AIRCRAFT MAINTENANCE MANUAL

Diamond AIRCRAFT

DA42 L360

D42L-AMM-001

NOTE: This AMM is a supplement and needs to be used in conjunction with the current DA42 TDI AMM. Complete maintenance instructions for the chapters not affected by TCCA STC No. SA09-54 (FAA STC No. SA02725NY) are available in Diamond Aircraft DA42 AMM, Document Number 7.02.01.

DIAMOND AIRCRAFT INDUSTRIES INC.
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Initial Issue: 01 Jun 09
Revision 5: 15 Oct 12

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RECORD OF REVISIONS

Use this list to record and control all of the revisions which you put in this Aircraft Maintenance Manual (AMM). Put the affected pages of the revision into the AMM as soon as you get them. Remove and destroy the pages that are superseded.

Complete the table below when you have put the revised pages into the AMM.

A vertical bar in the left margin shows changes on text pages and in drawings.

Revision Number	Date Issued	Date Inserted	Inserted By	Revision Number	Date Issued	Date Inserted	Inserted By
Rev 0	01 Jun 09	01 Jun 09	DAIC				
Rev 1	02 Nov 09	02 Nov 09	DAIC				
Rev 2	01 Oct 10	01 Oct 10	DAIC				
Rev 3	14 Jun 11	14 Jun 11	DAIC				
Rev 4	16 Apr 12	16 Apr 12	DAIC				
Rev 5	15 Oct 12	23 Oct 12	DAIC				

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HIGHLIGHTS

1. General

The table below highlights the changes that have been incorporated in this Revision 5.

CH-SE-SU	Page	Highlights
Front Matter		Cover Page, ROR, Highlights, SB List, LOEP, and TOC pages were revised.
05-20-00	217	Corrected the step 5 in Paragraph 4.F.
24-30-00	208 thru 212	Added new removal and installation proceedures for the EMI filter. Added Figures 202 to 204. Renumbered the pages due to pagination shift.
27-50-00	201 and 202	Added new chapter 27-50-00 and added replacement proceedures for the flap indicator lights lamp.
28-20-00	204 thru 216	Revised the installation procedure for Fuel Booster Pump. Added installation procedure for the replacement of gascolator assembly. Revised Figures 201 and 202. Renumbered the pages due to pagination shift.
32-60-00	203 thru 206	Added installation procedure for the replacement of flap and landing gear lights lamp.
80-00-00	5	Revised paragraph 2.C.
92-00-00	3 5	Revised the Table of Contents Revised Paras 1 and 2 and the Wiring Diagrams/Schematics table.
92-10-00	1 thru 24	Revised all of the existing schematics from Rev 4 to be in a standard format and added five schematics.

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LIST OF SERVICE BULLETINS

SB Number	Revision Number	Category	Title of Service Bulletin	Date Issued
D42L-25-01	0	Optional	DA42 L360 Ballast Installation	02 Dec 09
D42L-27-01	0	Optional	Modification of Variable Elevator Stop System	22 Oct 09
D42L-28-01	0	Optional	Lighted Fuel Pump Switch	10 Dec 09
D42L-28-02	0	Mandatory	Transfer Pump Circuit Breaker Change	30 May 12
D42L-32-01	0	Recommended	Implementation of CHECK GEAR Annunciation	18 Jan 12
D42L-34-01	1	Recommended	G1000 System Siftware Version 1054.02	15 Aug 11
D42L-34-02	0	Optional	Availability of the G1000 Synthetic Vision Pathways Option - Garmin SB 1039A	26 Sep 12
D42L-34-03	2	Optional	ADF System Improvements	05 Oct 12
D42L-34-04	1	Optional	G1000 System Siftware Version 1054.03	11 Oct 12
D42L-79-01	3	Optional	Installation of External Oil Cooler Scoop	07 Feb 12

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LIST OF TEMPORARY REVISIONS

Temporary Revision Number	Date Issued	Inserted Date	Inserted By
TR 05-01	07 Dec 09	14 Jun 11	DAIC
TR 11-01	07 Dec 09	14 Jun 11	DAIC
TR 12-01	12 Dec 11	16 Apr 12	DAIC
TR 25-01	07 Dec 09	14 Jun 11	DAIC
TR 25-02	07 Dec 09	14 Jun 11	DAIC
TR 28-01	07 Dec 09	14 Jun 11	DAIC
TR 28-02	10 Dec 09	14 Jun 11	DAIC
TR 28-03	12 Dec 11	16 Apr 12	DAIC

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LIST OF EFFECTIVE PAGES

1. General

The List of Effective Pages (LOEP) uses the following abbreviations:

- TOC = Table of Contents
- ROR = Record of Revisions
- SB = Service Bulletin
- TR = Temporary Revisions.

All Chapters have a Title page and Table of Contents.

Each revision to the Aircraft Maintenance Manual (AMM) will have a new List of Effective Pages. Revised pages and the revision date will be shown by a revision bar.

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INTRODUCTION

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INTRODUCTION

1. General

This Aircraft Maintenance Manual (AMM) contains the chapters necessary to carry out the maintenance that is relative and unique to the DA42 L360 aircraft with the Lycoming IO-360 M1A, left hand (LH) side engine and Lycoming LIO-360 M1A, right hand (RH) side engine installed by Supplemental Type Certificate (STC) No. SA09-54. It contains a full description of the systems, troubleshooting procedures, component removal and installation procedures and maintenance instructions related to the installation of STC No. SA09-54. It does not contain maintenance data for components removed form the aircraft. (Maintenance Shop data).

Complete maintenance instructions for the chapters not affected by this STC No. SA09-54 are available in Diamond Aircraft DA42 AMM, Document Number 7.02.01.

References made to the original DA42 AMM within this document are made by referencing the document number 7.02.01 followed by the Chapter number. For example: Refer to AMM # 7.02.01 Chapter XX-XX.

The AMM contains the wiring diagrams for the electrical system.

Use these manuals with the AMM and any related service bulletins:

- The DA42 L360 Illustrated Parts Catalog
- The DA42 L360 Airplane Flight Manual
- The ELT Manufacturer’s Operator’s Manual
- The MT Propeller Owner’s Manual
- The Lycoming Engine Operator’s Manual.

2. Revision Service

The manufacturer provides a revision service for the AMM. The revision shows design changes to the aircraft or changes in procedures. Each page of the manual shows the date of issue. If the page has changed, it shows the date of the revision.

3. Warning, Cautions and Notes

Obey all the usual safety precautions and maintenance instructions when doing maintenance.

This AMM also contains warnings, cautions and notes before applicable instructions:

WARNING: A WARNING TELLS THE PERSON DOING THE MAINTENANCE THAT INJURY OR DEATH IS POSSIBLE IF THEY DO NOT FOLLOW THE INSTRUCTIONS.

CAUTION: A CAUTION TELLS THE PERSON DOING THE MAINTENANCE THAT DAMAGE TO EQUIPMENT IS POSSIBLE IF THEY DO NOT FOLLOW THE INSTRUCTIONS.

NOTE: A Note tells the person doing the maintenance how to make the task easier.

4. Manual Configuration

This manual is written in accordance with the regulations of the Air Transport Association of America (ATA) Specification, *i*Spec2200. Each system is given a chapter number from the ATA *i*Spec2200.
Where applicable, a chapter contains sections for each sub-system.

The European Association of Aerospace Industries specification, AECMA Simplified English has been used to write this AMM. This is a mandatory requirement of the ATA *i*Spec2200.

There are only 3 sources of words available to use in Simplified English (SE).

- Approved words from the SE Guide. These words have defined meanings and selected parts of speech.

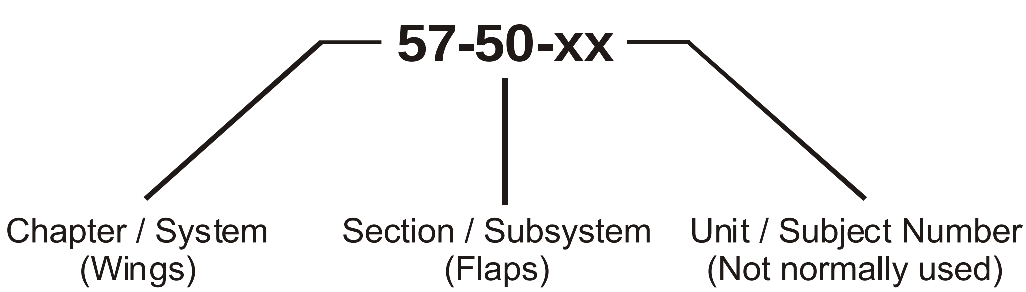
- Technical names as defined in the SE Guide. Used only as adjectives or nouns.

- Manufacturing processes as defined in the SE Guide. Always used as verbs.

This manual does not use the ATA *i*Spec2200 Aircraft Maintenance Task Oriented Support System (ATMOSS) or the ATA *i*Spec2200 Production Management Data Base (PMDB).

A. The ATA *i*Spec2200 Numbering System

The ATA *i*Spec2200 numbering system uses 3 pairs of numbers, for example:



The first pair of numbers shows the system. System 57 is the wings. Chapter 57 contains the data for the wings.

The second pair of numbers shows the sub-system. Sub-system 50 is the Trailing Edge Flaps. Chapter 57, section 50 contains the data for the trailing edge flaps installation.

The third pair of numbers shows a unit. A unit could be the flap itself. Only complex systems use unit numbers.

For simple systems, the main chapter has all of the data and there are no section/sub-system break-downs.

B. Groups of Chapters

The chapters are put together in the following groups:

Group A	Introduction	Chapters 01-02
Group B	Aircraft General	Chapters 03-12
Group C	Airframe Systems	Chapters 20-37
Group D	Structure	Chapters 51-57
Group E	Propeller	Chapter 61
Group F	Power Plant	Chapters 71-80

A separation sheet divides each chapter. The separation sheet shows the number of the chapter and the title.

The main contents of each group of chapters are given below:

(1) Group A - Introduction

Chapter 1 describes about the AMM and Chapter 2 describes how to use the AMM.

(2) Group B - Aircraft General

Chapter 3 describes the general description of the aircraft and its systems.

Chapter 4 describes the data about the Airworthiness Limitations and certification of the aircraft.

Chapter 5 contains the Scheduled Maintenance Checklist. Some tasks require a maintenance procedure. The scheduled maintenance checklist identifies the chapter in the manual that gives the maintenance procedure for the task. It also tells you where to find general information.

Chapters 6 to 10 describe about the dimensions of the aircraft and general procedures such as towing, parking and weighing.

Chapter 11 describes about the placards and markings which are important for the safe operation of the aircraft.

Chapter 12 contains servicing tasks such as refueling and lubrication. It also contains data about cleaning the aircraft.

(3) Group C - Airframe Systems

Chapter 20 contains the standard practices for airframe maintenance.

Chapters 21 to 37 describe about the airframe systems. They include the avionics systems (such as communications (23)) and the mechanical systems (such as flight controls (27)).

Chapter 31 shows the location of the instruments. The chapter which is applicable to the system gives the details. For example, Chapter 27 gives the details for the flap position indicator.

(4) Group D - Structure

Chapter 51 contains data about the design of the airframe. It also gives instructions for assessing damage to the airframe and how to do minor repairs.

Chapters 52 to 57 describe about each part of the structure.

(5) Group E - Propeller

Chapter 61 contains the maintenance procedures for the propeller. Refer to the propeller manufacturer's manual for other data.

(6) Group F - Engine

This group of chapters describes the engine and its systems. It contains the maintenance procedures for maintenance of the engine on the aircraft. Refer to the engine manufacturer's manual for other data.

5. Chapter Configuration

The first page of each chapter shows the number of the chapter and the title. The second page shows the contents. Where applicable, each chapter and section contains the topics that follow:

- Description and Operation
- Troubleshooting
- Maintenance Practices. Where applicable the Maintenance Practices give data on the following procedures:
  - Servicing
  - Removal and Installation
  - Adjustment/Tests
  - Checking/Testing
  - Cleaning/Painting
  - Repairs.

6. Page Numbering System

This manual uses the ATA *i*Spec2200 page block-numbering system. The page number is at the bottom of the page at the outer edge. It is adjacent to the chapter/section number.

Each topic in a Chapter has numbers from the following page blocks:

- Description and Operation: Pages 1 to 99
- Troubleshooting: Pages 101 to 199
- Maintenance Practices: Pages 201 to 299

7. Figures

Figures are given numbers in sequence. The first figure in a chapter or section is figure 1.

8. Record of Revisions

The AMM has a Record of Revisions (ROR). Use the ROR to show when changes were included in the AMM.

9. List of Effective Pages

This AMM has a List of Effective Pages (LOEP). The LOEP shows you the number and effective date of each page contained in the AMM.

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GENERAL DESCRIPTION
OF THE AIRCRAFT

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GENERAL DESCRIPTION OF THE AIRCRAFT

1. General

This chapter describes the configuration of DA42 L360 aircraft with Supplemental Type Certificate (STC) No. SA09-54 installed. Only those areas identified below are changed from the original DA42. All other information about the DA42 is contained in the Aircraft Maintenance Manual (AMM) document number 7.02.01.

2. Description

The DA42 L360 aircraft has been modified by the installation of STC No. SA09-54. This STC includes the following changes and is otherwise identical to the Thierlert powered DA42:

- Lycoming IO-360 M1A, left hand (LH) side and Lycoming LIO-360 M1A, right hand (RH) side 4-cylinders, horizontally opposed, air cooled engines power the DA42 L360 aircraft. The engines have wet sump oil systems and oil cooling systems. These engines are not Fully Automated Digital Engine Control (FADEC) controlled and therefore, the FADEC units have been removed. The starting system and electrical generation have also been changed to include a high power Sky Tech starter and a Kelly Aerospace 70 amp alternator.

- DA42 L360 aircraft has two 3 bladed MT propellers, MTV-12-B-C-F/CF 183-59b (LH) and MTV-12-B-C-F/CFL 183-59b (RH). The propellers are constant speed and fully feathering. A hydraulic accummulator is used for un-feathering the propellers.

- The fuel system has been modified to remove the fuel cooler and the fuel return line. A boost pump has also been added behind the firewall. The boost pump is typical of a fuel injected engine installation.

- The throttle quadrant has been changed to a standard throttle/propeller control/mixture layout.

- The instrument panel has been modified to account for the changes to the starting system, addition to the fuel pumps and removal of the engine control units (ECU).

3. Equipment Data

The table below gives the names and address of the manufacturers who supply systems and/or equipment for the DA42 L360 aircraft. This will help you get more data on a system and/or equipment.

"Yes" in the "Direct Shipping Approved" column means that the part can be ordered directly from the vendor. "No" means that the part must be obtained as a genuine Diamond Aircraft spare part. This is the case when a part needs to be configured for the DA42 L360 aircraft.

In any case, the parts must have exactly the part numbers shown in the Equipment List in Chapter 6 of the Airplane Flight Manual (AFM), Doc. No. D42L-AFM-002.

<table>
<tr><th>ATA Chapter</th><th>Equipment/System</th><th>Manufacturer Address</th><th>Direct Shipping Approved</th></tr>
<tr><td rowspan="2">23, 31, and 34</td><td>Integrated Cockpit System (ICS)</td><td>Garmin International, Inc.
1200 East 151st Street
Olathe, Kansas 66062, USA
Tel: (913) 397-8200
Fax: (913) 397-8282
Website: www.garmin.com</td><td>Yes</td></tr>
<tr><td>Cooling Fans for Integrated Cockpit System (ICS)</td><td>SANDIA aerospace
3700 Osuna Road NE, Suite 711
Albuquerque, NM 87109, USA
Tel: (505) 341-2930
Fax: (505) 341-2927
Website: www.sandiaaerospace.com</td><td>Yes</td></tr>
<tr><td colspan="4">NOTE: The airspeed indicator must have the markings specified in Chapter 2 of the Airplane Flight Manual, Doc. No. D42L-AFM-002.</td></tr>
<tr><td rowspan="2">31</td><td>Airspeed Indicator, Altimeter</td><td>United Instruments Inc.
3625 Comotara Avenue
Wichita, Kansas 67226, USA
Tel: (316) 636-9203
Fax: (316) 636-9243</td><td>Yes</td></tr>
<tr><td>Attitude Gyro</td><td>Mid Continent Instrument Co., Inc.
7706 E, Osie,
Wichita, Kansas 67207, USA
Tel: (316) 683-5619
Fax: (316) 683-1861</td><td>Yes</td></tr>
<tr><td colspan="4">NOTE: The propeller must have the pitch settings specified in Chapter 61 of this manual.</td></tr>
<tr><td>61</td><td>Propeller</td><td>MT-Propeller
Airport Straubing Wallmühle
D-94348 Atting
GERMANY
Tel: +49-9429-9409-0
E-mail: sales@mt-propeller.com
Website: www.mt-propeller.de</td><td>Yes</td></tr>
<tr><td>72</td><td>Engine</td><td>Textron Lycoming
652 Oliver Street
Williamsport, PA 17701, USA
Tel: (570) 323-6181
Fax:
Website: www.lycoming.textron.com</td><td>Yes</td></tr>
</table>

4. Handling of Identification Data

No person shall remove, change, or place identification information on any aircraft, engine, propeller, propeller blades, or propeller hub, without the approval of the competent national Airworthiness Authority.

If a deviation from the procedure above is necessary, any person performing maintenance work may in consultation with a competent national Airworthiness Authority:

- Remove, change, or place the identification plate on any aircraft, engine, propeller, propeller blades, or propeller hub.

- Remove an identification plate, when necessary during the maintenance operations.

- No person shall install an identification plate, removed in accordance with the procedures above, on any aircraft, engine, propeller, propeller blades, or propeller hub other than the one from which it was removed.

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CHAPTER 04-00
AIRWORTHINESS LIMITATIONS

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AIRWORTHINESS LIMITATIONS

THE AIRWORTHINESS LIMITATIONS SECTION IS APPROVED BY TRANSPORT CANADA CIVIL AVIATION (TCCA) IN ACCORDANCE WITH THE APPLICABLE CERTIFICATION PROCEDURES AND THE SUPPLEMENTAL TYPE CERTIFICATION BASIS. IT SPECIFIES THE AIRWORTHINESS LIMITATIONS REQUIRED BY CANADIAN AIR REGULATIONS (CAR) 523, UNLESS AN ALTERNATIVE PROGRAM HAS BEEN APPROVED BY THE COMPETENT AIRWORTHINESS AUTHORITY.

Signature : ______________________________

Project Certification Manager : ______________________________

Stamp : ______________________________

Date of Approval : ______________________________

THE AIRWORTHINESS LIMITATIONS SECTION IS TCCA/FAA APPROVED AND SPECIFIES MAINTENANCE REQUIRED UNDER SECS. 43.16 AND 91.403 OF THE FEDERAL AVIATION REGULATIONS UNLESS AN ALTERNATIVE PROGRAM HAS BEEN TCCA/FAA APPROVED.

SERVICE BULLETINS OR OTHER DOCUMENTS WHICH CONTAIN A STATEMENT THAT THE DOCUMENT IS EUROPIAN AVIATION SAFETY AGENCY (EASA) APPROVED ARE CONSIDERED TCCA/FAA APPROVED AND REVISE THIS SECTION.

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1. Airworthiness Limitations

This chapter describes the airworthiness limitations of the components that are modified with Supplemental Type Certificate (STC) No. SA09-54 installed. Only those areas identified below are changed from the original DA42. All other information about the DA42 is contained in the Aircraft Maintenance Manual (AMM) document number 7.02.01.

This chapter is approved and shows the mandatory inspections that were established as a result of the certification process.

Personnel must obey the limitations given in this section.

A. Certification Maintenance Requirements

(1) Component and System Checks

The component and system checks under this paragraph are also included in Chapter 05-10.

The following table lists aircraft components and systems that require monitoring through scheduled maintenance.

Where an interval is given in both flight time and calendar years, the limit that is reached first must be applied.

ATA Ch.	Component	Maintenance Requirement	Interval	
			hrs.	yrs.
61	MT Propeller	For Mandatory Maintenance Actions, refer to MT Propeller Operations and Maintenance Manual ATA 61-01-24, latest revision.	See ATA 61-01-24, latest revision.	
72	Lycoming IO-360 M1A/ LIO-360 M1A Engines	For Mandatory Maintenance Actions, refer to Lycoming Operations and Maintenance Manual, latest revision.	See Operations and Maintenance Manual, latest revision.	

B. Replacement Requirements

The replace requirements under this paragraph are also included in Chapter 05-10.

The following table lists life limited aircraft components that must be replaced at a specific time.

Where an interval is given in both flight time and calendar years, the limit that is reached first must be applied.

ATA Chapter	Component	Replacement Time	
		hrs.	yrs.
61	MT Propeller (for Mandatory Maintenance Actions, refer to MT Propeller Operations and Maintenance Manual ATA 61-01-24, latest revision)	See ATA 61-01-24, latest revision.	
72	Lycoming Engine (for Mandatory Maintenance Actions, refer to Lycoming Operations and Maintenance Manual, latest revision)	See Operations and Maintenance Manual, latest revision.	
73	Air Filter	500	
74	Ignition System (for Mandstory Maintenance Actions, refer to SlickSTART Installation, Operation, Maintenance and Troubleshooting Manual L-1492 (latest issue)	500	

2. Continued Airworthiness

Regular inspections of the aircraft including replacement and overhaul of certain components are required to make sure the continued airworthiness of the DA42 L360 aircraft.

The time limits given in Chapter 04 must be applied to make sure the continued airworthiness of the DA42 L360 aircraft.

The manufacturer recommends that you apply the time limits and maintenance check lists given in Chapter 05. National maintenance requirements must be complied with.

CHAPTER 05-00
TIME LIMITS AND MAINTENANCE CHECKS

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TIME LIMITS

1. General

All scheduled maintenance checks have time limits. You must do the scheduled maintenance within the time limits.

The time limits shown in this chapter pertain only to the components that are changed/modified due to the conversion of DA42 aircraft from TAE-125-01 (1.7 Liters) and TAE-125-02-99 (2.0 Liters) diesel engines to Lycoming IO-360 M1A/LIO-360 M1A gasoline engines by the Supplemental Type Certificate (STC) No. SA09-54.

Some components installed in the aircraft have a fixed time between overhaul (TBO), (for example the engine). Refer to Paragraph 4.

2. Regulatory Authorities

The recommended time limits given in this chapter were created to meet the requirements of the Canadian Airworthiness Authority, Transport Canada Civil Aviation (TCCA) and US Airworthiness Authority, Federal Aviation Administration (FAA). Other Regulatory Authorities can have different requirements. You must make sure that you meet the requirements of the Regulatory Authority of the country where the aircraft is registered.

3. Scheduled Maintenance Time Limits

Refer to Chapter 05-20.

The following recommended hourly and calendar time limits apply to the scheduled maintenance checks that are necessary to maintain the aircraft in a good technical condition. Do the scheduled maintenance at the intervals and within the tolerances shown below:

Scheduled Maintenance Check (Hourly)	Do At These Times	Maximum Tolerance
25 Hour Engine Check	At 25 hours since new, do a 50 hours engine check of the lycoming engines and re-torque engine mount attachment bolts on the firewall.	± 10%
50 Hour Check	At 50 hours since new and every 50 hour intervals.	± 10%
100 Hour Check	At 100 hours since new and every 100 hour intervals.	± 10%
200 Hour Check	At 200 hours since new and every 200 hour intervals.	± 5%
1000 Hour Check	At 1000 hours since new and every 1000 hour intervals or 12 years, whichever comes first.	± 5%
2000 Hour Structural Check	At 2000 hours since new and every 2000 hour intervals or 12 years, whichever comes first.	± 2.5%

NOTE: The use of the tolerances specified in the above table may require approval from the civil aviation authority in which the aircraft is registered.

The intervals between the inspections must be adhered to within the tolerances shown. These tolerances must not be added up. For example: if the 100 hour inspection was done at 110 hours, the next inspection must be done at 200 ±10 hours, not 210 ±10 hours.

If an inspection is carried out earlier than allowed by the specified tolerance, all subsequent inspection intervals are counted from that inspection. For example: If the 100 hour inspection was done at 83 hours, the next inspection must be done at 183 hours.

If the aircraft was flown less than 200 hours:

Scheduled Maintenance Check (Hourly)	Do At These Times
Annual Inspection (for aircraft registered in the USA).	At 12 months since new and every 12 month interval, do a 100 Hour Check.
Annual Inspection (for aircraft registered in other countries).	At 12 months since new and every 12 month interval, do a 200 Hour Check.

4. Component Time Limits

A. Maintenance Requirements

The following table lists aircraft components and systems which require overhaul or specific checks.

Where an interval is given in both flight time and calendar years, the limit which is reached first must be applied.

Visual Flight Route/Rules (VFR) in the "Kind of Operation" column means that this limit applies to day VFR, night VFR and Instrument Flight Route/Rules (IFR) operation. Night Visual Flight Route/ Rules (NVFR) in the "Kind of Operation" column means that this limit applies to night VFR and IFR operation. IFR in the "Kind of Operation" column means that this limit applies to IFR operation.

ATA Chapter	Component	Maintenance Requirement	Interval		Kind of Operation
			hrs.	yrs.	
24	Alternator	Overhaul	2000		VFR
31	CO Detector	Overhaul. Refer to CO Guardian Owners' Manual 03-452-201 latest version.		7	VFR
61	Propeller, MT-Propeller	Overhaul. Refer to mt-Propeller Service Bulletin No. 1AG (latest issue).	1800	6	VFR
	Propeller Governor	Overhaul. Refer to mt-Propeller Service Bulletin No. 1AG (latest issue).	2000	6	VFR
	Oil Accumulator	Overhaul. Refer to mt-Propeller Service Bulletin No. 1AG (latest issue).	2000	6	VFR
71	Air Filter Cartridge, JR filters	Replace. Re-use is permitted after washing and servicing the air filter according to the filter manufacturer`s manual.	500		VFR
72	Engine, Lycoming IO-360 M1A/LIO-360 M1A	Overhaul. Refer to Lycoming Service Instruction 1009 (latest issue).	2000	12	VFR
74	Ignition Switches	Overhaul, lubricate the ignition switches: - see FAA AD 93-05-06 reference ACS/Gerdes Service Bulletin SB 92-01-ACS, ignition switch lubrication/inspection.	2000		VFR
	Magnetos, Slick	Overhaul	With the engine		VFR
79	Oil Cooler	Proof-test at 250 psi (or replace)	2000	12	IFR

B. Aircraft Life-Limited Components

The following table lists life limited aircraft components which must be replaced at a specific time.

Where an interval is given in both flight time and calendar years, the limit which is reached first must be applied.

VFR in the "Kind of Operation" column means that this limit applies to day VFR, night VFR and IFR operation. NVFR in the "Kind of Operation" column means that this limit applies to night VFR and IFR operation. IFR in the "Kind of Operation" column means that this limit applies to IFR operation.

ATA Chapter	Component	Replacement Time		Kind of Operation
		Hours	Years	
21	CO Detector		7	VFR
71	Engine shock mounts	2000	12	VFR
73	Fuel hoses in the engine compartment	2000	12	NVFR
77	Deleted			
79	Oil hoses	2000	12	NVFR

C. Life-Limited Components for the Lycoming Engines

Refer to the Lycoming Service Bulletin No. 240 (latest issue) which gives the engine life-limited components. Replace the life-limited components at the times stated.

5. <u>Component Time Tracking</u>

To make sure that components overhaul/replacement is done at the correct time you must record the data that follows in the Aircraft Maintenance Log for each component requiring overhaul/replacement:

- Serial Number
- Flight hours and date at installation
- Flight hours and date at removal.

SCHEDULED MAINTENANCE CHECKS

1. General

This maintenance check list provided in this section pertains to the engine compartment that is modified with Supplemental Type Certificate (STC) No. SA09-54 installed. Only those areas identified below are changed from the original DA42. All other information about the DA42 is contained in the Aircraft Maintenance Manual (AMM) document number 7.02.01.

A. Do the scheduled maintenance checks in this section at the intervals (flight hours and calendar time) stated in Chapter 05-10.

NOTE: Only persons authorized by national regulatory authorities of the country where the airplane is registered, (or a JAR-145 approved maintenance organization in Europe), may do these checks. The inspection level for each item is a general visual inspection unless differently specified.

NOTE: Only Lycoming authorized maintenance organizations may carry out maintenance and inspection work on the Lycoming engine. Any engine malfunction must be reported to Lycoming.

2. Maintenance Checklist

Do the scheduled maintenance checks with reference to the Maintenance Checklist in this Section. Before starting a check, complete the requirements of Paragraphs 2 and 3 of the checklist.

Do all the applicable tasks on the checklist.

NOTE: For maintenance of aircraft registered in the USA, do the items marked X and the items marked X* in the Maintenance Checklist. For maintenance of aircraft registered in other countries, do only the items marked X in the Maintenance Checklist.

NOTE: The interval columns “50”, "100", "200", and "1000", “2000” are used for maintenance items which must be done at intervals of 50, 100, 200, 1000 or 2000 flight hours. The interval column "time" is used for maintenance items which must be done at certain calendar time intervals. These items are marked with the explicit time interval.

NOTE: The interval column "time" is used for maintenance items which must be done during a Major Structural Inspection (MSI). These items are marked with the term “MSI”.

NOTE: Where an interval is given in both flight time and calendar years, the limit which is reached first must be applied.

NOTE: Some inspection items must be done at other intervals than the standard intervals (50, 100, 200, 1000 or 2000 hours). In these cases, the maintenance interval is shown in the column for the next shorter interval instead of an X. For example, an item which must be done every 800 hours is identified by the words "800 hrs." in the 200 hrs. column.

All of the applicable items must be signed by authorized maintenance personnel. Record the completion of the check in the airplane log book. Complete a copy of the Maintenance Report.

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SCHEDULED MAINTENANCE CHECKS - MAINTENANCE PRACTICES

1. General

Enter the applicable data in the blocks below:

Registration: ____________	Date:	____________		
		LH	RH	
Aircraft S/N: ____________	Engine S/N:	______	______	
Aircraft	Engine Hours,	LH	RH	
Operating Hours: ____________	TTSN:	______	______	
		LH	RH	
Inspection: ____________	Propeller S/N:	______	______	
	Propeller Hours,	LH	RH	
(50, 100, 200, 1000, 2000 hrs, Annual Inspection)	TTSN:	______	______	

2. Preparation

Do the following items before you start the applicable check:

Inspection Items	Interval					
	50	100	200	1000	2000	Initials
1. Before you do the inspection: - Read the applicable Airworthiness Directives - Read the applicable Service Bulletins.		X	X	X	X	
2. Examine the Log Books. Look especially for: - Life limited parts - Reported problems.		X	X	X	X	
3. Clean the aircraft fully. (Refer to AMM # 7.02.01 Chapter 12-30).			X	X	X	

3. Engine Ground Test

Do an engine ground test as follows:

NOTE: Complete a copy of the Engine Ground Test Report as part of the engine ground test.

Inspection Items	Interval					
	100	200	1000	2000	Time	Initials
WARNING: DO NOT LET PERSONS GO INTO THE DANGER AREA OF THE PROPELLER. PROPELLERS CAN CAUSE INJURY OR DEATH. WARNING: SET THE PARKING BRAKE TO ON. IF YOU DO NOT DO THIS, THE AIRCRAFT CAN MOVE AND THIS CAN CAUSE INJURY OR DEATH.						
1. Do an operational test of the parking brake.	X	X	X	X		
2. Set the parking brake to ON.	X	X	X	X		
3. Put the chocks against the aircraft main wheels.	X	X	X	X		
4. Do an engine operational test. For the engine run procedures refer to DA42 L360 Airplane Flight Manual (AFM). Record the data in the checklist in Chapter 05-20.	X	X	X	X		
5. Do an operational test of the variable elevator stop with the engines running after the engine operational test. (Refer to Chapter 27-30).	X	X	X	X		
6. Check engine instruments.	X	X	X	X		
7. Check for carbon monoxide contamination in the cabin. - Switch cabin heat ON. - Use a carbon monoxide tester (CO tester)		X	X	X		
8. Do a test of the cross-feed system. (Refer to Chapter 28-20).	X	X	X	X		
9. Do an operational test of the fuel shut-off valve for correct operation. (Refer to Chapter 28-20).			X	X		
10. Do a test of the auxiliary fuel transfer system. (Refer to Chapter 28-20).	X	X	X	X		
11. Do a test of the feathering and unfeathering system. (Refer to Chapter 61-20).	X	X	X	X		
12. Shut the engine down.	X	X	X	X		
13. When the propeller stops rotating, set the ignition switches to the OFF position. Set the ALT/BAT switch to the OFF position. Set the Fuel selector to the OFF position.	X	X	X	X		

4. Maintenance of Checklist Zones

Do the applicable checks in each of the zones that follow:

A. Engine Compartments

(1) LH Engine

Inspection Items, LH Engine	Interval					
	50	100	200	1000	Time	Initials
WARNING: MAKE SURE THAT THE EXHAUST SYSTEM IS COOL BEFORE YOU DO MAINTENANCE ON THE ENGINE. THE EXHAUST SYSTEM CAN BE HOT AND THIS CAN CAUSE INJURY TO PERSONS.						
1. Remove the top and bottom cowlings. Examine the cowlings. Make sure that the fasteners are serviceable. Look for cracks and areas that have got too hot.	X	X	X	X		
WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE. WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE THE EQUIPMENT.						
2. Examine the engine for oil/fuel leaks.	X	X	X	X		
3. Clean the engine and engine compartment. (Refer to AMM # 7.02.01 Chapter 12-30).		X	X	X		
4. Remove the oil drain plug. Drain the engine oil into an approved container (with the engine warm). (Refer to Chapter 79-00).	X	X	X	X		
5. Examine the oil suction screen: - Remove the oil suction screen from the oil sump - Look for particles of metal. If the screen contains particles of metal, refer to the Lycoming Maintenance Manual - Replace the gasket - Install the oil suction screen to the oil sump.		X	X	X		
6. Install the drain plug. - Tighten the drain plug. Torque to 160 lbf-in (18 Nm) - Lock the drain plug with the safety wire.	X	X	X	X		
7. Replace the oil filter. (Refer to Chapter 79-00).	X	X	X	X		

Inspection Items, LH Engine	Interval					
	50	100	200	1000	Time	Initials
8. Cut open the used oil filter. Look for particles of metal. If the filter contains particles of metal, refer to the Lycoming Maintenance Manual.	X	X	X	X		
CAUTION: YOU MUST USE THE ENGINE OIL THAT AGREE WITH THE SPECIFICATION IN LYCOMING SERVICE INSTRUCTION NO. 1014.						
9. Fill the engine with new oil.	X	X	X	X		
NOTE: Drain the engine oil and fill with straight mineral oil 25 hours after a new engine is installed. Change to an ashless dispersant oil at the next 50 hour check. Refer to Lycoming Service Instruction No. 1014 for details of acceptable oils.						
10. Do a compression test with the engine warm and the throttle open. Do the compression test on the four cylinders. Use 5.5 bar (80 psi). Maximum permitted decrease 1.4 bar (20 psi). Record the compression test results: 1 _______ 2 _______ 3 _______ 4 _______		X	X	X		
11. Remove the spark plugs. - Examine the spark plugs. Look specially for damaged electrodes - Clean the spark plugs (refer to spark plug manufacturer's instructions) - Do a spark plug gap test (Refer to the manufacturer's specified spark plug gap).		X	X	X		
12. Install the spark plugs. Use a thread lubricant approved by the spark plug manufacturer: - Install the spark plugs - Torque to 35 lbf-ft. (47 Nm) - Refer to Lycoming Service Instruction No. 1042 for approved spark plugs.		X	X	X		
13. Examine the ignition harness and cables. Examine the sleeve nut on each spark-plug connector for cracks.	X	X	X	X		
14. Inspect the ignition system. - Do a 100 hrs/500 hrs check of the SlickSTART system and the magnetos. Refer to the SlickSTART Installation, Operation, Maintenance and Troubleshooting Manual L-1492 (latest issue).		X	500 hrs			

Inspection Items, LH Engine	Interval					
	50	100	200	1000	Time	Initials
NOTE: The inspection of ignition system at 500 hrs is indicated under the 200 hrs interval column.						
15. Examine each cylinder. Look specially for broken fins and heat damage.		X	X	X		
16. Examine the rocker-box covers. Look specially for signs of oil leaks.	X	X	X	X		

17. Examine the valves and rockers:
- Remove the rocker covers
- Look specially for abnormal wear and broken parts in the areas of:
  - Valve tips
  - Valve keepers
  - Springs
  - Spring seats.
- Install the rocker covers.
Refer to the Lycoming Maintenance Manual.
			400 hrs			

18. Examine the inlet manifolds.	X	X	X	X		
19. Examine the fuel injector. Remove and clean the inlet finger filter.		X	X	X		
20. Examine the fuel flow-divider.	X	X	X	X		
21. Deleted.						
22. Examine the fuel pump drain pipe.		X	X	X		
23. Do a functional test of the fuel emergency pumps to test the operation of the FUEL PUMP switches. (Refer to Chapter 28-20)		X	X	X		
24. Do an operational test of the failure indication that will show on the FUEL PUMP switch. (Refer to Chapter 28-20).		X	X	X		
25. Deleted.						
WARNING: MAKE SURE THAT THE EXHAUST SYSTEM IS COOL BEFORE YOU DO MAINTENANCE ON THE EXHAUST SYSTEM. THE EXHAUST SYSTEM CAN BE HOT AND THIS CAN CAUSE INJURY TO PERSONS.						

Inspection Items, LH Engine	Interval					
	50	100	200	1000	Time	Initials
26. Do a detailed visual inspection of the exhaust system especially within the heat exchanger section.		X	X	X		
Replace all components displaying cracking or general distortion with new parts or repair in accordance with the latest approved revision of AC 43.13. - Check for holes, cracks, and burned spots. Especially check areas adjacent to welds. Look for unusual tube discoloration. This may indicate an exhaust leak.		X	X	X		
- Remove the heat shroud to the extent necessary to visually inspect the inside of the heat exchanger section.		X	X	X		
- Visually inspect the tailpipe insert (baffle) in place by shining a flashlight up the tailpipe.	X	X	X	X		
- Replace the insert if any visible damage or collapse is observed. - Inspect for ball joint freedom of movement by disconnecting the exhaust hangar strap. The tailpipe should be free to move in all directions by applying minimal force. - At 500 hours or annual intervals, in addition to above inspection, lubricate all riser slip joints with high temperature anti-seize compound - While disassembled, inspect for surface abnormalities such as galling or wear marks.		X	X	X		
27. Examine the cabin heat system. - Remove the worm drive clamp from the flexible hose at the cabin-heat selector-valve - Examine the flexible hose for damage - Examine the cabin-heat selector-valve - Connect the flexible hose to the cabin-heat selector-valve - Install the worm drive clamp.		X	X	X		
28. Examine the engine baffles. Look specially for cracks and incorrect attachment.	X	X	X	X		
29. Examine the alternator mounting bracket and electrical connections.	X	X	X	X		

Inspection Items, LH Engine	Interval					
	50	100	200	1000	Time	Initials
30. Examine the alternator belt. (Refer to Chapter 24-30). - Look for abnormal wear - Do a test for correct adjustment.	X	X	X	X		
31. Examine the air hoses. Look specially for signs of leakage and damage. Make sure the air hoses are correctly attached.		X	X	X		
32. Examine the cable ties and all electrical connectors. Look specially for rub marks and damage. Pull lightly to make sure they are not loose.	X	X	X	X		
33. Examine the fuel and oil hoses. Look specially for signs of leakage and damage. Make sure the fuel and oil hoses are correctly attached.		X	X	X		
34. Examine the oil breather line. Look specially for blockage.		X	X	X		
35. Examine the oil cooler. Look specially for leakage and damage. Make sure the cooling fins are not blocked.		X	X	X		
36. Examine the air filter. (Refer to Chapter 71-60). Replace the air filter at 500 hours interval.	X	X	X	X		
37. Examine the alternate air valve assembly. (Refer to Chapter 71-60).	X	X	X	X		
38. Examine the throttle and mixture controls. - Make sure that the connection to the control lever is tight - Make sure that the end fitting can turn in the control lever - Examine the outer cables. Look specially for wear and for kinks.		X	X	X		
39. Examine the engine mounts. Look specially for: - Cracks or corrosion - Incorrect attachment and poor condition of the mounting bolts - Deterioration of the shock mounts - Incorrect torque value. (Refer to Chapter 71-20).		X	X	X		

(2) RH Engine

Inspection Items, RH Engine	Interval					
	50	100	200	1000	Time	Initials
WARNING: MAKE SURE THAT THE EXHAUST SYSTEM IS COOL BEFORE YOU DO MAINTENANCE ON THE ENGINE. THE EXHAUST SYSTEM CAN BE HOT AND THIS CAN CAUSE INJURY TO PERSONS.						
1. Remove the top and bottom cowlings. Examine the cowlings. Make sure that the fasteners are serviceable. Look for cracks and areas that have got too hot.	X	X	X	X		
WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE. WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE THE EQUIPMENT.						
2. Examine the engine for oil/fuel leaks.	X	X	X	X		
3. Clean the engine and engine compartment. (Refer to AMM # 7.02.01 Chapter 12-30).		X	X	X		
4. Remove the oil drain plug. Drain the engine oil into an approved container (with the engine warm). (Refer to Chapter 79-00).	X	X	X	X		
5. Examine the oil suction screen: - Remove the oil suction screen from the oil sump - Look for particles of metal. If the screen contains particles of metal, refer to the Lycoming Maintenance Manual - Replace the gasket - Install the oil suction screen to the oil sump.		X	X	X		
6. Install the drain plug. - Tighten the drain plug. Torque to 160 lbf-in. (18 Nm) - Lock the drain plug with the safety wire.	X	X	X	X		
7. Replace the oil filter. (Refer to Chapter 79-00).	X	X	X	X		
8. Cut open the used oil filter. Look for particles of metal. If the filter contains particles of metal, refer to the Lycoming Maintenance Manual.	X	X	X	X		

Inspection Items, RH Engine	Interval					
	50	100	200	1000	Time	Initials
CAUTION: YOU MUST USE ENGINE OILS THAT AGREE WITH THE SPECIFICATION IN LYCOMING SERVICE INSTRUCTION NO. 1014.						
9. Fill the engine with new oil.	X	X	X	X		
NOTE: Drain the engine oil and fill with straight mineral oil 25 hours after a new engine is installed. Change to an ashless oil at the next 50 hour check. Refer to Lycoming Service Instruction No. 1014 for details of acceptable oils.						
10. Do a compression test with the engine warm and the throttle open. Do the compression test on the four cylinders. Use 5.5 bar (80 psi). Maximum permitted decrease 1.4 bar (20 psi). Record the compression test results: 1 _______ 2 _______ 3 _______ 4 _______		X	X	X		
11. Remove the spark plugs. - Examine the spark plugs. Look specially for damaged electrodes - Clean the spark plugs (refer to spark plug manufacturer's instructions) - Do a spark plug gap test (Refer to the manufacturer's specified spark plug gap).		X	X	X		
12. Install the spark plugs. Use a thread lubricant approved by the spark plug manufacturer: - Install the spark plugs - Torque to 35 lbf-ft. (47 Nm) - Refer to Lycoming Service Instruction No. 1042 for approved spark plugs.		X	X	X		
13. Examine the ignition harness and cables. Examine the sleeve nut on each spark-plug connector for cracks.	X	X	X	X		
14. Inspect the ignition system. - Do a 100 hrs/500 hrs check of the SlickSTART system and the magnetos. Refer to the SlickSTART Installation, Operation, Maintenance and Troubleshooting Manual L-1492 (latest issue).		X	500 hrs			
15. Examine each cylinder. Look specially for broken fins and heat damage.		X	X	X		

Inspection Items, RH Engine	Interval					
	50	100	200	1000	Time	Initials
16. Examine the rocker-box covers. Look specially for signs of oil leaks.	X	X	X	X		

17. Examine the valves and rockers:
- Remove the rocker covers
- Look specially for abnormal wear and broken parts in the areas of:
  - Valve tips
  - Valve keepers
  - Springs
  - Spring seats
- Install the rocker covers.
Refer to the Lycoming Maintenance Manual.
			400 hrs			

18. Examine the inlet manifolds.	X	X	X	X		
19. Examine the fuel injector. Remove and clean the inlet finger filter.		X	X	X		
20. Examine the fuel flow-divider.	X	X	X	X		
21. Deleted.						
22. Examine the fuel pump drain pipe.		X	X	X		
23. Do a functional test of the fuel emergency pumps to test the operation of the FUEL PUMP switches. (Refer to Chapter 28-20)		X	X	X		
24. Do an operational test of the failure indication that will show on the FUEL PUMP switch. (Refer to Chapter 28-20).		X	X	X		
25. Deleted.						
WARNING: MAKE SURE THAT THE EXHAUST SYSTEM IS COOL BEFORE YOU DO MAINTENANCE ON THE EXHAUST SYSTEM. THE EXHAUST SYSTEM CAN BE HOT AND THIS CAN CAUSE INJURY TO PERSONS.						
26. Do a detailed visual inspection of the exhaust system especially within the heat exchanger section.		X	X	X		

Inspection Items, RH Engine	Interval					
	50	100	200	1000	Time	Initials
Replace all components displaying cracking or general distortion with new parts or repair in accordance with the latest approved revision of AC 43.13. - Check for holes, cracks, and burned spots. Especially check areas adjacent to welds. Look for unusual tube discoloration. This may indicate an exhaust leak. - Remove the heat shroud to the extent necessary to visually inspect the inside of the heat exchanger section.		X	X	X		
- Visually inspect the tailpipe insert (baffle) in place by shining a flashlight up the tailpipe.	X	X	X	X		
- Replace the insert if any visible damage or collapse is observed.		X	X	X		
- Inspect for ball joint freedom of movement by disconnecting the exhaust hangar strap. The tailpipe should be free to move in all directions by applying minimal force. - At 500 hours or annual intervals, in addition to above inspection, lubricate all riser slip joints with high temperature anti-seize compound - While disassembled, inspect for surface abnormalities such as galling or wear marks.		X	X	X		
27. Examine the cabin heat system. - Remove the worm drive clamp from the flexible hose at the cabin-heat selector-valve - Examine the flexible hose for damage - Examine the cabin-heat selector-valve - Connect the flexible hose to the cabin-heat selector-valve - Install the worm drive clamp.		X	X	X		
28. Examine the engine baffles. Look specially for cracks and incorrect attachment.	X	X	X	X		
29. Examine the alternator mounting bracket and electrical connections.	X	X	X	X		
30. Examine the alternator belt. (Refer to Chapter 24-30). - Look for abnormal wear - Do a test for correct adjustment.	X	X	X	X		

Inspection Items, RH Engine	Interval					
	50	100	200	1000	Time	Initials
31. Examine the air hoses. Look specially for signs of leakage and damage. Make sure the air hoses are correctly attached.		X	X	X		
32. Examine the cable ties and all electrical connectors. Look specially for rub marks and damage. Pull lightly to make sure they are not loose.	X	X	X	X		
33. Examine the fuel and oil hoses. Look specially for signs of leakage and damage. Make sure the fuel and oil hoses are correctly attached.		X	X	X		
34. Examine the oil breather line. Look specially for blockage.		X	X	X		
35. Examine the oil cooler. Look specially for leakage and damage. Make sure the cooling fins are not blocked.		X	X	X		
36. Examine the air filter. (Refer to Chapter 71-60). Replace the air filter at 500 hours interval.	X	X	X	X		
37. Examine the alternate air valve assembly. (Refer to Chapter 71-60).	X	X	X	X		
38. Examine the throttle and mixture controls. - Make sure that the connection to the control lever is tight - Make sure that the end fitting can turn in the control lever - Examine the outer cables. Look specially for wear and for kinks.		X	X	X		
39. Examine the engine mounts. Look specially for: - Cracks or corrosion - Incorrect attachment and poor condition of the mounting bolts - Deterioration of the shock mounts - Incorrect torque value. (Refer to Chapter 71-20).		X	X	X		

B. Propeller

The maintenance checks for LH propeller are given below and follow the same maintenance checks for the RH propeller.

Inspection Items	Interval					
	100	200	1000	2000	Time	Initials
WARNING: DO NOT LET PERSONS GO INTO THE DANGER AREA OF THE PROPELLER. THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER.						
1. Remove and clean the spinner. Examine the spinner for cracks. (Refer to Chapter 61).	X	X	X	X		
2. Check propeller blades for play: - Blade shake: maximum 1/8 in (3 mm) - Blade angle play: maximum 2°. If you measure more play, then you must contact the propeller manufacturer.	X	X	X	X		
3. Check outside parts of the propeller hub. Look specially for: - Cracks - Corrosion.	X	X	X	X		
4. Check nut for low pitch stop for looseness.	X	X	X	X		
5. Check propeller assembly for loose or missing locking devices.	X	X	X	X		
6. Check propeller flange nuts for looseness.	X	X	X	X		
7. Check front and rear spinner plate. Look specially for: - Cracks - Looseness.	X	X	X	X		
8. Check area of propeller hub and blade root for oil and grease leakage.	X	X	X	X		
9. Check propeller blades for cracks. Refer to MT propeller manual (E-124) for allowable cracks.	X	X	X	X		
10. If installed, check de-icing fluid slinger ring and nozzle for damage.	X	X	X	X		
11. Check the pressure in the propeller unfeathering accumulator.	X	X	X	X		
12. Install the spinner. (Refer to Chapter 61).	X	X	X	X		

C. Fuselage Nose

Inspection Items, Fuselage Nose	Interval					
	100	200	1000	2000	Time	Initials
1. Examine the nose baggage doors: - Check for damage to the doors - Check for defective hinges - Make sure that the locks operate correctly.	X	X	X	X		
2. Close only one nose baggage door and test the lock of the other one by pushing from inside. Repeat the procedure for the other side.		X	X	X		
3. Remove the covers from the rear wall of the nose baggage compartment.	X	X	X	X		
4. Examine the cable ties and all electrical connectors. - Look specially for rub marks and damage - Pull lightly to make sure they are not loose.	X	X	X	X		
5. Do a check of the airplane battery. (Refer to AMM Chapter 24-31). Look specially for: - Low charge and capacity - Incorrect acid level - Corrosion, pitting, burn marks or damage on battery terminals - Incorrect mounting.		X	X	X	11±1 mths since new and then 6±1 mths	
6. Examine the battery area. Clean the area.		X*	X	X		
7. Visually inspect the interior structure of the front fuselage (forward of instrument panel frame). Use mirror and flashlight where necessary. Check for damage, cracks, delamination and disbonding from the fuselage skin. Inspect the following components: - Instrument panel frame - Nose compartment floor - Nose frame.				X		
8. If installed, examine the removable nose cone (OÄM 42-077): - Check the nose cone for insecure attachment - Make sure that all screws are properly tightened.	X	X	X	X		
9. If the ice protection system is installed, replace filter cartridges on the LH side.				X		
10. If installed, clean the de-icing fluid strainer.					1 yr	

Inspection Items, Fuselage Nose	Interval					
	100	200	1000	2000	Time	Initials
11. If installed, check the spraybar for the de-icing fluid for damage.	X	X	X	X		
12. If the oxygen system is installed (OÄM 42-055), visually inspect the ventilation of the nose baggage compartments (oxygen, battery, and TKS compartment). Especially check both ventilation caps, installed on the LH and RH side of the nose landing gear.	X	X	X	X		
13. If the oxygen system is installed (OÄM 42-055), visually inspect all oxygen tubes installed in the oxygen and battery compartment. Check for improper fixture, chafing, leakage and improper ventilation of the high pressure tube.			X	X		
14. If the oxygen system is installed (OÄM 42-055), visually inspect the cylinder regulator valve installed on the oxygen cylinder. Check for damage, dust and corrosion.			X	X		
15. If the oxygen system is installed (OÄM 42-055), visually check the front baggage compartment for residues of oil, TKS fluid and grease.	X	X	X	X		
16. If ballast is installed [Post Diamond Aircraft Service Bulletin (SB) D42L-25-01], remove the cylindrical ballasts and inspect the following: - Dowel pins and ballast base plate for cracks, damage, or excessive wear. - Grease the dowel pins - Ballast mounting bracket for cracks or voids in the fabric and the bond to the nose bulkhead - Ballast clamps for cracks, damage or excessive wear - Make sure that the ballast clamp mechanism is functioning correctly.	X	X	X	X		

D. Flight Control System in Cabin

Inspection Items, Flight Control System in Cabin	Interval					
	100	200	1000	2000	Time	Initials
1. Examine the rudder cables and pulleys. Look specially for: - Incorrect attachment and function. (Refer to Chapter 27-20) - Lubrication at all cable ends - Defective cable eyes - Defective rubber sleeves - Corrosion - Rub marks - Defective safety plates - Worn out pulleys.		X	X	X		
2. Do the rudder system control force test. (Refer to Chapter 27-20)		X	X	X		

E. Miscellaneous Items in Nacelles

Inspection Items, Nacelles	Interval					
	100	200	1000	2000	Time	Initials
1. Examine the gascolator: - Remove and clean the fuel filter bowl - Install the filter bowl (Refer to Chapter 28-20) - Do a check for fuel leakage.	X	X	X	X		

F. General

Inspection Items, General	Interval					
	100	200	1000	2000	Time	Initials
1. Put chocks against the main airplane wheels.	X	X	X	X		
2. Do the post maintenance engine test. - For the engine run procedures, refer to the DA42 L360 AFM - Record the data (Refer to Paragraph 8, Engine Ground Test Record).	X	X	X	X		
3. Examine the engines for leakage.	X	X	X	X		

Inspection Items, General	Interval					
	100	200	1000	2000	Time	Initials
4. Make sure the engine oil filters are tight (LH and RH engine). (Refer to Chapter 79-00).	X	X	X	X		
5. Inspect the jacking pad to check: - whether the pad is either loose or has fallen off - if so, then bond jack pad with TEROSTAT M9380 or equivalent adhesive. - Cure for 24 hours at room temperature before the flight or cure for 72 hours at room temperature before using the jacking pads.	X	X	X	X		
6. Do a maintenance check flight. Put the engine ground test and the maintenance check flight reports in the Aircraft Maintenance Log.	X	X	X	X		
7. Complete the Maintenance Report and put it in the Aircraft Maintenance Log.	X	X	X	X		

5. Engine Ground Test Record

WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS.

WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER. MAKE SURE THAT:

- THE ELECT MASTER SWITCH IS SET TO "OFF".

- THE POWER LEVER IS SET TO "IDLE".

WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE. DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.

WARNING: WHEN YOU COMPLETE AN INSPECTION, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS/TOOLS FROM THAT AREA. LOOSE ITEMS/TOOLS CAN PREVENT FULL MOVEMENT OF THE AIRCRAFT CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

CAUTION: YOU MUST ATTACH BLANKS/CAPS TO HOLES/PIPES WHEN YOU REMOVE COMPONENTS. IF YOU DO NOT DO THIS, UNWANTED DEBRIS CAN ENTER THE HOLES/PIPES. THIS CAN CAUSE BLOCKAGE TO THE AIRCRAFT SYSTEMS.

Do the engine test in accordance with Chapter 71-00.

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CHAPTER 06-00
DIMENSIONS AND AREAS

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DIMENSIONS AND AREAS

1. General

   The DA42 L360 aircraft uses the Imperial dimensions for dimensions and areas. System International (SI) are also given in brackets. For example: Wing Span 39.2 ft (11.94 m).

   Conversions between SI units and imperial units are given in AMM Chapter 02.

2. Dimensions

   There are no changes in the dimensions and areas from the DA42 basic aircraft.

3. Adjustment Report

   The measurements of the DA42 L360 aircraft are recorded on an Adjustment Report at the factory when the aircraft is built. This report becomes part of the aircraft records.

   When you measure the dimensions, use the Adjustment Report as reference to show any deviations.

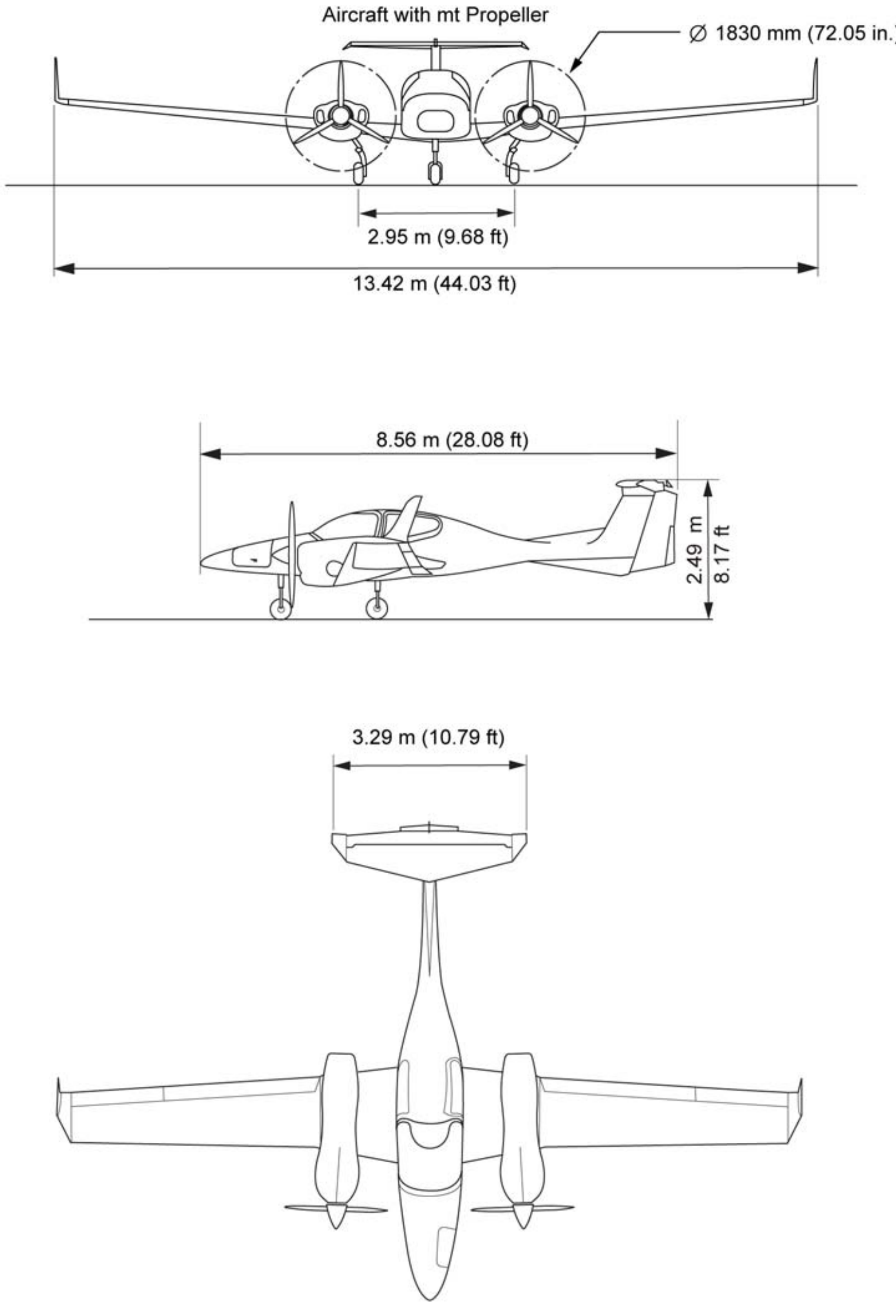

Figure 1 - DA42 L360 Overall Dimensions (Approximate Values)

	Rudder Trim								
	Rudder 20° LH			Rudder Neutral			Rudder 20° RH		
	Trim RH	Trim Neutral	Trim LH	Trim RH	Trim Neutral	Trim LH	Trim RH	Trim Neutral	Trim LH
Travel Limits (in.)	1.5 ±0.23	0.31 ±0.16	0.82 ±0.23	1.34 +0.2/-0	0.16 ±0.08	1.38 +0.2/-0.0	0.94 +0.23/-0.08	0.31 ±0.16	1.69 ±0.19
Travel Limits (mm)	39±6	8±4	21±6	35+5/-0	4±2	34+5/-0	24+6/-2	8±4	43±5
Travel Actual									
Angle Limits (°)	34±5	7±3	18+5/-1	30+5/-0	3±2	29+5/-0	21+5/-1	7±3	37±5
Angle Actual (°)									

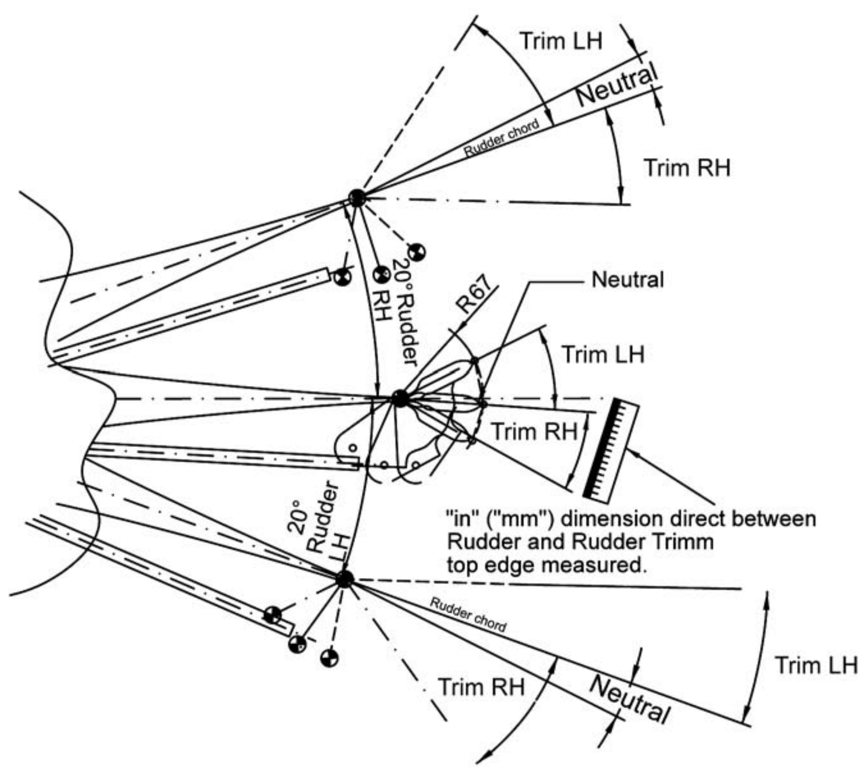

Figure 2 - Control Surfaces Adjustment Report - Rudder Trim

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CHAPTER 11-00
PLACARDS AND MARKINGS

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1. General 1

CHAPTER 11-30 INTERIOR PLACARDS AND MARKINGS 1

1. General 1
2. Replace Plastic Placards 1

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PLACARDS AND MARKINGS - DESCRIPTION AND OPERATION

1. General

Placards are used for identification and indication. They show the function, operation and operating limitations of systems and equipment.

This chapter shows you the location of these placards and markings:

- Exterior placards
- Exterior markings
- Interior placards.

2. Replace Plastic Placards

A. Material

Item	Quantity	Part Number
Solvent	A/R	Commercial

B. Replace a Placard

Use this procedure for both internal and external placards.

	Detail Steps/Work Items	Key Items/References
1.	Remove the old placard: - Warm the placard with a hot air blower. - Lift one corner of the placard. - Carefully pull the placard off.	
WARNING: DO NOT GET SOLVENT ON YOUR SKIN. DO NOT BREATHE SOLVENT VAPOR. SOLVENT CAN CAUSE DISEASE OR ILLNESS.		
2.	Clean the area where the new placard will go.	Use a commercial solvent. There must be no grease or dirt on the surface. Obey the solvent manufacturer’s instructions.
3.	Remove the protective backing from the new placard.	
4.	Put the new placard into the correct position. Make the placard smooth with a clean cloth.	Refer to the related Figure in this Chapter.

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EXTERIOR PLACARDS AND MARKINGS

1. General

Figure 1 shows the exterior placards for the DA42 L360 aircraft.

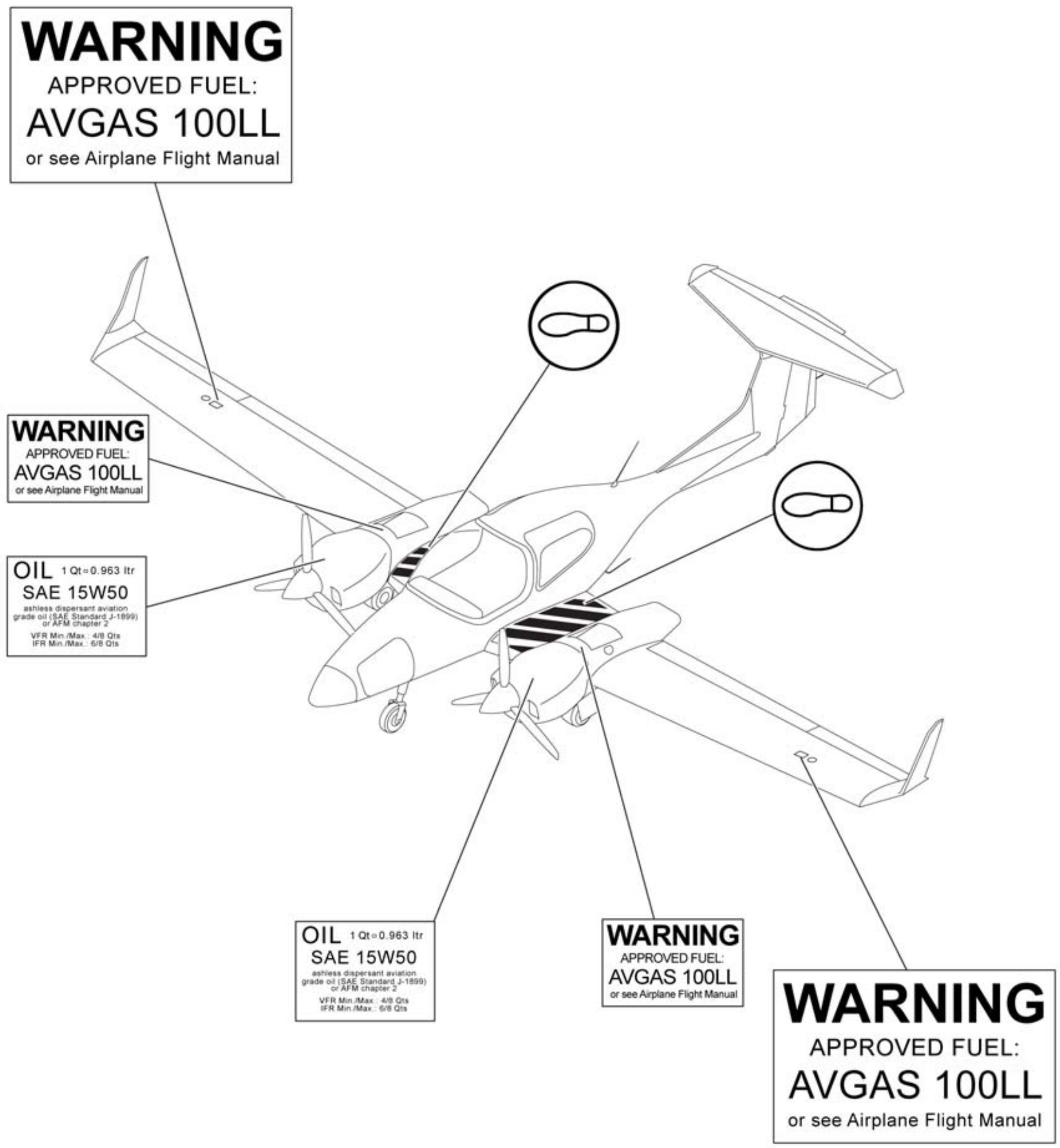

Figure 1 - Exterior Placards

INTERIOR PLACARDS AND MARKINGS

1. General

Figure 1 shows the instrument and control panel placards. Figure 2 shows the instrument panel placard panels. Figures 3 and 4 show the Cylindrical Ballast Assembly and Nose Forward Bulkhead Ballast installation placards.

2. Description

The DA42 L360 aircraft has self-adhesive placards for the cockpit interior. The instrument panel has placard panels that attach to the instrument panel with screws. The placard panels have integral lighting that is controlled by a combined ON/OFF Dimmer switch. The dimmer switch is mounted on the top left of the instrument panel. Refer to AMM # 7.02.01 Chapter 33-10 for more data about the dimmer switch and refer to Chapter 31-10 for more data about the inverter for the placard panels.

There are 8 placard panels and you can replace each of the placard panels.

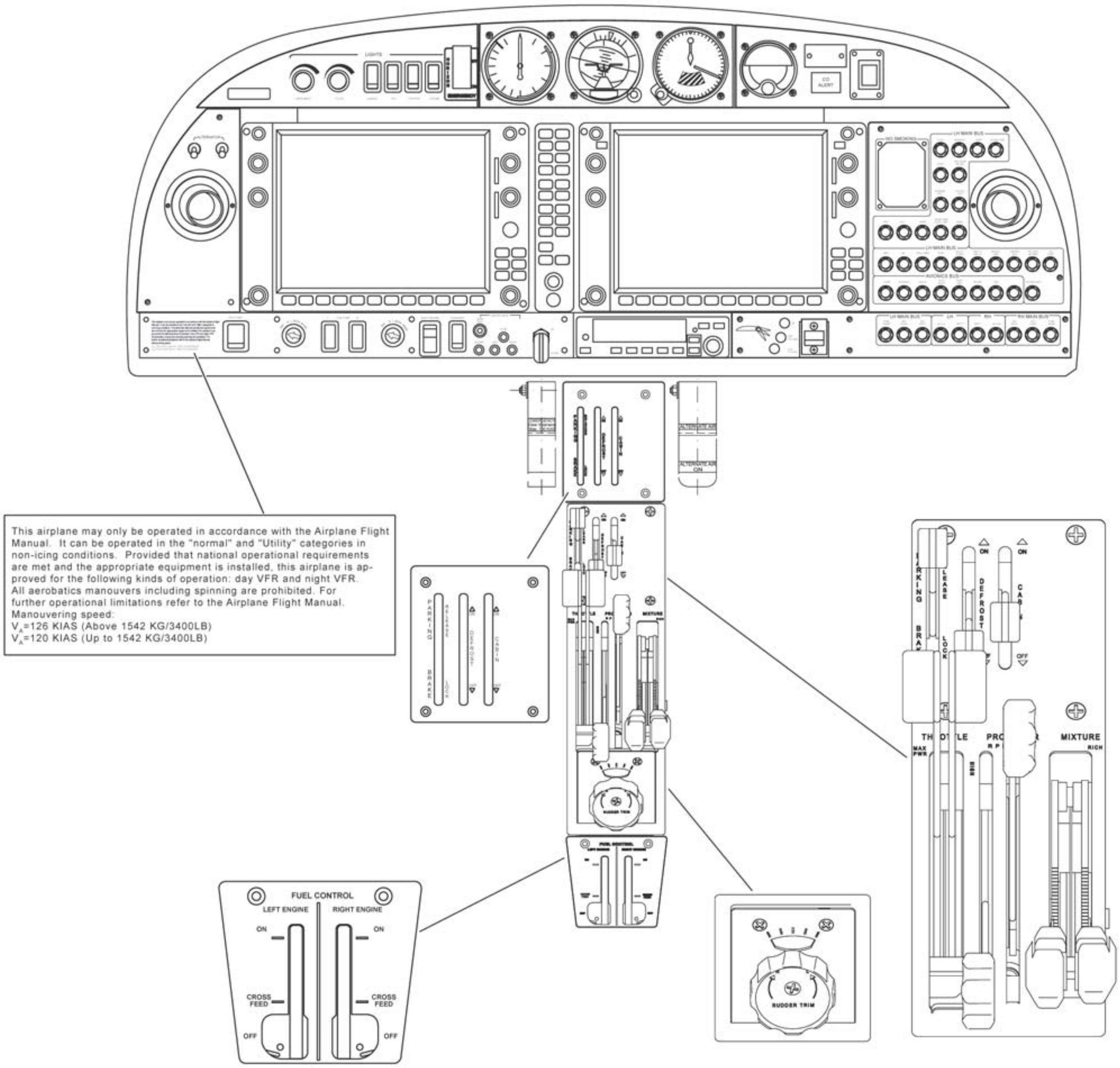

Figure 1 - Interior Placards - Instrument Control Panels

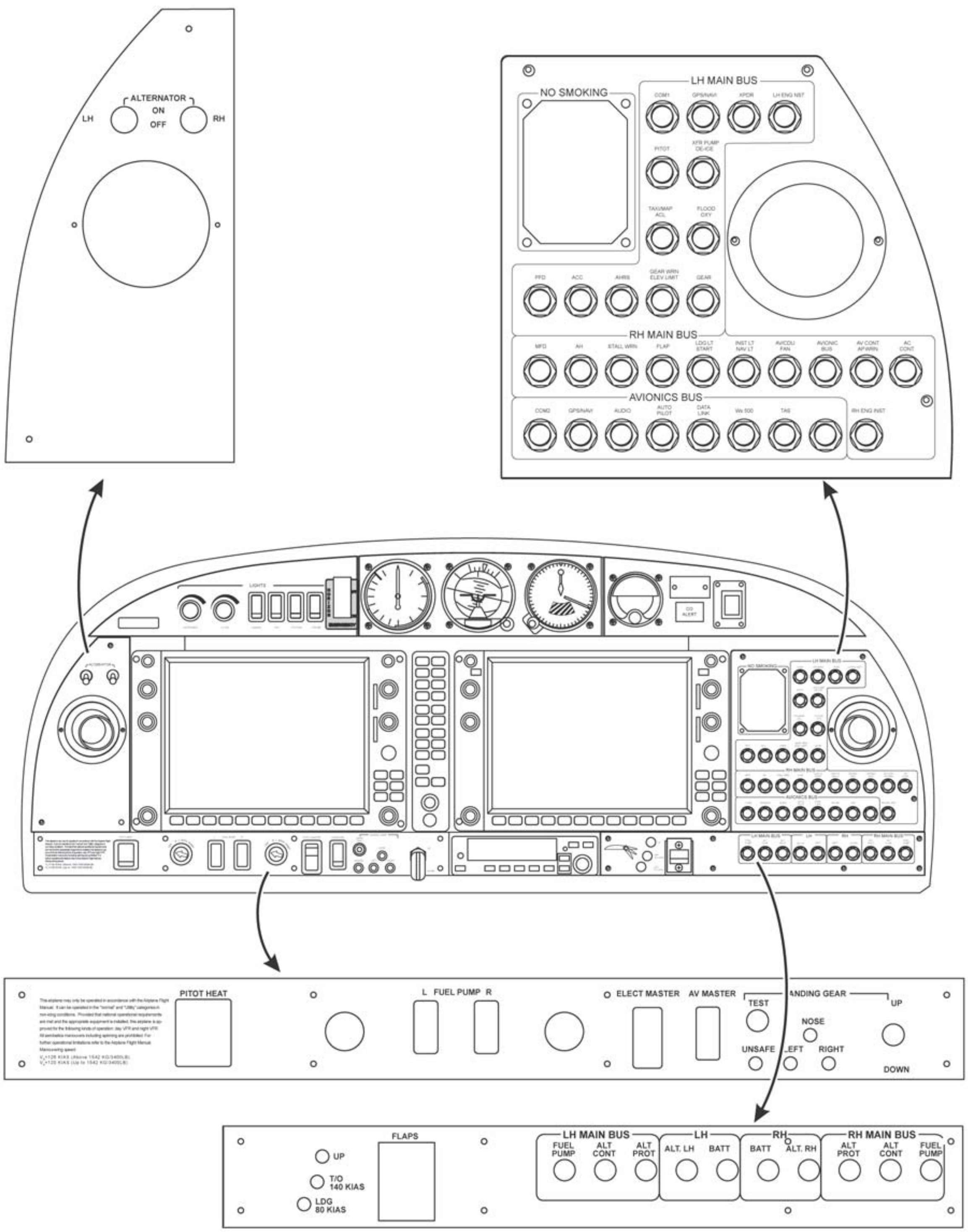

Figure 2 - Placards Panels (Sheet 1 of 2)

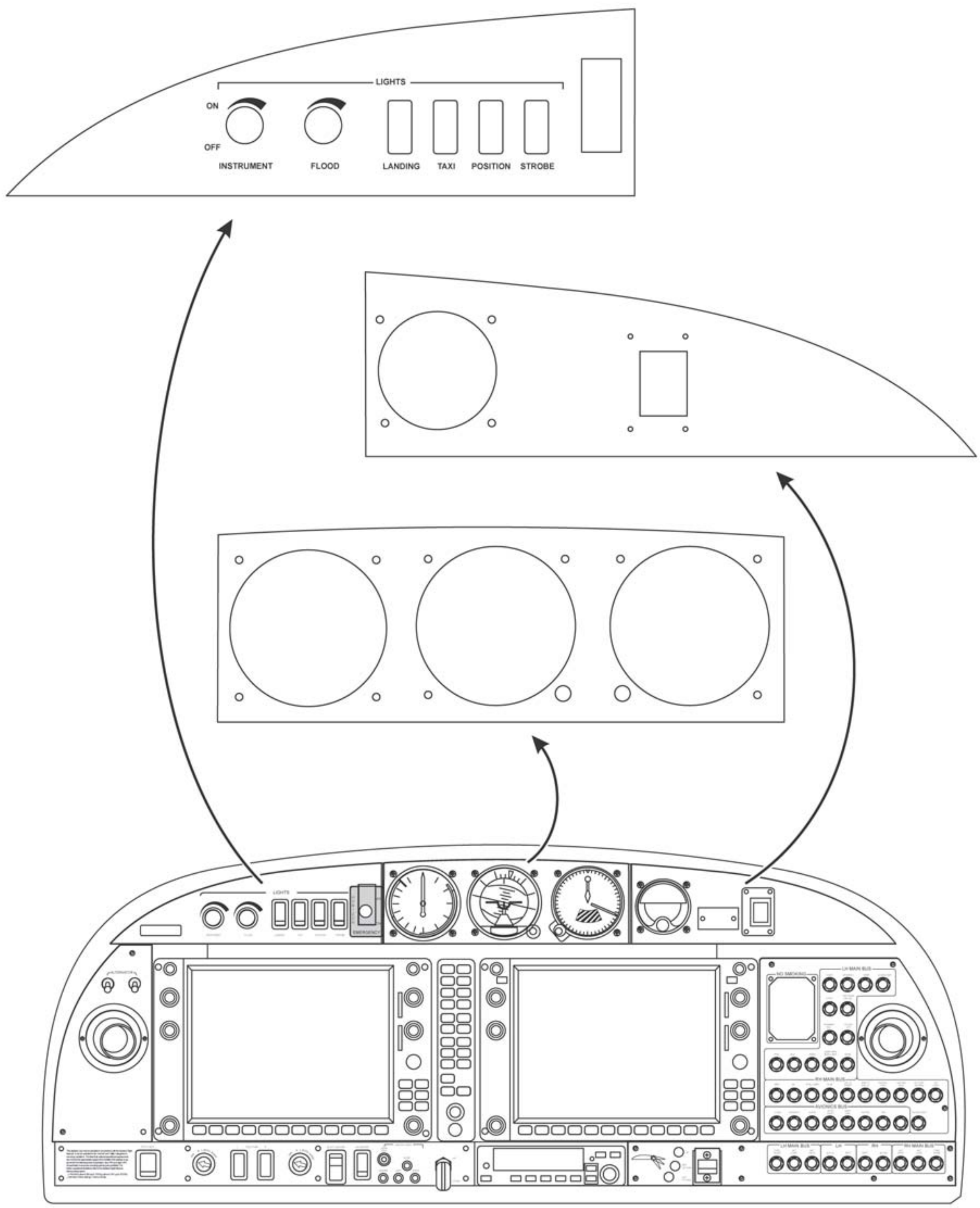

Figure 2 - Placards Panels (Sheet 2 of 2)

Ballast
Mass=5.08 kg (11.2 lbs)

Max. Ballast Mass:
6 x 5.08 kg = 30.5 kg [67.2 lb]

Figure 3 - Nose Forward Bulkhead Ballast Placards

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INTERNAL PLACARDS AND MARKINGS - MAINTENANCE PRACTICES

1. General

This chapter describes how to replace a placard panel. You can not repair a placard panel.

2. Replace a Placard Panel

Use this procedure for all of the placard panels

	Detail Steps/Work Items	Key Items/References
1.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
2.	Remove the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
3.	Disconnect the electrical cables from the placard panel that you will replace.	If necessary, at the in-line connector.
4.	Remove the placard panel:	
	- Remove the screws that attach the placard panel to the instrument panel	Make sure that you remove all of the screws.
	- Move the placard panel clear of the instrument panel	
	- Move the new placard panel into position on the instrument panel	Make sure that you route the electrical cables correctly.
	- Install the screws that attach the placard panel to the instrument panel	
	- Connect the electrical cables for the placard panel.	At the in-line connector.
5.	Install the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
6.	Connect the aircraft main battery.	Refer to Chapter 24-31.
7.	Do a test for the correct operation of the placard panel lights:	
	- Set the ELECT MASTER to ON	
	- Rotate the INSTRUMENT dimmer switch fully clockwise	The placard lights must come on.
	- Rotate the INSTRUMENT dimmer switch a small amount counter-clockwise	The placard lights must dim.
	- Rotate the INSTRUMENT dimmer switch fully counter-clockwise	The placard lights must go out.
	- Set the ELECT MASTER to OFF.	

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CHAPTER 12-00
SERVICING

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SERVICING

1. General

This chapter describes the servicing tasks that apply to the whole aircraft:

- Section 12-10 Replenishing procedure for fuel systems
- Section 12-20 Lubrication data
- Section 12-30 Cleaning and snow and ice removal.

The procedures for preventive and corrective maintenance of systems are given in the related chapter of this manual. Refer to Chapter 05 for the time limits and servicing schedules.

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REPLENISHING

1. General

Use the procedures in this section to replenish the fuel and engine oil system on the aircraft.

2. Fuel System

Three interconnected fuel tanks in each wing hold the fuel for the DA42 L360 aircraft. The aircraft can hold 26 US gallons (98.4 liters) of AVGAS 100 or 100LL in each wing main fuel tank. The tanks are located in the wing outboard of the engine nacelles, between the main spars. The aircraft can also hold 13.7 US gallons (52 liters) of AVGAS 100 or 100LL in each wing auxiliary fuel tank. The auxiliary fuel tanks are located in the rear of each engine nacelle.

NOTE: Although AVGAS 100LL is a better choice of fuel because the lower lead content reduces both the combustion chamber deposits as well as the spark plug deposits, the Lycoming (L) IO-360-M1A engine is approved by Lycoming to run on AVGAS 100 meeting ASTM D910 specifications.

Each wing main fuel tank has a filler cap located on the top surface of the wing. The filler cap connects to the outboard end of the outer fuel tanks. A fuel tank drain is located on the lower surface of each wing. The drain connects to the inboard end of the inner fuel tank.

Each wing auxiliary fuel tank has a filler cap located in the aft engine nacelle. The filler cap connects directly to the auxiliary tank. A fuel drain is located in the rear lower surface of each engine nacelle. The drain connects to the lowest point at the rear of the auxiliary fuel tank.

WARNING: DO NOT ALLOW FIRE, SPARKS OR HEAT NEAR FUEL. FUEL BURNS VIOLENTLY AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE AIRCRAFT.

WARNING: DO NOT GET FUEL ON YOUR SKIN. FUEL CAN CAUSE SKIN DISEASE.

WARNING: CONNECT THE AIRCRAFT AND THE FUEL SUPPLY VEHICLE TO ELECTRICAL GROUND BEFORE REFUELING. IF YOU DO NOT GROUND THE AIRCRAFT, STATIC ELECTRICITY CAN CAUSE FIRE DURING REFUELING.

WARNING: MAKE SURE THAT A SUITABLE FIRE EXTINGUISHER IS AVAILABLE AT ALL TIMES DURING REFUELING/DEFUELING.

WARNING: TURN OFF ALL GROUND EQUIPMENT IN THE REFUELING AREA.

WARNING: DO NOT OPERATE ELECTRICAL SWITCHES IN THE AIRCRAFT DURING REFUELING.

CAUTION: USE ONLY THE FUEL TYPES GIVEN IN CHAPTER 2 OF THE DA42 L360 AIRPLANE FLIGHT MANUAL (AFM).

A. Refueling

	Detail Steps/Work Items	Key Items/References
1.	Shut down the engines.	
2.	Ground the aircraft electrically.	At the refueling connection.
3.	Ground the refueling vehicle electrically.	
4.	Remove the related fuel filler cap for the main or auxiliary fuel tank that you will replenish.	
5.	Refuel the aircraft.	
6.	Install the related fuel filler cap.	Make sure that the filler cap is locked.
7.	Do the steps 4 through 6 for the other wing.	
8.	Remove the ground cable from the aircraft.	
9.	Remove the ground cable from the refueling vehicle.	

B. Defueling

	Detail Steps/Work Items	Key Items/References
1.	Ground the aircraft electrically.	At the refueling connection.
2.	Put a suitable container below the drain valve for the main tank or auxiliary tank that you will defuel.	Make sure that you have enough containers to hold all the fuel. Each main tank can hold approximately 100 liters fuel and each auxiliary tank 50 liters fuel.
3.	Open the drain valve.	
4.	When the fuel stops draining, close the drain valve.	Make sure that the drain valve is seated correctly.
5.	If necessary, do steps 2 through 4 for the main and auxiliary tanks in the other wing.	
6.	Remove the ground cable from the aircraft.	At the refueling ground connection.

3. Fuel Contamination Test

A. Equipment

Item	Quantity	Part Number
Glass Container	1	Commercial

B. Fuel Contamination Test Procedure

	Detail Steps/Work Items	Key Items/References
1.	Put the glass container under the drain valve that you will take the fuel from.	Test the fuel from both wings.
2.	Open the drain valve.	
3.	When the fuel container is half full, close the drain valve.	Make sure that the drain valve is seated correctly.
4.	Let the fuel in the glass container stand for 1 minute.	
5.	Examine the fuel: - It must be clear - Look specifically for small drops of water in the bottom of the glass container. - Look for small particles of solid material.	If you find any contamination you must do the test again. If you still find contamination after 3 tests, you must drain the related fuel tank. Flush the tank and fill it with clean fuel.

4. Engine Oil System

WARNING: ENGINE OPERATION WITH NO OIL (OR VERY LOW OIL LEVEL) WILL CAUSE ENGINE MALFUNCTION OR DAMAGE.

The engines installed in the DA42 L360 have a wet sump oil system. The engine oil sump can hold 8 liters (8.4 US quarts). Use only MIL-L-22851 Ashless Dispersant oil. Refer to the latest issue of Lycoming Service Instruction No. 1014 for more data about oil grades.

The oil filler is located on the right side of the engine. (Refer to Figure 1). You must open the oil filler door at the top engine cowling to have access to the oil filler. The oil filler has a dip-stick attached.

Some oil consumption is normal. Measure the oil contents before each flight (or engine ground run-up). If necessary, replenish the oil system.

A. Replenish the Oil System

	Detail Steps/Work Items	Key Items/References
1.	Open the oil filler access door at the top cowling for the engine oil system that you will replenish.	
2.	Remove the oil filler cap.	
3.	Measure the oil contents.	
	- Remove the filler cap. - Clean the oil dip stick. - Install the filler cap. - Remove the filler cap again. - Read the oil contents from the dip stick.	
CAUTION: USE ONLY THE CORRECT ENGINE OILS. REFER TO THE ENGINE MANUFACTURER'S OPERATION AND MAINTENANCE MANUAL FOR THE CORRECT OIL SPECIFICATIONS. IF YOU DO NOT USE THE CORRECT ENGINE OIL, THE ENGINE CAN BE DAMAGED.		
4.	If necessary, fill the oil system to the correct level.	Use only MIL-L-22851 Ashless Dispersant oil. Refer to Lycoming Service Instruction No. 1014.
5.	Install the filler cap.	
6.	Close the oil filler access door.	

B. Change the Engine Oil

	Detail Steps/Work Items	Key Items/References
1.	Remove the engine cowlings for the engine oil system that you will change.	Refer to Chapter 71-10.
2.	Remove the engine oil drain plug.	On the crankcase, rear right. Remove the lock-wire.
3.	Drain the engine oil with the engine warm.	Use a suitable container to catch the oil.
4.	Install the engine oil drain plug. - Tighten the drain plug.	Use a new seal washer.
	- Lock the drain plug with lock-wire.	
CAUTION: USE ONLY THE CORRECT ENGINE OILS. REFER TO THE ENGINE MANUFACTURER'S OPERATION AND MAINTENANCE MANUAL FOR THE CORRECT OIL SPECIFICATIONS. IF YOU DO NOT USE THE CORRECT ENGINE OIL, THE ENGINE CAN BE DAMAGED.		
5.	Fill the engine with new engine oil to the maximum level.	
6.	Do an engine run.	Until the oil temperature stabilizes at normal operating temperature.
6.	Check oil level and refill as necessary.	Refer to Paragraph A above.
7.	Check for leaks, specially at the drain plug.	
8.	Install the engine cowlings.	Refer to Chapter 71-10.

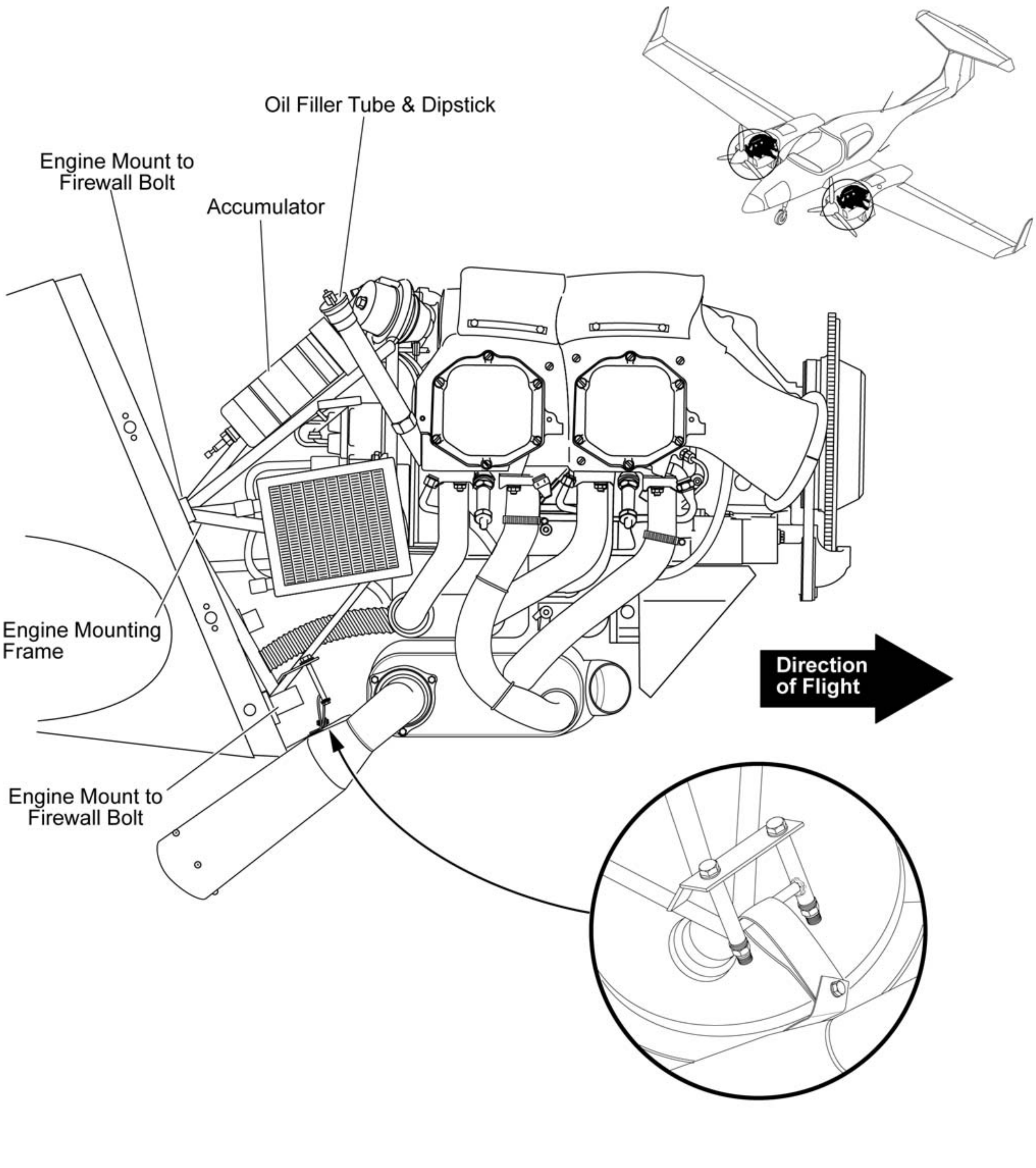

Figure 1 - DA42 L360 Engine

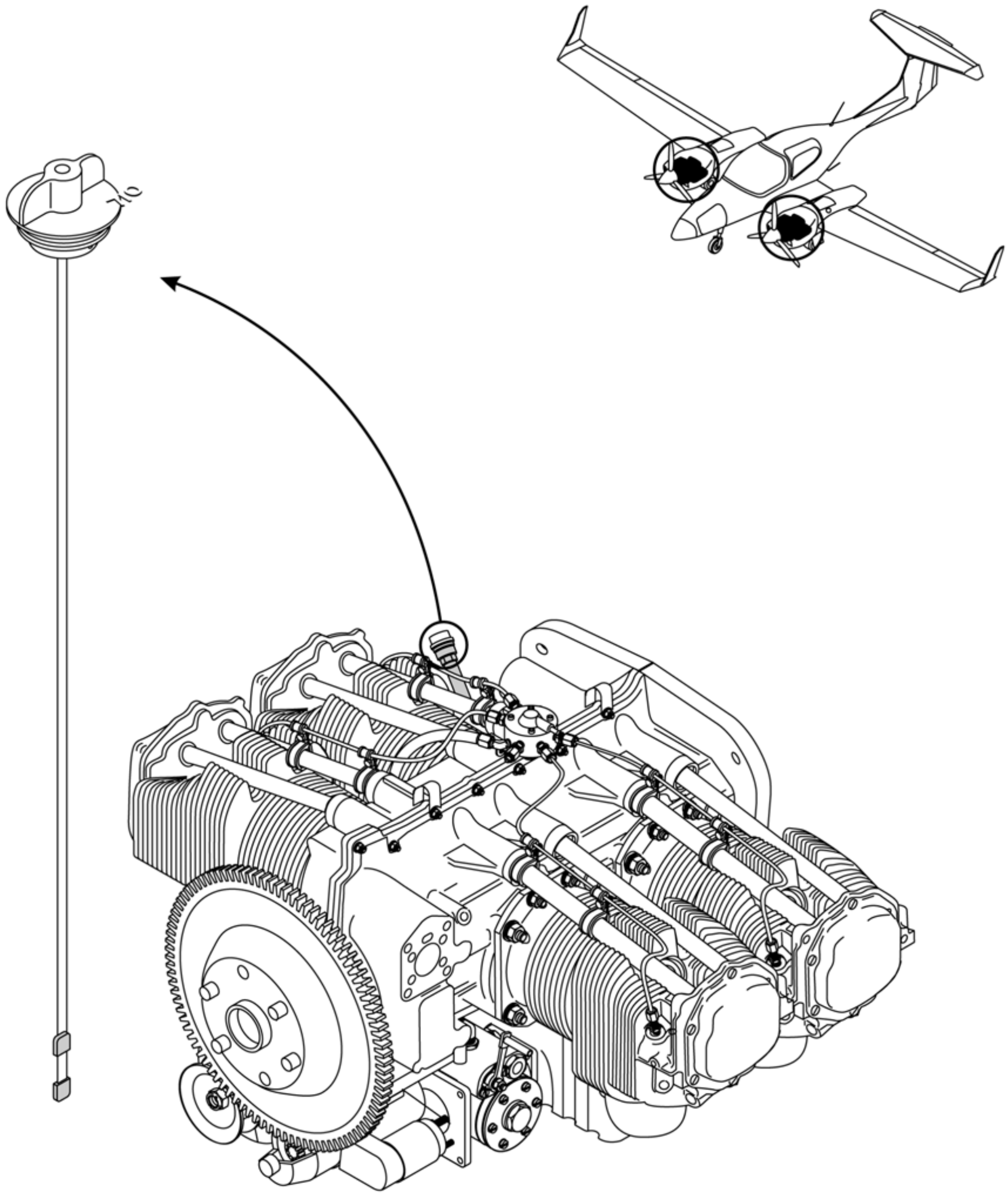

Figure 2 - Oil Dip Stick

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SCHEDULED SERVICING

1. General

This section gives the following:

- lubrication data
- where components are located
- a list of approved lubricants
- components that MUST NOT be lubricated.

Most systems and components have maintenance-free bearings. These can be sealed ball/roller bearings or Teflon bushes. These bearings MUST NOT be lubricated. Table 1 shows the bearings that MUST NOT be lubricated.

Table 1 - Items that MUST NOT be Lubricated	
Rudder pedal sled	DO NOT LUBRICATE
Flap rod-end bearings	DO NOT LUBRICATE
Aileron rod-end bearings	DO NOT LUBRICATE
Elevator rod-end bearings	DO NOT LUBRICATE
Throttle control cable	DO NOT LUBRICATE
Mixture control cable	DO NOT LUBRICATE
Propeller control cable	DO NOT LUBRICATE

2. Lubrication Schedule

Table 2 shows the lubrication schedule of the components that are modified with STC No. SA09-54 installed. Clean each lubrication point before lubrication.

The center column shows the type of lubricant. The right column shows the lubrication interval.

Table 2 - Lubrication Schedule

Location		Type of Lubricant						Interval
No.	See Figure 1 and 2	1	2	3	4	5	6	(Hours) see Notes (1), (2)
1.	Battery terminals				•			1000
2.	Mixture lock out rack	•						200
3.	Rudder trim screw jack	•						200
4.	Propeller detents (in the throttle quad)	•						200
5.	All cable ends in rudder control system	•						200
6.	Engine cable seals						•	200
7.	Nose Ballast System [Post Diamond Aircraft Service Bulletin (SB) D42L-25-01]	•						100

Notes:

(1) Lubricate at the time shown or at every disassembly/assembly.

(2) Lubricate more frequently in severe climates or operating conditions.

(3) Lubricate at the time shown and at Annual Inspection.

(4) Do not grease on the threads. It will reduce the friction of the lock-nut

(5) The wheel manufacturer lubricates the main wheel bearings with AeroShell grease 22. Type 1 grease is completely compatible for the wheel bearings.

(6) On aircraft registered in the USA, lubricate the wheel bearings at every annual/100 hour inspection (see FAR 43, Appendix D)

.

Table 3 - Lubricant Specifications		
Specification	Product	Manufacturer
TYPE 1		
MIL-G-3545	AeroShell Grease 5	Shell Oil Company
MIL-G-81322 Grade A	AeroShell Grease 22	Shell Oil Company
TYPE 4		
W-P-236 (petrolatum)	Royco 1	Royal Lubricants Co., Inc
	DC 4	Dow Corning
TYPE 6		
MIL-A-907	Loctite Antisieze 767	Loctite

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CHAPTER 20-00
STANDARD PRACTICES

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STANDARD PRACTICES - AIRFRAME

1. General

This chapter describes:

- the data about the fasteners (bolts/screws/nuts) used in the DA42 L360 aircraft and their related torque values
- the procedures used to tighten the fasteners.

NOTE: Composite structures can have a different thickness for the same component or assembly. You must always make sure that you use the correct length of fastener. The length of fastener given in the Illustrated Parts Catalogue (IPC) may NOT be correct for all components or assemblies.

2. Bolt and Nut Types Used in the Aircraft

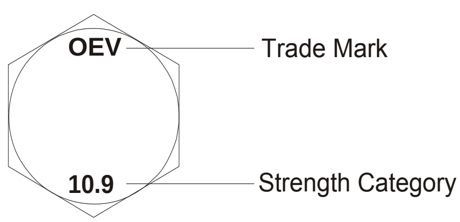
The DA42-L360 aircraft uses the following bolts:

- DIN bolts
- LN bolts
- AN bolts.

The minimum strength for the bolts is DIN specification 8.8. Letters and numbers on the head of the bolt identify the bolt type. The surface treatment also identifies the bolt.

A. DIN Bolt

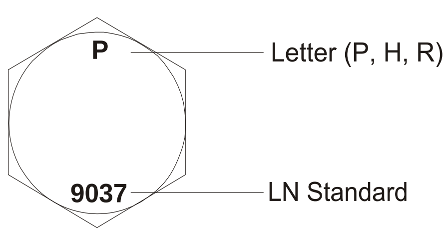
Bolt Head Identification



Surface Treatment - Galvanized

B. LN Bolts

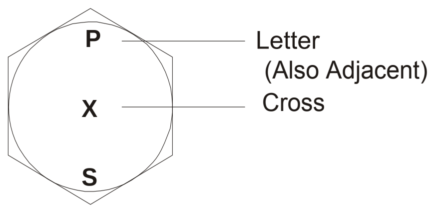
Bolt Head Identification



Surface Treatment - Galvanized and chromated yellow

C. AN Bolts

Bolt Head Identification



Surface Treatment - Galvanized or chromated yellow

The DA42 L360 aircraft uses the following types of standard nuts:

- DIN934, DIN985, AN364, AN365, MS21042, and MS21044.

3. Standard Torque Values

A. AN Fine Threads

Bolt Size	Torque (lbf-ft)	Torque (Nm)
10 - 32	1.2	1.6
1/4 - 28	4.6	6.2
5/16 - 24	10.0	13.6
3/8 - 24	15.3	20.7
7/16 - 20	27.8	37.7
1/2 - 20	40.0	54.2
9/16 - 18	66.7	90.4
5/8 - 18	91.7	124.3

B. AN Coarse Thread Series

Bolt Size	Torque (lbf-ft)	Torque (Nm)
10 - 24	1.2	1.6
1/4 - 20	4.2	5.7
5/16 - 18	7.5	10.2
3/8 - 16	15.4	20.9
7/16 - 14	21.3	28.9
1/2 - 13	40.0	54.2
9/16 - 12	58.3	79.0
5/8 - 11	75.0	101.6

C. DIN and LN Specifications

Metric Thread	Torque (lbf-ft)	Torque (Nm)
M4	1.3	1.8
M5	2.7	3.6
M6	4.7	6.4
M8	11.8	16.0
M10	23.6	32.0
M12	44.3	60.0

4. Special Torque Values

Part	Torque (lbf-ft)	Torque (Nm)
Propeller to engine nut	63 - 66	85.5 - 89.6
Engine mount to the firewall	29.5	40.0
Engine shock mount	41.0	55.0
Spark plugs	34.6	47.0

5. Torque Measurement

For self-locking nuts, add the torque value of the locking device (friction or brake torque) to the value in the table. Read the friction value from the torque wrench before the nut seats.

Where a bolt is tightened from the bolt-head, add the value of the shaft friction (the friction of the bolt in the attached part) to the value in the table. Read the fiction value from the torque wrench before the bolt seats.

STANDARD PRACTICES - ENGINES

1. General

This chapter describes:

- the data about the fasteners used on the Lycoming IO-360 M1A/LIO-360 M1A engines installed in the DA42 L360 aircraft and their related torque values
- the procedures used to tighten the fasteners.

2. Torque Values

Use the torque values given in Tables 1 through 4 for standard fasteners on the engine and use the torque values given in Table 5 for the components listed.

Table 1 - Standard Torque Values for Engine Bolts and Nuts

Inch Thread	Torque (lbf-ft)	Torque (Nm)
5/16	17	23
3/8	30	41
7/16	50	68
1/2	75	102
9/16	110	149
5/8	150	203
3/4	270	366

Table 2 - Standard Torque Values for Engine Pipe Plugs

Taper Thread	Torque (lbf-ft)	Torque (Nm)
1/16 - 27 NPT	3.3	4.5
1/8 - 27 NPT	3.3	4.5
1/4 - 18 NPT	7.0	9.5
3/8 - 18 NPT	9.0	12.3
1/2 - 14 NPT	13.3	18.0
3/4 - 14 NPT	19.0	26.0

Table 3 - Standard Torque Values for Engine Crush-Type Asbestos Gaskets

Thread Pitch	Angle of Turn (in degrees)	
Threads per Inch	Aluminum Asbestos	Copper Asbestos
8	135	67
10	135	67
12	180	90
14	180	90
16	270	135
18	270	135
20	270	135
24	360	180
28	360	180

NOTE: Install all crush type gaskets (except the self-centering type) with the continuous surface against the flange of the plug or against the part which you will tighten against the gasket. Turn the part until the surfaces which you must seal, touch the gasket. Then tighten to the angle of turn shown for the thread size as given in Table 3.

Table 4 - Standard Torque Values for Engine Flexible Hose (or Tube) Connections

Tube Size	Thread	Torque (lbf-ft)	Torque (Nm)
(-4) 1/4	7/16 - 20	7 - 11	11 - 16
(-6) 3/8	9/16 - 18	11 - 16	17 - 22
(-10) 5/8	7/8 - 14	30 - 36	41 - 48

Table 5 - Special Torque Values for the Engine

Item	Thread	Torque (lbf-ft)	Torque (Nm)
Engine Oil Filter	-	18.5	25
Spark Plugs	-	35.0	47.0
Ignition Wires at Spark Plugs	Finger tight then 1/16 to 1/8 of a turn with a wrench		
Oil Pressure sensor pipe to engine	3/8 NPT	9.2	13.6
Rocker cover screws	-	4.2	5.6

3. Special Torque Procedures

CAUTION: YOU MUST ADD THE SAFETY TORQUE (OR THE FRICTION TORQUE) TO THE FOLLOWING VALUES FOR SELF-LOCKING NUTS (OR BOLTS WITH SHAFT FRICTION).

When you use self-locking nuts, add the safety torque (friction torque or braking torque) to the table values. Set this value on the dial of the torque meter before you tighten the nut.

If a bolt has an additional torque due to shaft friction, add this torque value to the table value. Set this calculated value on the dial of the torque meter before you tighten the bolt.

Lubricate threads unless shown differently.

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CHAPTER 24-00
ELECTRICAL POWER

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ELECTRICAL POWER - DESCRIPTION AND OPERATION

1. General

The DA42 L360 aircraft has a 28 volts direct current (DC) electrical system. This chapter describes the complete system from the power supplies to the circuit-breakers or other interface with the consumer components.

The system has two integral sources of electrical power and a socket for connecting to an external power source. It has a 28 volts alternator in each engine bay and a 24 volts battery. In normal operation, the alternators supply power for the electrical power system. The alternator attaches to the front of the engine. A flexible belt turns the alternator. The alternator supplies power to the aircraft. The power supplied by the alternator is controlled by the voltage regulator. All the electrical engine wires are routed from the aircraft cabin into the center wing box to the nacelles. Penetration holes through the engine firewall are provided for the electrical wiring into the engine compartment. The electrical wires have been routed and protected to minimize the probability of contact with flammable fluids or vapors.

This chapter has only simplified schematic diagrams and location diagrams. Refer to AMM # 7.02.01 Chapter 92-00 and Chapter 92-00 in this manual for the wiring diagrams. Refer to the related chapter for data about systems. For example, refer to Chapter 80-00 for data about the starter system.

For Trouble-Shooting and Maintenance Practices for this electrical system, refer to the following chapters:

- Chapter 24-30 Electrical Power Generation
- Chapter 24-31 Battery Installation

NOTE: Equipment which is certified for installation in the DA42 L360 aircraft is listed in Chapter 6.5 of the Airplane Flight Manual (AFM). Such equipment may be installed in accordance with the AMM.

NOTE: Any equipment which is not listed in Chapter 6.5 of the AFM is called "Additional Equipment". The installation of additional equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin (SB).

2. Electrical System Description and Operation

A. Power Supplies

(1) Main Battery

The main battery is located in the front baggage compartment and is mounted on the forward side of the cockpit front bulkhead. It is a 24V, 10 AH sealed battery. The battery is connected to the main aircraft ground, the battery relay and the battery HOT BUS.

(2) Alternators

Each engine has an alternator located at the front of the engine, on the right side. A flat multi-vee belt with a manual tensioner turns the alternator. The alternators have voltage regulators. The output from the alternators connects to the left and right main bus, through terminal blocks, relays and fuses.

(3) Voltage Regulators

The DA42 L360 aircraft is fitted with Kelly Aerospace Voltage Regulators (VR-2000 model). These multiple function, high frequency regulators provide over-voltage protection, ground fault protection, low buss warning, alternator out indication, and LED diagnostics. These voltage regulators are capable of precise saturation paralleling.

(4) External Power Connector

The external power connector is located below the forward baggage compartment. The external power connector connects to the external power relay in the relay junction box in the forward baggage compartment.

- The control pin connects to the relay coil through a diode to prevent reverse connection.

- The + pin connects to the relay main input connection.

- The - pin connects to ground.

B. Power Supply Control

(1) Battery Relay

The battery relay is located on the relay panel in the front baggage compartment. The output from the battery connects directly relay box bus bar. The coil + of the battery relay is tied to the battery + connection to the relay. The ELECT MASTER switch provides the coil ground when set to the ON position.

(2) External Power Relay

The external power relay is located on the relay panel in the front baggage compartment. The relay output connects directly to the relay box bus bar.

If a 28V external power is connected, the +28VDC on the control pin energizes the relay. The relay operates and connects the external power to the relay box bus bar.

(3) Starter Relays

Each engine has a starter relay located in the front baggage compartment. The starter relays connect to the relay box bus bar. Power is applied to the coil of the left engine starter relay when the LH START switch is set to START LEFT. The energized coil operates the left engine starter relay which connects the power to the solenoid of the left engine starter motor. The right engine starter system is similar.

(4) Bus Structure

All buses (except the relay box bus) are flat metal strips connecting rows of circuit breakers. The circuit breakers are located on the tight side of the instrument panel.

(5) Relay Box Bus

The relay box bus is located in the front luggage compartment, next to the main battery. The bus is a metal strip which connects the following relays:

- The battery relay
- The external power relay
- LH Alternator
- RH Alternator

The relay box bus has the following fuses:

- Battery fuse
- LH Starter relay
- RH Starter relay
- Battery relay
- Map light
- ELT power supply.

(6) Hot Bus

The hot bus is located forward of the instrument panel and is protected by a 5 Amp fuse. The HOT BUS is connected to the main battery relay input connection. The HOT BUS supplies power for the PILOT MAP LIGHT.

(7) LH Main Bus

The LH main bus is connected to the relay box bus through a 90 Amp circuit-breaker. The LH main bus supplies power for the consumers. Each consumer or bus is protected by circuit-breakers or fuses. The LH main bus connects to the LH alternator output through a 70 Amp circuit-breaker and a relay.

(8) RH Main Bus

The RH main bus is connected to the relay box bus through a 90 Amp circuit-breaker. The RH main bus supplies power for the consumers and the AVIONICS BUS. Each consumer or bus is protected by circuit-breakers or fuses. The RH main bus connects to the RH alternator output through a 70 Amp circuit-breaker and a relay.

(9) Avionics Bus

The Avionics bus supplies power to avionic consumers through circuit-breakers and fuses. The power to the AVIONICS BUS is supplied by the RH MAIN BUS and is controlled by the Avionics Master Relay and Avionics Master Switch.

(10) Avionics Master Control System

The AVIONICS MASTER SWITCH and the AVIONICS MASTER RELAY make the main components of the avionics master control system.

In normal operation the AVIONICS MASTER SWITCH is set to the OFF position. In the OFF position the power is supplied to the coil of the avionics master relay and the avionics master relay operates.

(11) Avionics Master Relay

The avionics master relay connects the AVIONICS BUS to the RH Main Bus. The avionics master switch controls the AVIONICS MASTER RELAY.

(12) Elect Master Switch

The ELECT MASTER switch is located on the bottom of the instrument panel, left side. It is a rocker switch that has 3 sets of contacts. When the switch is set to ON the contacts operate as follows:

- The coil of the battery relay is connected to ground and the battery relay operates.
- The LH main bus is connected to the ALT LH switch through the ALT Control circuit-breaker.
- The RH main bus is connected to the ALT RH switch through the ALT Control circuit-breaker.

(13) Starter Switches

The LH and RH engine START switches are each operated with a key. The switch can be turned to OFF, L, R, BOTH, or START. The key must be held against a spring to maintain the START position. When the key is turned to the following positions these events occur in the related engine start system:

OFF:	Both magnetos are connected to the ground.
R:	The right magneto is LIVE and the left magneto is grounded.
L:	The left magneto is LIVE and the right magneto is grounded.
BOTH:	Both magnetos are LIVE.
START:	Both magnetos are LIVE and power is supplied to the Slick Start control unit. Power is supplied to the related engine start relay coil and the start relay energized. Power is supplied to the related engine starter motor.

(14) Alternator LH and Alternator RH Switches

Each engine alternator relay has a control switch. The control switches are labeled ALT LH and ALT RH. When the ELECT MASTER switch is set to ON, setting the ALT LH or ALT RH switch to ON supplies power to the related alternator regulator control connection. Setting both the ALT LH and ALT RH to ON will connect the PARALLELING system of both alternator regulators. This enables the load sharing control system of the alternator regulators to control the outputs of the alternators.

Current sensing circuits monitor the current flowing in the alternator outputs. The current sensing circuit is located in the rear of the engine nacelle and monitors the current flow between the alternators and their related main buses.

Each alternator has a related voltage regulator which is located on the engine mount frame. The regulator controls the output from its related alternator. When both engines are running and both alternators are set to ON, the LH and RH regulators are connected by a paralleling circuit. Their paralleling circuit controls the output from each alternator to maintain an equal electrical load on each alternator.

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DC GENERATION

1. General

The DC Generation system for the DA42 L360 aircraft has the following components:

- Alternators LH and RH
- Alternator switches LH and RH
- Electrical master switch
- Voltage regulators.

This chapter describes only the simplified description, troubleshooting and maintenance practices for the DC generating systems for the DA42 L360 aircraft. Refer to Chapter 24-00 for a general description of complete electrical system.

2. Description and Operation

Figure 1 shows the generation system simplified schematic diagram.

A. Alternators

Each engine has an alternator located at the front of the engine, on the right side. A flat multi-vee belt with a manual tensioner turns the alternator. The alternator has a regulator. The output from the alternators connects to the left and right main bus, through terminal blocks, relays and fuses. There is no approved maintenance that you can do to the alternator. Repair or overhaul instructions are not provided by Diamond Aircraft.

B. Alternator Switches

Each engine alternator relay has a control switch. The control switches are labeled ALT LH and ALT RH. When the ELECT MASTER switch is set to ON and setting the ALT LH or ALT RH switch to ON supplies power to the related alternator regulator control connection. Setting both the ALT LH and ALT RH to ON will connect the PARALLELING system of both alternator regulators. This enables the load sharing control system of the alternator regulators to control the outputs of the alternators.

C. Alternator Current Sensors

Current sensing circuits monitor the current flowing in the alternator outputs. The current sensing circuit is located in the rear of the engine nacelles and monitors the current flow between the alternators and their related main buses.

D. Voltage Regulators

Each alternator has a related voltage regulator which is located on the engine mounting frame. The regulator controls the output from its related alternator. When both engines are running and both alternator switches set to ON, the LH and RH regulators are connected by a paralleling circuit. This paralleling circuit controls the output from each alternator to maintain an equal electrical load on each alternator. There is no approved maintenance that you can do to the voltage regulators. Repair or overhaul instructions are not provided by Diamond Aircraft.

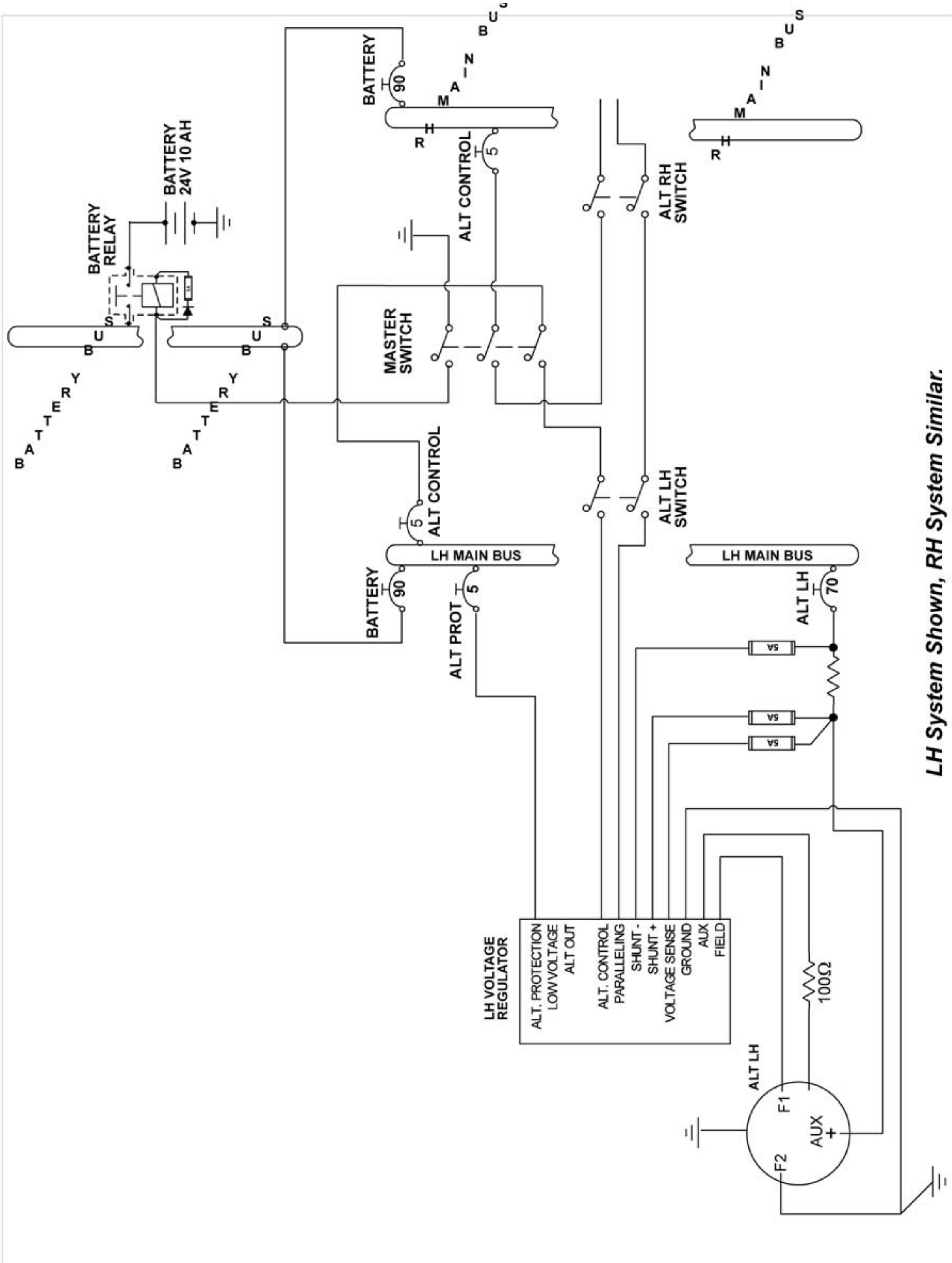

Figure 1 - DC Generation Schematic Diagram

DC GENERATION - TROUBLESHOOTING

1. General

This table explains how to troubleshoot the DC generation system. If you find the trouble in column 1, do the repair given in column 3.

TROUBLE	POSSIBLE CAUSE	REPAIR
Alternator warning light (ALT or ALTERNATOR) shows in the annunciator panel and the voltage/load meters in the engine integrated display flash with the engine running.	Alternator control circuit-beaker not set.	Set the alternator control circuit-breaker.
	Alternator circuit-beaker not set.	Set the alternator circuit-breaker.
	Alternator flexible drive belt loose/broken.	Adjust/replace the flexible drive belt. Refer to the maintenance practices in this chapter.
	Voltage regulator defective.	Test/replace the voltage regulator. Refer to AMM # 7.02.01 Chapter 92 for the wiring diagrams.
	Alternator defective.	Test/replace the voltage regulator. Refer to AMM # 7.02.01 Chapter 92 for the wiring diagrams.

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DC GENERATION - MAINTENANCE PRACTICES

1. General

This chapter describes how to replace components of the 28V DC electrical generation system on the aircraft. Refer to the components manufacturers' manuals for more data and for shop data.

2. Electrical Safety

The DA42 L360 aircraft has a low voltage DC electrical system. When correctly maintained it is safe to do work on. The battery can supply heavy current through low resistance circuits (for example, if you ground the battery positive with a wrench by accident).

Always follow the usual safety practices for working on electrical equipment. Allow only qualified persons to maintain the electrical system.

CAUTION: DISCONNECT THE BATTERY BEFORE YOU DO ANY WORK ON THE ELECTRICAL SYSTEM. MAKE SURE THAT YOU DISCONNECT THE NEGATIVE LEAD FIRST.

CAUTION: AFTER DOING ELECTRICAL MAINTENANCE, ALWAYS DO A CONFIDENCE TEST OF THE SYSTEM WITH A 24 VOLT POWER SUPPLY THAT HAS OVER-CURRENT PROTECTION. DO THIS BEFORE CONNECTING THE BATTERY.

CAUTION: USE ONLY DA42 L360 AIRCRAFT SPARE PARTS APPROVED BY THE MANUFACTURER.

3. Adjust an Alternator Drive Belt Tension

	Detail Steps/Work Items	Key Items/References
1.	Remove the engine cowlings.	Refer to Chapter 71-10.
2.	Disconnect the battery. Make sure that you disconnect the negative terminal first.	Refer to Chapter 24-31.
3.	Loosen the main mounting bolts: - Remove the cotter pins from the nuts. - Loosen the mounting bolts.	Refer to Figure 201.
4.	Loosen the adjusting bolt: - Cut the lock-wire. - Loosen the bolt.	
5.	Loosen the adjusting bracket attachment bolt: - Cut the lock-wire. - Loosen the bolt.	

	Detail Steps/Work Items	Key Items/References
6.	Move the alternator towards the engine and lift the flexible belt clear of the alternator pulley.	
7.	Examine the flexible belt. Look specially for: - Wear or damage to the belt. - Stretching of the belt.	
8.	Install the flexible belt: - Move the alternator up and towards the engine. - Put the flexible drive belt into position over the alternator pulley and the drive pulley. - Move the alternator down and away from the engine until the flexible belt tension is correct. - Then tighten the adjusting bolt and the adjusting bracket attachment bolt. - Lock the bolt heads to the adjusting bracket with lock-wire.	Make sure that the flexible belt is correctly seated in the Vee groove. Belt movement = 0.2 in (5 mm) with 6.5 lbs (3 kg) load applied.
9.	Tighten the 2 alternator mounting bolts and install the cotter pins.	
10.	Connect the battery. Make sure that you connect the positive lead first.	Refer to Chapter 24-31.
11.	Install the engine cowlings.	Refer to Chapter 71-10.
12.	Do the functional test of the alternator.	Refer to Paragraph 6.

4. Remove/Install an Alternator

Use the following procedures for both left and right alternators.

A. Remove an Alternator

	Detail Steps/Work Items	Key Items/References
1.	Remove the engine cowlings.	Refer to Chapter 71-10.
2.	Disconnect the battery. Make sure that you disconnect the negative terminal first.	Refer to Chapter 24-31.
3.	Disconnect the electrical connections at the alternator.	
4.	Loosen the alternator main mounting bolts: - Remove the cotter pins from the nuts. - Loosen the nuts on the mounting bolts.	
5.	Remove the adjusting bolt: - Cut the lock-wire. - Remove the bolt and the washer.	
6.	Loosen the adjusting bracket attachment bolt: - Cut the lock-wire. - Loosen the bolt.	
7.	Remove the flexible drive belt: - Move the alternator up towards the engine. - Lift the flexible drive belt clear of the alternator pulley.	
8.	Remove the alternator: - Remove the nuts from the two attachment bolts. - Remove the washers. - Remove the two bolts, the washers and the spacers that attach the alternator to the mounting bracket. - Move the alternator clear of the engine.	Hold the alternator.

B. Install an Alternator

	Detail Steps/Work Items	Key Items/References
1.	Move the alternator into position at the alternator mounting bracket and install the mounting bolts:	Refer to Figure 201.
	- Install the washer onto the front mounting bolt.	
	- Put the bolt through the link plate, alternator mounting bracket and the alternator.	From the front.
	- Install the washer on the rear mounting bolt.	
	- Put the bolt through the alternator, spacers and mounting bracket.	From the rear.
	- Install washers on the bolts.	
	- Install the nuts on the bolts and tighten the nuts.	
2.	Install the washer on the adjusting bolt and install the adjusting bolt through the adjusting bracket and into the alternator. Do NOT tighten the adjusting bolt.	
CAUTION:	DO NOT MAKE THE FLEXIBLE BELT TOO TIGHT. TOO MUCH TENSION ON THE BELT CAN DAMAGE THE BEARINGS IN THE ALTERNATOR AND CAUSE THE ALTERNATOR TO FAIL.	
3.	Install the flexible drive belt:	
	- Move the alternator up towards the engine and move the flexible drive belt into position over the alternator drive pulley.	Make sure that flexible belt is seated correctly in the Vee groove of the pulley.
	- Move the alternator down away from the engine until the tension in the flexible drive belt is correct.	Belt movement = 0.2 in (5 mm) with 6.5 lbs (3 kg) load applied.
	- Tighten the alternator adjusting bolt and secure with lock-wire.	
	- Tighten the alternator adjusting bracket bolt and secure with lock-wire.	

	Detail Steps/Work Items	Key Items/References
4.	Tighten the 2 alternator mounting bolts and install the cotter pins.	
5.	Connect the electrical cables to the alternator.	Refer to AMM # 7.02.01 Chapter 92-00 for the wiring diagrams.
6.	Connect the aircraft main battery. Make sure that you connect the positive lead first.	
7.	Install the engine cowlings.	Refer to Chapter 71-10
8.	Do the functional test of the alternator.	Refer to Paragraph 6.

5. Remove/Install a Voltage Regulator

Use these procedures for both left and right alternators.

A. Remove a Voltage Regulator

	Detail Steps/Work Items	Key Items/References
1.	Set the ELECT MASTER switch to OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the battery. Make sure that you disconnect the negative terminal first.	Refer to Chapter 24-31.
4.	Disconnect the electrical connections to the voltage regulator.	At the in-line connector.
5.	Remove the voltage regulator: - Remove the four nuts and the washers that attach the voltage regulator to the mounting bracket. - Move the voltage regulator clear of the engine.	Hold the voltage regulator.

B. Install a Voltage Regulator

	Detail Steps/Work Items	Key Items/References
1.	Install the voltage regulator: - Move the voltage regulator into position at the mounting bracket. - Install the four washers and the nuts that attach the voltage regulator to the mounting bracket.	
2.	Connect the electrical connections to the voltage regulator.	At the in-line connector.
3.	Connect the aircraft main battery. Make sure that you connect the positive lead first.	Refer to Chapter 24-31.
4.	Install the engine cowlings.	Refer to Chapter 71-10.
5.	Do the functional test of the alternator.	Refer to Paragraph 6.

6. Test an Alternator

Use these procedures for both left and right alternators.

	Detail Steps/Work Items	Key Items/References
1.	Set the ELECT MASTER switch to ON.	The ALT OFF warning caption on the integrated cockpit system (ICS) must show for the related alternator.
2.	Start the related engine.	Refer to DA42 L360 Airplane Flight Manual (AFM).
3.	Set the engine speed to 1720 RPM. Wait for the battery to charge and the electrical load meter has stabilized.	Monitor the ICS. The voltage must be 28 volts ±2.5%
4.	Set all the electrical loads to ON.	The voltage must remain at 28 volts ±2.5% and the load meter must indicate the increased load.
5.	Operate intermittent loads throughout this part of the test, for example, flaps, Pitot heat.	The voltage must remain at 28 volts ±2.5% and the load meter must indicate the increased load.
6.	Start the other engine.	Refer to DA42 L360 AFM.

	Detail Steps/Work Items	Key Items/References
7.	Repeat steps 3 through 5.	The voltage must remain at 28 volts ±2.5% for both alternators and the load must be shared equally between both alternators.
8.	Set all the electrical loads selected in steps 4 and 5 to OFF and shut down both engines.	Refer to the DA42 L360 AFM. Both ALT OFF warning captions must come on.
9.	Set the ELECT MASTER switch to OFF.	

7. Voltage Regulator (VR2000) Shunt paralleling Paralleling Procedure

Do the shunt paralleling procedure for VR2000 voltage regulators as follows:

	Detail Steps/Work Items	Key Items/References
1.	At either connector P2411 LH Voltage Regulator or P2412 RH Voltage Regulator, disconnect the paralleling circuit at pin 5.	
2.	Connect a voltmeter across the load bus to read the voltage generated as each alternator is brought on line.	Make sure that each alternator is connected to individual load meters to read the current.
3.	With the batteries and only essential loads switched on, start the engines.	Refer to DA42 L360 AFM.
4.	Turn on the alternator control switch for the left engine.	
5.	Bring the left engine up to approximately 1700 RPM.	
NOTE: Prior to initial voltage regulator adjustment, make sure that the engines have been brought to normal operating temperatures.		
6.	Adjust the voltage on the operating system to 28.5 volts.	
7.	Repeat steps 4 through 6 for the right engine and the right bus with the same load and engine speed.	
8.	Shut down the engines.	Refer to DA42 L360 AFM.
9.	Reconnect the paralleling circuit (pin 5) when the voltage adjustments are completed.	

	Detail Steps/Work Items	Key Items/References
	NOTE: Prior to carrying out the LH and RH load comparison, if removed, install the engine cowlings and bring the engines to normal operating temperatures.	
10.	With both engines running at approximately 1700 rpm, compare loads with both alternator control systems active.	The maximum load difference between bus bars should be approximately 10% of the alternator ratings.
	NOTE: The load difference may be brought closer together by adjusting the heavier loaded regulator bus lower or the lighter loaded regulator bus higher or both. Do not adjust either regulator more then ± 1 volt.	
11.	Test the system further by turning on the heaviest loads available and varying the engine speeds, in tandem and separately.	Both systems should remain in balance (9 to 10 amps) throughout the speed and load range of the alternators.

8. Removal/Installation of EMI Filter

A. Remove the EMI Filter

	Detail Steps/Work Items	Key Items/References
1.	Remove the engine cowlings.	Refer to Chapter 71-10.
2.	Disconnect the battery.	Refer to Chapter 24-31. Make sure that you disconnect the negative terminal first.
3.	Remove the alternator cable and the EMI filter pigtail from the alternator post.	Refer to Figure 204.
4.	Remove the lockwire from the EMI filter.	
5.	Remove the bolt and the EMI filter from the alternator flange.	Refer to Figure 203.

B. Install the EMI Filter

	Detail Steps/Work Items	Key Items/References
1.	Remove the engine cowlings.	Refer to Chapter 71-10.
2.	Disconnect the battery.	Refer to Chapter 24-31. Make sure that you disconnect the negative terminal first.

	Detail Steps/Work Items	Key Items/References
3.	Disconnect the alternator cable at the alternator.	
4.	Remove the alternator ground bolt.	Refer to Figure 202. clean area with isopropyl alcohol for grounding connection.
5.	Apply spiral wrap to ADF filter pigtail.	
6.	Install the EMI filter onto the alternator flange.	Refer to Figure 203.
7.	Install the lockwire after EMI filter is installed.	Apply Nycote 7-11 or equivalent.
8.	Install the alternator cable and the EMI filter pigtail wire onto the alternator post.	Refer to Figure 204.
9.	Remove all tools, equipment, and unwanted materials from the work area and inspect LH and RH engine as required.	
10.	Connect the aircraft battery.	Refer to Chapter 24-31.
11.	Install the engine cowlings.	Refer to Chapter 71-10
12.	Do the functional test of generating system as follows:	
	- Switch ELECT MASTER to ON position	
	- Run LH and RH engines	Refer to DA42 L360 AFM.
	- Make sure that the aircraft voltage on MFD's System Display page is approximately 28.0 Vdc.	Refer to Figure 213.
	- Make sure that the 'L VOLTS LOW' or 'R VOLTS LOW' amber annunciation does not appear on the PFD	
	- Shut down LH and RH engines	Refer to DA42 L360 AFM.
	- Switch ELECT MASTER to OFF position	

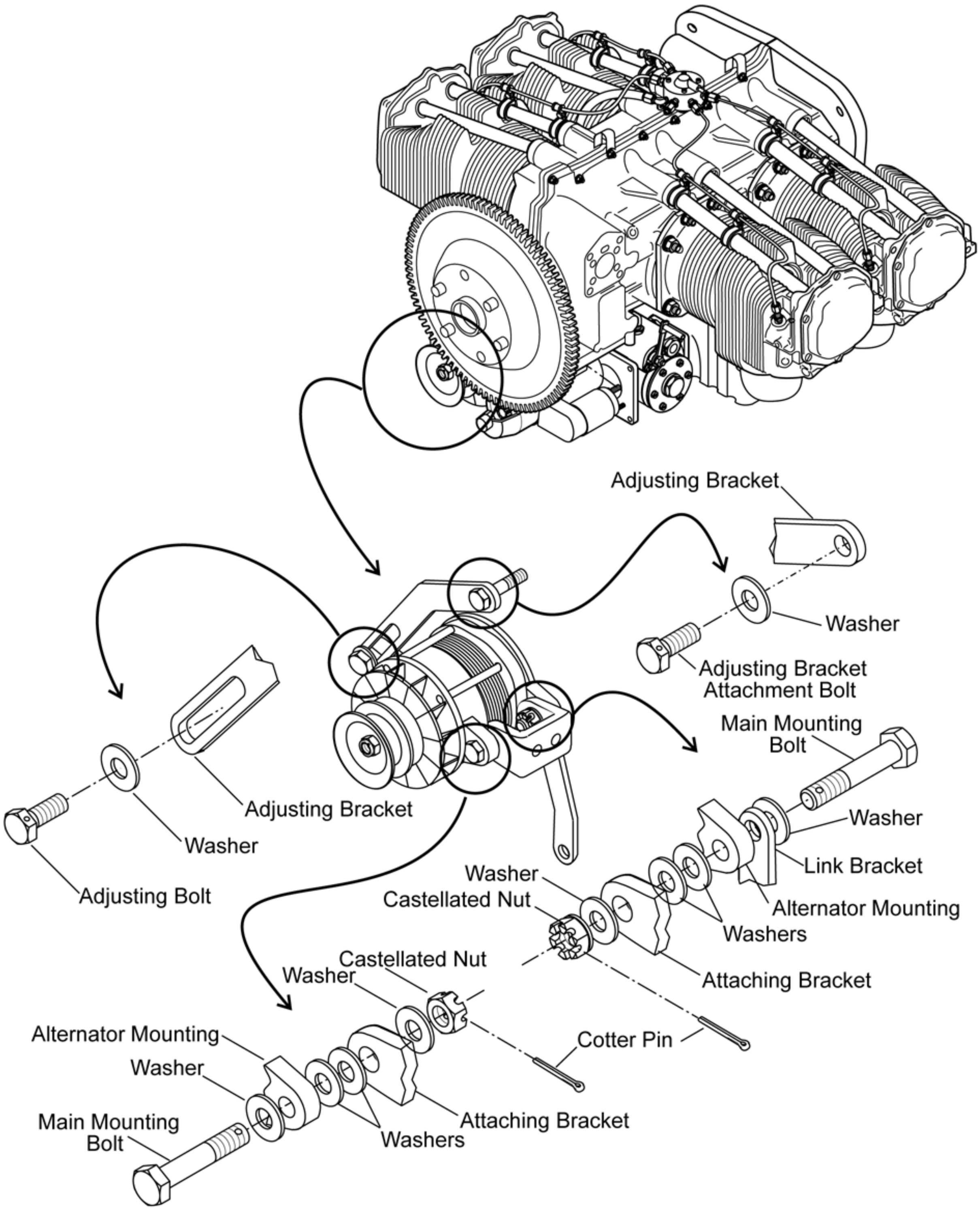
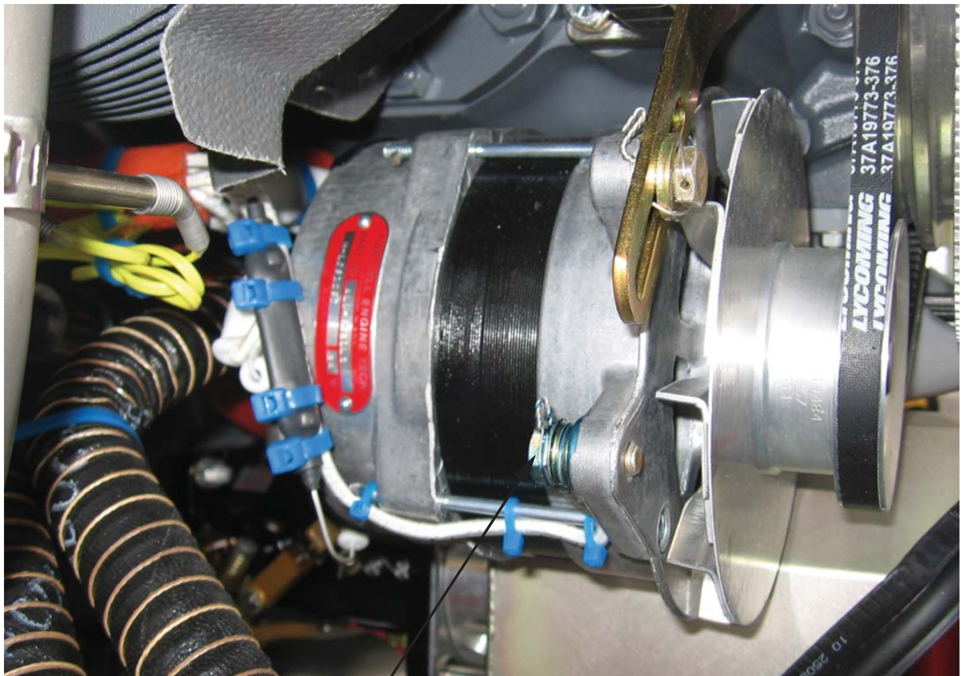


Figure 201 - Alternator Installation



Remove bolt and clean

Figure 202 - Alternator Ground Bolt

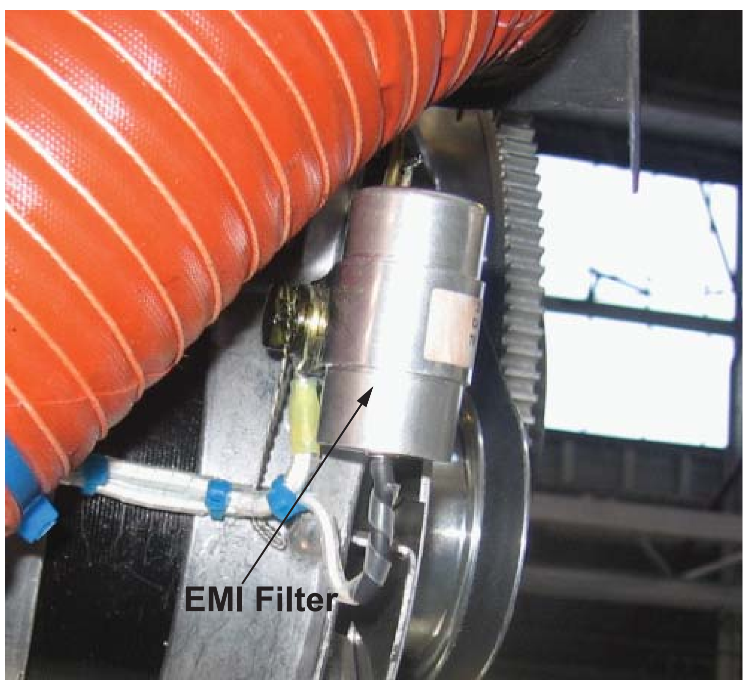


Figure 203 - Installation of EMI Filter

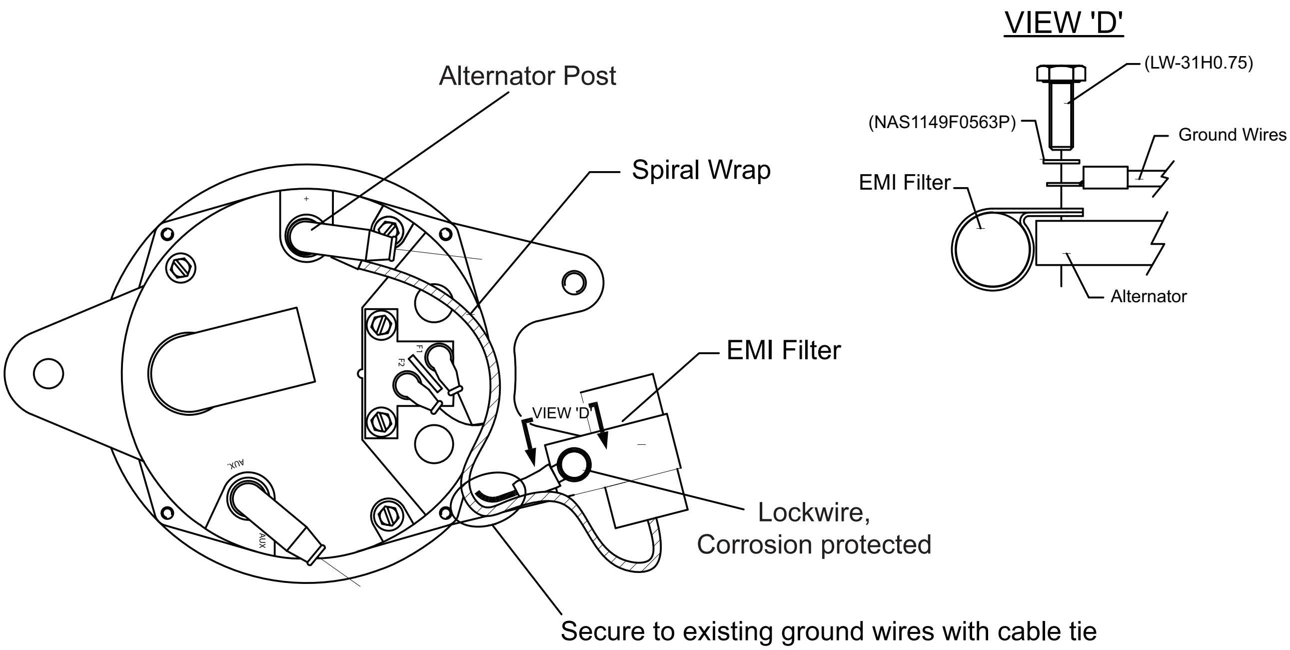


Figure 204 - Installation of Alternator Cable and EMI Filter Pigtail

BATTERY SYSTEMS

1. General

This chapter describes about the battery systems for the DA42 L360 aircraft. Refer to Chapters 24-00 and 24-30 for the description and operation of the batteries in the electrical generation system.

The DA42 L360 aircraft has the following battery systems:

- A main battery located in the front baggage compartment. This battery provides the usual airplane electrical services
- An emergency power pack. Refer to AMM # 7.02.01 Chapter 24-32 for more data about the emergency power pack.

2. Main Battery Description and Operation

The main battery is a 24V, 10AH sealed battery. A battery tray located on the forward face of the cockpit bulkhead holds the battery. You can access the battery through the front baggage compartment, right side. A clamp and two bolts hold the battery and battery cover in position. The positive and negative cables attach to terminals on the top of the battery, at the front. The usual rubber caps protect the electrical connections.

When either, or both of the engine alternators are on-line and the system voltage is greater than the battery voltage, the system charges the battery.

When either or both alternators are on-line the Integrated Cockpit System (ICS) display shows each alternator voltage. When both alternators are off-line, the ICS display shows the battery voltage.

The battery supplies current to the relay box bus through the battery relay. There is no circuit protection. The relay box bus also supplies power to the LH MAIN BUS, RH MAIN BUS and the hydraulic pump. Each of the main bus systems are protected by 90A circuit-breakers. The landing gear extension and retraction system is protected by a 50A fuse.

The battery also supplies the HOT BUS. A 20 Amp fuse protects the system.

Regular maintenance of the battery system is necessary. Do not wait until a problem occurs.

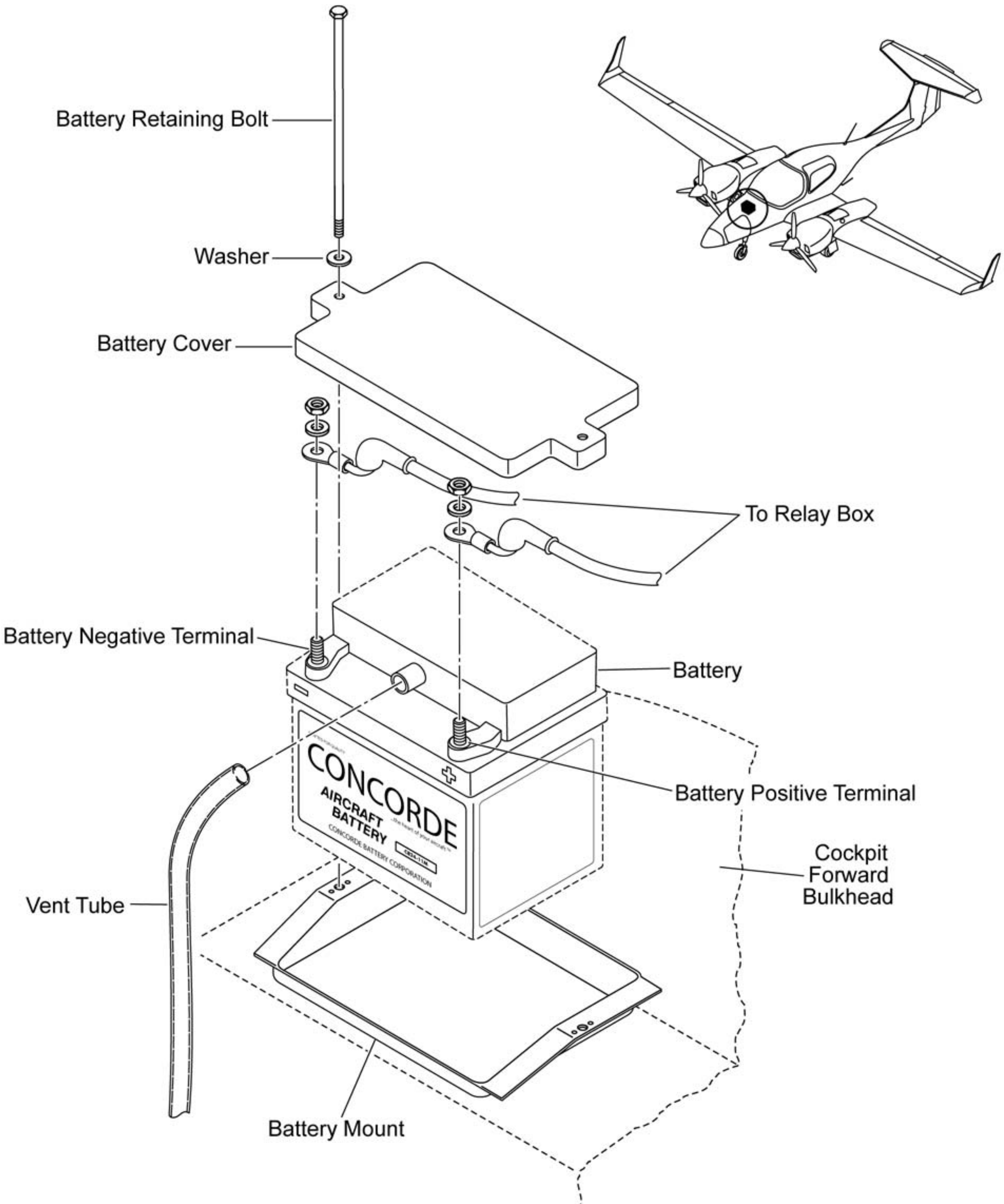


Figure 1 - Main Battery Installation

BATTERY SYSTEMS - TROUBLESHOOTING

1. General

This table explains how to troubleshoot the battery system. If you find the trouble in column 1, do the repair given in column 3.

TROUBLE	POSSIBLE CAUSE	REPAIR
Main battery voltage low.	Battery capacity low. Alternator(s) low output.	Do a capacity test. If necessary, replace the battery. Troubleshoot the alternator(s). Refer to Chapter 24-30.
Main battery will not connect to the RELAY bus.	Battery relay defective. ELECT MASTER Switch defective. Battery system wiring defective.	Replace the battery relay. Replace the ELECT MASTER switch. Do test of the battery system wiring. Refer to AMM # 7.02.01 Chapter 92 for the wiring diagrams.
Main battery will not connect to the hot battery bus.	20 Amp Fuse failed.	Replace the 20 amp fuse. If the fuse fails again do a test for a short circuit between the hot battery bus and ground. Repair or replace the defective component.
Ammeter on ICS display shows zero at all times for LH or RH alternator.	Defective shunt fuse.	Replace the related shunt fuse.
Voltmeter on ICS display shows zero with the ELECT MASTER switch set to ON.	Defective GEA. Defective wiring in the voltmeter system.	Troubleshoot the GEA. Do a test of the wiring. Refer to AMM # 7.02.01 Chapter 92-00 for the wiring diagrams.

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NOSE FORWARD BALLAST - DESCRIPTION AND OPERATION

1. General

A ballast assembly has been installed within the nose baggage bay area of the DA42 L360 aircraft for identified loading configurations in order to maintain the specified aircraft centre of gravity envelope. The ballast assembly installed can be comprised of one ballast mounting bracket, installed on only the left hand side of the aircraft or two ballast mounting brackets, installed on the left hand side and the right hand side of the aircraft.

Each ballast mounting bracket weighs 1.81 kg (3.90 lbs) and can be loaded with up to three cylindrical ballasts. The cylindrical ballasts each weigh 5.08 kg (11.20 lbs). Both ballast mounting brackets loaded with three cylindrical ballasts will give a total weight of 34.10 kgs (75.00 lbs).

The ballast assembly permits the pilot to maintain the weight limits and C of G for the DA42 L360 at all payload configurations.

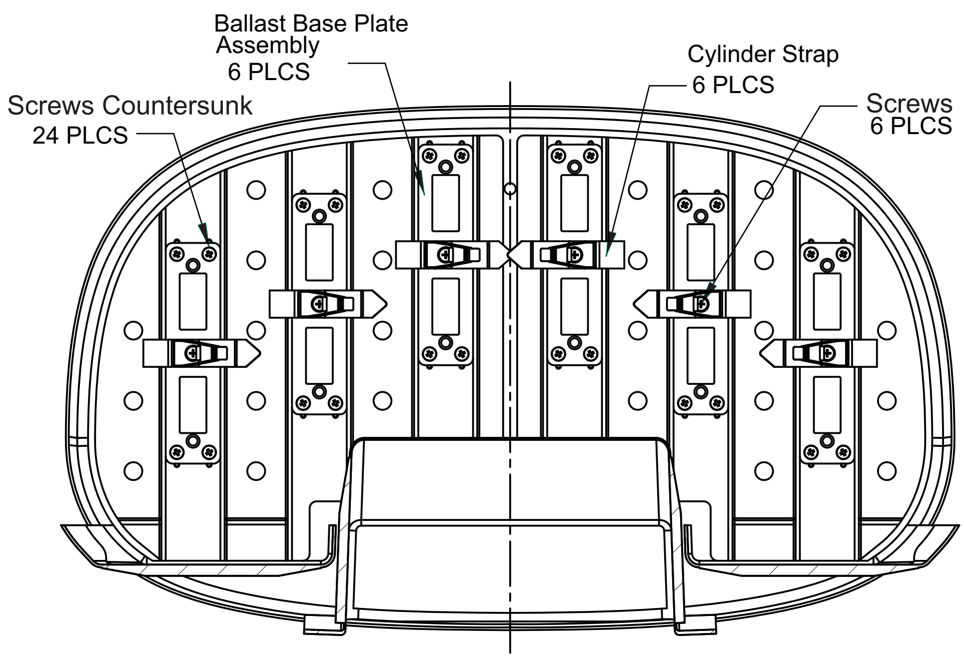

Figure 1 – Nose Forward Ballast Base Plate and Clamps Installation

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NOSE FORWARD BALLAST - MAINTENANCE PRACTICES

1. General

This chapter describes how to remove and install the ballast plate assemblies and the clamps on the adjustable ballast system mounted on the nose bulkhead of the DA42 L360 aircraft.

2. Remove/Install the Ballast Plate Assemblies and Clamps

A. Remove the Ballast Plate Assembly and Clamp

NOTE: The removal of one ballast plate assembly and one clamp is given. The other five are similar for removal.

	Detail Steps/Work Items	Key Items/References
1.	Open the nose baggage compartment door.	
2.	Release the cylinder clamp.	Make sure that the cylindrical ballast does not fall out.
3.	Remove the cylindrical ballast.	Refer to Figure 201.
4.	Remove the cylinder clamp as follows: - Remove the pan head screw and thin washer. - Remove the cylinder clamp.	Refer to Figure 201.
5.	Remove the ballast base plate assembly as follows: - Remove the 4 counter sunk screws - Remove the ballast base plate.	Refer to Figure 201.

B. Install the Ballast Base Plate Assembly and Clamp

<u>NOTE:</u> The installation of one ballast plate assembly and one clamp is given. The other five are similar for installation.

	Detail Steps/Work Items	Key Items/References
1.	Install the ballast base plate assembly as follows: - Put the ballast base plate in position - Install the 4 countersunk screws.	Refer to Figure 201.
2.	Install two Neoprene Foam Tape strips (P/N 892-361) to the inside of the cylinder clamp.	Refer to Figure 202.
3.	Install the cylinder clamp as follows: - Put the cylinder clamp in position - Install the pan head screw and washer together.	Refer to Figure 201. .
NOTE: Install the screws carefully to make sure that the thread does not bottom out on the nose bulkhead.		
4.	Apply Aeroshell 22 to the dowel pins on the ballast base plate assembly.	
5.	Open the cylinder clamp and install the necessary cylindrical ballast.	
6.	Close the cylinder clamp.	Make sure that the cylindrical ballast is held securely.
7.	Close the nose baggage compartment door.	

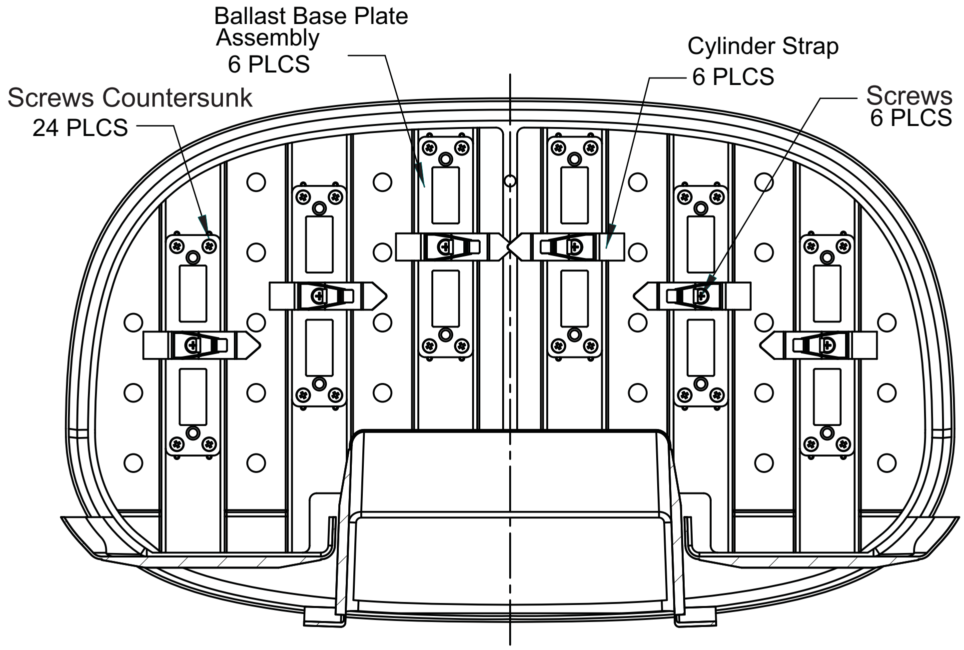

Figure 201 - Ballast Plate Assembly Installation

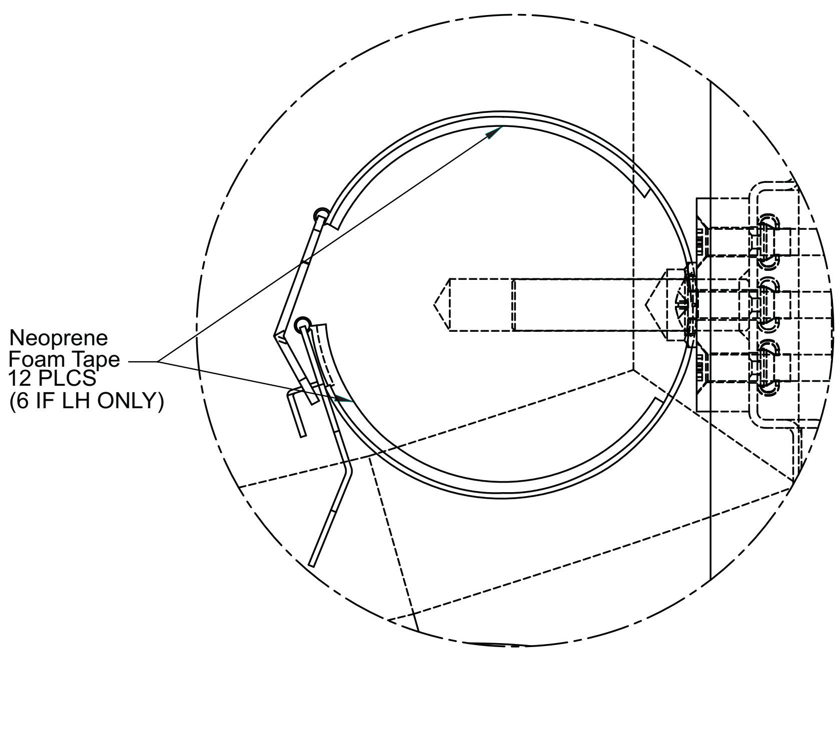

Figure 202 – Neoprene Foam Tape Installation

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CHAPTER 27-00
FLIGHT CONTROLS

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FLIGHT CONTROLS - RUDDER

1. General

The DA42 L360 aircraft has the usual rudder control system. Each pilot has a rudder pedal assembly. The pilot can adjust the pedal position. Control cables connect the pedal assembly to the rudder. The rudder has an adjustable trim tab. Refer to Chapter 27-21 for data about the rudder trim system.

2. Description

The DA42 L360 aircraft has a set of rudder control pedals for each pilot. The pedal assembly can be adjusted.

Figure 1 shows the rudder control system. Figure 2 shows the rudder pedal assembly. Figure 3 shows the rudder control in the cockpit and Figure 4 shows the rudder controls in the fuselage. The system has the following components:

- A rudder pedal assembly for each pilot at the front of the cockpit. The forward part of each pedal connects to a brake master cylinder (refer to AMM # 7.02.01 Chapter 32-40 for more data about the brake system).
- An adjuster handle for each pilot, attached to the aft face of each ruder pedal assembly.
- A yoke (a "T" shaped lever) assembly in the fuselage below the center console. The yoke attaches to the bottom of the control bulkhead and to the fuselage shell.
- A rudder pedestal at the rear of the fuselage. The rudder lower mounting-bracket is attached to the rudder leading edge. It connects the rudder to the rudder pedestal.
- Cable assemblies. Flexible control cables connect the cockpit front bulkhead to the yoke. Two long flexible control cables connect the yoke to the rudder. Each of the long flexible cables has a turnbuckle assembly for adjusting the length of the cable.

Six bolts attach each rudder pedal assembly to the cockpit floor.

Each rudder pedal assembly has two pedals. Each pedal has a lever and a foot pad. Each pedal has an "S" shaped tube. The lower part of the tube aligns with the pivot of the pedal. The upper part of the tube aligns with the foot pad of the pedal.

Four control cables (cockpit cables) go from the cockpit front bulkhead to enter the bottom of each "S" shaped tube. A multi-hole fitting at the bulkhead gives adjustment for each fitting. Each cable goes through an "S" shaped tube and comes ut at the top of the tube. Each cable then goes from the tube to the yoke.

Each outboard control cable goes through a Teflon tube in the aft face of the floor panel. Each outboard control goes inboard through a guide pulley on the control bulkhead. The cables connect each outer pedal to the front arm of the yoke.

Each inboard control cable goes through a Teflon tube in the aft face of the floor panel. The cables connect each inner pedal to the side arms of the yoke.

Two cable assemblies ('fuselage cables') attach to the rear of the yoke. Each cable has a short front cable and a longer rear cable. All cables go through Teflon tubes. Turnbuckles connect the front cable to the rear cable. The turnbuckles can adjust the tension in the fuselage cables and the neutral position of the rudder.

The 2 fuselage cables go through Teflon tubes in the rear fuselage. The cables attach to the rudder lower mounting-bracket. The cables cross over each other in the rear fuselage.

The rudder stop which limits the rudder deflection to the left side is located left of the lower rudder hinge (Figure 4). The rudder stop which limits the ruder deflection to the right side is located right of the rudder lower hinge. Each rudder stop consists of a nut which is welded to the rudder lower mounting-bracket and a bolt which is held tight in the nut by a jam-nut.

3. Operation

If you move the left rudder pedal forward:

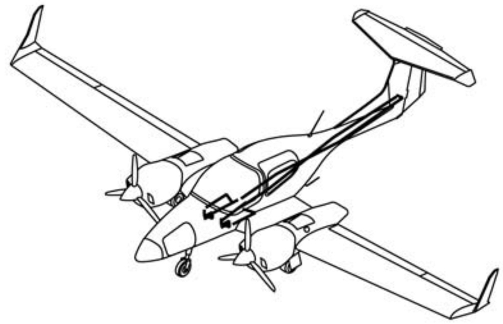
- The top of the "S" shaped tube moves forward
- The "S" shaped tube pulls the left cockpit cable
- The left cockpit cable moves the yoke counter-clockwise (seen from above)
- The yoke pulls the fuselage cable attached to its right arm forward. This cable connects to the left of the rudder
- The fuselage cable deflects the rudder to the left.
- The rudder movement pulls the other fuselage cable aft. This cable connects to the left of the yoke
- The fuselage cable moves aft with the left side of the yoke
- The left side of the yoke pulls both of the right cockpit cables aft. And the cables pull the "S" shaped tube on the right rudder pedals aft.

If you move the right rudder pedal forward each part moves in the opposite sense. The rudder moves to the right and pulls the left cables aft.

When you pull on the adjuster handle, the latch disengages from the bottom sledge tube. If you pull further, the pedal assembly moves along the sledge tube towards you. Release the handle, then push with your feet on both pedals. The latch will lock.

If you push with both feet while you pull the handle, the pedal assembly moves along the sledge tube away from you. Release the handle, then push with your feet on both of the pedals. The latch will lock.

When you adjust the position of the pedals, the control cables move through the "S" shaped tubes.



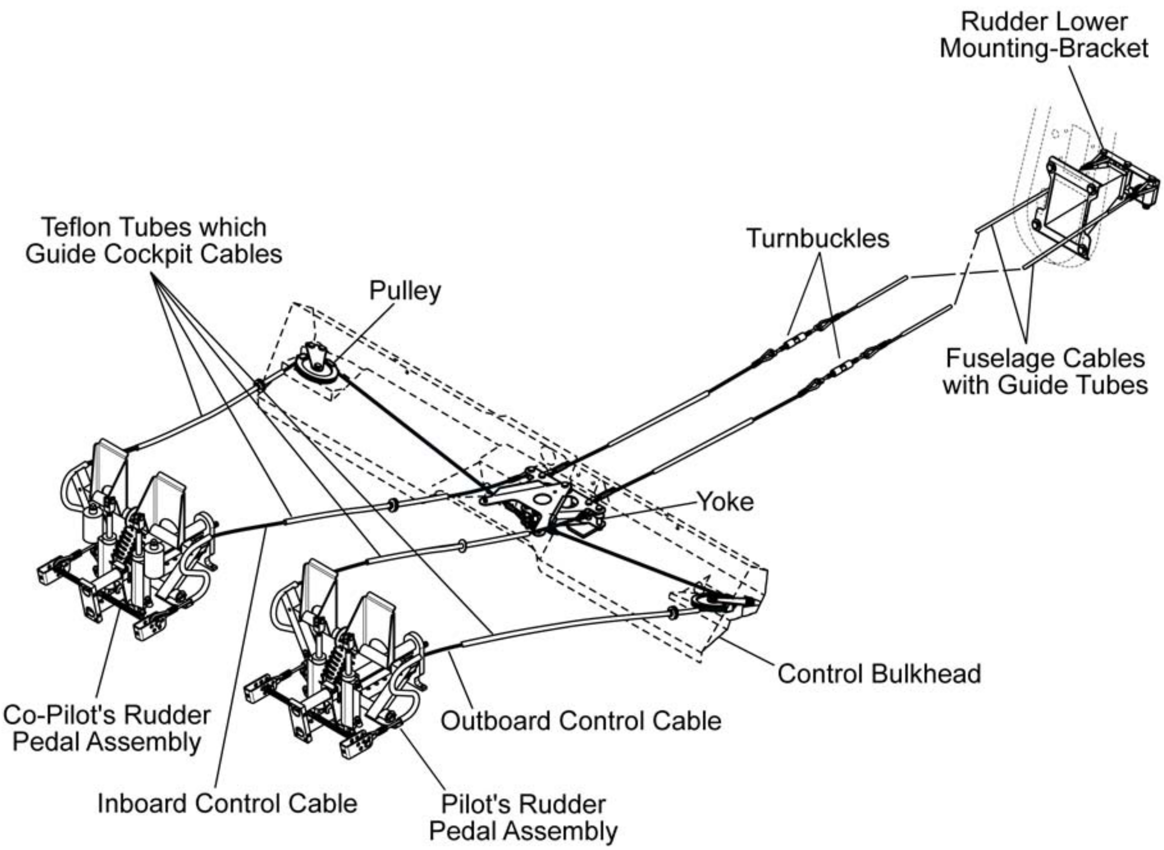
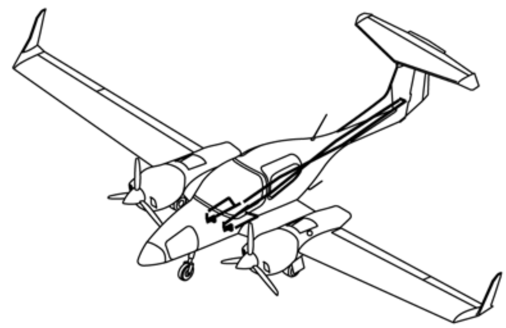


Figure 1 - Rudder Control System



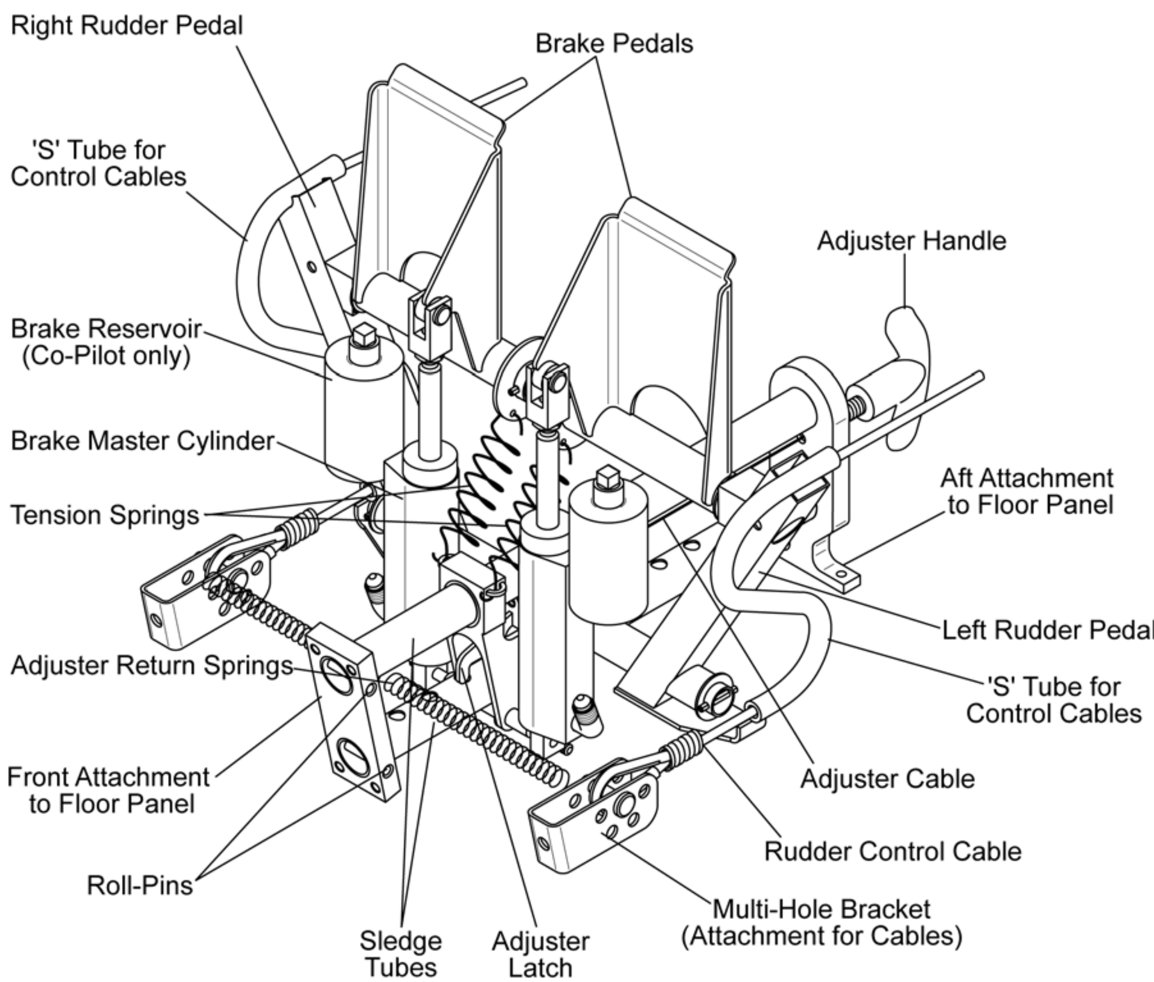


Figure 2 - Rudder Pedal Assembly

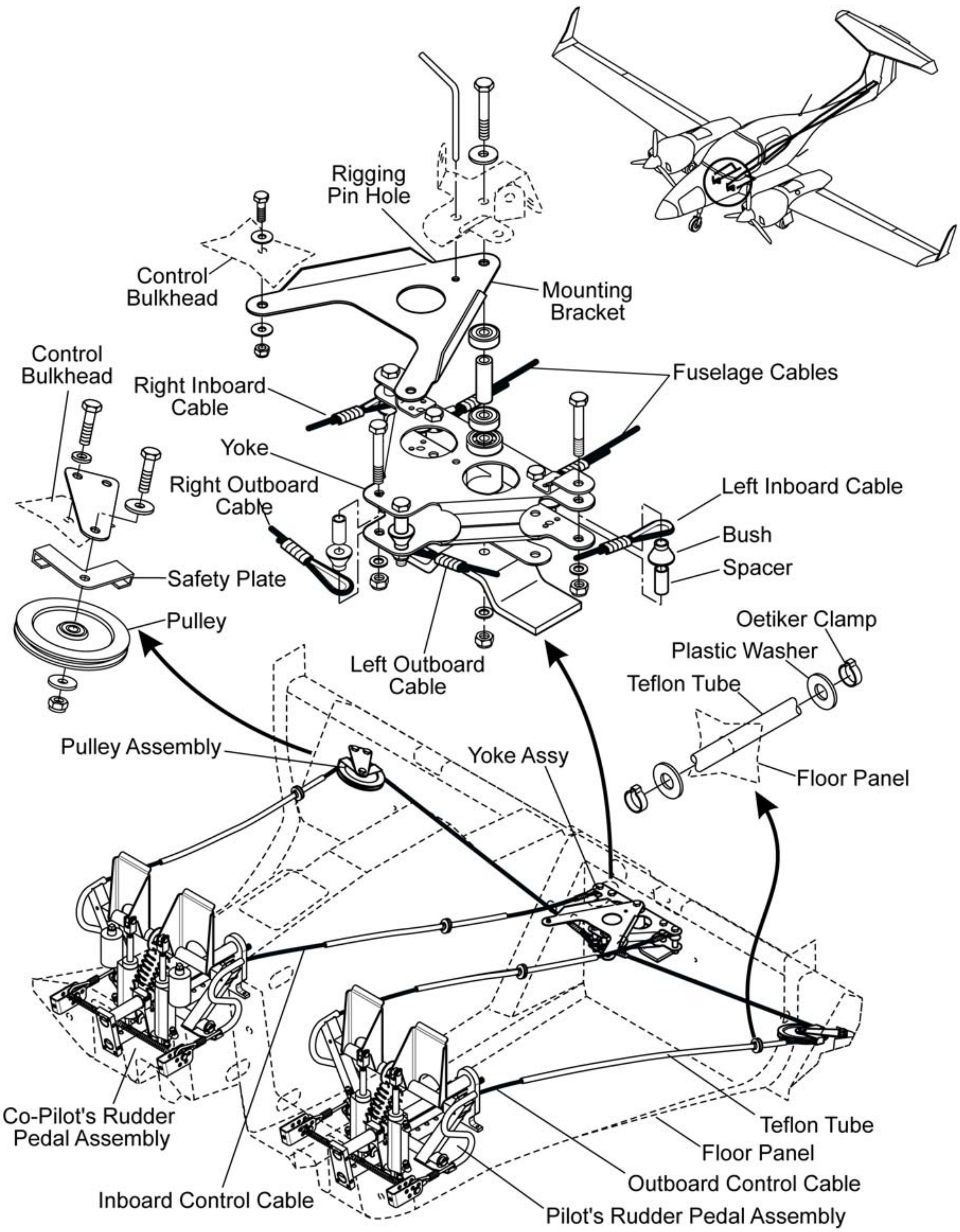


Figure 3 - Rudder Controls in the Cockpit

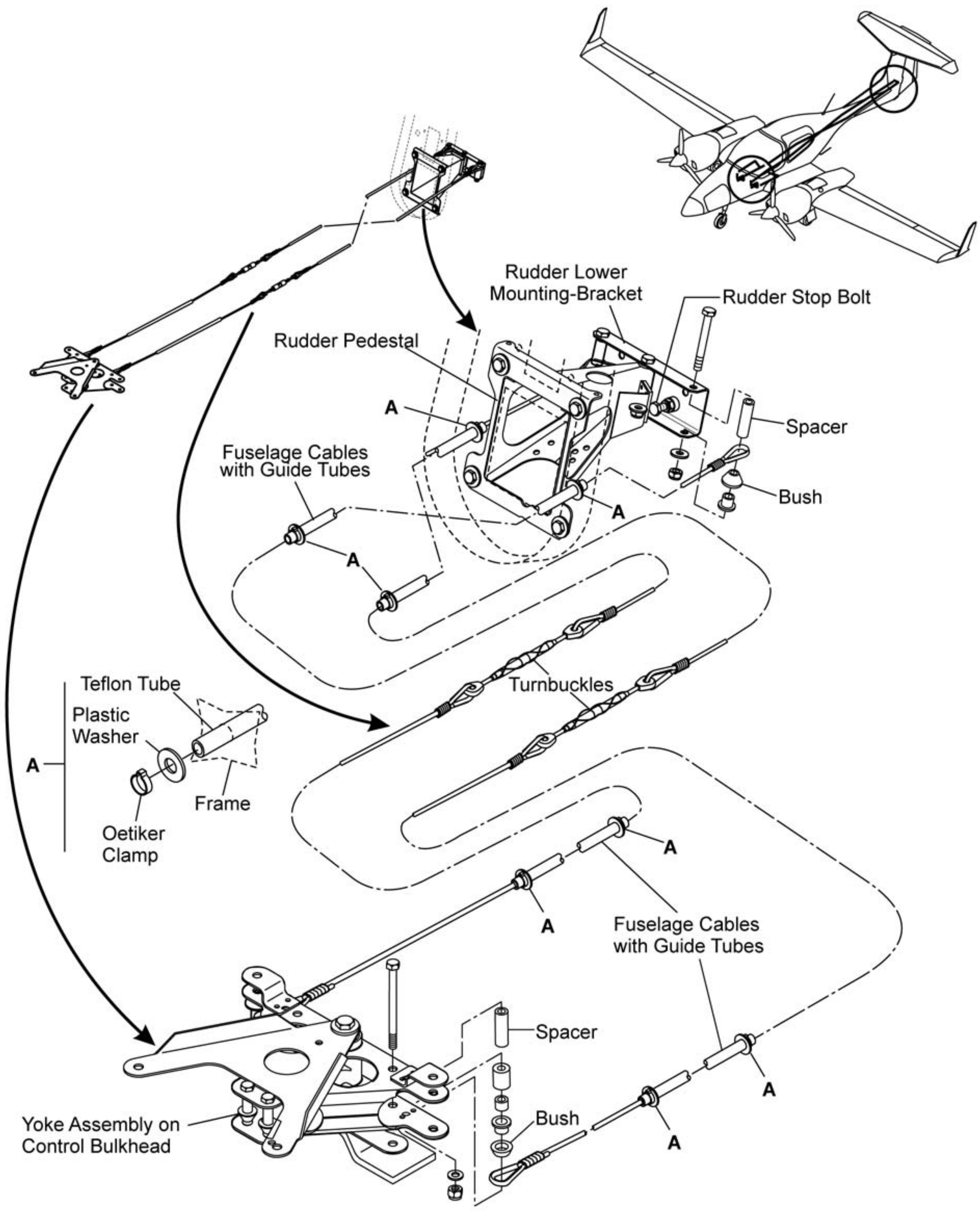


Figure 4 - Rudder Controls in the Fuselage

RUDDER - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to do test procedures on the rudder control system. They also describe how to adjust the rudder control system. Refer to AMM # 7.02.01 Chapter 52-40 for data on how to remove/install the rudder. Refer to Chapter 27-21 for data about the rudder trim systems.

WARNING: WHEN YOU DO WORK ON THE AIRCRAFT CONTROLS, MAKE SURE THAT THE AREAS AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.

WARNING: WHEN YOU COMPLETE WORK ON THE CONTROLS, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS/TOOLS FROM THAT AREA. LOOSE ITEMS/TOOLS CAN PREVENT FULL MOVEMENT OF THE AIRCRAFT CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

2. Rudder Control System Test for Correct Range of Movement

A. Equipment

Item	Quantity	Part Number
Ruler or deflection gauge	1	Commercial

B. Rudder Control Test Procedure

	Detail Steps/Work Items	Key Items/References
1.	Make a copy of the Control Surfaces Adjustment Report	Refer to Chapter 06-00. Use it to record the measurements.
2.	Set both rudder pedals fully forward.	
	WARNING: WHEN YOU DO WORK ON THE AIRCRAFT CONTROLS, MAKE SURE THAT THE AREAS AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.	
3.	Set the rudder pedals central.	The left pedal must align with the right pedal. Make sure that the rudder is in the neutral position shown in the Control Surfaces Adjustment Report for the aircraft.

	Detail Steps/Work Items	Key Items/References
4.	Set the rudder pedals to fully left.	The rudder must hit the stops at the rudder pedestal. The rudder position must be the distance to the left shown in the Control Surfaces Adjustment Report for the aircraft. (Measured from the neutral position).
5.	Set the rudder pedals to fully right.	The rudder must hit the stops at the rudder pedestal. The rudder position must be the distance to the right shown in the Control Surfaces Adjustment Report for the aircraft. (Measured from the neutral position).
6.	Make sure that the left and right rudder pedals are free to move when they are set in all of the adjustable positions.	

3. Rudder Control System Adjustments

If you cannot get the correct range of movements of the rudder control system, use this procedure to adjust the system.

A. Equipment

Item	Quantity	Part Number
Cable tension gauge (tensiometer).	1	Commercial
Ruler or deflection gauge	1	Commercial

B. Rudder Control Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
1.	Remove the following items for access: - Pilots' Seats - Passenger seats.	 Refer to AMM # 7.02.01 Chapter 25-10. Refer to AMM # 7.02.01 Chapter 25-10.
2.	Set both rudder pedals fully forward.	
3.	Set the rudder pedals central.	Make sure that the rudder is in the neutral position. The left rudder pedal must align with the right rudder pedal.
4.	If necessary, adjust the length of the cables between the yoke and the rudder lower mounting bracket: - Remove the lock-wire from the turnbuckles - Adjust the turnbuckles to set the rudder to neutral - Do a test for the correct cable tension - If the cable tension is incorrect, then adjust the cable tension using tensiometer between 150 and 170 N (33.72 and 38.22 lbf). - Tighten the turnbuckles and install the lock-wire.	Refer to Figure 204. Below the passenger seat. Refer to Figure 207.
5.	Set the rudder pedals to fully left.	The rudder must hit the stops at the rudder pedestal. The rudder position must be the distance to the left shown in the Control Surfaces Adjustment Report for the aircraft. (Measured from the neutral position).
6.	If necessary, adjust the rudder stop bolt on the left side of the rudder lower mounting bracket: - Release the jam-nut on the left stop bolt.	

	Detail Steps/Work Items	Key Items/References
	- Adjust the stop bolt to give the correct range of movement.	The rudder position must be the distance to the left shown in the Control Surfaces Adjustment Report for the aircraft. (Measured from the neutral position).
	- Tighten the jam-nut on the stop bolt.	
7.	Set the rudder pedals to fully right.	The rudder must hit the stops at the rudder pedestal. The rudder position must be the distance to the right shown in the Control Surfaces Adjustment Report for the aircraft. (Measured from the neutral position).
8.	If necessary, adjust the rudder stop bolt on the right side of the rudder lower mounting bracket:	
	- Release the jam-nut on the right stop bolt.	
	- Adjust the stop bolt to give the correct range of movement.	The rudder position must be the distance to the right shown in the Control Surfaces Adjustment Report for the aircraft. (Measured from the neutral position).
	- Tighten the jam-nut on the stop bolt.	
9.	Do a test for the correct range of rudder movement.	Refer to Paragraph 2.
10.	Do an inspection of all the controls that you have adjusted. If necessary for your airworthiness authority, do a duplicate inspection of the controls.	
11.	Install the following items:	
	- Passenger seats	Refer to AMM # 7.02.01 Chapter 25-10.
	- Pilots' Seats.	Refer to AMM # 7.02.01 Chapter 25-10.

4. Remove/Install the Rudder Control Cables

A. Equipment

Item	Quantity	Part Number
Cable tension gauge (tensiometer).	1	Commercial
Swaging tool.	1	Commercial
Nicopress Oval and Stop Sleeve Gauge ('go/no-go gauge') for 1/8" sleeves.	1	-

B. Remove the Cockpit Rudder Control Cables (Front Cables)

	Detail Steps/Work Items	Key Items/References
1.	Remove the following items for access: - Pilots' Seats	 Refer to AMM # 7.02.01 Chapter 25-10.
2.	Remove the cable between the cockpit front bulkhead and the yoke: - Remove the nut, the washer, the bolt and the spacer that attach the cable to the multi-hole bracket at the bulkhead - Remove the nut, the washer, the bolt, the bush and the spacer that attach the cable to the yoke - Cut the eye-end from the cable that you will remove, at the bulkhead end - Remove the old cable.	Refer to Figures 202 and 203.

C. Install the Rudder Control Cables (Front Cables)

	Detail Steps/Work Items	Key Items/References
WARNING: ONLY TRAINED AND AUTHORIZED PERSONS SHOULD INSTALL CABLE EYE-ENDS. IF THE EYE-ENDS ARE NOT INSTALLED CORRECTLY, THE RUDDER CONTROLS CAN FAIL. THIS CAN CAUSE DEATH OR INJURY TO PERSONNEL.		
NOTE: Install eye-ends in accordance with FAA AC 43.13-1B, Chapter 7, Section 8. NOTE: To make the work easier, install an eye-end on one end of the cable before you install it in the aircraft.		
1.	Install one new eye-end to the cable before you install it in the aircraft: - Make the eye-end using Locoloc thimbles and Nico-Press clamps for 1/8" (3.2 mm) diameter steel cables to specification LN9374. - Inspect the cable eye-end for correct assembly. - If necessary for your airworthiness authority, send a sample eye-end for proof test.	Inspect cable swages with go/no-go gauge for 1/8" Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
2.	Push the control cable through the Teflon tubes from the rear.	Refer to Figure 203.
3.	Make sure the cable is in the correct position on the pulley (for the outer cables only).	
4.	Push the cable through the "S" shaped tube on the rudder pedal assembly.	
5.	Install a new eye-end to the cable at the cockpit front bulkhead end: - Make the eye-end using Locoloc thimbles and Nico-Press clamps for 1/8" (3.2 mm) diameter steel cables to specification LN9374.	

	Detail Steps/Work Items	Key Items/References
	- Inspect the cable eye-end for correct assembly. - If necessary for your airworthiness authority, send a sample eye-end for proof test.	Inspect cable swages with go/no-go gauge for 1/8" Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
6.	Install the cable to the yoke: - Install the bolt, the bush and spacer that attach the cable to the yoke. - Install a washer and new self-locking nut onto the bolt.	Torque to 4.7 lbf-ft (6.4 Nm). Always use new self-locking nuts.
7.	Install the cable to the bracket at the cockpit front bulkhead: - Install the bolt and the spacer that attach the cable to the bracket.	Adjust the position of the bolt in the multi-hole bracket to give the correct rudder pedal position. The rudder pedal lever must be vertical when the rudder is set to neutral.
	- Install a washer and new self-locking nut onto the bolt.	Torque to 4.7 lbf-ft (6.4 Nm). Always use new self-locking nuts.
8.	Do a test for the correct range of rudder movement. If necessary adjust the rudder controls.	Refer to Paragraphs 2 and 3.
9.	Do an inspection of all the controls that you have adjusted. If necessary for your airworthiness authority do a duplicate inspection of the controls.	
10.	Install the following items: - Passenger seats - Pilots' Seats.	 Refer to AMM # 7.02.01 Chapter 25-10. Refer to AMM # 7.02.01 Chapter 25-10.

D. Remove the Fuselage Rudder Control Cables (Rear Cables)

	Detail Steps/Work Items	Key Items/References
1.	Remove the following items for access: - Pilots' Seats - Passenger seats.	 Refer to AMM # 7.02.01 Chapter 25-10. Refer to AMM # 7.02.01 Chapter 25-10.
2.	Remove the cable between the yoke and the turnbuckle: - Remove the nut, the washer, the bolt and the spacer that attach the cable to the yoke - Cut the eye-end from the cable that you will remove, at the yoke - Remove the old cable aft - Cut the eye-end from the cable that you will remove, at the turnbuckle.	Refer to Figure 204.
3.	Remove the cable between the turnbuckle and the rudder: - Remove the nut, the washer, the bolt, the bush and the spacer that attach the cable to the rudder lower mounting bracket - Cut the eye-end from the cable that you will remove, at the rudder end - Remove the old cable forward - Cut the eye-end from the cable that you will remove, at the turnbuckle.	

E. Install the Fuselage Rudder Control Cables (Rear Cables)

	Detail Steps/Work Items	Key Items/References
	WARNING: ONLY TRAINED AND AUTHORIZED PERSONS SHOULD INSTALL CABLE EYE-ENDS. IF THE EYE-ENDS ARE NOT INSTALLED CORRECTLY, THE RUDDER CONTROLS CAN FAIL. THIS CAN CAUSE DEATH OR INJURY TO PERSONNEL.	
	NOTE: Install eye-ends in accordance with FAA AC 43.13-1B, Chapter 7, Section 8. NOTE: To make the work easier, install an eye-end on one end of the cable before you install it in the aircraft.	
1.	Install one new eye-end to the front of the cable at the yoke end before you install the cable in the aircraft and: - Make the eye-end using Locoloc thimbles and Nico-Press clamps for 1/8" (3.2 mm) diameter steel cables to specification LN9374. - Inspect the cable eye-end for correct assembly. - If necessary for your airworthiness authority, send a sample eye-end for proof test.	Inspect cable swages with go/no-go gauge for 1/8" Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
2.	Push the control cable through the Teflon tubes from the rear.	Refer to Figure 204. Through the front and rear main bulkheads.
3.	Install a new eye-end to the cable at the turnbuckle end: - Make the eye-end using Locoloc thimbles and Nico-Press clamps for 1/8" (3.2 mm) diameter steel cables to specification LN9374. - Inspect the cable eye-end for correct assembly. - If necessary for your airworthiness authority, send a sample eye-end for proof test.	Inspect cable swages with go/no-go gauge for 1/8" Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.

	Detail Steps/Work Items	Key Items/References
4.	Install a new eye-end to the rear cable before you install the cable into the aircraft: - Make the eye-end using Locoloc thimbles and Nico-Press clamps for 1/8" (3.2 mm) diameter steel cables to specification LN9374. - Inspect the cable eye-end for correct assembly. - If necessary for your airworthiness authority, send a sample eye-end for proof test.	Inspect cable swages with go/no-go gauge for 1/8" Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
5.	Push the control cable through the Teflon tubes from the rear.	Towards the rudder.
6.	Install a new eye-end to the cable at the rudder mounting bracket end: - Make the eye-end using Locoloc thimbles and Nico-Press clamps for 1/8" (3.2 mm) diameter steel cables to specification LN9374. - Inspect the cable eye-end for correct assembly. - If necessary for your airworthiness authority, send a sample eye-end for proof test.	Inspect cable swages with go/no-go gauge for 1/8" Nicopress oval sleeve in accordance with FAA AC 43.13-1B, Chapter 7, Section 8.
7.	Install the cable to the rudder lower mounting-bracket: - Install the bolt, the bush and spacer that attach the cable to the rudder. - Install a washer and new self-locking nut.	Refer to Figure 204. Torque to 4.7 lbf-ft (6.4 Nm). Use new self-locking nut.
8.	Install the cable to the yoke: - Install the bolt, the bush and spacer that attach the cable to the yoke. - Install a washer and new self-locking nut.	Refer to Figure 204. Torque to 4.7 lbf-ft (6.4 Nm). Use new self-locking nut.

	Detail Steps/Work Items	Key Items/References
9.	Adjust both left and right rudder cable turnbuckles to give the correct tension to the control cables.	Refer to Paragraph 3.
10.	Do a test for the correct range of rudder movement.	Refer to Paragraph 2.
11.	Do an inspection of all the controls that you have adjusted. If necessary for your airworthiness authority do a duplicate inspection of the controls.	
12.	Install the following items:	
	- Passenger seats	Refer to AMM # 7.02.01 Chapter 25-10.
	- Pilots' Seats.	Refer to AMM # 7.02.01 Chapter 25-10.

5. Rudder System Control Forces Test

A. Equipment

Item	Quantity	Part Number
Force gauge with max load of 100 lbf min	1	Commercial
Weight 10 lbs.	1	
Cable and Pulley Stand	1	
Suction Cup Power Grip TL6 or equivalent	1	
Rudder rigging template (D60-5540-00-PL, Rev D)	1	

B. Test Procedure

	Detail Steps/Work Items	Key Items/References
1.	Lift the aircraft on jacks.	Refer to AMM # 7.02.01 Chapter 07-10.
2.	Retract the landing gear.	Refer to AMM # 7.02.01 Chapter 32-30.
3.	Adjust the rudder pedals to most FWD position	Refer to Chapter 27-20.
4.	Position rudder trim tab in neutral.	

	Detail Steps/Work Items	Key Items/References
5.	Place the pulley stand on the right side of the aircraft by the tail and attach the suction cup to the right skin of the rudder 12.4 in (315 mm) from the rudder hinge line.	Refer to Figure 205. Make sure that the cable is moving freely on the pulley and it is perpendicular to rudder chord and parallel to the ground.
6.	Do not attach the 10 LBS weight to the cable at this time.	
7.	Install the rudder rigging template D60-5540-00-PL Rev. D.	
8.	Position the force gauge against the pilot's left hand rudder pedal below the brake pedal.	Refer to Figure 206.
9.	Fit the 10 lbs weight to pulley system while holding rudder pedals in neutral position by applying force to the pilot's left hand rudder pedal.	
10.	Slowly move the rudder pedal forward until rudder reaches 10 degree deflection and document rudder system control force.	Rudder control force should not exceed 77 lbf.
NOTE: If rudder deflection exceeds 10 degrees, repeat the test from beginning.		
11.	Repeat the test for pilot's right hand pedal.	
12.	Extend landing gear.	Refer to AMM # 7.02.01 Chapter 32-30.
13.	Lower the aircraft.	Refer to AMM # 7.02.01 Chapter 07-10.

6. Rudder Control Cable and Yoke Access

Rudder Cable/Yoke	Remove/Install Access	References
Cockpit cables between the cockpit front bulkhead and the yoke.	Pilots' seats	Refer to AMM # 7.02.01 Chapter 25-10.
Rear fuselage cables between the yoke and the rudder.	Pilots' seats Passenger seat Rudder	Refer to AMM # 7.02.01 Chapter 25-10. Refer to AMM # 7.02.01 Chapter 55-40.
Yoke	Pilots' seats	Refer to AMM # 7.02.01 Chapter 25-10.

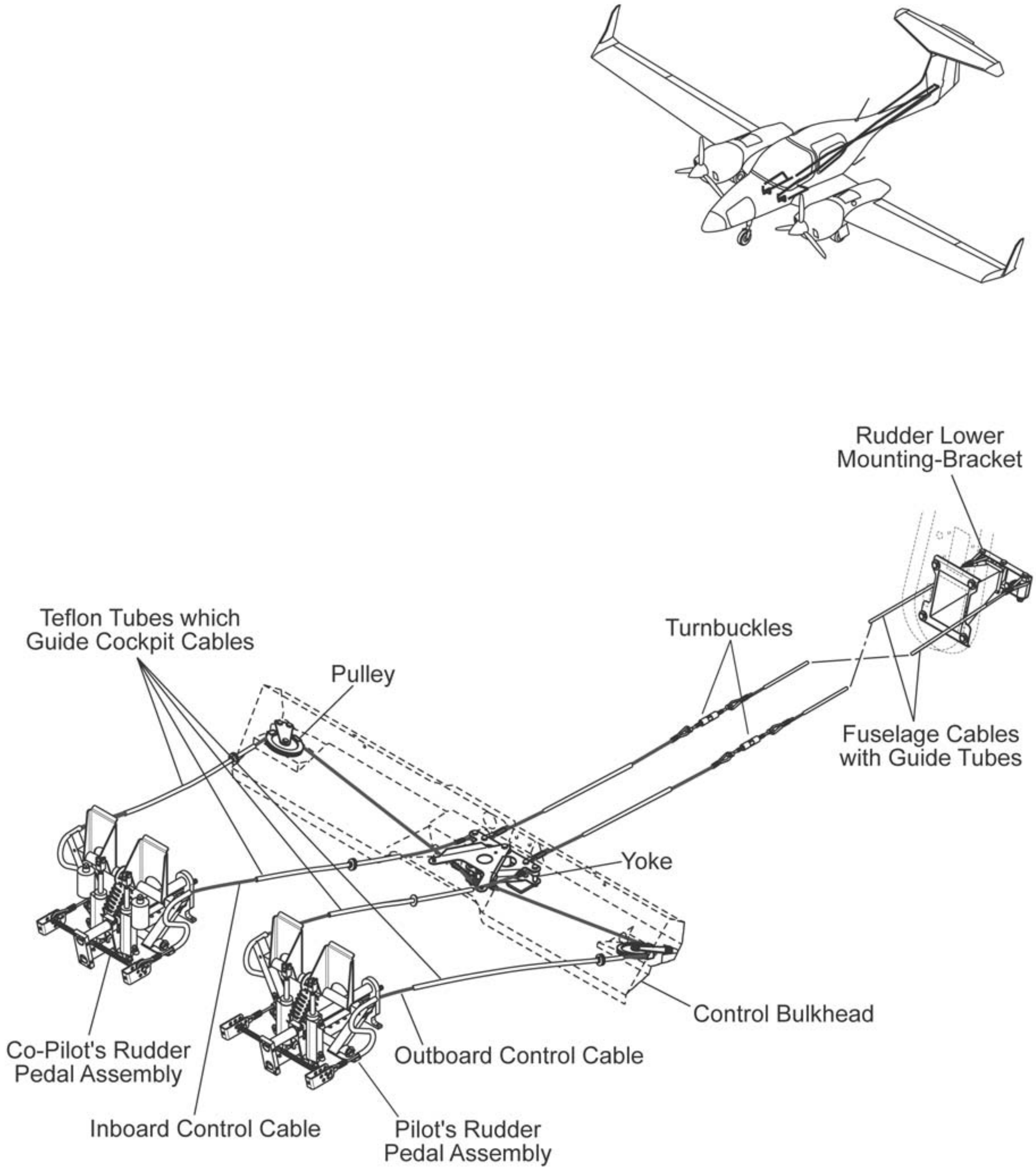
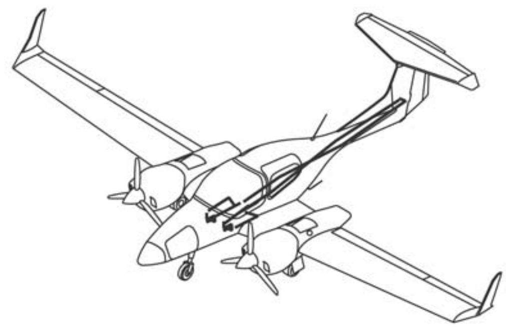


Figure 201 - Rudder Control System



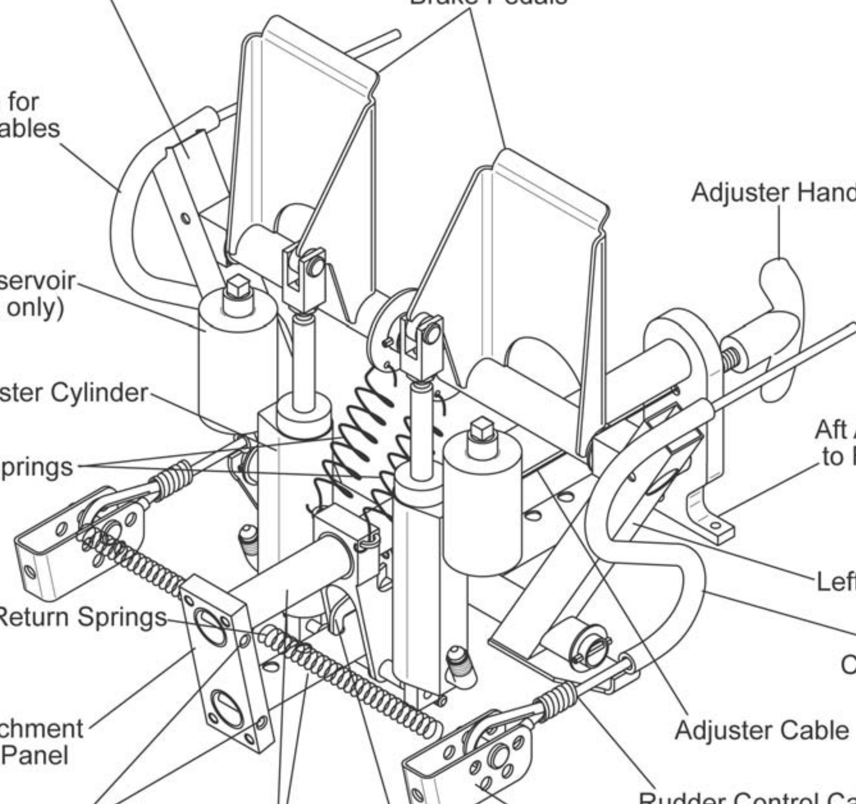


Figure 202 - Rudder Pedal Assembly

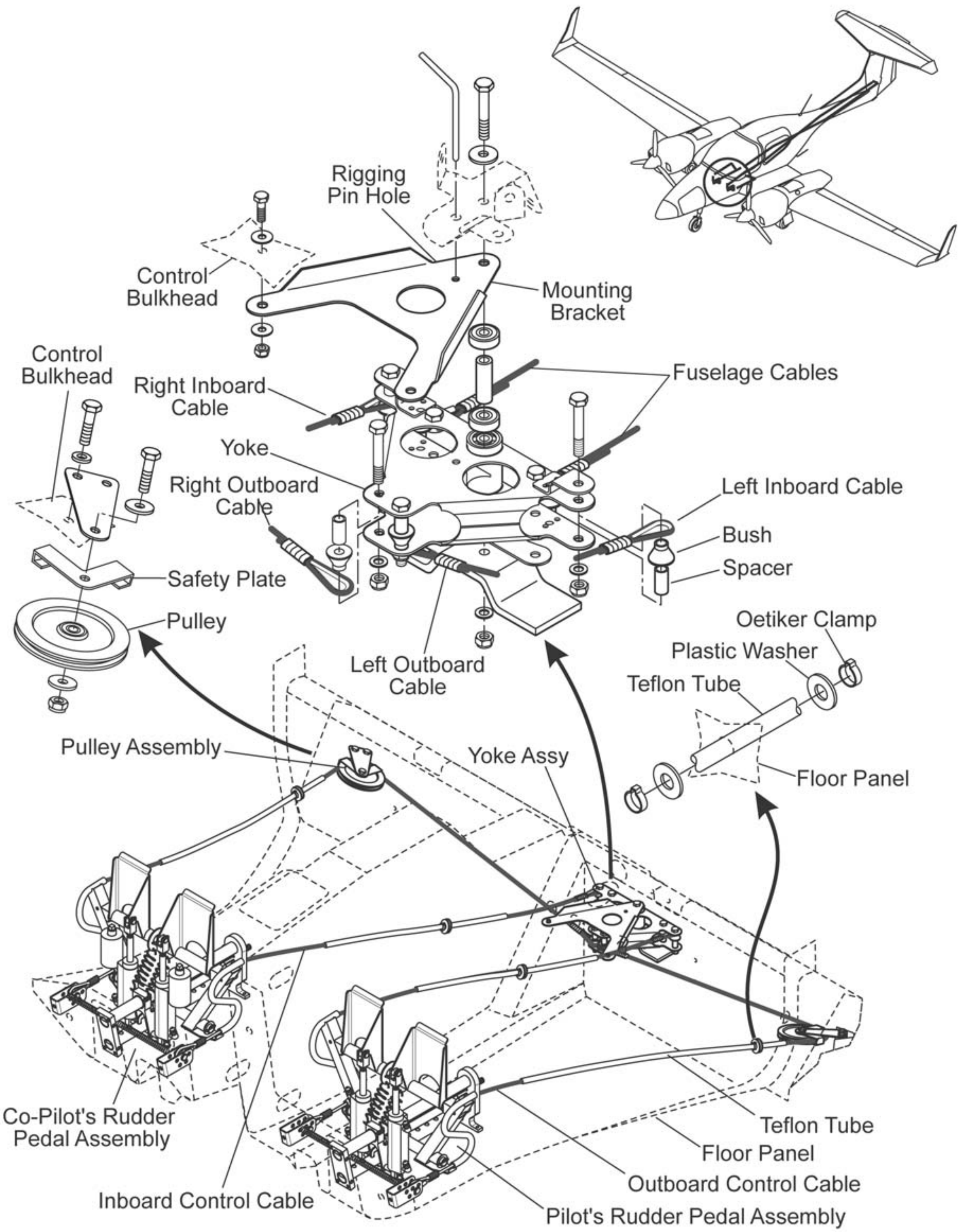


Figure 203 - Rudder Controls in the cockpit

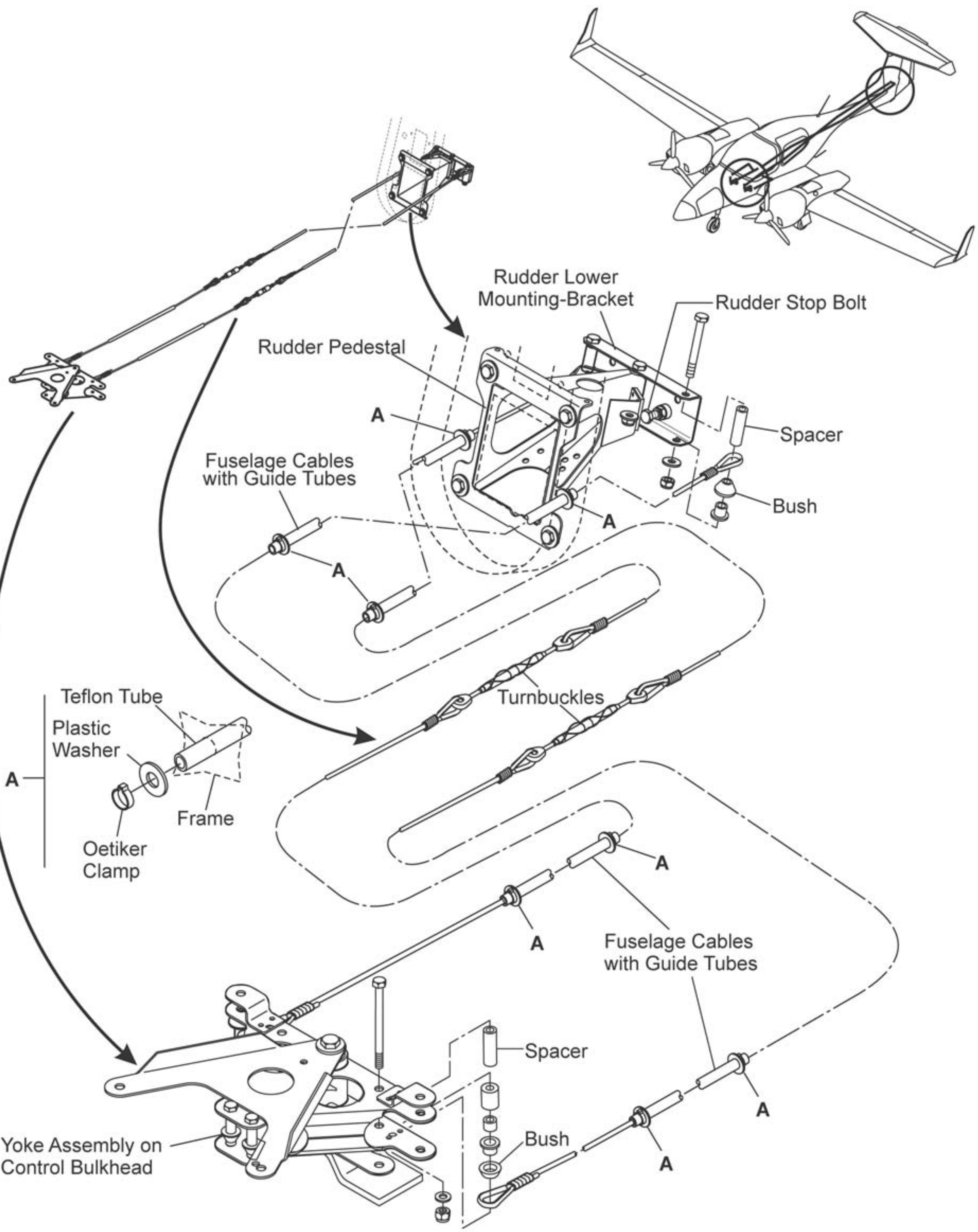


Figure 204 - Rudder Controls in the Fuselage

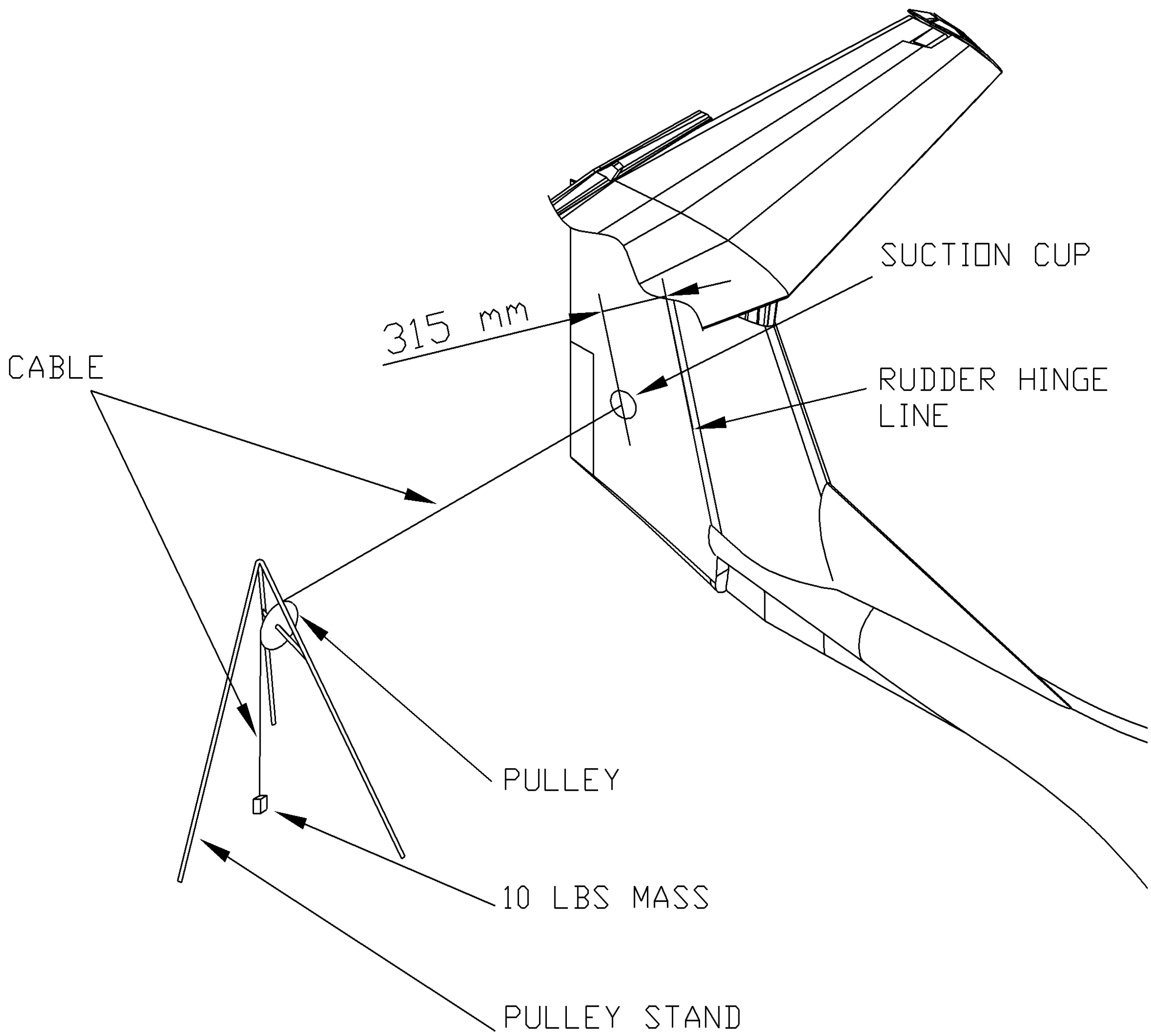


Figure 205 - Pulley System Installation

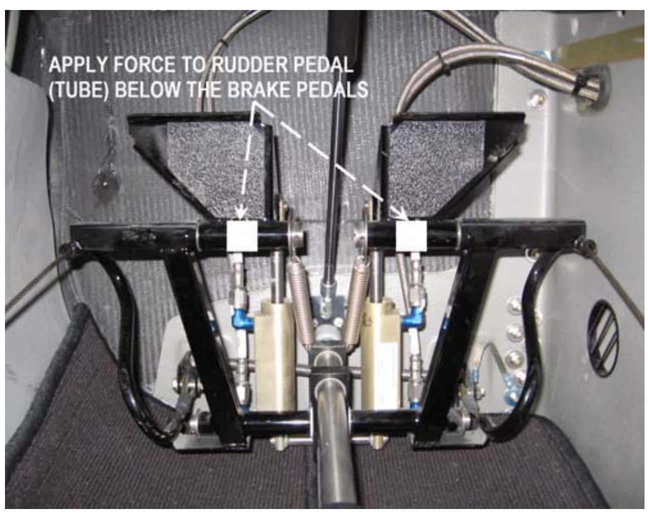


Figure 206 - Positioning of the Force Gauge on the Rudder Pedals

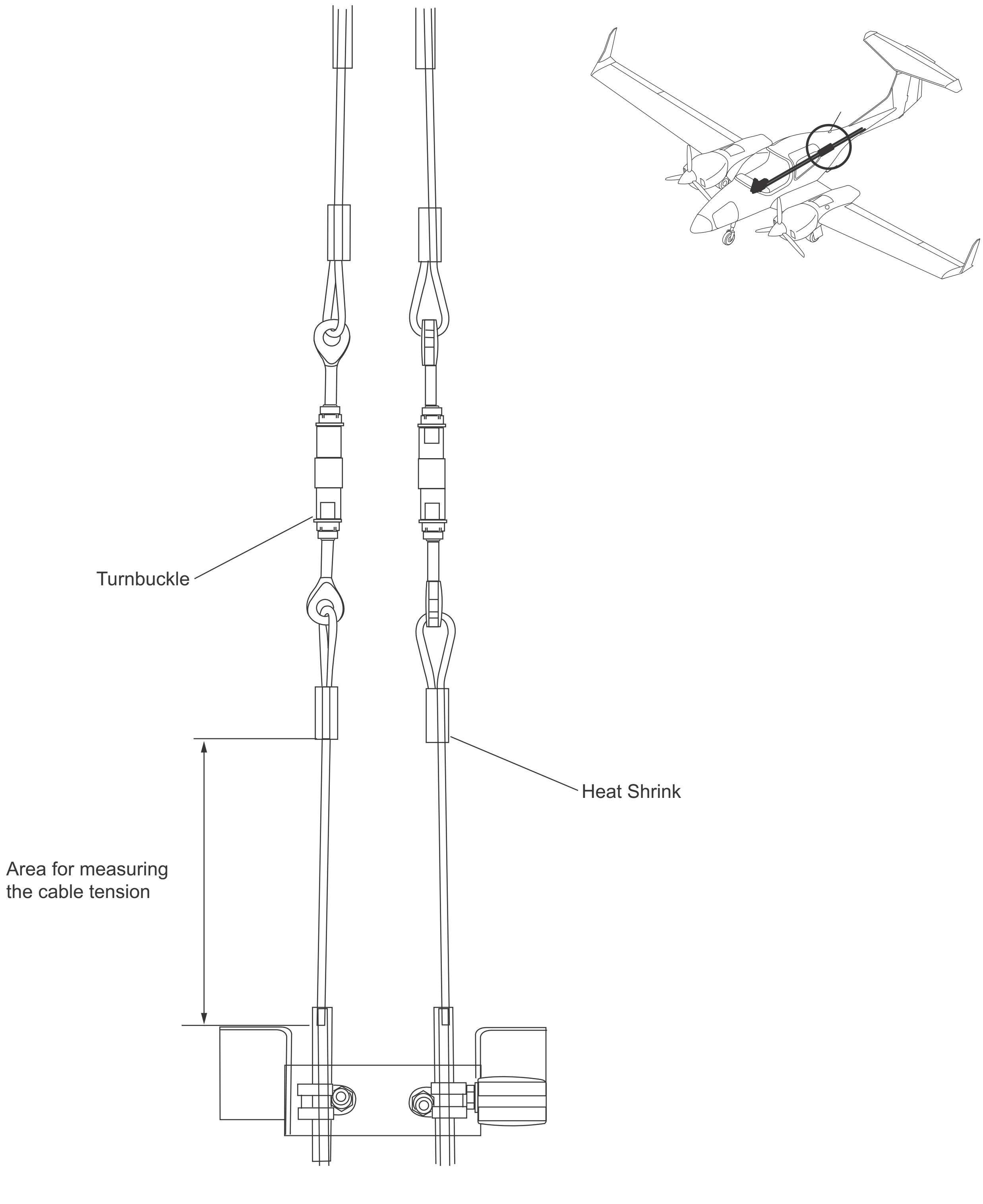


Figure 207 - Area for Measuring Cable Tension

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FLIGHT CONTROLS - RUDDER TRIM

1. General

The DA42 L360 aircraft has a rudder with a trim tab. The rudder trim knob is relocated from the DA42 aircraft between the throttle quadrant and engine fuel transfer/shut off valve in the center console. The pilot uses a rotary button to move the rudder trim tab. The rudder trim control uses a mechanical system to operate a Bowden control cable which connects to the rudder trim tab.

Figure 1 shows the main components of the rudder trim control system.

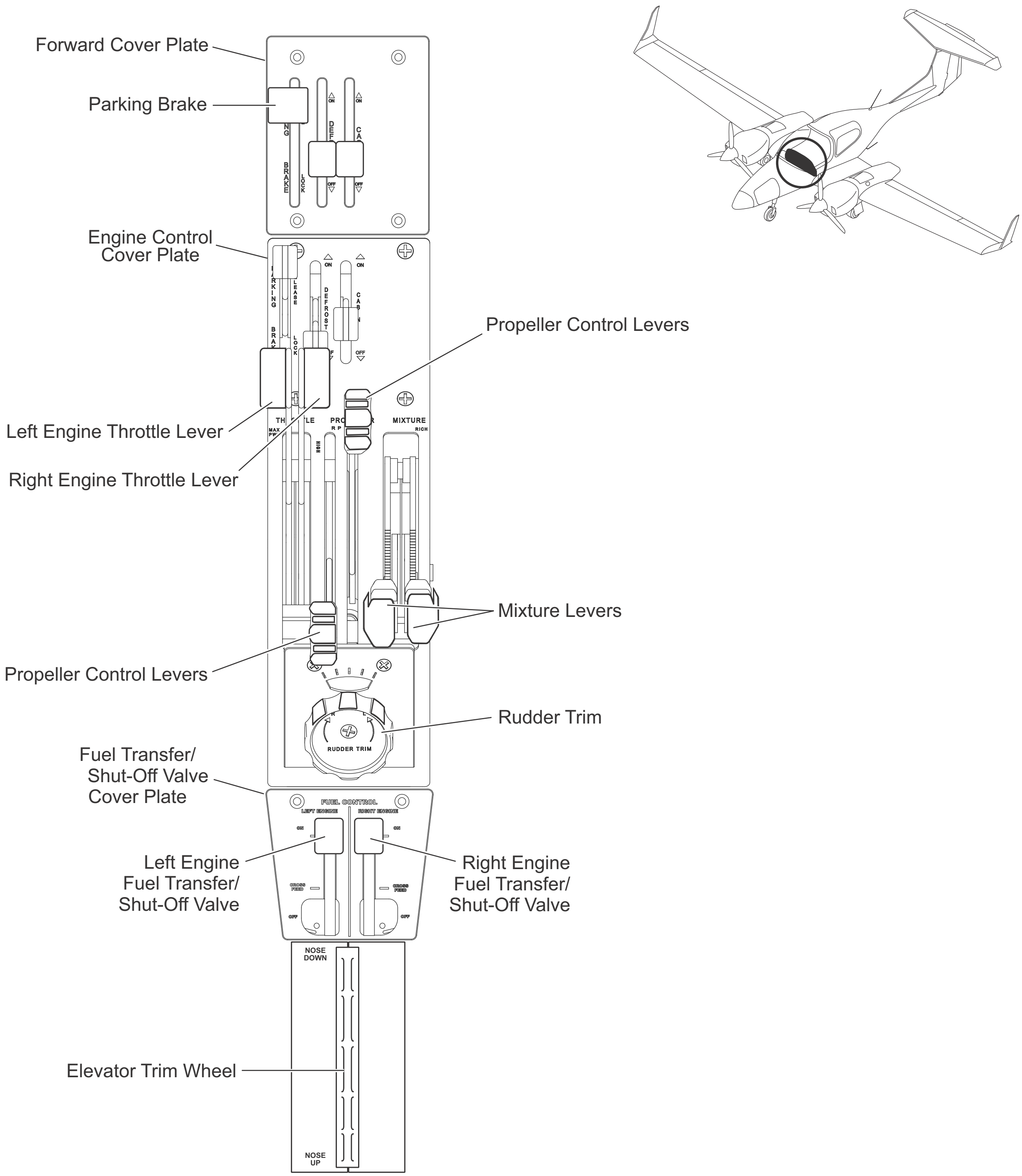

Figure 1 - Rudder Trim

RUDDER TRIM - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to:

- test and adjust the rudder trim damper friction force
- rig the rudder trim.

Refer to AMM # 7.02.01 Chapter 52-40 for data on how to remove/install the rudder.

WARNING: WHEN YOU DO WORK ON THE AIRCRAFT CONTROLS, MAKE SURE THAT THE AREAS AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.

WARNING: WHEN YOU COMPLETE WORK ON THE CONTROLS, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS/TOOLS FROM THAT AREA. LOOSE ITEMS/TOOLS CAN PREVENT FULL MOVEMENT OF THE AIRCRAFT CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

2. Rudder Trim Damper Friction Force - Test and Adjustment

	Detail Steps/Work Items	Key Items/References
1.	Measure the friction force of the rudder trim damper.	Make sure that the friction force is between 3daN and 5daN.
2.	If the friction force exceeds 5daN at the rudder trim friction rod, then do as follows: - Polish the surface of the rudder trim friction rod with an abrasive paper 1000 - If necessary, cut up to 1.5 winds of the pressure springs - Re-measure the friction force of the rudder trim damper.	Refer to Figure 201. Make sure that the friction force is within the allowable limits.

3. Rudder Trim Rigging Procedure

A. Equipment

Item	Quantity	Part Number
Ruler	1	Commercial
Rudder Rigging Template Tool No. D60-5540-00-PL	1	Commercial
Rudder Trim Rigging Template Tool No. D60-5545-00-PL	1	Commercial

B. Rudder Trim Rigging Procedure

	Detail Steps/Work Items	Key Items/References
1.	Make a copy of the Control Surfaces Adjustment Report	Refer to Chapter 06-00. Use it to record the measurements.
	WARNING: WHEN YOU DO WORK ON THE AIRCRAFT CONTROLS, MAKE SURE THAT THE AREAS AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONNEL AND EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.	
2.	Install the rudder rigging template as follows: - Position the rudder rigging template tight against vertical stabilizers leading edge - Place the templates hooked arm on the inboard side of the vertical stabilizers skin - Compress the suction cups to secure the template to the vertical stabilizers skin.	Use DAI tool number D60-5540-00-PL, Rev D. Refer to Figure 201. Refer to item 1 on Figure 201. By the rudder horn cut out. Refer to item 2 on Figure 201. Refer to item 3 on Figure 201.
3.	Install the rudder trim rigging template as follows: - Line up pointer on rigging template with the centre of the rudder trim hinge - Compress the suction cups to secure the template to the vertical stabilizers skin	Use DAI tool number D60-5545-00-PL, Rev D. Refer to item 4 on Figure 202.

	Detail Steps/Work Items	Key Items/References
	- The rudder trailing edge centre line should be located 3 ± 2° to the right in respect to the 0° mark on trim rigging template.	Refer to item 5 on Figure 203.
4.	With the rudder in the neutral position, operate the rudder trim from stop to stop.	
5.	Set the control knob to the neutral position.	
6.	Make sure that the rudder trim tab trailing edge lines up with 0° mark on the rigging template.	If required, make minor adjustments using the trim adjustment knob to obtain the 0° position.
7.	Measure the distance between the rudder trim friction damper and the trim coupler.	If required, adjust the Bowden cable position on control bulkhead support bracket. Refer to Figure 204.
8.	Measure the distance between the rudder trim friction dumper and the rudder trim Bowden cable threaded end.	If required, adjust the Bowden cable position on friction dumper. Refer to Figure 204.
9.	Actuate the rudder trim control knob fully clockwise and measure the rudder trim tab position.	Record the measurement. Verify that the rudder trim Spindle Pivot is against upper spindle mounting bracket.
10.	Make sure that there is a minimum 2 mm clearance between friction dumper and the trim coupler.	Refer to Figure 205.
11.	Actuate the rudder trim control knob fully counterclockwise and measure the rudder trim tab position.	Record the measurement. Verify that the rudder trim Spindle Pivot is against lower spindle mounting bracket.
12.	Make sure that the rudder trim tab range of movement conforms to adjustment report and are equally distributed over RH and LH minimum range with a tolerance of ±0.5°.	Refer to the examples 1 and 2 shown below.
	Example 1: Trim RH (measured) - 32° Limits 30 +5/-0° 32° - 30° = 2° Trim LH (measured) - 31° Limits 29 +5/-0° 31° - 29° = 2° The trim tab range of movement to the left and to the right is 2° over minimum limits. No adjustment required. Proceed to step 15.	

	Detail Steps/Work Items	Key Items/References
	Example 2: Trim RH (measured) - 33° Limits 30 +5/-0° 33° - 30° = 3° Trim LH (measured) - 29° Limits 29 +5/-0° 29° - 29° = 0° The trim tab range of movement to the right is 3° over minimum limit. Range of movement to the left is at minimum limit. Rudder trim tab require adjustment. Proceed to step 13.	
13.	If the rudder trim tab range of movement does not conform to above specified requirements, adjust the rudder trim tab control system as follows: - Calculate the delta range as follows:	
	$\frac{\text{(Measured Range RH + Measured Range LH) - (Min. Limit RH + Min. Limit LH)}}{2}$	
	- Calculate the required range of movement by adding the delta range to the minimum limits	30° - for RH and 29° - for LH. Refer to example 3 shown below.
	Example 3: Trim RH (measured) - 33° Limits 30 +5/-0° 33° - 30° = 3° Trim LH (measured) - 29° Limits 29 +5/-0° 29° - 29° = 0° Delta Range = $\frac{(33°+29°) - (30°+29°)}{2}$ = 1.5° Calculated Range RH = 30° + 1.5° = 31.5°. Calculated Range LH = 29° + 1.5° = 30.5°.	
14.	Adjust the rudder trim control system to range of travel calculated in step 13 as follows: - Make sure that rudder is in neutral position - Operate the rudder trim control knob fully clockwise and then counter-clockwise - Remove the bolts that attach operating rods to trim tab levers	

	Detail Steps/Work Items	Key Items/References
	- Loosen the locknut on the lower operating rod end fitting - Screw the end fitting in/out to achieve RH range of movement calculated in step 13 - Reinstall the lower operating rod to trim tab lever - Adjust the end fitting on the top operating rod until the end fitting aligns with trim tab lever - Reinstall the top operating rod to trim tab lever - Tighten the jam nuts on end fittings of both operating rods - Do the rudder trim tab control system test for correct range of movement with the rudder in neutral position.	The range of movement must meet the limitations calculated in step 13.
15.	Do the rudder trim tab control system test for correct range of movement.	Record the measurements.

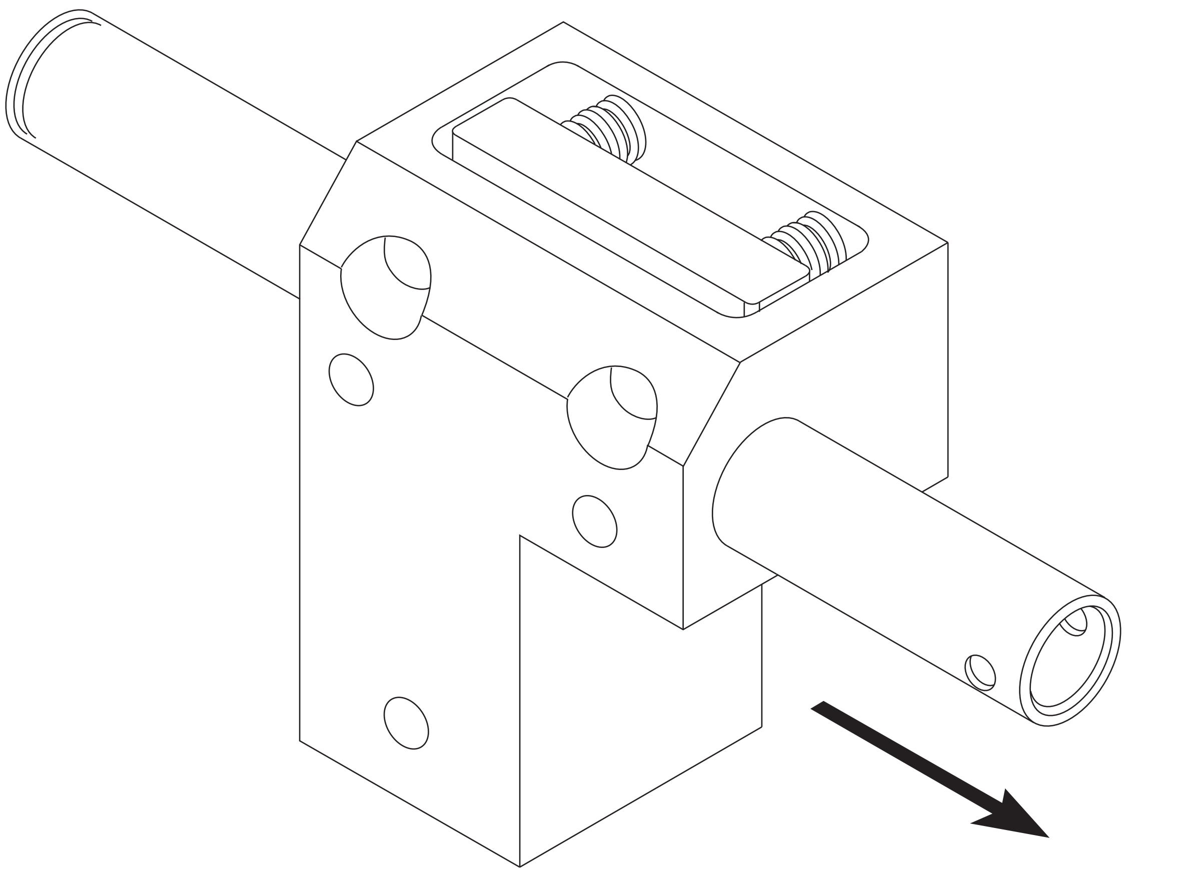

Figure 201 - Rudder Trim Damper Friction Force - Test and Adjustment

Figure 202

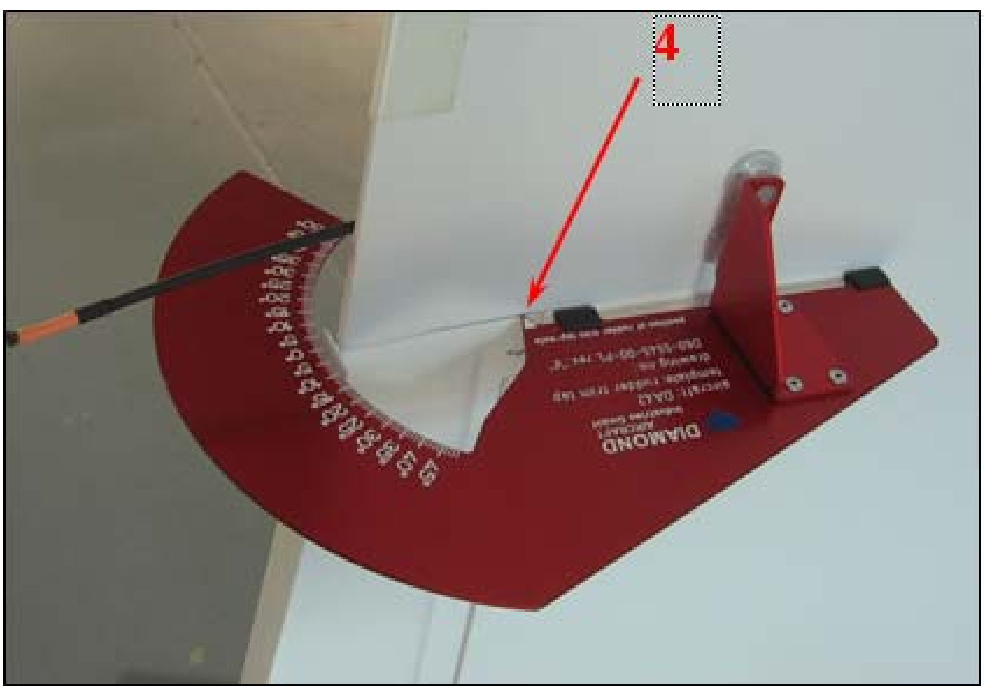

Figure 203

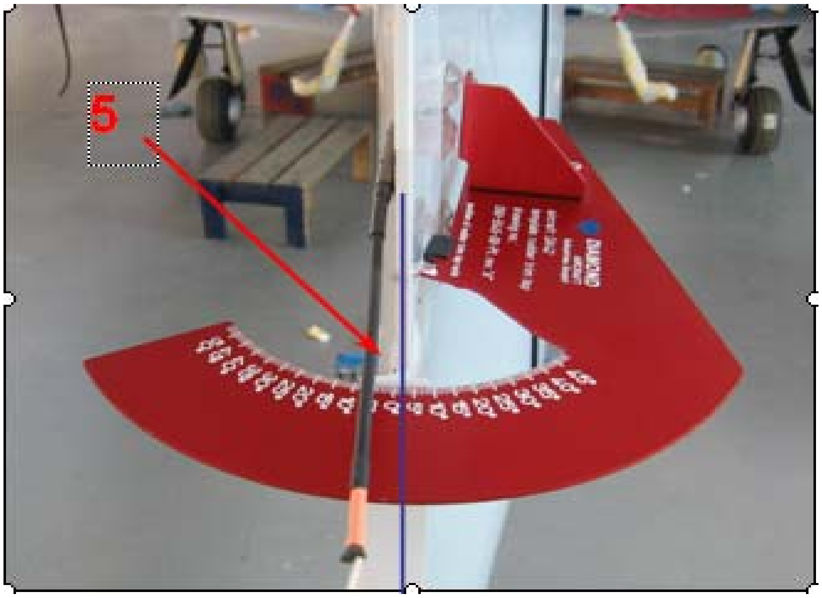

Figure 204

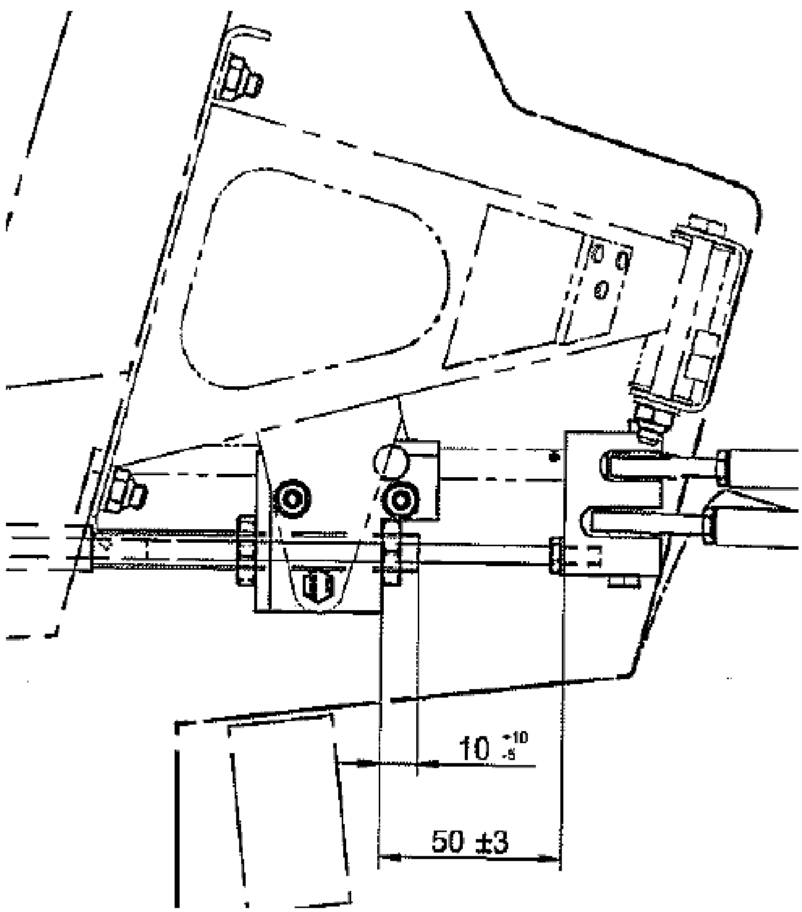

Figure 205

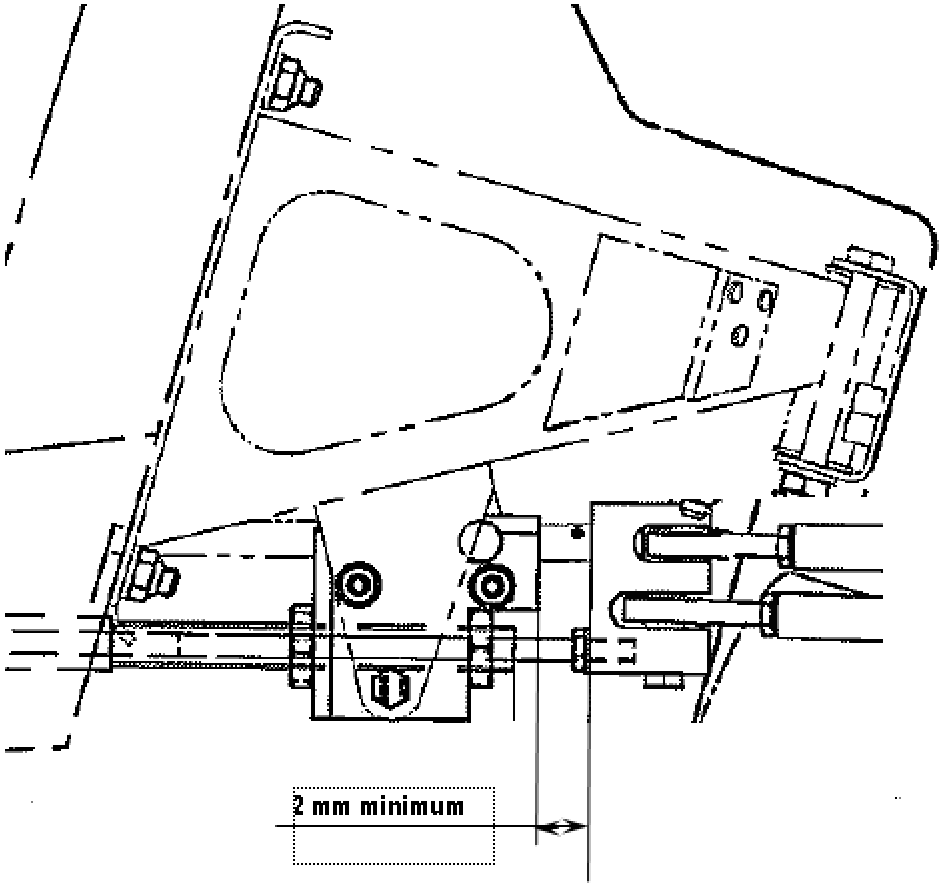

Figure 206

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FLIGHT CONTROLS - ELEVATOR

1. General

The DA42 L360 aircraft has the usual elevator control system. An elevator attaches to the horizontal stabilizer gives longitudinal control of the airplane. Two control sticks operate the elevator. The DA42 L360 aircraft has a mechanically operated elevator trim system.

2. Description

The basic elevator control system has not changed from the original DA 42 with the diesel engines and information contained in AMM # 7.02.01 still applies except for the following:

The DA42 L360 is equipped with an electrically operated actuator that limits the elevator up travel to 13 degrees as soon as the power setting of both engines exceeds 14.5 inHg at sea level with the flaps up. This is 2.5 degrees less than the 15.5 degrees full deflection. When the power of both engines is reduced below 14.5 inHg, or if the Flaps are set to APP or LDG, the elevator stop will disengage and full elevator deflection is regained. The elevator stop will not engage if the Flaps are in the APP or LDG position. The linear actuator acts as a movable stop and is controlled by position switches, on the throttle and flap switch.

An amber STICK LIMIT caution is provided on the PFD to inform the pilot in case a malfunction is present. The STICK LIMIT caution appears when the variable elevator stop should be in place and is actually not activated (power ON condition) or should be retracted and actually limits the elevator travel (power OFF condition). The annunciation circuitry is not operative when one power lever is positioned Above 14.5 inHg power setting, while the other is below or in idle position (engine failure or training) or when the flaps are not in the UP position. Figure 1 shows the stick limiter.

3. Operation

If you move the control stick forward:

- The torque tube assembly turns
- The lever below the torque tube assembly pushes the short push-rod aft
- The short push-rod pushes the long push-rod aft
- The long push-rod pushes the aft bellcrank rearward
- The bellcrank pushes the vertical push-rod up
- The vertical push-rod moves the front of the elevator horn upwards
- The elevator moves down.

If you move the control stick aft:

- The torque tube assembly turns
- The short and long push-rods move forward
- The bellcrank pulls the vertical push-rod downwards
- The elevator moves up.

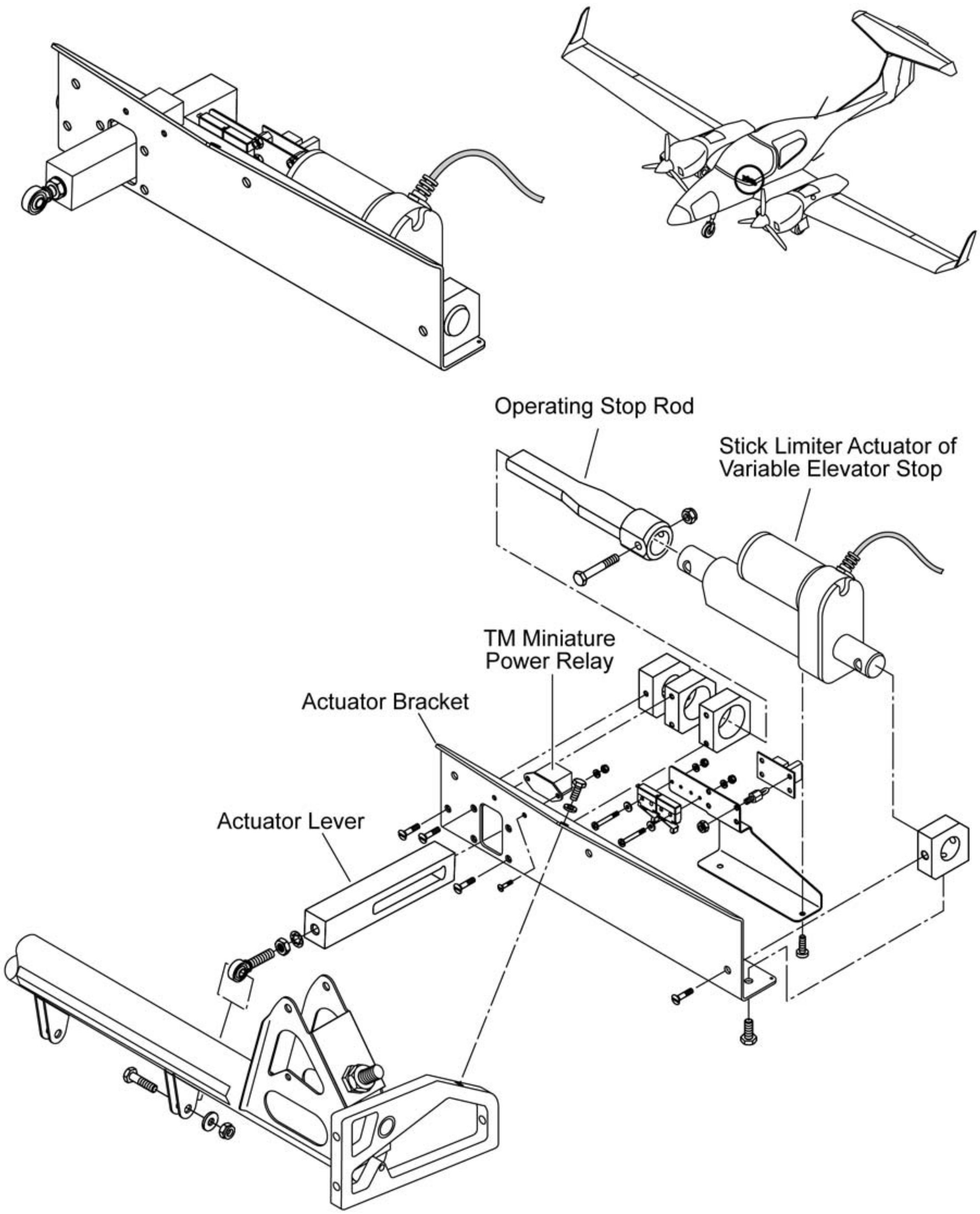

Figure 1 - Stick Limiter

ELEVATOR - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to do test procedures on the elevator control system. They also describe how to adjust the elevator control system. Refer to AMM # 7.02.01 Chapter 55-20 for data on how to remove/install the elevator. Refer to AMM # 7.02.01 Chapter 27-38 and Chapter 27-39 for data about the elevator trim systems.

WARNING: WHEN YOU DO WORK ON THE AIRCRAFT CONTROLS, MAKE SURE THAT THE AREAS AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OF PERSONS/EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONS AND DAMAGE TO CONTROL SURFACES CAN OCCUR.

WARNING: WHEN YOU COMPLETE WORK ON THE CONTROLS, MAKE SURE THAT YOU REMOVE ALL LOOSE ITEMS/TOOLS FROM THAT AREA. LOOSE ITEMS/TOOLS CAN PREVENT FULL MOVEMENT OF THE AIRCRAFT CONTROLS. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

2. Elevator Control System Test for Correct Range of Movement

A. Equipment

Item	Quantity	Part Number
Rigging Pin	1	-
Ruler or deflection gauge	1	Commercial
Fuselage Trestle	1	Commercial

B. Elevator Control Test Procedure

NOTE: If you use a deflection gauge, make sure that the airplane does not move in pitch during the test procedure. It will cause errors in the test.

	Detail Steps/Work Items	Key Items/References
1.	Make a copy of the Control Surfaces Adjustment Report	Refer to Chapter 06-00. Use it to record the measurements.
2.	If you will use a deflection gauge, put a trestle under the rear fuselage.	To prevent the movement in pitch.
3.	Remove the left pilot’s seat.	Refer to AMM # 7.02.01 Chapter 25-10.
4.	Install the rigging pin through the stick mounting block and the torque tube.	Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
NOTE: Use a ruler or deflection gauge to make all measurements at the elevator control surface. Make the measurements between the top surface of the trailing edge of the horizontal stabilizer and the top surface of the elevator.		
5.	Make sure that the elevator aligns with the horizontal stabilizer.	At the stabilizer tips.
6.	Measure the distance between the top surface of the trailing edge of the horizontal stabilizer and the top surface of the elevator.	Record the measurement.
7.	Remove the rigging pin from the stick mounting block.	
WARNING: WHEN YOU DO WORK ON THE AIRPLANE CONTROLS, MAKE SURE THAT THE AREA AROUND THE CONTROLS/CONTROL SURFACES ARE CLEAR OR PERSONS/EQUIPMENT. IF YOU DO NOT DO THIS, INJURY TO PERSONNEL AND DAMAGE TO CONTROL SURFACES CAN OCCUR.		
8.	Move the control stick fully forward and hold it against the stop.	
9.	Measure the distance between the top surface of the trailing edge of the horizontal stabilizer and the top surface of the elevator.	Record the measurement. The distance must be as shown in the Control Surfaces Adjustment Report.
10.	Move the control stick fully aft and hold it against the stop.	
11.	Measure the distance between the top surface of the trailing edge of the horizontal stabilizer and the top surface of the elevator.	Record the measurement. The distance must be as shown in the Control Surfaces Adjustment Report.
12.	Install the left pilot’s seat.	Refer to AMM # 7.02.01 Chapter 25-10.
13.	If necessary, remove the trestle from under the rear fuselage	

3. Elevator Control System Adjustments

If you cannot get the correct range of movements of the elevator control system, use this procedure to adjust the system. Gust travel refers to the amount of travel remaining at the control surface with the control stick held against the cockpit stop.

WARNING: IF YOU DO AN ADJUSTMENT OF A PUSH-ROD, MAKE SURE THAT THE PUSH-ROD IS STILL IN SAFETY. IF YOU DO NOT DO THIS, THE PUSH-ROD CAN DISCONNECT. THIS CAN CAUSE DEATH OR INJURY TO PERSONNEL

A. Equipment

Item	Quantity	Part Number
Ruler or deflection gauge	1	Commercial
Rigging Pins	3	-

B. Elevator Control Adjustment Procedure

	Detail Steps/Work Items	Key Items/References
1.	Remove the following items for access: - Pilots' Seats - The Rudder.	 Refer to AMM # 7.02.01 Chapter 25-10. Refer to AMM # 7.02.01 Chapter 55-40.
2.	Install the rigging pins in the following: - Through the stick mounting block and the torque tube. - Idle lever. - The rear bell crank.	 On the control bulkhead. On the front main bulkhead. On the vertical stabilizer rear web.
3.	If you cannot put a rigging pin into a lever or bellcrank, adjust the push-rods as necessary.	Refer to AMM # 7.02.01 Chapter 27-00 for the push-rod adjustment procedure.
4.	Make sure that the elevator aligns with the horizontal stabilizer.	At the stabilizer tips.
5.	If the elevator does not align with the horizontal stabilizer, adjust the vertical push-rod at the rear bellcrank.	Refer to AMM # 7.02.01 Chapter 27-00 for the push-rod adjustment procedure.

	Detail Steps/Work Items	Key Items/References
6.	Remove the rigging pins from the following:	
	- The stick mounting block and the torque tube	On the control bulkhead.
	- Idle lever	On the front main bulkhead.
	- The rear bell crank.	On the vertical stabilizer rear web.
7.	Do a test for the correct range of elevator movement.	Refer to Paragraph 2.
8.	Do an inspection of all the controls that you have adjusted. If necessary for your airworthiness authority, do a duplicate inspection of the controls.	
9.	Install the following items:	
	- Pilots' Seats	Refer to AMM # 7.02.01 Chapter 25-10.
	- The rudder.	Refer to AMM # 7.02.01 Chapter 55-40.

C. Elevator Angle Limits Table

Elevator Position	Elevator Deflection Indicator Angle Limits	Protractor Angle Limits
Upper Limit	15.5° ± 0.5°	15.5° ± 0.5° (- 6.5°)
Horizontal Position	0°	6.5°
Lower Limit	13° ± 1°	13° ± 1° (+ 6.5°)

4. Remove/Install the Variable Elevator Stop Assembly

A. Remove the Variable Elevator Stop Assembly

	Detail Steps/Work Items	Key Items/References
1.	Remove the LH Pilot's seat.	Refer to AMM # 7.02.01 Chapter 25-10.
2.	Open the GEAR WRN/ELEV.LIMIT circuit breaker.	On the right side of the instrument panel.

	Detail Steps/Work Items	Key Items/References
3.	Remove the variable elevator stop assembly: - Disconnect the three inline connectors from the power levers - Release the bolt that attaches the actuator lever adjustable fitting to the torque tube assembly - Remove the four bolts, the washers and the nuts that attach the assembly bracket to the control bulkhead - Move the variable elevator stop assembly clear of the pilot's compartment.	 Socket outlet and plug within the variable elevator stop assembly. Refer to Figure 201 and Figure 203.

B. Install the Variable Elevator Stop Assembly

	Detail Steps/Work Items	Key Items/References
1.	Install the variable elevator stop assembly: - Put the variable elevator stop assembly into position on the control bulkhead - Install the four bolts, the washers and the nuts that attach the assembly bracket to the control bulkhead - Install the bolt which attaches the actuator lever adjustable fitting to the torque tube assembly - Connect the three inline connectors to the power levers.	Refer to Figure 201 and Figure 203. Socket outlet and plug within the variable elevator stop assembly
2.	Close the GEAR WRN/ELEV.LIMIT circuit breaker.	On the right side of the instrument panel.
3.	Do an operational test.	Refer to paragraph 6.
4.	If necessary, adjust the actuator lever.	Refer to AMM # 7.02.01 Chapter 27-00.
5.	Install the LH Pilot’s seat.	Refer to AMM # 7.02.01 Chapter 25-10.

5. Test/Adjust the Variable Elevator Stop

A. Equipment

Item	Quantity	Part Number
Ruler or deflection gauge	1	Commercial

B. Variable Elevator Stop Test/Adjustment Procedure

NOTE: If you use a deflection gauge, make sure that the aircraft does not move in pitch during the test procedure. It will cause errors in the test.

	Detail Steps/Work Items	Key Items/References
1.	If you will use a deflection gauge, put a trestle under the rear fuselage	To prevent movement in pitch.
2.	Set the ELECT MASTER to ON.	Refer to Chapter 24-00.
3.	Position both throttle levers approximately beyond the 20% power level, while flaps in LDG position.	
4.	Continue according to the elevator control test procedure.	Refer to Paragraph 2. Required upward deflection: 13 ± 0.5 degrees (51 mm ± 2 mm).
5.	If necessary adjust the actuator lever.	Refer to AMM # 7.02.01 Chapter 27-00.
6.	Do an operational test of the STICK LIMIT caution message.	Refer to paragraph 7.
7.	Set the ELECT MASTER to OFF.	Refer to Chapter 24-00.

6. Operational Test of the Variable Elevator Stop

	Detail Steps/Work Items	Key Items/References
1.	Remove pilot's seat.	Refer to AMM # 7.02.01 Chapter 25-10.
2.	Connect the aircraft battery.	Refer to AMM # 7.02.01 Chapter 24-31.
3.	Set the ELECT MASTER to ON.	Refer to Chapter 24-00.
3.	Set the Flaps to the UP position and move the THROTTLE levers full forward.	The stick limiter should engage and move the stick limiter actuator slightly to the right.
4.	Move the THROTTLE to the full back position.	The stick limiter should disengage and move the stick limiter actuator slightly to the left.
5.	Move the THROTTLE levers full forward again.	The stick limiter should engage and move the stick limiter actuator slightly to the right.
6.	Once the stick limiter is engaged, select the Flaps to the APP position.	The stick limiter should disengage and move the stick limiter actuator slightly to the left.
7.	Cycle the THROTTLE levers full forward and back.	The stick limiter should not engage.
8.	Set the Flaps to the LDG position.	
9.	Cycle the THROTTLE levers full forward and back.	The stick limiter should not engage.
10.	Move the THROTTLE levers full forward and set the Flaps to the UP position.	The stick limiter should engage and move the stick limiter actuator slightly to the right.
11.	Move the THROTTLE levers to the IDLE position.	
12.	Set the ELECT MASTER to OFF.	Refer to AMM Chapter 24-00.
NOTE: Activation of the limiter should occur at a power lever setting that will give 14.5 ± 0.5 inHg (368.3 ± 12.7 mmHg) MP. This should be checked with engines running after the operational test. Refer to maintenance check flight on ground check in Chapter 05-20.		

7. Operational Test of the STICK LIMIT Caution Message

	Detail Steps/Work Items	Key Items/References
1.	Remove the Pilots' seat.	Refer to AMM # 7.02.01 Chapter 25-10.
2.	Set the ELECT MASTER to ON.	Refer to Chapter 24-00.
3.	Set both throttle levers to IDLE.	To test the system in the de-activated configuration.
4.	Connect pin "A" on the printed circuit (PC) board installed on the flap actuator assembly to the electrical ground.	Refer to AMM # 7.02.01 Chapter 92 for the wiring diagram of the variable elevator stop (stick limiter).
5.	The STICK LIMIT caution message must appear on the G1000 PFD after 6 seconds.	
6.	Remove ground connection from pin "A".	
7.	Set both throttle levers at approximately halfway position.	To test the system in the activated configuration.
8.	Connect pin "D" on the printed circuit (PC) board installed on the flap actuator assembly to the electrical ground.	Refer to AMM # 7.02.01 Chapter 92 for the wiring diagram of the variable elevator stop (stick limiter).
9.	The STICK LIMIT caution message must appear on the G1000 PFD after 6 seconds.	
10.	Remove ground connection from pin "D".	
11.	Set the ELECT MASTER to OFF.	Refer to Chapter 24-00.
12.	Install the Pilots' seat.	Refer to AMM # 7.02.01 Chapter 25-10.

8. Rigging Procedure for the Elevator Variable Stop Micro Switch

NOTE: The procedure for the LH variable stop micro switch is given. The rigging procedure for the RH variable stop micro switch is similar, using the RH engine.

	Detail Steps/Work Items	Key Items/References
1.	Apply masking tape to the throttle quadrant cover plate on the left hand side of the LH (RH) throttle lever.	Refer to Figure 204.
2.	Start the LH (RH) engine.	Refer to D42 L360 Airplane Flight Manual (AFM).
3.	Set the LH (RH) throttle lever to achieve idle RPM.	Refer to Figure 205.
4.	Push the throttle lever slowly forward until a manifold pressure of 14.5 ± 0.5 inHg is indicated.	
5.	Mark the masking tape in line with the front edge of the throttle lever.	Refer to Figure 206.
6.	Shut down the LH (RH) engine.	Refer to the D42 L360 AFM.
7.	Remove the pilots' and co-pilot's seats.	Refer to AMM # 7.02.01 Chapter 25-10.
8.	Remove the carbon inlays from both sides of the interior trim floor panels by gently prying them off.	Refer to Figure 207.
9.	Remove the interior trim floor panels as follows: - Remove the six mounting screws (three on each side).	
10.	Locate the elevator variable stop micro switch on the throttle lock plate.	
NOTE: The elevator variable stop micro switch and the landing gear micro switch are both mounted on the throttle lock plate. The elevator variable stop micro switch has 3 wires attached to the contacts while the landing gear micro switch has 2 wires attached to the contacts. Refer to Figure 208.		
11.	Adjust the elevator variable stop micro switch so that it engages when the front edge of the throttle lever aligns with the mark on the masking tape: - Loosen the two mounting screws while holding the locknuts	Refer to step 5.

	Detail Steps/Work Items	Key Items/References
	- Slide the micro switch to the desired location - Tighten the screws.	
NOTE: Do not bend the micro switch arm to achieve proper engagement. If necessary, remove the micro switch and extend the slots up to 1 mm each to allow proper positioning of the micro switch.		
12.	Clear the area and remove all unwanted materials.	
13.	Install the interior trim floor panels as follows: - Install the six mounting screws (three on each side).	
14.	Apply a silicone sealant/adhesive in three locations on the back of the carbon inlays	
15.	Install the carbon inlays on both sides of the interior trim floor panels by pressing them firmly in place.	
16.	Install the pilot's and co-pilot's seats.	Refer to AMM # 7.02.01 Chapter 25-10.
17.	Do a functional check of the micro switch:	
	- Start the LH (RH) engine	Refer to the D42 L360 AFM.
	- Set the throttle lever to achieve idle RPM	
	- Push the throttle lever slowly forward until a manifold pressure of 14.5 ± 0.5 inHg is indicated.	Make sure that the micro switch engages when a manifold pressure of 14.5 ± 0.5 inHg is indicated. The control column will move when the micro switch engages.
18.	Shut down the LH engine.	Refer to the D42 L360 AFM.

9. Elevator Pushrod Access

Elevator Push-Rod	Remove/Install Access	References
Between the control torque tube and the idler lever at the front main bulkhead.	Pilots' seats	Refer to AMM # 7.02.01 Chapter 25-10.
Between the idler lever at the front main bulkhead and the bellcrank at the vertical stabilizer rear web.	Pilots' seats Rudder	Refer to AMM # 7.02.01 Chapter 25-10. Refer to AMM # 7.02.01 Chapter 55-40.
Between the bellcrank at the vertical stabilizer rear web and the elevator.	Rudder	Refer to AMM # 7.02.01 Chapter 55-40.

10. Elevator Bellcrank and Lever Access

Elevator Pushrod	Remove/Install Access	References
Idler lever at the front main bulkhead	Pilots' seats	Refer to AMM # 7.02.01 Chapter 25-10.
Bellcrank at the vertical stabilizer rear web.	Rudder	Refer to AMM # 7.02.01 Chapter 55-40.

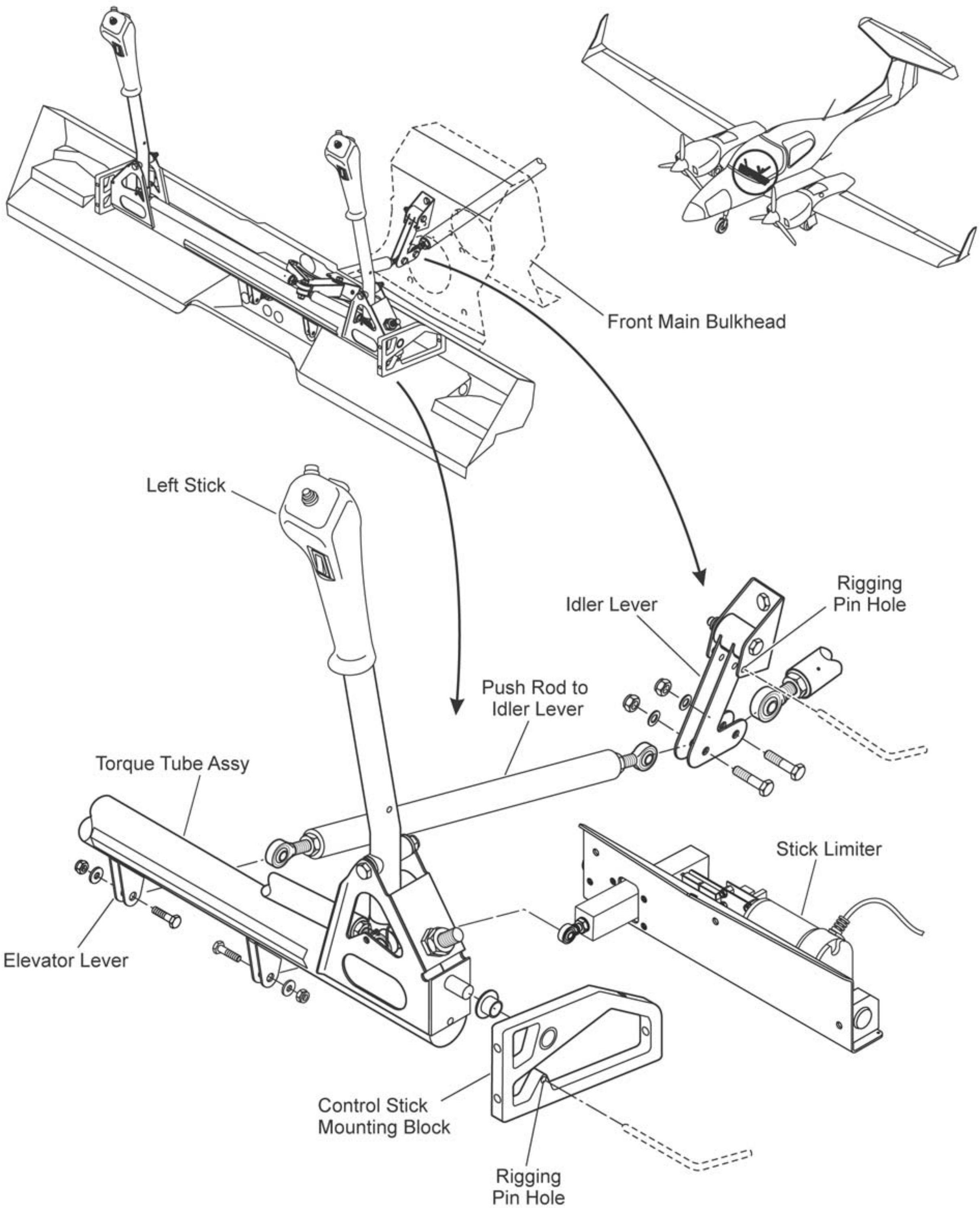

Figure 201 - Elevator Control Installation in the Cockpit

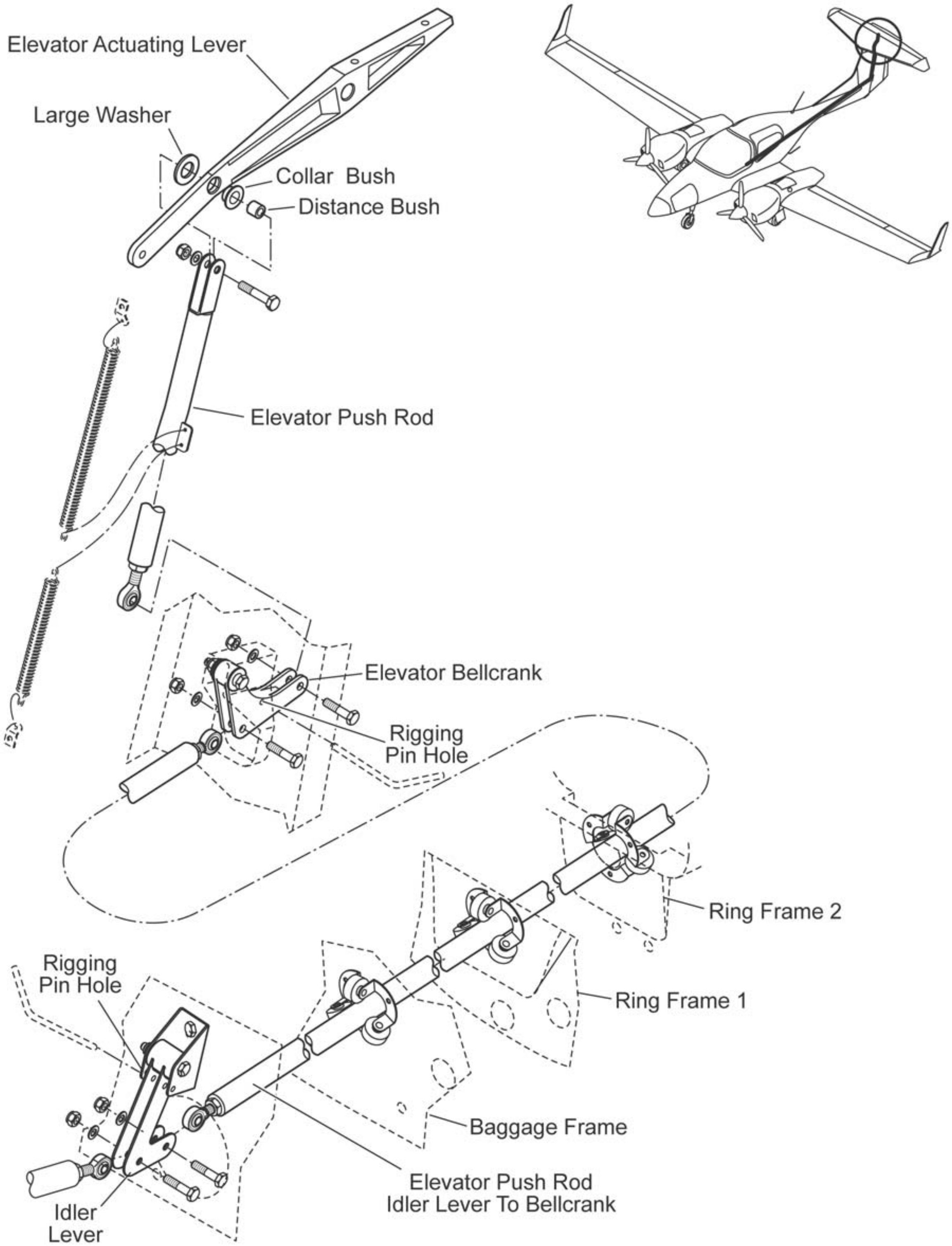

Figure 202 - Elevator Controls in the Rear Fuselage

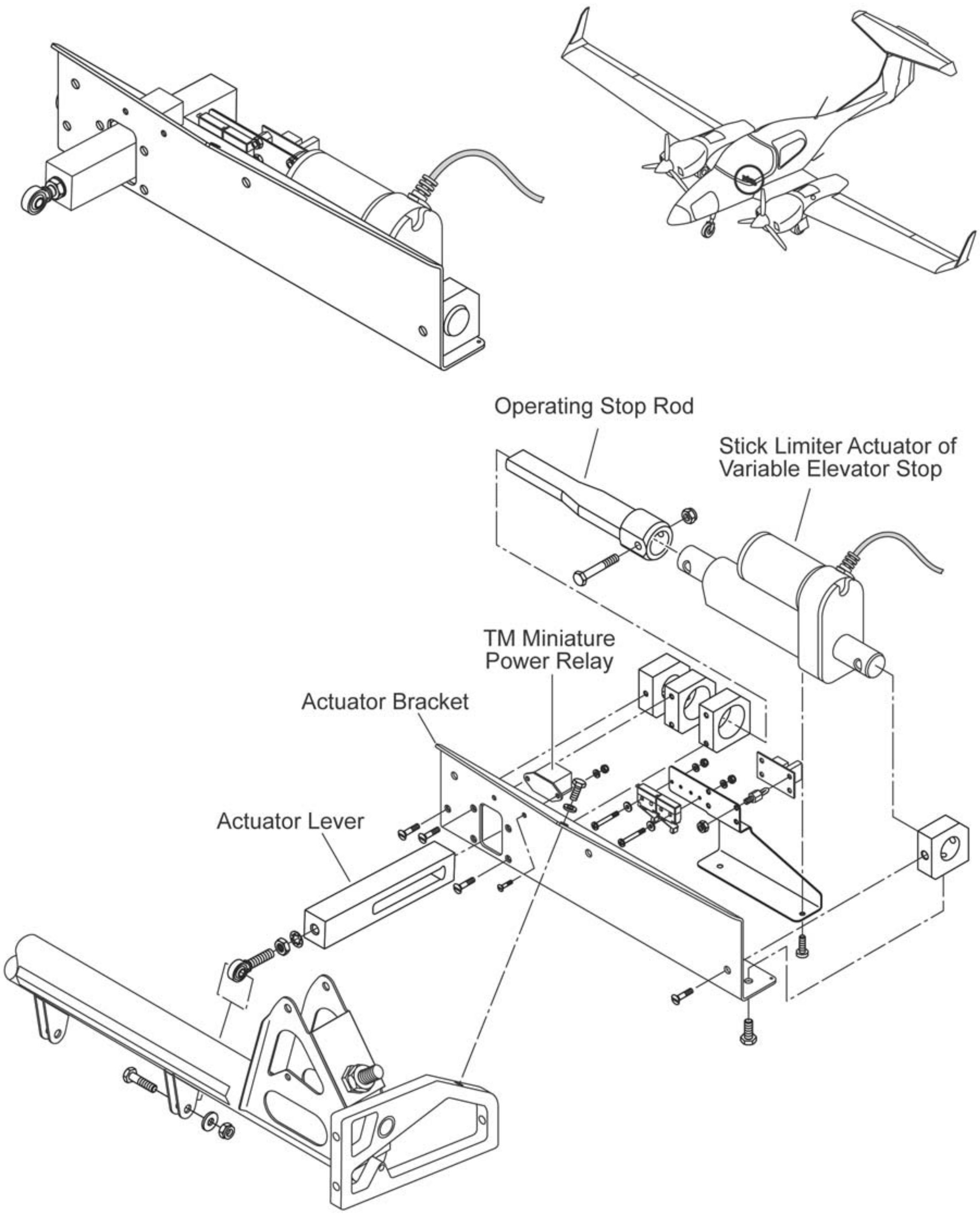

Figure 203 - Stick Limiter

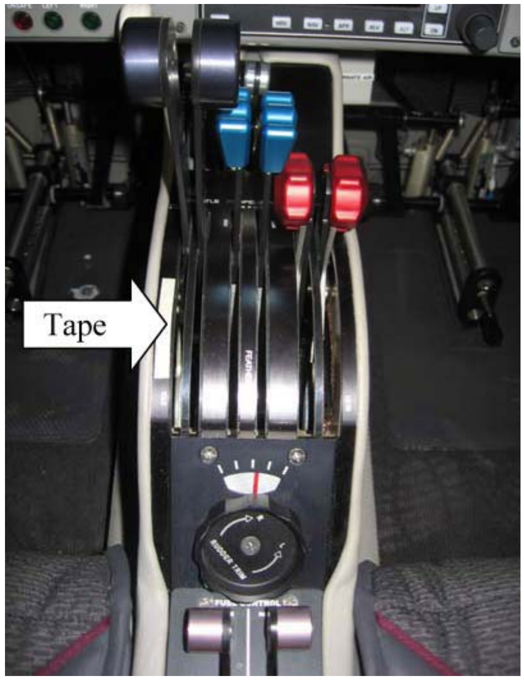

Figure 204 - Masking Tape applied to the Throttle Quadrant Cover Plate. Throttle Lever positioned at 16+ inHg

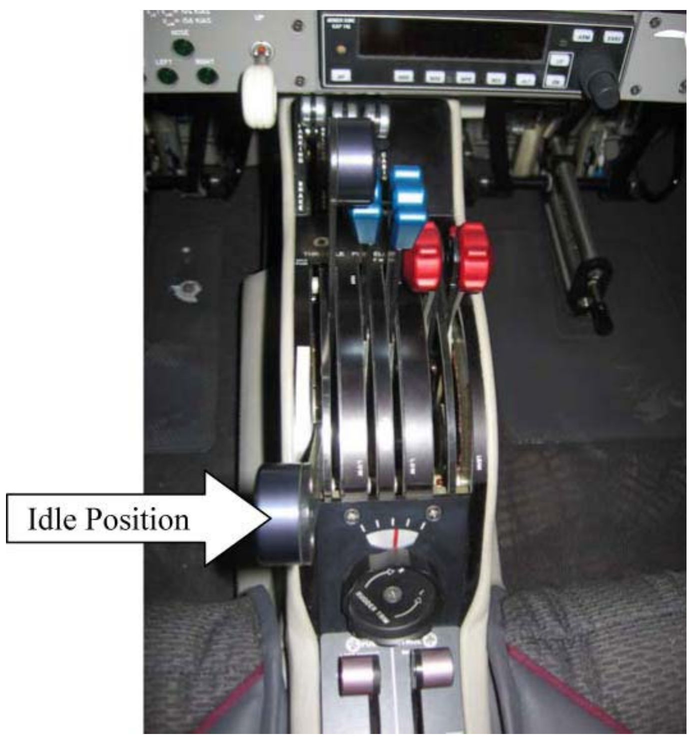

Figure 205 - LH Throttle Lever set to achieve Idle RPM

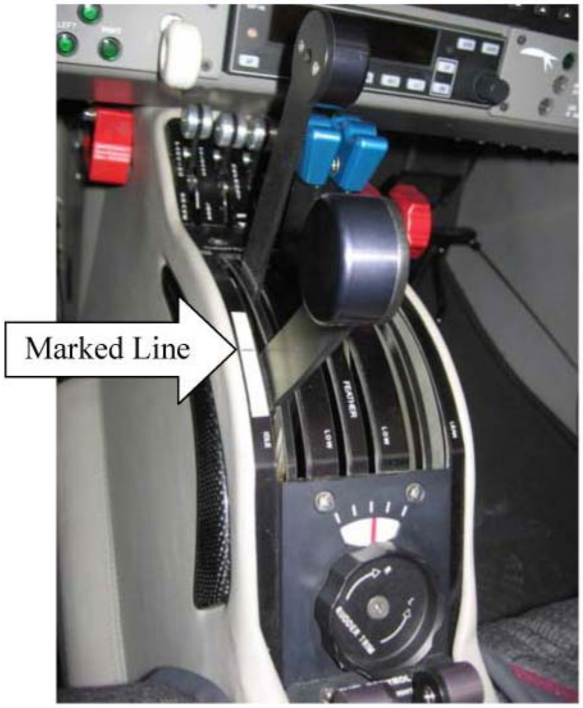

Figure 206 - Marking the Front Edge of the Throttle Lever

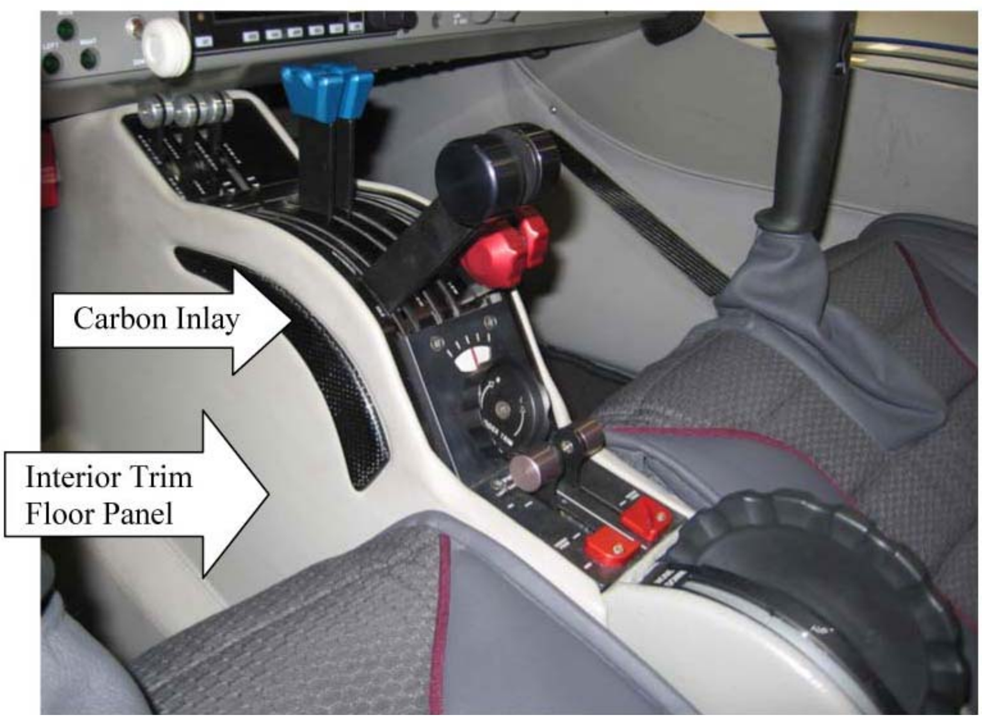

Figure 207 - Carbon Inlay and Interior Trim Floor Panel

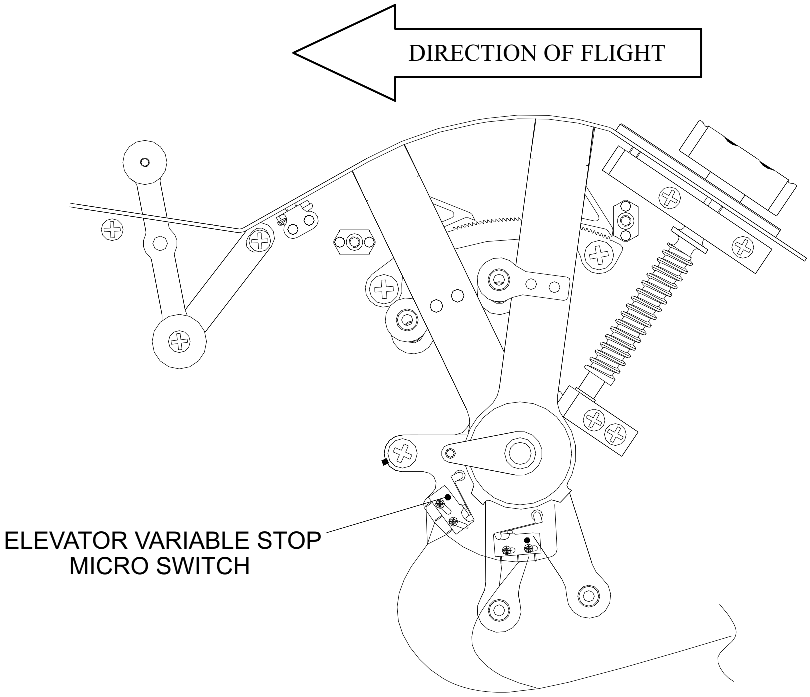

Figure 208 - Elevator Variable Stop Micro Switch Location

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FLAPS - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to replace the flap indicator lights lamp. Refer to AMM # 7.02.01 Chapter 27-50 for data about the flap systems.

2. Replacement of Flap and Landing Gear Indication Lights Lamp

NOTE: The flap and landing gear lights are polarity sensitive and therefore a functional test of the lights should be carried out after installation of the lamp to make sure that the lamp is installed correctly.

	Detail Steps/Work Items	Key Items/References
1.	Replace the lamp for the flap and landing gear indication lights as follows: - Remove the lens cap - Pull out the existing lamp - Install the LED lamp	
2.	Do a functional check of the lamp as follows: - Turn the power on - If the light does not come on, turn the power off and remove the LED lamp - Rotate the lamp 180 degress and install again - Turn the power on	 Make sure that the light comes on. Make sure that the light comes on.
3.	Turn the power off and install the lens cap.	

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CHAPTER 28-00
FUEL

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FUEL - DESCRIPTION AND OPERATION

1. General

This chapter describes the:

- DA42 L360 aircraft fuel system
- Fuel system from the fuel tanks to the engine fuel filter.

For more data on the engine fuel system refer to Aircraft Maintenance Manual (AMM) Chapter 73-00.

2. Description

The DA42 L360 aircraft has a fuel tank assembly in each wing. Each fuel tank assembly has an approximate capacity of 26 US Gals (98.4 liters) AVGAS 100 or 100LL. Each engine nacelle has an optional auxiliary fuel tank which has an approximate capacity of 13.7 US Gals (52 liters) AVGAS 100 or 100LL. The optional auxiliary fuel tanks supply fuel to the main wing fuel tanks by an electrical fuel transfer pump. Two fuel transfer switches in the cockpit are used to activate the fuel transfer pump. Also, fuel level switches shut the transfer pump off when the main tank is full or the auxiliary tank is empty. From the main wing tank, fuel is supplied to the engine through the engine fuel pump. The DA42 L360 aircraft fuel system is also provided with a cross feed line which allows the pilot to select the engine fuel feed among the two main wing tanks to alleviate imbalance or maximize range in case of an engine failure. Two levers positioned in the center console control two selector valves. The selector valves are located in each wing nacelle behind the engine firewall, minimizing the fuel volume between the shut off valve and the engine. The selector valve can be placed either to ON, CROSS FEED or OFF.

NOTE: Although AVGAS 100 LL is a better choice of fuel because the lower lead content reduces both the combustion chamber deposits as well as the spark plug deposits, the Lycoming (L) IO-360-M1A engine is approved by Lycoming to run on AVGAS 100 meeting ASTM D910 specifications.

A fuel transfer/shut-off valve at each engine firewall can be operated by the pilot to shut-off the fuel supply to each engine. Fuel is supplied to the engine driven fuel pump. Fuel level sensors in the inboard and outboard chambers of each fuel tank assembly give fuel quantity data which is displayed on the multi-function display screen of the integrated cockpit system (ICS). Refer to Chapter 73-00 for more data on the engine fuel system.

NOTE: Equipment which is certified for installation in the DA42 L360 aircraft is listed in Chapter 6.5 of the Airplane Flight Manual (AFM). Such equipment may be installed in accordance with the AMM.

NOTE: Any equipment which is not listed in Chapter 6.5 of the AFM is called "Additional Equipment". The installation of additional equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin (SB).

3. Operation

A. Electrical Boost Pump

A Dukes electrical fuel pump model 5100-00-9 is installed to prime the engine fuel system prior engine start up and for emergency. In the eventuality the primary engine driven mechanical fuel pump fails, the electrical fuel pump can be used to provide the required flow and pressure as specified by the engine manufacture.

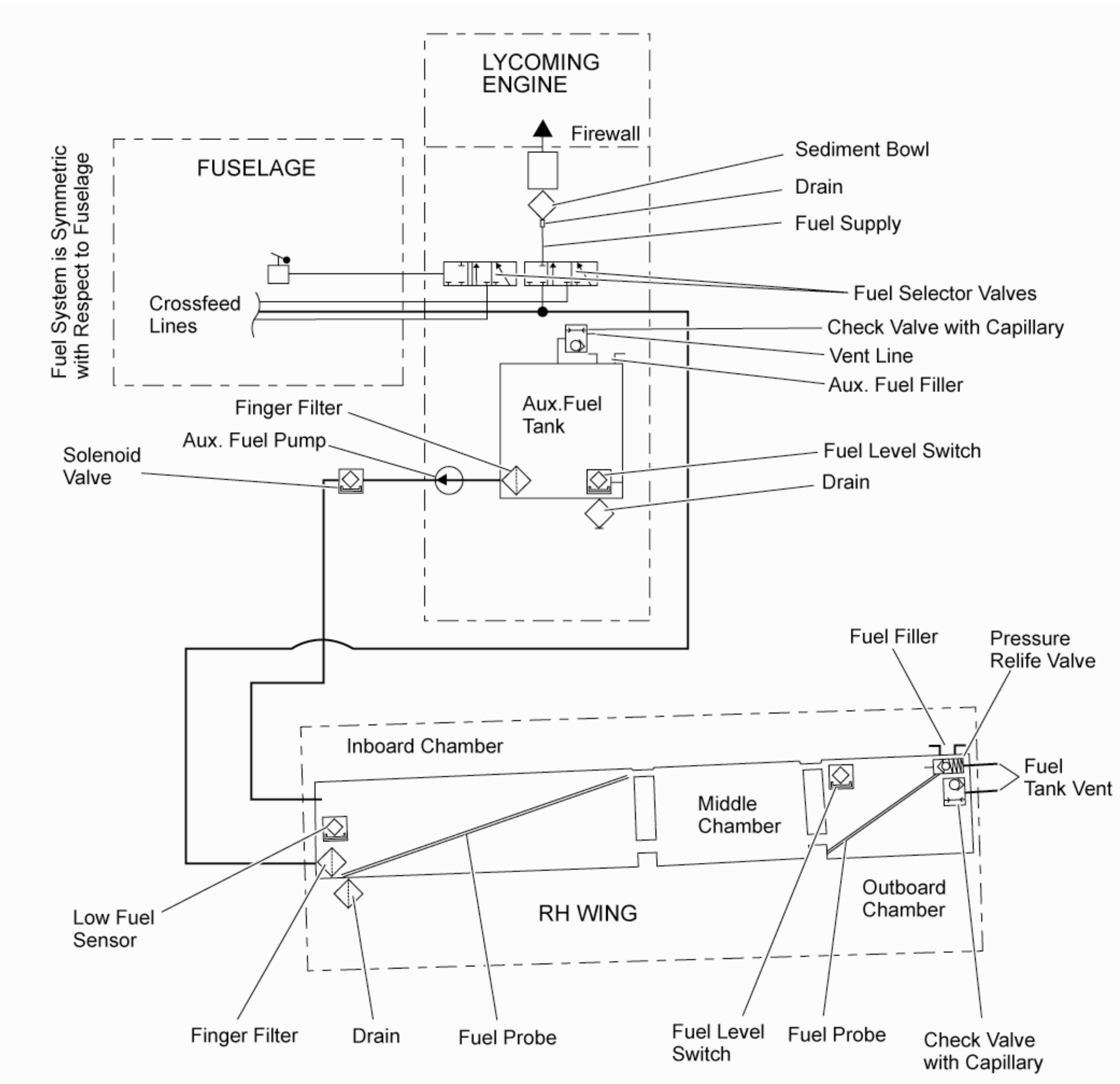
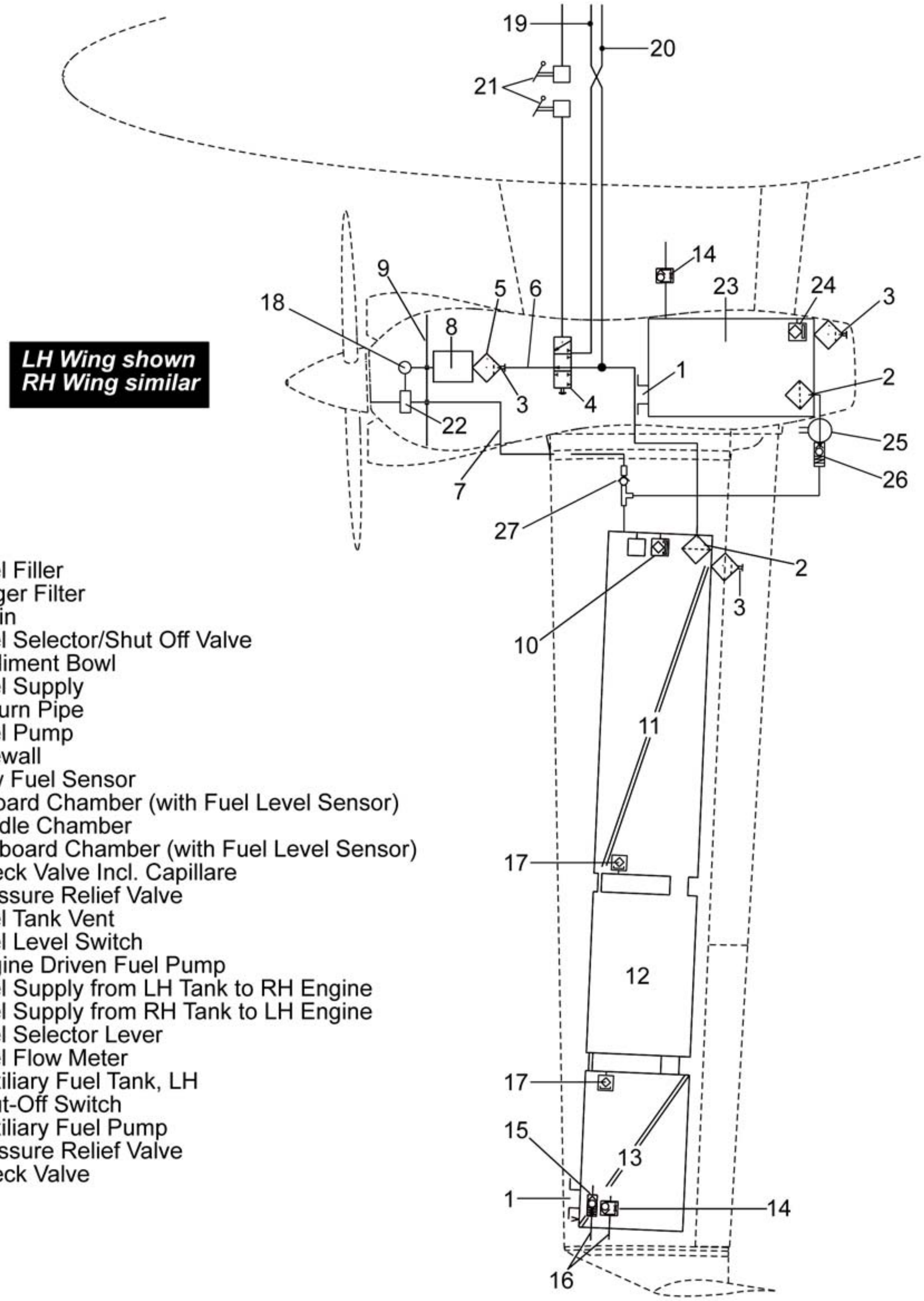


Figure 1 - Fuel System Schematic Diagram



1 Fuel Filler
2 Finger Filter
3 Drain
4 Fuel Selector/Shut Off Valve
5 Sediment Bowl
6 Fuel Supply
7 Return Pipe
8 Fuel Pump
9 Firewall
10 Low Fuel Sensor
11 Inboard Chamber (with Fuel Level Sensor)
12 Middle Chamber
13 Outboard Chamber (with Fuel Level Sensor)
14 Check Valve Incl. Capillare
15 Pressure Relief Valve
16 Fuel Tank Vent
17 Fuel Level Switch
18 Engine Driven Fuel Pump
19 Fuel Supply from LH Tank to RH Engine
20 Fuel Supply from RH Tank to LH Engine
21 Fuel Selector Lever
22 Fuel Flow Meter
23 Auxiliary Fuel Tank, LH
24 Shut-Off Switch
25 Auxiliary Fuel Pump
26 Pressure Relief Valve
27 Check Valve

Figure 2 - Fuel Distribution System

FUEL DISTRIBUTION - DESCRIPTION AND OPERATION

1. General

This chapter describes about the fuel distribution system for the DA42 L360 aircraft. The fuel distribution system supplies fuel from the fuel tanks to the engines. This chapter describes about the components and equipment which make the fuel distribution system that has been modified from the standard DA42. The following are the components of the fuel distribution system:

- Fuel gascolators and sediment bowls
- Fuel booster pumps.

Refer to Chapter 28-00 and Chapter 73-00 for a general description of the fuel system as it has been modified from the standard DA42.

2. Fuel Distribution System Components

A. Fuel Gascolator and Sediment Bowl

A fuel gascolator is located between the fuel transfer/shut-off valve and the fuel booster pump. The fuel gascolator has a filter and a sediment bowl. The sediment bowl collects any sediment in the fuel supply system. A drain is installed in the bottom of the sediment bowl. Use this drain to drain fuel from the fuel distribution system and for draining fuel when you will do a test for fuel contamination. You remove the fuel sediment bowl to gain access to the fuel filter.

B. Fuel Booster Pump

A short flexible hose connects the fuel gascolator assembly to the fuel booster pump. Switches in the instrument panel, between the engine start switches, control the booster pumps. Short flexible hoses connect the booster pumps to bulkhead connectors on the related engine firewall. Another flexible hose connects the bulkhead connector to the inlet connection of the engine driven fuel pump.

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FUEL DISTRIBUTION - TROUBLESHOOTING

1. General

This table explains how to troubleshoot the fuel distribution system. If you find the trouble in column 1, do the repair given in column 3.

TROUBLE	POSSIBLE CAUSE	REPAIR
The airplane smells of fuel.	Hose/pipe leaking.	Examine all hoses and pipes. Replace damaged or defective components.
	Loose connection.	Examine all connections. Tighten loose connections
	Component leaking.	Examine all components. Replace damaged or defective components.
When optional illuminated fuel pump switch is installed (Post SB D42L-28-01):		
FUEL PUMP switch does not illuminate when the pump fails.	FUEL PUMP switch is defective.	Replace the switch. Refer to Chapter 28-20.
FUEL PUMP failure indication light illuminates when the pump is operative.	FUEL PUMP switch is defective.	Replace the switch. Refer to Chapter 28-20.

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FUEL DISTRIBUTION - MAINTENANCE PRACTICES

1. General

This chapter describes the maintenance practices for the fuel distribution system. The procedures are limited to the removal/installation of the main components of the system.

Obey the safety precautions for fuel at all times.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE.

WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: DO NOT BREATHE FUEL VAPOR. FUEL VAPOR CAN MAKE YOU ILL.

2. Clean/Examine a Fuel Sediment Bowl

Obey the safety precautions for fuel at all times. Use this procedure for the left engine sediment bowl and the right engine sediment bowl.

A. Remove and Examine the Fuel Sediment Bowl

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the related FUEL SELECTOR lever is set to SHUT-OFF.	In the cockpit.
2.	Remove the fuel booster pump and gascolator assembly access panel.	Refer to AMM # 7.02.01 Chapter 52-40.
3.	Remove the fuel sediment bowl: - Drain the fuel from the fuel distribution system. - Remove the safety wire from the filter bowl. - Remove the locking ring that attaches the sediment bowl to the gascolator assembly. - Move the bowl assembly clear of the engine nacelle and pour the fuel from the sediment bowl into a suitable container. - Remove and discard the O-ring seal from the gascolator assembly.	Refer to Figure 201. Use a suitable container to catch spilled fluid. The bowl will contain fuel. Hold the sediment bowl. Examine the contents of the fuel sediment bowl for debris.
4.	Remove filter and clean.	

B. Install the Fuel Sediment Bowl

	Detail Steps/Work Items	Key Items/References
1.	Install a new O-ring seal into the gascolator assembly.	Refer to Figure 201.
2.	Make sure that the sediment bowl is clean and free of debris.	
3.	Install filter.	
4.	Install the fuel sediment bowl: - Move the sediment bowl into position at the gascolator and engage the sediment bowl with the gascolator body. - Turn the locking ring to secure the sediment bowl. - Secure the locking collar with lock-wire.	Make sure that the alignment mark on the sediment bowl aligns with the mark on the gascolator body. Make sure that the O-ring seal is located correctly.
5.	Do a test for leaks of the fuel sediment bowl assembly: - Make sure that there is fuel in the related fuel tank. - Set the FUEL SELECTOR lever to the related tank. - Examine the sediment bowl assembly for leaks.	
6.	Install the fuel booster pump and gascolator assembly access panel.	Refer to Chapter 52-40.

3. Replace a Gascolator Filter

Obey the safety precautions for fuel at all times. Use this procedure for the left engine gascolator filter and the right engine gascolator filter.

	Detail Steps/Work Items	Key Items/References
1.	Remove the fuel sediment bowl.	Refer to Paragraph 2.A.
2.	Replace the gascolator filter: - Remove the old filter. - Install the new filter.	 Counter-clockwise from below. Clockwise from below. Do not over-tight.
3.	Install the fuel sediment bowl.	Refer to Paragraph 2.B.
4.	Do a test for leaks at the fuel sediment bowl: - Make sure that there is fuel in the related fuel tank. - Make sure that the FUEL-SELECTOR lever is set to the related engine. - Examine the fuel sediment bowl for leaks.	
5.	Install the fuel booster pump and gascolator assembly access panel.	Refer to AMM # 7.02.01 Chapter 52-40.

4. Remove/Install a Fuel Booster Pump

Obey the safety precautions for fuel at all times. Use this procedure for the left engine fuel booster pump and the right engine fuel booster pump.

A. Remove a Fuel Booster Pump.

	Detail Steps/Work Items	Key Items/References
1.	Make sure that: - The related FUEL SELECTOR lever is set to SHUT-OFF. - The related fuel booster pump circuit-breaker is open.	 In the cockpit. Instrument panel, right side.
2.	Remove the fuel booster pump and gascolator assembly access panel.	Refer to AMM Chapter 52-40.

	Detail Steps/Work Items	Key Items/References
3.	Drain the fuel from the gascolator sediment bowl.	Use a suitable container to catch the fuel.
4.	Disconnect the following fuel connections: - The fuel inlet hose to the gascolator. - The fuel supply hose from the fuel booster pump to the bulkhead connector.	 At the fuel gascolator. At the fuel booster pump, install blanking caps to all open fuel connections.
5.	Disconnect the electrical cables to the fuel booster pump.	
6.	Remove the fuel booster pump and gascolator assembly: - Remove the two bolts and the washers that attach the clamp which holds the fuel booster pump and gascolator assembly to the firewall bracket. - Move the fuel booster pump and gascolator assembly clear of the engine nacelle and onto a clean work-bench.	 Note the location of the wire bonding lead connections.
7.	Remove the fuel booster pump from the fuel booster pump and gascolator assembly as follows: - Disconnect the fuel hose from the fuel gascolator to the fuel booster pump and remove the fittings from inlet and outlet parts of the pump. - Remove the four screws, the washers and the serrated washers that attach the fuel booster pump to the fuel booster pump and gascolator assembly mounting bracket. - Move the fuel booster pump clear of the bracket. - If you plan to replace the pump, then remove 90 fitting from the drain port after removing the pump from the assembly.	At the fuel booster pump, install the blanking caps on all open fuel connections.

B. Install the Fuel Booster Pump

	Detail Steps/Work Items	Key Items/References
1.	If necessary install the 90 degree fitting and the plug onto the drain ports of the fuel booster pump as follows:	
	- Apply seal lube to 90 degree fitting and the plug.	The plug is part of the fuel pump.
	- Install the 90 degree fitting into the drain port on the fuel pump and install the plug.	Locate the 90 degree fitting at 210 -240 degrees clockwise from the installed position.
	- Install the drain hose (200mm) onto the 90 degree fitting	
2.	Install the fuel booster pump onto the fuel booster pump and gascolator assembly:	
	- Move the fuel booster pump into position at the mounting bracket.	Rotate the fuel pump by 90 degrees to install onto fuel filter holding plate.
	- Install the four screws, the serrated washers and flat washers above and below the fuel filter holding plate that attach the fuel booster pump.	Secure the screws using Loctite 243. Make sure to install the washers between the fuel pump and the fuel filter holding plate.
	- Replace the O-ring on the 90 degree fittings and install fittings onto inlet and outlet ports of the fuel pump.	Make sure that you remove all blanking caps from the fuel pump and you install the hose fittings in the correct orientation with new O-ring seals.
3.	Connect the flexible outlet hose from the gascolator to the fuel booster pump inlet connection.	
4.	Install the fuel booster pump and gascolator assembly as follows:	
	- Install the clamp that holds the fuel booster pump and gascolator assembly to the firewall bracket:	
	- Move the clamp into position and align with the holes in the mounting bracket.	
	- Install the two bolts and the washers that attach the clamp, fuel booster pump and gascolator assembly to the mounting bracket.	Install the wire bonding lead connection.

	Detail Steps/Work Items	Key Items/References
5.	Connect the following hoses:	Make sure that you remove all blanking caps.
	- The fuel supply hose to gascolator.	At the gascolator.
	- The fuel outlet from the fuel pump to the bulkhead connector.	At the fuel pump.
6.	Connect the electrical cables for the fuel booster pump.	
7.	Do a test for leaks at the fuel booster pump and gascolator assembly:	
	- Make sure that there is fuel in the related fuel tank.	
	- Make sure that the FUEL-SELECTOR lever is set to the related engine.	
	- Examine the following items for leaks:	
	- Flexible hose connections to and from the gascolator.	
	- Flexible hose connections to and from the fuel booster pump.	
	- Fuel sediment bowl.	
8.	Do a test for the correct function of the fuel booster pump:	
	- Set the ELECT MASTER switch to ON.	
	- Set the related FUEL L/R switch to ON.	
	- Monitor the fuel pressure indication for the related engine fuel system on the integrated cockpit system display.	The fuel pressure must be 14 ± 2 psi.
	- Examine the fuel outlet connection from the fuel booster pump for leaks.	
	- Set the related FUEL L/R switch to OFF.	
	- Set the ELECT MASTER switch to OFF.	
9.	Install the fuel booster pump and gascolator assembly access panel.	Refer to AMM # 7.02.01 Chapter 52-40. Make sure that the drain hose from the fuel pump is routed through the cutout in the panel.

5. Replace Gascolator Assembly

Obey the safety precautions for fuel at all times. Use this procedure for the left and right engine fuel gascolator assembly.

	Detail Steps/Work Items	Key Items/References
1.	Remove the fuel booster pump gascolator assembly from the aircraft.	Refer to paragraph 4.A. steps 1 thru 6.
2.	Remove the gascolator from the fuel booster pump gascolator assembly as follows:	
	- Disconnect the hose from the outlet port of the gascolator assembly	Install the blanking caps to all open fuel connections.
	- Remove the bolts, the internal tooth lock washers, the stainless washers and the bushing	
	- Remove the gascolator.	
3.	Install the gascolator into the gascolator assembly as follows:	
	- If required, install the drain valve on the gascolator	Use seal lube on the threads of the drain valve.
	- Place the gascolator in position on the booster pump gascolator assembly	
	- Install the bolts, the internal tooth lock washers, the stainless washers, and the bushing	If required, add stainless washer between the bushing and the fuel filter holding plate. Install the wire bonding lead connection. Secure the bolts using Loctite 243.
	- Connect the fuel hose to the outlet port of the gascolator.	Make sure that you remove all blanking caps before connecting.
4.	Install the the fuel booster pump and gascolator assembly on the aircraft.	Refer to paragraph 4.B. steps 4 thru 9.

6. Remove/Install the FUEL PUMP Switch (Pre-SB D42L-28-01)

A. Remove the FUEL PUMP Switch

	Detail Steps/Work Items	Key Items/References
1.	Disconnect the aircraft battery.	Refer to AMM # 7.02.01 Chapter 24-31.
2.	Remove the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
3.	Unplug the fastons from the FUEL PUMP switch.	
4.	Remove the FUEL PUMP switch.	

B. Install the FUEL PUMP Switch

	Detail Steps/Work Items	Key Items/References
1.	Disconnect the aircraft battery.	Refer to AMM # 7.02.01 Chapter 24-31.
2.	Remove the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
3.	Put the FUEL PUMP switch in position on the instrument panel.	
4.	Plug the fastons to the FUEL PUMP switch.	
5.	Install the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
6.	Connect the aircraft battery.	Refer to AMM # 7.02.01 Chapter 24-31.
7.	Do the Functional Test of the fuel pumps.	Refer to paragraph 7.

7. Remove/Install the Illuminated FUEL PUMP Switch and the Current Monitor (Post-SB D42L-28-01 - Optional Installation)

A. Remove the Illuminated FUEL PUMP Switch and the Current Monitor

	Detail Steps/Work Items	Key Items/References
1.	Disconnect the aircraft battery.	Refer to AMM # 7.02.01 Chapter 24-31.
2.	Remove the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
3.	Unplug the fastons from the FUEL PUMP switch.	
4.	Cut the tywraps securing the current monitor.	
5.	Unplug the “WHITE” wire from the instrument panel harness.	Refer to Figure 205.
6.	Remove the illuminated FUEL PUMP switch and the current monitor.	

B. Install the Illuminated FUEL PUMP Switch and the Current Monitor

	Detail Steps/Work Items	Key Items/References
1.	Disconnect the aircraft battery.	Refer to AMM Chapter 24-00.
2.	Remove the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
3.	Put the illuminated FUEL PUMP switch and the current monitors in position on the instrument panel.	
4.	Plug the “WHITE” wire to the instrument panel harness.	
5.	Secure the current monitors to the instrument panel harness with tywraps.	Refer to Figure 206.
6.	Plug the fastons to the FUEL PUMP switch.	Refer to Figure 205.
7.	Install the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
8.	Connect the aircraft battery.	Refer to AMM # 7.02.01 Chapter 24-31.
9.	Do the Functional Test of the fuel pumps.	Refer to paragraph 7.
10.	Do an Operational Test of the fuel indication failure switch.	Refer to paragraph 7.

8. Functional Test of the Fuel Pumps and the Operational Test of the Fuel Indication Failure Switch

	Detail Steps/Work Items	Key Items/References
1.	Remove the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.
2.	Do a functional test of the fuel emergency pumps to test the operation of the FUEL PUMP switches, as follows:	
	- Set the ELECT MASTER switch to ON	
	- Set the related FUEL PUMP L/R switch ON	
	- Monitor the fuel pressure indication for the related engine fuel system on the integrated cockpit system display	Make sure that there is an increase in fuel pressure.
	- Set the related FUEL PUMP L/R switch OFF	
	- Set the ELECT MASTER switch to OFF.	
3.	Do an operational test of the failure indication that will show on the FUEL PUMP switch, as follows:	
	- Behind the instrument panel, disconnect the Current Monitor wire that electrically connects with the fuel pump (28011 or 28012) at the Faston connectors	
	- Set the ELECT MASTER switch to ON	
	- Set the related FUEL PUMP L/R switch ON	Make sure that the fail light comes on with Amber color at the fuel pump switch.
	- Set the related FUEL PUMP L/R switch OFF	
	- Set the ELECT MASTER switch to OFF	
	- Connect again the Current Monitor wire to the fuel pump wire at the faston connectors.	
	- Secure the wires	
	- Repeat the functional test of the fuel emergency pumps.	Refer to step 2.
4.	Install the instrument panel cover.	Refer to AMM # 7.02.01 Chapter 25-10.

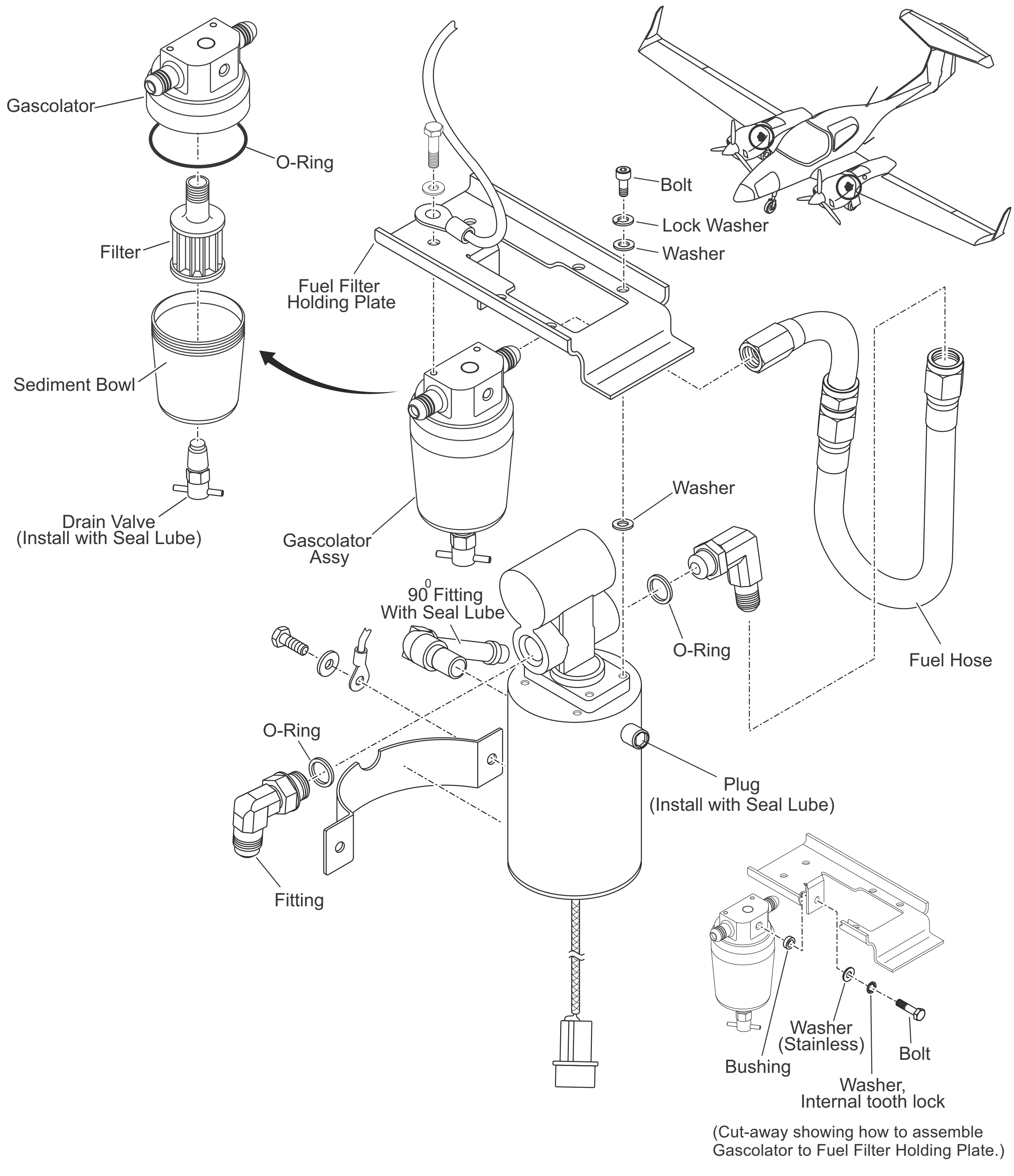


Figure 201 - Fuel Pump and Gascolator Assembly (LH)

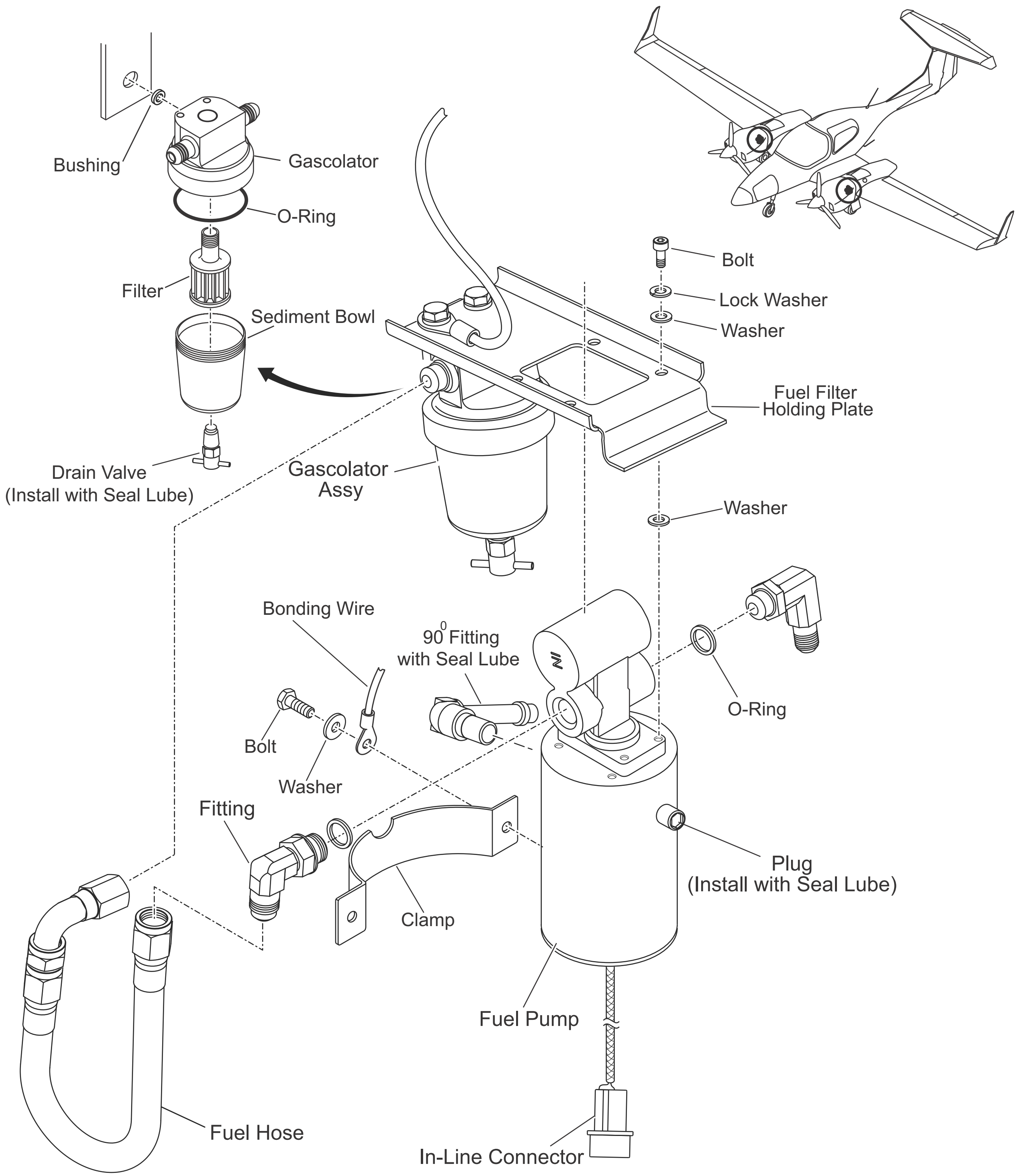
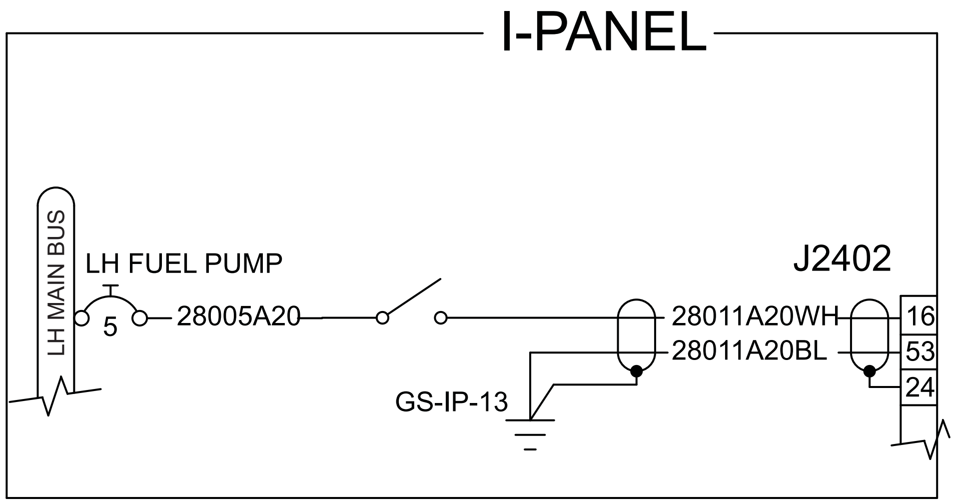


Figure 202 - Fuel Booster Pump and Gascolator Assembly (RH)



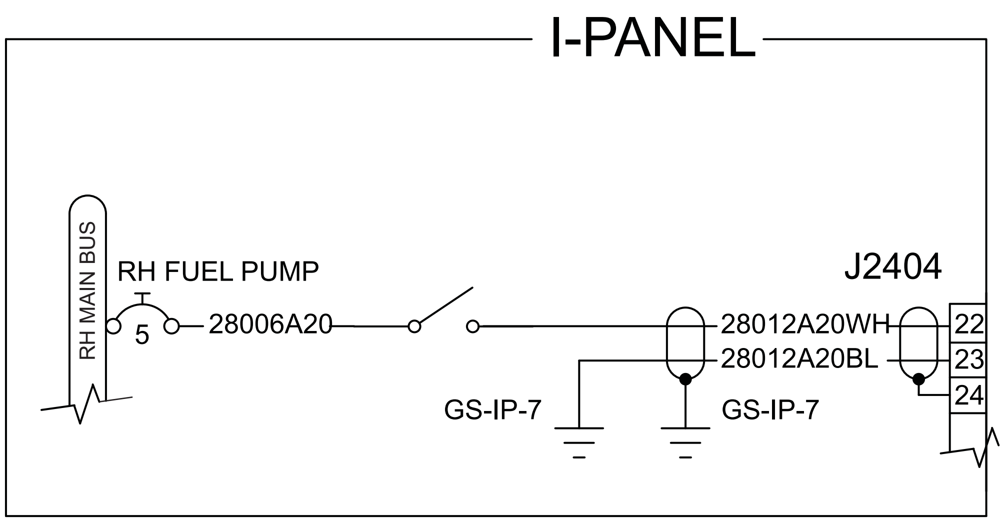
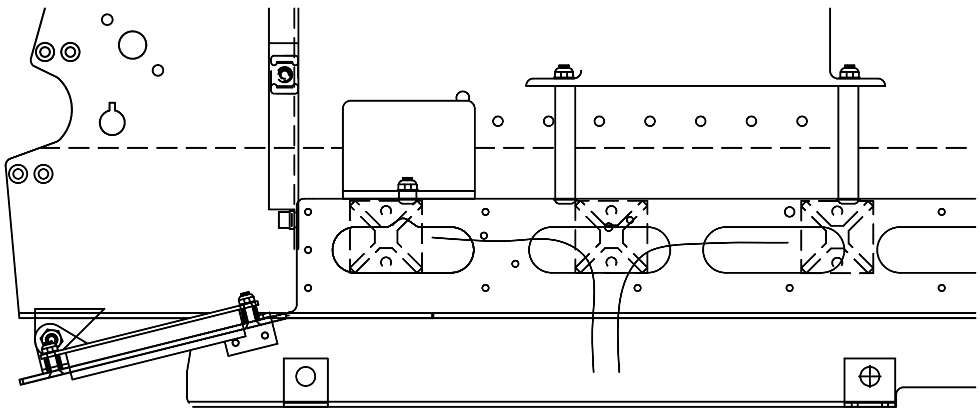
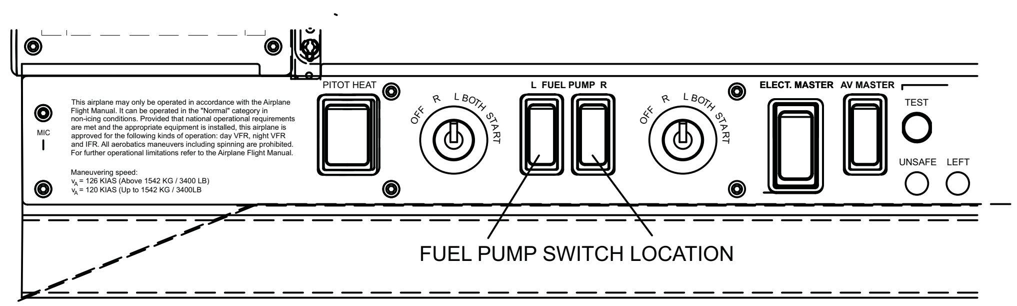


Figure 203 - Fuel Pump Switches Schematic Diagram (Pre-SB D42L-28-01)

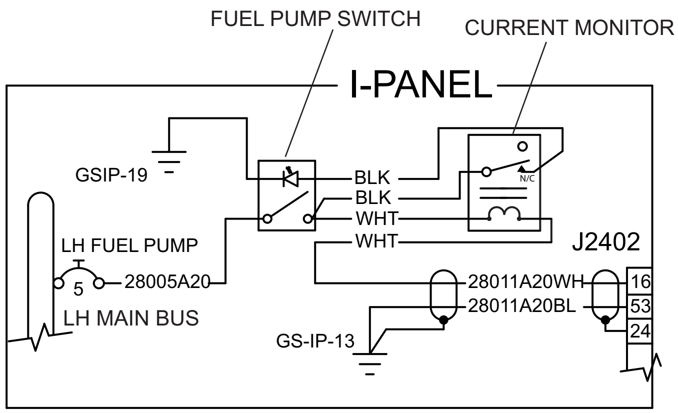


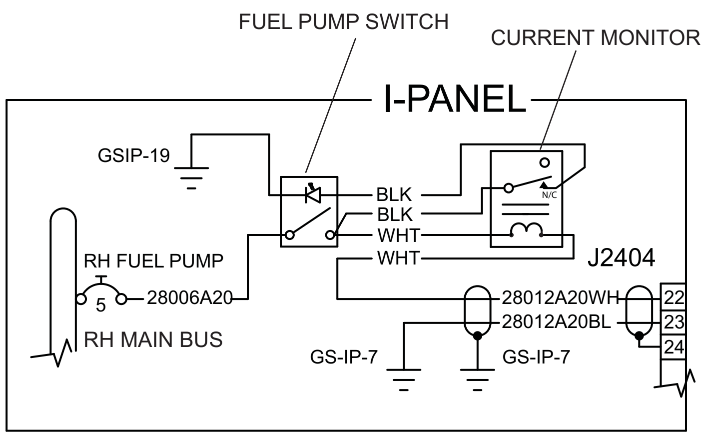
VIEW LOOKING DOWN



VIEW LOOKING FORWARD

Figure 204 - Removal/Installation of Fuel Pump Switches (Pre-SB D42L-28-01)





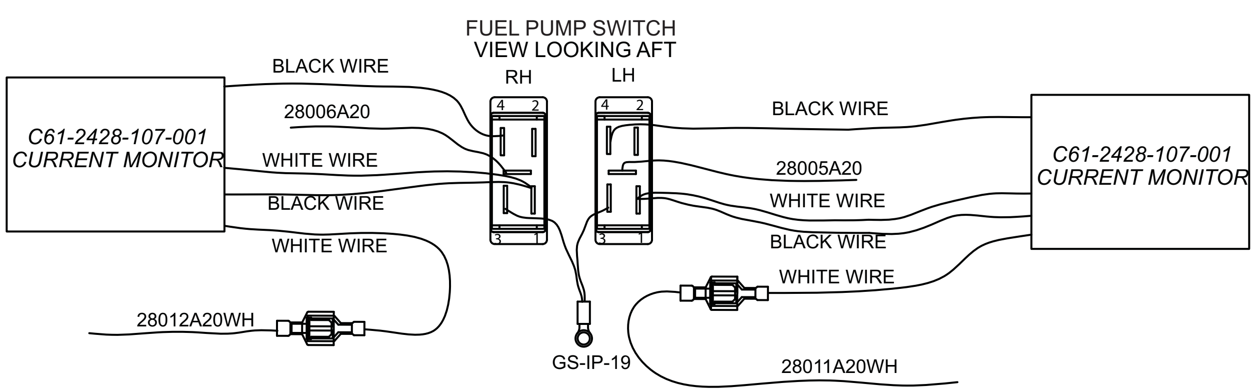


Figure 205 - Illuminated Fuel Pump Switches Schematic Diagram (Post-SB D42L-28-01-Optional)

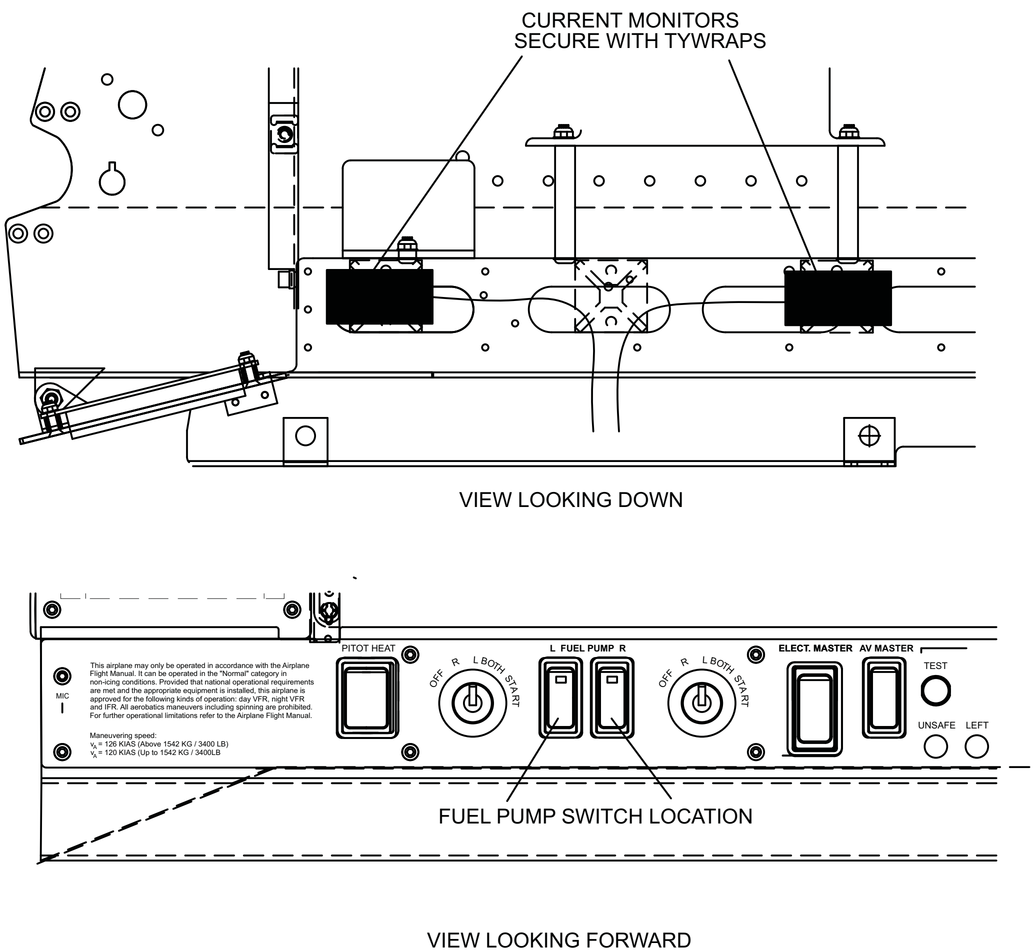


Figure 206 - Removal/Installation of Fuel Pump Switches (Post-SB D42L-28-01-Optional)

CHAPTER 30-00
ICE PROTECTION SYSTEM

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ICE PROTECTION SYSTEM - DESCRIPTION AND OPERATION

1. General

WARNING: DO NOT GET DE-ICING FLUID ON YOUR SKIN OR ON YOUR CLOTHES. DE-ICING FLUID IS HARMFUL AND CAN CAUSE INJURIES TO PERSONS AND CAN DAMAGE YOUR CLOTHING.

CAUTION: HANDLE DE-ICING FLUID WITH CARE. DE-ICING FLUID IS FLAMMABLE AND CAN CAUSE DAMAGE TO EQUIPMENT.

The ice protection system prevents accumulation of ice by distributing a thin film of a special de-icing fluid on the wings, horizontal stabilizer, vertical stabilizer, propellers and canopy.

This section describes the propeller ice protection system installed in the DA42 L360 aircraft. Refer to CAV Aerospace Ltd. (TKS system) for data on the ice protection system.

For additional details on this chapter, refer to Aircraft Maintenance Manual (AMM) Doc. # 7.02.01, latest revision.

2. Description

A. Propeller Ice Protection System

(1) Proportioning Unit

A proportioning unit is located in each engine nacelle between the center wing spars. It is accessible after the removal of the aft inspection panel on the outboard side of the nacelle.

The proportioning unit divides the flow into three sub-branches. For each sub-branch, there is a capillary which ensures the correct amount of de-icing fluid flows to the related sub-branch. One sub-branch goes forward to feed the propeller ice protection system.

(2) Propeller Protection System

A teflon tube goes from the proportioning unit forward to a nozzle near the propeller, which injects the de-icing fluid onto a slinger ring. In the engine compartment, the tube is protected by a fire sleeve. The slinger ring has three nozzles that allow the de-icing fluid to be distributed over the propeller blades by centifugal force. Refer to Figure 1.

B. Ice Light

The ice light is installed on the outboard sides of the left and right nacelles. The ice light illuminates the wings when it is switched on, for the pilot to check for any ice formation on the wing leading edges.

3. Operation

The ice protection system is operated through the following four toggle switches and two push buttons located on the de-ice control panel in the instrument panel:

- OFF/NORM/HIGH Switch
- MAX Push Button
- PUMP1/PUMP2 Switch
- WINDSHIELD Push Button
- ALTERNATE Switch
- ICE LIGHT/ANNUN-TEST Switch

A. ICE LIGHT/ANNUN-TEST Switch

This switch activates either both the ice lights or the annunciation test procedures.

(1) Ice lights operation

The ice lights are switched ON by setting the toggle switch to the upper position.

(2) Test of Annunciations

Proper function of the fluid level switch and the low pressure sensor can be tested with the following test mode:

(a) Test of the DEICE PRES LO Annunciation

(b) Test of the DEICE LVL LO Annunciation

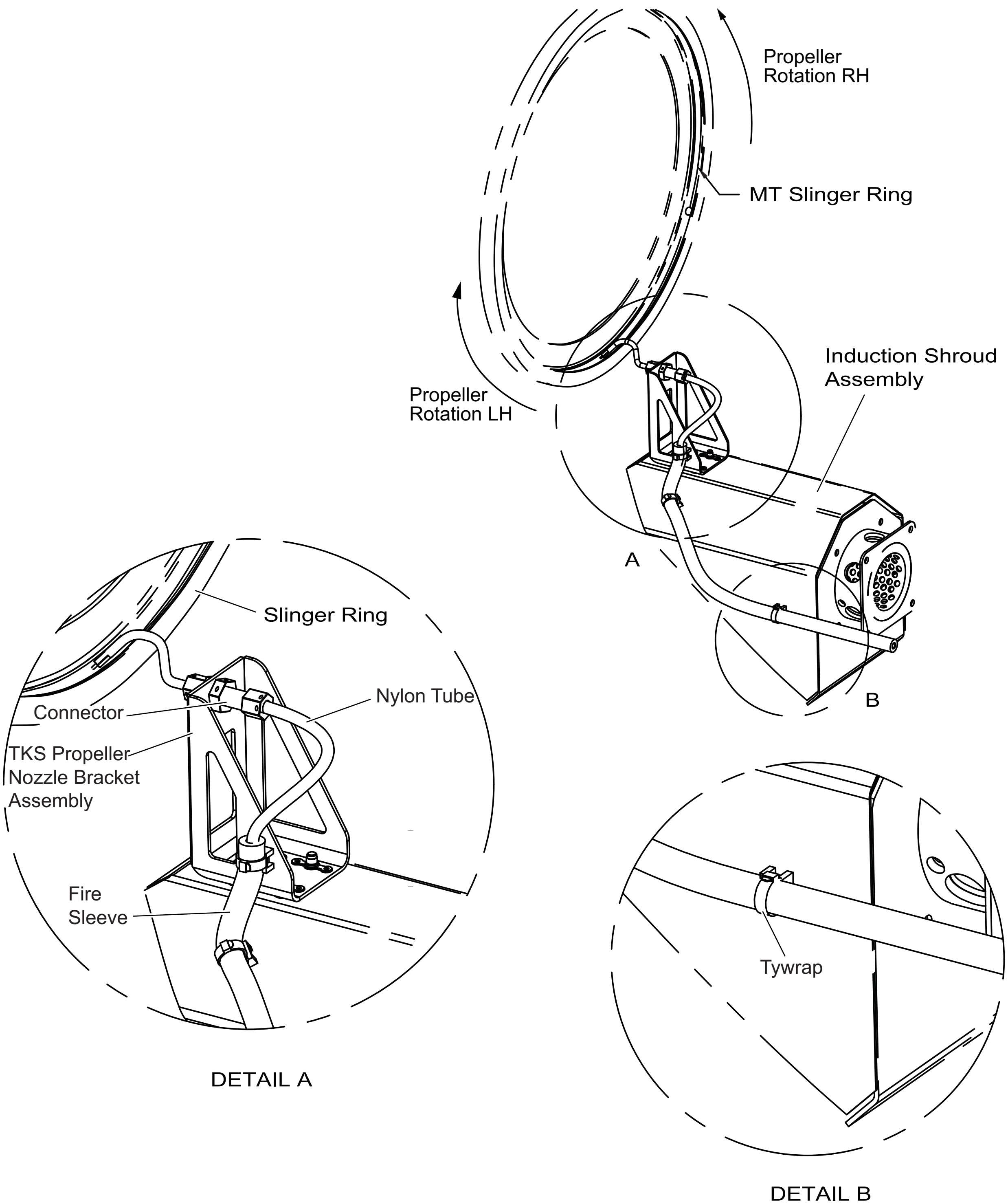

Figure 1 - Propeller Ice Protection System

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CHAPTER 31-00
INDICATING SYSTEMS

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INDICATING SYSTEMS - DESCRIPTION AND OPERATION

1. General

This chapter describes the indicating systems installed in the DA42 L360 aircraft. Refer to the following chapters for the related data:

- 31-10 The instrument and control panels installed in the DA42 L360 aircraft

The DA42 L360 aircraft has the following indicating systems:

- Instrument panel: The instrument panel is made in one piece with a shelf. The shelf goes between the panel and the cockpit forward bulkhead.
- Control panel in the center console: This panel has the cabin heat control levers, parking brake, the engine controls, fuel controls, and trim. It has a forward part and an aft part.
- Integrated cockpit system (ICS): The aircraft has an integrated cockpit system with two displays which give the aircraft flight and navigation displays, engine instrument displays and aircraft systems indications. The ICS has "Softkeys" on the display screens for the option of selecting which indications will be displayed on the screen.

This chapter does not explain about the indicators that belong to systems. See the related system for data.

NOTE: Equipment which is certified for installation in the DA42 L360 aircraft is listed in Chapter 6.5 of the Airplane Flight Manual (AFM). Such equipment may be installed in accordance with the Aircraft Maintenance Manual (AMM).

NOTE: Any equipment which is not listed in Chapter 6.5 of the AFM is called "Additional Equipment". The installation of additional equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin (SB).

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INSTRUMENT AND CONTROL PANELS - DESCRIPTION AND OPERATION

1. General

The DA42 L360 aircraft has the following instrument and control panels:

- An instrument panel: The instrument panel is made of several pieces with a shelf. The shelf goes between the panel and the forward bulkhead.

- A control panel in the center console: This panel has a forward cover and an aft cover. The forward cover has the heater control knob, cabin heat control, defrost control and parking brake lever. The aft cover has the engine controls and the fuel transfer/shut-off valves.

Refer to the related Chapter for data about the controls. For example, refer to Chapter 76-00 for data on the engine controls.

2. Instrument Panel Description

The instrument panel consists of several pieces of aluminum alloy. The panel has a vertical face with instruments and a horizontal 'shelf' with electrical components. The shelf goes between the forward bulkhead of the cockpit and the vertical face of the panel.

The DA42 L360 aircraft has an Integrated Cockpit System (ICS). The ICS has two large LCD display screens which are located in the instrument panel. These two display screens can digitally display all of the flight, navigation and aircraft system data. An audio control panel is located between the display screens. The audio control panel integrates with the ICS and is used to control all of the aircraft radio and navigation audio systems. Refer to Chapter 31-40 for more data about the ICS.

An airspeed indicator, artificial horizon, altimeter and magnetic compass are located along the top of the instrument panel. These instruments provide the basic data required to fly the airplane in the event of a power failure and the loss of the ICS. The artificial horizon is a gyroscopic instrument that is powered from an emergency power pack. An emergency switch is located near the artificial horizon and has a guard installed to prevent accidental selection.

The circuit-breakers for the electrical systems are all located on the right side of the instrument panel. The electrical system bus-bars are directly connected to the rear of the circuit-breakers.

Along the bottom of the instrument panel are the electrical, avionic and engine master switches. The landing gear and flap control switches are also located along the bottom of the instrument panel, each side of the autopilot control panel. The instrument panel and airplane light switches are located at the top-left of the instrument panel.

The shelf part of the instrument panel holds relays, junction blocks, connectors and ground studs.

The instrument panel has a cover attached by screws.

Refer to Chapter 24 for more data about the electrical system and AMM # 7.02.01 Chapter 34 for more data about the autopilot system.

3. Center Console Description

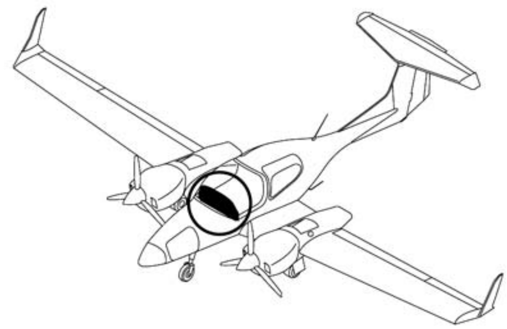
Figure 2 shows the center console structure. Refer to the related Chapters for the data on the controls.

The center console holds the engine control assembly. The engine control assembly holds the heater controls, parking brake, engine throttle control, mixture control, and propeller control levers. Aft of the engine control assembly are the mechanically operated rudder trim control knob, controls for the fuel transfer/shut-off valves, the elevator trim wheel, and the switches for the fuel transfer pumps.

The engine control assembly has two aluminum alloy side plates. Four brackets attach to the side plates with rivets. The front bracket has holes to anchor the outer sheaths of the brake and heat control cables. The top bracket has two anchor-nuts. Bolts engage the anchor nuts to attach the engine control assembly to the top of the floor panel.

The center bracket has two anchor nuts for the control cover plates. The rear bracket attaches to the elevator trim control assembly.

There are no user-maintainable parts in the engine control assembly structure or the center console structure.



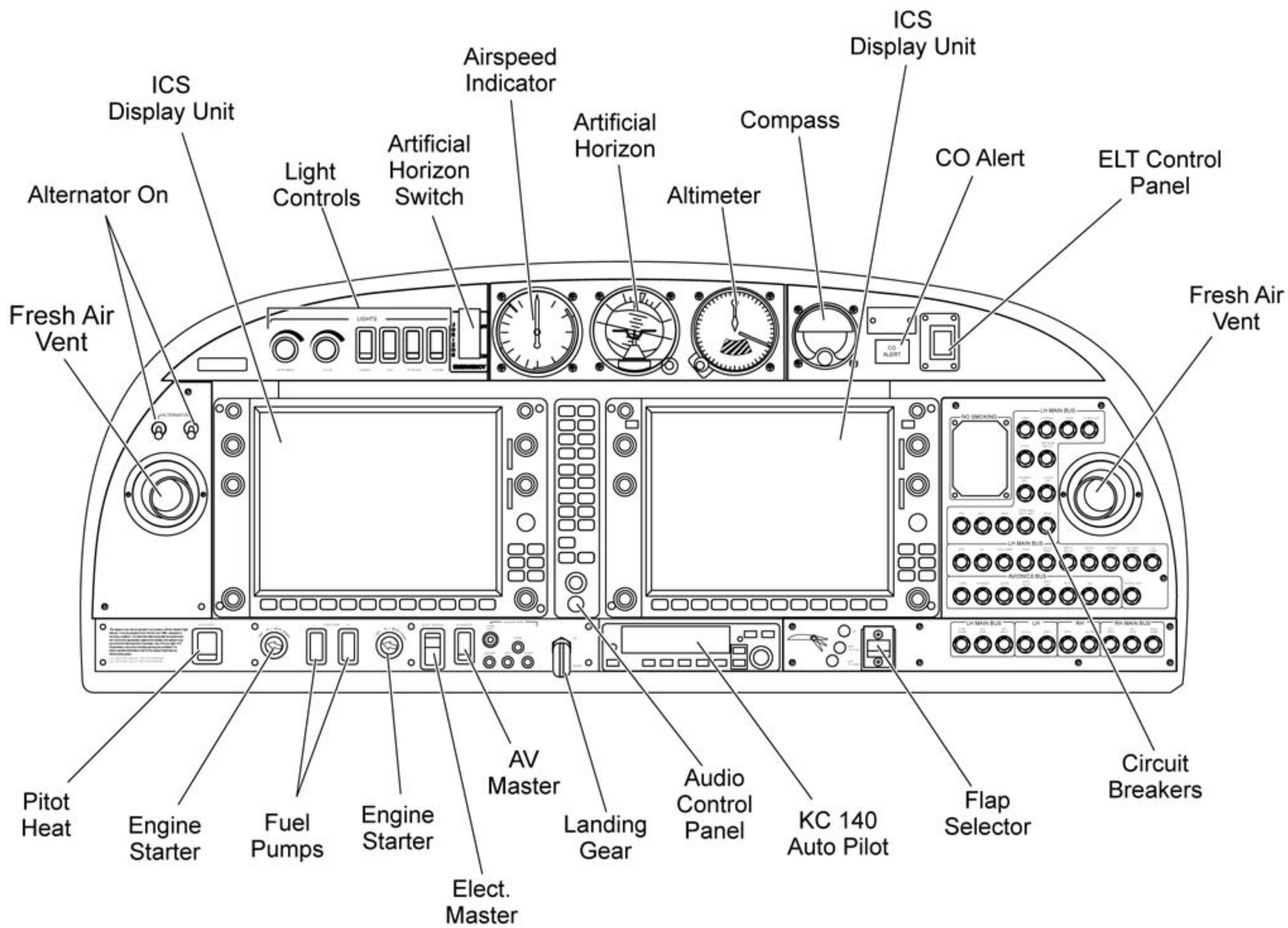


Figure 1 - Instrument Panel

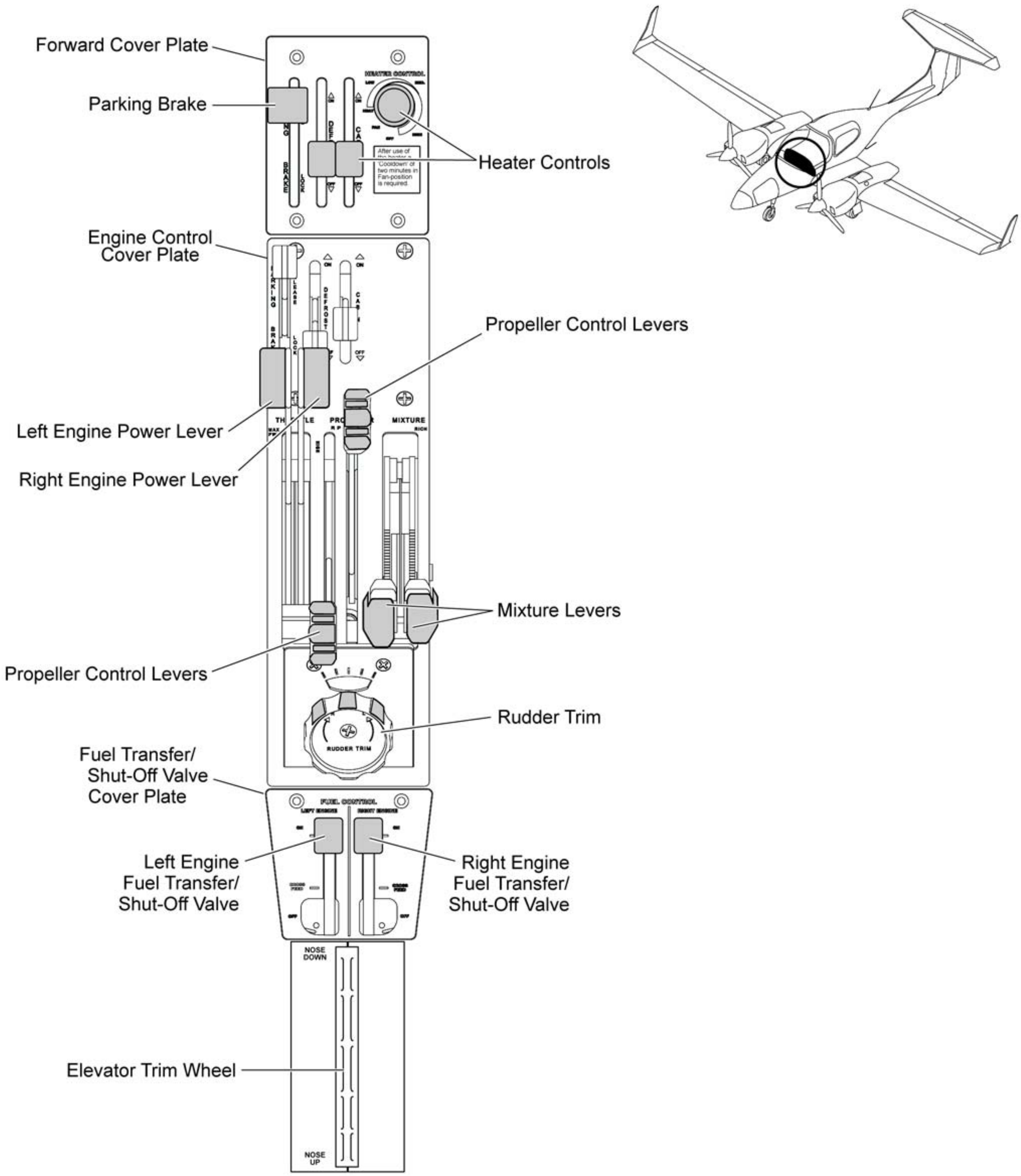


Figure 2 - Center Console

CENTRAL COMPUTERS - DESCRIPTION AND OPERATION

1. General

The DA42 L360 aircraft has a Garmin G1000 Integrated Cockpit System (ICS). The ICS integrates all the usual flight, avionic and airframe system indications into one system. The system displays the data on two display screens located in the instrument panel. An audio control panel is located between the two display screens. The audio control panel integrates and controls the airplane radio, navigation and intercom systems.

For more detailed data about the ICS refer to the G1000 Cockpit reference Guide for the DA42 L360 aircraft.

2. Description

A. Garmin Engine Airframe (GEA) 71

The DA42 L360 aircraft has two GEA 71 units. GEA 71 is a microprocessor based unit that receives and processes signals from airframe and engine sensors. The GEA 71 communicates directly with both Integrated Avionics Units (IAU), GIA63 using RS 485 digital interface. The GEA 71 units are located in the engine nacelle.

B. Garmin Integrated Avionics for WAAS Operations (GIA63W)

The aircraft may have installed as an option GIA63W integrated avionics units which contain hardware and software that will allow for WAAS operations. The outer shell of the unit itself is identical to the GIA 63 originally installed and it is installed and removed in the same manner as the original GIA 63. All references, maintenance instructions and other information relating to the GIA 63 in the original Diamond AMM 7.02.01 can be applied to the new GIA63W units. Refer to this manual and the Garmin manuals for maintenance information and instructions.

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CENTRAL COMPUTER - MAINTENANCE PRACTICES

1. General

These maintenance procedures describe how to remove and install the Garmin Engine Airframe (GEA) 71 units and how to load the G1000 system software. They do not describe how to maintain the components. For more data about maintaining the equipment, refer to the G1000 Line Maintenance Manual.

2. Remove/Install the GEA 71 Processor

A. Remove the GEA 71 Processor

	Detail Steps/Work Items	Key Items/References
1.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
2.	Disconnect the bonding strap.	
3.	Remove the GEA 71: - Remove the screws that attach the GEA71 unit to the mounting bracket. - Slide the GEA 71 unit from the mounting bracket. - Remove the unit.	Refer to Figure 201.

B. Install the GEA 71 Processor

	Detail Steps/Work Items	Key Items/References
1.	Install the GEA 71: - Slide the GEA 71 unit in the mounting bracket. - Install the screws that attach the unit to the mounting bracket.	
2.	Connect the bonding strap..	
3.	Connect the airplane main battery.	Refer to Chapter 24-31.
4.	Do a test for the correct operation of the integrated cockpit system (ICS): - Set the ELECT MASTER switch to ON. - Set the ELECT MASTER switch to OFF.	The ICS must power-up and successfully complete its self-test procedure.

3. G1000 System Software Load Procedure

A. G1000 Hardware/Software Compatibility Check

A G1000/DA42-L360 loader card is required to install software and configuration settings to a newly installed G1000 system. The part number of this card is directly associated with the combination of software file part numbers and version levels that are defined on the card. Should software part numbers or versions change, a new loader card part number is issued. Refer to the most current software service bulletin issued by the Diamond Aircraft for the DA42 L360. The part number will be 006-B1054-(XX), where XX refers to the software version level.

B. Software Load Procedure

	Detail Steps/Work Items	Key Items/References
1.	Energize the G1000 system as follows: - Connect the ground power unit to the external power receptacle - Set the power on to the ground power unit. - Set the ELECT MASTER switch ON - Set the AVIONICS MASTER switch ON.	
2.	Open the MFD and PFD circuit breakers.	
3.	Insert the loader card (part number as defined above) into MFD top card slot.	
4.	Remove the TERRAIN Data Cards if there are installed from the lower slots.	
5.	Load the software as follows: - While holding the ENT key on MFD, close the MFD circuit breaker to restore power. - When the words “INITIALIZING SYSTEM” appear in the upper left corner of MFD, release the MFD ENT key. - Press the MFD ENT key to acknowledge the following prompt: “DO YOU WANT TO UPDATE SYSTEM FILES” - The following screen appears: “UPDATING SYSTEM FILES. PLEASE WAIT”	A softkey labeled 'YES' appears in the lower right corner and may be used in lieu of the ENT key.

	Detail Steps/Work Items	Key Items/References
	- The software is loaded to the MFD. - Do not remove power.	When complete, the MFD starts in configuration mode displaying the "System Status" page.
6.	Remove the Loader Card from MFD and insert it into the top card slot on the PFD. Repeat the step 5 for the PFD.	
	NOTE: For the rest of the software/configuration procedure, do not operate the MFD while loading software or configuration files unless specifically instructed to do so. A failed or cancelled load may result.	
7.	On PFD, select the "System Upload" page by rotating the PFD small FMS knob clockwise.	
8.	Activate the cursor and rotate the PFD small FMS knob to highlight DA42-L360 in the AIRFRAME field.	Press the PFD ENT key to select the airframe type.
9.	Once an airframe type is selected, the cursor moves to the FILE window.	
10.	Rotate the PFD small FMS knob to activate the drop-down menu.	
11.	Move the cursor to highlight "Diamond DA42-L360" and press ENT on PFD. The PRODUCT window populates.	
	NOTE: The PRODUCT window displays information regarding each G1000 LRU. The LRU column depicts the reported software version of the LRU, whereas the CARD VERS column shows the LRU software version stored on the Loader Card. The SOFTWARE and CONFIGURATION columns default to having all required boxes checked. Each checked file is automatically loaded to the correct G1000 LRU.	
12.	Press the LOAD softkey.	
13.	Observe software loading progress and verify software load completes without errors as indicated by the following: - Green "PASS" or N/A in SOFTWARE and CONFIGURATION columns. - "Upload Complete…….COMPLETE" in the summary box.	
14.	Press PFD ENT key to acknowledge.	

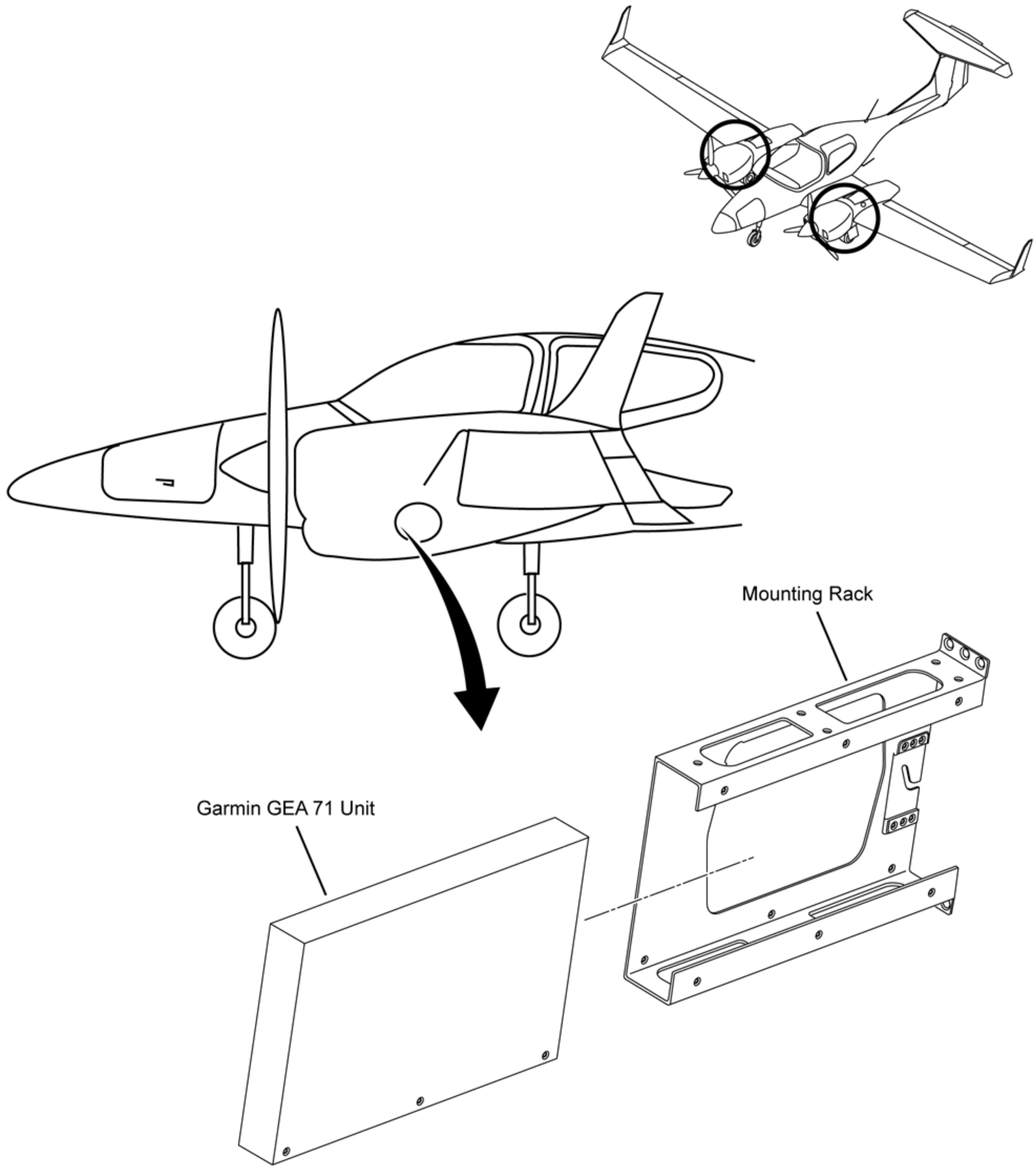

Figure 201 - GEA 71 Processor Unit

CHAPTER 32-00
LANDING GEAR

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2. Rigging Procedure for Landing Gear Warning Micro Switch 201

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POSITION AND WARNING - DESCRIPTION AND OPERATION

1. General

   This chapter provides information on the landing gear warning annunciation system. For additional details on this chapter, refer to Aircraft Maintenance Manual (AMM) Doc. # 7.02.01, latest revision.

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POSITION AND WARNING - MAINTENANCE PRACTICES

1. General

This chapter describes only the rigging procedure for the landing gear warning micro switch. For all other maintenance procedures, refer to Aircraft Maintenance Manual (AMM) Doc. # 7.02.01, Chapter 32-60.

2. Rigging Procedure for the Landing Gear Warning Micro Switch

NOTE: The procedure for the LH landing gear warning micro switch is given. The rigging procedure for the RH landing gear warning micro switch is similar, using the RH engine.

	Detail Steps/Work Items	Key Items/References
1.	Apply the masking tape to the throttle quadrant cover plate on the left hand side of the LH (RH) throttle lever.	Refer to Figure 201.
2.	Start the LH (RH) engine.	Refer to D42 L360 Airplane Flight Manual (AFM).
3.	Set the LH (RH) throttle lever to achieve a manifold pressure of 16 inHg or greater.	Refer to Figure 202.
4.	Pull the throttle lever slowly aft until a manifold pressure of 14.5 ± 0.5 inHg is indicated.	
5.	Mark the masking tape in line with front edge of the throttle lever.	Refer to Figure 203.
6.	Shut down the LH (RH) engine.	Refer to D42 L360 AFM.
7.	Remove the pilots’ and co-pilot’s seats.	Refer to AMM # 7.02.01 Chapter 25-10.
8.	Remove the carbon inlays from both sides of the interior trim floor panels by gently prying them off.	Refer to Figure 204.
9.	Remove the Interior Trim Floor Panels as follows: - Remove the six mounting screws (three on each side).	
10.	Locate the landing gear warning micro switch on the throttle lock plate.	
	NOTE: The landing gear warning micro switch and elevator variable stop micro switch are both mounted on the throttle lock plate. The landing gear warning micro switch has 2 wires attached to the contacts while the elevator variable stop micro switch has 3 wires attached to the contacts. Refer to Figure 205.	

	Detail Steps/Work Items	Key Items/References
11.	Adjust the landing gear warning micro switch so that it engages when the front edge of the throttle lever aligns with the mark on the masking tape: - Loosen the two mounting screws while holding the locknuts - Slide the micro switch to the desired location - Tighten the screws.	Refer to step 5.
NOTE: Do not bend the micro switch arm to achieve proper engagement. If necessary, remove the micro switch and extend the slots up to 1 mm each to allow proper positioning of the micro switch.		
12.	Clear the area and remove all unwanted materials.	
13.	Install the interior trim floor panels as follows: - Install the six mounting screws (three on each side).	
14.	Apply a silicone sealant/adhesive in three locations on the back of the carbon inlays	
15.	Install the carbon inlays on both sides of the interior trim floor panels by pressing them firmly in place.	
16.	Install the pilot's and co-pilot's seats.	Refer to AMM # 7.02.01 Chapter 25-10.
17.	Do a functional check of the micro switch: - - Start the LH (RH) engine - Set the throttle lever to achieve a manifold pressure of 16 inHg or greater - Pull the throttle lever slowly aft until a manifold pressure of 14.5 ± 0.5 inHg is indicated.	Refer to the D42 L360 AFM. Make sure that the micro switch engages when a manifold pressure of 14.5 ± 0.5 inHg is indicated. The landing gear warning horn will sound, if the aircraft is in a weight-off-wheels condition.
18.	Shut down the LH engine.	Refer to D42 L360 AFM.

3. Replacement of Flap and Landing Gear Indication Lights Lamp

NOTE: The flap and landing gear lights are polarity sensitive and therefore a functional test of the lights should be carried out after installation of the lamp to make sure that the lamp is installed correctly.

	Detail Steps/Work Items	Key Items/References
1.	Replace the lamp for the flap and landing gear indication lights as follows: - Remove the lens cap - Pull out the existing lamp - Install the LED lamp	
2.	Do a functional check of the lamp as follows:	
	- Turn the power on	Make sure that the light comes on.
	- If the light does not come on, turn off power and remove the LED lamp	
	- Rotate the lamp 180 degress and install again	
	- Turn the power on	Make sure that the light comes on.
3.	Turn off power and install the lens cap.	

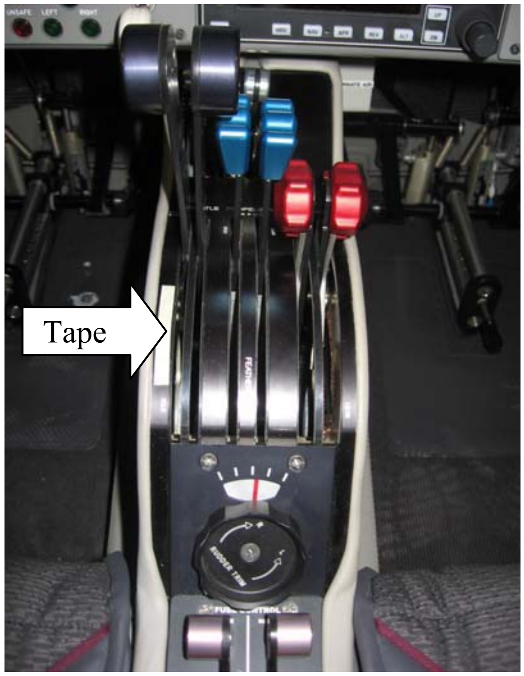

Figure 201 - Masking Tape applied to the Throttle Quadrant Cover Plate. Throttle Lever positioned at 16+ inHg

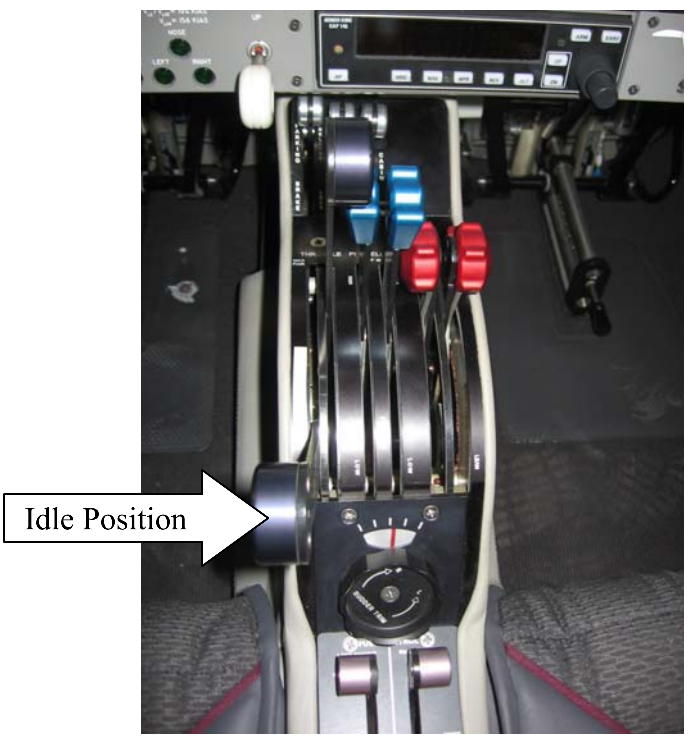

Figure 202 - LH Throttle Lever set to achieve Idle RPM

Figure 203 - Marking the Front Edge of the Throttle Lever

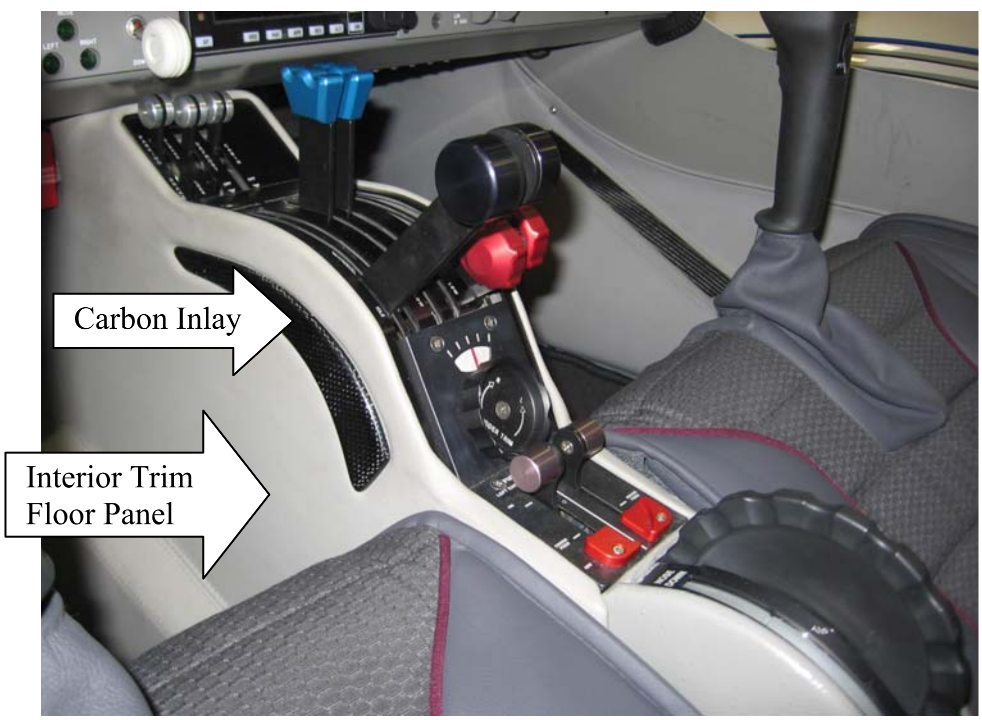

Figure 204 - Carbon Inlay and Interior Trim Floor Panel

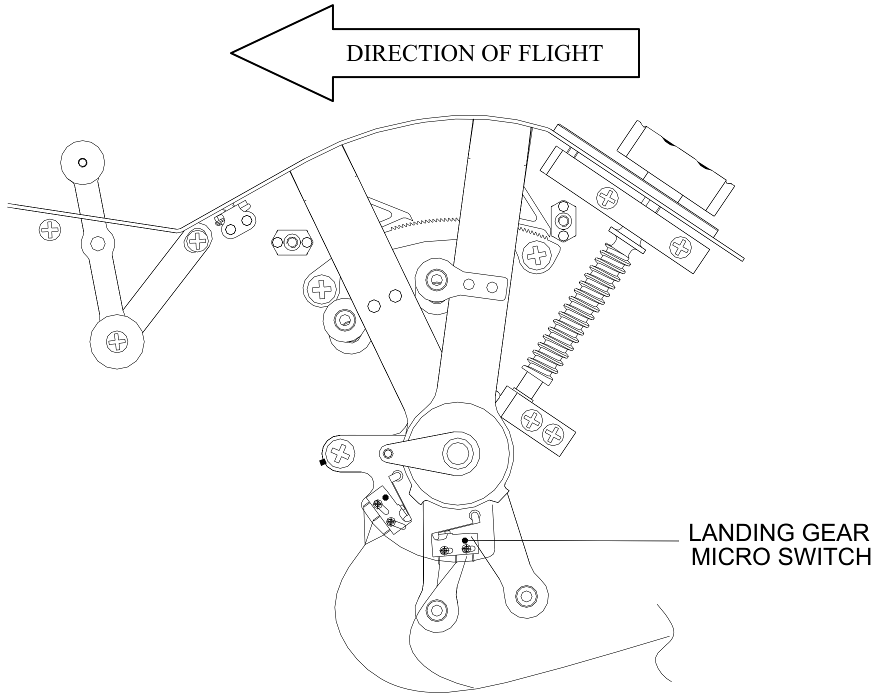

Figure 205 - Landing Gear Warning Micro Switch Location

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ELECTRICAL BONDING - DESCRIPTION AND OPERATION

1. General

The bonding system gives the aircraft good lightning protection. A special bonding system is necessary for the composite structure of the DA42 L360 aircraft. Without this special system, the composite structure would not sufficiently conduct electricity.

Refer to AMM # 7.02.01 Chapter 21-60 for details about the static discharge wicks.

2. Description

The lightning conductor system is the main part of the bonding system. High capacity aluminum alloy tubes and strips make the lightning conductor system.

The lightning conductor system has a longitudinal branch and a lateral branch. The longitudinal branch runs from the engine block via engine truss, firewall, cabin, aft fuselage and empennage to the elevator. The horizontal branch connects the left wing tip with the right wing tip. It is connected with the longitudinal branch at the cabin floor under the forward seats.

Metal braiding and strips connect all conductive components (for example: wing skin, fuel tanks, control systems, landing gear, engine, etc.) and antenna ground plates to the lightning conductor system.

The following design features also give lightning protection:

- The aluminum tubes of the lightning conductor system are also used as conduits for electric wires.
- Carbon fiber material is used for the lower wing skin and parts of the fuselage skin, canopy frame and rear door frame. Carbon fiber material is conductive.
- Carbon fiber material with interwoven aluminum fibers is used for the upper wing skin and the engine cowlings. Carbon fiber material with interwoven aluminum fibers is conductive.
- The forward wing spar separates the lightning conductor system from the fuel tanks.
- A lightning conductor strip is integrated in the horizontal stabilizer.
- The tail skid has an aluminum bar on the lower edge.
- The propeller is non-conductive (except for the erosion sheath), therefore currents cannot flow in structural parts of the propeller. The propeller spinner is made from aluminum and is connected to electrical ground.

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ELECTRICAL BONDING - MAINTENANCE PRACTICES

1. General

This section describes how to do a test of the electrical bonding system resistance measurements for very low, low, and high resistance measurements for the components installed by the STC No. SA09-54.

2. Test the Electrical Bonding System

The resistance measurements on the DA42 L360 are divided into three categories:

- Very low resistance measurements for conduits in the direct lightning path and electrical power grounds
- Low resistance measurements for bondings of controls and canopy
- High resistance measurements for the antistatic precipitation i.e. static wicks.

Do the low resistance bonding measurements with a milliohmmeter and Kelvin probes. The test current must be approximately 2 amps.

Do the high resistance measurements with a high voltage megaohmmeter.

All measurements for paragraphs 2.A and 2.B are referenced to the negative pole of the main battery. The aircraft must be in a serviceable condition during the tests, except that the engine cowlings must be removed.

A. Very Low Resistance Measurements

(1) Fuselage and Center Section without Wings Installed

Item	Attachment Point	Maximum Allowed (mΩ)	Measured (mΩ) LH / RH	Passed
Engine Compartments:				
- Firewall		6.0		
- Engine Mount	Top inboard	6.0		
- Engine	Propeller bearing front	6.0		
- Starter	Case	7.0		
- Oil Cooler	Case	8.0		
- Alternator	Case	7.0		
- Voltage Regulator	Baseplate	9.0		

Item	Attachment Point	Maximum Allowed (mΩ)	Measured (mΩ) LH / RH	Passed
Nacelle Components:				
- Electrical Junction Box	Sheet metal	7.0		
- GEA Rack	Mounting tray	7.0		
- Aux Fuel Tank (Optional)	LH/RH drain	10.0		
- Aux Fuel Tank Refill (Optional)	LH/RH tube	10.0		
Fuselage Components:				
- External Power Connector	Outer large pin	5.0		
- Instrument Panel	Above co-pilot's left knee	3.0		
- Taxi Light	Mounting screw	4.0		
- Landing Light	Mounting screw	4.0		
- Remote Avionics Box	Case	4.0		
- Hydraulic Module	Sheet metal	4.0		
- Nose Landing Gear Door Hinge	LH/RH front hinge	10.0		
- Nose Baggage Door Hinge	LH/RH front hinge	10.0		
- TKS Spray Bar (Optional)	Center	5.0		
External Conductive Parts:				
- LH Step	Grounding point	5.0		
- RH Step	Grounding point	5.0		
- OAT Sensor		10.0		
- Front Landing Gear	Yoke exposure mounting screw	10.0		
- Main LDG LH	Axis mounting screw	10.0		
- Main LDG RH	Axis mounting screw	10.0		

Item	Attachment Point	Maximum Allowed (mΩ)	Measured (mΩ) LH / RH	Passed
Antennas:				
- Top COM antenna	Mounting screws	6.0		
- Bottom COM antenna	Mounting screws	6.0		
Stabilizer:				
- Vertical lightning prot. tube	Upper end	7.0		
- Horizontal stabilizer LH lightning strap	Tip	15.0		
- Horizontal stabilizer RH lightning strap	Tip	15.0		
- Rudder hinge	Rudder side	10.0		
- Vertical Stabilizer fairing	FWD LH side screw	12.0		
- Vertical Stabilizer fairing	FWD RH side screw	12.0		
- Horizontal Stabilizer	Front bracket	10.0		
- Horizontal Stabilizer	Rear bracket	10.0		
- Horizontal Stabilizer TKS Panel (Optional)	LH inner panel section	15.0		
- Horizontal Stabilizer TKS Panel (Optional)	LH outer panel section	15.0		
- Horizontal Stabilizer TKS Panel (Optional)	RH inner panel section	15.0		
- Horizontal Stabilizer TKS Panel (Optional)	RH outer panel section	15.0		
- Vertical TKS Panel (Optional)	Upper panel section	25.0		
- Vertical TKS Panel (Optional)	Bottom panel section	25.0		
- TKS Low Pressure Switches (Optional)	Mounting plate	20.0		

(2) Fuselage and Center Section with Wings Installed

Item	Attachment Point	Maximum Allowed (mΩ)	Measured (mΩ) LH / RH	Passed
LH Wing:				
- Fuel Tank Drain	Drain	5.0		
- Tank Refill	Ring	5.0		
- Tank Vent	Plate	10.0		
- Pitot Tube Base	Tube base	6.0		
- Tip Light Assembly	Base plate	8.0		
- Aileron Pushrod Attachment	Bond strap connection	50.0		
- Outer Flap Pushrod Attachment	Bond strap connection	50.0		
- Inner Flap Pushrod Attachment	Bond strap connection	50.0		
- Stall Warning Switch	Mounting screw	10.0		
- Inner TKS Panel (Optional)	Inner panel section	15.0		
- Outer TKS Panel (Optional)	Inner panel section	15.0		
- Outer TKS Panel (Optional)	Outer panel section	10.0		
RH Wing:				
- Fuel Tank Drain	Drain	5.0		
- Tank Refill	Ring	5.0		
- Tank Vent	Plate	10.0		
- Tip Light Assembly	Base plate	8.0		
- Aileron Pushrod Attachment	Bond strap connection	50.0		
- Outer Flap Pushrod Attachment	Bond strap connection	50.0		
- Inner Flap Pushrod Attachment	Bond strap connection	50.0		
- Inner TKS Panel (Optional)	Inner panel section	15.0		
- Outer TKS Panel (Optional)	Inner panel section	15.0		
- Outer TKS Panel (Optional)	Outer panel section	10.0		

B. Low Resistance Measurements

Item	Attachment Point	Maximum Allowed (mΩ)	Measured (mΩ) LH / RH	Passed
Pilot Stick	Tube	50.0		
Copilot Stick	Tube	50.0		
Trim Wheel Assembly	Frame	5.0		
Levers	Frame	300		
Pilot Pedal Assembly		150		
Copilot Pedal Assembly		150		
Canopy Hinge RH	Tube tip	100		
Canopy Hinge LH	Tube tip	100		
Nacelle Fuel Filler Drain	Case	150		

C. High Resistance Measurements

WARNING: BE CAREFUL WHEN USING THE WET SPONGE. IT MAY GIVE SHOCK AND MAY CAUSE INJURY TO PERSONNEL.

Use a wet sponge to get a constant electrical connection to the static dischargers.

Item	Maximum Allowed (MΩ)	Measured (MΩ) (250V)	Passed
Static Wicks:			
- LH Wing	100		
- RH Wing	100		
- Rudder	100		
- Horizontal Stabilizer LH	100		
- Horizontal Stabilizer RH	100		
Tires			
- Nose	100		
- LH	100		
- RH	100		

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CHAPTER 55-00
STABILIZERS

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1. General 201

2. Remove/Install the Rudder Trim Seal 201

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RUDDER AND TRIM TAB - DESCRIPTION AND OPERATION

1. General

This chapter provides information on the rudder and trim tab system. For additional details on this chapter, refer to Aircraft Maintenance Manual (AMM) Doc. # 7.02.01, latest revision.

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RUDDER AND TRIM TAB - MAINTENANCE PRACTICES

1. General

This chapter describes only the removal and installation procedure for the rudder trim seal. For all other maintenance procedures, refer to Aircraft Maintenance Manual (AMM) Doc. # 7.02.01, Chapter 55-40-00.

2. Remove/Install the Rudder Trim Seal

A. Remove the Rudder Trim Seal

Remove the rudder trim seal as follows:

	Detail Steps/Work Items	Key Items/References
1.	Remove the TESA MG 4140 safety tape (19 mm wide).	
2.	Remove the mylar convex seal.	
3.	Remove the TESA 4965 two sided tape (12 mm wide)	
4.	Clean the area with isopropyl alcohol.	

B. Install the Rudder Trim Seal

Install the rudder trim seal as follows

	Detail Steps/Work Items	Key Items/References
1.	Form mylar convex seal (30 mm wide).	Use DAI tool C61-5540-001-44-01. Make sure that the tolerances are as per ISO 2768C.
2.	Apply TESA 4965 two sided tape (12 mm wide) as follows:	Refer to Figure 201.
	- Mask the designated area	
	- Clean the area with isopropyl alcohol	
	- Abrade the area lightly using scotch brite pad	
	- Clean the area with isopropyl alcohol.	
3.	Install the mylar convex seal and TESA MG 4140 safety tape (19 mm wide).	Use a rubber roller to apply pressure to the bonded surface to make sure proper adhesion.

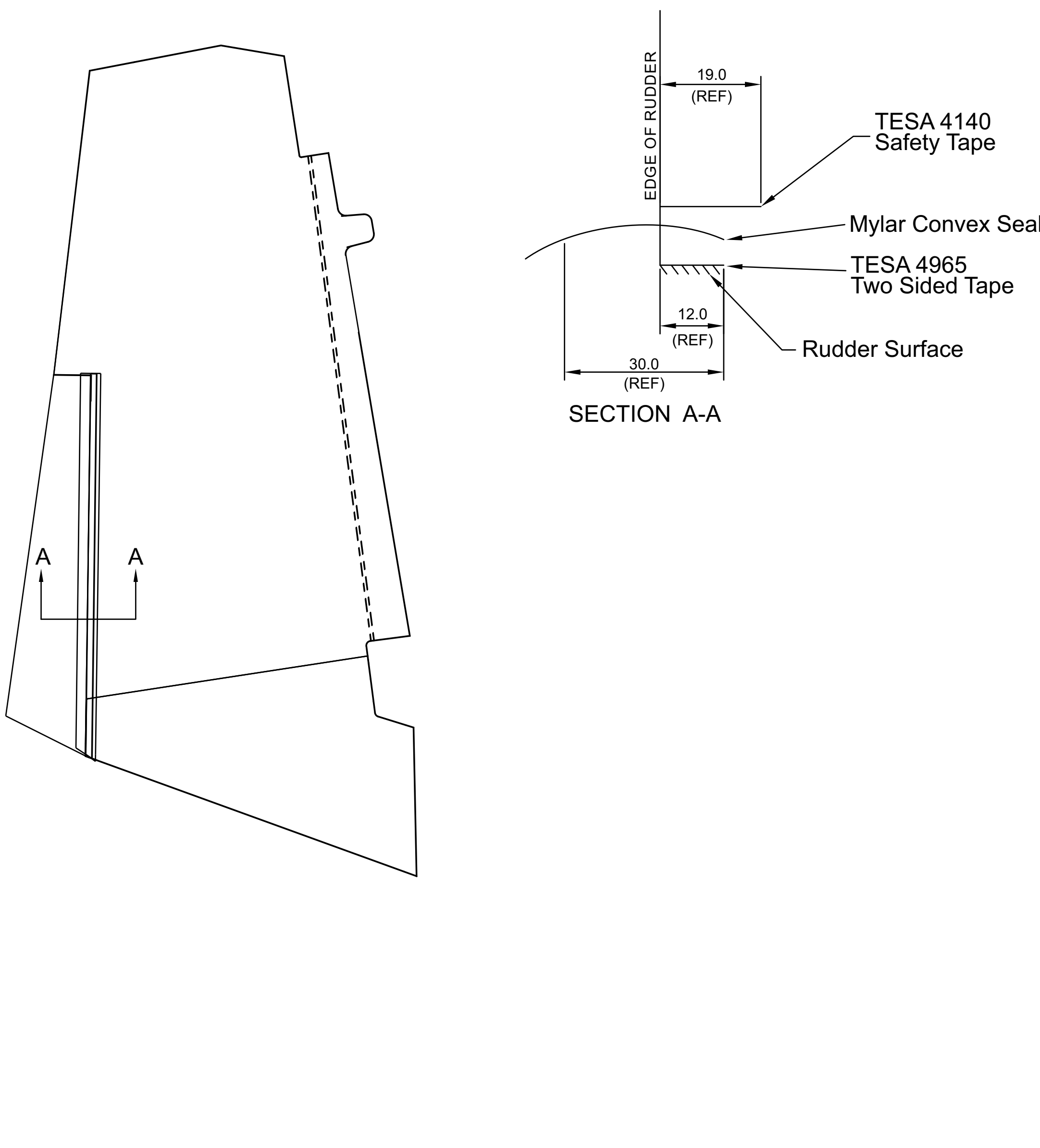

Figure 201 - Installation of Rudder Trim Seal

CHAPTER 61-00
PROPELLER

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PROPELLER - DESCRIPTION AND OPERATION

1. General

This chapter describes about the propellers that are installed on the DA42 L360 aircraft. Refer to Chapter 61-10 for data about the propellers and refer to Chapter 61-20 for data about the control of the propellers.

For more data on the propellers refer to the related propeller manufacturer's manual.

NOTE: Equipment which is certified for installation in the DA42 L360 aircraft is listed in Chapter 6.5 of the Airplane Flight Manual (AFM). Such equipment may be installed in accordance with the AFM.

NOTE: Any equipment which is not listed in Chapter 6.5 of the AFM is called “Additional Equipment”. The installation of additional equipment is a modification which must be handled in accordance with national regulations or a Service Bulletin (SB).

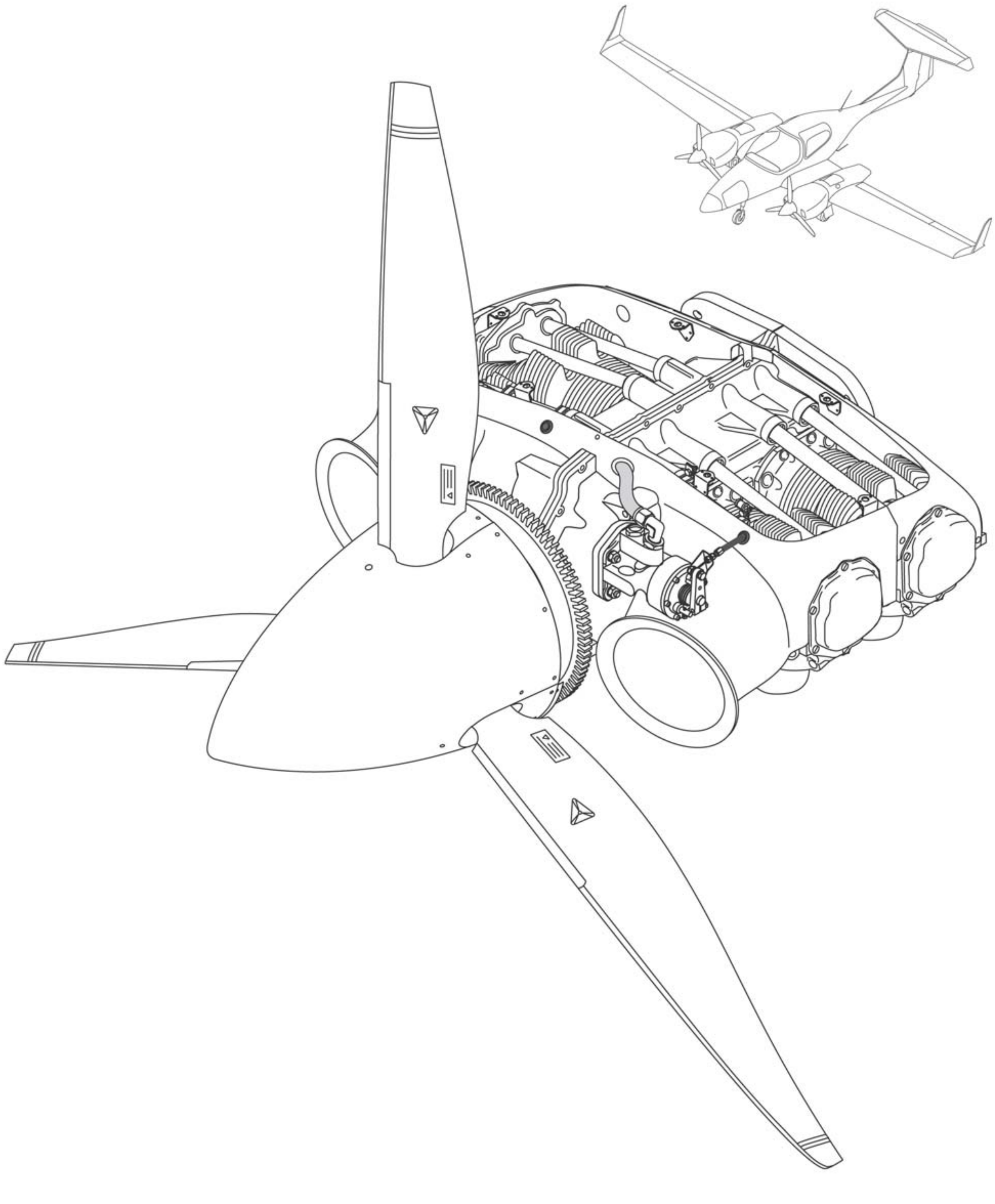

Figure 1 - Propeller

PROPELLER ASSEMBLY - DESCRIPTION AND OPERATION

1. General

The DA42 L360 aircraft has 2 three bladed MT variable pitch and feathering propeller.

The blades of the MT propellers are made from wood and covered with GFRP. The blades have an acrylic lacquer painted finish. The outboard leading-edges of the blades are protected from erosion by a stainless-steel sheath. The stainless-steel sheath is bonded into position. The inboard section of the leading-edge is protected by a self-adhesive rubber strip (PU tape).

This chapter describes how to remove and install the propellers and how to do a test for blade tracking. The Chapter 61-20 describes about the propeller governors.

Refer to the related propeller manufacturer's manual for more data on a propeller.

2. Description and Operation of MT Propeller

A. Description

Figure 1 shows the MT propeller. The propeller attaches to the engine crankshaft flange bushings with six special bolts and castle nuts. The castle nut is secured to the stud with a roll pin/split pin. The bolts are locked with wire. The bolts are retained within the propeller hub.

A spinner bulkhead (spinner backplate which is made from aluminum material) attaches to the rear of the hub with six bolts. The bolts are locked with wire. A front support plate attaches to the front of the hub with six screws. The screws are locked with wire. A spinner which is made from composite material attaches to the aft bulkhead with screws. The spinner is supported by the front support plate. Screws attach the spinner to the front support plate.

The propeller has a MT governor. The governor attaches to a drive pad on the left side of the engine at the front. The governor controls the propeller pitch hydraulically. Engine oil flows through internal oil galleries to the governor. The governor has a geared oil pump which increases the oil pressure. The oil flows from the governor to the propeller hub through the hollow crankshaft.

B. Operation

When the propeller is turning, centrifugal twisting moments normally cause the blades to turn towards fine pitch. The propeller installed on the DA42 L360 aircraft has counterweights attached to each propeller blade to overcome the centrifugal twisting moments. The counterweights act in the opposite sense to the centrifugal twisting moments and move the blades towards coarse pitch.

High pressure oil is used to control the propeller pitch. Oil from the engine is pumped to the propeller governor. The propeller governor directs the oil to the propeller as necessary to control the propeller pitch. Hydraulic pressure in the cylinder acts on a piston and the piston moves the blades towards fine pitch.

The pilot moves the propeller pitch control lever fully aft and through a small gate to set the propeller to the feather position. The propeller governor allows all the oil in the propeller to flow back to the engine and the counterweights will cause the propeller blades to move to the feather position.

If the oil pressure fails during normal flight the counterweights will cause the propeller to move past the coarse-pitch-stop to the feather position.

During normal operation high pressure oil also flows from the propeller governor to the un-feathering accumulator. The un-feathering accumulator can be used to un-feather the propeller when the engine is not operating.

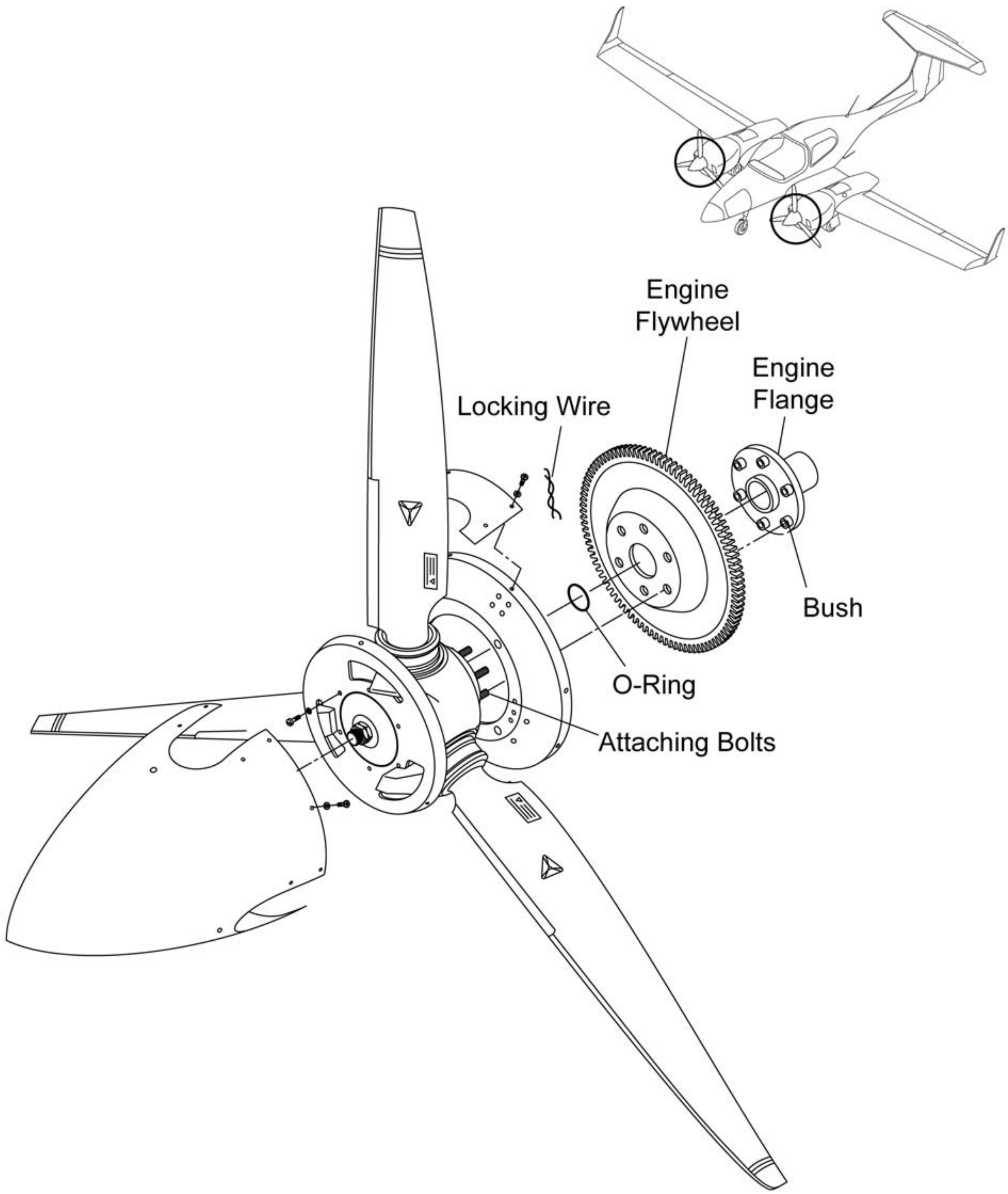

Figure 1 - MT Propeller Assembly

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PROPELLER ASSEMBLY - TROUBLESHOOTING

1. General

The table below lists the defects you could have for the propeller. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Engine vibration.	Propeller out of balance.	Examine the propeller. Balance the propeller. If you find any damage, repair the propeller in accordance with the manufacturer's Owners manual.
	Spinner out of balance.	Replace the spinner.
	Propeller mounting loose.	Tighten the mounting nuts to the correct torque. Refer to the manufacturer's Owners Manual.
	Spinner attaching screws loose.	Tighten the attaching screws. Refer to the manufacturer's Owners Manual.
	Blade tracking not correct.	Refer to the manufacturer's Owners Manual.
Cracks in the blades.	Over-speed.	Refer to the manufacturer's Owners Manual. (MTE-124 Maintenance and Operations Manual)
Holes/nicks/dents in the blade.	Stone damage.	Repair/replace the propeller. Refer to the manufacturer's Owners Manual.

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PROPELLER ASSEMBLY - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to remove and install a MT propeller and also how to do a propeller blade tracking test.

2. Remove/Install the MT Propeller

A. Remove the Propeller

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related START switch. - Set the throttle lever to IDLE. - Set the mixture control to LEAN CUT-OFF.	Fully Aft.
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the spark plug leads from the spark plugs.	
NOTE: Mark the propeller, spinner, front support plate and spinner bulkhead, with an index mark. This will help you to install these items in the correct position.		
4.	Remove the spinner as follows: - Mark the spinner and spinner bulkhead with index marks to aid installation. - Release the screws holding the spinner to the spinner bulkhead. - Release the screws holding the spinner to the front support plate and move the spinner clear of the aircraft.	Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
	- Mark the front support plate with an index mark to align with the other index marks.	
5.	Cut the lock-wire on the attaching bolts.	
6.	Remove the special bolts that attach the propeller to the crankshaft flange.	Hold the propeller. Two persons can hold the propeller.
7.	Pull the propeller forward and clear of the crank shaft flange bushings.	Oil will flow from the engine crankshaft and the propeller hub. Use suitable containers to catch spilled oil.

B. Install the Propeller

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related START switch. - Set the throttle lever to IDLE. - Set the mixture control to LEAN CUT-OFF.	Fully Aft.
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Make sure that the spark plug cables are disconnected from the spark plugs.	
4.	If necessary, install the spinner bulkhead onto the hub: - Make sure that the mating surfaces are clean and dry. - Install the six bolts and washers that attach the spinner bulkhead to the hub. - Lock the bolts in pairs with 0.32 in (0.81 mm) stainless steel lock-wire.	

	Detail Steps/Work Items	Key Items/References
5.	Make sure that the propeller shaft flange, engine flywheel, and the engine flange are clean and dry.	
6.	Make sure that a new O-ring oil seal is in place in the propeller hub. Lightly oil the seal.	Refer to Figure 201. Use clean engine oil.
NOTE: Make sure that the propeller is pushed into the correct position by hand. Do not use the nuts to pull the propeller into position.		
7.	Install the propeller: - If necessary, install the six bolts that attach the propeller hub to the crankshaft flange. - Move the propeller into position on the crankshaft bushings. - Turn each bolt a small amount. Turn the bolts in opposing pairs until the they are finger tight. - When the propeller is in the correct position, fully tighten the retaining studs in opposing pairs. - Secure the retaining studs with lock-wire.	 Take care not to damage the propeller O-ring seal. Make sure that the propeller is pushed into the correct position by hand. Do not use the bolts to pull the propeller into position. Torque the propeller to 63 - 66 lbf-ft (85.5 - 89.6 Nm). In pairs.
8.	If necessary, install the front support plate: - Make sure that the mating surfaces are clean and dry. - Install the six screws and washers that attach the support plate to the hub. - Lock the screws in pairs with 0.32 in (0.81 mm) stainless steel lock-wire.	
9.	Do a test for correct blade track.	Refer to Paragraph 3.
10.	Install the spinner: - Loosely install the screws and plastic washers that attach the spinner to the spinner bulkhead.	

	Detail Steps/Work Items	Key Items/References
	- Loosely install the screws and plastic washers that attach the spinner to the front support plate. - Tighten all the attaching screws.	 Torque the screws to 35 - 44 lbf-in (4 - 5 Nm).
11.	Connect the park plug leads to the spark plugs.	Refer to Chapter 74-20.
12.	Install the engine cowlings.	Refer to Chapter 71-10.
13.	Do an engine run-up. Do a test for correct operation of the propeller.	Refer to Chapter 71-00.

3. Propeller Blade Tracking Test

A. Equipment

Item	Quantity	Part Number
Tracking Stand	1	Commercial

B. Procedure

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related START switch. - Set the throttle lever to IDLE.	 Fully Aft.
2.	Put the tracking stand behind the propeller that you will test.	Do not move the tracking stand during the test.
3.	Turn the propeller backwards to align a blade with the tracking stand.	

	Detail Steps/Work Items	Key Items/References
4.	Measure the distance from the stand to the blade.	Measure from the stand to a point on the trailing edge 4 in (10 cm) from the blade tip.
5.	Do items 3 and 4 for the other blades and record the values.	
6.	The difference between any blades must not be more than 1/8 in (3 mm).	

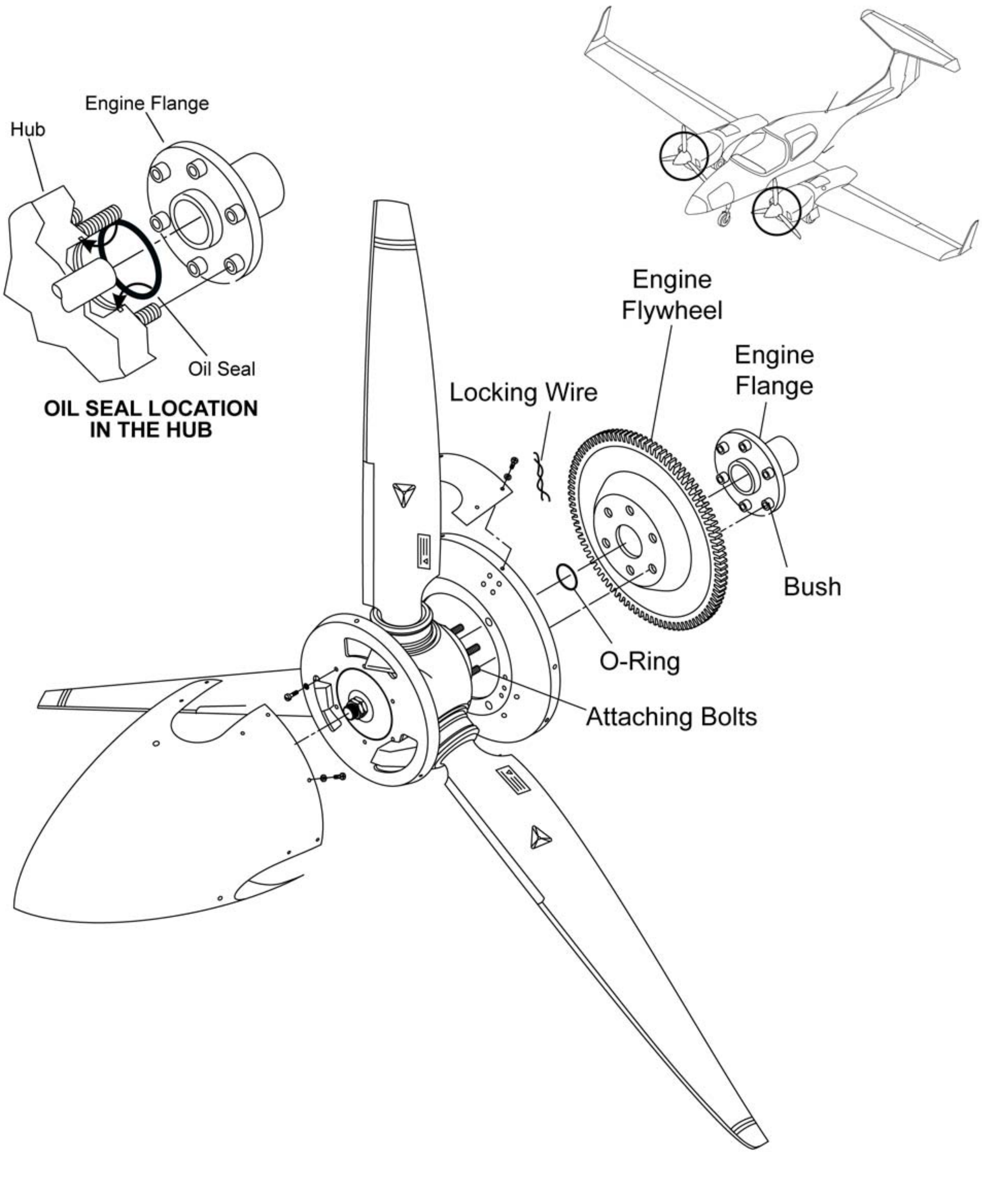

Figure 201 - Propeller Installation

PROPELLER CONTROL - DESCRIPTION AND OPERATION

1. General

The DA42 L360 aircraft has the 3 blade MT variable pitch and feathering propeller installed. A MT governor is installed on the engine controls the pitch of the propeller.

Refer to MT Propeller, Operation and Installation Manual ATA61-20-48 (E-1048) for installtion procedures and further details.

2. Description and Operation

The MT propellers for the DA42 L360 aircraft are of the variable pitch and feathering type. The propellers have counterweights fitted to the blades of the propeller.

When the propeller is rotating the counterweights overcome the normal centrifugal twisting moment of the rotating blades and causes the blades to move towards coarse pitch. The MT propeller uses a coil spring in the cylinder to help move the blades towards coarse pitch. The propeller uses oil pressure to move the blades towards fine pitch.

A. Propeller Governor

The propeller governor is flanged onto the front of the engine. It regulates the supply of engine oil to the propeller. The propeller governor oil circulation is an integral part of the engine oil circulation system. The necessary servo pressure of the engine oil is reached by a gear pump in the governor, which increases the oil pressure. Flyweight and a speeder spring move a pilot valve, allowing servo oil flow to and from the piston into the propeller. In on speed condition, when there is no oil flow, a speed adjusting lever changes the preload of the speeder spring. This results in engine speed change as its load is changed. The governor produces oil pressure to decrease pitch (unfeather). Thus, the propeller governor is a fail safe design to go into feathering mode in case of any failure within the system. In addition, the propeller has a single acting system where the natural twisting forces of the blades always turn them into high pitch (feather) position.

Figure 1 shows the schematic diagram for the propeller pitch control system. The governor has a control lever. The position of the control lever is set by the RPM lever in the airplane cockpit. The control lever changes the spring pressure acting on the drive shaft and pilot valve assembly. A flyweight assembly also moves the drive shaft and pilot valve assembly in opposition to the spring. The engine rotates the flyweight assembly and the force exerted by the flyweights on the pilot valve changes with the engine RPM.

In normal flight when the engine is running at the RPM set by the pilot the governor operates in the ON SPEED condition. In this position the force acting on the drive shaft and pilot valve assembly by the control lever balances the forces acting on the drive shaft and pilot valve assembly by the flyweight assembly. The pilot closes the oil flow to and from the propeller cylinder. The propeller blades remain at the set pitch.

If in normal flight the engine runs faster than the RPM set by the pilot the governor operates in the OVER SPEED condition. The forces from the flyweight assembly at the higher engine speed overcome the forces acting on the drive shaft and pilot valve assembly from the control lever. The pilot valve moves and allows oil to flow out from the propeller cylinder back to the engine sump.

The propeller blades move towards coarse pitch and the load on the engine causes the engine RPM to decrease. As the engine RPM decreases the force acting on the drive shaft and pilot valve assembly from the flyweight assembly decreases until the governor operates in the ON SPEED condition.

If in normal flight the engine runs slower than the RPM set by the pilot the governor operates in the UNDER SPEED condition. The forces from the flyweight assembly at the lower engine speed are less than the forces acting on the drive shaft and pilot valve assembly from the control lever. The pilot valve moves and allows oil to flow into the propeller cylinder from the governor. The propeller blades move towards fine pitch and the reduced load on the engine causes the engine RPM to increase. As the engine RPM increases the force acting on the drive shaft and pilot valve assembly from the flyweight assembly increases until the governor operates in the ON SPEED condition.

B. Hydraulic Accumulator

An hydraulic accumulator has been attached to each governor which enables unfeathering without running the engine. The accumulator is used to unfeather a feathered propeller during in flight engine restart. With this option, the governor is modified to provide an external high-pressure oil outlet through a check valve, as well as a device for unseating the check valve. The external outlet is connected to an accumulator. One side of the accumulator is filled with compressed nitrogen and the other side with oil. This allows the oil to be stored under high pressure, as it is during normal flight. When the propeller is feathered, a two position electrical magnetic valve maintains oil pressure in the accumulator. When the propeller control is moved from feather to low pitch, the check valve is unseated, permitting the high-pressure oil in the accumulator to flow to the governor pilot valve. With the RPM lever and the propeller shaft in low pitch, the speeder spring forces the pilot valve down so that the oil flows to the propeller and moves the blades to low pitch.

The propeller accumulator has an electromagnetic valve attached to the accumulator. A microswitch operated by the propeller control lever closes the valve when the lever is moved past the feather stop. The oil is trapped in the accumulator. When the propeller lever is moved forward, the switch opens and the electromagnetic valve allows the oil to flow to the propeller moving the blades to fine pitch.

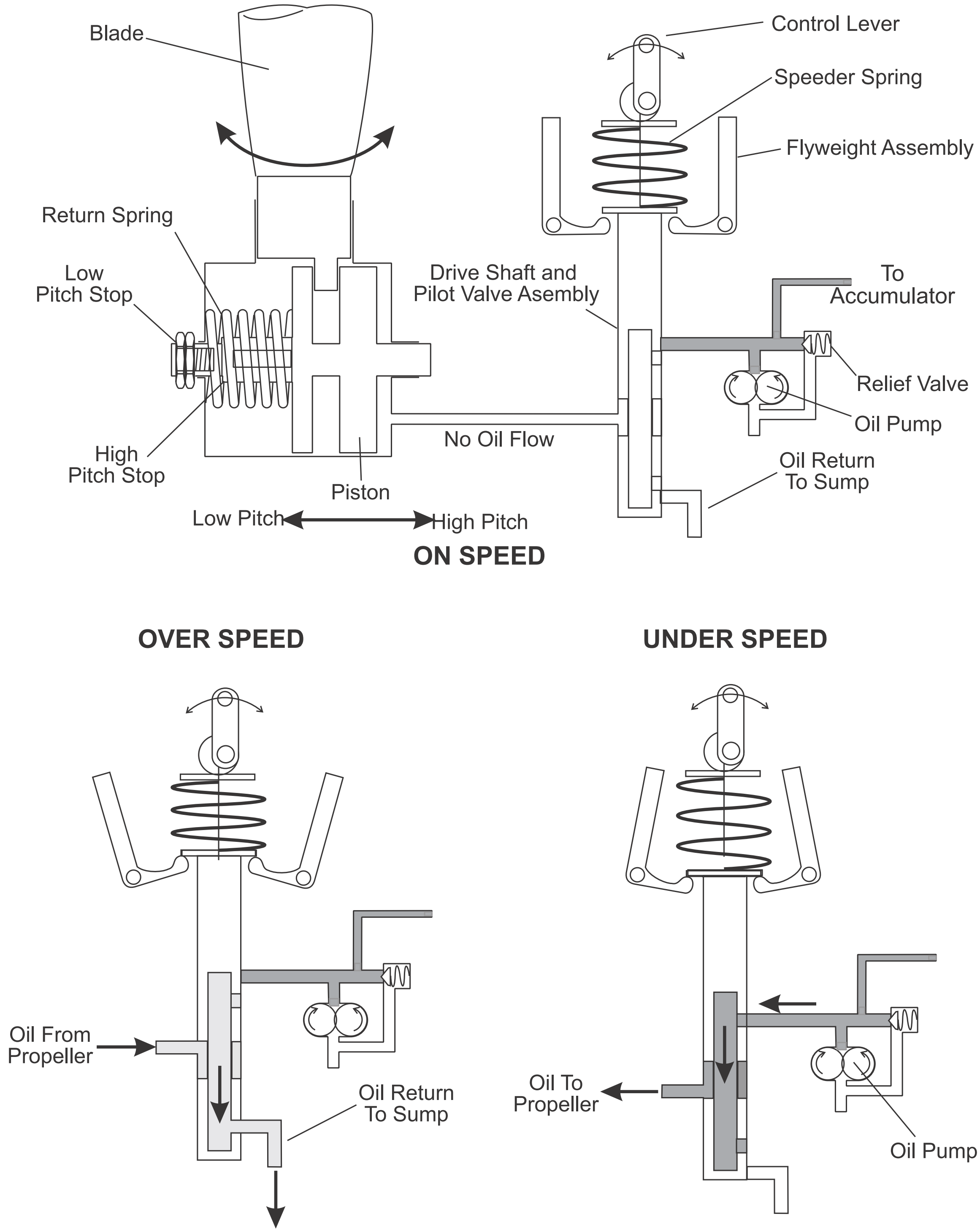

Figure 1 - Propeller Pitch Control System Schematic Diagram

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PROPELLER CONTROL - TROUBLESHOOTING

1. General

The table below lists the defects you could have for the propeller. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Propeller RPM erratic.	Propeller governor defective.	Replace the propeller governor.

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PROPELLER CONTROL - MAINTENANCE PRACTICES

1. General

This chapter describes how to remove and install the propeller governor and the propeller un-feathering accumulator.

2. Remove/Install the Propeller Governor

A. Remove the Propeller Governor

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related START switch. - Set the throttle lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
WARNING: YOU MUST RELEASE ALL THE NITROGEN PRESSURE FROM THE ACCUMULATOR BEFORE YOU DISCONNECT THE OIL HOSE AT THE PROPELLER GOVERNOR. NITROGEN AT HIGH PRESSURE CAN PENETRATE THE SKIN. THIS CAN CAUSE DISEASE.		
3.	Release the nitrogen pressure from the un-feathering accumulator: - Release the pressure from the charging valve at the end of the accumulator.	
4.	Disconnect the propeller governor control cable: - Remove the nut, the washer and the bolt that attach the propeller governor control cable eye-end to the propeller governor control lever. - Move the eye-end clear of the propeller governor.	Refer to Figure 201. At the propeller governor.

	Detail Steps/Work Items	Key Items/References
5.	Disconnect the flexible hose that connects the propeller governor to the accumulator.	At the propeller governor. Install blanking caps on all open oil lines. Use a suitable container to catch spilled oil.
6.	Remove the propeller governor: - Remove the four nuts, the serrated washers, the plain washers, and the spacers that attach the propeller governor to the engine. - Move the propeller governor away from the mounting studs and clear of the engine. - Remove and discard the propeller governor gasket.	

B. Install the Propeller Governor

	Detail Steps/Work Items	Key Items/References
1.	Install the Propeller governor: - Make sure that the mating surfaces of the propeller governor and the propeller governor mounting pad are clean. - Install a new gasket onto the propeller governor mounting pad. - Install the spacer, four plain washers, the serrated washers and the nuts that attach the propeller governor to the engine.	
2.	Connect the flexible hose from the un-feathering accumulator.	At the propeller governor. Remove all blanking caps.
3.	Connect the propeller governor control cable eye-end to the propeller governor control lever: - Move the eye-end into position at the propeller governor control lever. - Install the bolt through the control lever and then through the eye-end fitting.	 Towards the engine.

	Detail Steps/Work Items	Key Items/References
	- Install the washer and the nut onto the bolt.	
4.	Do a test for the correct adjustment of the propeller governor control cable:	
	- Set the related RPM lever in the cockpit to MAX.	The control lever at the propeller governor must touch the maximum stop. The RPM lever in the cockpit must have a minimum of 0.04 to 0.12 in (1 to 3 mm) clearance between the front of the lever and the stop in the control assembly.
	- Set the related RPM lever in the cockpit to FEATHER.	The control lever at the Propeller governor must touch the minimum stop. The RPM lever in the cockpit must have a minimum of 0.04 to 0.12 in (1 to 3 mm) clearance between the front of the lever and the stop in the control assembly. If necessary adjust the Bowden cable.
5.	If necessary for your airworthiness authority, do a duplicate inspection of the propeller control system.	
6.	Charge the accumulator with nitrogen:	Refer to Paragraph 3.C.
7.	Install the engine cowlings.	Refer to Chapter 71-10.
8.	Do a test for the correct operation of the Propeller governor.	Refer to the DA42 L360 Airplane Flight Manual.

3. Remove/Install the Propeller Un-Feathering Accumulator

A. Remove the Propeller Un-Feathering Accumulator

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related START switch. - Set the throttle lever to IDLE.	
2.	Remove the engine cowlings.	Refer to AMM 71-10.
WARNING: YOU MUST RELEASE ALL THE NITROGEN PRESSURE FROM THE ACCUMULATOR BEFORE YOU REMOVE IT. NITROGEN AT HIGH PRESSURE CAN PENETRATE THE SKIN. THIS CAN CAUSE DISEASE.		
3.	Release the nitrogen pressure from the accumulator: - Release the pressure from the charging valve at the end of the accumulator.	Refer to Figure 202.
4.	Disconnect the oil hose from the accumulator.	Use a suitable container to collect spilled oil.
5.	Disconnect the electrical connectors from the accumulator solenoid as follows: - Remove the four nuts, the washers and the blots from the accumulator solenoid.	
6.	Remove the accumulator: - Remove the four nuts, the washers and the bolts that attach the accumulator clamp to the mounting. - Lift the accumulator and retaining clamp clear of the mounting bracket.	Support the accumulator.

B. Install the Propeller Un-Feathering Accumulator

	Detail Steps/Work Items	Key Items/References
1.	Install the accumulator: - Move the accumulator and the accumulator retaining clamp into position in the mounting bracket. - Install the four bolts, the washers and the nuts that attach the retaining clamp and the accumulator to the mounting bracket.	 Make sure that the accumulator is orientated correctly and the retaining clamp aligned on the mounting bracket.
2.	Connect the electrical connector to the accumulator.	
3.	Connect the oil hose to the accumulator.	
4.	Charge the accumulator with nitrogen:	Refer to Paragraph 3.C.
5.	Install the engine cowlings.	Refer to Chapter 71-10.
6.	Do a test for oil leaks: - Start the engine and allow reaching normal operating temperature. - Stop the engine. - Remove the engine cowlings. - Look for oil leaks. Especially in the area of the propeller un-feathering accumulator. - Install the engine cowlings.	 Refer to the DA42 L360 Airplane Flight Manual. Refer to the DA42 L360 Airplane Flight Manual. Refer to Chapter 71-10. Refer to Chapter 71-10.
7.	Do a test for the correct operation of the un-feathering accumulator.	Refer to the DA42 L360 Airplane Flight Manual.

C. Charging the Accumulator with Nitrogen

NOTE: Make sure that the stored oil in the accumulator is fully discharged prior to charging with nitrogen. If the oil in the accumulator is not fully discharged, only partial nitrogen charge will be obtained.

	Detail Steps/Work Items	Key Items/References
1.	Charge the accumulator with nitrogen: - Remove the cap from the charging valve. - Make sure that the blades are in fine pitch position - Turn the Master switch to ON. - Cycle the propeller controls from the fine to feather several times. - Connect a suitable nitrogen supply to the charging valve and charge the accumulator to the correct pressure. - Disconnect the nitrogen supply. - Install the cap onto the charging valve.	 Make sure that the accumulator is empty of oil. Follow the manufacturer's instructions for the nitrogen supply. Charge to 8.62 bar (125 psi.)
2.	Carry out a propeller feathering operation test.	

4. Functional Test of the Propeller Un-Feathering

	Detail Steps/Work Items	Key Items/References
WARNING: DO NOT LET PERSONS INTO THE SAFETY RANGE OF THE AIRCRAFT. PROPELLERS CAN CAUSE INJURY OR DEATH TO PERSONNEL.		
1.	Position the aircraft on level ground. Make sure that: - There are no loose stones on the ground near the propeller - The safety zone around the aircraft is clear	
	- The aircraft heads into the wind.	
2.	Put chocks in front of each main wheel.	
3.	Set the parking brake to ON.	
4.	Make sure that the passenger door is closed and locked. Close and lock the canopy.	
CAUTION: ENGINE AND PROPELLER MANUFACTURERS RECOMMEND NOT TO USE HIGH ENGINE SPEED ON GROUND BECAUSE IT CAN RESULT IN AN EXCESSIVE ENGINE TEMPERATURE AND BLADE DAMAGE.		
5.	Do the functional check of the propeller as follows: - Set the throttle lever for approximately 1700 rpm. - Pull the propeller lever back (out) until the rpm drops by 300 - 500. - Push propeller lever full forward (in) for take off position and observe rpm increase. - Cycle three times to bleed air out of the system. - Set the throttle lever at approximately 2200 rpm now - Pull propeller lever back until rpm drops about 100 rpm	Decrease and increase of engine speed should have about the same time.

	Detail Steps/Work Items	Key Items/References
	- When the rpm is stabilized, increase the manifold pressure by about 3 inHg and observe the governor function	The rpm must stabilize.
	- Advance the throttle lever and the propeller lever for take off power and rpm.	The static rpm must be limited by the propeller and should be 50 - 100 rpm lower than the maximum rpm.
6.	Do the functional test of the unfeathering accumulator as follows:	For both LH and RH propellers.
	To move the propeller blades into feather position:	
	- Set rpm with throttle lever to 1400 - 1500 rpm.	
	- Pull the propeller control lever into feather position	Magnetic valve is closed and oil under pressure is stored in the accumulator.
	- Engine will shut down and the propeller blades will move to the feather position.	Verify that the propeller blades are in the feather position.
	To move the propeller blades from the feather position (electrical master switch in the ON position):	For both LH and RH propellers.
	- Before starting the engine, position the propeller control lever in the high rpm position	Magnetic valve opens and oil under pressure flows to the propeller.
	- Propeller blades will move to the high rpm position	Verify that the propeller blades are in the high rpm position.
	- Start the engines.	Refer to the DA42 L360 Airplane Flight Manual.

5. Rigging Procedure for Propeller Control Micro Switch

NOTE: The procedure for the LH propeller control micro switch is given. The rigging procedure for the RH propeller control micro switch is similar, using the RH Propeller RPM lever.

	Detail Steps/Work Items	Key Items/References
1.	Remove the pilots' and co-pilot's seats.	Refer to AMM # 7.02.01 Chapter 25-10.
2.	Remove the carbon inlays from both sides of the interior trim floor panels by gently prying them off.	Refer to Figure 206.
3.	Remove the interior trim floor panels as follows: - Remove the six mounting screws (three on each side).	
4.	Locate the propeller control micro switch on the throttle lock plate.	Refer to Figure 207.
5.	Set the Propeller RPM lever for the LH engine to the detent position.	Keep the Propeller RPM lever set to the detent position while the propeller control micro switch is adjusted.
6.	Adjust the propeller control micro switch so that it is engaged when the Propeller RPM lever is set at the detent position	
7.	Adjust the micro switch by loosening the two mounting screws while holding the locknuts and then slide the micro switch to the desired location and re-tighten the screws.	Make sure that the wires are clear of the frame connector spacer.
8.	Do an operational check of the micro switch:	
	- Push the throttle lever slowly forward out of the detent position	
	- Pull the throttle lever back to the detent position	Make sure that the micro switch engages when the throttle lever is in the detent position. A distinctive click of the micro switch can be heard when it engages.
	- Lift and pull the throttle lever slowly back out of the detent position	Make sure that the micro switch engages when the throttle lever is in the detent position. A distinctive click of the micro switch can be heard when it engages.

	Detail Steps/Work Items	Key Items/References
	- Push the throttle lever forward to the detent position.	
9.	Clear the area and remove all unwanted materials.	
10.	Install the interior trim floor panels as follows: - Install the six mounting screws (three on each side).	
11.	Apply a silicone sealant/adhesive in three locations on the back of the carbon inlays.	
12.	Install the carbon inlays on both sides of the interior trim floor panels by pressing them firmly in place.	
13.	Install the pilot's and co-pilot's seats.	Refer to AMM # 7.02.01 Chapter 25-10.

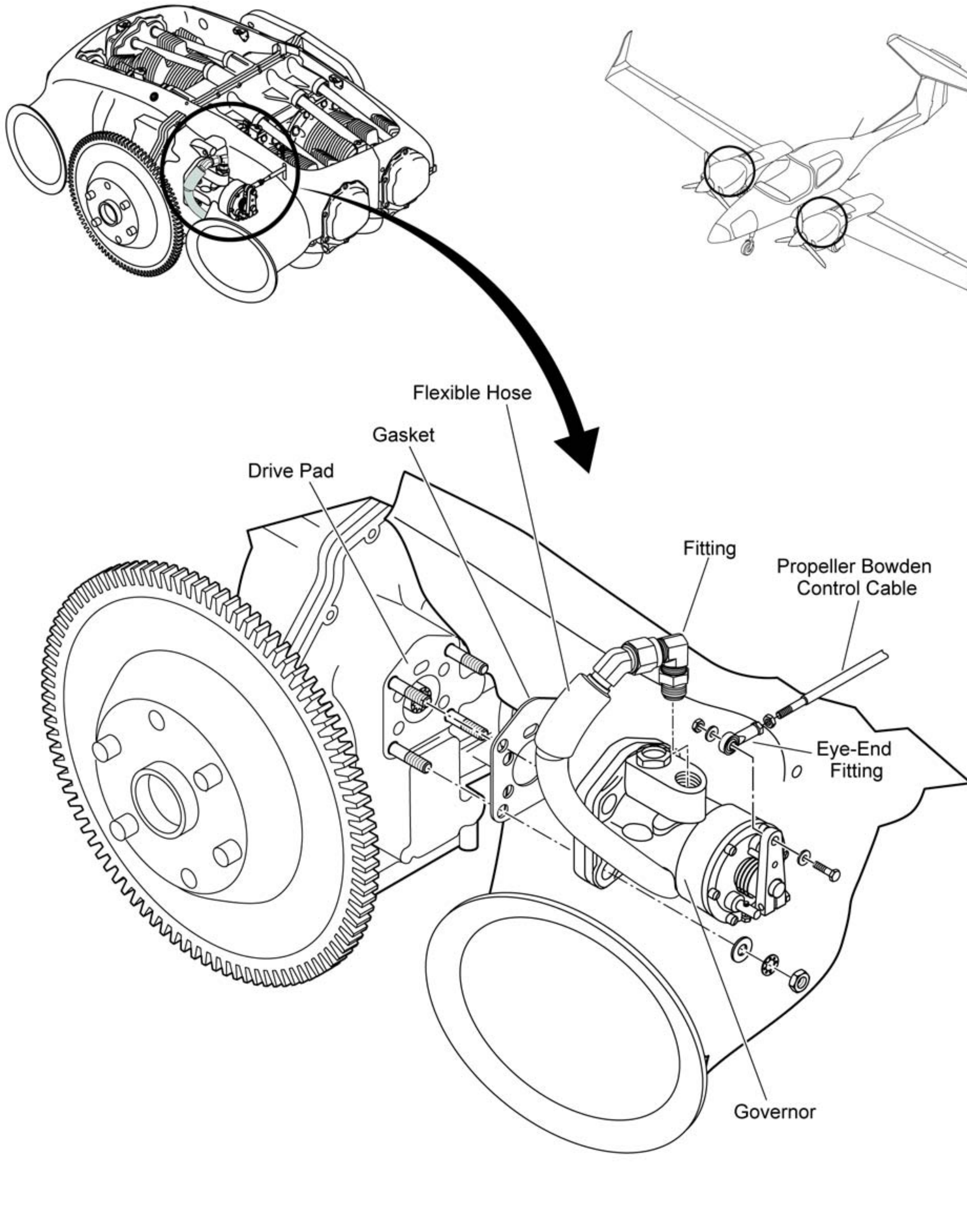

Figure 201 - Propeller governor Installation

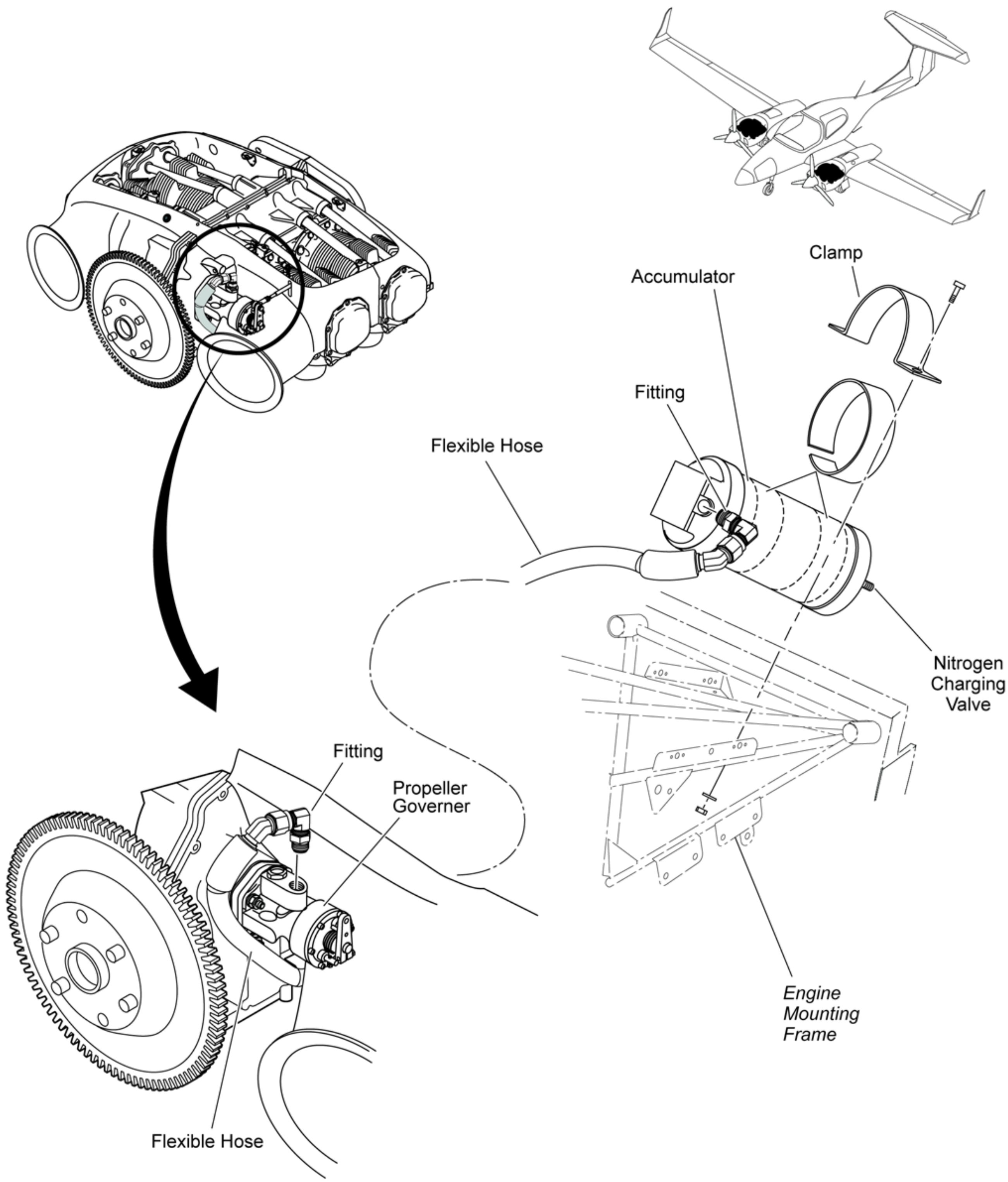

Figure 202 - Un-Feathering Accumulator Installation

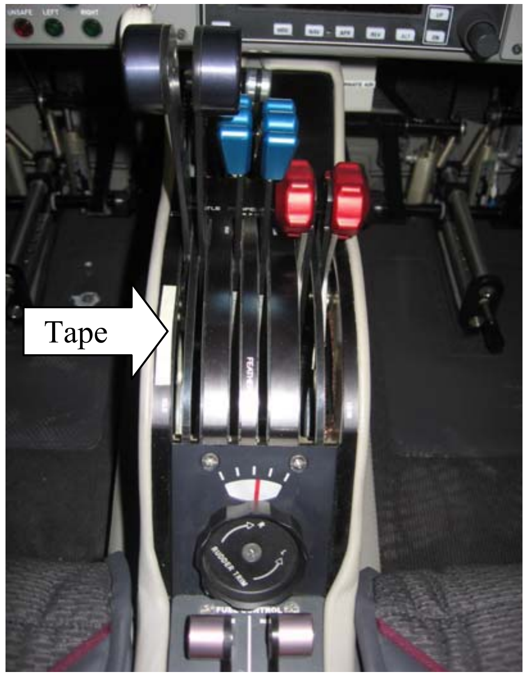

Figure 203 - Masking Tape applied to the Throttle Quadrant Cover Plate. Throttle Lever positioned at 16+ inHg

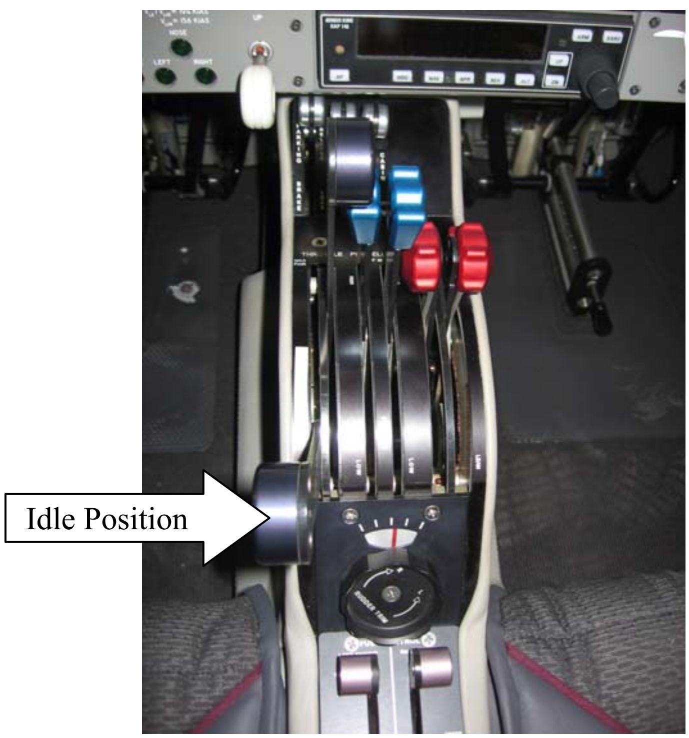

Figure 204 - LH Throttle Lever set to achieve Idle RPM

Figure 205 - Marking the Front Edge of the Throttle Lever

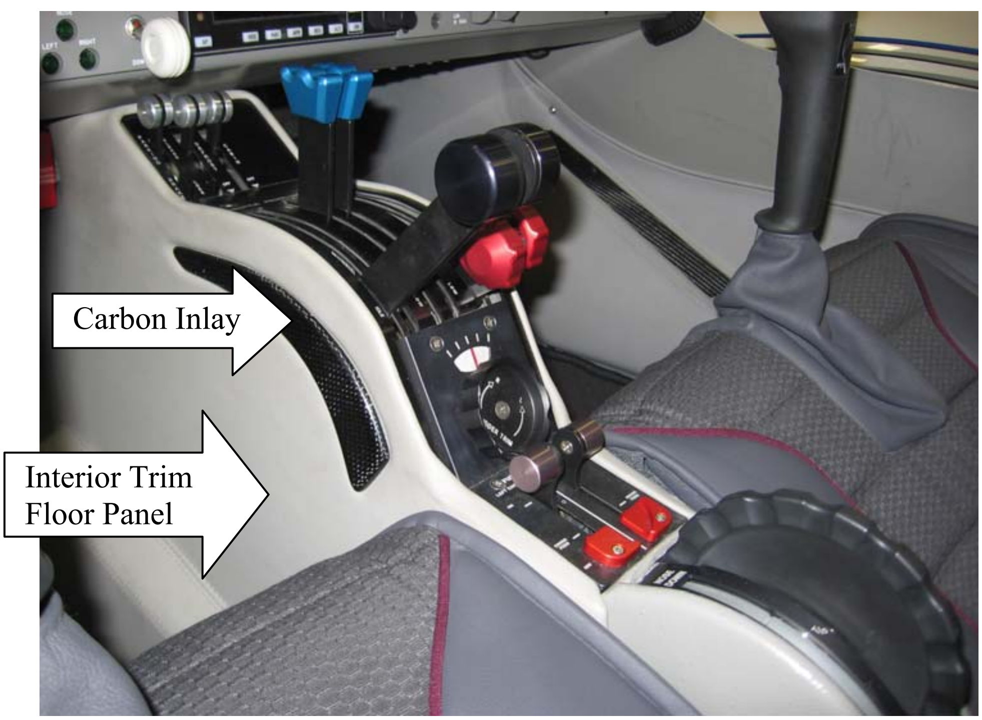

Figure 206 - Carbon Inlay and Interior Trim Floor Panel

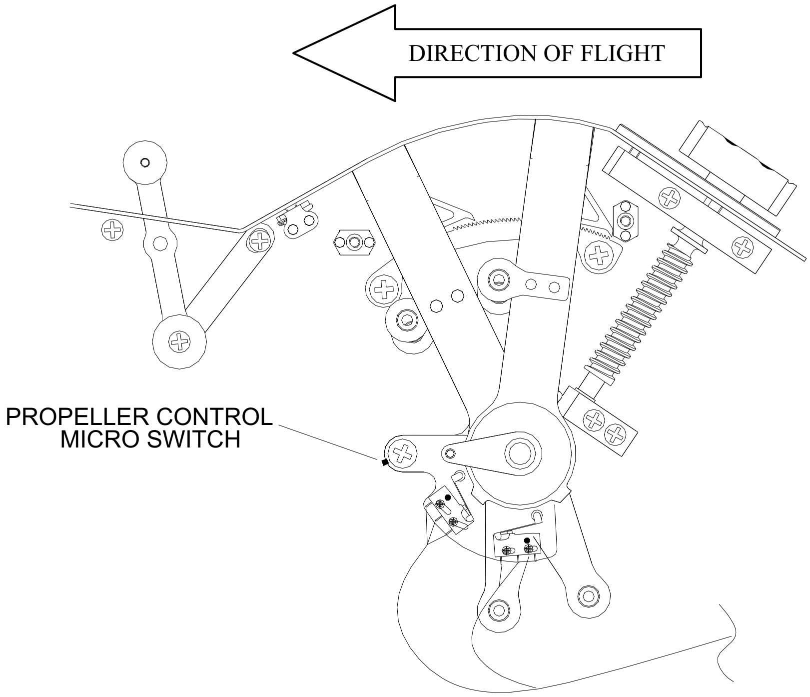

Figure 207 - Propeller Control Micro Switch Location

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CHAPTER 71-00
POWER PLANT

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POWER PLANT - DESCRIPTION AND OPERATION

1. General

This chapter describes:

- about the power plant installed in the DA42 L360 aircraft
- about the components that make the power plant
- how to remove/install the power plant.

For data on the engine test after the installation, refer to Lycoming Operator's Manual for the LYCOMING IO-360 M1A/LIO-360 M1A engines. Refer to the Airplane Flight Manual (AFM) for engine start/stop procedures.

Refer to these Chapters for data about other engine systems:

- Chapter 72 - Refer to the Lycoming Operator's Manual for data on the engine
- Chapter 73 - Engine fuel and control. Refer to the Lycoming Operator's Manual for data on the fuel injection system.
- Chapter 74 - Ignition system power supply and installation of high tension cables. Refer to the SlickSTART Maintenance Manual for more data on the magnetos. Refer to the Lycoming Operator's Manual for data on the spark plugs.
- Chapter 76 - Engine Controls
- Chapter 77 - Engine Indicating
- Chapter 78 - Exhaust System
- Chapter 79 - Oil system components installed in the airframe. Refer to the Lycoming Operator's Manual for data on the engine oil system.
- Chapter 80 - Starter system control and installation. Refer to the Lycoming Operator's Manual/ Sky-Tec Manual for data on the lightweight geared starter.

NOTE: Equipment which is certified for installation in the DA42 L360 aircraft is listed in Chapter 6.5 of the AFM. Such equipment may be installed in accordance with the AFM.

NOTE: Any equipment which is not listed in Chapter 6.5 of the AFM is called "Additional Equipment". The installation of Additional Equipment is a modification which must be handled in accordance with national regulations.

2. Description and Operation

Refer to Figure 1.

The DA42 L360 aircraft has Lycoming IO-360 M1A, left hand (LH) side engine and Lycoming LIO-360 M1A, right hand (RH) side engine, horizontally opposed, 4-cylinder engines with overhead valves. The engine has a hollow crankshaft which is directly coupled to the propeller. The engine has a fuel injection system and an electric starter. Ignition is provided by 2 Slick magnetos with a SlickSTART ignition booster for starting. The Lycoming IO-360 M1A has a wet sump oil system.

The power plant has the following components installed:

A. Cowlings

The power plant has a top and bottom engine cowlings. Both the cowlings attach to each other and the engine nacelle with camloc quick release fasteners.

The top cowling has air intakes for the engine cooling. The bottom cowling has air intake ducts for the oil cooler.

B. Engine Mounts

The engine mount attaches to the firewall at five locations. Tubular steel makes the mounting frame. The engine attaches to the engine mount with shock-mounts. Rubber and metal bushings make the engine shock-mounts.

C. Electrical Harness

Electrical cables go through the firewall to connect to the engine. They give electrical supply to the engine starter motor, ignition system and engine sensors. Electrical cables from the generator supply electrical power to the airplane electrical system.

D. Air Intakes

The top cowling has a large cooling air intake. The air enters this intake and then into the engine baffles assembly. The air from the engine baffle assembly passes down through the engine and then to the atmosphere through the main air outlet at the back of the power plant.

Air also flows from a National Advisory Committee for Aeronautics (NACA) duct on the right hand side of each lower cowling and the NACA duct contacts a foam gasket on the oil cooler.

Both cowlings have inlets for cooling air for the oil cooler. On the both engines a smaller air intake is located inside the main air intake. This smaller air intake supplies ventilation air to the cabin heater.

E. Drains

The power plant has the following drains:

- Engine driven fuel pump
- Fuel injection distributor drain
- Induction manifold drain
- Engine breather

The drains all collect at the bottom of the power plant at the engine firewall. The breather connects to an aluminum breather pipe which vents below the engine. The induction manifold drain valve connects to an aluminum tube. The tube passes back below the exhaust muffler and is clamped to the engine breather outlet. All the remaining drains connect to the aluminum breather outlet.

3. Engine Specification

Engine Manufacturer:	Lycoming
Engine Model:	LYCOMING IO-360-M1A (LH) LYCOMING LIO-360-M1A (RH)
Engine operating limits:	
Rated output power	180 HP (134.2 kW)
Max. Continuous rotation speed	2700 RPM
Ground run-up limits:	
Ground idle speed	740 +/- 20 RPM
Oil Pressure:	
Minimum	25 psi
Normal	55 - 95 psi
Maximum	115 psi
Fuel Pressure:	
Minimum	14 psi
Normal	14 - 35 psi
Maximum	35 psi

Oil Temperature:	
Minimum	149 ºF (65 ºC)
Normal	149 - 245 ºF (65 - 118 ºC)
Maximum	245 ºF (118 ºC)
Cylinder Head Temperature:	
Minimum	150 ºF (65.5 ºC)
Normal	150 - 475 ºF (65.5 - 246 ºC)
Maximum	500 ºF (260 ºC)
Fuel grade:	AVGAS 100 or 100LL
Oil Specification (see Chapter 12-10):	Refer to Lycoming Operator's Manual.

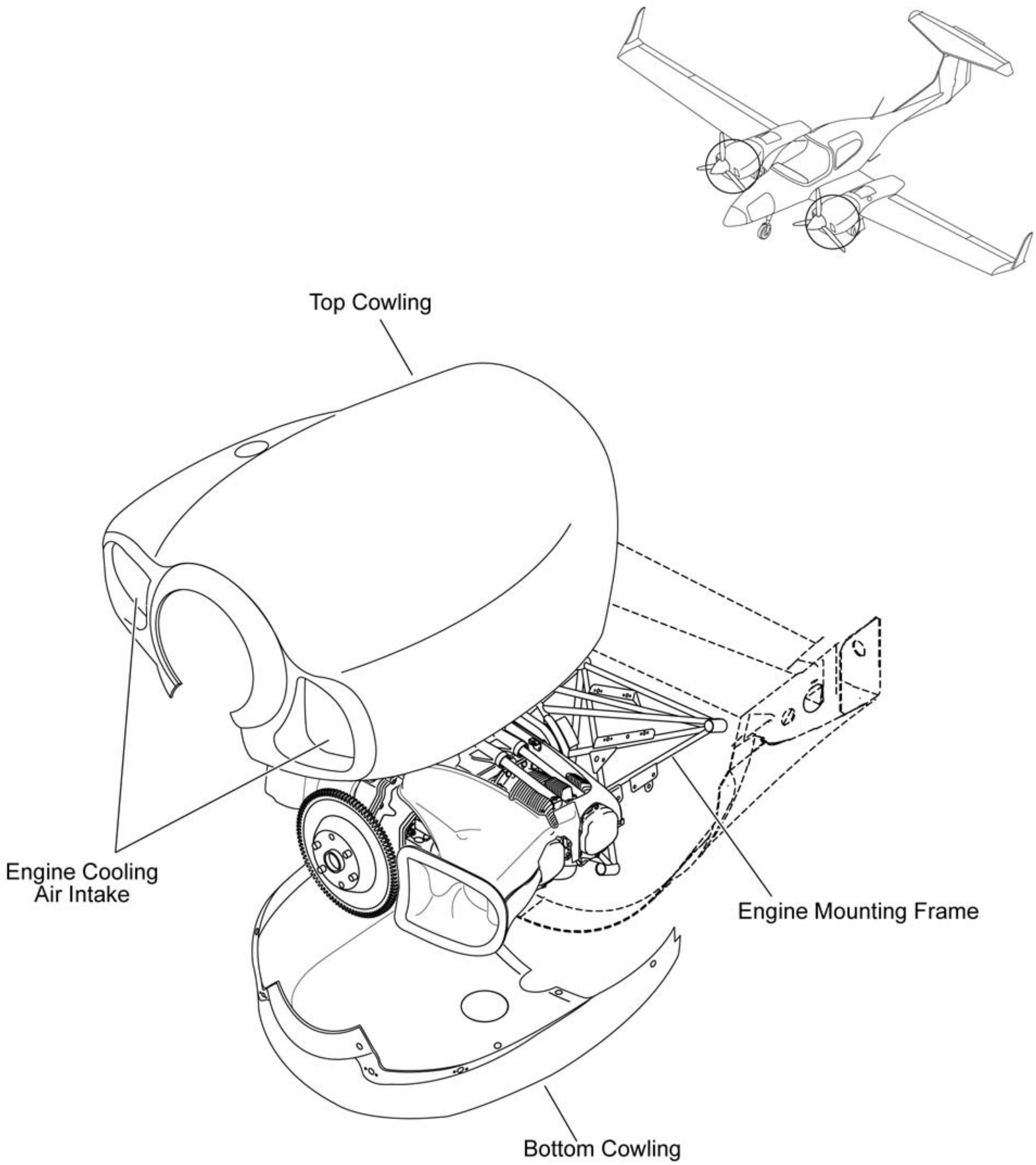

Figure 1 - DA42 L360 Power Plant

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POWER PLANT - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the power plant. It does not give troubleshooting data for the engine or the engine systems. Refer to the Lycoming Operator's Manual for engine and engine system trouble-shooting.

WARNING: BE CAREFUL WHEN YOU DO POWER PLANT TROUBLESHOOTING. OPERATION OF A DAMAGED ENGINE CAN CAUSE MORE DAMAGE TO THE ENGINE AND INJURY TO PERSONNEL.

If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Engine vibration.	Damaged shock mounts.	Replace the shock mounts.
	Propeller out of balance.	Balance the propeller.
Engine does not produce full power.	Engine air inlet blocked.	Examine air inlet. Examine/Replace the air filter.

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POWER PLANT - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to remove and install the engine.

WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS.

WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER. DISCONNECT THE BATTERY.

WARNING: DO NOT GO BELOW THE ENGINE WHEN YOU LIFT THE ENGINE WITH THE HOIST. THE HOIST CAN FAIL AND CAN CAUSE DEATH OR INJURY TO PERSONS.

WARNING: DO NOT GET ENGINE OIL, GEAR OIL OR COOLANT ON YOU. THESE LIQUIDS CAN CAUSE SKIN DISEASE.

WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE OR SPARKS NEAR FUEL. FUEL BURNS AND BURNING FUEL CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.

CAUTION: YOU MUST ATTACH CAPS TO HOLES/PIPES WHEN YOU REMOVE THE ENGINE. IF YOU DO NOT DO THIS, CONTAMINATION CAN ENTER THE HOLES/PIPES. THIS CAN CAUSE BLOCKAGE TO THE AIRCRAFT SYSTEMS.

2. Remove the Engine (Without the Engine Mount)

A. Equipment

Item	Quantity	Part Number
Hoist	1	Commercial
Engine Sling	1	Commercial
Engine Stand	1	Commercial
Tail Trestle	1	Commercial
Wing Trestles	2	Commercial

B. Remove the Engine (Without the Engine Mount)

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Set the related engine FUEL SELECTOR to OFF.	
2.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related START switch. - Set the throttle lever to IDLE. - Set the MIXTURE lever to CUT-OFF.	
3.	Remove the engine cowlings.	Refer to Chapter 71-10.
4.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
5.	Disconnect the spark plug cables from the spark plugs.	
6.	Remove the spark plugs and put blanks in the spark plug holes in the cylinders.	This will stop contamination going into the engine cylinders.
7.	Remove the two nuts, the washers and the screws that hold the left-hand fairlead for the top ignition cables.	
8.	Release the P-clamps holding the left ignition cables to the engine-cooling baffles.	
9.	Remove the two nuts, the washers and the screws that attach the right-hand fairlead for the top ignition cables.	
10.	Remove the cable ties attaching the left-side ignition cables to the engine mount and move the cables to the rear of the engine.	
11.	Release the P-clamps holding the right ignition cables to the engine cooling baffles.	

	Detail Steps/Work Items	Key Items/References
12.	Remove the cable ties attaching the right side ignition cables to the engine mount and move the cables to the rear of the engine.	Note the position of the cable ties.
13.	Remove the cable ties attaching the left side ignition cables to the right side ignition cables.	Note the position of the cable ties.
14.	Release the three screws which attach the ignition harness to the left magneto and move the harness assembly clear of the aircraft.	
15.	Release the three screws which attach the ignition harness to the right magneto and move the harness assembly clear of the aircraft.	
16.	Disconnect the electrical plugs from the left and right magnetos.	Move the plugs aft, clear of the engine.
17.	Remove the exhaust gas temperature probe from the exhaust manifold: - Release the worm-drive-clamp which attaches the probe to the exhaust manifold. - Remove the probe. - Remove the cable ties attaching the cable for the probe to the engine mount.	Do this item for each of the four probes. Note the location of the cable ties.
18.	Remove the engine exhaust system: - Remove the rubber support that attaches the exhaust tail pipe to the engine mount. - Remove the eight nuts and the washers from the exhaust port flanges. Move the exhaust system clear of the aircraft.	Only if you install a new engine. Hold the exhaust system. Discard the eight nuts and the washers.

	Detail Steps/Work Items	Key Items/References
19.	Disconnect the propeller control cable: - Remove the nut, the washer and the bolt that attach the cable eye-end fitting to the CSU control lever. - Remove the eye-end fitting from the cable as follows: - Loosen the lock-nut that locks the eye-end to the cable. - Remove the eye-end from the cable. - Remove the lock-nut from the fitting.	One 1/4 Turn. Mark the position of the lock-nut on the fitting.
20.	Remove the propeller (if necessary).	Refer to Chapter 61-00.
21.	Disconnect the mixture control eye end at the mixture control lever at the fuel injector: - Remove the nut and the washer from the long bolt at the mixture lever. - Release the mixture cable eye end from the lever. - Remove the spacer and the long bolt.	
22.	Release the mixture cable and support bracket: - Remove the lock-wire and the bolt that attach the bracket to the engine. - Move the mixture cable and bracket clear of the engine.	
23.	Disconnect the throttle control cable at the fuel servo: - Remove the nut and the washer from the bolt that attaches the cable eye-end to the lever. - Remove the cable eye-end from the bolt. - Remove the bolt and the washer from the throttle lever at the injector.	

	Detail Steps/Work Items	Key Items/References
24.	Remove the throttle control cable and the support bracket at the bottom of the engine: - Remove the lock-wire from the bolts that attach the throttle cable and the support bracket to the bottom of the engine. - Remove the two bolts and the washers that attach the throttle cable and the support bracket to the bottom of the engine. - Move the cable and the support bracket clear of the engine.	
25.	Disconnect the alternate air control cable: - Release the screw that attaches the wire end to the swivel in the alternate air assembly. - Move the control cable clear of the engine mount.	
26.	Remove the air baffle assembly.	Refer to Chapter 75-00.
WARNING:	DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PEOPLE AND DAMAGE TO EQUIPMENT.	
27.	Disconnect the fuel feed hose at the outlet from the fuel pump.	Move the hose clear of the engine mount.
28.	Disconnect the fuel drain hose from the engine-driven fuel-pump and move the hose clear of the engine.	
29.	Remove the cable ties that attach the fuel flow divider drain to the engine mount and the ignition harness.	Note the location of the ties.
30.	Disconnect the engine breather hose from the accessory housing at the top of the engine.	Put caps on the breather hose and the engine connection.
WARNING:	DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.	

	Detail Steps/Work Items	Key Items/References
31.	Disconnect the oil inlet and outlet hoses at the oil cooler.	Use a suitable container to catch the oil. Put the caps on all open connections.
32.	Disconnect the oil pipe for the oil pressure sensor at the engine crank-case.	Remove spilled oil.
33.	Remove the cylinder-head temperature probe from the bottom of the cylinder head: - Disconnect the electrical cables at the in-line connectors. - Remove the probe from its holder. - Remove the cable-ties/P-clamps that hold the cables for the cylinder-head temperature probe in position.	Do this item for each cylinder-head temperature-probe. Note the location of the cable-ties/ P-clamps.
34.	Disconnect the electrical cables from these components: - The alternator (5 cables) - The starter motor (1 cable) - Fuel pressure sensors (2 cables) - Oil temperature sensor - Fuel flow sensor - RPM sensor.	At the in-line connector.
35.	Remove the P-clamps and the cable-ties from the right-hand side of the engine. Move the cables clear of sensors.	Note the location of the P-clamps and the cable-ties.
36.	Disconnect the manifold pressure pipe from the No. 4 cylinder inlet manifold. Release the P-clamp from the rear of the No. 4 cylinder head.	
37.	Disconnect the wire bonding cables from the engine: - Remove the bolts and the washers that attach the wire bonding cable eye-ends to the engine.	

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT GO UNDER THE ENGINE WHILE IT IS HELD BY THE ENGINE HOIST. IF THE HOIST FAILS, THE ENGINE CAN FALL AND CAUSE INJURY TO PERSONS.	
38.	Attach the engine hoist to the engine.	At the top of the engine. At the lifting shackles.
	NOTE: The hoist must hold the weight of the engine. The weight of the engine is 330 lbs (150 kg). If the propeller and spinner are fitted the total weight is 378 lbs (172 kg).	
39.	Adjust the hoist to "take the weight" of the engine.	
40.	Remove the engine-mounting-bolts:	
	- Remove the nuts from the lower engine mounting bolts.	
	- Pull the mounting bolts rearwards and clear of the engine mount and remove the rear shock mount rubber.	
	- Remove the nuts from the upper engine mounting bolts.	
	- Pull the mounting bolts rearwards and clear of the engine mount and remove the rear shock mount rubber.	
	- Move the engine clear of the aircraft.	Remove the front shock mount rubber. Make sure that when you move the engine clear of the aircraft that you do not catch the engine on any of the equipment around the engine mount.
	- Lower the engine into the engine stand.	
41.	If necessary:	
	- Remove the oil pipe from the accessory housing.	Note the orientation.
	- Remove the fuel pipe from the inlet to the engine driven fuel pump.	Put the caps on the open connections. Note the orientation.

3. Install the Engine (Without the Engine Mount)

NOTE: If you install a new engine, you must do the engine break-in procedure after the installation. Refer to Paragraph 9.

A. Preparation

	Detail Steps/Work Items	Key Items/References
1.	Examine the engine and propeller control cables. Move each cable through its range of movement several times.	Refer to Chapter 12-20.
2.	Make sure all the electrical cables are clean and not damaged.	
3.	Make sure all the oil hoses are not damaged.	
4.	Make sure all the fuel pipes/hoses are not damaged.	
5.	Make sure that all drains and vents are not damaged or blocked.	
6.	Make sure that all the flexible hoses are clean and not damaged.	
7.	If you install a new engine: - Install the fuel supply hose to the inlet of the engine driven fuel pump. - Install the oil pipe to the connection below the oil filter.	

B. Install the Engine

	Detail Steps/Work Items	Key Items/References
1.	Move the engine into position with the hoist.	Make sure that the engine does not catch on any cables or equipment. Move the fuel and the oil hoses through the engine mount.
	NOTE: Top mountings have the cone-shaped shock-mount FORWARD, the cylindrical shaped shock-mount AFT. NOTE: Bottom mountings have the cylindrical-shaped shock-mount FORWARD, the cone-shaped shock-mount AFT.	
2.	Assemble the four shock mounts:	Do this item for each mount. Install the top mounts first and then the bottom mounts.
	- Install the washers between the engine and the bottom shock mounts.	
	- Move the front shock mount rubber into position between the engine mount and the rear face of the engine mounting.	Refer to Figure 202. Make sure that the rubbers are correctly seated.
	- Move the rear shock mount rubber into position in the engine mount.	Make sure that the rubbers are correctly seated.
	- Install the washer under the head of the engine mounting bolt.	
	- Push the engine mounting bolt through the shock mount assembly from aft.	
	- Install the nuts and the washers onto the engine mounting-bolts.	Do not tighten the nuts.
3.	When you have installed all the mounting bolts, then tighten all the engine mounting bolts.	
4.	Carefully lower the engine hoist to release the weight of the engine and move the hoist clear of the aircraft.	
5.	Install the engine air cooling baffle assembly.	Refer to Chapter 75-00.
6.	Put the electrical cables in position on the right hand side of the engine.	

	Detail Steps/Work Items	Key Items/References
7.	Install the propeller, if necessary.	Refer to Chapter 61-00.
8.	Install the cylinder head temperature (CHT) probes: - Put the cylinder probe into the cylinder mounting - Connect the electrical cables at the in-line connectors - Attach the probe cables to the main wiring loom with cable ties and P-clamps.	Do this item for each of the probes. White cable to white cable and red cable to red cable.
9.	Connect the manifold pressure hose to the No. 4 cylinder inlet manifold.	
10.	Connect the electrical cables to these components: - The alternator (5 cables) - The starter motor (1 cable) - Fuel pressure sensors (2 cables) - Oil temperature sensor - Fuel flow sensor - RPM sensor.	At the in-line connector.
11.	Install the P-clamps and the cable-ties that hold the electrical cables in their correct positions.	
12.	Connect the wire bonding cables to the engine: - Align each cable eye-end to the mounting on the engine - Install the bolt, the washer and the nut that attach each wire bonding cable.	
13.	Connect the oil pipe for the oil pressure sensor to the top of the accessory housing.	
14.	Connect the flexible inlet and return hoses to the oil cooler.	

	Detail Steps/Work Items	Key Items/References
15.	Connect the engine breather hose to the breather connection at the top of the accessory housing.	
16.	Attach the drain tube to the fuel flow divider: - Push one end of the tube onto the connector on the fuel flow divider and install the pipe clip. - Push the other end of the tube through the rubber grommet in the cooling baffles to the bottom rear of the engine compartment. - Connect the end to the tee piece in the fuel pump drain and install the pipe clip. - Hold the drain tube in its correct position with cable-ties.	
17.	Connect the drain tube to the engine driven fuel pump and install the pipe clip. Hold the drain tube in its correct position with cable ties.	
18.	Connect the alternate air control cable: - Put the control cable in position through the guide attached to the alternate air control assembly. - Install the lock-nut onto the control cable outer sheath and tighten the lock-nut. - Push the control cable wire end through the swivel in the operating ring. - Make sure that the alternate air control lever in the cockpit is set to OFF. - Make sure that the alternate air assembly is set to the OFF position. - Move the alternate air control lever in the cockpit 0.125 in. (3 mm) aft from OFF.	 Fully forward. Inlet holes fully closed.

	Detail Steps/Work Items	Key Items/References
	- Tighten the screw which attaches the wire end to the swivel. - Install the P-clamps and the cable ties that hold the Bowden-cable in the correct position.	
19.	Do a test for the correct operation of the alternate air control system.	Refer to Chapter 76-00.
20.	Connect the fuel feed and the return hoses at the engine firewall thru-connectors.	
21.	Connect the throttle cable to the fuel injector: - Move the cable and the bracket into position at the bottom of the engine. - Install the two bolts and the washers that attach the cable and the bracket to the bottom of the engine. - Secure the bolts with lock-wire. - Move the throttle cable eye-end into position at the injector throttle lever. - Install the bolt through the lever and eye-end. - Install the washer and the nut onto the bolt.	From the inboard of the engine.
22.	Move the throttle lever in the cockpit between FULL and IDLE. The throttle control must be smooth in operation with no restrictions.	
23.	Do a test for the correct operation of throttle control system.	
24.	Connect the mixture cable to the fuel injector: - Move the cable and the bracket into position at RH side of the engine. - Install the bolt to attach the cable and bracket to the engine. - Safety the bolt with 0.032” lock-wire.	

	Detail Steps/Work Items	Key Items/References
	- Move the mixture cable eye-end into position at the injector mixture lever. - Install the bolt through the fuel injector lever and eye-end. - Install the spacer, the washer and the nut onto the bolt.	From the outboard of the engine.
25.	Move the mixture control lever in the cockpit between RICH and LEAN CUT-OFF. The mixture control must be smooth in operation with no restrictions.	
26.	Do a test for the correct operation of the mixture control.	Refer to Chapter 76-00.
27.	Install the propeller control cable: - Install the two bolts, the washers and the nuts that attach the fairlead halves to the baffle assembly. - Install the eye-end fitting onto the propeller control cable: - Install the lock-nut onto the cable fitting. - Screw the eye-end fitting onto the cable fitting until the eye-end fitting contacts the cable fitting lock-nut and is correctly aligned to the CSU control lever. - Tighten the lock-nut to the eye-end fitting.	
28.	Connect the eye-end fitting to the CSU control lever: - Move the eye-end fitting into position at the CSU control lever. - Move the bolt into position through the CSU control lever. - Install the eye-end, washer and nut onto the bolt.	

	Detail Steps/Work Items	Key Items/References
29.	Move the propeller control lever in the cockpit between MAX and MIN, and to FEATHER. The propeller control must be smooth in operation with no restrictions.	
30.	Do a test for the correct operation of the propeller control.	Refer to Chapter 61-20.
31.	Install the engine exhaust assembly: - Move the exhaust manifold into position on the cylinder head studs. - Install the eight plain washers, the serrated washers and the nuts on the cylinder head studs. - Tighten the nuts.	 Use new gaskets. Use new washers and nuts.
32.	Install the exhaust gas temperature (EGT) probe: - Install the No. 1 cylinder sensor in the No. 1 exhaust manifold. - Install the worm drive clamp. - Hold the cable in the correct position with cable ties and P-clamps.	Do this item for each probe.
33.	Connect the electrical plugs to the left magneto and to the right magneto.	Make sure the START switch is set to OFF and that the key is removed from the switch.
34.	Install the spark plugs in the cylinder heads.	Torque: 35 lbf-ft (47.5 Nm).
35.	Install the left ignition harness: - Move the left ignition harness into position on the left magneto. - Install the three screws which attach the harness to the ignition. - Connect the ignition cables to the spark plugs.	 Make sure that the cap is seated correctly. Make sure that the cap is seated correctly. Make sure that the ignition cables are connected to the correct plugs. Torque: Hand-tight then 1/16 to 1/8 turn with a wrench.

	Detail Steps/Work Items	Key Items/References
36.	Install the fairlead which holds the top left ignition cables in the cooling baffle: - Assemble the fairlead around the cable and to baffle. - Install the two screws, the washers and the nuts which attach the fairlead to the baffle.	
37.	Install the right ignition harness: - Move the right ignition harness into position on the right magneto. - Install the three screws which attach the harness to the ignition. - Connect the ignition cables to the spark plugs.	Make sure that the cap is seated correctly. Make sure that the ignition cables are connected to the correct plugs. Torque: Hand-tight and then 1/16 to 1/8 turns with a wrench.
38.	Install the fairlead which holds the top right ignition cables in the cooling baffle: - Assemble the fairlead around the cable and to baffle. - Install the two screws, the washers and the nuts that attach the fairlead to the baffle.	
39.	Install the P-clamps that attach the ignition cables to the left side of the engine cooling air baffles.	Make sure that the ignition cables can reach the spark plugs without strain.
40.	Install the P-clamps that attach the ignition cables to the right side of the engine cooling air baffles.	Make sure that the ignition cables can reach the spark plugs without strain.
41.	Install the cable ties that hold the ignition cables to the left side of the engine mount.	
42.	Install the cable -ties that hold the ignition cables to the right side of the engine mount.	
43.	Install the cable ties that attach the left ignition harness to the right ignition harness.	

	Detail Steps/Work Items	Key Items/References
44.	Do engine oil level check.	Refer to Chapter 12-10.
45.	Install the aircraft main battery.	Refer to Chapter 24-31.
46.	If necessary, for your airworthiness authority, do a second inspection of these control systems: - Throttle - Mixture - Propeller - Alternate air.	
47.	Install the engine cowlings.	Refer to Chapter 71-10.
48.	Remove the wing trestles.	
49.	Do the engine test and leak check.	Refer to Paragraph 4.

4. Engine Test - General

These procedures describe how to do an engine test. For more data on the engine and engine performance testing, refer to the Lycoming Operator's Manual.

A. Equipment

Item	Quantity	Part Number
Aircraft chocks	2	Commercial
Fuel Sample Kit	1	Commercial

B. Preparation

	Detail Steps/Work Items	Key Items/References
WARNING: DO NOT LET PERSONS INTO THE SAFETY RANGE OF THE AIRCRAFT. PROPELLERS CAN CAUSE INJURY OR DEATH.		
1.	Look in the aircraft records for reports of problems.	
2.	Put the aircraft on level ground. Make sure that: - There are no loose stones on the ground near the propeller	

	Detail Steps/Work Items	Key Items/References
	- The safety zone all round the aircraft is clear - The aircraft points into the wind.	Refer to Figure 203.
3.	Do a test of a sample of fuel for contamination.	Refer to Chapter 12-10.
4.	Put chocks in front of each main wheel.	
5.	Remove the Pitot probe cover.	
6.	Make sure that there is enough fuel for the engine test: - Set the ELECT MASTER switch to ON - Read the fuel quantity indicator - Set the ELECT MASTER switch to OFF - Refuel the aircraft if necessary.	
7.	Read the engine oil contents. Add more oil if necessary.	Refer to Chapter 12-10.

5. Engine Starting

Use this procedure for both the left engine and the right engine. Refer to the Lycoming Operator's Manual for operating limits.

	Detail Steps/Work Items	Key Items/References
1.	Enter the cockpit.	
2.	Set the parking brake to ON.	
3.	Make sure that the fuel selector/shut-off valve is set to LEFT or RIGHT.	Refer to Chapter 12-10.
4.	Set the fuel selector valve as required.	
5.	Make sure that the passenger door is closed and locked. Close and lock the canopy.	

	Detail Steps/Work Items	Key Items/References
6.	Make sure that: - The throttle lever is free to move - The mixture lever is free to move - The propeller control lever is free to move.	
7.	Set the ELECT MASTER switch to ON.	Refer to Chapter 12-10.
8.	Make sure that the engine indicator display on the ICS panel reads correctly.	
9.	Set the alternate air control to OFF.	
10.	Set the propeller control to MAX RPM.	Fully forward.
11.	Set the electrical fuel pump to ON. Listen for the fuel pump working, Make sure that: - The fuel pressure increases.	
12.	Set the throttle to 1/4 open.	
13.	Prime the engine: - If the engine is cold, set the mixture control to full RICH for 3 seconds. Then move the mixture control to IDLE CUT-OFF - If the engine is warm, set the mixture control to full RICH for 1 second. Then move the mixture control to IDLE CUT-OFF.	
14.	Press on both brakes pedals together and hold the flying controls in neutral.	
15.	Make sure the area of the propeller is clear.	
16.	Turn the related engine ignition switch to the START position.	Make sure that the engine start light comes on.
17.	When the engine starts: - Release the ignition switch to the BOTH position - Move the mixture control to RICH.	Make sure that the engine start light goes out. Fully forward.

	Detail Steps/Work Items	Key Items/References
18.	Set the throttle to give 1000 - 1200 RPM.	Make sure that there are no warning lights on.
19.	Monitor the oil pressure.	The oil pressure must rise to 25 psi minimum, within 30 seconds of starting the engine. If it does not, then you must shut-down the engine.
20.	Set the electrical fuel pump to OFF.	
21.	Set the throttle to give 1500 RPM.	Warm up the engine until the oil temperature reaches 100 ºF (37.8 ºC). Monitor the instruments for unusual indications.

6. Measure/Adjust Engine Parameters

A. Measure Engine Performance

	Detail Steps/Work Items	Key Items/References
1.	Set the engine to 2000 RPM.	
2.	Do a test of the left magneto system: - Lean the fuel mixture to the engine before performing the magneto check and perform the check with the engine leaned - Set the ignition switch to L - Set the ignition switch to BOTH.	 The RPM must decrease by 50 - 175 RPM. The RPM must return to 2000 RPM.
3.	Do a test of the right magneto system: - Lean the fuel mixture to the engine before performing the magneto check and perform the check with the engine leaned - Set the ignition switch to R - Set the ignition switch to BOTH.	 The RPM must decrease by 50 - 175 RPM. The RPM must return to 2000 RPM. The maximum difference between the left and right magneto RPM drop is 50 RPM.

	Detail Steps/Work Items	Key Items/References
4.	Do a test of the alternate air:	
	- Set the alternate air control to ON for 10 - 15 seconds	
	- Set the alternate air control to OFF.	
5.	Do a test of the propeller control:	
	- Move the propeller control smoothly to MIN RPM	The RPM must decrease.
	- Move the propeller control smoothly to MAX RPM	The RPM must return to 2000 RPM.
6.	Do a test of the static RPM:	
	- Set the propeller control to MAX RPM	Fully forward.
	- Set the throttle control to FULL.	Note the engine RPM. It must be within the operating limits given in the Lycoming Operator's Manual.
	- Move the propeller control slowly towards minimum RPM until the RPM reduces by 25 RPM.	If you must move the propeller control a long way to get the 25 RPM decrease, then the pitch of the propeller will set the static RPM. Refer to the Propeller Owner's Manual to adjust the propeller pitch.
	- Set the propeller control to MAX RPM.	If you must move the propeller control a small way to get the 25 RPM decrease, then the propeller governor will set the static RPM. Refer to the Propeller Owner's Manual to adjust the governor.
	- Set the throttle to IDLE.	
NOTE: Operate the engine at up to 2000 RPM for 20 to 30 seconds before each measurement. This will allow the engine to stabilize between measurements.		
7.	Measure the idle RPM.	
	- Make sure that the oil temperature is at least 175 ºF (79.4 ºC). If it is not, operate the engine at up to 2000 RPM until the oil temperature is 175 ºF (79.4 ºC).	Low oil temperature can change the idle RPM.
	- Make sure that the propeller control lever is set to MAX RPM.	Fully forward.

	Detail Steps/Work Items	Key Items/References
	- Make sure that the mixture control lever is set to full RICH.	Fully forward.
	- Set the throttle to IDLE. Make a note of the idle RPM.	Allow the RPM to become stable. See Paragraph 6.B for the idle RPM adjustment procedure.
NOTE: Operate the engine at up to 2000 RPM for 20 to 30 seconds before each measurement. This will allow the engine to stabilize between measurements.		
8.	Measure the idle control mixture setting:	
	- Make sure that the oil temperature is at least 175 ºF (79.4 ºC). If it is not, operate the engine at up to 2000 RPM until the oil temperature is 175 ºF (79.4 ºC).	
	- Make sure that the mixture control lever is set to full RICH.	Fully forward.
	- Set the throttle to IDLE.	Allow the idle RPM to become stable.
	- Move the mixture control lever smoothly towards the LEAN position.	If the idle RPM increases by more than 50 RPM before decreasing then the mixture is too rich. If the idle RPM decreases immediately, then the mixture is too lean.
	- Move the mixture control lever to the full RICH position before the engine stops.	See Paragraph 6.C for the idle mixture adjustment.
9.	Do a test of the function of the fuel selector/shut-off valve:	
	- Set the engine to 1000 - 2000 RPM.	
	- Set the fuel shut-off valve to OFF.	The engine must stop within 2 minutes.
	- Set the fuel shut-off valve to ON.	
	- Set the ignition to OFF.	
10.	Start the engine.	Refer to Paragraph 5.

B. Adjust an Engine Idle Speed

	Detail Steps/Work Items	Key Items/References
NOTE: Do this work quickly. If the oil temperature is less than 175 ºF (79.4 ºC), it can change the idle RPM.		
1.	Shut down the engine.	Refer to Paragraph 7.
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Set the throttle lever to IDLE.	Make sure that the throttle lever at the injector is against the throttle stop screw. If the throttle lever at the injector is NOT against the idle stop screw, adjust the throttle control, see Chapter 76-00.
4.	Start the engine.	
5.	Set the propeller control to MAX RPM.	
6.	Set the mixture control to full RICH.	
7.	Operate the engine at 1500 RPM until it runs smoothly.	Obey the operating limits in the Lycoming Operator's Manual.
8.	Set the throttle to IDLE.	Allow the idle RPM to become stable.
9.	Make a note of the difference in idle RPM with the engine cowlings removed.	
10.	Shut down the engine.	Refer to Paragraph 7.
WARNING: DO NOT TOUCH THE EXHAUST SYSTEM. THE EXHAUST IS VERY HOT AND IT CAN BURN SKIN AND CLOTHING.		
11.	Adjust the idle-stop screw on the injector.	Turn the screw clockwise to increase idle RPM. Turn the screw counter-clockwise to decrease idle RPM.
12.	Start the engine.	Refer to Paragraph 5.
13.	Measure the idle RPM.	Refer to Paragraph 6.A. Make an allowance for the difference in idle RPM with the cowlings removed.
14.	Repeat steps 10 to 13 as necessary.	
15.	Shut down the engine.	Refer to Paragraph 7.
16.	Install the engine cowlings.	Refer to Chapter 71-10.

C. Adjust the Engine Mixture Control

Do this item only if a test shows that the mixture is incorrect.

	Detail Steps/Work Items	Key Items/References
NOTE: Do this work quickly. If the oil temperature is less than 175 ºF (79.4 ºC), it can change the idle RPM.		
1.	Shut down the engine.	Refer to Paragraph 7.
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Start the engine.	Refer to Paragraph 5.
4.	Set the propeller control to MAX RPM.	Fully forward.
5.	Set the mixture control to full RICH.	Fully forward.
6.	Operate the engine at 1500 RPM until it runs smoothly.	Obey the operating limits in the Lycoming Operator's Manual.
7.	Set the throttle to IDLE.	Allow the idle RPM to become stable.
8.	Make a note of the difference in idle RPM with the engine cowlings removed.	
9.	Shut down the engine.	Refer to Paragraph 7.
WARNING: DO NOT TOUCH THE EXHAUST SYSTEM. THE EXHAUST IS VERY HOT AND IT CAN BURN SKIN AND CLOTHING.		
10.	Adjust the mixture on the injector.	If you turn the thumb-screw to make the linkage shorter, you make the mixture leaner. If you turn the thumb-screw to make the linkage longer, you make the mixture richer.
NOTE: Make sure that the idle RPM is within limits. Make an allowance for the difference in idle RPM with the engine cowlings removed. The idle RPM can change when you adjust the mixture. If the idle RPM is not in limits, adjust the idle RPM. See Paragraph 6.B.		
11.	Start the engine.	Refer to Paragraph 5.
12.	Measure the mixture control setting.	Refer to Paragraph 6.A.
13.	Repeat steps 9 to 12 as necessary.	
14.	Shut down the engine.	Refer to Paragraph 7.
15.	Install the engine cowlings.	Refer to Chapter 71-10.

	Detail Steps/Work Items	Key Items/References
16.	Start the engine.	Refer to Paragraph 5.
17.	Measure the mixture control setting.	Refer to Paragraph 6.A.
18.	Shut down the engine.	Refer to Paragraph 7.

7. Engine Shut Down

	Detail Steps/Work Items	Key Items/References
1.	Set the mixture control to full RICH.	Fully forward.
2.	Set the propeller control to MAX RPM.	Fully forward.
3.	Set the throttle to IDLE.	Fully back. Let the engine idle until the cylinder head temperature decreases.
4.	Set 1000 RPM with the throttle lever.	
5.	Move the mixture control to fully LEAN.	The engine must stop within 5 seconds.
6.	Set the ELECT MASTER switch to OFF.	

8. After Engine Shut Down

	Detail Steps/Work Items	Key Items/References
1.	Read the engine oil level. Add more oil if necessary.	Refer to Chapter 12-10.
2.	Look under the bottom cowling for signs of oil leaks and signs of fuel leaks.	
3.	Install the Pitot probe cover.	

9. Engine Break-In Procedure

Do this procedure after a new engine has been installed. Refer to Lycoming Service Instruction No. 1427, latest issue.

	Detail Steps/Work Items	Key Items/References
1.	Do a careful pre-flight inspection.	Refer to DA42 L360 Airplane Flight Manual.
2.	Do a normal take-off. - Mixture Control Lever - RICH - RPM Lever - HIGH RPM - Throttle - MAX PWR	 Reduce RPM to 2400 as soon as possible after take-off.
CAUTION: CLIMB WITH A SMALL CLIMB ANGLE TO A SUITABLE ALTITUDE FOR CRUISE TO AVOID ENGINE OVER-HEATING.		
3.	Climb to an altitude which is suitable for cruise.	Stay below 5000 ft.
CAUTION: AVOID LOW MANIFOLD PRESSURE DURING HIGH ENGINE SPEEDS (DO NOT OPERATE BELOW 15 INCHES HG). IF YOU MUST REDUCE ENGINE POWER, FIRST REDUCE THE RPM.		
4.	Cruise for 2 hours and 30 minutes. - Cruise at 75% power during the first hour. - Change power setting a few times between 65% and 75% during the second hour. - Cruise with 2700 RPM and full throttle during the last 30 minutes.	 Lean engine as required. Lean engine as required. Lean engine as required.
5.	Record data during the flight every 15 minutes.	Use DA42L CIG.001 Chapter 3, Engine Break-In Procedure form to record the data.
CAUTION: DESCEND AT A MODERATE RATE AND LOW CRUISE POWER SETTINGS.		
6.	Descend and land.	Refer to DA42 L360 Airplane Flight Manual.

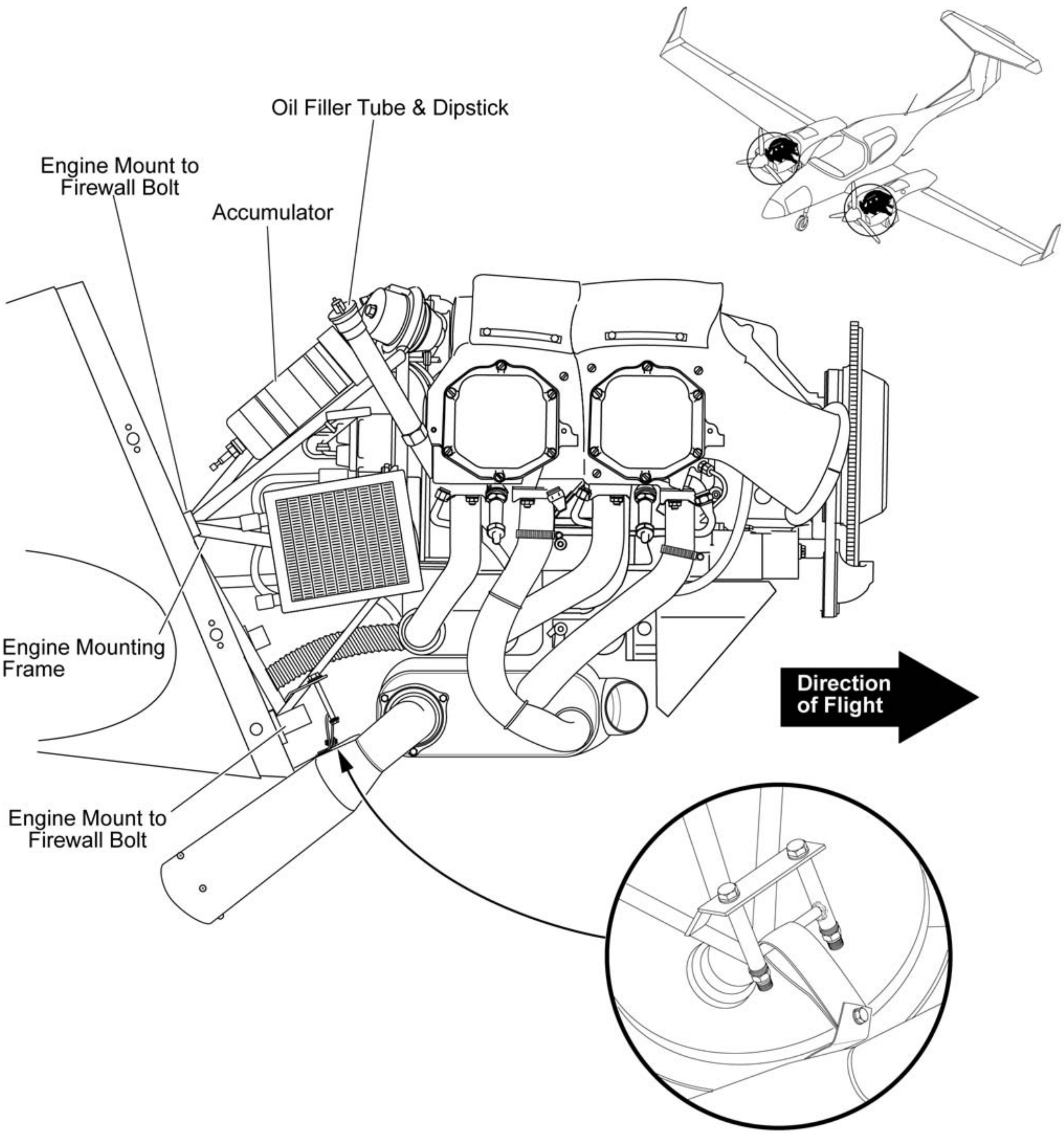

Figure 201 - Right Side of the Engine

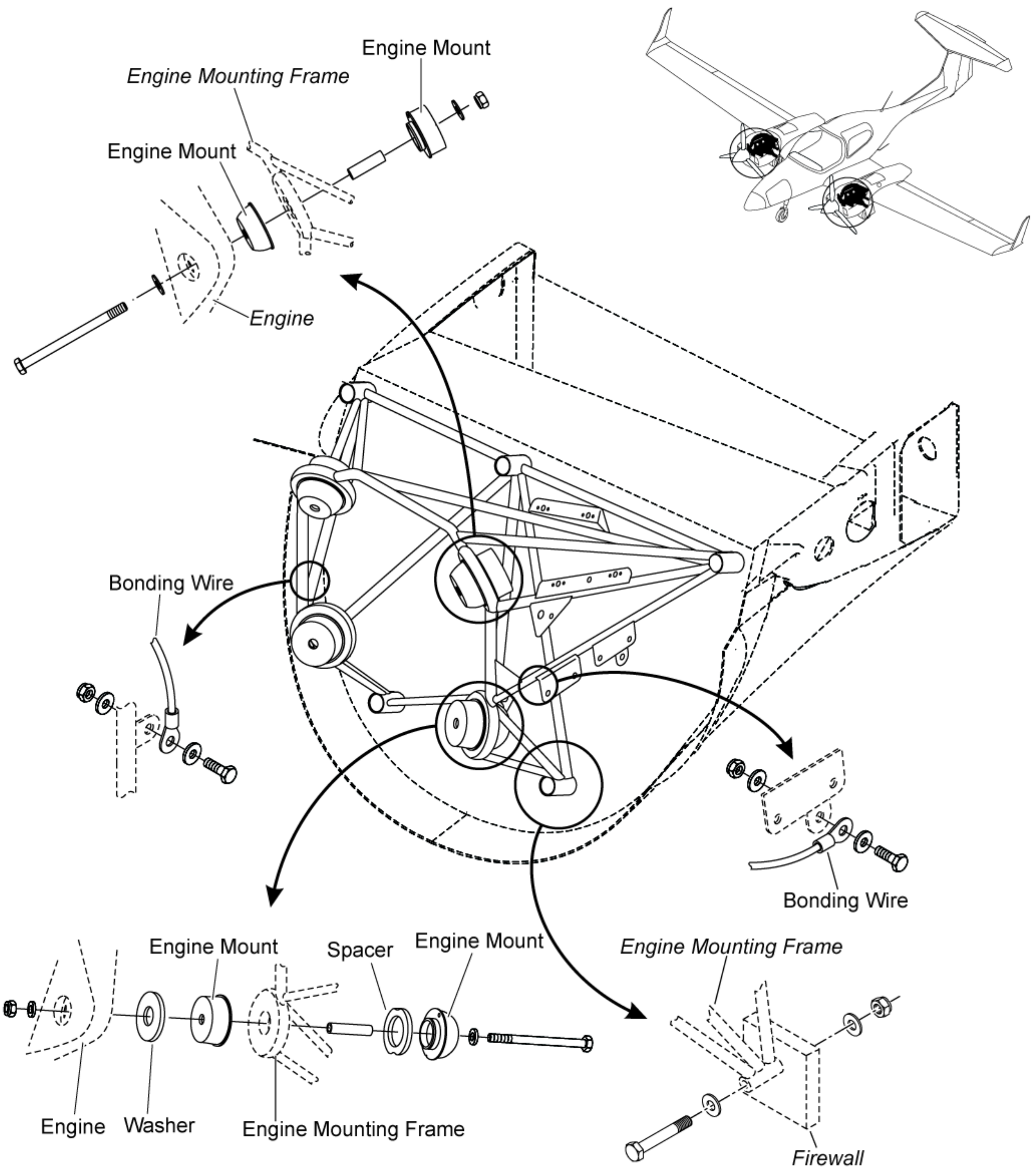

Figure 202 - Engine Mounting

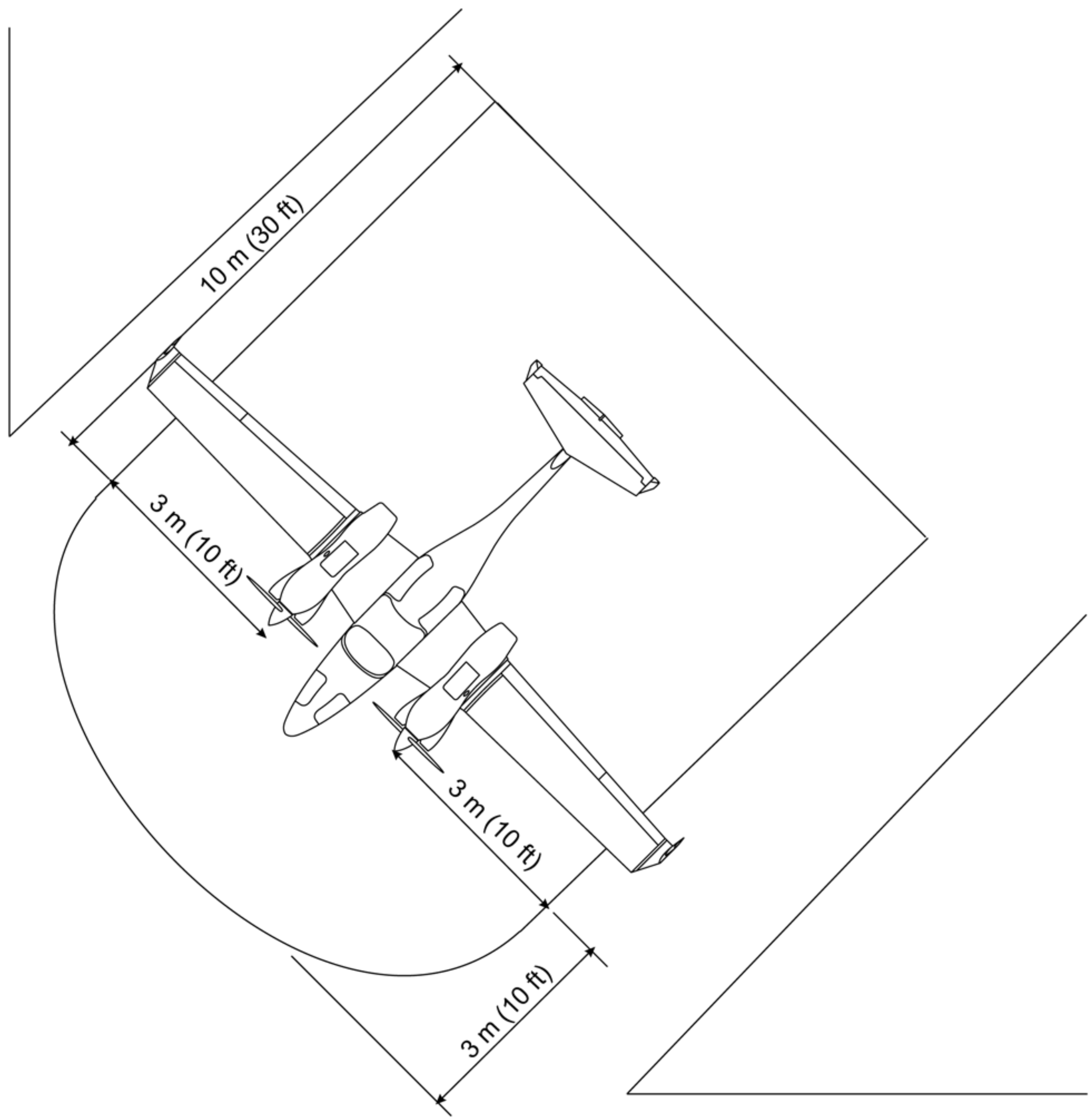

Figure 203 - Safety Range for Engine Start and Test

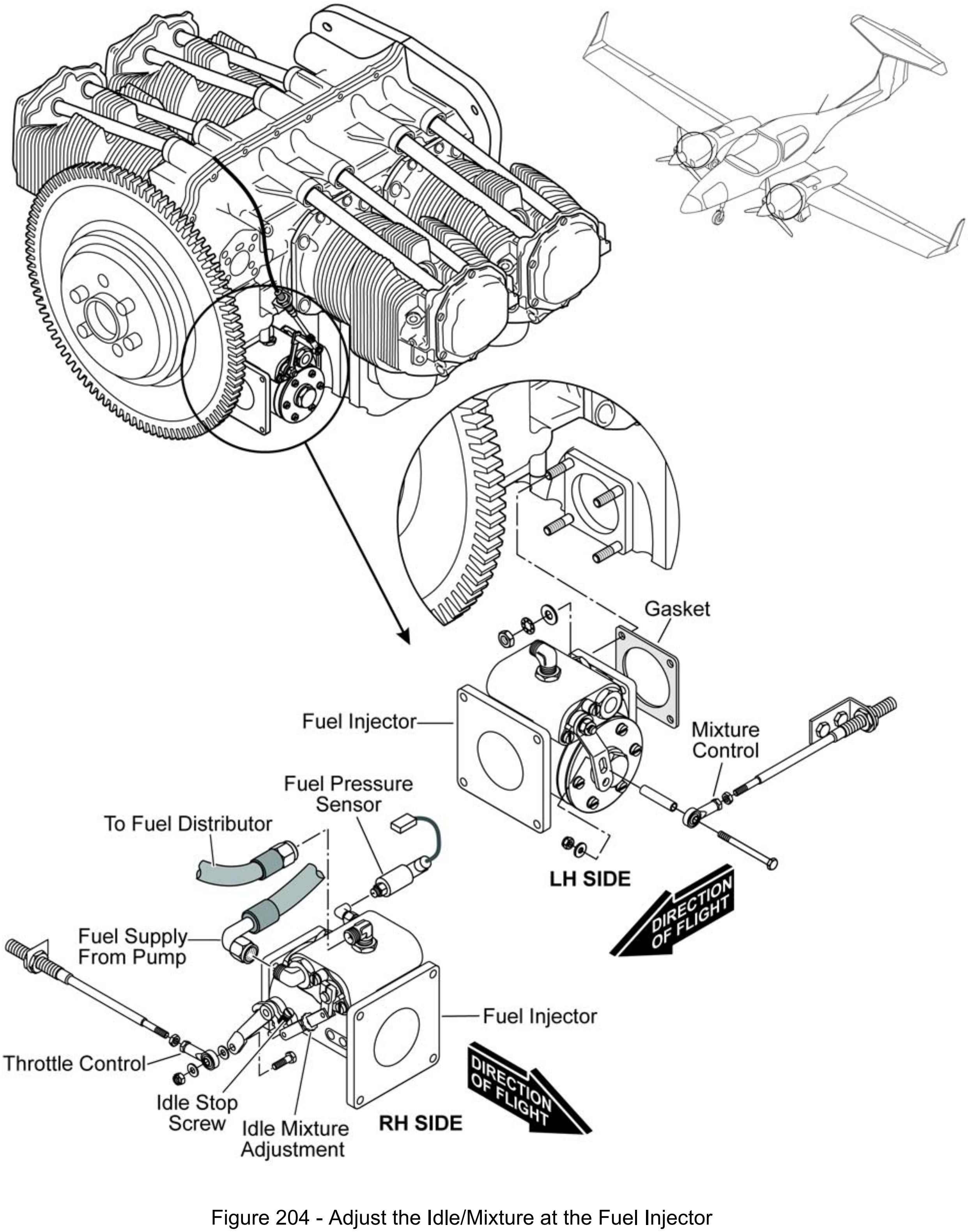

Figure 204 - Adjust the Idle/Mixture at the Fuel Injector

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COWLING - DESCRIPTION AND OPERATION

1. General

The DA42 L360 aircraft has two Carbon Fiber Reinforced Plastic (CFRP) panels which make the engine cowlings. They are:

- A top cowling
- A bottom cowling.

CFRP is very strong and is easy to maintain. The cowlings give a good aerodynamic shape to the engine nacelles. They are very easy to remove and give good access to the engine.

Refer to AMM # 7.02.01 Chapter 51-20 for repair data for the cowlings.

Refer to AMM # 7.02.01 Chapter 51-60 for data on the quick-release fasteners.

2. Description

Figures 1, 2, and 3 show the cowlings.

The Camloc quick-release fasteners attach the cowlings to each other and to the engine nacelle. Both the cowlings are very light and one person can hold them easily.

The top cowling has a large intake for the engine cooling air.

On aircraft with Pre-SB 42L 79-01: The bottom cowlings have an air intake for the engine and for the oil cooler on the right hand side. Refer to Figure 1.

On aircraft with Post-SB 42L 79-01: The bottom cowlings have an additional external oil cooler scoop on the right side of the cowlings. Refer to Figure 2 and Figure 3.

An Optional Winter Kit can be installed on lower cowl assemblies P/N C61-7116-104-005 (LH) and P/N C61-7116-104-006 (RH). Refer to Figure 4.

With the Winter Kit installed on the lower cowl assemblies, baffles can be installed at the intake of the oil cooler scoops to reduce the amount of cold air entering the oil cooler scoops. The Winter Kit baffles must be removed when operating in temperatures above 10 °C (50 °F). They must be stored in the assigned location on the aircraft when not in use.

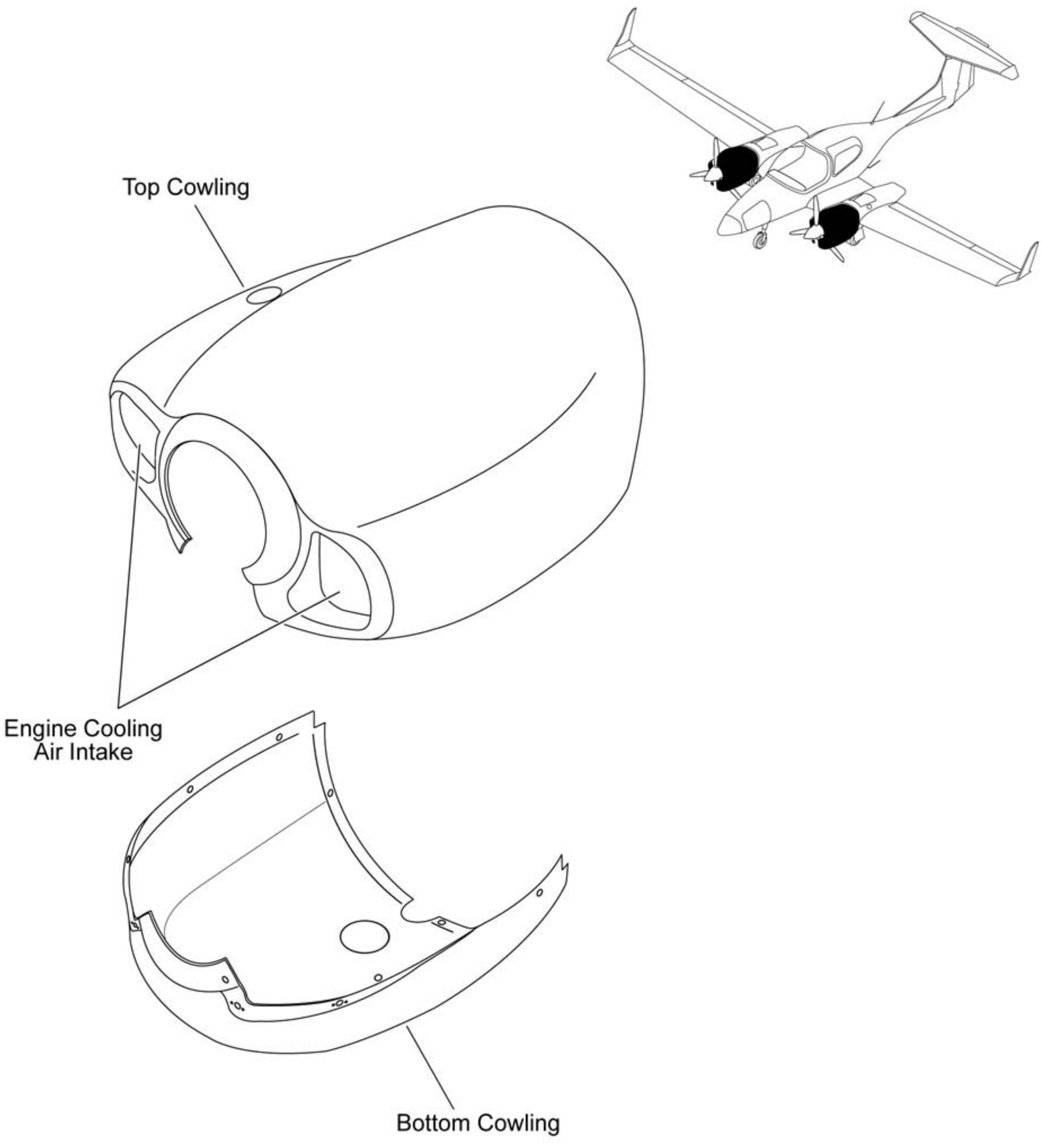

Figure 1 - Engine Cowlings (Pre-SB 42L-79-01)

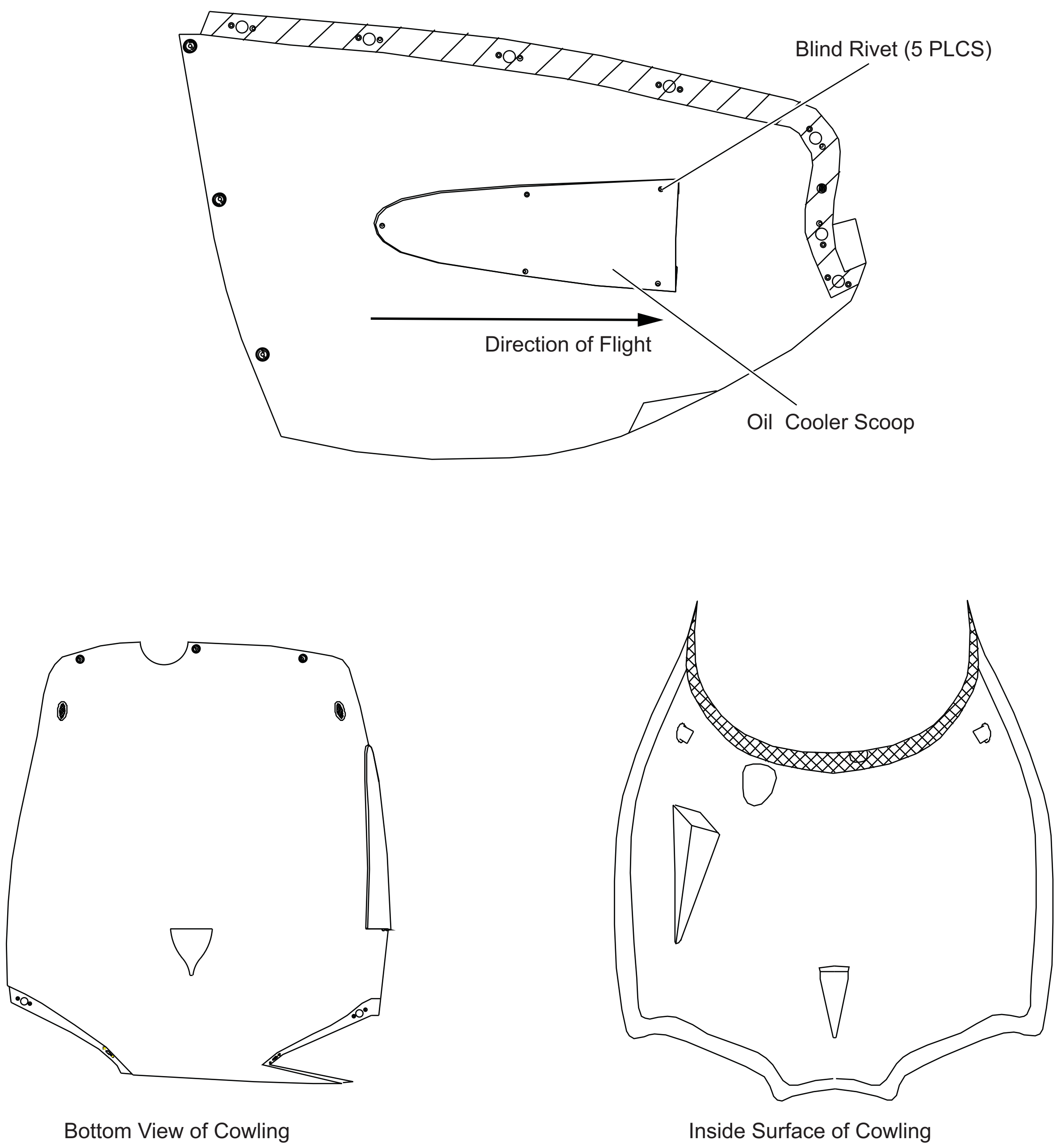

Figure 2 - Engine Lower Cowlings (Post-SB 42L-79-01)

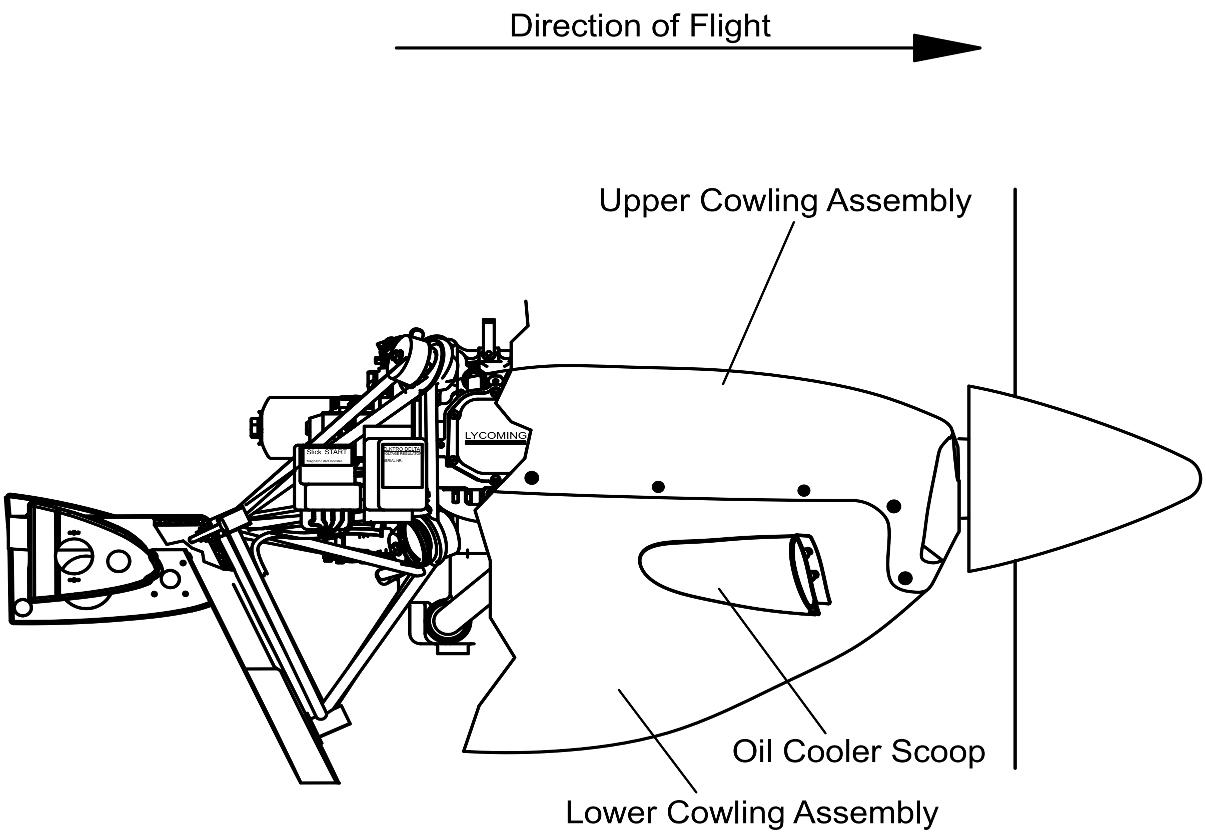

Figure 3 - Engine Cowlings (Post-SB 42L-79-01)

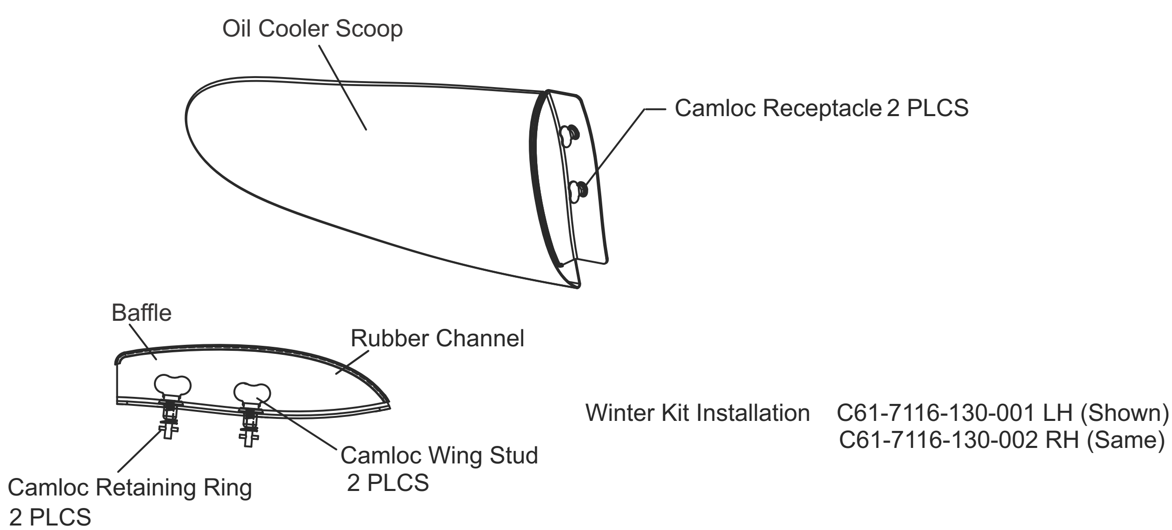

Figure 4 - Winter Kit Installation

COWLING - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the engine cowlings. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Outer surface of the cowling discolored.	Engine overheating.	Examine the engine for hot gas leaks.
Paint blistered.	Hot gas leak.	Examine the exhaust for cracks and leaking gaskets.
Black soot on the inner surface.	Engine fire.	Replace the damaged items. Repaint the cowlings.
Oil or fuel on the inner surface of the cowling.	Oil or fuel leak.	Examine the engine. Look especially for oil and fuel leaks. Correct the problems that you have found. Clean the cowling.

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COWLING - MAINTENANCE PRACTICES

1. General

This chapter describes the maintenance practices for the cowlings, as follows:

- How to remove and install the cowlings
- How to remove and install the Winter Kit baffles, when the Winter Kit is installed
- How to clean and paint the cowlings.

2. Remove/Install the Engine Cowlings

Use the following procedures for the left engine or the right engine.

A. Remove the Engine Top Cowling

WARNING: YOU MUST MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU WORK NEAR TO THE PROPELLER. SET THE ELECT MASTER SWITCH TO "OFF". SET THE ENGINE START SWITCH TO "OFF" AND REMOVE THE KEY. SET THE POWER LEVER TO "IDLE".

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE PROPELLER. IF THE ENGINE IS TURNED, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related engine START switch. - Set the throttle lever to IDLE.	
2.	Release the fasteners that attach the top cowling, the bottom cowling and the engine nacelle.	
3.	Pull the top cowling up and away from the bottom cowling and clear of the engine nacelle.	Take care not to catch the cowling on the propeller.

B. Remove the Bottom Cowling

	Detail Steps/Work Items	Key Items/References
1.	Release the quick-release fasteners which hold the bottom cowling.	Hold the bottom cowling.
2.	Remove the bottom cowling: - Lower the rear of the cowling. - Move the cowling down and forward. - Move the cowling clear of the aircraft.	Take care not to catch the cowling on the propeller.

C. Install the Bottom Cowling

	Detail Steps/Work Items	Key Items/References
1.	Examine the bottom cowling. Make sure that: - The cowling is clean. - The cowling is not damaged - The quick release fasteners are not missing or damaged.	Repair any damage.
2.	Lift the cowling into position: - Move the cowling upwards. - Lift the cowling fully into position. - Tighten the quick release fasteners that attach the cowling to the engine nacelle.	

D. Install the Engine Top Cowling

	Detail Steps/Work Items	Key Items/References
1.	Examine the top cowling. Make sure that: - The cowling is clean. - The cowling is not damaged - The quick release fasteners are not missing or damaged.	 Repair any damage.
2.	Install the top cowling: - Move the top cowling into position on the engine nacelle.	 Make sure that the fasteners engage correctly in the engine nacelle and bottom cowling.
3.	Tighten all the quick-release fasteners that attach the top cowling to the bottom engine cowling and the engine nacelle.	

3. Remove/Install the Winter Kit baffles

CAUTION: THE WINTER KIT BAFFLES MUST BE REMOVED WHEN OPERATING IN TEMPERATURES ABOVE 10 °C (50 °F).

A. Install the Winter Kit baffles

	Detail Steps/Work Items	Key Items/References
1.	Get the two baffles from the assigned storage area in the aircraft.	Make sure that they are clean and the camloc wing studs are satisfactory before they are installed on the aircraft.
2.	Place the baffles correctly in the oil cooler scoops.	Make sure that the oil cooler scoops are clean and free of debris. Make sure that the camloc wing studs line up with the two camloc receptacles.
3.	At the front of the oil cooler scoop, turn the camloc wing studs to lock the baffle in place in the oil cooler scoop.	Make sure that all components are correctly installed.

B. Remove the Winter Kit baffles

	Detail Steps/Work Items	Key Items/References
1.	At the front of the oil cooler scoop, turn the camloc wing studs to unlock the baffle from the two camloc receptacles.	
2.	Remove the baffle from the oil cooler scoop.	Make sure that the oil cooler scoops are clean and free of debris. Make sure that the baffles are clean and the camloc wing studs are satisfactory.
3.	Store the two baffles at the assigned storage area in the aircraft.	

4. Cleaning and Painting

A. Clean the Cowlings

	Detail Steps/Work Items	Key Items/References
1.	Wash the outer surface with a mixture of water and a mild detergent.	Obey the detergent manufacturer's instructions.
2.	Wash the inner surface with a mixture of water and a mild detergent.	Obey the detergent manufacturer's instructions.
	CAUTION: DO NOT USE POLISH CONTAINING SILICONE. SILICONE MAKES CFRP REPAIR DIFFICULT.	
3.	Polish the outer surface with wax polish.	Obey the polish manufacturer's instructions. Do not use silicone polish.

B. Paint the inside of the Cowlings

This paragraph gives the data for painting the inside of the engine cowlings with the fire protection paint. Refer to AMM # 7.02.01 Chapter 51-20 for repairs and painting the outside of the cowlings.

	Detail Steps/Work Items	Key Items/References
1.	Clean the inside of the cowling	
2.	Make the area rough for painting.	Use 150-320 grade wet and dry paper.
	WARNING: DO NOT GET ACETONE ON YOUR SKIN. ACETONE CAN CAUSE SKIN DISEASE. WARNING: DO NOT BREATHE ACETONE FUMES. ACETONE FUMES CAN CAUSE ILLNESS. CAUTION: REMOVE ACETONE AS SOON AS POSSIBLE FROM GFRP. ACETONE CAN CAUSE THE RESIN TO SOFTEN AND FAIL.	
3.	Clean the area rough for painting.	Use acetone.
4.	Paint the inside of the cowling with fire protection paint.	Obey the paint manufacturer's instructions.

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ENGINE MOUNTING - DESCRIPTION AND OPERATION

1. General

Tubular steel makes the engine mount. The engine mount has welded joints. Paint protects the frame from corrosion. Rubber lined P-clamps and cable ties hold electrical cables and other items of equipment to the engine mount.

The engine mounting frame has five small mounting pads at the rear of the frame. Bolts through the pads attach the engine mount to the fuselage.

The engine attaches to the engine mount at four mounting pads. Shock mounts go between the engine and the engine mount pads. These shock mounts isolate the airframe from engine vibrations.

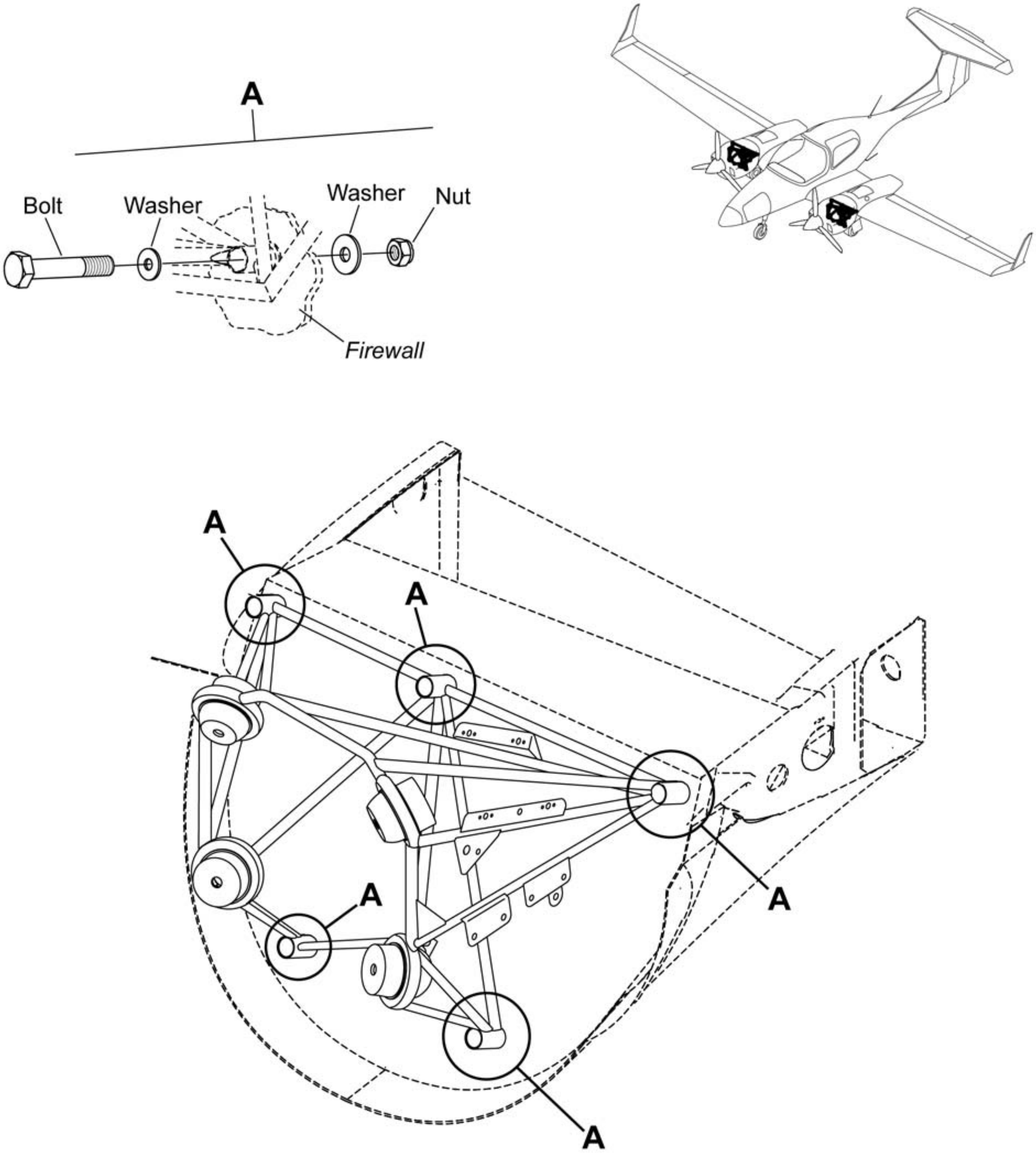

Figure 1 - Engine Mount Assembly

ENGINE MOUNTING - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the power plant. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Engine vibration.	Cracked engine mount.	Do a test for cracked tubes. Look especially at the welded joints. Repair all cracks using an approved method or replace the mount.
	Propeller out of balance.	Balance the propeller.
Defective shock mounts.	Refer to the engine manufacturer.	

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ENGINE MOUNTING - MAINTENANCE PRACTICES

1. General

The maintenance practices for the engine mount are limited to removal/installation. If the engine mount is damaged it must be repaired by an authorized repair facility.

2. Remove/Install an Engine Mount

A. Equipment

Item	Quantity	Part Number
Hoist	1	Commercial
Engine Sling	1	Commercial
Engine Stand	1	Commercial
Tail Trestle	1	Commercial

B. Remove an Engine Mount

	Detail Steps/Work Items	Key Items/References
1.	Remove the engine.	Refer to Chapter 71-00.
2.	Release all clamps, clips and ties holding the electrical harness and hoses to the engine mount.	
3.	Remove the un-feathering accumulator.	Refer to Chapter 61-20.
4.	Remove the Slick Start magneto booster.	Refer to Chapter 74-00.
5.	Remove the engine oil-cooler and shroud.	Refer to Chapter 79-00.
6.	Remove the alternator regulator.	Refer to Chapter 24-30.
7.	Remove the five nuts and the washers that hold the engine mount to the engine nacelle. Push the bolts out of the mounting pads.	Support the mount and then remove the bolts from the mounting pads. Failure to support the mount will result in the mount falling out of the firewall when the bolts are removed.
8.	Move the engine mount clear of the engine nacelle.	

C. Install an Engine Mount

	Detail Steps/Work Items	Key Items/References
1.	Move the engine mount into position on the firewall and support until the mount bolts are installed.	
2.	Install the five bolts that attach the engine mount to the engine nacelle firewall: - Push the bolts through the firewall and mounting pads. - Install the washers and the self-locking nuts on the bolts.	 Use new bolts. Use new fire resistant self-locking nuts. Torque to 29.5 lbf-ft (40 Nm).
3.	Install the alternator regulator.	Refer to Chapter 24-30.
4.	Install the engine oil cooler and shroud.	Refer to Chapter 79-00.
5.	Install the SlickSTART magneto booster.	Refer to Chapter 74-00.
6.	Install the un-feathering accumulator.	Refer to Chapter 61-20.
7.	Install all the clamps, the clips and the ties that hold the electrical harness and the hose to the engine mount.	The clamps, the clips and the ties that you removed in Paragraph 2.B (2).
8.	Install the engine.	Refer to Chapter 71-00.

ELECTRICAL CABLES IN THE ENGINE COMPARTMENT DESCRIPTION AND OPERATION

1. General

The engine compartment has a main electrical wiring harness. The harness has all of the low-power cables. There are no special maintenance practices for these cables. Refer to Chapter 24 for data about the battery and alternator wiring and Chapter 80 for more data about the starter cables. Refer to AMM # 7.02.01 Chapter 92 wiring diagrams for data about the cables in each system.

2. Description

Figure 1 shows the electrical cables in the rear of the engine compartment. Figure 2 shows the electrical cables on the right side of the engine.

The main electrical harness comes through the firewall on the right side. P-clamps attach the main harness to the tubes of the engine mount. These electrical cables split from the harness at the rear of the engine:

- No. 2 and No. 4 cylinder CHT probe cables
- No. 2 and No. 4 cylinder EGT probe cables
- Power cables for the Slick Start control unit
- Cables for the voltage regulator
- Manifold pressure sensor cable
- Oil Temperature sensor cable.

The main harness goes forward and down the right side of the engine. P-clamps attach the harness to brackets mounted on the engine sump bolts. These electrical cables split from the harness at the side of the engine:

- No. 1 and No. 3 cylinder CHT probe cables
- No. 1 and No. 3 cylinder EGT probe cables
- Oil pressure sensor cables (2 cables)
- Fuel pressure and fuel flow sensor cables (3 cables)
- The main harness passes under and across the engine to the following items:
  - Alternator
  - Starter.

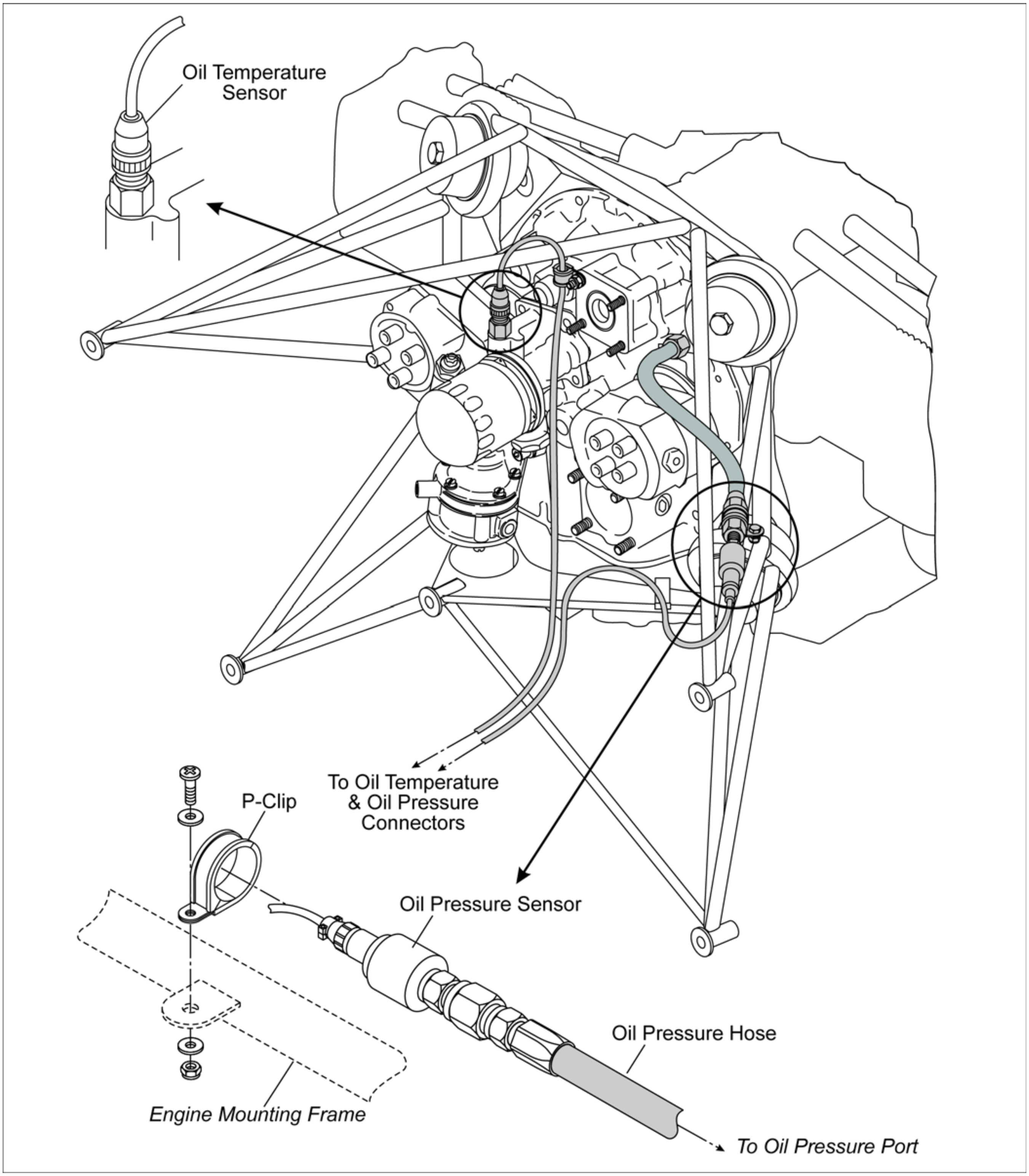

Figure 1 - Engine Cables at the Rear of the Engine

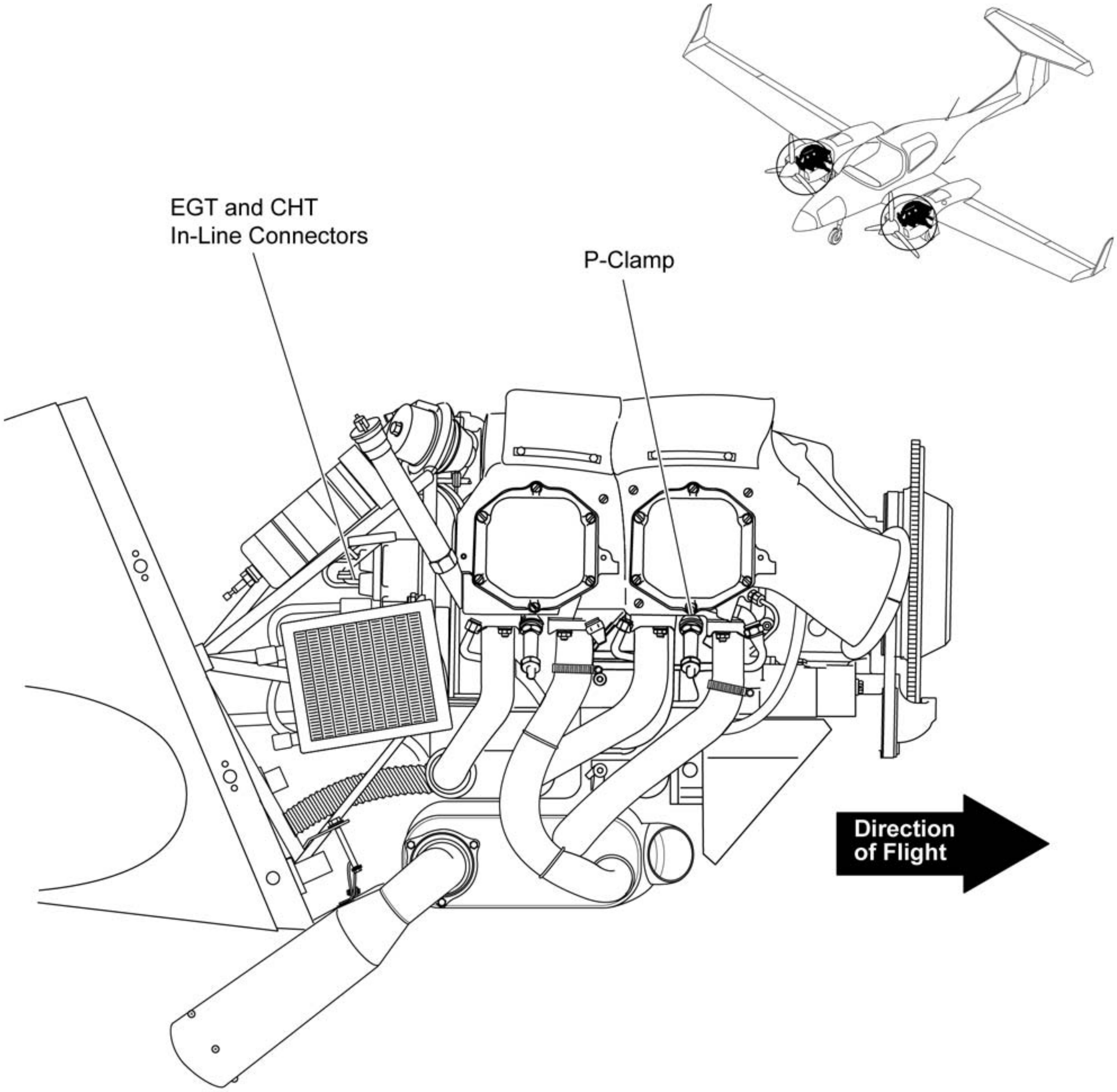

Figure 2 - Engine Cables on the Right Side of the Engine

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AIR INTAKES - DESCRIPTION AND OPERATION

1. General

An air filter housing, air filter and alternate air valve assembly make the engine air intake system for the DA42 L360 aircraft. The engine bottom cowling has a molded air intake duct and a flexible seal attached to the air filter housing. A lever below the instrument panel, right-side, operates both alternate air valves.

Figure 1 shows the engine air filter and alternate air valve.

2. Description

The air intake has the following main parts:

- Alternate air valve assembly
- Air filter housing
- Air filter
- Alternate air valve operating cables.

A. Alternate Air Assembly

Refer to Figure 1. The alternate air valve assembly has a valve body which has six air inlet holes around its circumference. A Bowden cable attaches to the valve body and rotates the valve body inside the valve flange. O-ring seals are located at each end of the valve body to make a seal between the valve body and the valve flange. A gasket and sealing compound between the fuel injector flange and the alternate air assembly provides tight sealing and prevents the suction sleeve from vibration during engine operation.

The valve flange has six air inlet holes drilled around its circumference. A suction sleeve locates inside the valve flange and passes through the center of the alternate air valve assembly.

B. Air Filter Housing

The air filter housing has a flexible seal which makes a seal between the air intake assembly and the engine bottom cowling. The flexible seal attaches to the air filter housing with bolts. Bolts with spacers attach both the air filter housing and the alternate air valve to the fuel injector. One of the spacers has a support bracket for the Bowden cable.

C. Air Filter

Refer to Figure 1. The air filter has a cotton weave type element. The air filter locates on the air filter housing and is held by a worm drive clamp.

D. Alternate Air Valve Operating Cables

A control lever on the right side of the center console, below the instrument panel operates the alternate air valves. A Bowden cable connects the control lever to a relay lever. The relay lever is mounted in the relay bracket which is located on the cockpit control bulkhead, below the pilot's seat. Two more Bowden cables connect the relay lever to the left and right engine alternate air valve operating levers.

3. Operation

In normal operation the alternate air control lever is set to the OFF position. The holes in the alternate air valve body and the flanged housing do not align and ambient air flows through the air filter into the fuel injector.

When the alternate air control lever in the cockpit is moved to the alternate air position, the Bowden cable rotates the valve body to align the holes in the valve body with the holes in the flanged housing. Warm air from the engine bay will now flow through the alternate air valve into the fuel injector.

The alternate air valve can be selected to the alternate air position to supply warm air for anti-icing or to maintain the air supply should the air filter become blocked. The alternate air supply is not filtered.

Figure 2 shows the alternate air valve controls. When the pilot pulls the alternate air valve control lever towards the rear of the airplane these events occur:

- The lever pulls the inner cable of the forward Bowden cable.
- The inner cable of the forward Bowden cable turns the relay lever clockwise.
- The relay lever pulls the inner cables of the left and right alternate valves.
- Both engine alternate air valves move to the alternate (unfiltered) position.

When the pilot moves the alternate air valve control lever forward both alternate air valves move back to the normal (OFF) position.

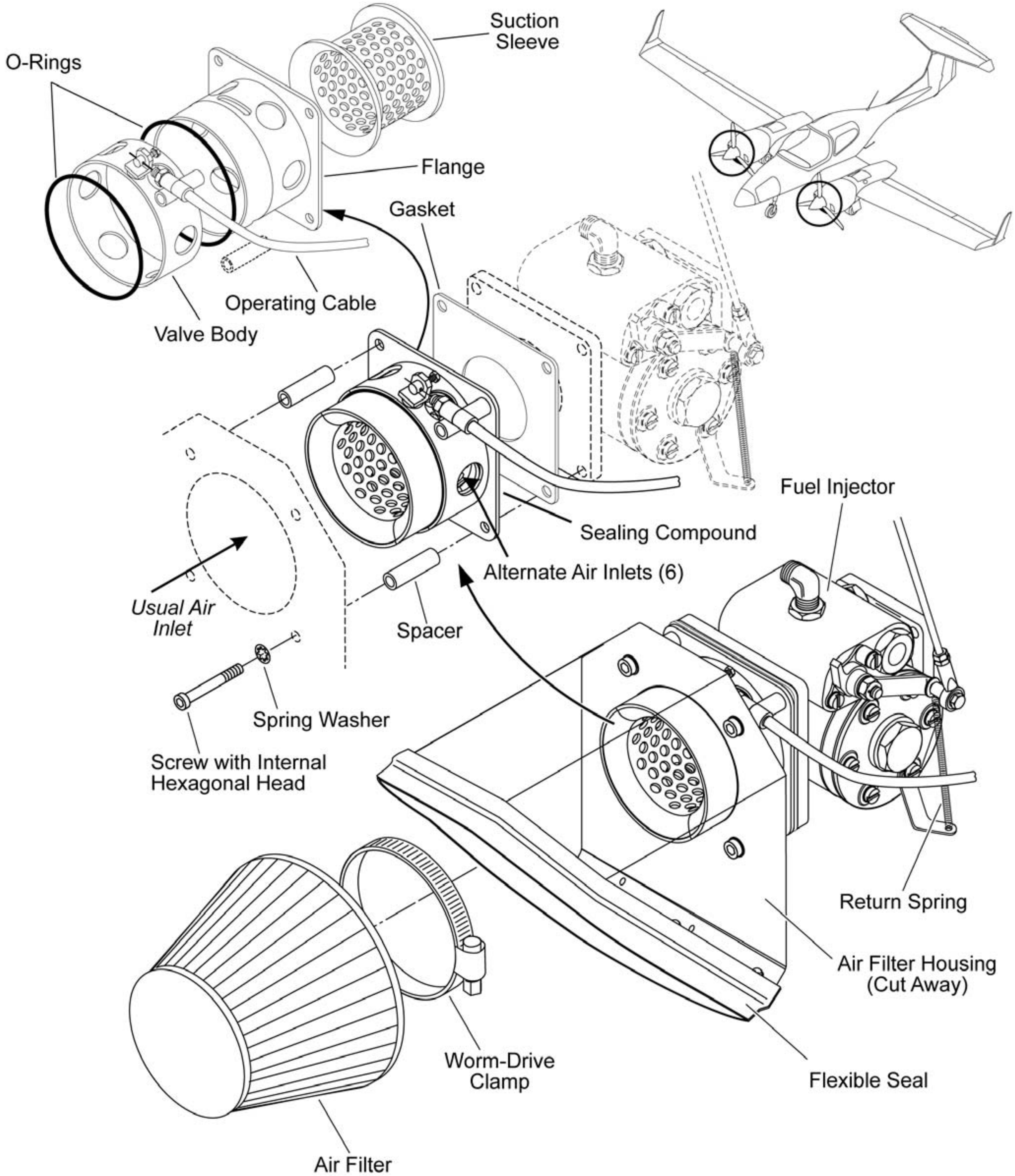

Figure 1 - Air Filter and Alternate Air Assembly

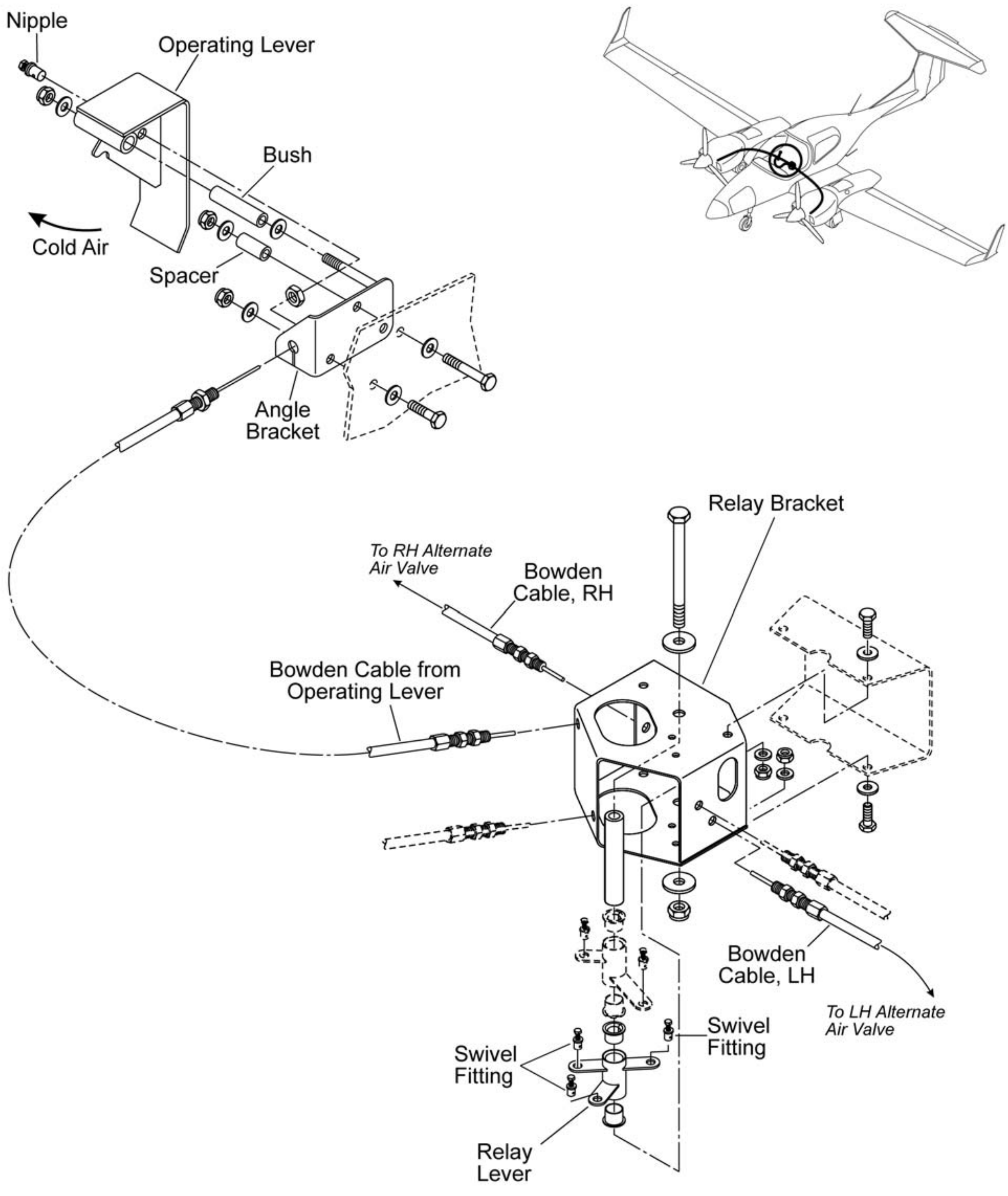

Figure 2 - Alternate Air Valve Controls

AIR INTAKES - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the power plant. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
An engine does not develop full power.	Air filter blocked/defective on related engine.	Replace the air filter for the related engine.
Fuel injector air intake throat is contaminated with fine aluminium particles.	Alternate air valve suction sleeve vibrates during engine operation, producing fine aluminium particles.	Replace the gasket or sealing compound between alternate air valve and the fuel injector with sealing compound.

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AIR INTAKES - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe:

- how to remove and install the air filter and the alternate air valve assembly
- how to adjust, remove and install the alternate air control cable.

They do not describe how to adjust the engine fuel injector.

Refer to the Lycoming Maintenance Manual for the data on the fuel injector.

2. Remove/Install an Air Filter

A. Remove an Air Filter

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF - Set the related ENGINE MASTER switch to OFF - Set the power lever to 0% - Set the THROTTLE lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Loosen the worm-drive clamp that holds the air filter to air filter housing.	Refer to Figure 201.
5.	Move the air filter forward and clear of the air filter housing.	

B. Install an Air Filter

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the worm-drive clamp is in position on the air filter.	
2.	Put the air filter in position on the air filter housing.	
3.	Tighten the worm-drive clamp which holds the air filter.	Refer to Figure 201.
4.	Connect the airplane main battery.	Refer to Chapter 24-31.
5.	Install the engine top cowling.	Refer to Chapter 71-10.

3. <u>Remove/Install an Alternate Air Valve</u>

A. Remove an Alternate Air Valve

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set ELECT MASTER switch to OFF - Make sure that the key is removed from the related engine START switch - Set the THROTTLE lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Loosen the worm-drive clamp that holds the air filter to air filter housing.	Refer to Figure 201.
5.	Remove the alternate air valve: - Remove the four internal hexagon head bolts and the serrated washers that attach the alternate valve and the filter housing to the fuel injector - Move the filter housing and the spacers clear of the engine - Hold the alternate air valve close to the engine and do step (6).	Note the location of the spring retaining plate. Support the alternate air valve.

	Detail Steps/Work Items	Key Items/References
6.	Disconnect the alternate air control cable at the alternate air valve: - Loosen the bolt of the swivel fitting - Move the control cable inner clear of the swivel fitting - Remove and retain the swivel fitting - Remove the lock-nut from the control cable outer sheath - Move the control cable outer sheath clear of the alternate air valve - Move the alternate air valve clear of the engine.	
7.	Remove and discard the gasket from the front face of the fuel injector.	
8.	Inspect the fuel injector inlet. If the fuel injector intake throat is contaminated with fine aluminium particles, replace the old gasket or sealing compound between the alternate air valve and the fuel injector: - Remove the old gasket or sealing compound. - Clean the alternate air valve. - Clean the fuel injector flange. - Clean the fuel injector air intake throat.	

B. Install an Alternate Air Valve

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the alternate air control lever in the cockpit is set to OFF.	Fully forward.
2.	Install a new gasket onto the front face of the fuel injector.	
3.	Move the alternate air valve close to the engine and do step 4.	
4.	Attach the operating cable to the alternate air valve: - Move the cable into position in the cable bracket	

	Detail Steps/Work Items	Key Items/References
	- Install the lock-nut onto the cable outer sheath end-fitting - Install the swivel into the operating lever of the alternate air valve - Move the control cable inner through the swivel fitting - Tighten the bolt of the swivel fitting.	
5.	Apply sealing compound to the alternate air valve flange and suction sleeve and install the alternate air valve onto the fuel injector: - Move the alternate air valve into position at the front face of the fuel injector - Move the filter housing into position in front of the alternate air valve - Install the four internal hexagon head screws with the serrated washers that attach the air filter housing and the alternate air valve to the fuel injector.	DP300 Sealant Install the spring retaining bracket at the location noted in Paragraph 3.A (5). Make sure that the gasket is located correctly.
6.	Adjust the alternate air control cable.	Refer to Paragraph 5.
7.	Install the air filter.	Refer to Paragraph 2.

4. Remove/Install an Alternate Air Control Inner Cable

A. Remove an Alternate Air Control Forward Inner Cable

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set ELECT MASTER switch to OFF - Make sure that the key is removed from the related engine START switch - Set the THROTTLE lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.

	Detail Steps/Work Items	Key Items/References
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Remove the pilot's seat.	Refer to AMM # 7.02.01 Chapter 25-10.
5.	Disconnect the control cable from the relay lever at the relay bracket: - Loosen the screw on the cable swivel fitting at the relay lever - Pull the inner control cable clear of the swivel fitting.	Refer to Figure 201. Retain the swivel fitting.
6.	Disconnect the control cable from the alternate air control operating lever in the cockpit: - Loosen the screw on the cable swivel fitting at the operating lever - Remove the swivel fitting from the cable.	Refer to Figure 202. Retain the swivel fitting.
7.	Remove the inner control cable form the sheath: - Attach a length of suitable cord to the end of the inner cable - Pull the inner cable from the outer sheath and pull the length of cord into the outer sheath and clear of the aircraft - Disconnect the inner cable from the length of cord.	 The cord must be longer than the inner cable. Leave the length of cord in the outer sheath.

B. Install an Alternate Air Control Forward Inner Cable

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the alternate air control cable outer sheath is in good condition and is not kinked.	
2.	Make sure that the new alternate air valve Forward control cable inner is clean and dry.	
3.	Install the new alternate air valve forward control cable inner: - Attach the end of the length of cord that is in the control cable outer sheath to the new control cable inner - Pull the new cable into the outer sheath with the length of cord - When the new inner cable is fully through the outer sheath: - Disconnect the length of cord from the inner cable.	At the cockpit end.
4.	Connect the alternate air forward inner cable to the operating lever in the cockpit: - Install the swivel fitting into the operating lever - Pass the inner cable through the swivel fitting and tighten the swivel fitting.	Refer to Figure 202.
5.	Connect the alternate air inner cable to the relay lever: - Install the swivel fitting into the relay lever - Pass the inner cable through the swivel fitting and tighten the swivel fitting screw.	Refer to Figure 202.
6.	Adjust the alternate air cable that you installed.	Refer to Paragraph 5.
7.	Install the engine cowlings.	Refer to Chapter 71-10.

C. Remove an Alternate Air Control Forward Left/Right-Cable

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set ELECT MASTER switch to OFF - Make sure that the key is removed from the related engine START switch - Set the THROTTLE lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Remove the pilot's seat.	Refer to AMM # 7.02.01 Chapter 25-10.
5.	Disconnect the control cable from the relay lever at the relay bracket: - Loosen the screw on the cable swivel fitting at the relay lever - Pull the inner control cable clear of the swivel fitting.	Refer to Figure 201. Retain the swivel fitting.
6.	Disconnect the control cable from the related alternate air valve: - Loosen the screw on the cable swivel fitting at the alternate air valve - Pull the inner control cable clear of the swivel fitting and remove the spring from the cable.	Refer to Figure 201. Retain the swivel fitting and the spring.
7.	Remove the inner control cable form the sheath: - Pull the inner cable from the outer sheath and pull the length of cord into the outer sheath and clear of the aircraft - Disconnect the inner cable from the length of cord.	Leave the length of cord in the outer sheath.

D. Install an Alternate Air Control Forward Left/Right-Cable

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the alternate air control cable outer sheath is in good condition and is not kinked.	
2.	Make sure that the new alternate air valve control cable inner is clean and dry.	
3.	Install the new alternate air valve left/right control cable inner: - Pull the new cable into the outer sheath with the length of cord - When the new inner cable is fully through the outer sheath: - Disconnect the length of cord from the inner cable.	 From the relay lever end.
4.	Connect the alternate air inner cable to the related engine alternate air valve operating lever: - Move the spring into position over the inner cable - Install the swivel fitting into the operating lever - Pass the inner cable through the swivel fitting and tighten the swivel fitting screw.	
5.	Connect the alternate air inner cable to the relay lever: - Install the swivel fitting into the relay lever - Pass the inner cable through the swivel fitting and tighten the swivel fitting screw.	Refer to Figure 202.
6.	Adjust the alternate air cable that you installed.	Refer to Paragraph 5.
7.	Install the engine cowlings.	Refer to Chapter 71-10.

5. Adjust an Alternate Air Valve Control Cable

A. Adjust the Alternate Air Valve Forward Control Cable

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set ELECT MASTER switch to OFF - Make sure that the key is removed from the related engine START switch - Set the THROTTLE lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Move the alternate air lever in the cockpit from OFF to ON: - Make sure the lever moves freely with no restrictions.	Fully aft.
4.	Set the alternate air lever in the cockpit to OFF and hold it in position: - Make sure that both the left and the right engine alternate air valves are fully closed.	Fully forward. With the alternate air valve fully closed there must be at least 0.125 in (3 mm) clearance (bounce) between the alternate air lever and the stop.
5.	Set the alternate air lever in the cockpit to ON.	
6.	If necessary, adjust the alternate air control cable to get the correct settings at step 5.	
7.	Do steps 5 to 7 again as necessary.	
8.	Install the engine top cowlings.	Refer to Chapter 71-10.

B. Adjust a Left/Right Engine Alternate Air Valve Control Cable

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set ELECT MASTER switch to OFF - Make sure that the key is removed from the related engine START switch - Set the THROTTLE lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Remove the pilot's seat.	Refer to AMM # 7.02.01 Chapter 25-10.
4.	Move the alternate air lever in the cockpit from OFF to ON: - Make sure the lever moves freely with no restrictions.	Fully aft.
5.	Set the alternate air lever in the cockpit to OFF and hold it in position: - Make sure that the related engine alternate air valve is fully closed.	Fully forward.
6.	Set the alternate air lever in the cockpit to ON.	
7.	If necessary, adjust the related engine alternate air control cable to get the correct settings at step 6.	
8.	Do steps 5 through 8 again as necessary.	
9.	Install the engine cowlings.	Refer to Chapter 71-10.
10.	Install the pilot's seat.	Refer to AMM # 7.02.01 Chapter 25-10.

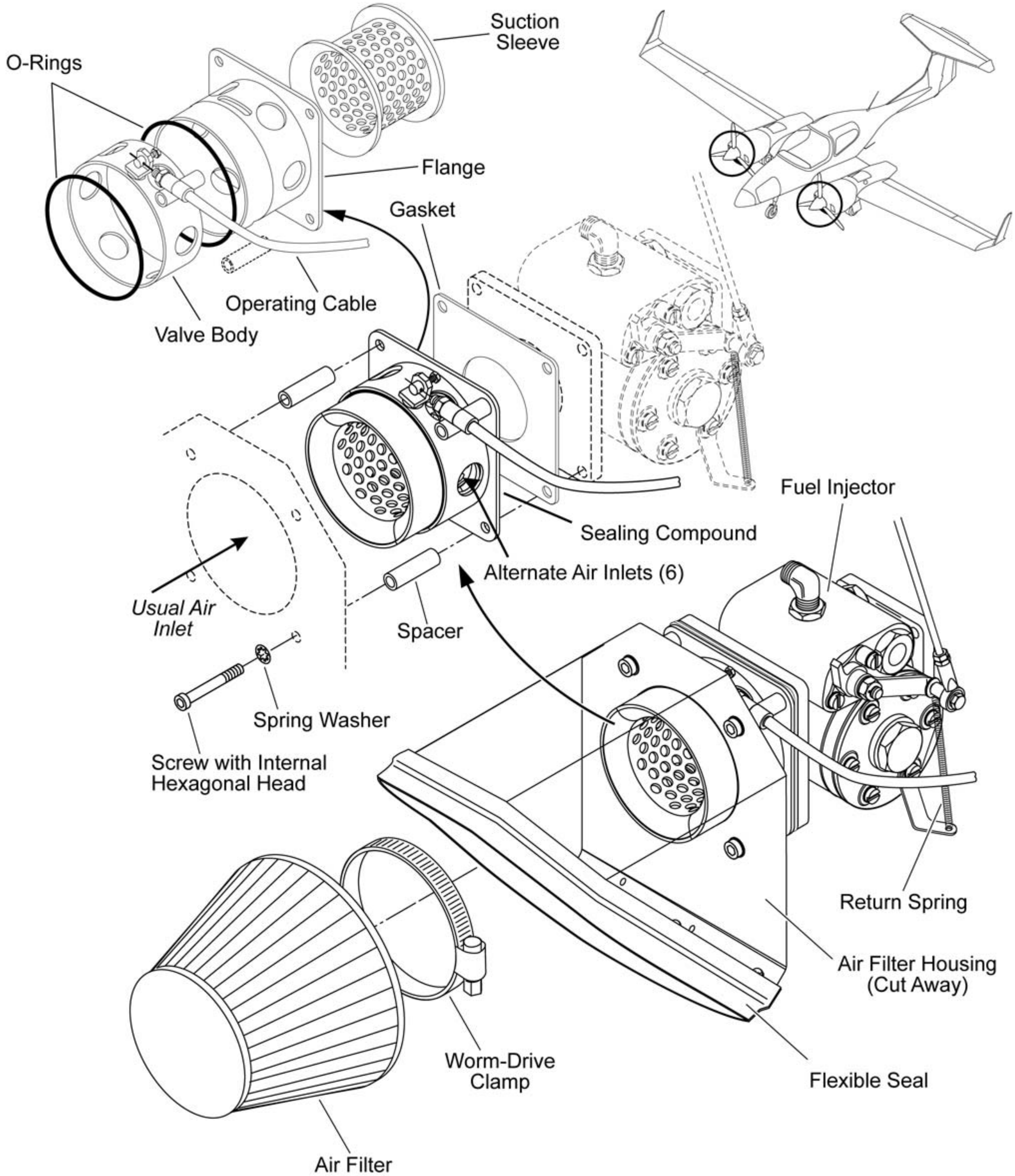

Figure 201 - Air Filter and Alternate Air Assembly

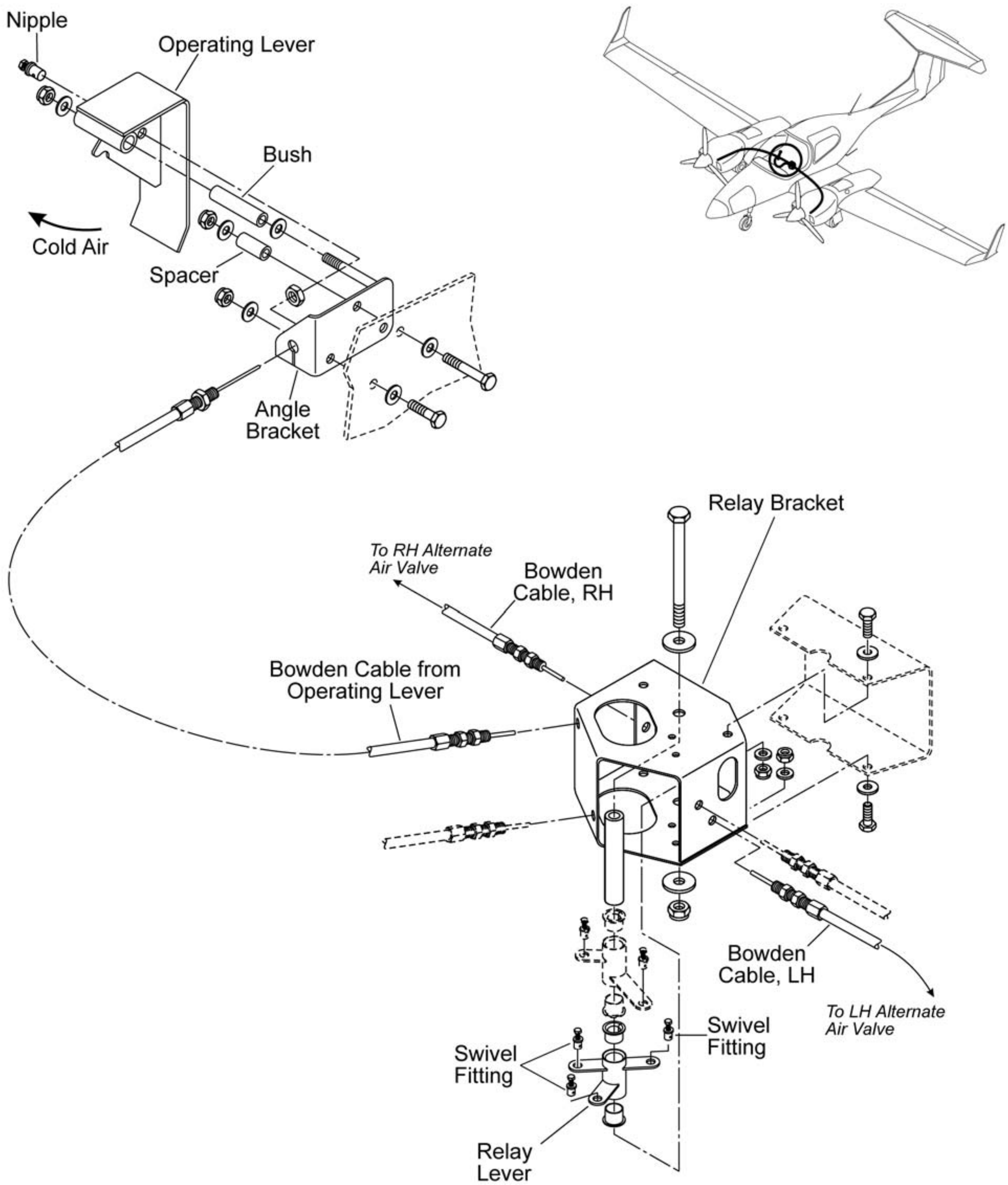

Figure 202 - Alternate Air Valve Controls

ENGINE DRAINS - DESCRIPTION AND OPERATION

1. General

The LYCOMING IO-360-M1A (LH) engine and LYCOMING LIO-360-M1A (RH) engine installed in the DA42 L360 aircraft have the following engine drains:

- Fuel/Oil drain for the engine-driven fuel-pump
- Fuel drain for the fuel-flow-divider
- Fuel drain for the induction manifold.

Refer to the Lycoming Operator's Manual for more data on the engine drains.

2. Description

Figure 1 shows the engine drains.

A. Engine Driven Fuel Pump

A transparent tube supplies the fuel drain for the engine driven fuel pump. The fuel pump is mounted on the rear accessory housing. The tube attaches to a pipe connector at the rear of the pump. Cable ties attach the tube to the engine breather pipe. The drain connects to the main drain tube assembly at the rear of the engine compartment.

B. Fuel Distributor Drain

A transparent tube supplies the fuel drain for the fuel distributor. The fuel distributor is mounted centrally on top of the engine. A hose clip attaches the drain tube to the drain outlet which is on the left side of the fuel distributor. The tube goes back through a rubber grommet in the engine cooling baffle and down the main drain tube assembly at the rear of the engine compartment.

C. Induction Manifold Drain

An aluminum alloy pipe supplies the induction manifold drain. The induction manifold drain connection is at the bottom of the engine below the engine sump. The drain goes from the drain connection and then aft below the exhaust muffler to the main drain tube assembly at the rear of the engine compartment. A vent valve in the pipe at the induction manifold end closes automatically when the engine runs.

3. Operation

A. Engine Driven Fuel Pump Drain

The fuel pump drain is connected the fuel pump above the diaphragm. If the diaphragm ruptures, fuel will flow from the fuel pump drain outlet.

(1) Fuel Distributor Drain

The fuel injector supplies pressurized fuel to one side of a diaphragm in the fuel distributor. Atmospheric air pressure acts on the other side of the diaphragm, assisted by a spring under a compression load. The fuel distributor drain connects to the air side of the diaphragm. If the diaphragm fails, then fuel will flow from the fuel distributor drain outlet.

(2) Induction Manifold Drain

All four induction manifolds connect to a check-valve at the bottom of the manifold. The manifold drain attaches to the check-valve. When the engine is stationary, the check valve is open and any residual fuel can drain from the induction manifolds. When the engine operates, the check valve closes to seal the induction manifold.

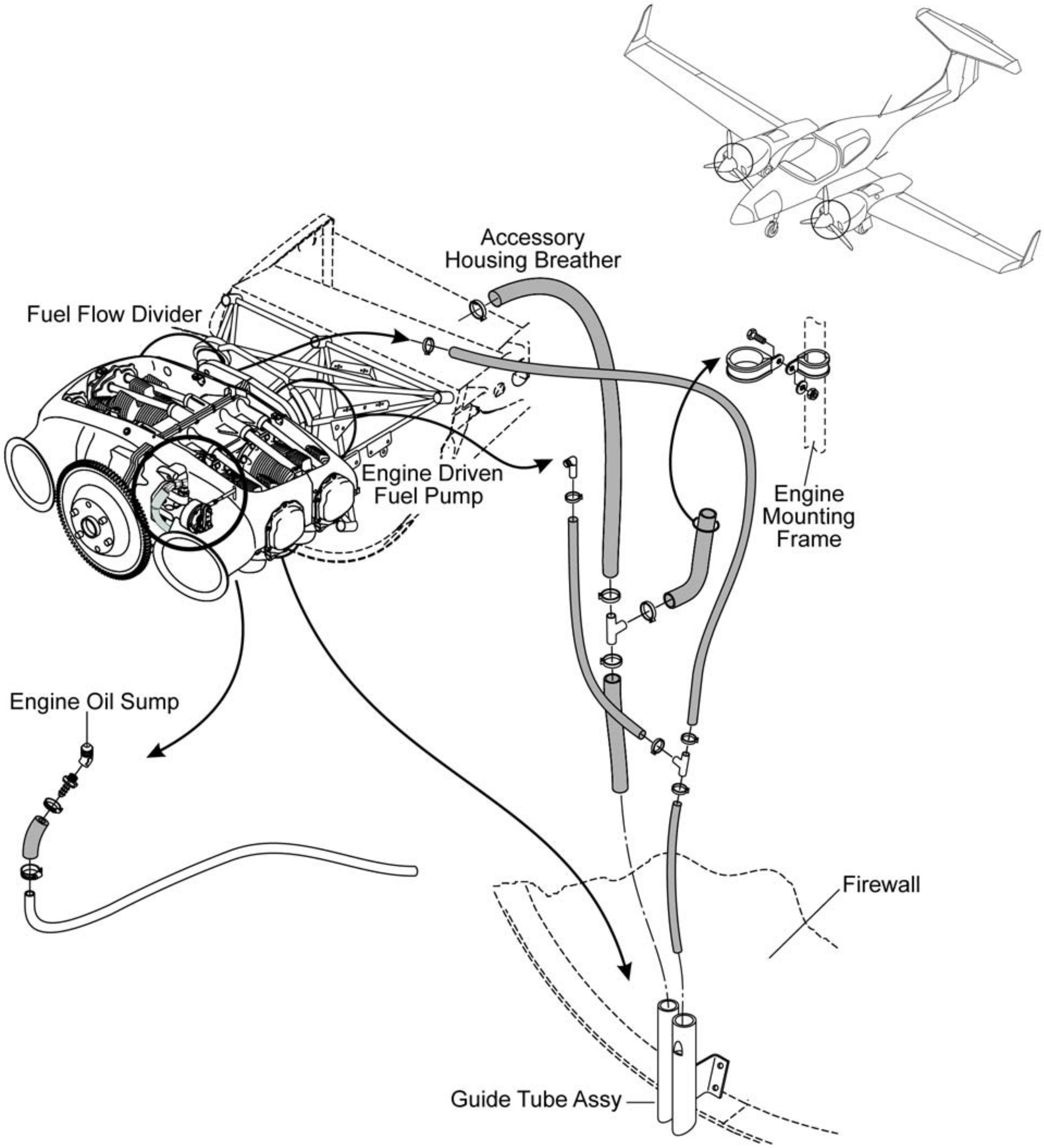

Figure 1 - Engine Drains

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ENGINE DRAINS - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the power plant. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Fuel flows from the engine driven fuel pump drain.	Ruptured diaphragm in the fuel pump.	Replace the engine driven fuel pump.
Fuel flows from the fuel distributor drain.	Ruptured diaphragm in the fuel distributor.	Replace the fuel distributor.

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ENGINE DRAINS - MAINTENANCE PRACTICES

1. General

The maintenance practices in this section describe how to remove and install the engine drains.

2. Remove/Install the Engine Driven Fuel Pump Drain

A. Remove the Engine Driven Fuel Pump Drain

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE DRAINS. MAKE SURE THAT THE IGNITION SWITCH IS SET TO "OFF". SET THE THROTTLE TO "IDLE" AND THE MIXTURE CONTROL TO "LEAN CUT-OFF".		
1.	Remove the engine cowlings.	Refer to Chapter 71-10.
2.	Release the drain pipe from the engine driven pump (EDP).	
3.	Release the drain pipe from the main engine drain assembly at the rear of the engine compartment.	
4.	Move the drain clear of the engine.	

B. Install the Engine Driven Fuel Pump Drain

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the drain tube is not damaged and that it is not blocked.	
2.	Move the drain tube into position. Attach the end of the tube to the engine driven fuel pump with a hose clip.	
3.	Attach the drain tube to the main engine drain assembly at the rear of the engine compartment with a hose clip.	
4.	Install the cowlings on the engine.	Refer to Chapter 71-10.

3. Remove/Install Fuel Flow Divider Drain

A. Remove the Fuel Flow Divider Drain

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE DRAINS. MAKE SURE THAT THE IGNITION SWITCH IS SET TO "OFF". SET THE THROTTLE TO "IDLE" AND THE MIXTURE CONTROL TO "LEAN CUT-OFF".		
1.	Remove the engine cowlings.	Refer to Chapter 71-10.
2.	Remove the hose clip that attaches the drain tube to the connector at the distribution valve and release the drain tube.	
3.	Move the drain tube to the rear, through the rubber grommet in the engine baffles, and clear of the engine.	
4.	Remove the hose clip that attaches the drain tube to the main engine drain assembly at the rear of the engine compartment.	

B. Install the Fuel Flow Divider Drain

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the drain tube is not damaged and that it is not blocked.	
2.	Move the drain tube into position through the rubber grommet in the engine baffle.	
3.	Attach the end of the drain tube to the fuel flow divider with a hose clip.	
4.	Attach the other end of the drain tube to the main engine drain assembly at the rear of the engine compartment with a hose clip.	

4. Remove/Install the Induction Manifold Drain

A. Remove the Induction Manifold Drain

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE DRAINS. MAKE SURE THAT THE IGNITION SWITCH IS SET TO "OFF". SET THE THROTTLE TO "IDLE" AND THE MIXTURE CONTROL TO "LEAN CUT-OFF".		
1.	Disconnect the drain pipe from the manifold drain connection at the bottom of the engine.	Hold the pipe.
2.	Release the drain pipe from the main engine drain assembly at the rear of the engine compartment.	
3.	Move the drain pipe clear of the engine.	

B. Install the Induction Manifold Drain

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the pipe is not damaged and that it is not blocked.	
2.	Move the pipe into position below the engine.	
3.	Connect the pipe to the drain connection at the bottom of the engine.	
4.	Connect the pipe to the main engine drain assembly at the rear of the engine compartment.	

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ENGINE

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ENGINE - DESCRIPTION AND OPERATION

1. General

This section describes about the Lycoming IO-360-M1A (LH) engine and Lycoming LIO-360-M1A (RH) engine installed in the DA42 L360 aircraft and about the engine for background only. The data given in this section will not be amended and always refer to the Lycoming manuals for data about the engine.

2. Description

A. Crankcase

The Lycoming IO-360-M1A is a four cylinder, horizontally opposed, direct drive engine. The engine has an aluminum alloy crankcase. The crankcase is in two halves, a left half and a right half. The bolts, the studs, the nuts and the washers attach the left half to the right half.

The oil sump bolts to the bottom of the crankcase. The fuel injector is attached to a pad at the front of the sump with four studs, the washers and the nuts. The first part of the induction manifold is integral with the sump.

The crankcase has the bearings for the crankshaft and the camshaft. The top of the crankcase has the mounting pads for the cylinders. The rear of the crankcase has the mounting for the accessories and the accessory housing.

B. Crankshaft

The Lycoming IO-360-M1A engine has a hollow crankshaft with four main bearings. The crankshaft has four big-end bearings for the connecting rods. The front of the crankshaft has a drive flange for the propeller and flywheel.

The drive flange has six bolt holes. The bolt holes have special bushes. The bushes have a screw thread on the inside for the propeller bolts. Four of the bushes are long and two of the bushes are shorter. One of the shorter bushes is marked with an "o", this is the index bush.

C. Camshaft

The one-piece camshaft is mounted in the crankcase. The camshaft is driven by a gear on the rear of the crankshaft. Another gear at the front of the camshaft drives the propeller governor gear-train. The camshaft has eccentric lobes which operate the push-rods for the valve-operating-gear.

D. Connecting Rods

The engine has the usual connecting rods. The "big-end" of the connecting rod attaches to the crankshaft journal and the "small-end" attaches to the piston.

Each rod has a split big-end bearing and it has a bearing cap. Two special bolts attach the bearing-cap to the connecting rod. The small-end has a plain bearing which is a sliding fit with the piston gudgeon-pin.

E. Flywheel

The flywheel attaches to the front of the crankshaft. The drive bushes hold the flywheel in place and a central spigot on the drive flange aligns the flywheel.

The flywheel has two Vee grooves machined in it. One Vee groove on the rear of flywheel moves a flexible belt for the alternator.

The outside of the flywheel has the starter-ring -gear attached. A pinion gear on the electric starter turns the flywheel with the starter-ring-gear when the starter is operated.

F. Cylinder Assembly

The engine has four individual cylinders. The head of the cylinder is aluminum alloy and the barrel of the cylinder is steel. The cylinder heads is screwed onto the cylinder during production and cannot be removed.

The base of the cylinder has a flange which is used to attach the cylinder to the crankcase. A spigot below the flange aligns the cylinder in the crankcase. Studs, nuts and washers attach the cylinder to the crankcase. An O-ring seal makes an oil-tight seal between the base of the cylinder and the crankcase.

G. Accessory Housing

The rear accessory housing attaches to the rear of the crankcase. The rear part of the crankcase holds the gears which turn the accessories. The crankshaft has a gear on the rear end.

The crankshaft gear turns two idler gears. The left idler gear turns the camshaft gear and it turns a gear which attaches to the left magneto. The right idler gear turns the right magneto.

The accessory housing closes the rear of the crankcase. Bolts attach the accessory housing to the crankcase. The accessory housing has mounting pads for the magnetos.

The accessory housing holds the engine lubricating oil pump. The oil pump is on the inside of the housing and an internal oil gallery connects the inlet of the oil pump to the sump. A shaft from the rear of the crankshaft turns the oil pump.

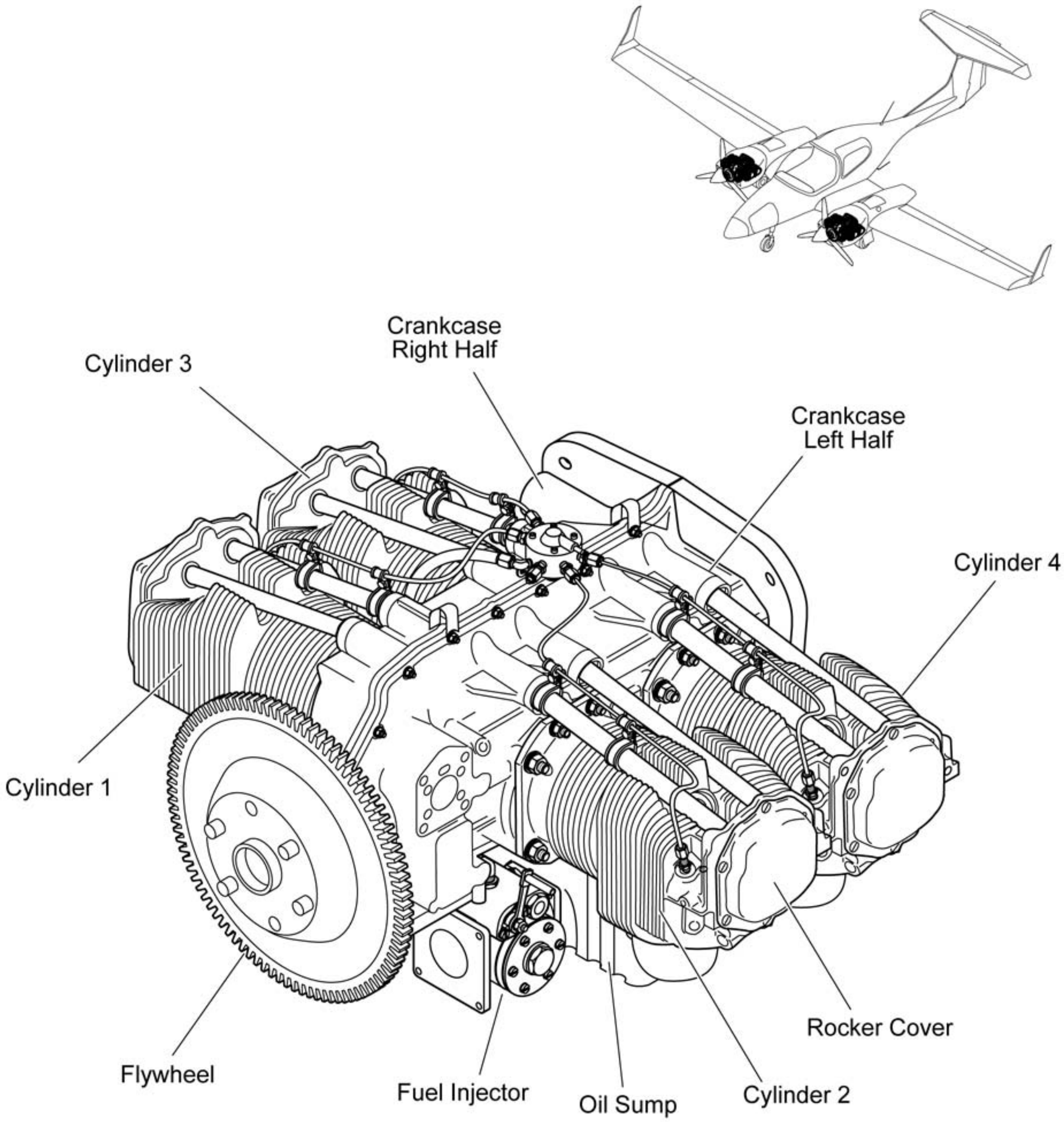

Figure 1 - Engine Assembly

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ENGINE - TROUBLESHOOTING

1. General

You must refer to the Lycoming Manuals for the Troubleshooting data for the IO-360-M1A engine.

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ENGINE - MAINTENANCE PRACTICES

1. General

The maintenance practices given in this section are limited to the compression testing of the cylinders. For more data on the engine, refer to the Lycoming Maintenance Manual and the Lycoming Overhaul Manual.

2. Cylinder Compression Test

Do this test with the warm engine, but not hot.

A. Equipment

Item	Quantity	Part Number
Differential compression test kit.	1	Commercial
Dry air pressure supply. Minimum pressure 5.5 bar (80 psi).		

B. Compression Test

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU TURN THE PROPELLER. MAKE SURE THAT THE IGNITION SWITCH IS SET TO "OFF" AND THAT THE SPARK-PLUG-CABLES ARE DISCONNECTED FROM THE SPARK PLUGS. SET THE THROTTLE TO "IDLE" AND THE MIXTURE CONTROL TO "LEAN CUT-OFF".	
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF - Set the fuel selector/shut off valve to OFF - Make sure that the key is removed from the related START switch - Set the throttle lever to IDLE.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.

	Detail Steps/Work Items	Key Items/References
4.	Disconnect the spark plug cables from the spark plugs.	
5.	Remove one spark plug from each cylinder.	
6.	Turn the propeller four complete turns by hand in the usual direction the propeller turns.	
7.	Connect the hose of the differential-pressure-tester (DPT) to the number 1 cylinder spark plug hole.	
8.	Turn the propeller by hand to set number 1 cylinder piston to top-dead-center (TDC) on the compression stroke.	Feel the open end of the DPT hose. The pressure in the hose will increase to a maximum when the piston is at TDC.
9.	Turn the DPT reducing valve fully counter-clockwise (closed).	
10.	Connect the air supply to the DPT.	Make sure that both gauges read zero.
WARNING: YOU MUST HOLD THE PROPELLER FIRMLY. WHEN YOU SUPPLY AIR TO THE CYLINDER THE PROPELLER WOULD LIKE TO TURN. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
11.	Hold the propeller firmly.	Use a second person.
12.	Connect the DPT to the tester hose (which is connected to the cylinder to be tested).	
13.	Turn the knob of the DPT reducing valve slowly clock-wise until the input gauge reads 5.5 bar (80 psi).	The person holding the propeller must be ready to resist the propeller turning. If the force necessary to resist the turning of the propeller is high then the cylinder may not be at TDC. Gently rock the propeller backwards and forwards until the turning force is at a minimum. Monitor the gauge readings.
14.	Read the DPT outlet gauge and make a note of the value.	
15.	Turn the knob of the DPT reducing valve fully counter-clockwise (closed).	Make sure that both gauges read zero.

	Detail Steps/Work Items	Key Items/References
16.	Disconnect the DPT from the tester hose and remove the tester hose from the cylinder.	
17.	Repeat items 7 to 16 for the other cylinders.	
18.	Install the spark plugs.	Torque to 35 lbf-ft (47 Nm).
19.	Connect the spark plug cables to the spark plugs.	
20.	Connect the battery.	Refer to AMM Chapter 24-31.
21.	Install the engine cowlings.	Refer to AMM Chapter 71-10.
22.	Write the compression test values in the airplane records.	
23.	Do an engine ground run-up test.	Refer to DA42 L360 Airplane Flight Manual.

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CHAPTER 73-00
ENGINE FUEL AND CONTROL

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ENGINE FUEL AND CONTROL - DESCRIPTION AND OPERATION

1. General

This section describes about the fuel system on the engine. It gives you general data on the system and the troubleshooting data on the system. Refer to the Lycoming Maintenance Manual for more data on the engine fuel system.

Refer to Chapter 28-00 for more data on the airplane fuel system and refer to Chapter 76-00 for more data on the controls which connect to the engine fuel system. The Chapter 77-40 describes more about the engine indications given in the Integrated Cockpit System (ICS).

2. Description and Operation

Figure 1 shows the schematic diagram for DA42 L360 aircraft. The engine fuel system has these components:

A. Engine Driven Fuel Pump

The engine driven fuel pump (EDP) is a diaphragm type pump that is mounted on the engine accessory housing. The EDP is operated by a push-rod which is driven directly from the engine camshaft. Check valves are installed at both the inlet and outlet connections of the fuel pump.

B. Fuel Injector

The injector has a hollow body attached to the front of the engine sump. Air flows through the injector to the inlet manifold. A throttle valve in the body of the fuel injector controls the air flow.

The body has a venturi. When air flows through the venture the air pressure decreases. The injector uses the decrease in pressure as a measure of air flow to the inlet manifold. Venturi pressure goes to one side of an air diaphragm and air inlet pressure goes to the other side of the diaphragm.

Fuel goes into the injector under pressure. The fuel goes through a fuel strainer to a manual mixture control valve. The fuel flows from the manual mixture control valve through a metering jet to an idle valve. The fuel flows from the idle valve to a fuel diaphragm. This is metered fuel.

The fuel diaphragm is connected to the air diaphragm and to a ball valve. The ball valve controls the fuel flow to the engine. Fuel pressure at the fuel strainer goes to the other side of the fuel diaphragm.

The pressure difference across the air diaphragm causes a force which opens the ball valve. The pressure difference across the fuel diaphragm causes a force which closes the ball valve. The fuel flow out of the ball valve causes the metered fuel pressure to decrease. When the fuel pressure differential balances the air pressure differential, then the system is stable and the correct amount of fuel goes to the fuel-flow-divider.

Air density decreases as the airplane climbs. The air diaphragm does not measure the air density and the system gives a continuously rich mixture. The pilot can adjust the mixture strength with the manual mixture control.

If you move the mixture control lever aft, then the mixture becomes leaner. If you move the mixture control fully aft, then all fuel flow is cut off and the engine stops.

Different mixture strengths are necessary for different power settings. A linkage connects the throttle lever to the idle valve. It controls the fuel flow at idle to give a rich mixture. When the throttle is opened, the idle valve changes the outlet from the metering jet to give the correct mixture strength.

The pressures acting on the air diaphragm at idle are very small. A small spring in the air diaphragm makes sure that the ball valve stays open and the system supplies sufficient fuel for idle.

The injector has two adjustments:

- Idle speed: You can adjust the idle speed with the stop screw on the throttle lever. Turn the stop-screw clockwise to increase the idle speed.

- Idle mixture: You can adjust the idle mixture with the thumb-screw. The thumb-screw is in the link between the throttle lever and the idle mixture lever. The thumb-screw has right-hand threads on both ends. One thread is coarse and the other thread is fine.

If you turn the thumb-screw so that the coarse thread is moves into its end-block, then the link becomes shorter and the idle mixture becomes leaner. If you turn the thumb-screw so that the coarse thread moves out of its end-block, then the link becomes longer and the idle mixture becomes richer. The AMM Chapter 71-00 describes how to do an engine run-up to set the mixture strength.

C. Fuel Flow Divider

The fuel outlet of the injector connects to the fuel-flow-divider. The fuel-flow-divider is on top of the engine crankcase and has an outlet for each cylinder.

The fuel-flow-divider has a diaphragm. Fuel injector outlet pressure connects to the bottom of the diaphragm and atmospheric pressure connects to the top of the diaphragm. A hollow needle-valve attaches to the diaphragm and a spring above the diaphragm pushes the needle-valve downwards.

Fuel pressure from the fuel injector pushes the diaphragm up against the spring and opens a port in the needle-valve. The port connects to the outlet pipes for the cylinders. When fuel flows out the pressure drops and the needle-valve closes a small amount to keep up the injector pressure. At idle the needle-valve can close between each pulse of fuel. At the usual power settings the needle-valve stays open to keep up the fuel pressure.

D. Injector Nozzles

Rigid pipes from the fuel-flow-divider connect to a nozzle in each cylinder inlet port. The nozzle has a jet. The fuel from the jet flows out under pressure into an air-bleed chamber. The air and the fuel mix in the air-bleed chamber and then go into the inlet port.

Each nozzle is calibrated ± 2%. Nozzles of the same part number are interchangeable between cylinders and they are interchangeable between engines.

E. Fuel Flow Indicator

The fuel flow indicator is part of the Integrated Cockpit System (ICS) display. The display is mounted in the center of the instrument panel. A transducer in the engine fuel system senses the fuel flow and the value and is displayed in ICS.

F. Fuel Pressure Indicator

The fuel pressure indicator is part of the ICS. A transducer in the engine fuel system senses the fuel pressure and the value and is displayed in the ICS.

G. Manifold Pressure Indicator

The manifold pressure indicator is part of the ICS. A transducer attached to the manifold pressure hose senses the manifold pressure and the value is displayed in the ICS.

H. Air Filter Assembly

The air filter is a cotton weaved type and is located on the front of the alternate air assembly. You can clean and re-use the air filter. The air filter needs to be replaced every 500 hours.

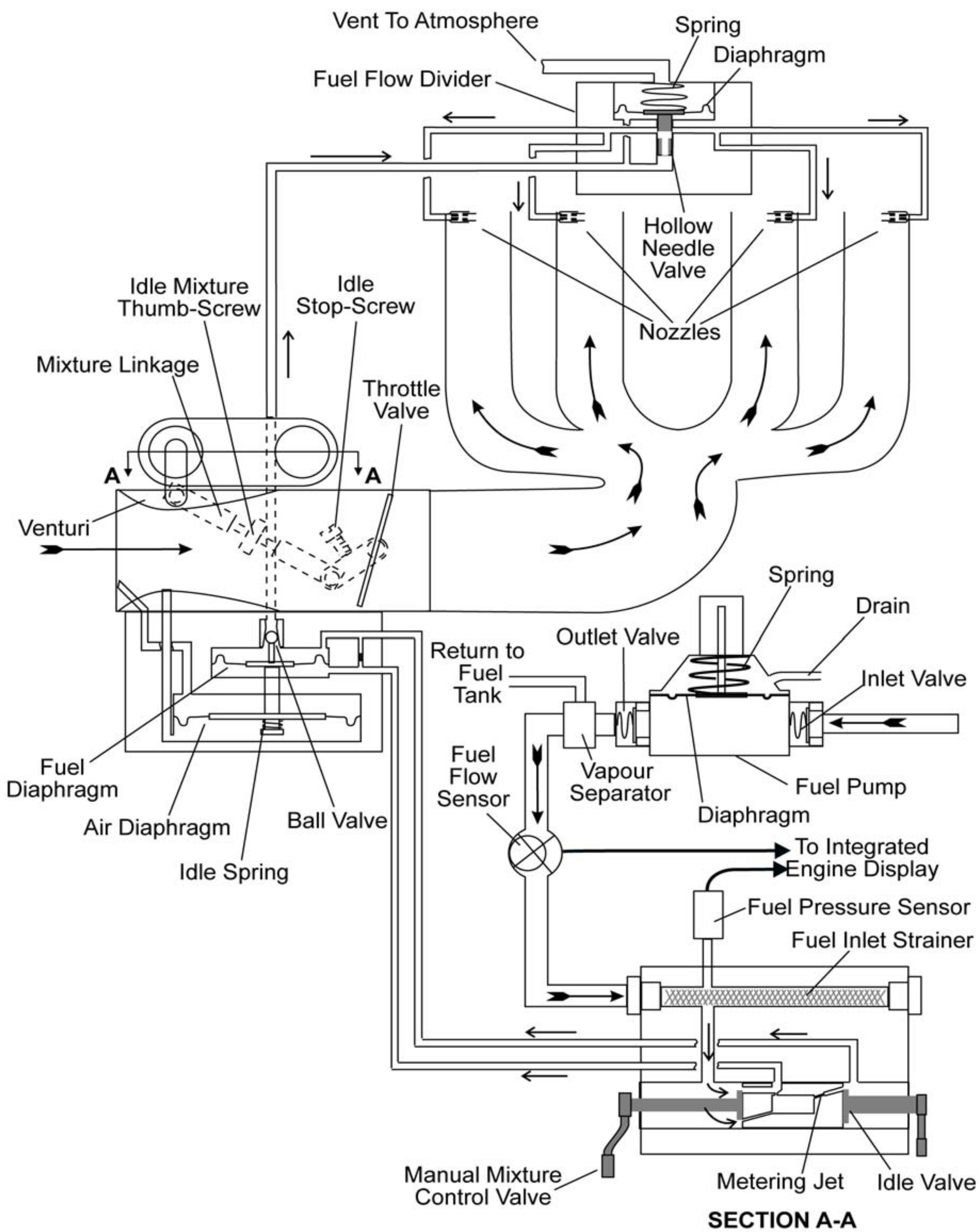

Figure 1 - Engine Fuel System Schematic

ENGINE FUEL AND CONTROL - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the engine fuel and control system. It only gives you the data for the air intake and filter assembly. For more data on trouble-shooting the engine fuel and control system, refer to the Lycoming Maintenance Manual. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Loss of engine power.	Blocked intake.	Examine air intake. Remove any obstructions.
	Dirty/Damaged air filter.	Replace the air filter.

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ENGINE FUEL AND CONTROL - MAINTENANCE PRACTICES

1. General

This section describes how to remove/Install the fuel injector. For more data on the engine fuel and control system, refer to the Lycoming Maintenance Manual.

For data on how to remove/install the air filter refer to Chapter 71-60.

2. Remove/Install the Fuel Injector

A. Remove the Fuel Injector

	Detail Steps/Work Items	Key Items/References
WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set the related engine ignition switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Remove the air filter and the alternate air assembly.	Refer to Chapter 71-60.
5.	Disconnect the throttle control: - Remove the nut and the washer from the throttle lever - Pull the eye-end from the lever - Remove the second washer and the bolt from the lever.	Refer to Figure 201.

	Detail Steps/Work Items	Key Items/References
6.	Disconnect the mixture control: - Remove the nut and the washer from the mixture lever - Pull the eye-end from the lever - Remove the spacer and the bolt from the lever.	
WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN INJURE PERSONS AND DAMAGE EQUIPMENT.		
7.	Disconnect the fuel hose to the fuel distributor.	Put a container to catch the fuel. Put caps on the hose and the injector.
8.	Disconnect the fuel supply hose to the injector.	Put a container to catch the fuel. Put caps on the hose and the injector.
9.	Remove the four nuts, the serrated washers and the plain washers that attach the fuel injector to the engine.	
10.	Pull the injector forward off the studs and away from the engine.	Discard the gasket. Put caps on the injector and cover on the engine intake.

B. Install the Fuel Injector

	Detail Steps/Work Items	Key Items/References
WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN INJURE PERSONS AND DAMAGE EQUIPMENT.		
1.	Prepare the new injector: - Remove the caps from the inlet and outlet connections of the new injector - Clean the inlet fuel strainer - Flush the injector with clean fuel until clean fuel flows from the outlets - Install a new gasket onto the injector mounting studs.	Use a syringe. Do not use more than 15 psi (1.03 bar) pressure.
2.	Remove the cover from the engine air intake and the caps from the injector.	

	Detail Steps/Work Items	Key Items/References
3.	Put the injector in position on the engine sump.	Use a new gasket.
4.	Install the four plain washers, the serrated washers and the nuts that attach the injector.	Torque to 17 lbf-ft (23 Nm).
5.	Connect the fuel hose to the fuel distributor.	
6.	Connect the fuel supply hose to the fuel injector.	
7.	Install the alternate air assembly and the air filter.	Refer to Chapter 71-60.
8.	Connect the mixture control cable: - Put the bolt and spacer in position on the mixture lever - Put the eye-end from the lever - Install the washer and the self locking nut.	
9.	Connect the throttle control cable: - Put the bolt and washer in position on the throttle lever - Put the eye-end from the lever - Install the washer and the self locking nut.	
10.	Do a test of the mixture control for freedom of movement and correct adjustment.	Refer to Chapter 76-10.
11.	Do a test of the throttle control for freedom of movement and adjustment.	Refer to Chapter 76-10.
12.	Connect the battery.	Refer to Chapter 24-31.
13.	Do a test for fuel leaks: - Set the fuel selector/shut-off valve ON - Set the ELECT MASTER switch to ON - Set the electrical fuel pump to ON - Set the mixture control to full rich position	

	Detail Steps/Work Items	Key Items/References
	- Make sure that there are no leaks from the injector - Set the electrical fuel pump to OFF - Set the ELECT MASTER switch to OFF - Set the fuel selector/shut-off valve to OFF.	
14.	Connect the spark plug cables to the spark plugs.	Torque to 110 - 120 lbf-in (12.4 to 13.6 Nm).
15.	Install the engine cowlings.	Refer to Chapter 71-10.
16.	Do an engine ground run-up test.	Refer to the DA42 L360 Airplane Flight Manual.

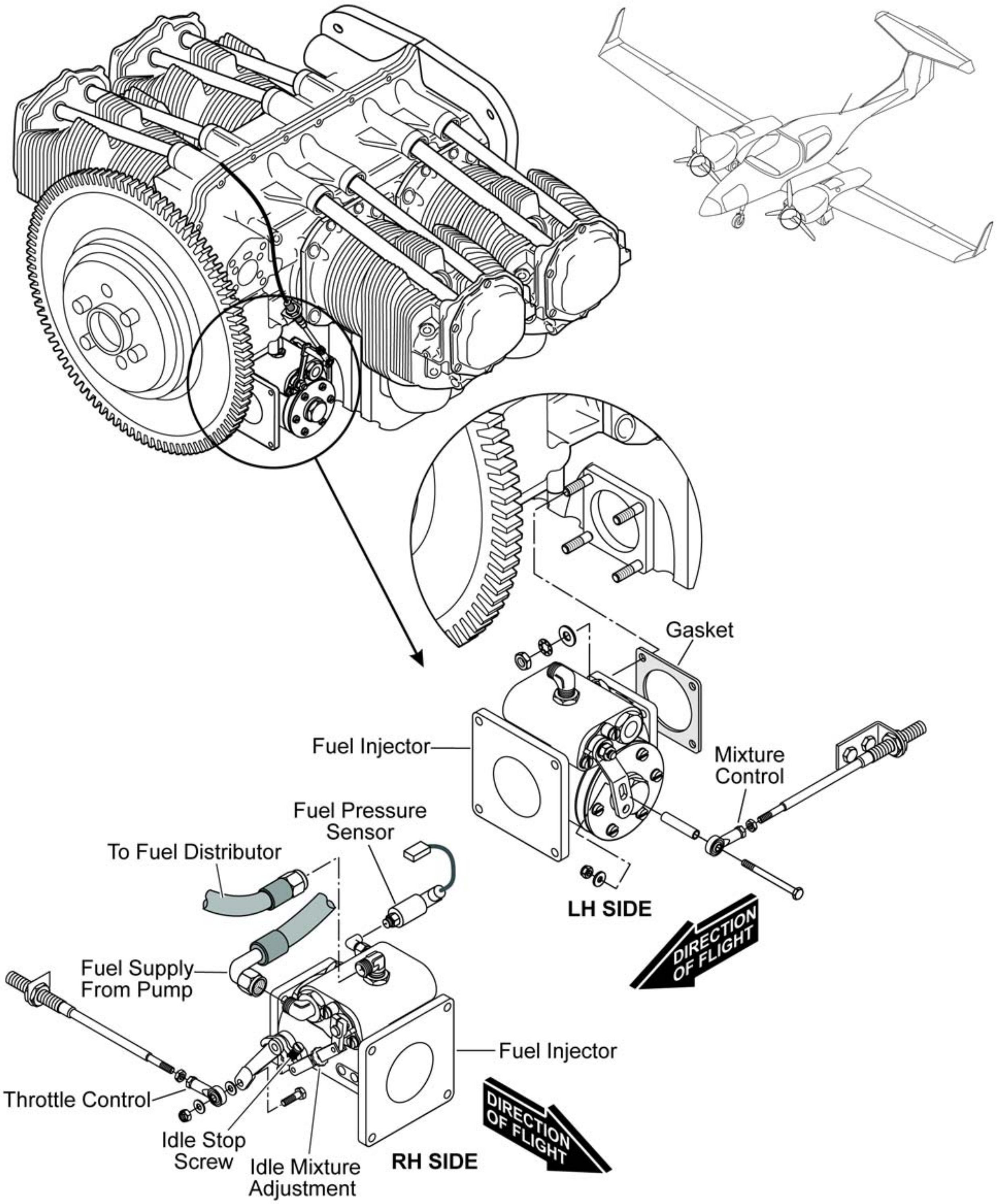

Figure 201 - Fuel Injector Installation

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CHAPTER 74-00
IGNITION

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IGNITION - DESCRIPTION AND OPERATION

1. General

This chapter describes about:

- the ignition system for the engine
- the general data about the ignition system
- the trouble-shooting data for the ignition system and
- how to remove/install the ignition switch.

For more data on the components of the ignition system refer to the Lycoming Maintenance Manual and the SlickStart manufacturers' manuals. (Spark-plug leads).

2. Description

The D42 L360 aircraft has dual ignition with a start booster (SlickSTART™) system for each engine. SlickSTART™ delivers over 400% more spark energy during start than conventional impulse coupled or retard breaker systems. This added energy enables the magnetos to fire partially fouled spark plugs, ignite less than optimum fuel mixtures, improve hot engine restarts, and improve starting performance during extreme cold weather operations. SlickSTART™ can be installed with either impulse coupled or retard breaker magnetos and can be used with either 12 volt or 24 volt electrical systems.

Each engine has a left magneto and a right magneto. The two magnetos supply the high voltage electrical impulses to the spark plugs. Ignition switches in the cockpit control the magnetos and screened cables connect the magnetos to the spark-plugs. Two spark-plugs in each cylinder give ignition. One of the spark plugs is connected to the left magneto and the other spark plug is connected to the right magneto. The engine ignition firing order is 1-3-2-4.

When an ignition switch is held in the START position electrical power is supplied to the start booster system. The start booster system boosts the power of the electrical impulse to the spark-plugs for easier starting. When an ignition switch is set to LEFT, RIGHT or BOTH, electrical power is removed from the start booster system and the magnetos operate as normal.

3. Ignition System Components

Each engine ignition system has the following components:

A. Ignition Switch

Each ignition switch is at the lower face of the instrument panel, on the left half. You operate the ignition switch with a key. The ignition switch has the following positions:

OFF:	Both magnetos are grounded. Slick-Start system inoperative.
R:	Right magneto is live, left magneto is grounded. Slick-Start system inoperative.
L:	Left magneto is live, right magneto is grounded. Slick-Start system inoperative.
BOTH:	Both magnetos are live. Slick-Start system inoperative.
START:	Both magnetos are live, Slick-Start system operative.

You cannot repair the ignition switch. Refer to Chapter 92-10 for the wiring diagram of the ignition system.

B. Ignition Switch Cables

The ignition switch has the following cables:

(1) Power Cable

The power cable connects the ignition switch to the RH MAIN BUS. The system is protected by a circuit-breaker.

(2) Left Magneto Ground Cable

The left magneto cable is a screened cable that grounds the left magneto when the ignition switch is set to R.

(3) Right Magneto Ground Cable

The right magneto cable is a screened cable that grounds the left magneto when the ignition switch is set to L.

(4) Start Relay Cable

The start relay cable supplies electrical power to the related start relay when the ignition switch is set to START.

(5) Start Booster Cable

The Slick-Start cable supplies electrical power to the related start relay when the ignition switch is set to START.

(6) Ground Cable

The ground cable gives a ground to the ignition switch at all times.

C. Start Booster

The start booster is located on the engine mounting, at the rear left side of the engine. Cables connect the booster to the ignition switch and to the left and right magnetos. You cannot repair the start booster. You can replace the start booster.

D. Magnetos

The 2 Slick magnetos attach to the rear accessory housing and are driven directly by the engine.

Each magneto has a set of contact-breakers in the low-tension circuit of the magneto. The contact breakers control the ignition timing. In normal operation the contact-breakers open when the engine piston is at 25 before the top of the compression stroke. The opening of the contact breakers causes the low tension circuit to collapse which induces a high voltage in the high tension circuit. When the voltage in the high tension circuit is sufficient the current 'jumps' the electrodes of the spark-plug and makes a spark to ignite the fuel/air mixture in the engine cylinder.

When the ignition switch is set to START the right magneto is grounded and the left magneto is live. While the ignition switch is held in the START position electrical power is supplied to the start booster.

The left magneto has a second set of contact breakers (retard breakers) that are only used for starting. During starting the electrical circuitry within the start booster uses the retard-breakers to cause the collapse of the low tension circuit in the magneto. The high tension circuit is boosted by the start booster which causes several high intensity sparks at the spark-plug when the engine piston is near top-dead-center of the compression stroke. This makes the engine easier to start.

When the ignition switch is released from the START position and set to BOTH the start booster is disconnected from the ignition circuit and both the left and right magnetos operate normally.

E. High-Tension Cables (Ignition Harness)

Each magneto supplies high-tension pulses to one spark-plug in each cylinder. High tension cables connect the magneto to the spark-plugs. Each cable has a core which transmits the high tension electricity. The core has thick layer of insulation and the insulation is covered with a braided metal screen. The braided metal screen connects to the cable end-fittings and prevents radio interference.

Each high tension cable has special end-fittings. The end-fittings stop water going into the cable connections and electrically bond the braided-screen.

You can test the high tension ignition cables with a high tension tester.

4. Operation

A. Ignition Switch to OFF:

- the ignition switch gives a ground to both magnetos
- the magnetos cannot make high tension pulses of electricity
- the spark plugs cannot make sparks
- the engine cannot run.

B. Ignition Switch to R:

Use this setting to test the right magneto:

- the ignition switch gives a ground to the left magneto
- the right magneto is live
- if the engine turns, the right magneto will make high tension pulses and the spark plugs will make sparks
- the engine can run.

C. Ignition Switch to L:

Use this setting to test the left magneto:

- the ignition switch gives a ground to the right magneto
- the left magneto is live
- if the engine turns, the left magneto will make high tension pulses and the spark plugs will make sparks
- the engine can run.

D. Ignition Switch to BOTH:

This is the usual setting when the engine runs.

- Both magnetos are live
- When the engine turns both magnetos make high tension pulses and the spark plugs make sparks.

E. Ignition Switch is Set to START:

Use this setting to start the engine.

- The right magneto is grounded
- The left magneto is live
- Electrical power is supplied to the Slick-Start booster
- The Slick-Start booster makes the retard breaker the in-use breakers for the left magneto
- The ignition switch connects a 28 V positive supply from RH Main Bus to the starter relay.

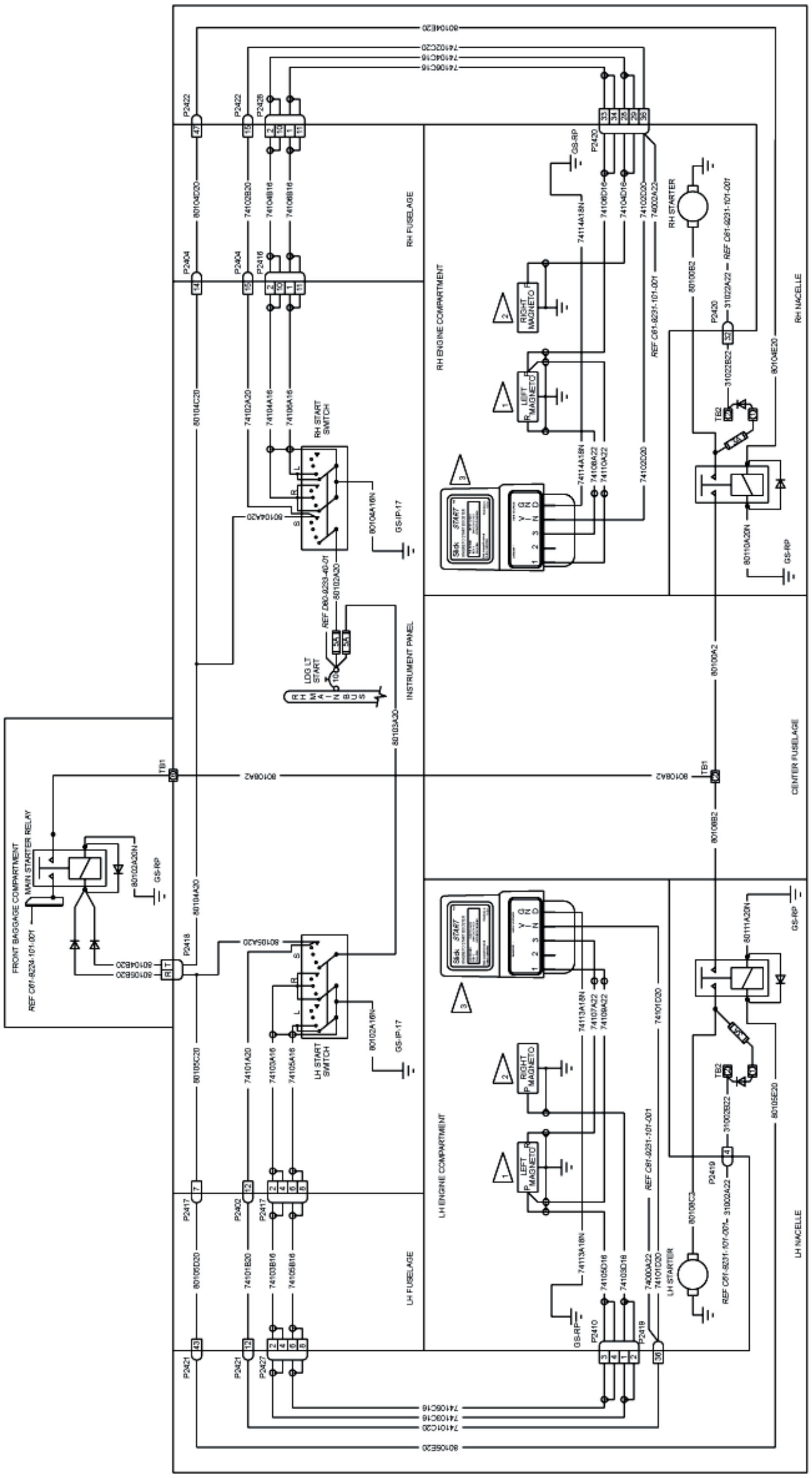

Figure 1 - Engine Ignition System Schematic Diagram

IGNITION - TROUBLESHOOTING

1. General

This chapter gives you the trouble-shooting data for the ignition switch. Refer to the Lycoming Maintenance Manual and the equipment manufacturer's manuals for more data on troubleshooting the engine ignition system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
Engine does not start or engine is not easy to start.	Ignition switch/switch cable defective.	Disconnect the battery. Disconnect the spark plugs. Disconnect the ignition switch cables from the Slick-Start control unit. Set the ignition switch to START. Do a test for an open circuit between the left switch-cable and ground. Do a test between the right switch-cable and ground. If you do not get an open circuit then repair the switch cable. Or replace the ignition switch.
	Defective start booster control unit.	Replace the start booster control unit.

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IGNITION - MAINTENANCE PRACTICES

1. General

The maintenance practices in this chapter describe how to remove/install the ignition switch and how to remove/install the start booster control unit. Refer to the Lycoming Maintenance Manual and the equipment manufacturer's manuals for more data on the engine ignition system.

2. Remove/Install an Engine Ignition Switch

A. Remove an Engine Ignition Switch

	Detail Steps/Work Items	Key Items/References
WARNING: DO NOT WORK ON THE IGNITION SYSTEM UNTIL YOU HAVE MADE IT SAFE BY DISCONNECTING THE SPARK PLUGS. THE PROPELLER CAN TURN SUDDENLY AND CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF. - Make sure that the key is removed from the related engine START switch. - Set the throttle lever to IDLE. - Set the mixture control lever to CUT-OFF. - Open the LDG LT START circuit-breaker.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Remove the instrument panel cover.	Refer to Chapter 31-10. To enable you to work at the rear of the ignition switch.
5.	Disconnect the electrical cables from the ignition switch that you will remove.	Make a note of the connections.

	Detail Steps/Work Items	Key Items/References
6.	Remove the ignition switch: - Hold the ignition switch at the rear of the ignition switch - Remove the knurled ring and the serrated washer that secure the ignition switch to the instrument panel from the cockpit side - Move the ignition switch clear of the airplane.	Refer to Figure 201.

B. Install an Engine Ignition Switch

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the spark plug cables are disconnected from the spark plugs.	
2.	Make sure that the battery is disconnected.	
3.	Install the ignition switch: - Move the ignition switch into position at the instrument panel. - Make sure that the ignition switch is correctly aligned with the instrument panel markings. - Install the serrated washer and knurled ring that secures the ignition switch to the instrument panel.	
4.	Connect the electrical cables to the ignition switch.	Refer to Chapter 92-00 for the Wiring Diagrams.
5.	Install the instrument panel cover.	Refer to Chapter 31-10.
6.	Connect the airplane battery.	Refer to Chapter 24-31.
7.	Install the engine cowlings.	Refer to Chapter 71-10.
8.	Do an engine ground run-up test.	Refer to the DA42 L360 Airplane Flight Manual.

3. Remove/Install a Start Booster Control Unit

A. Remove a Start Booster Control Unit

	Detail Steps/Work Items	Key Items/References
WARNING: DO NOT WORK ON THE IGNITION SYSTEM UNTIL YOU HAVE MADE IT SAFE BY DISCONNECTING THE SPARK PLUGS. THE PROPELLER CAN TURN SUDDENLY AND CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set the ELECT MASTER switch to OFF - Make sure that the key is removed from the related engine START switch - Set the throttle lever to IDLE - Set the mixture control lever to CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Remove the start booster control unit: - Disconnect the electrical cables from the control unit - Remove the nuts, the washers and the bolts that attach the control unit to the mounting bracket - Move the control unit clear of the aircraft.	Refer to Figure 201. Make a note of the positions of the cables. Support the control unit.

B. Install a Start Booster Control Unit

	Detail Steps/Work Items	Key Items/References
1.	Install the start booster control unit: - Move the control unit into position at the mounting bracket. - Install the four bolts, the washers, and the nuts that attach the control unit to the mounting bracket. - Connect the electrical cables to the control unit.	At the positions noted in Paragraph 3.A.(3). Refer to the wiring diagrams in AMM # 7.02.01 Chapter 92-00.
2.	Install the engine cowlings.	Refer to Chapter 71-10.
3.	Do an engine ground run-up test.	Refer to the DA42 L360 Airplane Flight Manual.

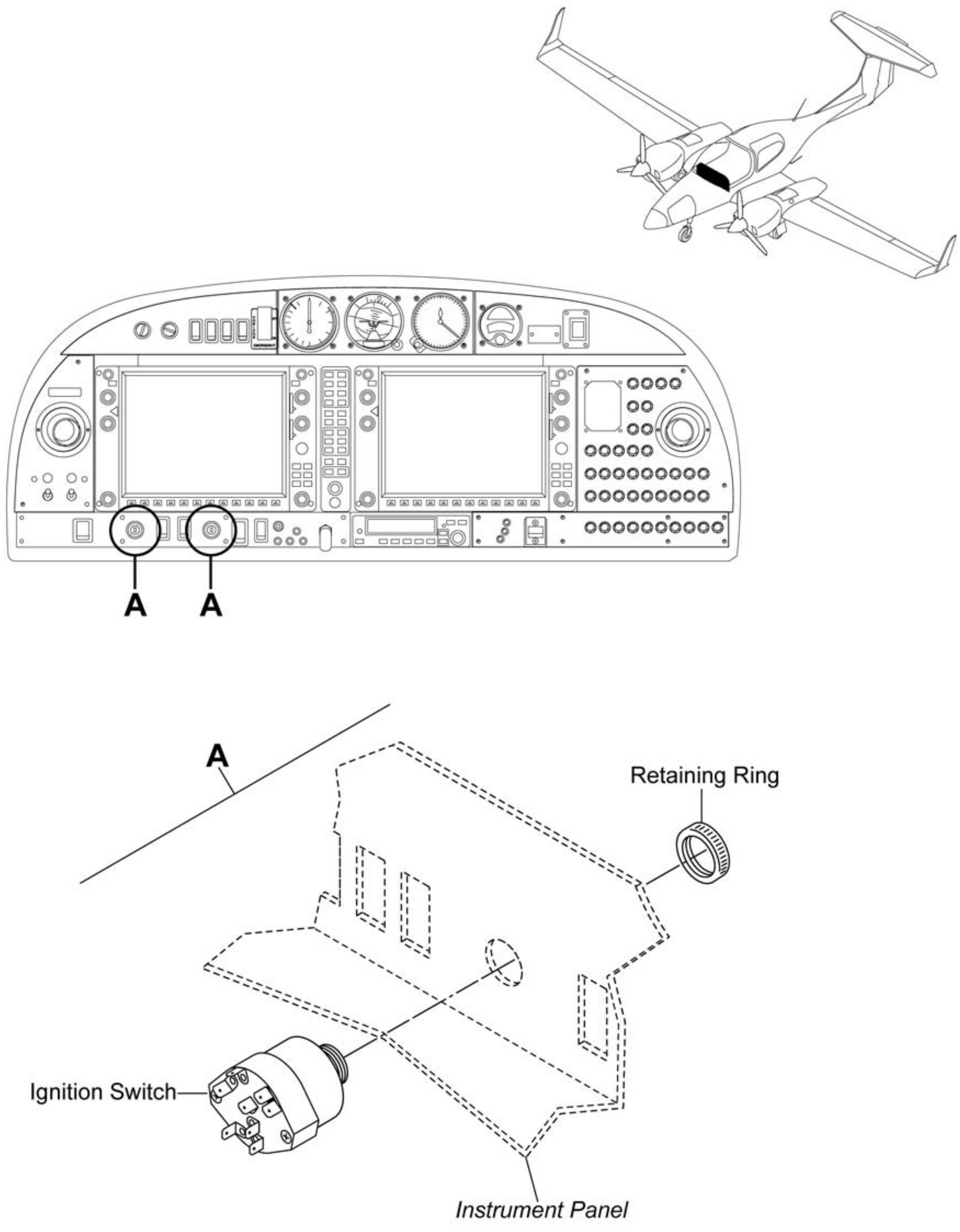

Figure 201 - Ignition Switch Installation

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CHAPTER 75-00
AIR

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AIR - DESCRIPTION AND OPERATION

1. General

This section gives you the data for the air cooling system. It gives you the maintenance practices to remove/install the baffle assembly. Refer to the Lycoming Maintenance Manual for data about the inter-cylinder cooling baffle. Figure 1 shows the air cooling baffle assembly.

2. Description

The baffle assembly controls the cooling air flow. Carbon reinforced composite makes the baffle assembly. The baffle assembly has these components:

- Left front baffle
- Left rear baffle
- Right front baffle
- Right rear baffle

Ram air enters the cooling baffle through the intakes in the left and right side engine cowlings. The front ducts of the baffle send the cooling air into the space over the top of the cylinders. The air goes down between the cylinders and around the outside of the cylinders. The used air goes out from the rear of the engine bay.

These items pass through rubber grommets in the cooling baffle:

- the propeller control cable
- mixture cable (RH forward and aft baffles)
- the fuel flow divider drain.

The cables for the top spark plugs of No's 1 and 3 cylinders go through a cable feed-thru in the rear of the baffle, on the right side. The cables for the top spark plugs of No's 2 and 4 cylinder pass through holes in the left side of the baffle, at the top.

Screws attach the baffles to the cylinder head and quick-release fasteners attach the baffle cover to the baffle assembly.

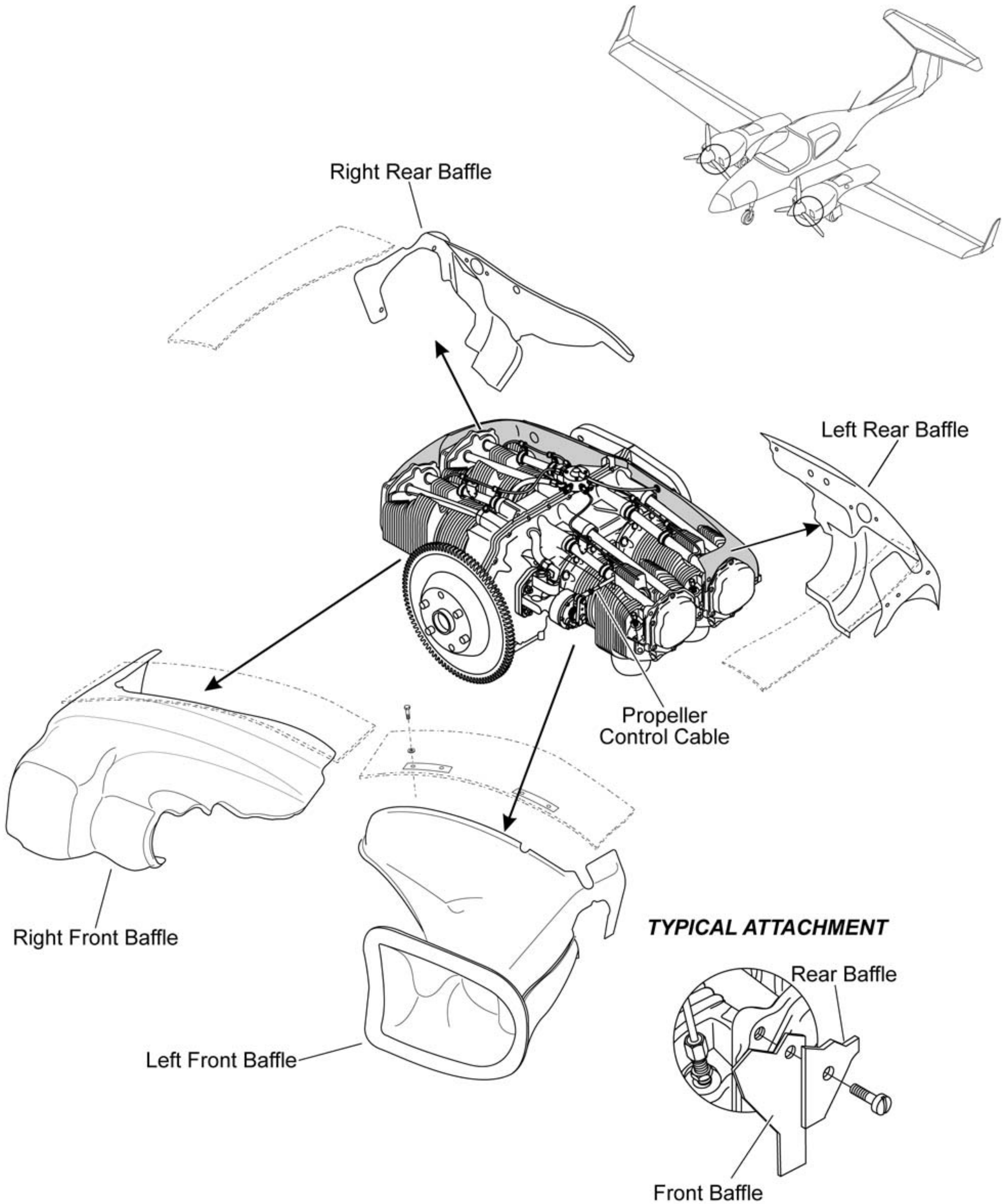

Figure 1 - Air Cooling Baffle Assembly

AIR - MAINTENANCE PRACTICES

1. General

This chapter describes how to remove/install the components of the air baffle assembly.

2. Remove/Install a Component of the Baffle Assembly

A. Remove the Left Front Baffle

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.	
1.	Make sure that the engine is safe: - The ignition switch is set to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Disconnect the propeller control cable at the propeller governor unit.	Refer to Chapter 61-20.
	WARNING: YOU MUST RELEASE ALL THE NITROGEN PRESSURE FROM THE ACCUMULATOR BEFORE YOU DISCONNECT THE OIL HOSE AT THE GOVERNOR. NITROGEN AT HIGH PRESSURE CAN PENETRATE THE SKIN. THIS CAN CAUSE DISEASE.	
5.	Disconnect the flexible oil hose that connects the propeller governor to the un-feathering accumulator.	At the governor. You must release the pressure from the un-feathering accumulator. Refer to Chapter 61-20.

	Detail Steps/Work Items	Key Items/References
6.	Remove the left front baffle: - Remove the screws that attach the left front baffle to the engine - Move the left front baffle clear of the engine.	 Make sure that you move the governor control and the flexible oil hose through the cut-outs in the baffle and clear of the baffle.

B. Remove the Left Rear Baffle

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.	
1.	Make sure that the engine is safe: - The ignition switch is set to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Disconnect the propeller control cable at the propeller governor unit.	Refer to Chapter 61-20.
5.	Remove the governor control cable assembly from the baffle: - Remove the fairlead for the governor control cable guide: - Remove the nuts and the washers that attach the fairlead to the rear baffle - Move the bolts from the fairlead	

	Detail Steps/Work Items	Key Items/References
	- Move the governor control cable and guide assembly clear of the rear baffle assembly.	
6.	Disconnect the top left-side ignition cables and move them clear of the baffle assembly: - Disconnect the ignition cables from the spark plugs at the top of cylinders 2 and 4 - Remove the P-clamp that holds number 2 cylinder top ignition lead to the baffle: - Remove the nut, the washer and the bolt that attach the P-clamp to the baffle - Move the P-clamp clear of the baffle and the ignition cable. - Remove the fairlead from the left rear baffle: - Remove the nuts, the washers and the bolts that attach the fairlead to the left rear baffle - Move the 2 halves of the fairlead clear of the baffle and move the ignition cables aft and clear of the baffle assembly.	
7.	Disconnect the fuel divider drain: - Remove the hose clip that attaches the drain to the flow divider - Move the drain clear of the fuel divider and through the cut-out in the left rear baffle.	At the fuel divider.
8.	Remove the left rear baffle: - Remove the screws that attach the left rear baffle to the engine - Move the left rear baffle clear of the engine.	

C. Remove the Right Front Baffle

	Detail Steps/Work Items	Key Items/References
<u>WARNING:</u> DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. <u>WARNING:</u> MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - The ignition switch is set to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Remove the mixture control cable.	Refer to Chapter 76-00.
5.	Remove the right front baffle: - Remove the screws that attach the right front baffle to the engine - Move the right front baffle clear of the engine.	

D. Remove the Right Rear Baffle

<table>
<tr><th></th><th>Detail Steps/Work Items</th><th>Key Items/References</th></tr>
<tr><td colspan="3">WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS.

WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.</td></tr>
<tr><td>1.</td><td>Make sure that the engine is safe:

- The ignition switch is set to OFF

- Set the throttle lever to IDLE

- Set the mixture control lever to LEAN CUT-OFF.</td><td></td></tr>
<tr><td>2.</td><td>Remove the engine cowlings.</td><td>Refer to Chapter 71-10.</td></tr>
<tr><td>3.</td><td>Disconnect the airplane main battery.</td><td>Refer to Chapter 24-31.</td></tr>
<tr><td colspan="3">WARNING: YOU MUST RELEASE ALL THE NITROGEN PRESSURE FROM THE ACCUMULATOR BEFORE YOU DISCONNECT THE OIL HOSE AT THE GOVERNOR. NITROGEN AT HIGH PRESSURE CAN PENETRATE THE SKIN. THIS CAN CAUSE DISEASE.</td></tr>
<tr><td>4.</td><td>Disconnect the flexible oil hose that connects the propeller governor to the un-feathering accumulator.</td><td>At the un-feathering accumulator. You must release the pressure from the un-feathering accumulator.

Refer to Chapter 61-20.</td></tr>
<tr><td>5.</td><td>Move the governor flexible hose through the cut-out in the rear right baffle and clear of the rear baffle assembly.</td><td></td></tr>
<tr><td>6.</td><td>Disconnect the top right-side ignition cables and move them clear of the baffle assembly:

- Disconnect the ignition cables from the spark plugs at the top of cylinders 1 and 3

- Remove the P-clamp that holds number 1 cylinder top ignition lead to the baffle:</td><td></td></tr>
</table>

	Detail Steps/Work Items	Key Items/References
	- Remove the nut, the washer and the bolt that attach the P-clamp to the baffle - Move the P-clamp clear of the baffle and the ignition cable. - Remove the fairlead from the right rear baffle: - Remove the nuts, washers and bolts that attach the fairlead to the right rear baffle - Move the 2 halves of the fairlead clear of the baffle and move the ignition cables aft and clear of the baffle assembly.	
7.	Remove the mixture control cable.	Refer to Chapter 76-00.
8.	Remove the right rear baffle: - Remove the screws that attach the right rear baffle to the engine - Move the right rear baffle clear of the engine.	

E. Install the Right Rear Baffle

	Detail Steps/Work Items	Key Items/References
1.	Install the mixture control cable.	Refer to Chapter 76-00.
2.	Install the right rear baffle: - Move the right rear baffle into position at the engine - Install the washers and screws that attach the right rear baffle to the engine - Install the serrated washer and knurled ring that secures the ignition switch to the instrument panel.	

	Detail Steps/Work Items	Key Items/References
3.	Install the top right-side ignition cables: - Move the top right-side ignition cables into position through the cut-out in the right rear baffle - Install the fairlead onto the right rear baffle: - Move the fairlead halves into position around the ignition cables and aligned with the holes in the right rear baffle - Install the bolts, washers and nuts that attach the fairlead to the baffle. - Install the P-clamp that attaches the number 1 ignition cable to the baffle.	Refer to the Lycoming Operator's Manual.
4.	Connect the flexible oil hose that connects the propeller governor to the un-feathering accumulator: - Move the flexible hose into position through the cut-out in the right rear baffle. - Connect the flexible hose to the un-feathering accumulator. - Charge the un-feathering accumulator with nitrogen.	At the accumulator. Refer to Chapter 61-20.
5.	Connect the airplane battery.	Refer to Chapter 24-31.
6.	Install the engine cowlings.	Refer to Chapter 71-10.
7.	Do a test for the correct operation of the engine and governor.	Refer to the DA42 L360 Airplane Flight Manual.

F. Install the Right Front Baffle

	Detail Steps/Work Items	Key Items/References
1.	Install the mixture control cable.	Refer to Chapter 76-00.
2.	Install the right front baffle: - Move the right front baffle into position at the engine - Install the washers and the screws that attach the right rear baffle to the engine.	
3.	Connect the aircraft battery.	Refer to Chapter 24-31.
4.	Install the engine cowlings.	Refer to Chapter 71-10.

G. Install the Left Rear Baffle

	Detail Steps/Work Items	Key Items/References
1.	Install the left rear baffle: - Move the left rear baffle into position at the engine - Install the washers and the screws that attach the baffle to the engine.	
2.	Install the top left-side ignition cables: - Move the top left-side ignition cables into position through the cut-out in the left rear baffle - Install the fairlead onto the left rear baffle: - Move the fairlead halves into position around the ignition cables and aligned with the holes in the left rear baffle - Install the bolts, the washers and the nuts that attach the fairlead to the baffle. - Connect the ignition cables to the top spark plugs of numbers 2 and 4 cylinders - Install the P-clamp that attaches the number 2 ignition cable to the baffle.	Refer to the Lycoming Operator's Manual.

	Detail Steps/Work Items	Key Items/References
3.	Install the propeller governor control cable and cable guide: - Move the governor control cable and cable guide into position through the cut-out in the left rear baffle - Move the governor cable end- fitting through the cut-out in the front left baffle - Connect the governor control cable end-fitting to the governor - Do a test for the correct operation of the governor control cable.	 Refer to Chapter 61-20. Refer to Chapter 61-20.
4.	Connect the fuel divider drain: - Move the drain into position through the left rear baffle - Connect the drain to the fuel divider and secure with a hose clip.	
5.	Connect the aircraft battery.	Refer to Chapter 24-31.
6.	Install the engine cowlings.	Refer to Chapter 71-10.
7.	Do a test for the correct operation of the engine and governor.	Refer to the DA42 L360 Airplane Flight Manual.

H. Install the Left Front Baffle

	Detail Steps/Work Items	Key Items/References
1.	Install the left front baffle: - Move the left front baffle into position at the engine - Install the washers and the screws that attach the baffle to the engine - Install the P-clamp that attaches the number 2 ignition cable to the baffle.	

	Detail Steps/Work Items	Key Items/References
2.	Connect the governor control cable to the governor: - Move the governor control cable through the cut-out in the left front baffle - Connect the governor control cable to the governor.	 Refer to Chapter 61-20.
3.	Connect the flexible hose to the governor: - Move the flexible oil hose through the cut-out in the front left baffle - Connect the flexible oil hose to the governor.	
4.	Charge the un-feathering accumulator with nitrogen.	Refer to Chapter 61-20.
5.	Connect the airplane battery.	Refer to Chapter 24-31.
6.	Install the engine cowlings.	Refer to Chapter 71-10.
7.	Do a test for the correct operation of the engine and the governor.	Refer to the DA42 L360 Airplane Flight Manual.

CHAPTER 76-00
ENGINE CONTROLS

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ENGINE CONTROLS - DESCRIPTION AND OPERATION

1. General

This chapter describes the engine controls of the DA42 L360 aircraft with the Lycoming IO-360-M1A (LH) and Lycoming LIO-360-M1A (RH) engines installed. Bowden cables transmit the control inputs from the control levers in the cockpit to the engines. It does not include data on the fuel control units themselves. For data on the engine fuel-control unit, refer to the Lycoming Maintenance Manual.

For data on the alternate air unit refer to Chapter 71-60. For data on the propeller control systems, refer to Chapter 61-20.

The D42 L360 aircraft has the following engine controls for each engine:

- Throttle control lever
- Mixture control lever.

2. Description and Operation

Figure 1 shows the engine control assembly in the cockpit. Figure 2 and Figure 3 show the details of each control system. An engine control assembly in the center console holds the throttle, mixture and propeller control levers. The engine control assembly has a control lever friction-adjuster. Tubular spacers in the control assembly make the stops for the control levers.

A. Friction Adjuster

The friction adjuster adjusts the force necessary to move the control levers in the engine control assembly. The friction adjuster control knob is on the right side of the center console. The control levers attach to a pivot shaft in the engine control assembly. The pivot shaft also has stator plates, plastic washers and spacers. The other end of the stator plates attach to the control assembly with a bolt. The friction between the levers, plastic washers and stator plates increases when the friction adjuster control knob is tightened and decreases when the knob is released. Spring washers keep the friction adjuster control knob setting.

B. Throttle

Figure 2 shows the throttle control installation.

The throttle control lever sets the position of the throttle lever on the fuel injector. Move the throttle control lever fully forward to open the throttle on the injector and move it rearward to close the throttle on the injector. The lever on the injector touches its stop before the control lever in the cockpit touches the cockpit stop. The cockpit stops prevent the pilot from putting too much load on the control system.

A Bowden cable connects between the throttle control lever in the cockpit and the fuel injector at the engine. The throttle has a push rod which connects to a transfer lever at the front of the control quadrant. The Bowden cable eye-end attaches to the relay lever with a bolt. The outer sheath of the Bowden cable has a threaded end-fitting. Two nuts attach the end-fitting to a bracket attached to the bottom of the engine control assembly.

The Bowden cable goes aft from the engine control assembly, down below the cockpit floor and through the wing center section to the related engine nacelle. A feed-thru fitting holds the cable in position at the firewall. A fire resistant compound seals the Bowden cable where it goes through the firewall.

From the firewall the Bowden cable goes down the right side of the engine and then under the engine to the fuel injector. The outer sheath of the Bowden cable attaches to a bracket on the bottom of the engine with two nuts. If you adjust these two nuts you adjust the range of movement of the throttle control lever. The control rod eye-end attaches to the throttle lever at the injector with a nut, bolt and two washers. The eye-end is adjustable. You can use it to set the correct range of movement of the throttle valve.

The motion of the knob is transferred to the carburetor by a bowden cable. The bowden cable jacket is attached to the control quadrant by a clamp. Next to the carburetor, the bowden cable is held by an adjustable casing screw. The stop is located on the carburetor.

C. Mixture Control

Figure 3 shows the mixture control installation. The mixture control lever sets the mixture between RICH and LEAN. It also stops the fuel supply to the engine when set to CUT-OFF. The mixture control lever attaches to the engine control assembly.

The mixture control lever has a lock-out lever attached. The lock-out lever prevents accidental movement of the mixture control lever. The spring loaded lock-out lever engages in a toothed rack. The toothed rack attaches to the tubular spacers at the right side of the engine control assembly.

A Bowden cable connects between the mixture control lever in the cockpit and the fuel injector at the engine. The mixture lever has a push rod which connects to a transfer lever at the front of the control quadrant. The Bowden cable eye-end attaches to the relay lever with a bolt. The outer sheath of the Bowden cable has a threaded end-fitting. Two nuts attach the end-fitting to a bracket attached to the bottom of the engine control assembly.

The Bowden cable goes aft from the engine control assembly, down below the cockpit floor and through the wing center section to the related engine nacelle. A feed-thru fitting holds the cable in position at the firewall. A fire resistant compound seals the Bowden cable where it goes through the firewall.

From the firewall the Bowden cable goes down the right side of the engine and then under the engine to the fuel injector. The outer sheath of the Bowden cable attaches to a bracket on the bottom of the engine with two nuts. If you adjust these two nuts you adjust the range of movement of the mixture control lever. The control rod eye-end attaches to the mixture lever at the injector with a nut, bolt and two washers. The eye-end is adjustable. You can use it to set the correct range of movement of the mixture valve.

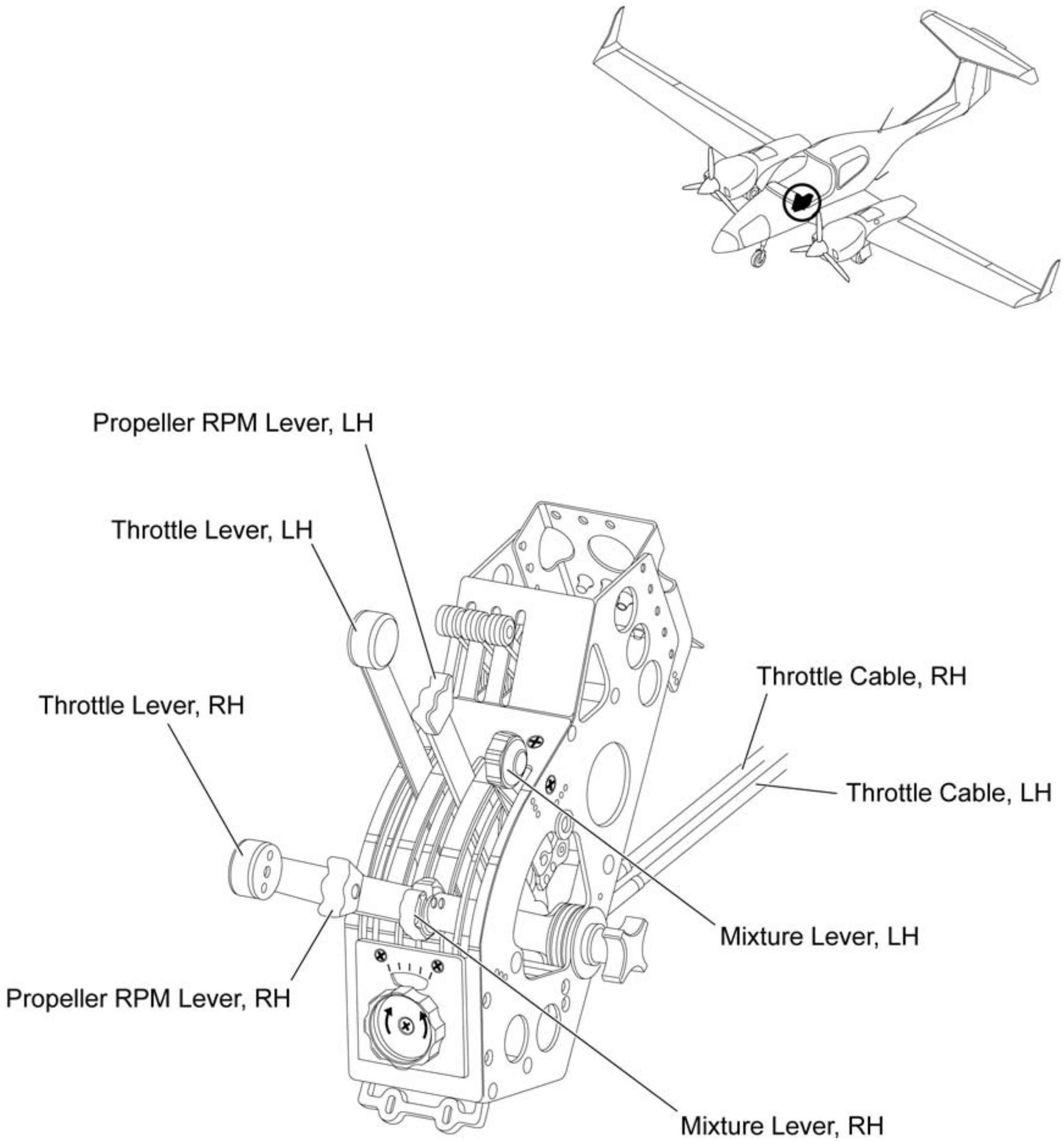

Figure 1 - Engine Controls in the Cockpit

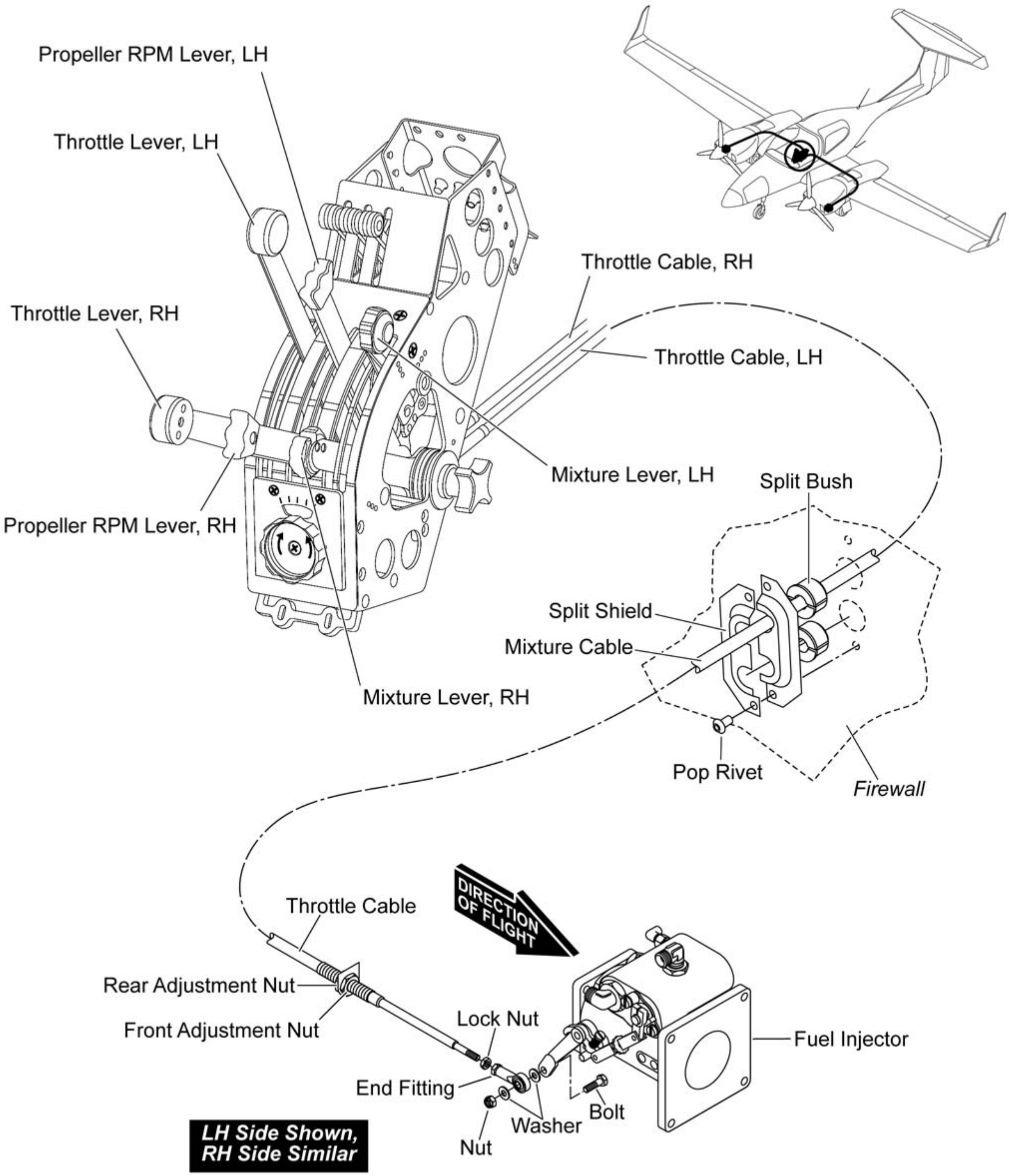

Figure 2 - Throttle Control Installation

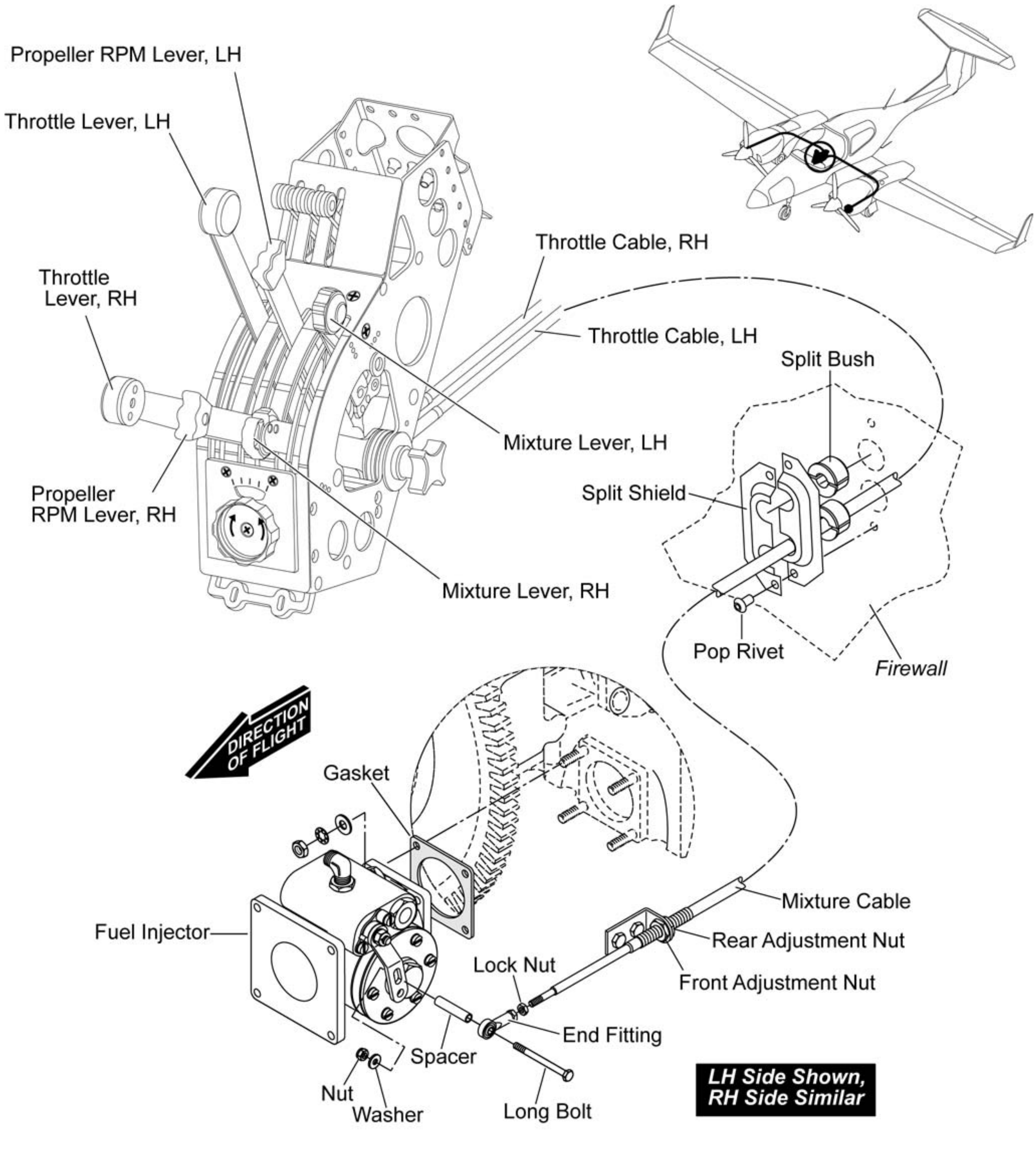

Figure 3 - Mixture Control Installation

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ENGINE CONTROLS - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the engine control system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

For all other engine control trouble refer to he Lycoming Maintenance Manual for the engine.

Use this trouble-shooting data for both the left engine and the right engine.

TROUBLE	POSSIBLE CAUSE	REPAIR
Engine will not start.	Mixture controls not correctly adjusted.	Do a range of movement check. Adjust the mixture controls.
Engine will not cut-off.	Mixture controls not correctly adjusted.	Do a range of movement check. Adjust the mixture controls.
Cannot control the engine.	Broken throttle Bowden cable. Throttle control not set correctly. Bowden cable not free to move.	Replace the broken cable. Do a range of movement check. Adjust the throttle controls. Replace the Bowden cable.
Throttle lever hard to move.	Friction adjuster incorrectly set. Throttle control lever restriction.	Check/adjust friction adjuster. Remove the restriction.
Engine does not give full power.	Throttle lever touches the cockpit stop before the lever on the engine touches its stop.	Do a range of movement check. Adjust the throttle controls.
Idle RPM changes each time idle is set.	Throttle lever touches the cockpit stop before the lever on the engine touches its stop.	Do a range of movement check. Adjust the throttle controls.

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ENGINE CONTROLS - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to remove, install and adjust the Bowden cables for the engine controls. They do not describe how to adjust the engine fuel injector.

Refer to the Lycoming Maintenance Manual for the data on the fuel injector.

WARNING: DO ALL THE STEPS OF THE CONTROL INSTALLATION AND ADJUSTMENT CAREFULLY. ENGINE FAILURE CAN OCCUR IF THE CONTROL INSTALLATION AND ADJUSTMENT ARE NOT DONE CORRECTLY. THIS CAN CAUSE DEATH OR INJURY TO PERSONS.

2. Remove/Install a Throttle Control Bowden Cable

A. Remove a Throttle Control Bowden Cable

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the engine is safe: - Set the ignition switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plug cables from the spark plugs.	
5.	Disconnect the throttle eye-end at the throttle lever in the engine bay: - Remove the nut, the washer, the spacer and the bolt that attach the Bowden cable eye-end to the throttle lever at the fuel injector.	Refer to Figure 201.
6.	Remove the eye-end from the Bowden cable: - Loosen the lock-nut that secures the eye-end and remove the eye end.	

	Detail Steps/Work Items	Key Items/References
7.	Remove the Bowden cable from the bracket at the bottom of the engine: - Remove the front adjustment nut from the outer sheath - Move the Bowden cable clear of the bracket - Remove the rear adjustment nut from the outer sheath	Make a note of the cable adjustment.
8.	Remove all clamps and cable ties that attach the Bowden cable to the components in the engine bay.	Note position of the all clamps and cable-ties.
9.	Remove the feed-thru from the engine side of the firewall: - Remove the fire resistant sealant from where the cable goes through the firewall - Remove the two rivets that attach the split shields to the firewall - Remove the split-shields - Move the two halves of the split-bush forward and clear of the cable.	
10.	Disconnect the throttle cable from the control assembly in the cockpit: - Lift the control assembly clear of the center console to gain access to the throttle Bowden cable - Disconnect the Bowden cable from the throttle relay lever: - Remove the nut, the washer and the bolt that attach the eye-end fitting to the relay lever.	Refer to Chapter 31-10.

	Detail Steps/Work Items	Key Items/References
11.	Remove the eye-end fitting from the Bowden cable: - Loosen the lock-nut that secures the eye-end fitting - Remove the eye-end fitting - Remove the lock-nut from the cable.	
12.	Disconnect the Bowden cable outer sheath from the bracket at the center console: - Remove the lock-nut from the lever side of the bracket - Move the Bowden cable outer sheath clear of the bracket - Remove the remaining lock-nut from the Bowden cable outer sheath.	
13.	Remove the pilot's/Co-pilot's seats.	Refer to AMM # 7.02.01 Chapter 25-10. Remove the pilot's seat for access to the left engine throttle Bowden cable assembly. Remove the co-pilot's seat for the right engine throttle Bowden cable assembly.
14.	Remove all the clamps that secure the throttle Bowden cable that you will remove.	Note the positions of the clamps.
15.	Remove the lower access panels from the left/right side of the wing center-section.	
16.	Remove the throttle Bowden cable from the airplane: - Carefully pull the Bowden cable clear of the airplane, from the cockpit end.	Note the position of the Bowden cable through its complete length. Take care to guide the Bowden cable clear of all the airplane components.

B. Install a Throttle Control Bowden Cable

	Detail Steps/Work Items	Key Items/References
1.	Move the new Bowden cable fully into position in the airplane. From the cockpit to the engine compartment.	
2.	Connect the Bowden cable outer sheath to the bracket at the center console in the cockpit: - Install the first lock-nut onto the outer sheath - Pass the outer sheath through the mounting bracket until the lock-nut contacts the bracket - Install the second lock-nut onto the outer sheath.	
3.	Install the eye-end fitting onto the Bowden cable: - Install the lock-nut that secures the eye-end fitting onto the cable - Install the eye-end fitting onto the cable until it contacts the lock-nut.	 Do not tighten the lock-nut.
4.	Connect the eye-end fitting to the throttle relay lever: - Align the eye-end fitting with the relay lever - Install the bolt, the washer and the nut that attaches the eye-end fitting to the relay lever - Tighten the lock-nut that secures the eye-end fitting to the Bowden control cable.	

	Detail Steps/Work Items	Key Items/References
5.	Connect the throttle Bowden cable outer sheath to the mounting bracket at the bottom of the engine: - Install the first lock-nut onto the outer sheath - Pass the outer sheath through the mounting bracket until the lock-nut contacts the mounting bracket - Install the second lock-nut onto the Bowden cable outer sheath.	
6.	Install the cable eye-end onto the throttle cable at the engine end: - Install the lock-nut onto the throttle cable - Install the eye-end onto the throttle cable until it contacts the lock-nut.	Do not tighten the lock-nut.
7.	Connect the throttle cable eye-end to the throttle lever at the fuel injector: - Align the eye-end with the fuel injector throttle lever - Install the bolt through the eye-end, spacer and fuel injector throttle lever - Install the washer and the nut onto the bolt.	
8.	Tighten the lock-nut that secures the throttle cable eye-end to the throttle cable.	
9.	Install all the clamps that you removed at Paragraph 2.A.(8).	
10.	Install the feed-thru to the engine side of the firewall with firewall sealant: - Put the two parts of the feed-thru round the Bowden cable - Push the feed-thru into the firewall.	Use PR 812 (MIL-S-38249 Type 1) Fire Wall Sealant.

	Detail Steps/Work Items	Key Items/References
	- Put the two shields in position over the feed-thru - Install two pop-rivets to attach the shields to the firewall.	
11.	Secure the Bowden cable in the fuselage and wing center-section: - Make sure that the Bowden cable is positioned correctly in the aircraft - Make sure that the Bowden cable is not kinked and that all the bends in the cable are at maximum radius - Install all the clamps and fixings that you removed in Paragraph 2.A.(14).	
12.	Install the control quadrant assembly in the cockpit center console.	Refer to Chapter 31-10.
13.	Do a test for correct range, full and free movement of the throttle control system.	Refer to the Throttle Control Range of Movement Test in this Chapter.
14.	Do an inspection of the control connections which you disconnected. If necessary, for your airworthiness authority, do a second inspection of the controls.	
15.	Do a check for loose items in the cockpit.	For example: Tools. Look especially in the area of the engine control assembly.
16.	Test all the engine control levers for freedom of movement.	
17.	Connect the spark plug cables to the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
18.	Connect the airplane battery.	Refer to Chapter 24-31.
19.	Install the engine cowlings.	Refer to Chapter 71-10.
20.	Do an engine ground run-up test.	Refer to the DA42 L360 Airplane Flight Manual.

3. Remove/Install a Mixture Control Bowden Cable

Use this procedure for the both the left engine and the right engine throttle controls.

A. Remove a Mixture Control Bowden Cable

	Detail Steps/Work Items	Key Items/References
1.	Make sure that the engine is safe: - Set the ignition switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plug cables from the spark plugs.	
5.	Disconnect the mixture cable eye-end at the mixture lever in the engine bay: - Remove the nut, the bolt and the washer that attach the eye-end to the mixture lever at the fuel injector.	Refer to Figure 201.
6.	Remove the eye-end from the Bowden cable: - Loosen the lock-nut that secures the eye-end and remove the eye end.	Support the control unit.
7.	Remove the Bowden cable from the bracket at the bottom of the engine: - Remove the front adjustment nut from the outer sheath - Move the Bowden cable clear of the bracket - Remove the rear adjustment nut from the outer sheath.	Make a note of the cable adjustment.

	Detail Steps/Work Items	Key Items/References
8.	Remove all clamps and the cable ties that attach the Bowden cable to the components in the engine bay.	Note position of the all clamps and cable-ties.
9.	Remove the feed-thru from the engine side of the firewall: - Remove the fire resistant sealant from where the cable goes through the firewall - Remove the two rivets that attach the split shields to the firewall - Remove the split-shields - Move the two halves of the split-bush forward and clear of the cable.	
10.	Disconnect the mixture control cable from the control assembly in the cockpit: - Lift the control assembly clear of the center console to gain access to the mixture Bowden cable - Disconnect the Bowden cable from the mixture lever: - Remove the nut, the washer, and the bolt that attaches the fork-end fitting to the mixture lever.	
11.	Remove the fork-end fitting from the Bowden cable: - Loosen the lock-nut that secures the fork-end fitting - Remove the fork-end fitting - Remove the lock-nut from the cable.	

	Detail Steps/Work Items	Key Items/References
12.	Disconnect the Bowden cable outer sheath from the bracket at the center console: - Remove the lock-nut from the lever side of the bracket - Move the Bowden cable outer sheath clear of the bracket - Remove the remaining lock-nut from the Bowden cable outer sheath.	
13.	Remove the pilot's/Co-pilot's seats.	Refer to AMM # 7.02.01 Chapter 25-10. Remove the pilot's seat for access to the left engine throttle Bowden cable assembly. Remove the co-pilot's seat for the right engine throttle Bowden cable assembly.
14.	Remove all the clamps/fittings that secure the mixture Bowden cable that you will remove.	Note the positions of the clamps.
15.	Remove the lower access panels from the left/right side of the wing center-section.	
16.	Remove the mixture control Bowden cable from the airplane: - Carefully pull the Bowden cable clear of the airplane, from the cockpit end.	Note the position of the Bowden cable through its complete length. Take care to guide the Bowden cable clear of all the airplane components.

B. Install a Mixture Control Bowden Cable

	Detail Steps/Work Items	Key Items/References
1.	Move the new Bowden cable fully into position in the airplane. From the cockpit to the engine compartment.	Carefully guide the cable into the position noted in Paragraph 3.A.
2.	Connect the Bowden cable outer sheath to the bracket at the center console in the cockpit: - Install the first lock-nut onto the outer sheath - Pass the outer sheath through the mounting bracket until the lock-nut contacts the bracket - Install the second lock-nut onto the outer sheath.	
3.	Install the eye-end fitting onto the Bowden cable: - Install the lock-nut that secures the fork-end fitting onto the cable - Install the fork-end fitting onto the cable until it contacts the lock-nut.	Do not tighten the lock-nut.
4.	Connect the fork-end fitting to the mixture lever: - Align the fork-end fitting with the lever - Install the bolt, the washer and the nut that attaches the fork-end fitting to the lever - Tighten the lock-nut that secures the fork-end fitting to the Bowden control cable.	
5.	Connect the mixture Bowden cable outer sheath to the mounting bracket at the bottom of the engine: - Install the first lock-nut onto the outer sheath	

	Detail Steps/Work Items	Key Items/References
	- Pass the outer sheath through the mounting bracket until the lock-nut contacts the mounting bracket - Install the second lock-nut onto the Bowden cable outer sheath.	
6.	Install the cable eye-end onto the mixture cable at the engine end: - Install the lock-nut onto the throttle cable - Install the eye-end onto the mixture cable until it contacts the lock-nut.	Do not tighten the lock-nut.
7.	Connect the mixture cable eye-end to the mixture lever at the fuel injector: - Align the eye-end with the fuel injector mixture lever - Install the bolt through the eye-end, spacer and fuel injector mixture lever - Install the washer and the nut onto the bolt.	
8.	Tighten the lock-nut that secures the mixture cable eye-end to the mixture cable.	
9.	Install all the clamps that you removed at Paragraph 3.A.(8).	
10.	Install the feed-thru to the engine side of the firewall with firewall sealant: - Put the two parts of the feed-thru round the Bowden cable - Push the feed-thru into the firewall - Put the two shields in position over the feed-thru - Install two pop-rivets to attach the shields to the firewall.	Use PR 812 (MIL-S-38249 Type 1) Fire Wall Sealant.

	Detail Steps/Work Items	Key Items/References
11.	Secure the Bowden cable in the fuselage and wing center-section: - Make sure that the Bowden cable is positioned correctly in the aircraft - Make sure that the Bowden cable is not kinked and that all the bends in the cable are at maximum radius - Install all the clamps and fixings that you removed in Paragraph 3.A.(14).	
12.	Install the control quadrant assembly in the cockpit center console.	Refer to Chapter 31-10.
13.	Do a test for correct range, full and free movement of the mixture control system.	Refer to the mixture control range of movement test in this chapter.
14.	Do an inspection of the control connections which you disconnected. If necessary, for your airworthiness authority, do a second inspection of the controls.	
15.	Do a check for loose items in the cockpit.	For example: Tools. Look especially in the area of the engine control assembly
16.	Test all the engine control levers for freedom of movement.	
17.	Connect the spark plug cables to the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
18.	Connect the aircraft battery.	Refer to Chapter 24-31.
19.	Install the engine cowlings.	Refer to Chapter 71-10.
20.	Do an engine ground run-up test.	Refer to the DA42 L360 Airplane Flight Manual.

4. Throttle/Mixture Control Range of Movement Test

These procedures describe how to do a throttle and mixture control range of movement test. They do not describe how to adjust the engine fuel control units. Refer to the Lycoming Maintenance Manual for data on the engine fuel control units.

Do the throttle/mixture control range of movement test using two persons. You must make sure that the throttle/mixture control levers hit the stops in the throttle/mixture valve before they hit their stops in the engine control assembly. This will make sure that the throttle/mixture controls have the correct range of movement. You should set the controls to 3 mm (0.125 in) clearance (bounce) at the engine control assembly cover plate.

A. Throttle Control Range of Movement Test

	Detail Steps/Work Items	Key Items/References
WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set the ignition switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plug cables from the spark plugs.	
5.	Move the throttle control lever between IDLE and FULL. - Make sure the lever moves freely with no restrictions.	

	Detail Steps/Work Items	Key Items/References
6.	Set the throttle control lever to FULL and hold it in position. - Make sure that the throttle lever at the injector hits the stop. If necessary, adjust the Bowden cable outer sheath at the support bracket at the bottom of the engine.	 With the throttle lever on the stop at the injector, there must be at least 0.125 in (3.02 mm) clearance (bounce) between the lever in the engine control assembly and the cover plate.
7.	Set the throttle control lever to IDLE and hold it in position: - Make sure that the throttle lever at the injector hits the IDLE stop. If necessary, adjust the Bowden cable outer sheath at the support bracket at the bottom of the engine.	 With the throttle lever on the IDLE stop at the injector, there must be at least 0.125 in (3.02 mm) clearance (bounce) between the lever in the engine control assembly and the cover plate.
8.	Move the throttle control lever between IDLE and FULL: - Make sure that the lever moves freely with no restriction.	Note the position of the all clamps and cable-ties.
9.	Do steps 6 through 8 again as necessary to get the correct values.	
10.	Do an inspection of the control connections which you disconnected. If necessary for your airworthiness authority, do a second inspection of the controls.	
11.	Install the cables to the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
12.	Connect the aircraft battery.	Refer to Chapter 24-31.
13.	Install the engine cowlings.	Refer to Chapter 71-10.
14.	Do an engine ground run-up test.	Refer to the DA42 L360 Airplane Flight Manual.

B. Mixture Control Range of Movement Test

	Detail Steps/Work Items	Key Items/References
	WARNING: DO NOT STAND WITHIN THE DANGER AREA OF THE PROPELLER. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE DEATH OR INJURY TO PERSONS. WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.	
1.	Make sure that the engine is safe: - Set the ignition switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the airplane battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plug cables from the spark plugs.	
5.	Move the mixture control lever between RICH and LEAN CUT-OFF. - Make sure the lever moves freely with no restrictions.	
6.	Set the mixture control lever to RICH and hold it in position. - Make sure that the mixture lever at the injector hits the stop. If necessary, adjust the Bowden cable outer sheath at the support bracket at the bottom of the engine.	With the mixture lever on the stop at the injector, there must be at least 0.125 in (3.02 mm) clearance (bounce) between the lever in the engine control assembly and the cover plate.
7.	Set the throttle control lever to LEAN CUT-OFF and hold it in position: - Make sure that the mixture lever at the injector hits the CUT-OFF stop. If necessary, adjust the Bowden cable outer sheath at the support bracket at the bottom of the engine.	With the mixture lever on the LEAN CUT-OFF stop at the injector, there must be at least 0.125 in (3.02 mm) clearance (bounce) between the lever in the engine control assembly and the cover plate.

	Detail Steps/Work Items	Key Items/References
8.	Move the throttle control lever between RICH and LEAN CUT-OFF: - Make sure that the lever moves freely with no restriction.	Note the position of the all clamps and cable-ties.
9.	Do steps 6 through 8 again as necessary to get the correct values.	
10.	Do an inspection of the control connections which you disconnected. If necessary for your airworthiness authority, do a second inspection of the controls.	
11.	Install the cables to the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
12.	Connect the aircraft battery.	Refer to Chapter 24-31.
13.	Install the engine cowlings.	Refer to Chapter 71-10.
14.	Do an engine ground run-up test.	Refer to the DA42 L360 Airplane Flight Manual.

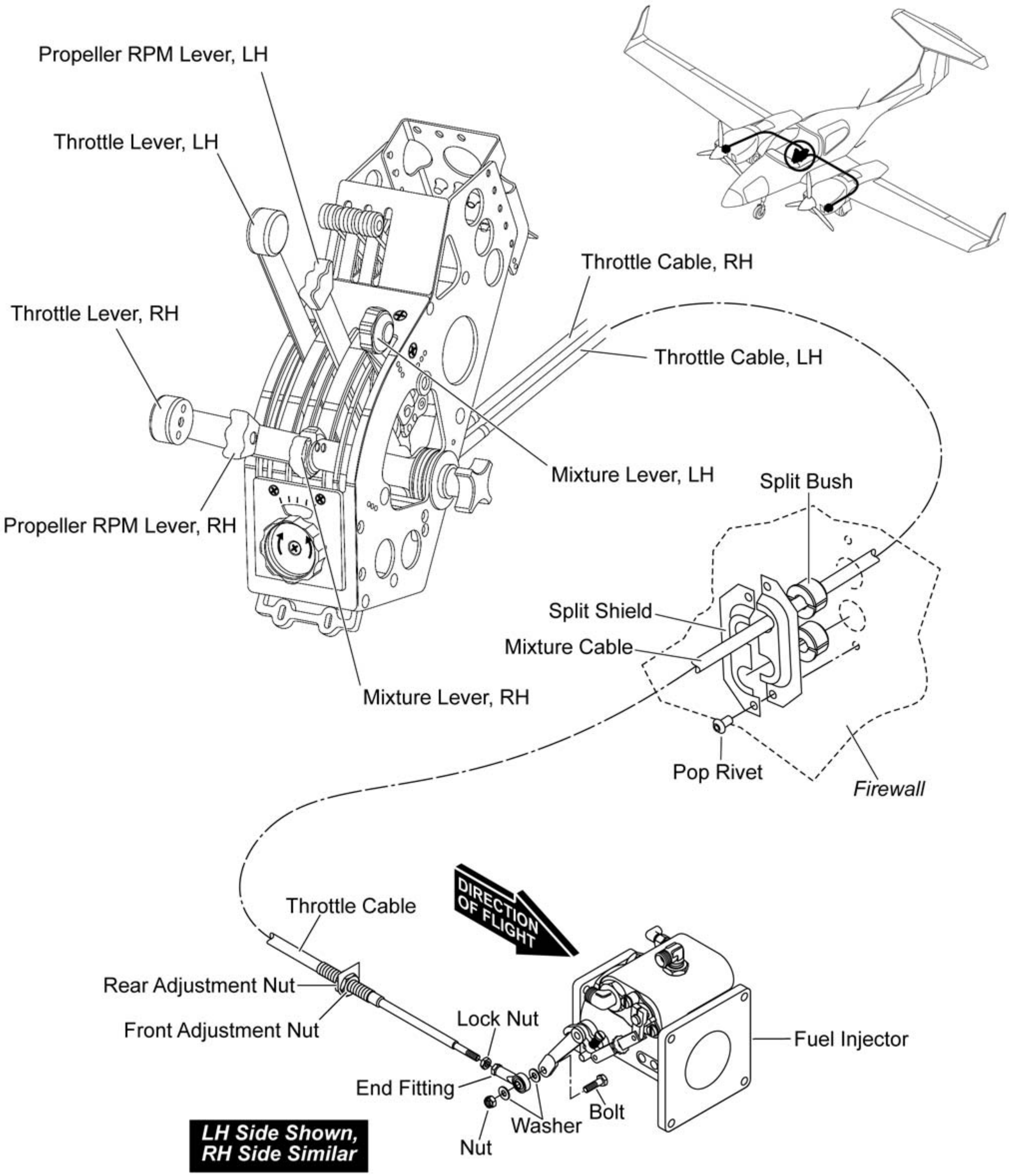

Figure 201 - Throttle Control Installation

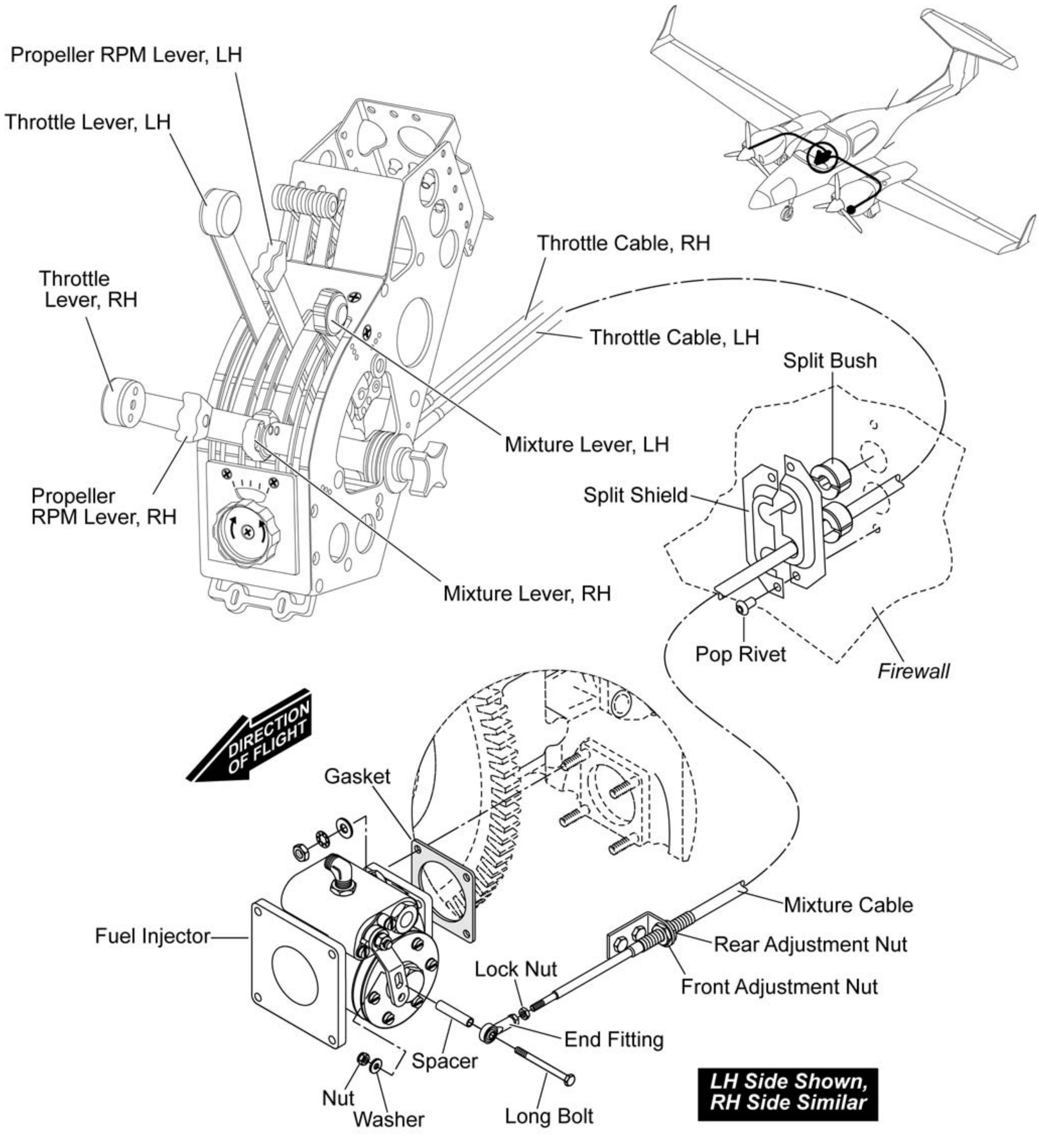

Figure 202 - Mixture Control Installation

CHAPTER 77-00
ENGINE INDICATING SYSTEMS

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ENGINE INDICATING SYSTEMS - DESCRIPTION AND OPERATION

1. General

This chapter describes about the engine indicating system for the DA42 L360 aircraft with the Lycoming IO-360-M1A (LH) and Lycoming LIO-360-M1A (RH) engines installed. An Integrated Cockpit System (ICS) with two large display screens located in the instrument panel show all engine related indications.

The Chapter 77-40 describes about the engine indications. For more data on the indicator system, refer to the equipment manufacturer's manual.

Refer to Chapter 28-40 for more data on the fuel quantity indicating system and refer to Chapter 24-30 for more data on the electrical current indicating system.

2. Description and Operation

The ICS gives all engine indications. The ICS displays are located in the left and right sides of the instrument panel. Each display has a combination of digital and analogue displays.

Either display can show all the engine indications. Refer to Chapter 77-40 for more data about the system sensors. Refer to Chapter 31-40 for more data about the ICS.

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ENGINE INDICATING SYSTEM - DESCRIPTION AND OPERATION

1. General

This chapter describes about the engine indicating system for the DA42 L360 aircraft with the Lycoming IO-360-M1A (LH) and Lycoming LIO-360-M1A (RH) engines installed. The Integrated Cockpit System (ICS) display screens which are located in the instrument panel give all engine and related airplane system indications. For normal operations, the left display is the primary flight display (PFD) and the right is the multi-function display (MFD). Both displays are similar and you can select which screen is the MFD or PFD.

Refer to Chapter 31-40 for more data about the ICS.

The ICS also shows fuel and systems data. Refer to Chapter 28-40 for data about the airframe parts of the system.

2. Description and Operation

The ICS displays the engine indications for both engines on the MFD screen. The MFD gives the following engine indications for each engine:

- RPM
- Oil temperature
- Fuel flow
- Cylinder head temperature (CHT) for all four cylinders
- Exhaust gas temperature (EGT) for all four exhaust down-pipes
- Oil Pressure
- Fuel Pressure
- Manifold pressure.

Engine alerts are given on the PFD screen. A flashing warning annunciator appears in the PFD when an alert is activated. Pressing the WARNING softkey at the bottom of the PFD opens an alert window in the PFD. The alerts window gives more details of the alert. The ICS alert system gives alerts and warning captions for both engine and aircraft systems. Refer to Chapter 31-40 for more data about the ICS.

A. Transducers and Sensors

The engine indicating system uses the following transducers/sensors:

RPM sensor:	Measures the RPM of the engine.
Oil temperature sensor:	The oil temperature sensor attaches to a special mounting on the rear accessory housing. You can replace the oil temperature sensor.
Fuel flow sensor:	The fuel flow sensor is located in the fuel supply hose to the fuel injector. You can replace the fuel flow sensor.
Cylinder Head Temperature (CHT) sensor:	The engine has a CHT probe attached to the bottom of each cylinder head. You can replace the CHT probe.
Exhaust Gas Temperature (EGT) sensor:	The engine has an EGT probe attached to the exhaust down-pipe from each cylinder head. You can replace the EGT probe.
Oil pressure transducer:	A P-clamp attaches the oil pressure transducer to the engine mounting-frame on the right-top side. A flexible hose connects the transducer to a connection in the engine oil system near the oil-pressure-relief-valve. You can replace the oil pressure transducer.
Fuel pressure transducer:	The fuel pressure transducer is in the fuel supply hose to the fuel injector. You can replace the fuel pressure transducer.
Manifold pressure transducer:	A P-clamp attaches the manifold pressure transducer to the engine-mounting-frame, on the top-left side. A flexible hose connects the transducer to a Tee-piece. The Tee-piece is located in the flexible hose which connects the LASAR control unit to the manifold pressure connection. You can replace the manifold pressure transducer.

ENGINE INDICATING SYSTEMS - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the engine control system. For more data on the system, refer to the equipment manufacturer's manual.

If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
One of the engine indicators in the ICS display does not indicate correctly.	Sensor/Transducer defective.	Do a test for continuity of the wires for the relevant sensor. If the wires are serviceable, then refer to the engine manufacturer. Replace the related sensor/ transducer.

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ENGINE INDICATING SYSTEMS - MAINTENANCE PRACTICES

1. General

These maintenance practices describe how to replace the following sensors and transducers:

- Oil temperature sensor
- Fuel flow sensor
- Cylinder Head Temperature (CHT) sensor
- Exhaust Gas Temperature (EGT) sensor
- Oil pressure transducer
- Fuel pressure transducer
- Manifold pressure transducer.

2. Replace an Oil Temperature Sensor

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON IT. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.	
1.	Make sure that the engine is safe: - Set the ignition switches to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plugs wires from the spark plugs.	

	Detail Steps/Work Items	Key Items/References
5.	Disconnect the electrical wires from the temperature sensor: - Remove the nut and washer from the electrical connector. - Remove the cable eye-end from the connector.	
WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.		
6.	Replace the oil temperature sensor: - Remove the sensor. - Remove and discard the O-ring seal. - Install a new O-ring seal on the new sensor. - Install a new sensor.	On the engine accessory housing.
7.	Connect the electrical cable to the sensor: - Put the electrical cable eye-end in position on the connector. - Install the washer and the nut onto the electrical connector.	
8.	Connect the spark plugs wires from the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
9.	Connect the aircraft main battery.	Refer to Chapter 24-31.
10.	Install the engine cowlings.	Refer to Chapter 71-10.
11.	Do a test of the engine oil temperature indicating system: - Monitor the oil temperature indication. - Set the ELECT MASTER switch to ON. - Do an engine ground run-up. - Shut the engine down.	The indicator must show the likely ambient temperature of the oil. Refer to the DA42 L360 Airplane Flight Manual. The oil temperature indicator must show the relevant temperature of the oil.

	Detail Steps/Work Items	Key Items/References
12.	Look for oil leaks from the sensor: - Remove the engine cowlings. - Look for oil leaks from the sensor. - Install the engine cowlings.	

3. Replace the Fuel Flow Sensor

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON IT. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switches to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plugs wires from the spark plugs.	
5.	Disconnect the electrical wires from the sensor.	
WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.		

	Detail Steps/Work Items	Key Items/References
6.	Replace the fuel flow sensor: - Disconnect the fuel hose from the inlet side of the fuel flow sensor. - Remove the two bolts and the washers that attach the fuel flow sensor to the mounting bracket. Move the fuel flow sensor clear of the airplane. - Put the new fuel flow sensor into position on the bracket and install the bolts and the washers that attach the sensor to the bracket. - Connect the fuel hose to the outlet side of the fuel flow sensor. - Connect the fuel hose to the inlet side of the fuel flow sensor.	 Use a suitable container to collect spilled fuel. Put a cap on open connections.
7.	Connect the electrical wires to the fuel flow sensor.	At the in-line connector.
8.	Look for fuel leaks from the sensor: - Set the ELECT MASTER switch to ON. - Set the related fuel pump switch to ON. - Look for fuel leaks, especially in the area of the fuel flow sensor. - Set the fuel pump switch to OFF. - Set the ELECT MASTER switch to OFF.	
9.	Connect the spark plugs wires from the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
10.	Connect the aircraft main battery.	Refer to Chapter 24-31.
11.	Install the engine cowlings.	Refer to Chapter 71-10.

4. Replace a Cylinder Head Temperature Probe

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON IT. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switches to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plugs wires from the spark plugs.	
5.	Disconnect the electrical wires from the temperature probe.	Refer to Figure 203. At the in-line connector.
6.	Replace the CHT probe: - Remove the probe from the cylinder head. - Move the probe clear of the airplane. - Install the new probe.	
7.	Connect the electrical wires to the probe.	At the in-line connector.
8.	Connect the spark plugs wires from the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
9.	Connect the aircraft main battery.	Refer to Chapter 24-31.
10.	Install the engine cowlings.	Refer to Chapter 71-10.

	Detail Steps/Work Items	Key Items/References
11.	Do a test of the CHT indicating system: - Monitor the CHT indicator. - Set the ALT/BAT Switch to ON. - Do a ground run-up of the engine.	 The indicator must show zero. The indicator must show the ambient temperature of the cylinder head. Refer to the DA42 L360 Airplane Flight Manual. The CHT indicator must show the relevant temperature.

5. <u>Replace an Exhaust Gas Temperature Probe</u>

	Detail Steps/Work Items	Key Items/References
	WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON IT. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.	
1.	Make sure that the engine is safe: - Set the ignition switches to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plugs wires from the spark plugs.	
5.	Disconnect the electrical wires from the EGT temperature probe.	Refer to Figure 204. At the in-line connector.
6.	Replace the EGT probe: - Release the worm drive clamp which holds the EGT probe in position. - Replace the EGT probe. - Install the worm drive clamp which holds the EGT probe.	

	Detail Steps/Work Items	Key Items/References
7.	Connect the electrical wires to the EGT probe.	At the in-line connector.
8.	Connect the spark plugs wires from the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
9.	Connect the airplane main battery.	Refer to Chapter 24-31.
10.	Install the engine cowlings.	Refer to Chapter 71-10.
11.	Do a test of the EGT indicating system:	
	- Monitor the EGT indicator.	The indicator must show zero.
	- Set the ELECT MASTER Switch to ON.	The indicator must show the ambient temperature of the cylinder head.
	- Do a ground run-up of the engine.	Refer to the DA42 L360 Airplane Flight Manual. The CHT indicator must show the relevant temperature.

6. Replace an Oil Pressure Transducer

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON IT. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switches to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plugs wires from the spark plugs.	

	Detail Steps/Work Items	Key Items/References
5.	Disconnect the wires from the transducer: - Pull back the protective boots from the cable eye-ends. - Remove the two nuts and the washers that attach the eye-ends to the connectors. - Remove the eye-ends from the connectors.	Refer to Figure 205.
WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.		
6.	Replace the transducer: - Remove the defective transducer from the mount and discard the O-ring seal. - Install a new O-ring seal on the new transducer. - Install the new transducer.	Use a suitable container to collect the spilled oil. Put caps on all open connections.
7.	Connect the electrical wires to the transducer: - Install the electrical cable eye-ends onto the transducer connectors. - Install the two washers and the nuts that attach the eye-ends. - Move the rubber protective boots back into position over the eye-ends.	Refer to AMM Chapter 92-00 for the Wiring Diagrams.
8.	Connect the spark plugs wires from the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
9.	Connect the airplane main battery.	Refer to Chapter 24-31.
10.	Install the engine cowlings.	Refer to Chapter 71-10.

	Detail Steps/Work Items	Key Items/References
11.	Do a test of the engine oil pressure indicating system: - Monitor the oil pressure indicator. - Set the ELECT MASTER Switch to ON. - Do a ground run-up of the engine. - Shut the engine down.	 The indicator must show zero. Refer to the DA42 L360 Airplane Flight Manual. The CHT indicator must show the relevant temperature.
12.	Look for oil leaks from the transducer: - Remove the engine top-cowling. - Look for oil leaks from the transducer. - Install the engine top-cowling.	

7. Replace a Fuel Pressure Transducer

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON IT. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switches to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plugs wires from the spark plugs.	

	Detail Steps/Work Items	Key Items/References
5.	Disconnect the electrical connector from the fuel pressure transducer: - Remove the screw which attaches the connector to the transducer. - Pull the connector off from the transducer.	Refer to Figure 206.
WARNING: DO NOT GET FUEL ON YOU. FUEL CAN CAUSE SKIN DISEASE. WARNING: DO NOT ALLOW FIRE NEAR FUEL. FUEL BURNS AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.		
6.	Replace the fuel pressure transducer: - Remove the defective transducer from the mounting and discard the O-ring seal. - Install a new O-ring seal onto the replacement transducer. - Install the replacement transducer into the mounting.	Use a suitable container to collect spilled fuel. Put a cap on open connections.
7.	Connect the electrical wires to the fuel pressure sensor. - Put the electrical connector into position on the transducer. - Install the screw which attaches the electrical connector to the transducer.	
8.	Connect the spark plugs wires from the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
9.	Connect the airplane main battery.	Refer to Chapter 24-31.
10.	Look for fuel leaks from the sensor: - Set the ELECT MASTER switch to ON. - Set the fuel pump switch to ON. - Look for fuel leaks, especially in the area of the fuel pressure sensor. - Set the fuel pump switch to OFF.	

	Detail Steps/Work Items	Key Items/References
	- Set the ELECT MASTER switch to OFF.	
11.	Install the engine cowlings.	Refer to Chapter 71-10.
12.	Do a test of the fuel pressure indicating system:	
	- Monitor the fuel pressure indicator.	The indicator must read zero.
	- Set the ALT/BAT switch to ON.	The indicator must read the relevant pressure.
	- Set the electric fuel pump to ON.	
	- Do an engine ground run-up.	Refer to the DA42 L360 Airplane Flight Manual. The indicator must show the relevant fuel pressure.
	- Shut the engine down.	

8. Replace a Manifold Pressure Transducer

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON IT. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switches to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
4.	Disconnect the spark plugs wires from the spark plugs.	

	Detail Steps/Work Items	Key Items/References
5.	Disconnect the electrical connector from the manifold pressure transducer: - Remove the screw which attaches the connector to the transducer. - Pull the connector off from the transducer.	
6.	Replace the manifold pressure transducer: - Remove the defective transducer from the mounting and discard the O-ring seal. - Install a new O-ring seal onto the replacement transducer. - Install the replacement transducer into the mounting.	
7.	Connect the electrical wires to the manifold pressure sensor. - Put the electrical connector into position on the transducer. - Install the screw which attaches the electrical connector to the transducer.	
8.	Connect the spark plugs wires from the spark plugs.	Torque to 110 - 120 lbf-in (12.4 - 13.6 Nm).
9.	Connect the airplane main battery.	Refer to Chapter 24-31.
10.	Install the engine top cowling.	Refer to Chapter 71-10.
11.	Do a test of the manifold pressure indicating system:	
	- Monitor the manifold pressure indicator.	The indicator must show the relevant indications.
	- Set the ELECT MASTER switch to ON.	The indicator must read the relevant pressure.
	- Do an engine ground run-up.	Refer to the DA42 L360 Airplane Flight Manual. The manifold pressure indicator must show the relevant indications.

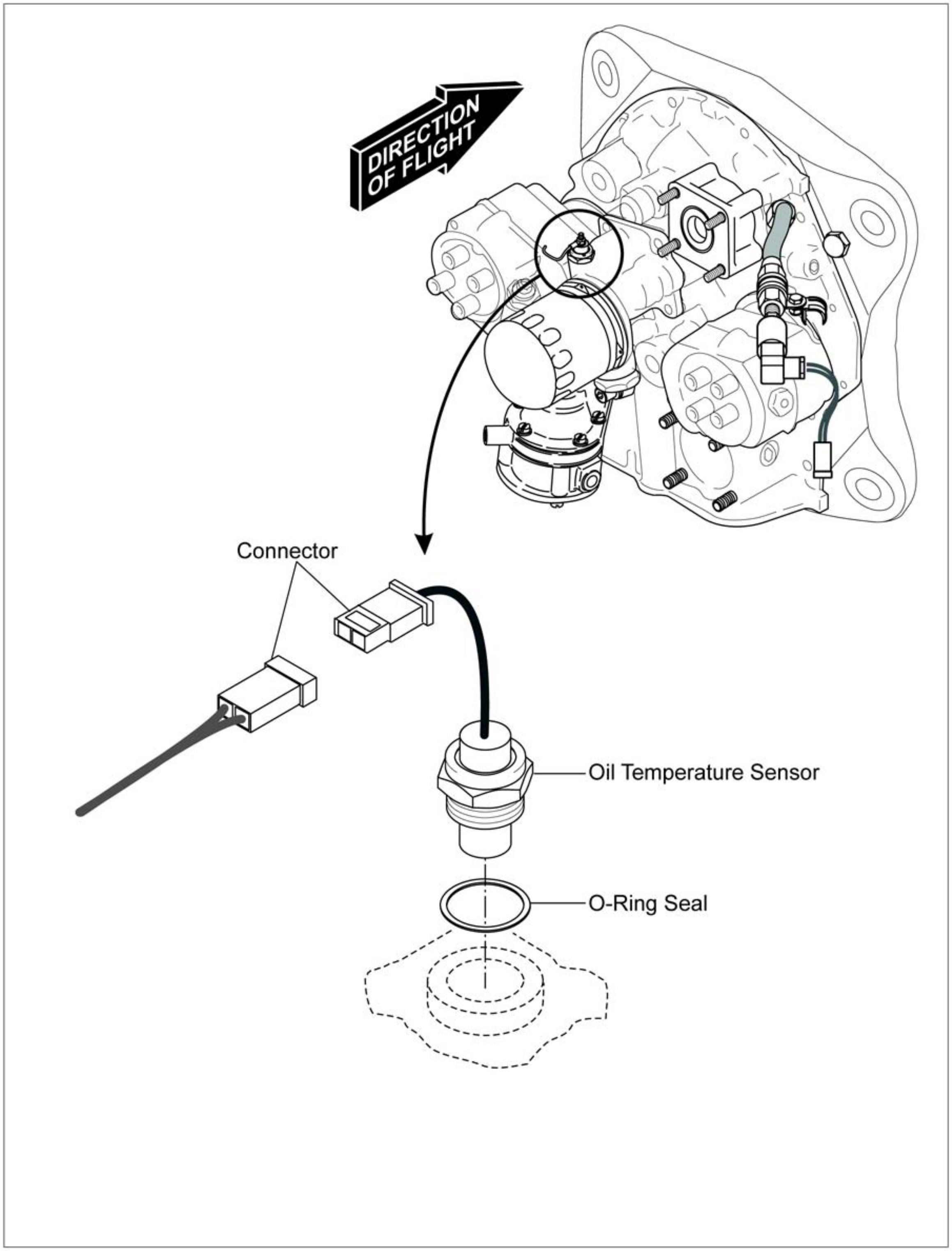

Figure 201 - Replace an Oil Temperature Sensor

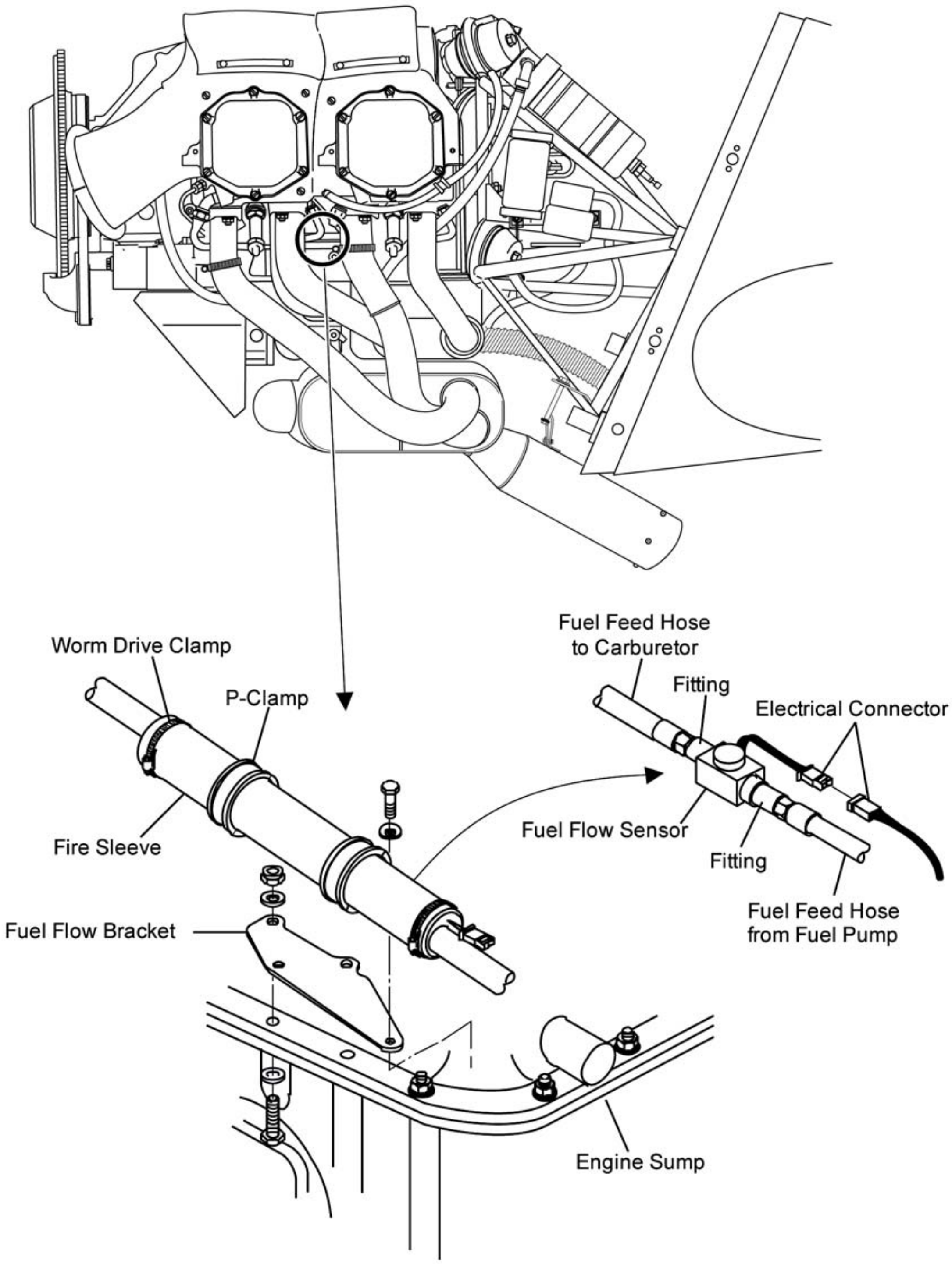

Figure 202 - Replace a Fuel Flow Sensor

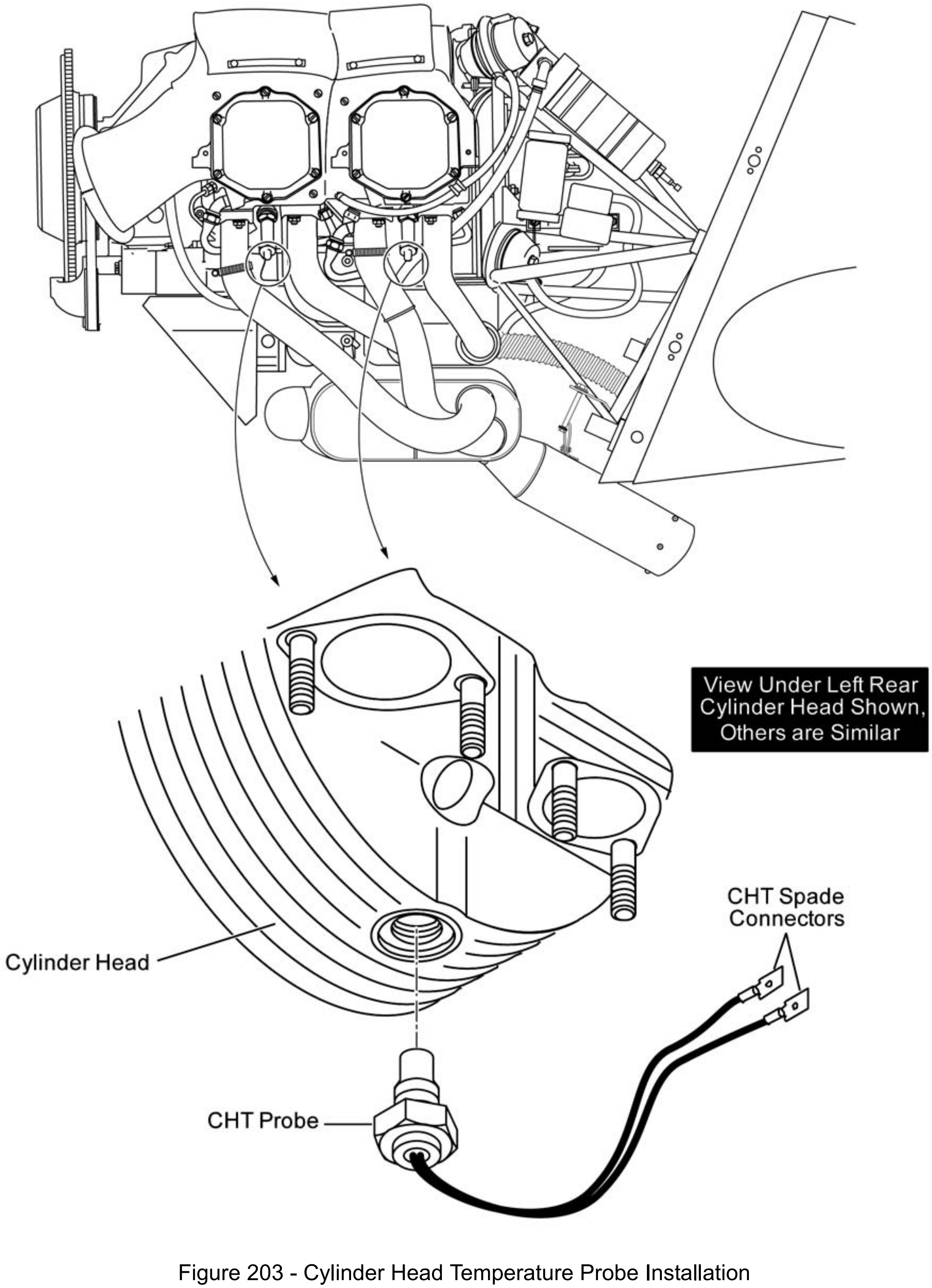

Figure 203 - Cylinder Head Temperature Probe Installation

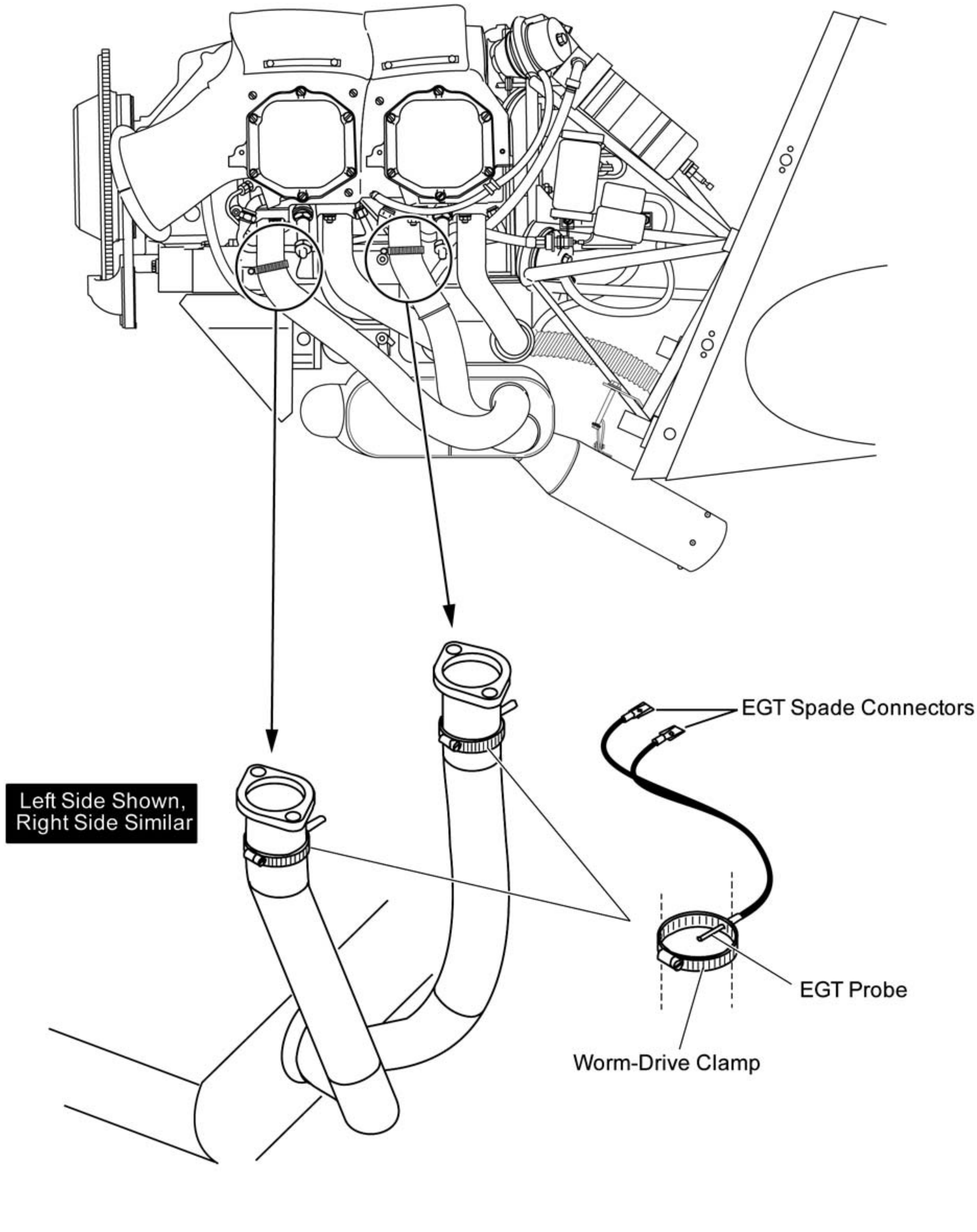

Figure 204 - Exhaust Gas Temperature Probe Installation

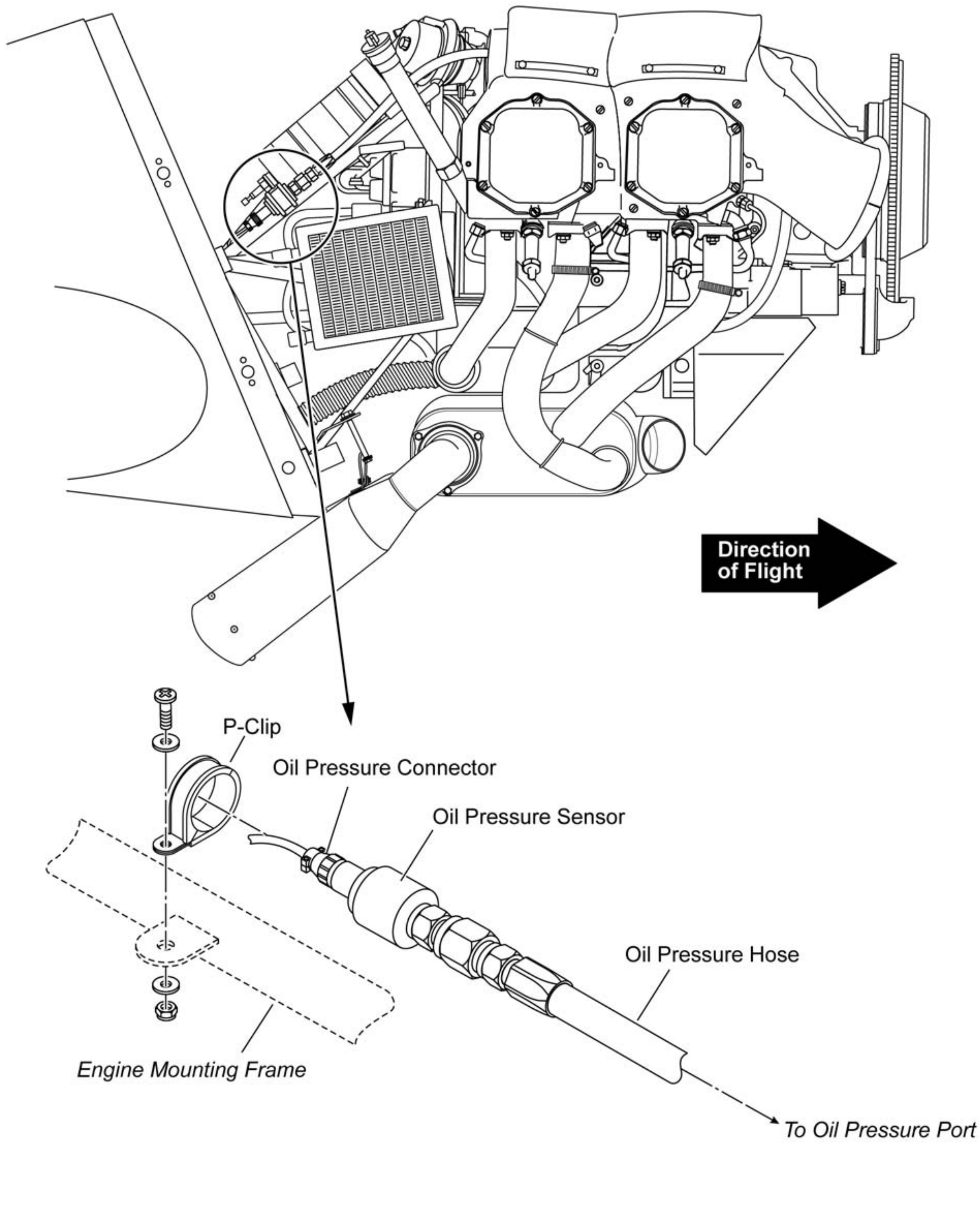

Figure 205 - Oil Pressure Sensor Installation

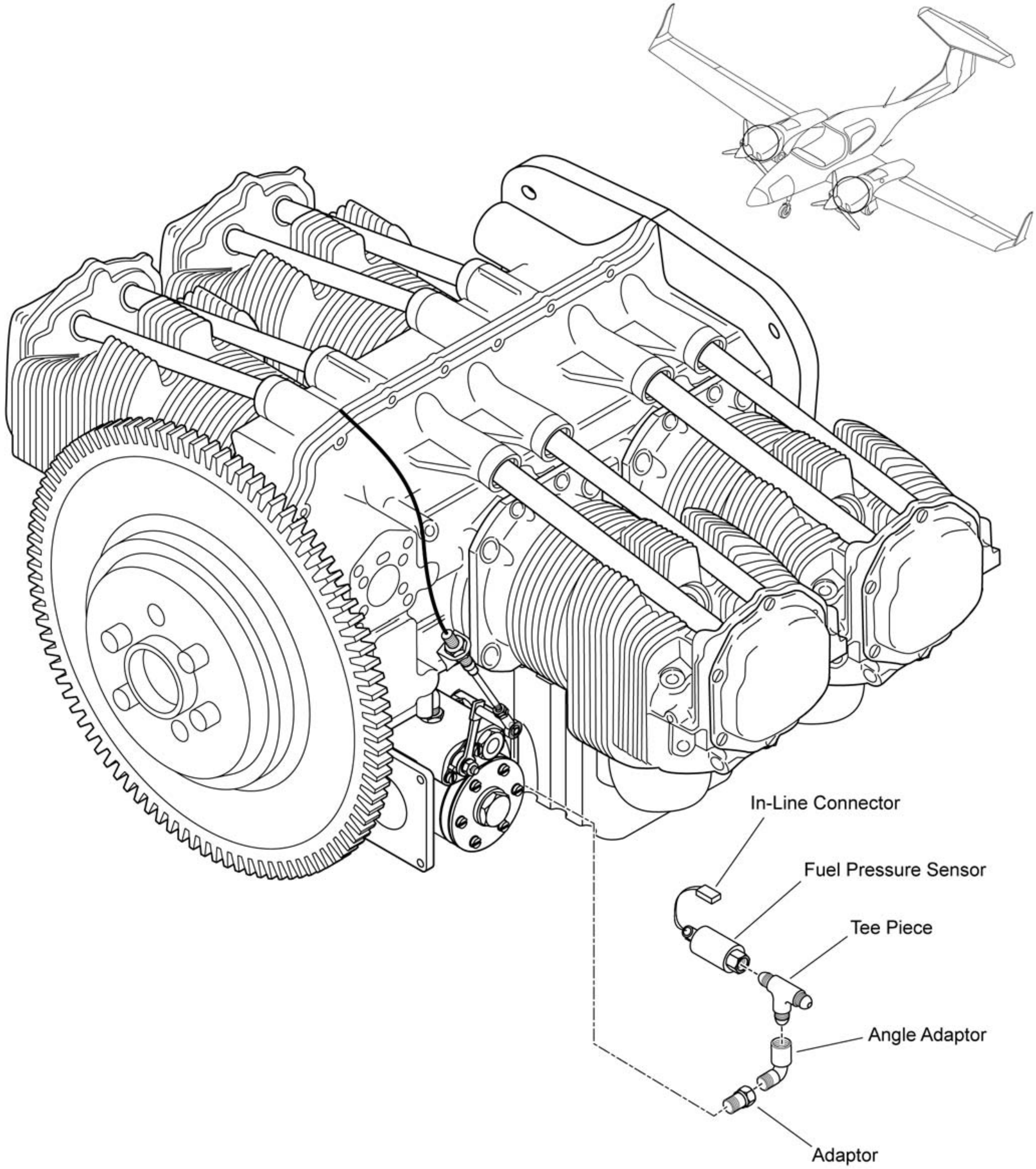

Figure 206 - Fuel Pressure Sensor Installation

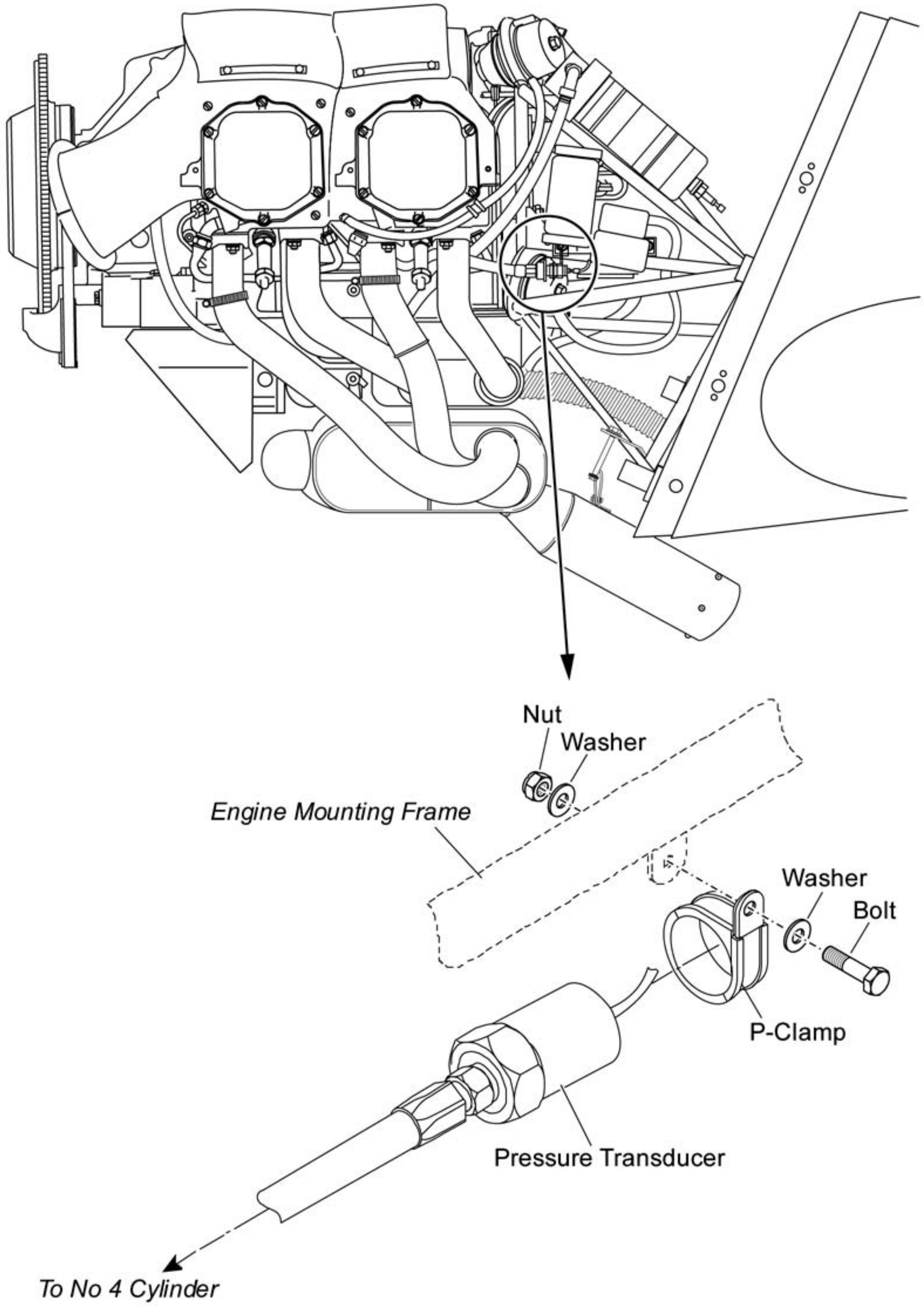

Figure 207 - Manifold Pressure Transducer Installation

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CHAPTER 78-00
EXHAUST

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EXHAUST - DESCRIPTION AND OPERATION

1. General

The DA42 L360 aircraft has simple exhaust systems for the engines. Four exhaust down-pipes connect the exhaust ports on the cylinder heads to an exhaust muffler. The muffler has a short outlet pipe which passes through the lower engine cowling to atmosphere.

2. Description

Figure 1 shows the engine exhaust system. The Power Flow Systems (PFS) exhaust consists of an exhaust pipe from each cylinder to the collector assembly located beneath the engine. The collector assembly is enclosed in a shroud, which captures ram air from the engine compartment baffle to be heated by passing around the collector assembly’s inner tubes. This heated air is used to heat the aircraft cabin. A tailpipe from the collector assembly routes exhaust gases to a muffler that directs gases out of the cowling.

Welded stainless-steel makes the exhaust system. Four down-pipes attach to the cylinder exhaust ports with special nuts, serrated washers and plain washers. A special gasket makes a gas-tight seal between the exhaust port and the flange of the down-pipe. The bottom end of the down-pipe connects to the exhaust muffler.

3. Operation

Exhaust gases from the cylinders flows through the down-pipes to the muffler. The muffler takes some of the energy from the gases. The gases then flow out of the muffler under the rear-right-side of the engine.

The shroud on the muffler has two functions. It makes a heat exchanger to give heat for the cabin heating system and it makes a heat shield for the very hot muffler. For cabin heating, refer to Chapter 21 of DA42 AMM, Document No. 7.02.01.

Cold air flows into the shroud through the front stub pipe. The cold air goes around the muffler and gets hot. The hot air then flows out through the rear stub-pipe and into the cabin heating system.

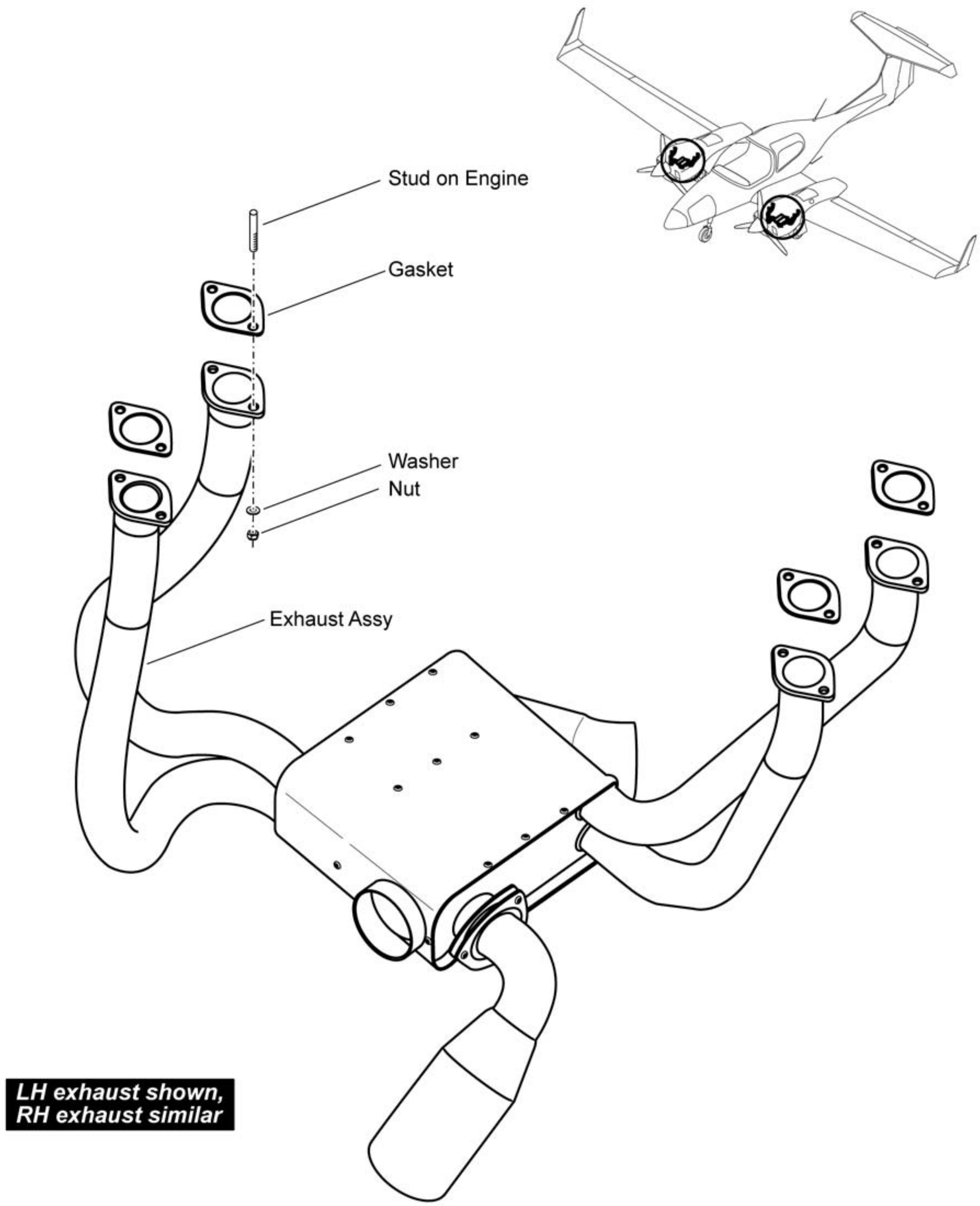

Figure 1 - Exhaust System Installation

EXHAUST - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the exhaust system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
More noise than usual.	Exhaust muffler/pipe cracked.	Look for signs of exhaust gas leaks. Replace damaged gaskets. Repair or replace the cracked pipes.
	Internal damage to muffler.	Replace the muffler.
Signs of exhaust gas leaks in the engine compartment.	Muffler cracked under the shroud.	Replace the muffler.

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EXHAUST - MAINTENANCE PRACTICES

1. General

These maintenance practices describe how to remove and install an engine exhaust system.

2. Remove/Install an Engine Exhaust System

WARNING: MAKE SURE THAT THE EXHAUST SYSTEM IS COOL BEFORE YOU TOUCH IT. THE EXHAUST SYSTEM CAN BE VERY HOT. THIS CAN CAUSE INJURY TO PERSONS.

A. Remove an Engine Exhaust System

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE EXHAUST SYSTEM. IF THE ENGINE STARTS THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switch to OFF. - Set the ELECT MASTER switch to OFF. - Set the throttle lever to IDLE. - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to AMM Chapter 71-10.
3.	Remove the EGT probes from each of the exhaust down-pipes.	Refer to AMM Chapter 77-40.
4.	Disconnect the fuel induction manifold drain tube: - Disconnect the fuel induction manifold drain tube from the drain valve. - Move the fuel induction manifold drain clear of the exhaust muffler.	Refer to AMM Chapter 71-70.

	Detail Steps/Work Items	Key Items/References
5.	Remove the exhaust system:	
	- Remove the four nuts and the plain washers that secure the exhaust down-pipes to the cylinder heads.	Support the exhaust system.
	- Lower the exhaust system clear of the airplane.	
	- Remove and discard the four exhaust gaskets.	

B. Install an Engine Exhaust System

	Detail Steps/Work Items	Key Items/References
1.	Install the collector box assembly and exhaust pipes as follows:	
	- Apply generous amounts of high-temperature anti-seize to the slip joints on the collector box.	
	- Insert the headers into the collector box according to the numbering on the headers and collector box.	Insert them in the following order: 1,3,4,2.
	- The header pipes must be installed at least $1^1/_2$" into the collector assembly.	Align each header with the factory's alignment marks to ensure correct orientation and adequate installation depth.
	- Install new exhaust gaskets into position on each cylinder	
	- Lift and hold the assembly into position.	It may be necessary to temporarily change alignment on one or more of the headers in order to install the collector box into position.
	- Maintain a minimum of 0.090 in (2.29 mm) clearance between exhaust pipes and a minimum of 0.030 in (0.76 mm) clearance between exhaust pipes and intake tubes.	Clearance should be rechecked after run-up with engine hot.
	- Install a washer, a lock washer and a nut on each stud loosely	

	Detail Steps/Work Items	Key Items/References
	- Torque the exhaust nuts to final torque after proper orientation and assembly position of the exhaust system is achieved.	Torque to 200 lbf-in (22.6 Nm).
	- Attach all flexible tubing to the appropriate inlet/outlet tube on the collector assembly.	The forward tube connects to the air inlet adapter or preheat shroud; the aft flange connects to the firewall-mounted cabin heat valve.
2.	Install the firewall bracket as follows:	
	- Install the bolts, the washers and the lock nuts.	The washer welded to the bracket is off-center. This washer should be closer to the co-pilot side of the aircraft.
3.	Install the tail pipe as follows:	
	- Position the tailpipe so that it will be in the correct position for clamping to the exhaust hanger.	
CAUTION: DO NOT OVER-TIGHTEN THE BALL JOINT. OVER-TIGHTENING THE BALL JOINT ASSEMBLY MAY CAUSE CRACKING IN THE COLLECTOR AND DAMAGE TO THE BALL JOINT ASSEMBLY.		
	- Assemble the ball joint	The compressed spring height on the ball joint should be between 0.430 and 0.475 in (10.9 and 12.1 mm). Add or remove the washers as necessary to obtain this height. Make sure the ball joint flanges stay parallel.
	- Attach the muffler clamp to the tailpipe assembly	
	- Position the clamp so that the tab is directly below and perpendicular to the tailpipe hanger (inboard side of the washer).	
NOTE: Do not position the tailpipe at an extreme inboard angle as this may cause exhaust leaks. Make sure that there is no open area at the ball joint once the tailpipe is positioned.		
4.	Install the EGT probes onto the exhaust down-pipes.	Refer to AMM Chapter 77-40.

	Detail Steps/Work Items	Key Items/References
5.	Connect the fuel induction manifold drain tube: - Move the drain tube into the correct position below the exhaust muffle. - Connect the fuel induction manifold drain tube to the drain valve.	 Refer to AMM Chapter 71-70.
6.	Install the engine cowlings.	Refer to AMM Chapter 71-10.
7.	Do an engine run-up. Listen for sounds of exhaust gas leakage.	Refer to the DA42 L360 Airplane Flight Manual.
8.	Examine the inside of the engine cowlings for signs of exhaust gas leakage.	

C. Inspection of the Exhaust System

	Detail Steps/Work Items	Key Items/References
1.	Inspect the exhaust system carefully for damage as follows: - Check for holes, cracks, and burned spots. Look especially for cracks at the welds. - Check for exhaust gas deposits in the surrounding areas. - Check for unusual tube discoloration. This may indicate an exhaust leak. - Inspect the inside of the tailpipe by using a high power flashlight, - Check for any deformation or damage to the perforated tube inside the tailpipe.	Exhaust leaks must be remedied before further flight. Deformed or damaged tailpipe inserts must be replaced before further flight.
2.	Inspect for ball joint freedom of movement by disconnecting the exhaust hanger.	The tailpipe should be free to move in all directions by applying minimal force.
3.	Open the stainless heat shroud and inspect the tubes and surfaces beneath it for holes, cracks, burned spots, gas deposits or unusual discoloration.	Defects within this area must be corrected before further flight to reduce the possibility carbon monoxide poisoning.

	Detail Steps/Work Items	Key Items/References
4.	Remove and lubricate all slip joints with a high-temperature anti-seize compound at 500 hour or annual interval (whichever comes first).	
5.	Inspect the joints for wear or galling.	
6.	Check for “polished” marks on the end of the header pipes that could indicate excessive wear.	
7.	Check for thinning material on the female portion of the slip joint that could indicate excessive wear or uneven wear.	Do this inspection more frequently if headers seize between inspections.

D. Pressure Test the Engine Exhaust System

If the integrity of a surface is suspect and if you notice any defects on the collector assembly (other than on the shroud) during the visual inspection, then pressure test the collector as follows:

	Detail Steps/Work Items	Key Items/References
1.	Remove the shroud.	
2.	Seal the four openings (tubes) with rubber expansion plugs.	
3.	Using a manometer or pressure gauge, apply 3.0 to 3.5 PSI (approximately 7” Hg) of air pressure to the fifth opening.	
4.	Submerge the collector assembly in water.	
5.	Let the unit sit pressurized for 10 to 30 seconds. The leak rate should be zero.	
6.	If a leak is found in the collector assembly, replace before further flight.	
7.	If no leaks are found, dry components and install on aircraft.	

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CHAPTER 79-00
OIL

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1. General 101

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2. Remove/Install an Engine Oil Cooler 201

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OIL SYSTEM - DESCRIPTION AND OPERATION

1. General

The Lycoming IO-360-M1A (LH) and Lycoming LIO-360-M1A (RH) engines installed in the DA42 L360 aircraft have the usual wet-sump oil system. The oil system has an oil cooler. The oil cooler attaches to brackets on the engine-mounting-frame. The oil system also has a temperature indicator and a pressure indicator. The indicator is part of the Integrated Cockpit System (ICS). For more data about the ICS, refer to Chapter 31-40. For more data about the indications system, refer to Chapter 77-40.

For more data on the oil system, refer to the Lycoming Maintenance Manual.

2. Engine Oil System

Figure 1 shows the schematic diagram for the oil system.

Oil is stored in the engine sump. Oil goes into the oil pump through an internal oil-way in the sump. The inlet to the oil-way has a strainer. The outlet of the oil pump flows to the thermostatic oil by-pass valve. When the oil is at normal operating temperature oil will flow through a flexible hose to the oil cooler. When the oil is cold the thermostatic by-pass valve sends the oil directly to the oil filter.

The oil filter has a by-pass valve. The by-pass valve is normally closed. If the oil filter becomes blocked the by-pass valve will open and oil will flow to the pressure regulating valve. From the oil pressure regulating valve the oil flows around the engine and back to the sump.

3. Oil Cooler NACA Duct

The oil cooler NACA duct is used as a dedicated air source supplying cooling air to the oil cooler. The modified NACA duct is located on both the lower engine cowls, RH side. The internal duct is a divergent channel bonded on the internal surface of the lower cowl. With the cowl installed, the duct outlet matches the engine oil cooler inlet. There are no rigid connections between the oil cooler and the NACA duct.

The NACA is composed by three exterior guide vanes and three inner turning vanes. The outside surface also has a dedicated airfoil to better direct air flow into the duct.

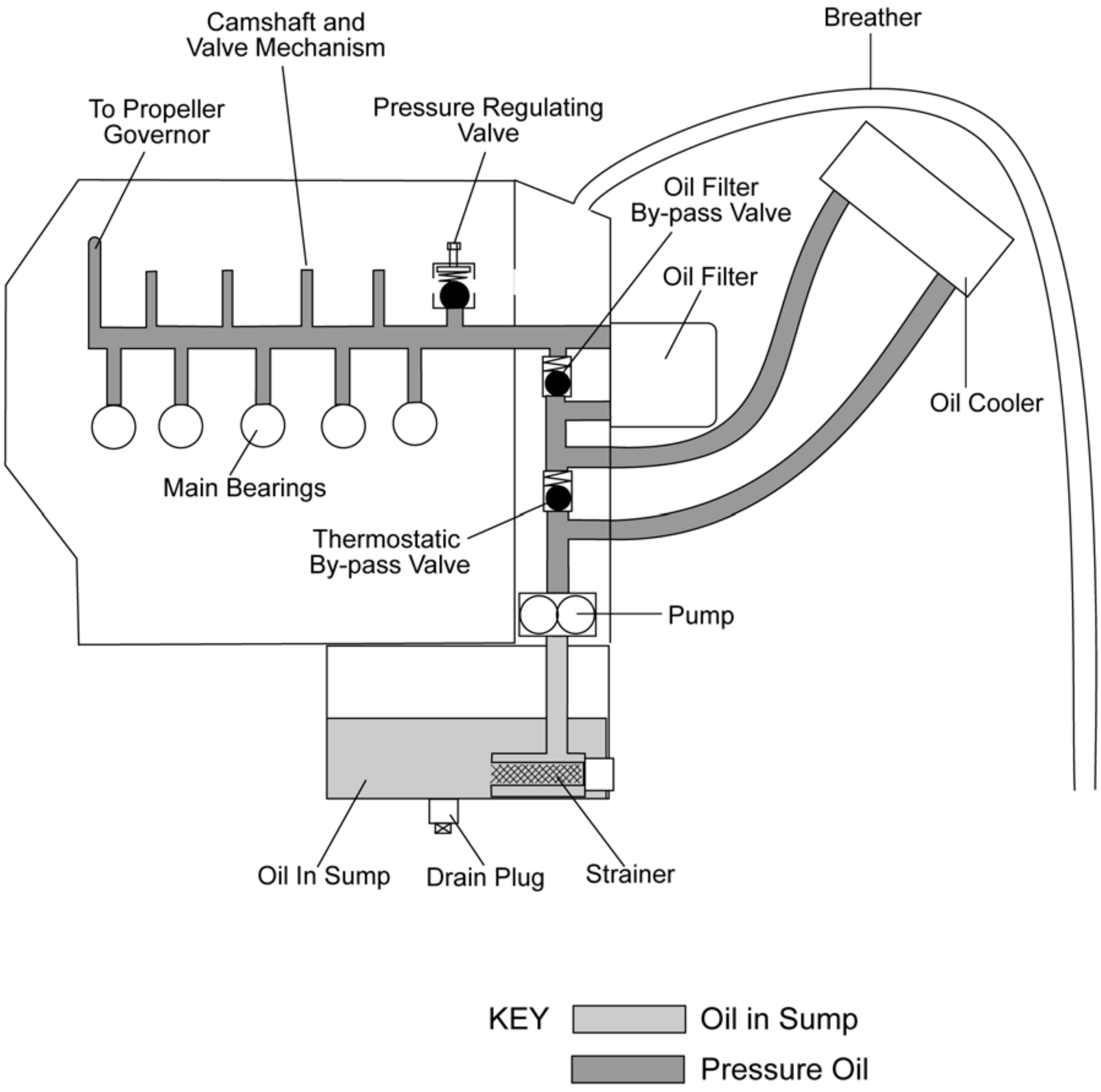

Figure 1 - Engine Oil System Schematic Diagram

OIL SYSTEM - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the oil system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

TROUBLE	POSSIBLE CAUSE	REPAIR
An engine oil temperature is too high.	Air inlet to oil cooler blocked.	Remove obstruction.
	Oil cooler matrix dirty/blocked.	Clean oil cooler matrix.
	Oil cooler blocked internally.	Remove oil cooler and flush with clean engine oil. Replace oil cooler.
	Low oil level.	Refill oil. Refer to Chapter 12-10.

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OIL SYSTEM - MAINTENANCE PRACTICES

1. General

The following maintenance practices describe how to remove and install an oil cooler. Use this procedure for both the left and right engine oil coolers. For more data on the oil system refer to the Lycoming Maintenance Manual.

2. Remove/Install an Engine Oil Cooler

WARNING: DO NOT GET OIL ON YOU. OIL CAN CAUSE SKIN DISEASE.

CAUTION: ALWAYS PUT A CAP ON OPEN CONNECTIONS. IF YOU DO NOT PUT A CAP ON OPEN CONNECTIONS, THEN CONTAMINATION CAN GET INTO THE SYSTEM AND CAUSE DAMAGE.

CAUTION: DO NOT MIX OIL TYPES. IF YOU MIX OIL TYPES THE OIL CAN LOSE ITS PROPERTIES AND THE ENGINE WILL WEAR MORE QUICKLY.

A. Remove an Engine Oil Cooler

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO WORK ON THE ENGINE CONTROLS. IF THE PROPELLER TURNS IT CAN CAUSE INJURY TO PERSONS.		
1.	Make sure that the engine is safe: - Set the ignition switch to OFF - Set the ELECT MASTER switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Remove the engine cowlings.	Refer to Chapter 71-10.
3.	Disconnect the two flexible hoses that connect the oil cooler to the engine.	At the oil cooler. Use a suitable container to catch spilled oil. Install blanking caps on all open connections.
4.	Move the oil cooler shroud clear of the oil cooler.	Support the oil cooler shroud.

	Detail Steps/Work Items	Key Items/References
5.	Remove the oil cooler: - Move the oil cooler clear of the engine - If necessary, remove the fittings from the oil cooler inlet and outlet connections.	

B. Install an Oil Cooler

	Detail Steps/Work Items	Key Items/References
1.	Install the oil cooler: - If necessary, install the pipe fittings into the oil cooler inlet and outlet ports - Move the oil cooler into position at the mounting bracket.	
2.	Move the shroud into position at the oil cooler.	
3.	Connect the flexible hose to the connection at the inboard end of the oil cooler.	Remove the blanking caps.
4.	Connect the flexible hose to the connection at the outboard end of the oil cooler.	Remove the blanking caps.
5.	Fill the engine with oil to the correct level.	Refer to Chapter 12-10.
6.	Install the engine cowlings.	Refer to Chapter 71-10.
7.	Do an engine ground run-up. Monitor the oil temperature. Look especially for oil leaks.	The oil temperature indicator must show the relevant oil temperature. Refer to the DA42 L360 Airplane Flight Manual.
8.	Stop the engine.	
9.	Do a test for leaks: - Remove the engine cowlings - Look for oil leaks, especially around the connections to the oil cooler - Install the engine cowlings.	 Refer to Chapter 71-10. Refer to Chapter 71-10.

CHAPTER 80-00
STARTING

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1. General 101

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2. Remove/Install an Engine Start Relay 201
3. Remove/Install an Engine Starter 202

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STARTING - DESCRIPTION AND OPERATION

1. General

This chapter describes about the system that cranks the Lycoming IO-360-M1A (LH) and Lycoming LIO-360-M1A (RH) engines for starting.

2. Description

Figure 1 shows a schematic diagram for the engine starter system. The system has the following components:

A. Elect Master Switch

The ELECT MASTER rocker switch is located on the bottom left of the instrument panel. Push the rocker to supply power to the main left and right bus bars.

B. Ignition Switches

The DA 42 L360 aircraft has the usual ignition switches. The ignition switches are located in the lower instrument panel, on the left. You operate the ignition switch with a key. You can set each ignition switch to any one of five positions. To set the START position you must hold the ignition key against a spring. If you release the key in the START position, the spring will turn the key counter-clockwise to the BOTH position. Each switch has the following positions:

OFF:	Both magnetos are grounded. The starter is off.
R:	Right magneto is live, left magneto is grounded. The starter is off.
L:	Left magneto is live, right magneto is grounded. The starter is off.
BOTH:	Both magnetos are live. The starter is off.
START:	Both magnetos are live. The starter is on.

You cannot repair the ignition switch. Refer to Section 74-00 for the procedure to replace the ignition switch.

C. Start Relays

The DA42 L360 aircraft has heavy-duty starter relays. The main starter relay is located in the front baggage compartment and the engine relays are located in each nacelle. You can access the relay mounting box through the front baggage compartment. Each relay has one small connector for the control wires and two tabs for the power wires. Wires for the starter-power-on-lights also attach to the start relays. These connections are made on the starter side of the engine relay in each nacelle.

D. Starter Motor

The DA42 L360 aircraft has lightweight starter motors. The motor attaches to the bottom of each engine crankcase at the front.

The starter has a pre-engage solenoid. The pre-engage solenoid moves the starter-pinion to engage with the engine-starter-gear. It also makes the electrical contacts for the starter motor. When the starter pinion is fully engaged with the engine-starter-gear, the electrical circuit for the starter motor is made and the starter turns.

The starter has a reduction gear. The reduction gear gives better performance from a smaller electric motor. Refer to the Lycoming Operators Manual/Sky-Tec Manual for more data about the starter motor.

E. Starter Power ON Caption

The start system has warning captions. The captions are located on the Integrated Cockpit System (ICS) display panel. The display panel is mounted in the center of the instrument panel. The related caption comes on when a starter relay is made and electrical power is going to the starter motor. A fuse protects the warning caption system.

F. Wires

Heavy duty wires supply electrical power from the battery to the starter relays and from the starter relays to each engine starter solenoid.

3. <u>Operation</u>

The starter will not operate with the ignition switch in any of the first four positions. If you turn the ignition switch to the START position with the ELECT MASTER Switch set to ON, then the following occurs:

- the current from the ignition switch energizes the related starter relay
- the starter relay connects the battery to the solenoid on the starter
- the solenoid moves the starter pinion to engage with starter gear on the engine flywheel
- the solenoid closes the contacts for the motor and the motor turns the engine
- the starter power-on caption shows on the ICS display.

When the engine turns faster than the starter motor, the starter motor gear disengages from the engine gear. The starter can turn until you turn the ignition key to one of the other positions.

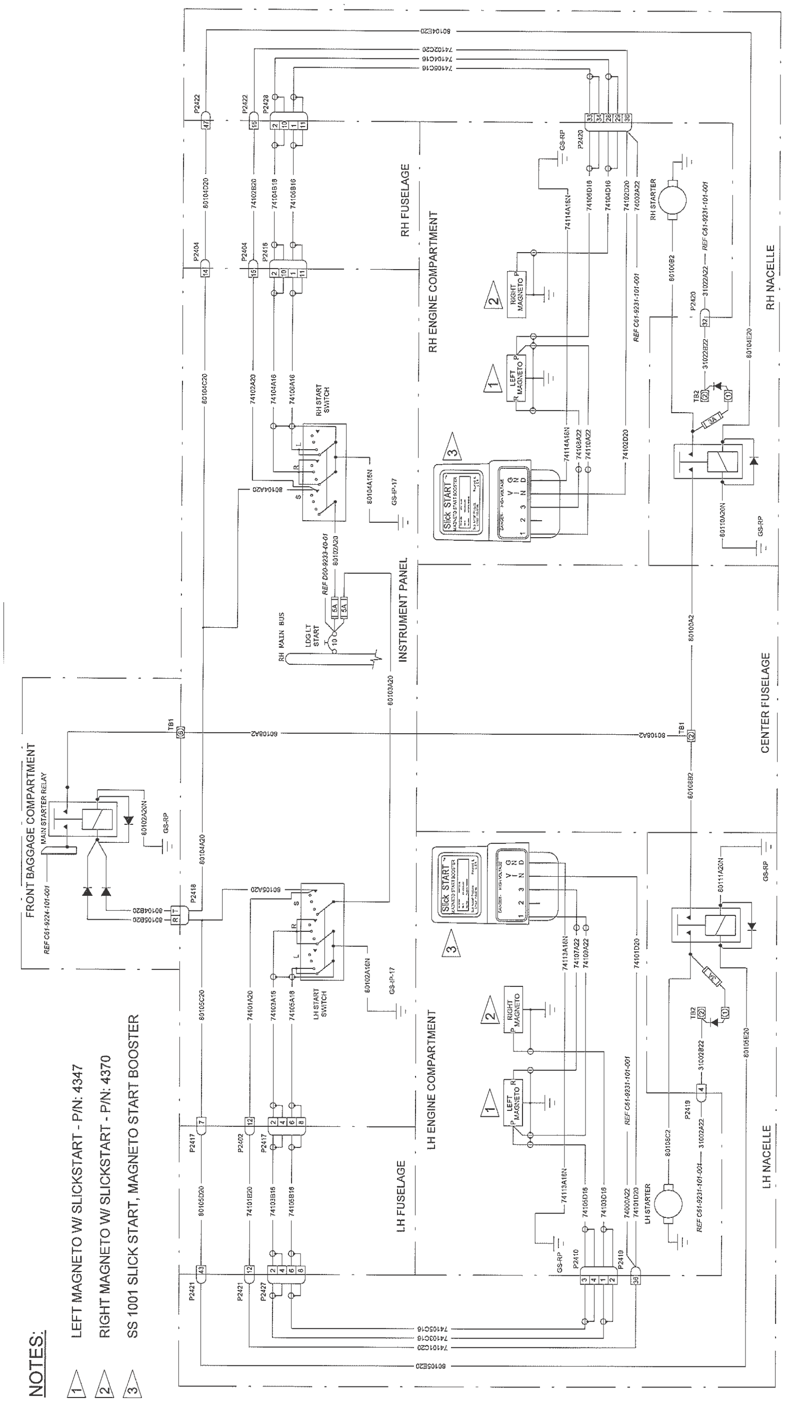

Figure 1 - Engine Starter System Schematic Diagram

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STARTING - TROUBLESHOOTING

1. General

The table below lists the defects you could have with the starting system. If you have the trouble detailed in the Trouble column read across to the Possible Cause column. Then do the repair given in the Repair column.

WARNING: DO NOT ALLOW PERSONS TO ENTER THE DANGER AREA OF A PROPELLER. THE PROPELLER MAY TURN AND CAUSE INJURY TO PERSONS.

WARNING: DISCONNECT AND ISOLATE THE STARTER POWER CABLES BEFORE DOING TESTS IN THIS SECTION. THE ENGINE MAY TURN AND CAUSE INJURY TO PERSONS.

TROUBLE	POSSIBLE CAUSE	REPAIR
The starter does not operate when the ignition key is set to START with the ELECT MASTER switch set to ON.	The main battery is discharged.	Replace/Recharge the main battery.
	The ignition switch is defective.	Replace the ignition switch. Refer to Chapter 74-00.
	The starter relay is defective.	Replace the starter relay. Refer to Chapter 24-00.
	Defective wire.	Do a test of the electrical wires. Refer to AMM # 7.02.01 Chapter 92-00 for the wiring diagrams. Repair/Replace the defective wire.
	Starter defective.	Replace the starter.
The starter Power-On caption stays on after the ignition key is released from the START position.	The starter relay is defective.	Replace the starter relay.
	Wire defective.	Do a test of the electrical wires. Refer to AMM # 7.02.01 Chapter 92-00 for the wiring diagrams. Repair/Replace the defective wire.

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STARTING - MAINTENANCE PRACTICES

1. General

This section describes how to remove/install the starter relay and how to remove/install the starter motor. Refer to Chapter 74-00 for data on how to remove/install the ignition switch.

For more data on the starter motor refer to the Lycoming Operators Manual.

2. Remove/Install an Engine Start Relay

A. Remove an Engine Start Relay

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switch to OFF - Set the ELECT MASTER switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Disconnect the aircraft main battery.	Refer to Chapter 24-31.
3.	Open the front baggage compartment door, left side for access to the relay panel.	
4.	Remove the cover from the relay mounting and identify the start relay that you will replace.	Refer to the wiring diagrams in AMM # 7.02.01 Chapter 92-00.
5.	Disconnect the control cables from the related starter relay.	At the in-line connector.
6.	Remove the starter relay: - Remove the two bolts and the washers that attach the relay to the relay panel - Move the relay up and clear of the relay panel and the aircraft.	Refer to Figure 201.

B. Install an Engine Starter Relay

	Detail Steps/Work Items	Key Items/References
1.	Install an engine starter relay: - Move the new relay into position in the relay panel - Install the two washers and the bolts that attach the relay to the relay panel.	
2.	Connect the control cables to the relay.	At the in-line connector.
3.	Install the cover onto the relay mounting.	
4.	Connect the aircraft main battery.	Refer to Chapter 24-31.
5.	Close and secure the front baggage compartment door.	
6.	Start the related engine and do a test for the correct operation of the engine starting system.	Refer to Chapter 71.

3. Remove/Install an Engine Starter

Use these procedures for both the left engine and the right engine.

A. Remove an Engine Starter

	Detail Steps/Work Items	Key Items/References
WARNING: MAKE SURE THAT THE ENGINE IS SAFE BEFORE YOU DO ANY WORK ON THE STARTER SYSTEM. IF THE ENGINE STARTS, THE PROPELLER CAN CAUSE INJURY OR DEATH.		
1.	Make sure that the engine is safe: - Set the ignition switch to OFF - Set the ELECT MASTER switch to OFF - Set the throttle lever to IDLE - Set the mixture control lever to LEAN CUT-OFF.	
2.	Disconnect the airplane main battery.	Refer to Chapter 24-31.
3.	Remove the engine cowlings.	Refer to Chapter 71-10.

	Detail Steps/Work Items	Key Items/References
4.	Disconnect the electrical cables from the starter: - Move the rubber boot clear of the power cable - Remove the nut and the washer that attach the cable to the connector stud - Remove the cable from the starter.	Refer to Figure 202.
5.	Cut the lock-wire on the bolt which holds the link for the alternator. Remove the bolt.	
6.	Release the three nuts and one bolt which attach the starter to the engine. Remove the starter from the airplane.	

B. Install an Engine Starter

	Detail Steps/Work Items	Key Items/References
1.	Put the starter into position on the engine.	
2.	Install the washers, three nuts, and one bolt which attach the starter to the engine.	Torque to 17 lbf-ft (23 Nm).
3.	Move the link for the alternator into position and install the bolt. Lock the bolt with lock-wire.	Torque to 17 lbf-ft (23 Nm).
4.	Connect the electrical cable to the starter: - Install the power cable on the stud - Install the washer - Install the nut - Move the rubber boot into position over the connector.	 Torque to 24 lbf-in (2.7 Nm).
5.	Connect the airplane main battery.	Refer to Chapter 24-31.
6.	Install the engine cowlings.	Refer to Chapter 71-10.
7.	Do an engine run-up.	Refer to the DA42 L360 Airplane Flight Manual.

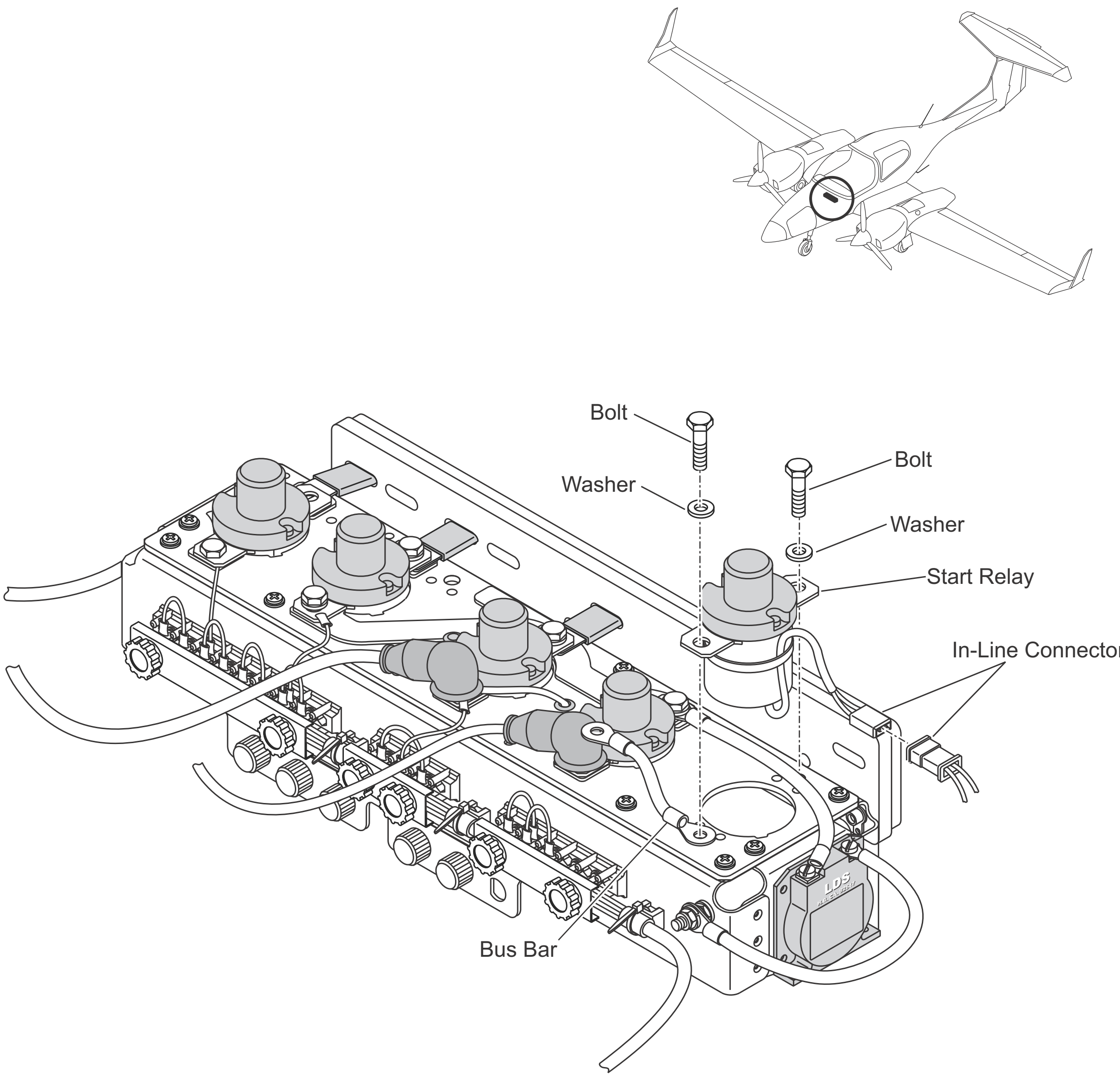

Figure 201 - Remove/Install an Engine Start Relay

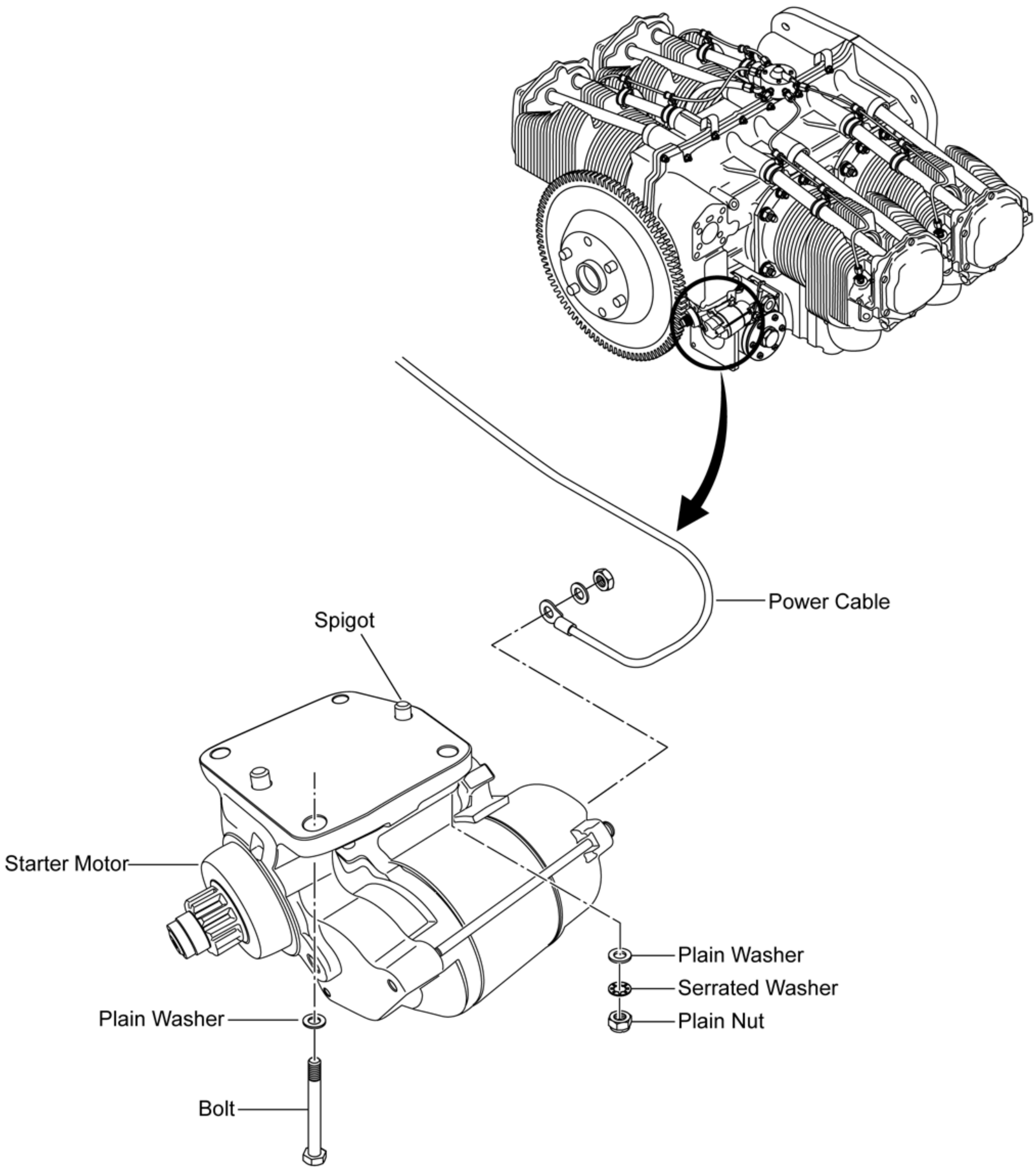

Figure 202 - Engine Starter Installation

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CHAPTER 92-00
WIRING DIAGRAMS

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WIRING DIAGRAMS

1. General

This Subject describes the Wiring Diagrams/Schematics related to the conversion of DA42 aircraft from diesel engines to gas engines. For the rest of the wiring diagrams, refer to DA42 AMM Document No. 7.02.01. The Wiring Diagrams/Schematics use the ATA Chapter-Section-Subject numbering system

2. List of Wiring Diagrams/Schematics .

Title	Drawing No.	Rev. No.	No. of Sheets
C61-9224-101-001	SCHEMATIC, ELECTRICAL SYSTEM	D	1
C61-9227-104-001	SCHEMATIC, FLAP SYSTEM	A	1
C61-9227-101-001	SCHEMATIC, STICK LIMITER	B	1
C61-9227-105-001	SCHEMATIC, STICK LIMITER - FLAPS UP ENGAGE ONLY	B	1
C61-9228-101-001	SCHEMATIC, LH FUEL SYSTEM	D	1
C61-9228-101-003	OPTIONAL SCHEMATIC, LH FUEL SYSTEM	B	1
C61-9228-101-002	SCHEMATIC, RH FUEL SYSTEM	B	1
C61-9228-102-004	OPTIONAL SCHEMATIC, RH FUEL SYSTEM	A	1
C61-9230-101-001	SCHEMATIC, TWIN LYCOMING, PITOT/STALL HEAT	B	1
C61-9231-101-001	SCHEMATIC, G1000	E	8
C61-9231-103-001	SCHEMATIC, DOOR WARNING	B	1
C61-9231-104-001	SCHEMATIC, DE-ICE INDICATION	A	1
C61-9231-105-001	SCHEMATIC, TWIN LYCOMING - CO DETECTOR	A	1
C61-9231-106-001	SCHEMATIC, AUDIO PANEL, CO-PILOT AUDIO XFR OPTION	A	1
C61-9231-107-001	SCHEMATIC, HOBBS INSTALLATION	A	1
C61-9261-101-001	SCHEMATIC, PROP CONTROL	A	1
C61-9274-101-001	SCHEMATIC, IGNITION SYSTEM	A	1

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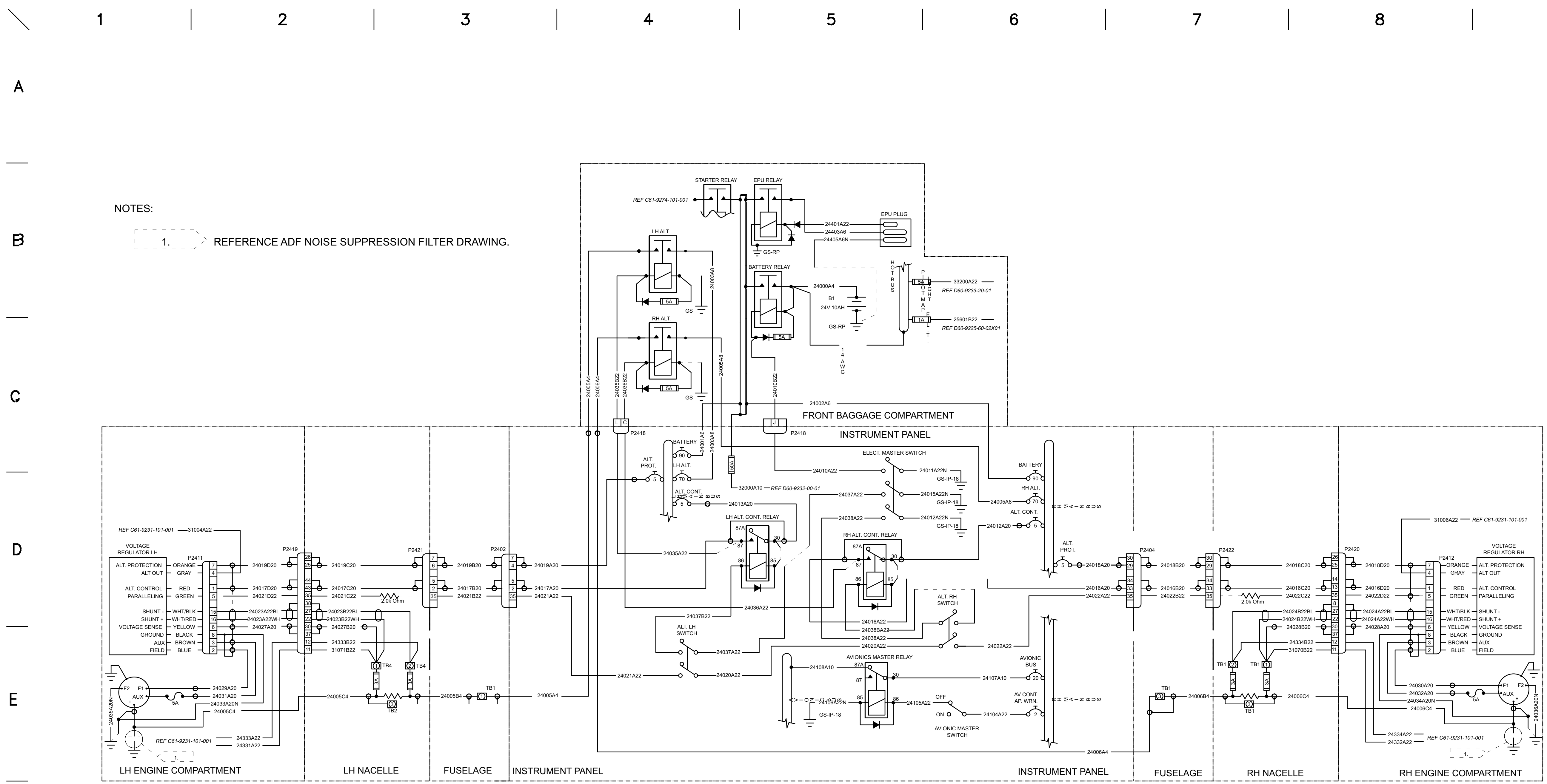
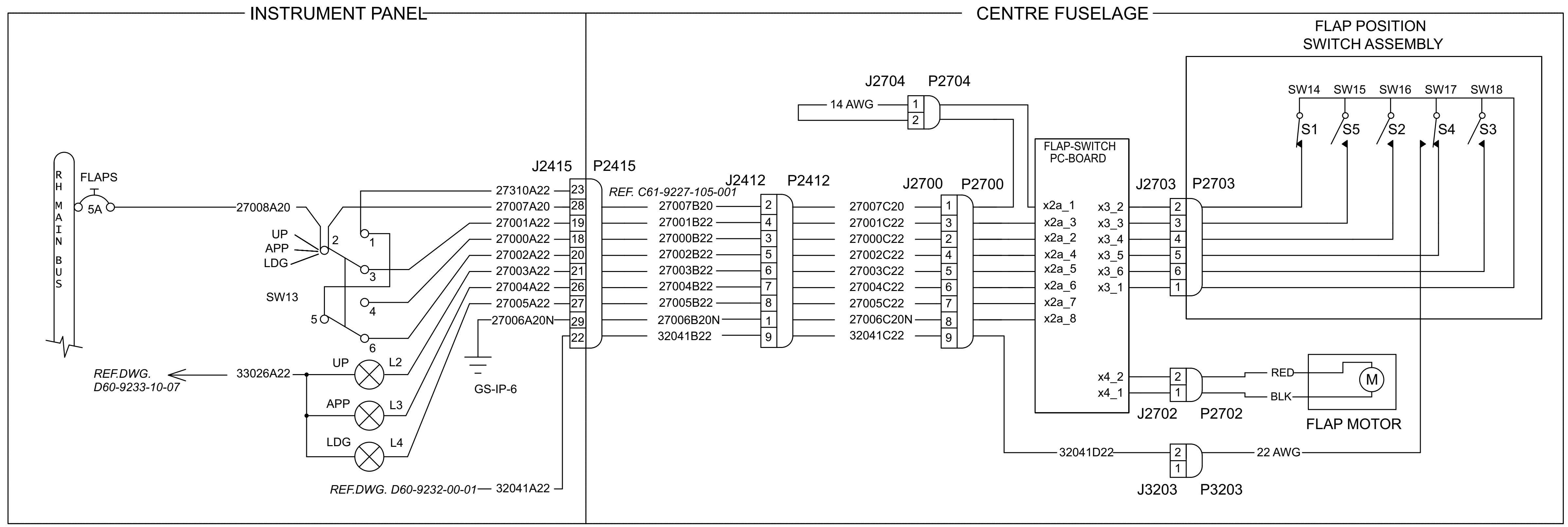
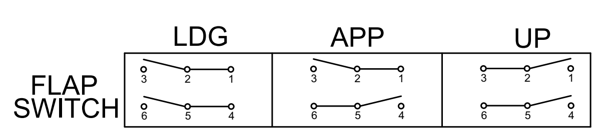
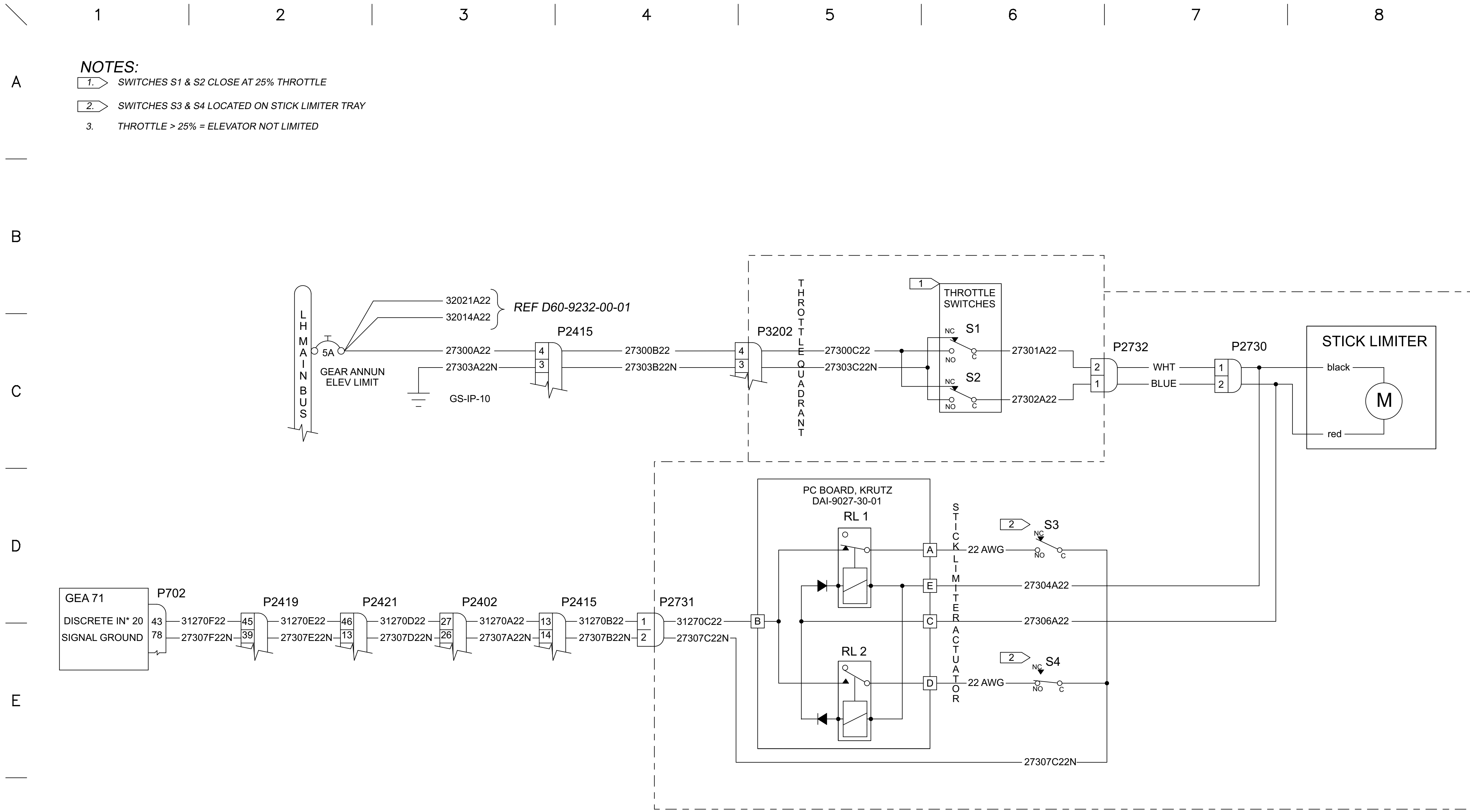


EFFECTIVITY D42L ALL	REV D	D42L360 ELECTRICAL SYSTEM	SCHEMATIC C61-9224-101-001	PAGE 1/1





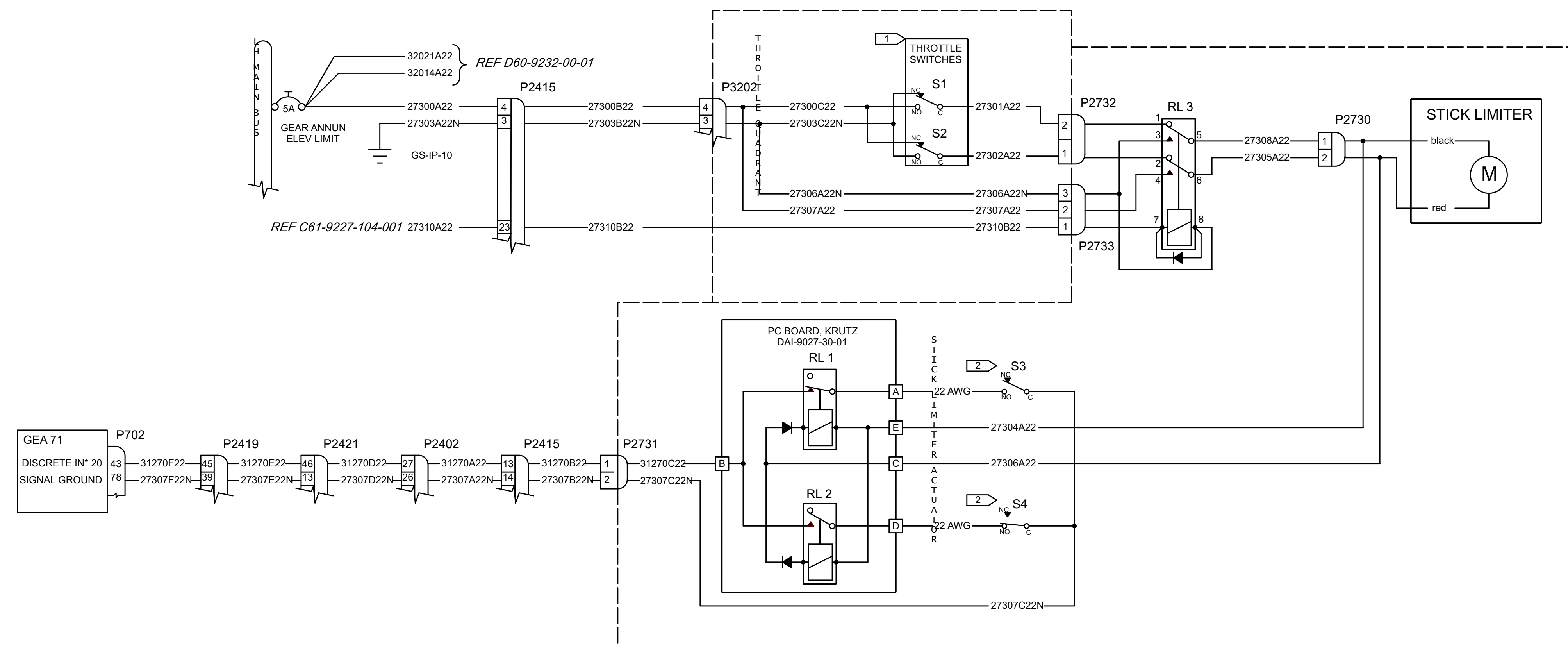
EFFECTIVITY D42L ALL	REV A	FLAP SYSTEM SCHEMATIC	SCHEMATIC C61-9227-104-001	PAGE 1/1



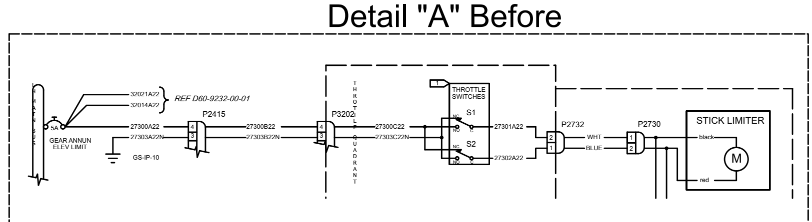
EFFECTIVITY D42L ALL	REV B	STICK LIMITER	SCHEMATIC C61-9227-101-001	PAGE 1/1

NOTES:

1. SWITCHES S1 & S2 CLOSE WHEN MANIFOLD PRESSURE > 14.5"Hg (±0.5"Hg) AT SEA LEVEL
2. SWITCHES S3 & S4 LOCATED ON STICK LIMITER TRAY
3. ELEVATOR NOT LIMITED WHEN MANIFOLD PRESSURE < 14.5"Hg (±0.5"Hg) AT SEA LEVEL



Detail "A" Before



EFFECTIVITY D42L ALL	REV B	STICK LIMITER - FLAPS UP SCHEMATIC	SCHEMATIC C61-9227-105-001	PAGE 1/1

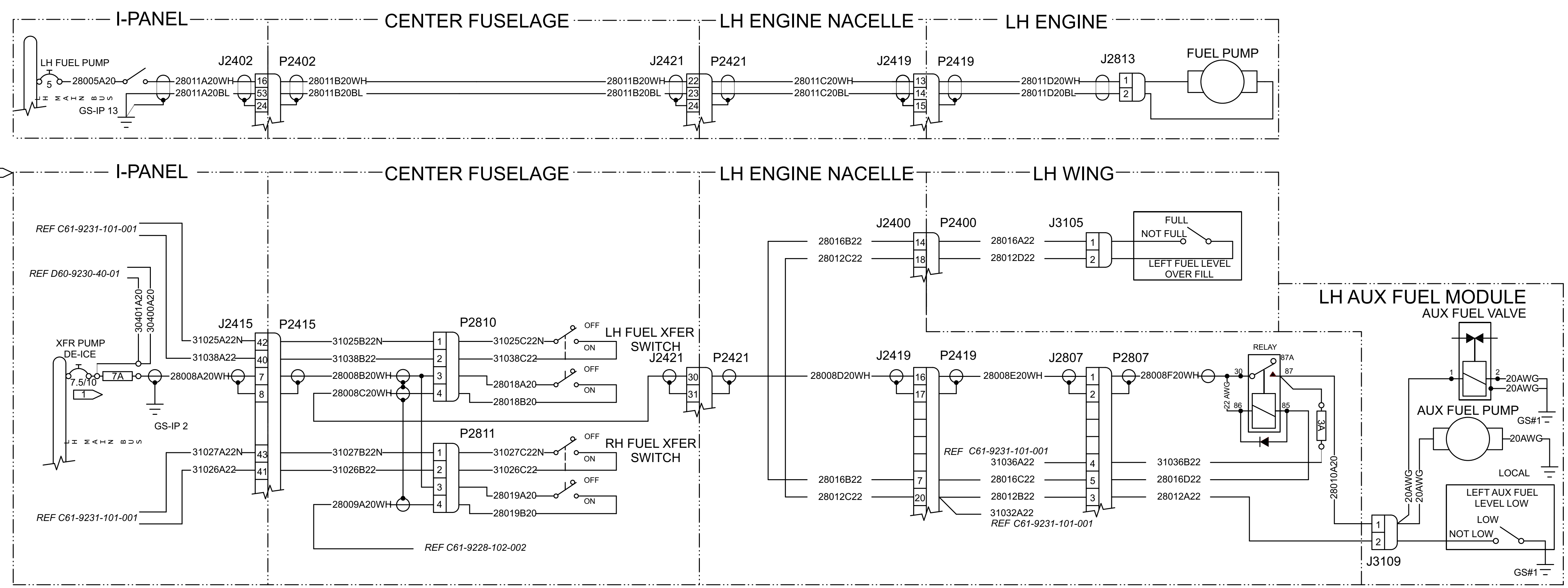
NOTES:

1. DEPENDING ON THE INSTALLED OPTIONS, THE INSTALLATION OF THE CIRCUIT PROTECTIVE DEVICE IS DIFFEERENT.

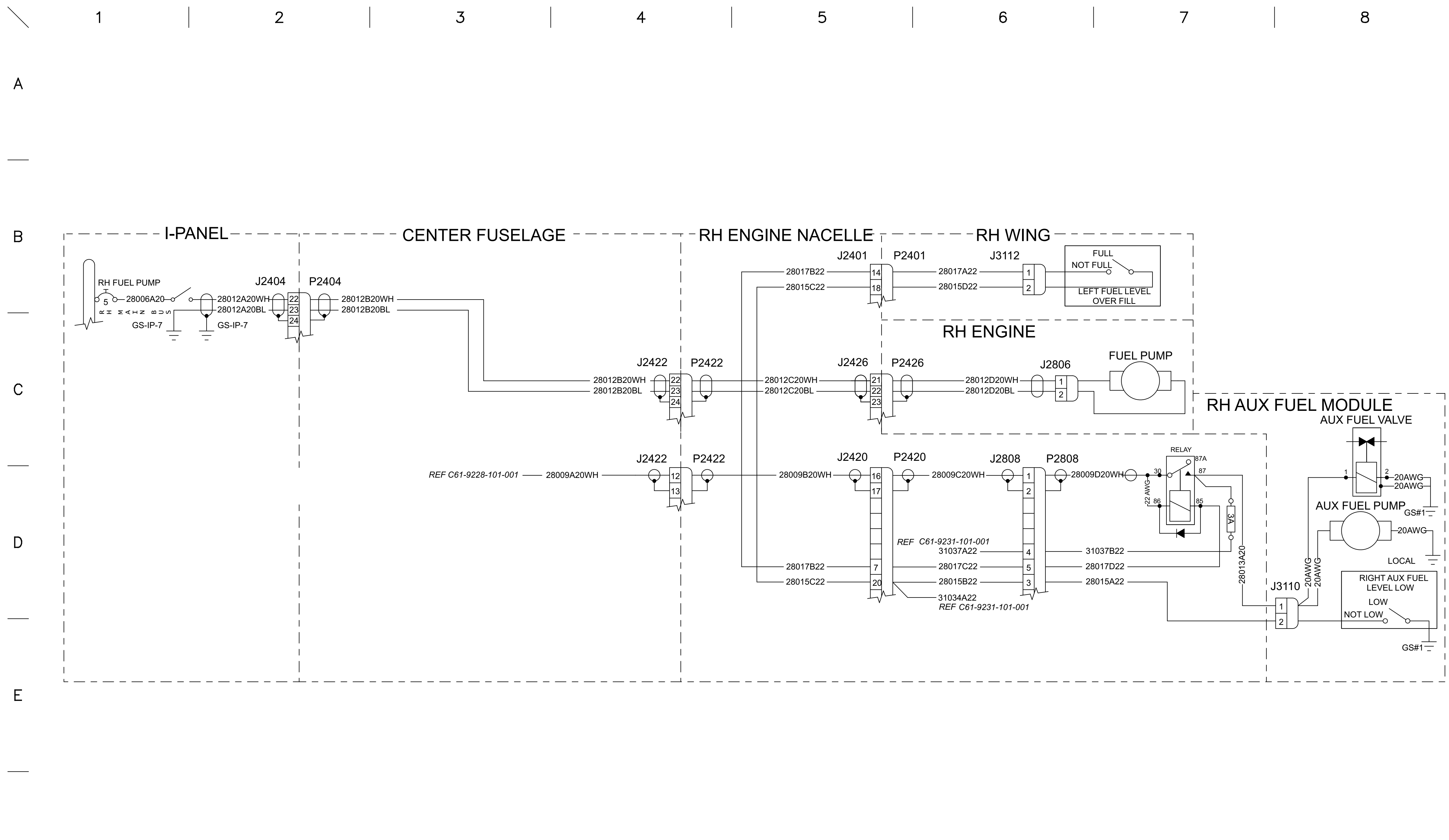
   AUX FUEL SYSTEM ONLY: 7.5A CIRCUIT BREAKER, NO FUSE

   AUX FUEL SYSTEM AND DE-ICE SYSTEM: 10A CIRCUIT BREAKER PLUS A 7A SLOW BLOW FUSE FOR THE AUX FUEL SYSTEM.

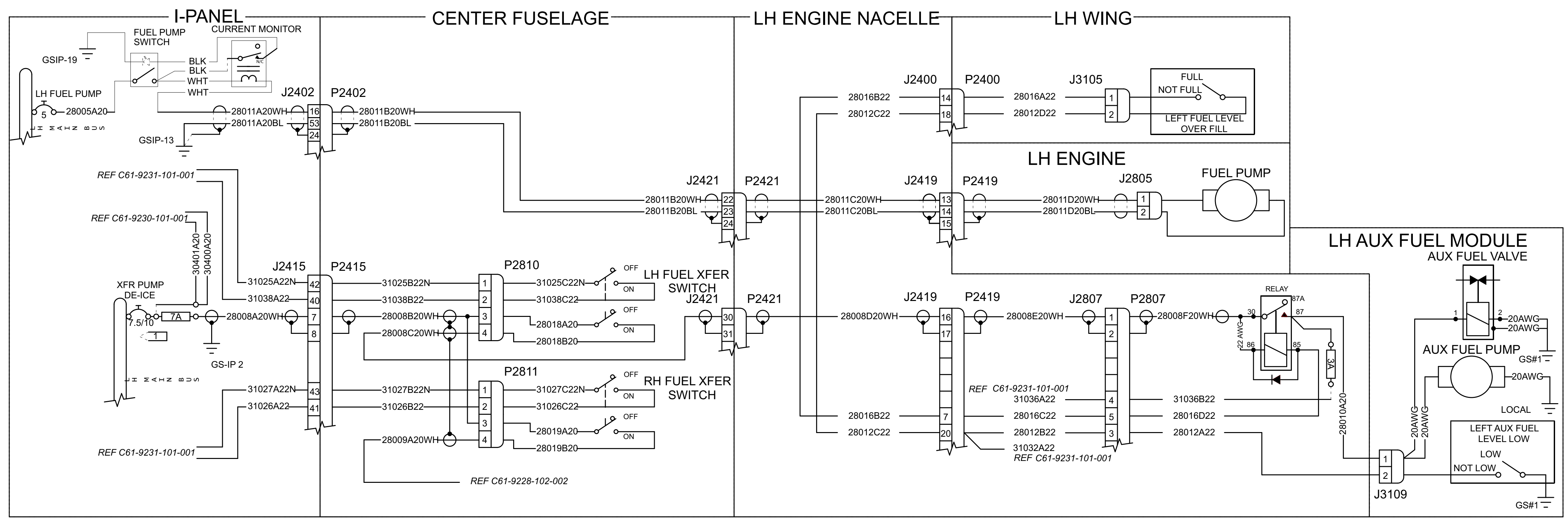
2. FOR AIRCRAFT WITH AUXILARY FUEL TANKS (OAM 42-056)



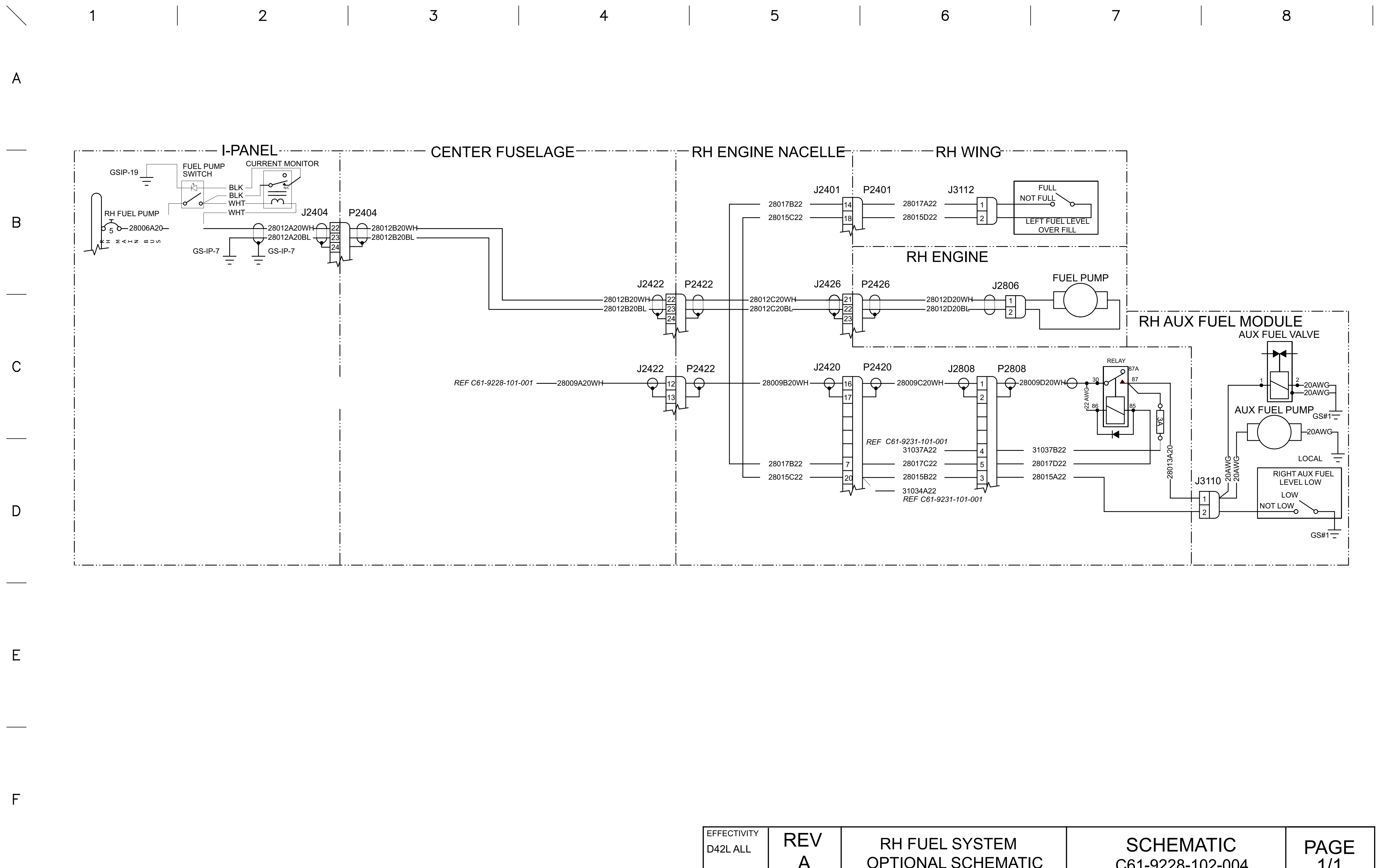
EFFECTIVITY D42L ALL	REV D	LH FUEL SYSTEM	SCHEMATIC C61-9228-101-001	PAGE 1/1

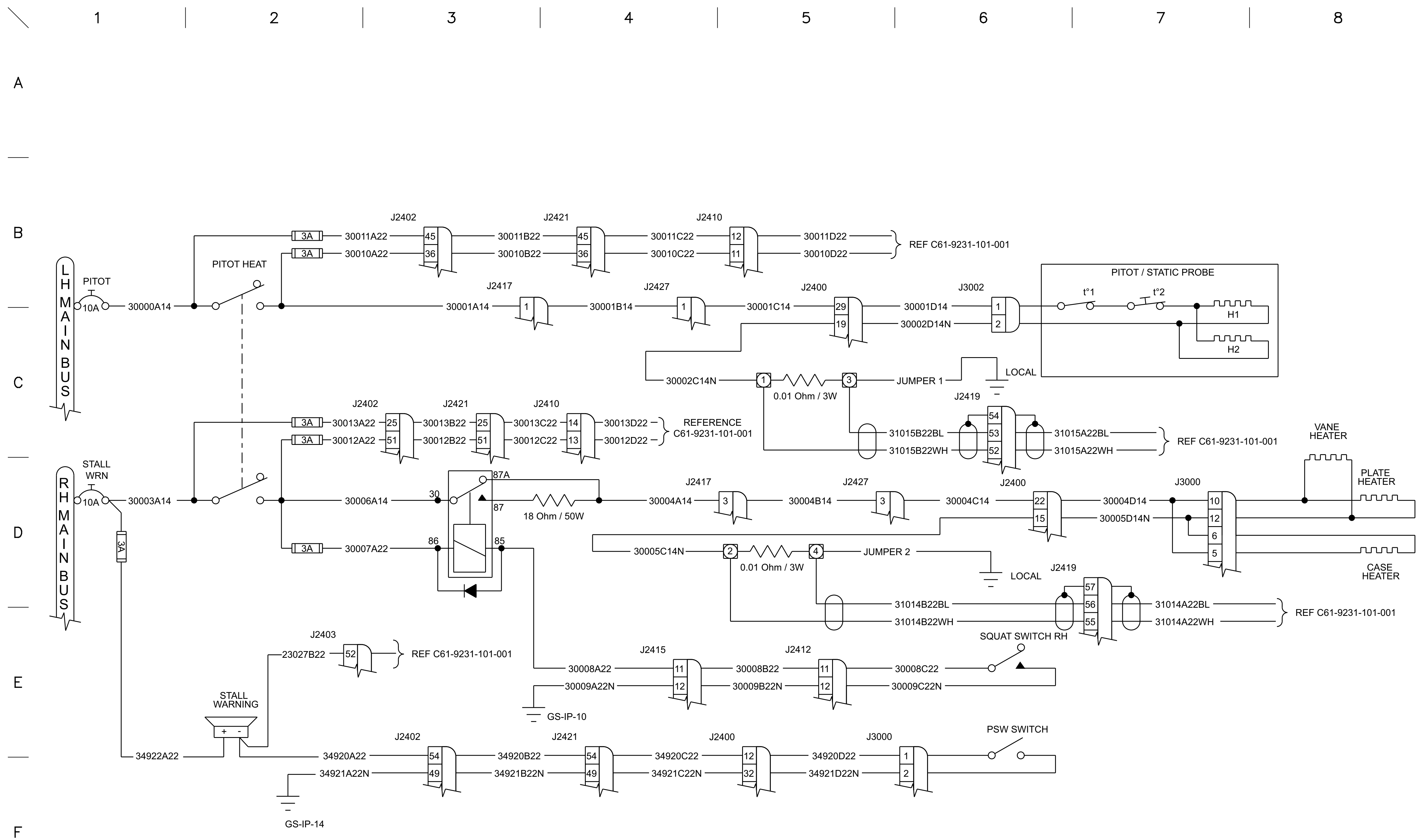


EFFECTIVITY D42L ALL	REV B	RH FUEL SYSTEM	SCHEMATIC C61-9228-101-002	PAGE 1/1



EFFECTIVITY D42L ALL	REV B	LH FUEL SYSTEM OPTIONAL SCHEMATIC	SCHEMATIC C61-9228-101-003	PAGE 1/1


I-PANEL
CENTER FUSELAGE
RH ENGINE NACELLE
RH WING
RH ENGINE
RH AUX FUEL MODULE
GSIP-19
FUEL PUMP SWITCH
CURRENT MONITOR
RH FUEL PUMP
RH MAIN BUS
28006A20
GS-IP-7
J2404
P2404
28012A20WH
28012A20BL
28012B20WH
28012B20BL
J2422
P2422
28012C20WH
28012C20BL
J2426
P2426
28012D20WH
28012D20BL
J2806
FUEL PUMP
J2401
P2401
J3112
28017B22
28015C22
28017A22
28015D22
FULL
NOT FULL
LEFT FUEL LEVEL OVER FILL
REF C61-9228-101-001
28009A20WH
28009B20WH
J2420
P2420
28009C20WH
J2808
P2808
28009D20WH
RELAY
REF C61-9231-101-001
31037A22
31037B22
28017C22
28017D22
28015B22
28015A22
31034A22
28013A20
AUX FUEL VALVE
AUX FUEL PUMP
20AWG
GS#1
LOCAL
J3110
RIGHT AUX FUEL LEVEL LOW
LOW
NOT LOW
EFFECTIVITY
D42L ALL
REV
A
RH FUEL SYSTEM
OPTIONAL SCHEMATIC
SCHEMATIC
C61-9228-102-004
PAGE
1/1



EFFECTIVITY D42L ALL	REV B	TWIN LYCOMING PITOT/STALL HEAT	SCHEMATIC C61-9230-101-001	PAGE 1/1

NOTES:

1. UNLESS OTHERWISE NOTED, ALL STRANDED WIRE MUST CONFORM TO MIL-W-22759/16 OR EQUIVALENT
2. UNLESS OTHERWISE NOTED, ALL SHIELDED WIRE MUST CONFORM TO MIL-C-27500 OR EQUIVALENT
3. UNLESS OTHERWISE NOTED, ALL WIRES ARE 24 GAUGE MINIMUM.
4. SYMBOL DESIGNATIONS
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED SINGLE CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED PAIR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED PAIR SHIELD FLOATS
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 3 CONDUCTOR SHIELD FLOATS
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD TERMINATED TO GROUND
   - TWISTED SHIELDED 4 CONDUCTOR SHIELD FLOATS
   - AIRCRAFT GROUND
   - GARMIN (SHIELD BLOCK) GROUND REFER TO DOC. 190-00313-09
   - WIRE SPLICE CONNECTION
   - COAXIAL CABLE
   - N/C = NO CONNECTION
5. UNLESS OTHERWISE NOTED, ALL SHIELD GROUNDS MUST BE MADE TO THE RESPECTIVE UNIT BACKSHELLS. ALL OTHER GROUNDS SHOULD BE TERMINATED TO AIRCRAFT GROUND AS CLOSE TO THE RESPECTIVE UNIT AS POSSIBLE.
6. USE AIRCRAFT GRADE CATEGORY 5 ETHERNET CABLE.

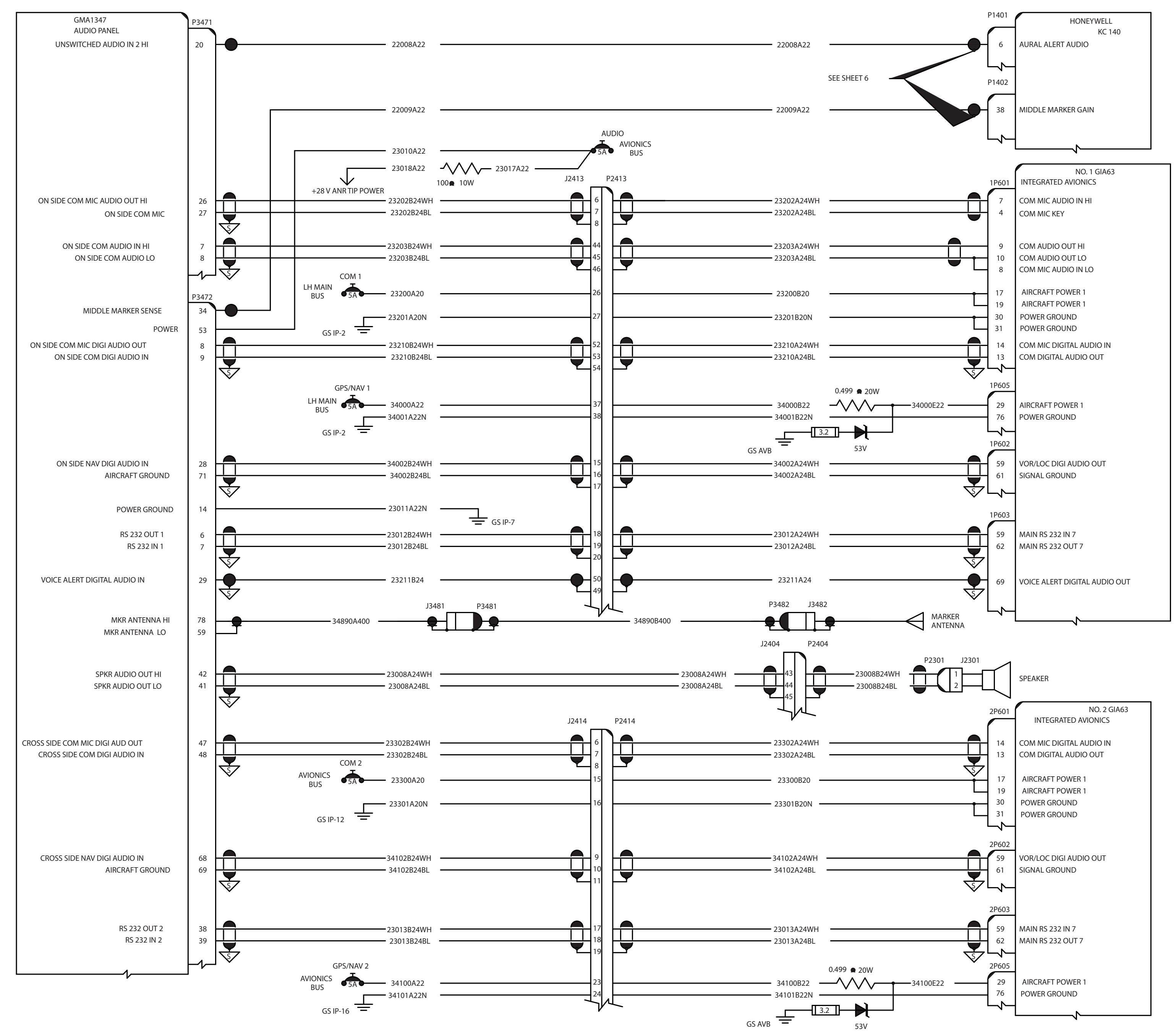
MANUFACTURER	P/N
PIC WIRE AND CABLE	E10422 (22 GAUGE)
PIC WIRE AND CABLE	E10424 (24 GAUGE)
ELECTRONIC CABLE SPECIALIST	392404 (24 GAUGE)

7. INSTALLATION INSTRUCTIONS FOR OAT PROBE, GMU44, GND HARNESS, CONFIGURATION MODULES, AND THERMOCOUPLES.

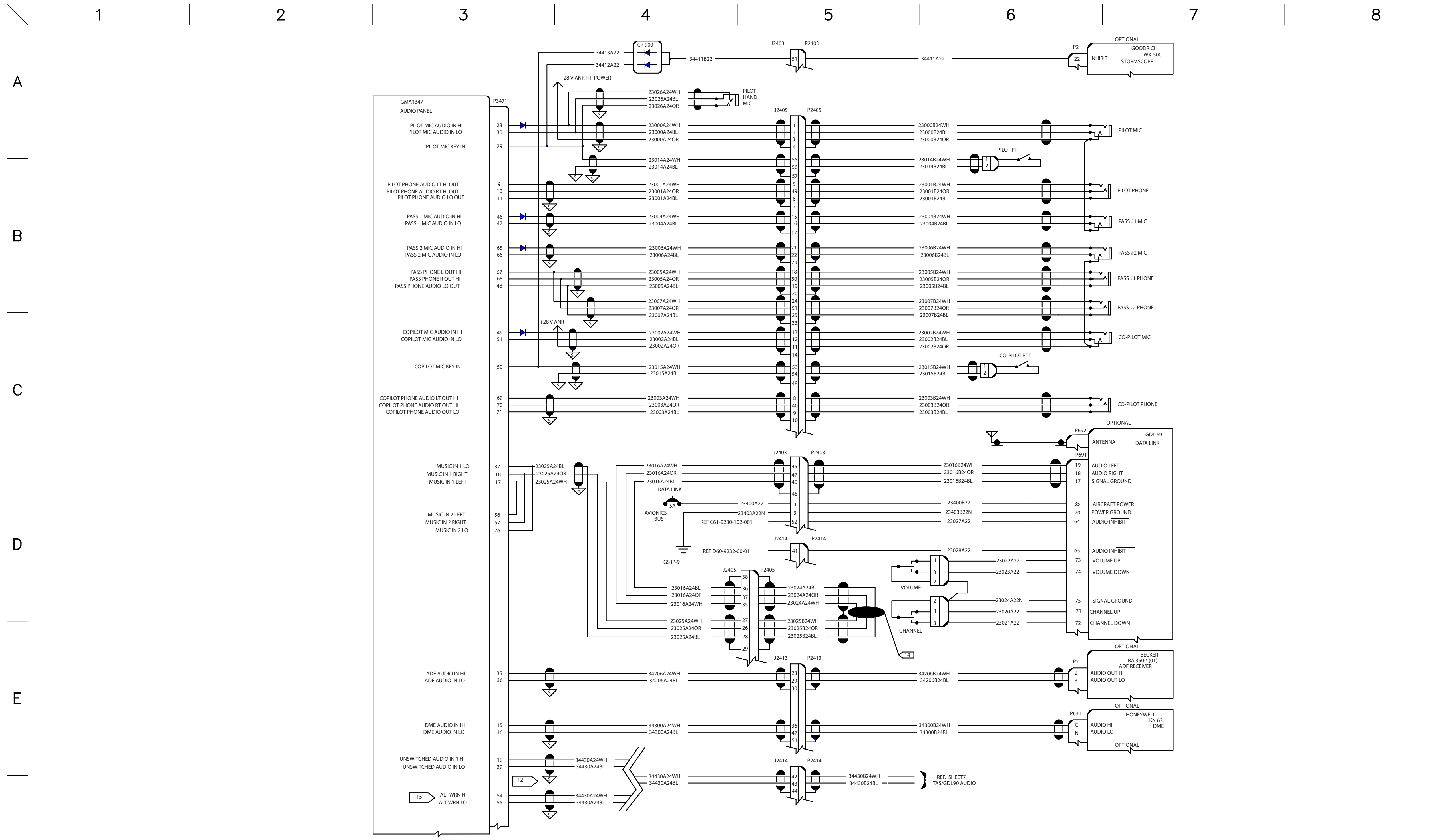
DESCRIPTION	DRAWING NUMBER
INSTR SHEET, OAT PROBE	190-00313-00
INSTR SHEET, GMU44	190-00313-04
INSTR SHEET, CONFIG MODULE	190-00313-02
INSTR SHEET, THERMOCOUPLE	190-00313-01

8. FOR FAN FAIL OUTPUT: OPEN = ACTIVE = FAN FAIL, GROUND = INACTIVE = FAN OK
9. FOR TRIM FAIL OUTPUT: GROUND = ACTIVE = TRIM FAIL, OPEN = INACTIVE = TRIM OK
10. RELATED DOCUMENTS
    190-00295-27 UNIT INTERCONNECT SUMMARY.
    190-00295-28 UNIT POWER.
    190-00295-29 INTERCONNECT.
11. FOR GROUNDING PROCEDURE REFER TO GARMIN DOCUMENTS 190-00313-00 AND 190-00313-04. ADDITIONAL FOR IFR OPERATION, REFER TO GARMIN DOCUMENT 190-00313-09.
    REV 2 UNITS HAVE SERIAL NUMBERS LESS THAN 46901600
    REV 3 UNITS HAVE SERIAL NUMBERS OF 46901600 OR GREATER
12. EITHER AVIDYNE TAS SYSTEM OR GDL90 SYSTEM MAY BE INSTALLED, NOT BOTH.
13. GDL90 PROVISIONAL WIRING INSTALLED.
14. WIRES SPLICED TOGETHER ONLY IF GDL69 DATA LINK INSTALLED.
15. PROVISONAL GDL90 PIN DESIGNATIONS.

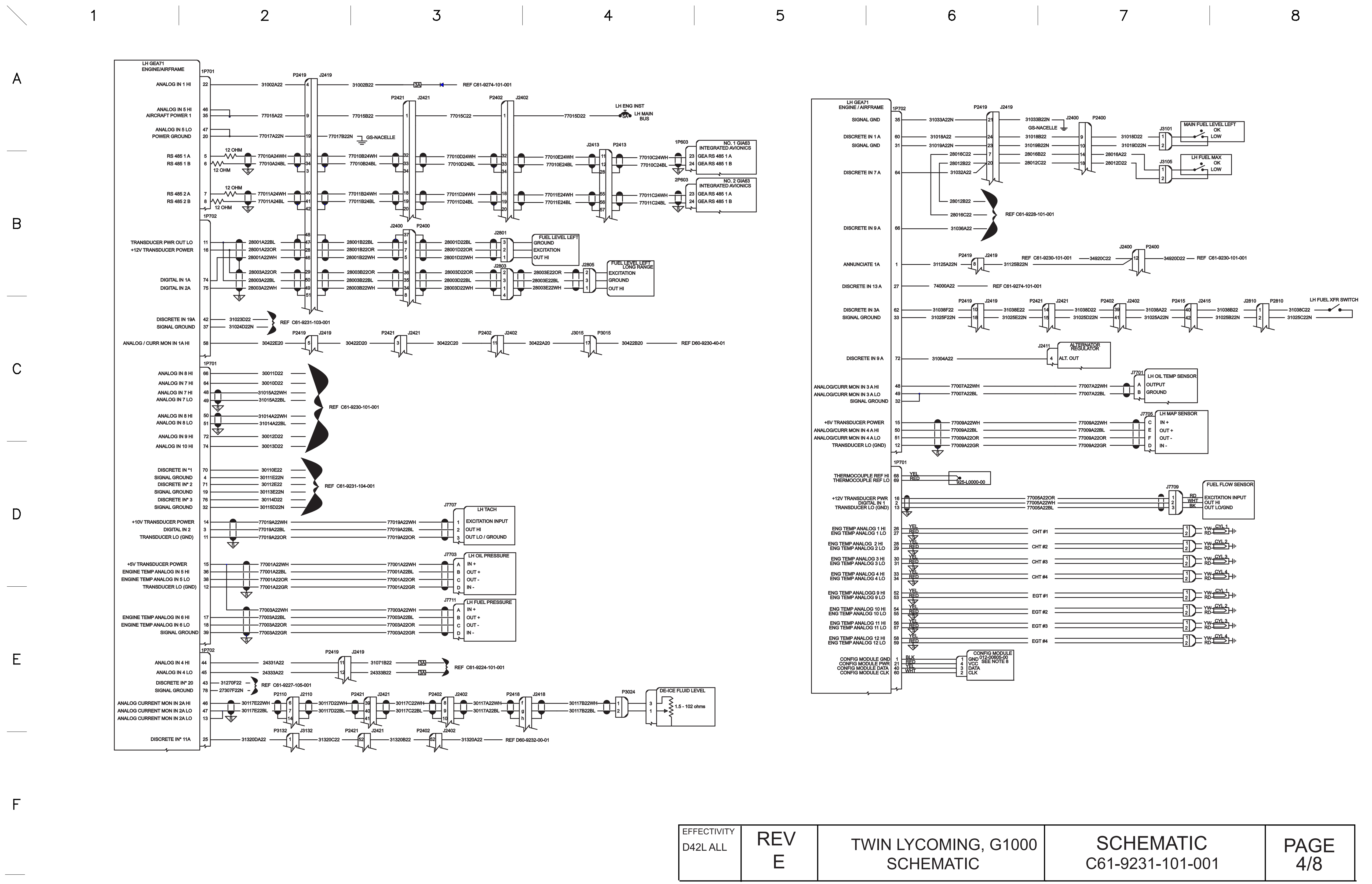
EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 1/8



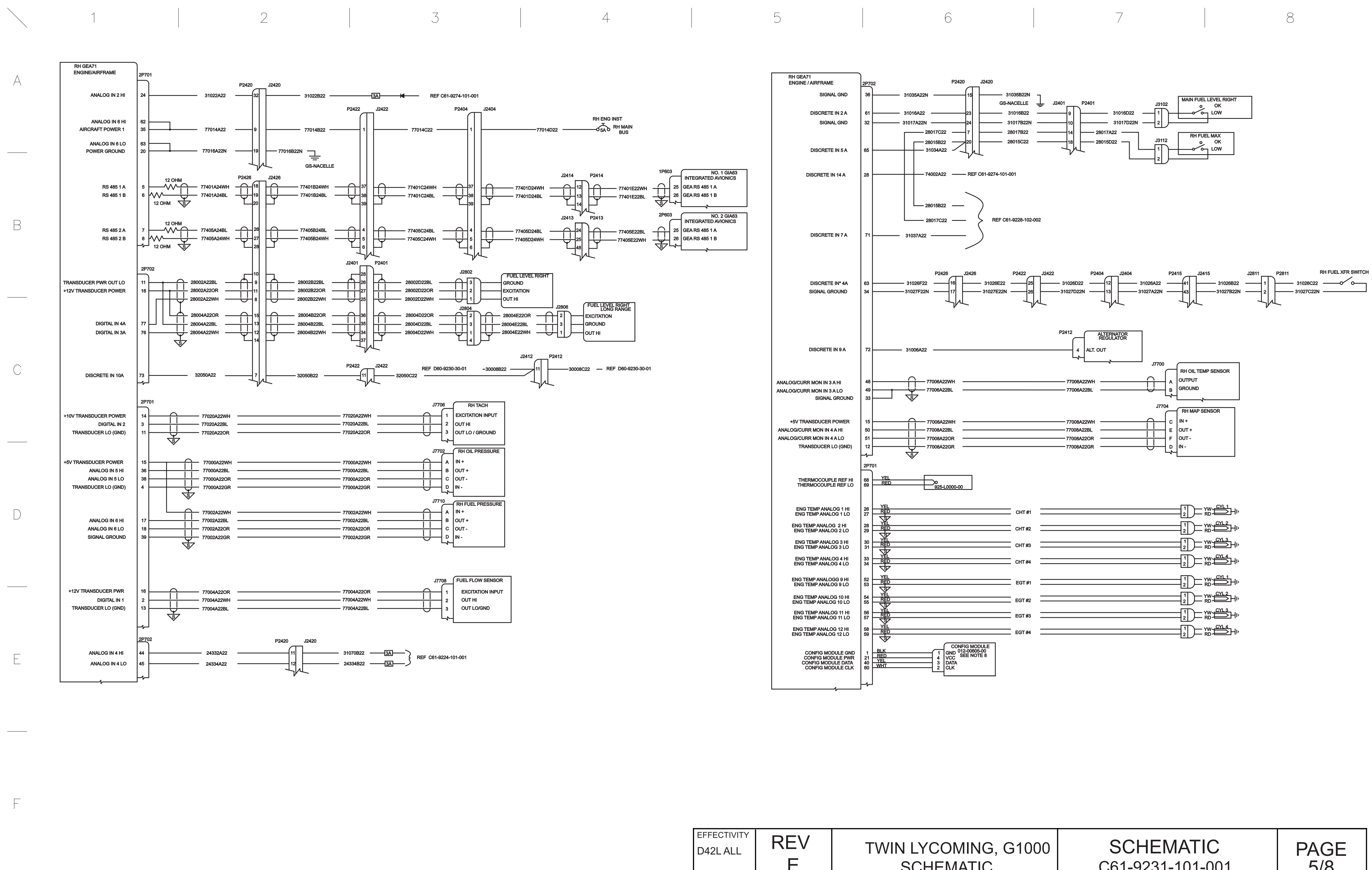
EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 2/8



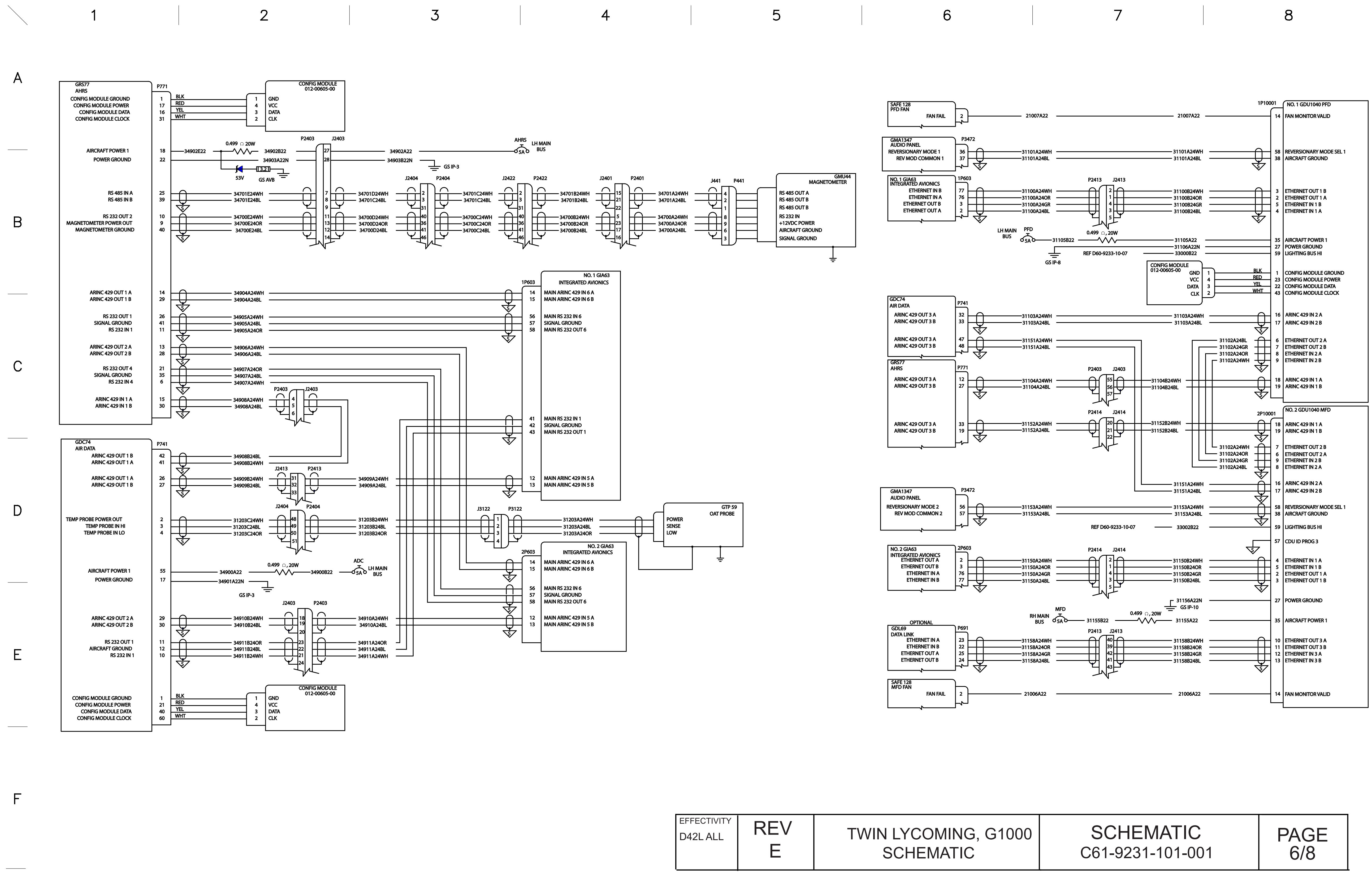
EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 3/8



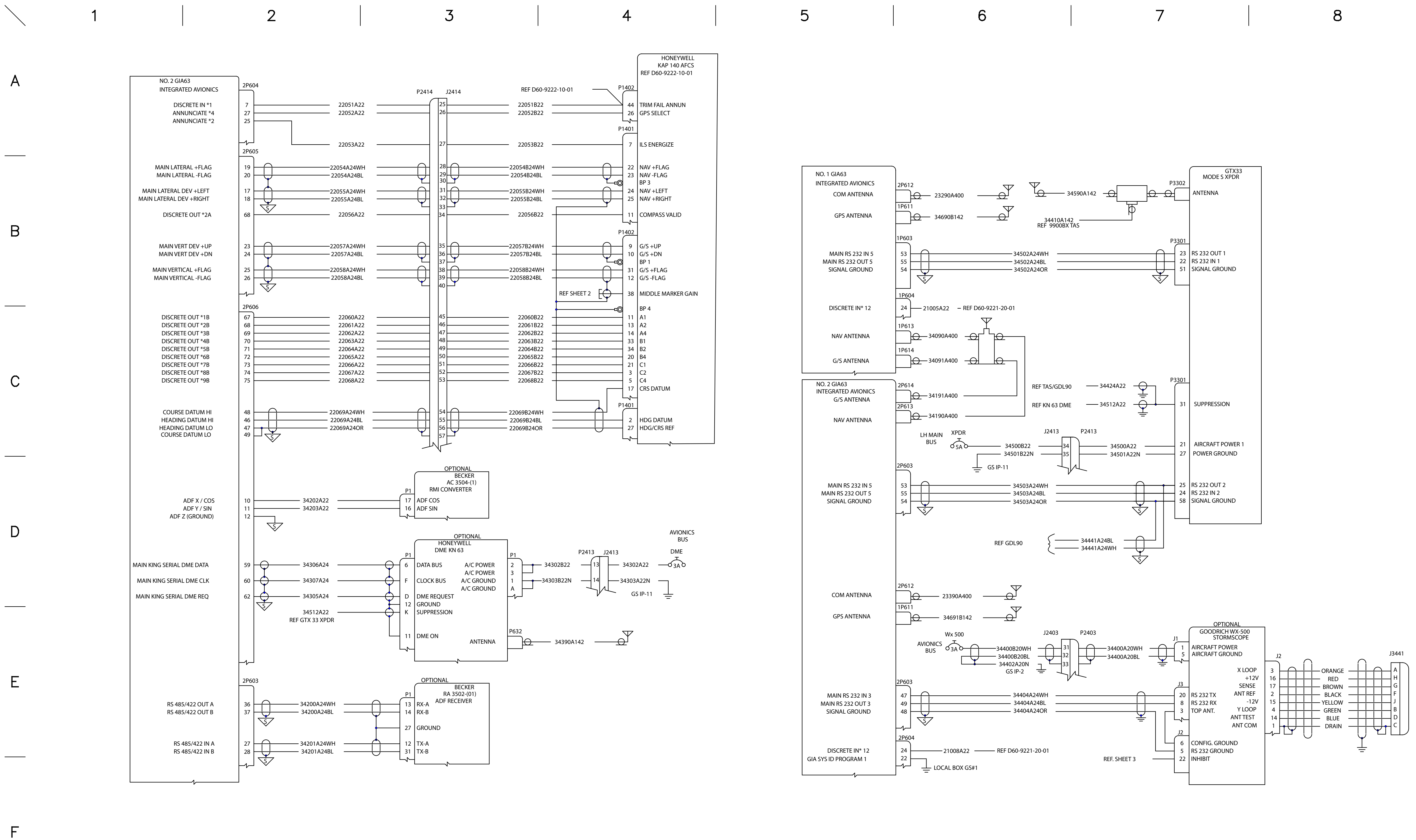
EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 4/8



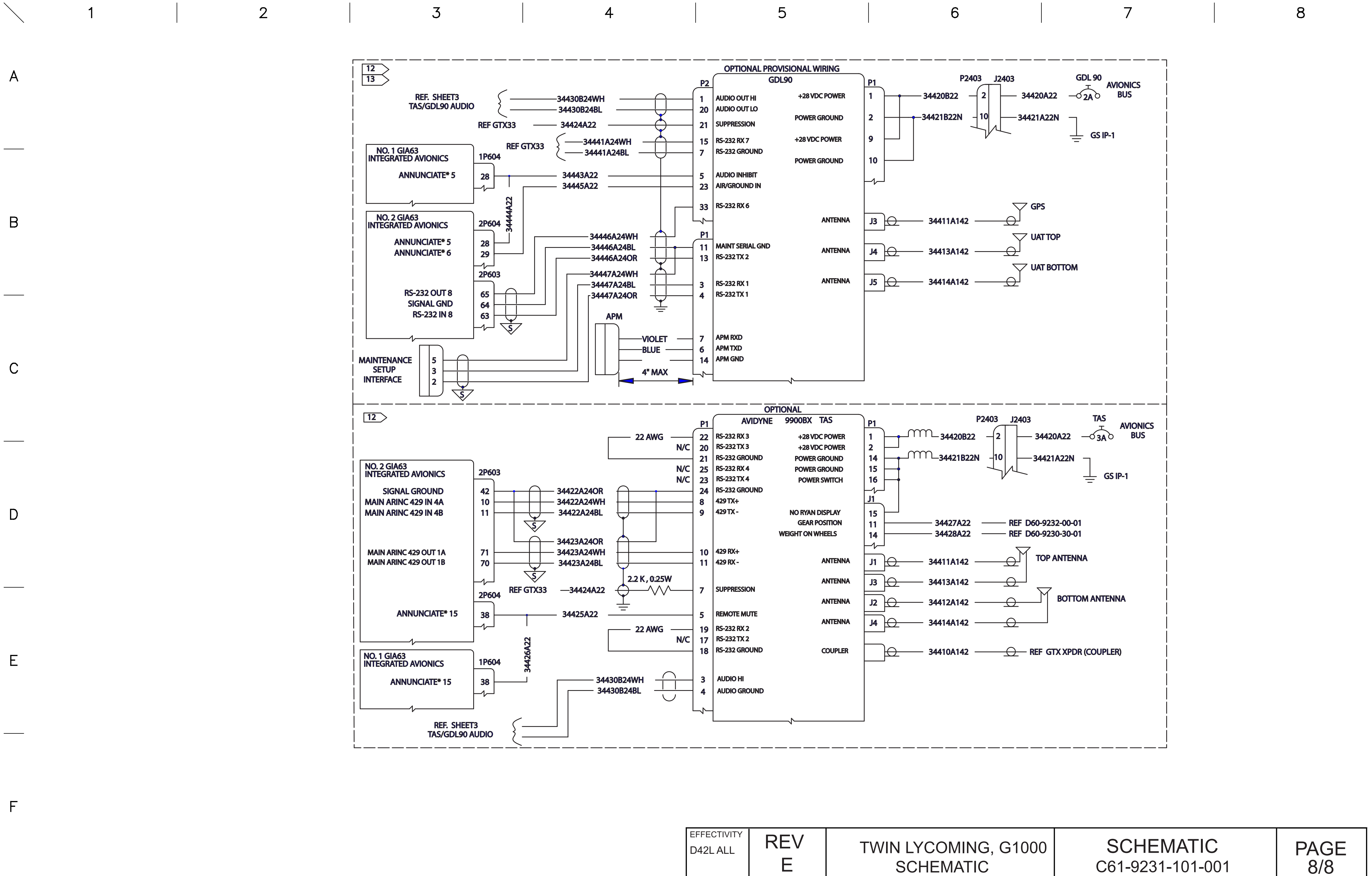
EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 5/8



EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 6/8

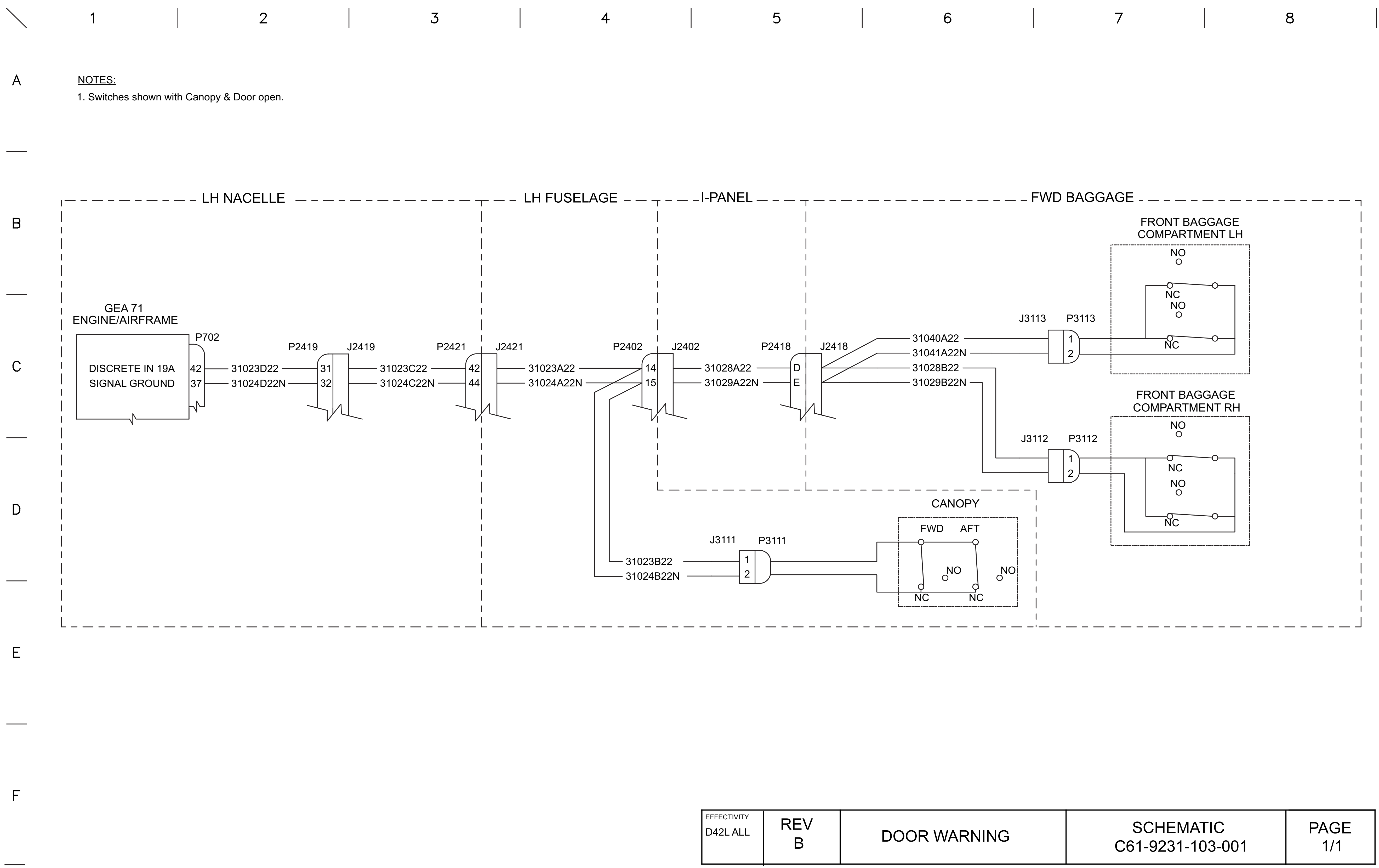


EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 7/8

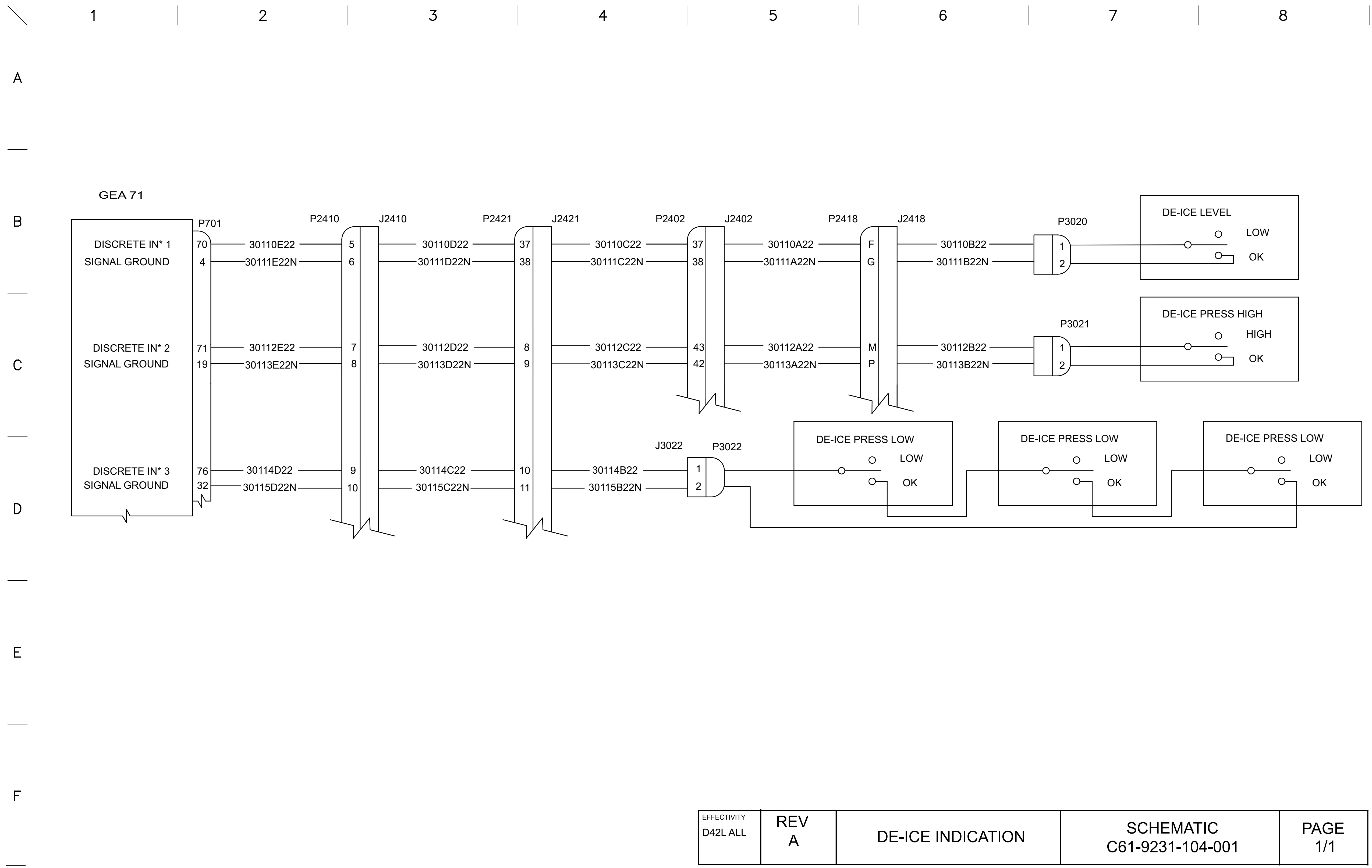


EFFECTIVITY D42L ALL	REV E	TWIN LYCOMING, G1000 SCHEMATIC	SCHEMATIC C61-9231-101-001	PAGE 8/8

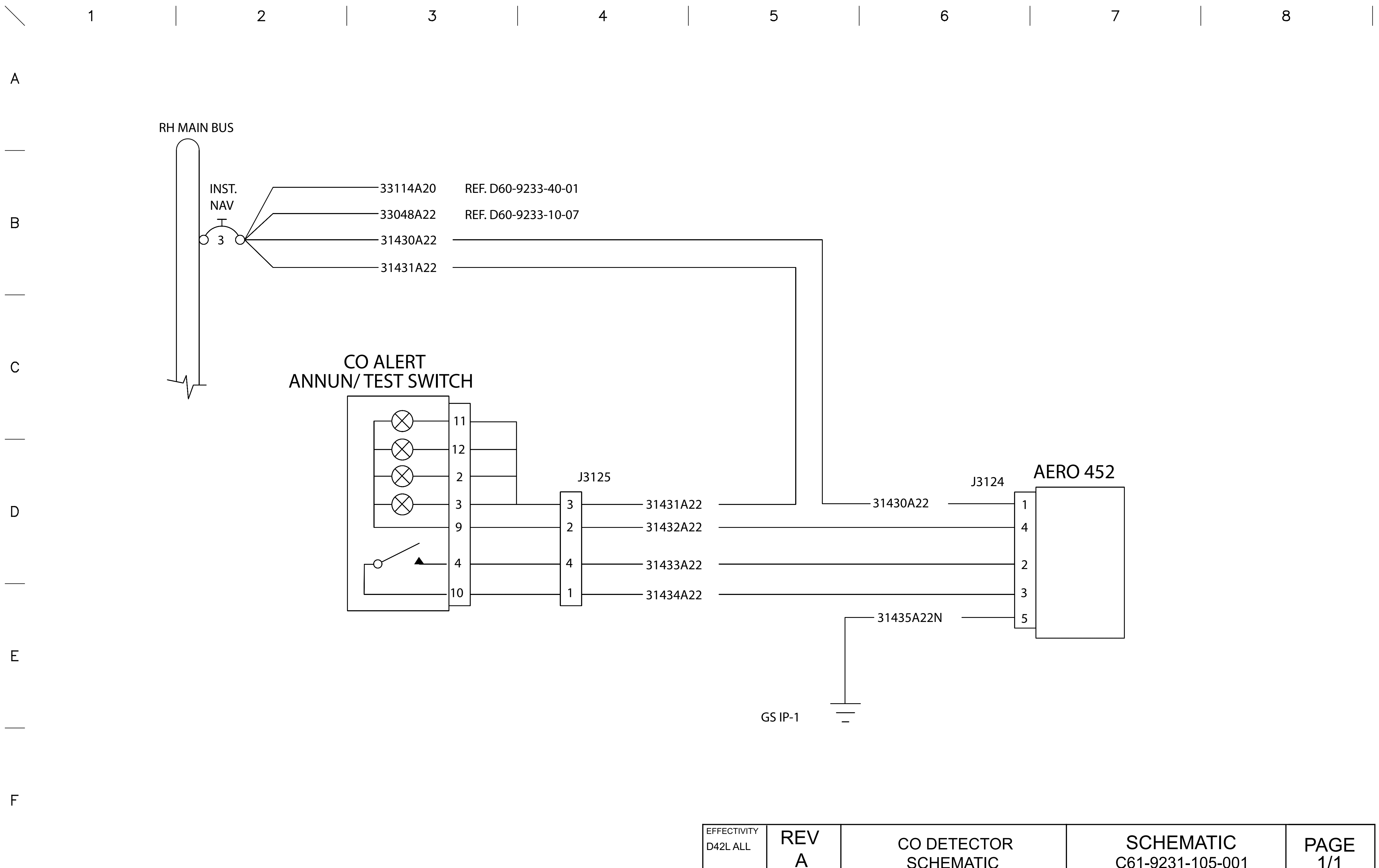
NOTES:
1. Switches shown with Canopy & Door open.



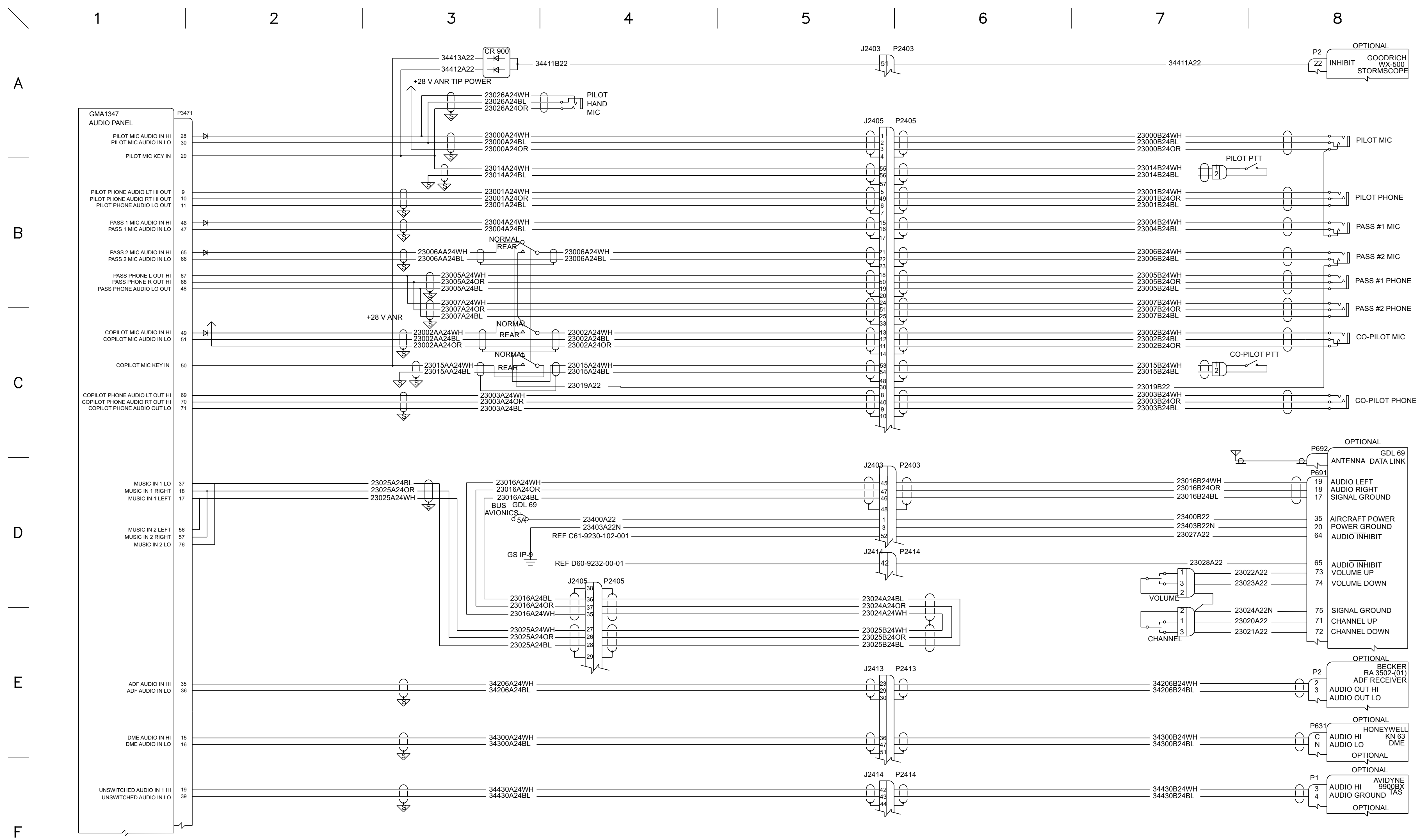
EFFECTIVITY D42L ALL	REV B	DOOR WARNING	SCHEMATIC C61-9231-103-001	PAGE 1/1



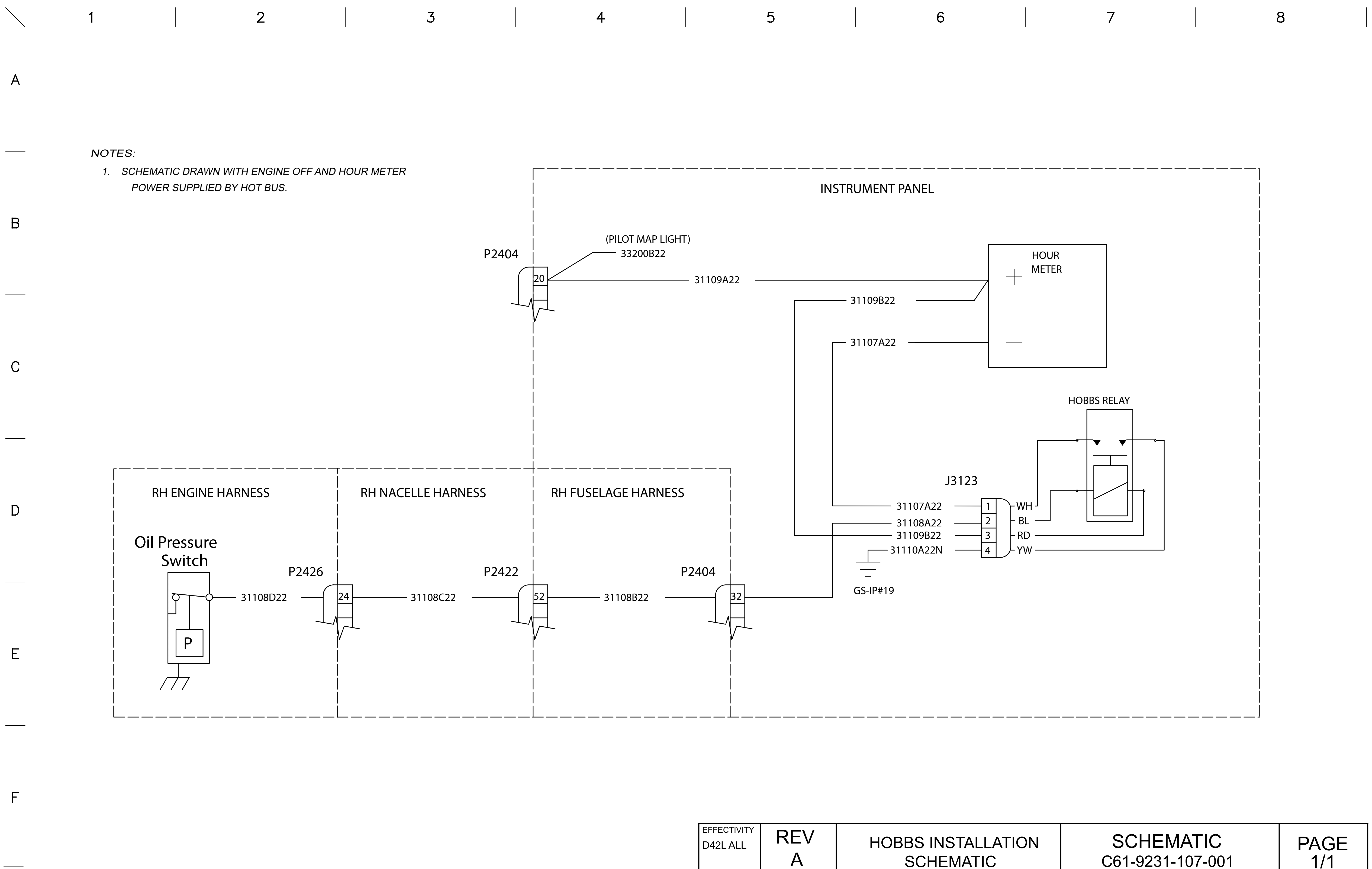
EFFECTIVITY D42L ALL	REV A	DE-ICE INDICATION	SCHEMATIC C61-9231-104-001	PAGE 1/1



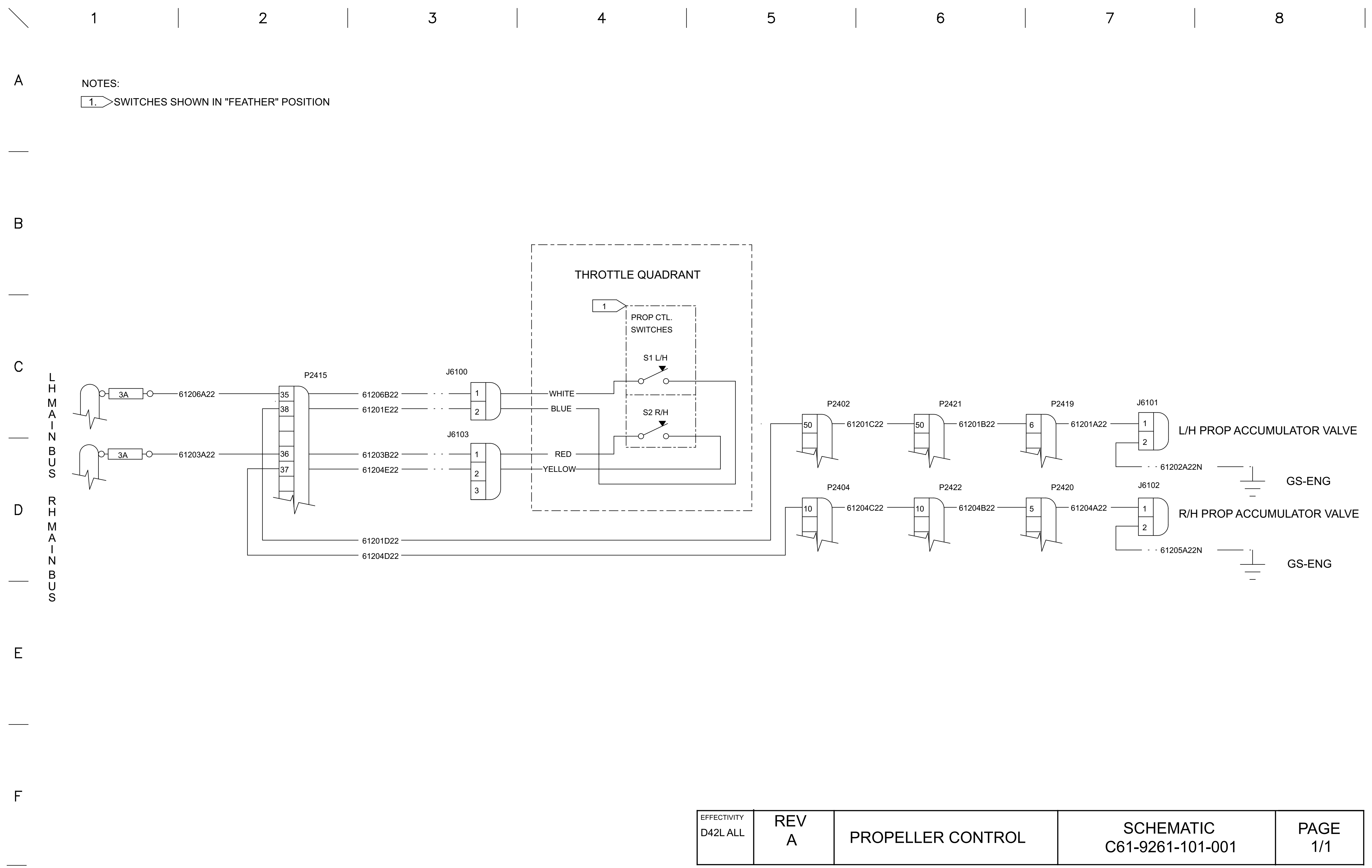
EFFECTIVITY D42L ALL	REV A	CO DETECTOR SCHEMATIC	SCHEMATIC C61-9231-105-001	PAGE 1/1



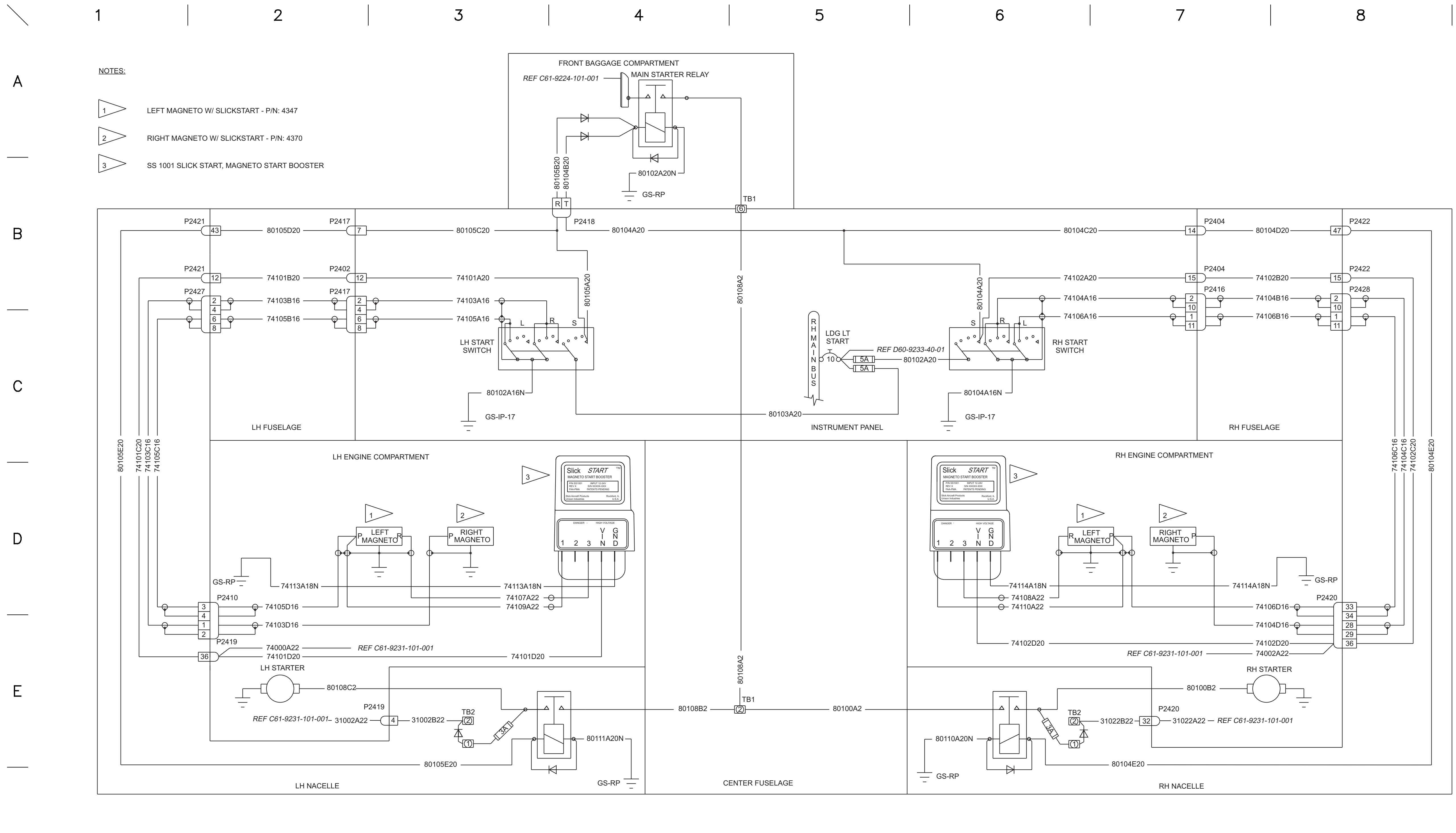
EFFECTIVITY D42L ALL	REV A	AUDIO PANEL CO-PILOT AUDIO XFR OPTION	SCHEMATIC C61-9231-106-001	PAGE 1/1



EFFECTIVITY D42L ALL	REV A	HOBBS INSTALLATION SCHEMATIC	SCHEMATIC C61-9231-107-001	PAGE 1/1



EFFECTIVITY D42L ALL	REV A	PROPELLER CONTROL	SCHEMATIC C61-9261-101-001	PAGE 1/1



EFFECTIVITY D42L ALL	REV A	IGNITION AND STARTING	SCHEMATIC C61-9274-101-001	PAGE 1/1