

LIST OF EFFECTIVE CHAPTERS

Chapter Title	Date*
GENERAL	
Introduction	02.03.10
04 Airworthiness Limitations	28.10.05
05 Time Limits / Maintenance Checks	25.11.10
06 Dimensions and Areas	26.04.05
07 Lifting & Shoring	02.03.10
08 Leveling and Weighing	27.09.01
09 Towing and Taxiing	02.03.10
10 Parking, Mooring, Storage & Return to Service	02.03.10
11 Placards and Markings	30.04.08
12 Servicing	26.04.05
AIRFRAME SYSTEMS	
20 Standard Practices Airframe	26.04.05
21 Ventilation and Heating	08.07.02
23 Communications	30.04.08
24 Electrical Power	26.04.05
25 Equipment and Furnishings	15.09.09
27 Flight Controls	02.03.10
28 Fuel	25.11.10
31 Indicating/Recording Systems	30.04.08
32 Landing Gear	15.03.02
33 Lights	25.11.10
34 Navigation	30.04.08
STRUCTURES	
51 Structures	22.03.02
52 Doors	30.04.08
53 Fuselage	14.05.02
55 Stabilizers	14.05.02
57 Wings	18.01.06
PROPELLER	
61 Propeller	26.04.05

LIST OF EFFECTIVE CHAPTERS

Chapter Title	Date*
POWER PLANT	
71 Power Plant	26.04.05
74 Ignition	29.10.01
75 Engine Cooling System	26.04.05
76 Engine Controls	26.04.05
77 Engine Indicating	26.11.01
78 Exhaust	07.11.01
79 Oil	07.11.01
80 Starting	05.11.01
91 Charts and Wiring Diagrams	30.04.08

* The date refers to the issue / revision date of the respective chapter.

CHAPTER 5

TIME LIMITS / MAINTENANCE CHECKS



TABLE OF CONTENTS

<u>Title</u>	<u>Chapter Section Subject</u>	<u>Page</u>
TIME LIMITS / MAINTENANCE CHECKS - GENERAL	05-00-00	1
Introduction	05-00-00	1
General Description	05-00-00	1
COMPONENT TIME LIMITS	05-00-01	1
General	05-00-01	1
Component Time Limits	05-00-01	1
SCHEDULED MAINTENANCE CHECKS.....	05-20-00	1
General	05-20-00	1
Inspection Time Intervals Chart AQUILA AT01	05-20-00	1
DAILY INSPECTIONS	05-30-00	1
General	05-30-00	1
Preflight Inspection	05-30-00	1
After Flights	05-30-00	1
UNSCHEDULED MAINTENANCE CHECKS	05-50-00	1
General	05-50-00	1
Special Inspections	05-50-00	1



TIME LIMITS / MAINTENANCE CHECKS - GENERAL

1. Introduction

- A. This chapter provides scheduled and unscheduled maintenance checks and inspections for the AQUILA AT01, recommended by the Type Certificate Holder AQUILA Aviation by Excellence AG as well as the time limits for service life limited components and parts.

2. General Description

In the following, a brief description and intended purpose of each section of this chapter is given.

- A. Section 05-00-00 - Time limits / Maintenance Checks - General. This section provides a general overview of the content and purpose of this chapter.
- B. Section 05-00-01 – Component Time Limits. This section contains the time limits of all service life limited components and parts and recommended time between overhaul (TBO) for components.
- C. Section 05-20-00 - Scheduled Maintenance Checks. This section contains information about recommended scheduled maintenance and inspections. The recommended maintenance and Inspection Program for the systems and components of the AQUILA AT01 as well as the relevant intervals are embodied in a checklist included in this section.
- D. Section 05-30-00 - Daily Inspections. In this section the preflight check and the checks after flights are described.
- E. Section 05-50-00 - Unscheduled Maintenance Checks. This section specifies checks, which have to be conducted after unusual events and incidences such as hard landings.



COMPONENT TIME LIMITS

1. General

- A. Different components and parts of the aircraft are certified for specific service life. When reaching this time limit, the respective item must be replaced or overhauled.
For monitoring the permissible service life the installation or removal of each item must be recorded in the aircraft logbook.

2. Component Time Limits

- A. Under specific circumstances the replacement or overhaul of components may be required before attaining the time limits as listed below.
- B. Replacement time limits, mandated by the type certificate holder AQUILA Aviation by Excellence AG:

Chapter	Component / Part	Replacement Time	Overhaul
25	Restraint Assy Pilot / Co-Pilot	12 years	no
32	Rubber Elements of the Elastomer Spring Package at the Nose Gear	5 years	no
32	Flexible Hoses of the Aircraft Brake System	10 years	no
71	Engine Shock Mounts	2000 h or 15 years, whichever comes first.	no

C. Vendor Established Component Time Limits

Chapter	Component / Part	Replacement Time	Overhaul
25	ELT Battery	Note 1	no
25	Fire Extinguisher Air Total	10 years	Note 4
25	Fire Extinguisher H3R	12 years	no
61	Propeller MTV-21-A/175-05	2000 h or 72 months from installation, whichever comes first.	Note 2
61	Propeller Governor Woodward	1500 h or 12 years, whichever comes first.	With Engine
61	Propeller Governor P-410-13	2000 h or 72 months, whichever comes first.	Note 2
61	Propeller Governor P-850-12	2000 h or 72 months, whichever comes first.	Note 2
71	Engine ROTAX 912S	2000 h or 15 years, whichever comes first.	Note 3
71	ROTAX Mechanical Fuel Pump	5 years	no
71	ROTAX Flexible Fuel Lines	5 years	no
71	ROTAX Rubber Parts of Carburetors	5 years	no
71	Rubber Hoses of the Engine Cooling System	5 years	no

NOTES:

Note 1: Refer to manufacturers instructions for battery replacement time limits.

- Note 2: Refer to latest issue of the mt-propeller Service Bulletin No. 1.-(), and to the mt-propeller E-124 Operation and Installation Manual.
- Note 3: Refer to the latest issues of BRP-Rotax concerning the **Time Between Overhaul**, i.e. Service Bulletins, Service Information, and to the ROTAX Aircraft Engines Maintenance Manual for ROTAX Engine Type 912 Serie.
- Note 4: Refer to manufacturers instruction for overhauling.



SCHEDULED MAINTENANCE CHECKS

1. General

- A. The inspection time intervals chart contained in this chapter provides the recommended intervals at which maintenance and maintenance checks are to be carried out on the aircraft.

Annual inspections and 100 hour inspections on the AQUILA AT01 must include all inspection items as required by FAR 43, Appendix D, Scope and Detail of annual/100 hour inspections. The chapter 4 „Airworthiness Limitations“ in front of this manual prescribes the inspection intervals on the AQUILA AT01 for the retention of airworthiness.

The following inspection time intervals chart represents an aircraft specific documentation of these inspections. It is not to be utilized as the primary checklist for inspection of the aircraft.

- B. Under specific circumstances, maintenance intervals can become shorter, if the aircraft is operating under conditions, which differ from normal environmental conditions.

2. AQUILA AT01 Inspection Time Interval Chart

- A. The maintenance and checks listed in the following chart are to be practiced in the specified periods and are to be documented in a required manner.

NOTE: For new aircraft the first check is to be accomplished at 25 hours. The scope of this check should be like a 100-hour inspection.

- B. NOTES: R* Maintenance Manual for ROTAX Engine Type 912 Series (refer to List of Vendor publications in the Introduction section of this manual).
MT* mt-propeller E-124 Operation and Installation Manual (refer to List of Vendor publications in the Introduction section of this manual).
TSN Time Since New

C. AQUILA AT01 Inspection Time Intervals Chart:

Aircraft S/N		Operating Hours		Registration Number	
Engine S/N		Operating Hours TTSN / TTSO:		Date	
Propeller S/N		Operating Hours TTSN / TTSO:		Type of Inspection	

No.	Pre-Inspection / Engine Ground Test	Reference	Interval 100 h Add.	Initials
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1.	<p>Check that the following documents up-to-date and available upon request.</p> <ul style="list-style-type: none"> - AT01 Maintenance Manual; - AT01 Airplane Flight Manual; - Aircraft Log Book and Required Certificates; - Engine and Propeller Log Books - Equipment List and Weight and Balance Record; - Airworthiness Directives; - Service Bulletins and Service Information; - Services Time Record. 	AT01 Maintenance Manual, AT01 Airplane Flight Manual	X		
2.	Engine and Engine Compartment - Clean for leakage check.	R* 12-00-00 Sec. 2.1	X		
3.	<p>Perform an engine test run as follows: Start engine and warm-up at 820 RPM for approx. 2 minutes, continue at 1030 RPM, duration depending on ambient temperature until oil temperature reaches 50° C.</p> <p>Rudder Pedal Brakes and Parking Brake - Check for proper operation</p> <p>Propeller Governor - Set 1700 RPM and note the manifold pressure, then reduce engine speed by moving the propeller control for 200 RPM. Note the RPM drop and manifold pressure. Increase RPM to 1700 RPM. Repeat three times.</p> <p>RPM drop: _____ RPM / Man. Press : _____ in.Hg</p> <p>Engine Instruments - Check engine parameters.</p> <p>Magneto RPM Drop - Set 1700 RPM. Check that RPM drop is below 120 RPM while operating on one magneto and no more than a 50 RPM drop difference between left and right magnetos.</p> <p>RPM drop left magneto : _____ RPM RPM drop right magneto: _____ RPM</p>	<p>R* 12-00-00 Sec. 2.8</p> <p>32-40-00</p> <p>MT* E-124</p> <p>R* 12-00-00 Sec. 2.8</p>	X		

No.	Pre-Inspection / Engine Ground Test (Cont.)	Reference	Interval 100 h Add.		Initials
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	<p>Carburetor Heat - Pull carburetor heat knob at 1700 RPM. Engine RPM should show a drop of at least 20 RPM.</p> <p>RPM drop: _____ RPM</p> <p>Engine Full Power - Advance throttle to full forward. Tachometer should read 2265 ± 50 RPM.</p> <p>Full power RPM: _____ RPM</p> <p>Engine Idle - Move throttle control lever to full aft. Tachometer should read 750 +50 RPM.</p> <p>Idle RPM: _____ RPM</p> <p>Cool down engine at 1100 RPM. Shut down engine, set the ignition switch and the master switch to the OFF position. Remove ignition key from aircraft.</p>				
4.	Airframe, Power Plant, Propeller - Perform a walk around to detect damages, fluid leaks or other abnormalities.		X		
5.	Fuselage and Empennage - Clean.		X		
6.	Aircraft Interior - Clean and vacuum.		X		
7.	<p>Prepare aircraft for visual checks as follows:</p> <p>Remove Engine Cowling;</p> <p>Remove Landing Gear Fairings;</p> <p>Remove Cabin Carpets and Floorboards;</p> <p>Remove Glareshield;</p> <p>Remove Baggage Compartment Floorboard;</p> <p>Remove Access Panel of the Baggage Compartment Bulkhead;</p> <p>Remove Access Panel 210AB.</p>	06-30-00	X		
8.	Make a record of all malfunctions and abnormalities.		X		

No.	Engine	Reference	Interval 100 h Add.		Initials
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1.	<p>Engine Cowling - Check for cracks, overheated areas, deformation, loose or missing fasteners.</p> <p>Check fire protect paint and heat resistance shielding for condition.</p>		X		
2.	<p>Engine Oil - Drain and change.</p> <p>Remove old oil filter from engine and install new oil filter.</p> <p><u>CAUTION:</u> DO NOT USE AIRCRAFT ENGINE OIL.</p>	<p>12-12-00</p> <p>R* 12-20-00 Sec. 11.3, 11.4 SI-912-016 latest Rev.</p>	X	50 h ¹⁾	

¹⁾ In the case of more than 30% of operation with leaded fuel e.g.: AVGAS 100LL (SI-912-016)

No.	Engine (Cont.)	Reference	Interval 100 h Add.		Initials
	<p>Due to the incorporated friction clutch and the high stresses in the reduction gear 4-stroke motor cycle oils highly recommended. For suitable lubricants and oil change intervals, see ROTAX Operators Manual and latest appropriate ROTAX publications.</p> <p>Remove oil drain screw from oil tank. Drain old oil and dispose as per environmental regulations. Remove oil filter from engine and install a new oil filter. Lubricate mating sealing ring of new oil filter with engine oil. Tighten new oil filter by hand. Renew gasket ring of drain screw on oil tank. Tighten drain screw to 25 Nm (220 in.lb). Check oil tank - Refill oil tank with approx. 3 liters of oil. For oil quality, see Operators Manual and SI-912-016 latest edition.</p> <p>Refilled: _____ Quantity: _____ L</p>	<p>SB-912-033 latest Rev.</p> <p>SI-27-1997, latest Rev. SI-912-010, latest Rev. SB-912-040, latest Rev.</p> <p>R* 12-20-00 Sec. 11.2, 11.6</p>			
3.	<p>Oil Change - Cut old oil filter without producing any metal chips and inspect filter mat for particles.</p> <p>Findings _____</p>	R* 12-20-00 Sec. 11.5	X	50 h ¹⁾	
4.	<p>Visual inspection of the magnetic plug for accumulation of chips</p>	R* 12-20-00 Sec. 12	X		
5.	<p>Check compression by differential pressure method. Test pressure: 6 bar (appr. 6000 hpa / 87 psi) Pressure drop: max. 25% cyl. 1 2 3 4</p> <p>Pressure drop: _____</p>	R* 12-20-00 Sec. 5		200 h	
6.	<p>Cooling Air Ducts, Engine Baffling and Cylinder Cooling Fins - Check for obstructions, cracks, wear and general condition. Check for signs of abnormal temperatures. Check crankcase for cracks.</p>	<p>R* 12-20-00 Sec. 3</p> <p>SB-912-029, latest Rev.</p>	X		recommended 50 h
7.	<p>Leakage Bore at the Base of the Water Pump - Check for signs of leakage.</p>	R* 12-20-00 Sec. 4	X		
8.	<p>Cooling System - Flushing the cooling system where conventional coolants are use.</p>	R* 12-00-00 Sec. 9.3 12-14-00			when replacing the coolant
9.	<p>Coolant Hoses and Lines - Check for damage, leakage, hardening from heat, porosity, for loose connections and secure attachments. Check routing for kinks and restricted elbows.</p>	R* 12-20-00 Sec. 9.1 75-10-00	X		
10.	<p>Coolant Expansion Tank - Check for damage and</p>	R* 12-20-00	X		

¹⁾ In the case of more than 30% of operation with leaded fuel e.g.: AVGAS 100LL (SI-912-016)

No.	Engine (Cont.)	Reference	Interval		Initials
			100 h	Add.	
	abnormalities. Inspect rubber protection plate on tank base for secure fit. Verify coolant level, replenish as necessary. Check coolant with densimeter. Check gasket of radiator cover, inspect pressure control valve, and return valve. The pressure control valve opens at 1,2 bar (18 psi).	Sec. 9.1 75-10-00 SB-912-043, latest Rev.			
11.	Overflow Bottle - Inspect for damage and abnormalities. Verify coolant level, replenish as necessary. Inspect venting bore in cap of overflow bottle for clear passage. Line from Exp. Tank to Overflow Bottle - Check for damage, leakage and clear passage.	R* 12-20-00 Sec. 9.5 75-10-00	X		
12.	Oil and Coolant Radiator - Check for obstructions, leaks and security of attachment. If necessary, clean cooling fins and perform a pressure leakage test.	79-20-00	X		
13.	Oil Lines - Inspect for damage, leakage, hardening from heat, porosity, security of connections and attachments. Verify routing for kinks or restricted elbows. Check fire protection shielding.	R* 12-20-00 Sec. 4	X		
14.	Oil Tank Vent Line - Check for proper routing, for obstructions and clear passage		X		
15.	Fuel Lines - Check for damage, leakage, hardening from heat, porosity, secure connections and attachments. Verify routing for kinks or restricted elbows. Steel fuel lines if applicable additionally check for cracks and for scuffing marks.	R* 12-20-00 Sec. 4	X		
16.	Fuel Selector / Shut-OFF Valve - Check for security of attachment. Check that the valve engages noticeable into the positions LEFT, RIGHT, and OFF.		X		
17.	Filter Element of Electrical Fuel Pump - inspect and clean.	28-20-00 Para. 4, 5	X		
18.	Battery - Clean. Check correct acid level, charge and capacity. Check battery vent house for obstructions and proper routing. If necessary, replenish and charge battery.	12-17-00	X		
19.	Battery Tray, Terminals and cables - Check for security, corrosion and general conditions.		X		
20.	Starter - Check security of attachment and electrical connections.	R* 12-00-00 Sec. 6.1	X		
21.	Alternator - Check attachment and V-belt tension. Inspect electrical connections.	R* 12-20-00 Sec. 6	X		
22.	Electrical Wiring System - Verify the complete electrical wiring system for security, damage, wear and secure fit. Check all cable connections for tight fit, good contact, corrosion and condition.	R* 12-20-00 Sec. 14.1	X		

No.	Engine (Cont.)	Reference	Interval		Initials
			100 h	Add.	
23.	Spark plugs- Remove all spark plugs, check the heat range designation, clean, check elektrode gab and adjust if necessary. Replace as required.	R* 12-20-00 Sec. 14.2	X		
24.	Spark Plug Connectors - Check that resistance spark plug connectors fit tightly on the spark plugs. Minimum pull-off force is 30N (7lb).			200 h	
25.	Replacing spark plug	R* 12-20-00 Sec. 14.2	X ¹⁾	200 h	
26.	Oil Temperature / Oil Pressure Sensor - Check for tight fit and condition.		X		
27.	Exhaust System - Check attachment screws and springs for security and fit. Inspect system for damage and missing parts. Visual inspection of the muffler, exhaust pipes and mounting flanges for cracks, corrosion and leakage. Check heat shielding for condition.		X		
28.	Cabin Heat - Check heat shroud and heat ducts for damage and security of attachment. Check heat control function.		X		
29.	Exhaust Muffler - Remove heat shroud from muffler and inspect muffler for condition, corrosion and leakage. <u>WARNING:</u> FAILURE TO INSPECT MUFFLER FOR LEAKS COULD RESULT IN CARBON MONOXIDE ENTERING THE CABIN, LEADING TO SERIOUS INJURY OR DEATH!	78-10-00		200 h	
30.	Propeller Gear Box - Check the friction torque in free rotation on gearboxes with overload clutch. Actual friction torque is measured: _____Nm	R* 12-20-00 Sec. 15	X		
31.	Propeller Gear Box - Gearboxes of series 3 (with overload clutch) and use of leaded fuel more than 30% of operation Inspect overload clutch	R* 05-50-00 Sec. 2 SB-912-033		600 h	
32.	Propeller Gear Box - Checking the propeller gearbox (with overload clutch).	R* 12-20-00 Sec. 15.2		1000 h	
33.	Carburetors - Check carburetor synchronization. Mechanical or pneumatic synchronization. Inspect the float chamber assy. contamination and corrosion.	R* 12-20-00 Sec. 10.2 Sec. 10.5	X		
34.	Carburetors - Check the ventilation of the float chambers. Any trouble with the float chamb. ventilation impairs engine and carburetor function and must therefore be avoided. Check that the passage of the ventilation lines is free and that no kinks can arise.			200 h	
35.	Carburetors - Removal/assembly of the two carburetors for carburetor inspection.	Rotax Heavy MM, 73-00-00 Sec. 3.1		200 h	

¹⁾ in the case of more then 30% of operation with leaded fuel e.g.: AVGAS 100LL (SI-912-016)

No.	Engine (Cont.)	Reference	Interval 100 h Add.	Initials
36.	Carburetors - Check the free movement of the carburetor actuation (throttle lever and starting carburetor). Check that the bowden cable allows the full travel of the throttle lever from stop to stop.	R* 12-20-00 Sec. 10.5	X	
37.	Carburetor Sockets and Drip Tray - Inspect the carburetor for damage and abnormalities, check for cracks, wear and good condition. Take note of changes caused by temperature influence.	Rotax Heavy MM, 73-00-00 Sec. 3.4.3		200 h ¹⁾
38.	Airbox Assy - Check for damage, security of attachment and condition. Inspect connected air hoses for condition and leakage. Check the flaps for hot and filtered ram air can be moved in their full arc of travel.		X	
39.	Air Filter - Inspect and clean. Renew if necessary. Clean air filter housing. Check the drain hole at the bottom of housing for obstructions or blockage.	R* 12-20-00 sec. 2	X	
40.	Other Engine External Accessories - Inspect screws and nuts of all other external engine parts and accessories for tight fit. Inspect safety wiring if applicable, replace as necessary.		X	
41.	Engine Mounts (manufactured by ROTAX and AQUILA A. b. E. AG) - Check mounts for deformation, cracks, corrosion, security and damage from heat. Check mounting bolts for condition and correct torque value. At engine (4 bolts M10): 35 Nm At shock mounts (4 bolts M10): 25 Nm At firewall (4 bolts M10): 30 Nm Inspect shock mounts for deterioration.	R* 12-20-00 Sec. 3.1 SB-912-028, latest Rev.	X	
42.	Engine Test Run - Install cowling and perform an engine test run as described above under chapter Pre-Inspection/ Engine ground test item 3. After engine test run, re-tighten oil filter by hand and examine engine and engine compartment for signs of leakage. Compare results with first engine test run. Verify oil level, replenish as necessary	17-10-00 05-20-00 R* 12-10-00 Sec. 4.1	X	

No.	Propeller	Reference	Interval 100 h Add.	Initials
1.	Spinner - Remove from aircraft and check for delaminations and cracks.	61-10-00	X	
2.	Spinner Plate - Check for cracks and fixing.		X	
3.	Blade Root and Hub Area - Examine for oil and grease leaks.		X	
4.	Propeller Blades - Check blade shake. (allowed up to 3 mm [1/8 in.]		X	

¹⁾ See SB-912-030 - latest edition

No.	Propeller (Cont.)	Reference	Interval		Initials
			100 h	Add.	
5.	Propeller Blades - Check blade angle play. (max. 2°)		X		
6.	Hub - Inspect outside condition of the hub and parts for cracks, corrosion and deterioration.		X		
7.	Check Nuts for Low Pitch - Inspect for tightness and safety wire.		X		
8.	Propeller Assy - Check all safety means to be intact.		X		
9.	Propeller Flange Stop Nuts - Check correct torque value (45 - 47 Nm).		X		
10.	Propeller Blades - Visual Inspection for damages and their repair. Install Spinner as required.	MT* E-124 Para. 6.2.1 thru 6.10	X		

No.	Fuselage / Cabin	Reference	Interval		Initials
			100 h	Add.	
1.	Fuselage Shell - Visual Inspection for paint coat damages, dents, cracks, holes, distortion and other evidence of failure. All unpainted parts for delaminations (white spots).		X		
2.	Lower Fin - Inspect fin and lower rudder for signs of breakage. Check skid plate for wear.		X		
3.	Canopy - Examine the acrylic glass for cracking, crazing and general condition. Check the canopy locking mechanism operates correctly. Check wear of parts. Inspect tubular canopy hinge frame and brackets for cracks, distortion, corrosion, wear, and security of attachment. Check the gas spring strut for sufficiently power and evidence of leakage.		X		
4.	Baggage Door - Check door seal, door latching mechanism, and door hinge for defects and condition. Inspect door structure for cracks or other damage.		X		
5.	Restraint Assy Pilot / Co-Pilot - Check for proper operation, condition, and security of attachment.		X		
6.	Seats - Verify security of attachment of the seat assy to aircraft structure. Check operation of seat adjustment mechanism and seat stops. Inspect gas spring struts for oil leakage or other damage.		X		
7.	Seats - Remove seats. Clean and lubricate seat rails as required. Visually examine that portion of the engine controls, lines, and cables, located in the center console.	25-10-00		Ann.	
8.	Main Landing Gear - Inspect fuselage structure at such points and areas where the main landing gear is attached.		X		

No.	Fuselage / Cabin (Cont.)	Reference	Interval 100 h	Add.	Initials
	Check for stress marks, distortion, dis-bonding, and delamination. Inspect main landing gear strut brackets for distortion, cracks, corrosion, and security of attachment. Check wear and condition of the polyamide inserts. Check bolts for correct torque.				
9.	Wheel Fairings - Check condition and correct fit.		X		
10.	Parking Brake Valve - Check for evidence of leakage especially at the brake line connections. Check control assy for damage.		X		
11.	Flap Actuator - Check for wear and damage, for secure mechanical connections and loose or missing lock devices. Check electrical wiring for wear, damage, and proper routing. Inspect electrical connections and switches for security, corrosion and poor condition. Check function of the limit switches and position indicator.		X		
12.	Elevator Trim System - Check the actuator and the springs for security, wear and damage. Inspect all safety means to be intact. Check electrical wiring for wear, insulation damage, and proper routing. Inspect electrical connections and switches for security, corrosion and poor condition. Perform system test and check the correct function of the position indicator.		X		
13.	Aileron and Elevator Control - Check the control sticks, the brackets and the control rods for distortion, cracks, chafing, corrosion and security. Examine all bearings for condition and security fit. Verify all safety means to be intact. Check travel of control surfaces if the control stick is in the full forward /neutral/ aft, and full left /neutral/ right positions. Verify no binding or jumpy movement of the control sticks through their full range of travel.		X		
14.	Rudder Control - Check rudder control weldment and rudder bellcrank for cracks, distortion, chafing and security. Inspect rudder control support brackets, rudder pedal pivot brackets and connection of the rudder controls with the nose gear steering tubes for security, condition and correct splintering. Check centering of springs and cables. Inspect control cables, control cable guides, cable connections, turnbuckles and hardware for correct installation, wear, safetying and proper operation.		X		
15.	Rudder / Aileron Control Interconnection - Check condition and correct function.		X		
16.	Brake Lines and Brake Master Cylinder in the Forward Cabin Area - Check for security and signs of leakage.		X		
17.	Brake Reservoir - Check for leakage and system for trapped air. Inspect the vent valve in the filler cap of the brake reservoir for obstruction and blockage. Make sure the hydraulic brake fluid level is correct. If necessary replenish, use only hydraulic brake fluid of the required grade		X		

No.	Fuselage / Cabin (Cont.)	Reference	Interval 100 h	Add.	Initials
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18.	Hydraulic Brake Fluid - Renew.			2 years	
19.	Fuel Lines - Check for leakage and security.		X		
20.	Wing Main Bolts - Inspect for proper fit, condition and correct safetying.	57-10-00	X		
21.	Wing Main Bolts - Remove for visual inspection and lubrication.	57-10-00		Ann.	
22.	Engine and Propeller Controls - Check for proper function, security of attachment and for evidence of wear.		X		
23.	Instruments - Check instrument panel mounting brackets for security and condition. Inspect instruments for security of attachment. Check electrical cables, hoses and lines for correct installation and proper routing. Inspect air filter of the pitot / static system for obstructions and contamination.			Ann.	
24.	Exterior / Interior Placards and Markings - inspect presence, legibility, and security. Consult A210 Pilot's Operating Handbook and Airplane Flight Manual for required placards.		X		

No.	Wings, Ailerons, Flaps	Reference	Interval 100 h	Add.	Initials
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1.	Wings with Winglets, Ailerons, and Flaps - Visual Inspection for paint coat damages, dents, cracks, holes, distortion and other evidence of failure. Examine all unpainted parts for delaminations (white spots).		X		
2.	Wing Spars in the Fuselage Belly - Remove spar covering and perform visual inspection of the spar web, the bonding between the spar web and the carbon fiber spar cap strip, as well the attachment of the root ribs to the spars. Check security and function of control system brackets attached to the spars.			Ann.	
3.	Drain and Vent Holes - Check for blockage and suspect appearance of any liquid.		X		
4.	Ailerons - Check aileron hinges, bearings, and hinge brackets for security and excessive play. Check bolts and nuts for proper safetying. Examine aileron pushrod for correct installation with stop nuts. Check aileron actuation assembly for suspect binding, and excessive play.		X		
5.	Aileron Hinges - Check play allowed: - Axial ± 1,00 mm (± 0.04 in.) - Radial ± 0,30 mm (± 0.01 in.)		X		

No.	Wings, Ailerons, Flaps (Cont.)	Reference	Interval 100 h Add.		Initials
6.	Aileron Control System - Measure the play in the aileron control system with the control surface locked. Apply a force of 30N (6.7 lbf) sideways to the control stick - the maximum play allowed on the top of the stick is 10 mm (0.4 in.) for both sides. The play should be measured at each control stick. If excessive play is detected, investigate cause.		X		
7.	Flaps - Inspect hinge brackets for damaged paint coat, for cracks and for delamination. Check bearings for correct fit and excessive play. Verify the correct safetying of all hinge bolts and castle nuts with cotter pins.		X		
8.	Flaps - Check flap hinges for play allowed: - Axial $\pm 0,30$ mm (± 0.01 in.) - Radial $\pm 0,30$ mm (± 0.01 in.) Measure the play in the flap control system at the flap trailing edge, at the inboard flap end. Max. play allowed if flaps in takeoff and landing positions: ± 5 mm (0.2 in.). No play if flaps retracted.		X		
9.	Flaps and Ailerons - Verify the gap between fuselage and flaps, between flaps and ailerons, as well as at the outboard end of the ailerons is at least 2 mm (0.08 in.).		X		
10.	Pitot / Static System - Check pitot tube for security of attachment, condition and obstructions. Check pitot and static pressure lines for correct installation, water and proper routing.		X		
11.	Stall Warning System - Check for condition and proper operation.		X		
12.	For serial numbers from AT01-100 to AT01-126: Bonding between wing spar and upper shell - Check condition	57-10-00		Ann.	
13.	Navigation / Strobe Lights - Check operation, condition of lens, and security of attachments.	33-40-00	X		
14.	Inner Fuel Tank Ribs - Check connections of fuel and vent lines to the fuel tank and the flange gasket of the fuel level sensors for signs leakage.	28-10-00 28-20-00 28-40-00		Ann.	
15.	Fuel Vent Lines - Check fuel vent lines for blockage.		X		
16.	Fuel Tank Drain Valves - Check for correct function and leakage.		X		
17.	Fuel Outlet Screens - Remove and clean.	28-10-00		Ann.	
18.	Fuel Filler Caps - Check for proper function and leakage.		X		
19.	Tie Down Points - Check thread and structure around the tie down attach point for any damage.	10-20-00	X		

No.	Empennage, Elevator, Rudder	Reference	Interval		Initials
			100 h	Add.	
1.	Empennage - Inspect complete surface of the vertical and horizontal stabilizers, of the elevator and rudder for damage such as dents, cracks, holes and delamination.		X		
2.	Rudder Hinge, Elevator Hinge and Bellcranks - Check brackets and bellcranks for security of attachment and corrosion. Inspect bearings for binding and excessive play. Check correct safetying of the lower rudder pivot pin with castellated nut and cotter pin.		X		
3.	Hinge Play and Control Surface Positioning - Verify clearance between horizontal stabilizer and elevator horns and clearance between vertical stabilizer and rudder horn is at least 1 mm (0.04 in.). Check elevator hinge and rudder hinge play max. allowed: - Axial ± 0,30 mm (± 0.01 in.) - Radial ± 0,30 mm (± 0.01 in.)			Ann.	
4.	Elevator Control System - Measure the play in the elevator control system with the control surface locked. Apply a force of 50N (11.2 lbf) forwards and then backwards to the control stick - the maximum play allowed on the top of the stick is 10 mm (0.4 in.) for both sides.			Ann.	
5.	Rudder - Remove Rudder. Examine the elevator actuation assembly inside of the vertical stabilizer. Check for any damage, for correct installation and function and for security and wear. Inspect rudder hinge brackets, rudder yoke and control cable thimble-eyes for security, conditions and wear. Lubricate control cable thimble-eyes as required.	55-40-00		Ann.	
6.	Rudder Rigging - Set rudder pedals in neutral position. Verify the rudder and the nose landing gear are also in neutral position. Set rudder pedals to fully left and then to fully right. The rudder must hit the rudder travel stops and the distance from rudder pedal to firewall must be sufficiently for applying the pedal brake. Adjust position of the rudder pedals by varying the length of nose wheel steering tubes. Adjust rudder neutral position and control cable tension by means of the turnbuckles in the cabin area.	27-20-00	X		

No.	Nose and Main Landing Gear	Reference	Interval		Initials
			100 h	Add.	
1.	Wheel Fairings - Clean. Check for paint coat damages, cracks, dents and delamination.		X		
2.	Fairing Mounts - Inspect for cracks, distortion or other damage.		X		
3.	Wheels and Rims - Clean. Check tires for wear, cuts, foreign matters and deterioration. Inspect rims for security, deformation, cracks and other damage. Examine wheel bearings for excessive play, corrosion and irregular operation.		X		

No.	Nose and Main Landing Gear (Cont.)	Reference	Interval 100 h	Add.	Initials
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	Check tire pressure and proper location of the red slide marks.				
4.	Nose Gear Strut Mount - Check for deformation, cracks, and corrosion. Check nose gear strut journal bearing for proper operation, play and correct safetying.		X		
5.	Nose Gear Strut and Elastomer Package - Check strut for deformation, stress marks, and cracks. Inspect correct installation of the nose wheel fork. Inspect elastomer package for wear, deterioration, cracks, correct fit and security. Check journal bearings of the elastomer package for play and condition.		X		
6.	Nose Wheel Steering - Inspect nose wheel steering tubes for condition, excessive play and correct safetying. Check return springs at nose gear strut for security and verify they tension-free, if the nose wheel is in neutral position.		X		
7.	Main Landing Gear - Check main gear struts for deformation, cracks, damage to the paint coat, and corrosion. Inspect wheel axles for security of attachment to struts and for any damage.		X		
8.	Wheel Bearings - Clean and lubricate.	12-22-00	X		
9.	Wheel Brakes - Clean. Check freedom of movement of the pistons and pressure plates. Inspect brake disks and brake linings for condition and wear. Replace brake disk if worn below 3,8 mm (0.15 in.). Replace brake linings when worn to 3,0 mm (0.12 in.). Inspect brake fluid carrying lines at the main landing gear for condition, leakage, and security of attachment.	32-40-00	X		

No.	Return to Service	Reference	Interval 100 h	Add.	Initials
-----	-------------------	-----------	-------------------	------	----------

1.	Install wheel fairings. Install seats. Install cabin floor boards. Install baggage compartment floorboard. Install access panel of the baggage compartment bulkhead. Install access panel 310AB.	06-30-00	X		
2.	Flight Controls - Check for full range of travel and excessive friction.		X		
3.	Flaps - Operate through full extension and retraction for steady and complete deployment. Check correct limit switches operation at CRUISE, T/O and LDG flap positions. Verify the corresponding flap switch position and the corresponding flap position indicator reading.		X		
4.	Elevator Trim - Check for full range of travel and excessive friction. Inspect proper operation of the trim control switch,		X		

No.	Return to Service (Cont.)	Reference	Interval 100 h Add.	Initials
-----	---------------------------	-----------	------------------------	----------

	the limit switches, and the trim position indicator. Verify the decreasing or increasing of the elevator control forces when operating elevator trim.			
5.	Engine and Propeller controls - Check full range of motion without any obstruction or excessive friction to travel. Check throttle and propeller control levers friction lock.		X	
6.	Airworthiness Directives - Verify all airworthiness directives complied with. Service Letters, Service Bulletins, and Service Information - Verify all Aquila A. b. E. AG and Suppliers service letters, service bulletins, and service information complied with.		X	
7.	Service Time Records, Equipment List and Weight and Balance Records - Check, if necessary update.		X	
8.	Aircraft File and Technical Documentation - Verify completeness and proper order.		X	
9.	Foreign Items - Remove foreign items from aircraft if necessary.		X	

<p>The aircraft is airworthy and meets the condition specified in the aircraft data sheet. All required by Service Information and Airworthiness Directives maintenance and all prescribed scheduled maintenance checks are accomplished.</p>		
Service Station:	Next inspection if _____ hours of operation has been reached.	
	Place, Date	
Name, Signature of Mechanic	Name, Signature of Inspector	Stamp

DAILY INSPECTIONS

1. General

- A. Daily inspections that are the pre-flight check and the checks after flights. These checks are to be practiced usually daily if the aircraft is in operation.

2. Pre-flight check

- A. This check is to be practiced before the first flight of the day. In this way, the general condition of the aircraft and its engine should be ascertained.

The scope of the pre-flight check is listed in the AQUILA AT01 Airplane Flight Manual, Section 4. A completely accomplished pre-flight check is very essential for safety of flights, since many accidents are to be traced back to an inadequate carrying out of this check.

3. After Flights

- A. These checks are to be practiced after the last flight of the day. Most of it are visual inspections.
- B. The checks should contain all points of the pre-flight check.
 - (1) Supplementary measures:
 - (a) Filling fuel tanks.
 - (b) Park aircraft properly (Refer to 10-10-00).
 - (c) Check the logbook entries for remarks about faults or defects, and for correct numbers of landings and flight hours.
 - (d) If necessary, moor the aircraft (Refer to 10-20-00).



UNSCHEDULED MAINTENANCE CHECKS

1. General

- A. Special checks are to be carried out only in circumstances, outside routine inspections, where event have occurred that may have caused damage to the aircraft or an impairment of airworthiness possibly during the operation of the aircraft.

Furthermore, the 25-hour inspection necessary for a newly delivered aircraft and its engine, as well as for overhauled engines and after extensive airframe repairs, falls under the special checks since it must only be carried out once after the first 25 hours of operation of the aircraft.

2. Special Checks

A. 25-Hour Inspection

After the first 25 hours of operation of a newly delivered aircraft and its engine, after an airframe overhaul, and after extensive airframe repairs an inspection within the specifications of a 100-hour inspection is to be completed (Refer to 05-20-00).

After the first 25 hours of operation of newly supplied or overhauled engines an inspection of the engine and propeller must be performed. Refer to ROTAX Aircraft Engines Maintenance Manual for ROTAX Engines Type 912 Series pertaining this inspection.

B. Hard Landing

After an excessively hard landing or other unusual loads of the landing gear a thorough inspection of the affected components and their attachment is required. Even if no obvious defects are detectable, a visual inspection must be carried out. Perform the following:

- (1) Prepare aircraft for visual checks as follows:
 - (a) Remove engine cowling (refer to 71-10-00).
 - (b) Remove landing gear fairings.
 - (c) Inside cabin and baggage compartment, remove required carpets and floorboards to gain access to the landing gear mounting brackets (Refer to 25-21-009).
- (2) Inspect main landing gear.
 - (a) Check wheel fairings for damages such as cracks, dents and delamination.
 - (b) Inspect fairing mounts for cracks, distortion or other damage.
 - (c) Inspect fuselage structure visually at such points and areas where the main landing gear is attached. Check for stress marks, distortion, dis-bonding, and delamination. Inspect main landing gear strut brackets for distortion, cracks and security of attachment. Check condition of the polyamide inserts. Check bolts for correct torque.
 - (d) Check main gear struts for deformation and cracks. Inspect wheel axles for security of attachment to struts and for any damage.
 - (e) Inspect tires for integrity and proper location of the red slide marks.
 - (f) Inspect brake fluid carrying lines at the main landing gear for condition, leakage, and security of attachment.

- (3) Inspect nose landing gear.
 - (a) Check wheel fairing for damages such as cracks, dents and delamination.
 - (b) Inspect fairing mounts for cracks, distortion or other damage.
 - (c) Check nose gear strut mount for deformation and cracks. Check nose gear strut journal bearing for proper operation and play.
 - (d) Check strut for deformation, stress marks, and cracks. Inspect elastomer package for deterioration, cracks, correct fit and security. Check journal bearings of the elastomer package for play and condition.
 - (e) Inspect nose wheel steering tubes for condition and excessive play.
 - (f) Inspect tire for integrity and proper location of the red slide marks.
- (4) Install all items removed while preparing and accomplishing this special inspection.
- (5) Perform a brake and steering system operational test (refer to 32-40-00).

C. Engine Fire

After an engine fire perform the following steps:

WARNING: If suspected that parts of the structure or of the cowling would be able to have been damaged by the high temperatures (detectably among other things by blistering on the protective coating), always the manufacturer should be contacted for the appraisal of the defects before the aircraft is put into operation again.

- (1) Disconnect battery (refer to 24-30-00).
- (2) Remove engine cowling (refer to 72-10-00).
- (3) Examine engine cowling. Check for signs of fire damage.
- (4) Examine electrical cables for damaged insulation.
- (5) Examine fuel lines for damage of the fire-protection sleeves.
- (6) Check oil lines for damage of the fire-protection sleeves.
- (7) Check air filter element for fire damage.
- (8) Examine engine mount and shock mounts for any fire damage.
- (9) Check all other hoses and pipes, as well as all gaskets and seals for fire damage.
- (10) Replace damaged items.
- (11) Install engine cowling (refer to 72-10-00).
- (12) Perform an engine test run (refer to 05-20-00).

D. Violent Stop of the Engine

In event that the propeller was touching ground or the engine was inadvertently stopped violently (shock loading) the propeller gear box must be disassembled and inspected by an authorized workshop. For further necessary inspections on the engine after the occurrence of a propeller ground strike and for more information, refer to the applicable technical documentation and to the ROTAX Maintenance Manual.

CAUTION: Only qualified technicians (authorized by Aviation Authority and after successful attendance of the relevant ROTAX training course) are authorized to perform this work.

Check additional equipment (external alternator, hydraulic governor, ignition unit, coolant and oil hoses) for damage.

CHAPTER 28

FUEL

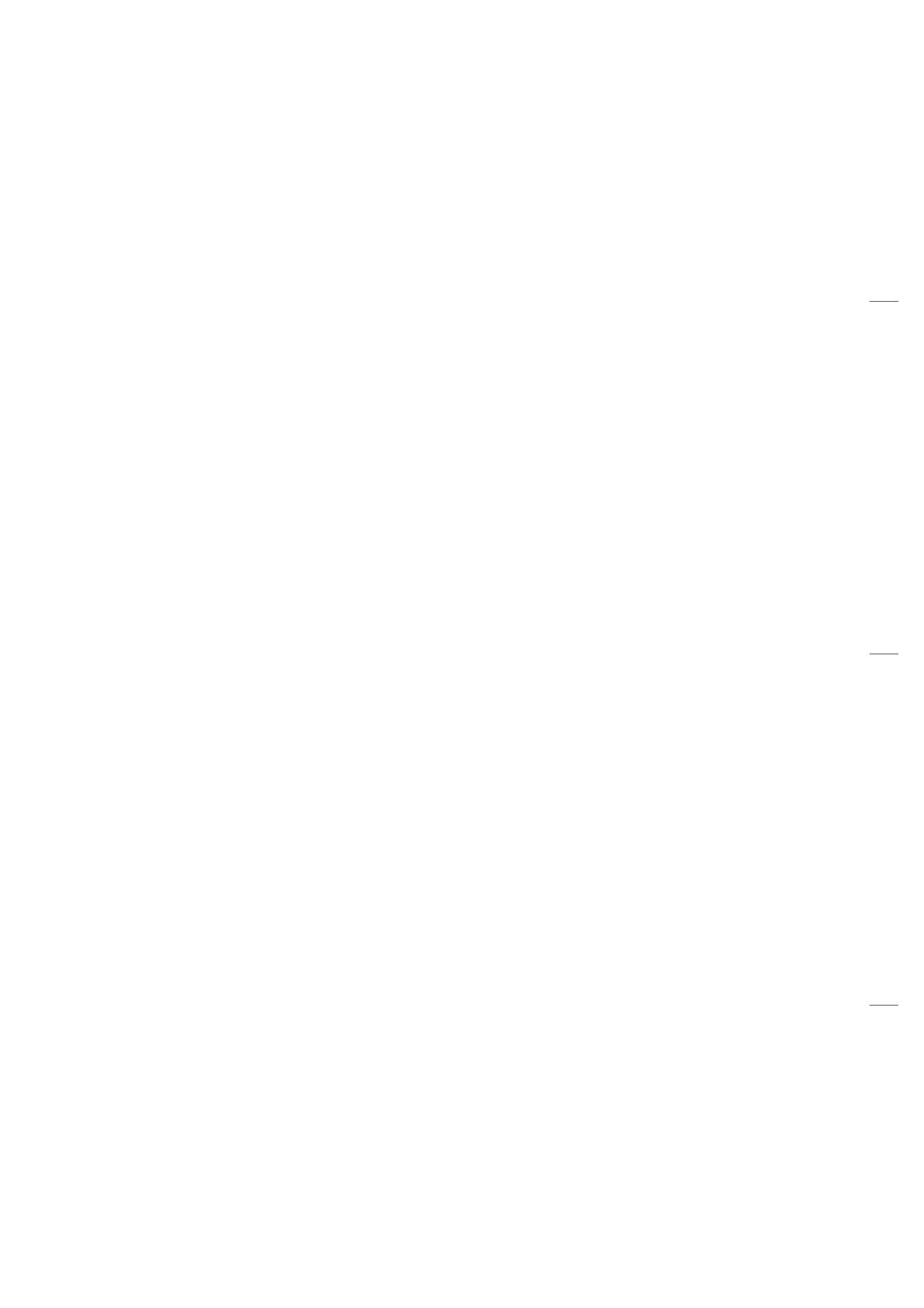
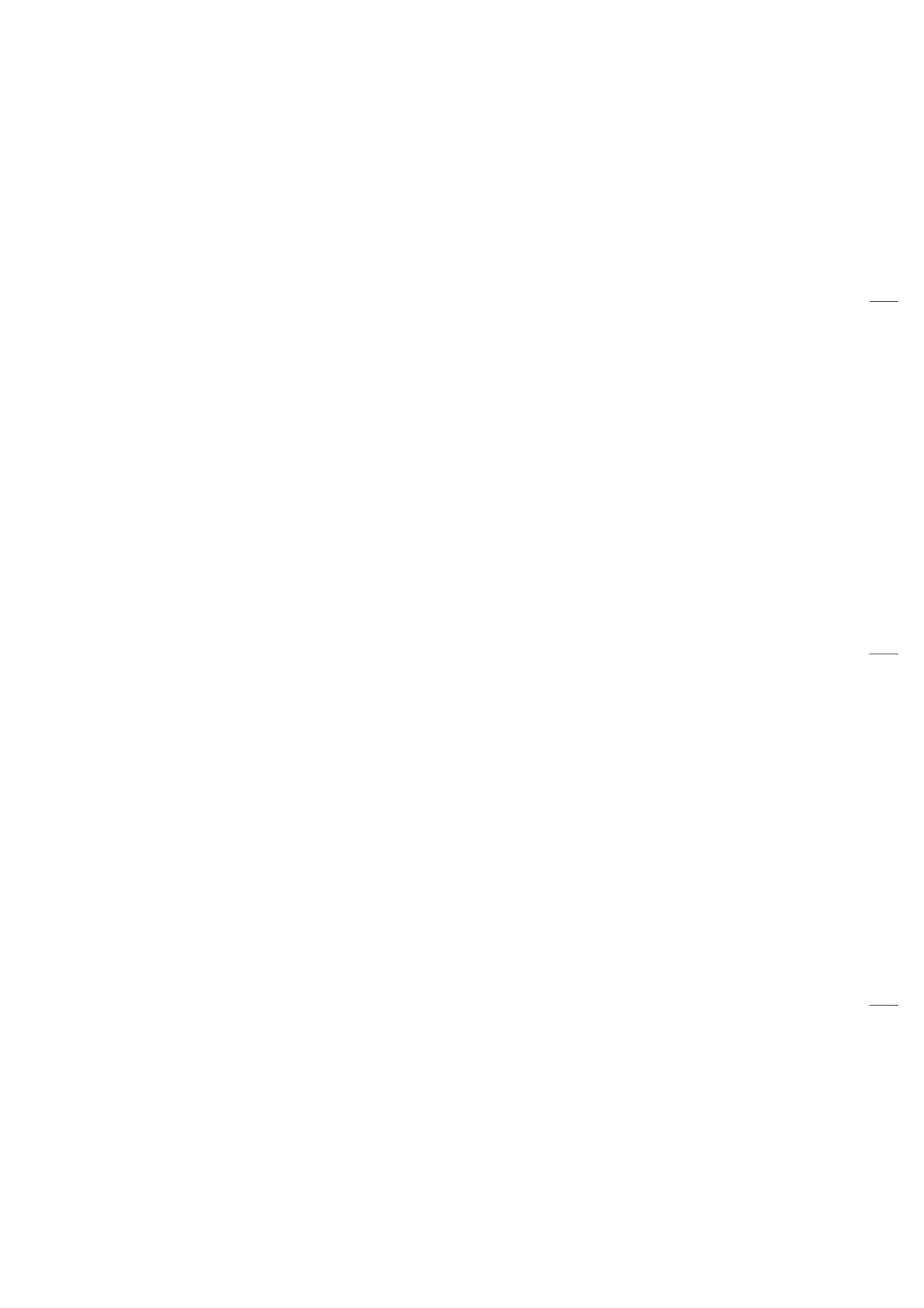


TABLE OF CONTENTS

<u>Title</u>	<u>Chapter Section Subject</u>	<u>Page</u>	<u>Effectivity</u>
FUEL - GENERAL	28-00-00	1	
Introduction	28-00-00	1	
General Description	28-00-00	1	
FUEL STORAGE - DESCRIPTION	28-10-00	1	
Introduction	28-10-00	1	
Description and Operation	28-10-00	1	
FUEL STORAGE - MAINTENANCE PRACTICES	28-10-00	201	
Wing Fuel Tanks	28-10-00	201	
Testing Wing Fuel Tanks	28-10-00	201	
FUEL DISTRIBUTION - DESCRIPTION	28-10-00	1	
Introduction	28-10-00	1	
Description and Operation	28-10-00	1	
FUEL DISTRIBUTION - MAINTENANCE PRACTICES	28-20-00	201	
General	28-20-00	201	
Fuel Selector / Shut-Off Valve Removal/Installation	28-20-00	201	
Electrical Fuel Pump Removal/Installation	28-20-00	201	
Maintenance of the Electrical Fuel Pump Filter Element	28-20-00	203	
Adjustment/Test Fuel System Pressure Test	28-20-00	203	
FUEL INDICATING - DESCRIPTION	28-10-00	1	
Introduction	28-10-00	1	
Description and Operation	28-10-00	1	
FUEL INDICATING - MAINTENANCE PRACTICES	28-40-00	201	
Fuel Level Indicator Removal/Installation	28-40-00	201	
Fuel Level Probe Removal/Installation	28-40-00	201	
Fuel Level Probe Test	28-40-00	202	Sensor with Pot.
Fuel Level Indicating System Test / Calibration	28-40-00	202	Sensor with Pot.
Fuel Level Probe Test	28-40-00	202	Electr. Sensor
Fuel Level Indicating System Test / Calibration	28-40-00	202	Electr. Sensor



FUEL SYSTEM - GENERAL

1. Introduction

- A. This chapter describes such systems and components, which store and deliver fuel to the engine.

2. General Description

- A. The fuel system of the AQUILA AT01 (Refer to Fig. 01) consists of two main fuel tanks which are integral of the wings, a fuel selector / shut-off valve on the center console, an auxiliary fuel pump with an integrated fuel filter, an engine driven fuel pump and two single-barrel float type carburetors in the engine compartment as well as flexible hoses and aluminum-fuel-lines.

Fuel Quantity Data:

Total Fuel:	120 l (31.7 Gallons)
Usable Fuel:	109,6 l (28.9 Gallons)
Unusable Fuel:	10,4 l (2.8 Gallons)

B. Fuel Supply

- (1) Fuel is delivered to the carburetors by the engine driven fuel pump from the fuel tank that is preselected by the fuel selector / shut-off valve. An electrical fuel pump is provided in case of the failure of the engine driven fuel pump. Excessive fuel flows through return lines and the fuel selector valve back to the same tank.
- (2) For selecting the desired fuel tank and to interrupt fuel supply in case of an emergency the fuel selector / shut-off valve is provided.
The selector handle is mounted in view of the pilot and well accessible in the center console between the seats. The red, arrow shaped handle has a LEFT, RIGHT, and OFF position. Each position has a positive detent.

C. Fuel Quantity Indicating

Fuel quantity is measured by two capacitive type fuel level probes, one in each tank, and indicated by a dual fuel level indicator mounted on the right side of the instrument panel.

D. Ventilation of the Fuel System

The fuel tanks are vented from the top of each fuel tank through a vent line, connected at the outboard fuel tank rib, to a vent located on the winglets.

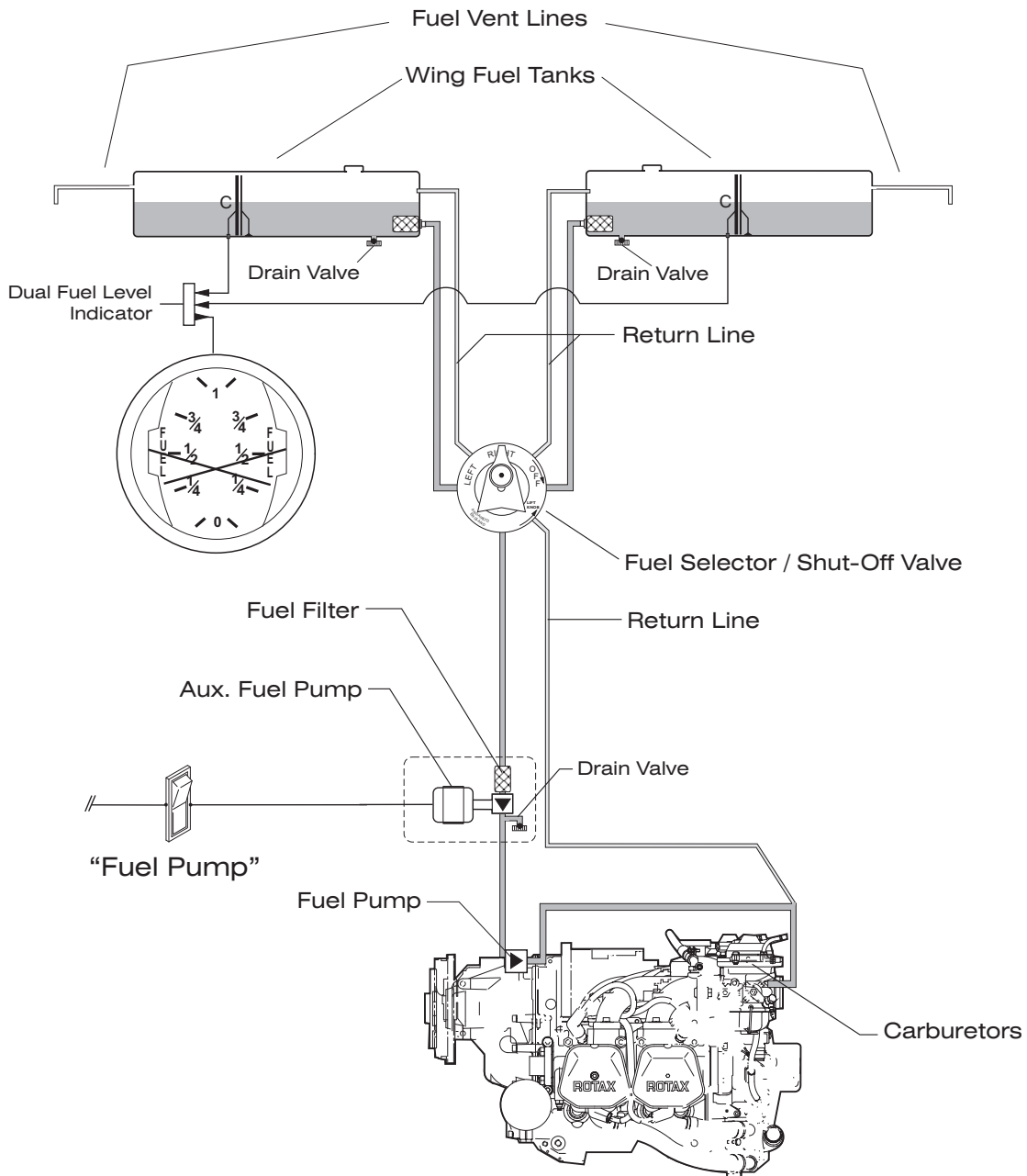
E. Fuel Drain System

Each tank has an individual, manually operated drain at the bottom, inboard rear corner. A further drain valve is installed at the fuel system lowest point, at the base of electrical fuel pump.

F. Fuel Lines

All the fuselage fuel lines are made of aluminum tubing. In the engine compartment, flexible hoses with fittings are used. These are Teflon hoses with silicone coated fire sleeves.

FUEL SYSTEM SCHEMATIC



Fuel System (Schematic)
Figure 01

FUEL STORAGE - DESCRIPTION

1. Introduction

- A. This section describes that portion of the fuel system, which stores fuel. The aircraft is equipped with a wet wing fuel storage system. The system consists of two integral fuel tanks (one each wing).

2. Description and Operation

- A. The fuel tanks are located at the inboard portion of each wing in front of the main spar. They are bounded by the upper and lower reinforced in this area wing skins, main spar web, and the inboard and outboard fuel tank ribs on the side. Each fuel tank has a lockable, grounded to the airframe fuel filler cap, which seals the fitting that is bonded flush with the upper wing skin. The inner surfaces of the composite integral tanks are sealed with a special fuel tank sealing material, to protect the fiber composite structure. For reducing fuel slosh in the fuel outlet and the fuel probe areas a fuel baffle rib is provided. The fuel tanks are vented from the top of each fuel tank through a vent line, connected at the outboard fuel tank rib, to a vent located on the winglets. Each inboard fuel tank rib has an outlet over sump level that is equipped with a removable mesh strainer. From this outlet fuel flows through the fuel selector / shut-off valve located in fuselage belly, below the center console, the electrical fuel pump, the engine driven fuel pump, the fuel distributor, and then to the float chambers of carburetors. Excessive fuel returns from the fuel distributor through the fuel selector / shut-off valve into the selected fuel tank.

The inboard fuel tank ribs are well accessible through an access panel 610 BB (510 BB) in the lower wing skin for maintenance.

Each tank has an individual manually operated drain on the lowest point to check fuel for water and sediment during preflight checks. A further drain valve is installed at the fuel system low point, at the bottom of fuselage, on the lower left front of the firewall.



FUEL STORAGE - MAINTENANCE PRACTICES

WARNING: PERFORM ANY FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. Wing Fuel Tanks

- A. The wing fuel tanks are maintenance-free. However, if a leak is suspected, AQUILA Technische Entwicklungen GmbH should be consulted.

2. Testing Wing Fuel Tanks

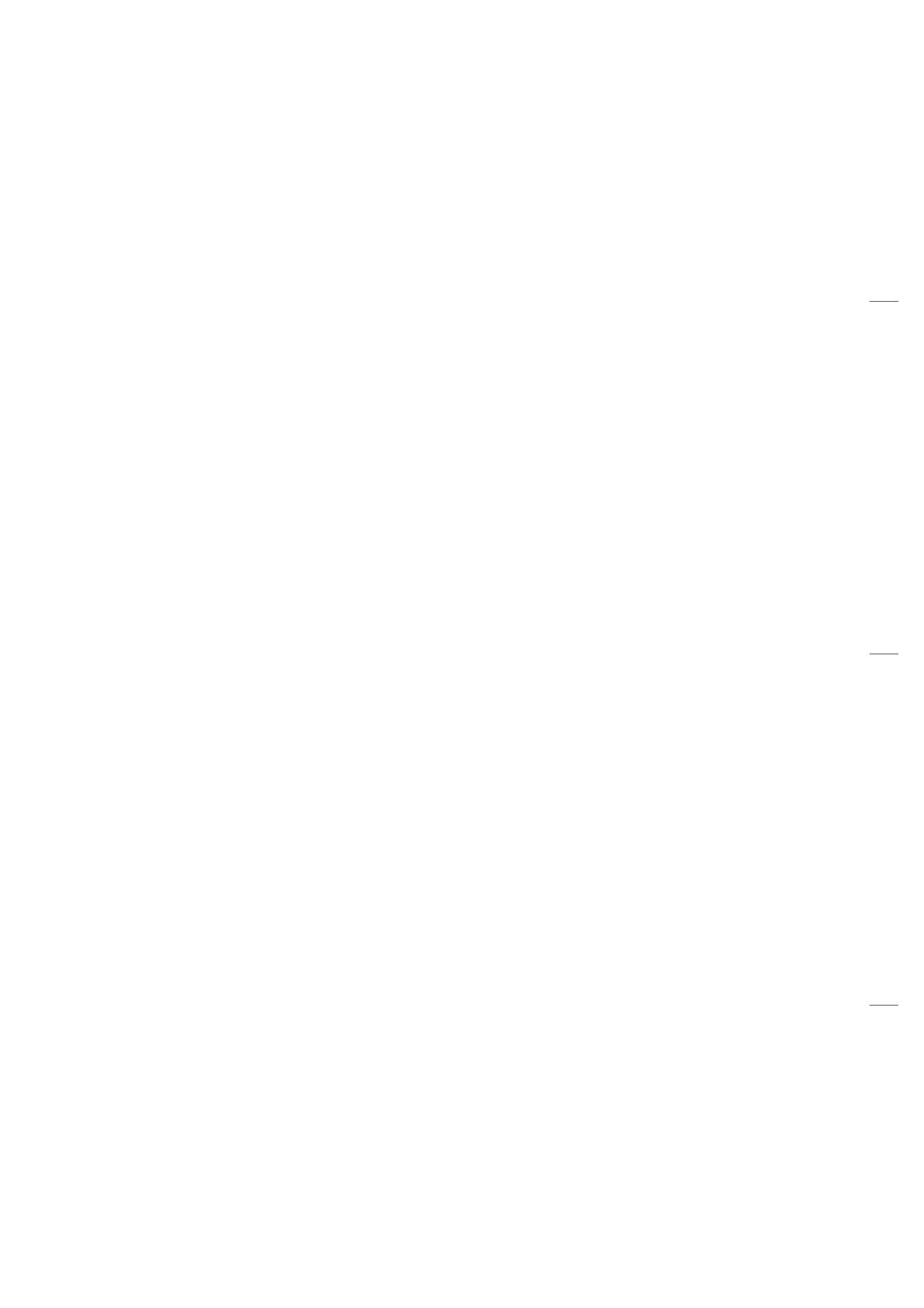
- A. The following procedure should be used to check a wing fuel tank for leakage.

- (1) Verify battery is disconnected.
- (2) Drain fuel from wing fuel tank.
- (3) Open access plate 610 BB (510 BB).
- (4) Disconnect fuel outlet line from fuel tank.
- (5) Disconnect fuel return line from fuel tank.
- (6) Cap fuel tank vent line.
- (7) Attach a suitable manometer (water manometer) to fuel tank outlet fitting.

WARNING: NEVER APPLY REGULATED OR UNREGULATED AIR FROM AN AIR COMPRESSOR TO THE FUEL SYSTEM OR COMPONENTS.

CAUTION: DO NOT PRESSURIZE THE FUEL TANKS TO MORE THAN 1.0 PSI. STRUCTURAL DAMAGE MAY OCCUR TO THE FUEL TANK IF MORE THAN 1.0 PSI IS APPLIED.

- (8) To the return line fitting, connect a well-regulated supply of air (1.0 PSI maximum).
- (9) Make sure filler cap is installed and sealed.
- (10) Apply pressure slowly until 1.0 PSI is obtained.
- (11) Shut off air supply.
- (12) If fuel tank holds for 15 minutes without pressure loss, the tank with vent line is sealed.



FUEL DISTRIBUTION - DESCRIPTION

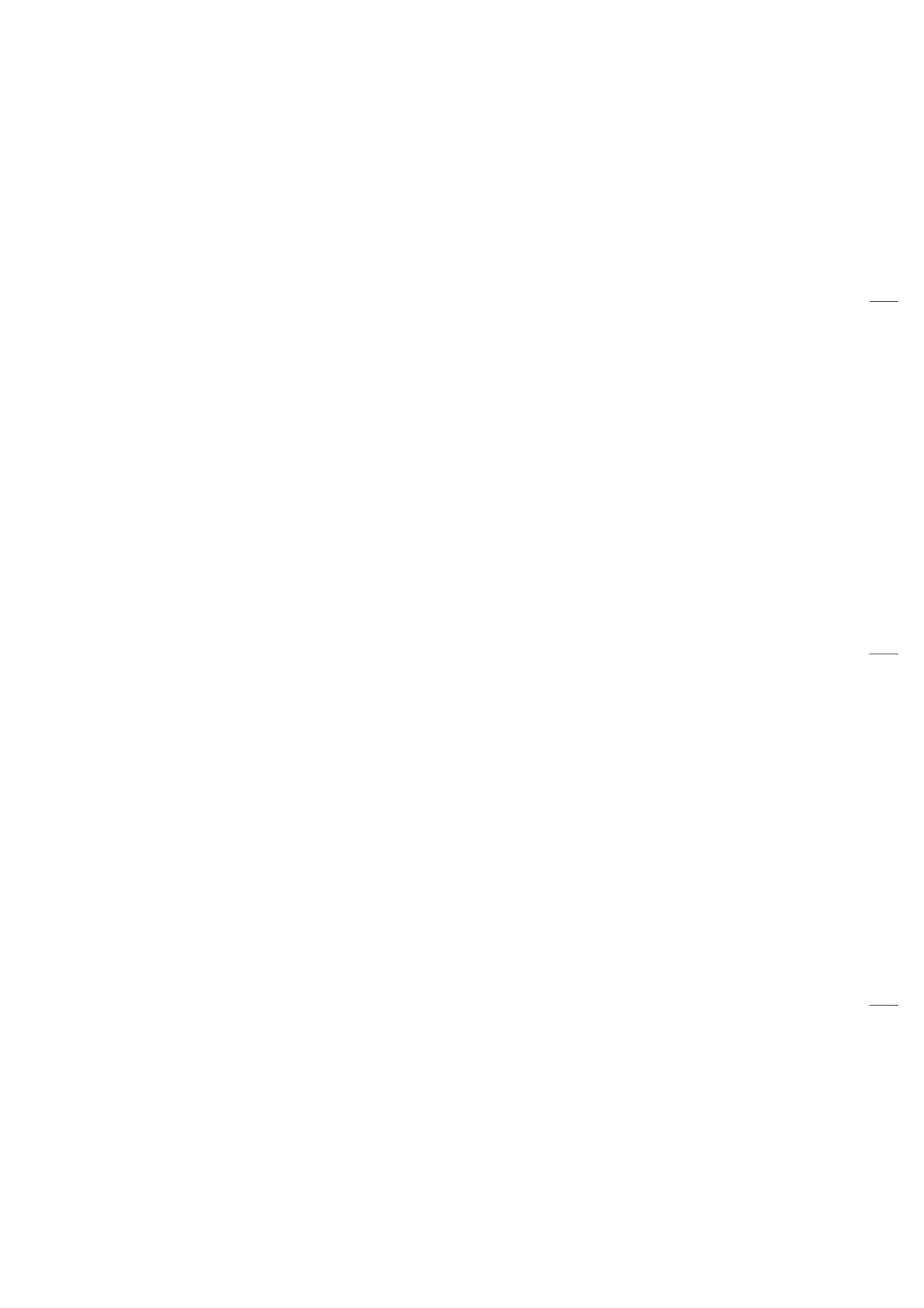
1. Introduction

- A. This section describes that portion of the fuel system, which is used to distribute fuel from the storage system to the power plant.
The system consists primarily of fuel selector / shut-off valve, an electrical fuel pump, fuel lines, and the fuel pump switch.

2. Description and Operation

- A. Fuel is delivered to the carburetors by the engine driven fuel pump from the fuel tank that is preselected by the fuel selector / shut-off valve. An electrical fuel pump is provided in case of the failure of the engine driven fuel pump. Excessive fuel flows through return lines and the fuel selector valve back to the same tank.
- B. For selecting the desired fuel tank and to interrupt fuel supply in case of an emergency the fuel selector / shut-off valve is provided.
The selector handle is mounted in view of the pilot and well accessible in the center console between the seats. The red, arrow shaped handle has a LEFT, RIGHT, and OFF position. Each position has a positive detent.
To switch the valve to the OFF position, a knob located at the top of the handle must be pulled simultaneously while rotating the handle. With the valve in this position fuel flow from and to tanks is stopped. The handle points back and to the right.
In both operating positions, the fuel supply / return lines of the selected fuel tank are opened, and the fuel supply/ return lines of the other one are closed. The valve handle points in the direction of the tank being selected.
- C. The electrical fuel pump is incorporated into the system without bypass. In this way fuel flows through a fuel strainer, which is integral of the fuel pump, even if the pump is off.
The electrical fuel pump is mounted in the engine compartment, at the lower left firewall. At fuel pump base, the fuel system lowest point, is a fuel drain valve provided for drainage of water and sediments from the fuel system. The drain valve is accessible from outside the nose section.
A further filter element that is integral of the fuel pump is only renewable by replacing entire fuel pump.

12 VDC electrical power for the pump is supplied from the main electrical bus. A rocker type switch in the row of switches on the instrument panel controls the pump.



FUEL DISTRIBUTION - MAINTENANCE PRACTICES

1. General

- A. For a secure, continuous fuel supply to the engine, a clean fuel distribution system is very important. The fuel system is equipped with drain valves to provide a means for the examination of fuel in the system for contamination and grade.
- (1) The electrical fuel pump is located on the lower left front of the firewall. It has a filter screen, which must be cleaned regularly. The filter screen can be removed for maintenance.
 - (2) A mesh strainer is installed on the fuel outlet in each fuel tank. The strainer is accessible by opening the fuel tank rib access panel 520 BB (510 BB). The strainer is brazed to a fitting that is installed in the fuel tank port. The fuel strainers in the fuel tanks should always be cleaned after aircraft has been in storage. If any damage or restrictions are noted, the strainer should be replaced.
 - (3) The fuel line has a drain valve at its lowest point, at the base of the fuel pump. The drain valve is accessible from outside the nose section without removal of any components. It is to be used regularly to check fuel for water, contamination.
 - (4) Each wing fuel tank has a drain-valve at its base. The drain valves are accessible from outside the bottom of wing in the wing root area. They also should be used for regular examination of fuel for water, contamination.
- The daily preflight check includes this inspection.

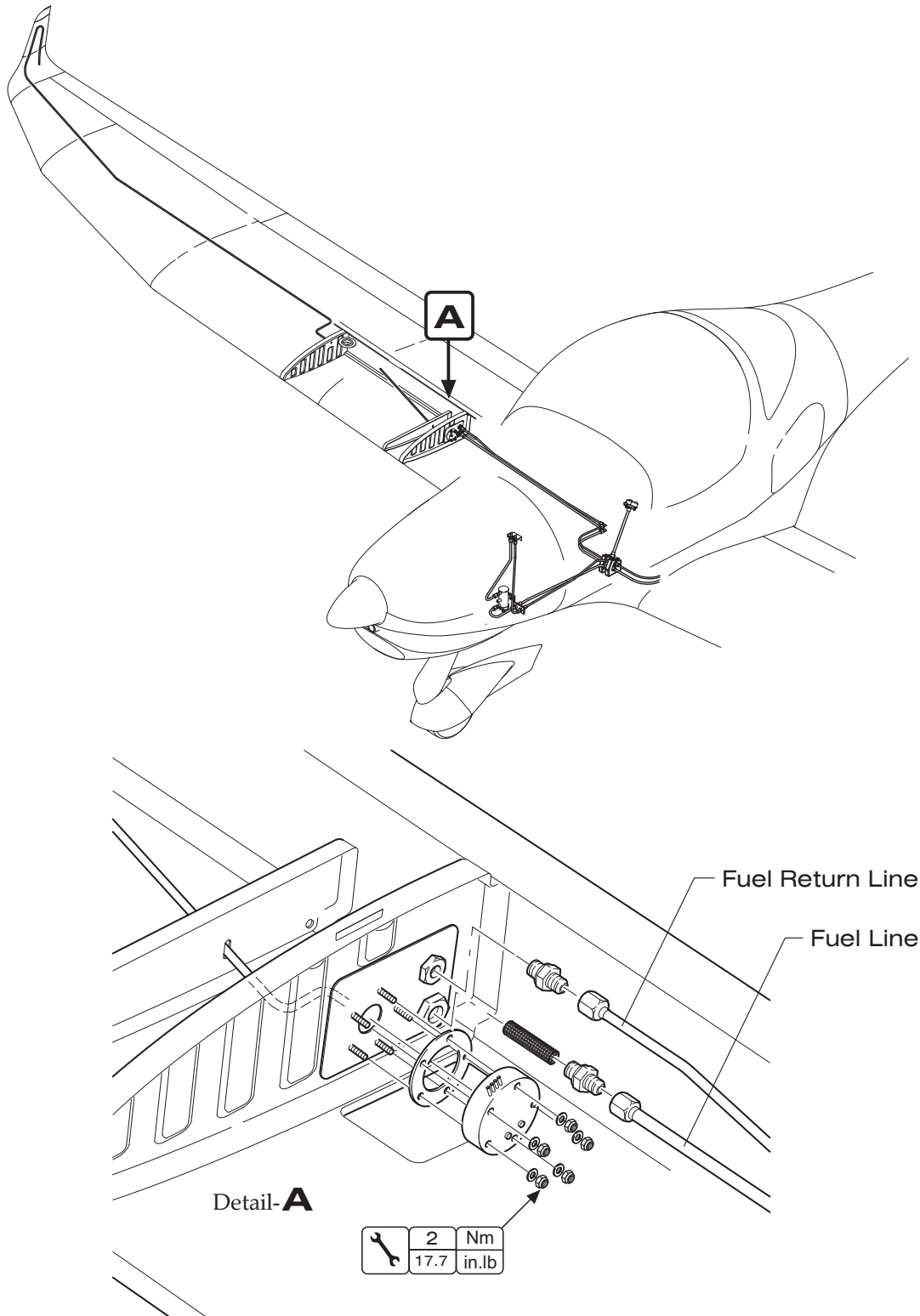
WARNING: PERFORM ANY FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

2. Fuel Selector / Shut-Off Valve Removal/Installation

- A. Remove Fuel Selector / Shut-OFF Valve

WARNING: DISCONNECT BATTERY PRIOR TO SERVICING THE SELECTOR VALVE.

- (1) Disconnect battery and insulate both cable ends to prevent accidental reconnection.
 - (2) Drain fuel from fuel system completely using the wing fuel tank drains and the drain at the electrical fuel pump.
 - (3) In the cabin remove access panels 211 BB and 211 HL/HR (Refer to 25-21-00).
 - (4) Remove access panel 211 GT with fuel selector / shut-off valve control lever and connecting shaft (Refer to 25-21-00).
 - (5) Disconnect the fuel supply and return lines at valve.
 - (6) Remove bolts securing valve to mounting bracket and remove the fuel selector / shut-off valve assembly from aircraft.
- B. Install Fuel Selector / Shut-OFF Valve
- (1) Verify battery is disconnected.
 - (2) Place fuel selector / shut-off valve into position and secure using washers and bolts.
 - (3) Connect all fuel supply and return lines at valve.
 - (4) Connect the fuel selector / shut-off valve control lever.
 - (a) Make sure both the valve and the valve control lever are set to off and install access



Fuel System Components Installation
Figure 201

panel 211 GT with fuel selector / shut-off valve control lever and connecting shaft (Refer to 25-21-00).

- (5) Refuel the aircraft.
- (6) Pressure check complete fuel system (Refer to 28-20-00).
- (7) Inspect fuel selector / shut-off valve and enclosure for any signs of fuel leakage.
- (8) Connect battery (Refer to 24-30-00).
- (9) Perform operational check of the fuel distribution system.
- (10) Install all items removed for access.

4. Electrical Fuel Pump Removal/Installation

A. Remove Electrical Fuel Pump

- (1) Disconnect battery (Refer to 24-30-00).
- (2) Close fuel selector / shut-off valve.
- (3) Remove engine cowling (Refer to 71-10-00).
- (4) Disconnect the pump wires.
- (5) Disconnect fuel lines at electrical fuel pump. Drain fuel from line.
- (6) Remove bolts, washers and nuts securing electrical fuel pump to firewall and remove electrical fuel pump.

B. Install Electrical Fuel Pump

- (1) Secure electrical fuel pump to firewall using bolts, washers and nuts.
- (2) Reconnect fuel lines to electrical fuel pump.
- (3) Reconnect the pump electrical wires.
- (4) Reconnect battery (Refer to 24-30-00).

5. Maintenance of the Electrical Fuel Pump Filter Element

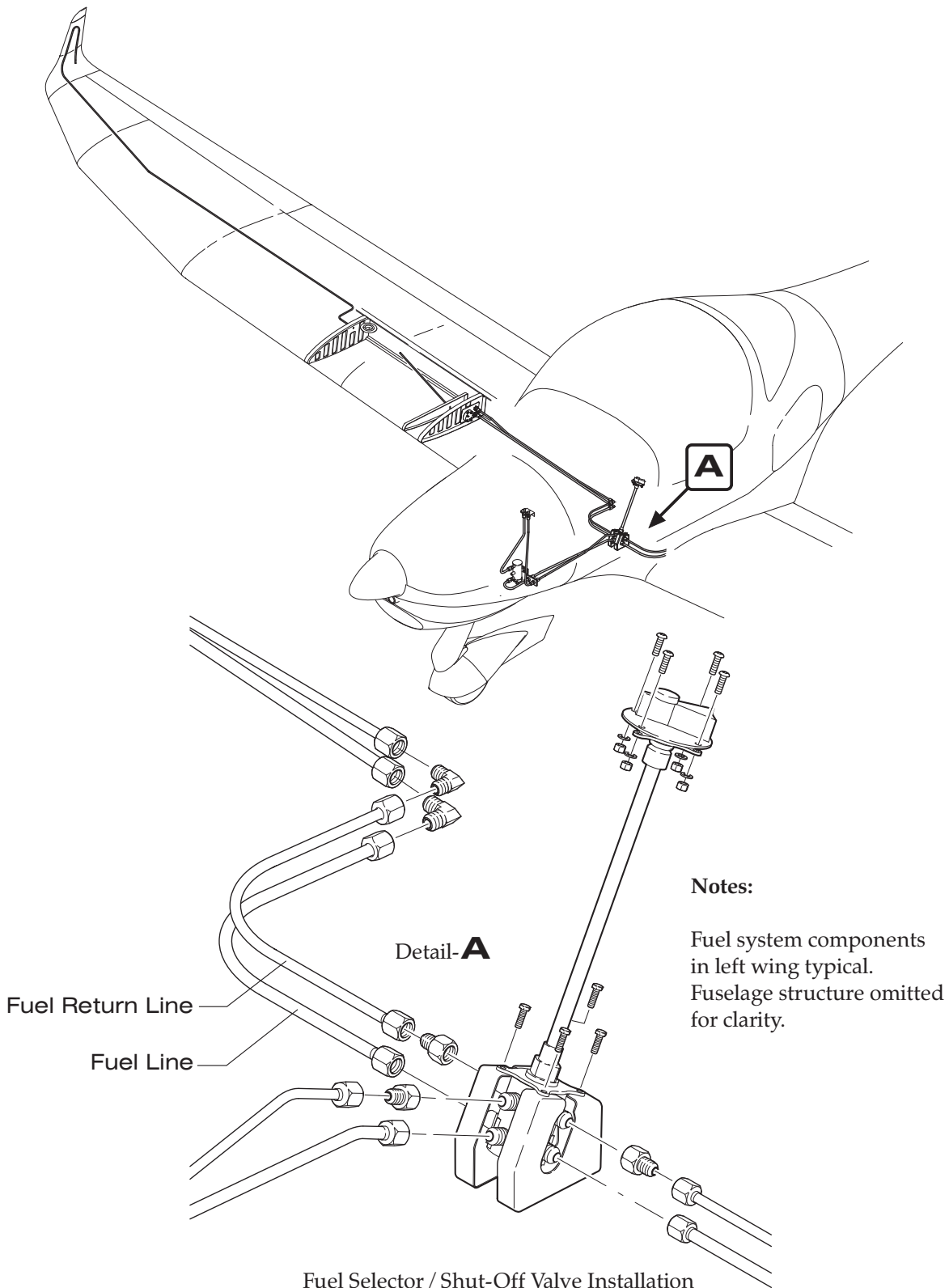
A. Maintenance is accomplished by the following procedure:

- (1) Remove locking wire at lower fuel pump cap.
- (2) Remove lower cap.
- (3) Remove filter element and clean by washing.
- (4) Check disk magnet for metal particles.
- (5) Reassemble filter and cap.
- (6) Secure cap using locking wire.

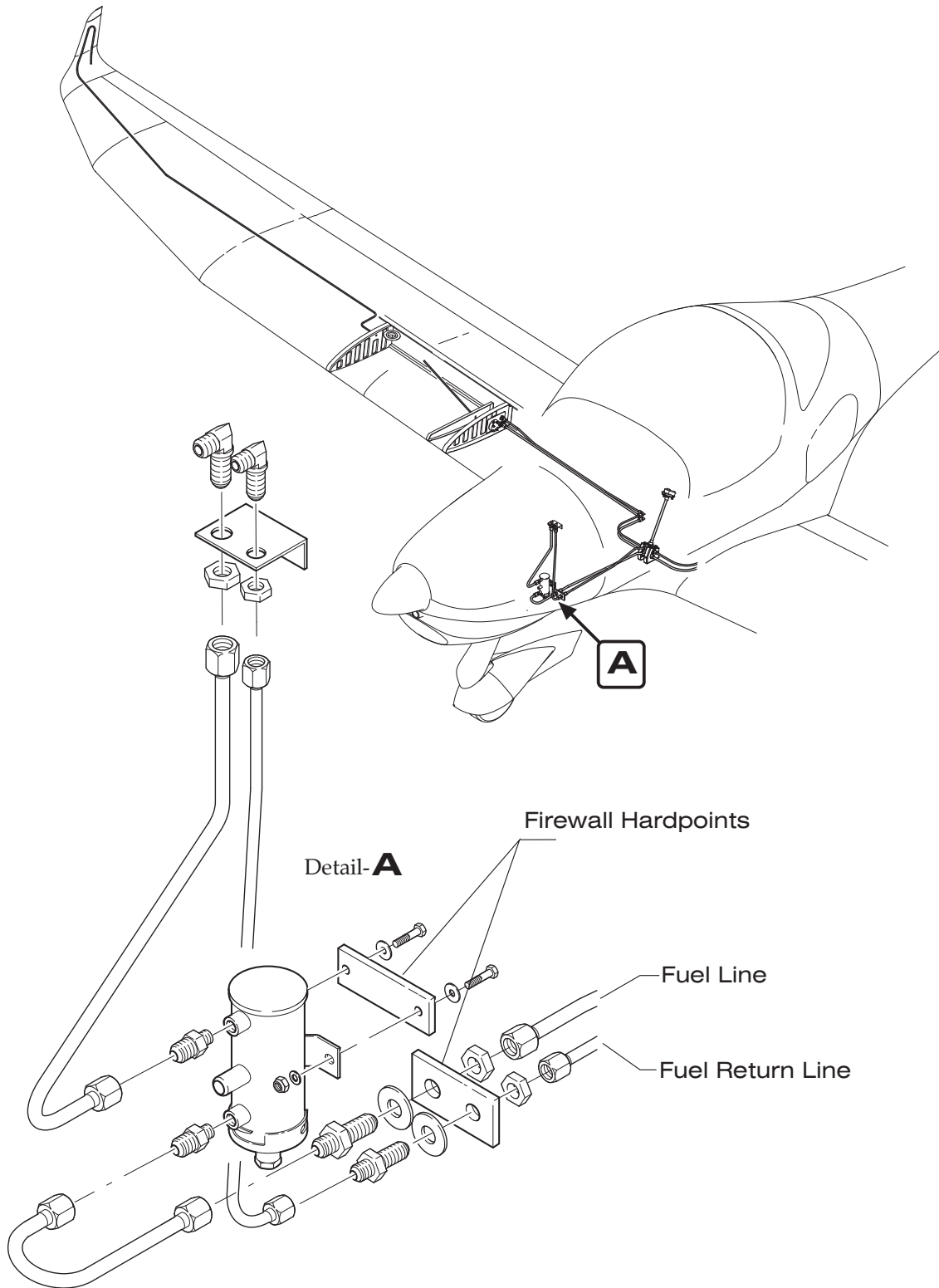
6. Adjustment/Test - Fuel System Pressure Test

A. Leak test of the fuel system by the following procedure:

- (1) Fill the wing fuel tank with approved fuel.
- (2) Remove engine cowling, crew seats and all other panels and covers to gain access to all fuel system components and fuel lines (Refer to 25-10-00, 25-21-00, and 71-10-00).
- (3) Place the fuel selector / shut-off valve in "LEFT" ("RIGHT") Position.
- (4) In engine compartment disconnect the pressure fuel line and return line there the flexible fuel lines connected to the aluminum lines and cap fittings.
- (5) Connect to the outboard end of either fuel tank vent line a rubber hose with a well-regulated



Fuel Selector / Shut-Off Valve Installation
Figure 202



Electrical Fuel Pump / System Components Installation
Figure 203

supply of air (1.0 PSI maximum).

- (6) Connect a suitable manometer (water manometer) to the other fuel vent line.
- (7) Make sure filler caps are installed and sealed.

WARNING: NEVER APPLY REGULATED OR UNREGULATED AIR FROM AN AIR COMPRESSOR TO THE FUEL SYSTEM OR COMPONENTS.

NEVER ATTEMPT TO REMOVE THE FUEL FILLER CAP WITH PRESSURE IN THE FUEL SYSTEM.

CAUTION: DO NOT PRESSURIZE THE FUEL SYSTEM TO MORE THAN 1.0 PSI. DAMAGE MAY OCCUR TO SYSTEM COMPONENTS IF MORE THAN 1.0 PSI IS APPLIED.

- (8) Apply pressure into the system slowly until 1.0 PSI is obtained.
- (9) Shut off air supply
- (10) System pressure should remain constant for 15 minutes.
- (11) Inspect the seams, fittings and connections of the accessible portion of the wing fuel tank.
Check the fuel lines, the fuel selector / shut-off valve and all other fuel related areas for signs of leakage.
- (12) If leakage is suspected (pressure readings drop), apply soapy water to the area in question and inspect for bubbles.
- (13) Release all Pressure from the fuel system.
- (14) Remove the rubber hose with the supply of air and the manometer from the end of fuel vent lines.
- (15) Reconnect the pressure fuel line to the electrical fuel pump.
- (16) Remove plugs of fuel filler caps vent holes.
- (17) Install all items that have been removed prior to performing the test (Refer to 25-10-00, 25-21-00 and 71-10-00).
- (18) If any leakage was detected, seal as required.

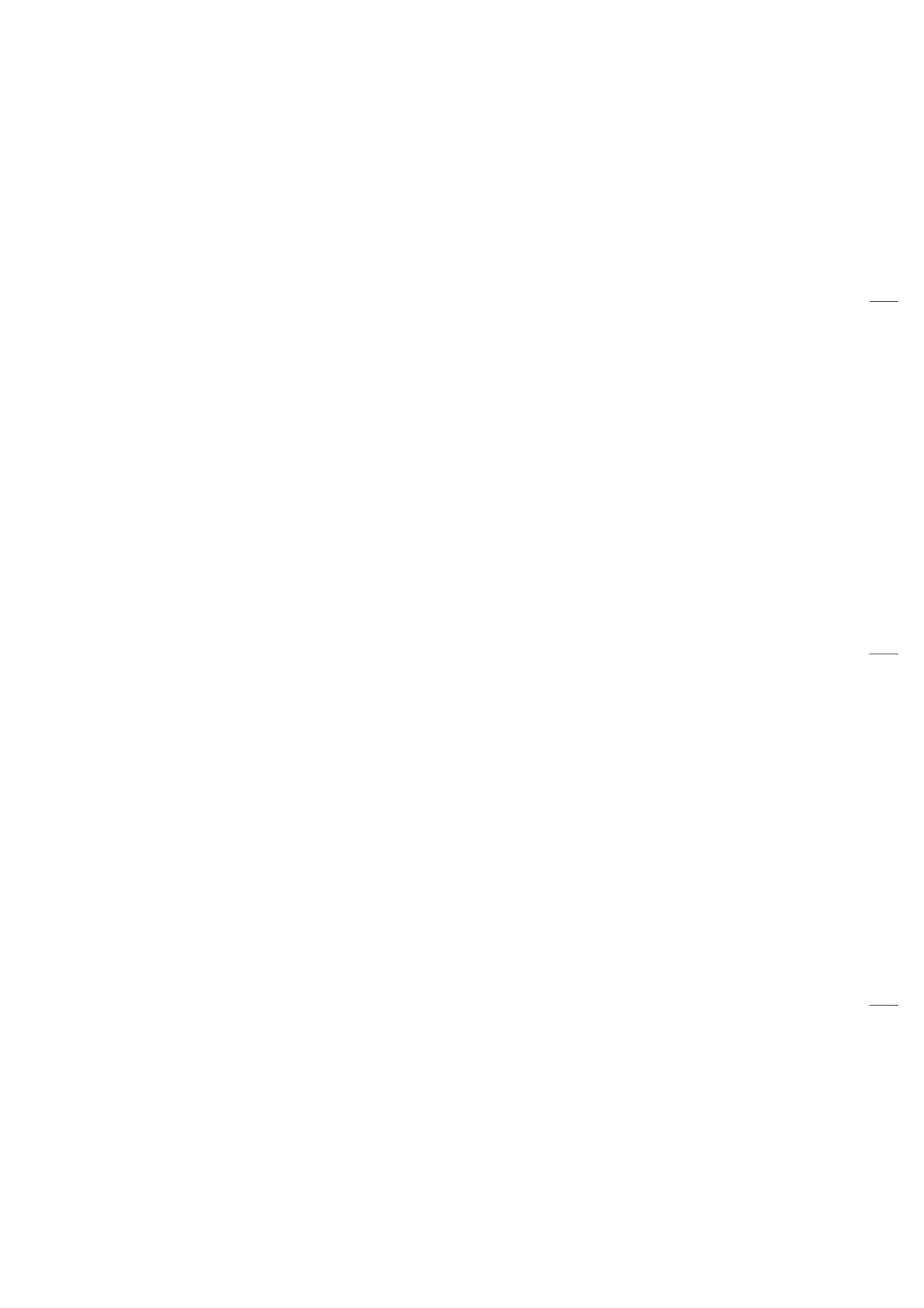
FUEL INDICATING - DESCRIPTION

1. Introduction

- A. This section describes that portion of the fuel system, which is used to indicate the quantity of the fuel.
The system consists primarily of two capacitive type fuel level probes, one in each tank, and a dual fuel level indicator mounted on the right side of the instrument panel.

2. Description and Operation

- A. Fuel quantity is measured by two capacitive type fuel level probes, one in each tank, and indicated by a dual fuel level indicator mounted on the right side of the instrument panel.
The fuel level indicator has the markings FULL, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{1}{4}$ and EMPTY for each tank and has been calibrated during installation. Through the access panels in the lower wing skin the fuel probes are well accessible for maintenance or replacement.



FUEL INDICATING - MAINTENANCE PRACTICES

WARNING: PERFORM ANY FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. Fuel Level Indicator Removal/Installation

A. Remove Fuel Level Indicator

- (1) Ensure the "ALT / BAT" switch is in OFF Position.
- (2) Remove glare shield (Refer to 31-10-00).
- (2) Gain access to back side of indicator and disconnect electrical connectors.
- (3) While supporting indicator, remove screws mounting indicator to instrument panel.
- (4) Remove indicator from aircraft.

B. Install Fuel Level Indicator.

- (1) Position fuel level indicator in instrument panel and secure with screws.
- (2) Reconnect electrical connectors to indicator.
- (3) Perform a fuel level system test / calibration as described below.
- (4) Install glare shield (Refer to 31-10-00).

2. Fuel Level Probe Removal/Installation

A. Remove Fuel Probe

- (1) Ensure "ALT / BAT" switch is in OFF position.
- (2) Disconnect battery and insulate both cable ends to prevent accidental connection (Refer to 24-30-00).
- (3) Drain wing fuel tank with fuel level probe that must be removed (Refer to 12-11-00).
- (4) Open access / inspection plate 510 BB (610 BB) (Refer to 06-30-00) to gain access to probe.
- (5) Disconnect fuel probe electrical cables at connector.
- (6) Remove nuts securing fuel probe to inboard fuel tank rib
- (7) Carefully withdraw fuel level probe from wing tank.

B. Install Fuel Level Probe

- (1) Verify battery is disconnected and the "ALT / BAT" switch is in OFF position.

CAUTION: THE FUEL LEVEL PROBE TUBE SHOULD BE WORKED CAREFULLY INTO THE FUEL TANK AND THROUGH THE HOLE OF THE FUEL BAFFLE RIB.

- (2) Place fuel level probe with new gasket onto the threaded studs at inboard fuel tank rib.
- (3) Secure fuel level probe with washers and nuts. Torque nuts crosswise to 2 Nm (17.7 in.lb).
- (5) Connect fuel probe electrical cables at connector.
- (6) Connect battery (Refer to 24-30-00).
- (7) Perform Fuel Level Indicating System Test / Calibration (Refer to 28-40-00).

3. Fuel Level Probe Test

- A. Test the fuel level probe as follows:
(1) Reserved

4. Fuel Level Indicating System Test / Calibration

WARNING: THE SYSTEM CALIBRATION MUST BE PERFORMED WITH UNLEADED SUPER (RON 95) OR SUPER PLUS (RON 98) FUEL GRADE.
DO NOT USE AVGAS OR MIXTURES OF FUEL GRADE FOR CALIBRATION!

NOTE: Anytime a fuel level probe or the indicator is replaced, the fuel level indicating system must be functionally tested and recalibrated as necessary.

NOTE: A 12V- and a 5V-system has been used.

A. Fuel Level Indicating System Test / Calibration

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks and from system (Refer to 12-11-00).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (Refer to 08-10-00).
 - (d) Open access panel 610 BB and 510 BB (Refer to 06-10-30).
- (2) On fuel level probe turn small potentiometers "empty" and "full" to right stop.
- (3) Turn "BAT" switch to the ON Position.
- (4) Place 5,2 liters (1.37 Gallons) of fuel in wing fuel tank.
- (5) Turn potentiometer "empty" counterclockwise until fuel level indicator reads zero.
- (6) Add 27,4 liters (7.23 gallons) of fuel to wing fuel tank.
- (7) Adjust the "full" potentiometer of the fuel level probe until the pointer of the fuel level indicator is at the ½ indication.
- (8) Repeat step (2) thru (7) for the other wing fuel tank.
- (9) Turn "BAT" switch off.
- (10) Place a locking compound on all potentiometer screws.
- (11) Close access panel 610 BB and 510 BB (Refer to 06-10-30) and fuel filler caps.

EFFECTIVITY

Fuel level sensor with potentiometer

3. Fuel Level Probe Test

- A. Test the fuel level probe as follows:
(1) Reserved

4. Fuel Level Indicating System Test / Calibration

WARNING: THE SYSTEM CALIBRATION MUST BE PERFORMED WITH UNLEADED SUPER (RON 95) OR SUPER PLUS (RON 98) FUEL GRADE.
DO NOT USE AVGAS OR MIXTURES OF FUEL GRADE FOR CALIBRATION!

NOTE: Anytime a fuel level probe or the indicator is replaced, the fuel level indicating system must be functionally tested and recalibrated as necessary.

NOTE: 5V-system only!

A. Fuel Level Indicating System Test / Calibration

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks and from system (Refer to 12-11-00).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (Refer to 08-10-00).
 - (d) Open access panel 610 BB and 510 BB (Refer to 06-10-30).
- (2) Turn "BAT" switch to the OFF Position.
- (3) Place 5,2 liters (1.37 Gallons) of fuel in wing fuel tank.
- (4) Jump the sender wire to ground and turn power ON, then remove the jumper. The pointer will fluctuate between empty and full readings and then settle on empty.
- (5) Add 54,8 liters (14.46 gallons) of fuel to wing fuel tank.
- (6) With power OFF jump the sender wire to ground, turn power ON for 4 sec., then remove the jumper. The pointer will fluctuate between empty and full readings then settle on full.
- (7) Repeat step (2) thru (7) for the other wing fuel tank.
- (8) Turn "BAT" switch OFF.
- (9) Close access panel 610 BB and 510 BB (Refer to 06-10-30) and fuel filler caps.

EFFECTIVITY

Fuel level sensor without potentiometer



CHAPTER 33

LIGHTS

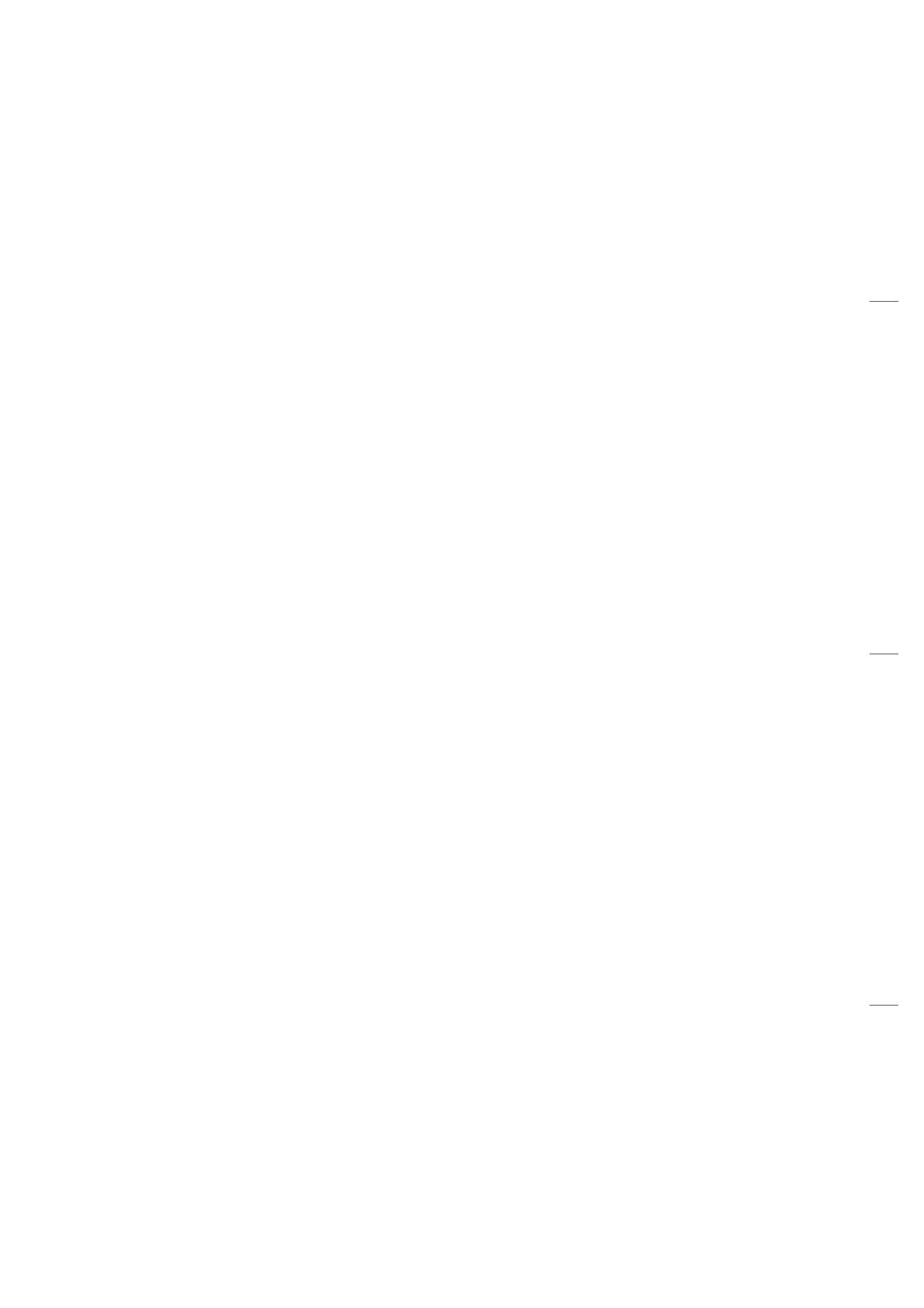
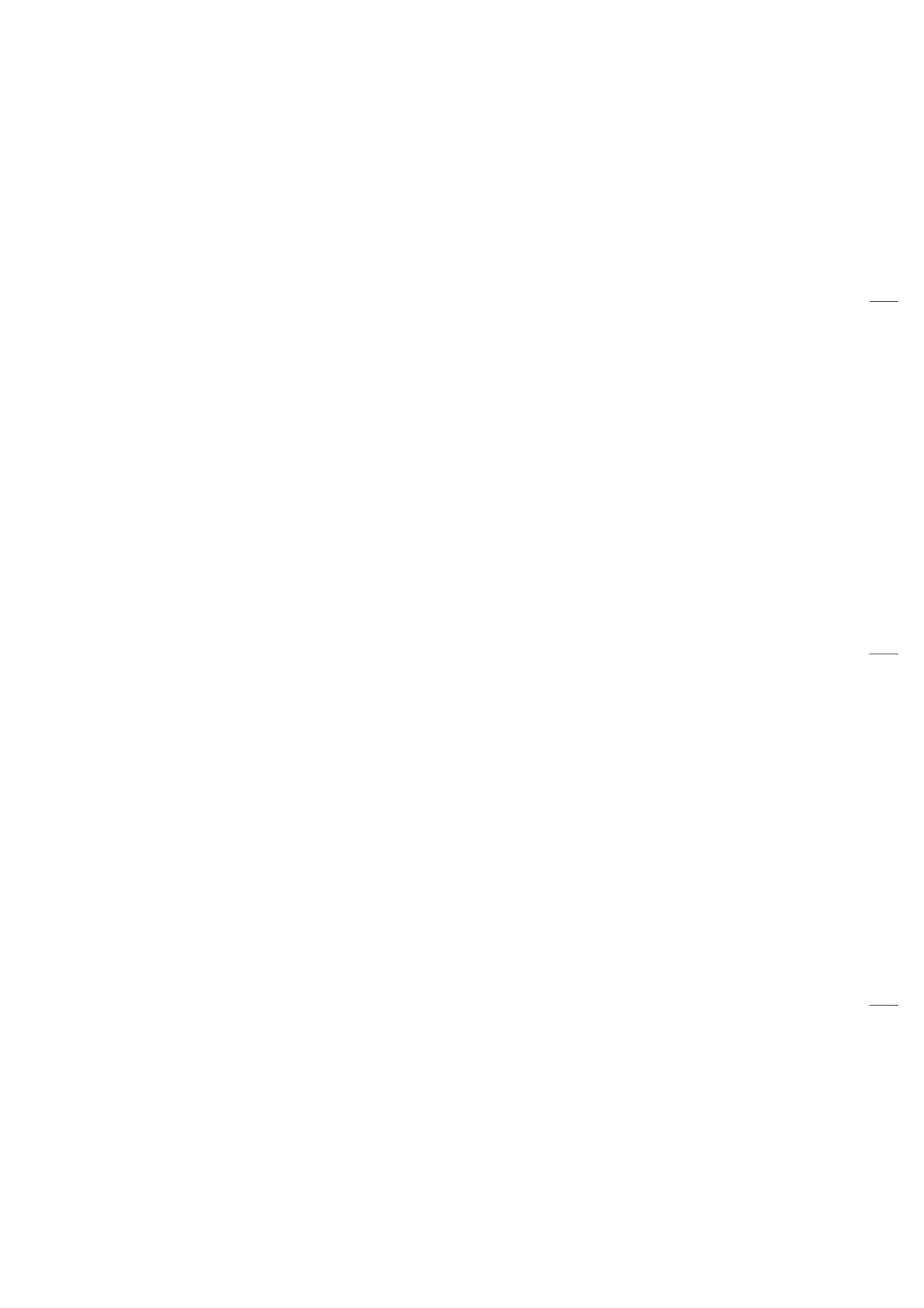


TABLE OF CONTENTS

<u>Title</u>	<u>Chapter Section Subject</u>	<u>Page</u>
LIGHTS - GENERAL.....	33-00-00	1
Introduction	33-00-00	1
General Description	33-00-00	1
EXTERIOR LIGHTS - MAINTENANCE PRACTICES	33-40-00	201
General	33-40-00	201
Tools, Equipment and Material	33-40-00	201
Landing Light Removal/Installation	33-40-00	201
Navigation / Position Light Bulb Replacement	33-40-00	201
Flash Tube Assembly Replacement	33-40-00	202
Anti-Collision Strobe Light Assembly Removal/Installation	33-40-00	202
Strobe Light Module Removal/Installation	33-40-00	203



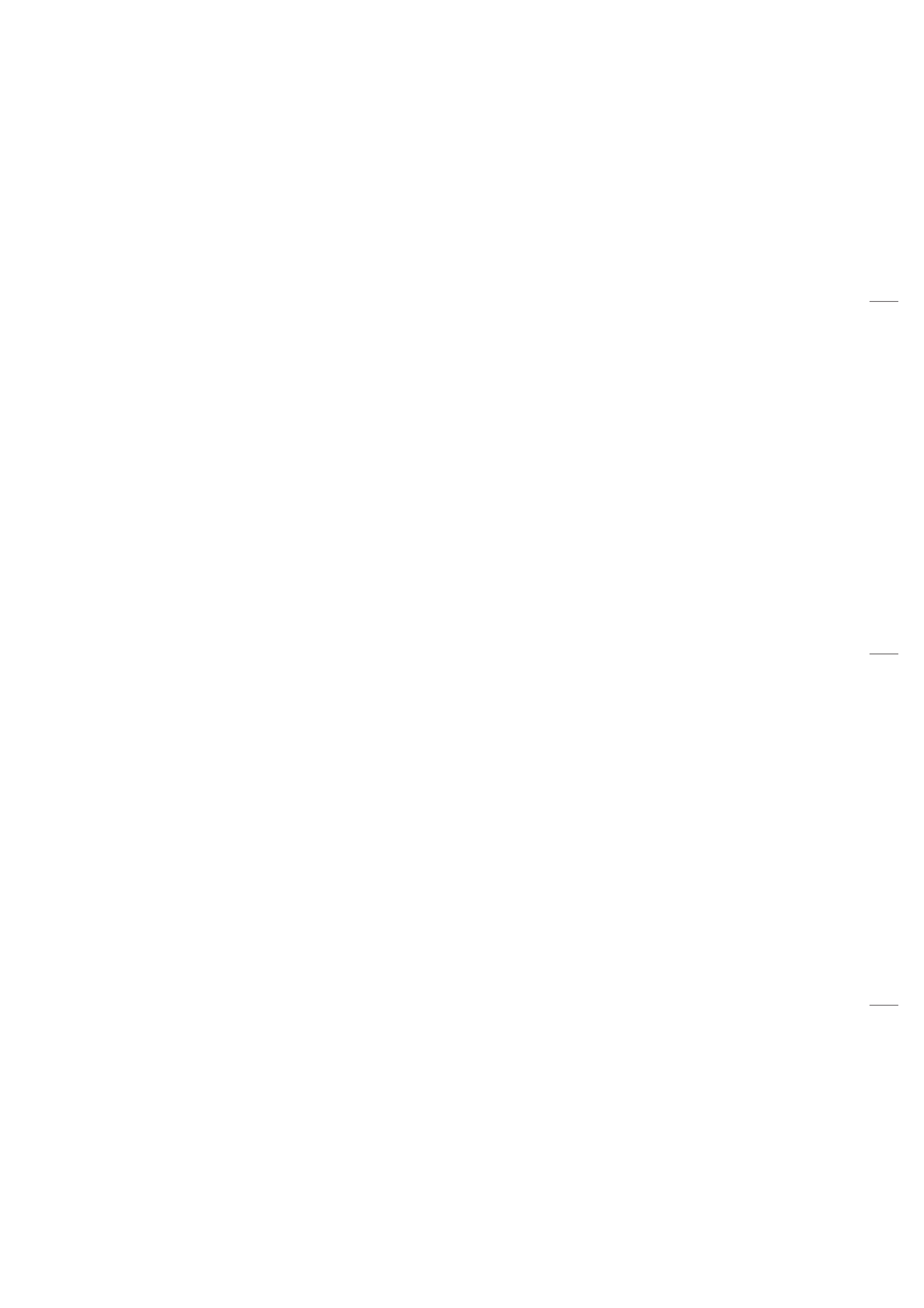
LIGHTS - GENERAL

1. Introduction

- A. This chapter describes interior and exterior lighting systems used on the aircraft, including removal and installation procedures of components and light bulb replacement instructions.

2. General Description

- A. For general cabin lighting, for emergency instrument panel lighting and as reading light a flood light is provided. The dimmable and swivel flood light is installed in the roof of the cabin just behind of the seats. The light is controlled through a dimmer switch at the light and receive power when the cabin light switch which is located in the instrument panel, in the row of switches, is on.
The voltmeter, the ammeter, the oil temperature, the oil pressure, and the cylinder heat temperature indicators as well as the most of the avionics equipment are internal lighted. Refer to appropriate manufacturer's publications for maintenance instruction.
- B. Exterior lighting consists of wing tip navigation lights with integral anti-collision strobe lights and position lights, and a single landing light.



EXTERIOR LIGHTS - MAINTENANCE PRACTICE

1. General

- A. The maintenance of exterior lights is limited to removal and installation of components, and light bulb replacement.

2. Tools, Equipment and Material

Required in	Quantity	Equipment	Parts No.	Manufacturer
4.A.	1	Nav. Light Bulb	-	-
4.A.	1	Pos. Light Bulb	-	-
4.B.	1	Flash Tube Assy	-	-

3. Landing Light Removal/Installation

- A. Remove Landing Light
- (1) Remove upper cowling (Refer to 71-10-00)
 - (2) Disconnect landing light electrical wires at connector.
 - (3) Remove screws securing landing light to cowling and remove landing light from aircraft.
- B. Install Landing Light
- (1) Position landing light to cowling and secure using screws.
 - (2) Connect landing light electrical wires at connector.
 - (3) Perform functional check, adjust landing light if necessary.
 - (4) Install cowling (Refer to 71-10-00).
- C. Landing Light Inspection/Check
- (1) Turn BAT switch ON.
 - (2) Turn LDG light ON.
 - (3) Verify the landing light works properly.
 - (4) Turn OFF all switches.

4. Navigation / Position Light Bulb Replacement

CAUTION: DO NOT ALLOW THE GLASS PORTION OF THE LIGHT BULB TO COME INTO CONTACT WITH EXPOSED SKIN.
PAY ATTENTION WHILE DISASSEMBLING ANTI-COLLISION STROBE LIGHT ASSEMBLY TO PREVENT GLASS LENSES FROM DROPPING DOWN.

NOTE: The illumination unit of the LED-version cannot be repaired.
If one LED of the cluster is failed the complete illumination unit is to be replaced.

- A. Navigation / Position Light Bulb Replacement
- (1) Ensure BAT, NAV light and Strobe light switches are in OFF position.
 - (2) Remove screws securing lens retainer to the base plate. Carefully remove lens retainer and lenses.

- (3) Grasp the navigation light bulb, depress slightly and turn counterclockwise to release bulb from bayonet mount.
- (4) To remove the position light bulb, pull it straight out from the socket.
- (5) Place the navigation light bulb into the bayonet socket, depress, and gently turn clockwise until bulb seats in socket.
- (6) To install the position light bulb, push it straight into the socket.
- (7) Place all lenses in position and secure using lens retainer and screws.

B. Navigation / Position Lights Inspection/Check

- (1) Turn BAT switch ON.
- (2) Turn NAV light switch ON.
- (3) Verify the navigation / position lights works properly.
- (4) Turn OFF all switches.

5. Flash Tube Assembly Replacement

WARNING: HIGH VOLTAGE! ENSURE ELECTRICAL POWER TO STROBE LIGHT SYSTEM IS OFF.

- (1) Ensure BAT, NAV light and Strobe light switches are in OFF position.
- (2) Remove screws securing lens retainer to the base plate. Carefully remove lens retainer and lenses.
- (3) Pull the flash tube assembly and wire out of the base plate. Disconnect wire at connector.
- (4) Connect wire at connector, and route wire through the base plate. Insert light assembly into base plate.
- (5) Place all lenses into position and secure using lens retainer and screws.

6. Anti-Collision Strobe Light Assembly Removal/Installation

WARNING: HIGH VOLTAGE! ENSURE ELECTRICAL POWER TO STROBE LIGHT SYSTEM IS OFF.

NOTE: Removal and installation is typical for both the left wing anti-collision strobe light assembly and the right wing anti-collision strobe light assembly.

A. Remove Anti-Collision Strobe Light Assembly

- (1) Ensure BAT, NAV light and Strobe light switches are in OFF position.
- (2) Remove screws securing lens retainer to the base plate. Carefully remove lens retainer and lenses.
- (3) Pull the flash tube assembly and wire out of the base plate. Disconnect wire at connector.
- (4) Remove screws securing base plate to wing tip fairing and remove base plate.
- (5) Disconnect wires to navigation and position lights at connector.

B. Install Anti-Collision Strobe Light Assembly

- (1) Connect wires to navigation and position lights at connector.
- (2) Place base plate to wing tip fairing and secure with screws.

- (3) Connect wire to flash light assembly at connector, and route wire through the base plate.
Insert light assembly into the base plate.
- (4) Place all lenses into position and secure using lens retainer and screws.

C. Anti-Collision Strobe Light Inspection/Check

- (1) Turn BAT switch ON.
- (2) Turn Strobe light switch ON.
- (3) Verify the anti-collision strobe light works properly.
- (4) Turn OFF all switches.

7. Strobe Light Module Removal/Installation

WARNING: HIGH VOLTAGE! ENSURE ELECTRICAL POWER TO STROBE LIGHT SYSTEM IS OFF

A. Remove Strobe Light Module

- (1) Verify the BAT and Strobe light switches in the OFF position.
- (2) Pull the battery circuit breaker to open the circuit.
- (3) Remove baggage compartment floorboard / 211 JB (Refer to 25-21-00).
- (4) Disconnect module connectors.
- (5) Remove bolts securing module to fuselage structure and remove module from aircraft.

B. Install Strobe Light Module

- (1) Position module to fuselage structure and secure using hardware.
- (2) Connect module connectors.
- (3) Reset battery circuit breaker.
- (4) Ensure proper Anti-collision Strobe Light operation (Refer to 33-40-00).

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