Cessna
A Textron Company

Service Manual

1977 Thru 1986

MODEL 206 & T206 SERIES

Member of GAMA

FAA APPROVAL HAS BEEN OBTAINED ON TECHNICAL DATA IN THIS PUBLICATION THAT AFFECTS AIRPLANE TYPE DESIGN.

REVISION 3 TO THE BASIC MANUAL INCORPORATES TEMPORARY REVISION 1, DATED 3 OCTOBER 1994

1 APRIL 1985

D2070-3-13
(RGI-200-10/01)

REVISION 3

2 JANUARY 1996

TEMPORARY REVISION NUMBER 8

DATE July 1, 2007

MANUAL TITLE	**Model 206 and T206 (1977-1986) Service Manual**
MANUAL NUMBER - PAPER COPY	**D2070-3-13**
MANUAL NUMBER - AEROFICHE	**D2070-3-13AF**
TEMPORARY REVISION NUMBER	**D2070-3TR8**

MANUAL DATE **1 April 1985** **REVISION NUMBER** **3** **DATE** **2 January 1996**

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche and CD information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
5	4	1D19			
5	4A	ADD			
5	4B	ADD			

REASON FOR TEMPORARY REVISION

1. Incorporated inspection of flat spring main landing gear (Section 5).

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

1. For Paper Publications, file this cover sheet behind the publication's title page to identify the inclusion of the Temporary Revision into the manual. Insert the new pages into the publication at the appropriate locations and remove and discard the superseded pages.

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3. For CD publications, mark the temporary revision part number on the CD label with permanent red marker. This will be a visual identifier that the temporary revision must be referenced when the content of the CD is being used. Temporary revisions should be collected and maintained in a notebook or binder near the CD library for quick reference.

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A Textron Company

TEMPORARY REVISION NUMBER 7

DATE 1 September 2004

MANUAL TITLE Model 206 & T206 Series 1977 Thru 1986 Service Manual

MANUAL NUMBER - PAPER COPY D2070-3-13

MANUAL NUMBER - AEROFICHE D2070-3-13AF

TEMPORARY REVISION NUMBER D2070-3TR7

MANUAL DATE 1 April 1985 **REVISION NUMBER** 3 **DATE** 2 January 1996

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
2	26	1/C10			
2	27	1/C11			
2	28	1/C12			
2	29	1/C13			
2	30	1/C14			
2	31	1/C15			
2	32	1/C16			
2	33	1/C17			
2	34	1/C18			
2	35	1/C19			
2	36	1/C20			

REASON FOR TEMPORARY REVISION

1. To change references from FAR to 14 CFR.
2. To make miscellaneous typographical corrections.
3. To correct interval requirements that were deleted in previous temporary revisions

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

1. For Paper Publications, file this cover sheet behind the publication's title page to identify the inclusion of the Temporary Revision into the manual. Insert the new pages into the publication at the appropriate locations and remove and discard the superseded pages.

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TEMPORARY REVISION NUMBER 6

DATE 5 April 2004

MANUAL TITLE Model 206 & T206 Series 1977 Thru 1986 Service Manual

MANUAL NUMBER - PAPER COPY D2070-3-13

MANUAL NUMBER - AEROFICHE D2070-3-13AF

TEMPORARY REVISION NUMBER D2070-3TR6

MANUAL DATE 1 April 1985 **REVISION NUMBER** 3 **DATE** 2 January 1996

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
2	31	1/C15			
2	32	1/C16			
2	36	1/C20			

REASON FOR TEMPORARY REVISION

1. To revise the cleaning and inspection interval for the engine fuel injection nozzles and to add the inspection interval for the magnetos.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

1. For Paper Publications, file this cover sheet behind the publication's title page to identify the inclusion of the Temporary Revision into the manual. Insert the new pages into the publication at the appropriate locations and remove and discard the superseded pages.

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Cessna
A Textron Company

TEMPORARY REVISION NUMBER 5

DATE 6 January 2003

MANUAL TITLE 1977 Thru 1986 Model 206 & T206 Series Service Manual

MANUAL NUMBER - PAPER COPY D2070-3-13

MANUAL NUMBER - AEROFICHE D2070-3-13AF

TEMPORARY REVISION NUMBER D2070-3TR5

MANUAL DATE 1 April 1985 **REVISION NUMBER** 3 **DATE** 2 January 1996

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
2	31	1/C15			
2	32	1/C16			
2	32A/Deleted	NA			
2	37	1/C21			
2	38	1/C22			
2	38A	Added			
16	19	2/I01			
16	21	2/I03			
16	22	2/I04			
16	22A	Added			
16	22B	Added			
16	22C	Added			

REASON FOR TEMPORARY REVISION

1. To add a Component Time Limits section and a fuel quantity indicating system operational test.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

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TEMPORARY REVISION NUMBER 4

DATED 7 January 2000

MANUAL TITLE 1977 THRU 1986 MODEL 206 & T206 SERIES SERVICE MANUAL

MANUAL NUMBER - PAPER COPY D2070-3-13 **AEROFICHE** D2070-3-13AF

TEMPORARY REVISION NUMBER PAPER COPY D2070-3TR4 **AEROFICHE** N/A

MANUAL DATE 1 APRIL 1985 **REVISION NUMBER** 3 **DATE** 2 JANUARY 1996

This Temporary Revision consists of the following pages, which affect existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
2	32A	Added			

REASON FOR TEMPORARY REVISION

To include the inspection requirements of Cessna Service Bulletin SEB99-18.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

For Paper Publications:

File this cover sheet behind the publication's title page to identify the inclusion of the Temporary Revision into the manual. Insert the new pages into the publication at the appropriate locations. Draw a line, with a permanent red ink marker, through any superceded information.

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TEMPORARY REVISION NUMBER 3

DATED October 19, 1998

MANUAL TITLE 1977 THRU 1986 MODEL 206 & T206 SERIES SERVICE MANUAL

MANUAL NUMBER - PAPER COPY D2070-3-13 **AEROFICHE** D2070-3-13AF

TEMPORARY REVISION NUMBER - PAPER COPY D2070-3TR3-13 **AEROFICHE** N/A

MANUAL DATE 1 APRIL 1985 **REVISION NUMBER** 3 **DATE** 2 JANUARY 1996

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

CHAPTER/ SECTION/ SUBJECT	PAGE	AEROFICHE FICHE/FRAME	CHAPTER/ SECTION/ SUBJECT	PAGE	AEROFICHE FICHE/FRAME
	2-26	1-C10		2-53	1-D13
	2-27	1-C11		2-54	1-D14
	2-28	1-C12		2-55	1-D15
	2-29	1-C13		2-56	1-D16
	2-30	1-C14		2-57	1-D17
	2-31	1-C15		2-58	1-D18
	2-32	1-C16		2-59	1-D19
	2-33	1-C17		2-60	1-D20
	2-34	1-C18		2-61	1-D21
	2-35	1-C19		2-62	1-D22
	2-36	1-C20		2-63	1-D23
	2-43	1-D03		2-64	1-D24
	2-44	1-D04		2-65	1-E01
	2-45	1-D05		2-66	1-E02
	2-46	1-D06		2-67	1-E03
	2-47	1-D07		2-68	1-E04
	2-48	1-D08		2-69	1-E05
	2-49	1-D09		2-70	1-E06
	2-50	1-D10		2-71	1-E07
	2-51	1-D11		2-72	1-E08
	2-52	1-D12			

REASON FOR TEMPORARY REVISION

To add 10 year replacement of S1495 hoses.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

For Paper Publications:

File this cover sheet behind the publication's title page to identify the inclusion of the temporary revision in the manual. Insert the new pages in the publication at the appropriate locations and remove and discard the superseded pages.

For Aerofiche Publications:

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TEMPORARY REVISION NUMBER 2

DATED 2 February, 1998

MANUAL TITLE MODEL 206 SERIES 1977 THRU 1986 SERVICE MANUAL

MANUAL NUMBER - PAPER COPY D2070-3-13 **AEROFICHE** D2070-3-13AF

TEMPORARY REVISION NUMBER - PAPER COPY D2070-3TR2-13 **AEROFICHE** N/A

MANUAL DATE 1 April, 1985 **REVISION NUMBER** 3 **DATE** 2 January, 1996

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

CHAPTER/ SECTION/ SUBJECT	PAGE	AEROFICHE FICHE/FRAME	CHAPTER/ SECTION/ SUBJECT	PAGE	AEROFICHE FICHE/FRAME
2	34	1-C18	2	63	1-D23
2	36	1-C20	2	64	1-D24
2	49	1-D09	2	71	1-E07
2	50	1-D10	2	72	1-E08
2	55	1-D15			
2	56	1-D16			

REASON FOR TEMPORARY REVISION

To add Parker Hannifin Vacuum Manifold Check Valve inspection/replacement times to inspection section.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

For Paper Publications:

File this cover sheet behind the publication's title page to identify inclusion of the temporary revision in the manual. Insert the new pages in the publication at the appropriate locations and remove and discard the superseded pages.

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LIST OF EFFECTIVE PAGES

INSERT LATEST REVISED PAGES. DESTORY SUPERSEDED PAGES.

NOTE

The portion of the text affected by the revision is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands.

Original	0	1 April 1985
Revision	1	4 Nov 1985
Revision	2	3 March 1992
Revision	3	2 January 1996

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 720

*** The asterisk indicates pages revised, added, or deleted by current revision.**

Page No.	Revision No.
*Title	3
*A thru B	3
*C Blank	3
i	1
*ii thru iv	3
1-1	1
1-2 thru 1-3	0
1-4 thru 1-14	1
1-15 thru 1-21	2
1-22 Blank	2
2-1	3
2-2 thru 2-7	0
2-8	1
*2-8A	3
*2-8B Blank	3
2-9	1
2-10	0
*2-11 thru 2-12	3
2-13 thru 2-14	1
2-15	2
2-16 thru 2-18	1
2-19	0
2-20	1
2-21	0
2-22 thru 2-24	1
2-25	2
*2-26 thru 2-36	3
2-37 thru 2-42	2
*2-43 thru 2-72	3
3-1	1
3-1A Blank	1
*3-1B	3
3-2 thru 3-16	0
*3-16A	2
*3-16B Blank	2
3-17 Thru 3-45	0
3-46 Blank	0

Page No.	Revision No.
4-1	1
4-2	0
4-2A	0
4-2B Blank	0
4-3 thru 4-7	0
4-8 Blank	0
5-1	3
5-2 thru 5-15	0
*5-16	3
5-17 thru5-29	0
5-30	1
5-31	0
*5-32	3
6-1	1
6-2 thru 6-10	0
7-1	1
7-2 thru 7-10	0
8-1	1
8-2 thru 8-7	0
8-8 Blank	0
9-1	1
9-2 thru 9-14	0
10-1	1
10-2 thru 10-7	0
10-8 Blank	0
11-1	1
11-2 thru 11-3	0
11-4 Blank	0
12-1 thru 12-2	1
12-3 thru 12-19	0
12-20	1
12-21	0
12-22	1
12-23 thru 12-29	0
12-30 thru 12-32	1
12-33 thru 12-37	0
12-38 Blank	0

LIST OF EFFECTIVE PAGES

Page No.	Revision No.
12A-1 thru 12A-2	1
12A-3 thru 12A-11	0
12A-12	1
12A-13 thru 12A-16	0
12A-16A	0
12A-16B Blank	0
12A-17 thru 12A-32	0
13-1	1
13-2 thru 13-3	0
13-4	2
13-5 thru 13-12	0
13-12A	0
13-12B Blank	0
13-13 thru 13-16	0
13-16A	0
13-16 B Blank	0
13-17 thru 13-19	0
13-20	2
13-20A	2
13-20B Blank	2
13-21 thru 13-26	0
14-1	1
14-2 thru 14-9	0
14-10 Blank	0
15-1	1
15-2 thru 15-7	0
15-8	1
15-8A thru 15-8B	1
15-9 thru 15-10	1
15-11 thru 15-20	0
15-21	1
15-22 Blank	1
16-1	1
16-2 thru 16-17	0
16-18	1
16-18A thru 16-18D	0
16-19	3
16-20	1
16-21 thru 16-22	3
16-22A thru 16-22B	3
16-23 thru 16-32	1
17-1	1
*17-2	3
17-3 thru 17-14	0
*17-15	3
17-16 thru 17-52	0
17-52A	0
17-52B Blank	0
17-53 thru 17-61	0
*17-62	3
17-63 thru 17-66	0
17-67 thru 17-67	1
*17-68	3
17-69 thru 17-71	0
17-72 thru 17-73	1
17-74 Blank	1
18-1	1
18-2	0
18-3	1
18-3A thru 18-3B	1
18-4 Blank	1
18-4A	1
18-4 thru 18-4D	0
18-5 thru 18-34	0
19-1	1
19-2 thru 19-6	0
20-1 thru 20-2	1
20-3 thru 20-4	0
20-4A	0
20-4B Blank	0
20-5 thru 20-118	0
20-118A	0
20-118B Blank	0
20-119 thru 20-122	0
20-122A thru 20-122B	0
20-123 thru 20-124	0
20-124A thru 20-124B	0
20-125 thru 20-134	0
20-134A thru 20-134B	0
20-135 thru 20-138	0
20-138A	0
20-138B Blank	0
20-139 thru 20-160	0
*20-161	3
*20-162 Blank	3

Upon receipt of a revision to this book, personnel responsible for maintaining this publication in current status should ascertain that all previous revisions have been received and incorporated.

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WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

CROSS REFERENCE LISTING
OF POPULAR NAME VS. MODEL NUMBER AND SERIALS

All aircraft regardless of manufacturer, are certificated under model number designations. However, popular names are often used for marketing purposes. To provide a consistent method of referring to these aircraft, the model number will be used in this publication unless the popular name is necessary to differentiate between versions of the same basic model. The following table provides a listing of popular name, model number, and serial number.

POPULAR NAME	MODEL YEAR	MODEL	SERIAL BEGINNING	SERIAL ENDING
STATIONAIR STATIONAIR II TURBO STATIONAIR TURBO STATIONAIR II	1977	U206G	U20603522	U20604074
STATIONAIR 6 TURBO STATIONAIR 6 STATIONAIR 6 II TURBO STATIONAIR 6 II	1978	U206G	U20604075	U20604649
STATIONAIR 6 TURBO STATIONAIR 6 STATIONAIR 6 II TURBO STATIONAIR 6 II	1979	U206G	U20604650	U20605309
STATIONAIR 6 STATIONAIR 6 II TURBO STATIONAIR 6 TURBO STATIONAIR 6 II	1980	U206G	U20605310	U20605919
STATIONAIR 6 STATIONAIR 6 II TURBO STATIONAIR 6 TURBO STATIONAIR 6 II	1981	U206G	U20605920	U20606439
STATIONAIR 6 STATIONAIR 6 II TURBO STATIONAIR 6 TURBO STATIONAIR 6 II	1982	U206G	U20606440	U20606699
STATIONAIR 6 STATIONAIR 6 II TURBO STATIONAIR 6 TURBO STATIONAIR 6 II	1983	U206G	U20606700	U20606788
STATIONAIR 6 STATIONAIR 6 II TURBO STATIONAIR 6 TURBO STATIONAIR 6 II	1984	U206G	U20606789	U20606846
STATIONAIR 6	1985	U206G	U20606847	U20606920
STATIONAIR 6 -WITH VALUE GROUP A TURBO STATIONAIR 6 TURBO STATIONAIR 6 - WITH VALUE GROUP A	1986	U206G	U20606921	U20607020

INTRODUCTION

This manual contains factory-recommended procedures and instructions for ground handling, servicing, and maintaining Cessna Model 206 and TU206 - Series aircraft. Besides serving as a reference for the experienced mechanic, this book also covers step-by-step procedures for the less experienced.

Information for Nav-O-Matic Autopilots, Electronic Communications, and Navigation Equipment are not included in this manual These manuals are available from Cessna Parts Distribution (CPD 2).

AEROFICHE

This service manual is designed for aerofiche presentation. To facilitate the use of the aerofiche, refer to the aerofiche header for basic information.

KEEPING CESSNA PUBLICATIONS CURRENT

The information in this publication is based on data available at the time of publication and is updated, supplemented, and automatically amended by all information issued in Service News Letters, Service Bulletins, Supplier Service Notices, Publication Changes, Revisions, Reissues and Temporary Revisions. All such amendments become part of and are specifically incorporated within this publication. Users are urged to keep abreast of the latest amendments to this publication through information available at Cessna Authorized Service Stations or through the Cessna Product Support subscription which provide disassembly, overhaul, and parts breakdowns for some of the various suppliers equipment items. Suppliers publications are updated, supplemented, and specifically amended by supplier issued revisions and service information which may be reissued by Cessna; thereby automatically amending this publication and is communicated to the field through Cessna Authorized Service Stations and/or Cessna subscription service.

WARNING

ALL INSPECTION INTERVALS, REPLACEMENT TIME LIMITS, OVERHAUL TIME LIMITS, THE METHOD OF INSPECTION, LIFE LIMITS, CYCLE LIMITS, ETC., RECOMMENDED BY CESSNA ARE SOLELY BASED ON THE USE OF NEW, REMANUFACTURED, OR OVERHAULED CESSNA APPROVED PARTS. IF PARTS ARE DESIGNED, MANUFACTURED, REMANUFACTURED, OVERHAULED, PURCHASED, AND/OR APPROVED BY ENTITIES OTHER THAN CESSNA, THEN THE DATA IN CESSNAS MAINTENANCE/SERVICE MANUALS NO LONGER APPLICABLE AND THE PURCHASER IS WARNED NOT TO RELY ON SUCH DATA FOR NON-CESSNA PARTS. ALL INSPECTION INTERVALS REPLACEMENT TIME LIMITS, OVERHAUL TIME LIMITS, THE METHOD OF INSPECTION, LIFE LIMITS, CYCLE LIMITS, ETC., FOR SUCH NON-CESSNA PARTS MUST BE OBTAINED FROM THE MANUFACTURER AND/OR SELLER OF SUCH NON-CESSNA PARTS.

REVISIONS/CHANGES. These are issued to the Cessna Service Station by Cessna Aircraft Company for this publication as required, and include only pages that require updating.

REISSUE. Manual is reissued to Service Stations as required, and is a complete manual incorporating all the latest information and outstanding revisions/changes. It supersedes and replaces previous issue(s).

REVISIONS, CHANGES and REISSUES can be purchased from your Cessna Service Station or directly from the Cessna Parts Distribution, (CPD 2) Dept 701, Cessna Aircraft Company, 5800 East Pawnee, Wichita, Kansas 67201.

All supplemental service information concerning this manual is supplied to all Cessna Service Stations so that they have the latest authoritative recommendations for servicing these Cessna aircraft. Therefore, it is recommended that Cessna owners utilize the knowledge and experience of the factory-trained Service Station Organization.

CUSTOMER CARE SUPPLIES AND PUBLICATIONS CATALOG

A Customer Care Supplies and Publications Catalog is available from your Cessna Service Station or directly from the Cessna Parts Distribution, (CPD 2), Dept. 701, Cessna Aircraft Company, 5800 East Pawnee, Wichita Kansas 67201. The Supplies and Publications catalog lists all publications and Customer Care Supplies available from Cessna for prior year models as well as new products.

SUPPLEMENTAL TYPE CERTIFICATE INSTALLATIONS

Inspection, maintenance and parts required for (STC) installations are not included in this manual. When an STC installation is incorporated on the aircraft, those portions of the aircraft affected by the installation must be inspected in accordance with the inspection program published by the owner of he STC. Since STC installations may change systems interface, operating characteristics and component loads or stress on adjacent structures. Cessna provided inspection criteria may not be valid for aircraft with STC installations.

CUSTOMER COMMENTS ON MANUAL

Cessna Aircraft Company has endeavored to furnish you with an accurate, useful, up-to-date manual. This manual can be improved with your help. Please use the return card, provided with your manual, to report any errors, discrepancies, and omissions in this manual as well as any general comments you wish to make.

SECTION 1

GENERAL DESCRIPTION

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1-1. GENERAL DESCRIPTION.

1-2. STATIONAIR 6 AND TURBO STATIONAIR 6 SERIES.

1-3 DESCRIPTION. Cessna Stationair 6 and Turbo Stationair 6 Series airplanes, described in the manual, are single-engine, high-wing, strut-braced monoplanes of all-metal, semimonocoque construction. These airplanes are equipped with a fixed tricycle landing gear employing spring-steel main landing gear struts and a steerable nose gear with an air/hydraulic fluid shock strut. Wing flaps are electrically-actuated. Both the Stationair 6 and Turbo Stationair 6 Series airplanes are equipped with large double cargo doors on the right side of the cabin. The seating arrangement of these airplanes consists of six individual seats. Both Stationair 6 and Turbo Stationair 6 Series airplanes are powered by a six-cylinder, horizontally opposed, air-cooled fuel injected Continental engine, driving an all-metal constant speed propeller. In addition the Turbo Stationair 6 engines are turbocharged.

1-4. AIRCRAFT SPECIFICATIONS. Leading particulars of these airplanes, with dimensions based on gross weight, are given in figure 1-1. If these dimensions are used for constructing a hangar or computing clearances, remember that such factors as nose gear strut inflation, tire pressure, tire sizes and load distribution may result in some dimensions that are considerably different from those listed.

1-5. STATIONS. A station diagram is shown in figure 1-2 to assist in locating equipment when a written description is inadequate or impractical.

MODEL U206 AND TU206 SERIES

GROSS WEIGHT (Takeoff and Landing)		
*Landplane	3600 Lbs.	
*Floatplane	3500 Lbs.	
*Amphibian	3600 Lbs.	
Standard Wing (Total)	61 Gal.	
Standard Wing (Usable)	59 Gal.	Thru Serial
Long Range Wing (Total)	80 Gal.	U20604649
Long Range Wing (Usable)	76 Gal.	
Wet Wing (Total)	92 Gal.	Beginning Serial
Wet Wing (Usable)	88 Gal.	U20604650
OIL CAPACITY		
(Without External Filter)	12 Qt.	
(With External Filter)	13 Qt.	
ENGINE MODEL		
U206 (Refer to Section 12 for Engine Data)	Continental IO-520 Series	
TU206 (Refer to Section 12A for Engine Data)	Continental TSIO-520 Series	
PROPELLER		
Three Blades (Standard)	80" McCauley	
MAIN WHEEL TIRES (Standard)	6.00 x 6	
Pressure	42 Psi	
MAIN WHEEL TIRES (Optional)	8.00 x 6	
Pressure	35 Psi	
NOSE WHEEL Tire (Standard)	5.00 x 5	
Pressure	49 Psi	
NOSE WHEEL Tire (Optional)	6.00 x 6	
Pressure	29 Psi	
NOSE GEAR STRUT PRESSURE (Strut Extended)	80 Psi	
WHEEL ALIGNMENT (At Empty Weight)		
Camber	4° ± 1°30'	
Toe-in	0" to .06"	
AILERON TRAVEL		
Up	21° ± 2°	
Down	14° 30' ± 2°	
WING FLAP TRAVEL	0° to 40°, +1° -2°	
RUDDER TRAVEL (Measured Parallel To Water Line)		
Right	24° ± 1°	
Left	24° ± 1°	
RUDDER TRAVEL (Measured Perpendicular To Hinge Line)		
Right	27° 13' ± 1°	
Left	27° 13' ± 1°	
ELEVATOR TRAVEL		
Up	21° ± 1°	
Down	17° ± 1°	
ELEVATOR TRIM TAB TRAVEL		
Up	25° +1 -0°	
Down	5° +1 -0°	
PRINCIPAL DIMENSIONS		
Wing Span (Conical-Camber Wing Tip)	432.00" ★	
Tail Span	156.32"	
Length (U206)	333.60"	
(TU206)	336.60"	
Fin Height (Maximum With Nose Gear Depressed And Flashing Beacon Installed on Fin)	101.65"	
Track Width	97.70"	
BATTERY LOCATION (12V)	Left Side Of Firewall	
(24V)	Left Side Of Firewall	

★ Measured with strobe lights installed.
* Refer to appropriate Pilot's Operating Handbook for Takeoff and Landing weights prior to 1985.

Figure 1-1. Aircraft Specifications

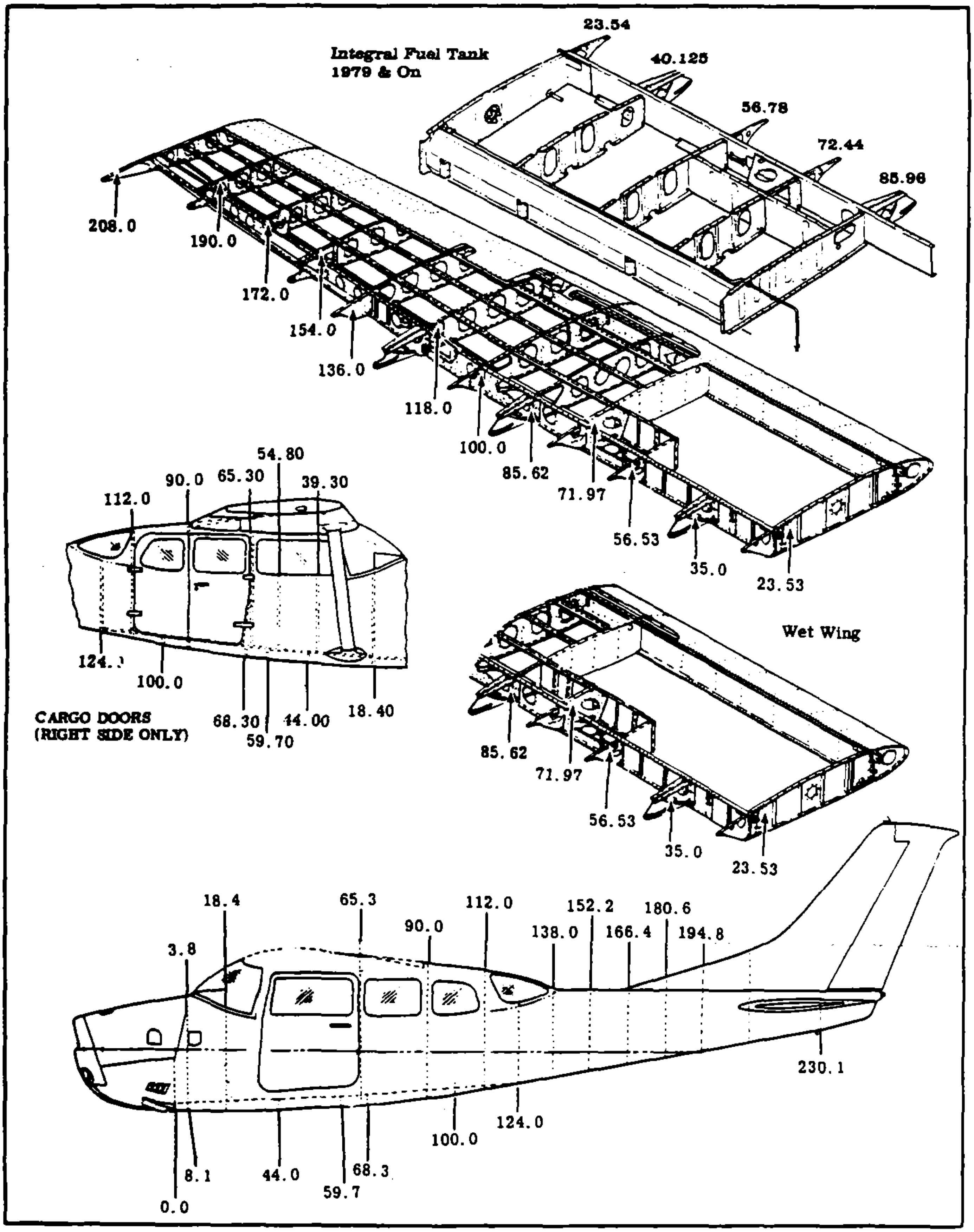


Figure 1-2. Wing and Fuselage Reference Stations

1-6. GENERAL. This chapter deals with general torque and safetying practices used to ensure security of installation and prevent overstressing of components. Special torque values, when required, are specified with the specific component maintenance and installation instructions.

1-7. TORQUEING PROCEDURES. The importance of correct application cannot be overemphasized. Undertorque can result in unnecessary wear of nuts and bolts as well as parts they are holding together. When insufficient pressures are applied, uneven loads will be transmitted throughout assembly, which may result in excessive wear or premature failure due to fatigue. Overtorque can be equally damaging because of failure of a bolt or nut from overstressing threaded areas.

a. Calculating Torque. There are a few simple, but very important, procedures that should be followed to assure that correct torque is applied:

1. Calibrate torque wrench periodically to assure accuracy; and recheck frequently.

2. When using a torque wrench adapter which changes distance from torque wrench drive to adapter drive, the indicated reading must be adjusted for desired torque reading. (See Figure 1-2.)

3. Be sure that bolt and nut threads are clean and dry unless otherwise specified.

4. *Determine friction drag torque* and add to specified dry torque value to ensure proper bolt utilization.

(a) Hand-turn nut onto bolt until it stops.

(b) Using a torque wrench, measure running torque (torque required to turn nut on bolt).

(c) This running torque must be added to specified dry torque value to ensure proper bolt utilization.

EXAMPLE

Average running torque for a nut	= 15 in.-lbs.
Dry torque required	= 125 ±5 in.-lbs.
Final torque wrench reading	= 140 ±5 in.-lbs.

(d) Since running torque will become less due to nut/bolt re-use (in accepted applications), this procedure must be repeated each time.

(e) When necessary to tighten from bolt head, increase torque value by an amount equal to shank torque (torque required to turn bolt when installed). Measure with a torque wrench.

EXAMPLE

Average running torque for a nut	= 15 in.-lbs.
Average running shank torque for installed bolt	= 10 in.-lbs.
Dry torque required	= 125 ±5 in.-lbs.
Final torque wrench reading	= 150 ±5 in.-lbs.

b. Torque Values - Bolts and Nuts. (See Table 1-1.)

1. Tables included in this section do not apply to the following exceptions:

(a) Sheet metal screws should be tightened firmly, but with no specific torque value.

(b) Screws attached to nutplates should be tightened firmly, but with no specific torque value.

(c) Bolts, nuts, and screws used in control systems and installations where required torque would cause binding or interfere with proper operation of parts.

(d) Screws used with dimpled washers should not be drawn tight enough to eliminate washer crown.

(e) Fasteners that have a specified torque in a specific installation.

2. The values shown in Table 1-1 are based on parts being clean and dry with no lubricants added.

3. Castellated nuts requiring cotter pins should be tightened to low torque value. Torque can be increased to install cotter pin, but should never exceed maximum torque value.

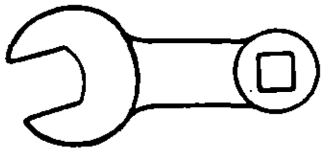
NOTE

Self-locking castellated nuts, MS17825 and MS17826, require a separate torque range. These values are shown separately in torque value tables.

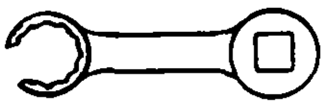
SHORT OPEN END ADAPTER

SETSCREW ADAPTER

HOSE CLAMP ADAPTER



OPEN-END WRENCH ADAPTER



FLARE NUT WRENCH ADAPTER

SPANNER WRENCH ADAPTER

NOTE

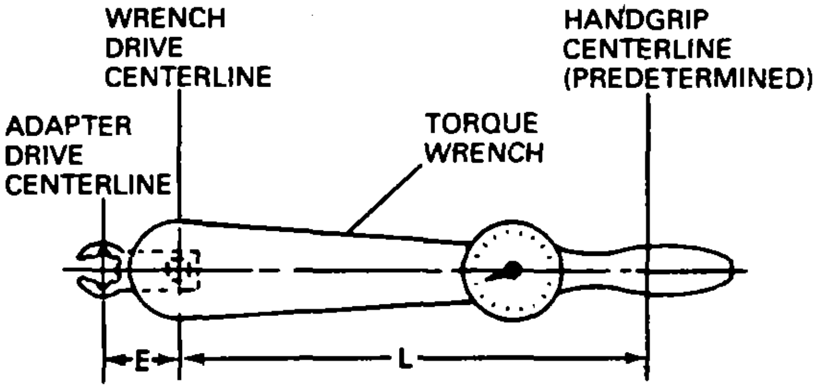
When using a torque wrench adapter which changes the distance from torque wrench drive to adapter drive, apply following formula to obtain corrected torque reading.

FORMULA

$$\frac{T \times L}{L + E} = Y$$

LEGEND

T = Desired Torque
Y = Indicated Torque
L = Effective Length Lever
E = Effective Length of Extension

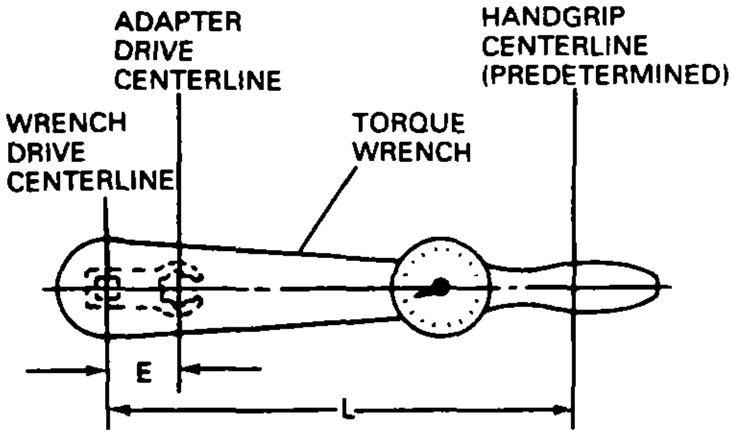


EXAMPLE

T = 135 In.-Lbs
Y = Unknown
L = 10.0 In.-Lbs
E = 1.5 In.

$$Y = \frac{135 \times 10}{10 + 1.5} = \frac{1350}{11.5} = 117.39$$

Y = 117 In.-Lbs



EXAMPLE

T = 135 In.-Lbs
Y = Unknown
L = 10.0 In.-Lbs
E = −1.5 In.

$$Y = \frac{135 \times 10}{10 - 1.5} = \frac{1350}{8.5} = 158.82$$

Y = 159 In.-Lbs

Figure 1-3. Torque Wrench Adapter Adjustment

BOLT TORQUE VALUES

	Tension	Shear
BOLTS	AN3 thru AN20 AN42 thru AN49 AN73 thru AN81 AN173 thru AN186 AN509NK9 AN525NK525 MS20033 thru MS20046 MS20073 MS20074 MS24694 MS27039	NOTE: Bolts in tension column may be used with shear nuts. Bolts in shear column should not be used unless a minimum of two threads extend beyond nut after installation.
NUTS	AN310 AN315 AN363 AN365 MS20365 MS20500 MS21045 NAS679 NAS1021	AN320 AN364 MS20364 NAS1022

	Tension	Shear
BOLTS	MS20004 thru MS20024 NAS144 thru NAS148 NAS172 NAS174 NAS333 thru NAS340 NAS585 thru NAS590 NAS624 thru NAS644 NAS1303 thru NAS1320 NAS517	NAS464
NUTS	AN310 AN315 NA363 AN365 MS20365 MS21045 NAS679 NAS1021 NAS1291	AN320 AN364 NAS1022 MS20364

FINE THREAD SERIES

Nut-bolt size	Torque Limits in.-lbs. MIN.	Torque Limits in.-lbs. MAX.	Torque Limits in.-lbs. MIN.	Torque Limits in.-lbs. MAX.
8-36	12	15	7	9
10-32	20	25	12	15
1/4-28	50	70	30	40
5/16-24	100	140	60	85
3/8-24	160	190	95	110
7/16-20	450	500	270	300
1/2-20	480	690	290	410
9/16-18	800	1000	480	600
5/8-18	1100	1300	660	780
3/4-16	2300	2500	1300	1500
7/8-14	2500	3000	1500	1800
1-14	3700	4500	2200	3300
1-1/8-12	5000	7000	3000	4200
1-1/4-12	9000	11000	5400	6600

FINE THREAD SERIES

Nut-bolt size	Torque Limits in.-lbs. MIN.	Torque Limits in.-lbs. MAX.	Torque Limits in.-lbs. MIN.	Torque Limits in.-lbs. MAX.
10-32	25	30	15	20
1/4-28	80	100	50	60
5/16-24	120	145	70	90
3/8-24	200	250	120	150
7/16-20	520	630	300	400
1/2-20	770	950	450	550
9/16-18	1100	1300	650	800
5/8-18	1250	1550	750	950
3/4-16	2650	3200	1600	1900
7/8-14	3550	4350	2100	2600
1-14	4500	5500	2700	3300
1-1/8-12	6000	7300	3600	4400
1-1/4-12	11000	13400	6600	8000

COURSE THREAD SERIES

Nut-bolt size	Torque Limits in.-lbs. MIN.	Torque Limits in.-lbs. MAX.	Torque Limits in.-lbs. MIN.	Torque Limits in.-lbs. MAX.
8-32	12	15	7	9
10-24	20	25	12	15
1/4-20	40	50	25	30
5/16-18	80	90	48	55
3/8-16	160	185	95	110
7/16-14	235	255	140	155
1/2-13	400	480	240	290
9/16-12	500	700	300	420
5/8-11	700	900	420	540
3/4-10	1150	1600	700	950
7/8-9	2200	3000	1300	1800
1-8	3700	5000	2200	3000
1-1/8-8	5500	6500	3300	4000
1-1/4-8	6500	8000	4000	5000

Nut-bolt size	MS17825 Torque Limits in.-lbs. MIN.	MS17825 Torque Limits in.-lbs. MAX.	MS17826 Torque Limits in.-lbs. MIN.	MS17826 Torque Limits in.-lbs. MAX.
10-32	28	35	16	20
1/4-28	65	80	35	45
5/16-24	180	225	70	90
3/8-24	260	325	100	125
7/16-20	460	575	180	225
1/2-20	720	900	240	300
9/16-18	880	1100	320	400
5/8-18	1300	1600	480	600
3/4-16	2200	2800	880	1100
7/8-14	3700	4600	1500	1900
1-14	5400	6800	2400	3000
1-1/8-12	8000	10000	4000	5000
1-1/4-12	11000	14000	5600	7000

Table 1-1. Torque Values - Bolts and Nuts

c. Torque Value - Threaded Straight Fittings.

NOTE

Tables in this section are for general applications. Refer to specific installations for special torque values and procedures.

1. Connectors installed in bosses with no required orientation should be installed using torque values given in Table 1-2.

THREADED CONNECTOR					
TUBE OUTSIDE DIAMETER (Inches)	THREAD	JAM-NUT Torque-Limits (in.-lbs.)		CONNECTOR w/ PACKING w/o JAM-NUT Torque-Limits (in.-lbs.)	
		MIN.	MAX.	MIN.	MAX.
1/8	5/16-24	35	50	50	55
3/16	3/8-24	65	80	65	75
1/4	7/16-20	85	105	95	105
5/16	1/2-20	105	125	125	135
3/8	9/16-18	120	150	155	165
1/2	3/4-16	240	280	280	305
5/8	7/7-14	320	380	380	405
3/4	1/16-12	500	600	550	600
1	1-5/16-12	720	880	800	900
1-1/4	1-5/8-12	960	1200	900	1000
1-1/2	1-7/8-12	1200	1440	900	1000
2	2-1/2-12	1400	1500	900	1000

Table 1-2. Torque Values
Jam-Nuts and Threaded Connector

2. Connectors installed in bosses requiring a specific orientation do not use a torque value, but use the following steps:

(a) Place jam-nut on fitting along with retainer and packing.

(b) Turn nut down until packing is firmly against lower threaded section of fitting.

(c) Install fitting into boss and tighten until there is a sudden increase in torque.

(d) Tighten fitting 1-1/2 turns.

(e) Orientation is accomplished by tightening fitting, but not exceeding one turn.

(f) Tighten jam-nut to torque values in Table 1-2.

3. Bulkhead fittings are installed with jam-nuts and should be torqued to values in Table 1-2.

4. Torque values for hose end fittings (nipple or nut) are given in Table 1-3.

TORQUE VALUE - HOSE ASSEMBLIES				
HOSE INSIDE DIAMETER	Nipple or Nut			
	ALUMINUM Torque-Limits in.-lbs.		STEEL Torque-Limits in.-lbs	
	MIN.	MAX.	MIN.	MAX.
1/8	20	30	75	85
3/16	25	35	95	105
1/4	50	65	135	150
5/16	70	90	170	200
3/8	110	130	270	300
1/2	230	260	450	500
5/8	330	360	650	700
3/4	460	500	900	1000
1	500	700	1200	1400
1-1/4	800	900	1520	1680
1-1/2	800	900	1900	2100
1-3/4	—	—	—	—
2	1800	2000	2660	2940

Table 1-3. Torque Values
Hose Assemblies

5. Torque values for straight threaded fittings used with rigid lines are given in Table 1-4.

THREADED STRAIGHT FITTING TORQUE VALUE (RIGID TUBE)													
	FLARED END						STRAIGHT END						
TUBE OUTSIDE DIAMETER	ALUMINUM Torque-Limits in-lbs.		ALUMINUM On Oxygen Lines Torque-Limits in-lbs		STEEL Torque-Limits in-lbs.		6061-0 ALUMINUM 5052-0 ALUMINUM Torque-Limits in-lbs.		STEEL Torque-Limits in-lbs.		6061-T(X) ALUMINUM w/ steel sleeve Torque-Limits in-lbs.		
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TUBE WALL	MIN.	MAX.
1 8							20	30	45	55			
3 16					90	100	30	40	90	100	0.028	45	55
1 4	40	65			135	150	40	65	135	150	0.022	80	105
											0.028	80	105
											0.035	80	105
											0.049	90	115
5 16	60	80	100	125	180	200	60	80	180	200	0.028	80	105
											0.035	80	105
											0.042	125	175
3 8	75	125			270	300	75	125	270	300	0.028	125	175
											0.035	125	175
											0.049	125	175
1 2	150	250			450	500	150	250	450	500	0.028	135	180
											0.035	200	300
											0.049	400	500
											0.058	400	500
											0.065	400	500
5 8	200	350			700	800	200	350	700	800	All	500	600
3 4	300	500			1100	1150	300	500	1100	1150	All	600	700
1	500	700			1200	1400	500	700	1200	1400	All	1000	1300
1-1 4	600	900			1300	1450	600	900	1300	1450	All	1300	1500
1-1 2	600	900			1350	1500	600	900	1350	1500	All	1400	1700
2							600	900	1500	1700			

Table 1-4. Torque Values - Straight Threaded Fittings (Line)

1-8. SAFETYING PROCEDURES. The use of safety wire, cotter pins, lockwashers, and self-locking nuts is to prevent relative movement of critical components subject to vibration, torque, tension, etc., which could cause attaching parts to be broken, loosened, and/or detached.

1-9. SAFETY WIRE PROCEDURES.

a. Identification. Lockwire comes in three types which are identified by size and color. The three types are classified by use.

1. Inconel and Monel wire is used for general lockwiring and is identified by a natural wire color.

(a) Inconel can withstand temperatures up to 1500°F.

(b) Monel can withstand temperatures up to 800°F.

2. Copper that is cadium-plated and dyed yellow is used for shear and seal wiring applications.

(a) Shear applications are those where it is necessary to break or shear wire to permit operation or actuation of emergency devices.

(b) Seal applications are where wire is used with a lead seal to prevent tampering or use of a device without indication.

3. Aluminum Alloy (Alclad 5056) is dyed blue and is used exclusively for safety-wiring magnesium parts.

4. Size of wire is dependent on material and purpose of installation.

(a) 0.020-inch diameter copper wire should be used for shear and seal application.

(b) 0.020-inch diameter wire may be used to lockwire parts with tie holes smaller than 0.045 inches; or, on parts with tie hole diameters between 0.045 and 0.062 when spacing between ports is less than two inches; or, when bolts and screws of 0.25-inch diameter or less are closely spaced.

(c) 0.032-inch minimum diameter wire is used for general purpose lockwiring.

NOTE

When using single-wire method of locking, the largest wire that will fit tie holes should be used.

b. Lockwire Installation. There are two basic forms of lockwiring. The single-wire method has limited application; the double-twist method is the common method of lockwiring.

1. Use new wire for each application; do not try to re-use old wire.

2. Single-wire method is accomplished by passing a single wire through tie holes and back with ends then twisted together. (See Figure 1-4.)

(a) Single-wire method is used for shear and seal wiring applications.

(b) Single-wire method can be used in closely spaced, closed geometric patterns. Closely spaced is defined as spacing two inches or less between centers of parts.

CAUTION

Screws in closely spaced geometric patterns which secure hydraulic or air seals, hold hydraulic pressure, or are used in critical areas should use double-twist method of lockwiring.

3. Lockwiring by the double-twist method is really one wire twisted on itself several times and is accomplished by the following steps (see Figure 1-4).

(a) Insert one end of wire through tie holes of bolt head and firmly loop around bolt head.

NOTE

This does not necessarily apply to castellated nuts when slot is close to top of nut. The wire will be more secure if it is made to pass along side of stud.

(b) While taut, twist strands to within 1/8 inch of next part. The twisting keeps wire taut without overstressing and prevents wire from becoming nicked, kinked, or mutilated.

(c) Lockwiring multiple groups by double-twist method is accomplished in a similar manner except twists between parts are alternated between clockwise and counterclockwise.

(d) After last tie hole, wire is twisted three to five times to form a pigtail.

(e) Cut off any excess wire and bend pigtail towards part.

4. When lockwiring widely spaced multiple groups by double-twist method, three units shall be the maximum number in a series.

NOTE

Widely spaced multiple groups shall mean those in which fasteners are from four to six inches apart. Lockwiring shall not be used to secure fasteners or fittings which are spaced more than six inches apart, unless tie points are provided on adjacent parts to shorten span of lockwire to less than six inches.

5. When lockwiring closely spaced multiple groups, the number of units that can be lockwired by a 24-inch length of wire shall be the maximum number in a series.

6. Parts should be lockwired so that wire is placed in tension (pulled on) if a part attempts to loosen.

c. Required Lockwire Installation Applications.

1. Bolts and other fasteners securing critical parts that affect airplane safety and operation.

(a) In blind-tapped hole applications or bolts or castellated nuts on studs, lockwiring is installed in same manner as described for bolt heads.

(b) Hollow head bolts are safetied in manner prescribed for regular bolts.

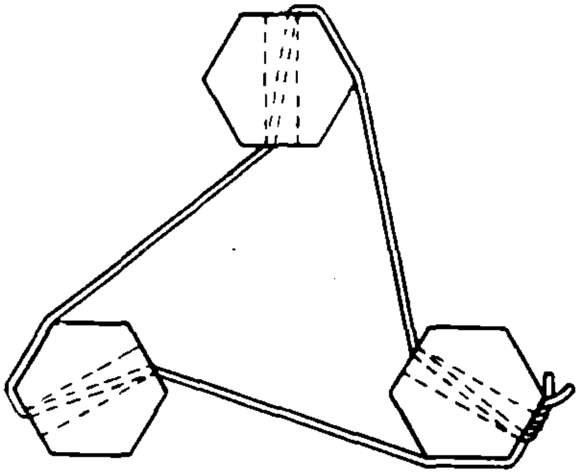
(c) Drain plugs and cocks may be safetied to a bolt, nut, or other part having a free tie hole in accordance with instructions described.

(d) External snap rings may be locked if necessary using general locking principles as described and illustrated. Internal snap rings should not be lockwired.

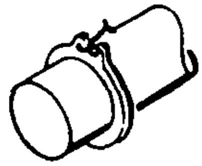
(e) When locking is required on electrical connectors which use threaded coupling rings, or on plugs which employ screws or rings to fasten individual parts of plug together, they shall be lockwired with 0.020-inch diameter wire in accordance with locking principles as described and illustrated. It is preferable to lockwire all electrical connectors individually. Do not lockwire one connector to another unless it is necessary to do so.

(f) Drilled head bolts and screws need not be lockwired if installed into self-locking nuts or installed with lockwashers. Castellated nuts with cotter pins or lockwire are preferred on bolts or studs with drilled shanks, but self-locking nuts are permissible within limitations described in Paragraph 1-13.

2. For new design, lockwire shall not be used to secure nor shall lockwire be dependent upon fracture as basis for operation of emergency devices such as handles, switches, and guard-covering handles that operate emergency mechanisms such as emergency exits, fire extingushers, emergency cabin pressure release, emergency landing gear release, and the like. However, where existing structural equipment or safety of flight emergency devices requires shear wire to secure equipment while not in use, but which are dependent upon shearing or breaking of lockwire for successful emergency operation of equipment, particular care exercised to assure that wiring under these circumstances shall not prevent emergency operations of these devices.



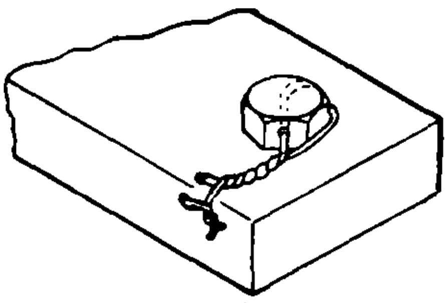
BOLTS IN CLOSELY SPACED, CLOSED GEOMETRICAL PATTERN. SINGLE- WIRE METHOD.



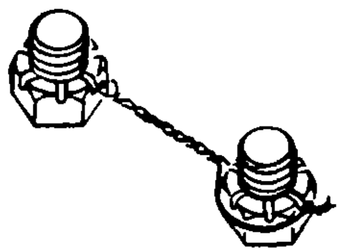
EXTERNAL SNAP RING SINGLE-WIRE METHOD

NOTE

RIGHT-HAND THREADED PARTS SHOWN. REVERSE DIRECTION FOR LEFT-HAND THREADS.



SINGLE FASTENER APPLICATION DOUBLE-TWIST METHOD



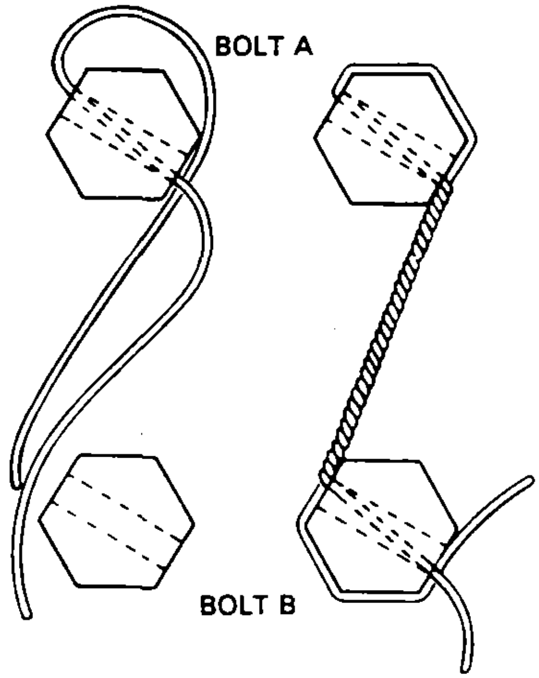
CASTELLATED NUTS ON DRILLED STUDS DOUBLE-TWIST METHOD

Figure 1-4. Lockwire Safetying (Sheet 1 of 2)

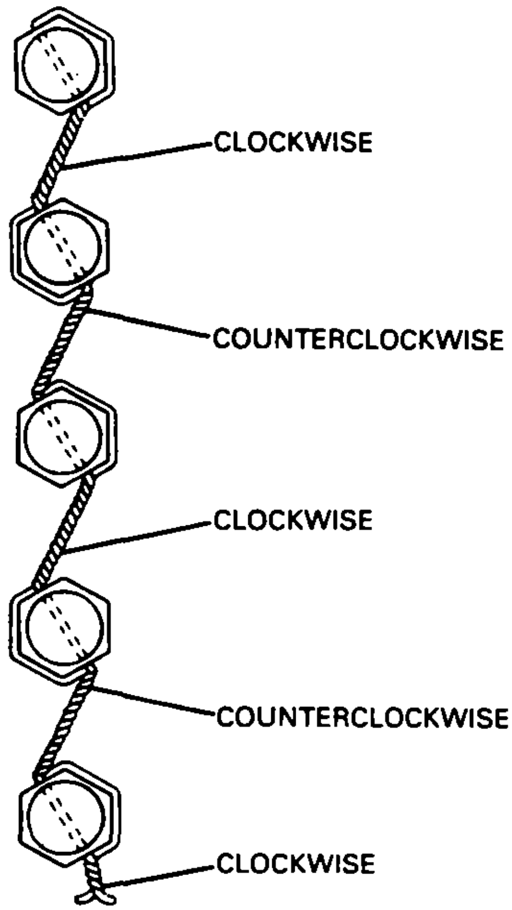
DOUBLE-TWIST METHOD

STEP 1. Insert wire through bolt A and bend around bolt (if necessary, bend wire across bolt head). Twist wires clockwise until they reach bolt B.

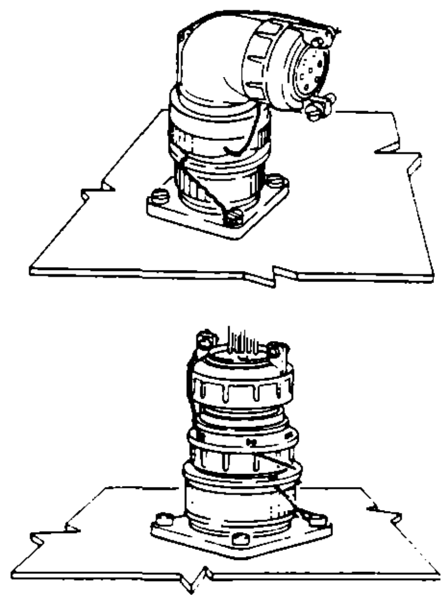
STEP 2. Insert one end of wire through bolt B. Bend other end around bolt (if necessary, bend wire across head of bolt). Twist wires counterclockwise 1/2 inch or six twists. *Clip ends. Bend pigtail back againt part.*



DOUBLE-TWIST METHOD



MULTIPLE FASTENER APPLICATION
DOUBLE-TWIST METHOD



ELECTRICAL CONNECTION

Figure 1-4. Lockwire Safetying (Sheet 2 of 2)

1-10. USE OF COTTER PINS.

a. Cotter Pin Installation. Castellated nuts and pins may be safetied with cotter pins or lockwire. The preferred method is to use cotter pins.

1. Select cotter pin material in accordance with temperature, atmosphere, and service limitations (see Table 1-5).

COTTER PINS (MS24665)		
MATERIAL	TEMP	USE
Carbon Steel	Up to 450°F	Pins that contact cadmium-plated surfaces. General Applications Normal Atmospheres
Corrosion-Resistant	Up to 800°F	Pins that contact corrosion-resistant steel. Corrosive atmospheres

Table 1-5. Cotter Pin Temperature and Use

2. Cotter pins shall be new upon each application.

3. When nuts are to be secured to fastener with cotter pins, tighten nut to low side (minimum) of applicable specified or selected torque range, unless otherwise specified, and if necessary, continue tightening until slot aligns with hole. In no case shall you exceed high side (maximum) torque range.

4. If more than 50 percent of cotter pin diameter is above nut castellation, a washer should be used under nut or a shorter fastener should be used. A maximum of two washers may be permitted under a nut.

5. The largest diameter cotter pin which hole and slots will accommodate should be used, but in no application to a nut, bolt, or screw shall pin size be less than sizes described in Table 1-6.

(6) Install cotter pin with head firmly in slot of nut with axis of eye at right angles to bolt shank. Bend prongs so that head and upper prong are firmly seated against bolt (see figure 1-5).

COTTER PIN - MINIMUM SIZE	
THREAD SIZE	MINIMUM PIN SIZE
6	0.028
8	0.044
10	0.044
1/4	0.044
5/16	0.044
3/8	0.072
7/16	0.072
1/2	0.072
9/16	0.086
5/8	0.086
3/4	0.086
7/8	0.086
1	0.086
1-1/8	0.116
1-1/4	0.116
1-3/8	0.116
1-1/2	0.116

Table 1-6. Cotter Pin Minimum Size

(7) In pin applications, install cotter pin with axis of eye parallel to shank of clevis pin or rod end. Bend prongs around shank of pin or rod end (see Figure 1-5).

CAUTION

Cadium-plated cotter pins should not be used in applications bringing them in contact with fuel, hydraulic fluid, or synthetic lubricants.

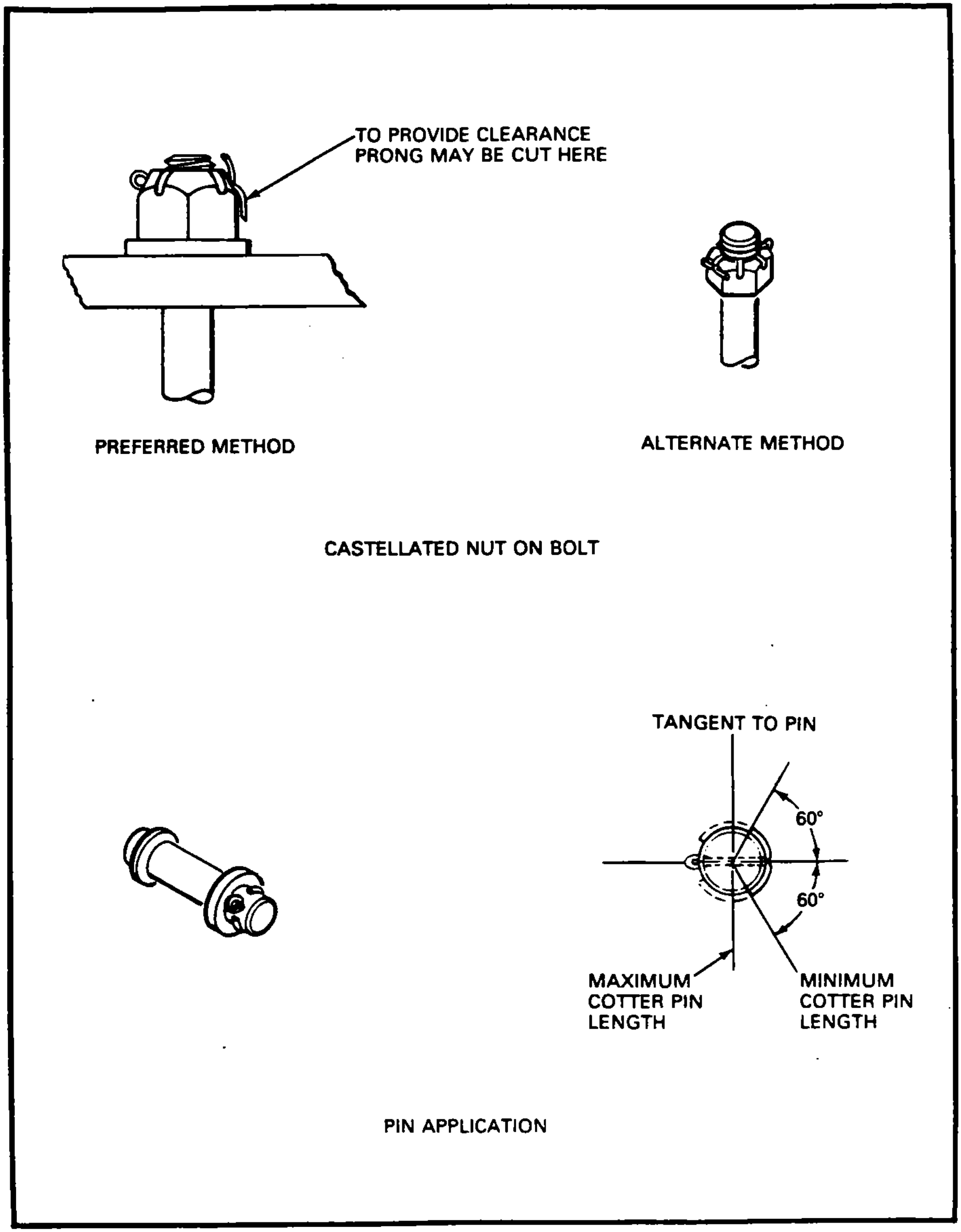


Figure 1-5. Installation of Cotter Pins

1-11. USE OF LOCKING CLIPS.

a. Safetying Turnbuckles. (See Figure 1-6.)

1. Prior to safetying, both threaded terminals shall be screwed an equal distance into turnbuckle body and shall be screwed in at least so far that not more than three threads of any terminal are exposed outside body.

2. After turnbuckle has been adjusted to its locking position, with slot indicator groove on terminals and slot indicator notch on body aligned, insert end of locking clip into terminal and body (refer to Figure 1-6) until U-curved end of locking clip is over hole in center of body.

(a) Press locking clip into hold to its full extent.

(b) Curved end of locking clip will expand and latch in body slot.

(c) To check proper seating of locking clip, attempt to remove pressed "U" end from body hole with fingers only.

NOTE

Do not use tool as locking clip could be distorted.

3. Locking clips are for one time use only and shall not be re-used.

4. Both locking clips may be inserted in same hole of turnbuckle body or in opposite holes of turnbuckle body.

1-12. USE OF LOCKWASHERS.

a. Lockwashers can be used only under the following conditions.

1. When self-locking feature cannot be provided in externally or internally threaded part.

2. When a cotter pin cannot be used to prevent rotation of internal threads with respect to external threads.

3. When lockwire cannot be used to prevent loosening of threaded parts.

4. When fastening is not used for fabrication of primary structure.

5. When loosening of threaded parts would not endanger safety of airplane or people.

6. When corrosion encouraged by gouging aluminum or magnesium alloys by edges of teeth on tooth-locked washers would not cause malfunctioning of parts being fastened together.

1-13. USE OF SELF-LOCKING NUTS.

a. Restrictions.

1. Self-locking nuts cannot be used under certain conditions.

(a) Used, reworked, or reprocessed nuts should not be installed for any application.

(b) Do not use if at joints in control systems for singular attach points.

(c) Do not use on externally threaded parts that serve as an axle of rotation for another part where tensional (torque) loads can cause nut to loosen and/or become separated. Examples are pulleys, levers, linkages, and cam followers.

NOTE

Self-locking nuts can be used when threaded parts are held by a positive locking device that requires shearing or rupture before torsional loads can act on threaded parts.

(d) Do not use where a loose nut, bolt, or screw could fall or be drawn into an area that would impede or damage or otherwise distort operation.

(e) Do not use to attach access panels and doors or to assemble components that are routinely disassembled or removed for access and servicing.

(f) In general, do not use self-locking nuts where loss of bolt affects safety of flight.

2. Bolts, studs, or screws, excluding Hi-Locks, must extend through self-locking nut for a length equivalent of two threaded pitches. This length includes chamfer.

3. Self-locking nuts which are attached to structure shall be attached in a positive manner to eliminate possibility of their rotation or misalignment when tightening is to be accomplished by rotating bolts to structure, and permit replacement of nuts.

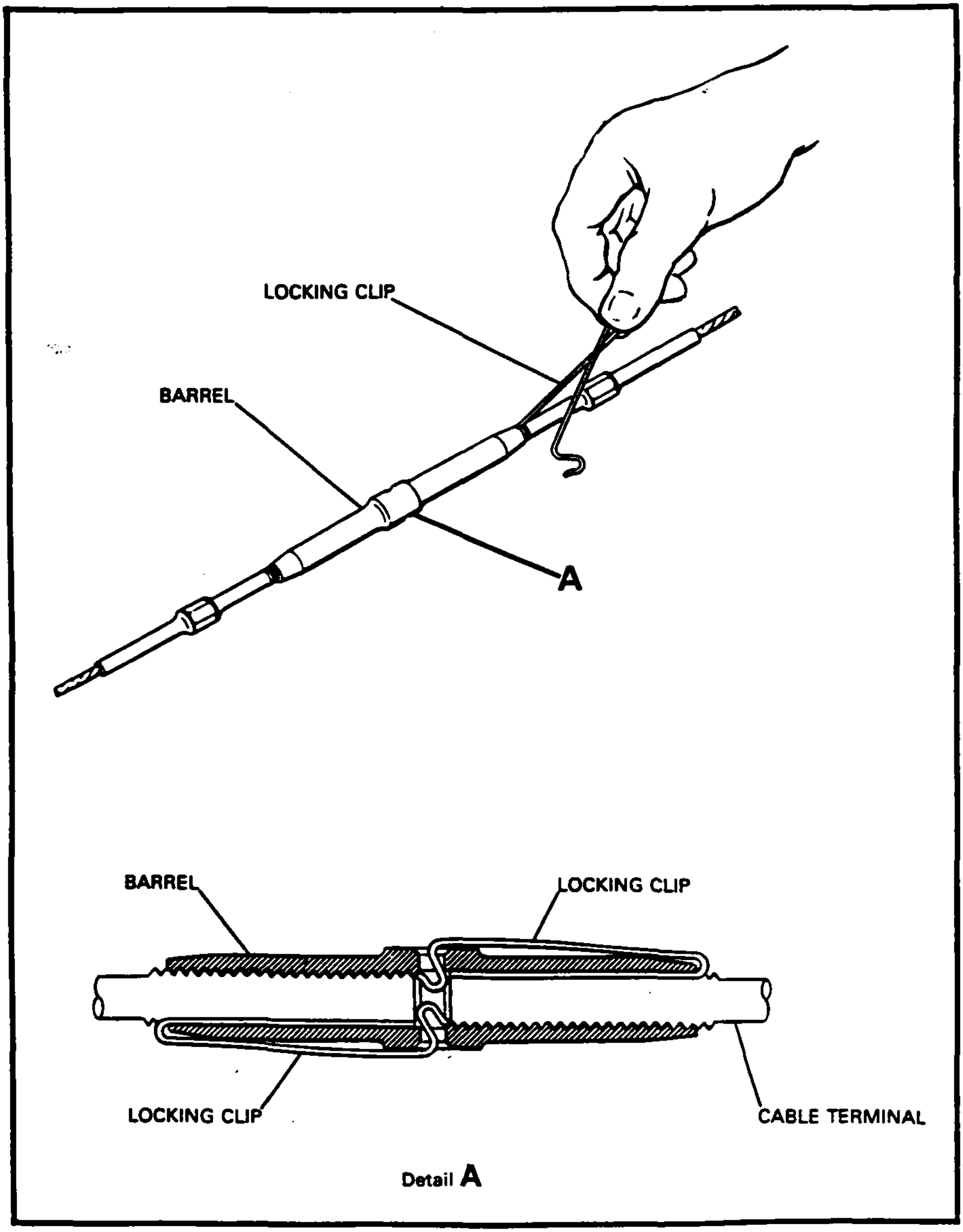


Figure 1-6. Safetying Turnbuckle Assemblies

1-14. CONTROL CABLE WIRE BREAKAGE AND CORROSION LIMITATIONS.

a. Inspection of Control Cables.

1. Control cable assemblies are subject to a variety of environmental conditions and forms of deterioration that ultimately may be easy to recognize such as wire/strand breakage, or the not so readily visible types ofdeterioration including corrosion and/or distortion. Thefollowing information will aid in detecting these cable conditions.

2. Broken Wire.

(a) Examine cables for broken wires by passing a cloth along length of cable. This will detect broken wires, if cloth snags on cable. Critical areas for wire breakage are those sections of cable which pass through fairleads, across rob blocks, and around pulleys.If no snags are found, then no further inspection is required. If snags are found or broken wires are suspected, then a more detailed inspection is necessary which requires that the cables be bent in a loop to confirm broken wires (refer to figure 1-7). Loosen or remove cable to allow it to be bent in a loop as shown. While rotating cable, inspect bent area for broken wires.

(b) Wire breakage criteria for cables in flap, aileron, rudder, and elevator systems are as follows:

(1) Individual broken wires are acceptable in primary and secondary control cables at random locations when there are no more than six broken wires in any given ten-inch cable length.

3. Corrosion.

(a) Carefully examine any cable for corrosion that has a broken wire in a section not in contact with wear-producing airframe components such as pulleys, fairleads, rub blocks, etc. It may be necessary to remove and bend cable to properly inspect it for internal strand corrosion as this condition is usually not evident on outer surface of cable. Replace cable if internal corrosion is found. If a cable has been wiped clean of its corrosion-preventive lubricant and metal-brightened, the cable shall be examined closely for corrosion. For description of control cable corrosion, refer to Chapter 51, Corrosion and Corrosion Control.

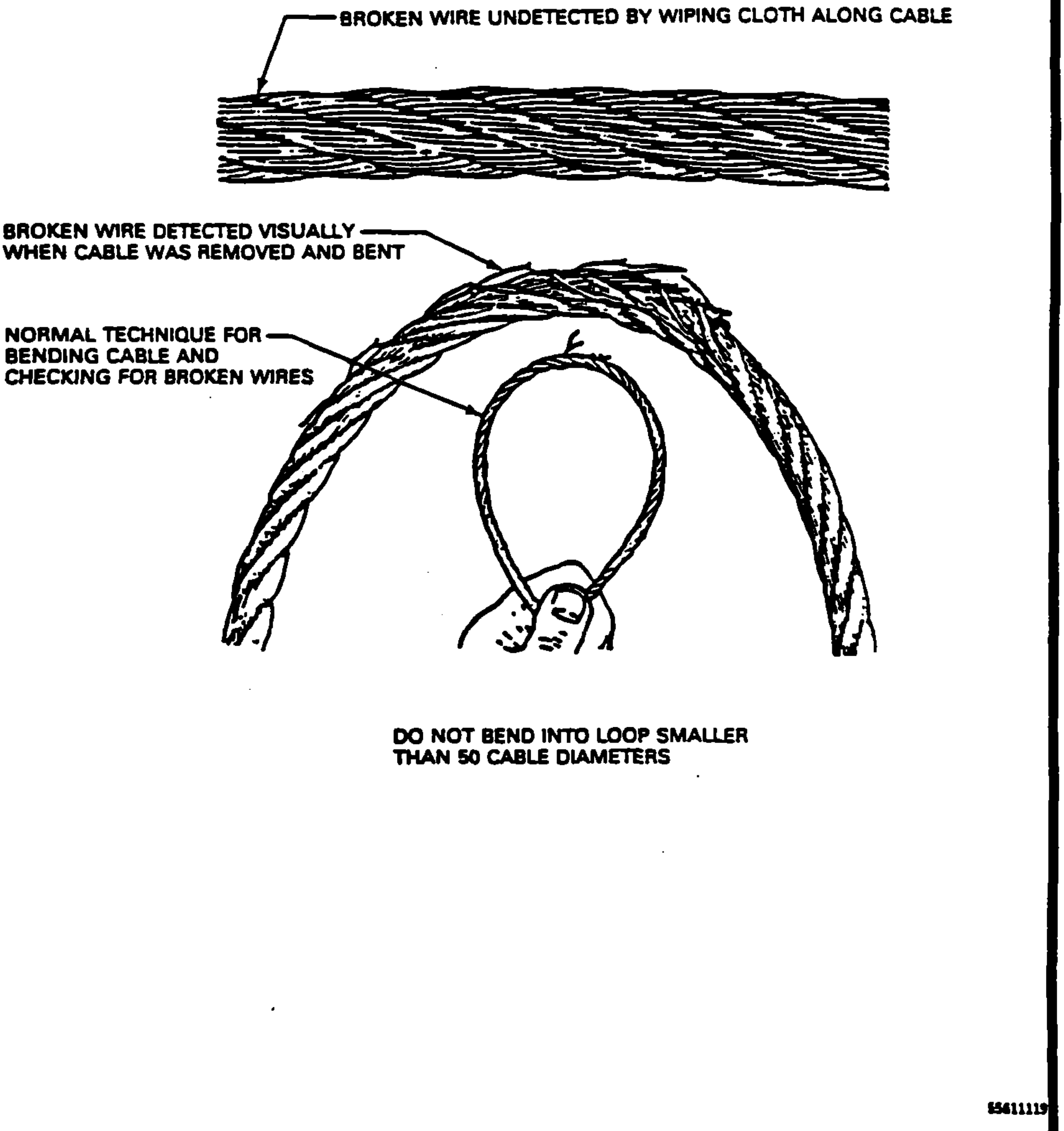


Figure 1-7. Cable Broken Wire Inspection

1-15. ADHESIVES, CEMENTS AND SEALANTS - SHELF LIFE AND STORAGE.

a. General.

1. This section provides information which defines the proper storage and usable life (shelf life) of adhesives, cements and sealents which are used for maintenance and/or repair of the airplane. Also included in this section is the criteria used for testing these materials after the normal shelf life has expired, to determine if an extension to the shelf life is possible.

2. Shelf life refers to a specified period of time usually from the date of manufacture (normally stamped or printed on the product container) to the expiration date (which should be determined using limits specified in Table 1-7 or if applicable, the manufacturer's expiration date printed or stamped on the product container). The specified shelf life is dependent on proper storage in accordance with the limits specified in this section and/or the manufacturer's instructions.

b. Storage Criteria.

1.Storage of Adhesives and Cements. All adhesives and cements shall be stored under controlled temperature conditions. . If open shop storage becomes necessary, these products shall in no case be stored in an area which will subject them to temperatures in excess of 95°F. Containers shall be tightly closed prior to being placing them into the proper storage environment. For proper storage environment, refer to Table 1-7 and the following paragraphs.

(a) Class I - These adhesives are epoxy base materials and have one year storage at room temperature. 0°F storage will extend the storage life. Refer to the product container instructions for storage temperature and life.

(b) Class II, III and IV - These adhesives are rubber and resin base and are good for six months at room temperature storage. 40°F storage will extend the storage life. Refer to the product container instructions for limits of each adhesive.

(c) Class V - These are silicone rubber adhesives. If stored in their original containers at a temperature below 80°F, have a shelf life of one year or as indicated on the storage container.

(d) Class VI - These are solvent bonding solvents. They should be stored in their original containers and tightly closed, and stored at 40°F temperature.

(e) Class VII - Cyanoacrylate base materials must be stored in the original containers at 40°F or as specified on the container instructions.

(f) Class VIII - These are pressure sensitive materials. The shelf life is two years when stored at 75°F and 50 percent relative humidity.

(g) Class IX - These are polyurethane products. Store in original container, between 70 and 100°F. Urethanes are moisture sensitive and precautions should be taken to ensure complete protection from moisture contamination. Container must be tightly closed at all times.

(h) Class X - These are acrylic base materials. They require storage at 40°F or per instructions on product container.

c. Storage of Sealants.

1. All sealants shall be stored under controlled temperature conditions. If open shop storage becomes necessary, these products shall in no case be stored in an area which will subject them to temperatures in excess of 95°F or below 40°F. Containers shall be tightly closed prior to placing them in the proper storage environment. For proper storage environment, refer to Table 1-7 and the following paragraphs.

(a) Premixed and frozen sealants shall be stored at -40°F or colder and shall not be used more than six weeks after the date of mixing even if all storage is at -40°F or colder. If storage temperatures rise above 40°F, but not warmer than -30°F, the material may be stored for a maximum of two weeks warmer than -40°F plus time at -40°F or colder for a combined total not to exceed five weeks beyond the date of mixing. If storage temperatures rise above -40°F but are not warmer than -20°F, the materials may be stored for a maximum of one week above -30°F plus time at -40°F or colder for a combined total not to exceed four weeks beyond the date of mixing.

(b) Unmixed sealants shall be stored at a controlled temperature of between 40 and 80°F and have a shelf life of approximately six months when stored within this temperature range. Unmixed sealants stored at temperatures exceeding 80°F shall be used within five weeks.

2. All materials should be used on a "first in-first out" basis. The adhesives, cements and sealants should be rotated so this requirement can be accomplished. All material containers should be clearly marked with a "use by" date, consisting of the year and month. All materials not used by this date must be tested prior to use. Refer to Testing criteria and Table 1-7.

d. Testing Criteria.

1. Any material (adhesive, cement or sealant) not used within its shelf life will be tested and the results reviewed to determine if the material is usable. If there is doubt about the material being usable, it must be properly disposed of. Material that has exceeded its original shelf life may be retested to determine if the material meets its requirements. Materials meeting their requirements will have their shelf life extended as specified in Table 1-7. Materials with shelf life extensions must be retested after a specified period of time. Refer to Table 1-7.

2. Testing of Overaged Adhesives and Cements.

NOTE

Overaged adhesives and cements are those that have exceeded their original shelf life and must be tested prior to use and/or given extended shelf life.

(a) Class I Epoxy Adhesive - Examine both components to ensure that they are still workable. Check for gelling and/or contamination. Stir components and mix a small amount of adhesive. Verify that adhesive sets up and hardens.

(b) Class II, III and IV Rubber and Resin Base Adhesives - Open containers and check for gelling and/or contamination. Check for spreading and drying.

(c)Class V Silicone Rubber Adhesives - Examine adhesive for hardness. If adhesive is still soft and can be spread, it is acceptable. Verify that adhesive will harden.

(d) Class VI Solvent Bonding Solvents - Check for signs of apparent contamination. Solvents should be clean and clear with no signs of cloudiness.

(e)Class VII Cyanoacrylic Base Adhesives - Verify that product is still liquid with no visible signs of contamination.

(f) Class VIII Pressure Sensitive Materials - Open containers and inspect for hardening, gelling and contamination. Stir components and mix a small amount of adhesive. Verify that adhesive sets up properly.

(g) Class X Acrylic Adhesives - Inspect base material to ensure that it is still liquid. Mix a small amount of the components and verify that it sets up properly.

3. In general, if these materials exhibit normal physical properties, with no signs of hardening, gelling or contamination and set up and/or harden properly as applicable, the shelf life may be extended as specified in Table 1-7.

e. Testing of Overaged Sealants.

NOTE

Overaged sealants are those that have exceeded their original shelf life and must be tested prior to use and/or given extended shelf life.

1. For identification of sealants Classification, refer to Fuel, Weather, Pressure and High-Temperature Sealing - Maintenance Practices.

2. Overaged sealants to be tested for possible shelf life extension shall be properly mixed using the correct materials, procedures and equipment.

3. Overaged premixed frozen sealants, along with unmixed sealants should be visually inspected. Sealants whic show conclusive evidence of separation, discoloration and/or gelling prior to the addition of a thinner or curing agent shall be discarded. When in doubt of the sealant quality, the overaged sealant should be compared with the same type of sealant, under six months old, which is known to be satisfactory.

4. The mixed sealants may be tested by placing a small amount of sealant (smaple buttons) on a sheet of paper. After the sample buttons have cured, they should be cut in half and examined. The sealant should show no signs of spots or streaks of unmixed base compound or curing agent. However, sample buttons containing spots, streaks, discoloration and/or variations in uniformity of color are acceptable if these spots, streaks, etc., are tack free upon inspection. All mixed sealant should be as void free as possible.

5. Contaminated sealant, premixed sealant that have been thawed and refrozen shall be discarded.

6. Type I, Class A sealants should be checked for appearance, application time, tack-free time, cure time and adhesion.

7. Type I, Class B sealants should be checked for appearance, applicatiion time, cure time, tack-free time and adhesion. In addition, Class B-2 and B-4 sealants should be checked for initial flow.

8. Type I, Class C sealants should be checked for appearance, application time, cure time and adhesion. In addition, Class C sealants should be tested to determine that they ARE NOT at a tackfree condition at the end of their rated work life (squeeze out life).

9. Type II sealants should be checked for appearance, application time, tack-free time and cure time.

10. Type III sealants should be easily thinned with MEK, when difficulty is encountered in thinning the sealant, it should be discarded.

11. Type IV sealants should be checked for appearance, application time, tack-free time and cure time.

12. Type V and VI sealants should be checked for appearance, tack-free time and cure time.

13. Type VII sealants should be checked for appearance, application time, tack-free time and cure time.

14. Type VIII sealants should be checked for appearance, application time, tack-free time, cure time and adhesion. Adhesion to aluminum should be (peel) less than two-pounds per inch of width.

PRODUCT	STORAGE CONDITION (TEMPERATURE IN DEGREES FAHENHEIT)	SHELF LIFE IN MONTHS	EXTEND SHELF LIFE IN MONTHS	RETEST IN MONTHS
ADHESIVES AND CEMENTS				
EA9309.3NA	40 TO 80°F	12 Months	6 Months	6 Months
EA9339	40 TO 80°F	12 Months	6 Months	6 Months
EA9314	40 TO 80°F	12 Months	6 Months	6 Months
EA9330	40 TO 80°F	12 Months	6 Months	6 Months
EA907	40 TO 80°F	12 Months	6 Months	6 Months
Devcon F	40 TO 80°F	12 Months	6 Months	6 Months
EA934NA	40 TO 80°F	12 Months	6 Months	6 Months
380/6	40 TO 80°F	12 Months	6 Months	6 Months
A1186B	40 TO 80°F	12 Months	6 Months	6 Months
EC2216	40 TO 80°F	12 Months	6 Months	6 Months
#10 Fastset	40 TO 80°F	12 Months	6 Months	6 Months
608 Quickset	40 TO 80°F	12 Months	6 Months	6 Months
EC880	40 TO 80°F	8 Months	3 Months	3 Months
EC847	40 TO 80°F	8 Months	3 Months	3 Months
EC1300L	40 TO 80°F	*6 Months	*3 Months	*3 Months
5452	40 TO 80°F	12 Months	6 Months	6 Months
56431	40 TO 80°F	12 Months	6 Months	6 Months
1636	40 TO 80°F	12 Months	6 Months	6 Months
RTV - 157	40 TO 80°F	12 Months	6 Months	6 Months
RTV - 158	40 TO 80°F	12 Months	6 Months	6 Months
RTV - 159	40 TO 80°F	12 Months	6 Months	6 Months
RTV732	40 TO 80°F	12 Months	6 Months	6 Months
RTV102	40 TO 80°F	12 Months	6 Months	6 Months
RTV103	40 TO 80°F	12 Months	6 Months	6 Months
RTV106	40 TO 80°F	12 Months	6 Months	6 Months
RTV108	40 TO 80°F	12 Months	6 Months	6 Months
RTV109	40 TO 80°F	12 Months	6 Months	6 Months
RTV94034	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 222	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 242	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 271	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 277	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 290	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 416	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 495	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 515	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 569	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 592	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 595	40 TO 80°F	12 Months	6 Months	6 Months

* Do not use after three months of storage in the 81°F to 90°F range
Do not use after five days of storage above 90°F.

Table 1-7. (Sheet 1 of 2)

PRODUCT	STORAGE CONDITION (TEMPERATURE IN DEGREES FAHENHEIT)	SHELF LIFE IN MONTHS	EXTEND SHELF LIFE IN MONTHS	RETEST IN MONTHS
ADHESIVES AND CEMENTS (CONTINUED)				
Loctite	40 TO 80°F	12 Months	6 Months	6 Months
Loctite	40 TO 80°F	12 Months	6 Months	6 Months
Loctite	40 TO 80°F	12 Months	6 Months	6 Months
Loctite	40 TO 80°F	12 Months	6 Months	6 Months
Loctite	40 TO 80°F	12 Months	6 Months	6 Months
DA-5521	40 TO 80°F	12 Months	6 Months	6 Months
PS-18	40 TO 80°F	12 Months	6 Months	6 Months
PS-30	40 TO 80°F	12 Months	6 Months	6 Months
XA-3678	40 TO 80°F	12 Months	6 Months	6 Months
XF-3585	40 TO 80°F	12 Months	6 Months	6 Months
LR-100-226	40 TO 80°F	12 Months	6 Months	6 Months
EC776	40 TO 80°F	* 8 Months	* 3 Months	*3 Months
SB and P2	40 TO 80°F	12 Months	6 Months	6 Months
SEALANTS				
Pro-Seal 890	40 TO 80°F	6 Months	2 Months	2 Months
GC-408	40 TO 80°F	6 Months	2 Months	2 Months
PR1422	40 TO 80°F	6 Months	2 Months	2 Months
PR1440	40 TO 80°F	6 Months	2 Months	2 Months
GC435	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 567	40 TO 80°F	6 Months	2 Months	2 Months
PR810	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 700	40 TO 80°F	6 Months	2 Months	2 Months
GC1900	40 TO 80°F	6 Months	2 Months	2 Months
PR366	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 735	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 895	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 706B	40 TO 80°F	6 Months	2 Months	2 Months
PR1321	40 TO 80°F	6 Months	2 Months	2 Months
GC200	40 TO 80°F	6 Months	2 Months	2 Months
RTV-730	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 815	40 TO 80°F	6 Months	2 Months	2 Months
GC402	40 TO 80°F	6 Months	2 Months	2 Months
PR-1005L	40 TO 80°F	*8 Months	*3 Months	*3 Months
GC-3001	40 TO 80°F	*8 Months	*3 Months	*3 Months
444R	40 TO 80°F	*8 Months	*3Months	*3 Months

* Do not use after three months of storage in the 81°F to 90°F range
Do not use after five days of storage above 90°F.

Table 1-7. (Sheet 2 of 2)

SECTION 2

GROUND HANDLING, SERVICING, CLEANING, LUBRICATION AND INSPECTION

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

TABLE OF CONTENTS

2-1. GROUND HANDLING.

2-2. TOWING. Moving the aircraft by hand is accomplished by using the wing struts and landing gear struts as push points. A tow bar attached to the nose gear should be used for steering and maneuvering the aircraft. When no tow bar is available, press down at the horizontal stabilizer front spar, adjacent to the fuselage, to raise the nose wheel off the ground. With the nose wheel clear of the ground, the aircraft can be pivoted about either main wheel.

CAUTION

When towing the aircraft, never turn the nose wheel more than 35 degrees either side of center, or the nose gear will be damaged. Do not push on control surfaces or outboard empennage surfaces. When pushing on the tailcone, always apply pressure at a bulkhead to avoid buckling the skin.

2-3. HOISTING. The aircraft may be lifted with a hoist of two-ton capacity, either by using hoisting rings(optional equipment) or by using suitable slings. The front sling should be hooked to the engine lifting eye, and the aft sling should be positioned around the fuselage at the first bulkhead forward of the leading edge of the stabilizer. If the optional hoisting rings are used, a minimum cable length of 60 inches for each cable is required to prevent bending the eyebolt type hoisting rings. If desired, a spreader jig may be fabricated to apply vertical force to the eyebolts.

2-4. JACKING. See figure 2-2 for jacking procedures.

2-5. LEVELING. Reference points for longitudinal leveling of the aircraft are the two screws on the left side of the tailcone at station 152.20 and 180.60. Corresponding points on the front seat rails may be used to level the aircraft laterally.

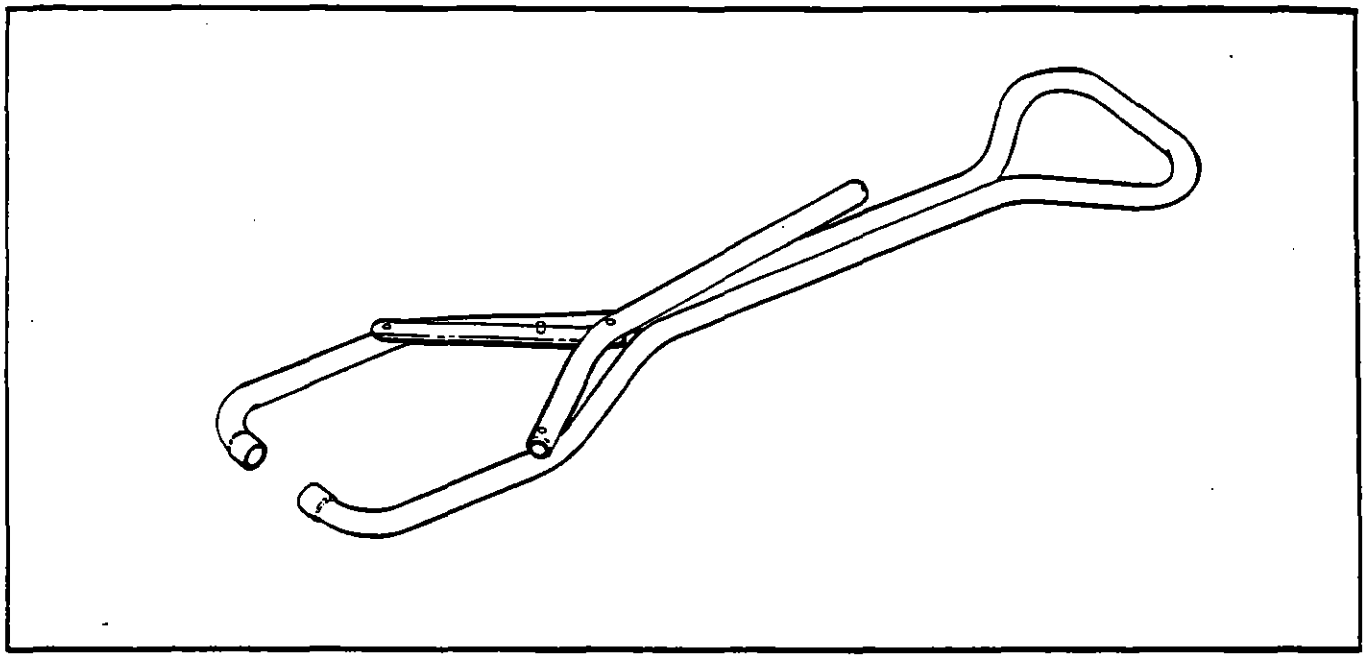


Figure 2-1. Typical Tow Bar

2-6. WEIGHING AIRCRAFT. Refer to Pilots Operating Handbook.

2-7. PARKING. Parking precautions depend principally on local conditions. As a general precaution, it is wise to set the parking brake or chock the wheels, and install the control lock. In severe weather, and high wind conditions, tie down the aircraft as outlined in paragraph 2-8 if a hangar is not available.

2-8. TIE-DOWN. When mooring the aircraft in the open, head into the wind if possible. Secure control surfaces with the internal control lock and set brakes.

CAUTION

Do not set parking brakes when they are overheated or during cold weather when accumulated moisture may freeze them.

a. Tie ropes, cables or chains to the wing tie-down fittings, located at the upper end of each wing strut. Secure the opposite ends of ropes, cables or chains to ground anchors.

b. Secure a tie-down rope (no chains or cables) to upper trunnion of the nose gear, and secure opposite end of rope to ground anchor.

c. Secure the middle of a rope to the tail tie-down ring. Pull each end of rope away at a 45-degree angle and secure to ground anchors at each side of tail.

d. Secure control lock on pilot control column. If control lock is not available, tie pilot control wheel back with front seat belts.

e. These aircraft are equipped with a spring-loaded steering bungee which affords protection against normal wind gusts. However, if extremely high wind gusts are anticipated, additional locks may be installed.

2-9. FLYABLE STORAGE.

NOTES

Preservation date should be written on propeller tag.

Maintain complete and accurate engine preservation records to ensure proper preservation of the engine cylinders can be documented and confirmed at a later date if necessary.

The airplane is delivered from Cessna with a Corrosion Preventive Aircraft Engine Oil mixture. This engine oil is a blend of aviation grade straight mineral oil and corrosion preventive compound. This oil should be used for the first 25 hours of engine operation. In the event it is necessary to add oil during the first 25 hours of operation, use MIL-L-6082 aviation grade straight mineral oil of the correct viscosity.

Flyable storage is defined as a maximum of 30 days non-operational storage and can be broken down into the following two programs.

a. Program 1 - engines or cylinders with less than 50 operating hours.

1. Propeller pull-thru every five days. (See step c.)

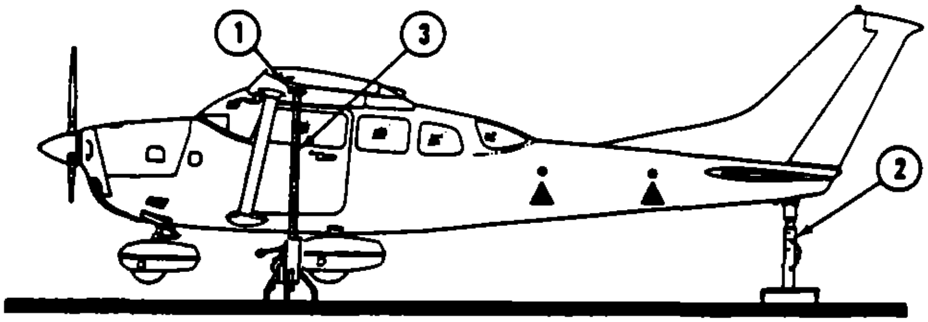
2. Fly airplane every 30 dyas. (See step d.)

b. Program 2 - engines or cylinders with more than 50 operating hours to TBO if not flown weekly.

1. Propeller pull-thru every seven days. (See step c.)

2. Fly airplane every 30 days. (See step d.)

c. The propeller should be rotated by hand without running the engine. For four and six cylinder straight drive engines, rotate engine six revolutions,



ITEM NUMBER	TYPE AND PART NUMBER	REMARKS
1	Block	1x4x4 padded with 1/4" rubber
2	Cessna #2-168	Universal tail stand (SEE NOTE 1)
3	#2-170 Basic jack #2-109 Leg extension #2-70 Slide tube extension	Closed height: 69-1/2 inches Extended height: 92 inches (Insert slide tube extension into basic jack.)

1. Attach weighted tie stand (2) to tie-down ring.
2. Items (2) and (3) are available from the Cessna Supply Division.

JACKING PROCEDURE

a. Lower aircraft tail so that wing jack can be placed under front spar just outboard of wing strut.
b. Raise aircraft tail and attach tail stand to tie-down ring. BE SURE the tail stand weighs enough to keep the tail down under all conditions and is strong enough to support aircraft weight.
c. Raise jacks evenly until desired height is reached.

NOTE

Beginning with Serial 20604075 and on, reference points for longitudinal leveling of the airplane are two screws on the left side of the tailcone. These points are indicated on the on the illustration by two ▲ (deltas). Refer to paragraph 2-5 for leveling information.

Figure 2-2. Jacking Details

stop propeller 45° to 90° from original position. For six cylinder geared engines, rotate propeller four revolutions and stop propeller 30° to 60° from original position.

CAUTION

For maximum safety, accomplish engine rotation as follows:

1. Verify magneto switches are OFF.
2. Place throttle in CLOSED position.
3. Place mixture control in IDLE CUT-OFF position.
4. Set brakes and block airplane wheels.
5. Leave airplane tie-downs installed and verify that cabin door latch is open.
6. DO NOT stand within arc of propeller blades while turning propeller.

d. The airplane should be flown for thirty (30) minutes, reaching, but not exceeding, normal oil and cylinder temperatures. If the aircraft cannot be flown it should be represerved in accordance with paragraph 2-11. (Temporary Storage) or paragraph 2-14. (Idefinite Storage). Ground running is not an acceptable substitute for flying.

NOTE

If step 2 in each program cannot be accomplished on schedule due to weather, maintenance, etc., pull the propeller through daily and accomplish as soon as possible.

e. If airplane is stored outside, tie it down in accordance with paragraph 2-7. In addition, the pitot tube, static air vents, air vents, openings in the engine cowling, and other similar openings shall have protective covers installed to prevent entry of foreign material.

2-10. RETURNING AIRCRAFT TO SERVICE. After flyable storage, returning the aircraft to service is accomplished by performing a thorough pre-flight inspection. At the end of the first 25 hours of engine operation, drain engine oil and clean oil pressure screen (or change external oil filter element). Service engine with correct grade and quantity of oil. See figure 2-5 and paragraph 2-22 for correct grade of engine oil.

2-11. TEMPORARY STORAGE. Temporary storage is defined as aircraft in a non-operational status for a maximum of 90 days. The aircraft is constructed of corrosion resistant alclad aluminum, which will last indefinitely under normal conditions if kept clean, however, these alloys are subject to oxidation. The first indication of corrosion on unpainted surfaces is in the form of white deposits or spots. On painted surfaces, the paint is discolored or blistered. Storage in a dry hangar is essential to good preservation and should be procured if possible. Varying conditions will alter the measures of preservation, but under normal conditions in a dry hangar, and for storage periods not to exceed 90 days, the following methods of treatment are suggested:

a. Fill fuel tanks with correct grade of gasoline.
b. Clean and wax aircraft thoroughly.
c. Clean any oil or grease from tires and coat tires with a tire preservative. Cover tires to protect against grease and oil.
d. Either block up fuselage to relieve pressure on tires or rotate wheels every 30 days to change supporting points and prevent flat spotting the tires.
e. Lubricate all airframe items and seal or cover all openings which could allow moisture and/or dust to enter.

NOTE

The aircraft battery serial number is recorded in the aircraft equipment list. To assure accurate warranty records, the battery should be re-installed in the same aircraft from which it was removed. If the battery is returned to service in a different aircraft, appropriate record changes must be made and notification sent to the Cessna Claims Department.

f. Remove battery and store in a cool dry place; service the battery periodically and charge as required.

NOTE

An engine treated in accordance with the following may be considered protected against normal atmospheric corrosion for a period not to exceed 90 days.

g. Disconnect spark plug leads and remove upper and lower spark plugs from each cylinder.

NOTE

The preservative oil must be MIL-L-46002, grade 1, at room temperature. Two preservative oils recommended for use in Teledyne Continental engines for temporary and indefinite storage are NOX RUST VCI-105 (Daubert Chemical Co., 4700 S. Central Avenue, Chicago, IL.) and PETROTECT VA (Pennsylvania Refining Company, Butler, PA).

h. Using a portable pressure sprayer, atomize spray preservative oil through the upper spark plug hole of each cylinder with the piston in a down position. Rotate crankshaft as each pair of cylinders is sprayed.
i. After completing step "h," rotate crankshaft so that no piston is at a top position. If the aircraft is to be stored outside, stop two-bladed propeller so that blades are as near horizontal as possible to provide maximum clearance with passing aircraft.
j. Again spray each cylinder without moving the crankshaft to thoroughly cover all interior surfaces of the cylinder above the piston.
k. Install spark plugs and connect spark plug leads.
l. Apply preservative oil to the engine interior by spraying approximately two ounces of the preservative oil through the oil filler tube.
m. Seal all engine openings exposed to the atmosphere using suitable plugs or non-hydroscopic tape. Attach a red streamer at each point that a plug or tape is installed.

n. If the aircraft is to be stored outside, perform the procedures outlined in paragraph 2-8. In addition, the pitot tube, static source vents, air vents, openings in the engine cowling and other similar openings should have protective covers installed to prevent entry of foreign material.

o. Attach a warning placard to the propeller to the effect that the propeller shall not be moved while the engine is in storage.

2-12. INSPECTION DURING STORAGE.

a. Inspect airframe for corrosion at least once a month and remove dust collections as frequently as possible. Clean and wax as required.

b. Inspect the interior of at least one cylinder through the spark plug hole for corrosion at least once a month.

NOTE

Do not move crankshaft when inspecting interior of cylinder for corrosion.

c. If at the end of the 90 day period, the aircraft is to be continued in non-operational storage, again perform the procedural steps "g thru o" of paragraph 2-11.

2-13. RETURNING AIRCRAFT TO SERVICE. After temporary storage, use the following procedures to return the aircraft to service.

a. Remove aircraft from blocks and check tires for proper inflation. Check for proper nose gear strut inflation.

b. Check battery and install.

c. Check that oil sump has proper grade and quantity of engine oil.

d. Service induction air filter and remove warning placard from propeller.

e. Remove materials used to cover openings.

f. Remove, clean, and gap spark plugs.

g. While spark plugs are removed, rotate propeller several revolutions to clear excess rust preventive oil from cylinders.

h. Install spark plugs and torque to value specified in Section 12 or 12A.

i. Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks and fuel lines for moisture and sediment, drain enough fuel to eliminate moisture and sediment.

j. Perform a thorough pre-flight inspection, then start and warm-up engine.

2-14. INDEFINITE STORAGE. Indefinite storage is defined as aircraft in a non-operational status for an indefinite period of time. Engines treated in accordance with the following may be considered protected against normal atmosphere corrosion, provided procedures outlined in paragraph 2-15 are performed at intervals specified.

a. Drain engine oil and refill with MIL-C-6529 Type II. The aircraft should be flown for thirty (30) minutes, reaching, but not exceeding normal oil and cylinder temperatures. Allow engine to cool to ambient temperature.

b. Remove top spark plug and spray preservative oil (Lubrication Oil - Contact and Volatile Corrosion - Inhibited, MIL-L-46002, Grade 1) at room temperature, through upper spark plug hole of each cylinder with piston in approximately bottom dead center position. Rotate crankshaft as each pair of opposite cylinders is sprayed. Stop crankshaft with no piston at top dead center. A pressure pot or pump-up type garden pressure sprayer may be used. The spray head should have ports around circumference to allow complete coverage of cylinder walls.

NOTE

The preservative oil must be MIL-L-46002, grade 1, at room temperature. Two preservative oils recommended for use in Teledyne Continental engines for temporary and indefinite storage are NOX RUST VCI-105 (Daubert Chemical Co., 4700 S. Central Avenue Chicago, IL.) and PETROTECT, VA (Pennsylvania Refining Company, Butler, PA).

c. Respray each cylinder without rotating crank. To thoroughly cover all surfaces of cylinder interior, move nozzle or spray gun from top to bottom of cylinder.

NOTE

MIL-C-6529 Type II may be formulated by thoroughly mixing one part compound MIL-C-6529 Type I (Esso Rust-Ban 628, Cosmoline No. 1223 or equivalent) with three parts new lubricating oil of the grade recommended for service (all at room temperature). Single grade oil is recommended.

d. Apply preservative to engine interior by spraying MIL-L-46002, Grade 1 oil (approximately two ounces) through oil filler tube.

e. Install dehydrator plugs MS27215-1 or-2, in each of the top spark plug holes, making sure that each plug is blue in color when installed. Protect and support spark plug leads with AN-4060 protectors.

f. DO NOT rotate propeller after completing step "e".

g. If engine is equipped with a pressure type carburetor, preserve this component by the following method. Drain carburetor by removing the drain and vapor vent plugs from regulator and fuel control unit. With mixture control in "Rich" position, inject lubricating oil, grade 1010, into fuel inlet at a pressure not to exceed 10 psi until oil flows from vapor vent opening. Allow excess oil to drain, plug inlet and tighten and safety the drain and vapor vent plugs. Wire throttle in open position, place bags of desiccant in the intake and seal opening with moisture resistant paper and tape or a cover plate.

h. If carburetor is removed from engine, place a bag of desiccant in throat of carburetor air adapter. Seal adapter with mositure resistant paper and tape or a cover plate.

i. The TCM fuel injection system does not require any special preservation preparation. For preservation of the Bendix RSA-7DA1 fuel injection system, refer to the Bendix Operation and Service Manual.

j. Place a bag of desiccant in the exhaust pipes and seal the openings with moisture resistant tape.

k. Seal cold air inlet to heater muff with moisture resistant tape to exclude moisture and foreign objects.
l. Seal engine breather by inserting a dehydrator MS27215-2 plug in breather hose and clamping in place.
m. Seal all other engine openings exposed to atmosphere, using suitable plugs or non-hygroscopic tape.
n. Attach a red streamer to each place on the engine where bags of desiccant are placed. Either attach red streamers outside of sealed area with tape or to inside of sealed area with safety wire to prevent wicking of moisture into sealed area.
o. Drain corrosion preventive mixture from engine sump and reinstall drain plug or close drain valve.

NOTE

The corrosion preventive mixture is harmful to paint and should be wiped from painted surfaces immediately.

p. Attach a warning placard on the throttle control knob to the effect that the engine contains no lubricating oil. Placard the propeller to the effect that it should not be moved while the engine is in storage.
q. Prepare airframe for storage as outlined in paragraph 2-11 thru step "f".

2-15. INSPECTION DURING STORAGE. Aircraft in indefinite storage shall be inspected as follows:
a. Aircraft prepared for indefinite storage should have cylinder dehydrator plugs visually inspected every 15 days. The plugs should be changed as soon as their color indicates unsafe conditions of storage. If the dehydrator plugs have changed color in one-half or more of the cylinders, all desiccant material on the engine should be replaced.
b. The cylinder bores of all engines prepared for indefinite storage should be resprayed with corrosion-preventive mixture every six months, or more frequently if bore inspection indicates corrosion has started earlier than six months. Replace all desiccant and dehydrator plugs. Before spraying, engine should be inspected for corrosion as follows: Inspect interior of at least one cylinder on each engine through the spark plug hole. If cylinder shows start of rust, spray cylinder corrosion-preventive oil and turn prop over six times, then respray all cylinders. Remove at least one rocker box cover from each engine and inspect valve mechanism.

2-16. RETURNING AIRCRAFT TO SERVICE. After indefinite storage, use the following procedure to return the aircraft to service.
a. Remove aircraft from blocks and check tires for correct inflation. Check for correct nose gear strut inflation.
b. Check battery and install.
c. Remove all materials used to seal and cover openings.
d. Remove warning placards posted at throttle and propeller.
e. Remove and clean engine oil screen, then reinstall and safety. On aircraft equipped with an external oil filter, install new filter element.
f. Remove oil sump drain plug or open drain valve and drain sump. Install or close drain valve and safety.

NOTE

The corrosion-preventive mixture will mix with the engine lubricating oil, so flushing the oil system is not necessary. Draining the oil sump will remove enough of the corrosion-preventive mixture.

WARNING

When returning the aircraft to service do not use the corrosion-preventive oil referenced in paragraph 2-14, step "a".

g. Service and install the induction air filter.
h. Remove dehydrator plugs and spark plugs or plugs installed in spark plug holes. Rotate propeller several revolutions by hand to clear corrosion-preventive mixture from cylinders.
i. Clean, gap and install spark plugs and rotate propeller by hand through the compression strokes of all the cylinders to check for possible liquid lock. Torque plugs the value specified in Section 11 or 11A.
j. Check fuel strainer. Remove and clean filter screen. Check fuel cells and fuel lines for moisture and sediment. Drain enough fuel to eliminate moisture and sediment.
k. If the carburetor has been preserved with oil, drain it by removing the drain and vapor vent plugs from the regulator and fuel control unit. With mixture control in "Rich" position, inject service type gasoline into fuel inlet at a pressure not to exceed 10 psi until all of the oil is flushed from the carburetor. Reinstall carburetor plugs and attach fuel line.
l. Perform a thorough preflight inspection, then start and warm up engine.
m. Thoroughly clean and test fly aircraft.

2-17. SERVICING.

2-18. DESCRIPTION. Servicing requirements are shown in figure 2-5. The following paragraphs supplement this figure by adding details not included in the figure.

2-19. FUEL. Fuel cells should be filled immediately after flight to lessen condensation in the cells and lines. Cell capacities are listed in figure 1-1. The recommended fuel grade to be used is given in figure 2-5.

WARNING

DURING ALL FUELING PROCEDURES, FIRE-FIGHTING EQUIPMENT MUST BE AVAILABLE. TWO GROUND WIRES FROM DIFFERENT POINTS ON THE AIRPLANE TO SEPARATE APPROVED GROUND STAKES SHALL BE USED TO PREVENT ACCIDENTAL DISCONNECTION OF ONE GROUND WIRE. ENSURE THAT FUELING NOZZLE IS GROUNDED TO THE AIRPLANE.

NOTE

Tie-down rings should be used as grounding points for all grounding wires during refueling procedures.

2-20. USE OF FUEL ADDITIVES FOR COLD WEATHER OPERATION. Strict adherence to recommended preflight draining instructions will eliminate

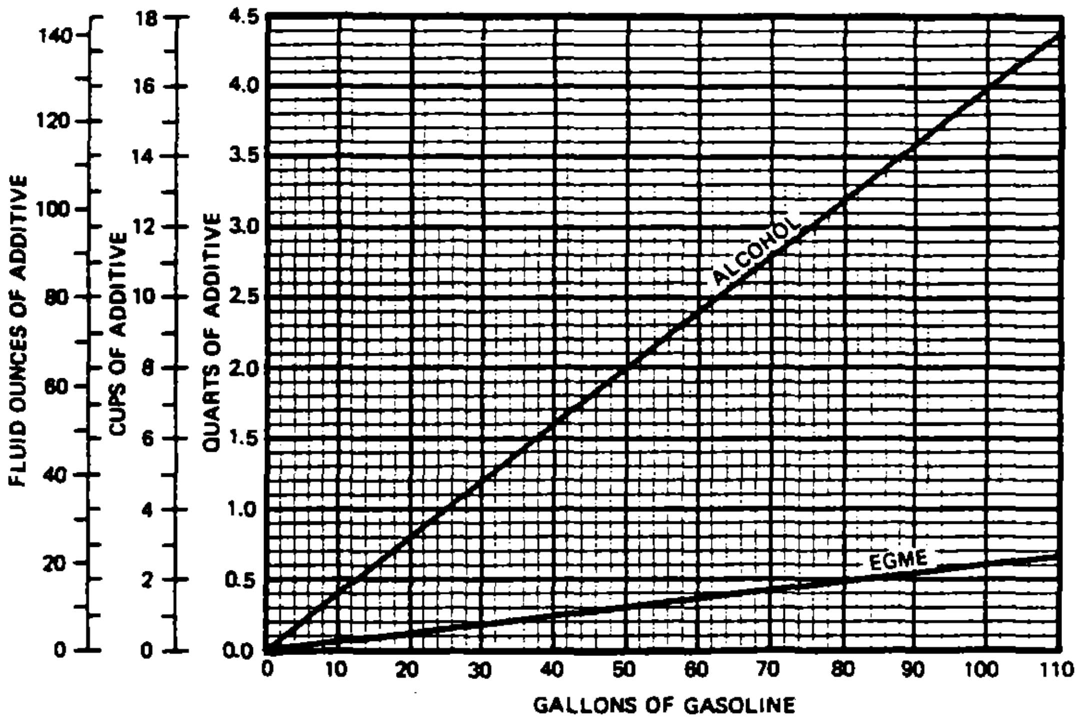


Figure 2-3. Fuel Additive Mixing Ratio Chart

any free water accumulations from the tank sumps. While small amounts of water may still remain in solution in the gasoline, it will normally be consumed and go unnoticed in the operation of the engine.

One exception to this can be encountered when operating under the combined effect of: 1) use of certain fuels, with 2) high humidity conditions on the ground 3) followed by flight at high altitude and low temperature. Under these unusual conditions small amounts of water in solution can precipitate from the fuel stream and freeze in sufficient quantities to induce partial icing of the engine fuel system.

While these conditions are quite rare and will not normally pose a problem to owners and operators, they do exist in certain areas of the world and consequently must be dealt with when encountered.

Therefore, to alleviate the possibility of fuel icing occurring under these unusual conditions it is permissible to add isopropyl alcohol or ethylene glycol monomethyl ether (EGME) compound to the fuel supply. See Figure 2-3 for fuel additive mixing ratio.

The introduction of alcohol or EGME compound into the fuel provides two distinct effects: 1) it absorbs the dissolved water from the gasoline and 2) alcohol has a freezing temperature depressant effect.

Alcohol, if used, is to be blended with the fuel in a concentration of 1% by volume. Concentration greater than 1% are not recommended since they can be detrimental to fuel tank materials.

The manner in which the alcohol is added to the fuel is significant because alcohol is most effective when it is completely dissolved in the fuel. To insure proper mixing the following is recommended.

1. For best results the alcohol should be added during the fueling operation by pouring the alcohol directly on the fuel stream issuing from the fuel nozzle.

2. An alternate method that may be used is to premix the complete alcohol dosage with some fuel in a separate clean container (approximately 2-3 gallon capacity) and then transfer this mixture to the tank prior to the fuel operation.

Any high quality isopropyl alcohol may be used, such as: Anti-icing fluid (MIL-F-5566) or Isopropyl alcohol (Federal Specification TR-I-735a).

Ethylene glycol monomethyl ether (EGME) compound in compliance with MIL-I-27686 or Phillips PFA-55MB, if used, must be carefully mixed with the fuel in concentrations not to exceed 0.15% by volume.

CAUTION

Mixing of the EGME compound with the fuel is extremely important because concentration in excess of that recommended (0.15 percent by volume maximum) will result in detrimental affects to the fuel tanks, such as deterioration of protective primer and sealants and damage to O-rings and seals in the fuel system and engine components. Use only blending equipment that is recommended by the manufacturer to obtain proper proportioning.

Do not allow the concentrated EGME compound to come in contact with the airplane finish or fuel cell as damage can result.

Prolonged storage of the airplane will result in a water buildup in the fuel which "leeches out" the additive. An indication of this is when an excessive amount of water accumulates in the fuel tank sumps. The concentration can be checked using a differential refractometer. It is imperative that the technical manual for the differential refractometer be followed explicitly when checking the additive concentration.

2-21. FUEL DRAINS. Drains are located at various places throughout the fuel system. Refer to Section 13 for locations of the various drains in the system. The strainer drain valve is an integral part of the fuel strainer assembly. The strainer drain is equipped with a control which is located adjacent to the oil dipstick. Access to the control is gained through the oil dipstick access door. Remove drain plugs and open drain valves at the intervals specified in figure 2-5. Drain valves are installed in the fuel cells and in the reservoir tanks, and a fuel sampler cup is furnished. To activate drain cup for sampling, place cup to valve and depress valve with rod protruding from cup. If water is found during daily inspection of the fuel strainer and fuel cell sump drains, open all drain valves and remove all fuel drain plugs to drain all water from the fuel system.

2-22. ENGINE OIL. Check engine lubricating oil with the dipstick five to ten minutes after the engine has been stopped. The aircraft should be in as near a level position as possible when checking the engine oil so that a true reading is obtained. Engine oil should be drained while the engine is still hot, and the nose of the aircraft should be raised slightly for more positive draining of any sludge which may have collected in the engine oil sump. Engine oil should be changed every six months, even though less than the specified hours have accumulated. Reduce these intervals for prolonged operations in dusty areas or in cold climates where sludging conditions exist, or where short flights and long idle periods are encountered, which cause sludging conditions. Always change oil and clean oil pressure screen (or change external filter element) whenever oil on the dipstick appears dirty. Aviation grade ashless dispersant oil conforming to Continental Motors Specification MHS-24 and all revisions or supplements thereto and conforming with current Continental Aircraft Engine Service Bulletins shall be used.

WARNING

The U.S. Environmental Protection Agency advises that mechanics and other workers who handle engine oil are advised to minimize skin contact with used oil and promptly remove used oil from the skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off, for most of their life span. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

NOTE

The aircraft is delivered from Cessna with a corrosion preventive aircraft engine oil (MIL-C-6259, Type I). If oil must be added during the first 25 hours of operation, use only aviation grade straight mineral oil conforming to Specification MIL-L-6082. After the first 25 hours of operation, drain engine oil sump and clean the oil pressure screen. If an external oil filter is installed, change filter element at this time. Refill sump with correct quantity and grade of ashless dispersant oil conforming to Continental Motors Specification MHS-24 and with current Continental Aircraft Engine Service Bulletins. Newly overhauled engines should also be operated on aviation grade straight mineral oil conforming to Specification MIL-L-6082 until a total of 25 hours has accumulated or oil consumption has stabilized.

When changing engine oil, remove and clean oil pressure screen or install a new filter element on aircraft equipped with an external oil filter. An oil quick-drain valve may be installed. This valve provides a quick and cleaner method of draining the engine oil. This valve is installed in the oil drain port of the oil sump. To drain the oil, proceed as follows:

a. Operate engine until oil temperature is at a normal operating temperature.

b. (With Quick-Drain Valve) Attach a hose to the quick-drain valve in oil sump. Push up on quick-drain valve until it locks open, and allows oil to drain through hose into container.

c. (Without Quick-Drain Valve) Remove oil drain plug from engine sump and allow oil to drain into a container.

d. After engine oil has drained, close quick-drain valve or install and safety drain plug.

e. Remove and clean oil pressure screen or change external oil filter element.

f. Service engine with correct quantity and viscosity of aviation grade engine oil.

NOTE

Refer to inspection charts for intervals for changing engine oil and external filter elements. Refer to figure 2-5 for correct viscosities and capacities of aviation grade engine oil.

2-23. ENGINE INDUCTION AIR FILTER. The induction air filter keeps dust and dirt from entering the induction system. The value of maintaining the air filter in a good clean condition can never be overstressed. More engine wear is caused through the use of a dirty or damaged air filter than is generally believed. The frequency with which the filter should be removed, inspected and cleaned will be determined primarily by aircraft operating conditions. A good general rule, however, is to remove, inspect and clean the filter at least every 100 hours of engine operating time, and more frequently if warranted by operating conditions. Under extremely dusty conditions, daily servicing of the filter is recommended. To service the induction filter, proceed as follows:

a. Remove filter from aircraft.

NOTE

Use care to prevent damage to filter element when cleaning filter with compressed air.

b. Clean filter by blowing with compressed air (not over 100 psi) from direction opposite of normal air flow. Arrows on filter case indicate direction of normal air flow.

c. Check bonding of the paper pleats to the face screen. The bonding holds the paper pleats in place and if broken, the pleats are free to shift which can impair filtration. A face screen that is loose or gapping away from the paper pleats is indicative of broken bonding and is cause to replace the filter element.

CAUTION

Do not use solvent or cleaning fluids to wash filter. Use only a water and household detergent solution when washing the filter.

c. After cleaning as outlined in step "b", the filter may be washed, if necessary, in a solution of warm water and a mild household detergent. A cold water solution may be used.

NOTE

The filter assembly may be cleaned with compressed air a maximum of 30 times or it may be washed a maximum of 20 times. A new filter should be installed after using 500 hours of engine operating time or one year, whichever should occur first. However, a new filter should be installed anytime the existing filter is damaged. A damaged filter may have sharp or broken edges in the filtering panels which would allow unfiltered air to enter the induction system. Any filter that appears doubtful, shall have a new filter installed in its place.

d. After washing, rinse filter with clear water until rinse water draining from filter is clear. Allow water to drain from filter and dry with compressed air (not over 100 psi).

NOTE

The filtering panels of the filter may become distorted when wet, but they will return to their original shape when dry.

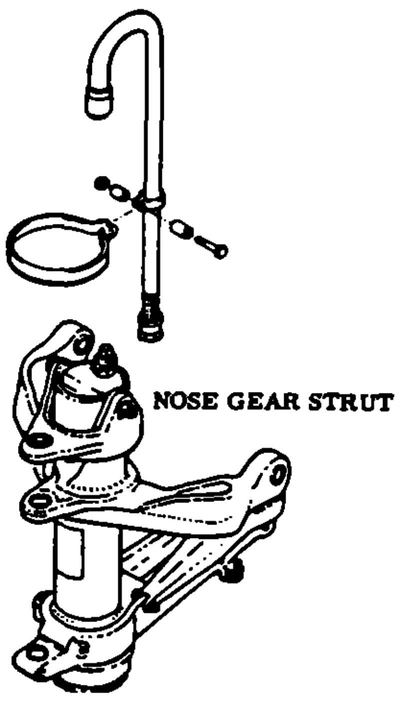
e. Be sure airbox is clean, and inspect filter. If filter is damaged, a new filter should be installed.
f. Install filter at entrance to airbox with gasket on aft face of filter frame and with flow arrows on filter frame pointed in the correct direction.

2-24. VACUUM SYSTEM AIR FILTER. The vacuum system central air filter keeps dust and dirt from entering the vacuum-operated instruments. Inspect the filter element every 100 hours of operation for damage. Change the filter element when damaged or every 500 hours of operating time and whenever it becomes sufficiently clogged to cause suction gage readings to drop below 4.6 inches of mercury. Also do not operate the vacuum system with the filter element removed, or a vacuum line disconnected, as dust particles or other foreign matter may enter the system and damage the vacuum-operated instruments.

CAUTION

Smoking will cause premature filter clogging.

2-25. BATTERY. Battery servicing involves adding distilled water to maintain the electrolyte even with the horizontal baffle plate or split ring at the bottom of the filter holes, checking cable connections, and neutralizing and cleaning off any spilled electrolyte or corrosion. Use bicarbonate of soda (baking soda) and clean water to neutralize electrolyte or corrosion. Follow with a thorough flushing with clean water. Do not allow bicarbonate of soda to enter battery. Brighten cable and terminal connection with a wire brush, then coat with petroleum jelly before connecting. Check the battery every 100 hours (or at least every 90 days), oftener in hot weather. Add only distilled water, not acid or "rejuvenators," to maintain electrolyte level in the battery. Inspect the battery box and clean and remove any evidence of corrosion.



NOTE

Valve core remains in strut valve. An internal flexible cable, in the valve extension, is used to depress the valve core in strut valve.

Figure 2-4. Strut Filler Valve Extension

2-26. TIRES. Maintain tire pressure at the value specified in Section 1. When checking pressure, examine tires for wear, cuts, bruises and slippage. Remove oil, grease and mud from tires with soap and water.

NOTE

Recommended tire pressures should be maintained. Especially in cold weather, remember that any drop in temperature of the air inside a tire causes a corresponding drop in air pressure.

2-27. NOSE GEAR STRUT. The nose gear strut requires periodic checking to ascertain that the strut is filled with hydraulic fluid and is inflated to the correct air pressure. To fill the nose gear strut with hydraulic fluid and air, proceed as follows:
a. Remove valve cap and release all air.

b. Remove filler valve assembly.
c. Compress strut completely (stops in contact with outer barrel hub).
d. Oil level.
1. Fluid used should comply with specification MIL-H-5606.
2. Fill strut to bottom of valve installation hole.
3. Maintain oil level at bottom ov valve installation hole.
e. Fully extend strut.
f. Replace filler valve assembly.
g. With strut fully extended and nose wheel clear of ground, inflate strut to 80 PSI and replace valve cap.

NOTE

The nose landing gear shock strut will normally require only a minimum amount of service. Maintain the strut extension pressure as shown in Section 1. Lubricate landing gear as shown in figure 2-6. Check the landing gear daily for general cleanliness, security of mounting, and for hydraulic fluid leakage. Keep machined surfaces wiped free of dirt and dust, using a clean lint-free cloth saturated with hydraulic fluid (MIL-H-5606) or kerosene. All surfaces should be wiped free of excessive hydraulic fluid.

2-28. NOSE GEAR SHIMMY DAMPENER. The shimmy dampener should be serviced at least every 100 hours. The dampener must be filled completely with hydraulic fluid, free of entrapped air with the compensating piston bottomed in the rod. Check that piston is completely bottomed as follows:
a. Remove shimmy dampener from the aircraft.
b. While holding the shimmy dampener in a vertical position with the filler plug pointed upward, loosen the filler plug.
c. Allow the spring to bottom out the floating piston inside the shimmy dampener rod.
d. When the fluid stops flowing, insert a length of stiff wire through the air bleed hole in the setscrew at the end of the piston rod until it touches the floating piston. The depth of insertion should be 3-13/16 inches.

NOTE

If the wire insertion is less than 3-13/16 inches, the floating piston is lodged in the shaft. If the wire cannot be used to free the piston, the rod assembly and piston should be replaced.

Service the shimmy dampener as follows:
a. Remove filler plug from dampener.
b. Move piston completely to opposite end from filler plug.
c. Fill dampener with clean hydraulic fluid completely full.
d. Reinstall filler plug and safety.
e. Wash dampener in solvent and wipe dry with a cloth.
f. Reinstall shimmy dampener in aircraft.

NOTE

Keep shimmy dampener, especially the exposed portions of the dampener piston shaft, clean to prevent collection of dust and grit which could cut the seals in the dampener barrel. Keep machined surfaces wiped free of dirt and dust, using a clean lint-free cloth saturated with hydraulic fluid (MIL-H-5606) or kerosene. All surfaces should be wiped free of excessive hydraulic fluid.

2-29. HYDRAULIC BRAKE SYSTEMS. Check brake master cylinders and refill with hydraulic fluid as specified in the inspection charts. Bleed the brake system of entrapped air whenever there is a spongy response to the brake pedals. Refer to Section 5 for filling and bleeding the brake systems.

2-30. OXYGEN SYSTEM. Refer to Section 15.

2-31. FACE MASKS. Refer to Section 15.

2-32. CLEANING.

2-33. GENERAL DESCRIPTION. Keeping the aircraft clean is important. Besides maintaining the trim appearance of the aircraft, cleaning lessens the possibility of corrosion and makes inspection and maintenance easier.

2-34. UPHOLSTERY AND INTERIOR. Cleaning prolongs the life of upholstery fabrics and interior trim. To clean the interior, proceed as follows:
a. Empty all the ash trays.
b. Brush out or vacuum clean the upholstery and carpeting to remove dirt.
c. Wipe leather and plastic surfaces with a damp cloth.
d. Soiled upholstery fabrics and carpet may be cleaned with a foam-type detergent, used according to the manufacturer's instructions.
e. Oily spots and stains may be cleaned with household spot removers, used sparingly. Before using any solvent, read the instructions on the container and test it on an obscure place in the fabric to be cleaned. Never saturate the fabric with a volatile solvent; it may damage the packing and backing material.
f. Scrape off sticky materials with a dull knife, then spot clean the area.

2-35. PLASTIC TRIM. The instrument panel, plastic trim and control knobs need only be wiped off with a damp cloth. Oil and grease on the control wheel and control knobs can be removed with a cloth moistened with Stoddard solvent.

CAUTION

Do not use gasoline, alcohol, benzene, acetone, carbon tetrachloride, fire extinguisher fluid, de-icer fluid, lacquer thinner or glass window cleaning spray. These solvents will soften and craze the plastic.

2-36. WINDSHIELD AND WINDOWS.

2-37. REQUIRED MATERIALS

NAME	MANUFACTURER	USE
Mild soap or detergent (hand dish-washing type without abrasives)	Commercially available	Cleaning windshields and windows.
Aliphatic naphtha Type II conforming to Federal Specification TT-N-95	Commercially available	Removing deposits which cannot be removed with mild soap solution on acrylic windshields and windows.
Polishing Wax: (Refer to Note 1)		Waxing acrylic windshields and windows.
Turtle Wax (paste)	Turtle Wax, Inc. Chicago, IL 60638	
Great Reflections Paste Wax	E. I. Du-Pont De Nemours and Co. (Inc.) Wilmington, DE 19898	
Slip-stream Wax (paste)	Classic Chemical Grand Prairie, TX 75050	
Acrylic Polish conforming to Federal Specification P-P-560 such as:		Cleaning and polishing acrylic windshields and windows.
Permatex plastic cleaner Number 4030	Permatex Company, Inc. Kansas City, KS 66115	
Mirror Glaze MGH-17	Mirror Bright Polish Co. 17991 Mitchell So. Irvine CA 92714	
Soft cloth, such as: Cotton flannel or cotton terry cloth material	Commercially available	Applying and removing wax and polish.

NOTE 1 These are the only polishing waxes tested and approved for use by Cessna Aircraft Company.

2-38. CLEANING INSTRUCTIONS.

CAUTION

Windshields and windows (Acrylic Faced) are easily damaged by improper handling and cleaning techniques.

a. Place aircraft inside hanger or in shaded area and allow to cool from heat of suns direct rays.
b. Using clean (preferably running) water, flood the surface. Use bare hands, with no jewelry, to feel and dislodge any dirt or abrasive materials.
c. Using mild soap or detergent(such as a dishwashing liquid) in water, wash the surface. Again use only the bare hand to provide rubbing force. A clean cloth may be used to transfer the soap solution to the surface, but extreme care must be exercised to prevent scratching the surface.
d. On acrylic windshields and windows only, if soils which cannot be removed by a mild detergent remain, Type II aliphatic naphtha applied with a soft cloth may be used as a cleaning solvent. Be sure to frequently re-fold the cloth to avoid redepositing soil and/or scratching windshield with any abrasive particles.
e. Rinse surface thoroughly with clean fresh water and dry with a clean cloth.

CAUTION

Do not use any of the following on or for cleaning windshields and windows: Methanol, Denatured Alcohol, Gasoline, Benzene, Xylene, MEK, Acetone, Carbon Tetrachloride, Lacquer Thinners, commercial or household window cleaning sprays. Additionally, strong acids or bases may destroy antistatic coatings on glass windshields. When in doubt, DO NOT USE IT.

f. Hard polishing wax should be applied to acrylic surfaces (The wax has an index of refraction nearly the same as transparent acrylic and will tend to mask any shallow scratches on the windshield surface).
g. Acrylic surfaces may be polished using a polish meeting Federal Specification P-P-560, applied per the manufacturers instructions.

NOTE

When applying and removing wax and polish, use a clean soft cloth.

h. Do not use rain repellent on acrylic surfaces.

2-39. WINDSHIELD AND WINDOW PREVENTIVE MAINTENANCE.

NOTE

Utilization of the following techniques will help minimize windshield and window crazing.

a. Keep all surfaces of windshields and windows clean.
b. If desired, wax acrylic surfaces.
c. Carefully cover all surfaces during any painting, powerplant cleaning or other procedure that calls for the use of any type of solvents or chemicals. The following coatings are approved for use in protecting surfaces from solvent attack.
1. White Spray Lab, MIL-C-6799, Type I, Class II
2. WPL-3 Masking Paper - St. Regis, 156 Oak St. Newton Upperfalls, MA, 02164-1440
3. 5x N - Poly-Spotstick - St. Regis, 156 Oak St. Newton Upperfalls, MA, 02164-1440
4. Protex 40 - Mask Off Company, 345 Maple Av. Monrovia, CA,91016-3331 and Southwest Paper Co., 3930 N. Bridgepotr Cir.Wichita, KS 67219
5. Protex 10VS - Mask Off Company, 345 Maple Av. Monrovia, CA,91016-3331 and Southwest Paper Co., 3930 N. Bridgepotr Cir.Wichita, KS 67219
6. Scotch 344 Black Tape - 3M Company
d. Do not park or store aircraft where it might be subjected to direct contact with or vapors from: methanol, denatured alcohol, gasoline, benzene, xylene, MEK, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays, paint strippers, or other types of solvents.
e. Do not use solar screens or shields installed inside of aircraft, or leave sun visors up against windshield. The reflected heat from these items cause elevated temperatures which accelerate crazing and may cause formation of bubbles in the inner ply of multiple ply windshields.
f. Do not use a power drill motor or other powered device to clean, polish, or wax surfaces.

2-40. INTERIOR TRIM. The instrument panel, plastic trim, and control knobs need only be wiped off with a damp cloth. Oil and grease on the control wheel and control knobs can be removed with a cloth moistened with Stoddard solvent. Volatile solvents such as mentioned in paragraph 2-38, must never be used since they soften and craze the plastic.

2-41. ALUMINUM SURFACES. The aluminum surfaces require a minimum of care, but should never be neglected. The aircraft may be washed with clean water to remove dirt and may be washed with nonalkaline grease solvents to remove oil and/or grease. Household type detergent soap powders are effective cleaners, but should be used cautiously since some of them are strongly alkaline. Many good aluminum cleaners, polishes, and waxes are available from commercial suppliers or aircraft products.

2-42. PAINTED SURFACES. The painted exterior surfaces of your new Cessna have a durable, long lasting finish. Approximately 10 days are required for the paint to cure completely; in most cases, the curing period will have been completed prior to delivery of the aircraft. In the event that polishing or buffing is required within the curing period, it is recommended that work be done by someone experienced in handling uncured paint. Any Cessna Service Station can accomplish this work.

Generally, the painted surfaces can be kept bright by washing with water and mild soap, followed by a rinse with water and drying with cloths or a chamois. Harsh or abrasive soaps or detergents which could cause corrosion or scratches should never be used. Remove stubborn oil and grease with a cloth moistened with Stoddard solvent.

To seal any minor surface chips or scratches and protect against corrosion, the aircraft should be waxed regularly with a good automotive wax applied in accordance with the manufacturers instructions. If the aircraft is operated in a seacoast or other salt water environment, it must be washed and waxed more frequently to assure adequate protection. Special care should be taken to seal around rivet heads and skin laps, which are the areas most susceptibleto corrosion. A heavier coating of wax on the leading edges of the wings and tail and on the cowl nose cap and propeller spinner will help reduce the abrasion encountered in these areas. Reapplication of wax will generally be necessary after cleaning with soap solutions or after chemical deicing operations.

2-43. ENGINE AND ENGINE COMPARTMENT. An engine and accessories washdown should be accomplished during each 100-hour inspection to remove oil, grease, salt corrosion or other residue that might conceal component defects during inspection. Also, periodic cleaning can be very effective in preventive maintenance.

Precautions should be taken when working with cleaning agents such as wearing of rubber gloves, an apron or coveralls and a face shield or goggles. Use the least toxic of available cleaning agents that will satisfactorily accomplish the work. These cleaning agents include: (1) Stoddard Solvent (Specification P-D-680 type II), (2) A water alkaline detergent cleaner (MIL-C-25769J) mixed, 1 part cleaner, 2 to 3 parts water and 8 to 12 parts Stoddard Solvent or (3) A solvent base emulsion cleaner (MIL-C-4361B) mixed 1 part cleaner and 3 parts Stoddard Solvent.

CAUTION

Do not use gasoline or other highly flammable substances for washdown.

Perform all cleaning operations in well ventilated work areas and ensure that adequate fire fighting and safety equipment is available. Do not smoke or expose a flame, within 100 feet of the cleaning area. Compressed air, used for cleaning agent, application or drying, should be regulated to the lowest practical pressure. Use of a stiff bristle brush rather than a steel brush is recommended if cleaning agents do not remove excess grease and grime during spraying. A recommended procedure for cleaning an engine and accessories is as follows:

CAUTION

Do not attempt to wash an engine which is still hot or running. Allow the engine to cool before cleaning.

a. Remove engine cowling in accordance with Paragraph 12-3.
b. Carefully cover the coupling area between the vacuum pump and the engine drive shaft so that no cleaning solvent can reach the coupling or seal.
c. Cover the open end of the vacuum discharge tube.
d. Cover the vacuum relief valve filter, if installed in the engine compartment.
e. Use fresh water for wash-down when the engine is contaminated with salt or corrosive chemicals. A cleaning agent such as described previously may then be used to remove oil and grime.

CAUTION

Care should be exercised to not direct cleaning agents or water streams at openings on the starter, magnetos, alternator or vacuum pump(s) or the turbocharger pressure relief valve.

f. Thoroughly rinse with clean warm water to remove all traces of cleaning agents.

CAUTION

Cleaning agents should never be left on engine components for an extended period of time. Failure to remove them may cause damage to components such as neoprene seals and silicone fire sleeves, and could cause additional corrosion.

g. Completely dry engine and accessories using clean, dry compressed air.
h. Remove the cover over the coupling area.
i. Remove the cover from the vacuum discharge tube.
j. Remove the cover from the vacuum relief valve filter, if installed.
k. If desired, engine cowling may be washed with the same cleaning agents, then rinsed thoroughly and wiped dry. After cleaning engine, relubricate all control arms and moving parts as required.
l. Reinstall engine cowling.

WARNING

For maximum safety, check that the magneto switches are OFF, the throttles are closed, the mixture controls are in the idle cut-off position, and the airplane is secured before rotating the propeller by hand. Do not stand within the arc of the propeller blades while turning the propeller.

m. Before starting engine, rotate the propeller by hand no less than four complete revolutions.

2-44. PROPELLER. The propeller should be wiped occasionally with an oily cloth to remove grass and bug stains. In salt water areas, this will assist in corrosion-proofing the propeller.

2-45. WHEELS. The wheels should be washed periodically and examined for corrosion, chipped paint, and cracks or dents in the wheel halves or in the flanges or hubs. If defects are found remove and repair in accordance with Section 5. Discard cracked wheel halves, flanges or hubs and install new parts.

2-46. LUBRICATION.

WARNING

The U.S. Environmental Protection Agency advises that mechanics and other workers who handle engine oil are advised to minimise skin contact with used oil and promptly remove used oil from the skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off, for most of their life span. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

2-47. GENERAL DESCRIPTION. Lubrication requirements are outlined in figure 2-6. Before adding lubricant to a fitting, wipe the fitting free of dirt. Lubricate until grease appears around part being lubricated and wipe excess grease from parts. The following paragraphs supplement figure 2-6 by adding details not shown in the figure.

2-48. NOSE GEAR TORQUE LINKS. Lubricate torque links every 50 hours. When operating in dusty conditions, more frequent lubrication is recommended.

2-49. TACHOMETER DRIVE SHAFT. Refer to Section 16.

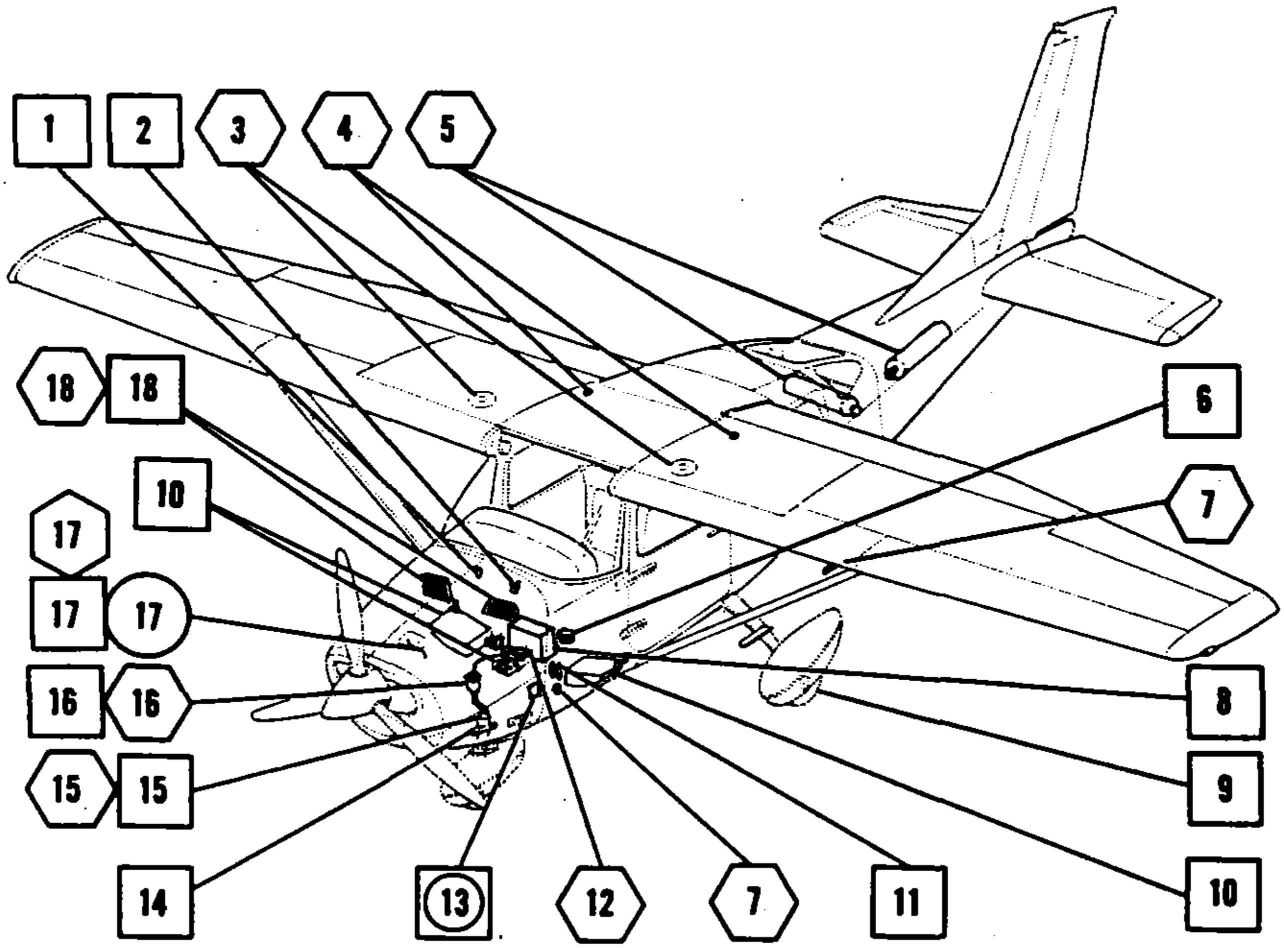
2-50. WHEEL BEARINGS. Clean and repack wheel bearings at the first 100-hour inspection and at each 500-hour inspection thereafter. If more than the usual number of take-off and landings are made, extensive taxiing is required or the aircraft is operated in dusty areas or under seacoast conditions, clean and lubricate wheel bearings at each 100-hour inspection.

2-51. WING FLAP ACTUATOR. Clean and lubricate wing flap actuator jack screw each 100 hours as follows:
a. Expose jack screw by operating flaps to full-down position.
b. Clean jack screw threads with solvent rag and dry with compressed air.

NOTE

It is not necessary to remove actuator from aircraft to clean or lubricate threads.

c. With oil can, apply light coat of No. 10 weight non-detergent oil to threads of jack screws.



NOTE

Refer to sheet 2 for specified Hydraulic Fluid, Oxygen, Fuel and Oil and Oil capacities.

Figure 2-5. Servicing (Sheet 1 of 4)

HYDRAULIC FLUID:
SPEC. NO. MIL-H-5606

OXYGEN:
SPEC. NO. MIL-O-27210

SPECIFIED AVIATION GRADE FUELS:

WARNING

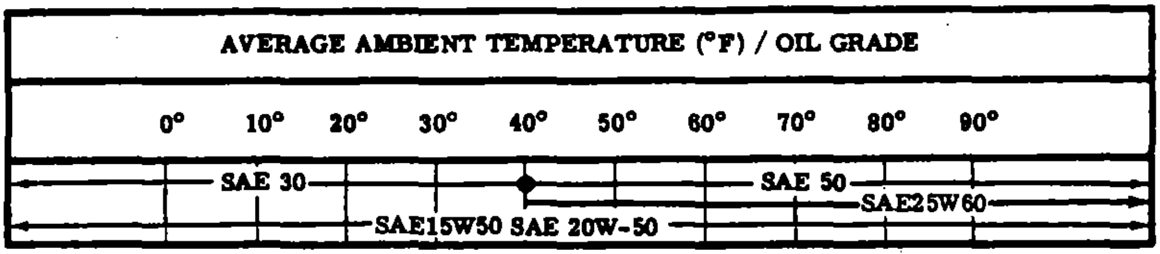
ONLY AVIATION GRADE FUELS ARE APPROVED FOR USE.

ENGINE MODEL	APPROVED FUEL GRADES	NOTE
Continental IO-520-F & TSIO-520-M	100LL (blue)	1
	100 (green) (formerly 100/130)	1

NOTE

1. Compliance with Continental Aircraft Engine Service Bulletin M82-8, and all supplements or revisions thereto, must be accomplished.

SPECIFIED AVIATION GRADE OIL:



Aviation grade ashless dispersant oil, conforming to Continental Motors Specification MHS-24, and all revisions or supplements thereto, must be used except as noted in paragraph 2-23, herein. Refer to Continental Aircraft Engine Service Bulletin M82-8, and any superseding bulletins, revisions or supplements thereto, for further recommendations.

Oil capacities for the aircraft are given in the following chart. To minimize loss of oil through the breather, fill to specified oil level on dipstick for normal operation (flight of less than three hours duration). For extended flight, fill to FULL mark on dipstick. Do not operate with less than MINIMUM FOR FLIGHT quantities listed. If an external oil filter is installed, one additional quart of oil is required when filter is changed.

CAPACITY (TOTAL)	CAPACITY (TOTAL WITH FILTER)	NORMAL OPERATION	MINIMUM FOR FLIGHT
12	13	10	9

Figure 2-5. Servicing (Sheet 2 of 4)

DAILY

3 **FUEL CELLS:**
Service after each flight. Keep full to retard condensation. Refer to paragraph 2-19.

4 **FUEL CELL SUMP DRAINS:**
Drain off any water and sediment before first flight of the day.

16 **FUEL STRAINER:**
Drain off any water and sediment before first flight of the day.

12 **OIL DIPSTICK:**
Check on preflight. Add oil as necessary. Refer to paragraph 2-22 for details. Check that filler cap is tight and oil filler is secure.

7 **PITOT AND STATIC PORTS:**
Check for obstructions before first flight of the day.

5 **OXYGEN CYLINDERS:**
Check for anticipated requirements before each flight. Refer to Section 15.

18 **INDUCTION AIR FILTER:**
Inspect and service under dusty conditions. Refer to paragraph 2-23 for details.

15 **NOSE GEAR SHOCK STRUT:**
Keep strut filled and inflated to correct pressure. Refer to paragraph 2-27.

FIRST 25 HOURS

17 **ENGINE OIL SYSTEM:**
Refill with ashless dispersant oil. Refer to paragraph 2-22 for details.

50 HOURS

17 **ENGINE OIL SYSTEM:**
Change oil each 50 hours if engine is NOT equipped with external filter. Beginning with serial U20605030, turbocharged engines: if equipped with external filter, change filter element each 50 hours and oil at least each 100 hours, or every six months.

100 HOURS

1 **FUEL AIR CONTROL UNIT SCREEN:**
Remove and clean screen.

2 **VACUUM RELIEF VALVE FILTER:**
Replace each 100 hours.

16 **FUEL STRAINER:**
Disassemble and clean strainer bowl and screen.

Figure 2-5. Servicing (Sheet 3 of 4)

100 HOURS

17 **ENGINE OIL SYSTEM:**
Beginning with serial U20605030, normally aspirated engines, if equipped with external oil filter, change oil filter element and oil at least every 100 hours, or every six months.

18 **INDUCTION AIR FILTER:**
Clean filter per paragraph 2-23. Replace as required.

8 **BATTERY:**
Check electrolyte level and clean battery compartment each 100 hours or 90 days.

10 **FUEL RESERVOIR TANK AND/OR SELECTOR VALVE DRAINS:**
Use fuel sampler cup or remove plugs and drain off any water and sediment. Reinstall and resafety plugs.

11 **BRAKE MASTER CYLINDERS:**
Check fluid level and fill as required with hydraulic fluid.

6 **VACUUM SYSTEM CENTRAL AIR FILTER:**
Inspect for damage. Refer to paragraph 2-24.

14 **SHIMMY DAMPER:**
Check fluid level and refill as required in accordance with paragraph 2-28.

9 **TIRES:**
Maintain correct tire inflation as listed in Section 1.
Refer to paragraph 2-26.

15 **NOSE GEAR SHOCK STRUT:**
Keep strut filled and inflated to correct pressure.
Refer to paragraph 2-27.

6 **VACUUM SYSTEM CENTRAL AIR FILTER:**
Inspect for damage. Refer to paragraph 2-24.

200 HOURS

13 **GROUND SERVICE RECEPTACLE:**
Connect to 12-volt, or 24-volt if aircraft is equipped with a 24-volt battery, DC, negative-ground power unit for cold weather starting and lengthy ground maintenance of the aircraft electrical equipment with the exception of electronic equipment. Master switch should be turned on before connecting a generator-type or battery-type power source.

NOTE

The ground power receptacle circuit incorporates a polarity reversal protection. Power from the external power source will flow only if the ground service plug is connected correctly to the aircraft.

500 HOURS

6 VACUUM SYSTEM CENTRAL AIR FILTER:
Replace every 500 hours. Refer to paragraph 2-24.

18 INDUCTION AIR FILTER:
Replace every 500 hours or annually. Refer to paragraph 2-23.

Figure 2-5. Servicing (Sheet 4 of 4)

FREQUENCY (HOURS)

50 | 100 | 500 | 1000

WHERE NO INTERVAL IS SPECIFIED, LUBRICATE AS REQUIRED AND WHEN ASSEMBLED OR INSTALLED.

METHOD OF APPLICATION

HAND | GREASE GUN | OIL CAN | SYRINGE (FOR POWDERED GRAPHITE)

NOTE

The military specifications listed below are not mandatory, but are intended as guides in choosing satisfactory materials. Products of most reputable manufacturers meet or exceed these specifications.

LUBRICANTS

PG	SS-G-659	POWDERED GRAPHITE
GR	MIL-G-81322A	GENERAL PURPOSE GREASE
GH	MIL-G-23827A	AIRCRAFT AND INSTRUMENT GREASE
GL	MIL-G-21164C	HIGH AND LOW TEMPERATURE GREASE
OG	MIL-L-7870A	GENERAL PURPOSE OIL
PL	VV-P-236	PETROLATUM
GP		NO. 10-WEIGHT, NON-DETERGENT OIL
OL	VV-L-800A	LIGHT OIL

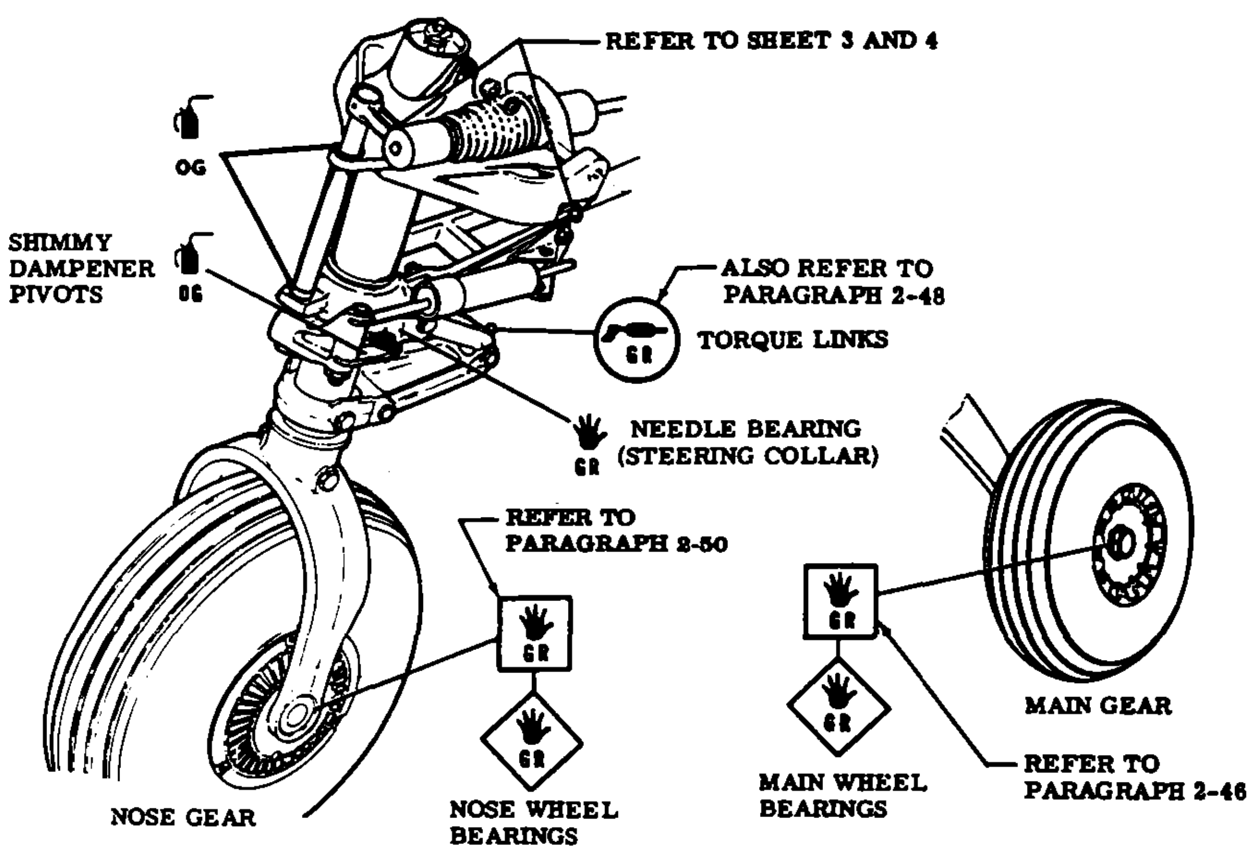


Figure 2-6. Lubrication (Sheet 1 of 4)

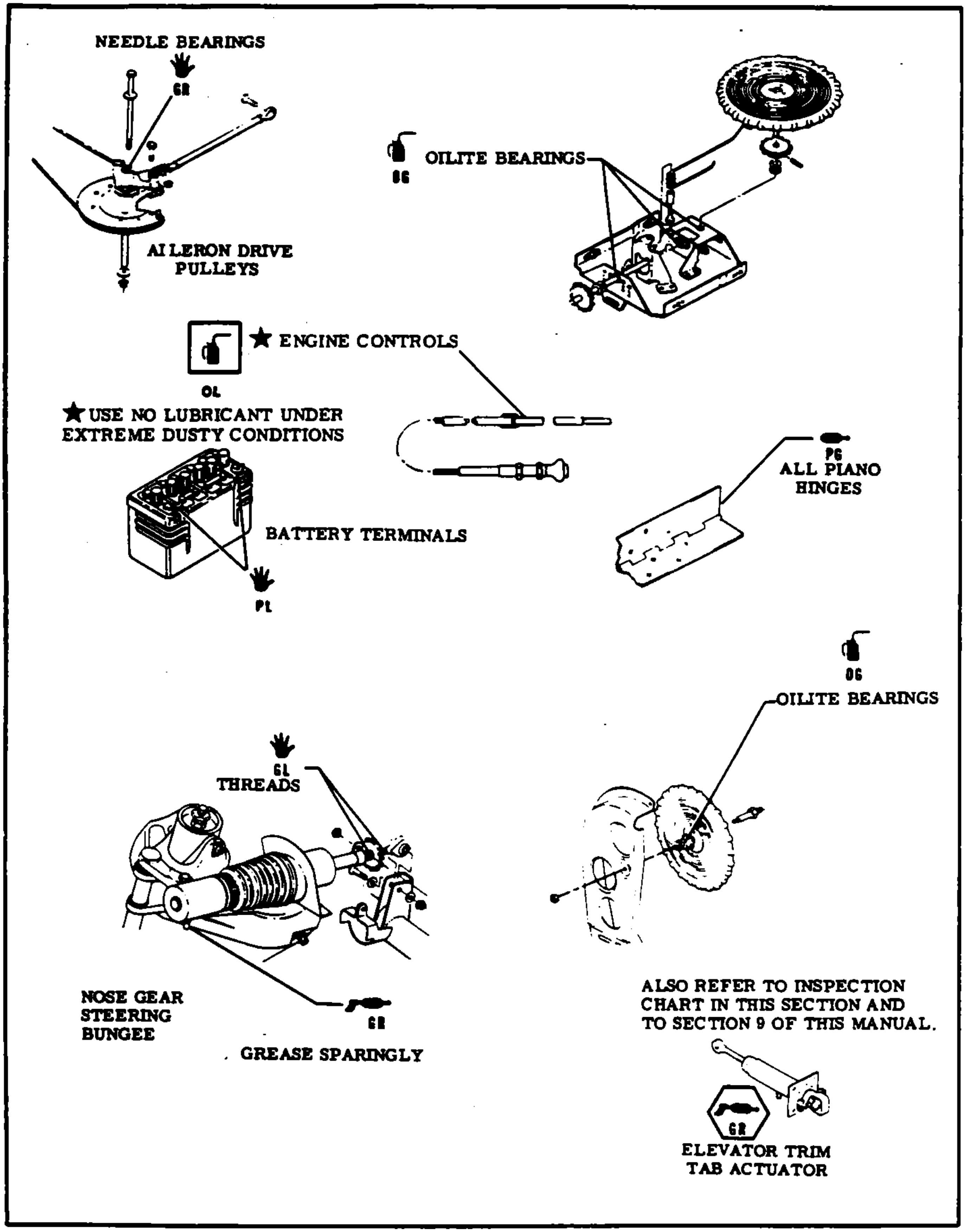


Figure 2-6. Lubrication (Sheet 2 of 4)

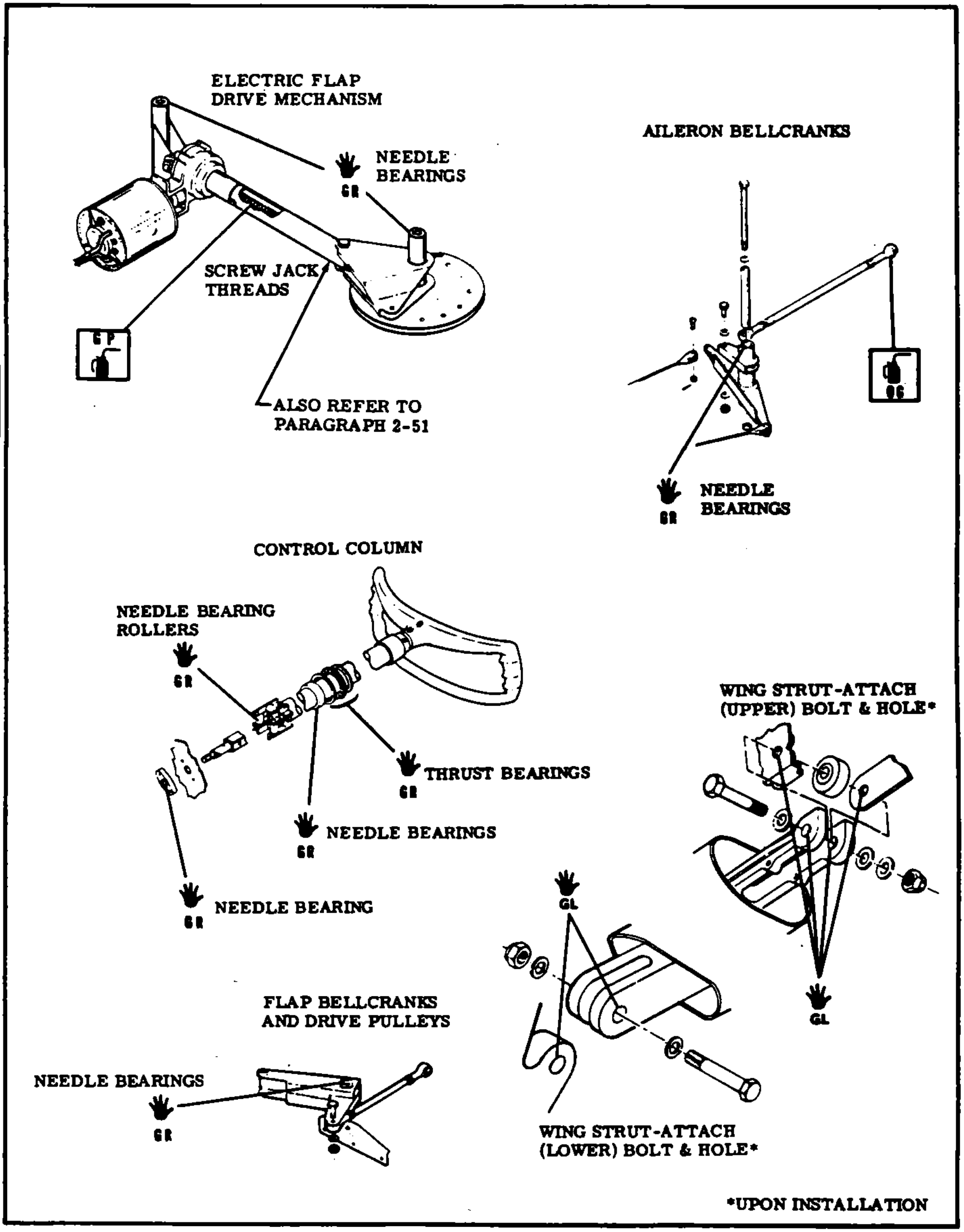
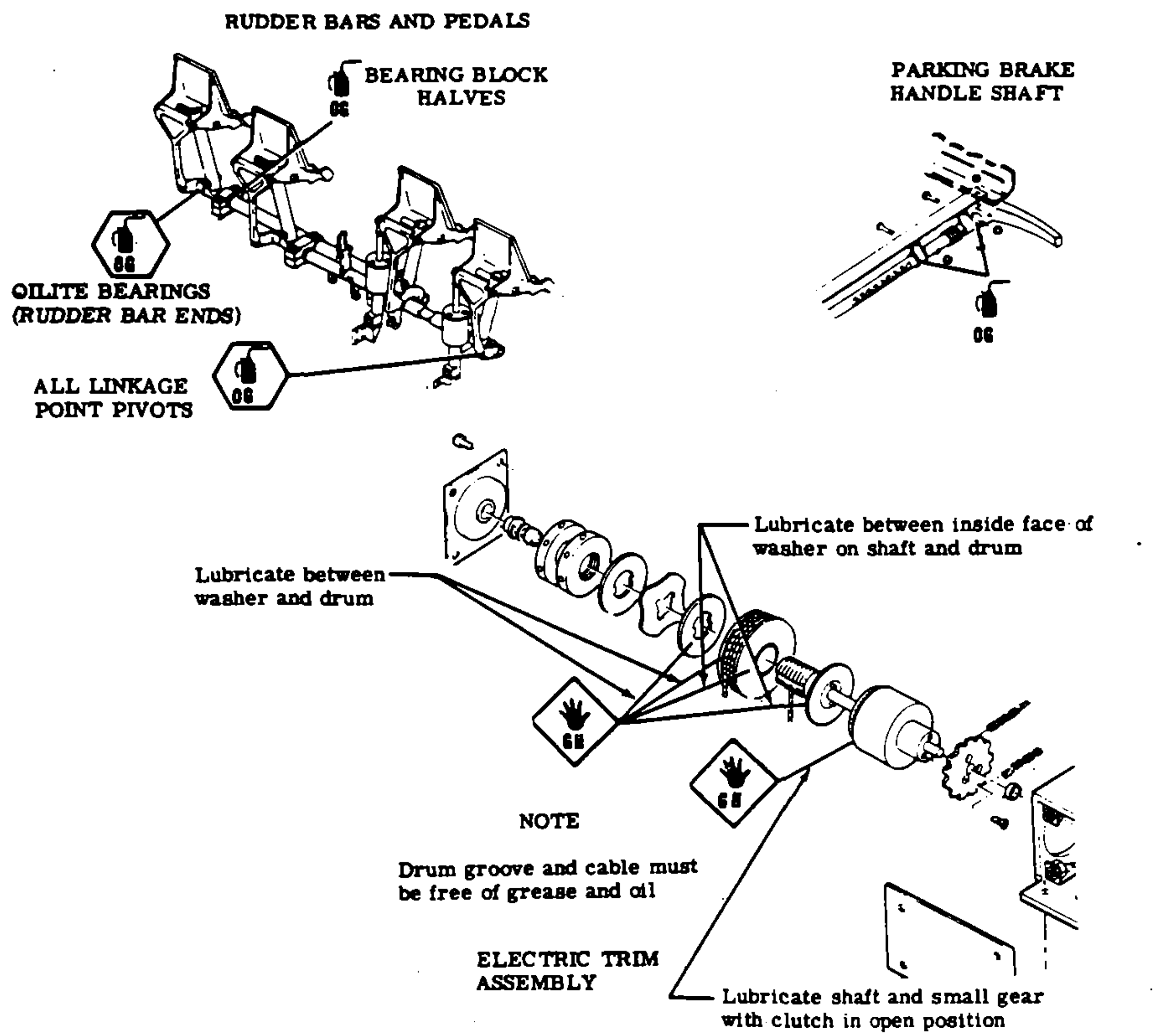


Figure 2-6. Lubrication (Sheet 3 of 4)



NOTES

Sealed bearings require no lubrication.

McCauley propellers are lubricated at overhaul and require no other lubrication.

Do not lubricate roller chains or cables except under seacoast conditions. Wipe with a clean, dry cloth.

Lubricate unsealed pulley bearings, rod ends, Oilite bearings, pivot and hinge points, and any other friction point obviously needing lubrication, with general purpose oil every 1000 hours or oftener if required.

Paraffin wax rubbed on seat rails will ease sliding the seats fore and aft.

Lubricate door latching mechanism with MIL-G-81322A or equivalent lubricant, applied sparingly to friction points, every 1000 hours or oftener if binding occurs.
No lubrication is recommended on the rotary clutch.
Apply DOOR - EZE lubricant to latch bolt.

Figure 2-6. Lubrication (Sheet 4 of 4)

2-52. GENERAL INSPECTION (MODEL 206 AND T206 AIRPLANES).

NOTE

Cessna Aircraft Company recommends PROGRESSIVE CARE for airplanes flown 200 hours or more per year, and 100-HOUR INSPECTION for airplanes flown less than 200 hours per year.

A. Inspection Requirements.

(1)Two basic types of inspections are available as defined below:

(a) As required by Federal Aviation Regulation Part 91.409(a), all civil airplanes of U.S. registry must undergo an annual inspection each 12 calendar months. In addition an annual 100 hour inspection, airplanes operated commercially (for hire) must also have a complete inspection each 100 hours of operation as required by Federal Aviation Regulation Part 91.409(b).

(b) In lieu of the above requirements, an airplane may be inspected in accordance with a progressive inspection program in accordance with Federal Aviation Regulation Part 91.409(d), which allows the work load to be divided into smaller operations that can be accomplished in a shorter time period. The CESSNA PROGRESSIVE CARE PROGRAM has been developed to satisfy the requirements of Part 91 409 (d).

B. Inspection Program Selection.

(1) As a guide for selecting the inspection program that best suits the operation of the airplane, the following is provided:

(a) If the airplane is flown less than 200 hours annually, the following conditions apply:

1. If flown for hire.

a. An airplane operating in this category must be inspected each 100 hours of operation (100-HOUR) and each 12 calendar months of operation (ANNUAL).

2. If not flown for hire.

a. An airplane operating in this category must be inspected each 12 calendar months of operation (ANNUAL). It is recommended that between annual inspections, all items be inspected at the intervals specified in the Inspection Time Limits Charts and Component Time Limits Charts.

(b) If the airplane is flown more than 200 hours annually, the following condition applies:

1. Whether flown for hire or not, it is recommended that airplanes operating in this category be placed on the CESSNA PROGRESSIVE CARE PROGRAM. However, if not placed on the CESSNA PROGRESSIVE CARE PROGRAM, the inspection requirements for airplanes in this category are the same as those defined under Paragraph B. (1)(a)1.a. or 2.a. CESSNA PROGRESSIVE CARE PROGRAM may be utilized as a total concept program which ensures that the inspection intervals in the inspection charts are not exceeded. Manuals and forms which are required for conducting the CESSNA PROGRESSIVE CARE PROGRAM inspections are available from the Cessna Supply Division.

C. Inspection Charts.

NOTE

Cessna has prepared these Inspection Charts to assist the owner or operator in meeting the foregoing responsibilities and to meet the intent of Federal Aviation Regulation Part 91.169(d), (4). The Inspection Charts are not intended to be all-inclusive, for no such charts can replace the good judgment of a certified airframe and powerplant mechanic in performance of his duties. As the one primarily responsible for this airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the airplane.

(1) The following Inspection Charts (Inspection Time Limits, Component Time Limits, Progressive Care Inspection, and Expanded Inspection) show the recommended intervals at which items are to be inspected based on normal usage under average environmental conditions. Airplanes operated in extremely humid tropics, or in exceptionally cold, damp climates, etc., may need more frequent inspections for wear, corrosion, and lubrication. Under these adverse conditions, perform periodic inspections in compliance with this chart at more frequent intervals until the operator can set his own inspection periods based on field experience. The operator's inspection intervals shall not deviate from the inspection time limits shown in this manual except as provided below:

(a) Each inspection interval can be exceeded by 10 hours or can be performed early at any time prior to the regular interval as provided below:

1. In the event of late compliance of any operation scheduled, the next operation in sequence retains a due point from the time the late operation was originally scheduled.
2. In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next phase due point may remain where originally set.
3. In the event of early compliance of any operation scheduled, that occurs more than 10 hours ahead of schedule, the next phase due point must be rescheduled to establish a new due point from the time of early accomplishment.

(2) As shown in the charts, there are items to be checked at 50 hours, 100 hours, 200 hours, or at Special of Yearly inspection. Special or Yearly inspection items require servicing or inspection at intervals other than 50, 100, or 200 hours. If two inspection time requirements are listed for one inspection item, one hourly and the yearly, both apply and whichever requirement occurs first determines the time limit.

(a) When conducting a 50-hour inspection, check all items listed under EACH 50 HOURS. A 100-hour inspection includes all items listed under EACH 50 HOURS and EACH 100 HOURS. The 200-hour inspection includes all items listed under EACH 50 HOURS, EACH 100 HOURS, and EACH 200 HOURS. All of the items listed would be inspected, serviced, or otherwise performed as necessary to ensure compliance with the inspection requirements.

(b) A COMPLETE AIRPLANE INSPECTION includes all 50-, 100-, and 200-hour items plus those Special and Yearly Inspection Items which are due at the specified time.

(c) Component Time Limits Charts should be checked at each inspection interval to ensure proper overhaul and replacement requirements are accomplished at the specified times.

D. **Inspection Guidelines.**

(1) The Inspection Charts are to be used as a recommended inspection outline. Detailed information of systems and components in the airplane will be found in various chapters of this Maintenance Manual and the pertinent vendor publications. It is recommended that reference be made to the applicable portion of this manual for service instructions, installation instructions, and to the vendor's data or publications specifications for torque values, clearances, settings, tolerances, and other requirements.

(2) For the purpose of this inspection, the term "on condition" is defined as follows: The necessary inspections and/or checks to determine that a malfunction or failure will not occur prior to the next scheduled inspection.

(3) MOVABLE PARTS: Inspect for lubrication, servicing, security of attachment, binding, excessive wear, safetying, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing, and tension.

(4) FLUID LINES AND HOSES: Inspect for leaks, cracks, bulging, collapsed, twisted, dents, kinks, chafing, proper radius, security, discoloration, bleaching, deterioration, and proper routing; rubber hoses for stiffness and metal lines for corrosion.

(5) METAL PARTS: Inspect for security of attachment, cracks, metal distortion, broken spotwelds, condition of paint (especially chips at seams and around fasteners for onset of corrosion) and any other apparent damage.

(6) WIRING: Inspect for security, chafing, burning, arcing, defective insulation, loose or broken terminals, heat deterioration, and corroded terminals.

(7) STRUCTURAL FASTENERS: Inspect for correct torque in accordance with applicable torque values. Refer to Bolt Torque Data during installation or when visual inspection indicates the need for a torque check.

NOTE

Torque values listed are not to be used for checking tightness of installed parts during service.

(8) FILTERS, SCREENS, AND FLUIDS: Inspect for cleanliness and the need for replacement at specified intervals.

(9) System check (operation or function) requiring electrical power must be performed using 28.5 $\pm$0.25 volts bus voltage. This will ensure all components are operating at their designed requirements.

(a) Airplane file.

1. Miscellaneous data, information, and licenses are a part of the airplane file. Check that the following documents are up-to-date and in accordance with current Federal Aviation Regulations. Most of the items listed are required by the Federal Aviation Regulations. Since the regulations of other nations may require other documents and data, owners of exported airplanes should check with their own aviation officials to determine their individual requirements.

a. To be displayed in the airplane at all times:

1) Standard Airworthiness Certificate (FAA Form 8100-2).
2) Aircraft Registration Certificate (FAA Form 8050-3).
3) Aircraft Radio Station License (Federal Communication Commission Form 556 if transmitter is installed).
4) Radio Telephone Station License (Federal Communication Commission Form 409 if Flitefone Radio Telephone is installed).

b. To be carried in the airplane at all times:

1) Weight and Balance Data Sheets and associated papers (all copies of the Repair and Alteration Form, FAA Form 337, are applicable).
2) Equipment List.
3) Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual.

c. To be made available upon request:

1) Airframe, Engine, Propeller, and Avionics Maintenance Records.

2-53. PREINSPECTION CHECKS. (MODEL 206 AND T206 AIRPLANES.)

A. Preinspection Operational Checks.

(1) Before beginning the step-by-step inspection, start and run up the engine and upon completion, shut down the engine in accordance with instructions in the Pilot's Operating Handbook and FAA approved Airplane Flight Manual. During the run-up, observe the following, make a note of any discrepancies or abnormalities:

(a) Engine temperature and pressures.
(b) Static RPM. (Also refer to Section 12 of this manual.)
(c) Magneto drop. (Also refer to Section 12 of this manual.)
(d) Engine response to changes in power.
(e) Any unusual engine noises.
(f) Fuel selector and/or shutoff valve: operate engine on each tank (or cell) position and OFF position long enough to ensure shutoff and/or selector valve functions properly.
(g) Idling speed and mixture: proper idle cut-off.
(h) Alternator and ammeter.
(i) Fuel flow indicator.

(2) After the inspection has been completed, an engine run-up should again be performed to determine that any discrepancies or abnormalities have been corrected.

(3) Some of the items in the Inspection Time Limits paragraph are optional, therefore not applicable to all airplanes.

Mechanic's Preinspection Discrepancies or Abnormalities to be checked:

Mechanic's Post-inspection Corrective Action Taken:

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
A		**Placards (Refer to Pilot's Operating Handbook).**					
A	1	Placard and Decals - Inspect presence, legibility, and security. Consult Pilot's Operating Handbook and FAA - Approved Airplane Flight Manual for required placards.			•		
B		**Fuselage (Section 3)**					
B	1	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.		•			
B	2	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, loose rivets, bolts and nuts.			•		
B	3	Control Wheel Lock - Check general condition and operation.			•		
B	4	Fuselage Mounted Equipment - Check for general condition and security of attachment.			•		
B	5	Antennas and Cables - Inspect for security of attachment, connection, and condition.			•		
B	6	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with 14 CFR Part 91.207. Refer to Section 16 - Emergency Locator Transmitter - Checkout Interval.		•			
B	7	Instrument Panel Shock Mounts, Ground Straps and Covers - Inspect for deterioration, cracks, and security of attachment.			•		
B	8	Pilot's and Copilot's Inertia Reels - Inspect for security of installation, proper operation and evidence of damage.		•			
B	9	Seats, Seat Belts, and Shoulder Harnesses - Check general condition and security. Check operation of seat stops and adjustment mechanism. Inspect belts for condition and security of fasteners.		•			
B	10	Windows, Windshield, Doors, and Seals - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.		•			
B	11	Upholstery, Headliner, Trim and Carpeting - Check condition and clean as required.				EACH 400	EACH 1
B	12	Flight Controls - Check freedom of movement and proper operation through full travel with and without flaps extended. Check electric trim controls for operation (as applicable).		•			
B	13	Aileron, Elevator, and Rudder Stops - Check for damage and security. Compliance with Cessna Service Letter SE80-65 is required.		•			
B	14	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation and servicing date.		•			

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	•				
B	16	Control Column - Inspect pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security.			•		
B	17	Fuel Line and Selector Valve Drains(s) - Remove plug and drain.		•			
C		**Wings and Empennage (Section 4)**					
C	1	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.		•			
C	2	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.			•		
C	3	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.			•		
C	4	Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.			•		
C	5	Wing Access Plates - Check for damage and security of installation.			•		
C	6	Vertical and Horizontal Stabilizers, Tips and Tailcone - Inspect externally for skin damage and condition of paint.		•			
C	7	Vertical and Horizontal Stabilizers and Tailcone Structure - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical and horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.		•			
C	8	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.		•			
D		**Landing Gear and Brakes (Section 5)**					
D	1	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake.		•			
D	2	Main Gear Tubular Struts - Inspect for cracks, dents, corrosion, condition of paint or other damage. Check axles for condition and security.		•			
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps and Fittings - Check for leaks, condition and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.				EACH 400	EACH 1
D	5	Tires - Check tread wear and general condition. Check for proper inflation.		•			
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.		•			

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
D	7	Main Landing Gear Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.		•			
D	8	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.			•		
D	9	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.		•			
D	10	Nose Gear Fork - Inspect for cracks, general, condition, and security of attachment.			•		
D	11	Wheel Bearings - Clean, inspect and lube.				A	
D	12	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.		•			
D	13	Brake System - Overhaul brake discs, parking brake system, wheel cylinders, and master cylinders. Replace brake pads and all rubber goods.					B
E		**Aileron Control System (Section 6)**					
E	1	Ailerons and Hinges - Check condition, security and operation.		•			
E	2	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.		•			
E	3	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.			•		
E	4	Autopilot Rigging - Check per Avionics Installation Manual.				C	EACH 1
E	5	Aileron Controls - Check freedom of movement and proper operation through full travel with and without flaps extended.		•			
F		**Wing Flap Control System (Section 7)**					
F	1	Flaps - Check tracks, rollers, and control rods for security of attachment. Check operation.		•			
F	2	Flap Actuator Threads - Clean and lubricate. Refer to paragraph 2-51 for detailed instructions.		•			
F	3	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.			•		
F	4	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.			•		
F	5	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turmbuckle safety. Check travel if cable tension requires adjustment.			•		
F	6	Flap Motor, Actuator, and Limit Switches (electric flaps) - Check wiring and terminals for condition and security. Check actuator for condition and security.			•		

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	YEARS
G		**Elevator Control System (Section 8)**					
G	1	Elevator Control - Check freedom of movement and proper operation through full travel.		•			
G	2	Elevator, Hinges, and Cable Attachment - Check condition, security, and operation.		•			
G	3	Elevator Control System - Inspect pulleys, cables, sprockets, bearings chains, and trunbuckles for condition, security, and operation.			•		
G	4	Elevator/Rudder Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.		•			
H		**Elevator Trim Tab Control System (Section 9)**					
H	1	Elevator Trim Tab and Hinges - Check condition, security, and operation.		•			
H	2	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, ect. for proper routing, condition, and security.		•			
H	3	Trim Controls and Indicators - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security. Check electric trim controls for operation as applicable.			•		
H	4	Elevator Trim Tab Stop Blocks - Inspect for damage and security.			•		
H	5	Elevator Trim Tab Actuator - Clean, lubricate, and check for free-play.				D	
H	6	Elevator Trim Tab Actuator - Free-Play limits inspection. Refer to Section 9-5A for cleaning, inspection and repair procedures.			•		
I		**Rudder Control System (Section 10)**					
I	1	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.		•			
I	2	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.			•		
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.		•		E	
I	4	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.			•		

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS	
						HOURS	YEARS
J		**Normally Aspirated and Turbocharged Engines (Sections 12 and 12A)**					
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	•				
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	•				
J	3	Cowl Flap Controls - Check freedom of movement through full travel.	•				
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	•				
J	5	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.		•			
J	6	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, ect. Check cowl shock mounts for condition and security.			•		
J	7	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.			•		
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	•				
J	9	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation. Clean and inspect air filter and re-oil if flock coated. Refer to Cessna Service Letter SE80-12.		•			
J	10	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-23.		•		G	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	•				
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	•			H	
J	13	Alternator - Check brushes, leads, commutator or slip ring for wear.				I	
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leades, and commutator.		•			
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	•				
J	16	Exhaust System (Normally aspirated engine) - Inspect for cracks and security. Air leak check exhaust system. Refer to Sections 12 and 12A, for inspection procedures.	•				
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust. Refer to Sections 12 and 12A for inspection procedure.	•				
J	18	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation and security. Remove and clean filter (as applicable).		•			
J	20	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.		•			

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
J	21	Magnetos - Timing Procedures and intervals, lubrication, and overhaul procedures.				K	
J	22	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.		•			
J	23	Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.		•			
J	24	Cylinder Compression - Perform differential compression test.			•		
J	25	Fuel Injection System - Check security of fuel-air control unit, manifold valve, nozzles, screws and pump. Check fuel lines for leaks, interference and proper routing.		•			
J	26	Engine Primer - Check for leakage, operation, and security.		•			
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	•				L
J	28	Cold and Hot Air Hoses - Check condition, routing, and security.		•			
J	29	Engine Cylinders, Rocker Box Covers and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment and general condition.		•			
J	30	Engine Baffles and Seals - Check condition and security of attachment.	•				
J	31	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.		•			
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	 • •			M	
J	33	Turbocharger (if applicable) A. Remove heat shields and inspect for burned areas, bulges or cracks. Remove tailpipe and ducting - inspect turbine for coking, carbonization, oil deposits, and turbine impellers for damage.			•		
J	34	Heater Components - Inspect all components for condition and security.		•			
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	 •			N	

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	• •			N	
J	37	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filters: A. Drain oil sump and refill with recommended grade aviation oil (when system is equipped with short oil filter). B. Drain oil sump, remove and replace long oil filter (approximately 5.8 inches long), and refill with recommended grade aviation oil.		• •		N	
K		**Fuel System (Section 13)**					
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.		•			
K	2	Integral Fuel Tanks - Drain fuel and check tank interior and outlet screens.				O	
K	3	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.		•			
K	4	Fuel Bladders - Drain fuel and check for wrinkles that would retain contaminants or liquid, and security of attachment and condition of outlet screens.				O	
K	5	Fuel System - Inspect plumbing and components for mounting and security.		•			
K	6	Fuel Tank or Bladder Drains - Drain water and sediment.	•				
K	7	Fuel Tank Vent Lines and Vent valves - Check vents for obstruction and proper positioning. Check valves for operation.		•			
K	8	Fuel Selector Valve - Check controls for detent in each position, secutity of attachment, and for proper placarding.		•			
K	9	Throttle Operated Auxiliary Fuel Pump Switch. Check condition of wiring and security of components. Perform rigging check (Refer to Section 13-33).		•			
K	10	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen bowl.		•			
K	11	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.					EACH 1
K	12	Fuel Quantity Indicators - Check for damage and security of installation and perform accuracy test.					EACH 1
K	13	Inspect/Clean the fuel injection nozzles				V	
L		**Propeller and Propeller Governor (Section 14)**					
L	1	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	•				
L	2	Propeller Mounting - Check for security of installation.	•				
L	3	Propeller Blades - Inspect for cracks, dents, nicks, scratches, errosion, corrosion, or other damage.	•				
L	4	Spinner - Check general condition and attachment.	•				
L	5	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.		•			

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
L	6	Propeller Mounting Bolts - Inspect mounting bolts and safety wire for signs of looseness. Retorque mounting bolts as required.			•		
L	7	Propeller Hub - Check general condition			•		
L	8	Propeller Governor and Control - Check for security and operation of controls.			•		
L	9	Propeller Assembly - Overhaul.				P	
M		**Utility Systems (Section 15)**					
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.				400	EACH 1
M	2	Heater Components, Inlets, and Outlets - Inspect all lines, connections, ducts, clamps, seals, and gaskets for condition, restriction, and security.		•			
M	3	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.			•		
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	•				
M	5	Pitot Tube Heater Element - Perform operational check.	•				
M	6	Propeller Anti-ice Slip Rings, Brushes and Boots - Inspect for condition and security. Perform operational check.	•				
M	7	Heated Windshield Panel - Check operation, security of installation, electrical wiring, and condition of storage bag.			•		
M	8	Oxygen System - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.			•		
M	9	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.					EACH 5
N		**Instruments and Instrument Systems (Section 16)**					
N	1	Vacuum System - Inspect for condition and security.		•			
N	2	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.		•			U
N	3	Vacuum Pump - Check for condition and security. Check vacuum system breather line for obstruction, condition, and security.		•			
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE: Smoking will cause premature filter clogging.		•		Q	
N	5	Vacuum System Relief Valve - Inspect for condition and security.		•		R	
N	6	Instruments - Check general condition and markings for legibility		•			
N	7	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.			•		
N	8	Static System - Inspect for security of installation, cleanliness, and evidence of damage.			•		
N	9	Navigation Indicators, Controls, and Components - Inspect for condition and security.			•		
N	10	Airspeed indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.					EACH 2
N	11	Altimeter and Static System - Inspect in accordance with 14 CFR Part 91.411.					EACH 2

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
N	12	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, Transponder, DME and Compass System) - Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.			•		
N	13	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.			•		
N	14	Remote Mounted Avionics - Inspect for security of wire ties and electrical connectors, condition and security of wire routing. Also check for evidence of damage and cleanliness.			•		
N	15	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.			•		
N	16	Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.			•		
N	17	Vacuum Manifold Check Valve (If so equipped)					T
O		**Electrical Systems (Section 17)**					
O	1	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.			•		
O	2	Instrument, Cabin, Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.		•			
O	3	Circuit Breakers and Fuses - Check operation and condition. Check for required number of spare fuses.		•			
O	4	Battery - Check general condition and security. Check level of electrolyte.				S	
O	5	Battery Box and Cables - Clean and remove any corrosion. Check cables for routing, support, and security of connections.		•			
O	6	Switch and Circuit Breaker Panel, Terminal Blocks and Junction Boxes - Inspect wiring and terminals for condition and security.			•		
O	7	Alternator Control Unit - Inspect wiring, mounting, condition, and wire routing.			•		
O	8	Switches - Check operation, terminals, wiring, and mounting for conditions, security, and interference.			•		
O	9	Instrument Panel and Control Pedestal - Inspect wiring, mounting, and terminals for condition and security. Check resistance between stationary panel and instrument panel for proper ground.			•		
O	10	External Power Receptacle and Power Cables - Inspect for condition and security.			•		

2-54. INSPECTION TIME LIMITS (Model 206 & T206 Airplanes)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
P		**Post Inspection**					
P	1	Replace all fairings, doors, and access hole covers, ground check engine, alternator charging rate, oil pressure, tachometer, oil temperature and pressure gages, and general operation of components.					
Q		**Perform the Following Operational Checks:**					
Q	1	Brakes - Test toe brakes and parking brake for proper operation.		•			
R		Service Bulletins/Airworthiness Directives					
R	1	Check that all applicable Cessna Service Bulletins and Supplier Service Bulletins are complied with.					
R	2	Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with.					
R	3	Ensure all Maintenance Record Entries required by Federal Aviation Regulations are completed before returning the airplane to service.					

Special Inspections Legends:

A. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
B. Serial U20603522 thru U20604649: Each 5 years. Serial U20604650 and on: Overhaul components and replace rubber goods on condition basis.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 1000 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Serial U20604650 thru U20605919: Compliance with Cessna Service Letter SE80-65 is required.
F. Lubricate each 100 hours (except in extreme dusty conditions). These controls are not repairable and should be replaced every 1500 hours or sooner if required.
G. Clean filter per paragraph 2-23. Replace paper filters at least each 500 hours.
H. Check belt tension after 10 to 25 hours of operation. Refer to Section 17.
I. Inspect each 500 hours.
J. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. Maintenance and overhaul information covering Slick magnetos is available from Cessna Parts Distribution (CPD 2). Order L-1037C1-13 for 4200/6200 series magnetos, or L-1020-13 for 400/600 series magnetos.
K. Every 500 hours of operation. perform the following items:
    a. Inspect contact points for condition and adjust or replace as required.
    b. Inspect carbon brush, high-tension lead, and distributive block for condition. Clean or replace parts as required.
    c. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only. Do not force when checking pawls.
    d. Inspect and lubricate bearings; replace as required.
    e. Lubricate contact point cam.
    The magnetos must be overhauled or replaced with new or rebuilt magnetos at every engine overhaul.
L. Replace engine compartment rubber hoses (Cessna-installed only) every 5 years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition must be placed on order immediately and then replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. For engine flexible hoses (Continental-installed), refer to Continental Maintenance Manual and Continental Engine Service Bulletins.
M. Replace check valves in turbocharger oil lines each 1000 hours.
N. First 25 hours: Refill with straight grade mineral oil and use until a total of 50 hours have accumulated, or oil consumption has stabilized. Change oil, replace filter, and refill sump with recommended grade of ashless dispersant oil. Change oil and replace filter at least every six months, regardless of accumulated hours.
O. Each 1000 hours.
P. See McCauley Service Manual: refer to list of publication.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.
T. Check condition and operation of check valve manifold beginning five years from date of manufacture, and every twelve months thereafter; replace check valve manifold ten years from date of manufacture. Refer to the latest revision of Airborne Service Letter 39 for date of manufacture information and check procedures.
U. Replace S1495 hoses every 10 years.
V. At the first 100-hour inspection on new, rebuilt or overhauled engines, remove and clean the fuel injection nozzles. Thereafter, the fuel injection nozzles must be cleaned at 300-hour intervals or more frequently if fuel stains are found.

2-55. COMPONENT TIME LIMITS

1. General

A. Most components listed throughout Section 2 should be inspected as detailed elsewhere in this section and repaired, overhauled or replaced as required. Some components, however, have a time or life limit, and must be overhauled or replaced on or before the specified time limit.

NOTE: The terms overhaul and replacement as used within this section are defined as follows:

Overhaul - Item may be overhauled as defined in FAR 43.2 or it can be replaced.

Replacement - Item must be replaced with a new item or a serviceable item that is within its service life and time limits or has been rebuilt as defined in FAR 43.2.

B. This section provides a list of items which must be overhauled or replaced at specific time limits. Table 1 lists those items which Cessna has mandated must be overhauled or replaced at specific time limits. Table 2 lists component time limits which have been established by a supplier to Cessna for the supplier's product.

C. In addition to these time limits, the components listed herein are also inspected at regular time intervals set forth in the Inspection Charts, and may require overhaul/replacement before the time limit is reached based on service usage and inspection results.

2. Cessna-Established Replacement Time Limits.

A. The following component time limits have been established by Cessna Aircraft Company.

Table 1: Cessna-Established Replacement Time Limits

COMPONENT	REPLACEMENT TIME	OVERHAUL
Restraint Assembly Pilot, Copilot, and Passenger Seats	10 years	NO
Trim Tab Actuator	1,000 hours or 3 years, whichever occurs first	YES
Vacuum System Filter	500 hours	NO
Vacuum System Hoses	10 years	NO
Pitot and Static System Hoses	10 years	NO
Vacuum Relief/Regulator Valve Filter (If Installed)	500 hours	NO
Engine Compartment Flexible Fluid Carrying Teflon Hoses (Cessna-Installed) Except Drain Hoses (Drain hoses are replaced on condition)	10 years or engine overhaul, whichever occurs first (Note 1)	NO

COMPONENT	REPLACEMENT TIME	OVERHAUL
Engine Compartment Flexible Fluid Carrying Rubber Hoses (Cessna-Installed) Except Drain Hoses (Drain hoses are replaced on condition)	5 years or engine overhaul, whichever occurs first (Note 1)	NO
Engine Air Filter	500 hours or 36 months, whichever occurs first (Note 9)	NO
Engine Mixture, Throttle, and Propeller Controls	At engine TBO	NO
Check Valve (Turbocharger Oil Line Check Valve)	Every 1,000 hours of operation (Note 10)	NO
Oxygen Bottle - Lightweight Steel (ICC-3HT, DOT-3HT)	Every 24 years or 4380 cycles, whichever occurs first	NO
Oxygen Bottle - Composite (DOT-E8162)	Every 15 years	NO
Engine Driven Dry Vacuum Pump Drive Coupling (Not lubricated with engine oil)	6 years or at vacuum pump replacement, whichever occurs first	NO
Engine Driven Dry Vacuum Pump (Not lubricated with engine oil)	500 hours (Note 11)	NO
Standby Dry Vacuum Pump	500 hours or 10 years, whichever occurs first (Note 11)	NO

3. Supplier-Established Replacement Time Limits

   A. The following component time limits have been established by specific suppliers and are reproduced as follows:

   Table 2: Supplier-Established Replacement Time Limits

COMPONENT	REPLACEMENT TIME	OVERHAUL
ELT Battery	(Note 3)	NO
Vacuum Manifold	(Note 4)	NO
Magnetos	(Note 5)	YES
Engine	(Note 6)	YES
Engine Flexible Hoses (TCM-Installed)	(Note 2)	NO
Auxiliary Electric Fuel Pump	(Note 7)	YES
Propeller	(Note 8)	YES

NOTES:

Note 1: This life limit is not intended to allow flexible fluid-carrying Teflon or rubber hoses in a deteriorated or damaged condition to remain in service. Replace engine compartment flexible Teflon (AE3663819BXXXX series hose) fluid-carrying hoses (Cessna-installed only) every ten years or at engine overhaul, whichever occurs first. Replace engine compartment flexible rubber fluid-carrying hoses (Cessna-installed only) every five years or at engine overhaul, whichever occurs first (this does not include drain hoses). Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose from Cessna.

Note 2: For TCM engines, refer to Teledyne Continental Service Bulletin SB97-6, or latest revision.

Note 3: Refer to FAR 91.207 for battery replacement time limits.

Note 4: Refer to Airborne Air & Fuel Product Reference Memo No. 39, or latest revision, for replacement time limits.

Note 5: For airplanes equipped with Slick magnetos, refer to Slick Service Bulletin SB2-80C, or latest revision, for time limits.

For airplanes equipped with TCM/Bendix magnetos, refer to Teledyne Continental Motors Service Bulletin No. 643, or latest revision, for time limits.

Note 6: Refer to Teledyne Continental Service Information Letter SIL98-9, or latest revision, for time limits.

Note 7: Refer to Cessna Service Bulletin SEB94-7 Revision 1/Dukes Inc. Service Bulletin NO. 0003, or latest revision.

Note 8: Refer to the applicable McCauley or Hartzell Service Bulletins and Overhaul Manual for replacement and overhaul information.

Note 9: The air filter may be cleaned, refer to Section 2 of this service manual and for airplanes equipped with an air filter manufactured by Donaldson, Refer to Donaldson Aircraft Filters Service Instructions P46-9075 for detailed servicing instructions.
The address for Donaldson Aircraft Filters is:
Customer Service
115 E. Steels Corners RD
Stow OH. 44224

Do not overservice the air filter, overservicing increases the risk of damage to the air filter from excessive handling. A damaged/worn air filter may expose the engine to unfiltered air and result in damage/excessive wear to the engine.

Note 10: Replace the turbocharger oil line check valve every 1,000 hours of operation (Refer to Cessna Service Bulletin SEB91-7 Revision 1, or latest revision).

Note 11: Replace engine driven dry vacuum pump not equipped with a wear indicator every 500 hours of operation, or replace according to the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first.

Replace standby vacuum pump not equipped with a wear indicator every 500 hours of operation or 10 years, whichever occurs first, or replace according to the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first.

For a vacuum pump equipped with a wear indicator, replace pump according to the vacuum pump manufacturer's recommended inspection and replacement intervals.

2-56. SCHEDULED MAINTENANCE CHECKS. (MODEL 206 & T206 AIRPLANES)

2-57. PROGRESSIVE CARE PROGRAM. (MODEL 206 & T206 AIRPLANES)

A. **Progressive Inspection Program.**

(1) Purpose and Use.

(a) As detailed in Federal Aviation Regulation Part 91.409, paragraph (d), airplanes that desire to use a Progressive Inspection Program must be inspected in accordance with an authorized progressive inspection program. This chapter presents the current progressive inspection program for the Cessna Model 206 and T206, recommended by the Cessna Aircraft Company.

B. **Introduction.**

(1) Following is the recommended Progressive Care Program for Model 206 and T206 airplanes.

(2) This program is divided into four separate operations which are to be accomplished initially after 50 hours of operation and each 50 hours of operation thereafter. Additional special requirements indicated as Special Inspection, which are required at other intervals are specified separately.

(3) Recommended progressive care inspection may be accomplished by one of the following.

NOTE

Some 100 HOUR items are covered in Operation 1 and 3, also some 200 HOUR items are covered in Operation 1, 2, 3 and 4. These items are placed here for convenience and expediency of the total inspection. After the first completion of all four Operations, these items will be at the proper intervals.

(a) NEW DELIVERED AIRCRAFT - A new delivered aircraft must have less than 50 hours total time in service and enough calendar time remaining since the issuance date of the original Airworthiness Certificate to allow the owner/operator to complete a cycle of all four Operations before the first annual inspection becomes due. Operation 1 will be due at 50 hours time in service. Operation 2 will be due at 100 hours. Operation 3 will be due at 150 hours and Operation 4 will be due at 200 hours. There are additional inspection requirements for new aircraft at the FIRST 50 HOUR inspection point. In addition to preforming Operation 1, the FIRST 50 HOUR ITEMS listed in the inspection Time Limits Charts in 2-54 must also be performed. After these FIRST 50 HOUR items have been accomplished, they have permanent inspection time limits which are covered in the Operations Schedules.

(b) ALL OTHER AIRCRAFT - To qualify other aircraft which have more than 50 hours time in service for the Progressive Inspection Program, conduct a COMPLETE AIRPLANE INSPECTION. Operation 1 will become due 50 hours from the time the COMPLETE AIRPLANE INSPECTION was accomplished.

(4) Performance of the inspections as listed herein at the specified points will assure compliance with the Inspection Time Limits detailed in 2-54. Special inspections shall be complied with at prescribed intervals and/or intervals coinciding with operations 1 through 4 as outlined in 2-57.

(5) An operator may elect to perform the recommended inspections on a schedule other than that specified. Any inspection schedule requiring the various inspection items detailed in this chapter to be performed at a frequency equal to that specified herein or more frequently is acceptable. Any inspection item performed at a time period in excess of that specified herein must be approved by the appropriate regulating agency.

(6) As defined in Federal Aviation Regulations Part 91.409(d), the frequency and detail of the Progressive Inspection Program shall provide for the complete inspection of the airplane within each 12-calendar months. If the airplane is approaching the end of a 12-calendar month period, but the complete cycle of 4 operations has not been accomplished, it will be necessary to complete the remaining operations, regardless of airplane hours before the end of the 12-calendar month period. If the Progressive Inspection Program is to be discontinued, an annual inspection becomes due at the time when any item reaches a maximum of 12 calendar months from the last time it was inspected under the Progressive Inspection Program. Refer to Federal Aviation Regulation Part 91.409(d) for detailed information.

C. **Inspection Time Limitations.**

(1) Each inspection interval may be exceeded by 10 hours or can be performed early at any time prior to the regular interval as provided below:

(a) In the event of late compliance of any operation scheduled, the next operation in sequence retains a due point from the time the late operation was originally scheduled.

(b) In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next phase due point may remain where originally set.

(c) In the event of early compliance of any operation scheduled, that occurs more than 10 hours ahead of schedule, the next phase due point must be rescheduled to establish a new due point from the time of early accomplishment.

D. **Procedures.**

(1) The following instructions are provided to aid in implementation of the Model 206 & T206 Series Progressive Care Program Schedule.

(a) Use the Progressive Care Program Inspection Chart, provided herein, for each airplane. The chart is to be placed in the airplane flight log book for use as a quick reference for pilots and maintenance personnel in determining when inspections are due and that they are performed within prescribed flight time intervals.

(b) Use the Progressive Care Program Component Overhaul and Replacement Log, provided herein, for each airplane. This log is to be kept with the airplane maintenance records and serves as a periodic reminder to maintenance personnel when various components are due for overhaul or replacement.

(c) To start the Progressive Care Program, begin conducting the inspections defined herein and refer to Federal Aviation Regulations Part 91.409(d) for procedures to notify the Federal Aviation Administration of the intent to begin a progressive inspection program.

(d) Accomplish each inspection and maintenance item per the checklists on the operation sheets of the Progressive Care and Maintenance Schedule. Spaces have been provided for the mechanic's and inspector's signatures as required, as well as any remarks. These are to become part of the maintenance records for each airplane. Each inspectior is to be logged in the airplane and/or engine log books. Refer to Federal Aviation Regulation Part 43.for the recommended entry statement.

PROGRESSIVE CARE PROGRAM
(MODEL 206 & T206 AIRPLANES)
COMPONENT OVERHAUL AND REPLACEMENT RECORD

COMPONENT	DATE	REASON FOR REPLACEMENT	REPLACEMENT PART NUMBER SERIAL NUMBER	NEXT OVERHAUL AIRPLANE HOURS DATE
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			

PROGRESSIVE CARE PROGRAM
INSPECTION CHART

AIRPLANE MODEL: 206/T206 **REGISTRATION NUMBER:**

INSPECTION POINTS	TIME		TIME	
	INSPECTION DUE	INSPECTION ACCOMPLISHED	INSPECTION DUE	INSPECTION ACCOMPLISHED
OPERATION 1				
OPERATION 2				
OPERATION 3				
OPERATION 4				

EXAMPLE:

The airplane in this example was placed on the Progressive Care Program after flying a total of 110 hours. At that point, a complete initial inspection of the airplane was performed. The following steps indicate what will have taken place up through an hourmeter reading of 261 hours.

1. After the initial inspection at 110 hours, the first Inspection Due Column was filled out to show the total flying time at which each of the four (4) operation inspections would be due.
2. As each inspection was performed, the total flying time was recorded in the Inspection Accomplished column. The next Inspection Due space for that particular operation is also filled in at this time. These times will always be 200 hours from the last due point providing the operation was actually accomplished within the ten (10) hours limit.
3. The sample airplane now has a total flying time of 261 hours and the inspection chart shows that a Phase 4 will be due at 310 hours.

INSPECTION POINTS	TIME		TIME	
	INSPECTION DUE	INSPECTION ACCOMPLISHED	INSPECTION DUE	INSPECTION ACCOMPLISHED
OPERATION 1	160	162	360	
OPERATION 2	210	209	409	
OPERATION 3	260	261	460	
OPERATION 4	310			

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.1

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
B	13	Aileron, Elevator, and Rudder Stops - Check for damage and security. Compliance with Cessna Service Letter SE80-65 is required.	
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
C	1	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	
C	6	Vertical and Horizontal Stabilizers, Tips and Tailcone - Inspect externally for skin damage and condition of paint.	
C	7	Vertical and Horizontal Stabilizers and Tailcone Structure - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical and horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	
C	8	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	
E	1	Ailerons and Hinges - Check condition, security and operation.	
E	2	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	
E	5	Aileron Controls - Check freedom of movement and proper operation through full travel with and without flaps extended.	
F	1	Flaps - Check tracks, rollers, and control rods for security of attachment. Check operation.	
F	2	Flap Actuator Threads - Clean and lubricate. Refer to paragraph 2-51 for detailed instructions.	
G	1	Elevator Control - Check freedom of movement and proper operation through full travel.	
G	2	Elevator, Hinges, and Cable Attachment - Check condition, security, and operation.	
G	4	Elevator/Rudder Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	
H	1	Elevator Trim Tab and Hinges - Check condition, security, and operation.	
I	1	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.1

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

INSPECTION COMPLETED BY

I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	
J	3	Cowl Flap Controls - Check freedom of movement through full travel.	
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	5	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	
J	6	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, ect. Check cowl shock mounts for condition and security.	
J	7	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	
J	9	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation. Clean and inspect air filter and re-oil if flock coated. Refer to Cessna Service Letter SE80-12.	
J	10	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-23.	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	
J	13	Alternator - Check brushes, leads, commutator or slip ring for wear.	
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leades, and commutator.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	

CESSNA PROGRESSIVE CARE

MODEL 206&T206

OPERATION No.1

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

INSPECTION COMPLETED BY

J	16	Exhaust System (Normally aspirated engine) - Inspect for cracks and security. Air leak check exhaust system. Refer to Sections 12 and 12A, for inspection procedures.	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust. Refer to Sections 12 and 12A for inspection procedure.	
J	18	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation and security. Remove and clean filter (as applicable).	
J	19	Engine Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	
J	20	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	
J	21	Magnetos - Timing Procedures and intervals, lubrication, and overhaul procedures.	
J	22	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	
J	23	Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	
J	24	Cylinder Compression - Perform differential compression test.	
J	25	Fuel Injection System - Check security of fuel-air control unit, manifold valve, nozzles, screws and pump. Check fuel lines for leaks, interference and proper routing.	
J	26	Engine Primer - Check for leakage, operation, and security.	
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	28	Cold and Hot Air Hoses - Check condition, routing, and security.	
J	29	Engine Cylinders, Rocker Box Covers and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment and general condition.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.1

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
J	30	Engine Baffles and Seals - Check condition and security of attachment.	
J	31	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	
J	33	Turbocharger (if applicable) A. Remove heat shields and inspect for burned areas, bulges or cracks. Remove tailpipe and ducting - inspect turbine for coking, carbonization, oil deposits, and turbine impellers for damage.	
J	34	Heater Components - Inspect all components for condition and security.	
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	
J	37	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filters: A. Drain oil sump and refill with recommended grade aviation oil (when system is equipped with short oil filter). B. Drain oil sump, remove and replace long oil filter (approximately 5.8 inches long), and refill with recommended grade aviation oil.	
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.	
K	3	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.1

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
K	5	Fuel System - Inspect plumbing and components for mounting and security.	
K	6	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	7	Fuel Tank Vent Lines and Vent valves - Check vents for obstruction and proper positioning. Check valves for operation.	
K	9	Throttle Operated Auxiliary Fuel Pump Switch. Check condition of wiring and security of components. Perform rigging check (Refer to Section 13-33).	
K	10	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen bowl.	
L	1	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	
L	2	Propeller Mounting - Check for security of installation.	
L	3	Propeller Blades - Inspect for cracks, dents, nicks, scratches, errosion, corrosion, or other damage.	
L	4	Spinner - Check general condition and attachment.	
L	5	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	
L	6	Propeller Mounting Bolts - Inspect mounting bolts and safety wire for signs of looseness. Retorque mounting bolts as required.	
L	7	Propeller Hub - Check general condition	
L	8	Propeller Governor and Control - Check for security and operation of controls.	
M	2	Heater Components, Inlets, and Outlets - Inspect all lines, connections, ducts, clamps, seals, and gaskets for condition, restriction, and security.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
M	6	Propeller Anti-ice Slip Rings, Brushes and Boots - Inspect for condition and security. Perform operational check.	
N	3	Vacuum Pump - Check for condition and security. Check vacuum system breather line for obstruction, condition, and security.	
O	1	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	
O	4	Battery - Check general condition and security. Check level of electrolyte.	
O	5	Battery Box and Cables - Clean and remove any corrosion. Check cables for routing, support, and security of connections.	
O	7	Alternator Control Unit - Inspect wiring, mounting, condition, and wire routing.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.1

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps and Fittings - Check for leaks, condition and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH1	
D	11	Wheel Bearings - Clean, inspect and lube.	A		
D	13	Brake System - Overhaul brake discs, parking brake system, wheel cylinders, and master cylinders. Replace brake pads and all rubber goods.		B	
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C	EACH 1	
H	5	Elevator Trim Tab Actuator - Clean, lubricate, and check for free-play.	D		
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	E		
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	F		
J	10	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-23.	G		
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	H		
J	13	Alternator - Check brushes, leads, commutator or slip ring for wear.	I		
J	20	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	21	Magnetos - Timing Procedures and intervals, lubrication, and overhaul procedures.	K		
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	M		
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	N		

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.1

SPECIAL INSPECTION AND YEARLY ITEMS Please review each of these items for required compliance			HOURS	YEARS	INSPECTION COMPLETED BY
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	N		
J	37	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filters: A. Drain oil sump and refill with recommended grade aviation oil (when system is equipped with short oil filter). B. Drain oil sump, remove and replace long oil filter (approximately 5.8 inches long), and refill with recommended grade aviation oil.		N	
K	2	Integral Fuel Tanks - Drain fuel and check tank interior and outlet screens.	O		
K	4	Fuel Bladders - Drain fuel and check for wrinkles that would retain contaminants or liquid, and security of attachment and condition of outlet screens.	O		
K	11	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	9	Propeller Assembly - Overhaul.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	9	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. **NOTE**: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System Relief Valve - Inspect for condition and security.	R		
N	10	Airspeed indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.	EACH 2		
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.	EACH 2		
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		
P	1	Replace all fairings, doors, and access hole covers, ground check engine, alternator charging rate, oil pressure, tachometer, oil temperature and pressure gages, and general operation of components.			
R	1	Check that all applicable Cesnna Service Bulletins and Supplier Service Bulletins are complied with.			
R	2	Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with.			
R	3	Ensure all Maintenance Record Entries required by Federal Aviation Regulations are completed before returning the airplane to service.			

Special Inspections Legends:

A. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
B. Serial U20603522 thru U20604649: Each 5 years. Serial U20604650 and On: Overhaul components and replace rubber goods on-condition basis.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 100 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Serial U20604650 thru U20605919: Compliance with Cessna Service Letter SE80-65 is required.
F. Lubricate each 100 hours (except in dusty conditions). These controls are not repairable and should be replaced every 1500 hours or sooner if required.
G. Clean filter per paragraph 2-23. Replace paper filters at least each 500 hours.
H. Check belt tension after 10 to 25 hours of operation. Refer to Section 17.
I. Inspect each 500 hours.
J. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked.
K. Every 500 hours of operation, perform the following items:
   a. Inspect contact points for condition and adjust or replace as required.
   b. Inspect carbon brush, high-tension lead, and distributive block for condition. Clean or replace parts as required.
   c. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only. Do not force when checking pawls.
   d. Inspect and lubricate bearings; replace as required.
   e. Lubricate contact point cam.
L. Replace engine compartment rubber hoses (Cessna installed only) every 5 years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental installed), (Refer to Continental Maintenance Manual and Continental Engine Service Bulletins).
M. Replace check valves in turbocharger oil lines each 1000 hours.
N. First 25 hours: Refill with straight grade mineral oil and use until a total of 50 hours have accumulated, or oil consumption has stabilized. Change oil, replace filter, and refill sump with recommended grade of ashless dispersant oil. Change oil and replace filter at least every six months, regardless of accumulated hours.
O. Each 1000 hours.
P. See McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.
T. Replace S1495 hoses every 10 years.

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.2

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
A	1	Placard and Decals - Inspect presence, legibility, and security. Consult Pilot's Operating Handbook and FAA - Approved Airplane Flight Manual for required placards.	
B	1	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	
B	6	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with FAR Part 91.207. Refer to Section 16 - Emergency Locator Transmitter - Checkout Interval.	
B	8	Pilot's and Copilot's Inertia Reels - Inspect for security of installation, proper operation and evidence of damage.	
B	9	Seats, Seat Belts, and Shoulder Harnesses - Check general condition and security. Check operation of seat stops and adjustment mechanism. Inspect belts for condition and security of fasteners.	
B	10	Windows, Windshield, Doors, and Seals - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	
B	12	Flight Controls - Check freedom of movement and proper operation through full travel with and without flaps extended. Check electric trim controls for operation (as applicable).	
B	14	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
B	17	Fuel Line and Selector Valve Drains(s) - Remove plug and drain.	
D	1	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake.	
D	2	Main Gear Tubular Struts - Inspect for cracks, dents, corrosion, condition of paint or other damage. Check axles for condition and security.	
D	4	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	
D	5	Tires - Check tread wear and general condition. Check for proper inflation.	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	
D	7	Main Landing Gear Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	
D	8	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.2

Registration No._____ Airplane Model and SN_____ Airplane Time_____

INSPECTION COMPLETED BY

D	9	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	
H	2	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, ect. for proper routing, condition, and security.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	
J	3	Cowl Flap Controls - Check freedom of movement through full travel.	
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	
J	16	Exhaust System (Normally aspirated engine) - Inspect for cracks and security. Air leak check exhaust system. Refer to Sections 12 and 12A, for inspection procedures.	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust. Refer to Sections 12 and 12A for inspection procedure.	
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	30	Engine Baffles and Seals - Check condition and security of attachment.	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	

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MODEL 206&T206

OPERATION No.2

Registration No._____ Airplane Model and SN_____ Airplane Time_____

INSPECTION COMPLETED BY

J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	
K	6	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	8	Fuel Selector Valve - Check controls for detent in each position, secutity of attachment, and for proper placarding.	
L	1	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	
L	2	Propeller Mounting - Check for security of installation.	
L	3	Propeller Blades - Inspect for cracks, dents, nicks, scratches, errosion, corrosion, or other damage.	
L	4	Spinner - Check general condition and attachment.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
M	6	Propeller Anti-ice Slip Rings, Brushes and Boots - Inspect for condition and security. Perform operational check.	
N	1	Vacuum System - Inspect for condition and security.	
N	2	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. **NOTE**: Smoking will cause premature filter clogging.	
N	5	Vacuum System Relief Valve - Inspect for condition and security.	
N	6	Instruments - Check general condition and markings for legibility	
O	2	Instrument, Cabin, Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	
O	3	Circuit Breakers and Fuses - Check operation and condition. Check for required number of spare fuses.	
Q	1	Brakes - Test toe brakes and parking brake for proper operation.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.2

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps and Fittings - Check for leaks, condition and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH1	
D	11	Wheel Bearings - Clean, inspect and lube.	A		
D	13	Brake System - Overhaul brake discs, parking brake system, wheel cylinders, and master cylinders. Replace brake pads and all rubber goods.		B	
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C	EACH 1	
H	5	Elevator Trim Tab Actuator - Clean, lubricate, and check for free-play.	D		
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	E		
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	F		
J	10	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-23.	G		
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	H		
J	13	Alternator - Check brushes, leads, commutator or slip ring for wear.	I		
J	20	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	21	Magnetos - Timing Procedures and intervals, lubrication, and overhaul procedures.	K		
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	M		
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	N		

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.2

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	N		
J	37	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filters: A. Drain oil sump and refill with recommended grade aviation oil (when system is equipped with short oil filter). B. Drain oil sump, remove and replace long oil filter (approximately 5.8 inches long), and refill with recommended grade aviation oil.		N	
K	2	Integral Fuel Tanks - Drain fuel and check tank interior and outlet screens.	O		
K	4	Fuel Bladders - Drain fuel and check for wrinkles that would retain contaminants or liquid, and security of attachment and condition of outlet screens.	O		
K	11	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	9	Propeller Assembly - Overhaul.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	9	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. **NOTE**: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System Relief Valve - Inspect for condition and security.	R		
N	10	Airspeed indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.	EACH 2		
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.	EACH 2		
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		
P	1	Replace all fairings, doors, and access hole covers, ground check engine, alternator charging rate, oil pressure, tachometer, oil temperature and pressure gages, and general operation of components.			
R	1	Check that all applicable Cesnna Service Bulletins and Supplier Service Bulletins are complied with.			
R	2	Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with.			
R	3	Ensure all Maintenance Record Entries required by Federal Aviation Regulations are completed before returning the airplane to service.			

Special Inspections Legends:

A. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
B. Serial U20603522 thru U20604649: Each 5 years. Serial U20604650 and On: Overhaul components and replace rubber goods on-condition basis.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 100 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Serial U20604650 thru U20605919: Compliance with Cessna Service Letter SE80-65 is required.
F. Lubricate each 100 hours (except in dusty conditions). These controls are not repairable and should be replaced every 1500 hours or sooner if required.
G. Clean filter per paragraph 2-23. Replace paper filters at least each 500 hours.
H. Check belt tension after 10 to 25 hours of operation. Refer to Section 17.
I. Inspect each 500 hours.
J. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked.
K. Every 500 hours of operation, perform the following items:
   a. Inspect contact points for condition and adjust or replace as required.
   b. Inspect carbon brush, high-tension lead, and distributive block for condition. Clean or replace parts as required.
   c. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only. Do not force when checking pawls.
   d. Inspect and lubricate bearings; replace as required.
   e. Lubricate contact point cam.
L. Replace engine compartment rubber hoses (Cessna installed only) every 5 years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental installed), (Refer to Continental Maintenance Manual and Continental Engine Service Bulletins).
M. Replace check valves in turbocharger oil lines each 1000 hours.
N. First 25 hours: Refill with straight grade mineral oil and use until a total of 50 hours have accumulated, or oil consumption has stabilized. Change oil, replace filter, and refill sump with recommended grade of ashless dispersant oil. Change oil and replace filter at least every six months, regardless of accumulated hours.
O. Each 1000 hours.
P. See McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.
T. Replace S1495 hoses every 10 years.

CESSNA PROGRESSIVE CARE
MODEL 206 & T206

OPERATION No.3

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

INSPECTION COMPLETED BY

B	13	Aileron, Elevator, and Rudder Stops - Check for damage and security. Compliance with Cessna Service Letter SE80-65 is required.	
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
C	1	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	
C	2	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.	
C	3	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	
C	4	Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.	
C	5	Wing Access Plates - Check for damage and security of installation.	
C	6	Vertical and Horizontal Stabilizers, Tips and Tailcone - Inspect externally for skin damage and condition of paint.	
C	7	Vertical and Horizontal Stabilizers and Tailcone Structure - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical and horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	
C	8	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	
E	1	Ailerons and Hinges - Check condition, security and operation.	
E	2	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	
E	3	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.	
E	5	Aileron Controls - Check freedom of movement and proper operation through full travel with and without flaps extended.	
F	1	Flaps - Check tracks, rollers, and control rods for security of attachment. Check operation.	
F	2	Flap Actuator Threads - Clean and lubricate. Refer to paragraph 2-51 for detailed instructions.	
F	3	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	
F	4	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	

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MODEL 206 & T206

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Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
F	5	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	
F	6	Flap Motor, Actuator, and Limit Switches (electric flaps) - Check wiring and terminals for condition and security. Check actuator for condition and security.	
G	1	Elevator Control - Check freedom of movement and proper operation through full travel.	
G	2	Elevator, Hinges, and Cable Attachment - Check condition, security, and operation.	
G	4	Elevator/Rudder Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	
H	1	Elevator Trim Tab and Hinges - Check condition, security, and operation.	
H	4	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	
H	6	Elevator Trim Tab Actuator - Free-Play limits inspection. Refer to Section 9-5A for cleaning, inspection and repair procedures.	
I	1	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	
I	4	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	
J	3	Cowl Flap Controls - Check freedom of movement through full travel.	
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	5	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	

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MODEL 206 & T206

OPERATION No.3

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
J	9	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation. Clean and inspect air filter and re-oil if flock coated. Refer to Cessna Service Letter SE80-12.	
J	10	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-23.	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leades, and commutator.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	
J	16	Exhaust System (Normally aspirated engine) - Inspect for cracks and security. Air leak check exhaust system. Refer to Sections 12 and 12A, for inspection procedures.	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust. Refer to Sections 12 and 12A for inspection procedure.	
J	18	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation and security. Remove and clean filter (as applicable).	
J	19	Engine Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	
J	20	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	
J	22	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	
J	23	Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	
J	25	Fuel Injection System - Check security of fuel-air control unit, manifold valve, nozzles, screws and pump. Check fuel lines for leaks, interference and proper routing.	
J	26	Engine Primer - Check for leakage, operation, and security.	
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	28	Cold and Hot Air Hoses - Check condition, routing, and security.	
J	29	Engine Cylinders, Rocker Box Covers and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment and general condition.	

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MODEL 206 & T206

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Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
J	30	Engine Baffles and Seals - Check condition and security of attachment.	
J	31	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	
J	34	Heater Components - Inspect all components for condition and security.	
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	
J	37	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filters: A. Drain oil sump and refill with recommended grade aviation oil (when system is equipped with short oil filter). B. Drain oil sump, remove and replace long oil filter (approximately 5.8 inches long), and refill with recommended grade aviation oil.	
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.	
K	3	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.	
K	5	Fuel System - Inspect plumbing and components for mounting and security.	
K	6	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	7	Fuel Tank Vent Lines and Vent valves - Check vents for obstruction and proper positioning. Check valves for operation.	

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Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
K	9	Throttle Operated Auxiliary Fuel Pump Switch. Check condition of wiring and security of components. Perform rigging check (Refer to Section 13-33).	
K	10	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen bowl.	
L	1	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	
L	2	Propeller Mounting - Check for security of installation.	
L	3	Propeller Blades - Inspect for cracks, dents, nicks, scratches, errosion, corrosion, or other damage.	
L	4	Spinner - Check general condition and attachment.	
L	5	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	
M	2	Heater Components, Inlets, and Outlets - Inspect all lines, connections, ducts, clamps, seals, and gaskets for condition, restriction, and security.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
M	6	Propeller Anti-ice Slip Rings, Brushes and Boots - Inspect for condition and security. Perform operational check.	
N	3	Vacuum Pump - Check for condition and security. Check vacuum system breather line for obstruction, condition, and security.	
O	4	Battery - Check general condition and security. Check level of electrolyte.	
O	5	Battery Box and Cables - Clean and remove any corrosion. Check cables for routing, support, and security of connections.	

CESSNA PROGRESSIVE CARE
MODEL 206 & T206

OPERATION No.3

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps and Fittings - Check for leaks, condition and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH1	
D	11	Wheel Bearings - Clean, inspect and lube.	A		
D	13	Brake System - Overhaul brake discs, parking brake system, wheel cylinders, and master cylinders. Replace brake pads and all rubber goods.		B	
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C	EACH 1	
H	5	Elevator Trim Tab Actuator - Clean, lubricate, and check for free-play.	D		
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	E		
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	F		
J	10	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-23.	G		
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	H		
J	13	Alternator - Check brushes, leads, commutator or slip ring for wear.	I		
J	20	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	21	Magnetos - Timing Procedures and intervals, lubrication, and overhaul procedures.	K		
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	M		
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	N		

CESSNA PROGRESSIVE CARE
MODEL 206 & T206

OPERATION No.3

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	N		
J	37	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filters: A. Drain oil sump and refill with recommended grade aviation oil (when system is equipped with short oil filter). B. Drain oil sump, remove and replace long oil filter (approximately 5.8 inches long), and refill with recommended grade aviation oil.		N	
K	2	Integral Fuel Tanks - Drain fuel and check tank interior and outlet screens.	O		
K	4	Fuel Bladders - Drain fuel and check for wrinkles that would retain contaminants or liquid, and security of attachment and condition of outlet screens.	O		
K	11	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	9	Propeller Assembly - Overhaul.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	9	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. **NOTE**: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System Relief Valve - Inspect for condition and security.	R		
N	10	Airspeed indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.	EACH 2		
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.	EACH 2		
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		
P	1	Replace all fairings, doors, and access hole covers, ground check engine, alternator charging rate, oil pressure, tachometer, oil temperature and pressure gages, and general operation of components.			
R	1	Check that all applicable Cesnna Service Bulletins and Supplier Service Bulletins are complied with.			
R	2	Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with.			
R	3	Ensure all Maintenance Record Entries required by Federal Aviation Regulations are completed before returning the airplane to service.			

Special Inspections Legends:

A. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
B. Serial U20603522 thru U20604649: Each 5 years. Serial U20604650 and On: Overhaul components and replace rubber goods on-condition basis.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 100 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Serial U20604650 thru U20605919: Compliance with Cessna Service Letter SE80-65 is required.
F. Lubricate each 100 hours (except in dusty conditions). These controls are not repairable and should be replaced every 1500 hours or sooner if required.
G. Clean filter per paragraph 2-23. Replace paper filters at least each 500 hours.
H. Check belt tension after 10 to 25 hours of operation. Refer to Section 17.
I. Inspect each 500 hours.
J. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked.
K. Every 500 hours of operation, perform the following items:
   a. Inspect contact points for condition and adjust or replace as required.
   b. Inspect carbon brush, high-tension lead, and distributive block for condition. Clean or replace parts as required.
   c. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only. Do not force when checking pawls.
   d. Inspect and lubricate bearings; replace as required.
   e. Lubricate contact point cam.
L. Replace engine compartment rubber hoses (Cessna installed only) every 5 years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental installed), (Refer to Continental Maintenance Manual and Continental Engine Service Bulletins).
M. Replace check valves in turbocharger oil lines each 1000 hours.
N. First 25 hours: Refill with straight grade mineral oil and use until a total of 50 hours have accumulated, or oil consumption has stabilized. Change oil, replace filter, and refill sump with recommended grade of ashless dispersant oil. Change oil and replace filter at least every six months, regardless of accumulated hours.
O. Each 1000 hours.
P. See McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.
T. Replace S1495 hoses every 10 years.

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.4

Registration No.____ Airplane Model and SN_____ Airplane Time_____

			INSPECTION COMPLETED BY
A	1	Placard and Decals - Inspect presence, legibility, and security. Consult Pilot's Operating Handbook and FAA - Approved Airplane Flight Manual for required placards.	
B	1	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	
B	2	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, loose rivets, bolts and nuts.	
B	3	Control Wheel Lock - Check general condition and operation.	
B	4	Fuselage Mounted Equipment - Check for general condition and security of attachment.	
B	5	Antennas and Cables - Inspect for security of attachment, connection, and condition.	
B	6	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with FAR Part 91.207. Refer to Section 16 - Emergency Locator Transmitter - Checkout Interval.	
B	7	Instrument Panel Shock Mounts, Ground Straps and Covers - Inspect for deterioration, cracks, and security of attachment.	
B	8	Pilot's and Copilot's Inertia Reels - Inspect for security of installation, proper operation and evidence of damage.	
B	9	Seats, Seat Belts, and Shoulder Harnesses - Check general condition and security. Check operation of seat stops and adjustment mechanism. Inspect belts for condition and security of fasteners.	
B	10	Windows, Windshield, Doors, and Seals - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	
B	12	Flight Controls - Check freedom of movement and proper operation through full travel with and without flaps extended. Check electric trim controls for operation (as applicable).	
B	14	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
B	16	Control Column - Inspect pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security.	

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MODEL 206&T206

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Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
B	17	Fuel Line and Selector Valve Drains(s) - Remove plug and drain.	
D	1	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake.	
D	2	Main Gear Tubular Struts - Inspect for cracks, dents, corrosion, condition of paint or other damage. Check axles for condition and security.	
D	4	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	
D	5	Tires - Check tread wear and general condition. Check for proper inflation.	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	
D	7	Main Landing Gear Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	
D	8	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.	
D	9	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	
H	2	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, ect. for proper routing, condition, and security.	
H	3	Trim Controls and Indicators - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security. Check electric trim controls for operation as applicable.	
I	2	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.4

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

INSPECTION COMPLETED BY

J	3	Cowl Flap Controls - Check freedom of movement through full travel.	
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	
J	16	Exhaust System (Normally aspirated engine) - Inspect for cracks and security. Air leak check exhaust system. Refer to Sections 12 and 12A, for inspection procedures.	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust. Refer to Sections 12 and 12A for inspection procedure.	
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	30	Engine Baffles and Seals - Check condition and security of attachment.	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.4

Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

			INSPECTION COMPLETED BY
K	6	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	8	Fuel Selector Valve - Check controls for detent in each position, secutity of attachment, and for proper placarding.	
L	1	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	
L	2	Propeller Mounting - Check for security of installation.	
L	3	Propeller Blades - Inspect for cracks, dents, nicks, scratches, errosion, corrosion, or other damage.	
L	4	Spinner - Check general condition and attachment.	
M	3	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
M	6	Propeller Anti-ice Slip Rings, Brushes and Boots - Inspect for condition and security. Perform operational check.	
M	7	Heated Windshield Panel - Check operation, security of installation, electrical wiring, and condition of storage bag.	
M	8	Oxygen System - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.	
N	1	Vacuum System - Inspect for condition and security.	
N	2	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. **NOTE**: Smoking will cause premature filter clogging.	
N	5	Vacuum System Relief Valve - Inspect for condition and security.	
N	6	Instruments - Check general condition and markings for legibility	
N	7	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	
N	8	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	
N	9	Navigation Indicators, Controls, and Components - Inspect for condition and security.	

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Registration No._____ **Airplane Model and SN_____** **Airplane Time_____**

INSPECTION COMPLETED BY

O	2	Instrument, Cabin, Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	
O	3	Circuit Breakers and Fuses - Check operation and condition. Check for required number of spare fuses.	
O	6	Switch and Circuit Breaker Panel, Terminal Blocks and Junction Boxes - Inspect wiring and terminals for condition and security.	
O	8	Switches - Check operation, terminals, wiring, and mounting for conditions, security, and interference.	
O	9	Instrument Panel and Control Pedestal - Inspect wiring, mounting, and terminals for condition and security. Check resistance between stationary panel and instrument panel for proper ground.	
Q	1	Brakes - Test toe brakes and parking brake for proper operation.	

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.4

SPECIAL INSPECTION AND YEARLY ITEMS Please review each of these items for required compliance			HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps and Fittings - Check for leaks, condition and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH1	
D	11	Wheel Bearings - Clean, inspect and lube.	A		
D	13	Brake System - Overhaul brake discs, parking brake system, wheel cylinders, and master cylinders. Replace brake pads and all rubber goods.		B	
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C	EACH 1	
H	5	Elevator Trim Tab Actuator - Clean, lubricate, and check for free-play.	D		
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	E		
J	4	Engine, Propeller Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	F		
J	10	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-23.	G		
J	12	Alternator and Electrical Connections - Check condition and security of alternator and support brackets. Check alternator belts for condition and proper adjustment.	H		
J	13	Alternator - Check brushes, leads, commutator or slip ring for wear.	I		
J	20	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	21	Magnetos - Timing Procedures and intervals, lubrication, and overhaul procedures.	K		
J	27	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	32	Turbocharger (if applicable) A. Inspect turbocharger mounting bracket, ducting, linkage and attaching parts for general condition, linkage or damage and security of attachment. B. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment and evidence of wear. Check waste gate return spring for condition and security.	M		
J	35	Engine Oil Change - Normally Aspirated Engine Without Oil Filter: A. Engine Oils without Oil Filter - Drain oil sump and oil cooler, clean and inspect screen, and refill with recommended grade aviation oil.	N		

CESSNA PROGRESSIVE CARE
MODEL 206&T206

OPERATION No.4

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
J	36	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filter: A. Remove and replace short oil filter (approximately 4.8 inches long.) B. Add recommended grade aviation oil to replace oil lost in existing filter.	N		
J	37	Engine Oil Change - Turbocharged and Normally Aspirated Engines With Oil Filters: A. Drain oil sump and refill with recommended grade aviation oil (when system is equipped with short oil filter). B. Drain oil sump, remove and replace long oil filter (approximately 5.8 inches long), and refill with recommended grade aviation oil.		N	
K	2	Integral Fuel Tanks - Drain fuel and check tank interior and outlet screens.	O		
K	4	Fuel Bladders - Drain fuel and check for wrinkles that would retain contaminants or liquid, and security of attachment and condition of outlet screens.	O		
K	11	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	9	Propeller Assembly - Overhaul.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	9	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. **NOTE**: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System Relief Valve - Inspect for condition and security.	R		
N	10	Airspeed indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.	EACH 2		
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.	EACH 2		
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		
P	1	Replace all fairings, doors, and access hole covers, ground check engine, alternator charging rate, oil pressure, tachometer, oil temperature and pressure gages, and general operation of components.			
R	1	Check that all applicable Cesnna Service Bulletins and Supplier Service Bulletins are complied with.			
R	2	Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with.			
R	3	Ensure all Maintenance Record Entries required by Federal Aviation Regulations are completed before returning the airplane to service.			

Special Inspections Legends:

A. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
B. Serial U20603522 thru U20604649: Each 5 years. Serial U20604650 and On: Overhaul components and replace rubber goods on-condition basis.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 100 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Serial U20604650 thru U20605919: Compliance with Cessna Service Letter SE80-65 is required.
F. Lubricate each 100 hours (except in dusty conditions). These controls are not repairable and should be replaced every 1500 hours or sooner if required.
G. Clean filter per paragraph 2-23. Replace paper filters at least each 500 hours.
H. Check belt tension after 10 to 25 hours of operation. Refer to Section 17.
I. Inspect each 500 hours.
J. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked.
K. Every 500 hours of operation, perform the following items:
    a. Inspect contact points for condition and adjust or replace as required.
    b. Inspect carbon brush, high-tension lead, and distributive block for condition. Clean or replace parts as required.
    c. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only. Do not force when checking pawls.
    d. Inspect and lubricate bearings; replace as required.
    e. Lubricate contact point cam.
L. Replace engine compartment rubber hoses (Cessna installed only) every 5 years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental installed), (Refer to Continental Maintenance Manual and Continental Engine Service Bulletins).
M. Replace check valves in turbocharger oil lines each 1000 hours.
N. First 25 hours: Refill with straight grade mineral oil and use until a total of 50 hours have accumulated, or oil consumption has stabilized. Change oil, replace filter, and refill sump with recommended grade of ashless dispersant oil. Change oil and replace filter at least every six months, regardless of accumulated hours.
O. Each 1000 hours.
P. See McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.
T. Replace S1495 hoses every 10 years.

SECTION 3

FUSELAGE

TABLE OF CONTENTS — Page No. Aerofiche/Manual

3-1. FUSELAGE.

3-2. WINDSHIELD AND WINDOWS.

3-3. DESCRIPTION. The windshield and windows are single-piece, acrylic panels, set in sealing strips and held by formed retaining strips, secured to the fuselage with screws and rivets. Isocryl 5603 sealing compound, used in conjunction with a felt seal is applied to all edges of windshield and windows, with exception of wing root area. The wing root fairing has a heavy felt strip which completes the windshield sealing.

3-4. CLEANING AND WAXING. (Refer to Section 2.)

3-5. WINDSHIELD AND WINDOW INSTALLATION TECHNIQUES.

a. Special drills must be used when drilling holes in acrylic. Standard drills will cause the hole to be oversized, distorted, or excessively chipped.

b. Whenever possible, a coolant such as a plastic drillingwax should be used to lubricate the drill bit. Cessna recommends "Reliance" drill wax or Johnson No. 140 Stick Wax.

c. Drilled holes should be smooth with a finish of 125 rhr.

d. The feed and speed of the drill is critical. The following chart indicates drill speed for various thicknesses of acrylic.

Material Thickness	Drill Speed
1/16 in to 3/16 in	1500 to 4500 rpm
1/4 in to 3/8 in	1500 to 2000 rpm
7/16 in	1000 to 1500 rpm
1/2 in	500 to 1000 rpm
3/4 in	500 to 800 rpm
1 in	500 rpm

e. Specification for the twist drill used to drill acrylics is as follows:

1. Shallow holes - when hole depth to hole diameter ratio is less than 1.5 in to 1 in, the drill shall have an included tip angle of 55 degrees to 60 degrees and a lip clearance angle of 15 degrees to 20 degrees.
2. Medium deep holes - when hole depth to hole diameter ratio is from 1.5 in to 1 in up to 3 in to 1 in, the drill shall have an included tip angle of 60 degrees to 140 degrees, and a lip clearance angle of 15 degrees to 20 degrees.
3. Deep holes - when hole depth to hole diameter ratio is greater than 3.0 in to 1 in, the drill shall have an included tip angle of 140 degrees and a lip clearance of 12 degrees to 15 degrees.

f. Parts which must have holes drilled shall be backed up with a drill fixture. Holes may be drilled through the part from one side. However, less chipping around holes will occur if holes are drilled by drilling the hole from both sides. This is accomplished by using a drill with an acrylic backup piece on the opposite side. Remove the drill from the hole and switch the backup plate and finish drilling from the opposite side.

3-6. REPAIR. Replace extensively damaged transparent plastic, rather than repair whenever possible, since even a carefully patched part is not the equal of a new section, either optically or structurally. At the first sign of crack development, drill a small hole at the extreme end of the crack, as shown in figure 3-1. This serves to localize the cracks, and to prevent further splitting by distributing the strain over a large area. If the cracks are small, stopping them with drilled holes will usually suffice until replacement or more permanent repair can be made. The following repairs are permissible; however, they are not to be located in the pilots line of vision during landing or normal flight.

a. SURFACE PATCH. If a surface patch is to be installed, trim away the damaged area, and round all corners. Cut a piece of plastic of sufficient size

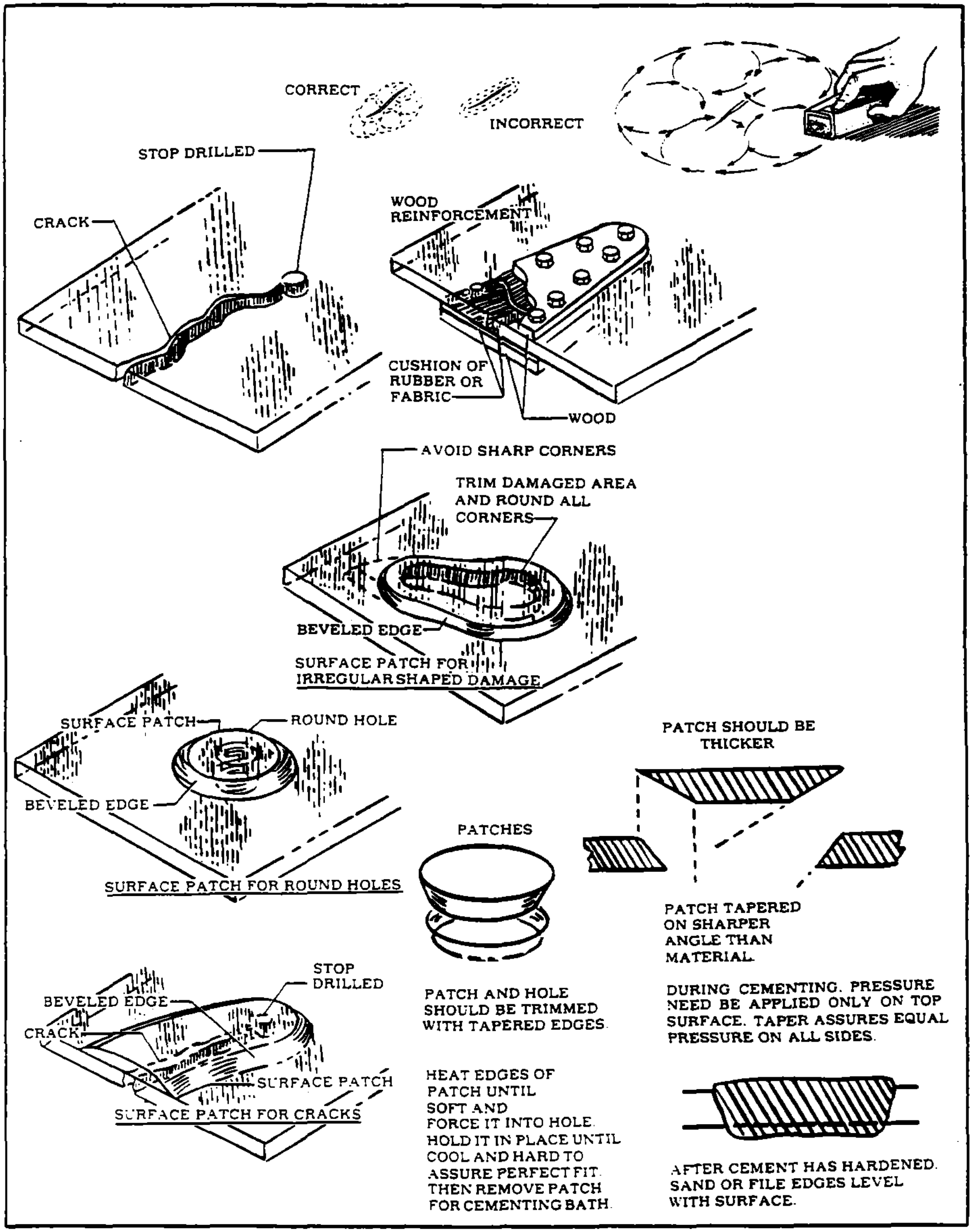


Figure 3-1. Repair of Windshield and Windows

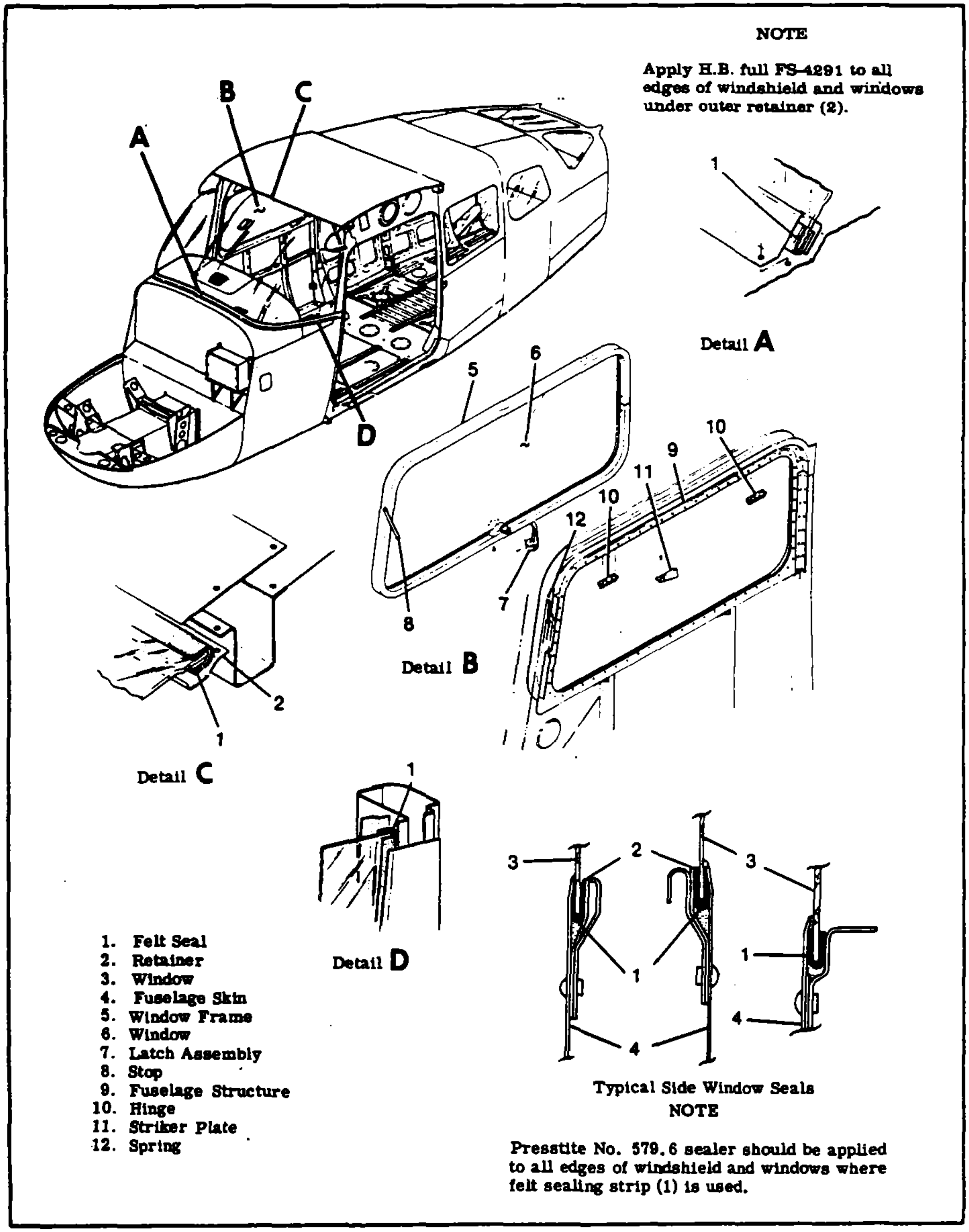


Figure 3-2. Windshield and Window Installation.

to cover the damaged area, and extend at least 3/4-inch on each side of the crack or hole. Bevel the edges as shown in figure 3-1. If the section to be repaired is curved, shape the patch to the same contour by heating it in an oil bath at a temperature of 248° to 302°F., or it may be heated on a hot plate until soft. Boiling water should not be used for heating. Coat the patch evenly with plastic solvent adhesive, and place immediately over the hole. Maintain a uniform pressure of from 5 to 10 psi on the patch for a minimum of 3 hours. Allow the patch to dry 24 to 36 hours before sanding or polishing is attempted.

b. PLUG PATCH. In using inserted patches to repair holes in plastic structures, trim the holes to a perfect circle or oval, and bevel the edges slightly. Make the patch slightly thicker than the material being repaired, and similarly, bevel the edges. Install patches in accordance with procedures illustrated in figure 3-1. Heat the plug until soft and press into the hole without cement, and allow to cool to make a perfect fit. Remove the plug, coat the edges with adhesive, and then reinstall in the hole. Maintain a firm light pressure until the cement has set, then sand or file the edges, level with the surface, buff and polish.

3-7. SCRATCHES. Scratches on clear plastic surfaces can be removed by hand-sanding operations followed by buffing and polishing, if steps below are followed carefully.

a. Wrap a piece of No. 320 (or finer) sandpaper or abrasive cloth around a rubber pad or wood block. Rub surface around scratch with a circular motion, keeping abrasive constantly wet with clean water to prevent scratching surface further. Use minimum pressure and cover an area large enough to prevent formation of "bull's-eyes" or other optical distortions.

CAUTION

Do not use a coarse grade of abrasive. No. 320 is of maximum coarseness.

b. Continue sanding operation, using progressively finer grade abrasives until scratches disappear.

c. When scratches have been removed, wash area thoroughly with clean water to remove all gritty particles. The entire sanded area will be clouded with minute scratches which must be removed to restore transparency.

d. Apply fresh tallow or buffing compound to a motor-driven buffing wheel. Hold wheel against plastic surface, moving it constantly over damaged area until cloudy appearance disappears. A 2000-foot-per-minute surface speed is recommended to prevent overheating and distortion. (Example: 750 rpm polishing machine with a 10 inch buffing bonnet.)

NOTE

Polishing can be accomplished by hand but will require a considerably longer period of time to attain the same result as produced by a buffing wheel.

e. When buffing is finished, wash area thoroughly and dry with a soft flannel cloth. Allow surface to cool and inspect area to determine if full transparency has been restored. Apply a thin coat of hard wax and polish surface lightly with a clean flannel cloth.

NOTE

Rubbing plastic surface with a dry cloth will build up an electrostatic charge which attracts dirt particles and may eventually cause scratching of surface. After wax has hardened, dissipate this charge by rubbing surface with a slightly damp chamois. This will also remove dust particles which have collected while wax is hardening.

f. Minute hairline scratches can often be removed by rubbing with commercial automobile body cleaner or fine-grade rubbing compound. Apply with a soft, clean, dry cloth or imitation chamois.

3-8. CRACKS. (Refer to figure 3-1.)

a. When a crack appears, drill a hole at end of crack to prevent further spreading. Hole should be approximately 1/8 inch in diameter, depending on length of crack and thickness of material.

b. Temporary repairs to flat surfaces can be accomplished by placing a thin strip of wood over each side of surface and inserting small bolts through wood and plastic. A cushion of sheet rubber or aircraft fabric should be placed between wood and plastic on both sides.

3-9. WINDSHIELD. (See figure 3-2.)

3-9A. REMOVAL.

a. Remove magnetic compass. (See Section 16.)
b. Remove wing fairings.
c. Remove air vent tubes.

CAUTION

If windshield is to be reinstalled, be sure to protect windshield during removal.

d. With two people sitting in the airplane placing their feet against the windshield, just above the centerline, press upward on windshield forcing it out of lower retainers.

e. Clean sealer from inner sidewalls and bottom of retainers.

3-9B. INSTALLATION.

a. If windshield.
b. If new windshield is to be installed, remove protective cover and clean, take care not to scratch windshield.
c. Apply new felt to edges of windshield.
d. Apply a strip of sealer (H.B. Fuller FS-4291) along the sides and bottom of felt.
e. Position bottom edge of windshield into lower retainer.
f. Using a piece of bent sheet metal (8 in. wide x length of top edge of windshield) placed under top edge of upper retainer, bow windshield and guide top edge of windshield into upper retainer using bent sheet metal in a shoe horn effect.

g. Install air vent tubes.
h. Install wing fairings.
i. Install Magnetic compass. (See Section 16.)

3-11. WINDOWS.

3-12. MOVABLE. (Refer to figure 3-2.) A movable window hinged at the top is installed in the left cabin door and in the RH forward side window position. The window assembly is a tinted plastic and frame unit which may be replaced by removing hinge pins and disconnecting window stop. To remove plastic panel from frame, drill out blind rivets at frame splice. When replacing plastic panel, ensure an adequate coating of Presstite 579.6 sealing compound is applied to all edges of panel.

3-13. FIXED. (Refer to figure 3-2.) Fixed windows, mounted in sealing strips and sealing compound, are held in place by various retainer strips. To replace side windows, remove upholstery and trim panels as necessary and drill out rivets securing retainers.

3-14. REAR. (Refer to figure 3-2.) The curved triangular rear side windows are mounted in retaining and sealing strips. Windows are removed from inside the cabin after rivets securing strips are drilled out. Removal of the rectangular rear window requires drilling out three rows of rivets immediately forward and above the window. Remove screws securing retainer strips at each side of the window and deflect strips up and aft from skin splice above the window. Remove the window from inside the aircraft. Reverse the preceding procedure for installation. Check fit of the new window and carefully file or grind away excess plastic. Apply felt strips and sealing compond to all edges.

3-15. CABIN DOORS. (Refer to figure 3-3.)

3-16. REMOVAL AND INSTALLATION. Removal of cabin doors is accomplished by removing screws which attach hinges and door stop or by removing hinge pins attaching door and door stop. If permanent hinge pins are removed from door hinges, they may be replaced by clevis pins secured with cotter pins or new hinge pins may be installed and "spin-bradded." When fitting a new door, some trimming of door skin at edges and some forming of door edges with a soft mallet may be necessary to achieve a good fit. Forming of the flanges on the bonded door is not permissible as forming of the flanges could cause damage to the bonded area.

3-17. ADJUSTMENT. Cabin doors should be adjusted so skin fairs with fuselage skin.

3-18. CABIN DOOR WEATHERSTRIP. A hollow fluted-type, rubber weatherstrip is cemented around all edges of the cabin door. When replacing weatherstrip, ensure that contact surfaces are clean and dry. Cut new weatherstrip to length using old weatherstrip as a guide. Cut small notch in butt ends of new weatherstrip to allow for drainage. Position splice with notch at door low point and apply a thin, even coat of EC-1300L adhesive (3M Company) or equivalent to both surfaces. Allow to dry until tacky before pressing into place on door. Do not stretch weatherstrip around door corners.

3-19. WEDGE ADJUSTMENT. Wedges at upper forward edge of door aid in preventing air leaks at this point. They engage as door is closed. Several attaching holes are located in wedges and holes which gives best results should be selected.

3-20. CABIN DOOR LATCHES. (Thru U20605309.) (See figure 3-4.)

3-21. DESCRIPTION. The cabin door latch is a push-pull bolt type, utilizing a rotary clutch for positive bolt engagement. As door is closed, teeth on underside of bolt engage gear teeth on clutch. The clutch gear rotates in one direction only and holds door until handle is moved to LOCK position, driving bolt into slot.

3-22. ADJUSTMENT. Adjustment of latch or clutch cover is afforded by oversize and/or slotted holes. Thsi adjustment ensures sufficient gear-to-bolt engagement and proper alignment. To adjust bolt (7), loosen the four latch base bolts (1) sufficiently to move latch base plate aft to extend the bolt or forward to retract the bolt.

CAUTION

Close the door carefully after adjustment and check for clearance between door jamb and bolt and alignment with clutch assembly.

NOTE

Lubricate door latch per Section 2. No lubrication is recommended for rotary clutch.

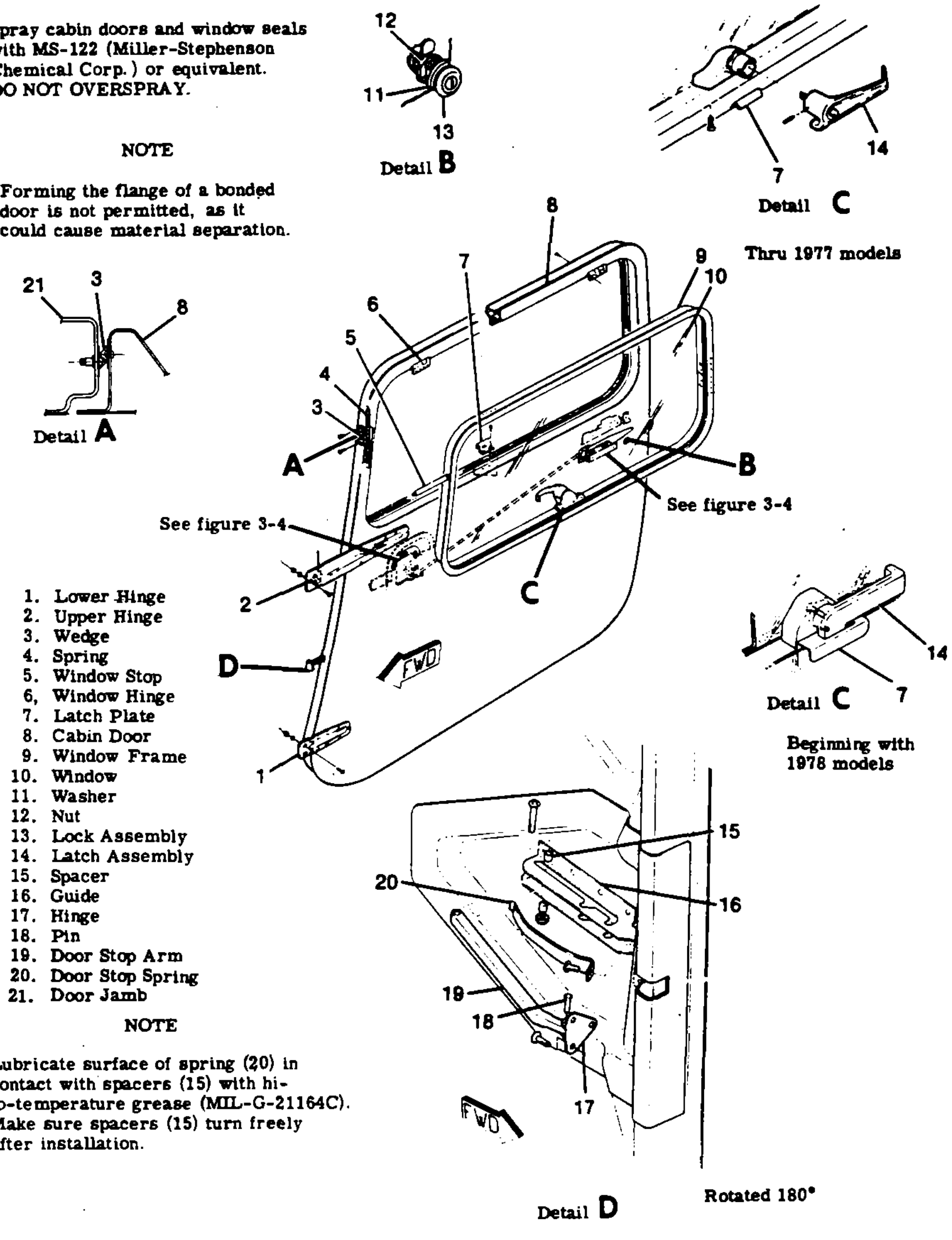
3-23. INDEXING INSIDE HANDLE. (See figure 3-4.)
a. Temporarily install handle (20) on shaft assembly (18), approximately vertical.
b. Move handle (20) forward until handle reaches CLOSE position.
c. If handle (20) is not horizontal with arm rest while in CLOSE position, remove handle and reinstall in horizontal position.
d. Ensure bolt (7) clears door post and teeth engage clutch gear (13) when handle (20) is in CLOSE position.
e. Readjust handle on serrated shaft as necessary to position forward end of handle approximately 8° above the handle shaft centerlineawhen in the LOCKED position.

NOTE

Spray cabin doors and window seals with MS-122 (Miller-Stephenson Chemical Corp.) or equivalent. DO NOT OVERSPRAY.

NOTE

Forming the flange of a bonded door is not permitted, as it could cause material separation.

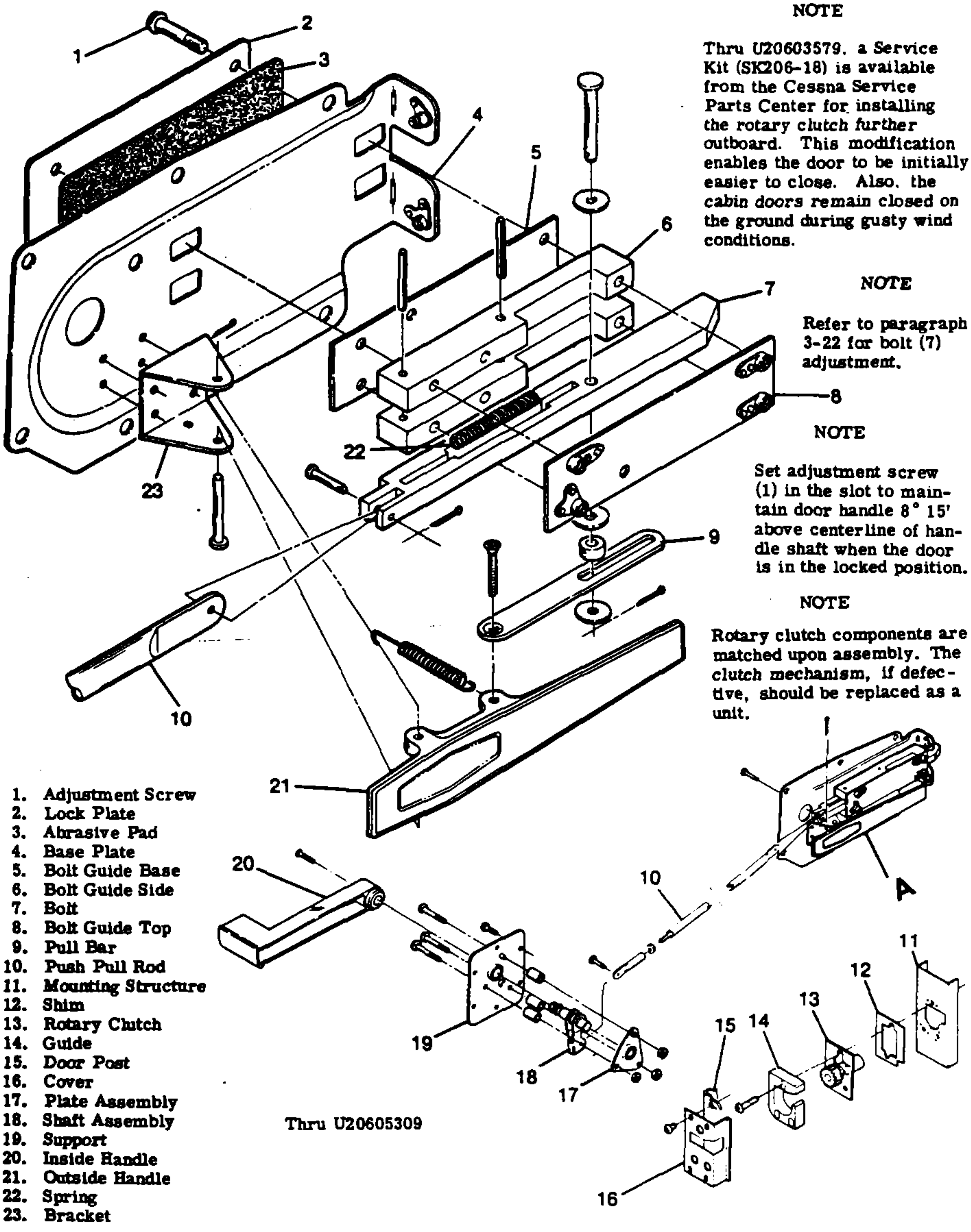


1. Lower Hinge
2. Upper Hinge
3. Wedge
4. Spring
5. Window Stop
6. Window Hinge
7. Latch Plate
8. Cabin Door
9. Window Frame
10. Window
11. Washer
12. Nut
13. Lock Assembly
14. Latch Assembly
15. Spacer
16. Guide
17. Hinge
18. Pin
19. Door Stop Arm
20. Door Stop Spring
21. Door Jamb

NOTE

Lubricate surface of spring (20) in contact with spacers (15) with hi-lo-temperature grease (MIL-G-21164C). Make sure spacers (15) turn freely after installation.

Figure 3-3. Cabin Door Installation



NOTE

Thru U20603579, a Service Kit (SK206-18) is available from the Cessna Service Parts Center for installing the rotary clutch further outboard. This modification enables the door to be initially easier to close. Also, the cabin doors remain closed on the ground during gusty wind conditions.

NOTE

Refer to paragraph 3-22 for bolt (7) adjustment.

NOTE

Set adjustment screw (1) in the slot to maintain door handle 8° 15' above centerline of handle shaft when the door is in the locked position.

NOTE

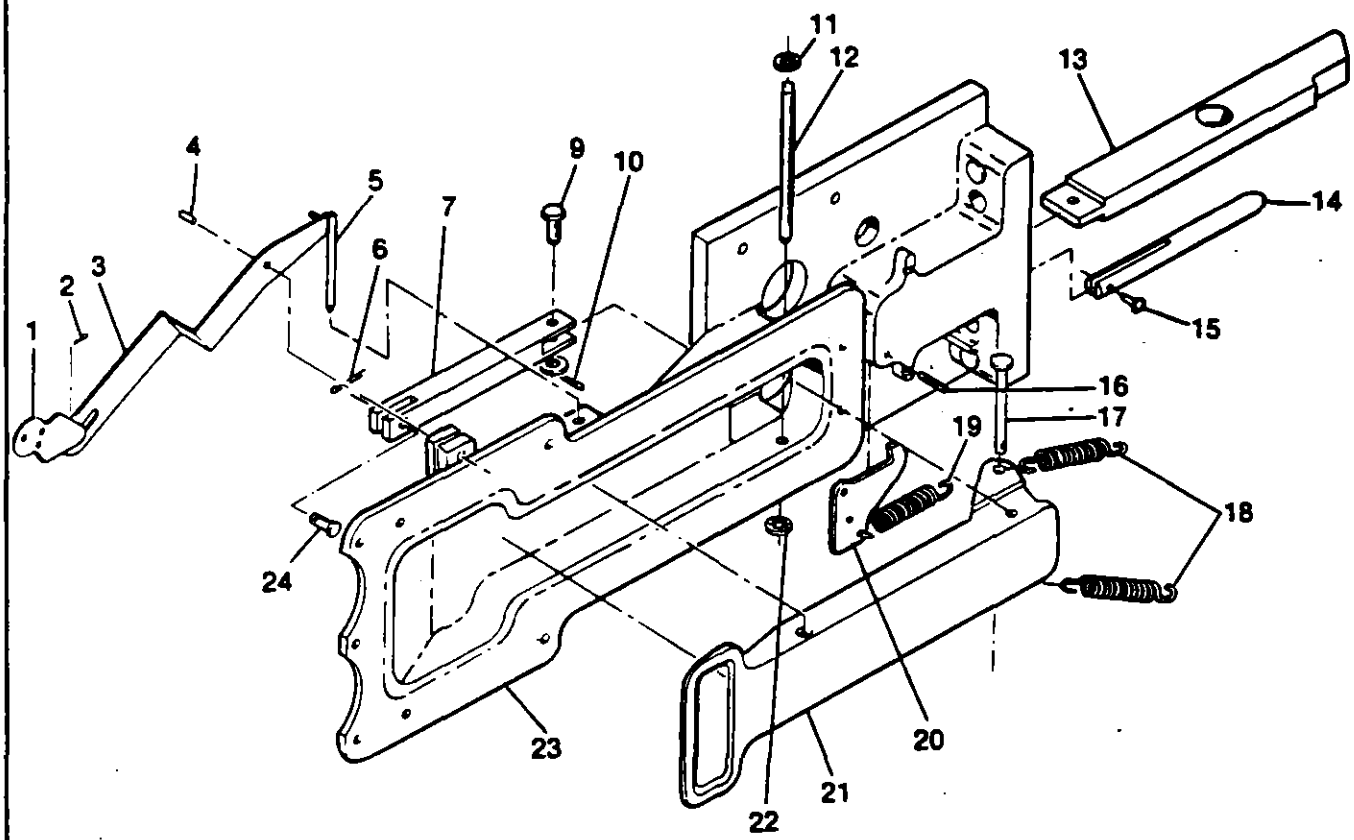
Rotary clutch components are matched upon assembly. The clutch mechanism, if defective, should be replaced as a unit.

1. Adjustment Screw
2. Lock Plate
3. Abrasive Pad
4. Base Plate
5. Bolt Guide Base
6. Bolt Guide Side
7. Bolt
8. Bolt Guide Top
9. Pull Bar
10. Push Pull Rod
11. Mounting Structure
12. Shim
13. Rotary Clutch
14. Guide
15. Door Post
16. Cover
17. Plate Assembly
18. Shaft Assembly
19. Support
20. Inside Handle
21. Outside Handle
22. Spring
23. Bracket

Figure 3-4. Cabin Door Latch Installation (Sheet 1 of 4)

NOTE

Apply Door Eze Lubricant to latch bolt (13).



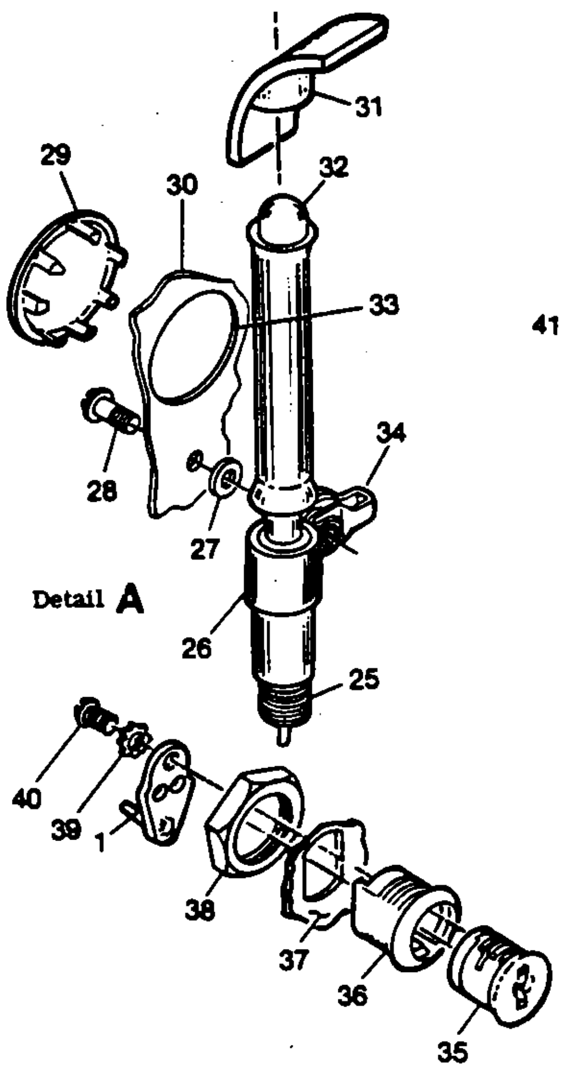
Beginning with U20605310

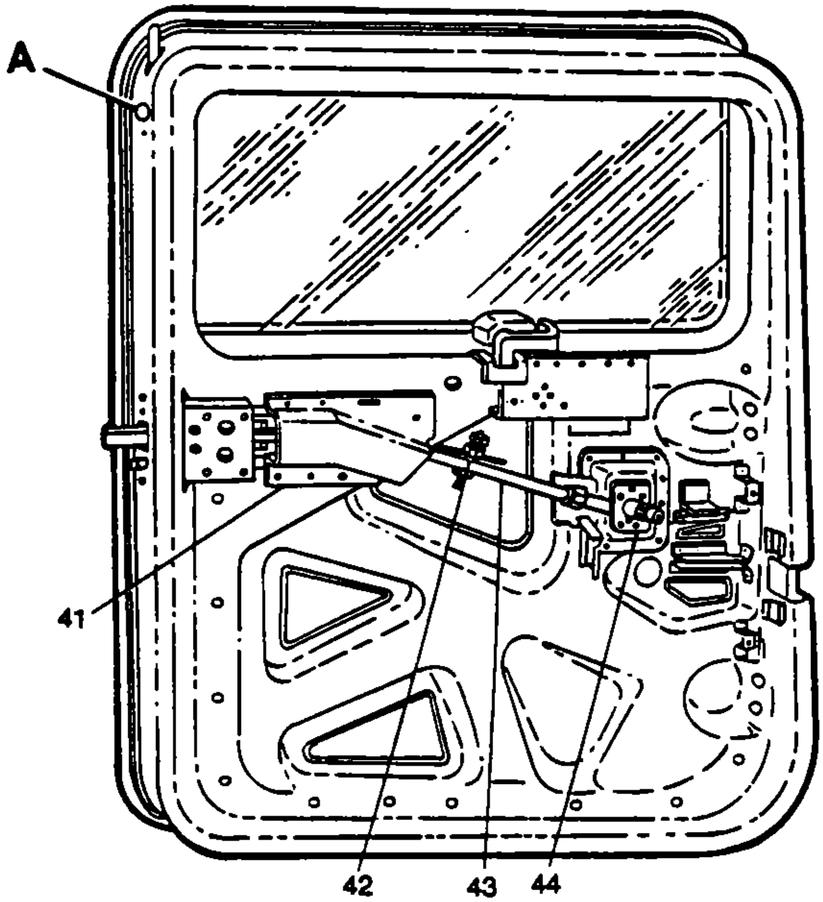
1. Cam Assembly
2. Cotter Pin
3. Locking Arm
4. Pin
5. Pin
6. Cotter Pin
7. Pull Bar
8. Deleted
9. Pin
10. Cotter Pin
11. Lock Washer
12. Pin
13. Bolt
14. Push Rod
15. Rivet
16. Pin
17. Pin
18. Spring
19. Spring
20. Catch
21. Outside Handle
22. Lock Washer
23. Latch Base Assembly
24. Pin

Figure 3-4. Cabin Door Latch Installation (Sheet 2 of 4)

NOTE

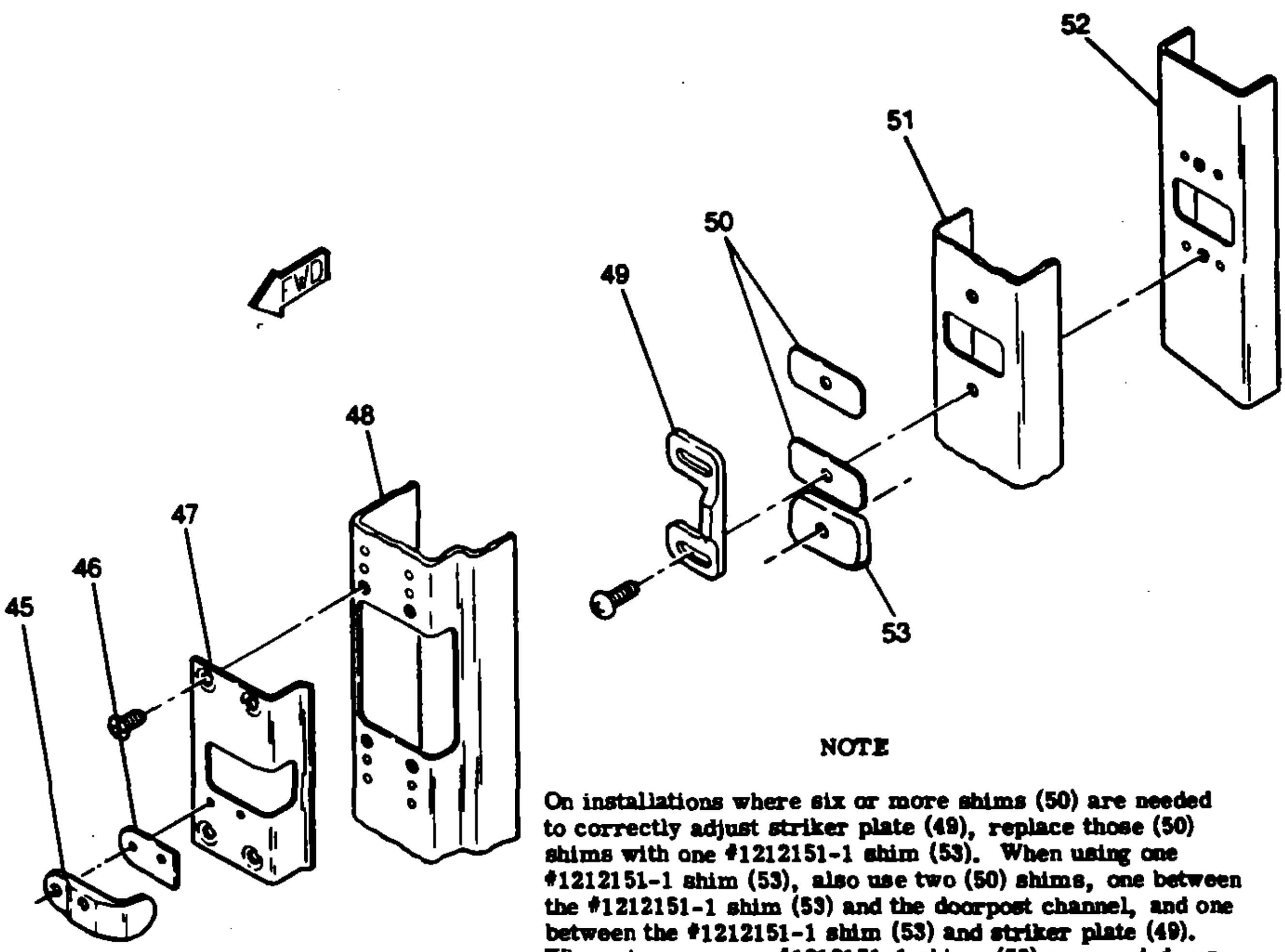
Washers (27) to be bonded to clip-on nut (34) with 579.6 Sealer (Inmont Corp., St. Louis, Mo.) or equivalent.





1. Cam Assembly
25. Cable Assembly
26. Clamp
27. S1450-2A4-062 Washer
28. Screw
29. Plug Button
30. Door Structure
31. Pin Guide
32. Pin
33. .875-inch Access Hole
34. Self-Locking Clip-On Nut
35. Tumblers
36. Casing
37. Door Skin
38. Nut
39. Washer
40. Screw
41. Cover Assembly
42. Clamp
43. Push Rod Assembly
44. Base Plate Assembly

Figure 3-4. Cabin Door Latch Installation (Sheet 3 of 4)



NOTE

On installations where six or more shims (50) are needed to correctly adjust striker plate (49), replace those (50) shims with one #1212151-1 shim (53). When using one #1212151-1 shim (53), also use two (50) shims, one between the #1212151-1 shim (53) and the doorpost channel, and one between the #1212151-1 shim (53) and striker plate (49). Where two or more #1212151-1 shims (53) are needed, use shims (50) as described above, plus, add one shim (50) between each #1212151-1 shim (53) used. In all cases, when shimming striker plate (49), be sure to retain minimal distance between striker plate (49) and cabin door latch bolt. Never grind the end of latch bolt to clear striker plate. Always remove shims as required to maintain minimal clearance.

NOTE

If cabin door is located forward such that the door latch will not operate, this will not allow the latch assembly push rod to ride up on the actuator and trigger the latch bolt. Install 1212150 shims as required beneath the actuator, located on the cover assembly.

45. Actuator
46. #1212150-1 Shim
47. Doorpost Jamb
48. Striker Plate Cover
49. Striker Plate
50. #1212147-1 Shim
51. Channel
52. Channel
53. #1212151-1 Shim

Figure 3-4. Cabin Door Latch Installation (Sheet 4 of 4)

3-24. LOCK. In addition to interior locks, a cylinder and key type lock is installed on left door. If lock is to be replaced, the new one may be modified to accept original key. This is desirable, as the same key is used for ignition switch and cabin door lock. After removing old lock from door, proceed as follows:

a. Remove lock cylinder from new housing.
b. Insert original key into new cylinder and file off any protruding tumblers flush with cylinder. Without removing key, check that cylinder rotates freely in housing.
c. Install lock assembly in door and check lock operation with door open.
d. Destroy new key and disregard code number on cylinder.

3-25. CABIN DOOR LATCHES. (Beginning with U20605310.) (See figure 3-4.)

3-26. DESCRIPTION. The cabin door latch consists of a two-piece nylon latch base, exterior handle, spring-loaded latch bolt/pull-bar assembly, and a spring-loaded catch/trigger pin assembly. The interior handle base plate assembly is directly connected to the cabin door latch by means of an adjustable push rod assembly. This push rod assembly has two clamps attached, 180° apart on the main rod. These clamps are used to operate a cable assembly that drives a cable pin from the upper aft end of the cabin door into the aft upper door sill. When the cabin door is open, the door latch exterior handle should be extended (out), held in this position by means of the spring-loaded latch catch engaged with the latch bolt through the beveled hole in the bolt. The push rod assembly will be moved forward, and the attached cable assembly will be retracted from the upper door sill with the cable pin recessed in the pin guide, located in the upper aft corner of the door. The interior handle, being directly connected by means of the push rod, will be moved approximately 15° aft of the vertical position. Closing the cabin door drives the trigger pin over the nylon actuator attached to the cover plate, located on the rear doorpost. As the trigger pin is driven forward, it disengages the latch catch from the latch bolt. The extended extension springs, attached to the latch handle and bolt/pull bar assembly, compress, pulling the latch handle in, and driving the latch bolt over the latch striker, located on the rear doorpost. Pushing the exterior handle flush with the fuselage skin. The push rod assembly, attached to the latch bolt/pull bar assembly, moves aft, which also drives the cable pin from the pin guide in the door into the upper aft door sill receptacle. The interior door handle has now moved from approximately 15° aft of vertical to approximately 45° forward of vertical. Pushing the interior handle to the horizontal position, flush with the arm rest, will overcenter the door latch, securing the door for flight. The cabin door latch assembly also incorporates a locking arm and locking pin, used with a key lock to secure the aircraft after use. With the cabin door closed, and the exterior latch handle flush, actuating the key lock drives the locking pin into the exterior latch handle, locking the aircraft. It is important to note that since the cabin door latch assembly and the interior handle fase plate assembly are directly connected by the push rod assembly, that any amount of force applied to the outside handle is subsequently applied to the inside handle. If the push rod assembly is not properly adjusted, it is possible to lock one's self out of the aircraft by applying too much force to the exterior handle when closing the cabin door. Therefore, it is important to adhere to all of the rigging and adjustment specifications pertaining to the preload forces of the interior door handle. Refer to the rigging and adjusting procedures in the following paragraphs.

3-27. INSTALLATION OF LOCK ASSEMBLY ON LATCH ASSEMBLY. (Beginning with U20605310.) (See figure 3-4.)

a. Assemble locking arm (3) with pin assembly (5).
b. Place pin (5) in 1/8-inch hole of base assembly (23).
c. Align .099-inch hole of locking arm (3) with .094-inch hole in latch base (23), and install pin (4).
d. Assemble cam assembly (1) to locking arm (3). Cam should be on latch side of locking arm (3).
e. Use washers between cam and cotter pin, and install cotter pin on clevis bolt.

3-28. INSTALLATION OF LATCH ASSEMBLY. (Beginning with U20605310.) (See figure 3-4.)

NOTE

Install with latch in CLOSED position.

a. Install latch assembly between door pan and door skin.
b. Cable assembly should be forward of latch base attach plate, and inboard of latch base cup.
c. Extend latch handle through cutout in door skin. This will pull latch bolt back far enough to allow latch to fall into place.
d. Push latch assembly aft so that bolt (13) and push rod (14) extend through their respective hole.
e. Trip push rod (14) so that bolt (13) is fully extended and handle (21) is flush.
f. Secure latch to door pan with four NAS220-5 screws through base assembly (23) and two AN525-10R6 screws through aft flange of door pan.
g. Drill eleven .128-inch holes to align with latch base (23).

NOTE

Do not oversize holes in the latch base and do not rivet base to skin at this time.

3-29. INSTALLING CABLE ASSEMBLY. (Beginning with U20605310.) (See figure 3-4.)

NOTE

Remove cover assembly (41).

a. On pin end of cable assembly (25), attach clamp (26) and nut (34), one-inch from end of casing, as shown in Detail A.

b. Insert pin end of cable between door pan and door skin at aft end of door. Push pin end of cable to top of door.
c. Remove plug button (29) and align pin on cable with pin guide (31), and insert pin through guide. Access is gained through .875-inch hole (33).
d. Align clamp on cable casing with hole located one-inch below .875-inch hole (33), and install screw.
e. Check operation of cable. If sluggish operation of cable is encountered, add S-1450-24A-062 washers (27) to clip-on nut (34) to facilitate smoother cable operation.

NOTE

Washers are to be bonded to clip-on nut with 579.6 sealer (Inmont Corp., St. Louis, Missouri), or equivalent.

3-30. RIGGING CABLE ASSEMBLY. (Beginning with U20605310.) (See figure 3-4.)

NOTE

Make sure door latch is in OPEN position before proceeding.

a. Cut casing of cable assembly approximately two inches from clamp (42) on push rod assembly (43).
b. Insert core of cable through clamp (42).
c. Pull core through clamp so that pin (32) extends approximately 1/8-inch from door pan contour.
d. Cut core approximately one-inch forward of push rod clamp (42).
e. Secure two nuts to push rod clamp.
f. Operate latch several times to ensure latch works freely. If latch binds up and will not work freely, remove cable core from clamp (42) and operate latch. If latch operates easily without cable attachment, check cable for possible adjustments to facilitate ease of operation.
g. After cable operates freely, install cover assembly (41) and recheck cable for operation.

3-31. RIGGING INSIDE HANDLE. (Beginning with U20605310.) (See figure 3-4.)
a. With latch secured to door pan, attach push rod assembly (43) to pull bar (7), and secure with pin (9).

NOTE

Do not install cotter pin (10).

b. Ensure that latch is CLOSED position.
c. By removing pin (9) that connects push rod to latch base assembly, rotate rod in or out (180°) for adjustment. Adjust rod so that it takes a load of 6 pounds to 12 pounds at the end of the inner handle to move it from closed position to overcenter position.

NOTE

Rod must be attached to latch assembly before rigging can be accomplished.

d. For fine adjustment for overcentering latch assembly, proceed as follows:

NOTE

Cabin door latch must be in OPEN position. Latch must operate smoothly and freely.

1. Adjust striker plate (49) forward by installing 1212147-1 shims (50) as required, so that there is a minimal clearance between bolt (13) and striker (49).

NOTE

This adjustment will ensure that when the door is opened from the outside, the bolt will engage the latch catch, and the exterior handle will stay open until the door is closed again.

NOTE

If cabin door is located too far forward such that the door latch will not operate, this will not allow latch assembly push rod (14) to ride up on actuator (45) and trigger the latch bolt (13), install 1212150-1 shims (46) as required beneath actuator (45), located on cover assembly (48).

2. Close the cabin door from inside the aircraft. When latch is overcentered, the exterior handle should pull flush. If it does not pull flush, the connecting push rod from the door latch to the inside handle assembly should be adjusted "out" (lengthened).

NOTE

When making this adjustment on the overcentering of the latch, it may be noticed that there is a sharp, loud canning noise when the inside handle is pushed down. It is preferred that the outside door handle be flush, even if the canning noise is noticeable.

3. When adjusting push rod (43), it may need only be adjusted 1/2 turn. To accomplish this, base plate (44) should be removed.
4. To make 1/2 turn adjustment, remove smaller end of push rod (43) and turn it over (180°). Then reinstall base plate assembly.
5. When closing cabin door from the outside, by using a large, sharp force on the outside handle, it is possible to overcenter the inside handle, thus, locking one's self out. To prevent this from occurring when adjusting the push rod in step "4", adjust the push rod so there is sufficient force (6 to 12 pounds) against the inside handle to prevent it from overcentering when closing the door from the outside.
6. Do not file, grind or sand any portion of the bolt.
7. Recheck clamps that secure cable. There must be no slippage between cable casing and clamp.
8. After overcenter adjustment has been made, install cotter pin (10) in clevis pin (9).

e. Rivet latch base (23) to door skin with MS20426A4-3 rivets.
f. Attach lock assembly casing (36) to door skin (37) with nut (38) provided.
g. Install tumblers (35) and attach cam (1) to tumblers with screw and lockwasher provided (40) and (39).

NOTE

After installing cam (1), seal over head of screw (40) and washer (39) with RTV-102 (white) or RTV-103 (black) silicone rubber sealant (General Electric, Waterford, N.Y.)

h. Operate lock several times to assure that all parts function properly.
Steps "f", "g" and "h" apply to left-hand doors only.

3-32. CARGO DOORS. (See figure 3-5.)

3-33. DESCRIPTION. U206 and TU206 aircraft are equipped with two cargo doors located on the right side of fuselage. The aft door is hinged at fuselage station 112 and is a structural, load-carrying member when closed and locked. The aft door handle is located in forward edge of door and is inaccessible with forward door closed, preventing inadvertent opening during flight. As rear door handle is moved to CLOSED position, hooks engage latch plates on upper and lower door sills holding door tightly closed. Telescoping door stops, with detent positions, are used to hold doors open. An entrance step is located on fuselage, below front cargo door. Flight with doors removed is only permissible when an optional spoiler kit is installed. This spoiler kit consists of a spoiler assembly which attaches to front door hinge points and deflects air away from door opening. Addition of screws to rear wall is required with installation of spoiler kit.

NOTE

A flap interrupt switch is installed to prevent operation of flaps with cargo doors open. Switch adjustment is provided by means of slotted holes on front cargo door frame. A switch depressor is provided with spoiler kit to retain use of flaps.

3-34. REMOVAL AND INSTALLATION.
a. Remove cotter pins and hinge pins from door hinges.
b. Disconnect door stops from doors.
c. Reverse preceding steps for installation.

3-35. CARGO DOOR LATCH. (See figure 3-6.)

3-36. REMOVAL AND INSTALLATION. Figure 3-6 shows details of the cargo door latch and may be used as a guide during removal, disassembly, reassembly and installation.

3-37. RIGGING. (See figure 3-5.)
a. Hooks (8) and (19) must fully engage latch plate (3), but must clear plates 0.05-inch as door is opened.
b. Pins (7) must fully engage sockets (6) when door is locked.
c. Door must be flush with fuselage skin when door is locked. Adjusting door slightly less than flush is permissible if air leaks around door seal is encountered.
d. Adjust bolts (10) to obtain correct depth of hook engagement and hook clearance as door is opened.
e. Move latch plates (3) as necessary to obtain full load-carrying pin engagement.
f. Add or delete washers (5) under sockets (6) to make door flush with fuselage skin.
g. Adjust turnbuckles (11) to cause both hooks to pull door tightly closed. Handle should snap over-center snugly, but should not require excessive force.

NOTE

Outside door handle, item (2), figure 3-6, sheet 2 of 2, can be used to close and lock forward cargo door. Lift handle out of its recess, grasp vertical tab of pull bar (3), behind handle (2). Pull vertical tab outboard until pull bar engages detent at its aft end. Then push handle (2) back into its recess while observing inside handle (20) rotating toward the locked position (it will not rotate fully forward).

CAUTION

If cargo door is closed and locked from the outside, the inside door handle must be rotated fully forward to disengage the outside locking mechanism, and allow door to be unlocked and opened from the inside.

3-38. SEATS. (See figures 3-7 and 3-8.)

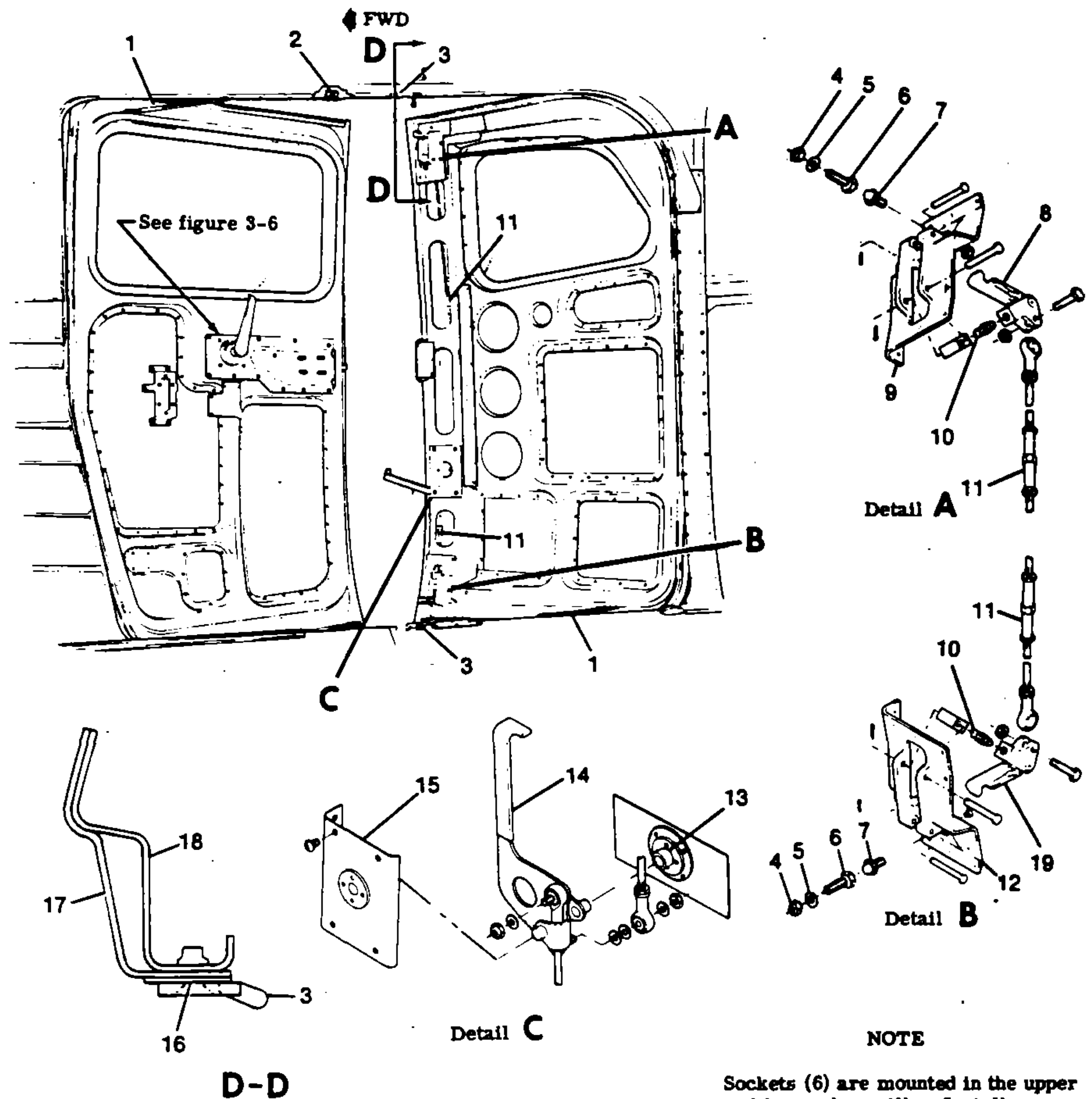
3-39. PILOT AND COPILOT.
Reclining back, articulating recline and vertical adjust.

3-40. DESCRIPTION. These seats are manually-operated throughout their full range of operation. Seat stops are provided to limit fore-and-aft travel. Install seat stops on rails as follows:
a. Pilots seat: inbd rail fwd and aft.
b. Copilots seat: outbd rail fwd and aft.
c. Center L H seat: outbd rail fwd and aft.
d. Center R H seat: outbd rail fwd and inbd rail aft.
e. Aft L H seat: outbd rail fwd and aft.
f. Aft R H seat: outbd rail aft only.

3-41. REMOVAL AND INSTALLATION.
a. Remove seat stops from rails.
b. Slide seat fore-and-aft to disengage seat rollers from rails.
c. Lift seat out.
d. Reverse the preceding steps for installation. Ensure all seat stops are reinstalled.

WARNING

It is extremely important that pilot's seat stops are installed, since acceleration and deceleration could possibly permit seat to become disengaged from seat rails and create a hazardous situation, especially during takeoff and landing.



1. Door Stop
2. Flap Interrupt Switch
3. Latch Plate
4. Nut
5. Washer
6. Bolt
7. Bolt-Door Stop
8. Upper Hook
9. Upper Latch Carrier
10. Adjusting Bolt
11. Turnbuckle
12. Lower Catch Carrier
13. Bushing
14. Handle
15. Cover
16. Shim
17. Upper Door Sill
18. Support
19. Lower Hook

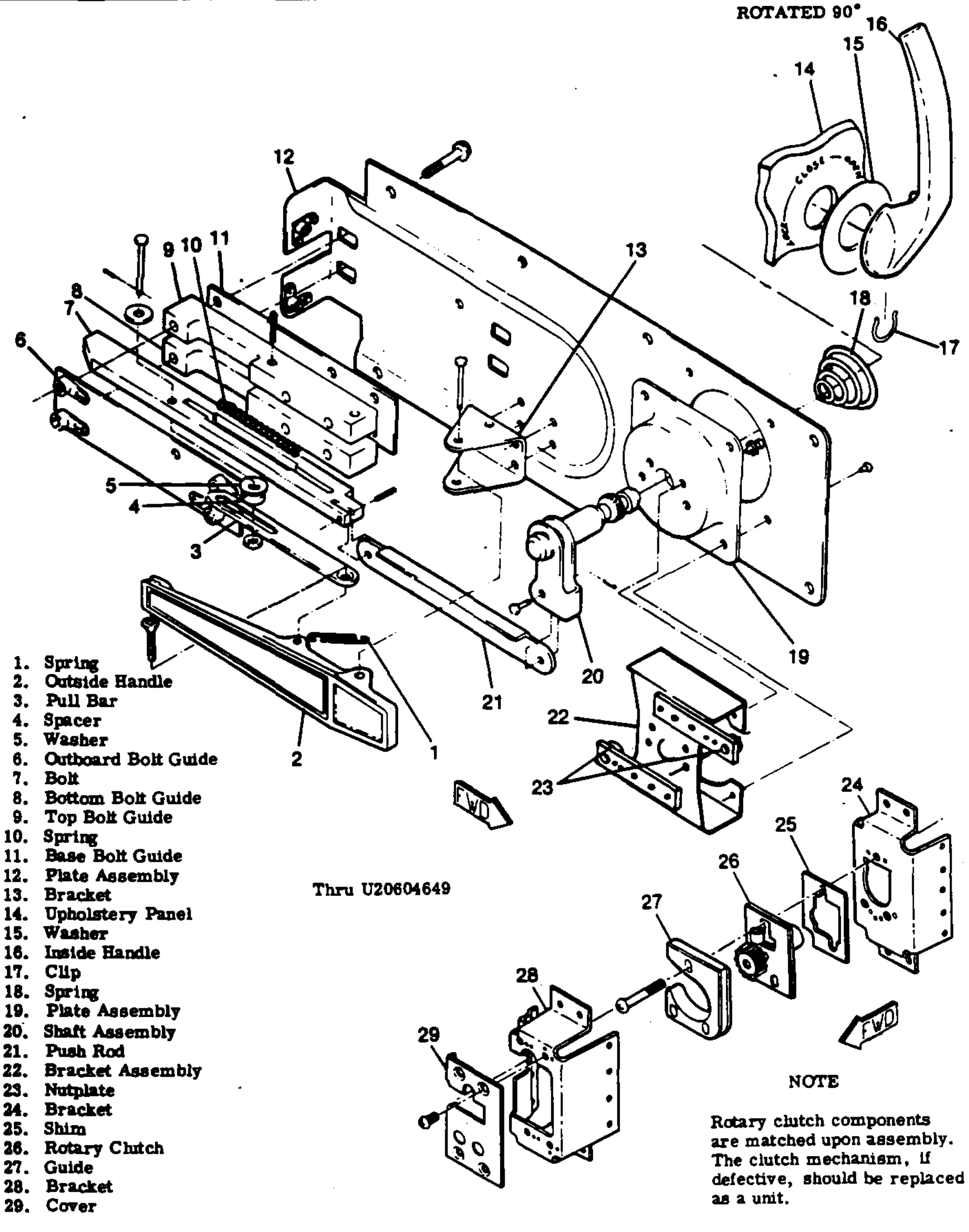
NOTE

Sockets (6) are mounted in the upper and lower door sills. Install an abrasive shim beneath latch plate (3) to prevent latch plate from slipping.

To aid in cargo loading, the center seat bolt attach points on the floor are designed to fold flat.

A tee handle is stowed in the glove compartment. The front cargo door may be locked and unlocked externally through a hole opposite the inside handle.

Figure 3-5. Cargo Door Installation

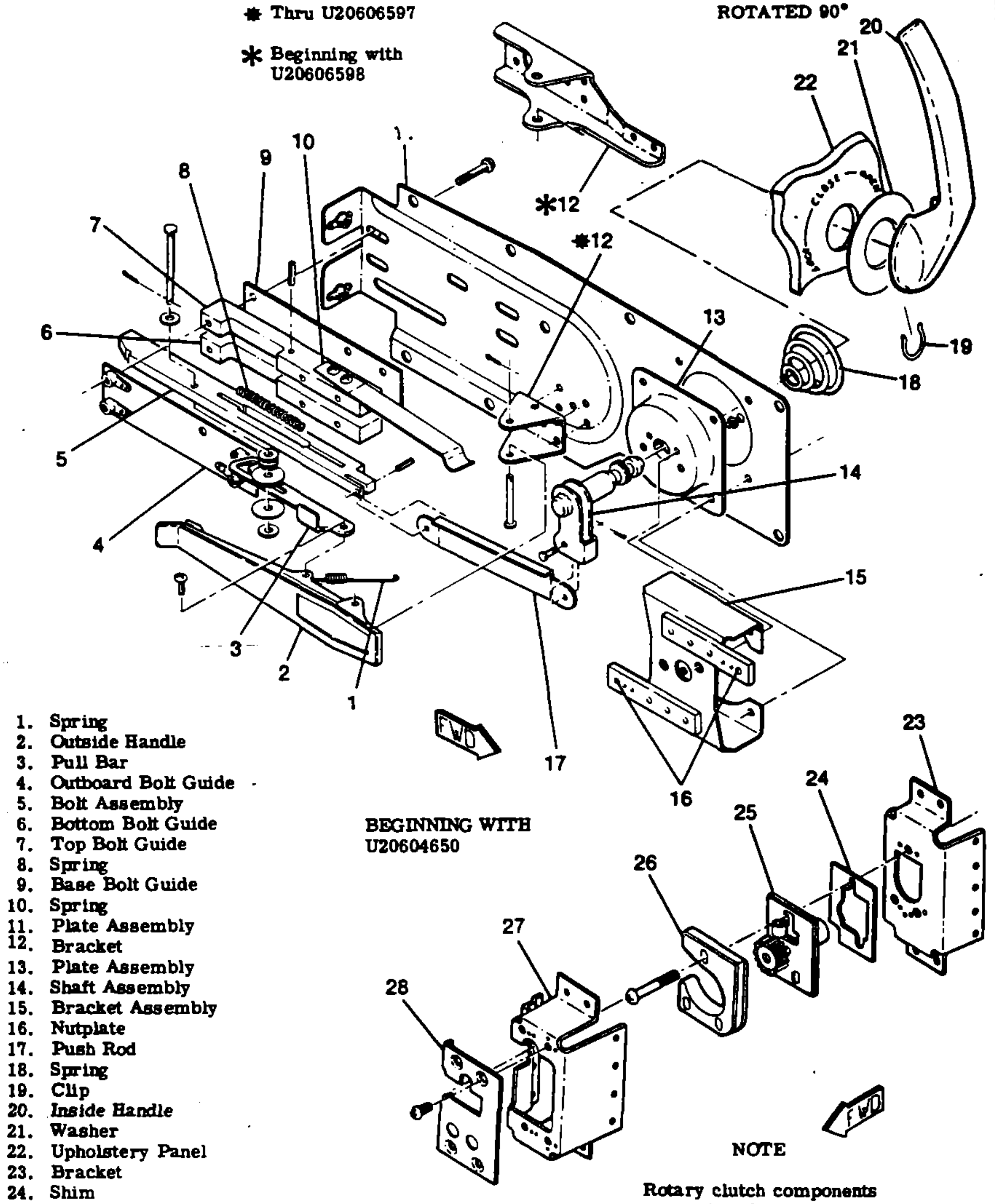


1. Spring
2. Outside Handle
3. Pull Bar
4. Spacer
5. Washer
6. Outboard Bolt Guide
7. Bolt
8. Bottom Bolt Guide
9. Top Bolt Guide
10. Spring
11. Base Bolt Guide
12. Plate Assembly
13. Bracket
14. Upholstery Panel
15. Washer
16. Inside Handle
17. Clip
18. Spring
19. Plate Assembly
20. Shaft Assembly
21. Push Rod
22. Bracket Assembly
23. Nutplate
24. Bracket
25. Shim
26. Rotary Clutch
27. Guide
28. Bracket
29. Cover

NOTE

Rotary clutch components are matched upon assembly. The clutch mechanism, if defective, should be replaced as a unit.

Figure 3-6. Cargo Door Latch Installation (Sheet 1 of 2)



1. Spring
2. Outside Handle
3. Pull Bar
4. Outboard Bolt Guide
5. Bolt Assembly
6. Bottom Bolt Guide
7. Top Bolt Guide
8. Spring
9. Base Bolt Guide
10. Spring
11. Plate Assembly
12. Bracket
13. Plate Assembly
14. Shaft Assembly
15. Bracket Assembly
16. Nutplate
17. Push Rod
18. Spring
19. Clip
20. Inside Handle
21. Washer
22. Upholstery Panel
23. Bracket
24. Shim
25. Rotary Clutch
26. Guide
27. Bracket
28. Cover

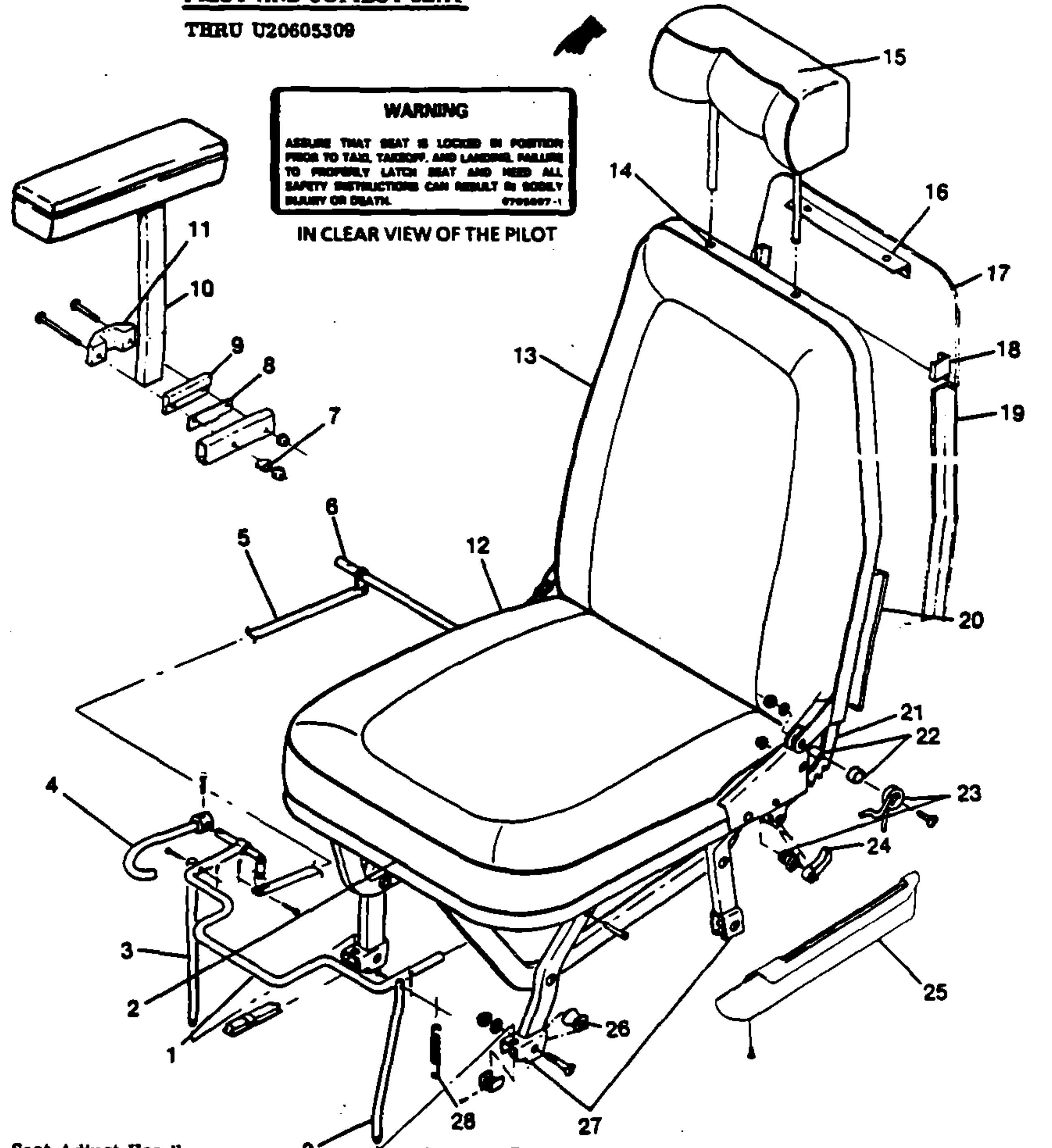
NOTE

Rotary clutch components are matched upon assembly. The clutch mechanism, if defective, should be replaced as a unit.

Figure 3-6. Cargo Door Latch Installation (Sheet 2 of 2)

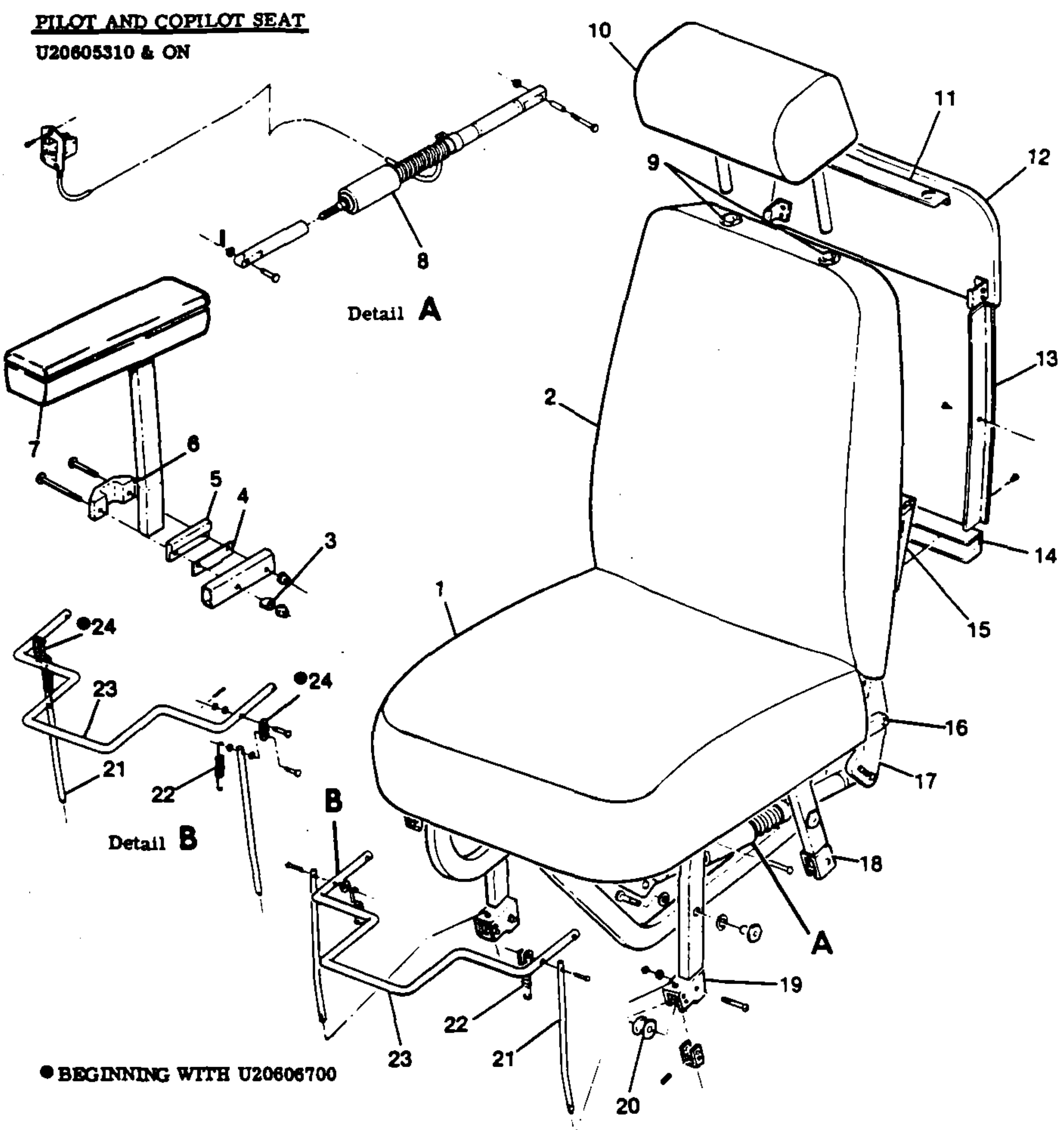
PILOT AND COPILOT SEAT

THRU U20605309



1. Seat Adjust Handle
2. Seat Bottom
3. Seat Adjust Pin
4. Reclining Adjust Handle
5. Seat Back Adjust Link
6. Torque Tube
7. Spacer
8. Stop
9. Spacer
10. Arm Rest
11. Socket
12. Seat Bottom Cover
13. Seat Back
14. Grommet
15. Head Rest
16. Bracket
17. Former
18. Bracket
19. Retainer
20. Pocket
21. Seat Back Cam
22. Bushing
23. Spring
24. Seat Back Adjust Pawl
25. Trim Assembly
26. Roller
27. Roller Housing
28. Seat Adjust Spring

Figure 3-7. Seat Installation (Sheet 1 of 14)

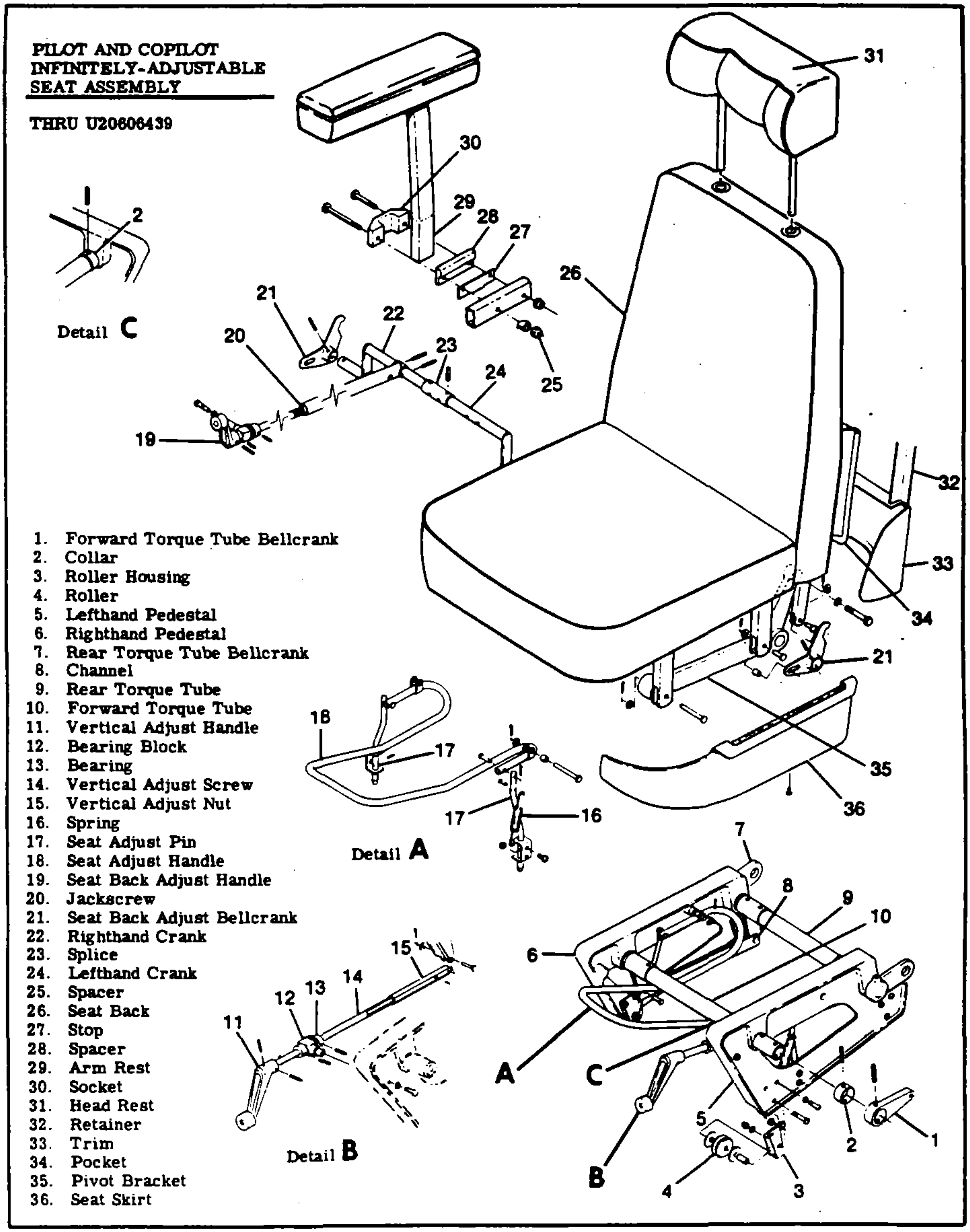


1. Seat Bottom	9. Grommet	17. Seat Back Frame
2. Seat Back.	10. Head Rest	18. Aft Roller Housing
3. Spacer	11. Bracket	19. Forward Roller Housing
4. Stop	12. Former	20. Roller
5. Spacer	13. Retainer	21. Pin
6. Socket	14. Trim	22. Spring
7. Arm Rest	15. Pocket	23. Seat Release Handle
8. Seat Lock Cylinder	16. Pivot Arm	24. Link-Seat Lock

Figure 3-7. Seat Installation (Sheet 2 of 14)

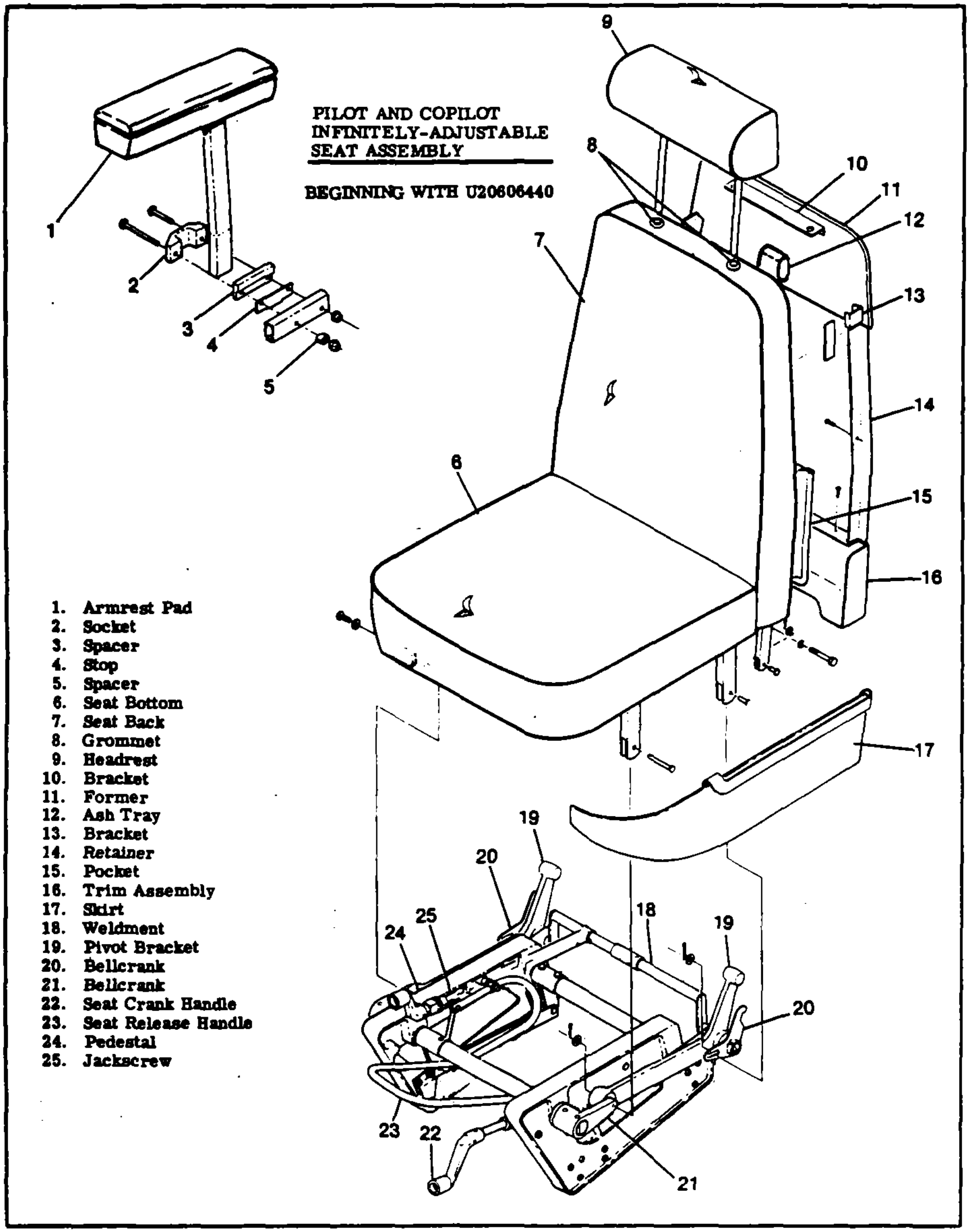
PILOT AND COPILOT INFINITELY-ADJUSTABLE SEAT ASSEMBLY

THRU U20606439



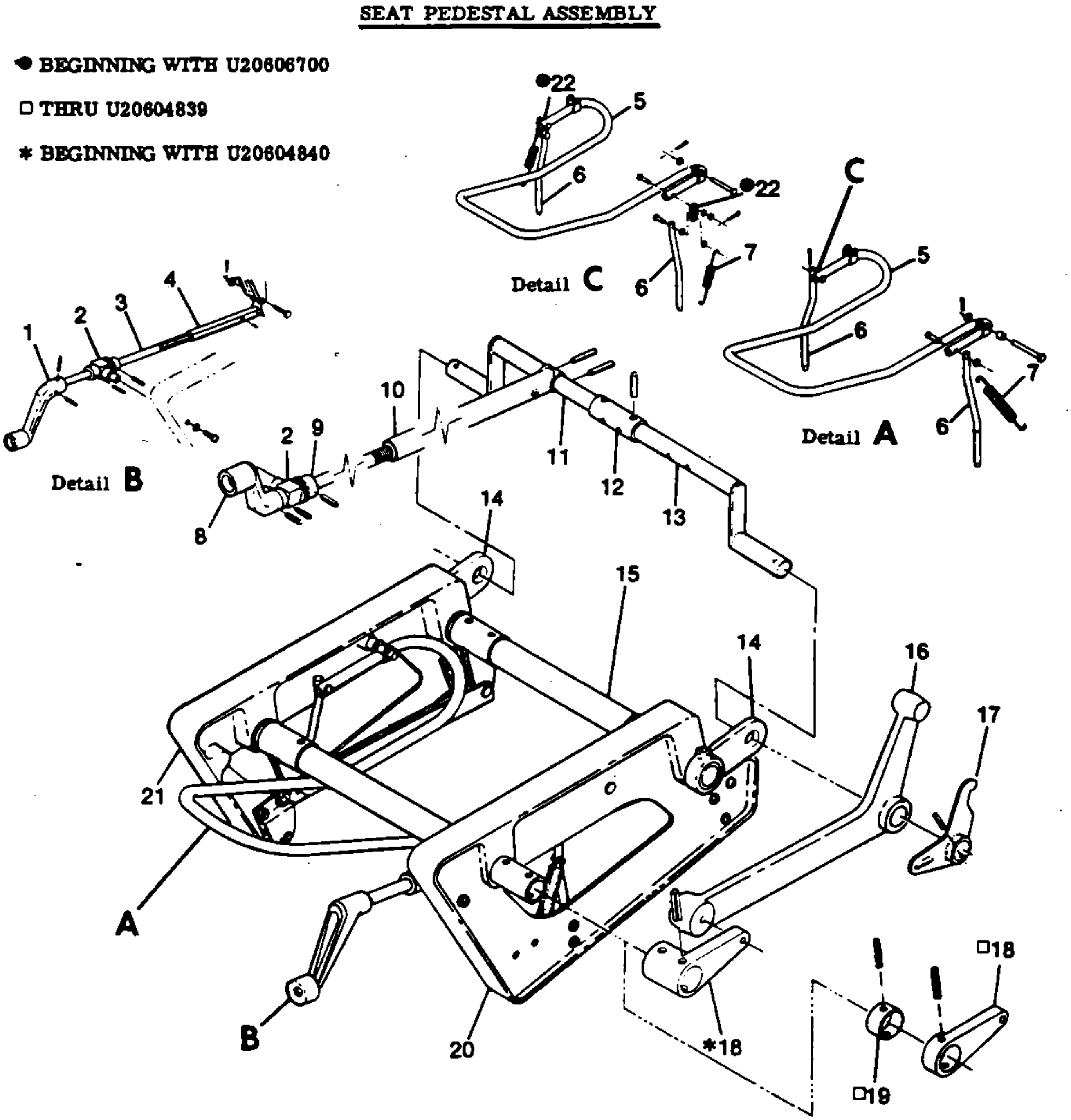
1. Forward Torque Tube Bellcrank
2. Collar
3. Roller Housing
4. Roller
5. Lefthand Pedestal
6. Righthand Pedestal
7. Rear Torque Tube Bellcrank
8. Channel
9. Rear Torque Tube
10. Forward Torque Tube
11. Vertical Adjust Handle
12. Bearing Block
13. Bearing
14. Vertical Adjust Screw
15. Vertical Adjust Nut
16. Spring
17. Seat Adjust Pin
18. Seat Adjust Handle
19. Seat Back Adjust Handle
20. Jackscrew
21. Seat Back Adjust Bellcrank
22. Righthand Crank
23. Splice
24. Lefthand Crank
25. Spacer
26. Seat Back
27. Stop
28. Spacer
29. Arm Rest
30. Socket
31. Head Rest
32. Retainer
33. Trim
34. Pocket
35. Pivot Bracket
36. Seat Skirt

Figure 3-7. Seat Installation (Sheet 3 of 14)



1. Armrest Pad
2. Socket
3. Spacer
4. Stop
5. Spacer
6. Seat Bottom
7. Seat Back
8. Grommet
9. Headrest
10. Bracket
11. Former
12. Ash Tray
13. Bracket
14. Retainer
15. Pocket
16. Trim Assembly
17. Skirt
18. Weldment
19. Pivot Bracket
20. Bellcrank
21. Bellcrank
22. Seat Crank Handle
23. Seat Release Handle
24. Pedestal
25. Jackscrew

Figure 3-7. Seat Installation (Sheet 4 of 14)



1. Vertical Adjust Handle
2. Bearing Block
3. Vertical Adjust Screw
4. Vertical Adjust Nut
5. Seat Adjust Handle
6. Seat Adjust Pin
7. Spring
8. Seat Back Adjust Handle
9. Bearing
10. Jack Screw
11. RH Crank
12. Splice
13. LH Crank
14. Torque Tube Bellcrank
15. Rear Torque Tube
16. Seat Pivot Bracket
17. Seat Back Adjust Bellcrank
18. Forward Torque Tube Bellcrank
19. Collar
20. LH Pedestal
21. RH Pedestal
22. Link-Seat Lock

Figure 3-7. Seat Installation (Sheet 5 of 14)

CENTER

THRU U20605309

1. Reclining Adjustment Handle
2. Spacer
3. Seat Bottom
4. Torque Tube
5. Link
6. Bellcrank
7. Fore/Aft Adjustment Handle
8. Fore/Aft Adjustment Pin
9. Spring
10. Spring Positioning Support
11. Reclining Adjustment Pawl
12. Bushing
13. Bushing
14. Seat Back
15. Seat Belt Retainer

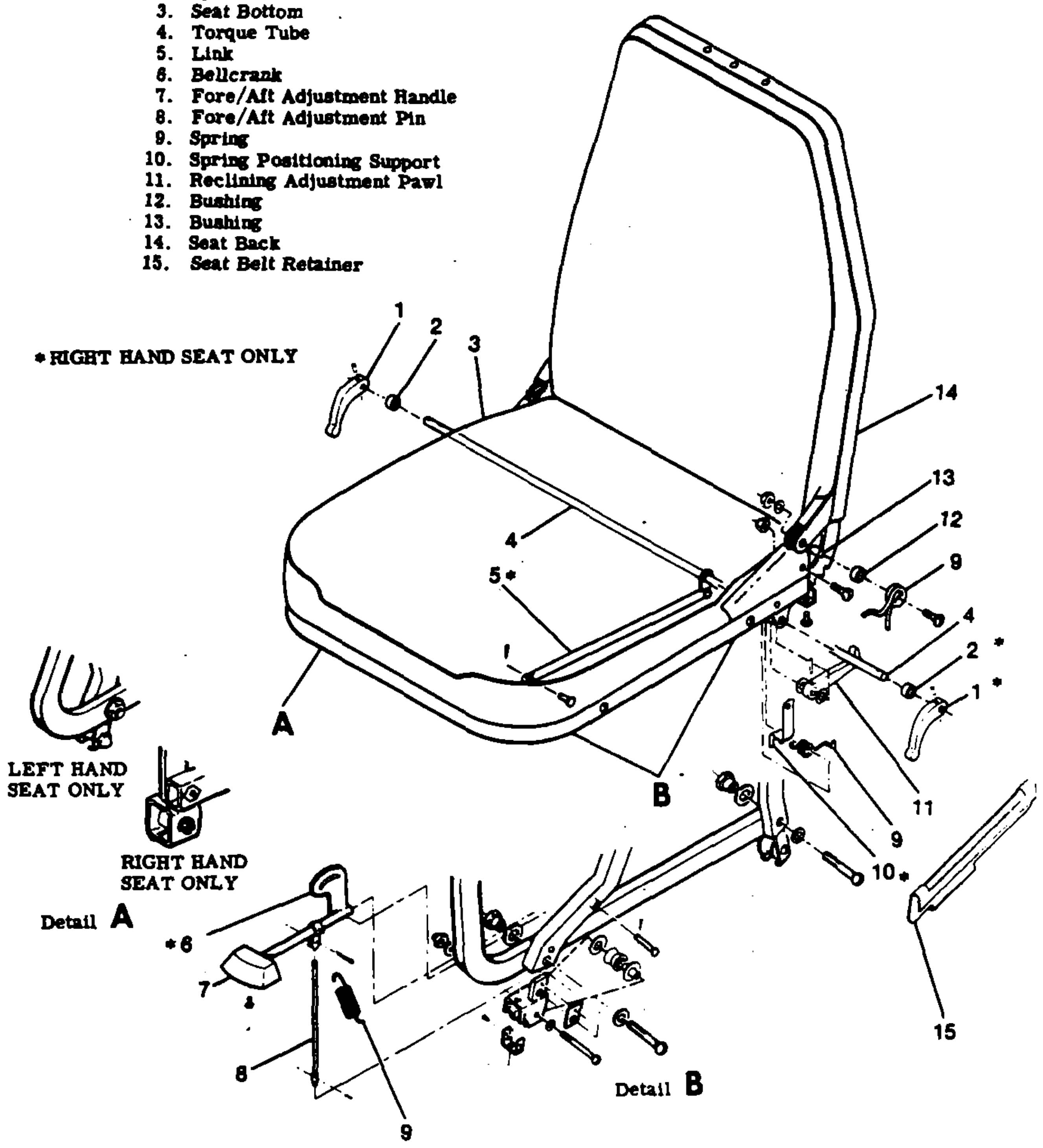
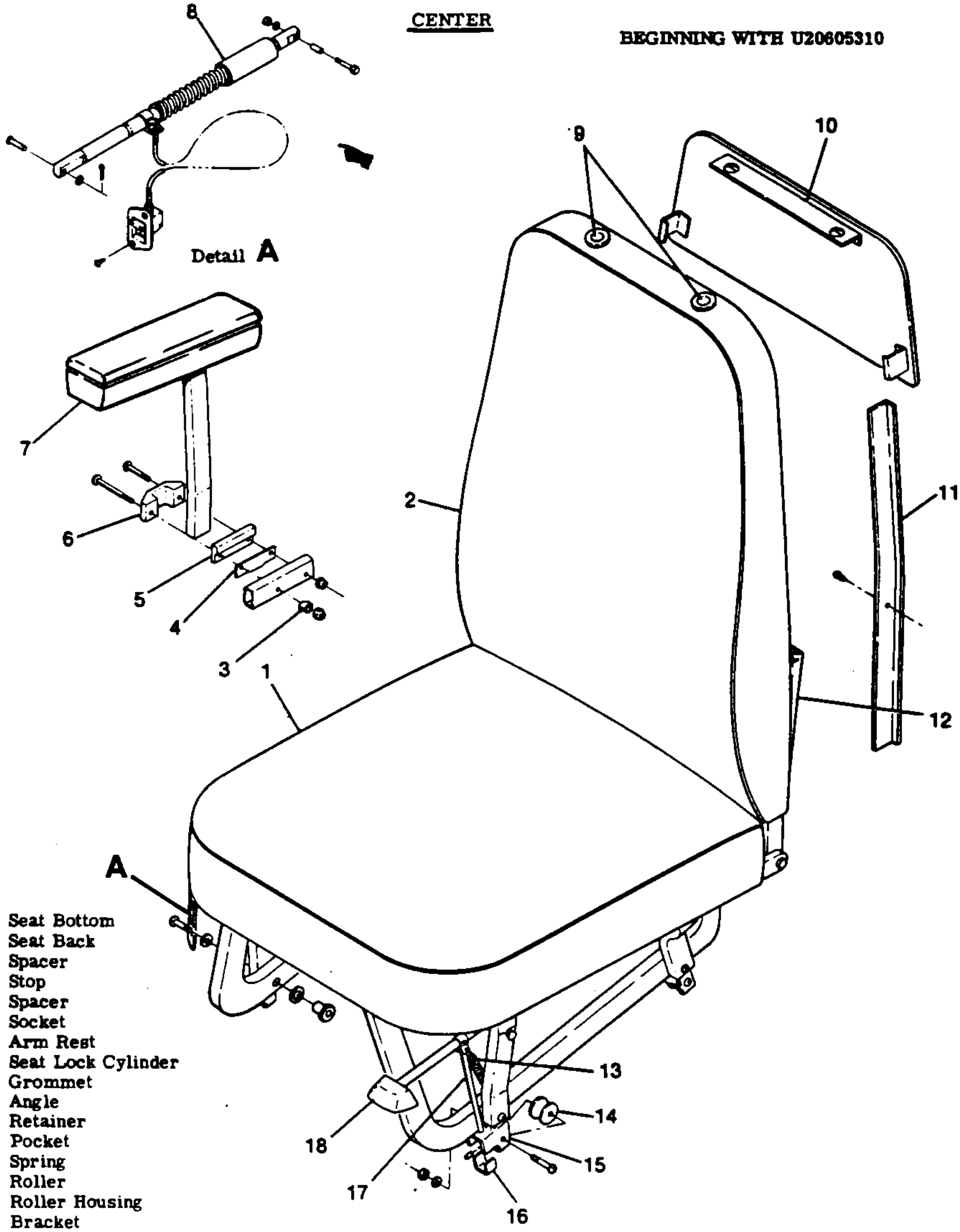


Figure 3-7. Seat Installation (Sheet 6 of 14)



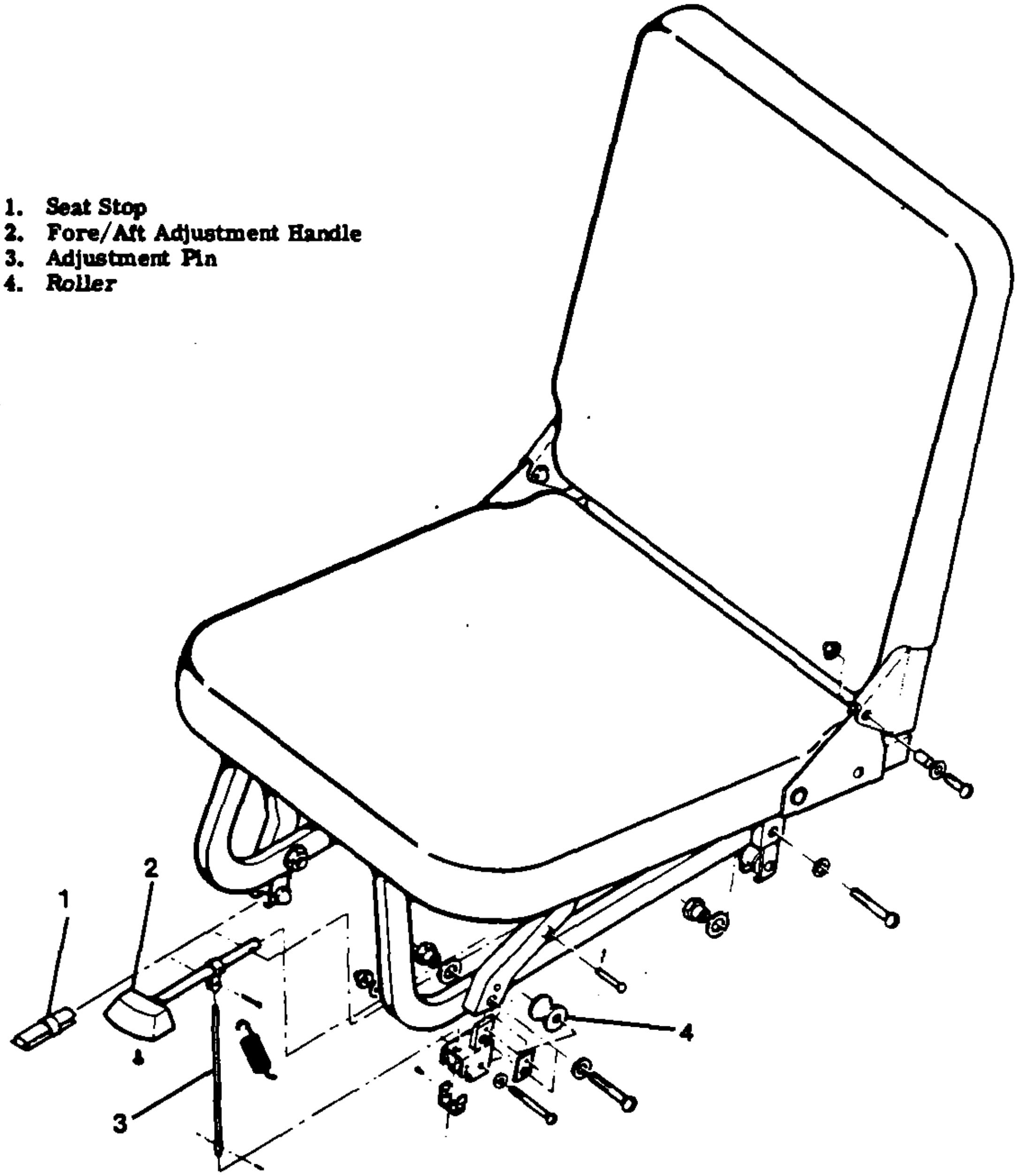
1. Seat Bottom
2. Seat Back
3. Spacer
4. Stop
5. Spacer
6. Socket
7. Arm Rest
8. Seat Lock Cylinder
9. Grommet
10. Angle
11. Retainer
12. Pocket
13. Spring
14. Roller
15. Roller Housing
16. Bracket
17. Pin
18. Fore/Aft Adjust Knob

Figure 3-7. Seat Installation (Sheet 7 of 14)

CENTER

BEGINNING WITH U20603522

1. Seat Stop
2. Fore/Aft Adjustment Handle
3. Adjustment Pin
4. Roller

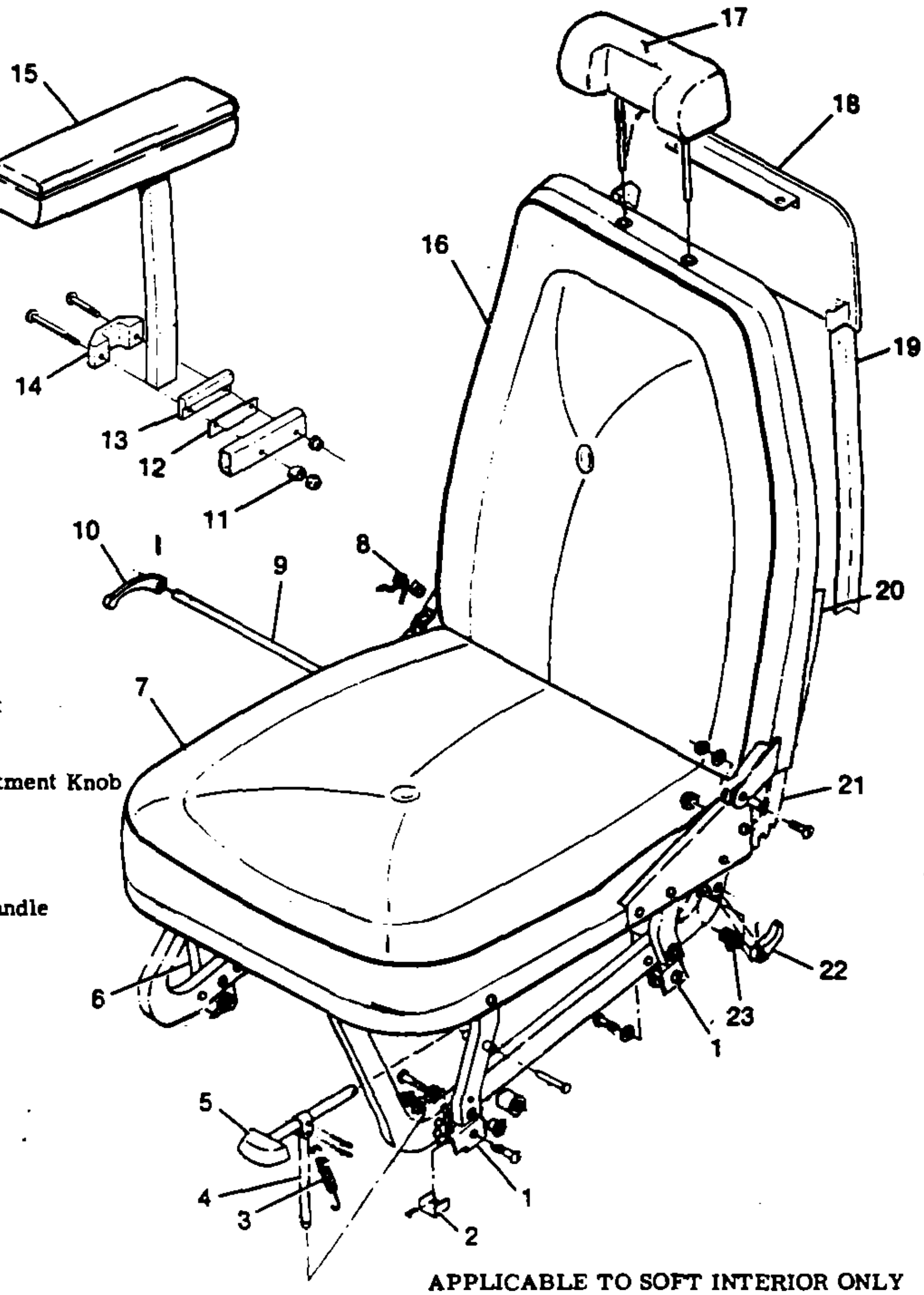


APPLICABLE TO HARD INTERIOR ONLY

Figure 3-7. Seat Installation (Sheet 8 of 14)

CENTER

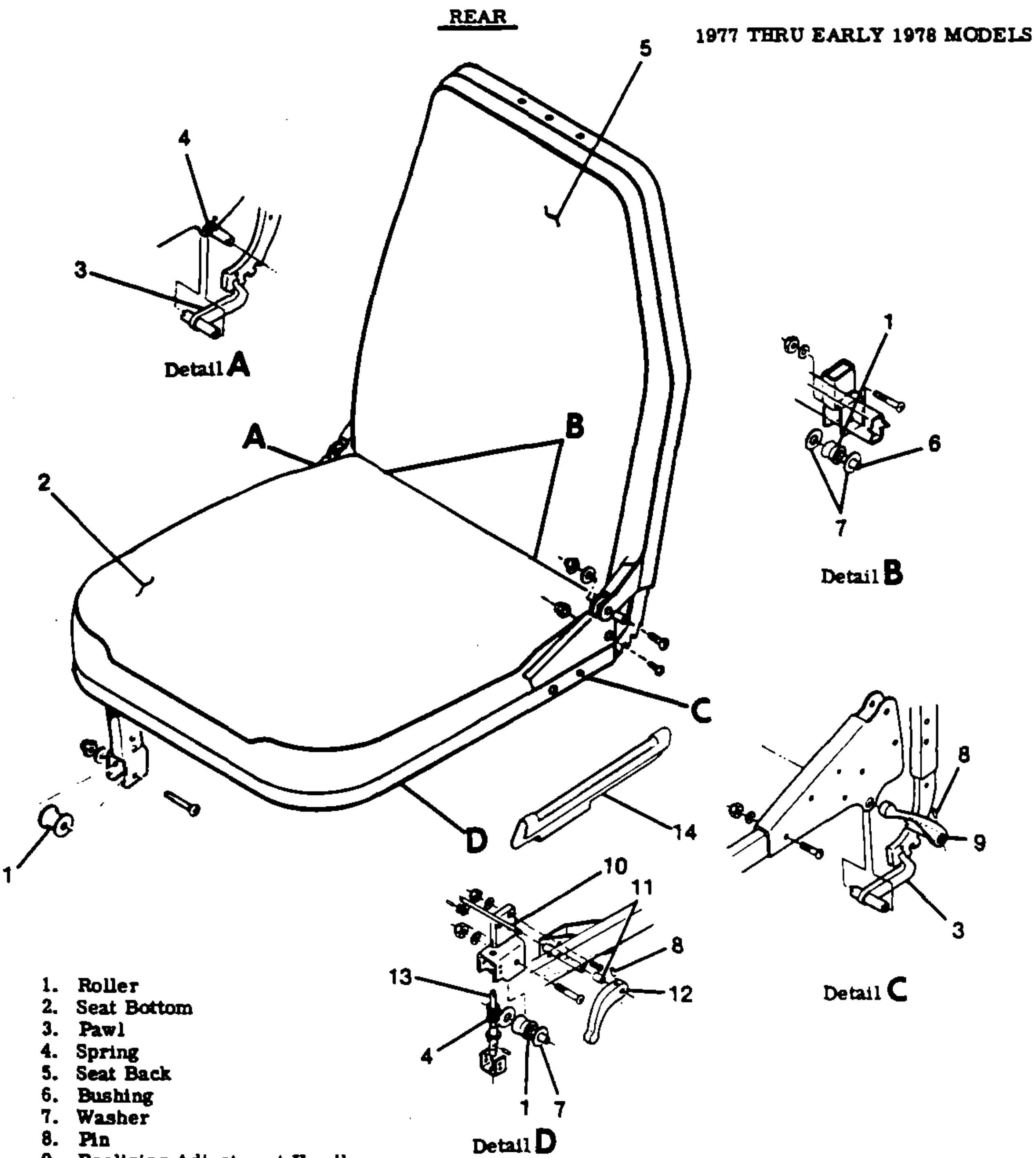
U20603522 THRU U20605309



1. Roller Housing
2. Seat Adjustment Bracket
3. Seat Adjustment Spring
4. Seat Adjustment Pin
5. Fore and Aft Seat Adjustment Knob
6. Righthand Seat Leg
7. Seat Bottom
8. Spring
9. Torque Tube
10. Reclining Adjustment Handle
11. Spacer
12. Stop
13. Spacer
14. Socket
15. Arm Rest
16. Seat Back
17. Head Rest
18. Former
19. Retainer
20. Pocket
21. Seat Back Cam
22. Pawl
23. Seat Adjustment Spring

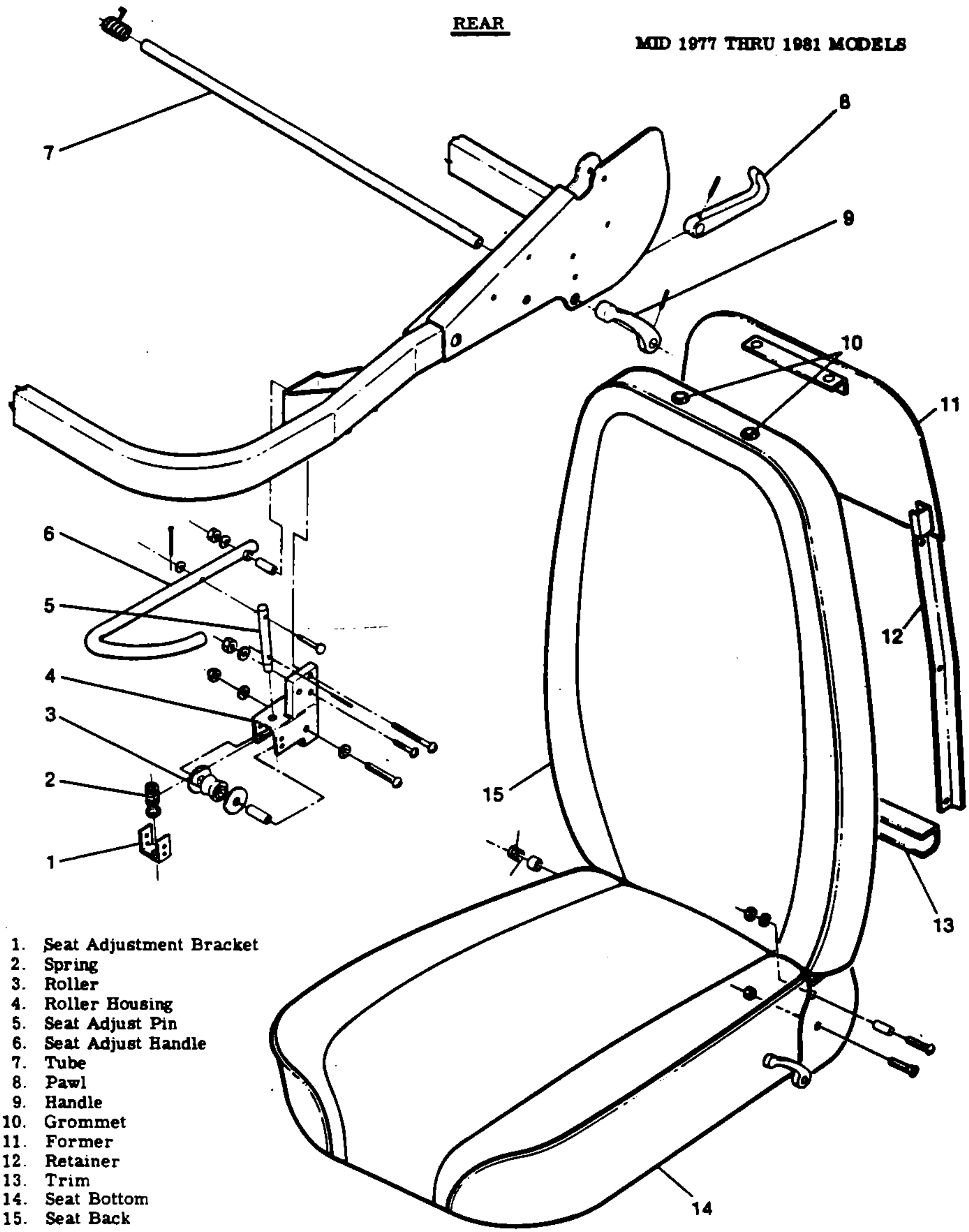
APPLICABLE TO SOFT INTERIOR ONLY

Figure 3-7. Seat Installation (Sheet 9 of 14)



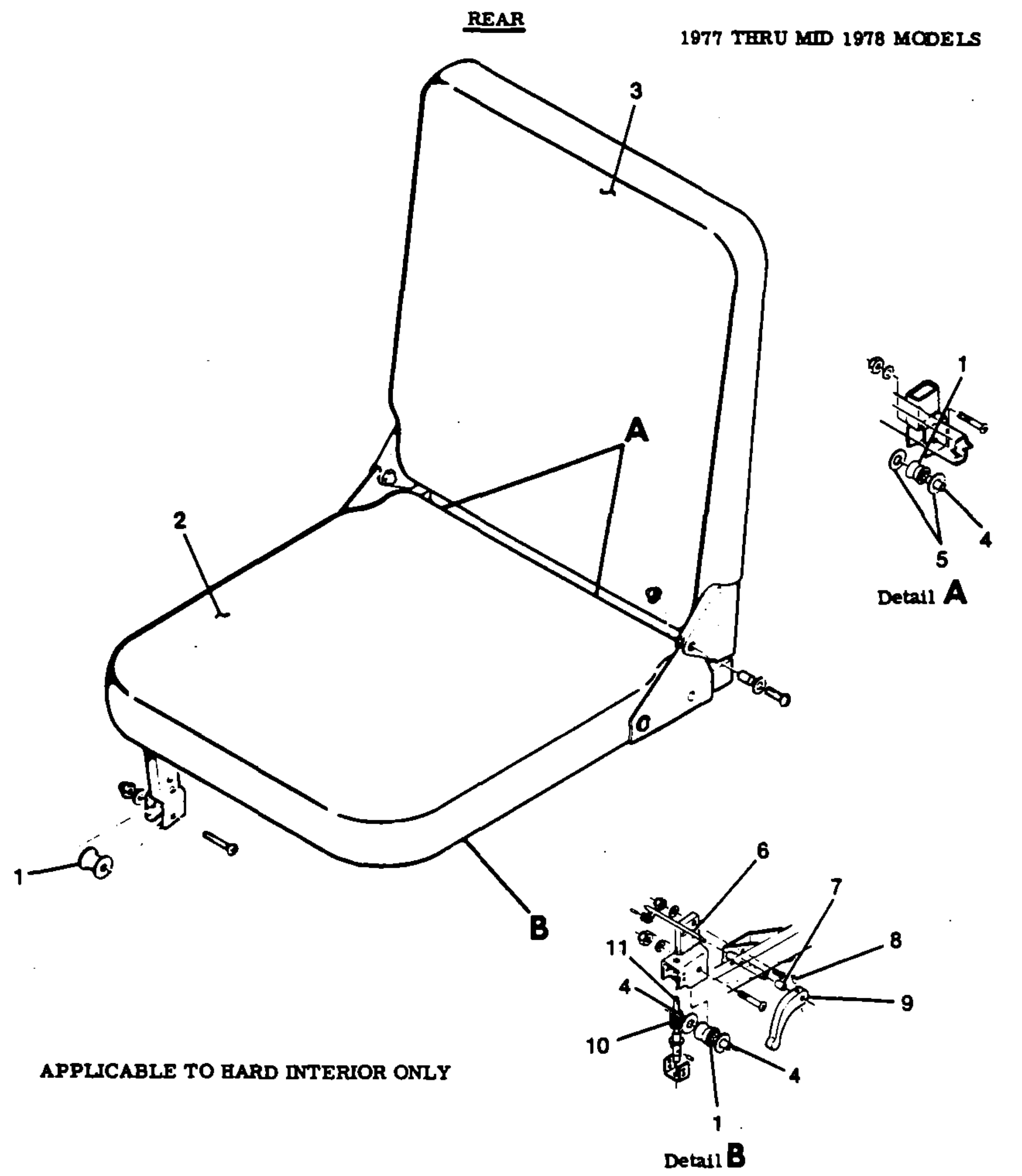
1. Roller
2. Seat Bottom
3. Pawl
4. Spring
5. Seat Back
6. Bushing
7. Washer
8. Pin
9. Reclining Adjustment Handle
10. Adjustment Arm
11. Spacer
12. Fore/Aft Adjustment Handle
13. Adjustment Pin
14. Seat Belt Retainer

Figure 3-7. Seat Installation (Sheet 10 of 14)



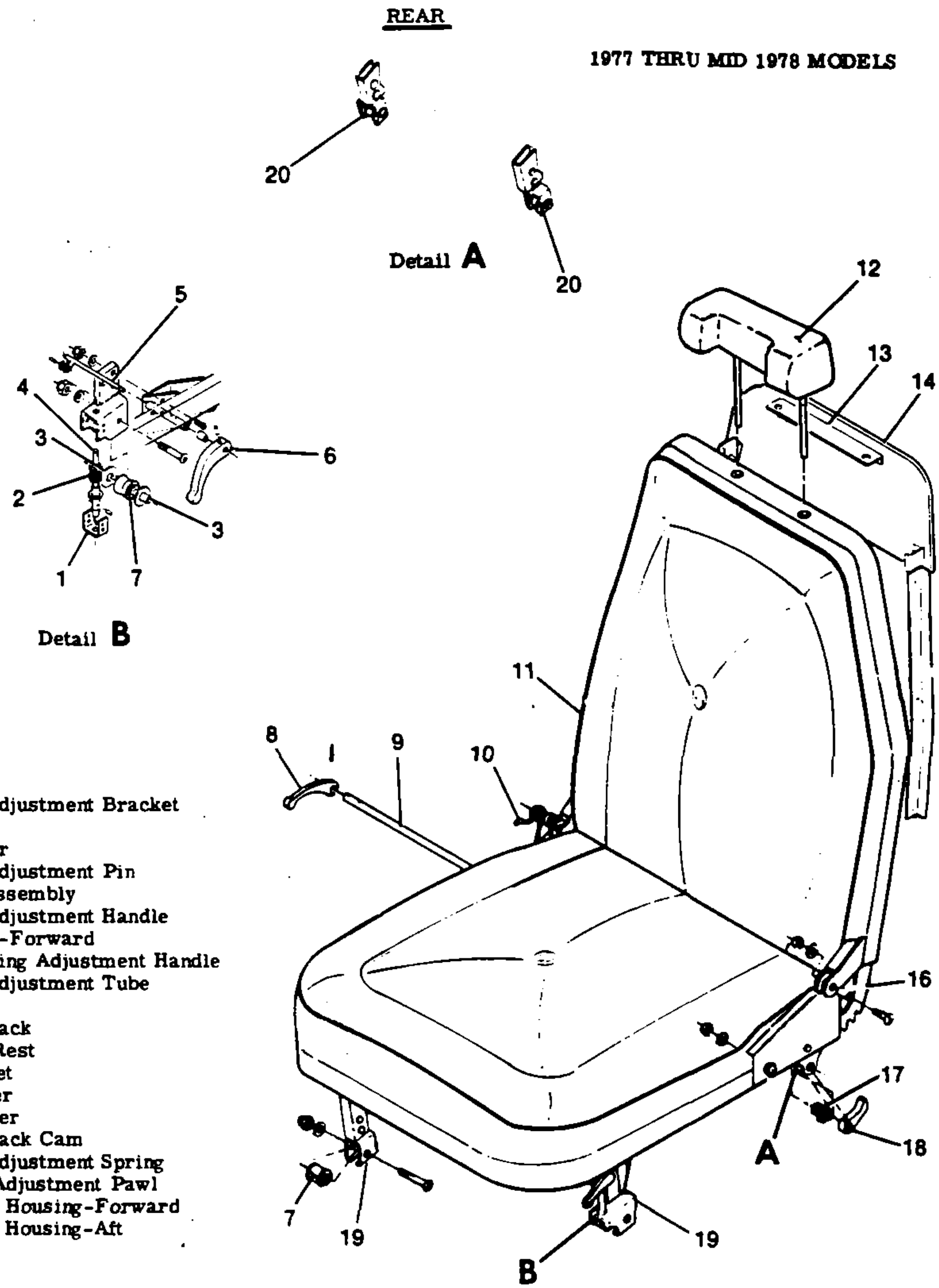
1. Seat Adjustment Bracket
2. Spring
3. Roller
4. Roller Housing
5. Seat Adjust Pin
6. Seat Adjust Handle
7. Tube
8. Pawl
9. Handle
10. Grommet
11. Former
12. Retainer
13. Trim
14. Seat Bottom
15. Seat Back

Figure 3-7. Seat Installation (Sheet 11 of 14)



1. Roller
2. Seat Bottom
3. Seat Back
4. Bushing
5. Washer
6. Adjustment Arm
7. Spacer
8. Pin
9. Handle
10. Spring
11. Adjustment Pin

Figure 3-7. Seat Installation (Sheet 12 of 14)



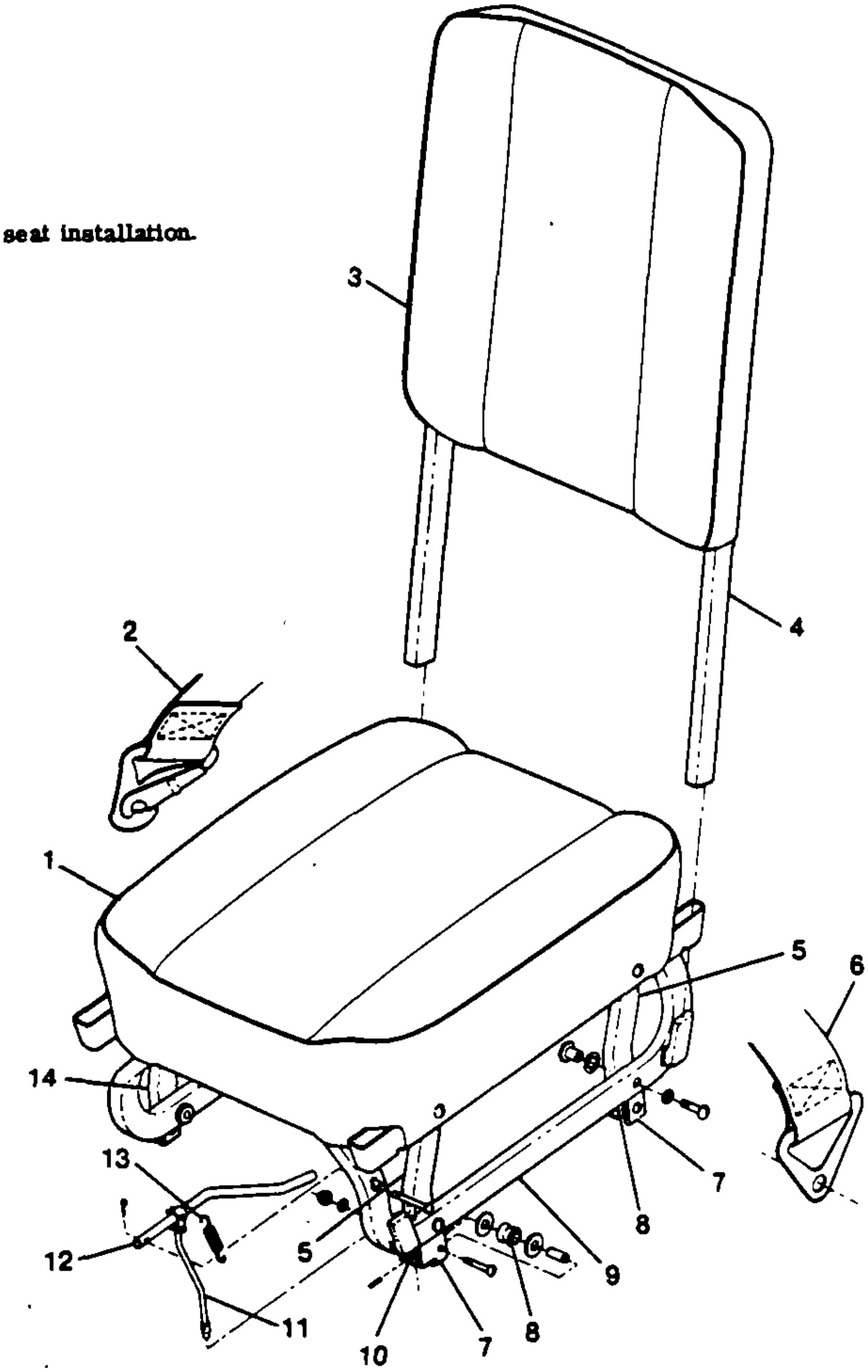
1. Seat Adjustment Bracket
2. Spring
3. Washer
4. Seat Adjustment Pin
5. Rod Assembly
6. Seat Adjustment Handle
7. Roller-Forward
8. Reclining Adjustment Handle
9. Seat Adjustment Tube
10. Spring
11. Seat Back
12. Head Rest
13. Bracket
14. Former
15. Retainer
16. Seat Back Cam
17. Seat Adjustment Spring
18. Seat Adjustment Pawl
19. Roller Housing-Forward
20. Roller Housing-Aft

Figure 3-7. Seat Installation (Sheet 13 of 14)

AMBULANCE ATTENDANT'S SEAT INSTALLATION

NOTE

See figure 3-15 for seat installation.



1. Seat Bottom
2. Inboard Seat Belt
3. Seat Back Cushion
4. Seat Back Frame
5. Outboard Leg
6. Outboard Seat Belt
7. Roller Housing
8. Roller
9. Seat Bottom Frame
10. Housing Bracket
11. Seat Stop Pin
12. Seat Adjust Handle
13. Spring
14. Inboard Leg

Figure 3-7. Seat Installation (Sheet 14 of 14)

3-42. CENTER AND REAR. (STANDARD SEATING.)
a. Reclining back, fore-and-aft adjustable.
b. Non-reclining, fore-and-aft adjustable.

3-43. DESCRIPTION. These seats are provided with fore-and-aft adjustment provisions. Seat stops are installed to limit travel. Removal and installation is outlined in paragraph 3-41.

3-44. CLUB SEATING INSTALLATION. (See figure 3-8.)

3-45. DESCRIPTION. An optional club seating arrangement may be installed beginning with the 1978 models. This installation consists of two center (3rd and 4th) seats installed facing aft and two rear (5th and 6th) seats installed facing forward. The seats have approximately 12 inches of forward/aft travel adjustment, limited by the seat stops installed on each inboard seat rail. The center seat backs have a fixed angle. Reclining backs are provided on the rear seats. Refer to paragraph 3-41 for removal and installation.

3-46. REPAIR. Replacement of defective parts is recommended in repair of seats. See figure 3-9 for seat back cam replacement.

3-47. CABIN UPHOLSTERY. Due to the wide selection of fabrics, styles and colors, it is impossible to depict each particular type of upholstery. The following paragraphs describe general procedures which will serve as a guide in removal and replacement of upholstery. Major work, if possible, should be done by an experienced mechanic. If work must be done by a mechanic unfamiliar with upholstery practices, the mechanic should make careful notes during removal of each item to facilitate its replacement later.

3-48. MATERIALS AND TOOLS. Materials and tools will vary with job. Scissors for trimming upholstery to size and a dull-bladed putty knife for wedging material beneath retainer strips are the only tools required for most trim work. Use industrial rubber cement to hold soundproofing mats and fabric edges in place. Refer to Section 18 for thermoplastic repairs.

3-49. SOUNDPROOFING. The aircraft is insulated with spun glass mat-type insulation and a sound deadener compound applied to inner surfaces of skin in most areas of cabin and baggage compartment. All soundproofing material should be replaced in its original position any time it is removed. A soundproofing panel is placed in the gap between the wing and fuselage and held in place by the wing root fairing.

3-50. CABIN HEADLINER. (See figure 3-10.)

3-51. REMOVAL.
a. Remove sun visors. all inside finish strips and plates. door post upper shields. front spar trim shield, dome light console and any other visible retainers securing headliner.
b. Work edges of headliner free from metal teeth which hold fabric.
c. Starting at front of headliner, work headliner down, removing screws through metal tabs which hold wire bows to cabin top. Pry loose outer ends of bows from retainers above doors. Detach each bow in succession.

NOTE

Always work from front to rear when removing headliner.

d. Remove headliner assembly and bows from aircraft.

NOTE

Due to difference in length and contour of wire bows, each bow should be tagged to assure proper location in headliner.

e. Remove spun glass soundproofing panels.

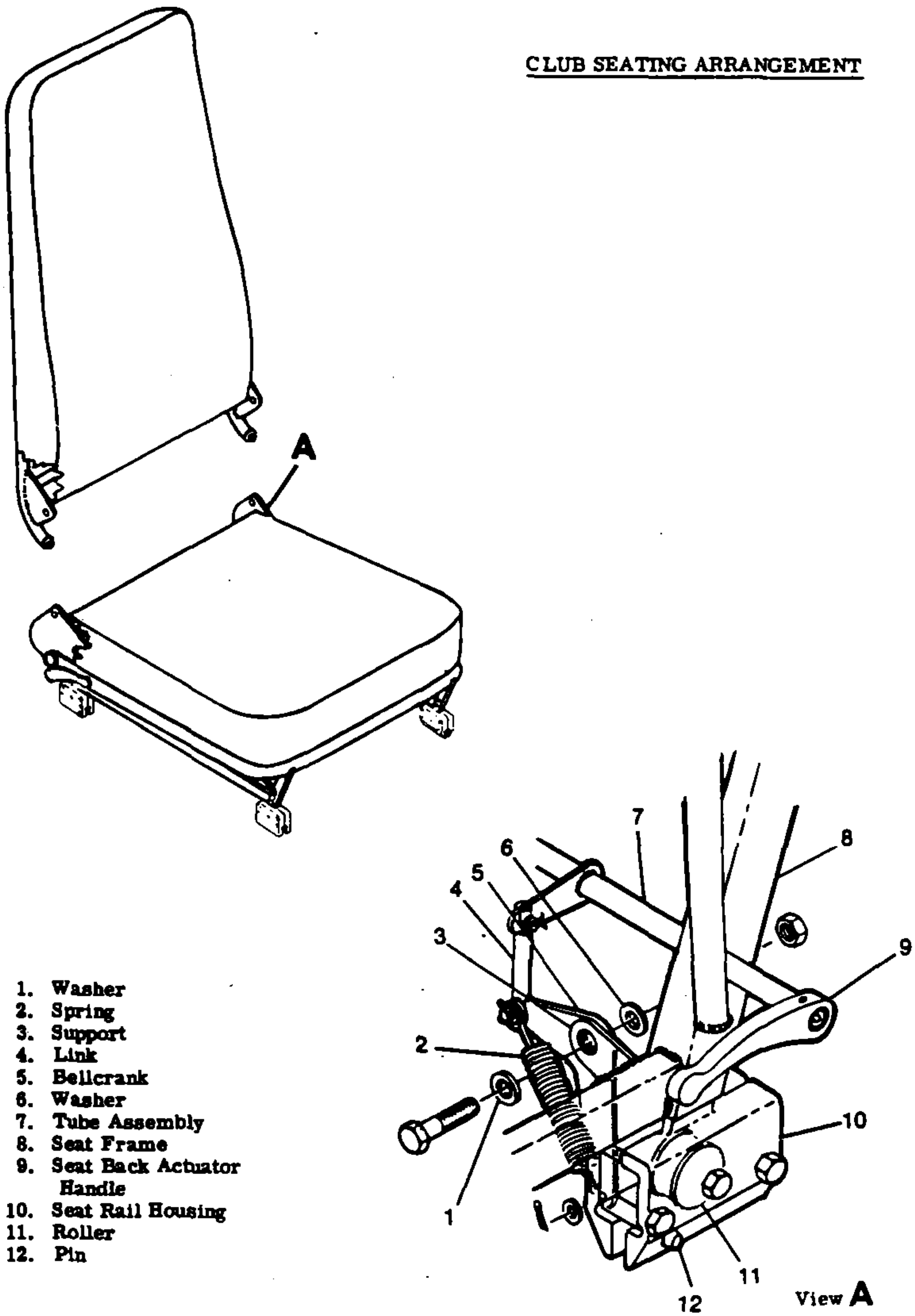
NOTE

The lightweight soundproofing panels are held in place with industrial rubber cement.

3-52. INSTALLATION.
a. Before installation, check items concealed by headliner for security. Use wide cloth tape to secure loose wires to fuselage and to seal openings in wing roots. Straighten tabs bent during removal of headliner.
b. Apply cement to inside of skin in areas where soundproofing panels are not supported by wire bows and press soundproofing in place.
c. Insert wire bows into headliner seams and secure rearmost edges of headliner after positioning two bows at rear of headliner. Stretch material along edges to ensure it is properly centered, but do not stretch enough to destroy ceiling contours or distort wire bows. Secure edges of headliner with metal teeth or rubber cement.
d. Work headliner forward, installing each wire bow in place with tabs. Wedge ends of wire bows into retainer strips. Stretch headliner just taut enough to avoid wrinkles and maintain a smooth contour.
e. When all bows are in place and fabric edges are secured, trim off excess fabric and reinstall all items removed.

3-53. UPHOLSTERY SIDE PANELS. Removal of upholstery side panels is accomplished by removing seats for access, then removing parts attaching panels. Remove screws, retaining strips, arm rests and ash trays as required to free panels. Automotive type spring clips attach most door panels. A dull putty knife makes an excellent tool for prying loose clips. When installing upholstery side panels, do not over-tighten sheet metal screws. Larger screws may be used in enlarged holes as long as

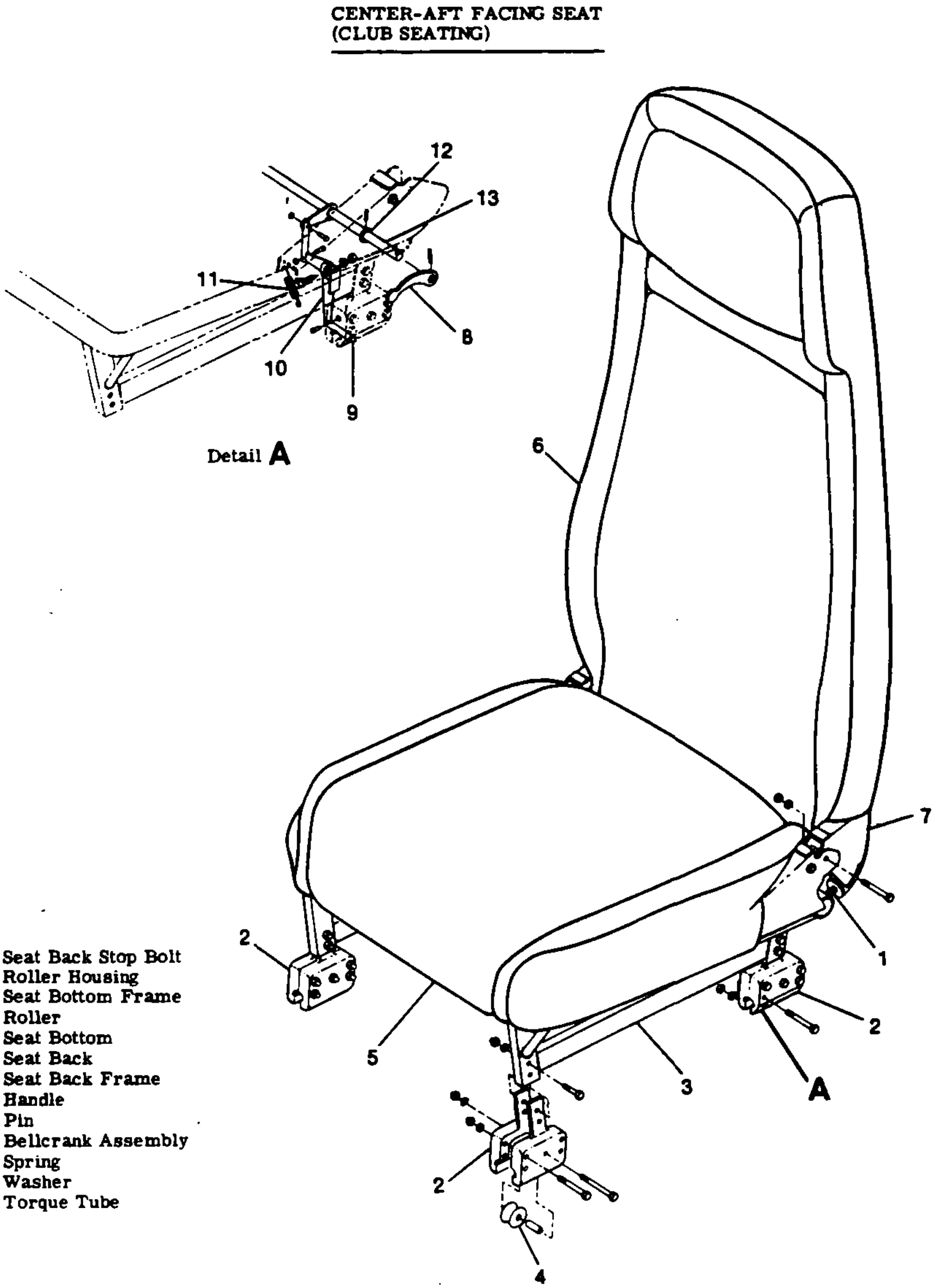
CLUB SEATING ARRANGEMENT



1. Washer
2. Spring
3. Support
4. Link
5. Bellcrank
6. Washer
7. Tube Assembly
8. Seat Frame
9. Seat Back Actuator Handle
10. Seat Rail Housing
11. Roller
12. Pin

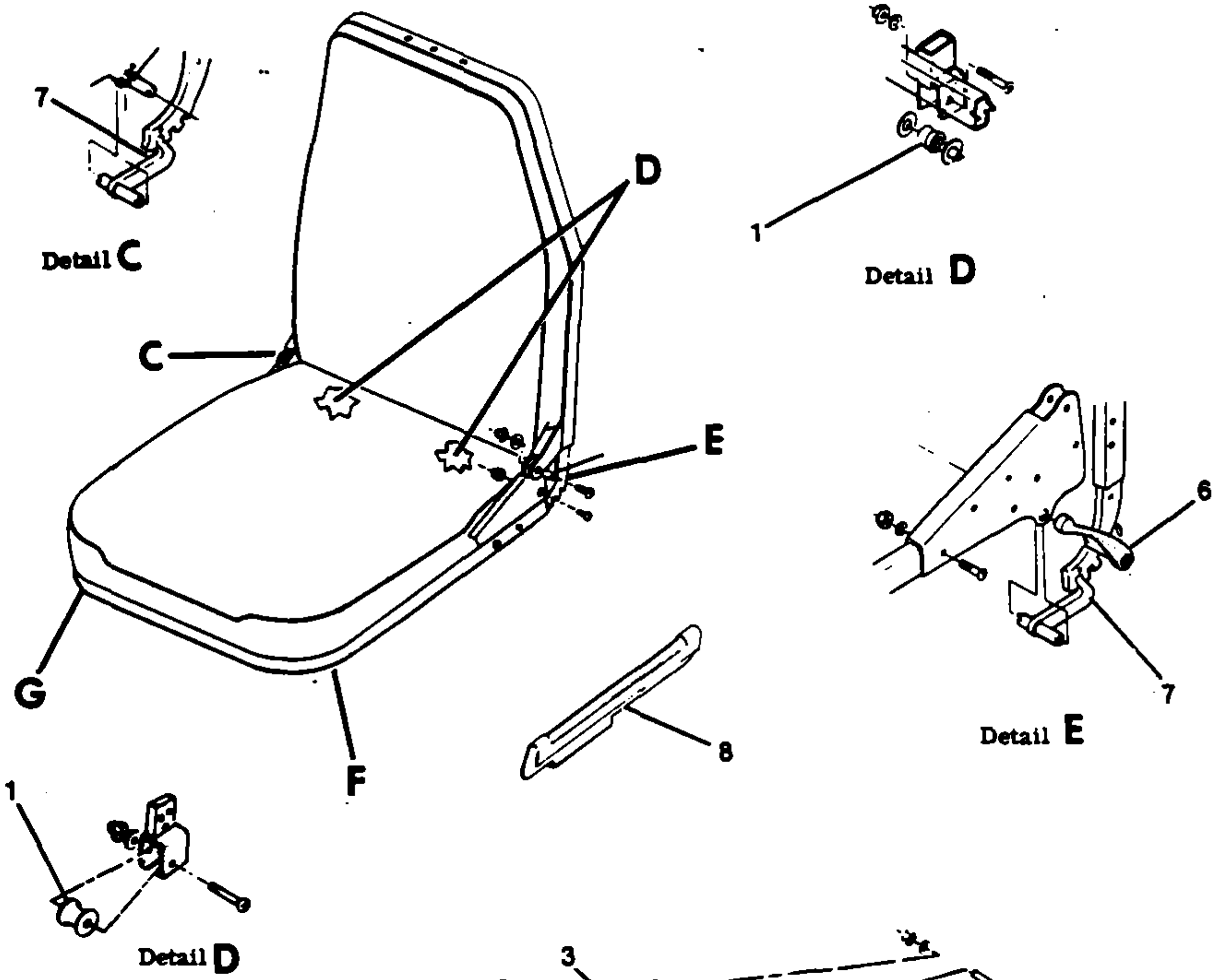
AFT FACING SEAT INSTALLATION (LEFT SEAT SHOWN)

Figure 3-8. Club Seating Installation (Sheet 1 of 3)

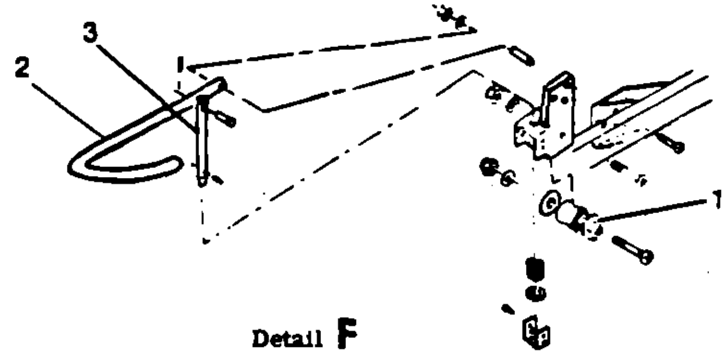


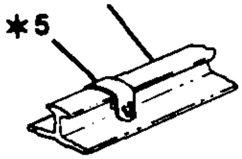
1. Seat Back Stop Bolt
2. Roller Housing
3. Seat Bottom Frame
4. Roller
5. Seat Bottom
6. Seat Back
7. Seat Back Frame
8. Handle
9. Pin
10. Bellcrank Assembly
11. Spring
12. Washer
13. Torque Tube

Figure 3-8. Club Seating Installation (Sheet 2 of 3)



1. Seat Roller Assembly
2. Fore/Aft Adjustment Handle
3. Seat Locking Pin
4. Seat Rail
5. Seat Stop
6. Reclining Back Adjustment Handle
7. Reclining Back Mechanism
8. Seat Belt Retainer



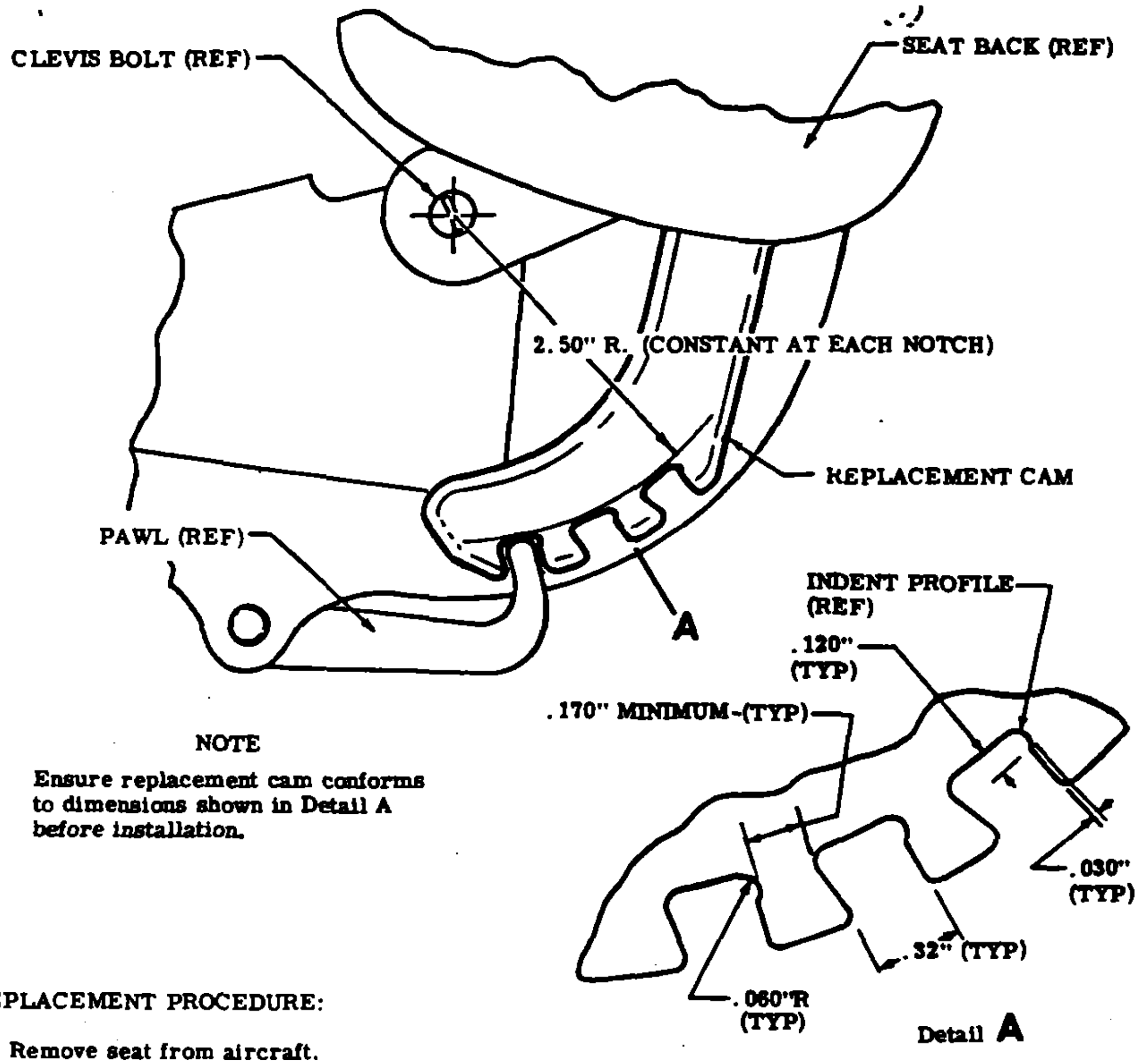


✱ NOTE

Seat stops (5) are installed on inboard rails only. Two stops on inboard rail of each forward facing seat and one stop on inboard rail of each aft facing seat.

FORWARD FACING SEAT INSTALLATION (LEFT SEAT SHOWN)

Figure 3-8. Club Seating Installation (Sheet 3 of 3)



NOTE

Ensure replacement cam conforms to dimensions shown in Detail A before installation.

REPLACEMENT PROCEDURE:

a. Remove seat from aircraft.

b. Remove plastic upholstery panels from aft side of seat back, then loosen upholstery retaining rings and upholstery material as required to expose rivets retaining old cam assembly.

c. Drill out existing rivets and insert new cam assembly (2). Position seat back so pawl (3) engages first cam slot as illustrated.

d. Position cam so each slot bottom aligns with the 2.50" radius as illustrated.

e. Clamp securely in this position and check travel of cam. Pawl must contact bottom of each cam slot. Using existing holes in seat frame, drill through new cam and secure with MS20470AD6 rivets.

f. Reinstall upholstery, upholstery panels and seat.

Figure 3-9. Seat Back Cam Replacement

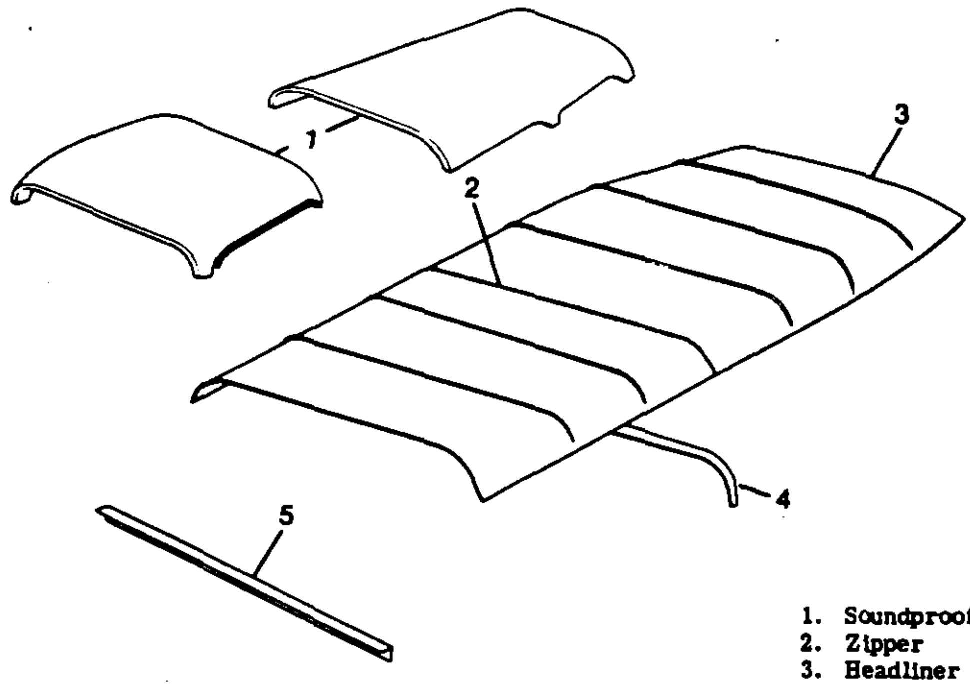


Figure 3-10. Cabin Headliner

area behind hole is checked for electrical wiring, fuel lines and other components which might be damaged by using a longer screw.

3-54. WINDLACE (DOOR SEAL). To furnish an ornamental edging for door opening and to provide additional sealing, a windlace is installed between upholstery panels or trim panels and doorpost structure. The windlace is held in place by sheet metal screws.

3-55. CARPETING. Cabin area and baggage compartment carpeting is held in place by rubber cement, small sheet metal screws and retaining strips. When fitting a new carpet, use old one as a pattern for trimming and marking screw holes.

3-56. SAFETY PROVISIONS.

3-57. CARGO TIE-DOWNS. Cargo tie-downs are used to ensure baggage cannot enter seating area during flight. Methods of attaching tie-downs are illustrated in figure 3-12. The eyebolt and nutplate can be located at various points. The sliding tie-down lug also utilizes eyebolt's and attaches to a seat rail. Different combinations of all four may be used.

3-58. SAFETY BELTS. Safety belts must be replaced if frayed or cut, latches are defective or stitching is broken. Attaching parts must be replaced if excessively worn or defective. On aircraft serials U20603004 thru U20606439, a seat belt shortener is available (SK172-76) which repositions the belt buckle/shoulder harness connection to prevent inadvertent loosening of the seat belt. (See figure 3-11.)

3-59. SHOULDER HARNESS. Individual shoulder harnesses may be installed at each seat. Each harness is connected to the upper fuselage structure and to the seat safety belt buckle. Component parts must be replaced as outlined in the preceding paragraph. In addition, the aircraft may be equipped with optional inertia reel. See figure 3-11 for this installation.

3-60. GLIDER TOW HOOK. A glider tow hook, which is mounted in place of tail tie-down ring, is available for all models.

3-61. REAR VIEW MIRROR. A rear view mirror may be installed on cowl deck above instrument panel thru serial U20604674.

3062. CARGO PACK. (See figure 3-14.)

3-62. REMOVAL.

a. Remove screws, fairing and seal from around each landing gear spring.

b. Position a suitable support under pack.

c. Remove screws attaching pack to aircraft and remove pack.

NOTE

If aircraft is to be returned to its original configuration (minus cargo pack), the four small panels which enclose area around nose gear shock strut and drag brace may be left installed instead of the two larger

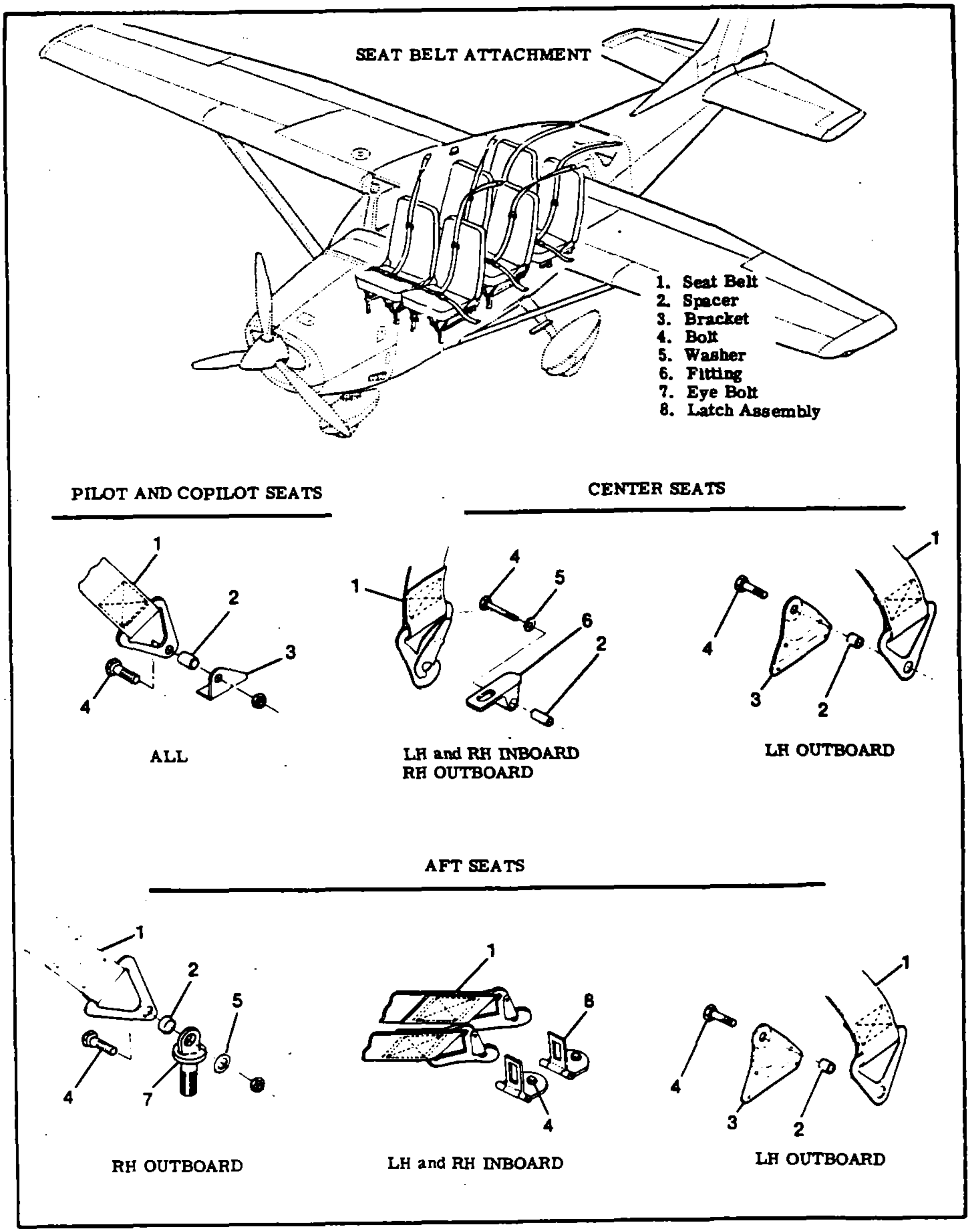


Figure 3-11. Seat Belt and Shoulder Harness Installation (Sheet 1 of 2)

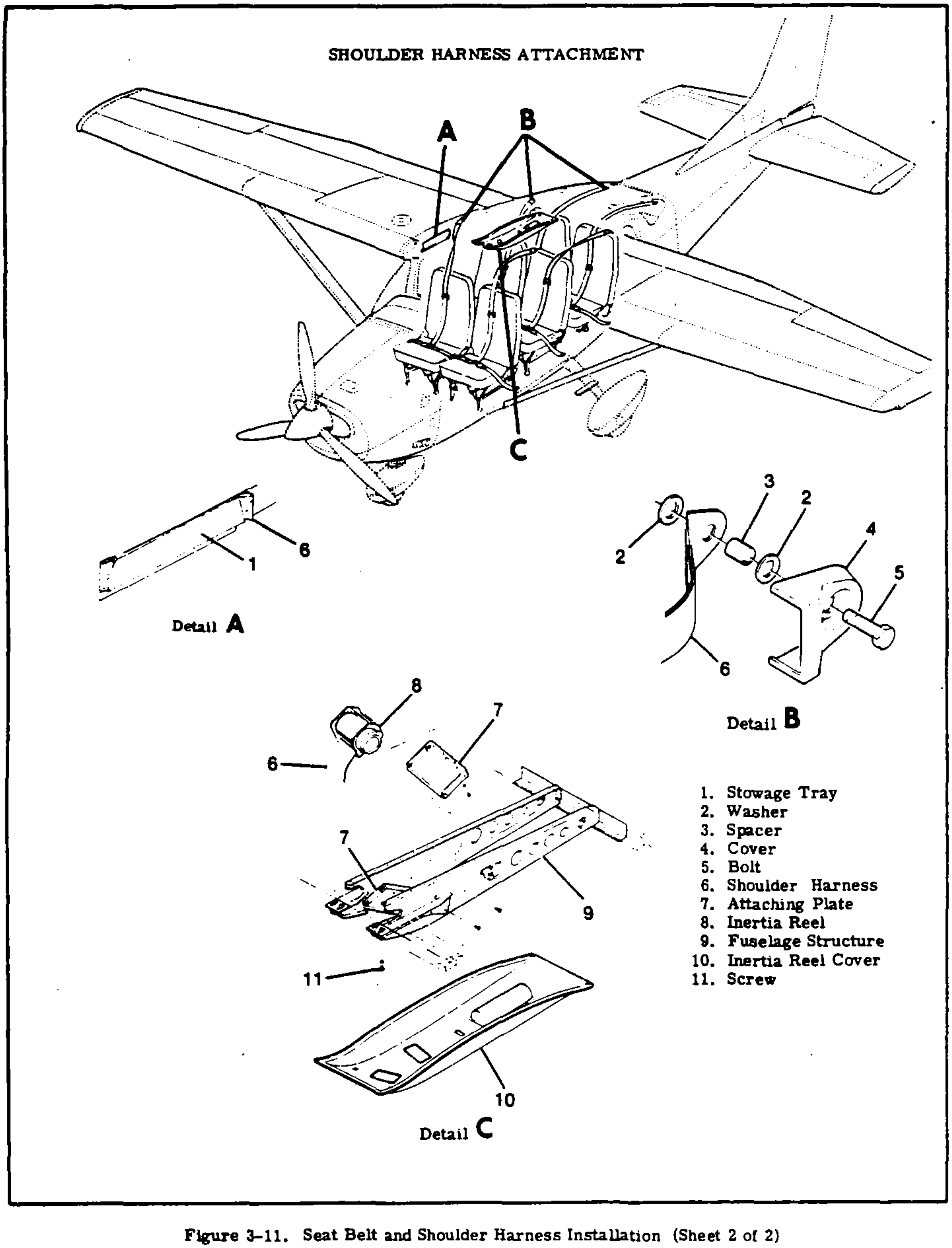


Figure 3-11. Seat Belt and Shoulder Harness Installation (Sheet 2 of 2)

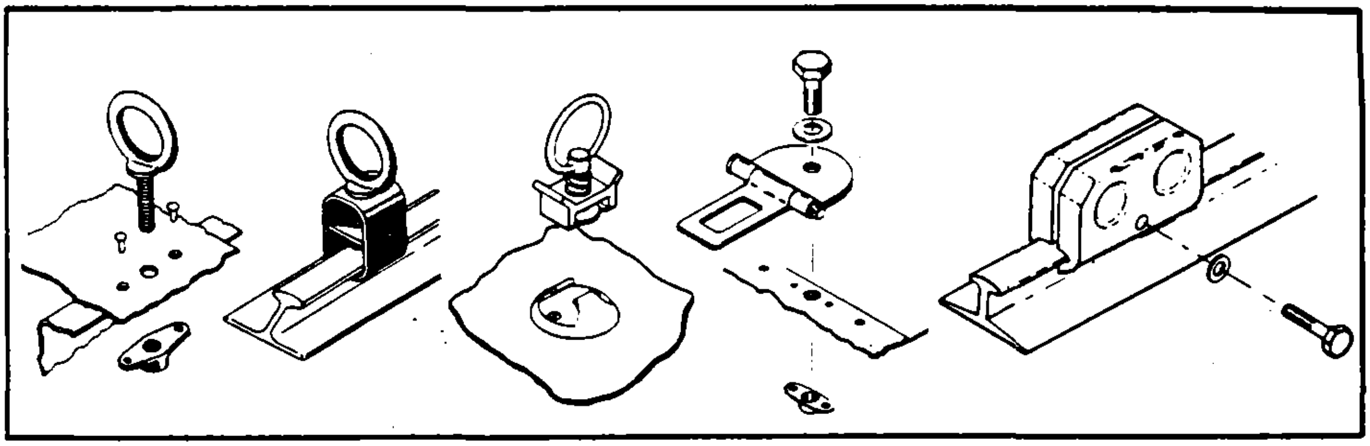


Figure 3-12. Cargo Tie-Down Ring Installation

panels. However, the control extension and cowl flap baffles must be removed as outlined in paragraph 3-66.

3-64. INSTALLATION. Prior to positioning pack under aircraft, inspect all rivnuts in bottom of fuselage for obstructions. Also check the small panels which enclose area around nose gear shock strut and drag brace. Two panels are provided in this area on standard aircraft; these are to be replaced by four smaller panels when a cargo pack is installed. If not previously removed, remove standard panels by unsnapping quick-release fasteners. Install the smaller panels furnished with cargo pack.

NOTE

Install the rearmost panels first, right hand panel lapping over left hand panel along aircraft centerline. Install the forward panels in a similar manner.

a. Move pack into position under aircraft. Raise aft end of pack and place a support under it.
b. Raise forward end of pack and align two forward holes in pack rim with two front rivnuts. Install two screws to support forward end of pack.

NOTE

Install lock washers and flat washers under heads of all pack attaching screws.

c. Raise aft end of pack and install two attaching screws.
d. Check pack for proper alignment, install and tighten all remaining screws, except for one screw just forward and aft of each landing gear spring. These two screws will be utilized later to help secure fairing which covers each landing gear opening.
e. Position rubber seal and fairing around each main landing gear spring by spreading these components, at their split side, enough to slip them over gear spring. When installed, split should be at back of gear spring. Check alignment and proper fit of fairing, then install fairing retaining screws.

NOTE

Seven screws are used to secure fairing at each landing gear. Two screws, previously mentioned in step "d," secure top of fairing and rim of cargo pack, in this area, to fuselage. Five additional screws secure and seal sides and bottom of each fairing to pack.

f. Install cowl flap baffles and control extensions in accordance with paragraph 3-67.)

3-65. COWL FLAP BAFFLES AND CONTROL EXTENSIONS. (See figure 3-14.)

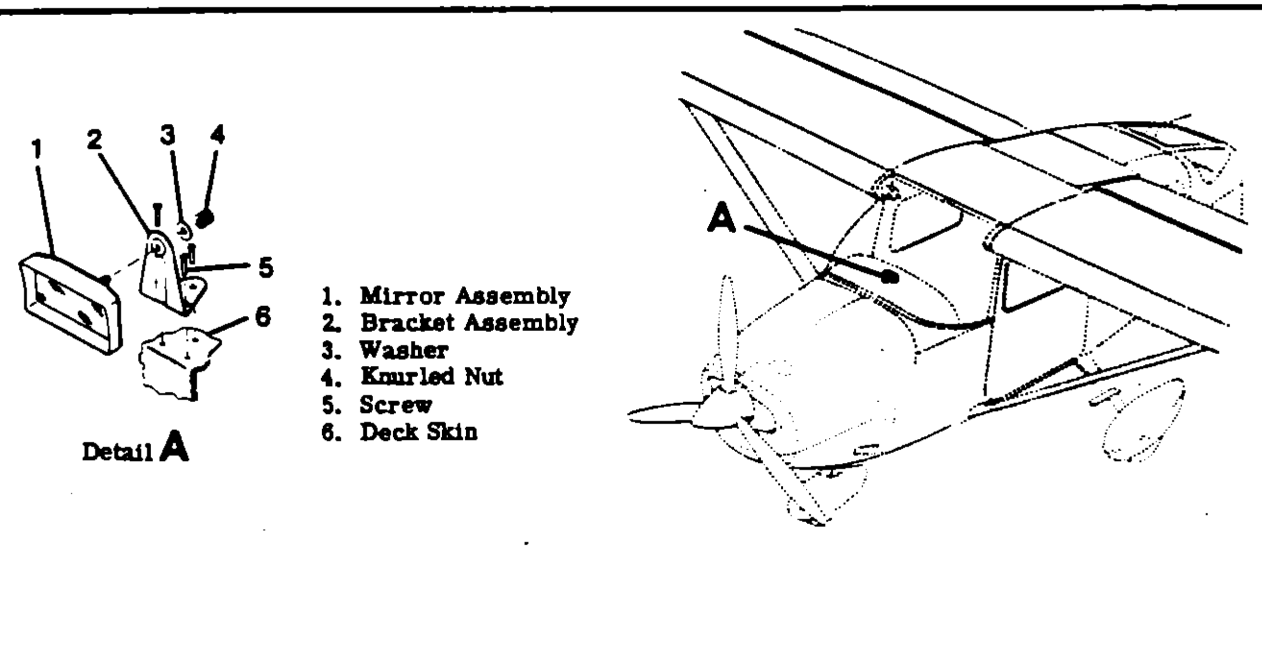
3-66. REMOVAL.
a. Disconnect cowl flap control clevises (7) from flaps and take off baffles (1) by removing screws (3) and nuts (2).
b. Remove clevis (7) and link (5) from each control end (8) and reinstall clevises.
c. Rig cowl flaps on standard aircraft per Section 12 and turbocharged aircraft per Section 12A.

3-67. INSTALLATION.
a. Disconnect cowl flap control clevises (7) from flaps and remove clevises. Leave jam nuts (4) on control ends (8).
b. Install links (5) on control ends (8), install jam nuts (6) on links and attach clevises (7) to links. Do not tighten jam nuts.
c. Position baffles (1) along sides of cowl flaps so attaching holes are aligned and install attaching screws and nuts.

NOTE

Each baffle is designed for installation on a specific cowl flap. Determine correct baffle for each flap. Turbocharged aircraft have baffles as standard equipment. Note that flanges on baffles are turned toward inside of each cowl flap opening.

d. Check to ensure flexible controls reach their internal stops in each direction. Mark controls so full control travel can readily be checked and main-



1. Mirror Assembly
2. Bracket Assembly
3. Washer
4. Knurled Nut
5. Screw
6. Deck Skin

Figure 3-13. Rear View Mirror Installation

tained during remaining rigging procedure.

e. Place cowl flap control lever in "OPEN" position and connect control ends (8) to flaps, but do not secure at this time.

f. On standard aircraft, measure distance from trailing edge of cowl skin. Disconnect clevises and adjust links (5) and clevises (7) so each cowl flap opens 6.00 inches with cockpit control OPEN and 1.05 inches with cockpit control CLOSED. On turbocharged aircraft, adjust clevis to obtain measurements of 8.00 inches (cockpit control OPEN) and 2.50 inches (cockpit control CLOSED), then secure clevises. These measurements are made in a straight line from the aft edge of cowl flap, just outboard of cutout to lower edge of firewall. Do not measure from aft corners of cowl flap. If either control needs to be lengthened or shortened, the lower clamp may be loosened and housing slipped in clamp or lower clevis may be adjusted. Maintain sufficient thread engagement of clevis.

g. Check that locknuts are tight, clamps are secure, then cycle cowl flaps several times, checking operation.

3-68. CASKET CARRIER. (See figure 3-15.)

3-69. DESCRIPTION. An optional mortuary kit consists of a casket carrier platform, rack assembly and belt tie-down assemblies. The kit provides aircraft modification instructions and parts required to make the installation.

3-70. INSTALLATION.

a. Lower seats and move them forward as far as they will go.

b. Fold pilot's seat back forward and hold down be pulling out on parking brake handle.

c. Have an assistant sit on back of copilot's seat.

d. Open LH cabin door.

e. Pull pin on aft cargo door stop.

f. Raise front of casket and move casket forward until it touches LH forward door post.

g. Line up casket in aircraft and move aft into position.

h. Tie casket down as shown in figure 3-15.

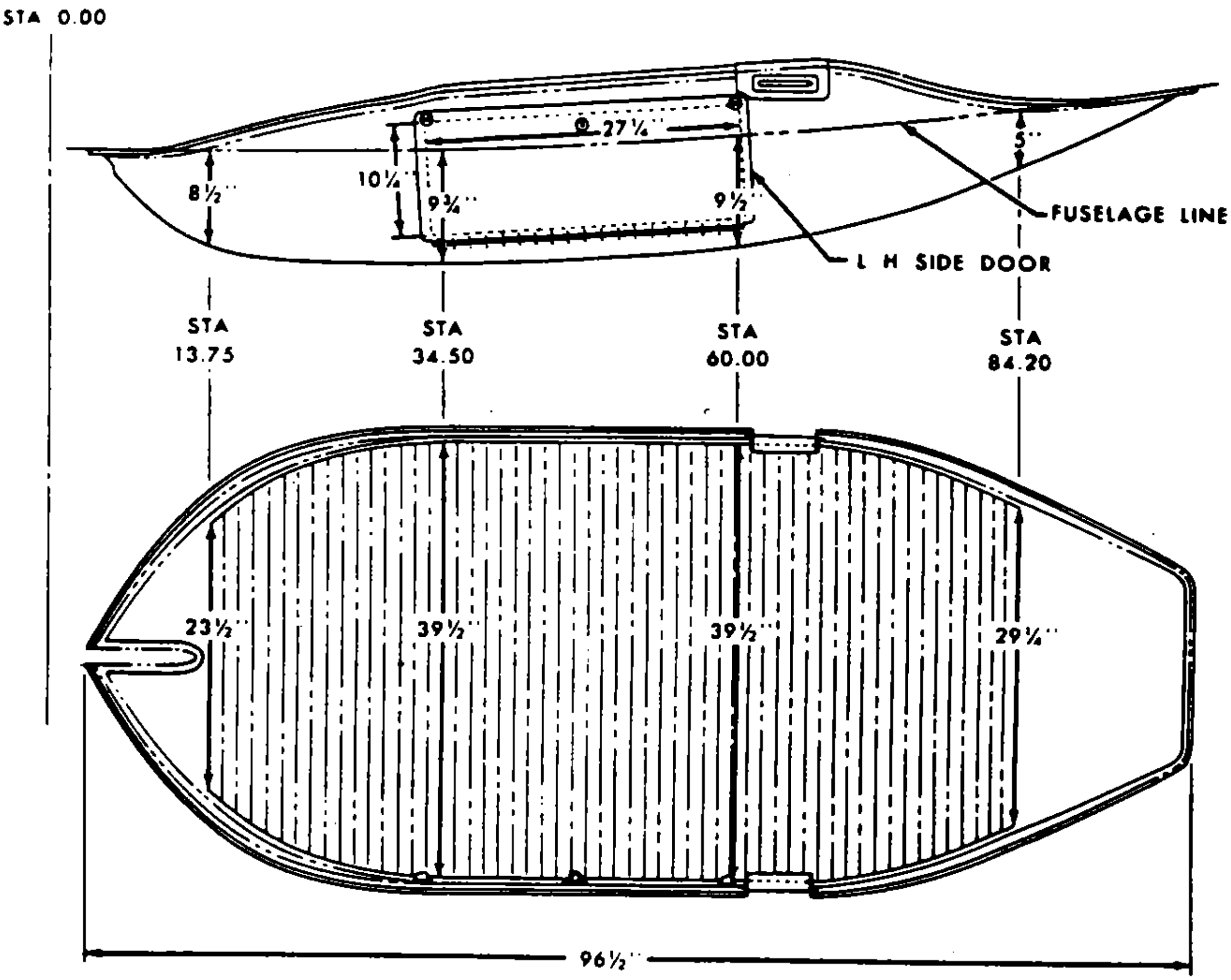
3-71. REMOVAL. Reverse the steps outlined in the preceding paragraph to remove casket.

3-72. AMBULANCE AIRCRAFT. (See figure 3-16.)

3-73. DESCRIPTION. These aircraft may be equipped with an optional ambulance kit installation. This installation consists of a stretcher, oxygen cylinder and regulator assembly, hose, mask, an attendant's seat (see figure 3-7), and associated safety belts and shoulder harness. An Accessory Kit (AK206-92) is available from the Cessna Service Parts Center, and provides modification instructions and parts required to make the installation.

3-74. OXYGEN CYLINDER, REGULATOR AND MASK ASSEMBLY. (See figure 3-16.) Cylinder and regulator assembly (P/N C166012-0101) is installed in the ambulance kit installation. The cylinder is a standard weight (DOT-3AA1800) type, and is installed vertically, as shown in the illustration. Cylinder general information, service and inspection requirements, system component service requirements, maintenance and cleaning, system purging, leak test and system charging are described in detail in Section 15 of this manual.

3-75. AMBULANCE KIT INSTALLATION. Refer to the instructions included in the Accessory Kit (AK206-92) for modification and installation procedures.



1. Baffles
2. Nut
3. Screw
4. Jam Nut
5. Link
6. Jam Nut
7. Clevis
8. Control

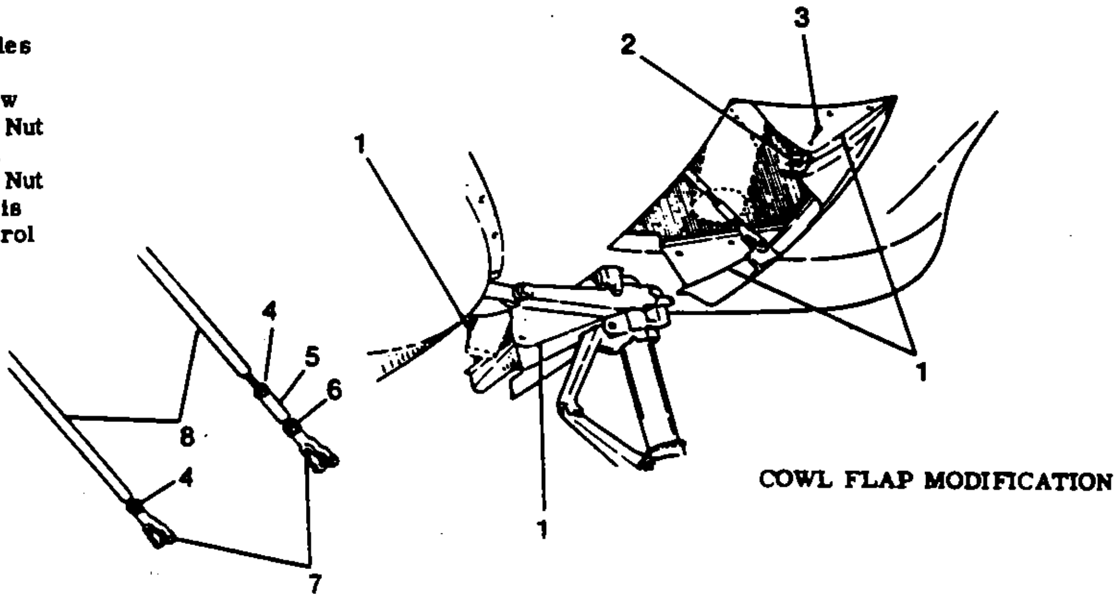
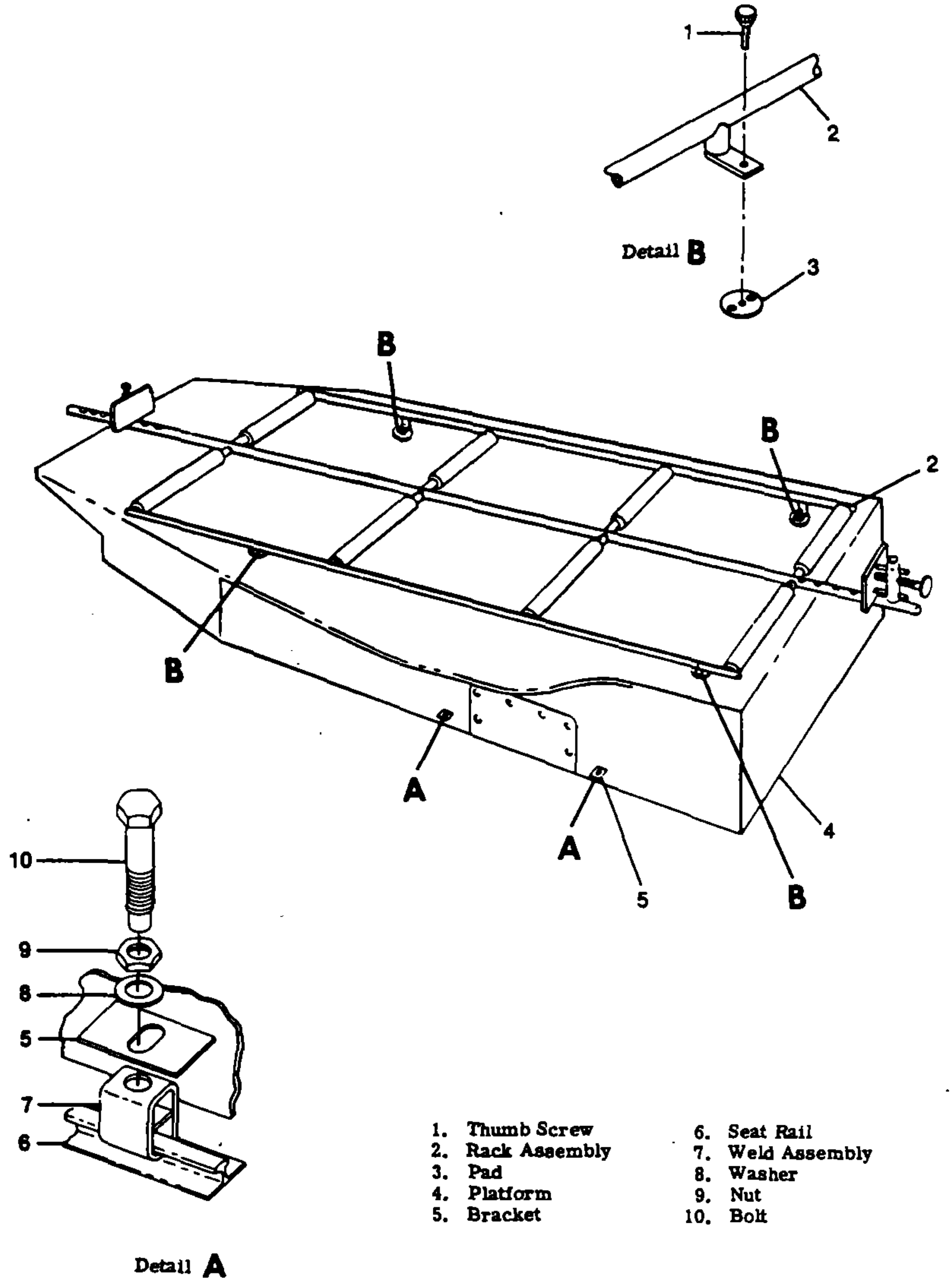


Figure 3-14. Cargo Pack Installation



1. Thumb Screw
2. Rack Assembly
3. Pad
4. Platform
5. Bracket
6. Seat Rail
7. Weld Assembly
8. Washer
9. Nut
10. Bolt

Figure 3-15. Casket Carrier Installation (Sheet 1 of 2)

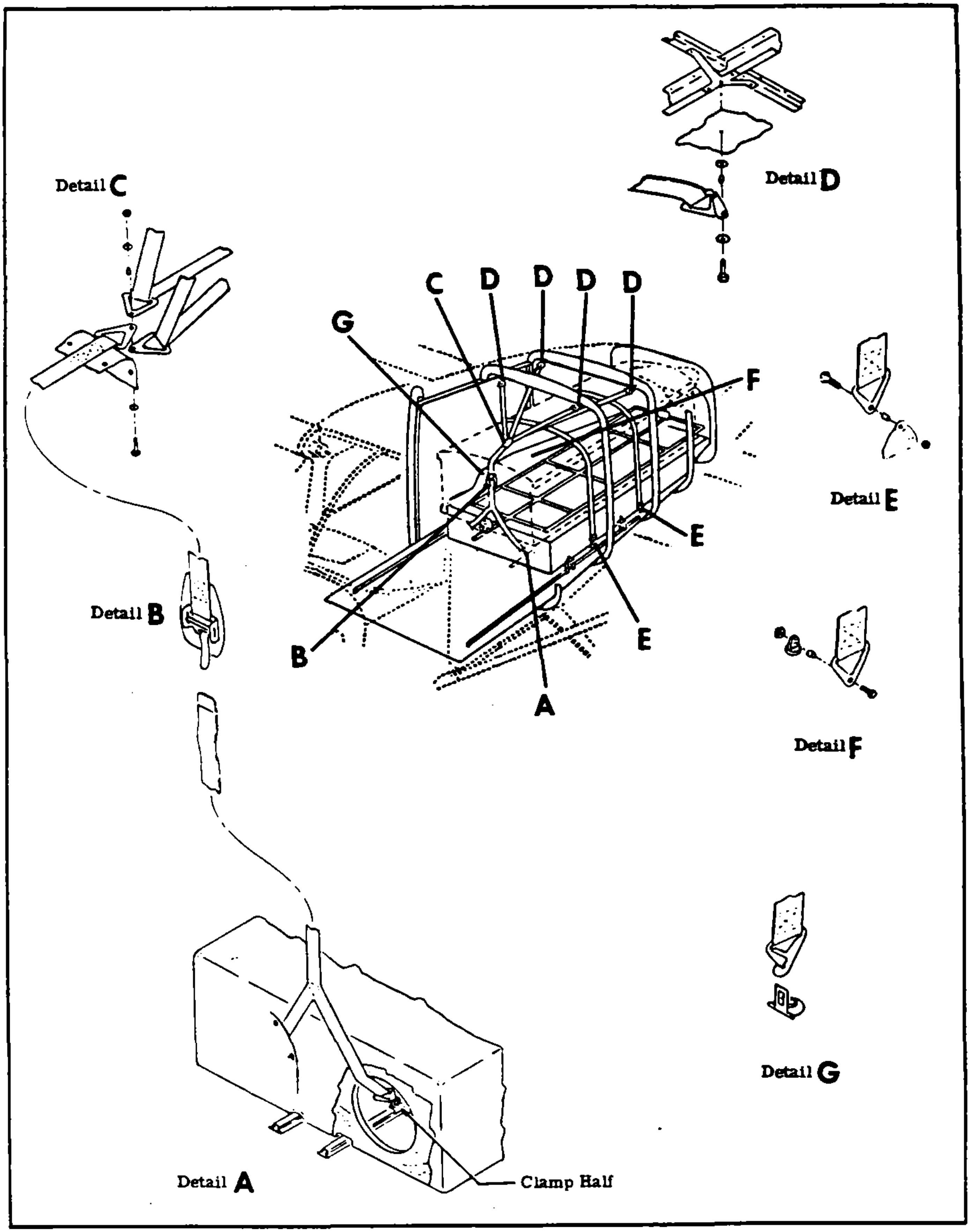
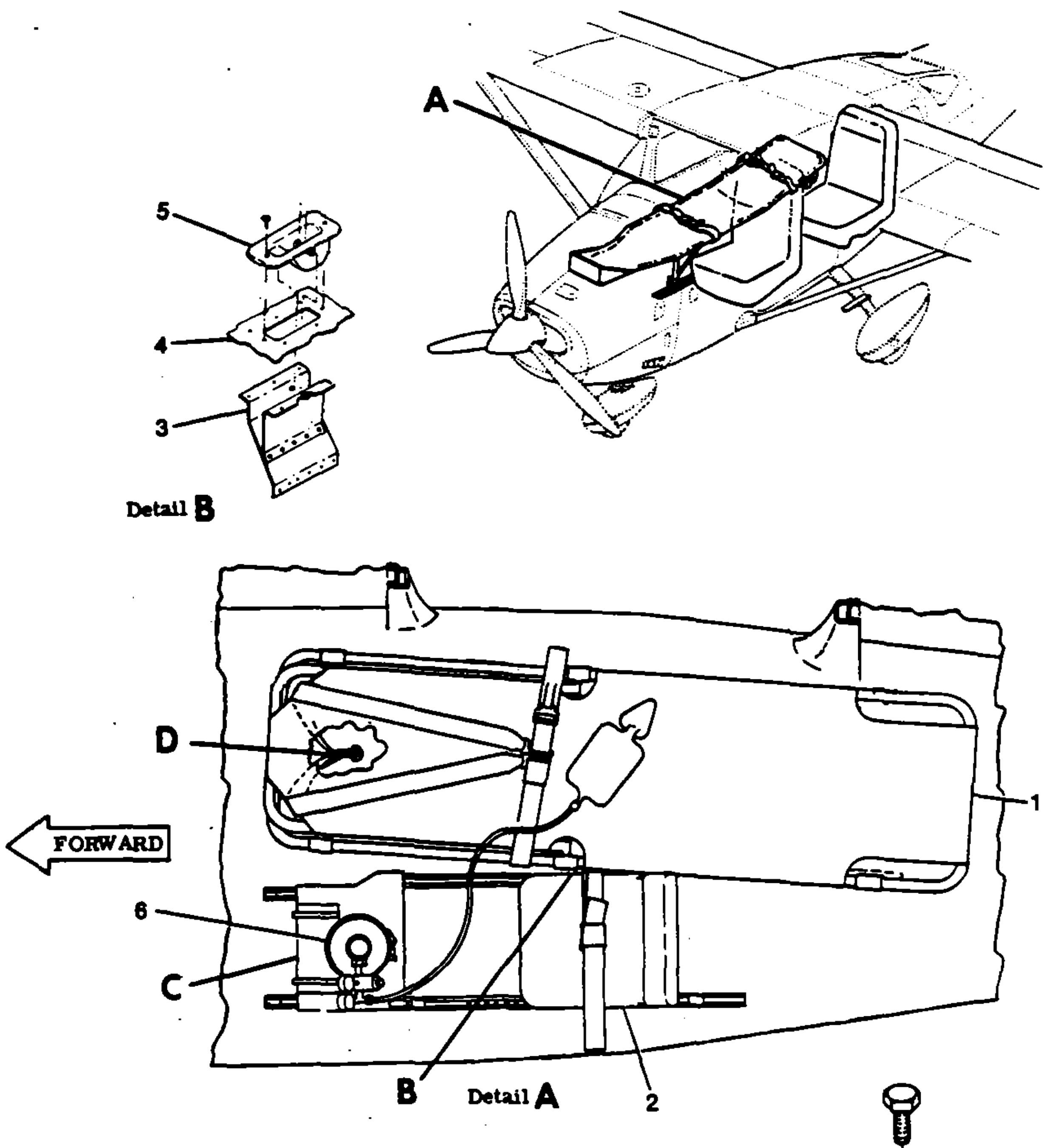
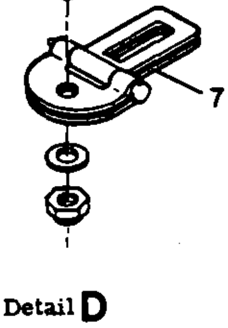


Figure 3-15. Casket Carrier Installation (Sheet 2 of 2)



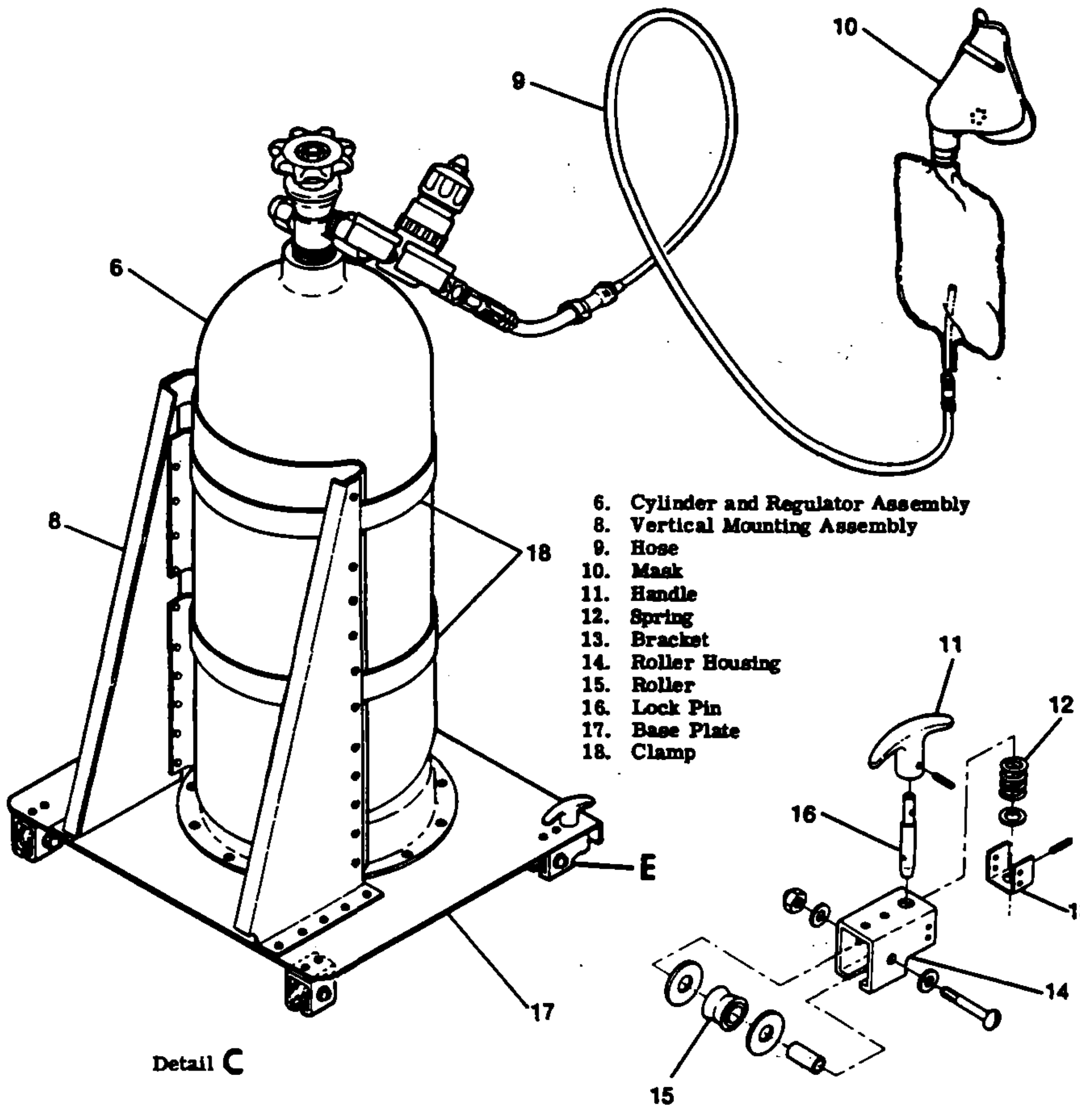
NOTE

An Accessory Kit (AK206-92), is available from the Cessna Service Parts Center, and provides modification instructions and parts required to make the installation.



1. Stretcher
2. Attendant's Seat
3. Bracket
4. Floorboard
5. Cup
6. Cylinder and Regulator Assembly
7. Latch Assembly

Figure 3-16. Ambulance and Stretcher Provisions (Sheet 1 of 2)



6. Cylinder and Regulator Assembly
8. Vertical Mounting Assembly
9. Hose
10. Mask
11. Handle
12. Spring
13. Bracket
14. Roller Housing
15. Roller
16. Lock Pin
17. Base Plate
18. Clamp

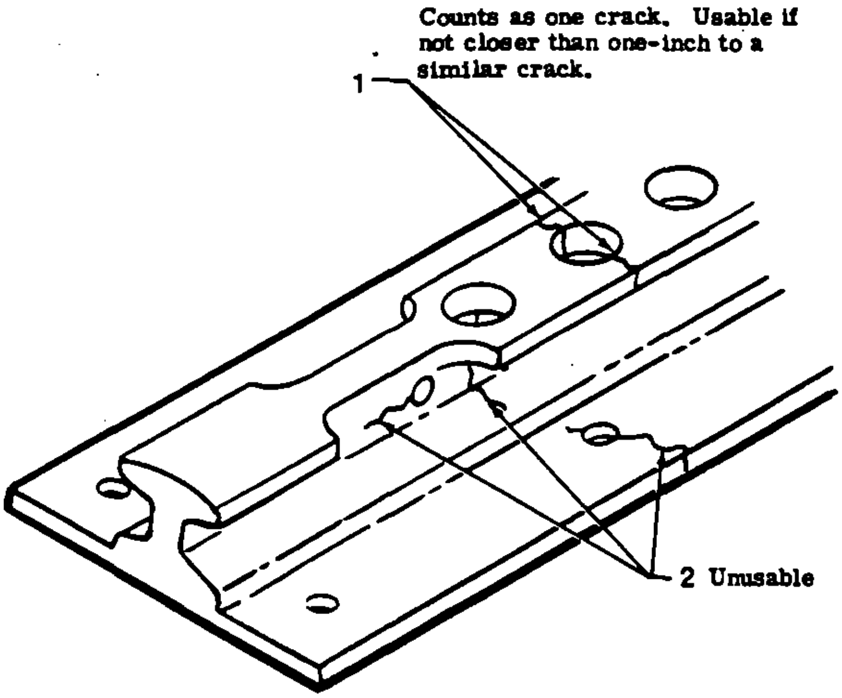
Detail C

Detail E

NOTE

Refer to Section 15 of this manual for cylinder general information, service and inspection requirements, system component service requirements, maintenance and cleaning, system purging, leak test and system charging.

Figure 3-16. Ambulance and Stretcher Provisions (Sheet 2 of 2)



REPLACE SEAT RAIL WHEN:

a. Any portion of web or lower flange is cracked, (index 2).
b. Any crack in crown of rail is in any direction other than right angle to length of rail.
c. Number of cracks on any one rail exceeds four, or any two cracks (index 1) are closer than one-inch.

NOTE

Use of seat rail cargo tie-downs is not permissible on seat rails with cracks.

Figure 3-17. Seat Rail Inspection

3-76. SEAT RAIL INSPECTION. A special inspection of seat rails should be conducted each 50 hours. See figure 3-17 for inspection procedures..

SECTION 4

WINGS AND EMPENNAGE

TABLE OF CONTENTS

4-1. WINGS AND EMPENNAGE.

4-2. WINGS. (See figure 4-1.)

4-3. DESCRIPTION. Each wing panel is of all metal construction and is a semicantilever, semimonocoque type with two main spars and suitable ribs for attachment of the skin. Leading edge skins are bonded. An all metal, balanced aileron, a flap and a detachable non-metallic wing tip are mounted on each wing assembly. A single rubberized bladder-type fuel cell is mounted between the wing spars at the inboard edge of each wing thru serial U20604649. Beginning serial U20604650, a portion of each wing between the main spar and rear spar is bonded, forming fuel bays. This wet wing construction strengthens the wing member, reduces weight, and increases aircraft fuel range. Navigation/strobe lights are mounted on each contoured wing tip.

4-4. REMOVAL. Wing panel removal is most easily accomplished if four men are available to handle the wing. Otherwise, the wing should be supported with a sling or maintenance stand when the fastenings are loosened.

a. Remove wing gap fairings and screws securing cabin top skin to the wing top skin.

b. Remove all wing inspection plates.

c. Drain fuel from cell of wing being removed.

d. Disconnect:

1. Electrical wires at wing root disconnects.
2. Fuel lines at wing root. (Refer to precautions outlined in paragraph 13-3.)
3. Pitot line (left wing only) at wing root.
4. Cabin ventilator hose at wing root.

e. Reduce flap and aileron cable tension by loosening turnbuckles, and disconnect cable at flap and aileron bellcranks.

NOTE

To simplify cable installation, an equal length of safety wire should be attached to each cable as it is withdrawn from the wing. This guide wire remains in the wing throughout the maintenance action, and is attached again to the cables on installation to guide cables into place.

f. Support wing at outboard end and dicsonnect strut at wing fitting. Tie strut up with wire to prevent it from swinging down and straining strut-to-fuselage fittings. If the fuselage fitting projects from the fuselage and is covered by the strut fairing, loosen the fairing and slide it up the strut; the strut may then be lowered without damage.

NOTE

Tape flap in the streamlined position during removal to prevent it from being damaged.

g. Mark position of wing attachment eccentric bushings (See figure 4-1); these bushings are used to rig out "wing-heaviness."

h. Remove nuts, washers, bushings and bolts attaching wing spars to fuselage fittings.

NOTE

It may be necessary to rock the wing slightly while pulling attaching bolts, or to use a long drift punch to drive out attaching bolts.

i. Remove wing and lay on padded stand.

4-5. REPAIR. A damaged wing panel may be repaired in accordance with instructions outlined in Section 18. Extensive repairs of wing skin or structure are best accomplished using the wing repair jig, which may be obtained from Cessna. The wing jig serves not only as a holding fixture, making work on the wing easier, but also assures absolute alignment of the repaired wing.

4-6. INSTALLATION.

a. Hold wing in position and install bolts, bushings, washers and nuts attaching wing spars to fuselage fittings. Ensure eccentric bushings are positioned as marked when removed.

b. Install bolts, spacers and nuts to secure upper and lower ends of wing strut to wing and fuselage fittings.

c. Route flap and aileron cables, using guide wires. (See note in paragraph 4-4.)

d. Connect:

1. Electrical wires at wing root disconnects.
2. Fuel lines at wing root. (Refer to precautions outlined in paragraph 13-3.)
3. Pitot line (if left wing is being installed.)
4. Wing leveler vacuum line, if installed, at wing root.
5. Ventilator hose at wing root.

e. Beginning with serial U20605326, seal leading edge rib as shown in view C-C of figure 4-1.

f. Rig aileron system per Section 6 of this manual.

g. Rig flap system per Section 7 of this manual.

h. Refuel fuel cells and check for leaks.

i. Check operation of navigation/strobe lights.

j. Check operation of fuel quantity indicators.

k. Install wing gap fairings.

l. Insert soundproofing panel in wing gap, if installed originally.

m. Install all wing inspection plates, interior panels and upholstery.

n. Test operate flap and aileron systems.

4-7. ADJUSTMENT (CORRECTING "WING-HEAVY" CONDITION). If considerable control wheel pressure is required to keep the wings level in normal flight, a "wing-heavy" condition exists.

a. Remove wing fairing strip on "wing-heavy" side of aircraft.

b. (See figure 4-1.) Loosen nut (7) and rotate bushings (5) simultaneously until the bushings are positioned with the thick side of the eccentrics up. This will lower the trailing edge of the wing, and decrease "wing-heaviness" by increasing the angle-of-incidence of the wing.

CAUTION

Be sure to rotate the eccentric bushings simultaneously. Rotating them separately will destroy the alignment between the off-center bolt holes in the bushings, thus exerting a shearing force on the bolt, with possible damage to the hole in the wing spar.

c. Tighten nut and reinstall fairing strip.

d. Test-fly the aircraft. If the "wing-heavy" condition still exists, remove fairing strip on the "lighter" wing, loosen nut and rotate bushings simultaneously until the bushings are positioned with the thick side of the eccentric down. This will raise the trailing edge of the wing, thus increasing "wing heaviness" to balance heaviness in the opposite wing.

e. Tighten nut, install fairing strip and repeat flight test.

4-8. WING STRUTS. (See figure 4-2.)

4-9. DESCRIPTION. Each wing has a single lift strut which transmits a part of the wing load to the lower portion of the fuselage. The strut consists of a streamlined tube riveted to two end fittings for attachment at the fuselage and wing.

4-10. REMOVAL AND INSTALLATION.

a. Remove screws attaching strut fairing and slide fairing along strut or remove from strut.

b. Remove fuselage and wing inspection plates at strut junction points.

c. Support wing securely, then remove nut and bolt securing strut to fuselage.

d. Remove nut, bolt and spacer used to attach strut to wing, then remove strut from aircraft.

e. Reverse preceding steps to install strut.

4-11. REPAIR. Wing strut repair is limited to replacement of tie-downs and attaching parts. A badly dented, cracked or deformed wing strut must be replaced.

4-12. VERTICAL FIN. (See figure 4-3.)

4-13. DESCRIPTION. The fin is primarily of metal construction, consisting of ribs and spars covered with skin. Fin tips are of glass fiber of ABS construction. Hinge brackets at the rear spar attach the rudder.

4-14. REMOVAL AND INSTALLATION. A fin may be removed without first removing the rudder. However, for access and ease of handling, the rudder may be removed by following procedures outlined in Section 10.

a. Remove fairings on either side of fin.
b. Disconnect flashing beacon lead, tail navigation light lead, antennas and antenna leads, and rudder cables, if rudder has not been removed.
c. Remove screws attaching dorsal to fuselage.
d. Remove bolts attaching fin front and rear spars to fuselage, and remove vertical fin.
e. Install fin by reversing preceding steps. Be sure to check and reset rudder and elevator travel if any stop bolts were removed or settings disturbed.

4-11. REPAIR.

a. For grooves in wing strut caused by upper and lower strut fairings, the following applies.
   1. If groove exceeds .010 inch in depth and is less than .75 inch from a rivet center, the strut should be replaced.
   2. If groove exceeds .020 inch in depth and is more than .75 inch from a rivet center, the strut should be replaced.
   3. If groove depth is less than .020 inch and is more than .75 inch from a rivet center, strut should be repaired by tapering gradually to the original surface and burnishing out to a smooth finish. The local area should be checked with dye penetrant to ensure that no crack has developed.

b. The following applies to wing struts with grooves worn in the lower trailing edge. This type damage can occur after extensive cabin door usage with a missing or improperly adjusted door stop which allows the door to bang against the aft edge of the strut at the lower end.

NOTE

Struts with a groove deeper than 50% of the original material thickness should be replaced. Lesser damage may be repaired as follows:

   1. Without making the damage deeper, remove strut material on each side of groove to reduce notch effect of damage. Smooth and blend the surface to provide a gradual transition of strut tube material thickness in damaged area. The local area should be checked with dye penetrant to ensure that no crack has developed.
   2. Apply brush alodine or zink chromate primer and repaint area.
   3. Re-rig the door stop and/or reform the lower portion of the door pan and skin inboard to prevent the door from rubbing the strut tube. If these actions prove to be ineffective, install some form of protective bumper, either on strut or lower portion of door. to prevent further damage. A short hard rubber strip bonded to the trailing edge of the strut where the door comes close to strut is a possibility.

c. Tie-downs and attaching parts may be replaced. If a wing strut is badly dented, cracked or deformed, it should be replaced.

4-15. REPAIR. Fin repair should be accomplished in accordance with applicable instructions outlined in Section 18.

4-16. HORIZONTAL STABILIZER (See figure 4-4.)

4-17. DESCRIPTION. The horizontal stabilizer is primarily of metal construction, consisting of ribs and a front and rear spar which extend throughout the full spars and ribs. Stabilizer tips are of ABS construction. The elevator tab actuator screw is contained within the horizontal stabilizer assembly, and is supported by a bracket riveted to the rear spar. The underside of the stabilizer contains a covered opening which provides access to the elevator tab actuator screw. Hinge brackets at the rear spar support the elevators.

4-18. REMOVAL AND INSTALLATION.

a. Remove elevators and rudder in accordance with procedures outlined in Sections 8 and 10.

b. Remove vertical fin in accordance with procedures outlined in paragraph 4-14.

c. Disconnect elevator trim control cables at clevis and turnbuckle inside tailcone, remove pulleys which route aft cables into horizontal stabilizer, and pull cables out of tailcone.

d. Remove bolts securing horizontal stabilizer to fuselage.

e. Remove horizontal stabilizer.

f. Install horizontal stabilizer by reversing preceding steps. Rig control systems as necessary. Check operation of tail navigation light and flashing beacon.

4-19. REPAIR. Horizontal stabilizer repair should be accomplished in accordance with applicable procedures outlined in Section 18.

4-20. STABILIZER ABRASION BOOTS.

NOTE

An Accessory Kit (AK182-217) is available from The Cessna Service Parts Center for installation of abrasion boots on aircraft not so equipped.

4-21. DESCRIPTION. The aircraft may be equipped with two extruded rubber abrasion boots, one on the leading edge of each horizontal stabilizer. These boots are installed to protect the stabilizer leading edge from damage caused by rocks thrown back by the propeller.

4-22. REMOVAL. The abrasion boots can be removed by loosening one end of the boot and pulling it off the stabilizer with an even pressure. Excess adhesive or rubber can be removed with Methyl-Ethyl-Ketone.

4-23. INSTALLATION. Install abrasion boots as outlined in the following procedures.

a. Trim boots to desired length.

b. Mask off boot area on leading edge of stabilizer with 1-inch masking tape, allowing 1/4-inch margin.

c. Clean metal surfaces of stabilizer, where boot is to be installed with Methyl-Ethyl-Ketone.

d. Clean inside of abrasion boot with Methyl-Ethyl-Ketone and a Scotch Brite pad to ensure a complete removal of paraffin/talc. Then a normal wipe down with MEK on a cloth will leave surface suitable for bonding to the aluminum.

NOTE

Boots may be applied over epoxy primer, but if the surface has been painted, the paint shall be removed from the bond area. This shall be done by wiping the surfaces with a clean, lint-free rag, soaked with solvent, and then wiping the surfaces dry, before the solvent has time to evaporate, with a clean, dry lint-free rag.

e. Stir cement (EC-1300 Minnesota Mining and Manufacturing Co.) thoroughly.

f. Apply one even brush coat to the metal and the inner surface of the boot. Allow cement to air-dry for a minimum of 30 minutes, and then apply a second coat to each surface. Allow at least 30 minutes (preferably one hour) for drying.

g. After the cement has thoroughly dried, reactivate the surface of the cement on the stabilizer and boot, using a clean, lint-free cloth, heavily moistened with Toluol. Avoid excess rubbing, which would *remove the cement from the surfaces.*

h. Position boot against leading edge, exercising care not to trap air between boot and stabilizer.

NOTE

Should boot be attached "off-course", pull it up immediately with a quick motion, and reposition properly.

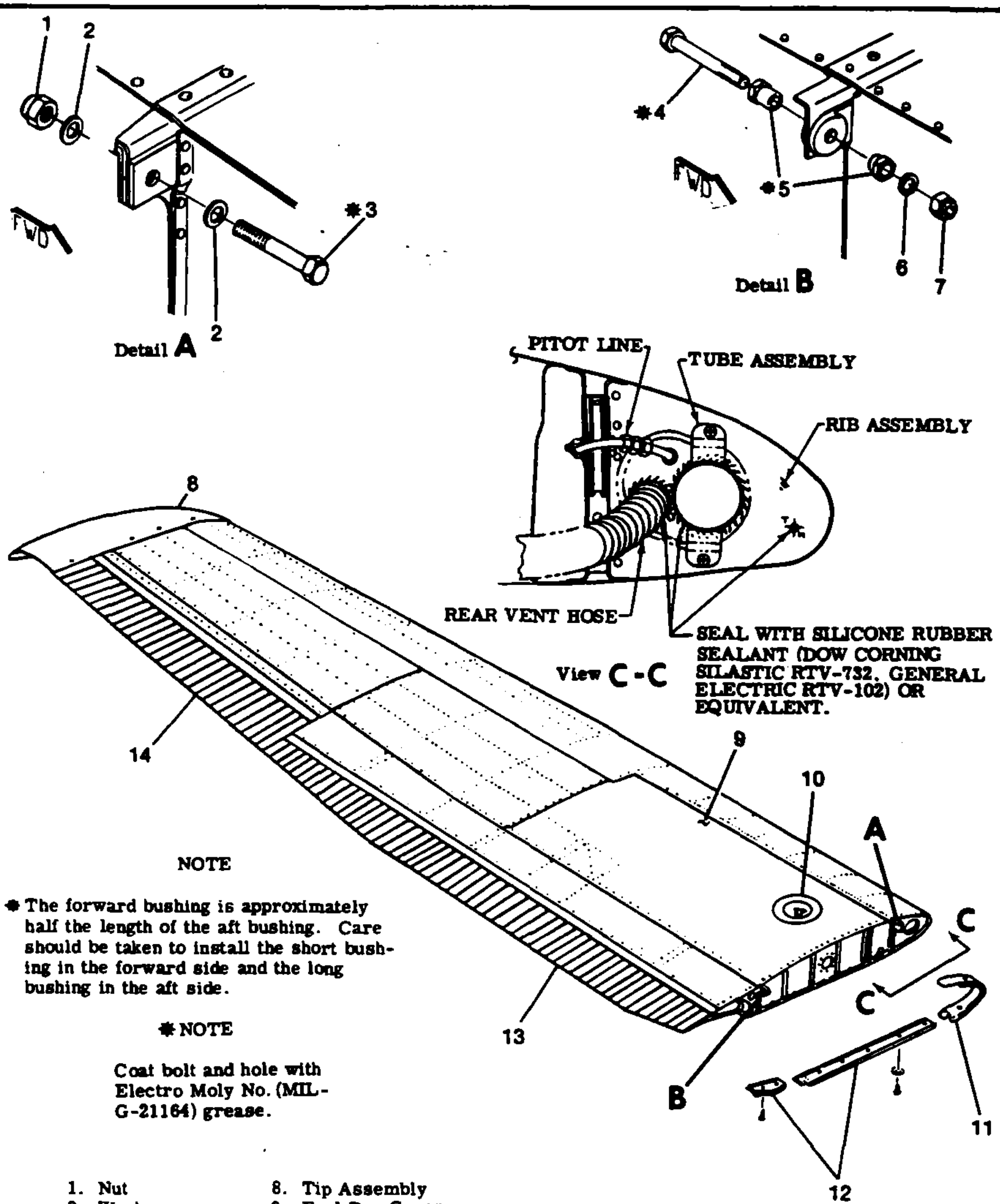
i. Press or roll entire surface of boot to assure positive contact between the two surfaces.

j. Apply a coat of GACO N700A sealer, or equivalent, conforming to MIL-C-21067, along the trailing edges of the boots to the surface of the skin to form a neat, straight fillet.

k. Remove masking tape and clean stabilizer of excess material.

l. Mask to the edge of boot for painting stabilizer.

SHOP NOTES:



NOTE

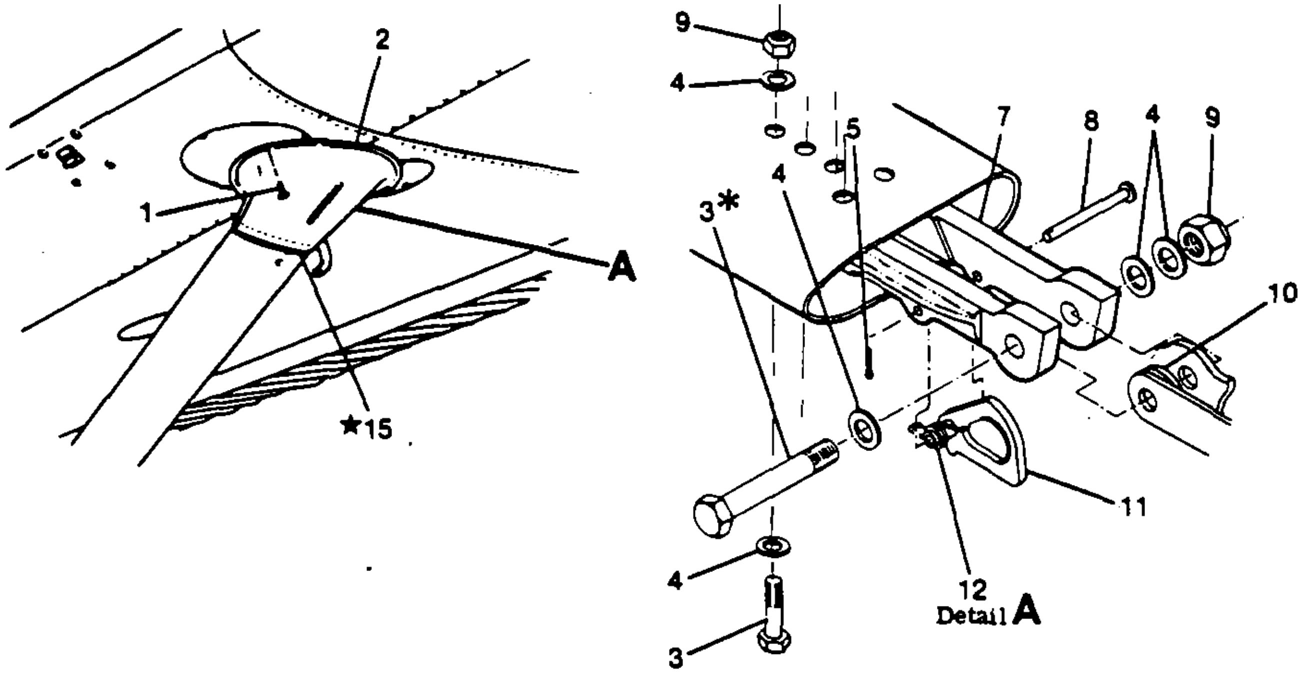
* The forward bushing is approximately half the length of the aft bushing. Care should be taken to install the short bushing in the forward side and the long bushing in the aft side.

* NOTE

Coat bolt and hole with Electro Moly No. (MIL-G-21164) grease.

1. Nut
2. Washer
3. Bolt
4. Bolt
5. Bushing
6. Washer
7. Nut
8. Tip Assembly
9. Fuel Bay Cover
10. Fuel Filler Cap
11. Fillet
12. Fairing
13. Flap
14. Aileron

Figure 4-1. Wing Installation



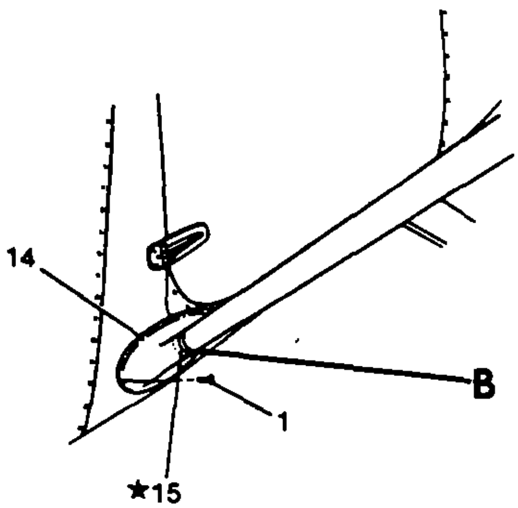
★NOTE

Wrap wing strut using Y8562 polyurethane tape (1" wide) centered at point where strut cuff terminates.

1. Screw
2. Upper Fairing
3. Bolt
4. Washer
5. Cotter Pin
6. Rivet
7. Strut Fitting
8. Pin
9. Nut
10. Spacer
11. Mooring Ring
12. Spring
13. Fuselage Fitting
14. Lower Fairing
15. Tape

*NOTE

Coat bolt and hole with Electro Moly No. (MIL-G-21164) grease.



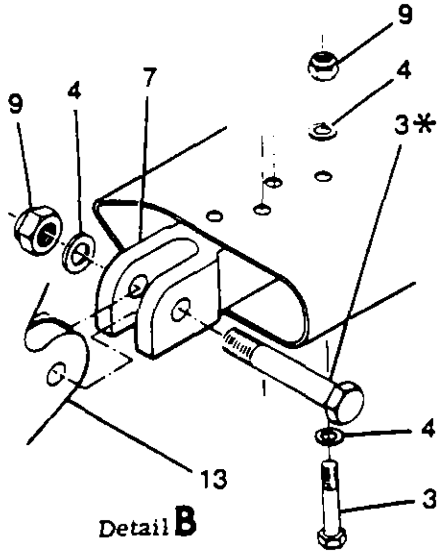
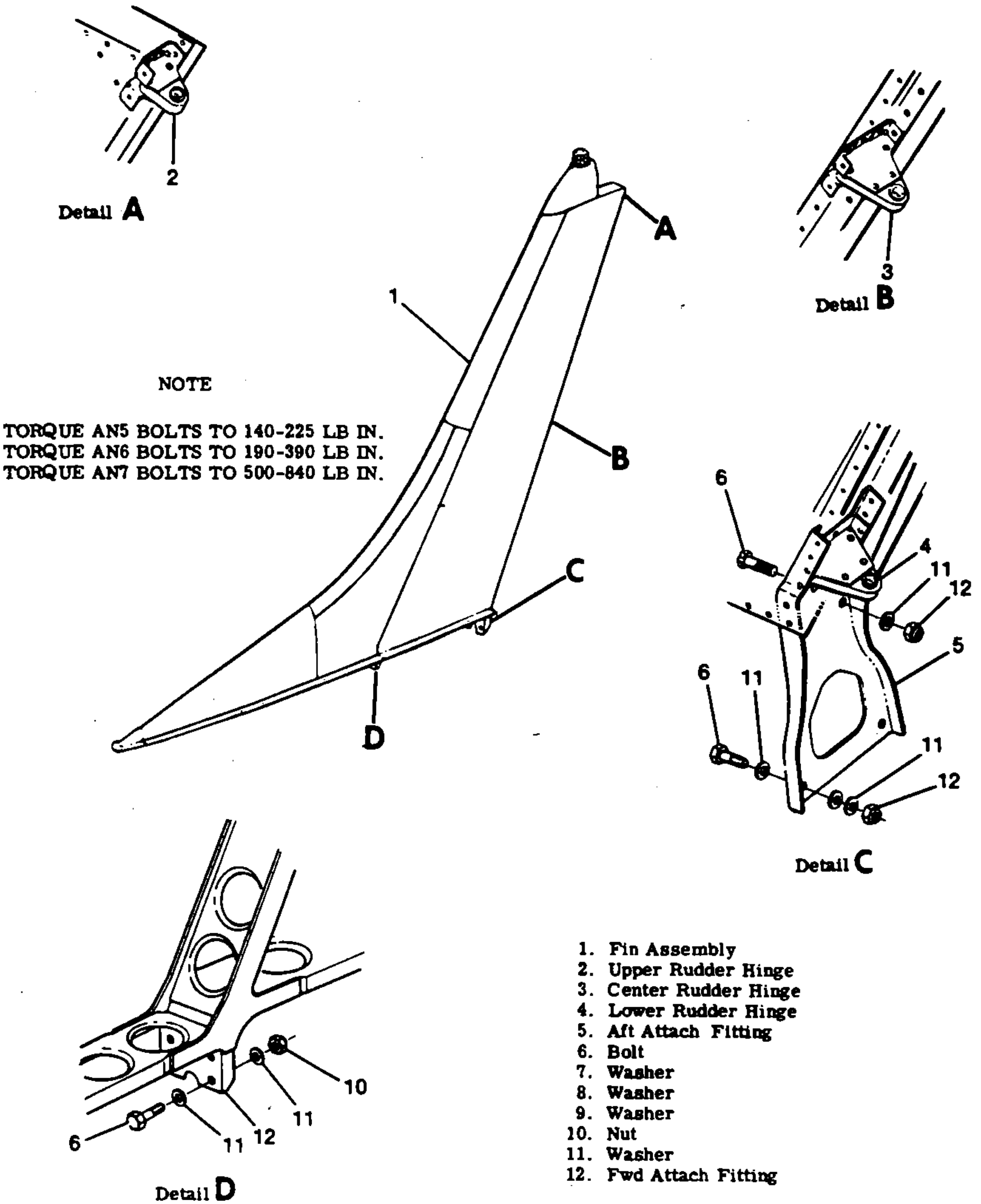
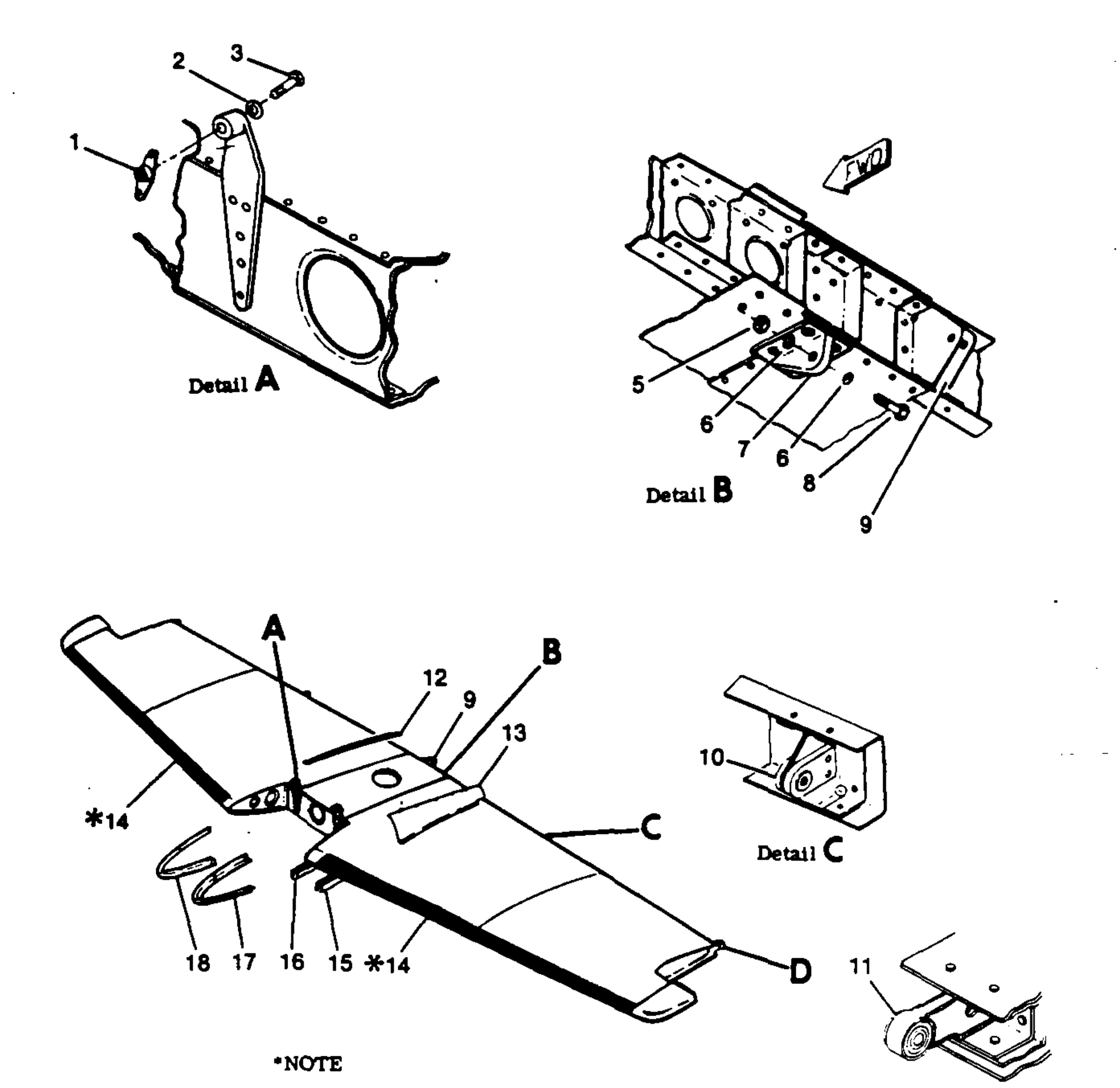


Figure 4-2. Wing Strut Installation



1. Fin Assembly
2. Upper Rudder Hinge
3. Center Rudder Hinge
4. Lower Rudder Hinge
5. Aft Attach Fitting
6. Bolt
7. Washer
8. Washer
9. Washer
10. Nut
11. Washer
12. Fwd Attach Fitting

Figure 4-3. Vertical Fin Installation



*NOTE

An Accessory Kit (AK182-217) is available from The Cessna Supply Division for installation of abrasion boots on aircraft not so equipped. Refer to paragraph 4-20.

1. Nutplate
2. Washer
3. Bolt
4. Bracket
5. Nut
6. Washer
7. Bracket
8. Bolt
9. Elevator Pylon Bracket
10. Elevator Inboard Hinge
11. Elevator Outboard Hinge
12. Upper Right Fairing
13. Upper Left Fairing
14. Abrasion Boot
15. Lower Left Moulding
16. Lower Right Moulding
17. Forward Left Fairing
18. Forward Right Fairing

Figure 4-4. Horizontal Stabilizer

SECTION 5

LANDING GEAR, WHEELS AND BRAKES

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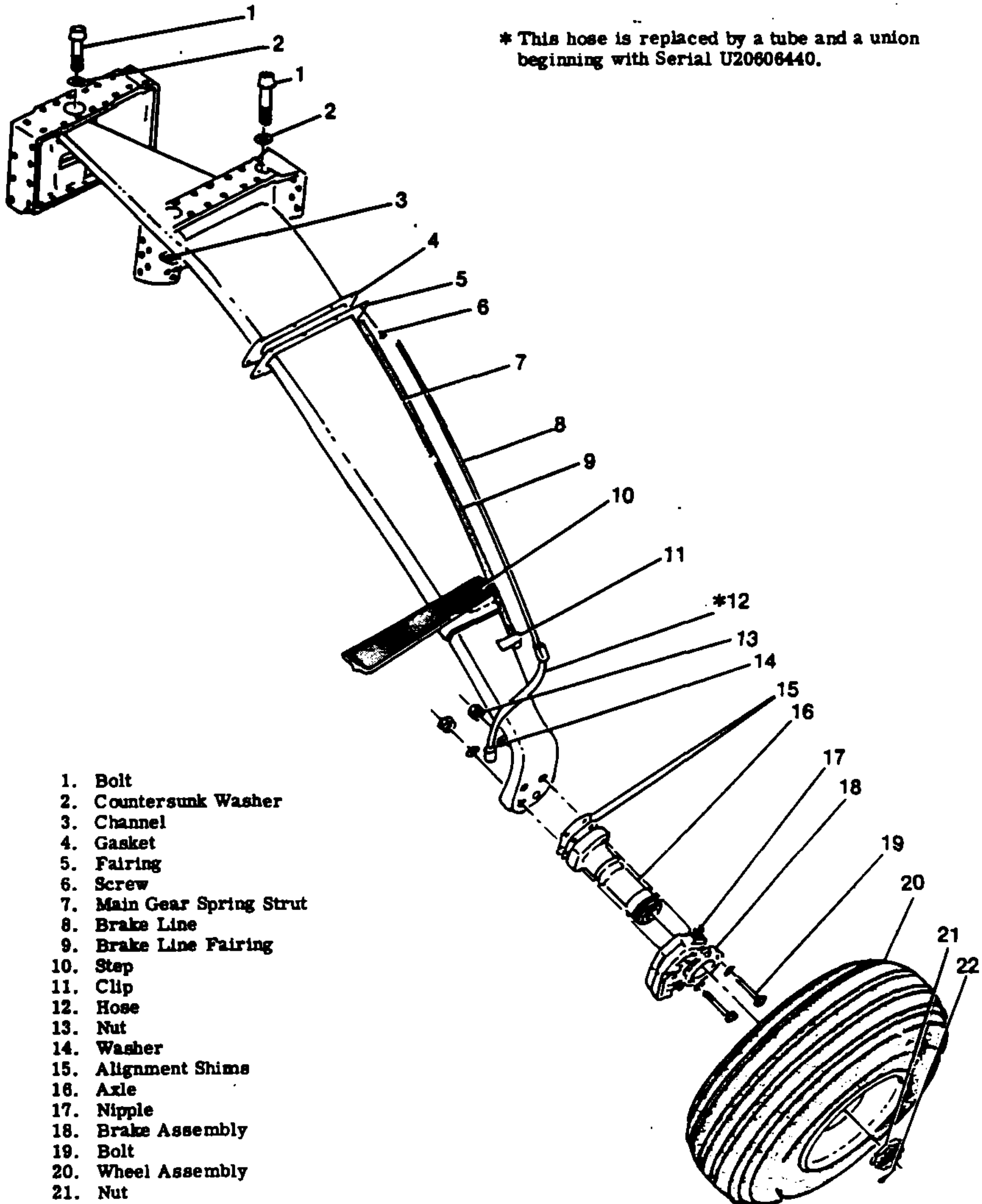
5-1. LANDING GEAR.

5-2. DESCRIPTION. The aircraft is equipped with a fixed tricycle landing gear, consisting of flat spring-steel main gear struts, and an air/oil steerable nose gear shock strut. Disc-type brakes and tube-type tires are installed on the axles at the lower end of the struts. Speed fairings or heavy-duty wheels and nose gear struts may be installed on some aircraft. The nose gear is a combination of a conventional air/oil (oleo) strut and fork, incorporating a shimmy dampener. The nose wheel is steerable with the rudder pedals up to a maximum pedal deflection, after which it becomes free-swiveling up to a maximum travel, right or left of center. Through use of the brakes, the aircraft can be pivoted around the outer wing strut fitting.

5-3. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
AIRCRAFT LEANS TO ONE SIDE.	Incorrect tire inflation.	Inflate to pressure specified in figure 1-1.
	Landing gear attaching parts not tight.	Tighten loose parts; replace defective parts with new parts.
	Landing gear spring excessively sprung.	Remove and install new part(s).
	Bent axles.	Install new part(s).
TIRES WEAR EXCESSIVELY.	Incorrect tire inflation.	Inflate to pressure specified in figure 1-1.
	Main wheels out of alignment.	Remove and install new part(s).
	Landing gear spring excessively sprung.	Remove and install new part(s).
	Bent axles.	Install new part(s).
	Dragging brakes.	Refer to paragraph 5-68.
	Wheel bearings excessively tight.	Adjust properly.
	Wheels out of balance.	Correct in accordance with paragraph 5-32.
	Loose torque links.	Add shims or install new parts as required.
WHEEL BOUNCE EVIDENT ON SMOOTH SURFACE.	Out of balance condition.	Refer to paragraph 5-32.

SHOP NOTES:



1. Bolt
2. Countersunk Washer
3. Channel
4. Gasket
5. Fairing
6. Screw
7. Main Gear Spring Strut
8. Brake Line
9. Brake Line Fairing
10. Step
11. Clip
12. Hose
13. Nut
14. Washer
15. Alignment Shims
16. Axle
17. Nipple
18. Brake Assembly
19. Bolt
20. Wheel Assembly
21. Nut
22. Cotter Pin

Figure 5-1. Main Landing gear

5-4. MAIN LANDING GEAR.

5-5. DESCRIPTION.
The flat spring-steel main landing gear struts are attached to the aircraft at inboard and outboard forgings, located in the belly of the aircraft. A hydraulic brake line, enclosed by a fairing is routed down the aft side of each spring-strut.

5-6. MAIN GEAR REMOVAL. (See figure 5-1.)

NOTE: The following procedure removes the landing gear as a complete assembly. Refer to applicable paragraph for removal of individual components.

a. Remove floorboard access covers over inboard and outboard landing gear forgings.
b. Hoist or jack aircraft in accordance with procedures outlined in Section 2.
c. Remove brake bleeder screw and drain hydraulic brake fluid from gear being removed.
d. Disconnect and cap or plug brake line at bulkhead fitting just inboard of outboard landing gear forging.
e. Remove bolt, washers and nut attaching spring strut to inboard forging.
f. Remove bolts, washers and nuts attaching spring strut and main gear spring channel to outboard landing gear forging.
g. Work strut out of fuselage forgings, using care to remove main gear spring channel.

5-5A CORROSION CONTROL ON LANDING GEAR SPRINGS.
a. General
   (1) The main landing gear springs are made from high strength steel that is shot peened on the lower surface to increase the fatigue life of the part.
   (2) The shot peened layer is between 0.010 and 0.020 inch thick.
   (3) If the protective layer of paint is chipped, scratched, or worn away, the steel may corrode (rust).

   NOTE: Corrosion pits that extend past the shot peen layer of the gear spring will cause a significant decrease in the fatigue life of the spring.

   (4) Operation from unimproved surfaces increases the possibility of damage.
b. Corrosion removal and repair.

WARNING: Do not use chemical rust removers or paint strippers on landing gear springs. High-strength steel parts are very susceptible to hydrogen embrittlement. Acidic solutions, such as rust removers and paint strippers, can cause hydrogen embrittlement. Hydrogen embrittlement is an undetectable, time-delayed process. Since the process is time delayed, failure can occur after the part is returned to service.

   (1) Examine for signs of corrosion (red rust) if damage to the paint finish of the landing gear spring is found.
   (2) Carefully remove any rust by light sanding.
      (a) The sanding must blend the damage into the adjacent area in an approximate 20:1 ratio.
      EXAMPLE: An 0.005-inch deep pit. The pit must be blended to a 0.10-inch radius or 0.20-inch diameter.

(b) Make sure the last sanding marks are along an inboard-to-outboard direction, or along the long dimension of the spring.

(3) After the sanding is complete, measure the depth of the removed material from the damaged area.

NOTE: The maximum combined depth of removed material to the top and bottom or leading and trailing edge is not to be more than 0.063 inch at any two opposite points on the gear spring. This measurement limitation includes areas that have previously been damaged and repaired.

(a) Make sure the depth of the damage area on the bottom of the gear spring is not more than 0.012 inch deep.

1 If the damage is deeper than 0.012 inch deep and less than 0.063 inch deep, replace or shot peen the gear spring. The gear spring must be removed and sent to an approved facility to be shot peened.

a The shot peen specification is to be Almen intensity of 0.012 to 0.016 with 330 steel shot.

(b) Make sure the depth of any damage on the leading edge, trailing edge, or top of the gear spring is not more than 0.063 inch deep.

1 If the damage is deeper than 0.063 inch deep, replace the gear spring.

(4) Touch-up paint as required.

NOTE: Additional information regarding corrosion control can be found in FAA documents AC-43-4, Chapter 6, or AC43.13-1B Chapter 6.

c. Axle bolt hole corrosion.

(1) Operation of an airplane on skis increases the loads on the lower part of the gear spring because of the unsymmetrical and twisting loads.

(a) The increased loads have produced spring fractures that originate from pits in the axle attach holes.

1 Catastrophic failures can occur from fatigue cracks as small as 0.003 to 0.010-inch long that originated at pits.

NOTE: Although operation on skis causes more loads, the criteria apply to all airplanes.

(2) There is no maximum damage depth for pits that develop in the axle bolt holes. If pits or corrosion is found, ream to remove it, subject to the following limitations:

(a) Remove the minimum material necessary to repair the damage.

(b) Make sure the diameter of the axle attachment holes are no more than 0.383 inch for 3/8-inch bolts.

(c) Make sure the diameter of the axle attachment holes are no more than 0.321 inch for 5/16-inch bolts.

(d) If reaming to the maximum dimension does not remove all signs of corrosion, discard the landing gear spring.

5-7. MAIN GEAR INSTALLATION.

NOTE: The following procedure installs the landing gear as a complete assembly. Refer to applicable paragraph for installation of individual components.

a. Install main gear spring channel in outboard landing gear forging.

NOTE: Convex surface of main gear spring channel is installed up against the lower side of the strut. The concave side of the channel is installed down, resting on the lower edge of the slot in the forging.

b. Work strut into fuselage forgings and install bolts, washers and nuts; tighten inboard bolt.
c. Torque outboard bolts to 660-750 lb. in.

NOTE: When outboard bolts are torqued to 660-750 lb in, channel should have a minimum of 80% contact with lower side of strut.

d. Connect hydraulic brake line at bulkhead fitting just inboard of outboard landing gear forging.
e. Install brake bleeder screw.
f. Fill and bleed brake system in accordance with applicable paragraph in this section.

5-8. BRAKE LINE FAIRING REPLACEMENT. (See figure 5-1.)
a. Disconnect brake line at brake assembly and drain fluid, or plug line to avoid draining.
b. Work brake line and split hose out of clip and flex line away from spring strut.
c. Remove all traces of original adhesive as well as any rust, paint or scale with a wire brush and sandpaper. Sand inner surface of fairing strip, running sandpaper marks lengthwise; leave primer on spring strut.
d. Thoroughly clean surfaces to be bonded. If a solvent is used, remove all traces of the solvent with a clean, dry cloth. It is Important for the surfaces to be clean and dry. Solvent should not be used on the vinyl fairing strip.
e. Leave surfaces slightly roughened or abraided. Deep scratches or nicks should be avoided.
f. Mix adhesive (A-1186, B. F. Goodrich, Akron, Ohio 443180), according to manufacturer's directions.
g. Apply a thin, uniform coat of adhesive to each bonding surface. Work life of A-1186-B is approximately 8 hours at 750 F or 20 minutes at 200° F.
h. Press brake line into groove of fairing strip and raise line and strip to attach to aft side of spring strut and fit into clip.
i. Immediately wrap fairing strip and spring strut with masking tape in five equally-spaced places. Excessive adhesive may be removed with solvents.
j. Allow adhesive to cure thoroughly according to manufacturer's directions before flexing the gear.
k. After recommended curing time, remove tape and connect brake line.
l. If necessary, prime spring strut with White Rust Inhibitive Primer - 32W6 (Kansas Paint Co., Wichita, Kansas), and repaint to original color.
m. Fill and bleed brake system.
n. Wrap landing gear spring with polyurethane tape as shown in Section view A-A in figure 5-2.

5-9. MAIN LANDING GEAR FAIRINGS. (See figure 5-2.)
5-10. DESCRIPTION.
These aircraft may be equipped with either standard or heavy-duty size main wheel speed fairings. The fairings are installed over the wheels and are attached to mounting plates, attached to the axles. The wheel fairings are equipped with adjustable scrapers, installed in the lower aft part of the fairings, directly behind the wheels. A brake fairing is installed over the lower strut and is attached to the speed fairing.

5-11. REMOVAL OF BRAKE PAIRINGS (STANDARD OR OVERSIZED.) (See figure 5-2.)
a. Remove screws from perimeter of brake fairing.
b. Remove screws from nutplates holding fairing together.
c. Flex brake fairing over landing gear spring strut to remove.

5-12. INSTALLATION OF BRAKE FAIRINGS. (STANDARD OR OVERSIZED.) (See figure 5-2.)
a. Flex fairing over landing gear spring strut.

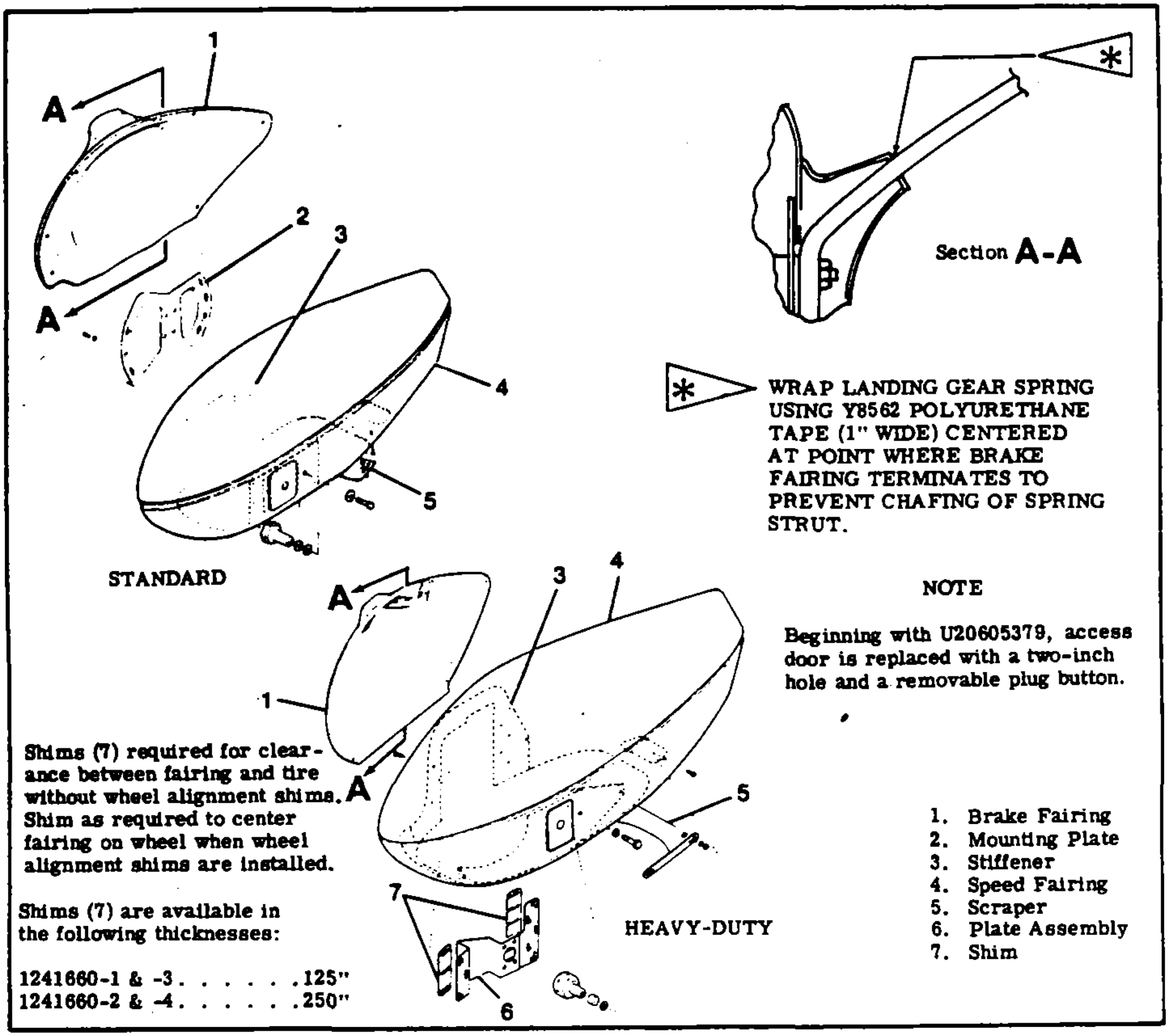


Figure 5-2. Main Wheel Speed Fairings

b. Install screws in nutplate holding fairing together.
c. Install screws around perimeter of brake fairing.

5-13. REMOVAL OF STANDARD MAIN WHEEL SPEED FAIRINGS.) (See figure 5-2.)
a. Remove brake fairing as outlined in paragraph 5-11.
b. Remove screws attaching inboard side of wheel fairing to mounting plate.
c. Remove bolt securing outboard side of wheel fairing to axle nut.
d. Remove wheel fairing, loosening wheel scraper, if necessary.

5-14. INSTALLATION OF STANDARD MAIN WHEEL SPEED FAIRINGS. (See figure 5-2.)
a. Work speed fairing down over wheel.
b. Install bolt securing outboard side of fairing to axle nut.
c. Install screws attaching inboard side of wheel fairing to mounting plate.
d. Install brake fairing in accordance with paragraph 5-12.
e. After installation, check scraper-to-tire clearance in accordance with the following CAUTION.

CAUTION

Always check scraper-to-tire clearance for a minimum of 0.25-inch to a maximum of 0.38-inch. Elongated holes are provided in the scraper for adjustment. Wheel scrapers should be checked after installing speed fairing, whenever a tire has been changed, and whenever scraper adjustment has been disturbed. If the aircraft is flown from surfaces with mud, snow, or ice, the speed fairing should be checked to make sure there is no accumulation which could prevent normal wheel rotation. Wipe fuel and oil from speed fairings to prevent stains and deterioration.

5-15. REMOVAL OF HEAVY-DUTY MAIN WHEEL SPEED FAIRINGS.

a. Remove brake fairing as outlined in paragraph 5-11.

b. Remove bolt securing outboard side of wheel fairing to axle nut.

c. Remove screws attaching inboard side of wheel fairing to mounting plate.

d. Note part number, position and locations of shims between fairing and mounting plate; remove shims.

e. Remove wheel fairing, loosening wheel scraper, if necessary.

5-16. INSTALLATION OF HEAVY-DUTY MAIN WHEEL SPEED FAIRINGS. (See figure 5-2.)

a. Work speed fairing down over wheel.

b. Install bolt securing outboard side of fairing to axle nut.

c. Install screws attaching inboard side of wheel speed fairing to mounting plate, installing shims in same position as they were when they were removed.

d. Install brake fairings in accordance with paragraph 5-12.

e. After installation, check scraper-to-tire clearance in accordance with the following CAUTION.

CAUTION

Always check scraper-to-tire clearance for a minimum of 0.40-inch to a maximum of 0.60-inch. Elongated holes are provided in the scraper for adjustment. Wheel scrapers should be checked after installing speed fairing, whenever a tire has been changed, and whenever scraper adjustment has been disturbed. If the aircraft is flown from surfaces with mud, snow, or ice, the speed fairing should be checked to make sure there is no accumulation which could prevent normal wheel rotation. Wipe fuel and oil from speed fairings to prevent stains and deterioration.

5-17. MAIN WHEEL REMOVAL. (See figure 5-3.)

a. Hoist or jack aircraft as outlined in Section 2 of this manual.

b. Remove speed fairing as outlined in paragraphs 5-13 or 5-15.

c. Remove cotter pin and axle nut.

d. Remove bolts and washers attaching brake back plate to brake cylinder, and remove back plate.

e. Pull wheel from axle.

5-18. DISASSEMBLY OF CLEVELAND MAIN WHEEL AND TIRE ASSEMBLY. (See figure 5-3.)

a. Deflate tire and break tire beads loose.

NOTE

Avoid damaging wheel flanges when breaking tire beads loose. A scratch, gouge or nick may cause wheel failure.

b. Remove thru-bolts and separate wheel halves, removing tire, tube and brake disc.

c. Remove grease seal rings, felts and bearing cones from wheel halves.

NOTE

Bearing cups are a press-fit in the wheel halves and should not be removed unless replacement is necessary to remove bearing cups, heat wheel half in boiling water for 15 minutes. Using an arbor press, if available, press out bearing cup and press in a new cup while wheel is still hot.

5-19. INSPECTION AND REPAIR OF CLEVELAND MAIN WHEEL AND TIRE ASSEMBLY. (See figure 5-3.)

a. Clean all metal parts and grease seal felts in cleaning solvent and dry thoroughly.

b. Inspect wheel halves for cracks. Cracked wheel halves shall be discarded and new parts used. Sand out small nicks, gouges and corroded areas. When the protective coating has been removed, the area should be cleaned thoroughly, primed with zinc chromate, and painted with aluminum lacquer.

c. Brake disc should be replaced if excessively scored or warped. Small nicks and scratches should be sanded smooth. Refer to paragraph 5-85.

d. Carefully inspect bearing cones and cups for damage and discoloration. After cleaning, pack bearing cones with clean aircraft wheel bearing grease (Section 2) before installing in the wheel.

5-20. REASSEMBLY OF CLEVELAND MAIN WHEEL AND TIRE ASSEMBLY. (See figure 5-3.)

a. Insert thru-bolts through brake disc and position in the inner wheel half, using the bolts to guide disc. Assure that the disc is bottomed in wheel half.

b. Position the tire and tube with the inflation valve through hole in outboard wheel half. Place inner wheel half in position. Apply a light force to bring wheel halves together. Maintaining the light force, assemble a washer and nut on one thru-bolt and tighten snugly. Assemble the remaining nuts and washers on thru-bolts and torque to 150 lb in.

NOTE

Uneven or improper torque of thru-bolt nuts may cause failure of bolts, with resultant wheel failure.

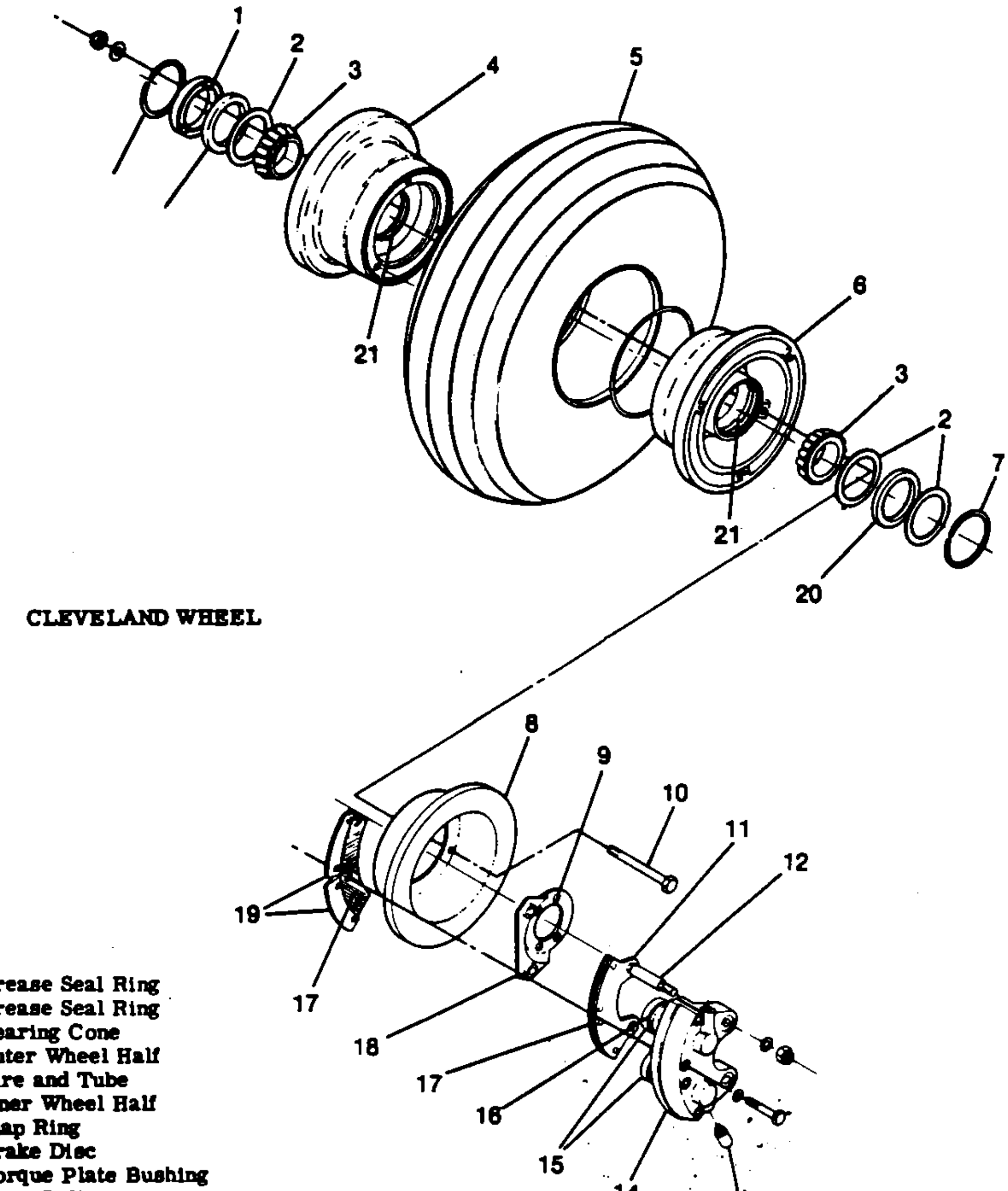
c. Clean and repack bearing cones with clean aircraft wheel bearing grease (Section 2).

d. Assemble bearing cones, grease seal felts, and rings into the wheel halves.

e. Inflate tire to seat tire beads, then adjust to correct pressure.

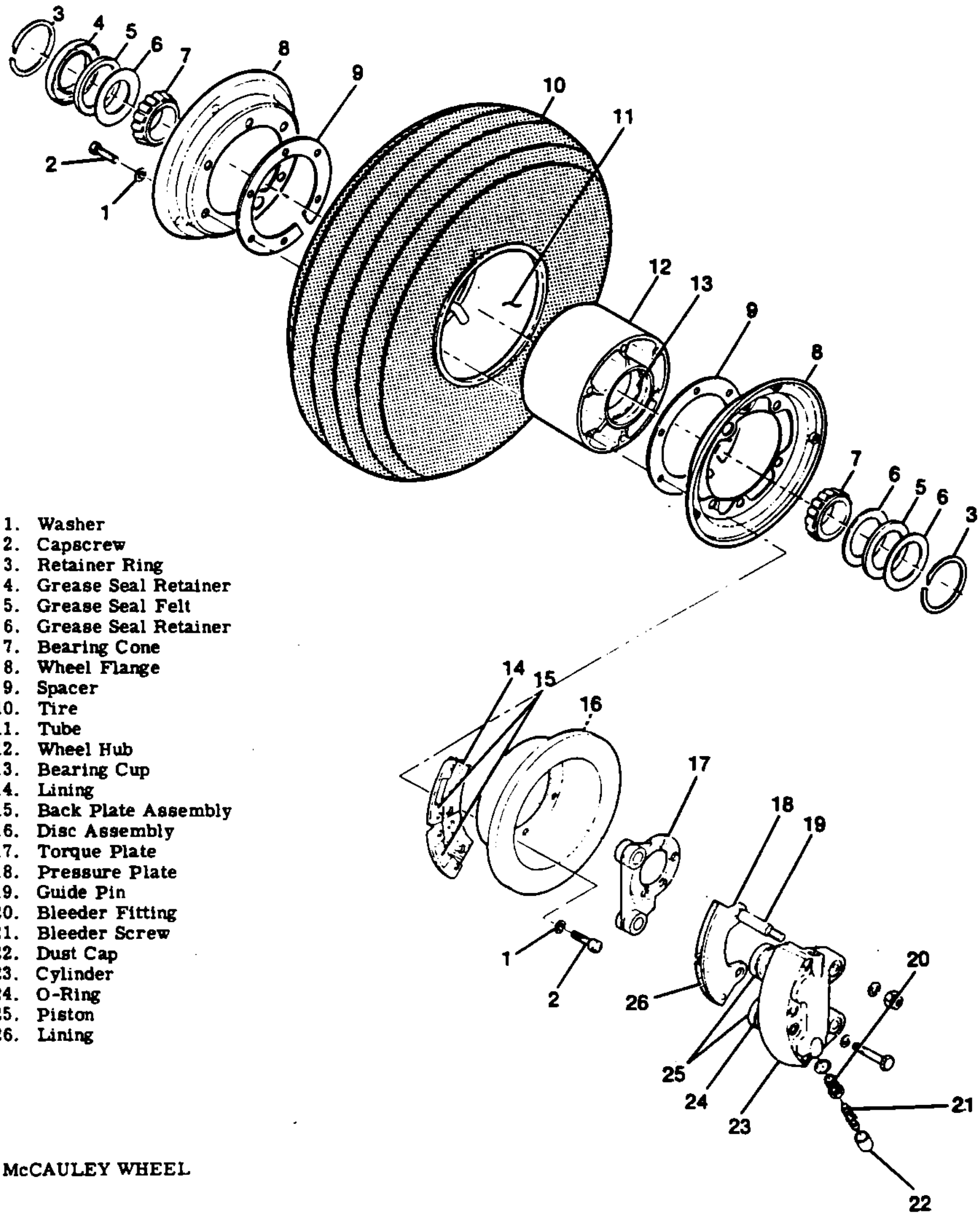
5-21. DISASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY (with hub and capscrews.) (See figure 5-3.)

a. Remove screws attaching hub cap, if installed, and remove hub cap.



1. Grease Seal Ring
2. Grease Seal Ring
3. Bearing Cone
4. Outer Wheel Half
5. Tire and Tube
6. Inner Wheel Half
7. Snap Ring
8. Brake Disc
9. Torque Plate Bushing
10. Thru-Bolt
11. Pressure Plate
12. Anchor Bolt
13. Bleeder Cap
14. Brake Cylinder
15. Piston
16. O-Ring
17. Lining
18. Torque Plate
19. Back Plate
20. Grease Seal Felt
21. Bearing Cup

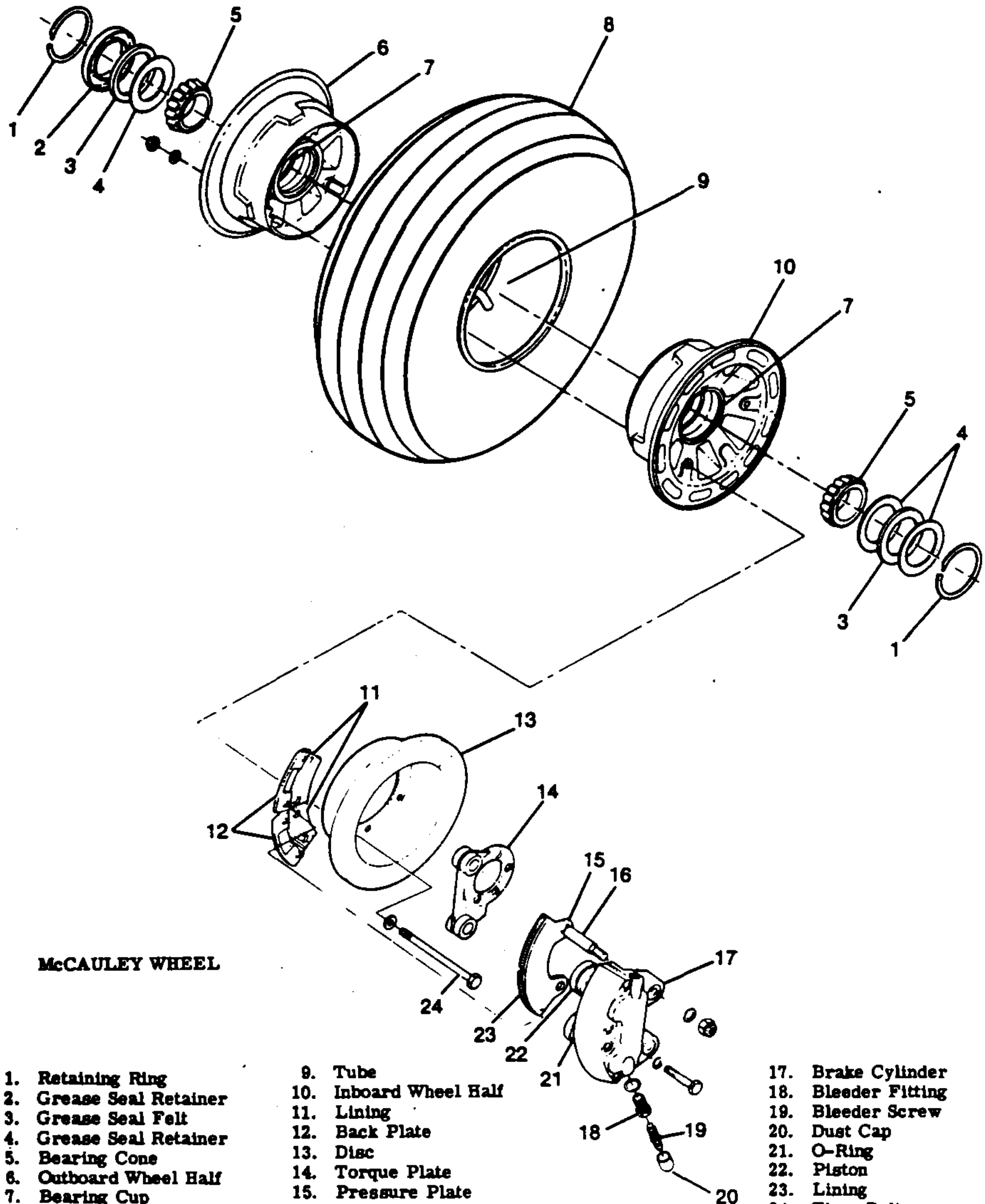
Figure 5-3. Main Wheel and Tire Assembly (Sheet 1 of 2)



1. Washer
2. Capscrew
3. Retainer Ring
4. Grease Seal Retainer
5. Grease Seal Felt
6. Grease Seal Retainer
7. Bearing Cone
8. Wheel Flange
9. Spacer
10. Tire
11. Tube
12. Wheel Hub
13. Bearing Cup
14. Lining
15. Back Plate Assembly
16. Disc Assembly
17. Torque Plate
18. Pressure Plate
19. Guide Pin
20. Bleeder Fitting
21. Bleeder Screw
22. Dust Cap
23. Cylinder
24. O-Ring
25. Piston
26. Lining

McCAULEY WHEEL

Figure 5-3. Main Wheel and Tire Assembly (Sheet 2 of 3)



1. Retaining Ring
2. Grease Seal Retainer
3. Grease Seal Felt
4. Grease Seal Retainer
5. Bearing Cone
6. Outboard Wheel Half
7. Bearing Cup
8. Tire
9. Tube
10. Inboard Wheel Half
11. Lining
12. Back Plate
13. Disc
14. Torque Plate
15. Pressure Plate
16. Guide Pin
17. Brake Cylinder
18. Bleeder Fitting
19. Bleeder Screw
20. Dust Cap
21. O-Ring
22. Piston
23. Lining
24. Thru-Bolt

Figure 5-3. Main Wheel and Tire Assembly (Sheet 3 of 3)

WARNING

Injury can result from attempting to remove wheel flanges with the tire and tube inflated. Avoid damaging wheel flanges when breaking tire beads loose. A scratch, gouge or nick in wheel flanges could cause wheel failure.

b. Remove valve core and deflate tire and tube. Break tire beads loose from wheel flanges.
c. Remove capscrews.
d. Remove brake disc.
e. Separate wheel flanges from wheel hub. Retain spacers on each side of wheel hub.
f. Remove wheel hub from tire.
g. Remove retainer rings and remove grease seal retainers, grease seal felts and bearing cones.

NOTE

Bearing cups (races) are a press-fit in the wheel hub and should not be removed unless a new part is to be installed. To remove the bearing cup, heat wheel in boiling water for 30 minutes or in an oven not to exceed 121°C (250°F). Using an arbor press, if available, press out the bearing cup and press in the new bearing cup while the wheel hub is still hot.

5-22. INSPECTION AND REPAIR OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY (with hub and capscrews.) (See figure 5-3.)
a. Clean all metal parts, grease seal felts and phenolic spacers in cleaning solvent and dry thoroughly.
b. Inspect wheel flanges and wheel hub for cracks. Cracked wheel flanges or hub should be discarded and new parts installed. Sand out smooth nicks, gouges and corroded areas. When the protective coating has been removed, the area should be cleaned thoroughly, primed with zinc chromate and painted with aluminum lacquer.
c. Brake disc should be replaced if excessively scored or warped. Small nicks and scratches should be sanded smooth. Refer to paragraph 5-85.
d. Carefully inspect bearing cones and cups for damage and discoloration. After cleaning, pack bearing cones with clean aircraft wheel bearing grease (refer to Section 2 of this manual) before installing in the wheel hub.

5-23. REASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY (with hub and capscrews.) (See figure 5-3.)
a. Place wheel hub in tire and tube with tube inflation stem in cutout of wheel hub.
b. Place spacer and wheel flange on inboard side of wheel hub (opposite of tube inflation stem), then place washer under head of each capscrew and start capscrews into wheel hub threads.
c. Place spacer and wheel flange on other side of hub and align valve stem in cutout in wheel flange.
d. Place washer under head of each capscrew and start capscrew into hub threads.

CAUTION

Ensure that spacers and wheel flanges are seated on flange of wheel hub. Uneven or improper torque of capscrews can cause failure of capscrews, with resultant wheel failure.

e. Tighten capscrews evenly and torque to 190-200 lb. in.
f. Clean and pack bearing cones with clean aircraft wheel bearing grease (refer to Section 2 of this manual).
g. Assemble bearing cones, grease seal felts and retainers into wheel hub.
h. Inflate tire to seat tire beads, then adjust to correct tire pressure (refer to Section 1 of this manual).

5-24. DISASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY (with thru-bolts.) (See figure 5-3.)
a. Deflate tire and break tire beads loose.

NOTE

Avoid damaging wheel flanges when breaking tire beads loose. A scratch, gouge or nick may cause wheel failure.

b. Remove thru-bolts and separate wheel halves, removing tire and tube and brake assembly.
c. Remove grease seal rings, felts and bearing cones from wheel halves.

NOTE

bearing cups are a press-fit in the wheel halves and should not be removed unless replacement is necessary. To remove bearing cups, heat wheel half in boiling water for 15 minutes. Using an arbor press, if available, press out the old bearing cup and press in the new cup while the wheel half is still hot.

5-25. INSPECTION AND REPAIR OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY. (with thru-bolts.) (See figure 5-3.)
a. Clean all metal parts and grease seal felts in solvent, and dry thoroughly.
b. Inspect wheel halves for cracks. Cracked wheel halves should be replaced. Sand out nicks, gouges and corroded areas. When the protective coating has been removed, the area should be cleaned thoroughly, primed with zinc chromate, and repainted with aluminum lacquer.
c. Brake disc should be replaced if excessively scored or warped. Small nicks and scratches should be sanded smooth. Refer to paragraph 5-85.
d. Bearing cups and cones should be inspected carefully for damage and discoloration. After cleaning, repack cones with clean aircraft wheel bearing grease. (See Section 2) before installation in the wheel.

5-26. REASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY (with thru-bolts.) (See figure 5-3.)

a. Insert thru-bolts through brake disc and position in the inner wheel half, using the bolts to guide the disc. Ascertain that the disc is bottomed in the wheel half.

b. Position the tire and tube with the inflation valve through hole in outboard wheel half.

c. Place inner wheel half in position on outboard wheel half. Apply a light pressure to bring wheel halves together. Maintaining the light pressure, assemble a washer and nut on one thru-bolt and tighten snugly. Assemble remaining nuts and washers on the thru-bolts, and torque to 140-150 lb in.

CAUTION

Uneven or improper torque of thru-bolt nuts may cause failure of bolts, with resultant wheel failure.

d. Clean and repack bearing cones with clean aircraft wheel bearing grease (Section 2).

e. Assemble the bearing cones, grease seal felts and rings into wheel halves.

f. Inflate tire to seat tire beads, then adjust to correct pressure.

5-27. MAIN WHEEL THRU-BOLT NUT AND CAP-SCREW TORQUE VALUES. (See Section 1.) During assembly of the main wheel, the thru-bolt nuts or capscrews should be tightened evenly and torqued to the values specified in the reassembly paragraph for each type wheel. To facilitate identification of wheel manufacturers, solid wheels are manufactured by Cleveland Aircraft Products Co., and webbed wheels are manufactured by McCauley Industrial Corporation. Cleveland wheels are also identified by having two plain wheel halves, and McCauley wheels are identified by having two wheel flanges and a hub or two interlocking wheel halves.

5-28. MAIN WHEEL INSTALLATION. (See figure 5-3.)

a. Install wheel on axle.

b. Install back plate to brake cylinder with bolts and washers.

c. Install axle nut and cotter pin.

d. Install speed fairing in accordance with paragraph 5-14 or 5-16, if installed.

e. Lower aircraft to ground.

CAUTION

Always check scraper-to-tire clearance after installing speed fairings, whenever a tire has been changed, and whenever scraper adjustment has been disturbed. If the aircraft is flown from surfaces with mud, snow, or ice, the fairing should be checked to make sure there is no accumulation which could prevent normal wheel rotation. Refer to paragraph 5-14 or 5-16 for correct scraper-to-tire clearance.

5-29. MAIN WHEEL AXLE REMOVAL.

a. Remove speed fairing in accordance with paragraph 5-13 or 5-15.

b. Remove wheel in accordance with paragraph 5-17.

c. Disconnect, drain, and plug the hydraulic brake line at the brake cylinder.

d. Remove nuts and bolts securing axle and brake components to spring-strut.

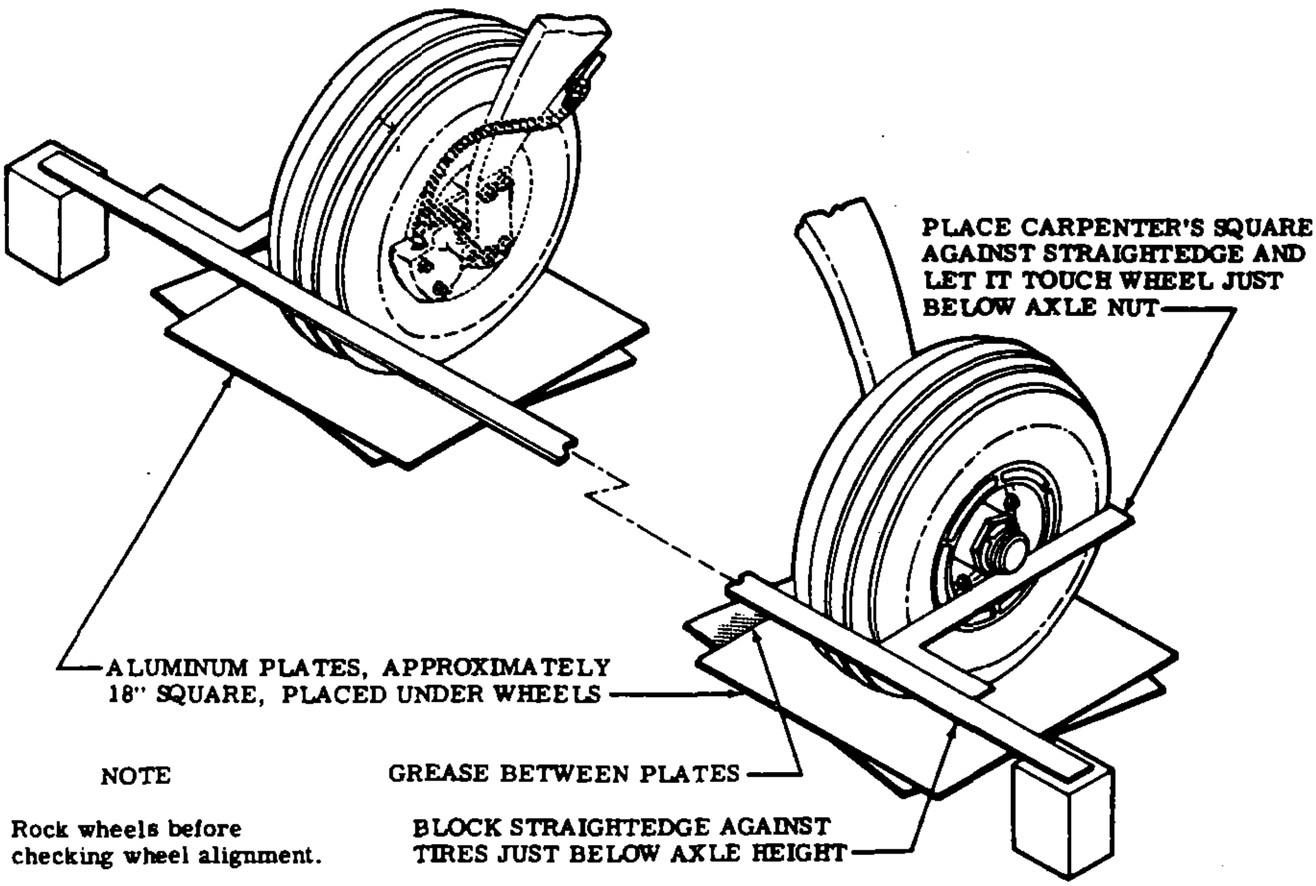
5-30. MAIN WHEEL AXLE INSTALLATION.

a. Secure axle and brake components to spring-strut, making sure that wheel alignment shims and speed fairing mounting plate are reinstalled in exactly the same position to ensure that wheel alignment is not disturbed.

NOTE

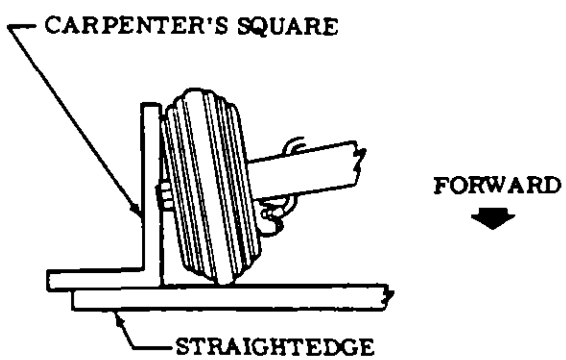
When removing axle from spring-strut, note number and position of wheel alignment shims. Mark these shims or tape them together carefully so they can be reinstalled in exactly the same position to ensure that wheel alignment is not disturbed.

SHOP NOTES:



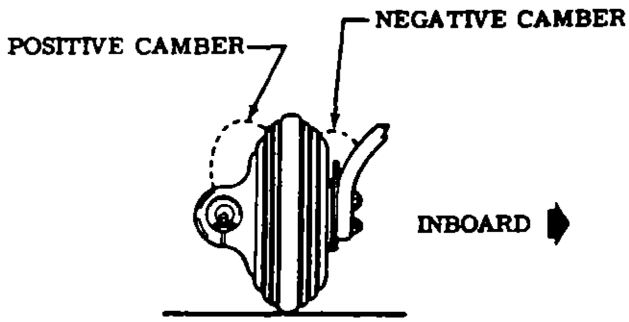
TOP VIEW OF TOE-IN CHECK

Measure toe-in at edges of wheel flange. Difference in measurements is toe-in for one wheel.



FRONT VIEW OF CAMBER CHECK

Measure camber by reading protractor level held vertically against outboard flanges of wheel.

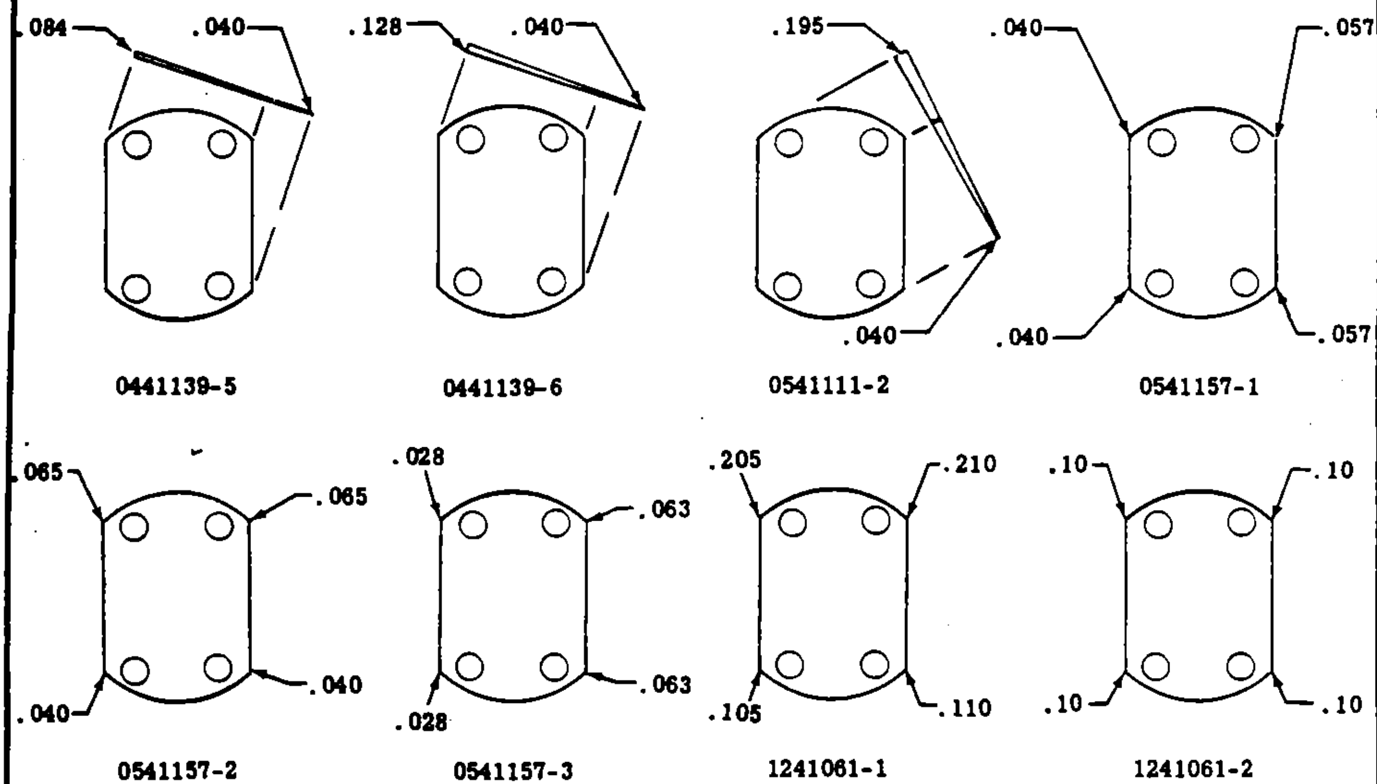


NOTE

See Section 1, figure 1-1 for toe-in and camber tolerances. Setting toe-in and camber within these tolerances while the cabin and fuel tanks are empty will give approximately zero toe-in and zero camber at gross weight. Therefore, if normal operation is at less than gross weight and abnormal tire wear occurs, realign the wheels to attain the ideal setting for the load conditions. Refer to sheet 2 of this figure for shims availability. Always use the least number of shims possible to obtain the desired result.

Figure 5-4. Main Wheel Alignment (Sheet 1 of 2)

SHIM CHART



NOTE

Maximum shim thickness is .375 inches (including fairing support plate, if installed between gear and axle). Maximum difference in shim thickness in camber plane is .108 inches. Maximum difference in shim thickness in toe plane is .100 inches. All dimensions taken at shim corners.

Figure 5-4. Main Wheel Alignment (Sheet 2 of 2)

b. Install wheel assembly on axle in accordance with paragraph 5-28.
c. Connect hydraulic brake line to brake cylinder.
d. Fill and bleed brake system in accordance with applicable paragraph in this Section.

5-31. MAIN WHEEL ALIGNMENT. Correct main wheel alignment is obtained through the use of tapered shims between the gear strut and the flange of the axle. Refer to figure 5-4 for procedures to use in checking wheel alignment. Wheel shims, and the correction imposed on the wheel by various shims, are listed in the figure.

NOTE

Failure to obtain acceptable wheel alignment through the use of the shims indicates a deformed main gear strut or strut-attaching bulkhead out of alignment.

5-32. WHEEL BALANCING. Since uneven tire wear is usually the cause of wheel unbalance, replacing the tire will probably correct this condition. Tire and tube manufacturing tolerances permit a specified amount of static unbalance. The lightweight point of the tire is marked with a red dot on the tire sidewall, and the heavyweight point of the tube is marked with a contrasting color line (usually near the valve stem. When installing a new tire, place these marks adjacent to each other. If a wheel becomes unbalanced during service, it may be statically rebalanced. Wheel balancing equipment is available from the Cessna Supply Division.

5-33. NOSE GEAR.

5-34. DESCRIPTION. A steerable nose wheel, mounted in a fork, attached to an air/oil (oleo) shock strut, make up the nose gear. Nose wheel steering is accomplished through the use of the rudder pedals. A hydraulic fluid-filled shimmy dampener is provided to minimize nose wheel shimmy. A nose wheel speed fairing may be installed.

5-35. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
TIRES WEAR EXCESSIVELY.	Loose torque links.	Add shim washers and replace parts as necessary.
	Defective shimmy dampener.	Repair or replace shimmy dampener.
	Loose or worn steering components.	Tighten loose parts; replace if defective.
	Loose wheel bearings.	Replace bearings if defective; tighten axle nut properly.
	Nose wheel out of balance.	Refer to paragraph 5-47.
NOSE WHEEL SHIMMY.	Nose strut attachment loose.	Secure attaching parts.
	Shimmy dampener lacks fluid.	Service as outlined in Section 2.
HYDRAULIC FLUID LEAKAGE FROM NOSE GEAR STRUT.	Defective strut seals and/or defects in lower strut.	Replace defective seals; stone out small defects in lower strut. Replace lower strut if badly scored or damaged.
NOSE GEAR STRUT WILL NOT HOLD AIR PRESSURE	Defective air filler valve or valve is not tight.	Check gasket and tighten loose valve. Replace defective valve.
	Defective O-ring at top of strut.	Replace O-ring.
	Result of fluid leakage at bottom of strut.	Replace defective seals; stone out small defects in lower strut. Replace lower strut if badly scored or damaged.

5-36. NOSE GEAR REMOVAL. (See figure 5-5.)

a. Weight tail to raise nose wheel off the ground.
b. Remove access plates around nose gear.
c. Disconnect nose gear steering bungee from steering arm.
d. Remove bolt and washers to disconnect drag link where it attaches to lower trunnion. Note positions of washers during removal of bolt.
e. Remove bolts to disconnect upper trunnion from fittings in tunnel structure.

NOTE

Access to bolts is obtained from inside cabin after removing carpet on each side of tunnel at firewall.

f. Remove nose gear shock strut.

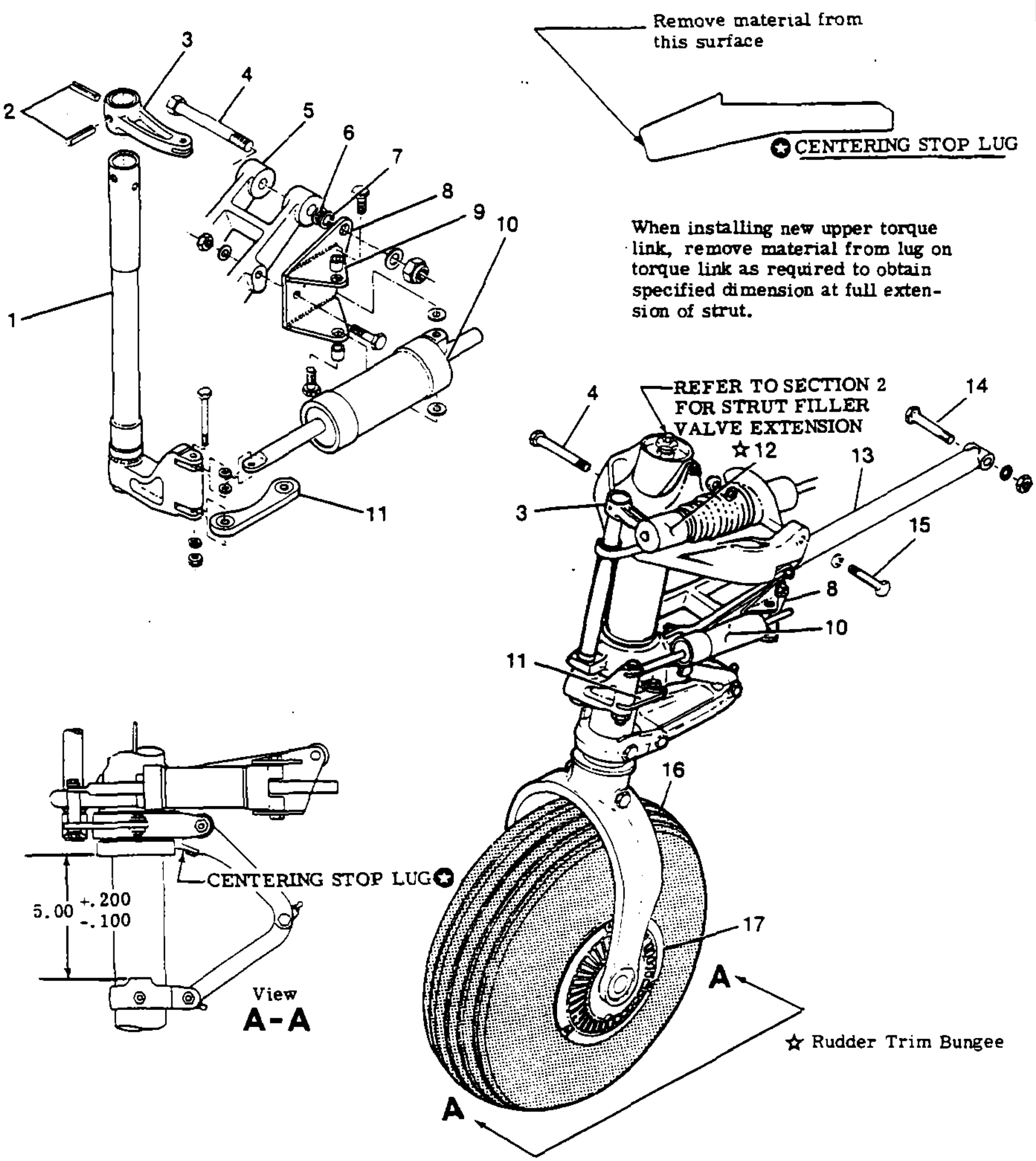
5-37. NOSE GEAR INSTALLATION. (See figure 5-5.)

a. Place nose gear strut in wheel well.
b. Install bolts to connect upper trunnion into fittings in tunnel structure.

NOTE

Access to bolts is obtained from inside cabin after removing carpet on each side of tunnel at firewall.

c. Install bolt and washers and connect drag link where it attaches to lower trunnion. Install washers



1. Steering Shaft
2. Roll Pin
3. Steering Arm
4. Bolt
5. Lower Trunnion
6. Thin Washer
7. Thick Washer
8. Bracket
9. Bushing
10. Shimmy Dampener
11. Link
12. ☆ Steering Bungee
13. Drag Link
14. Bolt
15. Bolt
16. Nose Wheel
17. Hub Cap

Figure 5-5. Nose Gear Installation

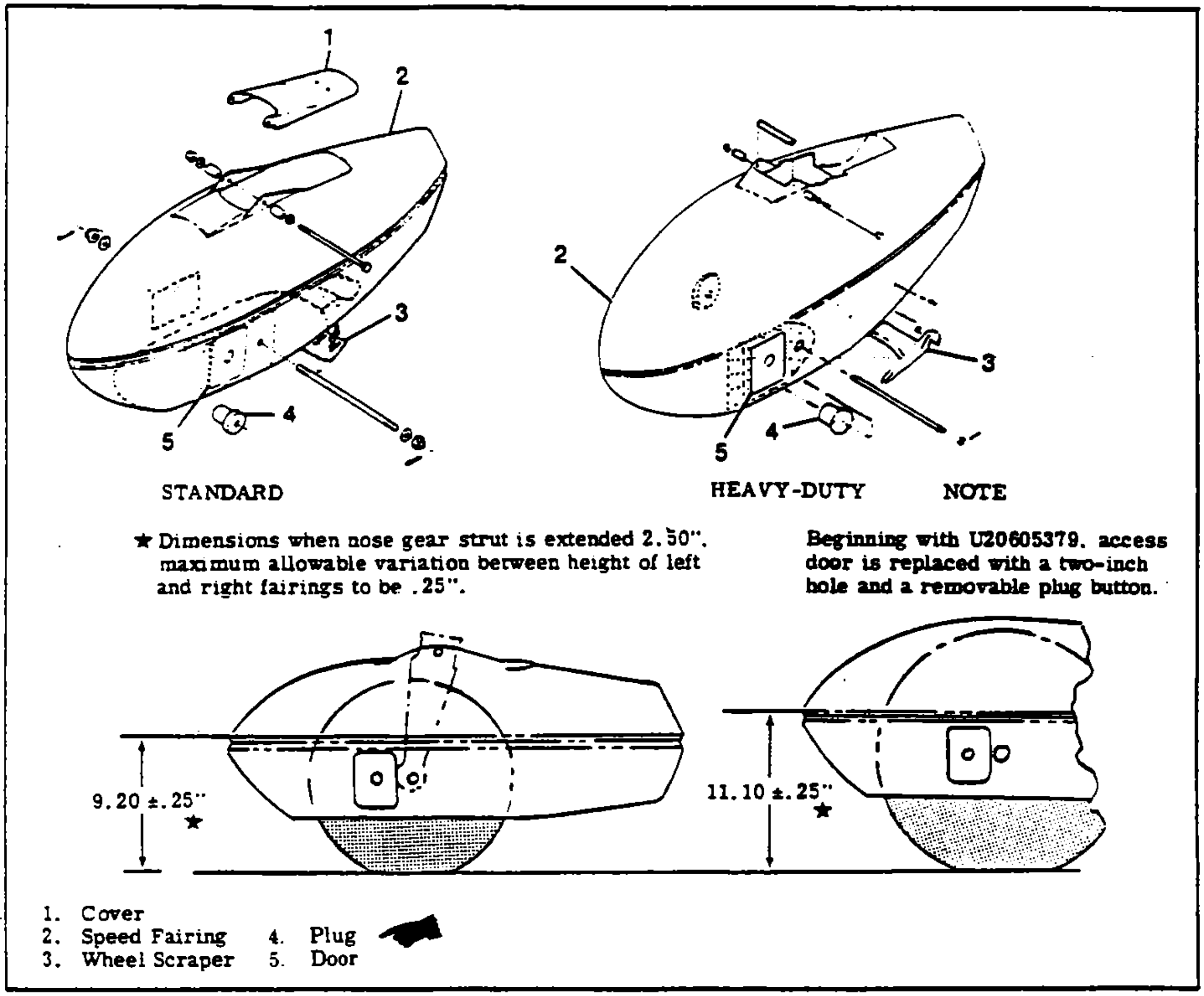


Figure 5-6. Nose Wheel Fairings

in positions from which they were removed.

d. Connect nose gear steering bungee at steering arm.

e. Install access plates around nose gear.

5-38. STANDARD NOSE WHEEL SPEED FAIRING REMOVAL. (See figure 5-6.)

a. Weight tail of aircraft to raise nose wheel off the floor.

b. Remove nose wheel axle stud.

c. Deflate strut completely.

WARNING

Ensure strut is deflated completely before removing bolt that attaches speed fairing to strut or disconnecting torque link.

d. Disconnect lower torque link from lower strut and allow strut to extend.

e. Remove bolt attaching speed fairing to strut. and remove the cover plate. This is the bolt that attaches the fork as well as the tow-bar spacers.

f. Slide speed fairing up and remove nose wheel: loosen scraper if necessary.

g. Use a rod or long punch inserted through one ferrule to tap the opposite one out of fork.

h. Remove both ferrules and pull nose wheel from fork.

i. Rotate speed fairing 90° and work it down over nose gear fork.

5-39. STANDARD NOSE WHEEL SPEED FAIRING INSTALLATION. (See figure 5-6.)

a. Rotate speed fairing 90° and work it up over nose gear fork.

b. Slide speed fairing up and install nose wheel in fork. then install both ferrules.

c. Install cover plate. bolt attaching speed fairing and tow-bar spacers to strut.

d. Connect lower torque link to lower strut.

e. Install nose wheel axle stud.

f. Tighten axle stud until a slight bearing drag is

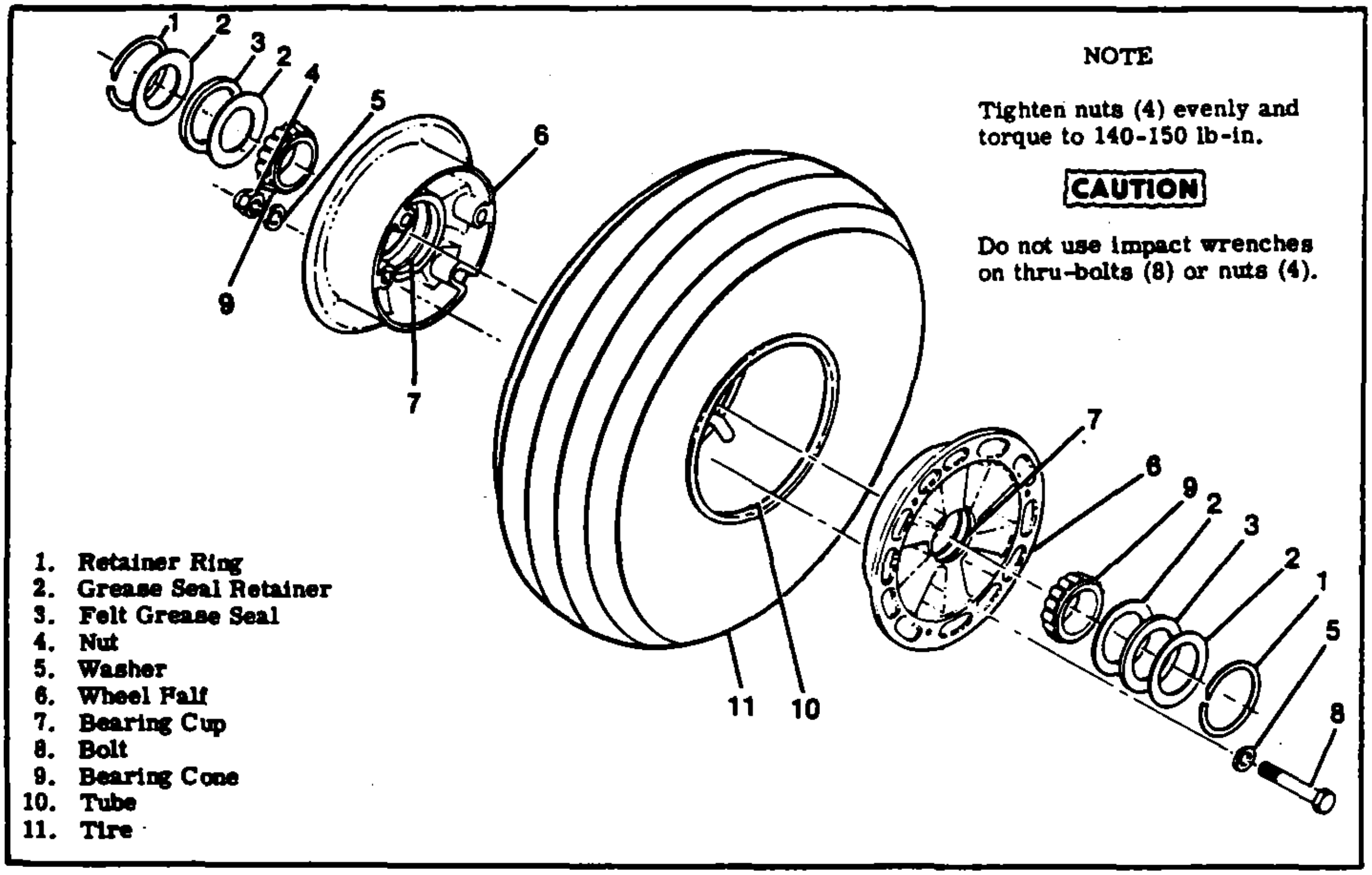


Figure 5-7. Nose Wheel

obvious when the wheel is turned. Back off the nut to the nearest castellation and install cotter pins.

g. Service shock strut after installation has been completed. (Refer to Section 2 of this manual for servicing instructions.)

CAUTION

See paragraph 5-14 for speed fairing wheel scraper adjustment.

5-40. HEAVY-DUTY NOSE WHEEL SPEED FAIRING REMOVAL. (See figure 5-6.)

a. Weight tail of aircraft to raise nose wheel off the ground.

b. Remove nose wheel axle stud.

WARNING

Be sure strut is deflated completely before disconnecting torque link.

c. Deflate strut completely and disconnect lower torque link from aft fork fitting.

d. Remove bolt securing tow-bar spacers, long spacer and speed fairing to forward fork fitting.

e. Slide speed fairing up and remove nose wheel, loosening scraper, if necessary. Use a rod or long punch inserted through one ferrule to tap the opposite one out of the fork. Remove both ferrules and pull the nose wheel from the fork.

f. Following procedures outlined in paragraph 5-51, remove lock ring from inside of lower end of upper strut. A small hole is provided in the lock ring groove to facilitate removal.

NOTE

Hydraulic fluid will drain from strut as lower strut is pulled from upper strut.

g. Using a straight, sharp pull, remove lower strut from upper strut.

h. Remove speed fairing up over lower strut.

5-41. HEAVY-DUTY NOSE WHEEL SPEED FAIRING INSTALLATION. (See figure 5-6.)

a. Slide speed fairing down over lower strut.

b. Install upper strut over lower strut.

c. Following procedures outlined in paragraph 5-53, install lock ring inside ring groove in lower end of upper strut. *When installing lock ring, position lock ring* so that one of its ends covers the small access hole in the lock ring groove.

d. Install nose wheel in fork and install ferrules.

e. Install long spacer between forward lugs of fork and speed fairing. Install tow-bar spacers washers, bolt and nut.

f. *Connect lower torque link to aft fork fitting.*

g. Install nose wheel axle stud.

h. Tighten axle stud until a slight bearing drag is obvious when the wheel is turned. Back off nut to nearest castellation and install cotter pins.

i. Service shock strut in accordance with procedures outlined in Section 2 of this manual.

j. Lower aircraft to the ground.

CAUTION

Refer to paragraph 5-16 for speed fairing wheel scraper adjustment.

5-42. NOSE WHEEL REMOVAL.

a. Weight or tie down tail of aircraft to raise nose wheel off floor.

b. Remove axle stud.

c. Use a rod or long punch inserted through one ferrule to tap the opposite one out of the fork. Remove both ferrules and pull nose wheel from fork.

NOTE

If a speed fairing is installed, it may be necessary to loosen the wheel scraper to remove the wheel.

5-43. NOSE WHEEL INSTALLATION.

a. Install nose wheel in fork and install ferrules.

b. Install axle stud.

c. Tighten axle stud until a slight bearing drag is obvious when the wheel is turned. Back off nut to nearest castellation and install cotter pins.

NOTE

If a speed fairing is installed, it may be necessary to loosen the wheel scraper to install the wheel. Refer to paragraph 5-14 for standard fairing scraper adjustment, or refer to paragraph 5-16 for heavy-duty fairing scraper adjustment.

5-44. NOSE WHEEL DISASSEMBLY. (See figure 5-7.)

WARNING

Serious injury can result from attempting to separate wheel halves with tire and tube inflated.

a. Completely deflate tire and tube and break loose tire beads. Extreme care must be exercised to prevent tire tool damage when removing tire from wheel halves (6).

b. Remove nuts (4) and washers (5).

c. Remove thru-bolts (8) and washers (5).

d. Separate and remove wheel halves (6) from tire and tube.

e. Remove retaining ring (1), grease seal retainer (2), felt grease seal (3), grease retainer (2) and bearing cone (9) from each wheel half (6).

NOTE

Bearing cups (races) (7) are a press fit in wheel half (6) and should not be removed unless a new part is to be installed. To remove bearing cups, heat wheel half in boiling water for 30 minutes, or in an oven, not to exceed 121°C (250°F). Using an arbor press, if available, press out bearing cup and press in a new bearing cup while wheel half is still hot.

5-45. NOSE WHEEL INSPECTION AND REPAIR. (See figure 5-7.)

a. Clean all metal parts and felt grease seals in Stoddard solvent, or equivalent, and dry thoroughly.

NOTE

A soft bristle brush may be used to remove hardened grease, dust or dirt.

b. Inspect wheel halves (6) for cracks or damage.

c. Inspect bearing cones (9), cups (7), retaining rings (1) and seals (2 and 3), for wear or damage.

d. Inspect thru-bolts (8) and nuts (4) for cracks in threads or cracks in radius.

e. Replace cracked or damaged wheel half (6).

f. Replace damaged retaining rings (1) and seals (2 and 3).

g. Replace any worn or cracked thru-bolts (8) or nuts (4).

h. Replace worn or damaged bearing cups (7) or cones (9).

i. Remove any corrosion or small nicks.

j. Repair reworked areas in wheel by cleaning thoroughly, then applying one coat of clean lacquer paint.

k. Pack bearings with grease specified in Section 2 of this manual.

5-46. NOSE WHEEL REASSEMBLY. (See figure 5-7.)

a. Assemble bearing cone (9), grease seal retainer (2), felt grease seal (3), grease seal retainer (2) and retaining ring (1) into both wheel halves (6).

b. Insert tube in tire, aligning index marks on tire and tube.

c. Place wheel half (6) into tire and tube (side opposite valve stem), aligning base of valve stem in valve slot. With washer (5) under head of thru-bolt (8), insert bolt through wheel half (6).

d. Place wheel half (6) into other side of tire and tube, aligning valve stem in valve slot.

e. Install washers (5) and nuts (4) on thru-bolts (8) and pre-torque to 10-50 lb. in.

CAUTION

Uneven or improper torque of the nuts can cause failure of the bolts with resultant wheel failure.

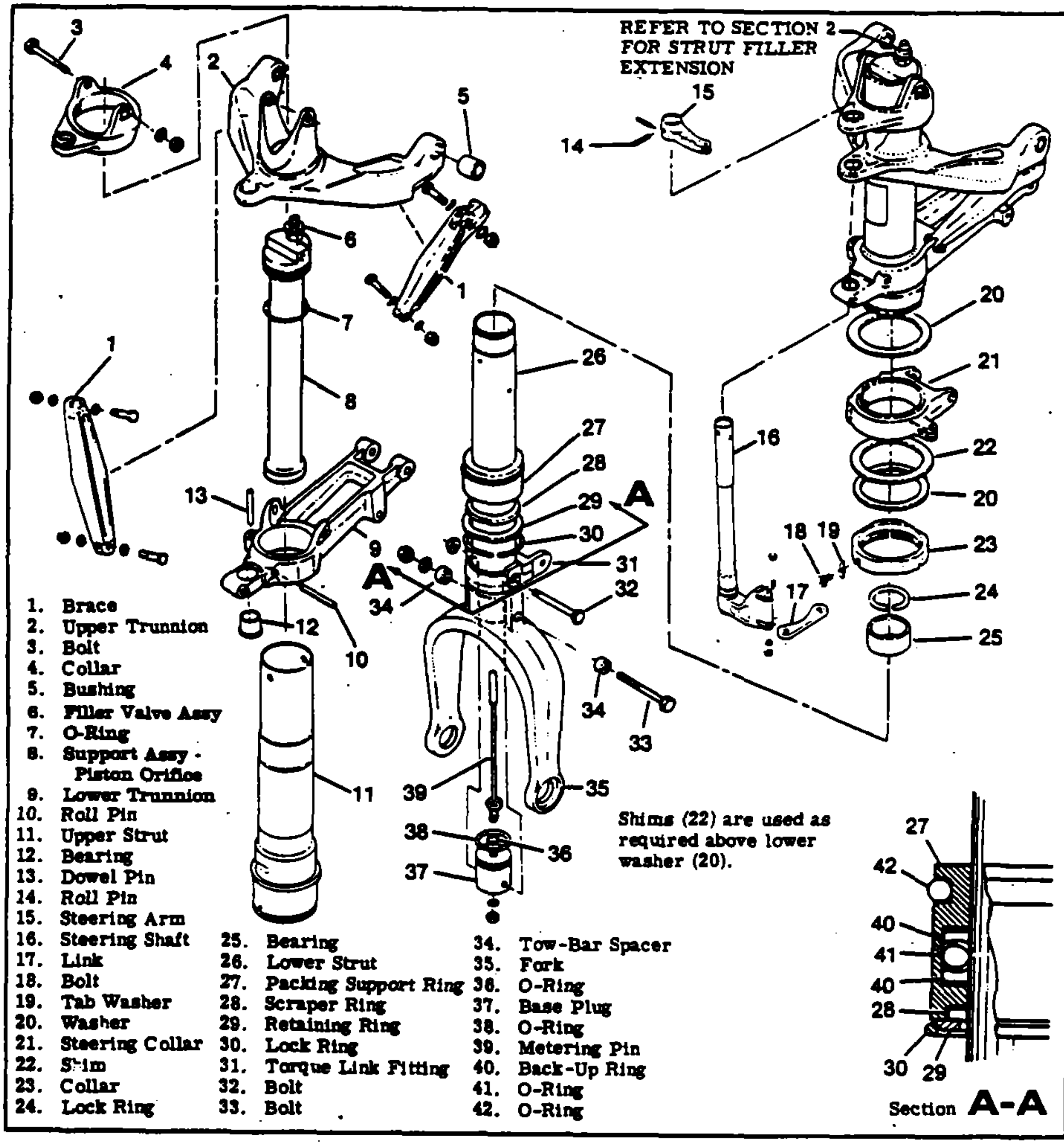
f. Prior to torquing nuts (4), inflate tube with approximately 10-15 psi air pressure to seat tire.

CAUTION

Do not use impact wrenches on thru-bolts or nuts.

g. Dry torque all nuts (4) evenly to the torque value specified in the figure.

h. Inflate tire to correct pressure specified in figure 1-1 of this manual.



1. Brace
2. Upper Trunnion
3. Bolt
4. Collar
5. Bushing
6. Filler Valve Assy
7. O-Ring
8. Support Assy - Piston Orifice
9. Lower Trunnion
10. Roll Pin
11. Upper Strut
12. Bearing
13. Dowel Pin
14. Roll Pin
15. Steering Arm
16. Steering Shaft
17. Link
18. Bolt
19. Tab Washer
20. Washer
21. Steering Collar
22. Shim
23. Collar
24. Lock Ring
25. Bearing
26. Lower Strut
27. Packing Support Ring
28. Scraper Ring
29. Retaining Ring
30. Lock Ring
31. Torque Link Fitting
32. Bolt
33. Bolt
34. Tow-Bar Spacer
35. Fork
36. O-Ring
37. Base Plug
38. O-Ring
39. Metering Pin
40. Back-Up Ring
41. O-Ring
42. O-Ring

Figure 5-8. Standard Nose Gear Shock Strut

5-47. WHEEL BALANCING. Since uneven tire wear is usually the cause of wheel unbalance, replacing the tire will probably correct this condition. Tire and tube manufacturing tolerances permit a specified amount of static unbalance. The light-weight point of the tire is marked with a red dot on the tire sidewall, and the heavy-weight point of the tube is marked with a contrasting color line (usually near the inflation valve stem). When installing a new tire, place these marks adjacent to each other. If a wheel shows evidence of unbalance during service, it may be statically balanced. Wheel balancing equipment is available from the Cessna Supply Division.

5-48. STANDARD NOSE GEAR SHOCK STRUT DISASSEMBLY. (See figure 5-8.)

NOTE

The following procedures apply to the nose gear shock strut after it has been removed from the aircraft and the speed fairing and the nose wheel have been removed. In many cases, separation of the upper and lower strut will permit inspection and parts installation without removal or complete disassembly of the strut.

WARNING

Deflate strut completely before removing bolt (3), lock ring (30) or bolt (32). Also deflate strut before disconnecting torque links.

a. Deflate strut completely.
b. Remove torque links. Note position of washers, shims, spacers and bushings.
c. Remove shimmy dampener.
d. Remove steering shaft (16) by driving out roll pins, and removing steering arm (15).
e. Remove lock ring (30) from groove inside lower end of upper strut. A small hole is provided in the lock ring groove to facilitate removal.

NOTE

Hydraulic fluid will drain from strut as lower strut is pulled from upper strut.

f. Using a straight, sharp pull, remove lower strut from upper strut. Invert lower strut and drain hydraulic fluid from strut.
g. Remove lock ring (24) and bearing (25) from top of lower strut (26).
h. Slide packing support ring (27), scraper ring (28), retaining ring (29) and lock ring (30) from lower strut. Note relative position and top side of each ring and bearing to assist in reassembly.
i. Remove and discard O-rings (41 and 42) and back-up rings (40) from packing support ring (27).
j. Remove bolt and slide torque link fitting from lower strut (26).
k. Remove metering pin (39) and base plug (37). Remove O-rings (36 and 38) and metering pin (39) from base plug (37).

NOTE

Lower strut and fork are a press fit, drilled on assembly. Separation of these parts is not recommended, except for replacement of parts.

l. Remove bolt (18), tab washer (19); unscrew collar (23) and remove shim(s) (22), washers (20) and steering collar (21) from upper strut (11).
m. Remove clamp attaching filler extension valve to strut, and disconnect from filler valve (6) at top of strut.
n. Remove bolt (3) at top of strut, and remove collar (4) and orifice support (8). Remove O-ring (7) and valve (6) from orifice support (8).
o. Bushings and bearings in lower trunnion (9), upper trunnion (2) and collar (4) may be replaced as required. Needle bearing in steering collar (21) should not be replaced; replace entire steering collar if needle bearing is defective.

5-49. STANDARD NOSE GEAR SHOCK STRUT INSPECTION AND REPAIR. (See figure 5-8.)

a. Thoroughly clean all parts in cleaning solvent and inspect them carefully.
b. All worn or defective parts, and all O-rings and back-up rings must be replaced with new parts.
c. Sharp metal edges should be smoothed with No. 40 emery paper, then cleaned with solvent.

5-50. STANDARD NOSE GEAR SHOCK STRUT REASSEMBLY. (See figure 5-8.)

NOTE

Lubricate new seals, packing and internal parts with Petrolatum VV-P-236, hydraulic fluid MIL-H-5606, or Dow-Corning DC-7. Do not use DC-7 on surfaces to be painted.

a. Install top washer (20), steering collar (21), shims (22) (as many as were removed), and collar (23). Screw collar (23) up threads on lower end of upper strut (11) until it is flush with the lower end of the strut, to the nearest one-third turn. Use shims as required above lower washer, to fill gap between collars. Shims are available from the Cessna Service Parts Center, as follows:

1243030-5	0.006"
1243030-6	0.012"
1243030-7	0.020"

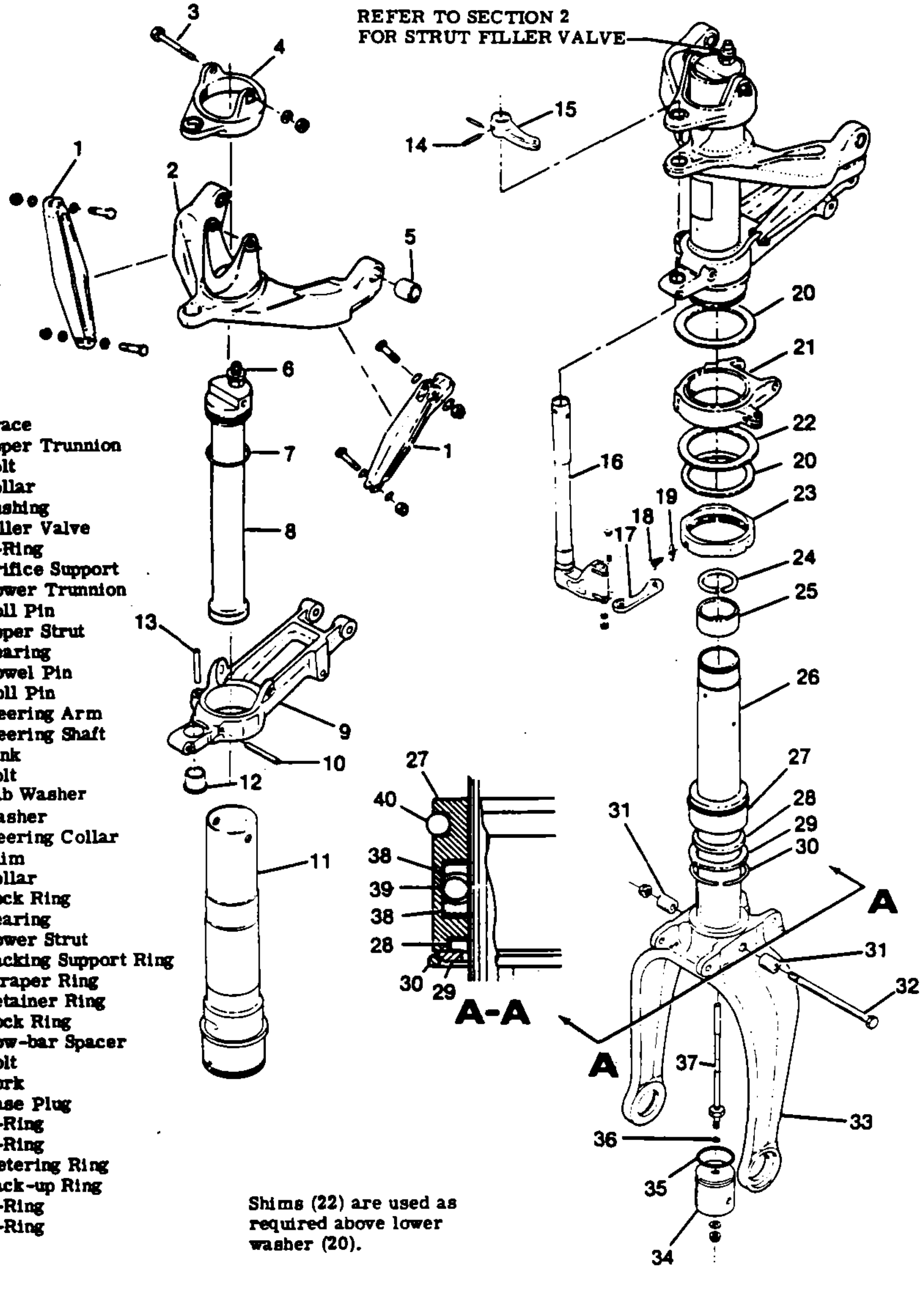
NOTE

When correct number of shims are installed, secure collar (23) with bolt (18) and secure bolt with tab washer (19) by bending tabs of washer.

b. Install O-ring (38) on base plug (37).
c. Install O-ring (36) on metering pin (39), and install in base plug (37).
d. Install tow-bar spacer (34) under head of bolt (33) and install bolt through holes in fork (35) and base plug (37). Install tow-bar spacer (34) and nut and washer on end of bolt.
e. Install lock ring (30), retaining ring (29) and scraper ring (28) down over lower strut (26). Ensure they are installed in same positions as they were when removed.
f. Install O-rings (41) and (42) and back-up rings (40) in packing support ring (27).

NOTE

Install contoured back-up rings (40), one on each side of O-ring (41) with concave surface of back-up rings next to O-ring.



1. Brace
2. Upper Trunnion
3. Bolt
4. Collar
5. Bushing
6. Filler Valve
7. O-Ring
8. Orifice Support
9. Lower Trunnion
10. Roll Pin
11. Upper Strut
12. Bearing
13. Dowel Pin
14. Roll Pin
15. Steering Arm
16. Steering Shaft
17. Link
18. Bolt
19. Tab Washer
20. Washer
21. Steering Collar
22. Shim
23. Collar
24. Lock Ring
25. Bearing
26. Lower Strut
27. Packing Support Ring
28. Scraper Ring
29. Retainer Ring
30. Lock Ring
31. Tow-bar Spacer
32. Bolt
33. Fork
34. Base Plug
35. O-Ring
36. O-Ring
37. Metering Ring
38. Back-up Ring
39. O-Ring
40. O-Ring

Shims (22) are used as required above lower washer (20).

Figure 5-9. Heavy-Duty Nose Gear Shock Strut

g. Install bearing (25) and lock ring (24) at upper end of lower strut assembly.

NOTE

Ensure that beveled edge of bearing is installed up next to lock ring.

h. Install upper strut assembly over lower strut assembly.
i. Install lock ring (30) in groove in lower end of upper strut (11). Position lock ring so that one of its ends covers the small access hole in the lock ring groove.
j. Install steering shaft (16) up through hole in lower trunnion (9) and hole in upper trunnion (2).
k. Install steering arm (15) over steering shaft (16) and secure with roll pins.
l. Install link (17) to bottom of steering shaft (16) and attach opposite end to steering collar (21).
m. If braces (1) were removed, they should be installed, connecting at upper trunnion (2) and lower trunnion (9).
n. Attach lower torque link to torque link fitting (31) and upper torque link to steering collar (21).
o. Install O-ring (7) and filler valve (6) on orifice support (8).
p. Install orifice support in upper strut (11); install bolt (3).
q. Service shock strut as outlined in Section 2 of this manual. Install strut filler valve extension.

5-51. HEAVY-DUTY NOSE GEAR SHOCK STRUT DISASSEMBLY. (See figure 5-9.)

NOTE

The following procedure outlines complete disassembly of the heavy-duty nose gear shock strut after it has been removed from the aircraft, and the nose wheel and speed fairing have been removed from the strut. In many cases, separating the upper and lower struts will permit inspection and parts replacement without removal or complete disassembly.

WARNING

Deflate strut completely before removing bolt (3), lock ring (30) or bolt (32). Also, deflate strut before disconnecting torque links.

a. Remove torque links. Note positions of washers, shims, spacers and bushings.
b. Remove shimmy dampener.
c. Remove link (17) from steering shaft (16) and steering collar (21).
d. Remove steering arm (15) by driving out roll pins (14) and (15): remove steering shaft (16).
e. Remove lock ring (30) from groove inside of lower end of upper strut (11). A small hole is provided in the lock ring groove to facilitate removal.

NOTE

Hydraulic fluid will drain from strut as lower strut is pulled from upper strut.

f. Using a straight, sharp pull, remove lower strut (26) from upper strut (11). Invert lower strut and drain hydraulic fluid from strut.
g. Remove lock ring (24) and bearing (25) from top end of lower strut.
h. Slide packing support ring (27), scraper ring (28), retaining ring (29) and lock ring (30) from lower strut (26). Note relative position and top side of each bearing and ring to aid in reassembly.
i. Remove and discard O-rings and back-up rings from packing support ring.
j. Remove bolt (32) securing tow-bar spacers (31), base plug (34) and metering pin (37). Remove O-rings and metering pin from base plug.
k. Remove bolt (18) and tab washer (19). Unscrew collar (23), and remove washers (20), shim(s) (22) and steering collar (21).
l. Remove clamp attaching filler valve extension to strut and disconnect from filler valve (6) at top of strut.
m. Remove bolt (3) and remove collar (4) and orifice support (8). Remove O-ring (7) and filler valve (6) from orifice support.

5-52. HEAVY-DUTY NOSE GEAR SHOCK STRUT INSPECTION AND REPAIR. (See figure 5-9.)

NOTE

Upper and lower trunnions are press-fitted to upper strut, with braces installed during the assembly. Pin is also press-fitted to the lower trunnion.

a. Thoroughly clean all parts in cleaning solution and inspect them carefully.
b. All worn or defective parts, and all O-rings and back-up rings must be replaced with new parts.
c. Sharp metal edges should be smoothed with No. 40 emery paper, then cleaned with solvent.

5-53. HEAVY-DUTY NOSE GEAR SHOCK STRUT REASSEMBLY. (See figure 5-9.)

NOTE

Lubricate new seals, packing and internal parts with Petrolatum VV-P-236, hydraulic fluid MIL-H-5606, or Dow-Corning DC-7. Do not use DC-7 on surfaces to be painted.

a. Install filler valve (6) and O-ring (7) on orifice support (8).
b. Insert orifice support (8) in upper strut (11). Install collar (4) and secure orifice support and collar inside upper strut (11) with bolt (3).
c. Install top washer (20), steering collar (21), shims (22) (as many as were removed), and collar (23). Screw collar (23) up threads on lower end of upper strut (11) until it is flush with the lower end of the strut, to the nearest one-third turn. Use shims

as required above lower washer, to fill gap between collars. Shims are available from the Cessna Service Parts Center, as follows:

1243030-5	0.006"
1243030-6	0.012"
1243030-7	0.020"

NOTE

When correct number of shims are installed, secure collar (23) with bolt (18), and secure with tab washer (19) by bending tabs of washer.

d. Install O-ring (35) on base plug (34).
e. Install O-ring (36) on metering pin (37), and install in base plug (34).
f. Install tow-bar spacer (31) under head of bolt (32), and install bolt through hole in fork (33) and base plug (34). Install tow-bar spacer (31) and nut on threaded end of bolt.
g. Install lock ring (30), retaining ring (29) and scraper ring (28) down over lower strut (26). Ensure they are in same positions in which they were when removed.
h. Install O-rings (39) and (40) and back-up rings (38) in packing support ring (27).

NOTE

Install contoured back-up rings (38), one on each side of O-ring (39) with concave surface of back-up rings next to O-ring.

i. Install bearing (25) and lock ring (24) at upper end of lower strut assembly.

NOTE

Ensure that beveled edge of bearing is installed up next to lock ring.

j. Install upper strut assembly over lower strut assembly.
k. Install lock ring (30) in groove in lower end of upper strut (11). Position lock ring so that one of its ends covers the small access hole in the lock ring groove.
l. Install steering shaft (16) up through hole in lower trunnion (9) and hole in upper trunnion (2).
m. Install steering arm (15) over steering shaft (16) and secure with roll pins.
n. Install link (17) to bottom of steering shaft (16) and attach opposite end to steering collar (21).
o. Attach upper torque link to steering collar (21), and attach lower torque link to aft lugs of fork (33).
p. Install strut filler valve extension and service shock strut as outlined in Section 2 of this manual.

5-54. TORQUE LINKS. (See figure 5-10.)

5-55. DESCRIPTION. Torque links keep the lower strut aligned with the nose gear steering system, but permit shock strut action.

5-56. TORQUE LINK REMOVAL.

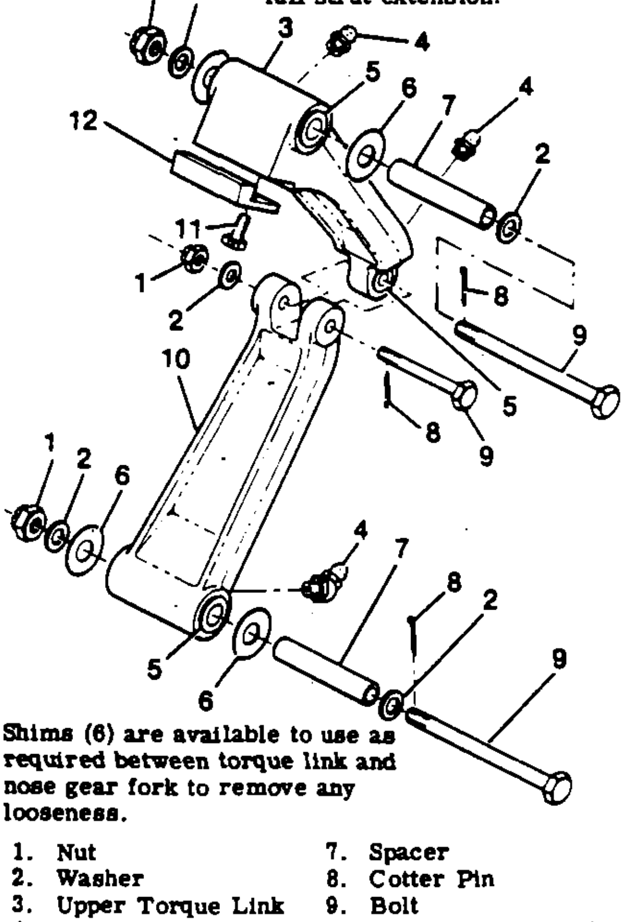
WARNING

Completely deflate strut before removing torque links.

a. Completely deflate shock strut.
b. Disconnect upper and lower attaching bolts, spacers, shims and nuts; remove torque links.

5-57. TORQUE LINK INSTALLATION. (See figure 5-10.)
a. With shock strut completely deflated, install upper and lower torque link assemblies.
b. Tighten torque link center bolt snugly, then tighten to next castellation and install cotter pin.
c. Check upper torque link and lower torque link for looseness. If looseness is apparent, remove attaching nuts and bolts, and install shims as necessary to take up any looseness. This will assist in preventing nose wheel shimmy.
d. Retighten nuts snugly, then tighten to align next

See figure 5-5 for removal of material from lug (12) to obtain correct dimension at full strut extension.



Shims (6) are available to use as required between torque link and nose gear fork to remove any looseness.

1. Nut	7. Spacer
2. Washer	8. Cotter Pin
3. Upper Torque Link	9. Bolt
4. Grease Fitting	10. Lower Torque Link
5. Bushing	11. Bolt
6. Shim	12. Centering Lug

Figure 5-10. Torque Links

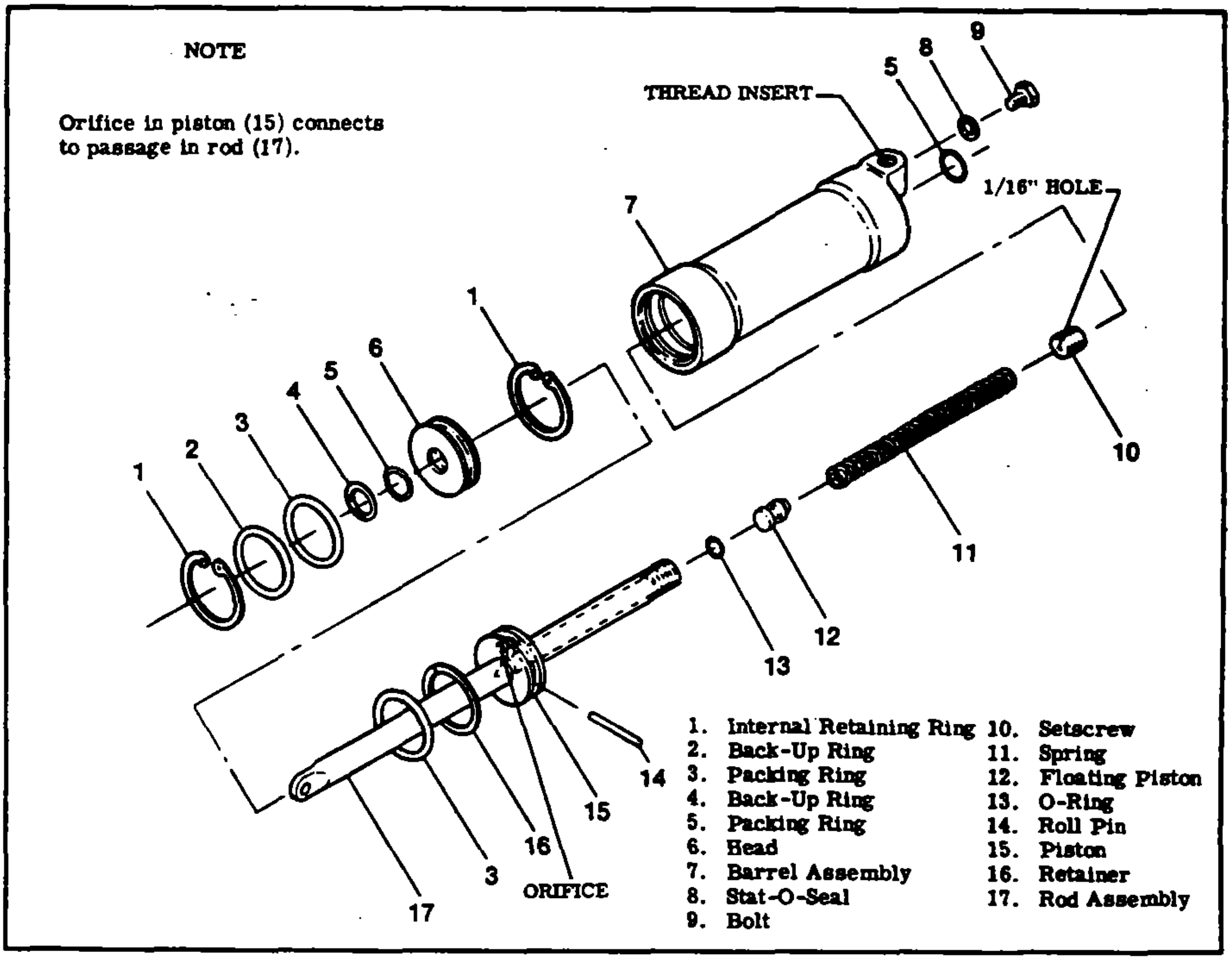


Figure 5-11. Shimmy Damper

castellation with cotter pin hole in bolt; install cotter pin.

e. Fill and inflate shock strut in accordance with procedures outlined in Section 2 of this manual.

5-58. SHIMMY DAMPER. (See figure 5-11.)

5-59. DESCRIPTION. The shimmy damper offers resistance to shimmy by forcing hydraulic fluid through small orifices in a piston. The damper piston shaft is secured to the nose gear steering shaft, and the housing is attached to a bracket on the lower trunnion.

5-60. SHIMMY DAMPER REMOVAL.

a. Remove bolts and washers attaching damper housing to bracket on the lower trunnion.

b. Remove bolt, washer, and nut attaching the damper piston shaft to the nose gear steering shaft.

c. Remove shimmy damper.

5-61. SHIMMY DAMPER INSTALLATION. (See figure 5-11.)

a. Install damper piston shaft in nose gear steering shaft; install bolt, piston, and nut.

b. Install damper housing in bracket installed on lower trunnion; install washers and nuts.

NOTE

Do not torque nut or bolt over 10 lb.-in. at either end of shimmy damper.

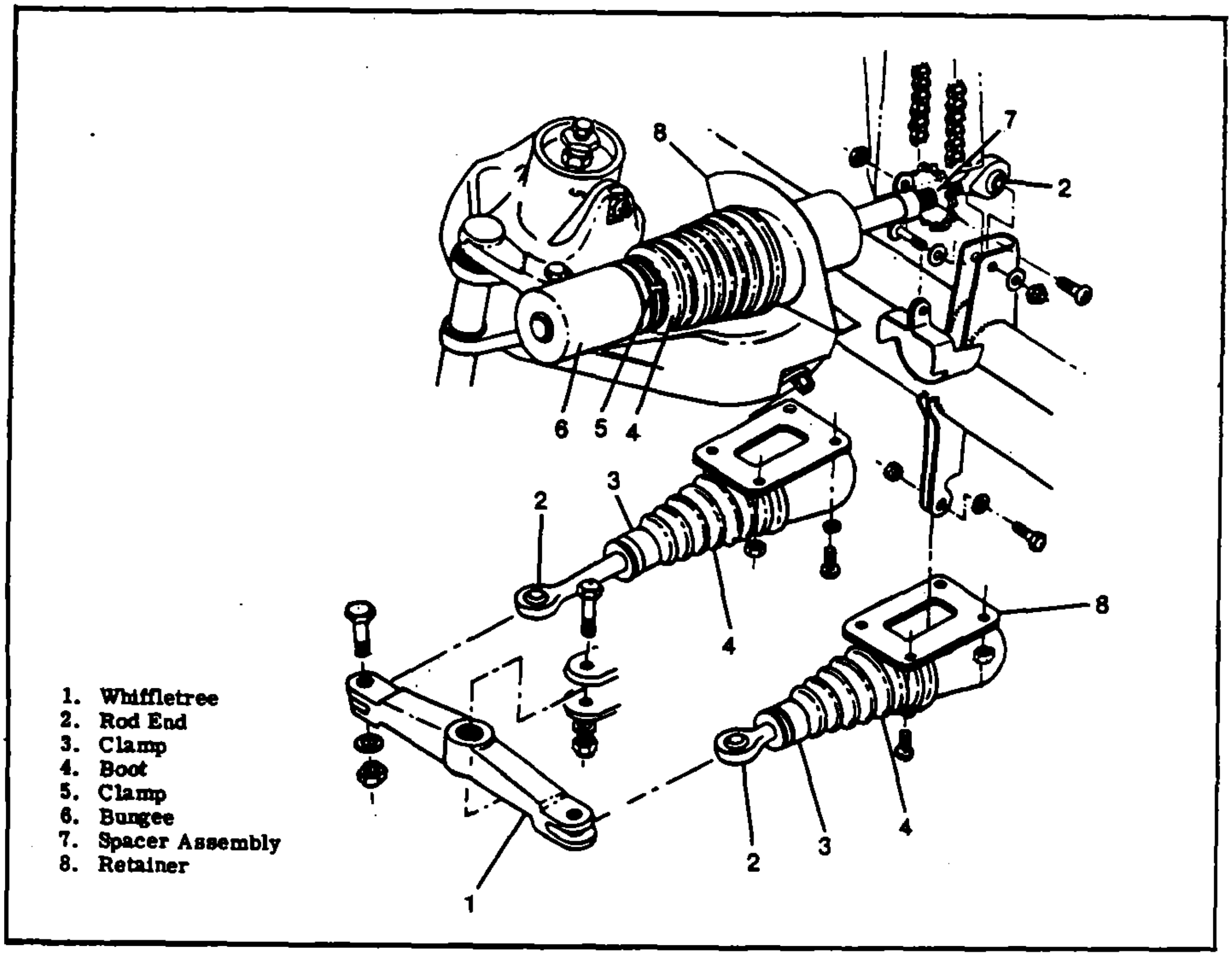


Figure 5-12. Nose Wheel Steering System

5-62. NOSE WHEEL STEERING SYSTEM. (See figure 5-12.)

5-63. DESCRIPTION. The nose wheel steering system links the rudder pedals to the nose wheel steering arm, affording steering control through the use of the rudder pedals and brakes. When moving the aircraft by hand, never turn the nose wheel more than 35-degrees either side of center.

5-64. REMOVAL AND INSTALLATION OF STEERING SYSTEM COMPONENTS. (See figure 5-12.) *The figure may be used as a guide during replacement of parts.*

5-65. NOSE WHEEL STEERING SYSTEM RIGGING. Since the nose wheel steering system is connected to the rudder control system and the rudder trim control system, adjustment to one system will affect the other systems. Refer to Section 10 of this manual for system rigging.

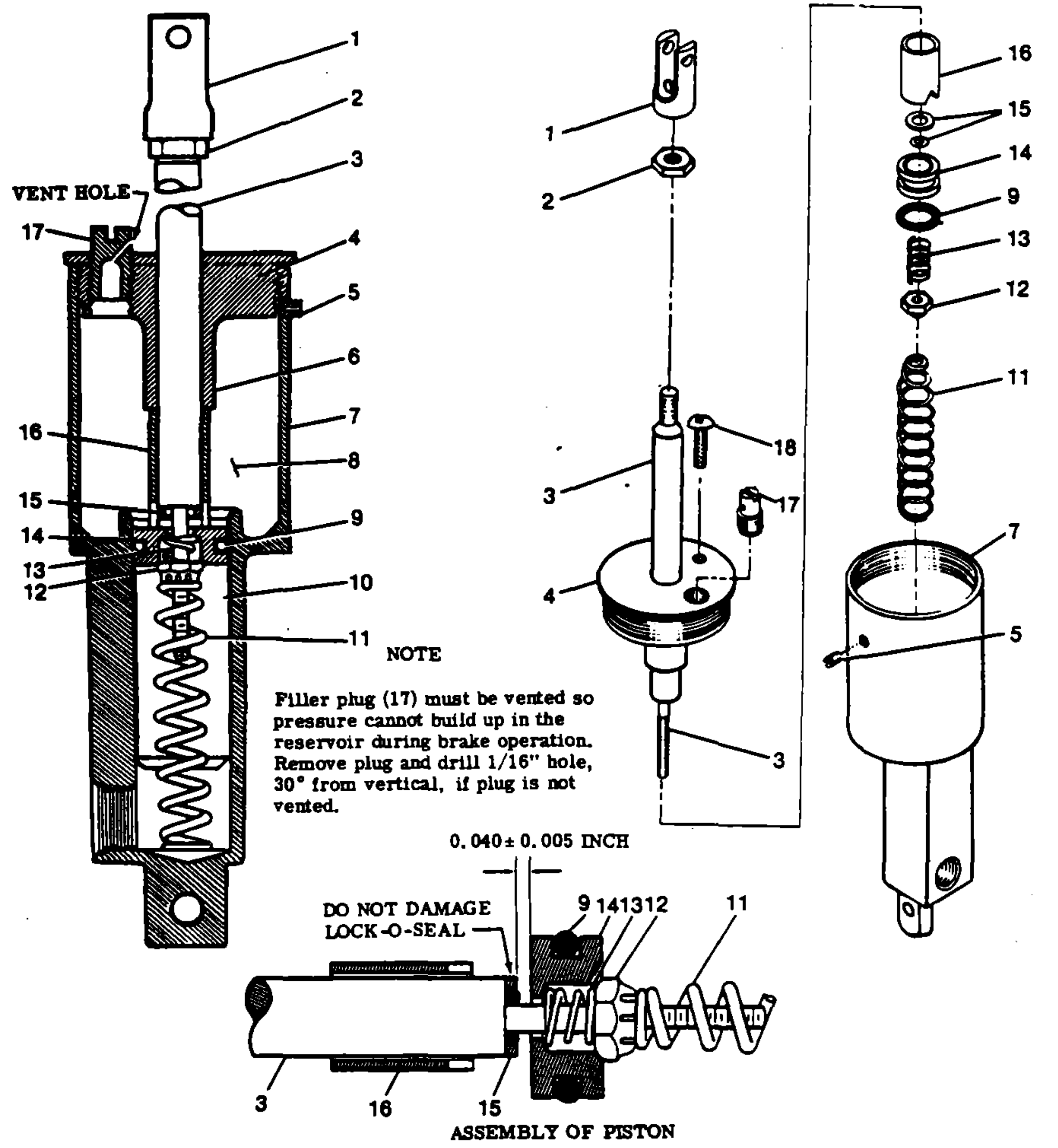
SHOP NOTES:

5-66. BRAKE SYSTEM.

5-67. DESCRIPTION. The hydraulic brake system is comprised of two master cylinders, located immediately forward of the rudder pedals; brake lines, connecting each master cylinder to its wheel brake cylinder, and the single-disc, floating cylinder-type brake assembly, located at each main landing gear wheel.

5-68. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
DRAGGING BRAKES.	Brake pedal binding.	Lubricate pivot points; replace or repair defective parts.
	Weak or broken piston return spring in master cylinder.	Repair or replace master cylinder.
	Parking brake control improperly adjusted.	Adjust properly.
	Insufficient clearance between lock-O-seal and piston in master cylinder.	Adjust clearance per paragraph 5-74.
	Restriction in hydraulic lines or in passage in master cylinder compensating sleeve.	Remove restrictions; flush brake system with denatured alcohol. Repair or replace master cylinder.
	Warped or badly scored brake disc.	Replace disc and linings.
	Damage or accumulated dirt restricting free movement of wheel brakes.	Clean and repair or replace brake parts.
BRAKES FAIL TO OPERATE.	Fluid low in master cylinder or wheel cylinder.	Fill system and bleed brakes.
	Faulty O-rings in master cylinder or wheel cylinder.	Replace O-rings.
	Faulty lock-O-seal in master cylinder.	Replace lock-O-seal.
	Excessive clearance between lock-O-seal and piston.	Adjust clearance per paragraph 5-74.
	Internal damage to hose and O-rings due to use of wrong type of hydraulic fluid.	Replace damaged parts. Flush system with denatured alcohol. Fill and bleed brake system.
	Pressure leak in system.	Tighten connection; repair or replace faulty parts.
	Brake linings worn out.	Replace linings.
	Oil or grease on brake linings or new linings just installed.	Clean linings with carbon tetrachloride.



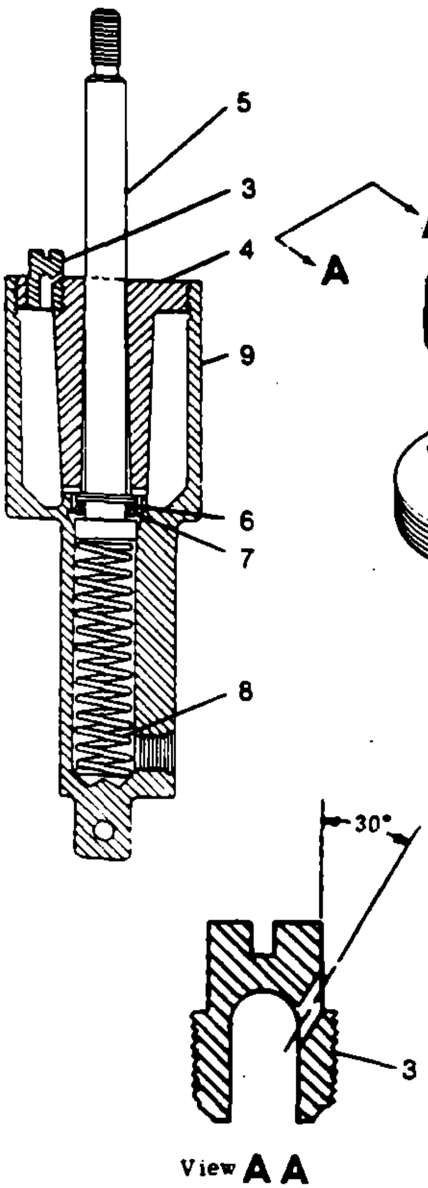
NOTE

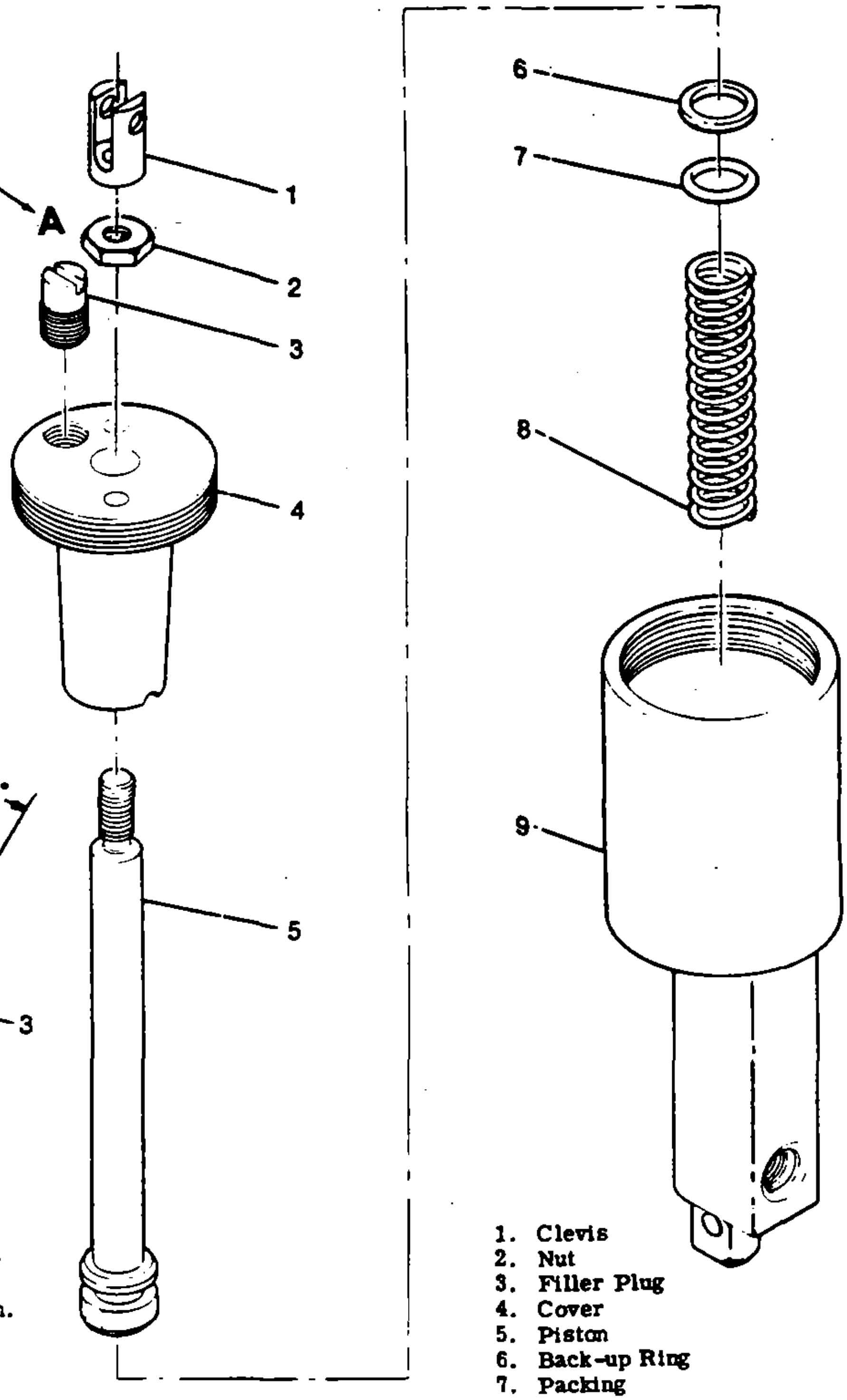
Filler plug (17) must be vented so pressure cannot build up in the reservoir during brake operation. Remove plug and drill 1/16" hole, 30° from vertical, if plug is not vented.

THRU 20604649

1. Clevis
2. Jam Nut
3. Piston Rod
4. Cover
5. Setscrew
6. Cover Boss
7. Body
8. Reservoir
9. O-Ring
10. Cylinder
11. Piston Return Spring
12. Nut
13. Piston Spring
14. Piston
15. Lock-O-Seal
16. Compensating Sleeve
17. Filler Plug
18. Screw

Figure 5-13. Brake Master Cylinder (Sheet 1 of 2)





NOTE

Filler plug (3) must be vented so pressure cannot build up in the reservoir during brake operation. Remove plug and drill 1/16" hole 30° from vertical (as shown in view A-A), if plug is not vented.

1. Clevis
2. Nut
3. Filler Plug
4. Cover
5. Piston
6. Back-up Ring
7. Packing
8. Spring
9. Cylinder Body

BEGINNING WITH 20604650

Figure 5-13. Brake Master Cylinder (Sheet 2 of 2)

5-69. BRAKE MASTER CYLINDER.

5-70. DESCRIPTION. The brake master cylinders, located immediately forward of the pilot's rudder pedals, are actuated by applying pressure at the top of the rudder pedals. A small reservoir is incorporated into each master cylinder for the fluid supply. When dual brakes are installed, mechanical linkage permits the copilot pedals to operate the master cylinders.

5-71. BRAKE MASTER CYLINDER REMOVAL.
a. Remove bleeder screw at wheel brake assembly and drain hydraulic fluid from brake cylinders.
b. Remove front seats and rudder bar shield for access to brake master cylinders.
c. Disconnect parking brake linkage and disconnect brake master cylinders from rudder pedals.
d. Disconnect hydraulic hose from brake master cylinders and remove cylinders.
e. Plug or cap hydraulic fittings, hose and lines, to prevent entry of foreign material.

5-72. DISASSEMBLY. (Thru 20604649.) (See figure 5-13, sheet 1 of 2.)
a. Unscrew clevis (1) and jamb nut (2).
b. Remove screw (18).
c. Remove filler plug (17) and setscrew (5).
d. Unscrew cover (4) and remove up over piston rod (3).
e. Remove piston rod (3) and compensating sleeve (16).
f. Slide sleeve (16) up over rod (3).
g. Unscrew nut (12) from threads of piston rod (3).
h. Remove piston spring (13) and O-ring (9) from piston (14).
i. Remove Lock-O-Seal (15).

5-73. INSPECTION AND REPAIR. (Thru 20604649.) (See figure 5-13, sheet 1 of 2.)
limited to installation of new parts, cleaning and adjusting. (Refer to reassembly paragraph for adjustment.) Use clean hydraulic fluid (MIL-H-5606) as a lubricant during reassembly of the cylinders. Inspect Lock-O-Seal (Parker Seal Co. P/N 800-001-6) and replace if damaged. Replace all O-rings. Filler plug must be vented so pressure cannot build up in the reservoir during brake operation. Remove plug and drill a 1/16-inch hole, 30° from vertical, if plug is not vented.

5-74. REASSEMBLY. (Thru 20604649.) (See figure 5-13, sheet 1 of 2.)
a. Install Lock-O-Seal (15) at bottom of piston rod (3).
b. Install O-ring (9) in groove in piston (14); insert piston spring (13) into piston, and slide assembly up on bottom threaded portion of piston rod (3).
c. Run nut (12) up threads to spring (13). Tighten nut enough to obtain 0.040±0.005-inch clearance between top of piston and bottom of Lock-O-Seal, as shown in the figure.
d. Install piston return spring (11) into cylinder (10) portion of body (7).
e. Install piston rod (3) through spring (11).
f. Slide compensating sleeve (16) over rod (3).
g. Install cover (4) and screw (18).
h. Install jamb nut (2) and clevis (1).
i. Install filler plug (17), making sure vent hole is open.
j. Install setscrew (5).

5-75. DISASSEMBLY. (Beginning with 20604650.) (See figure 5-13, sheet 2 of 2.)
a. Unscrew clevis (1) and jam nut (2).
b. Remove filler plug (3).

NOTE

A special tool, brake master cylinder wrench No. 34-101, is available from the Cessna Supply Division to accomplish the following step.

c. Unscrew cover (4) and remove up over piston (5).
d. Remove piston (5) and spring (8).
e. Remove packing (7) and back-up ring (8) from piston (5).

5-76. INSPECTION AND REPAIR. (Beginning with 20604650.) (See figure 5-13, sheet 2 of 2.)
Repair is limited to installation of new parts and cleaning. Use clean hydraulic fluid (MIL-H-5606) as a lubricant during reassembly of the cylinder. Replace packing and back-up ring. Filler plug (3) must be vented so pressure cannot build up during brake operation. Remove plug and drill 1/16-inch hole 30° from vertical, if plug is not vented. Refer to view A-A for location of vent hole.

5-77. REASSEMBLY. (Beginning with 20604650.) (See figure 5-13, sheet 2 of 2.)
a. Install spring (8) into cylinder body (9).
b. Install back-up ring (6) and packing (7) in groove of piston (5).
c. Install piston (5) in cylinder body (9).
d. Install cover (4) over piston (5) and screw cover into cylinder body (9).
e. Install nut (2) and clevis (1).
f. Install filler plug (3), making sure vent hole is open.

5-78. BRAKE MASTER CYLINDER INSTALLATION.
a. Connect hydraulic hoses to brake master cylinders, and install cylinders.
b. Connect brake master cylinders to rudder pedals, and connect parking brake linkage.
c. Install rudder bar shield and install front seats.
d. Install bleeder screw at wheel brake assembly and fill and bleed brake system in accordance with applicable paragraph in this Section.

5-79. HYDRAULIC BRAKE LINES.

5-80. DESCRIPTION. The brake lines are of rigid tubing, except for flexible hose at the wheel brakes and at the brake master cylinders. A separate line is used to connect each brake master cylinder to its corresponding wheel brake cylinder.

WARNING

After connecting brake hose, ensure the hose does not contact or rub against brake disc, causing brake hose failure.

5-81. WHEEL BRAKE ASSEMBLY. (See figure 5-3.)

5-82. DESCRIPTION. The wheel brake assemblies employ a floating brake assembly and a disc which is attached to the main wheel.

5-83. WHEEL BRAKE REMOVAL. (See figure 5-3.) Wheel brake assemblies can be removed by disconnecting the brake line (drain fluid when disconnecting line) and removing the back plate. The brake disc is removed after the wheel is removed and disassembled. To remove the torque plate, remove wheel and axle.

5-84. WHEEL BRAKE DISASSEMBLY. (See figure 5-3 for a breakdown of wheel brake parts. This figure may be used as a guide for disassembling the wheel brakes.

5-85. WHEEL BRAKE INSPECTION AND REPAIR.

a. Clean all parts except brake linings and O-rings in dry cleaning solvent and dry thoroughly.
b. Install all new O-rings. If O-ring reuse is necessary, wipe with a clean cloth saturated in hydraulic fluid and inspect for damage.

NOTE

Thorough cleaning is important. Dirt and chips are the greatest single cause of malfunctions in the hydraulic brake system.

c. Check brake lining for deterioration and maximum permissible wear. (Refer to applicable paragraph for maximum wear limit.)
d. Inspect brake cylinder base for scoring. A scored cylinder will leak or cause rapid O-ring wear. Install a new brake cylinder if the base is scored.
e. If the anchor bolts on the brake assembly are nicked or gouged, they shall be sanded smooth to prevent binding with the pressure plate or the torque plate. When new anchor bolts are to be installed, press out old bolts and install new bolts with a mallet.
f. Inspect brake disc. Sand smooth small nicks and scratches. If excessively warped or scored, brake disc should be replaced with a new part. Replace disc if worn to less than minimum allowable thickness:

Cleveland C163001-0301: (0.327-inch),
Cleveland C163001-0302: (0.327-inch),
McCauley C163006-0102: (0.330-inch),
McCauley C163006-0103: (0.330-inch),
McCauley C163004-0101: (0.325-inch),
McCauley C163004-0102: (0.325-inch).

5-86. WHEEL BRAKE REASSEMBLY. (See figure 5-3.)

NOTE

Lubricate parts with clean hydraulic fluid during brake reassembly.

a. Refer to figure 5-3 as a guide while reassembling wheel brakes.

5-87. WHEEL BRAKE INSTALLATION.

a. Place brake assembly in position with pressure plate in place.

NOTE

If torque plate was removed, install as the axle is installed, or install on axle. If the brake disc was removed, install as wheel is assembled.

5-88. CHECKING BRAKE LINING. New brake lining should be installed when the existing lining has worn to a thickness of 3/32-inch. A 3/32-inch thick strip of material held adjacent to each lining can be used to determine amount of wear. The shank end of a drill bit of the correct size can also be used to determine wear of brake linings.

5-89. BRAKE LINING INSTALLATION. (See figure 5-3.)

a. Remove bolts securing back plate, and remove back plate.
b. Pull brake cylinder out of torque plate and slide pressure plate off anchor bolts.
c. Place back plate on a table with lining side down flat. Center a 9/64-inch (or slightly smaller) punch in the rolled rivet, and hit the punch sharply with a hammer. Punch out all rivets securing the linings to the back plate and pressure plate in the same manner.

NOTE

A rivet setting kit, Part No. 199-00100, is available from the Cessna Supply Division. This kit consists of an anvil and punch.

d. Clamp the flat side of the anvil in a vise.
e. Align new lining on back plate and place brake rivet in hole with rivet head in the lining. Place the head against the anvil.
f. Center rivet setting punch on lips of rivet. While holding back plate down firmly against lining, hit punch with hammer to set rivet. Repeat blows on punch until lining is firmly against back plate.
g. Realign the lining on the back plate and install and set rivets in the remaining holes.
h. Install a new lining on pressure plate in the same manner.
i. Position pressure plate on anchor bolts and place cylinder in position so that anchor bolts slide into the torque plate.
j. Install back plate with bolts and washers.

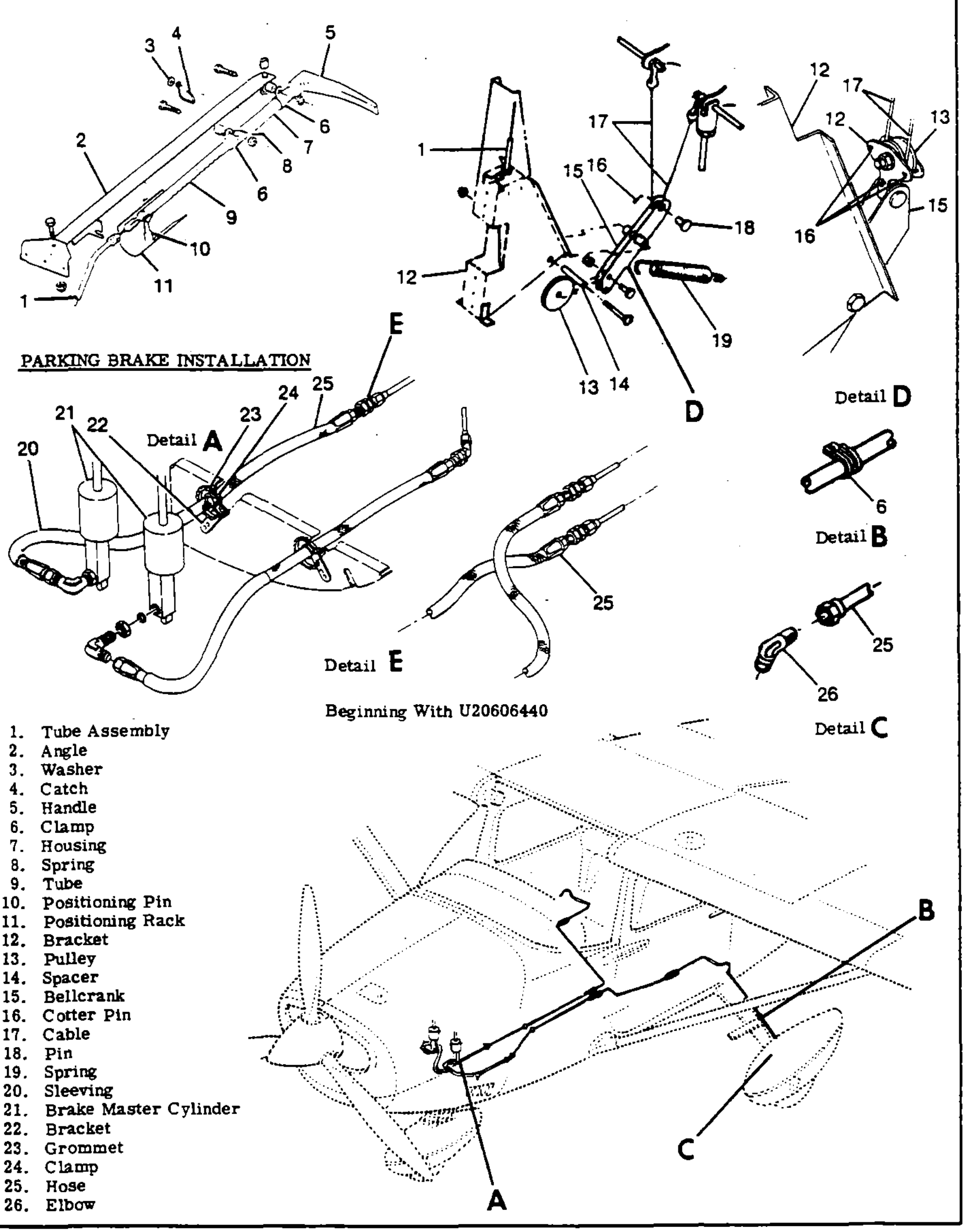
WARNING

After reinstallation of the brake assembly, check brake line clearance to the disc in the area above the axle.

5-90. BRAKE SYSTEM BLEEDING.

NOTE

Bleeding with a clean hydraulic pressure source connected to the wheel cylinder bleeder is recommended.



1. Tube Assembly
2. Angle
3. Washer
4. Catch
5. Handle
6. Clamp
7. Housing
8. Spring
9. Tube
10. Positioning Pin
11. Positioning Rack
12. Bracket
13. Pulley
14. Spacer
15. Bellcrank
16. Cotter Pin
17. Cable
18. Pin
19. Spring
20. Sleeving
21. Brake Master Cylinder
22. Bracket
23. Grommet
24. Clamp
25. Hose
26. Elbow

Figure 5-14. Brake System

a. Remove brake master cylinder filler plug and screw flexible hose with appropriate fitting into the filler hole at top of the brake master cylinder.

b. Immerse opposite end of flexible hose in a container with enough hydraulic fluid to cover end of the hose.

c. Connect a clean hydraulic pressure source, such as a hydraulic hand pump or Hydro-Fill unit to the bleeder valve in the wheel cylinder.

d. As fluid is pumped into the system, observe the immersed end of the hose at the master brake cylinder for evidence of air bubbles being forced from the brake system. When bubbling has ceased, remove bleeder source from wheel cylinder, and tighten bleeder valve.

e. Remove flexible hose from filler hole in brake master cylinder and install filler plug.

5-90A. BRAKE LINING CONDITIONING. The brake lining pads used in this assembly are either non-asbestos organic composition or iron based metallic composition. Brake pads must be properly conditioned (glazed) before use in order to provide optimum service life. This is accomplished by a brake burn-in. Burn-in also wears off brake high spots prior to operational use. If brake use is required before burn-in, use breaks intermittently at LOW taxi speeds.

CAUTION

Brake burn-in must be performed by a qualified person familiar with acceleration and stop distance of the aircraft.

a. Non-asbestos Organic Composition Burn-in.

1. Taxi the aircraft for 1500 feet, with engine at 1700 rpm, applying brake pedal forces as needed to maintain 5 to 10 MPH. (5 to 9 knots).
2. Allow brakes to cool for 10 to 15 minutes.
3. Apply brakes and check to see if a high throttle static engine runup can be held with normal pedal force. If so, conditioning burn-in is complete.
4. If static runup cannot be held, repeat Steps 1 thru 3 as needed.

b. Metallic Composition Burn-in.

1. Taxi the aircraft at 34 to 40 MPH. (30 to 35 knots) and perform full stop braking application.
2. Without allowing brake disc to cool substantially, repeat Step 1 for second full stop braking application.
3. Apply brakes and check to see if a high throttle static engine runup can be held with normal pedal force. If so, conditioning burn-in is complete.
4. If static runup cannot be held, repeat Steps 1 thru 3 as needed.

NOTE

Normal brake usage should generate enough heat to maintain the glaze throughout the life of the lining. Light brake usage can not cause the glaze to wear off, resulting in reduced brake performance. In such cases, the lining may be conditioned again following the instructions set forth above.

5-91. PARKING BRAKE SYSTEM. (Refer to figure 5-14.)

5-92. DESCRIPTION. The parking brake system is essentially a ratchet held handle which depresses and holds the brake master cylinders in the compressed position.

5-93. REMOVAL AND INSTALLATION OF SYSTEM COMPONENTS. Refer to figure 5-14 for relative location of system components. The illustration may be used as a guide during removal and installation.

5-94. INSPECTION AND REPAIR OF SYSTEM COMPONENTS. Inspect lines for leaks, cracks, dents, chafing, improper radius, security, corrosion, deterioration, obstructions and foreign matter. Check brake master cylinders and repair in accordance with instructions outlined in applicable paragraphs in this Section. Check parking brake and ratchet for proper operation and release. Replace worn or damaged parts.

SECTION 6

AILERON CONTROL SYSTEM

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6-1. AILERON CONTROL SYSTEM. (See figure 6-1.)

6-2. DESCRIPTION. The aileron control system is comprised of push-pull rods, bellcranks, cables, pulleys, quadrants and components forward of the instrument panel, all of which, link the control wheels to the ailerons.

6-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 6-17.

TROUBLE	PROBABLE CAUSE	REMEDY
LOST MOTION IN CONTROL WHEEL.	Loose control cables.	Check cable tension. Adjust cables to proper tension.
	Broken pulley or bracket, cable off pulley or worn rod end bearings.	Check visually. Replace worn or broken parts, install cables correctly.
RESISTANCE TO CONTROL WHEEL MOVEMENT.	Cables too tight.	Check cable tension. Adjust cables to proper tension.
	Pulleys binding or cable off.	Observe motion of the pulleys. Check cables visually. Replace defective pulleys. Install cables correctly.
	Bellcrank distorted or damaged.	Check visually. Replace defective bellcrank.
	Defective quadrant assembly.	Check visually. Replace defective quadrant.
	Clevis bolts in system too tight.	Check connections where used. Loosen, then tighten properly and safety.

6-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
CONTROL WHEELS NOT LEVEL WITH AILERONS NEUTRAL.	Improper adjustment of cables.	Refer to paragraph 6-17.
	Improper adjustment of aileron push-pull rods.	Adjust push-pull rods to obtain proper alignment.
DUAL CONTROL WHEELS NOT COORDINATED.	Cables improperly adjusted.	Refer to paragraph 6-17.
INCORRECT AILERON TRAVEL.	Push-pull rods not adjusted properly.	Refer to paragraph 6-17.
	Incorrect adjustment of travel stop bolts.	Refer to paragraph 6-17.

6-4. CONTROL COLUMN. (See figure 6-2.)

6-5. DESCRIPTION. Rotation of the control wheel rotates four bearing roller assemblies (3) on the end of the control wheel tube (4), which in turn, rotates a square control tube assembly (18) inside and extending from the control wheel tube (4). Attached to this square tube (18) is a quadrant (32) which operates the aileron system. This same arrangement is provided for both control wheels. Synchronization of the control wheels is obtained by the interconnect cable (38), turnbuckle (37) and adjustment terminals (35). The forward end of the square control tube (18) is mounted in a bearing block (27) on firewall (33) and does not move fore-and-aft, but rotates with the control wheel. The four bearing roller assemblies (3) on the end of the control wheel tube reduce friction as the control wheel is moved fore-and-aft for elevator system operation. A sleeve weld assembly (7), containing bearings which permit the control wheel tube to rotate within it, is secured to the control wheel tube by a sleeve and retaining ring in such a manner it moves fore-and-aft with the control wheel tube. This movement allows the push-pull tube (19) attached to the sleeve weld assembly (7) to operate an elevator arm assembly (22), to which one elevator cable (39) is attached. A torque tube (21) connects this arm assembly (22) to the one on the opposite end of the torque tube (21), to which the other elevator cable is attached. When dual controls are installed, the copilot's control wheel is linked to the aileron and elevator control systems in the same manner as the pilot's control wheel.

6-6. REMOVAL AND INSTALLATION. (See figure 6-2.)

a. Slide cover (1) toward instrument panel to expose adapter (40). Remove screws securing adapter (40) to control wheel tube assembly (4) and remove control wheel assembly. Disconnect electrical wiring to map light, mike switch at connector (47), if installed. Slide cover (1) off control wheel tube assembly (4).

b. (See figure 6-2, sheet 1.) Remove decorative cover from instrument panel.

c. Remove screw securing adjustable glide plug (16) to control tube assembly (18) and remove plug (16) and glide (17).

d. Disconnect push-pull tube (19) at sleeve weld assembly (7).

e. Remove screws securing cover plate (13) at instrument panel.

f. (See figure 6-2, sheet 1.) Using care pull control wheel tube assembly (4) aft and work assembly out through instrument panel.

NOTE

To ease removal of control wheel tube assembly (4), snap ring (11) may be removed from its locking groove to allow sleeve weld assembly (7) additional movement.

If removal of control tube assembly (18) or quadrant (32) is necessary, proceed to step "g."

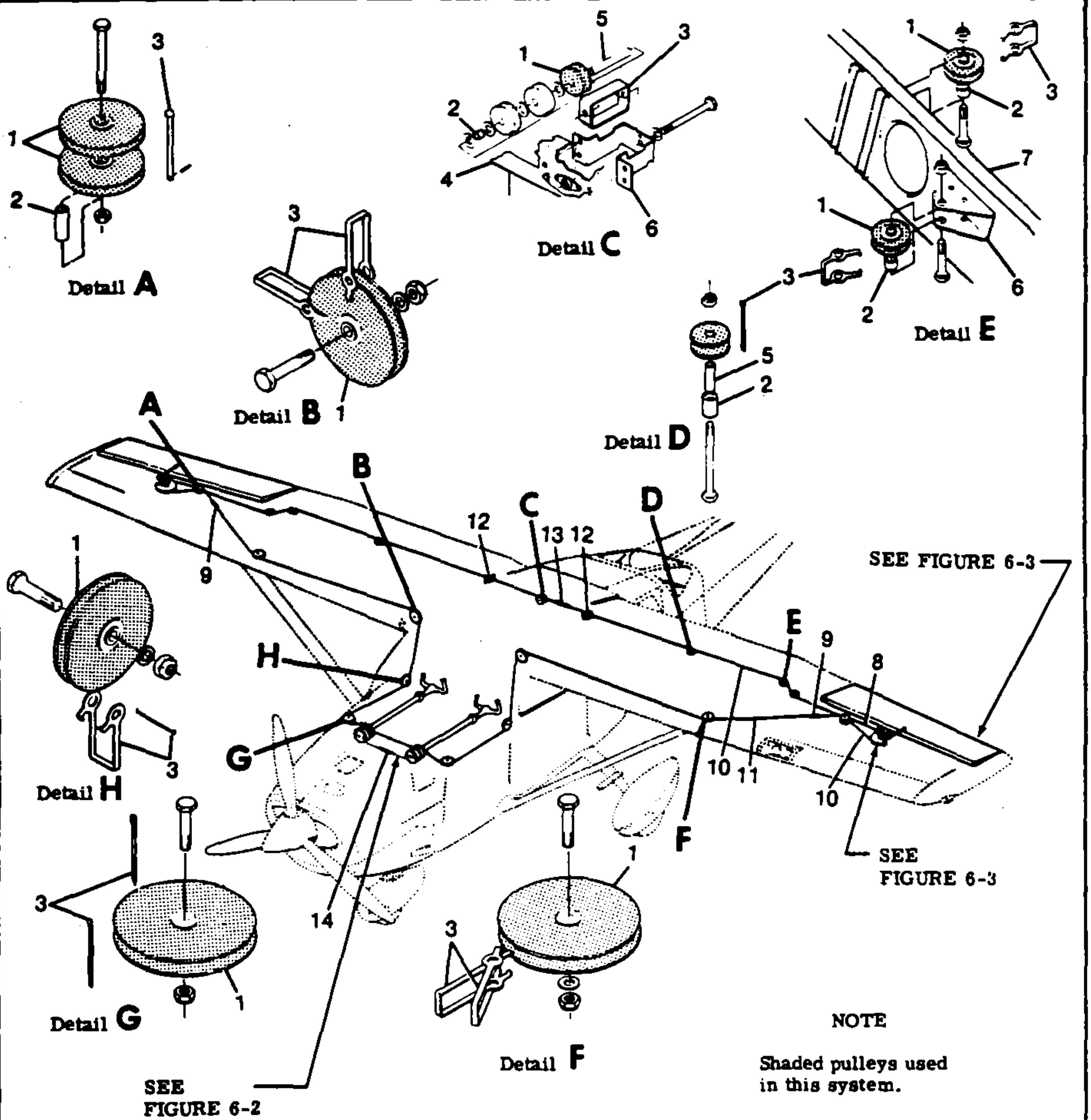
g. Remove safety wire and relieve direct cable tension at turnbuckles (index 9, figure 6-1).

h. Remove safety wire, relieve interconnect cable tension at turnbuckle (37) and remove cables from quadrant (32).

i. Remove safety wire and remove roll pin (36) through quadrant (32) and control tube assembly (18).

j. Remove pin, nut (34) and washer from control tube assembly (18) protruding through bearing block (27) on forward side of firewall (33).

k. Using care, pull control tube assembly (18) aft and remove quadrant (32).



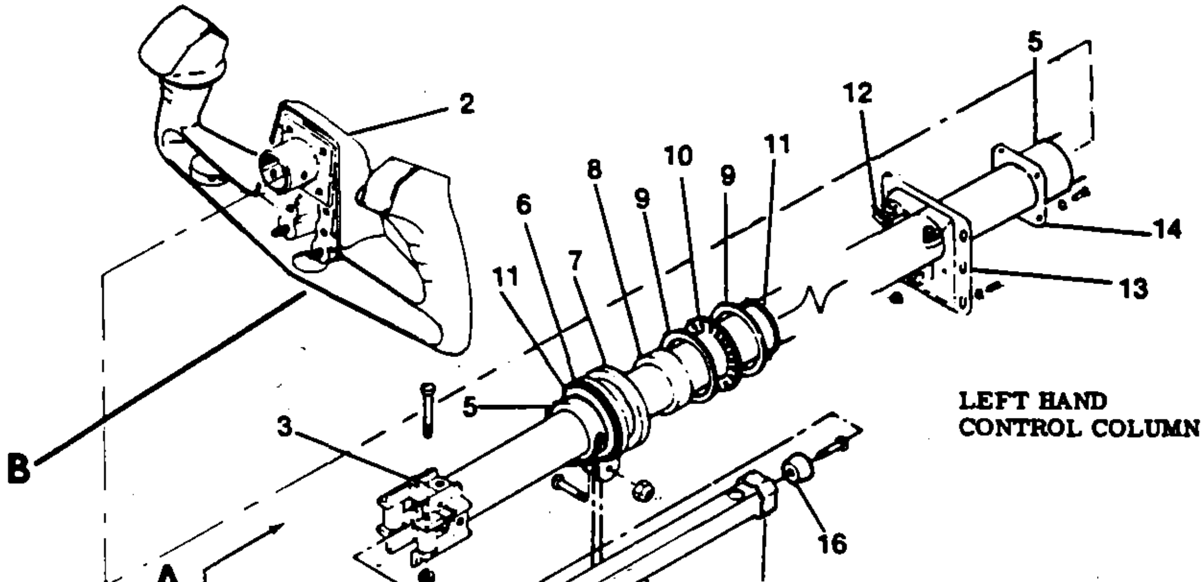
1. Pulley
2. Spacer
3. Cable Guard
4. Rear Carry-Thru Spar
5. Bushing
6. Bracket
7. Wing Spar
8. Cable (Outboard Direct)
9. Turnbuckle (Direct Cable)
10. Cable (Carry-Thru)
11. Cable (Inboard Direct)
12. Rub Strip
13. Turnbuckle (Carry-Thru Cable)
14. Turnbuckle (Interconnect Cable)

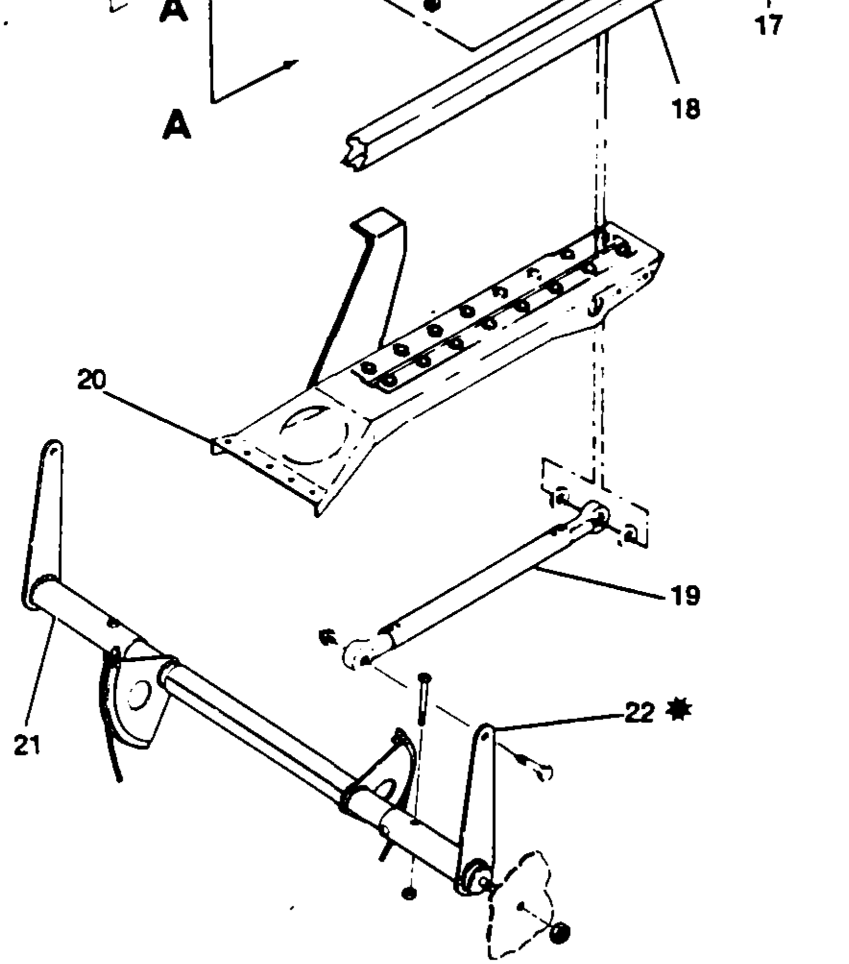
CAUTION

MAINTAIN PROPER CONTROL CABLE TENSION.

CABLE TENSION:
40 LBS ± 10 LBS ON AILERON CARRY-THRU CABLE (AT AVERAGE TEMPERATURE FOR THE AREA.)
SEE FIGURE 1-1 FOR TRAVEL.

Figure 6-1. Aileron Control System



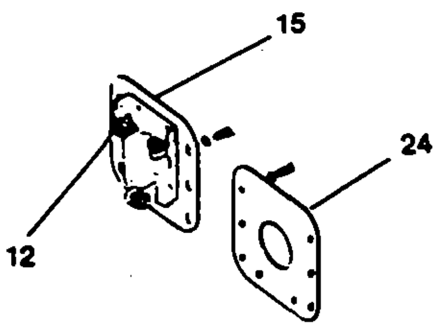


✱ NOTE

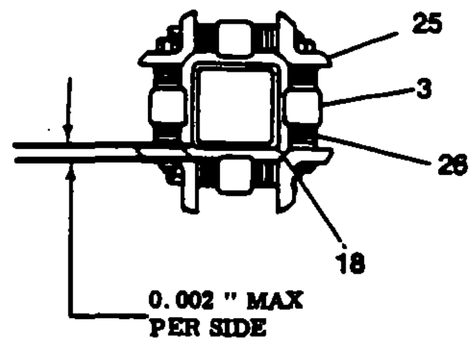
Refer to Section 8

1. Decorative Cover
2. Control Wheel
3. Bearing Roller Assembly
4. Control Wheel Tube Assembly
5. Collar
6. Washer
7. Sleeve Weld Assembly
8. Bearing
9. Bearing Race
10. Thrust Bearing
11. Snap Ring
12. Roller Assembly
13. Cover Plate
14. Collar
15. Cover Plate
16. Adjustable Glide Plug
17. Control Tube Glide
18. Control Tube Assembly
19. Push-Pull Tube
20. Guide Assembly
21. Torque Tube
22. Arm Assembly (Elev)
23. Retainer
24. Cover Plate
25. Retainer
26. Washer
27. Bearing Block
28. Support Bracket
29. Idler Shaft
30. Cable Guard
31. Cable (Aileron Direct)
32. Quadrant (Cable Drum)
33. Firewall
34. Nut
35. Adjustable Nut
36. Roll Pin
37. Turnbuckle (Interconnect Cable)
38. Cable (Interconnect)

Figure 6-2. Control Column Installation (Sheet 1 of 4)



RIGHT HAND
CONTROL COLUMN



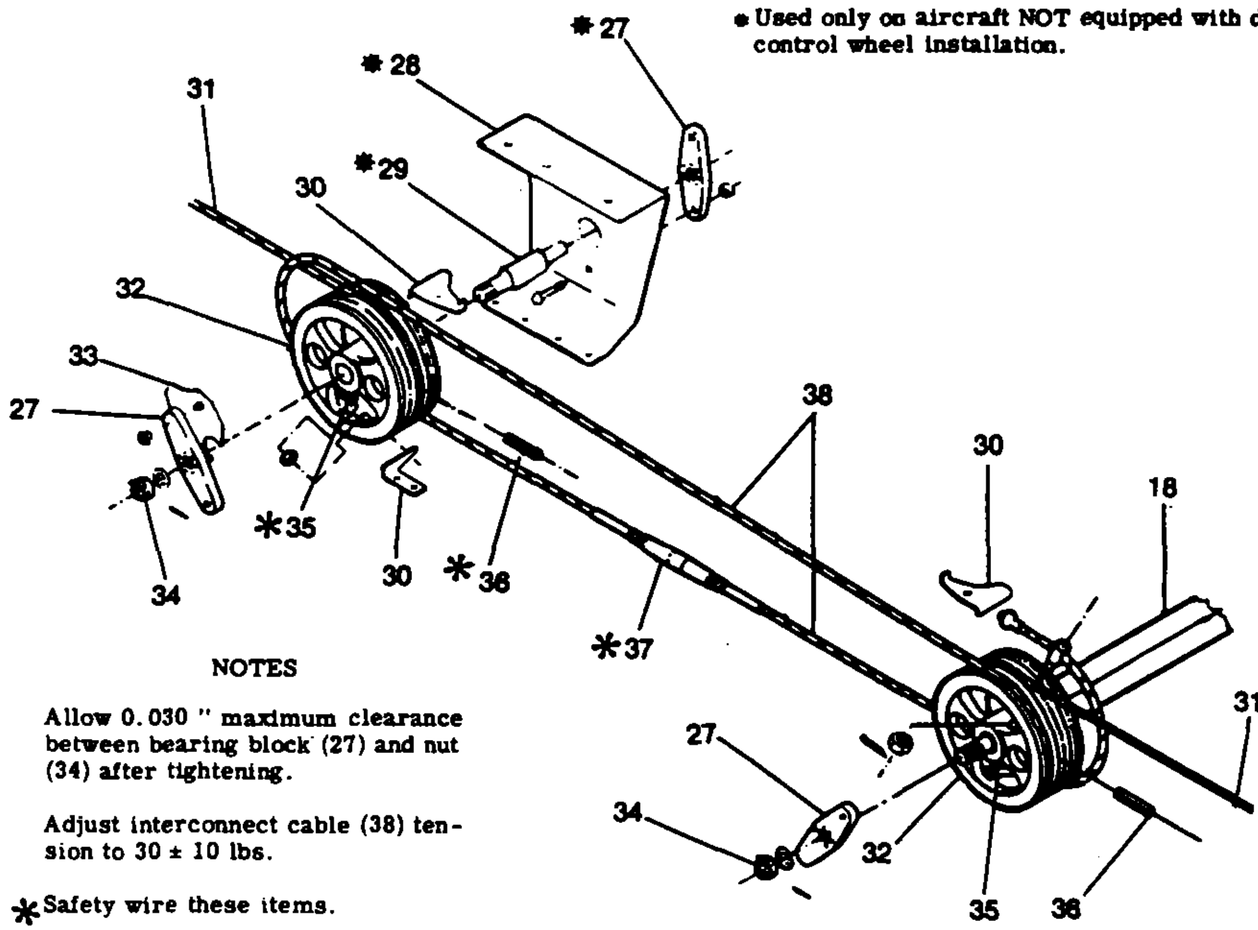
VIEW **A-A**

NOTES

Washers (26) are of various thicknesses and are used to obtain dimension shown in view A-A.

Use washers (6) as required to adjust free play. Do not exceed 4 washers per assembly.

* Used only on aircraft NOT equipped with dual control wheel installation.



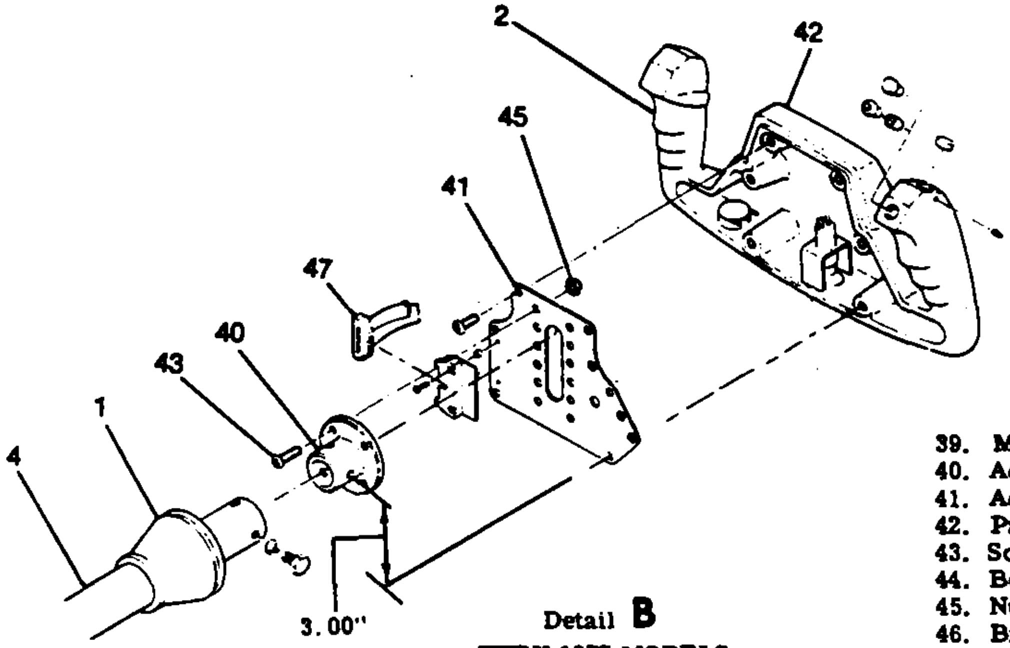
NOTES

Allow 0.030 " maximum clearance between bearing block (27) and nut (34) after tightening.

Adjust interconnect cable (38) tension to 30 ± 10 lbs.

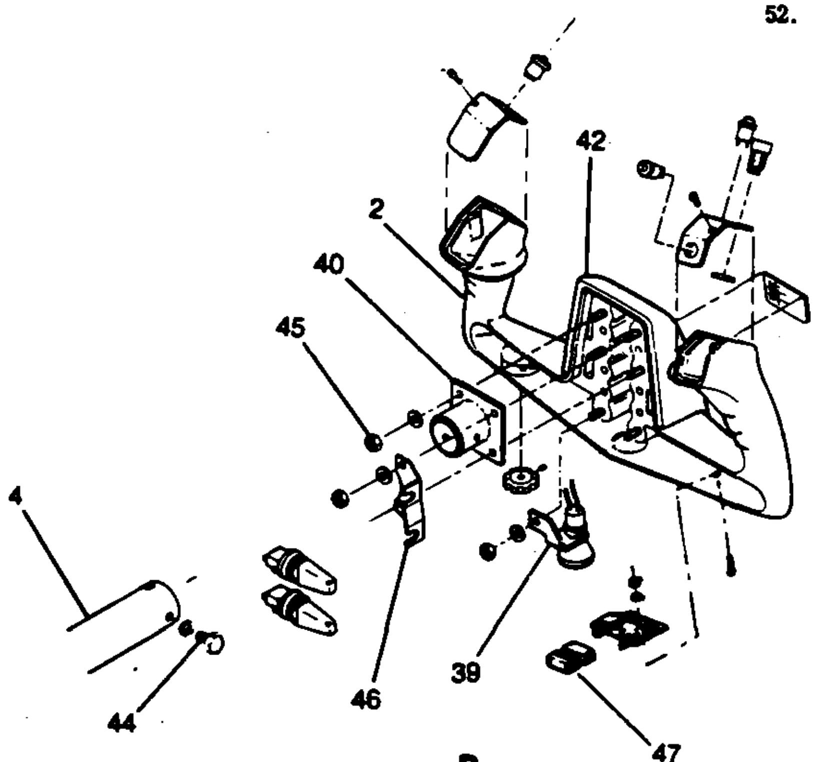
*Safety wire these items.

Figure 6-2. Control Column Installation (Sheet 2 of 4)



Detail B
THRU 1977 MODELS

39. Map Light Assembly
40. Adapter
41. Adapter Plate
42. Pad
43. Screw
44. Bolt
45. Nut
46. Bracket
47. Connector Plug
48. Bracket
49. Clamp
50. Cable
51. Grommet
52. Screw



Detail B
BEGINNING
1978 MODELS

Figure 6-2. Control Column Installation (Sheet 3 of 4)

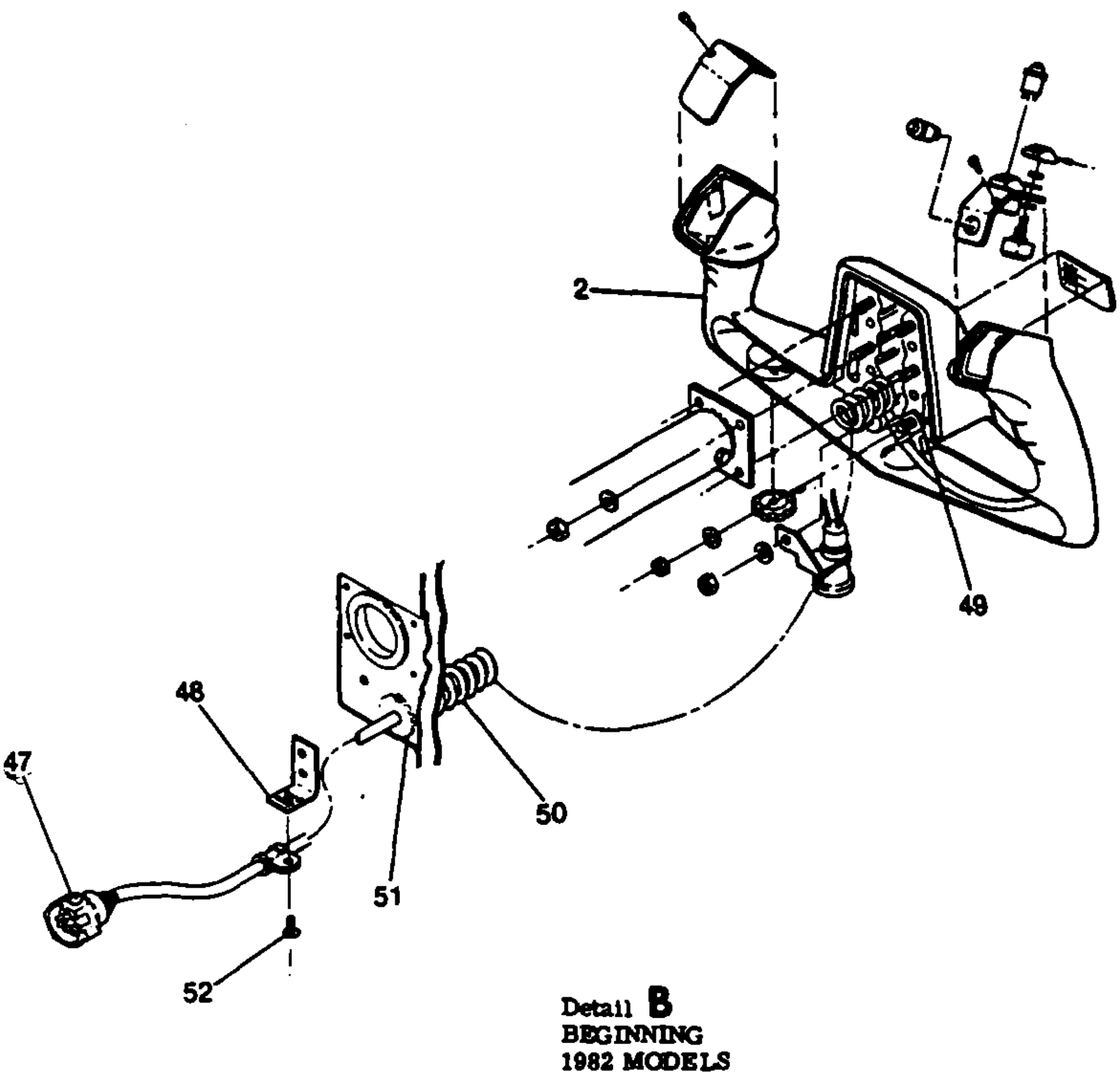
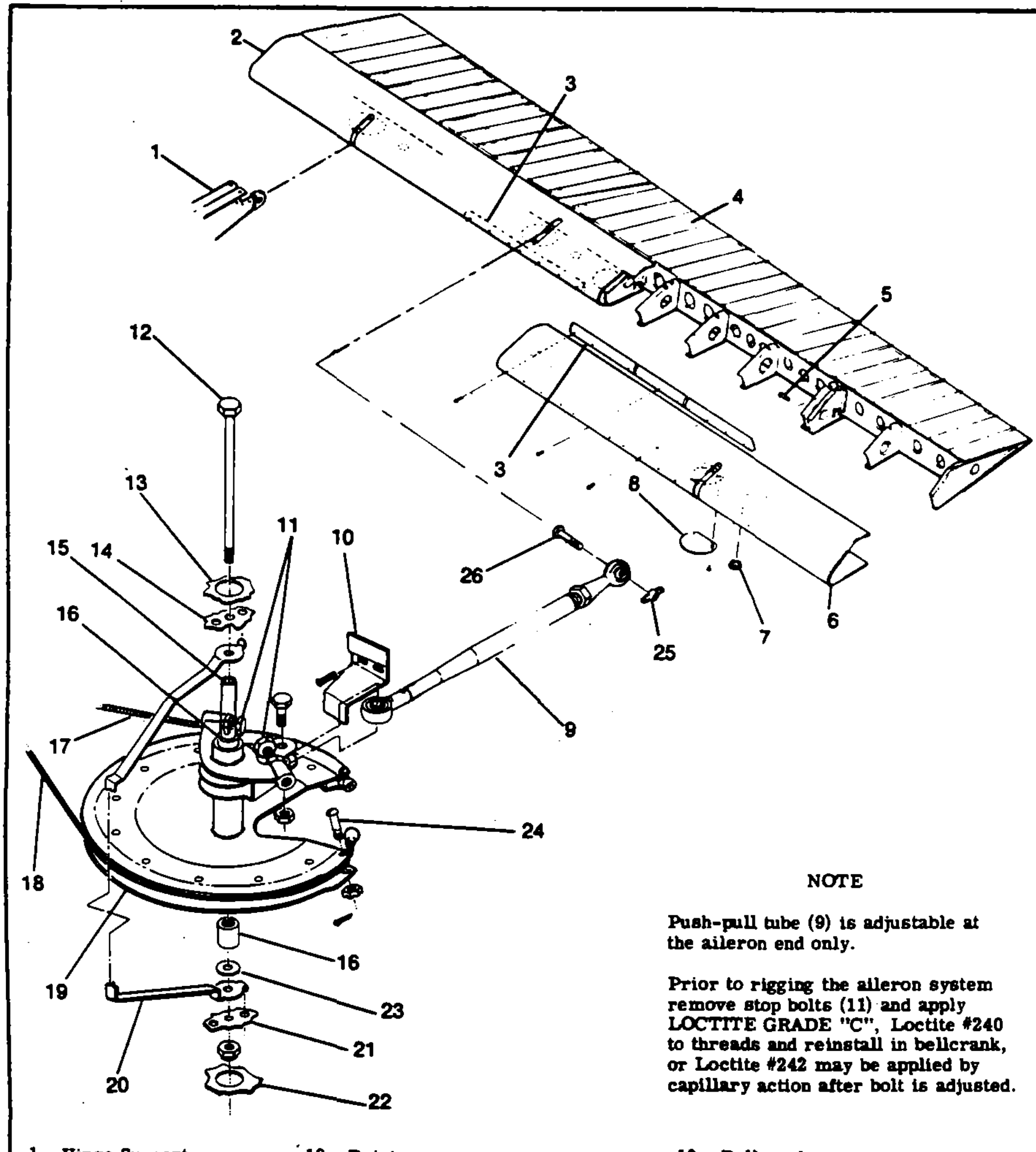


Figure 6-2. Control Column Installation (Sheet 4 of 4)



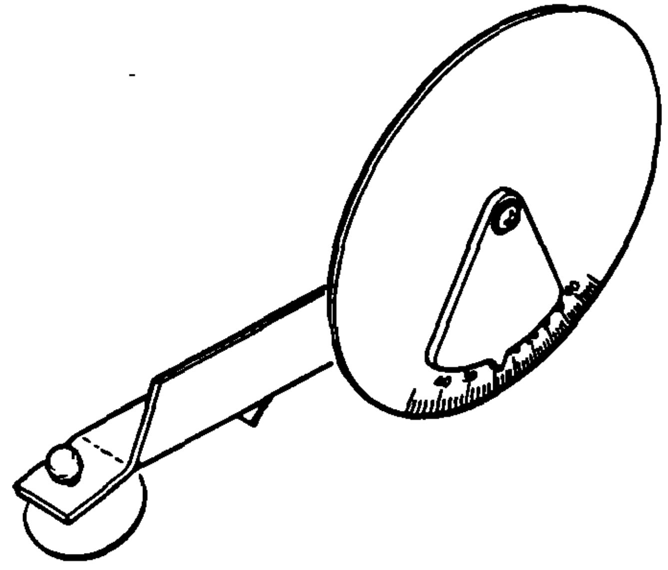
NOTE

Push-pull tube (9) is adjustable at the aileron end only.

Prior to rigging the aileron system remove stop bolts (11) and apply LOCTITE GRADE "C", Loctite #240 to threads and reinstall in bellcrank, or Loctite #242 may be applied by capillary action after bolt is adjusted.

1. Hinge Support
2. Aileron Assembly
3. Balance Weight
4. Upper Skin
5. Bolt
6. Leading Edge Skin
7. Plug Button
8. Access Plate
9. Push-Pull Tube
10. Retainer
11. Travel Stop Bolt
12. Pivot Bolt
13. Upper Wing Skin
14. Upper Aileron Bellcrank Bracket
15. Bushing
16. Bearing
17. Cable (Outboard Direct)
18. Cable (Carry-Thru)
19. Bellcrank
20. Cable Guard
21. Lower Aileron Bellcrank Bracket
22. Lower Wing Skin
23. Brass Washer
24. Cable Lock
25. Nutplate
26. Bolt

Figure 6-3. Aileron Installation



AVAILABLE FROM THE CESSNA SUPPLY DIVISION (TOOL NO. SE 716)

Figure 6-4. Inclinometer for Measuring Control Surface Travel

l. Reverse the preceding steps for reinstallation. Rig aileron and elevator control systems in accordance with paragraphs 6-17 and section 8 respectively. Safety turnbuckles and all other items previously safetied. Tighten nut (34) securing control tube assembly (18) to firewall snugly, then loosen nut to 0.030" maximum clearance between nut and bearing block, align cotter pin hole and install pin.

6-7. REPAIR. Worn, damaged or defective shafts, bearings, quadrants, cables or other components should be replaced. Refer to Section 2 for lubrication requirements.

6-8. BEARING ROLLER ADJUSTMENT. (See figure 6-2.) Each bearing assembly (index 12, sheet 1) has an 0.062" eccentric adjustment when installed, for aligning the control tube weld assembly (index 7, sheet 1) and push-pull tube (index 19, sheet 1) with the guide assembly (index 20, sheet 1). For alignment, proceed as follows:

a. Remove control wheel assembly in accordance with paragraph 6-6.

b. Install cover plate (index 13, sheet 1) backwards (bearings on aft side) and leave loose with instrument panel.

c. Align control wheel tube assembly (index 4, sheet 1) for free travel of push-pull tube (index 19, sheet 1) along full length of guide assembly (index 20, sheet 1).

d. Center cover plate (index 13, sheet 1) over tube and bearing assembly and secure plate to instrument panel.

e. Adjust each bearing (index 12, sheet 1) to control wheel tube assembly and tighten bearings in place.

f. Remove cover plate and reinstall with bearings facing forward.

6-9. AILERON BELLCRANK. (See figure 6-3.)

6-10. REMOVAL AND INSTALLATION.

a. Remove access plate inboard of each bellcrank (19) on underside of wing.

b. Remove safety wire and relieve cable tension at turnbuckles (index 9, figure 6-1).

c. Disconnect control cables from bellcrank (19).

d. Disconnect push-pull tube (9) at bellcrank (19).

e. Remove bolt securing bellcrank to wing structure.

f. Remove bellcrank through access opening, using care that bushing (15) is not dropped from bellcrank.

NOTE

Brass washers (23) may be used as shims between lower end of bellcrank and lower bracket (21). Retain these shims. Tape open ends of bellcrank to prevent dust and dirt from entering bellcrank needle bearings (16).

g. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 6-17, safety turnbuckles and reinstall all items removed for access.

6-11. REPAIR. Repair of bellcranks consists of replacement of defective parts. If needle bearings are dirty or in need of lubrication, clean thoroughly and lubricate as outlined in Section 2.

6-12. CABLES AND PULLEYS. (See figure 6-1.)

6-13. REMOVAL AND INSTALLATION.

a. Remove access plates, wing root fairings and upholstery as required.
b. Remove safety wire and relieve cable tension at turnbuckles (9 and 13).
c. Disconnect cables from aileron bellcranks (index 19, figure 6-3) and quadrants (index 32, figure 6-2).
d. Remove cable guards and pulleys as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to end of cable before being withdrawn from aircraft. Leave wire in place, routed through structure; then attach cable being installed and use to pull cable into position.

e. Reverse the preceding steps for reinstallation.
f. After cables are routed in position, install pulleys and cable guards. Ensure cables are positioned in pulley grooves before installing guards.
g. Re-rig aileron system in accordance with paragraph 6-17, safety turnbuckles and install access plates, fairings and upholstery removed in step "a."

6-14. AILERONS. (See figure 6-3.)

6-15. REMOVAL AND INSTALLATION.

a. Remove access plates (8) and plug buttons (7) from underside of aileron.
b. Disconnect push-pull tube (9) at ailerons.
c. Remove bolts (5) attaching ailerons to hinge supports (1).
d. Using care. pull ailerons out and down.
e. Reverse the preceding steps for reinstallation.

NOTE

If rigging was correct and push pull tube adjustment was not disturbed, it should not be necessary to re-rig system.

f. Check aileron travel and alignment, re-rig if necessary, in accordance with paragraph 6-17.

6-16. REPAIR. Aileron repair may be accomplished in accordance with instructions outlined in Section 18. Before installation, ensure balance weights and hinges are securely attached.

6-17. RIGGING.

a. (See figure 6-1.) Remove access plates and upholstery as required.
b. Remove safety wire and relieve cable tension at turnbuckles (9 and 13).
c. (See figure 6-3.) Disconnect push-pull tubes (9) at ailerons (2).
d. (See figure 6-2.) Adjust turnbuckle (37) and adjustment nuts (35) on interconnect cable (38) to remove slack, acquire proper tension (30±10 pounds) and position both control wheels level (synchronized).
e. Tape a bar across both control wheels to hold them in neutral position.
f. (See figure 6-1.) Adjust direct cable turnbuckles (9) and carry-thru cable turnbuckle (13) to position bellcranks (index 19, figure 6-3) approximately in neutral while maintaining proper cable tension.
g. Streamline ailerons with reference to flaps (flaps full UP positions), then adjust push-pull tubes (index 9, figure 6-3) to fit and install.
h. With ailerons streamlined, mount an inclinometer on trailing edge of aileron and set pointer to 0°.
i. Remove bar from control wheels and adjust travel stops (index 11, figure 6-3) to obtain travel specified in figure 1-1.
j. Ensure all turnbuckles are safetied, all cables and cable guards are properly installed, all jam nuts are tight and replace all parts removed for access.

WARNING

Be sure ailerons move in correct direction when operated by the control wheels.

SHOP NOTES:

SECTION 7

WING FLAP CONTROL SYSTEM

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7-1. WING FLAP CONTROL SYSTEM. (See figure 7-1.)

7-2. DESCRIPTION. The wing flap control system is comprised of an electric motor and transmission assembly, drive pulleys, push-pull rods, cables and a follow-up control. Power from the motor and transmission assembly is transmitted to the flaps by a system of drive pulleys, cables and push-pull rods. Electrical power to the motor is controlled by two microswitches mounted on a floating arm assembly, by a camming lever and a follow-up control. As the flap control lever is moved to the desired flap setting, the attached cam trips one of the microswitches, activating the flap motor. As the flaps move to the position selected, the floating arm is rotated by the follow-up control until the active microswitch clears the cam breaking the circuit and stopping the motor. To reverse flap direction, the control lever is moved in the opposite direction causing the cam to trip the second microswitch which reverses the flap motor. The follow-up control moves the cam until it is clear of the second switch, shutting off the flap motor. Limit switches on flap actuator assembly prevent over-travel of the flaps in the full UP or DOWN positions.

7-3. OPERATIONAL CHECK.

a. Operate flaps through their full range of travel observing for uneven travel or jumpy motion, binding or lost motion. Ensure flaps are moving together through their full range of travel.

b. Check for positive shut-off of motor at flap travel extremes to prevent damage to actuator assembly.

c. Check flaps for sluggishness in operation.

d. With flaps full UP, mount an inclinometer on one flap and set to 0°. Lower flaps to full DOWN position and check flap angle as specified in figure 1-1. Check approximate mid-range percentage setting against degrees as indicated on inclinometer. Repeat the same procedure for the opposite flap.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

e. Remove access plates adjacent to flap drive pulleys and attempt to rock pulleys to check for bearing wear.

f. Inspect flap rollers and tracks for evidence of binding or defective parts.

7-4. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraphs 7-21 and 7-22.

TROUBLE	PROBABLE CAUSE	REMEDY
BOTH FLAPS FAIL TO MOVE.	Popped circuit breaker.	Reset and check continuity. Replace breaker if defective.
	Defective switch.	Place jumper across switch. Replace switch if defective.
	Defective motor.	Remove and bench test. Replace motor if defective.
	Broken or disconnected wires.	Run continuity check of wiring. Connect or repair wiring as necessary.
	Disconnected or defective transmission.	Connect transmission. Remove, bench test and replace transmission if defective.
	Defective limit switch.	Check continuity of switches. Replace switches found defective.
	Follow-up control disconnected or slipping.	Secure control or replace if defective.
BINDING IN SYSTEM AS FLAPS ARE RAISED AND LOWERED.	Cables not riding on pulleys.	Open access plates and observe pulleys. Route cables correctly over pulleys.
	Bind in drive pulleys.	Check drive pulleys in motion. Replace drive pulleys found defective.
	Broken or binding pulleys.	Check pulleys for free rotation or breaks. Replace defective pulleys.
	Frayed cable.	Check condition of cables. Replace defective cables.
	Flaps binding on tracks.	Observe flap tracks and rollers. Replace defective parts.
LEFT FLAP FAILS TO MOVE.	Disconnected or broken cable.	Check cable tension. Connect or replace cable.
	Disconnected push-pull rod.	Attach push-pull rod.
FLAPS FAIL TO RETRACT.	Disconnected or defective UP operating switch.	Check continuity of switch. Connect or replace switch.

7-5. FLAP MOTOR AND TRANSMISSION ASSEMBLY.

7-6. REMOVAL AND INSTALLATION (See figure 7-2.)

a. Run flaps to full DOWN position.

7-4. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
FLAPS FAIL TO EXTEND.	Disconnected or defective DOWN operating switch.	Check continuity of switch. Connect or replace switch.
INCORRECT FLAP TRAVEL.	Incorrect rigging.	Refer to paragraphs 7-21 and 7-22.
	Defective limit switch.	Check continuity of switches. Replace switches found defective.

b. Disconnect battery ground cable and insulate terminal as a safety precaution.
c. Remove access plates beneath flap motor and transmission assembly in right wing.

NOTE

Flap motor (24), transmission (2), hinge assembly (26) and actuating tube (16) are removed from the aircraft as a unit.

d. Remove bolt (15) securing actuating tube (16) to drive pulley (8).
e. Screw actuating tube (16) in toward transmission (2) as far as possible by hand.
f. Remove bolt (1) securing flap motor hinge (26) to wing. Retain brass washer between hinge and wing structure for use on reinstallation.
g. Disconnect motor electrical leads at quick-disconnects.
h. Disconnect wiring at limit switches (17) and (23).
i. Carefully work assembly from wing through access opening.
j. Reverse preceding steps for reinstallation. If hinge assembly (26) was removed from the transmission (2) for any reason, ensure that short end of hinge is reinstalled toward the top.
k. Complete operational check as outlined in paragraph 7-3 and rerig system in accordance with paragraph 7-18 and 7-19.

7-7. REPAIR. Repair consists of replacement of motor, transmission, actuating tube and associated hardware. Bearings in hinge assembly may also be replaced. Lubricate as outlined in Section 2.

7-8. FLAP CONTROL LEVER.

7-9. REMOVAL AND INSTALLATION. (See figure 7-3.)
a. Disconnect follow-up control bellcrank (24) from switch mounting arm (8).
b. Remove flap operating switches (15 and 16) from switch mounting arm (8). DO NOT disconnect electrical wiring at switches.
c. Remove knob (11) from control lever (12).

NOTE

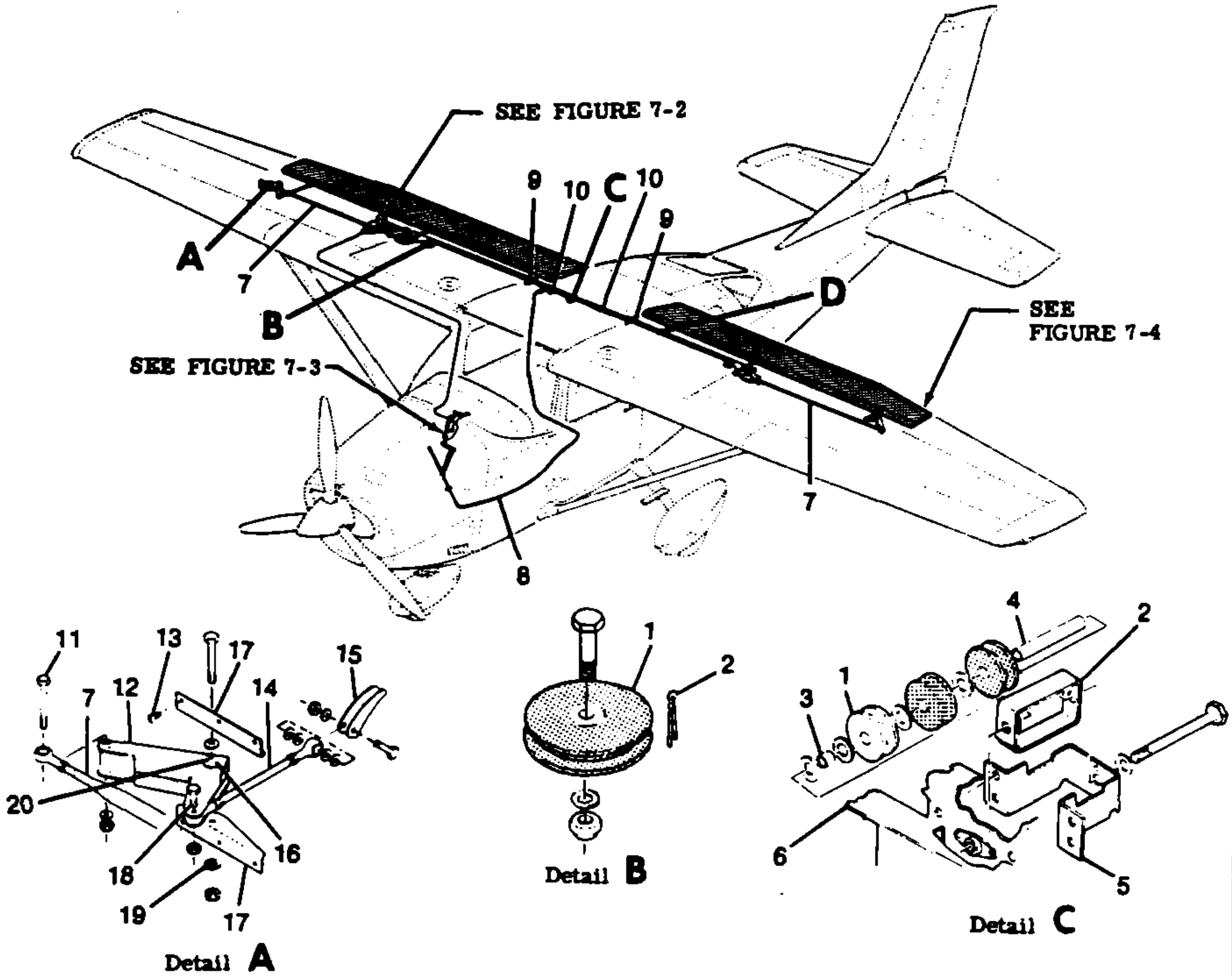
Before replacing knob (11) on control lever (12) (see figure 7-3), clean control lever threads with MEK or equivalent. After threads have thoroughly dried, prime with grade "T" primer, and allow primer to flash off or dry from three to five minutes. Apply grade CU Loctite (MIL-S-22473), STA-LOK Catalog Number 800, or equivalent to threads of control lever (12). Replace knob (11) on lever and allow Loctite or equivalent to cure from five to 20 minutes before service use.

d. Remove remaining items by removing bolt (18). Use care not to drop parts into tunnel area. Do not overtighten bolt (18) causing lever (12) to bind. Rig system in accordance with paragraphs 7-21 and 7-22.

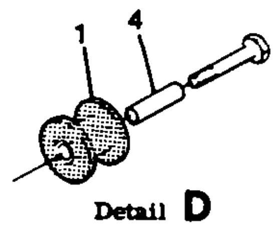
7-10. DRIVE PULLEYS. (See figure 7-2.)

7-11. REMOVAL AND INSTALLATION.
a. Remove access plates adjacent to drive pulley (20) in right wing.
b. Unzip or remove headliner as necessary for access to turnbuckles (index 10, figure 7-1), remove safety wire and loosen turnbuckles.
c. Remove bolt (14) securing flap push-pull rod (9) to drive pulley (8).
d. Remove bolt (3) securing synchronizing push-pull tube (4) to drive pulley (8) and lower RIGHT flap gently.
e. Remove bolt (15) securing actuating tube (16) to drive pulley (8) and lower LEFT flap gently. Retain bushing.
f. Remove cable locks (7) securing control cables to drive pulley (8). Tag cables for reference on reinstallation.
g. Remove bolt (6) attaching drive pulley (8) to wing structure.
h. Using care, remove drive pulley through access opening, being careful not to drop bushing. Retain brass washer between drive pulley and wing structure for use on reinstallation. Tape open ends of drive pulley after removal to protect bearings.
i. To remove left wing drive pulley, use this same procedure omitting steps "e" and "g."
j. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraphs 7-21 and 7-22, safety turnbuckles and reinstall all items removed for access.

7-12. REPAIR. Repair is limited to replacement of bearings. Cracked, bent or excessively worn drive



1. Pulley
2. Cable Guard
3. Spacer
4. Bushing
5. Bracket
6. Rear Carry-Thru Spar
7. Synchronizing Push-Pull Tube
8. Follow-Up Control
9. Rub Strip
10. Turnbuckle
11. Bolt
12. Bellcrank
13. Bolt
14. Push-Pull Rod
15. Attach Bracket
16. Bearing
17. Support
18. Bolt
19. Washer
20. Bushing

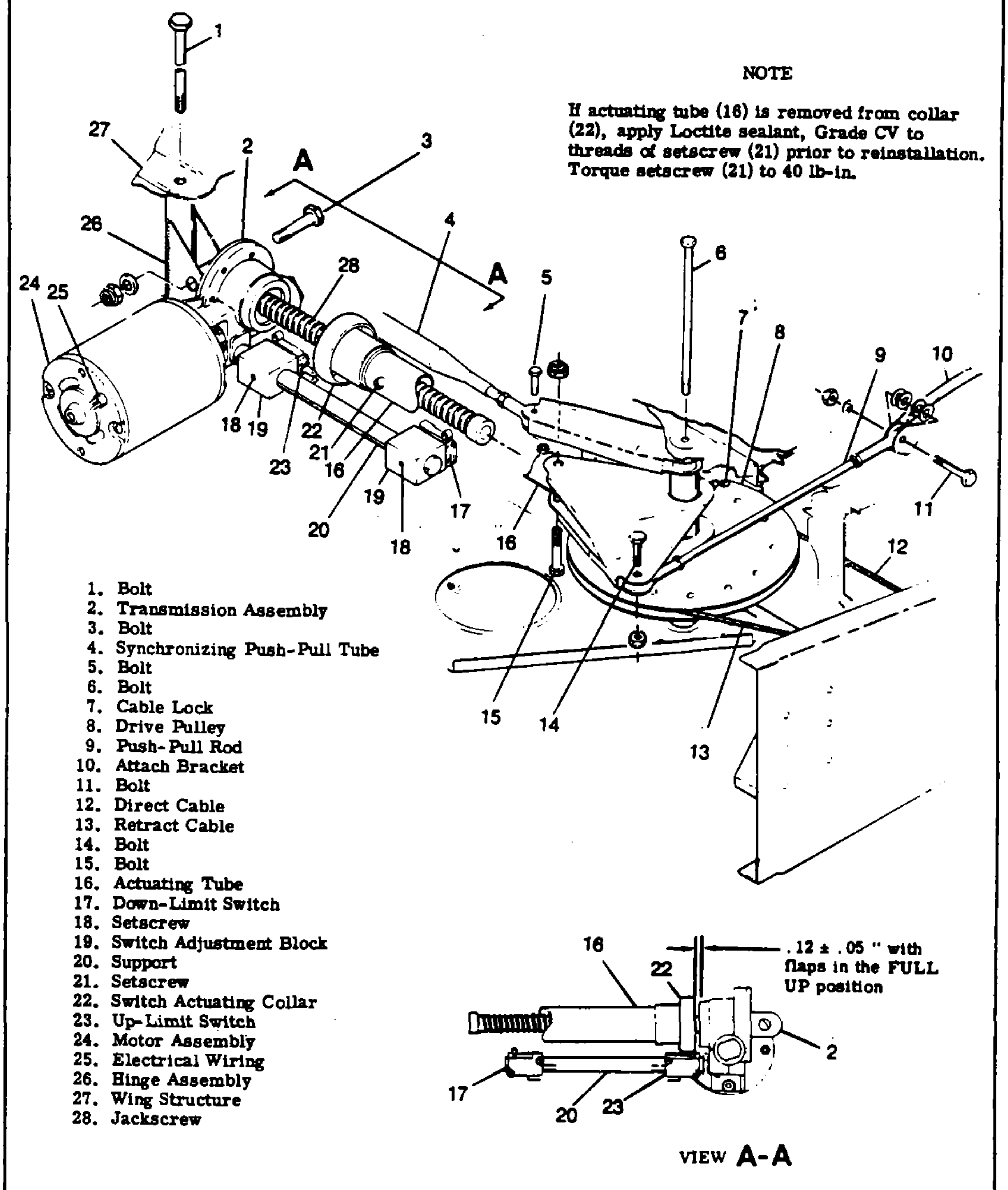


CAUTION

MAINTAIN SPECIFIED CONTROL CABLE TENSION

CABLE TENSION:
70 LBS ± 10 LBS (AT AVERAGE TEMPERATURE FOR THE AREA)
SEE FIGURE 1-1 FOR TRAVEL

Figure 7-1. Wing Flap Control System



1. Bolt
2. Transmission Assembly
3. Bolt
4. Synchronizing Push-Pull Tube
5. Bolt
6. Bolt
7. Cable Lock
8. Drive Pulley
9. Push-Pull Rod
10. Attach Bracket
11. Bolt
12. Direct Cable
13. Retract Cable
14. Bolt
15. Bolt
16. Actuating Tube
17. Down-Limit Switch
18. Setscrew
19. Switch Adjustment Block
20. Support
21. Setscrew
22. Switch Actuating Collar
23. Up-Limit Switch
24. Motor Assembly
25. Electrical Wiring
26. Hinge Assembly
27. Wing Structure
28. Jackscrew

Figure 7-2. Flap Motor and Transmission Installation pulleys must be replaced. Lubricate drive pulley bearings as outlined in Section 2.

7-13. BELLCRANKS. (See figure 7-1.)

7-14. REMOVAL AND INSTALLATION.

a. Run flaps to full DOWN position.
b. Remove access plate adjacent to bellcrank (12).
c. Remove bolt (18) securing outboard push-pull rod (14) to bellcrank (12).
d. Remove bolt (11) securing synchronizing push-pull tube (7) to bellcrank (12).
e. Remove bolts (13) securing upper and lower Supports (17).
f. Work bellcrank out through access opening.
g. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraphs 7-21 and 7-22.

7-15. REPAIR. Repair is limited to replacement of bearings. Cracked, bent or excessively worn bellcranks must be replaced. Lubricate bearings as outlined in Section 2.

7-16. FLAPS. (See figure 7-4.)

7-17. REMOVAL AND INSTALLATION.

a. Run flaps to full DOWN position.
b. Remove access plates (5) from top leading edge of flap.
c. Disconnect push-pull rods at flap brackets (4).
d. Remove bolts (12) at each flap track, pull flap aft and remove remaining bolt. As flap is removed from wing, all washers, rollers and bushings will fall free. *Retain these for reinstallation.*
e. Reverse the preceding steps for reinstallation. If push-pull rod adjustment is not disturbed, rerigging of system should not be necessary. Check flap travel and rig in accordance with paragraphs 7-21 and 7-22, if necessary.

7-18. REPAIR. Flap repair may be accomplished in accordance wtih instructions outlined in Section 18.

7-19. CABLES AND PULLEYS. (See figure 7-1.)

7-20. REMOVAL AND INSTALLATION.

a. Remove access plates, fairings, headliner and upholstery as necessary for access.
b. Remove safety wire, relieve cable tension, disconnect turnbuckles (10) and carefully lower LEFT flap.
c. Disconnect cables at drive pulleys, remove cable guards and pulleys as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to the end of cable being withdrawn from the aircraft. Leave wire in place, routed through structure; then attach the cable being installed and use wire to pull cable into position.

d. Reverse the preceding steps for reinstallation.
e. After cables are routed in position, install pulleys and cable guards. Ensure cables are positioned in pulley grooves before installing guards.
f. Re-rig flap system in accordance with paragraphs 7-21 and 7-22, safety turnbuckles and reinstall all items removed in step "a."

7-21. RIGGING-FLAPS. (See figure 7-2.)

a. Unzip or remove headliner as necessary for access to turnbuckles (index 10, figure 7-1).
b. Remove safety wire, relieve cable tension, disconnect turnbuckles and carefully lower LEFT flap.
c. Remove bolt (14) securing flap push-pull rod (9) to drive pulleys (8) in both wings.
d. Remove bolt (3) securing synchronizing push-pull tube (4) to drive pulley (8) in right wing and carefully lower RIGHT flap.
e. Remove bolt securing synchronizing push-pull tube to drive pulley in left wing.
f. Disconnect outboard flap push-pull rods from bellcranks in both wings.
g. Disconnect actuating tube (16) from drive pulley (8).

NOTE

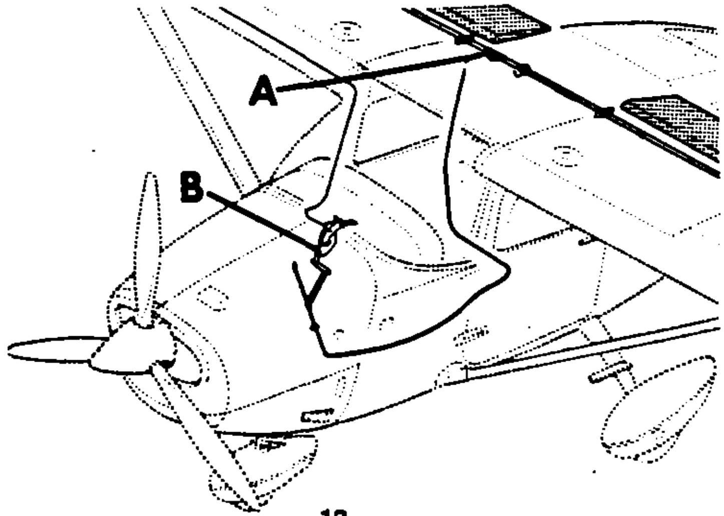
Ensure that the 3/32 inch retract cable is connected to the forward side of the right drive pulley and to the aft side of the left drive pulley and that the 1/8 inch direct cable is connected to the aft side of the right drive pulley and to the forward side of the left drive pulley. Ensure that the right drive pulley rotates clockwise, when viewed from below, as the flaps are extended. *(See figure 7-5.)*

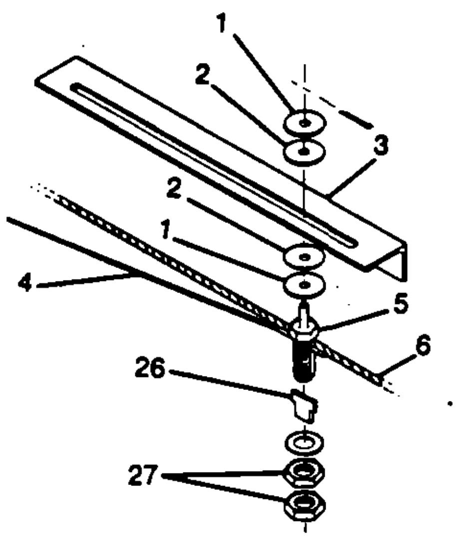
h. Adjust synchronizing push-pull tube (4) in RIGHT wing to 48.69 inches between centers of rod end holes, tighten jam nuts and connect to bellcrank and drive pulley.
i. Adjust travel on flap motor so centerline of bolt hole for inboard push-pull rod is 4.20 inches aft of fuel well bulkhead. (See figure 7-5). Screw actuating tube (16) IN toward transmission (2) by hand to .12 inches between switch actuating collar (22) and transmission (2) see figure 7-2 VIEW A-A, loosen setscrew (21) securing actuating collar (22). Hold actuating collar to maintain .12 inches and adjust actuating tube IN or OUT as necessary to obtain 11.16 inches from centerline to centerline of actuator attach bolts (1) and (15) figure 7-2. Tighten setscrew (21) in accordance with figure 7-2 and secure actuating tube (16) to drive pulley (8) with bolt (15).
j. Manually holding RIGHT flap full up, adjust push-pull rods (4) and (9) to align with drive pulley and bellcrank attachment holes. Connect push-pull rods and tighten locknuts.

NOTE

The right flap and actuator MUST be correctly rigged before cables and left flap can be rigged.

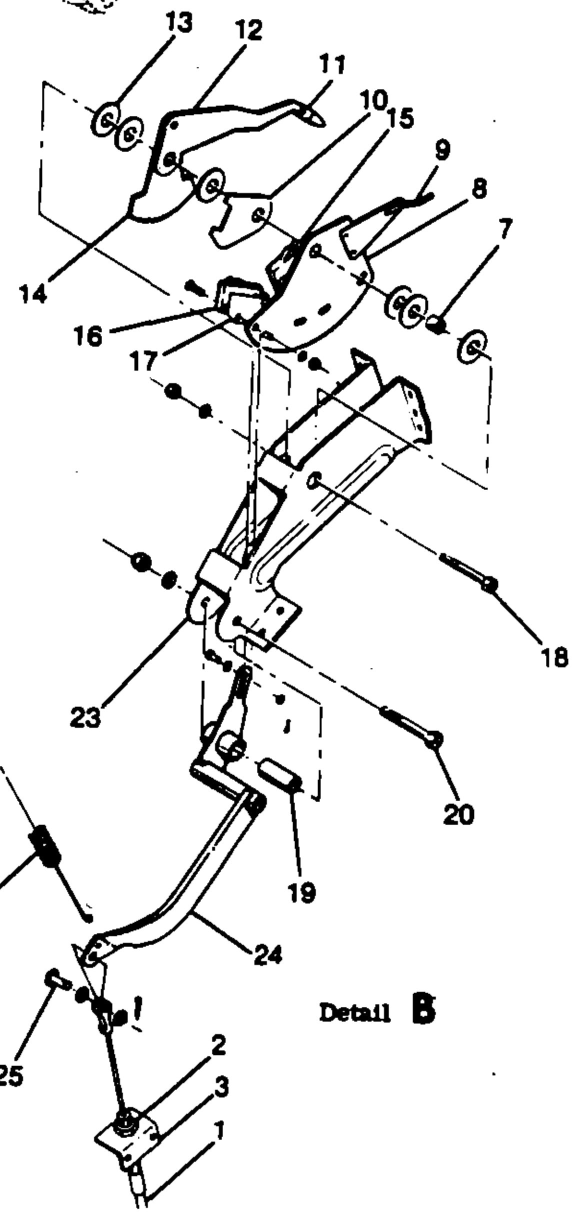
k. Mount an inclinometer on trailing edge of RIGHT flap.

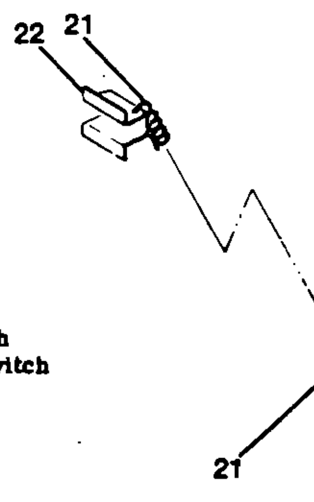




NOTE

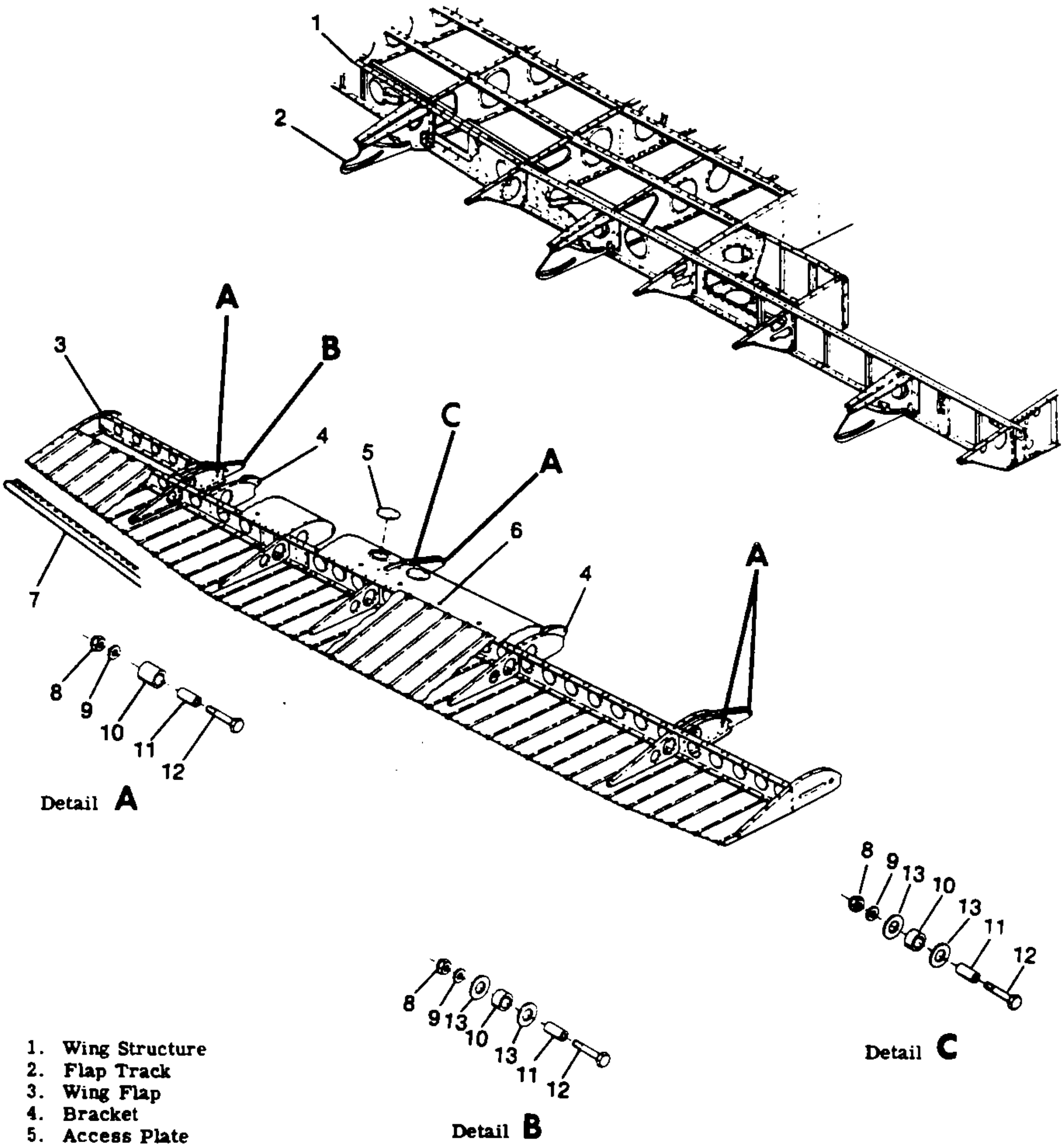
Torque nut (27) to 40-50 inch pounds and lock with second nut





1. Metal Washer
2. Teflon Washer
3. Guide
4. Follow-Up Cable
5. Clamp Assembly
6. Flap Retract Cable
7. Bushing
8. Switch Mounting Arm
9. Position Indicator
10. Bracket
11. Knob
12. Control Lever
13. Washer
14. Cam
15. Flaps UP Operating Switch
16. Flaps DOWN Operating Switch
17. Insulator
18. Bolt
19. Spacer
20. Bolt
21. Spring
22. Firewall Stiffener
23. Bracket
24. Bellcrank Assembly
25. Pin
26. Clamp Bar
27. Clamp Nut

Figure 7-3. Flap Control Lever and Follow-Up System



1. Wing Structure
2. Flap Track
3. Wing Flap
4. Bracket
5. Access Plate
6. Nylon Plug Button
7. Stiffener
8. Nut
9. Washer
10. Roller
11. Bushing
12. Bolt
13. Spacer

NOTE

Bushings (11), rollers (10) and spacers (13) are first positioned through slots in flap tracks, then are secured to the flap roller supports with attaching bolts, washers and nuts. Nylon plug buttons (6) prevent flap from chafing wing trailing edge.

Figure 7-4. Flap Installation

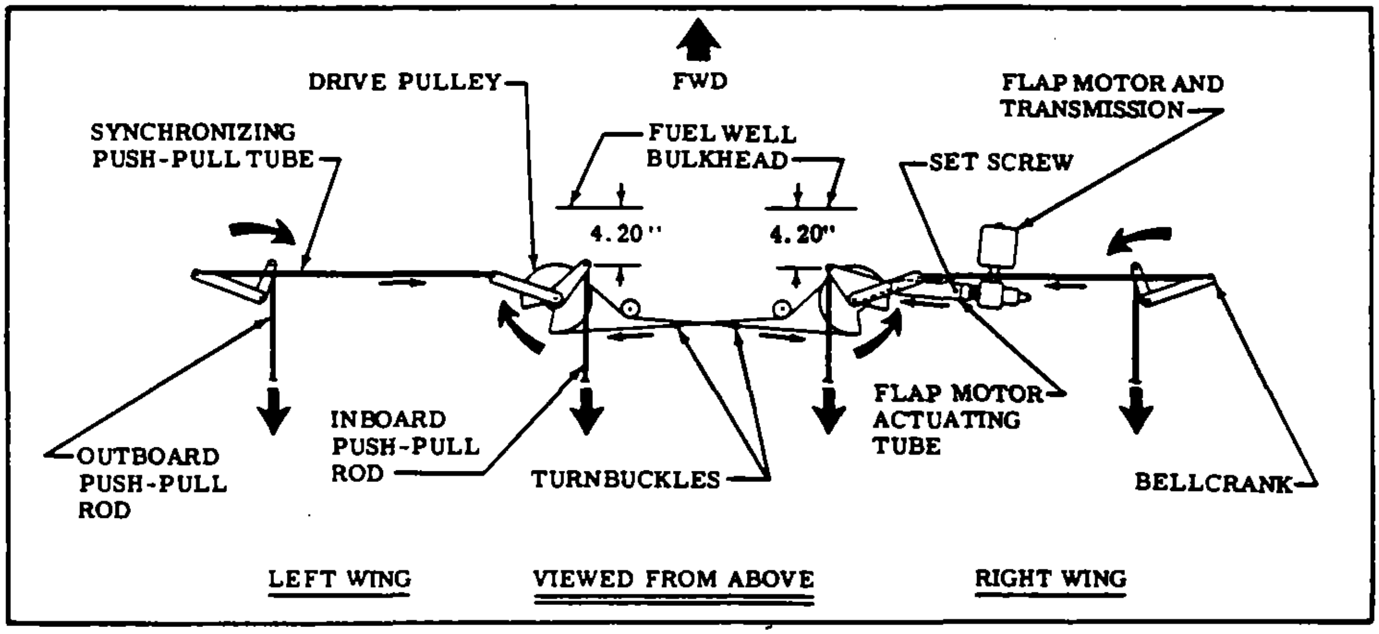


Figure 7-5. Flap System Schematic

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. Refer to section 6.

l. With RIGHT flap in full UP position, loosen setscrew (18) and slide UP-LIMIT switch (23) adjustment block (19) to operate switch and shut-off electrical power to motor at full UP position. Tighten setscrew (18).

m. Run RIGHT flap to DOWN position and adjust DOWN-LIMIT switch (17) adjustment block (19) to operate switch and shut-off electrical power to motor at degree of travel specified in figure 1-1. Tighten setscrew (18).

n. Run RIGHT flap to full UP position.

o. Complete step "h" for synchronizing push-pull tube in LEFT wing.

p. Connect control cables at turnbuckles (index 10, figure 7-1). Adjust turnbuckles to position left drive pulley so that the centerline of bolt hole for the inboard push-pull rod attachment is 4.20 inches aft of fuel well bulkhead while maintaining the similar 4.20 inches in the RIGHT wing, and maintaining 70±10 pounds cable tension. Adjust retract cable first.

NOTE

Ensure cables are positioned in pulley grooves and cable ends are positioned correctly at drive pulleys before tightening turnbuckles.

q. Manually holding LEFT flap full UP, adjust push-pull rods to align with drive pulley and bellcrank attachment holes. Connect push-pull rods and tighten locknuts.

r. After completion of steps "a" thru "s", operate flaps and check for positive shut-off of flap motor through several cycles. Check for specified flap travel with inclinometer mounted on each flap separately.

NOTE

Since the flap rollers may not bottom in the flap tracks with flaps fully extended, some free play may be noticed in this position.

7-22. RIGGING - FLAP CONTROL LEVER AND FOLLOW-UP. (See figure 7-3.)

a. Run flaps to full UP position.

b. Remove upholstery and headliner as necessary for access.

c. Pull all slack from follow-up control cable and with position indicator (9) in the full UP position, secure follow-up cable to retract cable (6) with union assembly (5).

d. Connect spring (21) to bellcrank (24).

e. Make minor cable length adjustments at brackets (3) by adjusting nuts (2).

f. With control lever (12) in full UP position, adjust switches (15 and 16) in slotted holes until cam (14) is centered between switch rollers. Be sure control lever (12) is in full UP position during this adjustment.

g. Mount an inclinometer on trailing edge of one flap and set to 0°. Turn master switch ON and move control lever to 10° position. If flap travel is more than 10°, adjust flaps DOWN operating switch (16) away from cam (14) and recycle flaps. If flap travel is less than 10°, adjust flaps DOWN operating switch (16) closer to cam (14) and recycle flaps.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

h. Adjust flaps UP operating switch (15) in slotted holes for .062 inch clearance between switch roller and cam (14) when the flaps DOWN operating switch has just opened in the 10° and 20° position.

NOTE

Flap travel on UP cycle may deviate a maximum of 4° from indicated position.

i. Turn master switch ON and run flaps through several cycles, stopping at various mid-range settings and checking that cable tension is within limits. Retract cable tension may increase to 90 pounds when flaps are fully retracted.
j. Check security of all components and replace items removed for access.

SHOP NOTES:

SECTION 8

ELEVATOR CONTROL SYSTEM

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8-1. ELEVATOR CONTROL SYSTEM. (See figure 8-1.)

8-2. DESCRIPTION. The elevators are operated by power transmitted through fore-and-aft movement of the pilot or copilot control wheels. The system is comprised of control columns, an elevator torque tube, cables and pulleys. The elevator control cables, at their aft ends, are attached to a bellcrank mounted on a bulkhead in the tailcone. A push-pull tube connects this bellcrank to the elevator arm assembly, installed between the elevators. An elevator trim tab is installed in the trailing edge of the right elevator and is described in Section 9.

8-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 8-14.

TROUBLE	PROBABLE CAUSE	REMEDY
NO RESPONSE TO CONTROL WHEEL FORE-AND-AFT MOVEMENT.	Forward or aft end of push-pull tube disconnected.	Check visually. Attach push-pull tube correctly.
	Cables disconnected.	Check visually. Attach cables and rig system in accordance with paragraph 8-14.
BINDING OR JUMPY MOTION FELT IN MOVEMENT OF ELEVATOR SYSTEM.	Defective bellcrank or arm assembly pivot bearings or push-pull tube attach bearings.	Move bellcrank or arm to check for play or binding. Disconnect push-pull tube and check that bearings rotate freely. Replace defective parts.
	Cables slack.	Check and adjust to tension specified in figure 8-1.

8-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
BINDING OR JUMPY MOTION FELT IN MOVEMENT OF ELEVATOR SYSTEM. (Cont.)	Cables not riding correctly on pulleys.	Check visually. Route cables correctly over pulleys.
	Nylon grommet on instrument panel binding.	Replace grommet.
	Defective control column bearing rollers.	Check visually. Replace defective rollers.
	Defective control column torque tube bearings.	Disconnect necessary items and check that bearings rotate freely. Replace defective bearings.
	Control guide on aft end of control square tube adjusted too tightly.	Loosen screw and tapered plug in end of control tube enough to eliminate binding.
	Defective elevator hinges.	Disconnect push-pull tube and move elevators by hand. Replace defective hinges.
	Defective pulleys or cable guards.	Check visually. Replace defective parts and install guards properly.
ELEVATORS FAIL TO ATTAIN PRESCRIBED TRAVEL.	Stops incorrectly set.	Rig in accordance with paragraph 8-14.
	Cables tightened unevenly.	Rig in accordance with paragraph 8-14.
	Interference at instrument panel.	Rig in accordance with paragraph 8-14.

8-4. CONTROL COLUMN. (See figure 6-2.) Section 6 outlines removal, installation and repair of control column.

8-5. ELEVATORS. (See figure 8-2.)

8-6. REMOVAL AND INSTALLATION.

a. Remove stinger.

b. Disconnect trim tab push-pull tube at tab actuator. (Refer to Section 9.)

NOTE

If trim system is not moved and actuator screw is not turned, re-rigging of trim system should not be necessary after reinstallation of elevator.

NOTE

Bolts (13) are installed using EA9309-25GR, it may be necessary to apply heat in the area of the bolt shank to soften the epoxy prior to removing the bolts (13).

c. Remove bolts (13) securing elevator torque tubes (7) to arm assembly (8). A heat gun may be required to soften epoxy adhesive on bolt (13).

d. Remove bolts (6) from elevator hinges (5).

e. Using care, remove elevator.

f. To remove left elevator use same procedure, omitting step "b."

g. Reverse the preceding steps for reinstallation.

h. Set right hand elevator maintaining 0.18" dimension specified in figure 8-2.

i. When reinstalling bolts (13) install a washer under the head of each bolt and under each nut. Apply Adhesive EA-9309-25GR from Hysol Division, Dexter Corp., or its equivalent, only to the shanks of bolts (13). Wipe off excess adhesive after installation.

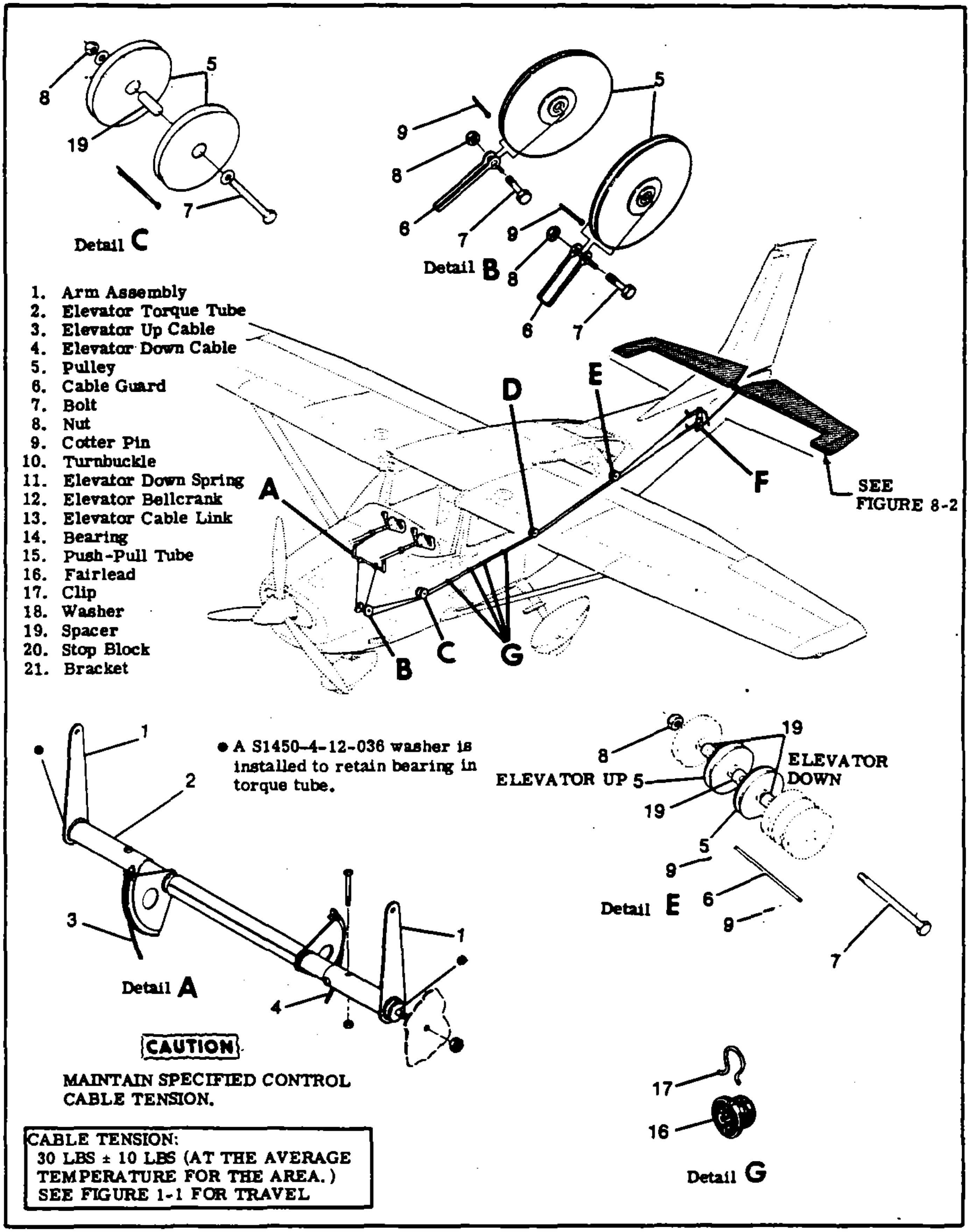


Figure 8-1. Elevator Control System (Sheet 1 of 2)

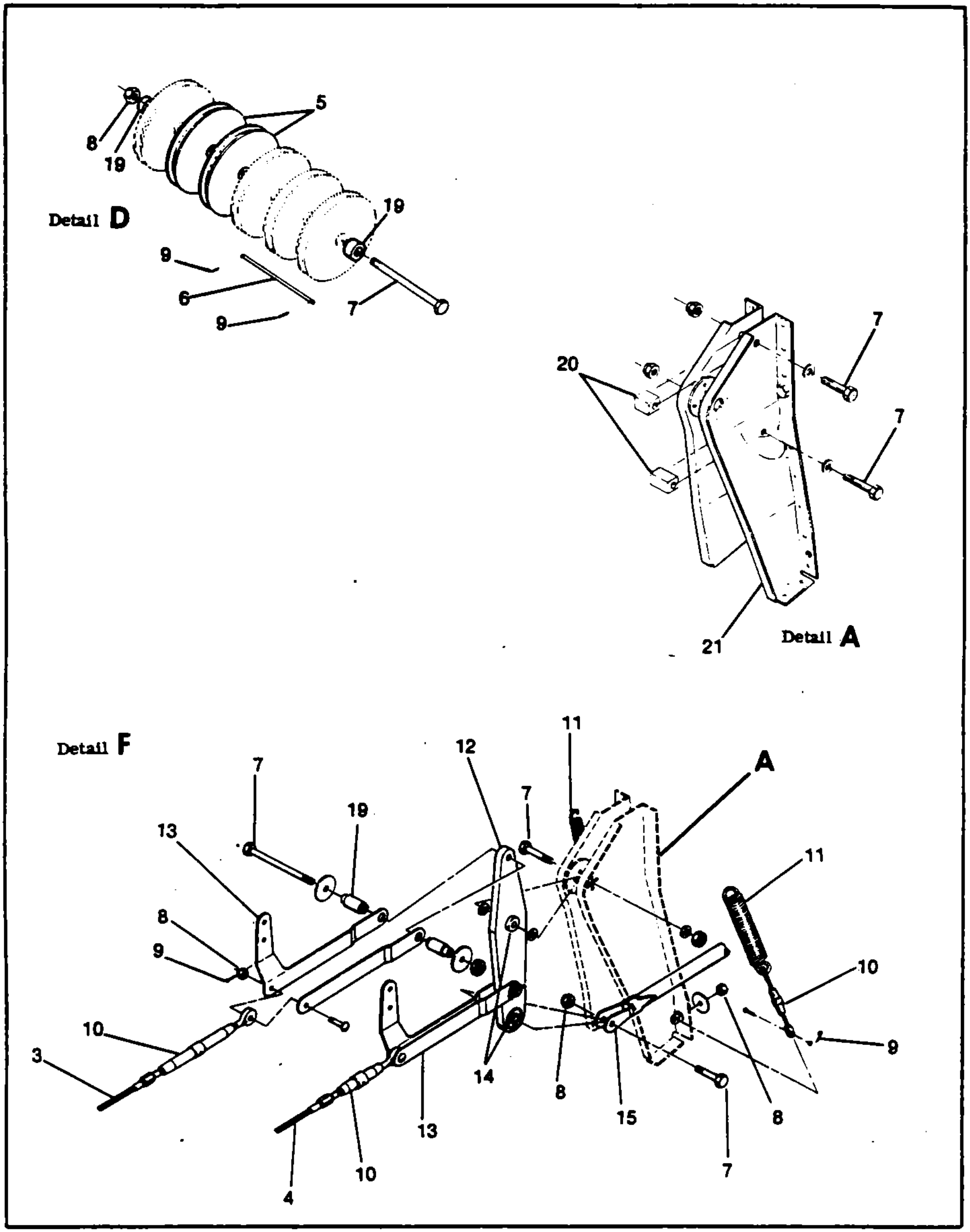
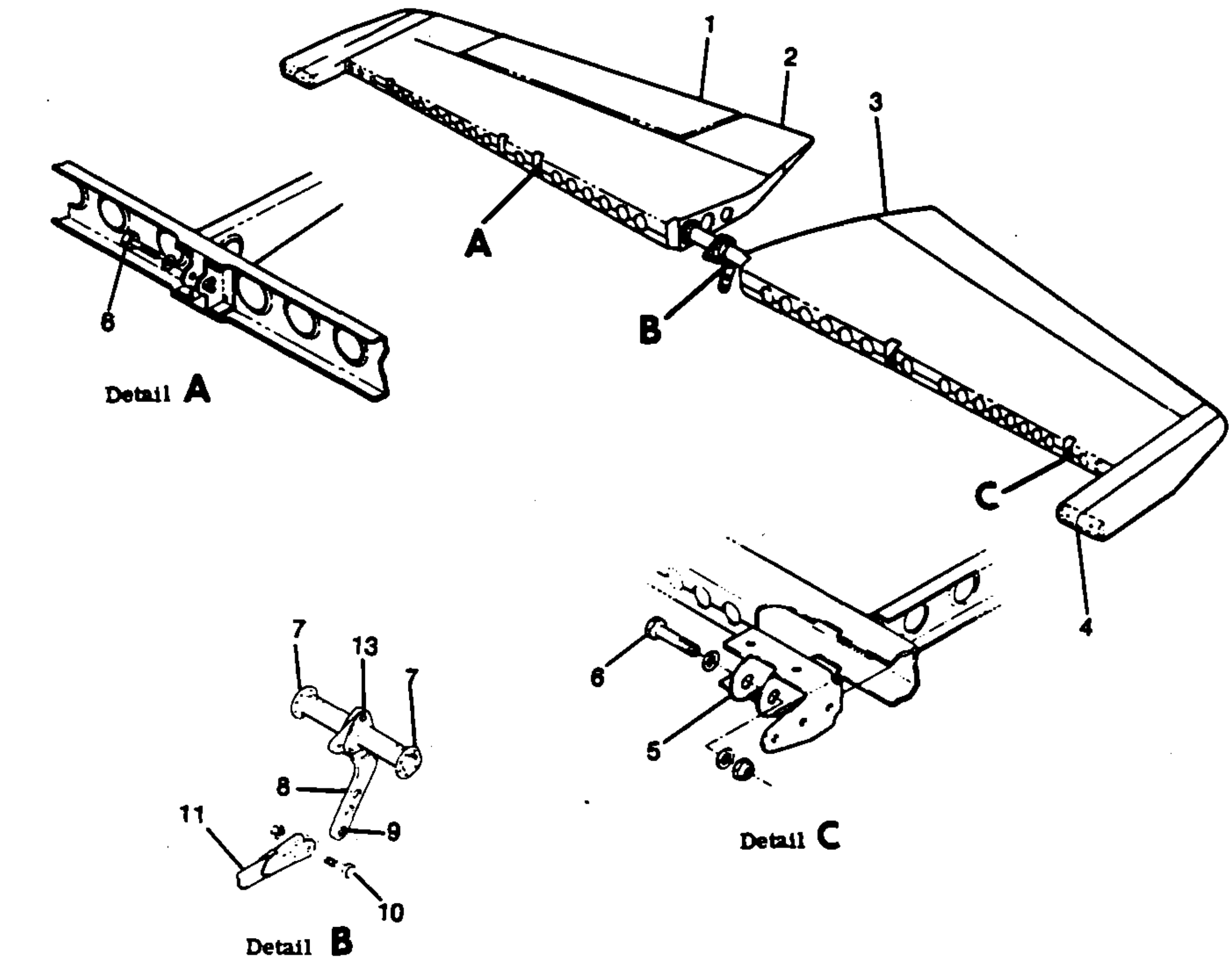
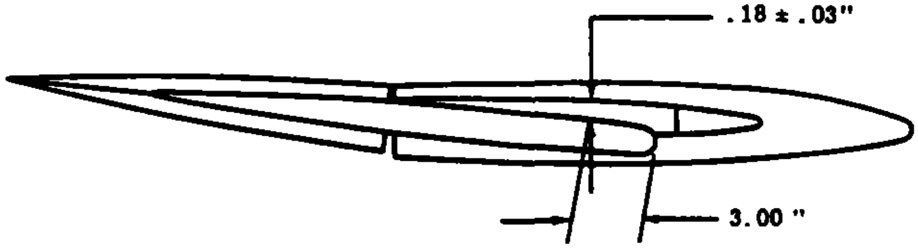


Figure 8-1. Elevator Control System (Sheet 2 of 2)





THIS VIEW APPLIES TO THE RIGHT HAND ELEVATOR
WHEN THE LEFT HAND ELEVATOR IS STREAMLINED

1. Trim Tab
2. Right Elevator
3. Left Elevator
4. Balance Weight
5. Hinge Assembly
6. Bolt
7. Torque Tube
8. Arm Assembly
9. Needle Bearing
10. Bolt
11. Push-Pull Tube
12. Pivot Bolt
13. Bolt

NOTE

Do not attempt to align the elevator trailing edges as there is a 0° 54' twist designed into the connecting torque tube. This twist causes the right elevator to be higher than the left.

Figure 8-2. Elevator Installation

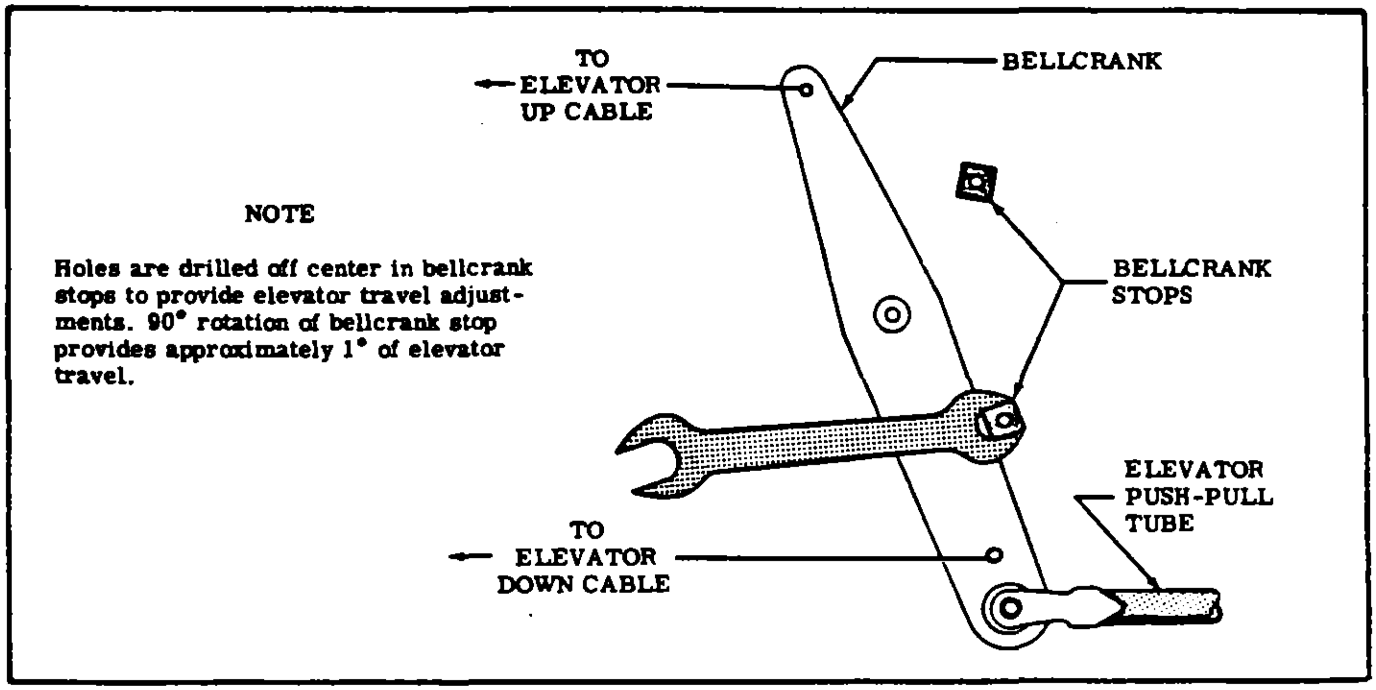


Figure 8-3. Elevator Bellcrank Travel Stop Adjustment

8-7. REPAIR. Repair may be accomplished as outlined in Section 18. Hinge bearings may be replaced as necessary. If repair has affected static balance, check and rebalance as required.

8-8. BELLCRANK. (See figure 8-1.)

8-9. REMOVAL AND INSTALLATION.

a. Remove access plate below bellcrank on tailcone.

CAUTION

Position a support stand under tail tie-down ring to prevent the tailcone from dropping while working inside.

b. Remove safety wire, relieve cable tension at turnbuckles (10) and disconnect turnbuckle eyes at bellcrank links (13).

c. Remove bolt (7) securing push-pull tube (15) to bellcrank (12).

d. Remove pivot bolt (7) attaching bellcrank (12) to brackets (21) and remove bellcrank.

e. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 8-14, safety turnbuckles and reinstall all items removed for access.

8-10. ARM ASSEMBLY. (See figure 8-2.)

8-11. REMOVAL AND INSTALLATION.

a. Remove stinger.

b. Remove bolt (10) securing push-pull tube (11) to arm assembly (8).

c. Remove bolts (13) securing elevator torque tubes (7) to arm assembly (8). A heat gun may be required to soften epoxy adhesive on bolts (13).

d. Remove pivot bolt (12) securing arm assembly (8) and slide assembly from between elevator torque tubes.

e. Reverse the preceding steps for reinstallation and reinstall all items removed for access.

f. Set right hand elevator maintaining 0.18" dimension specified in figure 8-2.

g. When reinstalling bolts (13) install a washer under the head of each bolt and under each nut. Apply Adhesive EA-9309 from Hysol Division, Dexter Corp., or its equivalent, only to the shanks of bolts (13). Wipe off excess adhesive after installation.

8-12. CABLES AND PULLEYS. (See figure 8-1.)

8-13. REMOVAL AND INSTALLATION.

CAUTION

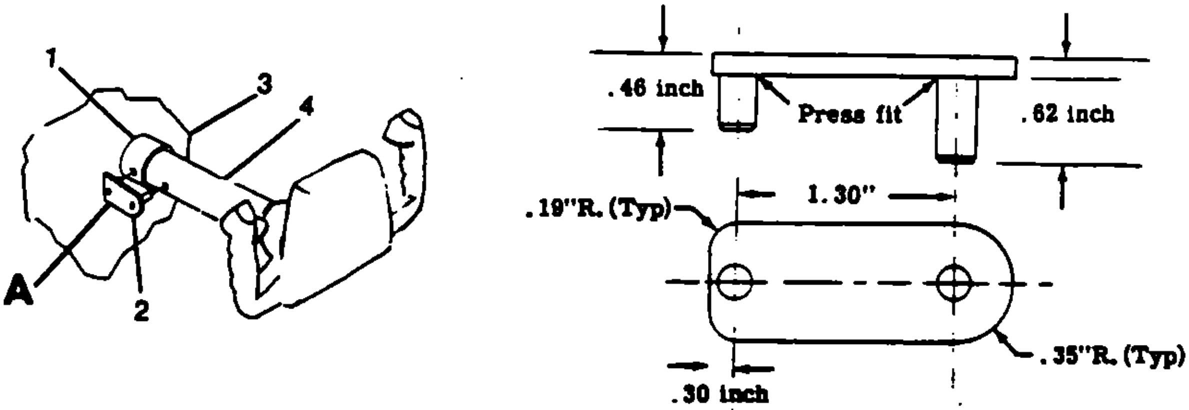
Position a support stand under tail tie-down ring to prevent the tailcone from dropping while working inside.

a. Remove seats, upholstery and access plates as necessary.

b. Remove safety wire and relieve cable tension at turnbuckles (10).

c. Disconnect cables at control column arm assemblies (3).

d. Disconnect cables at bellcrank links (index 16, figure 8-3).



1. Support
2. Neutral Rigging Tool
3. Instrument Panel
4. Pilot's Control Column

Detail **A**

Fabriacte from .125 inch steel plate with .209 inch dia. drill rod for the short pin (.46 inch) and .250 inch dia. drill rod for the long pin (.62 inch) according to dimensions shown.

Figure 8-4. Control Column Neutral Position Rigging Tool

e. Remove fairleads, cable guards and pulleys as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to the end of cable being withdrawn from aircraft. Leave wire in place, routed through structure; then attach the cable being installed and pull cable into position.

f. Reverse the preceding steps for reinstallation.
g. After cables are routed in position, install pulleys and cable guards. Ensure cables are positioned in pulley grooves before installing guards.
h. Re-rig system in accordance with paragraph 8-14, safety turnbuckles and reinstall all items removed in step "a."

8-14. RIGGING. (See figure 8-2.)

CAUTION

Position a support stand under tail tie-down ring to prevent the tailcone from dropping while working inside.

a. Lock control column in neutral position by installing neutral rigging tool (see figure 8-4).

NOTE

Disregard counterweight areas of the elevator when streamlining. These areas are contoured to be streamlined at cruising speed (elevators approximately 3° down).

b. With left elevator in streamlined position, mount an inclinometer on elevator and set to 0°.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

c. Adjust bellcrank travel stop blocks (8) to obtain correct elevator travel as specified in figure 1-1.
d. Move control wheel through full range of travel and check cable tension in various positions. Tension should be 30±10 pounds in any position.
e. Insure that all turnbuckles are safetied and all parts secured, then reinstall all parts removed for access.

WARNING

Be sure elevators move in the correct direction when operated by the control wheels.

SECTION 9

ELEVATOR TRIM TAB CONTROL SYSTEM

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9-1. ELEVATOR TRIM TAB CONTROL SYSTEM. (See figure 9-1.)

9-2. DESCRIPTION. The elevator trim tab, located on the trailing edge of the right elevator, is controlled by a trim wheel mounted in the pedestal. Power to operate the tab is transmitted from the trim control wheel by means of roller chains, cables, an actuator and a push-pull tube. A mechanical pointer, adjacent to the trim wheel indicates nose attitude of the aircraft. Forward rotation of the wheel trims the nose down and aft rotation of the wheel trims the nose up. An electric trim assist may be installed and is described in paragraph 9-16. When de-energized the electric trim assist has no effect on manual operation.

9-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 9-15.

TROUBLE	PROBABLE CAUSE	REMEDY
TRIM CONTROL WHEEL MOVES WITH EXCESSIVE RESISTANCE.	Cable tension too high.	Check cable tension and adjust.
	Pulleys binding or rubbing.	Check pulleys visually. Repair or replace as necessary.
	Cables not in place on pulleys.	Check visually. Install cables correctly.
	Trim tab hinge binding.	Disconnect actuator and move tab up and down to check hinge resistance. Lubricate or replace hinge as necessary.
	Defective trim tab actuator.	Remove chain from actuator sprocket and operate actuator manually. Replace defective actuator.
	Rusty chain.	Check visually. Replace rusty chain.

9-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
TRIM CONTROL WHEEL MOVES WITH EXCESSIVE RESISTANCE (CONT).	Damaged sprocket.	Check visually. Replace damaged sprockets.
	Bent sprocket shaft.	Observe motion of sprockets. Replace defective shafts.
LOST MOTION BETWEEN CONTROL WHEEL AND TRIM TAB.	Cable tension too low.	Check cable tension and adjust.
	Broken pulley.	Check visually. Replace defective pulley.
	Cables not in place on pulleys.	Check visually. Install cables correctly.
	Worn trim tab actuator.	Disconnect trim tab and check for play in actuator. Replace defective actuator.
	Actuator attachment loose.	Check actuator for security and tighten.
TRIM INDICATION INCORRECT.	Indicator incorrectly engaged on wheel track.	Check visually. Reset indicator.
INCORRECT TRIM TAB TRAVEL.	Stop blocks loose or incorrectly adjusted.	Adjust stop blocks on cables. Refer to figure 9-5.
	Incorrect rigging.	Refer to paragraph 9-15.

9-4. TRIM TAB. (See figure 9-3.)

9-5. REMOVAL AND INSTALLATION.

a. Disconnect push-pull tube (9) from horn assembly (6).

NOTE

If trim system is not moved and actuator screw is not turned, re-rigging of system should not be necessary after reinstallation of tab.

b. Remove screw (11) securing hinge pin (10), pull pin until free of tab and remove tab.

NOTE

It is not necessary to completely remove hinge pin.

c. Reverse the preceding steps for reinstallation. Rig system, if necessary, in accordance with paragraph 9-15.

9-6. TRIM TAB FREE-PLAY INSPECTION.

a. Place elevator and trim tab in neutral position and secure elevator from movement.

b. Determine maximum amount of allowable free play using formula shown in figure 9-2.

c. Using moderate hand pressure (up and down), measure free-play at trailing edge of trim tab.

d. If trim tab free-play is less than maximum allowable, the system is within prescribed limits.

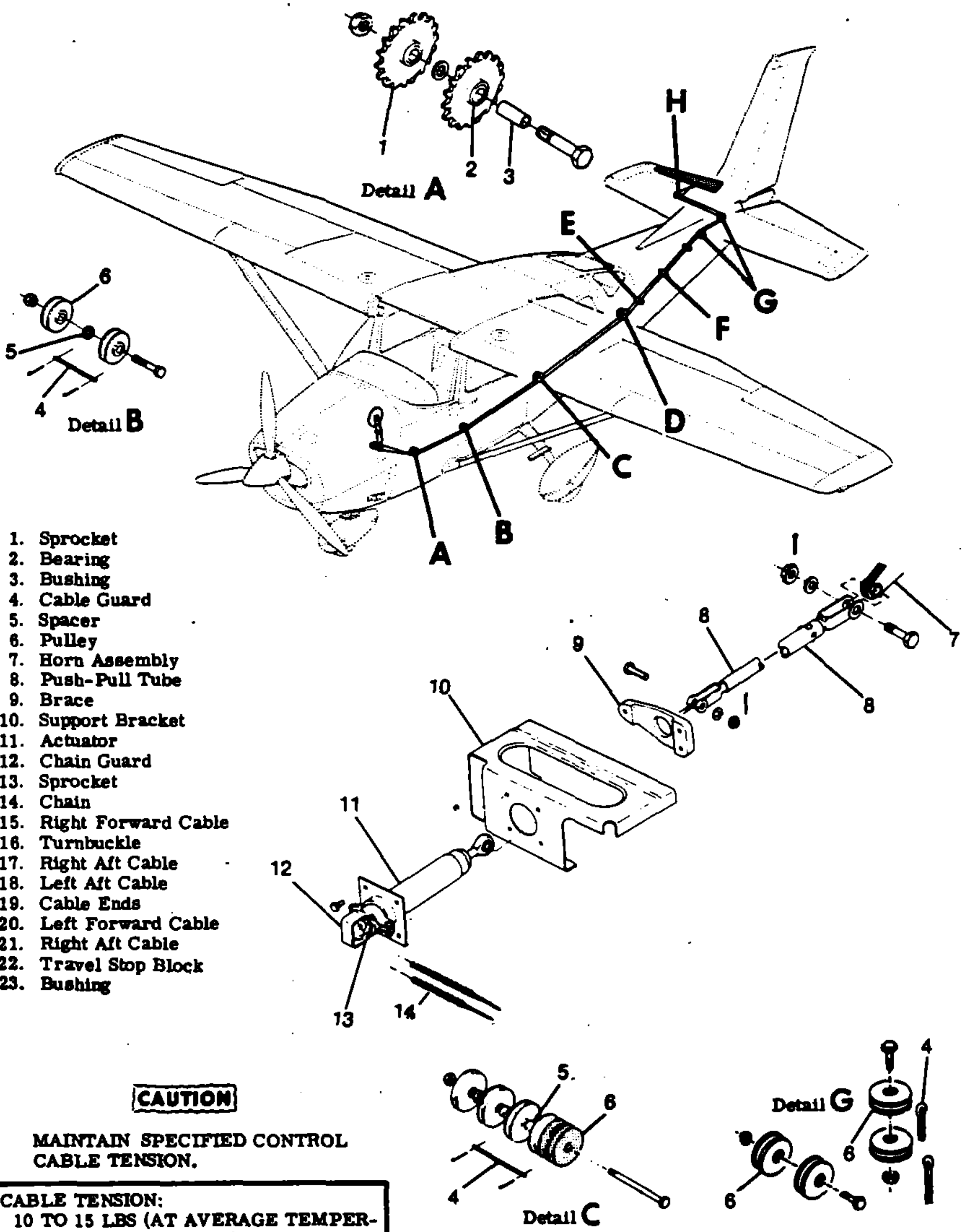
e. If trim tab free-play is more than maximum allowable, check the following items for looseness while moving trim tab up and down.

1. Check push-pull tube to trim tab horn assembly attachment for looseness.

2. Check push-pull tube to actuator assembly threaded rod end attachment for looseness.

3. Check actuator assembly threaded rod end for looseness in the actuator assembly with push-pull tube disconnected.

f. If looseness is apparent while checking steps e-1 thru e-3, repair by replacing defective components. Recheck trim tab free play.



1. Sprocket
2. Bearing
3. Bushing
4. Cable Guard
5. Spacer
6. Pulley
7. Horn Assembly
8. Push-Pull Tube
9. Brace
10. Support Bracket
11. Actuator
12. Chain Guard
13. Sprocket
14. Chain
15. Right Forward Cable
16. Turnbuckle
17. Right Aft Cable
18. Left Aft Cable
19. Cable Ends
20. Left Forward Cable
21. Right Aft Cable
22. Travel Stop Block
23. Bushing

CAUTION

MAINTAIN SPECIFIED CONTROL CABLE TENSION.

CABLE TENSION:
10 TO 15 LBS (AT AVERAGE TEMPERATURE FOR THE AREA.)
SEE FIGURE 1-1 FOR TRAVEL

Figure 9-1. Elevator Trim Tab Control System (Sheet 1 of 2)

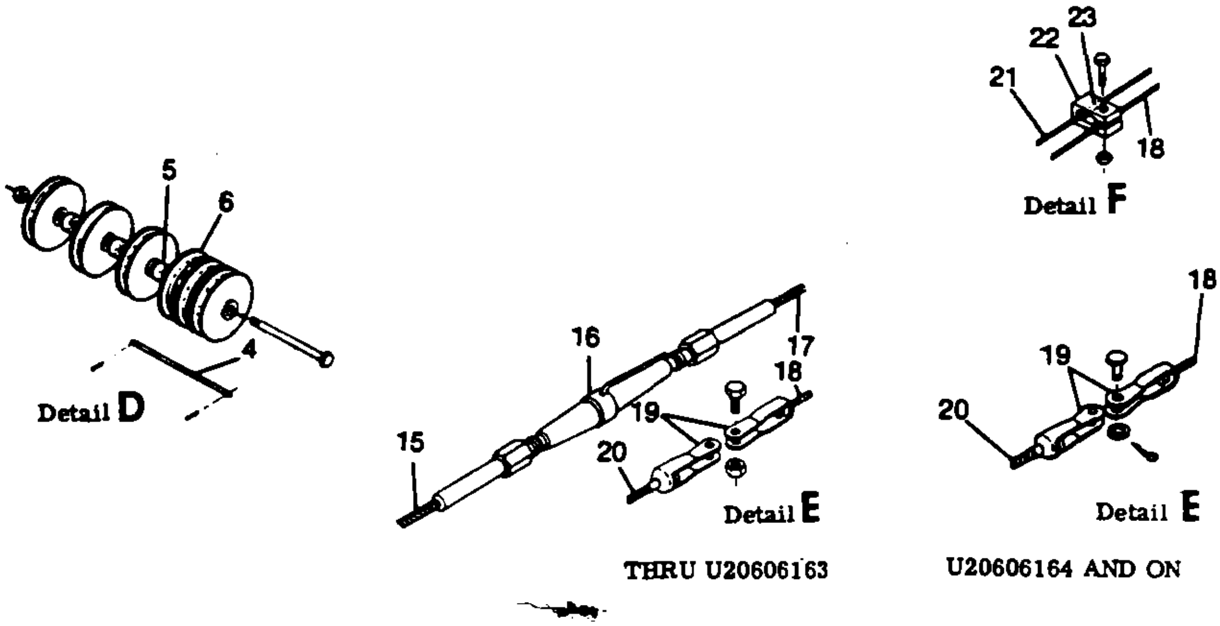
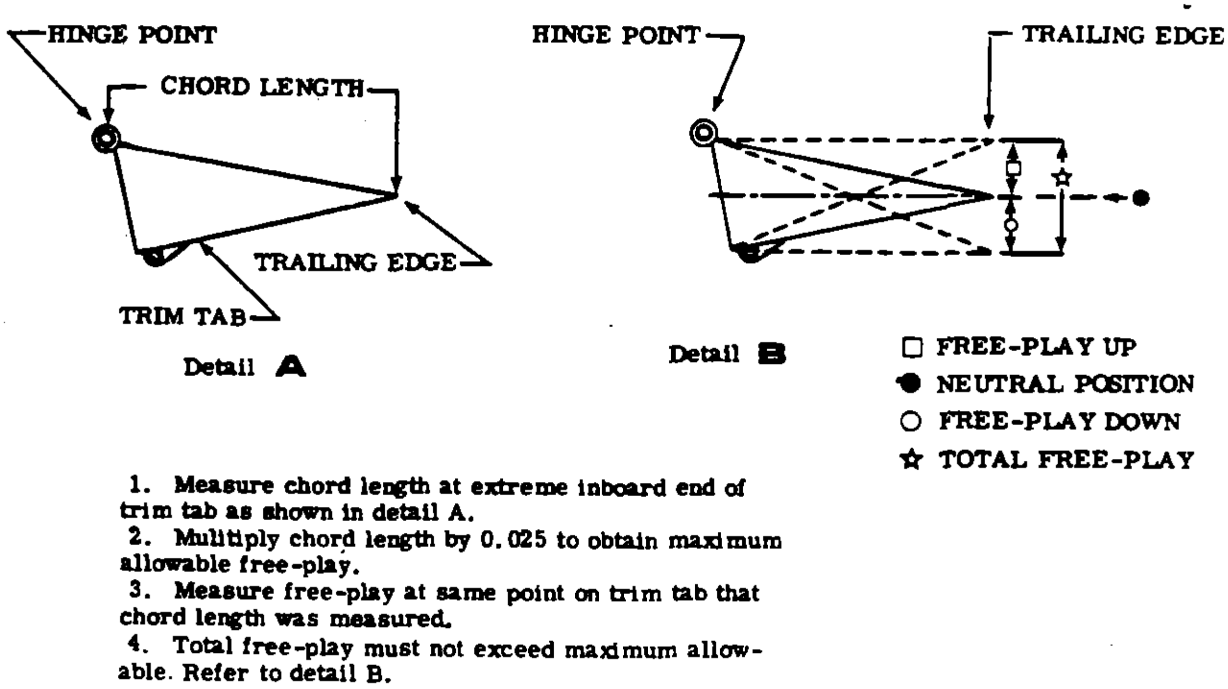
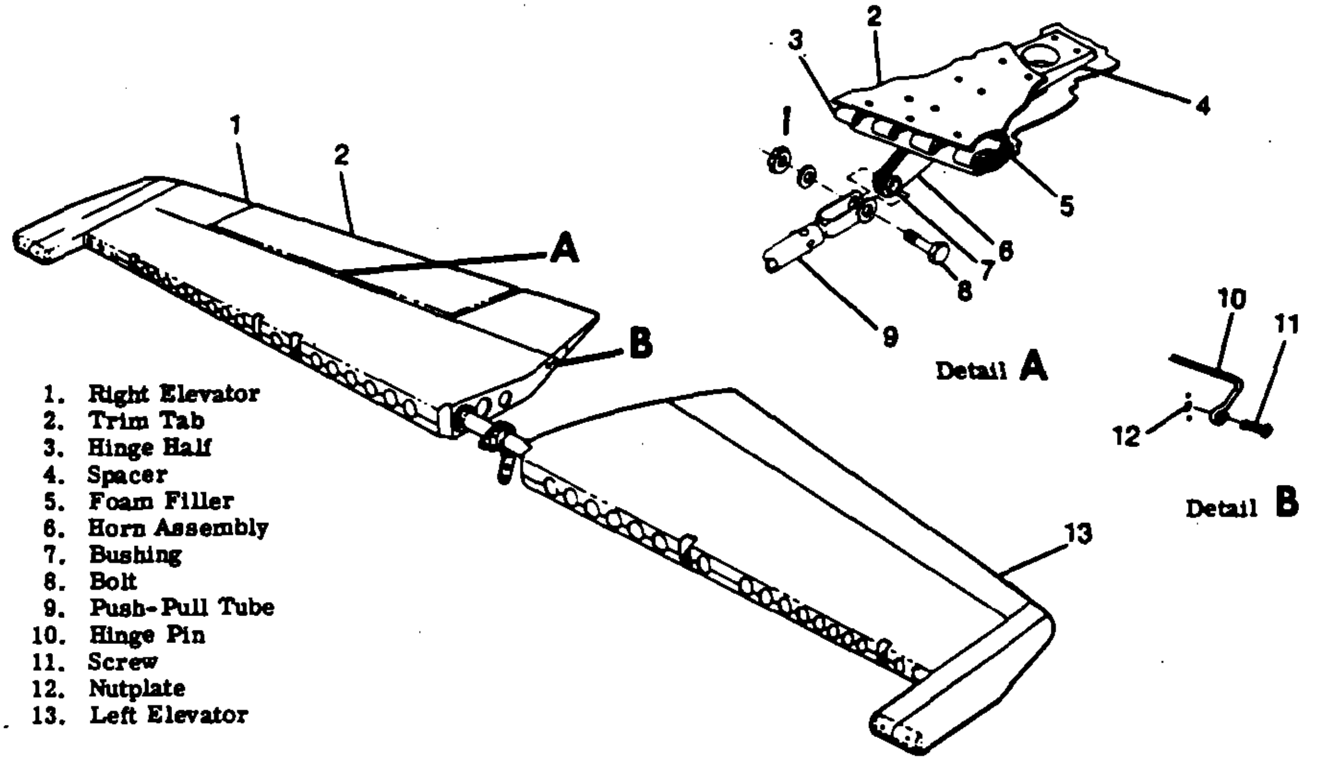


Figure 9-1. Elevator Trim Tab Control System (Sheet 2 of 2)



1. Measure chord length at extreme inboard end of trim tab as shown in detail A.
2. Mulitiply chord length by 0.025 to obtain maximum allowable free-play.
3. Measure free-play at same point on trim tab that chord length was measured.
4. Total free-play must not exceed maximum allowable. Refer to detail B.

Figure 9-2. Trim Tab Free-Play Inspection



1. Right Elevator
2. Trim Tab
3. Hinge Half
4. Spacer
5. Foam Filler
6. Horn Assembly
7. Bushing
8. Bolt
9. Push-Pull Tube
10. Hinge Pin
11. Screw
12. Nutplate
13. Left Elevator

Figure 9-3. Elevator Trim Tab Installation

9-7. TRIM TAB ACTUATOR. (See figure 9-1.)

9-8. REMOVAL AND INSTALLATION.

a. Relieve cable tension at turnbuckle (16).

CAUTION

Position a support stand under tail tie-down ring to prevent tailcone from dropping while working inside.

b. Disconnect push-pull tube (8) at actuator (11).
c. Remove access plate beneath actuator.
d. Remove chain guard (12) and disengage roller chain (14) from actuator sprocket (13).
e. Remove screws attaching clamps to bracket (10) and remove actuator (11) through access opening.
f. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 9-15, safety turnbuckle and reinstall all items removed for access.

9-9. TRIM TAB CONTROL WHEEL. (See figure 9-5.)

9-10. REMOVAL AND INSTALLATION.

a. Remove pedestal cover as outlined in paragraph 9-13.
b. Remove screws (8) and nuts (6) securing chain guard (7) to pedestal structure (9).
c. Remove nut (4) securing indicator (2) to pivot stud (1). Retain washers (3) for reinstallation.
d. Loosen bolts (12) securing idler sprockets (11) to pedestal structure (9), slide idler sprockets in slotted holes and disengage chain (13) from sprockets.
e. Remove bolts (12) and remove chain guard (7) using care not to bend indicator (2) or drop parts into tunnel area.
f. Remove roller chain (13) from trim wheel sprocket and carefully slide wheel (5) from pivot stud (20).
g. Reverse the preceding steps for reinstallation. Remove roller chain (13) slack by adjusting idler sprockets (11) in slotted holes and reinstall all items removed for access.

9-11. CABLES AND PULLEYS.

9-12. REMOVAL AND INSTALLATION.

a. FORWARD CABLE. (See figure 9-1.)

1. Peel back carpeting as necessary to expose access plates in cabin and baggage areas and remove plates.
2. Remove safety wire, relieve cable tension and disconnect turnbuckle (16).
3. Disconnect cable ends (19).
4. (Refer to figure 9-5.) Remove pedestal cover as outlined in paragraph 9-13.
5. Remove lower pedestal panel (17) and disengage roller chain (15) from drive sprocket assembly (16).
6. Remove cable guards and pulleys as necessary to work cable free of aircraft.

NOTE

To ease routing of cable, a length of wire may be attached to the end of cable before being withdrawn from aircraft. Leave wire in place, routed through structure; then attach the cable

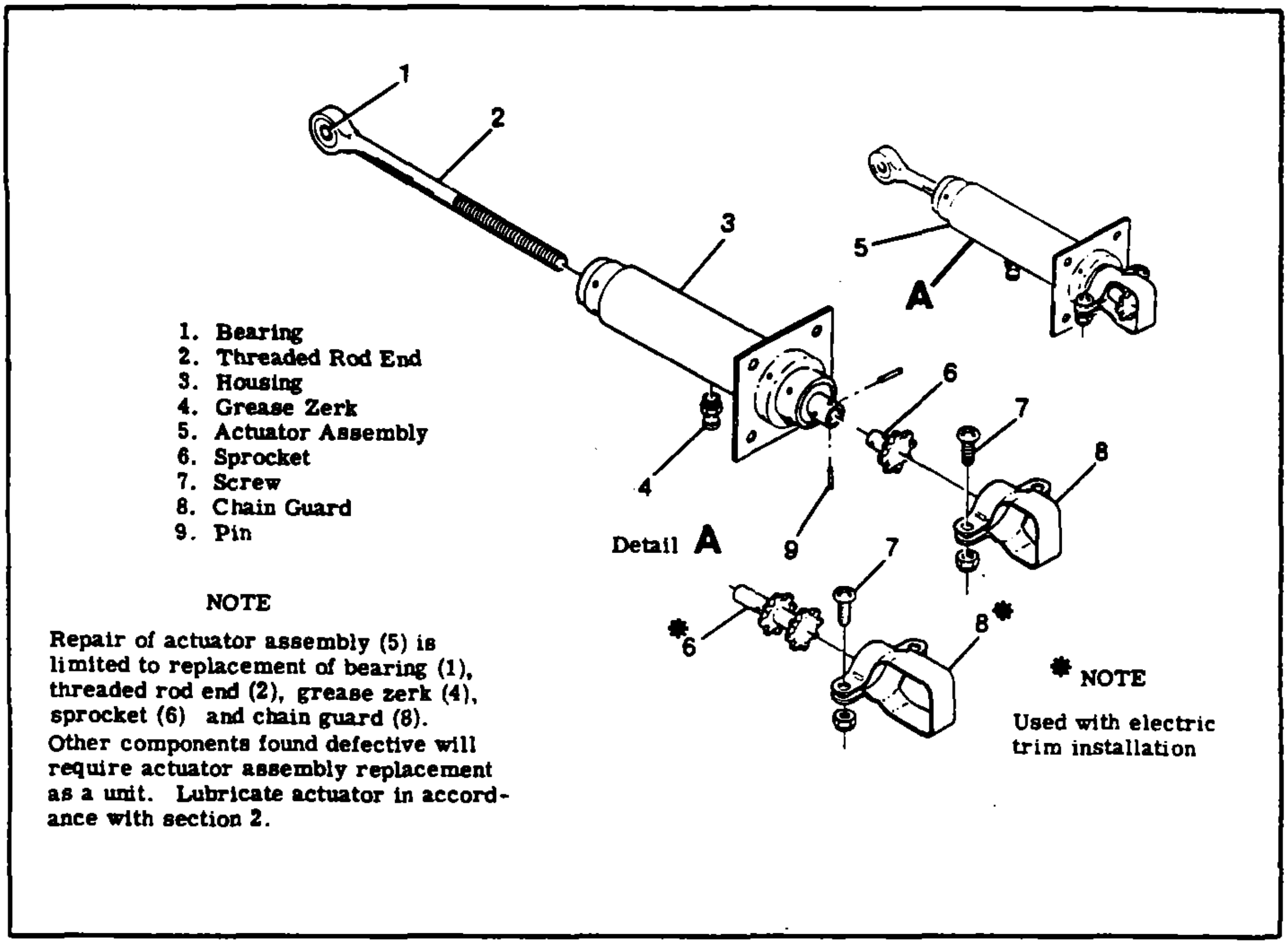


Figure 9-4. Elevator Trim Tab Actuator Assembly

being installed and pull cable into position.

7. Reverse the preceding steps for reinstallation.
8. After cable is routed in position, install pulleys and cable guards. Ensure cable is positioned in pulley grooves before installing guards. Ensure roller chain (15) is positioned correctly over drive sprocket (16).
9. Re-rig system in accordance with paragraph 9-15, safety turnbuckle (index 16, figure 9-1) and reinstall all items removed for access.

b. AFT CABLE. (See figure 9-1.)
1. Remove rear baggage compartment wall.
2. Remove safety wire, relieve cable tension and disconnect turnbuckle (16).

CAUTION

Position a support stand under tail tie-down wing to prevent tailcone from dropping while working inside.

3. Disconnect cable ends (19).
4. Remove travel stop blocks (22).
5. Remove access plate beneath trim tab actuator (11) and remove chain guard (12).

9-13. PEDESTAL COVER.

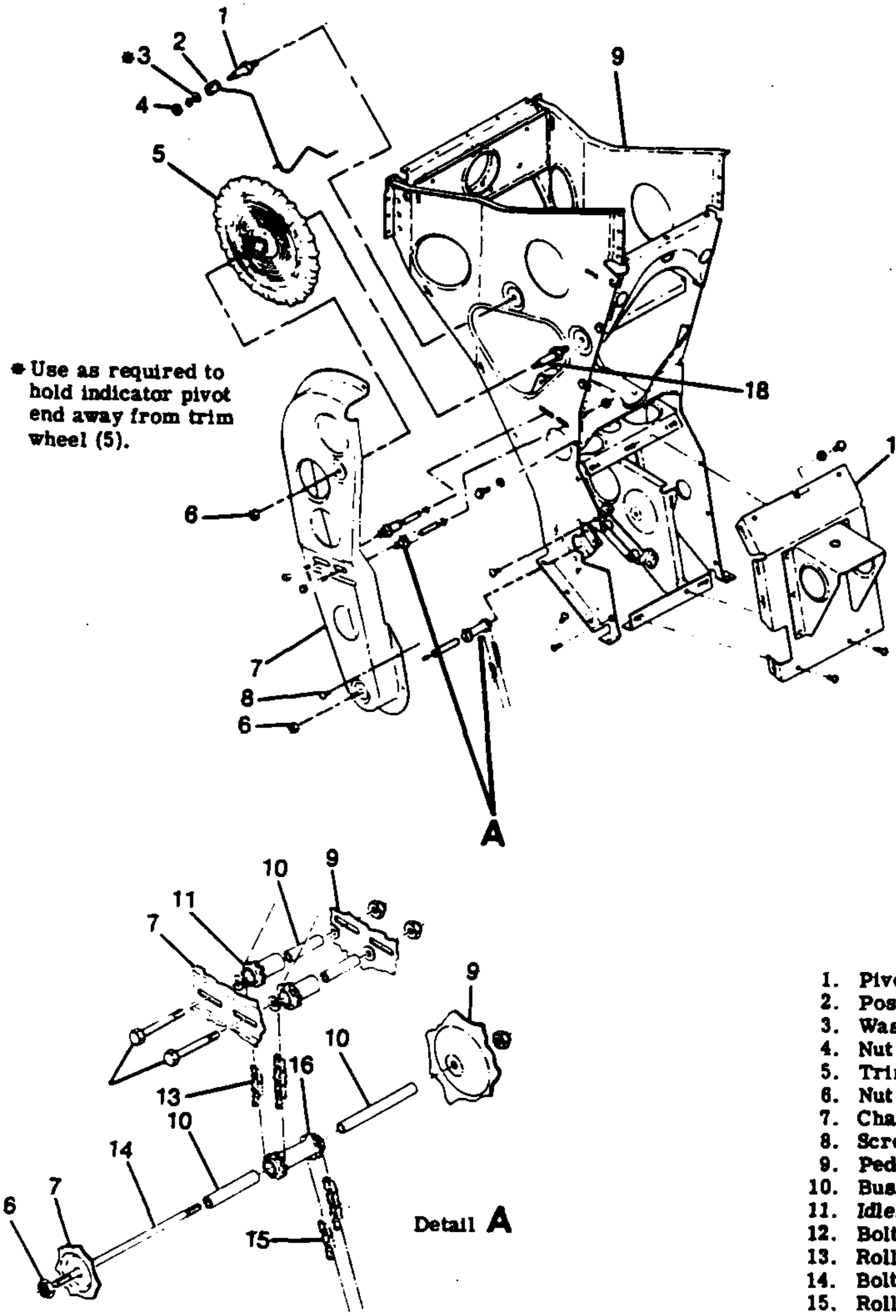
9-14. REMOVAL AND INSTALLATION.

a. Turn fuel selector valve to OFF position and drain fuel from strainer and lines.
b. Remove knurled nut from engine primer if installed and pull plunger from primer body. Protect primer from dirt.
c. Remove fuel selector handle and placard.
d. Remove cowl flap handle knob.
e. Remove electric trim circuit breaker nut and microphone mounting bracket, if installed.
f. Fold carpet back as necessary and remove screws securing cover to floor and pedestal.
g. Disconnect electrical wiring to pedestal lights.
h. Carefully work cover from pedestal to prevent damage.
i. Reverse the preceding steps for reinstallation.

9-15. RIGGING - STANDARD TRIM SYSTEM. (See figure 9-1.)

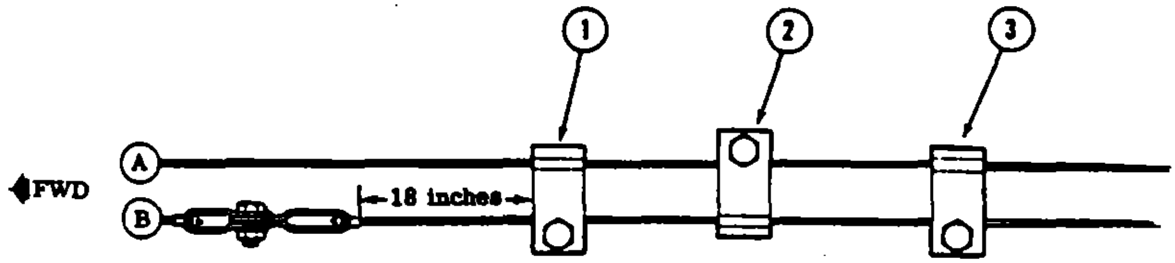
CAUTION

Position a support stand under tail tie-down ring to prevent tailcone from dropping while working inside.



1. Pivot Stud
2. Position Indicator
3. Washer
4. Nut
5. Trim Wheel
6. Nut
7. Chain Guard
8. Screw
9. Pedestal Structure
10. Bushing
11. Idler Sprocket
12. Bolt
13. Roller Chain
14. Bolt
15. Roller Chain
16. Drive Sprocket
17. Lower Pedestal Panel
18. Pivot Stud

Figure 9-5. Elevator Trim Wheel Installation



1. With elevators in neutral, set trim tab to neutral (split the non-faired difference between the inboard and outboard ends). Mount an inclinometer on the trim tab and set to 0°.
2. Lower tab to degree specified in Section 1.
3. Position stop block (1) 18 inches aft of clevis on cable B and secure to cable B.
4. Position stop block (2) aft of and against stop block (1) and secure to cable A.
5. Raise trim tab to specified degree, place stop block (3) aft of and against stop block (2) and secure to cable B.

Figure 9-6. Elevator Trim Tab Travel Stop Adjustment

a. Remove rear baggage compartment wall and access plates as necessary.
b. Loosen travel stop blocks (22) on trim tab cables (18 and 19).
c. Disconnect push-pull tube (8) from actuator (11).
d. Check cable tension for 10-15 pounds and readjust turnbuckle (16), if necessary.

NOTE

If roller chains and/or cables are being installed, permit actuator screw to rotate freely as roller chains and cables are connected. Adjust cable tension and safety turnbuckle (16).

e. (Refer to figure 9-4.) Rotate trim control wheel (5) full forward (nose down). Ensure pointer (2) does not restrict wheel movement. If necessary to reposition pointer, proceed as follows:
1. Remove pedestal cover as outlined in paragraph 9-13.
2. Loosen nut (6) at trim wheel pivot stud (20).
3. Loosen screws (8) securing chain guard (7) far enough that trim wheel (5) can be moved approximately 1/8 inch, then reposition pointer (2) using a thin screwdriver to pry trailing leg of pointer out of groove in trim wheel. Reposition pointer as required.
4. Tighten nut (6) and screws (8), but do not reinstall pedestal cover until rigging is complete.

NOTE

Full forward (nose down) position of trim wheel is where further movement is prevented by the roller chain or cable ends contacting sprockets or pulleys.

f. With elevator and trim tab both in neutral (split the non-faired difference between the inboard and outboard ends), mount an inclinometer on trim tab and set to 0°. Disregard counterweight areas of elevators when streamlining. These areas are contoured so they will be approximately 3° down at cruising speed.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

g. Rotate actuator screw in or out as required to place trim tab up with a maximum of 2° overtravel, with actuator screw connected to push-pull tube (index 8, figure 9-1).
h. Rotate trim wheel to position trim tab up and down, readjusting actuator screw as required to obtain overtravel in both directions.
i. Position stop blocks and adjust as illustrated in figure 9-6 to degree of trim tab travel specified in figure 1-1.
j. Install pedestal cover and adjust trim tab pointer (2) as follows:
1. Rotate trim control wheel (5) to place tab at 10° up position.
2. Locate the pointer (2) at the "TAKE-OFF" triangle as viewed from the pilot seat. (Refer to step "e," and reposition pointer if necessary.)
3. Bend pointer (2) as required to clear pedestal cover. (Pointer must NOT rub against pedestal cover or clear cover more than .125 inch maximum.)
k. Safety Turnbuckle and reinstall all items removed in step "a".

WARNING

Be sure trim tab moves in correct direction when operated by trim control wheel. Nose down trim corresponds to tab up position.

9-16. ELECTRIC ELEVATOR TRIM ASSIST INSTALLATION. (See figure 9-7.)

9-17. DESCRIPTION. The electric trim installation consists of two switches mounted on the pilot's control wheel, a circuit breaker located in the left sidewall circuit breaker panel, fuselage wiring running aft to the 24 volt D.C. electric drive assembly and a chain connecting the drive assembly to an additional sprocket on the standard elevator trim actuator. The electric drive assembly includes a motor, sprockets and a chain-driven solenoid type adjustable clutch. The electric drive assembly chain connects to the FORWARD sprocket of the trim tab actuator, and the manual trim chain connects to the AFT sprocket of the actuator. When the clutch or the drive assembly is not energized, it "free wheels" and, therefore, has no effect on manual operation.

9-18. TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
SYSTEM INOPERATIVE.	Circuit breaker out.	Check visually. Reset breaker.
	Defective circuit breaker.	Check continuity. Replace defective breaker.
	Defective wiring.	Check continuity. Repair wiring.
	Defective trim switch.	Check continuity. Replace defective switch.
	Defective trim motor.	Remove and bench test. Replace defective motor.
TRIM MOTOR OPERATING - TRIM TAB FAILS TO MOVE.	Defective clutch solenoid.	Check continuity. Replace solenoid.
	Improperly adjusted clutch tension.	Check and adjust spanner nuts for proper tension.
	Disconnected or broken cable.	Operate manual trim wheel. Connect or replace cable.
	Defective actuator.	Check actuator operation. Replace actuator.

9-19. REMOVAL AND INSTALLATION. (See figure 9-7.)

a. Remove access plate below actuator and covers (7) & (8).

b. Disconnect electric trim assist cable (37) and three Mate-N-Lok connectors on drive assembly. Remove bolt and nut from ground wire thru rib.

c. Remove sprocket guard (14) from actuator body.

d. Remove mounting bolts from voltage regulator (2) and drive assembly (6) actuator (12) and remove units from aircraft.

e. Reverse the preceding steps for reinstallation. Check system rigging in accordance with paragraph 9-21 and safety wire turnbuckle if re-rigging is necessary.

9-20. CLUTCH ADJUSTMENT. (See figure 9-7).

a. Remove access plate below actuator and covers (7) & (8).

b. Remove safety wire and relieve cable tension and chain tension at turnbuckles.

c. Disconnect electric motor by unplugging the three Mate-N-Lok connectors leading to the motor.

d. Remove mounting bolts from drive assembly. It is necessary to remove from elevator to make the necessary adjustments to clutch.

NOTE

Step c isolates the motor assembly from the remainder of the electric trim system so it cannot be engaged during clutch adjustment.

e. Remove screws securing covers (24) and (25) to housing (35) and slide the cover down over electrical wiring far enough to expose the clutch assembly.

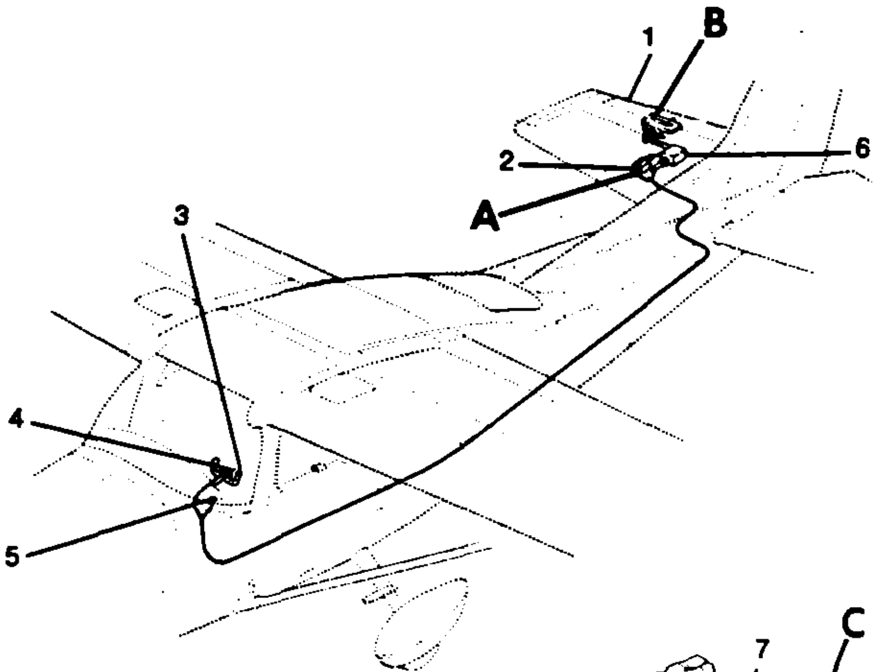
f. Verify the electric trim circuit breaker on the left sidewall circuit breaker is pushed in and the master switch is in the ON position.

g. Operate the dual control wheel-mouted switch (3) UP of DN to energize the solenoid clutch (26).

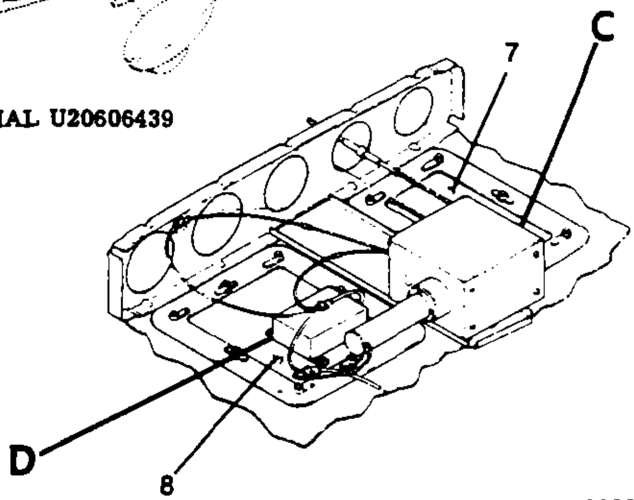
h. Attach the spring scale (Figure 9-7 to chain (29) and pull scale slowly until slippage is noticed.

i. Repeat Steps g & h several times to break the initial friction of the clutch.

j. Repeat Steps i and j very slowly, carefully watch-



THRU SERIAL U20606439



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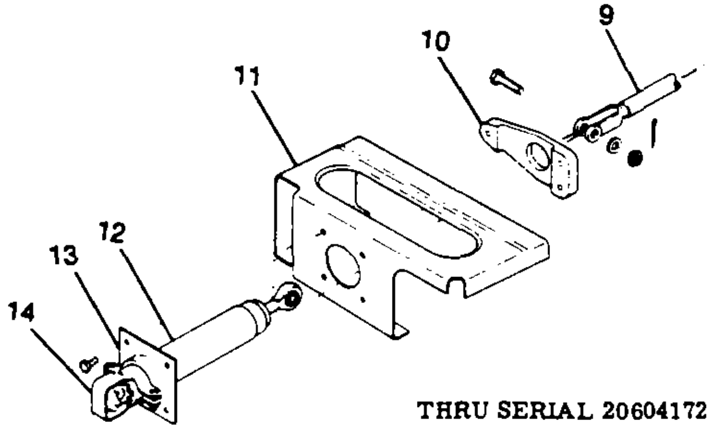

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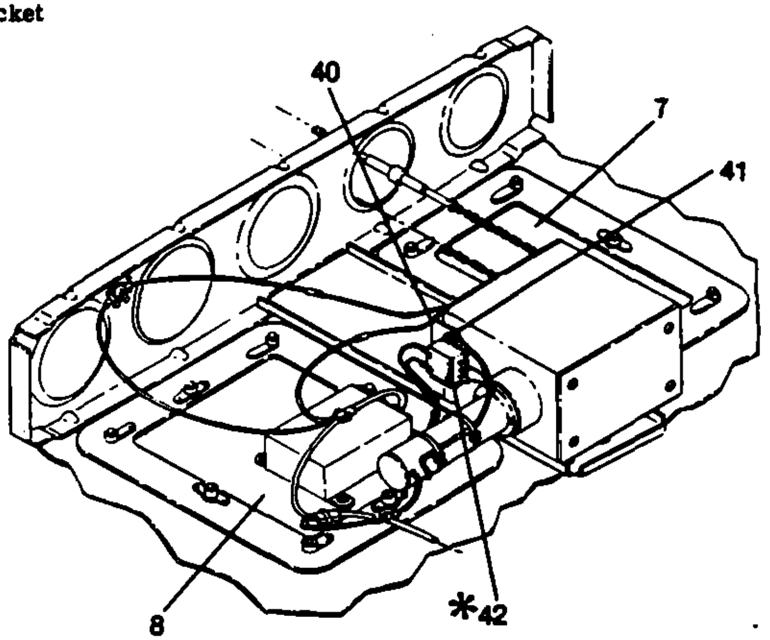
Detail **B**

1. Trim Tab
2. Voltage Regulator
3. Trim Switch
4. Disengage Switch
5. Circuit Breaker
6. Drive Assembly
7. Cover
8. Cover
9. Push-Pull Tube
10. Brace
11. Mounting Bracket Assembly
12. Actuator Assembly
13. Mounting Plate - FWD.
14. Sprocket Guard
15. Washer
16. Shaft
17. Sprocket
18. Chain Assembly
19. Washer Assembly
20. Spring Washer
21. Washer
22. Nut
23. Shaft Assembly
24. Cover Assembly
25. Rub Strip
26. Clutch
27. Sprocket
28. Bushing
29. Chain
30. Gear Motor
31. Mounting Plate
32. Sprocket
33. Pin
34. Cover
35. Housing Assembly
36. Mounting Plate Assembly
37. Connector
38. CTR2 Adjustment
39. CTR1 Adjustment

Figure 9-7. Electric Elevator Trim Assist Installation (Sheet 1 of 4)

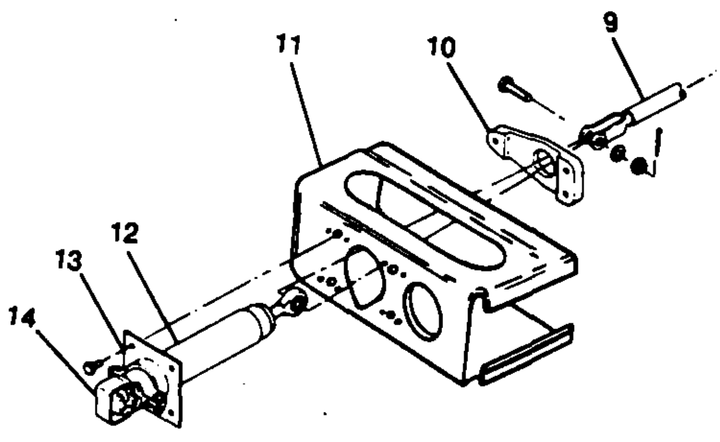
40. Support Bracket
41. Screw
42. Noise Filter



THRU SERIAL U20606439

* NOTE

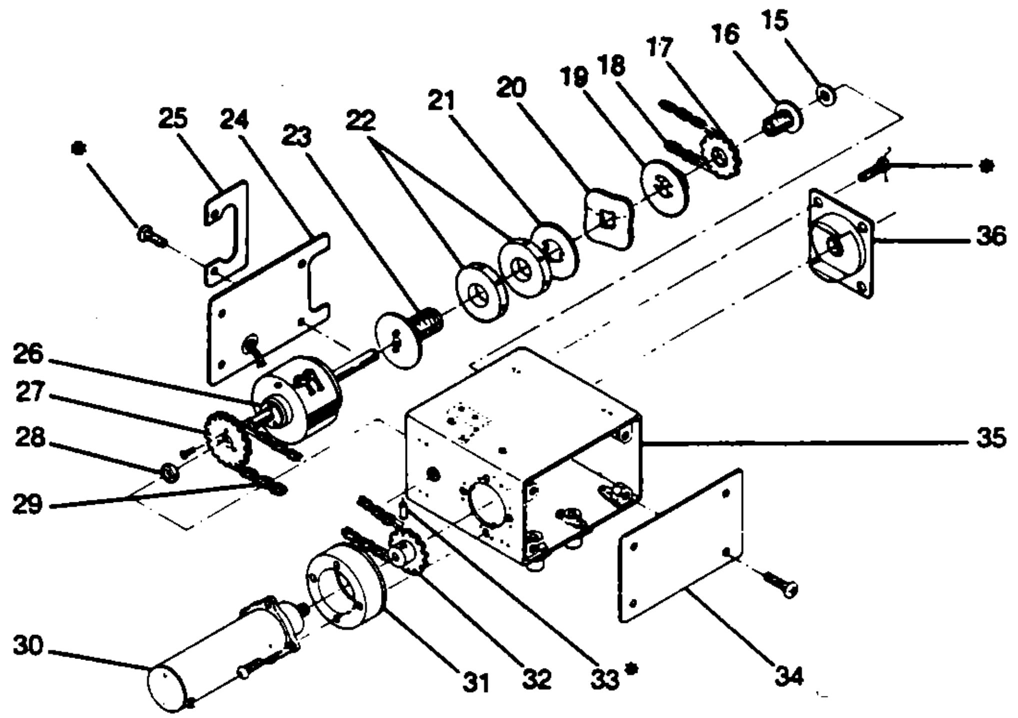
BEGINNING WITH 1980 MODEL YEAR
A-374A Noise filter must be installed
with the 400 Autopilot.



Detail **B**

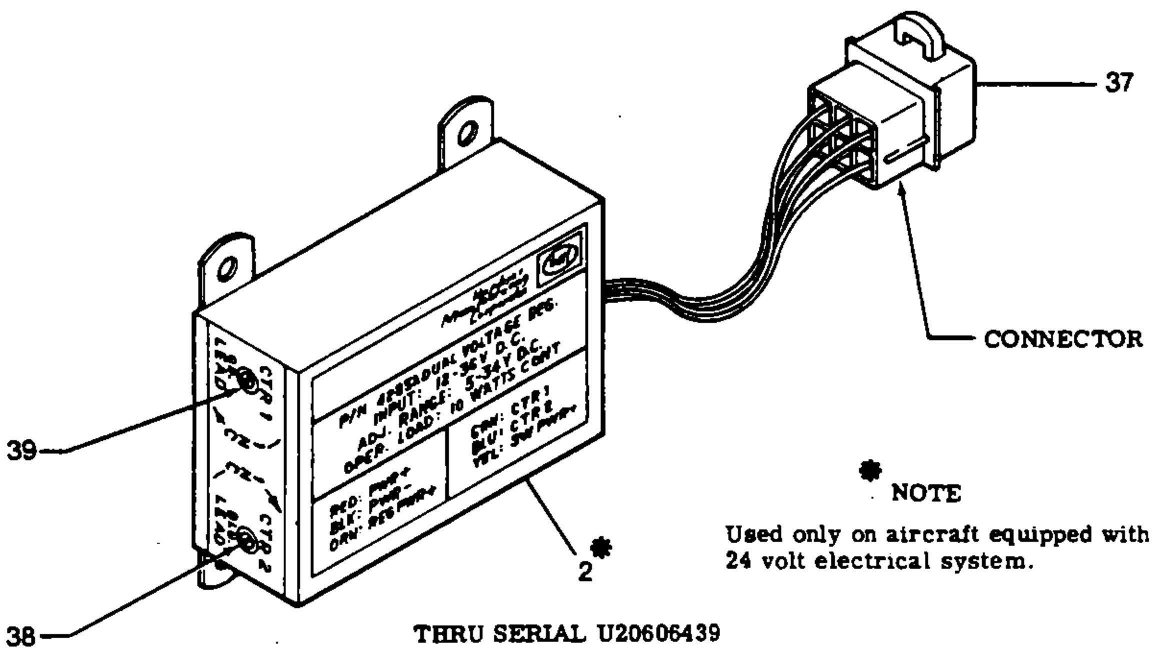
BEGINNING WITH SERIAL 20604173

Figure 9-7. Electric Elevator Trim Assist Installation (Sheet 2 of 4)



Detail C

* SAFETY WIRE THESE ITEMS

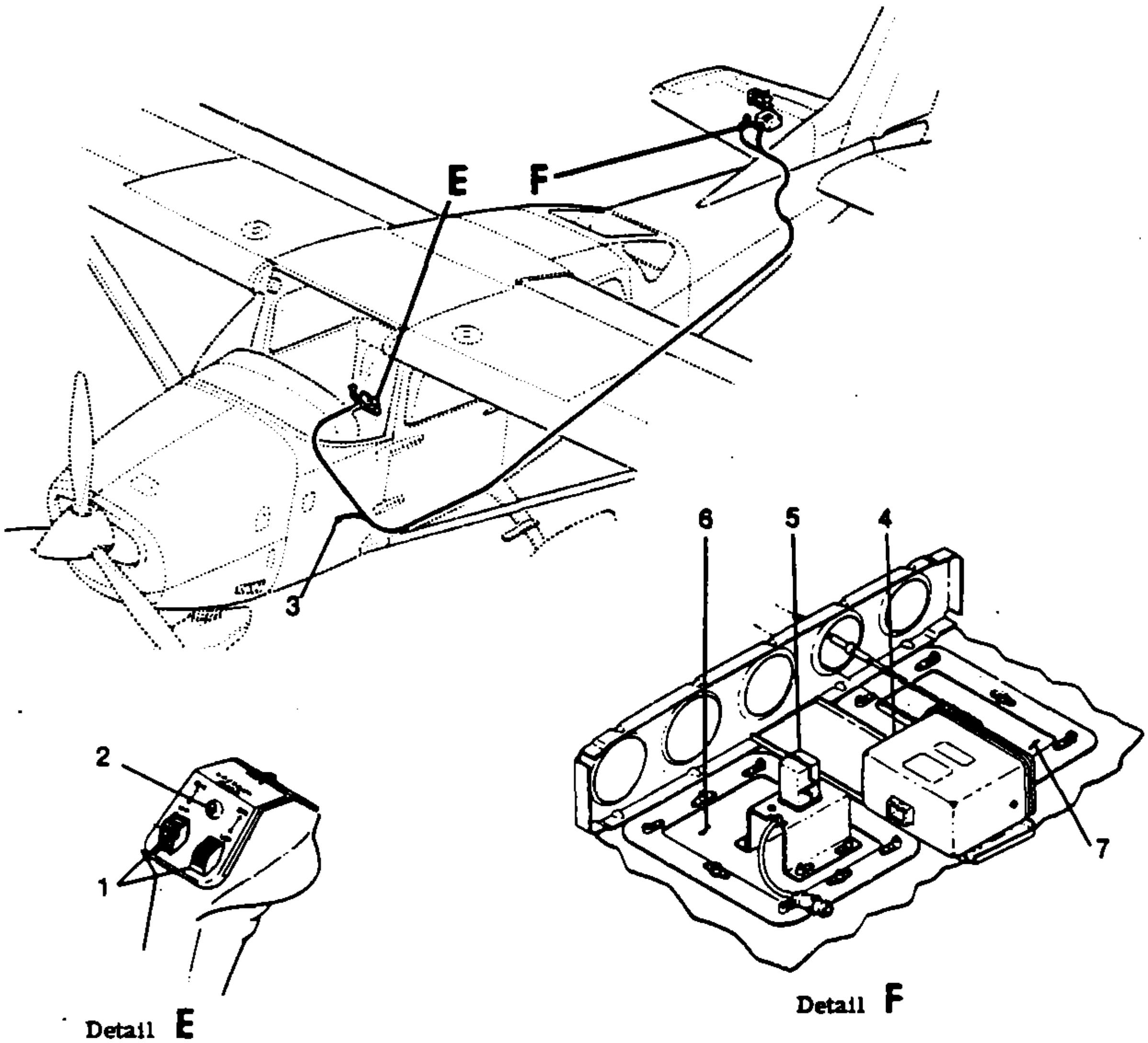


* NOTE
Used only on aircraft equipped with 24 volt electrical system.

THRU SERIAL U20606439

Detail D

Figure 9-7. Electric Elevator Trim Assist Installation (Sheet 3 of 4)



1. Dual Trim Switch
2. Disengage Switch
3. Circuit Breaker
4. Drive Assembly
5. Relay
6. Cover
7. Cover

BEGINNING WITH SERIAL U20606440

Figure 9-7. Electric Elevator Trim Assist Installation (Sheet 4 of 4)

ing the indicator on the spring scale Slippage should occur between 29.1 to 32.9 lbs. on 12 and 24 volt aircraft systems.

k. IF tension is not within tolerance, loosen OUTSIDE spanner nut (19) which acts as a lock. Tighten INSIDE spanner nut to increase clutch tension and loosen nut to decrease clutch tension.

NOTE

Spanner nut (22) may be loosened or tightened with a suitable hammer and panel.

l. Repeat Steps j and k until tension is in accordance with j then tighten outside spanner nut against inside nut.

m. Connect electrical wiring to motor assembly which was removed in Step c, re-rig trim system in accordance with paragraphs 9-15 and 9-21 and reinstall all items removed for access.

9-21. VOLTAGE REGULATOR ADJUSTMENT. (24V ELECTRICAL SYSTEM) (See figure 9-7.)

a. Remove access cover (8).

b. Connect an external power source of 27.5 volts dc continuous to the aircraft electrical system, or if an external power supply is not available, run the aircraft engine at approximately 1000 RPM to maintain the normal operating aircraft voltage.

c. Disconnect the electrical power leads to the motor by unplugging the connectors installed in the RED and BLACK wire leading to the motor assembly.

d. Connect one lead of a D.C. voltmeter capable of measuring the aircraft voltage to either the RED or BLACK wire leading to the motor and the other voltmeter lead to a good aircraft ground.

e. Operate the dual electric trim switch to the nose UP and nose DN positions and check voltage present at the RED and BLACK wires.

f. Adjust CTR 1 and CTR 2 adjustment screws on the voltage regulator counterclockwise (CCW), then slowly turn adjustment screws clockwise (CW) until a 13.5 volt output is obtained for both (RED and BLACK) leads.

g. Remove voltmeter and reconnect the motor assembly power leads. Be sure to connect RED to RED and BLACK to BLACK when reconnecting leads.

h. Check to see if full "NOSE UP" to full "NOSE DOWN" and full "NOSE DOWN" to full "NOSE UP" cycle time is 32±3 seconds.

i. Readjust voltage regulator as required to obtain 32±3 seconds cycle time.

j. Check trim system for proper operation and reinstall all items removed for access.

CAUTION

The trim motor should be allowed to cool between voltage regulator adjustments for approximately 5 minutes if several actuations of the motor becomes necessary during adjustment.

9-22. RIGGING-ELECTRIC TRIM ASSIST. (See figure 9-7.)

a. The standard manual elevator trim control system MUST be rigged in accordance with paragraph 9-15 before the electric trim assist system can be rigged.

b. Remove access cover (7) located on lower side of right stabilizer.

c. Rig electric trim drive chain as follows:

1. Move elevator trim tab to full "NOSE UP" position.
2. Locate turnbuckle on upper side of chain at a point 0.75 inches from drive assembly housing.
3. Adjust turnbuckle until chain deflection between sprockets is approximately 0.25 inch.
4. Resafety turnbuckle and reinstall all items removed for access.

SHOP NOTES:

SECTION 10

RUDDER CONTROL SYSTEM

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10-1. RUDDER CONTROL SYSTEM. (See figure 10-1.)

10-2. DESCRIPTION. Rudder control is maintained through use of conventional rudder pedals which also control nose wheel steering. The system is comprised of the rudder pedals installation, cables and pulleys, all of which link the pedals to the rudder and nose wheel steering. When dual controls are installed, stowable rudder pedals are provided at the copilot's position thru 1977 models and beginning with 1980 models.

10-3. TROUBLE SHOOTING.

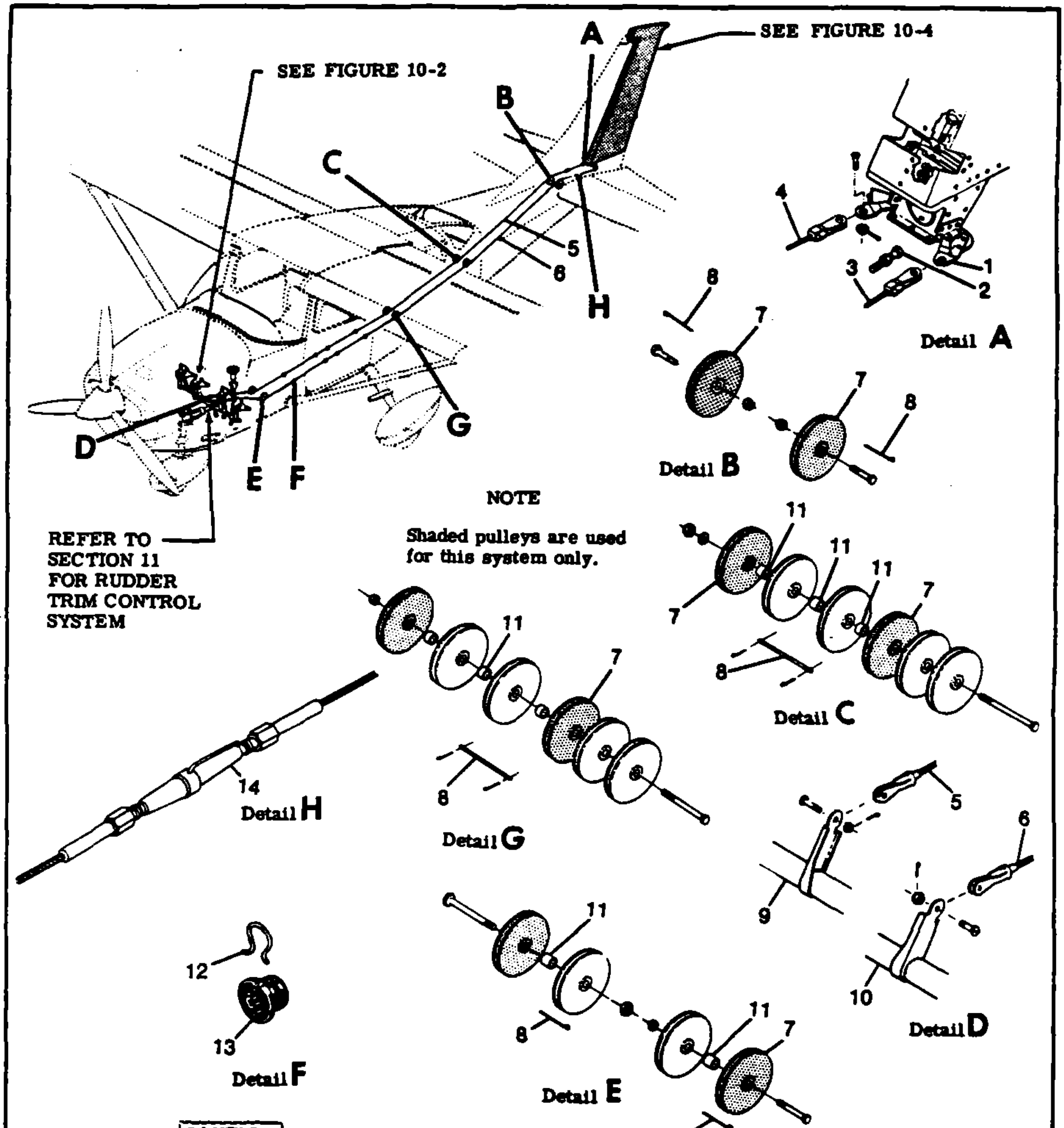
NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 10-11.

TROUBLE	PROBABLE CAUSE	REMEDY
RUDDER DOES NOT RESPOND TO PEDAL MOVEMENT.	Broken or disconnected cables.	Open access plates and check visually. Connect or replace cables.

10-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
BINDING OR JUMPY MOVEMENT OF RUDDER PEDALS.	Cables too tight.	Refer to figure 10-1 for cable tension. Rig system in accordance with paragraph 10-11.
	Cables not riding properly on pulleys.	Open access plates and check visually. Route cables correctly over pulleys.
	Binding, broken or defective pulleys or cable guards.	Open access plates and check visually. Replace defective pulleys and install guards properly.
	Pedal bars need lubrication.	Refer to Section 2.
	Defective rudder bar bearings.	If lubrication fails to eliminate binding. Replace bearing blocks.
	Defective rudder hinge bushings.	Check visually. Replace defective bushings.
	Clevis bolts too tight.	Check and readjust bolts to eliminate binding.
	Steering rods improperly adjusted.	Rig system in accordance with paragraph 10-11.
LOST MOTION BETWEEN RUDDER PEDALS AND RUDDER.	Insufficient cable tension.	Refer to figure 10-1 for cable tension. Rig system in accordance with paragraph 10-11.
INCORRECT RUDDER TRAVEL.	Incorrect rigging.	Rig in accordance with paragraph 10-11.
STOWABLE PEDALS DO NOT DISENGAGE.	Broken or defective control.	Disengage control and check manually. Replace control.
STOWABLE PEDALS DO NOT STOW.	Defective cover, catch or latch pin.	Check visually. Replace defective parts.
STOWABLE PEDALS DO NOT RE-ENGAGE.	Binding control.	Check control operation. Repair or replace control.
	Misaligned or bent mechanism.	Check visually. Repair or replace defective parts.



CAUTION

MAINTAIN SPECIFIED CONTROL CABLE TENSION.

CABLE TENSION:
30 LBS ± 10 LBS (AT AVERAGE TEMPERATURE FOR THE AREA.)
SEE FIGURE 1-1 FOR TRAVEL

1. Bellcrank Assembly
2. Travel Stop Bolt
3. Cable (Left Rear)
4. Cable (Right Rear)
5. Cable (Right Forward)
6. Cable (Left Forward)
7. Pulley
8. Cable Guard
9. Right Rudder Bar
10. Left Rudder Bar
11. Spacer
12. Clip
13. Fairlead
14. Turnbuckle

Figure 10-1. Rudder Control System

10-4. RUDDER PEDAL ASSEMBLY.

10-5. REMOVAL AND INSTALLATION. (See figure 10-2.)

a. Remove carpeting, shields and soundproofing from the rudder pedal and tunnel areas as necessary for access.

b. Disconnect brake master cylinders (18) and parking brake cables at pilot's rudder pedals.

c. Remove rudder pedals (2) and brake links (5).

d. Disconnect stowable rudder pedal controls (10).

e. Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension by loosening turnbuckles (index 14, figure 10-1).

f. Disconnect cables (6 and 7) from rudder bar arms (12 and 13).

g. Disconnect steering bungee (Refer to Section 11) from rudder bar arm (16). The bungee serves for both rudder trim and nosewheel steering.

h. Disconnect whiffletree push-pull rods at arms (15).

i. Remove bolts securing bearing blocks (11) and carefully work rudder bars out of tunnel area.

NOTE

The two inboard bearing blocks contain clearance holes for the rudder bars at one end and a bearing hole at the other. Tag these bearing blocks for reference on reinstallation.

j. Reverse the preceding steps for reinstallation. Lubricate rudder bar assemblies as outlined in Section 2. Rig system in accordance with paragraph 10-11, safety turnbuckles and reinstall all items removed for access.

10-6. RUDDER. (See figure 10-3.)

10-7. REMOVAL AND INSTALLATION.

a. Remove stinger.

b. Disconnect tail navigation light wire.

c. Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension by loosening turnbuckles (index 14, figure 10-1.)

d. Disconnect cables (4 and 6) from rudder bellcrank (3).

e. With rudder supported, remove all hinge bolts (2) and using care, lift rudder free of vertical fin.

f. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 10-11, safety turnbuckles and reinstall all items removed for access.

10-8. REPAIR. Repair may be accomplished as outlined in Section 18.

10-9. CABLES AND PULLEYS. (See figure 10-1.)

10-10. REMOVAL AND INSTALLATION.

a. Remove seats, upholstery and access plates as necessary.

b. Remove safety wire, relieve cable tension and disconnect cables at turnbuckles (14).

c. Disconnect cables (5 and 6) at rudder bars (9 and 10).

d. Remove cable guards, pulleys and fairleads as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to end of the cable before being withdrawn from aircraft. Leave wire in place, routed through structure; then attach cable being installed and pull the cable into position.

e. Reverse the preceding steps for reinstallation.

f. After cable is routed in position, install pulleys, fairleads and cable guards. Ensure cable is positioned in pulley grooves before installing guards.

g. Re-rig system in accordance with paragraph 10-11, safety turnbuckles and reinstall all items removed in step "a."

10-11. RIGGING.

a. Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension at turnbuckles (index 14, figure 10-1).

b. Tie down or weight tail to raise nosewheel free of ground.

c. Extend strut and ensure nose gear is centered against the external centering stop.

d. Disconnect steering bungee from rudder bar arm (Index 16, figure 10-2).

e. Clamp rudder pedals in neutral position.

f. Adjust turnbuckles (index 14, figure 10-1) to streamline rudder with 30±10 lbs tension on cables.

g. Remove clamps from rudder pedals.

h. Adjust travel stop bolts (index 2, figure 10-1) to obtain degree of travel specified in figure 1-1. Figure 10-4 illustrates correct travel and one method of checking.

i. Connect steering bungee and rig trim system as outlined in Section 11.

j. Operate rudder system, checking for ease of movement and full travel. Check cable tension with rudder in various positions. Cable tension should not be less than 20 pounds or more than 40 pounds in any position.

k. Check that all turnbuckles are safetied and reinstall all items removed for access.

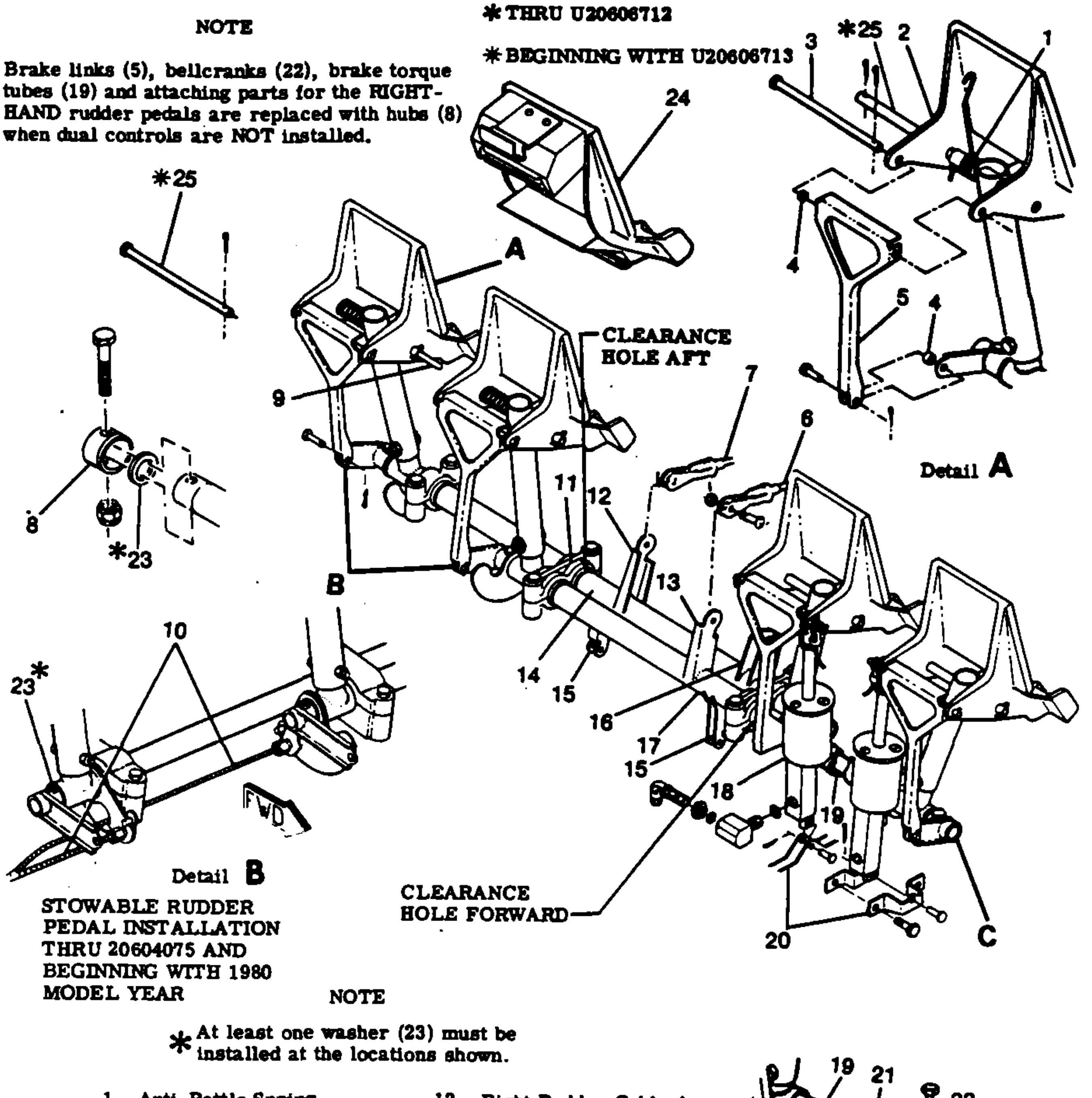
l. Lower nosewheel to ground.

WARNING

Be sure rudder moves in the correct direction when operated by the rudder pedals.

NOTE

Brake links (5), bellcranks (22), brake torque tubes (19) and attaching parts for the RIGHT-HAND rudder pedals are replaced with hubs (8) when dual controls are NOT installed.



STOWABLE RUDDER PEDAL INSTALLATION THRU 20604075 AND BEGINNING WITH 1980 MODEL YEAR

NOTE

*At least one washer (23) must be installed at the locations shown.

1. Anti-Rattle Spring
2. Pedal
3. Shaft
4. Spacer
5. Brake Link
6. Cable (Left Forward)
7. Cable (Right Forward)
8. Single Controls Hub
9. Pin (Stowable Pedals Only)
10. Stowable Pedals Controls
11. Bearing Block
12. Right Rudder Cable Arm
13. Left Rudder Cable Arm
14. Aft Rudder Bar
15. Nosewheel Steering Arm
16. Rudder Trim Bungee Arm
17. Forward Rudder Bar
18. Master Cylinder
19. Brake Torque Tube
20. Bracket
21. Bearing
22. Bellcrank
23. Special Washer
24. Pedal Extension
25. Shaft

Figure 10-2. Rudder Pedals Installation

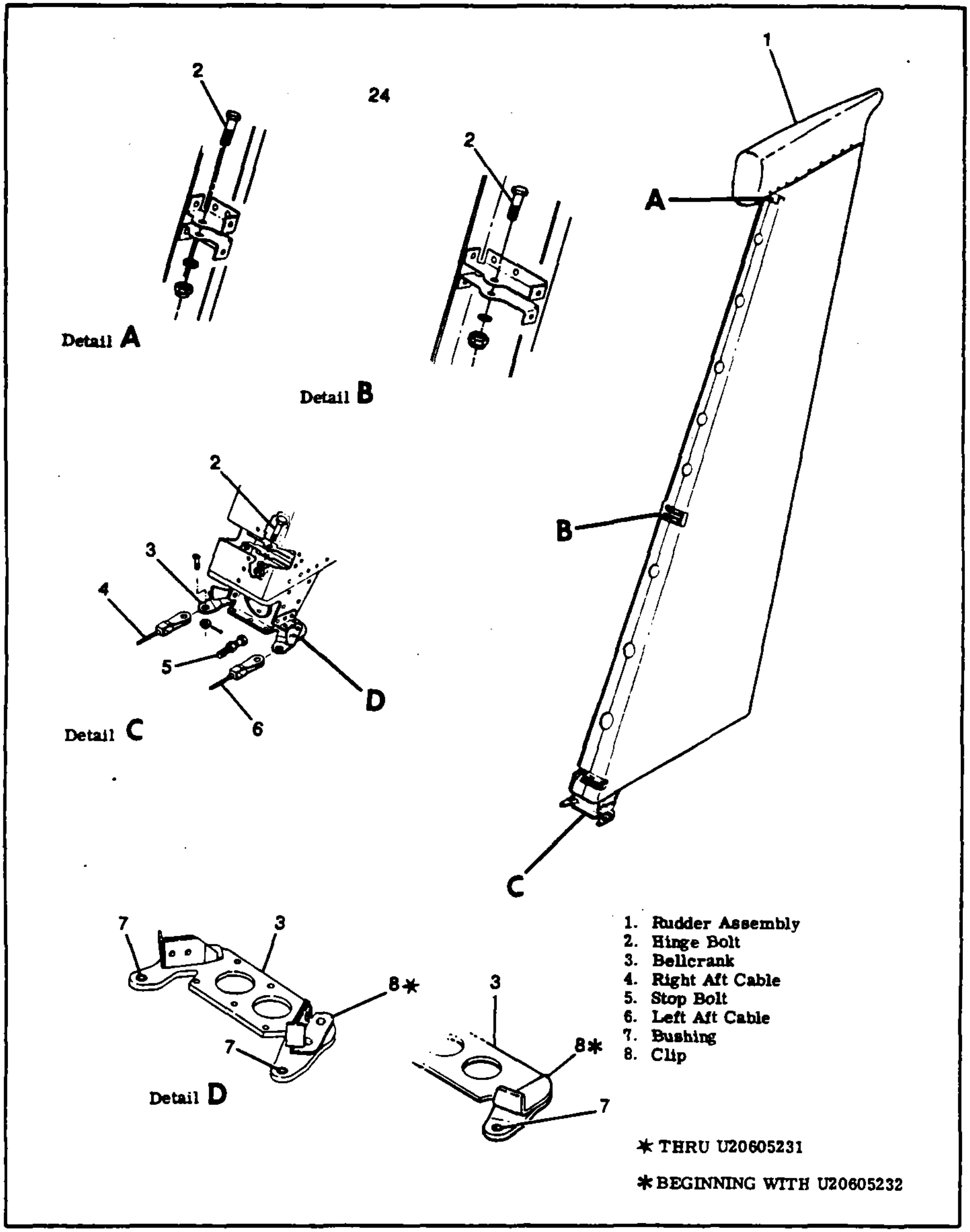
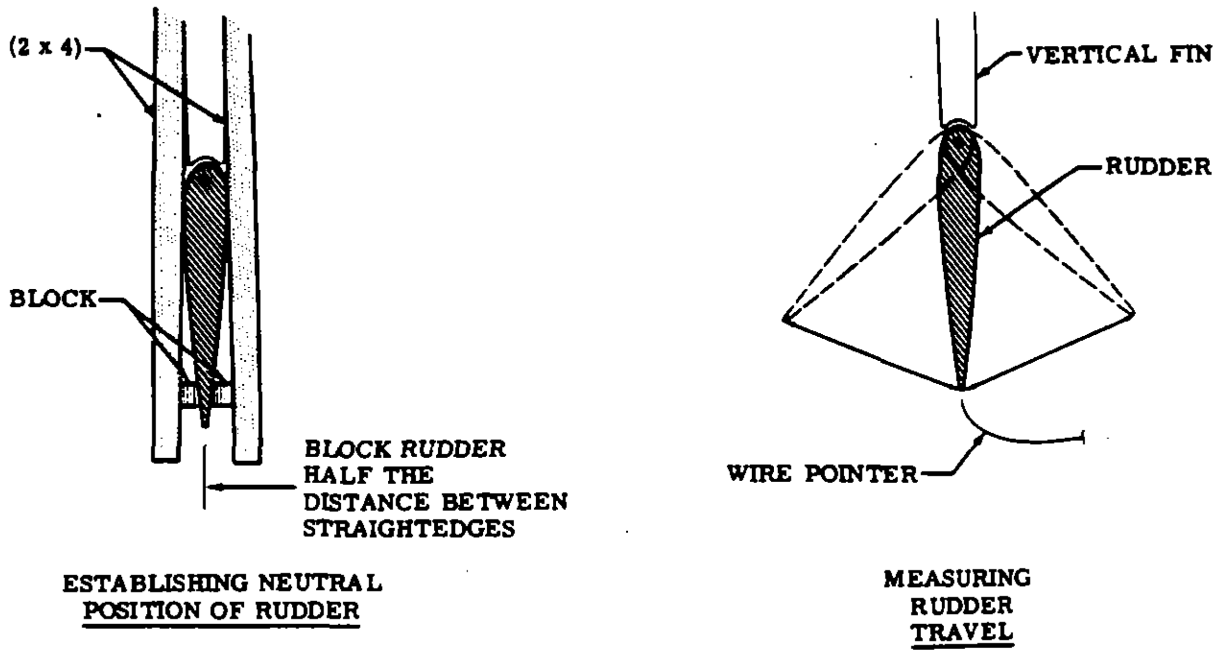


Figure 10-3. Rudder Installation



1. Establish neutral position of rudder by clamping straightedge (such as wooden 2 x 4) on each side of fin and rudder and blocking trailing edge of rudder half the distance between straightedges as shown.
2. Tape a length of soft wire to the stinger in such a manner that it can be bent to index at the lower corner of the rudder trailing edge.
3. Using soft lead pencil, mark rudder at point corresponding to soft wire indexing point (neutral).
4. Remove straightedges and blocks.
5. Hold rudder against right, then left, rudder stop. Measure distance from pointer to pencil mark on rudder in each direction of travel. Distance should be between 8.12" and 8.72".

Figure 10-4. Checking Rudder Travel

SECTION 11

RUDDER TRIM CONTROL SYSTEM

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11-1. RUDDER TRIM CONTROL SYSTEM.

11-2. DESCRIPTION. The rudder trim system is operated by a trim control wheel, mounted in the pedestal. A sprocket-operated screw mechanism is incorporated at the aft end of the steering bungee which attaches to the aft rudder bar. The nose gear steering, rudder control system and rudder trim control system are interconnected, therefore, adjustments to one system will affect the others. For maintenance to nose gear steering, other than rigging, refer to Section 5.

11-3. TROUBLE SHOOTING.

NOTE

This trouble shooting chart should be used in conjunction with the trouble shooting chart in section 10.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 11-8.

TROUBLE	PROBABLE CAUSE	REMEDY
FALSE READING ON TRIM POSITION INDICATOR.	Improper rigging.	Refer to paragraph 11-8.
	Worn, bent or disconnected linkage.	Check visually. Repair or replace parts as necessary.
HARD OR SLUGGISH OPERATION OF TRIM WHEEL.	Worn, bent or binding linkage.	Check visually. Repair or replace parts as necessary.
	Incorrect rudder cable tension.	Check and adjust rudder cable tension.
FULL TRIM TRAVEL NOT OBTAINED.	Rudder trim system improperly rigged.	Refer to paragraph 11-8.

11-4. STEERING BUNGEE. (See figure 11-1.)

11-5. REMOVAL AND INSTALLATION. (See figure 11-1.)

a. Remove pedestal cover in accordance with Section 9.
b. Remove chain guard (20).
c. Remove pilot's rudder bar shield.
d. Loosen bolt (1) securing idler sprocket (4), slide idler sprocket in the adjustment slot to release tension on chain (16).
e. Disconnect steering bungee adjustable rod end (17) from rudder bar arm (18).
f. Remove chain guard (26) and disengage chain (16) from sprocket (29).
g. Remove clamp (28) at bungee (27).

NOTE

The nose gear must be removed to allow access to steering bungee. Refer to Section 5 for nose gear removal.

h. Reverse the preceding steps for reinstallation. Rig nosewheel steering and rudder trim system in accordance with paragraph 11-8.

11-6. TRIM WHEEL. (See figure 11-1.)

11-7. REMOVAL AND INSTALLATION.

a. Remove pedestal cover in accordance with Section 9.
b. Remove cotter pin and washers.
c. Lift trim wheel (8) up and out using care not to drop washers or bend indicator (7).

NOTE

Removal of sprocket (9) from trim wheel shaft is not recommended except for replacement of parts.

d. Reverse the preceding steps for reinstallation.

11-8. RIGGING-RUDDER TRIM AND NOSEWHEEL STEERING SYSTEM. (See figure 11-1.)

a. Remove pedestal cover in accordance with Section 9.
b. Remove pilot's rudder bar shield.
c. Disconnect steering bungee rod end (17) at rudder bar arm (18).
d. Tie down or weight tail to raise nosewheel free of ground.
e. Extend strut and ensure nose gear is centered against the external centering stop.
f. Loosen bolt (1) securing idler sprocket (4), slide idler sprocket in the adjustment slot and disengage chain (16) from sprocket (29).
g. Clamp rudder pedals in neutral position.

NOTE

Rudder control system MUST be correctly rigged prior to rigging trim system.

h. Screw bungee sprocket (29) in against bungee shaft, then screw rod end (17) in against sprocket (29) to obtain bungee shortest length.
i. Holding rod end (18) to prevent turning, rotate sprocket (29) until hole in rod end aligns exactly with attaching hole on rudder bar arm (18) and connect.
j. Engage chain (16) on sprockets and tighten idler sprocket (4) so chain is taut but not tight.
k. Remove clamps and run trim wheel (8) through its full range of travel, observing full indicator (7) travel is reached before full bungee extension or contraction.
l. Lower nose gear to ground and install all parts removed for access.

WARNING

Be sure rudder moves in the correct direction when operating trim wheel.

SHOP NOTES:

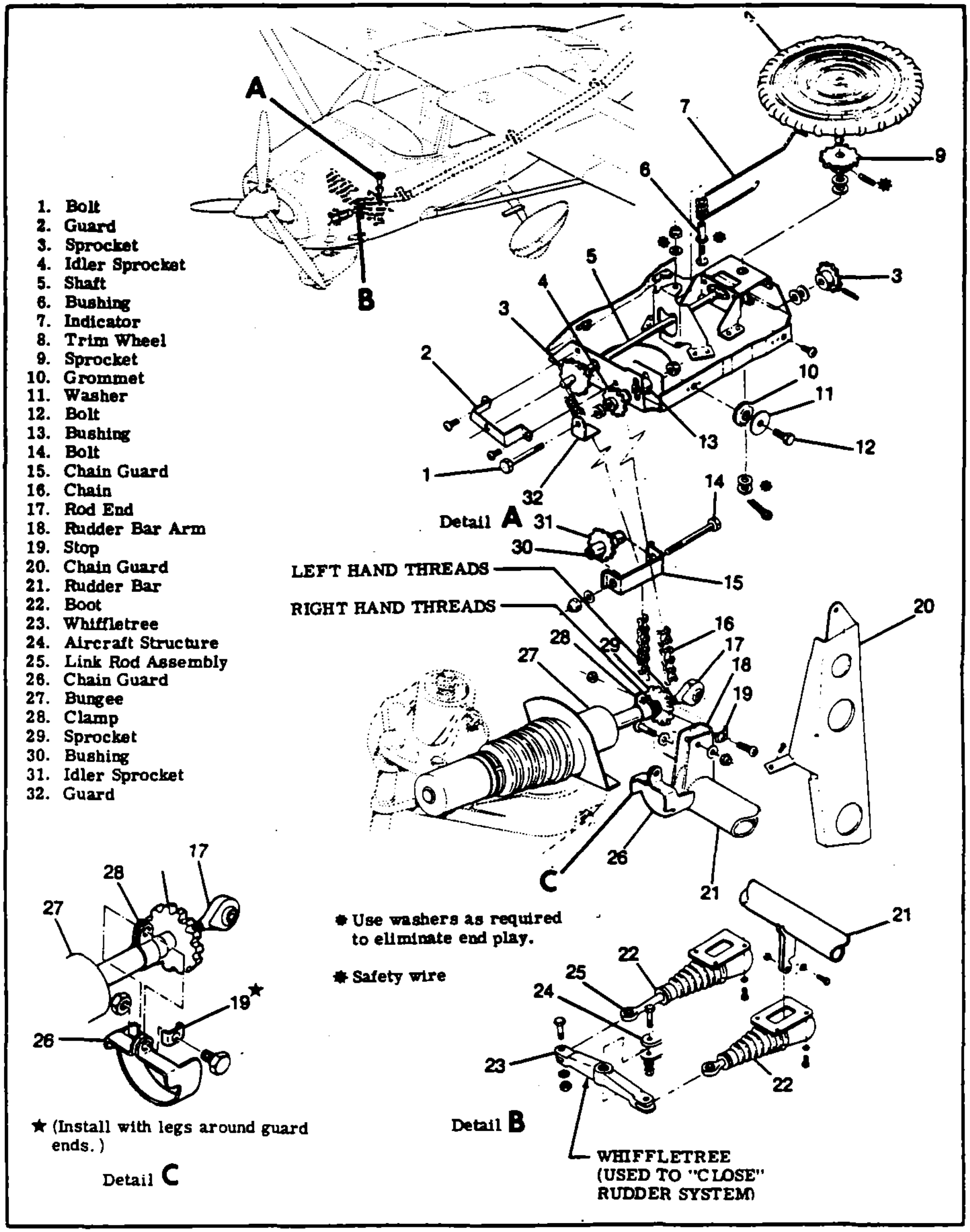

Figure 11-1. Rudder Trim and Nosewheel Steering System

SECTION 12

ENGINE

(NORMALLY ASPIRATED)
REFER TO SECTION 12A FOR TURBOCHARGED ENGINE

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

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12-1. ENGINE COWLING.

12-2. DESCRIPTION. The engine cowling is divided into four major removable segments. The left upper cowling segment has two access doors, one at the upper front provides access to the oil filler neck and one at the left aft side provides access to the oil dipstick. The right and left nose caps are fastened to the lower engine nacelle and to each other with screws. The right and left upper cowl segments are secured with quick-release fasteners and either segment may be removed individually. The lower engine nacelle is an extension of the fuselage.

12-3. REMOVAL AND INSTALLATION.

a. Release the quick-release fasteners attaching the cowling to the fuselage and at the parting surfaces of the left and right segments.
b. Remove screws securing the left and right nose cap together and to the lower engine nacelle.
c. Disconnect air ducts from nose caps and remove caps.
d. Reverse the preceding steps for reinstallation. Ensure the baffle seals are turned in the correct direction to confine and direct air flow around the engine. The vertically installed seals must fold forward and the side seals must fold upwards.

12-4. CLEANING AND INSPECTION. Wipe the inner surfaces of the cowling segments with a clean cloth saturated with cleaning solvent (Stoddard or equivalent). If the inside surface of the cowling is coated heavily with oil or dirt, allow solvent to soak until foreign material can be removed. Wash painted surfaces of the cowling with a solution of mild soap and water and rinse thoroughly. After washing, a coat of wax may be applied to the painted surfaces to prolong paint life. After cleaning, inspect cowling for dents, cracks, loose rivets and spot welds. Repair all defects to prevent spread of damage.

12-5. REPAIR. If cowling skins are extensively damaged, new complete sections of the cowling should be installed. Standard insert-type patches may be used for repair if repair parts are formed to fit contour of cowling. Small cracks may be stop-drilled and small dents straightened if they are reinforced on the inner surface with a doubler of the same material as the cowling skin. Damaged reinforcement angles should be replaced with new parts. Due to their small size, new reinforcement angles are easier to install than to repair the damaged part.

12-6. COWL FLAPS.

12-7. DESCRIPTION. Cowl flaps are provided to aid in controlling engine temperature. Two cowl flaps, operated by a single control in the cabin, are located at the lower aft end of the engine nacelle. The engine exhaust tailpipes extend through cutouts in the aft portion of each cowl flap.

12-8. REMOVAL AND INSTALLATION. (See figure 12-1.)

a. Place control lever (2) in the OPEN position.
b. Disconnect control clevises (13) from shock-mounts (14).
c. Remove safety wire securing hinge pins (9) to cowl flaps, pull pins from hinges and remove flaps.
d. Reverse the preceding steps for reinstallation.

12-9. RIGGING. (See figure 12-1.)

a. Disconnect control clevises (13) from shock-mounts (14).
b. Check to make sure that the flexible controls reach their internal stops in each direction. Mark controls so that full travel can be readily checked and maintained during the remaining rigging procedures.
c. Place control lever (2) in the CLOSED position. If the control lever cannot be placed in the closed position, loosen clamp (5) at upper end of controls and slip housings in clamp or adjust controls at upper clevis (4) to position control lever in bottom hole of position bracket (3).
d. With the control lever in CLOSED position, hold one cowl flap closed (against the rubber bumpers on the fuselage), loosen jam nut and adjust clevis (13) on the control to hold cowl flap in this position and install bolt.

NOTE

If the lower control clevis (13) cannot be adjusted far enough to streamline flap and still maintain sufficient thread engagement, loosen the lower control housing clamp (8) and slide housing in clamp as necessary. Be sure threads are visible in clevis inspection holes.

e. Repeat the preceding step for the opposite cowl flap. Cowl flaps should open approximately 5.00 inches (MIN) when measured in a straight line from the aft edge of cowl flap, just outboard of cutout to lower edge of firewall.
g. Check that all clamps and jam nuts are tight.

12-10. ENGINE.

12-11. DESCRIPTION. An air cooled, wet-sump, six-cylinder, horizontally-opposed, direct-drive, fuel injected, Continental IO-520 series engine driving a constant-speed propeller is used to power the aircraft. The cylinders, numbered from rear to front are staggered to permit a separate throw on the crankshaft for each connecting rod. The right rear cylinder is number 1 and cylinders on the right side are identified by odd numbers 1, 3 and 5. The left rear cylinder is number 2 and the cylinders on the left side are identified as numbers 2, 4 and 6. Refer to paragraph 12-12 for engine data. For repair and overhaul of the engine, accessories and propeller, refer to the appropriate publications issued by their manufacturer's. These publications are available from the Cessna Service Parts Center.

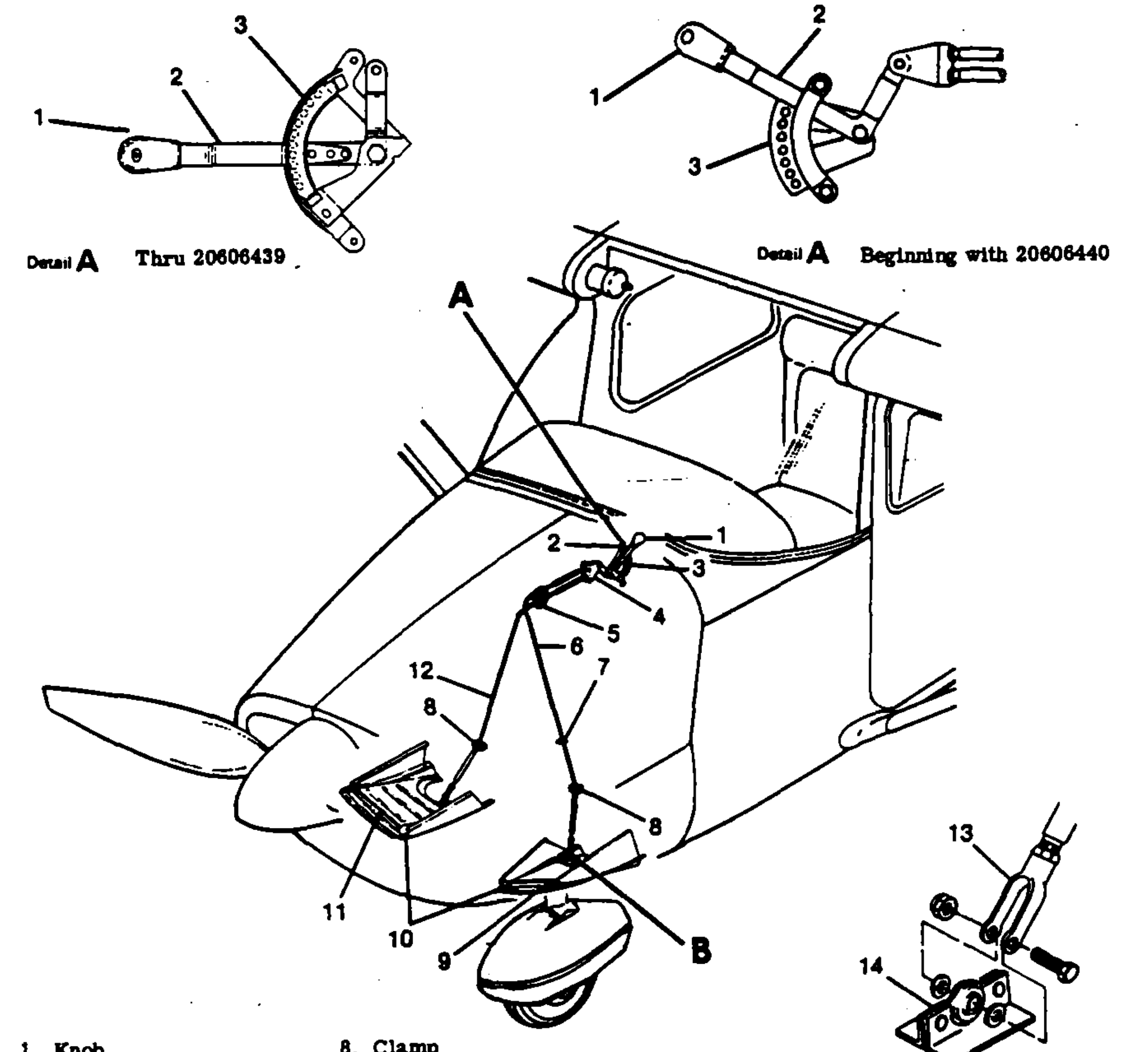
12-12. ENGINE DATA.

Aircraft Series	U206
Model (Continental)	IO-520-F
BHP Maximum for Take-Off	300
(5 Minutes) at RPM	2850
BHP Maximum Except Take-Off	285
RPM (Max. Continuous)	2700
Number of Cylinders	6-Horizontally Opposed
Displacement	520 Cubic Inches
Bore	5.25 Inches
Stroke	4.00 Inches
Compression Ratio	8.5:1
Magnetos	Slick No 662 thru 1979 Models Slick No 6210Beginning with 1980 Models
Right Magneto	Fires 22° BTC Upper Right and Lower Left
Left Magneto	Fires 22° BTC Upper Left and Lower Right
Firing Order	1-6-3-2-5-4
Spark Plugs	18mm (Refer to Continental Service Bulletin M77-10 for factory approved spark plugs and required gap)
Torque	330 ±30 LB-IN.
Fuel Metering System	Continental Fuel Injection
Unmetered Fuel Pressure	9.0 to 11.0 PSI at 600 RPM 31.0 to 33.0 PSI at 2850 RPM
Nozzle Pressure	3.5 to 4.0 PSI at 600 RPM 17.5 to 18.5 PSI at 2850 RPM
Oil Sump Capacity	12 U.S. Quarts
With External Filter	13 U.S. Quarts
Tachometer	Mechanical Drive
Oil Pressure (PSI)	
Minimum Idling	10
Normal	30 to 60
Maximum (Cold Oil Starting)	100
Connection Location	Between No. 2 and No. 4 Cylinders
Oil Temperature	
Normal Operating	Within Green Arc
Maximum Permissible	Red Line (240°F)
Probe Location	Below Oil Cooler
Cylinder Head Temperature	
Normal OPerating	Within Green Arc
Maximum	Red Line (460°F)
Probe Location	Lower Side of Number 3 Cylinder *
Approximate Dry Weight	471 LB. (Weight is approximate and will vary with optional accessories installed.)
Economy Mixture Indicator (EGT) Probe Location	Exhaust Collector L.H. Side

*For 1979 thru Mid 1980 Models refer to Cessna Service Information Letter SE82-18 dated 7 May 1982

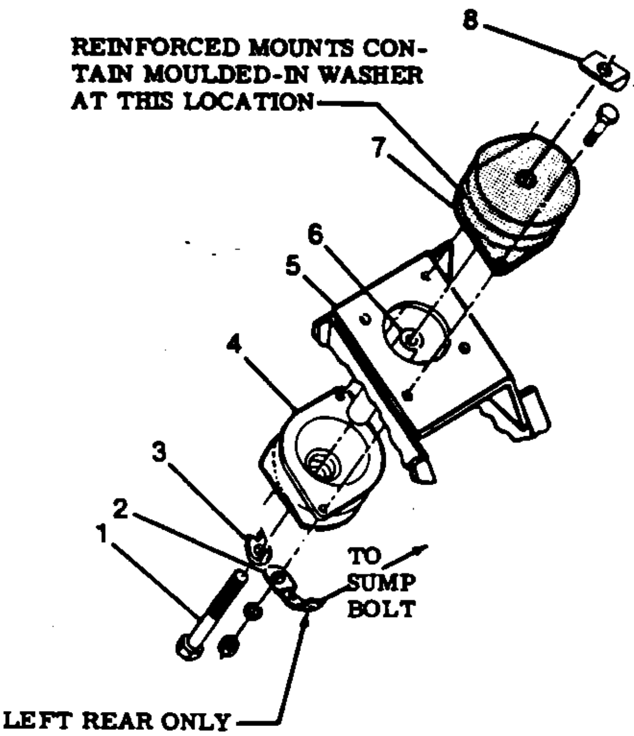
12-13. TIME BETWEEN OVERHAUL (TBO). Teledyne Continental Motors recommends engine overhaul at 1700 hours operating time for the IO-520 series engines. Refer to Continental Aircraft Engine Service Bulletin M81-22, and any superseding bulletins, revisions or supplements thereto, for further recommendations. At the time of overhaul, engine accessories should be overhauled. Refer to Section 14 for propeller and governor overhaul periods.

12-14. OVERSPEED LIMITATIONS. The engine must not be operated above specified maximum continuous RPM. However, should inadvertant overspeed occur, refer to Continental Aircraft Engine Service Bulletin M75-16, and to any superseding bulletins, revisions or supplements thereto, for further recommendations.



1. Knob
2. Control Lever
3. Position Bracket
4. Clevis
5. Clamp
6. Left Cowl Flap Control
7. Clamp (Left Side Only)
8. Clamp
9. Hinge Pin
10. Cowl Flap
11. Hinge Half
12. Right Cowl Flap Control
13. Clevis
14. Shock Mount

Figure 12-1. Cowl Flaps Installation



Detail **A**

NOTES

ON ALL MODELS:

It is important that the correct engine mounts be installed in the correct positions. Install upper mounts with beveled edge at the top, except as noted below for turbocharged engines. Install lower mounts with beveled edge at the front, except as noted below for turbocharged engines. In addition, be sure that the two reinforced mounts are used at the upper, forward positions.

To determine which two of the eight mounts are the reinforced ones, use fingernail to feel whether moulded-in washer is present.

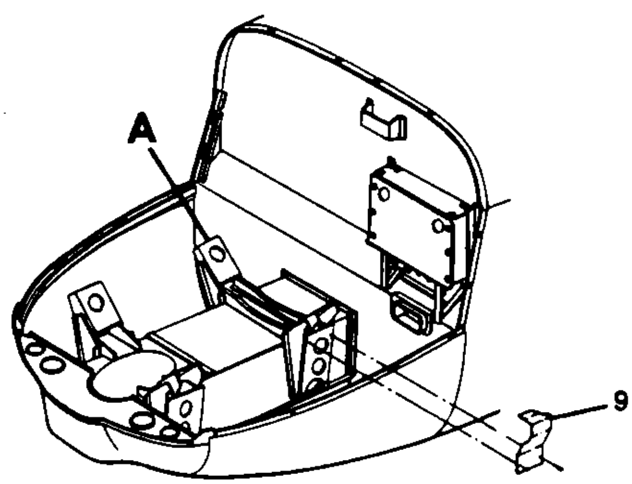
Torque bolts (1) to 300 +50 -00 lb-in.

ON TURBOCHARGED ENGINES:

Barrel nuts (8) are replaced with turbine support shafts at the right mounts of turbocharged engines.

Install left, forward, lower mount with beveled edges at the front and at the top on turbocharged engines.

If shock-mounts will be re-used, mark each one so it will be reinstalled in exactly the same position. If new shock-mounts will be installed, position them as noted above.



1. Bolt
2. Ground Strap
3. Tab Lockwasher
4. Lower Mount
5. Engine Mount Support
6. Spacer
7. Upper Mount
8. Barrel Nut
9. Heat Shield

Figure 12-2. Engine Mount Installation

12-15. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE FAILS TO START.	Improper use of starting procedure.	Review starting procedure. Refer to Pilot's Operating handbook.
	Defective aircraft fuel system.	Refer to Section 13.
	Spark plugs fouled.	Remove and clean. Check gaps and insulators. Use new gaskets. Check cables to persistently fouled plugs.
	Defective magneto switch or grounded magneto leads.	Check continuity, repair or replace switch or leads.
	Defective ignition system.	Refer to paragraph 12-86.
	Excessive induction air leaks.	Check visually. Correct cause of air leaks.
	Dirty screen in fuel control unit or defective fuel control unit.	Check screen visually. Check fuel flow through control unit. Replace defective fuel control unit.
	Defective electric fuel pump.	Refer to Section 13.
	Defective fuel manifold valve or dirty screen.	Check fuel flow through valve. Remove and clean. Replace if defective.
	Clogged fuel injection lines or discharge nozzles.	Check fuel through lines and nozzles. Clean lines and nozzles. Replace if defective.
	Fuel pump not permitting fuel from auxiliary pump to bypass.	Check fuel flow through engine-driven fuel pump. Replace engine-driven pump.
	Vaporized fuel in system.	Refer to Pilot's Operating Handbook.
	Fuel tanks empty.	Visually inspect tanks. Fill with proper grade and quantity of gasoline.
	Fuel contamination or water in fuel system.	Open fuel strainer drain and check for water. Drain all fuel and flush out fuel system. Clean all screens, fuel lines, strainer, etc.
	Mixture control in the IDLE CUT-OFF position.	Move control to the full RICH position.
	Engine flooded.	Refer to Pilot's Operating Handbook.
	Fuel selector valve in OFF position.	Place selector valve in the ON position to a cell known to contain gasoline.

12-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE STARTS BUT DIES, OR WILL NOT IDLE.	Idle stop screw or idle mixture incorrectly adjusted.	Refer to paragraph 12-52.
	Spark plugs fouled or improperly gapped.	Remove, clean and regap plugs. Replace if defective.
	Water in fuel system.	Open fuel strainer drain and check for water. If water is present, drain fuel tank sumps, lines and strainer.
	Defective ignition system.	Refer to paragraph 12-86.
	Vaporized fuel. (Most likely to occur in hot weather with a hot engine.)	Refer to Pilot's Operating Handbook.
	Induction air leaks.	Check visually. Correct the cause of leaks.
	Manual primer leaking.	Disconnect primer outlet line. If fuel leaks through primer, repair or replace primer.
	Dirty screen in fuel control unit or defective fuel control unit.	Check screen visually. Check fuel flow through control unit. Clean screen. Replace fuel control unit if defective.
	Defective manifold valve or clogged screen.	Check fuel flow through valve. Replace if defective. Clean screen.
	Defective engine-driven fuel pump.	If engine continues to run with electric pump turned on, but stops when it is turned off, the engine-driven pump is defective. Replace pump.
	Defective engine.	Check compression. Listen for unusual engine noises. Engine repair is required.
	Propeller control set in high pitch position (low rpm).	Use low pitch (high rpm) position for all ground operation.
	Defective aircraft fuel system.	Refer to Section 13.
	Restricted fuel injection lines or discharge nozzles.	Check fuel flow through lines and nozzles. Clean lines and nozzles. Replace if defective.
ENGINE RUNS ROUGHLY, WILL NOT ACCELERATE PROPERLY, OR LACKS POWER.	Propeller control in high pitch (low rpm) position.	Use low pitch (high rpm) for all ground operations.
	Restriction in aircraft fuel system.	Refer to Section 13.
	Restriction in fuel injection system.	Clean system. Replace any defective units.

12-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE RUNS ROUGHLY, WILL NOT ACCELERATE PROPERLY, OR LACKS POWER. (Cont.)	Engine-driven fuel pump pressure improperly adjusted.	Refer to paragraph 12-67.
	Worn or improperly rigged throttle or mixture control.	Check visually. Rig properly. Replace worn linkage.
	Spark plugs fouled or improperly gapped.	Clean and regap. Replace if defective.
	Defective ignition system.	Refer to paragraph 12-86.
	Defective engine.	Check compression. Listen for unusual engine noises. Engine repair is required.
POOR IDLE CUT-OFF.	Worn or improperly rigged mixture control.	Rig properly. Replace worn linkage.
	Defective or dirty manifold valve.	Operate electric fuel pump and check that no fuel flows through manifold valve with mixture control in IDLE CUT-OFF. Remove and clean. Replace if defective.
	Fuel leakage through primer.	Repair or replace primer.
	Auxiliary fuel pump ON.	Turn to OFF position.
	Defective fuel control unit.	If none of the preceding causes corrects the problem, the control unit is probably at fault. Replace control unit.

12-16. REMOVAL. If an engine is to be placed in storage or returned to the manufacturer for overhaul, proper preparatory steps should be taken for corrosion prevention prior to beginning the removal procedure. Refer to Section 2 for storage preparation. The following engine removal procedure is based upon the engine being removed from the aircraft with the lines and hoses being disconnected at the firewall.

NOTE

Tag each item when disconnected to aid in identifying wires, hoses, lines and control linkages when engine is reinstalled. Likewise, shop notes made during removal will often clarify reinstallation. Protect openings, exposed as a result of removing or disconnecting units, against entry of foreign material by installing covers or sealing with tape.

a. Place all cabin switches in the OFF position.
b. Place fuel selector valve in the OFF position.
c. Remove engine cowling in accordance with paragraph 12-3.
d. Disconnect battery cables and insulate terminals as a safety precaution.
e. Drain fuel strainer and lines with strainer drain control.

NOTE

During the following procedures, remove any clamps or lacings which secure controls, wires, hoses or lines to the engine, engine nacelle or attached brackets, so they will not interfere with engine removal. Some of the items listed can be disconnected at more than one place. It may be desirable to disconnect some of these items at other than the places indicated. The reason for engine removal should be the governing factor in deciding at which point to disconnect them. Omit any of the items which are not present on a particular engine installation.

f. Drain the engine oil sump and oil cooler.
g. Disconnect magneto primary lead wires at magnetos.

WARNING

The magnetos are in a SWITCH ON condition when the switch wires are disconnected. Ground the magneto points or remove the high tension wires from the magnetos or spark plugs to prevent accidental firing.

h. Remove the spinner and propeller in accordance with Section 14. Cover exposed end of crankshaft flange and propeller flange to prevent entry of foreign material.

i. Disconnect throttle, mixture and propeller controls from their respective units. Remove clamps attaching controls to engine and pull controls aft clear of engine. Use care to avoid bending controls too sharply. Note EXACT position, size and number of attaching washers and spacers for reference on reinstallation.

j. Disconnect all hot and cold air flexible ducts and remove.

k. Remove exhaust system in accordance with paragraph 12-105.

l. Disconnect wires and cables as follows:

1. Disconnect tachometer drive shaft at adapter.

CAUTION

When disconnecting starter cable do not permit starter terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

2. Disconnect starter electrical cable at starter.
3. Disconnect cylinder head temperature wire at probe.
4. Disconnect oil temperature wire at probe below oil cooler.
5. Disconnect electrical wires and wire shielding ground at alternator.
6. Disconnect exhaust gas temperature wires at quick-disconnects.
7. Disconnect electrical wires at throttle microswitch.
8. Disconnect fuel strainer drain control from strainer.
9. Remove all clamps and lacings attaching wires or cables to engine and pull wires and cables aft to clear engine.

m. Disconnect lines and hoses as follows:

1. Disconnect vacuum hose at firewall.
2. Disconnect oil breather and vacuum system oil separator vent lines where secured to the engine.

WARNING

Residual fuel and oil draining from disconnected lines and hoses constitutes a fire hazard. Use caution to prevent accumulation of such fuel and oil when lines or hoses are disconnected.

3. Disconnect fuel supply and vapor return hoses at fuel pump.
4. Disconnect primer line at firewall fitting.
5. Disconnect fuel-flow gage hose at firewall.
6. Disconnect oil pressure line at firewall fitting.
7. Disconnect manifold pressure hose at firewall.
8. Disconnect manifold and balance tube drain lines.

n. Carefully check the engine again to ensure ALL hoses, lines, wires, cables, clamps and lacings are disconnected or removed which would interfere with the engine removal. Ensure all wires, cables and engine controls have been pulled aft to clear the engine.

CAUTION

Place a suitable stand under tail tie-down ring before removing engine. The loss of engine weight will cause the aircraft to be tail heavy.

o. Attach a hoist to the lifting lug at the top center of the engine crankcase. Lift engine just enough to relieve the weight from the engine mounts.

p. Remove bolts, ground strap and heat deflectors.

q. Slowly hoist engine out of nacelle and clear of aircraft checking for any items which would interfere with the engine removal. Balance the engine by hand and carefully guide the disconnected parts out as the engine is removed.

r. Remove engine shock-mounts.

NOTE

If shock-mounts will be re-used, mark each one so it will be reinstalled in exactly the same position. If new shock-mounts will be installed, position them as illustrated in figure 12-2.

12-17. STATIC RUN-UP PROCEDURES. In a case of suspected low engine power, a static RPM run-up should be conducted as follows:

a. Run-up engine, using take-off power and mixture settings, with the aircraft facing 90° right and then left to the wind direction.

b. Record the RPM obtained in each run-up position.

NOTE

Daily changes in atmospheric pressure, temperature and humidity will have a slight effect on static run-up.

c. Average the results of the RPM obtained. It should be within 50 RPM of 2775 RPM.

d. If the average results of the RPM obtained are lower than stated above, the following recommended checks may be performed to determine a possible deficiency.

1. Check governor control for proper rigging. It should be determined that the governor control arm travels to the high RPM stop on the governor

and that the high RPM stop screw is adjusted properly. (Refer to Section 14 for procedures).

NOTE

If verification of governor operation is necessary the governor may be removed from the engine and a flat plate installed over the engine pad. Run-up engine to determine that governor was adjusted properly.

2. Check operation of alternator air door spring or magnetic lock to make sure door remains closed in normal operation.
3. Check magneto timing, spark plugs and ignition harness for settings and conditions.
4. On fuel injection engines, check fuel injection nozzles for restriction and check for correct unmetered fuel flow.
5. Check condition of induction air filter. Clean if required.
6. Perform an engine compression check (Refer to engine Manufacturer's Manual).

12-18. CLEANING. Clean engine in accordance with instructions in Section 2.

12-19. ACCESSORIES REMOVAL. Removal of engine accessories for overhaul or for engine replacement involves stripping the engine of parts, accessories and components to reduce it to the bare engine. During the removal process, removed items should be examined carefully and defective parts should be tagged for repair or replacement with new components.

NOTE

Items easily confused with similar items should be tagged to provide a means of identification when being installed on a new engine. All openings exposed by the removal of an item should be closed by installing a suitable cover or cap over the opening. This will prevent entry foreign material. If suitable covers are not available, tape may be used to cover the openings.

12-20. INSPECTION. For specific items to be inspected, refer to the engine manufacturer's manual.
a. Visually inspect the engine for loose nuts, bolts, cracks and fin damage.
b. Inspect baffles, baffle seals and brackets for cracks, deterioration and breakage.
c. Inspect all hoses for internal swelling, chafing through protective plys, cuts, breaks, stiffness, damaged threads and loose connections. Excessive heat on hoses will cause them to become brittle and easily broken. Hoses and lines are most likely to crack or break near the end fittings and support points.
d. Inspect for color bleaching of the end fittings or severe discoloration of the hoses.

NOTE

Avoid excessive flexing and sharp bends when examining hoses for stiffness.

e. Refer to Section 2 for replacement intervals for flexible fluid carrying hoses in the engine compartment.
f. For major engine repairs, refer to the engine manufacturer's overhaul and repair manual.

12-21. BUILD-UP. Engine build-up consists of installation of parts, accessories and components to the basic engine to build up an engine unit ready for installation on the aircraft. All safety wire, lockwashers, nuts, gaskets and rubber connections should be new parts.

12-22. INSTALLATION. Before installing the engine on the aircraft, install any items which were removed from the engine or aircraft after the engine was removed.

NOTE

Remove all protective covers, plugs, caps and identification tags as each item is connected or installed. Omit any items not present on a particular engine installation.

a. Hoist the engine to a point just above the nacelle.
b. Install engine shock-mounts and ground strap as illustrated in figure 12-2.
c. Carefully lower engine slowly into place on the engine mounts. Route controls, lines, hoses and wires in place as the engine is positioned on the engine mounts.

NOTE

Be sure engine shock-mounts, spacers and washers are in place as the engine is lowered into position.

d. Install engine-to-mount bolts, then remove the hoist and support stand placed under tail tie-down fitting. Torque bolts to 300+50-00 lb-in.
e. Route throttle, mixture and propeller controls to their respective units and connect. Secure controls in position with clamps.

NOTE

Throughout the aircraft fuel system, from the fuel cells to the engine-driven pump, use NS-40 (RAS-4) (Snap-On-Tools Corp., Kenosha, Wisconsin), MIL-T-5544 (Thread Compound Antiseize, Graphite Petrolatum), USP Petrolatum or engine oil as a thread lubricator or to seal a leaking connection. Apply sparingly to male threads only, omitting the first two threads, exercising extreme caution to avoid "stringing" sealer across the end of the fitting. Always ensure that a compound, the residue from a previously used compound, or any other foreign material cannot enter the system.

f. Connect lines and hoses as follows:
1. Connect manifold and balance tube drain lines.
2. Connect manifold pressure hose at firewall.
3. Connect oil pressure line at firewall fitting.
4. Connect fuel-flow gage hose at firewall.
5. Connect primer line at firewall fitting.
6. Connect fuel supply and vapor return hose at firewall.
7. Connect oil breather and vacuum system oil separator vent lines where secured to the engine.
8. Connect vacuum hose at firewall.
9. Install clamps and lacings securing hoses and lines to the engine to prevent chafing.

g. Connect wires and cables as follows:
1. Connect electrical wires and wire shielding ground at alternator.
2. Connect cylinder head temperature wire at probe.

CAUTION

When connecting starter cable, do not permit starter terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

3. Connect starter electrical cable at starter.
4. Connect tachometer drive shaft at adapter. Be sure drive cable engages drive in adapter. Torque housing attach nut to 100-lb-in.
5. Connect exhaust gas temperature wires at quick-disconnects.
6. Connect electrical wires at throttle microswitch.
7. Connect oil temperature wire to probe below oil cooler.
8. Connect fuel strainer drain control to strainer.
9. Install clamps and lacings securing wires and cables to engine, engine mount and brackets.

h. Install exhaust system in accordance with paragraph 12-105.
i. Connect all hot and cold air flexible ducts.
j. Install propeller and spinner in accordance with instructions outlined in Section 14.
k. Complete a magneto switch ground-out and continuity check, then connect primary lead wires to the magnetos. Remove the temporary ground or connect spark plug leads, whichever procedure was used during removal.

WARNING

Be sure magneto switch is in OFF position when connecting switch wires to magnetos.

l. Clean and install induction air filter in accordance with Section 2.
m. Service engine with proper grade and quantity of engine oil. Refer to Section 2 if engine is new, newly overhauled or has been in storage.
n. Check all switches are in the OFF position and connect battery cables.
o. Rig engine controls in accordance with paragraphs 12-92, 12-93 and 12-94.
p. Inspect engine installation for security, correct routing of controls, lines, hoses and electrical wiring, proper safetying and tightness of all components.
q. Install engine cowling in accordance with paragraph 12-3.
r. Perform an engine run-up and make final adjustments on the engine controls.

12-23. FLEXIBLE FLUID HOSES.

12-24. PRESSURE TEST. Refer to Section 2 for pressure test intervals. Perform pressure test as follows:
a. Place mixture control in the idle cut-off position.
b. Operate the auxiliary fuel pump in the high position.
c. Examine the exterior of hoses for evidence of leakage or wetness.
d. Hoses found leaking should be replaced.
e. After pressure testing fuel hoses, allow sufficient time for excess fuel to drain overboard from the engine manifold before attempting an engine start.
f. Refer to paragraph 12-20 for detailed inspection procedures for flexible hoses.

12-25. REPLACEMENT.
a. Hoses should not be twisted on installation. Pressure applied to a twisted hose may cause failure or loosening of the nut.
b. Provide as large a bend radius as possible.
c. Hoses should have a minimum of one-half inch clearance from other lines, ducts, hoses or surrounding objects or be butterfly clamped to them.
d. Rubber hoses will take a permanent set during extended use in service. Straightening a hose with a bend having a permanent set will result in hose cracking. Care should be taken during removal so that hose is not bent excessively, and during reinstallation to assure hose is returned to its original position.
e. Refer to Advisory Circular 43.13, Chapter 10, for additional installation procedures for flexible fluid hose assemblies.

12-26. ENGINE BAFFLES.

12-27. DESCRIPTION. The sheet metal baffles installed on the engine direct the flow of air around the cylinders and other engine components to provide optimum cooling. These baffles incorporate rubber-asbestos composition seals at points of contact with the engine cowling and other engine components to help confine and direct the airflow to the desired area. It is very important to engine cooling that the baffles and seals are in good condition and installed correctly. The vertical seals must fold forward and the side seals must fold upwards. Removal and installation of the various baffle segments is possible with the cowling removed. Be sure that any new baffles seal properly.

12-28. CLEANING AND INSPECTION. The engine baffles should be cleaned with a suitable solvent to remove oil and dirt.

NOTE

The rubber-asbestos seals are oil and grease resistant but should not be soaked in solvent for long periods.

Inspect baffles for cracks in the metal and for loose and/or torn seals. Repair or replace any defective parts.

12-29. REMOVAL AND INSTALLATION. Removal and installation of the various baffle segments is possible with the cowling removed. Be sure that any replaced baffles and seals are installed correctly and that they seal to direct the airflow in the correct direction. Various lines, hoses, wires and controls are routed through some baffles. Make sure that these parts are reinstalled correctly after installation of baffles.

12-30. REPAIR. Repair of an individual segment of engine baffle is generally impractical, since, due to the small size and formed shape of the part, replacement is usually more economical. However, small cracks may be stop-drilled and a reinforcing doubler installed. Other repairs may be made as long as strength and cooling requirements are met. Replace sealing strips if they do not seal properly.

12-31. ENGINE OIL SYSTEM.

12-32. DESCRIPTION. The lubricating system is of the full pressure wet sump type. Refer to applicable engine manufacturer's overhaul manual for specific details and descriptions.

WARNING

The U.S. Environmental Protection Agency advises that mechanics and other workers who handle engine oil are advised to minimize skin contact with used oil and promptly remove used oil from the skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off, for most of their life span. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

SHOP NOTES:

12-33. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
NO OIL PRESSURE.	No oil in sump.	Check with dipstick. Fill sump with proper grade and quantity of oil. Refer to Section 2.
	Oil pressure line broken, disconnected or pinched.	Inspect pressure lines. Replace or connect lines as required.
	Oil pump defective.	Remove and inspect. Examine engine. Metal particles from damaged pump may have entered engine oil passages.
	Defective oil pressure gage.	Check with a known good gage. If second reading is normal, replace gage.
	Oil congealed in gage line.	Disconnect line at engine and gage; flush with kerosene. Pre-fill with kerosene and install.
	Relief valve defective.	Remove and check for dirty or defective parts. Clean and install; replace valve if defective.
LOW OIL PRESSURE.	Low oil supply.	Check with dipstick. Fill sump with proper grade and quantity of oil. Refer to Section 2.
	Low viscosity oil.	Drain sump and refill with proper grade and quantity of oil.
	Oil pressure relief valve spring weak or broken.	Remove and inspect spring. Replace weak or broken spring.
	Defective oil pump.	Check oil temperature and oil level. If temperature is higher than normal and oil level is correct, internal failure is evident. Remove and inspect. Examine engine. Metal particles from damaged pump may have entered oil passages.
	Secondary result of high oil temperature.	Observe oil temperature gage for high indication. Determine and correct reason for high oil temperature.
	Dirty oil screens.	Remove and clean oil screens.

12-33. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
HIGH OIL PRESSURE.	High viscosity oil.	Drain sump and refill with proper grade and quantity of oil.
	Relief valve defective.	Remove and check for dirty or defective parts. Clean and install; replace valve if defective.
	Defective oil pressure gage.	Check with a known good gage. If second reading is normal, replace gage.
LOW OIL TEMPERATURE.	Defective oil temperature gage or temperature bulb.	Check with a known good gage. If second reading is normal, replace gage. If reading is similar, the temperature bulb is defective.
	Oil cooler thermostatic bypass valve defective or stuck.	Remove valve and check for proper operation. Replace valve if defective.
HIGH OIL TEMPERATURE.	Oil cooler air passages clogged.	Inspect cooler core. Clean air passages.
	Oil cooler oil passages clogged.	Drain oil cooler and inspect for sediment. Remove cooler and flush thoroughly.
	Thermostatic bypass valve damaged or held open by solid matter.	Feel front of cooler core with hand. If core is cold, oil is bypassing cooler. Remove and clean valve and seat. If still inoperative, replace.
	Low oil supply.	Check with dipstick. Fill sump with proper grade and quantity of oil. Refer to Section 2.
	Oil viscosity too high.	Drain sump and refill with proper grade and quantity of oil.
	Prolonged high speed operation on the ground.	Hold ground running above 1500 rpm to a minimum.
	Defective oil temperature gage.	Check with a known good gage. If second reading is normal. Replace gage.
	Defective oil temperature bulb.	Check for correct oil pressure, oil level and cylinder head temperature. If they are correct, check oil temperature gage for being defective; if similar reading is observed, bulb is defective. Replace bulb.

12-33. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
HIGH OIL TEMPERATURE (Cont.)	Secondary effect of low oil pressure.	Observe oil pressure gage for low indication. Determine and correct reason for low oil pressure.
	Oil congealed in cooler.	This condition can occur only in extremely cold temperatures. If congealing is suspected, use an external heater or a heated hangar to warm the congealed oil.
OIL LEAK AT FRONT OF ENGINE.	Damaged crankshaft seal.	Replace. Also refer to Service Newsletter SNL85-8, Feb. 15, 1985.
OIL LEAK AT PUSH ROD HOUSING.	Damaged push rod housing oil seal.	Replace.

12-34. FULL-FLOW OIL FILTER. Thru U20605029

12-35. DESCRIPTION. An external oil filter may be be installed on the engine. The filter and filter adapter replace the regular engine oil pressure screen. The filter adapter incorporates a bypass valve which will open allowing pressure oil from the oil pump to flow to the engine oil passages if the filter element should become clogged.

12-36. REMOVAL AND INSTALLATION. (See figure 12-3.)

NOTE

Filter element replacement kits are available from the Cessna Supply Division.

a. Remove engine cowling in accordance with paragraph 12-3.
b. Remove both safety wires from filter can and unscrew hollow stud (1) to detach filter assembly from adapter (11) as a unit. Remove filter assembly from aircraft and discard gasket (9). Oil will drain from filter as assembly is removed from adapter.
c. Press downward on hollow stud (1) to remove from filter element (5) and can (4). Discard metal gasket (2) on stud (1).
d. Lift lid (7) off filter can (4) and discard lower gasket (6).
e. Pull filter element (5) out of filter can (4).

NOTE

Before discarding removed filter element (5), remove the outer perforated paper cover; using a sharp knife, cut through the folds of the filter element at both ends. Then, carefully unfold the pleated element and examine the material trapped in the element for evidence of internal engine damage, such as chips or particles from bearings. In new or newly overhauled engines, some small particles or metallic shavings might be found, these are generally of no consequence and should not be confused with particles produced by impacting, abrasion or pressure. Evidence of internal damage found in the oil filter element justifies further examination to determine the cause.

f. Wash lid (7), hollow stud (1) and filter can (4) in solvent and dry with compressed air.

NOTES

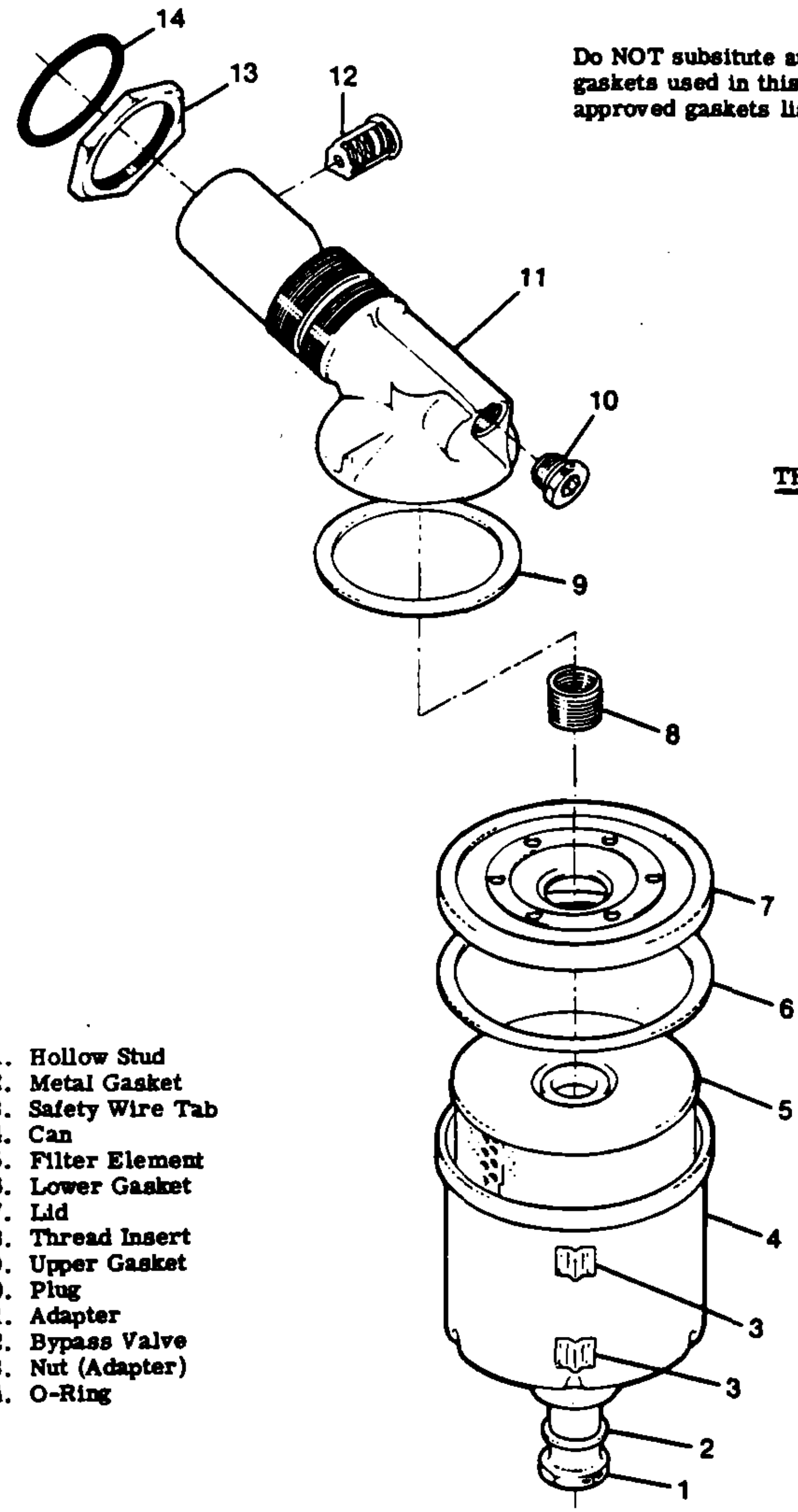
When installing a new filter element (5), it is important that all gaskets are clean, lubricated and positioned properly. Apply a thin coating of Dow Corning Compound, DC-4, on the base gasket by brushing or wiping. Also check that the correct amount of torque is applied to the hollow stud (1). If the stud is under-torqued, oil leakage will occur. If the stud is over-torqued, the filter can might possibly be deformed, again causing oil leakage.

Lubricate all rubber grommets in the new filter element, lid gaskets and metal gasket with clean engine oil or general purpose grease before installation. Dry gaskets may cause false torque readings, again resulting in oil leakage.

Before assembly, place a straightedge across bottom of filter can. Check for distortion or out-of-flat condition greater than 0.010 inch. Install a new filter can if either of these conditions exist.

NOTE

Do NOT subsitute automotive gaskets for any gaskets used in this assembly. Use only approved gaskets listed in the Parts Catalogs.



THRU U20605029

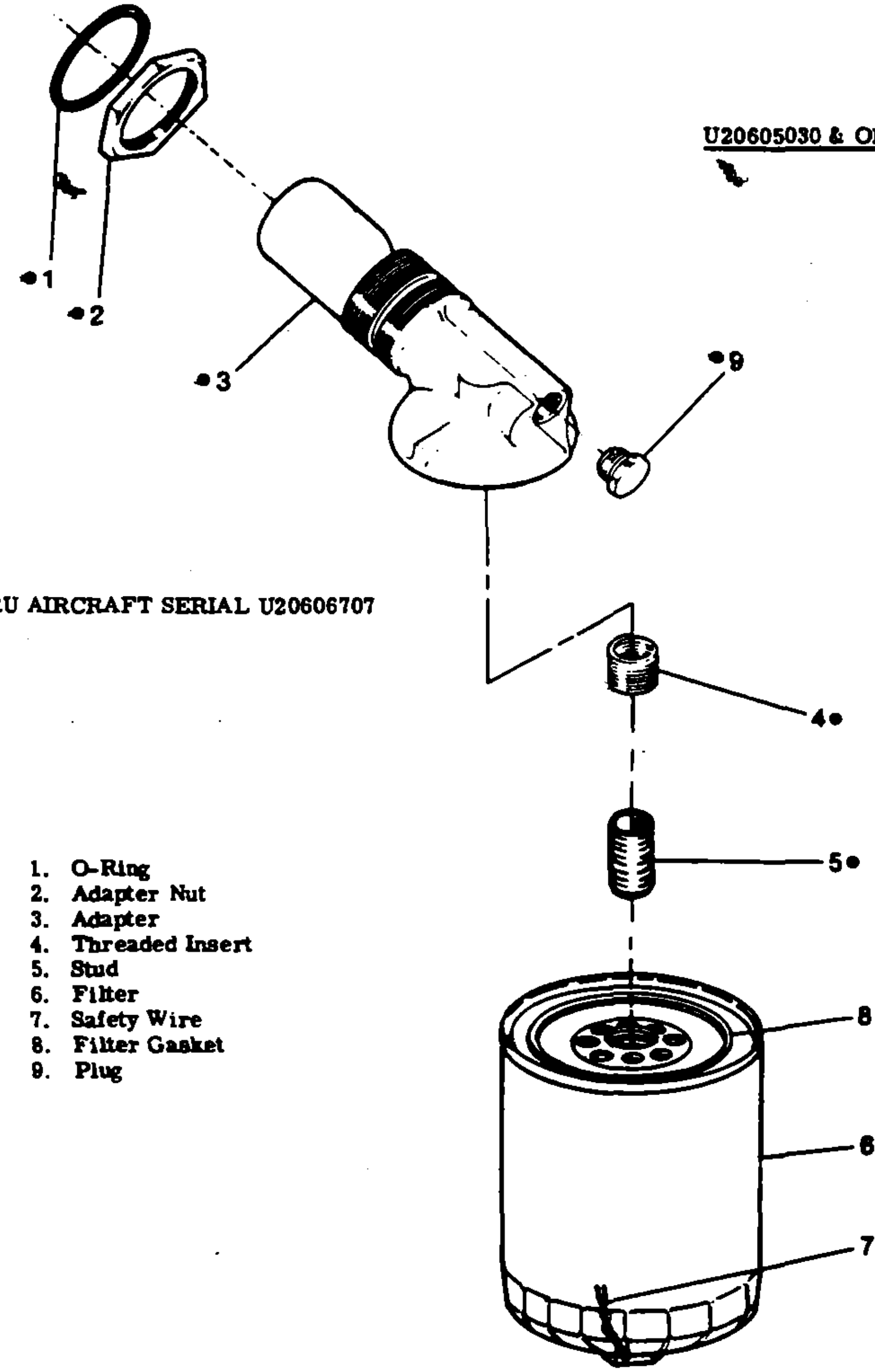
1. Hollow Stud
2. Metal Gasket
3. Safety Wire Tab
4. Can
5. Filter Element
6. Lower Gasket
7. Lid
8. Thread Insert
9. Upper Gasket
10. Plug
11. Adapter
12. Bypass Valve
13. Nut (Adapter)
14. O-Ring

Figure 12-3. Full-Flow Oil Filter (1 of 2)

NOTE

Do NOT substitute automotive gaskets for any gaskets used in this assembly. Use only approved gaskets listed in the Parts Catalogs.

U20605030 & ON



• THRU AIRCRAFT SERIAL U20606707

1. O-Ring
2. Adapter Nut
3. Adapter
4. Threaded Insert
5. Stud
6. Filter
7. Safety Wire
8. Filter Gasket
9. Plug

Figure 12-3. Full-Flow Oil Filter (2 of 2)

- After installing a new gasket on lid, turn lid over. If gaskets falls, try a different gasket and repeat test. If this gasket falls off, install a new lid.

g. Inspect the adapter gasket seat for gouges, deep scratches, wrench marks and mutilation. If any of these conditions are found, install a new adapter.
h. Place a new filter element (5) in can (4) and insert the hollow stud (1) with a new metal gasket (2) in place, through the filter can and element.
i. Position a new gasket (6) inside flange of lid (7) and place lid in position on filter can.
j. With a new gasket (9) on face of lid, install filter can assembly on adapter (11). While holding filter can to prevent turning, tighten hollow stud (1) and torque to 20-25 lb-ft (240-300 lb-in), using a torque wrench.
k. Install all parts removed for access and service the engine with the proper grade and quantity of engine oil. One additional quart of oil is required each time the filter element is changed.
l. Start engine and check for proper oil pressure. Check for oil leakage after warming up the engine.
m. Again check for oil leakage after engine has been run at high power setting (preferably a flight around the field).
n. Check to make sure filter can has not been making contact with any adjacent parts due to engine torque.
o. While engine is still warm, recheck torque on hollow stud (1) then safety stud to lower tab (3) on filter can and safety adapter (11) to upper tab on filter can.

12-37. FULL-FLOW OIL FILTER. U20605030 THRU U20606707. (See figure 12-3.)

12-38. DESCRIPTION. An external oil filter may be installed on the engine. The filter and filter adapter replace the regular engine oil pressure screen. The filter is a throw-away type spin-on filter which has an internal bypass valve.

12-39. REMOVAL AND INSTALLATION. (See figure 12-3.)
a. Remove engine cowling in accordance with paragraph 12-3.
b. Remove safety wire (7) from filter, (6).
c. Unscrew filter from adapter, (3).

NOTE

Teledyne Continental Motors recommends that the spin-on filter be inspected. Refer to Continental Aircraft Engine Service Bulletin M74-2, dated 16 January 1974.

d. Before installing oil filter (6) lightly lubricate filter gasket (8) with a thin coating of Dow Corning Compound, DC-4, apply by brushing or wiping lubricant on to base gasket.
e. Install spin-on filter, (6), on the stud and torque to 20-25 lb-ft or 3/4 to 1 full turn after gasket makes contact.
f. Safety wire filter to adapter.
g. Install all parts removed for access and service the engine with the proper grade and quantity of engine oil. One additional quart of oil is required each time the filter element is changed.
h. Start engine and check for proper oil pressure. Check for oil leakage after warming up the engine.
i. Again check for oil leakage after engine has been run at high power setting (preferably a flight around the field).
j. Check to make sure filter can has not been making contact with any adjacent parts due to engine torque.
k. While engine is still warm, recheck filter (6), to assure proper tightness.

SHOP NOTES:

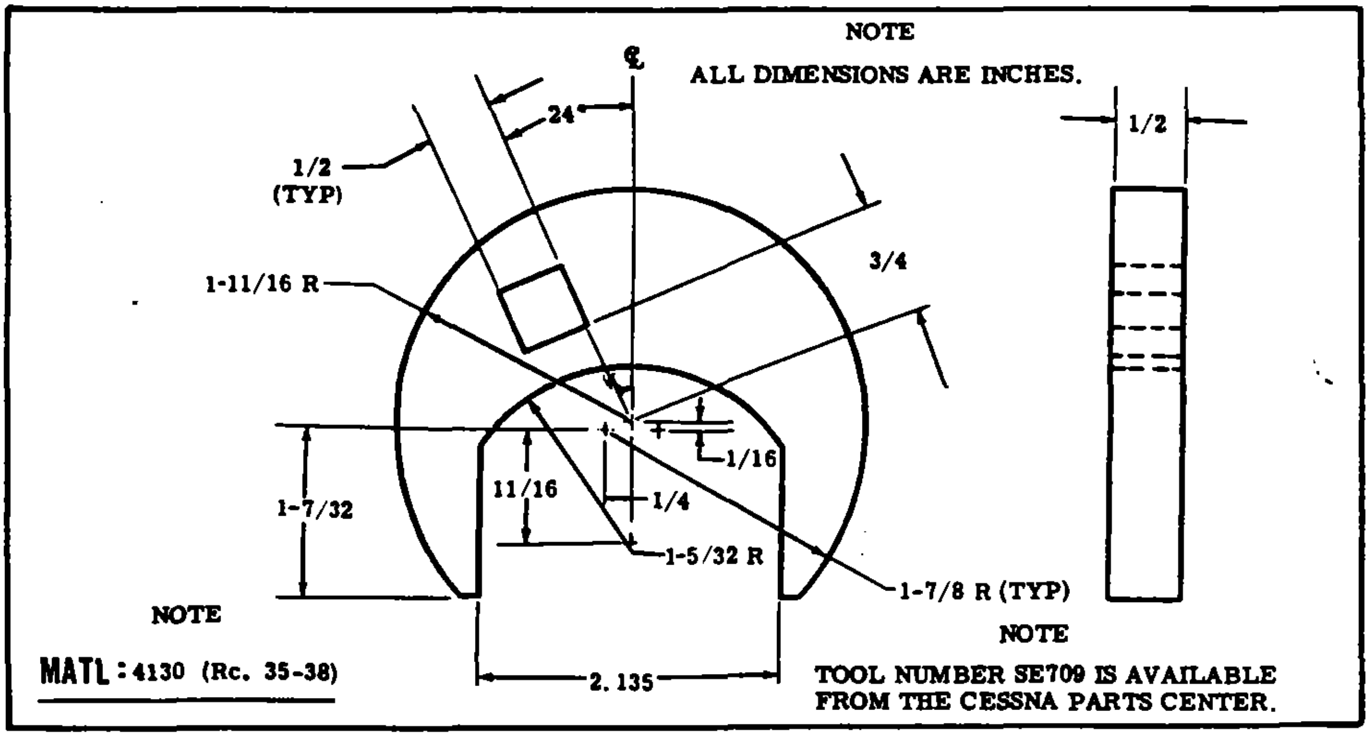


Figure 12-4. Oil Filter Adapter Wrench Fabrication

12-40. FILTER ADAPTER. THRU U20606707.

12-41. REMOVAL. (See figure 12-3.)

a. Remove filter assembly in accordance with paragraphs 12-36 or 12-39.

NOTE

A special wrench adapter for adapter nut (14) (Part No. SE-709) is available from the Cessna Supply division, or one may be fabricated as shown in figure 12-4. Remove any engine accessory that interferes with removal of the adapter.

b. Note angular position of adapter (11), then remove safety wire and loosen adapter nut (14).

c. Unscrew adapter and remove from engine. Discard adapter O-ring (15).

12-42. DISASSEMBLY, INSPECTION AND REASSEMBLY. Figure 12-3 shows the relative position of the internal parts of the filter adapter and may be used as a guide during installation of parts. The bypass valve is to be installed as a complete unit, with the valve being staked three places. The heli-coil type insert (8) in the adapter may be replaced, although special tools are required. Follow instructions of the tool manufacturer for their use. Inspect threads on adapter and in engine for damage. Clean adapter in solvent and dry with compressed air. Ascertain that all passages in the adpater are open and free of foreign material. Also, check that bypass valve is seated properly.

12-43. INSTALLATION.

a. Assembly adapter nut (14) and new O-ring (15) on adapter (11) in sequence illustrated in figure 12-4.

b. Lubricate O-ring on adapter with clean engine oil. Tighten adapter nut until O-ring is centered in its groove on the adapter.

c. Apply anti-seize compound sparingly to the adapter threads, then simultaneously screw adapter and adapter nut into engine until O-ring seats against engine boss without turning adapter nut (14). Rotate adapter to approximate angular position noted during removal. Do not tighten adapter nut at this time.

d. Temporarily install filter assembly on adapter, and position so adequate clerance with adjacent parts is attained. Maintaining this position of the adapter, tighten adapter nut to 50-60 lb-ft (600-720 lb-in.) and safety. Use a torque wrench, extension and adapter as necessary when tightening adapter nut.

e. Using new gaskets, install filter assembly as outlined in paragraph 12-39. Be sure to service the engine oil system.

12-44A. FULL-FLOW OIL FILTER. BEGINNING WITH U20606708.

12-44B. DESCRIPTION. Beginning with U20606708, the oil filter mounts directly to an adapter which is part of the oil pump. The filter is a throw-away type spin-on filter which has an internal bypass valve.

12-44C. REMOVAL.

a. Remove engine cowling.

b. Cut safety wire and unscrew filter.

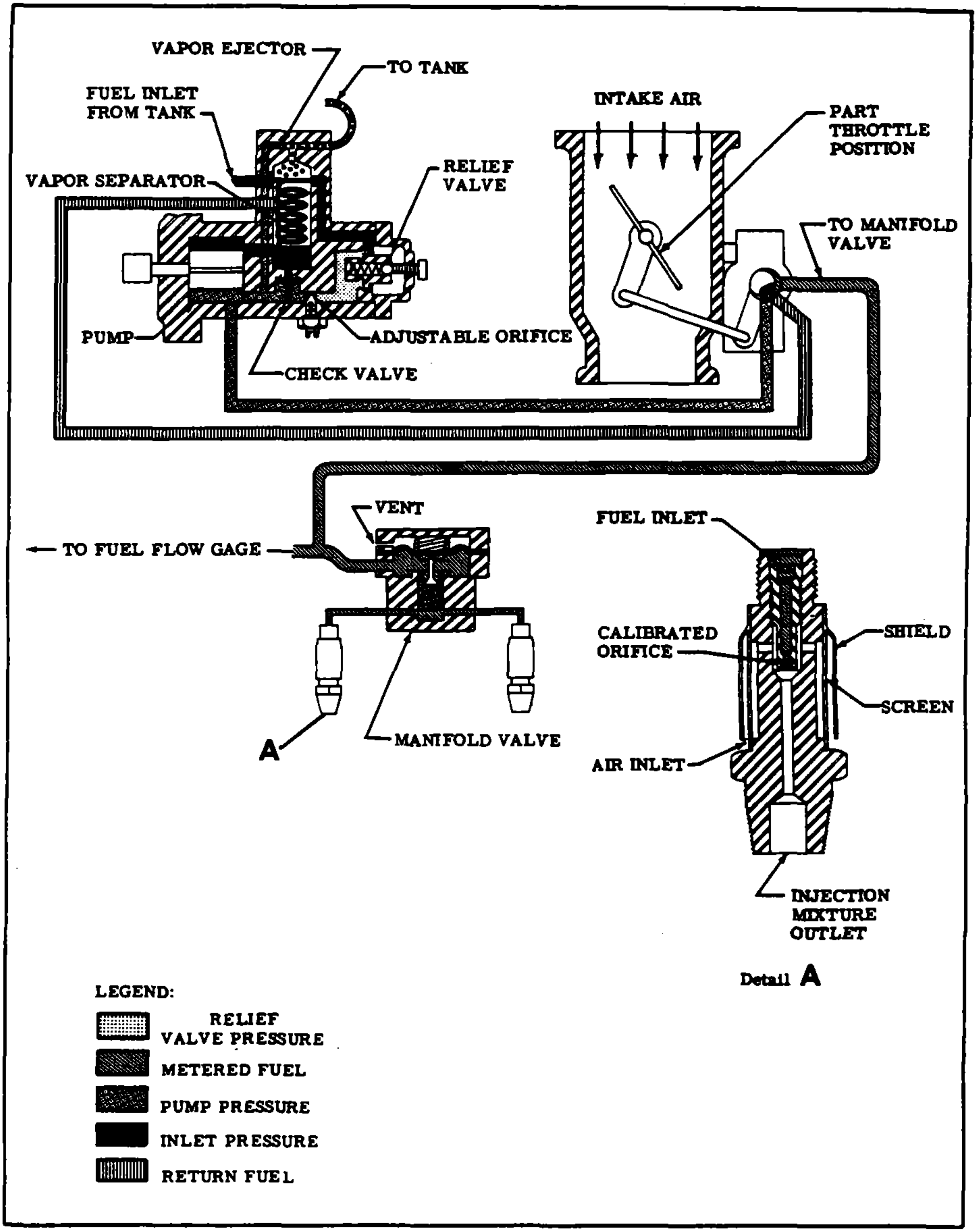


Figure 12-5. Fuel Injection Schematic

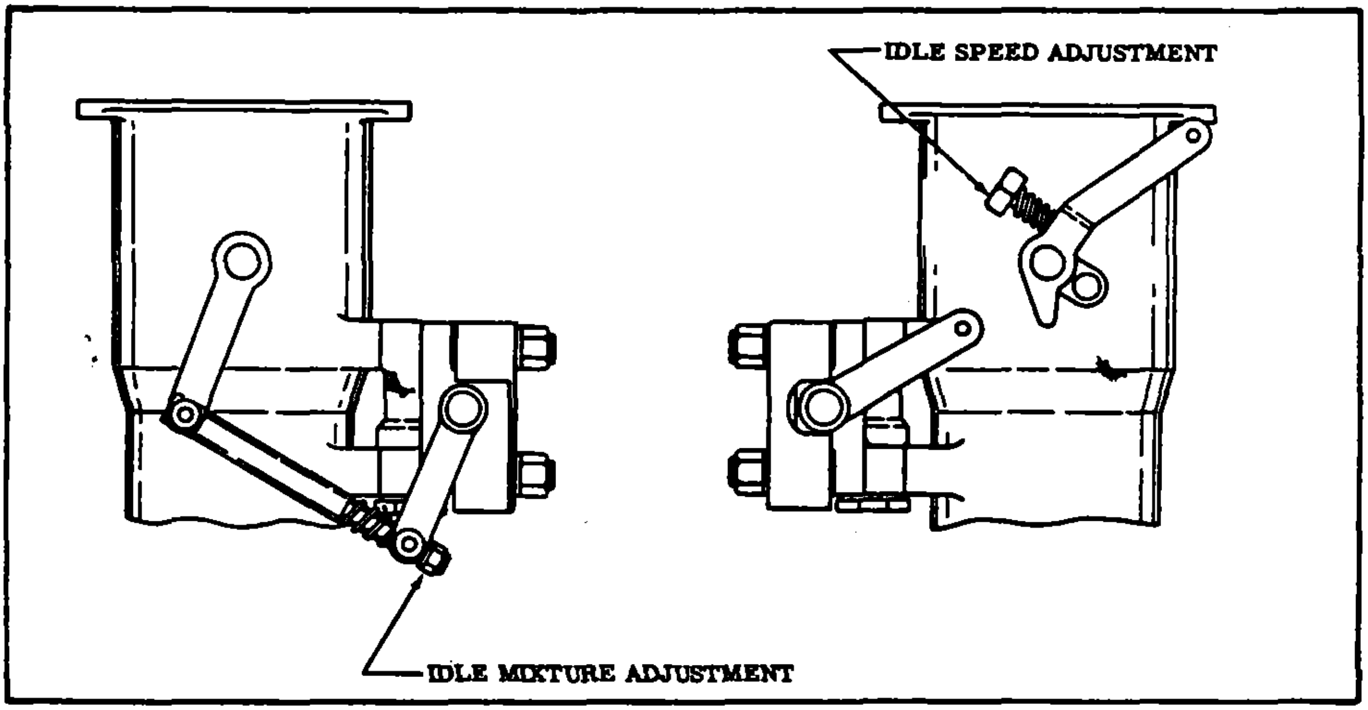


Figure 12-6. Idle Speed and Idle Mixture Adjustment

NOTE

Before discarding filter, cut filter can open, remove filter element, and cut through filter at both ends. Then carefully unfold pleated element and examine material trapped in element for evidence of internal engine damage, such as chips or particles from bearings. In new or newly overhauled engines, some small particles or metallic shavings might be found; these are generally of no consequence and should not be confused with particles produced by impacting, abrasion, or pressure. Evidence of internal damage found in oil filter element justifies further examination to determine cause.

12-44D. INSTALLATION.

a. Lightly lubricate gasket with engine oil or Dow Corning Compound (DC-4).

b. Screw oil filter on and torque to 216-240 pound inches. Safety wire.

c. Start engine and check for proper oil pressure. Check for leakage after warming up engine.

d. Check again for oil leakage after engine has been operated at high power setting (preferably a flight around the field.)

e. Check to ensure filter does not make contact with any adjacent parts due to engine torque.

12-44. OIL COOLER.

12-45. DESCRIPTION. A non-congealing oil cooler (standard beginning with the 1983 Models) may be installed on the aircraft. The cooler is mounted on the right forward side of the engine crankcase directly in front of number five cylinder and has no external oil lines. Ram air passes through the oil cooler and is discharged into the engine compartment. Oil circulating through the engine is allowed to circulate continuously through warm-up passages to prevent the oil from congealing when operating in low temperatures. On the standard and non-congealing oil coolers, as the oil increases to a certain temperature, the thermostat valve closes, causing the oil to be routed to all of the cooler passages for cooling. Oil returning to the engine from the cooler is routed through the internally drilled oil passages.

12-46. ENGINE FUEL SYSTEM. (See figure 12-5.)

12-47. DESCRIPTION. The fuel injection system is a low pressure system of injecting fuel into the intake valve port of each cylinder. It is a multinozzle, continuous-flow type which controls fuel flow to match engine airflow. Any change in throttle position, engine speed, or a combination of both, causes changes in fuel flow in the correct relation to engine airflow. A manual mixture control and a fuel flow indicator are provided for leaning at any combination of altitude and power setting. The fuel flow indicator is calibrated in gallons per hour and indicates approximately the gallons of fuel consumed per hour. The continuous-flow system uses a typical rotary vane fuel pump. There are no running parts in this system except for the engine-driven fuel pump.

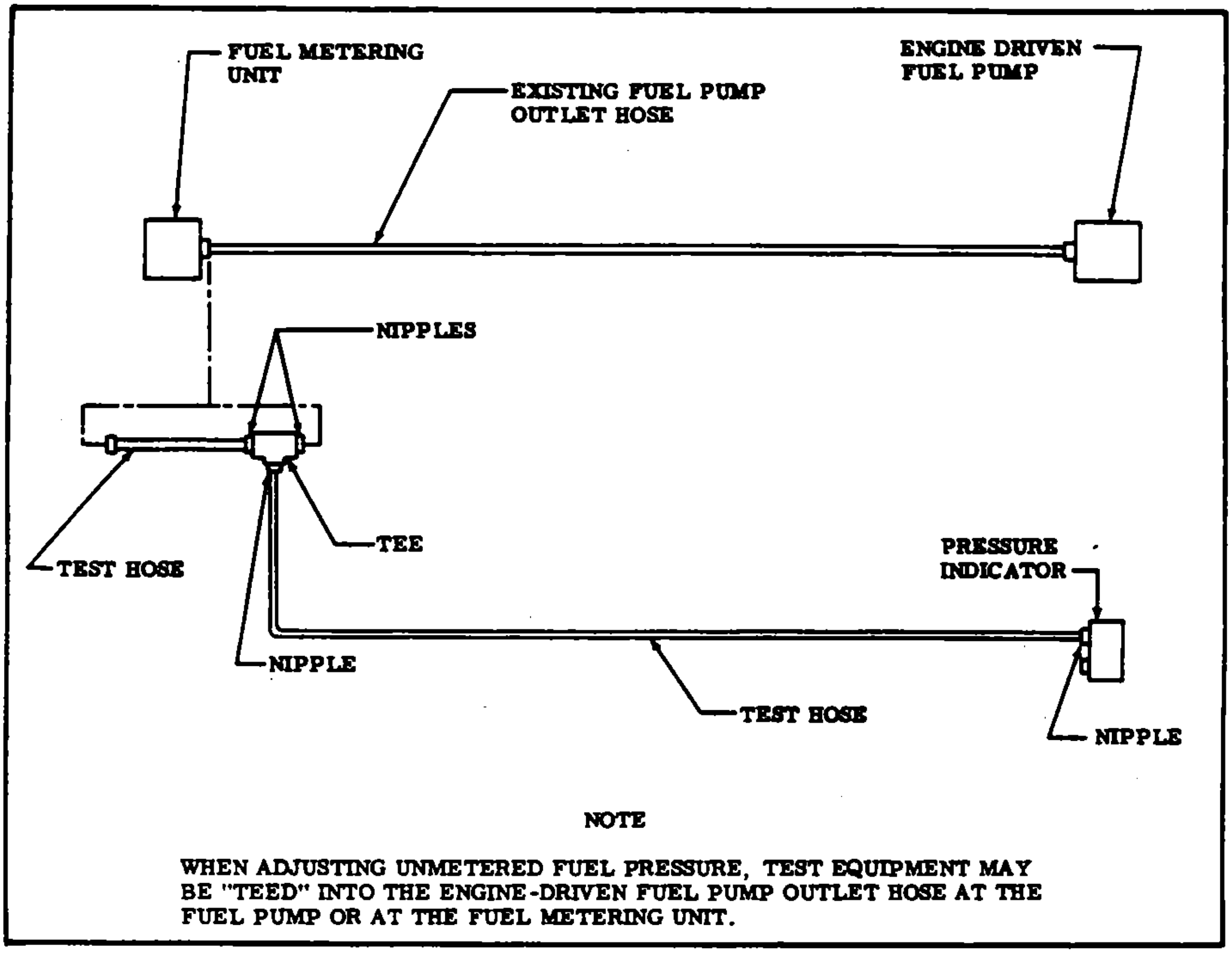


Figure 12-7. Fuel Injection Pump Adjustment Test Harness

NOTE

Throughout the aircraft fuel system, from the fuel cells to the engine-driven pump, use NS-40 (RAS-4) (Snap-On-Tools Corp., Kenosha, Wisconsin), MIL-T-5544 (Thread Compound Antiseize, Graphite Petrolatum), USP Petrolatum or engine oil as a thread lubricator or to seal a leaking connection. Apply sparingly to male threads only, omitting the first two threads, exercising extreme caution to avoid "stringing" sealer across the end of the fitting. Always ensure that a compound, the residue from a previously used compound, or any other foreign material cannot enter the system.

12-48. FUEL-AIR CONTROL UNIT.

12-49. DESCRIPTION. This unit occupies the position ordinarily used for a carburetor, at the intake manifold inlet. The function of this unit is to control engine air intake and to set the metered fuel pressure for proper fuel-air ratio. There are three control elements in this unit, one for air and two for fuel. One of the fuel control elements is for fuel mixture and the other is for fuel metering. Fuel enters the control unit through a strainer and passes to the metering valve. The position of the metering valve controls this fuel passed to the manifold valve and nozzles. A linkage connecting the metering valve to the air throttle proportions airflow to fuel flow. The position of the mixture valve determines the amount of fuel returned to the fuel pump. The fuel control portion of the fuel-air control unit is enclosed in a shroud and is blast-air cooled to help prevent vapor lock.

12-50. REMOVAL AND INSTALLATION.

a. Place all cockpit switches and fuel selector valve in the OFF position.
b. Remove cowling in accordance with paragraph 12-3.
c. Remove induction airbox in accordance with paragraph 12-72.
d. Disconnect engine controls at throttle and mixture control arms.

NOTE

Cap all disconnected hoses, lines and fittings.

e. The three fuel lines which attach to the fuel control unit are routed inside flexible tubing to help cool the fuel. Loosen tubing clamps at the control unit and slide tubing back to gain access to the fuel line fittings.
f. Disconnect fuel lines at control unit.
g. Loosen hose clamps which secure the control unit to the right and left intake manifolds.
h. Remove control unit.
i. Cover the open ends of the intake manifold piping to prevent entry of foreign matter.
j. Reverse the preceding steps for reinstallation. Use new gaskets when installing control unit. Rig throttle and mixture controls in accordance with paragraphs 12-92 and 12-93 respectively. Rig throttle-operated microswitch in accordance with Section 13.

12-51. CLEANING AND INSPECTION.

a. Check control connections, levers and linkage for security, safetying and for lost motion due to wear.
b. Remove the fuel screen assembly and clean in solvent (Stoddard or equivalent). Reinstall and safety.
c. Check the air control body for cracks and control unit for overall condition.

12-52. ADJUSTMENTS. (See figure 12-6.) The idle speed adjustment is a conventional spring-loaded screw located in the air throttle lever. The idle mixture adjustment is the locknut at the metering valve end of the linkage. Tightening the nut to shorten the linkage provides a richer mixture. A leaner mixture is obtained by backing off the nut to lengthen the linkage. Idle speed and mixture adjustment should be accomplished after the engine has been warmed up. Since idle rpm may be affected by idle mixture adjustment, it may be necessary to readjust idle rpm after setting the idle mixture correctly.

a. Set the throttle stop screw to obtain 600 ± 25 rpm, with throttle control pulled full out against idle stop.

NOTE

Engine idle speed may vary among different engines. An engine should idle smoothly, without excessive vibration and the idle speed should be high enough to maintain idling oil pressure and to preclude any possibility of engine stoppage in flight when the throttle is closed.

b. Advance throttle to increase engine speed to 1000 rpm.
c. Pull mixture control knob slowly and steadily toward the idle cut-off position, observing tachometer, then return control full IN (RICH) position before engine stops.
d. Adjust mixture adjusting nut to obtain a slight and momentary gain of 25 rpm maximum at 1000 rpm engine speed as mixture control is moved from full IN (RICH) toward idle cut-off position. Return control to full IN (RICH) to prevent engine stoppage.
e. If mixture is set too LEAN, engine speed will drop immediately, thus requiring a richer mixture. Tighten adjusting nut (clockwise) for a richer mixture.
f. If mixture is set too RICH, engine speed will increase above 25 rpm, thus requiring a leaner mixture. Back off adjusting nut (counterclockwise) for a leaner mixture.

NOTE

After each adjustment to the idle mixture, run engine up to approximately 2000 rpm to clear engine of excess fuel to obtain a correct idle speed.

12-53. FUEL MANIFOLD VALVE (FUEL DISTRIBUTOR).

12-54. DESCRIPTION. Metered fuel flows to the fuel manifold valve, which provides a central point for distributing fuel to the individual cylinders. An internal diaphragm, operated by fuel pressure, raises or lowers a plunger to open and close the individual cylinder supply ports simultaneously. A needle valve in the plunger ensures that the plunger fully opens the outlet ports before fuel flow starts and closes the ports simultaneously for positive engine shut-down. A fine-mesh screen is included in the fuel manifold valve.

NOTE

The fuel manifold valves are supplied in two flow ranges. When replacing a valve assembly, be sure the replacement valve has the same suffix letter as the one stamped on the cover of the valve removed.

12-55. REMOVAL.

NOTE

Cap all disconnected lines, hoses and fittings.

a. Disconnect all fuel and fuel injection lines at the fuel manifold.
b. Remove bolts which secure fuel manifold and remove manifold.

12-56. CLEANING.

a. Remove manifold valve from engine in accordance with paragraph 12-55 and remove safety wire from cover attaching screws.

b. Hold the top cover down against internal spring until all four cover attaching screws have been removed, then gently lift off the cover. Use care not to damage the spring-loaded diaphragm below cover.
c. Remove the upper spring and lift the diaphragm assembly straight up.

NOTE

If the valve attached to the diaphragm is stuck in the bore of the body, grasp the center nut, rotate and lift at the same time to work gently out of the body.

CAUTION

Do not attempt to remove needle or spring from inside plunger valve. Removal of these items will disturb the calibration of the valve.

d. Using clean gasoline, flush out the chamber below the screen.
e. Flush above the screen and inside the center bore making sure that outlet passages are open. Use only a gentle stream of compressed air to remove dust and dirt and to dry.

CAUTION

The filter screen is a tight fit in the body and may be damaged if removal is attempted. It should be removed only if a new screen is to be installed.

f. Clean diaphragm, valve and top cover in the same manner. Be sure the vent hole in the top cover is open and clean.
g. Carefully replace diaphragm and valve. Check that valve works freely in body bore.
h. Position diaphragm so that horizontal hole in plunger valve is 90 degrees from the fuel inlet port in the valve body.
i. Place upper spring in position on diaphragm.
j. Place cover in position so that vent hole in cover is 90 degrees from inlet port in valve body. Install cover attaching screws and tighten to 20±1 lb-in. Install safety wire on cover screws.
k. Install fuel manifold valve assembly on engine in accordance with paragraph 12-57 and reconnect all lines and hoses to valve.
l. Inspect installation and install cowling.

12-57. INSTALLATION.
a. Secure the fuel manifold to the crankcase with the two crankcase bolts.
b. Connect the fuel lines and the six fuel injection lines. Inspect completed installation and install cowling.

12-58. FUEL DISCHARGE NOZZLES.

12-59. DESCRIPTION. From the fuel manifold valve, individual, identical size and length fuel lines carry metered fuel to the fuel discharge nozzles located in the cylinder heads. The outlet of each nozzle is directed into the intake port of each cylinder. The nozzle body contains a drilled central passage with a counterbore at each end. The lower end is used as a chamber for fuel-air mixture before the spray leaves the nozzle. The upper bore contains an orifice for calibrating the nozzles. Near the top, radial holes connect the upper counterbore with the outside of the nozzle body for air admission. These radial holes enter the counterbore above the orifice and draw outside air through a cylindrical screen fitted over the nozzle body. This screen prevents dirt and foreign material from entering the nozzle. A press-fit shield is mounted on the nozzle body and extends over the greater part of the filter screen, leaving a small opening at the bottom of the shield. This provides an air bleed into the nozzle which aids in vaporizing the fuel by breaking the high vacuum in the intake manifold at idle rpm and keeps the fuel lines filled. The nozzles are calibrated in several ranges. All nozzles furnished for one engine are the same range and are identified by a number and a suffix letter stamped on the flat portion of the nozzle body. When replacing a fuel discharge nozzle be sure it is of the same calibrated range as the rest of the nozzles in the engine. When a complete set of nozzles is being installed, the number must be the same as the one removed, but the suffix letters may be different, as long as they are the same for all nozzles being installed on a particular engine.

12-60. REMOVAL.

NOTE

Plug or cap all disconnected lines and fittings.

a. Disconnect the fuel injection lines at the fuel discharge nozzles. Remove nozzles with a 1/2 inch deep well socket wrench.

12-61. CLEANING AND INSPECTION. To clean nozzles, immerse in clean solvent and use compressed air to dry them. When cleaning, direct air through the nozzle in the direction opposite of normal fuel flow. Do not remove the nozzle shield or distort it in any way. Do not use a wire or other metal object to clean the orifice or metering jet. After cleaning, check the shield height from the hex portion of the nozzle. The bottom of the shield should be approximately 1/16 inch above the hex portion of the nozzle.

12-62. INSTALLATION.
a. Install nozzles in the cylinders and tighten to a torque value of 60 to 80 lb-in.
b. Connect the fuel lines at discharge nozzles.
c. Check installation for crimped lines, loose fittings, etc.

12-63. FUEL INJECTION PUMP.

12-64. DESCRIPTION. The fuel pump is a positive-displacement, rotating vane type, connected to the accessory drive section of the engine. Fuel enters the pump at the swirl well of the pump vapor separator. Here, vapor is separated by a swirling motion so that only liquid fuel is fed to the pump. The vapor is drawn from the top center of the swirl well by a small pressure jet of fuel and is fed into the vapor return line, where it is returned to the aircraft fuel system. Since the pump is engine-driven, changes in engine speed affects total pump flow proportionally. A check valve allows the auxiliary fuel pump pressure to bypass the engine-driven fuel pump for starting, or in the event of engine-driven fuel pump failure. The pump supplies more fuel than is required by the engine; therefore, a spring-loaded, diaphragm type relief valve is provided, with an adjustable orifice installed in the fuel passage to the relief valve to maintain desired fuel pressure for engine power setting. The adjustable orifice allows the exact desired pressure setting at full throttle. The fuel pump is equipped with a manual mixture control to provide positive mixture control throughout the range required by the injection system. This control limits output of the pump from full rich to idle cut-off. Non-adjustable mechanical stops are located at these positions. The fuel pump is ram-air cooled to help prevent high fuel temperatures. The ram air is picked up at the upper left engine baffle and directed through a flexible tube to the fuel pump shroud. The fuel supply and return lines from the fuel pump to the control unit are routed inside flexible tubes to help prevent vaporized fuel at these points.

12-65. REMOVAL.

a. Place fuel shut-off valve in OFF position and mixture control in IDLE CUT-OFF position.
b. Remove cowling in accordance with paragraph 12-3.
c. Loosen the clamps and slide the flexible tubes free of the horns on the fuel pump shroud to gain access to the fuel lines.
d. Remove the alternator drive belt.
e. Tag and disconnect all lines and fittings attached to the fuel pump.

NOTE

Plug or cap all disconnected lines, hoses and fittings.

f. Remove the shroud surrounding the fuel pump.
g. Remove the nuts and washers attaching the fuel pump to the engine.
h. Remove fuel pump and gasket.

WARNING

Residual fuel draining from lines and hose constitutes a fire hazard. Use caution to prevent accumulation of fuel when lines or hoses are disconnected.

i. If a replacement pump is not being installed immediately, a temporary cover should be installed on the fuel pump mount pad.

12-66. INSTALLATION.

a. Position a new gasket and fuel pump on the mounting studs with fuel pump inlet to the left. Be sure pump drive aligns with drive in the engine.
b. Secure pump to engine with plain washers, internal tooth lock washers and nuts. Tighten nuts evenly.
c. Install cooling shroud on fuel pump.
d. Install all fittings and connect all lines.
e. Install the flexible ram air tube on the air horn of the fuel pump shroud and install clamp
f. Replace the alternator drive belt and tighten the nuts on the adjusting arm so that the drive belt has proper tension. Refer to Section 17.
g. Inspect completed installation.

12-67. ADJUSTMENT. The full rich performance of the fuel injection system is controlled by manual adjustment of the air throttle, fuel mixture and pump pressure at idle and only by pump pressure at full throttle. To make full rich adjustments, proceed as follows:

a. Remove engine cowling in accordance with paragraph 12-3.

NOTE

Inspect the slot-headed adjustable orifice needle valve (located just below the fuel pump inlet fitting) to see if it is epoxy sealed or safety wired to the brass nut. If the needle valve is epoxy sealed, Continental Aircraft Engine Service Bulletin No. 70-10 must be complied with before calibration of the unit can be performed.

b. Disconnect the engine-driven fuel pump outlet fitting or the fuel metering unit inlet fitting and "tee" the test gage into the fuel injection system as illustrated in figure 12-7.

NOTE

Cessna Service Kit No. SK320-2J provides a test gage, line and fittings for connecting the test gage into the system to perform accurate calibration of the engine-driven fuel pump.

c. The test gage MUST be vented to atmosphere and MUST be held as near to the level of the engine-driven fuel pump as possible. Bleed air from test gage line prior to taking readings.

NOTE

The test gage should be checked for accuracy at least every 90 days or anytime an error is suspected. The tachometer accuracy should also be determined prior to making any adjustments to the pump.

d. Start engine and warm-up thoroughly. Set mixture control to full rich position and propeller control full forward (low pitch, high rpm).

e. Adjust engine idle speed to 600±25 rpm and 1 check test gage for 9-11 PSI. See figure 12-6 -7 for idle mixture adjustment.

NOTE

Do not adjust idle mixture until idle pump pressure is obtained.

WARNING

DO NOT make fuel pump pressure adjustments while engine is operating.

f. If the pump pressure is not 9 to 11 PSI, stop engine and turn the fuel pump relief valve adjustment, on the centerline of the fuel pump clockwise (CW) to increase pressure and counterclockwise (CCW) to decrease pressure.
g. Maintaining idle pump pressure and idle RPM, obtain correct idle mixture in accordance with paragraph 12-52.
h. Completion of the preceding steps have provided:
1. Correct idle pump pressure.
2. Correct fuel flow.
3. Correct fuel metering cam to throttle plate orientation.
i. Advance to full throttle and maximum rated engine speed with the mixture control in full rich position and propeller control in full forward (low pitch, high rpm).
j. Check test gage for pressures specified in paragraph 12-12. If pressure is incorrect, stop engine and adjust pressure by loosening locknut and turning the slotheaded needle valve located just below the fuel pump inlet fitting clockwise (CW) to increase pressure and counterclockwise (CCW) to decrease pressure.

NOTE

If at static run-up, rated RPM cannot be achieved at full throttle, adjust pump pressure slightly below limits making certain the correct pressures are obtained when rated RPM is achieved during take-off roll.

k. After correct pressures are obtained, safety adjustable orifice and orifice locknut.
l. Remove test equipment, run engine to check for leaks and install cowling.

12-68. AUXILIARY ELECTRIC FUEL PUMP FLOW RATE ADJUSTMENT. Refer to Section 13.

12-69. INDUCTION AIR SYSTEM.

12-70. DESCRIPTION. Ram air enters the induction air system through a filter at the upper left engine baffle. A spring-loaded alternate air door is incorporated in the airbox and will open by engine suction if the air filter should become clogged. This permits unfiltered induction air to be drawn from within the engine compartment.

12-71. AIRBOX.

12-72. REMOVAL AND INSTALLATION.
a. Remove cowling in accordance with paragraph 12-3.
b. Remove induction air filter.
c. Disconnect electrical wiring at throttle-operated micro-switch and tape terminals as a safety precaution.
d. Remove clamps attaching lines, wires and controls to airbox.
e. Remove bolts securing airbox to fuel-air control unit and engine and remove airbox and gasket.
f. Install a cover over fuel-air control opening.
g. Reverse the preceding steps for reinstallation. Adjust throttle operated switch in accordance with Section 13.

12-73. CLEANING AND INSPECTION. Clean metal parts of the induction airbox with Stoddard solvent or equivalent. Inspect for cracks, dents, loose rivets, etc. Minor cracks may be stop-drilled. In case of continued or severe cracking, replace airbox. Inspect alternate spring-loaded door for freedom of operation and complete closing.

12-74. INDUCTION AIR FILTER.

12-75. DESCRIPTION. An induction air filter, mounted at the airbox inlet, removes dust particles from the ram air entering the engine.

12-76. REMOVAL AND INSTALLATION.
a. Remove cowling in accordance with paragraph 12-3.
b. Remove bolts securing filter to the upper left engine baffle and induction airbox inlet.
c. Reverse the preceding steps for reinstallation. Make sure the gasket is in place between the filter and airbox intake.

12-77. CLEANING AND INSPECTION. Clean and inspect filter in accordance with instructions in Section 2.

12-78. IGNITION SYSTEM.

12-79. DESCRIPTION. The ignition system is comprised of two magnetos, two spark plugs in each cylinder, an ignition wiring harness, an ignition switch mounted on the instrument panel and required wiring between the ignition switch and magnetos.

12-80. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE FAILS TO START.	Defective ignition switch.	Check switch continuity. Replace if defective.
	Spark plugs defective, improperly gapped or fouled by moisture or deposits.	Clean, regap and test plugs. Replace if defective.
	Defective ignition harness.	If no defects are found by a visual inspection, check with a harness tester. Replace defective parts.
	Magneto "P" lead grounded.	Check continuity. "P" lead should not be grounded in the ON position, but should be grounded in OFF position. Repair or replace "P" lead.
	Failure of impulse coupling.	Impulse coupling pawls should engage at cranking speeds. Listen for loud clicks as impulse couplings operate. Remove magnetos and determine cause. Replace defective magneto.
	Defective magneto.	Refer to paragraph 12-86.
	Broken drive gear.	Remove magneto and check magneto and engine gears. Replace defective parts. Make sure no pieces of damaged parts remain in engine or engine disassembly will be required.
ENGINE WILL NOT IDLE OR RUN PROPERLY.	Spark plugs defective, improperly gapped or fouled by moisture or deposits.	Clean, regap and test plugs. Replace if defective.
	Defective ignition harness.	If no defects are found by a visual inspection, check with a harness tester. Replace defective parts.
	Defective magneto.	Refer to paragraph 12-86.
	Impulse coupling pawls remain engaged.	Listen for loud clicks as impulse coupling operates. Remove magneto and determine cause. Replace defective magneto.
	Spark plugs loose.	Check and install properly.

12-81. MAGNETOS

12-82. DESCRIPTION. The airplane may be equipped with either 662 Series or 6200 Series Slick magnetos. The magnetos contain a conventional two-pole rotating magnet (rotor), mounted in ball bearings. Driven by the engine through an impulse coupling at one end, the rotor shaft operates the breaker points at the other end of the shaft. The nylon rotor gear drives a nylon distributor gear which transfers high-tension current from the wedge-mounted coil to the proper outlet in the distributor block. A coaxial capacitor is mounted in the distributor block housing to serve as the condenser as well as a radio noise suppressor. Both nylon gears are provided with timing marks for clockwise or counterclockwise rotation. The distributor gear and distributor block have timing marks, visible through the air vent holes, for timing to the engine. A timing hole is located in the 662 Series magneto in the bottom of the magneto adjacent to the flange. In the 6200 Series, the timing hole is located in the distributor block. A timing pin or 6-penny nail can be inserted through this timing hole into the mating hole in the rotor shaft to lock the magneto approximately in the proper firing position. The breaker assembly is accessible only after removing the screws fastening the magneto halves together and disconnecting the capacitor slip terminal. Do not separate magneto halves while magneto is installed on the engine.

12-83. REMOVAL.
a. Remove engine cowling in accordance with paragraph 12-3.
b. Tag for identification and remove high tension wires from the magneto being removed.

WARNING

The magneto is in a SWITCH ON condition when the switch wire is disconnected. Remove the high tension wires from magneto or disconnect spark plug leads from the spark plugs to prevent accidental firing.

c. Disconnect switch wire from condenser terminal at magneto. Tag wire for identification so it may be installed correctly.
d. Rotate propeller in direction of normal rotation until No. 1 cylinder is coming up on its compression stroke.

NOTE

To facilitate the installation of a replacement magneto, it is good practice to position the crankshaft at the advanced firing angle for No. 1 cylinder during step "d." Any standard timing device or method can be used, or if the magneto being removed is correctly timed to the engine, the crankshaft can be rotated to a position at which the breaker points will be just opening to fire No. 1 cylinder.

e. Remove magneto retainer clamps, nuts and washers and pull magneto from crankcase mounting pad.

NOTE

As the magneto is removed from its mounting, be sure that the drive coupling rubber bushing and retainer do not become dislodged from the gear hub and fall into the engine.

12-84. INTERNAL TIMING.
a. Whenever the gear on the rotor shaft or the cam (which also serves as the key for the gear) has been removed, be sure that the gear and cam are installed so the timing mark on the gear aligns with the "O" etched on the rotor shaft.
b. When replacing breaker assembly or adjusting contact breaker points, place a timing pin (or 0.093 inch 6-penny nail) through the timing hole in the bottom of the magneto next to the flange and into the mating hole in the rotor shaft. Adjusting contact breaker points so they are just starting to open in this position will give the correct point setting. Temporarily assemble the magneto halves and capacitor slip terminal and use a timing light to check that the timing marks, visibly through the ventilation plug holes are approximately aligned.

NOTE

The side of the magneto with the manufacturer's insignia has a red timing mark and the side opposite to the insignia has a black timing mark viewed through the vent plug holes. The distributor gear also has a red timing mark and a black timing mark. These marks are used for reference only when installing magneto on the engine. Do not place red and black lines together on the same side.

c. Whenever the large distributor gear and rotor gear have been disengaged, they must be engaged with their timing marks aligned for correct rotation. Align the timing mark on the rotor gear with the "RH" on the distributor gear. Care must be taken to keep these two gears meshed in this position until the magneto halves are assembled.

12-85. INSTALLATION AND TIMING TO ENGINE. The magneto MUST be installed with its timing marks correctly aligned, with the number one cylinder on its compression stroke and with number one piston at its advanced firing position. Refer to paragraph 12-12 for the advanced firing position of number one piston.

WARNING

The magneto is grounded through the ignition switch, therefore, any time the switch (primary) wire is disconnected from the magneto, the magneto is in a switch ON or HOT condition. Before turning the propeller by hand, remove the high tension wires from the magneto or disconnect all spark plug leads to prevent accidental firing of the engine.

To locate the compression stroke of number one cylinder, remove the lower spark plugs from each cylinder except number one cylinder. Remove the top plug from number one cylinder. Place thumb of one hand over the number one cylinder spark plug hole and rotate the crankshaft in the direction of normal rotation until the compression stroke is indicated by positive pressure inside the cylinder lifting the thumb off the spark plug hole. After the compression stroke is obtained, locate number one piston at its advanced firing position. Locating the advanced firing position of number one cylinder may be obtained by use of a timing disc and pointer, Timrite, protractor and piston locating gage or external engine timing marks alignment.

NOTE

External engine timing marks are located on a bracket attached to the starter adapter, with a timing mark on the alternator drive pulley as the reference point.

In all cases, it must be definitely determined that the number one cylinder is at the correct firing position and on the compression stroke, when the crankshaft is turned in its normal direction of rotation. After the engine has been placed in the correct firing position, install and time the magneto to the engine in the following manner.

NOTE

Install the magneto drive coupling retainer and rubber bushings into the magneto drive gear hub slot. Insert the two rubber bushings into the retainer with the chamfered edges facing toward the front of the engine.

a. Turn the magneto shaft until the timing marks visible through the ventilation plug holes are aligned (red-to-red or black-to-black) and insert a timing pin (or 0.093-inch 6-penny nail) through the time hole (on the 662 magneto in the bottom of the magneto next to the flange and on the 6200 magneto in the distributor block) and into the mating hole in the rotor shaft. This locks the magneto approximately in the firing position while installing on the engine.

NOTE

If the magneto drive gear was disengaged during magneto removal, hold the magneto in the horizontal position it will occupy when installed, make certain that the drive gear coupling slot is aligned with the magneto coupling lugs. If it is not aligned, pull the magneto drive gear out of mesh with its drive gear and rotate it to the aligned angle, then push it back into mesh. DO NOT WITHDRAW THE MAGNETO DRIVE GEAR FROM ITS OIL SEAL.

b. After magneto gasket is in place, position the magneto on the engine and secure, then remove the timing pin from the magneto. Be sure to remove this pin before turning the propeller.

c. Connect a timing light to the capacitor terminal at the front of the magneto and to a good ground.

d. Turn propeller back a few degrees (opposite of normal rotation) to close the contact points.

NOTE

Do not turn the propeller back far enough to engage the impulse coupling or the propeller will have to be turned in normal direction of rotation until the impulse coupling releases, then backed up to slightly before the firing position.

e. Slowly advance the propeller in the normal direction of rotation until the timing light indicates the contact points breaking. Magneto mounting clamps may be loosened so that the magneto may be shifted to break the points at the correct firing position.

f. Tighten magneto mounting nuts and recheck timing.

g. Repeat steps "a" through "f" for the other magneto.

h. After both magnetos have been timed, check synchronization of both magnetos. Magnetos must fire at the same time.

i. Remove timing devices from magneto and engine.

j. Connect spark plug leads to their correct magneto outlets.

NOTE

The No. 1 magneto outlet is the one closest to the ventilation plug on the side of the magneto having the manufacturer's insignia. The magneto fires at each successive outlet in clockwise direction. Connect No. 1 magneto outlet to No. 1 cylinder spark plug lead, No. 2 outlet to the next cylinder to fire, etc. Engine firing order is listed in paragraph 12-12.

k. Connect ignition switch (primary) leads to the capacitor terminals on the magnetos.

NOTE

Magneto (primary) lead nut torque range is 13-15 in.-lbs. Exceeding this torque range could result in possible condenser damage.

l. Inspect magneto installation and install engine cowling in accordance with paragraph 12-3.

12-86. MAINTENANCE. Every 100 hours of service or at annual inspection, whichever comes first, perform magneto-to-engine timing check as outlined in Slick 4200/6200 Series Aircraft Maintenance and Overhaul Instructions No. 1037C or 1020-13 (for 400/600 Series magnetos) and revisions and supplements hereto. If timing is as specified in paragraph 12-12, internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. In the event the magneto internal timing marks are off more than plus or minus five degrees when the breaker points open to fire number one cylinder, remove the magneto and check the magneto internal timing. Whenever the magneto halves are separated the breaker point assembly should always be checked. As long as internal timing and magneto-to-engine timing are within the preceding tolerances, it is recommended that the magneto be checked internally only at 500 hour intervals. It is normal for contact points to burn and the cam to wear a comparable amount so the magneto will remain in time within itself. This is accomplished by having a good area making contact on the surface between the points and the correct amount of spring pressure on the cam. The area on the points should be twenty-five percent of the area making contact. The spring pressure at the cam should be 10.5 to 12.5 ounces. When the contact points burn, the area becomes irregular, which is not detrimental to the operation of the points unless metal transfer is too great which will cause the engine to misfire. Figure 12-8 illustrates good and bad contact points. A small dent will appear on the nylon insulator between the cam follower and the breaker bar. This is normal and does not require replacement.

NOTE

If ignition trouble should develop, spark plugs and ignition wiring should be checked first. If the trouble definitely is associated with a magneto, use the following to help disclose the source of trouble without overhauling the magneto.

a. Moisture Check.

1. Remove magneto from engine and remove screws securing the magneto halves together, disconnect capacitor slip terminal and remove distributor. Inspect for moisture.

2. Check distributor gear finger and carbon brush for moisture.

3. Check breaker point assembly for moisture, especially on the surfaces of the breaker points.

4. If any moisture is evident in the preceding places, wipe with a soft, dry, clean, lint-free cloth.

b. Breaker Compartment Check.

1. Check all parts of the breaker point assembly for security.

2. Check breaker point surface for evidence of excessive wear, burning, deep pits and carbon deposits. Breaker points may be cleaned with a hard-finish paper. If breaker point assembly is defective, install a new assembly. Make no attempt to stone or dress the breaker points. Clean new breaker points with clean, unleaded gasoline and hard-finish paper before installing.

3. Check capacitor mounting bracket for cracks or looseness.

4. Check the carbon brush on the distributor gear for excessive wear. The brush must extend a minimum of 1/32 inch beyond the end of the gear shaft. The spring which the carbon brush contacts should be bent our approximately 20 degrees from vertical, since spring pressure on the brush holds the distributor gear shaft against the thrust bearing in the distributor block.

5. Oil the bearings at each end of the distributor gear shaft with a drop of SAE 20 oil. Wipe excess oil from parts.

6. Make sure internal timing is correct and reassemble magneto. Install and properly time magneto to engine.

12-87. MAGNETO CHECK. Advanced timing settings in some cases, is the result of the erroneous practice of bumping magnetos up in timing in order to reduce RPM drop on single ignition. NEVER ADVANCE TIMING BEYOND SPECIFICATIONS IN ORDER TO REDUCE RPM DROP. Too much importance is being attached to RPM drop on single ignition. RPM drop on single ignition is a natural characteristic of dual ignition design. The purpose of the following magneto check is to determine that all cylinders are firing. If all cylinders are not firing, the engine will run extremely rough and cause for investigation will be quite apparent. The amount of RPM drop is not necessarily significant and will be influenced by ambient air temperature, humidity, airport altitude, etc. In fact, absence of RPM drop should be cause for suspicion that the magneto timing has been bumped up and is set in advance of the setting specified. Magneto checks should be performed on a comparative basis between individual right and left magneto performance.

a. Start and run engine until the oil and cylinder head temperature is in the normal operating range.

b. Place the propeller control in the full low pitch (high rpm) position.

c. Advance engine speed to 1700 rpm.

d. Turn the ignition switch to the "R" position and note the rpm drop, then return the switch to the "BOTH" position to clear the opposite set of plugs.

e. Turn the switch to the "L" position and note the rpm drop, then return the switch to the "BOTH" position.

f. The rpm drop should not exceed 150 rpm on either magneto or show greater than 50 rpm differential between magnetos. A smooth rpm drop-off past normal is usually a sign of a too lean or too rich mixture. A sharp rpm drop-off past normal is usually a sign of a fouled plug, a defective harness lead or a magneto out of time. If there is doubt concerning operation of the ignition system, rpm checks at a leaner mixture setting or at higher engine speeds will usually confirm whether a deficiency exists.

NOTE

An absence of rpm drop may be an indication of faulty grounding of one side of the ignition system, a disconnected ground lead at magneto or possibly the magneto timing is set too far in advance.

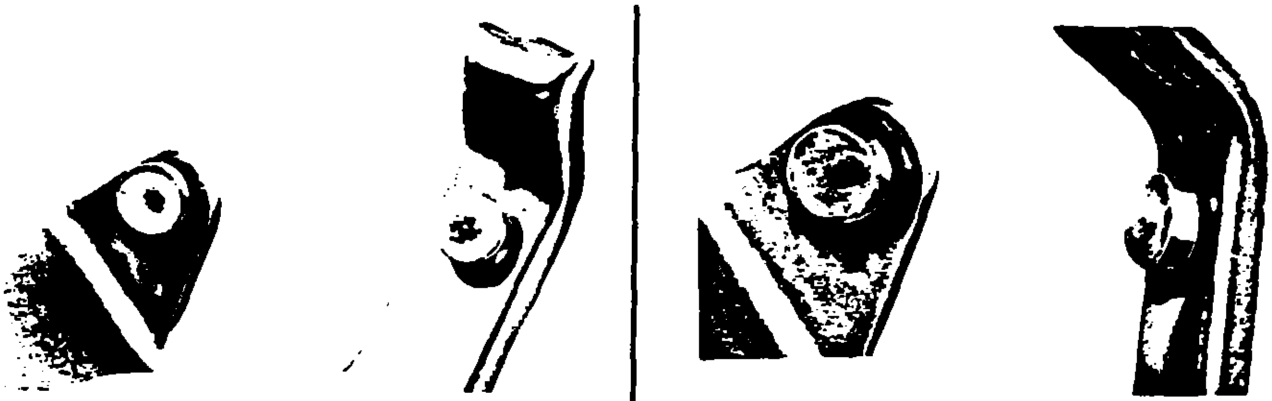


Figure 12-8. Magneto Contact Breaker Points

12-88. SPARK PLUGS. Two spark plugs are installed in each cylinder and screw into helicoil type thread inserts. The spark plugs are shielded to prevent spark plug noise in the radios and have an internal resistor to provide longer terminal life. Spark plug service life will vary with operating conditions. A spark plug that is kept clean and properly gapped will give better and longer service than one that is allowed to collect lead deposits and is improperly gapped.

NOTE

Refer to Section 2 for inspection intervals. Remove, clean, inspect and regap all spark plugs at these intervals. At this time, install lower spark plugs in upper portion of cylinders and install upper spark plugs in lower portion of cylinders. Since deterioration of lower spark plugs is usually more rapid than that of the upper spark plugs, rotating helps prolong spark plug life.

12-89. ENGINE CONTROLS. (See figure 12-9)

12-90. DESCRIPTION. The throttle, mixture and propeller controls are of the push-pull type. The propeller and mixture controls are equipped to lock in any position desired. To move the control, the spring-loaded button, located in the end of the control knob, must be depressed. When the button is released, the control is locked. The propeller and mixture controls also have a vernier adjustment. Turning the control knob in either direction will change the control setting. The vernier is primarily for precision control setting. The throttle control has neither a locking button nor a vernier adjustment, but contains a knurled friction knob which is rotated for more or less friction as desired. The friction knob prevents vibration induced "creeping" of the control.

12-91. RIGGING. When adjusting any engine control, it is important to check that the control slides smoothly throughout its full travel, that it locks securely if equipped with a locking device and the arm or lever which it operates moves through its full arc of travel.

CAUTION

Whenever engine controls are being disconnected, pay particular attention to the EXACT position, size and number of attaching washers and spacers. Be sure to install attaching parts as noted when connecting controls.

12-92. THROTTLE CONTROL.

a. Push throttle control full in, then pull control out approximately 1/8 inch for cushion.

b. Check that throttle control arm is against the mechanical stop. If necessary, loosen locknut and screw rod end IN or OUT as necessary to align with attachment hole while throttle arm is against the mechanical stop.

c. Pull control full out and check that throttle arm contacts the idle stop.

d. The throttle arm must contact the stops in each direction and the control should have approximately 1/8 inch cushion when pushed full in.

NOTE

Refer to the inspection chart in Section 2 for inspection and/or replacement interval for the throttle control.

12-93. MIXTURE CONTROL.

a. Push mixture control full in, then pull control out approximately 1/8 inch for cushion.

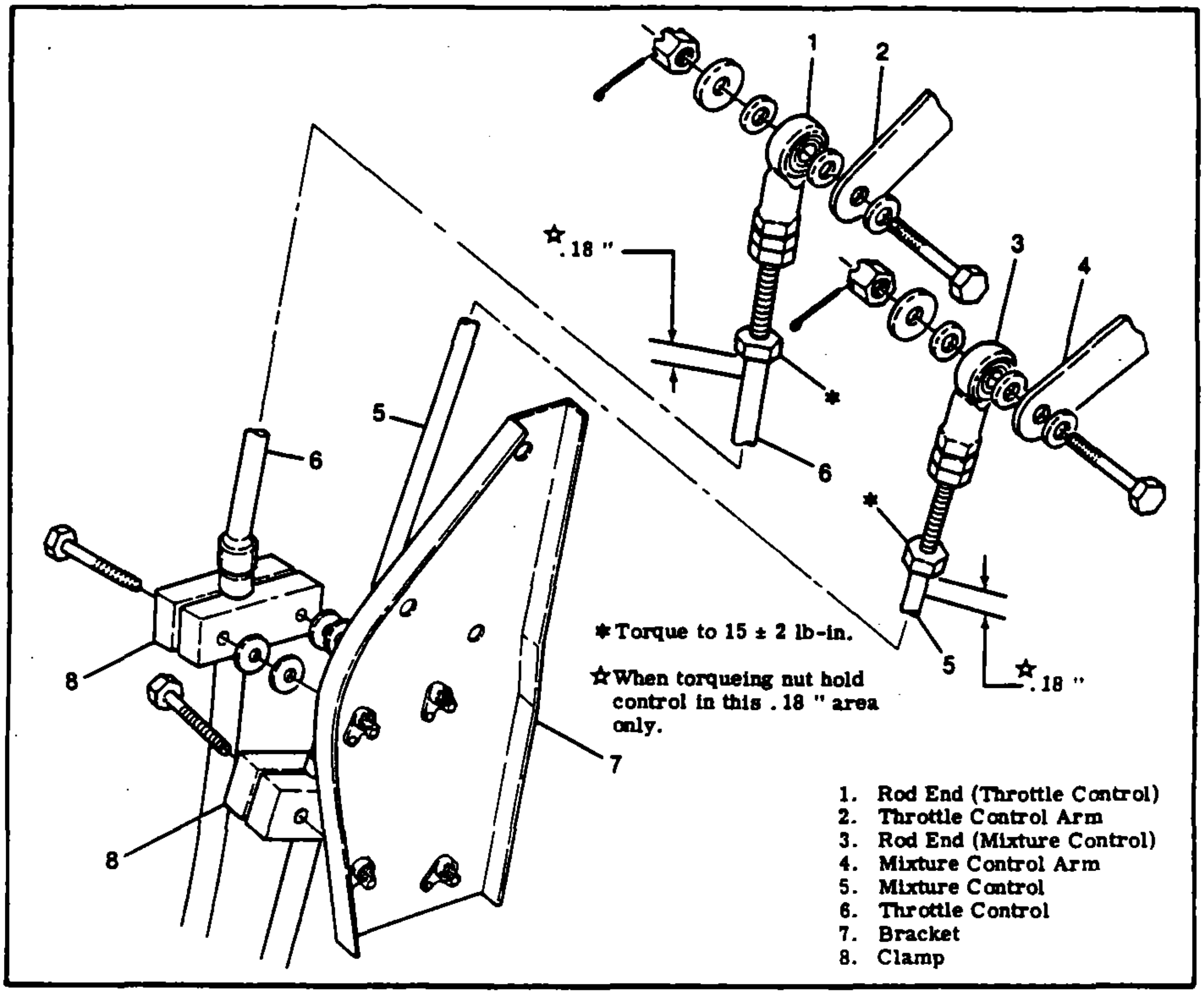


Figure 12-9. Engine Controls

b. Check that mixture control arm is in full rich position (against stop). If necessary, loosen locknut and screw rod end IN or OUT as necessary to align with attachment hole while mixture arm is against the mechanical stop.

c. Pull control full out and check that mixture arm contacts the idle cut-off stop.

d. The mixture arm must contact the stops in each direction and the control should have approximately 1/8 inch cushion when pushed full in.

NOTE

Refer to the inspection chart in Section 2 for inspection and/or replacement interval for the mixture control.

12-94. THROTTLE OPERATED MICROSWITCH. (Refer to Section 13.)

12-95. PROPELLER CONTROL. Refer to Section 14.

12-96. STARTING SYSTEM.

12-97. DESCRIPTION. The automatically-engaged starting system employs an electrical starter motor mounted to a 90-degree adapter. A solenoid is activated by the ignition switch on the instrument panel. When the solenoid is activated, its contacts close and electrical current energizes the motor. Initial rotation of the motor engages the starter through an overrunning clutch in the starter adapter, which incorporates worm reduction gears. The starter motor is located just aft of the right rear cylinder.

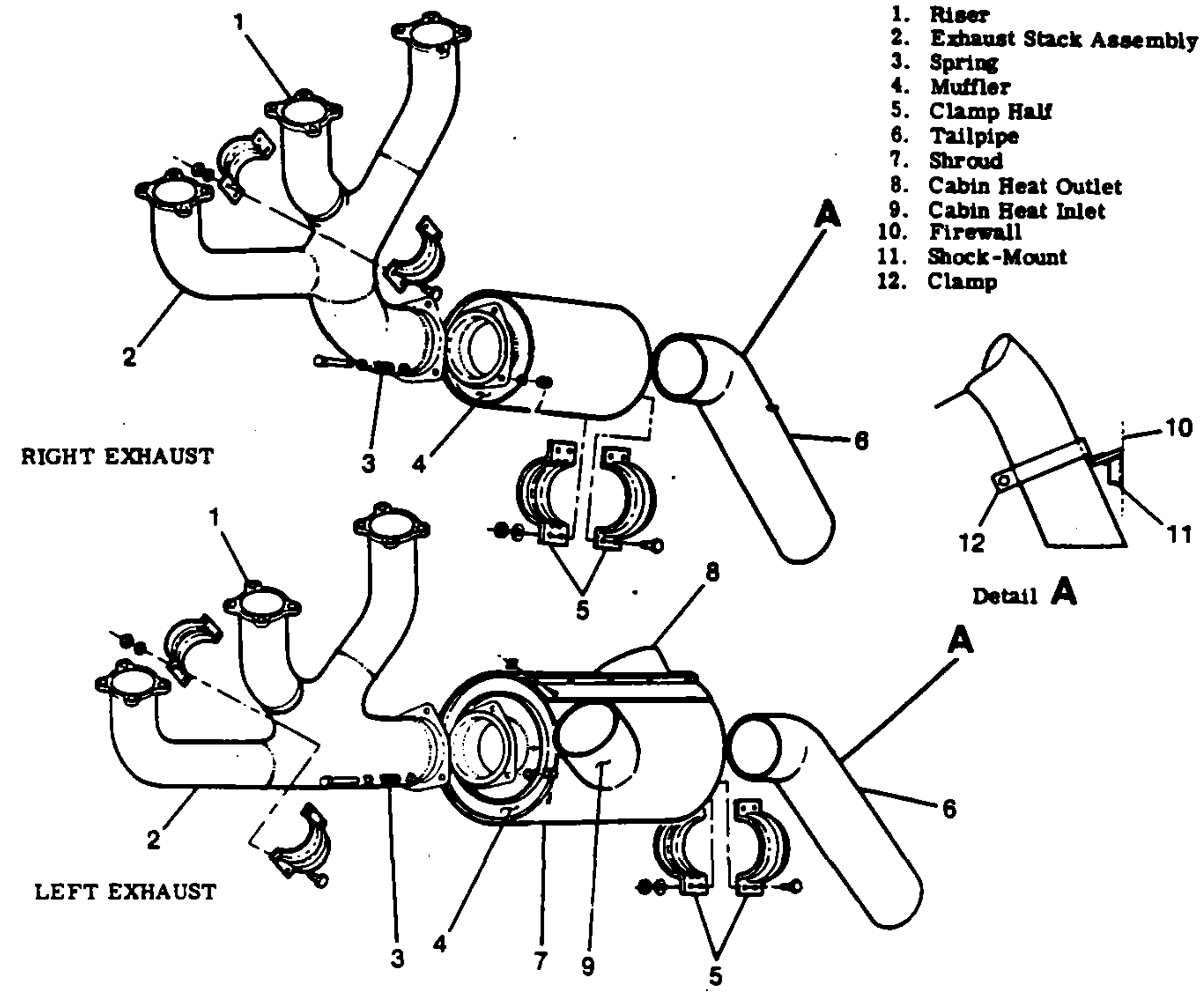
CAUTION

Never operate the starter motor more than 12 seconds at a time. Allow starter motor to cool between cranking periods to avoid overheating. Longer cranking periods without cooling time will shorten the life of the starter motor.

12-98. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
STARTER WILL NOT OPERATE.	Defective master switch or circuit.	Check continuity. Install new switch or wires.
	Defective starter switch or switch circuit.	Check continuity. Install new switch or wires.
	Defective starter motor.	Check electrical power to motor. Repair or replace starter motor.
STARTER MOTOR RUNS, BUT DOES NOT TURN CRANK-SHAFT.	Defective overrunning clutch or drive.	Check visually. Install new starter adapter.
	Starter motor shaft broken.	Check visually. Install new starter motor.
STARTER MOTOR DRAGS.	Low battery.	Check battery. Charge or install new battery.
	Starter switch or relay contacts burned or dirty.	Install serviceable unit.
	Defective starter motor power cable.	Check visually. Install new cable.
	Loose or dirty connections.	Remove, clean and tighten all terminal connections.
	Defective starter motor.	Check starter motor brushes, brush spring tension, thrown solder on brush cover. Repair or install new starter motor.
	Dirty or worn commutator.	Check visually. Clean and turn commutator.
STARTER EXCESSIVELY NOISY.	Worn starter pinion.	Remove and inspect. Replace starter drive.
	Worn or broken teeth on crankshaft gears.	Check visually. Replace crankshaft gear.

12-99. PRIMARY MAINTENANCE. The starting circuit should be inspected at regular intervals, the frequency of which should be determined by the amount of service and conditions under which the equipment is operated. Inspect the battery and wiring. Check battery for fully charged condition, proper electrolyte level with approved water and terminals for cleanliness. Inspect wiring to be sure that all connections are clean and tight and that the wiring insulation is sound. Check that the brushes slide freely in their holders and make full contact on the commutator. When brushes are worn to one-half of their original length, install new brushes (compare brushes with new brushes). Check the commutator for uneven wear, excessive glazing or evidence of excessive arcing. If the commutator is only slightly dirty, glazed or discolored, it may be cleaned with a strip of No. 00 or No. 000 sandpaper. If the commutator is rough or worn, it should be turned in a lathe and the mica undercut. Inspect the armature shaft for rough bearing surfaces. New brushes should be properly seated when installing by wrapping a strip of No. 00 sandpaper around the commutator (with sanding side out) 1-1/4 to 1-1/2 times maximum. Drop brushes on sandpaper covered commutator and turn armature slowly in the direction of normal rotation. Clean sanding dust from motor after sanding operations.



ECONOMY MIXTURE INDICATOR (EGT) PROBE LOCATION

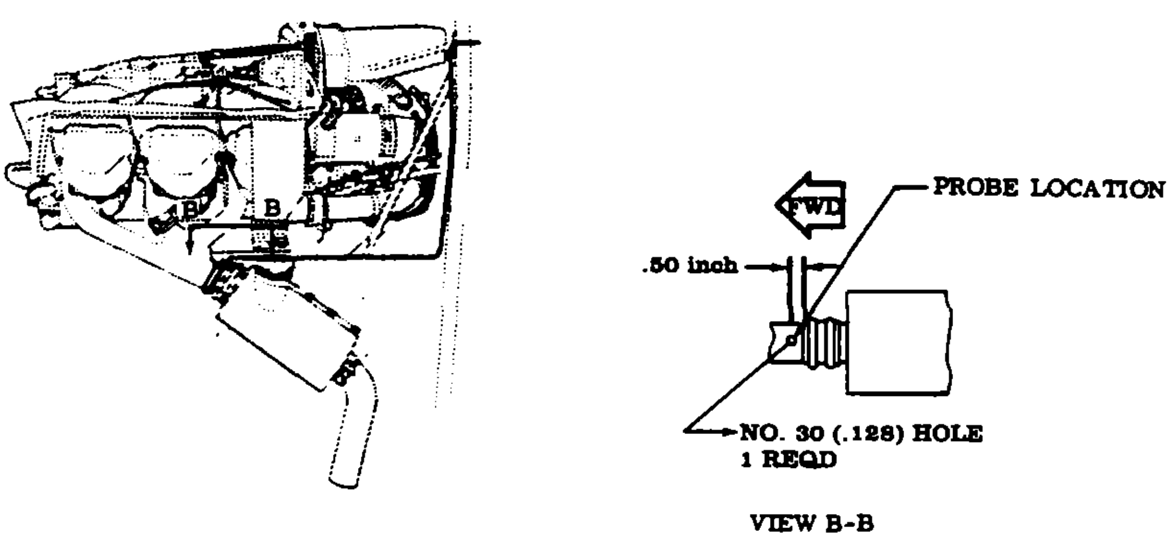


Figure 12-10. Exhaust System

12-100. STARTER MOTOR.

12-101. REMOVAL AND INSTALLATION.

a. Remove engine cowling in accordance with paragraph 12-3.

CAUTION

When disconnecting starter electrical cable, do not permit terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

b. Disconnect battery cables and insulate as a safety precaution.
c. Disconnect electrical cable at starter motor.
d. Remove nuts and washers securing motor to starter adapter and remove motor. Refer to engine manufacturer's overhaul manual for adapter removal.
e. Reverse the preceding steps for reinstallation. Install a new O-ring seal on motor, then install motor. Be sure motor drive engages with the adapter drive when installing.

12-102. EXHAUST SYSTEM.

12-103. DESCRIPTION. The exhaust system consists of two exhaust stack assemblies, for the left and right bank of cylinders. Each cylinder has a riser pipe attached to the exhaust port. The three risers at each bank of cylinders are joined together into a collector pipe forming an exhaust stack assembly. The center riser on each bank is detachable, but the front and aft risers are welded to the collector pipe. The left muffler is enclosed in a shroud which captures exhaust heat which is used to heat the cabin.

12-104. ECONOMY MIXTURE INDICATOR (EGT) Refer to Section 16.

12-105. REMOVAL AND INSTALLATION. (See figure 12-10.)
a. Remove engine cowling in accordance with paragraph 12-3.
b. Disconnect ducts from heater shroud on left muffler assembly.
c. Disconnect tailpipe braces from shock-mounts at firewall brackets.
d. Remove nuts, springs and bolts attaching tailpipe and muffler to collector pipe and remove muffler and tailpipe assemblies.
e. Remove nuts attaching exhaust stack assemblies to the cylinders and remove exhaust stacks and gaskets.
f. Reverse the preceding steps for reinstallation. Install a new copper-asbestos gasket between each riser and its mounting pad on each cylinder, regardless of apparent condition of those removed. Torque exhaust stack nuts at cylinders to 100-110 pound-inches.

12-106. INSPECTION. Refer to Section 2 for inspection intervals. Since exhaust systems of this type are subject to burning, cracking and general deterioration from alternate thermal stresses and vibrations, inspection is important and should be accomplished as specified in the Inspection Charts in Section 2. A thorough inspection of the engine exhaust system is required to detect cracks which could cause leaks and result in loss of engine power. To inspect the engine exhaust system proceed as follows:
a. Remove engine cowling as required so that ALL surfaces of the exhaust assemblies can be visually inspected.

NOTE

Especially check the areas adjacent to welds and slip joints. Look for gas deposits in surrounding areas, indicating that exhaust gases are escaping through a crack or hole or around the slip joints.

b. After visual inspection, an air leak check should be made on the exhaust system as follows:
1. Attach the pressure side of an industrial vacuum cleaner to the tailpipe opening, using a rubber plug to effect a seal as required.

NOTE

The inside of the vacuum cleaner hose should be free of any contamination that might be blown into the engine exhaust system.

2. With vacuum cleaner operating, all joints in the exhaust system may be checked manually by feel, or by using a soap and water solution and watching for bubbles. Forming of bubbles is considered acceptable, If bubbles are blown away system is not considered acceptable.
c. Where a surface is not accessible for a visual inspection, or for a more positive test, the following procedure is recommended.
1. Remove exhaust stack assemblies.
2. Use rubber expansion plugs to seal openings.
3. Using a manometer or gage, apply approximately 1-1/2 psi (3 inches of mercury) air pressure while each stack assembly is submerged in water. Any leaks will appear as bubbles and can be readily detected.
4. It is recommended that exhaust stacks found defective be replaced before the next flight.
d. After installation of exhaust system components perform the inspection in step "b" of this paragraph to ascertain that system is acceptable
e. In addition to the above inspections, at 200 hours (after the mufflers have accumulated more than 1000 hours time in service) perform the following inspection:
1. Remove engine cowling in accordance with paragraph 12-3.
2. Remove the mufflers from the collector assemblies.
3. Remove the tailpipes from the mufflers.
4. Using a flashlight and a mirror, inspect the baffles and cones from both ends of the mufflers. Check for general deterioration and make sure the baffles are intact and not separated from the support rods.
5. If defects are found, replace the mufflers before further flight.
6. If no defects are found, reinstall the mufflers and tailpipes.

12-107. EXTREME WEATHER MAINTENANCE.

12-108. COLD WEATHER. Cold weather starting will be made easier by the installation of an engine primer system and a ground service receptacle. The primer system is manually operated from the cabin. Fuel is supplied by a line from the fuel strainer to the plunger. Operating the primer forces fuel to the engine. With an external power receptacle installed, an external power source may be connected to assist in cold weather or low battery starting. Refer to paragraph 12-110 for use of the external power receptacle. The following may also be used to assist engine starting in extremely cold weather. After the last flight of the day, drain the engine oil into a clean container so the oil can be preheated. Cover the engine to prevent ice or snow from collecting inside the cowling. When preparing the aircraft for flight or engine run-up after these conditions have been followed, preheat the drained engine oil.

WARNING

Do not heat the oil above 121°C (250°F). A flash fire may result. Before pulling the propeller through, ascertain that the magneto switch is in the OFF position to prevent accidental firing of the engine.

After preheating the engine oil, gasoline may be mixed with the heated oil in a ratio of 1 part gasoline to 12 parts engine oil before pouring into the engine oil sump. If the free air temperature is below minus 20°C (-20°F) the engine compartment should be preheated by a ground heater. Pre-heating the engine compartment is accomplished by inducing heated air up through the cowl flap openings; thus heating both the oil and cylinders. After the engine compartment has been preheated, inspect all engine drain and vent lines for presence of ice. After this procedure has been complied with, pull propeller through several revolutions by hand before attempting to start the engine.

CAUTION

Due to the desludging effect of the diluted oil, engine operation should be observed closely during the initial warm-up of the engine. Engines that have considerable amount of operational hours accumulated since their last dilution period may be seriously affected by the dilution process. This will be caused by the diluted oil dislodging sludge and carbon deposits within the engine. This residue will collect in the oil sump and possibly clog the screened inlet to the oil sump. Small deposits may actually enter the oil sump and be trapped by the main oil filter screen. Partial or complete loss of engine lubrication may result from either condition. If these conditions are anticipated after oil dilution, the engine should be run for several minutes at normal operating temperatures and then stopped and inspected for evidence of sludge and carbon deposits in the oil sump and oil filter screen. Future occurrence of this condition can be prevented by diluting the oil prior to each engine oil change. This will also prevent the accumulation of the sludge and carbon deposits.

12-109. SEACOAST AND HUMID AREAS. In salt water areas special care should be taken to keep the engine, accessories and airframe clean to prevent oxidation. In humid areas, fuel and oil should be checked frequently and drained of condensation to prevent corrosion.

12-110. GROUND SERVICE RECEPTACLE. Refer to Section 17.

SHOP NOTES:

SECTION 12A

ENGINE (TURBOCHARGED)

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

NOTE

For additional information covering turbocharger and component maintenance, overhaul and trouble shooting refer to the Manufacturer's Overhaul Manual.

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12A-1. ENGINE COWLING.

12A-2. DESCRIPTION. The engine cowling is similar to that described in Section 12, except it is wider at the front, with additional ram air openings in the right and left nose caps. The opening in the right side supplies ram air to the turbocharger. The opening in the left side supplies ram air to the cabin heating system.

12A-3. REMOVAL AND INSTALLATION. Refer to paragraph 12-3.

12A-4. CLEANING AND INSPECTION. Refer to paragraph 12-4.

12A-5. REPAIR. Refer to paragraph 12-5.

12A-6. COWL FLAPS.

12A-7. DESCRIPTION. The cowl flaps are similar to that described in Section 12, except the overboard exhaust tube for the cabin heater extends through the cutout in the aft portion of the left cowl flap.

12A-8. REMOVAL AND INSTALLATION. Refer to paragraph 12-8.

12A-9. RIGGING.

a. Disconnect cowl flap control clevises from cowl flaps.

b. Check to make sure that the flexible controls reach their internal stops in each direction. Mark controls so that full control travel can readily be checked and maintained during the remaining rigging procedures.

c. Place cowl flap control lever in the OPEN position, which is the top hole in the bracket. Be sure that correct hole in bracket is used. If control lever cannot be placed in correct hole in bracket, loosen clamp at upper end of controls and slip housings in clamp or adjust controls at upper clevis to position control lever in correct hole in bracket.

d. Adjust clevis at lower end of control to open cowl flap 6.00 inches (MIN) when in the OPEN position and to remain open 1.00 inch in the CLOSED position. This measurement is made in a straight line from centerline of the aft edge of the cowl flap to the lower edge of the firewall. Do not measure from aft corners of cowl flaps. Repeat for other cowl flap. If either control needs to be lengthened or shortened, the lower clamp may be loosened and housing slipped in the clamp, or lower clevis may be adjusted. Maintain sufficient thread engagement of clevis.

e. Check that locknuts are tight, clamps are secure and all bolts and nuts are installed.

NOTE

In all cases, the flexible controls must reach their internal stops in each direction to assure full travel of the controls.

12A-10. ENGINE.

12A-11. DESCRIPTION. An air-cooled, horizontally-opposed, direct-drive, fuel-injected, six-cylinder turbocharged Continental TSIO-520 series engine, driving a constant-speed propeller, is used to power the aircraft. The cylinders, numbered from rear to front, are staggered to permit a separate throw on the crankshaft for each connecting rod. The right rear cylinder is number 1 and cylinders on the right side are identified by odd numbers 1, 3 and 5. The left rear cylinder is number 2 and the cylinders on the left side are identified as 2, 4 and 6. Refer to paragraph 12A-12 for engine data. For repair and overhaul of the engine, accessories and propeller, refer to the appropriate publications issued by their manufacturer's. These publications are available from the Cessna Service Parts Center.

12A-12. ENGINE DATA.

Aircraft Series	TU206
Model (Continental)	TSIO-520-M
BHP Maximum for Take-Off	310
(5 Minutes) at RPM	2700
BHP Maximum Except Take-Off	285
RPM (Maximum Continuous)	2600
Limiting Manifold Pressure (Sea Level)	36.5 Inches Hg.
Number of Cylinders	6-Horizontally Opposed
Displacement	520 Cubic Inches
Bore	5.25 Inches
Stroke	4.00 Inches
Compression Ratio	7.5:1
Magnetos	Slick No 662 thru 1982 Models Slick No 6210 Beginning with 1983 Models
Right Magneto	Fires 22° BTC Upper Right and Lower Left
Left Magneto	Fires 22° BTC Upper Left and Lower Right
Firing Order	1-6-3-2-5-4
Spark Plugs	18mm (Refer to Continental Service Bulletin M77-10 for factory approved spark plugs and required gap)
Torque	330±30 Lb-In.
Fuel Metering System	Continental Fuel Injection
Unmetered Fuel Pressure	5.5 to 6.5 PSI at 600 RPM 33.0 to 37.0 PSI at 2700 RPM
Nozzle Pressure	3.5 to 4.0 PSI at 600 RPM 19.5 to 21.0 PSI at 2700 RPM
Oil Sump Capacity	12 U.S. Quarts
With Filter Element Change	13 U.S. Quarts
Tachometer	Mechanical Drive
Oil Pressure (PSI)	
Minimum Idling	10
Normal	30 to 60
Maximum (Cold Oil Starting)	100
Connection Location	Between No. 2 and No. 4 Cylinders
Oil Temperature	
Normal Operating	Within Green Arc
Maximum Permissible	Red Line (240°F)
Probe Location	Below Oil Cooler
Cylinder Head Temperature	Red Line (460°F) Max.
Probe Location	Lower Side No. 5 Cylinder
Approximate Dry Weight With Accessories (Excluding Turbocharger System)	461 Lb. (Weight is approximate and will vary with optional accessories installed.)
Economy Mixture Indicator (EGT)	
Probe Location	Exhaust Collector R. H. Side

12A-13. TIME BETWEEN OVERHAUL (TBO). Teledyne Continental Motors recommends engine overhaul at 1400 hours operating time for the TSIO-520 series engines. Refer to Continental Aircraft Engine Service Bulletin M81-22 and any superseding bulletins, revisions or supplements thereto, for further recommendations. At the time or overhaul, engine accessories should be overhauled. Refer to Section 14 for propeller and governor overhaul periods.

12A-14. OVERSPEED LIMITATIONS. Refer to paragraph 12-14.

12A-15. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE FAILS TO START.	Engine flooded or improper use of starting procedure.	Refer to Pilot's Operating Handbook.
	Defective aircraft fuel system.	Refer to Section 13.
	Fuel tanks empty.	Service fuel tanks.
	Spark plugs fouled or defective.	Remove, clean, inspect and regap. Use new gaskets. Check cables to presistently fouled plugs. Replace if defective.
	Magneto impulse coupling failure.	Repair or install new coupling.
	Defective magneto switch or grounded magneto leads.	Repair or replace switch and leads.
	Defective ignition system.	Refer to paragraph 12-86.
	Induction air leakage.	Correct cause of air leakage.
	Clogged fuel screen in fuel control unit or defective unit.	Remove and clean. Replace defective unit.
	Clogged fuel screen in fuel manifold valve or defective valve.	Remove and clean screen. Replace defective valve.
	Clogged fuel injection lines or discharge nozzles.	Remove and clean lines and nozzles. Replace defective units.
	Defective auxiliary fuel pump.	Refer to Section 13.
	Engine-driven fuel pump not permitting fuel from auxiliary pump to bypass.	Install new engine-driven fuel pump.
	Vaporized fuel in system. (Most likely to occur in hot weather with a hot engine.)	Refer to Pilot's Operating Handbook.
ENGINE STARTS BUT DIES, OR WILL NOT IDLE PROPERLY.	Propeller control in high pitch (low rpm) position.	Use low pitch (high rpm) position for all ground operations.
	Improper idle speed or idle mixture adjustment.	Refer to paragraph 12-52.
	Defective aircraft fuel system.	Refer to Section 13.
	Spark plugs fouled or defective.	Remove, clean, inspect and regap. Use new gaskets. Check cables to persistently fouled plugs. Replace if defective.
	Water in fuel system.	Drain fuel tank sumps, lines and fuel strainer.
	Defective ignition system.	Refer to paragraph 12-86.

12A-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE STARTS BUT DIES, OR WILL NOT IDLE PROPERLY (CONT).	Induction air leakage.	Correct cause of air leakage.
	Clogged fuel screen in fuel control unit or defective unit.	Remove and clean. Replace defective unit.
	Clogged fuel screen in fuel manifold valve or defective valve.	Remove and clean. Replace defective valve.
	Restricted fuel injection lines or discharge nozzles.	Remove, clean lines and nozzles. Replace defective units.
	Defective engine-driven fuel pump.	Install and calibrate new pump.
	Vaporized fuel in system. (Most likely to occur in hot weather with a hot engine.)	Refer to Pilot's Operating Handbook.
	Manual engine primer leaking.	Disconnect primer outlet line. If fuel leaks through primer, repair or replace primer.
	Obstructed air intake.	Remove obstruction; service air filter, if necessary.
	Discharge nozzle air vent manifolding restricted or defective.	Check for bent lines or loose connections. Tighten loose connections. Remove restrictions and replace defective components.
	Defective engine.	Check compression and listen for unusual engine noises. Check oil filter for excessive metal. Repair engine as required.
ENGINE HAS POOR ACCELERATION, RUNS ROUGHLY AT SPEEDS ABOVE IDLE OR LACKS POWER.	Idle mixture too lean.	Refer to paragraph 12-52.
	Propeller control in high pitch (low rpm) position.	Use low pitch (high rpm) position for all ground operations.
	Incorrect fuel-air mixture, worn control linkage or restricted air filter.	Replace worn elements of control linkage. Service air filter.
	Defective ignition system.	Refer to paragraph 12-86.
	Malfunctioning turbocharger.	Check operation, listen for unusual noise. Check operation of wastegate valve and for exhaust system defects. Tighten loose connections.
	Improper fuel-air mixture.	Check intake manifold connections for leaks. Tighten loose connections. Check fuel controls and linkage for setting and adjustment.

12A-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE HAS POOR ACCELERATION, RUNS ROUGHLY AT SPEEDS ABOVE IDLE OR LACKS POWER (CONT).	Spark plugs fouled or defective.	Remove, clean, inspect and regap. Use new gaskets. Check cables to persistently fouled plugs. Replace if defective.
	Fuel pump pressure improperly adjusted.	Refer to paragraph 12A-65.
	Restriction in fuel injection system.	Clean out restriction. Replace defective items.
	Propeller out of balance.	Check and balance propeller.
	Defective engine.	Check compression, check oil filter for excessive metal. Listen for unusual noises. Repair engine as required.
	Exhaust system leakage.	Refer to paragraph 12A-105.
	Turbocharger wheels rubbing.	Replace turbocharger.
	Improperly adjusted or defective waste-gate controller.	Refer to paragraph 12A-117.
	Leak in turbocharger discharge pressure system.	Correct cause of leaks. Repair or replace damaged parts.
	Manifold pressure overshoot. (Most likely to occur when engine is accelerated too rapidly.)	Move throttle about two-thirds open. Let engine accelerate and peak. Move throttle to full open.
	Engine oil viscosity too high for ambient air.	Refer to Section 2 for proper grade of oil.
POOR IDLE CUT-OFF.	Mixture control linkage improperly rigged.	Refer to paragraph 12-91.
	Defective or dirty fuel manifold valve.	Remove and clean manifold valve.
	Fuel contamination.	Drain all fuel and flush out fuel system. Clean all screens, fuel strainers, fuel manifold valves, nozzles and fuel lines.
	Defective mixture control valve in fuel pump.	Replace fuel pump.
ENGINE LACKS POWER, REDUCTION IN MAXIMUM MANIFOLD PRESSURE OR CRITICAL ALTITUDE.	Incorrectly adjusted throttle control, "sticky" linkage or dirty air filter.	Check movement of linkage by moving control through range of travel. Make proper adjustments and replace worn components. Service air filter.

12A-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE LACKS POWER, REDUCTION IN MAXIMUM MANIFOLD PRESSURE OR CRITICAL ALTITUDE (CONT).	Defective ignition system.	Inspect spark plugs for fouled electrodes, heavy carbon deposits, erosion of electrodes, improperly adjusted electrode gaps and cracked porcelains. Test plugs for regular firing under pressure. Replace damaged or misfiring plugs.
	Improperly adjusted waste-gate valve.	Refer to paragraph 12A-117.
	Loose or damaged exhaust system.	Inspect entire exhaust system to turbocharger for cracks and leaking connections. Tighten connections and replace damaged parts.
	Loose or damaged manifolding.	Inspect entire manifolding system for possible leakage at connections. Replace damaged components, tighten all connections and clamps.
	Fuel discharge nozzle defective.	Inspect fuel discharge nozzle vent manifolding for leaking connections. Tighten and repair as required. Check for restricted nozzles and lines and clean and replace as necessary.
	Malfunctioning turbocharger.	Check for unusual noise in turbocharger. If malfunction is suspected, remove exhaust and/or air inlet connections and check rotor assembly, for possible rubbing in housing, damaged rotor blades or defective bearings. Replace turbocharger if damage is noted.
BLACK SMOKE EXHAUST.	Turbo coking, oil forced through seal of turbine housing.	Clean or change turbocharger.
HIGH CYLINDER HEAD TEMPERATURE.	Defective cylinder head temperature indicating system.	Refer to Section 16.
	Improper use of cowl flaps.	Refer to Pilots Operating Handbook.
	Engine baffles loose, bent or missing.	Install baffles properly. Repair or replace if defective.
	Dirt accumulated on cylinder cooling fins.	Clean thoroughly.
	Incorrect grade of fuel.	Drain and refill with proper fuel.

12A-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
HIGH CYLINDER HEAD TEMPERATURE (CONT).	Incorrect ignition timing.	Refer to paragraph 12-85.
	Improper use of mixture control.	Refer to Pilots Operating Handbook.
	Defective engine.	Repair as required.
HIGH OR LOW OIL TEMPERATURE OR PRESSURE.		Refer to paragraph 12-33.

NOTE

Refer to paragraph 12A-112 for trouble shooting of controller and waste-gate actuator.

12A-16. REMOVAL. If an engine is to be placed in storage or returned to the manufacturer for overhaul, proper preparatory steps should be taken for corrosion prevention prior to beginning the removal procedure. Refer to Section 2 for storage preparation. The following engine removal procedure is based upon the engine being removed from the aircraft as a complete unit with the turbocharger and accessories installed.

NOTE

Tag each item when disconnected to aid in identifying wires, hoses, lines and control linkages when engine is reinstalled. Likewise, shop notes made during removal will often clarify reinstallation. Protect openings, exposed as a result of removing or disconnecting units, against entry of foreign material by installing covers or sealing with tape.

a. Place all cabin switches in the OFF position.
b. Place fuel selector valve in the OFF position.
c. Remove engine cowling in accordance with paragraph 12-3.
d. Disconnect battery cables and insulate terminals as a safety precaution. Remove battery and battery box for additional clearance, if desired.
e. Drain fuel strainer and lines with strainer drain control.

NOTE

During the following procedures, remove any clamps or lacings which secure controls, wires, hoses or lines to the engine, engine nacelle or attached brackets, so they will not interfere with engine removal. Some of the items listed can be disconnected at more than one place. It may be desirable to disconnect some of these items at other than the places indicated. The reason for engine removal should be the governing factor in deciding at which point to disconnect them. Omit any of the items which are not present on a particular engine installation.

f. Drain the engine oil sump and oil cooler.
g. Disconnect magneto primary lead wires at magnetos.

WARNING

The magnetos are in a SWITCH ON condition when the switch wires are disconnected. Ground the magneto points or remove the high tension wires from the magnetos or spark plugs to prevent accidental firing.

h. Remove the spinner and propeller in accordance with Section 14. Cover exposed end of crankshaft flange and propeller flange to prevent entry of foreign material.
i. Disconnect throttle, mixture and propeller controls from their respective units. Remove clamps attaching controls to engine and pull controls aft clear of engine. Use care to avoid bending controls too sharply. Note EXACT position, size and number of attaching washers and spacers for reference on reinstallation.
j. Disconnect wires and cables as follows:
1. Disconnect tachometer drive shaft at adapter.

CAUTION

When disconnecting starter cable do not permit starter terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

2. Disconnect starter electrical cable at starter.
3. Disconnect cylinder head temperature wire at probe.
4. Disconnect oil temperature wire at probe below oil cooler.
5. Disconnect electrical wires and wire shielding ground at alternator.
6. Disconnect exhaust gas temperature wires at quick-disconnects.
7. Disconnect electrical wires at throttle microswitch.
8. Remove all clamps and lacings attaching wires or cables to engine and pull wires and cables aft to clear engine.

k. Disconnect lines and hoses as follows:
1. Disconnect vacuum hose at vacuum pump and remove oil separator vent line.

WARNING

Residual fuel and oil draining from disconnected lines and hoses constitutes a fire hazard. Use caution to prevent accumulation of such fuel and oil when lines or hoses are disconnected.

2. Disconnect fuel supply and vapor return hoses at fuel pump. Disconnect and remove fuel pump drain line.
3. Disconnect manifold pressure line at intake manifold.
4. Disconnect the fuel-flow gage line at firewall.
5. Disconnect the oil pressure line at the engine.
6. Disconnect and remove the right and left manifold drain lines and the balance tube drain line.
7. Disconnect air and oil lines at the waste-gate controller, located on the firewall.
8. Disconnect the air vent line to fuel-flow gage, at firewall.
9. Disconnect engine primer lines at right and left intake manifolds.
10. Disconnect the oil drain line from oil deflector under external oil filter.

l. Carefully check the engine again to ensure ALL hoses, lines, wires, cables, clamps and lacings are disconnected or removed which would interfere with the engine removal. Ensure all wires, cables and engine controls have been pulled aft to clear the engine.

CAUTION

Place a suitable stand under tail tie-down ring before removing engine. The loss of engine weight will cause the aircraft to be tail heavy.

m. Attach a hoist to the lifting lug at the top center of the engine crankcase. Lift engine just enough to relieve the weight from the engine mounts.
n. Remove mount bolts, ground strap and heat shields.
o. Slowly hoist engine out of nacelle and clear of aircraft checking for any items which would interfere with the engine removal. Balance the engine by hand and carefully guide the disconnected parts out as the engine is removed.
p. Remove engine shock-mounts

NOTE

If shock-mounts will be re-used, mark each one so it will be reinstalled in exactly the same position. If new shock-mounts will be installed, position them as illustrated in figure 12-2.

12A-17. STATIC RUN-UP PROCEDURES. In a case of suspected low engine power, a static RPM run-up should be conducted as follows:

a. Run-up engine, using take-off power and mixture settings, with the aircraft facing 90° right and then left to the wind direction.
b. Record the RPM obtained in each run-up position.

NOTE

Daily changes in atmospheric pressure, temperature and humidity will have a slight effect on static run-up.

c. Average the results of the RPM obtained. It should be within 50 RPM of 2650 RPM.
d. If the average results of the RPM obtained are lower than stated above, the following recommended checks may be performed to determine a possible deficiency.
1. Check governor control for proper rigging. It should be determined that the governor control arm travels to the high RPM stop on the governor and that the high RPM stop screw is adjusted properly. (Refer to Section 14 for procedures).

NOTE

If verification of governor operation is necessary the governor may be removed from the engine and a flat plate installed over the engine pad. Run-up engine to determine that governor was adjusted properly.

2. Check carburetor heat control (carburetor equipped engines) for proper rigging. If partially open it would cause a slight power loss. On fuel injected engines check operation of alternate air door spring or magnetic lock to make sure door will remain closed in normal operation.
3. Check magneto timing, spark plugs and ignition harness for settings and conditions.
4. On fuel injection engines, check fuel injection nozzles for restriction and check for correct unmetered fuel flow.
5. Check condition of induction air filter. Clean if required.
6. Perform an engine compression check (Refer to engine Manufacturer's Manual).

12A-18. CLEANING. Refer to paragraph 12-18.

12A-19. ACCESSORIES REMOVAL. Refer to paragraph 12-19.

12A-20. INSPECTION. Refer to paragraph 12-20.

12A-21. BUILD-UP. Refer to paragraph 12-21.

12A-22. INSTALLATION. Before installing the engine on the aircraft, install any items which were removed from the engine or aircraft after the engine was removed.

NOTE

Remove all protective covers, plugs, caps and identification tags as each item is connected or installed. Omit any items not present on a particular engine installation.

a. Hoist the engine to a point just above the nacelle.
b. Install engine shock-mounts and ground strap as illustrated in figure 12-2.
c. Carefully lower engine slowly into place on the engine mounts. Route controls, lines, hoses and wires in place as the engine is positioned on the engine mounts.

NOTE

Be sure engine shock-mounts, spacers and washers are in place as the engine is lowered into position.

d. Attach ground strap under engine sump bolt and install engine mount bolts. Torque bolts to 300+ 50-00 lb-in. Bend tab washers to form lock for mount bolts. Install heat shields.
e. Remove support stand placed under tail tie-down fitting and remove hoist.

NOTE

If the exhaust system was loosened or removed, refer to paragraph 12A-104.

f. Connect flexible ducting on heater shroud and cabin valve.
g. Route propeller governor control along left side of engine and secure with clamps.

NOTE

Throughout the aircraft fuel system, from the fuel cells to the engine-driven fuel pump, use NS-40 (RAS-4)(Snap-On Tools Corp., Kenosha. Wisconsin), MIL-T-5544 (Thread Compound. Antiseize. Graphite Petrolatum), USP Petrolatum or engine oil as a thread lubricant or to seal a leaking connection. Apply sparingly to male threads only, omitting the first two threads, exercising extreme caution to avoid "stringing" sealer across the end of the fitting. Always ensure that a compound, the residue from a previously used compound, or any other foreign material cannot enter the system. Throughout the fuel injection system, from the engine-driven fuel pump through the discharge nozzles, use only a fuel-soluble lubricant, such as engine oil, on fitting threads. Do not use any other form of thread compound on the injection system.

h. Connect lines and hoses as follows:
1. Install and connect the left and right manifold drain lines and the balance tube drain line.
2. Connect the oil pressure line at its fitting.
3. Connect the fuel-flow gage line at firewall.
4. Connect the fuel supply and the vapor return lines at the fuel pump. Connect and install fuel pump drain line.
5. Connect manifold pressure line at intake manifold.
6. Connect vacuum line at the vacuum pump, and install oil separator vent line.
7. Connect air and oil lines at waste-gate controller on firewall.
8. Connect air vent line to fuel-flow gage line at firewall.
9. Connect engine primer lines at right and left intake manifolds.
10. Connect oil drain line to oil deflector under external oil filter.
11. Install all clamps securing lines and hoses to engine or structure.

i. Connect wires and cables as follows:
1. Connect oil temperature wire at probe below oil cooler.
2. Connect tachometer drive to adapter and torque to 100 lb-in.

WARNING

When connecting starter cable, do not permit starter terminal bolt to rotate. Rotation of the bolt could break conductor between terminal and field coils causing starter to be inoperative.

3. Connect starter electrical lead.
4. Connect cylinder head temperature wire at probe.
5. Connect electrical wires and wire shielding ground to alternator.
6. Connect electrical wires to throttle switch.
7. Connect exhaust gas temperature wires at quick-disconnects.
8. Install clamps that attach wires or cables, to engine or structure.

j. Connect engine controls and install block clamps.
k. Rig engine controls in accordance with paragraphs 12-92, 12-93 and 12-94.
l. Install propeller and spinner in accordance with instructions outlined in Section 14.
m. Complete a magneto switch ground-out and continuity check, then connect primary lead wires to the magnetos. Remove the temporary ground or connect spark plug leads, whichever procedure was used during removal.

WARNING

Be sure magneto switch is in OFF position when connecting switch wires to magnetos.

n. Clean and install induction air filter in accordance with Section 2.
o. Service engine with proper grade and quantity of engine oil. Refer to Section 2 if engine is new, newly overhauled or has been in storage.
p. Check all switches are in the OFF position and connect battery cables.
q. Inspect engine installation for security, correct routing of controls, lines, hoses and electrical wiring, proper safetying and tightness of all components.

NOTE

When installing a new or newly overhauled engine, and prior to starting the engine, disconnect the oil inlet line at the controller (tag the line) and the oil outlet line at the controller (tag the line) connect these oil lines to a full-flow oil filter, allowing oil to bypass the controller. With the filter connected, operate the engine approximately 15 minutes to filter out any foreign particles from the oil. Shut-down the engine, remove the full-flow oil filter and reconnect the tagged inlet and outlet oil lines to the controller. This procedure is done to prevent foreign material from entering the controller.

r. Install engine cowling in accordance with paragraph 12-3.
s. Perform an engine run-up and make final adjustments on the engine controls.

12A-23. FLEXIBLE FLUID HOSES. Refer to paragraph 12-23.

12A-24. PRESSURE TEST. Refer to paragraph 12-24.

12A-25. REPLACEMENT. Refer to paragraph 12-25.

12A-26. ENGINE BAFFLES. Refer to paragraph 12-26.

12A-27. DESCRIPTION. Refer to paragraph 12-27.

12A-28. CLEANING AND INSPECTION. Refer to paragraph 12-28.

12A-29. REMOVAL AND INSTALLATION. Refer to paragraph 12-29.

12A-30. REPAIR. Refer to paragraph 12-30.

12A-31. ENGINE OIL SYSTEM.

12A-32. DESCRIPTION. The lubricating system is of the full pressure wet sump type. Refer to applicable engine manfacturer's overhaul manual for specific details and descriptions.

12A-33. TROUBLE SHOOTING. Refer to paragraph 12-33.

12A-34. FULL-FLOW OIL FILTER. Refer to paragraph 12-34 or 12-37.

12A-35. DESCRIPTION. Refer to paragraph 12-35 or 12-38.

12A-36. REMOVAL AND INSTALLATION. Refer to paragraph 12-36 or 12-39.

12A-37. FILTER ADAPTER. Refer to paragraph 12-40.

12A-38. REMOVAL. Refer to paragraph 12-41.

12A-39. DISASSEMBLY, INSPECTION AND REASSEMBLY. Refer to paragraph 12-42.

12A-40. INSTALLATION, Refer to paragraph 12-43.

12A-41. OIL COOLER. Refer to paragraph 12-44.

12A-42. DESCRIPTION. Refer to paragraph 12-45.

SHOP NOTES:

12A-43. ENGINE FUEL SYSTEM. See figure 12A-1.

12A-44. DESCRIPTION. The fuel injection system is a low pressure system of injecting fuel into the intake valve port of each cylinder. It is a multi-nozzle, continuous-flow type which controls fuel flow to match engine airflow. Any change in throttle position, engine speed, or a combination of both, causes changes in fuel flow in the correct relation to engine airflow. A manual mixture control and a fuel flow indicator are provided for leaning at any combination of altitude and power setting. The fuel flow indicator is calibrated in gallons per hour and indicates approximately the gallons of fuel consumed per hour. The continuous-flow system uses a typical rotary vane fuel pump. There are no running parts in this system except for the engine-driven fuel pump. The four major components of the system are: the fuel injection pump, fuel-air control unit, fuel manifold valve and the fuel discharge nozzles. The fuel injection pump incorporates an adjustable aneroid sensing unit which is pressurized from the discharge side of the turbocharger compressor. Turbocharger discharge air pressure is also used to vent the fuel discharge nozzles and the vent port of the fuel-flow gage.

NOTE

Throughout the aircraft fuel system, from the fuel cells to the engine-driven fuel pump, use NS-40 (RAS-4) (Snap-On Tools Corp., Kenosha, Wisconsin), MIL-T-5544 (Thread Compound, Antiseize, Graphite Petrolatum), USP Petrolatum or engine oil as a thread lubricant or to seal a leaking connection. Apply sparingly to male threads only, omitting the first two threads, exercising extreme caution to avoid "stringing" sealer across the end of the fitting. Always ensure that a compound, the residue from a previously used compound, or any other foreign material cannot enter the system. Throughout the fuel injection system, from the engine-driven fuel pump through the discharge nozzles, use only a fuel-soluble lubricant, such as engine oil, on fitting threads. Do not use any other form of thread compound on the injection system.

12A-45. FUEL-AIR CONTROL UNIT. Refer to paragraph 12-48.

12A-46. DESCRIPTION. Refer to paragraph 12-49.

12A-47 REMOVAL.

a. Place all cabin switches and fuel shut-off valve in the OFF position.
b. Remove cowling in accordance with paragraph 12-3.
c. Loosen clamp and disconnect flexible duct from elbow at top of air throttle.
d. Tag and disconnect electrical wires from electric fuel pump microswitch.
e. Disconnect throttle and mixture control rod ends at fuel-air control unit.

NOTE

Cap or plug all disconnected hoses, lines and fittings.

f. Disconnect cooling air blast tube from fuel control valve shroud.
g. Disconnect and tag all fuel lines at the fuel control valve.
h. Remove nuts and washers securing triangular brace to fuel-air control unit and engine, at lower end of control unit. Remove brace.

SHOP NOTES:

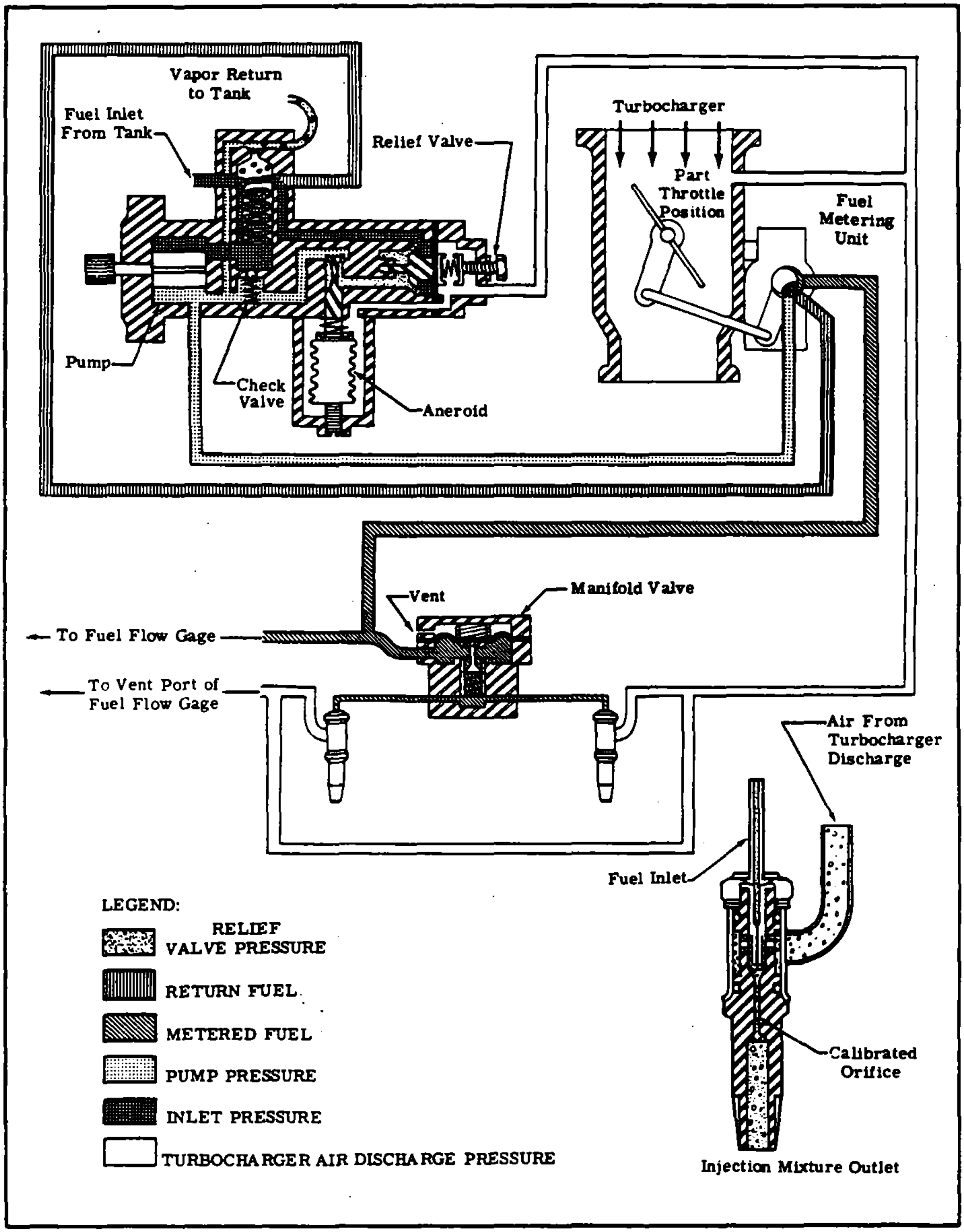


Figure 12A-1. Fuel System Schematic

i. Remove bolt attaching fuel-air control unit to brace at top of control unit.
j. Loosen hose clamps which secure fuel-air control unit to right and left intake manifold assemblies and slip hoses from fuel-air control unit.
k. Remove fuel-air control unit.

12A-48. CLEANING AND INSPECTION. Refer to paragraph 12-61.

12A-49. INSTALLATION.
a. Place control unit in position at rear of engine.
b. Install bolt attaching control unit to brace at top of unit. Ascertain that shock-mount is in place and in good condition.
c. Install triangular brace at lower end of control unit.
d. Install hoses and clamps which secure control unit to right and left intake manifold assemblies. Tighten hose clamps.
e. Connect fuel lines to unit and connect air blast tube at fuel control shroud.
f. Connect throttle and mixture control rod ends to control unit.
g. Connect electrical wires to electric fuel pump microswitch. Check switch rigging in accordance with Section 13.
h. Install induction air duct to elbow at top of control unit.
i. Inspect installation and install cowling.

12A-50. ADJUSTMENTS. Refer to paragraph 12-52.

12A-51. FUEL MANIFOLD VALVE (FUEL DISTRIBUTOR). Refer to paragraph 12-53.

12A-52. DESCRIPTION. Refer to paragraph 12-54.

12A-53. REMOVAL. Refer to paragraph 12-55.

12A-54. CLEANING. Refer to paragraph 12-56.

12A-55. INSTALLATION. Refer to paragraph 12-57.

12A-56. FUEL DISCHARGE NOZZLES.

12A-57. DESCRIPTION. From the fuel manifold valve, individual, identical size and length fuel lines carry metered fuel to the fuel discharge nozzles located in the cylinder heads. The outlet of each nozzle is directed into the intake port of each cylinder. An air bleed and nozzle pressurization arrangement is incorporated in each nozzle to aid in vaporization of the fuel. The nozzles are calibrated in several ranges. All nozzles furnished for one engine are of the same calibrated range and are identified by a number and suffix letter stamped on the flat portion of the nozzle body. When replacing a fuel discharge nozzle, be sure that it is of the same calibrated range as the rest of the nozzles in that engine. When a complete set of nozzles is being replaced, the number must be the same as the one removed but the suffix letter may be different, as long as they are the same for all nozzles being installed in a particular engine.

12A-58. REMOVAL.
a. Remove engine cowling in accordance with paragraph 12-3.

NOTE

Plug or cap all disconnected lines and fittings.

b. Disconnect nozzle pressurization line at nozzles and disconnect pressurization line at "tee" fitting so that pressurization line may be moved away from discharge nozzles.
c. Disconnect fuel injection line at fuel discharge nozzle.
d. Using care to prevent damage or loss of washers and O-rings, lift sleeve assembly from fuel discharge nozzle.
e. Using a standard 1/2-inch deep socket, remove fuel discharge nozzle from cylinder.

12A-59. CLEANING AND INSPECTION. Refer to paragraph 12-61.

12A-60. INSTALLATION.
a. Using a standard 1/2-inch deep socket, install nozzle body in cylinder and tighten to a torque value of 60-80 lb-in.
b. Install O-rings, sleeve assembly and washers.
c. Align sleeve assembly and connect pressurization line to nozzles. Connect pressurization line to "tee" fitting.
d. Install O-ring and washer at top of discharge nozzle and connect fuel injection line to nozzle.
e. Inspect installation for crimped lines and loose fittings.
f. Inspect nozzle pressurization vent system for leakage. A tight system is required, since turbocharger discharge pressure is applied to various other components of the injection system.
g. Install cowling.

12A-61. FUEL INJECTION PUMP.

12A-62. DESCRIPTION. The fuel pump is a positive displacement, rotating vane type. It has a splined shaft for connection to the accessory drive section of the engine. Fuel enters the pump at the swirl well of the pump vapor separator. Here, vapor is separated by a swirling motion so that only liquid fuel is fed to the pump. The vapor is drawn from the top center of the swirl well by a small pressure jet of fuel and is fed into the vapor return line where it is returned to the fuel tank. Since the pump is engine-driven, changes in engine speed affect total pump flow proportionally. A check valve allows the auxiliary fuel pump pressure to bypass the engine-driven pump for starting, or in the event of engine-driven fuel pump failure in flight. The pump supplies more fuel than is required by the engine; therefore, a relief valve is provided to maintain a constant fuel pump pressure. The engine-driven fuel pump is equipped with an aneroid. The aneroid and relief valve are pressurized from the discharge side of the turbocharger compressor to maintain a proper fuel/air ratio at altitude. The aneroid is adjustable for fuel pump outlet pressure at full throttle and the relief valve is adjustable for fuel pump outlet pressure at idle.

12A-63. REMOVAL.

a. Place fuel selector valve handle in OFF position.
b. Remove engine cowling in accordance with paragraph 12-3.
c. Remove alternator and left rear intake elbow.
d. Hoist engine far enough to remove weight from engine mount and remove left rear engine mount leg, shock-mount and alternator bracket.
e. Remove flexible duct and shroud, removing fuel lines and fittings as necessary. Tag each fitting and line for identification and cap or seal to prevent entry of foreign material. Flanges of shroud may be straightened to facilitate removal and installation, but must be re-formed after installation. Note angular position of fittings before removal.
f. Remove nuts and washers attaching fuel pump to engine and pull pump aft to remove. Remove thin gasket.
g. Place temporary cover on pump mounting pad.

12A-64. INSTALLATION.

a. Install and align any fittings removed after pump removal.
b. Using new thin gasket, install pump with aneroid chamber down.
c. Install cooling shroud and remainder of fittings, bending flanges of shroud to their original positions and aligning fittings as noted during removal.
d. Connect all fuel lines and shroud flexible duct.
e. Install alternator bracket, shock-mount and engine mount leg. Remove hoist, then adjust alternator drive belt tension. Refer to Section 17.
f. Install intake elbow.
g. Start engine and perform an operational check, adjusting fuel pump if required.
h. Install cowling.

12A-65. ADJUSTMENT. Adjustments of the fuel injection pump requires special equipment and procedures. Adjustment to the aneroid applies only to the full throttle setting. Adjustment of the idle position is obtained through the relief valve. To adjust the pump to the pressures specified in paragraph 12A-12, proceed as follows:

a. Remove engine cowling in accordance with paragraph 12-3.
b. Disconnect the engine-driven fuel pump pressure hose and fittings, connect the test gage pressure and vent ports into the fuel injection system in as illustrated in figure 12A-2.

NOTE

Cessna Service Kit No. SK320-2J provides a test gage, lines and fittings for connecting the test gage into the system to perform accurate calibration of the engine-driven fuel pump.

c. The test gage MUST be vented to atmospheric pressure and MUST be held as near to the level of the engine-driven pump as possible. Bleed air from test gage line prior to taking readings.

NOTE

The test gage should be checked for accuracy at least every 90 days or anytime an error is suspected. The tachometer accuracy should also be determined prior to making any adjustments to the pump.

d. Start engine and warm-up thoroughly. Set mixture control to full rich position and propeller control full forward (low pitch, high rpm).
e. Adjust engine idle speed to 600 ± 25 RPM and check test gage for 5.5 to 6.5 PSI. See figure 12-8 for idle mixture adjustment.

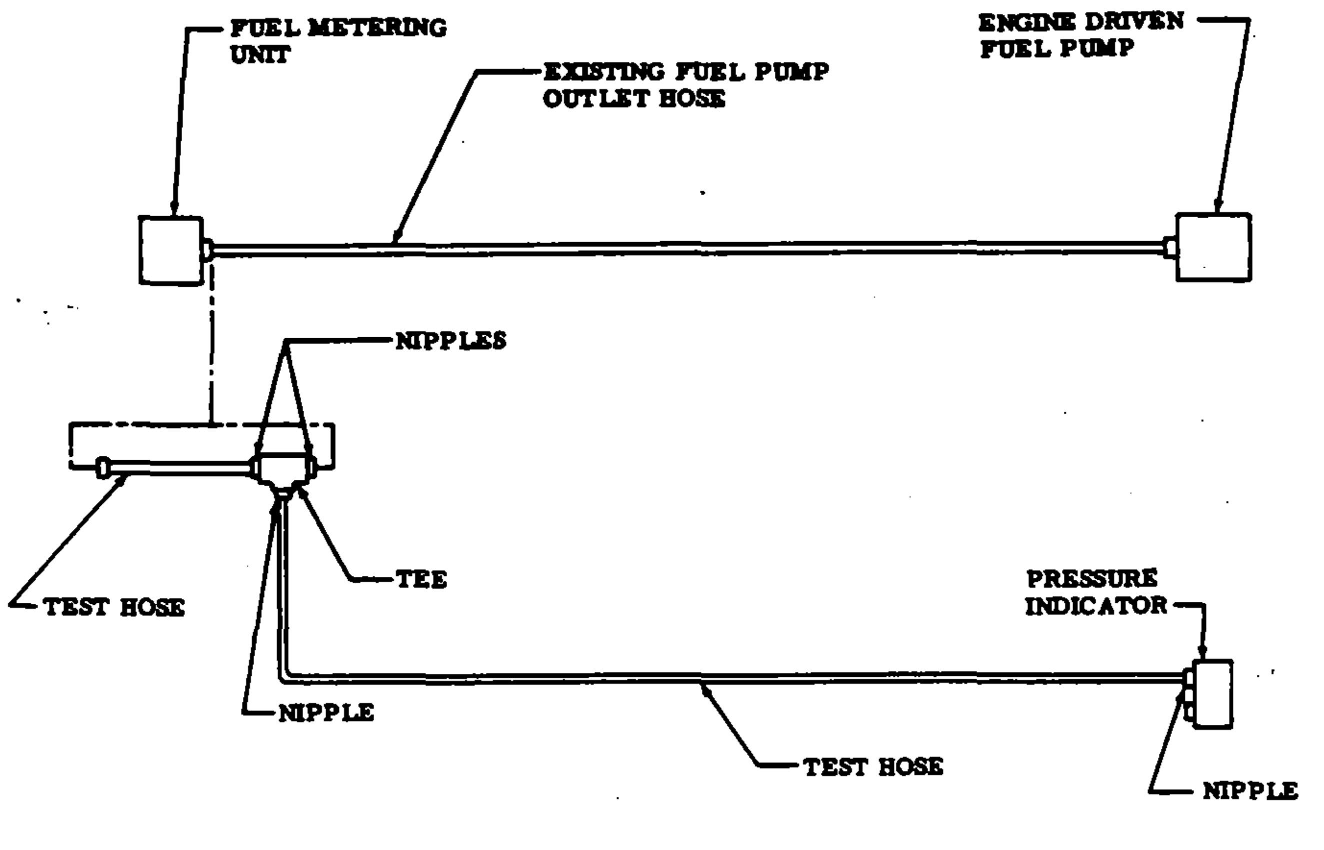
NOTE

Do not adjust idle mixture until idle pump pressure is obtained.

WARNING

DO NOT make fuel pump pressure adjustments while engine is operating.

f. If the pump pressure is not 5.5 to 6.5 PSI, stop engine and turn the fuel pump relief valve adjustment, on the centerline of the fuel pump clockwise (CW) to increase pressure and counterclockwise (CCW) to decrease pressure.
g. Maintaining idle pump pressure and idle RPM, obtain correct idle mixture in accordance with paragraph 12-52.
h. Completion of the preceding steps have provided:
   1. Correct idle pump pressure.
   2. Correct fuel flow.
   3. Correct fuel metering cam to throttle plate orientation.



NOTE

WHEN ADJUSTING UNMETERED FUEL PRESSURE, TEST EQUIPMENT MAY BE "TEED" INTO THE ENGINE-DRIVEN FUEL PUMP OUTLET HOSE AT THE FUEL PUMP OR AT THE FUEL METERING UNIT.

Figure 12A-2. Fuel Injection Pump Adjustment Test Harness

SHOP NOTES:

i. Advance to full throttle and maximum rated engine speed with the mixture control in full rich position and propeller control in full forward (low pitch, high rpm).

j. Check test gage for pressures specified in paragraph 12A-12. If pressure is incorrect, stop engine and adjust pressure by loosening locknut and turning the adjusting screw located at rear of aneroid counterclockwise (CCW) to increase pressure and clockwise (CW) to decrease pressure.

NOTE

If at static run-up, rated RPM cannot be achieved at full throttle, adjust pump pressure slightly below limits making certain the correct pressures are obtained when rated RPM is achieved during takeoff roll.

k. After correct pressures are obtained, tighten locknut.

l. Remove test equipment, run engine to check for leaks and install cowling.

12A-66. RIGGING THROTTLE OPERATED MICRO-SWITCH. Refer to Section 13.

12A-67. AUXILIARY ELECTRIC FUEL PUMP FLOW RATE ADJUSTMENT. Refer to Section 13.

12A-68. INDUCTION AIR SYSTEM.

12A-69. DESCRIPTION. Ram air to the engine enters an induction air duct at the right side of the nose cap. The air is filtered through a dry filter, located in the induction airbox. From the filter, the air passes through a flexible duct to the inlet of the turbocharger compressor. The pressurized air is then routed through a duct to the fuel-air control unit mounted behind the engine and is then supplied to the cylinders through the intake manifold piping. The fuel-air control unit is connected to the cylinder intake manifold by elbows, hoses and clamps. The intake manifold is attached to each cylinder by four bolts through a welded flange, which is sealed by a gasket. A balance tube passes around the front side of the engine to complete the manifold assembly. An alternate air door, mounted in the duct between the filter and the turbocharger compressor, is held closed by a small magnet. If the induction air filter should become clogged, suction from the turbocharger compressor will open the door permitting the compressor to draw heated, unfiltered air from within the engine compartment. The alternate air door should be checked periodically for freedom of operation and complete closing. The induction air filter should be removed and cleaned at each 50-hour inspection, more often when operating under dusty conditions. Refer to Section 2.

12A-70. AIRBOX.

12A-71. REMOVAL AND INSTALLATION.

a. Remove engine cowling in accordance with paragraph 12-3.

b. Loosen clamp at lower end of airbox and remove flexible duct.

c. Remove two screws, washers and nuts attaching airbox to upper rear engine baffle.

d. Remove four screws attaching airbox to induction air duct and work airbox and filter from duct.

e. Remove screws attaching clips on duct to clips on rocker box covers.

f. Remove screws attaching lower side of induction air duct to the two front cylinder rocker box covers.

g. Loosen clamp and remove air duct from flexible inlet air duct and remove duct.

h. Reverse the preceding steps for reinstallation.

NOTE

Clean filter and ascertain that induction air ducts and airbox are clean when installing.

12A-72. CLEANING AND INSPECTION. Refer to paragraph 12-73.

12A-73. INDUCTION AIR FILTER.

12A-74. DESCRIPTION. An induction air filter, mounted in the aft end of the induction airbox removes dust particles from the ram air entering the engine.

12A-75. REMOVAL AND INSTALLATION.

a. Remove right half of engine cowling in accordance with paragraph 12-3.

b. Remove screws attaching airbox to upper rear baffle.
c. Loosen clamp and disconnect flexible air duct to airbox.
d. Remove four screws attaching airbox to forward air duct and work airbox and filter from aircraft.
e. Remove four bolts, washers and nuts attaching filter between airbox halves.

NOTE

When installing filter, note direction of air flow. Inspect and install gasket at aft face of filter assembly. Also, when tightening bolts fastening filter, push inward on lower end of the upper duct (where turbocharger inlet connects to the upper duct) so that inlet hose doesn't chafe against the cowling.

f. Reverse the preceding steps for reinstallation.

12A-76. CLEANING AND INSPECTION. Clean and inspect filter in accordance with Section 2.

12A-76A. INSTALLATION OF INDUCTION AIR SYSTEM DUCTS. When cutting induction air system ducts to length, the support wire should be cut back far enough to bend back (Minimum bend radius, 1/8 inch) under the clamp and protrude 1/4 inch. Do not break the bond between the wire and the fabric. Before tightening clamps, make sure there is no twist or torque on the duct. If the duct is supported with MIL-Y-1140 cord in place of wire, the preceding installation applies except; MIL-Y-1140 cord has no minimum bend radius requirements.

The minimum installed bend radii for wire-supported ducts in plane of bend, measured from the wall of the duct, are as follows:

1. Neoprene - one ply. 1/4 diameter of the maximum duct dimension.
2. Neoprene - two ply, and silicone - one ply. 1/3 diameter of the maximum duct dimension.
3. Silicone - two ply. 1/2 diameter of the maximum duct dimension.

NOTE

Ducts carrying filtered induction air may not have local areas hand-formed to a different cross section.

12A-77. IGNITION SYSTEM. Refer to paragraph 12-78.

12A-78. DESCRIPTION. Refer to paragraph 12-79.

12A-79. TROUBLE SHOOTING. Refer to paragraph 12-80.

12A-80. MAGNETOS. Refer to paragraph 12-81.

12A-81. DESCRIPTION. Refer to paragraph 12-82.

12A-82. REMOVAL. Refer to paragraph 12-83.

12A-83. INTERNAL TIMING. Refer to paragraph 12-84.

12A-84. INSTALLATION AND TIMING-TO-ENGINE. Refer to paragraph 12-85, except that timing shall be as specified in paragraph 12A-12.

12A-85. MAINTENANCE. Refer to paragraph 12-86, except that timing shll be as specified in paragraph 12A-12.

12A-86. MAGNETO CHECK. Refer to paragraph 12-87

12A-87. SPARK PLUGS. Refer to paragraph 12-88.

12A-88. ENGINE CONTROLS. Refer to paragraph 12-89.

12A-89. DESCRIPTION. Refer to paragraph 12-90.

12A-90. RIGGING. Refer to paragraph 12-91.

12A-91. THROTTLE CONTROL. Refer to paragraph 12-92.

12A-92. MIXTURE CONTROL. Refer to paragraph 12-93.

12A-93. PROPELLER CONTROL. Refer to Section 14.

12A-94. STARTING SYSTEM. Refer to paragraph 12-96.

12A-95. DESCRIPTION. Refer to paragraph 12-97.

12A-96. TROUBLE SHOOTING. Refer to paragraph 12-98.

12A-97. PRIMARY MAINTENANCE. Refer to paragraph 12-99.

12A-98. STARTER MOTOR.

12A-99. REMOVAL AND INSTALLATION.

a. Remove cowling in accordance with paragraph 12-3.
b. Remove induction airbox in accordance with paragraph 12A-71.
c. Disconnect electrical power cable at starter and insulate terminal as a safety precaution.
d. Remove nuts securing starter and remove starter.
e. Reverse the preceding steps for reinstallation. Install a new O-ring and be sure the starter drive engages with the drive in the adapter.

12A-100. EXHAUST SYSTEM. See figure 12A-3.

12A-101. DESCRIPTION. The exhaust system consists of two exhaust stack assemblies, one for the left and one for the right bank of cylinders. These exhaust stack assemblies are joined together to route the exhaust from all cylinders through the waste-gate or turbine. The three risers on the left bank of cylinders are joined together into a common pipe to form the left stack assembly. The right rear cylinder exhaust is routed down and aft to the rear of the engine where it connects to the left stack assembly. The risers on the two right front cylinders are connected to a common pipe to form the right stack assembly. The right stack assembly connects to the left stack assembly at the front of the engine. Mounting pads for the waste-gate and turbine are provided on the right stack assembly. From the exhaust port of the turbine, a tailpipe routes the exhaust overboard through the lower fuselage. The exhaust port of the waste-gate is routed into the tailpipe so the exhaust gas can be expelled from the system when not needed at the turbine. The waste-gate is actuated by the waste-gate actuator which, in turn, is controlled by the waste-gate controller. Also, sleeving is installed on the fuel hose from the engine-driven pump to the fuel metering body and on the hose from the auxiliary fuel pump to the engine-driven pump. This is to prevent excessive heat on these fuel hoses as they route close to the exhaust stack.

12A-102. ECONOMY MIXTURE INDICATOR (EGT). (Refer to Section 16)

12A-103. REMOVAL.

a. Remove engine cowling and right and left nose caps in accordance with paragraph 12-3.
b. Remove intake manifold balance tube from front of engine.
c. Remove heat shield at front of engine.
d. Loosen clamp and disconnect flexible duct at aft end of cabin heater shroud on left exhaust stack assembly.
e. Remove clamps and bolts securing rear heat shield to engine and remove heat shield.
f. Remove clamps attaching left exhaust stack assembly to riser pipes and to rear crossover pipe on left side of engine.
g. Work left exhaust stack assembly down from risers and out of crossover pipes at front and rear of engine.
h. Remove four nuts and washers attaching exhaust riser pipe to each cylinder on left bank of cylinders and remove riser pipes and gaskets.
i. Remove clamp attaching exhaust tailpipe to exhaust port of turbine.
j. Remove bolts attaching waste-gate to right exhaust stack assembly. Work tailpipe from turbine and lower waste-gate and tailpipe into cowling.
k. Remove bolts attaching turbocharger to mounting brackets.
l. Remove bolts and nuts attaching turbocharger to right exhaust stack assembly. Lower turbocharger into cowling.
m. Remove bolts, nuts and clamps attaching right exhaust stack assembly to riser pipes on right side of engine.
n. Work right exhaust stack assembly down from risers and remove.
o. Remove nuts and washers attaching riser pipes to front two cylinders on right side of engine and remove riser pipes and gaskets.
p. Remove nuts and washers attaching exhaust pipe to rear cylinder on right side of engine and remove pipe and gasket.

12A-104. INSTALLATION.

NOTE

It is important that the complete exhaust system, including the turbocharger and waste-gate, be installed without pre-loading any section of the exhaust stack assembly.

a. Use new gaskets between exhaust stacks and engine cylinders, at each end of waste-gate and between turbocharger and exhaust stack.
b. Place all sections of exhaust stacks in position and torque nuts attaching them to the cylinders evenly to 100-110 lb-in., while riser clamps are loose.
c. Manually check that crossover pipe slip-joints do not bind. Tighten clamp attaching left risers to left stack assembly. Tighten the clamp attaching right stack to right front riser.
d. Raise turbocharger into position and install bolts and nuts attaching turbocharger to right exhaust stack and those attaching turbocharger to front and rear turbocharger supports (figure 12A-5). Tighten bolts securely.

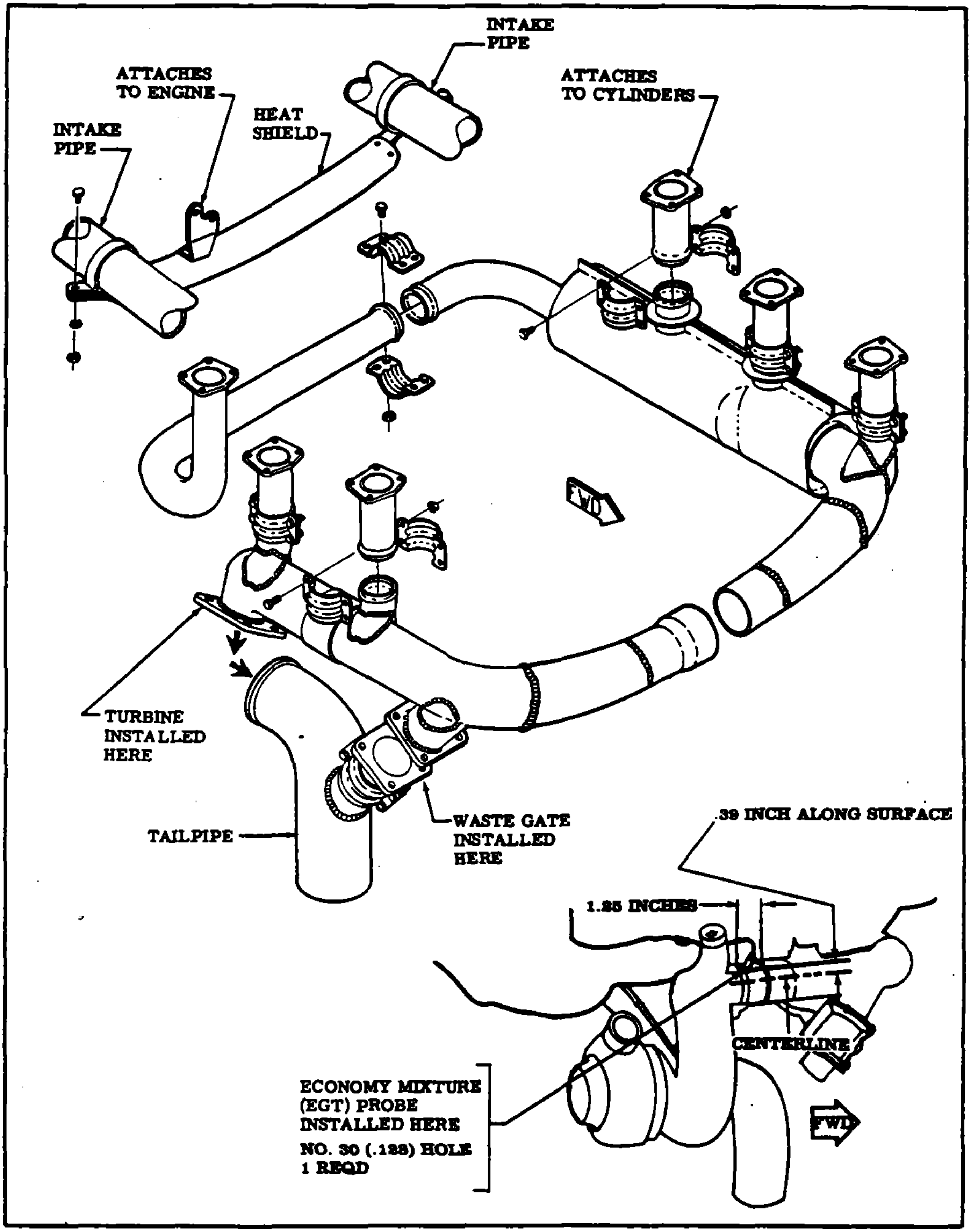
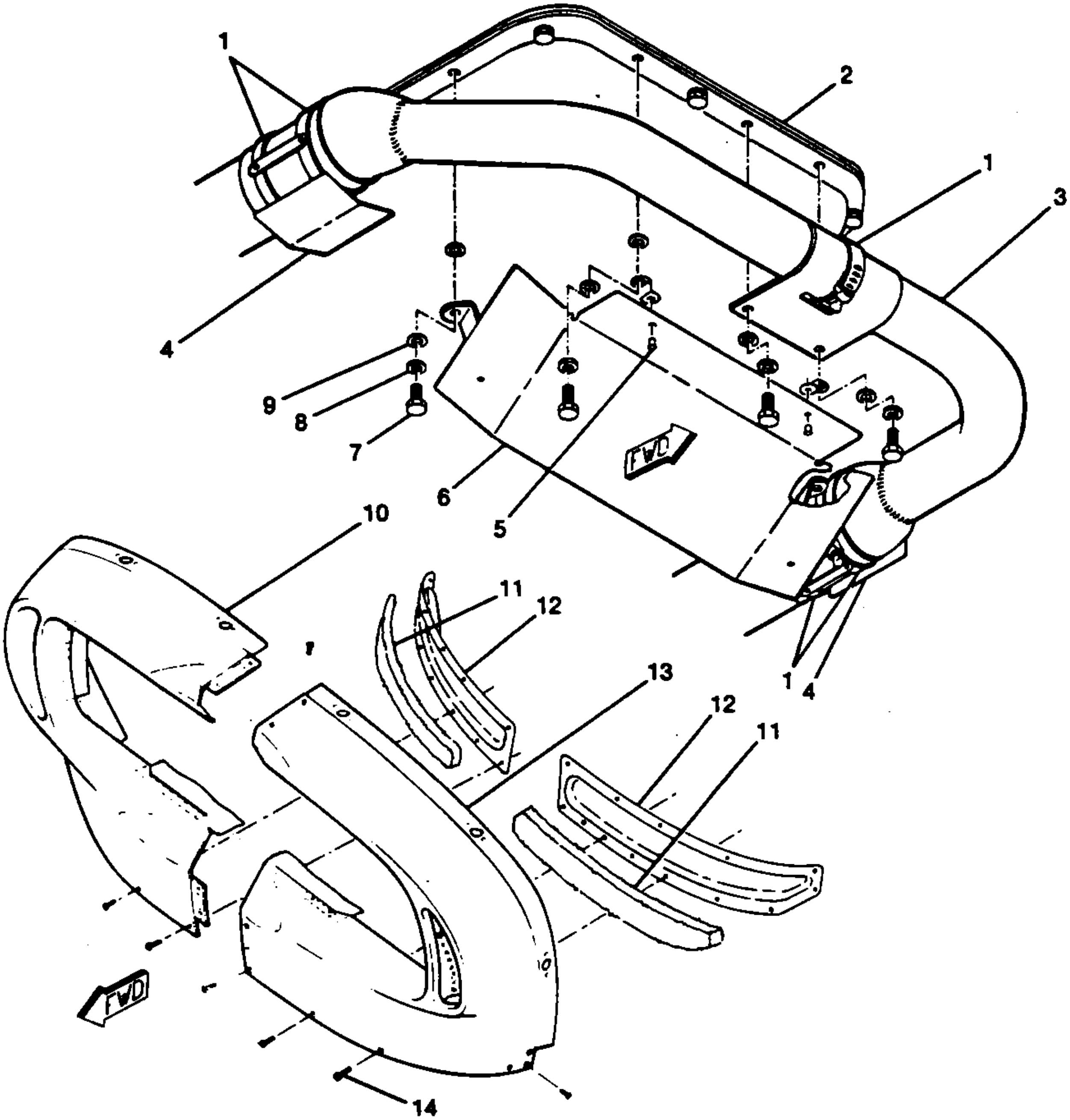


Figure 12A-3. Exhaust System (Sheet 1 of 2)



HEAT DEFLECTORS AND INSULATORS

1. Clamp
2. Crankcase
3. Intake Manifold Balance Tube
4. Heat Deflector
5. Rivet
6. Heat Shield
7. Bolt
8. Lockwasher
9. Washer
10. Right Nosecap
11. Insulation
12. Retaining Skin
13. Left Nosecap
14. Screw

Figure 12A-3. Exhaust System (Sheet 2 of 2)

e. Install bolts and nuts attaching waste-gate to right hand exhaust stack and tighten securely.

f. While applying an upward force of one G to counteract weight of turbocharger and waste-gate assembly, tighten clamp attaching exhaust stack to riser.

g. Tighten clamp securing tailpipe to turbocharger.

h. Be sure all parts are secure and safetied as required, then preform step "b" of paragraph 12A-105 to check for air leaks.

i. Install heater shroud duct and heat shields.

j. Install intake manifold balance tube at front of engine and install heat shields at front of engine, then install nose caps and cowling.

NOTE

The lower sections of turbocharger supports (index 8, figure 12A-5) are supplied as service parts with their upper holes omitted. These undrilled parts are also supplied when a new turbocharger inlet stack, right front stack, or either of the two right front risers is ordered. The following steps outline the proper procedure for drilling and installing the supports.

k. Install all parts but do not tighten attaching clamps or bolts.

l. Torque nuts attaching risers to cylinders evenly to 100-110 lb-in.

m. Tighten bolts and clamps per steps "d" through "g".

NOTE

It is important that weight of turbocharger and waste-gate assembly be counteracted, as listed in step "f", when tightening clamps attaching stacks to risers.

n. Make hole locations in undrilled supports to match existing holes in upper supports.

o. Remove lower supports, leaving all other parts tight.

p. Drill the marked holes with a 3/8-inch drill.

q. Reinstall supports, install bolts fastening upper and lower supports together, then tighten all bolts securely. If any exhaust system bolts or clamps were loosened while lower supports were not installed, loosen all clamps and bolts and repeat the installation procedure to be sure no pre-loading is present.

r. Be sure all parts are secure and safetied as required, reinstall any parts removed for access, then install nose caps and cowling.

12A-105. INSPECTION. Since exhaust systems of this type are subject to burning, cracking and general deterioration from alternate thermal stresses and vibrations, inspection is important and should be accomplished every 50 hours of operation. Also, a thorough inspection of the engine exhaust system should be made to detect cracks causing leaks which could result in loss of optimum turbocharger efficiency and engine power. To inspect the engine exhaust system proceed as follows:

a. Remove engine cowling as required and remove heater shroud so that ALL surfaces of the exhaust assemblies can be visually inspected.

WARNING

Never use highly flammable solvents on engine exhaust systems. Never use a wire brush or abrasives to clean exhaust systems or mark on the system with lead pencils.

NOTE

Especially check the areas adjacent to welds and slip joints. Look for gas deposits in surrounding areas, indicating that exhaust gases are escaping through a crack or hole or around the slip joints.

b. After visual inspection, an air pressure test should be made on the exhaust system as follows:

1. Attach the pressure side of an industrial vacuum cleaner to the tailpipe opening, using a rubber plug to effect a seal as required.

NOTE

The inside of the vacuum cleaner hose should be free of any contamination that might be blown into the engine exhaust system.

2. With vacuum cleaner operating, all joints in the exhaust system and the heat exchanger area may be checked manually by feel, or by using a soap and water solution and watching for bubbles. The exhaust manifold in the heat exchanger area must be free of air leaks. In other areas, forming of bubbles is acceptable; however, if bubbles are blown away system is not acceptable. Also, some bubbles will appear at the joint of the turbocharger turbine and compressor bearing housing.

c. Where a surface is not accessible for a visual inspection, or for a more positive test, the following procedure is recommended.

1. Remove exhaust stack assemblies.
2. Use rubber expansion plugs to seal openings.
3. Using a manometer or gage, apply approximately 1-1/2 psi (3 inches of mercury) air pressure while each stack assembly is submerged in water. Any leaks will appear as bubbles and can be readily detected.

d. It is recommended that any components of the exhaust system found defective be replaced before the next flight.

e. After installation of exhaust system components, recheck by performing the air pressure test to make sure that system is acceptable.

12A-106. TURBOCHARGER.

NOTE

For additional information covering turbocharger and component maintenance, overhaul and trouble shooting refer to the Manufacturer's Overhaul Manual.

12A-107. DESCRIPTION. The turbocharger is an exhaust gas-driven compressor, or air pump, which provides high velocity air to the engine intake manifold. The turbocharger is composed of a turbine wheel, compressor wheel, turbine housing and compressor housing. The turbine, compressor wheel and interconnecting drive shaft comprise one complete assembly and are the only moving parts in the turbocharger. Turbocharger bearings are lubricated with filtered oil supplied from the engine oil system. Engine exhaust gas enters the turbine housing to drive the turbine wheel. The turbine wheel, in turn, drives the compressor wheel, producing a high velocity of air entering the engine induction intake manifold. Exhaust gas is then dumped overboard through the exhaust outlet of the turbine housing and exhaust tailpipe. Air is drawn into the compressor through the induction air filter and is forced out of the compressor housing through a tangential outlet to the intake manifold. The degree of turbocharging is varied by means of a waste-gate valve, which varies the amount of exhaust gas allowed to bypass the turbine.

12A-108. REMOVAL AND INSTALLATION.

a. Remove engine cowling as required.
b. Remove waste-gate to tailpipe clamp.
c. Loosen clamp at turbine exhaust outlet and work tailpipe from turbine outlet.
d. Loosen clamps and remove air inlet and outlet ducts from turbocharger compressor.
e. Disconnect oil pressure and scavenger lines from turbocharger. Plug or cap open oil lines and fittings. Remove clamp on oil supply line to the turbocharger.
f. Loosen clamp and remove induction air inlet elbow at turbocharger compressor.
g. Remove right cowl flap by disconnecting control at cowl flap and removing hinge pin.
h. Cut safety wire and remove two bolts attaching turbine to forward mounting bracket.
i. Remove three bolts attaching turbine to turbine rear mounting bracket.
j. Remove three remaining bolts, washers and nuts attaching turbine to exhaust manifold.
k. Work turbocharger from aircraft through cowl flap opening in lower cowling.
l. Reverse the preceding steps for reinstallation. When installing the turbocharger, install a new gasket between exhaust manifold and turbine exhaust inlet. Reinstall safety wire.

12A-109. CONTROLLER AND WASTE-GATE ACTUATOR.

12A-110. FUNCTIONS. The waste gate actuator and controller use engine oil for power supply. The turbocharger is controlled by the waste gate, waste gate actuator, absolute pressure and overboost control valve. The waste gate bypasses engine exhaust gas around the turbocharger turbine inlet. The waste gate actuator, which is physically connected to the waste gate by mechanical linkage, controls the position of the waste gate butterfly valve. The absolute pressure controller controls the maximum turbocharger compressor discharge pressure, the overboost control valve prevents an excessive pressure increase to the throttle body.

12A-111 OPERATION. The waste-gate actuator is spring-loaded to position the waste-gate to the normally open position when there is not adequate oil pressure in the waste-gate actuator power cylinder during engine shut down. When the engine is started, oil pressure is fed into the waste-gate actuator power cylinder through the capillary tube. This automatically fills the waste-gate actuator power cylinder and lines leading to the controllers, blocking the flow of oil by normally closed metering and/or poppet valves. As oil pressure builds up in the waste-gate actuator power cylinder, it overcomes the force of the waste-gate open spring, closing the waste-gate. When the waste-gate begins to close, the exhaust gases are routed through the turbocharger turbine. As the engine increases its power and speed, the increase of

SHOP NOTES:

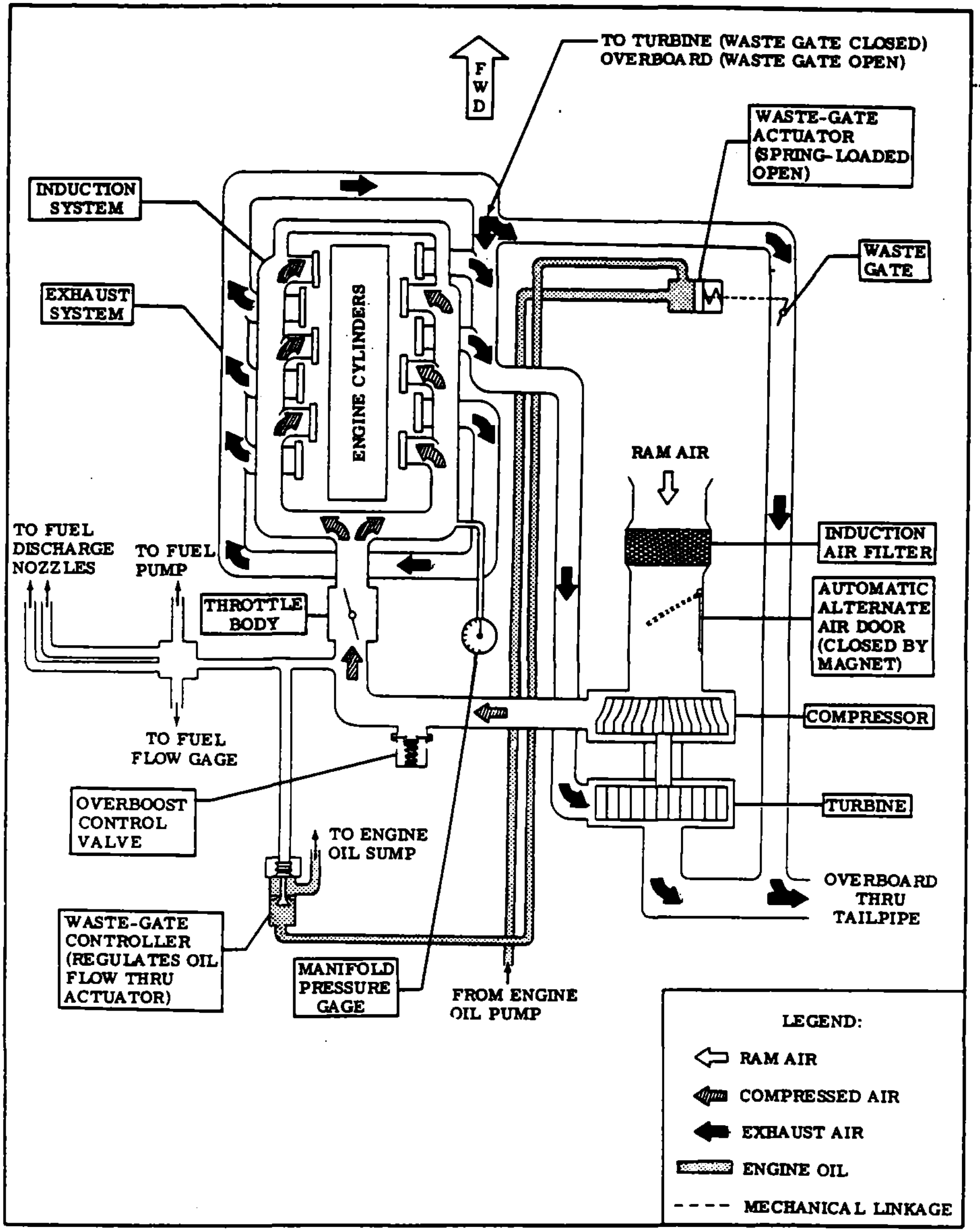


Figure 12A-4. Turbocharger System Schematic temperature and pressure of the exhaust gases causes the turbocharger to rotate faster, raising the turbocharger compressor outlet pressure. As the compressor outlet pressure rises, the aneroid bellows and the absolute pressure controller sense the increase in pressure. When at high engine speed and load and the proper absolute pressure is reached, the force on the aneroid bellows opens the normally closed metering valve. When the oil pressure in the waste-gate actuator power cylinder is lowered sufficiently, the waste-gate actuator open spring forces the mechanical linkage to open the waste-gate. A portion of the exhaust gases then bypasses the turbocharger turbine, thus preventing further increase of turbocharger speed and holding the compressor discharge absolute pressure to the desired valve. Conversely, at engine idle, the turbocharger runs slowly with low compressor pressure output; therefore, the low pressure applied to aneroid bellows is not sufficient to affect the unseating of the normally closed metering valve. Consequently, engine oil pressure keeps the waste-gate closed. The overboost control valve acts as a pressure relief valve and will open to prevent an excessive pressure increase to the throttle body. Above 17,000 feet, the absolute pressure controller will continue to maintain 35 inches of mercury manifold pressure with the throttle to follow the maximum manifold pressure versus altitude shown on the instrument panel placard.

CAUTION

This turbocharged engine installation is equipped with a controller system which automatically controls the engine within prescribed manifold pressure limits. Although these automatic controller systems are very reliable and eliminate the need for manual control through constant throttle manipulation, they are not infallible. For instance, such things as rapid throttle manipulation (especially with cold oil), momentary waste-gate sticking, air in the oil system of the controller, etc., can cause overboosting.

Consequently, it is still necessary that the pilot observe and be prepared to control the manifold pressure, particularly during takeoff and power changes in flight.

The slight overboosting of manifold pressure beyong established maximums, which is occasionally experienced during initial takeoff roll or during a change to full throttle operation in flight, is not considered detrimental to the engine as long as it is momentary. Momentary overboost is generally in the area of 2 to 3 inches and can usually be controlled by slower throttle movement. No corrective action is required where momentary overboosting corrects itself and is followed by normal engine operation. However, if overboosting of this nature persists, or if the amount of overboost goes as high as 6 inches, the controller and overboost control should be checked for necessary adjustment or replacment of the malfunctioning component.

OVERBOOST EXCEEDING 6 INCHES beyond established maximums is excessive and can result in engine damage. It is recommended that overboosting of this nature be reported to your Cessna Dealer, who will be glad to determine what, if any, corrective action needs to be taken.

12A-112. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
UNABLE TO GET RATED POWER BECAUSE MANIFOLD PRESSURE IS LOW.	Controller not getting enough oil pressure to close the waste-gate.	Check oil pump outlet pressure, oil filter and external lines for obstructions. Clean lines and replace if defective. Replace oil filter.
	Controller out of adjustment or defective.	Refer to paragraph 12A-115. Replace controller if defective.
	Defective actuator.	Refer to paragraph 12A-117. Replace actuator if defective.
	Leak in exhaust system.	Check for cracks and other obvious defects. Replace defective components. Tighten clamps and connections.
	Leak in intake system.	Check for cracks and loose connections. Replace defective components. Tighten all clamps and connections.
ENGINE SURGES OR SMOKES.	Defective controller.	Refer to paragraph 12A-115. Replace if not adjustable.
	Waste-gate actuator linkage binding.	Refer to paragraph 12A-117.
	Waste-gate actuator leaking oil.	Replace actuator.
TURBOCHARGER NOISY WITH PLENTY OF POWER.	Turbocharger overspeeding from defective or improperly adjusted controller.	Refer to paragraph 12A-115. Replace if defective.
	Waste-gate sticking closed.	Correct cause of sticking. Refer to paragraph 12A-115. Replace defective parts.
	Controller drain line (oil return to engine sump) obstructed.	Clean line. Replace if defective.
ENGINE POWER INCREASES SLOWLY OR SEVERE MANIFOLD PRESSURE FLUCTUATIONS WHEN THROTTLE ADVANCED RAPIDLY.	Overboost control valve out of adjustment or defective.	Replace if defective.
	Waste-gate operation is sluggish.	Refer to paragraph 12A-117. Replace if defective. Correct cause of sluggish operation.
ENGINE POWER INCREASES RAPIDLY AND MANIFOLD PRESSURE OVERBOOSTS WHEN THROTTLE ADVANCED RAPIDLY.	Overboost control valve out of adjustment or defective.	Replace if defective.
	Waste-gate operation is sluggish.	Refer to paragraph 12A-117. Replace if defective. Correct cause of sluggish operation.

12A-112. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
FUEL PRESSURE DECREASES DURING CLIMB, WHILE MANIFOLD PRESSURE REMAINS CONSTANT.	Compressor discharge pressure line to fuel pump aneroid restricted.	Check and clean out restrictions.
	Leaking or otherwise defective engine-driven fuel pump aneroid.	Replace engine-driven fuel pump.
MANIFOLD PRESSURE DECREASES DURING CLIMB AT ALTITUDES BELOW NORMAL PART THROTTLE CRITICAL ALTITUDE, OR POOR TURBOCHARGER PERFORMANCE INDICATED BY CRUISE RPM FOR CLOSED WASTE-GATE. (Refer to paragraph 12A-113.)	Leak in intake system.	Check for cracks and other obvious defects. Tighten all hose clamps and fittings. Replace defective components.
	Leak in exhaust system.	Check for cracks and other obvious defects. Tighten all clamps and fittings. Replace defective components.
	Leak in compressor discharge pressure line to controller.	Check for cracks and other obvious defects. Tighten all clamps and fittings. Replace defective components.
	Controller seal leaking.	Replace controller.
	Waste-gate actuator leaking oil.	Replace actuator.
	Waste-gate butterfly - closed gap is excessive.	Refer to paragraph 12A-117.
	Intake air filter obstructed.	Service air filter. Refer to Section 2 for servicing instructions.
FUEL FLOW DOES NOT DECREASE AS MANIFOLD PRESSURE DECREASES AT PART-THROTTLE CRITICAL ALTITUDE.	Defective engine-driven fuel pump aneroid mechanism.	Replace engine-driven fuel pump.
	Obstruction or leak in compressor discharge pressure line to engine-driven fuel pump.	Check for leaks or obstruction. Clean out lines and tighten all connections.
FUEL FLOW INDICATOR DOES NOT REGISTER CHANGE IN POWER SETTINGS AT HIGH ALTITUDES.	Moisture freezing in indicator line.	Disconnect lines, thaw ice and clean out lines.
SUDDEN POWER DECREASE ACCOMPANIED BY LOUD NOISE OF RUSHING AIR.	Intake system air leak from hose becoming detached.	Check hose condition. Install hose and hose clamp securely.
MANIFOLD PRESSURE GAGE INDICATION WILL NOT REMAIN STEADY AT CONSTANT POWER SETTINGS.	Defective controller.	Replace controller.
	Waste-gate operation is sluggish.	Refer to paragraph 12A-117. Replace if defective. Correct cause of sluggish operation.

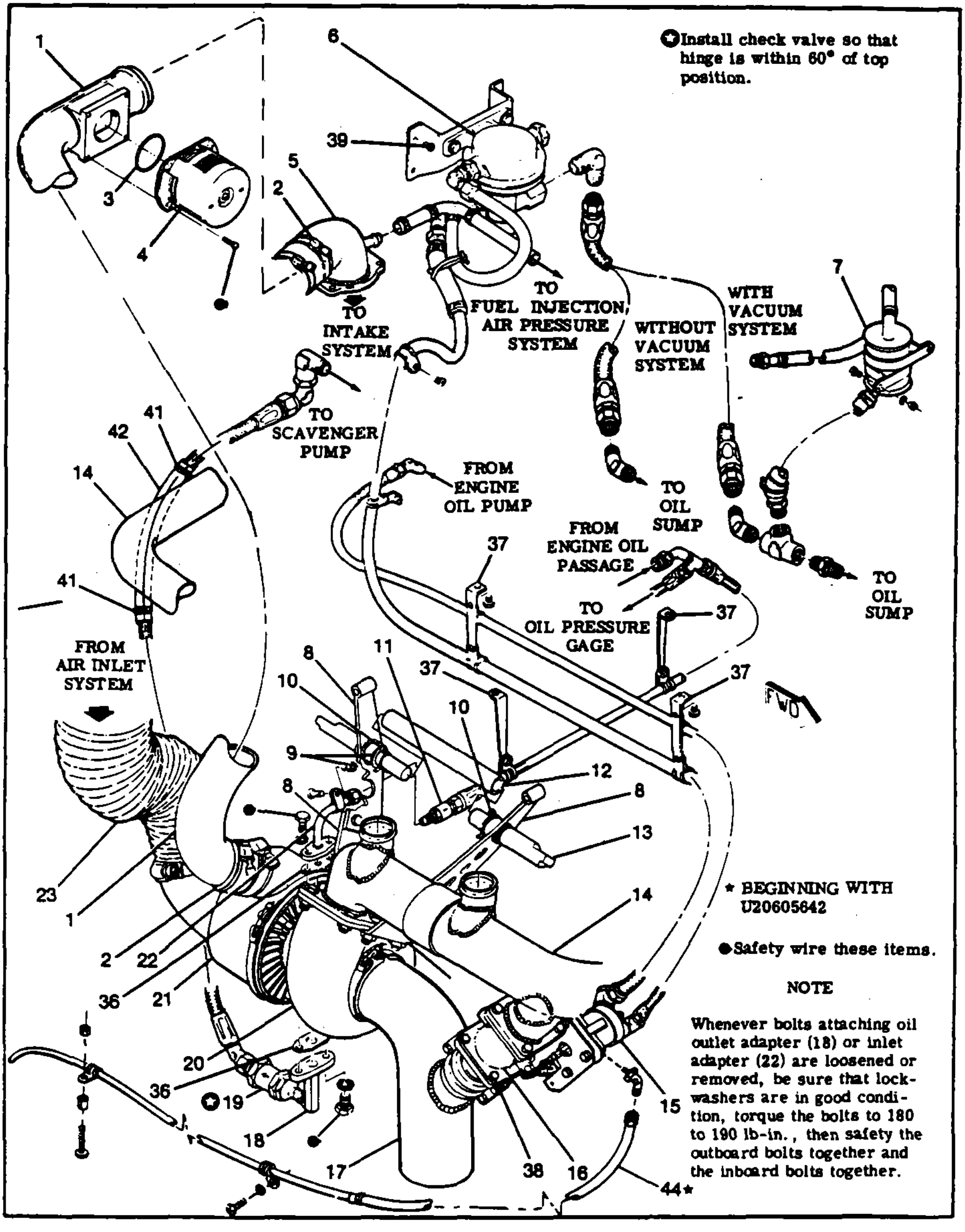
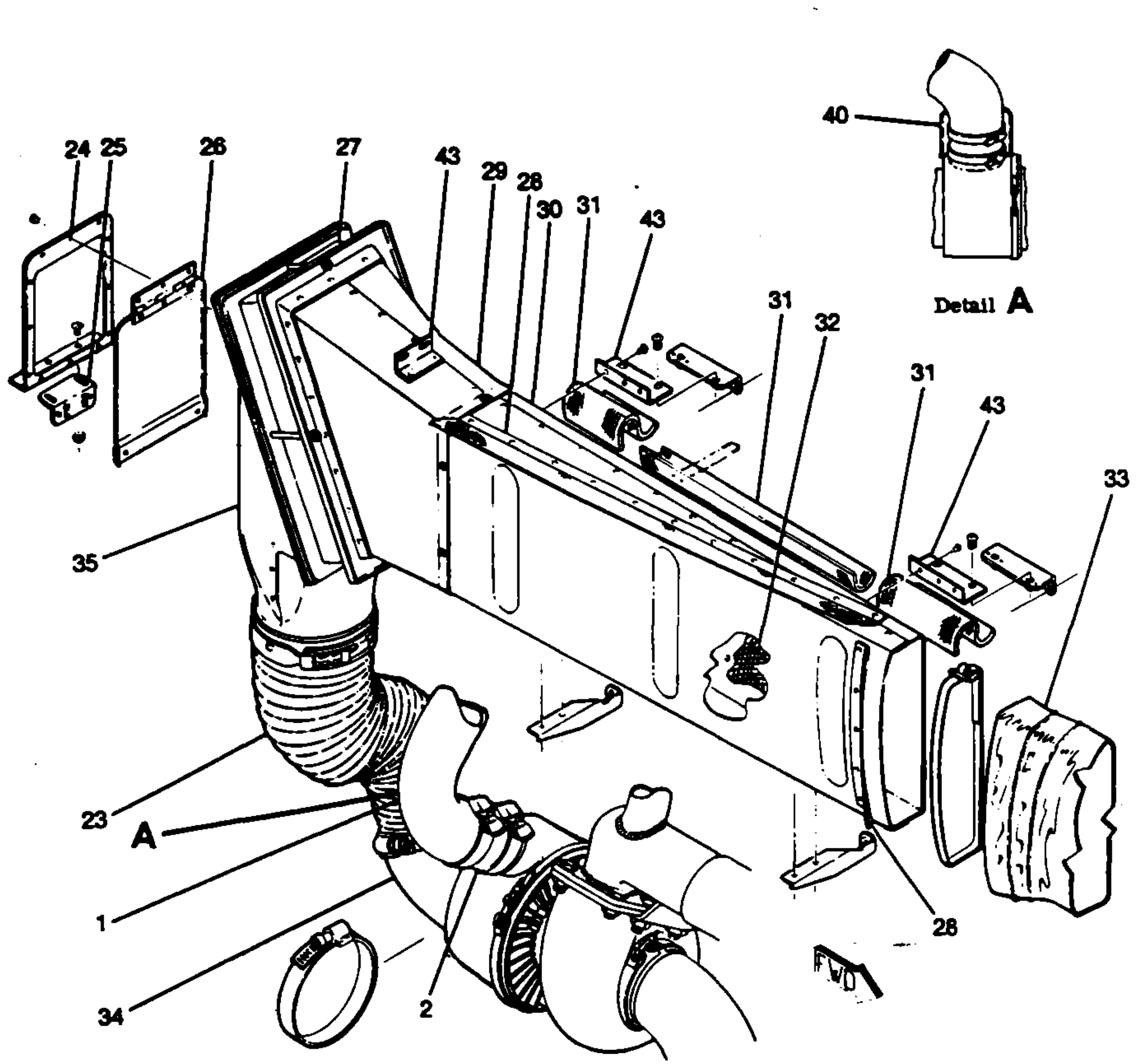


Figure 12A-5. Turbocharger System (Sheet 1 of 2)



1. Turbocharger Discharge Duct
2. Coupler
3. O-Ring Seal
4. Overboost Control Valve
5. Throttle Body Adapter
6. Absolute Controller
7. Vacuum System Oil Separator
8. Turbocharger Support (FWD &AFT)
9. Washer
10. Cotter Pin
11. Check Valve
12. Tube
13. Shaft Assembly
14. Exhaust System
15. Waste-Gate Actuator
16. Waste-Gate
17. Tail Pipe
18. Oil Outlet Adapter Assembly
19. Check Valve
20. Turbine Housing
21. Compressor Housing
22. Oil Inlet Adapter Assembly
23. Turbocharger Inlet Hose
24. Doubler
25. Magnet
26. Door
27. Induction Air Filter
28. Baffle Assembly
29. Center Duct
30. Forward Duct
31. Seal
32. Wire Guard
33. Nose Cap Flexible Duct
34. Turbocharger Inlet Elbow
35. Aft Duct
36. Gasket
37. Support
38. Bolt
39. Screw
40. Shield Assembly
41. Clamp
42. Sleeve
43. Support
44. Drain Line

Figure 12A-5. Turbocharger System (Sheet 2 of 2)

12A-113. CONTROLLER AND TURBOCHARGER OPERATIONAL FLIGHT CHECK. The following procedure details the method of checking the operation of the absolute controller overboost control valve, and a performance check of the turbocharger.

(1) TAKE-OFF-ABSOLUTE CONTROLLER CHECK.

a. Cowl Flaps - Open.
b. Airspeed - 90 KIAS.
c. Oil Temperature - Middle of green arc.
d. Engine Speed - 2700 ± 25 RPM.
e. Fuel Flow - 31.0 -0 +2 GPH (Full Rich Mixture and oil temperature in middle of the green arc).
f. Full Throttle M. P. - Absolute controller should maintain 36.5 ±5 in. Hg (stabilized).

Climb 2000 feet after take-off to be sure manifold pressure has stabilized. It is normal on the first take-off of the day for full throttle manifold pressure to decrease 1/2 to 1.0 inch of mercury within one minute after the initial application of full power. Refer to paragraph 12A-115 for absolute controller adjustment.

(2) CLIMB - ABSOLUTE CONTROLLER AND TURBOCHARGER PERFORMANCE CHECK.

a. Cowl Flaps - Open.
b. Airspeed - 105 KIAS.
c. Engine Speed - 2500 RPM.
d. Fuel Flow - Adjust mixture for 20 GPH (120.0 LBS/HR).
e. Part-Throttle M. P. - 30.0 in. Hg.
f. Climb to 17,000 feet - Check part-throttle critical altitude during climb.

This part-throttle critical altitude is where manifold pressure starts decreasing during the climb at a rate of approximately 1.0 inch of mercury per 1000 feet. After noting this altitude and the outside air temperature, the desired manifold pressure should be maintained by advancing the throttle during the remainder of the climb.

Once the climb power setting is established after take-off, the controller should maintain a steady manifold pressure up to the part-throttle critical altitude indicated in the following chart. If part-throttle critical altitude has not been reached by 17,000 feet, discontinue check and proceed to cruise check.

Outside Air Temperature	Part-Throttle Critical Altitude (80% Power)
Standard or Colder	Above 21,000 feet
20°F Above Standard	13,000 to 19,000 feet
40°F Above Standard	7,000 to 13,000 feet

Part-throttle critical altitudes lower than those listed indicate the turbocharger system is not operating properly (refer to the trouble shooting chart in paragraph 12A-112). Critical altitudes above those listed indicate turbocharger performance better than normal. Also check that fuel flow decreases as manifold pressure decreases at critical altitude. Refer to the trouble shooting chart if fuel flow does not decrease.

(3) CRUISE - TURBOCHARGER PERFORMANCE CHECK.

a. Cowl Flaps - Closed.
b. Airspeed - Level flight.
c. Pressure Altitude - 17,000 feet.
d. Engine Speed - 2700 RPM (5 minute limit).
e. Part-Throttle M.P. - 30.0 in. Hg.
f. Fuel Flow - Lean to 20.0 GPH (120 LBS/HR).
g. Propeller Control -

(1) Slowly decrease RPM until manifold pressure starts to drop, indicating waste gate is closed.

NOTE

If the waste gate closes at engine speeds lower than 2200 RPM, the turbocharger performance is normal.

(2) Note the outside air temperature and RPM as the manifold pressure starts to drop. Enter the chart (fig. 12A-6) with these numbers and verify no bootstrapping occurs above the line. If bootstrapping does occur above the line, refer to the trouble shooting chart in paragraph 12A-112.
(3) After noting temperature and RPM, increase engine speed 50 RPM to stabilize manifold pressure, with the waste gate modulating exhaust flow to control compressor output.

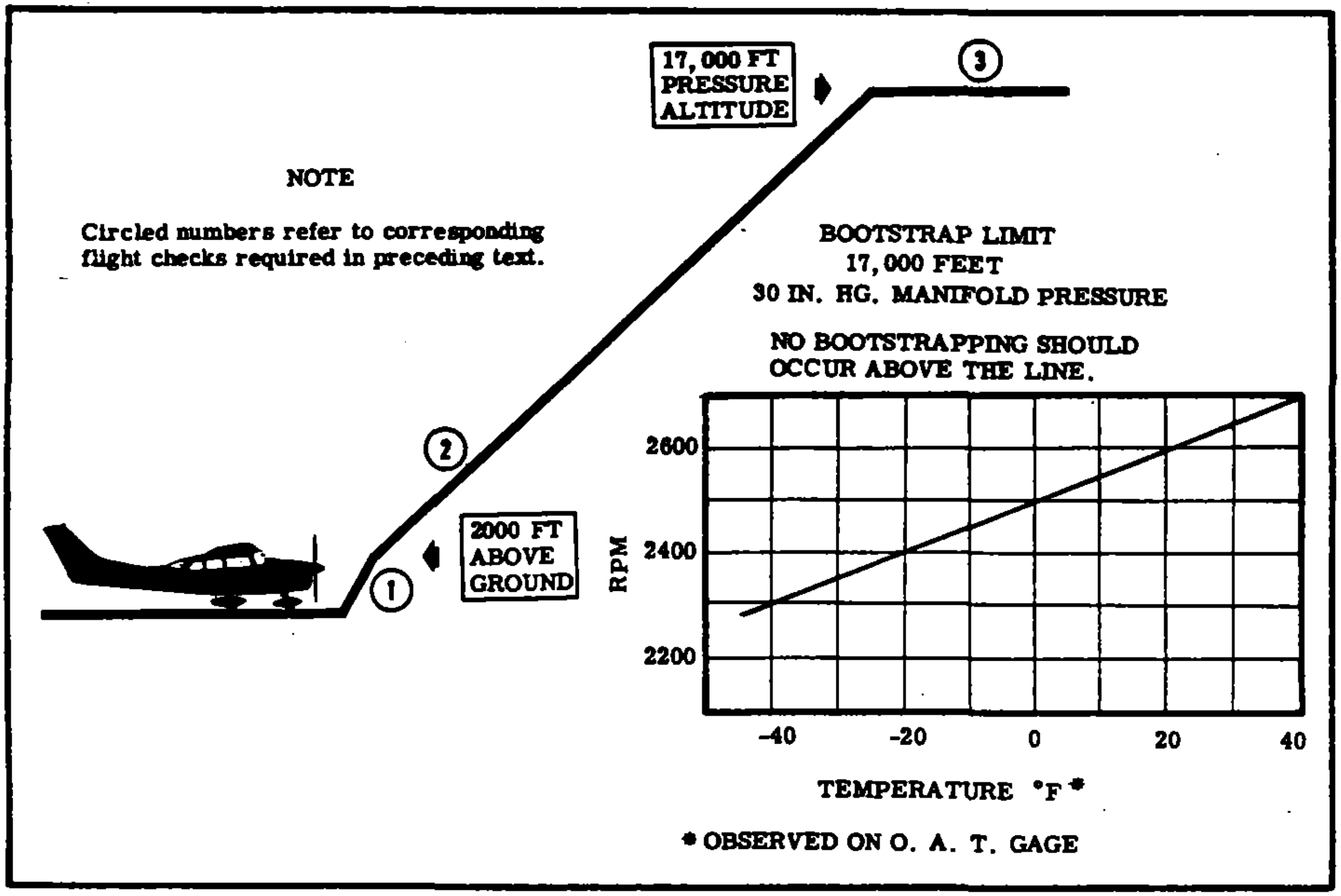


Figure 12A-6. Operational Flight Check

12A-114. REMOVAL AND INSTALLATION OF TURBOCHARGER CONTROLLER.

a. Disconnect and tag oil lines from controller and plug or cap open lines and fittings.

b. Disconnect compressor outlet pressure sensing line from controller and plug or cap open line and fitting.

c. Remove two bolts attaching controller to mounting bracket on firewall.

d. Remove controller from aircraft, being careful not to drop controller unit.

e. Installation of the controller may be accomplished by reversing the preceding steps. Resafety bolts attaching controller to bracket.

12A-115. ABSOLUTE CONTROLLER ADJUSTMENTS. (See figure 12A-7.)

a. With engine oil temperature at middle of green arc, slowly open throttle and note maximum manifold pressure obtainable. Do not exceed 36.5±.5 in. Hg.

b. Cut safety wire and remove plug from bottom of absolute controller (the vertical unit).

c. Using a flat-bladed screwdriver, rotate metering valve seat clockwise to increase manifold pressure and counterclockwise to decrease manifold pressure. Lightly tap the unit after each adjustment to seat internal parts.

NOTE

When adjusting, rotate in VERY small increments as this is an extremely sensitive adjustment. Approximately 13 degrees rotation will change the manifold pressure reading about one inch Hg.

d. Install and safety plug in absolute unit, then operate engine as in step "a" to ascertain that adjustment has not caused radical change in manifold pressure.

NOTE

When making adjustment on the ground, the *hotter the engine gets, the lower the manifold* pressure will be.

e. After each adjustment, the aircraft must be flight tested to check results.

f. Repeat this procedure until desired results are obtained.

12A-116. REMOVAL AND INSTALLATION OF WASTE GATE AND ACTUATOR.

a. Disconnect and tag oil lines from actuator and plug or cap open lines and fittings.

b. Remove bolts, washers and nuts attaching waste-gate and actuator assembly to tailpipe.
c. Loosen clamp attaching tailpipe to turbine exhaust outlet and work tailpipe from turbine.
d. Remove bolts, washers and nuts attaching the assembly to the exhaust manifold.
e. Remove the assembly from aircraft, being careful not to drop the unit.
f. Installation may be accomplished by reversing the preceding steps.

NOTE

When installing the assembly, be sure the gaskets at inlet and outlet of valve are installed and are in good condition. Replace gaskets if damaged.

12A-117. ADJUSTMENT OF WASTE-GATE ACTUATOR. (See figure 12A-8.)
a. Remove waste-gate actuator in accordance with paragraph 12A-116.
b. Plug actuator outlet port and apply a 50 to 60 psig air pressure to the inlet port of the actuator.
c. Check for 0.00 gap between butterfly and waste-gate body as shown in figure 12A-8.
d. If adjustment is required, remove pin from actuator shaft.
e. Hold clevis end and turn shaft clockwise to increase gap or counterclockwise to decrease gap of butterfly. Install pin through clevis and shaft, securing pin with washer and cotter pin.
f. After adjusting closed position and with zero pressure in cylinder, check butterfly for a clearance of 1.100 + .000 -.125 inch in the full-open position as shown in figure 12A-8.
g. If adjustment is required, loosen locknut and turn stop screw clockwise to decrease or counterclockwise to increase clearance of butterfly.

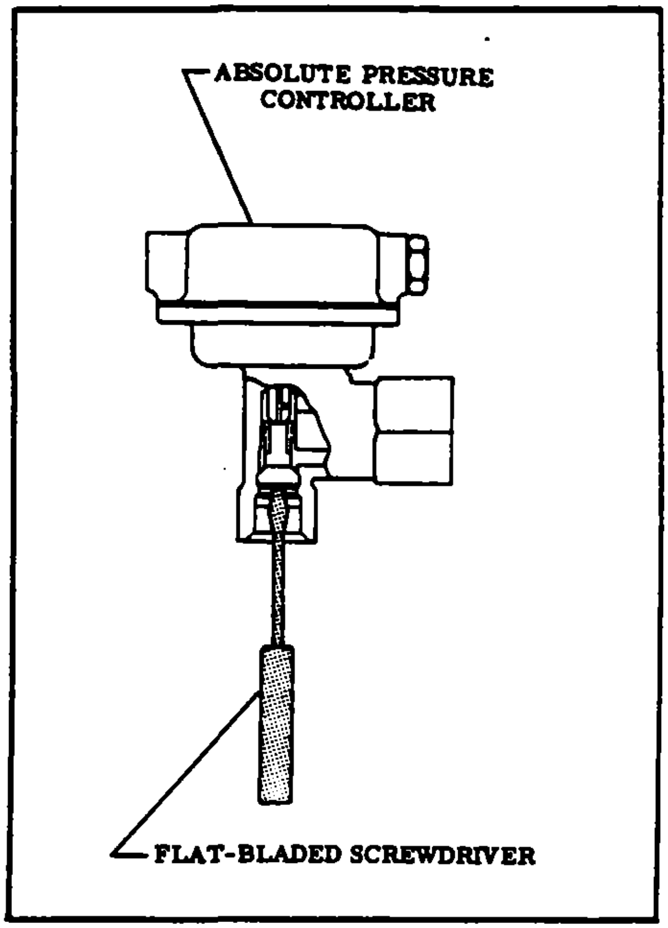


Figure 12A-7. Controller Adjustment

SHOP NOTES:

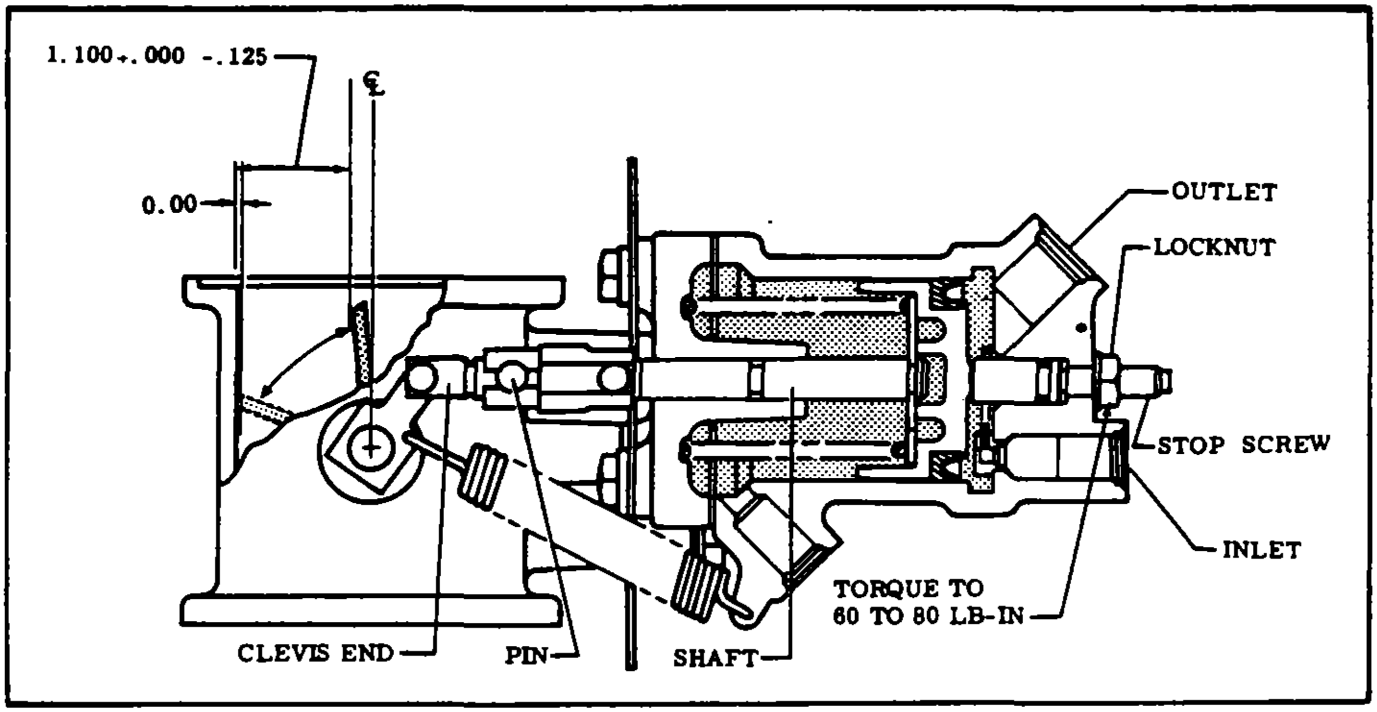


Figure 12A-8. Waste-Gate Adjustment

h. Recheck butterfly in the closed position to ascertain that gap tolerance has been maintained.

NOTE

To assure correct spring loads, actuate butterfly with air pressure. Actuator shaft and butterfly should move freely. Actuator shaft should start to move at 15±2 psig and fully extend at 35±2 psig. Two to four psi hysteresis is normal, due to friction of O-ring against cylinder wall.

i. Remove air pressure line and plug from actuator.

j. Install waste-gate and actuator as outlined in paragraph 12A-116.

12A-118. EXTREME WEATHER MAINTENANCE. Refer to paragraph 12-106.

12A-119. COLD WEATHER. Refer to paragraph 12-107.

12A-120. SEACOAST AND HUMID AREAS. Refer to paragraph 12-109.

12A-121. GROUND SERVICE RECEPTACLE. Refer to Section 17.

SHOP NOTES:

SECTION 13

FUEL SYSTEM

TABLE OF CONTENTS

13-1 FUEL SYSTEM. The fuel system as de scribed in this manual includes all components of fuel system up to and including the fuel line connecting to the engine driven fuel pump

13-2. DESCRIPTION. Fuel is gravity fed from the wing mounted cells through the fuel reservoir tanks located just forward of the front door post, underneath the cabin floor, to the engine driven fuel pump. Acting as both a fuel feed and vapor return line, is the line from the lower forward connection of each cell. Fuel by-passes the electric, (auxiliary) fuel pump, when it is not operating. Both fuel cells are vented overboard through individual fuel cell vents located beneath the wings just aft of the wing struts.

13-3. PRECAUTIONS. Observe the following general precautions and rules during fueling, defueling, tank or integral fuel bay purging, repairing, assembly or disassembly of system components, and electrical system checks and repairs on the airplane fuel system

WARNING

DURING ALL FUELING PROCEDURES, FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE. TWO GROUND WIRES FROM DIFFERENT POINTS ON THE AIRPLANE TO SEPARATE APPROVED GROUND STAKES SHALL BE USED TO PREVENT ACCIDENTAL DISCONNECTION OF ONE GROUND WIRE. ENSURE THAT FUELING NOZZLE IS GROUNDED TO THE AIRPLANE.

NOTE

Tie-down rings should be used as grounding points for all grounding wires during re-fueling procedures.

13-4. TROUBLE SHOOTING.

Use this chart in conjunction with the engine trouble shooting charts in Section 12 and 12A.

TROUBLE	PROBABLE CAUSE	REMEDY
NO FUEL FLOW TO ENGINE-DRIVEN FUEL PUMP.	Fuel selector valve not turned on.	Turn fuel selector valve on.
	Fuel cells empty.	Service with proper grade and amount of fuel.

13-4. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
NO FUEL FLOW TO ENGINE-DRIVEN FUEL PUMP. (Cont).	Fuel line disconnected or broken.	Connect or repair fuel lines.
	Fuel cell screen plugged.	Remove and clean screen. Flush out fuel cell.
	Defective fuel selector valve.	Remove and repair or replace selector valve.
	Plugged fuel strainer.	Remove and clean strainer and screen.
	Defective check valve in electric fuel pump.	Repair or replace electric pump.
	Fuel line plugged.	Disconnect lines as necessary to locate obstructions, then clean.
FUEL STARVATION AFTER STARTING.	Partial fuel flow from the preceding causes.	Use the preceding remedies.
	Malfunction of engine-driven fuel pump or fuel injection system.	Refer to Section 12 or 12A.
	Fuel vents plugged.	See paragraph 13-7.
	Water in fuel.	Drain fuel tank sumps, fuel lines, and fuel strainer.
NO FUEL FLOW WHEN ELECTRIC PUMP OPERATED.	Defective fuel pump switch.	Replace defective switch.
	Open or defective circuit breaker.	Reset. Replace if defective.
	Loose connections or open circuit.	Tighten connections; repair or replace wiring.
	Defective electric fuel pump.	Replace defective pump.
	Defective engine-driven fuel pump bypass or defective fuel injection system.	Refer to Section 12 or 12A.
NO FUEL QUANTITY INDICATION.	Fuel cells empty.	Service with proper grade and amount of fuel.
	Circuit breaker open or defective.	Reset. Replace if defective.
	Loose connections or open circuit.	Tighten connections; repair wiring.
	Defective fuel quantity indicator.	Replace indicator or sending unit.
FLUCTUATING FUEL PRESSURE INDICATIONS. (TURBO AIRCRAFT)	Obstructed filter in fuel inlet strainer of metering unit.	Remove and clean.
	Manifold valve.	Replace.
	Fuel flow indicator.	Replace.

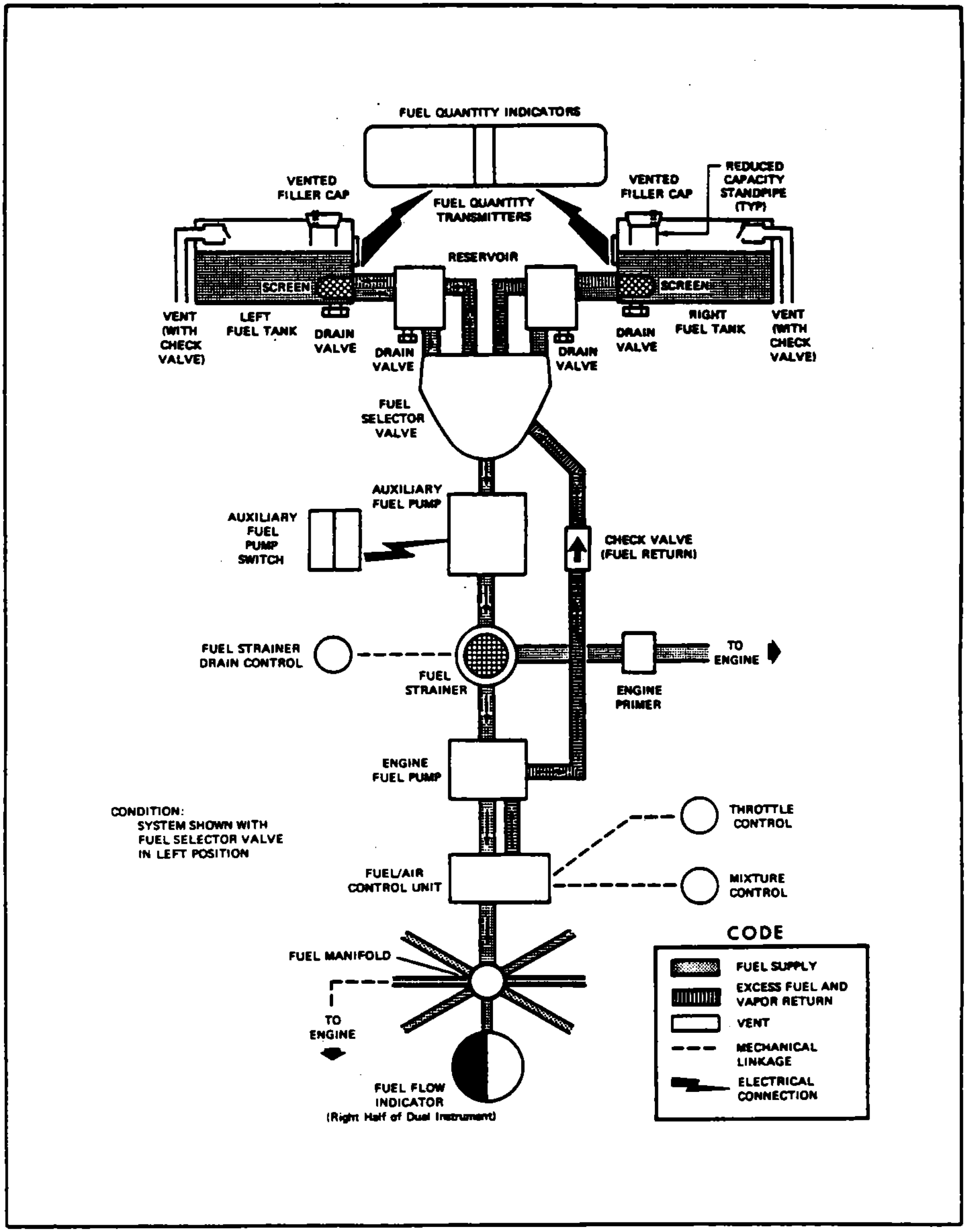
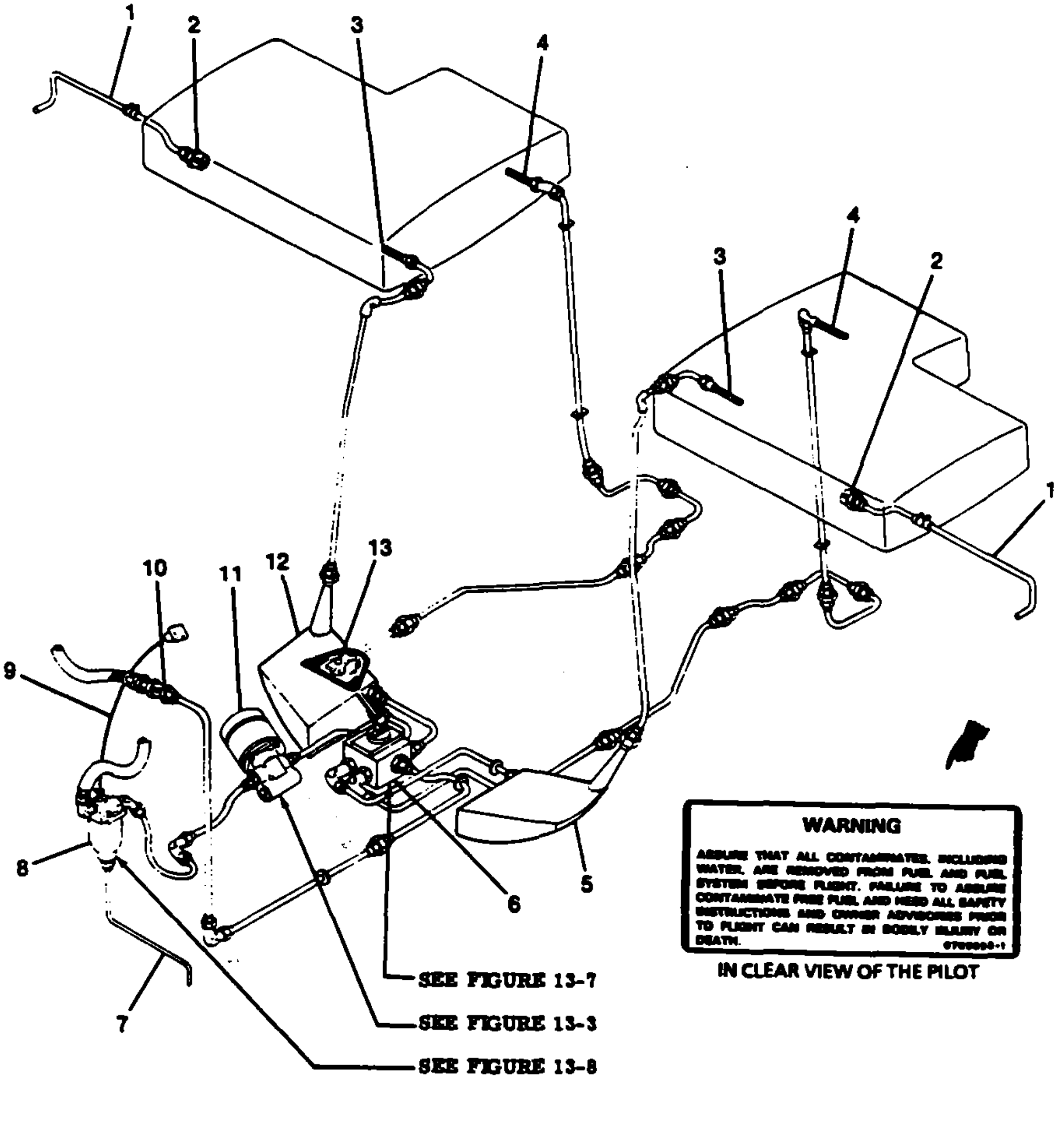


Figure 13-1. Fuel System Schematic



1. Fuel Vent Line
2. Fuel Vent Valve
3. Forward Line Screen
4. Aft Line Screen
5. Left Reservoir
6. Fuel Selector Valve
7. Auxiliary Pump Drain Line
8. Fuel Strainer
9. Strainer Drain Control
10. Vapor Return Check Valve
11. Auxiliary Fuel Pump
12. Right Reservoir
13. Fuel Selector Handle

Figure 13-2. Fuel System

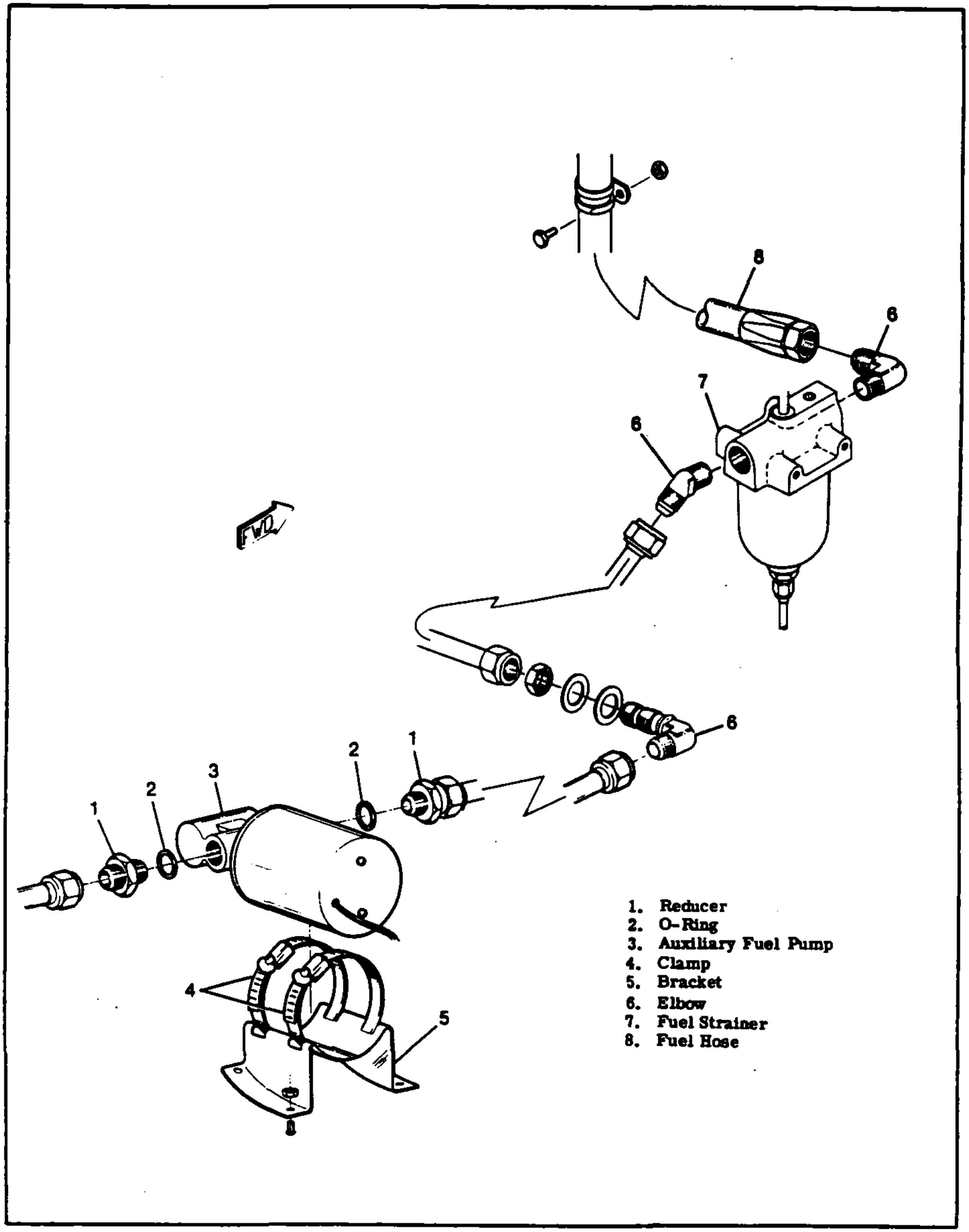


Figure 13-3. Electric Fuel Pump and Strainer Installation

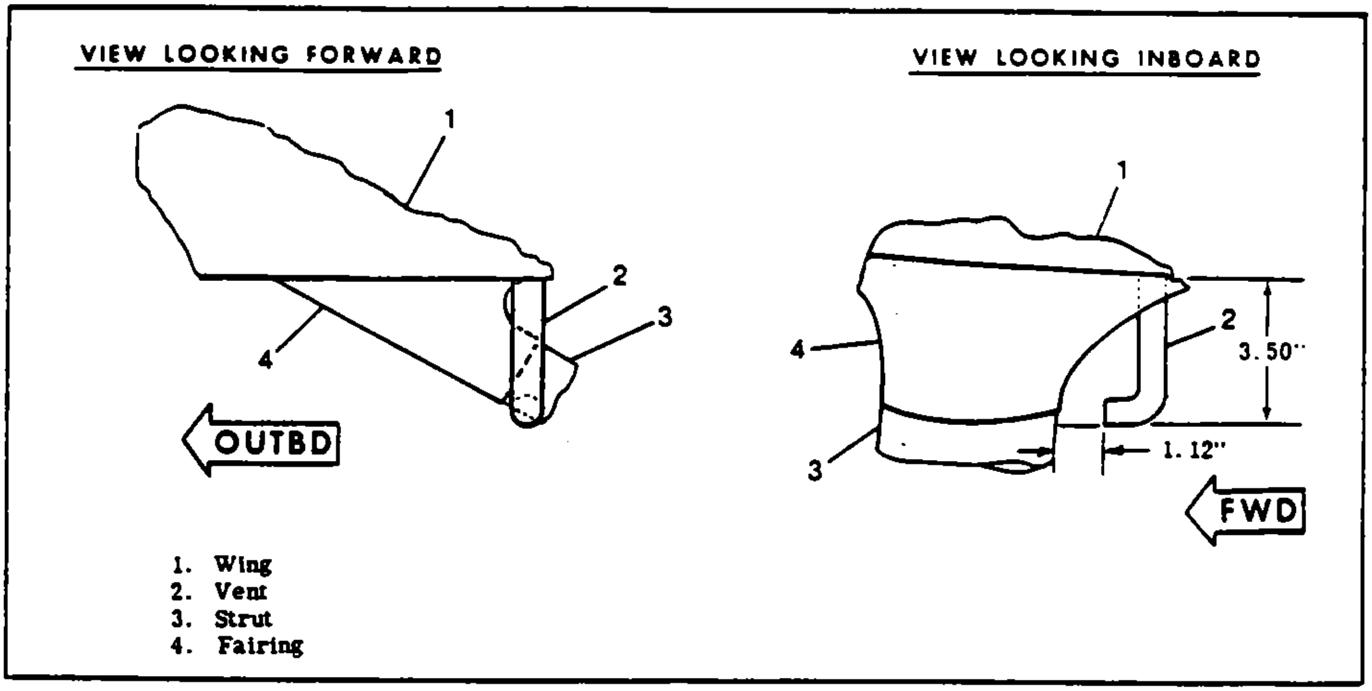


Figure 13-4. Fuel Vent Location

WI 53140) or MIL-T-5544 (Thread Compound. Antiseize. Graphite Petrolatum) USP Petrolatum. or engine oil as a thread lubricant. or to seal leaking connections. Apply sparingly to all but first two threads. Use of any thread compound is PROHIBITED on the injection system.

13-5. FUEL VENTS.

13-6. DESCRIPTION. A fuel vent line is installed in the outboard end of each fuel cell. The vent line extends overboard down through the lower wing skin. The inboard end of the vent line extends into the fuel cell. then bends down and aft from cell upper surface. A vent valve is installed on the inboard end of the vent line inside the fuel cell.

13-7. CHECKING FUEL VENT. Due to physical size, fuel vents can easily become plugged, preventing proper fuel flow to engine. Also the bleed hole can become stopped-up allowing pressurization of fuel cells and possible siphoning of fuel with natural expansion of gas. The following procedures should be used to check operability of cell vent and bleed systems.

a. Attach a rubber tube to the end of the vent line beneath one wing.
b. Plug vent on opposite wing from one being tested.
c. Turn off fuel selector valve.
d. Blow into tube to slightly pressurize the tank. If air can be blown into the tank, the vent line is open.
e. After tank is slightly pressurized, insert end of rubber tube into a container full of water and watch for a continous stream of bubbles. which indicates the bleed hole in valve assembly is open and relieving pressure.
f. Repeat procedures for opposite fuel bay.

NOTE

Remember that a plugged vent line or bleed hole can cause either fuel starvation or the pressurization of bays by fuel expansion.

NOTE

The fuel vent outlet, that portion protruding beneath the wing, must be correctly aligned in relation to the wing strut to prevent icing, see figure 13-4.

CAUTION

All fuel vents found plugged or restricted must be corrected prior to returning aircraft to service.

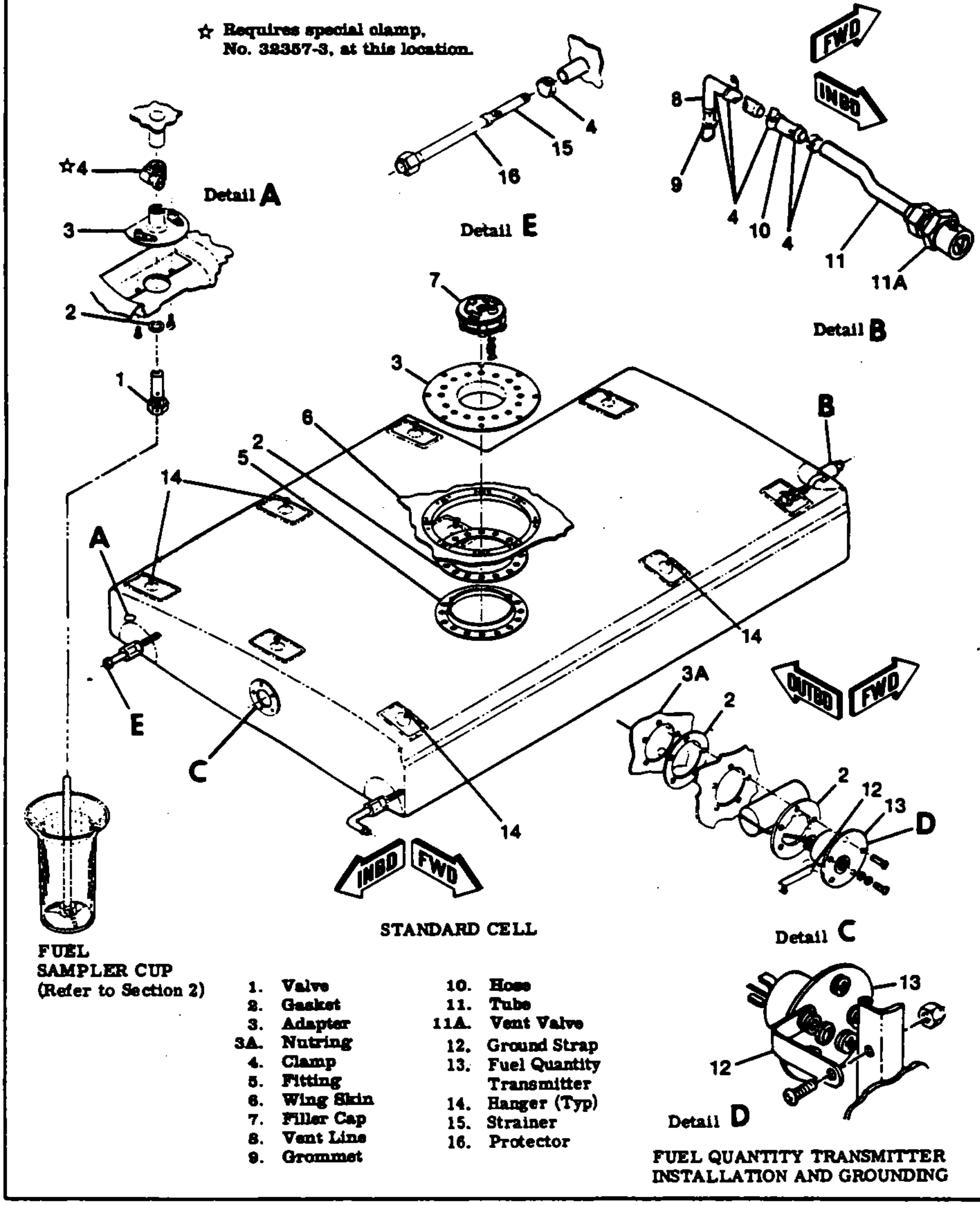
13-8. FUEL CELLS. (RUBBERIZED.)

13-9. DESCRIPTION. Rubberized. bladder-type fuel cells are installed in the inboard bay of each wing panel. These cells are secured by fasteners to prevent collapse of the flexible cells.

13-10. GENERAL PRECAUTIONS. When storing inspecting or handling rubberized, bladder-type fuel cells, the following precautions should be adhered to:
a. Fold cells as smoothly and lightly as possible with a minimum number of folds. Place protective wadding between folds.
b. Wrap cell in moisture-proof paper and place in a suitable container. Do not crowd cell in container. Use wadding to prevent movement.
c. Stack boxed cells to allow access to oldest cells first. Do not allow stacks to crush bottom boxes. Leave cells in boxes until used.

Hinge for vent valve (11A) must be at top. Tube (11) for vent extends into fuel cell, then bends down and aft.

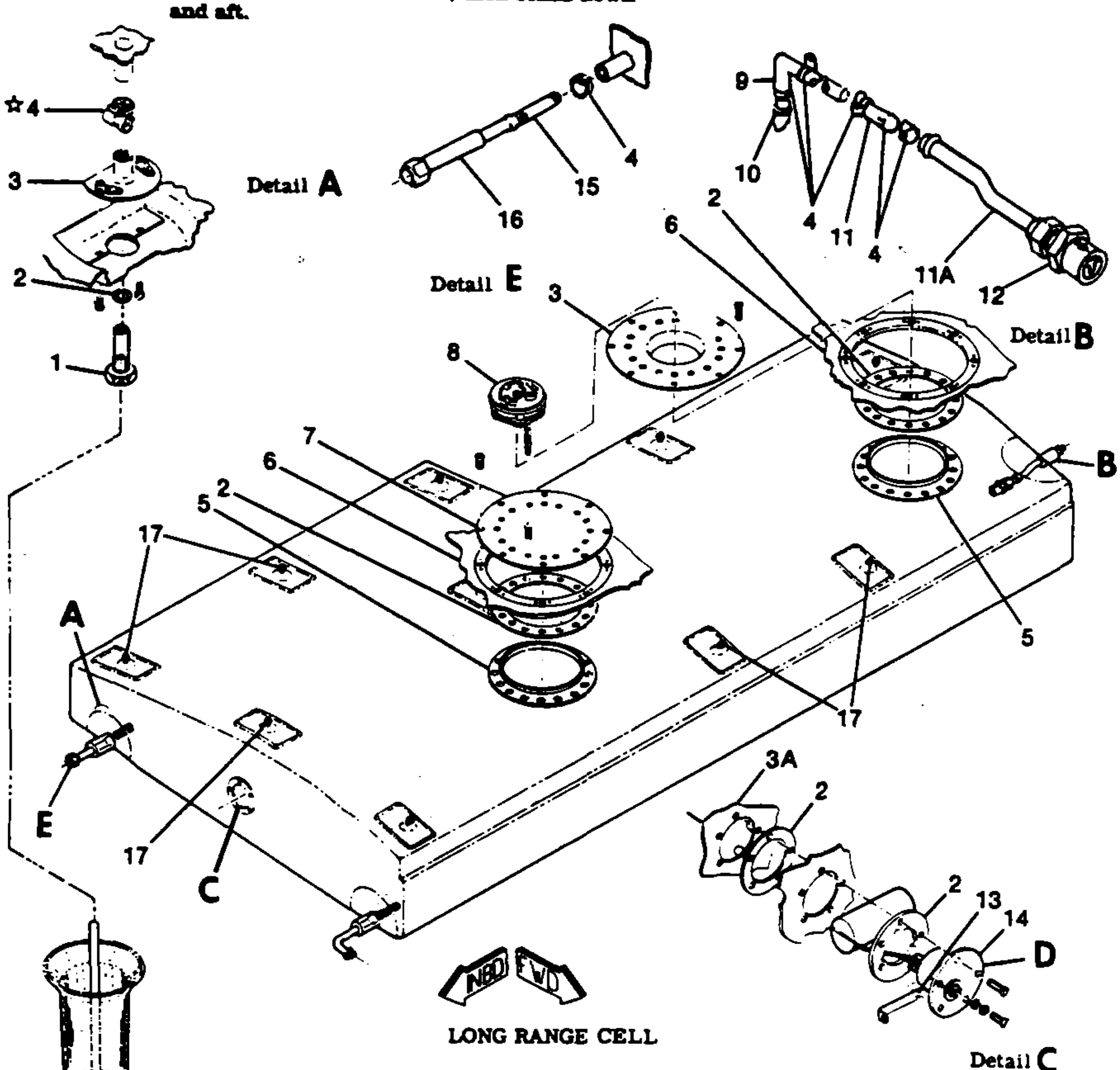
☆ Requires special clamp, No. 32357-3, at this location.



1. Valve
2. Gasket
3. Adapter
3A. Nutring
4. Clamp
5. Fitting
6. Wing Skin
7. Filler Cap
8. Vent Line
9. Grommet
10. Hose
11. Tube
11A. Vent Valve
12. Ground Strap
13. Fuel Quantity Transmitter
14. Hanger (Typ)
15. Strainer
16. Protector

Figure 13-5. Fuel Cell Installation (Sheet 1 of 2)

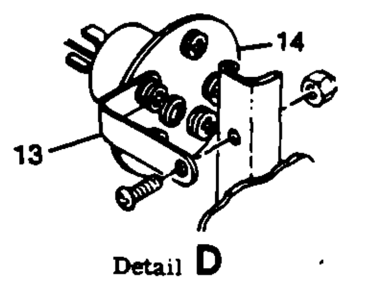
Hinge for vent valve (12) must be at top. Tube (11A) extends into fuel cell, then bends down and aft.



FUEL SAMPLER CUP (Refer to Section 2)

☆ **Requires special clamp number S2357-3 at this location.**

1. **Valve**
2. **Gasket**
3. **Adapter**
3A. **Nutring**
4. **Clamp**
5. **Fitting**
6. **Wing Skin**
7. **Cover Plate**
8. **Filler Cap**
9. **Vent Line**
10. **Grommet**
11. **Hose**
11A. **Tube**
12. **Vent Valve**
13. Ground Strap
14. Fuel Quantity Transmitter
15. Strainer
16. Protecter
17. Hanger (Typ)



FUEL QUANTITY TRANSMITTER INSTALLATION AND GROUNDING

Figure 13-5. Fuel Cell Installation (Sheet 2 of 2)

d. Storage area must be cool, +30°F to +85°, and free of exposure to sunlight, dirt and damage.
e. Used cells must be cleaned with soap and warm water prior to storage. Dry and package as outlined in the preceding steps.
f. Do not carry cells by fittings. Maintain original cell contours or folds when refolding for boxing.

13-11. FUEL CELL REMOVAL.
a. Drain fuel from applicable cell.

NOTE

Befor removing cell, drain, wash, and fresh air purge to remove all traces of fuel and vapors.

b. Remove wing root fairings and disconnect fuel lines at wing root.
c. Remove clamps from forward and aft fuel cell bosses at wing root and carefully work fuel strainers and lines from cell bosses.
d. Disconnect electrical lead and ground strap from fuel quantity transmitter and carefully work transmitter from fuel cell and wing rib.
e. Remove screws attaching drain adapter to lower surface of wing.
f. Remove fuel filler adapter and gaskets by removing screws attaching adapter to wing and fuel cell. On aircraft equipped with long-range cells, remove cover plate and gaskets, and remove nylon vent tube from inside cell.
g. Work through filler neck opening, loosen snap fasteners. Tilt snap fasteners slightly when pulling cell free, to prevent tearing rubber.
h. Collapse and carefully fold cell for removal, then work cell out of fuel bay through filler opening in upper wing surface. Use care when removing to prevent damage to cell.
i. Unfold cell and remove fittings, snap fasteners and fuel sump drain adapter.

13-12. FUEL CELL REPAIR.

NOTE

For fuel cell repair information, refer to Cessna Service News Letter dated August 28, 1970. For minor repair, a fuel cell repair kit is available from Goodyear, complete with required materials and instructions.

13-13. FUEL CELL INSTALLATION. (See figure 13-5.)

a. Thoroughly clean fuel cell compartment, removing all foreign materials and rounding off all sharp protrusions.
b. Apply protective tape to rivets and edges to protect fuel cell.
c. Inspect cell compartment just prior to installation of a cell for conditions noted in the preceding steps.
d. Install fuel drain adapter and snap fasteners.
e. Check to ensure cell is warm enough to be flexible and fold as necessary to fit through fuel cell access opening.
f. Place cell in compartment, develop it out to full size and attach fasteners, then reverse procedures outlined in the preceding paragraph for installation. Install all new gaskets when installing cell.
g. On aircraft equipped with long range cells, install nylon vent tube inside cell, inserting tube through four hangers (17) in top of cell. If a replacement cell is being installed, use nylon vent tube removed from old cell or order tube from applicable Parts Catalog.
h. When tightening screw-type clamps (4) on the standard fuel cell (BTC-39 construction), apply a maximum torque of 20 inch-pounds to clamp screws. On the extended range fuel cell (BTC-67 construction), apply a maximum torque of 30-35 inch-pounds to clamp screws. A light application of No. 10 engine oil to metal tube aids installation into nipple fittings.
i. When installing filler adapter (3) cover plate (7) fuel quantity transmitter to the wing and fuel cell, tighten attaching screws evenly. The sealing or compression surfaces must be assembled when absolutely dry (NO SEALING PASTE IS TO BE USED).
j. After installation has been completed, cell should be inspected for final fit within compartment, making certain that cell is extended out to the structure and no corners are folded in.
k. The final inspection, prior to closing the cell, should be a close check to ensure that cell is free of foreign matter such as lint, dust, oil or any installation equipment. If a cell is not thoroughly clean, it should be cleaned with a lint-free cloth, soaked in water, alcohol or kerosene. NO OTHER SOLVENT SHALL BE USED.

13-14. VENTED FUEL FILLER CAPS. (See figure 13-6.)

13-15. DESCRIPTION. The flush-type filler cap assemblies may be constructed of either metal or red plastic. Both cap assemblies incorporate a vent safety valve that provides vacuum and positive pressure relief for their respective fuel tanks. It is important that both type caps to be cleaned on as required basis, if proper filler cap sealing is to be maintained. Beginning with 1985 models, flush-type filler caps are replaced with LSE-type filler caps.

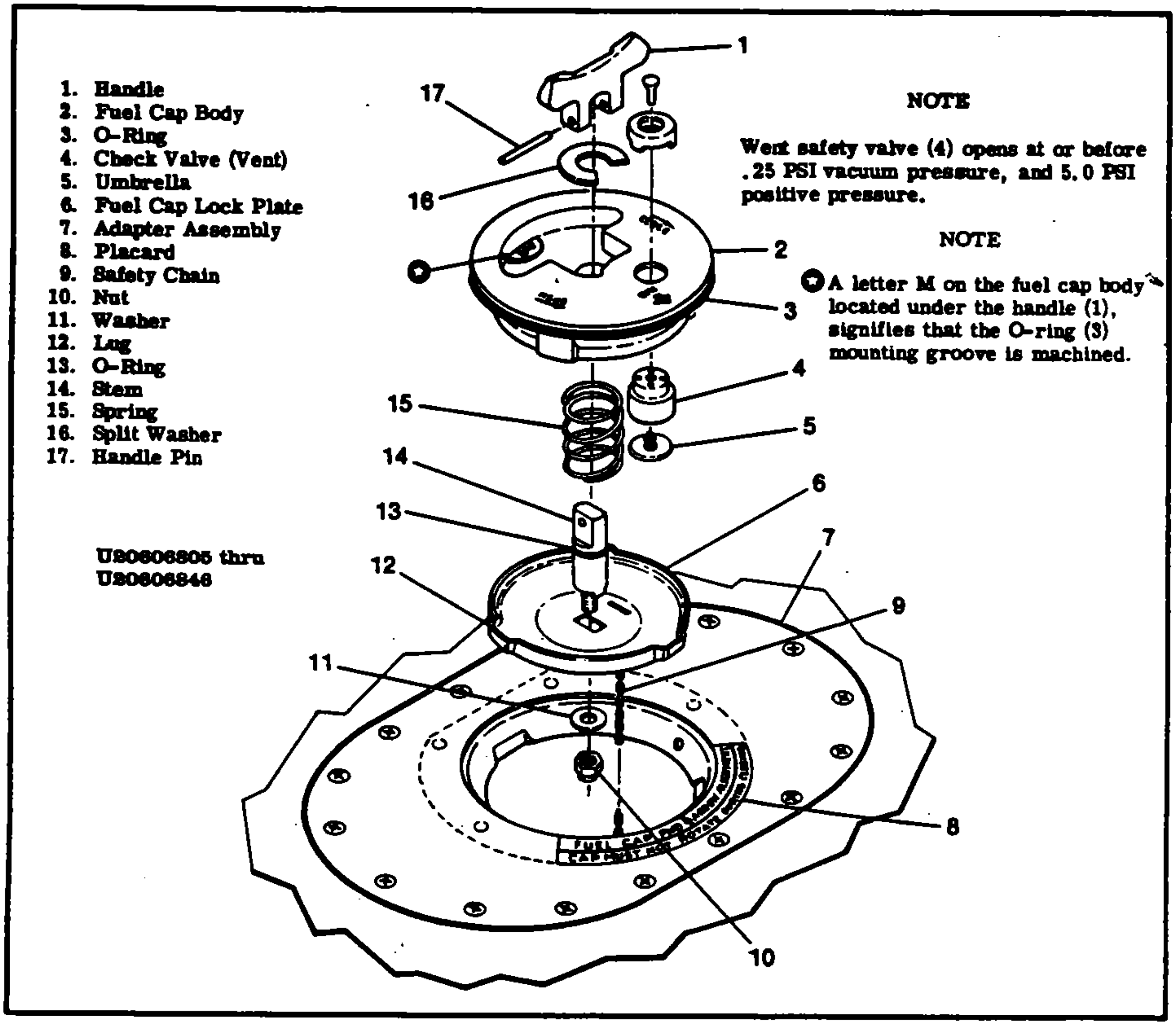


Figure 13-6. Fuel Filler Cap - Metal (Sheet 1 of 3)

13-16. METAL "FLUSH-TYPE" FILLER CAPS. Except for minor differences in construction and weight, metal fuel filler caps perform the same function as red plastic fuel filler caps. The caps are interchangeable and will fit the same adapter assembly.

13-17. INSPECTION.

NOTE

If fuel collects in the handle well it could indicate stem O-ring leakage. Fuel collecting around perimeter of cap could indicate cap O-ring or check valve leakage.

a. Remove fuel cap from adapter (7), remove safety chain (9) from cap and cover or plug fuel opening to keep out foreign matter.

b. Remove nut (10) and, observing position of lock plate (6) in relation to stem (14) disassemble cap.

c. Note resiliency of O-rings (3 & 13) and condition of grooves. If the O-rings (3 & 13) have deteriorated they must be replaced.

13-18. CLEANING.

a. Using a cotton swab and Stoddard solvent or equivalent, gently lift edges of rubber umbrella (5) and clean stainless steel seat and umbrella removing all contaminates. Using a second swab wipe seat and umbrella thoroughly, removing all cotton fibers. Repeat until swabs show no discoloration.

b. If O-ring grooves appear contaminated, clean with Stoddard solvent or equivalent and cotton swabs.

c. Ascertain that all vent holes in check valve are unobstructed.

d. Clean cap body and lock plate, check for defects.

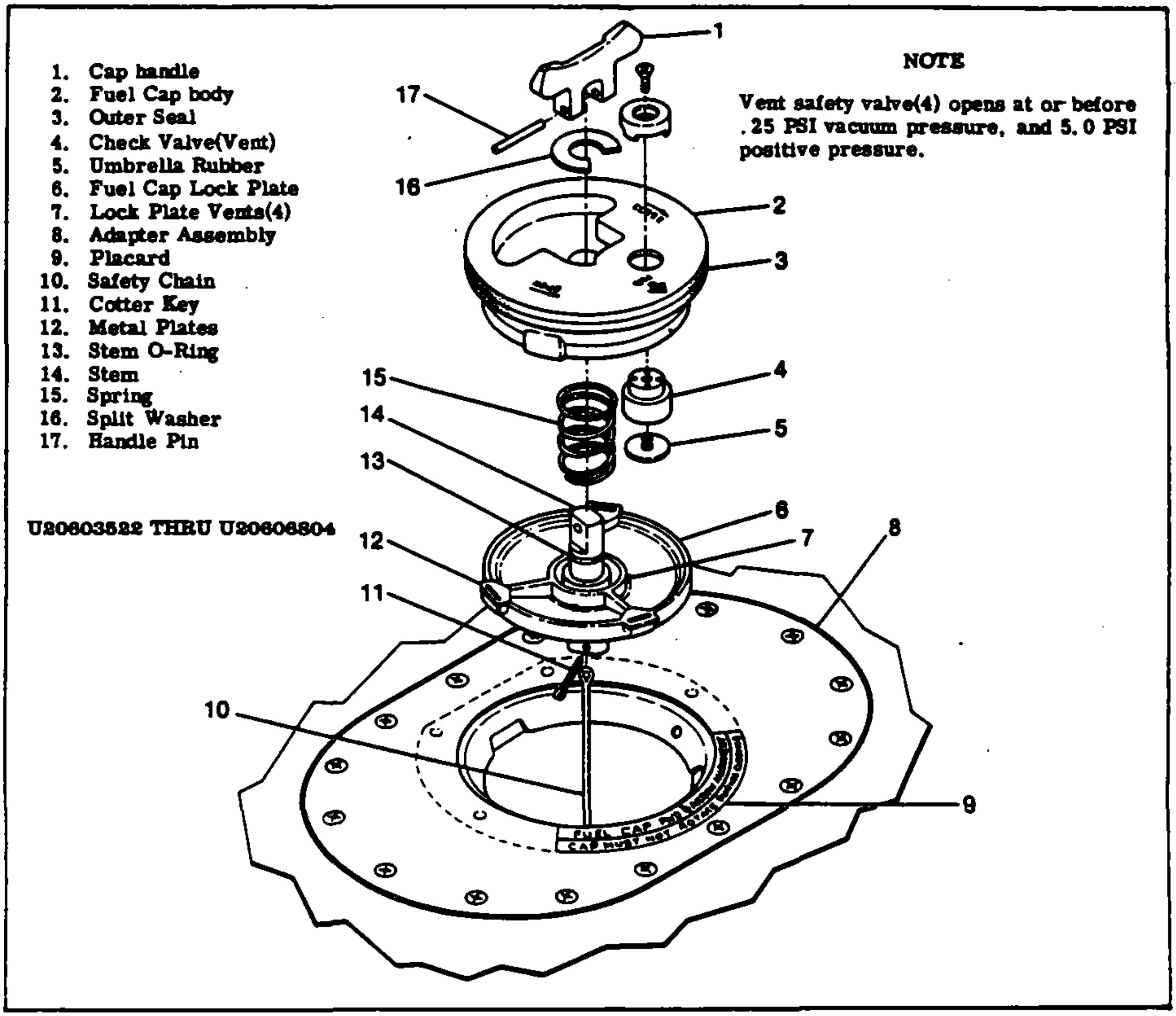


Figure 13-6. Fuel Filler Cap - Plastic or Metal (Sheet 2 of 3)

e. If the umbrella continues to leak or is deteriorated it must be replaced.

f. To remove umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid to prevent tearing the stem.

g. To replace the umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid and use a small blunt tool to insert the retaining knob on the umbrella stem into the check valve body to prevent damaging the stem.

13-19. REASSEMBLY.

a. Place split washer (16) in cap well correctly.

b. With handle (1) and O-ring installed on stem (14), insert stem (14) through split washer (16) on cap body (2).

c. Place spring (15) on stem (14).

d. Position cap handle (1) to full "OPEN" position.

e. Place lock plate (6) on threaded end of stem (14) and align all three lugs (12) with three guide bosses on the cap body (2).

f. Check that square hole in bottom of lock plate (6) is aligned with square surface on threaded end of stem (14).

NOTE

It is possible to install the lock plate (6) 180° out of the desired position, if the alignment procedures in steps "d" and "f" are not followed. If the cap will not fit when assembled, remove the lock plate (6) and reassemble after rotating it 180°.

g. Compress the lock plate (6) and fuel cap body (2) and secure with washer (11) and nut (10).

h. Connect fuel cap assembly to safety chain (9) and reinstall in tank.

1. Umbrella
2. Check Valve
3. Gasket
4. Frictionless Washer
5. Body
6. Cover
7. Screw

NOTE

Check valve (2) shall open at or before 4.0 inches of water vacuum pressure, and be able to withstand 0.5 PSI positive pressure without leakage.

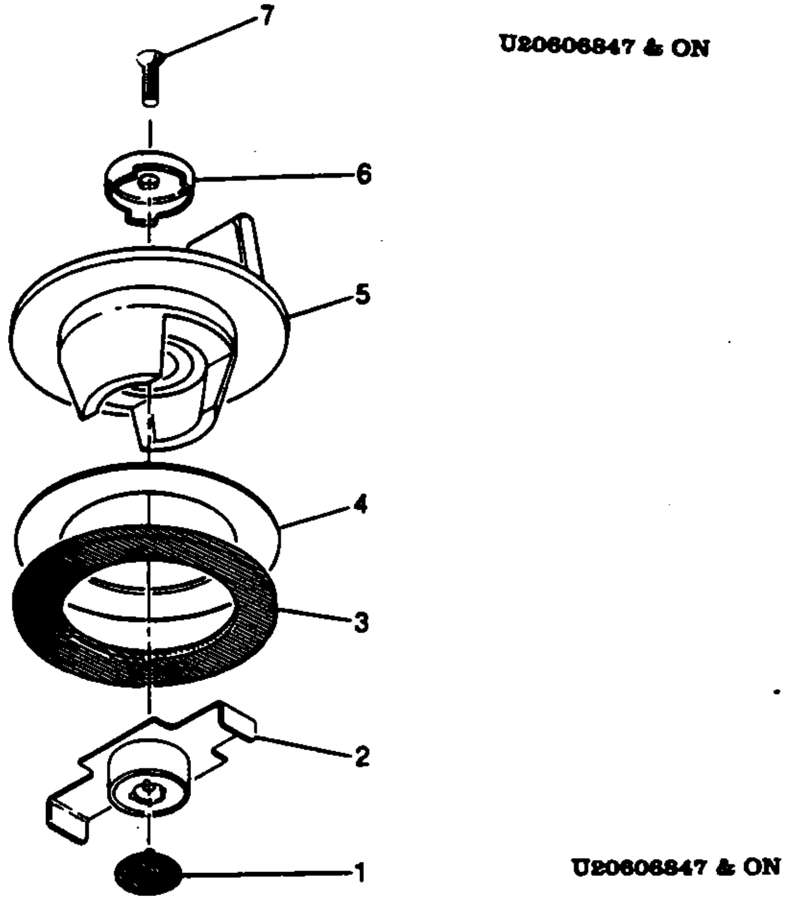


Figure 13-6. Fuel Filler Cap - LSE (Sheet 3 of 3)

13-19A. CLEANING LSE FUEL FILLER CAPS.

a. Disconnect safety chain and remove RH filler cap from fuel tank adapter.

b. Plug fuel tank opening to keep dirt and foreign matter from contaminating the tank.

NOTE

Check condition of gasket (3) and frictionless washer (4). Replace gasket and washer if worn or fuel leaks between adapter gasket.

c. Using cotton swabs and Stoddard solvent or equivalent, gently lift edges of rubber umbrella and clean seat and umbrella, removing all contaminants. Using a second swab, wipe seat and umbrella thoroughly, removing all cotton fibers. Repeat until swabs show no discoloration.

d. If the umbrella continues to leak or is deteriorated, remove and replace. To remove the umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid to prevent tearing the stem. When installing the new umbrella, lubricate the stem with (MIL-H-5606) hydraulic fluid and use a small blunt tool to insert the retaining knob on the umbrella into the check valve body.

e. Unplug fuel tank, connect fuel cap to safety chain, and reinstall cap in the adapter assembly.

13-20. RED PLASTIC "FLUSH-TYPE" FILLER CAPS. A red plastic "Flush-Type" vented filler cap may be used. Extra care is required when reinstalling plastic filler caps in the fuel filler adapter assembly. An improperly installed filler cap could cause a loss of fuel from the tanks during flight.

13-21. INSPECTION.

NOTE

If fuel collects in the handle well it could indicate stem O-ring leakage. Fuel collecting around perimeter of cap could indicate cap outer seal or check valve leakage.

a. Remove fuel cap from adapter (8), remove safety chain (10) from cap and cover or plug fuel opening to keep out foreign matter.
b. Rotate cap handle (1) to the "OPEN" position, compress cap body (2) and lock plate (6) to expose the .125 inch diameter handle pin (17).
c. Using a small wire push out the handle pin (17).
d. Note resilience of O-ring (13) and outer seal (3) and condition of grooves. If the O-ring (13) or the outer seal (3) have deteriorated they must be replaced.
e. Note condition of tabs on lock plate (6) for signs of abnormal wear, if such wear is evident replace the complete cap assembly.

13-22. CLEANING.
a. Using a cotton swab and Stoddard solvent or equivalent, gently lift edges of rubber umbrella (5) and clean stainless steel seat and umbrella removing all contaminates. Using a second swab wipe seat and umbrella thoroughly, removing all cotton fibers. Repeat until swabs show no discoloration.
b. If O-ring or outer seal grooves appear contaminated, clean with Stoddard solvent or equivalent and cotton swabs.
c. Ascertain that all vent holes in check valve are unobstructed.
d. Clean cap body and lock plate, check for defects.
e. If the umbrella continues to leak or is deteriorated it must be replaced.
f. To remove umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid to prevent tearing the stem.
g. To replace umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid and use a small blunt tool to insert the retaining knob on the umbrella stem into the check valve body to prevent damaging the stem.

13-23. REASSEMBLY.

NOTE

If fuel was observed leaking around the cap periphery prior to disassembly and the leakage was not due to a bad O-ring or outer seal an additional split washer (16) may be added for a total of two, prior to reassemblying cap. To make sure that these washers are not installed upside down, check to see that edges of the split parallel the respective sides of the cap well. The addition of a washer under the cap handle will increase the effort required to uncap the fuel tank.

a. Install spring (15) on stem (14).
b. Install fuel cap body (2) on stem (14).
c. Check that three metal plates (12) on top rim of lock plate (6) are aligned with three guide bosses on fuel cap body (2).

CAUTION

It is possible to install the handle pin in the pin hole 180° out of the desired position, if the alignment procedure in step "c" is not followed. If the handle (1) is not installed properly the FWD arrow on the cap will not align with the arrow on the placard (9) when the cap is reinstalled.

d. Compress cap body (2) and lock plate (6), install split washer(s) (16) as required.
e. Install cap handle (1) on stem (14) so that the handle (1) will be in the open position.
f. Insert handle pin (17) through handle (1) and stem (14).
g. Connect fuel cap assembly to safety chain (10) and reinstall fuel cap. Make certain that the arrow on the fuel cap body (2) and the arrow on the placard (9) align.

13-23A. LEAK TESTING METAL OR RED PLASTIC FILLER CAPS.

The following procedure may be used to detect fuel filler cap leakage.
a. Service the aircraft with approved fuel filling each bay.
b. Place the fuel selector in the OFF position.
c. Plug one of the fuel bay vent lines (where it protrudes beneath the wing) with a small rubber plug or tape.
d. Connect a rubber hose to the other vent. Then tee into this hose a pressure measuring device, such as a water manometer, manifold pressure gage or airspeed indicator.
e. Blow into the open end of the hose. The pressure must not exceed .7 psi which equals 20 inches of water on a water manometer, or 1.43 inches Hg on a manifold pressure gage, or 174 Kts on an airspeed indicator.

WARNING

Do not inhale fuel vapor while blowing into the rubber hose.

f. It may take several applications of pressure to bring the bay to the desired pressure level.

WARNING

Do not apply regulated or unregulated air pressure from an air compressor to the fuel vent. Over inflation and major structural damage will occur if more than .7 psi is applied.

g. Pinch or close the rubber hose to sustain pressure in the fuel bay.
h. Apply a soap solution to the fuel filler caps and inspect for leakage around the rubber seal to filler neck junction, the fuel cap vent, and the fuel cap handle stem. Load the cap sideways in all directions by pressing on the fuel cap vent housing by hand.

NOTE

No leakage is permissible. If leaks are present, replace the cap with a new unit or repair in accordance with Cessna Service Information Letter SE 80-59 Supplement #1, dated June 23, 1980.

CAUTION

Care must be exercised in removing the fuel filler caps until the system has been depressurized.

i. After replacement or repair of either fuel filler cap, repeat the inspection.
j. Remove the rubber hose, unplug or remove the tape from the other fuel vent, and place the fuel selector in the desired position.

13-24. FUEL QUANTITY TRANSMITTERS.

13-25. DESCRIPTION. Two fuel quantity indicators, located in a cluster on the instrument panel are actuated individually by an electric fuel quantity transmitter installed in each fuel cell.

13-26. REMOVAL AND INSTALLATION. (Refer to Section 16.)

13-27. FUEL RESERVOIRS.

13-27A. DESCRIPTION. Fuel from cells in the wings is gravity-fed through the fuel reservoirs installed forward of the front doorposts beneath the cabin floor, to the engine driven fuel pump. The fuel lines from the lower forward corners of the fuel cells to the reservoirs serve as a combination fuel feed and vapor return line.

13-27B. REMOVAL AND INSTALLATION OF RESERVOIRS.
a. Remove front seats, carpeting, and access plates as necessary for access to the reservoir to be removed.
b. Disconnect fuel lines at the reservoir to be removed.
c. Remove four screws securing reservoir mounting.
d. Remove reservoir.
e. Reverse the preceding steps to install reservoir.

13-28. FUEL SELECTOR VALVE.

13-28A. DESCRIPTION. A four position fuel selector valve is located beneath the floorboard. Thru serial 20606439 a shaft incorporating two universal joints linked the valve to the fuel selector handle. Beginning with 20606440 the valve and handle are linked by a shaft only.

13-28B. REMOVAL AND INSTALLATION OF FUEL SELECTOR VALVE.
a. Drain all fuel from wing tanks at fuel tank sump drain plugs. With valve turned to LEFT TANK, drain left fuel lines at selector valve; with valve turned to RIGHT TANK, drain right fuel lines.
b. Remove control pedestal cover. (Refer to section 11 for procedures.)
c. Remove access hole covers in floorboard and fuselage skin in area of fuel selector valve.
d. Disconnect all fuel lines from selector valve.
e. Disconnect square shaft from valve by removing attached roll pin.
f. Remove bolts or screws attaching valve to support bracket and remove valve.
g. Install valve by reversing this procedure.

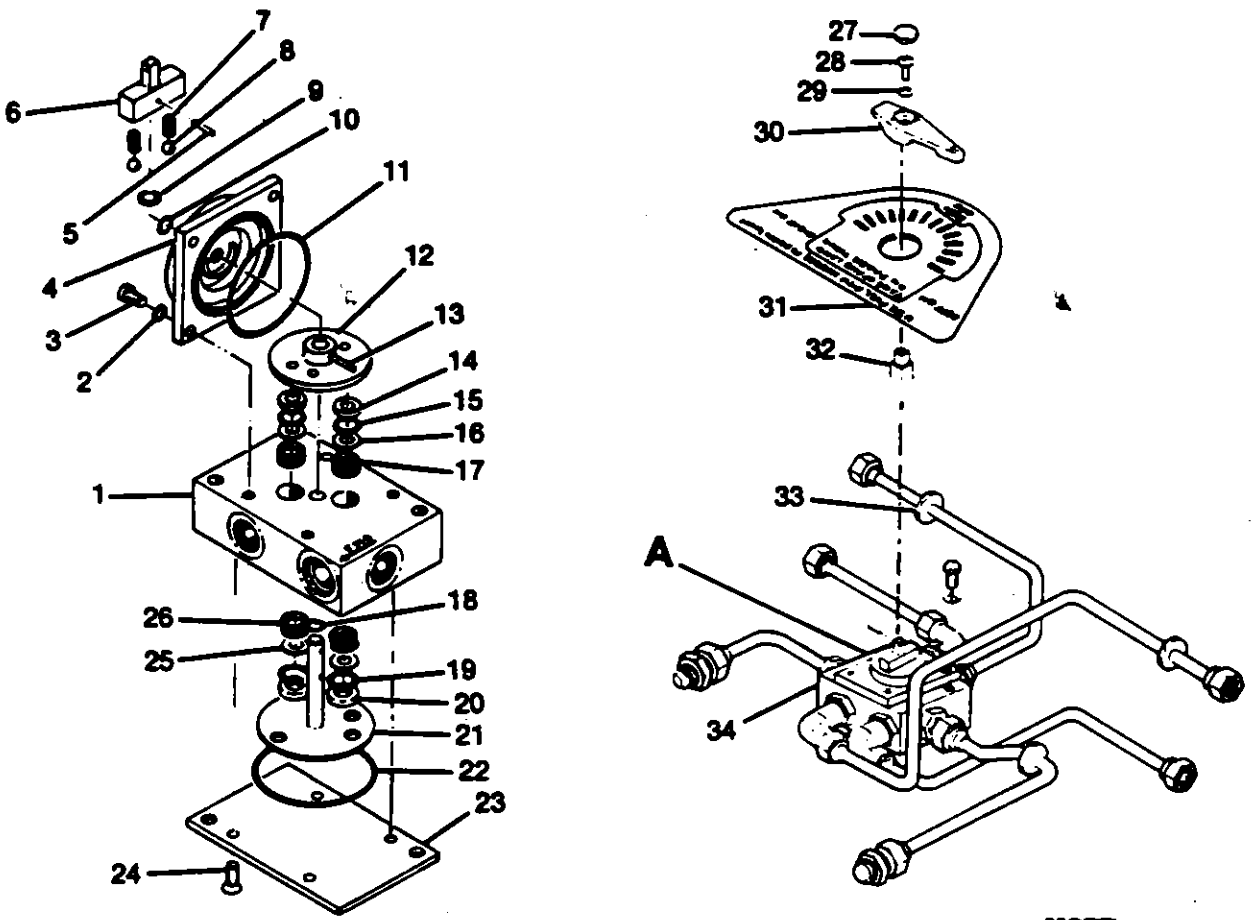
13-29. FUEL SELECTOR VALVE REPAIR. (See figure 13-7.) The fuel selector valve may be repaired by disassembly, replacement of defective parts, and reassembly as follows:

a. Mark sump plate (23) and body (1) to ensure correct reassembly, then remove sump plate (23) and O-ring (22) after removing four screws.
b. Drive out roll pin (5) securing yoke (6) to shaft. As yoke is lifted off, balls (8) and springs (7) are free. Retain them.
c. Lift off washer (9).
d. Mark cover (4) and body to assure later alignment of parts and remove screws (3).
e. With fine emery paper, sand off any burrs or sharp edges on shaft (21). Apply petrolatum to shaft as a lubricant, then work cover off shaft.
f. Drive back roll pin (13) and remove rotor (12). Teflon seal (14), O-rings (15), washers (16), and springs (17) are now free to be removed. Check all parts carefully to locate any defects.
g. Remove burrs or sharp edges on shaft, lubricate and slide it down, out of body (1). Remove teflon seals (20) and O-rings (19).
h. Remove O-ring (18) within body and O-ring (10) within cover.
i. Replace all O-rings, lap or replace teflon seals. and lubricate O-rings before installation.

CAUTION

Install all parts in the relative position depicted in figure 13-6, otherwise the valve will not operate correctly.

j. Install O-ring (18) in body shaft hole. Install O-rings (19) and teflon seals (20), then slide shaft and rotor into place. Position rotor in exact relative position shown in figure 13-7, then install O-ring (22) and sump plate (23).



Detail A

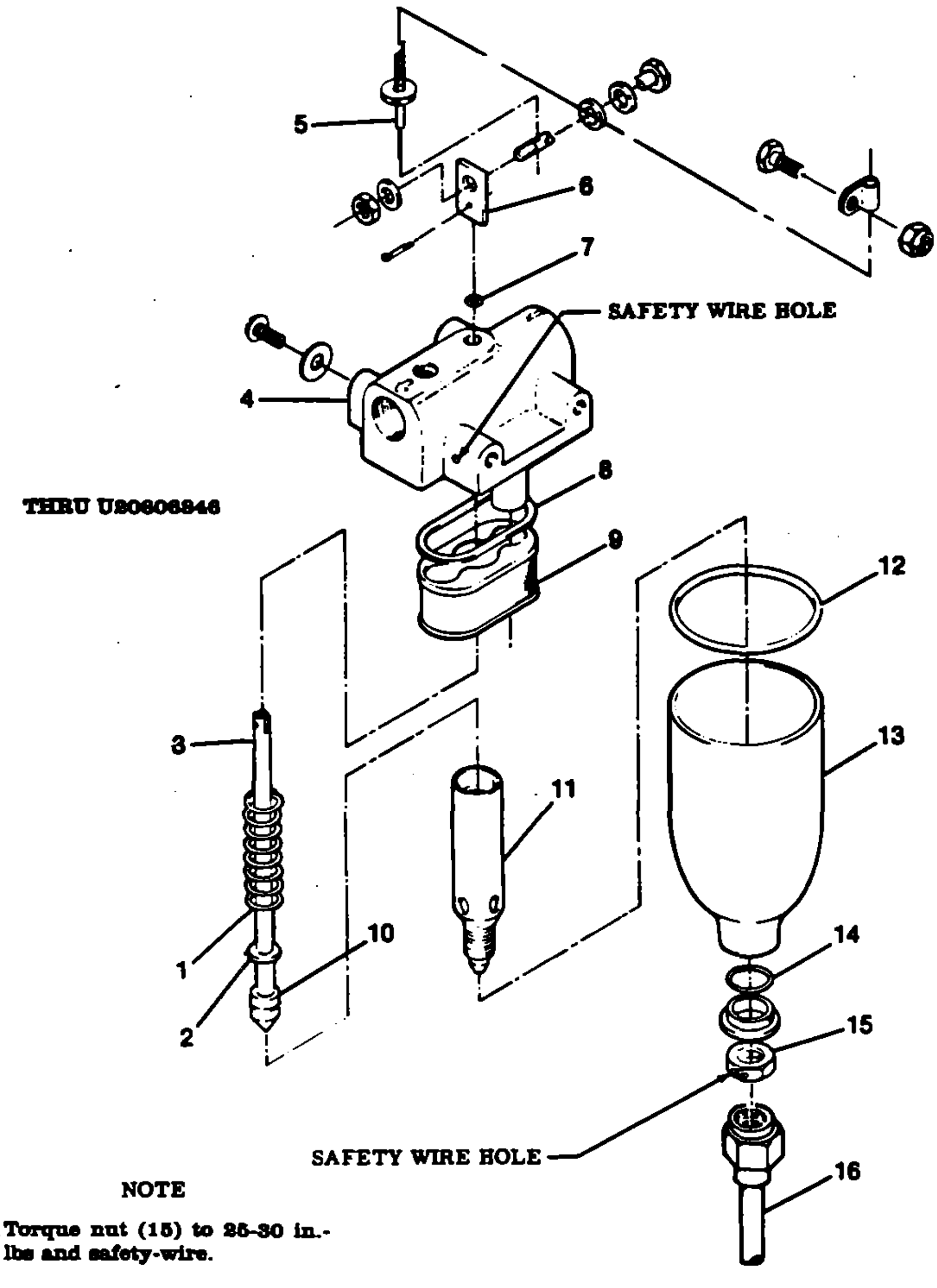
NOTE

After attaching yoke (6) to rotor (21), install and safety-wire roll pin (5).

1. Valve Body
2. Lockwasher
3. Screw
4. Cover
5. Roll Pin
6. Yoke
7. Spring
8. Ball
9. Brass Washer
10. O-Ring
11. O-Ring
12. Rotor
13. Roll Pin
14. Seal
15. O-Ring
16. Washer
17. Spring
18. O-Ring
19. O-Ring
20. Seal
21. Rotor
22. O-Ring
23. Sump Plate
24. Screw
25. Washer
26. Spring
27. Cap
28. Screw
29. Washer
30. Handle
31. Placard
32. Selector Shaft
33. Grommet
34. Selector Valve

Figure 13-7. Fuel Selector Valve Assembly

SHOP NOTES:



NOTE

Torque nut (15) to 25-30 in.-lbs and safety-wire.

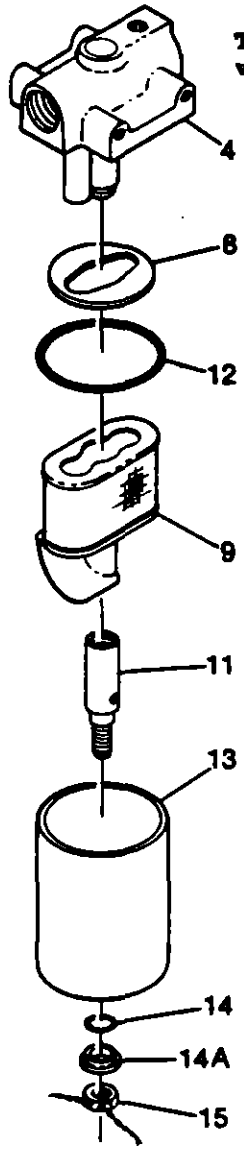
1. Spring
2. Washer
3. Plunger
4. Top
5. Drain Control
6. Plate
7. O-Ring
8. Gasket
9. Filter
10. Collar
11. Standpipe
12. O-Ring
13. Bowl
14. O-Ring
15. Nut
16. Drain Line

Figure 13-8. Fuel Strainer (Sheet 1 of 2)

4. Top
8. Gasket
9. Filter
11. Standpipe
12. O-Ring
13. Bowl
14. O-Ring
14A. Washer
15. Nut

NOTE

Torque nut (15) to 25-30 in.-lbs and safety-wire.



NOTES

Items 1, 2, 3, 5, 6, 7, and 10 have been omitted from this illustration, since installation procedures for these parts are identical for both fuel strainers.

Torque nut (15) to 25-30 in.-lbs and safety-wire.

U20606847 AND ON

Figure 13-8. Fuel Strainer (Sheet 2 of 2)

k. Install .169" diameter pins in body ports, then slide springs (17), washers (16), O-rings (15) and teflon seals over pins. Slide rotor (12) over shaft. Remove .169" dia. pins and, readjusting rotor vs. shaft position as necessary, tap roll pin (13) into place, letting it protrude on the side depicted.

NOTE

This roll pin serves also as a stop, limiting valve shaft travel.

l. Install O-ring (10) in cover, lubricate shaft (21) with petrolatum, install large O-ring (11), and slide cover down into place.

CAUTION

Make sure cover is installed in relative position illustrated. A lug on the cover protrudes to serve as a stop detent and if the cover is not installed correctly, the valve will not operate correctly.

m. Install brass washer (9) and yoke (6). Note the position of the small hole in the squared, upper portion of the yoke. If this is reversed, the valve linkage will not attach properly.

13-30. AUXILIARY ELECTRIC FUEL PUMP. The auxiliary electric fuel pump is located under the floorboard on the right side of the cabin, immediately forward of the copilot seat. An integral bypass and check valve permit fuel flow through the pump even when the pump is inoperative, but prevents reverse flow. A separate overboard drain line from the pump prevents entry of fuel into the electric motor in the event of pump internal leakage.

13-31. REMOVAL AND INSTALLATION.

a. Ensure master switch is in "OFF" position or disconnect battery ground cable.
b. Place fuel selector in "OFF" position.
c. Peel back carpet and remove access plate in floorboard immediately forward of copilot seat.
d. Disconnect all fuel lines and electrical connections from pump.
e. Loosen clamps securing pump and lift pump from aircraft.
f. Reverse preceding steps for installation.

13-32. CIRCUIT DESCRIPTION. The auxiliary fuel pump is controlled by a split rocker type switch.

The yellow right half of the switch is labeled "START", and its upper "ON" position is used for normal starting, minor vapor purging and continued engine operation in the event of an engine-driven pump failure. With the right half of the switch in the "ON" position, the pump operates at one of two flow rates that are dependent upon the setting of the throttle. With the throttle open to a cruise setting, the pump operates high enough capacity to supply sufficient fuel flow to maintain flight with an inoperative engine-driven fuel pump. When the throttle is moved toward the closed position (as during letdown, landing and taxiing), the fuel pump flow rate is automatically reduced, preventing an excessively rich mixture during these periods of reduced engine speed.

NOTE

If the engine-driven fuel pump is functioning and the auxiliary fuel pump switch is placed in the "ON" position, a fuel/air ratio considerably richer than best power is produced unless the mixture is leaned. Therefore, this switch should be turned off during takeoff.

CAUTION

If the auxiliary fuel pump switch is accidently placed in the "ON" position with the master switch on and the engine stopped, the intake manifolds will be flooded.

The red left half of the switch is labeled "EMERG", and its upper "HI" position is used in the event of an engine-driven fuel pump failure during take-off or high power operation. The "HI" position may also be used for extreme vapor purging. Maximum fuel flow is produced when the left half of the switch is held in the spring-loaded "HI" position. In this position, an interlock within the switch automatically trips the right half of the switch to the "ON" position. When the spring-loaded left half of the switch is released, the right half will remain in the "ON" position until manually returned to the "OFF" position.

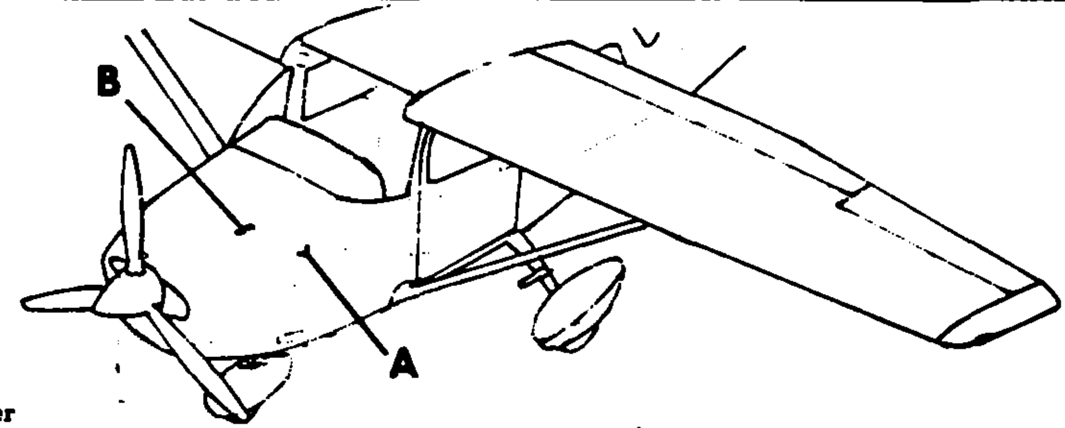
13-33. RIGGING THROTTLE MICROSWITCH. (See figure 13-9.) A throttle microswitch automatically selects "slow" speed when the throttle is retarded or "hi" speed when throttle is advanced, if the auxiliary fuel pump is being used. This switch is preadjusted to cause low speed operation when throttle is retarded to less than 19" Hg manifold pressure (sea level aircraft), and 23" Hg manifold pressure (turbo charged aircraft).

NOTE

These settings must be established during ground run-up only, because they do not apply in flight.

a. Start engine and adjust throttle setting to obtain 19" Hg manifold pressure on sea level aircraft, or 23" Hg manifold pressure turbocharged aircraft.
b. Mark position of throttle control at instrument panel and shut down engine.
c. Adjust microswitch at the engine throttle shaft lever as required, so the speed of the auxiliary pump is reduced when throttle is moved to the previously marked position.
d. With Mixture Control in "IDLE CUT-OFF" position (Control pulled out), Auxiliary Fuel Switch in "ON" position, and Master Switch in "ON" position, listen for change in sound of electric fuel pump as the throttle is retarded to the marked position.

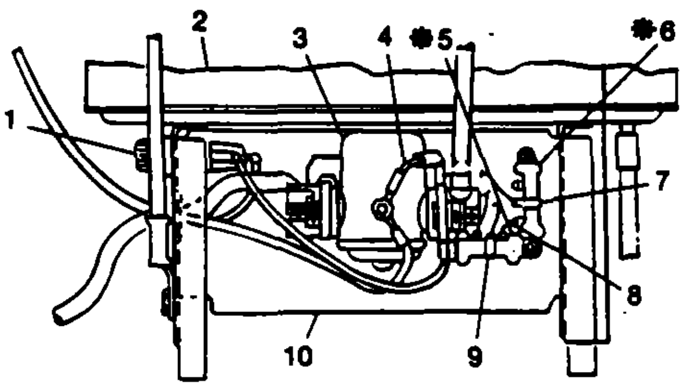
13-34. FUEL FLOW TEST. (See figure 13-9.) This test to be conducted with engine stopped, and proper external power applied to aircraft bus.



1. Fuse Holder
2. Battery Box
3. Battery Contactor
4. Diode
5. Low Boost Resistor (#2) (12 volt)
6. High Boost Resistor(#1) (12 volt)
7. Adjustable Lug
8. Jumper
9. Adjustable Lug
10. Bracket
11. Throttle Shaft Lever Cam
12. Airbox Bracket
13. Switch Actuator
14. Microswitch
15. Mounting Screw

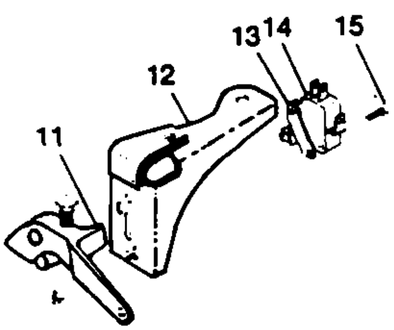
✱ NOTE

Adjust resistors to the following tolerances before installation:
12 VOLT HIGH BOOST (AMOR20-1.5 to 1.0±.25 ohms)
12 VOLT LOW BOOST (AMOR20-5 to 2.0±.25 ohms)
24 VOLT HIGH AND LOW BOOST (AMOR 20-10 to 3.5±.50 ohms)
Readjust as required to comply with the requirements of paragraph 13-34.
On 24 volt systems items 5 and 6 are the same size resistor.



LOOKING AFT AT FIREWALL (LEFT-HAND SIDE)

Detail **A**



THROTTLE MICROSWITCH

Detail **B**

Figure 13-9. Throttle Microswitch and Fuel Pump Resistors

WARNING

During this test, raw fuel will drain from engine compartment, therefore, proper safety precautions should be taken. Conducted in a well ventilated area, use drip pans, and insure aircraft is properly grounded.

a. On 12V aircraft, apply a external source of 13.75 VDC± .25V, and on 24V aircraft, apply 27.75 VDC± .25V, to aircraft bus.
b. Set Mixture Control to "FULL RICH" (full in).
c. Turn Master Switch to "ON" position
d. Turn Auxiliary Fuel Pump Yellow Switch to "ON" position.
e. Advance throttle to "FULL OPEN", (full in).
f. Check metered fuel pressure/flow on aircraft gage for a flow of 88 to 96 pounds/hour (14.7-16.0 gallons/hour).
g. Adjust number one resistor (6) if required to reach above indicated flow. (Refer to figure 13-9, Note.)
h. Retard throttle slowly from "FULL OPEN" position until speed/sound of electric fuel pump changes due to microswitch activation, and wait for fuel pressure reading to stabilize.
i. The metered fuel pressure/flow on aircraft gage should read on the low end red line or approximately "one red line" width above.
j. Adjust number two (5) resistor to reach above indicated pressure/flow.

13-35. MAXIMUM HIGH BOOST CHECK. To verify high position function, momentarily depress spring-loaded rocker and verify a noticeable increase in indicated fuel flow on the fuel flow gage.

13-36. FUEL STRAINER. The fuel strainer is located in the nose wheel well. Access to the strainer is gained by removing fairings aft of the nose gear. The fuel strainer drain control is located adjacent to the oil dipstick. Access to the drain control is gained through the oil dipstick cowling door.

13-37. FUEL STRAINER DISASSEMBLY. (See figure 13-8.) To disassemble and assemble the strainer, proceed as follows:
a. Turn off fuel selector valve.
b. Disconnect strainer drain tube and remove safety wire, nut, and washer at bottom of filter bowl and remove bowl.
c. Carefully unscrew standpipe and remove.
d. Remove filter screen and gasket. Wash filter screen and bowl in solvent (Federal Specification P-S-661, or equivalent) and dry with compressed air.
e. Using a new gasket between filter screen and top assembly, install screen and standpipe. Tighten standpipe only finger tight.
f. Using all new O-rings, install bowl. Note that step-washer at bottom of bowl is installed so that step seats against O-ring. Connect strainer drain tube.
g. Turn on fuel selector valve, close strainer drain, and check for leaks. Check for proper operation.
h. Safety wire bottom nut to top assembly. Wire must have right hand wrap, at least 45 degrees.

13-38. ELECTRIC FUEL QUANTITY INDICATORS AND TRANSMITTERS. Refer to Section 16 for description, removal, installation and calibration.

13-39. INTEGRAL FUEL BAY.

13-40. DESCRIPTION. Beginning serial U20604650, a new fuel system incorporating an integral bay is introduced, as opposed to removable cells or tanks. The sections are sealed and interconnected to form one fuel bay in each wing. Each bay is approximately the same volume as the previously used long range cells, see Section 1 for capacities. Some advantages of fuel bay construction is: less weight, elimination of fuel bladder, stronger wing member, increased aircraft operating range, and increased usable load, thereby enhancing aircraft flight characteristics considerably.

13-41. FUEL LEAK CLASSIFICATION. Fuel leaks which do not constitute flight hazards are those stains, seeps, and heavy seeps NOT in an enclosed area. However, they should be repaired when the airplane is down for maintenance. Fuel leaks that constitute flight hazards are running leaks in any area, seeps, heavy seeps, or stains in an enclosed area, such as a wing leading edge, those wing sections inboard or outboard of the bays, and the area between the rear fuel spar and the main spar. These leaks must be repaired immediately, or the airplane GROUNDED. A wet or stained spot in the wing in a bay area indicates the leak intensity. (See figure 13-10.)

NOTE

Allowable stains and seeps must be inspected after each flight, and repaired during the next maintenance action process.

If a flight safety leak is discovered when the airplane is in an area that does not have authorized repair capabilities, the affected bay should be drained, the leak temporarily repaired, and the airplane flown on the opposite fuel bay to an area with adequate repair facilities.

13-42. PURGING FUEL BAYS.

WARNING

Before repairing fuel bays, it is necessary to purge the fuel fumes from the bay with an inert gas such as argon or carbon dioxide. Also even after purging, use non-sparking tools, i.e., air motors, plastic scrapers, aluminum wool, etc., to preclude the possibility of igniting fuel vapors. Argon and carbon dioxide are both heavier than air, therefore, will remain in the bay during repair action.

Use the following procedures to purge the leaking bay prior to repair action:
a. Ground airplane to a suitable ground stake.
b. Set fuel selector to OFF position, or to opposite fuel bay.

c. Drain all fuel from bay to be repaired, observing precautions in paragraph 13-3.

d. Remove access doors, and insert a hose (inert gas supply) in each end of bay simultaneously.

e. Allow inert gas to flow into bay for several minutes, depending on volume emitted from remove all fuel vapors.

NOTE

Portable vapor detectors, calibrated for leaded fuel, are available to determine presence of combustible mixture. Use these detectors to ensure safe vapor level for repair.

13-43. INTEGRAL FUEL BAY SEALANT. Two kinds of sealants are used, one to seal the fuel bay area and the other to seal the access doors. The access door sealant is more pliable and will not adhere to metal as firmly as the bay sealant does. This permits the access doors to be removed without damage to them. Service Kits SK210-56 (6-ounce tube) and SK210-101 (2.5-ounce tube), which are available from the Cessna Supply Division, contain these sealants and accelerators can be identified by the color of the material.

WARNING

Keep sealants away from heat and flame. Use only in a well ventilated area. Avoid skin and eye contact. WEAR EYE SHIELDS. In case of eye contact, flush generously with clean water, and secure prompt medical attention.

13-44. MIXING SEALANT. Mix sealant according to service kit instructions.

13-45. SEALING. (Refer to Section 18 for repair procedures).

CAUTION

Protect drains and fuel outlet screens when applying sealants. DO NOT plug drain channels in stiffeners (22) at inboard and of lower wing skin (6) (see figure 13-12).

Any repair that breaks the fuel bay seal will necessitate resealing of that area of the bay. Repair parts that need sealing must be installed and riveted during the sealing operation. All joints within the boundary of the bay, but which do not provide a direct fuel path out of the bay, such as stringers and rib flanges within the bay, must be fay surface sealed only. Joints which provide a direct fuel path out of the bay area, such as fuel spar flanges and inboard and outboard rib flanges, must be fay surface sealed and fillet sealed on the fuel side. Fay surface sealing is applying sealant to one mating part before assembly. Enough sealant must be applied so it will squeeze out completely around the joint when the parts are riveted or fastened together. The fillet seal is applied after the joint is fay surface sealed and riveted or fastened together. Fillet sealing is applying sealant to the edge of all riveted joints, joggles, bend reliefs, voids, rivets or fasteners through the boundary of the bay and any place that could produce a fuel leak. The fay sealant need not be cured before the fillet seal is applied, but the squeezed out sealant, to which the fillet sealant is applied, must be free of dirt and contamination. Fillets laid on intersecting joints shall be joined together to produce a continuous fillet. Filler sealant must be pressed into the joint, working out all entrapped air. The best method of applying sealant is with an extrusion gun. Then work the sealant into the joint with a small paddle, being careful to eliminate all air bubbles.

NOTE

During structural repair, parts must be predrilled, countersunk or dimpled and cleaned before being sealed and positioned for final installation.

a. Remove all existing sealant from area to be sealed, leaving a taper on the remaining sealant. The taper will allow a scarf bond and a continuous seal when the new sealant is applied.

NOTE

The best method for removing sealant is with a chisel-type tool made of hard fiber. Remaining sealant is then removed with aluminum wool. Neither steel wool nor sandpaper can be used.

b. Vacuum thoroughly to remove all chips, filings, and other foreign material from bay areas.

c. All surfaces and areas to be sealed shall be thoroughly cleaned by wiping with a clean cloth dampened with Methyl Ethyl Ketone (MEK), acetone or similar solvent, and dried with a clean cloth prior to solvent evaporation. Always pour the solvent on the cloth. Never use contaminated solvent. The cloth shall not be so saturated that dripping occurs.

13-46. SEALING FUEL LEAKS. First determine the source of the fuel leak. Fuel can flow along a seam or structure of the wing for several inches, making the leak source difficult to find. A stained area is an indication of the leak source. Fuel leaks can be found by testing the complete bay as described in paragraph 12-49. Another method of detecting the source of a fuel leak is to remove access doors and blow with an air nozzle from the inside of the bay in the area of the leak while soap bubble solution is applied to the outside of the bay. After the leak source has been found, proceed as follows:

a. Remove existing sealant in the area of the leak as described in paragraph 12-46.

b. Clean the area and apply a fillet seal. Press sealant into leaking area with a small paddle, working out all air bubbles.

c. If leakage occurs around a rivet or bolt, restrike the rivet or loosen bolt, retorque, and reseal around nutplate.

d. Apply fay surface door sealant to access doors, fuel quantity transmitters, etc., if removed, and install.

e. Test fuel bay for leakage as outlined in paragraph 13-48.

13-47. NORMAL CURE TIME. Service Kit SK210-56 contains: (A) SP654706B2 access door sealant and (B) SP654890B2 fuel bay sealant. Cure times for (A) and (B) are 24 hours. Service Kit SK210-101 contains: (C) PR 1321 B 1.2 access door sealant and (D) PR1422B1.2 fuel bay sealant. Cure time for (C) is 18 hours: cure time for (D) is 48 hours. Cure times for both kits are based on 77°F (25°C) and 50 percent relative humidity.

13-47A. NORMAL WORK TIME. Normal work time for Service Kit SK210-56 is two hours, and 0.5 hour for Service Kit SK210-101. Shelf life of these kits is approximately six months. If more rapid cure times are desired, refer to the following note and accelerated curing time chart.

NOTE

Temperature shall not exceed 160°F (71°C). Bay must be vented to relieve pressure during accelerated curing.

ACCELERATED CURING TIME	
°F of Sealant	Time in Hours
160	3
140	4
★ 130	★ 5 1/2
120	7

★ Applicable to SK210-101 only.

13-14B. INTEGRAL FUEL BAY QUICK REPAIR SEALANT. GC-435 is a quick-repair synthetic rubber sealant for use in fuel bays when it is necessary to refill bays as soon as the repair has been made: the sealant requires no cure time. The sealant is a two-part, medium viscosity polysulfide liquid polymer and is formulated for application by brush or extrusion. GC-435 may be purchased from: Goal Chemical Sealants Corp. 3137 East 26th. Street, Los Angeles, CA 90023.

13-14C. SURFACE PREPARATION. To ensure maximum adhesion of GC-435 integral bay surfaces should be free of oil, grease, wax, dirt, etc. Pour the cleaning solvent onto the cloth and wipe the surface, then use a clean, dry cloth to wipe the solvent from the surface prior to its evaporation. Be sure the surface to be sealed is clean and dry. Observe all warnings and cautions covering preparation and application of sealants as noted in this section and the instructions included with GC-435 sealant.

WARNING

The accelerators contain heavy metal Peroxides, keep away from heat and flame. Use only in well-ventilated area, avoid skin and eye contact, and WEAR EYE SHIELDS. In case of eye contact, flush liberally with water, and get prompt medical attention.

13-14D. MIXING SEALANT. GC-435 comes in premeasured and proportioned kits ready for use. The base compound is cream-colored, and the catalyst is black. If the entire kit is not needed, the GC-435 may be proportioned by combining (10) parts of the base compound (cream colored), with (1) part of the catalyst (black) by weight. Use an accurate scale and slowly mix the base and catalyst until a homogeneous blend of color and appearance is accomplished.

NOTE

Work life of GC-435 is approximately (15) minutes. Shelf life is at least (6) months when stored in an area where the ambient temperatures are 80° (26°C) or lower. Unless specifically noted all items relating to Integral Fuel Tank Sealants also apply to GC-435 quick-repair sealant.

13-48. TESTING INTEGRAL FUEL BAY.

a. Remove vent line from vent fitting and cap fitting.

b. Disconnect fuel lines from bay.

c. To one of the bay fittings, attach a water manometer capable of measuring twenty inchec of water.

d. To the other bay fitting, connect a well regulated supply of air (1/2 PSI MAXIMUM, or 13.8 INCHES of water). Nitrogen may be used where the bay might be exposed to temperature changes while testing.

e. Make sure filler cap is installed and sealed.

CAUTION

Do not attempt to apply pressure to the bay without a good regulator and a positive shut-off in the supply line. Do not inflate the fuel bay to more than 1/2 psi or damage may occur.

f. Apply pressure slowly until 1/2 PSI is obtained.
g. Apply soap solution as required.
h. Allow 15 to 30 minutes for pressure to stabilize.
i. If bay holds for 15 minutes, without pressure loss, bay is acceptable.
j. Reseal and retest if any leaks are found.

13-49. FUEL VENTS.

13-50. DESCRIPTION. The fuel bay vent line extends from the upper forward corner of each fuel bay to the vents extending down through the wing skin behind the wing struts.

13-51. REMOVAL AND INSTALLATION.
a. Remove access covers as necessary.
b. Disconnect vent lines at fuel bay fitting.
c. Disconnect line from wing skin, and remove.
d. Reverse above procedure for reinstallation, see figure 13-4, for diminsions.

13-52. CHECKING. Field experience has demonstrated that the vents can become plugged, causing possible fuel starvation of the engine. Also, the bleed hole in the vent valve assembly could possibly become plugged, allowing pressure from expanding fuel to pressurize the bay areas. The following procedure may be used to check the vent and bleed hole in the vent valve assembly.
a. Attach a rubber tube to the end of the vent line at the rear of wing strut.
b. Turn fuel selector to OFF, and be certain that both fuel filler caps are secure.
c. Apply a low press air supply (0.5 psi Max.) to the tube. If air flows into the bay, the vent line is open.
d. After bay is slightly pressurized, insert end of tube into a container of water, and watch for a continuous stream of bubbles. When visible, bubbles indicate proper bleed through the vent valve bleed hole.
e. Repeat this procedure on opposite wing system.

CAUTION

Be sure to remove the rubber tubes from outside vents after completing the test.

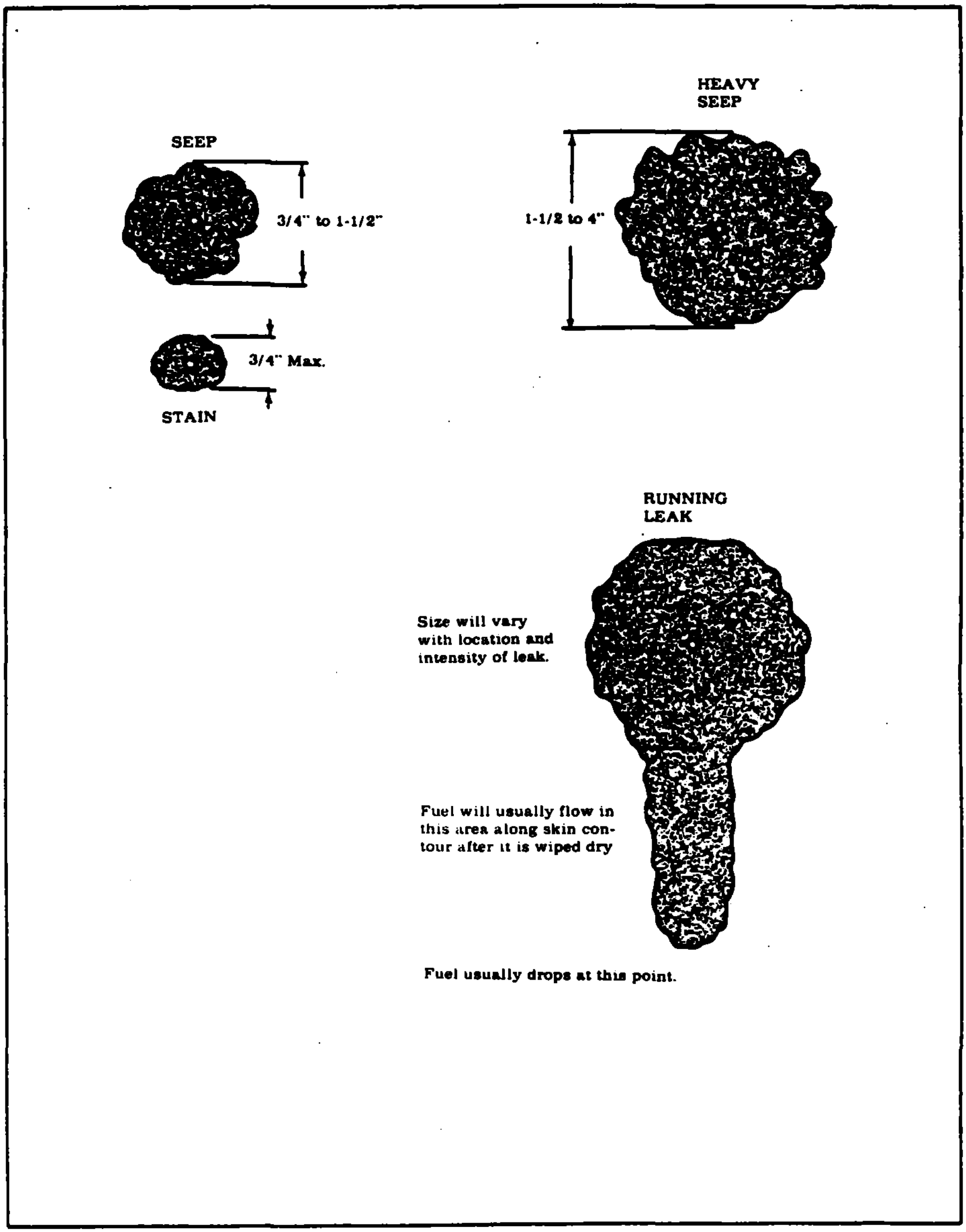


Figure 13-10. Fuel Leak Classification

NOTE

Refer to paragraph 13-45.

1. Fuel Side
2. Nutplate
3. Fillet Seal
4. Faying
5. Rivet and Fastener Seal

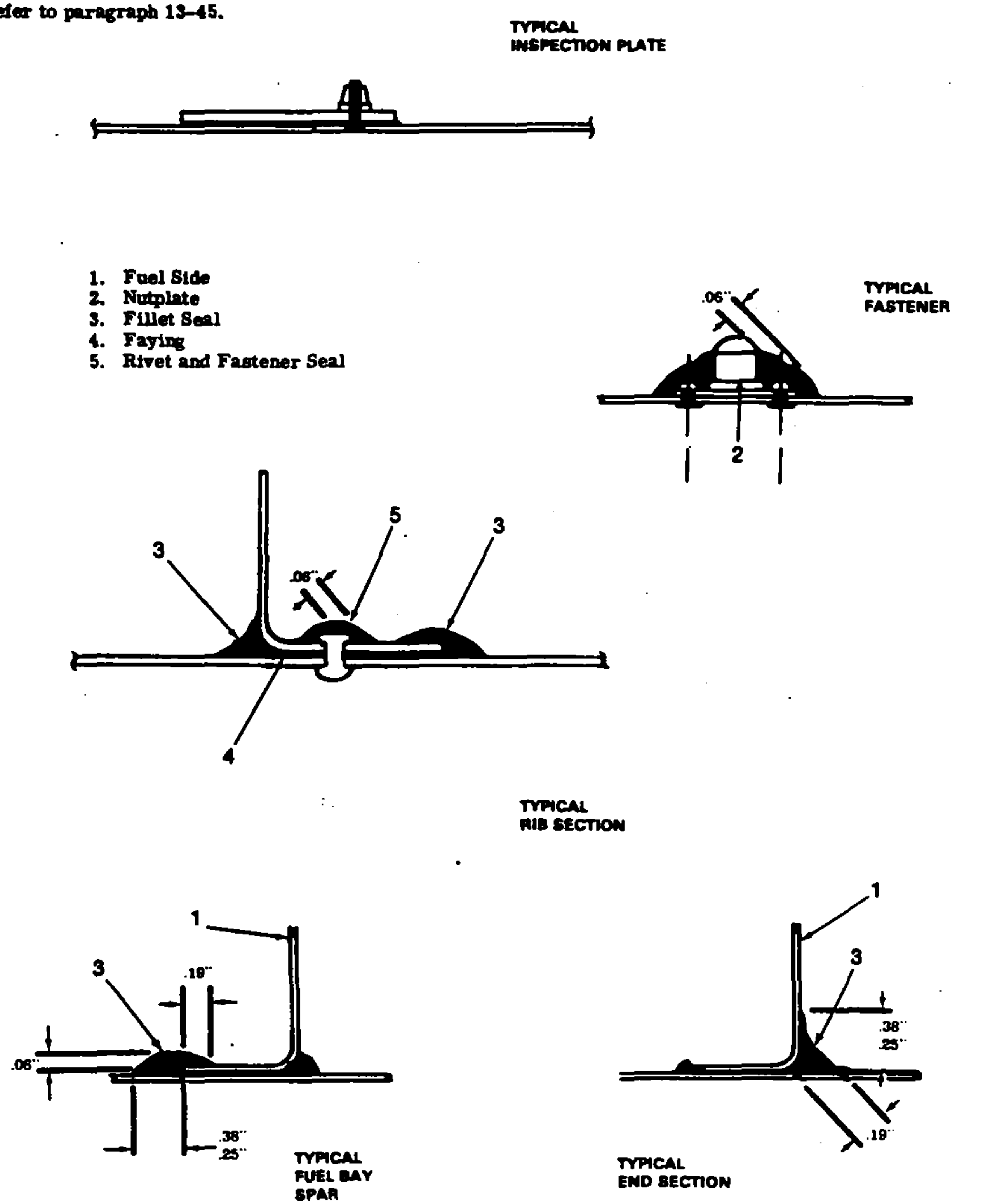
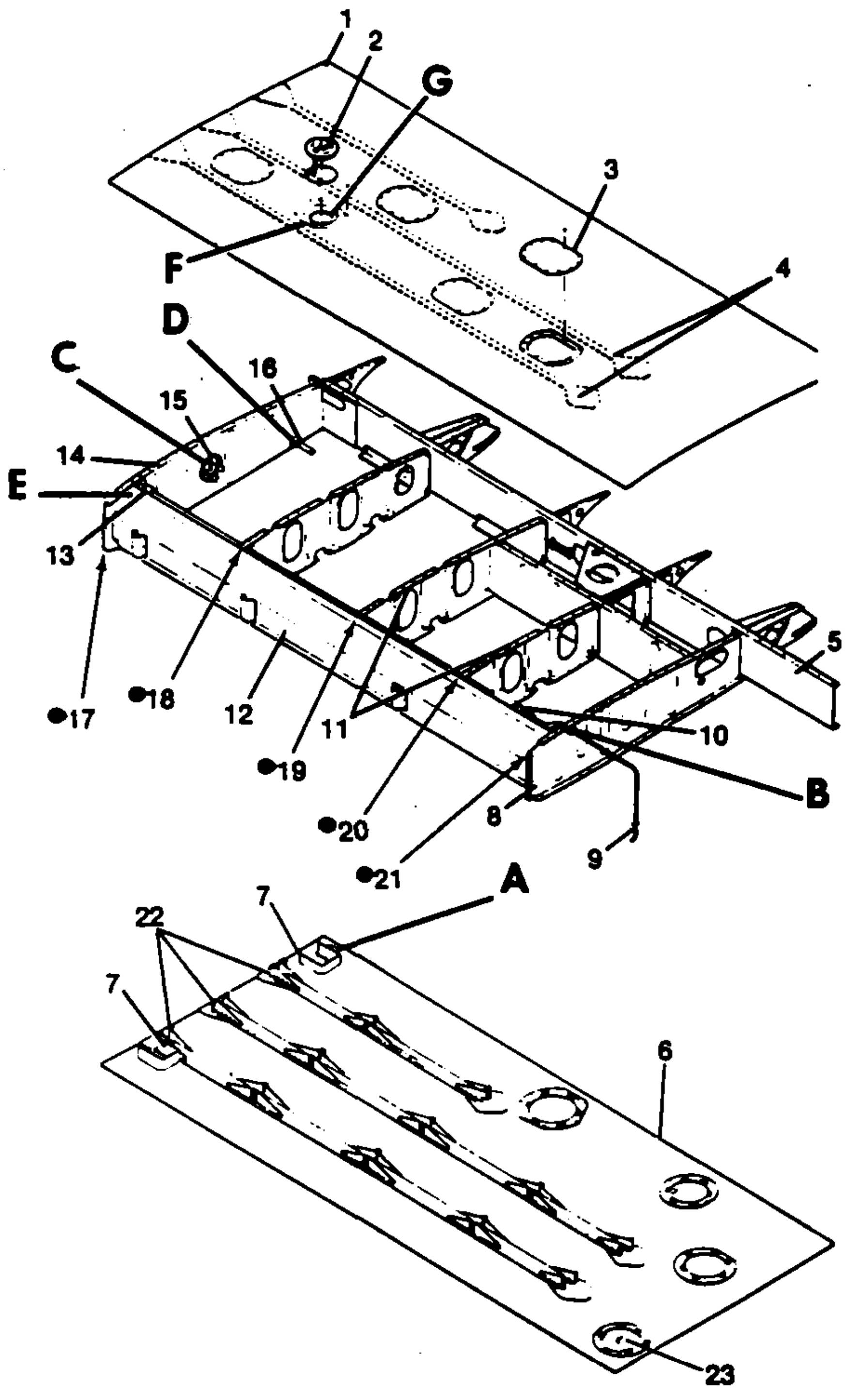


Figure 13-11. Typical Fuel Bay Sealing



NOTE

When applying sealant in the fuel bay, DO NOT plug fuel drain path below the hat section stiffeners (22) at the inboard end of lower wing skin (6).

1. Upper Wing Skin
2. Filler Cap
3. Access Cover
4. Stiffeners
5. Main Spar
6. Lower Wing Skin
7. Outlet Baffels Baffles
8. Wing Rib
9. Fuel Vent
10. Vent Valve
11. Interior Ribs (Baffles)
12. Front Spar
13. Interior Vent
14. Root Rib
15. Quantity Transmitter
16. Finger Filters
●17. WS - 23.54
●18. WS - 40.125
●19. WS - 56.53
●20. WS - 72.44
●21. WS - 85.62
22. Hat Section Stiffener
23. Inspection Plate

NOTE
Beginning with Serial 10606071, inspection plate (23) fasteners change from 3 each to 6 each.

Figure 13-12. Integral Fuel Bay Installation (1 of 4)

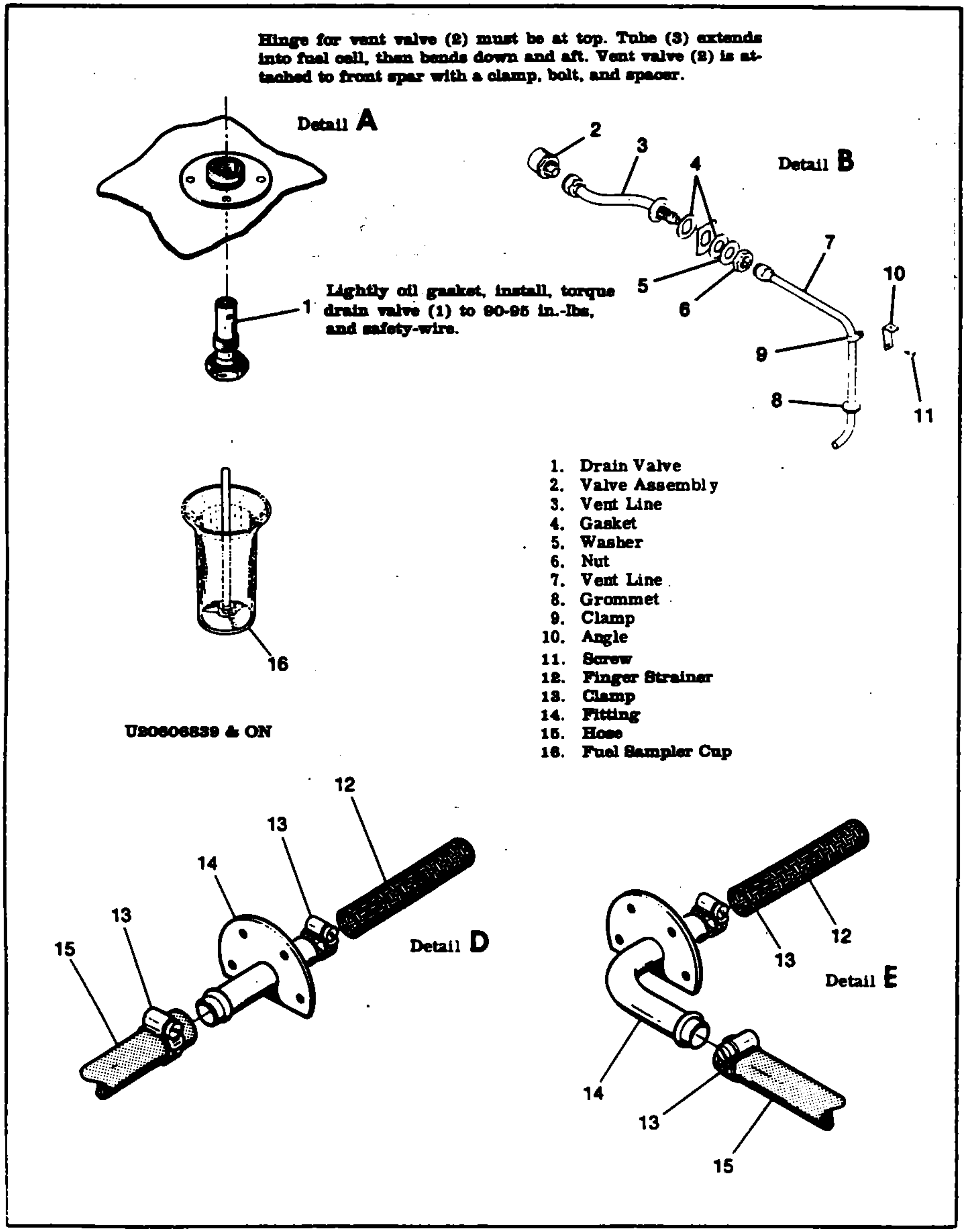
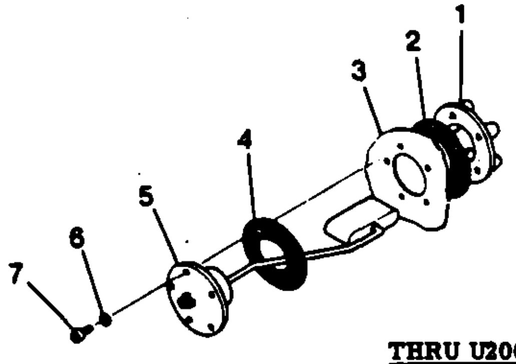
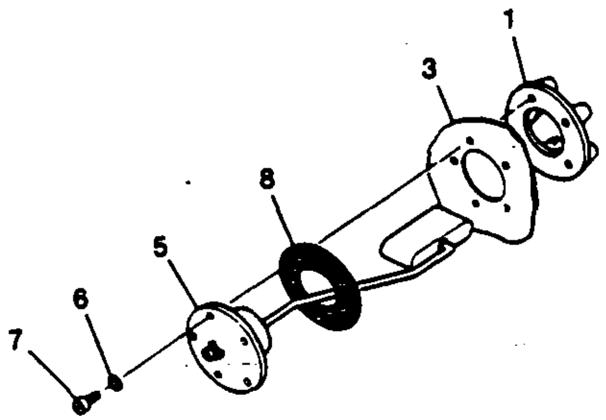


Figure 13-12. Integral Fuel Bay Installation (2 of 4)

1. Nutring
2. Gasket - Root Rib
3. Root Rib
4. Gasket - Transmitter
5. Fuel Quantity Transmitter
6. Washer
7. Screw
8. Gasket



THRU U20606862



U20606863 AND ON

Detail C

NOTES

Beginning with Serial U20606863, nutring (1) is bonded to root rib (3). Order Service Kit No. SK210-56 or SK210-101 fuel tank sealant from Cessna Supply Division.

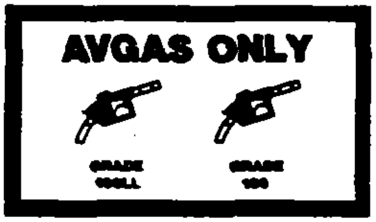
On Serials U20603522 thru U20606862, whenever removing and replacing fuel quantity transmitter (5), discard gasket (4) and replace it with new S2670-1 gasket (8).

Torque screws (7) to 20 in.-lbs (once only), using a cross-pattern sequence.

Figure 13-12. Integral Fuel Bay Installation (3 of 4)

FUEL 100LL/100 MIN GRADE AVIATION GASOLINE CAP. 46.0 U.S. GAL. CAP. 34.5 U.S. GAL. TO BOTTOM OF FILLER NECK

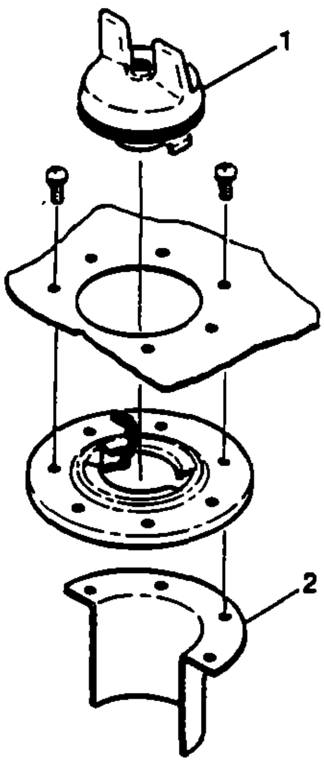
Fuel Quantity Placard



Fuel Grade Placard

1. **Fuel Cap (See figure 13-6)**
2. **Fuel Filler Collar**

Detail **F**



Detail **G**

Figure 13-12. Integral Fuel Bay Installation (4 of 4)

SECTION 14

PROPELLER AND GOVERNOR

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

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14-1. PROPELLER.

14-2. DESCRIPTION. The aircraft is equipped with an all-metal, constant-speed, governor-regulated propeller. The constant-speed propeller is single-acting, in which engine oil pressure, boosted and regulated by the governor is used to obtain the correct blade pitch for the engine load. Engine lubricating oil is supplied to the power piston in the propeller hub through the crankshaft. The amount and pressure of the oil supplied is controlled by the engine-driven governor. An increase or decrease in throttle setting or a change in aircraft attitude will affect the balance which maintains a given RPM. If the throttle is opened further or if aircraft speed is increased, engine RPM will try to increase. The governor senses this and directs oil pressure to the forward side of the piston. The blades will be moved to a higher pitch and engine speed will remain constant. Conversely, if the throttle opening or the aircraft speed is decreased, the engine RPM will try to decrease. The governor senses this and allows oil to drain from the forward side of the piston. Spring tension and centrifugal twisting moment will move the blades to a lower pitch to maintain the selected engine speed.

14-3. REPAIR. Metal propeller repair first involves evaluating the damage and determining whether the repair will be a major or minor one. Federal Aviation Regulations, Part 43 (FAR 43), and Federal Aviation Agency, Advisory Circular No. 43.13 (FAA AC No. 43.13), define major and minor repairs, alterations and who may accomplish them. When making repairs or alterations to a propeller FAR 43, FAA AC No. 43.13 and the propeller manufacturer's instructions must be observed.

14-4. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
FAILURE TO CHANGE PITCH.	Governor control disconnected or broken.	Check visually. Connect or replace control.
	Governor not correct for propeller. (Sensing wrong.)	Check that correct governor is installed. Replace governor.
	Defective governor.	Refer to paragraph 14-10.
	Defective pitch changing mechanism inside propeller or excessive propeller blade friction.	Propeller repair or replacement is required.
FAILURE TO CHANGE PITCH FULLY.	Improper rigging of governor control.	Check that governor control arm and control have full travel. Rig control and arm as required.
	Defective governor.	Refer to paragraph 14-10.
SLUGGISH RESPONSE TO PROPELLER CONTROL.	Excessive friction in pitch changing mechanism inside propeller or excessive blade friction.	Propeller repair or replacement is required.
STATIC RPM TOO HIGH OR TOO LOW.	Improper propeller governor adjustments.	Perform static RPM check Refer to section 12 and 12A for procedures.
ENGINE SPEED WILL NOT STABILIZE.	Sludge in governor.	Refer to paragraph 14-10.
	Air trapped in propeller actuating cylinder.	Trapped air should be purged by exercising the propeller several times prior to take-off after propeller has been reinstalled or has been idle for an extended period.
	Excessive friction in pitch changing mechanism inside propeller or excessive blade friction.	Propeller repair or replacement is required.
	Defective governor.	Refer to paragraph 14-10.
OIL LEAKAGE AT PROPELLER MOUNTING FLANGE.	Damaged O-ring and seal between engine crankshaft flange and propeller.	Check visually. Remove propeller and install O-ring seal.
	Foreign material between engine crankshaft flange and propeller mating surfaces or mounting nuts not tight.	Remove propeller and clean mating surfaces; install new O-ring and tighten mounting nuts evenly to torque value in para 14-6, e.
OIL LEAKAGE AT ANY OTHER PLACE.	Defective seals, gaskets, threads, etc., or incorrect assembly.	Propeller repair or replacement is required.

14-5. REMOVAL. See figure 14-1.

a. Remove spinner attaching screws (2) and remove spinner (1), spinner support (3) and spacers (4). Retain spacers (4).

b. Remove cowling as required for access to mounting nuts (9).

c. Loosen all mounting nuts (9) approximately 1/4 inch and pull propeller (15) forward until stopped by nuts.

WARNING

Be certain that magneto is GROUNDED before turning propeller.

NOTE

As the propeller (15) is separated from the engine crankshaft flange, oil will drain from the propeller and engine cavities.

d. Remove all propeller mounting nuts (9) and pull propeller forward to remove from engine crankshaft (12).

e. If desired, the spinner bulkhead (11) can be removed by removing screws (10) attaching lugs (8), (normally-aspirated aircraft); or removed by removing bolts (19) and nuts attaching spinner bulkhead to propeller (turbocharged aircraft).

14-6. INSTALLATION.

a. If the spinner bulkhead (11) was removed, position bulkhead so the propeller blades will protrude from the spinner (1) with ample clearance and install spinner bulkhead attaching lugs (8) and screws (10) (normally-aspirated aircraft), or bolts (19) and nuts attaching spinner bulkhead to propeller (turbocharged aircraft).

CAUTION

Avoid scraping metal from bore of spinner bulkhead and wedging scrapings between engine flange and propeller. Trim the inside diameter of the bulkhead as necessary when installing a new spinner bulkhead.

b. Clean propeller hub cavity and mating surfaces of propeller and crankshaft.

c. Lightly lubricate a new O-ring (13) and the crankshaft pilot with clean engine oil and install the O-ring in the propeller hub.

d. Align propeller mounting studs and dowel pins with proper holes in engine crankshaft flange and slide propeller carefully over crankshaft pilot until mating surfaces of propeller and crankshaft flange are approximately 1/4 inch apart.

WARNING

Be certain that magneto is GROUNDED before turning propeller.

e. Install propeller attaching washers and nuts (9) and work propeller aft as far as possible, then tighten nuts evenly and torque to 660-780 lb-in.

f. Install spacers (4) and spinner support (3) on propeller cylinder (5). If spacers (4) are not centered mechanically (piloted), visually center and hold them until spinner support (3) is forced firmly in place.

g. Hold spinner (1) snug against spinner support (3) and check alignment of holes in spinner (1) with holes in spinner bulkhead (11). Add or remove spacers (4) from propeller cylinder (5) until holes are within .050 of alignment.

h. Push hard on spinner (1) to align holes and install screws and washers (if installed) in 3 or more equal spaces around the spinner bulkhead (11). Relax pressure on the spinner and install the remaining screws and washers (if required) in the spinner.

i. Tighten all screws uniformly around the spinner.

14-7. TIME BETWEEN OVERHAUL (TBO). Propeller overhaul shall coincide with engine overhaul, but interval between overhauls of the propeller shall not exceed 1500 hours. Refer to Section 12 and to Section 12A for engine time between overhaul (TBO) periods.

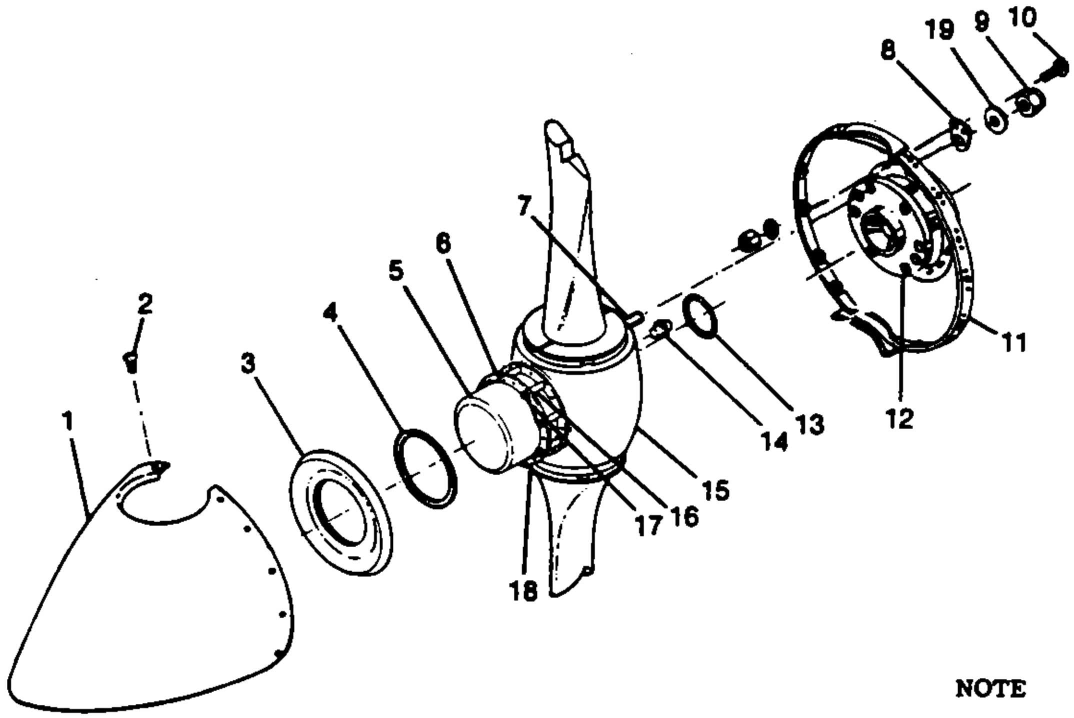
14-8. GOVERNOR.

14-9. DESCRIPTION. The propeller governor is a single-acting, centrifugal type, which boosts oil pressure from the engine and directs it to the propeller where the oil is used to increase blade pitch. A single-acting governor uses oil pressure to effect a pitch change in one direction only; a pitch change in the opposite direction results from a combination of centrifugal twisting moment of rotating blades and compressed springs. Oil pressure is boosted in the governor by a gear type oil pump. A pilot valve, fly weight and speeder spring act together to open and close governor oil passages as required to maintain a constant engine speed.

NOTE

Outward physical appearance of specific governors is the same, but internal parts determine whether it uses oil pressure to increase or decrease blade pitch. The propellers used on these aircraft require governors which "sense" in a certain manner. "Sensing" is determined by the type pilot valve installed inside the governor. Since the basic governor may be set to "sense" oppositely, it is important to ascertain that the governor is correct for the propeller being used.

14-10. TROUBLE SHOOTING. When trouble shooting the propeller-governor combination, it is recommended that a governor known to be in good condition be installed to check whether the propeller or the governor is at fault. Removal and replacement, rigging, high-speed stop adjustment, desludging and replacement of the governor mounting gasket are not



NOTE

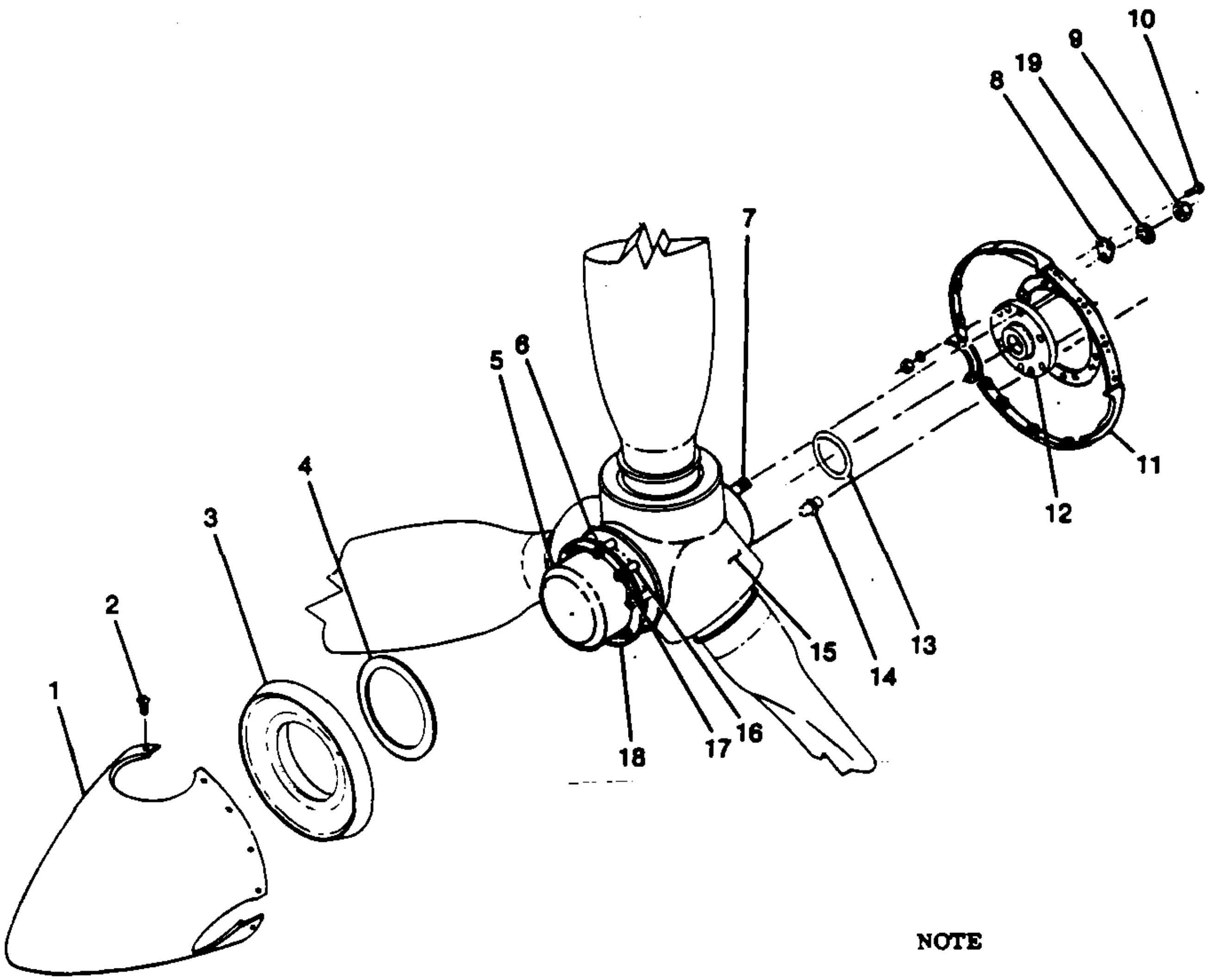
Additional spacers (4), Cessna Part No. 0752620-3, may be required when installing a new spinner (1) to ensure a snug fit between spinner (1) and spinner support (3). DO NOT USE more than 6 spacers (4) (U20603522 thru U20603858) or more than 14 spacers (Beginning with U20603859) in this installation.

1. Spinner
2. Screw
3. Spinner Support
4. Spacer
5. Cylinder
6. Screw
7. Stud
8. Lug
9. Mounting Nut
10. Screw
11. Spinner Bulkhead
12. Engine Crankshaft
13. O-Ring
14. Dowel Pin
15. Propeller
16. Tube
17. Safety Wire
18. Ring
19. Washer

THRU U20604074

NORMALLY ASPIRATED AIRCRAFT
TWO-BLADED PROPELLER

Figure 14-1. Propeller Installation (Sheet 1 of 3)



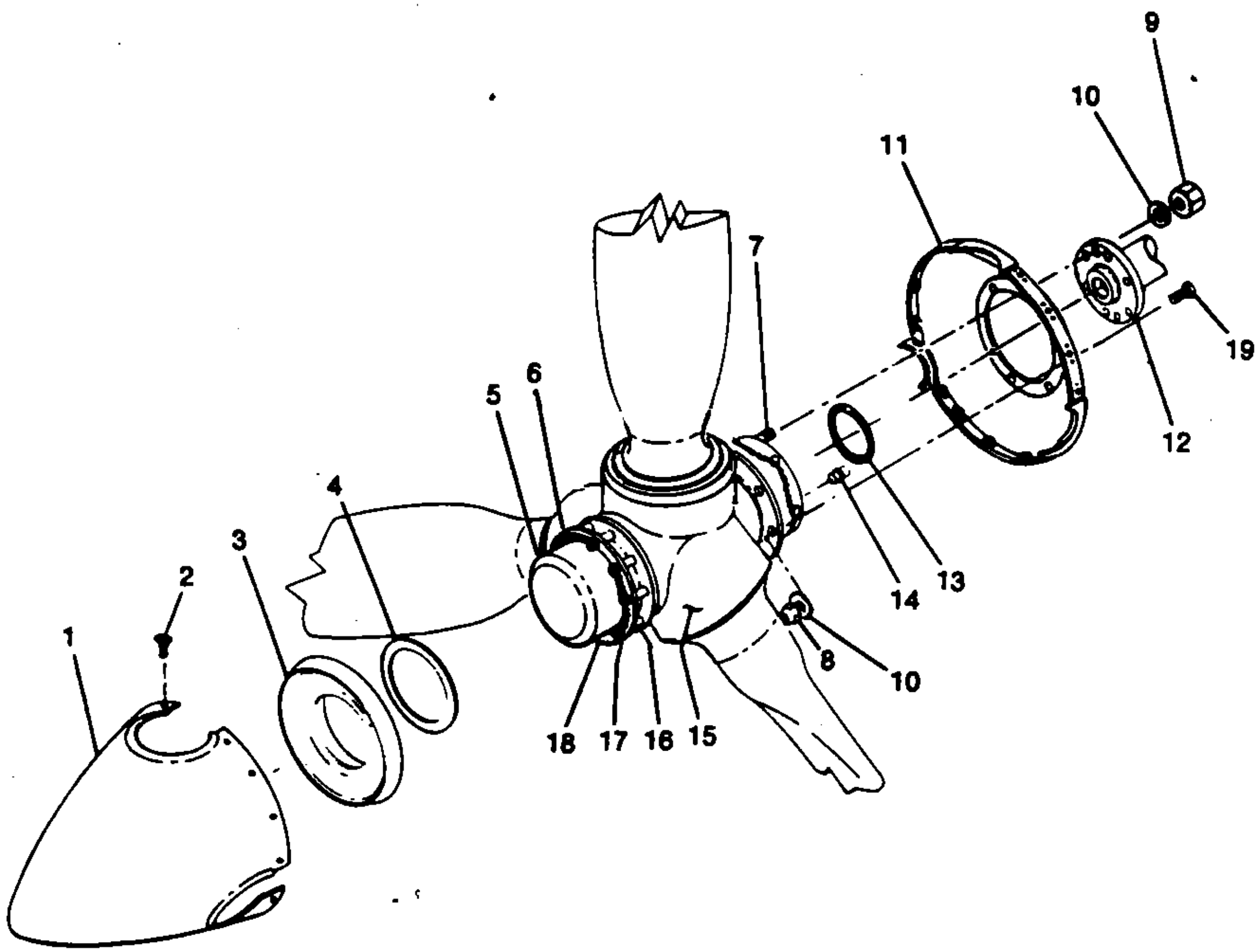
NOTE

Additional spacers (4), Cessna part No. 0752620-3, may be required when installing a new spinner (1) to ensure a snug fit between spinner (1) and spinner support (3). DO NOT USE more than 6 spacers (4) (U20603522 Thru U20603858), or more than 14 spacers, (beginning with U20603858) in this installation.

U20603522 THRU U20604074

(NORMALLY-ASPIRATED AIRCRAFT)
Short Hub
THREE-BLADED PROPELLER

Figure 14-1. Propeller Installation (Sheet 2 of 3)



1. Propeller Spinner
2. Screw
3. Spinner Support
4. Spacer
5. Cylinder
6. Screw
7. Stud
8. Nut
9. Nut
10. Washer
11. Spinner Bulkhead
12. Engine Crankshaft
13. O Ring
14. Dowel Pin
15. Propeller
16. Tube
17. Safety Wire
18. Ring
19. Bolt

U206 BEGINNING WITH U20604075

TU206 BEGINNING WITH U20603522

USED ON TURBOCHARGED & NORMALLY-ASPIRATED ENGINES

Extended Hub

THREE-BLADED (THREADLESS)

Figure 14-1. Propeller Installation (Sheet 2 of 2)

major repairs and may be accomplished in the field. Repairs to propeller governors are classed as propeller major repairs in Federal Aviation Regulations, which also define who may accomplish such repairs.

14-11. REMOVAL.

a. Remove cowling, nose cap and engine baffles as required for access to governor.

b. Disconnect governor control from governor.

NOTE

Note EXACT position of all washers so that washers may be installed in the same position on reinstallation.

c. Disconnect intake manifold balance tube at front of engine and move as required for clearance.

d. Remove nuts and washers securing governor to engine and pull governor from mounting studs.

e. Remove gasket from between governor and engine mounting pad.

14-12. CONTROL ARM AND BEARING ASSEMBLY. (See figure 14-2).

14-13. REMOVAL AND INSTALLATION.

a. Using a scribe, make aligning index marks on governor arm (8) and end of governor serrated shaft.

NOTE

The governor arm (8) must be installed on the governor shaft in the same serration or the governor speed will be changed approximately 200 rpm.

b. Remove safety wire from governor arm screw and from screws attaching governor head to governor.

c. Remove screws (7) that pass through the non-notched holes in the retainer (6).

d. Loosen, but do not remove, the four remaining screws so that retainer (6) may be rotated.

e. Loosen screw in governor arm (8) so that arm may be slipped toward end of serrated shaft.

f. Slip governor arm toward end of serrated shaft and work retainer (6) and control arm (8) from governor (1).

NOTE

If governor arm (8) becomes disengaged from serrated shaft, align index marks and install arm on serrated shaft. The control arm spring has approximately 1-1/2 turns preload.

g. Rotate and remove bearing race (3) from governor (1).

h. Reverse the preceding steps for reinstallation.

14-14. INSTALLATION.

a. Wipe governor and engine mounting pad clean.

b. Install a new gasket on the mounting studs. Install gasket with raised surface of the gasket screen toward the governor.

WARNING

Be certain that magneto is GROUNDED before turning propeller.

c. Position governor on mounting studs, aligning governor drive splines with splines in the engine and install mounting nuts and washers. Do not force spline engagement. Rotate engine crankshaft slightly and splines will engage smoothly when properly aligned.

d. Connect governor control to governor and rig control as outlined in paragraph 14-16.

e. Connect intake manifold balance tube, if removed. Ensure all clamps are tight.

f. Reinstall all items removed for access.

14-15. HIGH-RPM STOP ADJUSTMENT. (See figure 14-3).

a. Remove engine cowling.

b. Disconnect cabin heater inlet air duct from nose cap.

c. Remove safety wire and loosen the high-speed stop screw locknut.

d. Turn the stop screw IN to decrease maximum RPM and out to increase maximum RPM. One full turn of the stop screw causes a change of approximately 25 RPM.

e. Tighten stop screw locknut, safety wire stop screw and make propeller control linkage adjustment as necessary to maintain full travel.

f. Install cabin heater inlet air duct and install cowling.

g. Test operate propeller and governor.

NOTE

It is possible for either the propeller low pitch (high-rpm) stop or the governor high-rpm stop to be the high-rpm limiting factor. It is desirable for the governor stop to limit the high-rpm at the maximum rated rpm for a particular aircraft. Due to climatic conditions, field elevation, low-pitch blade angle and other considerations, an engine may not reach rated rpm on the ground. It may be necessary to readjust the governor stop after test flying to obtain maximum rated rpm when airborne.

14-16. RIGGING PROPELLER GOVERNOR CONTROL.

a. Disconnect control end (5) from governor (1).

b. Place propeller control in cabin, full forward, then pull it back approximately 1/8 inch and lock in this position. This will allow "cushion" to assure full contact with governor high-rpm stop screw.

c. Place governor arm against high-rpm stop screw.

d. Loosen jam nuts and adjust control rod end until attaching holes align while governor arm is against high-rpm stop screw. Be sure to maintain sufficient thread engagement of the control and rod end. If necessary, shift control in the clamps to achieve this.

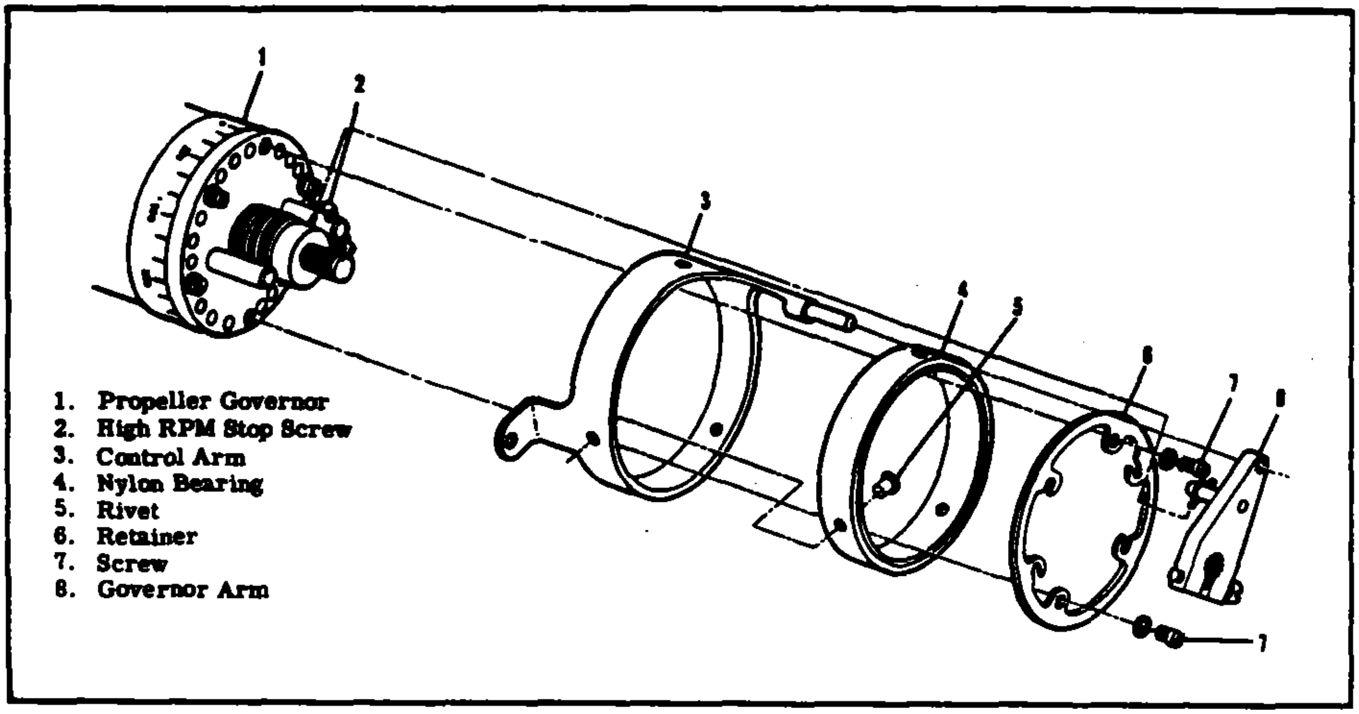


Figure 14-2. Governor Control Arm and Bearing Assembly

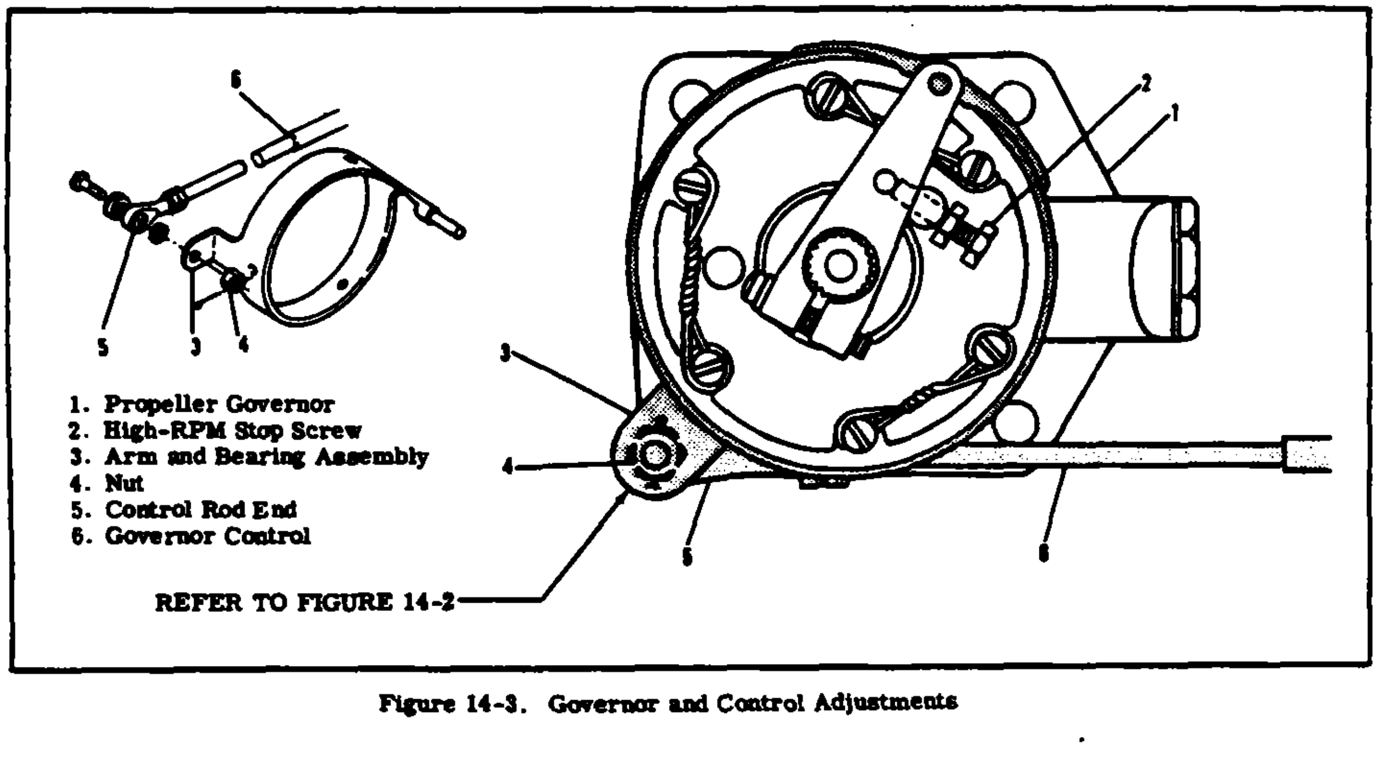


Figure 14-3. Governor and Control Adjustments

e. Attach rod end to the governor. Be sure all washers are installed correctly.

f. Operate the control to see that the governor arm bottoms out against the low pitch stop and bottoms out against or a maximum of .12" from the high pitch stop on the governor before reaching the end of control cable travel.

NOTE

The result of rigging is full travel of the governor arm (bottom out against both high and low pitch stops) with some cushion at both ends of control travel.

14-17. TIME BETWEEN OVERHAUL (TBO). Propeller governor overhaul shall coincide with engine overhaul. *Refer to* Sections 12 and 12A for engine time between overhaul (TBO) periods. The governor overhaul manual is available from the Cessna Service Parts Center.

SHOP NOTES:

SECTION 15

UTILITY SYSTEMS

TABLE OF CONTENTS

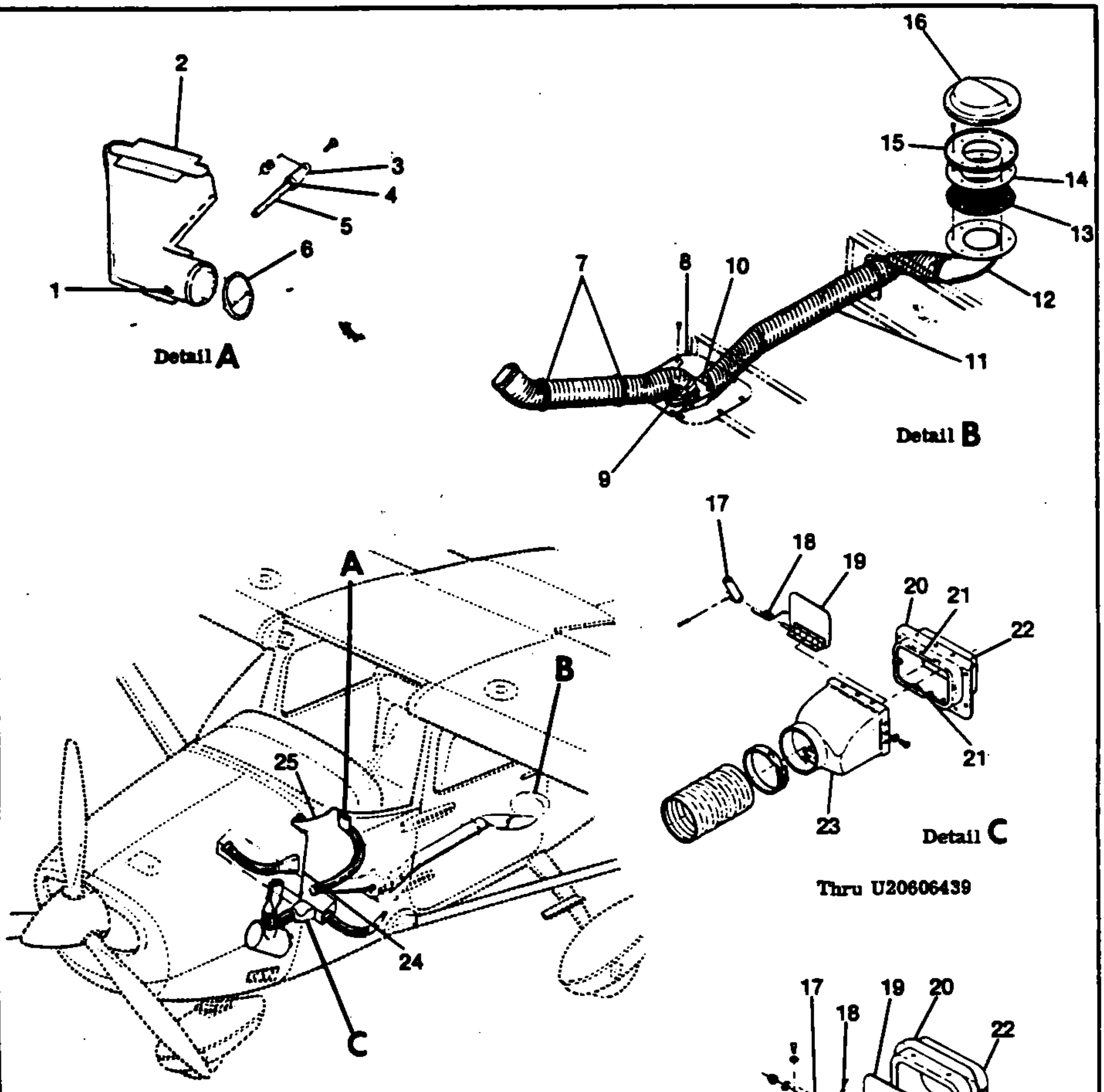
15-1. UTILITY SYSTEMS.

15-2. HEATING SYSTEM. (See figure 15-1.)

15-3. DESCRIPTION. On non-turbocharged aircraft, the heating system is comprised of the heat exchange section of the left exhaust muffler, a heater valve, mounted on the left forward side of the firewall, a duct across the aft side of the firewall, a push-pull control on the instrument panel, and flexible ducts connecting the system. On aircraft with turbocharged engines, the heating system consists of an opening in the left side of the nose cap, an exhaust shroud, a heater valve, mounted on the left forward side of the firewall, to which is attached an adapter and a tube, extending downward and overboard. The system also includes a duct across the aft side of the firewall, a push-pull control on the instrument panel, and flexible ducts, connecting the system.

15-4. HEATER OPERATION. On aircraft with non-turbocharged engines, ram air is ducted through an engine baffle and the heat exchanger section of the left exhaust muffler, to the heater valve at the firewall. On aircraft with turbocharged engines, ram air is ducted through an opening in the left side of the nose cap, through an exhaust shroud, to the heater valve at the firewall. On both models, heated air flows from the heater valve into a duct across the aft side of the firewall, where it is distributed into the cabin. The heater valve, operated by a push-pull control marked "CABIN HEAT", located on the instrument panel, regulates the volume of heated air entering the system.

15-5. TROUBLE SHOOTING. Most of the operational troubles in the heating system are caused by sticking or binding air valves and their controls, damaged air ducting, or defects in the exhaust muffler. In most cases, valves or controls can be freed by proper lubrication. Damaged or broken parts should be replaced. When checking controls, be sure valves respond freely to control movement, that they move in the correct direction, and that they move through their full range of travel and seal properly. Check that hoses are properly secured, and replace hoses that are burned, frayed or crushed. If fumes are detected in the cabin, a very thorough inspection of the exhaust muffler should be accomplished. Refer to the applicable paragraph in Section 12 for the non-turbocharged engine exhaust system inspection, or for the turbocharged engine, refer to Section 12A. Since any holes or cracks may permit exhaust fumes to enter the cabin, replacement of defective parts is imperative because fumes constitute an extreme danger. Seal any gaps in heater ducts across the firewall with Pro-Seal #700 (Coast Pro-Seal Co., Los Angeles, California) compound, or equivalent compound.



1. Washer
2. Defroster Nozzle
3. Arm Assembly
4. Roll Pin
5. Shaft
6. Valve Assembly
7. Sta-Strap
8. Cover
9. Clamp
10. Plenum
11. Hose
12. Cabin Heat Outlet
13. Screen
14. Spacer
15. Retainer
16. Outlet Cover
17. Control Arm
18. Spring
19. Valve Plate
20. Valve Seat
21. Nutplate
22. Valve Extension
23. Valve Body
24. Cabin Heat Control
25. Defrost Control

NON-TURBOCHARGED AIRCRAFT

Figure 15-1. Heating and Defrosting System (Sheet 1 of 2)

1. Washer
2. Defroster Nozzle
3. Arm Assembly
4. Roll Pin
5. Shaft
6. Valve Assembly
7. Sta-Strap
8. Cover
9. Clamp
10. Plenum
11. Hose
12. Cabin Heat Outlet
13. Screen
14. Spacer
15. Retainer
16. Outlet Cover
17. Control Arm
18. Spring
19. Valve Plate
20. Valve Seat
21. Nutplate
22. Valve Extension
23. Valve Body
24. Cabin Heat Control
25. Defrost Control

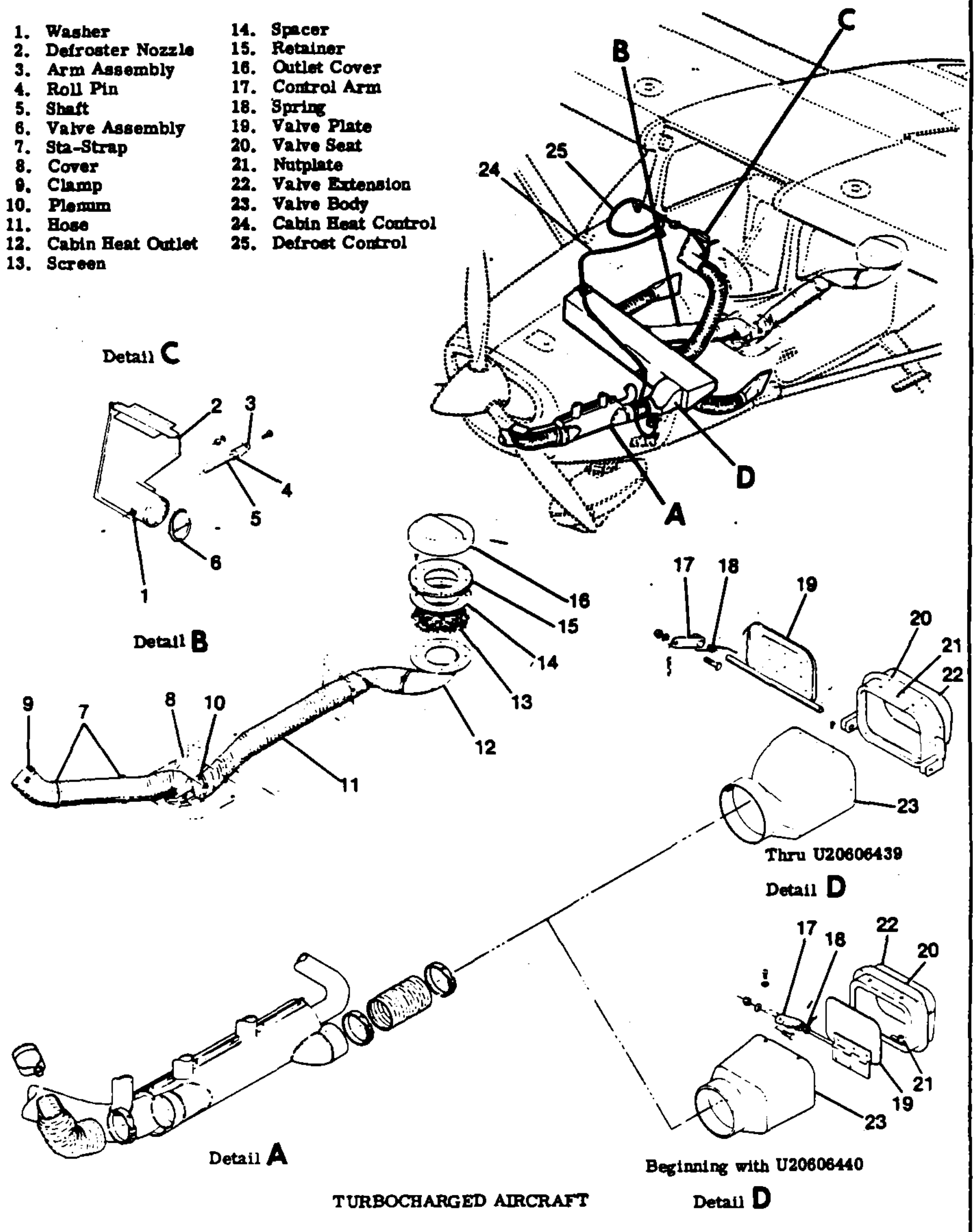
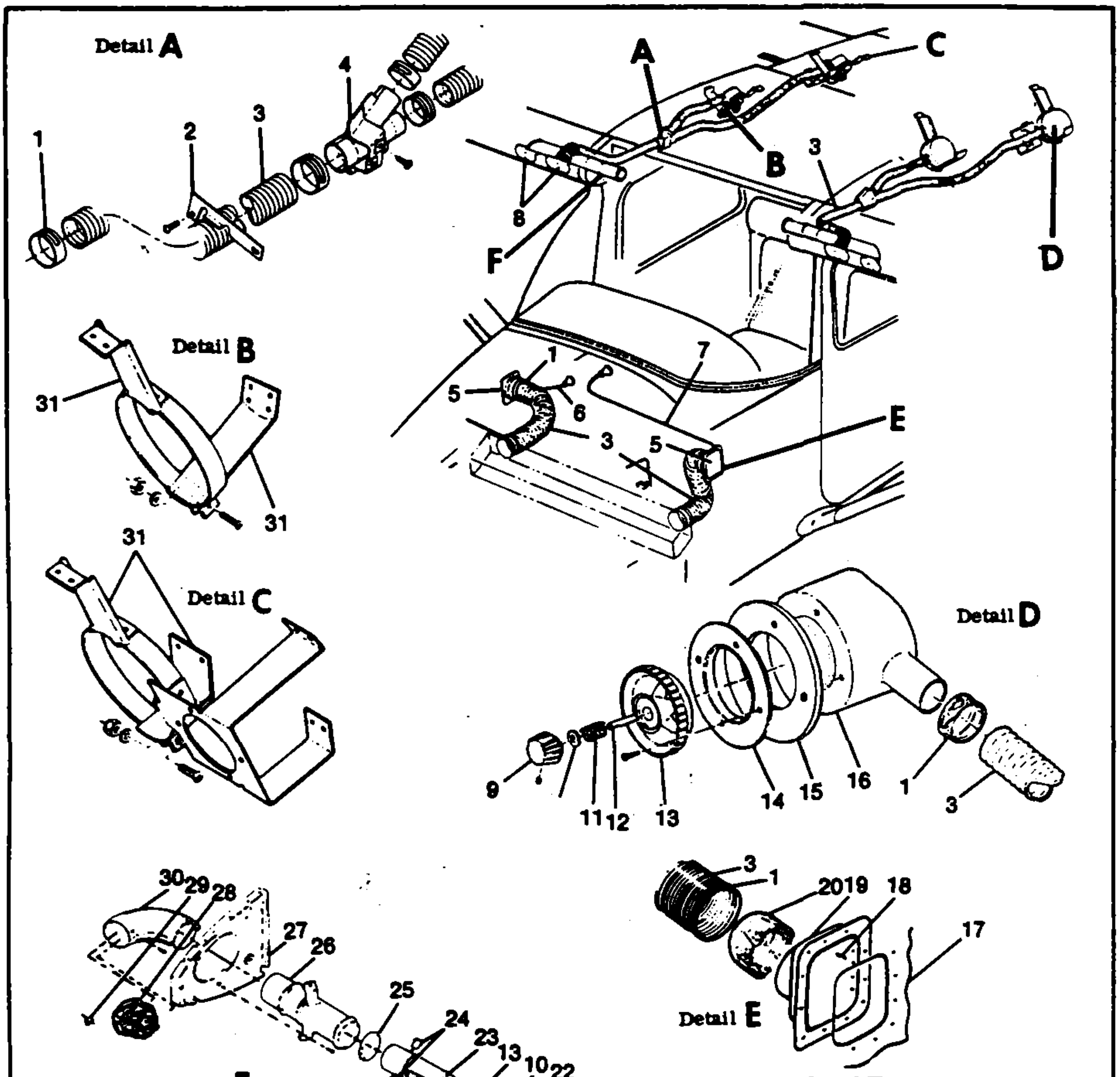


Figure 15-1. Heating and Defrosting System (Sheet 2 of 2)



1. Clamp
2. Hose Retainer
3. Hose
4. Cold Air Fitting
5. Cold Air Inlet
6. Aux. Cabin Air Control
7. Cabin Air Control
8. Air Scoop
9. Knob
10. Washer
11. Spring
12. Shaft
13. Knob
14. Escutcheon
15. Gasket
16. Silencer Valve Body
17. Fuselage Skin
18. Scoop Door
19. Air Valve Assembly
20. Screen
21. Insert
22. Screw
23. Outlet Assembly
24. Bullet Catch
25. Seal
26. Tube Assembly
27. Rib
28. Element
29. Nut
30. Elbow
31. Bracket

Figure 15-2. Ventilating Systems

15-6. REMOVAL AND INSTALLATION OF COMPONENTS. Figure 15-1 may be used as a guide for removal and installation of components of the heater system. Cut replacement hose to length and install in the original routing. Trim hose winding shorter than the hose to allow hose clamps to be fitted. Defective heater valves should be repaired or replaced. Check for proper operation of valves and their controls after installation or repair.

15-7. DEFROSTING SYSTEM. (See figure 15-1.)

15-8. DESCRIPTION. The system is composed of a duct across the aft side of the firewall, a defroster outlet, mounted on the left side of the cowl deck, immediately aft of the windshield, a defroster control knob on the instrument panel, and flexible ducting connecting the system.

15-9. DEFROSTER OPERATION. Air from the duct across the aft side of the firewall flows through a flexible duct to the defroster outlet. The defroster control operates a damper in the outlet to regulate the amount of air deflected across the inside surface of the windshield. The temperature and volume of this air is controlled by the settings of the cabin heating system control.

15-10. TROUBLE SHOOTING. Most of the operational troubles in the defrosting system are caused by sticking or binding of the damper in the defroster outlet or its control. Since the defrosting system depends on proper operation of the cabin heating system, refer to paragraph 15-5 for trouble shooting the heating and defrosting systems.

15-11. REMOVAL AND INSTALLATION OF COMPONENTS. Figure 15-1 may be used as a guide for removal and installation of components of the defrosting system. Cut replacement hose to length and install in the original routing. Trim hose winding shorter than the hose to allow hose clamps to be fitted. A defective defroster outlet should be repaired or replaced. Check for proper operation of defroster outlet and its control after installation or repair.

15-12. VENTILATING SYSTEM. (See figure 15-2.)

15-13. DESCRIPTION. The system is comprised of two airscoops, mounted in the inboard leading edge of each wing, an adjustable ventilator mounted on each side of the cabin near the upper corners of the windshield, two plenum chambers mounted in the left and right rear cabin wing root areas, two fresh airscoop doors, one on each side of the fuselage, just forward of the front seats, a control on the instrument panel for each of these scoop doors and flexible ducting connecting the system.

15-14. VENTILATING SYSTEM OPERATION. Air received from scoops mounted in the inboard leading edges of the wings, is ducted to adjustable ventilators mounted on each side of the cabin near the upper corners of the windshield. Rear seat ventilation is provided by plenum chambers mounted in the left and right rear cabin wing root areas. These plenum chambers receive ram air from the airscoops in the inboard leading edges of the wings. Each plenum chamber is equipped with a valve which meters the incoming cabin ventilation air. This provides a chamber for the expansion of cabin air which greatly reduces inlet air noise. Forward cabin ventilation is provided by two fresh airscoop doors, one on each side of the fuselage, just forward of the front seats. The left scoop door is operated by a control in the instrument panel marked "CABIN AIR," and the right scoop door is operated by a control in the instrument panel marked "AUX CABIN AIR." Fresh air from the scoop doors is routed to the duct across the aft side of the firewall, where it is distributed into the cabin. As long as the "CABIN HEAT" control is pushed full-in, no heated air can enter the firewall duct; therefore, when the "CABIN AIR" or "AUX CABIN AIR" controls are pulled out, only fresh air from the scoops will flow through the duct into the cabin. As the "CABIN HEAT" control is gradually pulled out, more and more heated air will blend with the fresh air from the scoops and be distributed into the cabin. All of the controls may be set in any position from full open to full-closed.

15-15. TROUBLE SHOOTING. Most of the operational troubles in the ventilating system are caused by sticking or binding of the lever in the inlet scoop door or its control. The spring or plate in the plenum chambers could also bind or stick, requiring repair or replacement of the plenum chamber. Check the filter elements in the airscoops in the leading edges of the wings for obstructions. If used, the elements can be removed and cleaned or replaced. Since air passing through the filters is emitted into the cabin, do not use a cleaning solution which would contaminate cabin air. The filters may be removed to increase air flow. However, their removal will cause a slight increase in noise level.

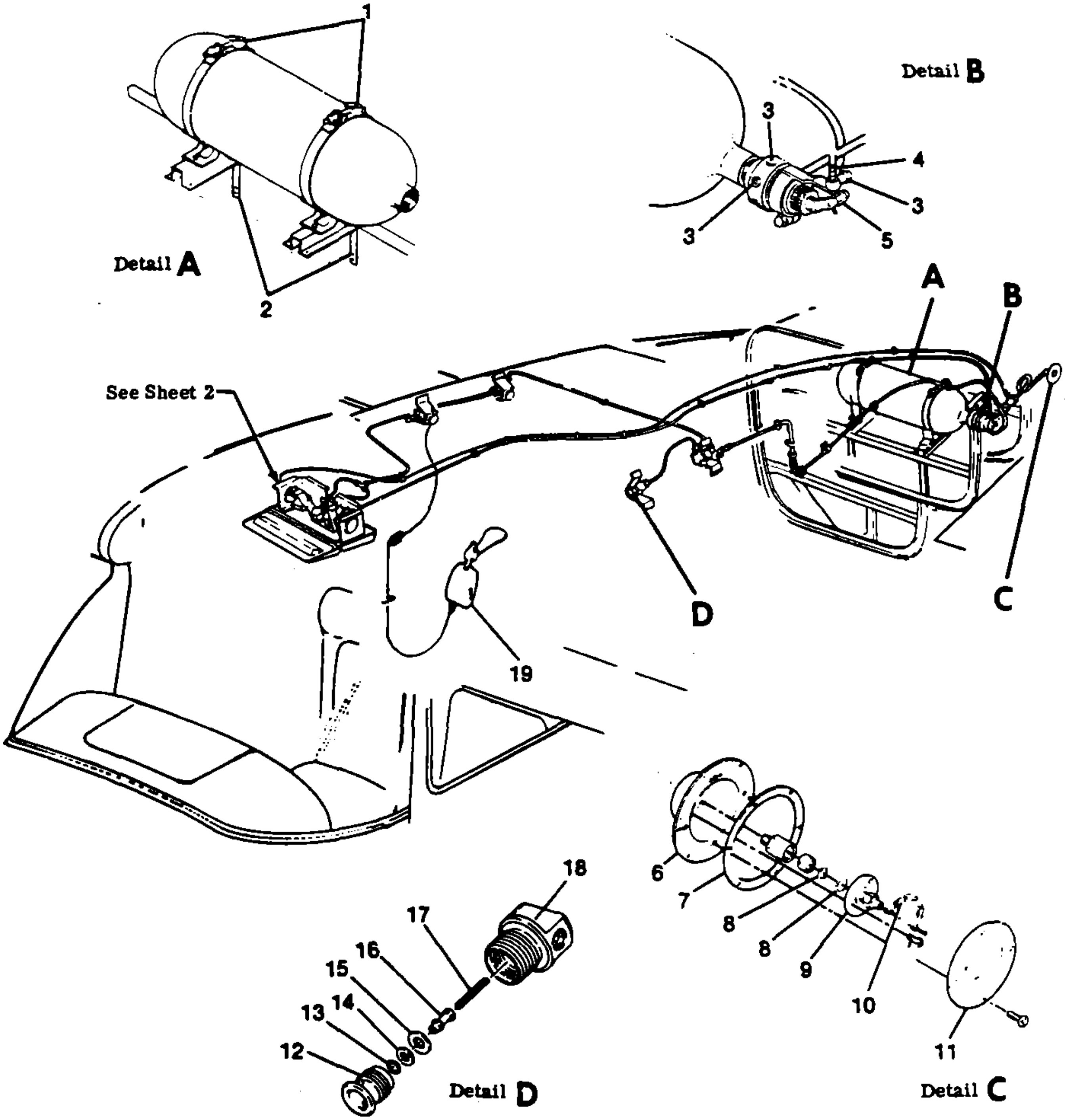
15-16. REMOVAL AND INSTALLATION OF COMPONENTS. Figure 15-2 may be used as a guide for removal and installation of components of the ventilating system. Cut replacement hose to length and install in the original routing. Trim hose winding shorter than the hose to allow hose clamps to be fitted. A defective plenum chamber should be repaired or replaced. Check for proper operation of ventilating controls after installation or repair.

15-17. OXYGEN SYSTEM.

WARNING

Under NO circumstances should the ON-OFF control on the oxygen regulator be turned to the "ON" position with the outlet (low pressure) ports open to atmosphere. Operation of these units in this manner will induce serious damage to the regulators and having the following results:

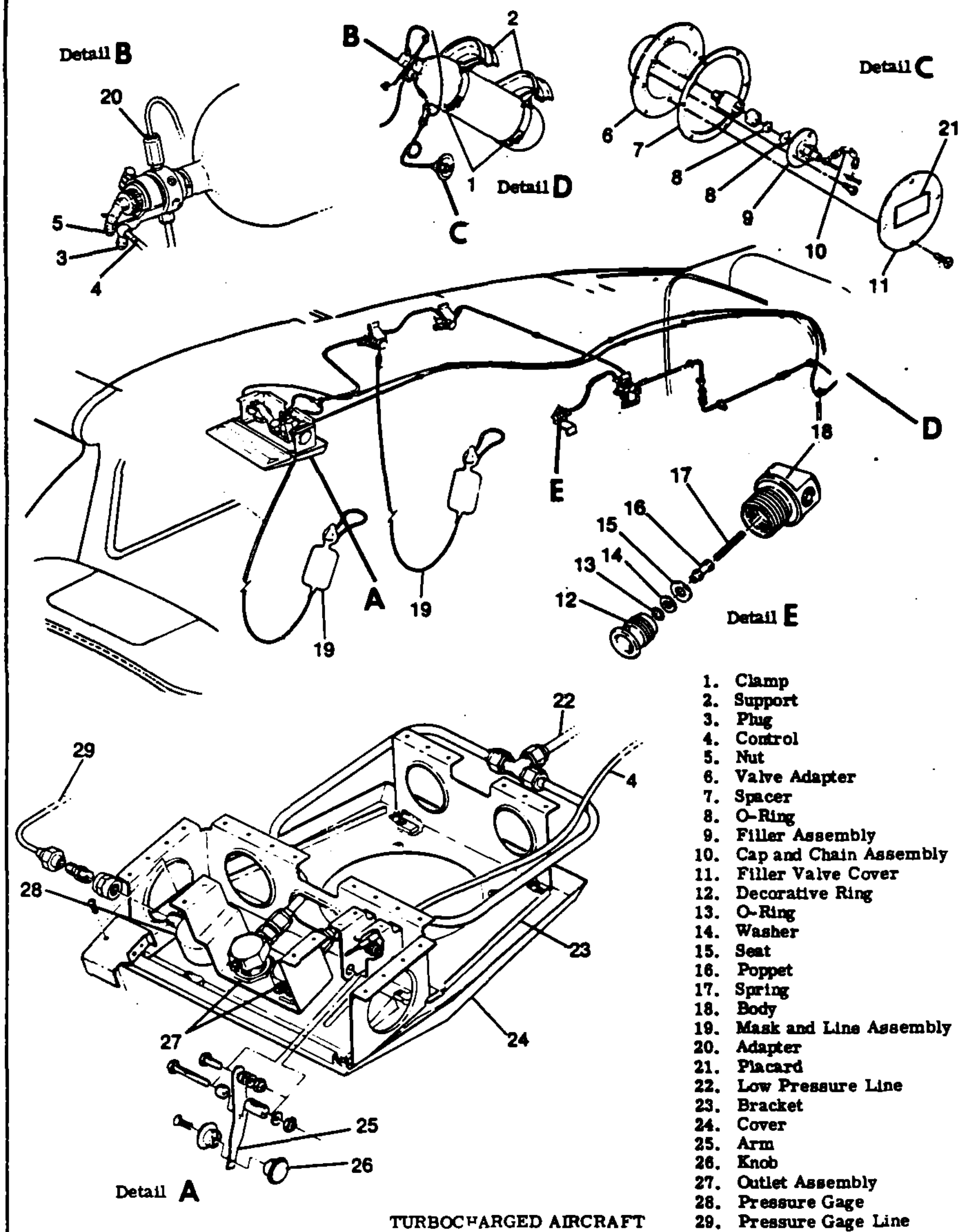
1. Loss of outlet set pressure.
2. Loss of oxygen flow through the regulator which will result in inadequate oxygen being fed through the aircraft system.
3. Internal leakage of oxygen through the regulator.



1. Clamp
2. Support
3. Plug
4. Control
5. Nut
6. Valve Adapter
7. Spacer
8. O-Ring
9. Filler Assembly
10. Cap and Chain Assembly
11. Filler Valve Cover
12. Decorative Ring
13. O-Ring
14. Washer
15. Seat
16. Poppet
17. Spring
18. Body
19. Mask and Line Assembly

NON-TURBOCHARGED AIRCRAFT

Figure 15-3. Oxygen System (Sheet 1 of 2)



1. Clamp
2. Support
3. Plug
4. Control
5. Nut
6. Valve Adapter
7. Spacer
8. O-Ring
9. Filler Assembly
10. Cap and Chain Assembly
11. Filler Valve Cover
12. Decorative Ring
13. O-Ring
14. Washer
15. Seat
16. Poppet
17. Spring
18. Body
19. Mask and Line Assembly
20. Adapter
21. Placard
22. Low Pressure Line
23. Bracket
24. Cover
25. Arm
26. Knob
27. Outlet Assembly
28. Pressure Gage
29. Pressure Gage Line

Figure 15-3. Oxygen System (Sheet 2 of 2)

Opening of the control lever with the outlet ports open to atmosphere, results in an "overshoot" of the regulator metering device due to the extreme flow demand through the regulator. After overshooting, the metering poppet device goes into oscillation, creating serious damage to the poppet seat and diaphragm metering probe. This condition can occur even by turning the control lever on and then turning it quickly off.

A potential hazard exists to aircraft in the field where inexperienced personnel might remove the cylinder and regulator assembly from the aircraft and for some reason, attempt to turn the regulator to the "ON" position with the outlet ports open. Unfortunately, after the units have been improperly operated as noted, there is no outward appearance indicating that damage has occurred.

Testing these regulators should be accomplished only after installation in the aircraft, with the "downstream" low pressure line attached.

15-18. DESCRIPTION. The system is comprised of an oxygen cylinder and regulator assembly, filler valve, pressure gage, pressure lines, outlets and mask assemblies. The oxygen cylinder is mounted aft of the baggage compartment. Locations of system components are shown in figure 15-3. The pilot's supply line is designed to receive a greater flow of oxygen than the passengers. The pilot's mask is equipped with a microphone, keyed by a switch button on the pilot's control wheel. The filler valve is located on the aft baggage curtain and access is gained through the baggage door.

WARNING

Oil, grease or other lubricants in contact with high-pressure oxygen, create a serious fire hazard and such contact should be avoided. Do not permit smoking or open flame in or near aircraft while work is performed on oxygen systems.

15-19. Tools and Equipment.

NOTE: Equivalent substitutes may be used instead of the following items.

NAME	NUMBER	MANUFACTURER	USE
Teflon Lubricating Tape	S1465	Commercially Available	To lubricate threads and fittings.
Trichloro-ethylene	MIL-T-7003	Commercially Available	To clean oxygen lines.
Naphtha	TT-N-95	Commercially Available	Flush oxygen lines.
Anti-Icing Fluid	MIL-F-5566	Commercially Available	Flush oxygen lines.
Sherlock Leak Detector	Type CG (MIL-L-25567A)	Puritan-Zep El segundo, CA	For leak test fluid.
Flowrater (0 to 10 Liters per Minute LPM)		Commercially Available	Check pressure flow to passenger mask.
Pressure Gage (0-100 PSIG)		Commercially Available	To check oxygen flow.
Oxygen Outlet Adapter	C166005-0506	Cessna Aircraft Company	Used with pressure gage.

15-19A. MAINTENANCE PROCEDURES AND PRECAUTIONS. If maintenance is performed on the airplane oxygen system, or on any other system in the airplane requiring removal of an oxygen system component, strict adherence to the following procedures and precautions is required.

WARNING

Do Not permit smoking or open flame near airplane while maintenance is being performed on the oxygen system. Assure all electrical power is disconnected and that airplane is properly grounded. In addition, oils, grease and solvents may burn or explode spontaneously when contacted by oxygen under pressure.

a. Working area, tools and hands must be clean.
b. Use extreme caution to assure every port in the

system is kept thoroughly clean and free of water, oil, grease and solvent contamination.

c. Cap all openings immediately upon removal of any component. Do Not use tape or caps which will induce moisture.

d. Lines and fittings shall be clean and dry.

e. Use only teflon lubricating tape on threads of oxygen valves, tubing connectors, fittings and parts of assemblies. The teflon tape shall be used in accordance with the instructions listed following this step. Extreme care must be exercised to prevent contamination of teflon tape with oil, grease or other lubricants.

1. Lay tape on threads close to end of fitting: Clockwise on standard threads, opposite on left-hand threads.
2. Apply enough tension while winding so tape forms into thread grooves.
3. After wrap is complete, maintain tension and tear tape by pulling apart in direction it was applied. Resulted ragged end is the key to the tape staying in place. (If sheared or cut, tape may unwind.)
4. Press tape well into threads.
5. Make connections.

f. Fabrication of oxygen pressure lines is not recommended. Lines should be replaced by part numbers called out in the aircraft Parts Catalog.

g. Lines and fittings must be clean and dry. One of the following methods may be used.

1. Clean by degreasing with stabilized trichlorethylene, conforming to Federal Specifications O-T-634 or MIL-T-27602. These items can be obtained from American Mineral Spirits of Houston, Texas.

NOTE

Most air compressors are oil lubricated, and a minute amount of oil may be carried by the airstream. If only an oil lubricated air compressor is available, drying must be accomplished by heating at a temperature of 250° to 300°F for a suitable period.

2. Flush with naphtha, conforming to Specification TT-N-95 (aliphatic naphtha). Blow clean and dry off all solvents with clean, dry, oil-free, filtered air. Flush with anti-icing fluid conforming to Specification TT-T-735 or anhydrous ethyl alcohol. Rinse thoroughly with fresh water. Dry thoroughly with a stream of clean, dry, oil-free, filtered air.
3. Flush with hot inhibited alkaline cleaner until free from oil and grease. Rinse with fresh water and dry with clean, dry, filtered air.

NOTE

Cap lines at both ends immediately after drying to prevent contamination.

15-20. REPLACEMENT OF COMPONENTS. Removal, disassembly, assembly and installation of system components may be accomplished while using figure 15-3 as a guide.

CAUTION

The pressure regulator, pressure gage and line and filler valve should be removed and replaced only by personnel familiar with high-pressure fittings. Observe the maintenance precautions listed in the preceding paragraph.

NOTE

Oxygen cylinder and regulator assemblies may not always be installed in the field exactly as illustrated in figure 15-3, which shows factory installation. Important points to remember are as follows.

a. Before removing cylinder, release low-pressure line by opening cabin outlets. Disconnect push-pull control cable, filler line, pressure gage line and outlet line from regulator. CAP ALL LINES IMMEDIATELY.

b. If it is necessary to replace filler valve O-rings, remove parts necessary for access to filler valve. Remove line from quick-disconnect valve at the regulator, then disconnect chain, but do not remove cap from filler valve. Remove screws securing valve and disconnect pressure line. Referring to applicable figure, cap pressure line and seat. Disassemble valve, replace O-rings and reassemble valve. Install filler valve by reversing procedures outlined in this step.

c. To remove entire oxygen system, headliner must be lowered and soundproofing removed to expose lines. Refer to Section 3 for headliner removal.

15-21. OXYGEN CYLINDER GENERAL INFORMATION. The following information is permanently steel stamped on the shoulder, top head or neck of each oxygen cylinder:

a. Cylinder specification, followed by service pressure (e.g. "ICC-3AA1800" and "ICC-3HT1850" for standard and light weight cylinders respectively).

NOTE

Effective 1 January 1970, all newly-manufactured cylinders are stamped "DOT" (Department of Transportation), rather than "ICC" (Interstate Commerce Commission). An example of the new designation would be: "DOT-3HT1850".

b. Cylinder serial number is stamped below or directly following cylinder specification. The symbol of the purchaser, user or maker, if registered with the Bureau of Explosives, may be located directly below or following the serial number. The cylinder serial number may be stamped in an alternate location on the cylinder top head.

c. Inspector's official mark near serial number.

d. Date of manufacture: This is the date of the first hydrostatic test (such as 4-69 for April 1969). The dash between the month and the year figures may be replaced with the mark of the testing or inspection agency (e.g. 4L69).

e. Hydrostatic test date: The dates of subsequent hydrostatic tests shall be steel stamped (month and year) directly below the original manufacture date. The dash between the month and year figures can be replaced with the mark of the testing agency.

f. A Cessna identification placard is located near the center of the cylinder body.

g. Halogen test stamp: "Halogen Tested", date of test (month, day and year) and inspector's mark appears directly underneath the Cessna identification placard.

15-22. OXYGEN CYLINDER SERVICE REQUIREMENTS.

a. Hydrostatic test requirements:

1. Standard weight (ICC or DOT-3AA1800) cylinders must be hydrostatically tested to 5/3 their working pressure every five years commencing with the date of the last hydrostatic test.

2. Light weight (ICC or DOT-3HT1850) cylinders must be hydrostatically tested to 5/3 their working pressure every three years commencing with the date of the last hydrostatic test.

b. Service life requirements:

1. Standard weight (ICC or DOT-3AA1800) cylinders have no age life limitations and may continue to be used until they fail hydrostatic test.

2. Light weight (ICC or DOT-3HT1850) cylinders must be retired from service after 24 years or 4,380 filling cycles after date of manufacture, whichever occurs first.

NOTE

These test periods and life limitations are established by the Interstate Commerce Commission Code of Federal Regulations, Title 49, Chapter 1, Para. 73.34.

15-23. OXYGEN CYLINDER INSPECTION REQUIREMENTS.

Discrepancies	DOT-3AA 1800	See Steps		DOT-3HT 1850	See Steps	
Isolated Pitting or Corrosion (Depth)	0.020	1	2	0.010	1	2
Local Pitting or Corrosion or Line Corrosion (Depth)	0.010	2	3	0.005	2	3
General Corrosion	Not Allowed		4	Not Allowed		4
Cuts, Digs, Gauges (Depth)	0.010	5		0.005	5	
Dents (Depth)	0.062	6		0.031	6	
Fire Damage	Not Allowed		7	Not Allowed		7
Bulges	Not Allowed		8	Not Allowed		8

(Cylinder Classification: DOT-3AA 1800, DOT-3HT 1850)

a. Inspect the entire exterior surface of the cylinder for indication of abuse, dents, bulges and strap chafing. See chart and steps 1 thru 8.

1. Isolated pits of small cross section involving loss of wall thickness by corrosive media. Small isolated pits with a maximum depth as shown are acceptable.

2. If depth exceeds figure shown, cylinder must be returned to the manufacturer for disposition.

3. Local pitting or corrosion or line corrosion involving loss of wall thickness by corrosive media with a pattern of pits which are connected to others in a band or line. A small area with a minimum depth as shown is acceptable. Areas extending beyond 3 inches in diameter or 4 inches long shall be considered general corrosion.

4. General corrosion (sometimes accompanied by pitting) involving loss of wall thickness by corrosive media covering a considerable area. Cylinder must be returned to the manufacturer for hydrostatic testing.

5. Deformations caused by contact with a sharp object cutting or upsetting the material of the cylinder, decreasing the wall thickness. Maximum defect permissible without corrective action. If this depth is exceeded, the cylinder must be returned to the manufacturer for removal of defects and verification of cylinder strength by hydrostatic testing.

6. Deformations caused by contact with blunt objects in such manner that the thickness of the metal is not impaired. The major diameter of the dent must be equal to or greater than 32 times the depth of the dent. Sharper dents (or deeper dents) than this are considered too abrupt and must be returned to the cylinder manufacturer for disposition.

7. Fire damage is indicated by charring or burning or sintering of the metal, charring or burning of the paint, distortion of the cylinder, functioned safety relief devices, melting of valve parts, etc. Cylinders must be returned to the cylinder manufacturer for disposition.

8. Bulged cylinders are not acceptable. Cylinders must be returned to the cylinder manufacturer for disposition.

NOTE

The above data may be used to determine that oxygen cylinders are acceptable for service. This criteria should be used prior to charging cylinders.

b. Examine the neck of cylinder for cracks, distortion or damaged threads.
c. Check the cylinders to determine if markings are legible.
d. Check date of last hydrostatic test. If the periodic retest date is past, do not return the cylinder to service until the test has been accomplished.
e. Inspect the cylinder mounting bracket, bracket hold-down bolts and cylinder holding straps for cracks, deformation, cleanliness, and security of attachment.
f. In the immediate area where the cylinder is stored or secured, check for evidence of any types of interference, chafing deformation or deterioration.

15-24. OXYGEN SYSTEM COMPONENT SERVICE REQUIREMENTS.
a. PRESSURE REGULATOR. The regulator shall be functionally tested every two years or 1,000 hours for aircraft operating under 15,000 ft. and one year for aircraft operating over 15,000 ft. The regulator shall be overhauled every five years or at time of hydrostatic test.
b. FILLER VALVE. The valve shall be functionally tested every two years and overhauled every five years or at time of hydrostatic test.
c. QUICK-RELEASE COUPLING. The coupling shall be functionally tested every two years and overhauled every five years or at time of hydrostatic test.
d. PRESSURE GAGE. The gage shall be replaced when found to be faulty. No re-conditioning or overhaul of the gage is authorized.
e. OUTLETS. The outlets shall be disassembled and inspected and the sealing core replaced, regardless of condition, every five years.

15-25. OXYGEN SYSTEM COMPONENT INSPECTION REQUIREMENTS.
a. Examine all parts for cracks, nicks, damaged threads or other apparent damage.
b. Actuate regulator controls and valve to check for ease of operation.
c. Determine if the gage is functioning properly by observing the pressure build-up and the return to zero when the system oxygen is bled off.
d. Replace any oxygen line that is chafed, rusted, corroded, dented, cracked or kinked.
e. Check fittings for corrosion around the threaded area where lines are joined together. Pressurize the system and check for leaks.

15-26. MASKS AND HOSE.
a. Check oxygen masks for fabric cracks and rough face seals. If the mask is a full-faced model, inspect glass or plastic for cleanliness and state of repair.
b. Flex the mask hose gently over its entirety and check for evidence of deterioration or dirt.
c. Examine mask and hose storage compartment for cleanliness and general condition.

15-27. MAINTENANCE AND CLEANING.
a. Clean and disinfect mask assemblies after use, as appropriate.

NOTE

Use care to avoid damaging microphone assembly while cleaning and sterilizing.

b. Wash mask with a mild soap solution and rinse it with clear water.
c. To sterilize, swab mask thoroughly with a gauze or sponge soaked in a water/merthiolate solution. This solution should contain 1/5 teaspoon of merthiolate per one quart of water. Wipe the mask with a clean cloth and let air dry.
d. Observe that each mask breathing tube end is free of nicks and that the tube end will slip into the cabin oxygen receptacle with ease and will not leak.
e. If a mask assembly is defective (leaks, does not allow breathing or contains a defective microphone) it is advisable to return the mask assembly to the manufacturer or a repair station.
f. Replace hose if it shows evidence of deterioration.
g. Hose may be cleaned in the same manner as the mask.

15-28. OXYGEN SYSTEM PURGING.
a. A vapor degreasing solution of stabilized trichlorethylene conforming to MIL-T-7003, followed by blowing tubing clean and dry with a jet of nitrogen gas (BB-N411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).

CAUTION

MOST AIR COMPRESSORS ARE OIL LUBRICATED, AND A MINIMUM AMOUNT OF OIL MAY BE CARRIED BY THE AIR STREAM. A WATER LUBRICATED COMPRESSOR SHOULD BE USED TO BLOW TUBING CLEAN WHEN NITROGEN OR ARGON ARE NOT AVAILABLE. THE AIR MUST BE CLEAN, DRY AND FILTERED.

b. Flush with naphtha conforming to Specification TT-N-95; then blow clean and dry with clean, dry, filtered air. Flush with anti-icing fluid conforming to MIL-F-5566 or anhydrous ethyl alcohol. Rinse thoroughly with fresh water and dry with a jet of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).

c. Flush with hot inhibited alkaline cleaner until free from oil and grease. Rinse with fresh water and dry with a jet of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).

NOTE

Cap all lines immediately after drying.

d. Fabrication of pressure lines is not recommended. Lines should be replaced from the factory by part number.

e. Use only S1465 Teflon lubricating tape on the threads of the male fittings. No lubricating tape is used on coupling sleeves or outside of the flares.

f. Maintenance personnel must assure that their hands are free of dirt and grease prior to installation of oxygen tubing or fittings.

WARNING

USE NONSPARKING TOOLS.

CAUTION

WITH OXYGEN BOTTLE CHARGED, DO NOT PULL CONTROL TO "ON" POSITION WITH OUTLET PORTS (LOW PRESSURE) OPEN TO ATMOSPHERE. DAMAGE TO REGULATOR METERING POPPET MAY OCCUR.

CAUTION

WHENEVER A COMPONENT OF THE OXYGEN SYSTEM HAS BEEN REMOVED, REINSTALLED, REPLACED OR SYSTEM HAS BEEN DISASSEMBLED IN ANY WAY, THE OXYGEN SYSTEM MUST BE LEAK CHECKED AND PURGED.

3. All tools used for installation of oxygen tubes or fittings must be free of dirt, grease and oils.

15-29. FUNCTIONAL TESTING. Whenever the regulator and cylinder assembly has been replaced or overhauled, perform the following flow and internal leakage tests to check that the system functions properly.

a. Fully charge oxygen system in accordance with procedures outlined in paragraph 15-31.

b. Disconnect line and fitting assembly from pilot's mask and line assembly. Insert outlet end of line and fitting assembly into cabin outlet and attach opposite end of line to a pressure gage (gage should be calibrated in one-pound increments from 0 to 100 PSI). Place control lever in ON position. Gage pressure should read 75±10 PSI.

c. Insert mask and line assemblies into all remaining cabin outlets. With oxygen flowing from all outlets, test gage pressure should still be 75±10 PSI.

d. Place oxygen control lever in OFF position and allow test gage pressure to fall to 0 PSI. Remove all adapter assemblies except the one with the pressure gage. The pressure must not rise above 0 PSI when observed for one minute. Remove pressure gage and adapter from oxygen outlet.

NOTE

If pressures specified in the foregoing procedures are not obtained, the oxygen regulator is not operating properly. Remove and replace cylinder-regulator assembly with another unit and repeat test procedure.

e. Connect mask and line assemblies to each cabin outlet and check each mask for proper operation.

f. Check pilot's mask microphone and control wheel switch for proper operation. After checking, return all masks to mask case.

g. Recharge oxygen system in accordance with procedures outlined in paragraph 15-31.

15-30. SYSTEM LEAK TEST. When oxygen is being lost from a system through leakage, a sequence of steps may be necessary to locate the opening. Leakage may often be detected by listening for the distinct hissing of escaping gas. If this check proves negative, it will be necessary to soap-test all lines and connections with a castile soap and water solution or specially compounded leak-test material. Make the solution thick enough to adhere to the contours of the fittings. At the completion of the leakage test, remove all traces of the leak detector or soap and water solution.

CAUTION

Do not attempt to tighten any connections while the system is charged.

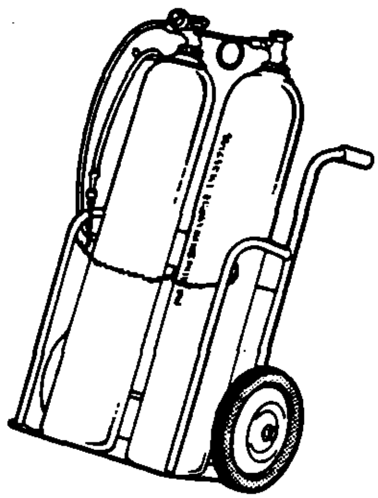
15-31. SYSTEM CHARGING.

WARNING

BE SURE TO GROUND AIRCRAFT AND GROUND SERVICING EQUIPMENT BEFORE CHARGING OXYGEN SYSTEM.

NOTE

Each interconnected series of oxygen cylinders is equipped with a single gage. The trailer type cascade may also be equipped with a nitrogen cylinder (shown reversed) for filling landing gear struts, accumulators, etc. Cylinders are not available for direct purchase, but are usually leased and refilled by a local compressed gas supplier.



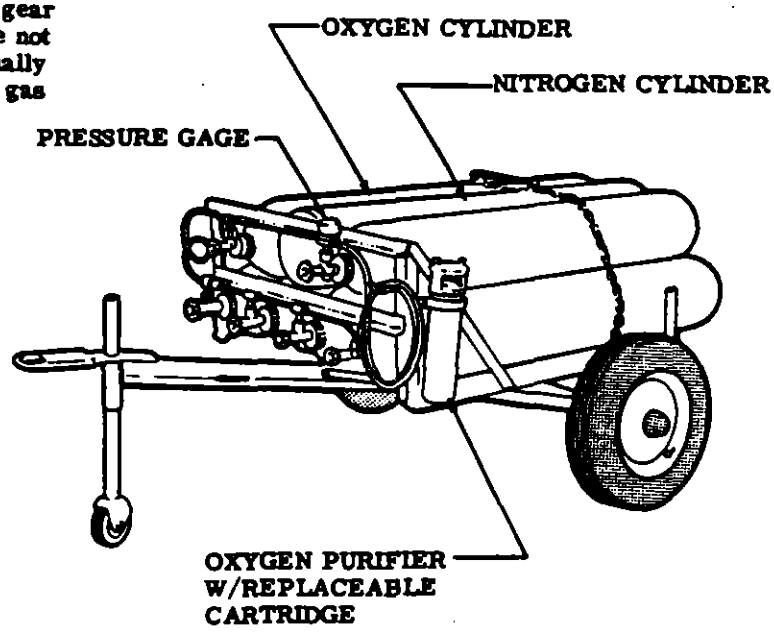


Figure 15-4 Portable Oxygen Cascades

a. Do not attempt to charge oxygen cylinders if servicing equipment fittings or filler valve are corroded or contaminated. If in doubt, clean with stabilized trichlorethylene and let air dry. Do not allow solvent to enter any internal parts.

b. If cylinder is completely empty, do not charge, as the cylinder must then be removed, inspected and cleaned.

CAUTION

A cylinder which is completely empty may well be contaminated. The regulator and cylinder assembly must then be disassembled, inspected and cleaned by an FAA approved facility, before filling. Contamination, as used here, means dirt, dust or any other foreign material, as well as ordinary air in large quantities. If a gage line or filler line is disconnected and the fittings capped immediately, the cylinder will not become contaminated unless temperature variation has created a suction within the cylinder. Ordinary air contains water vapor which could condense and freeze. Since there are very small orifices in the system, it is very important that this condition not be allowed to occur.

c. Connect cylinder valve outlet or outside filler valve to manifold or portable oxygen cascade.

d. Slowly open valve on cascade cylinder or manifold with lowest pressure, as noted on pressure gage, allow pressure to equalize, then close cascade cylinder valve.

e. Repeat this procedure, using a progressively higher pressure cascade cylinder, until system has been charged to the pressure indicated in the chart immediately following step "f" of this paragraph.

f. Ambient temperature listed in the chart is the air temperature in the area where the system is to be charged. Filling pressure refers to the pressure to which aircraft cylinders should be filled. This table gives approximations only and assumes a rise in temperature of approximately 25°F. due to heat of compression. This table also assumes the aircraft cylinders will be filled as quickly as possible and that they will only be cooled by ambient air; no water bath or other means of cooling be used.

Example: If ambient temperature is 70°F., fill aircraft cylinders to approximately 1,975 psi or as close to this pressure as the gage may read. Upon cooling, cylinders should have approximately 1,850 psi pressure.

TABLE OF FILLING PRESSURES

Ambient Temp. °F	Filling Press. psig	Ambient Temp. °F	Filling Press. psig
0	1650	50	1875
10	1700	60	1925
20	1725	70	1975
30	1775	80	2000
40	1825	90	2050

15-32. PROPELLER DE-ICE SYSTEM.

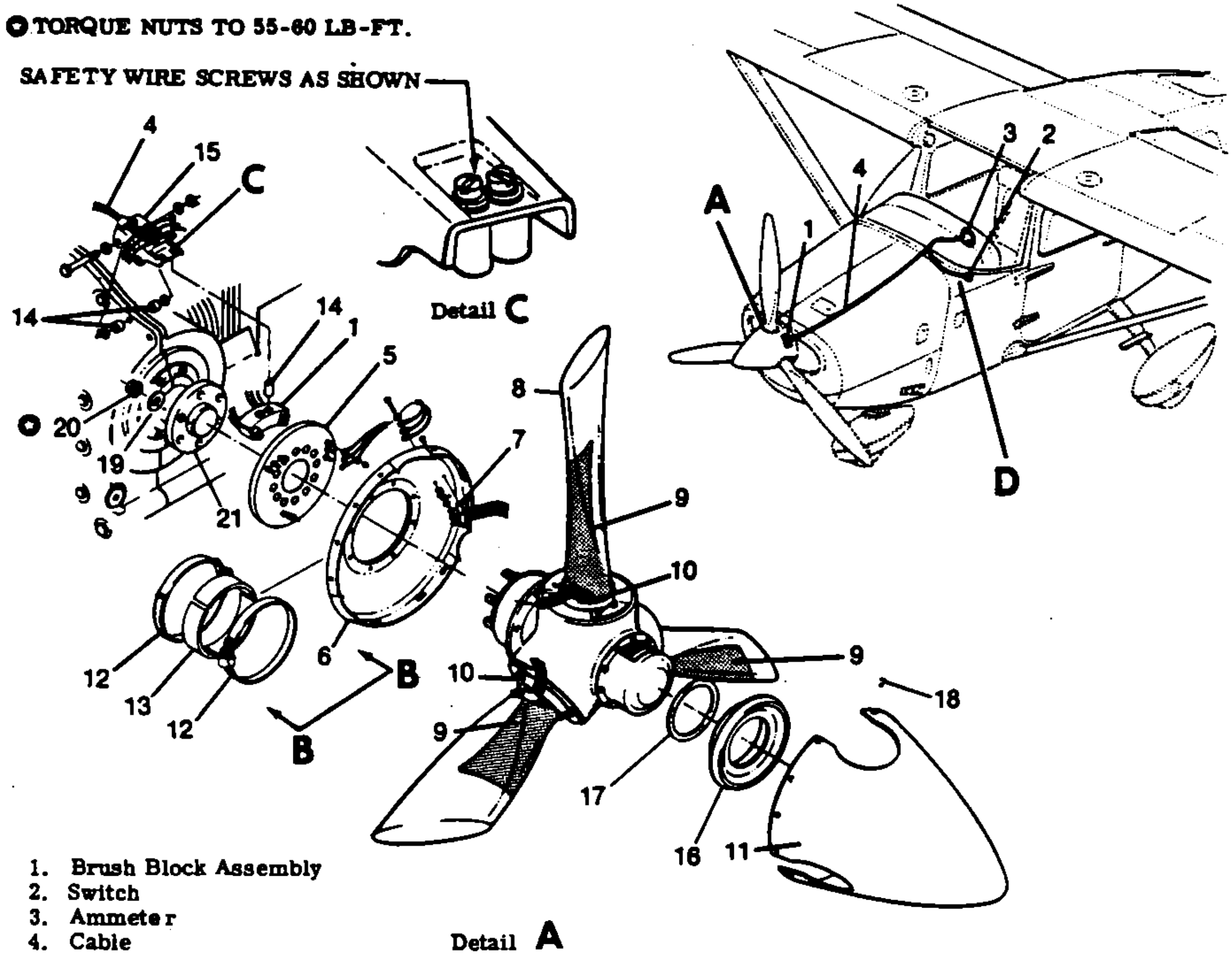
15-32A. DESCRIPTION. The system is of an electrothermal type, consisting of electrically heated de-icers bonded to each propeller blade, a slip ring assembly for power distribution to the propeller de-icers, a brush block assembly to transfer electrical power to the rotating slip ring, a timer to cycle electric power to the de-icers in proper sequence, an ammeter mounted in the instrument panel, a switch and a circuit breaker. The de-ice system applies heat to the surfaces of the propeller blades where ice normally would adhere. This heat, plus centrifugal force and the blast from the airstream, removes accumulated ice. Each de-icer has two separate electrothermal heating elements, an inboard and an outboard section. When the switch is turned on, the timer provides power through the brush block and slip ring to outboard elements for approximately 20 seconds, reducing ice adhesion in these areas. Then the timer switches power to inboard heating elements for approximately 20 seconds. It then returns to the outer elements and continues cycling action. This outboard-inboard sequence is very important since the loosened ice, through centrifugal force, moves outboard. Heating may begin at any phase in the cycle, depending on the timer position when the switch was turned off from previous use. Ground checkout of the system is permitted with the engine not running. System components may be removed and replaced, using figure 15-5 as a guide. Propeller removal is not necessary before de-ice system components, except brush block assembly, can be installed or removed.

15-33. TROUBLE SHOOTING.

NOTE

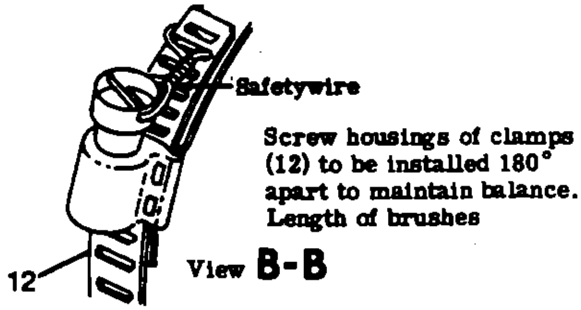
The propeller anti-ice ammeter may be used while trouble shooting the system. The ammeter needle should rest within the shaded band except for "flickers" approximately 20 seconds apart, as the step switch of the timer operates. The ammeter will also reflect a bad connection or open circuit by reading below normal or zero. A high reading indicates a short circuit.

TROUBLE	PROBABLE CAUSE	REMEDY
ELEMENTS DO NOT HEAT.	Circuit breaker out or defective.	Reset circuit breaker. If it pops out again, determine cause and correct. Replace defective parts.
	Defective wiring.	Repair or replace wiring.
	Defective switch.	Replace switch.
	Defective timer.	Replace timer.
	Defective brush-to-slip ring connection.	Check alignment. Replace defective parts.
SOME ELEMENTS DO NOT HEAT.	Incorrect wiring.	Correct wiring.
	Defective wiring.	Repair or replace wiring.
	Defective timer.	Replace timer.
	Defective brush-to-slip ring connection.	Check alignment. Replace defective parts.
	Defective element.	Replace element.
CYCLING SEQUENCE NOT CORRECT OR NO CYCLING.	Crossed connections.	Correct wiring.
	Defective timer.	Replace timer.
RAPID BRUSH WEAR, FREQUENT BREAKAGE, SCREECHING OR CHATTERING.	Brush block or slip ring out of alignment.	Align properly.



1. Brush Block Assembly
2. Switch
3. Ammeter
4. Cable
5. Slip Ring
6. Spinner Bulkhead
7. Clip Assembly
8. Propeller
9. Boot
10. Restrainer Strap
11. Spinner
12. Clamp
13. Rubber Spacer
14. Spacer
15. Mounting Bracket
16. Spinner Support
17. Spacer
18. Spinner Attaching Screws
19. Washer
20. Propeller Mounting Nuts
21. Engine Crankshaft

Apply ice-repellant (MI-903) (Glidden Mfg. Co.) to the leading edge surfaces, landing light covers and windshield to retain ice build-up. Age Master #1 and ICEX may be applied to the boots to help prolong their life. Refer to "Anti-Ice Boot Care" in Section 8 of the "Pilot's Operating Handbook" for specific instructions on the use of these products.



Beginning with U20606440

Figure 15-5. Propeller De-Ice Systems. (Sheet 1 of 3)

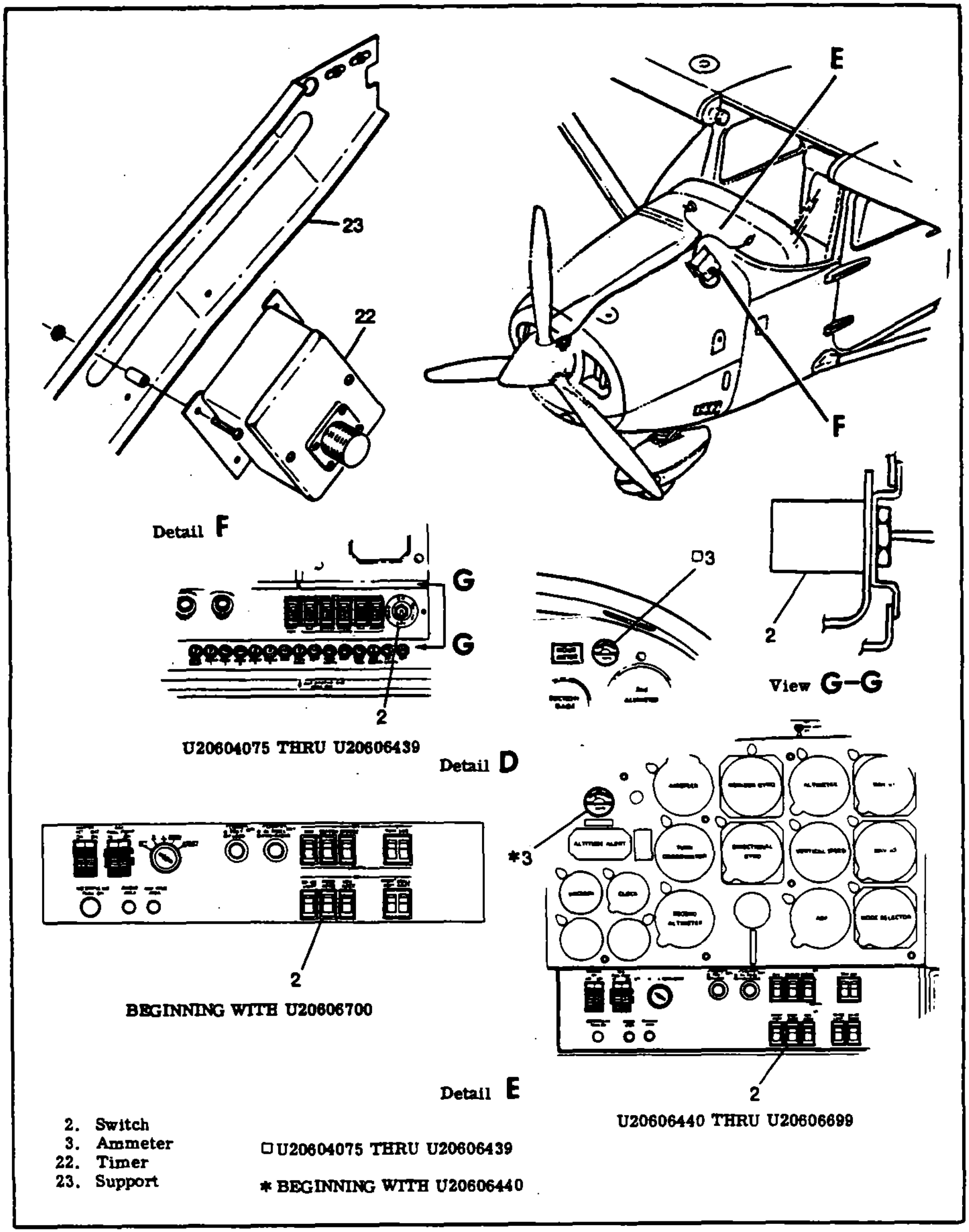


Figure 15-5. Propeller De-Ice Systems (Sheet 2 of 3)

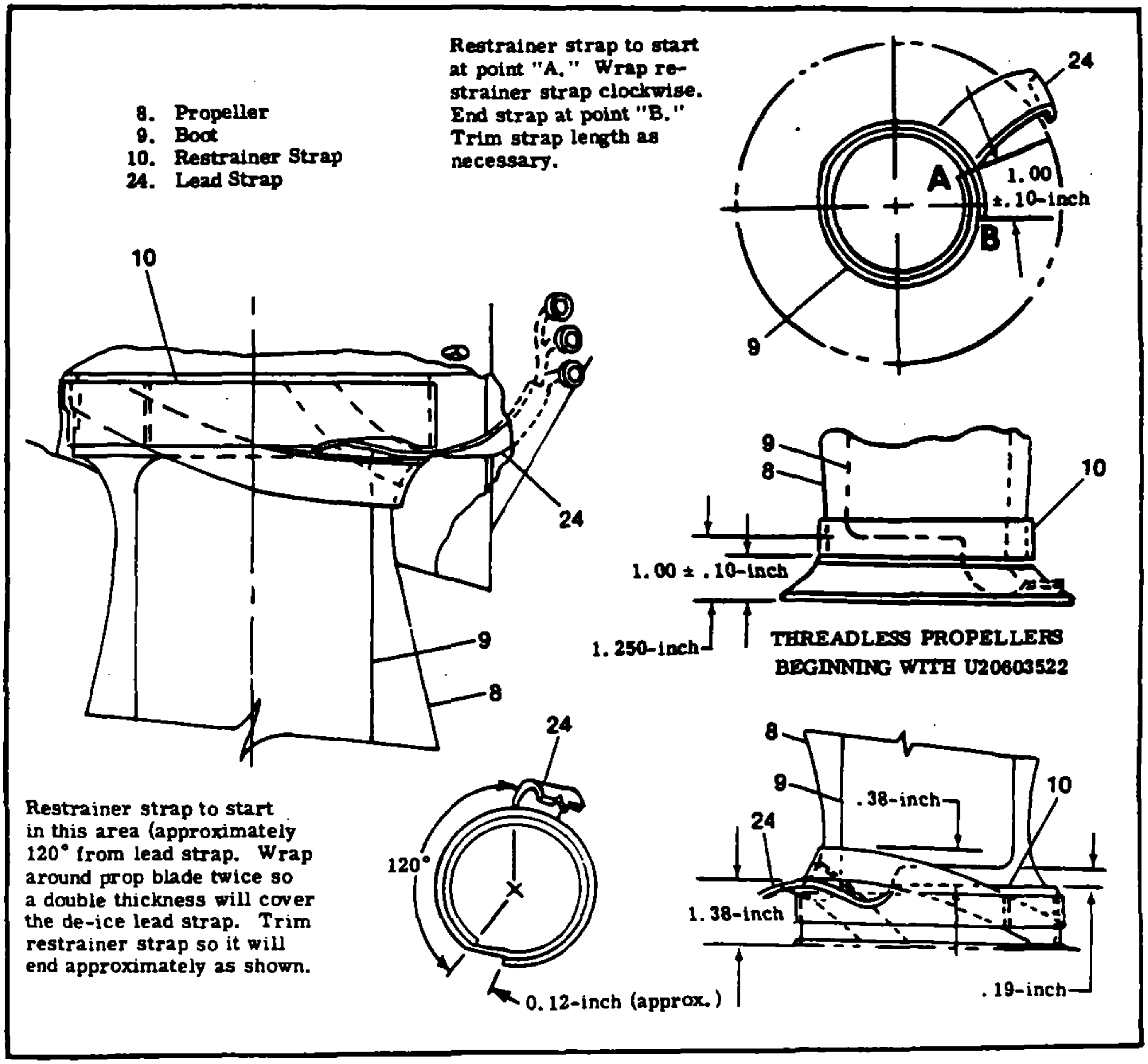


Figure 15-5. Propeller De-Ice Systems. (Sheet 3 of 3)

SHOP NOTES:

15-34 REMOVAL. (See figure 15-5).

WARNING

Be certain magneto is grounded before turning propeller.

a. Remove spinner attaching screws (18) and remove spinner (11), spinner support (16) and spacers (17).
b. Remove engine cowling as required for access to propeller mounting nuts (20) and washers (19).
c. Loosen all propeller mounting nuts (20) approximately 1/4 - inch and pull propeller forward until stopped by mounting nuts (20).

NOTE

As propeller is separated from engine crankshaft flange, oil will drain from propeller and engine cavities.

CAUTION

Use caution when removing propeller. Removing propeller without the de-ice slip ring requires disconnecting nine wires at the spinner bulkhead, since the slip ring is mounted to the bulkhead. Wires should be identified according to wiring diagrams to facilitate reassembly. During removal, installation or other maintenance, use care to prevent damaging slip ring and brushes.

d. Remove safety wire and loosen clamps(12).
e. Remove nuts, washers, de-ice lead wires and slip ring lead wires from screws in aft spinner bulkhead (6). Tag lead wires to facilitate reinstallation.
f. Remove all propeller mounting nuts (20) and washers (19) and pull propeller forward to remove from engine crankshaft (21).
g. Remove slip ring (5).

15-35. INSTALLATION. (See figure 15-5).
a. Install slip ring (5) and aft spinner bulkhead (6).
b. Install de-icer boot lead wires and slip ring lead wires, screws, washers and nuts in aft spinner bulkhead (6).
c. Install propeller and washers (19) and propeller mounting nuts (20).
d. Secure aft spinner bulkhead (6) to propeller with screws.
e. Tighten propeller mounting nuts to a torque of 55 to 60 lb. ft.
f. Tighten clamps (12) with clamp screw housings 180° apart to maintain balance. Safety wire clamp screw housings to clamps as shown in view B-B.
g. Install spacer (17) and spinner support (16) in spinner (11) and install spinner on propeller.

15-36. TIMER TEST.

input pins. (Refer to chart following this step for pin identification.)

b. Jump timer ground pin to ground.

c. Turn on De-Icing System.

d. Check timer operation per the chart preceding step "b." (Use a voltmeter.)

e. Check volts to ground in each case. If engine is not running, and auxiliary power is not used, voltage will be battery voltage and cycle time may be slightly longer than indicated.

a. Remove connector plug of wire harness from timer and jump power input socket of wire harness to timer

f. Hold voltmeter probe on the pin until the voltage drops to 0. Move the probe to the next pin in the sequence shown in the chart. Check voltage at each pin in sequence. When correctness of the cycling sequence is established, turn propeller de-icing switch off at the beginning of one of the on - time periods, and record the letter of the pin at which the voltage supply is present.

NOTE

Timers do not home to pin "C" when turned off.

Timer P/N	Power Input Pin & Socket	Ground Pin	Output Sequence, Time, Voltage	Time Repeat Cycle Time (sec)
C165020-0101	B (28VDC) (24-32)	G (28VDC)	C, D 20 seconds each	40

15-37. SLIP RING ALIGNMENT CHECK. After installation, slip ring must be checked for run-out. Total run-out must not exceed .010 - inch.

NOTE

Excessive slip ring run-out will result in severe arcing between slip ring and brushes and cause rapid brush wear. If allowed to continue, this condition will result in rapid deterioration of slip ring and brush contact surfaces, and lead to the eventual failure of the propeller de-ice system.

a. Securely attach a dial indicator gage to the engine, place the pointer on the surface of the slip ring and zero the dial.

b. Rotate the propeller slowly by hand one revolution to verify that the pointer is in contact with the surface of the slip ring and that the indicator is noting the deviation from a true plane.

c. Continue to rotate the propeller and check that the surface of the slip ring does not deviate more than .010 - inch (± .005 - inch total indicator reading), and that the high and low points on the slip ring surface are separated by at least 4 inches of slip ring travel.

d. If the run-out checks within .010 - inch total, the slip ring is in correct alignment, if the run-out is greater than .010 - inch, the slip-ring must be removed and replaced, and the defective slip-ring returned to the claims department of the Cessna Service Parts Center.

SHOP NOTES:

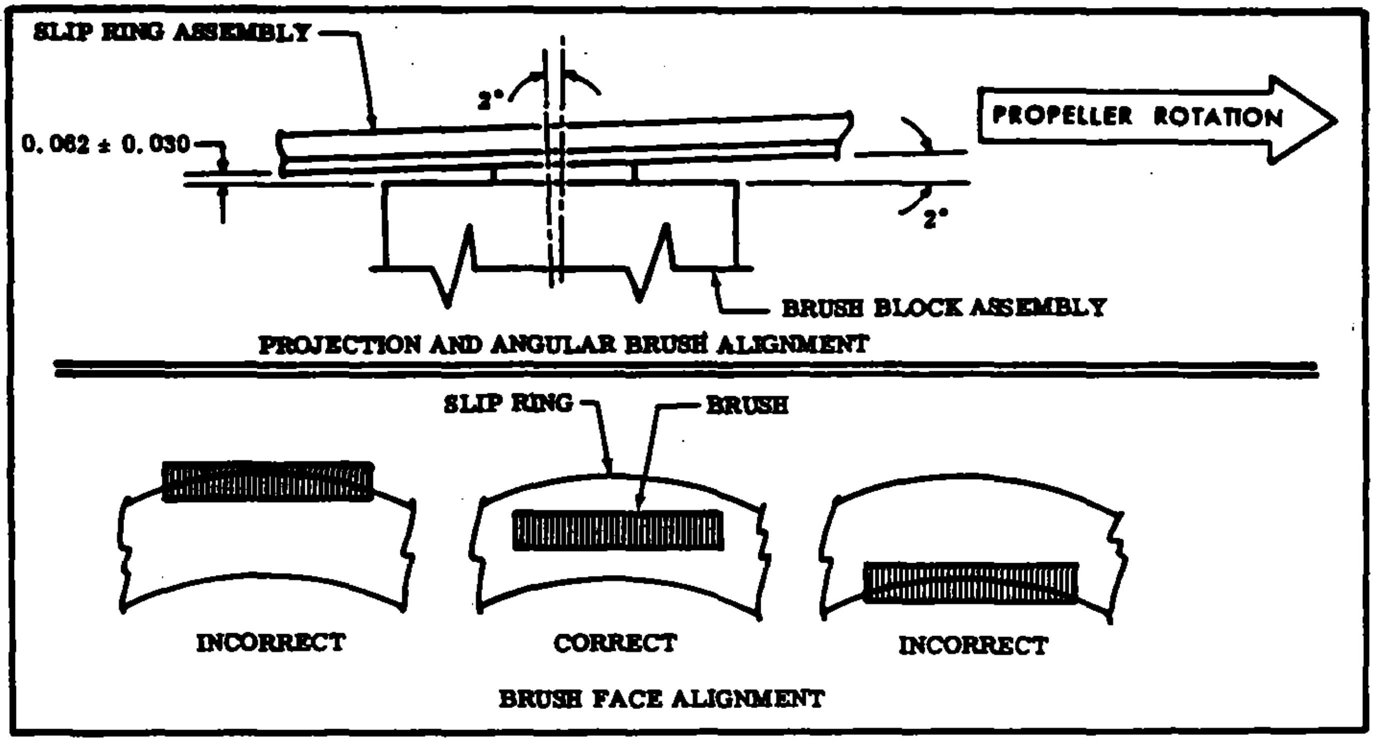


Figure 15-6 Brush Face Alignment and Projection and Angular Brush Alignment

15-38. INSTALLATION AND ALIGNMENT OF BRUSH BLOCK ASSEMBLY. (See figure 15-6.)

NOTE

Installation of the brush block should be deferred, when possible, until after the slip ring, propeller, and related components are installed. However, the brush block assembly may be replaced without removing the propeller. To avoid breakage when installing the brush block assembly, keep brushes retracted in brush block until slip ring and propeller assemblies have been installed.

CAUTION

Make sure that slip ring run-out has been corrected before attempting to align brushes on slip ring.

a. In order to get smooth, efficient and quiet transfer of electric power from the brushes to the slip ring, brush alignment must be checked and adjusted, if necessary to meet the following requirements.

1. Projection must be such that the distance between the brush block and the slip ring is 0.062 ± 0.030-inch.

2. The brushes must be lined up with the slip ring so that the entire face of each brush is in contact with the slip ring throughout the full 360° of slip ring rotation.

3. The brushes must contact the slip ring at an angle of approximately 2° from perpendicular to the slip ring surface, measured toward the direction of rotation of the slip ring.

b. Brush projection can normally be adjusted by loosening hardware attaching the brush block and holding the brushes in the desired location while retightening the hardware. Slotted holes are provided.

c. One method for face alignment is described in step "b". Another is to use shims between brush block and bracket. Laminated metal shims are generally provided. Layers of metal .003" are used to make up shims which are approximately 0.20" thick overall. Shims may be fabricated locally.

d. Loosen mounting bolts and twist block while tightening to attain proper angular adjustment.

CAUTION

Use care not to disturb other adjustments when adjusting angular alignment.

15-39. REPLACEMENT OF DE-ICE BOOTS. To remove or loosen installed de-ice boots, use toluol to soften the "cement line." Apply a minimum amount of this solvent to the cement line as tension is applied to peel back the boot. Removal should be slow enough to allow the solvent to undercut the cement so that parts will not be damaged. To install a propeller anti-ice boot, proceed as follows:

a. Clean the metal to be bonded with Methyl Ethyl

Ketone, (MEK). For final cleaning, wipe the solvent film off quickly with a clean, dry cloth before it has time to dry.

b. Prepare a pattern the size of the boot, including three inches of the boot strap. Draw a centerline (lengthwise) through the pattern.

c. Draw a line on the centerline of the leading edge of the blade. Position the pattern centerline over the leading edge centerline. Position pattern so bottom of boot is 1/2" below spinner cutout. Draw a line on the propeller hub on each side of the pattern boot strap where it crosses the hub. Check boot strap position by fitting restraining strap on the hub and comparing its position with the marked position of the strap.

d. Mask off an area 1/2" from each side and outer end of the pattern, and remove the pattern.

NOTE

Apply cement at room temperature (65°-75°F). For best results, allow to air dry for a minimum of one hour at 50°F or above when relative humidity is less than 75%. If the humidity is 75% to 90%, allow additional drying time. Do not apply cement if relative humidity is higher than 90% or if the temperature is below 50°F. Allow 12 hours cement curing time before operating the de-icers.

e. Mix EC-1300 cement (Minnesota Mining & Mfg. Co.) thoroughly. Surfaces shall be 65°F prior to applying cement. During periods of high humidity, care should be taken to prevent moisture condensation due to the cooling effect of the evaporating solvent. This can be done by warming the area with a heat gun or heat lamp. Apply one even coat of EC-1300L cement to the cleaned metal surface. Allow to air dry for a minimum of one hour. Then apply a second even brush coat of EC-1300L cement.

f. Clean the unglazed back surface of the boot with mild soap and water, then rinse thoroughly with clean water.

NOTE

Isopropyl alcohol can be used to remove grime which cannot be removed using soap. If isopropyl alcohol is used for cleaning, wash area with mild soap and water, then rinse thoroughly with clean water. Avoid usage of Methyl-Ethyl Ketone (MEK), non-leaded gasoline or any petroleum base liquids which can harm the boot material.

g. Apply one even coat of EC-1300L cement to back surface of boot. It is not necessary to cement more than 1/2" of the boot strap.

h. Using a silver-colored pencil, mark a centerline along the leading edge of the propeller blade and a corresponding centerline on the cemented side of the boot.

i. Reactivate the surface of the cement using a clean, lint-free cloth, heavily moistened with toluol. Avoid excessive rubbing of cement, which would remove the cement.

j. Position the boot centerline on the propeller leading edge, starting at the hub end at the position marked. Make sure that boot strap will fall in the position marked. Tack the boot centerline to the leading edge of the propeller blade. If the boot is allowed to get off-center, pull up with a quick motion and replace properly. Roll firmly along centerline with a rubber roller.

k. Gradually tilting the roller, work the boot carefully over either side of the blade contour to avoid trapping air in pockets.

l. Roll outwardly from the centerline to the edges. If excess material at the edges tends to form wrinkles, work them out smoothly and carefully with fingers.

m. Apply one even coat of EC-539 (Minnesota Mining & Mfg. Co.), mixed per manufacturer's instructions, around the edges of the installed boot.

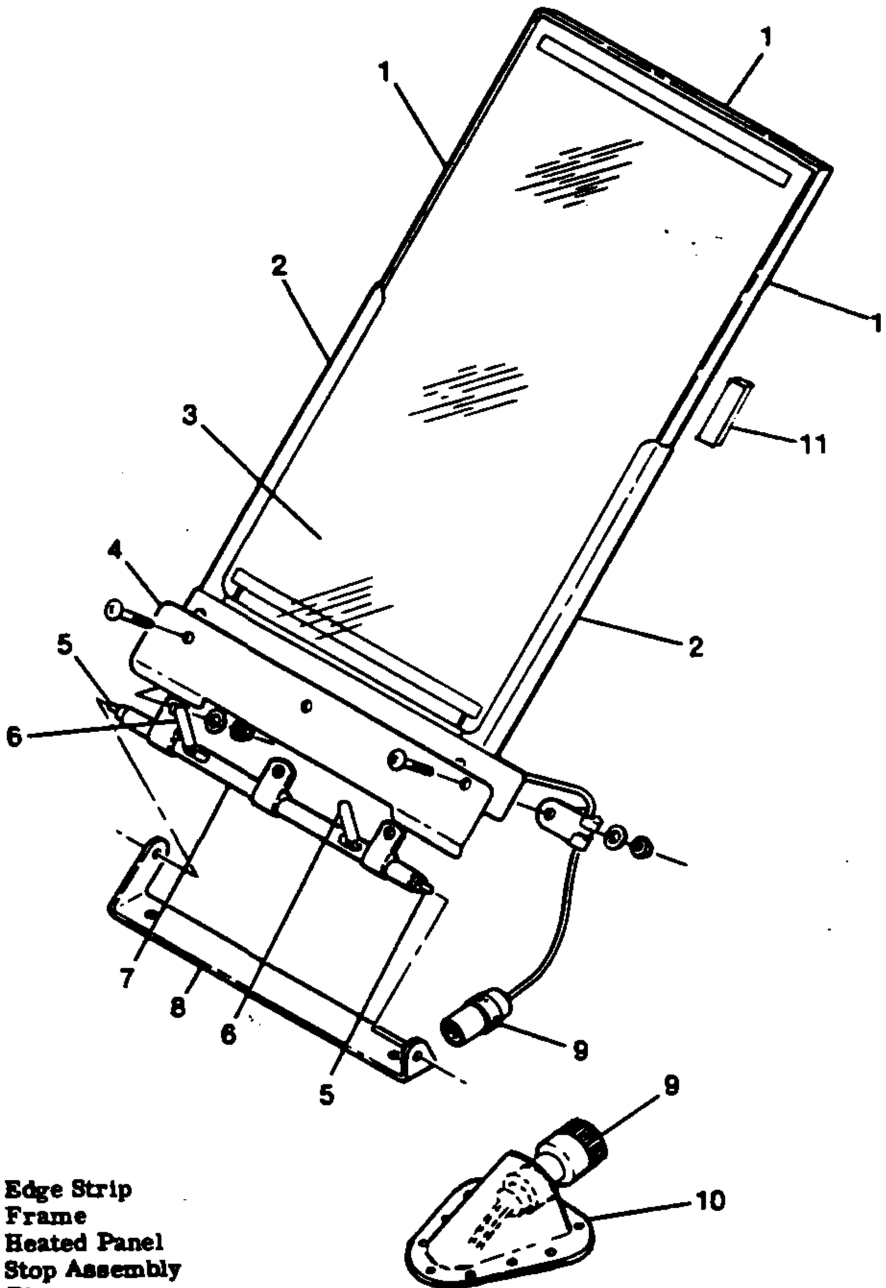
n. Remove masking tape from the propeller and clean the surface of the propeller by wiping with a clean cloth dampened with toluol.

o. Place restraining strap in position and secure with screws, washers and sleeves.

15-40. HEATED WINDSHIELD PANEL.

15-41. DESCRIPTION. The panel is constructed of two sheets of plate glass covering a layer of vinyl. Imbedded in the vinyl is a fine resistance wire which provides the heat for windshield de-icing. The lower edge of the panel is mounted on the deck skin just forward of the windshield. The upper end of the panel is supported by a rubber bumper which holds the panel off the windshield. The lower mounting bracket is hinged for easy cleaning between the panel and windshield. The hinge pins are spring loaded so the panel may be easily removed. Power to the windshield panel is provided through a plug located in a housing assembly just left of the lower support bracket. A switch located on the instrument panel is a off-on switch and a circuit breaker to protect the system.

15-42. REMOVAL AND INSTALLATION. See figure 15-7.



1. Edge Strip
2. Frame
3. Heated Panel
4. Stop Assembly
5. Plunger
6. Handle
7. Tube
8. Bracket
9. Connector
10. Cover
11. Bumper

Figure 15-7. Windshield Anti-Ice Panel Installation

15-43. CONTROL SURFACE DISCHARGERS.

15-44. DESCRIPTION. Wick-type static dischargers are installed on the trailing edge surfaces of the ailerons, elevators and rudder of the airplane. These dischargers are used to reduce the stored voltage that is the result of electrostatic charging. The buildup of static electricity on the airframe is a consequence of flying through haze, dust, rain, snow or ice crystals.

Reduction of stored potential (voltage) is necessary to prevent undesirable electrostatic currents that could cause unacceptable radio noise or electrical insulation failures.

The wick is attached to the base by a threaded fitting, and may be replaced without removing the base from the airplane.

15-45. INSPECTION. Static wicks and their bases should be check for physical condition. The majority of failures will be due to "hangar rash" or lightning damage, be certain to inspect the airframe itself for damage. Wick-type dischargers are functional as long as any material is present and their resistance is within the range given in paragraph 15-46. Static discahrgers lose their effectiveness with age and exposure to static electricity; therefore, they should have a resistance check when installed or every 500 hours or annually; whichever occurs first.

15-46. RESISTANCE CHECK. Perform the following resistance checks on each control surface discharger and replace those which do not conform to the resistance requirements.

NOTE

A GOOD airframe ground must be established in order to perform RELIABLE resistance checks on the control surface dischargers.

a. Check the resistance from the base to a good airframe ground using a low voltage ohmmeter. The resistance should not exceed 1.0 ohm maximum.

WARNING

Do not bend the wick during the following step since wicks have a higher resistance when bent.

b. Using a "megger", connect the EARTH terminal to the base of the discharger and check the resistance at the tip of the wick. The resistance should check between 1 to 100 megohms.

NOTE

A "megger" is a 500 to 1000 volt capacity megohmmeter and is available from the James G. Biddle Co., Plymouth Meeting, PA. 19462.

15-47. REMOVAL/INSTALLATION.

a. Remove discharger wick from base. Discard lockwasher.

b. To remove base drill out rivets taking care not to distort holes in skin.

c. Installing the mounting base.

1. Use fine grit sandpaper and remove any paint that is around the attaching holes or under the mounting base footprint.

2. With a 500 or 600 grit emery cloth, break the aluminum oxide in the footprint (new oxide will form within minutes, do not delay performing steps 3. and 4.

3. Clean the mating surface of the airplane's skin with solvent.

4. Brush the cleaned skin with Aluma Prep 1201 alodine and wait until it is dry before proceeding.

5. Install the new base using an appropriate size blind rivet.

6. Primer and paint may be used as desired on the airplane skin (cover any attached discharger with paper or rag; do not use tape). Screw threads in the base should be protected with a lightly inserted wooden plug.

d. Installing the discharger wick.

1. Remove the plastic lockwasher retainer from the new discharger and discard (do not lose the new lockwasher).

2. Screw the new static discharger into the base only tight enough to compress the lockwasher; do not overtorque.

15-48. ELECTRICAL BONDING.

15-49. DESCRIPTION. Individual electrically conductive components and structures of the airplane must be electrically bonded together. This bonding is necessary to ensure that all conductive material on the airplane is at the same electric potential. If electrical bonding is not maintained, crew members or passengers may encounter electrical shocks, radio and other avionic system interference or even damage will result and corrosion between disimilar materials may occur.

Bond resistance between structures should not exceed 0.003 ohms unless otherwise specified in specific installations. After major repair and/or replacement of components or control surfaces an electrical bonding check is required.

SECTION 16

INSTRUMENTS AND INSTRUMENT SYSTEMS

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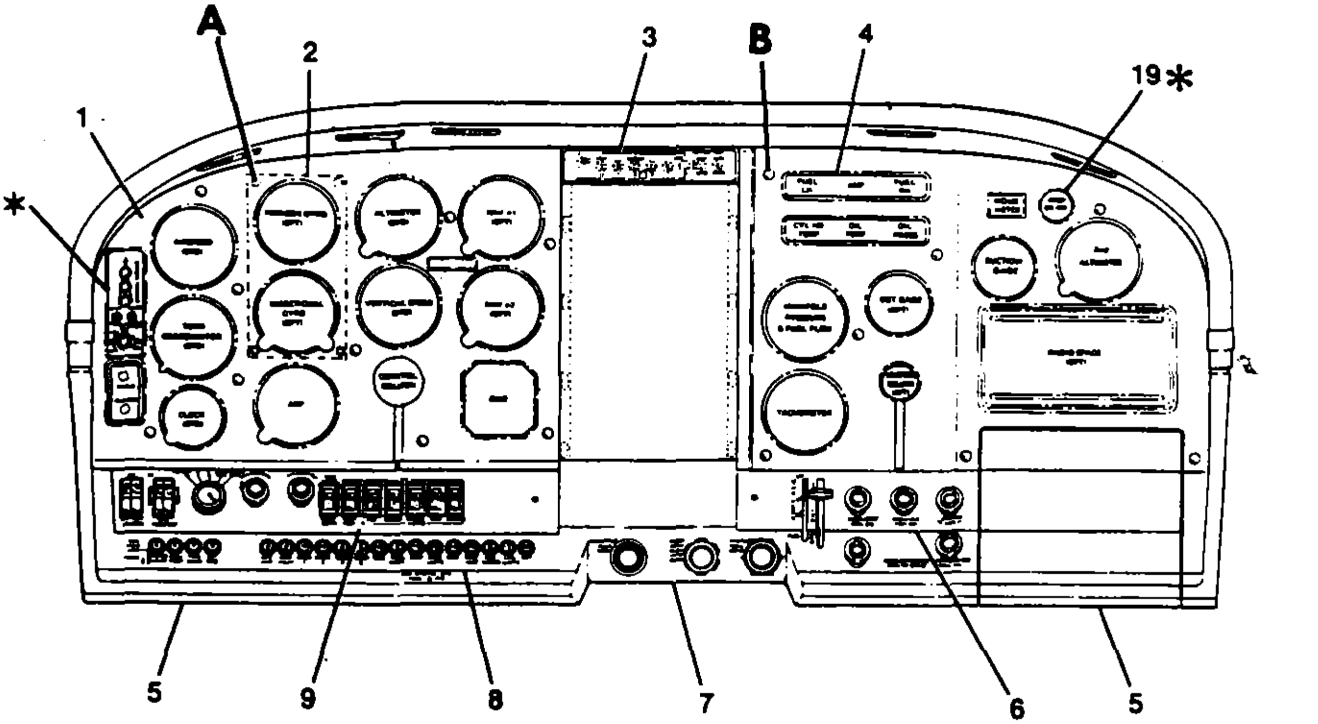
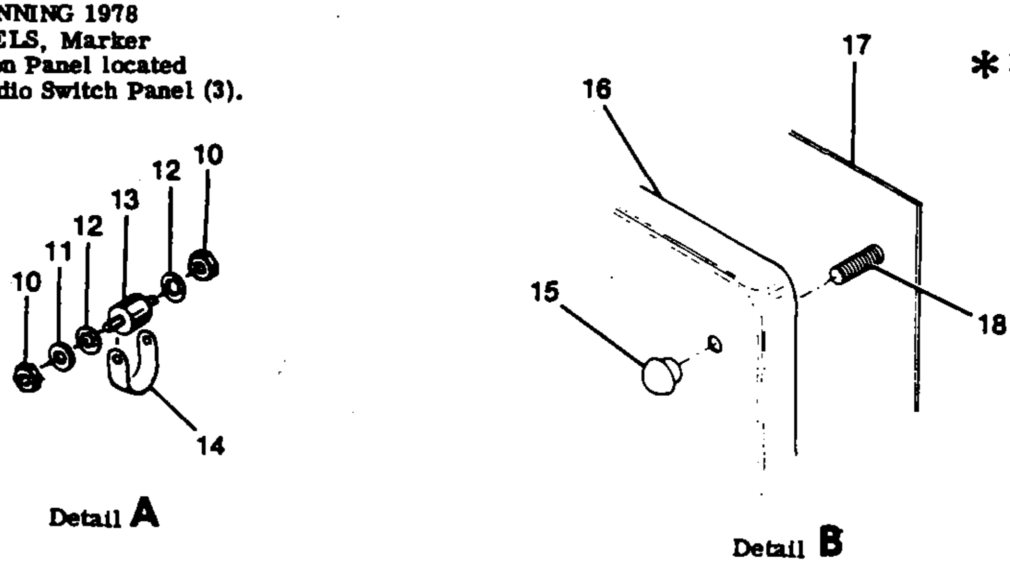


* BEGINNING 1978
MODELS, Marker
Beacon Panel located
on Radio Switch Panel (3).

* BEGINNING
1978 MODELS



1. Removeable Panel
2. Shock Panel
3. Radio Switch Panel
4. Engine Instruments
5. Protective Padding
6. Heating and Venting Controls
7. Engine Controls
8. Circuit Breaker Panel
9. Switch Panel
10. Nut
11. Washer
12. Lock Washer
13. Shock Mount
14. Ground Strap
15. Threaded Button
16. Decorative Cover
17. Instrument Panel
18. Stud
19. Propeller De-ice Ammeter

Figure 16-1. Typical Instrument Panel Installation

16-1. INSTRUMENT AND INSTRUMENT SYSTEMS.

16-2. GENERAL. This section describes typical instrument installations and the systems operating them, with emphasis on trouble shooting and corrective measures for the systems themselves. It does NOT deal with specific instrument repairs since this usually requires special equipment and data and should be handled by instrument specialists. Federal Aviation Regulations require malfunctioning instruments be sent to an approved instrument overhaul and repair station or returned to manufacturer for servicing. Our concern here is with preventive maintenance on various instrument systems and correction of system faults which result in instrument malfunctions. The descriptive material, maintenance and trouble shooting information in this section is intended to help the mechanic determine malfunctions and correct them, up to the defective instrument itself, at which point instrument technicians should be called in. Some instruments, such as fuel quantity and oil pressure gages, are so simple and inexpensive repairs usually will be more costly than a new instrument. On the other hand, aneroid and gyro instruments usually are well worth repairing. The words "replace instrument" in the text, therefore, should be taken only in the sense of physical replacement in aircraft. Whether replacement is to be with a new instrument, an exchange or original instrument is to be repaired must be decided on basis of individual circumstances.

16-3. INSTRUMENT PANEL. (See figure 16-1.)

16-4. DESCRIPTION. The instrument panel assembly consists of a stationary, removable and shock-mounted panel. The stationary panel, normally NOT considered removable, contains instruments such as tachometer, manifold/fuel pressure, fuel and oil gages. The removable panel contains flight instruments such as airspeed, vertical speed and altimeter which ARE NOT sensitive to vibration. The shock-mounted panel, located in the removable panel, contains the major flight instruments such as horizontal and directional gyros which ARE affected by vibration. Most of the instruments are screw-mounted on the panel.

16-5. REMOVAL AND INSTALLATION. The stationary panel is secured to engine mount stringers and ordinarily not considered removable. The removable panel is secured to the stationary panel with screws. The shock mounted panel is secured to the removable panel with rubber shock-mounts. To remove flight instrument panel proceed as follows:

a. Remove threaded buttons and remove decorative cover, disconnect post light wiring if installed.
b. Remove control knobs or switches from panel as necessary and remove panel.
c. Remove screws securing panel to stationary panel, tag and disconnect instrument wiring and plumbing and pull panel straight back.

NOTE

If panel is to be removed from aircraft, remove control wheel.

d. To remove shock-mounted panel remove nuts from shock mounts and pull panel straight back.
e. Reverse preceding steps for installation.

NOTE

A light coat of paraffin, beeswax or soap on prongs of retainer clips will ease installation.

16-6. SHOCK MOUNTS. Service life of instruments is directly related to adequate shock-mounting of panel. If removal of panel is necessary, check mounts for deterioration and replace as necessary.

16-7. INSTRUMENTS. (See figure 16-1.)

16-8. REMOVAL. Most instruments are secured to panel with screws inserted through panel face, under decorative cover. To remove an instrument, remove decorative cover, disconnect plumbing or wiring to instrument concerned, remove retainer screws and take instrument out from behind, or, in some cases from front of instrument panel. Instrument clusters are installed as units, secured by a screw on each corner of cluster. Cluster must be removed from panel to replace an individual gage. In all cases when an instrument is removed, lines or wires disconnected from it should be protected. Cap open lines and cover pressure connections on instrument to prevent thread damage and entrance of foreign matter. Wire terminals should be insulated or tied up so they will not ground accidentally or short-circuit on another terminal.

16-9. INSTALLATION. Generally, installation procedure is the reverse of removal procedure. Make sure mounting screw nuts are tightened firmly, but do not overtighten, particularly on instruments having plastic cases. The same rule generally applies to connecting plumbing and wiring.

NOTE

All instruments (gages and indicators), requiring a thread seal or lubricant, shall be installed using teflon tape on male fittings only. This tape is available through Cessna Service Parts Center.

When replacing an electrical gage in an instrument cluster assembly, avoid bending pointer or dial plate. Distortion of dial or back plate could change calibration of gages.

16-10. PITOT AND STATIC SYSTEMS. (See figure 16-2.)

16-11. DESCRIPTION. The pitot system conveys ram air pressure to the airspeed indicator. The static system vents vertical speed indicator, altimeter and airspeed indicator to atmospheric pressure through plastic tubing connected to static ports.

A static line sump is installed at each source button. to collect condensation in the static system. An alternate static source may be installed for use should the normal source become obstructed or partially obstructed causing an inaccurate indication or no indication. When used as a static source, cabin pressure is substituted for atmospheric pressure, causing instrument readings to vary from normal. Refer to Owners Manual for flight operation using alternate static source pressure. A pitot tube heater and stall warning heater may be installed, refer to Section 17.

16-12. MAINTENANCE. Proper maintenance of pitot and static system is essential for proper operation of altimeter, vertical speed and airspeed indicators. Leaks, moisture and obstructions in pitot system will result in false airspeed indications, while static system malfunctions will affect readings of all three instruments. Under instrument flight conditions, these instrument errors could be hazardous. Cleanliness and security are the principal rules for system maintenance. The pitot tube and static ports MUST be kept clean and unobstructed.

16-13. STATIC PRESSURE SYSTEM INSPECTION AND LEAKAGE TEST. The following procedure outlines inspection and testing of static pressure system, assuming altimeter has been tested and inspected in accordance with current Federal Aviation Regulations.

a. Ensure static system is free from entrapped moisture and restrictions.

b. Ensure no alterations or deformations of airframe surface have been made which would affect the relationship between air pressure in static pressure system and true ambient static air pressure for any flight configuration.

c. Seal off one static pressure source opening with plastic tape. This MUST be an air-tight seal.

d. Close static pressure alternate source valve, if installed.

e. Attach a source of suction to remaining static pressure source opening. Figure 16-4 shows one method of obtaining suction.

f. Slowly apply suction until altimeter indicates a 1000-foot increase in altitude.

CAUTION

When applying or releasing suction, do not exceed range of vertical speed indicator or airspeed indicator.

g. Cut off suction source to maintain a "closed" system for one minute. Leakage shall not exceed 100 feet of altitude loss as indicated on altimeter.

h. If leakage rate is within tolerance, slowly release suction source, then remove tape used to seal static source.

NOTE

If leakage rate exceeds maximum allowable, first tighten all connections, then repeat leakage test. If leakage rate still exceeds maximum allowable, use following procedure.

i. Disconnect static pressure lines from airspeed indicator and vertical speed indicator. Use suitable fittings to connect lines together so altimeter is the only instrument still connected into static pressure system.

j. Repeat leakage test to check whether static pressure system or the removed instruments are cause of leakage. If instruments are at fault, they must be repaired by an "appropriately rated repair station" or replaced. If static pressure system is at fault, use following procedure to locate leakage.

k. Attach a source of positive pressure to static source opening. Figure 16-4 shows one method of obtaining positive pressure.

CAUTION

Do not apply positive pressure with airspeed indicator or vertical speed indicator connected to static pressure system.

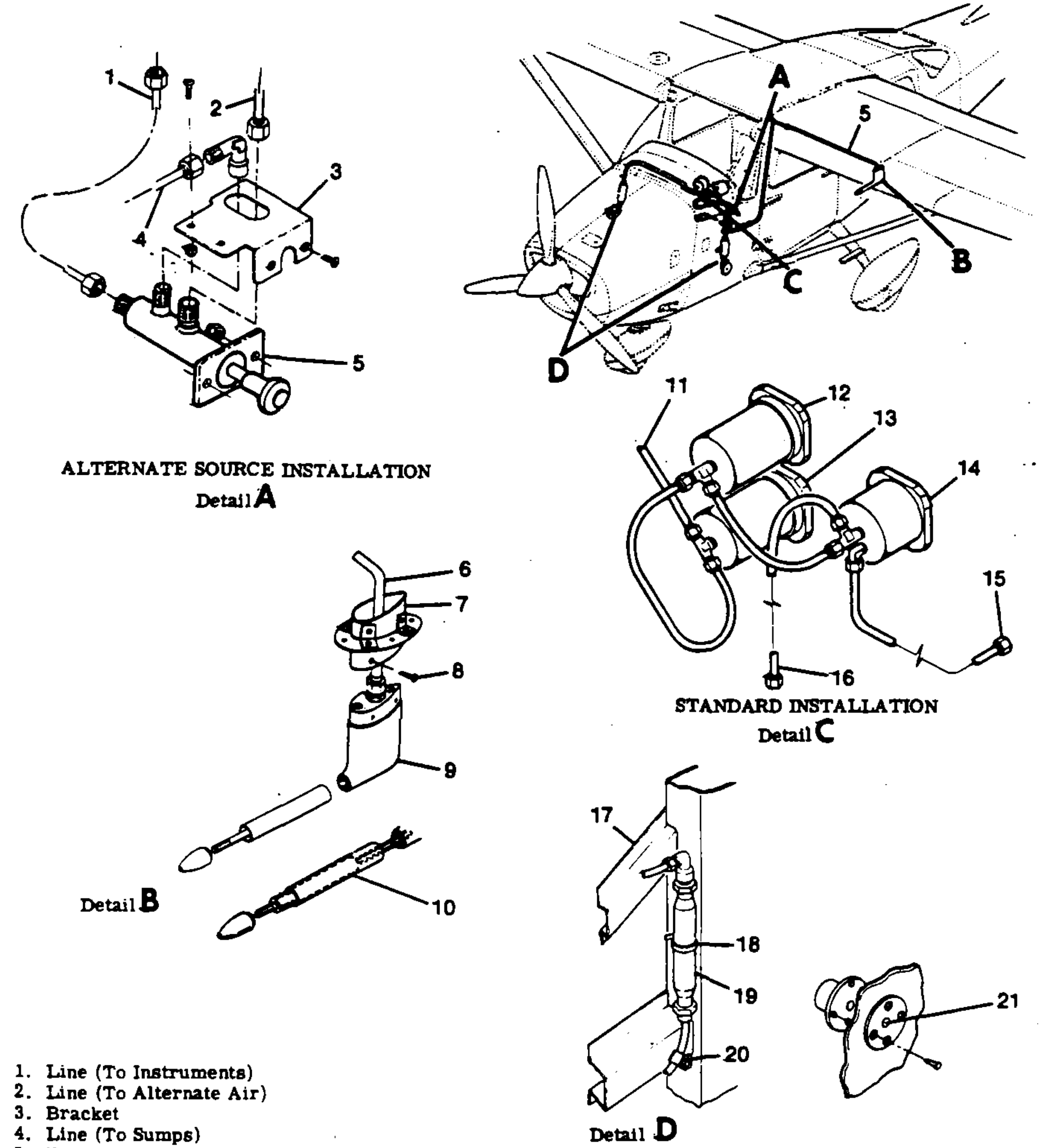
l. Slowly apply positive pressure until altimeter indicates a 500-foot decrease in altitude and maintain this altimeter indication while checking for leaks. Coat line connections, static pressure alternate source valve and static source flange with solution of mild soap and water, watching for bubbles to locate leaks.

m. Tighten leaking connections. Repair or replace parts found defective.

n. Reconnect airspeed and vertical speed indicators into static pressure system and repeat leakage test per steps "c" thru "h".

16-14. PITOT SYSTEM INSPECTION AND LEAKAGE TEST. To check pitot system for leaks, fasten a piece of rubber or plastic tubing over pitot tube, close opposite end of tubing and slowly roll up tube until airspeed indicator registers in cruise range. Secure tube and after a few minutes recheck airspeed indicator. Any leakage will have reduced the pressure in system, resulting in a lower airspeed indication. Slowly unroll tubing before removing it, so pressure is reduced gradually. Otherwise instrument may be damaged. If test reveals a leak in system, check all connections for tightness.

16-15. BLOWING OUT LINES. Although pitot system is designed to drain down to pitot tube opening, condensation may collect at other points in system and produce a partial obstruction. To clear line, disconnect at airspeed indicator. Using low pressure air, blow from indicator end of line toward pitot tube.



1. Line (To Instruments)
2. Line (To Alternate Air)
3. Bracket
4. Line (To Sumps)
5. Valve
6. Line (To Pitot Tube)
7. Connector
8. Screw
9. Pitot Tube Mast Body
10. Heater Element
11. Line (To Right Sump)
12. Altimeter
13. Vertical Speed Indicator
14. Airspeed Indicator
15. Line (To Pitot Tube)
16. Line (Airspeed to Left Sump)
17. Stringer
18. Sta-Strap
19. Sump
20. Clamp
21. Static Port

Figure 16-2. Pitot-Static Systems

CAUTION

Never blow through pitot or static lines toward instruments.

Like pitot lines, static pressure lines must be kept clear and connections tight. All models have static source sumps which collect moisture and keep system clear. However, when necessary, disconnect static line at first instrument to which it is connected, then blow line clear with low-pressure air.

NOTE

On aircraft equipped with alternate static source, use same procedure, opening alternate static source valve momentarily to clear line, then close valve and clear remainder of system.

Check all static pressure line connections for tightness. If hoses or hose connections are used, check for general condition and clamps for security. Replace hoses which have cracked, hardened or show other signs of deterioration.

16-16. REMOVAL AND INSTALLATION. (See figure 16-2.) To remove pitot mast remove four mounting screws on side of connector (7) and pull mast out of connector far enough to disconnect pitot line (6). Electrical connections to heater assembly (if installed) may be disconnected through wing access plate just inboard of mast. Pitot and static lines are removed in the usual manner, after removing wing access plates, lower wing fairing strip and upholstery as required. Installation of tubing will be simpler if a guide wire is drawn in as tubing is removed from wing. The tubing may be removed intact by drawing it out through cabin and right door. When replacing components of pitot and static pressure systems, use anti-seize compound sparingly on male threads on both metal and plastic connections. Avoid excess compound which might enter lines. Tighten connections firmly, but avoid overtightening and distorting fittings. If twisting of plastic tubing is encountered when tightening fittings, VV-P-236 (USP Petrolatum), may be applied sparingly between tubing and fittings.

16-17. TROUBLE SHOOTING--PITOT STATIC SYSTEM.

TROUBLE	PROBABLE CAUSE	REMEDY
LOW OR SLUGGISH AIRSPEED INDICATION. (Normal altimeter and vertical speed.)	Pitot tube obstructed, leak or obstruction in pitot line.	Test pitot tube and line for leaks or obstructions. Blow out tube and line, repair or replace damaged line.
INCORRECT OR SLUGGISH RESPONSE. (all three instruments.)	Leaks or obstruction in static line.	Test line for leaks and obstructions. Repair or replace line, blow out obstructed line.

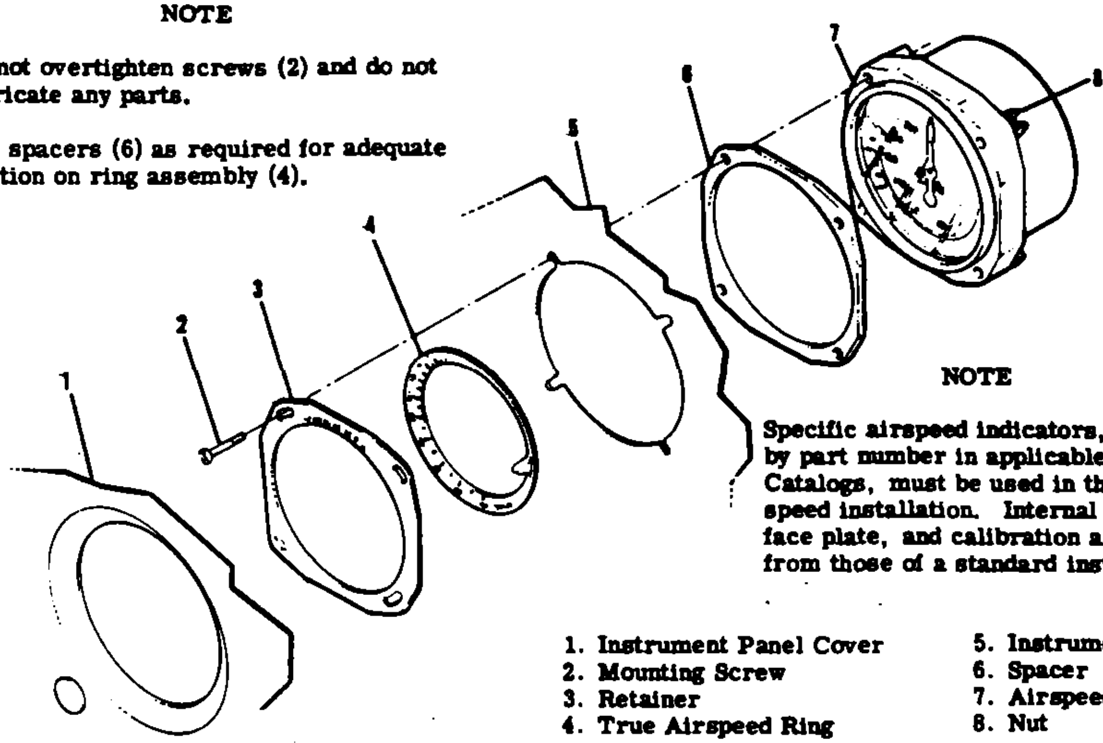
16-18. TRUE AIRSPEED INDICATOR. A true airspeed indicator may be installed. This indicator, equipped with a conversion ring, may be rotated until pressure altitude is aligned with outside air temperature, then airspeed indicated on instrument is read as true airspeed on adjustable ring. Refer to figure 16-3 for removal and installation. Upon installation, before tightening mounting screws (2), calibrate the instrument as follows: Rotate ring (4) until 105 knots on adjustable ring aligns with 105 knots on indicator. Holding this setting, move retainer (3) until 60°F aligns with zero pressure altitude, then tighten mounting screws (2) and replace decorative cover.

SHOP NOTES:

NOTE

Do not overtighten screws (2) and do not lubricate any parts.

Use spacers (6) as required for adequate friction on ring assembly (4).



NOTE

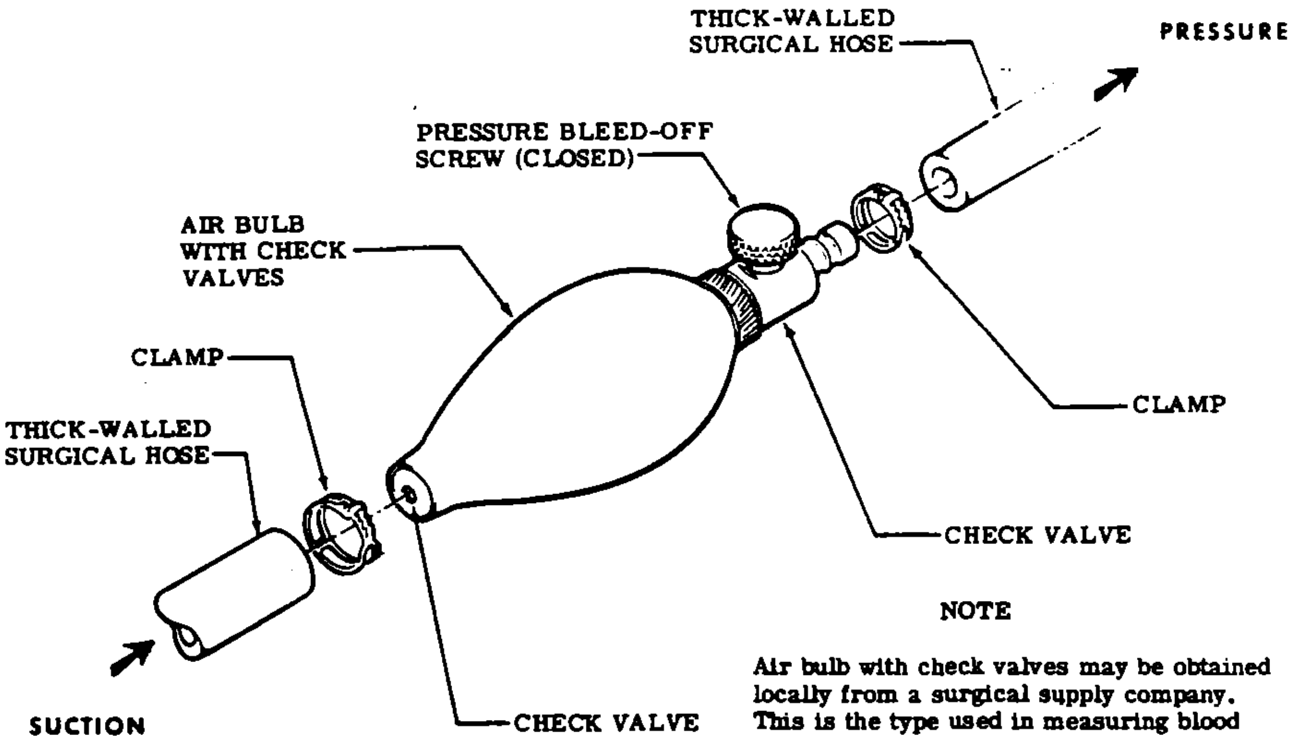
Specific airspeed indicators, listed by part number in applicable Parts Catalogs, must be used in the true airspeed installation. Internal mechanism, face plate, and calibration are different from those of a standard instrument.

1. Instrument Panel Cover
2. Mounting Screw
3. Retainer
4. True Airspeed Ring
5. Instrument Panel
6. Spacer
7. Airspeed Indicator
8. Nut

Figure 16-3. True Airspeed Indicator

16-19. TROUBLE SHOOTING--AIRSPEED INDICATOR.

TROUBLE	PROBABLE CAUSE	REMEDY
HAND FAILS TO RESPOND.	Pitot pressure connection not properly connected to pressure line from pitot tube.	Test line and connection for leaks. Repair or replace damaged line, tighten connections.
	Pitot or static lines clogged.	Check line for obstructions. Blow out lines.
INCORRECT INDICATION OR HAND OSCILLATES.	Leak in pitot or static lines.	Test lines and connections for leaks. Repair or replace damaged lines, tighten connections.
	Defective mechanism or leaking diaphragm.	Substitute known-good indicator and check reading. Replace instrument.
	Leaking diaphragm.	Substitute known-good indicator and check reading. Replace instrument.
HAND VIBRATES.	Excessive vibration.	Check panel shock mounts. Replace defective shock mounts.
	Excessive tubing vibration.	Check clamps and line connections for security. Tighten clamps and connections, replace tubing with flexible hose.



NOTE

Air bulb with check valves may be obtained locally from a surgical supply company. This is the type used in measuring blood pressure.

TO APPLY SUCTION:

1. Squeeze air bulb to expel as much air as possible.
2. Hold suction hose firmly against static pressure source opening.
3. Slowly release air bulb to obtain desired suction, then pinch hose shut tightly to trap suction in system.
4. After leak test, release suction slowly by intermittently allowing a small amount of air to enter static system. To do this, tilt end of suction hose away from opening, then immediately tilt it back against opening. Wait until vertical speed indicator approaches zero, then repeat. Continue to admit this small amount of air intermittently until all suction is released, then remove test equipment.

TO APPLY PRESSURE:

CAUTION

Do not apply positive pressure with airspeed indicator or vertical speed indicator connected into static system.

1. Hold pressure hose firmly against static pressure source opening.
2. Slowly squeeze air bulb to apply desired pressure to static system. Desired pressure may be maintained by repeatedly squeezing bulb to replace any air escaping through leaks.
3. Release pressure by slowly opening pressure bleed-off screw, then remove test equipment.

Figure 16-4. Static System Test Equipment

16-20. TROUBLE SHOOTING--ALTIMETER

TROUBLE	PROBABLE CAUSE	REMEDY
INSTRUMENT FAILS TO OPERATE.	Static line plugged.	Check line for obstructions. Blow out lines.
	Defective mechanism.	Substitute known-good altimeter and check reading. Replace instrument.
INCORRECT INDICATION.	Hands not carefully set.	Reset hands with knob.
	Leaking diaphragm.	Substitute known-good altimeter and check reading. Replace instrument.
	Pointers out of calibration.	Compare reading with known-good altimeter. Replace instrument.
HAND OSCILLATES.	Static pressure irregular.	Check lines for obstruction or leaks. Blow out lines, tighten connections.
	Leak in airspeed or vertical speed indicator installations.	Check other instruments and system plumbing for leaks. Blow out lines, tighten connections.

16-21. TROUBLE SHOOTING--VERTICAL SPEED INDICATOR.

TROUBLE	PROBABLE CAUSE	REMEDY
INSTRUMENT FAILS TO OPERATE.	Static line plugged.	Check line for obstructions. Blow out lines.
	Static line broken.	Check line for damage, connections for security. Repair or replace damaged line, tighten connections.
INCORRECT INDICATION.	Partially plugged static line.	Check line for obstructions. Blow out lines.
	Ruptured diaphragm.	Substitute known-good indicator and check reading. Replace instrument.
	Pointer off zero.	Reset pointer to zero. Reset pointer to zero.
POINTER OSCILLATES.	Partially plugged static line.	Check line for obstructions. Blow out lines.

16-21. TROUBLE SHOOTING--VERTICAL SPEED INDICATOR. (Cont)

TROUBLE	PROBABLE CAUSE	REMEDY
POINTER OSCILLATES. (cont).	Leak in static line.	Test lines and connections for leaks. Repair or replace damaged lines, tighten connections.
	Leak in instrument case.	Substitute known-good indicator and check reading. Replace instrument.
HAND VIBRATES.	Excessive vibration.	Check shock mounts. Replace defective shock mounts.
	Defective diaphragm.	Substitute known-good indicator and check for vibration. Replace instrument.

16-22. TROUBLE SHOOTING--PITOT TUBE HEATER.

TROUBLE	PROBABLE CAUSE	REMEDY
TUBE DOES NOT HEAT OR CLEAR ICE.	Switch turned "OFF."	Turn switch "ON."
	Popped circuit breaker.	Check circuit breaker. Reset.
	Break in wiring.	Test for open circuit. Repair wiring.
	Heating element burned out.	Check resistance of heating element. Replace element.

16-23. VACUUM SYSTEM.

16-24. DESCRIPTION. A dry vacuum system is installed on the aircraft. The system utilizes a sealed bearing, engine-driven vacuum pump. A discharge tube is connected to the pump to expell the air from the pump overboard. A suction relief valve is used to control system pressure and is connected between the pump inlet and the instruments. In the cabin the vacuum line is routed from the gyro instruments to the relief valve at the firewall. A central air filtering system is utilized. The reading of the suction gage indicates net difference in suction before and after air passes through a gyro. This differential pressure will gradually decrease as the central air-filter becomes dirty, causing a lower reading on the suction gage.

A dual vacuum pump system may be installed in the airplane. The system consists of two engine-driven vacuum pumps, two relief valves, and a check valve manifold. Should one pump fail, the check valve manifold closes to that pump then the other pump will maintain the system.

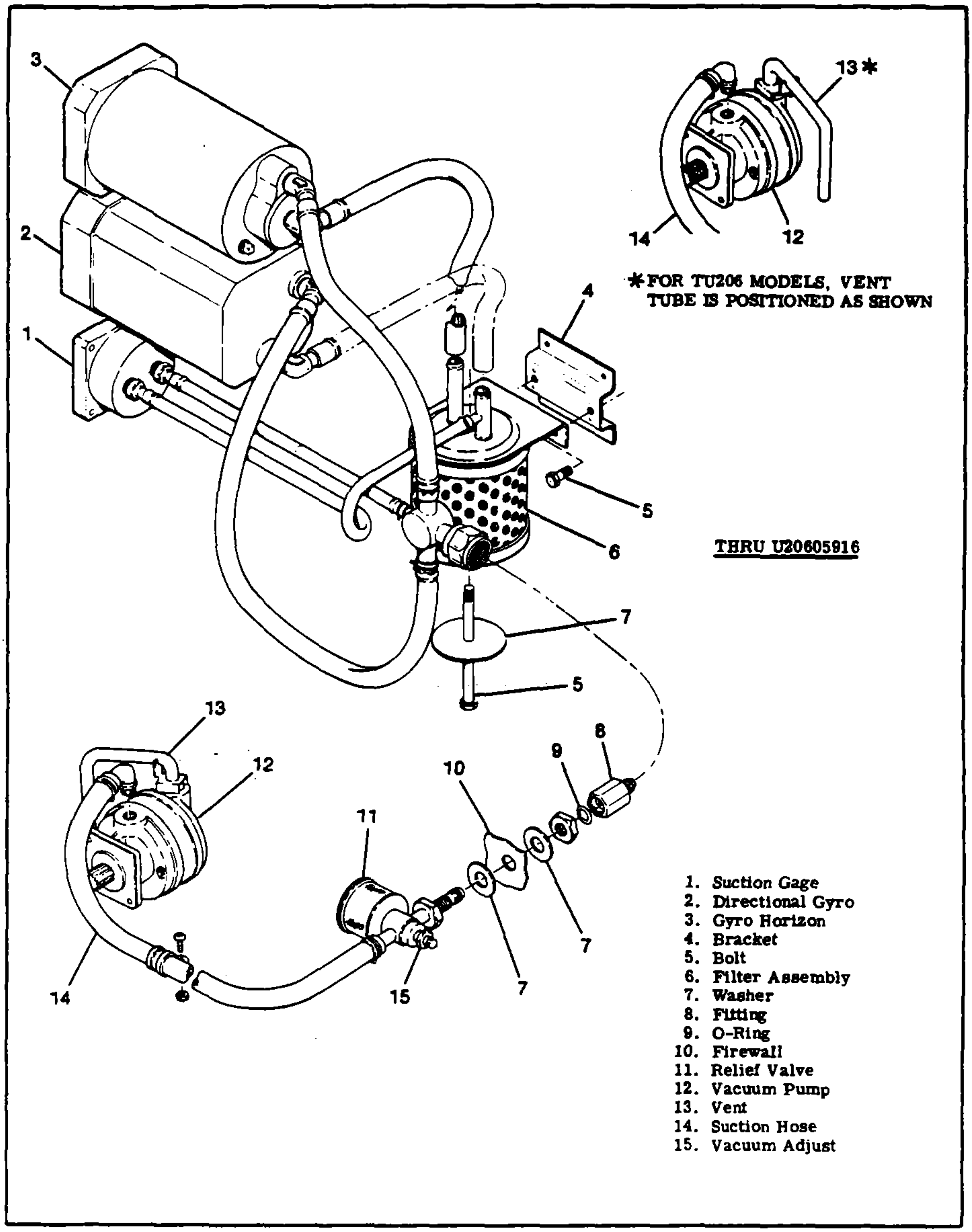
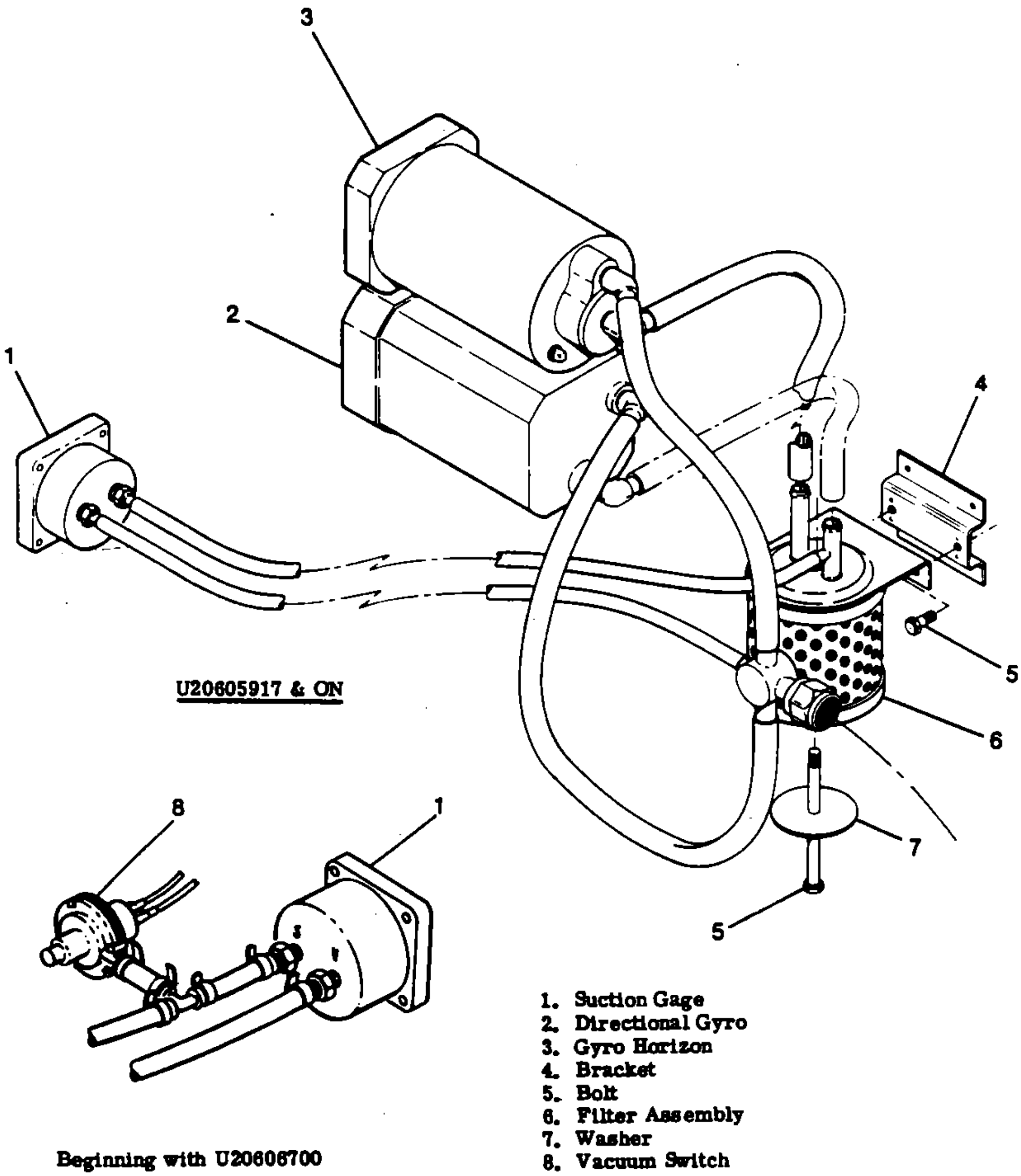
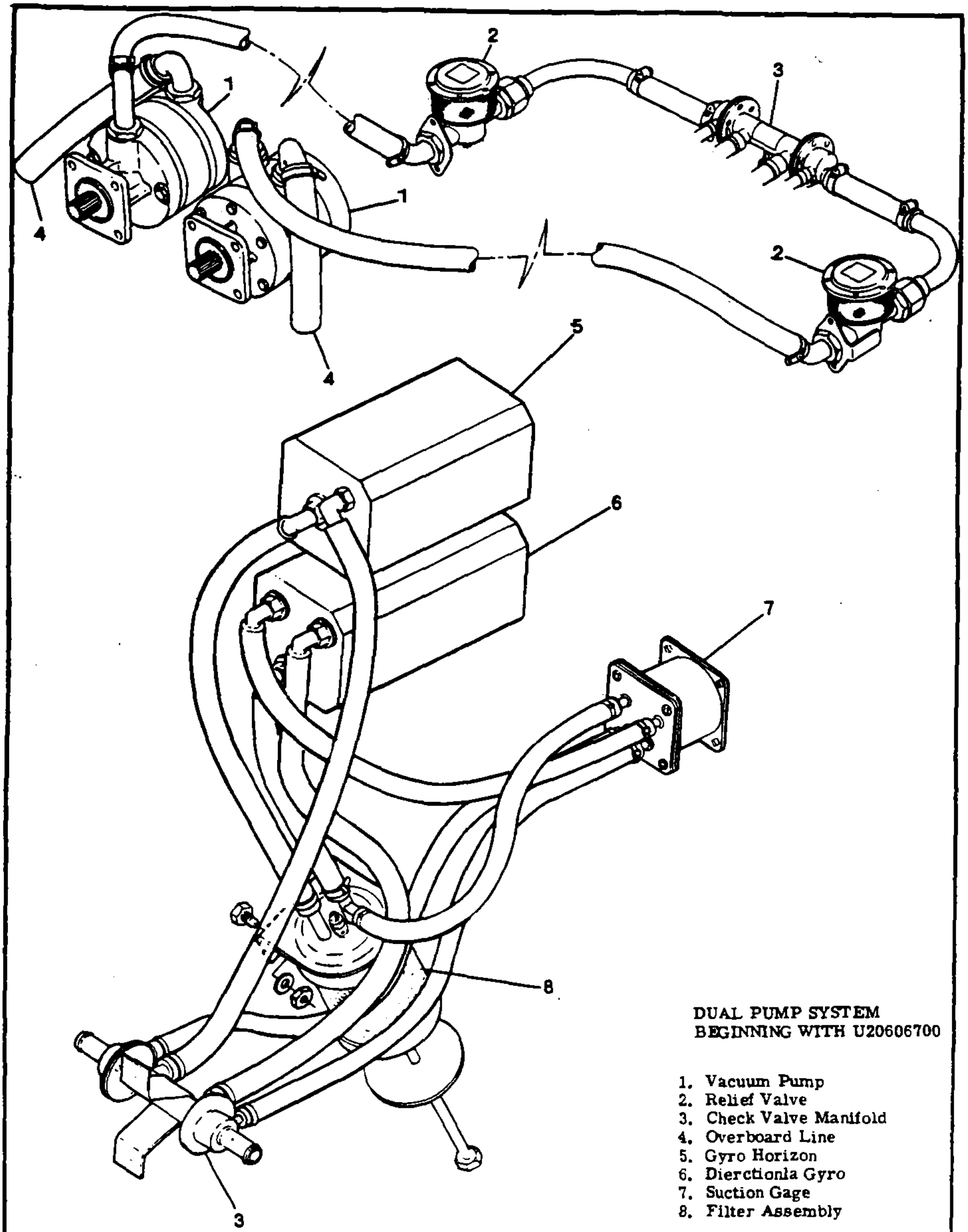


Figure 16-5. Vacuum System (Sheet 1 of 3)



1. Suction Gage
2. Directional Gyro
3. Gyro Horizon
4. Bracket
5. Bolt
6. Filter Assembly
7. Washer
8. Vacuum Switch

Figure 16-5. Vacuum System (Sheet 2 of 3)



DUAL PUMP SYSTEM
BEGINNING WITH U20606700

1. Vacuum Pump
2. Relief Valve
3. Check Valve Manifold
4. Overboard Line
5. Gyro Horizon
6. Dierctionla Gyro
7. Suction Gage
8. Filter Assembly

Figure 16-5. Vacuum System (Sheet 3 of 3)

16-25. TROUBLE SHOOTING--VACUUM SYSTEM

TROUBLE	PROBABLE CAUSE	REMEDY
HIGH SUCTION GAGE READINGS.	Gyros function normally-relief valve filter clogged, relief valve malfunction.	Check screen, then valve. Compare gage readings with new gage. Replace filter, reset valve. Replace gage.
NORMAL SUCTION GAGE READING, SLUGGISH OR ERRATIC GYRO RESPONSE.	Instrument air filters clogged.	Check filter. Replace filter.
LOW SUCTION GAGE READINGS.	Leaks or restriction between instruments and relief valve, relief valve out of adjustment, defective pump.	Check lines for leaks, disconnect and test pump. Repair or replace lines, adjust or replace relief valve, repair or replace pump.
	Central air filter dirty.	Check filter, Replace filter.
SUCTION GAGE FLUCTUATES.	Defective gage or sticking relief valve.	Check suction with test gage. Replace gage. Clean sticking valve with Stoddard solvent. Blow dry and test. If valve sticks after cleaning, replace valve.

16-26. TROUBLE SHOOTING--GYROS.

TROUBLE	PROBABLE CAUSE	REMEDY
HORIZON BAR FAILS TO RESPOND.	Central filter dirty.	Check filter. Replace filter.
	Suction relief valve improperly adjusted.	Adjust or replace relief valve.
	Faulty suction gage.	Substitute known-good suction gage and check gyro response. Replace suction gage.
	Vacuum pump failure.	Check pump. Replace pump.
	Vacuum line kinked or leaking.	Check lines for damage and leaks. Repair or replace damaged lines, tighten connections.
HORIZON BAR DOES NOT SETTLE.	Defective mechanism.	Substitute known-good gyro and check indication. Replace instrument.
	Insufficient vacuum.	Adjust or replace relief valve.
	Excessive vibration.	Check panel shock-mounts. Replace defective shock-mounts.

16-26. TROUBLE SHOOTING--GYROS. (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
HORIZON BAR OSCILLATES OR VIBRATES EXCESSIVELY.	Central filter dirty.	Check filter. Replace filter.
	Suction relief valve improperly adjusted.	Adjust or replace relief valve.
	Faulty suction gage.	Substitute known-good suction gage and check gyro indication. Replace suction gage.
	Defective mechanism.	Substitute known-good gyro and check indication. Replace instrument.
	Excessive vibration.	Check panel shock-mounts. Replace defective shock-mounts.
EXCESSIVE DRIFT IN EITHER DIRECTION.	Central air filter dirty.	Check filter. Replace filter.
	Low vacuum, relief valve improperly adjusted.	Adjust or replace relief valve.
	Faulty suction gage.	Substitute known-good suction gage and check gyro indication. Replace suction gage.
	Vacuum pump failure.	Check pump. Replace pump.
	Vacuum line kinked or leaking.	Check lines for damage and leaks. Repair or replace damaged lines, tighten connections.
DIAL SPINS IN ONE DIRECTION CONTINUOUSLY.	Operating limits have been exceeded.	Replace instrument.
	Defective mechanism.	Substitute known-good gyro and check indication. Replace instrument.

16-27. TROUBLE SHOOTING--VACUUM PUMP

TROUBLE	PROBABLE CAUSE	REMEDY
OIL IN DISCHARGE.	Damaged pump drive seal.	Replace gasket.
HIGH SUCTION.	Suction relief valve screen clogged.	Clean or replace screen.
LOW SUCTION.	Relief valve leaking.	Replace relief valve.
	Vacuum pump failure.	Replace vacuum pump.

16-28. MAINTENANCE PRACTICES.

NOTE

When replacing a vacuum system component, ensure all connections are made correctly to avoid damage to gyro system. When a component is removed, cap off and identify all open lines, hoses, and fittings to prevent dirt from entering system, and to ensure proper reinstallation. Upon component replacement, check all hoses carefully to be sure they are clean and free of debris, oil, solvent, collapsed inner liners, and external damage. Replace old, hard, cracked, or brittle hoses, particularly on pump inlet, to avoid possible pump damage. On vacuum pump, where hose clearance is tight, making it difficult to reinstall hoses, apply a light film of petrolatum to the fitting. Install hoses by pushing them straight on, and do not wiggle hoses from side to side as this could cause particles to be cut from inside of hose, allowing particles to enter system.

CAUTION

Do not use teflon tape, pipe dope, or thread lubricants of any type on fitting threads, and avoid over-tightening of connections. All filters in vacuum system must be changed when installing a new pump. Failure to do so will void pump warranty. DO NOT CONNECT A PUMP BACKWARDS since the manifold check valves provide no pressure relief, the pump will be destroyed within a matter of seconds after starting the engine.

16-28A. REMOVAL OF VACUUM PUMP.

a. Remove upper engine cowling in accordance with procedures in Section 11.
b. Disconnect, cap off and identify hose on inlet side of vacuum pump.
c. Identify and disconnect hose on outlet side of vacuum pump.
d. Remove nuts, lockwashers, and flat washers securing vacuum pump to engine.
e. Remove vacuum pump from mounting studs on engine.
f. Remove elbow from pump and retain if it is reusable.

NOTE

Discard any twisted fittings or nuts with rounded corners.

16-28B. MOUNTING PAD INSPECTION.

a. Check condition of the AND 20000 pad seal. If the seal shows any signs of oil leakage, replace the seal. Replace seal if there is any doubt as to its serviceability.

16-28C. INSTALLATION OF VACUUM PUMP.

a. Before installing a new vacuum pump purge all lines in the system to remove carbon particles or pump components that may have been deposited in the lines by a previous pump.
b. Consult the applicable Parts Catalog, the pump vendor's application list, or the PMA label on the pump box to verify that the pump is the correct model for the engine and/or system.

NOTE

Before installing vacuum pump on engine, ensure that mating surfaces are clean and free of any old gasket material.

c. Position vacuum pump in a jaw-protected vise, with drive coupling downward.

CAUTION

Pump housing should never be placed directly in a vise, since clamping across center housing will cause an internal failure of carbon rotor. Protect pump mounting flange with soft metal or wood. NEVER INSTALL a pump that has been dropped.

NOTE

Do not use teflon tape, pipe dope, or thread lubricants of any type, and avoid over-tightening of connections.

d. Install elbow in pump; hand-tighten only.

NOTE

Use only a box wrench to tighten fittings to desired position. Do not make more than one and one-half (1-1/2) turns beyond hand-tighten position.

e. Position new mounting pad gasket on mounting studs on engine.
f. Position vacuum pump on mounting studs.
g. Secure pump to engine with flat washers, new lockwashers, and nuts.

CAUTION

Always replace all lockwashers with new ones when installing a new vacuum pump. Tighten all four mounting nuts (4) to 50 to 70 pound-inches.

h. Connect hose to inlet side of vacuum pump.
i. Install upper engine cowling in accordance with procedures in Section 11.

16-29. CLEANING. Remove and discard suction relief valve filter. Wash relief valve with Stoddard solvent and dry with low pressure, dry compressed air. Install new filter. Check hoses for external damage and collapsed inner liners.

CAUTION

Never apply compressed air to lines or components installed in aircraft. The excessive pressures will damage gyros. If an obstructed line is to be blown out, disconnect at both ends and blow from instrument panel out.

16-29A. LOW-VACUUM WARNING LIGHT. (See figure 16-5, sheet 2 of 3.) A red low-vacuum warning light is installed on the instrument panel. This light is used in conjunction with the single pump system only. The light is controlled by a vacuum switch which is teed into the line between the suction gage and the directional gyro. The switch contacts are normally closed. The light may be checked by turning ON the master switch. With the engine running the light should illuminate when the vacuum drops below 3±.5 inches Hg.

16-30. VACUUM RELIEF VALVE ADJUSTMENT. A suction gage reading of 5.3 inches Hg is desireable for gyro instruments. However a range of 4.6 to 5.4 inches Hg is acceptable.

Single pump adjustment. Remove central air filter. run engine at 2200 RPM. adjust relief valve to 5.3±.1 inches Hg. Replace central air filter.

Dual pump adjustment. Remove central air filter, with engine at 1900 set relief valves at lower end of green arc (4.6 inches Hg) with individual pump only on the line. Combined reading (both pumps on line) not to exceed 5.4 inches Hg at 1900 RPM. Replace central air filter.

NOTE

With either a single or dual vacuum pumps, if vacuum drops noticeably after replacing central air filter, remove and replace existing filter with a new filter.

16-30A. STANDBY VACUUM SYSTEM.

16-30B. DESCRIPTION. A standby vacuum system may be installed in the airplane. The system consists of a electric motor driven vacuum pump, a vacuum relief valve, a manifold valve and associated hoses. The vacuum pump and motor assembly is mounted in the nose gear tunnel. A switch on the circuit breaker panel controls the system and a circuit breaker protects the system. When the system is installed per SK206-29, the circuit breaker and switch are replaced by a circuit breaker switch.

16-30C. TROUBLE SHOOTING - STANDBY VACUUM SYSTEM.

TROUBLE	PROBABLE CAUSE	REMEDY
NO SUCTION GAGE READING.	Circuit breaker or circuit breaker switch has opened.	Reset circuit breaker or circuit breaker switch. If switch reopens, check wire from switch to bus bar for short. Repair or replace wire.
	Defective motor.	Check voltage input wire and ground wire. Repair or replace wires.
	Defective pump.	Check pump operation. Replace pump.
LOW SUCTION GAGE READING.	Leak or restriction between pump and suction gage.	Check hoses and connections for leaks and obstructions. Install new clamps at connection, clear or replace hoses.
	Relief valve not properly adjusted.	Adjust relief valve.
	Defective pump.	Check pump. Replace pump.
	Central air filter dirty.	Replace central air filter.

16-30D. REMOVAL (See figure 16-5A.)

a. Remove nose gear tunnel cover.
b. Make sure circuit breaker switch or switch and battery switch are off.
c. Remove clamp securing hose (21) to vacuum pump (10).
d. Cap hose and pump fitting so dirt cannot enter system.
e. Disconnect ground wire (6) and voltage input wire (9).
f. Remove clamp (5).
g. Remove safety wire from bolts (25).
h. Remove bolts (25) and washers (26) and remove motor and pump assembly.
i. If motor (27) is to be removed from assembly, remove nuts (7) and washers (8).
j. If vacuum pump (10) is to be removed from assembly remove nuts (23) and washers (24).

16-30E. INSTALLATION (See figure 16-5A.)

a. If pump was removed from assembly, position pump (10) on studs and install washers (24) and nuts (23).
b. If motor was removed from assembly, position motor (27) on studs and install washers (8) and nuts (7).
c. Position pump and motor assembly on rack (4) and install washers (26) and bolts (25).
d. Safety wire bolts (25).
e. Install clamp (5).
f. Place hose (21) over forward pump fitting and install clamp.
g. Connect voltage input wire (9) and ground wire (6).
h. Turn on battery switch and circuit breaker switch or switch (1), then check suction gage to see that system is operating properly. Turn off switches.
i. Install nose gear tunnel cover.

CAUTION

Check that voltage input wire (17) is not pushed down into motor as it could become entangled with the armature, locking it.

16-31. ENGINE INDICATORS.

16-32. TACHOMETER.

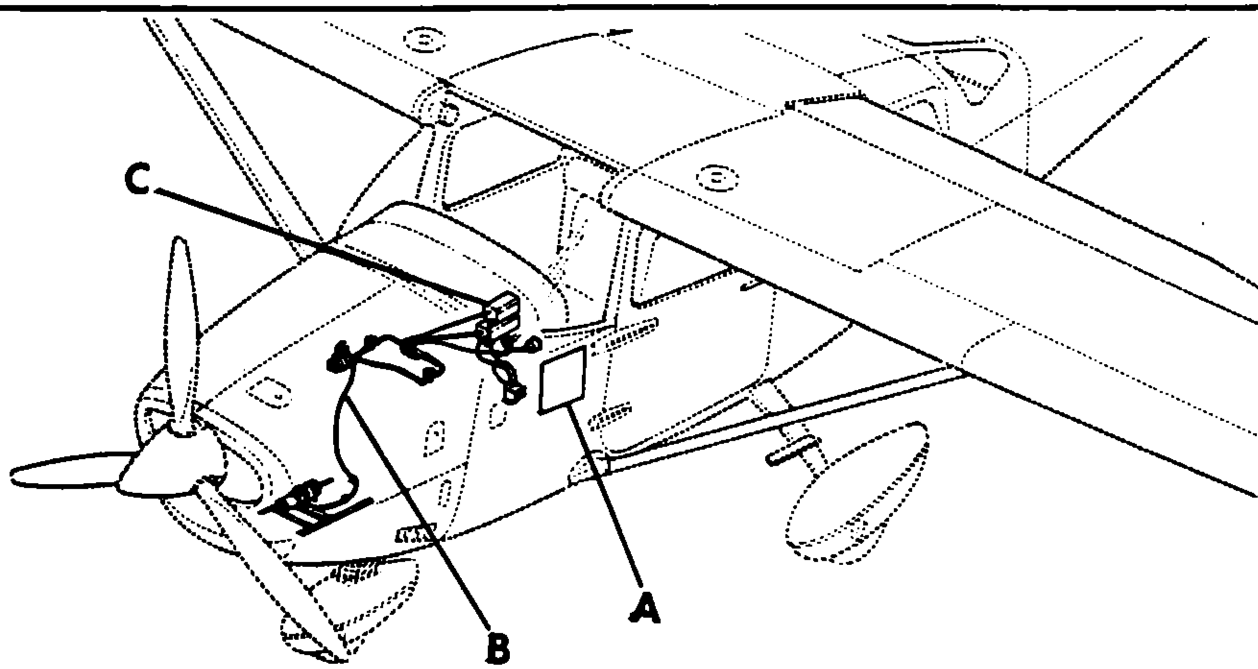
16-33. *DESCRIPTION.* The tachometer is a mechanical indicator driven at half crankshaft speed by a flexible shaft. Most tachometer difficulities will be found in the drive-shaft. To function properly, the shaft housing must be free of kinks, dents and sharp bends. There should be no bend on a radius shorter than six inches and no bend within three inches of either terminal. If a tachometer is noisy or pointer oscillates, check cable housing for kinks, sharp bends and damage. Disconnect cable at tachometer and pull it out of housing. Check cable for worn spots, breaks and kinks.

NOTE

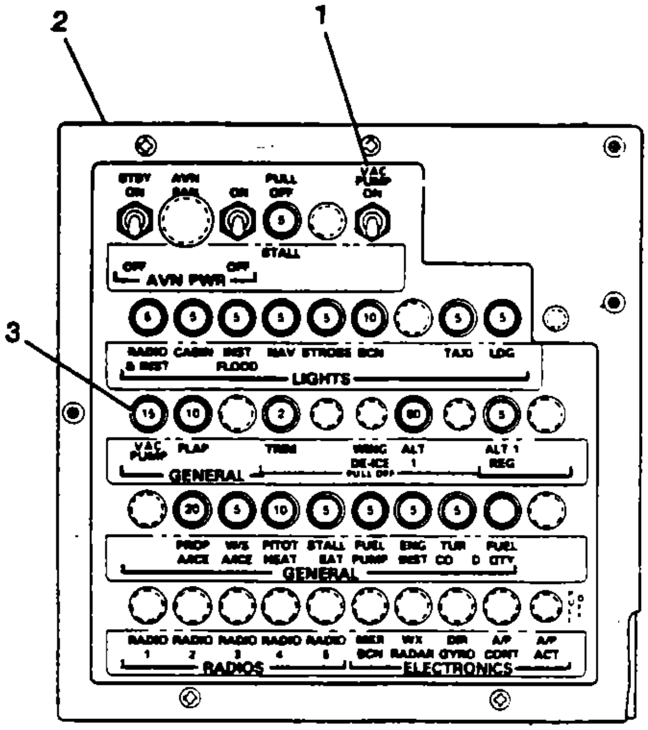
Before replacing a tachometer cable in housing, coat lower two thirds with AC Type ST-640 speedometer cable grease or Lubriplate No. 110. Insert cable in housing as far as possible, then slowly rotate to make sure it is seated in engine fitting. Insert cable in tachometer, making sure it is seated in drive shaft, then reconnect housing and torque to 50 pound-inches (at instrument).

16-34. MANIFOLD PRESSURE/FUEL FLOW INDICATOR.

16-35. DESCRIPTION. The manifold pressure and fuel flow indicators are in one instrument case. However, each instrument operates independently. The manifold pressure gage is a barometric instrument which indicates absolute pressure in the intake manifold inches of mercury. The fuel flow indicator is a pressure instrument calibrated in gallons per hour, indicating approximate gallons of fuel metered per hour to the engine. Pressure for operating the indicator is obtained through a hose from the fuel manifold valve. The fuel flow indicator is vented to atmospheric pressure with standard engines and to turbocharger outlet pressure on turbocharged engines.

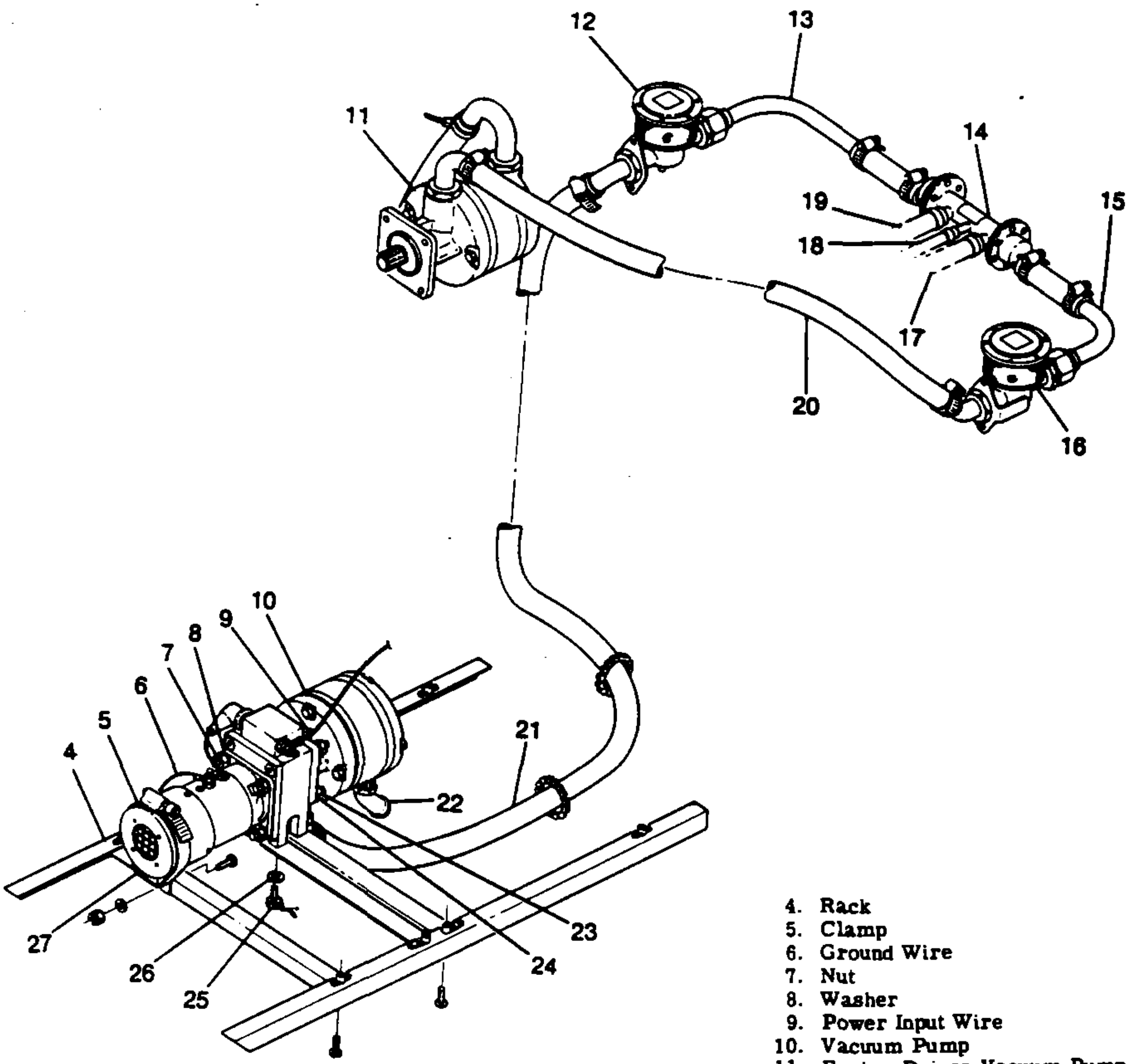


1. Switch
2. Circuit Breaker Panel
3. Circuit Breaker



Detail A

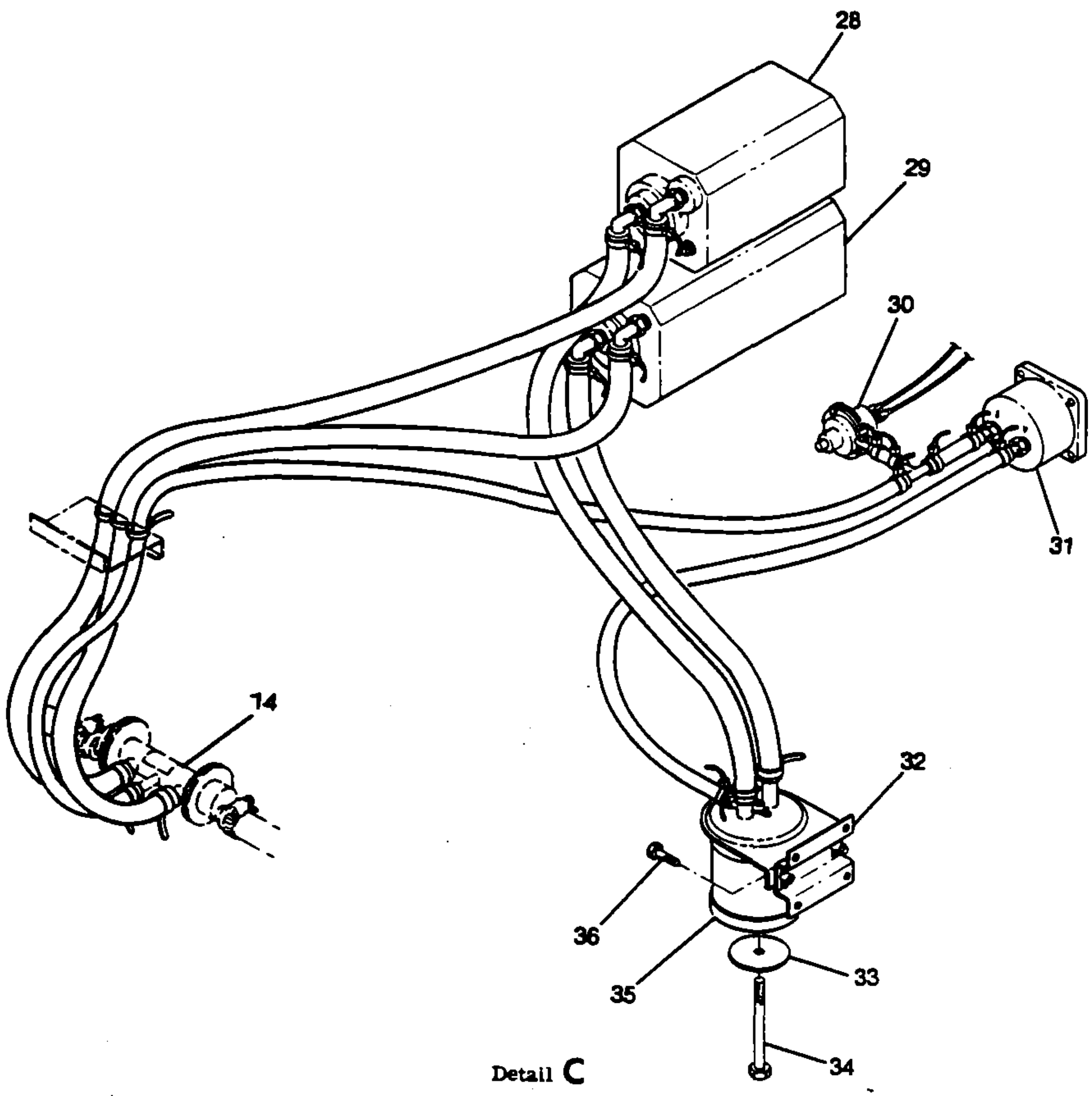
Figure 16-5A. Standby Vacuum System (Sheet 1 of 3)



Detail B

4. Rack
5. Clamp
6. Ground Wire
7. Nut
8. Washer
9. Power Input Wire
10. Vacuum Pump
11. Engine-Driven Vacuum Pump
12. Relief Valve
13. Tube
14. Manifold
15. Tube
16. Relief Valve
17. Hose (to Directional Gyro)
18. Hose (to Suction Gage)
19. Hose (to Gyro Horizon)
20. Hose
21. Hose (to Relief Valve)
22. Vent Fitting
23. Nut
24. Washer
25. Bolt
26. Washer
27. Motor

Figure 16-5A. Standby Vacuum System (Sheet 2 of 3)



14. Manifold
28. Directional Gyro
29. Gyro Horizon
30. Vacuum Switch
31. Suction Gage
32. Bracket
33. Washer
34. Bolt
35. Filter Assembly
36. Bolt

Figure 16-5A. Standby Vacuum System (Sheet 3 of 3)

16-36. TROUBLE SHOOTING -- FUEL FLOW INDICATOR.

TROUBLE	PROBABLE CAUSE	REMEDY
DOES NOT REGISTER.	Pressure line clogged.	Blow out line.
	Pressure line broken.	Repair or replace damaged line.
	Fractured bellows or damaged mechanism.	Replace instrument.
	Clogged snubber orifice.	Replace instrument.
	Pointer loose on staff.	Replace instrument.
POINTER FAILS TO RETURN TO ZERO.	Foreign matter in line.	Blow out line.
	Clogged snubber orifice.	Replace instrument.
	Damaged bellows or mechanism.	Replace instrument.
INCORRECT OR ERRATIC READING.	Damaged or dirty mechanism.	Replace instrument.
	Pointer bent, rubbing on dial or glass.	Replace instrument.
	Leak or partial obstruction in pressure or vent line.	Blow out dirty line, repair or tighten loose connections.

16-37. TROUBLE SHOOTING -- MANIFOLD PRESSURE INDICATOR.

TROUBLE	PROBABLE CAUSE	REMEDY
EXCESSIVE ERROR AT EXISTING BAROMETRIC PRESSURE.	Pointer shifted.	Replace instrument.
	Leak in vacuum bellows.	Replace instrument.
	Loose pointer.	Replace instrument.
	Leak in pressure line.	Repair or replace damaged line, tighten connections.
	Condensate or fuel in line.	Blow out line.
JERKY MOVEMENT OF POINTER.	Excessive internal friction.	Replace instrument.
	Rocker shaft screws tight.	Replace instrument.
	Link springs too tight.	Replace instrument.
	Dirty pivot bearings.	Replace instrument.
	Defective mechanism.	Replace instrument.
	Leak in pressure line.	Repair or replace damaged line, tighten connections.

16-37. TROUBLE SHOOTING - - MANIFIOLD PRESSURE INDICATOR. (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
SLUGGISH OPERATION OF POINTER.	Foreign matter in line.	Blow out line.
	Damping needle dirty.	Replace instrument.
	Leak in pressure line.	Repair or replace damaged line, tighten connections.
EXCESSIVE POINTER VIBRATION.	Tight rocker pivot bearings.	Replace instrument.
	Excessive vibration.	Tighten mounting screws.
IMPROPER CALIBRATION.	Faulty mechanism.	Replace instrument.
NO POINTER MOVEMENT.	Faulty mechanism.	Replace instrument.
	Broken pressure line	Repair or replace damaged line.

16-38. CYLINDER HEAD TEMPERATURE GAGE.

16-39. DESCRIPTION. The temperature sending unit regulates power through the cylinder head temperature gage. The gage and sending unit require little or no maintenance other than cleaning, making sure lead is properly supported, and all connections are clean, tight and properly insulated. Rochester gages are connected the same as Stewart Warner gages, but the Rochester gages do not have a calibration pot and are not adjustable.

Refer to Table 2 on page 16-22C when trouble shooting the cylinder head temperature gage.

NOTE

A Cylinder Head Temperature Gage Calibration Unit (SK182-43) is available for Stewart Warner gages and may be ordered through the Cessna Service Pats Center. Rochester gages are not adjustable.

16-40. TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE INOPERATIVE.	No current to circuit.	Repair electrical circuit.
	Defective gage, bulb, or circuit.	Repair or replace defective items.
GAGE FLUCTUATES RAPIDLY.	Loose or broken wire permitting alternate make and break of gage circuit.	Repair or replace defective wire.
GAGE READS TOO HIGH ON SCALE.	High voltage.	Check "A" terminal.
	Gage off calibration.	Recalibrate or replace gage.
GAGE READS TOO LOW ON SCALE.	Low voltage.	Check voltage supply and "D" terminal.
	Gage off calibration.	Recalibrate or replace gage.

16-40. TROUBLE SHOTING. (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE READS OFF SCALE ATHIGH END.	Break in bulb.	Replace bulb.
	Break in bulb lead.	Replace bulb.
	Internal break in gage.	Replace gage.
OBVIOUSLY INCORRECT READING.	Defective gage mechanism.	Replace gage.
	Incorrect calibration.	Recalibrate.

16-41. OIL PRESSURE GAGE.

16-42. DESCRIPTION. The Bourdon tube-type oil pressure gage is a direct reading instrument, operated by a pressure pickup line connected to the engine main oil gallery. The oil pressure line from the instrument to the engine should be filled with kerosene, especially during cold weather operation, to obtain an immediate oil indication.

16-43. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE DOES NOT REGISTER.	Pressure line clogged.	Check line for obstructions. Clean line.
	Pressure line broken.	Check line for leaks and damage. Repair or replace damaged line.
	Fractured Bourdon tube.	Replace instrument.
	Gage pointer loose on staff.	Replace instrument.
	Damaged gage movement.	Replace instrument.
GAGE POINTER FAILS TO RETURN TO ZERO.	Foreign matter in line.	Check line for obstructions. Clean line.
	Foreign matter in Bourdon tube.	Replace instrument.
	Bourdon tube stretched.	Replace instrument.
GAGE DOES NOT REGISTER PROPERLY.	Faulty mechanism.	Replace instrument.
GAGE HAS ERRATIC OPERATION.	Worn or bent movement.	Replace instrument.
	Foreign matter in Bourdon tube.	Replace instrument.
	Dirty or corroded movement.	Replace instrument.
	Pointer bent and rubbing on dial, dial screw or glass.	Replace instrument.
	Leak in pressure line.	Check line for leaks and damage. Repair or replace damaged line.

16-44. OIL TEMPERATURE GAGE

16-45. DESCRIPTION. On some airplanes, the oil temperature gage is a Bourdon tube type pressure instrument connected by armored capillary tubing to a temperature bulb in the engine. The temperature bulb, capillary tube and gage are filled with fluid and sealed. Expansion and contraction of fluid in the bulb with temperature changes operates the gage. Checking the capillary tube for damage and fittings for security is the only maintenance required. Since the tube's inside diameter is small, small dents and kinks, which would be acceptable in larger tubing, may partially or completely close off the capillary, making the gage inoperative. Some airplanes are equipped with gages that are electrically actuated, and are not adjustable. Refer to Table 1 on page 16-22AB when trouble shooting the oil temperature gage.

16-46. FUEL QUANTITY INDICATING SYSTEM.

16-47. DESCRIPTION. The magnetic type fuel quantity indicators are used in conjunction with a float operated variable-resistance transmitter in each fuel tank. The full position of the float produces a minimum resistance through the transmitter, permitting maximum current flow through the fuel quantity indicator and maximum pointer deflection. As fuel level is lowered, resistance in transmitter is increased, producing a decreased current flow through fuel quantity indicator and a smaller pointer deflection. A heat sink assembly (Voltage Regulator) is installed in aircraft equipped with 24-volt systems. The unit is located on the glove box. The unit converts 28-volt current flow from the bus to a 14-volt current flow to the fuel quantity indicators and transmitters. Refer to Section 20 for a schematic wiring diagram of the heat sink assembly.

16-48. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
FAILURE TO INDICATE.	No power to indicator or transmitter. (Pointer stays below E.)	Check fuse and inspect for open circuit. Replace fuse, repair or replace defective wire.
	Grounded wire. (Pointer stays above F.)	Check for partial ground between transmitter and gage. Repair or replace defective wire.
	Low Voltage.	Check voltage at indicator. Correct voltage.
	Defective indicator.	Substitute known-good indicator. Replace indicator.
OFF CALIBRATION.	Defective indicator.	Substitute known good indicator. Replace indicator.
	Defective transmitter.	Substitute known good transmitter Recalibrate or replace transmitter.
	Low or high voltage.	Check voltage at indicator. Correct voltage.
STICKY OR SLUGGISH INDICATOR OPERATION.	Defective indicator.	Substitute known-good indicator. Replace indicator.
	Low voltage.	Check voltage at indicator. Correct voltage.
ERRATIC READINGS.	Loose or broken wiring on indicator or transmitter.	Inspect circuit wiring. Repair or replace defective wire.
	Defective indicator or transmitter.	Substitute known good component. Replace indicator or transmitter.
	Defective master switch.	Replace switch.

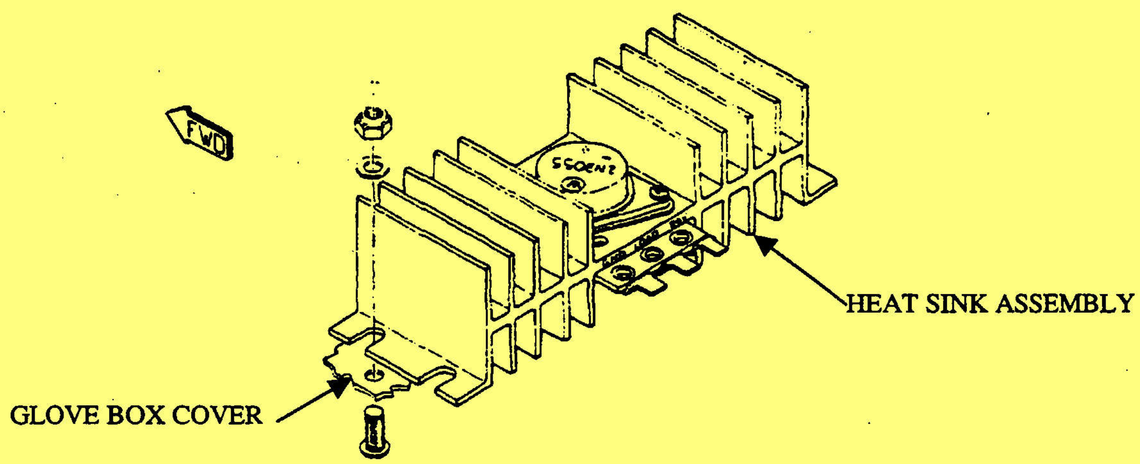


Figure 16-6. Heat Sink Assembly (Voltage Regulator) Installation

16.49. TRANSMITTER ADJUSTMENT
(Refer to page 16-22A)

16-50. REMOVAL AND INSTALLATION, FUEL QUANTITY TRANSMITTERS.
Observe precautions in Section 13 when working with fuel components.

a. Drain fuel from cell.
b. Remove wing root fairing.
c. Disconnect electrical lead and ground strap from transmitter.
d. Remove screws through transmitter and wing root rib, and remove transmitter.
e. Install transmitter by reversing preceding steps. No gasket paste should be used.
f. Fill fuel cell. Check for leaks and correct fuel quantity indication.

NOTE

Be sure grounding is secure.

NOTE

Torque retaining screws so gasket seats evenly and inspect float position to ensure bottom of float is approximately .20 inch from the bottom of the fuel tank.

16-51. REMOVAL AND INSTALLATION, HEAT SINK. (See Figure 16-6.)

a. Turn off master switch or disconnect battery leads.
b. Disconnect three wires from heat sink assembly and tag for identification.
c. Remove nuts, screws and washers attaching unit to glove box and remove the unit.
d. Reverse proceeding steps to install the heat sink unit.

16-52. HOURMETTER.

16-53. DESCRIPTION. The hour meter is an electrically operated instrument, actuated by a pressure switch in the oil pressure gage line. Electrical power is supplied through a one-amp fuse from the electrical clock circuit, and therefore will operate independent

16-49. TRANSMITTER ADJUSTMENT

WARNING: USING THE FOLLOWING FUEL TRANSMITTER CALIBRATION PROCEDURES ON COMPONENTS OTHER THAN THE ORIGINALLY INSTALLED (STEWART WARNER) COMPONENTS WILL RESULT IN A FAULTY FUEL QUANTITY READING.

16-49A. STEWART WARNER GAGE TRANSMITTER CALIBRATION

Chances of transmitter calibration changing in normal service is remote; however it is possible that the float arm or the float arm stops may become bent if the transmitter is removed from the fuel cell/tank. Transmitter calibration is obtained by adjusting float travel. Float travel is limited by the float arm stops.

WARNING: USE EXTREME CAUTION WHILE WORKING WITH ELECTRICAL COMPONENTS OF THE FUEL SYSTEM. THE POSSIBILITY OF ELECTRICAL SPARKS AROUND AN "EMPTY" FUEL CELL CREATES A HAZARDOUS SITUATION.

Before installing transmitter, attach electrical wires and place the master switch in the "ON" position. Allow float arm to rest against lower float arm stop and read indicator. The pointer should be on E (empty) position. Adjust the float arm against the lower stop so pointer indicator is on E. Raise float until arm is against upper stop and adjust upper stop to permit indicator pointer to be on F (full). Install transmitter in accordance with paragraph 16-50.

16-49B. ROCHESTER FUEL GAGE TRANSMITTER

Do not attempt to adjust float arm or stop. No adjustment is allowed.

16-49C FUEL QUANTITY INDICATING SYSTEM OPERATIONAL TEST.

WARNING: REMOVE ALL IGNITION SOURCES FROM THE AIRPLANE AND VAPOR HAZARD AREA. SOME TYPICAL EXAMPLES OF IGNITION SOURCES ARE STATIC ELECTRICITY, ELECTRICAL POWERED EQUIPMENT (TOOLS OR ELECTRONIC TEST EQUIPMENT - BOTH INSTALLED ON THE AIRPLANE AND GROUND SUPPORT EQUIPMENT), SMOKING AND SPARKS FROM METAL TOOLS.

WARNING: OBSERVE ALL STANDARD FUEL SYSTEM FIRE AND SAFETY PRACTICES.

1. Disconnect all electrical power from the airplane. Attach maintenance warning tags to the battery connector and external power receptacle stating:

   DO NOT CONNECT ELECTRICAL POWER, MAINTENANCE IN PROGRESS.

2. Electrically ground the airplane.

3. Level the airplane and drain all fuel from wing fuel tanks.

4. Gain access to each fuel transmitter float arm and actuate the arm through the transmitter's full range of travel.

   A. Ensure the transmitter float arm moves freely and consistently through this range of travel. Replace any transmitter that does not move freely or consistently.

   WARNING: USE EXTREME CAUTION WHILE WORKING WITH ELECTRICAL COMPONENTS OF THE FUEL SYSTEM. THE POSSIBILITY OF ELECTRICAL SPARKS AROUND AN "EMPTY" FUEL CELL CREATES A HAZARDOUS SITUATION.

B. While the transmitter float arm is being actuated, apply airplane battery electrical power as required to ensure that the fuel quantity indicator follows the movement of the transmitter float arm. If this does not occur, troubleshoot, repair and/or replace components as required until the results are achieved as stated.

NOTE: Stewart Warner fuel quantity indicating systems can be adjusted. Refer to paragraph 16-49A for instructions for adjusting Stewart Warner fuel indicating systems. Rochester fuel quantity indicating system components are not adjustable, only component replacement or standard electrical wiring system maintenance practices are permitted.

5. With the fuel selector valve in the "OFF" position, add unusable fuel to each fuel tank.

6. Apply electrical power as required to verify the fuel quantity indicator indicates "EMPTY".

A. If "EMPTY" is not indicated, adjust, troubleshoot, repair and/or replace fuel indicating components as required until the "EMPTY" indication is achieved.

NOTE: Stewart Warner fuel quantity indicating systems can be adjusted. Refer to paragraph 16-49A for instructions for adjusting Stewart Warner fuel indicating systems. Rochester fuel quantity indicating system components are not adjustable, only component replacement or standard electrical wiring system maintenance practices are permitted.

7. Fill tanks to capacity, apply electrical power as required and verify fuel quantity indicator indicates "FULL".

A. If "FULL" is not indicated, adjust, troubleshoot, repair and/or replace fuel indicating components as required until the "FULL" indication is achieved.

NOTE: Stewart Warner fuel quantity indicating systems can be adjusted. Refer to paragraph 16-49A for instructions for adjusting Stewart Warner fuel indicating systems. Rochester fuel quantity indicating system components are not adjustable, only component replacement or standard electrical wiring system maintenance practices are permitted.

8. Install any items and/or equipment removed to accomplish this procedure, remove maintenance warning tags and connect the airplane battery.

16-49D. OIL TEMPERATURE INDICATING SYSTEM RESISTANCE TABLE 1

The following table is provided to assist in the troubleshooting the oil temperature indicating system components.

Select the oil temperature sending unit part number that is used in your airplane from the left column and the temperature from the column headings. Read the ohms value under the appropriate temperature column.

Part Number	Type	72°F	120°F	165°F	220°F	250°F
S1630-1	Oil Temp				46.4 Ω	
S1630-3	Oil Temp		620.0 Ω			52.4 Ω
S1630-4	Oil Temp		620.0 Ω			52.4 Ω
S1630-5	Oil Temp			192.0 Ω		
S2335-1	Oil Temp	990.0 Ω				34.0 Ω

16-49E. CYLINDER HEAD TEMPERATURE INDICATING SYSTEM RESISTANCE TABLE 2

The following table is provided to assist in the troubleshooting the cylinder head temperature indicating system components.

Select the cylinder head temperature sending unit part number that is used in your airplane from the left column and the temperature from the column headings. Read the ohms value under the appropriate temperature column.

Part Number	Type	200°F	220°F	450°F	475°F
S1372-1	CHT		310.0 Ω	34.8 Ω	
S1372-2	CHT		310.0 Ω	34.8 Ω	
S1372-3	CHT			113.0 Ω	
S1372-4	CHT			113.0 Ω	
S2334-3	CHT	745.0 Ω			38.0 Ω
S2334-4	CHT	745.0 Ω			38.0 Ω

of the master switch. A diode incorporated into the meter prevents interruption of avionics operation. This type hourmeter is identified by a white + above the positive terminal.

NOTE

When installing the hourmeter, the positive (red) wire must be connected to the white + terminal. Connecting wires incorrectly will damage the meter.

16-54. ECONOMY MIXTURE INDICATOR.

16-55. DESCRIPTION. The economy mixture indicator is an exhaust gas temperature (EGT) sensing device which is used to aid pilot in selecting most desirable fuel-air mixture for cruising flight at less than 75% power. Exhaust gas temperature (EGT) varies with ratio of fuel-to-air mixture entering engine cylinders. Refer to Owner's Manual for operating procedure of system.

16-56. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE INOPERATIVE.	Defective gage, probe or circuit.	Repair or replace defective part.
INCORRECT READING.	Indicator needs calibrating.	Calibrate indicator in accordance with paragraph 15-57.
FLUCTUATING READING.	Loose, frayed or broken lead, permitting alternate make and break of circuit.	Tighten connections and repair or replace defective leads.

16-57. CALIBRATION. A potentiometer adjustment screw is provided either on the back or the face of the instrument for calibration. This adjustment screw is used to position the pointer over the reference increment line (4/5 scale) at peak EGT. Establish peak EGT according to the instructions in the Pilot's Operating Handbook.

NOTE

This setting will provide relative temperature indications for normal cruise power settings within range of the instrument.

Turning the screw clockwise increases the meter reading and counterclockwise decreases the meter reading. There is a stop in each direction and damage can occur if too much torque is applied against stops. Approximately 600°F total adjustment is provided. The adjustable yellow pointer on the face of the instrument is a reference pointer only.

16-58. REMOVAL AND INSTALLATION. Removal of the indicator is accomplished by removing the mounting screws and disconnecting the leads. Tag leads to facilitate installation. The thermocouple probe is secured to the exhaust stack with a clamp. When installing probe, tighten clamp to 45 pound-inches and safety as required.

16-59. MAGNETIC COMPASS.

16-60. DESCRIPTION. The magnetic compass is liquid-filled, with expansion provisions to compensate for temperature changes. It is equipped with compensating magnets adjustable from the front of the case. The compass is internally lighted, controlled by the panel lights rheostat. No maintenance is required on the compass except an occasional check on a compass rose and replacement of the lamp. The compass mount is attached by three screws to a base plate which is bonded to the windshield with methylene chloride. A tube containing the compass light wires is attached to the metal strip at the top of the windshield. Removal of the compass is accomplished by removing the screw at the forward end of the compass mount, unfastening the metal strip at the top of the windshield and cutting the two wire splices. Removal of the compass mount is accomplished by removing the outside air temperature probe and removing the three screws attaching mount to the base plate. Access to the inner screw is gained through a hole in the bottom of mount, through which a thin screwdriver may be inserted. When installing the compass, it will be necessary to splice the compass light wires.

16-61. STALL WARNING HORN AND TRANSMITTER.

16-62. DESCRIPTION. The stall warning horn is mounted on the glove box. It is electrically operated and controlled by a stall warning transmitter mounted on leading edge of left wing. For further information on warning horn and transmitter, refer to Section 17.

16-63. TURN-AND-SLIP INDICATOR.

16-64. DESCRIPTION. The turn-and-slip indicator is operated by the aircraft electrical system and operates ONLY when the master switch is on. Its circuit is protected by an automatically-resetting circuit breaker.

16-65. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
INDICATOR POINTER FAILS TO RESPOND.	Automatic resetting circuit breaker defective.	Check circuit breaker. Replace circuit breaker.
	Master switch "OFF" or switch defective.	Check switch "ON." Replace defective switch.
	Broken or grounded lead to indicator.	Check circuit wiring. Repair or replace defective wiring.
	Indicator not grounded.	Check ground wire. Repair or replace defective wire.
	Defective mechanism.	Replace instrument.
HAND SLUGGISH IN RETURNING TO ZERO.	Defective mechanism.	Replace instrument.
	Low voltage.	Check voltage at indicator. Correct voltage.
POINTER DOES NOT INDICATE PROPER TURN.	Defective mechanism.	Replace instrument.
HAND DOES NOT SIT ON ZERO.	Gimbal and rotor out of balance.	Replace instrument.
	Hand incorrectly sits on rod.	Replace instrument.
	Sensitivity spring adjustment pulls hand off zero.	Replace instrument.
IN COLD TEMPERATURES, HAND FAILS TO RESPOND OR IS SLUGGISH.	Oil in indicator becomes too thick.	Replace instrument.
	Insufficient bearing end play.	Replace instrument.
	Low voltage.	Check voltage at indicator. Correct voltage.
NOISY GYRO.	High voltage.	Check voltage at indicator. Correct voltage.
	Loose or defective rotor bearings.	Replace instrument.

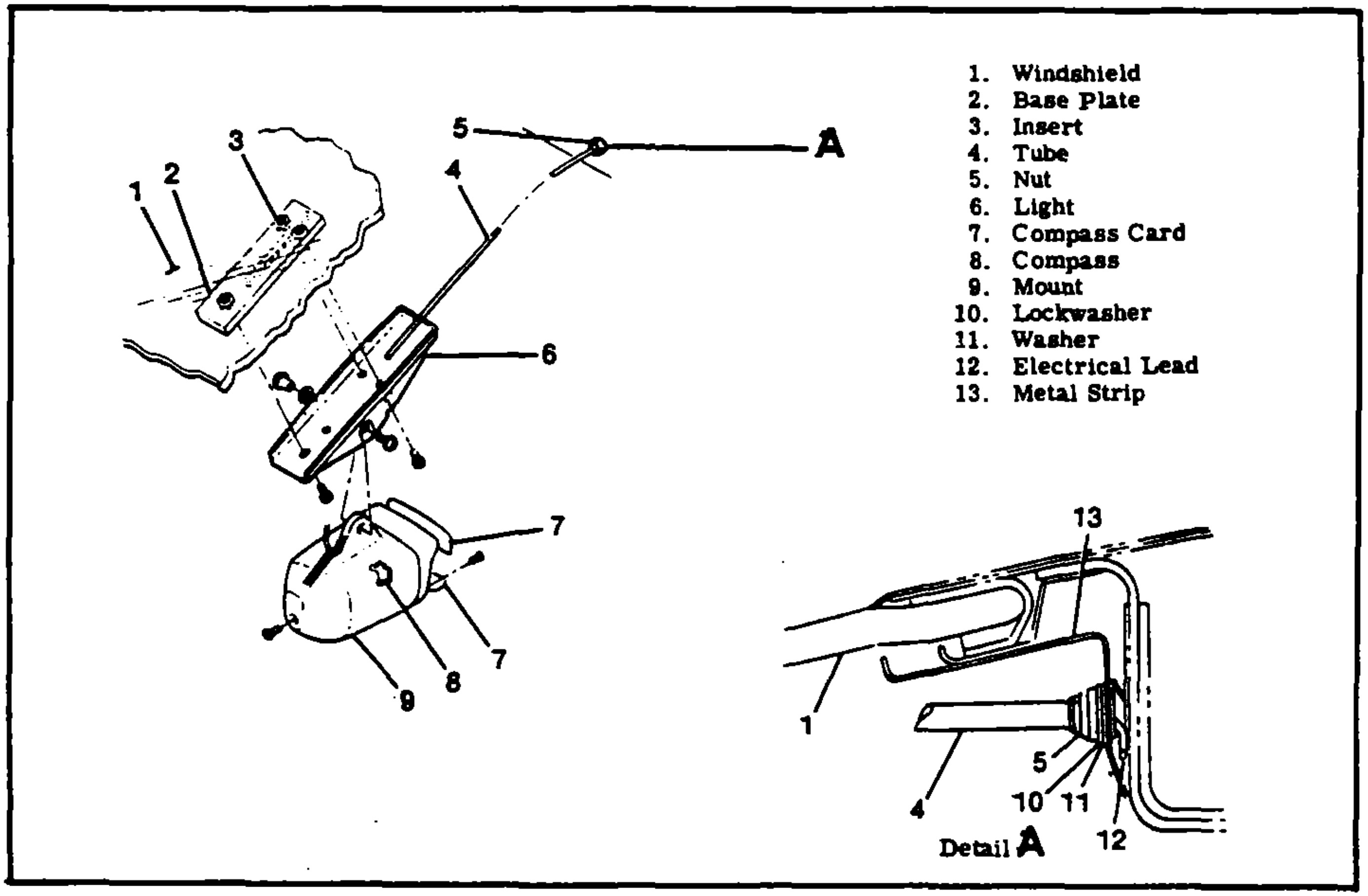


Figure 16-7. Magnetic Compass Installation

SHOP NOTES:

16-66. TURN COORDINATOR.

16-67. DESCRIPTION. The turn coordinator is an electrically operated, gyroscopic, roll-rate turn indicator. Its gyro simultaneously senses rate of motion roll and yaw axes which is projected on a single indicator. The gyro is a non-tumbling type requiring no caging mechanism and incorporates an a.c. brushless spin motor with a solid state inverter.

16-68. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
INDICATOR DOES NOT RETURN TO CENTER.	Friction caused by contamination in the indicator damping.	Replace instrument.
	Friction in gimbal assembly.	Replace instrument.
DOES NOT INDICATE A STANDARD RATE TURN (TOO SLOW).	Low voltage.	Measure voltage at instrument. Correct voltage.
	Inverter frequency changed.	Replace instrument.
NOISY MOTOR.	Faulty bearings.	Replace instrument.
ROTOR DOES NOT START.	Faulty electrical connection.	Check continuity and voltage. Correct voltage or replace faulty wire.
	Inverter malfunctioning.	Replace instrument.
	Motor shorted.	Replace instrument.
	Bearings frozen.	Replace instrument.
IN COLD TEMPERATURES, HAND FAILS TO RESPOND OR IS SLUGGISH.	Oil in indicator becomes too thick.	Replace instrument.
	Insufficient bearing end play.	Replace instrument.
	Low voltage.	Check voltage at instrument. Correct voltage.
NOISY GYRO.	High voltage.	Check voltage to instrument. Correct voltage.
	Loose or defective rotor bearings.	Replace instrument.

16-69. ELECTRIC CLOCK.

16-70. DESCRIPTION. The electric clock is connected to the battery through a one-ampere fuse mounted adjacent to the battery box. The electrical circuit is separate from the aircraft electrical system and will operate when the master switch is OFF. Beginning with 1979 Models a digital clock may be installed. Refer to Pilots Operating Handbook for operating procedures.

16-71. FUEL COMPUTER/DIGITAL CLOCK.

16-72. DESCRIPTION. The Astro Tech FT-2 is a dual function instrument providing a complete fuel management system and a multi-purpose time keeping device in a single instrument with each function sharing a common display panel. The instrument may be used as a replacement for the digital or electric clock, and may be mounted in the same location on the instrument panel.

The fuel computer portion of the instrument displays the following selections; fuel flow as measured by an engine mounted transducer, total fuel used, current fuel remaining and time remaining based on fuel remaining at the current flow rate. Fuel quantities are displayed in pounds with a gallon display available by utilizing a push button located below and to the right of the display. When time remaining at the currect flow rate reaches 45 minutes or less, the display will be blanked from one-tenth to three-tenths of a second per second in all of the selections.

The digital clock portion of the instrument displays the following selections; current time of day in either local (LCL) or Greenwich Mean Time (GMT) in hours and minutes, cummulative flight time in minutes and seconds (first hour) and hours and minutes (up to 100 hours) whenever fuel flow is greater than 25 to 30 pounds per hour (PPH) and elapsed time in minutes and seconds (first hour) and hours and minutes (up to 100 hours).

Fuel selections and time selections are made by utilizing a rotary-type selector switch common to both functions. Two pushbuttons, located below the display, are used to program the fuel computer digital clock.

16-73. FUEL COMPUTER OPERATION. The fuel computer contains five selections. They are selected by rotating the selector switch to the positions labeled ADD, FLOW, LB USD, LB REM, and TIME REM. These selections, when used in proper sequence with the programming buttons, will correctly program the computer.

The fuel quantity added during servicing of the airplane must be entered in the computer so that the LB REM position accurately represents the correct amount of usable fuel on board for each flight. The fuel quantity added is entered in the computer as follows:

To enter fill-up:
a. Rotate the selector switch to the ADD position.
b. Press left and right programming buttons together until display panel reads FULL.
c. Rotate the selector switch to LB REM position to display the usable fuel quantity in pounds on board.

NOTE

The usable fuel quantity for each airplane is programmed into the instrument at the factory. A battery disconnect or other power interruption will not alter this quantity.

To enter less than fill-up:
a. Rotate the selector switch to the ADD position.
b. Press right programming button, labeled GAL, until the right digit represents the correct units of gallons of fuel added.
c. Press left programming button, labeled RST, until the left two digits represent the correct tens and hundreds of gallons of fuel added.
d. Rotate the selector switch to LB REM position to display the correct usable fuel quantity in pounds on board.

If an error has been made, resulting in an incorrect display of LB REM, the correct amount may be entered as follows:
a. Leave the selector switch in the ADD position.
b. Enter the corrected fuel quantity in gallons.
c. Rotate the selector switch to FLOW, then press and hold the left programming button.
d. While holding the left button pressed, slowly rotate the selector switch to the LB REM position. The set-in amount in gallons, multiplied by six, will now appear as LB REM.

When the selector switch is placed in the FLOW position, the display indicates the current fuel flow rate in pounds per hour (PPH). Press the GAL programming button to display the flow rate in gallons per hour (GPH).

Placing the selector switch in the LB USD position displays the current fuel quantity used (in pounds) since the last addition of fuel to the airplane. Press the GAL programming button to display the fuel used in gallons.

NOTE

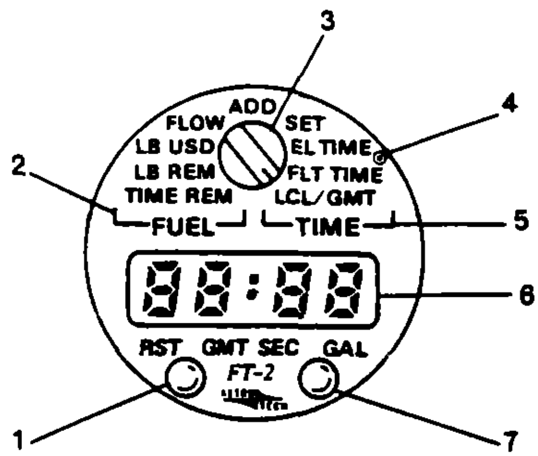
Any entry of additional fuel to LB REM will reset the LB USD to zero.

The LB REM position displays the current total remaining fuel (in pounds) on board the airplane, based on the takeoff amount minus the fuel used as computed using fuel flow rates. Press the GAL programming button to display the remaining fuel in gallons.

NOTE

When the display is changed from pounds to gallons in the FLOW, LB USD, and LB REM positions, the gallons shown are computed on the ratio of 6 pounds per gallon and no volumetric correction for temperature change is made. Therefore maximum accuracy may be obtained by referring to the gallons functions.

The TIME REM position displays the flight time remaining in hours and minutes as computed using the current fuel flow rate and fuel remaining amounts. Since this displayed value is dependent upon flow rate, a reduction in engine power will show an increase in time remaining.



1. Programming Button
2. Fuel Computer Selections
3. Selector Switch
4. Reset Switch
5. Digital Clock Selections
6. Display Panel
7. Programming Button

Figure 16-8. Fuel Computer/Digital Clock

NOTE

With the selector switch in the TIME REM position, power settings of less than 25 to 30 PPH flow rate will cause the word OFF to be displayed.

If it is desired to test the display, rotate the selector switch to TIME REM position, then press the right programming button. This will cause all 8's to be shown, thereby testing each segment of each digit.

Any power interruption that might alter a memory value or activation of the reset switch will erase a line of dashes to be displayed in all selector switch positions. Pressing the right programming button will clear the dashes from the display and show the current selector switch position. All memory values will be erased and must be re-entered. However, the usable fuel quantity will not be altered, since it is permanently entered in the instrument.

NOTE

If an abnormally low voltage condition should occur, such as during a cold weather engine start or if power is interrupted during programming sequences, such as the reset sequence, it is possible for the instrument to enter a "locked up" condition in which the display will not change with selector switch selection. Should this occur, it will be necessary to clear the condition by pressing the reset switch with a pencil or similar small diameter tool. The reset switch is in a small diameter hole located between the words "EL TIME" and "FLT TIME" near the outer periphery of the instrument face. The instrument should now operate normally, but will have to be reprogrammed.

16-74. DIGITAL CLOCK OPERATION. The digital clock contains four selections. They are selected by rotating the selector switch to the positions labeled SET, EL TIME, FLT TIME, and LCL/GMT. These selections, when used in proper sequence with the programming buttons, will correctly program the digital clock.

NOTE

Some models may have an unmarked detent position between the ADD and SET positions. This position performs the same function as the SET position.

The digital clock may be set to the local (LCL) and Greenwich Mean Time (GMT) as follows:

a. Rotate the selector switch to the SET position.
b. Press the left programming button until local hours advance to the correct value.
c. Press both programming buttons together until Greenwich Mean Time hours advance to the correct value.
d. Press right programming button until minutes advance to correct value. This action sets and holds seconds to zero.

e. Rotate selector switch from SET to start seconds from zero hold.

To display the local time-of-day in hours and minutes, rotate the selector switch to LCL/GMT. If a minutes and seconds display is desired, press the right programming button, labeled SEC. If Greenwich Mean Time in hours and minutes is desired, press the left programming button, labeled GMT.

NOTE

Local or Greenwich Mean Time hours may be changed without resetting the minutes and seconds.

To display accumulated flight time, rotate the selector switch to FLT TIME. After the first hour, if a minutes and seconds display is desired in place of the hours and minutes display, press the right (SEC) programming button. Flight time may be reset to zero by pressing the left (RST) programming button.

NOTE

Accumulated flight time may be zeroed only when the instrument is not counting (whenever fuel flow is less than 25-30 PPH) to prevent accidently zeroing flight time in the air.

Elapsed time (since pressing the RST button) is displayed by rotating the selector switch to the EL TIME position. After the first hour, if a minutes and seconds display is desired in place of the hours and minutes display, press the right (SEC) programming button. Elapsed time may be reset to zero by pressing the left (RST) programming button.

16-75. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
FUEL COMPUTER FUNCTION INOPERATIVE	Faulty wiring from transducer to instrument. Faulty transducer	Repair or replace wiring. Replace transducer
NO DISPLAY	Faulty wiring or open fuse.	Repair or replace wiring. Replace fuse.
DISPLAY WILL NOT CHANGE WITH SELECTOR SWITCH SELECTION	Low voltage or power interruption.	Correct low voltage condition. Connect power supply. Depress reset switch to reset instrument.

16-76. FUEL FLOW TRANSDUCER. The fuel flow transducer, located in the engine fuel line, measures the fuel flow rate (in pounds or gallons) to the throttle body metering unit. Fuel flow rate is measured by a turbine within the unit, mounted tangentially to the inlet port. Liquid fuel follows a helical flow path through the turbine and exits vertically to the outlet port, thereby venting any trapped vapor bubbles. The rotating turbine emits current pulse signals to the fuel computer section of the fuel computer/digital clock where they are displayed in pounds or gallons.

16-77. FUEL FLOW TRANSDUCER INSTALLATION. (See figure 16-9). A filter should be located upstream of the inlet port to prevent dirt from entering the turbine bearings. There should be a reasonable length of straight line between the inlet port and a valve, elbow or other turbulence producing device. Since upstream turbulence affects the performance of the instrument, turbulence should be held to a minimum. Be sure to install the transducer in a horizontal position with the wire leads or tabs UP and the turbine totally immersed in fuel.

NOTE

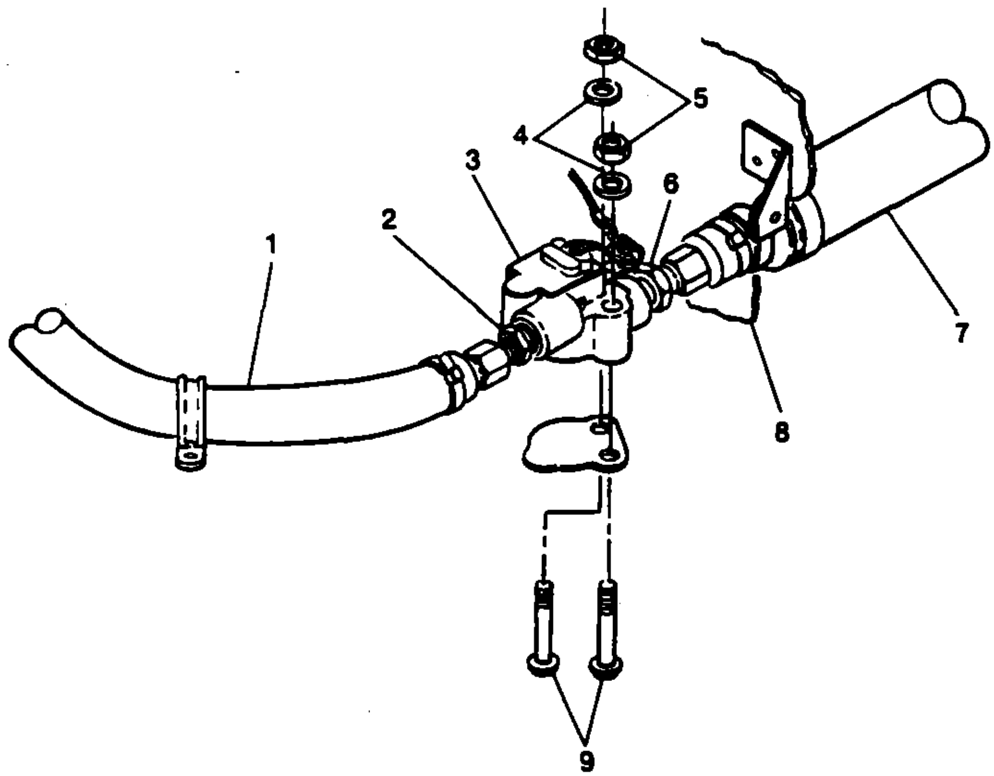
Whenever a transducer is installed it must be calibrated. See paragraph 16-79 for calibration procedures.

16-78. TRANSDUCER REMOVAL AND REPLACEMENT (See figure 16-9.)

CAUTION

When performing any maintenance on the fuel system, the precautions in Section 13 must be observed.

a. Place the fuel selector in the OFF position.
c. Remove the fuse from the clock fuse holder mounted on the battery contactor bracket.
d. Disconnect the electrical connector, connecting the transducer to the instrument.
e. Disconnect and cap both fuel lines (1 and 7).



1. Line to Flow Divider
2. Adapter
3. Transducer
4. Washers
5. Nuts
6. Adapter
7. Line to Throttle Body Metering Unit
8. Vertical Baffle
9. Bolts

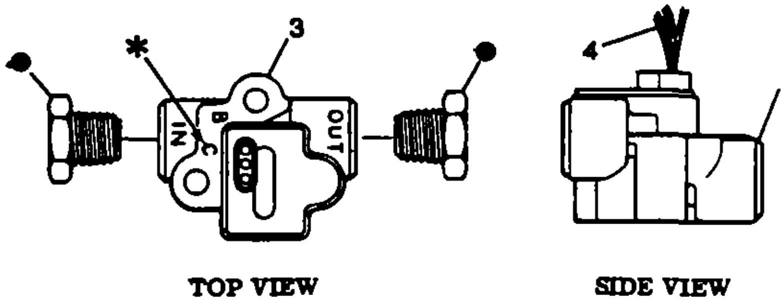
Figure 16-9. Fuel Flow Transducer

f. Remove nuts (5), washers (4), bolts (9) and remove transducer (3).
g. Reverse these steps for reinstallation.

NOTE

When replacing the inlet and outlet pipe fittings they are to be turned 3 times past hand tight or torqued to 25-30 lbs-ft whichever occurs first.

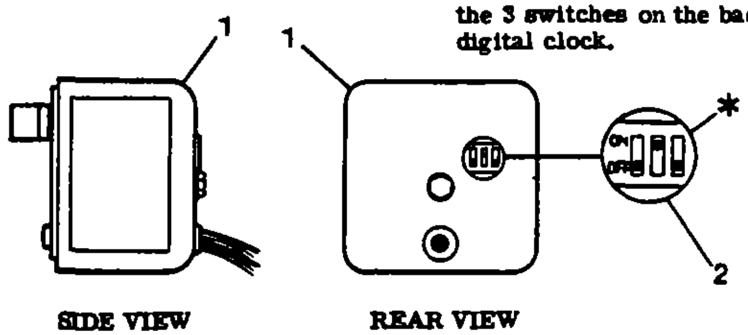
The transducer must be mounted horizontally with the electrical leads on top.



● Torque to 25-30 Lbs/Ft.

TRANSDUCER

✱ This letter determines the specific setting of the 3 switches on the back of the fuel computer/ digital clock.



FUEL COMPUTER/DIGITAL CLOCK

1. Fuel Computer/Digital Clock
2. Fuel Computer/Digital Clock Switches
3. Transducer
4. Wire Leads

✱ As an example, the setting shown on the fuel computer/digital clock switches (2) would be correct if the boss on top of the transducer (3) had an "F" stamped on it.

Figure 16-10. Transducer Markings and Fuel Computer/Digital Clock Switches.

16-79. FUEL TRANSDUCER CALIBRATION. (See figures 16-10 and 16-11.) The fuel computer/digital clock (1) has a 3-section switch (2) located on the back of the unit under a tape cover. Remove the cover and set the switches as shown on the fuel transducer table, figure 16-11. The fuel transducer (3) may have one or two letters (stamped or raised), located on the boss adjacent to the inlet port. If the boss contains two letters, DISREGARD the first letter. The second letter, near the mounting bolt hole, is the calibration "K" factor letter and determines the switch setting on the fuel computer/digital clock. After setting the 3 switches to the transducer marking designation, replace the tape cover.

TRANSDUCER "K" FACTOR (PULSES PER GALLON)	SWITCH #1	SWITCH #2	SWITCH #3	TRANSDUCER MARKING DESIGNATION
81,500 - 82,375	ON	ON	ON	A
82,376 - 83,250	OFF	ON	ON	B
83,251 - 84,125	ON	OFF	ON	C
84,126 - 85,000	OFF	OFF	ON	D
85,001 - 85,875	ON	ON	OFF	E
85,876 - 86,750	OFF	ON	OFF	F
86,751 - 87,625	ON	OFF	OFF	G
87,626 - 88,500	OFF	OFF	OFF	H

Figure 16-11. Fuel Transducer Table.

SECTION 17
ELECTRICAL SYSTEMS

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, not allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

TABLE OF CONTENTS

17-1. ELECTRICAL SYSTEMS.

17-2. GENERAL. This section contains service information necessary to maintain the Aircraft Electrical Power Supply System, Battery and External Power Supply System, Alternator Power System, Aircraft Lighting System, Pitot Heater, Stall Warning, Cigar Lighter and Electrical Load Analysis Chart.

17-3. ELECTRICAL POWER SUPPLY SYSTEM.

17-4. DESCRIPTION. Electrical energy for the aircraft is supplied by a 14-volt or optional 24-volt, direct current, single wire, negative ground electrical system. A single 33 Amp-Hour 12-volt battery or optional 17 Amp-Hour, 24-volt battery supplies power for starting and furnishes a reserve source of power in the event of alternator failure. An engine driven alternator is the normal source of power during flight and maintains a battery charge controlled by a voltage regulator. An external power source receptacle is offered as optional equipment to supplement the battery alternator system for starting and ground operation.

17-5. SPLIT BUS BAR.

17-6. DESCRIPTION. Electrical power is supplied through three bus bars. Two sides of the bus bar are jumpered together and supplies power to the electrical equipment. The other bar powers the electronic installations. When the master switch is closed the battery contactor engages and battery power is supplied to the electrical side of the split bus bar. Thru U20604066 the electrical bus feeds power to the electronic bus through a normally closed relay, this relay opens when the starter switch is engaged or when an external power source is used, preventing transient voltages from damaging the semiconductor circuitry in the electronic installations. Beginning with U20604067 the relay is replaced with a avionics master switch. (Refer to figure 17-1).

17-7. SPLIT BUS POWER RELAY. (THRU U20604066).

17-8. DESCRIPTION. A power relay is installed behind the instrument panel on all aircraft utilizing a split bus bar. The relay is a normally closed type, opening when external power is connected or when the starter is engaged, thus removing battery from the electronic side of the split bus bar and preventing transient voltages from damaging the electronic installations. (Refer to figure 17-1.)

17-9. MASTER SWITCH.

17-10. DESCRIPTION. The master switch is an interlocking split rocker with the battery mode on the right hand side and the alternator mode on the left hand side. This arrangement allows the battery to be on the line without the alternator, however, operation of the alternator without the battery on the line is not possible. The switch is labeled "BAT" and "ALT" below the switch and is located on the left hand side of the switch panel.

17-11. AMMETER.

17-12. DESCRIPTION. The ammeter is connected between the battery and the aircraft bus. The meter indicates the amount of current flowing either to or from the battery. With a low battery and the engine operating at cruise speed the ammeter will show the full alternator output when all electrical equipment is off. When the battery is fully charged and cruise RPM is maintained with all electrical equipment off, the ammeter will show a minimum charging rate.

17-13. BATTERY POWER SYSTEM.

17-14. BATTERY.

17-15. DESCRIPTION. On 14-volt systems, the battery is 12-volt and is approximately 33 ampere-hour capacity. On the 28-volt systems, the battery is 24-volt and is approximately 12.75 ampere hour capacity on the standard battery and 15.5 ampere hour capacity on the optional battery.

17-16. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
BATTERY WILL NOT SUPPLY POWER TO BUS OR IS INCAPABLE OF CRANKING ENGINE	Battery discharged.	1. Measure voltage at "BAT" terminal of battery contactor with master switch and a suitable load such as a taxi light turned on. Normal battery will indicate 11.5 volts or more on a 14 volt system or 23 volts or more on a 28 volt system. If voltage is low proceed to step 2. If voltage is normal, proceed to step 3.
	Battery faulty.	2. Check fluid level in cells and charge 12-volt battery at 14 volts or 24-volt battery at 28 volts for approximately 30 minutes or until battery voltage rises to 14 volts on 12-volt battery or 28 volts on 24-volt battery. If tester indicates a good battery, the malfunction may be assumed to be a discharged battery. If the tester indicates a faulty battery, replace the battery.
	Faulty contactor or wiring. between contactor and master switch.	3. Measure voltage at master switch terminal (smallest) on contactor with master switch closed. Normal indication is zero volts. If voltage reads zero, proceed to step 4. If a voltage reading is obtained, check wiring between contactor and master switch. Also check master switch.

17-16. TROUBLE SHOOTING. (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
BATTERY WILL NOT SUPPLY POWER TO BUS OR IS INCAPABLE OF CRANKING ENGINE (Cont.)	Open coil on contactor.	4. Check continuity between "BAT" terminal and master switch terminal of contactor. Normal indication on 14 volt aircraft is 16-24 ohms. Normal indication on 28 volt aircraft is 50-70 ohms. If ohmmeter indicates an open coil, replace contactor. If ohmmeter indicates a good coil, proceed to step 5.
	Faulty contactor contacts.	5. Check voltage on "BUS" side of contactor with master switch closed. Meter normally indicates battery voltage. If voltage is zero or intermittent, replace contactor. If voltage is normal, proceed to step 6.
	Faulty wiring between contactor and bus.	6. Inspect wiring between contactor and bus. Repair or replace wiring.

17-17. REMOVAL AND INSTALLATION OF 12 VOLT BATTERY. (See figure 17-2.)

a. To gain access to the battery, remove the upper left half of cowling.

b. Remove the battery box lid and disconnect the battery ground cable.

CAUTION

Always remove the ground cable first and connect it last to prevent accidentally shorting the battery to the airframe with tools.

c. Disconnect the positive cable from the battery and remove the battery from aircraft.

d. To install a battery, reverse this procedure.

17-18. REMOVAL AND INSTALLATION OF 24 VOLT BATTERY. (See figure 17-2.)

a. To gain access to the battery, remove the upper left half of the engine cowling.

b. Remove the battery box lid and disconnect the battery ground cable.

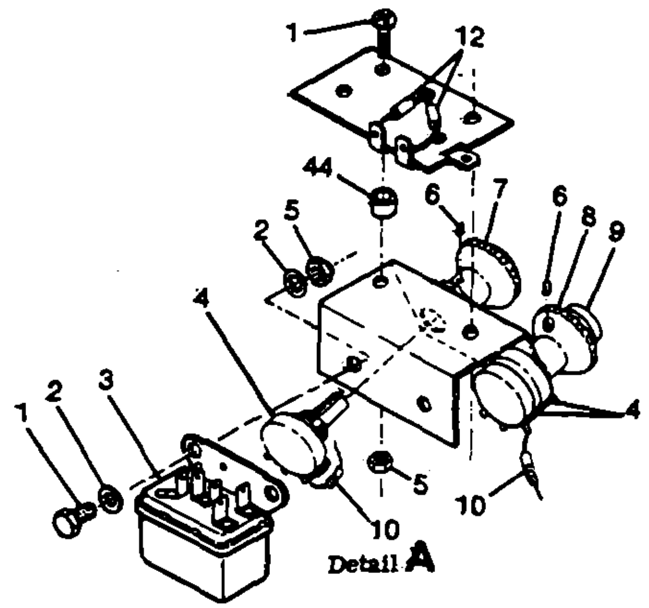
CAUTION

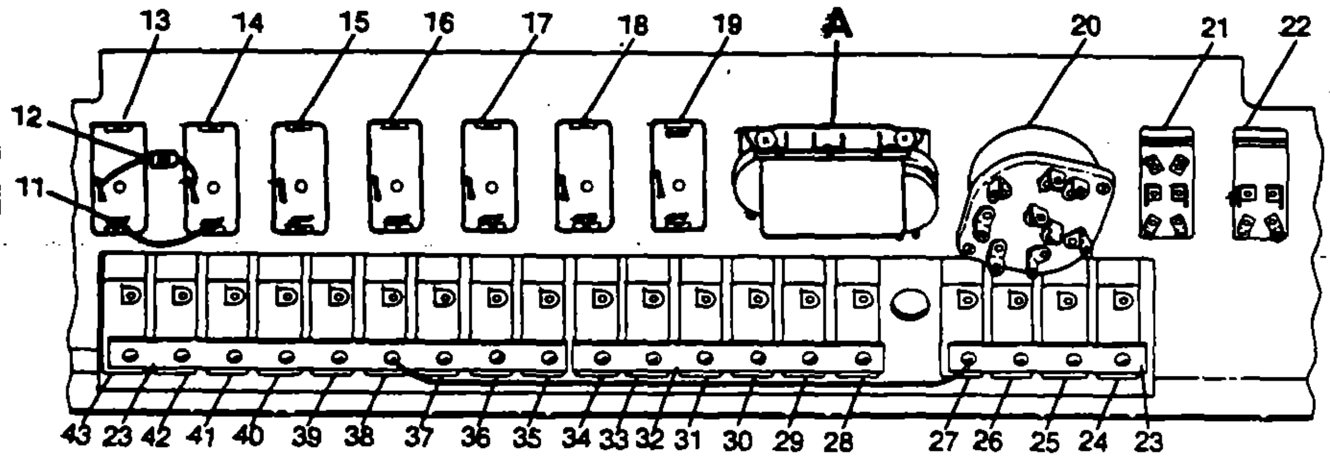
Always remove the ground cable first and connect it last to prevent accidentally shorting the battery to the airframe with tools.

c. Disconnect the positive cable from the battery and remove the battery from the aircraft.

d. To install the battery, reverse this procedure.

1. Bolt
2. Washer
3. Split Bus Relay
4. Rheostat
5. Nut
6. Set Screw
7. Instrument Light Control
8. Engine-Radio Light Control
9. Lower Panel (EL Panel) Light Control
10. Resistor





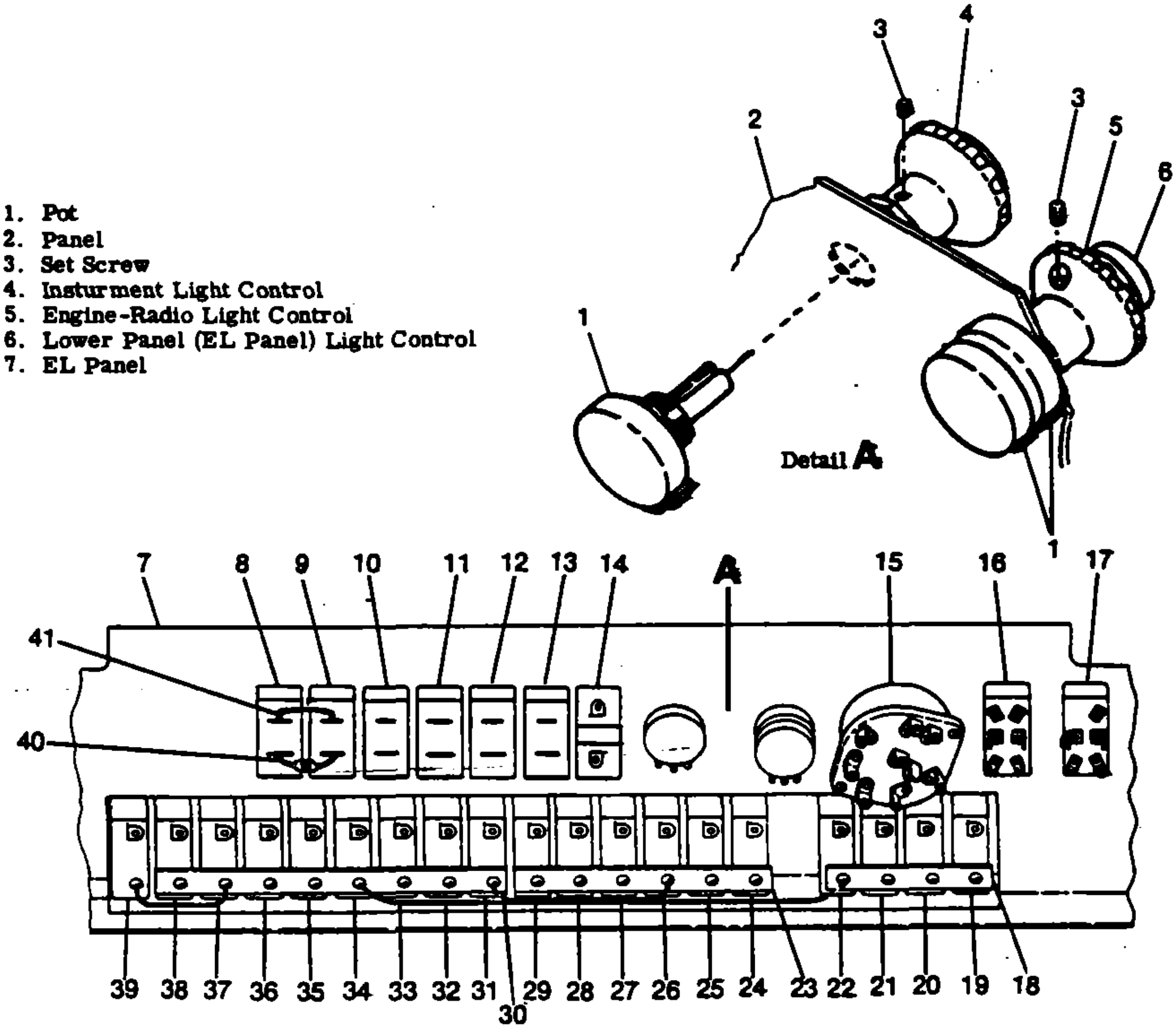
VIEWED FROM THE BACK SIDE OF THE SWITCH PANEL (TYPICAL INSTALLATION)

11. Jumper Wire
12. Diode
13. Landing Light Switch
14. Taxi Light Switch
15. Strobe Light Switch
16. Flashing Beacon Light Switch
17. Navigation Light Switch
18. Pitot Heat Switch
19. Post Light and Flood Light Switch
20. Magneto Switch
21. Fuel Pump Switch
22. Master Switch
23. Primary Bus Bar
24. Strobe Light Circuit Breaker
25. Stall Warning Circuit Breaker
26. Turn Coordinator Circuit Breaker
27. Alt-Reg Circuit Breaker
28. Audio Amp Circuit Breaker
29. Autopilot Circuit Breaker
30. Radio #1 Circuit Breaker
31. Radio #2 Circuit Breaker
32. Electronics Bus Bar
33. Radio #3 Circuit Breaker
34. Radio #4 Circuit Breaker
35. Flashing Beacon Circuit Breaker
36. Fuel Pump Circuit Breaker
37. Flap Circuit Breaker
38. Cabin Light Circuit Breaker
39. Instrument Light Circuit Breaker
40. Pitot Heat Circuit Breaker
41. Naviagtion Light Circuit Breaker
42. Landing Light Circuit Breaker
43. Alternator Circuit Breaker
44. Spacer

THRU U20604066

Figure 17-1. Split Bus Bar and Split Bus Power Relay Installation (Sheet 1 of 5)

1. Pot
2. Panel
3. Set Screw
4. Insturment Light Control
5. Engine-Radio Light Control
6. Lower Panel (EL Panel) Light Control
7. EL Panel

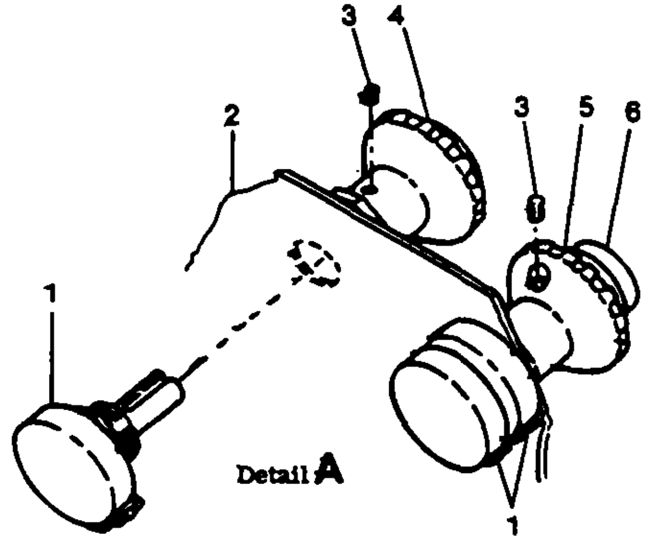


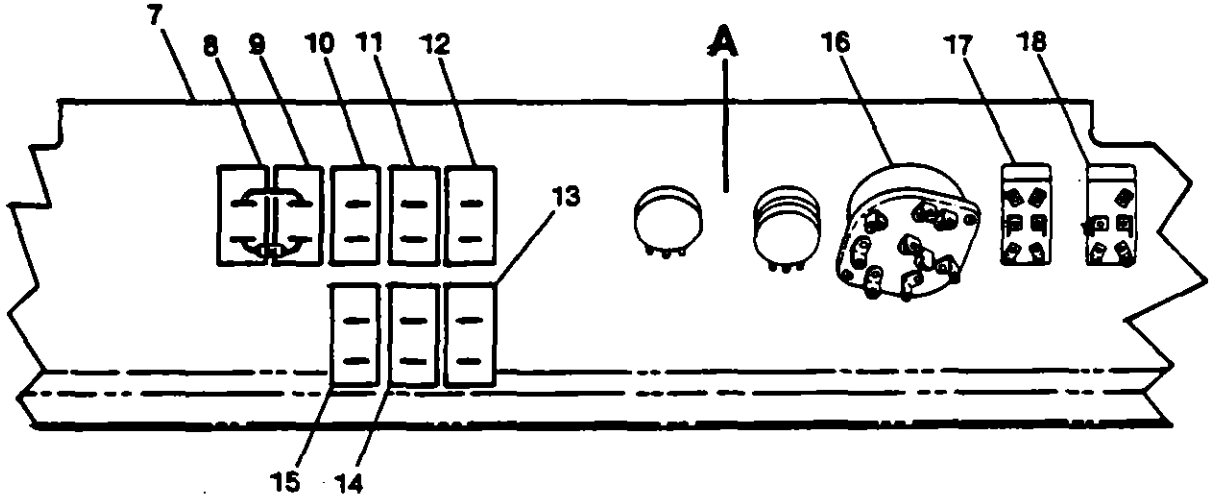
8. Landing Light Switch
9. Taxi Light Switch
10. Strobe Light Switch
11. Flashing Beacon Light Switch
12. Navigation Light Switch
13. Pitot Heat Switch
14. Avionics Master Switch
15. Magneto Switch
16. Fuel Pump Switch
17. Master Switch
18. Bus Bar
19. Strobe Light Circuit Breaker
20. Stall Warning Circuit Breaker
21. Turn Coordinator Circuit Breaker
22. Alt-Reg Circuit Breaker
23. Electronics Bus Bar
24. Autopilot Circuit Breaker
25. Radio #1 Circuit Breaker
26. Radio #2 Circuit Breaker
27. Radio #3 Circuit Breaker
28. Radio #4.Circuit Breaker
29. Radio #5 Circuit breaker
30. Primary Bus Bar
31. Flashing Beacon Circuit Breaker
32. Fuel Pump Circuit Breaker
33. Flap Circuit Breaker
34. Cabin Light Circuit Breaker
35. Instrument Light Circuit Breaker
36. Pitot Heat Circuit Breaker
37. Navigation Light Circuit Breaker
38. Landing Light Circuit Breaker
39. Alternator Circuit Breaker
40. Diode
41. Jumper Wire

U20604067 THRU U20606439

Figure 17-1. Split Bus Bar and Split Bus Power Relay Installation (Sheet 2 of 5)

1. Pot
2. Panel
3. Set Screw
4. Instrument Light Control
5. Engine-Radio Light Control
6. Lower Panel (EL Panel) Light Control
7. EL Panel

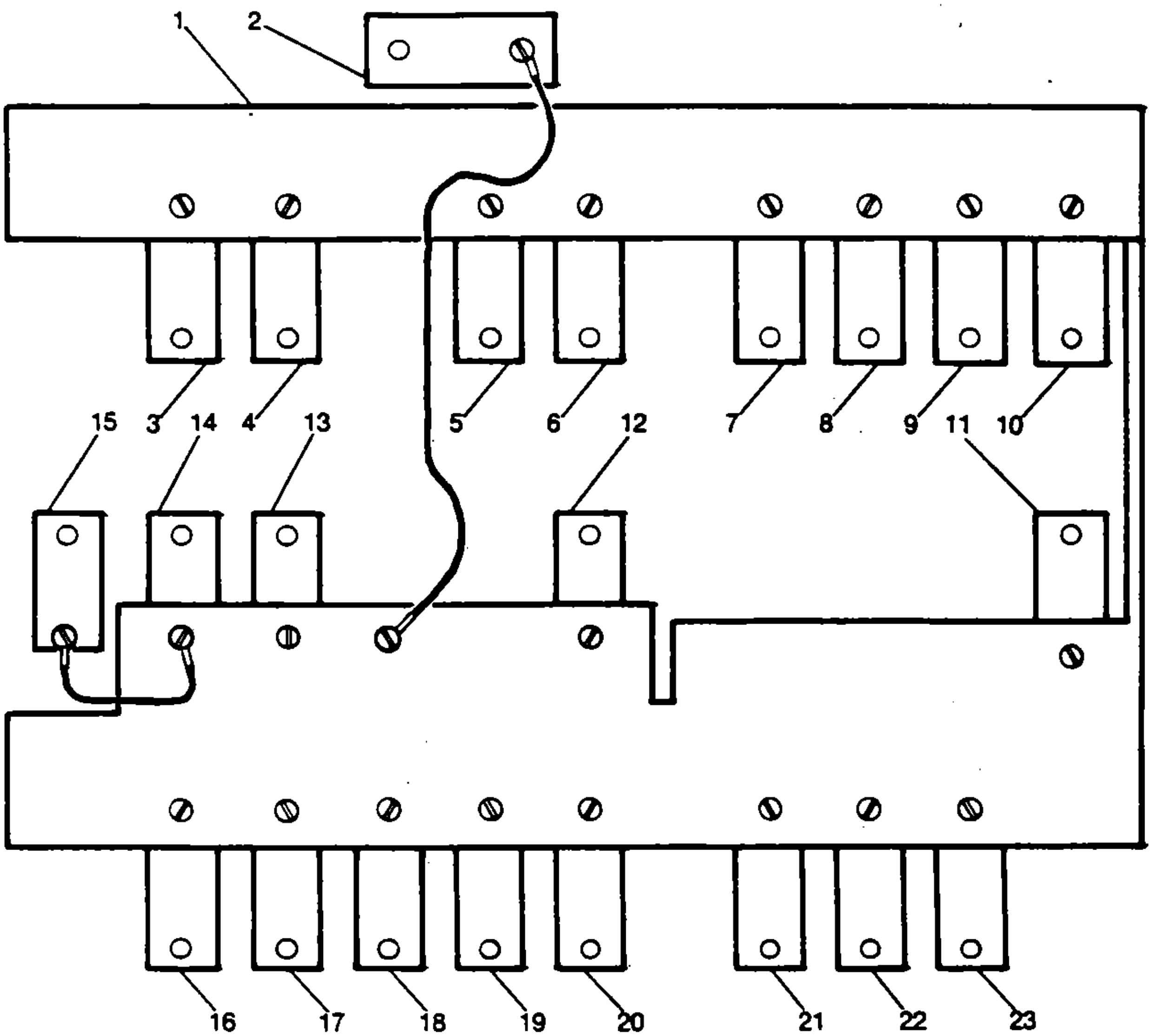




8. Landing Light Switch
9. Taxi Light Switch
10. Strobe Light Switch
11. Flashing Beacon Light Switch
12. Navigation Light Switch
13. Pitot Heat Switch
14. Propeller Anti-Ice Switch
15. Windshield Anti-Ice Switch
16. Magneto Switch
17. Fuel Pump Switch
18. Master Switch

BEGINNING WITH U20606440

Figure 17-1. Split Bus Bar and Split Bus Power Relay Installation (Sheet 3 of 5)

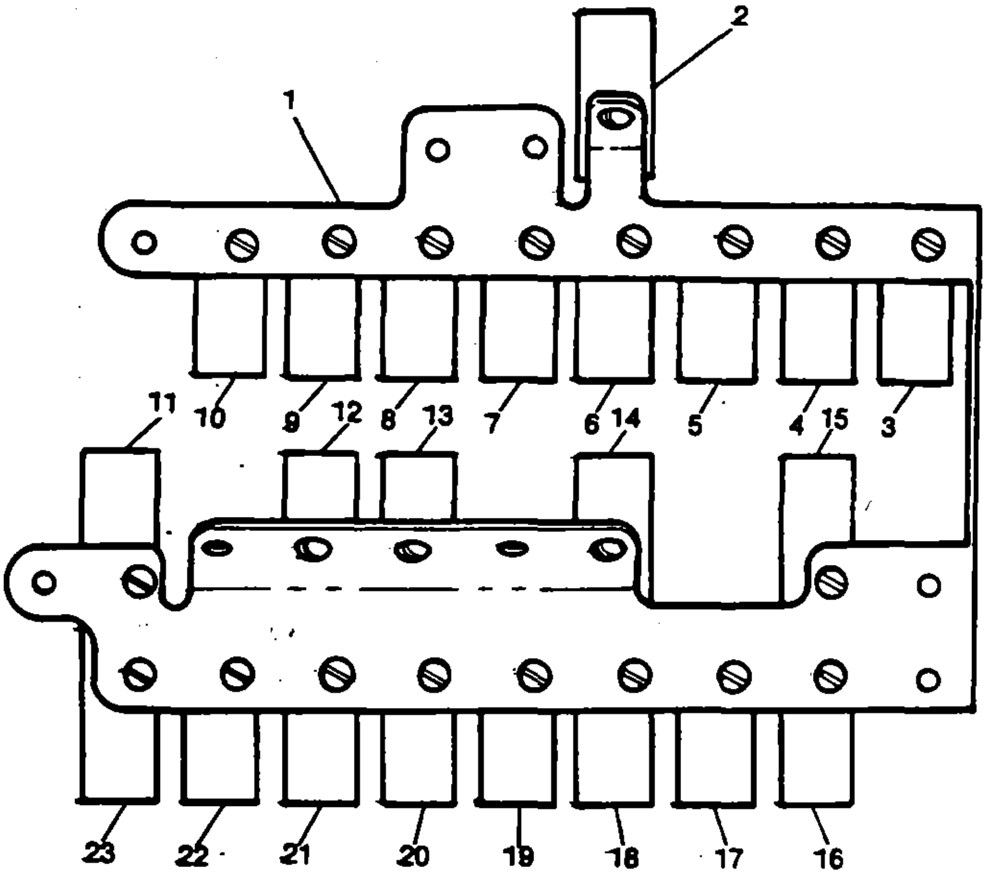


U20606440 THRU U20606699

VIEWED FROM THE BACK OF THE CIRCUIT BREAKER PANEL (TYPICAL INSTALLATION)

1. Bus Bar
2. Avionics Master Switch
3. Landing Light Circuit Breaker
4. Taxi Light Circuit Breaker
5. Beacon Circuit Breaker
6. Strobe Light Circuit Breaker
7. Navigation Light Circuit Breaker
8. Instrument Light Circuit Breaker
9. Cabin Light Circuit Breaker
10. Radio & Instrument Light Circuit Breaker
11. Flap Circuit Breaker
12. Avionics Fan Circuit Breaker
13. Electric Trim Circuit Breaker
14. Alternator Circuit Breaker
15. Alternator Regulator Circuit Breaker
16. Stall Warning Circuit Breaker
17. Fuel Quantity Circuit Breaker
18. Turn Coordinator Circuit Breaker
19. Engine Instrument Circuit Breaker
20. Fuel Pump Circuit Breaker
21. Pitot Heat Circuit Breaker
22. Windshield Anti-Ice Circuit Breaker
23. Prop Anti-Ice Circuit Breaker

Figure 17-1. Split Bus Bar and Split Bus Power Relay Installation (Sheet 4 of 5)

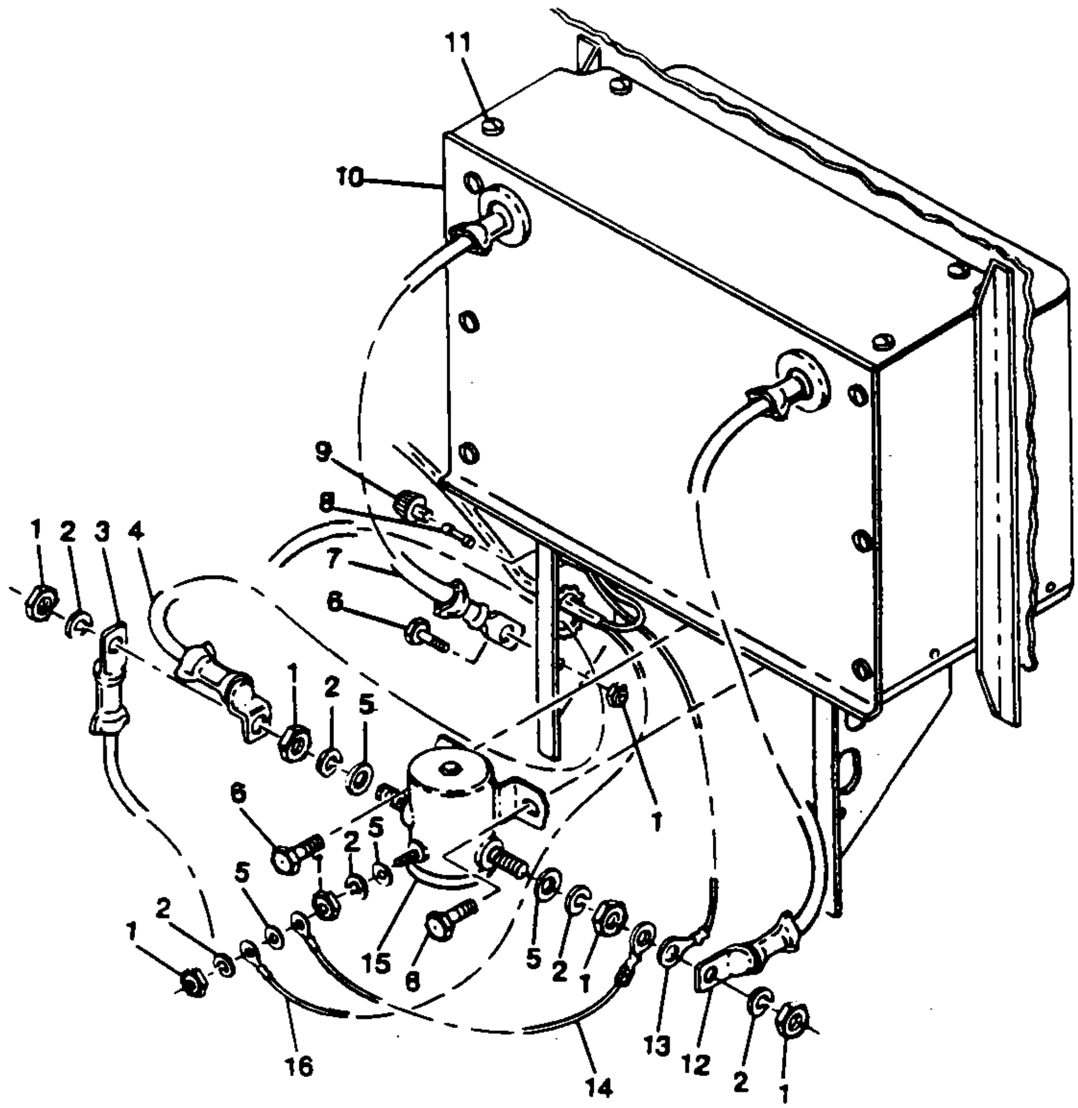


BEGINNING WITH U20606700

VIEWED FROM THE BACK OF THE CIRCUIT BREAKER PANEL (TYPICAL INSTALLATION)

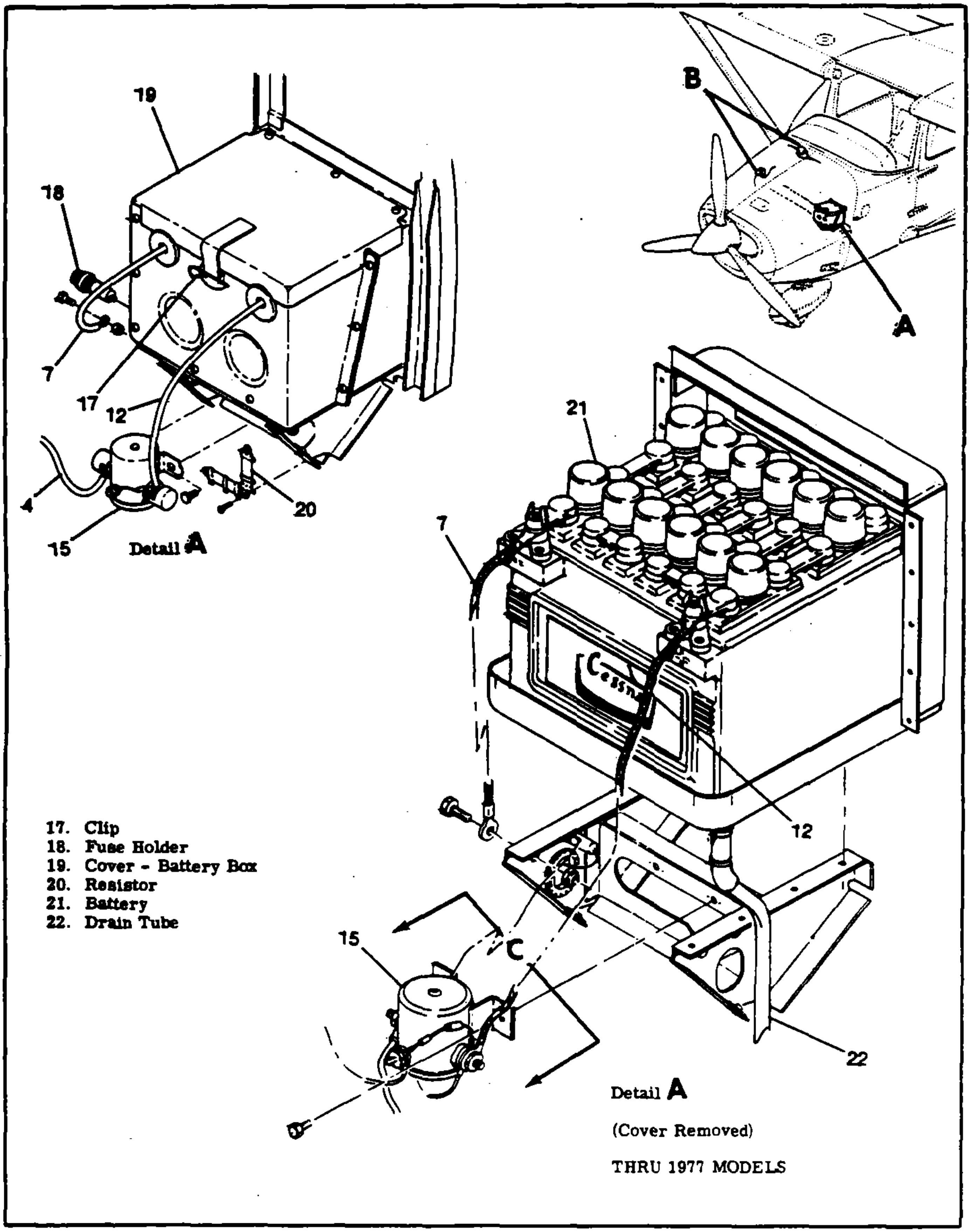
1. Bus Bar
2. Stall Warning Horn Circuit Breaker
3. Radio & Instrument Circuit Breaker
4. Cabin Lights Circuit Breaker
5. Instrument Flood Circuit Breaker
6. Navigation Light Circuit Breaker
7. Strobe Light Circuit Breaker
8. Flashing Beacon Circuit Breaker
9. Taxi Light Circuit Breaker
10. Landing Light Circuit Breaker
11. Alternator Regulator Circuit Breaker
12. Alternator Circuit Breaker
13. Wing De-Ice Circuit Breaker
14. Electric Trim Circuit Breaker
15. Flap Circuit Breaker
16. Prop Anti-Ice Circuit Breaker
17. Windshield Anti-Ice Circuit Breaker
18. Pitot Heat Circuit Breaker
19. Stall Heat Circuit Breaker
20. Fuel Pump Circuit Breaker
21. Engine Instrument Circuit Breaker
22. Turn Coordinator Circuit Breaker
23. Fuel Quantity Circuit Breaker

Figure 17-1. Split Bus Bar and Split Bus Power Relay Installation (Sheet 5 of 5)



1. Nut
2. Lockwasher
3. Gnd Ser Recpt Cable
4. Starter Contactor Cable
5. Washer
6. Bolt
7. Ground Cable
8. Fuse
9. Cap-Fuse
10. Battery Box
11. Fasteners
12. Power Cable
13. Clock Wire
14. Diode Wire
15. Battery Solenoid
16. Master Switch Wire

Figure 17-2. Battery and Electrical Installations (Sheet 1 of 5)



17. Clip
18. Fuse Holder
19. Cover - Battery Box
20. Resistor
21. Battery
22. Drain Tube

Figure 17-2. Battery and Electrical Installations (Sheet 2 of 5)

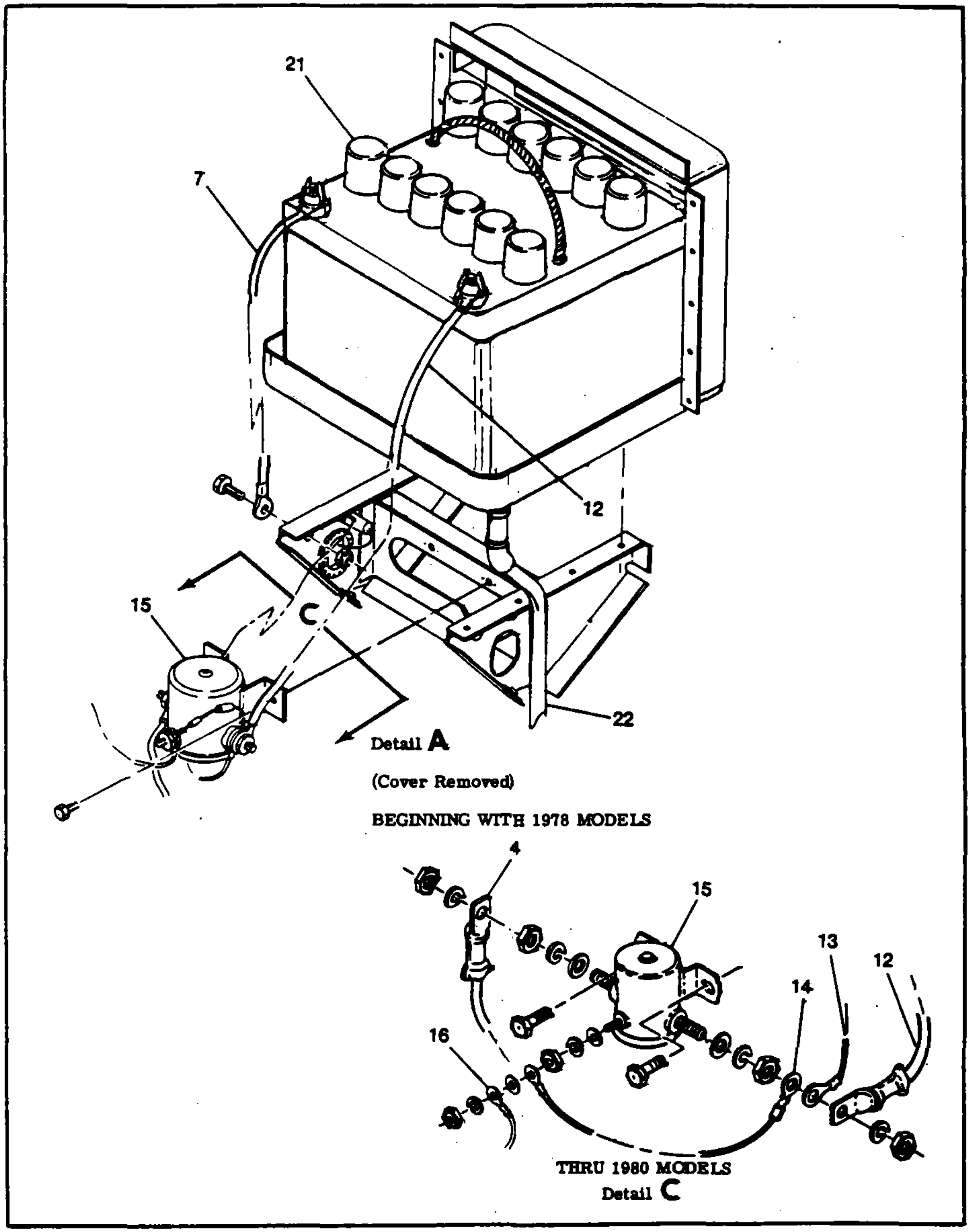
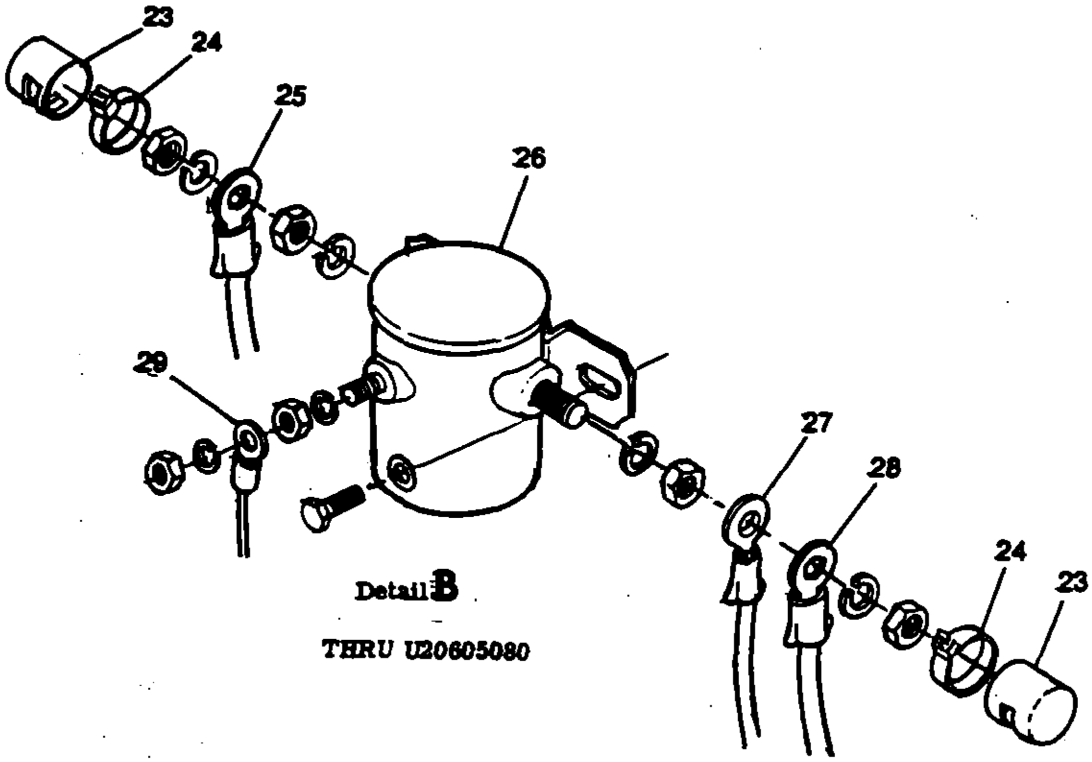
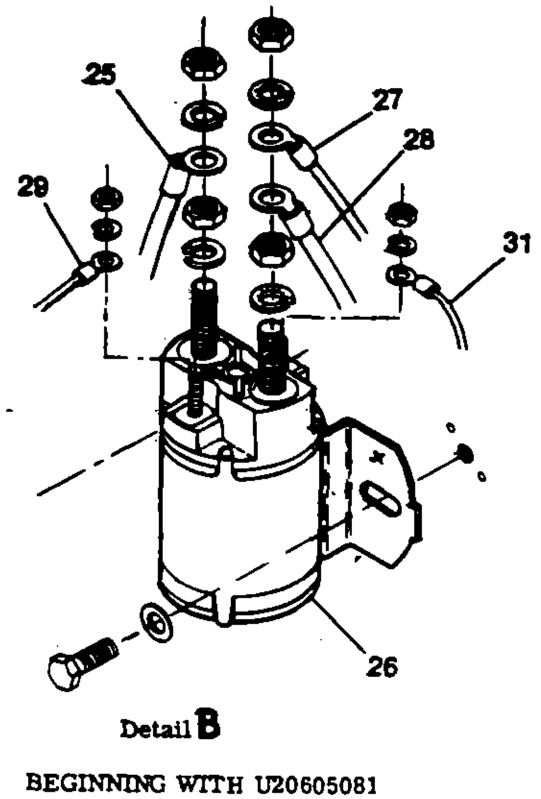
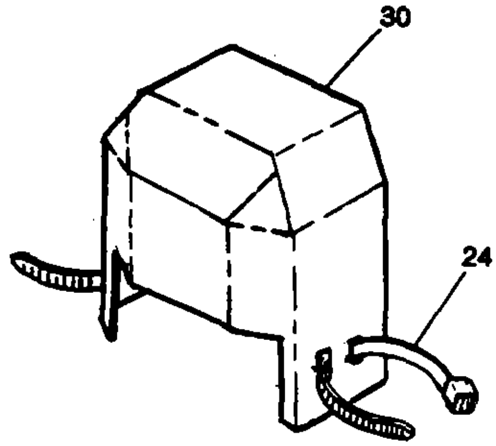


Figure 17-2. Battery and Electrical Installations (Sheet 3 of 5)

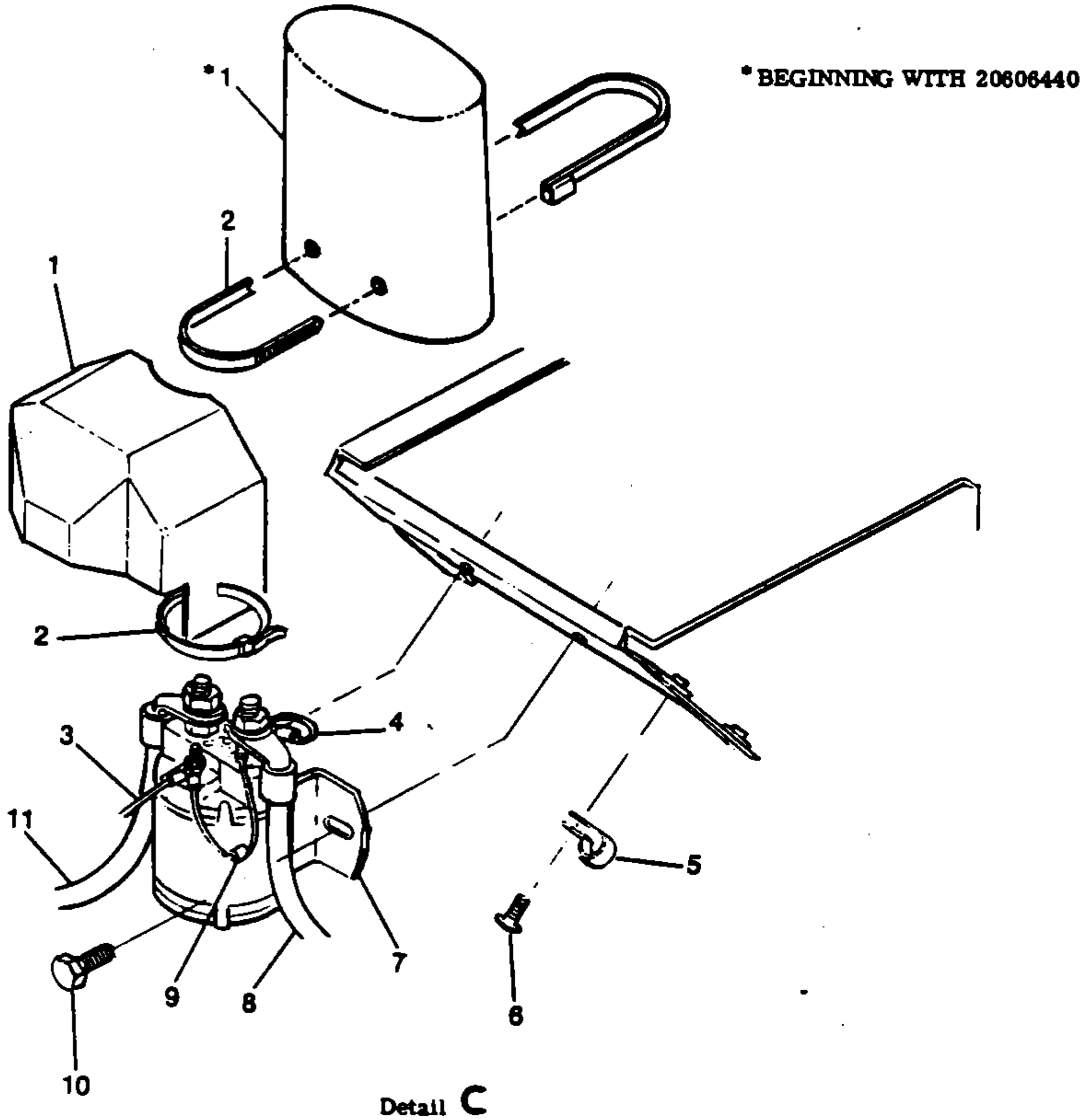






23. Nylon Cover
24. Sta-strap
25. Cable - to Starter
26. Starter Contactor
27. Wire - to Ammeter
28. Cable - to Battery Contactor
29. Wire - to Magneto Switch
30. Starter Contactor Cover
31. Ground Wire

Figure 17-2. Battery and Electrical Installations (Sheet 4 of 5)



Detail C

BEGINNING WITH 1981 MODELS

1. Cover
2. Sta-strap
3. Master Switch Wire
4. Jumper Wire
5. Clamp
6. Screw
7. Battery Contactor
8. Positive Battery Cable
9. Diode
10. Bolt
11. Wire (to Starter Contactor)

Figure 17-2. Battery and Electrical Installations (Sheet 5 of 5)

17-19. CLEANING THE BATTERY. For maximum efficiency, the battery and connections should be kept clean at all times.

a. Remove the battery and connections in accordance with the preceding paragraph.

b. Tighten battery cell filler caps to prevent the cleaning solution from entering the cells.

c. Wipe the battery cable ends, battery terminals, and the entire surface of the battery with a clean cloth moistened with a solution of bicarbonate of soda (baking soda) and water.

d. Rinse with clean water, wipe off excess water and allow battery to dry.

e. Brighten cable ends and battery terminals with emery cloth or a wire brush.

f. Install the battery according to the preceding paragraph.

g. Coat the battery terminals with petroleum jelly or an ignition spray product to reduce corrosion.

17-20. ADDING ELECTROLYTE OR WATER TO THE BATTERY.

NOTE

Remove battery from aircraft prior to adding electrolyte.

A battery being charged and discharged with use will decompose the water from the electrolyte by electrolysis. When the water is decomposed, hydrogen and oxygen gases are formed which escape into the atmosphere through the battery vent system. The acid in the solution chemically combines with the plates of the battery during discharge or is suspended in the electrolyte solution during charge. Unless the electrolyte has been spilled from a battery, acid should not be added to the solution. The water, however will decompose into gases and should be replaced regularly. Add distilled water as necessary to maintain the electrolyte level above the horizontal baffle plate, and just below the split ring on the filler neck inside the battery. When activating a new dry charged battery, care must be taken to ensure the proper strength of electrolyte is used. The specific gravity of the electrolyte must be 1.285 ± .005 when measured at 80°F ±5°F. When electrolyte level falls below normal with use, add only distilled water to maintain the proper level. The battery electrolyte contains approximately 25% sulphuric acid by volume. Any change in this volume will hamper the proper operation of the battery.

CAUTION

Do not add any type of battery rejuvenator to the electrolyte. When acid has been spilled from a battery, the acid balance may be adjusted by following instructions published by the Association of American Battery Manufacturers.

17-21. TESTING THE BATTERY. The specific gravity check method of testing the battery is preferred when the condition of the battery is in a questionable state of charge. However, when the aircraft has been operated for a period of time with an alternator output voltage which is known to be correct, the question of battery capability may be answered more correctly with a load type tester. If testing the battery is deemed necessary, the specific gravity should be checked first and compared with the following chart.

BATTERY HYDROMETER READINGS

1.280 Specific Gravity	100% Charged
1.250 Specific Gravity	75% Charged
1.220 Specific Gravity	50% Charged
1.190 Specific Gravity	25% Charged
1.160 Specific Gravity	Practically Dead

NOTE

All readings shown are for and electrolyte temperature of 80° Fahrenheit. For higher temperatures the readings will be slightly lower. For cooler temperatures the readings will be slightly higher. Some hydrometers will have a built-in temperature compensation chart and a thermometer. If this type tester is used, disregard this chart.

If specific gravity reading indicates that the battery is not fully charged, the battery should be charged on 12-volt systems at 14-volts, or on 24-volt systems at 28-volts for approximately 30 minutes, or until battery voltage rises to 14-volts on 12-volt systems or 28-volts on 24-volt systems. After charging, a load tester will give more meaningful results. A special gravity check can be used after charging but the check cannot spot cells which short under load, broken connectors between plates of a cell, etc..

17-22. CHARGING THE BATTERY. When the battery is to be charged, the level of electrolyte should be checked and adjusted by adding distilled water to cover the tops of the internal battery plates. The battery cables and connections should be clean.

WARNING

When a battery is charging, hydrogen and oxygen gases are generated. Accumulation of these gases can create a hazardous explosive condition. Always keep sparks and open flame away from the battery. Allow unrestricted ventilation of the battery area during charging.

The main points of consideration during a battery charge are excessive battery temperature and violent gassing. Under a reasonable rate of charge, the battery temperature should not rise over 125° F nor should gassing be so violent that acid is blown from the vents.

17-23. BATTERY BOX.

17-24. DESCRIPTION. On both 12 and 24-volt aircraft the battery is enclosed in a metal battery box which is painted with acid proof paint. The box is riveted to the left side of the firewall. The battery box completely encloses the battery preventing any spillage of electrolyte or accumulation of battery gases inside the aircraft. The box is vented by a tube which attaches to the bottom of the battery box and extends down the firewall.

17-25. REMOVAL AND INSTALLATION. (See figure 17-2.) The battery box is riveted to the firewall. The rivets must be drilled out to remove the box. When a battery box is installed and riveted in place, all rivets and scratches should be painted With acid-proof lacquer. Part No. CES1054-381, available from the Cessna Supply Division.

17-26. MAINTENANCE OF BATTERY BOX. The battery box should be inspected and cleaned periodically. The box and cover should be cleaned with a strong solution of bicarbonate of soda (baking soda) and water. Hard deposits may be removed from a metal box with a wire brush or from a plastic box with a plastic scraper. When all corrosive deposits have been removed from the box, flush it thoroughly with clean water.

WARNING

Do not allow acid deposits to come in contact with skin or clothing. Serious acid burns may result unless the affected area is washed immediately with soap and water. Clothing will be ruined upon contact with battery acid.

Inspect the cleaned box and cover for physical damage and for areas lacking proper acid proofing. A badly damaged or corroded box should be replaced. If the box or lid require acid proofing, paint the area With acid-proof black lacquer. Part No. CES1054-381, available from the Cessna Supply Division.

17-27. BATTERY CONTACTOR.

17-28. DESCRIPTION. The battery contactor is bolted to the battery box support bracket on the firewall. The contactor is a solenoid plunger type, which is actuated by turning on the master switch. A silicon diode is installed to eliminate spiking of the transistorized radio equipment. The cathode (+) terminal of the diode connects to the battery terminal of the battery contactor. The anode (-) terminal of the diode connects to the same terminal on the contactor as the master switch wire. This places the diode directly across the contactor solenoid coil so the inductive spikes originating in the coil are clipped when the master switch is opened.

17-29. REMOVAL AND INSTALLATION. (See figure 17-2.)

a. Remove battery box cover and disconnect ground (negative) cable from terminal.
b. Cut sta-straps and remove nylon covers from contactor terminals.
c. Remove nuts and washers securing battery cable and starter contactor cable.
d. Remove nut and washer securing ignition switch wire.
e. Remove bolt, washer and nut securing each side of the battery contactor to the battery box support and remove contactor.
f. To install battery contactor, reverse the preceding steps. be sure to install diode assembly if removed.

17-30. BATTERY CONTACTOR CLOSING CIRCUIT.

17-31. DESCRIPTION. This circuit consists of a fuse, a resistor and a diode mounted on the ground service receptacle bracket. This serves to shunt a small charge around the battery contactor so that ground power may be used to close the contactor. Refer to figure 17-3.

17-32. GROUND SERVICE RECEPTACLE.

17-33. DESCRIPTION. A ground service receptacle is installed to permit the use of external power for cold weather starting or when performing lengthy electrical maintenance. A reverse polarity protection system is utilized whereby ground power must pass through an external power contactor to be connected to the bus. A silicon junction diode is connected in series with the coil on the external power contactor so that if the ground power source is inadvertently connected with a reversed polarity, the external power contactor will not close. This feature protects the diodes in the alternator, and other semiconductor devices used in the aircraft, from possible reverse polarity damage.

NOTE

Maintenance of the electronic installations cannot be performed when using external power. Application of external power opens the relay supplying voltage to the electronics bus. For lengthy ground testing of electronics systems, connect a well regulated and filtered power supply directly to the battery side of the battery contactor. Adjust the supply for 14-volts on 12-volt systems or 28-volt on 24-volt systems and close the master switch.

NOTE

When using ground power to start the aircraft, close the master switch before removing the ground power plug. This will ensure closure of the battery contactor and excitation of the alternator field

CAUTION

Failure to observe polarity when connecting an external power source directly to the battery or directly to the battery side of the battery contactor, will damage the diodes in the alternator and other semiconductor devices in the aircraft.

WARNING

External power receptacle must be functionally checked after wiring, or after replacement of components of the external power or split bus systems. Incorrect wiring or malfunctioned components can cause immediate engagement of starter when ground service plug is inserted.

NOTE

On Aircraft Serials U20603522 thru U20604119 refer to Cessna Single-engine Service Letter SE78-19, dated March 27, 1978.

17-34. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
STARTER ENGAGES WHEN GROUND POWER IS CONNECTED.	Shorted or reversed diode in split bus-bar system.	Check wiring to, and condition of diode mounted on the split bus relay bracket adjacent to the magneto switch. Correct wiring. Replace diode board assembly.
GROUND POWER WILL NOT CRANK ENGINE.	Ground service connector wired incorrectly.	1. Check for voltage at all three terminals of external power contactor with ground power connected and master switch off. If voltage is present on input and coil terminals but not on the output terminal, proceed to step 4. If voltage is present on the input terminal but not on the coil terminal, proceed to step 2. If voltage is present on all three terminals, check wiring between contactor and bus.
		2. Check for voltage at small terminal of ground service receptacle. If voltage is not present, check ground service plug wiring. If voltage is present, proceed to step 3.
	Open or mis-wired diode on ground service diode board assembly.	3. Check polarity and continuity of diode on diode board at rear of ground service receptacle. If diode is open or improperly wired, replace diode board assembly.
	Faulty external power contactor.	4. Check resistance from small (coil) terminal of external power contactor to ground (master switch off and ground power unplugged). Normal indication is 16-24 ohms. on 12-volt system or 50-70 ohms on the 24-volt systems. If resistance indicates an open coil, replace contactor. If resistance is normal, proceed to step 5.
	Faulty contacts in external power contactor.	5. With master switch off and ground power applied, check for voltage drop between two large terminals of external power (turn on taxi light for a load). Normal indication is zero volts. If voltage is intermittently present or present all the time, replace contactor.

17-35. REMOVAL AND INSTALLATION. (See figure 17-3.)

a. Open the battery box and disconnect the ground cable from the negative terminal of the battery and pull the cable free of the box.

b. Remove the nuts, washers, ground strap, bus bar and diode board from the studs of the receptacle and remove battery cable.

c. Remove the screws and nuts holding the receptacle and ground strap. Remove ground strap and receptacle.

d. To install a ground service receptacle, reverse this procedure.

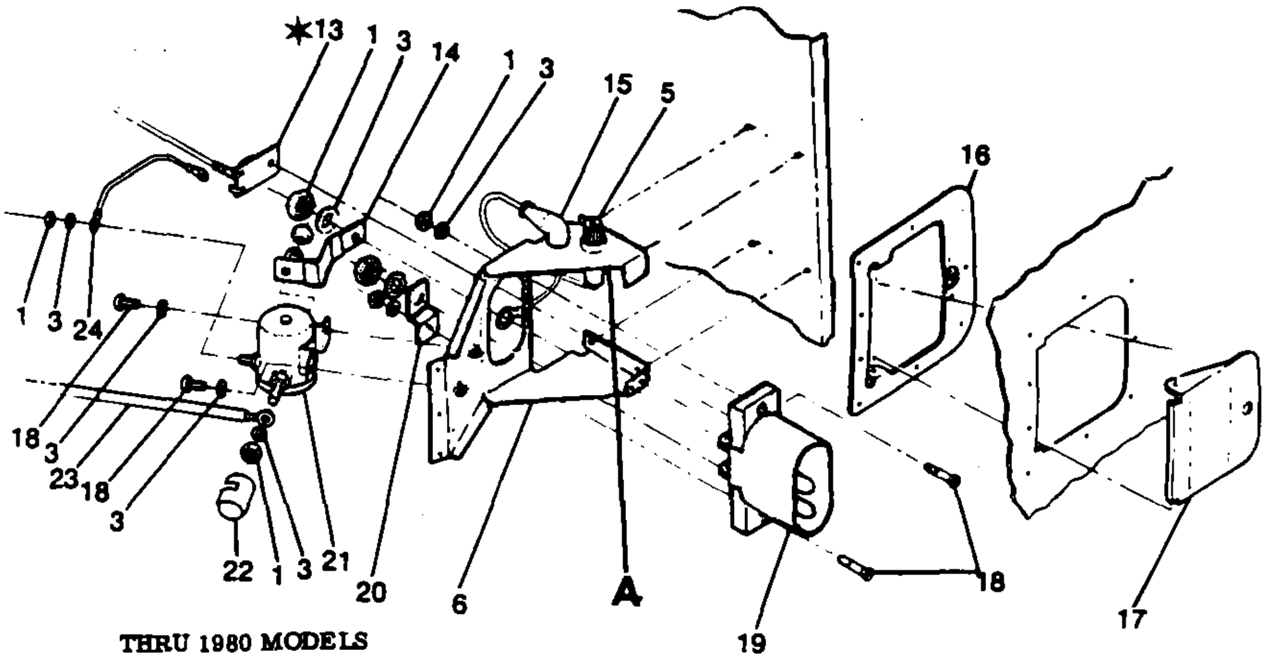
17-36. ALTERNATOR POWER SYSTEM.

17-37. DESCRIPTION. The alternator system consists of an engine driven alternator, a voltage regulator/alternator control unit and a circuit breaker located on the instrument panel to protect the system. The system is controlled by the left hand portion of the split rocker, master switch labeled "ALT". Thru 1978 Models an over-voltage sensor switch and red warning light labeled, HIGH VOLTAGE, are also incorporated to protect the system. Beginning with 1979 Models the over-voltage sensor, also a low-voltage sensor are incorporated in the alternator control unit. The warning light is labeled, LOW VOLTAGE. The aircraft battery supplies the source of power for excitation of the alternator.

17-38. ALTERNATOR.

17-39. DESCRIPTION. The 60-ampere alternator used on the aircraft is three-phase, delta connected with integral silicon diode rectifiers. The alternator is rated at 14-volts or 28-volts at 60-amperes continuous output. Beginning with 1981 Models a 28-volt 95 amper alternator may be installed as optional equipment.

17-40. ALTERNATOR REVERSE VOLTAGE DAMAGE. The alternator is very susceptible to reverse polarity damage due to the very low resistance of the output windings and the low resistance of the silicon diodes in the output. If a high current source, such as a battery or heavy duty ground power cart is attached to the aircraft with the polarity inadvertently reversed, the current through the alternator will flow almost without limit and the alternator will be immediately damaged.



1. Nut
2. Lockwasher
3. Washer
4. Insulating Washer
5. Fuse
6. Bracket
7. Wire to Battery Contactor
8. Resistor-.75 ohm
9. Diode
10. Wire to Ext. Pwr. Recept.
11. Solder Terminal
12. Spacer
13. Diode Board
14. Bus Bar
15. Nipple - Used before resistor was added
16. Doubler
17. Door
18. Screw
19. Receptacle
20. Ground Strap
21. Ext. Power Contactor
22. Cover
23. Power Cable
24. Contactor Control Wire

Figure 17-3. Ground Service Receptacle Installation (Sheet 1 of 3)

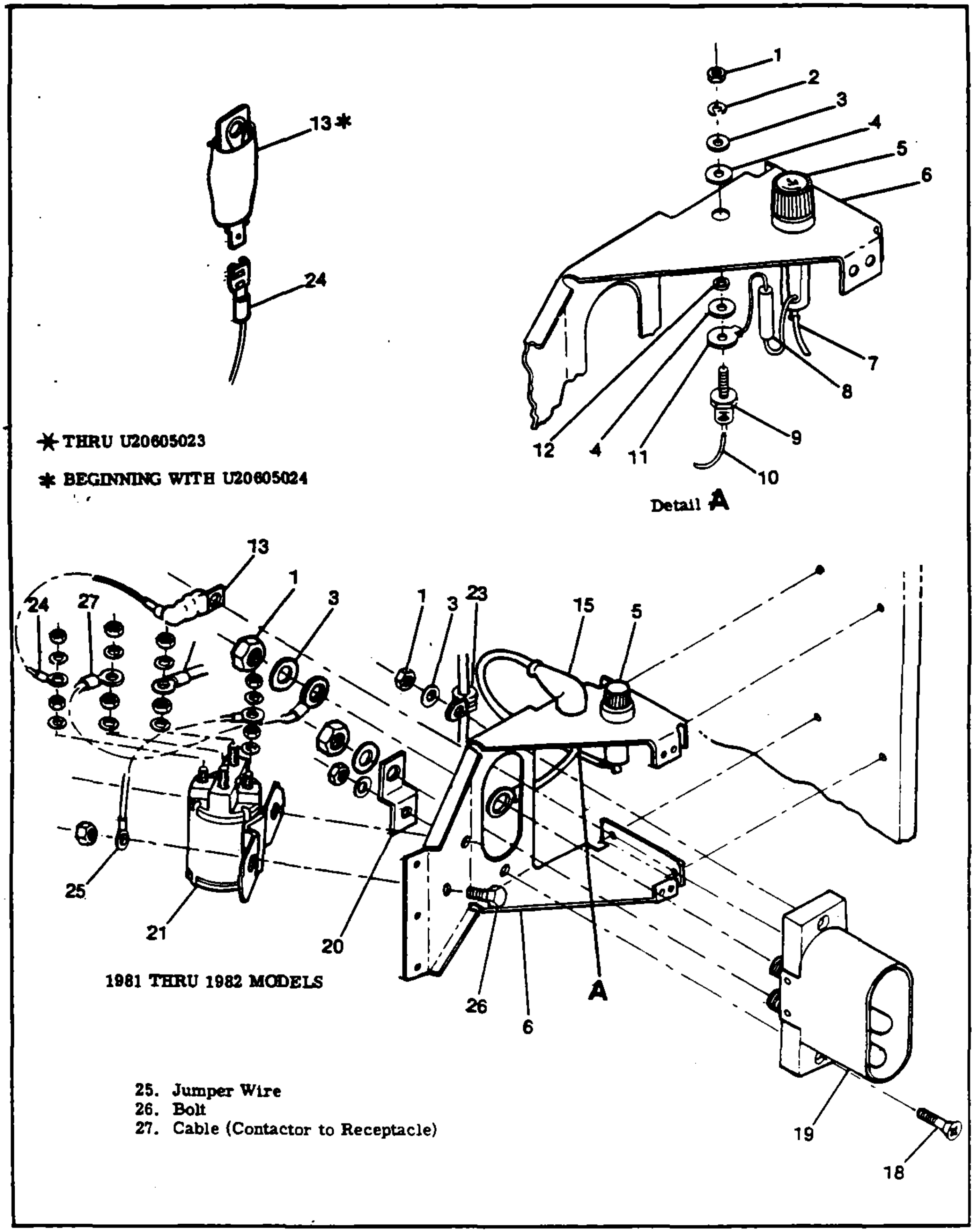
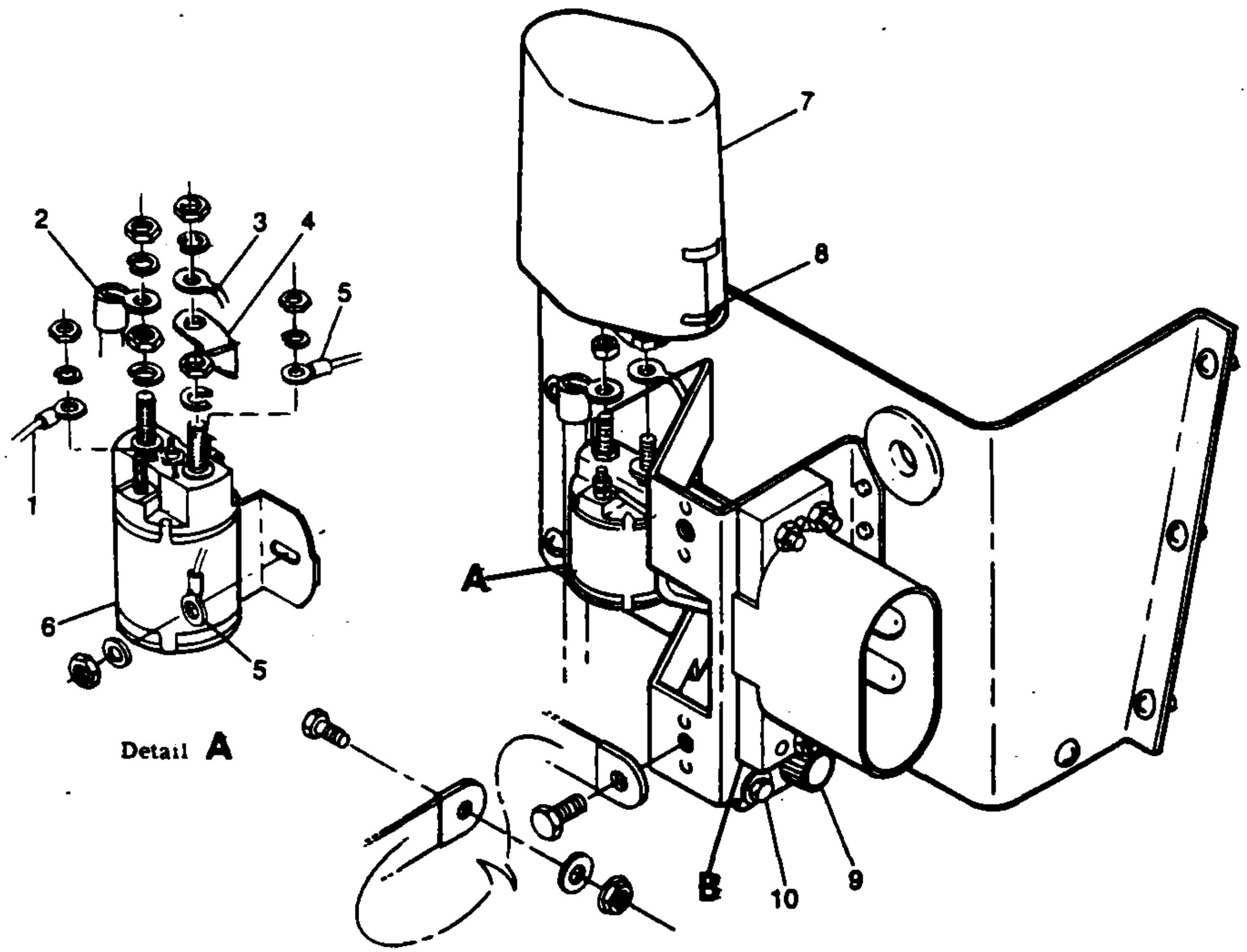
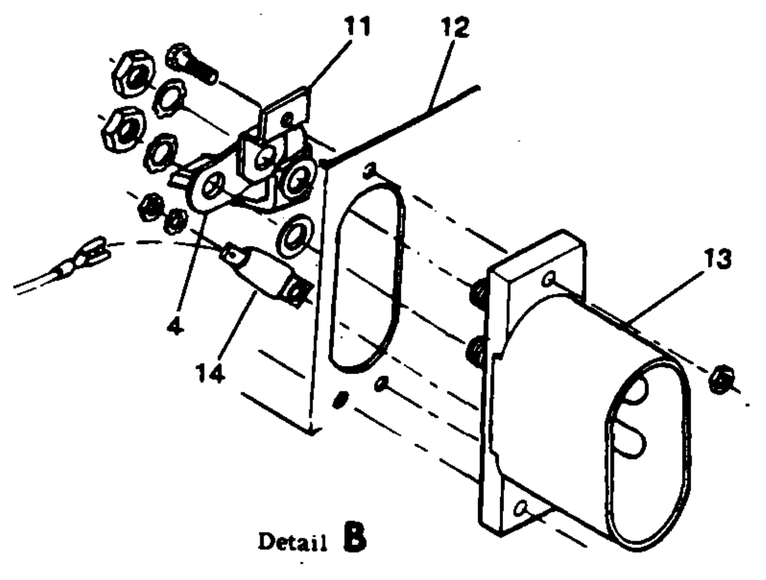


Figure 17-3. Ground Service Receptacle Installation (Sheet 2 of 3)



BEGINNING WITH 1983 MODELS



1. Wire (to Diode Board)
2. Power Cable
3. Wire (to Fuse)
4. Bus Bar
5. Ground Wire
6. Ground Service Contactor
7. Cover (Ground Service Contactor)
8. Sta-strap
9. Fuse
10. Diode
11. Ground Strap
12. Bracket
13. Receptacle
14. Diode Board

Figure 17-3. Ground Service Receptacle Installation (Sheet 3 of 3)

17-41. TROUBLE SHOOTING (12-VOLT)

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE WITH ENGINE NOT RUNNING OR ALTERNATOR CIRCUIT BREAKER OPENS WHEN MASTER SWITCH IS TURNED ON.	Shorted field in alternator.	1. Remove plug from regulator with master switch on and observe if heavy drain persists. If heavy drain is reduced, proceed to step 2. If heavy drain is not reduced, proceed to step 3.
		2. Check resistance from terminal "F" on alternator to the alternator case. Normal indication on 12-volt system is 6-7 ohms. If resistance is too low, repair or replace alternator.
	Shorted radio noise filter or shorted wire.	3. Remove cable from output terminal of alternator. Check resistance from end of cable to ground (MASTER SWITCH MUST BE OFF). If resistance does not indicate a direct short, proceed to step 6. If resistance indicates a direct short, proceed to step 4.
		4. Remove cable connections from radio noise filter. Check resistance from the filter input terminal to ground. Normal indication is infinite resistance. If reading indicates a direct short, replace filter. If no short is evident, proceed to step 5.
		5. Check resistance from ground to the free ends of the wires which were connected to the radio noise filter (or alternator if no noise filter is installed). Normal indication does not show a direct short. If a short exists in wires, repair or replace wiring.
	Shorted diodes in alternator.	6. Check resistance from output terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.

17-41. TROUBLE SHOOTING (12-VOLT) (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Regulator faulty or improperly adjusted.	1. Start engine and adjust for 1500 RPM. Ammeter should indicate a heavy charge rate with all electrical equipment turned off. Rate should taper off in 1-3 minutes. A voltage check at the bus should indicate a reading consistant with the voltage vs temperature chart in the Cessna Alternator Charging Systems Service/Parts Manual. If charge rate tapers off very quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage is low, proceed to step 2.
		2. Stop engine, remove cowl, and remove cover from voltage regulator. Turn master switch ON/OFF several times and observe field relay in regulator. Relay should open and close with master switch and small arc should be seen as contacts open. If relay is inoperative, proceed to step 3. If relay operates, proceed to step 4.
		3. Check voltage at "S" terminal of regulator with master switch closed. Meter should indicate bus voltage. If voltage is present, replace regulator. If voltage is not present, check wiring between regulator and bus.

CAUTION

Before performing step 4, remove radios from the panel.

TROUBLE	PROBABLE CAUSE	REMEDY
		4. Remove plug from regulator and start engine. Momentarily jumper the "A+" and "F" terminals together on the plug. Aircraft's ammeter should show heavy rate of charge. If heavy charge rate is observed, replace regulator. If heavy charge rate is not observed, proceed to step 5.
	Faulty wiring between alternator and regulator, or faulty alternator.	5. Check resistance from "F" terminal of regulator to "F" terminal of alternator. Normal indication is a very low resistance. If reading indicates no, or poor continuity, repair or replace wiring from regulator to alternator.

17-41. TROUBLE SHOOTING (12-VOLT) (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED. (Cont).	Faulty wiring between alternator and regulator, or faulty alternator. (Cont).	6. Check resistance from "F" terminal of alternator to alternator case. Normal indication on 12-volt system is 6-7 ohms. If resistance is high or low, repair or replace alternator.
		7. Check resistance from case of alternator to airframe ground. Normal indication is very low resistance. If reading indicates no, or poor continuity, repair or replace alternator ground wiring.
ALTERNATOR OVERCHARGES BATTERY - BATTERY USES EXCESSIVE WATER.	Regulator faulty or improperly adjusted.	Check bus voltage with engine running. Normal indication agrees with voltage vs temperature chart in the Cessna Alternator Charging Systems Service/Parts Manual. Ammeter should indicate near zero after a few minutes of engine operation. Replace regulator.
OVER-VOLTAGE WARNING LIGHT ON.	Regulator faulty or improperly adjusted. Faulty sensor switch.	1. With engine running turn off and on battery portion of the master switch. If the light stays on shut down engine then turn on the "BAT" and "ALT" portions of the master switch. Check for voltage at the "S" terminal of the voltage regulator. If voltage is present adjust or replace regulator. If voltage is not present check master switch and wiring for short or open condition. If wiring and switch are normal replace sensor.

17-42. TROUBLE SHOOTING THE ALTERNATOR SYSYEM (24 VOLT) (THRU 1978 MODELS).

a. ENGINE NOT RUNNING.

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE OR ALTERNATOR CIRCUIT BREAKER OPENS. (Battery Switch ON, Alternator Switch OFF, all other electrical switches OFF.)	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON.	Short in Over-Voltage sensor.	Disconnect Over-Voltage Sensor plug and recheck. If circuit breaker stays in replace Over-Voltage Sensor.
	Short in alternator voltage regulator.	Disconnect regulator plug and recheck. If circuit breaker stays in, replace regulator.
	Short in alternator field.	Disconnect "F" terminal wire and recheck. If circuit breaker stays in, replace alternator.

b. ENGINE RUNNING.

ALTERNATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, OVER-VOLTAGE LIGHT DOES NOT COME ON.	Defective circuit breaker.	Replace circuit breaker.
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, OVER-VOLTAGE LIGHT DOES NOT COME ON	Shorted field in alternator.	Check resistance from "F" terminal of alternator to alternator case, if resistance is less than 5 ohms repair/replace.

CAUTION

This malfunction frequently causes a shorted regulator which will result in an over-voltage condition when system is again operated.

17-42. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (24 VOLT) (THRU 1978 MODELS) (Cont.)
b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR MAKES ABNORMAL WHINING NOISE.	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
OVER-VOLTAGE LIGHT DOES NOT GO OUT WHEN ALTERNATOR AND BATTERY SWITCHES ARE TURNED ON.	Shorted regulator.	Replace regulator.
	Defective over-voltage sensor.	Replace sensor..
AFTER ENGINE START WITH ALL ELECTRICAL EQUIPMENT TURNED OFF CHARGE RATE DOES NOT TAPER OFF IN 1-3 MINUTES	Regulator faulty or high resistance in field circuit.	With engine not running turn off all electrical loads and turn on battery and alternator switches. Measure bus voltage to ground, then measure voltage from terminal of alternator to ground. If there is more than 2 volts difference check field circuit wiring shown on alternator system wiring diagram in Section 19. Clean all contacts. Replace components until there is less than 2 volts difference between bus voltage and field voltage.
NOTE Also refer to battery power system trouble shooting chart.		
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Alternator output voltage insufficient.	1. Connect voltmeter between D.C. Bus and ground. Turn off all electrical loads. Turn on Battery Switch, start engine and adjust for 1500 RPM. Voltage should read approximately 24 volts Turn on alternator switch, voltage should read between 27.4 and 28.0 volts. Ammeter should indicate a heavy charge rate which should taper off in 1-3 minutes. If charge rate tapers off very

17-42. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (24 VOLT) (THRU 1978 MODELS)(Cont.)
b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED. (Cont.)	Alternator output voltage insufficient (cont).	quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage does not rise when alternator switch is turned on proceed to Step 2.
		2. Stop engine, turn off all switches. Connect voltmeter between "F" terminal of alternator and ground. Do NOT start engine. Turn on battery switch and alternator switch. Battery voltage should be present at "F" terminal, less 1 volt drop thru regulator, if not refer to Step 3.
		3. Starting at "F" terminal of alternator trace circuit to voltage regulator, at "B" terminal of regulator trace circuit to over-voltage sensor, to master switch, to Bus Bar. Replace component which does not have voltage present at output. Refer to alternator system wiring diagram in Section 19.
	Alternator field winding open.	1. If voltage is present turn off alternator and battery switches. Check resistance from "F" terminal of alternator to alternator case, turning alternator shaft during measurement. Normal indication is 12-20 ohms. If resistance is high or low, repair or replace alternator. If ok refer to Step 2.
		2. Check resistance from case of alternator to airframe ground. Normal indication is very low resistance. If reading indicates no, or poor continuity, repair or replace alternator ground wiring.

17-42. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (24 VOLT) (BEGINNING WITH 1979 MODELS).

a. ENGINE NOT RUNNING.

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE OR ALTERNATOR CIRCUIT BREAKER OPENS. (Battery Switch ON. Alternator Switch OFF. all other electrical switches OFF.)	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction. repair or replace alternator.
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON.	Short in alternator control unit.	Disconnect Over-Voltage Sensor plug and recheck. If circuit breaker stays in replace Over-Voltage Sensor.
		Disconnect alternator control unit plug and recheck. If circuit breaker stays in. replace alternator control unit.
	Short in alternator field.	Disconnect "F" terminal wire and recheck. If circuit breaker stays in. replace alternator
b. ENGINE RUNNING.		
ALTERNATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON. LOW-VOLTAGE LIGHT DOES NOT COME ON.	Defective circuit breaker	Replace circuit breaker
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, LOW-VOLTAGE LIGHT MAY OR MAY NOT COME ON.	Shorted field in alternator.	Check resistance from "F" terminal of alternator to alternator case, if resistance is less than 5 ohms repair/replace.

CAUTION

This malfunction may cause a shorted alternator control unit. which will result in an over-voltage condition when system is again operated.

17-42. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (24 VOLT) (BEGINNING WITH 1979 MODELS) (Cont).

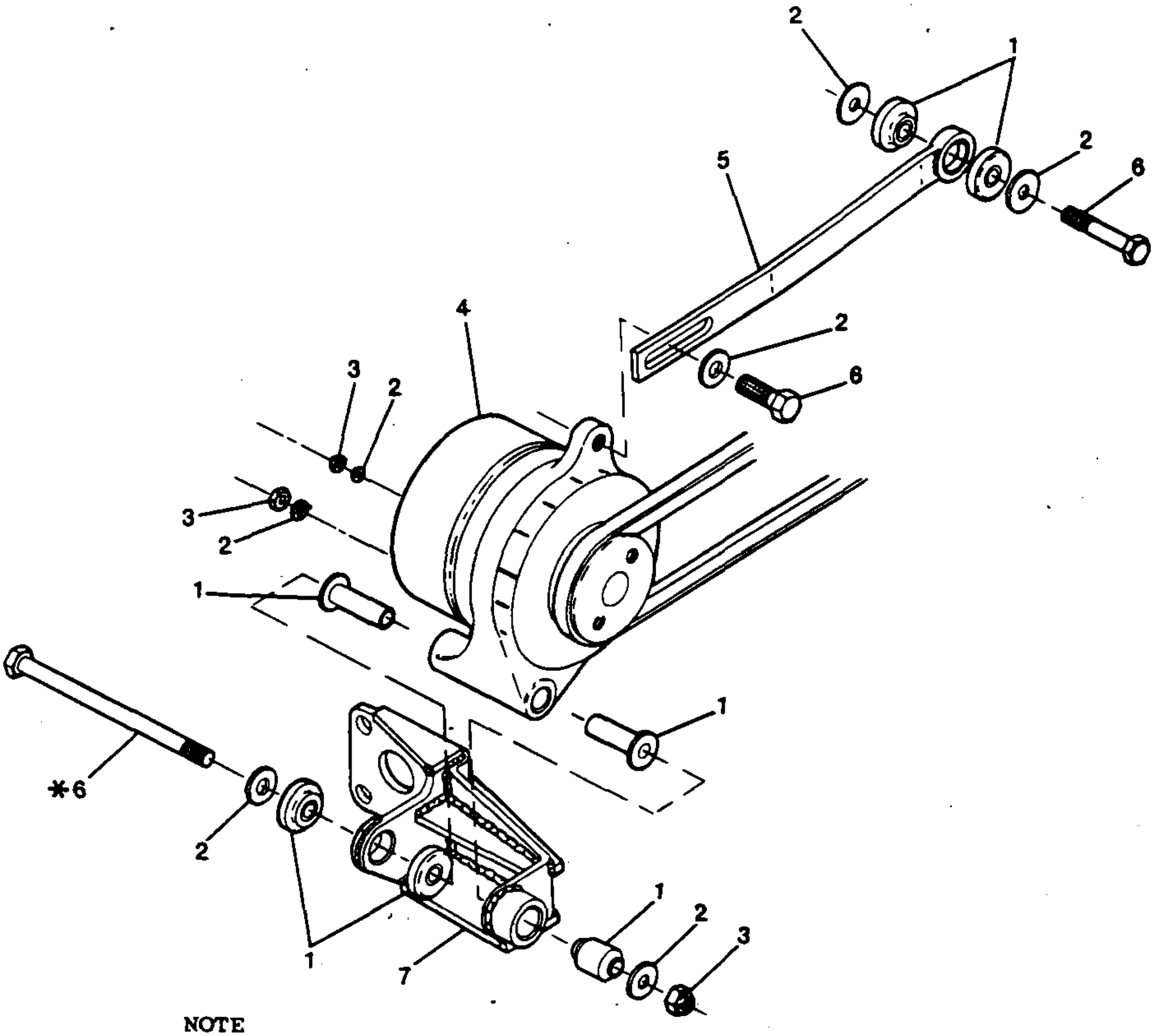
b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR MAKES ABNORMAL WHINING NOISE.	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in one direction, repair or replace alternator.
LOW-VOLTAGE LIGHT DOES NOT GO OUT WHEN ALTERNATOR AND BATTERY SWITCHES ARE TURNED ON.	Shorted alternator control unit.	Replace alternator control unit.
	Defective low-voltage sensor.	Replace alternator control unit.
AFTER ENGINE START WITH ALL ELECTRICAL EQUIPMENT TURNED OFF CHARGE RATE DOES NOT TAPER OFF IN 1-3 MINUTES	Alternator control unit faulty or high resistance in field circuit	With engine not running turn off all electrical loads and turn on battery and alternator switches. Measure bus voltage to ground, then measure voltage from terminal of alternator to ground. If there is more than 2 volts difference check field circuit wiring shown in alternator system wiring diagram in Section 19. Clean all contacts. Replace components until there is less than 2 volts difference between bus voltage and field voltage.
NOTE Also refer to battery power system trouble shooting chart.		
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Alternator output voltage insufficient.	1. Connect voltmeter between D.C. Bus and ground. Turn off all electrical loads. Turn on Battery Switch, start engine and adjust for 1500 RPM, voltage should read approximately 24 volts. Turn on alternator switch, voltage should read between 28.4 and 28.9 volts. Ammeter should indicate a heavy charge rate which should taper off in 1-3 minutes. If charge rate tapers off very quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage does not rise when alternator switch is turned on proceed to Step 2.

17-42. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (24 VOLT) (BEGINNING WITH 1979 MODELS) (Cont).

b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED. (Cont.)	Alternator output voltage insufficient (cont.)	2. Stop engine, turn off all switches. Connect voltmeter between "F" terminal of alternator and ground. Do NOT start engine. Turn on battery switch and alternator switch. Battery voltage should be present at "F" terminal, less 1 volt drop thru regulator, if not refer to Step 3.
		3. Starting at "F" terminal of alternator, trace circuit to alternator control unit at Pin 1 (Blue Wire). Trace circuit from Pin 3 (Red Wire) to master switch. to Bus Bar. Trace circuit from alternator control unit Pin 2 (Orange Wire) to alternator "BAT" terminal. Check connections and replace component which does not have voltage present at output. Refer to alternator system wiring diagram in Section 19.
	Alternator field winding open.	1. If voltage is present turn off alternator and battery switches. Check resistance from "F" terminal of alternator to alternator case, turning alternator shaft during measurement. Normal indication is 12-20 ohms. If resistance is high or low, repair or replace alternator. If OK refer to Step 2.
	Alternator output voltage insufficient.	2. Check resistance from case of alternator to airframe ground. Normal indication is very low resistance. If reading indicates no, or poor continuity, repair or replace alternator ground wiring.



NOTE

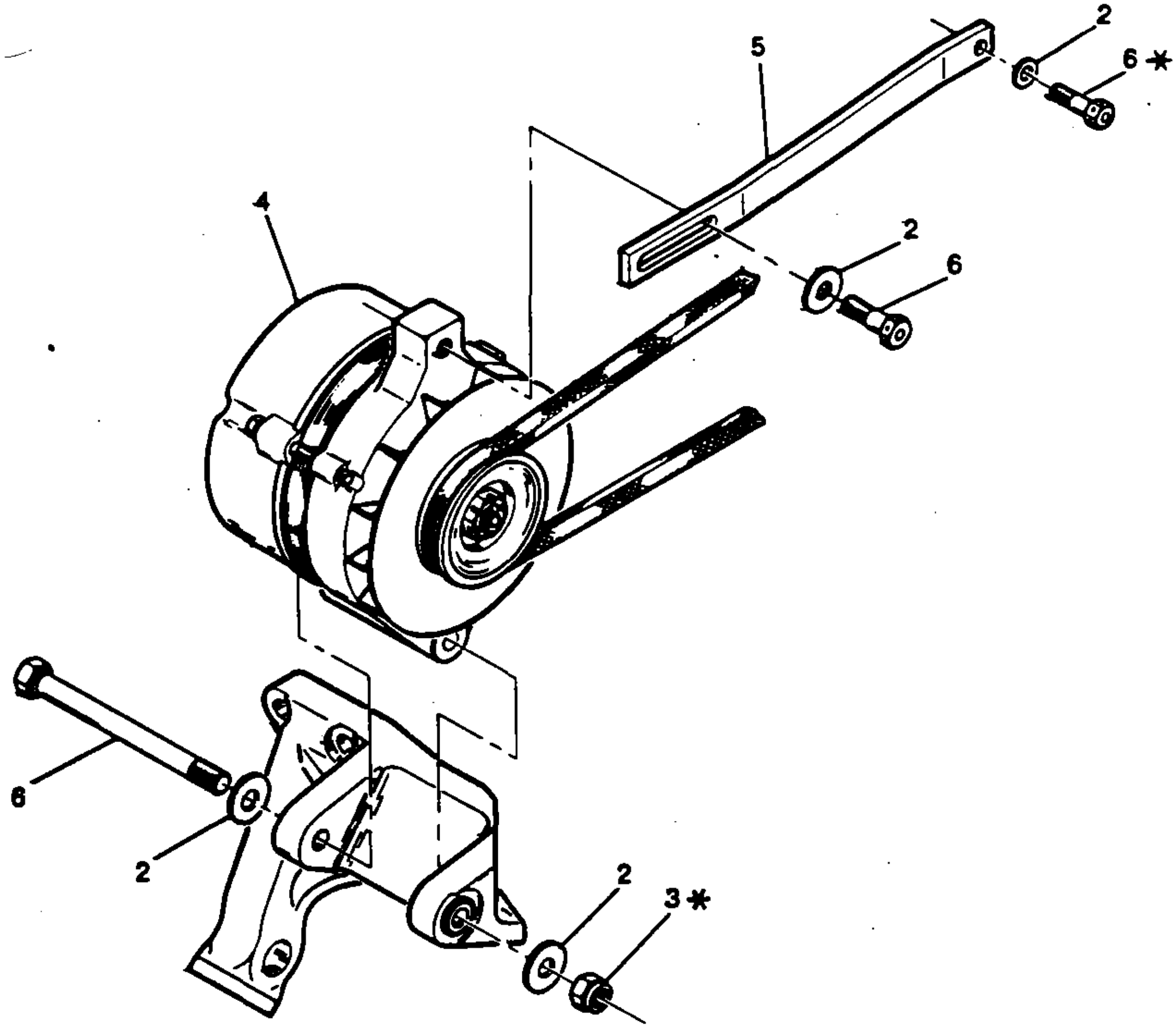
On aircraft U206-0276 thru U20604468 for replacement of alternator support bracket refer to Cessna Single-Engine Service Information Letter SE79-5 Dated February 26, 1979.

* TORQUE TO 100-140 LB IN.

THRU 1978 MODELS

1. Bushing
2. Washer
3. Nut
4. Alternator
5. Adhustment Bracket
6. Bolt
7. Support Assembly

17-4. Alternator Installation (Sheet 1 of 3)

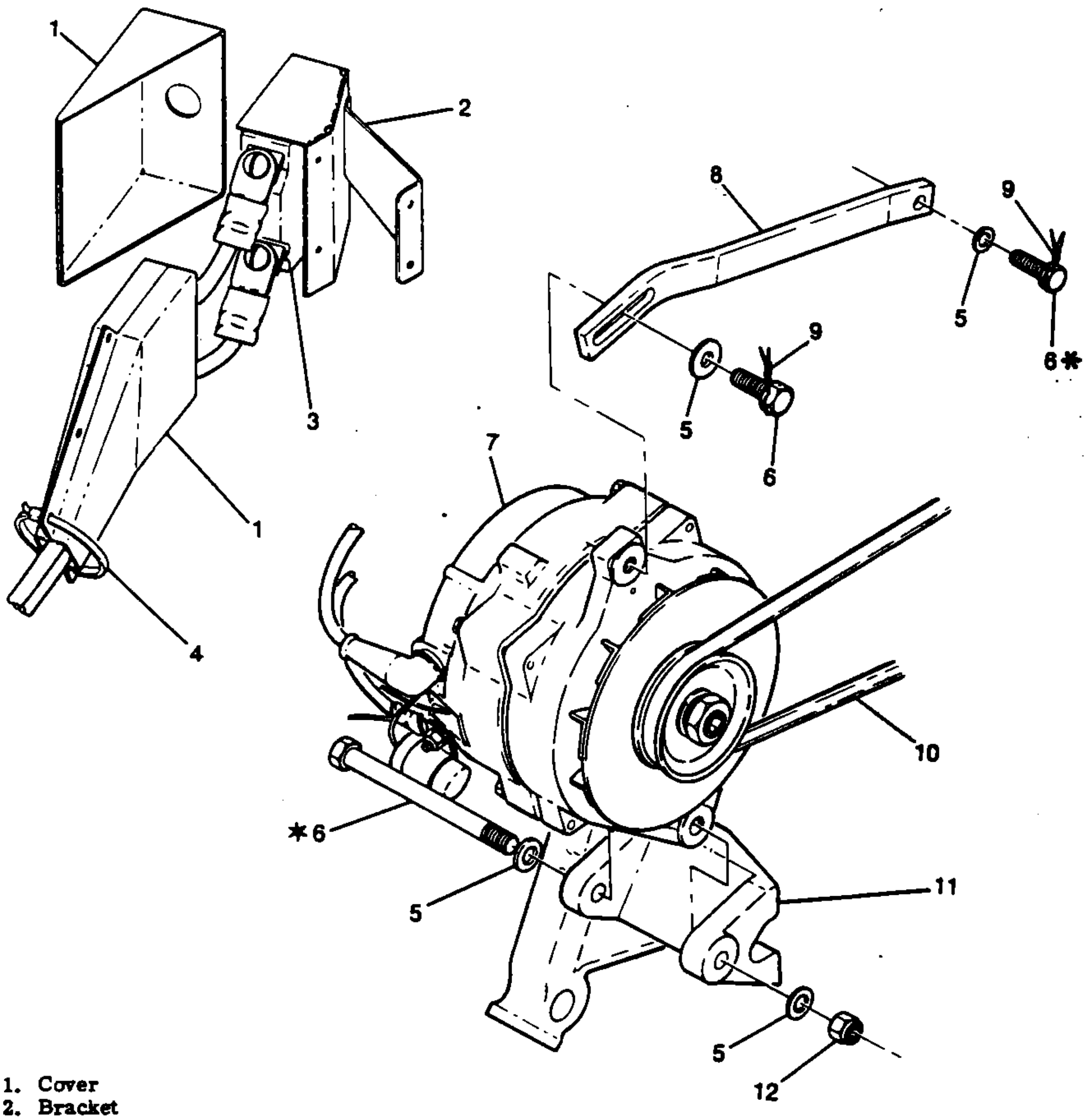


* TORQUE TO 165 ± 10 IN LBS.

* TORQUE TO 450 - 500 IN LPS.

BEGINNING WITH 1979 MODELS

17-4. Alternator Installation (Sheet 2 of 3)



1. Cover
2. Bracket
3. Circuit Breaker
4. Sta-strap
5. Washer
6. Bolt
7. Alternator
8. Adjustment Arm
9. Safety Wire
10. Belt
11. Engine Mount
12. Nut

* TORQUE TO 165 ± 10 IN LBS

* TORQUE TO 450 - 500 IN LBS

95 AMP ALTERNATOR

17-4. Alternator Installation (Sheet 3 of 3)

17-43. REMOVAL AND INSTALLATION. (See figure 17-4.)

a. Make sure that the master switch remains in the off position or disconnect the negative lead from the battery.

b. Disconnect the wiring from the alternator.

c. Remove the safety wire from the upper adjusting bolt and remove the bolt from the alternator.

d. Remove the nut and washer from the lower mounting bolt.

e. Remove the alternator drive belt and lower mounting bolt to remove the alternator.

f. To replace alternator, reverse this procedure.

g. Adjust belt tension to obtain 3/8" deflection at the center of the belt when applying 12 pounds pressure to the belt. After belt is adjusted and bolt is safety wired, tighten the bottom bolt to torque shown in figure 17-4, to remove any play between alternator mounting foot and the U-Shaped support assembly.

CAUTION

On new aircraft belt tension should be checked within 15 to 25 hours of operation. When a new belt is installed, belt tension should be checked within 10 to 25 hours of operation.

NOTE

When tightening the alternator belt, apply pry bar pressure only to the end of the alternator nearest to the belt pulley.

17-44. ALTERNATOR FIELD CIRCUIT PROTECTION. A manually resettable circuit breaker located on the circuit breaker panel is provided to protect the alternator field circuit.

17-45. ALTERNATOR VOLTAGE REGULATOR. 12 VOLT AIRCRAFT ONLY.

17-46. DESCRIPTION. The voltage regulator is semi-solid state. The field relay in the regulator is actuated by the aircraft master switch and connects the regulator to the battery. The solid state portion is voltage sensitive and controls the current applied to the field windings of the alternator. The regulator is a remove and replace item and not repairable. The regulator is adjustable, but adjustment on the aircraft is not recommended. A bench adjustment procedure is outlined in the Cessna Alternator Charging Systems Service/Parts Manual.

17-47. REMOVAL AND INSTALLATION. (See figure 17-5.)

a. Make sure that master switch is off or disconnect the negative lead from the battery.

b. Remove the connector plug from the regulator.

c. Remove the two screws holding the regulator on the firewall.

d. To install the regulator, reverse this procedure. Be sure the connections for grounding the alternator, wiring shields and the base of the regulator are clean and bright before assembly. Otherwise, poor voltage regulation and/or excessive radio noise may result.

17-48. ALTERNATOR VOLTAGE REGULATOR. 24 VOLT AIRCRAFT ONLY. (THRU 1978 MODELS.)

17-49. DESCRIPTION. The 24 volt regulator is a solid-state device mounted on the left hand side of the firewall. The regulator is a remove and replace item and not repairable. The regulator is adjustable, but adjustment on the aircraft is not recommended. A bench adjustment procedure is outlined in the Cessna Alternator Charging Systems Service/Parts Manual. A Cessna Alternator Charging System Test Box Assembly (PN. 9870000-1) is available through the Cessna Service/Parts Center for use in isolating failures in the 28-volt transistorized voltage regulator (C611002-0105) and the 28-volt Alternator.

17-50. REMOVAL AND INSTALLATION. (See figure 17-5.)

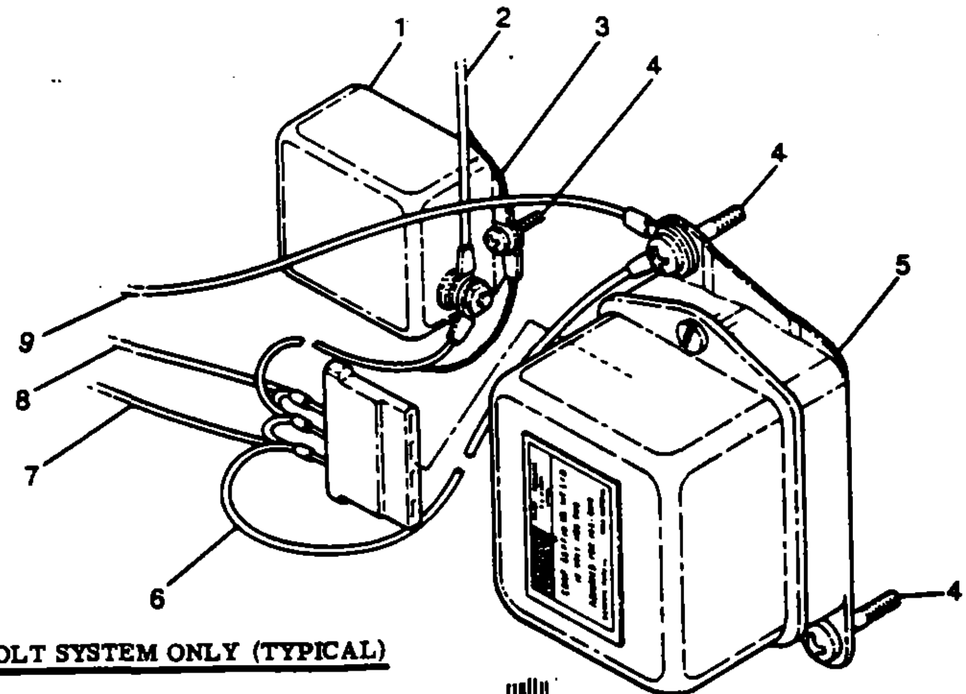
a. Make sure that master switch is off or disconnect the negative lead from the battery.

b. Remove upper engine cowl to gain access to the regulator.

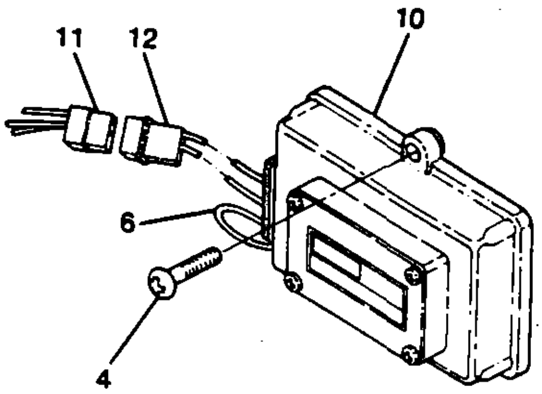
c. Disconnect wiring from the regulator and lable wires.

d. Remove the mounting bolts and remove regulator.

e. To install, reverse this procedure. Be sure that the connections for grounding the alternator, wiring shields and the base of the regulator are clean and bright before assembly. Otherwise, poor voltage regulation and/or excessive radio noise may result.

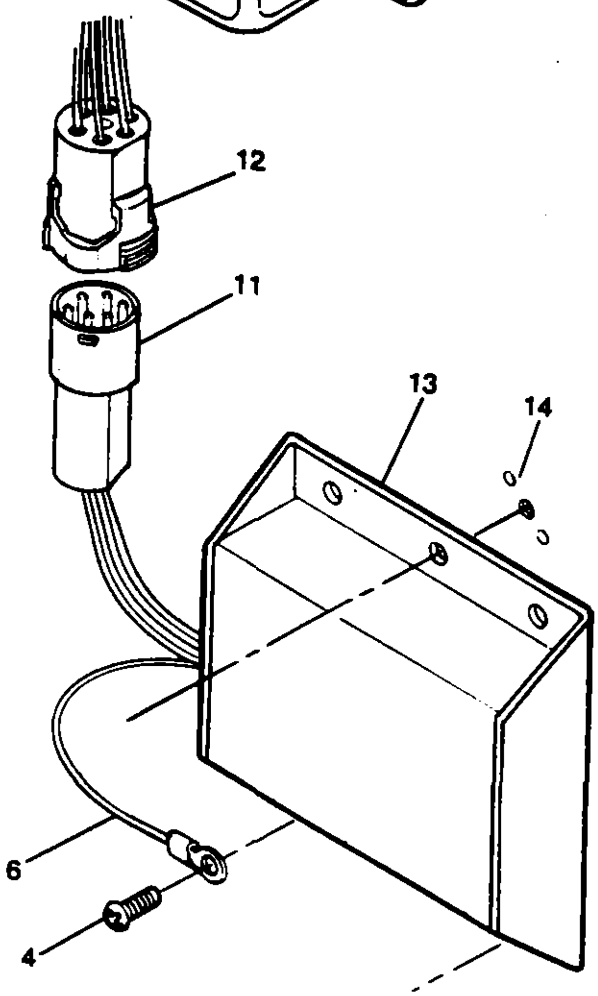


12-VOLT SYSTEM ONLY (TYPICAL)



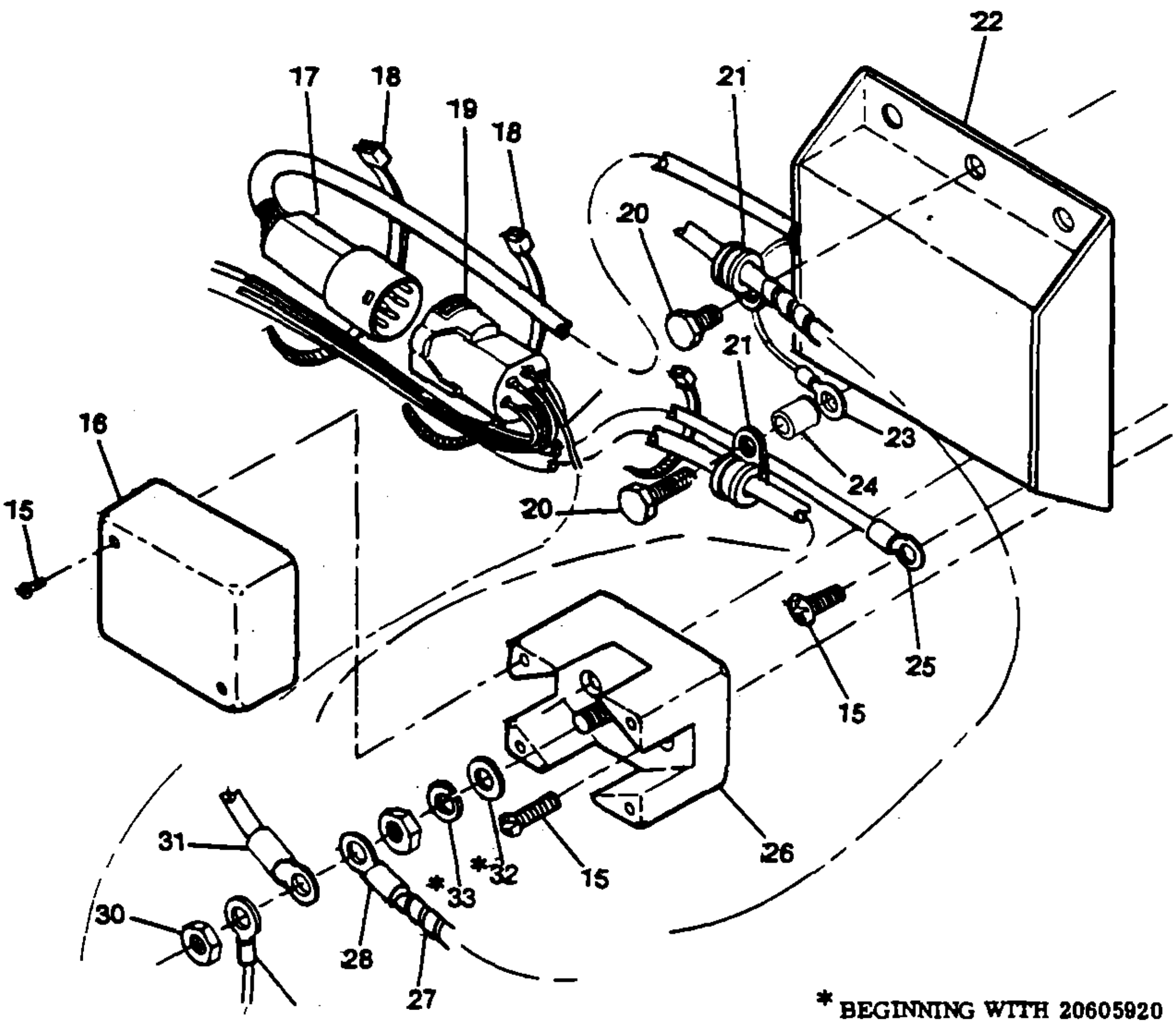
THRU 1978 MODELS

1. Filter - Radio Noise
2. Wire to Master Switch
3. Shield - Ground
4. Screw
5. Voltage Regulator
6. Wire Shields to Ground
7. Wire to Alternator "F"
8. Wire to Alternator "A+"
9. Wire to Alternator Ground
10. Alternator Regulator
11. Housing - Plug
12. Housing - Cap
13. Alternator Control Unit
14. Firewall



THRU U20605120

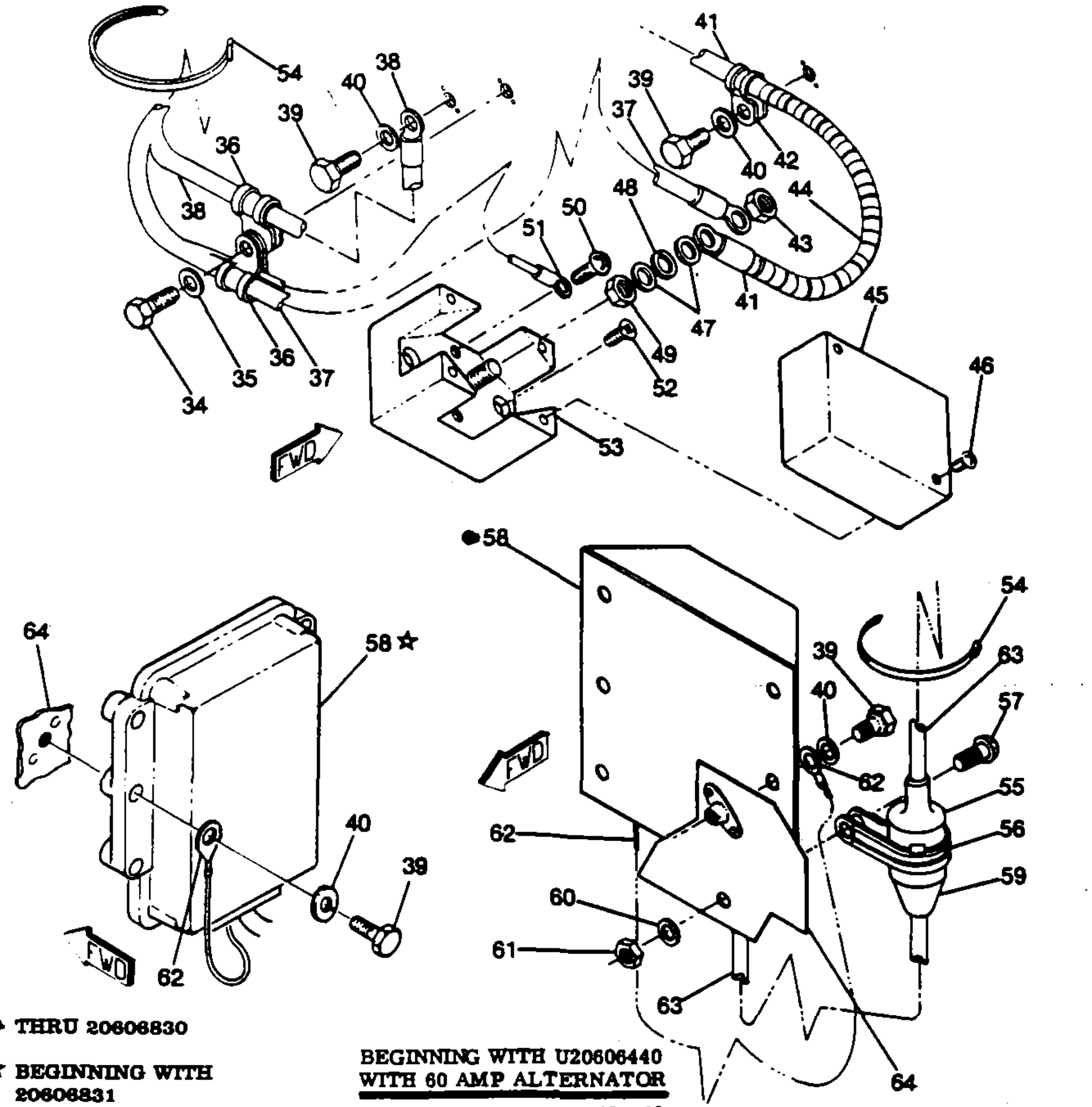
Figure 17-5 Voltage Regulator/Alternator Control Unit Installation (Sheet 1 of 3)



U20605121 THRU U20606439
WITH 60 AMP ALTERNATOR

15. Screw
16. Cover
17. Housing-Plug
18. Sta-strap
19. Housing-Cap
20. Bolt
21. Clamp
22. Alternator Control Unit
23. Ground Wire
24. Spacer
25. Alternator Ground
26. Terminal Block
27. Spiral Wrap
28. Wire-to Circuit Breaker
29. Wire-to Alternator Control Unit
30. Nut
31. Wire-to Alternator
32. Washer
33. Lockwasher

Figure 17-5 Voltage Regulator/Alternator Control Unit Installation (Sheet 2 of 3)



● THRU 20606830

☆ BEGINNING WITH
20606831

BEGINNING WITH U20606440
WITH 60 AMP ALTERNATOR

34. Bolt
35. Washer
36. Clamp
37. Wire - Alternator
38. Wire - Alternator Ground
39. Bolt
40. Washer
41. Wire - Alternator to Circuit Breaker
42. Clamp
43. Nut
44. Spiral Wrap
45. Cover
46. Screw
47. Washer
48. Lockwasher
49. Nut
50. Screw
51. Wire - To Fused Terminal Block
52. Screw
53. Terminal Block
54. Sta-Strap
55. Housing - Plug
56. Clamp
57. Screw
58. Alternator Control Unit
59. Housing - Cap
60. Washer
61. Nut
62. Ground Wire
63. Wire - To Low Voltage Light
64. Battery Box

Figure 17-5. Voltage Regulator/Alternator Control Unit Installation (Sheet 3 of 3)

17-51. ALTERNATOR CONTROL UNIT. (BEGINNING WITH 1979 MODELS.)

17-52. DESCRIPTION. The alternator control unit is a solid state voltage regulator with an over-voltage sensor and a low-voltage sensor incorporated in the unit. The control unit is not adjustable and is a remove and replace item. A Cessna Alternator Charging System Test Box Assembly (PN 9870005) is Available through the Cessna Supply Division for use in isolating failures in the 28-volt alternator control units (C611005-1010 and C611005-0102) and the 28-volt alternator.

17-53. REMOVAL AND INSTALLATION. (See figure 17-5.)

a. Remove upper half of engine cowl.
b. Place master switch in the "OFF" position.
c. Disconnect negative lead from the battery.
d. Remove sta-strap and disconnect housing plug from alternator control unit.
e. Remove screws securing the control unit to the firewall.
f. To install control unit reverse the preceding steps. Be sure the connections for grounding are clean and bright before assembly. Otherwise faulty voltage regulation and/or excessive radio noise may result.

17-54. OVER-VOLTAGE WARNING CIRCUIT. 24 VOLT AIRCRAFT ONLY.

17-55. DESCRIPTION. The over-voltage system consists of a relay assembly and a red warning light. The relay is voltage sensitive, opening the alternator field circuit and turning on the red warning light if excessive voltage is present. Simultaneously with lamp illumination, the alternator will automatically shut down. To recycle the system, turn the ALT side of the master switch OFF and then ON. Monitor the output of the alternator on the ammeter and shut off enough electronic equipment to bring the reading below full scale. The relay is a remove and replace item and not adjustable.
Beginning with 1979 Models the over-voltage sensor is contained within the alternator control unit. The unit also contains a low-voltage sensor. A red warning light labeled "LOW VOLTAGE" is installed on the instrument panel. When an over-voltage condition occurs the over-voltage sensor turns off the alternator and the voltage in the system drops. When system voltage drops below 24.8 volts the low-voltage sensor turns on the low-voltage light indicating a drain on the battery and the ammeter will show a discharge. Turn off both sections of the master switch to recycle the over-voltage sensor. If the over-voltage condition was transient, the normal alternator charging will resume and no further action is necessary. If the over-voltage tripoff recurs, then a generating system malfunction has occurred such that the electrical accessories must be operated from the aircraft battery only. Conservation of electrical energy must be practiced until the flight can be terminated. The over-voltage light filament may be tested at any time by turning off the "Alternator" portion of the master switch and leaving the battery portion on. This test does not induce an over-voltage condition on the electrical system.

17-56. REMOVAL AND INSTALLATION. (See figure 17-6.)

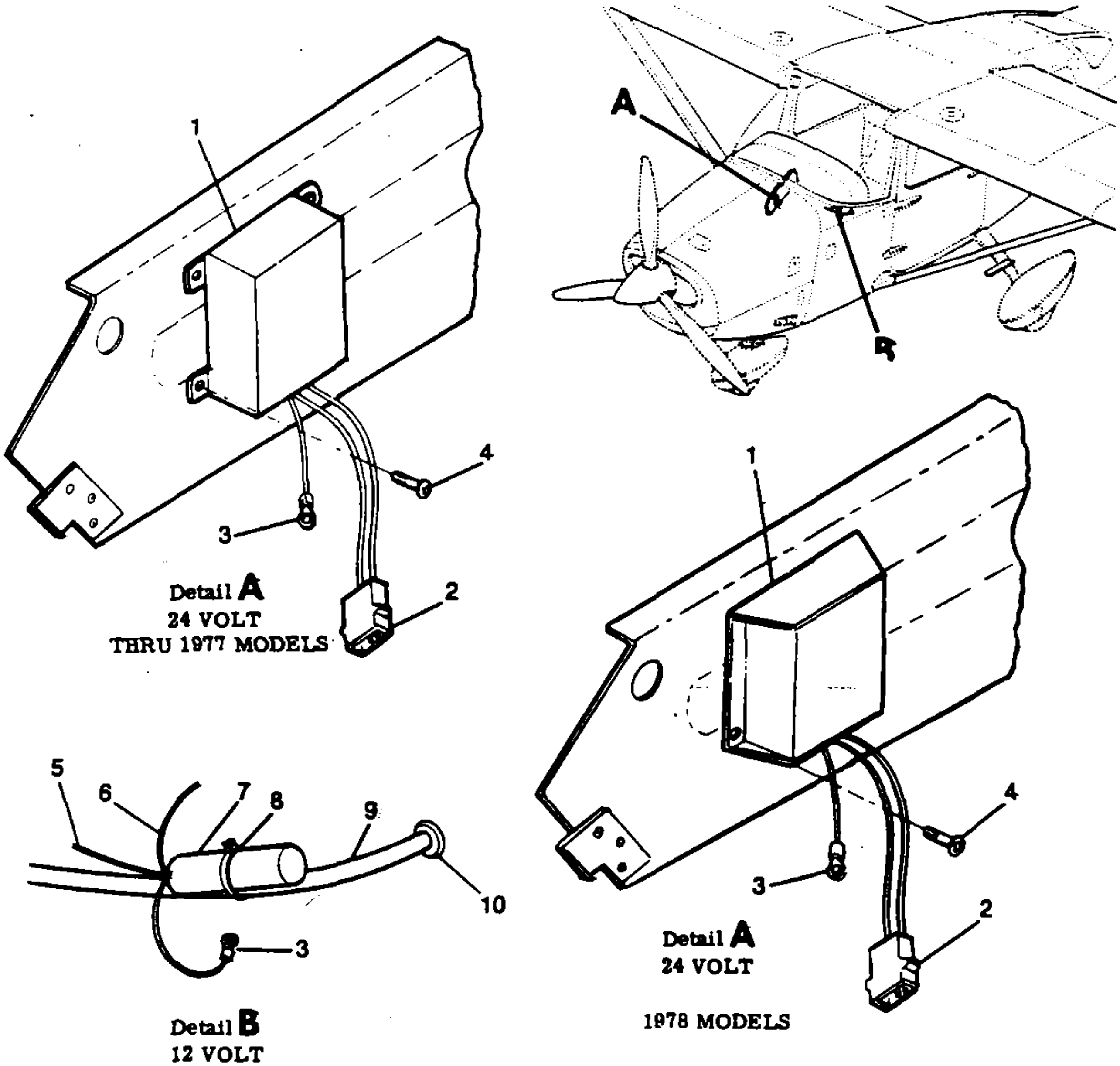
a. Turn master switch (BATT side) to OFF position.
b. Disconnect plug.
c. Remove mounting screws and remove relay.
d. To install reverse the procedure.

17-57. OVER-VOLTAGE SENSOR AND WARNING LIGHT. 12 VOLT AIRCRAFT ONLY.

17-58. DESCRIPTION. The over-voltage system consists of a over-voltage sensor switch and a red warning light labeled, "HIGH VOLTAGE", on the instrument panel. When an over-voltage tripoff occurs the over-voltage sensor turns off the alternator system and the red warning light comes on. The ammeter will show a discharge. Turn off both sections of the Master Switch to recycle the over-voltage sensor. If the over-voltage condition was transient, the normal alternator charging will resume and no further action is necessary. If the over-voltage tripout recurs, then a generating system malfunction has occurred such that the electrical accessories must be operated from the aircraft battery only. Conservation of electrical energy must be practiced until the flight can be terminated. The over-voltage red warning light filament may be tested at any time by turning off the "Alternator" portion of the Master Switch and leaving the "Battery" portion turned on. This test does not induce an over-voltage condition on the electrical system.

17-59. RIGGING THROTTLE OPERATED MICRO-SWITCH. Refer to Section 13.

17-60. AUXILIARY ELECTRIC FUEL PUMP FLOW RATE ADJUSTMENT. Refer to Section 13.



1. Overvolt Relay
2. Housing - Plug
3. Ground Wire
4. Screw
5. Wire - To Circuit Breaker
6. Wire - To Master Switch
7. Overvolt Sensor
8. Tie Strap
9. Wire Bundle
10. Grommet

Figure 17-6. Overvolt Relay Installation

17-61. AIRCRAFT LIGHTING SYSTEM.

17-62. DESCRIPTION. The aircraft lighting system consists of landing and taxi lights, navigation lights, anti-collision strobe lights, flashing beacon light, interior and instrument panel flood lights, electro-luminescent panel lighting, instrument post lighting, pedestal lights, courtesy lights, control wheel map light, compass and radio dial lights.

17-63. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
LANDING AND TAXI LIGHTS OUT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test each circuit separately until short is located. Repair or replace wiring.
	Defective switch.	3. Check voltage at lights with master and landing and taxi light switches ON. Should read battery voltage. Replace switch.
LANDING OR TAXI LIGHT OUT.	Lamp burned out.	1. Test lamp with ohmmeter or new lamp. Replace lamp.
	Open circuit in wiring.	2. Test wiring for continuity. Repair or replace wiring.
FLASHING BEACON DOES NOT LIGHT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.
	Lamp burned out.	3. Test lamp with ohmmeter or a new lamp. Replace lamp. If lamp is good, proceed to step 4.
	Open circuit in wiring.	4. Test circuit from lamp to flasher for continuity. If no continuity is present, repair or replace wiring. If continuity is present, proceed to step 5.
	Defective switch.	5. Check voltage at flasher with master and beacon switch on. Should read battery voltage. Replace switch. If voltage is present, proceed to step 6.
	Defective flasher.	6. Install new flasher.
FLASHING BEACON CONSTANTLY LIT.	Defective flasher.	1. Install new flasher.

17-63. TROUBLE SHOOTING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALL NAV LIGHTS OUT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Isolate and test each nav light circuit until short is located. Repair or replace wiring.
	Defective switch.	3. Check voltage at nav light with master and nav light switches on. Should read battery voltage. Replace switch.
ONE NAV LIGHT OUT.	Lamp burned out.	1. Inspect lamp. Replace lamp.
	Open circuit in wiring.	2. Test wiring for continuity. Repair or replace wiring.
WARNING The anti-collision system is a high voltage device. Do not remove or touch tube assembly while in operation. Wait at least 5 minutes after turning off power before starting work.		
BOTH ANTI-COLLISION STROBE LIGHTS WILL NOT LIGHT.	Open circuit breaker.	1. Check, if open reset. If circuit breaker continues to open proceed to step 2.
		2. Disconnect red wire between aircraft power supply (battery/external power) and strobe power supplies, one at a time. If circuit breaker opens on one strobe power supply, replace strobe power supply. If circuit breaker opens on both strobe power supplies proceed to step 3. If circuit breaker does not open proceed to step 4.
		3. Check aircraft wiring. Repair or replace as necessary.
		4. Inspect strobe power supply ground wire for contact with wing structure.
CAUTION Extreme care should be taken when exchanging flash tube. The tube is fragile and can easily be cracked in a place where it will not be obvious visually. Make sure the tube is seated properly on the base of the nav light assembly and is centered in the dome.		

17-63. TROUBLE SHOOTING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
NOTE: When checking defective power supply and flash tube, units from opposite wing may be used. Be sure power leads are protected properly when unit is removed to prevent short circuit.		
ONE ANTI-COLLISION STROBE LIGHT WILL NOT LIGHT.	Defective Strobe Power Supply, or flash tube.	1. Connect voltmeter to red lead between aircraft power supply (battery/external power) and strobe power supply, connecting negative lead to wing structure. Check for 12 volts. If OK proceed to step 2. If not, check aircraft power supply (battery/external power).
		2. Replace flash tube with known good flash tube. If system still does not work, replace strobe power supply.
DOME LIGHT TROUBLE.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.
		3. Test for open circuit. Repair or replace wiring. If no short cr open circuit is found, proceed to step 4.
	Lamp burned out.	4. Test lamp with ohmmeter or new lamp. Replace lamp.
	Defective switch.	5. Check for voltage at dome light with master and dome light switch on. Should read battery voltage. Replace switch.
ELECTROLUMINESCENT PANELS WILL NOT LIGHT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring. 3. Test for open circuit. Repair or replace wiring. If no open or short circuit is found, proceed to step 4.
	Defective resistor.	4. Check resistor for continuity. (Located in line between rheostat and inverta-pak.) Replace resistor.

17-63. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ELECTROLUMINESCENT PANELS WILL NOT LIGHT. (Cont).	Defective rheostat.	5. Check input voltage at inverta-pak with master switch on. Voltmeter should give a smoothly varied reading over the entire control range of the rheostat. If no voltage is present or voltage has a sudden drop before rheostat has been turned full counterclockwise, replace rheostat.
	Defective inverta-pak.	6. Check output voltage at inverta-pak with ac voltmeter. Should read about 125 volts ac with rheostat set for full bright. Replace inverta-pak.
INSTRUMENT LIGHTS WILL NOT LIGHT.	Short circuit wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring. 3. Test for open circuit. Repair or replace wiring. If no short or open circuit is found, proceed to step 4.
	Faulty section in dimming potentiometer.	4. Lights will work when control is placed in brighter position. Replace potentiometer.
	Faulty light dimming transistor.	5. Test both transistors with new transistor. Replace faulty transistor.
	Faulty selector switch.	6. Inspect. Replace switch.
INSTRUMENT LIGHTS WILL NOT DIM.	Open resistor or wiring in minimum intensity end of potentiometer.	1. Test for continuity. Replace resistor or repair wiring.
	Shorted transistor.	2. Test transistor by substitution. Replace defective transistor.
CONTROL WHEEL MAP LIGHT WILL NOT LIGHT.	Nav light switch turned off.	1. Nav light switch has to be ON before map light will light.
	Short circuit in wiring.	2. Check lamp fuse on terminal board located on back of stationary panel with ohmmeter. If fuse is open, proceed to step 3. If fuse is OK, proceed to step 4.

17-63. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
CONTROL WHEEL MAP LIGHT WILL NOT LIGHT (Cont).	Defective wiring.	3. Test circuit until short is located. Repair or replace wiring. 4. Test for open circuit. Repair or replace wiring. If a short or open circuit is not found, proceed to step 5.
	Defective map light assembly.	5. Check voltage at map light assembly with master and nav switches on. If battery voltage is present, replace map light assembly.

17-64. LANDING AND TAXI LIGHTS.

17-65. DESCRIPTION. The landing and taxi lights are mounted in the lower nose cowl. The right hand lamp is used for taxi and both lamps for landing. The lamps are controlled by two rocker switches. A diode across the switches directs power around the taxi light switch to the taxi lamp when the landing light switch is actuated so both lamps are used for landing but only the one lamp for taxi.

17-66. REMOVAL AND INSTALLATION. (See figure 17-7.)

a. Remove screws securing support assembly (2) to cowl and pull assembly forward from cowl.

b. Remove screws securing the wiring to lamp contacts.

c. Remove the tinnerman screws from the bracket (5) and remove bracket and lamp.

d. Install new lamp and reassemble.

17-67. NAVIGATION LIGHTS.

17-68. DESCRIPTION. The navigation lights are located on each wing tip and the stinger. Operation of the lights is controlled by a single switch. A plastic light detector on each wing tip allows the pilot to determine if the lamps are working properly during flight.

17-69. REMOVAL AND INSTALLATION. (See Figure 17-8 for removal and installation.

17-70. ANTI-COLLISION STROBE LIGHTS.

17-71. DESCRIPTION. A white strobe light is installed on each wing tip. These lights are vibration resistant and operate on the principle of a capacitor discharge into a xenon tube, producing an extremely high intensity flash. Energy for the lights is supplied from individual power supplies mounted on each wing tip rib.

17-72. OPERATIONAL REQUIREMENTS. (THRU 20604074).

WARNING

The capacitors in the strobe light power supplies must be reformed if not used for a period of six (6) months. The following procedure must be used.

Connect the power supply, red wire to plug, black to ground to 6 volt DC source. Do Not connect strobe tube. Turn on 6 volt supply. Note current draw after one minute. If less than 1 ampere, continue operation for 24 hours. Turn off DC power source. Then connect to the proper voltage, 12/24 volt. Connect tube to output of strobe power supply and allow to operate, flashing, for 15 minutes. Remove strobe tube. Operating power supply at 12/24 volts, note the current drain after one minute. If less than 0.5 amperes, operate for 6 hours. If current draw is greater than 0.5 amperes, reject the unit.

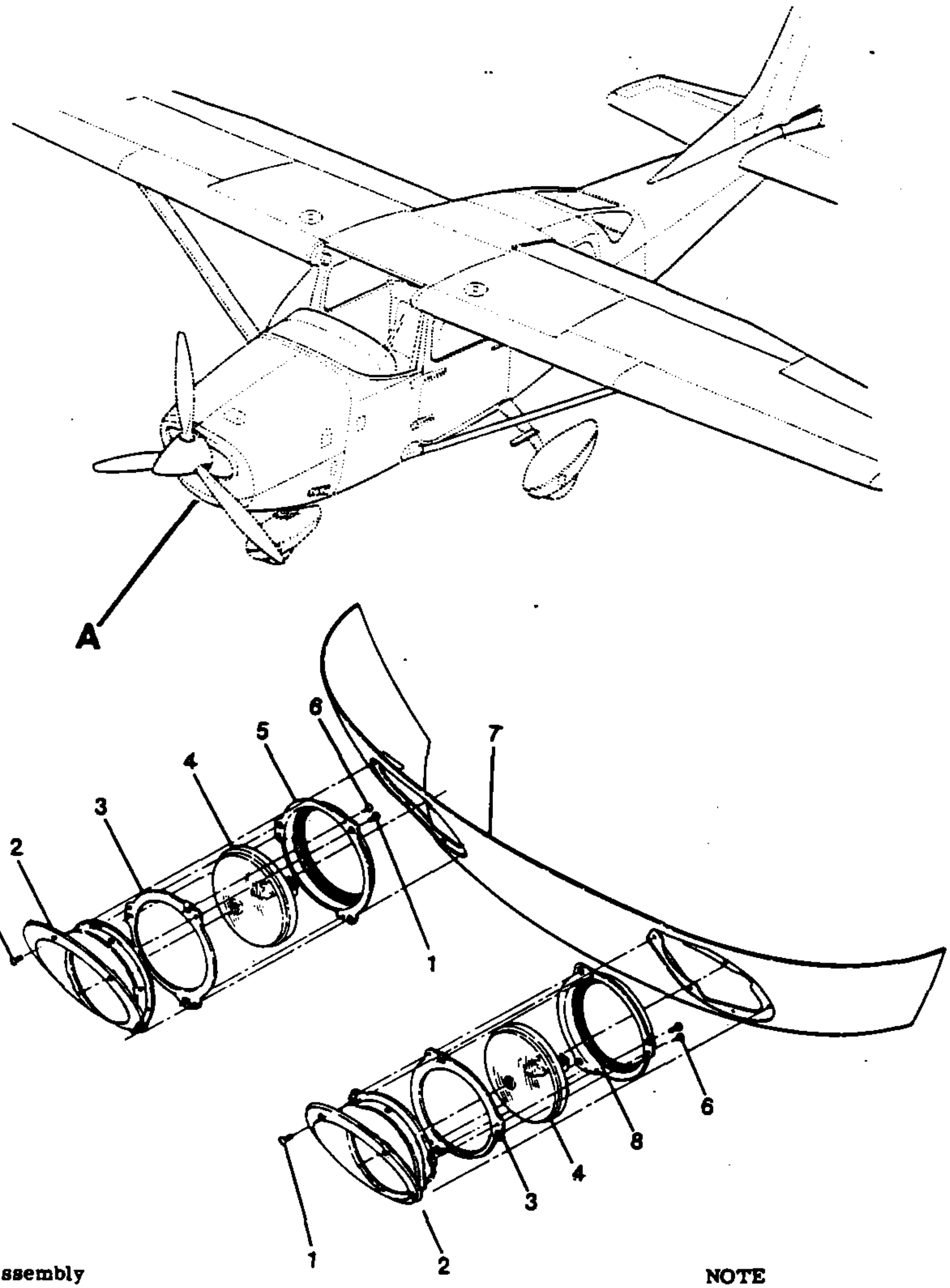
17-73. REMOVAL AND INSTALLATION. (See Figure 17-8 as a guide for removal and installation.

WARNING

The anti-collision system is a high voltage device. Do not remove or touch the tube assembly while in operation. Wait at least five minutes after turning off power before starting work.

17-74. FLASHING BEACON LIGHT.

17-75. DESCRIPTION. The flashinf beacon light is attached to the vertical fin tip. The assembly consists of a red dome cover and a iodine vapor lamp electrically switched by a solid-state flasher assembly. The flasher assembly is located in the vertical fin tip. A resistor is installed on the forward upper

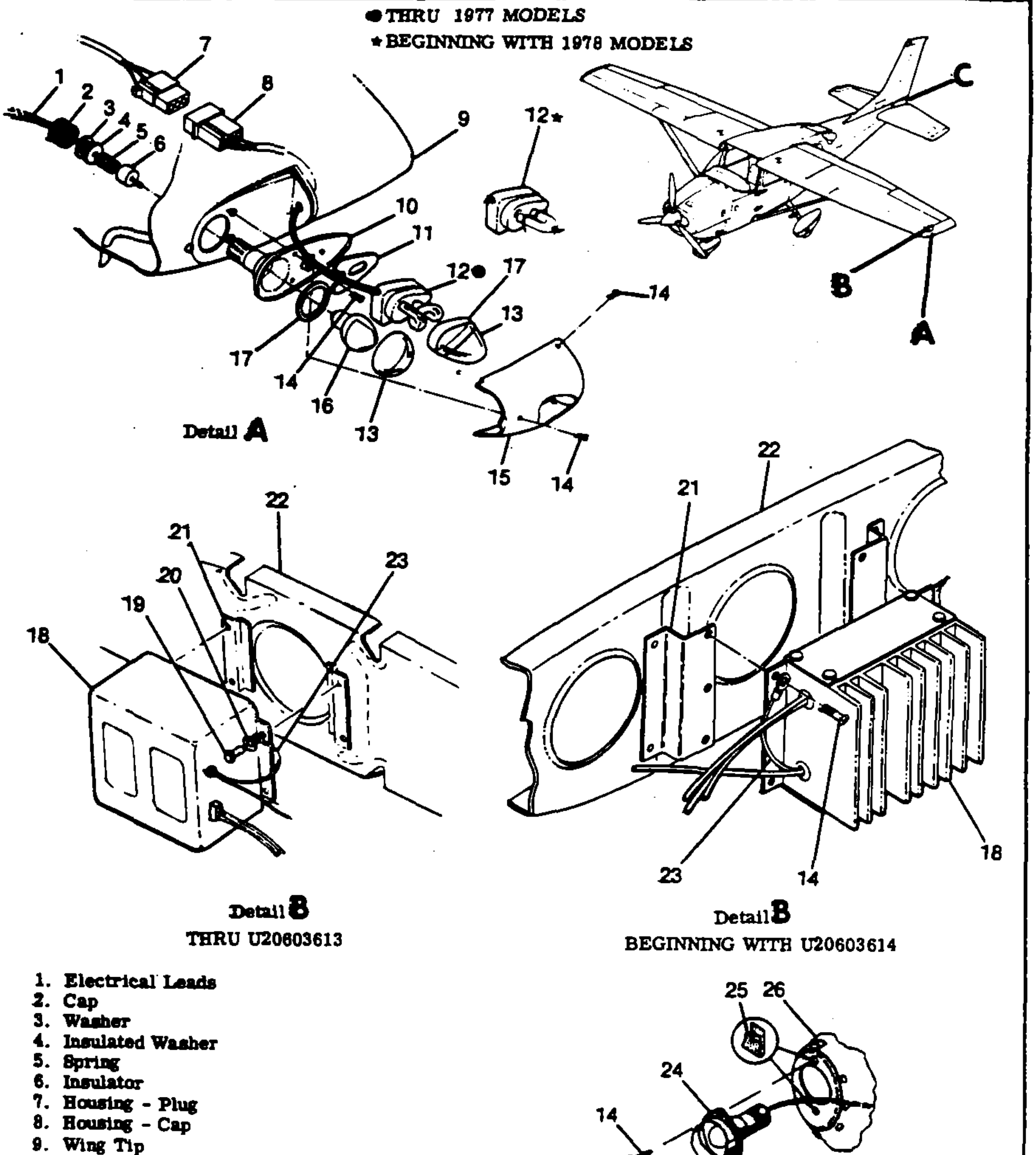


1. Screw
2. Support Assembly
3. Plate
4. Lamp
5. Bracket
6. Tinnerman Screw
7. Nose Cap
8. Gasket

NOTE

Should further adjustment be desired washers may be added between retainer (2) and plate (3).

Figure 17-7. Landing and Taxi Light Installation



1. Electrical Leads
2. Cap
3. Washer
4. Insulated Washer
5. Spring
6. Insulator
7. Housing - Plug
8. Housing - Cap
9. Wing Tip
10. Wing Navigation Light
11. Spacer
12. Flash Tube Assembly
13. Lens
14. Screw
15. Lens Retainer
16. Bulb
17. Seal
18. Power Supply
19. Bolt
20. Washer
21. Bracket
22. Wing Tip Rib
23. Ground Wire
24. Tail Light Assembly
25. Nutplate
26. Stinger

Figure 17-8. Navigation and Anti-Collision Strobe Lights Installation side of the stabilizer to prevent pulsing of the aircraft lighting when the beacon is operating. The switching frequency of the flasher assembly operates the beacon at approximately 45 flashes per minute.

17-76. REMOVAL AND INSTALLATION. (See figure 17-9 for removal and installation.

17-77. INSTRUMENT LIGHTING.

17-78. DESCRIPTION. The instrument panel lighting consists of two seperate sections. The lower two-thirds of the panel is illuminated by two lights mounted in the overhead console. The lighting for the upper one-third of the panel is provided by four lights mounted in the instrument panel glare shield. The intensity of the lighting is controled by the instrument light dimming rheostat located on the switch panel.

17-79. REMOVAL AND INSTALLATION. (See figure 17-10 and 17-12.

17-80. TRANSISTORIZED LIGHT DIMMING.

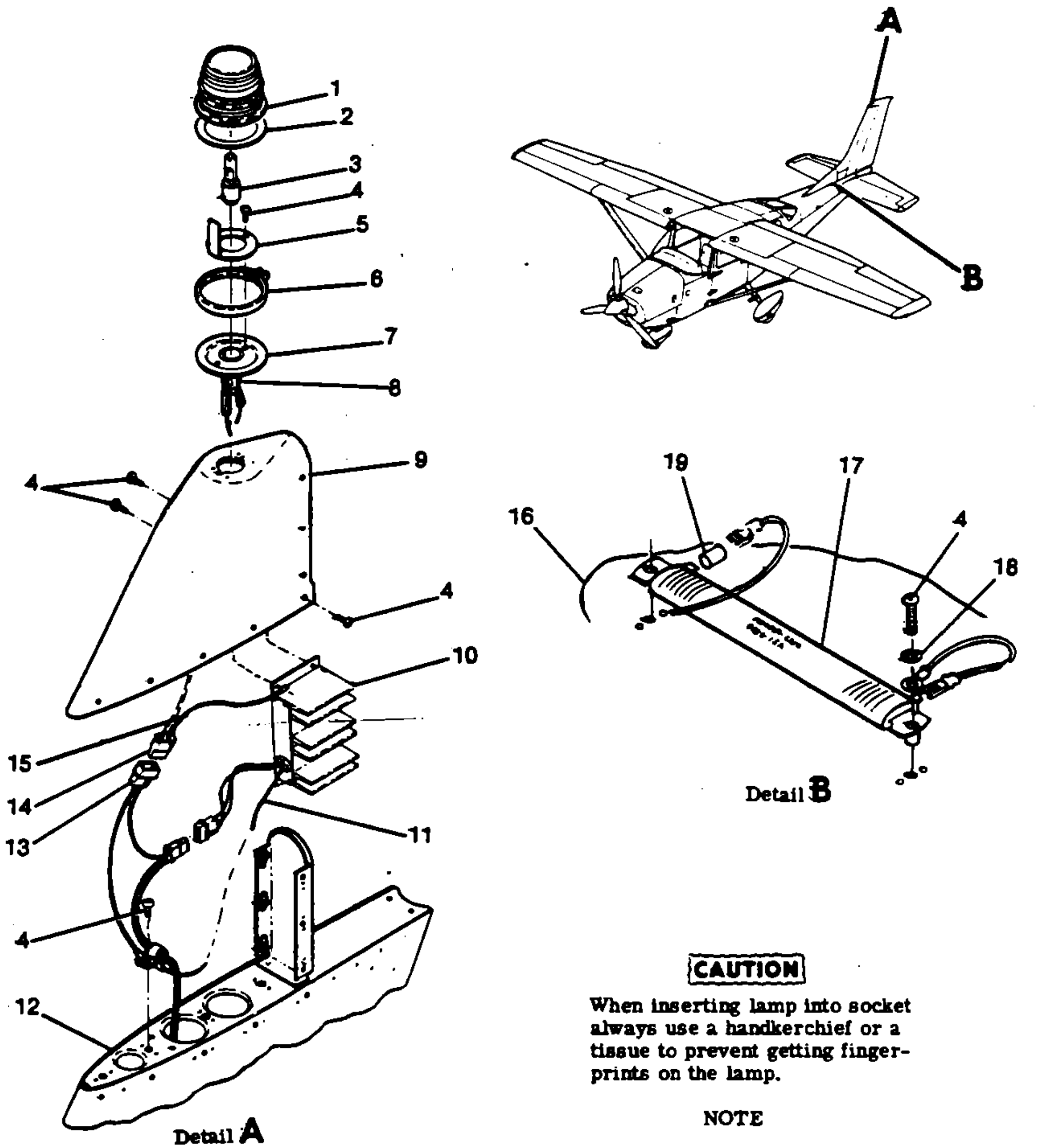
17-81. DESCRIPTION. The light dimming circuit consists of a two-circuit transistorized dimming assembly, mounted on the right hand side of the cabin forward of the instrument panel, and two controls on the lower left hand side of the panel. The left control is a dual rheostat with a concentric knob arrangement. The center portion controls lower panel lighting, the outer portion controls engine instrument and radio lighting. The right hand control is a single rheostat and controls instrument lighting, this includes, glare shield lights, instrument flood lights, compass light and post lighting if installed.

17-82. REMOVAL AND INSTALLATION. (See figure 17-11 for removal and installation.

17-83. ELECTROLUMINESCENT PANEL LIGHTING.

17-84. DESCRIPTION. The electroluminescent lighting consists of three "EL"panels, the switch

SHOP NOTES:



CAUTION

When inserting lamp into socket always use a handkerchief or a tissue to prevent getting fingerprints on the lamp.

NOTE

Fingerprints on lamp may shorten the life of the lamp.

1. Dome
2. Gasket
3. Lamp
4. Screw
5. Baffle
6. Clamp Assembly
7. Plate
8. Socket
9. Tip Assembly - Fin
10. Flasher Assembly
11. Ground Wire
12. Fin Assembly
13. Housing - Cap
14. Housing - Plug
15. Ground Wire
16. Stabilizer Skin - Upper
17. Resistor
18. Washer
19. Insulating Sleeve

Figure 17-9. Flashing Beacon Light Installation (Sheet 1 of 2)

NOTE

When installing lamp be sure socket assembly is installed in mounting plate so lamp may be installed with filament perpendicular to the longitudinal axis of the aircraft.

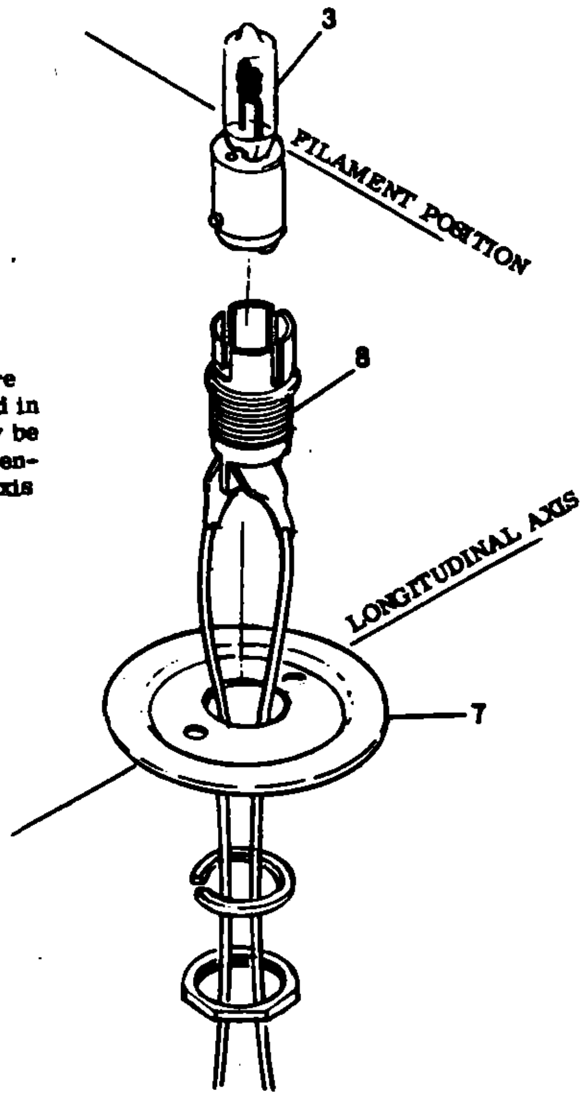
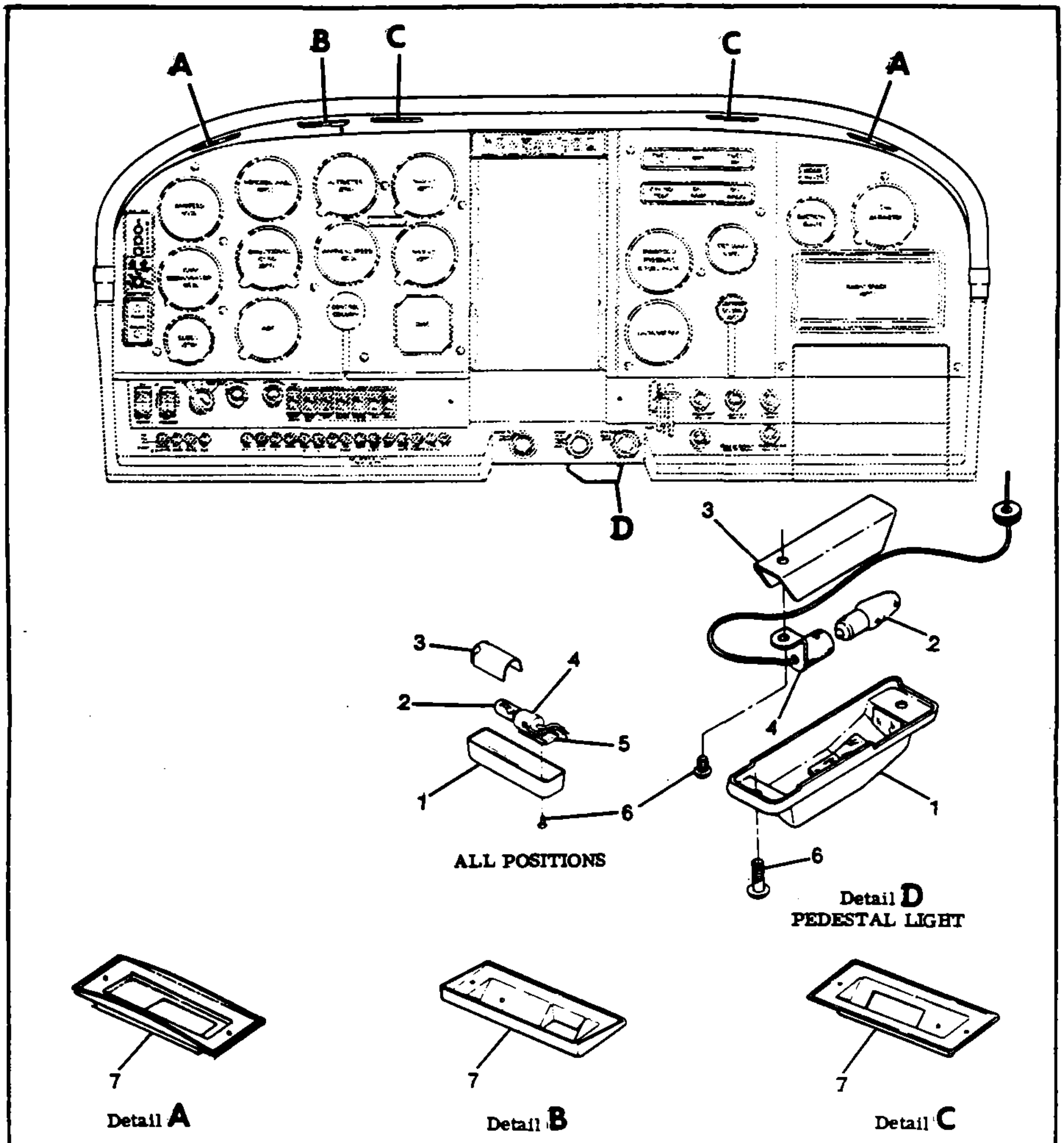


Figure 17-9. Flashing Beacon Light Installation (Sheet 2 of 2)



1. Housing
2. Lamp
3. Reflector
4. Lamp Socket
5. Tinnerman Nut
6. Tinnerman Screw
7. Housing - Cover

Figure 17-10. Instrument Panel Glare Shield and Pedestal Lighting Installation

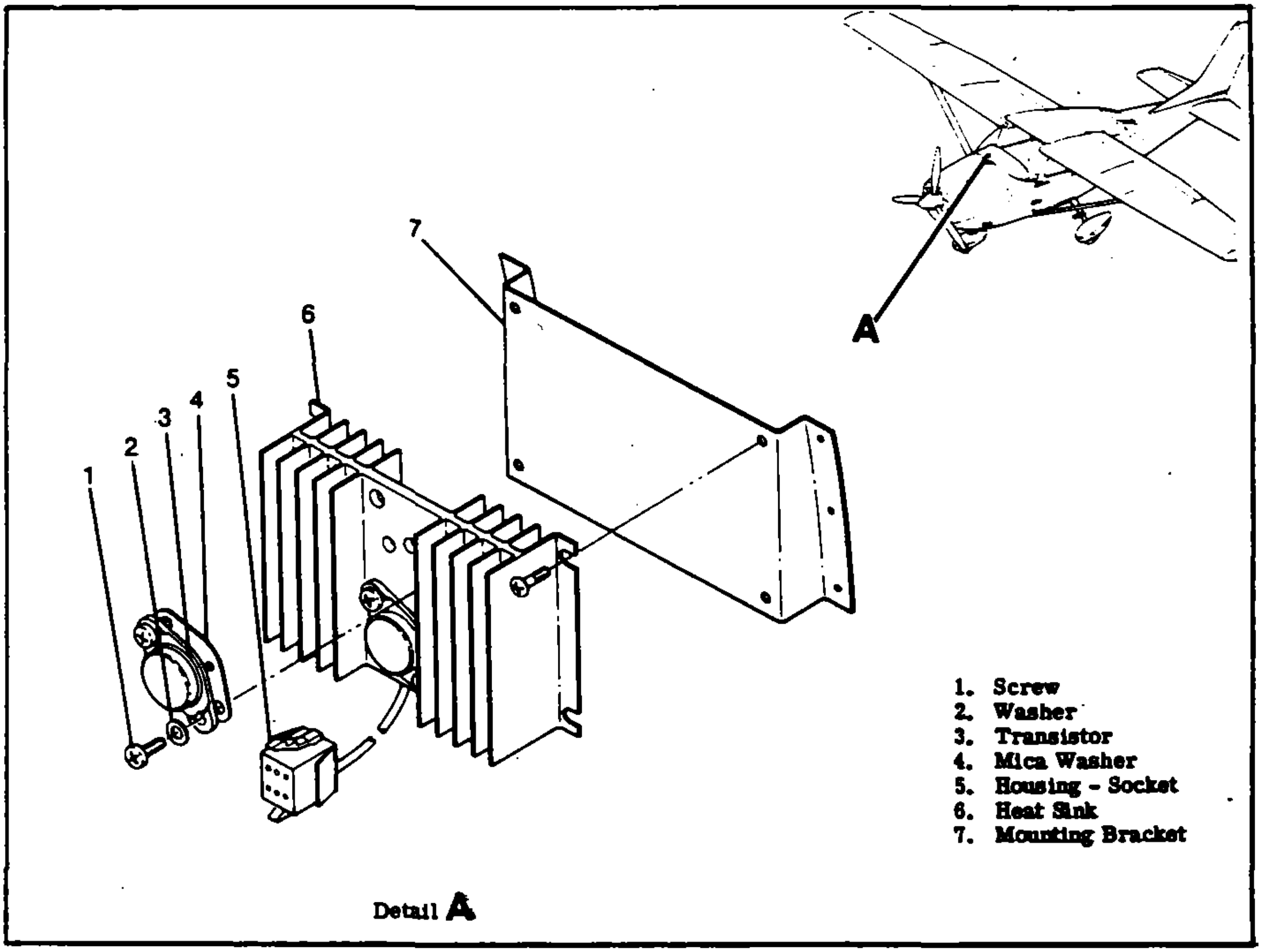


Figure 17-11. Transistorized Light Dimming Installation

panel, the comfort control panel and the audio control panel. The ac voltage required to drive the "EL" panels is supplied by a small inverta-pak (power supply) located behind the instrument panel on the right hand side. The intensity of "EL" panel lighting is controlled by the instrument light dimming rheostat located on the left hand lower instrument panel. A resistor is installed ahead of the rheostat as a load for the AC output of the EL inverter. Due to heat disspation, the resistor must be kept away from the wire bundle. Refer to figures 17-1 and 17-13.

17-85. PEDESTAL LIGHTS .

17-86. DESCRIPTION. The pedestal lights consist of two post type lights mounted on the pedestal to illuminate the rudder and elevator trim controls. The pedestal lights are controlled by the instrument light rheostat.

17-87. REMOVAL AND INSTALLATION. For removal and replacement of the pedestal lamp, slide the cap and lens assembly from the base. Slide the lamp from the socket and replace.

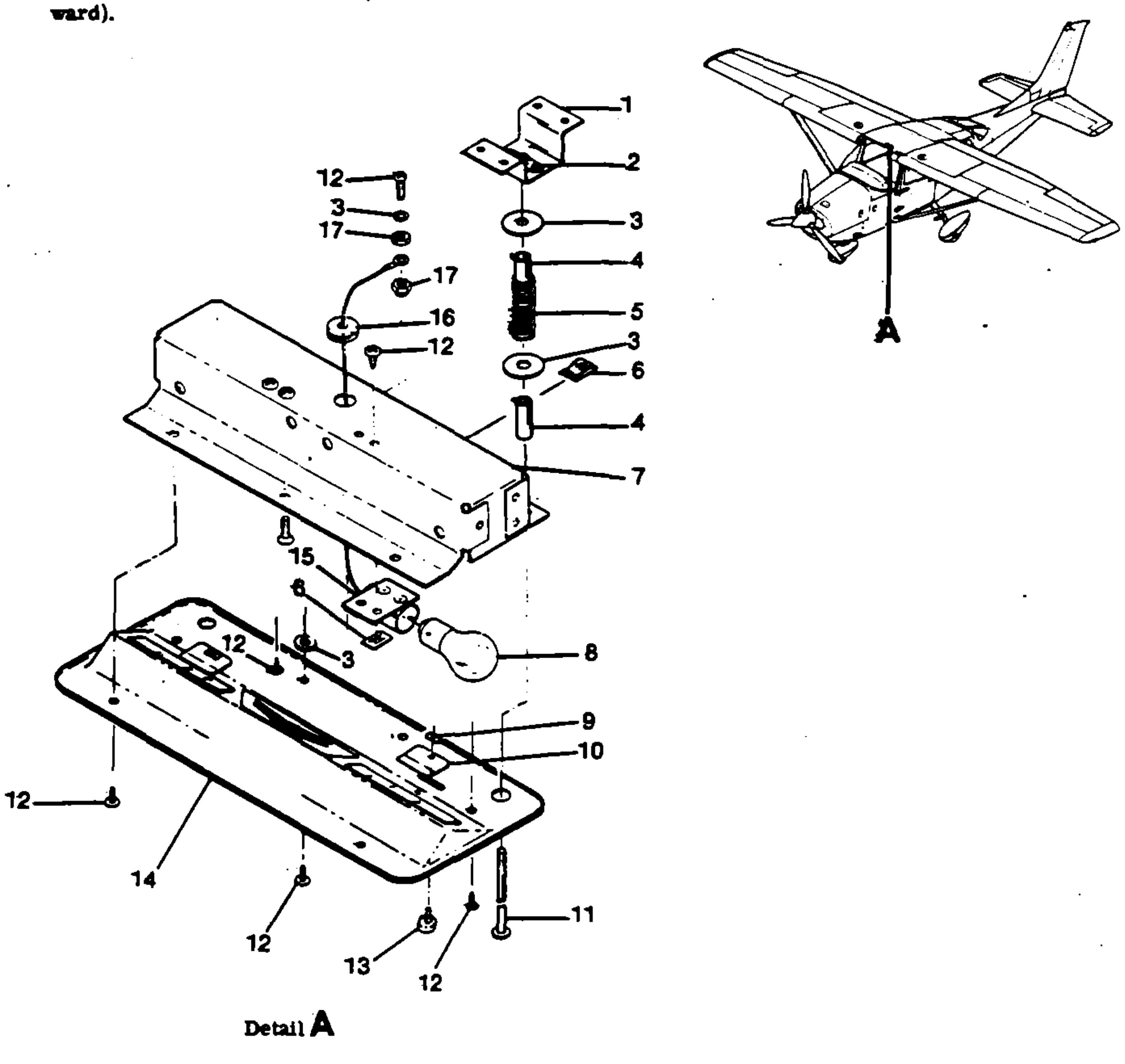
17-88. INSTRUMENT POST LIGHTING.

17-89. DESCRIPTION. Individual post lighting may be installed as optional equipment to provide for non-glare instrument lighting. The post light consists of a cap and a clear lamp assembly with a tinted lens. The intensity of the instrument post lights is controlled by the radio light dimming rheostat located on the switch panel.

17-90. REMOVAL AND INSTALLATION. For removal and replacement of the instrument post lamps, slide the cap and the lens assembly from the base. Slide the lamp from the socket and replace.

NOTE

Adjust the overhead map light so that the forward edge of the lighted area is 3.0 (±1.0) inches aft of the control wheel (when full forward).



1. Panel Light Bracket
2. Nutplate
3. Washer
4. Spacer
5. Spring
6. Tinnerman Nut
7. Panel Light Housing
8. Lamp
9. Clip
10. Slide Cover
11. Adjustment Screw
12. Screw
13. Slide Knob
14. Panel Light Cover
15. Lamp Socket
16. Grommet
17. Nut

Figure 17-12. Overhead Console Installation

NOTE

When installing postlight assemblies, assemblies shall be coated with RTV-102, General Electric, Waterford, New York, on forward side of panel where postlight could come in contact with sheet metal subpanel. This coating shall insulate postlight assembly from contact with airplane structure. Maximum coating thickness to be .03.

17-90A. TROUBLE SHOOTING - POSTLIGHTING.

TROUBLE	PROBABLE CAUSE	REMEDY
LAMP WILL NOT LIGHT.	Defective lamp.	1. Test lamp with ohmmeter or replace with a new lamp. If lamp is OK, proceed to step 2.
	Defective socket or open circuit.	2. With switch on, test socket. If defective, replace socket or wiring.
ONE SECTION OF LAMPS WILL NOT LIGHT.	Defective connector.	1. Test for voltage on lamp side of connector. If voltage is not present, check opposite side of connector. If voltage is present, replace pins and sockets as necessary. If voltage is not present, check connections at terminal block.
	Defective circuit in dimming assembly.	2. Refer to paragraph 17-90B.
	Defective rheostat.	3. Check voltage at output side of rheostat with battery switch on. Should read battery voltage with rheostat turned full clockwise. voltage should decrease as rheostat is turned counterclockwise. If no voltage is present or voltage has a sudden drop before rheostat has been turned full counterclockwise replace rheostat.
ALL LAMPS OUT.	Open circuit breaker.	1. With battery switch on, check circuit breaker. Reset if open. If circuit breaker is set, check voltage at output side of breaker. If no voltage is present, replace circuit breaker.
LAMPS WILL NOT DIM.	Defective resistor or rheostat.	1. Check resistor and rheostat for continuity and resistance value. Also, check transistors for partial short. Refer to paragraph 17-90B. Replace rheostat and transistor.

17-90B. TROUBLE SHOOTING - TRANSISTOR HEAT SINK. Remove heat sink from airplane. Check transistors for opens and shorts, check transistor sockets for evidence of shorting out against heat sink, especially on the bottom side. Check that legs of transistor socket have not been bent up against heat sink. If this has happened, you may see burned spot on the socket leg. If the transistor sockets and wiring appear to be in good condition, install transistor back in heat sink and make a continuity check. Attach one lead of an ohmmeter to the heat sink then check every pin of the pigtail plug with the other lead for continuity. (These should not be continuity). If continuity is found, this will burn out transistors immediately.

17-91. COURTESY LIGHTS.

17-92. DESCRIPTION. The lights consist of one light located on the underside of each wing to provide ground lighting around the cabin area. The courtesy lights have clear lens and are controlled by a single slide switch labeled, "Utility Lights," located on the left rear door post.

17-93. REMOVAL AND INSTALLATION. See figure 17-15 for removal and installation.

17-94. DOME LIGHT.

17-95. DESCRIPTION. The dome light is mounted aft of the overhead console. The assembly consists of a housing a socket, lamp and a cover. The light is controlled by a slide switch mounted on the cover aft of the light.

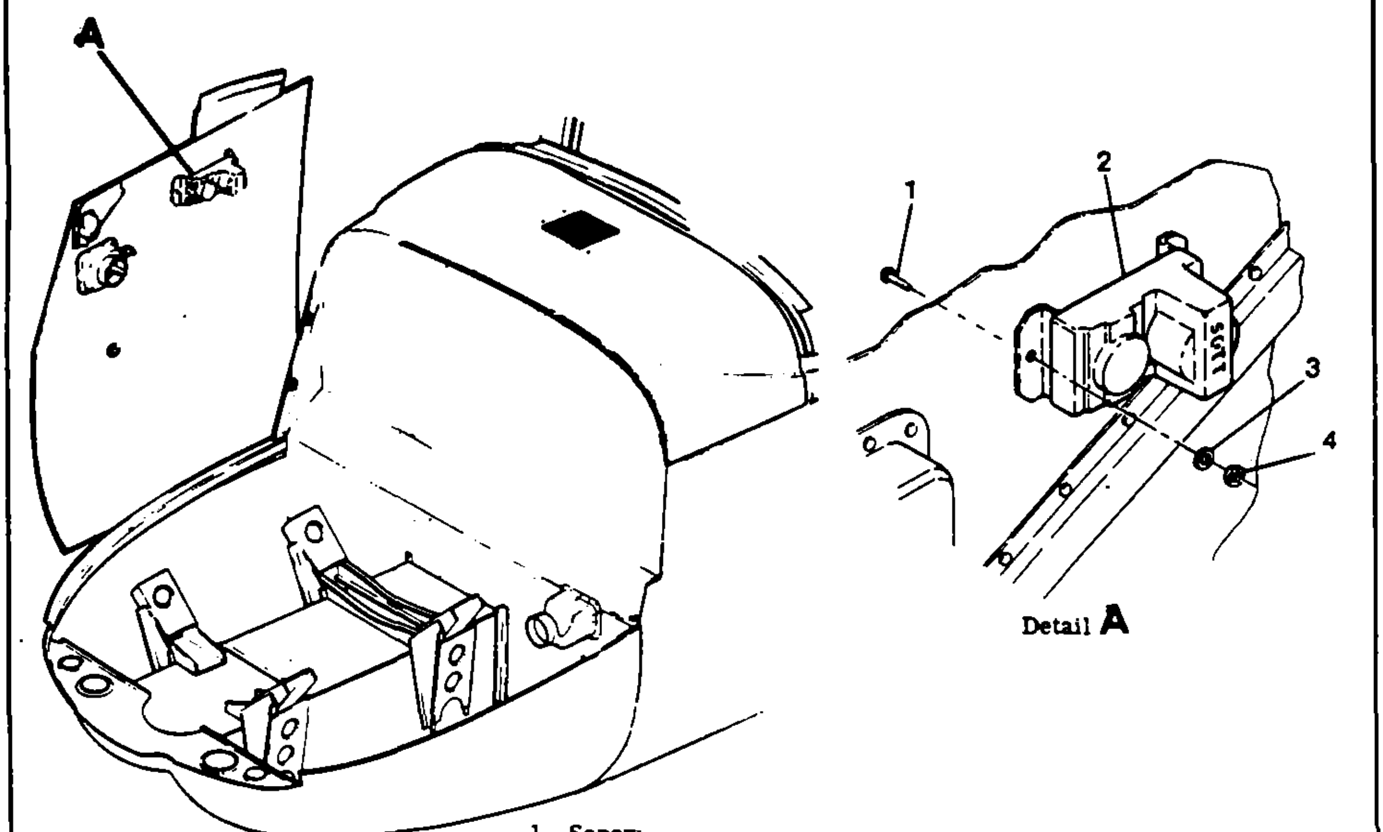
17-96. CONTROL WHEEL MAP LIGHT.

17-97. DESCRIPTION. The control wheel map light is internally mounted in the control wheel. A rheostat located on the lower right hand side of the wheel controls the light.

17-98. REMOVAL AND INSTALLATION. See figure 17-16. To remove lamp, push upward on the lamp and turn. The lamp and reflector are replaced as a unit.

17-99. COMPASS AND RADIO DIAL LIGHTS.

17-100. DESCRIPTION. The compass and radio dial lights are contained within the individual units. The



1. Screw
2. Inverta-pak. Power Supply
3. Washer
4. Nut

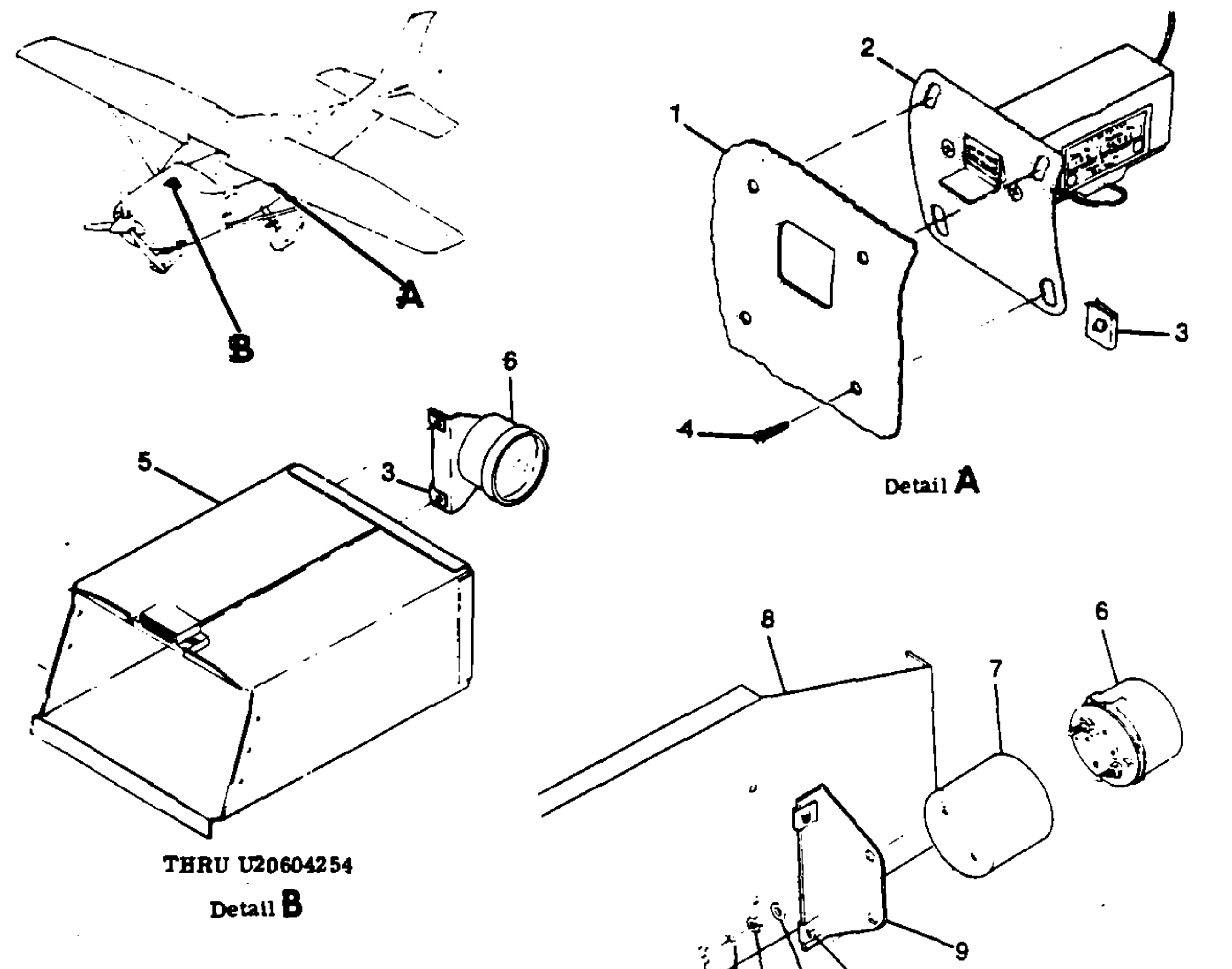
Figure 17-13. Electroluminescent Panel Inverta-pak Power Supply light intensity is controlled by the radio dial light dimming rheostat mounted on the lower left side of the instrument panel.

17-101. ELECTRIC CLOCK.

17-102. DESCRIPTION. The electric clock is connected to the battery through a 1-ampere fuse mounted adjacent to the battery box. The clock has a sweep second hand and is an electro-mechanical type which rewinds approximately every one and one-half minutes. Beginning with 1979 Models a digital clock may be installed. Refer to Pilots Operating Handbook for operating procedures.

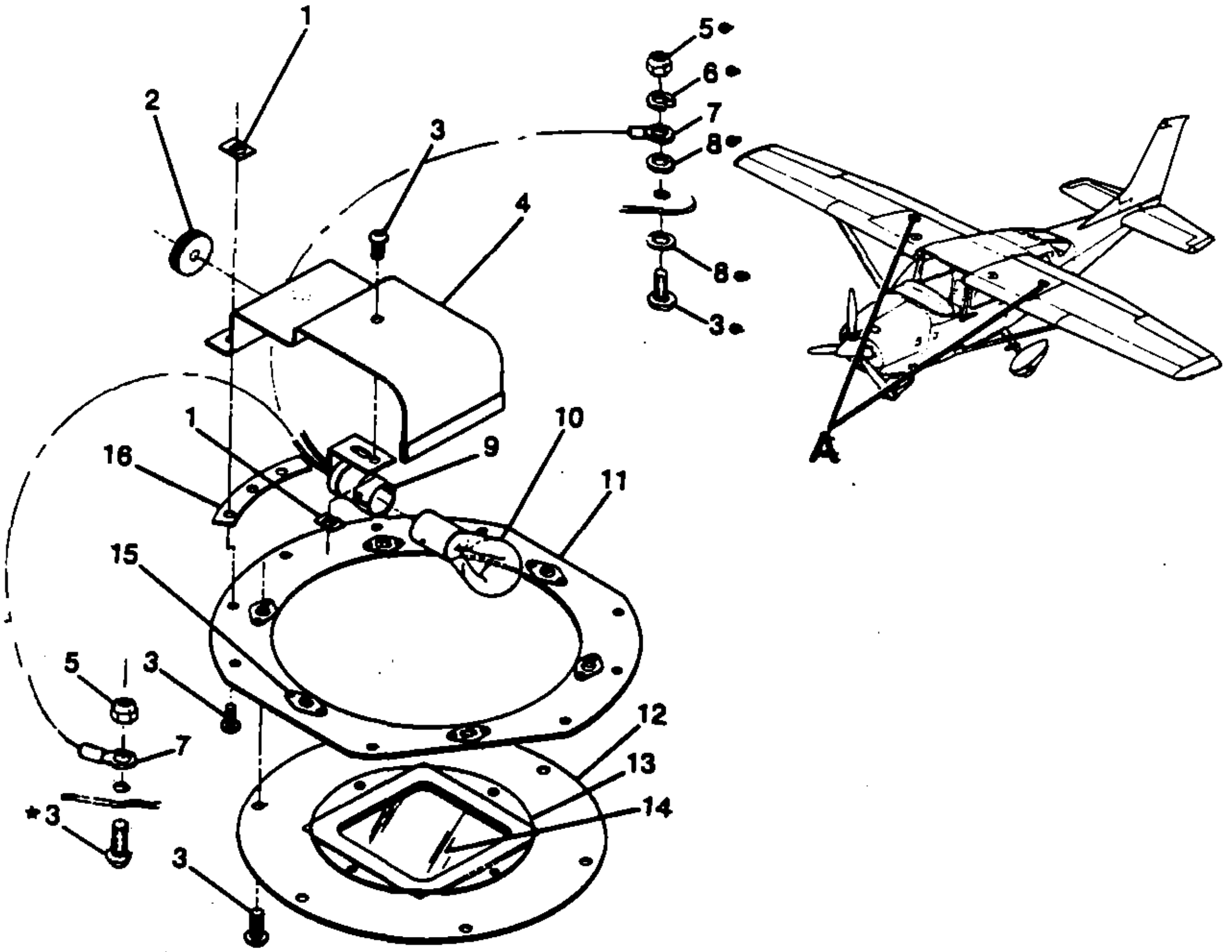
17-103. STALL WARNING SYSTEM.

17-104. DESCRIPTION. The stall warning circuit is comprised of a warning horn and an actuating switch. The switch is installed in the leading edge of the left wing and is actuated by airflow over the surface of the wing. The switch will close as a stall condition is approached, actuating the warning horn which is mounted on the glove box. The stall warning unit should actuate the stall warning horn approximately five to ten miles per hour above the aircraft stall speed. Install the lip of the warning unit approximately one-sixteenth of an inch below the centerline of the wing skin cutout. Test fly the aircraft to determine if the unit actuates the



1. Wing Skin
2. Actuator
3. Tinnerman Nut
4. Screw
5. Map Compartment
6. Stall Warning Horn
7. Cup
8. Panel Support
9. Bracket
10. Step Washer
11. Nut
12. Washer

Figure 17-14. Stall Warning, Actuator and Horn Installation.



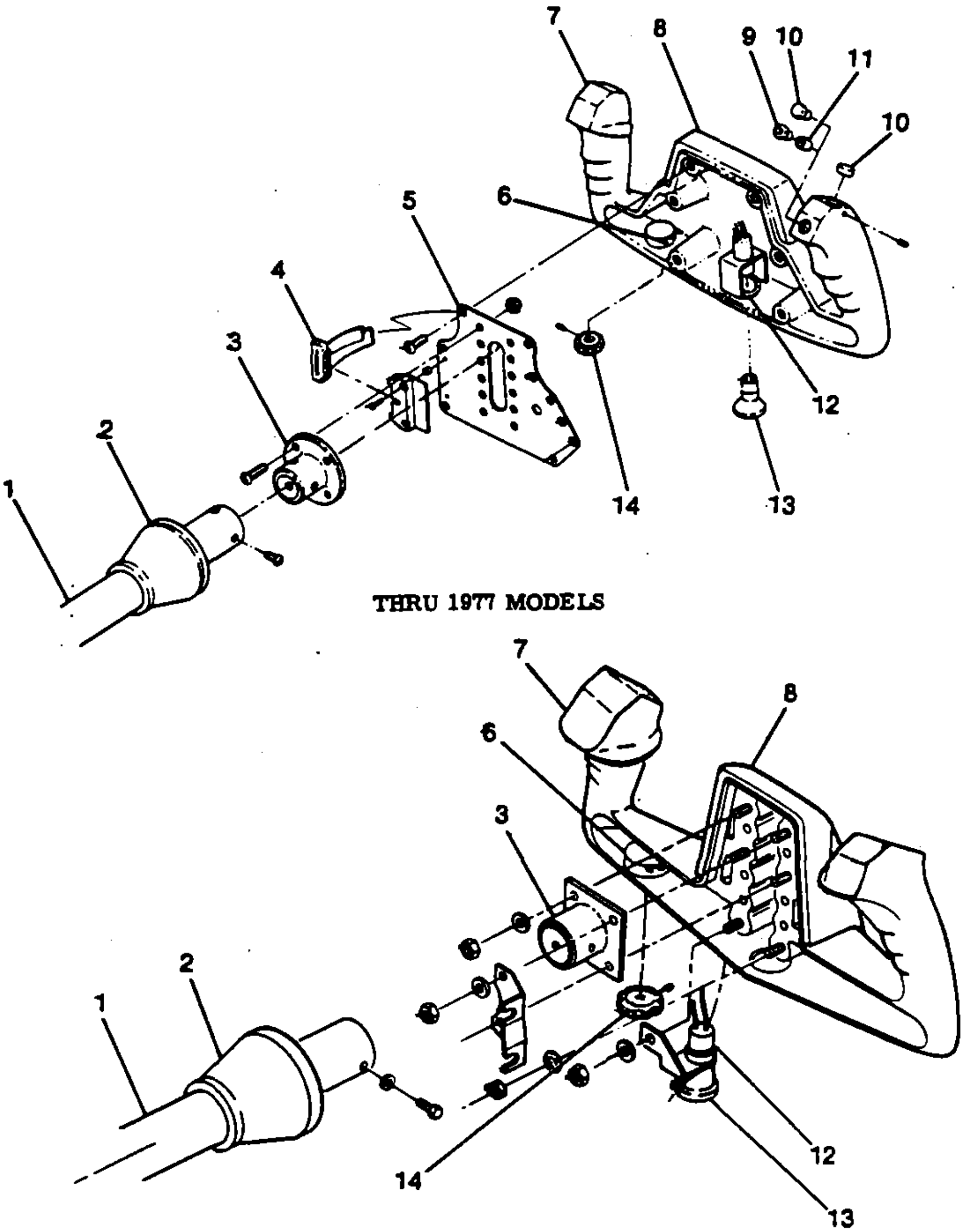
Detail A

* THRU 1978 MODELS

• BEGINNING WITH 1979 MODELS

1. Tinnerman Nut
2. Grommet
3. Screw
4. Reflector
5. Nut
6. Lockwasher
7. Ground Wire
8. Washer
9. Socket
10. Lamp
11. Doubler
12. Inspection Plate
13. Retainer
14. Lens
15. Nutplate
16. Spacer

Figure 17-15. Courtesy Light Installation.



THRU 1977 MODELS

BEGINNING WITH 1978 MODELS

1. Control Tube Assembly
2. Cover
3. Adapter
4. Connector
5. Plate
6. Map Light Rheostat
7. Control Wheel
8. Pad
9. Mike Switch
10. Plug
11. Insulator
12. Map Light Assembly
13. Lamp
14. Knob (Map Light)

Figure 17-16. Control Wheel Map Light Installation.

warning horn at the desired speed. If the unit actuates the warning horn at a speed in excess of ten miles per hour above stall speed, loosen the mounting screws and move the unit down. If the unit actuates the horn five miles per hour below stall speed, loosen the mounting screws and move the unit up.

17-105. PITOT AND STALL WARNING HEATERS.

17-106. DESCRIPTION. Electrical heater units are incorporated in some pitot tubes and stall warning switch units. The heaters offset the possibility of ice formations on the pitot tube and stall warning actuator switch. The heaters are integrally mounted in the pitot tube and the stall warning actuator switch. Both heaters are operated by the pitot heat switch.

17-107. REMOVAL AND INSTALLATION OF PITOT HEATER. Refer to Figure 17-17 for removal and installation.

17-108. CIGAR LIGHTER.

17-109. DESCRIPTION. A special circuit breaker is

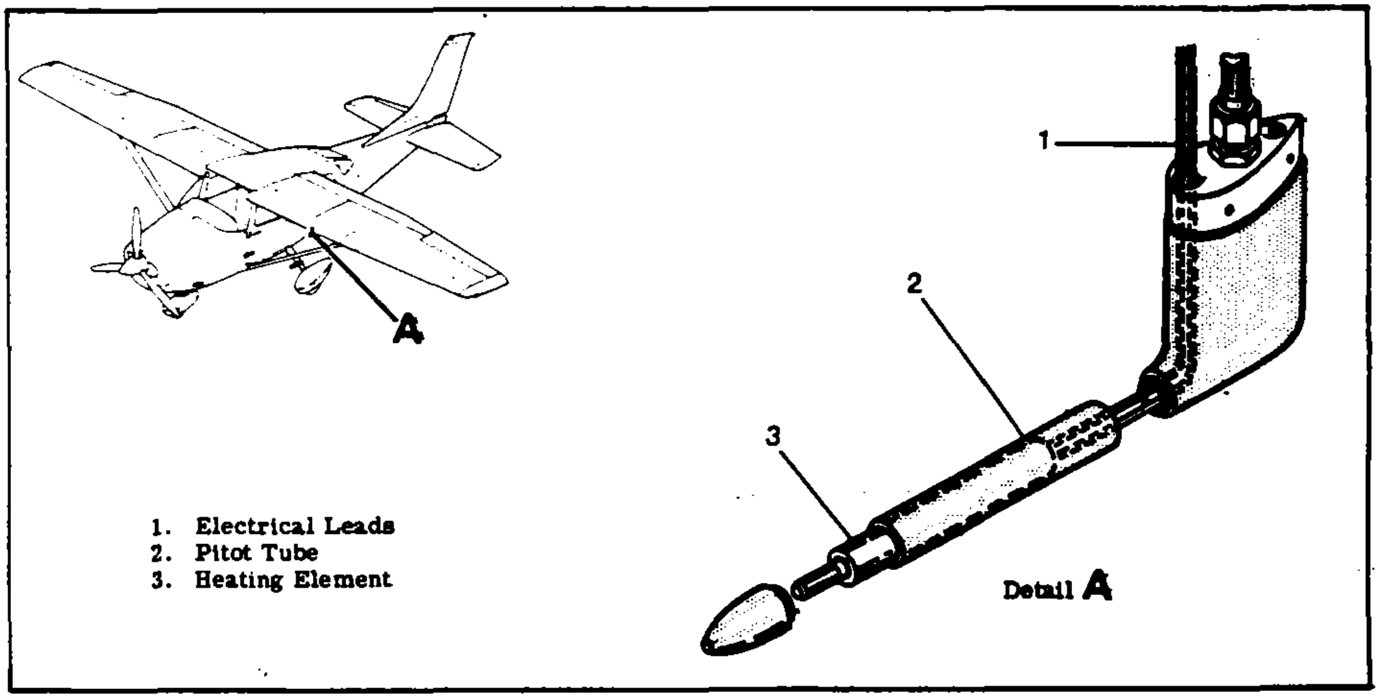


Figure 17-17. Pitot Heater Installation

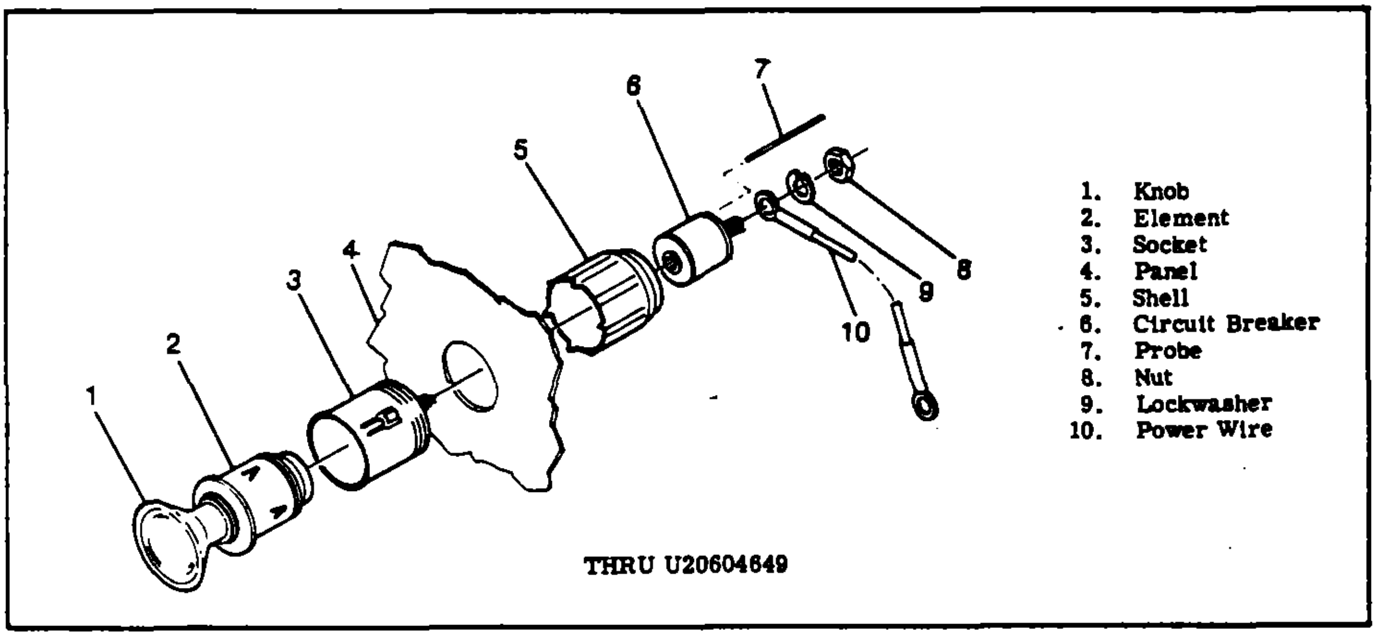


Figure 17-18. Cigar Lighter Installation

contained in a small cylinder screwed directly on the back of the cigar lighter socket. The circuit breaker is a bi-metallic type and is resettable. To reset a breaker, make sure that the master switch is off, then insert a small diameter pin (end of a paper clip works) into the hole in the phenolic back plate of the breaker and apply pressure. A small click will be heard when the breaker resets.

17-110. REMOVAL AND INSTALLATION. (See Figure 17-18.)

a. Ensure that the master switch is "OFF."
b. Remove cigar lighter element.
c. Disconnect wire on back of lighter.
d. Remove shell that screws on socket back of panel.
e. The socket will then be free for removal.
f. To install a cigar lighter, reverse this procedure.

17-111. SKYDIVING KIT.

17-112. DESCRIPTION. The kit consists of a spoiler, sky diver steering switch, and a steering signal light console. The spoiler is installed on the door hinges of the removed front cargo door to minimize the strong air flow buffeting within the cabin when cargo doors are removed. The rocker-type steering switch is mounted inside the cabin on the upper sill of the cargo door opening and is used by the sky diver to signal the pilot of his desired flight path over the drop zone. A steering signal light console, with red and green lights controlled by operation of the steering switch, is mounted on top of the instrument panel. Illumination of the red light indicates to the pilot that the diver desires that the aircraft be steered left; conversely, a green light shows that the pilot is to steer right. Removal of the cargo doors necessitates the installation of a depressor plate over the wing flap circuit interrupt switch to permit flap operation with doors removed. (Under normal operations with the cargo door installed the switch prevents flap operation whenever the front cargo door is open to prevent accidental damage to the door or wing flap if the flaps are lowered.)

17-113. REMOVAL AND INSTALLATION. For removal and installation of skydiving kit, refer to Figure 17-19. Refer to wing flap wiring diagrams in the Wiring Section of this manual for wiring associated with the flap circuit interrupt switch.

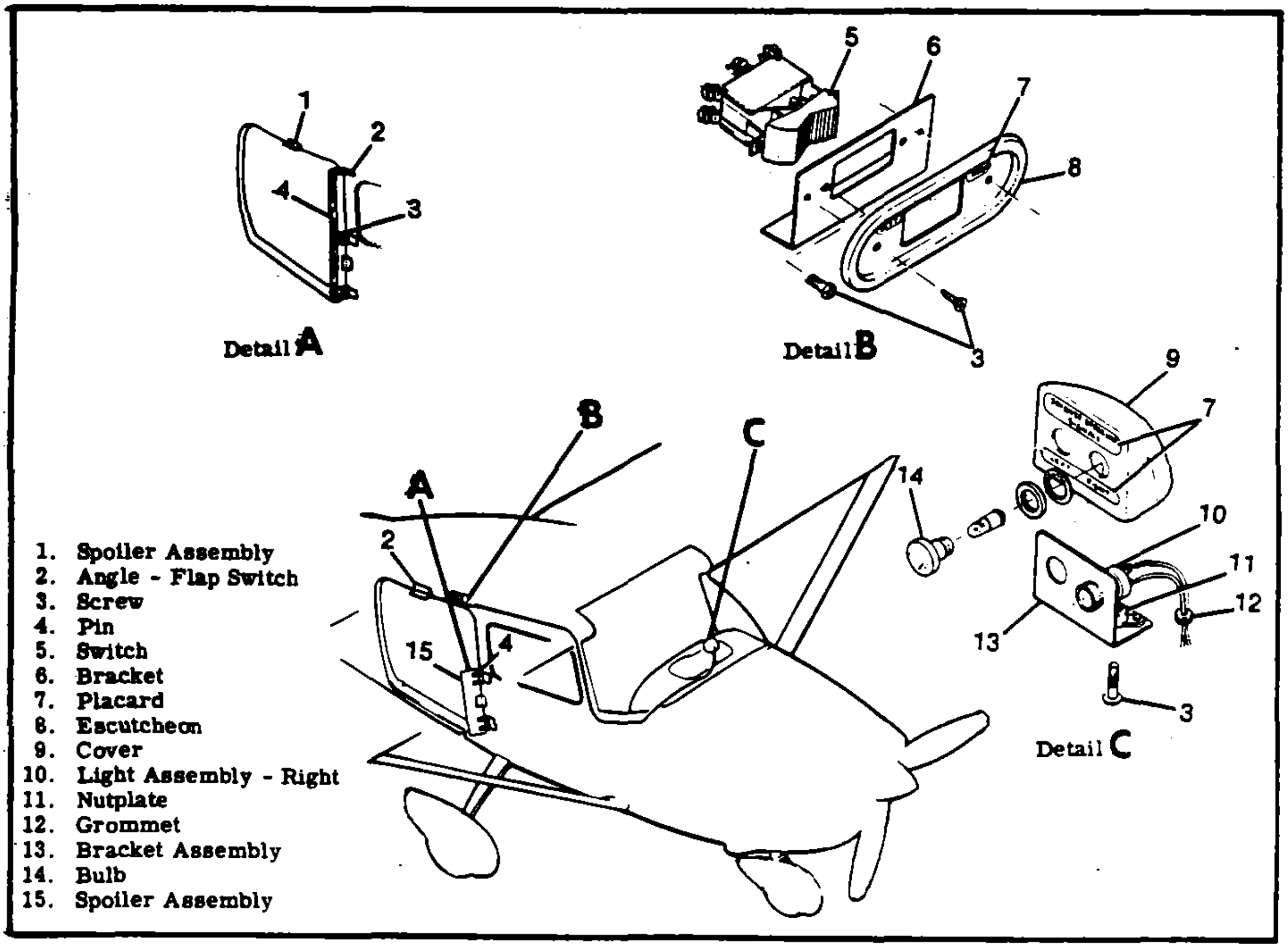
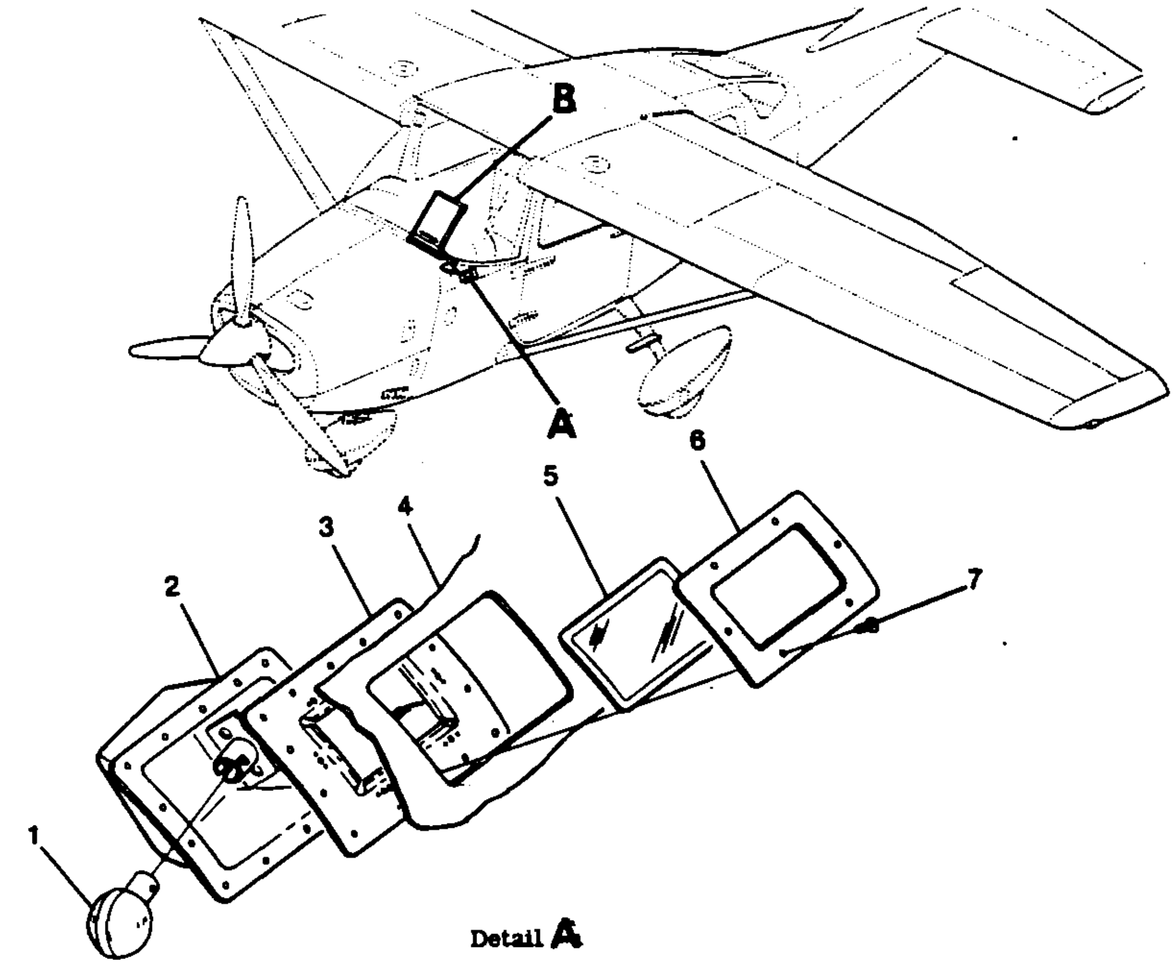


Figure 17-19. Sky Diving Components Equipment Installation



1. Lamp
2. Bracket Assembly
3. Doubler
4. Cabin Skin
5. Lens
6. Cover
7. Screw

Figure 17-20. Ice Detector Light Installation.

17-114. ICE DETECTOR LIGHT.

17-115. DESCRIPTION. An optional ice detector light may be installed on the left hand side of the fuselage forward of the cabin door. The ice detector light will illuminate the leading edge of the left wing so the pilot can visually detect ice formation on the wing. A rocker type switch located below the pilots control wheel controls the ice detector light.

17-116. REMOVAL AND INSTALLATION. See figure 17-20 for removal and installation.

17-117. EMERGENCY LOCATOR TRANSMITTER. THRU U20603658.

17-118. DESCRIPTION. The ELT is a self-contained, solid state unit, having its own power supply, with an externally mounted antenna. The C589510-0209 transmitter is designed to transmit simultaneously on dual emergency frequencies of 121.5 and 243.0 Megahertz. The C589510-0211 transmitter used for Canadian registry, operates on 121.5 only. The unit is mounted in the tailcone, aft of the baggage curtain on the right hand side. The transmitters are designed to provide a broadcast tone that is audio modulated in a swept manner over the range of 1600 to 300 Hz in a distinct, easily recognizable distress signal for reception by search and rescue personnel and others monitoring the emergency frequencies. Power is supplied to the transmitter by a battery-pack which has the service life of the batteries placarded on the batteries and also on the outside end of the transmitter. ELT's are equipped with a battery-pack containing four lithium "D" size batteries which are stacked in two's (See figure 17-22). The ELT exhibits line of sight transmission characteristics which correspond approximately to 100 miles at a search altitude of 10,000 feet. When battery inspection and replacement schedules are adhered to, the transmitter will broadcast an emergency signal at rated power (75 MW-minimum), for a continuous period of time as listed in the following table.

TRANSMITTER LIFE
TO 75 MILLIWATTS OUTPUT

Temperature	4 Cell Lithium Battery Pack
+130°F	115 hrs
+ 70°F	115 hrs
- 4°F	95 hrs
- 40°F	23 hrs

Battery-packs have a normal shelf life of five to ten (5-10) years and must be replaced at 1/2 f normal shelf life in accordance with TSO-C91. Cessna specifies 5 years replacement of lithium (4-cell) battery packs.

17-119. OPERATION. A three position switch on the forward end of the unit controls operation. Placing the switch in the ONposition will energize the unit to start transmitting emergency signals. In the OFF position, the unit is inoperative. Placing the switch in the ARM position will set the unit to start transmitting emergency signals only after the unit has received a 5g (tolerances are +2g and -0g) impact force, for a duration of 11-16 milliseconds.

CAUTION

Do not leave the emergency locator transmitter in the ON position longer than 5 seconds or you may activate downed aircraft procedures by C.A.P., D.O.T. or F.A.A. personnel.

17-120. CHECKOUT INTERVAL:

100 HOURS.

a. Turn aircraft master switch ON.
b. Turn aircraft transceiver ON and set frequency on receiver to 121.5 MHz.
c. Remove the ELT's antenna cable from the ELT unit.
d. Place the ELT's function selector switch in the ON position for 5 seconds or less. Immediately replace the ELT function selector switch in the ARM position after testing ELT.
e. Test should be conducted only within the time period made up of the first five minutes after any hour.

CAUTION

Tests with the antenna connected should be approved and confirmed by the nearest control tower.

NOTE

Without its antenna connected, the ELT will produce sufficient signal to reach your receiver, yet it will not disturb other communications or damage output circuitry.

NOTE

After accumulated test or operation time equals 1 hour, battery-pack replacement is required.

f. Check calendar date for replacement of battery-pack. This date is supplied on a sticker attached to the outside of the ELT case and to each battery.

17-121. REMOVAL AND INSTALLATION OF TRANSMITTER. (See figure 17-21.)

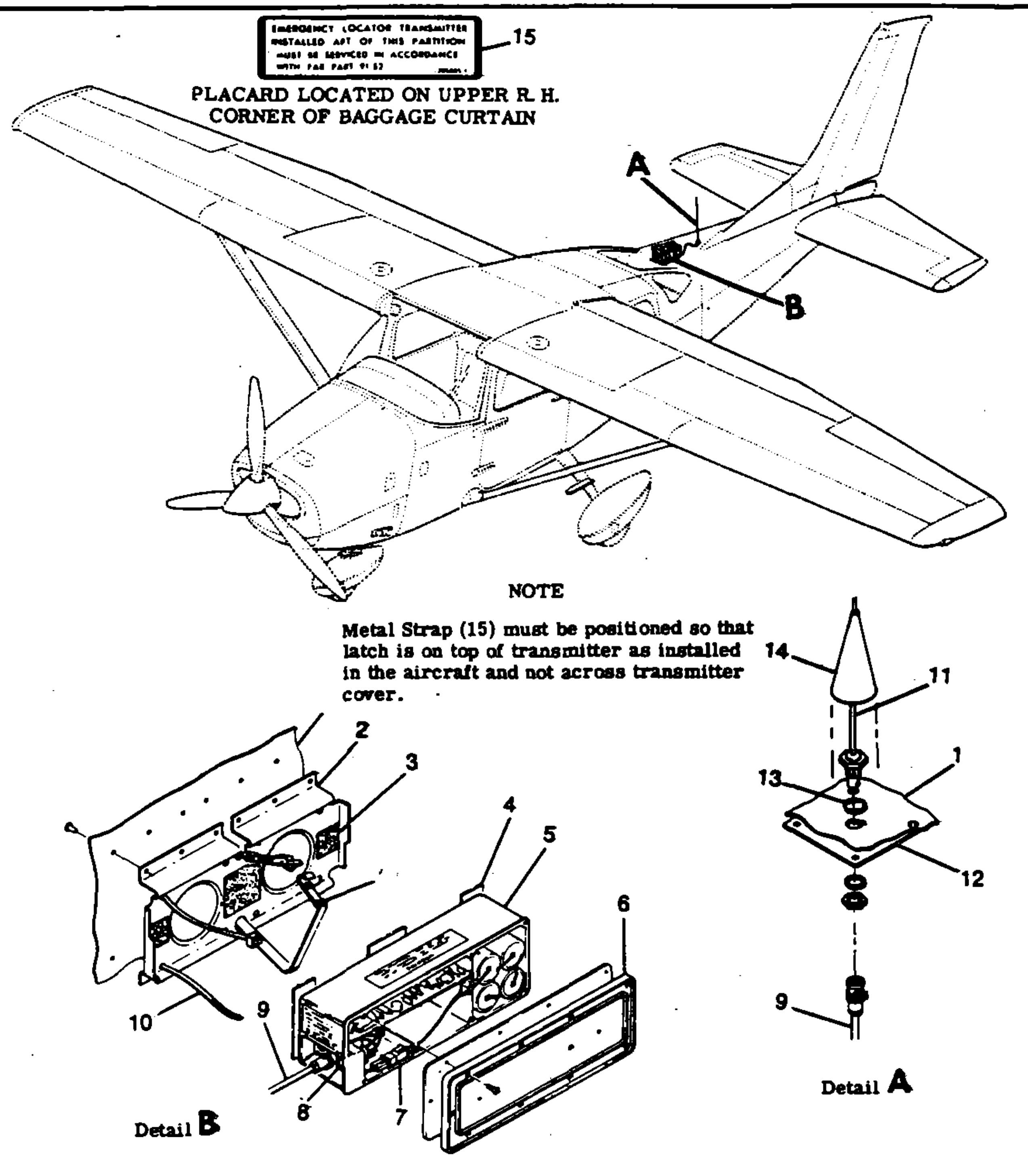
a. Remove baggage curtain to gain access to the transmitter and antenna.
b. Disconnect co-axial cable from end of transmitter.
c. Cut sta-strap securing antenna cable and unlatch metal strap to remove transmitter.

CAUTION

The C589511-0111 and C589511-0119 co-axial cable must be installed as indicated on the cable sleeve. Cable end marked "TO ANT" must be connected to the ELT antenna, and the end marked "TO ELT" must be connected to the C589511-0113/-0117 and C589511-0103/-0104 transmitters.

NOTE

Transmitter is also attached to the mounting bracket by velcro strips; pull transmitter to free from mounting bracket and velcro.



NOTE

Metal Strap (15) must be positioned so that latch is on top of transmitter as installed in the aircraft and not across transmitter cover.

1. Tailcone Skin
2. Bracket
3. Fabric Fastener - Hook
4. Fabric Fastener - Pile
5. Transmitter
6. Cover
7. Connector
8. Arm Switch
9. Antenna
10. Sta-strap
11. Antenna
12. Doubler
13. Rubber Washer
14. Rubber Boot
15. Placard

Figure 17-21. Emergency Locator Transmitter Installation.

NOTE

To replace velcro strips, clean surface thoroughly with clean cloth saturated in one of the following solvents: Trichloric thylene, Aliphatic Napthas, Methyl Ethyl Ketone or Enmar 6094 Lacquer Thinner. Cloth should be folded each time the surface is wiped to present a clean area and avoid redepositing of grease. Wipe surface immediately with clean dry cloth, do not allow solvent to dry on surface. Apply Velcro #40 adhesive to each surface in a thin even coat and allow to dry until quite tacky, but no longer transfers to the finger when touched (usually between 5 and 30 minutes). Porous surfaces may require two coats. Place the two surfaces in contact and press firmly together to insure intimate contact. Allow 24 hours for complete cure.

d. To reinstall transmitter, reverse preceding steps.

NOTE

An installation tool is required to properly secure sta-strap. This tool may be purchased locally or ordered from the Pandiut Corporation, Tinley Park, Ill., part number GS-2B (Conforms to MS90387-1).

CAUTION

Ensure that the direction of flight arrows (placarded on the transmitter) are pointing towards the nose of the aircraft.

17-122. REMOVAL AND INSTALLATION OF ANTENNA. (See figure 17-21.)

a. Disconnect co-axial cable from base of antenna.
b. Remove the nut and lockwasher attaching the antenna base to the fuselage and the antenna will be free for removal.
c. To reinstall the antenna, reverse the preceding steps.

NOTE

Upon reinstallation of antenna, cement rubber boot (14) using RTV102, General Electric Co. or equivalent, to antenna whip only; do not apply adhesive to fuselage skin or damage to paint may result.

17-123. REMOVAL AND INSTALLATION OF LITHIUM FOUR (4) CELL BATTERY-PACK. (See figure 17-22.)

NOTE

Transmitters equipped with the 4 cell battery-pack can only be replaced with another 4 cell battery-pack.

NOTE

When existing battery fails or exceeds normal expiration date, convert ELT System to new D/M alkaline powered ELT per Avionics Service Letter AV78 31 Dated November 20, 1978.

a. After the transmitter has been removed from aircraft in accordance with para. 17-121, place the transmitter switch in the OFF position.
b. Remove the nine screws attaching the cover to the case and then remove the cover to gain access to the battery-pack.

NOTE

Retain the rubber gasket and screws for reinstallation.

c. Disconnect the battery-pack electrical connector and remove battery-pack.
d. Place new battery-pack in the transmitter with four batteries as shown in the case in figure 17-22.
e. Connect the electrical connector as shown in figure 17-22.

NOTE

Before installing the new 4 cell battery-pack, check to ensure that its voltage is 11.2 volts or greater.

CAUTION

It is desireable to replace adhesive material on the 4 cell battery-pack, use only 3M Jet Melt Adhesive #3738. Do not use other adhesive materials since other materials may corrode the printed circuit board assembly.

f. Replace the transmitter cover and gasket.
g. Remove the old battery-pack placard from the end of transmitter and replace with new battery-pack placard supplied with the new battery-pack.

CAUTION

Be sure to enter the new battery-pack expiration date in the aircraft records. It is also recommended this date be placed in your ELT Owner's Manual for quick reference.

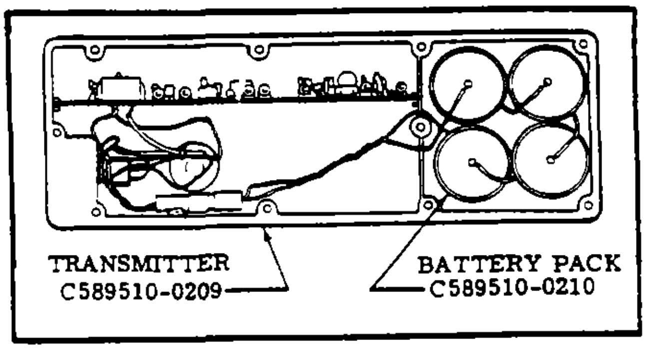


Figure 17-22. Lithium 4 Cell

17-123A. G SWITCH OPERATIONAL CHECK.

a. Remove emergency locator beacon transmitter from aircraft in accordance with paragraph 17-121.

b. While holding transmitter in one hand, sharply strike the end of the case in the direction of activation, indicated on the case of the transmitter.

1. Verify that the G switch has been actuated.

c. Reset the G switch.

d. Reinstall transmitter in aircraft in accordance with paragraph 17-121.

17-124. TROUBLE SHOOTING. Should your Emergency Locator Transmitter fail the 100 Hours performance checks, it is possible to a limited degree to isolate the fault to a particular area of the equipment. In performing the following trouble shooting procedures to test peak effective radiated power, you will be able to determine if battery replacement is necessary, or if your unit should be returned to your dealer for repair.

TROUBLE	PROBABLE CAUSE	REMEDY
*POWER LOW	Low battery voltage.	1. Set toggle switch to OFF. 2. Remove plastic plug from the remote jack and by means of a Switchcraft #750 jackplug, connect a Simpson 260 model voltmeter and measure voltage. If battery-pack voltage is 11.2 volts or less, the battery-pack is below specifications.
	Faulty transmitter.	3. If the battery-pack voltage meets the specifications in step 2., the battery-pack is O.K. If the battery is O.K., check the transmitter as follows: a. Remove the voltmeter. b. By means of a Switchcraft 750 jackplug and 3 inch maximum long leads, connect a Simpson Model 1223 ammeter to the jack. c. Set the toggle switch to ON and observe the ammeter current drain. If the current-drain is in the 85-100 ma range, the transmitter or the coaxial cable is faulty.
	Faulty coaxial antenna cable	4. Check coaxial antenna cable for high resistance joints. If this is found to be the case, the cable should be replaced.

*This test should be carried out with the coaxial cable provided with your unit.

17-125. EMERGENCY LOCATOR TRANSMITTER. BEGINNING WITH U20603659.

17-126. DESCRIPTION. The ELT is a self-contained, solid state unit, having its own power supply with an externally mounted antenna. The unit is mounted in the tailcone, aft of the baggage curtain on the right hand side. The transmitters are designed to provide a broadcast tone that is audio modulated in a swept manner over the range of 1600 to 300 Hz in a distinct, easily recognizable distress signal for reception by search and rescue personnel and others monitoring the emergency frequencies. The ELT exhibits line of sight transmission characteristics which correspond approximately to 100 miles at a search altitude of 10,000 feet. The C589511-0103 transmitter, and the C589511-0104 transmitter on aircraft with Canadian registry, are used thru U20604649. The C589511-0117 transmitter, and the C589511-0113 transmitter on aircraft with Canadian registry, are used on U206-04650 thru U20606727. Beginning with U20606728 the C589512-0103 transmitter is used on all aircraft.

The C589511-0104 transmits on 121.5 MHz at 25 mw rated power output for 100 continuous hours in the temperature range of -40°F (-40°C to + 55°C). The C589511-0113 transmits on 121.5 MHz at 25 mw rated power output for continuous hours in the temperature range of -4°F to + 131°F (-20°C to + 55°C). The C589511-0103 transmits on 121.5 and 243.0 MHz simultaneously at 75 mw rated power output for 48 continuous hours in the temperature range of -40°F to + 131°F (-40°C to + 55°C). The C589511-0117 and C589512-0103 transmits on 121.5 and 343.0 MHz at 75 mw rated power output for 48 continuous hours in the temperature range of -4°F to + 131°F (-20°C to + 55°C).

Power is supplied to the transmitter by a battery-pack. The C589511-0104 and C589511-0103 ELT's equipped with a lithium battery-pack must be modified by SK185-20 as outlined in Avionics Service Letter AF78-31, dated 20 November 1981, to incorporate alkaline battery-packs. The C589511-0114 alkaline battery-packs have the service life of the battery-pack stamped on the battery-pack, on the end of the transmitter below the switch and on top of the transmitter. The C589512-0107 alkaline battery-packs have the replacement date and date of installation on the top of the transmitter.

17-127. OPERATION. A three position switch on the forward end of the unit controls operation. Placing the switch in the ON position will energize the unit to start transmitting emergency signals. In the OFF position, the unit is inoperative. Placing the switch in the ARM position will set the unit to start transmitting emergency signals only after the unit has received a 5g (tolerances are +2g and -0g) impact force, for a duration of 11-16 milliseconds.

CAUTION

Do not leave the emergency locator transmitter in the ON position longer than 1 second (3 sweeps of the warble tone) or you may activate downed aircraft procedures by C.A.P., D.O.T. or F.A.A. personnel.

17-128. CHECKOUT INTERVAL:

100 HOURS OR THREE MONTHS, WHICHEVER COMES FIRST.

a. Turn aircraft master switch ON.
b. Turn aircraft transceiver ON and set frequency on receiver to 121.5 MHz.
c. Remove the ELT's antenna cable from the ELT unit.
d. Place the ELT's function selector switch in the ON position for 5 seconds or less. Immediately replace the ELT function selector switch in the ARM position after testing ELT.
e. Test should be conducted only within the time period made up of the first five minutes after any hour.

CAUTION

Tests with the antenna connected should be approved and confirmed by the nearest control tower. The F.A.A./D.O.T. allows free space transmission tests from the aircraft anytime within five minutes after each hour. The test time allowed is generally three sweeps of the warble tone, or approximately one second. The control tower should be notified that a test is about to be performed.

NOTE

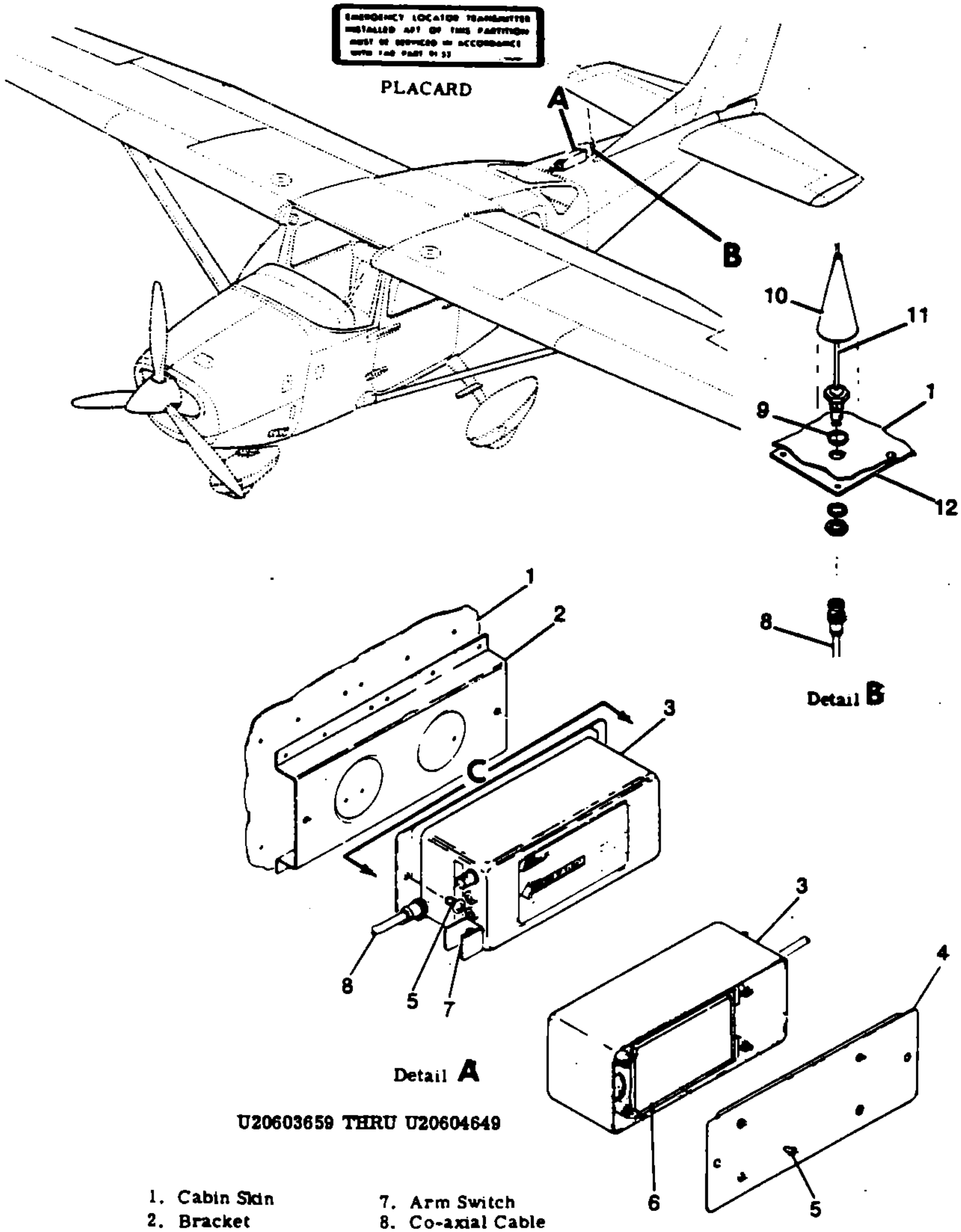
Without its antenna connected, the ELT will produce sufficient signal to reach your receiver, yet it will not disturb other communications or damage output circuitry.

NOTE

After accumulated test or operation time equals 1 hour, battery-pack replacement is required.

f. Check calendar date for replacement of battery-pack. This date is supplied on a sticker attached to the outside of the ELT case and to each battery.

17-129. REMOVAL AND INSTALLATION OF TRANSMITTER. (See figure 17-23.)
a. Remove baggage curtain to gain access to the transmitter and antenna.
b. Disconnect co-axial cable from end of transmitter.
c. Remove the two #10 screws from the baseplate of the ELT and remove ELT.
d. To reinstall transmitter, reverse preceding steps.



1. Cabin Skin
2. Bracket
3. Transmitter
4. Cover
5. Screw
6. Battery Pack
7. Arm Switch
8. Co-axial Cable
9. Rubber washer
10. Rubber Boot
11. Antenna
12. Doubler

Figure 17-23. Emergency Locator Transmitter. (Sheet 1 of 3)

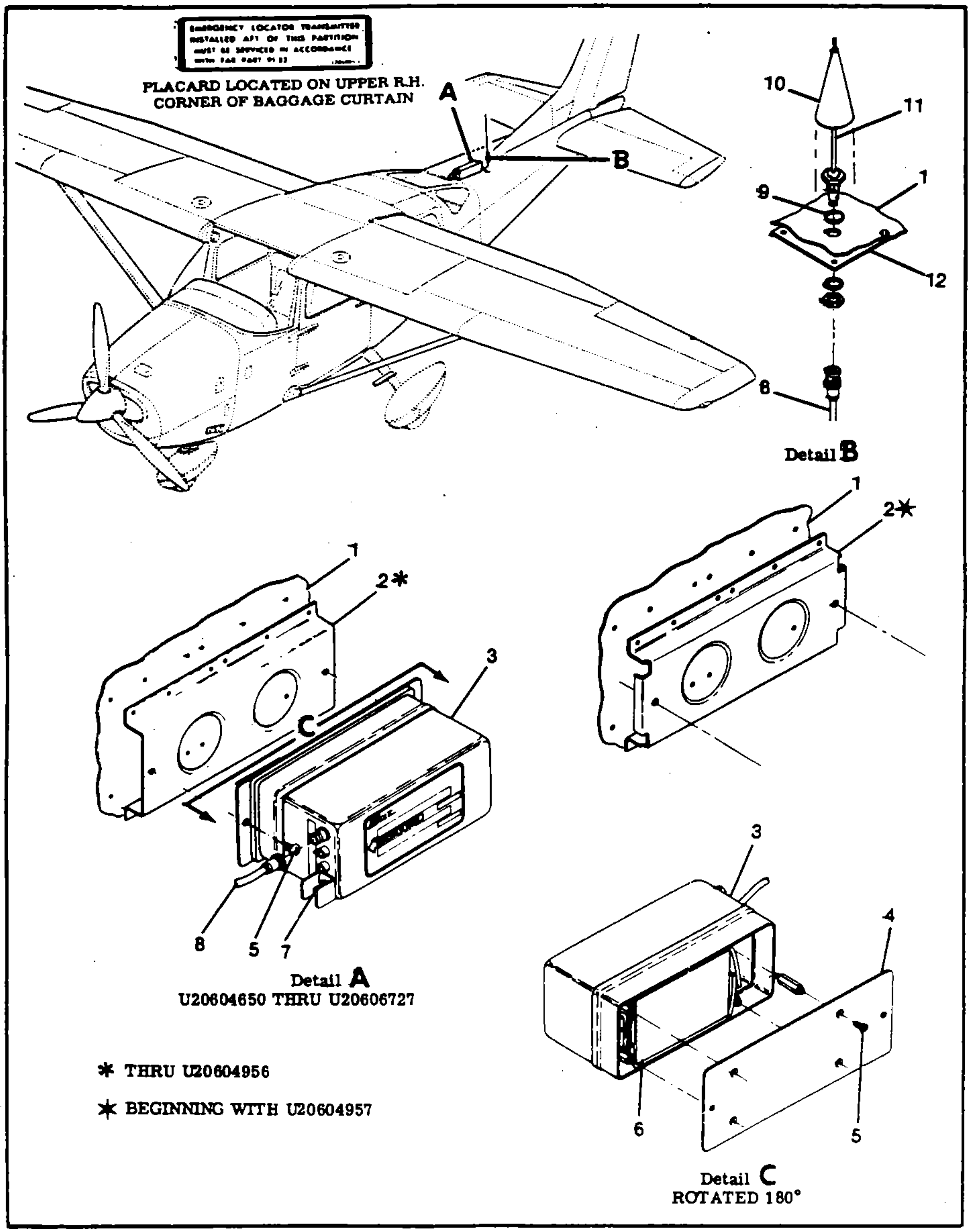


Figure 17-23. Emergency Locator Transmitter. (Sheet 2 of 3)

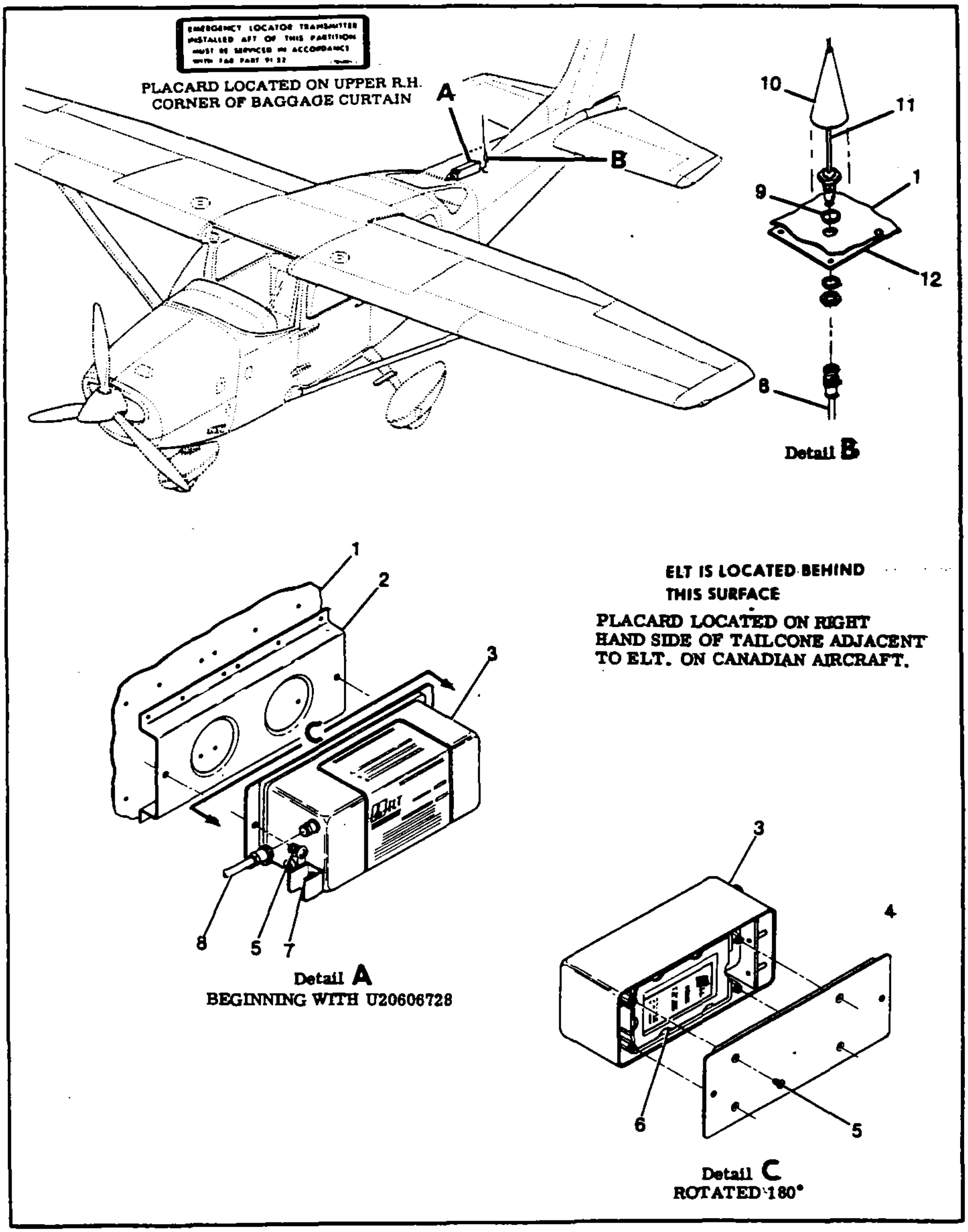


Figure 17-23. Emergency Locator Transmitter. (Sheet 3 of 3)

CAUTION

Ensure that the direction of flight arrows (placarded on the transmitter) are pointing towards the nose of the aircraft.

17-130. REMOVAL AND INSTALLATION OF ANTENNA. (See figure 17-23.)

a. Disconnect co-axial cable from base of antenna.

b. Remove the nut and lockwasher attaching the antenna base to the fuselage and the antenna will be free for removal.

CAUTION

The C589511-0111 and C589511-0119 co-axial cable must be installed as indicated on the cable sleeve. Cable end marked "TO ANT" must be connected to the ELT antenna, and the end marked "TO ELT" must be connected to the C589511-0113/-0117 and C589511-0103/-104 transmitters.

NOTE

Upon reinstallation of antenna, cement rubber boot (14) using RTV 102, General Electric Co. or equivalent, to antenna whip only; do not apply adhesive to fuselage skin or damage to paint may result.

17-131. REMOVAL AND INSTALLATION OF BATTERY PACK. (See figure 17-24.)

NOTE

Transmitters equipped with the C589511-0105 or C589511-0106 battery packs can only be replaced with a C589511-0114 after modification by SK185-20 has been completed.

CAUTION

Lithium battery-pack must be replaced with alkaline battery-packs per SK185-20.

a. After the transmitter has been removed from aircraft in accordance with para. 17-129, place the transmitter switch in the OFF position.

b. Remove the four screws attaching the cover to the case and then remove the cover to gain access to the battery-pack.

c. Disconnect the battery-pack electrical connector and remove battery-pack.

d. Place new battery-pack in the transmitter with four batteries as shown in the case in figure 17-24.

e. Connect the electrical connector as shown in figure 17-24.

NOTE

Before installing the C589511-0105 pack, check to ensure that its voltage is 7.5 volts or greater.

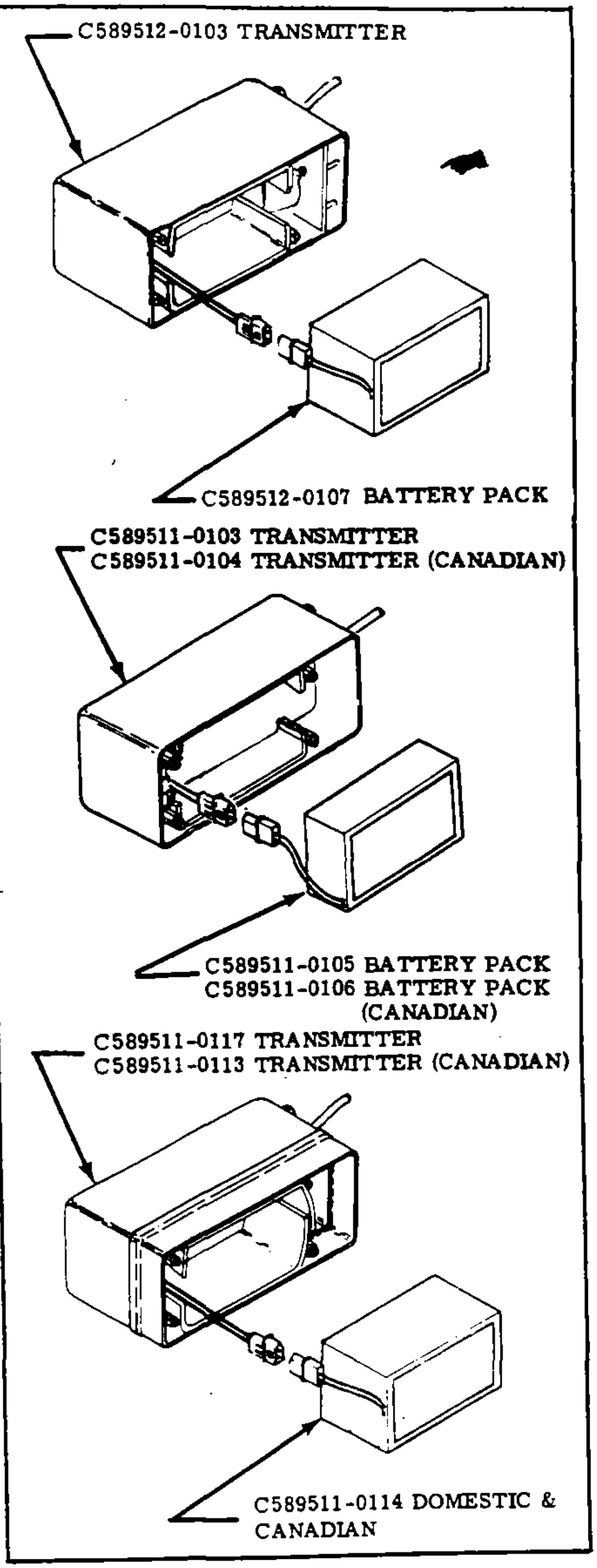


Figure 17-24. Battery Pack Installation.

f. Replace the transmitter cover on the unit, and pressing the cover and unit together, attach cover with four Nylok Patch screws.

g. Stamp the new replacement date on the outside of the ELT. The date should be noted on the switching nameplate on the side of the unit as well as on the instruction nameplate on top of the unit.

WARNING

The battery pack has pressurized contents. Do not recharge, short, or dispose of in fire.

CAUTION

Be sure to enter the new battery pack expiration date in the aircraft records. It is also recommended this date be placed in your ELT Owners Manual for quick reference.

17-131A. G SWITCH OPERATIONAL CHECK.

a. Remove emergency locator beacon transmitter from aircraft in accordance with paragraph 17-121.

b. While holding transmitter in one hand, sharply strike the end of the case in the direction of activation, indicated on the case of the transmitter.

1. Verify that the G switch has been actuated.

c. Reset the G switch.

d. Reinstall transmitter in aircraft in accordance with paragraph 17-121.

17-132. TROUBLE SHOOTING. Should your Emergency Locator Transmitter fail the 100 Hours performance checks, it is possible to a limited degree to isolate the fault to a particular area of the equipment. In performing the following trouble shooting procedures to test peak effective radiated power, you will be able to determine if battery replacement is necessary, or if your unit should be returned to your dealer for repair.

TROUBLE	PROBABLE CAUSE	REMEDY
*POWER LOW	Low battery voltage.	1. Set toggle switch to OFF. 2. Disconnect the battery-pack from the transmitter and connect a Simpson 260 model voltmeter and measure voltage. If the battery-pack transmitter is 7.5 volts or less, the battery-pack is below specifications.
	Faulty transmitter.	3. If the battery-pack voltage meets the specifications in step 2., the battery-pack is O.K. If the battery is O.K., check the transmitter as follows: a. Reconnect battery pack to the transmitter. b. By means of E. F. Johson 105-0303-001 jackplugs and 3 inch maximum long leads, connect a Simpson Model 1223 ammeter to the jack. c. Set the toggle switch to AUTO and observe the ammeter current drain. If the current-drain is in the 15-25 ma range, the transmitter or the coaxial cable is faulty.
	Faulty coaxial antenna cable	4. Check coaxial antenna cable for high resistance joints. If this is found to be the case, the cable should be replaced.

*This test should be carried out with the coaxial cable provided with your unit.

ELECTRICAL LOAD ANALYSIS CHART (CONT.)

12 VOLT ALL MODELS

STANDARD EQUIPMENT (RUNNING LOAD)	AMPS REQD 1977
Battery Contactor	0.6
Clock	†
Cylinder Head Temperature Indicator	0.2
Fuel Quantity Indicators	0.4
Flashing Beacon	7.0
Instrument Lights	
a. Electroluminescent Panel	0.4
b. Cluster	0.32
c. Console*	2.08
d. Compass	0.8
Position Lights	5.6
Turn Coordinator	0.8
OPTIONAL EQUIPMENT (RUNNING LOAD)	
Heated-Pitot, Stall Warning Heater	10.0
Strobe Lights	2.0
Carburator Air Temp	0.03
Cessna 200A Navomatic Autopilot (Type AF-295B)	2.5
Cessna 300 ADF (Type R-546E)	1.0
Cessna 300 Nav/Com (360 Channel-Type RT-308C)	1.5
Cessna 300 Nav/Com (Type RT-328T)	1.5
Cessna 300 Transponder (Type RT-359A)	2.0
Cessna 300A Navomatic (Type AF-395A)	2.5
Cessna 400 ADF (Type R-446A)	1.0
Cessna 400 Glideslope (Type R-443B)	0.5
Cessna 400 Transponder (Type RT-459A)	2.0
Cessna 400 Nav-O-Matic (Type AF-420A)	2.4
Sunair SSB Transceiver (Type ASB-125)	5.0
Pantronics PT-10A HF Transceiver	1.5
Bendix Marker Beacon (Type GM-247A)	0.1
United Instruments Blind Encoder	0.1
Narco DME 190	2.9
ITEMS NOT CONSIDERED AS PART OF RUNNING LOAD	
Auxiliary Fuel Pump	3.0
Cigratte Lighter	10.0
Flap Motor	15.0
Landing Lights	15-6
Stall Warning Horn	0.25
Wing Courtesy Lights and Cabin Lights	3.3
Sky Diving Lights	0.1

*Console lights not used with Post Lights
Only one or the other may be used at one time
†Negligible

ELECTRICAL LOAD ANALYSIS CHART

24 VOLT ALL MODELS

STANDARD EQUIPMENT (RUNNING LOAD)	AMPS REQD 1977	1978	1979	1980	1981	1982	1983
Instrument Lights.			1.7	1.7	1.7	1.9	2.1
Instruments (Engine)			0.2	0.2	0.2	0.2	0.2
Battery Contactor	.41	.45	0.5	0.5	0.5	0.5	0.5
Clock	†	†	†	†	†	†	†
Cylinder Head Temperature Indicator	0.039	0.04	0.04	0.04	0.04		
Fuel Quantity Indicators	0.12	0.12	0.12	0.12	0.12		
Flashing Beacon	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Instrument Lights							
a. Electroluminescent Panel	0.02	0.75				0.7	0.7
b. Cluster	0.16	0.16					
c. Console*	1.14	1.70					
d. Compass	0.04	0.04					
Position Lights	2.0	2.53	2.5	2.5	2.5	2.5	2.5
Turn Coordinator	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Turn & Bank Indicator					0.2	0.2	0.2
OPTIONAL EQUIPMENT (RUNNING LOAD)							
Windshield Anti-Ice System				4.4	4.4	4.4	4.4
Prop Anti-Ice		16.0	16.0	16.0	18.0	18.0	18.0
Heated-Pitot and Stall Warning	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Strobe Lights	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Carburetor Air Temp	0.03	0.03	0.03	0.03	0.03		
Cessna 200A Navomatic (Type AF-295B) . . .	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Cessna 300 ADF (Type R-546E)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Cessna 300 Nav/Com (360 Channel-Type RT-308C)	1.5						
Cessna 300 Nav/Com (Type RT-385A)** . . .		1.0	1.0	1.0	1.0	1.0	1.0
Cessna 300 Nav/Com (Type RT-328T).	1.5						
Cessna 300 Transponder (Type RT-359A) . . .	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Cessna 300A Navomatic (Type AF-395A) . . .	2.5	2.5	2.5	2.5	2.5	2.5	2.5
With Unslaved HSI					2.8	2.8	2.8
Cessna 400B Nav-O-Matic (Type AF-550A) . .						3.6	3.6
With Slaved Directional Gyro						3.8	3.8
With Slaved Directional Gyro and Course Datum						4.0	4.0
With Unslaved HSI						3.8	3.8
With Slaved HSI						4.0	4.0
With Slaved HSI and Course Datum						4.2	4.2
Cessna 400 ADF (Type R-446A)	1.0	1.6	1.6	1.6	1.6	1.6	1.6
Cessna 400 Glide Slope (Type R-443B)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cessna 400 Transponder (Type RT-459A) . . .	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Cessna 400 Nav-O-Matic (Type AF-420A) . . .	1.2	1.2			1.2		
Cessna 400 Nav/Com (Type RT-428A).	1.5						
Cessna 400 Area Nav (Type RN-478A).	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cessna 400 DME (Type RT-476A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Cessna 400 Nav/Com (Type RT-485A)** . . .						1.6	1.6
Cessna 400 Nav/Com (Type RT-485B)** . . .						1.6	1.6
Bendix MKR RCVR (Type GM-247A)	0.1	0.1					
Sunair SSB Transceiver (Type ASB-125) . . .	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Pantronics PT-10A HF Transceiver	1.0	1.0	1.0	1.0			
Cessna 400 Marker Beacon (Type R-402A). . .		0.1	0.1	0.1	0.1	0.1	0.1
Cessna 400 Marker Beacon (Type 402B) (ALT).							0.1
Cessna 400 Area Nav (Type RT-479A).							1.00
Cessna 400 DME (Type RT-477A)							1.50
Cessna 400 Encoding Altimeter (Type EA-401A)		0.1	0.1	0.1	0.1	0.1	0.1
DME 190		2.9	2.9	2.9	2.9		

ELECTRICAL LOAD ANALYSIS CHART

24 VOLT ALL MODELS

OPTIONAL EQUIPMENT (RUNNING LOAD)	AMPS REQD 1977	1978	1979	1980	1981	1982	1983
Altitude Encoder (Blind)		0.1	0.1	0.1	0.1	0.1	0.1
Post Lights		0.72	0.7	0.7	0.7	0.7	0.7
Foster RNAV 511			1.0	1.0	1.0		1.0
Ice Detection System				1.5	1.5	1.5	1.5
Stereo				1.0	1.0	1.0	1.0
Avionics Cooling Fan					0.6	0.6	0.6
DME 451					1.2	1.2	
ANS-351 RNAV					0.65	0.65	
Interphone System					†	†	
Weather Radar (Type RDR-160 Black and White)						3.5	3.5
Weather Radar (Scout II)						2.0	2.0
Weather Radar (Type RDR-160XD Color)						3.5	3.5
ITEMS NOT CONSIDERED AS PART OF RUNNING LOAD							
Auxiliary Fuel Pump	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Cigar Lighter	7.0	7.0	7.0	7.0	7.0	7.0	
Flap Motor	8.5	10.0	10.0	10.0	8.5	8.5	8.5
Landing Lights (Each)	3.57	3.57	3.6	3.6	3.6	3.6	3.6
Stall Warning Horn	0.28	0.28	0.28	0.28			
Wing Courtesy Lights and Cabin Lights	1.65	1.19	1.2	1.2	1.2	1.2	1.2
Sky Diving Lights	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Cessna 300 Nav/Com (Type RT-385A)**		2.3	2.3	2.3	2.0	2.0	2.0
Cessna 400 Nav/Com (Type RT-485A)**					4.0	4.0	4.0
Cessna 400 Nav/Com (Type RT-485B)**						4.0	4.0
AS 125B SSB HF Transceiver**		7.5	7.5	7.5	7.5	7.5	7.5
PT10A HF Transceiver		9.0	9.0	9.0			
Map Light (Control Wheel)		0.1	0.1	0.1	0.1	0.1	0.1
Electric Elevator Trim		0.7	0.7	0.7	0.7	0.7	0.7

*Console lights not used with post lights. Only one or the other may be used at one time.
†Negligible ** Receive **Transmit

ELECTRICAL LOAD ANALYSIS CHART

24 VOLT ALL MODELS

STANDARD EQUIPMENT (RUNNING LOAD)	AMPS REQD 1984	AMPS REQD 1985	AMPS REQD 1986
Instrument Lights	2.1	2.1	2.1
Instruments (Engine)	0.2	0.2	0.2
Battery Contactor	0.5	0.5	0.5
Clock	†	†	†
Cylinder Head Temperature Indicator	0.04	0.04	0.04
Flashing Beacon	6.0	7.0	7.0
Instrument Lights	1.7	1.7	1.7
a. Electroluminescent Panel	0.7	0.7	0.7
Position Lights	2.5	2.5	2.5
Turn Coordinator	0.3	0.3	0.3
Turn & Bank Indicator	0.2	0.2	0.2
OPTIONAL EQUIPMENT (RUNNING LOAD)			
Windshield Anti-Ice System	4.4	4.4	4.4
Prop Anti-Ice	18.0	18.0	18.0
Heated-Pitot and Stall Warning	5.8	5.8	5.8
Strobe Lights	3.0	2.0	2.0
Cessna 200A Navomatic (Type AF-295B)	2.5	2.5	2.5
Cessna 300 ADF (Type R-546E)	1.0	1.0	1.0
Cessna 300 Nav/Com (Type RT-385A)**	1.0	1.0	1.0
Cessna 300 Transponder (Type RT-359A)	2.0	2.0	2.0
Cessna 300A Navomatic (Type AF-395A)	2.5	2.5	2.5
With Unslaved HSI	2.8	2.8	2.8
Cessna 400B Nav-O-Matic (Type AF-550A)	3.6	3.6	3.6
With Slaved Directional Gyro	3.8	3.8	3.8
With Unslaved HSI	3.8	3.8	3.8
With Slaved HSI	4.0	4.0	4.0
Cessna 400 ADF (Type R-446A)	1.6	1.6	1.6
Cessna 400 Glide Slope (Type R-443B)	0.5	0.5	0.5
Cessna 400 Transponder (Type RT-459A)	2.0	2.0	2.0
Cessna 400 Area Nav (Type RN-478A)	0.5	0.5	
Cessna 400 DME (Type RT-476A)	2.5	2.5	2.5
Cessna 400 Nav/Com (Type RT-485A)**	1.6	1.6	1.6
Cessna 400 Nav/Com (Type RT-485B)**	1.6	1.6	1.6
Sunair SSB Transceiver (Type ASB-125)**	2.5	2.5	2.5
Cessna 400 Marker Beacon (Type R-402A)	0.1	0.1	0.1
Cessna 400 Marker Beacon (Type r02B) (ALT)	0.1	0.1	0.1
Cessna 400 Area Nav (Type RT-479A)	1.0	1.0	1.0
Cessna 400 DME (Type RT-477A)	1.5	1.5	1.5
Cessna 400 Encoding Altimeter (Type EA-401A)	0.1	0.1	0.1
Sperry RT-377A DME		0.3	0.3
Altitude Encoder (Blind)	0.1	0.1	0.1
Post Lights	0.7	0.7	0.7
Ice Detection System	1.5	1.5	1.5
Stereo	1.0	1.0	1.0
Avionics Cooling Fan	0.60	1.0	1.0
Interphone System	†	†	†
Weather Radar (Type RDR-160 Black and White)	3.5	3.5	3.5
Weather Radar (Scout II)	2.0	2.0	2.0
Weather Radar (Type RDR-169XD Color)	3.5	3.5	3.5

ELECTRICAL LOAD ANALYSIS CHART

24 VOLT ALL MODELS

ITEMS NOT CONSIDERED AS PART OF RUNNING LOAD	AMPS REQD 1984	AMPS REQD 1985	AMPS REQD 1986
Auxiliary Fuel Pump	3.0	3.0	3.0
Flap Motor	8.5	1.8	1.8
Landing Lights (Each)	3.6	3.6	3.6
Stall Warning Horn	0.28	0.28	0.28
Wing Courtesy Lights and Cabin Lights	1.2	1.2	1.20
Sky Diving Lights	0.04	0.04	0.04
Cessna 300 Nav/Com (Type RT-385A) (Transmitting)	2.0	2.3	2.3
Cessna 400 Nav/Com (Type RT-485A) (Transmitting)	4.0	4.0	4.0
Cessna 400 Nav/Com (Type RT-485B) (Transmitting)	4.0	4.0	4.0
AS 125B SSB HF Transceiver (Transmitting)	7.5	7.5	7.5
Map Light (Control Wheel)	0.1	0.10	0.10
Electric Elevator Trim	0.7	0.70	0.70
Standby Vacuum System		13.0	13.0

*Console lights not used with post lights. Only one or the other may be used at one time.
†Negligible **Receive

SECTION 18

STRUCTURAL REPAIR

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18-1. STRUCTURAL REPAIR.

18-2. REPAIR CRITERIA. Although this section outlines repair permissible on structure of the aircraft, the decision of whether to repair or replace a major unit of structure will be influenced by such factors as time and labor available, and by a comparison of labor costs with the price of replacement assemblies. Past experience indicates that replacement, in many cases, is less costly than major repair. Certainly, when the aircraft must be restored to its airworthy condition in a limited length of time, replacement is preferable. Restoration of a damaged aircraft to its original design strength, shape, and alignment involves careful evaluation of the damage, followed by exacting workmanship in performing the repairs. This section suggests the extent of structural repair practicable on the aircraft, and supplements Federal Aviation Regulation, Part 43. Consult the factory when in doubt about a repair not specifically mentioned here.

18-3. EQUIPMENT AND TOOLS.

18-4. SUPPORT STANDS. Padded, reinforced sawhorse or tripod type support stands, sturdy enough to support any assembly placed upon them, must be used to store a removed wing or tailcone. Plans for local fabrication of support stands are contained in figure 18-1. The fuselage assembly, from the tailcone to the firewall, must NOT be supported from the underside, since the skin bulkheads are not designed for this purpose. Adapt support stands to fasten to the wing attach points or landing gear attach points when supporting a fuselage.

18-5. FUSELAGE REPAIR JIGS. Whenever a repair is to be made which could affect structural alignment, suitable jigs must be used to assure correct alignment of major attach points, such as fuselage, firewall, wing and landing gear. These fuselage repair jigs are obtainable from the factory.

18-6. WING JIGS. These jigs serve as a holding fixture during extensive repair of a damaged wing, and locates the root rib, leading edge and tip rib of the wing. These jigs are also obtainable from the factory.

18-7. WING TWIST AND STABILIZER ANGLE-OF-INCIDENCE.

18-8. Wing twist (washout) and horizontal stabilizer angle-of-incidence are shown below. Stabilizers do not have twist. Wings have no twist from the root to the lift strut station. All twist in the wing panel occurs between this station and the tip rib. See figure 18-2 for wing twist measurement.

WING
Twist (Washout) . . . . .3°

STABILIZER
Angle-of-Incidence . . . . -3° ± 15'

18-9. REPAIR MATERIALS. Thickness of a material on which a repair is to be made can easily be determined by measuring with a micrometer. In general, material used in Cessna aircraft covered in this manual is made from 2024 aluminum alloy, heat treated to a -T3, -T4, or -T42 condition. If the type of material cannot readily be determined, 2024-T3 may be used in making repairs, since the strength of -T3 is greater than -T4 or -T42 (-T4 and -T42 may be used interchangeably, but they may not be substituted for -T3). When necessary to form a part with a smaller bend radius than the standard cold bending radius for 2024-T4, use 2024-0 and heat treat to 2024-T42 after forming. The repair material used in making a repair must equal the gauge of the material being replaced unless otherwise noted. It is often practical to cut repair pieces from service parts listed in the Parts Catalog. A few components (empennage tips, for example) are fabricated from thermo-formed plastic or glass-fiber constructed material.

18-10. WING.

18-11. DESCRIPTION. The wing assemblies are a semicantilever type employing semimonocoque type of structure. Basically, the internal structure consists of built-up front and rear spar assemblies, a formed auxiliary spar assembly and formed sheet metal nose, intermediate, and trailing edge ribs. Stressed skin, riveted to the rib and spar structures, completes the rigid structure. Access openings (hand holes with removable cover plates) are located in the underside of the wing between the wing root and tip section. These openings afford access to aileron bellcranks, flap bellcranks, electrical wiring, strut attach fittings, control cables and pulleys, and control disconnect points.

18-12. WING SKIN.

18-13. NEGLIGIBLE DAMAGE. Any smooth dents in the wing skin that are free from cracks, abrasions and sharp corners, which are not stress wrinkles and do not interfere with any internal structure or mechanism, may be considered as negligible damage. In areas of low stress intensity, cracks, deep scratches, or deep, sharp dents, which after trimming or stop-drilling can be enclosed by a two-inch circle, can be considered negligible if the damaged area is at least one diameter of the enclosing circle away from all existing rivet lines and material edges. Stop drilling is considered a temporary repair and a permanent repair must be made as soon as practicable. Refer to paragraph 18-63 for other damage to wing and fuselage skin.

18-14. REPAIRABLE DAMAGE. Figure 18-4 outlines typical repair to be employed in patching skin. Before installing a patch, trim the damaged area to form a retangular pattern, leaving at least a one-half inch radius at each corner, and de-burr. The sides of the hole should lie span-wise or chord-wise. A circular patch may also be used. If the patch is in an area where flush rivets are used, make a flush patch type of repair; if in an area where flush rivets are not used, make an overlapping type of repair. Where optimum appearance and airflow are desired, the flush patch may be used. Careful workmanship will eliminate gaps at butt-joints; however, an epoxy type filler may be used at such joints.

18-15. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If a skin is badly damaged, repair must be made by replacing an entire skin panel, from one structural member to the next. Repair seams must be made to lie along structural members and each seam must be made exactly the same in regard to rivet size, spacing and pattern as the manufactured seams at the edges of the original sheet. If the manufactured seams are different, the stronger must be copied. If the repair ends at a structural member where no seam is used, enough repair panel must be used to allow an extra row of staggered rivets, with sufficient edge margin, to be installed.

18-16. WING STRINGERS.

18-17. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-18. REPAIRABLE DAMAGE. Figure 18-5 outlines a typical wing stringer repair. Two such repairs may be used to splice a new section of stringer material in position, without the filler material.

18-19. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If a stringer is so badly damaged that more than one section must be spliced, replacement is recommended.

18-20. WING AUXILIARY SPARS.

18-21. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-22. REPAIRABLE DAMAGE. Figure 18-8 illustrates a typical auxiliary spar repair.

18-23. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If damage to an auxiliary spar would require a repair which could not be made between adjacent ribs, the auxiliary spar must be replaced.

18-24. WING RIBS.

18-25. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-26. REPAIRABLE DAMAGE. Figure 18-6 illustrates a typical wing rib repair.

18-27. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Leading and trailing edge ribs that are extensively damaged can be replaced. However, due to the necessity of unfastening an excessive amount of skin in order to replace the rib, they should be repaired if practicable. Center ribs, between the front and rear spar should always be repaired if practicable.

18-28. WING SPARS.

18-29. NEGLIGIBLE DAMAGE. Due to the stress which wing spars encounter, very little damage can be considered negligible. All cracks, stress wrinkles, deep scratches, and sharp dents must be repaired. Smooth dents, light scratches and abrasions may be considered negligible.

18-30. REPAIRABLE DAMAGE. Figure 18-7 illustrates typical spar repairs. It is often practical to cut repair pieces from service parts listed in the Parts Catalog. Service Kits are available for certain types of spar repairs.

18-31. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Damage so extensive that repair is not practicable requires replacement of a complete wing spar. Also refer to paragraph 18-2.

18-32. WING FUEL BAY SPARS AND RIBS.

18-33. NEGLIGIBLE DAMAGE. Any smooth dents in the fuel spars that are free from cracks, abrasions and sharp corners, which are not stress wrinkles and do not interfere with any internal structure or mechanism, may be considered as neglible damage in any area of the spar.

18-34. REPAIRABLE DAMAGE. The type of repair outlined in figure 18-7 also applies to fuel bay spars. Refer to Section 13 for sealing procedures when working in fuel bay areas.

18-35. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Due to the amount of fuel bay sealant which must be removed from fuel bay components to facilitate repair, individual parts are not available to replace fuel bay spars or ribs. The entire fuel bay area must be replaced as a unit.

18-36. WING LEADING EDGES.

18-37. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-38. REPAIRABLE DAMAGE. Wing skin repairs, outlined in paragraph 18-14, may be used to repair leading edge skins, although the flush-type patches should be used. To facilitate repair, extra access holes may be installed in locations noted in figure 18-13. If the damage would require a repair which could not be made between adjacent ribs, refer to the following paragraph.

18-39. DAMAGE NECESSITATING REPLACEMENT. OF PARTS. Where extreme damage has occured, complete leading edge skin panels should be replaced. Extra access holes may be installed (See figure 18-13) to facilitate replacement.

18-40. BONDED LEADING EDGE REPAIR.

18-41. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-42. REPAIRABLE DAMAGE. (See figure 18-11.) Cut out damaged area, as shown, to the edge of undamaged ribs. Using a corresponding section from a new leading edge skin, overlap ribs and secure to wing, using rivet pattern as shown in the figure.

18-42A. WING STRUT.

18-42B. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-42C. REPAIRABLE DAMAGE.

a. For grooves in wing strut caused by strut fairings, the following applies.

1. If groove exceeds .010 inch in depth and is less than .75 inch from a rivet center, the strut should be replaced.

2. If groove exceeds .020 inch in depth and is more than .75 inch from a rivet center, the strut should be replaced.

3. If groove depth is less than .020 inch and is more than .75 inch from a rivet center, strut should be repaired by tapering gradually to the original surface and burnishing out to a smooth finish. The local area should be checked with dye penetrant to ensure that no crack has developed.

b. The following applies to wing struts with grooves worn in the lower trailing edge. This type damage can occur after extensive cabin door usage with a missing or improperly adjusted door stop which allows the door to bang against the aft edge of the strut at the lower end.

NOTE

Struts with a groove deeper than 50% of the original material thickness should be replaced. Lesser damage may be repaired as follows.

1. Without making the damage deeper, remove strut material on each side of groove to reduce notch effect of damage. Smooth and blend the surface to provide a gradual transition of strut tube material thickness in damaged area. The local area should be checked with dye penetrate to ensure that no crack has developed.

2. Apply brush alodine or zink chromate primer and repaint area.

3. Rerig the door stop and/or reform the lower portion of the door pan and skin inboard to prevent the door from rubbing the strut tube. If these actions prove to be ineffective, install some form of protective bumber, either on strut or lower portion of door, to prevent further damage. A short hard rubber strip bonded to the trailing edge of the strut where the door comes to strut is a possibility.

c. Tie-downs and attaching parts may be replaced. If a wing strut is badly dented, cracked or deformed, it should be replaced.

18-43. AILERONS.

18-44. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-45. REPAIRABLE DAMAGE. The repair shown in figure18-9 may be used to repair damage to aileron leading edge skins. Figure 18-4 may be used as a guide to repair damage to flat surface between corrugations, when damaged area includes corrugations refer to figure 18-12. It is recommended that material used for repair be cut from spare parts of the same gauge and corrugation spacing. Following repair, the aileron must be balanced. Refer to paragraph 18-47 for balancing. If damage would require a repair which could not be made between adjacent ribs, refer to paragraph 5-46.

18-46. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If the damage would require a repair which could not be made between adjacent ribs, complete skin panels must be replaced. Ribs and spars may be repaired, but replacement is generally preferable. Where extensive damage has occurred, replacement of the aileron assembly is recommended. After repair and/or replacement, balance aileron in accordance with paragraph 18-47 and figure 18-3.

18-47. AILERON BALANCING. Following repair, replacement or painting, the aileron must be balanced. Complete instructions for fabricating balancing fixtures and mandrels and their use are given in figure 18-3.

18-48. WING FLAPS.

18-49. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-50. REPAIRABLE DAMAGE. Flap repairs should be similar to aileron repairs discussed in paragraph 18-45. A flap leading edge repair is shown in figure 18-10.

18-51. DAMAGE NECESSITATING REPLACEMENT. OF PARTS. Flap repairs which require replacement of parts should be similar to aileron repairs discussed in paragraph 18-46. Since the flap is not considered a movable control surface, no balancing is required.

18-52. ELEVATORS AND RUDDER.

18-53. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13. The exception to negligible damage on the elevator surfaces is the front spar, where a crack appearing in the web at the hinge fittings or in the structure which supports the overhanding balance weight is not considered negligible. Cracks in the overhanging tip rib, in the area at the front spar intersection with the web of the rib, also cannot be considered negligible.

18-54. REPAIRABLE DAMAGE. Skin patches illustrated in figure 18-4 may be used to repair skin damage between corrugations. For skin damage which includes corrugations refer to figure 18-12. Following repair the elevator/rudder must be balanced. Refer to figure 18-3 for balancing. If damage would require a repair which could not be made between adjacent ribs, see paragraph 18-55.

18-55. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If the damaged area would require a repair which could not be made between adjacent ribs, complete skin panels must be replaced. Ribs and spars may be repaired, but replacement is generally preferable. Where extensive damage has occurred, replacement of the entire assembly is recommended. After repair and/or replacement, balance elevators and rudder in accordance with paragraph 18-56 and figure 18-3.

18-56. ELEVATOR AND RUDDER BALANCING. Following repair, replacement or painting, the elevators and rudder must be balanced. Complete instructions for fabricating balancing fixtures and mandrels and their use are given in figure 18-3.

18-57. FIN AND STABILIZER.

18-58. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-59. REPAIRABLE DAMAGE. Skin patches illustrated in figure 18-4 may be used to repair skin damage. Access to the dorsal area of the fin may be gained by removing the horizontal closing rib at the bottom of the fin. Access to the internal fin structure is best gained by removing skin attaching rivets on one side of the rear spar and ribs, and springing back the skin. Access to the stabilizer structure may be gained by removing skin attaching rivets on one side of the rear spar and ribs, and springing back the skin. If the damaged area would require a repair which could not be made between adjacent ribs, or a repair would be located in an area with compound curves, see the following paragraph.

18-60. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If the damaged area would require a repair which could not be made between adjacent ribs, or the repair would be located in an area with compound curves, complete skin panels must be replaced. Ribs and spars may be repaired, but replacement is generally preferable. Where damage is extensive, replacement of the entire assembly is recommended.

18-61. FUSELAGE

18-62. DESCRIPTION. The fuselage is of semi-monocoque construction, consisting of formed bulkheads, longitudinal stringer, reinforcing channels, and skin panels.

18-63. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13. Mild corrosion appearing upon alclad surfaces does not necessarily indicate incipient failure of the base metal. However, corrosion of all types must be carefully considered, and approved remedial action taken. Small cans appear in the skin structure of all metal aircraft. It is strongly recommended however, that wrinkles which appear to have originated from other sources, or which do not follow the general appearance of the remainder of the skin panels, be thoroughly investigated. Except in the landing gear bulkhead areas, wrinkles occurring over stringers which disappear when the rivet pattern is removed, may be considered negligible. However, the stringer rivet holes may not align perfectly with the skin holes because of a permanent "set" in the stringer. If this is apparent, replacement of the stringer will usually restore the original strength characteristics of the area.

NOTE

Wrinkles occurring in the skin of the main landing gear bulkhead areas must not be considered negligible. The skin panel must be opened sufficiently to permit a thorough examination of the lower portion of the landing gear bulkhead and its tie-in structure.

Wrinkles occurring in open areas which disappear when the rivets at the edge of the sheet are removed, or a wrinkle which is hand removable, may often be repaired by the addition of a 1/2 x 1/2 x .060 inch 2024-T4 extruded angle, riveted over the wrinkle and extended to within 1/16 to 1/18 inch of the nearest structural members. Rivet pattern should be identical to existing manufactured seam at edge of sheet. Negligible damage to stringers, formed skin flanges, bulkhead channels, and like parts is similar to that for the wing skin, given in paragraph 18-13.

18-64. REPAIRABLE DAMAGE. Fuselage skin repairs may be accomplished in the same manner as wing skin repairs outlined in paragraph 18-14. Stringers, formed skin flanges, bulkhead channels and similar parts may be repaired as shown in figure 18-5.

18-65. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Fuselage skin major repairs may be accomplished in the same manner as the wing repairs outlined in paragraph 18-15. Damaged fittings must be replaced.

18-66. BULKHEADS.

18-67. LANDING GEAR BULKHEADS. Since these bulkheads are highly stressed members, irregularly formed to provide clearance for control cables, fuel lines, etc., the patch-type repairs will be, for the most part, impractical. Minor damage, consisting of small nicks or scratches, may be repaired by dressing out the damaged area, or by replacement of rivets. Any other damage must be repaired by replacing the landing gear support assembly as an aligned unit.

18-68. REPAIR AFTER HARD LANDING. Buckled skin or floorboards, and loose or sheared rivets in the area of the main gear support will give evidence of damage to the structure from an extremely hard landing. When such evidence is present, the entire support structure must be examined, and all support forgings must be checked for cracks, using a dye penetrant and proper magnification. Bulkheads in the damaged area must be checked for alignment, and deformation of the bulkhead webs must be determined with the aid of a straightedge. Damaged support structure, buckled floorboards and skins, and damaged or questionable forgings must be replaced.

18-69. FIREWALL DAMAGE. Firewalls may be repaired by removing the damaged material (MIL-S-5059) corrosion - resistant (18-8) steel, and splicing in a new section. The new portion must be lapped over the old material, sealed with Pro-Seal #700 (Coast Pro-Seal Co., Chemical Division, 2235 Beverly Blvd., Los Angeles, California), compound or equivalent, and secured with steel (MS16535) rivets. Patches, splices and joints should be repaired with steel rivets. The upper firewall and lower firewall are joined with steel rivets. The heater valve in the left side of the lower firewall is attached with steel rivets. The battery box support is attached with steel rivets. Angles around the periphery, channels and angles are attached with aluminum rivets.

18-70. FASTENERS. Fasteners used in the aircraft are generally solid aluminum rivets, blind rivets, and steel-threaded fasteners. Usage of each is primarily a function of the loads to be carried, accessibility, and frequency of removal. Rivets used in aircraft construction are usually fabricated from aluminum alloys. In special cases, monel, corrosion-resistant steel and mild steel, copper, and iron rivets are used.

18-71. RIVETS. Standard solid-shank MS rivets are those generally used in aircraft construction. They are fabricated in the following head types: roundhead, flathead, countersunk head, and brazier head. Flathead rivets are generally used in the aircraft interior where head clearance is required. MS20426 countersunk head rivets are used on the exterior surfaces of the aircraft to minimize turbulent airflow. MS20470 brazier head rivets are used on the exterior surfaces of the aircraft where strength requirements necessitate a stronger rivet head than that of the countersunk head rivet. Both the brazier head and the countersunk head rivets are used on the exterior of the aircraft where head clearance is required. Hi-shear rivets are special, patented rivets having a hi-shear strength equivalent to that of standard AN bolts. They are used in special cases in locations where hi-shear loads are present, such as in spars, wings, and in heavy bulkhead ribs. This rivet consists of a cadmium-plated pin of alloy steel. Some have a collar of aluminum alloy. Some of these rivets can be readily identified by the presence of the attached collar in place of the formed head on standard rivets. Blind rivets are used, where strength requirements permit, where one side of the structure is inaccessible, making it impossible or impractical to drive standard solid-shank rivets.

18-72. REPLACEMENT OF HI-SHEAR RIVETS. Replacement of hi-shear rivets with close-tolerance bolts or other commercial fasteners of equivalent strength properties is permissible. Holes must not be elongated, and the hi-shear substitute must be a smooth, push-fit. Field replacement of main landing gear forgings on bulkheads may be accomplished by using the following fasteners.

a. NAS464P-* bolt, MS21042-* nut and AN960-* washer in place of Hi-shear rivets for forgings with machined flat surfaces around attachment holes.

b. NAS464P-* bolt, ESNA2935-* mating base washer and ESNA RM52LH2935-* self-aligning nut for forgings (with draft angle of up to a maximum of 8°) without machined flat surfaces around attachment holes.

*Dash numbers to be determined according to the size of the holes and the grip lengths required. Bolt grip length should be chosen so that no threads remain in the bearing area.

18-73. SUBSTITUTION OF RIVETS.

a. Solid-shank rivets (MS20426AD). When placing rivets in installations which require raised head rivets, it is desirable to use rivets identical to the type of rivet removed. Countersunk-head rivets (MS20426) are to be replaced by rivets of the same type and degree of countersink. When rivet holes become enlarged, deformed, or otherwise damaged, use the next larger size rivet as a replacement. Replacement shall not be made with rivets of lower strength material.

b. Hi-shear Rivets. When hi-shear rivets are not available, replacement of sizes 3/16-inch or greater rivets shall be made with bolts of equal or greater strength than the rivet being replaced, and with self-locking nuts of the same diameter.

c. The following pages contain approved solid-shank and hi-shear rivet substitution.

Replace	In thickness (or thicker)	With
MS20470AD3	.025	NAS1398B4, NAS1398D4
	.020	NAS1738B4, NAS1738D4, NAS1768D4, CR3213-4, CR3243-4
MS20470AD4	.050	NAS1398B4, NAS1398D4
	.040	NAS1398B5, NAS1398D5, NAS1738B4, NAS1738E4, NAS1768D4, CR3213-4
	.032	NAS1738B5, NAS1738E5, NAS1768D5, CR3213-5, CR3243-4
	.025	CR3243-5
MS20470AD5	.063	NAS1398B5, NAS1398D5
	.050	NAS1398B6, NAS1398D6, NAS1398B5, NAS1738E5, CR3213-5
	.040	NAS1738B6, NAS1738E6, NAS1768D5, CR3213-6, CR3243-5
	.032	CR3243-6
MS20470AD6	.080	NAS1398B6
	.071	NAS1398D6
	.063	NAS1738B6, NAS1738D6, NAS1768D6, CR3213-6
	.050	CR3243-6
MS20426AD3 (Countersunk)	.063	NAS1399B4, NAS1399D4
	.040	NAS1769D4, CR3212-4
(See Note 1)	.025	NAS1769B4, NAS1739E4, CR3242-4

Replace	In thickness (or thicker)	With
MS20426AD4 (Countersunk)	.080	NAS1399B4, NAS1399D4
	.063	NAS1739B4, NAS1739D4, CR3212-4
	.050	NAS1769D4
	.040	CR3242-4
(See Note 1)	.050	CR3212-5
	.040	NAS1739B5, NAS1739D5, NAS1769D4
	.032	CR3242-5
MS20426AD4 (Dimpled)	.063	NAS1739B4, NAS1739D4
MS20426AD5 (Countersunk)	.090	NAS1399B5, NAS1399D5
	.080	CR3212-5
	.071	NAS1739B5, NAS1739E5
	.063	NAS1769D5
	.050	CR3242-5
(See Note 1)	.063	NAS1739B6, NAS1739D6, NAS1769D6, CR3212-6
	.040	CR3242-6
	.032	AN509-10 Screw with MS20365 Nut
MS20426AD5 (Dimpled)	.071	NAS1739B5, NAS1739D5
	.090	NAS1739B6, NAS1739D6, CR3212-6
MS20426AD6 (Countersunk)	.071	NAS1769D6
	.063	CR3242-6
	.032	AN509-10 Screw with MS20365 Nut
MS20426AD6 (Dimpled)	.090	NAS1739B6, NAS1739D6
	.032	AN509-10 Screw with MS20365 Nut

NOTE 1: Rework required. Countersink oversize to accommodate oversize rivet.

NOTE 2: Do not use blind rivets in high-vibration areas or to pull heavy sheets or extrusions together. High-vibration areas include the nacelle or engine compartment including the firewall. Heavy sheets or extrusions include spar caps.

REPLACE		DIAMETER	WITH	
Fastener	Collar		Fastener	Collar
• NAS178	NAS179	(See Note 1)	• NAS1054	NAS179, NAS528
		(See Note 1)	• NAS14XX	NAS1080C, NAS1080E, NAS1080G
		(See Note 1)	• NAS529	NAS524A
		(See Notes 1 and 2)	★ NAS1446	NAS1080C, NAS1080A6
		(See Note 1)	★ NAS7034	NAS1080K
		(See Note 1)	□ NAS464	AN364, MS20364, MS21042
			□ NAS1103	
			□ NAS1303	
			□ NAS6203	
			□ AN173	AN305, MS20305, MS21044, MS21045
• NAS1054	NAS179, NAS528		• NAS14XX	NAS1080C, NAS1080E
			• NAS529	NAS524A
		(See Note 2)	★ NAS1446	NAS1080C, NAS1080A6
			★ NAS7034	NAS1080K
			□ NAS464	AN364, MS20304, MS21042
			□ NAS1103	
			□ NAS1305	
			□ NAS6203	
• NAS14XX	NAS1080C NAS1080E NAS1080G		• NAS529	NAS524A
			★ NAS1446	NAS1080C, NAS1080A6
			★ NAS7034	NAS1080K
			□ NAS464	AN364, MS20364, MS21042
			□ NAS1103	
			□ NAS1303	
			□ NAS6203	
• NAS529	NAS524A	(See Note 3)	□ NAS1446	NAS1080C, NAS1080A6

NOTE 1: *See appropriate tables for nominal diameters available.*

NOTE 2: Available in oversize for repair of elongated holes. Ream holes to provide a .001 inch interference fit.

NOTE 3: NAS1446 oversize only permitted as a replacement for NAS529.

• *Steel shank fastener designed for drive-on collars.*

★ Steel shank fastener designed for squeeze-on collars. Installation requires sufficient space for the tool and extended shank of the fastener.

□ Threaded fastener.

18-74. BAFFLES. Baffles ordinarily require replacement if damaged or cracked. However, small plate reinforcements riveted to the baffle will often prove satisfactory both to the strength and cooling requirements of the unit.

18-75. *ENGINE COWLING.*

18-76. REPAIR OF COWLING SKINS. If extensively damaged, complete sections of cowling must be re-

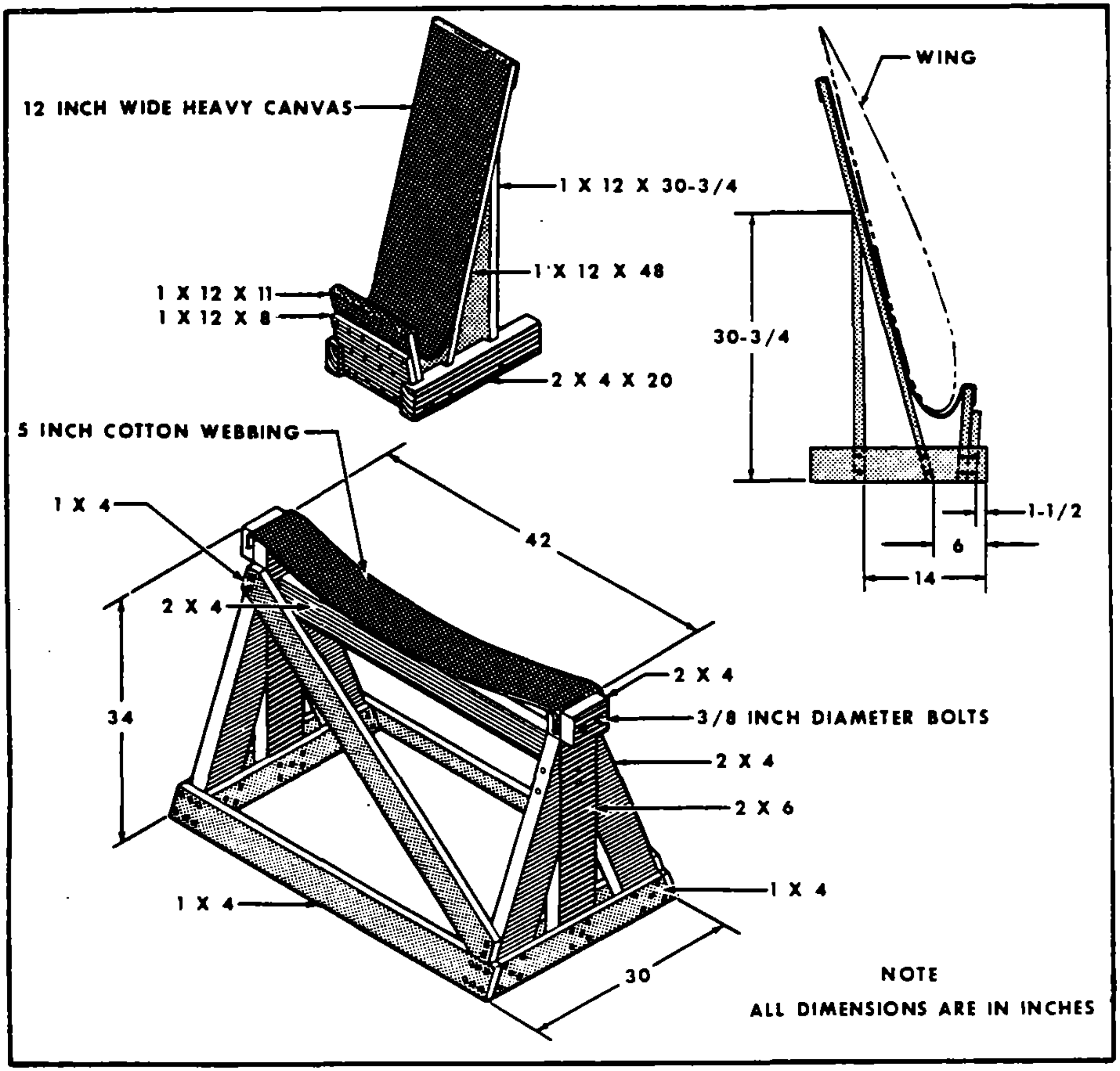
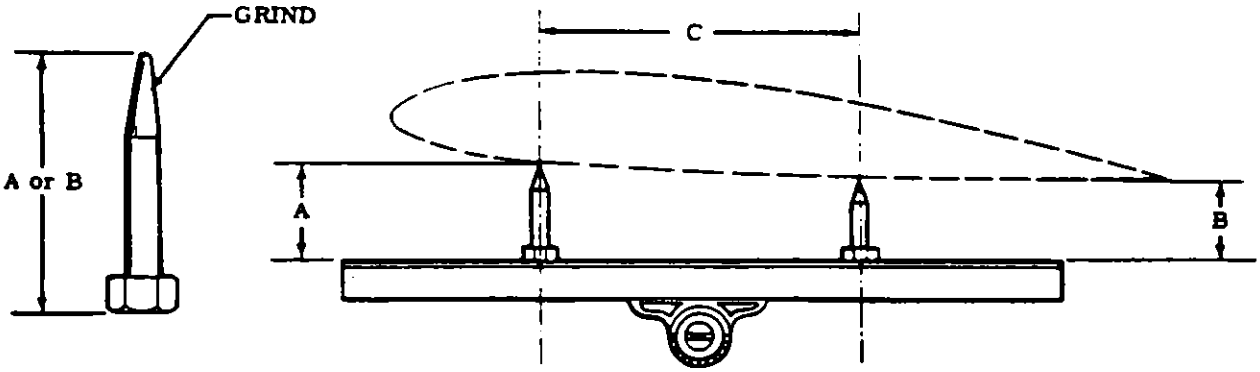


Figure 18-1. Wing and Fuselage Support Stands

placed. Standard insert-type skin patches, however, may be used if repair parts are formed to fit. Small cracks may be stop-drilled and dents straightened if they are reinforced on the inner side with a doubler of the same material.

18-77. REPAIR OF REINFORCEMENT ANGLES. Cowl reinforcement angles, if damaged, must be replaced. Due to their small size they are easier to replace than to repair.

18-78. REPAIR OF GLASS-FIBER CONSTRUCTED COMPONENTS. Glass-fiber constructed components on the aircraft may be repaired as stipulated in instructions furnished in Service Kit SK182-12. Observe the resin manufacturer's recommendations concerning mixing and application of the resin. Epoxy resins are preferred for making repairs, since epoxy compounds are usually more stable and predictable than polyester and, in addition, give



MODEL	A	B	C	WING STATION
U206G	2.00 2.00 .66	1.00 1.00 1.00	29.50 29.50 20.00	39.00 100.00 207.00

ALL WING TWIST OCCURS BETWEEN STA. 100.00 AND STA. 207.00.

(See figure 18-8.)

MEASURING WING TWIST

If damage has occurred to a wing, it is advisable to check the twist. The following method can be used with a minimum of equipment, which includes a straightedge (32" minimum length of angle, or equivalent), three modified bolts for a specific wing, and a protractor head with level.

1. Check chart for applicable dimension for bolt length (A or B).
2. Grind bolt to a rounded point as illustrated, checking length periodically.
3. Tape two bolts to straightedge according to dimension C.
4. Locate inboard wing station to be checked and make a pencil mark approximately one-half inch aft of the lateral row of rivets in the wing leading edge spar flange.
5. Holding straightedge parallel to wing station (staying as clear as possible from "cans"). place longer bolt on pencil mark and set protractor head against lower edge of straightedge.
6. Set bubble in level to center and lock protractor to hold this reading.
7. Omitting step 6, repeat procedure for each wing station, using dimensions specified in chart. Check to see that protractor bubble is still centered.
8. Proper twist is present in wing if protractor readings are the same (parallel). Forward or aft bolt may be lowered from wing .10 inch maximum to attain parallelism.

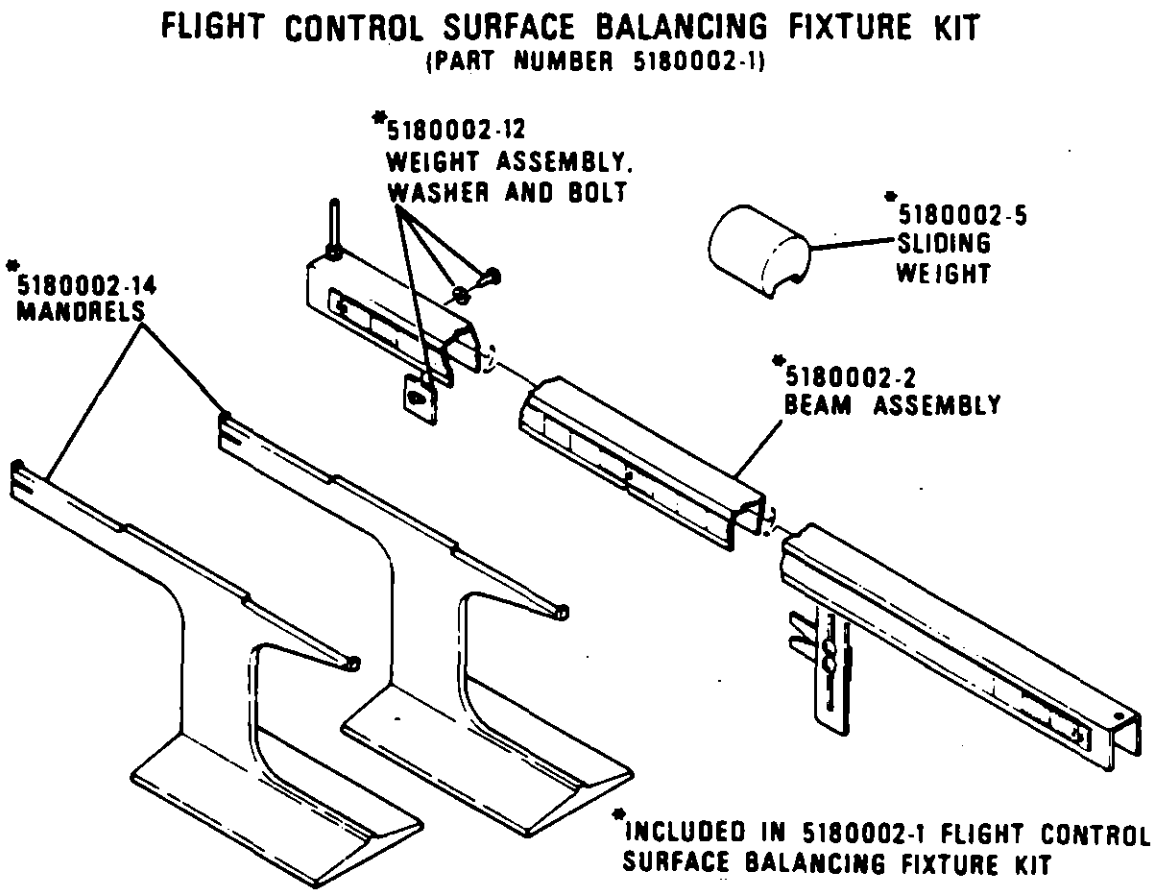
Figure 18-2. Checking Wing Twist

better adhesion. In addition, repair kits are also available for the repair of cracks in ABS, PBC, PVPC, graphite, and fiberglass material. These kits, Part No.'s 51543 thru 51548, are available from the Cessna Supply Division.

18-79. CORROSION AND CORROSION CONTROL.

NOTE

For information on corrosion and corrosion control for aircraft, refer to FAA Advisory Circular AC43-4.



GENERAL NOTES

1. **Balance control surfaces in a draft-free area.**
2. **Place hinge bolts through control surface hinges and position on knife edge balancing mandrels. Be sure hinge bolt shank rests on knife edge.**
3. **Make sure all control surfaces are in their approved flight configurations: painted (if applicable), trim tabs installed, all foreign matter removed from inside of control surface, elevator trim tab push-pull rod installed and all tips installed.**
4. **Place balancing mandrels on a table or other suitable flat surface.**
5. **Adjust trailing edge support to fit control surface being balanced while center of balancing beam is directly over hinge line. Remove balancing beam and balance the beam itself by moving the adjustable weight (fastened by bolt and washer). Fine balance may be accomplished by use of washers at long screw on end of beam.**
6. When positioning balancing beam on control surface, avoid rivets to provide a smooth surface for the beam and keep the beam 90° to the hinge line of the control surface.

Figure 18-3. Control Surface Balancing (Sheet 1 of 5)

7. Paint is a considerable weight factor. In order to keep balance weight to a minimum, it is recommended that existing paint be removed before adding paint to a control surface. Increase in balance weight will also be limited by the amount of space available and clearance with adjacent parts. Good workmanship and standard repair practices should not result in unreasonable balance weight.

8. The approximate amount of weight needed may be determined by taping loose weight at the balance weight area.

9. Lighten balance weight by drilling off part of weight.

10. Make balance weight heavier by fusing bar stock solder to weight after removal from control surface. The ailerons should have balance weight increased by ordering additional weight and gang channel, listed in applicable Parts Catalog and installing next to existing inboard weight the minimum length necessary for correct balance, except that a length which contains at least two attaching screws must be used. If necessary, lighten new weight or existing weights for correct balance.

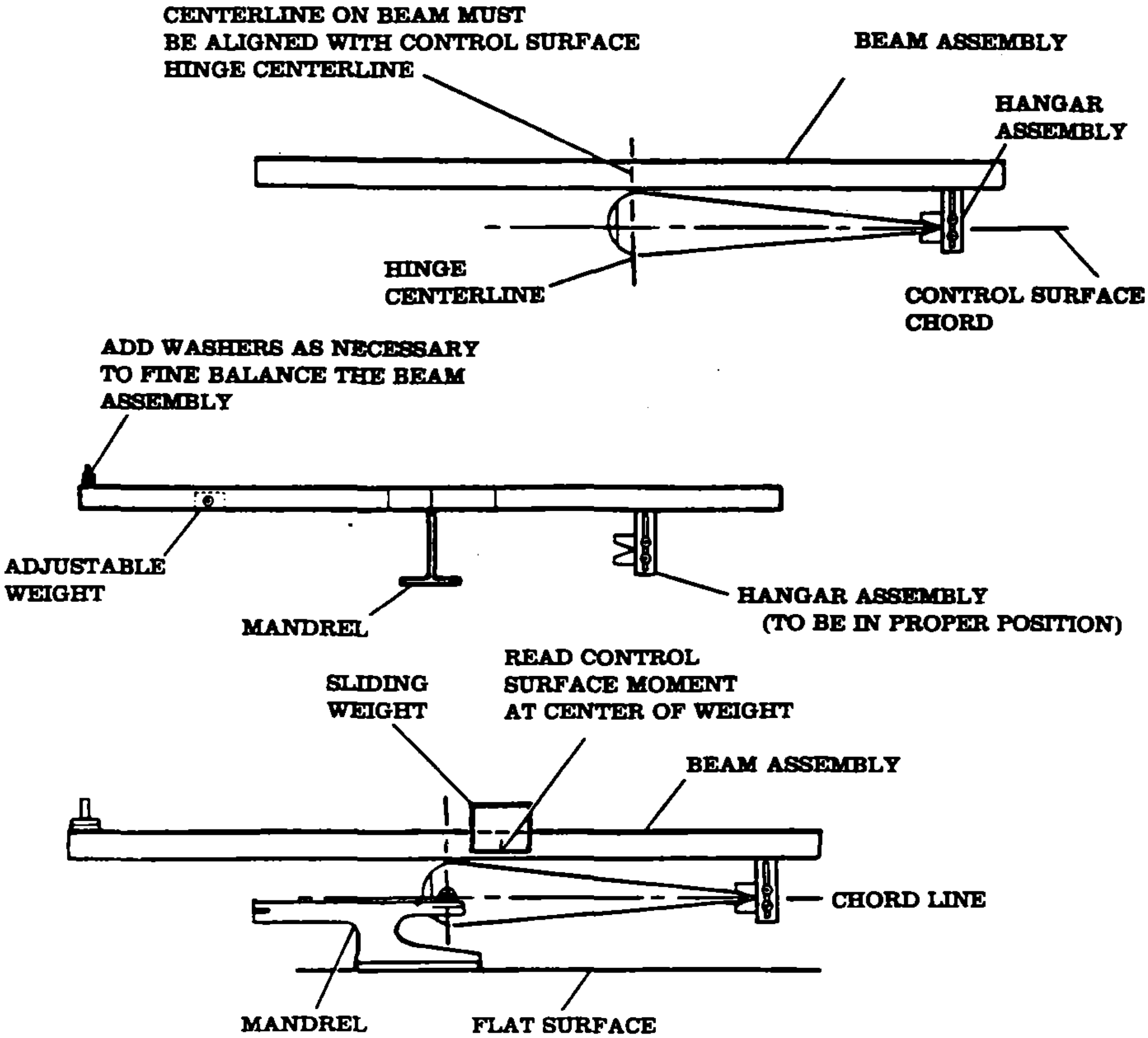


Figure 18-3. Control Surface Balancing (Sheet 2 of 5)

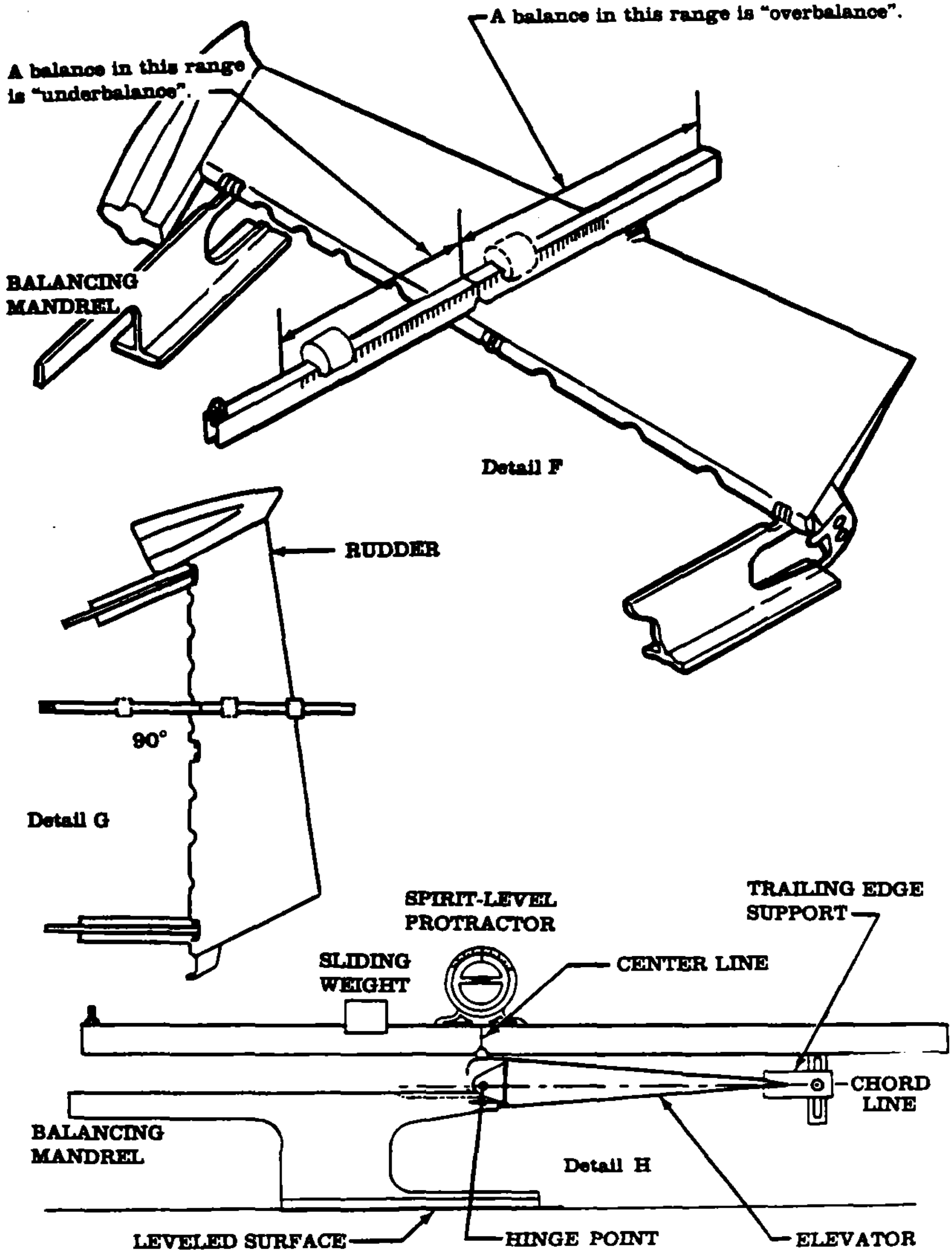
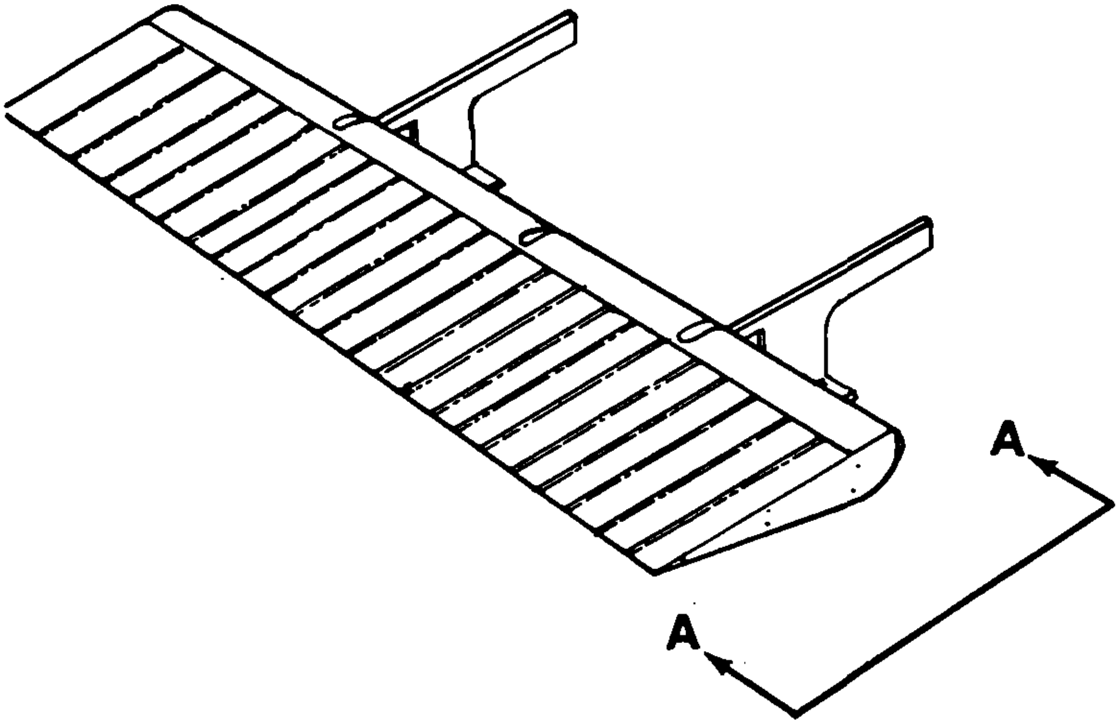
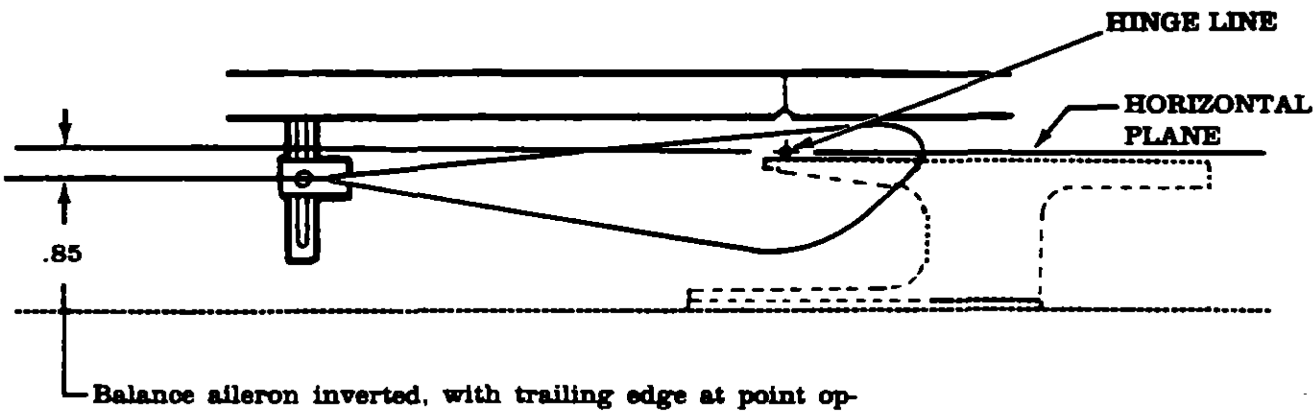


Figure 18-3. Control Surface Balancing (Sheet 3 of 5)

AILERONS





DETAIL A-A

Figure 18-3. Control Surface Balancing (Sheet 4 of 5)

CONTROL SURFACE BALANCE REQUIREMENTS

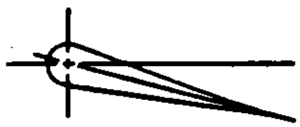
NOTE

Balance limits for control surfaces are expressed for "Approved Flight" configuration. "Approved Flight" configuration is that condition of the control surface as prepared for flight of the airplane whether it be painted or unpainted.

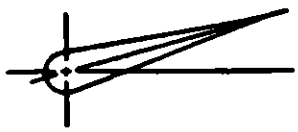
"Approved Flight" limits must never be exceeded when the surface is in its final configuration for flight.

DEFINITIONS:

UNDERBALANCE is defined as the condition that exists when surface is trailing edge heavy and is defined by a symbol (+). If the balance beam sliding weight must be on the leading edge side of the hinge line (to balance the control surface), the control surface is considered to be underbalanced.



OVERBALANCE is defined as the condition that exists when surface is leading edge heavy and is defined by a symbol (-). If the balance beam sliding weight must be on the trailing edge side of the hinge line (to balance the control surface), the control surface is considered to be overbalanced.



CONTROL SURFACE	APPROVED FLIGHT CONFIGURATION BALANCE LIMITS (Inch-Pounds)
AILERON	0.0 to +3.0
RUDDER	Landplane -4.0 to +3.0 Floatplane 0.0 to +12.43
RIGHT ELEVATOR	0.0 to +12.1
LEFT ELEVATOR	0.0 to +12.1

Figure 18-3. Control Surface Balancing (Sheet 5 of 5)

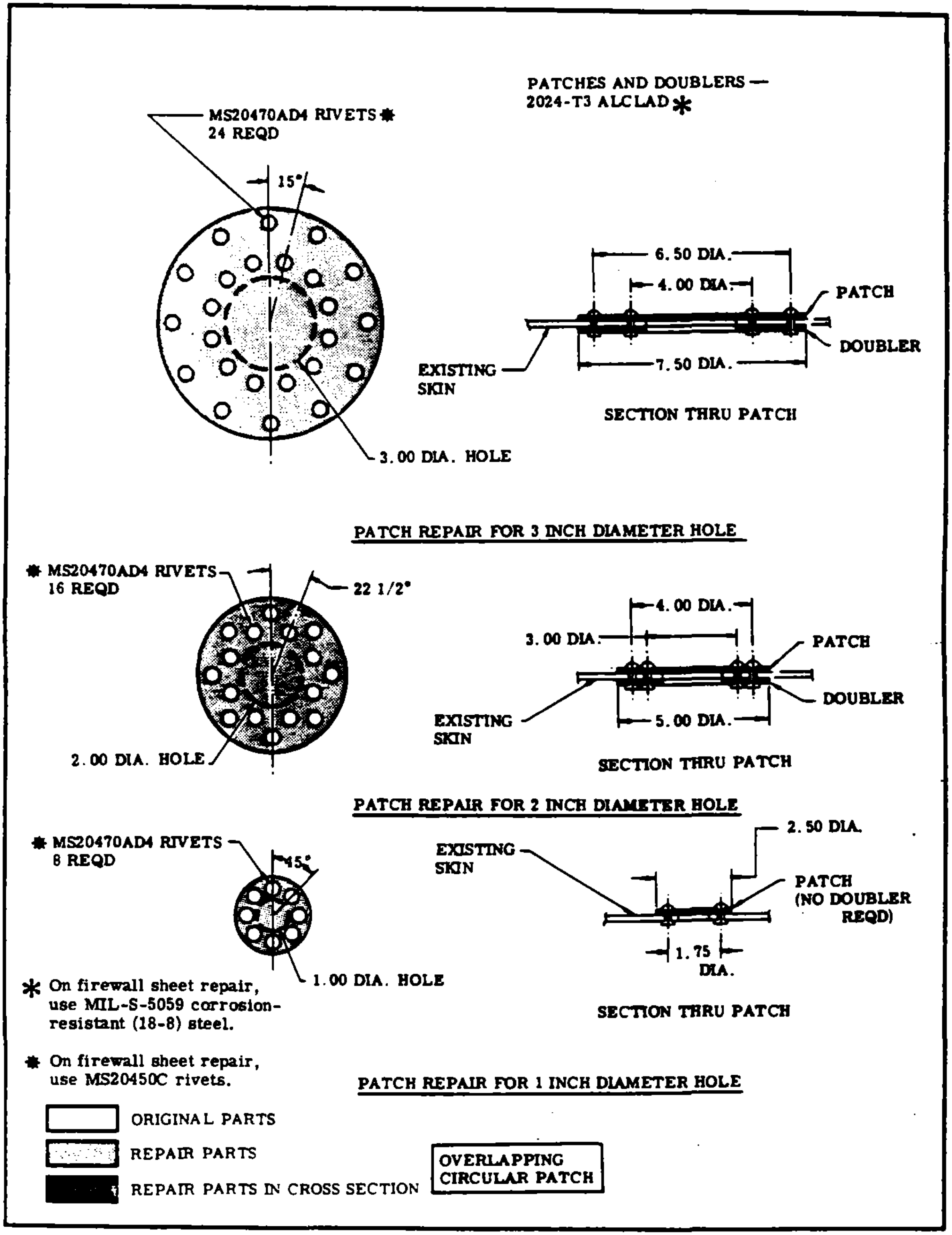
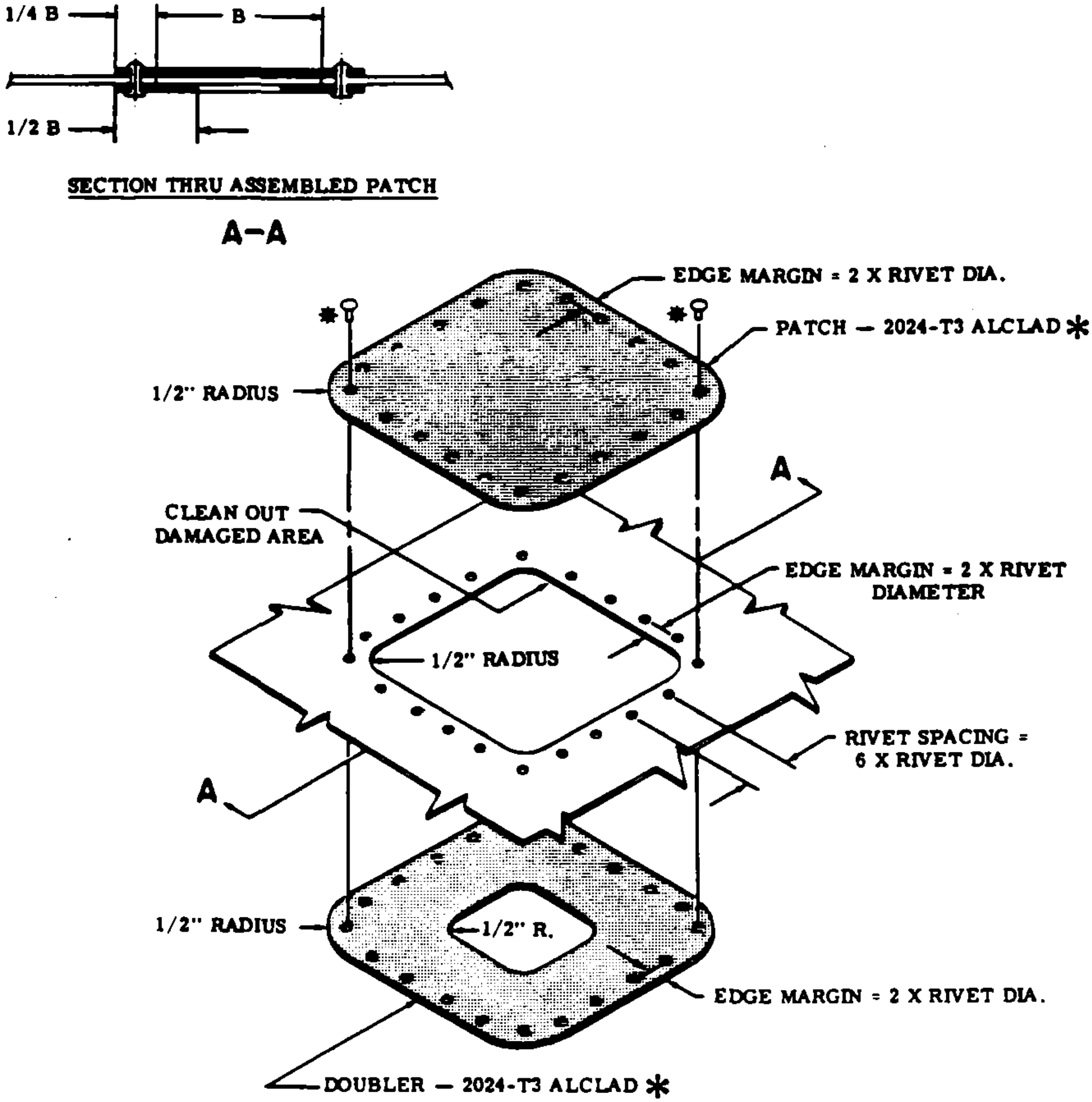


Figure 18-4. Skin Repair (Sheet 1 of 6)



* On firewall sheet repair, use MIL-S-5059 corrosion-resistant (18-8) steel.

\# On firewall sheet repair, use MS20450C rivets.

ORIGINAL PARTS

REPAIR PARTS

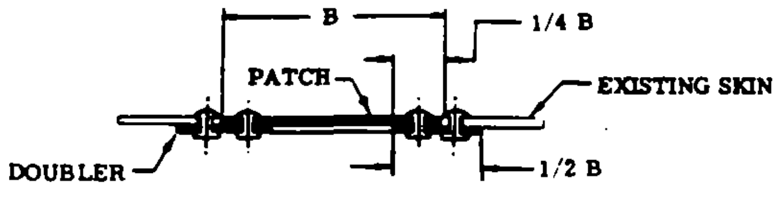
REPAIR PARTS IN CROSS SECTION

OVERLAPPING RECTANGULAR PATCH

RIVET TABLE

SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

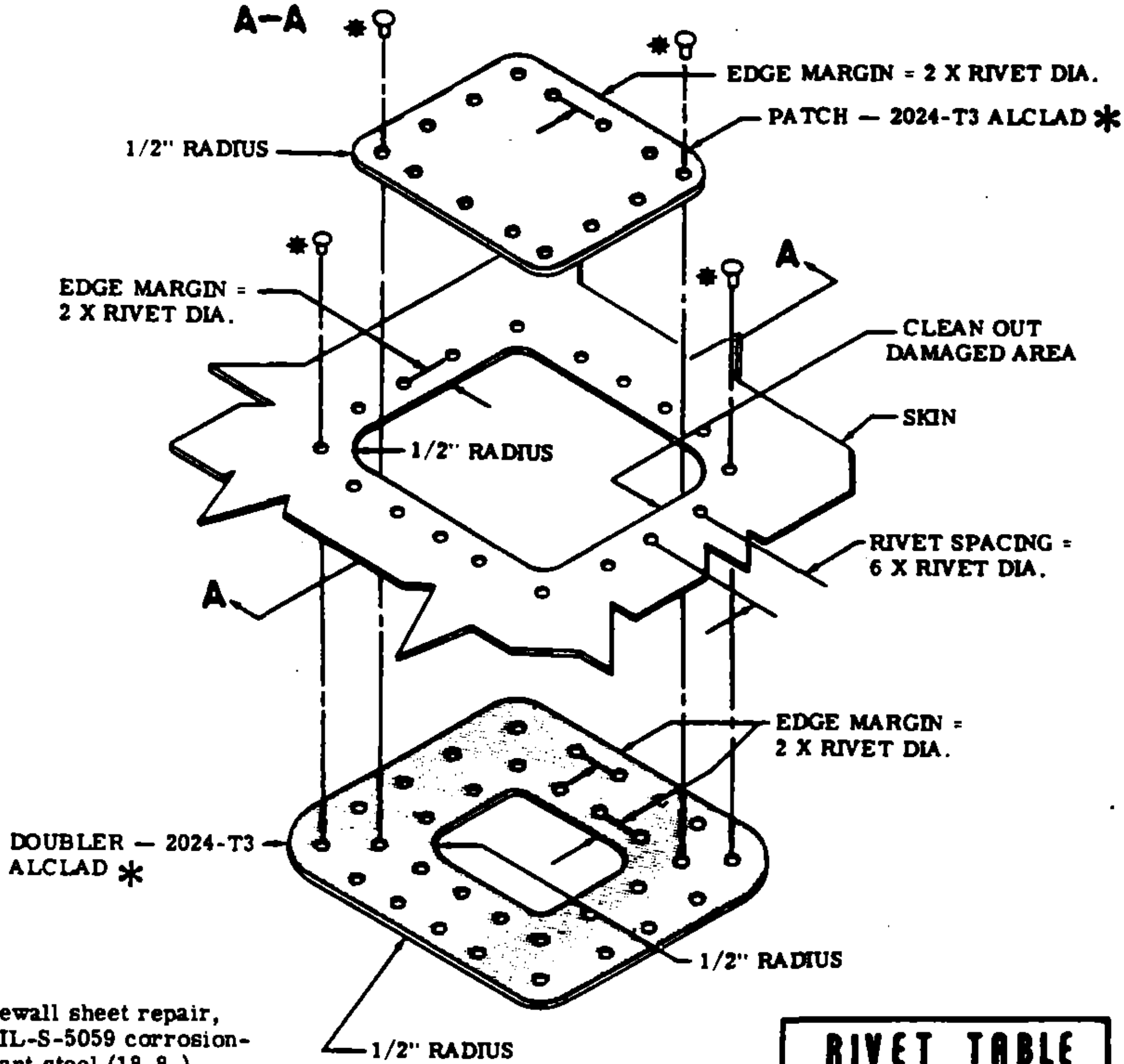
Figure 18-4. Skin Repair (Sheet 2 of 6)



SECTION THRU ASSEMBLED PATCH

NOTE

For optimum appearance and airflow, use flush rivets, dimpled skin and patch, and countersunk doubler.



✱ On firewall sheet repair, use MIL-S-5059 corrosion-resistant steel (18-8.)

✸ On firewall sheet repair, use MS20450C rivets.

ORIGINAL PARTS

REPAIR PARTS

REPAIR PARTS IN CROSS SECTION

FLUSH RECTANGULAR PATCH (CIRCULAR FLUSH PATCH IS SIMILAR)

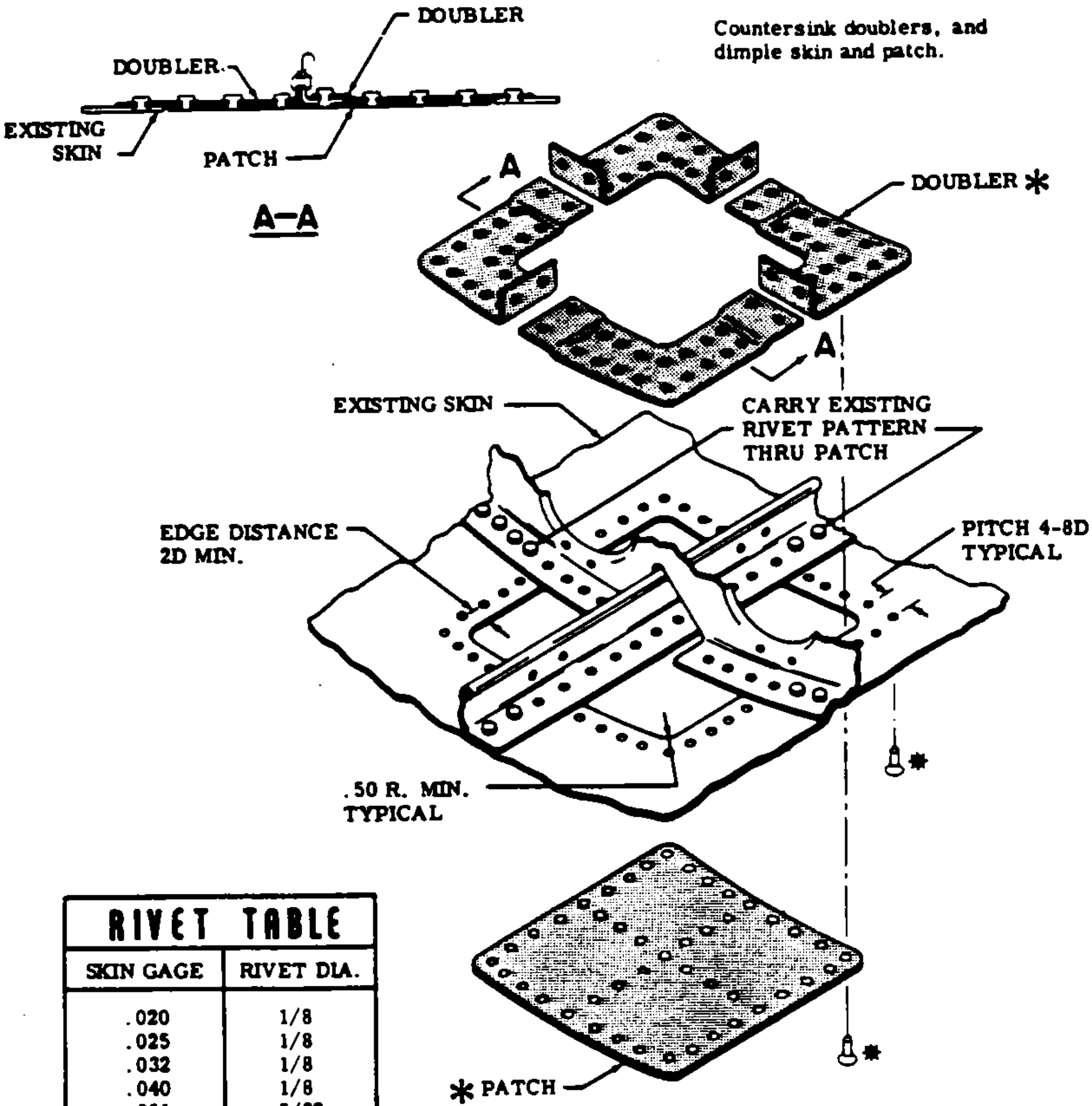
RIVET TABLE

SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

Figure 18-4. Skin Repair (Sheet 3 of 6)

NOTE

Countersink doublers, and dimple skin and patch.



RIVET TABLE

SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

FLUSH PATCH AT STRINGER/BULKHEAD INTERSECTION

* On firewall sheet repair, use MIL-S-5059 corrosion-resistant (18-8) steel.

✱ On firewall sheet repair, use MS20450C rivets.

ORIGINAL PARTS

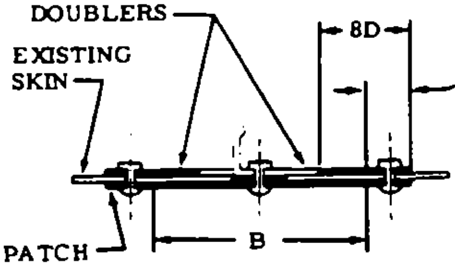
REPAIR PARTS

REPAIR PARTS IN CROSS SECTION

NOTE

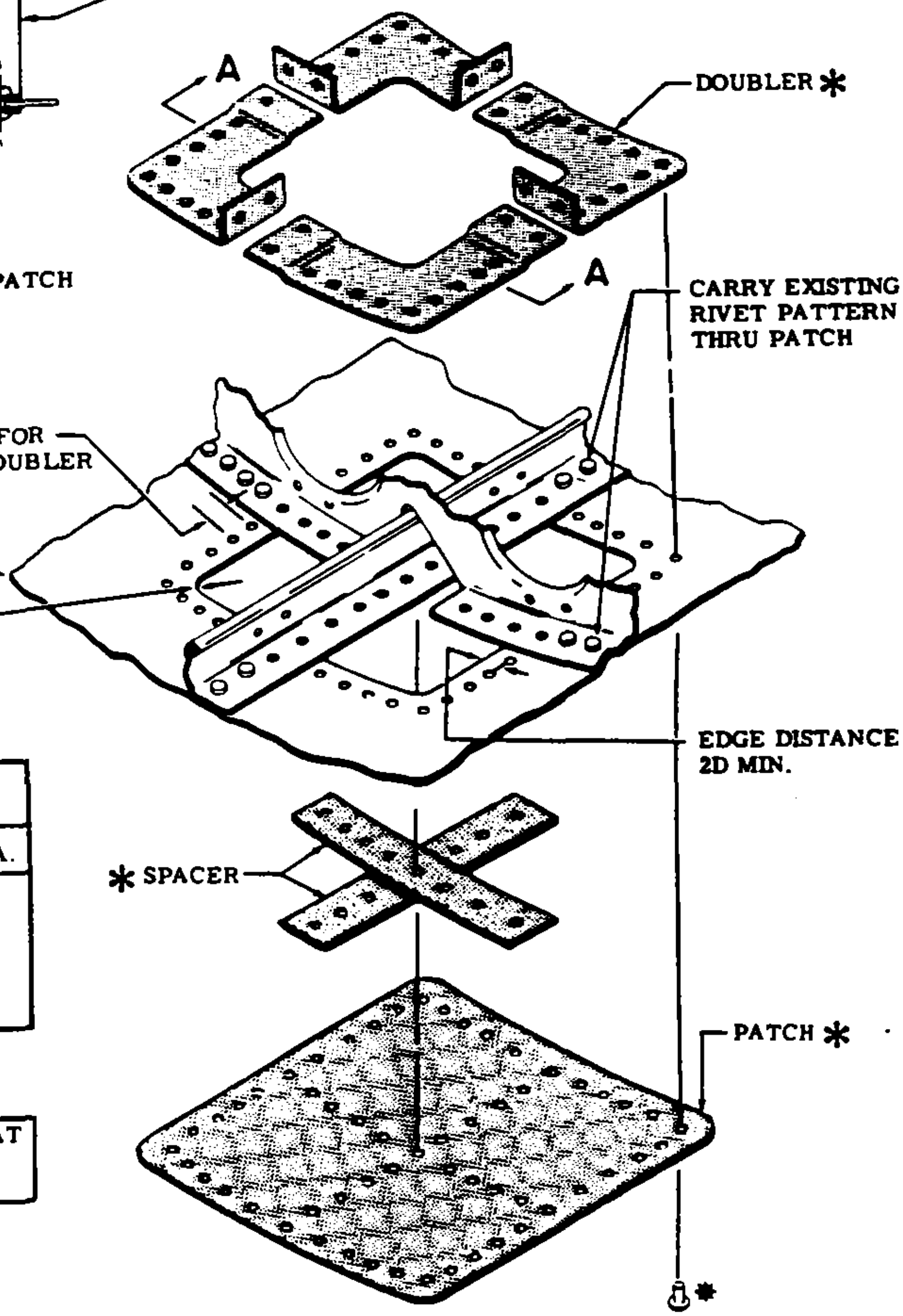
This procedure is not recommended in areas where stringers are riveted to bulkheads.

Figure 18-4. Skin Repair (Sheet 4 of 6)



A—A

SECTION THRU ASSEMBLED PATCH



RIVET TABLE	
SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

OVERLAPPING PATCH AT STRINGER/BULKHEAD INTERSECTION

✱ On firewall sheet repair, use MIL-S-5059 corrosion-resistant (18-8) steel.

✱ On firewall sheet repair, use MS20450C rivets.

ORIGINAL PARTS

REPAIR PARTS

REPAIR PARTS IN CROSS SECTION

Figure 18-4. Skin Repair (Sheet 5 of 6)

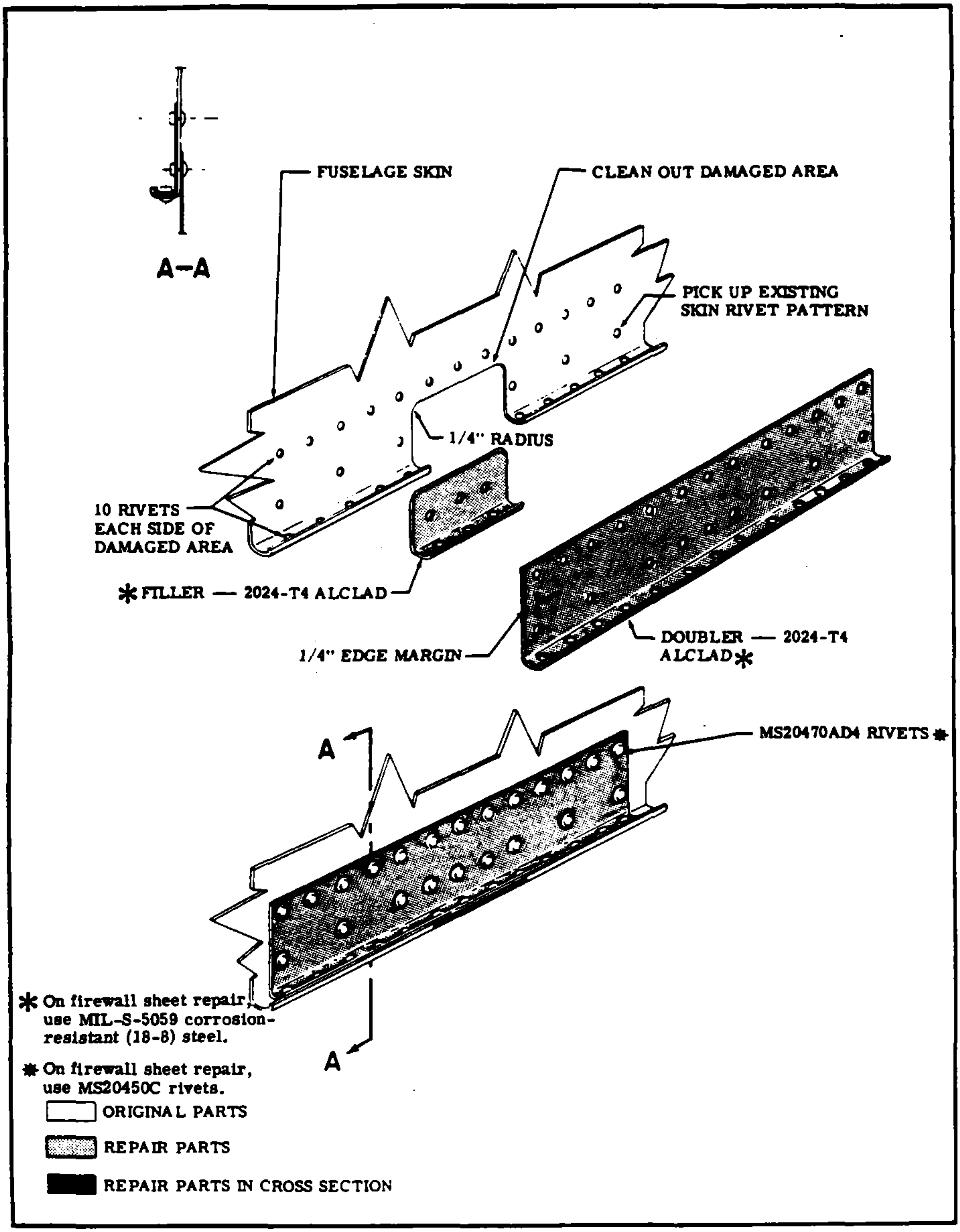


Figure 18-4. Skin Repair (Sheet 6 of 6)

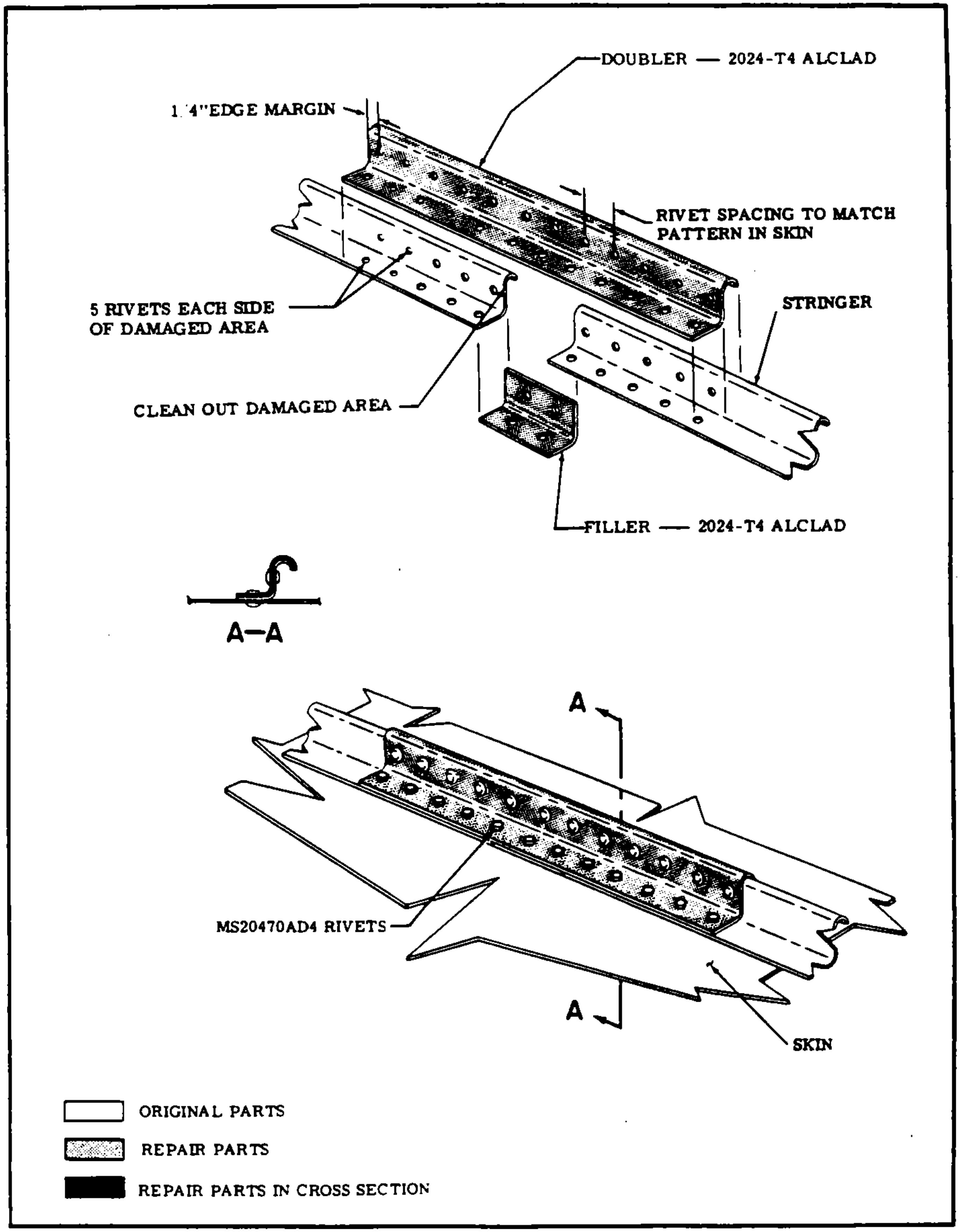


Figure 18-5. Stringer and Channel Repair (Sheet 1 of 4)

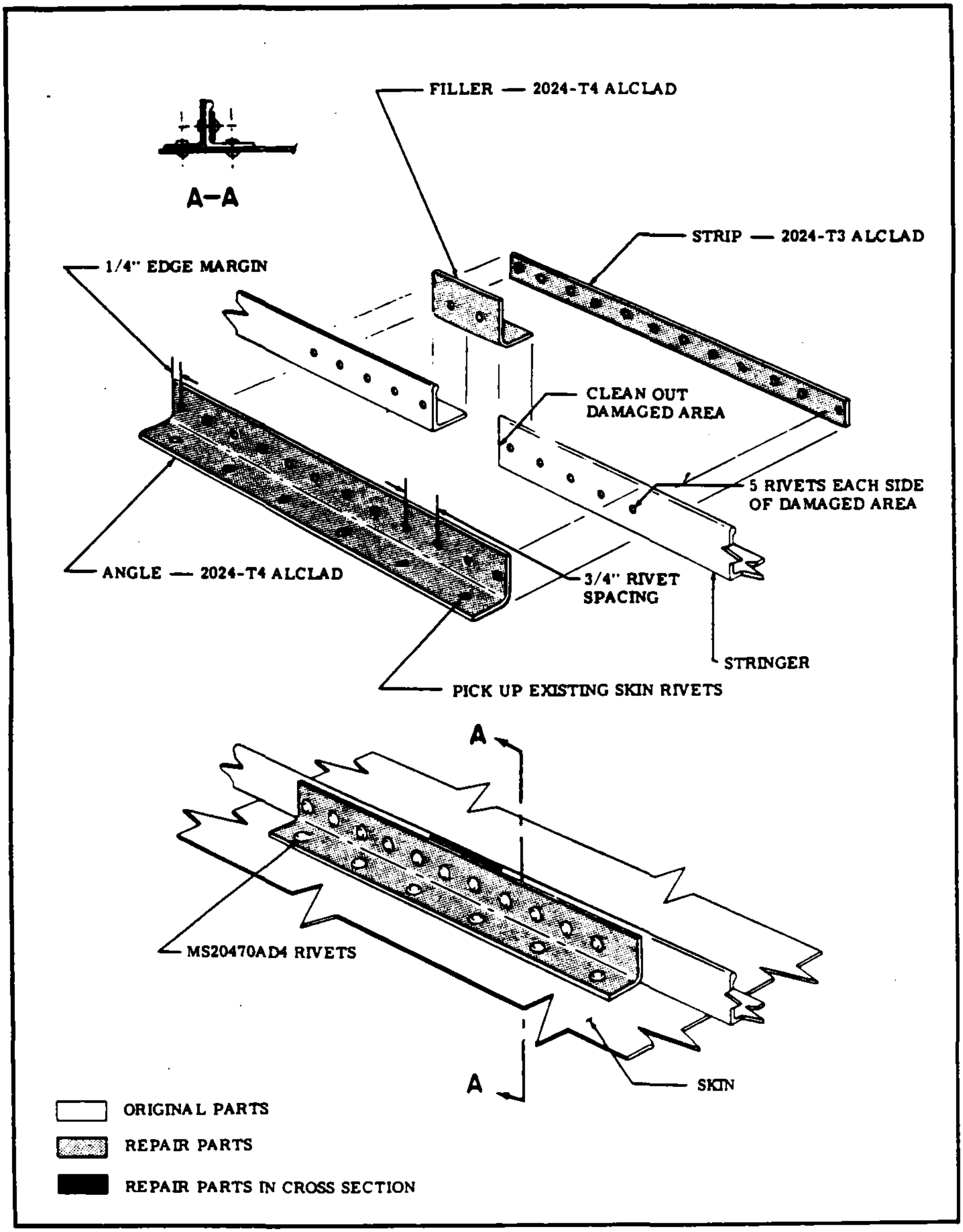


Figure 18-5. Stringer and Channel Repair (Sheet 2 of 4)

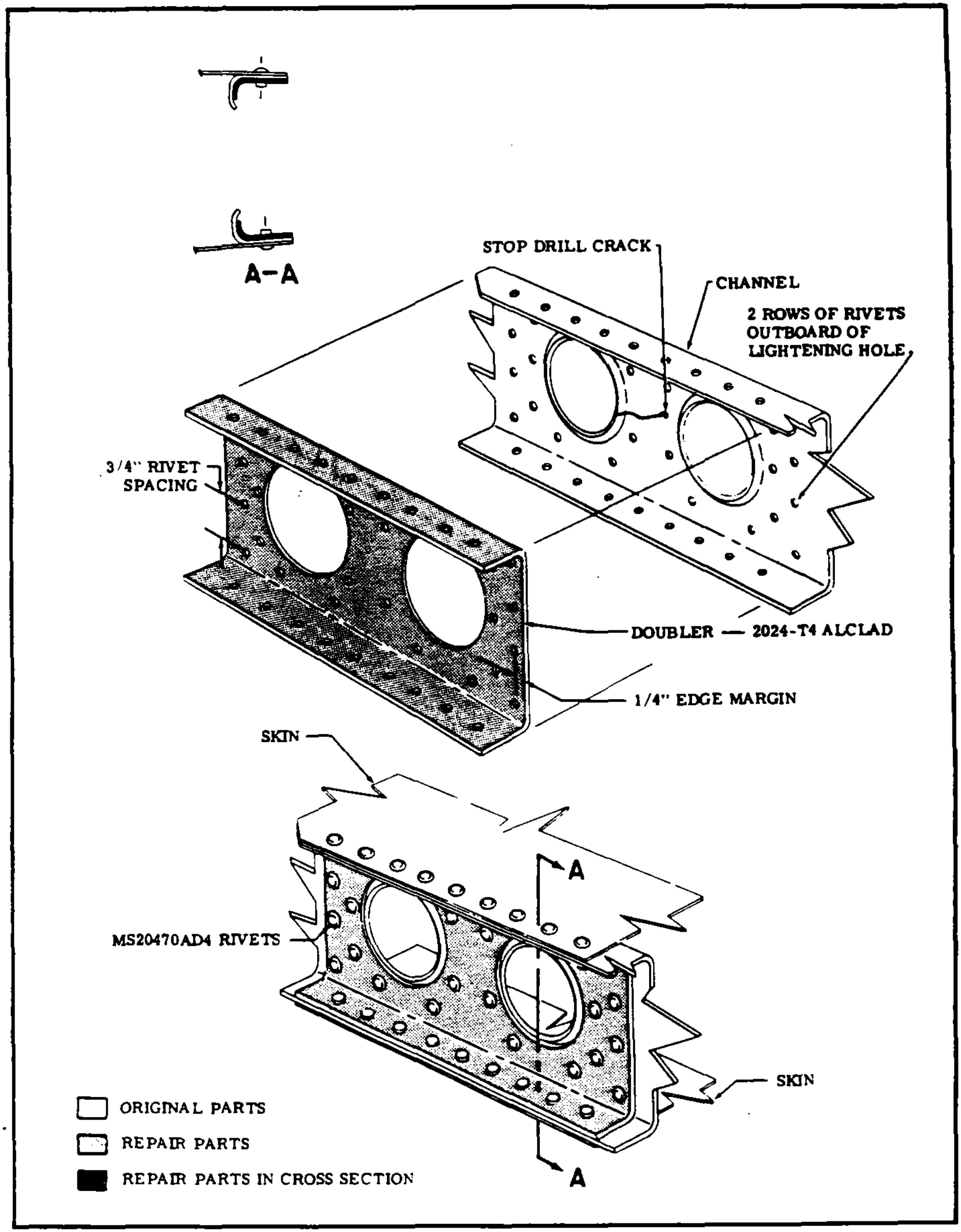


Figure 18-5. Stringer and Channel Repair (Sheet 3 of 4)

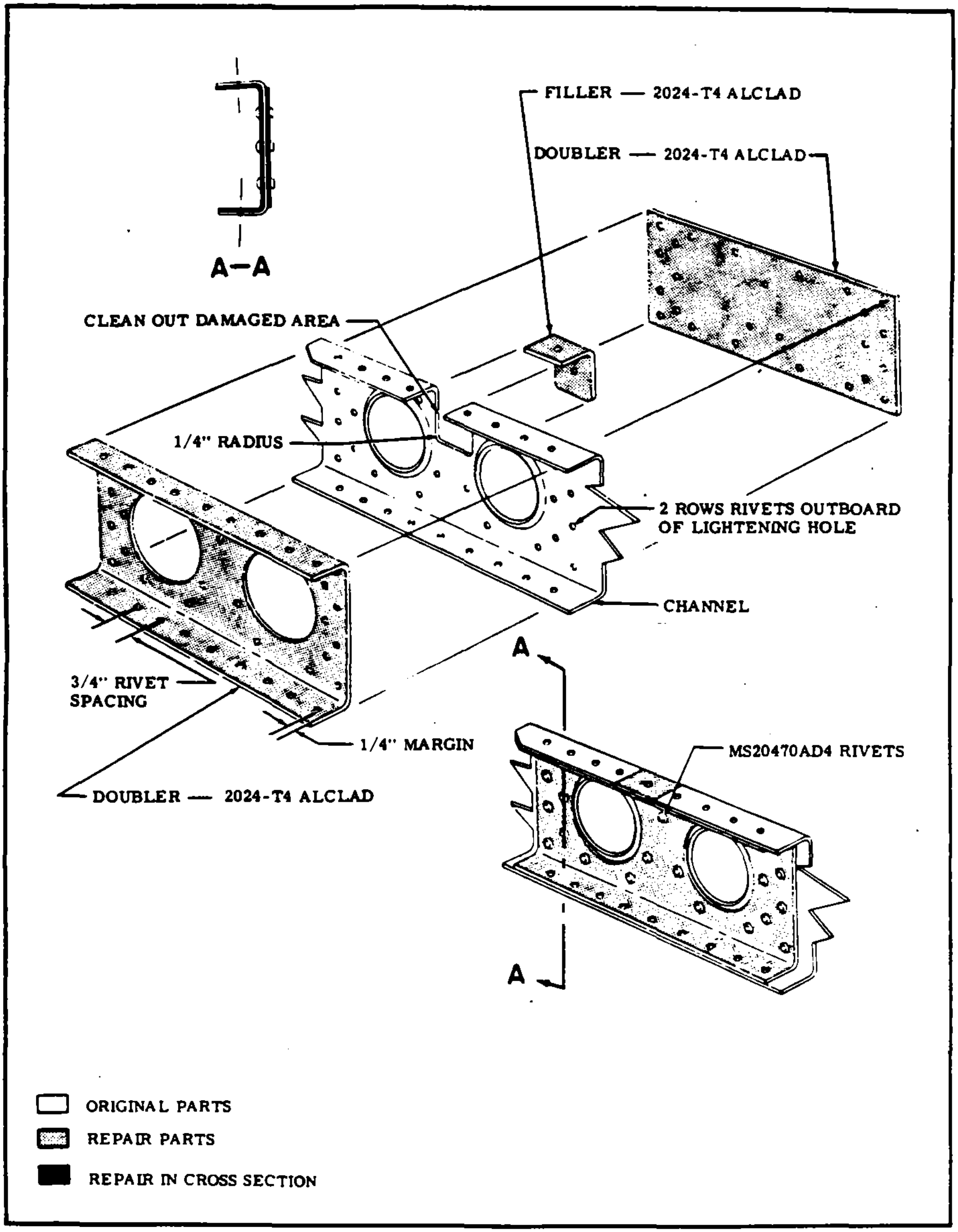


Figure 18-5. Stringer and Channel Repair (Sheet 4 of 4)

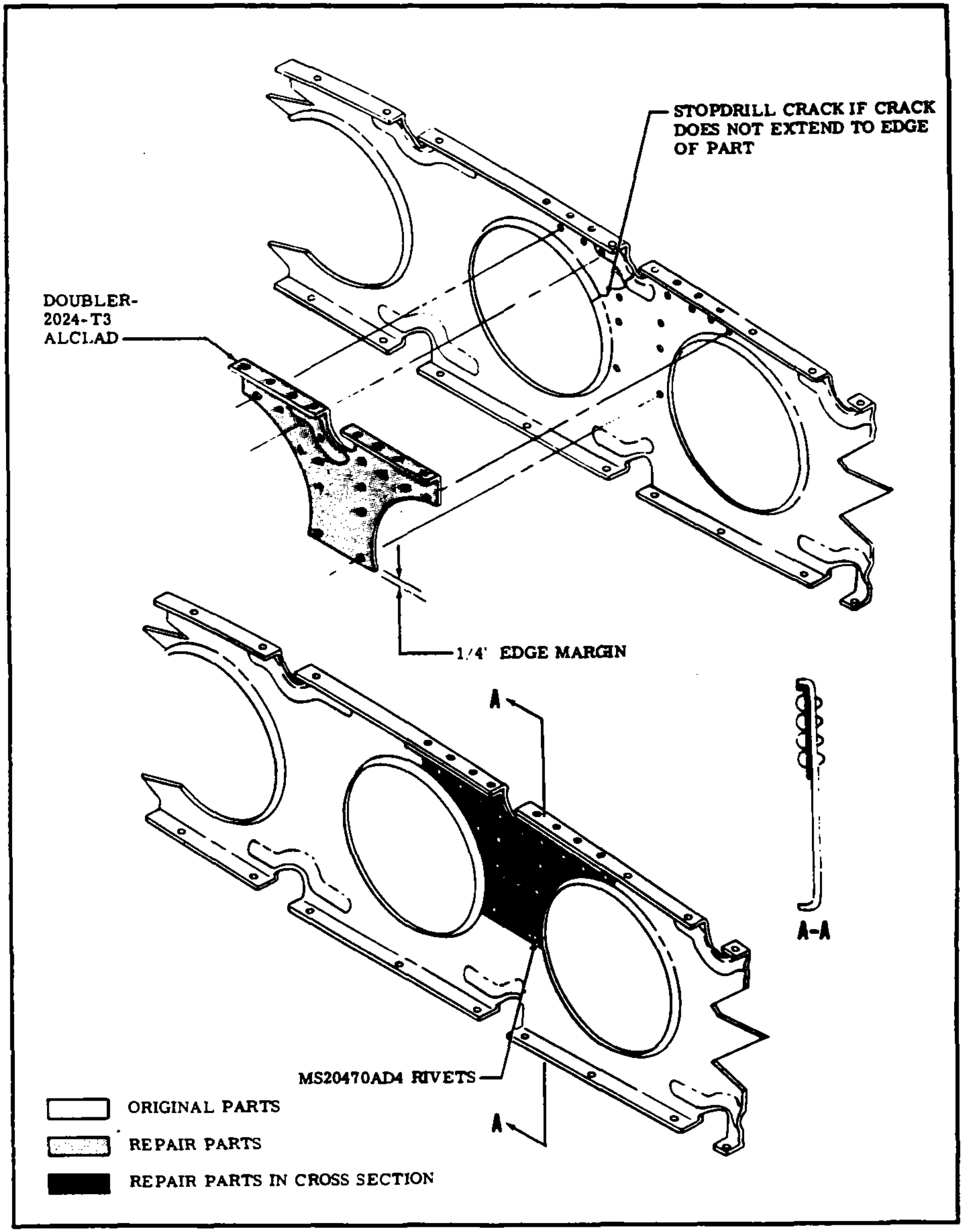


Figure 18-6. Rib Repair (Sheet 1 of 2)

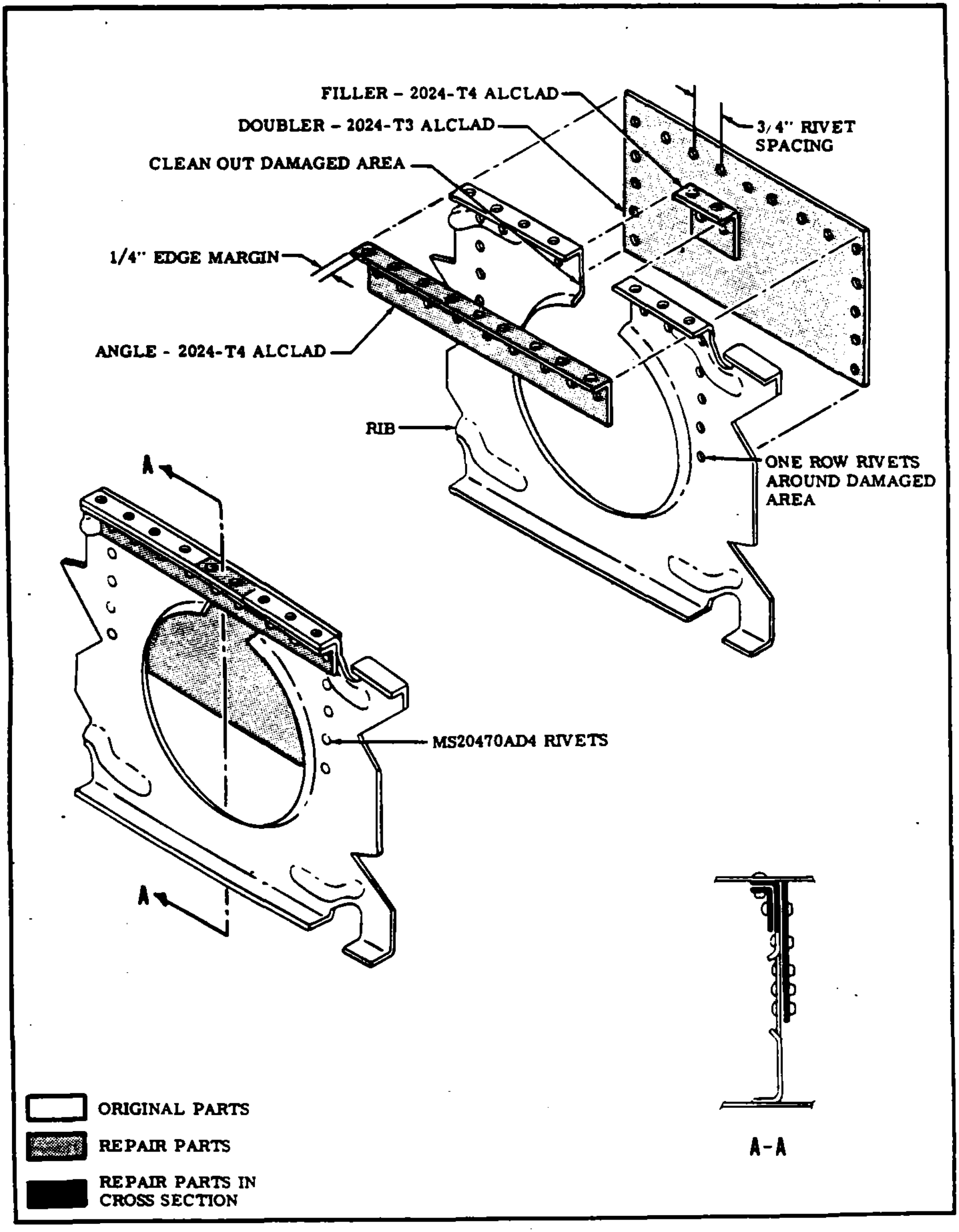


Figure 18-6. Rib Repair (Sheet 2 of 2)

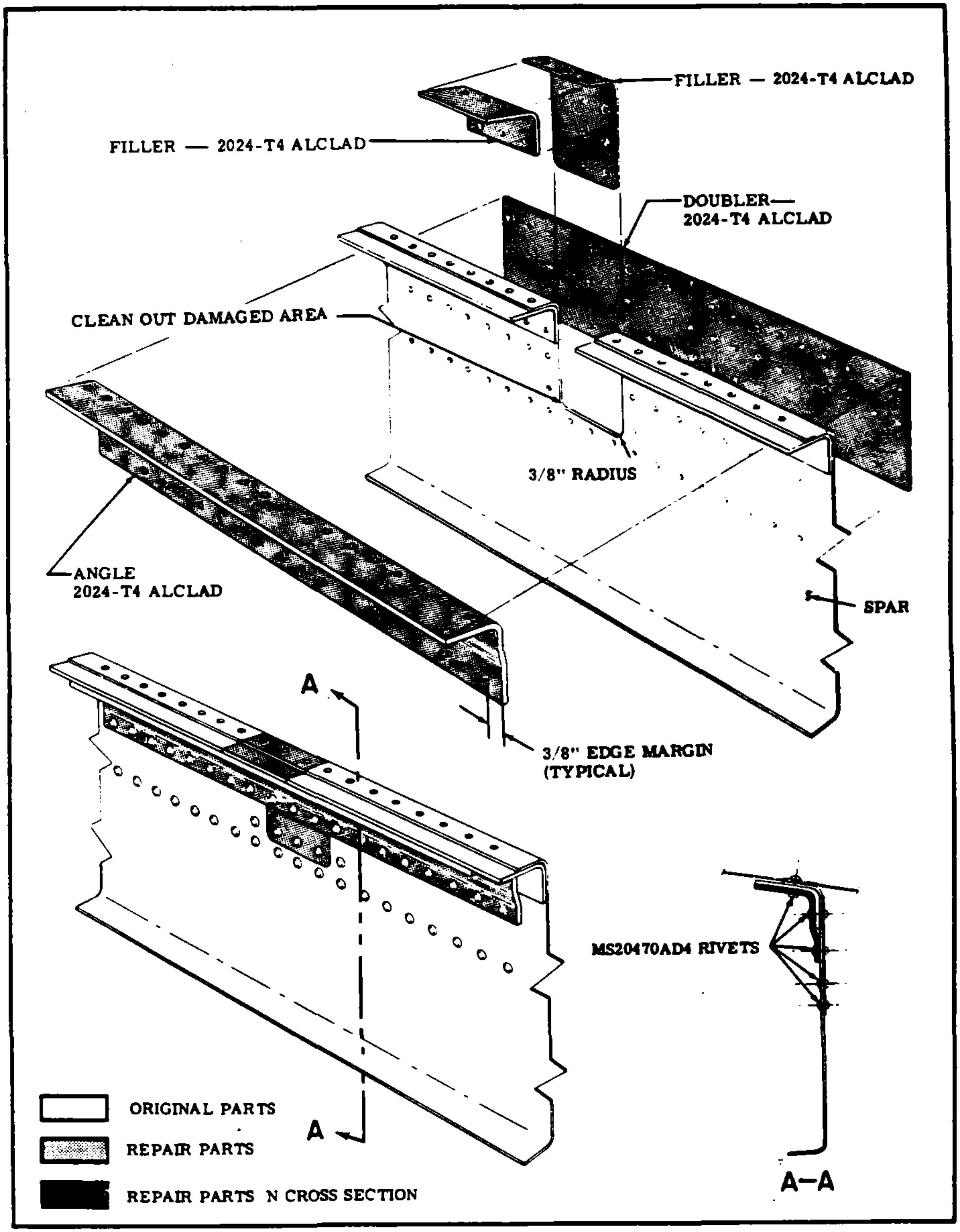


Figure 18-7. Wing Spar Repair (Sheet 1 of 4)

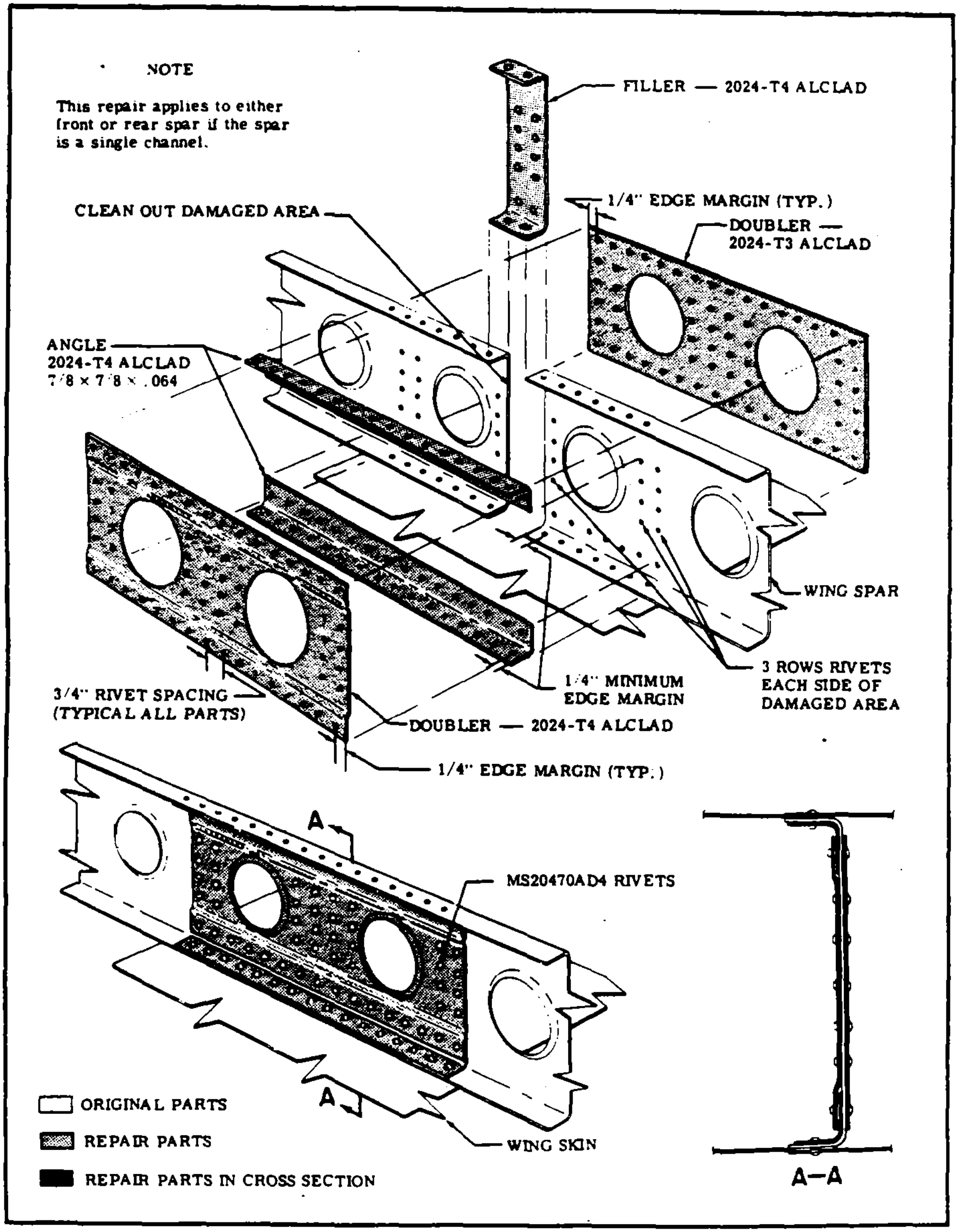


Figure 18-7. Wing Spar Repair (Sheet 2 of 4)

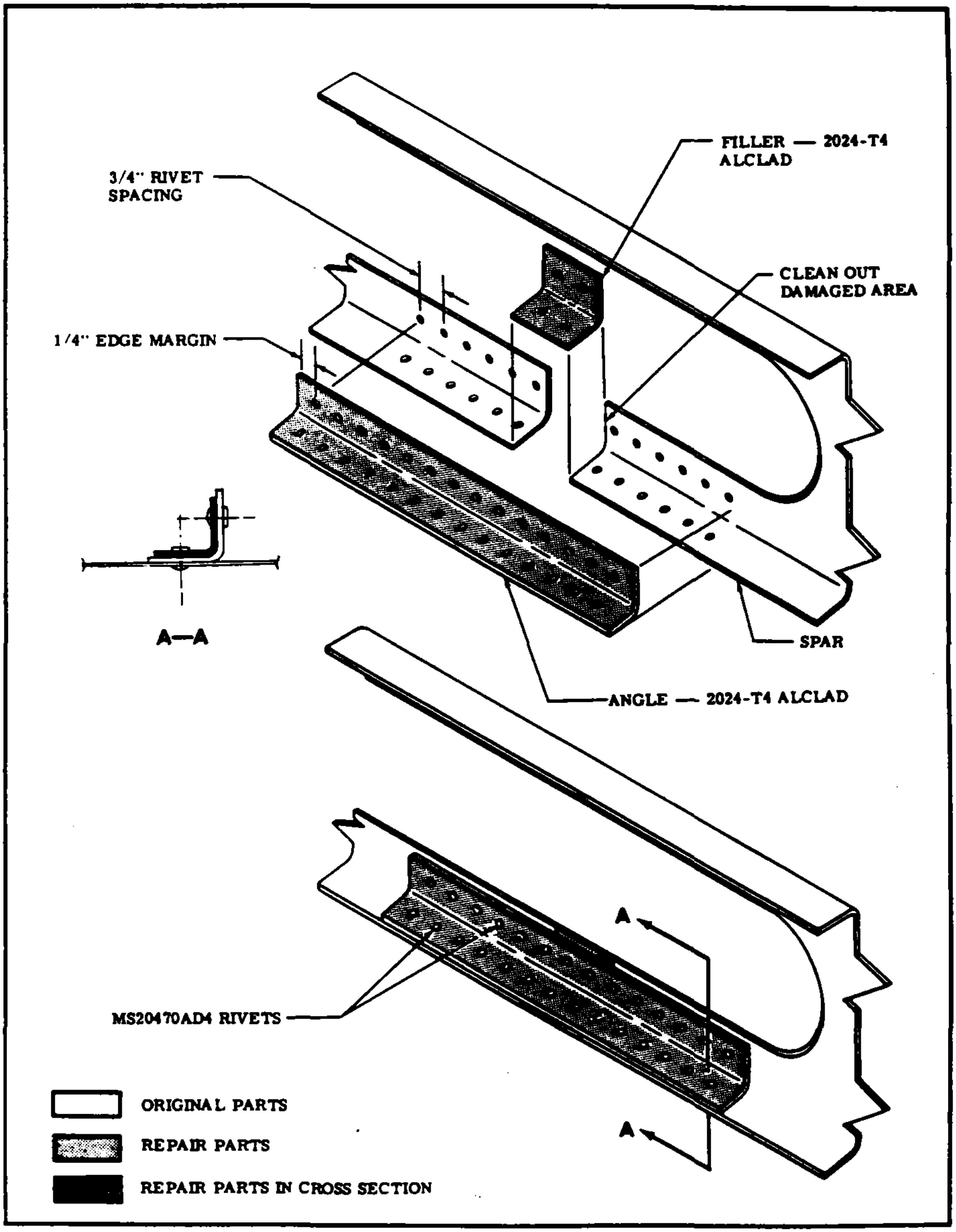


Figure 18-7. Wing Spar Repair (Sheet 3 of 4)

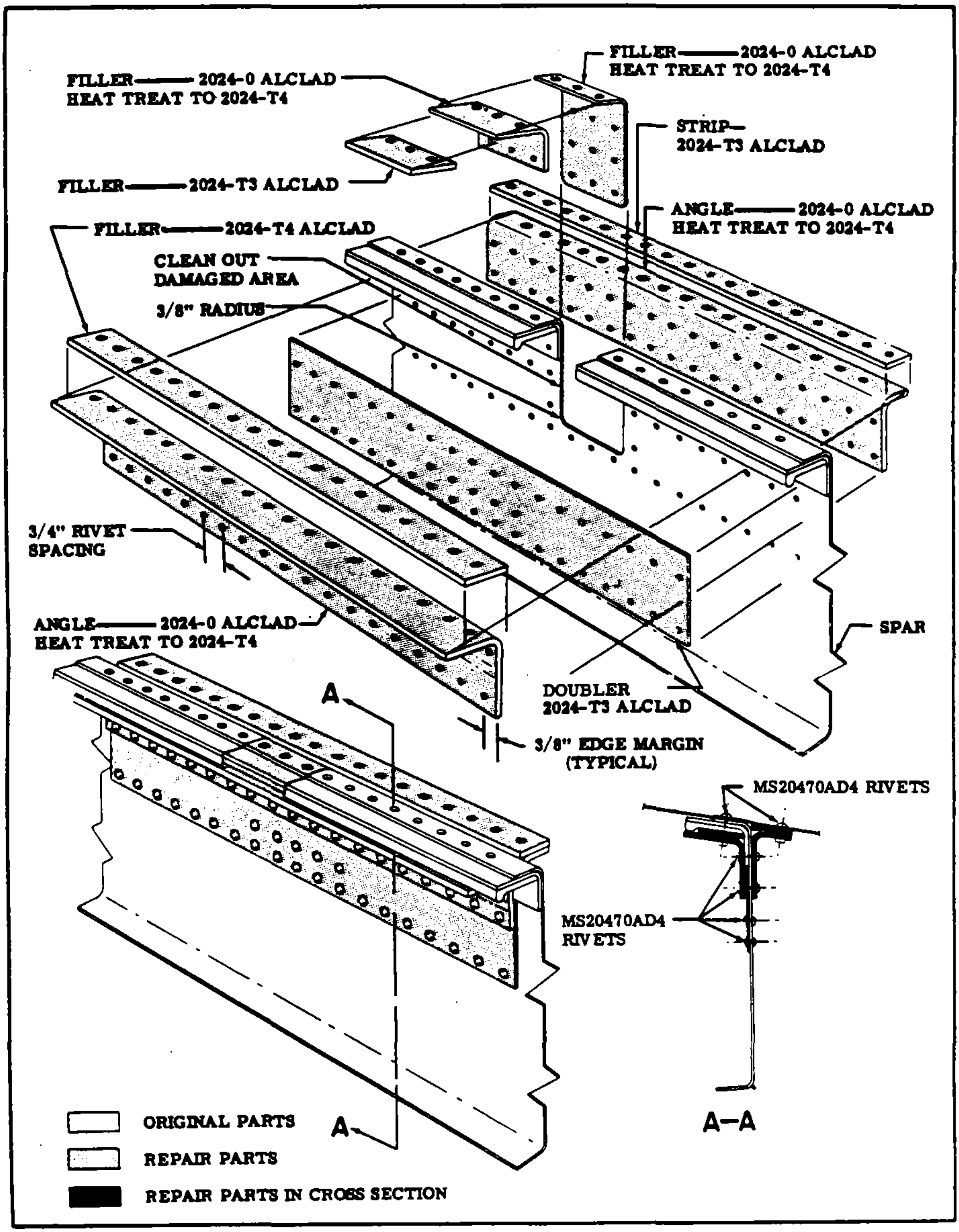


Figure 18-7. Wing Spar Repair (Sheet 4 of 4)

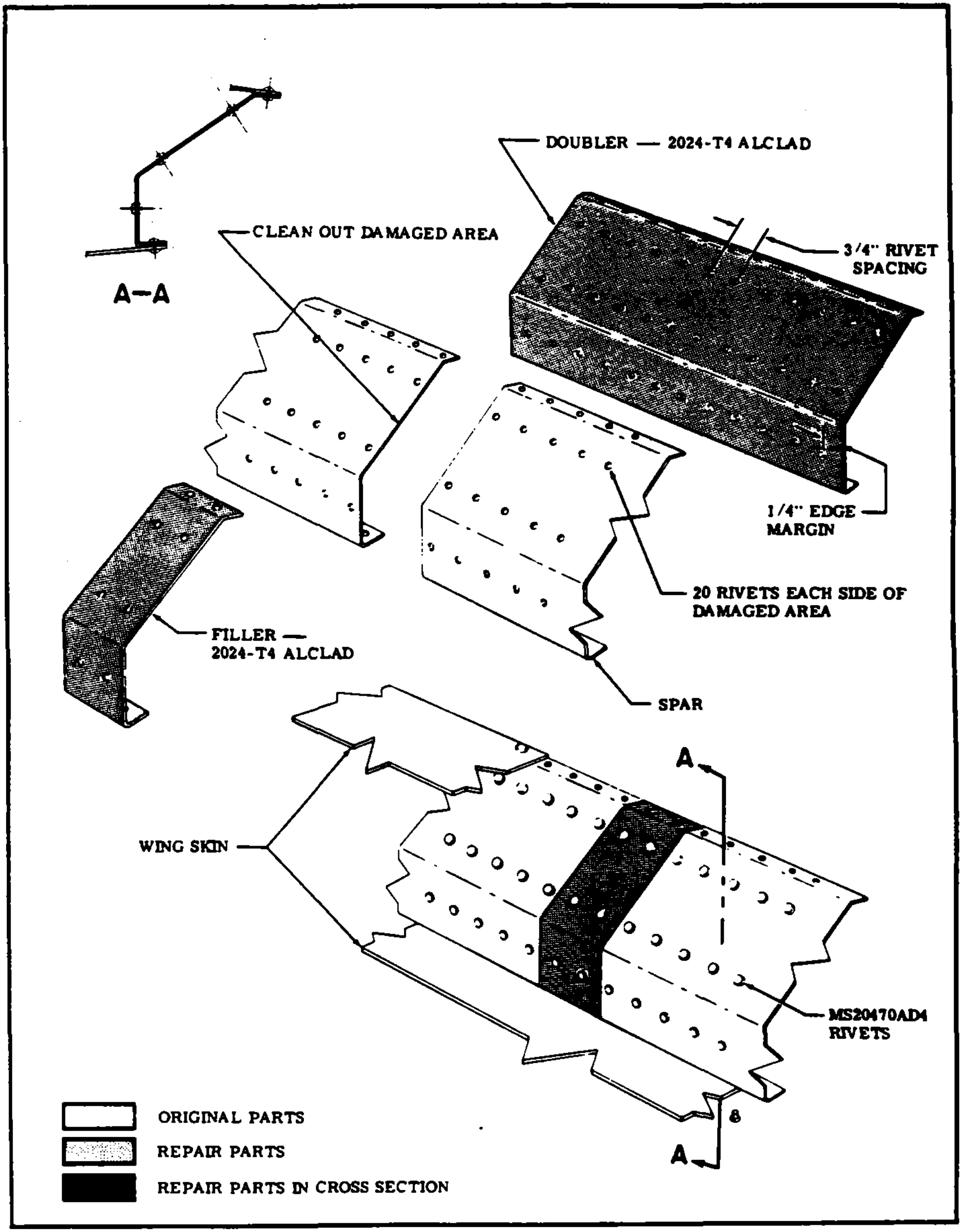


Figure 18-8. Auxiliary Spar Repair

NOTES:

1. Dimple leading edge skin and filler material; countersink the doubler.
2. Use MS20426AD4 rivets to install doubler.
3. Use MS20426AD4 rivets to install filler, except where bucking is impossible. Use CR162-4 Cherry (blind) rivets where regular rivets cannot be bucked.
4. Contour must be maintained; after repair has been completed, use epoxy filler as necessary and sand smooth before painting.
5. Vertical size is limited by ability to install doubler clear of front spar.
6. Lateral size is limited to seven inches across trimmed out area.
7. Number of repairs is limited to one in each bay.

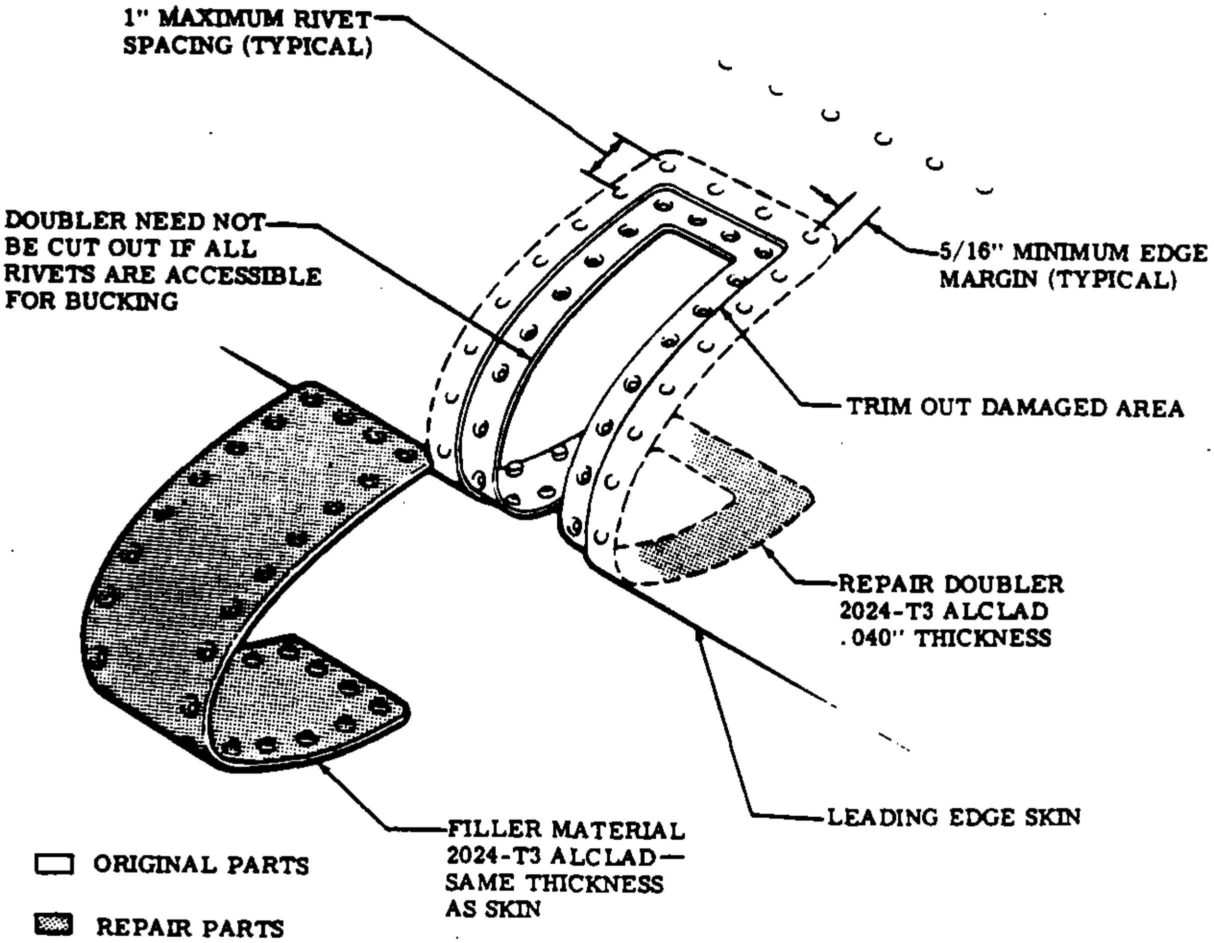


Figure 18-9. Leading Edge Repair

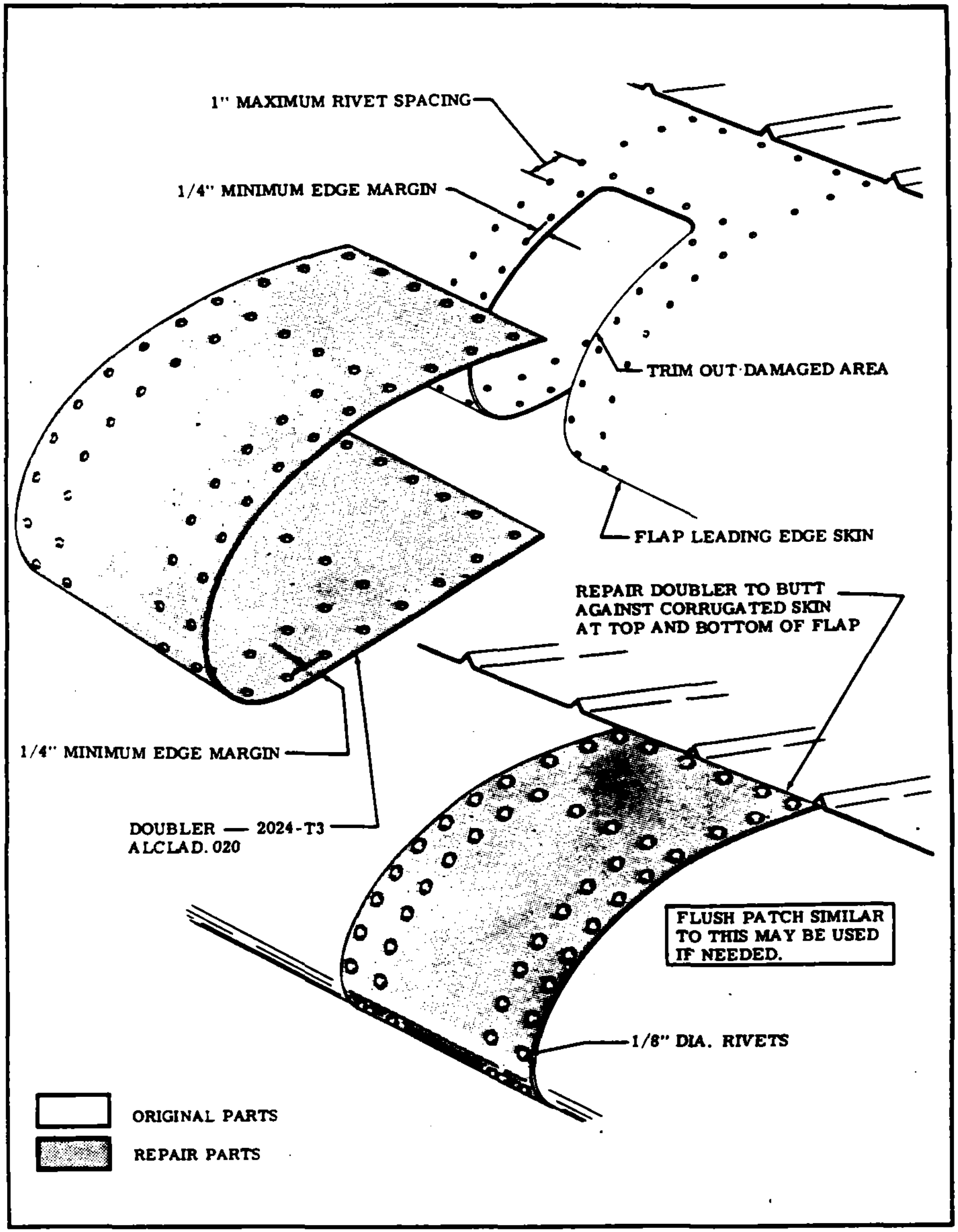


Figure 18-10. Flap Leading Edge Repair

(1) Use rivet pattern at wing station 23.53 for repair from wing station 23.53 to wing station 85.62. Use rivet pattern at wing station 100.00 for lap splice patterns from wing station 100.00 to 190.00. See figure 1-2 for wing stations.

(2) Use rivet spacing similar to the pattern at wing station 100.00 at leading edge ribs between lap splices.

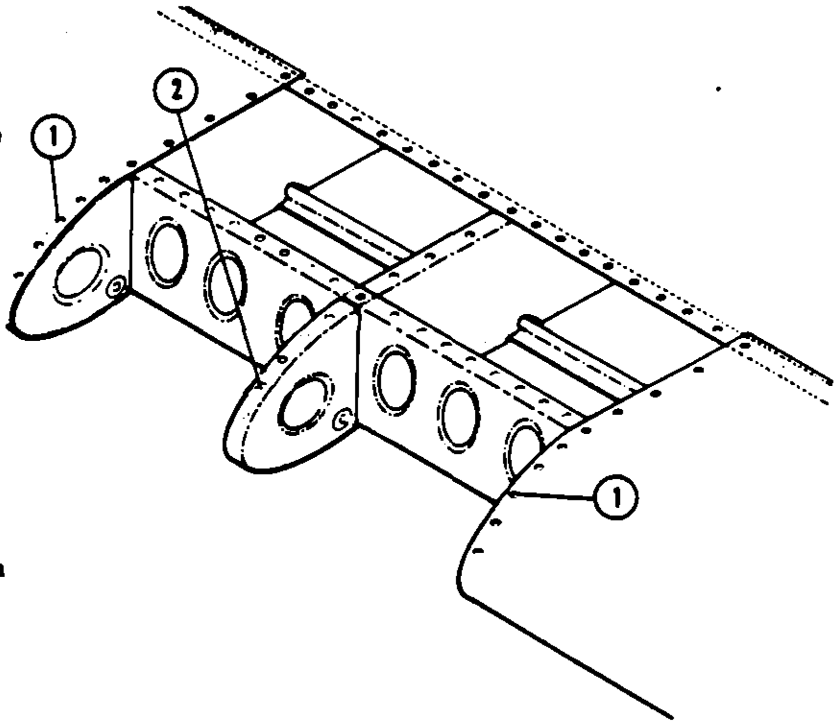
Select number of flush rivets to be used at each wing station leading edge rib from table.

RIBS AND STRINGERS:

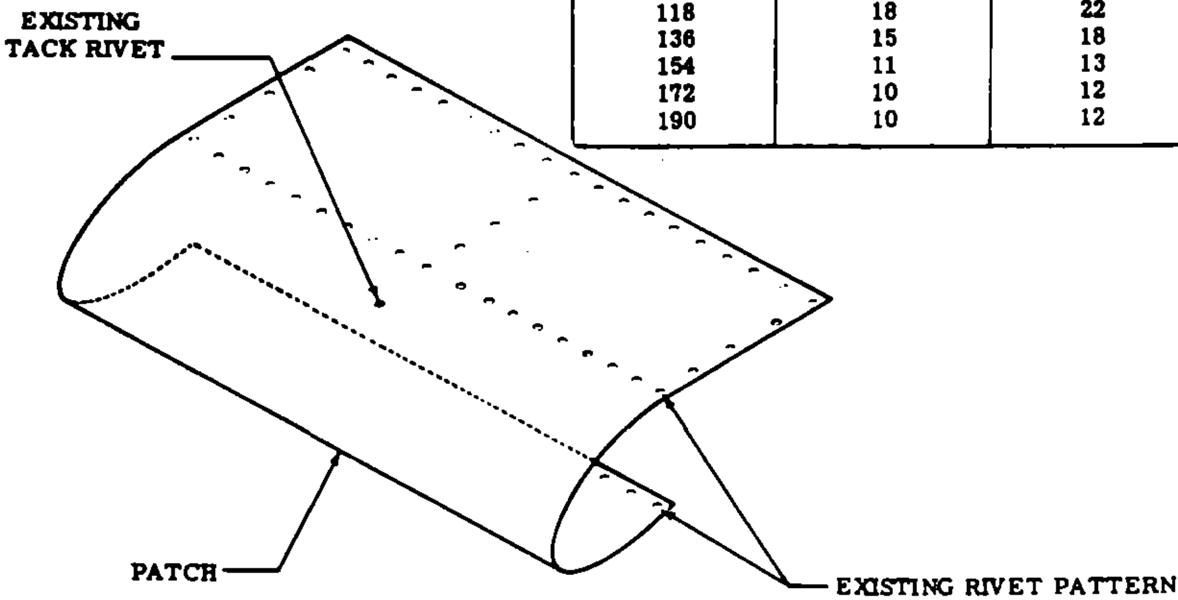
Blind rivets may be substituted for solid rivets in proportionally increased numbers in accordance with the table.

SPARS:

Blind rivets may be installed in wing spars only in those locations where blind rivets were used during original manufacture, ie fuel bay area of front spars on aircraft with integral fuel bays.



NUMBER OF FLUSH RIVETS IN DIMPLED SKIN REQUIRED IN REPLACEMENT LEADING EDGE SKINS		
WING STATION RIB	SOLID MS20426-4	BLIND CR2248-4
118	18	22
136	15	18
154	11	13
172	10	12
190	10	12



TYPICAL LEADING EDGE SECTION

Figure 18-11. Bonded Leading Edge Repair

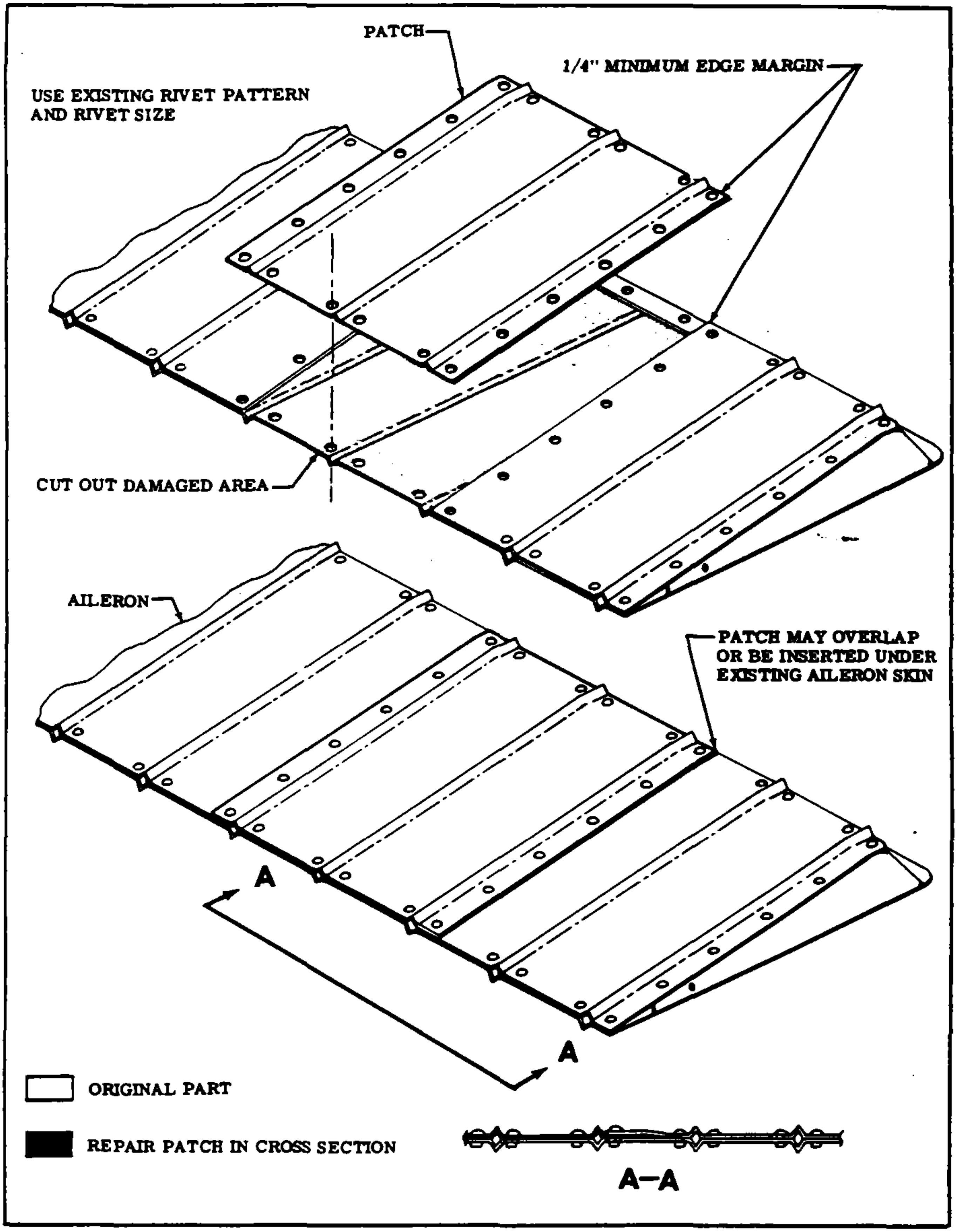
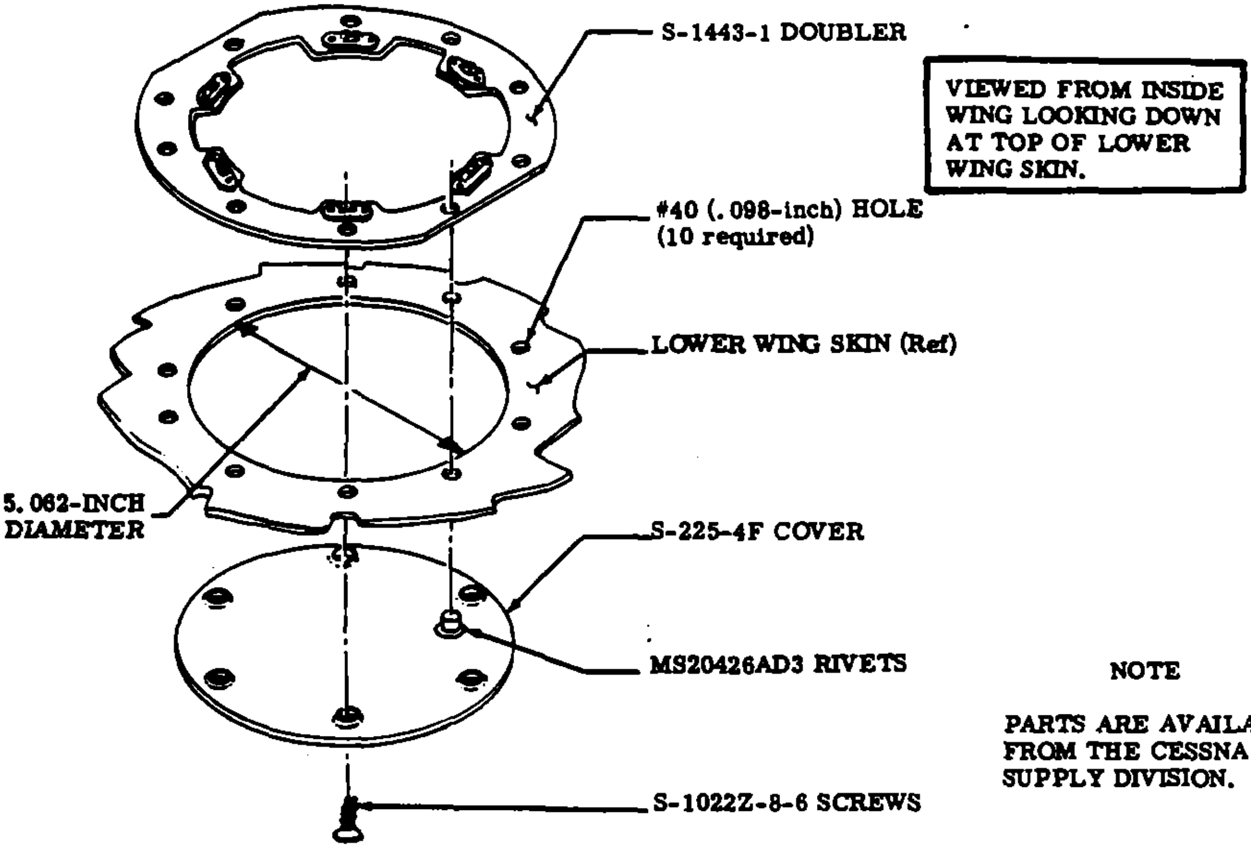


Figure 18-12. Corrugated Skin Repair



NOTE

PARTS ARE AVAILABLE FROM THE CESSNA SUPPLY DIVISION.

PRECAUTIONS

1. Add the minimum number of access holes necessary.
2. Any circular or rectangular access hole which is used with approved optional equipment installations may be added in lieu of the access hole illustrated.
3. Use landing light installations instead of adding access holes where possible. Do not add access holes at outboard end of wing; remove wing tip instead.
4. Do not add an access hole in the same bay where one is already located.
5. Locate new access holes near the center of a bay (spanwise).
6. Locate new access holes forward of the front spars as close to the front spar as practicable.
7. Locate new access holes aft of the front spar between the first and second stringers aft of the spar. When installing the doubler, rotate it so the two straight edges are closest to the stringers.
8. Alternate bays, with new access holes staggered forward and aft of the front spar, are preferable.
9. A maximum of five new access holes in each wing is permissible; if more are required, contact the Cessna Supply Division.
10. When a complete leading edge skin is being replaced, the wing should be supported in such a manner so that wing alignment is maintained.

a. Establish exact location for inspection cover and inscribe centerlines.

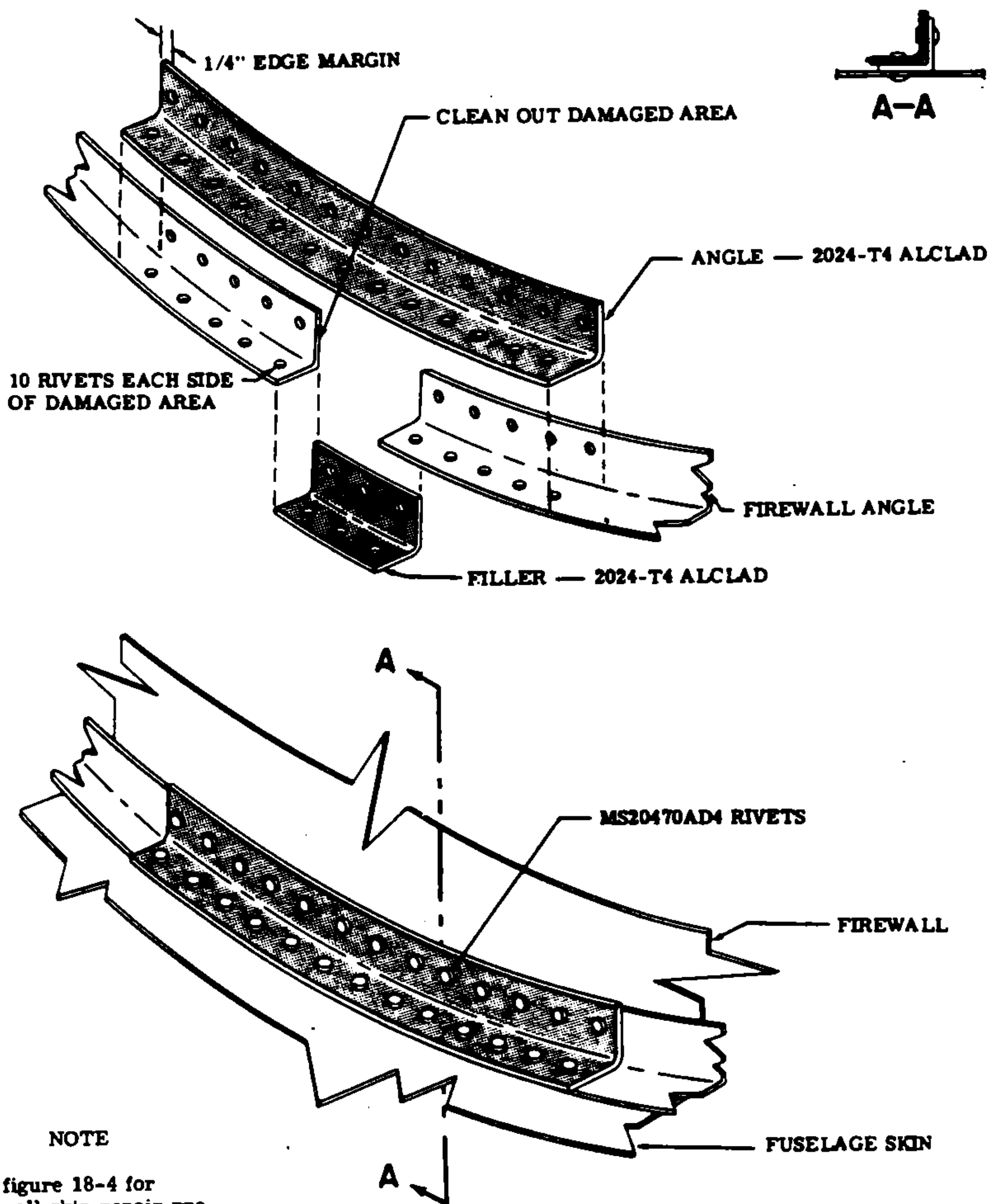
b. Determine position of doubler on wing skin and center over centerlines. Mark the ten rivet hole locations and drill to size shown.

c. Cutout access hole, using dimension shown.

d. Flex doubler and insert through access hole, and rivet in place.

e. Position cover and secure, using screws as shown.

Figure 18-13. Access Hole Installation



NOTE

See figure 18-4 for firewall skin repair procedures.

ORIGINAL PARTS

REPAIR PARTS

REPAIR PARTS IN CROSS SECTION

Figure 18-14. Firewall Angle Repair

SECTION 19

PAINTING

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NOTE

Acrylic Lacquer is standard through U20603809 and U20603815.

MATERIAL	NO /TYPE	AREA OF APPLICATION
PAINT	ACRYLIC LACQUER	Used on exterior airframe. (THRU U20603809 and U20603815)
PRIMER	EX-ER-7 WITH T-ER-4 REDUCER	Used with acrylic lacquer.
PRIMER	P60G2 WITH R7K46 REDUCER	Used with acrylic lacquer.
THINNER	T-8402A	Used to thin acrylic lacquer and for burndown.
SOLVENT	METHYL ETHYL KEYTONE (MEK)	Used to clean aluminum surfaces on aircraft exterior prior to priming.
SOLVENT CLEANER	FORM TECH AC	Used to clean ABS, Plexiglas and acrylic finishes.

NOTE

Do not paint pitot tube, gas caps, aileron gap seals or antenna covers which were not painted at the factory.

19-1. INTERIOR PARTS. (Finish Coat of Lacquer)

a. Painting of Spare Parts.

1. Ensure a clean surface by wiping with Form Tech AC to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or Lacquer Thinner since prolonged exposure can soften or embrittle ABS.

2. After the part is thoroughly dry, it is ready for the lacquer topcoat. Paint must be thinned with lacquer thinner and applied as a wet coat to ensure adhesion.

b. Touch Up of Previously Painted Parts.

1. Light sanding is acceptable to remove scratches and repair the surface but care must be exercised to maintain the surface texture or grain.

2. Ensure a clean surface by wiping with Form Tech AC to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or Lacquer Thinner since prolonged exposure can soften or embrittle ABS.

3. After the part is thoroughly dry it is ready for the lacquer topcoat. Paint must be thinned with lacquer thinner and applied as a wet coat to insure adhesion.

NOTE

Lacquer paints can be successfully spotted in.

19-2. EXTERIOR PARTS (Acrylic Topcoat)

a. Painting of Spare Parts.

1. Lightly scuff sand to remove scratches and improve adhesion.

2. Ensure a clean surface by wiping with Form Tech AC to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or Lacquer Thinner since prolonged exposure can soften or embrittle ABS.

3. After the part is thoroughly dry it is ready for the topcoat. Paint must be thinned with appropriate acrylic thinner and applied as a wet coat to insure adhesion.

b. Touch Up of Previously Painted Parts.

1. Lightly scuff sand to remove scratches and improve adhesion.

2. Ensure a clean surface by wiping with Form Tech AC to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or Lacquer Thinner since prolonged exposure can soften or embrittle ABS.

3. Apply a compatible primer - surfacer and sealer.

4. After the part is thoroughly dry it is ready for the topcoat. Paint must be thinned and applied as a wet coat to insure adhesion.

NOTE

Acrylic topcoats can be successfully spotted in.

19-3. EXTERIOR PARTS (Epoxy or Polyurethane Topcoat)

a. Painting of Spare Parts and Touch Up of Painted Parts.

1. Lightly scuff sand to remove scratches and improve adhesion.

2. Ensure a clean surface by wiping with Form Tech AC to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or Lacquer Thinner since prolonged exposure can soften or embrittle ABS.

3. Apply a primer compatible with Epoxy or Polyurethane topcoat.

4. After the part is thoroughly dry it is ready for the topcoat.

NOTE

Epoxy or Polyurethane topcoats cannot be successfully spotted in - finish should be applied in areas with natural breaks such as skin laps or stripe lines.

When painting interior and exterior polycarbonate parts, or where the part material is questionable, a "barrier primer" should be applied prior to the Enamel, Lacquer, Epoxy or Polyurethane topcoat.

NOTE

Enflex III is standard beginning with serials, U20603810 thru U20603814, U20603816 thru U20603859, U20603861 thru U20603865, U20603874, U20603878 thru U20603880, U20603882, U20603885, U20603887, U20603889 thru U20603892, U20603894, U20603895, and U20603905.

ENMAR MODIFIED URETHANE

MATERIAL	NO/TYPE	AREA OF APPLICATION
PAINT	ENFLEX III ENAMEL	Standard Exterior overall color
	ENFLEX III ADDUCT	Catalyst for Enflex III Enamel
ACCELERATOR	URETHANE ACCELERATOR 120-975	Used to speed curing
PRIMER	WASH PRIMER EX-ER-7	Used to prime aircraft for Enflex III topcoat
REDUCER	T-ER-4	Used to thin EX-ER-7
THINNER	Jet Glo 86T-10399 (110-655)	Used to thin Enflex III
	110-805	Used to thin Enflex III
RETARDER	110-996	Used to slow curing time

NOTE

Imron Polyurethane is Standard beginning serial U20603860, U20603866 thru U20603873, U20603875 thru U20603877, U20603881, U20603883, U20603884, U20603886, U20603888, U20603893, U20603896 thru U20603904, and U20603906 and on and all 1978 models.

IMRON MODIFIED URETHANE

MATERIAL	NO/TYPE	AREA OF APPLICATION
PAINT	IMRON ENAMEL	Used for stripe colors
	IMRON 192S Activator	Catalyst for Imron Enamel
PRIMER	WASH PRIMER P60G2	Used to prime aircraft for Imron Enamel
REDUCER/ THINNER	IMRON Y8485S Reducer	Used to thin Imron Enamel
	Catalyst Reducer R7K44	Used to reduce P60G2

NOTE

Do not paint pitot tube, gas caps, aileron gap seals or antenna covers which were not painted at the factory.

MATERIAL	NO/TYPE	AREA OF APPLICATION
STRIPPER	Strypeeze Stripper	Used to strip primer overspray
CLEANER	Form Tech AC	Used to clean aircraft exterior for removal of grease, bug stains, etc.
	Klad Polish	Used to clean aluminum finish
	808 Polishing Compound	Used to rub out overspray
SOLVENT	(MEK) Methyl Ethyl Ketone	Used to tack aircraft prior to topcoat
CLOTH	HEX Wiping Cloth	Used with solvent to clean aircraft exterior
FILLER	White Streak	Used to fill small dents
MASKING	Class A Solvent Proof Paper	Used to mask areas not to be painted
	Tape Y218	Used for masking small areas
	Tape Y231	Used for masking small areas

19-4. FACILITY. Painting facilities must include the ability to maintain environmental control; temperature at 65°F., and a positive pressure inside to preclude the possibility of foreign material damage. All paint equipment must be clean, and accurate measuring containers available for mixing protective coatings. Modified Urethane has a pot life of four to eight hours, depending on ambient temperature and relative humidity. Use of approved respirators while painting is a must, for personal safety. All solvent containers should be grounded to prevent static build-up. Catalyst materials are toxic, therefore, breathing fumes or allowing contact with skin can cause serious irritation. Material stock should be rotated to allow use of older materials first, because its useful life is limited. All supplies should be stored in an area where temperature is higher than 50°F., but lower than 90°F. Storage at 90°F is allowable for no more than sixty days providing it is returned to room temperature for mixing and use.
Modified urethane paint requires a minimum of seven days to cure under normal conditions, if humidity and temperature is lower, curing time will be extended a maximum of 14 days. During the curing period, indiscriminate use of masking tape, abrasive polishes, or cleaners can cause damage to finish. Desirable curing temperature for modified urethane is 60°F. for a resulting satisfactory finish.

19-5. CLEANUP.

a. Inspect aircraft for any surface defects such as dents or unsatisfactory previous repairs, and correct in accordance with paragraph 18-9.

b. Wipe excess sealer from around windows and skin laps. Mask windows, ABS parts, and any other areas not to be primed, with 3M tape and Class A Solvent Proof Paper. Care must be exercised to avoid cuts, scratches or gouges by metal objects to all plexiglass surfaces, because cuts and scratches may contribute to crazing and failure of plexiglass windows.

c. Methyl Ethyl Ketone (MEK) or Form Tech AC solvent should be used for final cleaning of airplanes prior to painting. The wiping cloths shall be contaminant and lint free HEX. Saturate cloth in the solvent and wring out so it does not drip. Wipe the airplane surface with the solvent saturated cloth in one hand, and immediately dry with a clean cloth in the other hand. It is important to wipe dry solvent before it evaporates.
When an airplane has paint or zinc chromate overspray on the exterior, stripper may be used to remove the overspray. The stripper may be applied by brush and will require a few minutes to soften the overspray. Heavy coatings may require more than one application of the stripper. Use extreme care to prevent stripper from running into faying surfaces on corrosion proofed airplanes. After removal of the overspray, clean the airplane with Methyl Ethyl Ketone (MEK) or Form Tech AC solvent in the prescribed manner.

NOTE

It is imperative that clean solvent be used in cleaning aircraft. Dispose of contaminated solvent immediately. Fresh solvent should be used on each aircraft.

WARNING

Use explosion-proof containers for storing wash solvents and other flammable materials.

19-6. PREPRIMING.

NOTE

Enflex III is standard beginning with serials, U20603810 thru U20603814, U20603816 thru U20603859, U20603861 thru U20603865, U20603874, U20603878 thru U20603880, U20603882, U20603885, U20603887, U20603889 thru U20603892, U20603894, U20603895, and U20603905.

a. Above serialized aircraft have Enmar Wash Primer EX-ER-7, Enflex III Enamel for overall color and stripes.

b. Mix one to one, EX-ER-7 primer with T-ER-4 Reducer by volume. Mix only in stainless steel or lined containers only. After mixing allow primer to set for 30 minutes before spraying. Pot life of the mixed primer is six (6) hours. All mixed material should be discarded if not used within this time. Pot pressure during spraying should be approximately 10±1 psi. Air pressure should be 40 to 30 psi at the gun. Blow loose contaminant of the aircraft with clean, dry air. Check all tapes to make sure it adheres properly. Cover the flap tracks, nose gear strut tube, wheels, and shimmy dampener rod ends. ABS parts and other preprimed parts do not receive wash primer.

NOTE

Imron Polyurethane is Standard beginning serial U20603860, U20603866 thru U20603873, U20603875 thru U20603877, U20603881, U20603883, U20603884, U20603886, U20603888, U20603893, U20603896 thru U20603904, and U20603906 and on and all 1978 models.

c. Corrosion proofed and standard aircraft will receive Sherwin Williams Primer P60G2, DuPont Imron Enamel for over all color, and for stripes.

d. Mix 1 part P60G2 primer with 1 1/2 parts R7K44 catalyst reducer, by volume. Mix in stainless steel or lined containers only. After mixing allow primer to set for 30 minutes before spraying. Pot life of the mixed primer is six (6) hours, all mixed materials should be discarded if not used within that time limit. Pot pressure during spraying should be approximately 10 ± 1 psi. Air pressure should be 40 to 50 psi at the gun. Blow loose contaminant off the airplane with clean, dry air. Check all tapes to make sure they adhere properly. Cover the flap tracks, nose gear strut tube, wheels, and shimmy dampener rod ends. ABS parts and other preprimed parts do not receive wash primer.

WARNING

AIRCRAFT SHOULD BE GROUNDED PRIOR TO PAINTING TO PREVENT STATIC ELECTRICITY BUILD-UP AND DISCHARGE.

19-7. PRIMING.

a. Apply primer in one wet even coat. Dry film thickness to be .0003 to .0005 inches. Do not topcoat until sufficiently cured. When scratching with firm pressure of the fingernail does not penetrate the coating, the primer is cured. Primer should be topcoated within four hours after application.

19-8. PREPAINTING.

NOTE

Enflex III is standard beginning with serials, U20603810 thru U20603814, U20603816 thru U20603859, U20603861 thru U20603865, U20603874, U20603878 thru U20603880, U20603882, U20603885, U20603887, U20603889 thru U20603892, U20603894, U20603895, and U20603905.

a. On above serialized aircraft, mix the required amount of Enflex III with Enflex III Adduct in a 4 to 1 ratio by volume. Mix thoroughly, and allow to stand for approximately 30 minutes before spraying. Enflex III can be thinned with Jet Glo thinner 86T-10399 (110-655) to obtain spraying viscosity, which should be checked after four hours and adjusted if necessary.

NOTE

Imron Polyurethane is Standard beginning serial U20603860, U20603866 thru U20603873, U20603875 thru U20603877, U20603881, U20603883, U20603884, U20603886, U20603888, U20603893, U20603896 thru U20603904, and U20603906 and on and all 1978 models.

b. On standard aircraft mix the required amount of Imron with Imron 192S Activator in a 3 to 1 ratio by volume. Mix thoroughly, and begin spraying immediately, because there is no induction time requirement. Imron can be thinned to spraying viscosity with Y8485S Imron Reducer. Viscosity should be checked and adjusted after four hours if necessary.

c. When applying modified urethane finishes, the painter should wear an approved respirator, which has a dust filter and organic vapor cartridge, or an air supplied respirator. All modified urethane finishes contain some isocyanate, which may cause irritation to the respiratory tract or an allergic reaction. Individuals may become sensitized to isocyanates.

d. The pot life of the mixture is approximately 6-8 hours at 75°F. Pot pressure should be approximately 12 psi during application. Air pressure at the gun should be 40 to 50 psi.

e. Scuff sand the primer only where runs or dirt particles are evident. Minor roughness or grit may be removed by rubbing the surface with brown Kraft paper which has been thoroughly wrinkled. Unmask ABS and other preprimed parts and check tapes. Clean surface with a jet of low-pressure dry air.

19-9. PAINTING ALL-OVER WHITE OR COLOR.

a. Complete painting of the aircraft should be done with 2 or 3 wet, even coats. Dry coats will not reflow, and will leave a grainy appearance.

b. Allow a 5 minute period for the finish to flash off before moving aircraft to the oven.

c. move to the force-dry oven and dry for approximately 1-1/2-hours at 120°F to 140°F.

d. Dry film thickness of the overall color should be between 1.3 and 2.0 mils. Films in excess of 3.0 mils are not desirable.

19-10. MASKING FOR STRIPES.

a. Remove aircraft from the oven. Allow aircraft to cool to room temperature before masking.

b. Mask stripe area using 3M Tape 231 or 3M Tape Y218 and Class A solvent-proof paper. Double tape all skin laps to prevent blow by.

c. Aircraft which will have a stripe only configuration shall be masked, cleaned and primed in stripe area only.

d. If the base coat is not over 72 hours old, the stripe area does not require sanding If sanding is necessary because of age or to remove surface defects, use #400 or #600 sandpaper. Coarse paper will leave sand marks which will decrease gloss and depth of gloss to the finish. The use of power sanders should be held to a minimum. If used, exercise care to preclude sanding through the white base coat. Wipe surfaces to be striped with a tack cloth and check all tapes.

e. Stripe colors on Enflex III base coat will be Imron Enamel. Mix as outlined in paragraph 19-8.

f. Painting of the stripes should be done with 2 or 3 wet-even coats. Dry coats will not reflow, and will leave a grainy appearance. Stripes may be force-dried or air-dried. Film thickness of a stripe is approximately 1.0 mil.

g. Do not remove masking tape and paper until the paint has dried to a "dry to touch" condition. Care should be exercised in removal of the masking to prevent damage to the finish.

h. Modified urethane finishes are sensitive to moisture, therefore, should be stored out of rain until cured.

19-11. TOUCH-UP. When necessary to touch-up or refinish an area, the defect should be sanded with #400 and followed by #600 sand paper. Avoid, if possible, sanding through the primer. If the primer is penetrated over an area 1/2-inch square or larger, repriming is necessary. Avoid spraying primer on the adjacent paint as much as possible. Since urethane finishes cannot be "spotted in", repairs should be in sections extending to skin laps or stripe lines.

a. Dry overspray and rough areas may be compounded out with DuPont #808 rubbing compound.

b. Grease, bug stains, etc., may be removed from painted surfaces with Form Tech AC. Klad Polish may be used on bare aluminum to remove stains, oxides, etc.

c. Rework areas where paint or primer removal is required, may be stripped with Strypeeze Paint Removal. All traces of stripper must be removed before refinishing.

19-12. REPAIR OF DENTS.

To repair dents, use White Streak Filler or equivalent. Mix White Streak in the correct proportions as recommended by the manufacturer.

b. Do not apply White Streak Filler over paint. All paint shall be removed in the repair area, and the aluminum surfaces sanded lightly to increase adhesion. Apply the White Streak to a level slightly above the surrounding skin. After drying for 10-15 minutes, sand the filler flush with the skin surface, using care to feather the edges.

SECTION 20
WIRING DIAGRAMS

THRU 1977 Model

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1978 Thru 1981 Models

CIRCUIT FUNCTION AND SPECIFIC CIRCUIT CODE LETTERS

A - Armament
B - Photographic
C - Control Surface
  CA - Automatic Pilot
  CC - Wing Flaps
  CD - Elevator Trim
D - Instrument (Other Than Flight or Engine Instrument)
  DA - Ammeter
  DB - Flap Position Indicator
  DC - Clock
  DD - Voltmeter
  DE - Outside Air Temperature
  DF - Flight Hour Meter
E - Engine Instrument
  EA - Carburetor Air Temperature
  EB - Fuel Quantity Gage and Transmitter
  EC - Cylinder Head Temperature
  ED - Oil Pressure
  EE - Oil Temperature
  EF - Fuel Pressure
  EG - Tachometer
  EH - Torque Indicator
  EJ - Instrument Cluster
  EK - Turbine Inlet Temperature
F - Flight Instrument
  FA - Bank and Turn
  FB - Pitot Static Tube Heater and Stall Warning Heater
  FC - Stall Warning
  FD - Speed Control System
  FE - Indicator Lights
G - Landing Gear
  GA - Actuator
  GB - Retraction
  GC - Warning Device (Horn)
  GD - Light Switches
  GE - Indicator Lights
H - Heating, Ventilating and De-Icing
  HA - Anti-icing
  HB - Cabin Heater
  HC - Cigar Lighter
  HD - De-ice
  HE - Air Conditioners
  HF - Cabin Ventilation
J - Ignition
  JA - Magneto
K - Engine Control
  KA - Starter Control
  KB - Propeller Synchronizer
L - Lighting
  LA - Cabin
  LB - Instrument
  LC - Landing
  LD - Navigation
  LE - Taxi
  LF - Rotating Beacon
  LG - Radio
  LH - De-ice
  LJ - Fuel Selector
  LK - Tail Floodlight
  LL - Recognition Lights
M - Miscellaneous
  MA - Cowl Flaps
  MB - Electrically Operated Seats
  MC - Smoke Generator
  MD - Spray Equipment
  ME - Cabin Pressurization Equipment
  MF - Chem O_2 - Indicator
P - D. C. Power
  PA - Battery Circuit
  PB - Generator Circuits
  PC - External Power Source
  PH - Anti-Ice Power Source
Q - Fuel and Oil
  QA - Auxilliary Fuel Pump
  QB - Oil Dilution
  QC - Engine Primer
  QD - Main Fuel Pumps
  QE - Fuel Valves
R - Radio (Navigation and Communication)
  RA - Instrument Landing
  RB - Command
  RC - Radio Direction Finding
  RD - VHF
  RE - Homing
  RF - Marker Beacon
  RG - Navigation
  RH - High Frequency
  RJ - Interphone
  RK - UHF
  RL - Low Frequency
  RM - Frequency Modulation
  RP - Audio System and Audio Amplifier
  RR - Distance Measuring Equipment (DME)
  RS - Airborne Public Address System
S - Radar
U - Miscellaneous Electronic
  US - Identification - Friend or Foe
W - Warning and Emergency
  WA - Flare Release
  WB - Chip Detector
  WC - Fire Detection System
X - A. C. Power

FUNCTION CIRCUITS	GAUGE	BASE COLOR (or solid)	STRIPE COLOR
A+ Power	16	Red	None
	18	Red	Black
		Red	White
	20	Red	Green
	22	Red	Yellow
Ground	16	Black	None
	18	Black	White
Mike Ground	22	Black	None
Radio Lights Dim	18	Yellow	None
Mike Audio	22	Tan	None
		Tan (Shielded)	None
Mike Key	22	White	Black
Radio Speaker	20	Green	None
Headphones	22	Blue	None
Dev + ●	22	Gray	Red
Dev - ●	22	Gray	Green

● "Dev+" and "Dev-" circuits are for use in Nav-o-matic 300 autopilots and any associated omni indicator circuit to which it connects.

NOTE

All other color coded wires are for general use in multi-conductor radio and autopilot harness assemblies.

NOTE

Effectivity of diagrams are designated as follows: Eff thru ser (SRXXXXX) denotes effectivity to the serial number prior to the (SRXXXXX) serial. Ser (SRXXXXX) & on denotes effectivity for the (SRXXXXX) serial and on. Diagrams and/on portions of, may be individually serialized and not designated by a (SRXXXXX) number.

CROSS REFERENCE LISTING OF SERIAL REQUEST NUMBERS
LISTED ON DIAGRAMS VS. AIRCRAFT SERIAL NUMBERS.

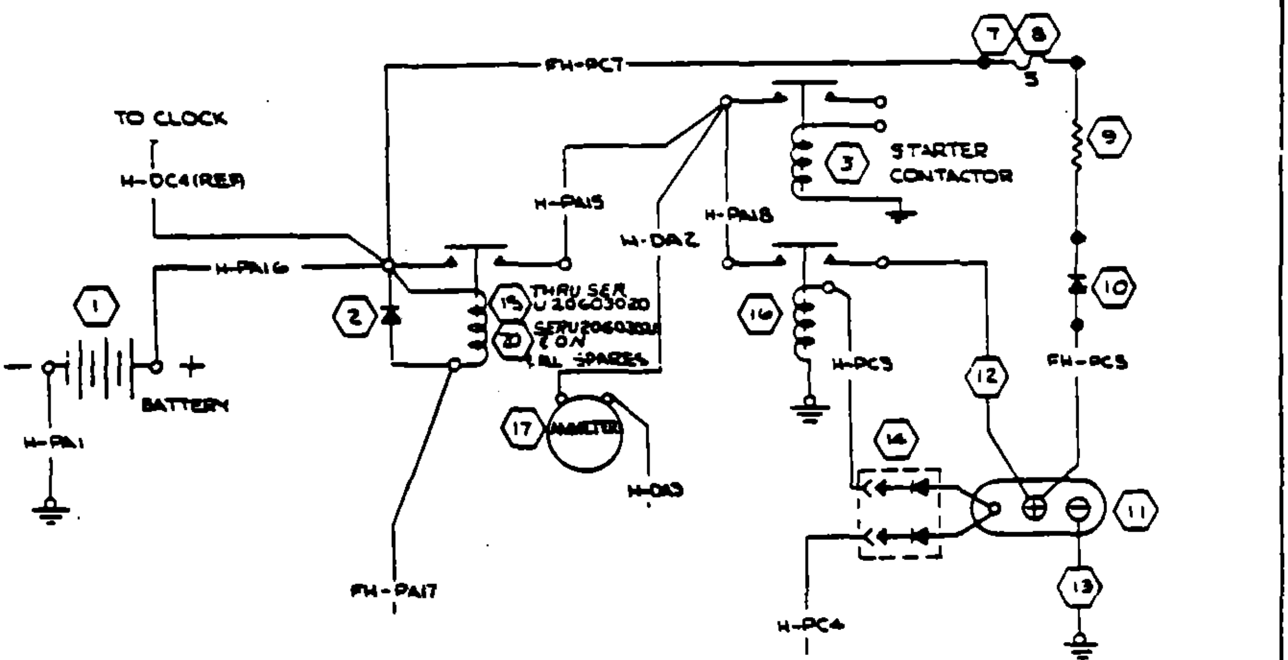
SR. No.	AIRCRAFT SERIAL NO.
SR4464	P206-0177
SR4659	P206-0161
SR4660	U206-0438
SR4901	U206-0657
SR4902	P206-0307
SR5401	U206-1235
SR5402	P206-0520
SR6005	U20601445
SR6006	P20600604
SR6222	P206-0591 U206-1354
SR6546	U20601573
SR6766	U20601701
SR7061	U20601875
SR7126	U20601980
SR7201	U20601912
SR7403	U20602200
SR7473	U20602209
SR7639	U20602367
SR7670	U20602580
SR7677	U20602407
SR7692	U20602580
SR7910	U20603021
SR7922	U20602439
SR8082	U20602650
SR8085	U20602725
SR8140	U20603522
SR8153	U20602724
SR8259	U20603021
SR8260	U20602847
SR8297	U20603079

SR. No.	AIRCRAFT SERIAL NO.
SR8337	U20603455
SR8426	U20603272
SR8458	U20604075
SR8490	U20603522
SR8499	U20603522
SR8552	U20603565
SR8656	U20603599
SR8633	U20603844
SR8778	U20604650
SR8861	U20604075
SR8968	U20604430
SR9014	U20604468
SR9080	U20604452
SR9195	U20604551
SR9110	U20605310
SR9187	U20604650
SR9195	U20604551
SR9215	U20605081
SR9369	U20604520
SR9429	U20604923
SR9437	U20604774, U20604780, U20604783, U20604786 & U20604788 AND ON
SR9572	U20605659
SR9630	U20605920
SR9785	U20605956
SR9949	U20606440
SR10097	U20606700
SR10418	U20606847
SR10563	U20606747
SR10567	U20606710

(SER P206-0591 & ON)
(SER U206-1354 & ON)

REVISION			
LTR	DESCRIPTION	DATE	APPD
A	BY REV: SER OUT S-1579-1 & ADD S-1579-2 (527201)	BPH 6-16-72	
B	BY REV: ADD DETAIL "B" & 5&6 (SR8259)	RS 6-4-73	
C	BY REV: ADD DETAIL "A", SER OUT 0770719-2 (SR 6766X REF)	SDS 4-13-76	
D	BY REV: RELOCATE FH-PA16 TO OPP SIDE TERM; INACTIVATE DWG (SR6452)	PH JCS 12-1-76	

INACTIVE
EFF THRU SER (SR6452)
JCS 1-27-77



20	S-1579-2	CONTACTOR	
18	S-1596-60	CKT BKR	
17	C669502-0102	INST CLUSTER	
16	S-1660-1	CONTACTOR	
15	S-1579-1	CONTACTOR	
14	1570043	DIODE ASSY	
13	0312155-10	GND STRAP	
12	1270653-1	BUS BAR STRAP	
11	AN2552-3A	RECEPTABLE	
10	2043P	DIODE	84970
9	126263	RESISTOR (.15Ω)	94310
8	S-1050-2	FUSEHOLDER ASSY	
7	S-1051-5	FUSE	
6	S-1844-1-1	SWITCH	
5	0770719-2	DIODE ASSY	
4	S-1984-1-1	SWITCH	
3	S-1931-1	STARTER CONTACTOR	
2	0770728-1	DIODE ASSY	
1	0712603	BATTERY ASSY	
ITEM NO.	PART NO.	DESCRIPTION	VENDOR

EQUIPMENT TABLE

FH-PC7	18			SOLDER	S-1367-1-3	(OPT)	
FH-PC5	18			S-1367-1-4	SOLDER	(OPT)	
H-PC4	18			S-1498-1	S-1493-1	(OPT)	
H-PC3	18			S-1493-1	S-1367-1-10	(OPT)	
H-PA18	2			S-1367-7-14	S-1367-7-13	(OPT)	
FH-PA17	18		141	S-1493-1	S-1367-1-10		
H-PA16	2			S-1367-7-13	S-1367-7-13		
H-PA15	2			S-1606-1	S-1367-7-14		
FH-PA16	18		6	S-1493-1	S-1367-1-8		
H-PA1	2		14	S-1367-7-12	S-1367-7-13		
H-DA3	8		42	S-1367-4-10	S-1367-4-10		
H-DA2	8		58	S-1367-4-10	S-1367-4-14		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

CESSNA AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H. Wine	6-9-69
DRAWN	M. SWANEY	5-29-69
CHECK	R. YOUNGERS	5-29-69
STRESS		6-4-69
PROJECT		
APPD		

TITLE
WIRING DIAGRAM — BATTERY & EXTERNAL POWER SYSTEM

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1270625

SCALE: NONE | P206 & U206 | PAGE 4.1.7

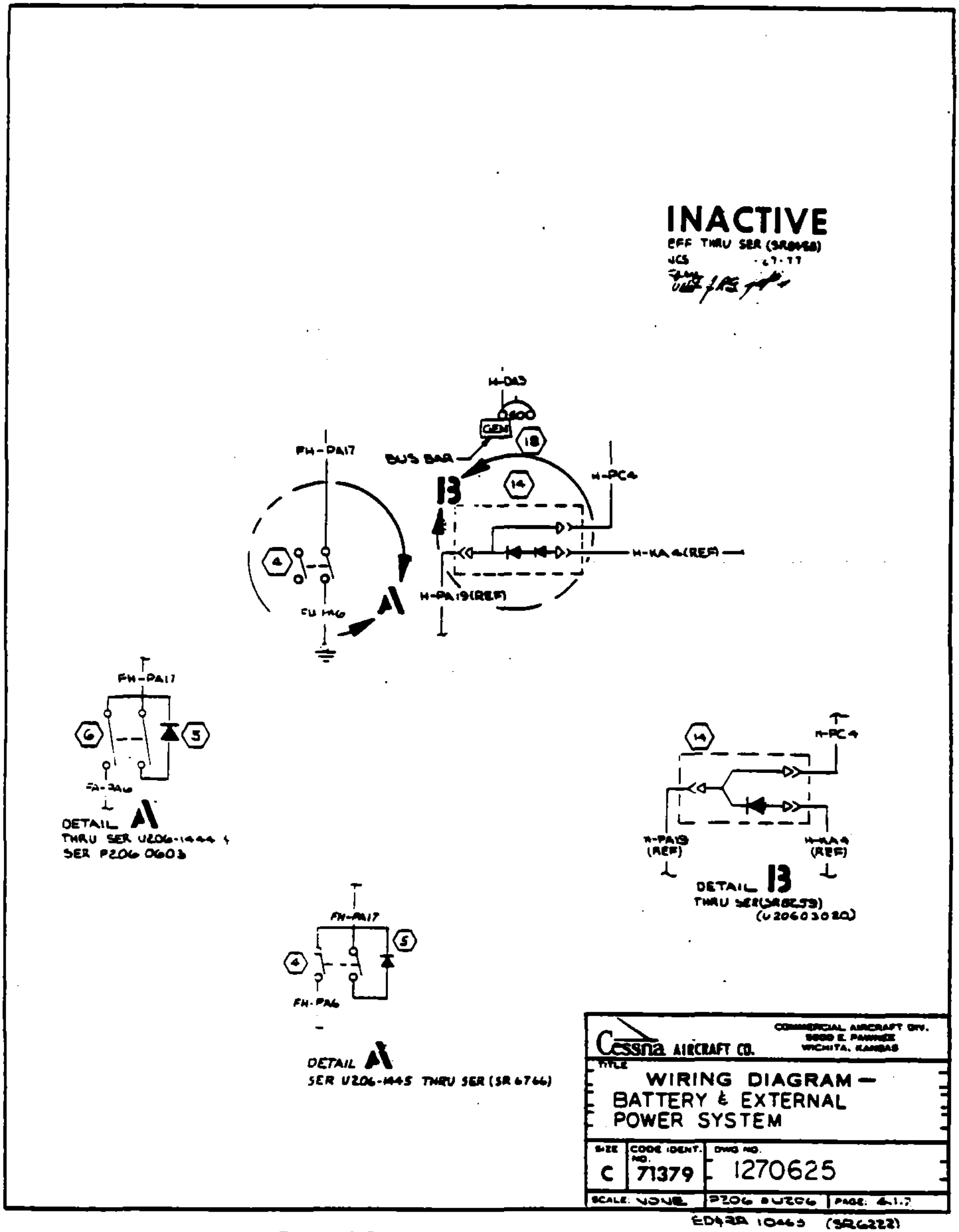
CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES: P 4.L1

SUPERSEDED BY:

ED4RR 10468 (SR6222)

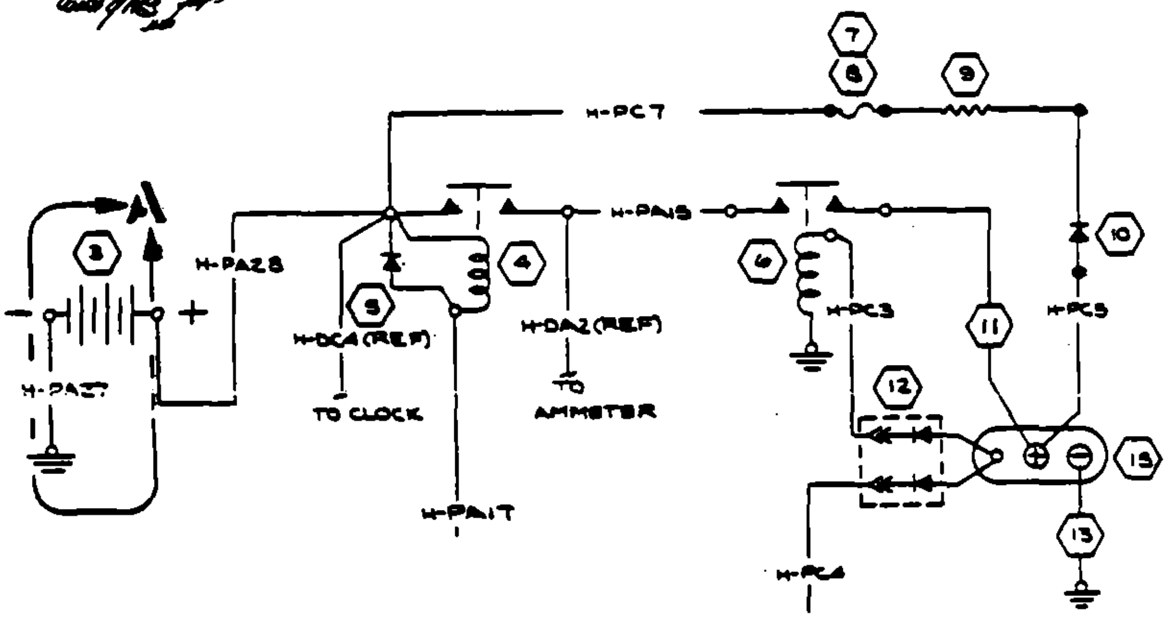
Battery & External Power System (Sheet 1 of 2)



Battery & External Power System (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A", PA27, PA28 & SER; SER OUT PA23 PA24 PA25, PA26, MS25182-2 & 0570052-2 SER U20601701	RAM 8-6-73	[illegible]
B	BY REV: ADD DETAIL "B" & SER (SR8259)	RS 6-12-75	[illegible]

INACTIVE
EFF THRU SER(SR8468)
JG ..27-77



18			
17			
16	S-1994-1-1	SWITCH	
15	AN2552-3A	RECEPTACLE	
14			
13	0512155-10	GROUND STRAP	
12	1570048	DIODE ASSY	
11	1270652-1	BUS BAR STRAP	
10	20H3P	DIODE	(84970)
9	X26263	RESISTOR	(83777)
8	S-1090-2	FUSEHOLDER ASSY	
7	S-1091-5	FUSE	
6	S-1577-1	CONTACTOR	
5	0770728-1	DIODE ASSY	
4	S-1880-1	BAT. CONTACTOR	
3	0570060-1	BATTERY ASSY	
2	0570052-2	ADAPTER ASSY	
1	MS25182-2	PLUG	
ITEM NO.	PART NO.	DESCRIPTION	VENDOR
	EQUIPMENT TABLE		

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS
H-PA28	2			S-1367-7-13	S-1367-7-13	SER U20601701 & ON
H-PA27	2			S-1367-7-12	S-1367-7-12	SER U20601701 & ON
H-PC7	18			SOLDER	S-1367-1-13	
H-PC5	18			S-1367-1-4	SOLDER	
H-PC4	18			S-1493-1	S-1493-1	
H-PC3	18			S-1367-1-10	S-1493-1	
H-PA15	2			S-1606-1	S-1367-7-13	
H-PA26	2			S-1367-7-13	S-1367-7-13	THRU SER U20601700
H-PA25	2			S-1367-7-13	S-1367-7-13	
H-PA24	2			S-1367-7-13	S-1367-7-13	
H-PA23	2			S-1367-7-13	S-1367-7-13	THRU SER U20601700
H-PA17	18			S-1367-1-10	S-1493-1	
H-PA6	18			S-1493-1	S-1367-1-6	

WIRE TABLE

CSS-4000 IS APPLICABLE
VENDOR CODES PER S-1400
CSS-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12205-406
SUPERSEDED BY: 1270835 R4.4

CONTRACT NO:

	NAME	DATE
DESIGN	[illegible]	3-11-70
GROUP	H. Wise	3-10-70
DRAWN	R. YOUNGERS	2-4-70
CHECK	HARRIS	2-6-70
STRESS		
PROJECT	[illegible]	[illegible]
APPD	R. YOUNGERS	3-2-70

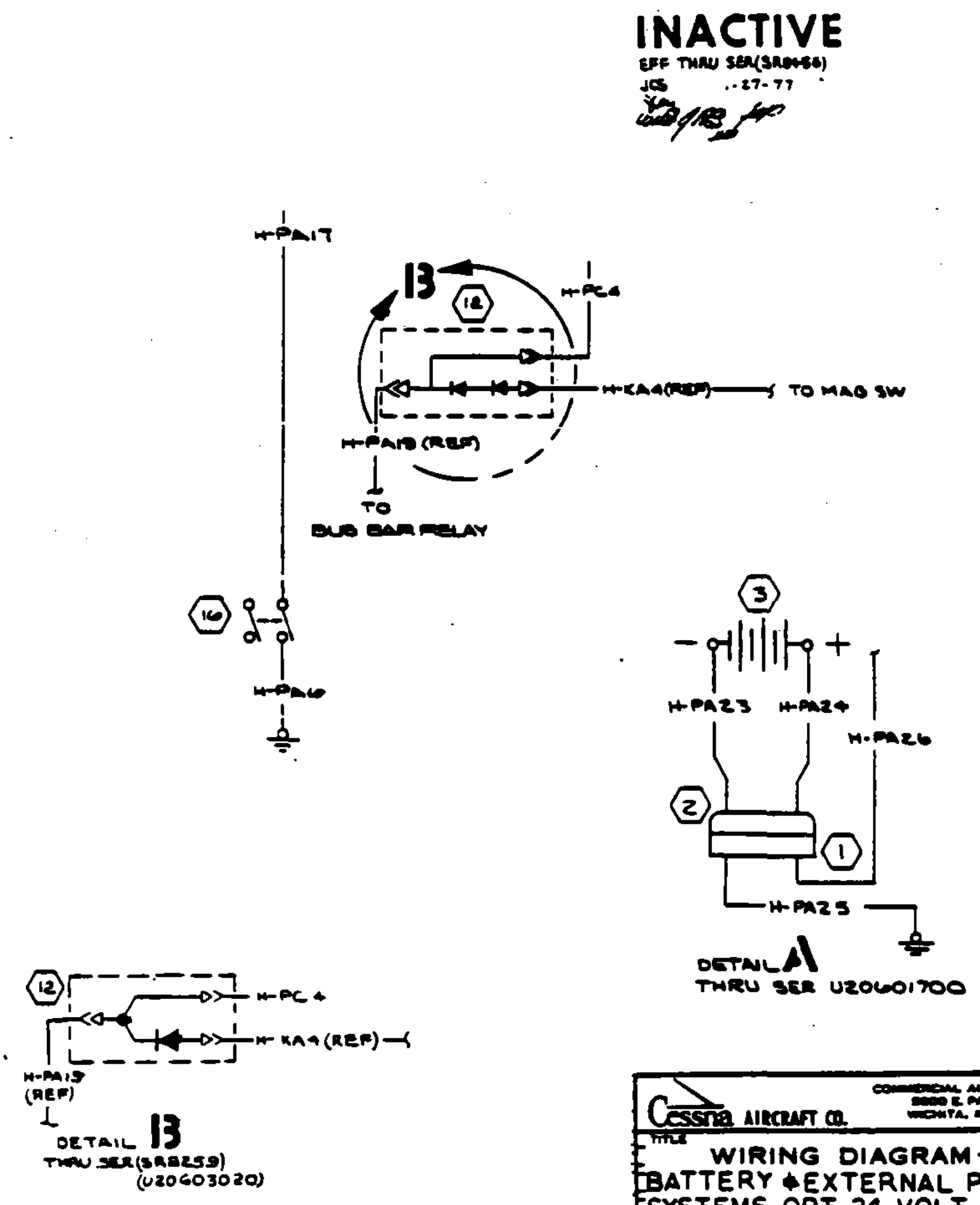
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

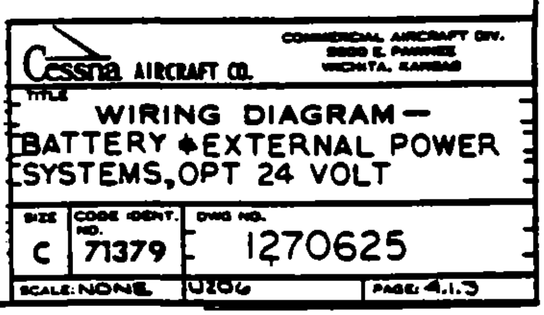
TITLE
WIRING DIAGRAM — BATTERY & EXTERNAL POWER SYSTEMS, OPT 24 VOLT

SIZE C | CODE IDENT. NO. 71379 | DWG NO. 1270625
SCALE: NONE | U206 | PAGE: 4.1.3

EDARR 10367 (SR6546)

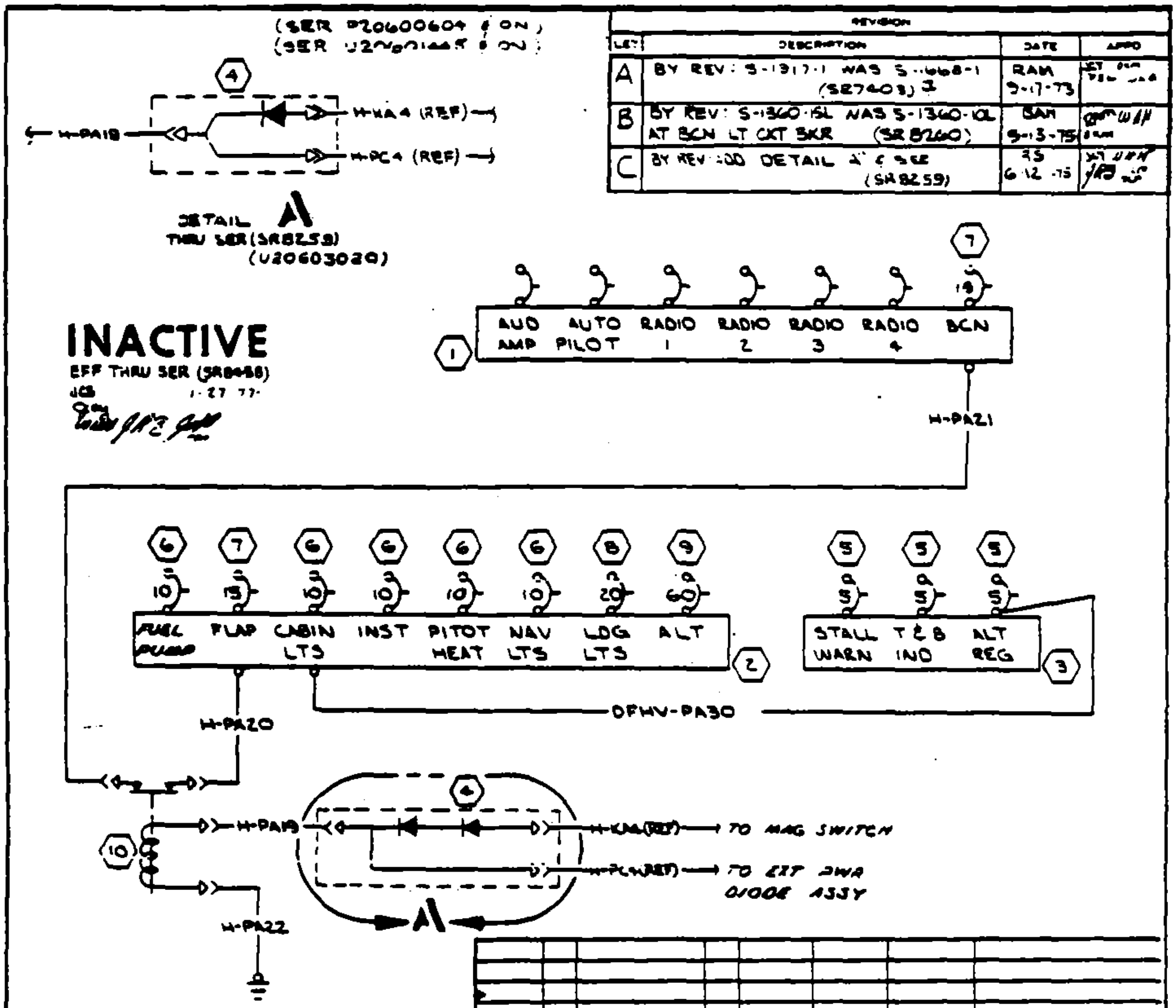
Battery & External Power Systems, Opt 24 Volt (Sheet 1 of 2)





Battery & External Power Systems, Opt 24 Volt (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-1317-1 WAS S-1668-1 (SE27403)	RAM 9-17-73	[illegible]
B	BY REV: S-1360-15L WAS S-1360-10L AT BCN LT CKT BKR (SR8260)	BAH 9-13-75	[illegible]
C	BY REV: ADD DETAIL "A" & SER (SR8259)	RS 6-12-75	[illegible]



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
DFHV-PA30	14			S-1367-2-6	S-1367-2-6		
H-PA19	18			S-1493-1	S-1493-1		
H-PA22	18			S-1493-1	S-1367-1-8		
H-PA21	14			S-1493-2	S-1367-2-6		
H-PA20	14			S-1493-2	S-1367-2-6		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
10	S-1917-1	RELAY-POWER
9	S-1360-60L	CIRCUIT BKR
8	S-1360-20L	CIRCUIT BKR
7	S-1360-15L	CIRCUIT BKR
6	S-1360-10L	CIRCUIT BKR
5	S-1360-5L	CIRCUIT BKR
4	1570043	DIODE ASSY
3	0713854-3	BUS BAR-PRIMARY 2
2	0713854-2	BUS BAR-PRIMARY 1
1	0713854-1	BUS BAR-ELECTRONIC

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXX=CESSNA STD. NO.

SUPERSEDES: P 4.5

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	HENSHAW	4-1-69
GROUP	[illegible]	8-6-69
DRAWN	D.L. BURKE	8-1-69
CHECK	R. YOUNGERS	8-5-69
STRESS	[illegible]	8-7-69
PROJ	[illegible]	
APPD	[illegible]	8-6-69
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

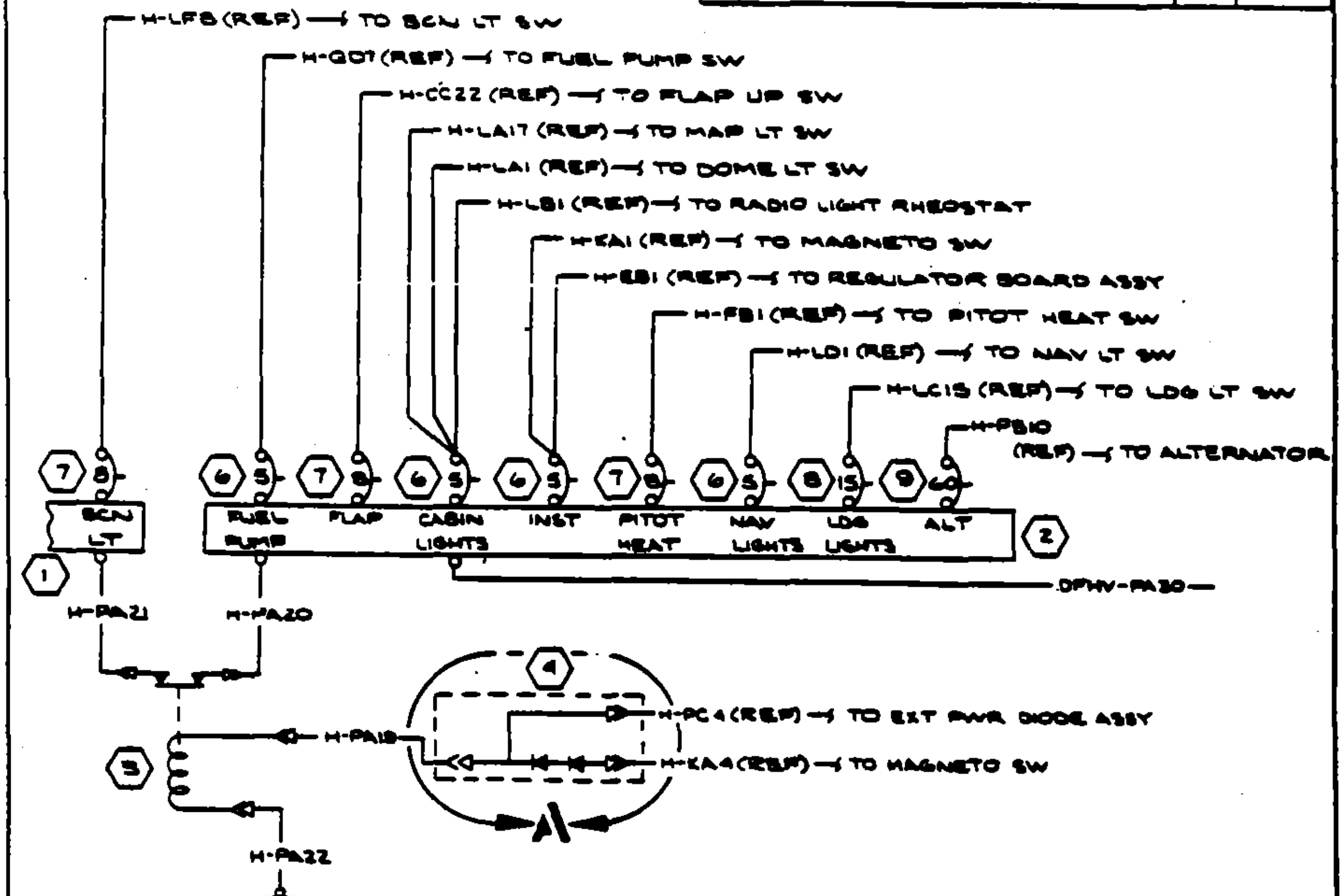
TITLE
WIRING DIAGRAM —
SPLIT BUS BAR

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE NONE P206 & U206 PAGE 4.7

ED & RR 10422 (SR6005) & (SR6006) Z

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-1360-8L WAS S-1360-5L AT NAV LT CKT BKR (SR3667)	BAH 5-15-72	
B	BY REV. ADD DETAIL "A" & CEK (SK8259)	RS	



INACTIVE
EFF THRU SER (SR8468)
JCS

9	S-1596-60L	CKT BKR	
8	S-1360-15L	CKT BKR	
7	S-1360-8L	CKT BKR	
6	S-1360-5L	CKT BKR	
5	0713854-3	BUS BAR-PRIMARY 2	
4	1510043	DIODE ASSY	
3	S-1917-2	POWER RELAY	
2	0713854-2	BUS BAR-PRIMARY 1	
1	0713854-1	BUS BAR-ELECTRONIC	
ITEM NO.	PART NO.	DESCRIPTION	VENDOR
	EQUIPMENT TABLE		

DPHV-PA30	14			S-1367-2-6	S-1367-2-6		
H-PA22	10			S-1493-1	S-1367-1-6		
H-PA21	14			S-1493-2	S-1367-2-6		
H-PA20	14			S-1493-2	S-1367-2-6		
H-PA19	10			S-1493-1	S-1493-1		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
WIRE TABLE							

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12205-406
SUPERSEDED BY: 1270835 P.4.3

CONTRACT NO:

	NAME	DATE
DESIGN	J HENSHAW	2-1-70
GROUP	H Wise	3-1270
DRAWN	R.YOUNGERS	2-4-70
CHECK	HARRIS	2-6-70
STRESS		
PROJECT		2-12-70
APPD	R.YOUNGERS	3-2-70

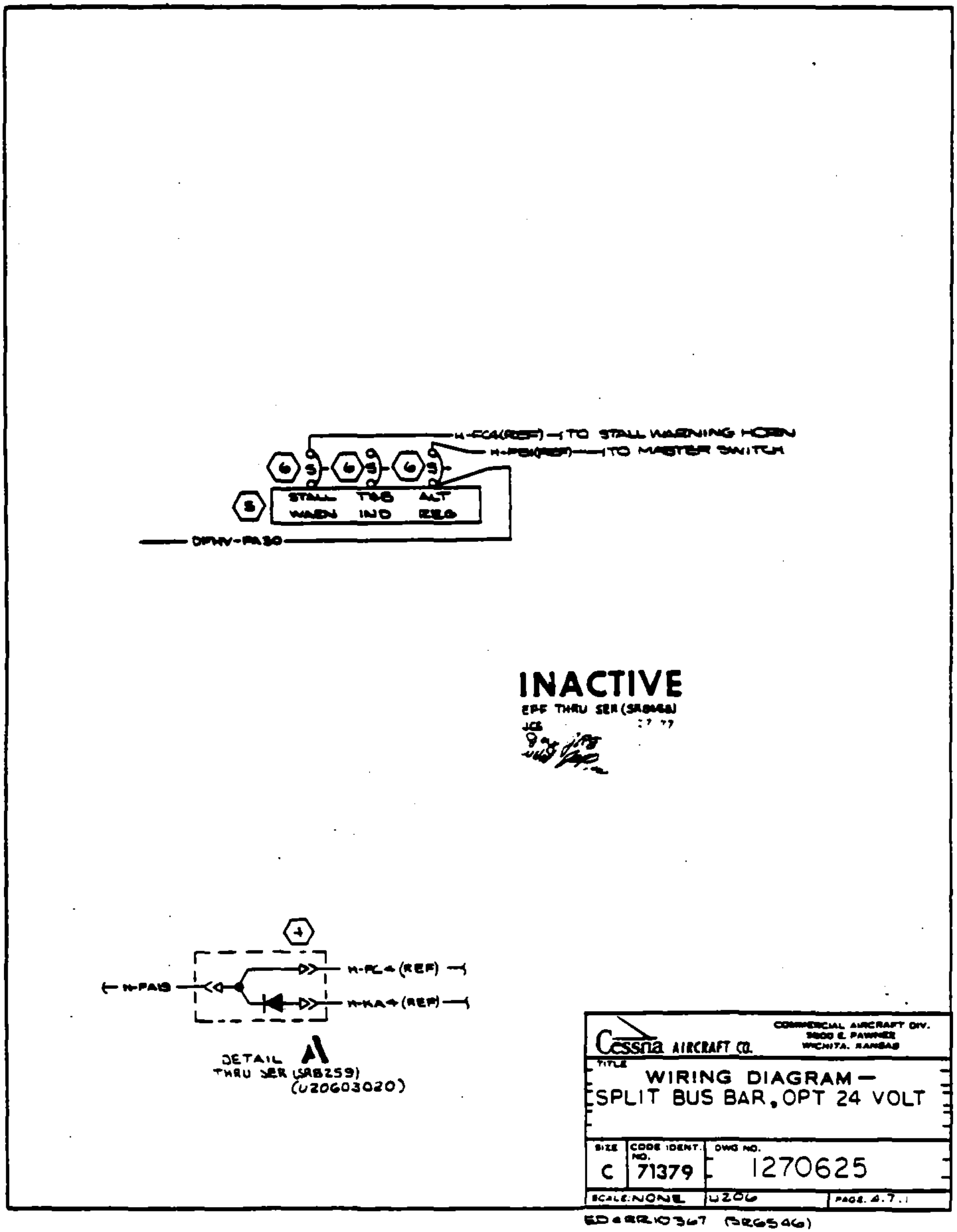
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM —
SPLIT BUS BAR, OPT 24 VOLT

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1270625
SCALE: NONE	U206	PAGE: 4.7.1

ED4EEL10367 (SR6546)

Split Bus Bar, Opt 24 Volt (Sheet 1 of 2)

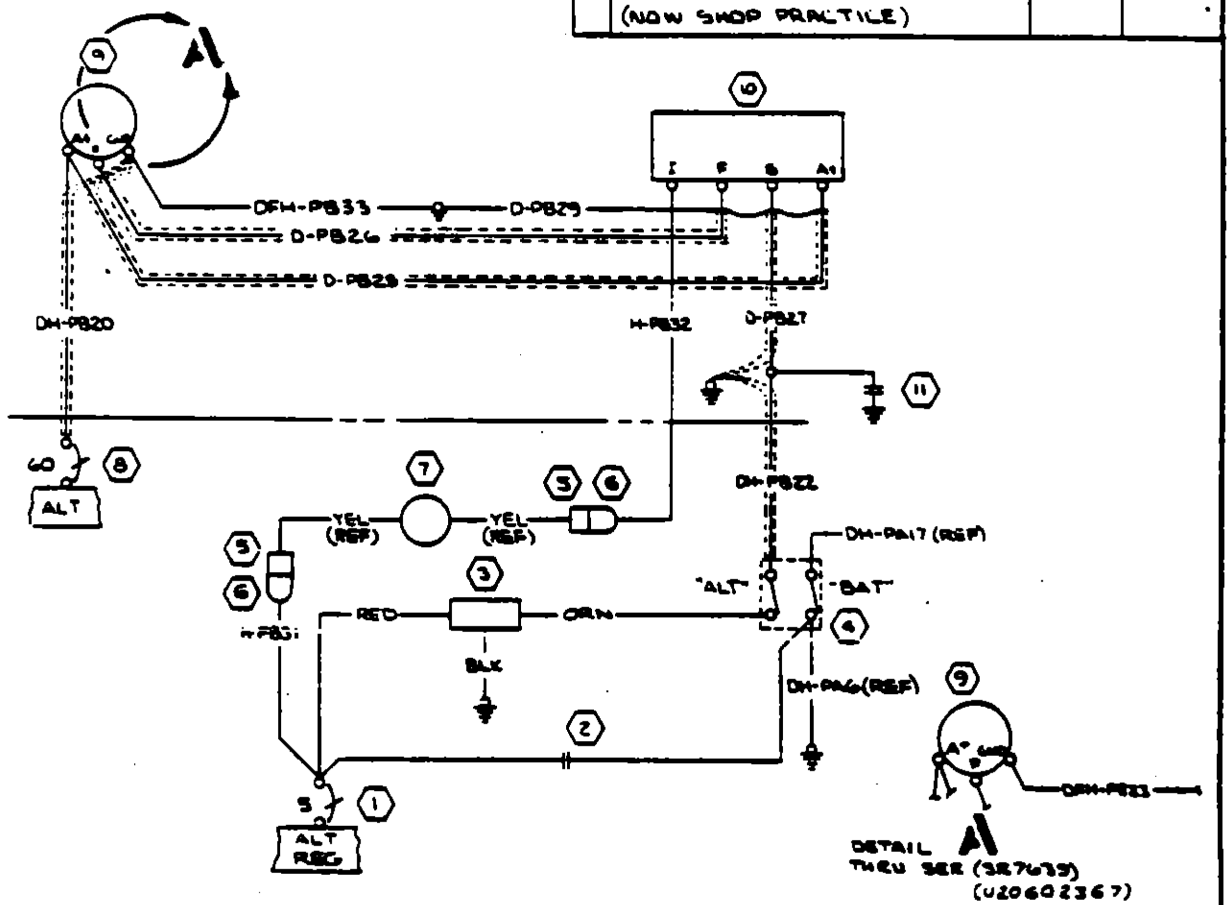


Split Bus Bar, Opt 24 Volt (Sheet 2 of 2)

NOTES:

▷ AMP TERMINAL 42281-2 (00779) ON CONDUCTOR. AMP TERMINAL 2-323931-2 ON SHIELD + GROUNDING WIRE.

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A", PB33 & SER; SER OUT PB23 (SR7639)	2AM 7-31-73	
B	BY REV: S-1943-2 TERM. WAS S-1367-3-10 TERM. (DH-PB20) ADD WIRE LENGTHS (NOW SHOP PRACTICE)	TON 9-10-73	



INACTIVE
EFF THRU SER (SR8458)
JCS 1-27-77

DFH-PB33	8	S-1562-8-9	21	S-1943-2	[illegible]		SER (SR7639) & ON
D-PB29	18		8	S-1367-1-12	▷		
H-PB32	18			S-1636-1	42281-2		
H-PB31	18			S-1367-1-6	S-1639-1		
D-PB28	18S		23	[illegible]	▷		
D-PB27	18S		10	[illegible]	▷		
D-PB26	18S		23	[illegible]	▷		
DH-PB23	10		21	S-1367-3-10	S-1367-3-10		THRU SER (SR7639)
DH-PB22	18S		29	S-1493-1	[illegible]		
DH-PB20	8S	S-1534-8-9	56	S-1367-4-10	S-1943-2		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

11	0770038-2	FILTER	
10	C611001-0201	VOLTAGE REGULATOR	
9	C611501-0102	ALTERNATOR ASSY	
8	S-1396-60L	CKT BKR	
7	S-2135-1	LIGHT ASSY	
6	S-1637-1	HOUSING	
5	S-1637-2	HOUSING	
4	S-1994-1-1	SWITCH	
3	C593001-0101	OVERVOLTAGE SENSOR	
2	TVA-1515	CAPACITOR	
1	S-1360-5L	CKT BKR	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 4.8 & 4.8.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-17-73
GROUP	[illegible]	4-27-73
DRAWN	WHITE	4-25-73
CHECK	EVOUNGAGES	4-17-73
STRESS	C. Bass	20 APR 73
PROJ	[illegible]	4-19-73
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

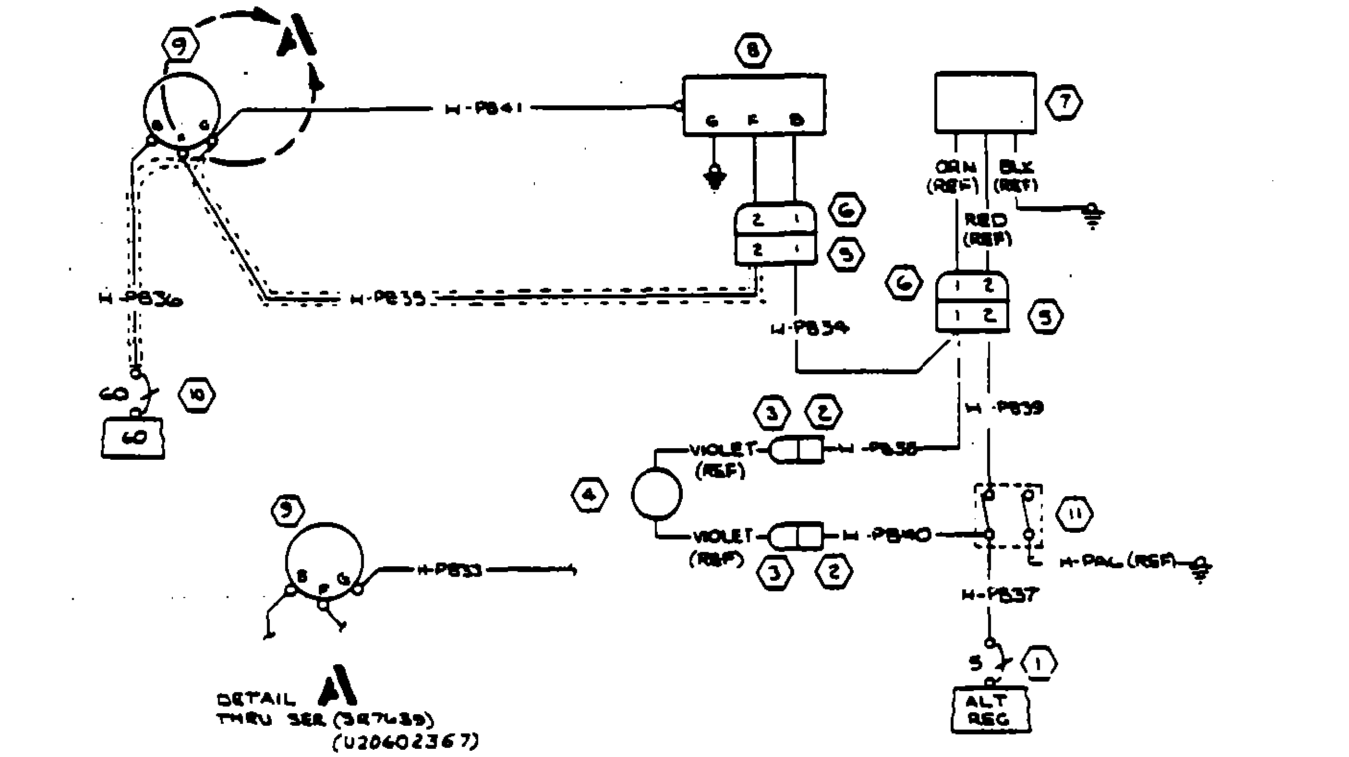
TITLE
WIRING DIAGRAM—ALTERNATOR SYSTEM, 60 AMP, 12V

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE | SR 7403 | PAGE: 4.8.3

U20602200

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A" FE... SER: SER OUT PB33 .. (SR7639)	KAM 7-31-73	[illegible]
B	BY REV C5943003-0101 WAS ...C INACTIVATE DWG (92-499)	[illegible]	JCY



INACTIVE
EFF THRU SER (SR8458)
JCS 1-27-77

H-PB41	6	S-1562-8-9		S-1493-3	S-1367-4-8		SER (SR7639) & ON
H-PB40	20			SEE PB37	S-1636-1		
H-PB39	20			S-1636-1	S-1493-1		
H-PB38	20			S-1636-1	SEE PB34		
H-PB37	20			S-1367-1-6	S-1493-5		
H-PB36	6S			S-1493-1	S-1367-4-10		
H-PB35	20S			S-1636-1	S-1367-1-10		
H-PB34	20			S-1636-1	S-1636-3		
H PB33	10			S-1367-3-10	S-1367-3-10		THRU SER (SR7639)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

11	S-1994-1-1	SWITCH	
10	S-1596-60L	CKT BKR	
9	C611503-0102	ALTERNATOR ASSY	
8	C611002-0106	REGULATOR ASSY	
7	C593003-0101	OVERVOLT UNIT	
6	S-1638-2	HOUSING	
5	S-1638-1	HOUSING	
4	S-2138-2	LIGHT ASSY	
3	S-1637-1	HOUSING	
2	S-1637-2	HOUSING	
1	S-1360-5L	CKT BKR	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-10000=CESSNA SPEC. NO. S-1000 OR CM0000=CESSNA STD. NO.

SUPERSEDES: P 4.8.1

SUPERSEDED BY: 1270835 P.4.1

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-17-73
GROUP	[illegible]	4-27-73
DRAWN	WHITE	4-23-73
CHECK	R. YOUNGERS	6-27-73
STRESS	C. [illegible]	10 Aug 73
PROJ	[illegible]	
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ALTERNATOR SYSTEM, 60 AMP, 24 V

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE (SR7403) PAGE: 4.8.4

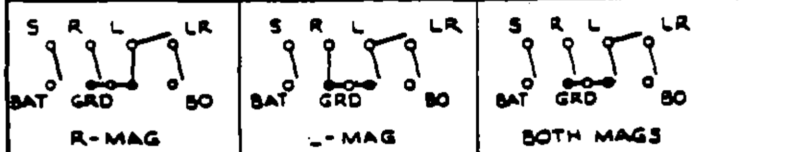
U20602200

SER 205-0001 THRU
SER 205-0577
SER 206-0001 THRU
SER 206-0275
SER P206-0001 & ON
SER U206-0001 & ON

NOTES:

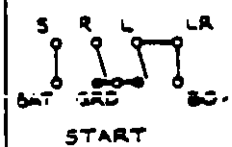
1. TERMINATE WITH (7).
2. SHORTING BAR BETWEEN "R" AND UNMARKED TERMINAL ADJACENT TO IT IS NOT USED FOR THIS CIRCUIT.
3. TERMINATE SHIELDS ON JA-1 & JA-2 WIRES AT THE SWITCH WITH S-1367-2-6 TERMINALS & CONNECT TO "GRD" TERMINAL ON SWITCH.
4. S-1367-1-10 TERMINAL ON HOT LEAD S-1367-3-10 ON SHIELD.

CHG LET	REVISION	BY DATE	CHK APPD
A	REMOVED N/A FROM STD WIRES 0713129-1 WAS S-1259-1 ADD NOTE 2 & 3 REMOVED PUSH FROM SWITCH POSITIONS ADD SHIELDED WIRE TO JA1 & JA2 WIRES ADD NOTE 4 (SR3629-10)	GLW 4-2-62	
B	605 WAS 65 MATERIAL ON JA1 & JA2 WIRES		
C	ADD MODEL 206 1270461-1 BUS BAR WAS 1270429-1 S-1360-10 CKT BKR WAS S-1232-10 ON BUS BAR, INST WAS INST LIGHTS (SR4036-6) (SR 3989-6)	GLW 6-7-63	
D	ADDED P206 & U206 TO MODEL SERIES REMOVED 1270461-1 BUS BAR, H-KA1 & H-KA2 FROM & H/T. ADDED WIRE LENGTHS TO W/T	WJR 6-26-64	
E	ON WIRES H-JA1 & H-JA2, 8-5 WIRE WAS 10-05	GLW 11-1-65	
F	BY REV: ADD DETAIL "A" & "B", S-1675-1, S-1991-1 & SR; SER OUT 0750027-1 ED&RR 10468 (SR6222)	WOS 5-23-67	
G	BY REV: C29250l-0101 WAS 0713129-1, SER OUT C292501-0001 SER IN C292501-0105; SER OUT S-1360-10, SER IN S-1360-10L (SR7126), (SR6766)	ELY 3-1-72	



DIAGRAMS SHOW NOT ACTUAL SWITCH BUT CIRCUIT CONTINUITY AT EACH POSITION

o EXTERNALLY ACCESSIBLE TERMINAL



INACTIVE

EFF THRU SER (SR8458)

JCS 1-27-77

H-JA3	18		9	S-1367-1-8 S-1367-1-8		
H-JA2	18-S		63	S-1367-1-6	4	3
H-JA1	18-S		63	S-1367-1-6	4	3
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

9	S-1360-10	CIRCUIT BREAKER	
8	S-1360-10L	CIRCUIT BKR	
7	S-1991-1	CONTACTOR	
6	S-1675-1	CONTACTOR	
5	0750027-1	START SOLENOID	
4	SLICK #662	RIGHT MAGNETO	
3	SLICK #662	LEFT MAGNETO	
2	C292501-0106	IGNITION SWITCH	
1	C292501-0101	SWITCH	
	PART NO.	DESCRIPTION	SERIALS

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION WICHITA, KANSAS

DRAWN G WOOD 12-7-61

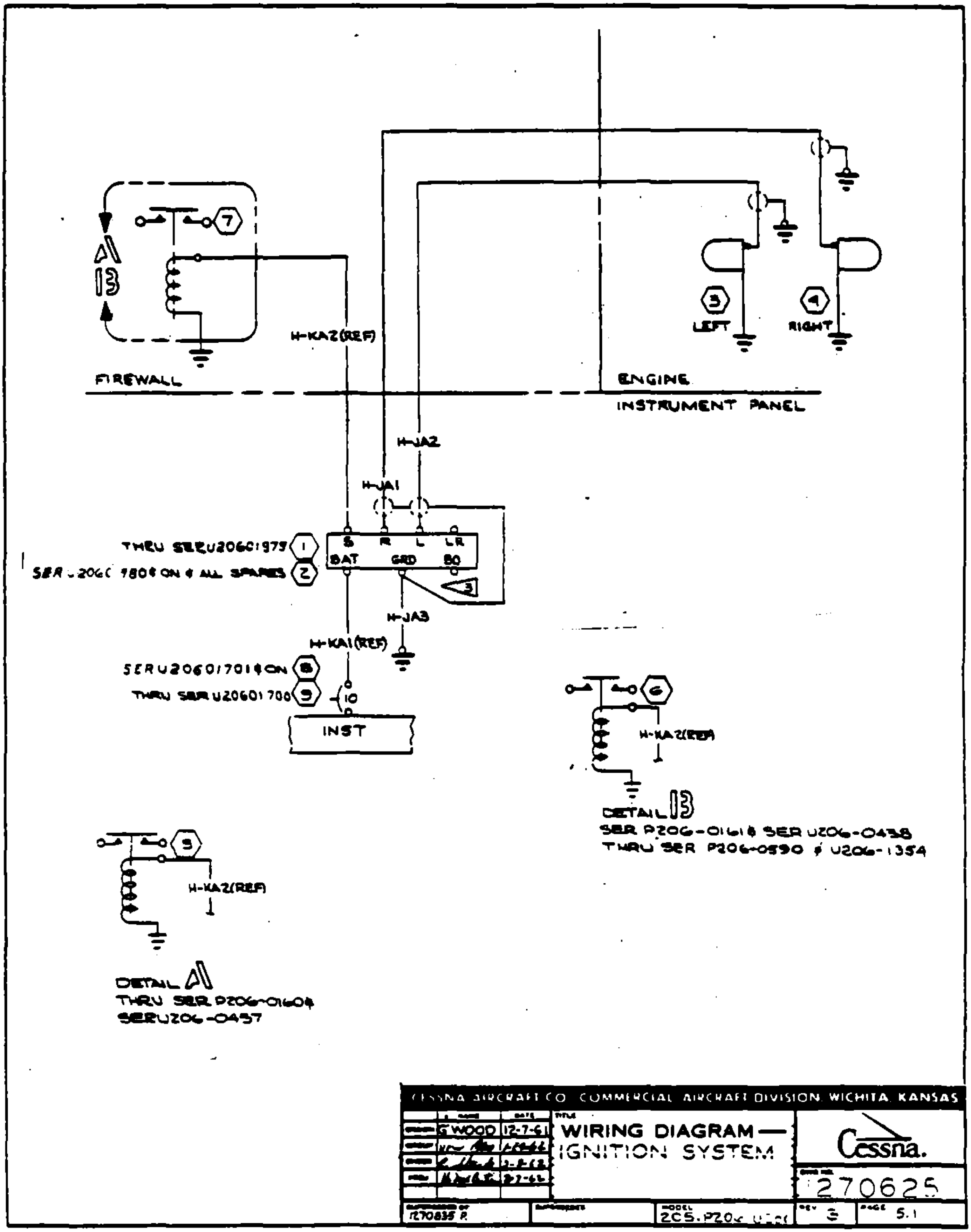
TITLE: WIRING DIAGRAM — IGNITION SYSTEM

Cessna.

DWG NO. 1270625

SUPERSEDES 1270635 R — MODEL 205-P206-U206 — REV G — PAGE 5.1

Ignition System (Sheet 1 of 2)

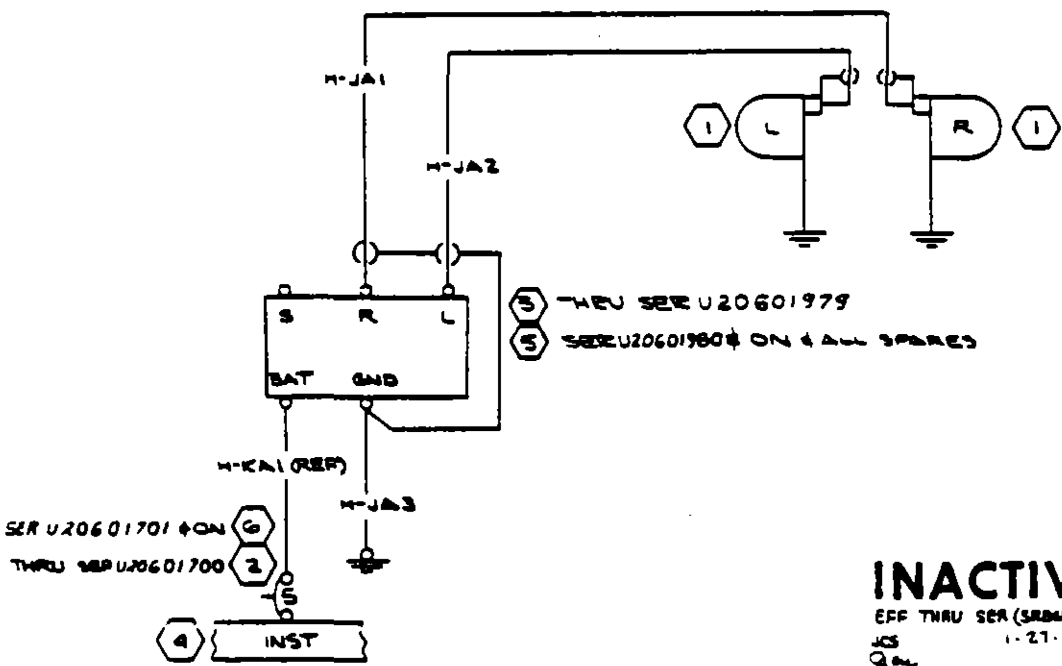


Ignition System (Sheet 2 of 2)

NOTES:

1. TERMINATE SHIELDS ON JA1 & JA2 WIRES AT THE SWITCH WITH S-1367-2-6 TERMINALS & CONNECT TO GND TERMINAL ON SWITCH
2. USE S-1367-1-10 ON HOT LEAD & S-1367-3-10 ON SHIELD

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: SER OUT C292501-0101; SER IN C292501-0105; SER OUT S-1360-10, SER IN S-1360-6L (SR7126), (SR6766) (REF)	3-1-72	



INACTIVE
EFF THRU SER (SR8486)
JCS 1-21-77

H-JA3	18			S-1367-6 S-1367-1-10		
H-JA2	18S			S-1367-1-6	2	1
H-JA1	18S			S-1367-1-6	2	1
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

6	S-1360-6L	CIRCUIT BREAKER	
5	C292501-0105	IGNITION SWITCH	
4	0713054-2	BUS BAR	
3	C292501-0101	MAGNETO SW	
2	S-1360-6	CIRCUIT BREAKER	
1	SLICK #662	MAGNETO	(08033)
ITEM NO.	PART NO.	DESCRIPTION	VENDOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER H-4400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1220S-406

SUPERSEDED BY: 1270635 P.S.1

CONTRACT NO.

	NAME	DATE
DESIGN	J.HENSHAW	2-11-70
GROUP		3-11-70
DRAWN	R.YOUNGERS	2-4-70
CHECK	HARRIS	2-6-70
STRESS		
PROJECT		
APPD	R.YOUNGERS	3-L-70

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM —
IGNITION SYSTEM, OPT 24 VOLT

SIZE C | CODE IDENT. NO. 71379 | DWG NO. 1270625

SCALE: NONE | U206 | PAGE: S.2

ED4RR10367 (SR6846)

SER 205-0001 THRU
SER 205-0577
SER 206-0001 THRU
SER 206-0275
SER P206-0001 & ON
SER U206-0001 & ON

NOTE:
1 ▷ PART OF 1250600 ENGINE INSTALLATION.

CHG LET	REVISION	BY / DATE	CHK / APPD
A	REMOVED W/A FROM STD WIRES 0713129-1 WAS S-1255-1 (SR3624-10)	GLW 4-3-62	[illegible]
B	ADD MODEL 206 S-1360-10 CKT BKR WAS S-1232-0 1270461-1 BUS BAR WAS 1270459-1 ON BUS BAR, INST WAS INST LIGHTS (SR 4088-G)(SR 3983-G)	[illegible] 5-7-63	[illegible]
C	[illegible]	[illegible]	[illegible]
D	BY REV: ADD DETAIL A, 1570043-1 & H-KA4 ED & RF 10279	FER 2-3-68	[illegible]
E	BY REV: ADD DETAIL 'B' & 'C', S-1673-1, S-1991-1 & SR; SER OUT 0750027-1 ED & RR 10468 (SR6222)	MOS 5-23-69	[illegible]
F	BY REV: C292601-0101 WAS 0713129-1; SER OUT C292601-0101, SER IN C292601-0105; SER OUT S-1360-10, SER IN S-1360-10L (SR7126), (SR6766) II (REM)	RLY 6-4-72	NEW
G	BY REV: ADD PG 6.1.1 & DETAIL "C" & SER (SR8259)	RS 6-12-75	[illegible]

INACTIVE

EFF THRU SER (SR8456)
PN 1-27-77

H-KA4	18			SEE KA2	S-1493-1		SER P206-0[illegible] & ON SER U206-0[illegible] & ON
H-KA3	2		12	S-1367-7-14	S-1367-7-14		
H-KA2	18		89	S-1367-1-6	S-1367-1-10		
H-KA1	18		8	S-1367-1-6	S-1367-1-8		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	SERIALS
10	S-1360-10L	CIRCUIT BKR	
3	C292501-0105	IGNITION SWITCH	
8	S-1991-1	CONTACTOR	
7	1570043	DIODE ASSY	
6	S-1360-10	CIRCUIT BREAKER	
5	C292501-0101	SWITCH, MAG	
4	1 ▷	STARTER	
3	0750027-1	START SOLENOID	
2	S-1673-1	CONTACTOR	
1	0712603-2	BAT. CONTACTOR	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
	G WOOD	12-6-61
	[illegible]	1-29-62
	[illegible]	2-5-62
	[illegible]	2-7-62

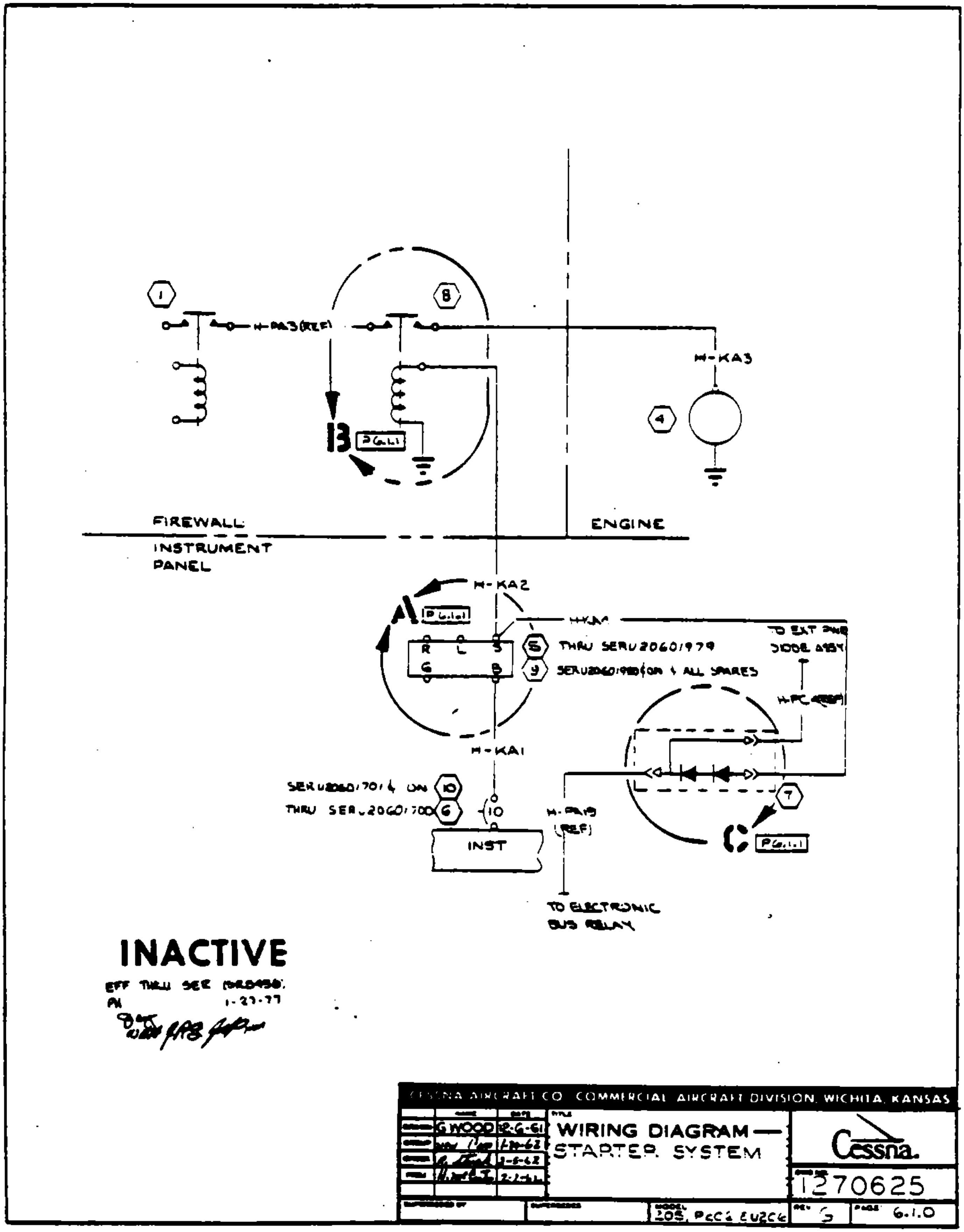
WIRING DIAGRAM — STARTER SYSTEM

Cessna.

1270625

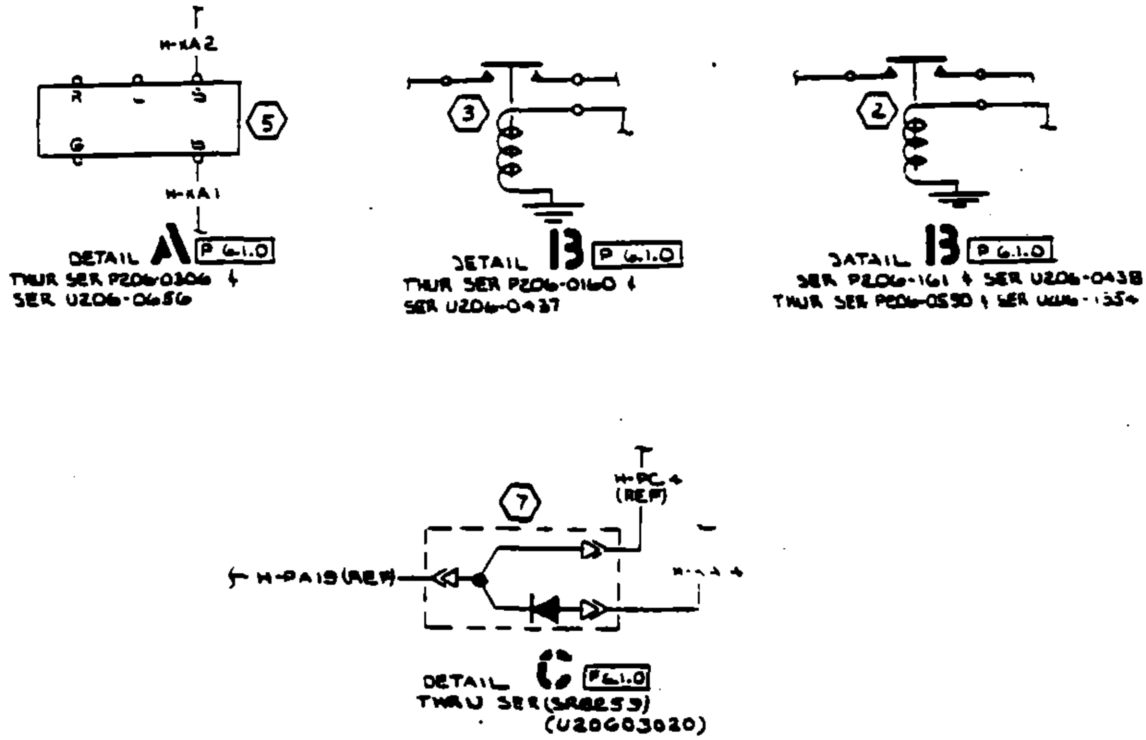
MODEL 205, P206 & U206 | REV 5 | PAGE 6.1.0

Starter System (Sheet 1 of 2)



Starter System (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
G	SEE PG 6.1.D FOR REVISION		



INACTIVE

EFF THRU SER (SR 8458)

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

PART NO.	DESCRIPTION	
EQUIPMENT TABLE		

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA
STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP		6-25-75
DRAWN	R Swanson	6-12-75
CHECK		6-18-75
STRESS		
PROJ		
APPD	AAS	
OTHER		

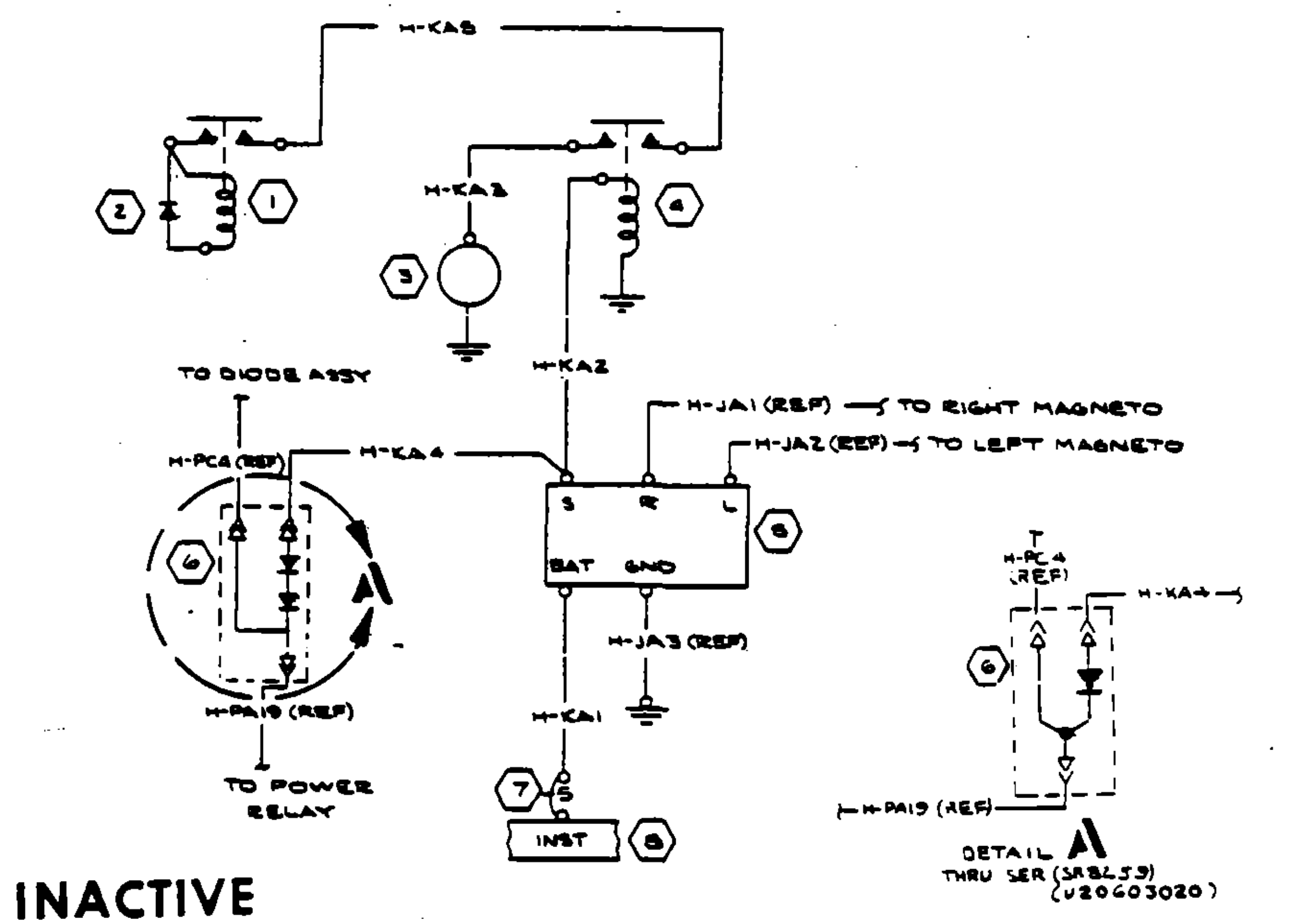
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STARTER SYSTEM

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE | 205.P206.U206 | PAGE: 6.1.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A" & SEE (SR8259)	RS 6-16-75	



INACTIVE

EFF THRU SER (SR8468) 1-27-77

H-KA5	2			5-1367-7-13	5-1367-7-13		
H-KA4	18			[illegible]	[illegible]		
H-KA2	18			S-1367-1-6	S-1367-1-10		
H-KA3	2			S-1367-7-10	S-1367-7-13		
H-KA1	18			S-1367-1-6	S-1367-1-8		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

8	0713854-2	BUS BAR	
7	S-1360-5	CIRCUIT BREAKER	
6	1570043	DIODE ASSY	
5	C292501-0101	MAGNETO SW	
4	S-1577-1	STARTER CONTACTOR	
3	CMC634433	STARTER	(12984)
2	0770728-1	DIODE ASSY	
1	S-1580-1	BAT. CONTACTOR	
ITEM NO.	PART NO.	DESCRIPTION	VENDOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12205-406

SUPERSEDED BY: 1270836 P.6.1

CONTRACT NO:

	NAME	DATE
DESIGN	J. HEUS	3-11-70
GROUP		3-10-70
DRAWN	R. YOUNGER	2-4-70
CHECK		2-6-70
STRESS		
PROJECT		
APPD	R. YOUNGER	3-2-70

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — STARTER SYSTEM, OPT 24 VOLT

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1270625
SCALE: NONE	U206	PAGE: 6.2

ED #RR10367 (SR6546)

NOTE:

1. ~~PLACE YELLOW ROCKER SWITCH IN HIGH BOOST POSITION ADJUST RESISTORS WITH 13.75 ± .25 VOLTS FOR 14 VOLT SYSTEM AND 27.75 ± .25 FOR 28 VOLT SYSTEM. OPEN TO FULL THROTTLE & ADJUST 1ST RESISTOR TO PRODUCE [illegible] MA INDICATION ON FUEL FLOW METER. ADJUST 2ND RESISTOR WITH THROTTLE CLOSED TO PRODUCE [illegible] MA INDICATION ON FUEL FLOW METER. RESISTORS ARE IN SERIES WHEN THROTTLE IS CLOSED.~~

2. ADJUST AMOR 20-1.5 TO 1.0 ± .25 OHMS PRIOR TO INSTALLATION

3. ADJUST AMOR 20-10 TO 3.5 ± .5 OHMS PRIOR TO INSTALLATION

4. READJUST RESISTOR AS REQD AFTER INSTL TO COMPLY WITH FUEL FLOW REQUIREMENTS PER CES 1243

5. ADJUST AMOR 20-5 TO 2.0 ± .25 OHMS PRIOR TO INSTALLATION

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: SOLDER/QD27 WAS SEE QD25; ADD WIRE LENGTHS; REVISED NOTE 1. DELETE NOTE 1; ADD NOTES 2, 3 & 4; ADD JUMPER FOR AMOR20-10 RESISTOR (NOW SHOP PRACTICE) (SR 8062)	DEF 2-8-74 BLA	
B	BY REV: ADD AMOR 20-5 & NOTE 5: REVISE NOTES 2 & 3. ADD DETAIL 'A' AND SER'S (SR8297)	GW 7-30-75	
C	BY REV: ADD P 7.1.6, QD30, QD31 S-2035-1, S-2035-2 & SER; SER OUT QD25 & QD27. 2LM-E WAS USMS-B MBR 20750436 (SR8115) (SR8426)	GW JMS 1-14-76	
D	BY REV: S 2035-1/QD20-QD22 WAS S-1637-1; S 2035-2/QD23, QD24 WAS S-1637-2 (NEW SHOP PRACTICE) MBR 80925	PM 8-27-76	

INACTIVE

E88 THRU (SR 8458)

LSS 1-24-77

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
QD31	18			S-1635-1	S-1510-1		SER (SR8426) & ON
QD30	18			S-1493-1	S-1635-1		SER (SR8426) & ON
QD27	18		80	S-1493-1	SOLDER		THRU SER (SR8426)
QD26	18		13	S-1493-1	S-1367-1-6		
QD25	18		80	SOLDER	S-1570-1		THRU SER (SR8426)
QD24	18		10	SOLDER	S-1635-1		
QD23	18		78	S-1493-1	S-1636-1		
QD22	18		30	SOLDER	S-1635-1		
QD21	18		10	SOLDER	S-1636-1		
QD20	18		18	SOLDER	S-1635-1		
QD28	18		10	SOLDER	S-1636-1		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
13	S-2035-1	HOUSING	
12	S-2035-2	HOUSING	
11	AMOR 20-5	RESISTOR (12V)	
10	2LM-E	SWITCH	
9	4140-00-17	FUEL PUMP (12V)	
8	1426058-5	FUEL PUMP (24V)	
7	AMOR20-10	RESISTOR (24V)	
6	AMOR20-1.5	RESISTOR (12V)	
5	S-1637-1	HOUSING	
4	S-1637-2	HOUSING	
3	S-1846-3-2	SWITCH	
2	S-1360-10L	CIRCUIT BKR (12V)	
1	S-1360-5L	CIRCUIT BKR (24V)	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: P 7.1.2 & P 7.1.3

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H. Wire	4-30-73
DRAWN	GREUBEL	4-30-73
CHECK	R. YOUNGREN	4-30-73
STRESS		
PROJ	Bergmann	5-1-73
APPD	MK	
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

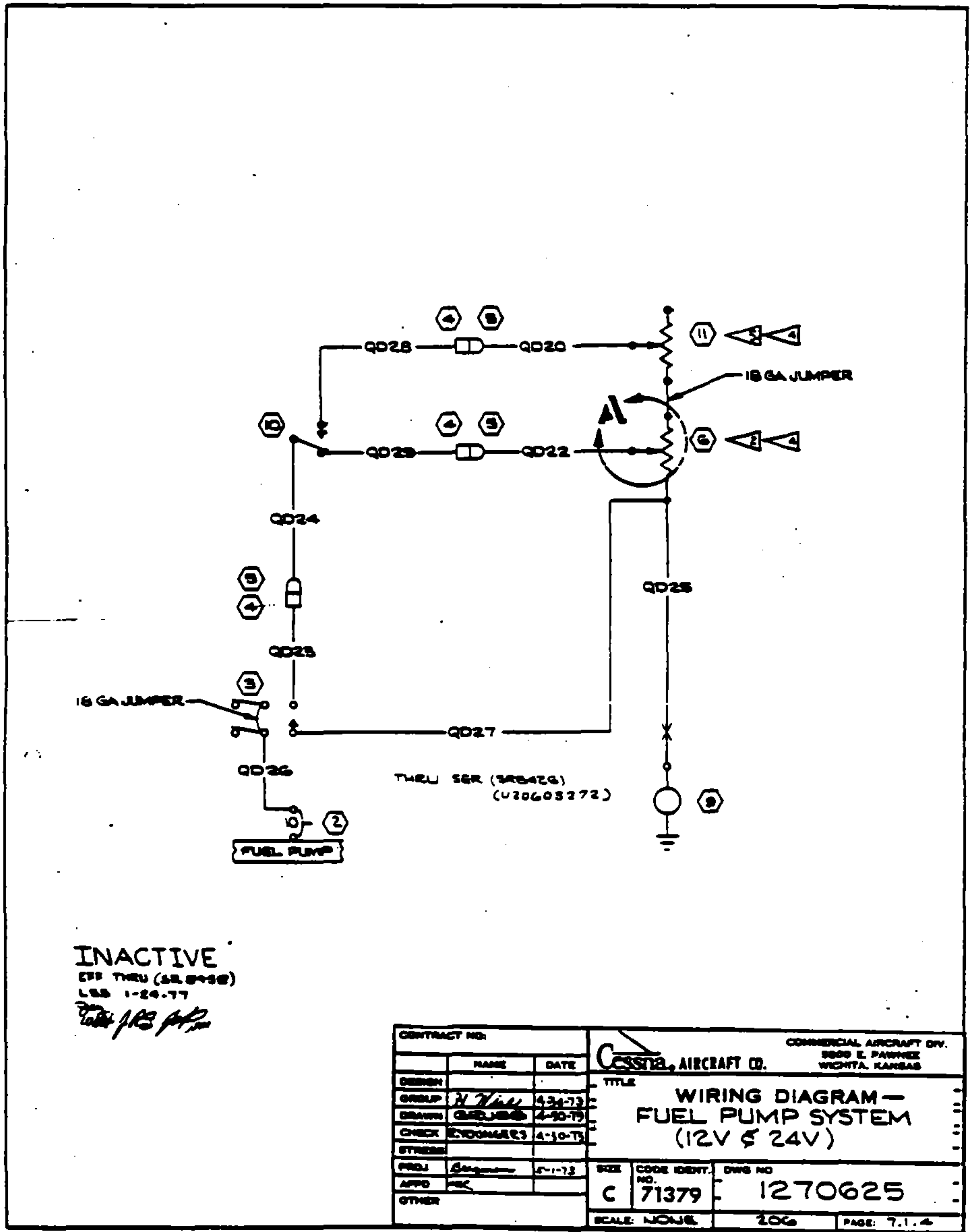
TITLE: WIRING DIAGRAM — FUEL PUMP SYSTEM (12V & 24V)

SIZE: C | CODE IDENT NO. 71379 | DWG NO 1270625

SCALE: NONE | 206 | PAGE: 7.1.4

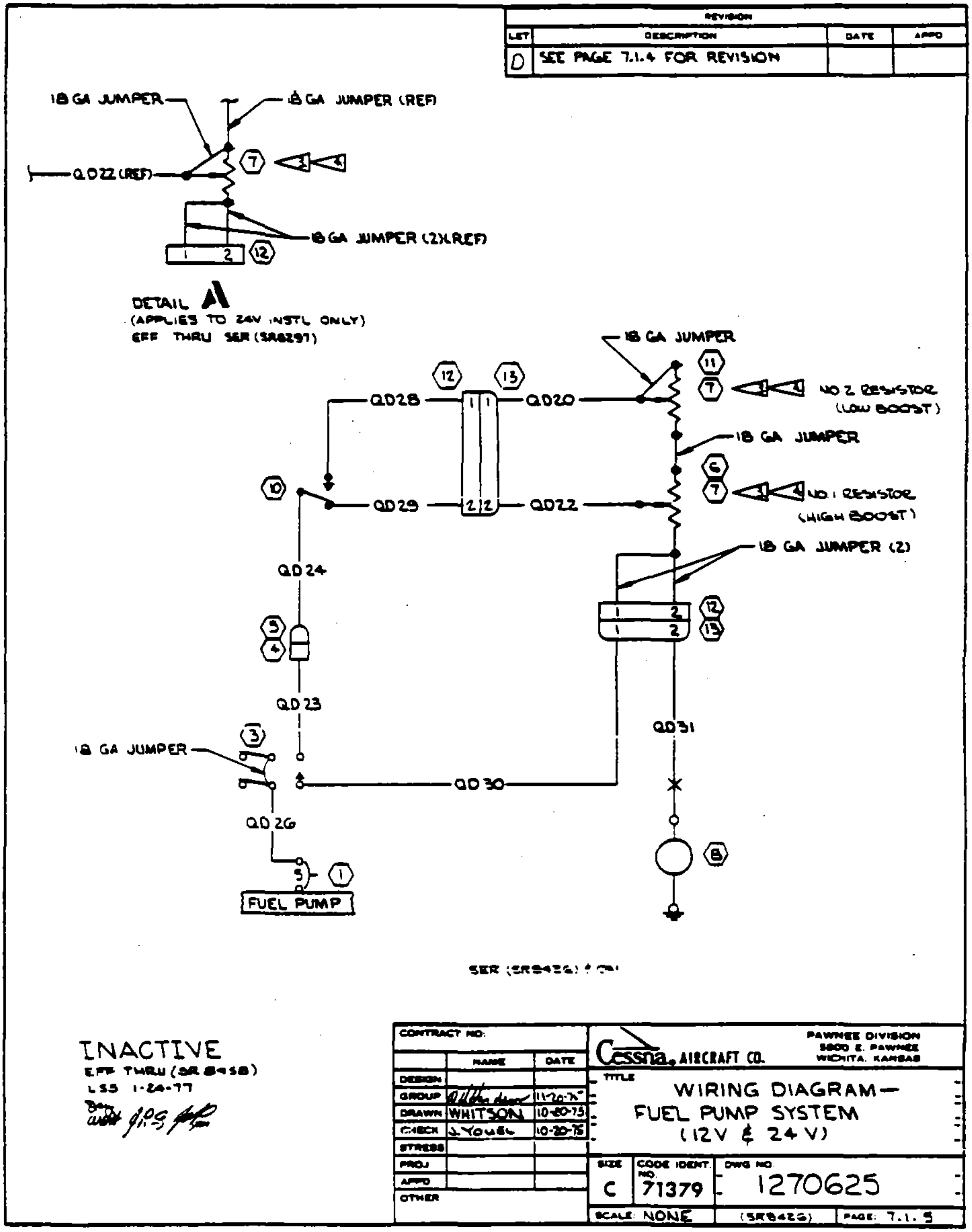
(SR7405) IX
(U20602200)

Fuel Pump System (Sheet 1 of 2)



(U20602200)

Fuel Pump System (Sheet 2 of 2)


REVISION
LET
DESCRIPTION
DATE
APPD
D
SEE PAGE 7.1.4 FOR REVISION
18 GA JUMPER
18 GA JUMPER (REF)
QD22 (REF)
7
3
4
18 GA JUMPER (2)(REF)
1
2
12
DETAIL A
(APPLIES TO 24V INSTL ONLY)
EFF THRU SER (SR8297)
18 GA JUMPER
11
7
NO 2 RESISTOR
(LOW BOOST)
12
13
QD28
QD20
18 GA JUMPER
6
7
NO 1 RESISTOR
(HIGH BOOST)
10
QD29
QD22
18 GA JUMPER (2)
QD24
5
4
QD23
QD31
8
18 GA JUMPER
3
QD30
QD26
1
FUEL PUMP
INACTIVE
EFF THRU (SR8458)
LSS 1-24-77
CONTRACT NO:
NAME
DATE
DESIGN
GROUP
11-20-75
DRAWN
WHITSON
10-20-75
CHECK
J. YOUEL
10-20-75
STRESS
PROJ
APPD
OTHER
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM—
FUEL PUMP SYSTEM
(12V & 24V)
SIZE
C
CODE IDENT. NO.
71379
DWG NO.
1270625
SCALE: NONE
(SR8426)
PAGE: 7.1.5

NOTES:

1. PART NO. 110691 (PR50)
   COLOR: BROWN
2. TEMP BULB FOR 205, P206 & U206 HAVE BEEN LOCATED ON NO. 1 CYL. AT GIVEN SERIALS. MODEL 205 TEMP BULB MOVES TO NO. 6 CYL. MODEL P206 & U206 TEMP BULB REMAINS AT NO. 1 CYL.
3. CRIMP S-1636-5 TERMINAL AROUND WIRE INSULATION, BEND .25 OF STRIPPED WIRE BACK OVER CRIMP & SOLDER PER CES 1040. USE MOLEX HT-1719-C CRIMPING TOOL ONLY
4. *MATERIAL IS ALPHA 5837-7 (VENDOR CODE 92194) OR BELDEN 83009-1 (VENDOR CODE 70903)*

SER 205-0001 THRU
SER 205-0577
SER 206-0001 THRU
SER 206-0275
SER P206-0001 & ON
SER U206-0001 & ON

CHG LET	REVISION	BY / DATE	CHK / APPD
A	REMOVED WA FROM STD WIRES 383634-101	GLW 4-4-62	
B	ADDED 0713602-4 POTENTIOMETER SR 3901	GLW 8-27-62	
C	ADD MODEL 206 S-1360-10 CKT BKR WAS S-1232-10 1270461-1 BUS BAR WAS 1270429-1 1213505-1 WAS 0713608-1; ADD 1213505-2 ON BUS BAR, INST WAS INST LIGHTS H-ECI WIRE WAS 0700603-ECI WIRE ADDED NOTE 2. MATL WAS PER MIL-W-5086A, TYPE I (SR 4038-6)(SR 3983-6)	GLW	
D	BY REVISION. 1 WAS MATL PER MIL-W-16878D TYPE E 200°C GRADE EXTRUDED TEFLON DIELECTRIC. REMOVED 1 FROM H-ECI ADD 1 IN FIELD "BROWN" WAS H-ECI. SER (SR4464)	GLW 2-12-64	
E	ADDED WIRE LENGTHS TO W/T; ADDED PREFIX USED TO TITLE BLOCK; REMOVED 1270461-1 BUS BAR & 2706... FROM E/T; C669502-0104 WAS 1213505-1 & 1213505-2	WJR 7-6-64	
F	BY REV: SER OUT BRN & S-1372-1; SER IN ECC2 & S-1372-2, ADD ITEM 5 & NOTE 3 (SR8085)	RAA 11-12-74	JRS
G	*BY REV: ADD NOTE 4 (NOW SHOP PRACTICE)*	1-30-76	JRS

INACTIVE

EFF THRU SER (SR8498)
PN 1-27-77
JRS

BRN (ECC2)	18	4	93	S-1367-1-8	S-1636-5		3	SER (SR8085) & ON
BROWN	18	1		S-1367-1-8	S-1367-1-4	NO. 6 CYL	2	205-0466 THRU SER (SR8085)
BROWN	18	1	93	S-1367-1-8	S-1367-1-4	NO. 1 CYL	2	205-0001 THRU 205-0465; 206-0001 & P206-0001 & ON
H-ECI	18		93	S-1367-1-8	S-1367-1-4	NO. 1 CYL		INACTIVE 205-0001 & ON; 206-0001 & ON
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS				SERIALS

WIRE TABLE

7				
6	0713602-4	POTENTIOMETER		
5	S-1637-4	HOUSING PLUG		
4	S-1372-2	BULB, CYL HD TEMP		
3	C669502-0104	INST CLUSTER KIT		
2	S-1372-1	BULB, CYL HD TEMP		
1	S-1360-10	CIRCUIT BREAKER		
ITEM NO.	PART NO.	DESCRIPTION		SERIALS

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
	G WOOD	12-27-61
		1-7-62
		2-1-62
		2-1-62

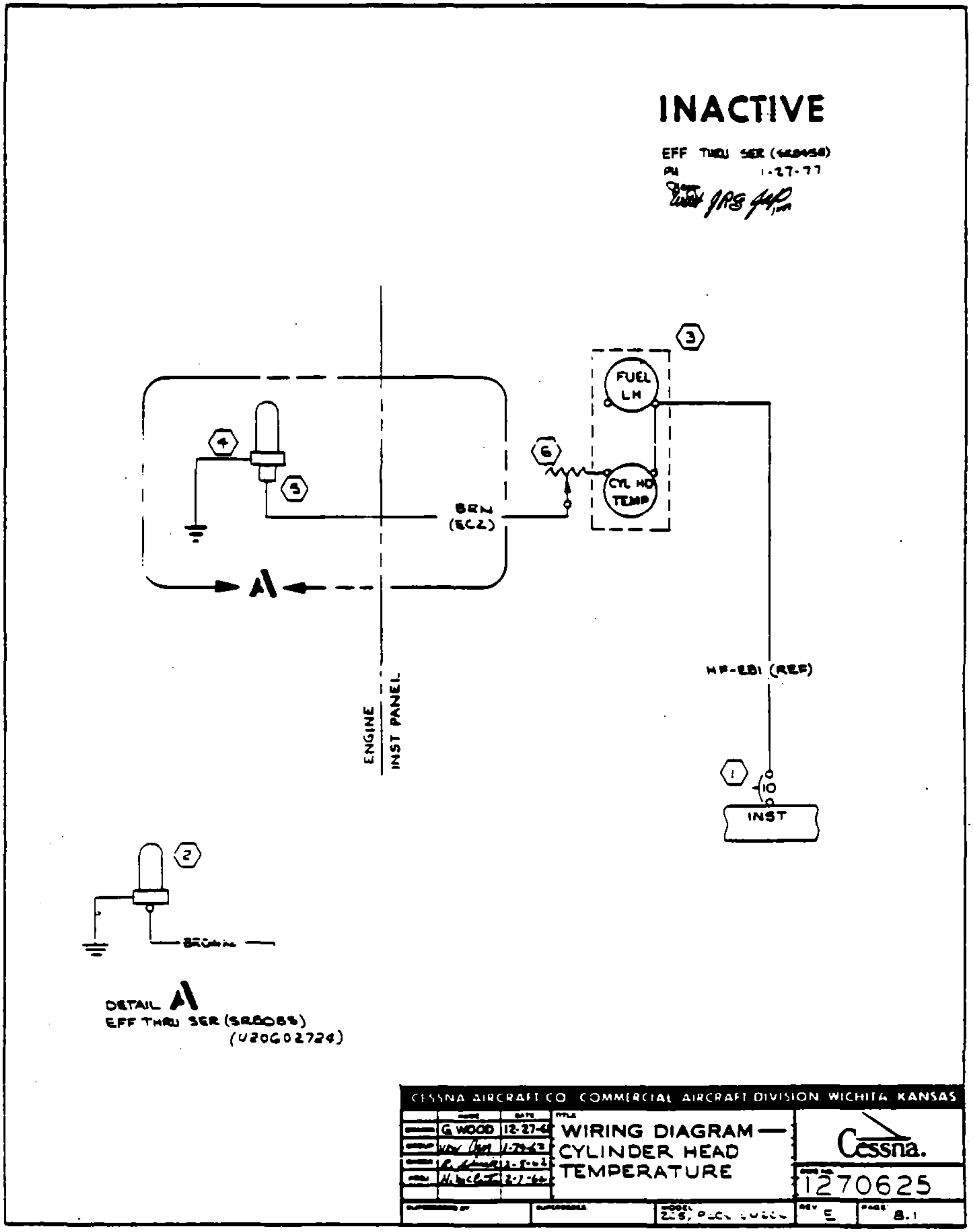
TITLE: WIRING DIAGRAM — CYLINDER HEAD TEMPERATURE

Cessna.

DWG NO. 1270625

MODEL 205, P206, U206 | REV E | PAGE 8.1

Cylinder Head Temperature (Sheet 1 of 2)

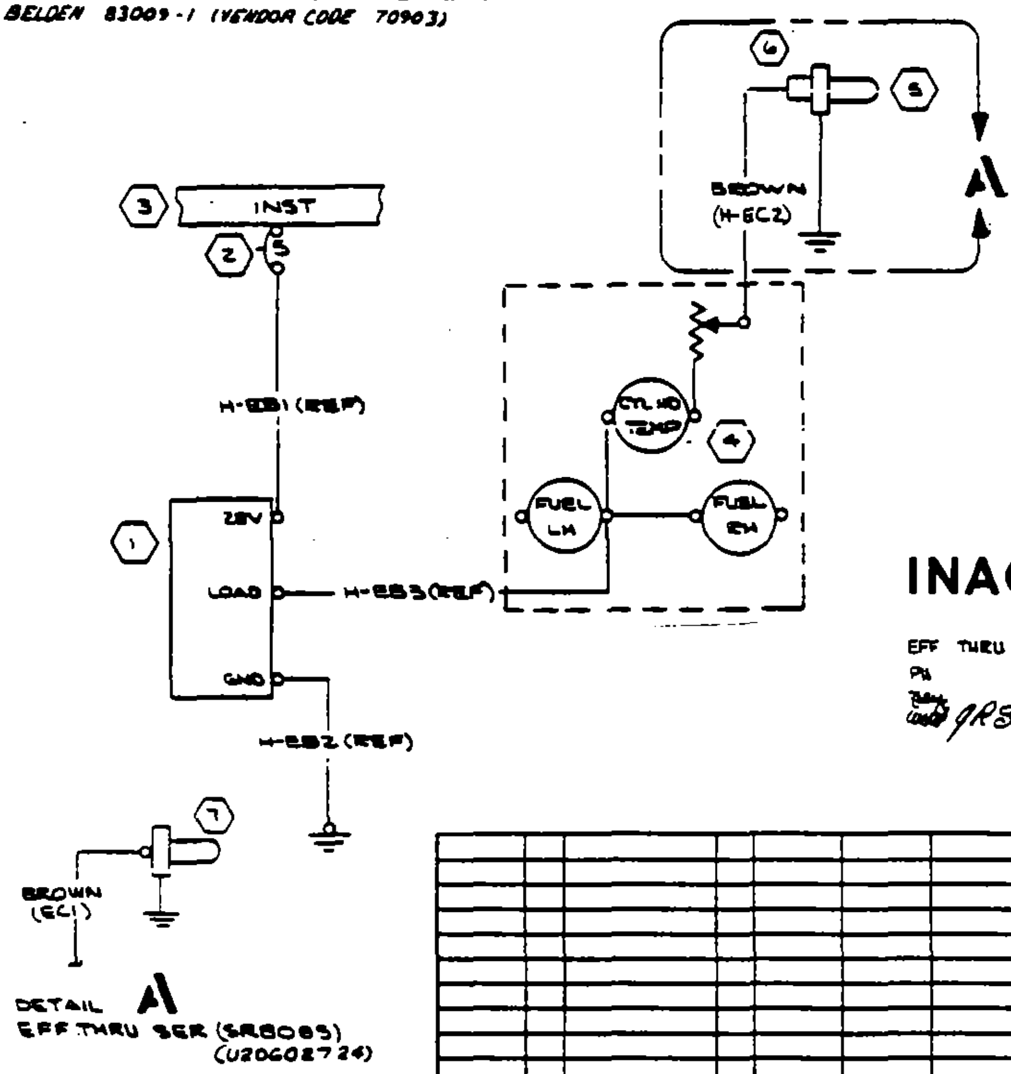


Cylinder Head Temperature (Sheet 2 of 2)

NOTES:

1. PART NO. 110691, (12984)
2. CRIMP S-1636-5 TERMINAL AROUND WIRE INSULATION. BEND .25 OF STRIPPED WIRE BACK OVER CRIMP & SOLDER PER CES 1040. USE MOLEX HT-1719-C CRIMPING TOOL ONLY
3. MATERIAL IS ALPHA 5857-7 (VENDOR CODE 92/94) OR BELDEN 83009-1 (VENDOR CODE 70903)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED H-EC1 (SR74-03)	RAM 8-0-74	
B	BY REV: SER OUT EC1 & S-1372-1, SER IN EC2 & S-1372-4. ADD DETAIL "A". NOTE 2 (SR8085)	RAM 11-12-74	
C	BY REV: ADD NOTE 3 (NOW SHOP PRACTICE)	1-30-76	



INACTIVE

EFF THRU SER (SR8448)

PN 1-27-77

BROWN (H-EC2)	18	3		S-1364-6	S-1636-5	2	SER (SR8085) & ON
BROWN (H-EC1)	18	1		S-1363-1-6	S-1364-4		THRU SER (SR8085)
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

7	S-1372-1	SENDING UNIT	
6	S-1637-4	HOUSING - PLUG	
5	S-1372-2	SENDING UNIT	
4	C669502-0202	INST CLUSTER	
3	0713854-2	BUS BAR	
2	S-1360-5L	CIRCUIT BREAKER	
1	0570409-1	HEAT SINK ASSY	
	PART NO.	DESCRIPTION	VENDOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12205-406

SUPERSEDED BY: 1270835 P.S.1

CONTRACT NO:

	NAME	DATE
DESIGN	J. HENSHAW	3-11-70
GROUP	H. W.	3-10-70
DRAWN	R. YOUNGERS	2-4-70
CHECK		
STRESS		
PROJECT		
APPD	R. YOUNGERS	3-2-70

Cessna AIRCRAFT CO.

COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — CYLINDER HEAD TEMP, OPT 24 VOLT

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1270625

SCALE: NONE U206 PAGE: 8.1.1

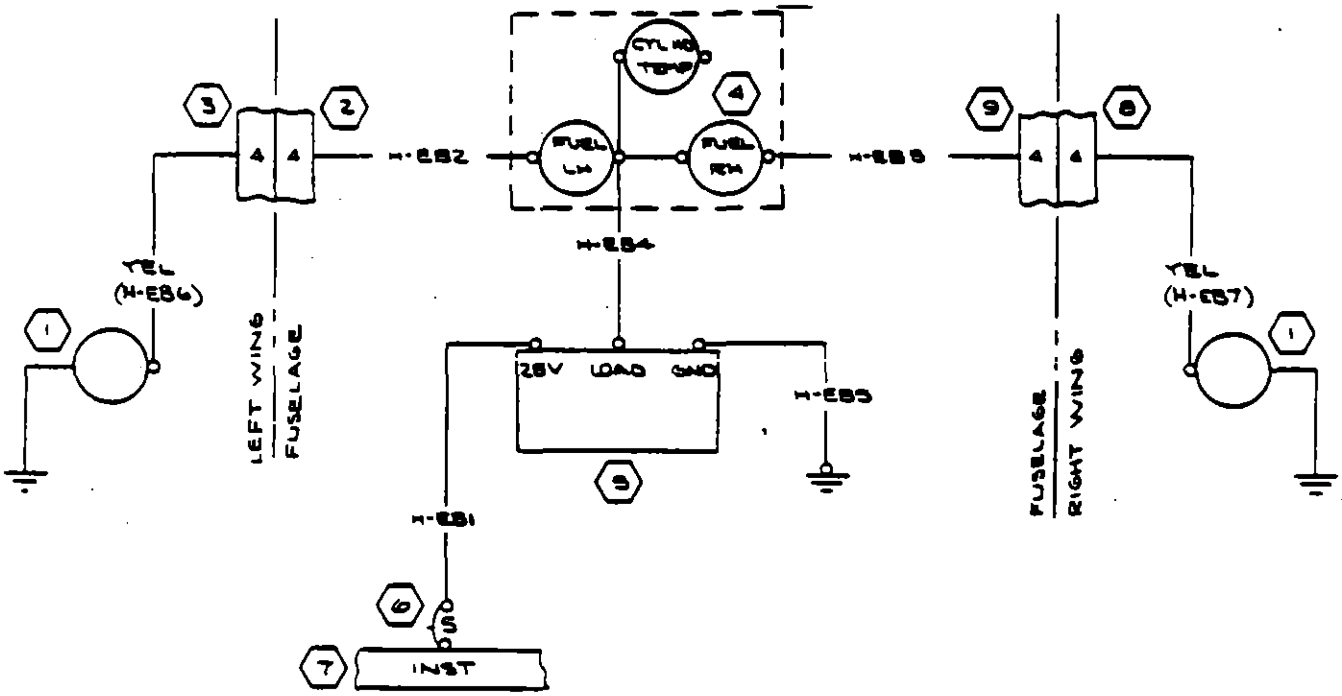
BD 4RR 10367 (SR6546)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: H-EB3 WAS H-EB2 & H-EB2 WAS H-EB3 IN FIELD ED&ER 10040 (SR6546)	ZLY 5-1-70	
B	BY REV: ADDED H-EB6 & H-EB7 (SR7403)		
C	BY REV: ADD S-1640-12, S-1641-12, S-1640-6 & S-1641-6 & WIRE LENGTHS; PIN 4 WAS PIN 6/LH & PIN 2/RH; S-1367-1-10 WAS S-1367-1-6/EB2 PER EO 393 (NOW SHOP PRACTICE)	BLA 12-10-7	

INACTIVE

EFF THRU S66 (SR2462)

1-27-77



YELLOW (H-EB7)	18	-18-4		S-1638-1	S-1367-1-10		
YELLOW (H-EB6)	18	-18-4		S-1638-1	S-1367-1-10		
H-EB5	18		30	S-1493-1	S-1367-1-6		
H-EB4	18		30	S-1493-1	S-1367-1-6		
H-EB3	18		100	S-1367-1-6	S-1636-1		
H-EB2	18		132	S-1367-1-10	S-1636-1		
H-EB1	18		6	S-1367-1-6	S-1493-1		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

9	S-1641-12	HOUSING-SOCKET	
8	S-1640-12	HOUSING-PIN	
7	0713854-2	BUS BAR	
6	S-1360-5	CIRCUIT BREAKER	
5	0570409-1	HEAT SINK ASSY	
4	C669502-0202	INST CLUSTER	
3	S-1640-6	HOUSING-PIN	
2	S-1641-6	HOUSING-SOCKET	
1	0726110-1	XMTR-FUEL LEVEL	
ITEM NO.	PART NO.	DESCRIPTION	VENDOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1220S-406

SUPERSEDED BY: 1270635 P.8.2

CONTRACT NO:

	NAME	DATE
DESIGN	J. HENSHAW	2-11-70
GROUP		3-10-70
DRAWN	R. YOUNGERS	2-4-70
CHECK	HARRIS	2-6-70
STRESS		
PROJECT		2-7-70
APPD	R. YOUNGERS	3-2-70

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — FUEL QUANTITY INDICATOR, OPT 24 VOLT

SIZE C | CODE IDENT. NO. 71379 | DWG NO. 1270625

SCALE: NONE | U206 | PAGE 8.2.1

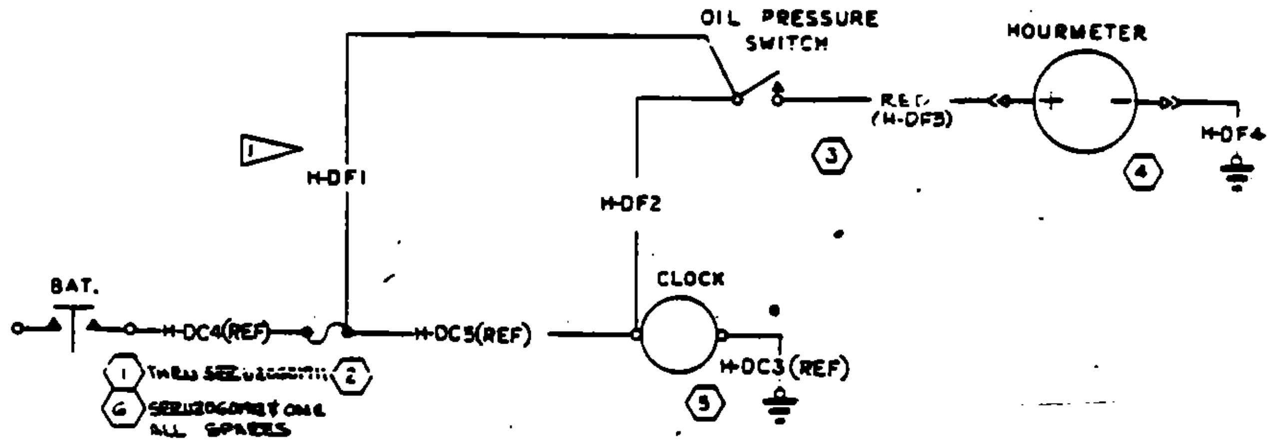
ED&RR 10367 (SR6546)

SER P206-0406 & ON
SER U206-0501 & ON

NOTE:

1. WIRING DIAGRAM SHOWN IS FOR USE WHEN AN OPTIONAL ELECTRIC CLOCK IS INSTALLED. WHEN ELECTRIC CLOCK IS NOT INSTALLED WIRE H-DF1 CONNECTS PRESSURE SWITCH TO FUSEHOLDER. INSTALL S-1091-1 FUSE AND S-1090-22 FUSEHOLDER.

CHG LET	REVISION	BY / DATE	CHK / APPD
A	BY REV: SER CUT S-1579-1 & ADD S-1579-2 (SE7201)	DPM 6-16-72	
B	BY REV: C664502-0101 WAS C664501-0103. S-1090-22 WAS S-1690-22/NOTE 1 NOW SHOP PRACTICE (SR8144)	DLP 2-2-76	
C	BY REV: RED (H-DF3) WAS H-DF3 (SR8686)	PH 9-23-76	



INACTIVE

EFF THRU SER (SR8686)
PH 1-27-77

[illegible]	GA	[illegible]	LG	[illegible]			[illegible]
H-DF4	18			S-1493-1	S-1367-1-6		
RED (H-DF3)	18	-18-2		S-1493-1	S-1367-1-6		
H-DF2	18			S-1367-1-6	S-1367-1-6		
H-DF1	18			S-1367-1-6	SOLDER		

WIRE TABLE

6	S-1579-2	CONTACTOR	
5	S-1317-1	CLOCK	
4	C664502-0101	HOURMETER	
3	S-1711-1	OIL PRESSURE SW	
2	S-1091-1	FUSE	
1	S-1579-1	BAT. CONTACTOR	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION WICHITA KANSAS

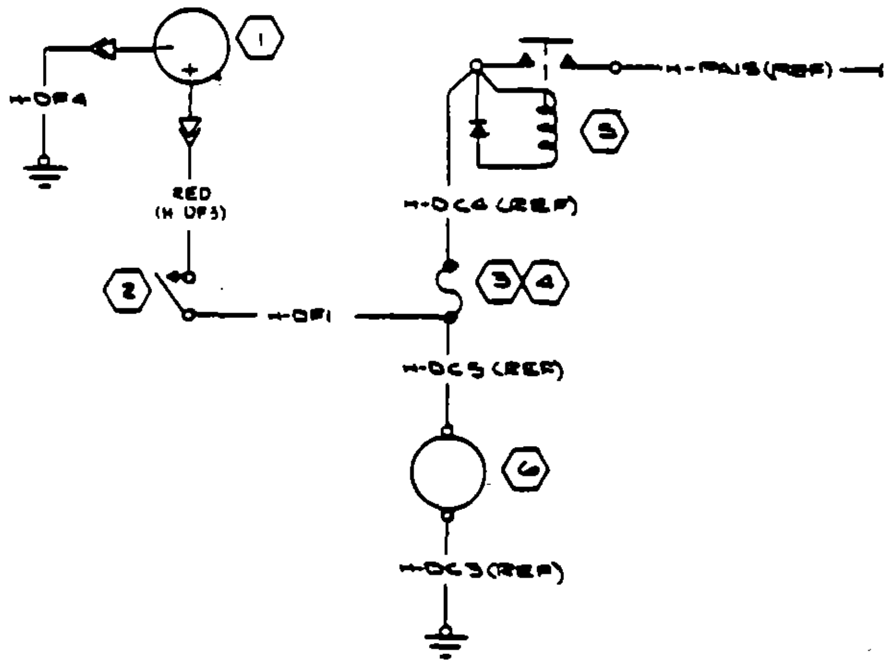
WIRING DIAGRAM—HOURMETER (OPT)

Cessna.

1270625

P206 & U206

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C664502-0101 WAS C664501-0103 (SR8140)	DLP 2-2-76	
B	BY REV: RED (H-DF3) WAS H-DF3 (SR8686)	PR 4-01-76	



INACTIVE

EFF THRU SER (SR8458)

11-27-77

H-DF4	18			S-1493-1	S-1361-1-6	
RED (H-DF3)	18	-18-2		S-1361-1-6	S-1361-1-6	
H-DF1	18			S-1361-1-6	SOLDER	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

6	S-1317N2	CLOCK	
5	S-1580-1	BAT. CONTACTOR	
4	S-1090-22	FUSEHOLDER	
3	S-1091-1	FUSE	
2	S-1711-1	OIL PRESS. SW	
1	C664502-0101	HOURMETER	
ITEM NO	PART NO.	DESCRIPTION	VENDOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC NO
S-XXX OR CMXXXX CESSNA STD NO

SUPERSEDES
12205-406

SUPERSEDED BY

CONTRACT NO

	NAME	DATE
DESIGN	J. HENSHAW	3-4-70
GROUP	N. Nigh	3-10-70
DRAWN	R. YOUNGERS	3-4-70
CHECK		
STRESS		
PROJECT		
APP	R. YOUNGERS	3-2-70

Cessna AIRCRAFT CO.

COMMERCIAL AIRCRAFT DIV.
5800 E PAWNEE
WICHITA, KANSAS

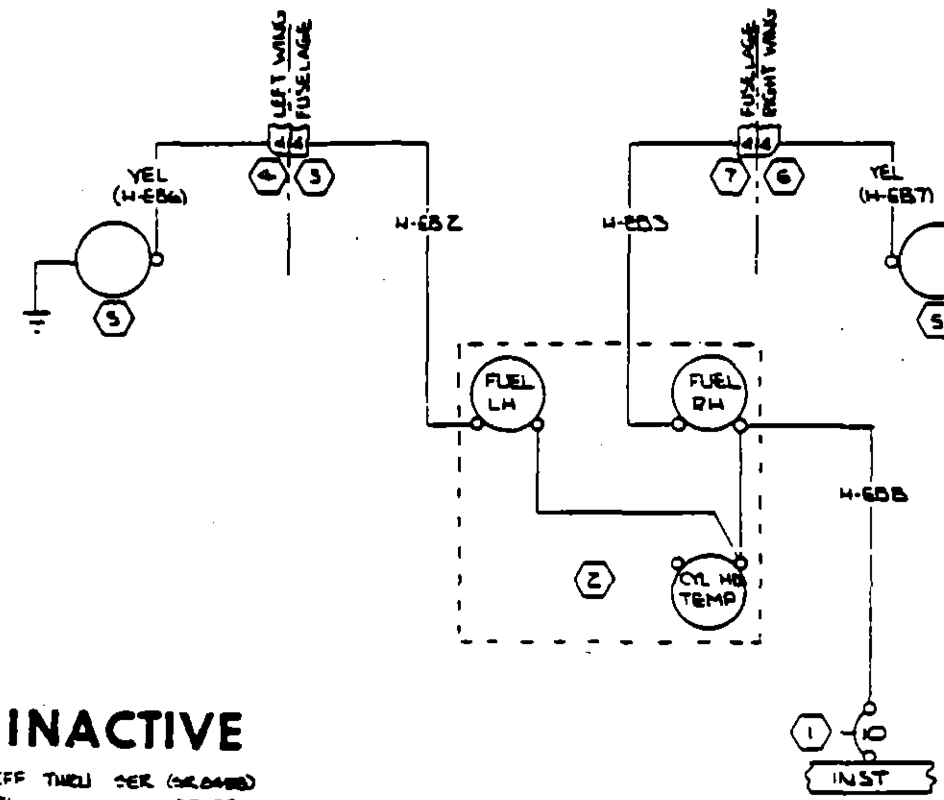
TITLE
WIRING DIAGRAM —
HOURMETER, OPT 24 VOLT

SIZE	CODE IDENT NO	DWG NO
C	71379	1270625

NONE

(SR6546)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: DELETE S-1637-1 & S-1637-2; ADD S-1640-6, S-1640-12, S-1641-6 S-1641-12 & WIRE LENGTHS; S-1367-1-10 WAS S-1367-1-6/EB2 MER EO 393(NOW SHOP PRACTICE)	SLA 12-10-74	



INACTIVE

EFF THRU SER (U20604033)

H-EB8	18		43	S-1367-1-8	S-1367-1-6	
[illegible]	18	-18-4		S-1635-1	S-1367-1-10	
[illegible]	18	-18-4		S-1635-1	S-1367-1-10	
H-EB3	18		100	S-1367-1-6	S-1636-1	
H-EB2	18		132	S-1367-1-10	S-1636-1	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

7	S-1641-12	HOUSING-SOCKET
6	S-1640-12	HOUSING-PIN
5	0726110	XMTR-FUEL LEVEL
4	S-1640-6	HOUSING-PIN
3	S-1641-6	HOUSING-SOCKET
2	C669502-0202	INST CLUSTER
1	S-1360-10L	CIRCUIT BREAKER
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: FG B.2

SUPERSEDED BY:

CONTRACT NO:

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

	NAME	DATE
DESIGN		
GROUP	H. Wise	8-14-73
DRAWN	D. CLLER	8-14-73
CHECK	E. YOUNGERS	8-14-73
STRESS		
PROJ		
APPD		
OTHER		

TITLE WIRING DIAGRAM — FUEL QUANTITY INDICATOR (14V)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270625

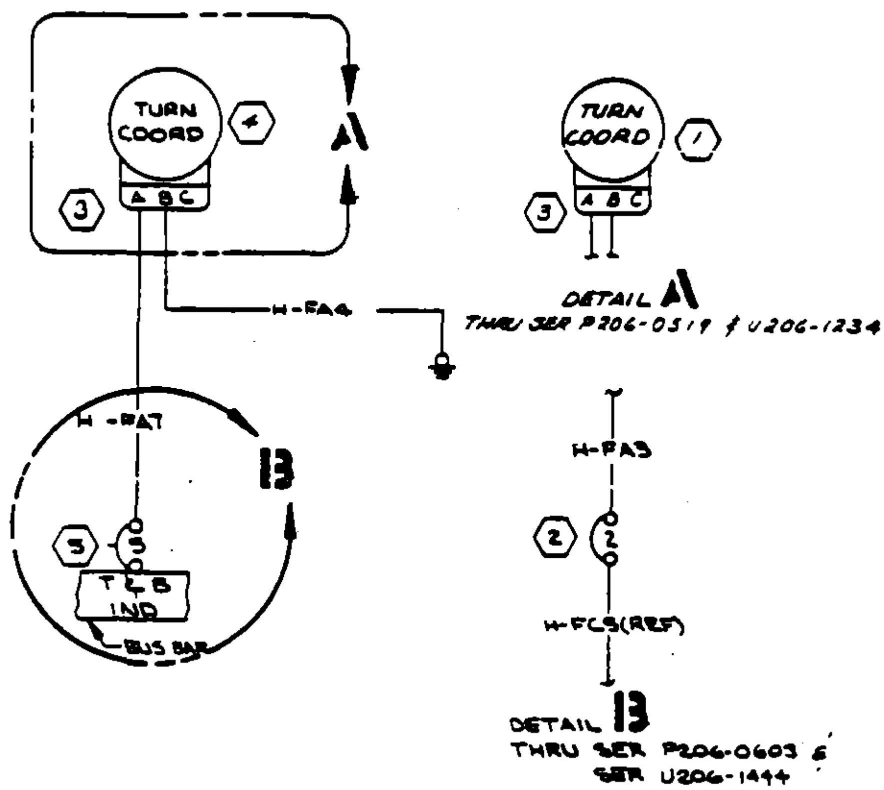
SCALE: NONE | (S2740-3) | PAGE: 8.4

(U20602200)

(SER P206-0420 & ON)
(SER U206-0915 & ON)

REVISION

LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED DETAIL A & C661003-0501 ED&RR03436 (SR5401)Ⅲ (SR5402)Ⅲ	EGY 9-10-68	GKL MDS
B	BY REV: SER OUT CA-2; SER IN S-1360-5; ADD DETAIL B ED&RR 10422 (SR6005)(SR6006)Ⅲ	DLB 3-4-69	RLY



INACTIVE

EFF THRU SER (SR8458)
PU 1-27-77

H-FA7	18			S-1504-8 SOLDER		
H-FA4	18			S-1322-1 SOLDER		
H-FA3	18			S-1322-1 SOLDER		THRU SER(SR6005)(SR6006)
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
5	S-1360-5	CKT BKR	
4	C661003-0501	TURN COORDINATOR	
3	MS3106A10SL3S	CONNECTOR	
2	CA-2	CIRCUIT BREAKER (B0602)	
1	C661003-0201	TURN COORDINATOR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	COOK	9-13-67
GROUP	H. Wood	9-13-67
DRAWN	HARRIS	9-8-67
CHECK	LAURIE	9-9-67
STRESS		9-14-67
PROJECT		9-14-67
APPD		

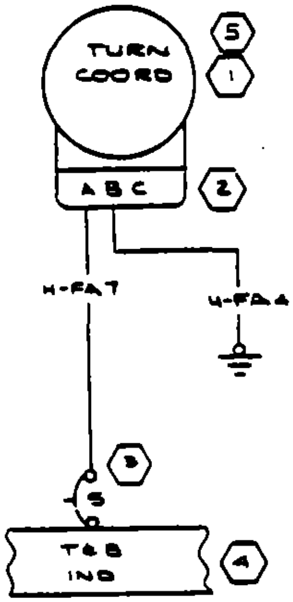
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — TURN COORDINATOR

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1270625

SCALE: NONE | P206/U206 | PAGE: 9.4

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD S-1303-2 TURN & BANK TO TITLE: C661003-0505 WAS C661003-0502 (SR 7903)(REF) (MER 206-E0103)	MEM 5-8-74	[illegible]



INACTIVE

EFF THRU SER (5R8458)
1-27-77

H-FA4	18			S-1342-14 SOLDER			
H-FA7	18			S-1342-14 SOLDER			
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

5	S-1303-2	INDICATOR-T&B	
4	0713854-3	BUS BAR	
3	S-1360-5	CKT BKR	
2	MS3106A10SL3S	CONNECTOR	
1	C661003-0505	TURN COORDINATOR	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12206-406

SUPERSEDED BY: 1270835 P.9.2

CONTRACT NO:

	NAME	DATE
DESIGN	J. HENSHAW	3-11-70
GROUP	H. Wae	3-10-70
DRAWN	R. YOUNGERS	2-4-70
CHECK	HARRIS	2-6-70
STRESS		
PROJECT	[illegible]	3-11-70
APPD	R. YOUNGERS	3-2-70

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — TURN COORDINATOR, TURN & BANK, OPT 24 VOLT

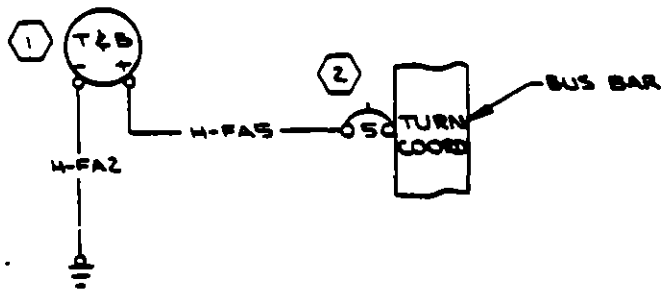
SIZE: C | CODE IDENT. NO. 71379 | DWG NO. 1270625

SCALE: NONE | U206 | PAGE: 9.4.1

ED&ER 10367 (9RG846)

(SER P20600604 & ON)
(SER U20601445 & ON)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-1413-2 WAS S-1302N1, S-1360-5L WAS S-1360-5 & FA5/S-1367-1-6 WAS S-1367-1-8	7-5-73 RAM	



INACTIVE

EFF THRU SER (SR8456)
1-27-77

H-FA5	18			S-1367-1-6	S-1367-1-8	
H-FA2	18		16	S-1367-1-8	S-1367-1-8	
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

2	S-1360-5L	CIRCUIT BKR
1	S-1413-2	INDICATOR
ITEM NO.	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA
STD. NO.

SUPERSEDES: P 9.1

SUPERSEDED BY: 1270835 P. 9.2

CONTRACT NO:

	NAME	DATE
DESIGN	HENSHAW	7-1-69
GROUP	H. Wise	8-7-69
DRAWN	D.L. BURKE	8-1-69
CHECK		8-5-69
STRESS		8-7-69
PROJ		
APPD		8-6-69
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — TURN & BANK INDICATOR

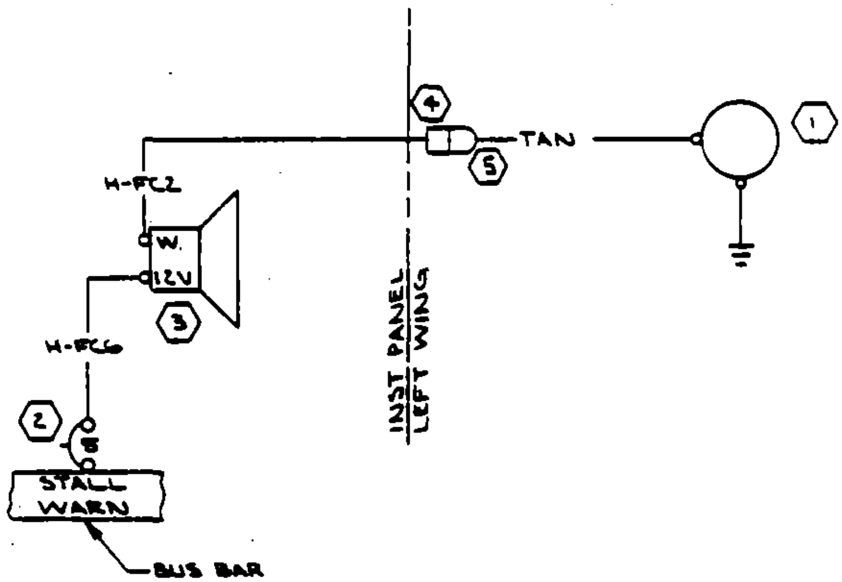
SIZE C | CODE IDENT NO. 71379 | DWG NO 1270625

SCALE: NONE | P206 & U206 | PAGE. 9.5

ED & RR 10422 (SR6005) E (SR6006) E

(SER P20600604 & ON)
(SER U20601445 & ON)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-1635-1 & S1636-1 WAS S-341-2 (SR7405) (REP)	DLO 3-1-74	



INACTIVE

EFF THRU SER (SR8458)
PH 1-27-77

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
TAN	18	S-1460-18-10	100	S-1367-1-6	S-1635-1		
H-FC6	18			S-1367-1-6	S-1367-1-6		
H-FC2	18		61	S-1367-1-6	S-1636-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
5	S-1637-1	HOUSING-CAP	
4	S-1637-2	HOUSING-PLUG	
3	S-1407-6	HORN, STALL WARN	
2	S-1360-5	CIRCUIT BKR	
1	0511062-4	XMTR, STALL WARN	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 9.2

SUPERSEDED BY: 1270835 P.9.1

CONTRACT NO:

	NAME	DATE
DESIGN		8-7-69
GROUP	H. Wise	8-7-69
DRAWN	D.L. BURKE	8-1-69
CHECK		8-8-69
STRESS		
PROJ		
APPD		8-6-69
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — STALL WARNING SYSTEM (NON-HEATED)

SIZE C | CODE IDENT NO 71379 | DWG NO 1270625

SCALE NONE | P206 & U206 | PAGE 9.6

ED & RR 10422 (SR6005) (SR6006)

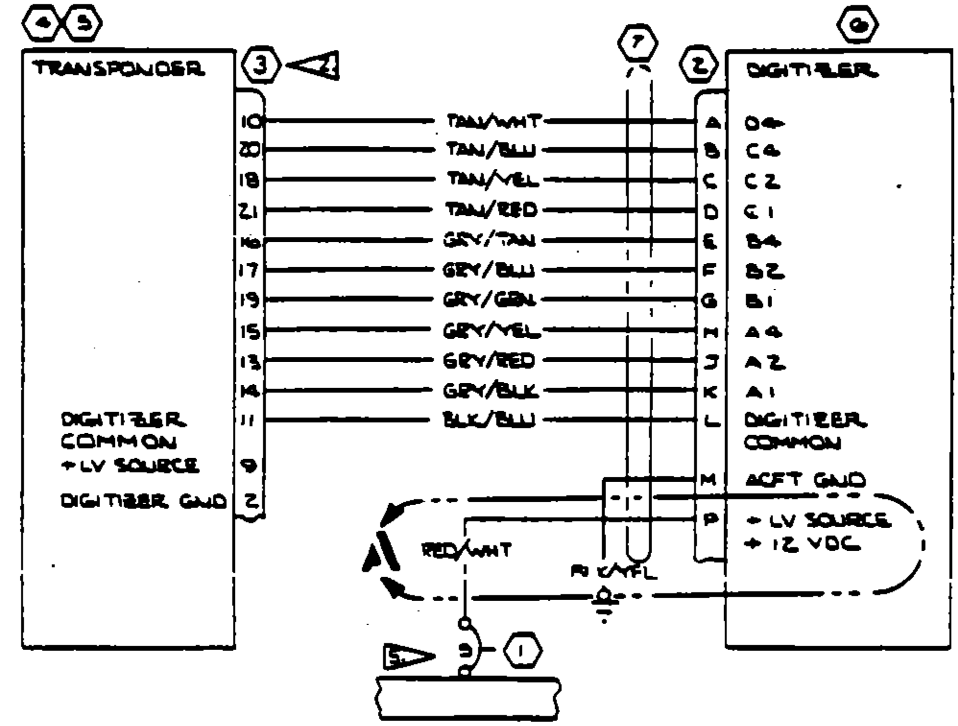
NOTES:

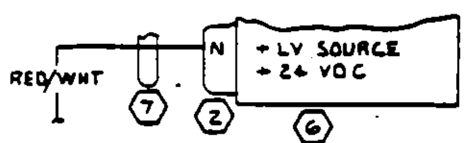
1. ~~FOR 24V WIRING & WIRE TERMINALS REFER TO 1570010 PAGE 9.2~~
2. TRANSPONDER CONNECTOR HOUSING IS PART OF TRANSPONDER CABLE ASSY
3. FOR WIRING DIAGRAM OF 300 & 400 TRANSPONDER REFER TO 3920143
4. PINS ARE CRIMP TYPE & VENDOR FURNISHED WITH CONNECTOR
5. ATTACH BOTH TRANSPONDER AND ENCODING ALTIMETER TO NO. 4 RADIO CIRCUIT BREAKER.

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE NO. 5; DELETE TURN COORDINATOR FROM BUS BAR; ADD (SR7922) (SR7922)	MEM 3-5-74	
B	BY REV: ADD WIRE LENGTHS; 1570312 WAS 1570312-1; DELETE NOTE 1 (SR7692)(REF)(SR7922)(REF)	GDS 6-18-76	

INACTIVE

EFF THRU SER (SR8468)
PU 1-27-77





DETAIL A
(APPLIES TO 24V INSTL)

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
RED/WHT	20	-20-2-9	60	S-1367-1-8	4	
BLK/YEL	22	-22-0-4	60	S-1367-1-8		
BLK/BLU		-22-0-6	43	S-2190-1		
GRY/BLK		-22-8-9				
GRY/RED		-22-8-2				
GRY/YEL		-22-8-4				
GRY/GRN		-22-8-5				
GRY/BLU		-22-8-6				
GRY/TAN		-22-8-10				
TAN/YEL		-22-10-4				
TAN/RED		-22-10-2				
TAN/BLU		-22-10-6				
TAN/WHT	22	-22-10-9	43	S-2190-1	4	

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
7	1570312	CABLE ASSY	
6	EA-401A	ALT DIGITIZER	
5	RT-359A	TRANSPONDER	
4	RT-459A	TRANSPONDER	
3	S-2189-1	CONNECTOR	
2	42816	CONNECTOR	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400
CES-1000=CESSNA SPEC. NO.
S-XXX OR CHXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	D. Henderson	11-13-73
DRAWN	J. OLLER	11-9-73
CHECK	J. YOUEL	11-9-73
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE: WIRING DIAGRAM — ENCODING ALTIMETER (12 & 24 VOLT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

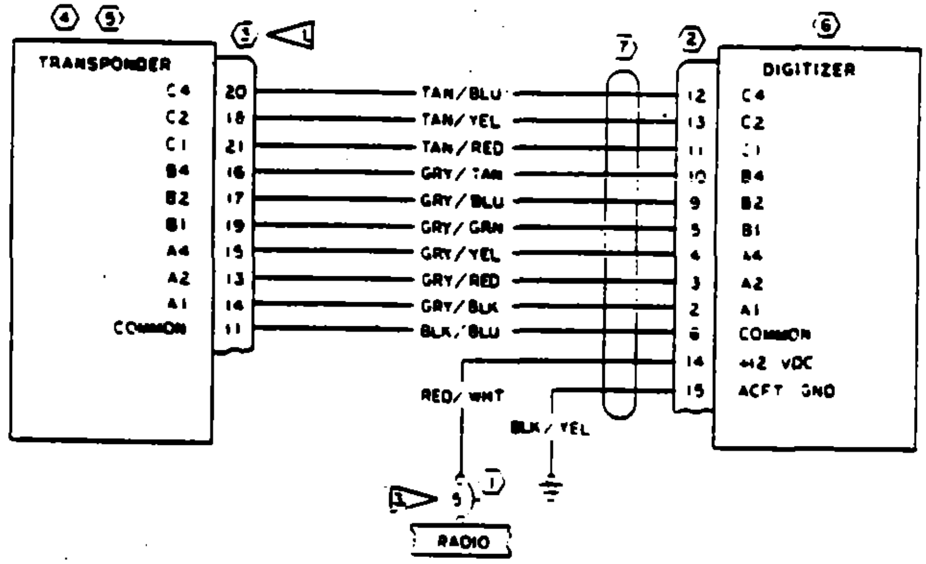
SCALE: NONE (SR7922) PAGE: 9.7

(SR 7692)

NOTES:

1. TRANSPONDER CONNECTOR HOUSING IS PART OF TRANSPONDER CABLE ASSY
2. FOR WIRING DIAGRAM OF 300 & 400 TRANSPONDER REFER TO 392016A
3. ATTACH BOTH TRANSPONDER AND ENCODING ALTIMETER TO THE NO. 4 CIRCUIT BREAKER

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: DELETE DETAIL "A" (SR8490)	PH 8-5-76	



INACTIVE

EFF THRU SER (SR8490)
PH 1-27-77

TAN/BLU	22	22-10-6		S-2190-1	SOLDER		
TAN/YEL		22-10-4					
TAN/RED		22-10-2					
GRY/TAN		22-8-10					
GRY/BLU		22-8-6					
GRY/GRN		22-8-5					
GRY/YEL		22-6-4					
GRY/RED		22-4-2					
GRY/BLK		22-8-0					
BLK/BLU		22-0-6		S-2190-1			
BLK/YEL		22-0-4		S-1367-1-6			
RED/WHT	22	22-2-9		S-1367-1-6	SOLDER		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

7	0470404	CABLE ASSY	
6	C744001	ALT DIGITIZER	
5	RT-459A	TRANSPONDER	
4	RT-359A	TRANSPONDER	
3	S-2189-1	CONNECTOR	
2	DA-15S	CONNECTOR	
1	S-1360-5L	CIRCUIT BREAKER	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CXXXX-CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	G. STAMM	4-23-76
GROUP	D. Wh...	5-5-76
DRAWN	R. KLEIN	4-22-76
CHECK	Yowel	4-22-76
STRESS		
PROJ	W. MOORE	5-6-76
APPD	JPS	5-5-76
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

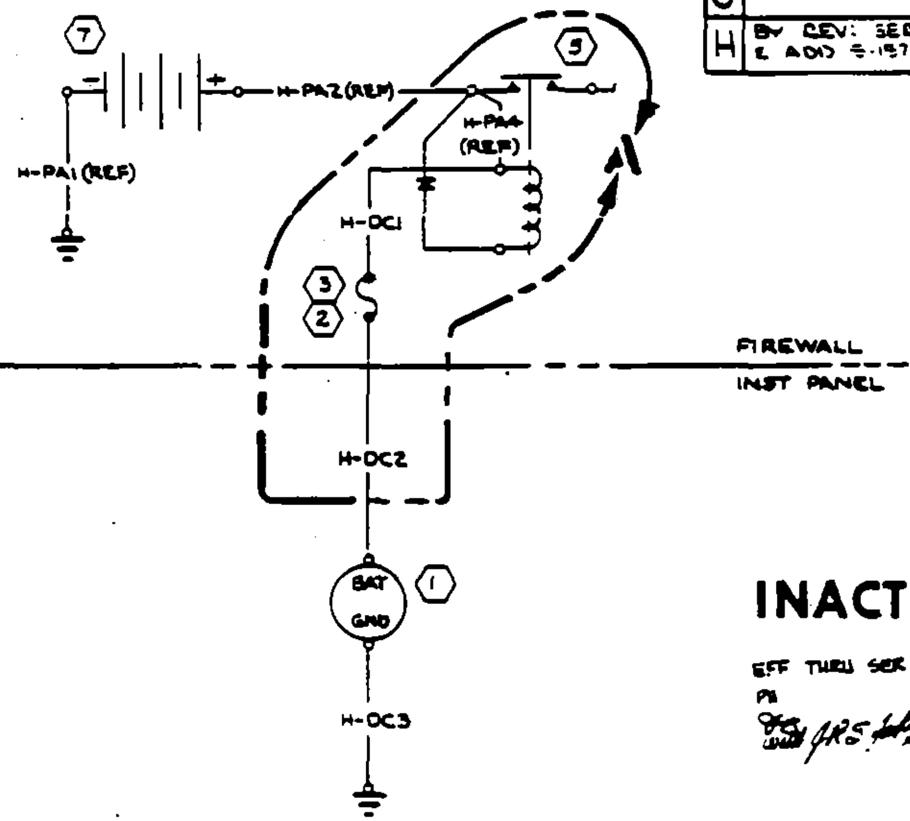
TITLE: WIRING DIAGRAM — BLIND ENCODER U206, TU206

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270625

SCALE: NONE | SER (SR 8490) | PAGE: 9.1

SER 205-0001 THRU
SER 205-0577
SER 206-0001 THRU
SER 206-0275
SER P206-0001 & ON
SER U206-0001 & ON

CHG LET	REVISION	BY / DATE	CHK / APPD
A	REMOVED N/A FROM STD WIRES (SR3429-10)	GLW 4-4-62	[illegible]
B	REMOVED OBSOLETE NEVEL USED FROM FACE OF DRAWING. S-1091-1 WAS -2; S-1090-22 WAS -18 (SR4021)	[illegible]	[illegible]
C	ADD MODEL 206 SR (1983-6)	GLW [illegible]	[illegible]
D	ADDED P206 & U206 TO S/M: ADDED WIRE LENGTHS TO W/T; REMOVED H-PA1, H-PA2 & H-PA4 FROM E.T	WJR 7-16-64	[illegible]
E	BY REV: ADD DETAIL A, H-DC4 / ITEM 6. SER 201 [illegible]	[illegible]	[illegible]
F	ADDED H-DC5; [illegible] & DC2 ([illegible])	WJR [illegible]	[illegible]
G	BY REV: S-1317N2 WAS S-1317N1 [illegible]	[illegible]	[illegible]
H	BY REV: SER OUT S-1579-1 & ADD S-1579-2 (SR7201)	EPH 6-16-72	[illegible]



INACTIVE

EFF THRU SER (SR8450)
PB 1-27-77

WIRE CODE NO.	GA	MATERIAL	LG.	TERMINALS		N/A	SERIALS
H-DC5	18			S-1367-1-6	SOLDER		[illegible]
H-DC4	18		8	S-1367-1-6	SOLDER		[illegible]
H-DC3	18		11	S-1367-1-6	S-1367-1-6		205-0129 & ON
H-DC2	18		120	S-1367-1-6	SOLDER		205-0129 THRU [illegible]
H-DC1	18		8	S-1367-1-6	SOLDER		205-0129 THRU [illegible]

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	SERIALS
9	S-1579-2	CONTACTOR	
8	0770728-1	DIODE ASSY.	
7	0712605-1	BATTERY	
6	S-1579-1	CONTACTOR, BAT.	
5	0712603-2	CONTACTOR, BAT.	
4	S-1579-2	CONTACTOR	
3	S-1091-1	FUSE	
2	S-1090-22	FUSEHOLDER	
1	S-1317N2	CLOCK ASSY	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
DRAWN	G WOOD	12-27-61
	[illegible]	1-29-62
CHECK	[illegible]	2-5-62
APPD	[illegible]	2-7-62

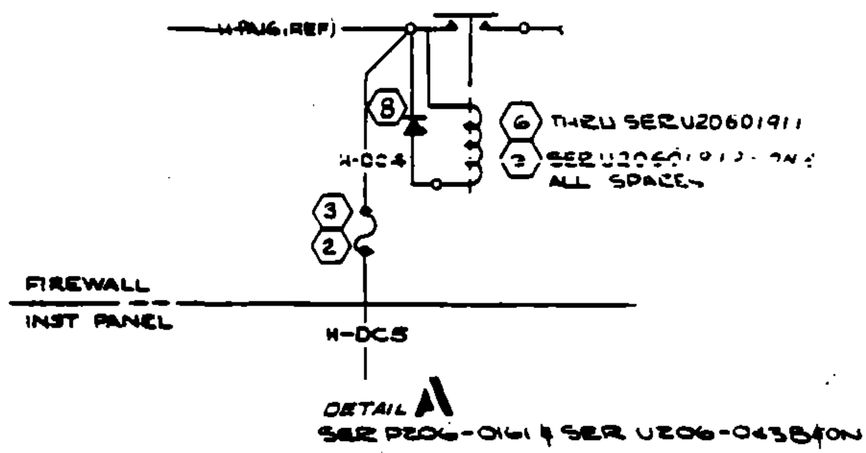
TITLE: WIRING DIAGRAM — CLOCK

Cessna.

DWG NO. 1270625

SUPERSEDED BY: | SUPERSEDES: | MODEL 205, P206 & U206 | REV H | PAGE 10.1

Clock (Sheet 1 of 2)



INACTIVE

EFF THRU SER
1-27-77

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION WICHITA KANSAS

G WOOD	12-27-61	
	1-24-62	
	2-5-62	
	2-7-66	

WIRING DIAGRAM — CLOCK

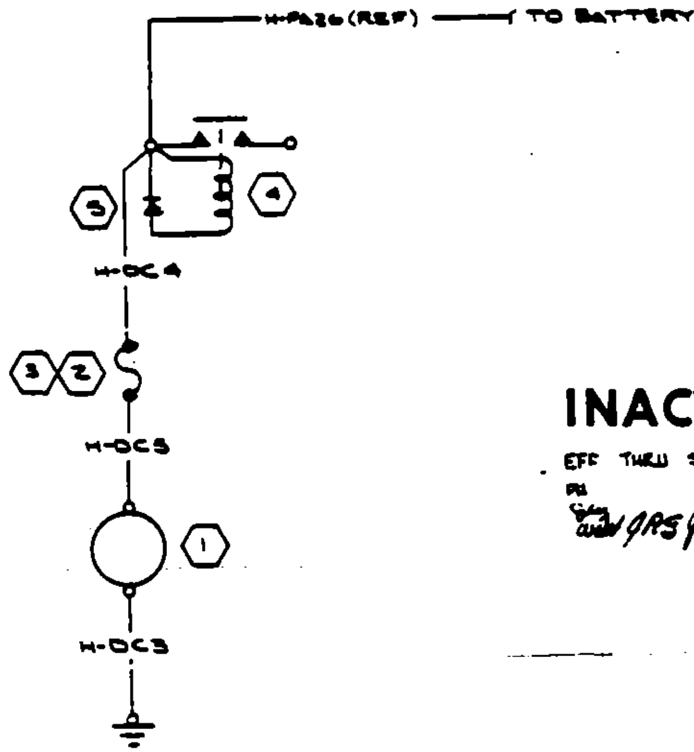
Cessna.

1270625

205, P206 & U206 | REV H | PAGE 10.1

Clock (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD



INACTIVE

EFF THRU SER. (SR8458)
RI 1-27-77

H-DC5	18			SOLDER	S-1367-1-8		
H-DC4	18		8	S-1367-2-8	SOLDER		
H-DC3	18		11	S-1367-1-8	S-1367-1-8		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

5	0770728-1	DIODE ASSY	
4	S-1580-1	BAT. CONTACTOR	
3	S-1090-22	FUSEHOLDER	
2	S-1091-1	FUSE	
1	S-1317N2	CLOCK	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12206-406
SUPERSEDED BY: 1270855 P.10.1

CONTRACT NO:

	NAME	DATE
DESIGN	J. HENSHAW	3-11-70
GROUP	[illegible]	3-10-70
DRAWN	R. YOUNGERS	2-4-70
CHECK	HARRIS	2-6-70
STRESS		
PROJECT	[illegible]	[illegible]
APPD	R. YOUNGERS	3-2-70

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

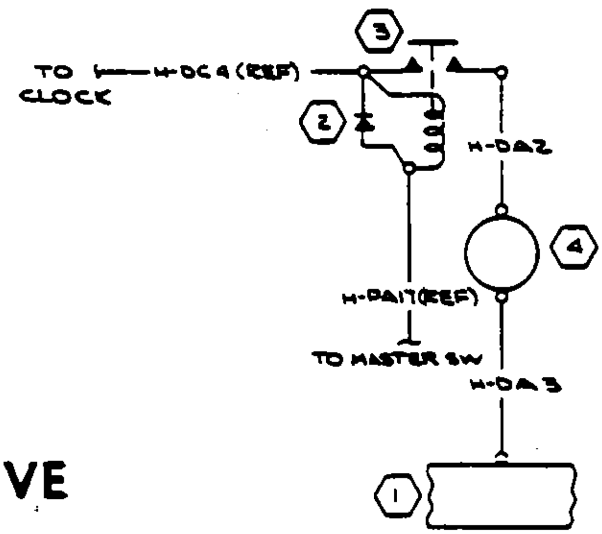
TITLE
WIRING DIAGRAM — CLOCK, OPT 24 VOLT

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1270625

SCALE: NONE | U206 | PAGE: 10.1.1

ED&RR 10367 (SR6546)

REVISION			
LET	DESCRIPTION	DATE	APPD



INACTIVE

EFF THRU PER (SR8458)
PN 1-27-77

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
H-DA3	8			S1363-4-10	S1363-4-10		
H-DA2	8			S1363-4-10	S1363-4-19		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	VENDOR
4	C669502-0202	INST CLUSTER	
3	S-1880-1	BAT. CONTACTOR	
2	0710728-1	DIODE ASSY	
1	0713854-2	BUS BAR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12205-406
SUPERSEDED BY: 1270835 P.6.2

CONTRACT NO:

	NAME	DATE
DESIGN	J. HENSHAW	2-11-70
GROUP		3-19-70
DRAWN	R. YOUNGER	2-4-70
CHECK	HARRIS	2-6-70
STRESS		
PROJECT		2-11-70
APPD	R. YOUNGER	3-2-70

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

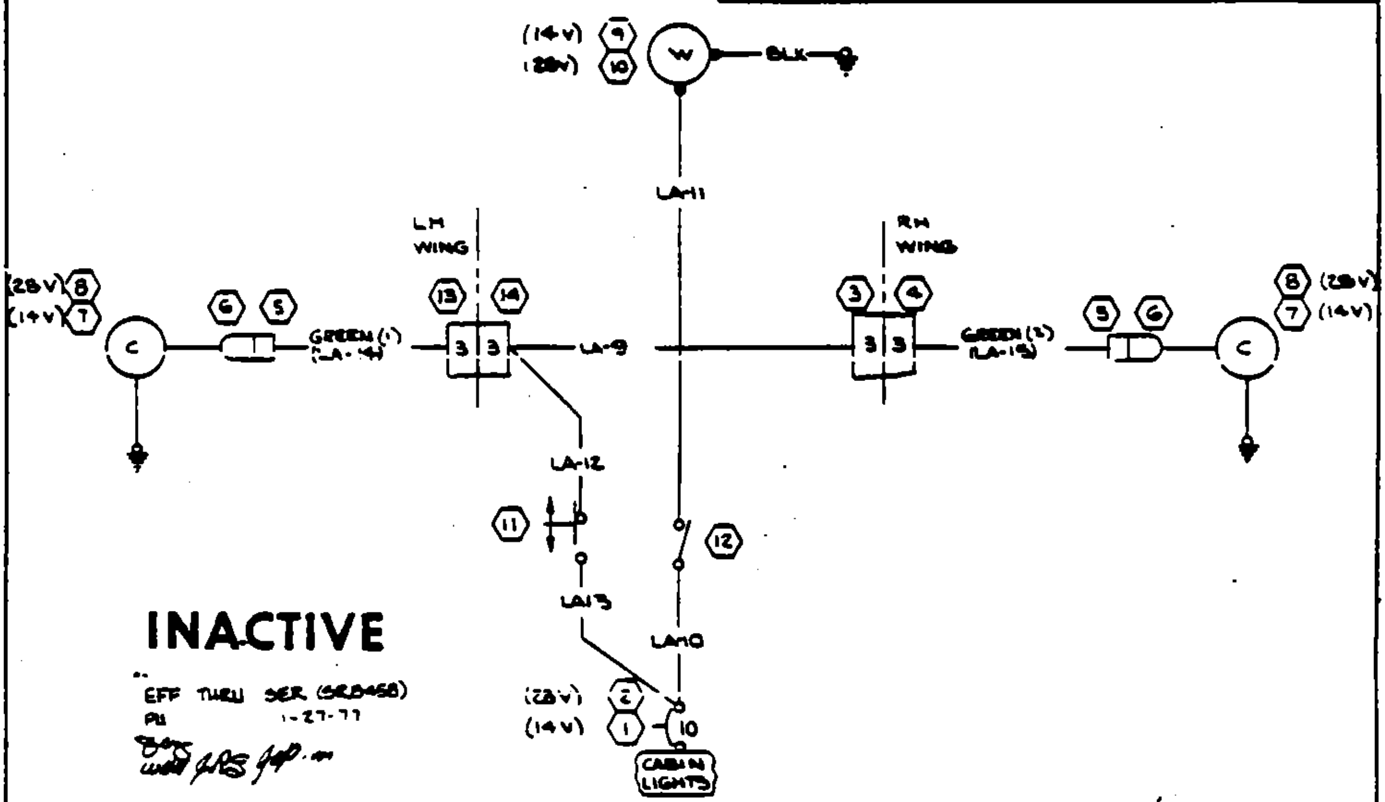
TITLE
WIRING DIAGRAM — AMMETER, OPT 24 VOLT

SIZE: C | CODE IDENT. NO. 71379 | DWG NO. 1270625

SCALE: NONE | U206 | PAGE: 10.1.2

BD4RR 10367 (SR6646)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED LA-14 & LA-15, LA9 WAS LA13, LA13 WAS LA1 & S-1831-1 WAS 0713025-6 (SR 7403)	7-9-73	
B	BY REV: ADD S-1640-6 & S-1641-6; PIN 3 WAS 7; S-1640-12 & S-1641-12 WAS S-1640-9 & S-1641-9 MER 60 393 (NOW SHOP PRACTICE)	BLA 2-10-78	



INACTIVE

EFF THRU SER. (SR0458) 1-27-77

14	S-1641-6	HOUSING-SOCKET	
13	S-1640-6	HOUSING-PIN	
12	S-2160-1	SWITCH	
11	S-1831-1	SWITCH	
10	1210110-2	LIGHT INSTL	
9	1210110-1	LIGHT INSTL	
8	GE 308	LAMP	
7	MS15584-2	LAMP	
6	S-1637-1	HOUSING	
5	S-1637-2	HOUSING	
4	S-1640-12	HOUSING-PIN	
3	S-1641-12	HOUSING-SOCKET	
2	S-1360-5L	CKT BKR	
1	S-1360-10L	CKT BKR	
ITEM NO.	PART NO.	DESCRIPTION	
EQUIPMENT TABLE			

BLK	18	-18-0		S-1367-8	SOLDER		
GREEN (LA-14)	18	-18-5		S-1635-1	S-1636-1		
GREEN (LA-15)	↑	-18-5		S-1635-1	S-1636-1		
LA13			120	S-1367-6	S-1830-1		
LA12			64	[illegible]	S-1830-1		
LA11			10	S-1493-1	SOLDER		
LA10	↓		176	S-1367-6	S-1493-1		
LA9	18		78	S-1636-3	S-1636-2		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
WIRE TABLE							

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1000-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: P 11.1 & 11.1.1

SUPERSEDED BY: 1270835 P.11.4

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-4-73
GROUP	H. Wise	4-27-73
DRAWN	WHITE	4-25-73
CHECK	E.YOUNGERS	4-27-73
STRESS	C. Pate	8 Ap. 73
PROJ		6-19-73
APPD		
OTHER		

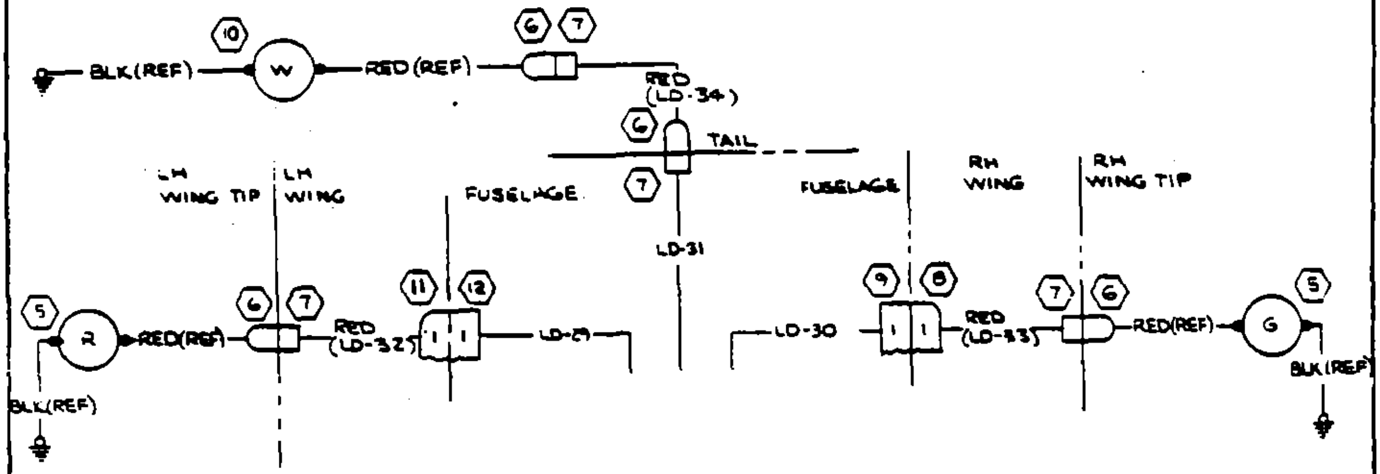
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — DOME & COURTESY LIGHTS (14V & 28V)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE (SR 7403) PAGE: 11.1.2

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED LD-32, LD-33 & LD-33 (SR7403) II	RAM 8-10-73	
B	BY REV: ADD WIRE LENGTHS; S-1640-12 & S-1641-12 WAS S-1640-9 & S-1641-9, S-1640-6 & S-1641-6 WAS S-1640-9 & S-1641-9; MER 50 395 (NOW SHOP PRACTICE)	BLA 12-10-76	JRS



INACTIVE

EFF THRU SER (SR8450)
1-27-71

RED (LD-34)	18	-18-2		S-1636-1	S-1635-1		
RED (LD-33)	|	-18-2	190	S-1636-1	S-1635-1		
RED (LD-32)	|	-18-2	190	S-1636-1	S-1635-1		
LD31	|		352	S-1829-1	S-1636-1		
LD30	|		75	|	S-1636-1		
LD29	|		27	|	S-1636-1		
LD28	|		7	S-1829-1	S-1493-1		
LD1	18		6	S-1561-6	S-1493-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

13		
12	S-1641-6	HOUSING-SOCKET
11	S-1640-6	HOUSING-PIN
10	C622001-0102	LIGHT ASSY
9	S-1641-12	HOUSING-SOCKET
8	S-1640-12	HOUSING-PIN
7	S-1637-2	HOUSING
6	S-1637-1	HOUSING
5	C622001-0201	LIGHT ASSY
4	34002-55	TERMINAL BLOCK
3	S-2160-1	SWITCH
2	S-1360-5L	CKT BKR
1	S-1360-10L	CKT BKR
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXXX OR CHXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.4.1 & P11.4.2

SUPERSEDED BY: 1270835 P.11.8

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-4-73
GROUP		4-23-73
DRAWN	WHITE	4-23-73
CHECK	R. YOUNGERS	4-17-73
STRESS		
PROJ		4-?-73
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

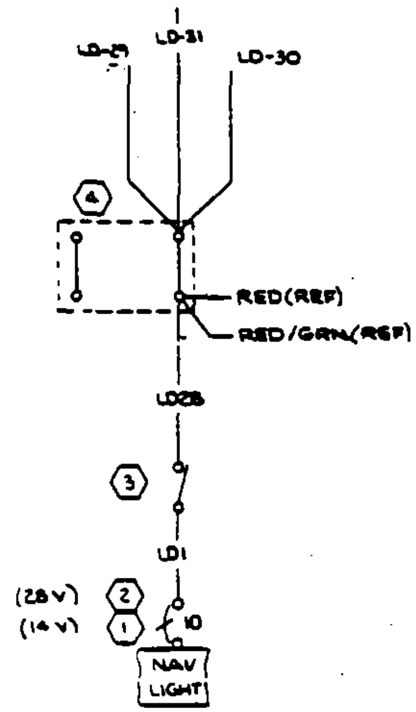
TITLE WIRING DIAGRAM — NAVIGATION LIGHTS

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270625

SCALE: NONE | (SR 7403) II | PAGE: 11.4.3

(U20602200)

Navigation Lights (Sheet 1 of 2)



INACTIVE

EFF THRU SER (U206-02200)
1-27-77

CONTRACT NO:		
	NAME	DATE
DESIGN	WHITE	1-4-73
GROUP		4-23-73
DRAWN	WHITE	4-23-73
CHECK	E. YOUNGERS	4-17-73
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — NAVIGATION LIGHTS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE (SR 7403) PAGE: 11.4.3

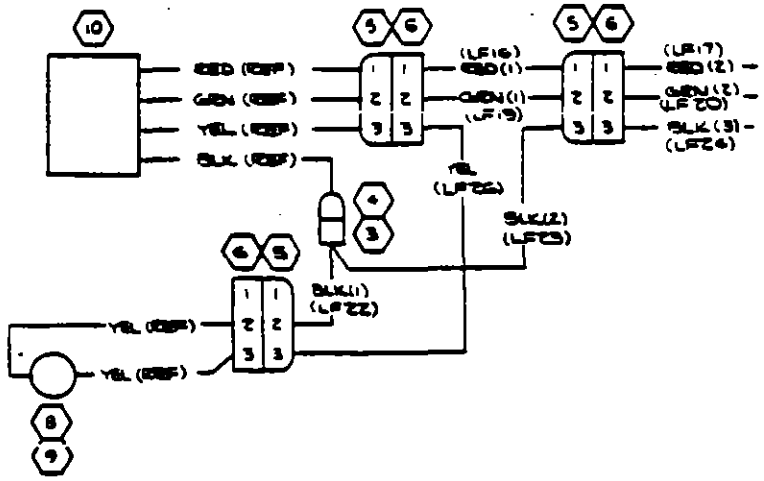
(U20602200)

Navigation Lights (Sheet 2 of 2)

NOTES:

1. COLORED WIRES BEARING CES1100 CODING IN PARENTHESIS SHALL NOT BE STAMPED. CES1100 CODING ON THESE WIRES IS FOR PARTS LIST USE ONLY.

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE 1, ZED GRN BLK 2 SER; SEE OUT LF7, LF12, LF13 & LF15; C621001-0106 WAS C621001-0103 (SR7475)	DCP 1-10-73	
B	BY REV: S-1360-15L WAS S-1360-10L (12V); S-1360-8L WAS S-1360-5L (24V) (SR8260)	5AR 5-13-75	
C	BY REV: C594502-0102 WAS C594502-0101 (SR8552)	GDS 8-2-76	



INACTIVE

EFF THRU SER (SER458)

1-27-77

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (LF15)	16			S-1636-2	S-1367-2-8		SER U20602209 & ON
BLK (LF13)				S-1367-2-8	S-1493-2		SER U20602209 & ON
GRN (LF12)				S-1636-2	S-1493-2		SER U20602209 & ON
[illegible]				S-1636-2	S-1638-2		SER U20602208 & ON
YEL (LF25)				S-1636-2	S-1638-2		
BLK(3) (LF24)				S-1636-2	S-1638-2		
BLK(1) (LF20)				S-1636-2	S-1685-2		
BLK(2) (LF23)				S-1636-2	S-1635-2		
BLK(1) (LF22)				S-1636-2	S-1636-2		
GRN(2) (LF21)				S-1636-2	S-1636-2		
GRN(1) (LF20)							
GRN(1) (LF19)							
RED(1) (LF18)							
RED(2) (LF17)							
RED(1) (LF16)					S-1636-2		
LF15				S-1636-2	S-1367-2-8		THRU SER U20602208
LF13				S-1367-2-8	S-1493-2		THRU SER U20602208
LF12				S-1636-2	S-1493-6		THRU SER U20602208
LF 9				S-1636-2	S-1493-2		
LF 8				S-1493-2	S-1367-2-6		
LF 7	16			S-1638-2	S-1638-2		THRU SER U20602208

WIRE TABLE

	PART NO.	DESCRIPTION	
12	S-1360-8L	CKT BKR	(24V)
11	0R95-6	RESISTOR (85TT7)	(24V)
10	C594502-0102	FLASHER ASSY	
9	C621001-0106	LIGHT ASSY	(12V)
8	C621001-0102	LIGHT ASSY	(24V)
7	0R95-1.5	RESISTOR (85TT7)	(12V)
6	S-1638-1	HOUSING-PLUG	
5	S-1638-2	HOUSING-CAP	
4	S-1637-1	HOUSING	
3	S-1637-2	HOUSING	
2	S-1843-1-2	SWITCH	
1	S-1360-15L	CKT BKR	(12V)

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1000=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.5.4

SUPERSEDED BY: 1270835 P.11.10

CONTRACT NO.

	NAME	DATE
DESIGN		
GROUP		11-3-72
DRAWN	PAPE	11-2-72
CHECK	R. YOUNGERS	11-2-72
STRESS		
PROJ		11-3-72
APPD		
OTHER		

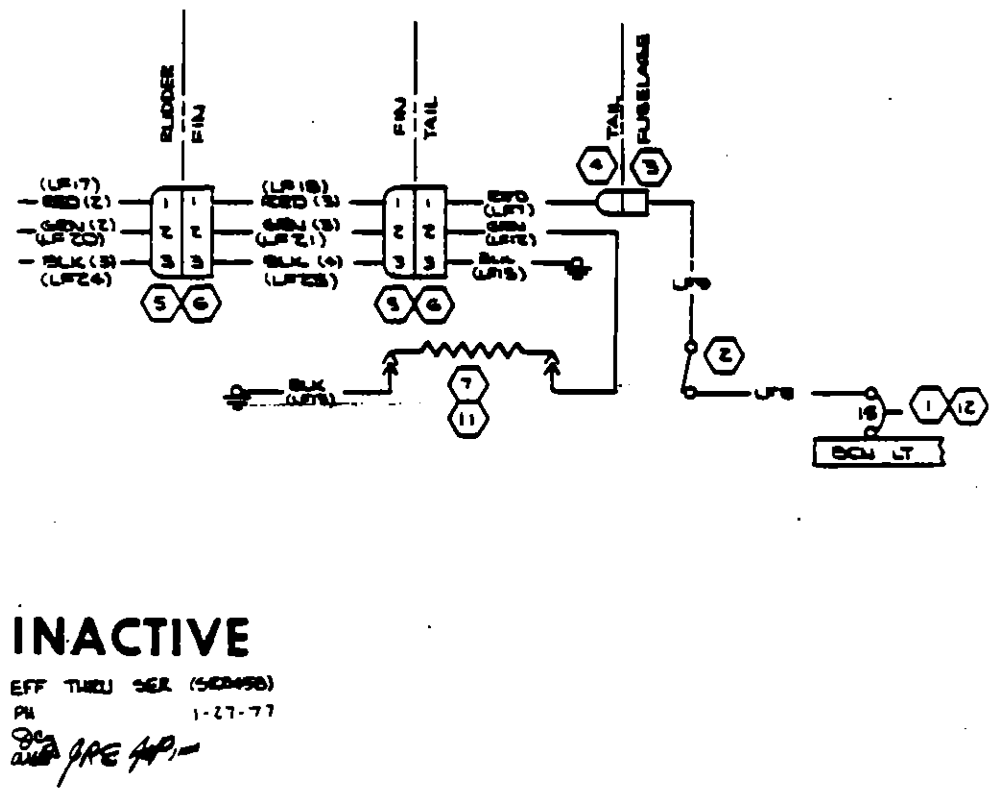
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — FLASHING BEACON (FLOATPLANE)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625
SCALE: NONE	206	PAGE: 11.5.4.1

(SR7061) (REF)

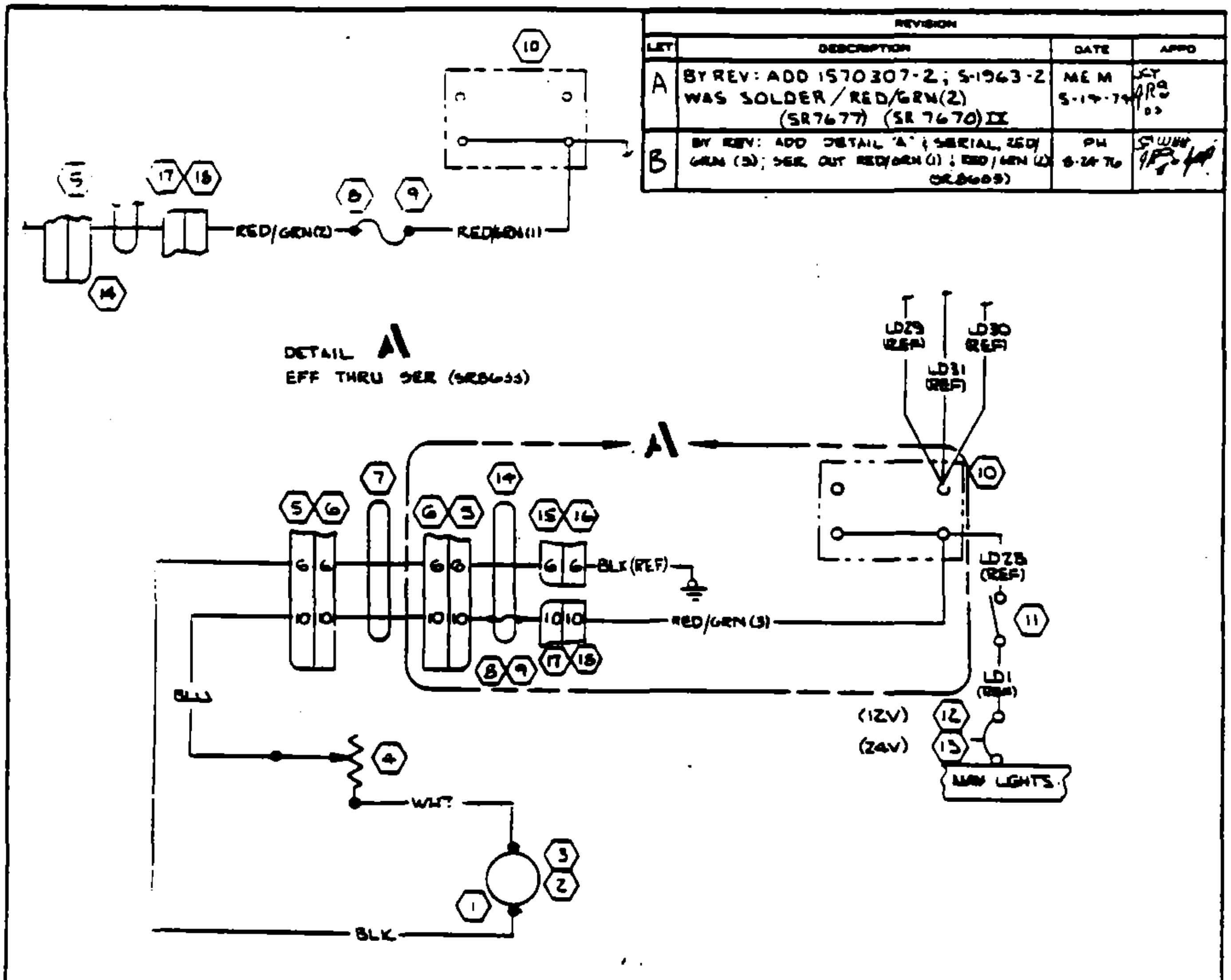
Flashing Beacon (Floatplane) (Sheet 1 of 2)



CONTRACT NO:			Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS		
	NAME	DATE	TITLE: WIRING DIAGRAM — FLASHING BEACON (FLOATPLANE)		
DESIGN					
GROUP					
DRAWN	PAPE	11-2-76			
CHECK		11-2-76			
STRESS					
PROJ			SIZE C	CODE IDENT. NO. 71379	DWG NO 1270625
APPD					
OTHER			SCALE: NONE	206	PAGE: 11.5.4.1

Flashing Beacon (Floatplane) (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD 1570307-2; S-1963-2 WAS SOLDER/RED/GRN(2) (SR7677) (SR 7670) IX	MEM 5-14-74	
B	BY REV: ADD DETAIL "A" & SERIAL, RED/GRN (3); SER. OUT RED/GRN (1); RED/GRN (2) (SR8609)	PH 8-24-76	



18	S-1962-2-0	HOUSING	
17	S-1962-1-0	HOUSING	
16	S-1960-2-0	HOUSING	
15	S-1960-1-0	HOUSING	
14	1570307-2	CABLE ASSY	
13	S-1360-10L	CKT BKR	
12	S-1360-5L	CKT BKR	
11	S-2160-1	SWITCH	
10	34002-55	TERM BLOCK	
9	AGC-1/2	FUSE	
8	HHJ-A	FUSE HOLDER	
7	1570308-1	CABLE ASSY	
6	3421-0000	SOCKET	
5	1570307-1	CONNECTOR ASSY	
4	3893AKU-152A	RHEOSTAT	
3	24RB	LAMP (24V)	
2	12RB	LAMP (12V)	
1	4157-001	SOCKET	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

RED/GRN(3)	22	-22-2-5		S-1963-2	S-1829-1		SER (SR8653) & ON
BLU	22	-22-6		SOLDER	SOLDER		
BLK	22	-22-0		SOLDER	SOLDER		
WHT	22	-22-9		SOLDER	SOLDER		
RED/GRN(2)	22	-22-2-5		S-1963-2	SOLDER		THRU SER (SR8653)
RED/GRN(1)	22	-22-2-5		SOLDER	S-1829-1		THRU SER (SR8653)
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

CED-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CED-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.11.3

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	Vanderhoof	11-12-73
DRAWN	D. OLLER	11-2-73
CHECK	PAPE	11-5-73
STRESS		
PROJ	McCarter	
APPD		
OTHER		

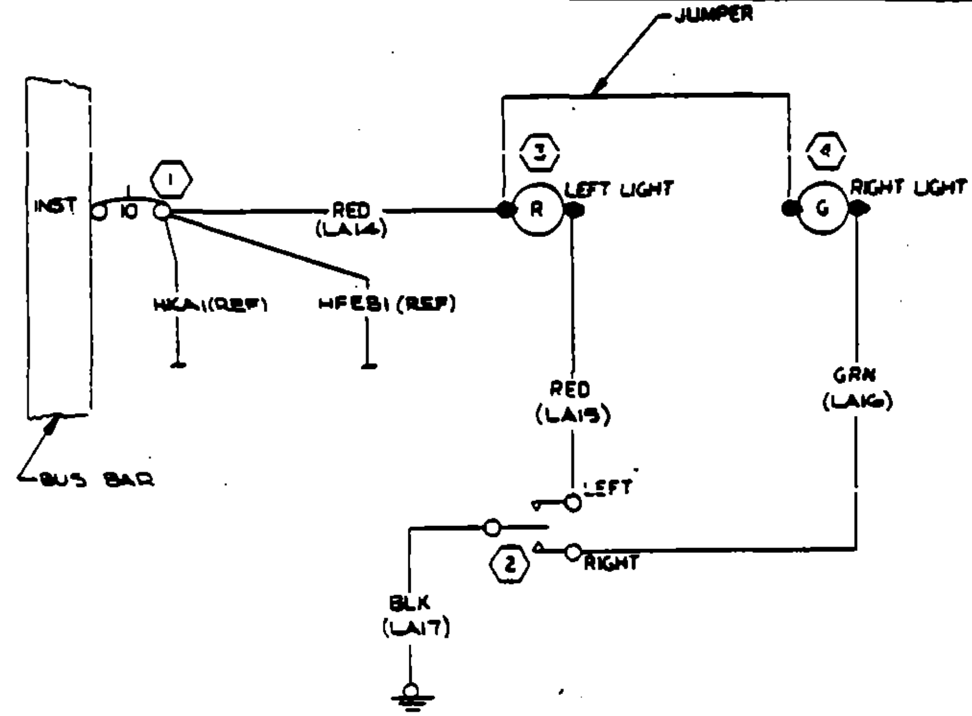
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — MAP LIGHT, CONTROL WHEEL

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE | SR7677 | PAGE: 11.11.4

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV: INST WAS CABIN LTS, ADD (OPT) TO TITLE BLOCK, HFEB1(REF) & HKA1 (REF); DELETE HLA1(REF) ED & RR 02372	SEM 6-17-68	
B	BY REV: S-1460-18-2 WAS S-1460-20-2 ED & RR 10290	A.S. 12-6-68	
C	BY REV: ADD CES1100 CODE TO WIRES NOW SHOP PRAC	GKG 6-15-73	
D	BY REV: 14-30380-7PG WAS VM304-7; 14-30380-6PG WAS VM304-6 MER 206-E0482 (SE8337)	DLP 12-8-75	



INACTIVE

EFF THRU MER (SE8468)
1-27-77

CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
RED (LA14)	18	S-1460-18-2		S-1367-1-6	SOLDER		
RED (LA15)	18	S-1460-18-2		S-1367-1-6	SOLDER		
GRN (LA16)	20	S-1460-20-3		S-1367-1-6	SOLDER		
BLK (LA17)	18	S-1460-18-0		S-1367-1-6	S-1367-1-8		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
4	14-30380-7PG	LIGHT ASSY (87034)
3	14-30380-6PG	LIGHT ASSY (87034)
2	S-1238-1-1	SWITCH
1	S-1360-10	CKT BKR

EQUIPMENT TABLE

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H. Wise	7-8-67
DRAWN	SWANEY	6-22-67
CHECK	YAKSHAW	6-23-67
STRESS		7-5-67
PROJECT		7-10-67
APPD		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — SKYDIVING SIGNAL LIGHT (OPT)

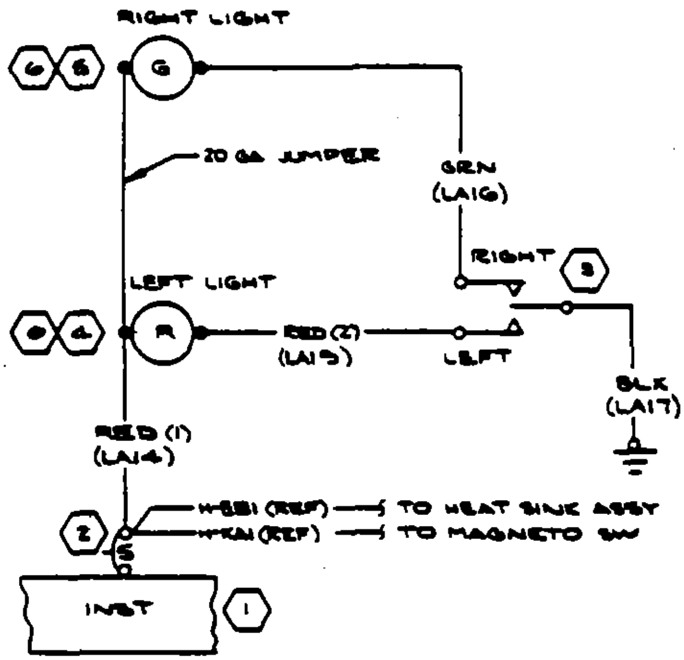
SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1270625

SCALE: NONE | U206 | PAGE 1 1 2

SER U206-0915 & ON

REVISION

LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD CES1100 CODE TO WIRES NOW SHOP PRAC.	6-25-73	
B	BY REV: 14-30380-7P6 WAS VM304-7, 14-30380-6P6 WAS VM304-6, MER 206-E0482 (SR8337)	12-8-75	



INACTIVE

EFF THRU SER (583458)
1-27-77

WIRE CODE NO.	GA	MATERIAL	LC	TERMINALS		SERIALS
	18	-18-0		S-1367-1-6	S-1367-1-8	
	20	-20-5		SOLDER	S-1367-1-6	
	20	-20-2		SOLDER	S-1367-1-6	
	20	-20-2		S-1367-1-6	SOLDER	

WIRE TABLE

	PART NO.	DESCRIPTION	VENDOR
6	GE 327	LAMP	(24446)
5	14-30380-7P6	LIGHT ASSY	(87034)
4	14-30380-6P6	LIGHT ASSY	(87034)
3	S-1238-1-1	SWITCH	
2	S-1360-5	CIRCUIT BREAKER	
1	0715854-2	BUS BAR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX: CESSNA SPEC. NO.
S-XXX OR CMXXXX: CESSNA STD NO.

SUPERSEDES:

SUPERSEDED BY

CONTRACT NO.

	NAME	DATE
DESIGN	J. HENSHAW	3-11-70
GROUP	[illegible]	3-10-70
DRAWN	R. YOUNGERS	2-6-70
CHECK	[illegible]	[illegible]
STRESS		
PROJ	[illegible]	[illegible]
APP	R. YOUNGERS	[illegible]

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV
5800 E. PAWNEE
WICHITA, KANSAS

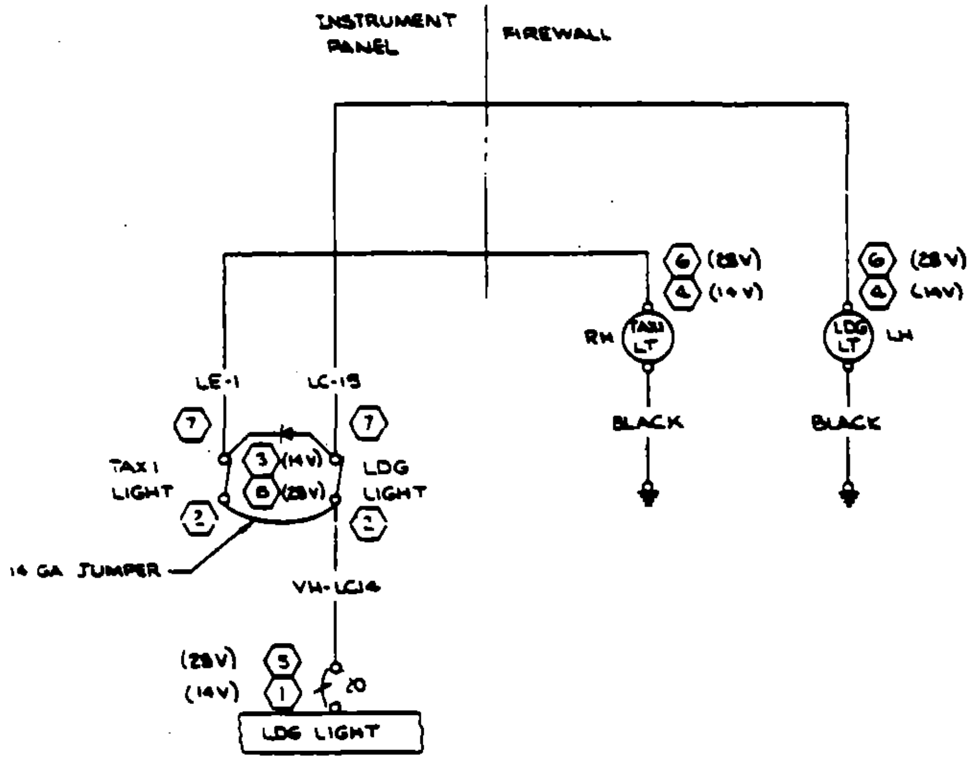
TITLE
WIRING DIAGRAM — SKYDIVING SIGNAL LIGHT, OPT 24 VOLT

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1270625

SCALE NONE | -406

E2488 2367 SR6546

REVISION			
LET	DESCRIPTION	DATE	APPD



INACTIVE

EFF THRU SER (ERASED)
1-27-77

BLACK	14	-14-0		S-1367-2-8	S-1367-2-8		
LE-1	14			S-1493-2	S-1372-8		
LC-15	14			S-1493-2	S-1372-8		
LC-14	14			S-1367-2-6	S-1493-2		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

8	1270082-1	DIODE ASSY	
7	S-2023-1	ADAPTER	
6	4591	PAR-36, 100 W LAMP	(24446)
5	S-1360-15L	CKT BREAKER	
4	4509	PAR-36, 100 W LAMP	(24446)
3	1270082-2	DIODE ASSY	
2	S-2160-1	SWITCH	
1	S-1360-20L	CKT BREAKER	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.13.2

SUPERSEDED BY: 1270835 P.11.7

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-3-73
GROUP	H. Wise	1-17-73
DRAWN	WHITE	1-12-73
CHECK	EYOUNGERS	1-15-73
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — LANDING LIGHT & TAXI LIGHT

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270625

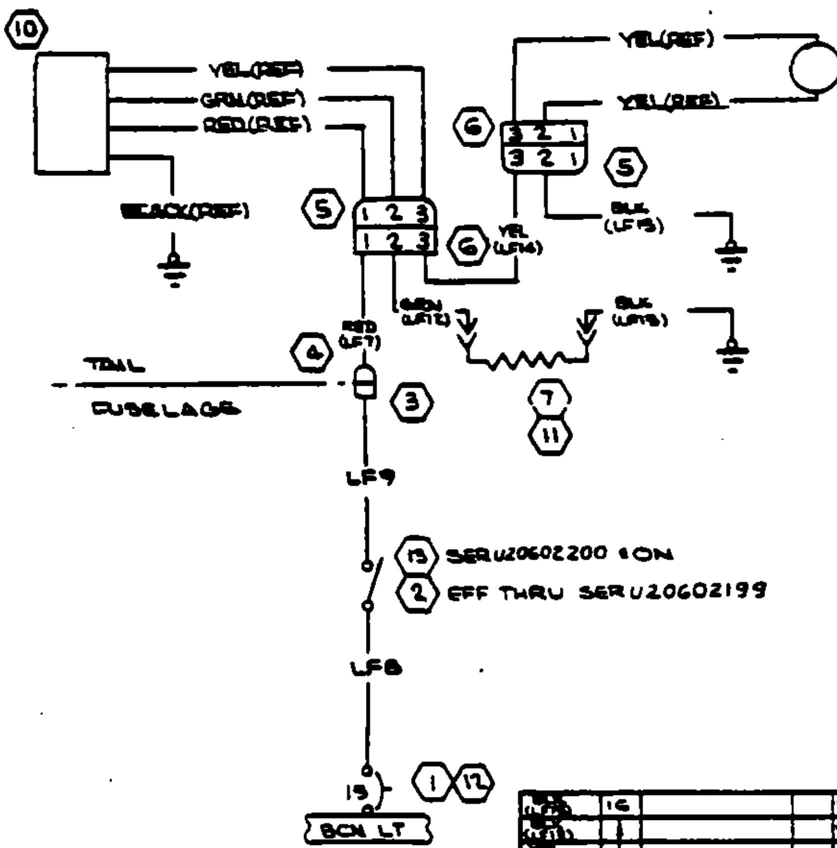
SCALE: NONE | PAGE: 11.13.3

SER (SR7403) U20602200

NOTES:

1. COLORED WIRES BEARING CES1100 CODING IN PARENTHESIS SHALL NOT BE STAMPED. CES1100 CODING ON THESE WIRES IS FOR PARTS LIST USE ONLY.

REVISION			
LTR	DESCRIPTION	DATE	APPD
A	BY REV: ADD S-2160-1 RED, GRN, YEL BLK & SER: SEE OUT S-1845-1-2, LF7, LF12, LF13, LF14 & LF15; ADD NOTE 1 C621001-0106 WAS C621001-0103 (SR7403)II (SR7473)	JKW 1-10-73	[illegible]
B	BY REV: S-1360-15L WAS S-1360-10L (12V); S-1360-8L WAS S-1360-5L (24V) (SR8260)	BAH 5-13-75	[illegible]



INACTIVE

EFF THRU SER (SR8456)

1-27-77

[illegible]	16			S-1635-2	S-1367-2-8		SER U20602209 & ON
[illegible]				S-1493-2	S-1367-2-8		SER U20602209 & ON
[illegible]				S-1636-2	S-1635-2		SER U20602209 & ON
[illegible]				S-1636-2	S-1493-2		SER U20602209 & ON
[illegible]				S-1636-2	S-1635-2		SER U20602209 & ON
LF15				S-1635-2	S-1367-2-8		THRU SER U20602208
LF14				S-1636-2	S-1635-2		THRU SER U20602208
LF13				S-1493-2	S-1367-2-8		THRU SER U20602208
LF12				S-1636-2	S-1493-2		THRU SER U20602208
LF9				S-1493-2	S-1636-2		
LF8				S-1367-2-8	S-1493-2		
LF7	16			S-1636-2	S-1635-2		THRU SER (SR7473)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

13	S-2160-1	SWITCH	
12	S-1360-8L	CIRCUIT BREAKER	(24V)
11	0R95-6	RESISTOR (83777)	(24V)
10	C594502-0101	FLASHER	
9	C621001-0106	LIGHT ASSY	(12V)
8	C621001-0102	LIGHT ASSY	(24V)
7	0R95-1.5	RESISTOR (83777)	(12V)
6	S-1638-1	HOUSING-PLUG	
5	S-1638-2	HOUSING-CAP	
4	S-1637-1	HOUSING	
3	S-1637-2	HOUSING	
2	S-1845-1-2	SWITCH	
1	S-1360-15L	CIRCUIT BREAKER	(12V)
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CONTRACT NO:

	NAME	DATE
DESIGN	COOK	6-16-72
GROUP	[illegible]	6-22-72
DRAWN	COOK	6-16-72
CHECK	WHITE	6-19-72
STRESS		
PROJ	[illegible]	[illegible]
APPD	[illegible]	[illegible]
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE: WIRING DIAGRAM — LIGHT-FLASHING BEACON

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE | 206 | PAGE: 11.14.2

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: Pages 11.14 & 11.14.1

SUPERSEDED BY: 1270836 P.II.9

(SR7061)
(U20601875)

NOTES:

1. THIS END OF RESISTOR TERMINATED WITH S-1367-1-16 TERMINAL & INSTALLED ON SHAFT OF TANDOM POT ASSY. DUE TO HEAT DISSIPATION, RESISTOR MUST BE KEPT FROM WIRE BUNDLE.
2. TO BE RETAINED IN TERMINAL, WIRE MUST BE STRIPED, DOUBLED & TWISTED

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD LB57: DELETE LB20 & 5.6K, 2W, 10% (NOW SHOP PRACTICE)	RAM 9-25-74	[illegible]
B	BY REV: VAL-S-400 WAS VAL-S-2000, ADD DETAIL 'A' TO DELETE VAL-S-200 RESISTOR ON 24 VOLT SYSTEM (SR 8153)	CJH 1-4-75	[illegible]
C	BY REV: ADD WIRING FOR 1213757 EL MKR BCN PANEL (SR7110)	SAH 2-28-75	[illegible]
D	BY REV: ADD S-2091-4 & S-1904-2; S-2091-2 WAS S-2091, S-1904-2 WAS S-1904 (NOW SHOP PRACTICE)	GW 7-31-75	[illegible]
E	BY REV ADD S-1637-2, LB58/ORIG LB59 WIRES (SR8499)	GDS 8-13-76	[illegible]

INACTIVE

EFF THRU SER. (SR8458)

PN 1-27-77

19	S-1637-2	HOUSING	
18	S-1904-2	POT ASSY (24V)	
17	1213757	EL PANEL	
16	S-1360-5L	CKT BRKR	
15	VAL-S-200	RESISTOR	
14	S-1640-6	HOUSING	
13	S-1641-6	HOUSING	
12	[illegible]	POT ASSY (12V)	
11	[illegible]	RESISTOR	
10	S-2091-2	POT ASSY (12V)	
9	S-2091-4	POT ASSY (24V)	
8	VAL-S-2000	RESISTOR	
7	1213542	EL PANEL	
6	1213563	EL PANEL	
5	C615001	POWER SUPPLY	
4	1570166	DIMMING ASSY	
3	34002-65	TERMINAL BLOCK	
2	S-2160-1	SWITCH	
1	S-1360-10L	CKT BKR	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

ORIG (LB 59)	20	-20-3		S-1636-1	[illegible] LB58		SER (SR8499) & ON
LB58	18			S-1370-1	LB57		SER (SR8499) & ON
LB57	18			SOLDER	S-1370-2		
[illegible]	18	-18-2		S-1370-1	S-1829-1		
WHT	1	-18-10		SOLDER	S-1370-1		
LB22	1			S-1367-1-6	[illegible]		
LB21	18			S-1368-1	SOLDER		
[illegible]	18			S-1635-1	SOLDER		
[illegible]	[illegible]			S-1635-2	SOLDER		
[illegible]	[illegible]			S-1635-1	S-1829-1		
[illegible]	18			S-1635-1	[illegible]		
CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

CEB-1000 IS APPLICABLE VENDOR CODES PER B-4400 CEB-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.15

SUPERSEDED BY: 1270625 P.11.2

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-5-72
GROUP	H. Wise	4-27-73
DRAWN	WHITE	4-23-73
CHECK	EXOUNGES	4-27-73
STRESS		
PROJ	[illegible]	4-27-73
APPD	[illegible]	
OTHER		

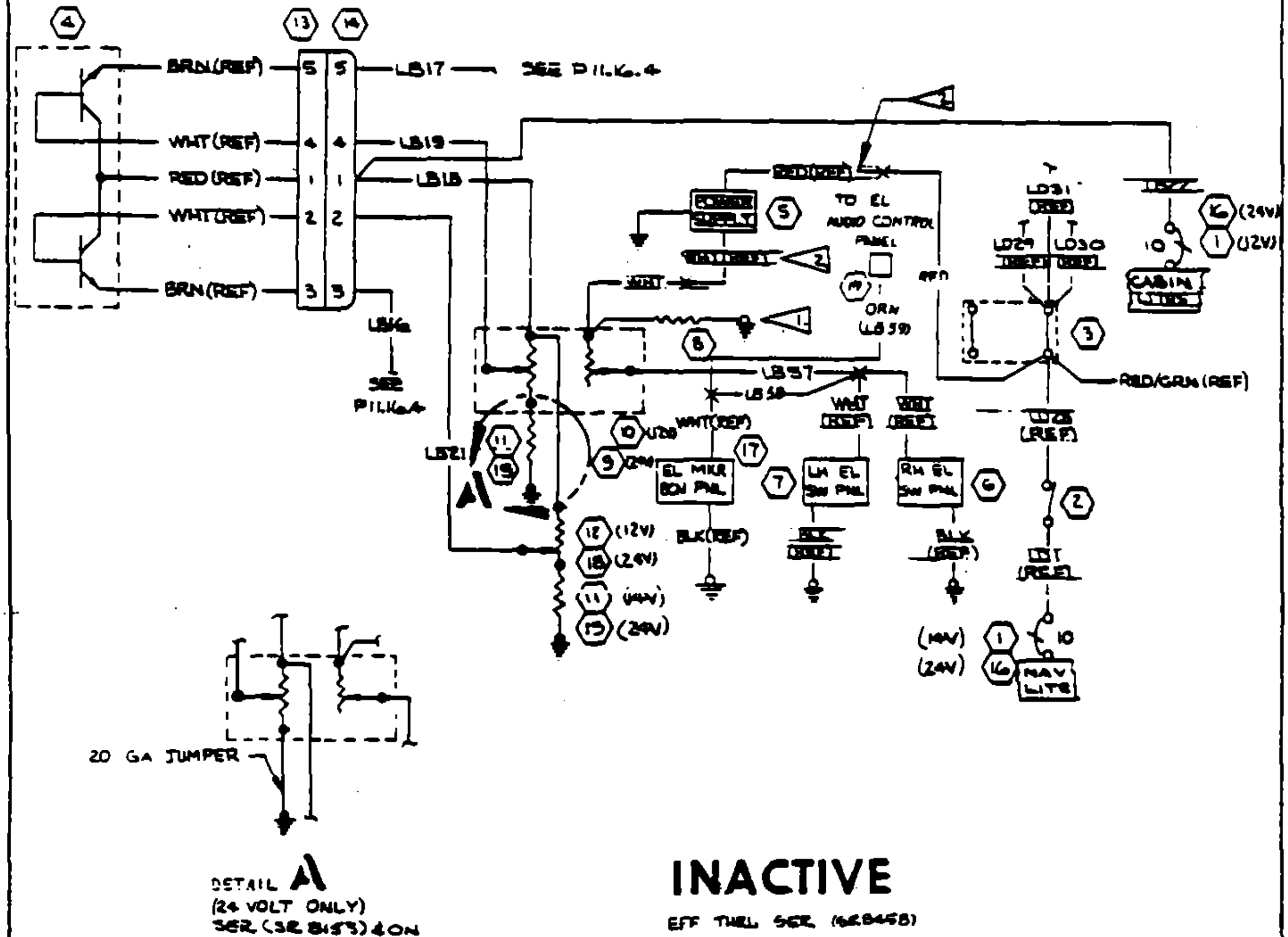
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — ELECTRO LUMINESCENT PANEL (14 V) & (28V)

SIZE: C | CODE IDENT. NO. 71379 | DWG NO. C1270625

SCALE: NONE | (SR7403) E | PAGE: 11.15.2

Electro Luminescent Panel 14V & 28V (Sheet 1 of 2)



INACTIVE

EFF THRU SER (62 8458)

PN 1-27-77

CONTRACT NO.		
	NAME	DATE
DESIGN	WHITE	1-5-72
GROUP	H. Wise	4-27-73
DRAWN	WHITE	4-25-73
CHECK	ENGINEERING	4-27-73
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO. — COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — ELECTRO LUMINESCENT PANEL (14 V) & (28V)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE (62 7403) PAGE: 15.2

Electro Luminescent Panel 14V & 28V (Sheet 2 of 2)

NOTES:

1. INSTALL S-1635-1 TERMINAL ON VENDOR FURNISHED WIRE
2. INSTALL S-1636-1 TERMINAL ON VENDOR FURNISHED WIRE
3. INSTALL S-1367-2-6 TERMINAL ON VENDOR FURNISHED WIRE

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL A; SER OUT LB38 & LB39; SER IN LB53, LB54 RED(1) & RED(2); S-2035-1 & S-2035-2 WAS S-1637-1 & S-1637-2 MERE0011 & MERE0039 (SER 206-2258) (SR 7903)(REF)	TJP JEF 2-8-74	JCY JKM JRS
B	BY REV: S-1637-1 WAS S-2035-1/ LB47, RED(1), LB54; S-1637-2 WAS S-2035-2/LB44, LB53, LB56 S-1367-2-6 WAS S-1637-2-6/NOTE 3; DELETE DETAIL "B". (MER 206-E0098)	MEM 5-9-74	JRS
C	BY REV: 34003-55-3410 WAS 34002-55 (SR7910)	BLA 3-6-75	JCY JRS
D	BY REV: 34004-818 WAS 34003-55-3410 (SR7910)	GW 8-4-75	JRS

INACTIVE

EFF THRU SER (SR8458)
PI 1-27-77

LB54	18			S-1635-1	SOLDER		SER206-2258 & ON
LB55	18			S-1829-1	S-1636-1		SER206-2258 & ON
RED(2) LB56	18	-18-2		SOLDER	S-1636-1		SER206-2258 & ON
RED(1) LB53	18	-18-2		S-1635-1	SOLDER		SER206-2258 & ON
LB47	18			S-1639-1	S-1367-1-8		
LB38	18			S-1829-1	SOLDER		THRU SER206-2257
LB39	18			SOLDER	SOLDER		THRU SER206-2257
RED/YEL(2)	18	-18-2-5		SOLDER	SOLDER		
RED/YEL(1)		-18-2-5		SOLDER	SOLDER		
BLK(5)		-18-0		SOLDER	SOLDER		
BLK(4)		-18-0		S-1370-1	S-1367-1-8		
BLK(3)		-18-0		SOLDER	S-1367-1-8		
BLK(2)		-18-0		SOLDER	S-1367-1-8		
BLK(1)		-18-0		SOLDER	S-1367-1-8		
LB31				SOLDER	S-1367-1-8		
LB30				SOLDER	S-1829-1		
LB26				S-1370-1	S-1829-1		
LB44				S-1829-1	S-1636-1		
LB42				S-1829-1	S-1636-1		
LB41				S-1829-1	S-1370-1		
LB27	18			SOLDER	S-1829-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

14	S-1637-1	HOUSING-CAP
13	S-1637-2	HOUSING-PLUG
12	S-2035-1	HOUSING-CAP
11	S-2035-2	HOUSING-PLUG
10	34004-818	TERMINAL BLOCK
9	S-1899	LIGHT ASSY
8	S-1899	LIGHT ASSY
7	S-1899	LIGHT ASSY
6	1270479	LIGHT ASSY
5	S-1696-2	SWITCH
4	1213319	LIGHT ASSY
3	C660801	COMPASS ASSY
2	0700623-15	HOUSING ASSY
1	1213319	LIGHT ASSY
ITEM NO	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1000-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: P.11.16.0, 11.16.1, 11.16.3 & 11.16.2

SUPERSEDED BY: 1270835 P.11.1.0

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-16-73
GROUP	H. Wiel	3-1-73
DRAWN	WHITE	4-23-73
CHECK	ZXOUNGER	4-30-73
STRESS		
PROJ	Baugman	5-2-73
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

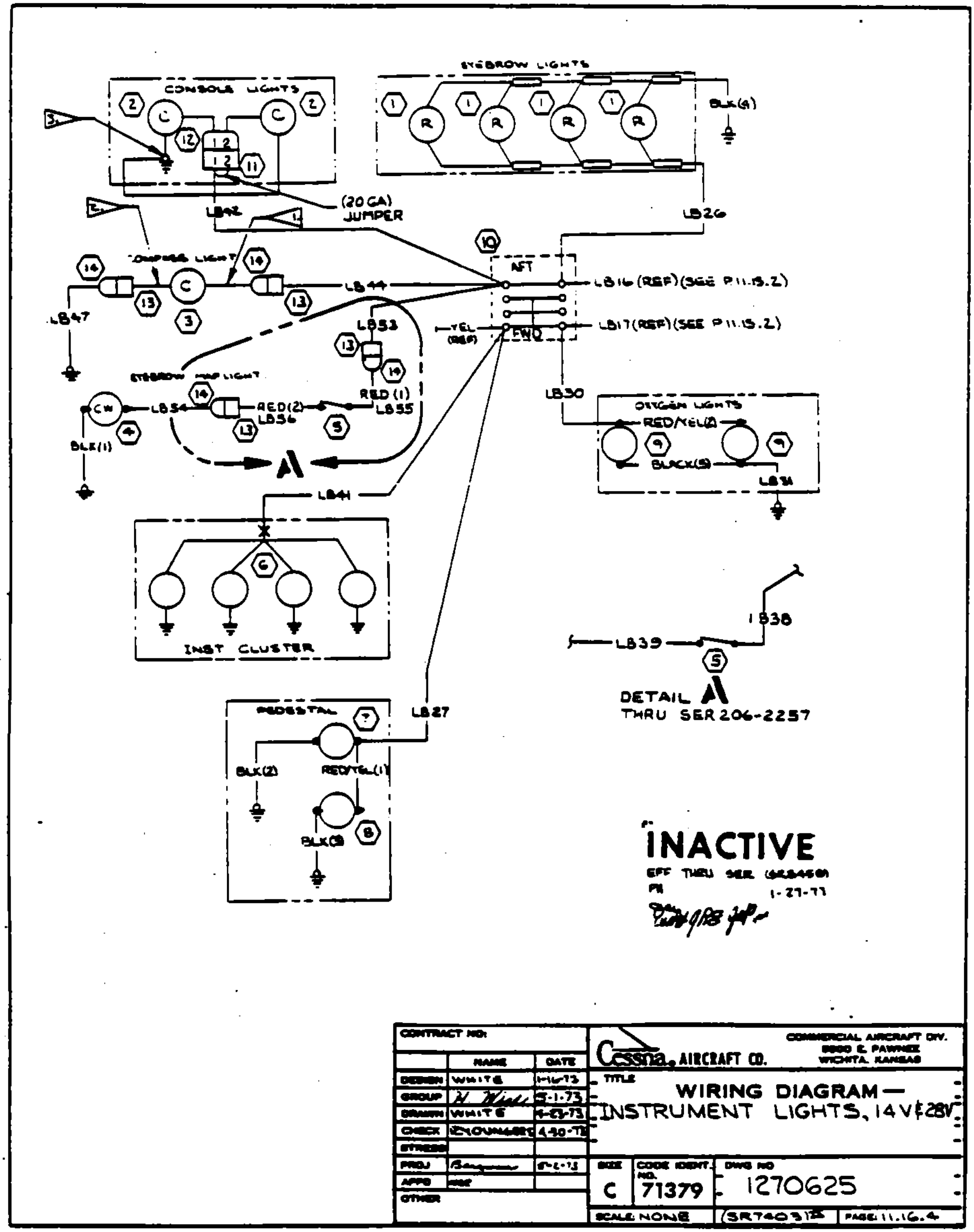
TITLE WIRING DIAGRAM — INSTRUMENT LIGHTS, 14V & 28V

SIZE C | CODE IDENT NO. 71379 | DWG NO 1270625

SCALE NONE | (SR7403) | PAGE: 11.16.4

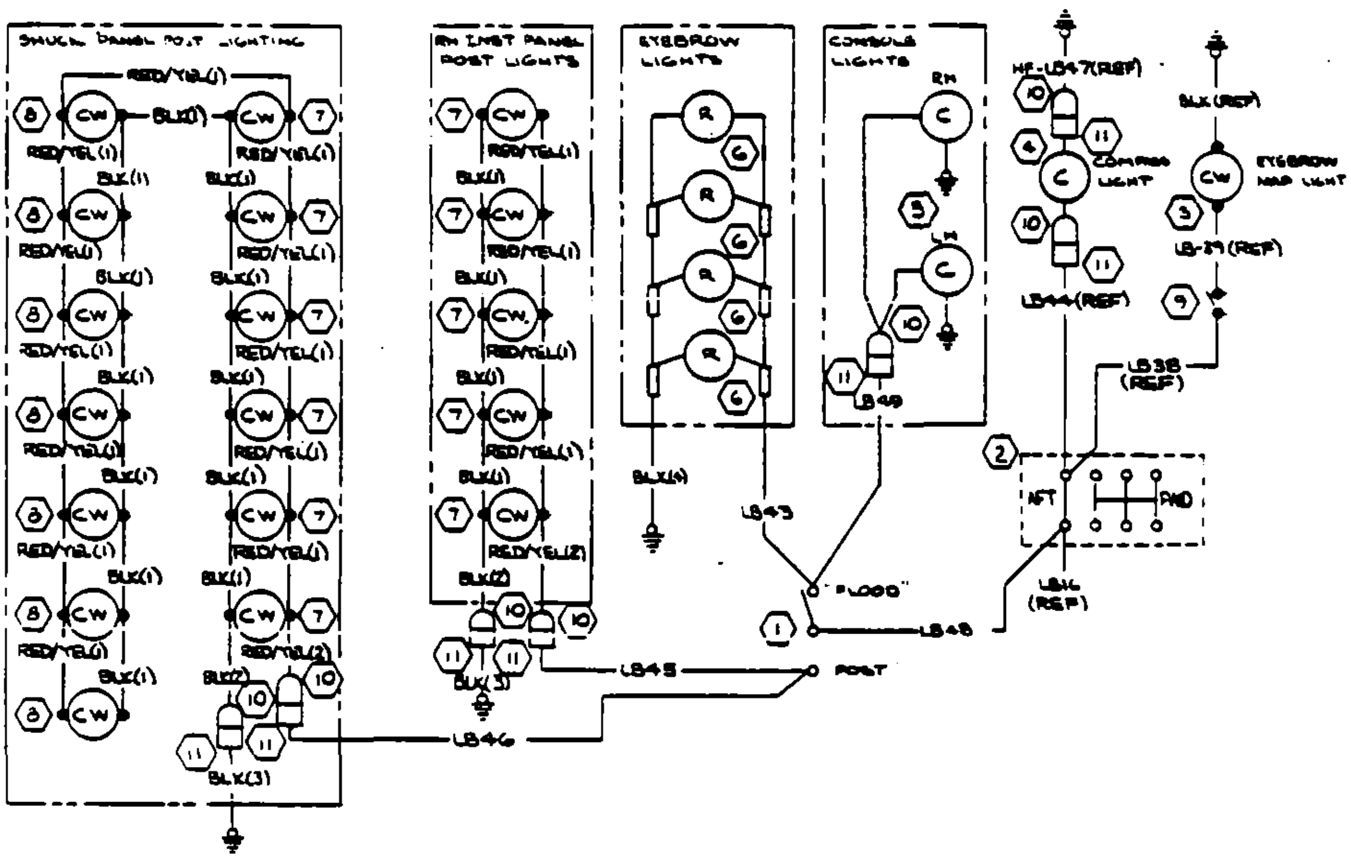
U2060220D

Instrument Lights 14V & 28V (Sheet 1 of 2)



Instrument Lights 14V & 28V (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: 34004-818 WAS 34002-55 SR75101	GW 8-4-75	



INACTIVE

EFF THRU SER (SR8458)

1-27-77

RED/YEL(2)	18			SOLDER	S-1635-2		
RED/YEL(1)	18			SOLDER	SOLDER		
BLK(4)	18			S-1370-1	S-1367-1-8		
BLK(3)	18			S-1636-2	S-1367-1-8		
BLK(2)	18			SOLDER	S-1635-2		
BLK(1)	18			SOLDER	SOLDER		
LB46	18			S-1493-1	S-1829-1		
LB46	18			S-1493-1	S-1636-2		
LB45	18			S-1493-1	S-1636-2		
LB43	18			[illegible]	S-1370-1		
LB49	18			S-1493-1	S-1636-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

11	S-1637-2	HOUSING	
10	S-1637-1	HOUSING	
9	S-1698-2	SWITCH	
8	S-1899	LIGHT ASSY	
7	S-1899	LIGHT ASSY	
6	1213319	LIGHT ASSY	
5	0700623-15	HOUSING ASSY	
4	C660501	COMPASS ASSY	
3	1213319	LIGHT ASSY	
2	34004-818	TERMINAL BLOCK	
1	S-2160-2	SWITCH	
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDED: P11.17.0, 11.17.1, 11.17.2 & 11.17.3

SUPERSEDED BY: 1270835 P.11.3

CONTRACT NO:

	NAME	DATE
DESIGN	WHITE	1-10-73
GROUP		5-1-73
DRAWN	WHITE	4-25-73
CHECK	E. YOUNGAVES	5-1-73
STRESS		
PROJ		5-1-73
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — POST LIGHTS, 14V & 28V (OPTIONAL)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270625

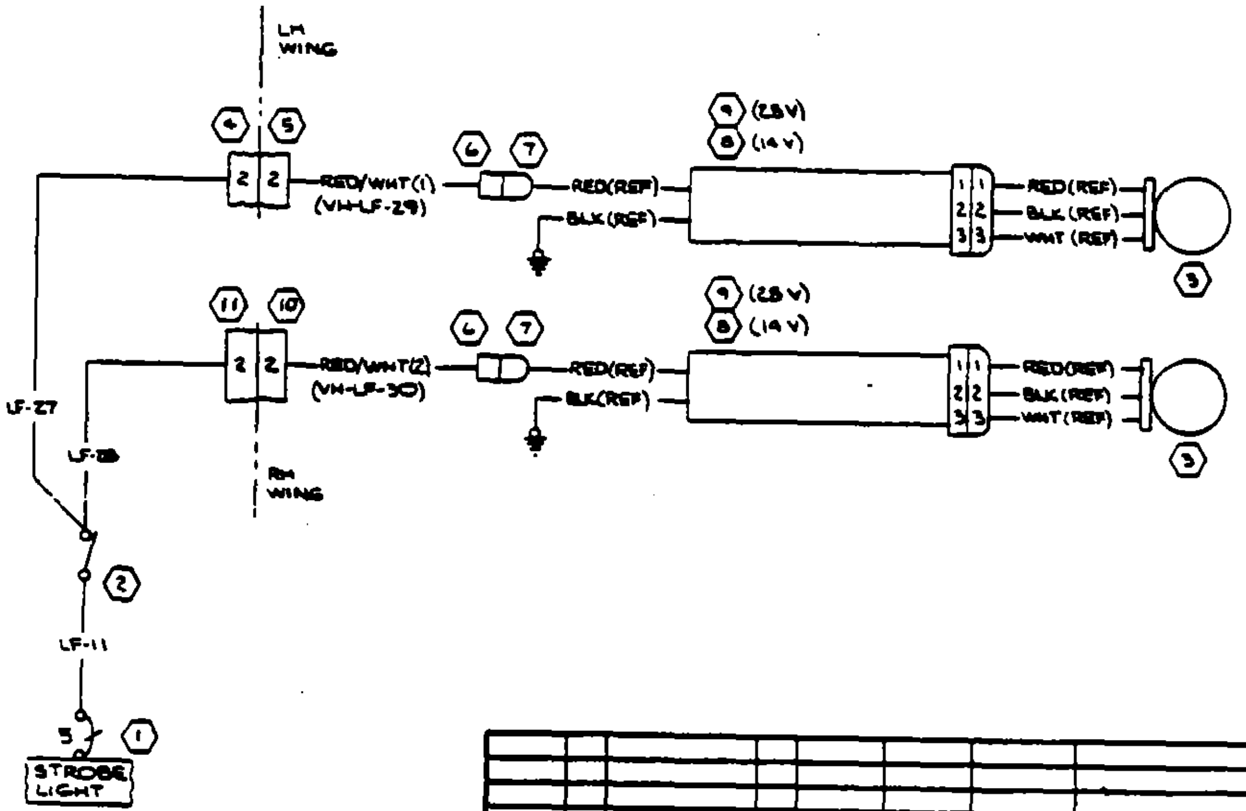
SCALE: NONE | (SR 7403) | PAGE: 11.17.4

U206022 30

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: PIN 2 WAS PIN 4 LH WING; S-1641-6 & S-1640-6 WAS S-1640-9 & S-1641-9, S-1640-12 & S-1641-12 WAS S-1640-9 & S-1640-9; DRAWING BECOMES INACTIVE; (NOW SHOP PRACTICE) MER E0393 (SR 7910)	CJH 11-22-74	
B	BY REV: REACTIVATE DRAWING (SR 7910)	TMS 1-21-75	
C	BY REV: C622008-0101 WAS C622007-0101; C622008-0102 WAS C622007-0103 (SR8595)(REF)	DLP 6-5-78	

INACTIVE

EFF THRU SER (SR8498)
PH 1-27-77



11	S-1641-12	HOUSING - SOCKET
10	S-1640-12	HOUSING - PIN
9	C622008-0102	POWER SUPPLY
8	C622008-0101	POWER SUPPLY
7	S-1637-1	HOUSING
6	S-1637-2	HOUSING
5	S-1640-6	HOUSING-PIN
4	S-1641-6	HOUSING-SOCKET
3	C622006-0101	LAMP ASSY
2	S-2160-1	SWITCH
1	S-1360-5L	CKT BKR
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SPLICES	REMARKS
VH-LF-29	18	-18-2-9		S-1636-1	S-1635-1	STD	
VH-LF-30		-18-2-9		S-1636-1	S-1636-1	STD	
LF 28				S-1493-2 LF 27	S-1636-1		
LF 27				S-1493-2	S-1636-1		
LF 11	18			S-1367-1-6	S-1493-1		

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER 94000
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.18.1

SUPERSEDED BY: 1270698 P.11.11

CONTRACT NO.

	NAME	DATE
DESIGN	WHITE	1-6-73
GROUP	H. Wise	4-27-73
DRAWN	WHITE	4-23-73
CHECK	E. YOUNGER	4-27-73
STRESS		
PROJ		4-18-73
APPD		
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STROBE LIGHTS, WING TIP (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE (SR 7403) PAGE: 1.18.2

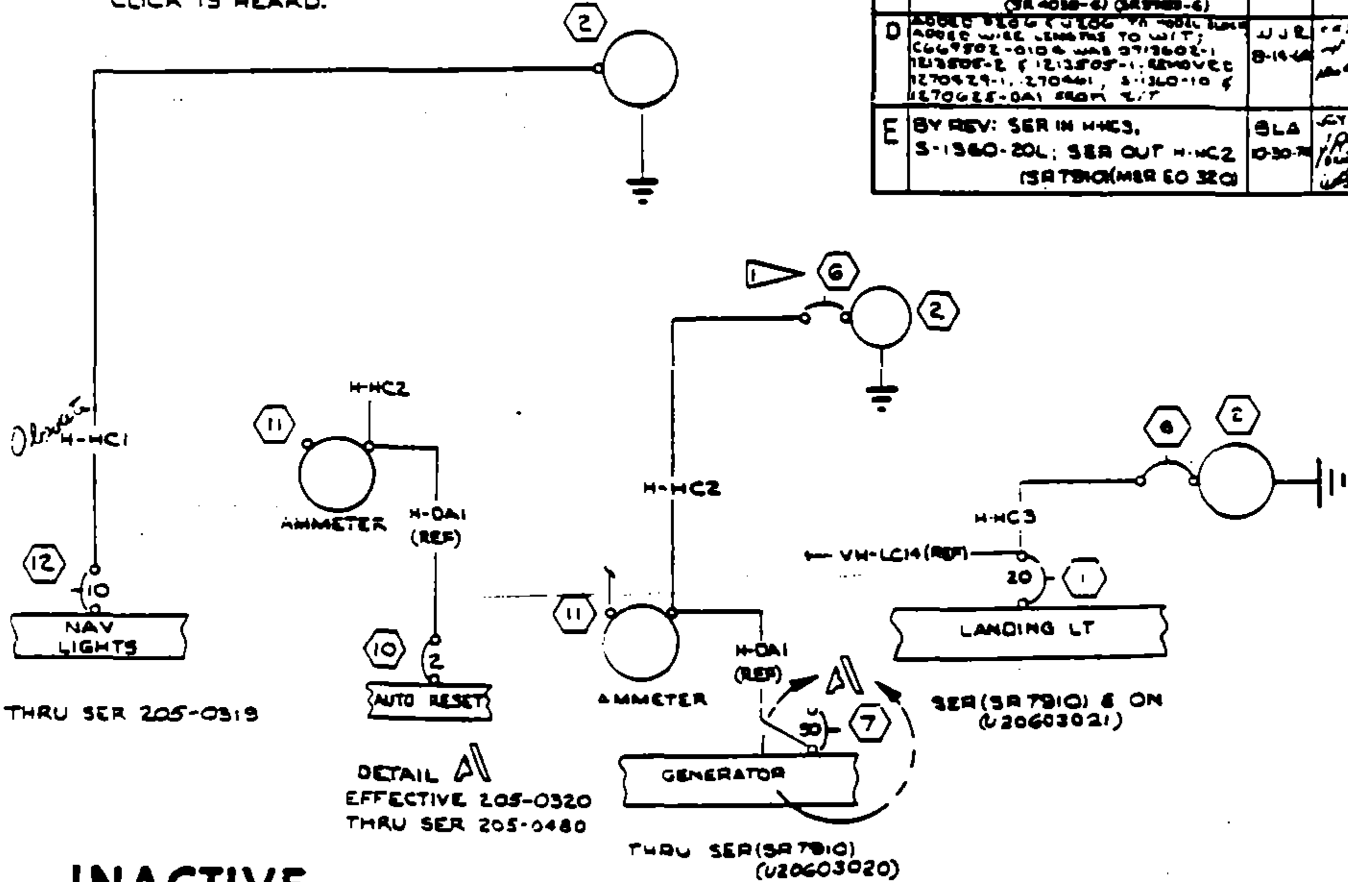
V206022200

SER 205-0001
THRU SER 205-0577
SER P206-0001 & ON
SER U206-0001 & ON
SER 206-0001 THRU
SER 206-0275

CHG LET	REVISION	BY DATE	CHK APPD
A	REMOVED N/A FROM STD WIRES (SR 3699-40)	GLW 4-8-62	
B	ADD 602321-1 CKT BKR TO CIGAR LIGHTER ADD H-HC2 WIRE ADD NOTE 1, CA-2 CKT BKR, 0713602-1 OBSOLETED H-HC1. H-HC1 WAS 18 GA S-1367-2-8 TERM WAS S-1367-1 TERM (SR 4081)	GLW 2-0-63	
C	ADD MODEL 206 S-1360-10 CKT BKR 1270461-1 BUS BAR 1213505-1 INST CLUSTER S-1360-10 CKT BKR 1213506-2 INST CLUSTER & DETAIL A (SR 4038-6) (SR 5189-6)	GLW 6-21-63	
D	ADDED P206 & U206 TO MODEL BLOCK ADDED WIRE LENGTHS TO W/T; C669502-0104 WAS 0713602-1 1213506-2 & 1213505-1, REMOVED 1270429-1, 1270461, S-1360-10 & 1270625-0A1 FROM E/T	JJR 8-14-64	
E	BY REV: SER IN H-HC3, S-1360-20L; SER OUT H-HC2 (SR 7910)(MSR EO 3201)	BLA 10-30-7?	

NOTE:

1 CIRCUIT BREAKER IS RESET BY INSERTING A PROBE INTO THE 1/8 DIA HOLE IN BREAKER FACE AND PUSHING LIGHTLY UNTIL A CLICK IS HEARD.



INACTIVE

EFF THRU SER (S20458)

1-27-77

12	S-1232-10	CIRCUIT BREAKER	
11	C669502-0104	INST CLUSTER KIT	
10	CA-2	CKT BKR (MTCC)	
9			
8			
7	S-1360-50	CIRCUIT BREAKER	
6	602321-1	CKT BKR (CUE)	
5			
4			
3			
2	0513039-7	CIGAR LIGHTER	
1	S-1360-20L	CKT BKR	
ITEM NO	PART NO.	DESCRIPTION	INSTALLED ON

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		N/A	SERIALS
H-HC3	16			S-1367-2-8	S-1367-2-8		SER (SR 7910) & ON
H-HC2	16		18	S-1367-2-10	S-1367-2-8		THRU SER (SR 7910)
H-HC1	16		85	S-1367-2-8	S-1367-2-8		THRU SER 205-0319

WIRE TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
DRAWN	G WOOD	12-30-62
CHECKED		1-?0-63
		2-5-63
		2-7-63

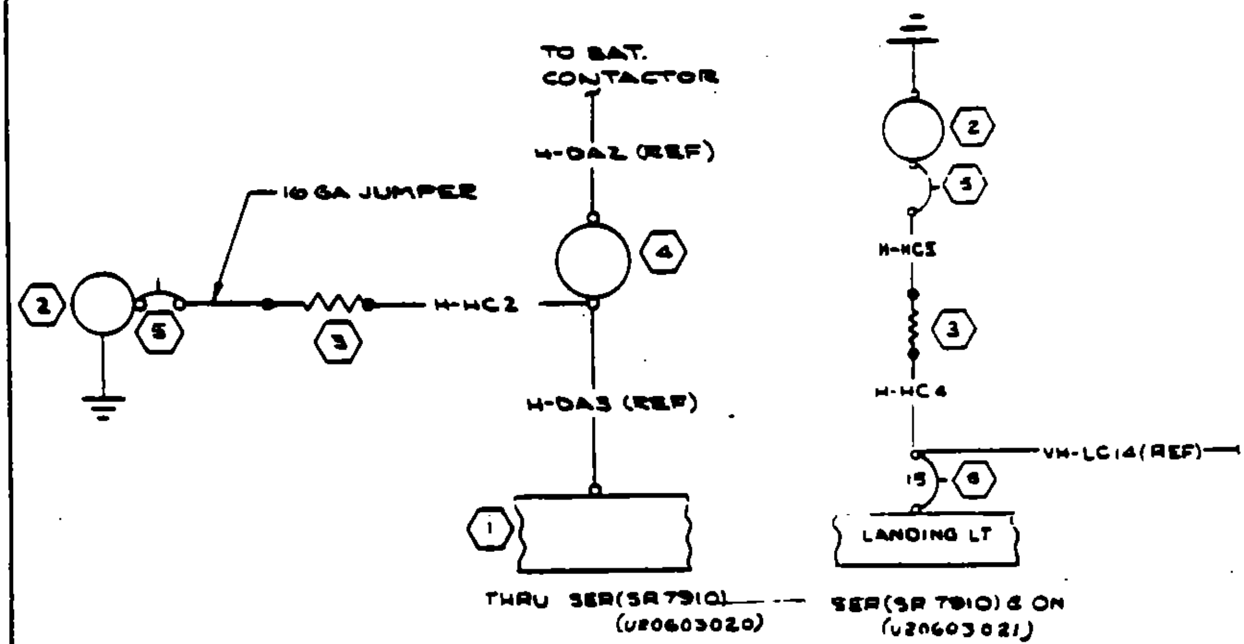
WIRING DIAGRAM — CIGAR LIGHTER

Cessna.

DWG NO. 1270625

MODEL 205, P206, U206 — REV D — PAGE 13.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: SER IN H-HC4, S-1367-5L SER OUT H-HC2 (SR7910) MER EO 3201	BLA 0304	
B	BY REV: H-HC5 WAS 16 GA JUMPER (SR7910)	RJP 8-4-75	



INACTIVE

EFF THRU SER (SR8458)
PH 1-27-77

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
H-HC5	16		6	SOLDER	S-1367-2-10		SER(SR7910) & ON
H-HC4	16			S-1367-2-8	SOLDER		SER(SR7910) & ON
H-HC2	16			S-1367-2-10	SOLDER		THRU SER(SR7910)

WIRE TABLE

	PART NO.	DESCRIPTION
6	S-1360-15L	CIRCUIT BREAKER
5	60232-1	CIRCUIT BREAKER
4	C668502-0202	INST CLUSTER
3	S-2041-50-1.6	RESISTOR
2	0513039-1	CIGAR LIGHTER
1	0713834-2	BUS BAR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 12205-406
SUPERSEDED BY: 1270635 P.13.1

CONTRACT NO:

	NAME	DATE
DESIGN	J. HENSHAW	3-11-70
GROUP		3-10-70
DRAWN	E. YOUNGER	2-4-70
CHECK	HARRIS	2-0-70
STRESS		
PROJECT		
APPD	E. YOUNGER	3-1-70

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — CIGAR LIGHTER, OPT 24 VOLT

SIZE C | CODE IDENT. NO. 71379 | DWG NO. 1270625

SCALE: NONE | U206 | PAGE: 13.1

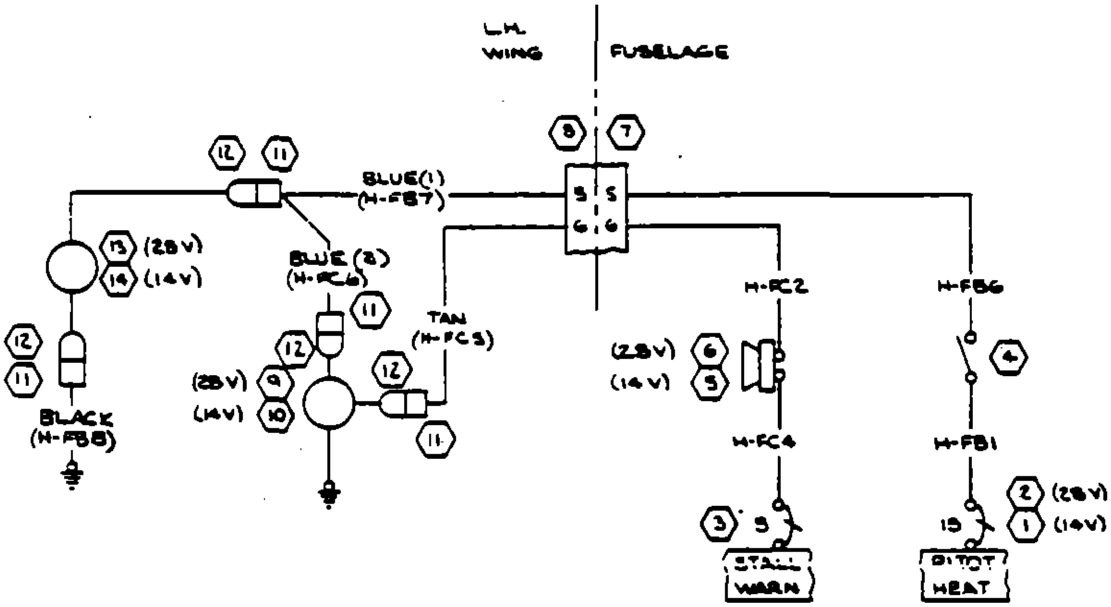
ED&RR 10367 (SR6646)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED H-FC5, H-FC6, H-FB7 & H-FB8 (387403) IX	EAM 8-10-73	
B	BY REV: S-1640-6 WAS S-1640-8; S-1641-6 WAS S-1641-8; ADD WIRE LENGTHS PER ED 380 (NOW SHOP PRACTICE)	BLA 12-10-74	

INACTIVE

EFF THRU SER (U206-02458)

1-27-77



TAN (H-FC5)	18	-18-10		S-1635-2	S-1636-2		
BLACK (H-FB8)	16	-16-0		S-1636-2	S-1367-2-8		
BLUE(2) (H-FC6)	16	-16-6		SEE BLUE(1)	S-1636-2		
BLUE(1) (H-FB7)	16	-16-6		S-1635-2	S-1636-3		
H-FC4	18		.	S-1367-1-6	S-1367-1-6		
H-FC2	18		100	S-1367-1-6	S-1636-2		
H-FB6	16		99	S-1493-2	S-1636-2		
H-FB1	16		8	S-1367-2-6	S-1493-2		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

14	0721105-15	PITOT TUBE	
13	0721105-18	PITOT TUBE	
12	S-1637-1	HOUSING	
11	S-1637-2	HOUSING	
10	0511062-15	XMTR	
9	0511062-16	XMTR	
8	S-1640-6	HOUSING-PIN	
7	S-1641-6	HOUSING-SOCKET	
6	S-2077-8	STALL WARN HORN	
5	S-2077-5	STALL WARN HORN	
4	S-2160-1	SWITCH	
3	S-1360-5L	CKT BKR	
2	S-1360-5L	CKT BKR	
1	S-1360-15L	CKT BKR	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES: P 13.3, 13.3.1

SUPERSEDED BY: 1270835 P.13.2

CONTRACT NO:

Cessna AIRCRAFT CO.

COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

	NAME	DATE
DESIGN	WHITE	4-11-73
GROUP	V. White	4-27-73
DRAWN	WHITE	4-23-73
CHECK	EHOUNGREEN	4-27-73
STRESS		
PROJ		
APPD		
OTHER		

TITLE
WIRING DIAGRAM — HEATED PITOT TUBE & STALL WARNING XMTR (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE | 387403 IX | PAGE: 13.2

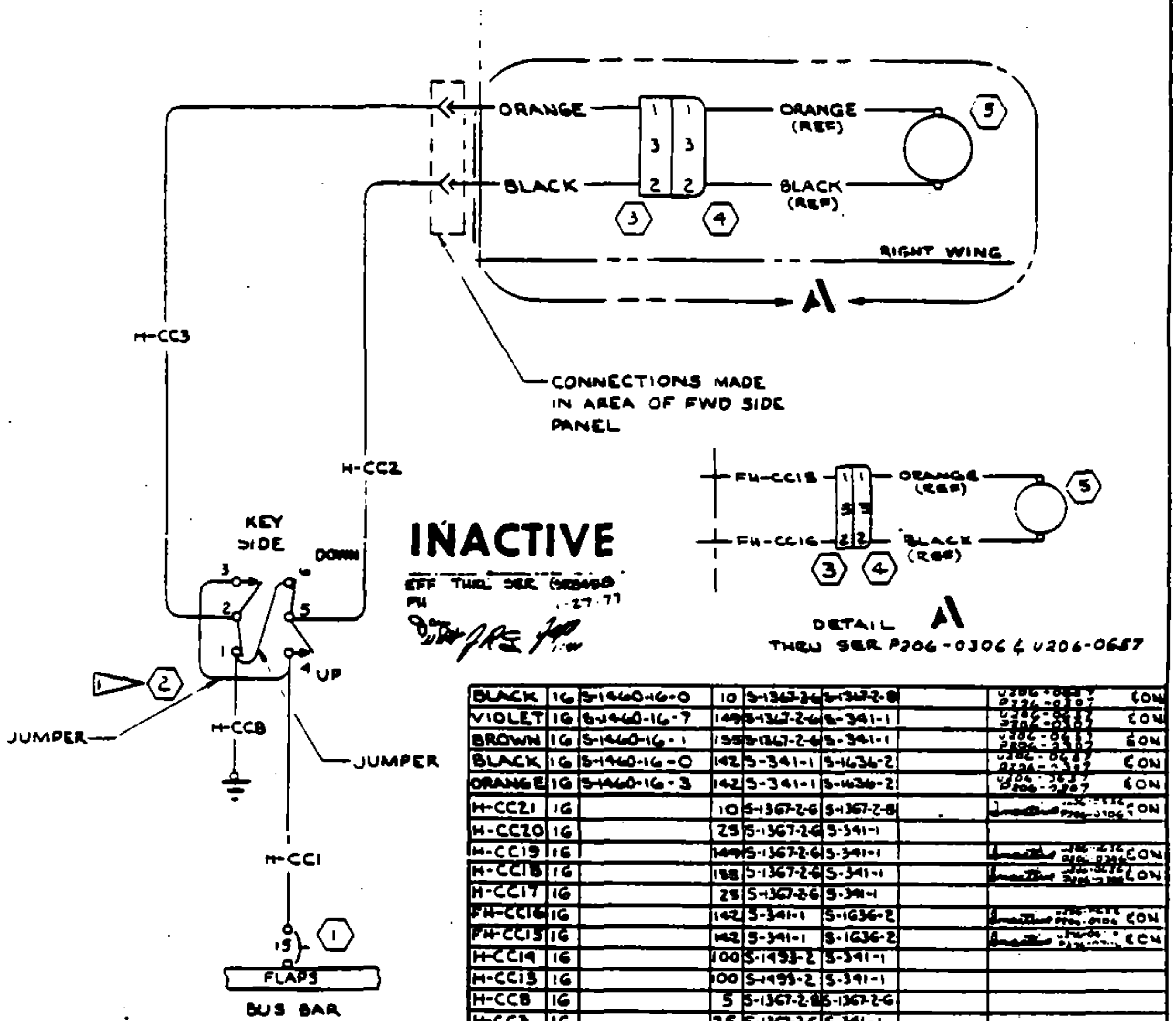
U20602200

(SR4946)

CHG LET	REVISION	BY / DATE	CHK / APPD
A	0760657-3 WAS 2301001-3:01; INACTIVATED FH-CC15, FH-CC16, H-CC18, H-CC19 & H-CC21; ADDED ORANGE, BLACK, BROWN, VIOLET & BLACK WIRES; ADD DETAIL (SR4901) (SR4902)	G.W. 10-26-65	[illegible]

NOTE:

1. SWITCH SHOWN IS A "MOMENTARY ON" - "ON" - "MOMENTARY ON" CONFIGURATION. THE MOTOR IS SHORTED WHEN THE SWITCH IS IN THE CENTER "ON" POSITION. THE SWITCH IS SHOWN IN CENTER "ON" POSITION.
2. SWITCH TERMINALS SHOWN AS VIEWED FROM TOGGLE SIDE OF SWITCH.



WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			DETAILS
BLACK	16	S-1460-16-0	10	S-1367-2-6	S-1367-2-8		U206-0657 P206-0307 CON
VIOLET	16	S-1460-16-7	149	S-1367-2-6	S-341-1		U206-0657 P206-0307 CON
BROWN	16	S-1460-16-1	155	S-1367-2-6	S-341-1		U206-0657 P206-0307 CON
BLACK	16	S-1460-16-0	142	S-341-1	S-1636-2		U206-0657 P206-0307 CON
ORANGE	16	S-1460-16-3	142	S-341-1	S-1636-2		U206-0657 P206-0307 CON
H-CC21	16		10	S-1367-2-6	S-1367-2-8		[illegible] P206-0306 CON
H-CC20	16		25	S-1367-2-6	S-341-1		
H-CC19	16		149	S-1367-2-6	S-341-1		[illegible] CON
H-CC18	16		188	S-1367-2-6	S-341-1		[illegible] CON
H-CC17	16		25	S-1367-2-6	S-341-1		
FH-CC16	16		142	S-341-1	S-1636-2		[illegible] P206-0306 CON
FH-CC15	16		142	S-341-1	S-1636-2		[illegible] CON
H-CC14	16		100	S-1493-2	S-341-1		
H-CC13	16		100	S-1493-2	S-341-1		
H-CC8	16		5	S-1367-2-8	S-1367-2-6		
H-CC3	16		25	S-1367-2-6	S-341-1		
H-CC2	16		25	S-1367-2-6	S-341-1		
H-CC1	16		34	S-1367-2-6	S-1367-2-8		

WIRE TABLE

	PART NO.	DESCRIPTION	INSTALLED ON
7	BZ-7RW2T04	LIMIT SWITCH (MCS)	
6	E13-OOM	SWITCH (CRYE)	
5	0760657-3	FLAP MOTOR ASSY	
4	S-1638-2	HOUSING-CAP	
3	S-1638-1	HOUSING-PLUG	
2	S-1661-1	SWITCH ASSY	
1	S-1360-15	CIRCUIT BREAKER	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO., COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
	G WOOD	10-19-65
	[illegible]	10-19-65
	[illegible]	10-20-65
	[illegible]	10-23-65

WIRING DIAGRAM—WING FLAPS

Cessna.

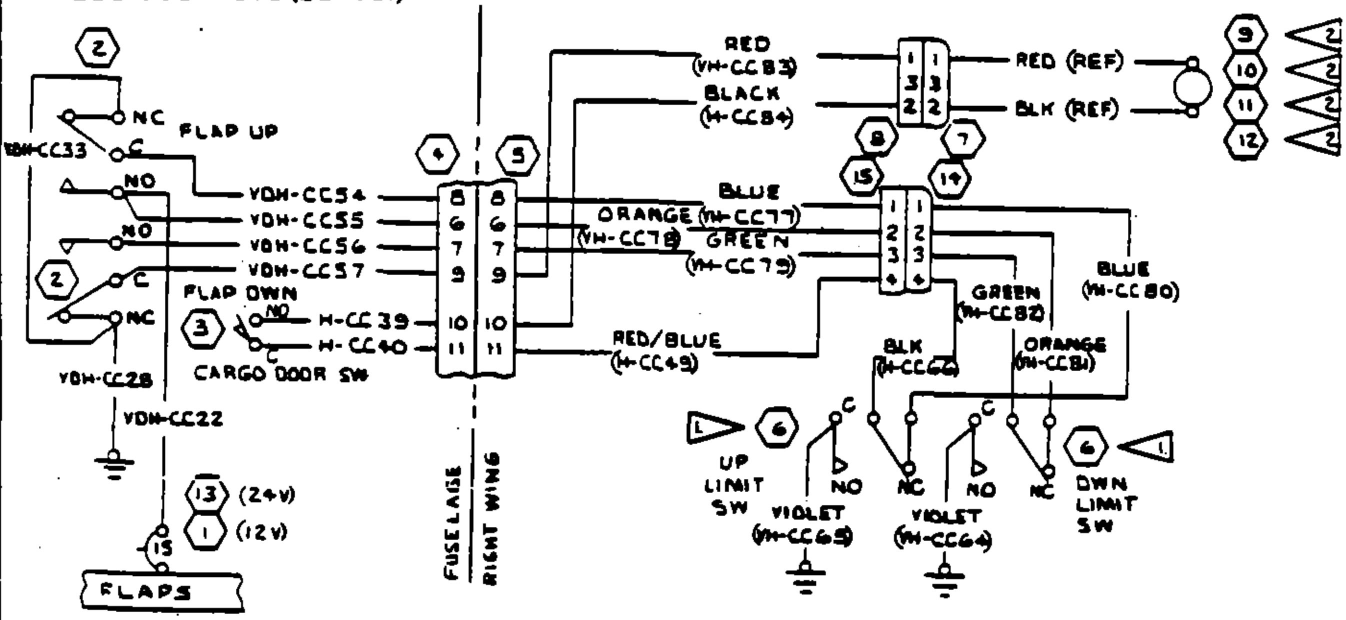
1270625

SUPERSEDED BY 1270535 P.14.1 — SUPERSEDES 1270625 PAGE M.1.0 — MODEL TP206 P206 — REV A — PAGE 14.2.0

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES

1. THESE SWITCHES ARE PART OF C301002 ACTUATOR ASSY
2. FOR ALL SPARES USE: C301002-0301 (14 VOLT) AND C301002-0302 (28 VOLT)



INACTIVE

EFF THRU SER (SR8456)

PR 1-27-77

BLACK (VH-CC84)	16	-16-0	13	S-1635-2	S-1636-2		
RED (VH-CC83)	16	-16-2	13	↓	S-1636-2		
GREEN (VH-CC82)	16	-16-5	13	↓	S-1493-2		
ORANGE (VH-CC81)	16	-16-3	13	↓	S-1493-2		
BLUE (VH-CC80)	16	-16-6	13	↓	S-1493-2		
GREEN (VH-CC79)	16	-16-5		↓	S-1636-2		
ORANGE (VH-CC78)	16	-16-3		↓	S-1636-2		
BLUE (VH-CC77)	16	-16-6		S-1635-2	S-1636-2		
BLACK (VH-CC66)	16	-16-0	13	S-1493-2	S-1635-2		
VIOLET (VH-CC65)	16	-16-7	19	S-1493-2	S-1367-2-8		
VIOLET (VH-CC64)	16	-16-7	19	S-1493-2	S-1367-2-8		
RED/BLUE (H-CC49)	16	-16-2-6		S-1635-2	S-1636-2		
VDH-CC54	16		102	S-1367-2-4	S-1636-2		
VDH-CC33	16		6	S-1367-2-4	S-1367-2-4		
VDH-CC57	16		62	S-1367-2-4	S-1636-2		
VDH-CC28	16		10	↓	S-1367-2-8		
VDH-CC56	16		62	↓	S-1636-2		
VDH-CC55	16		62	S-1367-2-4	S-1636-2		
VDH-CC22	16		36	S-1367-2-4	S-1367-2-4		
H-CC40	16			S-1636-2	S-1493-2		
H-CC39	16			S-1636-2	S-1493-2		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
15	S-1641-6	HOUSING-SOCKET	
14	S-1640-6	HOUSING-PIN	
13	S-1360-8L	CIRCUIT BREAKER	
12	C301002-0102	ACTUATOR ASSY	
11	C301002-0302	ACTUATOR ASSY	
10	C301002-0101	ACTUATOR ASSY	
9	C301002-0301	ACTUATOR ASSY	
8	S-1638-1	HOUSING-PLUG	
7	S-1638-2	HOUSING-CAP	
6	V3L 3 D9	SWITCH	
5	S-1640-12	HOUSING-PIN	
4	S-1641-12	HOUSING-SOCKET	
3	E13-00M	SWITCH	
2	S-1906-1	SWITCH	
1	S-1360-15L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CM-XXXX=CESSNA STD. NO.

SUPERSEDES: PAGE 14.5

SUPERSEDED BY: 1270835 P.14.1

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP		6-29-78
DRAWN	MCBRIDE	6-13-74
CHECK	J L OLLER	6-13-74
STRESS		
PROJ		6-15-74
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — WING FLAPS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE | U206 | PAGE: 4.5.1

(U20603258U) (SR7670X)

NOTES:

BLK WHT & GRY WIRE TO BE REMOVED FROM SF-1030-BX CABLE ON INSTL IN CONTROL WHEEL

2 — 60215-4LP TERMINAL, VENDOR (00779)

3 — PART OF SF-1030-BX CABLE (08261)

REVISION			
LET	DESCRIPTION	DATE	APPD
C	BY REV: REVISED & REDRAWN. ADD P19,7J, CD25 THRU CD35, BLK(4), RED(2), YEL(2) ORN(2), BRN(2), 1370308-1, 1370307-1, [illegible] C611003-0101 WAS MODEL 4285A. ADD WIRE COLORS CD26 GRN & CD25 BLU SER (SR 7677) (SR 7403)(REF)	DEF 1-12-74	[illegible]
D	BY REV: ADD 1370307-2 & S-1370-2; S1963-2 WAS SOLDER, (CD27, CD28, CD29, & BLK(4)) (SR7677), (SR 4970)	MEM 5-14-74	[illegible]
E	BY REV: S-1360-5L WAS S-1370-5L (NOW SHOP PRACTICE)	JBG 7/15/74	JRS
F	BY REV: S-1636-1 WAS S-1370-2/CD-12 (PER 206-P03[illegible]) (NOW SHOP PRACTICE)	RJP 1-23-75	JRS
G	BY REV: ADD BLU (CD25) & GRN (CD26) TO DTL 'A', (CD34) RED WAS CD34; (CD36) BLK WAS CD36 (NOW SHOP PRACTICE) [illegible]	PH 8-16-76	JRS

INACTIVE

EFF THRU SER (SR8486)

PH 1-27-77

JRS

CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
CD23	20			2	S-1636-1		THRU SER (SR7677)
CD22	20						
CD21	20						
CD20	20						
CD19	20			2			THRU SER (SR7677)
BLK (1)	20	-20-0		S-1367-1-8	S-1636-1		
JUMPER	18			S-1635-1	S-1635-1	12V	
BLK (CD33)	20	-20-0		S-1636-1	S-1370-2	12V	
[illegible] (CD34)	20	-20-2		S-1635-1	S-1370-2	12V	
BLK (4)	20	-20-0		S-1367-1-8	S-1963-2		SER U20602407[illegible] ON
ORN (2)		-20-3		SOLDER	SOLDER		
YEL (2)		-20-4					
BRN (2)		-20-1					
RED (2)	20	-20-2					SER U20602407[illegible] ON
ORN (1)		3					THRU SER U2060240 6
YEL (1)							
BRN (1)							
RED (1)		3		SOLDER	SOLDER		
BLK (3)	20	-20-0		S-1367-1-8	2		THRU SER U20602406
BLK (2)		-20-0		S-1367-1-8	S-1370-2		
[illegible] (CD35)		-20-6	34	S-1635-1	S-1636-1		
[illegible] (CD32)		-20-5	34				
[illegible] (CD31)		-20-3	34				
[illegible] (CD30)		-20-2	34	S-1635-1			
CD29				S-1963-2			SER U20602407[illegible] ON
CD28				S-1963-2			
CD27				S-1963-2			
[illegible] (CD26)		-20-5		SOLDER			
[illegible] (CD25)		-20-6		SOLDER			
CD24				S-1635-1			SER U20602407[illegible] ON
CD18				S-1367-1-8			
YEL [illegible]		-20-4	50	S-1636-1	S-1636-1		
CD7	20		34	S-1367-1-8	S-1367-1-8		

WIRE TABLE

26	S-1360-5L	CIRCUIT BREAKER	
25	S-1360-2-0	HOUSING	
24	S-1960-1-0	HOUSING	
23	S-1962-2-0	HOUSING	
22	S-1962-1-0	HOUSING	
21	1370307-2	CABLE ASSY	
20	582384-9	SOCKET	
19	1270062-1	CKT BOARD	
18	1270060-1	CABLE ASSY	
17	1270061-1	CKT BOARD	
16	25S-D-20-190	CONNECTOR	
15	SF-1030-BX	CABLE	
14	S-1885-1	SWITCH-KEYING	
13	2421-0000	SOCKET	
12	1370307-1	CONNECTOR ASSY	
11	1370308-1	CABLE ASSY	
10	7271-8-3	CIRCUIT BREAKER	
9	305-4304	PITCH TRIM SW	
8	S-1695-2	SWITCH (TRIM DESENGAGE)	
7	C610502-0101	TRIM MOTOR	
6	S-1637-1	HOUSING PIN	
5	S-1637-2	HOUSING PLUG	
4	TCS-206	CLUTCH	
3	S-1640-6	HOUSING	
2	S-1641-6	HOUSING	
1	C611008-0101	TRIM REGULATOR	24 V
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: REV "B"

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H WISE	3-2-73
DRAWN	J YOUEL	2-28-73
CHECK	R. YOUNGERS	3-2-73
STRESS		
PROJ	BERGMAN	3-3-73
APPD	MGR	
OTHER		

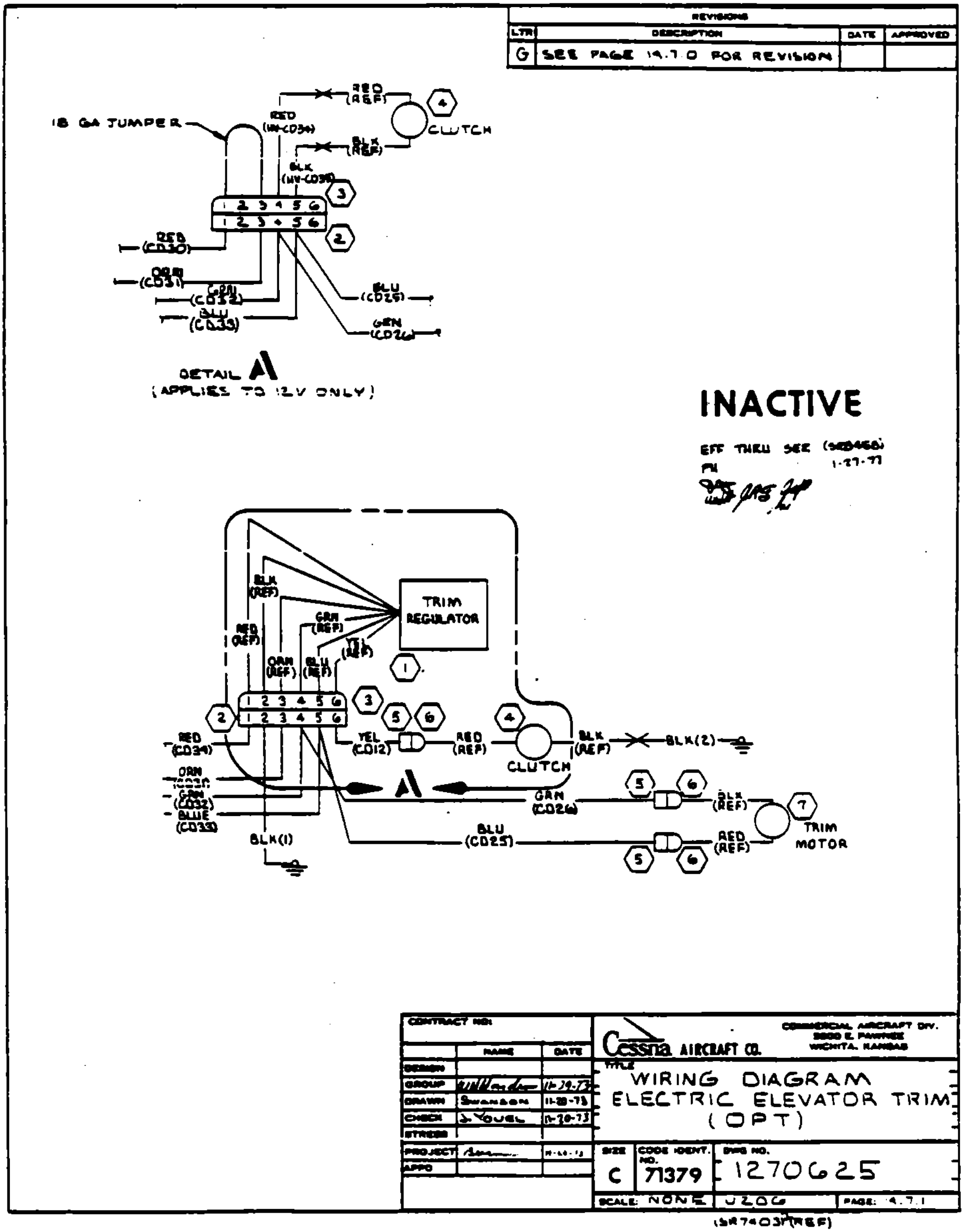
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ELECTRIC ELEVATOR TRIM (OPT)

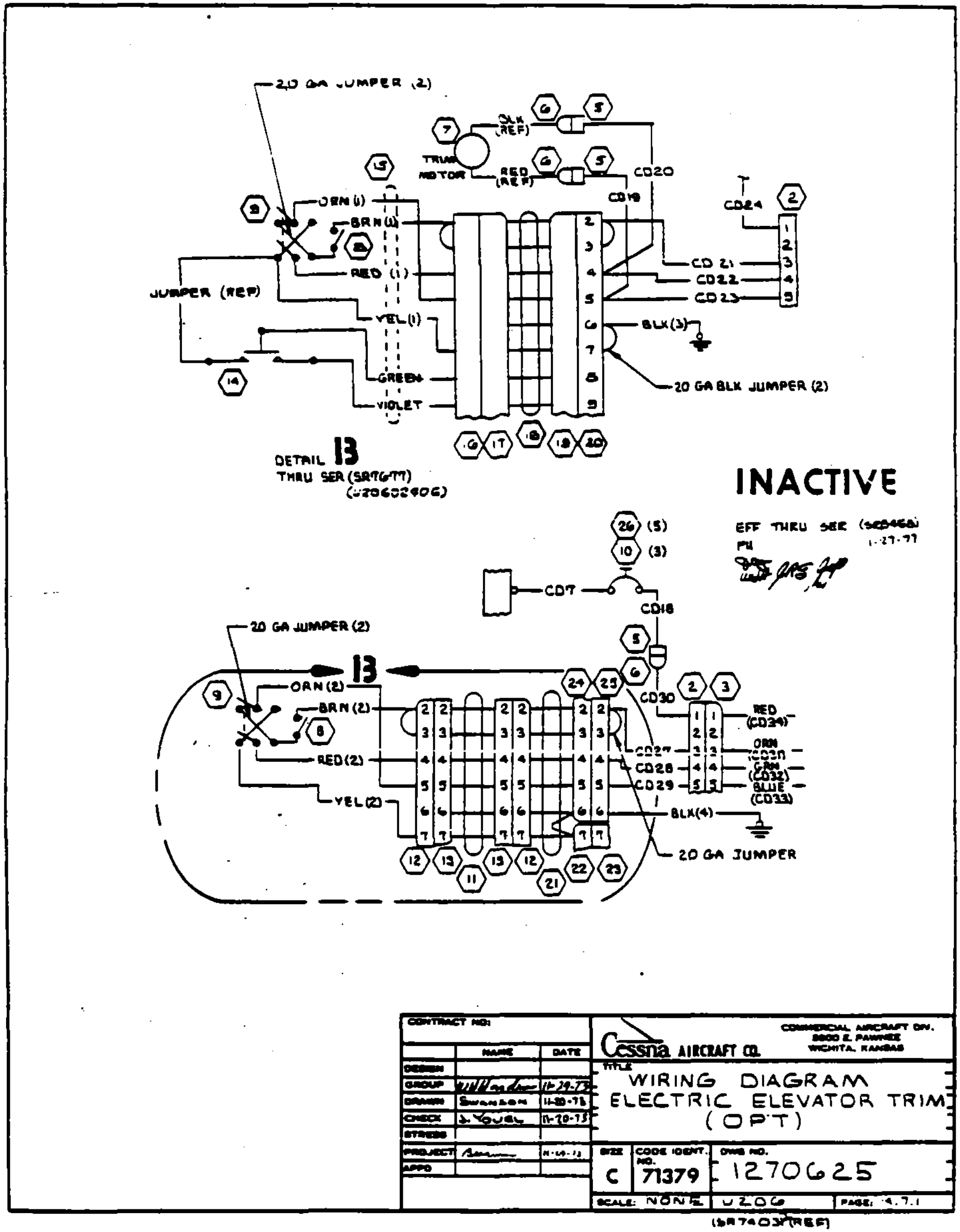
SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270625

SCALE: NONE U206 PAGE: 14.7.0

(SR7403)(REF)

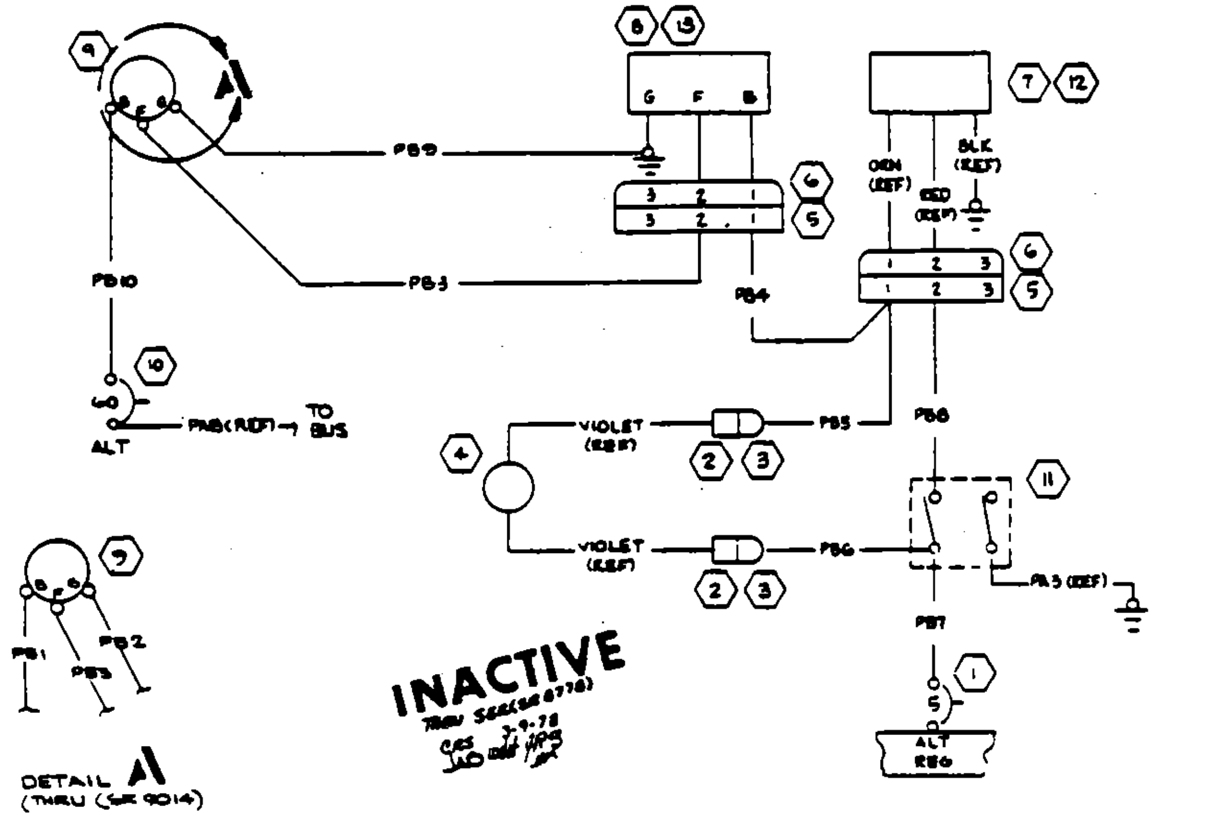


Electric Elevator Trim Opt. (Sheet 1 of 2)



Electric Elevator Trim Opt. (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED DETAIL A, SER IN PB9, PB10, SER OUT PB1 & PB2 (SR 9014)	G.DM 12-19-77	
B	BY REV: ADDED C593003-0103 OVERVOLT SENSOR (ALT) (SR 9140) ADD C611004-0101 (ALT); S-1635-1/PB5 & PB6 WAS S-1636-1; REVERSE S-1637-1 & S-1637-2 (NOW SHOP PRACTICE)	TPS 4-12-78 LSB DLP	



13	C611004-0101	VOLTAGE REGULATOR (ALT)	
12	C593003-0103	OVERVOLT SENSOR	(ALT)
11	S-1994-1-1	SWITCH	
10	S-1707-60	CIRCUIT BREAKER	
9	C611505-0102	ALTERNATOR ASSY	
8	C611002-0105	REGULATOR ASSY	
7	C593003-0101	OVERVOLT SENSOR	
6	S-1638-2	HOUSING	
5	S-1638-1	HOUSING	
4	S-2155-2	LIGHT ASSY	
3	S-1637-1	HOUSING	
2	S-1637-2	HOUSING	
1	S-1360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

PB10	8	S1862-8-9		S-1993-2	S-1367-4-8		(SR 9014) & ON & ALL SPARES
PB9	8	S1862-8-9		S-1993-3	S-1367-4-8		(SR 9014) & ON & ALL SPARES
PB8	22			S-1493-1	S-1636-1		
PB7				S-1367-1-6	S-1493-1		
PB6				S-1635-1	S-1493-1		
PB5				SEE PB4	S-1635-1		
PB4				S-1636-1	S-1636-2		
PB3	22			S-1367-1-10	S-1636-1		
PB2	8	S1362-8-9		S-1367-4-10	S-1367-4-10		THRU (SR 9014)
PB1	8	S1362-8-9		S-1367-4-12	S-1367-4-8		THRU (SR 9014)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.4.8.4

SUPERSEDED BY: 1270835 R 4.5

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	HARVEY	1-25-77
CHECK	J. Young	1-26-77
STRESS		
PROJ		
APPD		
OTHER		

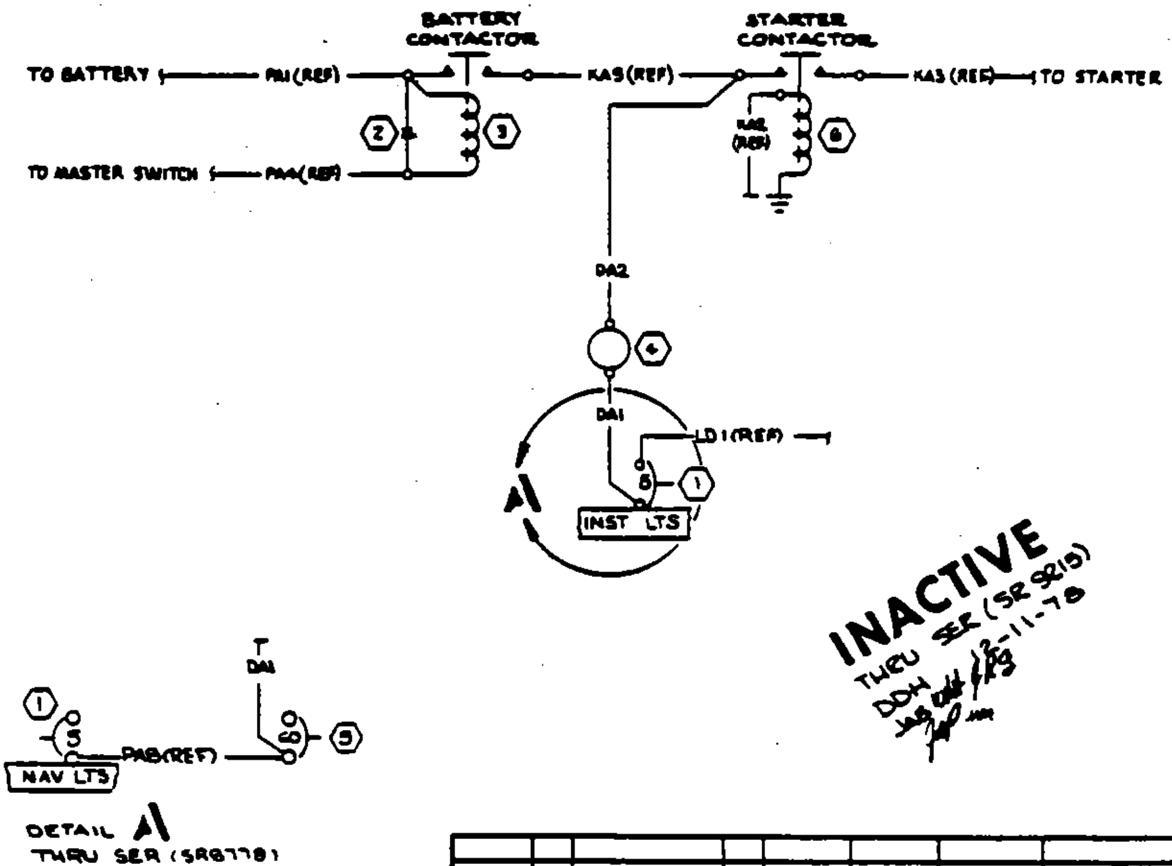
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ALTERNATOR SYSTEM - 60 AMP

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR 8438) PAGE: 4.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C669545 WAS C669502; ADD DETAIL A (SR8778)	CS 3-9-78	



DA2	8	S1560-8-9		S1367-4-10	S1367-4-13		
DA1	8	S1560-8-9		S1367-4-10	S1367-4-10		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

6	S1577-1	STARTER CONTACTOR	
5	S-1707-60	CIRCUIT BREAKER	
4	C669545	INSTRUMENT CLUSTER	
3	S1580-1	BATTERY CONTACTOR	
2	0770728	DIODE ASSY	
1	S1360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.10.1.2

SUPERSEDED BY: 1270835 P 46

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C. SMITH	1-28-77
CHECK	J.	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — AMMETER

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR 8458) PAGE: 4.2

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: EXTENDED HC1 TO BUS, S-1630-10L WAS S-1630-5L (SR8458)	CRS 3-4-77	[illegible]
B	BY REV: ADD S1360-20L; HA1 WAS CONN TO BUS BAR AT LDG LTS CKT BKR (SR8458)	GDS 5-17-77	[illegible]
C	BY REV: PB18 WAS PB10; PB10 WAS PB1; ADD PB16; DA1 WAS CONNECTED TO ALT CKT BKR (SR8778)(SR9014)	CRS 3-9-78	[illegible]
D	BY REV: S-1232-60 WAS S1707-60L; ADD DETAIL A, B & D, W/S A/ICE, WING DE-ICE RADIO 5 CKT BKRS, HD1(REF), HD13(REF), HD9(REF), HD10(REF), HA13(REF) HD5 (REF), SHT 4.3.1 (SR9110)	SFU HHG 2-26-79	[illegible]
E	BY REV: ADD DETAIL "C" & SER. ADD DETAIL "E", PA11, 1270305 & SER. (SR9630)	RLY RAO 3-5-80	[illegible]
F	BY REV: LD14(REF) WAS LD19(REF) (SR9630)	MKM 9-2-80	[illegible]

NOTES:
THIS DRAWING IS REFERENCE INFORMATION ONLY. FOR WIRING AND TERMINAL REQUIREMENTS NOT DEFINED ON THIS PAGE REFER TO THE APPROPRIATE PAGES OF 1270835

30-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
PA11	8	S-1562-8-9		S-1367-4-10	S-1367-4-6		SER (SR9630) & ON
PA8	8	S1562-8-9		S-1367-4-6	S-1367-4-10		
PA5	10	S1562-10-9		S-1367-3-6	S-1367-3-8	(OPT)	
PA6	10	S1562-10-9		S-1367-3-10	S-1367-3-6		
PA7	14			S-1367-2-6	S-1367-2-6		THRU SER (SR9630)

WIRE TABLE

10	S-2326-3	CIRCUIT BREAKER	
9	1270305	BUS BAR	
8	S-1232-5	CIRCUIT BREAKER (REF)	
7	S1360-20L	CIRCUIT BREAKER	
6	S-1232-60	CIRCUIT BREAKER	
5	S1360-15L	CIRCUIT BREAKER	
4	S1360-10L	CIRCUIT BREAKER	
3	S1360-5L	CIRCUIT BREAKER	
2	0713854	BUS BAR	
1	CM3589-40	SWITCH	
REQ NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.4.1.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-28-77
DRAWN	HARVEY	1-25-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ	[illegible]	1-31-77
APPD	[illegible]	
OTHER		

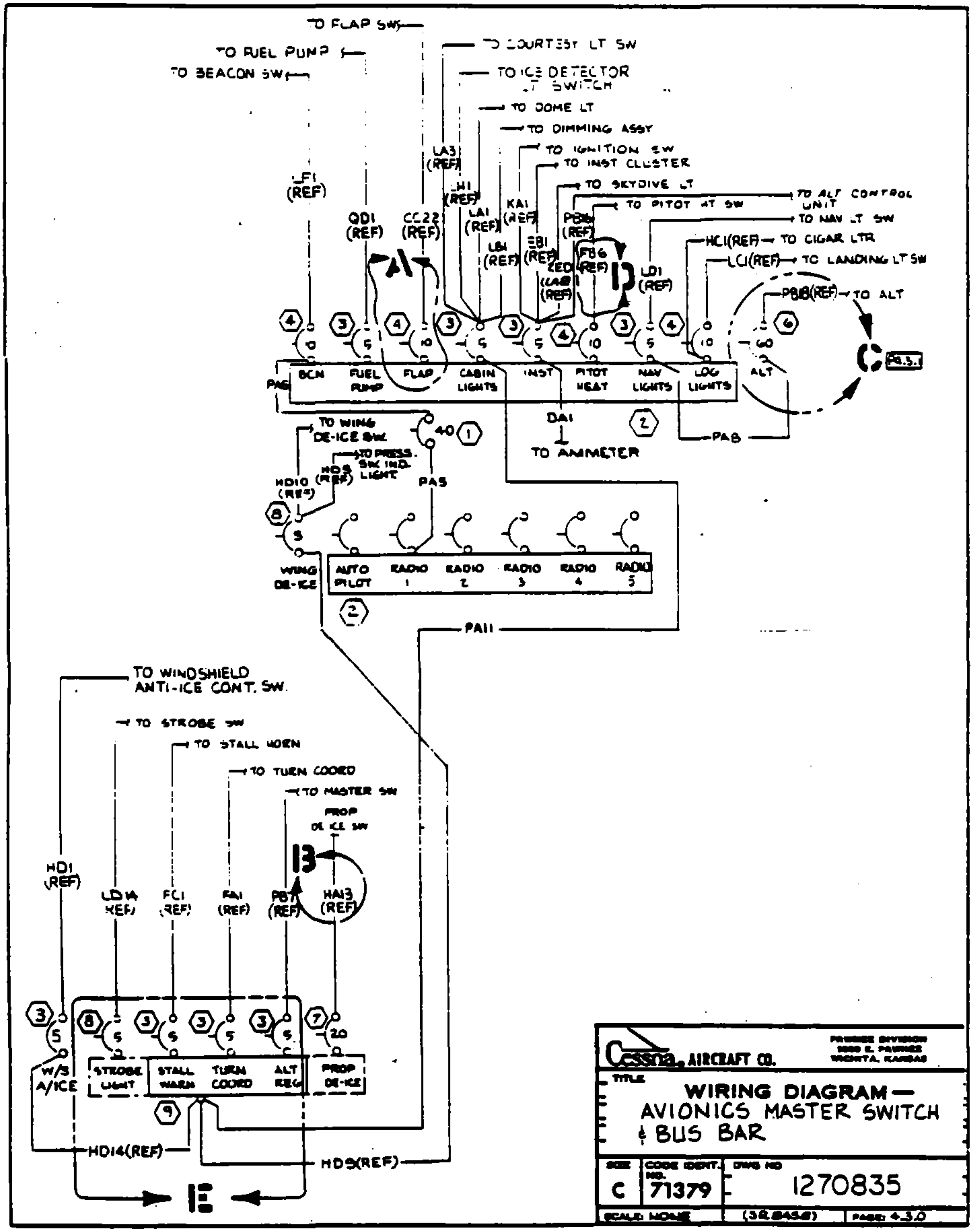
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — AVIONICS MASTER SWITCH & BUS BAR

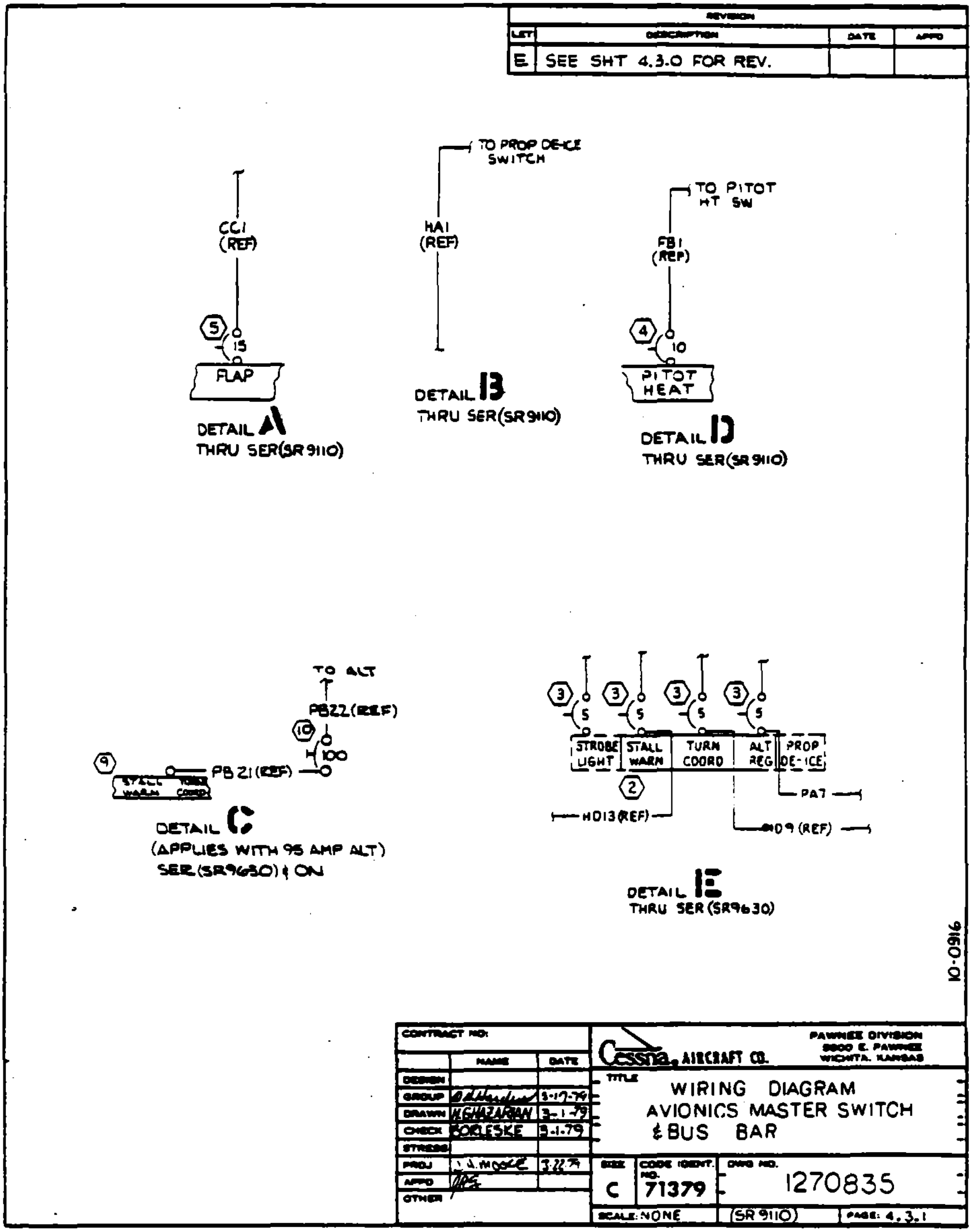
SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR8458) PAGE: 4.3.0

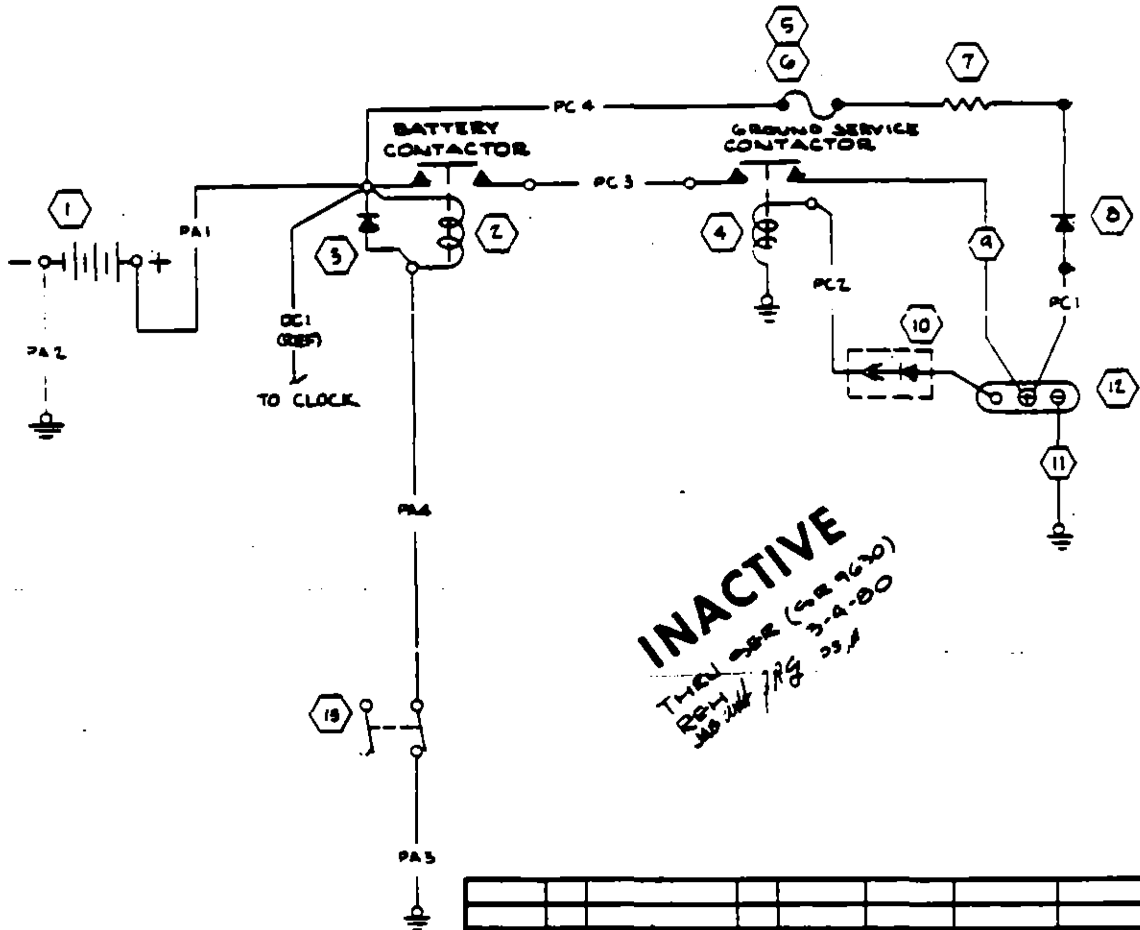
Avionics Master Switch & Bus Bar (Sheet 1 of 2)



Avionics Master Switch & Bus Bar (Sheet 2 of 2)


REVISION
LET
DESCRIPTION
DATE
APPD
E
SEE SHT 4.3.0 FOR REV.
CC1 (REF)
5
15
FLAP
DETAIL A
THRU SER(SR9110)
TO PROP DE-ICE SWITCH
HA1 (REF)
DETAIL B
THRU SER(SR9110)
TO PITOT HT SW
FB1 (REF)
4
10
PITOT HEAT
DETAIL D
THRU SER(SR9110)
TO ALT
PB22 (REF)
10
100
9
PB 21 (REF)
STALL WARN
TURN COORD
DETAIL C
(APPLIES WITH 95 AMP ALT)
SER(SR9630) & ON
3
5
STROBE LIGHT
STALL WARN
TURN COORD
ALT REG
PROP DE-ICE
2
PA7
HD13 (REF)
HD9 (REF)
DETAIL E
THRU SER (SR9630)
10-0916
CONTRACT NO:
NAME
DATE
DESIGN
GROUP
3-12-79
DRAWN
K GHAZARIAN
3-1-79
CHECK
BORLESKE
3-1-79
STRESS
PROJ
3-22-79
APPD
OTHER
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM
AVIONICS MASTER SWITCH
& BUS BAR
SIZE
C
CODE IDENT. NO.
71379
DWG NO.
1270835
SCALE: NONE
(SR 9110)
PAGE: 4.3.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C614001-0101 WAS 0870060 (SR8861)	GDS 5-10-77	
B	BY REV: C614001-0105 WAS C614001-0101 (SR9149)	24Y 5-23-78	



PC 4	22			SOLDER	S-1367-1-14		
PC 3	4	S1562-4-9		S-1367-6-15	S-1367-6-15		
PC 2	22			S-1493-1	S-1367-1-10		
PC 1	22			S-1367-1-10	SOLDER		
PA 4	22			S-1493-1	S-1367-1-4		
PA 3	22			S-1367-1-8	S-1493-1		
PA 2	4	S1562-4-9		S-1367-6-13	S-1367-6-12		
PA 1	4	S1562-4-9		S-1367-6-13	S-1367-6-9		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

15	S-1994-1-1	SWITCH
12	MS 3506-1	RECEPTACLE
11	0312155	GROUND STRAP
10	1570043	DIODE ASSY
9	1270653	BUS BAR STRAP
8	20HSP	DIODE
7	X26263	RESISTOR
6	S-1090-2	FUSEHOLDER ASSY
5	S-1091-5	FUSE
4	S-1577-1	CONTACTOR
3	0770728	DIODE ASSY
2	S-1580-1	BAT. CONTACTOR
1	C614001-0105	BATTERY ASSY
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.4.1.3

SUPERSEDED BY: 1270835 P.4.7

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	HARVEY	1-25-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — BATTERY & EXTERNAL POWER

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835
SCALE: NONE	(SR 8458)	PAGE: 4.4

REVISION			
LTR	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A" (SR9429)	RLK 10-5-78	[illegible]
B	BY REV: 206A WAS 226A/PB11, PB14, PB15 166A WAS 226A/PB12 S-2099-8 WAS S-2099-6; S-1367-2-10 WAS S-1367-1-10 (NOW SHOP PRACTICE) YEL(PB15) WAS PB15, RED(PB14) WAS PB14 ORN(PB13) WAS (PB13), BLU(PB12) WAS PB12 (USE EXISTING STOCK) ADD DETAIL "A", PB20 WIRE, & SER (SR9872)	RLK HHG 9-5-79 NTL	[illegible]
C	BY REV: ADD BASIC YEL(PB21), RED(PB22) ORN(PB23), BLU(PB24), PB25, PB26, PB27, & DETAIL "B", 1270305 0570315 WAS 0570314 (SR 9630) ADD DETAIL "A" (SR 9785)	NTL SEB 3-31-80	[illegible]
D	BY REV: BLU(PB28) WAS BLU(PB24), INACT. PB20 (SR9650)	MKM 9-2-80	[illegible]

NOTES:

1. TERMINATE VENDOR FURNISHED WIRES WITH S-1636-1 PIN
2. PART OF BASIC AVIONICS KIT. INSTALLED WITH FIRST RADIO
3. MAXIMUM PERMISSIBLE LENGTH OF PB13 NOT TO EXCEED 8 INCHES THRU SER(SR9630)

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
PB 27	8	S-1562-8-9		S-1943-1	S-2484-1		SER(SR 9785) ON
PB26	8	S-1562-8-9		S-1943-2	S-1943-1		SER(SR 9785) & ON
PB25	20			S-2099-6	S-1367-1-12		SER(SR9630) & ON
BLU(PB28)	16	-16-6		S-2099-8	S-1367-2-10		SER(SR9630) & ON
ORN(PB23)	20	-20-3		S-2099-6	S-1367-1-4		SER(SR9630) & ON
RED(PB22)	20	-20-2		S-2099-6	S-1493-1		SER(SR9630) & ON
YEL(PB21)	20	-20-4		S-1635-1	S-2099-6		SER(SR9630) & ON
PB20	5	S-1562-5-9		S-1943-2	S-2484-1	THU SER(SR9785)	
PB19	8	S-1562-8-9		S-1943-2	S-1943-3		SER(SR9429) THRU (SR9872)
PB18	8	S-1562-8-9		S-1367-4-8	S-1943-2		
PB17	8	S-1562-8-9		S-1943-2	S-1943-2	THRU SE	R (SR 9785)
PB16	22			S-1367-1-6	S-1635-1		
YEL(PB15)	20	-20-4		S-1635-1	S-2099-6	THRU SE	R (SR 9630)
RED(PB14)	20	-20-2		S-2099-6	S-1493-1	THRU SE	R (SR 9630)
ORN(PB13)	20	-20-3		S-2099-6	S-1367-1-18	3	THRU SER (SR 9630)
BLU(PB12)	16	-16-6		S-2099-8	S-1367-2-10		THRU SER (SR9630)
PB11	20			S-2099-6	S-1367-1-18		THRU SER (SR9630)
PB9	8	S-1562-8-9		S-1943-3	S-1367-4-12	THRU SE	R (SR9429)
PB7	22			S-1367-1-6	S-1493-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
15	1270305	BUS BAR	
14	0713854	BUS BAR	
13	C611005-0102	ALT CONT UNIT (ALT)	
12	S-1915-1	CAPACITOR	2
11	C611503-0102	ALTERNATOR ASSY	
10	0570315	TERMINAL BOARD	
9	S-1994-1-1	MASTER SWITCH	
8	S-1707-60	CIRCUIT BREAKER	
7	S-1360-5L	CIRCUIT BREAKER	
6	S-2135-2	LAMP ASSY	1
5	S-1637-2	HOUSING	
4	S-1637-1	HOUSING	
3	S-2373-2	CONNECTOR	
2	S-2373-1	CONNECTOR	
1	C611005-0101	ALT CONTROL UNIT	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270835 PG 4.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	3-13-78
GROUP	[illegible]	3-17-78
DRAWN	SHAVER	3-9-78
CHECK	SORLESKE	3-10-78
STRESS		
PROJ	[illegible]	3-17-78
APPD	[illegible]	
OTHER		

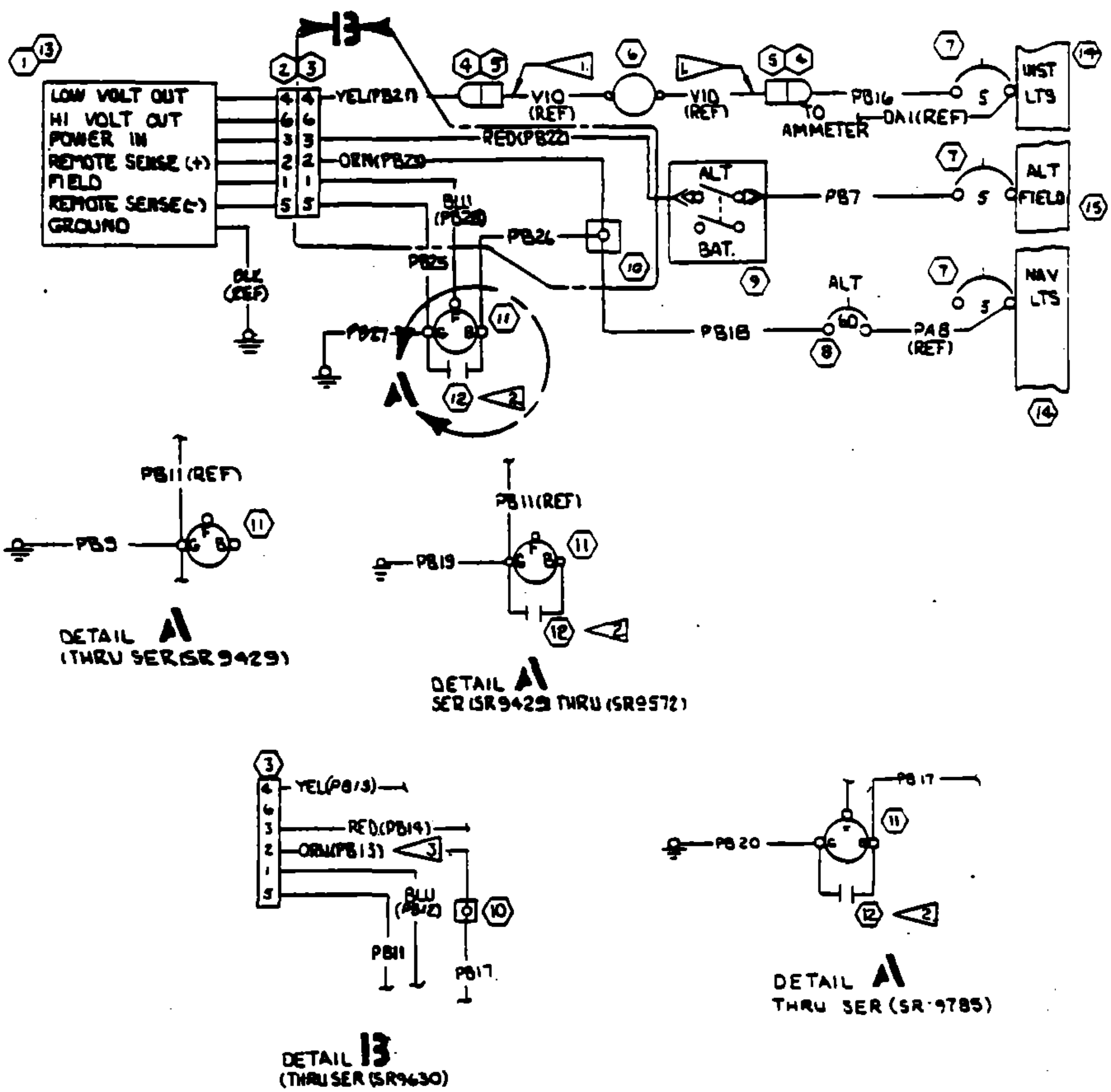
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — ALTERNATOR SYSTEM 60 AMP

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR8778) U206 PAGE: 4.5.0

REVISION			
LET	DESCRIPTION	DATE	APPD
D	SEE PG 4.5.0 FOR REVISION		



CONTRACT NO:		
	NAME	DATE
DESIGN	C. STAMM	3-18-80
GROUP	[illegible]	3-20-80
DRAWN	LANCASTER	3-5-80
CHECK	BOLESKE	3-6-80
STRESS		
PROJ	[illegible]	-3-80
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.

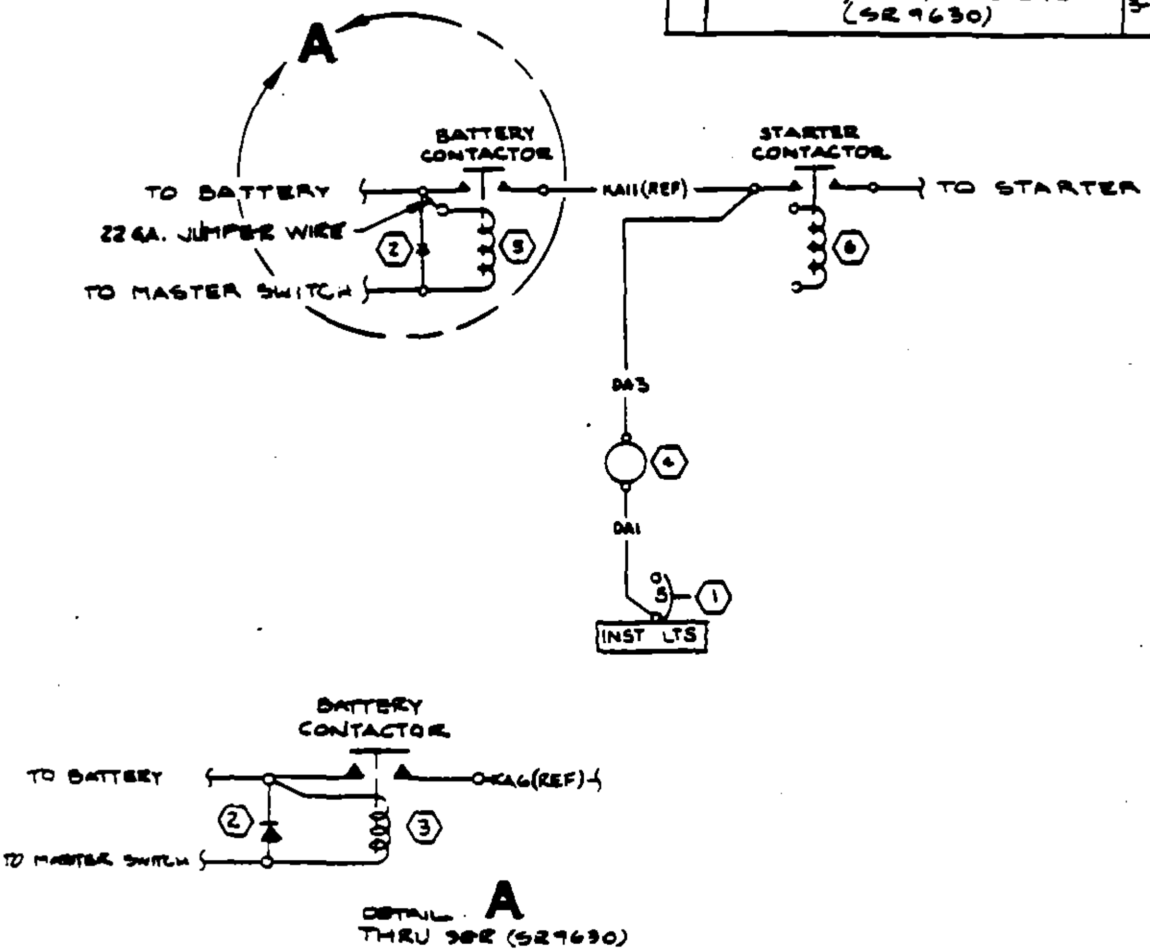
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM —
ALTERNATOR SYSTEM
60 AMP

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1270835

SCALE: NONE (SR 9630) PAGE: 4.5.1
(SR 9785)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL A & S-2475-1; KA11 WAS KA6 (S29630)	RE HAIR 3-4-80	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
DA3	8	S1562-8-9		S-2447-8	S-1367-4-10		
DA1	8	S1562-8-9		S1367-4-10	S1367-4-10		

WIRE TABLE

	PART NO.	DESCRIPTION
6	S-2443-1	STARTER CONTACTOR
5	S-2475-1	BATTERY CONTACTOR
4	C669545	INSTRUMENT CLUSTER
3	S1580-1	BATTERY CONTACTOR
2	0770728	DIODE ASSY
1	S1360-5L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CSXXXX-CESSNA STD. NO.

SUPERSEDES: 1270835 P4.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WINTSON	12-11-78
GROUP		12-20-78
DRAWN	HAUN	12-11-78
CHECK	BORLESKE	12-12-78
STRESS		
PROJ		12-14-78
APPD		
OTHER		

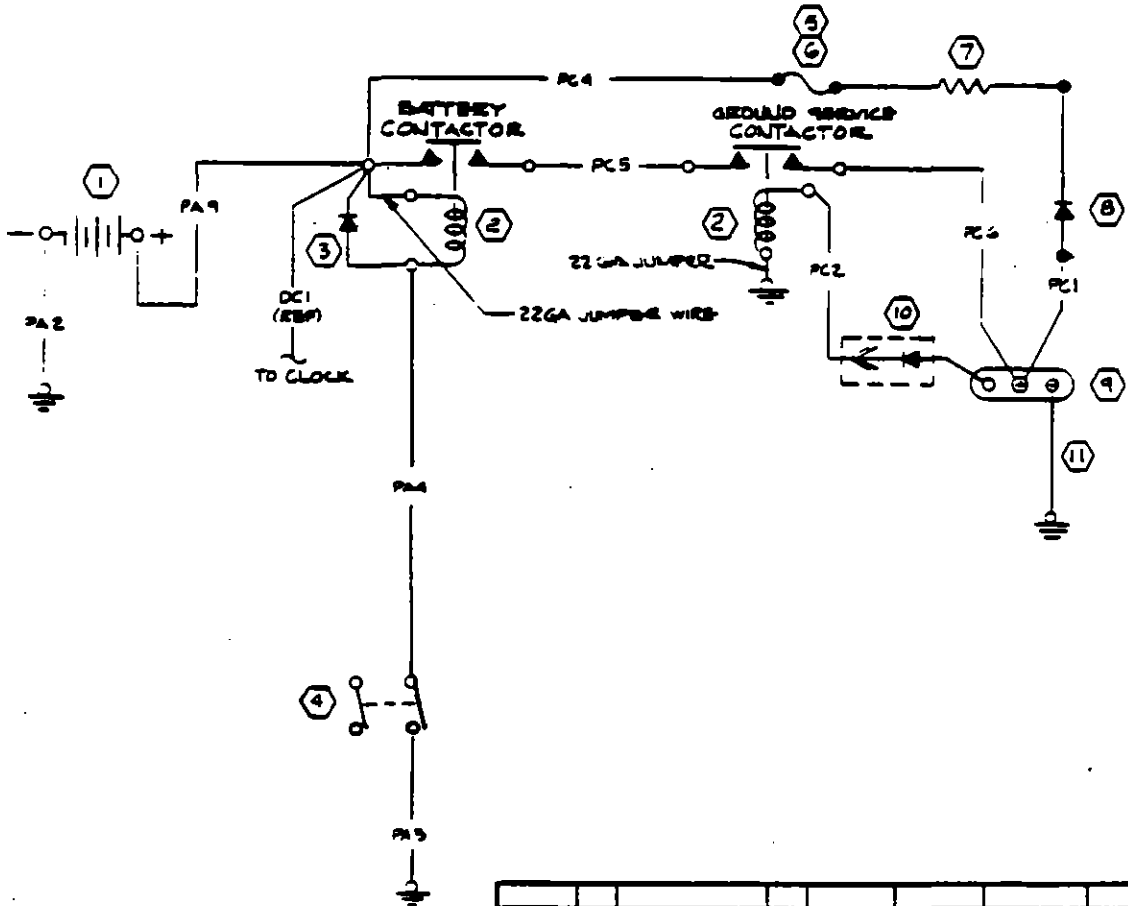
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — AMMETER

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | S29215 | PAGE: 4.6

REVISION			
LET	DESCRIPTION	DATE	APPD



11	0812155	GROUND STRAP	
10	1570043	DIODE ASSY	
9	MS3506-1	RECEPTACLE	
8	2043P	DIODE	
7	X26263	RESISTOR	
6	S-1090-2	FUSE HOLDER ASSY	
5	S-1091-5	FUSE	
4	S-1994-1-1	SWITCH	
3	0770728	DIODE ASSY	
2	S-2479-1	BATT CONTACTOR	
1	C614001-0105	BATTERY ASSY	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
PC 6	4	S-1562-4-9		S-2447-4	S-1367-6-4	(OPT)	
PC 5	4	S-1562-4-9		S-2447-4	S-2447-4	(OPT)	
PC 4	22			SOLDER	S-1367-1-5	(OPT)	
PC 2	22			S-1493-1	S-1367-1-10	(OPT)	
PC 1	22			S-1367-1-10	SOLDER	(OPT)	
PA 9	4	S-1562-4-9		S-1367-6-8	S-2447-4		
PA 4	22			S-1493-1	S-1367-1-10		
PA 3	22			S-1367-1-8	S-1493-1		
PA 2	4	S1562-4-9		S-1367-6-8	S-1367-6-4		

WIRE TABLE

CONTRACT NO:

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

	NAME	DATE
DESIGN	G. STAMM	3-19-80
GROUP	[illegible]	3-20-80
DRAWN	R.B. HAIR	3-4-80
CHECK	BORLESKE	3-6-80
STRESS		
PROJ	J. MOORE	3-21-80
APPD	[illegible]	
OTHER		

TITLE: WIRING DIAGRAM — BATTERY & EXTERNAL POWER

SIZE: C | CODE IDENT. NO.: 71379 | DWG NO: 1270835

SCALE: NONE | (SE 9630) | PAGE: 4.7

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 1270835 P 4.4

SUPERSEDED BY:

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: BLU(P829) WAS BLU(P825) (P825) WAS (P811) (SR9630)	MKM 9-2-80	

NOTES:

1. TERMINATE VENDOR FURNISHED WIRES WITH S-1636-1 PIN
2. PART OF BASIC AVIONICS KIT INSTALLED WITH FIRST RADIO

30-0916

16	1270303	BUS BAR	
15	S-1915-1	CAPACITOR	2
14	C611505-0101	ALTERNATOR ASSY	
13	S-2326-3	CIRCUIT BREAKER	
12	0570314	TERMINAL BLOCK	
11	D208-14489-KA	CONNECTOR	
10	S-1994-1-1	MASTER SWITCH	
9	0713854	BUS BAR	
8	S-1360-5L	CIRCUIT BREAKER	
7	S-2135-2	LAMP ASSY	
6	S-1637-2	HOUSING	
5	S-1637-1	HOUSING	
4	S-2373-2	CONNECTOR	
3	S-2373-1	CONNECTOR	
2	C611005-0102	ALT CONTROL UNIT	(ALT)
1	C611005-0101	ALT CONTROL UNIT	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
BLUE (P829)	18	S-1460-18-6		S-2099-8	S-2376-1		
P824	4	S-1562-4-9		S-2402-2	S-2402-1		
P823	4	S-1562-4-9		S-2402-2	S-2402-2		
P822	4	S-1562-4-9		S-2402-2	S-1367-12		
P821	4	S-1562-4-9		S-2402-2	S-2402-1		

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

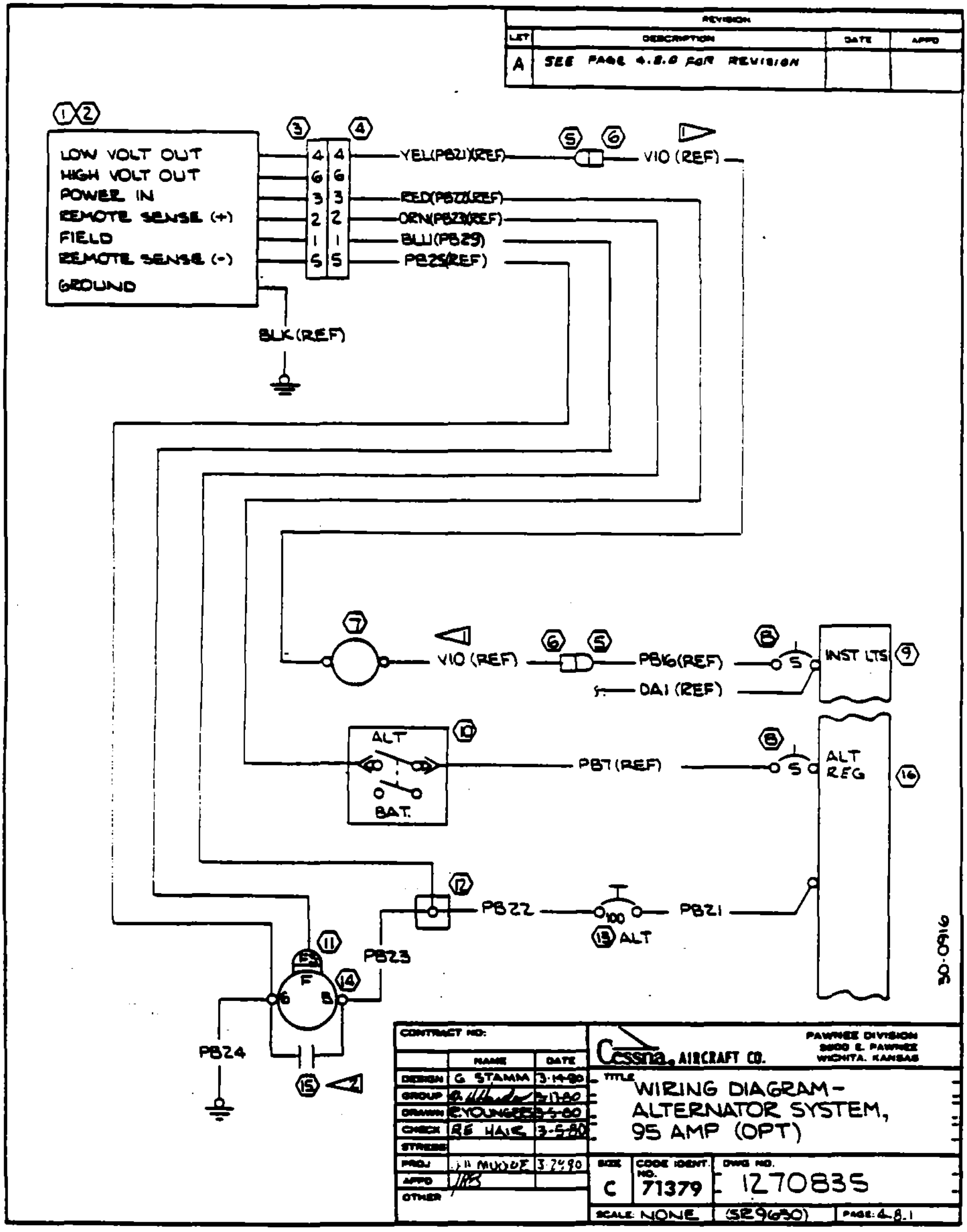
	NAME	DATE
DESIGN	G. STAMM	3-4-80
GROUP		3-7-80
DRAWN	E. YOUNGER	3-5-80
CHECK	RE HAIR	3-5-80
STRESS		
PROJ	MOORE	3-4-80
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ALTERNATOR SYSTEM, 95 AMP (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

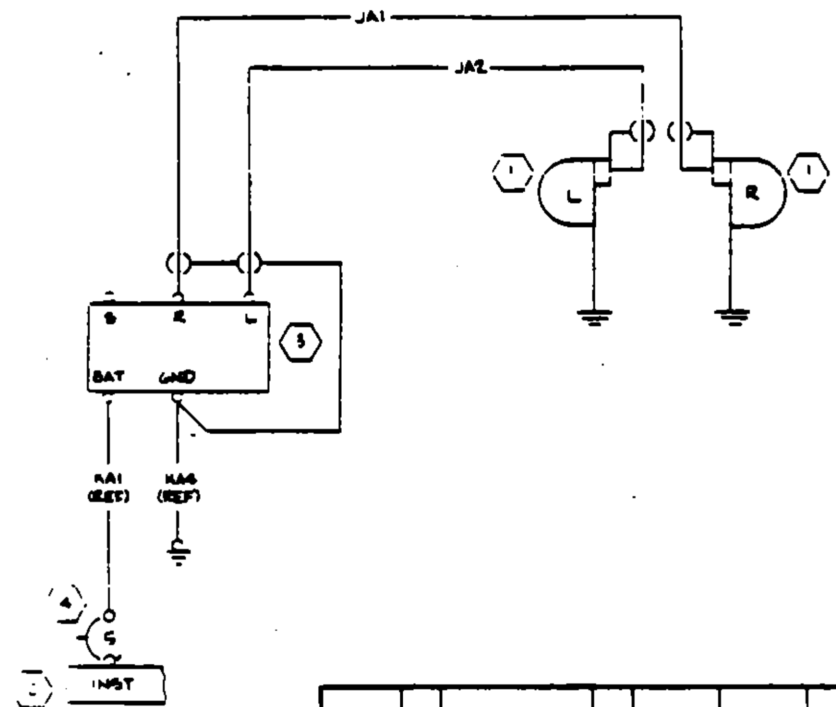
SCALE: NONE (SR9630) PAGE: 4.20


REVISION
LET
DESCRIPTION
DATE
APPD
A
SEE PAGE 4.8.0 FOR REVISION
LOW VOLT OUT
HIGH VOLT OUT
POWER IN
REMOTE SENSE (+)
FIELD
REMOTE SENSE (-)
GROUND
YEL(PB21)(REF)
VIO (REF)
RED(PB22)(REF)
ORN(PB23)(REF)
BLU(PB29)
PB25(REF)
BLK(REF)
VIO (REF)
PB16(REF)
DA1 (REF)
INST LTS
ALT
BAT.
PB7(REF)
ALT REG
PB22
PB21
ALT
PB23
F
B
PB24
30-0916
CONTRACT NO:
NAME
DATE
DESIGN
G. STAMM
3-14-80
GROUP
DRAWN
CHECK
3-5-80
STRESS
PROJ
3-24-80
APPD
OTHER
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM-
ALTERNATOR SYSTEM,
95 AMP (OPT)
SIZE
C
CODE IDENT. NO.
71379
DWG NO.
1270835
SCALE NONE
(S29630)
PAGE 4.8.1

NOTES:

1. TERMINATE SHIELDS ON JA1 & JA2 WIRES AT THE SWITCH WITH S-1367-2-6 TERMINALS & CONNECT TO GND TERMINAL ON SWITCH

2. USE S1367-1-10 ON HOT LEAD & S-1367-3-10 ON SHIELD



JA2	18S			S-1367-1-6	2	1	
JA1	18S			S-1367-1-6	2	1	
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

4	S-1360-5L	CIRCUIT BREAKER
3	C292501-0105	IGNITION SWITCH
2	0713864	BUS BAR
1	SLICK	MAGNETO
ITEM NO.	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.S.2

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	D Wander	1-4-77
DRAWN	Harvey	1-25-77
CHECK	J. Young	1-26-77
STRESS		
PROJ	[illegible]	1-31-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

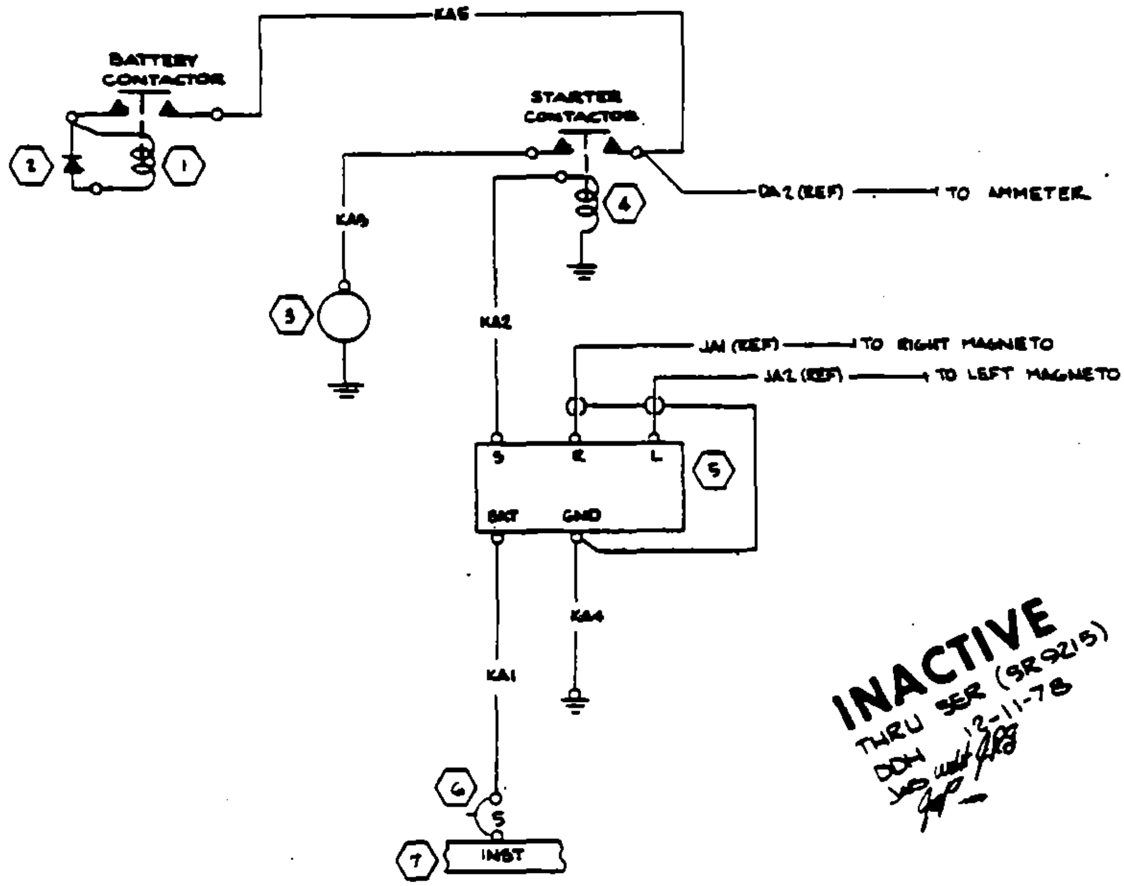
TITLE WIRING DIAGRAM — IGNITION SYSTEM

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE U206 TU206 PAGE: 5.1

(SR8458)

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
KA 5	4	S-1562-4-9		S-1367-6-10	S-1367-6-13		
KA 4	22			S-1367-1-8	S-1367-1-8		
KA 3	4	S-1562-4-9		S-1367-6-10	S-1367-6-10		
KA 2	22			S-1367-1-8	S-1367-1-10		
KA 1	22			S-1367-1-6	S-1367-1-8		

WIRE TABLE

	PART NO.	DESCRIPTION	
7	0713854	BUS BAR	
6	S-1360-5L	CIRCUIT BREAKER	
5	C292501-0105	MAGNETO SWITCH	
4	S-1577-1	STARTER CONTACTOR	
3		STARTER	
2	0770728	DIODE ASSY	
1	S-1580-1	BAT. CONTACTOR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1000=CESSNA SPEC. NO. S-XXX OR CXXXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.6.2

SUPERSEDED BY: 1270835 P 6.2

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	W. Woodard	1-28-77
DRAWN	HARVEY	1-25-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ	[illegible]	1-31-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

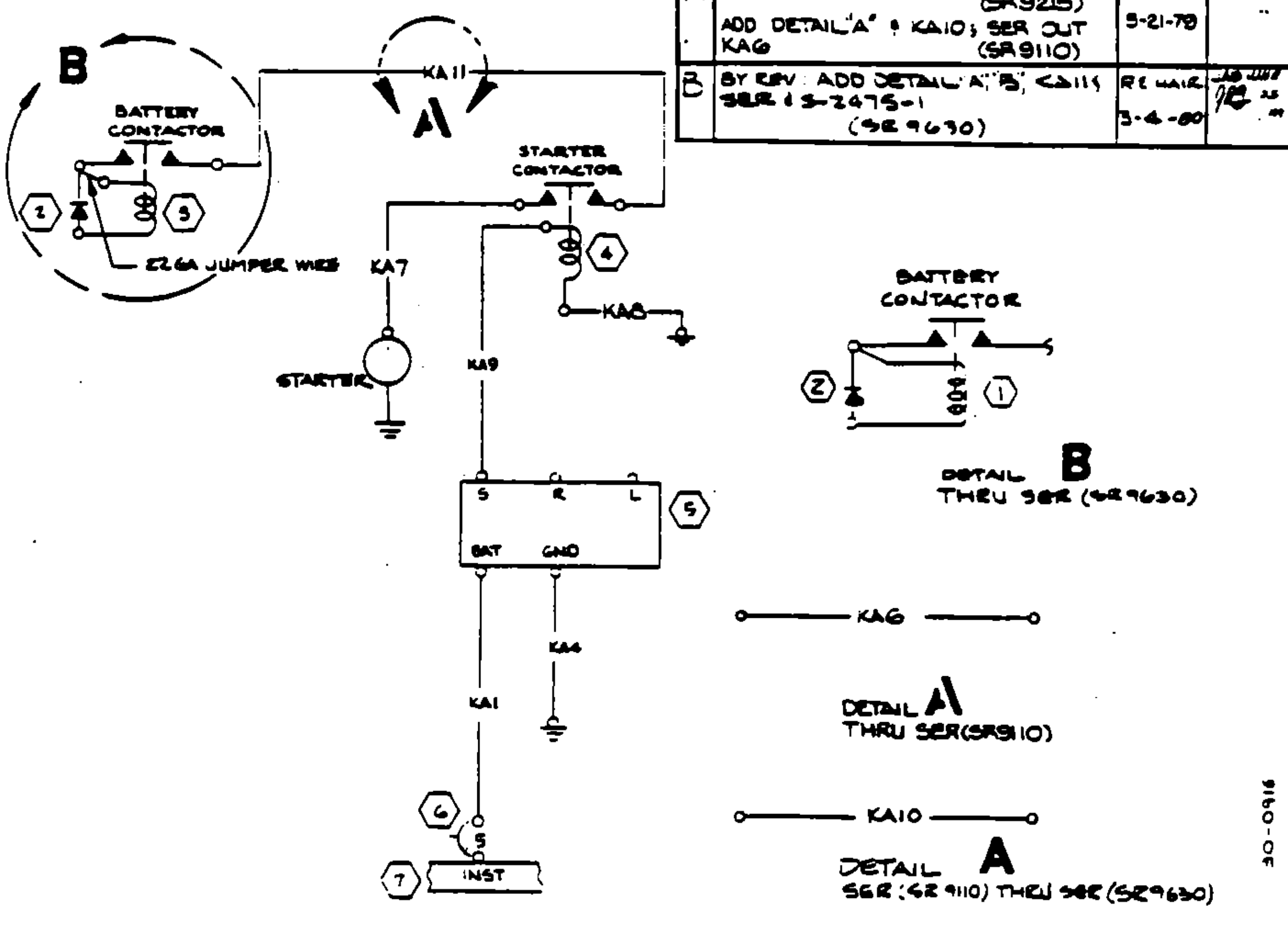
TITLE
WIRING DIAGRAM — STARTER SYSTEM

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | U206 | TU206 | PAGE: 6.1

(SR8458)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: KA9 WAS KA2 (SR9215) ADD DETAIL "A" & KA10; SER OUT KA6 (SR9110)	5-21-79	
B	BY REV: ADD DETAIL "A", "B", KA11; SER & S-2475-1 (SR9630)	3-4-80	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
KA11	4	S1562-4-9		S-2447-4	S-2447-4		SER(SR9630)& ON
KA10	4	S1562-4-9		S2447-4	S2447-4		THRU SER(SR9630)
KA9	22			S1367-1-6	S1367-1-10		
KA8	22			S1367-1-10	S1367-1-10		
KA7	4	S-1562-4-9		S-2447-4	S-1367-6-13		
KA4	22			S-1367-1-8	S-1367-1-8		
KA6	4	S-1562-4-9		S-1367-6-11	S-2447-4		THRU SER(SR9110)
KA1	22			S-1367-1-6	S-1367-1-8		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
7	0713854	BUS BAR
6	S-1360-5L	CIRCUIT BREAKER
5	C292501-0105	MAGNETO SWITCH
4	S-2443-1	STARTER CONTACTOR
3	S-2475-1	BATTERY CONTACTOR
2	0770728	DIODE ASSY
1	S-1580-1	BAT. CONTACTOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270835 PG.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	12-4-78
GROUP		12-20-78
DRAWN	HAUN	12-11-78
CHECK	BORLESKE	12-12-78
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STARTER SYSTEM

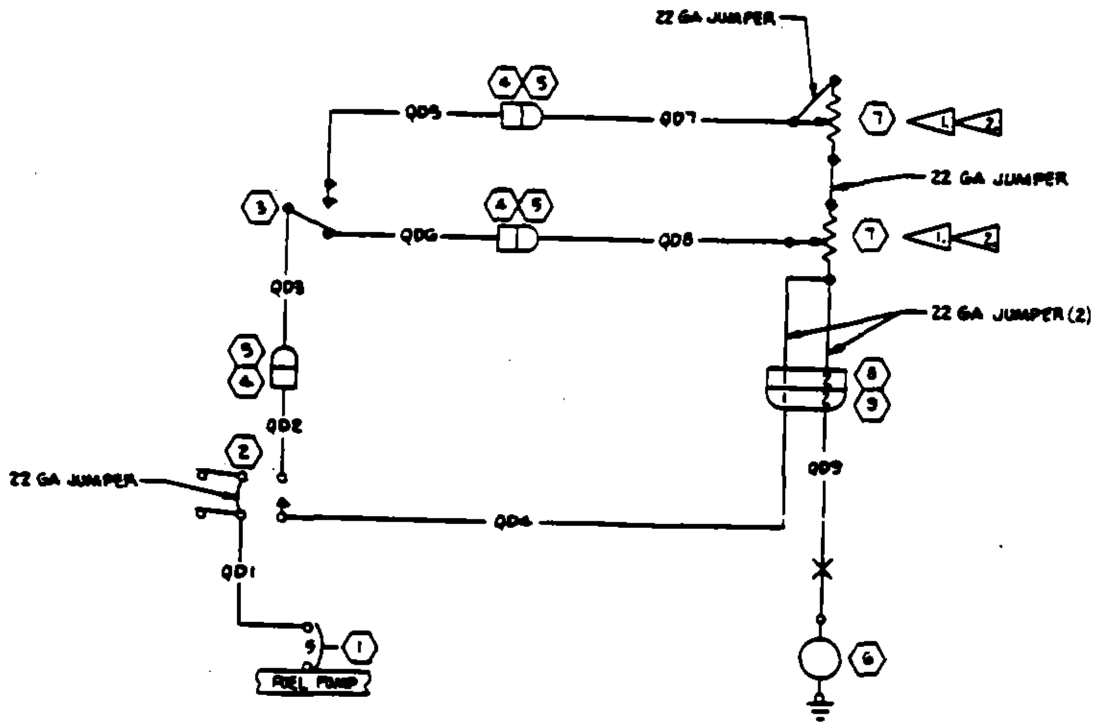
SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE | SR 9215 | PAGE: 2

NOTES:

1. ADJUST AMOR-20-10 TO 3.5 ±.5 OHMS PRIOR TO INSTL

2. READJUST RESISTOR AS REQUIRED AFTER INSTL TO COMPLY WITH FUEL FLOW REQUIREMENTS PER CES1243



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			REMARKS
QD9	22			S1635-1	S1370-1		
QD8				S1635-1	SOLDER		
QD7				S1635-1	SOLDER		
QD6				SOLDER	S1636-1		
QD5				SOLDER	S1636-1		
QD4				S1493-1	S1635-1		
QD3				S1635-1	SOLDER		
QD2				S1493-1	S1636-1		
QD1	22			S1367-1-G	S1493-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
9	S2035-1	HOUSING	
8	S2035-2	HOUSING	
7	AMOR-20-10	RESISTOR	
6	C291504-0201	FUEL PUMP	
5	S1637-1	HOUSING	
4	S1637-2	HOUSING	
3	2LM-E	SWITCH	
2	S1846-3-2	SWITCH	
1	S1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 1270629 P.7.1.5

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C. SMITH	1-25-77
CHECK		1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

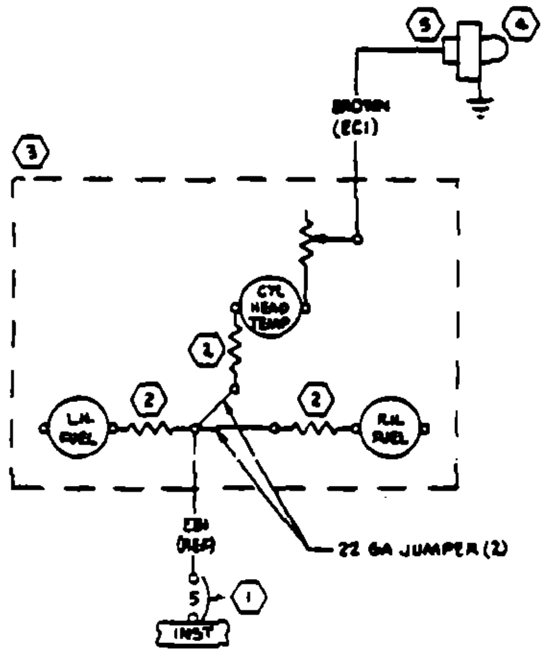
TITLE
WIRING DIAGRAM — FUEL PUMP SYSTEM

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR8458) PAGE: 7.1

NOTES:

1. MATERIAL IS ALPHA 5857-7 (VENDOR CODE 92194) OR BELDEN 83009-1 (VENDOR CODE 70903)
2. CRIMP 51636-5 TERMINAL AROUND WIRE INSULATION, BEND .25 OF STRIPPED WIRE BACK OVER CRIMP & SOLDER PER CES1060. USE MOLEX HT-1719-C CRIMPING TOOL ONLY



INACTIVE

THRU SER (SR 8778)
CS 3-9-78

BRN (EC1)	18	1		51367-1-8	51636-5	2
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		REMARKS

WIRE TABLE

5	51637-4	HOUSING	
4	51372-2	SENDING UNIT	
3	C669502	INSTRUMENT CLUSTER	
2	819210	RESISTOR ASSY	
1	51360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CM-XXX-CESSNA STD. NO.

SUPERSEDES: 1270625 P.8.1.1

SUPERSEDED BY: 1270835 P & 5

CONTRACT NO:

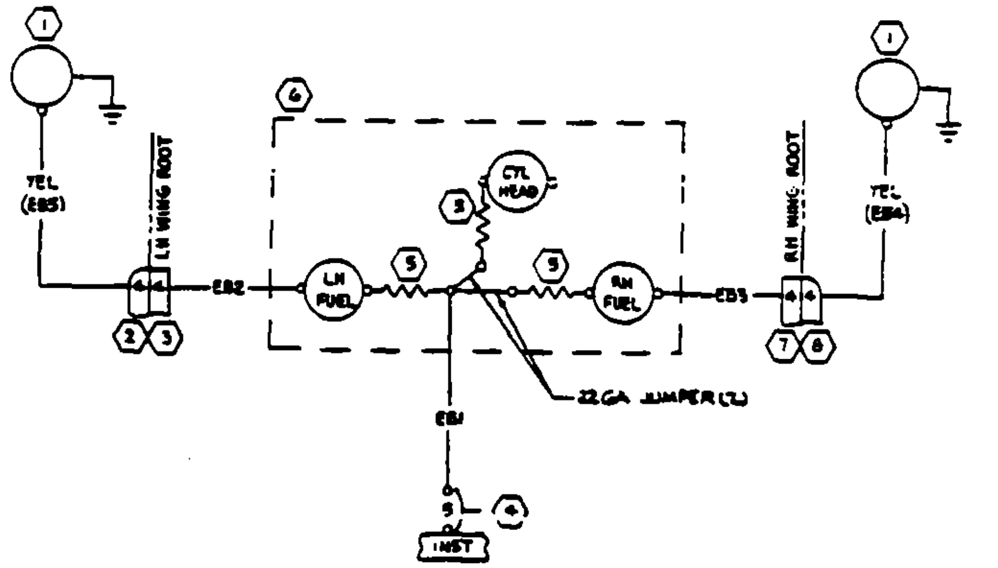
	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-28-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUBL	1-26-77
STRESS		
PROJ	[illegible]	1-31-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — CYLINDER HEAD TEMP

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (3R8458) PAGE: 8J



INACTIVE

THRU SER(SR8778)
CS 3-9-78
JAD

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
YEL (EB5)	22	-22-4		S1635-1	S1367-1-10		
YEL (EB4)		-22-4		S1635-1	S1367-1-10		
EB3				S1367-1-10	S1630-1		
EB2				S1367-1-10	S1636-1		
EB1	22			S1367-1-6	S1367-1-10		

WIRE TABLE

	PART NO.	DESCRIPTION	
8	S1640-12	HOUSING	
7	S1641-12	HOUSING	
6	C669502	INSTRUMENT CLUSTER	
5	613210	RESISTOR ASSY	
4	S1360-5L	CIRCUIT BREAKER	
3	S1641-6	HOUSING	
2	S1640-6	HOUSING	
1	0726110	TRANSMITTER - FUEL	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 1270826 P.8.2.1

SUPERSEDED BY: 1270835 P. 8.4

CONTRACT NO:

	NAME	DATE
DESIGN	WATSON	1-27-77
GROUP		1-26-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUNG	1-26-77
STRESS		
PROJ		
APPD		
OTHER		

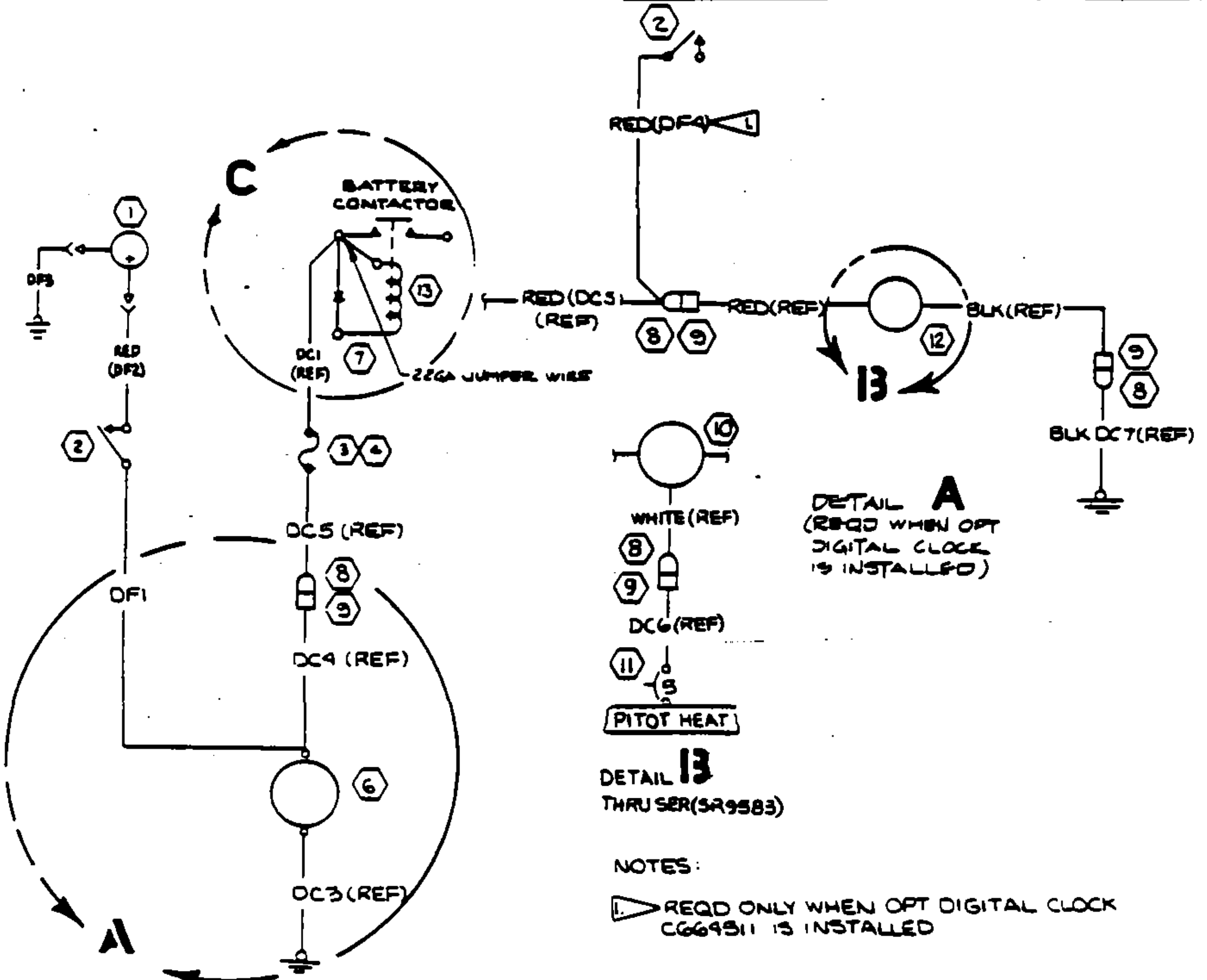
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — FUEL INDICATOR & TRANSMITTER

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR 8458) | PAGE: 8.2

LTR	DESCRIPTION	DATE	APPD
B	BY REV: ADD DETAIL B; C664511-0102 (SR 9583) ADD DETAIL C, S2475-1 & P.8.3.1 (SR9630)	HHG 2-13-80	
A	BY REV: C664503-0101 WAS C664502-0101; ADD NOTE 1, RED DF4, S1637-1,-2, C664511-0101, S1360-5L & DETAIL A(SR9180)(REF)(SR9187)	CMK 7-13-78	



NOTES:

1. REQD ONLY WHEN OPT DIGITAL CLOCK C664511 IS INSTALLED

ITEM NO.	PART NO.	DESCRIPTION
13	S-2475-1	BATT CONTACTOR
12	C664511-0102	DIGITAL CLOCK
11	S-1360-5L	CIRCUIT BREAKER
10	C664511-0101	DIGITAL CLOCK
9	S-1637-2	HOUSING
8.	S-1637-1	HOUSING
7	0770728	DIODE ASSY
6	C664508-0101	CLOCK
5	S1580-1	BATTERY CONTACTOR
4	S1050-22	FUSEHOLDER
3	S1091-1	FUSE
2	S1711-1	OIL PRESSURE SWITCH
1	C664503-0101	HOURMETER

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(DF4)	22	-22-2		S-1367-1-6	S1636-2	1.	
DF3	22			S1493-1	S1367-1-8		
RED(DF2)	22	-22-2		S1367-1-6	S1493-1		
DF1	22			SOLDER	S1367-1-6		

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.8.3.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C.SMITH	1-25-77
CHECK	J.YOUEL	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

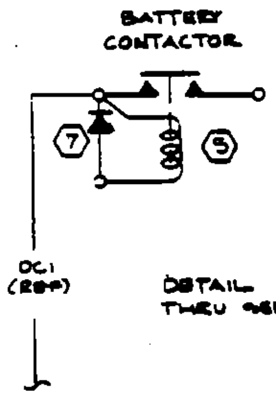
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — HOURMETER (OPT)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR8458) | PAGE: 8.3.2

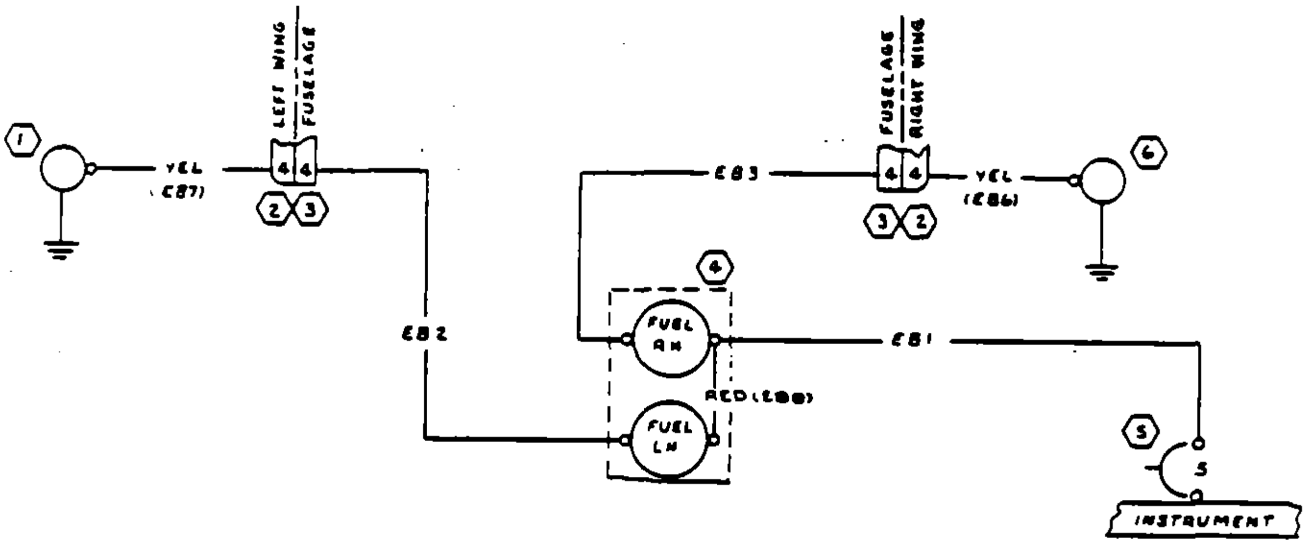
REVISION			
LTR	DESCRIPTION	DATE	APPD
B	SEE PG 5.3.0 FOR REV.		



DETAIL C
THRU SER (SE9630)

CONTRACT NO.			Cessna AIRCRAFT CO.	PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS
	NAME	DATE	TITLE	WIRING DIAGRAM HOURMETER (OPT)
DESIGN	G. STAMM	3-18-80		
GROUP	[illegible]	3-20-80		
DRAWN	B.E. HAIR	3-6-80		
CHECK	BOBLESKE	3-6-80		
STRESS				
PROJ	M303F	3-25-80	SIZE C	CODE IDENT. NO. 71379 — DWG NO. 1270835
APPD	[illegible]			
OTHER			SCALE: NONE	(SE9630) PAGE: 5.3.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C668050(-0301 WAS -0201); ADD C668050-0302 (SR8778)	3-2-78	



WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(E88)	22	-22-2		S-1367-1-10	S-1367-1-10		
YEL(E87)		-22-4		S-1635-1	S-1367-1-8		
YEL(E86)		-22-4		S-1635-1	S-1367-1-8		
E83				S-1367-1-10	S-1636-1		
E82				S-1367-1-10	S-1636-1		
E81	22			S-1367-1-6	S-1367-1-10		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
6	C668050-0302	FUEL TRANSMITTER	
5	S-1360-5L	CIRCUIT BREAKER	
4	C669545-0103	INSTRUMENT CLUSTER	
3	S-1641-9	HOUSING	
2	S-1640-9	HOUSING	
1	C668050-0301	FUEL TRANSMITTER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXX=CESSNA STD. NO.

SUPERSEDES: 1270835 P. 8.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	3-13-78
GROUP		3-17-78
DRAWN	SHAVER	3-9-78
CHECK	BORLESKE	3-10-78
STRESS		
PROJ		3-17-78
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — FUEL INDICATOR & TRANSMITTER

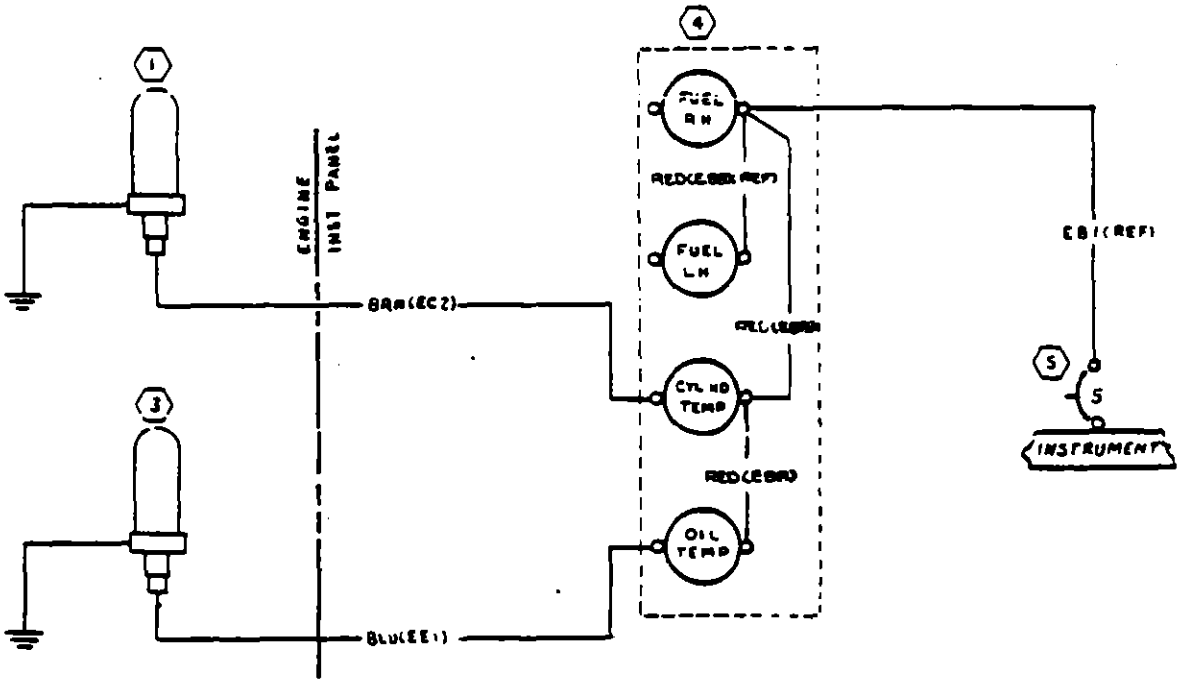
SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR8778) PAGE: 9.4

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV S-2334-2 WAS S-2334-1 (CR9778)	4-17-78	

NOTES:

1. MATERIAL IS ALPHA 5857-7 (VENDOR CODE 92194) OR BELDEN 83007-1 (VENDOR CODE 70903)
2. MATERIAL IS ALPHA 5857-6 (VENDOR CODE 92194) OR BELDEN 83009-6 (VENDOR CODE 70903)
3. CRIMP S-1636-5 TERMINAL AROUND WIRE INSULATION. BEND .25 OF STRIPPED WIRE BACK OVER CRIMP AND SOLDER PER CES1040. USE MOLEX HT-1921 CRIMPING TOOL ONLY.



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(EB8)	22	-22-2		S-1367-1-10	S-1367-1-10		
BRN(EC2)	18	1		S-1367-1-10	S-16V-6	3	
BLU(EE1)	15	2		S-1367-1-10	S-1367-1-10		

WIRE TABLE

5	S-1360-5L	CIRCUIT BREAKER	
4	C669545-0103	INST CLUSTER	
3	S-2335-1	SENDING UNIT	
2			
1	S-2334-2	TRANSDUCER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 1270835 P. 8.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G STAMM	3-13-78
GROUP		3-17-78
DRAWN	SHAVER	3-9-78
CHECK	BORLESKE	3-10-78
STRESS		
PROJ		
APPD		
OTHER		

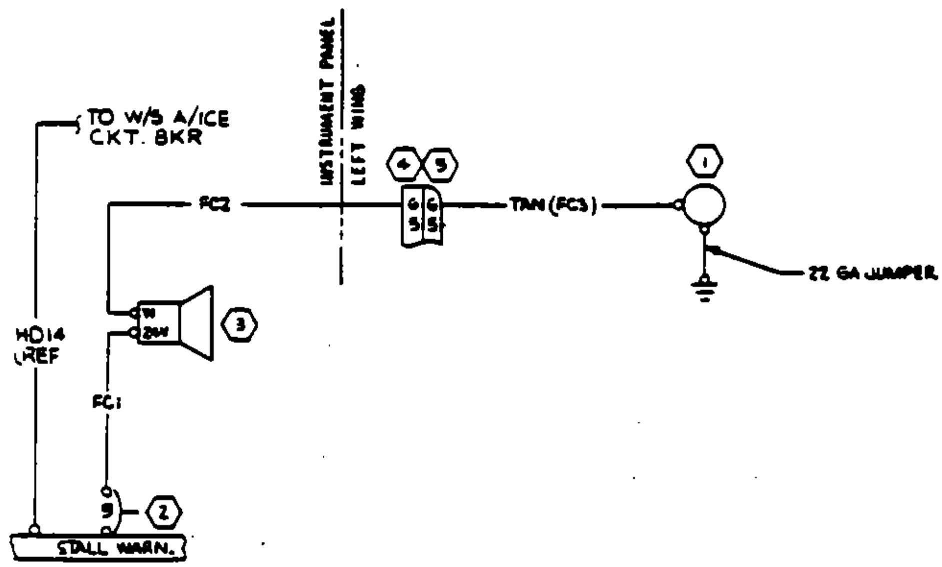
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — CYLINDER HEAD TEMP & OIL TEMPERATURE

SIZE	CODE IDENT NO.	DWG NO
C	71379	1270835

SCALE: NONE (5E3775) PAGE: 8.5

REVISION			
LTR	DESCRIPTION	DATE	APPD
A	BY REV: ADD HD13(REF) (SR9110)	HHG 2-26-79	
B	BY REV: HD14 (REF) AT BUS BAR WAS HD13 (REF) TO STALL WARN BKR AT BUS BAR (SR9630)	RAO 3-27-80	JAB



WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
TAN(FC3)	22	-22-10		S1639-1	S1637-1-6		
FC2	22			S1367-1-6	S1636-1		
FC1	22			S1367-1-6	S1367-1-6		

WIRE TABLE

	PART NO.	DESCRIPTION	
5	S1640-6	HOUSING	
4	S1641-6	HOUSING	
3	S2077-8	HORN	
2	S1360-5L	CIRCUIT BREAKER	
1	0511062	TRANSMITTER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-1000X-CESSNA SPEC. NO.
S-1XXX OR CM0000-CESSNA STD. NO.

SUPERSEDES: 1270625 P.9.6

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUNG	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO.

PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

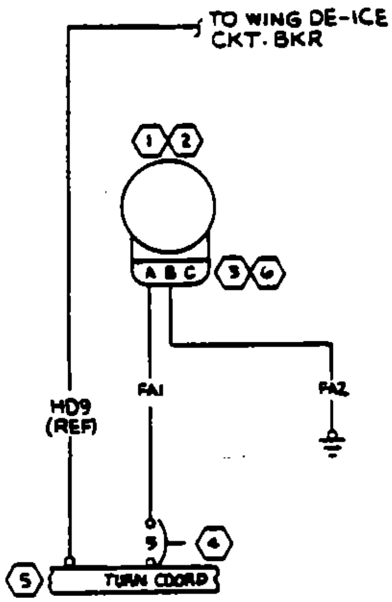
TITLE

WIRING DIAGRAM — STALL WARNING SYSTEM, NON-HEATED

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR8448) | PAGE: 3.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD HD9 (REF) (SR 9110)	HHG 2-26-79	JAB JRS
B	BY REV: 1270305 WAS 0713854: HD9 (REF) TO BUS BAR WAS TO TURN COORD BKR AT BUS BAR (SR9630)	RAO 3-27-80	JAB JRS



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
FA2	22			SOLDER	S1367-1-8		
FA1	22			S1367-1-6	SOLDER		

WIRE TABLE

	PART NO.	DESCRIPTION	
6	MS3057-4A	CLAMP	
5	1270305	BUS BAR	
4	S1360-5L	CIRCUIT BREAKER	
3	MS3108A10SL3S	CONNECTOR	
2	S1305-2	INDICATOR-TURN & BANK	
1	C661003-0505	TURN COORDINATOR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.9.4.1 & P.9.5

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	D. Wunder	1-28-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ	[illegible]	1-31-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — TURN COORDINATOR, TURN & BANK

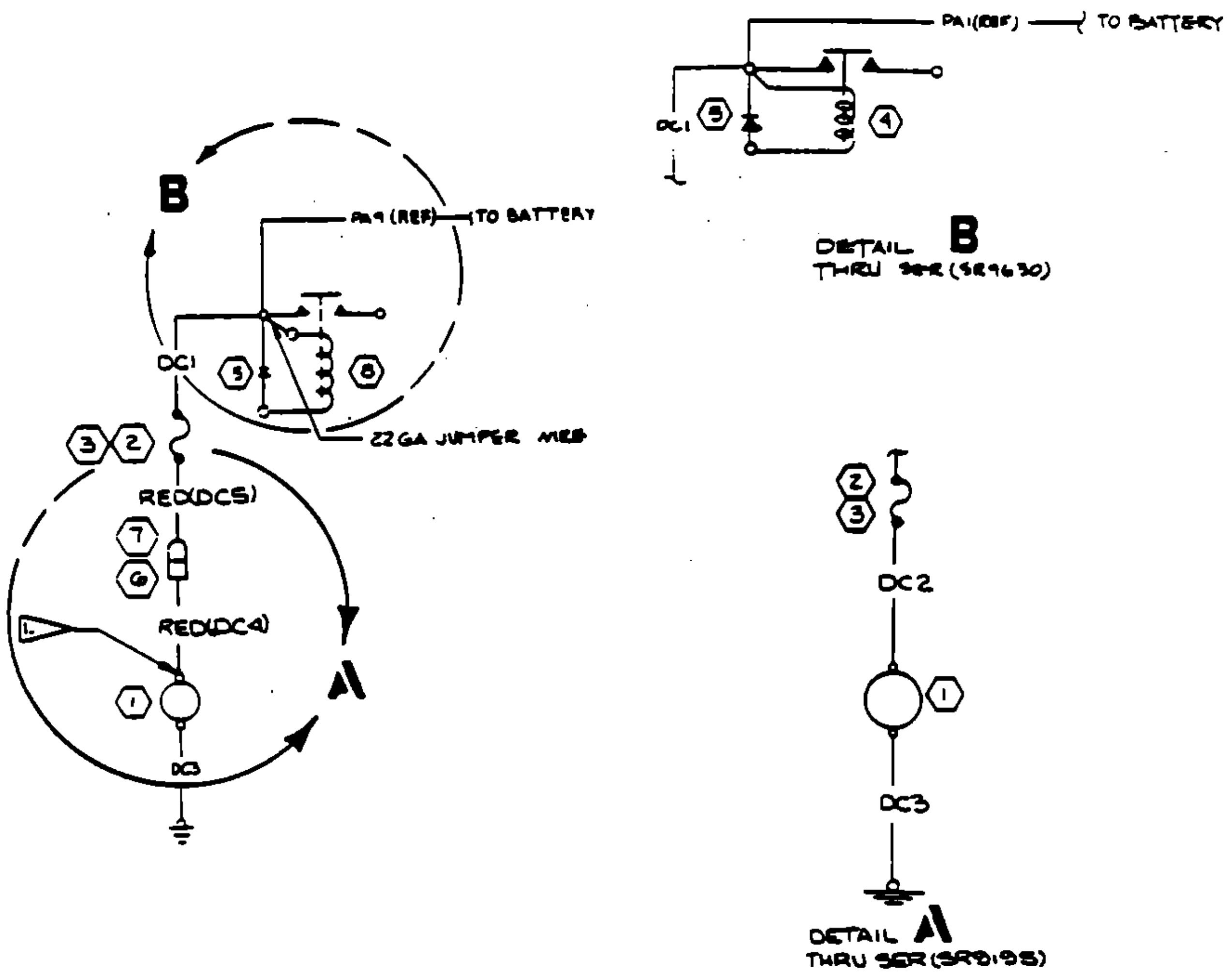
SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR8458) | PAGE: 9.2

NOTES:

1. CAUTION: POWER WIRE MUST BE CONNECTED TO 'BATT' TERMINAL OF CLOCK OTHERWISE INTERNAL DAMAGE TO UNIT WILL RESULT

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE 1 DETAIL A (SR9195)	7-13-78	
B	BY REV: ADD DETAIL B & S-2475-1 (SR9630)	3-4-80	



SER DC5	22	-22-2		SOLDER	S-1635-1		SER(SR9195) & ON
SER DC4	22	-22-2		S-1636-1	S1367-1-6		SER(SR9195) & ON
DC3	22			S1367-1-6	S1367-1-8		
DC2	22			SOLDER	S1367-1-6		THRU SER(SR9195)
DC1	22			S1367-1-13	SOLDER		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

8	S-2475-1	BATT CONTACTOR
7	S-1637-2	HOUSING
6	S-1637-1	HOUSING
5	0770728	DIODE ASSY
4	S1580-1	BATTERY CONTACTOR
3	S1090-22	FUSEHOLDER
2	S1091-1	FUSE
1	C664508-0102	CLOCK
ITEM NO.	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P. 10.1.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.G.SMITH	1-25-77
CHECK	J. YOUELL	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — CLOCK

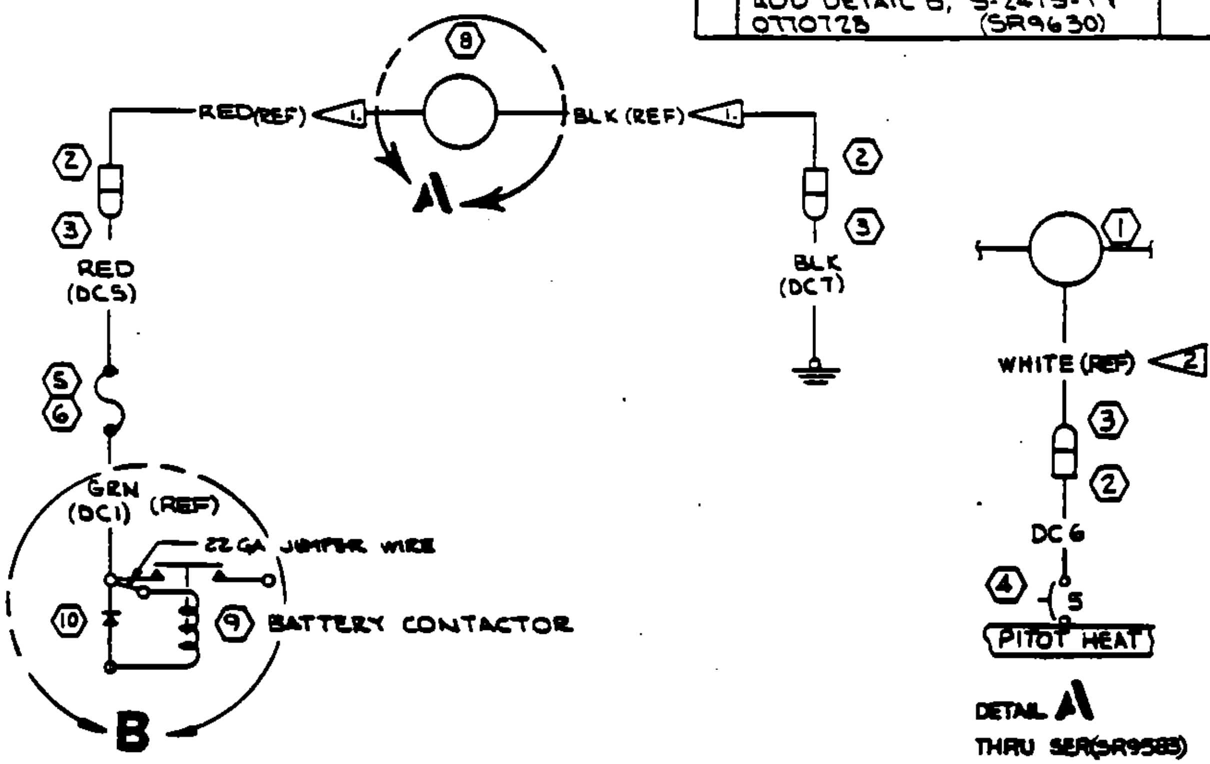
SIZE: C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR8458) | PAGE: 10.1

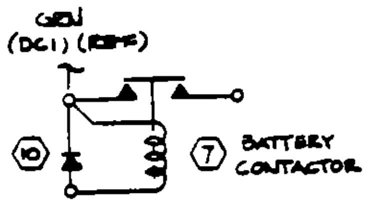
NOTES:

1. INSTALL S-1636-1 ON VENDOR WIRE
2. INSTALL S-1635-1 ON VENDOR WIRE

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: WHITE (REF) WAS RED (REF), RED (REF) WAS BLU (REF), RED DC5 WAS BLU DC5; GRN (DC1) (REF) WAS GRN (DC1), DC7 WAS DC4 (SR9187)	CMK 7-13-78	
B	BY REV: ADD DETAIL A & C664511-0102 (SR 9583) ADD DETAIL B, S-2475-1 & 0770728 (SR9630)	HHG 2-13-80	



DETAIL A
THRU SER (SR9583)



DETAIL B
THRU SER (SR9630)

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
DC6	18			S-1367+S-1636-1			THRU SER (SR9583)
BLK (REF)				1			
WHT (REF)				2			THRU SER (SR9583)
RED (REF)				1			
RED (DC5)	22	-22-2		SOLDER	S-1635-1		
BLK (DC7)	18	-18-0		S-1635-1	S-1367-8		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
10	0770728	DIODE ASSY
9	S-2475-1	BATT. CONTACTOR
8	C664511-0102	DIGITAL CLOCK
7	S-1580-1	CONTACTOR
6	S-1091-1	FUSE
5	S-1090-22	FUSEHOLDER
4	S-1360-5L	CIRCUIT BREAKER
3	S-1637-1	HOUSING
2	S-1637-2	HOUSING
1	C664511-0101	DIGITAL CLOCK

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	6-12-78
GROUP	W. HARLOW	4-12-78
DRAWN	R. YOUNGERS	4-11-78
CHECK	BORLESKE	4-11-78
STRESS		
PROJ	J.W. MOORE	4-14-78
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — DIGITAL CLOCK (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835
SCALE: NONE	(SR9187)	PAGE: 10.2

NOTES:

1. INSTALL S1635-1 TERMINAL ON VENDOR FURNISHED WIRE
2. INSTALL S1636-1 TERMINAL ON VENDOR FURNISHED WIRE
3. INSTALL S1367-1-6 TERMINAL ON VENDOR FURNISHED WIRE
4. REQD ONLY WHEN OPT DIGITAL CLOCK C669511 IS INSTALLED

REVISION			
LTR	DESCRIPTION	DATE	APPD
A	BY REV: ADD C669545, DETAIL A & SER, LB42, LB43, & LB44; SER OUT LB17; S-1370-1/LB14 WAS SOLDER (SR8778)	CS 3-9-78	
B	BY REV: ADD NOTE 4, LB45, S2431-1 & MS25231-1819; 2000C201J WAS 2000B271J (SR9187)	CMK 7-13-78	
C	BY REV: ADD 2 LTS/C669545	DLP 8-23-78	
D	BY REV: ADD DETAIL A (SER C669545-0107 (SR9437)	HHG 9-25-78	

WIRE TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS	
LB45	22			S-1829-1	S-1370-1	4	
LB44	22	-22-2-4		SEE LB14	SOLDER	SER (SR8778) ON	
LB43	22	-22-2-9		S-1367-1-8	S-1367-1-8	SER (SR8778) THRU (SR9437)	
LB42	22			S-1829-1	S-1367-1-8	SER (SR8778) THRU (SR9437)	
[illegible]	22	-22-2-4		SOLDER	SOLDER		
[illegible]		-22-2-4		SOLDER	SOLDER		
[illegible]		-22-2		SOLDER	S1636-1		
[illegible]		-22-2		S1635-1	SOLDER		
[illegible]		-22-0		SOLDER	SOLDER		
[illegible]		-22-0		SOLDER	SOLDER		
[illegible]		-22-0		SOLDER	S1367-1-8		
[illegible]		-22-0		SOLDER	S1367-1-8		
[illegible]		-22-0		S1370-1	S1367-1-8		
LB17				S1829-1	S1370-1		
LB16				S1829-1	SOLDER		
LB15				SOLDER	S1367-1-8		
LB14				S1829-1	S-1370-1		
LB13				S1695-1	S1367-1-8		
LB12				S1829-1	S1636-1		
LB11				S1635-1	S1829-1		
LB10				SOLDER	S1635-1		
LB9				SOLDER	SOLDER		
LB8				SOLDER	S1635-1		
LB7				S1636-1	S1829-1		
LB6				S1636-2	S1829-1		
LB5				S1829-1	S1370-1		
LB4				S1635-1	S1829-1		
LB3				SOLDER	S1636-1		
LB2				SEE LB1	SOLDER		
LB1	22			S1367-1-6	S1636-2		

EQUIPMENT TABLE

ITEM NO	PART NO.	DESCRIPTION	
21	C669545-0107	INST CLUSTER	
20	S-2431-1	SOCKET	4
19	MS25231-1819	LIGHT	4
18	C669545-0103	INST CLUSTER	
17	S1899	LIGHT ASSY	
16	1213319	LIGHT ASSY	
15	1270479	LIGHT ASSY	
14	S1695-2	SWITCH	
13	0700623	HOUSING ASSY	
12	S2035-1	HOUSING	
11	S2035-2	HOUSING	
10	MS25237-327	LAMP	
9	S1637-1	HOUSING	
8	S1637-2	HOUSING	
7	1570166	DIMMING ASSY	
6	S1640-6	HOUSING	
5	S1641-6	HOUSING	
4	S4004-818	TERMINAL BLOCK	
3	S2000C201J	RESISTOR	
2	S1304-2	RESISTOR	
1	S1360-5L	CIRCUIT BREAKER	

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 1270625 P. 1L16.4

SUPERSEDED BY:

CONTRACT NO.

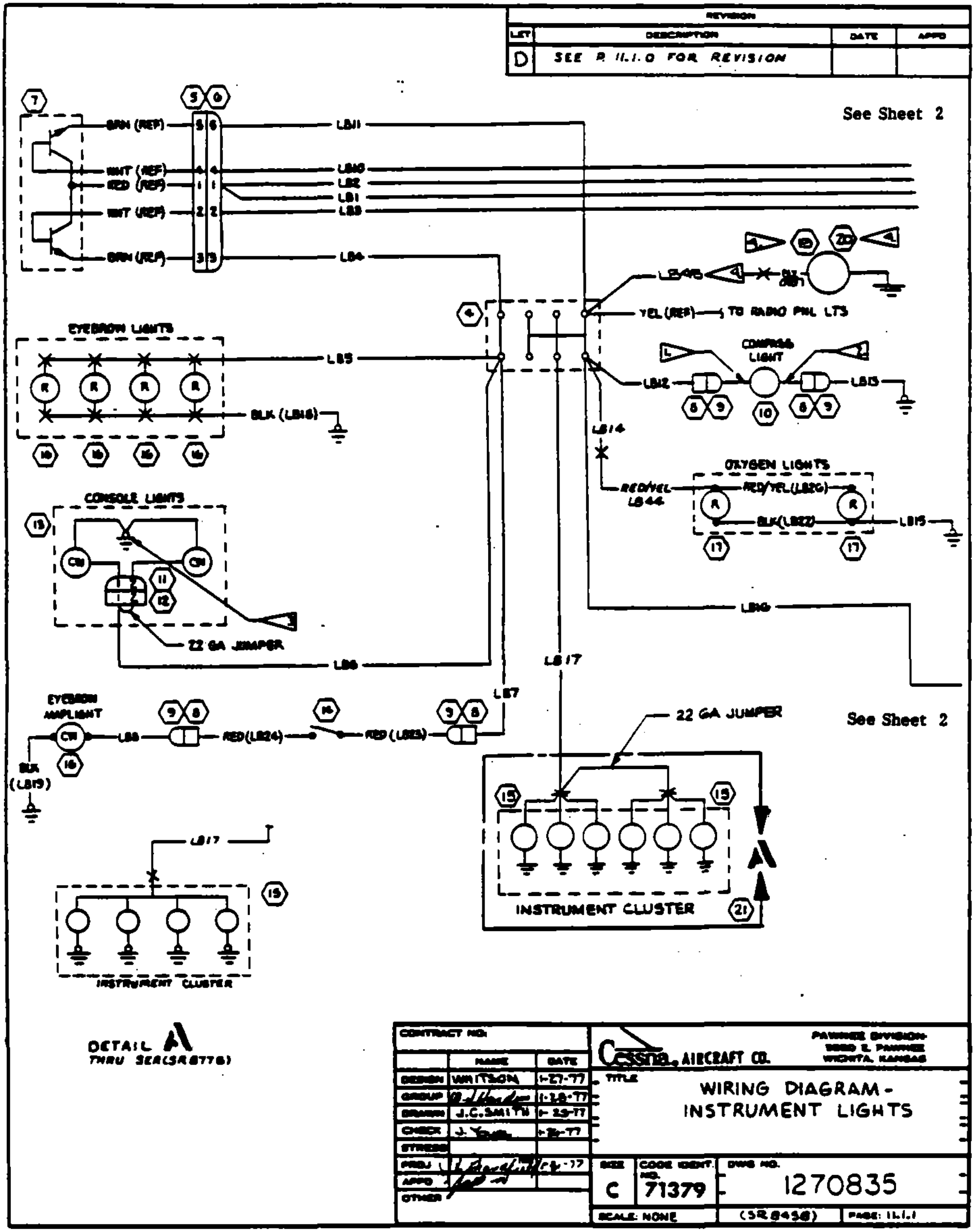
	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C.SMITH	1-25-77
CHECK	J. TOUBL	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

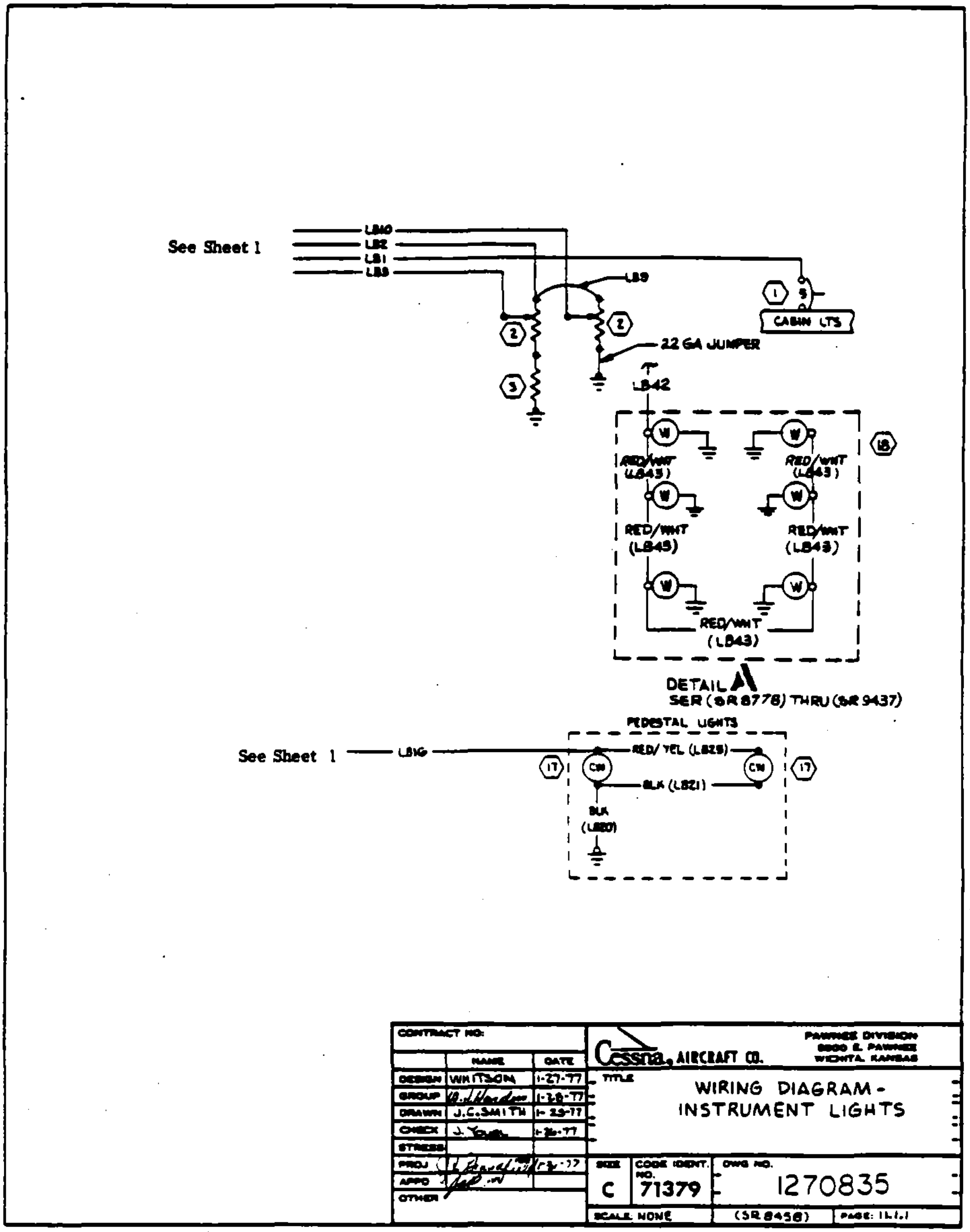
TITLE
WIRING DIAGRAM —
INSTRUMENT LIGHTS

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE (SR 8458) PAGE: 1L1.0



Instruments Lights (Sheet 1 of 2)



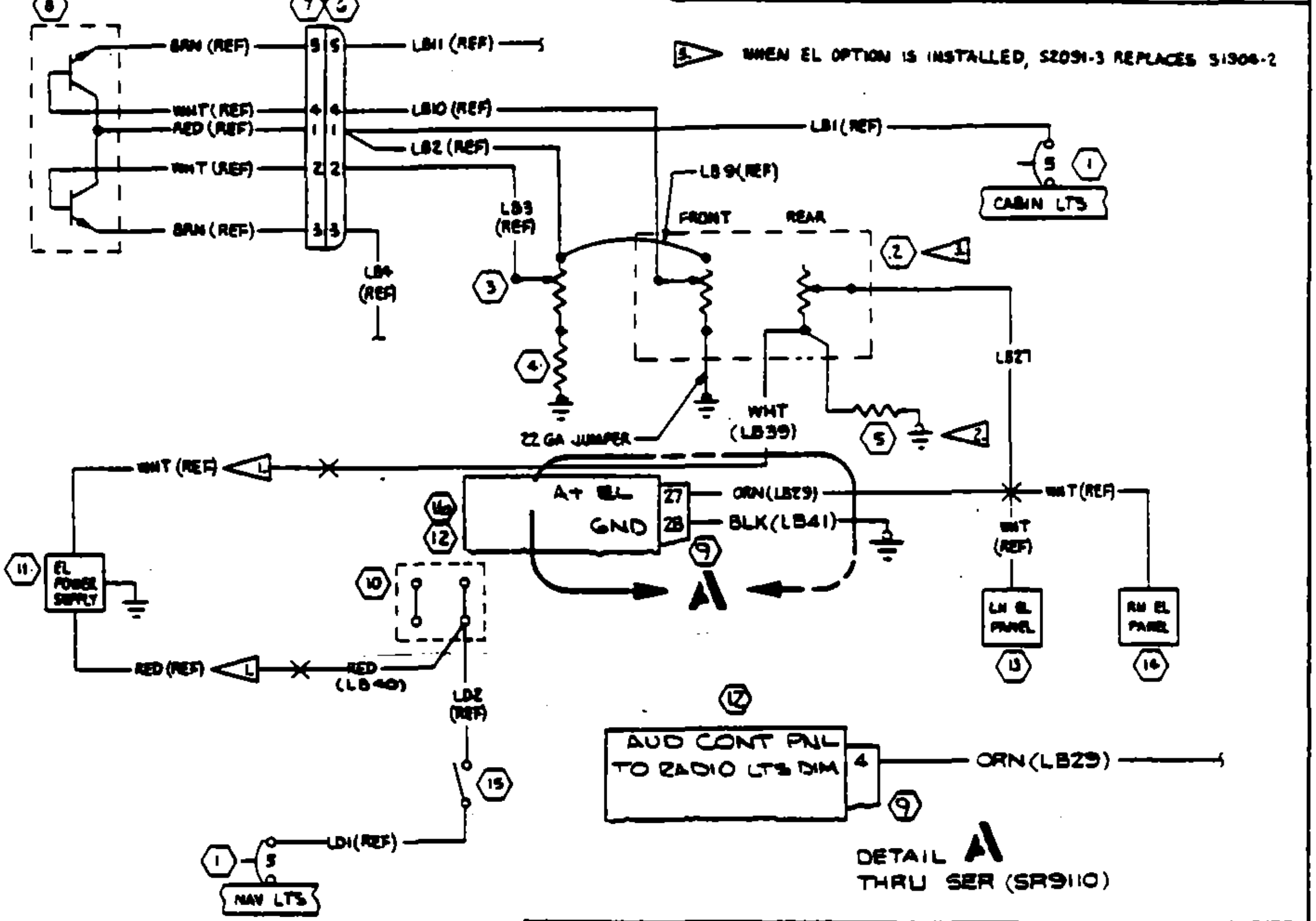
Instruments Lights (Sheet 2 of 2)

NOTES:

1. TO BE RETAINED IN TERMINAL, WIRE MUST BE STRIPPED, DOUBLED & TWISTED

2. THIS END OF RESISTOR TERMINATED WITH S1367-1-14 TERMINAL & INSTALLED ON BUSHING OF TANDEM POT ASSY. DUE TO HEAT DISSIPATION, RESISTOR MUST BE KEPT FROM WIRE BUNDLE

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: DELETE 1213757 & LB28; SEE LB27 WAS SEE LB28 (SR8458)	C R S 3-4-77	
B	BY REV: S-2000C201J WAS S-2000B271J (SR8968)	C R S 10-3-77	
C	BY REV: ADD DETAIL A LB41 & SER 0570442 & 2470003 (SR9110)	DLP 2-20-79	



16	2470003	AUD CONT PNL	
15	S2160-1	SWITCH	
14	1213722	EL PANEL ASSY	
13	1213723	EL PANEL ASSY	
12	0570442	AUD CONT PNL	
11	C613001-0101	POWER SUPPLY	
10	S4002-5S	TERMINAL BLOCK	
9	87149-7	CONNECTOR	
8	1570166	DIMMING ASSY	
7	S1641-6	HOUSING	
6	S1640-6	HOUSING	
5	WL-5-6000	RESISTOR	
4	S-2000C201J	RESISTOR	
3	S1304-2	RESISTOR	
2	S2091-3	RESISTOR	
1	S1360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK(LB41)	22	-22-0		85969-6	S1367-8		SER (SR9110) & ON
RED(LB40)	22	-22-2		S1370-1	S1629-1		
WHT(LB39)		-22-9		SOLDER	S1370-1		
ORN(LB29)		-22-3		SEE LB27	85969-6		
LB27	22			SOLDER	S1370-2		

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER 64400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 1270625 P.11.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-27-77
DRAWN	J.C. SMITH	1-26-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — ELECTRO LUMINESCENT PANEL

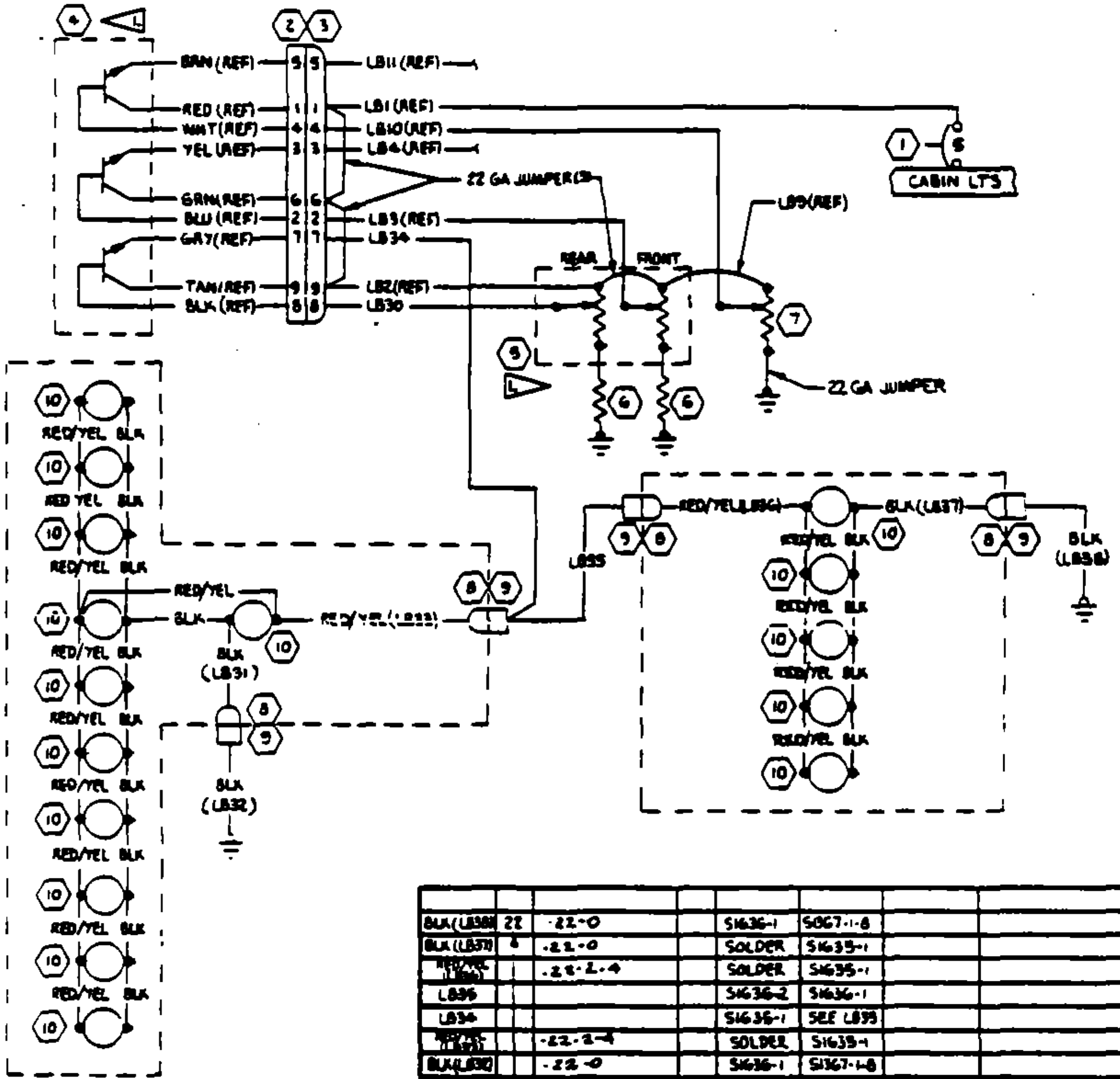
SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR8458) | PAGE: 11.2

REVISION			
LET	DESCRIPTION	DATE	APPD
A	B7 REV: S-2000C201J WAS S-2000B271J (SR8968)	C.R.S. 10-3-77	

NOTES:

1. WHEN POST LIGHT OPTION IS INSTALLED 1570301-1 DIMMING ASSY REPLACES 1570166 & S2097-1 POTENTIOMETER ASSY REPLACES S1504-2



BLK (LB38)	22	-22-0		S1636-1	S067-1-8		
BLK (LB37)		-22-0		SOLDER	S1635-1		
RED/YEL (LB36)		-22-2-4		SOLDER	S1635-1		
LB35				S1636-2	S1636-1		
LB34				S1636-1	SEE LB35		
RED/YEL (LB33)		-22-2-4		SOLDER	S1635-1		
BLK (LB32)		-22-0		S1636-1	S1367-1-8		
BLK (LB31)		-22-0		SOLDER	S1635-1		
LB30				SOLDER	S1636-1		
BLK				SOLDER	SOLDER		
RED/YEL	22	-22-2-4		SOLDER	SOLDER		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

10	S1899-	LIGHT ASSY	
9	S1637-2	HOUSING	
8	S1637-1	HOUSING	
7	S1904-2	RESISTOR	
6	S-2000C201J	RESISTOR	
5	S2091-7	POTENTIOMETER ASSY	
4	1570301	DIMMING ASSY	
3	S1640-9	HOUSING	
2	S1641-9	HOUSING	
1	S1360-5L	CIRCUIT BREAKER	
FIND NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-1XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P. IL17.4

SUPERSEDED BY:

CONTRACT NO:

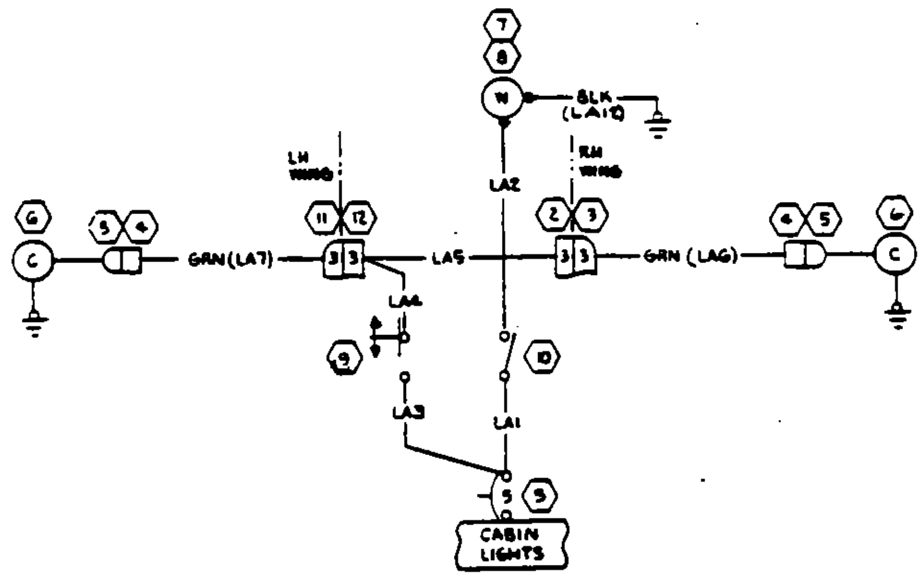
	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C.SMITH	1-25-77
CHECK	J. YOUSL	1-26-77
STRESS		
PROJ		1-3-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — POST LIGHTS (OPT)

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR 8458) | PAGE: 11.3



12	S1641-6	HOUSING	
11	S1640-6	HOUSING	
10	S2160-1	SWITCH	
9	S1831-1	SWITCH	
8	1210110	CABIN LIGHT ASSY	
7	MS25069-1495	LAMP	
6	1201054	COURTESY LIGHT INSTL	
5	S1637-1	HOUSING	
4	S1637-2	HOUSING	
3	S1640-12	HOUSING	
2	S1641-12	HOUSING	
1	S1360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK(LA10)	22	-22-0		SOLDER	S-1367-1-6		
GRN(LA7)	22	-22-5		S1635-1	S1636-1	(STD)	
GRN(LA6)		-22-5		S1635-1	S1636-1	(STD)	
LA5				SEE LA4	S1636-1	(STD)	
LA4				S1830-1	S1636-2	(STD)	
LA3				S1367-1-6	S1830-1	(STD)	
LA2				S1493-1	SOLDER		
LA1	22			S1367-1-6	S1493-1		

WIRE TABLE

CONTRACT NO:

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-28-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOAKEL	1-26-77
STRESS		
PROJ	[illegible]	1-31-77
APPD	[illegible]	
OTHER		

TITLE WIRING DIAGRAM — DOME & COURTESY LIGHTS

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (3R8458) | PAGE: 11.4

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXX=CESSNA STD. NO.

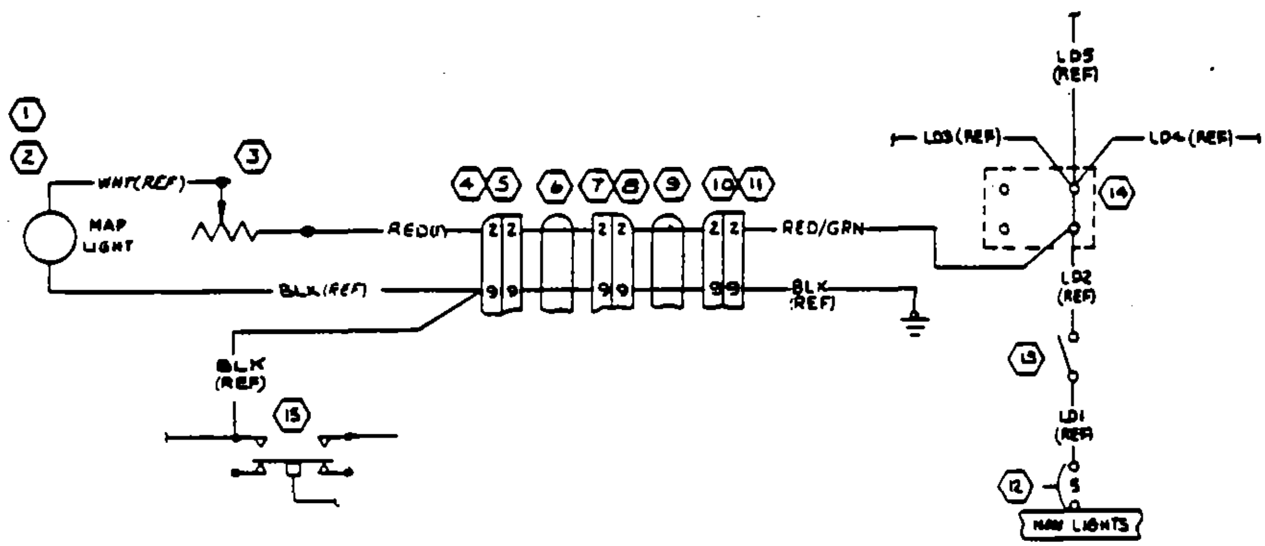
SUPERSEDES: 1270625 P. 11.1.2

SUPERSEDED BY:

NOTES:

1. FOR INTERCONNECTION WITH ELECTRIC ELEVATOR TRIM SEE PAGE 14.2.0

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: PINS 2 WAS PINS 8, RED/GRN WAS BLK(REF). BLK(1) WAS RED/GRN, MOVED GND TO BLK(1), 8568-10 WAS -22-0 & -22-2-5, 8568-2 WAS -22-2, S-1367-1-8 WAS S-1829-1 (SR8458)	CRS 3-4-77	
B	BY REV: ADD S-1985-1; WHT(REF) WAS RED(2), BLK(REF) WAS BLK (SR 8458)(REF)	CRS 11-21-77	
C	BY REV: BLK(REF) WAS BLK (1) (NOW SHOP PRACTICE)(MER-182-EO-0829)	DFS 8-5-90	



ITEM NO.	PART NO.	DESCRIPTION	
16			
15	S-1985-1	MIKE SWITCH	
14	34002-55	TERMINAL BLOCK	
13	S-2160-1	SWITCH	
12	S-1360-5L	CIRCUIT BREAKER	
11	S-1961-2-0	HOUSING	
10	S-1961-1-0	HOUSING	
9	1370307-3	CABLE	
8	1370307	CONNECTOR ASSY	
7	3421-0000	CONNECTOR SOCKET	
6	1270844	CABLE	
5	3473-3000	CONNECTOR SOCKET	
4	1270842-1	CONNECTOR ASSY	
3	3859A16 152A	RHEOSTAT	
2	24RB	LAMP	
1	4157-001	SOCKET	

EQUIPMENT TABLE

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS
RED(1)	22	8568-2		SOLDER	SOLDER	
RED/GRN	22	-22-2-5		S-1829-1	S-1963-2	

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 1270625 P.11.11.4

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-24-77
DRAWN	J.C.SMITH	1-25-77
CHECK	J.YOUEL	1-26-77
STRESS		
PROJ		
APPD		
OTHER		

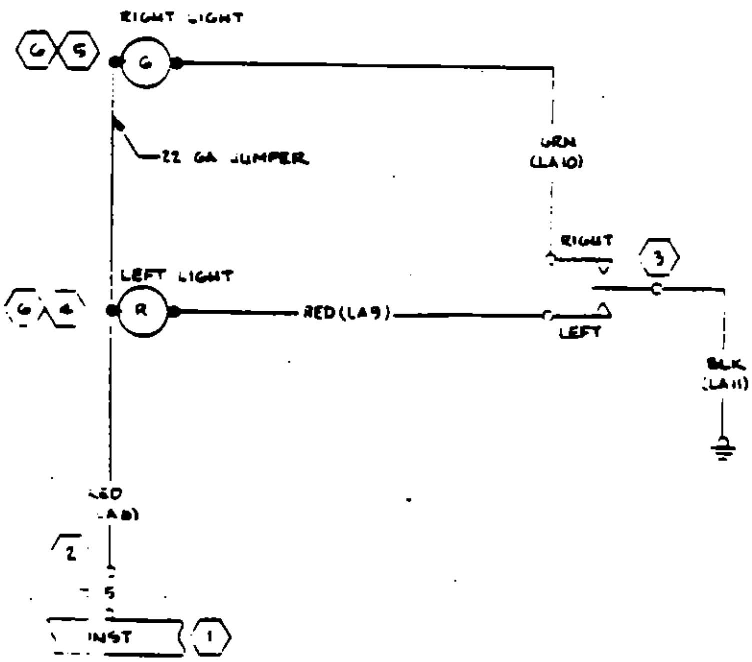
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE

WIRING DIAGRAM — MAP LIGHT, CONTROL WHEEL (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR8458) PAGE: 11.5



CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (LA11)	22	-22-0		S-1367-1-6	S-1367-1-6		
GRN (LA10)	22	-22-5		SOLDER	S-1367-1-6		
RED (LA9)	22	-22-2		SOLDER	S-1367-1-6		
RED (LA8)	22	-22-2		S-1367-1-6	SOLDER		

WIRE TABLE

	PART NO.	DESCRIPTION	
6	GE327	LAMP	
5	14-30380-TPG	LIGHT ASSY	
4	14-30380-LPG	LIGHT ASSY	
3	S-1238-1-1	SWITCH	
2	S-1360-5L	CIRCUIT BREAKER	
1	0713094	BUS BAR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 1270625 P.11.12.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-28-77
DRAWN	HARVEY	1-28-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ	[illegible]	1-3-77
APPD	[illegible]	
OTHER		

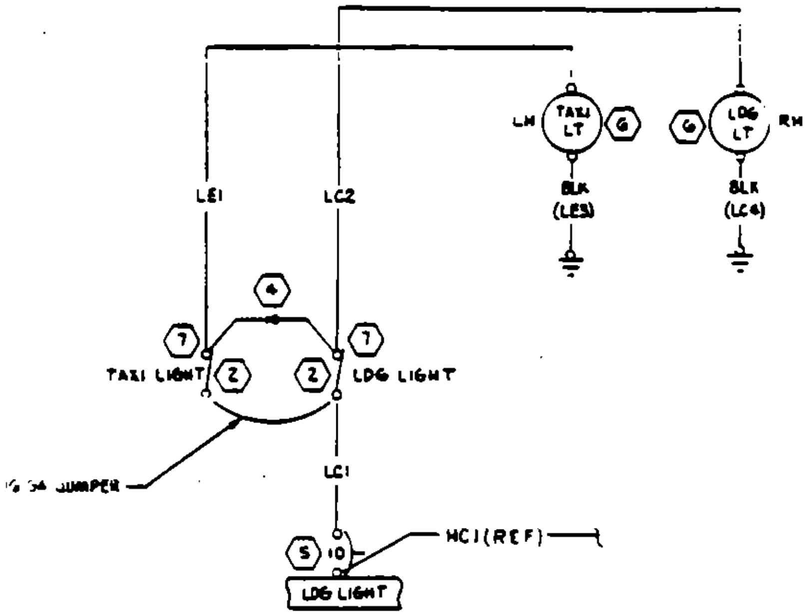
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM—
SKYDIVING SIGNAL LIGHT
(OPT)

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (3R8958) | PAGE: 11.6

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S1360-10L WAS S1360-15L, ADD HC1 (REF), 18 GA WIRE WAS 16 S1367-1-8 WAS [illegible], S[illegible]-1 WAS S1[illegible], S1[illegible]3-1 WAS [illegible] S1367-1-6 WAS S1367-2-6 [illegible] WAS S1493-2 [illegible]	C R S 3-4-77	[illegible]
B	BY REV: DELETE S2735-1-2 HOUSING, LE2 WIRE, & LC3 WIRE. ON LE1 & LC2 WIRE S1367-1-8 TERMINAL WAS S1636-1. TAXI LIGHT LH WAS RH. LDG LIGHT RH WAS LH (NOW SHOP PRACTICE) (MER 206-60677)	TPS 4-12-78	JAD [illegible]



BLK(LE3)	18			S1367-1-8	S1367-1-8		
LE1				S1493-1	S1367-1-8		
BLK(LC4)				S1367-1-8	S1367-1-8		
LC2				S1493-1	S1367-1-8		
LC1	18			S1367-1-6	S1493-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

7	S2023-1	ADAPTER - TERMINAL	
6	4591	LAMP	
5	S1360-10L	CIRCUIT BREAKER	
4	1270082	DIODE ASSY	
3			
2	S2160-1	SWITCH	
1			
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P[illegible]
SUPERSEDED BY:

CONTRACT NO:

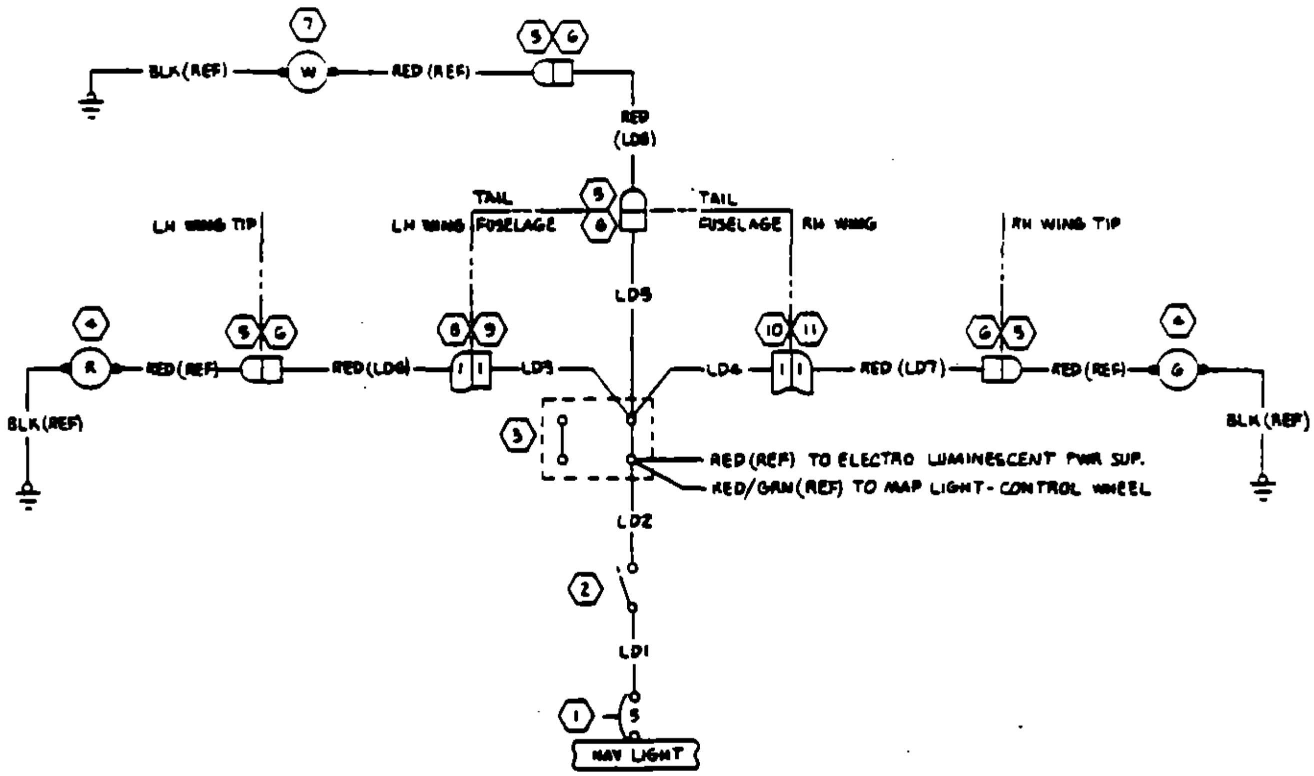
	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-28-77
DRAWN	J.C.SMITH	1-25-77
CHECK	J.YOUEL	1-26-77
STRESS		
PROJ	[illegible]	[illegible]
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — LANDING LIGHT & TAXI LIGHT

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR 8458) PAGE: 11.7



RED(LD8)	22			S1635-1	S1636-1		
RED(LD7)				S1635-1	S1636-1		
RED(LD6)				S1635-1	S1636-1		
LD5				S1829-1	S1636-1		
LD4				S1829-1	S1636-1		
LD3				S1829-1	S1636-1		
LD2				S1493-1	S1829-1		
LD1	22			S1367-1-6	S1493-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

11	S1640-12	HOUSING	
10	S1641-12	HOUSING	
9	S1641-6	HOUSING	
8	S1640-6	HOUSING	
7	C622001-0102	LIGHT ASSY	
6	S1637-2	HOUSING	
5	S1637-1	HOUSING	
4	C622001-0201	LIGHT ASSY	
3	34002-55	TERMINAL BLOCK	
2	S2160-1	SWITCH	
1	S1360-5L	CIRCUIT BREAKER	
FIND NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES: 0470625 P.8.4.2

SUPERSEDED BY:

CONTRACT NO.

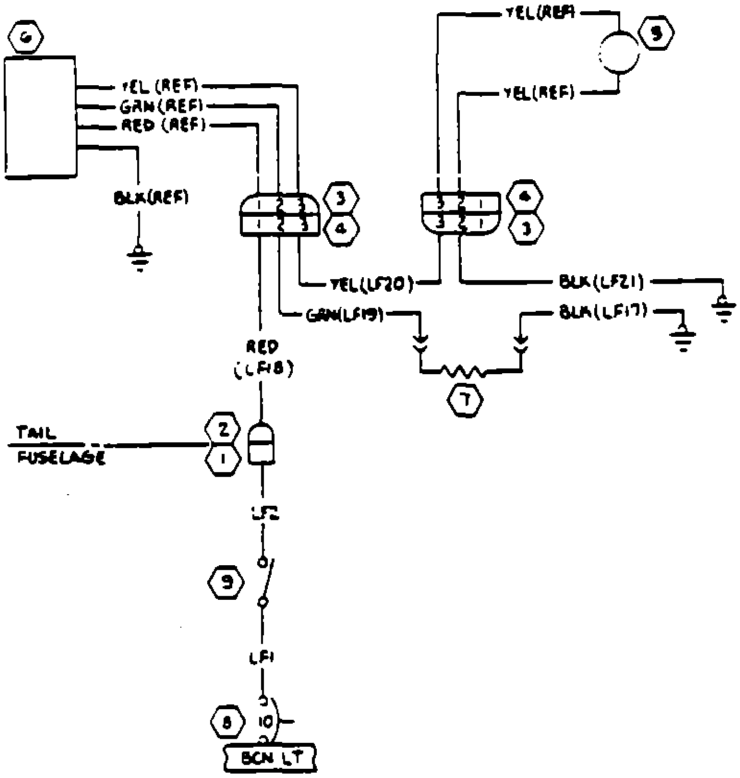
	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-28-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUNG	1-26-77
STRESS		
PROJ	[illegible]	1-31-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE

WIRING DIAGRAM — NAVIGATION LIGHTS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835
SCALE: NONE	(SR8458)	PAGE: 11.8



BLK(LF21)	18	-18-0		S1635-1	S1367-1-8		
BLK(LF17)		-18-0		S1493-1	S1367-1-8		
YEL(LF20)		-18-4		S1636-1	S1635-1		
GRN(LF19)		-18-5		S1636-1	S1493-1		
RED(LF18)		-18-2		S1635-1	S1636-1		
LF2				S1493-1	S1636-1		
LF1	18			S1367-1-6	S1493-1		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

9	S2160-1	SWITCH	
8	S1360-10L	CIRCUIT BREAKER	
7	0R95-6	RESISTOR	
6	C584502-0102	FLASHER ASSY	
5	C621001-0102	LIGHT ASSY	
4	S1638-1	HOUSING	
3	S1638-2	HOUSING	
2	S1637-1	HOUSING	
1	S1637-2	HOUSING	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 1270625 P.11,14.1

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

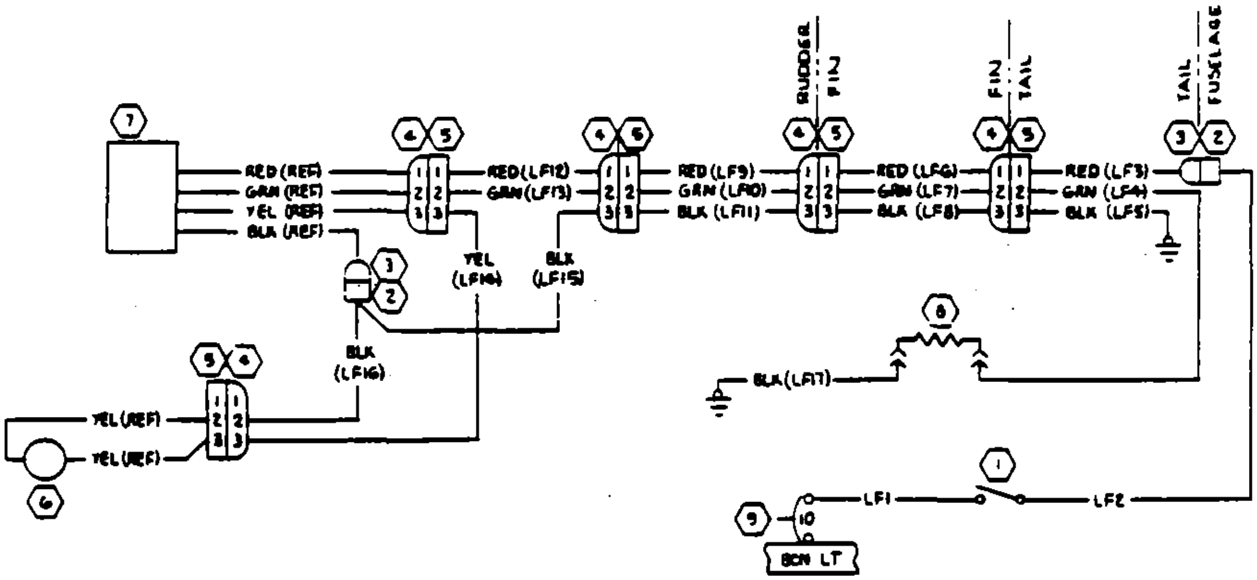
Cessna AIRCRAFT CO.

PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — FLASHING BEACON LIGHT

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR 8438) PAGE: 11.9



BLK(LF17)	18	-18-0		S1493-1	S1367-1-8		
BLK(LF16)		-18-0		S1636-2	S1635-1		
BLK(LF15)		-18-0		S1635-1	SEE LF16		
YEL(LF14)		-18-4		S1636-1	S1635-1		
GRN(LF13)		-18-5		S1635-1	S1636-1		
RED(LF12)		-18-2		S1635-1	S1636-1		
BLK(LF11)		-18-0		S1635-1	S1636-1		
GRN(LF10)		-18-5		S1635-1	S1636-1		
RED(LF9)		-18-2		S1635-1	S1636-1		
BLK(LF8)		-18-0		S1635-1	S1636-1		
GRN(LF7)		-18-5		S1635-1	S1636-1		
RED(LF6)		-18-2		S1635-1	S1636-1		
BLK(LF5)		-18-0		S1636-1	S1367-1-8		
GRN(LF4)		-18-5		S1636-1	S1493-1		
RED(LF3)		-18-2		S1635-1	S1636-1		
LF2				S1493-1	S1636-1		
LF1	18			S1367-1-6	S1493-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

9	S1360-10L	CIRCUIT BREAKER	
8	OR95-6	RESISTOR	
7	C594502-0102	FLASHER ASSY	
6	C621001-0102	LIGHT ASSY	
5	S1638-1	HOUSING	
4	S1638-2	HOUSING	
3	S1637-1	HOUSING	
2	S1637-2	HOUSING	
1	S2160-1	SWITCH	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 1270625 P 11.5.4.1

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	J.C.SMITH	1-25-77
CHECK	J. YOWELL	1-26-77
STRESS		
PROJ		1-2 77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

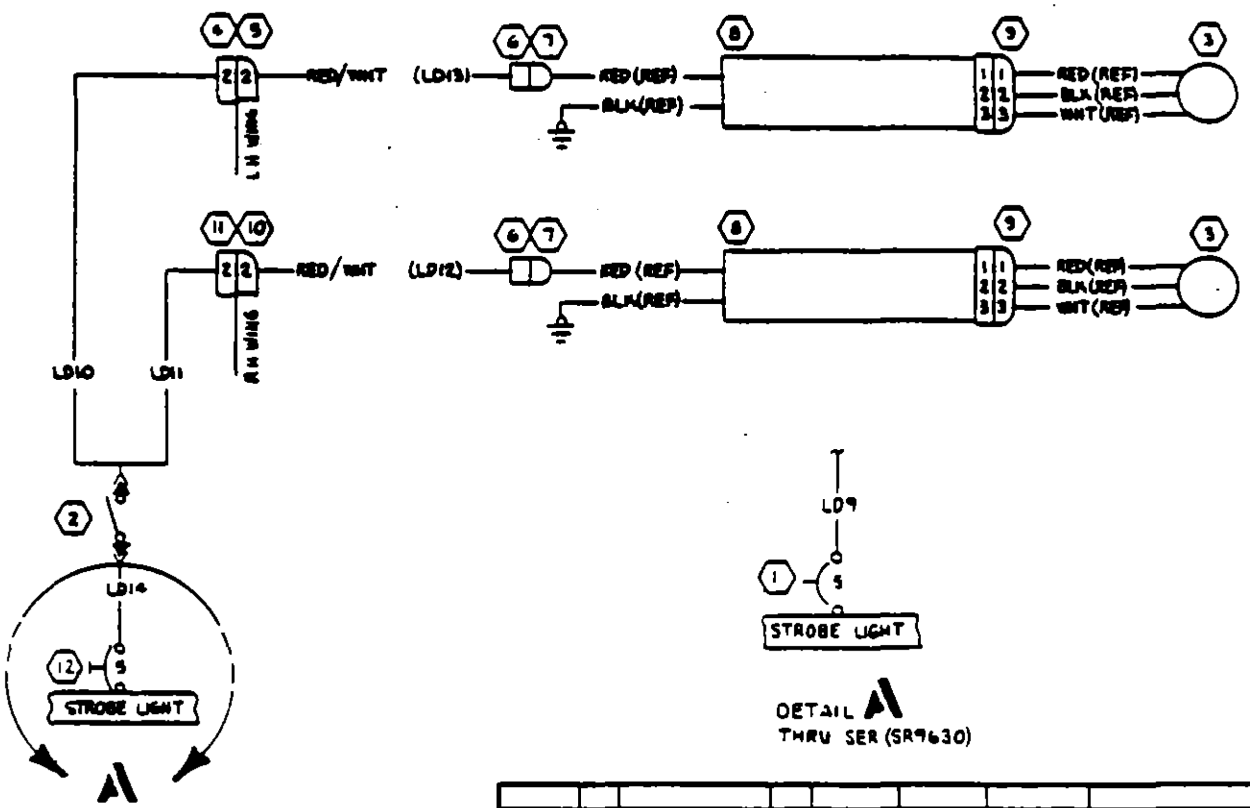
TITLE

WIRING DIAGRAM — FLASHING BEACON (FLOATPLANE)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR 8458) | PAGE: 11.10

LTR	REVISION DESCRIPTION	DATE	APPD
A	BY REV: LD12 & LD13 20 GA WIRE WAS 22 GA, (SR8458)	CRS 3-4-77	
B	BY REV C622006 0107 WAS 0101; DELETE "PIGTAIL"/C622008-0102 (SR8458)(REF)	GLP 6-2-78	
C	BY REV: ADD DETAIL 'A', S-1232-5, LD14 & SER (SR9630)	RAO 3-27-80	



LD14	22			S-1367-1-8	S-1493-1		SER (SR9630) & ON
(LD13)	20	-20-2-9		S1635-1	S1636-1	(STD)	
(LD12)	20	-20-2-9		S1635-1	S1630-1	(STD)	
LD11	22			SEE LD10	S1636-1	(STD)	
LD10	22			S1493-2	S1636-1	(STD)	
LD9	22			S1367-1-6	S1493-1		THRU SER (SR9630)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

12	S-1232-5	CIRCUIT BREAKER	
11	S1641-12	HOUSING	
10	S1640-12	HOUSING	
9	S1638-2	HOUSING	
8	C622008-0102	POWER SUPPLY	
7	S1637-1	HOUSING	
6	S1637-2	HOUSING	
5	S1640-6	HOUSING	
4	S1641-6	HOUSING	
3	C622006-0107	TUBE & LENS ASSY	
2	S2160-1	SWITCH	
1	S1860-5L	CIRCUIT BREAKER	
FIND NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.11.18.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-26-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUELL	1-26-77
STRESS		
PROJ		
APPD		
OTHER		

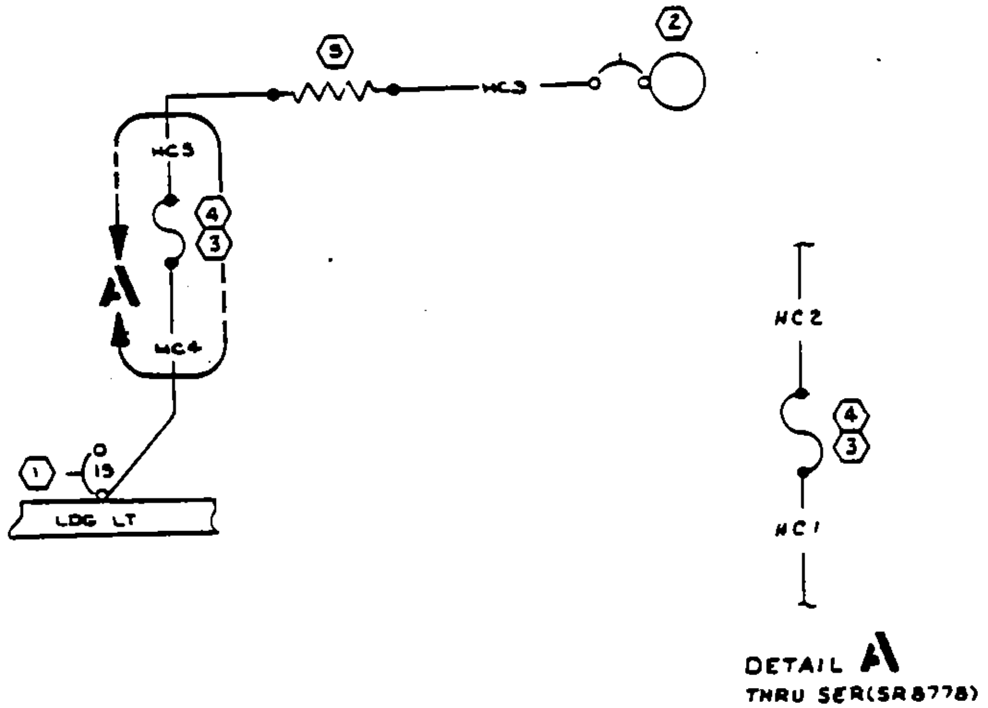
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STROBE LIGHTS, WING TIP (OPT)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR8458) | PAGE: 11.11

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A" & SER; SER OUT HC1, HC2; SER IN HC4 & HC5 (SR8778)	CS 10-4-79	



HC5	18			SOLDER	SOLDER	SER(SR8778) & ON	
HC4	18			S-1367-1-6	SOLDER	SER(SR8778) & ON	
HC3	18			SOLDER	S-1367-1-6		
HC2	18			SOLDER	SOLDER	THRU SER(SR8778)	
HC1	18			S-1367-1-6	SOLDER	THRU SER(SR8778)	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS	

WIRE TABLE

5	3204-50-16	RESISTOR	
4	S-2375-7.5	FUSE	
3	S-2374-7.5	FUSE HOLDER	
2	0513052	LIGHTER ASSY	
1	S-1360-15L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P. 13.1.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-28-77
DRAWN	HARVEY	1-25-77
CHECK	YOUNG	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

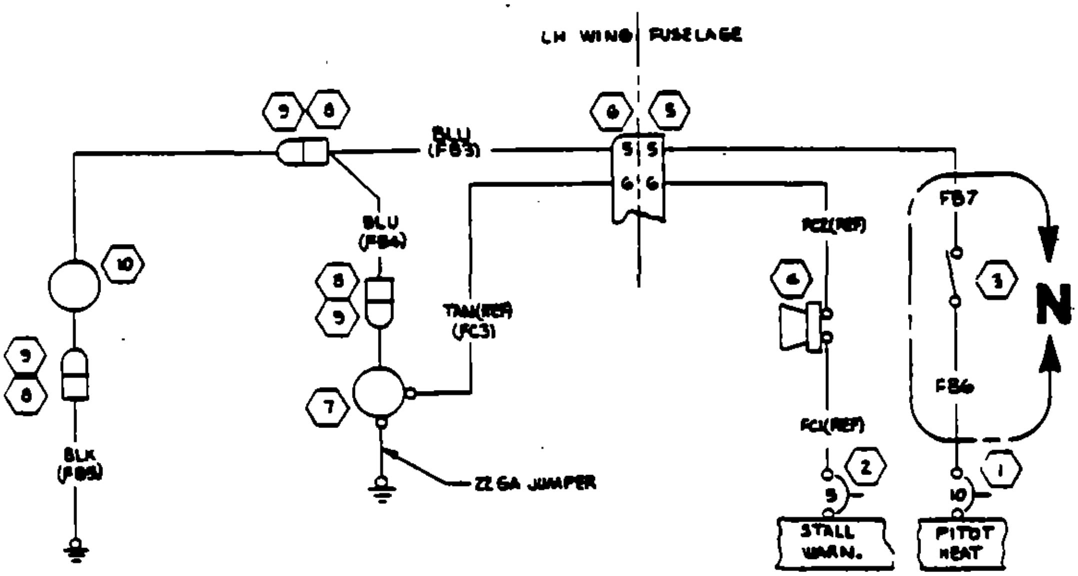
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

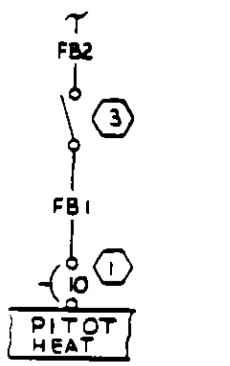
TITLE WIRING DIAGRAM — CIGAR LIGHTER

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR8458) PAGE: 13.1

LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL N, FB6, FB7 (SER (SR9110)	HHG 2-28-79	





DETAIL **N**
THRU SER (SR9110)

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
FB7	18			S1493-1	S1636-1	(STD)	SER (SR9110) & ON
FB6	18			S1493-1	S1367-1-6		SER (SR9110) & ON
BLK (FB5)	18	-18-0		S1636-1	S1367-1-8		
BLU (FB4)		-18-6		SEE FB3	S1636-1	(STD)	
BLU (FB3)		-18-6		S1635-1	S1636-1	(STD)	THRU SER (SR9110)
FB2				S1493-1	S1636-1	(STD)	THRU SER (SR9110)
FB1	18			S1367-1-6	S1493-1		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
10	0721105	PITOT TUBE ASSY
9	S1637-1	HOUSING
8	S1637-2	HOUSING
7	0511062	WING UNIT - XMTR
6	S1640-6	HOUSING
5	S1641-6	HOUSING
4	S2077-8	HORN ASSY
3	S2160-1	SWITCH
2	S1360-5L	CIRCUIT BREAKER
1	S1360-10L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P. 13.3.2
SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-24-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOWELL	1-26-77
STRESS		
PROJ	[illegible]	1-24-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE: WIRING DIAGRAM — HEATED PITOT TUBE & STALL WARNING TRANSMITTER (OPT)

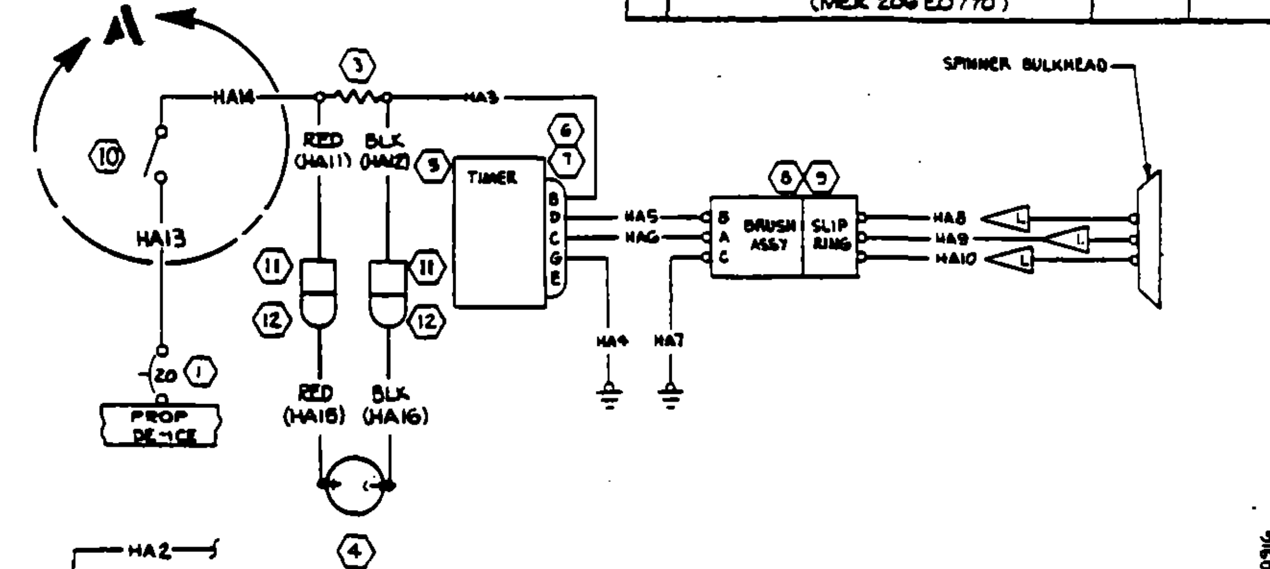
SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835
SCALE: NONE | (SR 8458) | PAGE: 13.2

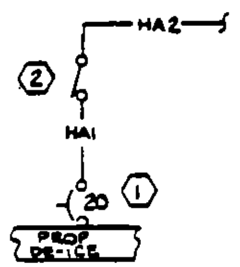
NOTES:

1. FOR COMPLETE INSTL THREE (3) EACH OF THESE WIRES ARE REQUIRED

2. THESE WIRES TO BE PER MIL-W-81044/12-18-9

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S1360-20L WAS S1360-15L & S-382-2 WAS 112-220-101 (SR8458)	GOS 5-7-77	
B	BY REV: S-1367-2-6 WAS S-1367-2-10/ HA1, HA2, HA5, HA6, HA7. S-1367-2-8 (WAS) S-1367-2-12/HA11 & HA12. ADD HA13, HA14 & DETAIL "A" (NOW SHOP PRACTICE)(SR9110).	HHG 2-26-79	
C	BY REV: RED(HA11) WAS HA11, BLK(HA12) WAS HA12, S-1636-2/HA11, HA12 WAS SOLDER. ADD RED(HA15), BLK (HA16), S-1637-1, & S-1637-2 (MER 206 E0770)	MDR 5-22-79	





DETAIL A
THRU SER(SR9110)

10-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (HA16)	14	-14-0		SOLDER	S-1635-2		SER(SR9110) & ON
RED (HA15)	14	-14-2		SOLDER	S-1635-2		SER(SR9110) & ON
HA14	14			S1493-2	S-1367-2-12		SER(SR9110) & ON
HA13	14			S1493-2	S-1367-2-6		SER(SR9110) & ON
BLK (HA12)	14	-14-0		S1367-2-8	S-1636-2		
RED (HA11)	14	-14-2		S1367-2-8	S-1636-2		
HA10		2		S1367-1-6	S1367-1-6	1	
HA9		2		S1367-1-6	S1367-1-6	1	
HA8		2		S1367-1-6	S1367-1-6	1	
HA7	14			S1367-2-10	S1367-2-6		
HA6				SOLDER	S1367-2-6		
HA5				SOLDER	S1367-2-6		
HA4				SOLDER	S1367-2-8		
HA3				S1367-2-12	SOLDER		
HA2				S1367-2-6	S1367-2-12		THRU SER(SR9110)
HA1	14			S1367-2-6	S1367-2-6		THRU SER(SR9110)

WIRE TABLE

	PART NO.	DESCRIPTION	
12	S-1637-1	CONNECTOR	
11	S-1637-2	CONNECTOR	
10	S-2160-1	SWITCH	
9	D40106	SLIP RING	
8	C40055	BRUSH ASSY	
7	MS3106A20-15S	PLUG	
6	MS3057-12A	CLAMP	
5	C165020-0101	TIMER	
4	C662500-0106	GAGE-AMMETER	
3	22370-20	SHUNT	
2	S-382-2	SWITCH	
1	S1360-20L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1000=CESSNA SPEC. NO. S-1XXX OR C1XXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		1-26-77
DRAWN	J.C.SMITH	1-26-77
CHECK	J. YOUEL	1-26-77
STRESS		
PROJ		1-31-77
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — PROP DE-ICE SYSTEM (OPT)

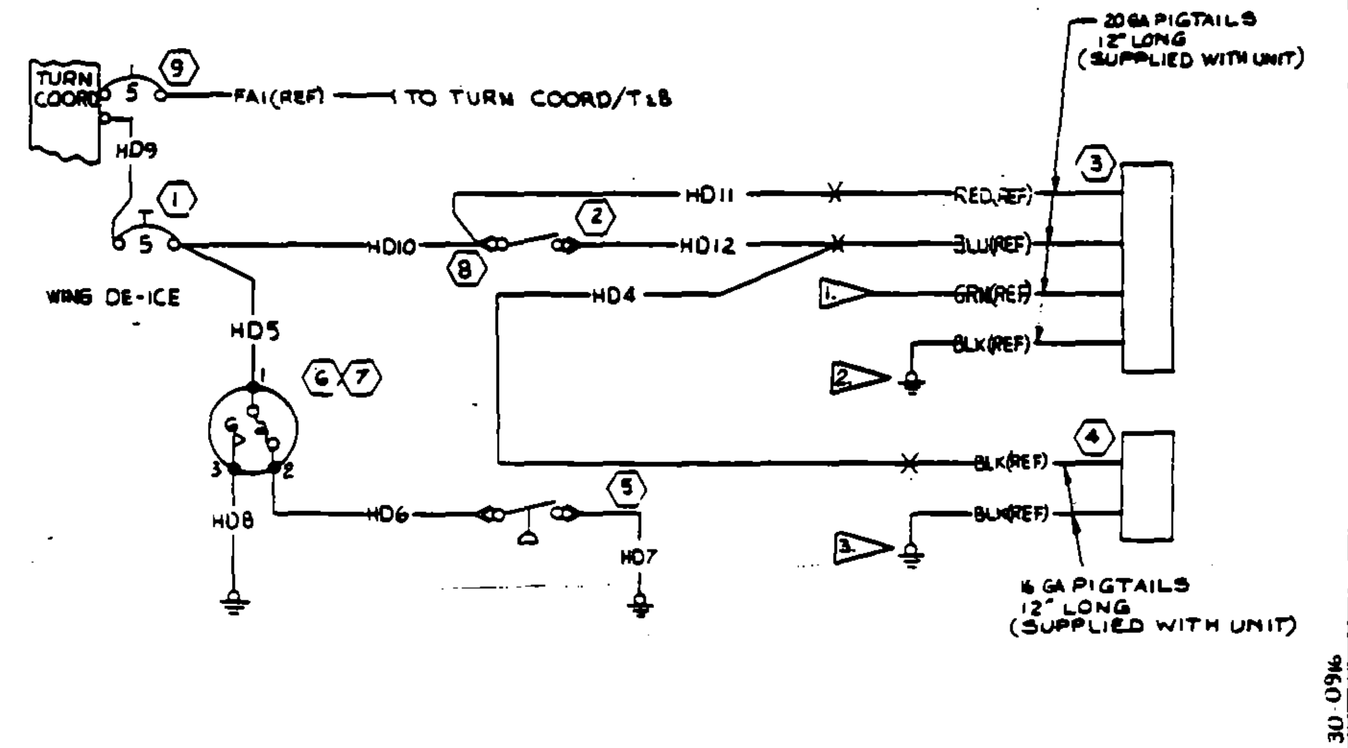
SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

SCALE: NONE (SR 8458) PAGE: 13.3

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV I HD9 WAS CONNECTED TO BUS BAR AT TURN COORD BKR; S-1367-1-8 WAS S-1367-1-6/HD9 (SR9630)	RAO 3-27-80	

NOTES:

1. CAP VENDOR WIRE WITH S-1557-1 CAP.
2. TERMINATE VENDOR FURNISHED WIRE WITH S-1367-1-10 TERMINAL (REF).
3. TERMINATE VENDOR FURNISHED WIRE WITH S-1367-2-10 TERMINAL (REF).



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
HD12	20			S-1493-1	S-1370-1		
HD11	20			S-1493-1	S-1370-0		
HD10	20			S-1367-1-8	S-1493-1		
HD9	20			S-1367-1-10	S-1367-1-8		
HD8	22			S-1367-1-8	SOLDER		
HD7	22			S-1493-1	S-1367-1-8		
HD6	22			S-1493-1	SOLDER		
HD5	22			S-1367-1-8	SOLDER		
HD4	20			S-1370-0	SEE HD12		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
9	S-1360-5L	CKT. BKR.	
8	S-2023-1	ADAPTER	
7	MS25237-327	LAMP	
6	MS25041-3	LIGHT ASSY	
5	1D 1194-1	PRESS. SW.	
4	3D2346-01	VALVE	
3	3D2495-02	TIMER	
2	S-2160-3	SWITCH	
1	S-1232-3	CKT BKR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		3-1-79
GROUP		3-7-79
DRAWN	W.GHAZARIAN	2-26-79
CHECK	BORLESKE	2-28-79
STRESS		
PROJ	J U MOORE	3-22-79
APPD	JBS	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

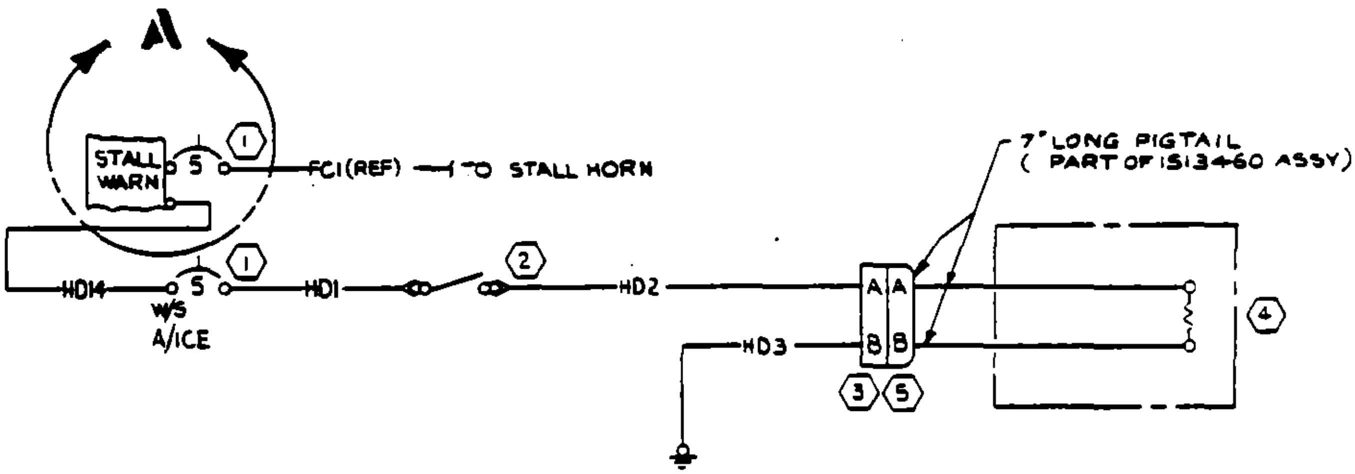
TITLE

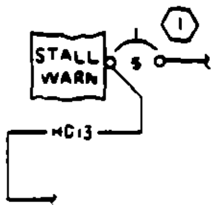
WIRING DIAGRAM — DE ICE SYSTEM-WING&STAB (OPT)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR 9110) | PAGE: 13.4

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A", HD14 & SER (SR9630)	RAD 3-27-80	





DETAIL A
THRU SER (SR9630)

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
HD14	20			S-1367-1-6	S-1367-1-10		SER (SR9630) & ON
HD13	20			S-1367-1-6	S-1367-1-6		THRU SER (SR9630)
HD3	20			SOLDER	S-1367-1-10		
HD2	20			S-1493-1	SOLDER		
HD1	20			S-1367-1-6	S-1493-1		

WIRE TABLE

5	KPT06E8-2P	PLUG	
4	1513460	ANTI-ICE ASSY WINDSHIELD	
3	KPT07E8-2S	RECEPTACLE	
2	S-2160-1	SWITCH	
1	S-1360-5L	CKT. BKR.	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		3-1-79
GROUP		
DRAWN	W. GHAZARIAN	2-26-79
CHECK	BORLESKE	2-28-79
STRESS		
PROJ		
APPD		
OTHER		

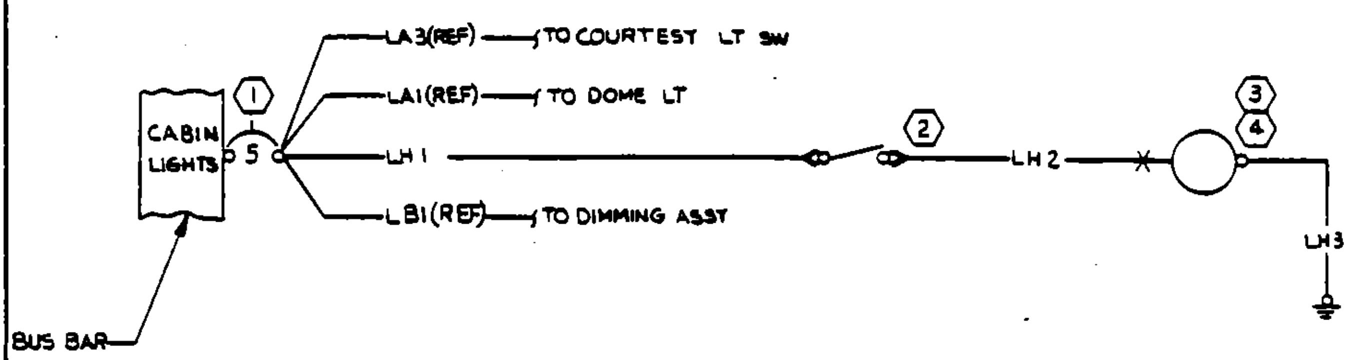
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — WINDSHIELD ANTI-ICE SYSTEM (OPT)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE | (SR9110) | PAGE: 13.3

REVISION			
LET	DESCRIPTION	DATE	APPD



10-0916

LH3	22			S-1367-1-6	S-1367-1-8		
LH2	22			S-B704	S-1493-1		
LH1	22			S-1367-1-6	S-1493-1		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

4	1201115	SOCKET	
3	MS25338-7079	LAMP	
2	S-2160-3	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	[illegible]	3-2-79
GROUP	D. H. [illegible]	3-17-79
DRAWN	W. GHAZARIAN	3-1-79
CHECK	BOLESKE	3-1-79
STRESS		
PROJ	J. H. MOORE	3-22-79
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 1800 E. PAWNEE WICHITA, KANSAS

TITLE **WIRING DIAGRAM — LIGHT, ICE DETECTOR (OPT)**

SIZE	CODE IDENT. NO.	DWG NO
C	71379	1270835

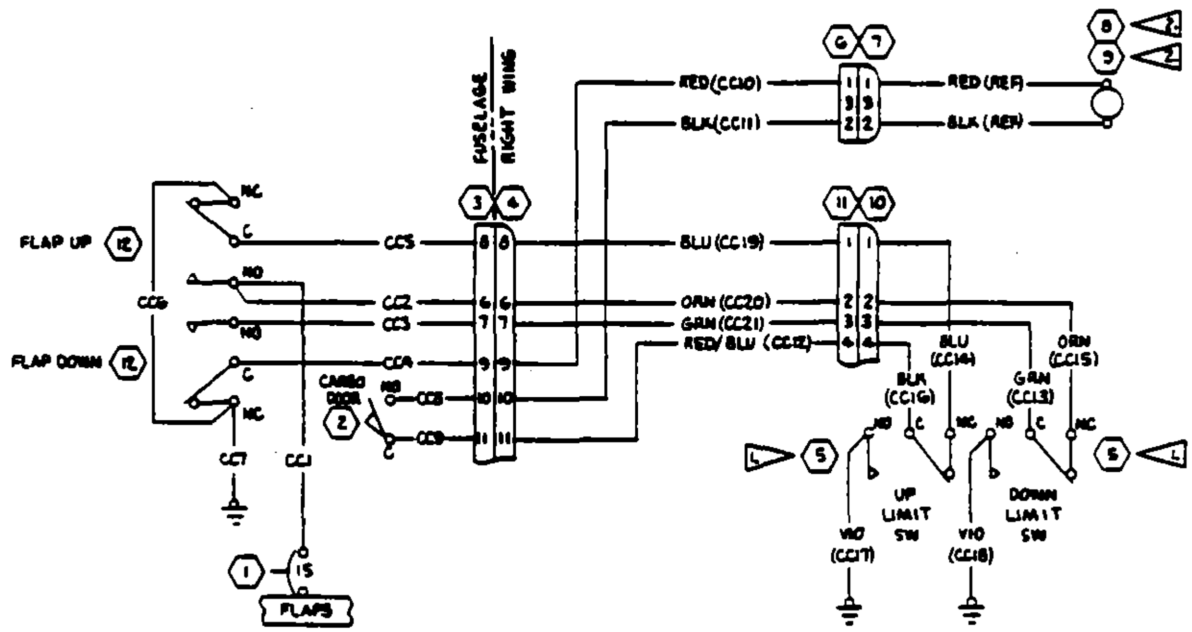
SCALE: NONE (SR 9110) PAGE: 13.6

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. THESE SWITCHES ARE PART OF THE C301002 ACTUATOR ASSY

2. FOR SPARES USE C301002-0302



INACTIVE
THRU SER (SR9110)
SFU 2-13-77

10-0916

WIRE CODE NO	GA	MATERIAL	LG		TERMINALS		SERIALS
GRN(CC22)	16	-16-5			S1636-2	S1636-2	
ORN(CC20)		-16-3			S1695-2	S1636-2	
BLU(CC19)		-16-6			S1635-2	S1636-2	
VIO(CC18)		-16-7			S1493-2	S1367-2-8	
VIO(CC17)		-16-7			S1493-2	S1367-2-8	
BLK(CC16)		-16-0			S1635-2	S1493-2	
ORN(CC15)		-16-3			S1635-2	S1493-2	
BLU(CC14)		-16-6			S1635-2	S1493-2	
GRN(CC13)		-16-5			S1635-2	S1493-2	
RED/BLU (CC12)		-16-2-0			S1635-2	S1636-2	
BLK(CC11)		-16-0			S1635-2	S1636-2	
RED(CC10)		-16-2			S1635-2	S1636-2	
CC9					S1493-2	S1636-2	
CC8					S1493-2	S1636-2	
CC7					S1367-2-4	S1367-2-8	
CC6					S1367-2-4	S1367-2-4	
CC5					S1367-2-4	S1636-2	
CC4					S1367-2-4	S1632-2	
CC3					S1367-2-4	S1636-2	
CC2					S1367-2-4	S1636-2	
CC1	16				S1367-2-6	S1367-2-4	

WIRE TABLE

	PART NO.	DESCRIPTION	
12	S1906-2	SWITCH	
11	S1641-6	HOUSING	
10	S1640-6	HOUSING	
9	C301002-0102	ACTUATOR ASSY	
8	C301002-0302	ACTUATOR ASSY	
7	S1638-2	HOUSING	
6	S1638-1	HOUSING	
5	Y3L-3-09	SWITCH	
4	S1640-12	HOUSING	
3	S1641-12	HOUSING	
2	E13-00M	SWITCH	
1	S1360-15L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CHXXXX=CESSNA STD. NO.

SUPERSEDES: 1270625 P.14.5.1

SUPERSEDED BY: 1270835 P14.3

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP	[illegible]	1-27-77
DRAWN	J.C. SMITH	1-25-77
CHECK	J. YOUALL	1-26-77
STRESS		
PROJ	[illegible]	1-28-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — WING FLAPS

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 1270835

SCALE: NONE (SR 8458) PAGE: 14.1

NOTES:

1. WHEN MIKE KEY IS REQD WITH ELECTRIC TRIM REFER TO 3920144 FOR WIRING OF ELECTRIC TRIM SWITCHES IN CONTROL WHEEL

2. INSTALL S-1071-1 TUBING OVER CD18 WIRE BEFORE INSTALLING TERMINALS

3. C611003-0101 TRIM REGULATOR WITH MOD "A" OR LATER WILL BE REQD AT SER (SR9369) & ON & ALL SPARES. MOD DESIGNATION WILL BE A SUFFIX TO THE VENDOR PART NUMBER

4. WHEN A374A FILTER IS INSTALLED, REMOVE S-1636-1 TERMINALS FROM WIRES & TERMINALS FROM MOTOR LEADS & SOLDER DIRECTLY TO FILTER AS SHOWN IN DETAIL C

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: DELETE RED(3) WIRE, RE-ROUTE RED(REF) TO CONN PIN # 2, WIRE CODE NO CD3, CD4, CD5, & CD6 WAS 22 GA, 8568-10 WAS -22-0, 8568-2 WAS -22-2, 8568-3 WAS -22-3, 8568-1 WAS -22-1 (SR8458)	CRS 3-4-77	
B	BY REV: S-1963-2 WAS S-1636-1/CD11, CD6, CD5 & CD4; S-1367-1-6 WAS S-1367-1-8/CD1 & CD2; SER OUT CD1; SER IN CD17; ADD NOTE 2 & DETAIL "B"; CD1 & CD2 WERE 22 GA (NOW SHOP PRACTICE) (SR9193) ADD NOTE 3 & PG 14.2.1 (SR9369)	RLY CMK 7-13-78	
C	BY REV: ADD NOTE 4, DETAIL "C" & A-374A FILTER (SR 9438)	H.H.G 10-26-78	
D	BY REV: ADD DETAIL "D"; CD18 WAS CD17/NOTE 2; SER OUT CD2 & CD17, SER IN CD18 & CD19 (SR9630)	NAL 3-27-80	
E	BY REV: BLK(REF) WAS BLK(CD11) (NOW SHOP PRACTICE)(MER 182-E0-0829)	DFS 5-5-80	

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
CD 19	20			S-1367-1-8	S-1636-1		SER (SR9630) & ON
CD 18	14			S-1367-2-6	S-1367-2-8		SER (SR9630) & ON
BRN	22	8568-1		SOLDER	SOLDER		
ORN	22	8568-3		SOLDER	SOLDER		
CD17	14			S-1367-2-6	S-1367-2-6	SER(SR9193) THRU SER(SR9630)	
RED(2)	22	8568-2		SOLDER	SOLDER		
RED(1)		8568-2		SOLDER	SOLDER		
BLK(2)		8568-10		SOLDER	SOLDER		
BLK(1)		8568-10		SOLDER	SOLDER		
BLK(CD14)		-22-0		S1370-1	S1367-1-8		
YEL(D10)		-22-4		S1636-1	S1636-1		
BLK(CD11)		-22-0		S1636-1	S1367-1-8		
BRN(CD13)		-22-6		S1636-1	SEE CD10	4	
GRN(CD12)		-22-5		S1636-1	SEE CD9	4	
BLUE(D10)		-22-6		S1639-1	S1636-1		
GRN(D9)		-22-5		S1639-1	S1636-1		
ORN(CD8)		-22-3		S1639-1	S1636-1		
RED(CD7)	22	-22-2		S1639-1	S1636-1		
CD6	20			S1636-1	S-1963-2		
CD5	20			S1636-1	S-1963-2		
CD4	20			S1636-1	S-1963-2		
CD3	20			S1639-1	S1636-1		
CD2	20			S1367-1-6	S1636-1		THRU SER (SR9630)
CD1	20			S1367-1-6	S1367-1-6		THRU SER (SR9193)

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
21	S-1232-5	CIRCUIT BREAKER	
20	A-374A	FILTER	4
19	1260243	MAP LIGHT INSTL	
18	1961-2-0	HOUSING	
17	S-1961-1-0	HOUSING	
16	1570307	CABLE	
15	1570307	CONNECTOR ASSY	
14	3421-0000	CONNECTOR SOCKET	
13	1270844	CABLE	
12	3473-3000	CONNECTOR SOCKET	
11	1270842	CONNECTOR ASSY	
10	7101-01	SWITCH	
9	S-2050-1	SWITCH	
8	S-1360-5L	CIRCUIT BREAKER	
7	C610502-0101	GEAR MOTOR	
6	S1637-1	HOUSING	
5	S1637-2	HOUSING	
4	TC5208	CLUTCH	
3	S1640-6	HOUSING	
2	S1641-6	HOUSING	
1	C611003-0101	TRIM REGULATOR	3

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CEF-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	1-27-77
GROUP		
DRAWN	L. STOREY	1-25-77
CHECK	J. YOUNG	1-26-77
STRESS		
PROJ		77
APPD		
OTHER		

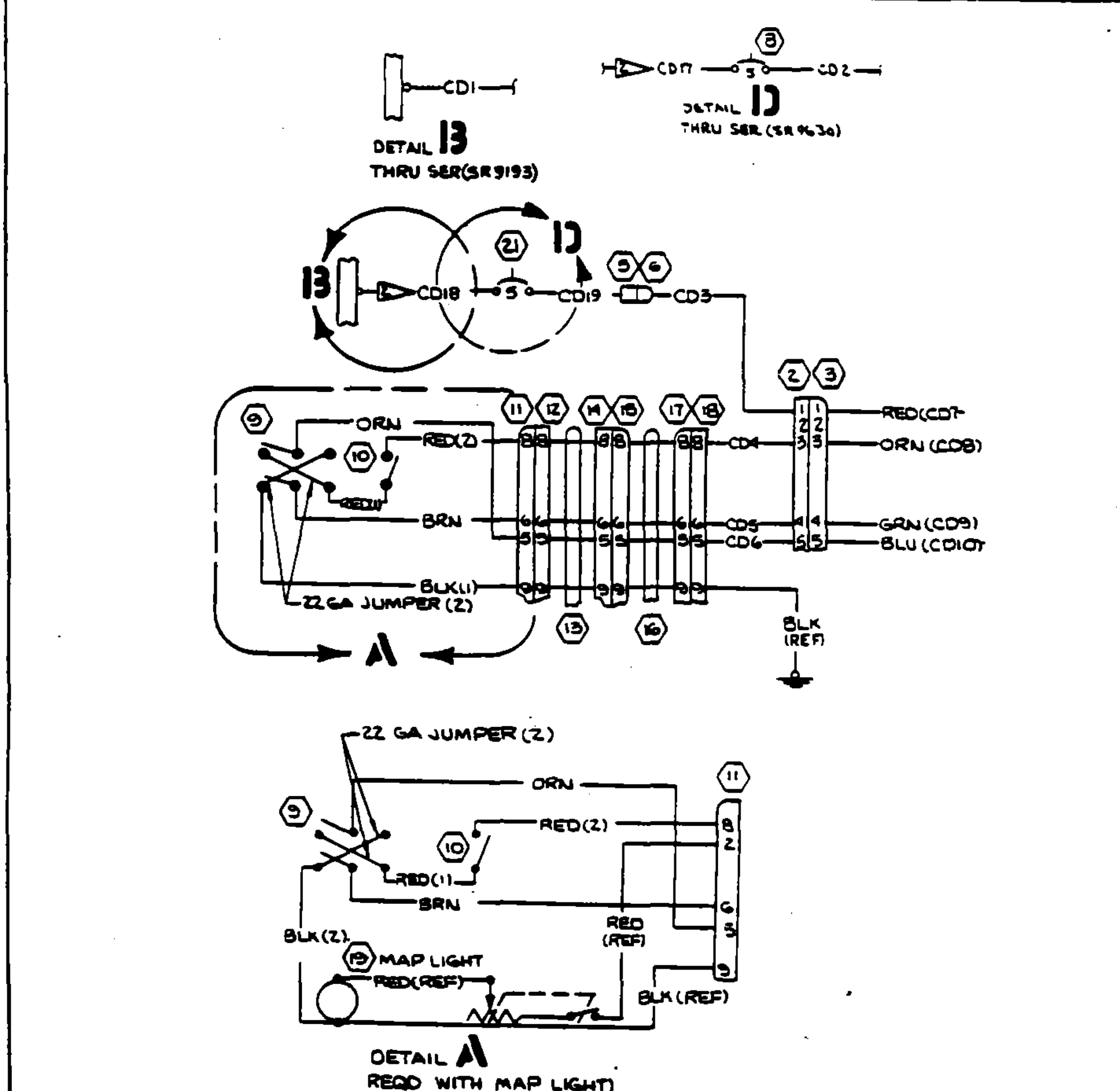
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ELECTRIC ELEVATOR TRIM (OPT)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 1270835

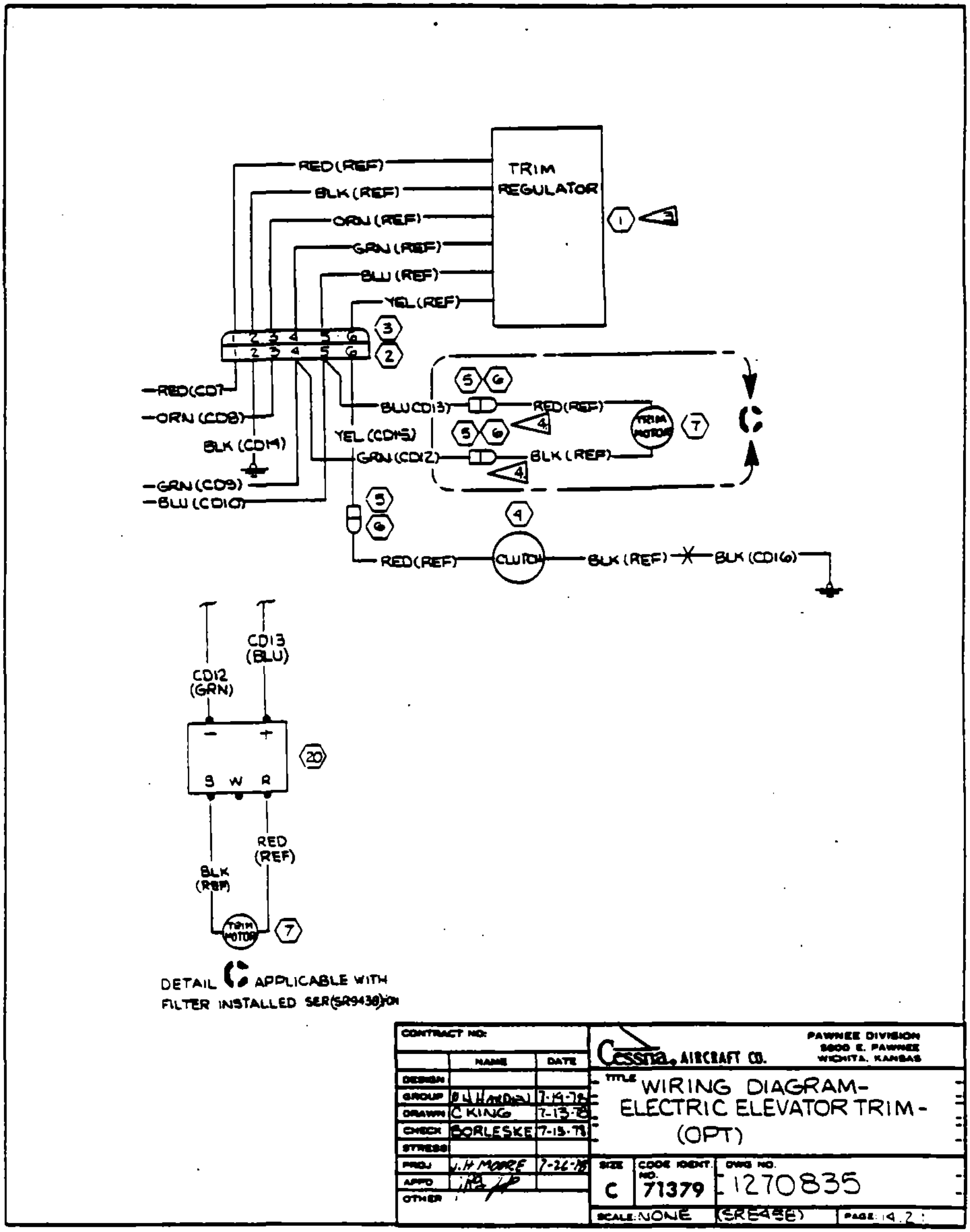
SCALE: NONE | (SR 8458) | PAGE: 14.2.0

REVISION			
LTR	DESCRIPTION	DATE	APPD
E	SEE PG. 14.2.0 FOR REVISION		



CONTRACT NO.			Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS
	NAME	DATE	TITLE WIRING DIAGRAM-ELECTRIC ELEVATOR TRIM-(OPT)
DESIGN			
GROUP	W.H. Hamson(?)	7-19-78	
DRAWN	C KING	7-13-78	
CHECK	BORLESKE	7-13-78	
STRESS			
PROJ	J.H. MOORE	7-26-78	SIZE C · CODE IDENT. NO. 71379 · DWG NO. 1270835
APPD			
OTHER			SCALE: NONE · (SR8458) · PAGE: 14.2.1

Wiring Diagram Electric Elevator Trim Opt. (Sheet 1 of 2)

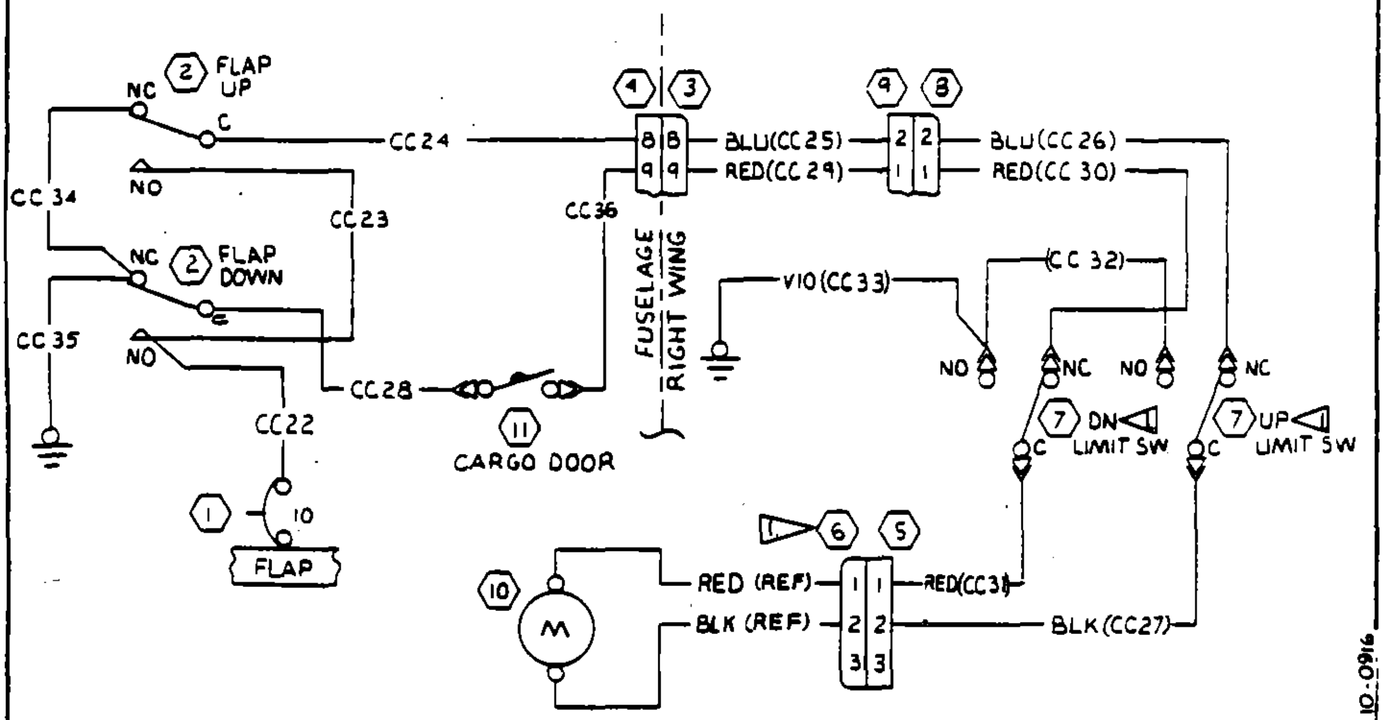


Wiring Diagram Electric Elevator Trim Opt. (Sheet 2 of 2)

REVISION			
LTR	DESCRIPTION	DATE	APPD
A	BY REV: S-2035-1 WAS S-1640-6, S-2035 -2 WAS S-1641-6 (SR9110)	H HG 6-20-79	

NOTES:

1. S-1906-2 SWITCHES AND S-1638-2 HOUSING. PART OF C301002 ACTUATOR ASSY.



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
CC 36	16			S-1493-2	S-1636-2		
CC 35				S-1367-2-4	S-1367-2-8		
CC 34				S-1367-2-4	S-1367-2-4		
VIO (CC 33)		-16-7		S-1493-2	S-1367-2-8		
CC 32				S-1493-2	S-1493-2		
RED (CC 31)		-16-2		S-1493-2	S-1636-2		
RED (CC 30)		-16-2		S-1635-2	S-1493-2		
RED (CC 29)		-16-2		S-1635-2	S-1636-2		
CC 28				S-1367-2-4	S-1493-2		
BLK (CC 27)		-16-0		S-1493-2	S-1636-2		
BLU (CC 26)		-16-6		S-1635-2	S-1493-2		
BLU (CC 25)		-16-6		S-1635-2	S-1636-2		
CC 24				S-1367-2-4	S-1636-2		
CC 23				S-1367-2-4	S-1367-2-4		
CC 22	16			S-1367-2-6	S-1367-2-4		

WIRE TABLE

	PART NO.	DESCRIPTION	
11	E13-00M	SWITCH	
10	C301002	ACTUATOR ASSY	
9	S-2035-2	HOUSING	
8	S-2035-1	HOUSING	
7	S-1906-2	SWITCH	
6	S-1638-2	HOUSING	
5	S-1638-1	HOUSING	
4	S-1641-9	HOUSING	
3	S-1640-9	HOUSING	
2	S-1906-1	SWITCH	
1	S-1360-10L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 1270835 P. 14.1

SUPERSEDED BY:

CONTRACT NO:

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

	NAME	DATE
DESIGN		2-14-79
GROUP		3-7-79
DRAWN	S.F. UNRUH	2-13-79
CHECK	BORLESKE	2-14-79
STRESS		
PROJ	J.H. MOORE	3-22-79
APPD		
OTHER		

TITLE: WIRING DIAGRAM — WING FLAPS

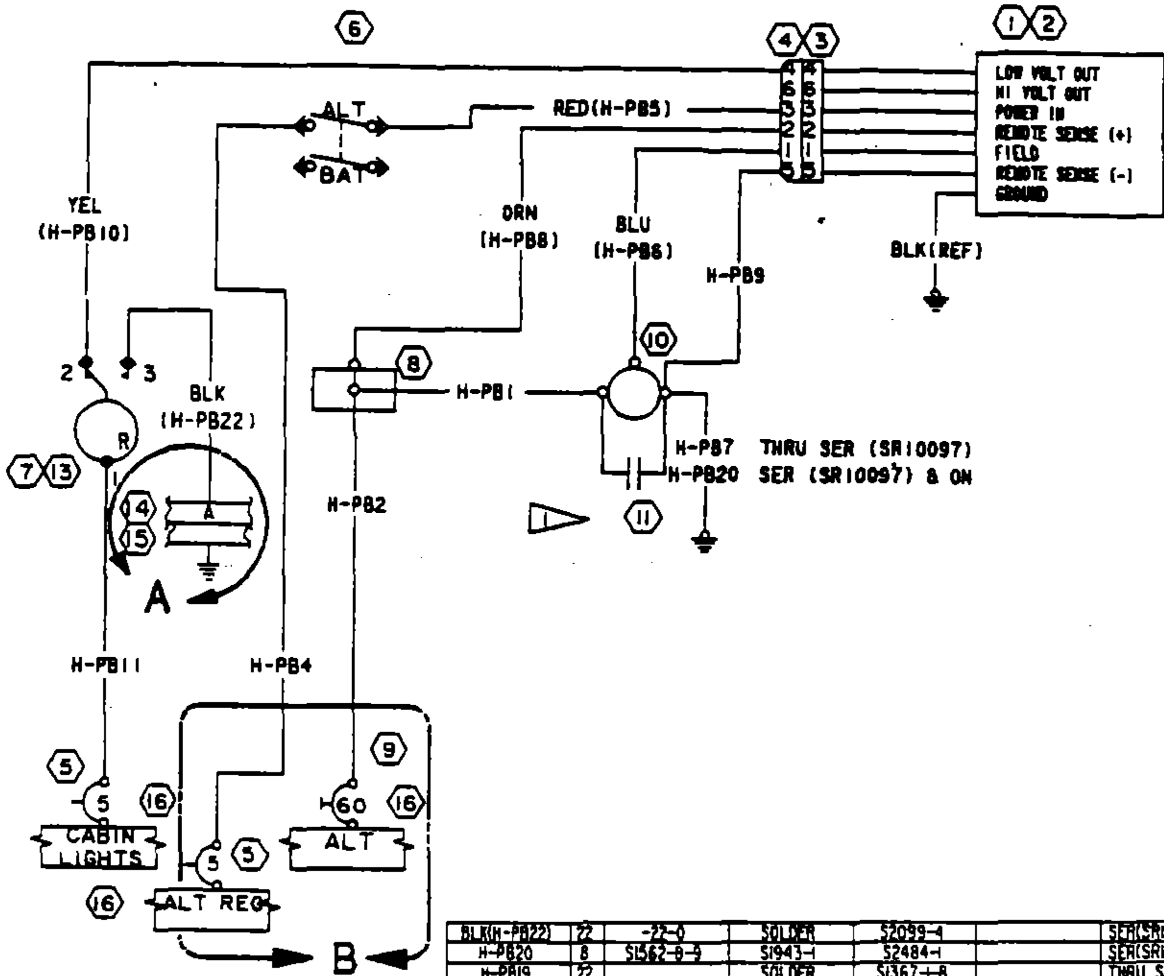
SIZE: C | CODE IDENT. NO.: 71379 | DWG NO: 1270835

SCALE: NONE (SR9110) PAGE: 14.3

NOTES:

[1] PART OF BASIC AVONICS KIT. INSTALLED WITH FIRST RADIO.

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	[illegible]



97-00916

BLK(H-PB22)	22	-22-0	SOLDER	S2099-4		SER(SR10097) & ON
H-PB20	8	S1562-8-9	S1943-1	S2484-1		SER(SR10097) & ON
H-PB19	22		SOLDER	S1367-1-8		THRU SER(SR10097)
H-PB11	22		S1367-1-6	SOLDER		
YEL(H-PB10)	20	-20-4	SOLDER	S2099-6		
H-PB9	20		S2099-6	S1367-1-10		
ORN(H-PB8)	20	-20-3	S2099-6	S1367-1-4		
H-PB7	8	S1562-8-9	S1943-1	S2484-1		THRU SER (SR10097)
BLU(H-PB6)	16	-16-6	S2099-8	S1367-2-10		
RED(H-PB5)	20	-20-2	S2099-6	S1493-1		
H-PB4	22		S1367-1-6	S1493-1		
H-PB3	22		S1367-1-6	S1367-1-8		THRU SER (SR10097)
H-PB2	8	S1562-8-9	S1367-4-8	S1943-1		
H-PB1	8	S1562-8-9	S1943-1	S1943-1		
WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
WIRE TABLE						

16	2170955	BUS BAR	
15	S2527-2	GROUND CONNECTOR	
14	S2527-1	LH GROUND BLOCK	
13	MS25041-2	INDICATOR LIGHT	
12	1270741	BUS BAR	
11	S1915-1	CAPACITOR	
10	C611503-0102	ALTERNATOR ASSY	
9	S1232-60	CIRCUIT BREAKER	
8	0570315	TERMINAL BLOCK	
7	MS25237-327	LAMP	
6	S2501-1	MASTER SWITCH	
5	S1360-5	CIRCUIT BREAKER	
4	S2373-2	CONNECTOR	
3	S2373-1	CONNECTOR	
2	C611005-0102	ALT CONTROL UNIT(ALT)	
1	C611005-0101	ALT CONTROL UNIT	
	PART NO.	DESCRIPTION	
	EQUIPMENT TABLE		

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

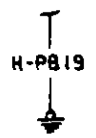
Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - ALTERNATOR SYSTEM 60 AMP

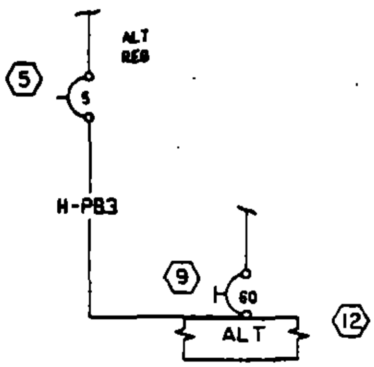
SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR 3R9949 | PAGE 4.1.0

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
D	SEE PG 4.1.0 FOR REVISION		



DETAIL A PG4.1.0
THRU SER(SR10097)

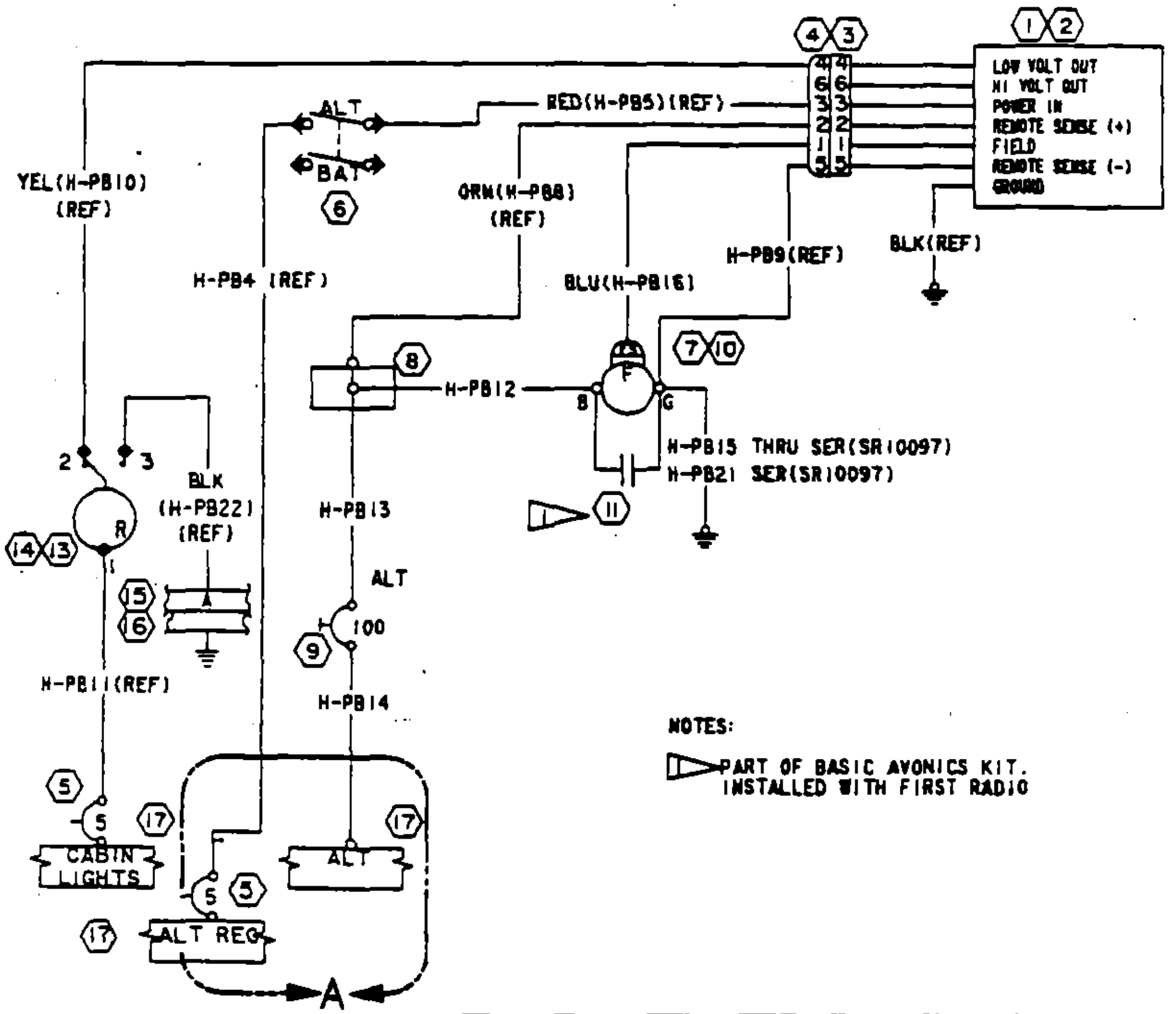


DETAIL B PG 4.1.0
THRU SER(SR10097)

98-00816

CONTRACT NO.			Cessna AIRCRAFT CO.		
	NAME	DATE	TITLE WIRING DIAGRAM - ALTERNATOR SYSTEM 60 AMP		
DESIGN	STA[illegible]	11-5-81			
GROUP	HA[illegible]	11-11-81			
DRAWN	[illegible]	11-3-81			
CHECK	[illegible]	11-3-81	SIZE	CODE IDENT NO.	DWG NO.
PROJECT	G. F[illegible]	11-17-81	C	71379	1271000
APPD	[illegible]	11-11-81	SCALE NONE		PAGE 4.1.1
OTHER	AC				

LTR	DESCRIPTION	DATE	APPROVED
A	BY REV: ADD MODEL CODE TO WIRES (SR9949)	JRB 6-3-81	RLT JRG LDB
B	BY REV: H-PB10 (REF) WAS H-PB17 (REF) (SR9949)	ARB 6-30-81	RLT JRG LDB
C	BY REV: REF OUT H-PB15 DWG. SER IN H-PB21 DWG (SR10097)	JRB 9-14-81	RLT JRG SP
D	BY REV: ADD S2527-1 (-18-2): PB22(REF) WAS PB17(REF) (SR10097)	ARB 11-3-81	RLT JRG AC GF
E	BY REV: REF IN DETAIL A: ADD PG 4.2.1 (SR10097)	FAG 3-19-82	RDI JRG



NOTES:

[Triangle 1] PART OF BASIC AVONICS KIT. INSTALLED WITH FIRST RADIO

97-00916

ITEM NO.	PART NO.	DESCRIPTION	
17	2170035	BUS BAR	
16	S2527-2	GROUND CONNECTOR	
15	S2527-1	LH GROUND BLOCK	
14	MS25237-327	LAMP	
13	MS25041-2	INDICATOR LIGHT	
12	1270741	BUS BAR	
11	S1915-1	CAPACITOR	
10	C611505-0101	ALTERNATOR ASSY	
9	S2326-3	CIRCUIT BREAKER	
8	0570315	TERMINAL BLOCK	
7	D208-14489-EA	CONNECTOR	
6	S2595-1	MASTER SWITCH	
5	S1360-5L	CIRCUIT BREAKER	
4	S2375-2	CONNECTOR	
3	S2375-1	CONNECTOR	
2	C611005-0102	ALT CONTROL UNIT(ALT)	
1	C611005-0101	ALT CONTROL UNIT	

EQUIPMENT TABLE

WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
H-PB21	4	S1562-4-9	S2402-2	S2402-1		SER(SR10097) & ON
BLU(H-PB16)	18	-18-6	S2099-8	S2376-1		
H-PB15	4	S1562-4-9	S2402-2	S2402-1		THRU SER(SR10097)
H-PB14	4	S1562-4-9	S2402-2	S2402-1		
H-PB13	4	S1562-4-9	S2402-2	S1367-6-12		
H-PB12	4	S1562-4-9	S2402-2	S2402-2		

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

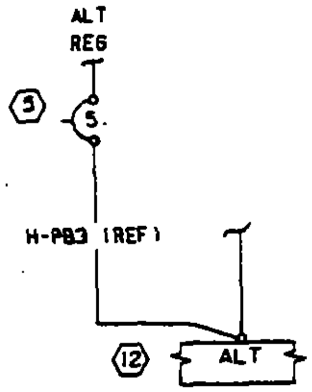
Cessna AIRCRAFT CO. PAWNEE DIVISION DWANE L. WALLACE WICHITA, KANSAS

TITLE WIRING DIAGRAM - ALTERNATOR SYSTEM 95 AMP (OPT)

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000

SCALE: NONE SR9949 PAGE 4.2.0

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
E	SEE PG 4.2.0 FOR REVISION		



DETAIL A PG 4.2.0
THRU SER (SR10037)

97-00316

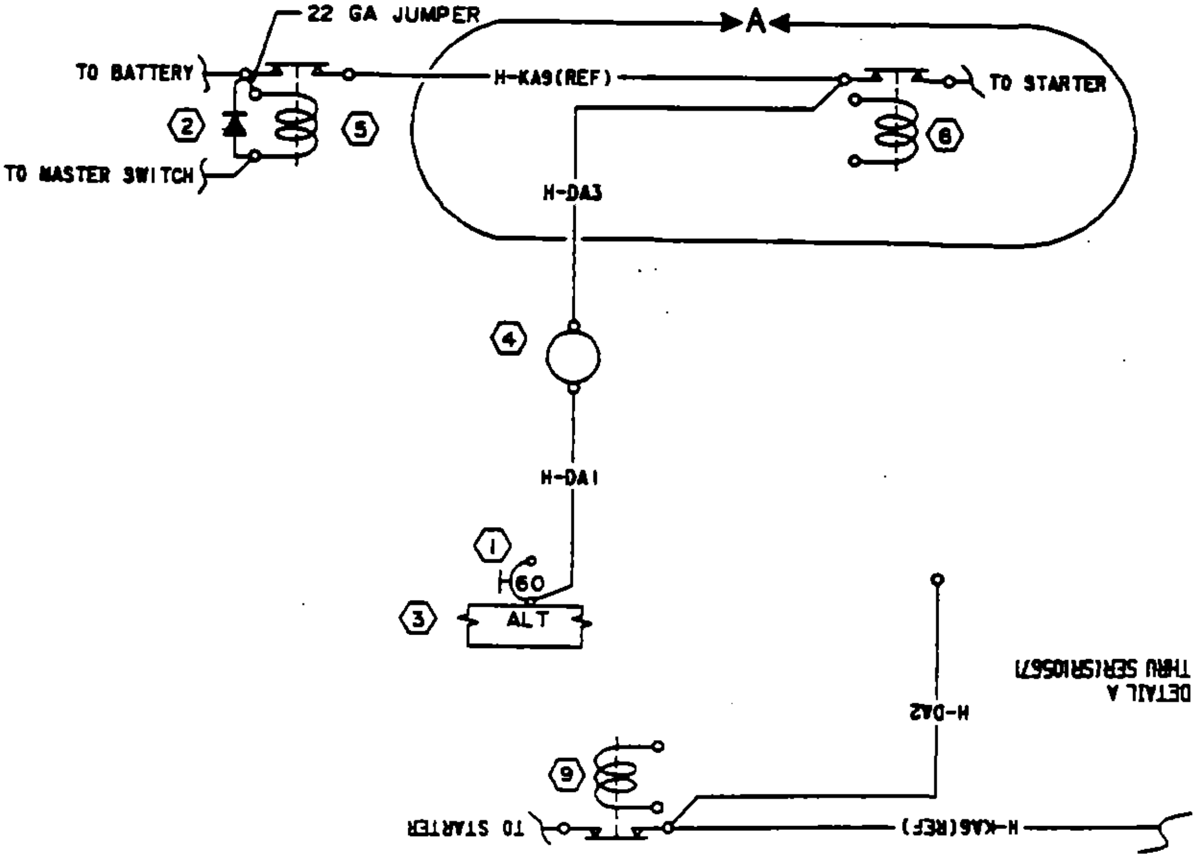
CONTRACT NO.		
	NAME	DATE
DESIGN		
GROUP	[illegible]	6-1-82
DRAWN	SP[illegible]ER	5-19-82
CHECK	[illegible]	5-19-82
PROJECT	J.H.[illegible]	6-1-82
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - ALTERNATOR SYSTEM 95 AMP (OPT)

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000
SCALE NONE		PAGE 4.2.1

LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible] 6-2-81	[illegible]
B	[illegible]	[illegible] 10-30-81	[illegible]
C	[illegible]	[illegible]	[illegible]



49-00916

WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
H-DA3	8	S1562-8-9	S1367-4-10	S1367-4-13		SER(SR10567) & ON
H-DA2	8	S1562-8-9	S1367-4-10	S2447-8		THRU SER(SR10567)
H-DA1	8	S1562-8-9	S1367-4-10	S1367-4-8		

WIRE TABLE

	PART NO.	DESCRIPTION	
6	S2443-1	STARTER CONTACTOR	
5	S2475-1	BATTERY CONTACTOR	
4	C669560	INSTRUMENT CLUSTER	
3	1270741	BUS BAR	
2	0770728	DIODE ASSY	
1	S1232-60	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CXXXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

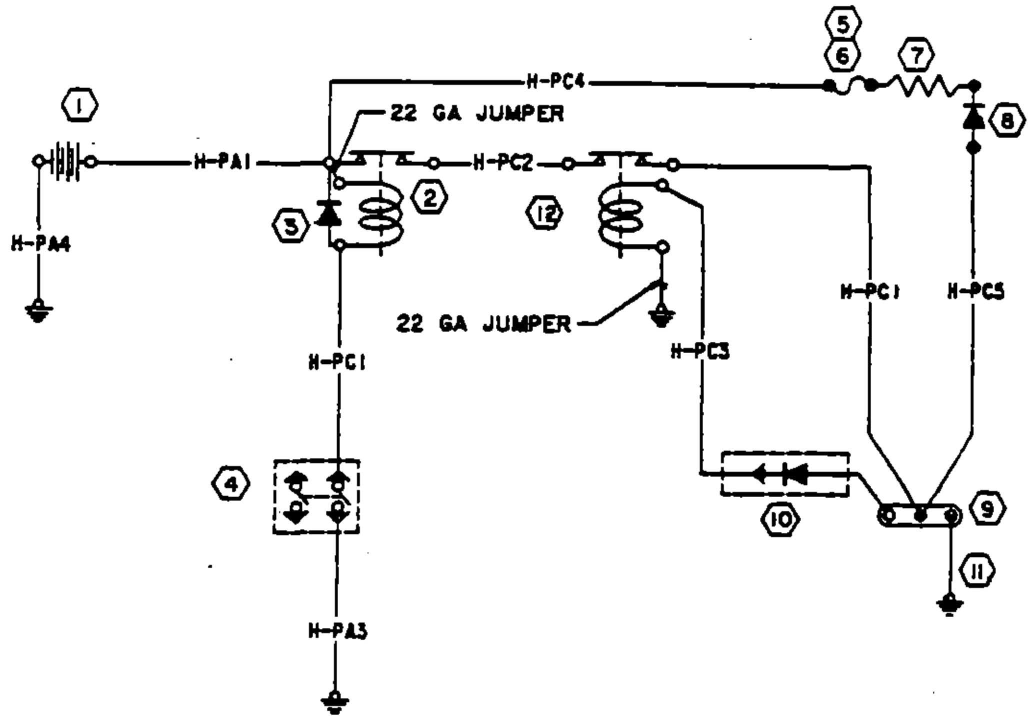
Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - AMMETER

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000

SCALE: NONE | SN9949 | PAGE 4.3

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] (SR9949)	6-3-81	[illegible]



INACTIVE
THRU SER(SR10097)
JMM 11-3-81
11-5-81

87-00916

H-PC5	22		S1367-1-14	SOLDER		
H-PC4	22		SOLDER	S1367-1-13		
H-PC3	22		S1493-1	S1367-1-10		
H-PC2	4	S1562-4-9	S2447-4	S2447-4		
H-PC1	4	S1562-4-9	S2447-4	S1367-6-14		
H-PA4	4	S1562-4-9	S1367-6-13	S1367-6-12		
H-PA3	22		S1367-1-8	S1493-1		
H-PA2	22		S1493-1	S1367-1-10		
H-PA1	4	S1562-4-9	S1367-6-13	S2447-4		
WIRE CODE	GA	MATERIAL	TERMINALS			DETAILS

WIRE TABLE

12	S2475-1	GND SERVICE CONTACTOR	
11	0312135	GROUND STRAP	
10	1570043	DIODE ASSY	
9	MS3506-1	RECEPTACLE	
8	20N3P	DIODE	
7	1Z6263	RESISTOR	
6	S1090-2	FUSEHOLDER ASSY	
5	S1091-5	FUSE	
4	S1994-1-1	SWITCH	
3	0770728	DIODE ASSY	
2	S2475-1	BATTERY CONTACTOR	
1	C614001-0105	BATTERY ASSY	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CXXXXX=CESSNA STD.NO.

SUPERSEDED BY: PG 4.6

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81
APPD		
OTHER		

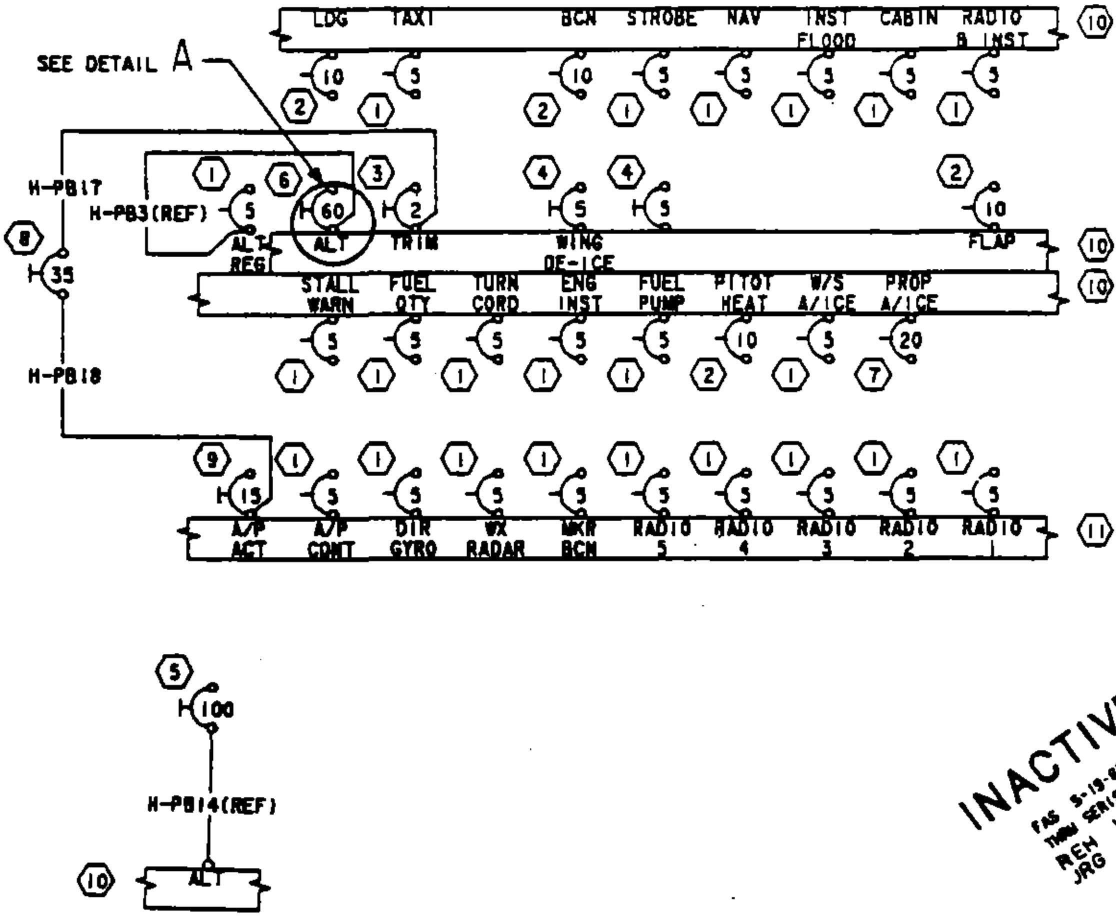
Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - BATTERY & EXTERNAL POWER

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR9949 | PAGE 4.4

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV ADD MODEL CODE TO WIRES (SR9949)	JHM 6-3-81	RLY WHH JRG LDB
B	BY REV [illegible] OUT (1) S1232-5 PER DETAIL B: ADD DETAIL B (SR10097)	JHM 11-11-81	JRG JHM RLY WHH
C	BY REV DELETE DETAIL B INACTIVATE DWG (SR10097)	FAS 5-19-82	REH WHH JRG JHM



DETAIL A
APPLIES WITH 95 AMP
ALTERNATOR SYSTEM

INACTIVE
FAS 5-19-82
THRU SER(SR10097)
REH WHH
JRG JHM

97-00916

11	1270792	[illegible]	
10	1270791	[illegible]	
9	S1232-15	CIRCUIT BREAKER	
8	S2001-	SWITCH	
7	S1360-20L	CIRCUIT BREAKER	
6	S1232-60	CIRCUIT BREAKER	
5	S2325-	CIRCUIT BREAKER	
4	S1232-5	CIRCUIT BREAKER	
3	S1232-2	CIRCUIT BREAKER	
2	S1360-10L	CIRCUIT BREAKER	
1	S1360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC.NO. S-XXX OR CMXXXX-CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY: 1271000 PG4.7

WIRE CODE	GA	MATERIAL	TERMINALS		SERIALS
H-PB18	10		S1367-3-8	S1367-3-8	
H-PB17	10		S1367-3-8	S1367-3-8	

WIRE TABLE

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

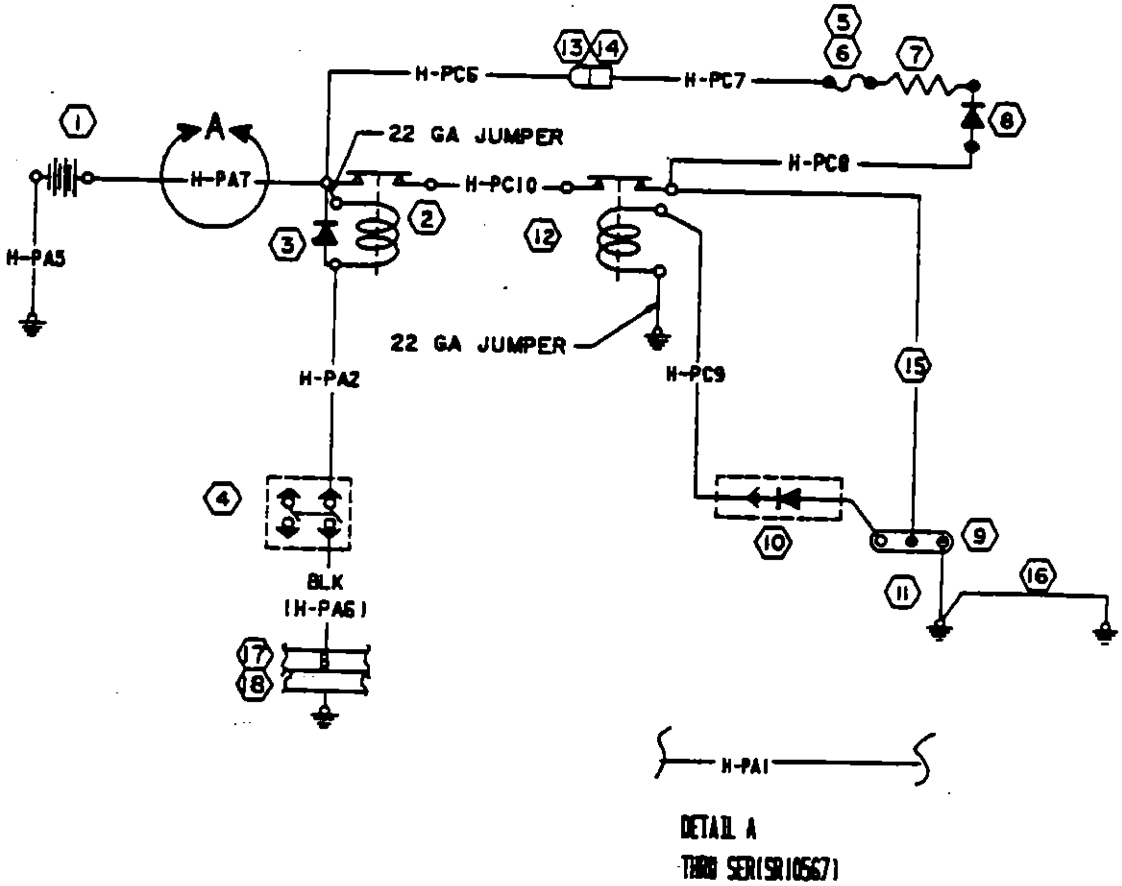
Cessna AIRCRAFT CO.

TITLE: WIRING DIAGRAM - CIRCUIT BREAKERS

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000

SCALE: NONE | SR9949 | PAGE 4.3

LTR	REVISIONS DESCRIPTION	DATE	APPROVED
A	(SR10097)	3-19-82	
B	ADD DETAIL A AND H-PA7 (SR10567)	3-21-82	



97-00916

18	S2527-2	GROUND CONNECTOR
17	S2527-1	LH GROUND BLOCK
16	1412097	GND SERVICE GND
15	1270744	BUS BAR ASSY
14	S1637-2	HOUSING
13	S1637-1	HOUSING
12	S2475-1	GND SERVICE CONTACTOR
11	0312135	GROUND STRAP
10	1570043	DIODE ASSY
9	MS3506-1	RECEPTACLE
8	2063P	DIODE
7	2K263	RESISTOR
6	S1890-2	FUSEHOLDER ASSY
5	S1091-3	FUSE
4	S2695-1	SWITCH
3	0770728	DIODE ASSY
2	S2475-1	BATTERY CONTACTOR
1	C614001-0105	BATTERY ASSY
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

WIRE CODE	GA	MATERIAL	TERMINALS		DETAILS
H-PA7	4	S1562-4-9	S1367-6-13	S2447-4	SER(SR10567 & ON)
H-PC10	2	S1562-2-9	S2447-2	S1367-7-13	
H-PC9	22		S1367-1-10	S1493-1	
H-PC8	22		S1367-1-14	SOLDER	
H-PC7	22		S1636-1	SOLDER	
H-PC6	22		S1367-1-13	S1635-1	
BLK(H-PA6)	22	-22-0	S1493-1	S2099-4	
H-PA5	4	S1562-4-5	S1367-6-13	S1367-6-12	
H-PA2	22		S1493-1	S1367-1-10	
H-PA1	4	S1562-4-9	S1367-6-13	S2447-4	THRU SER(SR10567)

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXXX OR CSXXXX=CESSNA STD.NO.

SUPERSEDES: PG 4.4

SUPERSEDED BY:

	NAME	DATE
	STANN	11-5-81
	HARDER	11-11-81
	MCGUIGAN	11-3-81
	YOUNGERS	11-3-81
	G. FICKEL	11-17-81
	JRG	
	AC	

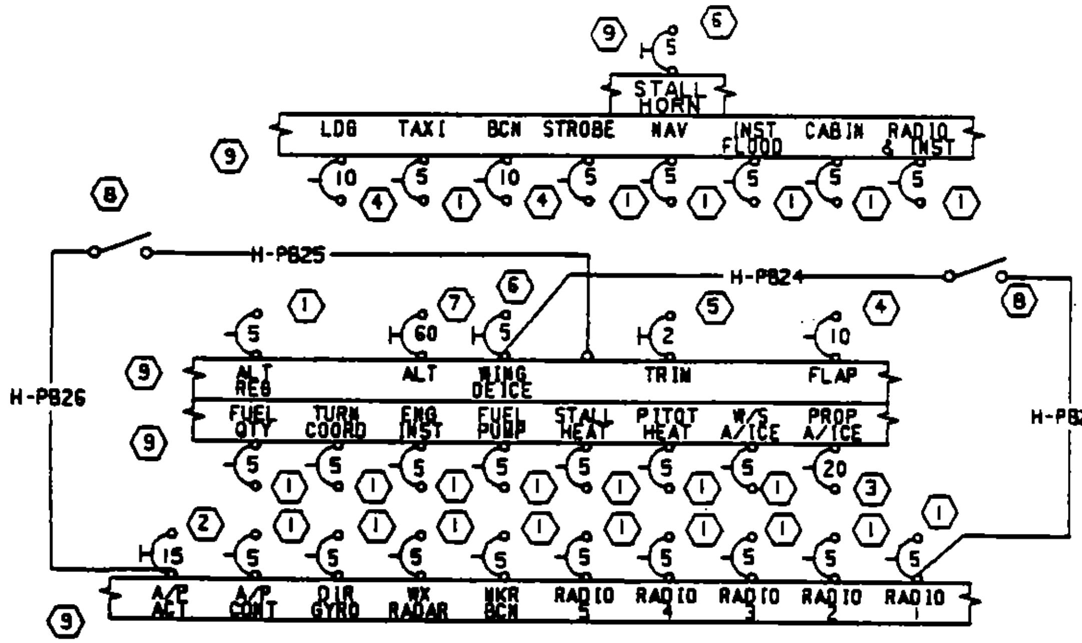
Cessna AIRCRAFT CO.

WIRING DIAGRAM - BATTERY & EXTERNAL POWER

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000

SCALE NONE | SR10097 | PAGE 4.6

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



INACTIVE
THRU 1SR10563)
GLS 8-20-83
RLY WHH JRG JHM

97-00816

H-PB24	10	S1562-10-9	S1367-3-8	S1367-3-6		
H-PB23	10	S1562-10-9	S1367-3-5	S1367-3-5		
H-PB26	10	S1562-10-9	S1367-3-5	S1367-3-6		
H-PB25	10	S1562-10-9	S1367-3-8	S1367-3-6		
WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS

WIRE TABLE

9	2170015	BUS BAR	
8	[illegible]	[illegible] SWITCH	
7	S1232-60	CIRCUIT BREAKER	
6	S1232-5	CIRCUIT BREAKER	
5	S1232-2	CIRCUIT BREAKER	
4	S1360-10	CIRCUIT BREAKER	
3	S1360-20	CIRCUIT BREAKER	
2	S1232-15	CIRCUIT BREAKER	
1	S1360-5	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC.NO.
S-XXX OR SXXXXX=CESSNA STD.NO.

SUPERSEDES:
1271000 PG4.5

SUPERSEDED BY:

CONTRACT NO.

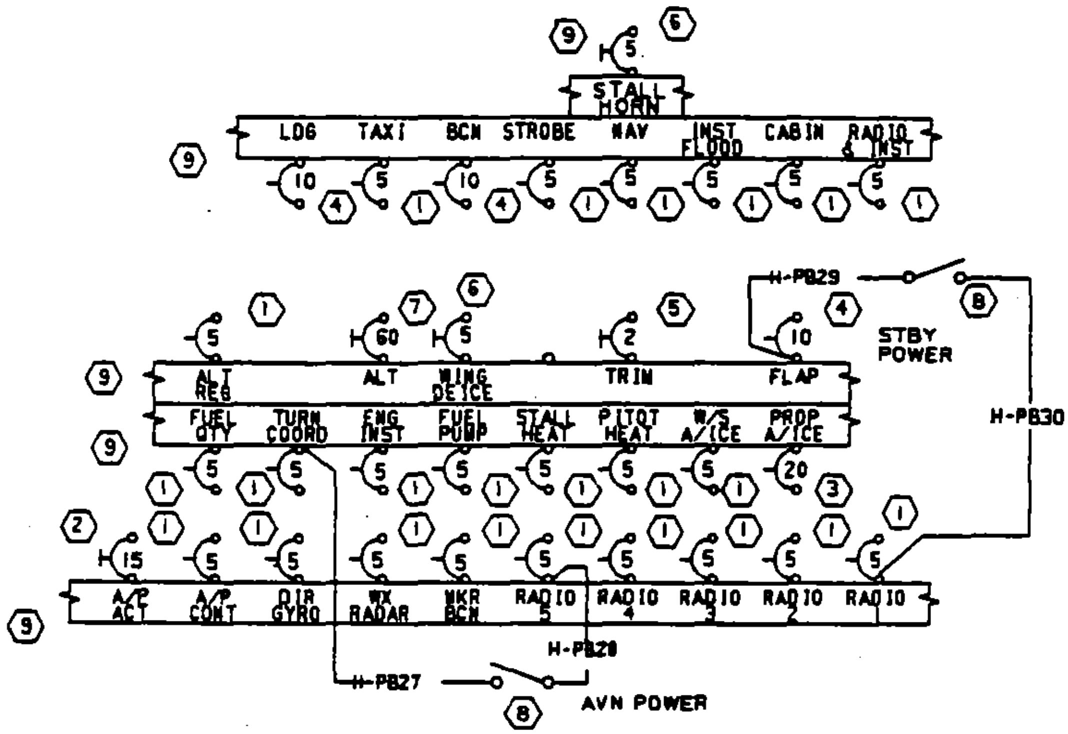
	NAME	DATE
DESIGN		
GROUP	HARBER	6-1-82
DRAWN	SPINDER	5-28-82
CHECK	HAIR	5-28-82
PROJECT	J.H.MOORE	6-1-82
APPD	JRG	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
DALE E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM -
CIRCUIT BREAKERS

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000
SCALE NONE	SH 1SR10097)	PAGE 4.7

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



				H-PB29	10	S1562-10-5	S1367-3-6	S1367-3-6	
				H-PB28	10	S1562-10-5	S1367-3-6	S1367-3-6	
9	2170015	BUS BAR		H-PB27	10	S1562-10-5	S1367-3-6	S1367-3-6	
8	MS25306-222	AVIONICS SWITCH		H-PB30	10	S1562-10-5	S1367-3-6	S1367-3-6	
7	S1232-60	CIRCUIT BREAKER		WIRE CODE	GA	MATERIAL	TERMINALS		SERIALS
6	S1232-5	CIRCUIT BREAKER		WIRE TABLE					
5	S1232-2	CIRCUIT BREAKER							
4	S1360-10L	CIRCUIT BREAKER							
3	S1360-20L	CIRCUIT BREAKER							
2	S1232-15	CIRCUIT BREAKER							
1	S1360-5L	CIRCUIT BREAKER							
	PART NO.	DESCRIPTION							

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC.NO.
S-XXX OR SXXXXX=CESSNA STD.NO.

SUPERSEDES: 1271000 PG4.7

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	G. STANK	8-18-82
GROUP	HARDEN	8-27-82
DRAWN	W. PAINE	8-18-82
CHECK	R. YOUNGERS	
PROJECT	J.N. MOORE	9-8-82
APPD	JRG	8-27-82
OTHER		

Cessna AIRCRAFT CO.

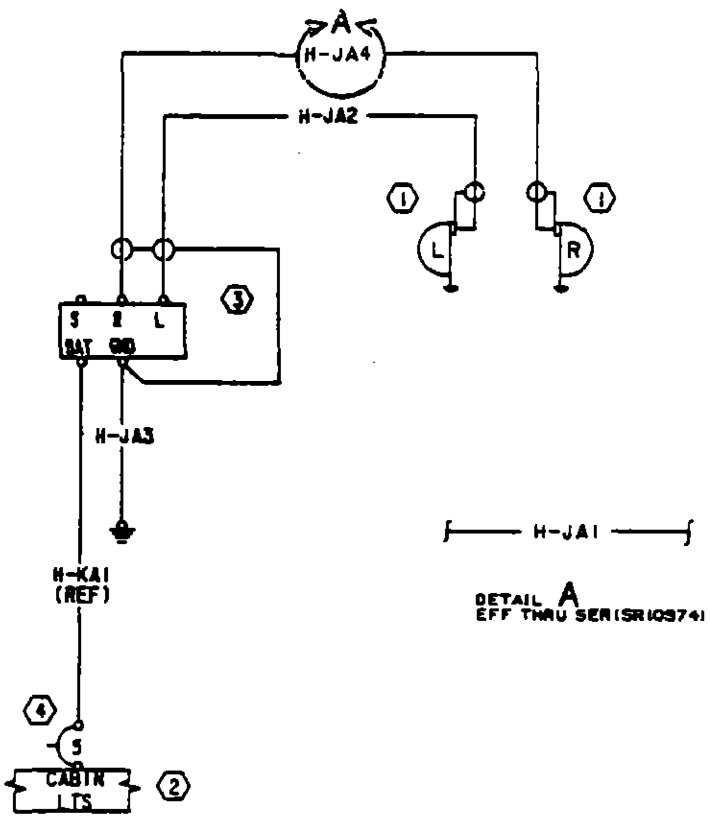
TITLE: WIRING DIAGRAM - CIRCUIT BREAKERS

SIZE	CODE IDENT NO.	DWG NO.	
C	71379	1271000	
SCALE: NONE		(SR10983)	PAGE 4.8

NOTES:

1. TERMINATE SHIELDS ON JA1 & JA2 WIRES AT THE SWITCH WITH S1367-2-6 TERMINALS & CONNECT TO GND TERMINAL ON SWITCH
2. USE S1367-1-10 ON HOT LEAD & S1367-3-10 ON SHIELD

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV. H-JA3 WAS KA4(REF). ADD MODEL CODE TO WIRES (SR9949)	[illegible] 6-5-81	PLY [illegible] JPG LD3
B	BY REV: ADD DETAIL A & JA4 (SR10974)	[illegible] 2-26-85	



49-00916

H-JA4	18S			S1367-1-6	2 / 1	(SR10974) & ON
H-JA3	18			S1367-1-6	S1367-1-6	
H-JA2	18S			S1367-1-6	2 / 1	
H-JA1	18S			S1367-1-6	2 / 1	THRU (SR10974)

WIRE TABLE

4	S1360-5L	CIRCUIT BREAKER
3	C295001-0105	IGNITION SWITCH
2	1270741	BUS BAR
1	SLICK	MAGNETO

EQUIPMENT TABLE

Cessna AIRCRAFT CO.

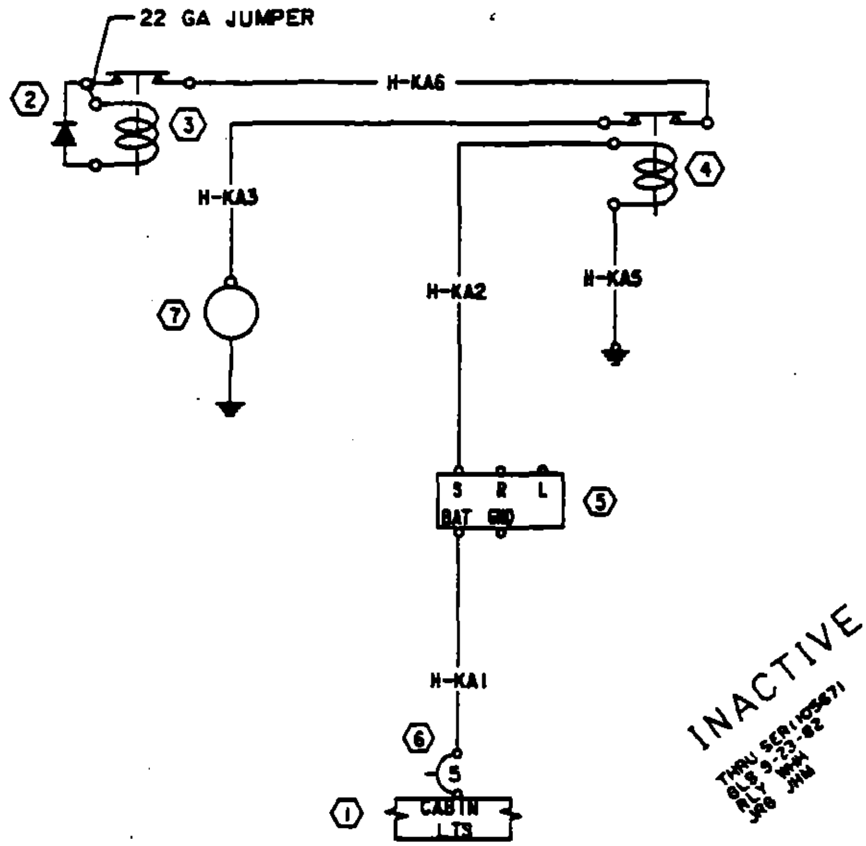
	NAME	DATE
	WHITSON	4-7-81
	HARDER	4-10-81
	MCMULLAN	4-2-81
	NAME	4-2-81
	MOORE	4-13-81

WIRING DIAGRAM - IGNITION SYSTEM

C 71379 1271000

NONE SR9949

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]



49-00916

H-KA6	4	S1562-4-9		S2447-4	S2447-4		
H-KA5	22			S3367-1-10	S3367-1-10		
H-KA3	4	S1562-4-9		S2447-4	S3367-6-8		
H-KA2	22			S3367-1-6	S3367-1-10		
H-KA1	22			S3367-1-6	S3367-1-6		

WIRE TABLE

7		STARTER	
6	S1360-5L	CIRCUIT BREAKER	
5	C292501-0105	IGNITION SWITCH	
4	S2443-1	STARTER CONTACTOR	
3	S2475-1	BATTERY CONTACTOR	
2	0770728	DIODE ASSY	
1	1270741	BUS BAR	

EQUIPMENT TABLE

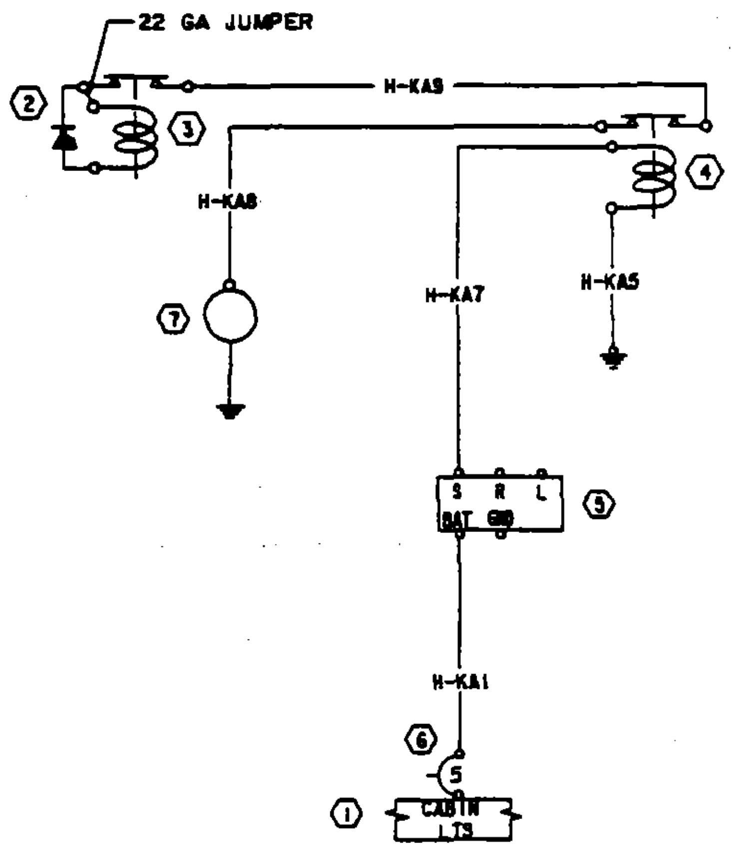
	NAME	DATE
	WHITSON	4-7-81
	HARDEN	4-10-81
	MCGUIGAN	4-7-81
	HAIR	4-2-81
	MOORE	4-13-81

CESSNA AIRCRAFT CO.

WIRING DIAGRAM - STARTER SYSTEM

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1271000
NONE		PAGE 6.1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



49-00816

H-KA9	4	S1562-4-5		S1367-4-13	S1367-4-13		
H-KA5	22			S1367-1-10	S1367-1-10		
H-KA8	4	S1562-4-5		S1367-4	S1367-4-13		
H-KA7	22			S1367-1-6	S1367-1-10		
H-KA1	22			S1367-1-6	S1367-1-6		

WIRE TABLE

7		STARTER	
6	S1360-5L	CIRCUIT BREAKER	
5	C422001-0105	IGNITION SWITCH	
4	S2443-1	STARTER CONTACTOR	
3	S2375-1	BATTERY CONTACTOR	
2	0770726	DIODE ASSY	
1	1270743	BUS BAR	

EQUIPMENT TABLE

	G STAMM	9-14-82
	HARDER	
	W PAUKE	9-23-82

Cessna AIRCRAFT CO.

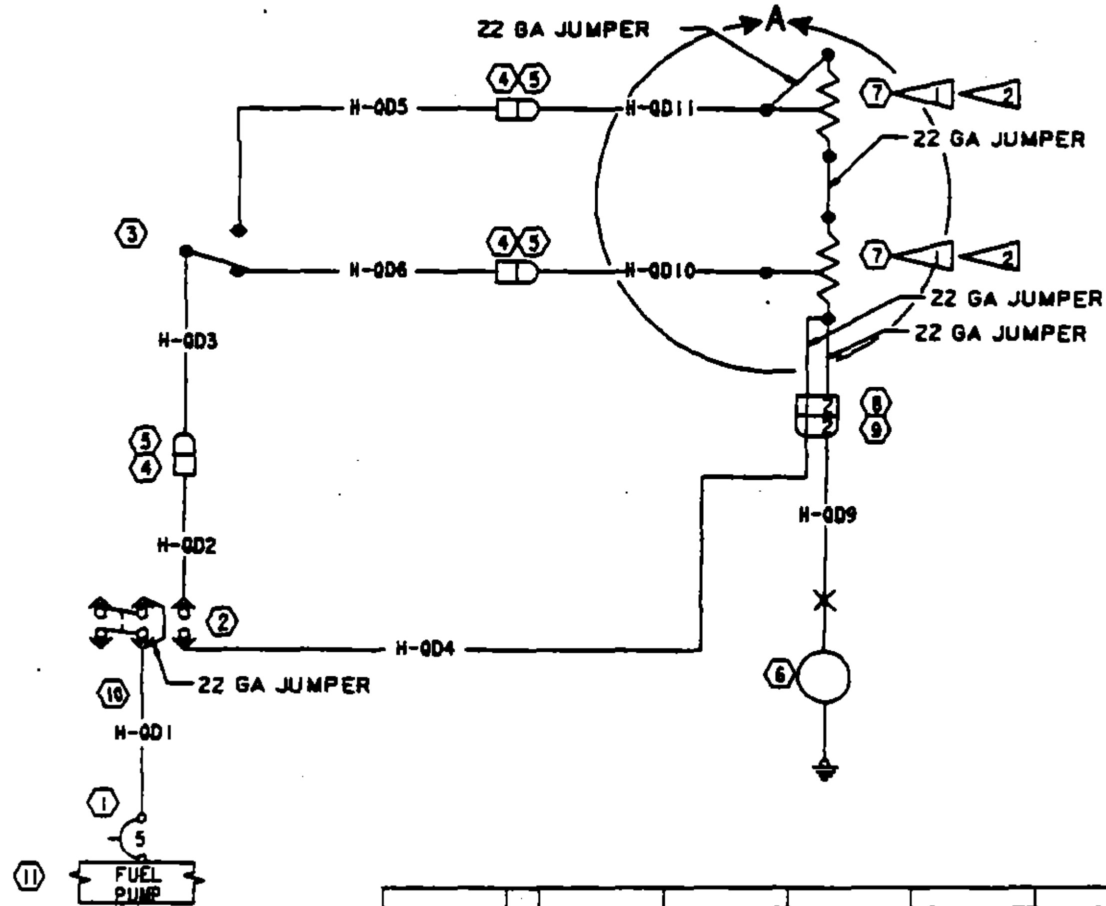
WIRING DIAGRAM - STARTER SYSTEM

SIZE		DWG NO.
C	71379	1271000
SCALE NONE	SR10367	PAGE 5.2

NOTES:

1. ADJUST AMOR-20-10 TO 3.5±.5 OHMS PRIOR TO INSTL
2. READJUST RESISTOR AS REQD AFTER INSTL TO COMPLY WITH FLOW REQUIREMENTS PER CES1243

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	6-?-81	[illegible]
B	[illegible]	7-17-81	[illegible]
C	[illegible]	2-23-82	[illegible]



49-00916

WIRE CODE	GA	MATERIAL	TERMINALS			REMARKS
H-QD11	22		S1635-1	SOLDER		SER(SR10567) & ON
H-QD10	22		S1635-1	SOLDER		SER(SR10567) & ON
H-QD9	22		S1635-1	S1370-1		
H-QD8	22		S1635-1	SOLDER		THRU SER(SR10567)
H-QD7	22		S1635-1	SOLDER		THRU SER(SR10567)
H-QD6	22		SOLDER	S1636-1		
H-QD5	22		SOLDER	S1636-1		
H-QD4	22		S1493-1	S1635-1		
H-QD3	22		S1635-1	SOLDER		
H-QD2	22		S1493-1	S1636-1		
H-QD1	22		S1367-1-6	S1493-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
11	1270741	[illegible]	
10	S2825-1	ADAPTER	
9	S2035-1	HOUSING	
8	S2035-2	HOUSING	
7	AMOR-20-10	RESISTOR	
6	C291504-0201	FUEL PUMP	
5	S1637-1	HOUSING	
4	S1637-2	HOUSING	
3	S2327-1	SWITCH-THROTTLE	
2	S1046-5-2	SWITCH	
1	S1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CXXXX=CESSNA STD.NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDER	4-10-81
DRAWN	MCGUIGAN	4-7-81
CHECK	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81

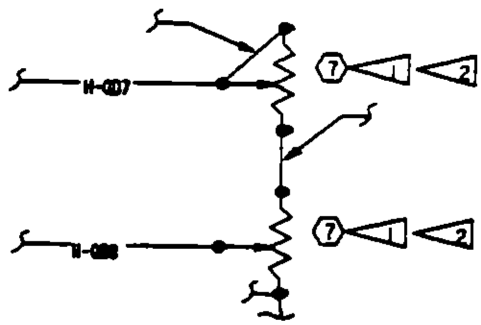
CESSNA AIRCRAFT CO.

WIRING DIAGRAM - FUEL PUMP SYSTEM

SIZE C | 71379 | 1271000

SCALE NONE | SR9949

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
C	SEE PAGE 7.1 FOR REVISIONS		



DETAIL A
THRU SER(SR10567)

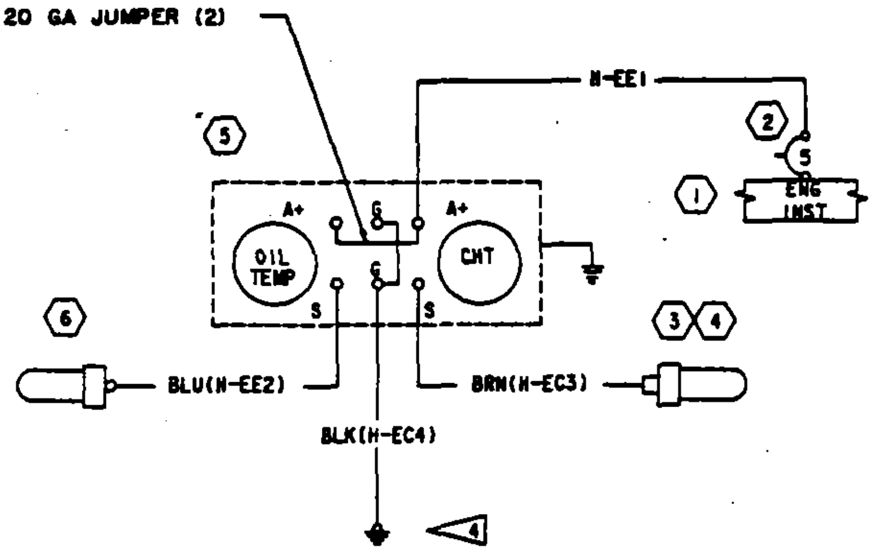
CONTRACT NO			Cessna AIRCRAFT CO.			
	NAME	DATE	TITLE WIRING DIAGRAM - FUEL PUMP SYSTEM			
DESIGN	G STANN	9-20-82				
GROUP	HARDER	9-29-82				
DRAWN	W PAINE	9-23-82				
CHECK	YOURGERS	9-24-82				
PROJECT	J.H.MOORE	10-12-82	SIZE C	CODE IDENT NO 71379	DWG NO. 1271000	
APPD	JBG					
OTHER			SCALE NONE		SR10567	PAGE 7.1.1

NOTES:

1. MATL IS ALPHA 5857-6 (VENDOR CODE 92194) OR BELDEN 83009-6 (VENDOR CODE 70903)
2. MATL IS ALPHA 5857-7 OR BELDEN 83009-1
3. CRIMP S1636-5 TERMINAL AROUND WIRE INSULATION. BEND .25 OF STRIPPED WIRE BACK OVER CRIMP & SOLDER PER CES1040. USE MOLEX HT-1921 CRIMPING TOOL ONLY
4. GROUND TO ENGINE ACCESSORY PLATE LEFT HAND SIDE

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]



WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
BLK(H-EC4)	20	4	S1367-1-8	S1367-1-12		
BRN(H-EC3)	18	2	S1367-1-10	S1635-5	1	
BLU(H-EE2)	18	1	S1367-1-10	S1367-1-10		
H-EE1	20		S1367-1-6	S1367-1-8		

WIRE TABLE

	PART NO.	DESCRIPTION	
6	S2335	TRANSMITTER	
5	C669561	INSTRUMENT CLUSTER	
4	S2334	TRANSMITTER	
3	S1637-4	HOUSING	
2	S1360-5L	CIRCUIT BREAKER	
1	1270741	BUS BAR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-4400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CNXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION DWANE L. WALLACE WICHITA, KANSAS

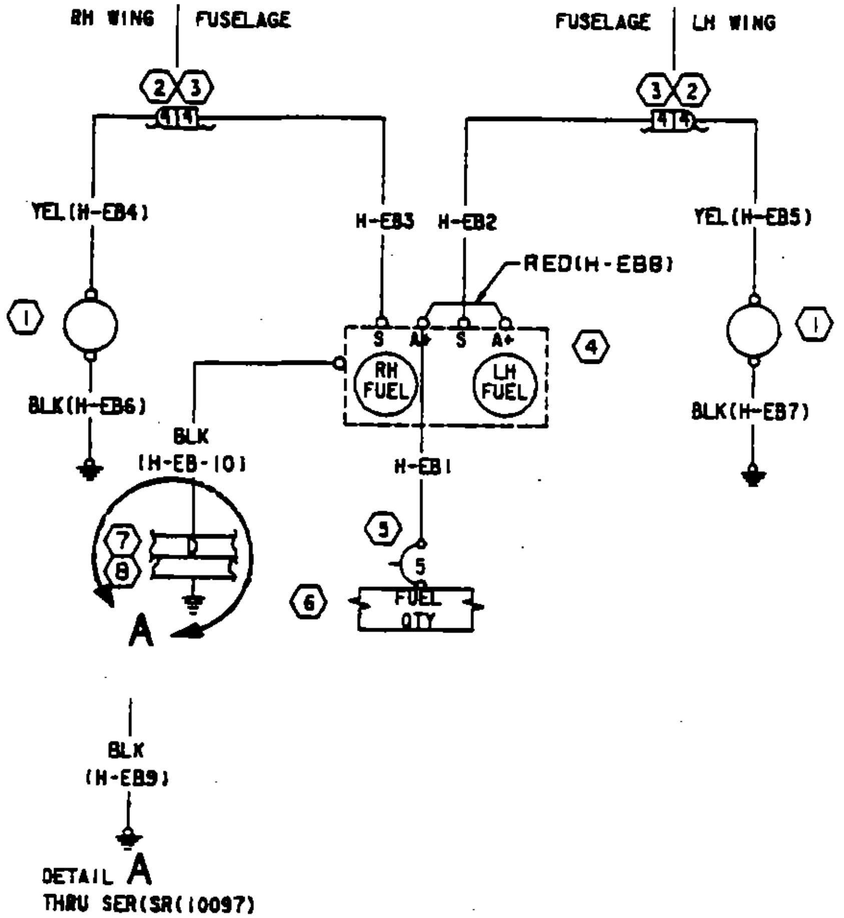
TITLE WIRING DIAGRAM - CYLINDER HEAD TEMP & OIL TEMP

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR9949 | PAGE 0.1

49-00916

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] (SR9949)	[illegible]	[illegible]
B	[illegible]	10-30-81	[illegible]
C	[illegible] (SR10097)	11-3-81	[illegible]



97-00916

BLK(H-EB10)	20	-20-0	S1367-1-6	S2099-4		SER(SR10097) & ON
BLK(H-EB9)	20		S1367-1-8	S1367-1-6		THRU SER(SR10097)
RED(H-EB8)	20		S1367-1-10	S1367-1-10		
BLK(H-EB7)	20		S1367-1-10	S1367-1-8		
BLK(H-EB6)	20		S1367-1-10	S1367-1-8		
YEL(H-EB5)	20		S1635-1	S1367-1-10		
YEL(H-EB4)	20		S1635-1	S1367-1-10		
H-EB3	20		S1367-1-10	S1636-1		
H-EB2	20		S1367-1-10	S1636-1		
H-EB1	20		S1367-1-6	S1367-1-10		
WIRE CODE	GA	MATERIAL	TERMINALS			DETAILS

WIRE TABLE

8	S2271-2	GROUND CONNECTOR	
7	S2271-1	LH GROUND BLOCK	
6	1270741	BUS BAR	
5	[illegible]	CIRCUIT BREAKER	
4	[illegible]	INSTRUMENT CLUSTER	
3	S1641-3	HOUSING	
2	S1640-3	HOUSING	
1	[illegible]	FUEL TRANSMITTER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81

CESSNA AIRCRAFT CO.

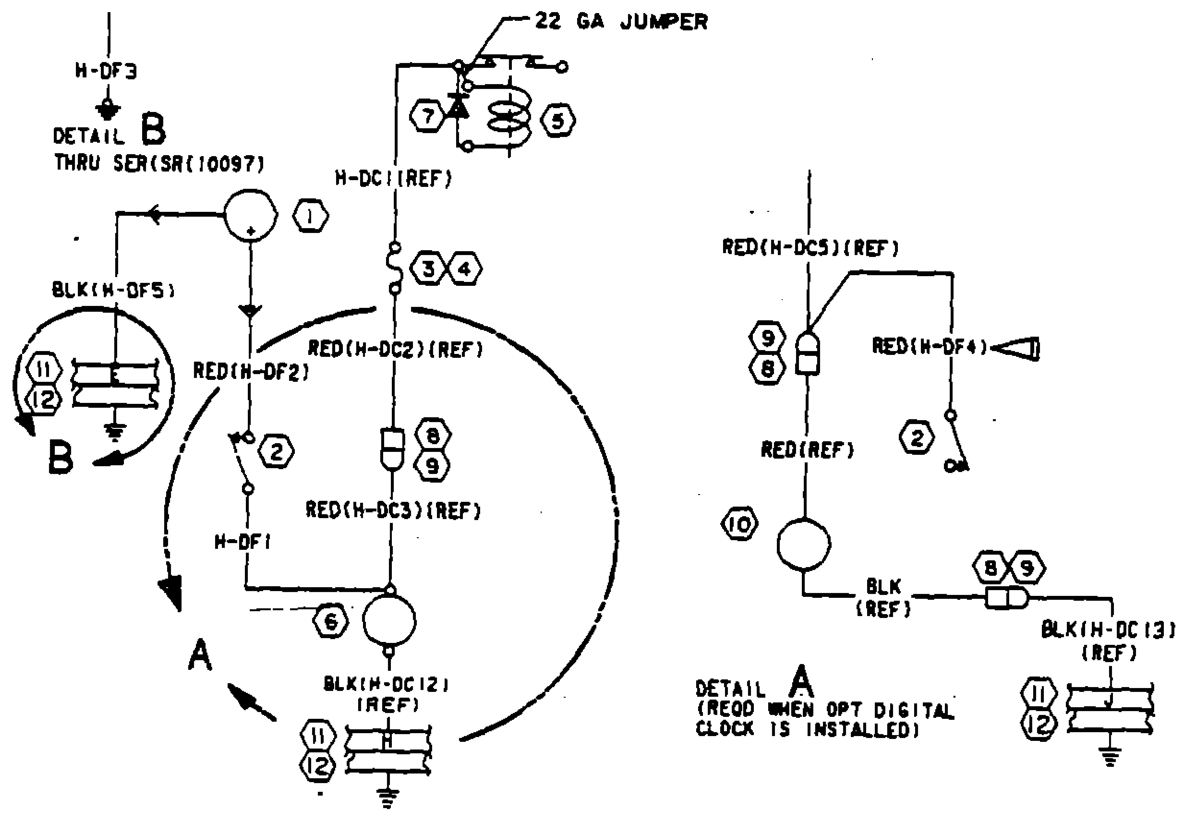
WIRING DIAGRAM - FUEL GAGES

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000
SCALE NONE	SR9949	PAGE 8.2

NOTES:

REQD ONLY WHEN OPT DIGITAL CLOCK C664511 IS INSTALLED

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]
B	[illegible] S2271-18-27 [illegible]	[illegible] 11-4-81	[illegible]
C	[illegible]	[illegible]	[illegible]



97-00916

BLK(H-DF5)	22	-22-0	S2099-4	S1493-1		SER(SR10097) & ON
RED(H-DF4)	22	-22-2	S1367-1-8	SEE H-DC5	◁	
H-DF3	22		S1493-1	S1367-1-8		THRU SER(SR10097)
RED(H-DF2)	22	-22-2	S1367-1-8	S1493-1		
H-DF1	22		S1367-1-8	S1367-1-8		
WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS

WIRE TABLE

12	S2527-2	GROUND CONNECTOR	
11	S2527-1	LH GROUND BLOCK	
10	C664511-0102	DIGITAL CLOCK	
9	S1637-1	HOUSING	
8	S1637-2	HOUSING	
7	0770728	DIODE ASSY	
6	C664508-0101	CLOCK	
5	S2475-1	BATTERY CONTACTOR	
4	S1990-22	FUSEHOLDER	
3	S1091-1	FUSE	
2	S1711-1	OIL PRESSURE SWITCH	
1	C664503-0101	HOURMETER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CXXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

PAWNEE DIVISION
[illegible]
WICHITA, KANSAS

TITLE
WIRING DIAGRAM - HOURMETER (OPT)

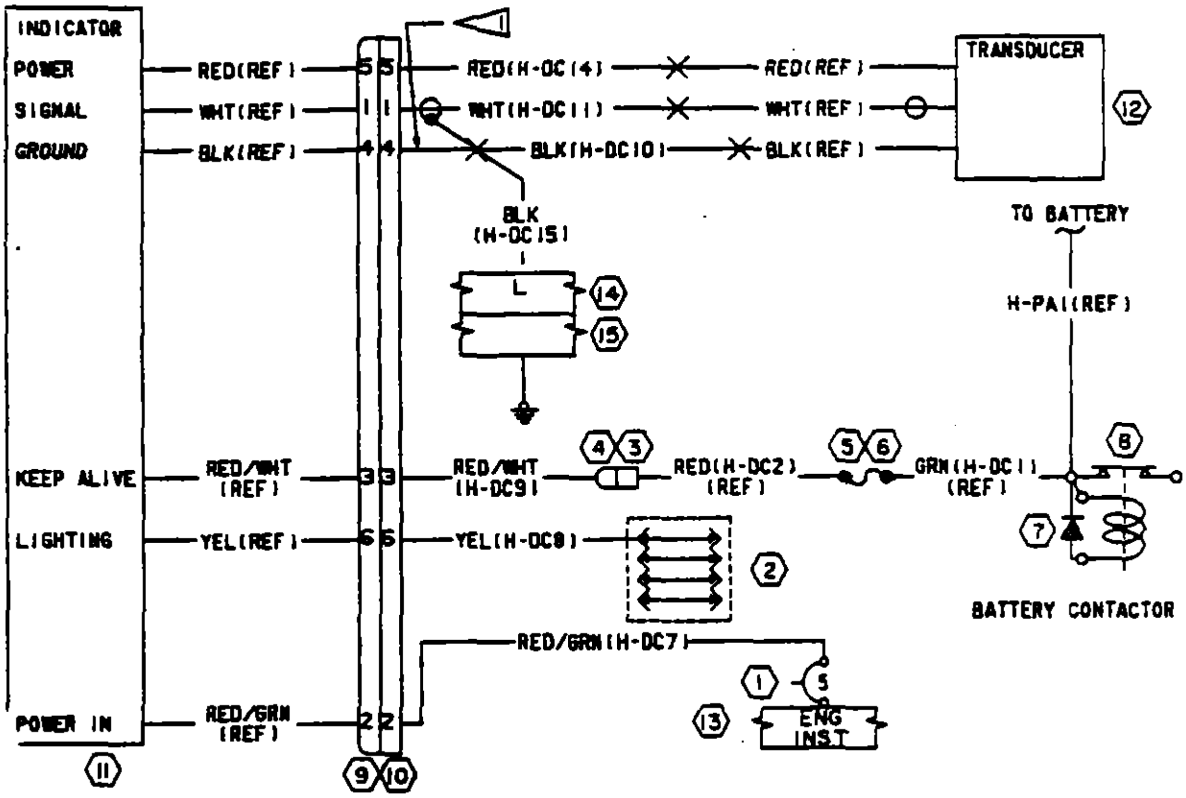
SIZE C | CODE IDENT NO 71379 | DWG NO. 1271000

SCALE: NONE | SR 58949 | PAGE 8.3

NOTES:

1. TERMINATE 22A JUMPER WITH S-1636-1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV: ADD JUMPER WIRE & NOTE 1 S-1370-1 WAS S-1636-1/ BLK(H-DC10): S-2080-4 WAS S-1367-1-8/ BLK(H-DC15): ADD S-2527-1 & S-2527-2 (SR10097)	3-5-82	JRG



97-00916

BLK(H-DC15)	22	-22-0	SEE DC10	S2080-4		
RED(H-DC4)	22	-22-2	S1636-1	S1370-1		
WHT(H-DC11)	22S	S1661-22-4	S1636-1	S1370-1		
BLK(H-DC10)	22	-22-0	S1370-1	S1370-1		
RED/WHT(H-DC9)	22	-22-2-9	S1636-1	S1636-1		
YEL(H-DC8)	22	-22-4	S1636-1	S1020-1		
RED/GRN(H-DC7)	22	-22-2-5	S1367-1-6	S1636-1		
WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS

WIRE TABLE

15	S2527-2	GND CONNECTOR	
14	S2527-1	LH GND BLOCK	
13	1270741	BUS BAR	
12	C613001	FUEL TRANSDUCER	
11	C662050	INDICATOR	
10	S1641-5	HOUSING	
9	S1640-5	HOUSING	
8	S2475-2	BATTERY CONTACTOR	
7	0770731	DIODE ASSY	
6	S1450-22	FUSE HOLDER	
5	S1081-1	FUSE	
4	S1637-1	HOUSING	
3	S1637-2	HOUSING	
2	3404-018	TERMINAL BLOCK	
1	S1360-5L	CIRCUIT BREAKER	
REF	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC.NO. S-XXX OR CXXXXXX-CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	STAIB	11-11-81
GROUP	MOSER	11-11-81
DRAWN		11-11-81
CHECK	YOUNGERS	11-11-81
PROJECT	G. FICKEL	11-17-81
APPD	JRG	
OTHER	AC	

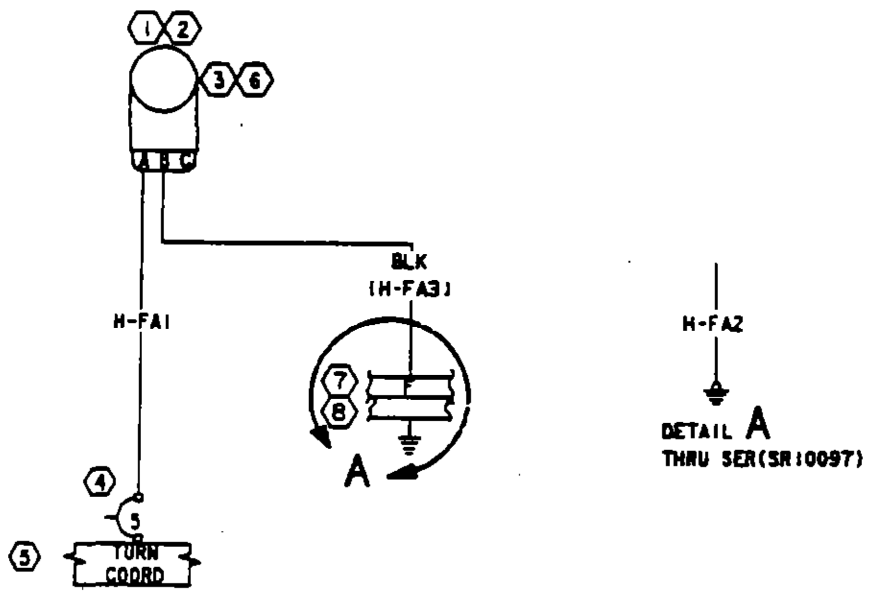
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE WIRING DIAGRAM - FUEL TOTALIZER/CLOCK (OPT)

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR10097 | PAGE 8.4

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]



97-00916

8	S2527-2	GROUND CONNECTOR
7	S2527-1	LH GROUND BLOCK
6	MS3057-4A	CLAMP
5	1270741	BUS BAR
4	S1360-5L	CIRCUIT BREAKER
3	MS3106A10SL3S	CONNECTOR
2	S1303-2	TURN & BANK
1	C661003-0505	TURN COORDINATOR
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

WIRE NO.	GA	MATERIAL	LG	TERMINALS		DETAILS
H-FA3	22	-22-0		SOLDER S2099-4		SER(SR10097) & ON
H-FA2	22			SOLDER S1367-1-8		THRU SER(SR10097)
H-FA1	22			S1367-1-6 SOLDER		

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1XXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

	NAME	DATE
[illegible]	WHITSON	4-7-81
[illegible]	HARDEN	4-10-81
[illegible]	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
[illegible]		
[illegible]	MOORE	4-13-81

Cessna AIRCRAFT CO.

WIRING DIAGRAM - TURN COORDINATOR. TURN & BANK

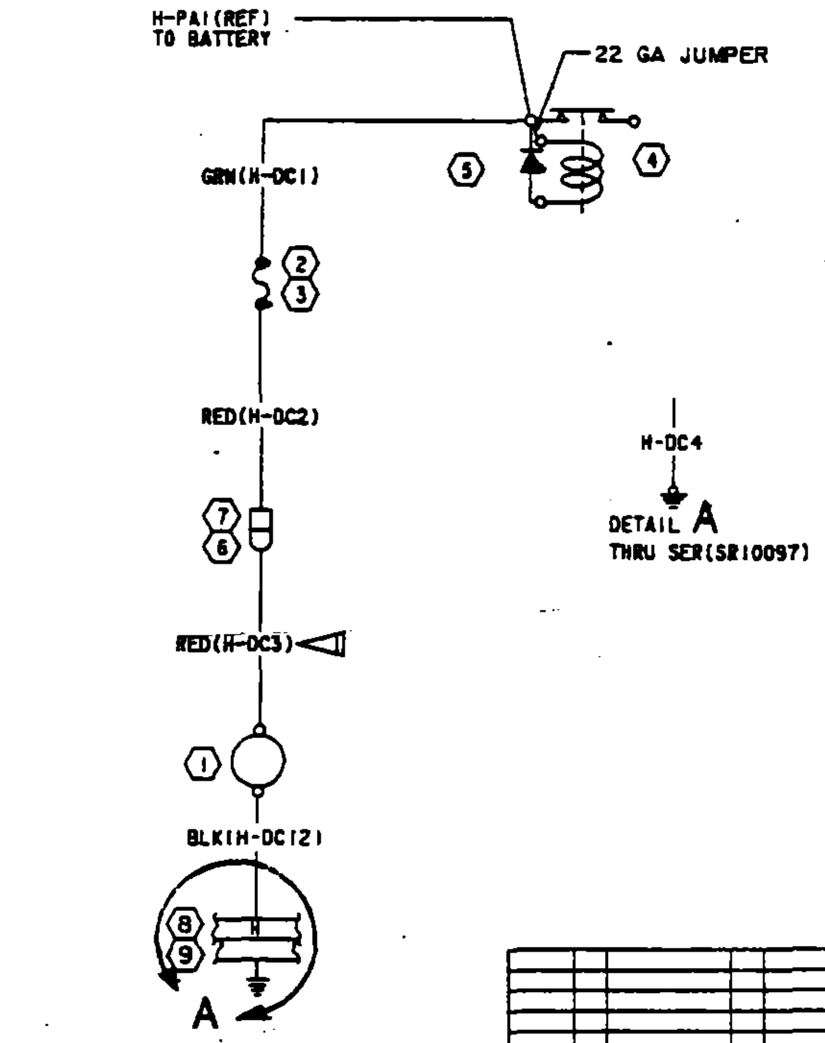
SIZE C | 71379 | 1271000

SCALE NONE | SR9949 | PAGE 9.1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] (SR9949)	6-5-81	[illegible]
B	[illegible] S2427-18-2 (SR10097)	11-4-81	[illegible]

NOTES:

CAUTION: POWER WIRE MUST BE CONNECTED TO "BATT" TERMINAL OF CLOCK OTHERWISE INTERNAL DAMAGE TO UNIT WILL RESULT



97-00916

[illegible]	22	-22-3		S1567-1-6	S2099-4		SER(SR10097) & ON
H-DC4	22			S1567-1-6	S1567-1-8		THRU SER(SR10097)
[illegible](H-DC3)	22	-22-2		S1635-1	S1567-1-6		
[illegible](H-DC2)	22	-22-2		SOLDER	S1635-1		
[illegible](H-DC1)	22			S1567-1-9	SOLDER		

WIRE TABLE

9	S2427-3	GROUND CONNECTOR
8	S2427-1	LH GROUND BLOCK
7	S1637-2	HOUSING
6	S1637-1	HOUSING
5	0770720	DIODE ASSY
4	S2475-1	BATTERY CONTACTOR
3	S1080-22	FUSEHOLDER
2	S1081-1	FUSE
1	C664508-0102	CLOCK

EQUIPMENT TABLE

	NAME	DATE
	WHITSON	4-7-81
	HARDEL	4-10-81
	MCGUIGAN	4-2-81
	HAIR	4-2-81
	MOORE	4-13-81

CESSNA AIRCRAFT CO.

WIRING DIAGRAM - CLOCK

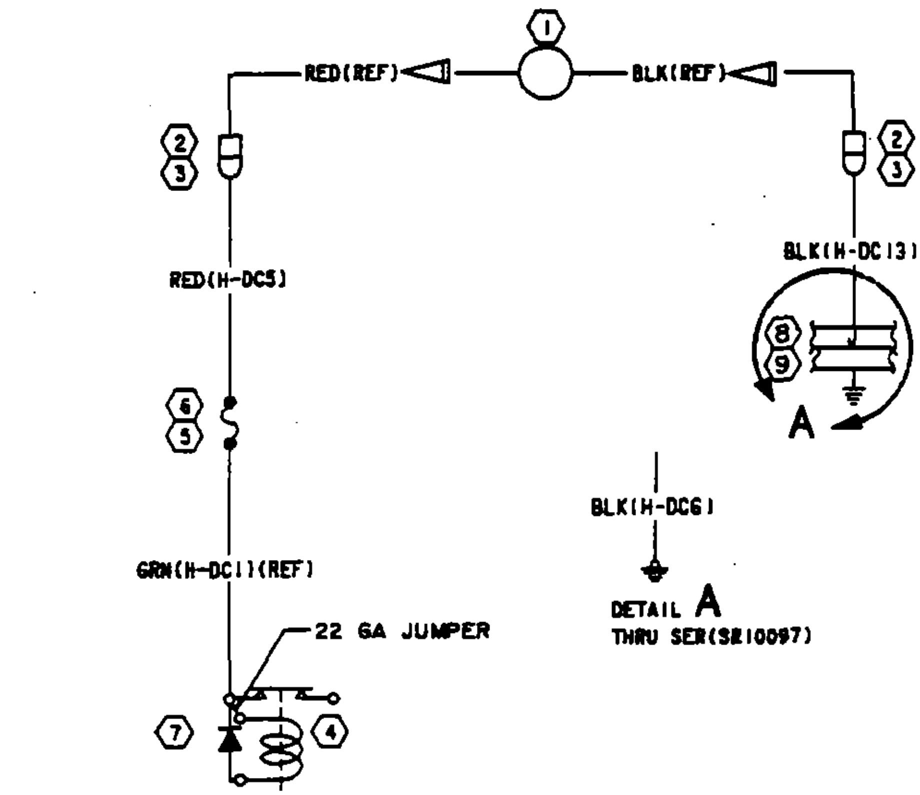
C 71379 1271000

NONE SR9949 10.1

NOTES:

INSTALL S1636-1 ON VENDOR WIRE

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible] 6-3-81	[illegible]
B	[illegible]	[illegible] 11-4-81	[illegible]



97-00916

WIRE ID NO.	GA	MATERIAL	LG	TERMINALS		REMARKS
BLK(H-DC13)	18	-18-0		S1635-1	S2099-3	SER(SR10097) & ON
BLK(H-DC6)	18	-18-0		S1635-1	S1367-1-8	THRU SER(SR10097)
RED(H-DC5)	22	-22-2		SOLDER	S1635-1	

WIRE TABLE

	PART NO.	DESCRIPTION	
9	S2527-2	GROUND CONNECTOR	
8	S2527-1	LH GROUND BLOCK	
7	0770720	DIODE ASST	
6	S1091-1	FUSE	
5	S1090-22	FUSEHOLDER	
4	S2475-1	BATTERY CONTACTOR	
3	S1637-1	HOUSING	
2	S1637-2	HOUSING	
1	C664511-0102	DIGITAL CLOCK	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1XXX=CESSNA SPEC.NO. S-XXX OR CXXXXXX=CESSNA STD.NO.

SUPERSEDES: | SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM - DIGITAL CLOCK (OPT)

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1271000
SCALE NONE	SR9949	PAGE 10.2

LTR	DESCRIPTION	DATE	APPROVED
F	BY REP: SEE IN DETAIL E: DELETE DETAIL C & D (SR10096)	FAS 3-19-82	[illegible]

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	BY REP: ADD MODEL CODE TO WIRES: ADD PG 11.1.1: PG 11.1.2 WAS 11.1.1: PG 11.1.3 WAS 11.1.2: ON PG 11.1.2 ADD 22 GA JUMPER(1): BLK(H-LB21) WAS 500 WIRE FROM 1215179 LAMP ON PG 11.1.3 ADD 2113025, 2113026, 1513030, AND WIRES RED/YEL(1), RED/YEL(2), RED/YEL(3), BLK(1), BLK(2), BLK(3), H-LB27, H-LB28, H-LB29 AND H-LB30 (SR9949)	6-3-81	[illegible]
B	BY REP: ADD NOTE 5: BLK(REF) WIRE WAS H-LB21: WHT(REF) WIRE WAS H-LB8 (SR9949)	7-17-81	[illegible]
C	BY REP: ON PG 11.1.2 MS25231-1829 LAMP WAS S1600 LIGHT ASSY: DELETE WIRES H-LB15, H-LB16 & H-LB17: S1370-1 TERMINAL ON H-LB14 WAS SOLDER ON PG 11.1.3 H-LB45 WAS H-LB27: H-LB46 WAS H-LB28: H-LB47 WAS H-LB29: H-LB48 WAS H-LB30 (SR9949)	8-27-81	[illegible]
D	BY REP: S1367-1-6 TERMINAL PER LB28 WAS S1370-1: C669502 WAS C669501: DELETE 1270479 (SR9949)(REF)	11-4-81	[illegible]
E	BY REP: SEE 16 LB09, LB14, LB12 & LB13 WIRES: SEE NOTE LB13, LB16, LB45 & LB46 WIRES: ADD S2527-1-40-21 & PG11.1.4 (SR10097)	11-6-81	[illegible]

NOTES:

1. INSTALL S1635-1 TERMINAL ON VENDOR FURNISHED LEAD
2. INSTALL S1636-1 TERMINAL ON VENDOR FURNISHED LEAD
3. INSTALL S1367-1-6 TERMINAL ON VENDOR FURNISHED LEAD
4. REQUIRED ONLY WHEN OPTIONAL DIGITAL CLOCK (C664511) IS INSTALLED
5. INSTALL S1635-1 TERMINAL ON VENDOR FURNISHED WIRE

	PART NO.	DESCRIPTION	
29	S2527-2	GROUND CONNECTOR	
28	S2527-1	LT GROUND BLOCK	
27	MS25231-1829	LAMP	
26	1513037	POST LIGHT ASSY	
25	2113025	COVER ASSY RH	
24	2113025	COVER ASSY LH	
23	1270741	BUS BAR	
22	C669502	INSTRUMENT CLUSTER	
21	C669501	INSTRUMENT CLUSTER	
20	S2413-1	SOCKET	4
19	MS25231-1819	LAMP	4
18	C669500	INSTRUMENT CLUSTER	
17	S1899	LIGHT ASSY	
16	1215179	LIGHT ASSY	
14	S1692-2	SWITCH	
13	1700625	HOUSING ASSY	
12	S2055-2	HOUSING	
11	S2055-1	HOUSING	
10	MS25231-327	LAMP	
9	S1657-1	HOUSING	
8	S1657-2	HOUSING	
7	1570148	DIMMING ASSY	
6	S1640-6	HOUSING	
5	S1641-6	HOUSING	
4	1800-810	TERMINAL BLOCK	
3	S2066C10LL	RESISTOR	
2	S1906-2	RESISTOR	
1	S1360-5	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXXX OR CXXXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

WIRE CODE	GA.	MATERIAL	TERMINALS			SERIALS
H-LB26	22		S1829-1	S-1367-1-8		
H-LB25	22		S1367-1-8	S1367-1-8		
H-LB24	22		S1829-1	S1367-1-8		
H-LB23	22		SEE H-LB9	SOLDER		
H-LB22	22		S1829-1	S1370-1	4	
RED(H-LB20)	22	-22-2	SOLDER	S1636-1		
RED(H-LB19)	22	-22-2	S1635-1	SOLDER		
BLK(H-LB18)	22	-22-0	S1370-1	S1367-1-8		THRU SER(SR00097)
H-LB14	22		S1829-1	S1370-1		
H-LB13	22		S1635-1	S1367-1-8		THRU SER(SR00097)
H-LB12	22		S1829-1	S1636-1		
H-LB11	22		S1635-1	S1829-1		
H-LB10	22		S1635-1	SOLDER		
H-LB9	22		S1367-1-6	S1635-2		
H-LB7	22		S1829-1	S1636-1		
H-LB6	22		S1829-1	S1636-2		
H-LB5	22		S1829-1	S1370-1		
H-LB4	22		S1635-1	S1829-1		
H-LB3	22		S1635-1	SOLDER		
H-LB2	22		SEE H-LB1	SOLDER		
H-LB1	22		S1367-1-6	S1635-2		

WIRE TABLE

97-00916

CONTRACT NO.	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCDUNCAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION, 5800 E. PAWNEE, WICHITA, KANSAS

TITLE: WIRING DIAGRAM - INSTRUMENT LIGHTS

SIZE: C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE: NONE | SR9949 | PAGE 11.1.0

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
E	SEE PG 11.1.0 FOR REVISION		

91600-16

WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
BLK(3)	22	-22-0	SOLDER	S1636-1		
BLK(2)	22	-22-0	SOLDER	SOLDER		
BLK(1)	22	-22-0	S1635-1	SOLDER		
RED/YEL(3)	22	-22-2-4	S1636-1	SOLDER		
RED/YEL(2)	22	-22-2-4	SOLDER	SOLDER		
RED/YEL(1)	22	-22-2-4	S1636-1	SOLDER		
BLK(H-ME5)	22	-22-0	SOLDER	S1367-1-8		
BLK(H-ME4)	22	-22-0	SOLDER	SOLDER		
RED/YEL(H-ME3)	22	-22-2-4	SOLDER	SOLDER		
RED/YEL(H-ME2)	22	-22-2-4	SEE H-ME1	SOLDER		
H-ME1	22		S1829-1	S1370-1		
BLK(H-LB53)	22	-22-0	S1636-1	S2099-4		SER(SR10097) & ON
BLK(H-LB52)	22	-22-0	S1635-1	S2099-4		SER(SR10097) & ON
BLK(H-LB50)	22	-22-0	S1370-1	S2099-4		SER(SR10097) & ON
BLK(H-LB49)	22	-22-0	S1635-1	S2099-4		SER(SR10097) & ON
H-LB48	22		S1635-1	S1367-1-8		THRU SER(SR10097)
H-LB47	22		S1829-1	S1635-1		
H-LB46	22		S1636-1	S1367-1-8		THRU SER(SR10097)
H-LB45	22		S1829-1	S1635-1		

WIRE TABLE

	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	HARDEN	6-8-81
DRAWN	MCGUIGAN	6-3-81
CHECK	YOUNGERS	6-3-81
PROJECT	BURGESS	6-10-81
APPD	JRG/WHH	6-8-81
OTHER		

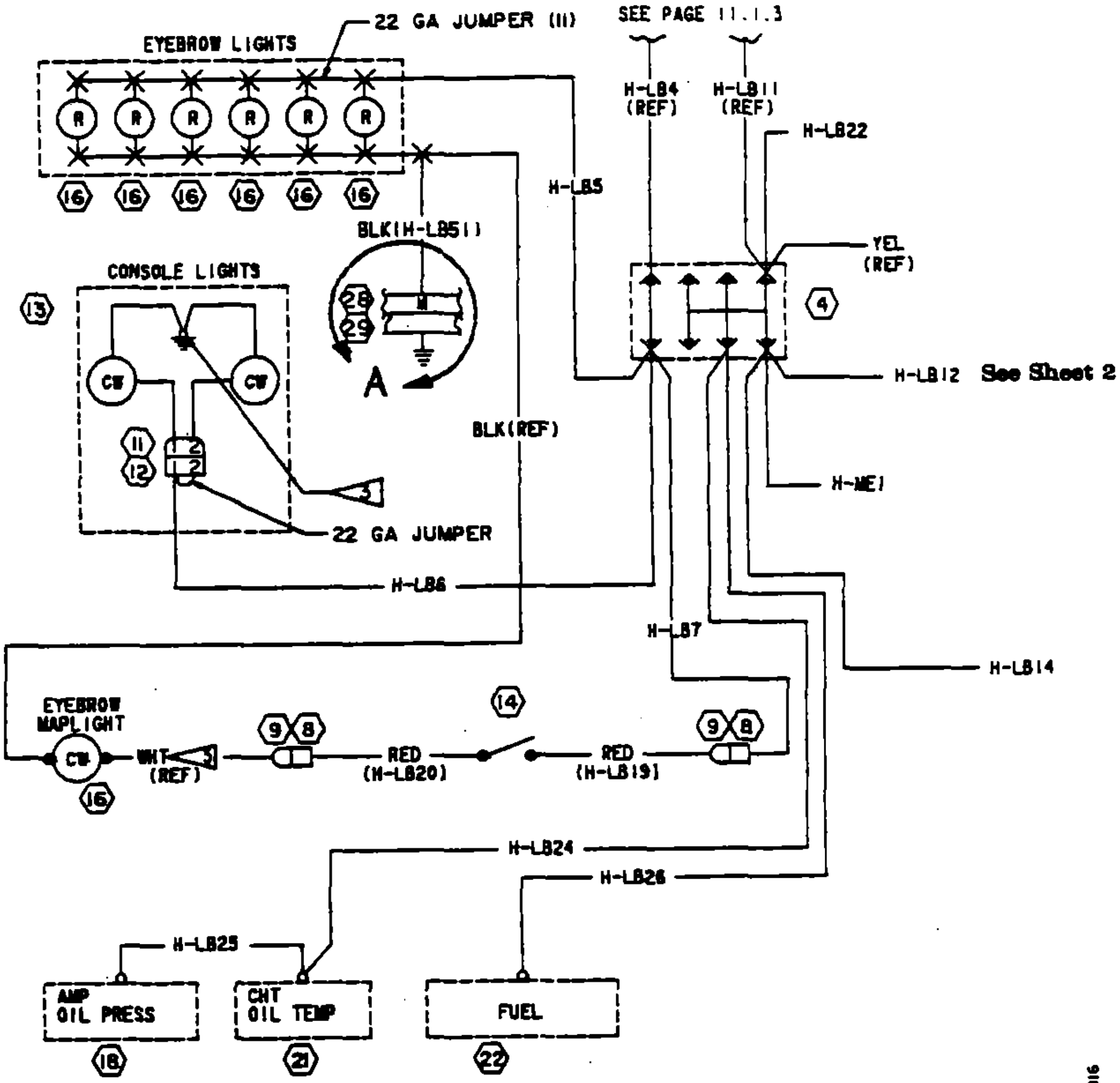
Cessna AIRCRAFT CO.

PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM - INSTRUMENT LIGHTS

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000
SCALE: NONE	SR 5R9949	PAGE 11.1.1

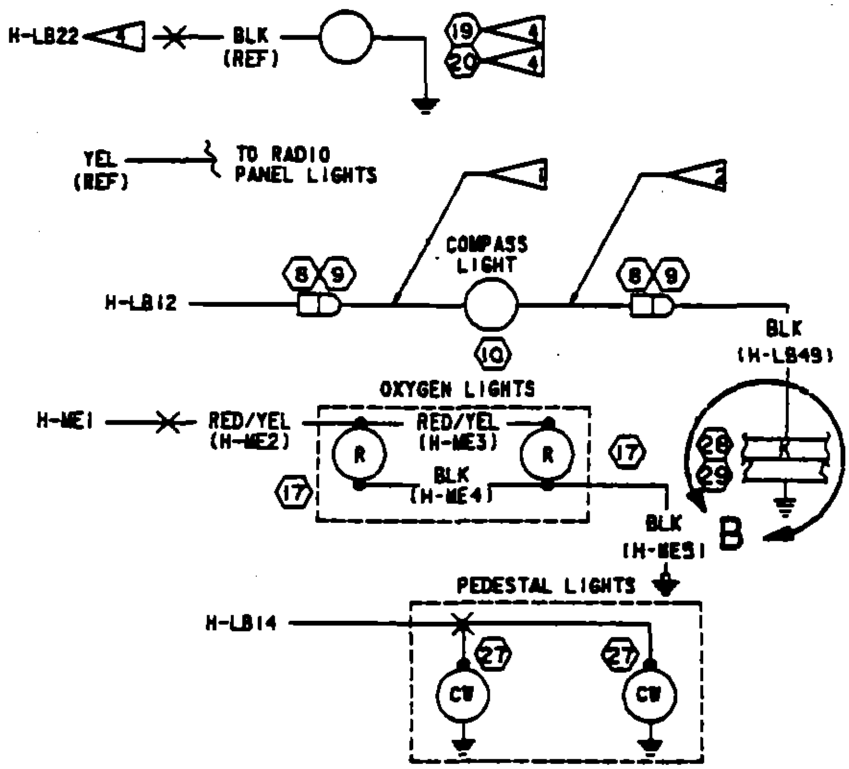
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
E	SEE PG 11.1.6 FOR REVISION		



CONTRACT NO	NAME	DATE	Cessna AIRCRAFT CO.		
DESIGN	WHITSON	4-7-81	TITLE WIRING DIAGRAM - INSTRUMENT LIGHTS		
GROUP	HARDEN	4-10-81			
DRAWN	MCGUIGAN	4-2-81			
CHECK	HAIR	4-2-81	SIZE C	CODE IDENT NO. 71379	DWG NO. 1271000
PROJECT	MOORE	4-13-81			
APPD					
OTHER			SCALE NONE	WT 389949	PAGE 11.1.2

Instrument Lights (Sheet 1 of 2)

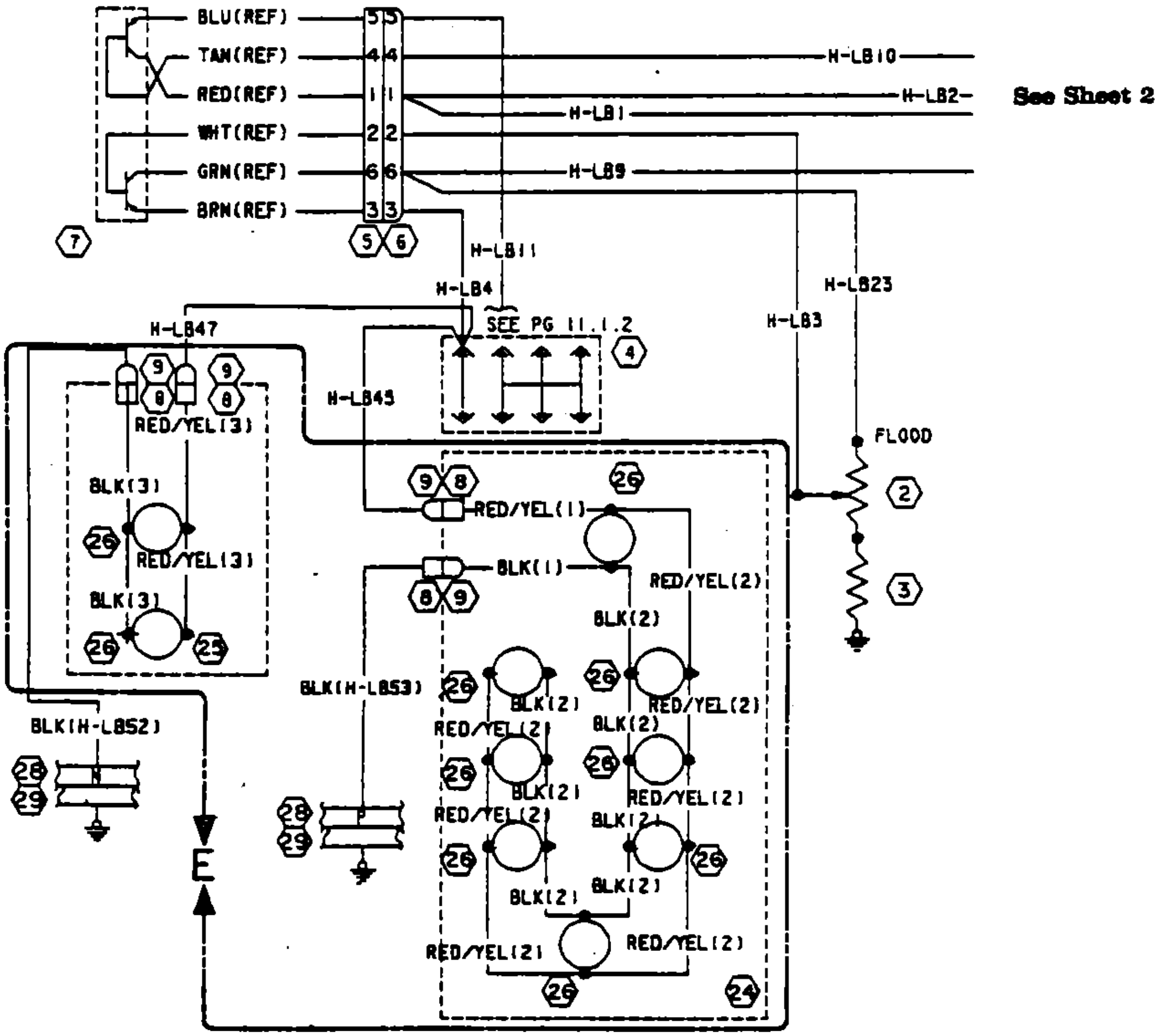
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
E	SEE PG 11.1.0 FOR REVISION		



CONTRACT NO.			Cessna AIRCRAFT CO.
	NAME	DATE	TITLE WIRING DIAGRAM - INSTRUMENT LIGHTS
DESIGN	WHITSON	4-7-81	
GROUP	HARDEN	4-10-81	
DRAWN	MCGUIGAN	4-2-81	
CHECK	HAIR	4-2-81	
PROJECT	MOORE	4-13-81	SIZE C · CODE IDENT NO 71379 · DWG NO. 1271000
APPD			SCALE NONE · SR9949 · PAGE 11.2
OTHER			

Instrument Lights (Sheet 2 of 2)

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
F	SEE PG 11.1.0 FOR REVISION		

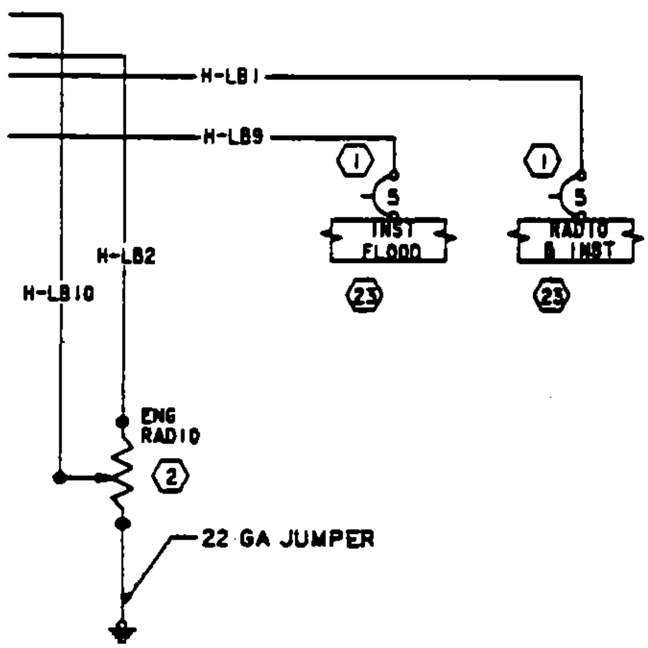


97-00916

CONTRACT NO			Cessna AIRCRAFT CO.		
	NAME	DATE	TITLE WIRING DIAGRAM - INSTRUMENT LIGHTS		
DESIGN	WATSON	4-7-81			
GROUP	HARDEN	4-10-81			
DRAWN	MCGUIGAN	4-2-81			
CHECK	HAIR	4-2-81			
PROJECT	MOORE	4-13-81	SIZE C	CODE IDENT NO. 71379	DWG NO. 1271000
APPD					
OTHER			SCALE NONE	SR9949	PAGE 11.1.3

Instrument Lights (Sheet 1 of 2)

LTR	DESCRIPTION	DATE	APPROVED
F	SEE PG 11.1.0 FOR REVISION		



CONTRACT NO.	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

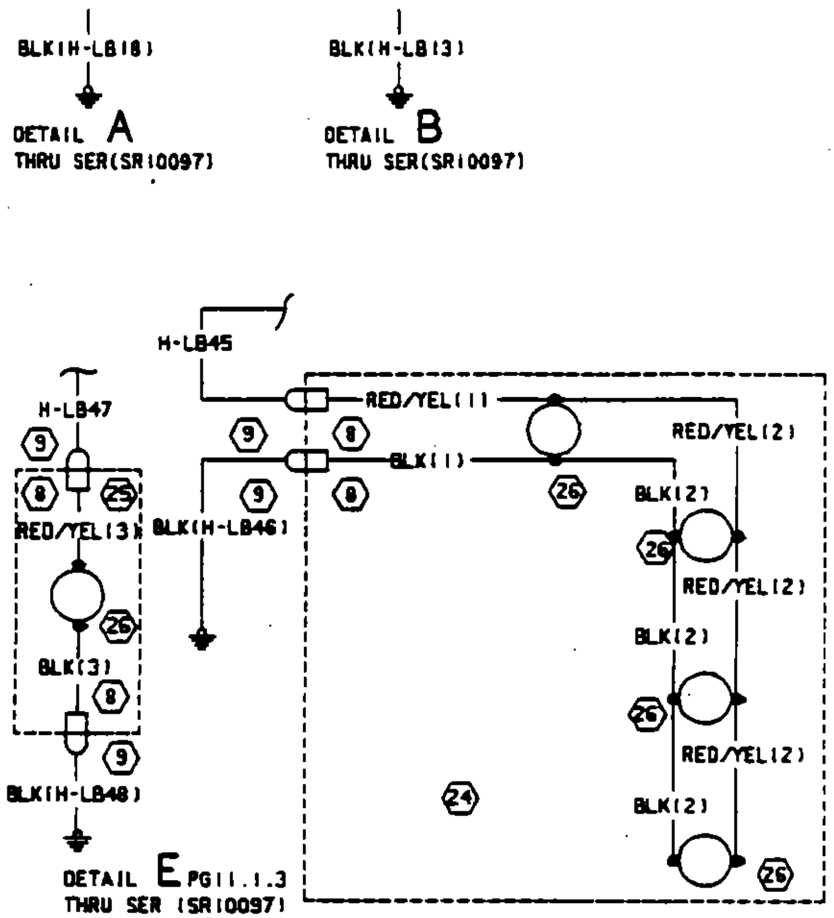
TITLE WIRING DIAGRAM - INSTRUMENT LIGHTS

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE

Instrument Lights (Sheet 2 of 2)

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
F	SEE PG 11.1.8 FOR REVISION		



97-00916

CONTRACT NO.			Cessna AIRCRAFT CO.		
	NAME	DATE	TITLE WIRING DIAGRAM - INSTRUMENT LIGHTS		
DESIGN	[illegible]	11-5-81			
GROUP	[illegible]	11-11-81			
DRAWN	[illegible]	11-5-81			
CHECK	[illegible]	11-5-81	SIZE	CODE IDENT NO.	DWG NO.
PROJECT	[illegible]	11-17-81	C	71379	1271000
APPD	[illegible]		SCALE NONE	SR10097	PAGE 11.1.4
OTHER AC					

NOTES:

1. TO BE RETAINED IN TERMINAL. WIRE MUST BE STRIPPED, DOUBLED AND TWISTED
2. THIS END OF RESISTOR TERMINATED WITH S1367-1-14 TERMINAL AND INSTALLED ON BUSHING OF TANDEM RESISTOR. DUE TO HEAT DISSIPATION, RESISTOR MUST BE KEPT FROM WIRE BUNDLE
3. WHEN EL OPTION IS INSTALLED S2091-3 REPLACES S1904-2
4. TERMINATE VENDOR SUPPLIED LEAD WITH S1367-1-8

REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] ([illegible])	[illegible]	[illegible]
B	[illegible] ([illegible])	[illegible] 11-4-81	[illegible]

18	S2527-2	GROUND CONNECTOR								
17	S2527-1	LH GROUND BLOCK								
16	2470011	AUDIO CONTROL PANEL								
15	S2160-1	SWITCH		BLK(H-LB56)	22	-22-0	85969-6	S2099-4		SER(SR10097) & ON
14	1213782	EL PANEL ASSY		BLK(H-LB55)	22	-22-0	S1370-1	S2099-4		SER(SR10097) & ON
13	2113021	EL PANEL ASSY		BLK(H-LB54)	22	-22-0	S1370-1	S2099-4		SER(SR10097) & ON
12	1270741	BUS BAR		BLK(H-LB40)	22	-22-0	85969-6	S1367-1-8		THRU SER(SR10097)
11	C613001-0101	POWER SUPPLY		ORN(H-LB39)	22	-22-4	SEE LB38	85969-6		
10	S4002-55	TERMINAL BLOCK		H-LB38	22		SOLDER	S1370-2		
9	87149-7	CONNECTOR		H-LB37	22		S1370-1	SOLDER		
8	1570166	DIMMING ASSY		WHT(H-LB36)	22	-22-2	[illegible]	S1370-1		
7	S1641-5	HOUSING		WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
6	S1640-5	HOUSING		WIRE TABLE						
5	TAL-5-6000	RESISTOR								
4	S2005C2R14	RESISTOR								
3	S1904-2	RESISTOR								
2	S2091-3	RESISTOR								
1	S1360-5L	CIRCUIT BREAKER								
	PART NO.	DESCRIPTION								

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

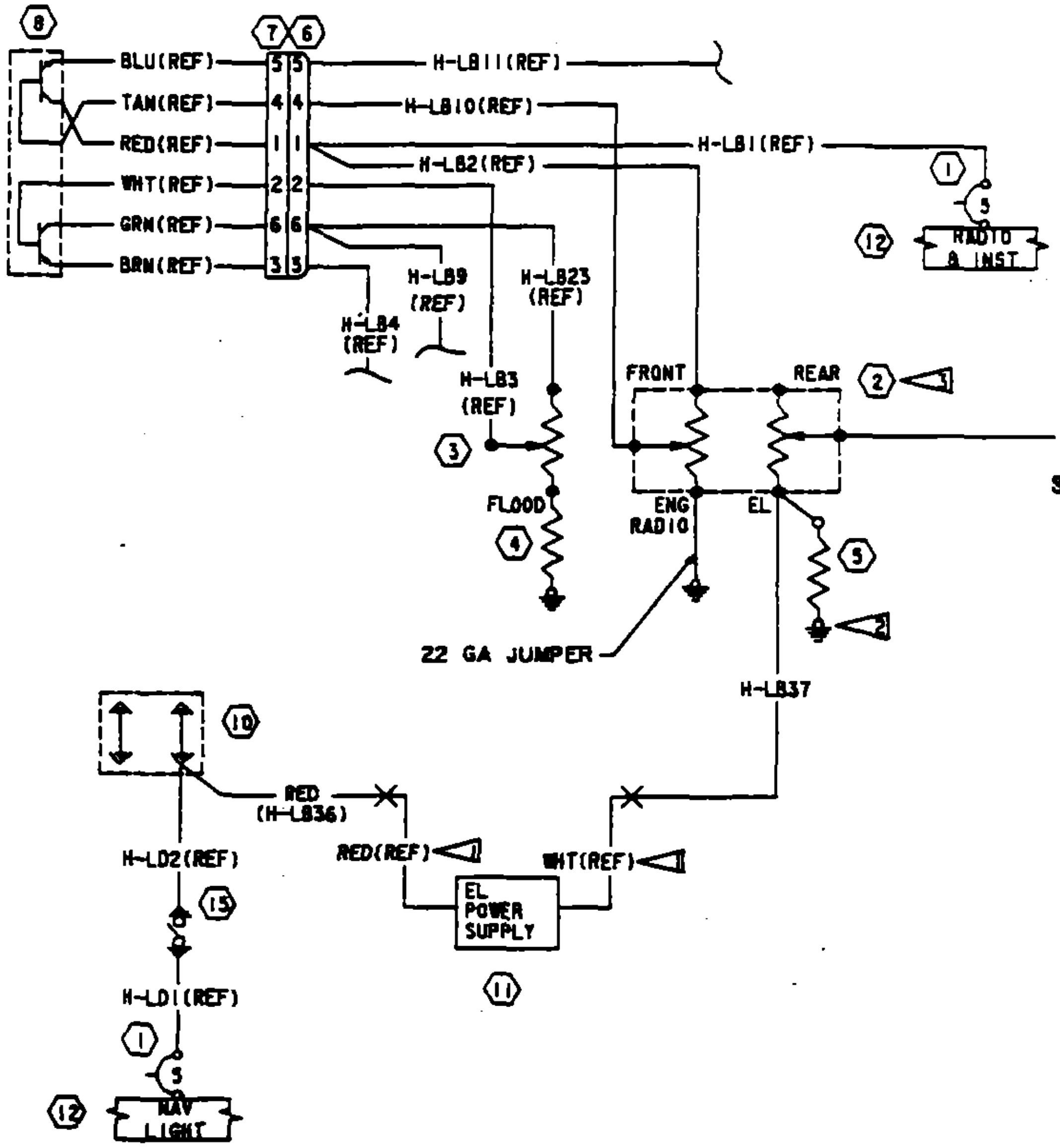
TITLE WIRING DIAGRAM - ELECTRO LUMINESCENT PANEL

SIZE C CODE IDENT NO 71379 DWG NO. 1271000

SCALE NONE SR9949 PAGE 11.2.0

97-00916

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
B	SEE PG 11.2.0 FOR REVISION		



See Sheet 2

97-00915

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-61
GROUP	HARDEN	4-10-61
DRAWN	MCGUIGAN	4-2-61
CHECK	HAIR	4-2-61
PROJECT	MOORE	4-13-61
APPD		
OTHER		

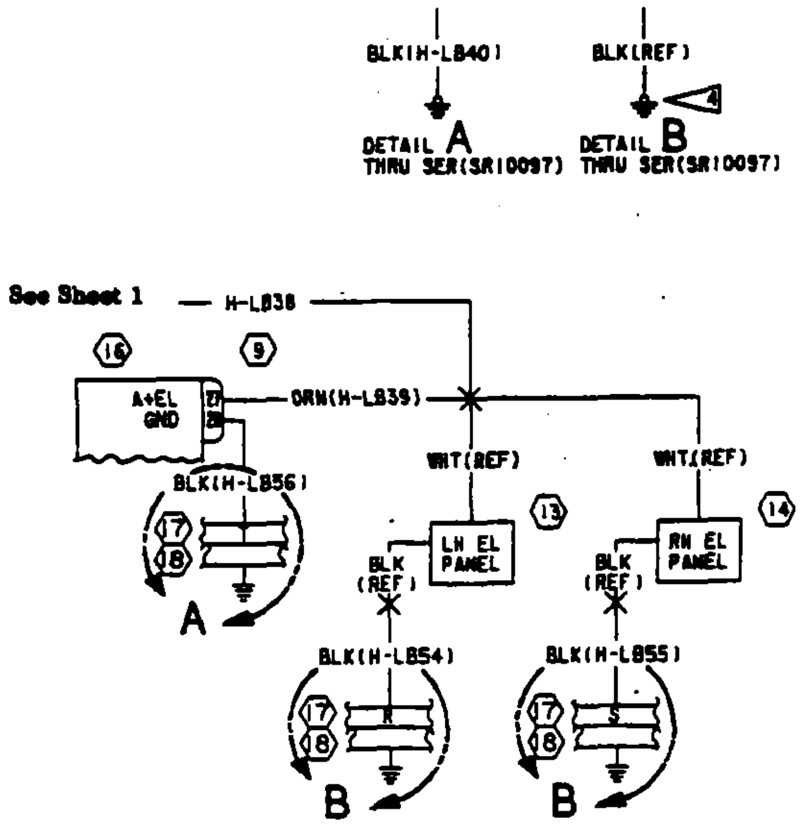
Cessna AIRCRAFT CO.

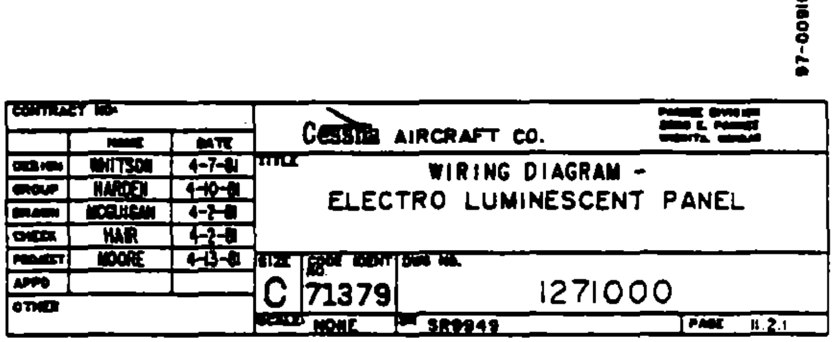
TITLE WIRING DIAGRAM - ELECTRO LUMINESCENT PANEL

SIZE C CODE IDENT NO. 71379 DWG NO. 1271000

SCALE NONE WT 3R9949 PAGE 11.2.1

Electro Luminescent Panel (Sheet 1 of 2)





Electro Luminescent Panel (Sheet 2 of 2)

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] ([illegible])	[illegible] [illegible]	[illegible]
B	[illegible] S2271-10-2 [illegible] ([illegible])	[illegible] 11-9-81	[illegible]

NOTES:

1 WHEN POST LIGHT OPTION IS INSTALLED 1570301-1 DIMMING ASSY REPLACES 1570166 AND S2091-7 POT ASSY REPLACES S1904-2

2 THIS POT IS PART OF S2091-7 DUAL POT ASSY WHEN OPTIONAL EL LIGHTING IS INSTALLED

97-00916

WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
BLK(H-LB58)	22	-22-0	S1636-1	S2099-4		SER(SR10097) & ON
BLK(H-LB57)	22	-22-0	S1636-1	S2099-4		SER(SR10097) & ON
BLK	22	-22-0	SOLDER	SOLDER		
RED/YEL	22	-22-2-4	SOLDER	SOLDER		
BLK(H-LB35)	22	-22-0	S1636-1	S1367-1-8		THRU SER(SR10097)
BLK(H-LB34)	22	-22-0	SOLDER	S1635-1		
RED/YEL(H-LB33)	22	-22-2-4	S1635-1	SOLDER		
BLK(H-LB32)	22	-22-0	S1636-1	S1367-1-8		THRU SER(SR10097)
BLK(H-LB30)	22	-22-0	SOLDER	S1635-1		
H-LB30	22		SEE H-LB28	S1636-1		
RED/YEL(H-LB29)	22	-22-2-4	S1635-1	SOLDER		
H-LB28	22		S1635-1	S1636-2		
H-LB27	22		S1635-1	SOLDER		

WIRE TABLE

14	S2127-2	GROUND CONNECTOR	
13	S2127-1	LH GROUND BLOCK	
12	1270741	BUS BAR	
11	S2009C201J	RESISTOR	
10	S1899	LIGHT ASSY	
9	S1637-2	HOUSING	
8	S1637-1	HOUSING	
7	S1904-2	POT ASSY	2
6	S1360-5L	CIRCUIT BREAKER	
5	S2091-7	POT ASSY	
4	S1604-614	TERMINAL BLOCK	
3	S1640-1	HOUSING	
2	S1641-1	HOUSING	
1	1570166	DIMMING ASSY	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC.NO. S-XXX OR CSXXXX-CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDER	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

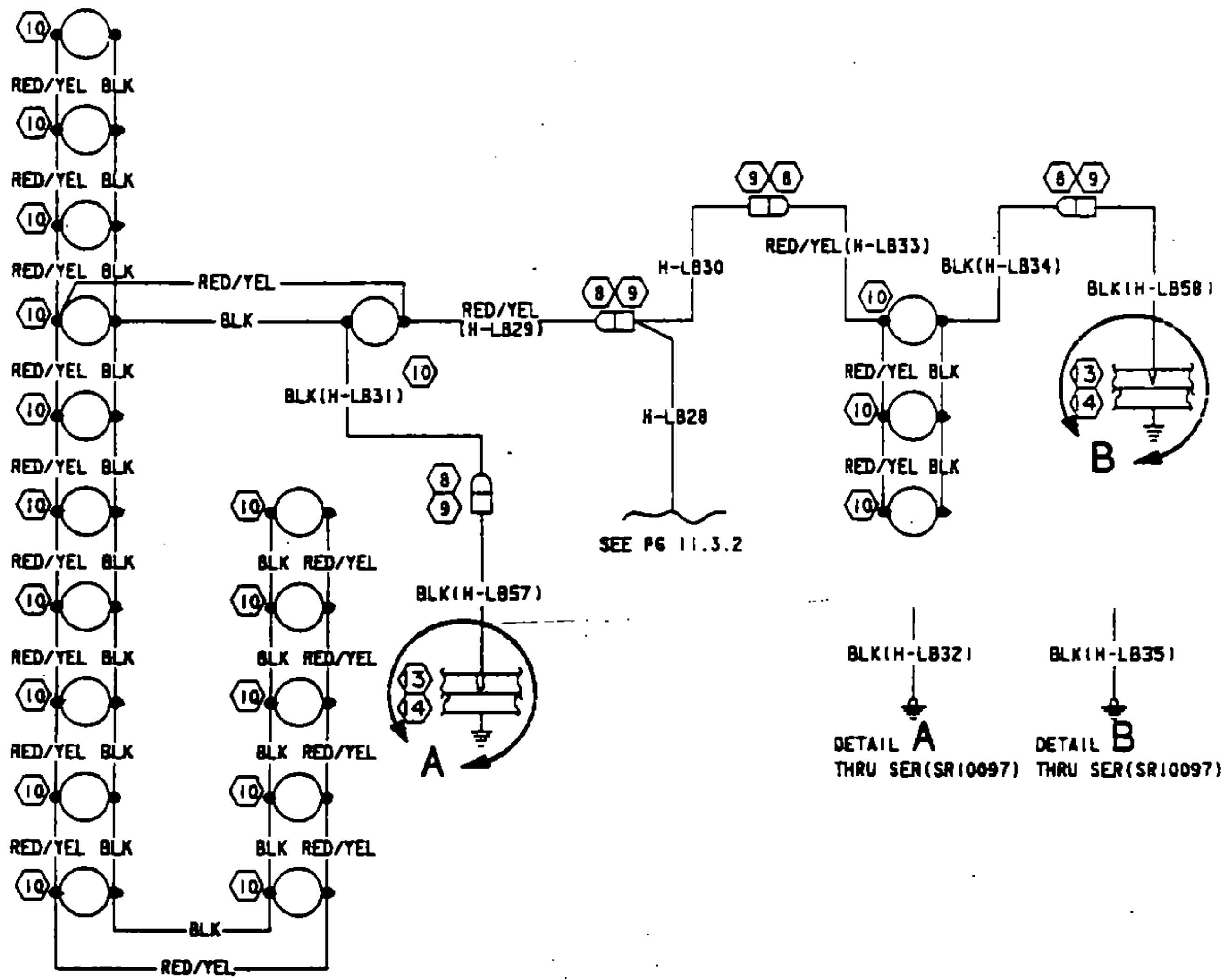
PAWNEE DIVISION
BOX 7 PAWNEE
WICHITA, KANSAS

TITLE WIRING DIAGRAM - POST LIGHTS

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR9949 | PAGE 11.3.0

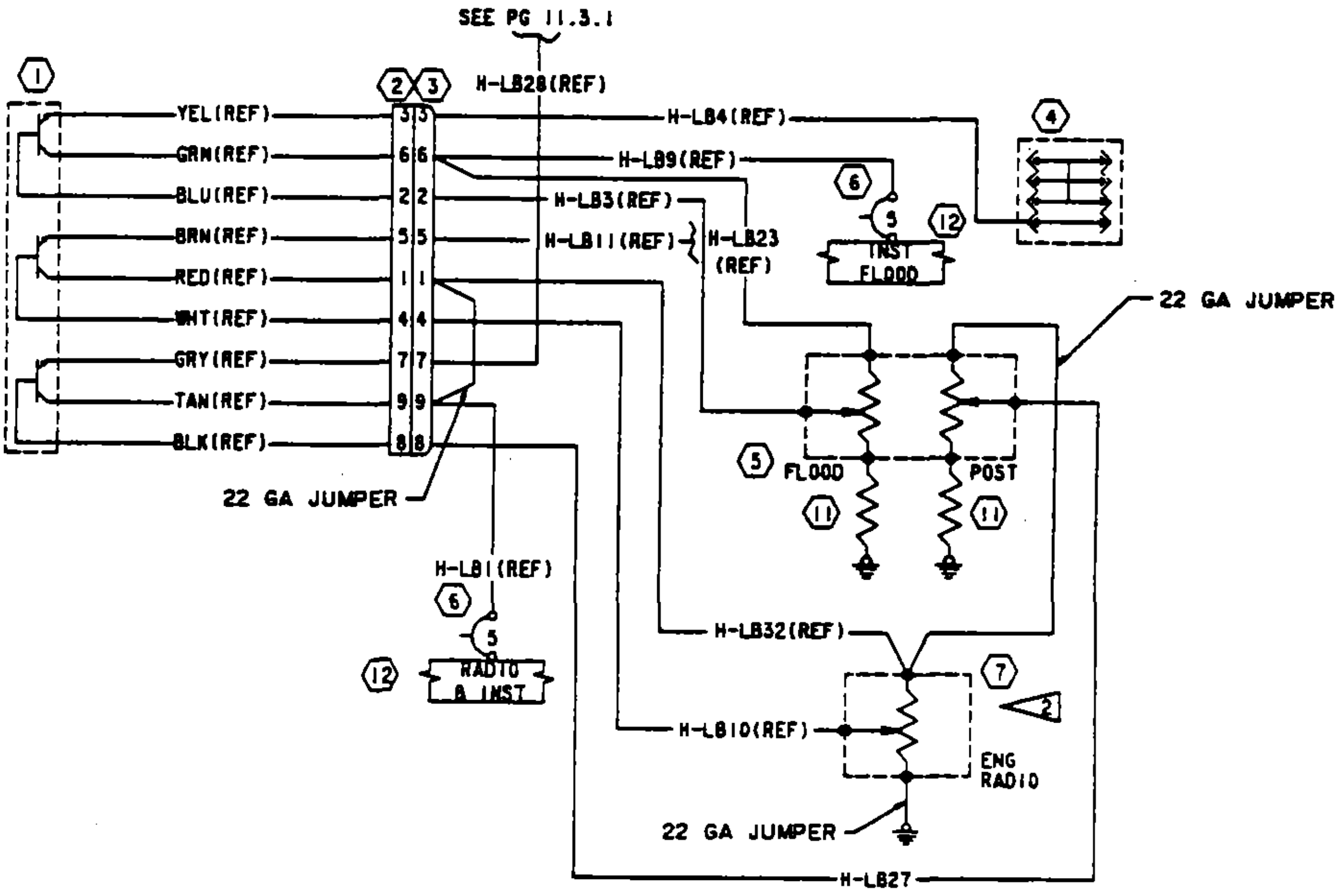
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
B	SEE PG 11.3.0 FOR REVISION		



97-00816

CONTRACT NO			Cessna AIRCRAFT CO.		
	NAME	DATE	TITLE WIRING DIAGRAM - POST LIGHTS		
DESIGN	WHITSON	4-7-81			
GROUP	HARDEN	4-10-81			
DRAWN	MCGUIGAN	4-2-81			
CHECK	HAIR	4-2-81			
PROJECT	MOORE	4-13-81	SIZE C	CODE IDENT NO 71379	DWG NO 1271000
APPD					
OTHER			SCALE NONE	SR9949	PAGE 11.3.1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	SEE PG 11.3.4 FOR REVISION		



49-00916

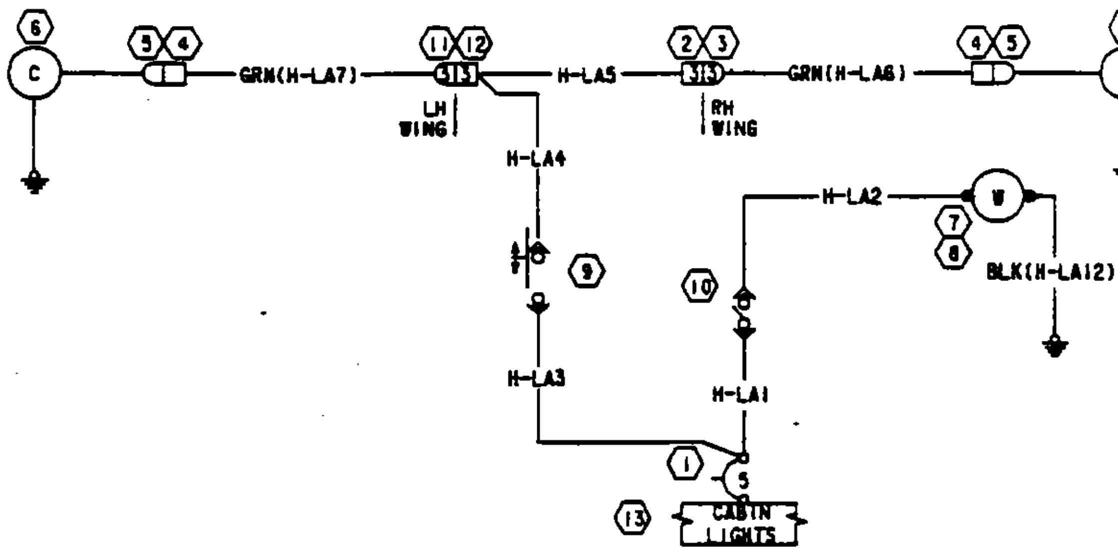
CONTRACT NO:		
	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

TITLE: WIRING DIAGRAM - POST LIGHTS

SIZE	CODE IDENT NO.	DWG NO.	
C	71379	1271000	
SCALE: NONE		SR9948	PAGE 11.3.2

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV: ADD MODEL CODE TO TABLE (SR9948)	6-3-81	[illegible]



49-00916

WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
BLK(H-LA12)	22	-22-0	SOLDER	S1367-1-6		
GRN(H-LA7)	22	-22-5	S1635-1	S1636-1		
GRN(H-LA6)	22	-22-5	S1635-1	S1636-1		
H-LA5	22		SEE H-LA4	S1636-1		
H-LA4	22		S1830-1	S1636-2		
H-LA3	22		S1367-1-6	S1830-1		
H-LA2	22		S1493-1	SOLDER		
H-LA1	22		S1367-1-6	S1493-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
13	1270741	BUS BAR	
12	S1641-6	HOUSING	
11	S1640-6	HOUSING	
10	S2160-1	SWITCH	
9	S1881-1	SWITCH	
8	1270110	CABIN LT ASSY	
7	[illegible]	LAMP	
6	1201094	COURTESY LT INSTL	
5	S1637-1	HOUSING	
4	S1637-2	HOUSING	
3	S1640-12	HOUSING	
2	S1641-12	HOUSING	
1	S1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGEAGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

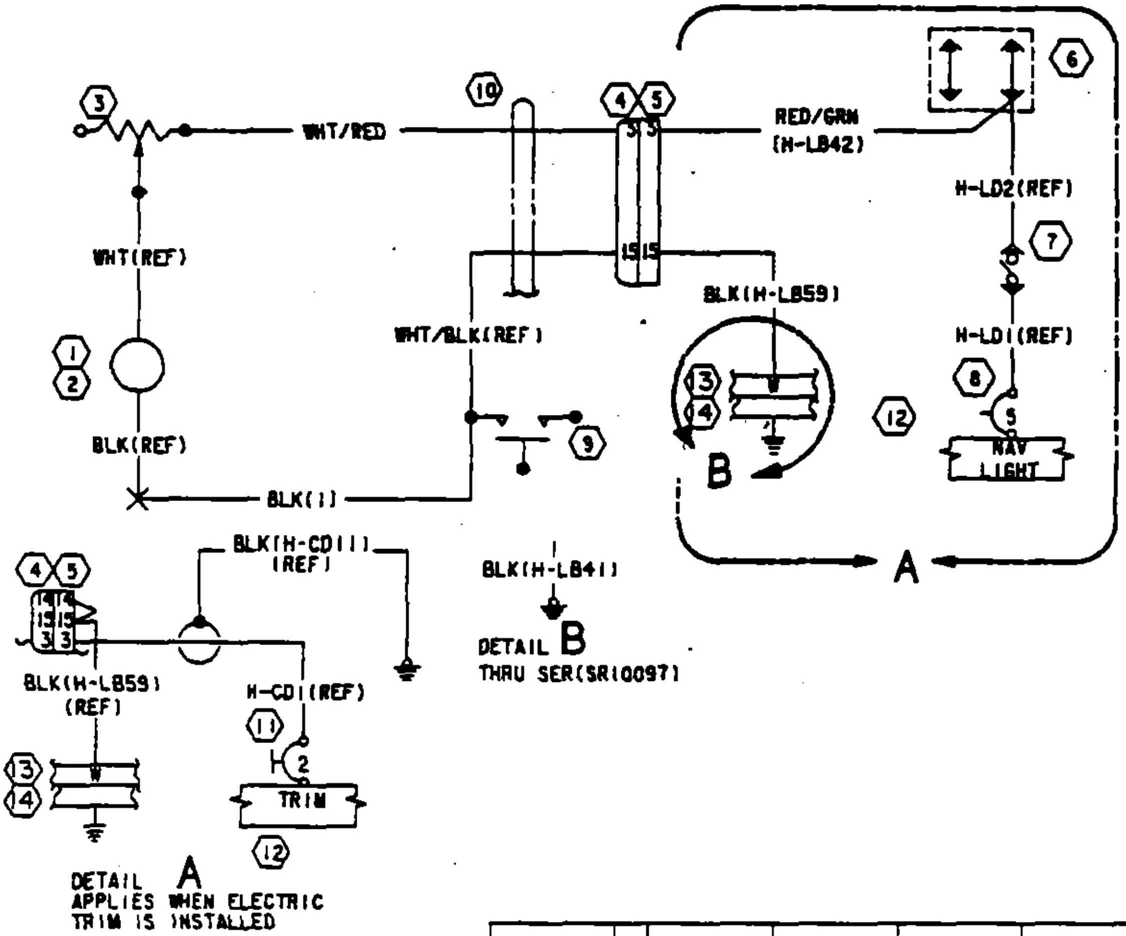
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM - DOME & COURTESY LIGHTS

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR9948 | PAGE 11.4

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]



97-00916

BLK(H-LB59)	22	-22-0	S1963-2	S2099-4		SER(SR10097) & ON
BLK(1)	22	-22-0	SOLDER	S1370-0		
BLK(H-LB41)	22	-22-0	S1963-2	S1367-1-8		THRU SER(SR10097)
RED/GRN(H-LB42)	22	-22-2-5	S1963-2	S1829-1		
WHT/RED	24	REF-S3306	SOLDER	S1963-1		
WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS

WIRE TABLE

14	S2527-2	GROUND CONNECTOR	
13	S2527-1	LH GROUND BLOCK	
12	1270131	[illegible]	
11	S1232-2	CIRCUIT BREAKER	
10	2270038	CABLE ASSY	
9	S1985-1	MIKE SWITCH	
8	S1360-5	CIRCUIT BREAKER	
7	S2160-1	SWITCH	
6	S4002-35	TERMINAL BLOCK	
5	S1962-2-9	HOUSING	
4	S1962-1-9	HOUSING	
3	3559A161-152A	RHEOSTAT	
2	2401	LAMP	
1	4157-001	SOCKET	
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CROOXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

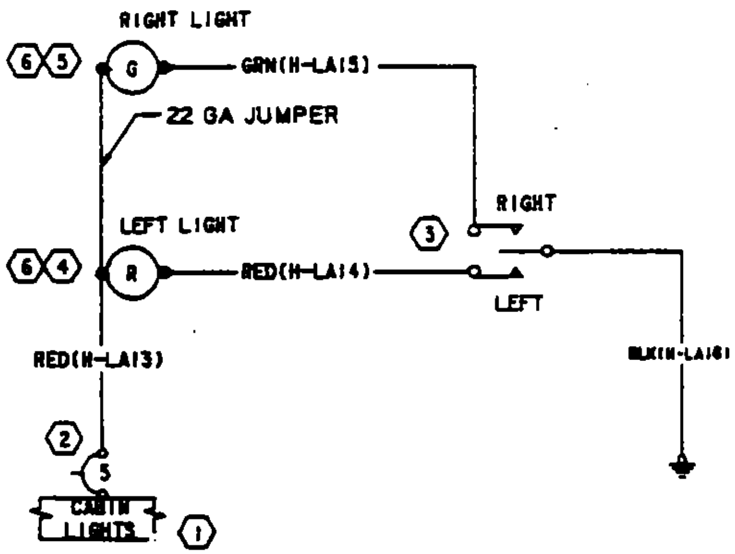
Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - MAP LIGHT CONTROL WHEEL

SIZE C | CODE IDENT NO 71379 | DWG NO. 1271000

SCALE: NONE | SR9949 | PAGE 11.5

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] ADD MODEL CODE TO WIRES (SR[illegible])	[illegible] 6-3-81	[illegible]
B	[illegible] LA17 WIRE: [illegible] LA16 WIRE: [illegible] (SR[illegible])	[illegible] 11-[illegible]-81	[illegible]
C	[illegible] DELETE [illegible], LA17 WIRE & SERIAL (SHOP PRACTICE)	[illegible] 5-7-82	[illegible]



97-00916

[illegible]	22	-22-0		[illegible]	[illegible]	
[illegible]	22	-22-5		SOLDER	[illegible]	
[illegible]	22	-22-2		SOLDER	[illegible]	
[illegible]	22	-22-2		[illegible]	SOLDER	

WIRE TABLE

6	[illegible]	LAMP	
5	[illegible]	LIGHT ASSY	
4	[illegible]	LIGHT ASSY	
3	[illegible]	SWITCH	
2	[illegible]	CIRCUIT BREAKER	
1	[illegible]	BUS BAR	

EQUIPMENT TABLE

	WHITSON	4-7-81
	HARDEN	4-10-81
	MCGUIGAN	4-2-81
	HAAS	4-2-81
	MOORE	4-13-81

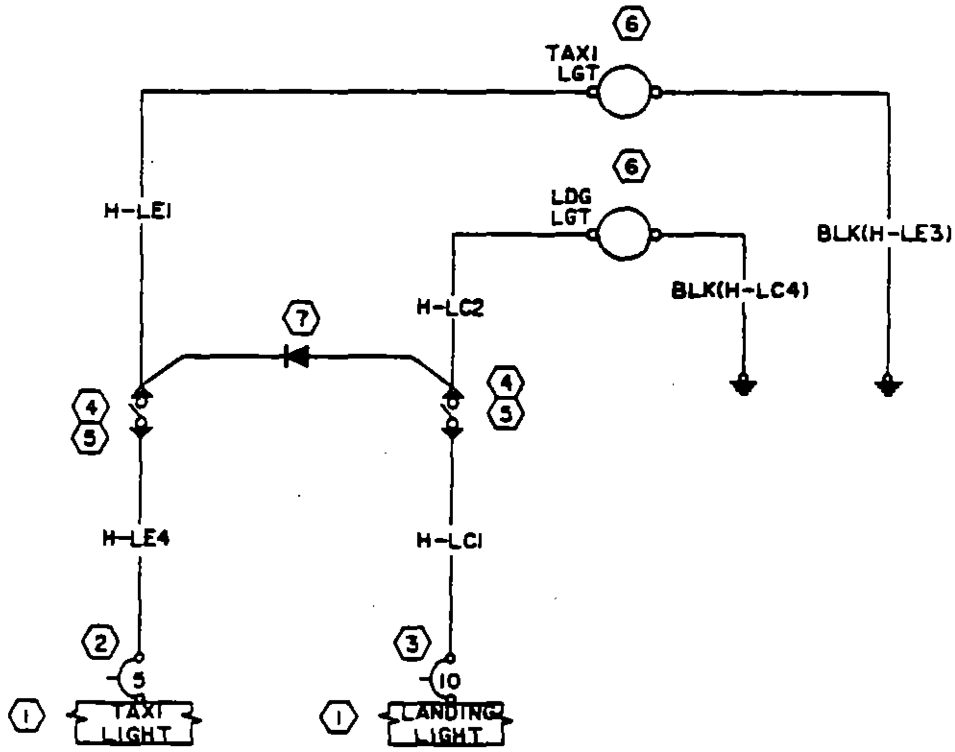
CESSNA AIRCRAFT CO.

WIRING DIAGRAM - SKYDIVING SIGNAL LIGHT (OPT)

C 71379 1271000

NONE SR8949

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]



49-00916

WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
H-LE4	20		S1367-1-6	S1493-1		
BLK(H-LE3)	18	-18-0	S1367-1-8	S1367-1-8		
H-LE1	18		S1493-1	S1367-1-8		
BLK(H-LC4)	18	-18-0	S1367-1-8	S1367-1-8		
H-LC2	18		S1493-1	S1367-1-8		
H-LC1	18		S1367-1-6	S1493-1		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
7	1270082	DIODE ASSY	
6	4594	LAMP	
5	S2160-1	SWITCH	
4	S2023-1	ADAPTER	
3	S1360-10L	CIRCUIT BREAKER	
2	S1360-5L	CIRCUIT BREAKER	
1	1270741	BUS BAR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

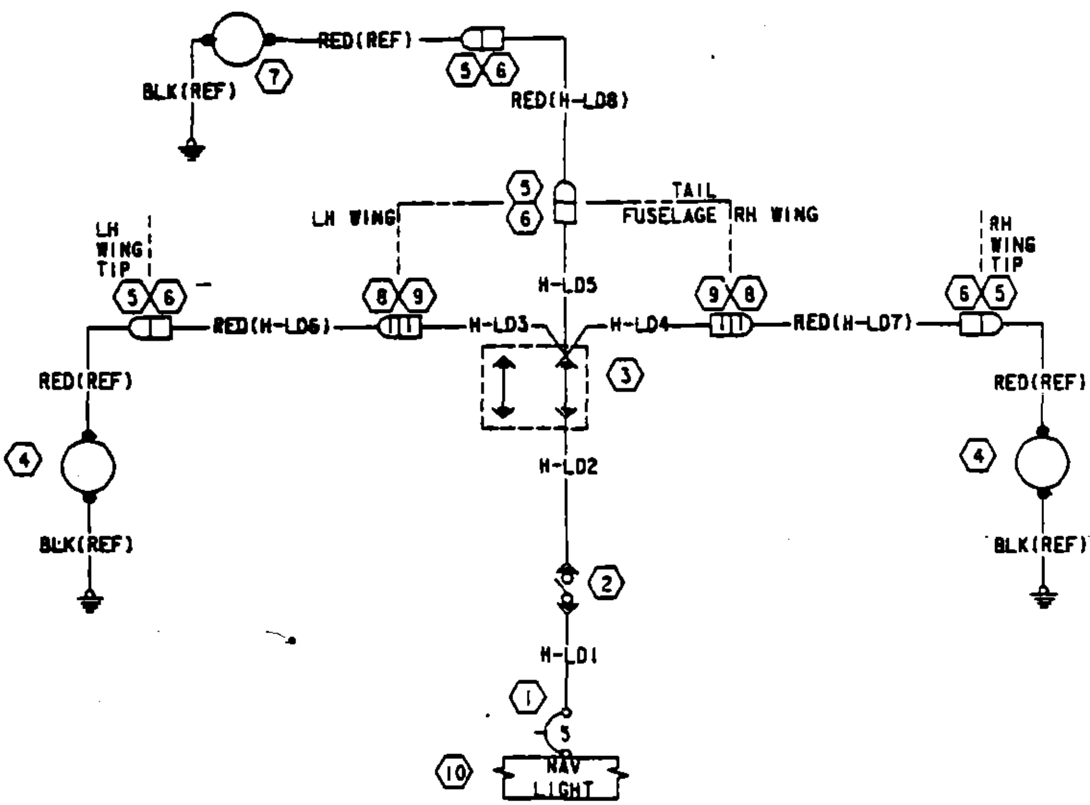
Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - LANDING LIGHT & TAXI LIGHT

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000

SCALE: NONE SR 5R9949 PAGE 11.7

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV. ADD MODEL CODE TO WIRES (SR9949)	6-3-81	[illegible]



49-00916

RED(H-LD8)	20	-20-2	S1635-1	S1636-1		
RED(H-LD7)	20	-20-2	S1635-1	S1636-1		
RED(H-LD6)	20	-20-2	S1635-1	S1636-1		
H-LD5	20		S1829-1	S1636-1		
H-LD4	22		S1829-1	S1636-1		
H-LD3	22		S1829-1	S1636-1		
H-LD2	22		S1493-1	S1829-1		
H-LD1	22		S1367-1-6	S1493-1		

WIRE TABLE

10	1270741	[illegible]	
9	S1641-?	HOUSING	
8	S1640-?	HOUSING	
7	[illegible]-0102	LIGHT ASSY	
6	S1637-2	HOUSING	
5	S1637-1	HOUSING	
4	[illegible]-0101	LIGHT ASSY	
3	[illegible]	TERMINAL BOARD	
2	S2160-1	SWITCH	
1	S1360-?	CIRCUIT BREAKER	

EQUIPMENT TABLE

[illegible]	WHITSON	4-7-81
[illegible]	HARDER	4-10-81
[illegible]	MCGUIGAN	4-2-81
[illegible]	HAHN	4-2-81
[illegible]	MOORE	4-13-81

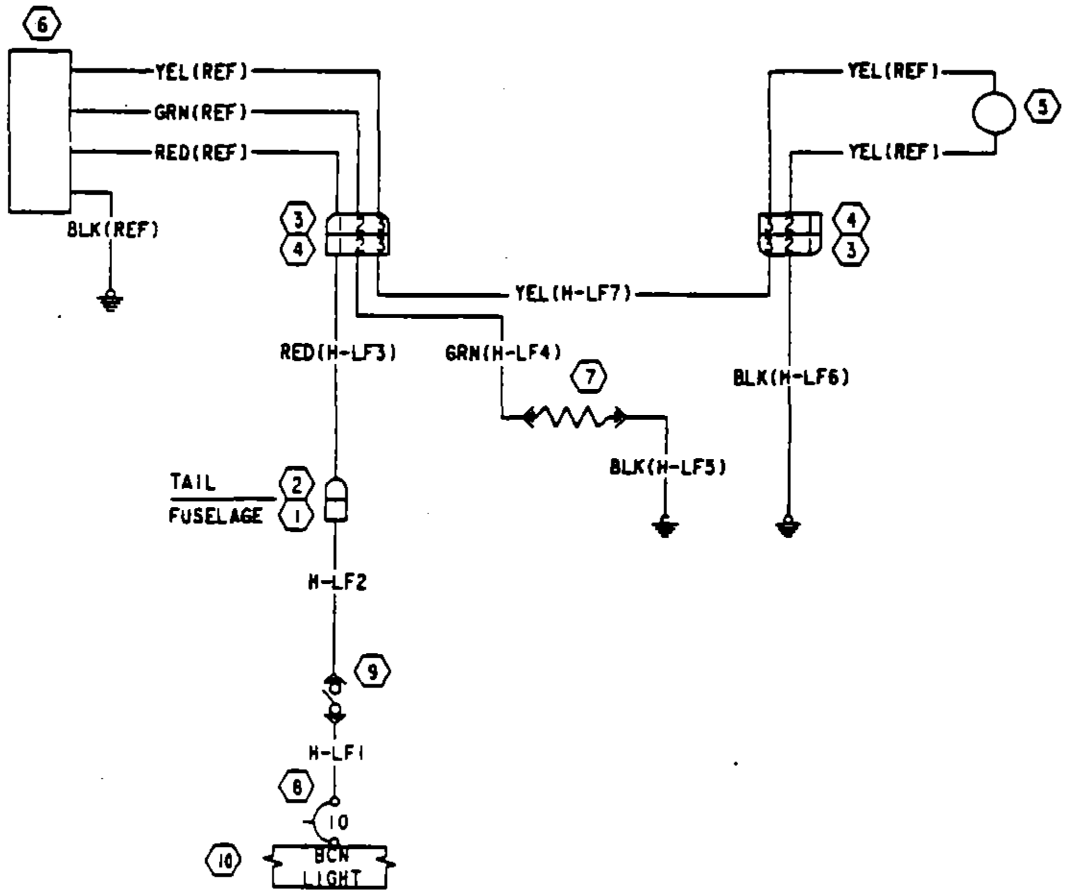
Cessna AIRCRAFT CO.

WIRING DIAGRAM - NAVIGATION LIGHTS

C 71379 1271000

NONE SR9949 11.8

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	6-3-81	[illegible]



49-00916

YEL(H-LF7)	18	-18-4	S1636-1	S1635-1		
BLK(H-LF6)	18	-18-0	S1635-1	S1367-1-8		
BLK(H-LF5)	18	-18-0	S1493-1	S1367-1-8		
GRN(H-LF4)	18	-18-5	S1636-1	S1493-1		
RED(H-LF3)	18	-18-2	S1635-1	S1636-1		
H-LF2	18		S1493-1	S1636-1		
H-LF1	18		S1367-1-6	S1493-1		
WIRE CODE	GA	MATERIAL	TERMINALS			[illegible]

WIRE TABLE

10	1270741	BUS BAR	
9	S2160-1	SWITCH	
8	S1360-10L	CIRCUIT BREAKER	
7	0R95-6	RESISTOR	
6	C594502-0102	FLASHER ASSY	
5	C621001-0102	LIGHT ASSY	
4	S1636-1	HOUSING	
3	S1636-2	HOUSING	
2	S1637-1	HOUSING	
1	S1637-2	HOUSING	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

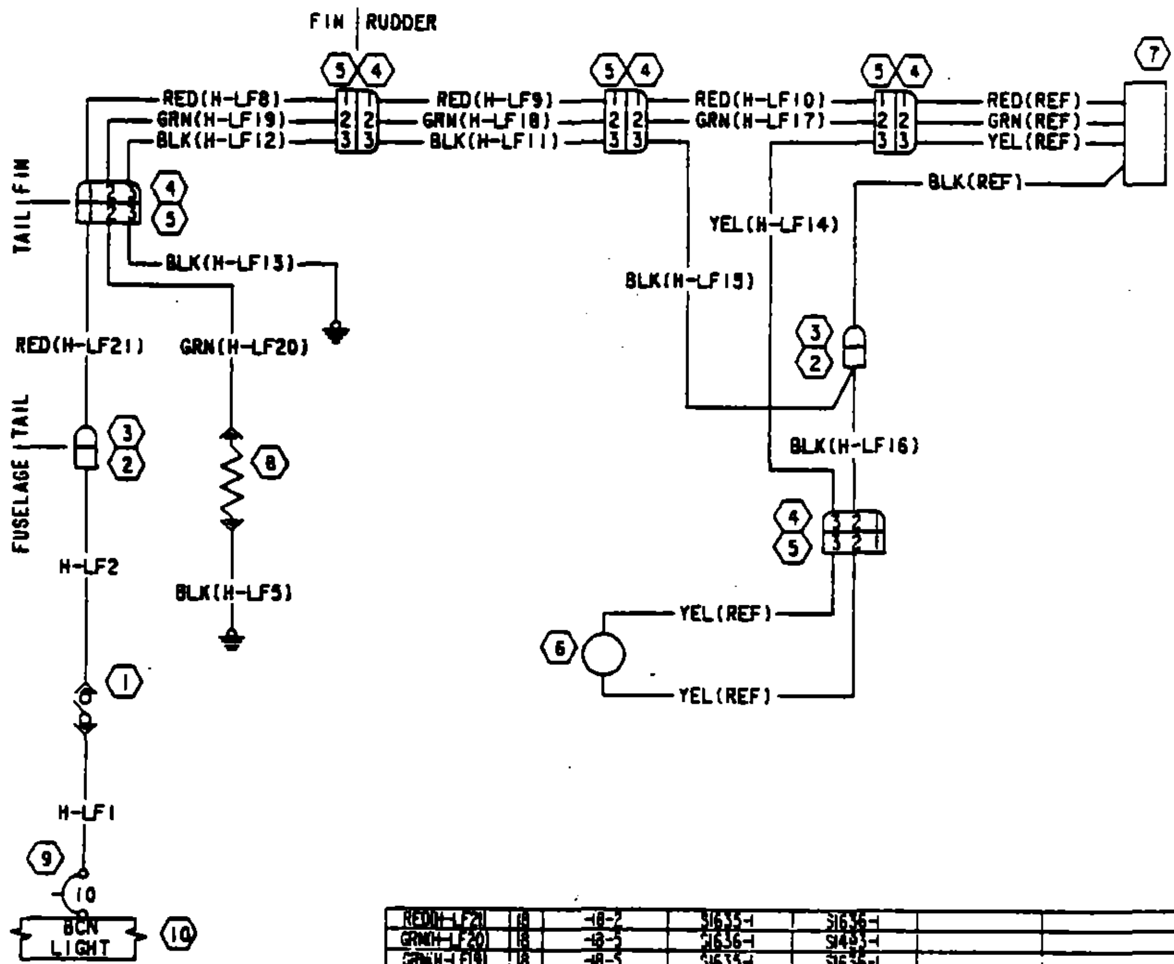
	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - FLASHING BEACON LIGHT

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000
SCALE: NONE	SR9949	PAGE 1 1, 9

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] (SR9949)	6-1-81	[illegible]



RED(H-LF21)	18	-18-2	S1635-1	S1636-1		
GRN(H-LF20)	18	-18-5	S1636-1	S1493-1		
GRN(H-LF19)	18	-18-5	S1635-1	S1636-1		
GRN(H-LF18)	18	-18-5	S1635-1	S1636-1		
GRN(H-LF17)	18	-18-5	S1635-1	S1636-1		
BLK(H-LF16)	18	-18-0	S1636-2	S1635-1		
BLK(H-LF15)	18	-18-0	S1635-1	SEE H-LF16		
YEL(H-LF14)	18	-18-4	S1636-1	S1635-1		
BLK(H-LF13)	18	-18-0	S1636-1	S1367-1-8		
BLK(H-LF12)	18	-18-0	S1635-1	S1636-1		
BLK(H-LF11)	18	-18-0	S1635-1	S1636-1		
RED(H-LF10)	18	-18-2	S1635-1	S1636-1		
RED(H-LF9)	18	-18-2	S1635-1	S1636-1		
RED(H-LF8)	18	-18-2	S1635-1	S1636-1		
BLK(H-LF5)	18	-18-0	S1493-1	S1367-1-8		
H-LF2	18		S1493-1	S1636-1		
H-LF1	18		S1367-1-8	S1493-1		
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]

WIRE TABLE

10	[illegible]	BCN LAMP	
9	[illegible]	CIRCUIT BREAKER	
8	[illegible]	RESISTOR	
7	[illegible]	FLASHER ASSY	
6	[illegible]	LIGHT ASSY	
5	S1635-1	HOUSING	
4	S1636-2	HOUSING	
3	S1637-1	HOUSING	
2	S1637-2	HOUSING	
1	S2160-1	SWITCH	
	[illegible]	[illegible]	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO.

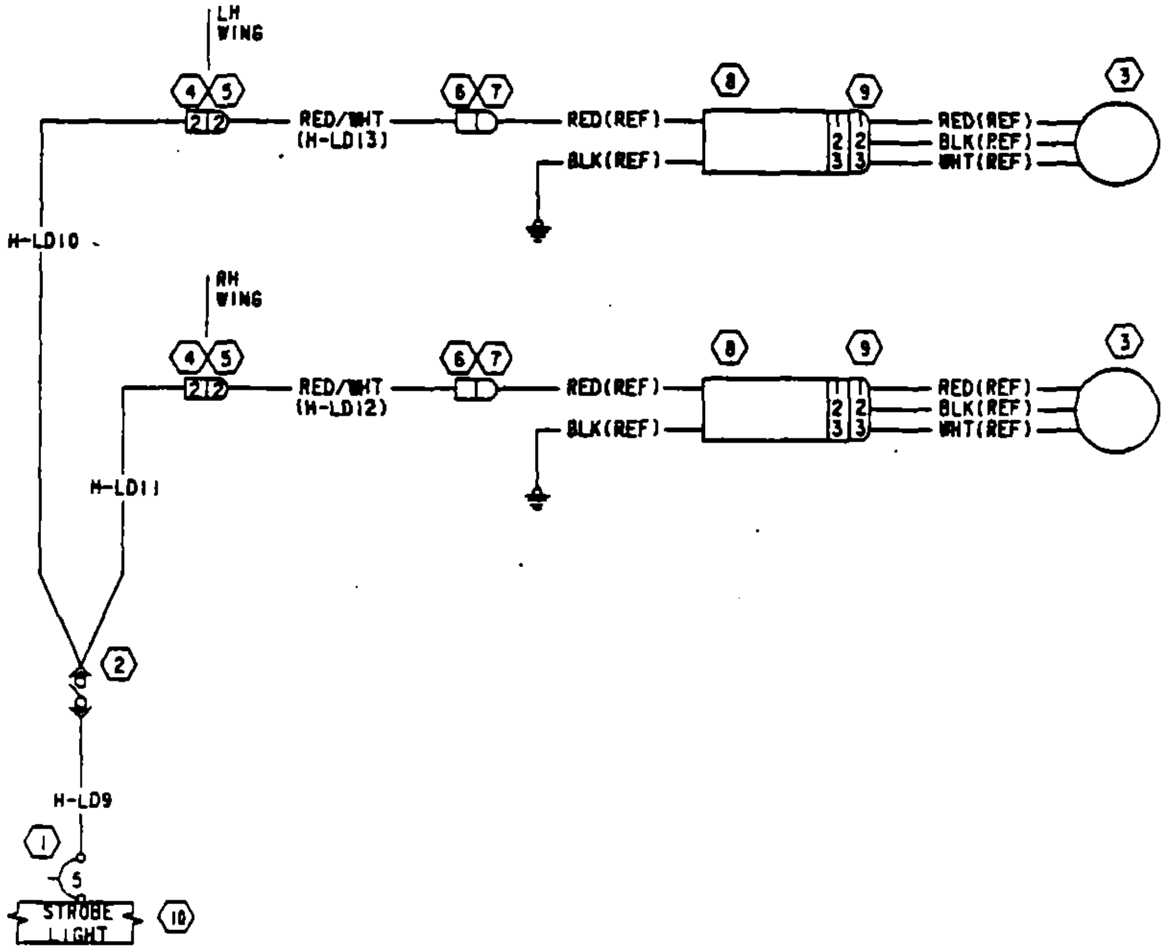
WIRING DIAGRAM -
FLASHING BEACON
(FLOATPLANE)

	WHITSON	4-7-81
	HARDER	4-10-81
	MCMAHAN	4-2-81
	NAIF	4-2-81
	MOORE	4-13-81

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR9949 | PAGE H.10

LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]



49-00916

WIRE CODE	GA	MATERIAL	TERMINALS			DETAILS
RED/WHT(H-LD13)	20	-20-2-9	S1635-1	S1636-1		
RED/WHT(H-LD12)	20	-20-2-9	S1635-1	S1636-1		
H-LD11	22		SEE H-LD10	S1636-1		
H-LD10	22		S1493-2	S1636-1		
H-LD9	22		S1367-1-6	S1493-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
10	1270741	BUS BAR	
9	S1638-2	HOUSING	
8	C622009-0102	POWER SUPPLY	
7	S1637-1	HOUSING	
6	S1637-2	HOUSING	
5	S1640-3	HOUSING	
4	S1641-3	HOUSING	
3	C622006-0107	TUBE & LENS ASSY	
2	S2160-1	SWITCH	
1	S1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

	NAME	DATE
DRAWN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DESIGN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81
APPD		

Cessna AIRCRAFT CO.

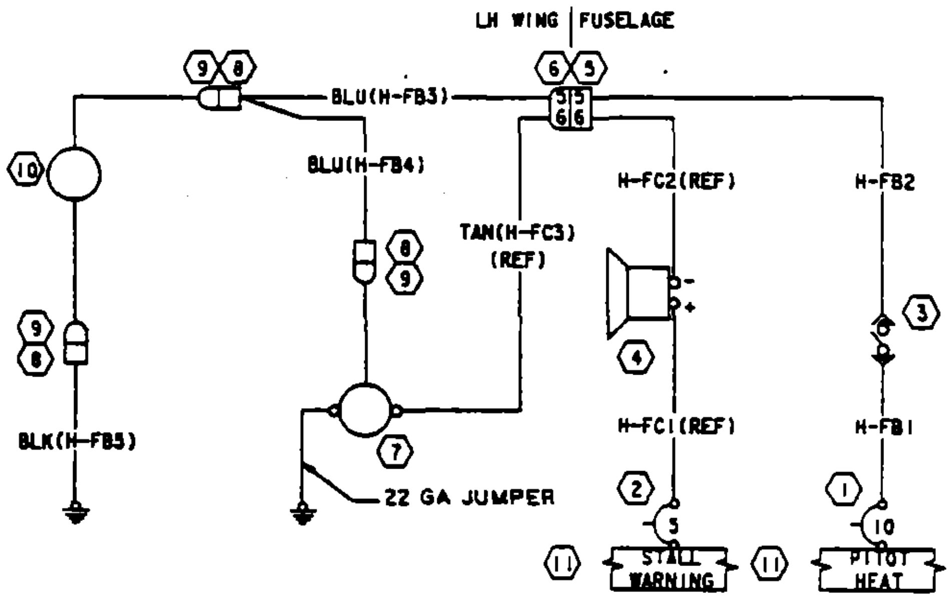
WIRING DIAGRAM - STROBE LIGHTS, WING TIP (OPT)

SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | 3R9949 | PAGE 11.11

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] ADD MODEL CODE TO WIRES (SR9949)	[illegible] 6-3-81	[illegible]

INACTIVE THRU SER (SR10097) JPQ 2-8-82 JAB WHH JRG JHM



97-00916

BLK(H-FB5)	18	-18-0	S1636-1	S1367-1-8		
BLU(H-FB4)	18	-18-6	SEE H-FB3	S1636-1		
BLU(H-FB3)	18	-18-6	S1635-1	S1636-2		
H-FB2	18		S1493-1	S1636-1		
H-FB1	18		S1367-1-6	S1493-1		
WIRE CODE	GA	MATERIAL	TERMINALS			REMARKS

WIRE TABLE

11	[illegible]	[illegible]	
10	[illegible]	PITOT TUBE ASSY	
9	S1637-1	HOUSING	
8	S1636-2	HOUSING	
7	[illegible]	[illegible]	
6	[illegible]	HOUSING	
5	[illegible]	HOUSING	
4	[illegible]	HORN ASSY	
3	[illegible]	SWITCH	
2	[illegible]	CIRCUIT BREAKER	
1	[illegible]	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

	NAME	DATE
DRAWN	WHITSON	4-7-81
CHECK	[illegible]	4-10-81
[illegible]	[illegible]	4-7-81
[illegible]	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

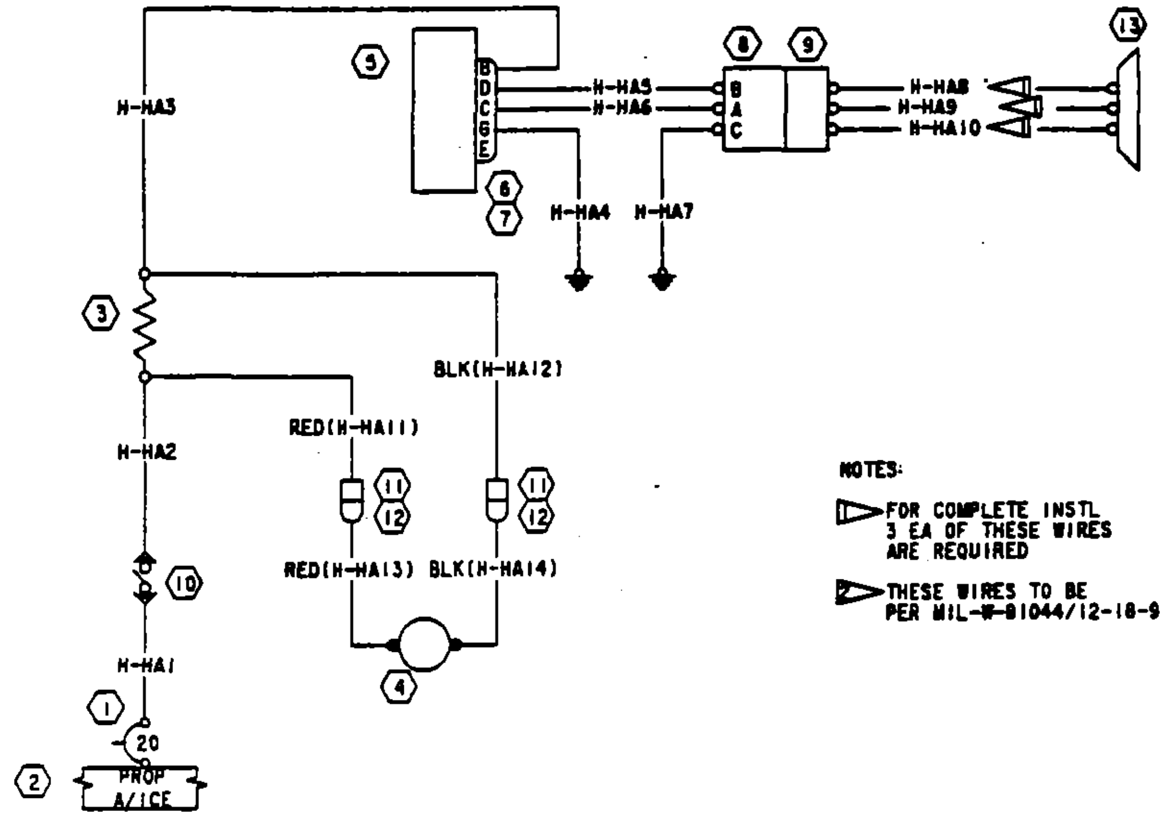
WIRING DIAGRAM - HEATED PITOT TUBE & STALL WARNING TRANSMITTER (OPT)

SIZE C — CODE IDENT NO. 71379 — DWG NO. 1271000

SCALE NONE — SR9949 — PAGE 13.1

SUPERSEDED BY: 1271000 PG13.2

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]



NOTES:

FOR COMPLETE INSTL 3 EA OF THESE WIRES ARE REQUIRED

THESE WIRES TO BE PER MIL-W-81044/12-18-9

49-00916

Wire Code	GA	Material	Terminals			Serials
BLK(H-HA14)	14	-14-0	SOLDER	S1635-2		
RED(H-HA13)	14	-14-2	SOLDER	S1635-2		
BLK(H-HA12)	14	-14-0	S1367-2-8	S1636-2		
RED(H-HA11)	14	-14-2	S1367-2-8	S1636-2		
H-HA10		2	S1367-1-6	S1367-1-6		
H-HA9		2	S1367-1-6	S1367-1-6		
H-HA8		2	S1367-1-6	S1367-1-6		
H-HA7	14		S1367-2-10	S1367-2-6		
H-HA6	14		SOLDER	S1366-2-6		
H-HA5	14		SOLDER	S1367-2-6		
H-HA4	14		SOLDER	S1367-2-8		
H-HA3	14		S1367-2-12	SOLDER		
H-HA2	14		S1493-2	S1367-2-12		
H-HA1	14		S1493-2	S1367-2-6		

WIRE TABLE

	Part No.	Description	
13		SPINNER BULKHEAD	
12	S1637-1	HOUSING	
11	S1637-2	HOUSING	
10	S2160-1	SWITCH	
9	D40106	SLIP RING	
8	C40023	BRUSH ASSY	
7	MS3106A20-15S	PLUG	
6	MS3057-12A	CLAMP	
5	C165020-0101	TIMER	
4	C662503-0106	AMMETER	
3	22310-20	SHUNT	
2	1270741	BUS BAR	
1	S1360-20L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC.NO.
S-XXX OR CMXXXX=CESSNA STD.NO

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

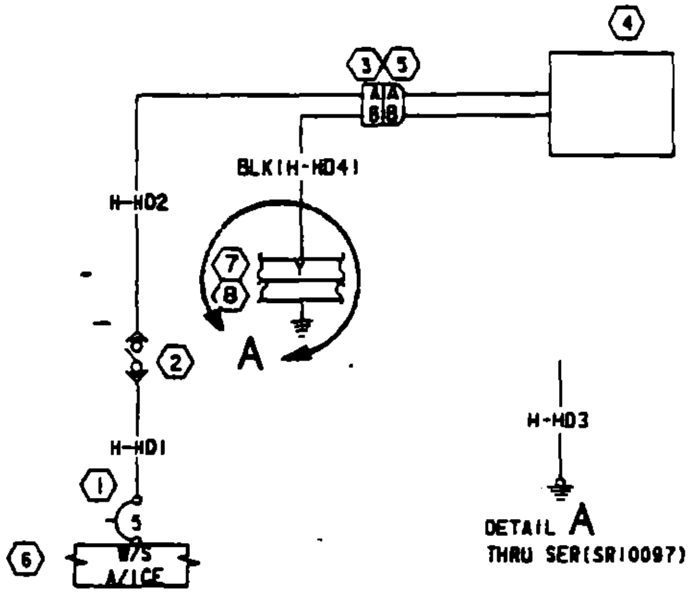
	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	NAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO.

TITLE WIRING DIAGRAM - PROP DE-ICE SYSTEM (OPT)

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000
SCALE NONE		SR9949 PAGE 13.2

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible] ([illegible])	[illegible]	[illegible]
B	[illegible] S2527[illegible] ([illegible])	[illegible] 11-4-81	[illegible]



49-00916

BLK(H-HD4)	20	-20-0	SOLDER	S2099-4		SER(SR10097) & ON
H-HD3	20		SOLDER	S1367-1-10		THRU SER(SR10097)
H-HD2	20		S1493-1	SOLDER		
H-HD1	20		S1367-1-5	S1493-1		
WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS

WIRE TABLE

8	S2527-2	GROUND CONNECTOR	
7	S2527-1	[illegible] GROUND BLOCK	
6	1270411	W/S BAR	
5	[illegible]-29	PLUG	
4	1311068	W/S A/ICE ASSY	
3	[illegible]-29	RECEPTACLE	
2	S2160-1	SWITCH	
1	S1360-5L	CIRCUIT BREAKER	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

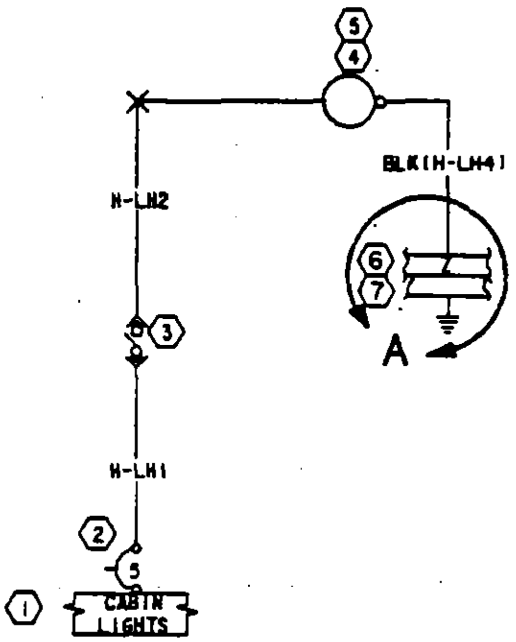
	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEN	4-10-81
DRAWN	MCCRUGAN	4-2-81
CHECK	NAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

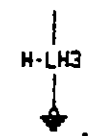
Cessna AIRCRAFT CO.
PAWNEE DIVISION
WICHITA, KANSAS

TITLE
WIRING DIAGRAM -
WINDSHIELD ANTI-ICE SYSTEM
(OPT)

SIZE	CODE IDENT NO.	DWG NO.
C	71379	1271000
SCALE NONE	SR9949	PAGE 13.4

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible] 6-1-81	[illegible]
B	[illegible]	11-10-81	[illegible]





DETAIL A
THRU SER(SR10097)

97-00916

BLK(H-LH4)	22	-22-0		S1367-1-5	S2099-4	SER(SR10097) & ON
H-LH3	22			S1367-1-5	S1367-1-8	THRU SER(SR10097)
H-LH2	22			S1370-1	SM93-1	
H-LH1	22			S1367-1-6	SM93-1	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

WIRE TABLE

7	S2527-2	GROUND CONNECTOR
6	S2527-1	LH GROUND BLOCK
5	1281115	SOCKET
4	MS25338-7079	LAMP
3	S2160-3	SWITCH
2	S1360-5L	CIRCUIT BREAKER
1	1270741	BUS BAR
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDER	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81
APPD		
OTHER		

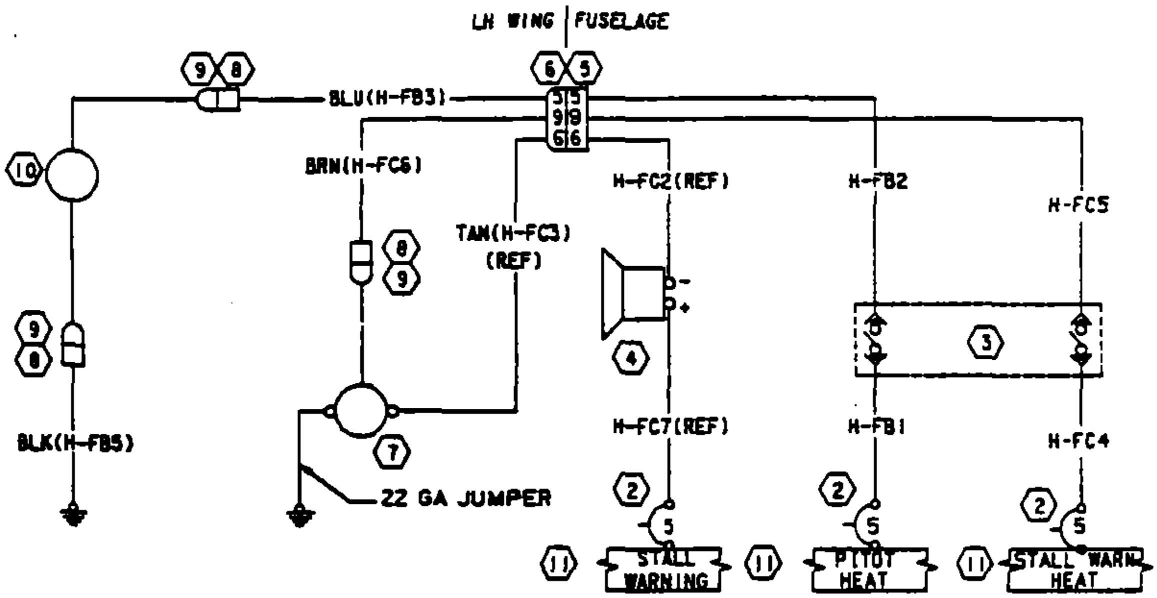
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM - LIGHT,ICE DETECTOR (OPT)

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1271000

SCALE NONE | SP9949 | PAGE 13.3

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BT REV: PIN 9 WAS 7 (SR10097)	JPB 5-7-02	[illegible]
B	BT REV: 2170035 WAS 1270741: H-FC7 (REF) WAS H-FC1 (REF) (SR10097)	FAS 5-25-02	[illegible]
C	BT REV: S-1360-5L WAS S-1360-10L/PITOT HEAT (NOW SHOP PRACTICE) [illegible] 206ED1021	[illegible] 5-27-03	REH AC [illegible]



97-00916

WIRE CODE	GA	MATERIAL	TERMINALS			REMARKS
H-FC5	[illegible]		S1493-1	S1636-1		
H-FC4	[illegible]		S1367-1-6	S1493-1		
BLK(H-FB5)	[illegible]	-18-0	S1636-1	S1367-1-8		
BRN(H-FC6)	[illegible]	-18-1	S1635-1	S1636-2		
BLU(H-FB3)	[illegible]	-18-6	S1635-1	S1636-2		
H-FB2	[illegible]		S1493-1	S1636-1		
H-FB1	[illegible]		S1367-1-6	S1493-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
11	2170035	[illegible]	
10	0721106	PITOT TUBE ASSY	
9	S1637-1	HOUSING	
8	S1637-2	HOUSING	
7	S-1677-3	WING UNIT-[illegible]	
6	S1640-3	HOUSING	
5	S1641-3	HOUSING	
4	[illegible]	HORN ASSY	
3	S2160-1	SWITCH	
2	S1360-5L	CIRCUIT BREAKER	
1			

EQUIPMENT TABLE

SUPERSEDES 1271000 PG13.1

	NAME	DATE
DESIGN	STAMM	3-24-02
GROUP	HARDEN	3-24-02
DRAWN	OPALIA	2-8-02
CHECK	BORLESKE	2-8-02
STRESS		
PROJECT	J.H.MOORE	3-24-02
APPD	[illegible]	

Cessna AIRCRAFT CO.

WIRING DIAGRAM -
HEATED PITOT TUBE & STALL
WARNING TRANSMITTER (OPT)

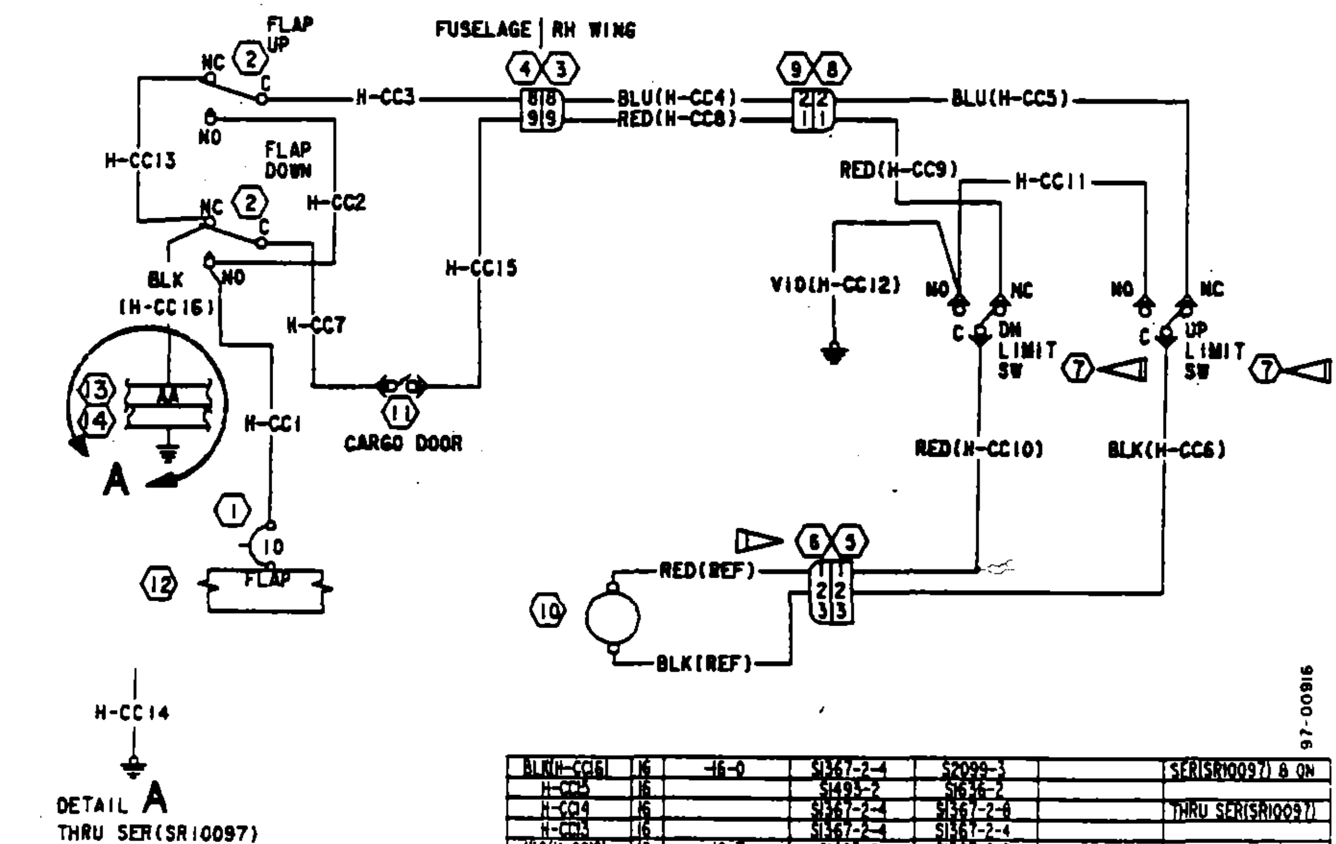
SIZE C | CAGE CODE NO. 71379 | DWG NO. 1271000

SCALE NONE | (SR10097) | PAGE 13.6

NOTES:

1. S1906-2 SWITCHES AND S1638-2 HOUSING ARE PART OF C301002 ACTUATOR ASSY

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	[illegible]
E	[illegible]	[illegible]	[illegible]



BLK(H-CC16)	16	-16-0	S1367-2-4	S2099-3		SER(SR10097) & ON
H-CC15	16		S1493-2	S1636-2		
H-CC14	16		S1367-2-4	S1367-2-8		THRU SER(SR10097)
H-CC13	16		S1367-2-4	S1367-2-4		
VIO(H-CC12)	16	-16-7	S1493-2	S1367-2-8		
H-CC11	16		S1493-2	S1493-2		
RED(H-CC10)	16	-16-2	S1493-2	S1636-2		
RED(H-CC9)	16	-16-2	S1635-2	S1493-2		
RED(H-CC8)	16	-16-2	S1635-2	S1636-2		
H-CC7	16		S1367-2-4	S1493-2		
BLK(H-CC6)	16	-16-0	S1493-2	S1636-2		
BLU(H-CC5)	16	-16-6	S1635-2	S1493-2		
BLU(H-CC4)	16	-16-6	S1635-2	S1636-2		
H-CC3	16		S1367-2-4	S1636-2		
H-CC2	16		S1367-2-4	S1367-2-4		
H-CC1	16		S1367-2-6	S1367-2-4		

WIRE TABLE

14	S2527-2	GROUND CONNECTOR	
13	S2527-1	LH GROUND BLOCK	
12	1270741	BUS BAR	
11	S1952-1	SWITCH	
10	C301002	ACTUATOR ASSY	
9	S1638-5	HOUSING	
8	S1638-4	HOUSING	
7	S1906-2	SWITCH	
6	S1638-2	HOUSING	
5	S1639-1	HOUSING	
4	S1641-9	HOUSING	
3	S1640-9	HOUSING	
2	S1906-1	SWITCH	
1	S1360-10L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXXX OR CXXXXXX=CESSNA STD.NO.

	NAME	DATE
	WHITSON	4-7-81
	HARDEN	4-10-81
	MCGUIGAN	4-2-81
	HAIR	4-2-81
	MOORE	4-13-81

Cessna AIRCRAFT CO.

WIRING DIAGRAM - WING FLAPS

SIZE C | 71379 | 1271000

SCALE NONE | SR9949 | 14.1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV: ADD MODEL CODE TO WIRES (SR9949)	[illegible] 6-3-81	[illegible]
B	BY REV: WIRE GA PER H-C01 WAS 20: WIRE GA PER H-C06 WAS 22: ADD WIRES H-C010 & H-C011: DELETE (2) 22 GA JUMPER WIRE (SR9949)	[illegible] 6-25-81	[illegible]
C	BY REV: CORRECT FIGURE FOR S-1963-3 SWITCH [illegible] SHOP PRACTICE	[illegible] 6-7-81	[illegible]
D	BY REV: [illegible] (SR10097)	[illegible] 11-10-81	[illegible]
E	BY REV: [illegible] (SHOP PRACTICE)	[illegible] 5-7-82	[illegible]

NOTES

1 MATERIAL IS RCF5130B COIL CORD VENDOR CODE(096906)

97-00916

WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS
BLK(H-C014)	18	-18-0	SOLDER	S2099-3		SER(SR10097) & ON
BLK(H-C013)	18	-18-0	S1963-2	S2099-3		SER(SR10097) & ON
BLK(H-C011)	18	-18-0	SOLDER	S1367-1-8		THRU SER(SR10097)
BLK(H-C010)	18	-18-0	S1963-2	S1367-1-8		THRU SER(SR10097)
ORN(H-C009)	20	-20-3	S2099-5	S2099-8		
BLU(H-C008)	20	-20-6	S2099-5	S2099-9		
BLU(H-C007)	20	-20-0	S2099-5	S1367-1-8		
BLK(H-C006)	18	-18-0	S1963-2	S1367-1-8		THRU SER(SR10097)
WHT/ORN(H-C005)	20	-20-9-3	S1963-2	S2099-9		
ORN(H-C004)	20	-20-4	S1963-2	S2099-9		
WHT/YEL(H-C003)	20	-20-9-4	S1963-2	S2099-5		
YEL(H-C002)	20	-20-4	S1963-2	S2099-9		
H-C001	[illegible]		S1963-2	S1367-1-8		
VIO	24	1	SOLDER	S1963-1		
RED	24	1	SOLDER	S1963-1		
WHT/ORN	24	1	SOLDER	S1963-1		
ORN	24	1	SOLDER	S1963-1		
WHT/YEL	24	1	SOLDER	S1963-1		
YEL	24	1	SOLDER	S1963-1		
BLK(2)	24	1	SOLDER	S1963-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
13	S2271-?	GROUND CONNECTOR	
12	S2???	10 GROUND BLOCK	
11	[illegible]	[illegible]	
10	S1963-?	SWITCH	
9	[illegible]	TRIM ACTUATOR	
8	S2099-?	CONNECTOR	
7	[illegible]	CIRCUIT BREAKER	
6	[illegible]	[illegible]	
5	[illegible]	[illegible]	
4	RCF5130B	COILED ASSY	
3	[illegible]	RELAY ASSY	
2	S2099-?	CONNECTOR	
1	[illegible]	SWITCH	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC.NO. S-XXX OR CXXXXX-CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO

	NAME	DATE
DESIGN	WHITSON	4-7-81
GROUP	HARDEL	4-10-81
DRAWN	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
PROJECT	MOORE	4-13-81
APPD		
OTHER		

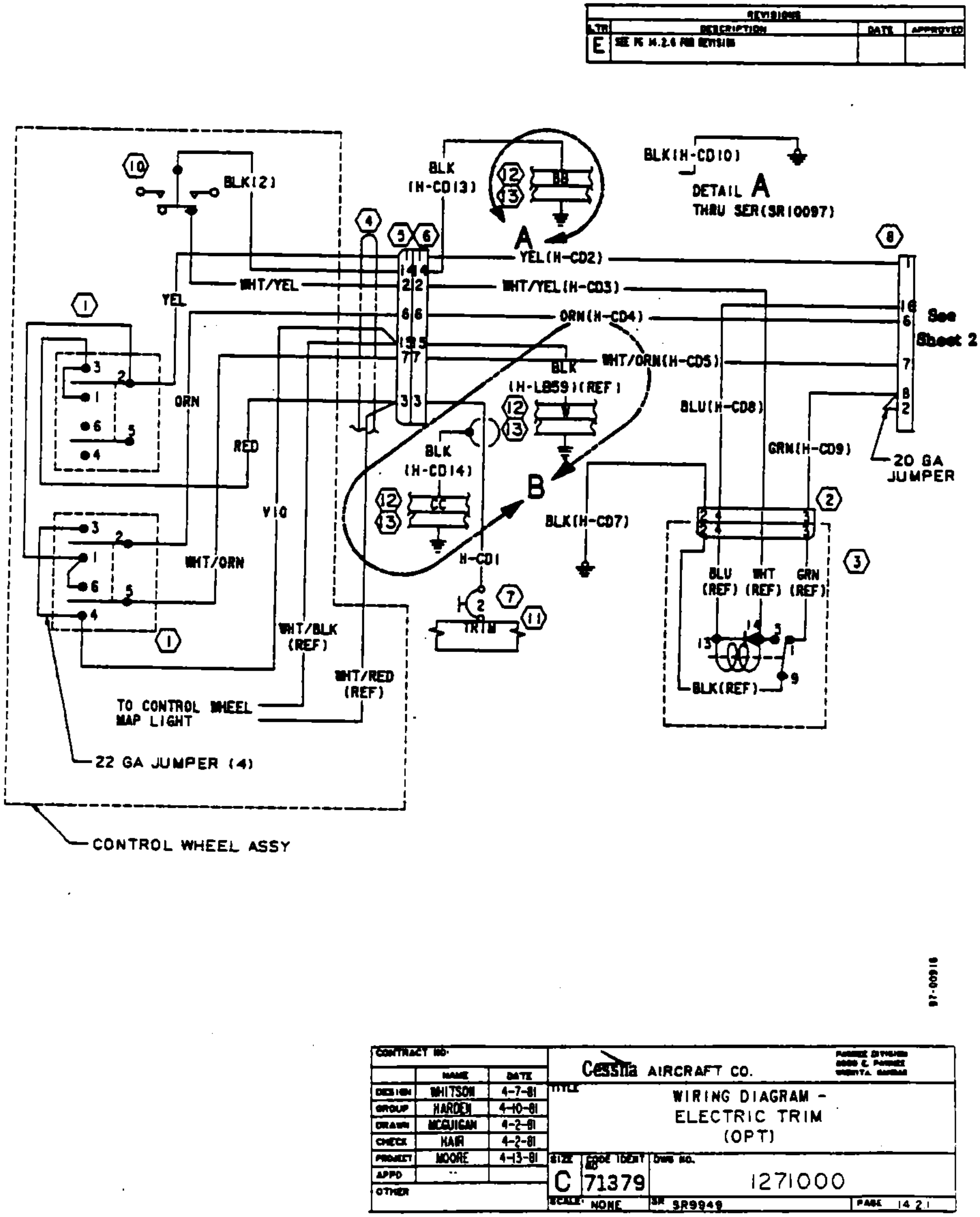
Cessna AIRCRAFT CO.

PAWNEE DIVISION
[illegible]
WICHITA, KANSAS

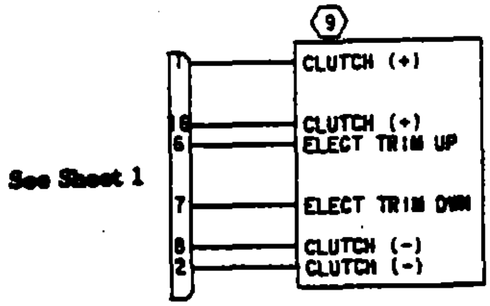
TITLE WIRING DIAGRAM - ELECTRIC TRIM (OPT)

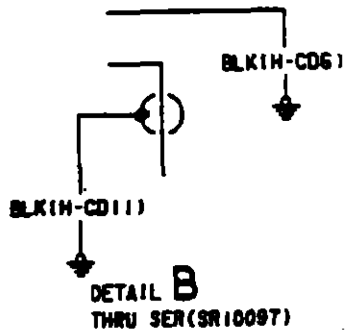
SIZE C | CODE IDENT NO. 71379 | DWG NO. 1271000

SCALE NONE | SR SR9949 | PAGE 14.2.0



Electric Trim (OPT) (Sheet 1 of 2)





CESSNA AIRCRAFT CO.

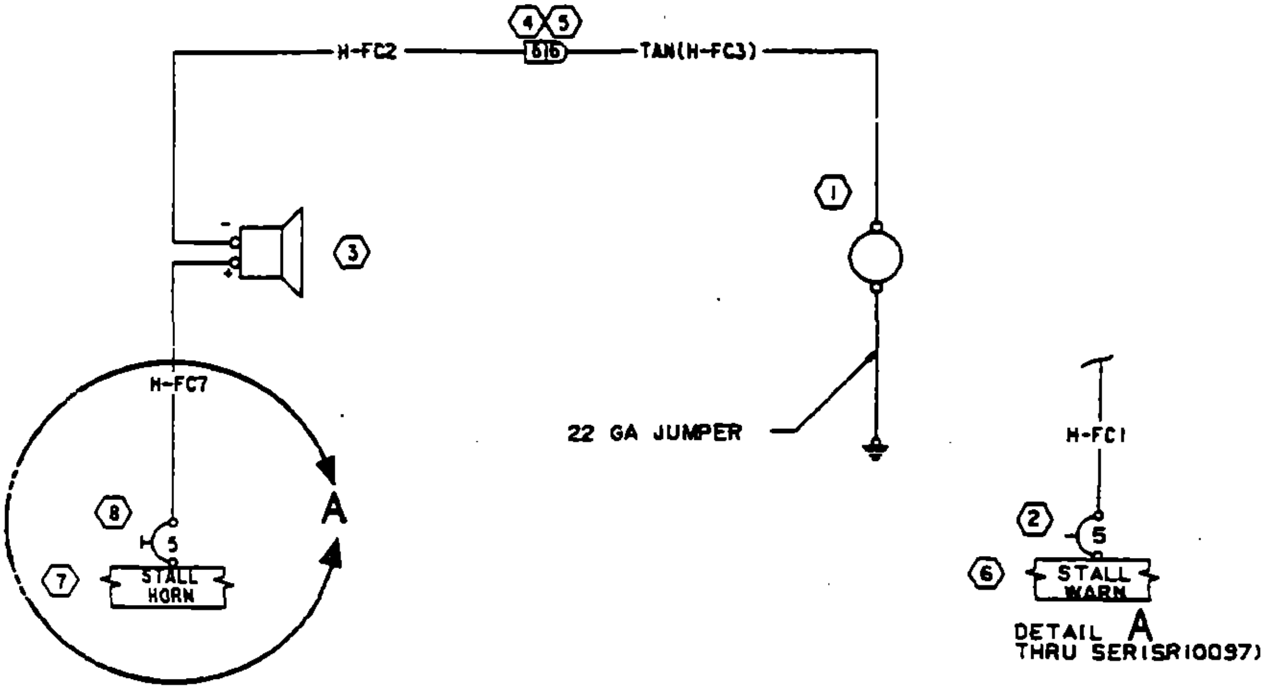
WIRING DIAGRAM - ELECTRIC TRIM (OPT)

SIZE	CAGE IDENT NO.	DWG NO.
C	71379	1271000

SCALE NONE

Electriv Trim (OPT) (Sheet 2 of 2)

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	[illegible]	[illegible]	[illegible]
B	[illegible] DETAIL A [illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]



97-00916

WIRE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS
H-FC7	22			S1367-1-6	S1367-1-6	SER(SR10097)&ON
TAN(H-FC3)	22	-22-10		S1635-1	S1367-1-6	
H-FC2	22			S1367-1-6	S1636-1	
H-FC1	22			S1367-1-6	S1367-1-6	THRU SER(SR10097)

WIRE TABLE

	PART NO.	DESCRIPTION
8	S1239-5	CIRCUIT BREAKER
7	2170035	BUS BAR
6	1270741	BUS BAR
5	S1640-1	HOUSING
4	S1641-1	HOUSING
3	1670056	HORN
2	S1360-5L	CIRCUIT BREAKER
1	0511062	TRANSMITTER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXXX OR CMXXXX=CESSNA STD.NO.

SUPERSEDES

SUPERSEDED BY

CONTRACT NO.

	NAME	DATE
DESIGN	WHITSON	4-7-81
CHECK	HARDEN	4-10-81
STRESS	MCGUIGAN	4-2-81
CHECK	HAIR	4-2-81
STRESS		
PROJECT	MOORE	4-13-81
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA KANSAS

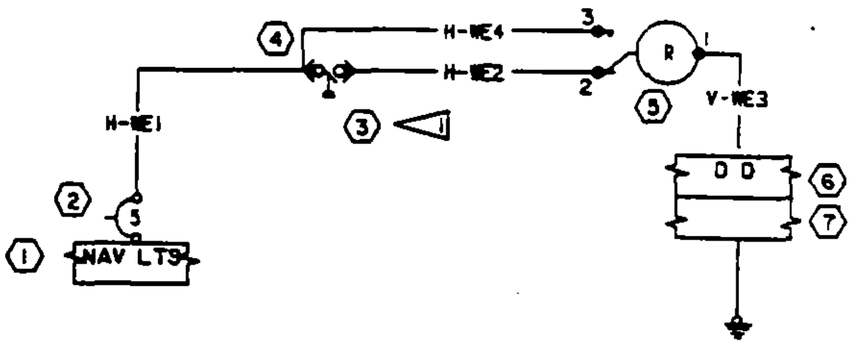
TITLE WIRING DIAGRAM - STALL WARNING SYSTEM, NON-HEATED

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	1271000
SCALE NONE	SR9949	PAGE 15.1

NOTES:

1. VACUUM SWITCH CONTACTS ARE NORMALLY CLOSED. CONTACTS OPEN AT 7±1 INCHES OF MERCURY VACUUM

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	BY REV: ADD S2527-1 & S2527-2. S2099-4 WAS S1367-1-6/H-WE3 WIRE (SR10097)	3-5-82	[illegible]



97-00916

H-WE4	22	-22-0	S1493-1	SOLDER		
H-WE3	22	-22-0	SOLDER	S2099-4		
H-WE2	22	-22-0	S1493-1	SOLDER		
H-WE1	22	-22-0	S1367-1-6	S1493-1		
WIRE CODE	GA	MATERIAL	TERMINALS			SERIALS

WIRE TABLE

7	S2527-2	GND CONNECTOR	
6	S2527-1	LT GND BLOCK	
5	MS25041-2-327	LAMP ASSY	
4	S2422-1	ADAPTER	
3	S2571-1	VACUUM SWITCH	
2	S1360-5L	CIRCUIT BREAKER	
1	1270741	BUS BAR	
	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-1XXX=CESSNA SPEC.NO. S-XXX OR CXXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	STAMM	10-28-81
GROUP	HARDEN	11-13-81
DRAWN	MCGUIGAN	10-27-81
CHECK	R. YOUNGERS	10-27-81
PROJECT	J.H. MOORE	11-25-81
APPD	JRG	
OTHER		

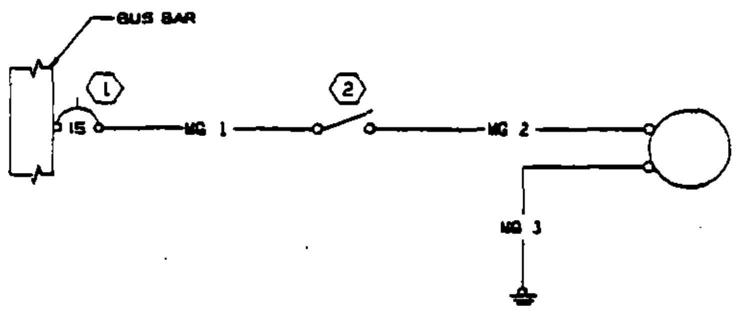
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM - VACUUM OUT WARNING SYSTEM

SIZE: C | CODE IDENT NO.: 71379 | DWG NO.: 1271000

SCALE: NONE | SR10097 | PAGE 15.2

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



WG 3	16	-16-9	S-1367-2-8	S-1367-2-6	
WG 2	16	-16-9	S-1367-2-6	S-1367-2-8	
WG 1	16	-16-9	S-1367-2-6	S-1367-2-6	
WIRE CODE	GA	MATERIAL	TERMINALS		SERIALS
WIRE TABLE					

3	C165008-0104	VACUUM PUMP MOTOR
2	S-382-2	SWITCH
1	S-1360-15L	CIRCUIT BREAKER
	PART NO.	DESCRIPTION
	EQUIPMENT TABLE	

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC.NO. S-XXX OR CNXXXX=CESSNA STD.NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.:

	NAME	DATE
DESIGN	W.H. HARDEN	1-15-85
GROUP	W.H. HARDEN	1-15-85
DRAWN	KEN LUNDY	1-15-85
CHECK	R.E. HAIR	1-15-85
PROJECT	G FICKEL	1-18-85
APPD	WDP	1-16-85
OTHER	A. COVEY	1-16-85

Pawnee Aircraft Division
Cessna Aircraft Company
Wichita, Kansas

TITLE
STANDBY VACUUM PUMP
MODEL 206

SIZE	CODE IDENT NO.	DWG NO.	
C	71379	1271000	
SCALE: NONE	SH	SR104181	PAGE 5.1