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¹⁾ Depending on effectivity.

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¹⁾ Depending on effectivity.

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[illegible]



AQUILA AT01-100/200/300 MAINTENANCE MANUAL

Highlights of Revisions

HIGHLIGHTS OF REVISIONS

Revision Number	Date of Revision	Reason for Revision	Revision Number	Date of Revision	Reason for Revision
A.01	30.04.13	Initial issue.	A.11	01.06.22	New Beringer and Rotax manuals; Whelen Orion 660
A.02	26.08.13	SB-AT01-027	A.12	01.02.23	New variant AT01-200A; Garmin G3X autopilot
A.03	24.10.13	FAA validation (airworthiness limitations, wire routing diagrams); lubrication revised; standard torque ROTAX engine mount revised	A.13	31.05.24	New model AT01-300
			A.14	31.07.25	TBO updates; Rotax 912 maintenance manual updates
A.04	02.03.15	Life time limit, 6000 hour inspection	A.15	19.11.25	Unusable fuel AT01-300
A.05	20.08.15	Fuel quantity indicating system calibration procedures added; TBO's and maintenance checklist revised; Temporary revisions 1 & 2 incorporated			
A.06	29.02.16	Control surface ply lay-up added; repair procedures revised			
A.07	10.06.16	6000h check & TBOs added; battery check; wing bolts safetying			
A.08	09.10.18	Beringer: new axle and new wheels; Rotax: new spark plugs			
A.09	28.02.20	New model AT01-200			
A.10	05.03.21	Garmin GFC 500 autopilot			

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

The technical content of this document (revision A.15) is approved under the authority of the
DOA ref. EASA.21J.025.

19.11.25 A circular blue stamp with the text 'AQUILA Head of Airworthiness' is placed over a handwritten signature in blue ink.

Date, Signature Office of Airworthiness



AQUILA AT01-100/200/300 MAINTENANCE MANUAL

CHAPTER 11

PLACARDS AND MARKINGS

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PLACARDS AND MARKINGS - GENERAL

1. Introduction

- A. This chapter provides information about interior and exterior graphics, placards, labels and interior markings, their maintenance and repair.

2. General Description

Below a brief description and intended purpose of each section of this chapter is given.

- A. Section 11-00 - Placards and Markings - General. This section provides a general overview of content and purpose of the chapter.
- B. Section 11-20 - Exterior Placards and Markings. This section gives maintenance and care instructions for external placards, graphics, markings etc. and contains information about the equipment and material required.
- C. Section 11-30 - Interior Placards and Markings. This section gives maintenance and care instructions for internal placards, graphics, markings etc. and contains information about the equipment and material required.

EXTERIOR PLACARDS AND MARKINGS

1. General

- A. This section gives maintenance and care instructions for exterior graphics, markings, etc..
Figure 201 shows the locations of the exterior placards and markings.

2. Tools, Equipment and Material

	Quantity	Equipment	Parts No.	Manufacturer
3.A. and B.	1	heat gun	-	commercially available
3.A. and B.	as required	isopropyl alcohol	-	commercially available
3.B.	1	needle	-	commercially available
3.B.	1	handy, dense, closed cell foam block	-	commercially available

3. Removal/Installation

- A. Remove Self-Adhesive Placards

NOTE: Reference marks should be made on aircraft before removing old graphics.

- (1) Warm the placard a little using a heat gun (approx. 40-50°C).
- (2) Carefully separate a corner of the placard from the aircraft and then pull off parallel to the surface to remove it.
- (3) Remove all traces of old adhesive by using a cloth with isopropyl alcohol as required.

- B. Placing Self-Adhesive Placards

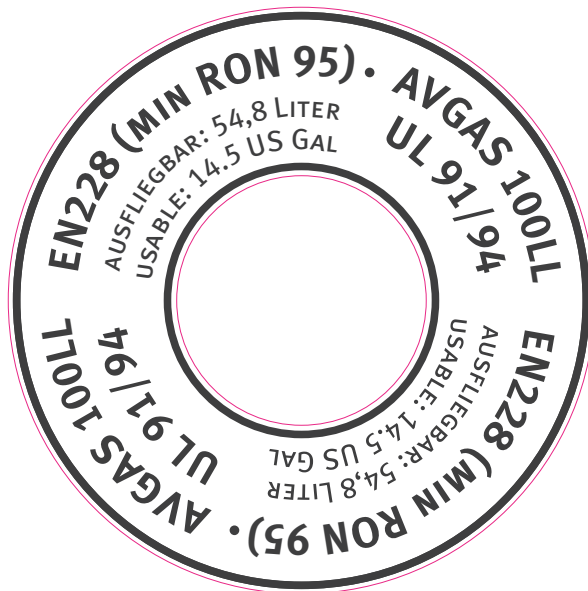
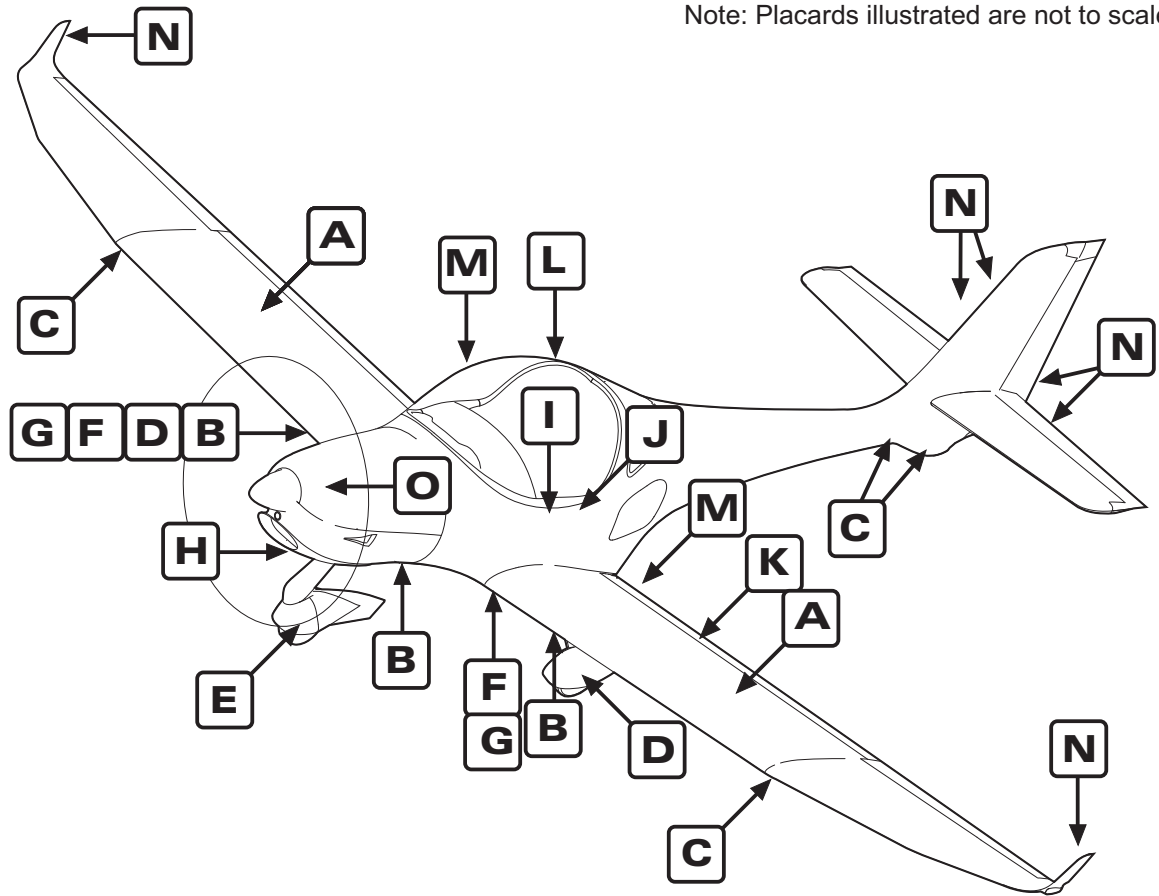
- (1) Clean aircraft surface carefully. Remove all old adhesive traces using isopropyl alcohol.
- (2) Remove paperliner from backside of placard to expose adhesive.
- (3) Position top edge of the placard precisely.
- (4) Work uniformly downward and apply placard to aircraft with a dry, clean cloth.
- (5) Remove the premask (outer protective film) from the placard.
- (6) Remove air bubbles by perforating bubble with a small needle and then flattening.

4. Maintenance/Care

- A. The following instructions should be followed to guarantee a maximum service life for the graphics:
- (1) Clean aircraft exterior surface (refer to 12-23).
 - (2) Do not use any solvents to clean the graphics.
 - (3) Test other cleaning agents on a small inconspicuous part of the graphic.

- (4) Do not allow fuel to spill on to graphics. If fuel spills on to graphics, wipe off with a cloth and rinse with water thoroughly.
 - (5) Do not remove snow and ice from surfaces using sharp-edged instruments.
 - (6) If a high-pressure washer is used, keep nozzle at least 0,5 m (approx. 1.6 ft) from edge of graphic.
-
-
-

Note: Placards illustrated are not to scale.

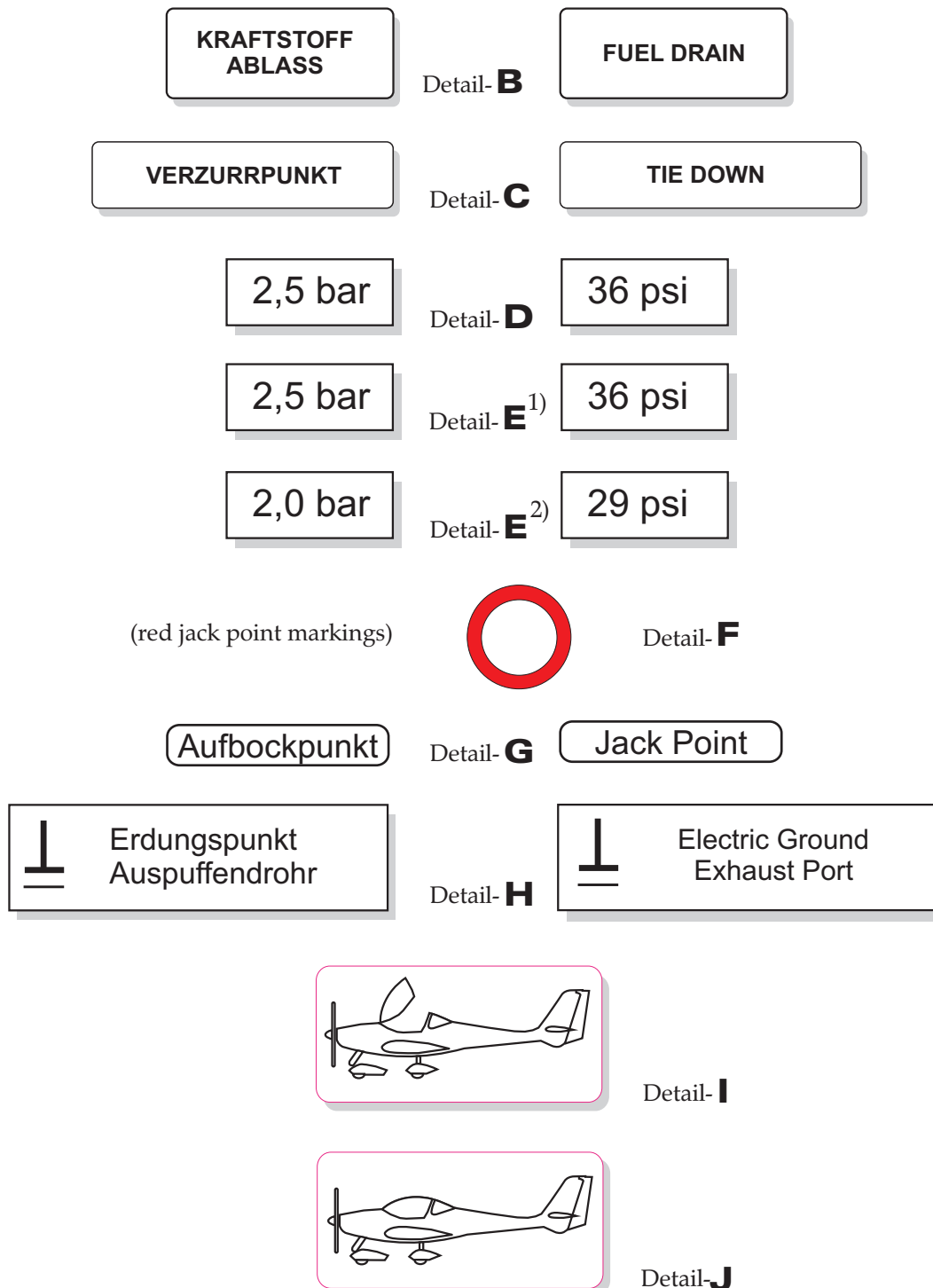


Detail-**A**

The unusable amount of fuel depends on model and S/N. Refer to 12-10 for fuel capacities and use the corresponding placard.

Exterior Placards and Markings
Figure 201 (1)

Note: Placards illustrated are not to scale.



Exterior Placards and Markings
Figure 201 (2)

¹⁾ Aircraft equipped with Beringer wheel/brake system only.

²⁾ Aircraft equipped with Cleveland/Grove wheel/brake system only.

Note: Placards illustrated are not to scale.



Detail-**K**

(flap position markings)



Detail-**L**



Detail-**M**



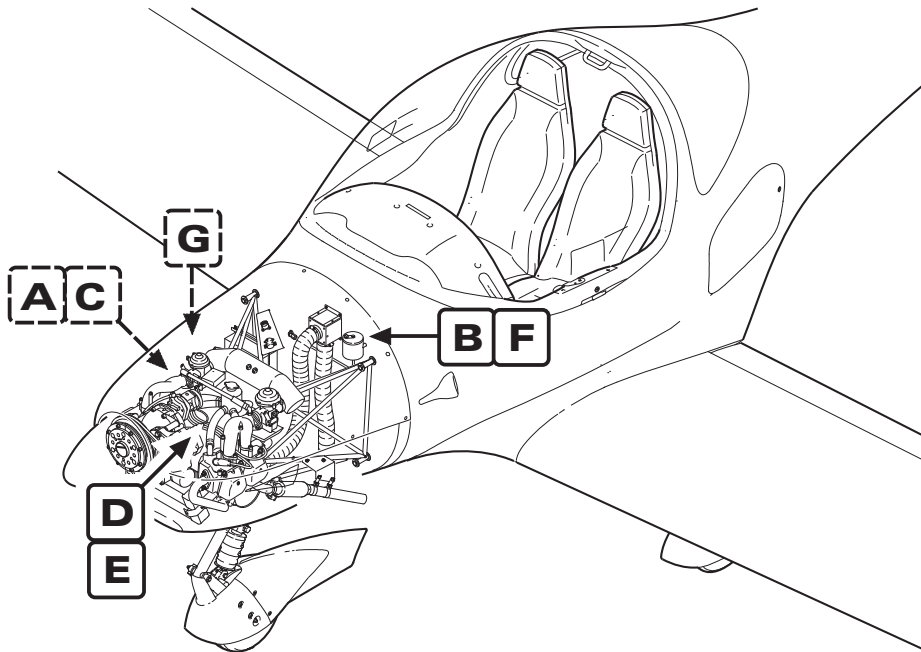
Detail-**N**



Detail-**O**

Exterior Placards and Markings
Figure 201 (3)

Note: Placards illustrated not in scale.



! ACHTUNG !

Kein Flugmotorenöl einfüllen.
Siehe Flughandbuch

Detail-**A**

! CAUTION !

DO NOT use aviation grade oil
Refer to POH

! ACHTUNG !

Keine Automobilbremsflüssigkeit
verwenden.
Siehe Flughandbuch

Detail-**B**

! CAUTION !

DO NOT use automotive
brake fluid
Refer to POH

ÖLFÜLLUNG 3,0 Liter
SIEHE FLUGHANDBUCH

Detail-**C**

OIL CAPACITY
3.17 US quarts, 3,0 Liter
REFER to POH

KÜHLMITTEL-
AUSGLEICHSGEFÄSS
BEI HEISSEM TRIEBWERK
NICHT ÖFFNEN!

Detail-**D**

COOLANT
DO NOT OPEN
IF ENGINE IS HOT!

KÜHLWASSERFÜLLUNG 2,5 Liter
SIEHE FLUGHANDBUCH

Detail-**E**

COOLANT CAPACITY
2.64 US quarts, 2,5 Liter
REFER to POH

HYDRAULIKÖL
FLUID 4

Detail-**F**

HYD. BRAKE
FLUID (FLUID 4)

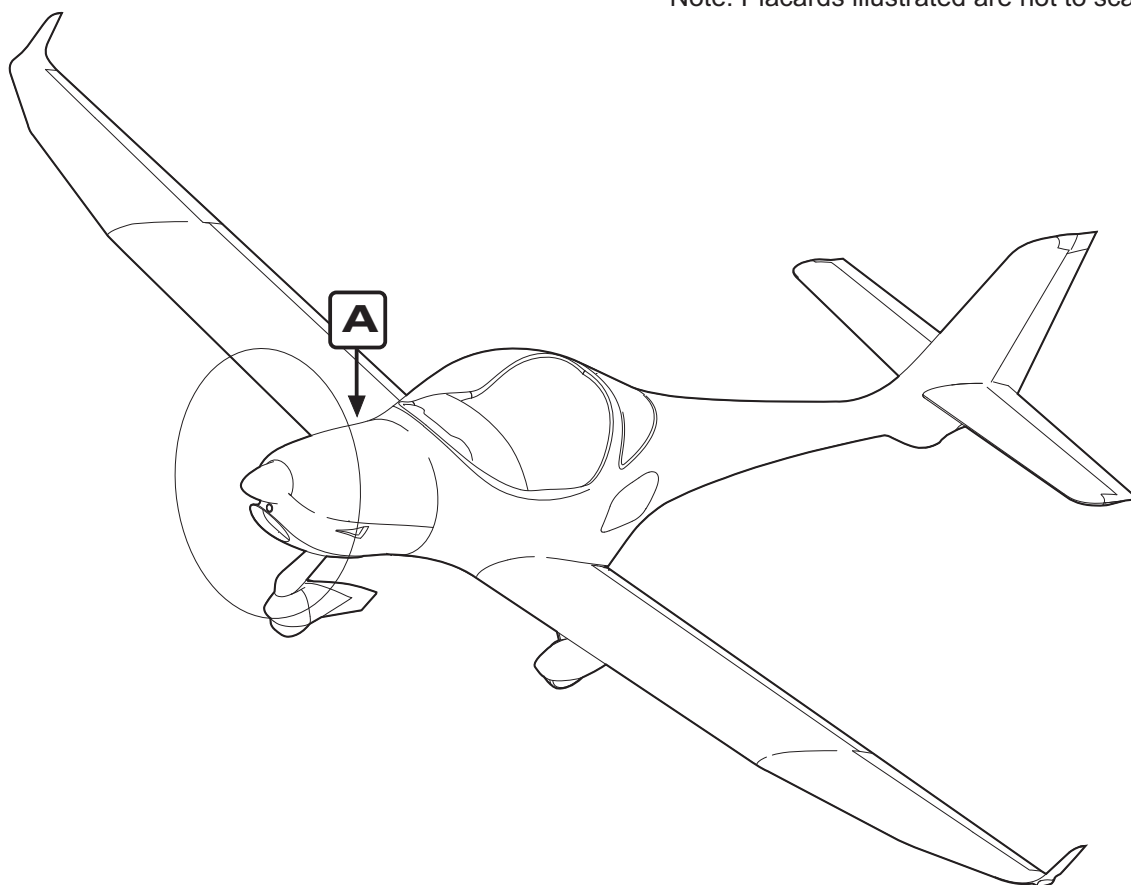
KÜHLMITTEL

Detail-**G**

COOLANT

Exterior Placards and Markings
Figure 201 (4)

Note: Placards illustrated are not to scale.



**Externe
Stromversorgung
12 V DC**

Detail-**A**

**GROUND
POWER
12 VDC**

Exterior Placards and Markings
Figure 201 (5)

EFFECTIVITY

Aircraft equipped with external power receptacle

INTERIOR PLACARDS AND MARKINGS**1. General**

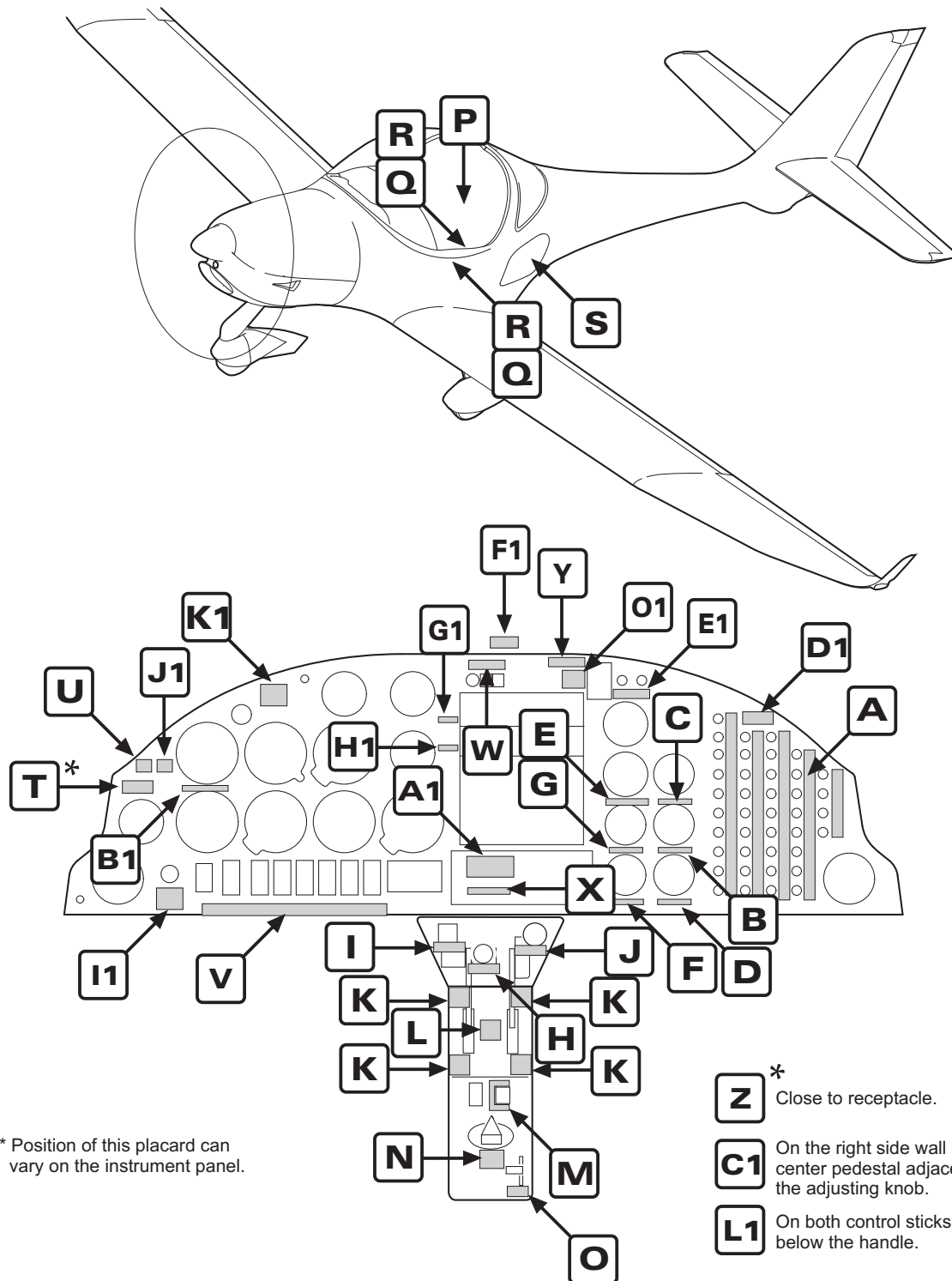
- A. This section gives information about removal and installation of interior placards, markings etc.. Figure 201 shows the aircraft interior placards and markings.
- B. If the information on the placard is no longer legible or the placard is partially destroyed or is no longer in place, it must be replaced.

2. Tools, Equipment and Material

	Quantity	Equipment	Parts No.	Manufacturer
3.A	1	heat gun	-	commercially available
3.A	as required	isopropyl alcohol	-	commercially available
3.B	1	needle	-	commercially available

3. Removal/Installation

- A. Remove Self-Adhesive Placards
- (1) Warm the placard a little using a heat gun (approx. 40-50°C).
 - (2) Carefully separate a corner of the placard from the aircraft and then pull off parallel to the surface to remove it.
 - (3) Remove all traces of old adhesive by using a cloth with isopropyl alcohol as required.
- B. Placing Self-Adhesive Placards
- (1) Remove protective film from backside of placard to expose adhesive.
 - (2) Position top edge of the placard precisely.
 - (3) Apply placard by rubbing with a dry, clean cloth.
 - (4) Remove air bubbles by perforating bubble with a small needle and then flattening.



Note: Placards illustrated are not to scale.

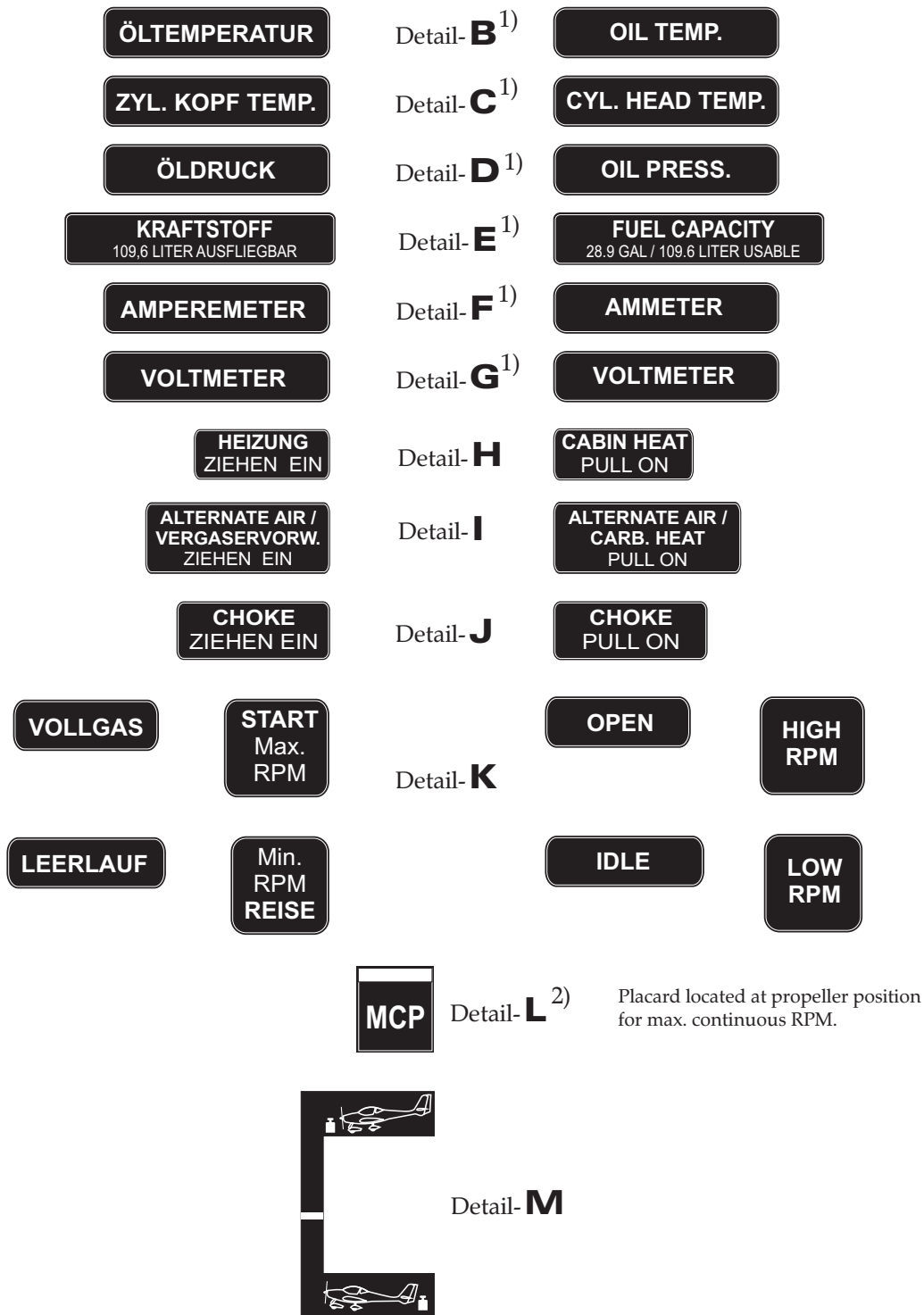
Schalter Leiste	Kraftstoff Pumpe MAIN	Künstl. Horizont	Audio	ADF	Switch Panel	Fuel Pump MAIN	Attitude Indicator	Audio	ADF
Schalter Leiste	CHT (OAT)	Wende Zeiger	COM 1	DME	Switch Panel	CHT (OAT)	Turn Coordin.	COM 1	DME
HR Trim	Kraftstoff Vorrat	Kurs Kreisel	COM 2	WX	Elevator Trim	Fuel Gauge	Directional Gyro	COM 2	WX
Klappen Strg	Motor Instr. 1	MFD	NAV/GPS 1	ADAHRS 1	Flap Control	Engine Instr. 1	MFD	NAV/GPS 1	ADAHRS 1
Klappen Motor	Motor Instr. 2	PFD	NAV/GPS 2	ADAHRS 2	Flap Actuator	Engine Instr. 2	PFD	NAV/GPS 2	ADAHRS 2
Start Relais	TCU	Kontr. Leuchten	TXP	GAD PWR	Starter Relay	TCU	Warning Lights	TXP	GAD PWR
ALT 2	ALT 2 Trennung	Flut- Licht	Höhen Kodierer	MOTOR SNSR	ALT 2	ALT 2 Disconnect	Flood Light	Blind Encoder	ENG SNSR
ALT 1	ALT 1 Erregung	Überzieh Warnung	Traffic	GPS	ALT 1	ALT 1 Excitation	Stall Warning	Traffic Monitor	GPS
BAT	12V/USB	G5 ATT	G5 GAD	Kraftst. Pumpe Test	BAT	12V/USB	G5 ATT	G5 GAD	Fuel Pump Test

Detail-**A**

NOTE: Depending on equipment and serial number of the aircraft the placards shown may vary in presence and arrangement.

Interior Placards and Markings
Figure 201 (2)

Note: Placards illustrated are not to scale.



Interior Placards and Markings
Figure 201 (3)

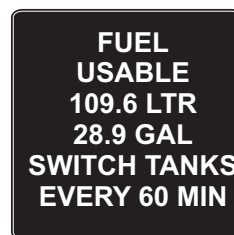
¹⁾ Aircraft equipped with analog engine instruments only.

²⁾ Aircraft equipped with MVP-50 or Garmin G3X Touch only.

Note: Placards illustrated are not to scale.



Detail- **N**



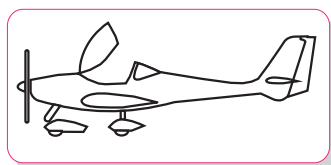
The unusable amount of fuel depends on model and S/N. Refer to 12-10 for fuel capacities and use the corresponding placard.



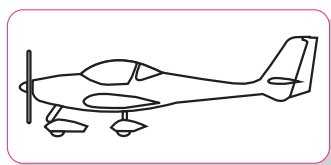
Detail- **O**



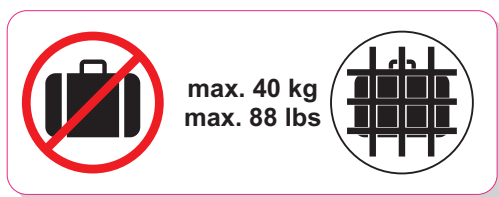
Detail- **P**



Detail- **Q**



Detail- **R**



Detail- **S**



Detail- **T**

Interior Placards and Markings
Figure 201 (4)

Note: Placards illustrated are not to scale.

TCU Detail-**U**²⁾

ALT1 / BAT	ALT2 / BAT2	Kraftst.-Pumpe AUX	PFD	Avionik	Positions- lichter	ACL	Lande- licht	Instrumenten- beleuchtung	P/S Heat	AP
ALT1 / BAT	ALT2 / BAT2	Fuel Pump AUX	PFD	Avionics	Nav Lights	ACL	Landing Light	Instrument Lights	P/S Heat	AP
2)			9)						5)	8)

Detail-**V**

ALT1	ALT2	BOOST	TCU	KRAFTSTOFF- DRUCK	SPANNUNG	ENG WARN	ENG CAUT	P/S HEAT
ALT1	ALT2	BOOST	TCU	FUEL	VOLT	ENG WARN	ENG CAUT	P/S HEAT
2)			2)	1)	1)	3)	3)	5)

Detail-**W**⁴⁾

GPS NUR ZUR INFORMATION

Detail-**X**⁶⁾

GPS FOR INFORMATION ONLY

ELT-FERNBEDIENUNG
ELT Hauptschalter
auf ARMED stellen!

Detail-**Y**

ELT-REMOTE CONTROL
Switch ELT-transmitter
to ARM !

STECKDOSE
12 - 14 V
max. 5 A

Detail-**Z**

RECEPTACLE
12 - 14 V DC
MAX: 5 A

Dieses Flugzeug ist in der Kategorie VLA zertifiziert und nur für den Betrieb VFR-Tag ohne Vereisungsbedingungen zugelassen. Alle Kunstflugmanöver, einschließlich beabsichtigtem Trudeln, sind verboten. Weitere Betriebsgrenzen stehen im Flughandbuch.

Detail-**A1**

This aeroplane is classified as a very light aeroplane approved for day VFR only in non-icing conditions. All aerobatic manoeuvres, including intentional spinning are prohibited. See Flight Manual for other limitations.

Dieses Flugzeug ist in der Kategorie VLA zertifiziert und für den Betrieb VFR-Tag und VFR-Nacht ohne Vereisungsbedingungen zugelassen. Alle Kunstflugmanöver, einschließlich beabsichtigtem Trudeln, sind verboten. Weitere Betriebsgrenzen stehen im Flughandbuch.

Detail-**A1**⁷⁾

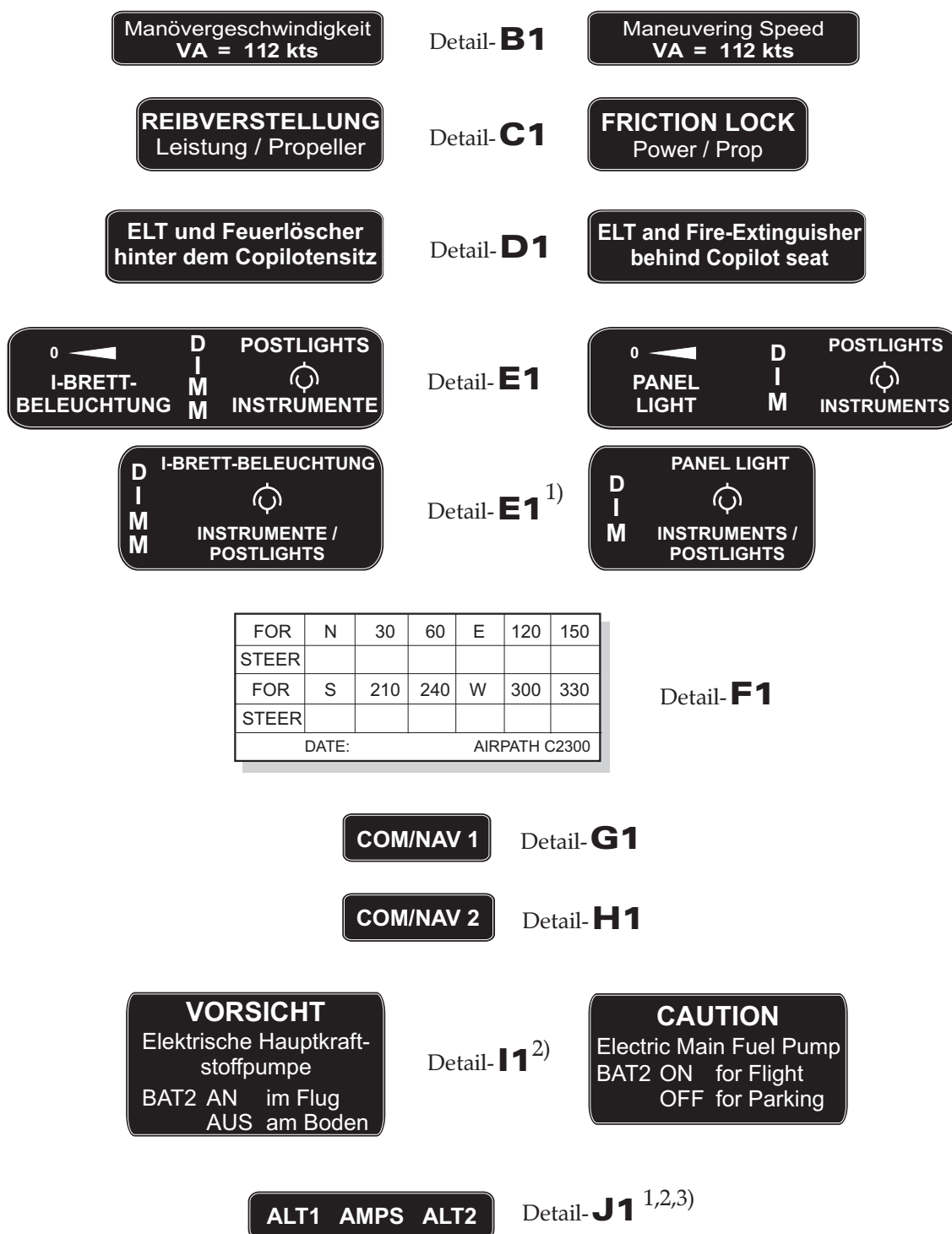
This aeroplane is classified as a very light aeroplane for day VFR and night VFR in non-icing conditions. All aerobatic manoeuvres including intentional spinning are prohibited. See Flight Manual for other limitations.

Interior Placards and Markings

Figure 201 (5)

- 1) AT01-100 only.
- 2) AT01-200 only.
- 3) AT01-300 only.
- 4) Aircraft equipped with analog engine instruments or Garmin G3X Touch only.
- 5) Aircraft equipped with pitot heating system only.
- 6) Aircraft equipped with non-(E)TSO'd GPS-receiver only.
- 7) Aircraft equipped for Night-VFR only.
- 8) Aircraft equipped with autopilot only.
- 9) Aircraft equipped with Aspen avionics only.

Note: Placards illustrated are not to scale.



Interior Placards and Markings
Figure 201 (6)

¹⁾ Aircraft equipped with Garmin G3X Touch only.

²⁾ AT01-200 only.

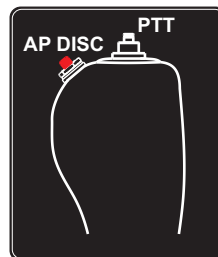
³⁾ AT01-300 only.

Detail- **K1** ¹⁾

AP operation restricted to $\geq 2000\text{ft AGL}$			
Speed range 60 KIAS to 150 KIAS with Flaps up (cruise) only			
if indicated	↓	Trim ELE DN / FWD	in intervals of max. 2 sec.
	↑	Trim ELE UP / AFT	

AP-Betrieb beschränkt auf $\geq 2000\text{ft AGL}$			
Geschwindigkeitsbereich 60 - 150 KIAS, ausschließlich mit Klappen in Reisestellung			
wenn angezeigt	↓	ELE DN / VORNE trimmen	in Intervallen von max. 2 Sek.
	↑	ELE UP / HINTEN trimmen	

Detail- **L1** ¹⁾



Placard located on both control sticks.

Detail- **M1** ¹⁾

ROLL
PITCH

Placard located on roll / pitch servo pushrod.

Detail- **N1** ¹⁾

YAW SERVO
ROLL SERVO
PITCH SERVO

Placard located on yaw / roll / pitch servo.

**“Direct-to”-
Knopf auf
NAV/GPS 1
drücken und
halten um
Smart Glide
zu aktivieren**

Detail- **O1** ²⁾

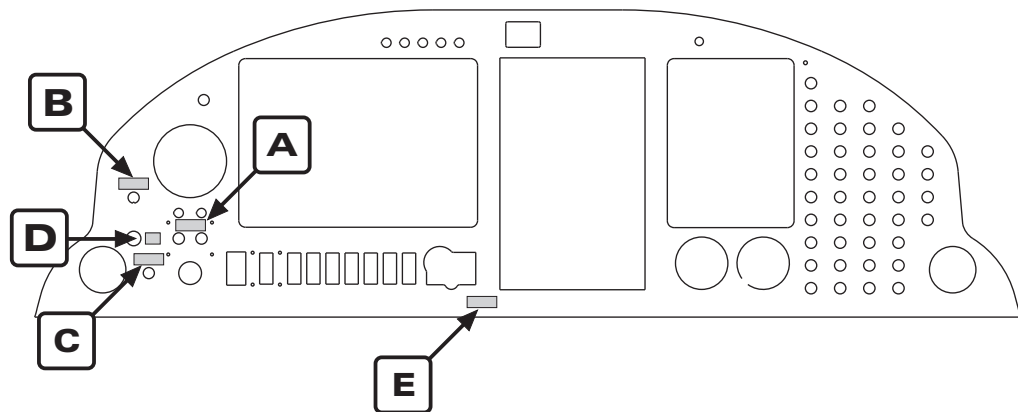
**Press & hold
“Direct-to”
button on
NAV/GPS 1
to activate
Smart Glide**

Interior Placards and Markings
Figure 201 (7)

¹⁾ Aircraft equipped with autopilot only.

²⁾ Aircraft equipped with Garmin GTN 650 Xi only.

Note: Placards illustrated are not to scale.



LANE A LANE B Detail-**A**

ENG BACKUP PWR Detail-**B**

ENG START PWR Detail-**C**

**Kraftst.
Pumpe
Test** Detail-**D**

**Fuel
Pump
Test**

**ALTERNATE AIR
ZIEHEN EIN** Detail-**E**

**ALTERNATE AIR
PULL ON**

Interior Placards and Markings
Figure 201 (8)

EFFECTIVITY

Aircraft equipped with Rotax 912iS engine



AQUILA AT01-100/200/300 MAINTENANCE MANUAL

CHAPTER 12 SERVICING

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SERVICING - GENERAL

1. Introduction

- A. This chapter gives information on the replenishment of fluids and the lubrication of components. The chapter also contains instructions required to carry out scheduled servicing.

2. General Description

The chapter is designed to help authorized personnel to correctly service the aircraft. Below a brief description and intended purpose of each section of this chapter is given.

- A. Section 12-00 - Servicing - General. This section provides a general overview of content and purpose of the chapter.
- B. The subsequent sections are divided into 3 groups.
- (1) Replenishment Fluids
Provides information for the maintenance personnel to help them to correctly perform the necessary servicing during daily aircraft operation. This group begins with section 12-10 - Replenishing - Description. The section includes approved fluids specifications and information about tank and reservoir capacities.
 - (2) Scheduled Servicing
Provides information for the maintenance personnel to help them to correctly perform periodic servicing, such as lubricating components or cleaning the aircraft. This group begins with section 12-20 - Scheduled Servicing - Description.
 - (3) Unscheduled Servicing
Provides information for the maintenance personnel to help them to correctly perform servicing, which is carried out at irregular intervals, for example removing ice and snow.

REPLENISHING - DESCRIPTION

1. General

- A. This chapter provides information about fluids which must be replenished during operation.

2. Fuel

A. Fuel Capacity

		Liters	U.S. Gallons
Total Capacity		120,0	31.7
Usable Fuel	AT01-100/200:	109,6	29.0
	AT01-300 up to S/N 408:	97,0	25.6
	AT01-300 from S/N 409:	109,6	29.0
Unusable Fuel	AT01-100/200:	10,4	2.7
	AT01-300 up to S/N 408:	23,0	6.1
	AT01-300 from S/N 409:	10,4	2.7

B. Fuel Specification

The following fuel is approved for use in the AQUILA AT01.
The minimum RON should be 95 (ASTM D4814: min. AKI 91).

EN 228 Super (Premium)
EN 228 Super plus (Premium plus)
AVGAS 100 LL (Grade ASTM-D910, blue color)
AVGAS UL 91/94 (Grade ASTM-D7547)

WARNING: ONLY USE FUEL SUITABLE FOR THE RESPECTIVE CLIMATIC ZONE.

NOTES: For fuel specifications set down by the FAA, refer to standard spec. for automotive spark-ignition engine fuel ASTM D 4814.

There is a risk of vapor formation if winter fuel is used for summer operation.

Due to the higher lead content in AVGAS, wear of the valve sets and deposits in combustion chamber and lead sediments in the lubrication system will increase. It is, therefore, recommended to use AVGAS only if problems with vapor lock are experienced or if the other fuel types are not available.

3. Engine Oil

A. Engine Oil Capacity

	Liters	U.S. Quarts
Engine oil capacity	3,0	3.17
Initial filling	3,5	3.70
Minimum	2,5	2.64

B. Oil Specification

CAUTION: DO NOT USE AVIATION GRADE ENGINE OIL.

IF MORE THAN 30% OF OPERATION HOURS HAVE BEEN FLOWN WITH
LEADED FUEL (E.G. AVGAS 100LL), AN OIL CHANGE SHOULD BE
UNDERTAKEN EVERY 50 H (REFER TO ROTAX AIRCRAFT ENGINES SERVICE
INSTRUCTION SI-912-016 / SI-914-019 / SI-912i-001).

- (1) Only use oil with ROTAX Norm (RON) 424 classification.
- (2) Due to the high stresses in the reduction gears, oils with gear additives such as high performance motor cycle oils must be used.
- (3) Because of the incorporated friction clutch, oils with friction modifier additives are unsuitable as this could result in a slipping clutch during normal operation.
- (4) Heavy duty 4-stroke motor cycle oils meet all requirements. These oils are normally not mineral oils but semi- or full synthetic oils.
- (5) Diesel engine oils are generally unsuitable due to temperature properties and additives which favor clutch slipping.

NOTE: For more information on the necessary lubricants, refer to Rotax Aircraft Engines Service Instruction SI-912-016 / SI-914-019 / SI-912i-001.

C. Recommended Oil Viscosity for various Air Temperatures:

Mean ambient temperature	Multi grade oils	
0°C (32 °F) to 40°C (104 °F)	SAE 20W-50	SAE 20W-40
-10°C (14 °F) to 40°C (104 °F)	SAE 15W-50	SAE 15W-40
-20°C (-4 °F) to 40°C (104 °F)	SAE 10W-40	SAE 10W-30
-30°C (-22 °F) to 40°C (104 °F)	SAE 5W-50	SAE 5W-40

4. Hydraulic Fluid

- A. Only hydraulic fluid fulfilling the MIL-H-5606 specification should be used.

FUEL - SERVICING**1. General****A. Fuel Tanks**

- (1) The aircraft is equipped with two integral wing fuel tanks.
The fuel tanks are located inside each wing between the front and rear spars. Each fuel tank has a filler cap on the top wing surface.

B. Drain System

- (1) The fuel system is equipped with drain valves to allow examination for contamination, water and for de-fueling. Each wing fuel tank has a drain valve at the bottom, inboard rear corner. A further drain valve is located at the lowest point of the fuel system; at the base of the electrical fuel pump (AT01-100) / at the base of the gascolator close to the electrical fuel pumps (AT01-200/300). The drain is accessible from outside the nose section.
The center of the fuel drains can be pushed inward with the fuel sampler to inspect for water and contamination.

NOTE: Chapter 28 (Fuel) contains more detailed information about the fuel system.

2. Safety and Maintenance Precautions**A. Safety Precautions**

WARNING: SERVICEABLE FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE DURING ALL FUEL SYSTEM SERVICING PROCEDURES.

AIRCRAFT AND FILLING FITTINGS MUST BE GROUNDED.

ALL ELECTRICAL EQUIPMENT IN THE AIRCRAFT SHOULD BE TURNED OFF. THE ALT1/BAT AND ALT2/BAT2 (AT01-200 ONLY) SWITCHES SHOULD BE IN THE "OFF" POSITION AND THE IGNITION KEY REMOVED FROM THE AIRCRAFT.

NO SMOKING!

- (1) Before beginning maintenance, a serviceable fire extinguisher (at least foam extinguisher) must be positioned within easy access.
- (2) Do not wear clothing that has a tendency to generate static electricity (i.e. synthetic fabrics).
- (3) No metal tabs on footwear.
- (4) Carry out fuel system servicing procedures only in a designated fuel loading/unloading area.
- (5) Ground equipment near the aircraft must be turned off.
- (6) While filling do not turn on any electrical device.
- (7) Make sure that the aircraft and filling fittings are properly grounded:
 - (a) First ground the aircraft;
 - (b) If a mobile filling device is being used, ground the filling device (same potential as aircraft);
 - (c) Ground the mobile filling device with the aircraft.

B. Maintenance Precautions

- (1) Use designated equipment for fuel loading / unloading to prevent contamination.
- (2) Only use approved anti-icing additive.
- (3) Blend fuel in accordance with prescribed procedures.
- (4) Document all fuel blending.

3. Fueling and Defueling**A. Fueling**

- (1) Move aircraft to a designated fuel loading / fuel unloading area.
- (2) Make sure that the ALT1/BAT and ALT2/BAT2 (AT01-200) switches are in the OFF position.
- (3) Ground aircraft and filling device as described above.
- (4) Position a fire extinguisher near to the fuel tank to be serviced.
- (5) Remove fuel filler cap and fill fuel tank to desired level.
- (6) Remove fuel service nozzle and install fuel cap.
- (7) Move fire extinguisher and the fuel service nozzle to the other tank to be filled.
- (8) Remove fuel filler cap and fill fuel tank to desired level.
- (9) Remove fuel service nozzle and install fuel cap.
- (10) Check correct lock of both fuel filler caps. Remove excess fuel from the wing area using a cloth.
- (11) Remove ground cables.
- (12) Compare reading of fueled amount on filling device with readings on the fuel indicators in the aircraft.

B. Defueling

- (1) Move aircraft to a designated fuel loading / fuel unloading area.
- (2) Make sure you have enough fuel collectors.
- (3) Make sure that the ALT1/BAT and ALT2/BAT2 (AT01-200) switches are in the OFF position.
- (4) Ground aircraft and filling device as described above.
- (5) Position a fire extinguisher near to the fuel tank to be defueled.
- (6) Remove fuel cap and remove as much fuel as possible using a defueling nozzle.
- (7) Install fuel cap.
- (8) Move fire extinguisher and the defueling nozzle to the other tank to be defueled.
- (9) Remove fuel cap and remove as much fuel as possible using a defueling nozzle.
- (10) Install fuel cap.
- (11) Drain remaining fuel from each wing fuel tank.
- (12) Drain remaining fuel from the drain valve located at the base of the electrical fuel pump with the fuel selector valve in the position LEFT and then in the position RIGHT.
- (13) Make sure all drain valves are closed securely.
- (14) Remove ground cables.

ENGINE OIL - SERVICING**1. General**

- A. This chapter provides information for checking and changing engine oil.
- B. The oil filler cap of the oil tank is located on the right side of the engine behind cylinder no. 3 (AT01-100/300) / on the left side of the engine behind cylinder no. 4 (AT01-200). It is accessible by opening the oil access plate on the upper cowling. The oil filler cap has a dipstick with min - max markings to check oil level.

WARNING: AVOID SKIN CONTACT WITH ENGINE OIL. USED OIL IN PARTICULAR CONTAINS MATERIALS DETRIMENTAL TO HEALTH.

WARNING: BEFORE ROTATING THE PROPELLER BY HAND, ENSURE IGNITION SWITCH IS OFF AND THE THROTTLE IS CLOSED.

CAUTION: DO NOT ROTATE THE PROPELLER CLOCKWISE.

CAUTION: DO NOT ROTATE THE PROPELLER WITH THE STARTER IF THE SPARK PLUGS ARE NOT CONNECTED AS THIS MAY DAMAGE THE ELECTRONIC MODULES.

2. Checking Engine Oil**A. Oil Checking Procedure**

- (1) Turn the propeller several times by hand to transfer all the oil from the engine to the tank.

NOTE: The process is completed when air flows back to the oil tank. This flow of air can be perceived as gurgling sound when the cover of the tank is removed.

- (2) Open oil access plate on upper cowling.
- (3) Remove oil filler cap and withdraw dipstick.
- (4) Wipe oil dipstick dry with a cloth.
- (5) Reinsert dipstick.
- (6) Withdraw dipstick and read oil level on dipstick.
- (7) If necessary, refill engine oil with correct grade and viscosity (refer to 12-10).

NOTE: For normal engine operation maintain the oil level between the two marks as an excessive oil level will allow oil to escape via the venting line.
For longer flights replenish oil to max. mark to warrant more oil reserve.

- (8) Reinsert oil dipstick, close filler cap, check for proper seating.
- (9) Close oil access plate.

3. Oil Change Intervals

CAUTION: FOR ENGINE OPERATION WITH AVGAS, OIL SHOULD BE CHANGED EVERY 50 HOURS (REFER TO ROTAX AIRCRAFT ENGINES SI-912-016 / SI-914-019 / SI-912i-001).

CAUTION: UNDER SEVERE OPERATING CONDITIONS, THE FREQUENCY OF OIL CHANGES MUST BE INCREASED REGARDLESS OF THE TYPE OF FUEL USED (MOGAS OR AVGAS).

A. Oil Change Intervals

- (1) Under normal operating conditions, oil must be changed every 100 hours.
- (2) For oil specifications, refer to 12-10 and to ROTAX Aircraft Engines SI-912-016 / SI-914-019 / SI-912i-001, which contains further operating information for ROTAX engines.

4. Oil Changing

CAUTION: DRAINING THE OIL LINES AND OIL COOLER IS NOT NECESSARY AND MUST BE AVOIDED, AS IT RESULTS IN AIR ENTERING THE OIL SYSTEM. (REFER TO ROTAX AIRCRAFT ENGINES SI-912-018 / SI-914-020 / SI-912i-004).

A. Oil Changing Procedure

- (1) Run engine until operating temperature is reached.
- (2) Shut down engine.

WARNING: HOT ENGINE COMPONENTS MAY CAUSE SKIN BURNS!

- (3) Turn the propeller several times by hand to transfer all the oil from the engine to the tank.

NOTE: The process is completed when air flows back to the oil tank. This flow of air can be perceived as gurgling sound when the cover of the tank is removed.

- (4) Remove engine cowling (refer to 71-10).
- (5) Cut safety wire on drain screw at oil tank base. Remove drain screw.
- (6) Drain oil and dispose of it as per environmental regulations.
- (7) Remove oil filter from engine.
- (8) Lubricate mating sealing ring of new oil filter with engine oil.
- (9) Install new oil filter. Screw on new oil filter by hand.
- (10) Cut oil filter out of its casing (without producing any metal chips) and inspect filter material.
- (11) Renew gasket ring of drain screw on oil tank. Fit drain screw and tighten to 25 Nm (220 in.lbs). Secure drain screw with safety wire.
- (12) Refill oil tank with approx. 3 liters (3.17 quarts) of oil. For oil specification, refer to 12-10 and to ROTAX Aircraft Engines SI-912-016 / SI-914-019 / SI-912i-001.
- (13) Reinsert oil dipstick, close filler cap, check for proper seating.
- (14) Run engine until normal operating temperature is reached. Shut down engine.

WARNING: HOT ENGINE COMPONENTS MAY CAUSE SKIN BURNS!

INDUCTION AIR FILTER - SERVICING**1. General**

- A. The air filter in the air induction system keeps dust and dirt particles from entering the system. It is located in the air filter box on the left (AT01-100/300) / right (AT01-200) inside of the lower cowling. To increase its effectiveness, the filter element should be treated with filter oil.
- B. The condition of the air filter element will be determined primarily by engine operating conditions. Therefore, it should be regularly inspected, cleaned and replaced, if necessary, at least every 100 hours or once a year, whichever comes first.

2. Air Filter Changing

- A. Air Filter Changing Procedure
 - (1) Remove cowling (AT01-100/300: upper cowling only / refer to 71-10).
 - (2) AT01-100/300 only: Remove the cover of the air filter box.
 - (3) Remove air filter element from air filter box and replace by a new one.
 - (4) AT01-100/300 only: Install the cover of the air filter box.
 - (5) Reinstall cowling (refer to 71-10).

3. Air Filter Cleaning

- A. Cleaning Procedures
 - (1) Remove air filter element as described above.
 - (2) Inspect air filter element for damage. If necessary renew filter element.

CAUTION: NEVER USE GASOLINE, STEAM, CAUSTIC LIQUIDS, DETERGENTS OR HIGH PRESSURE CLEANING.

- (3) Lightly tap and brush off surface dirt.
- (4) Spray filter cleaner on to entire element and let it soak for approx. 10 min.

WARNING: DO NOT DRY OVER NAKED FLAME OR WITH HOT AIR GUN. EXCESSIVE HEAT WILL SHRINK THE PORES OF THE FILTER MATERIAL RESTRICTING ENGINE AIR FLOW.

- (5) Rinse filter element with water from the inside out and let it dry naturally.

CAUTION: NEVER USE GEAR OIL, DIESEL OIL OR MOTOR OIL AS THEY ATTRACT WATER.

- (6) After cleaning, lubricate filter element evenly with filter oil spray or filter oil according to the manufacturer's instructions.
- (7) Ensure air filter box is clean and free of debris.
- (8) Install air filter as described above, pay attention to correct fit.

COOLING SYSTEM - SERVICING**1. General**

- A. The cooling system of the engine is designed for liquid cooling of the cylinder heads and ram air cooling of the cylinders. The cooling system of the cylinder heads is a closed circuit with an expansion tank. For a more detailed description and related maintenance procedures of the cooling system, refer to 75-20.
- B. Coolant
- (1) 50% antifreeze concentrate with additives against corrosion and 50 % pure water, or use of an equivalent premixed coolant. Refer to the ROTAX Service Instruction SI-912-016 / SI-914-019 / SI-912i-001, latest revision, for further information on suitable coolants.
The maximum coolant quantity is 2,5 liters (2.6 U.S. quarts).

CAUTION: ENSURE THAT ONLY ANTIFREEZE CONCENTRATE CONTAINING
ADDITIVES AGAINST CORROSION FOR LIGHT METAL ENGINES IS USED.

USE ANTIFREEZE CONCENTRATE IN ACCORDANCE WITH
MANUFACTURER'S INSTRUCTIONS.

THE USE OF WATERLESS COOLANT BASED ON PROPYLENE GLYCOL IS
NOT PERMITTED!

- (2) The coolant must be renewed every three years.

WARNING: NEVER OPEN PRESSURE CAP OR RADIATOR CAP WHEN THE COOLING SYSTEM
IS HOT. FOR SAFETY REASONS, COVER CAP WITH A CLOTH AND OPEN
SLOWLY. SUDDEN OPENING OF THE CAP COULD PROVOKE THE EXIT OF
BOILING COOLANT AND RESULT IN SEVERE SCALDING.

2. Adding Coolant

- A. Prior to adding coolant, the reason for the loss of the liquid must be investigated and corrected.
- B. Servicing Procedure
- (1) Remove engine cowling (refer to 71-10).
- (2) When engine is cold, open pressure cap of the expansion tank and fill up the expansion tank completely.
- (3) Run engine to operating temperature and allow engine to cool down before checking coolant level again. Replenish as necessary.
- (4) Close pressure cap, check the condition of the rubber sealing rings.
- (5) Install engine cowling (refer to 71-10).

3. Renewal of the Coolant

A. Servicing Procedure

- (1) When engine is cold, open pressure cap of the expansion tank and lowest coolant hose on the radiator and drain the coolant.
- (2) Reconnect coolant hose.
- (3) Refill freshly mixed coolant into expansion tank (highest point of the cooling system).
- (4) Install radiator tester and apply air pressure of 2 bar (30 psi). After 30 minutes there should be no noticeable pressure drop.
- (5) Reinstall pressure cap of the expansion tank.
- (6) Run engine to operating temperature and allow engine to cool down. Check system for leaks. Check coolant level and replenish as necessary.

4. Flushing the Cooling System

A. Servicing Procedure

- (1) When engine is cold, open pressure cap of the expansion tank and lowest coolant hose on the radiator and drain the coolant.
- (2) Flush system with a water hose at a max. pressure of 2 bar (30 psi).
- (3) Reconnect coolant hose.
- (4) Refill freshly mixed coolant into expansion tank (highest point of the cooling system).
- (5) Install radiator tester and apply air pressure of 2 bar (30 psi). After 30 minutes there should be no noticeable pressure drop.
- (6) Reinstall pressure cap of the expansion tank.
- (7) Run engine to operating temperature and allow engine to cool down. Check system for leaks. Check coolant level and replenish as necessary.

BRAKE SYSTEM - SERVICING**1. General**

- A. Ground service for the brake system is limited to the replenishment of brake fluid. The brake fluid reservoir is located at the upper left firewall in the engine compartment.
- B. Refer to 32-40 for brake system bleeding / brake fluid change procedures.

2. Replenishing Hydraulic Fluid**A. Hydraulic Fluid Replenishing**

CAUTION: ONLY USE HYDRAULIC FLUID WHICH CONFORMS TO MIL-H-5606 SPECIFICATION.

- (1) Remove upper cowling (refer to 71-10).
- (2) Remove filler plug from hydraulic fluid reservoir.

CAUTION: REMOVE EXCESSIVE HYDRAULIC FLUID IMMEDIATELY FROM PAINT SURFACES TO PREVENT CHEMICAL ATTACK.

- (3) Refill hydraulic fluid.
- (4) Install filler plug.
- (5) Install upper cowling (refer to 71-10).

TIRES - SERVICING

1. General

- A. The landing gear is equipped with 5.00-5 tires. Depending on the wheel/brake system installed, either 8 or 10 PLY rated tubeless tires (Beringer wheels) or 6 PLY rated tube-type tires (Cleveland / Grove wheels) are mounted. Required tire pressure is:

- (a) Main gear tire: 2,5 bar (36 psi)
- (b) Nose gear tire: 2,5 bar (36 psi) (Beringer)
2,0 bar (29 psi) (Cleveland/Grove)

Checking tire pressure regularly is the most important preventive measure in tire service. Improper tire pressure causes deterioration in the ground handling behavior of the aircraft and reduces the service life of the tire. For tubeless tires there is a risk of bed blow out at under-pressure. Under-pressure is indicated by excessive wear in the tire shoulder area, over-pressure by excessive wear in the center of tire.

2. Tire Servicing

WARNING: WHILE SERVICING, DO NOT STAND IN FRONT OF EITHER BEAD AREA OF THE TIRE BECAUSE BURSTING TIRES HAVE THE TENDENCY TO RUPTURE ALONG THE BEAD. ALWAYS STAND AT A 90° ANGLE TO THE AXLE ALONG THE TIRE CENTERLINE.

A. Service Notes

- (1) If possible, do not expose the tires permanently to intensive solar radiation.
- (2) Ensure tire pressure gauges used are accurate.
- (3) While checking tire pressure, the aircraft should be on level ground and the tire cold.
- (4) A freshly mounted and installed tube-type tire should be closely monitored during the first hours of operation. Air trapped between the tire and the tube at the time of mounting could seep out, resulting in under pressure in the tire.

B. Tire servicing comprises the following items:

- (1) Check tire pressure regularly. If necessary inflate or drain air.
- (2) Examine tires for wear, cuts, bruises, and foreign bodies in the tread.
- (3) Check proper location of the red slide marks.
- (4) Always remove oil, grease and mud from tires with soap and water.

BATTERY - SERVICING**1. General**

- A. The battery should be serviced every 100 hours. In the case of heavy-duty operation or operation in cold regions, service intervals should be shorter.
- B. On aircraft equipped with Rotax 914F engine, an additional battery (BAT2) is installed. This battery has to be replaced annually.
- C. For installation/removal procedures and a capacity check of the battery, refer to 24-30.

2. Battery Servicing

NOTE: The battery should be serviced only after it has been removed from the aircraft.

- A. Battery servicing involves the following:
 - (1) Check battery and battery tray for any corrosion and dirt. Clean with clear water and dry.
 - (2) Check battery charging using a battery tester. Recharge battery if required.
 - (3) Clean and grease battery terminals (refer to 12-22).
 - (4) If existent, test ventilation tube for condition and obstructions.

SCHEDULED SERVICING - DESCRIPTION**1. General**

- A. This section provides instructions necessary to carry out scheduled servicing, such as the periodic lubrication of aircraft components; external and internal cleaning. Service intervals are also provided. This section does not include lubrication procedures required to complete maintenance measures.

LUBRICANTS - DESCRIPTION

1. General

- A. This section assists with the selection of proper lubricants used to maintain the aircraft. To ensure a long service life of the lubricated components, it is recommended to always use pure and authorized lubricants.

2. Service Notes

- A. Use of the lubricants
- (1) Cleanliness is essential to good lubrication. Lubricants and required equipment must be kept clean.
 - (2) Store the lubricants in a secure place and in accordance with the manufacturer's specifications.
 - (3) Wipe grease fittings and areas to be lubricated with clean dry cloths before lubricating.
 - (4) When lubricating bearings which are vented, force grease into fitting until old grease is expelled. Remove old grease.
 - (5) Control cables should not be lubricated, unless to prevent corrosion.

3. Definition of "As Needed"

- A. In the following sections, time requirements for lubrication are shown either by a specific time interval or by „as needed“. The latter means that no interval is determined for this item. The mechanic decides when lubrication is required.
- B. If one or several of the following conditions occurs simultaneously, the component must be lubricated:
- (1) The old lubricant has been removed.
 - (2) Dirt or wear residue are visible near the movement contact area.
 - (3) While moving squeaks, grinding or other abnormal sounds are audible.
 - (4) During movement by the hand, jerky or restricted movement occurs throughout portions of travel range.

4. Recommended Lubricants:

A. Categories of lubricants, their specifications and typical areas of application are provided below.

Abbreviation	Specification	Description
GR	MIL-PRF-81322	Grease, wide temperature range
GH	MIL-PRF-23827	Grease, aircraft and instrument, Gear and actuator screw
OG	MIL-L-7870	Oil, general purpose
PL	VV-P-236	Technical petrolatum
PG	SS-G-659	Powdered graphite
GL	MIL-G-21164	Grease, molybdenum disulfide, for high and low temperatures
OL	VV-L-800	Light oil
SG	MIL-S-8660 or SAE AS 8660	Thick silicone grease (-50°C to 200°C), (liquid grease in spray is not allowed)
CP	MIL-C81309E Type II & III	Corrosion preventive compound (corrosion protection of metal parts)

B. Recommended Lubricants

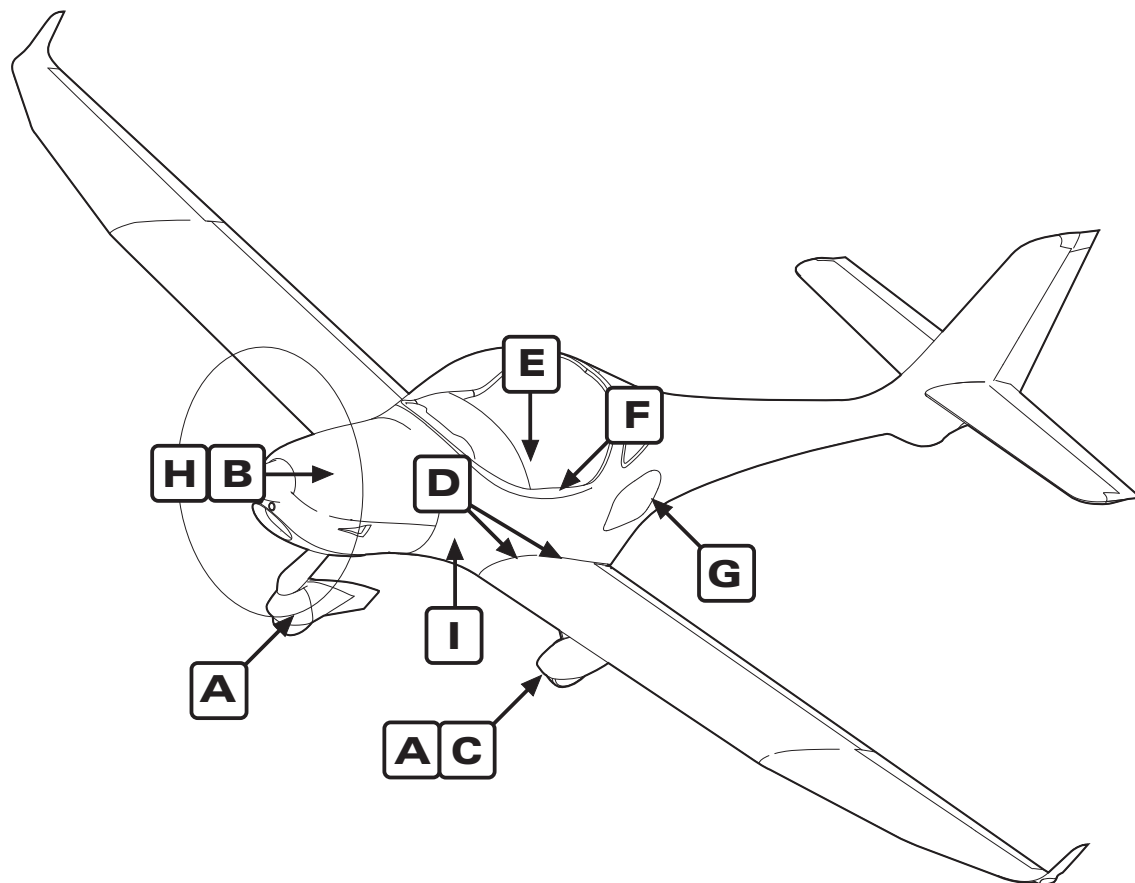
Abbreviation	Product	Manufacturer
GR	AeroShell Grease 22	Shell Oil Company
GL	AeroShell Grease 64	Shell Oil Company
PL	Royco 1 DC 4	Royal Lubricants Co. Inc. Dow Corning

LUBRICATION - SERVICING**1. General**

- A. This section contains information on lubrication intervals for components or parts.

2. Lubrication Chart

- A. Figure 201 shows the location of components or parts to be regularly lubricated. The following chart contains detailed information about the lubrication interval, the recommended lubricant and the dispensing equipment.



Lubrication Chart
 Figure 301 (1)

INDEX	ZONE	ACCESS PLATE	ITEM	LUBE TYPE (APPL.)	INTERVAL
A	721, 722 720		Cleveland / Grove: Main wheel bearings Nose wheel bearings	GR (Hand) GR (Hand)	500 h or annual
B	120		Battery terminals	PL (Hand)	100 h
C	721 722		Cleveland / Grove: Brake anchor bolts Beringer: Brake caliper cylinder, seal groove, piston, piston seal	SG SG	annual or on assembly on assembly
D	510 610		Wing attachment bolts	GL (Hand) or GR ¹⁾ (Hand)	500 h / 5 years or on assembly
E	211		Seat tracks	Grease	annual
F	211		Canopy lock assembly	GR (Hand)	annual
G	211		Cargo door lock	GR (Hand)	as needed
H	120		Carburetor throttle shaft Engine / propeller control cables	Eng. oil (Oil can) GR	100 h on assembly
I	211		Rudder pedal bearing Beringer: Brake master cylinder rod ends	GR (Hand) GR (Grease gun)	annual annual

¹⁾ If this type of lubricant is used the lubrication interval is reduced to annual.

Lubrication Chart
Figure 301 (2)

AIRCRAFT EXTERIOR - CLEANING AND CARE**1. General**

- A. The good flight performance of the aircraft is achieved due to the modern construction and the use of specific materials. For efficient laminar flow, a clean surface is very important. Therefore, one should always keep the entire aircraft clean, but especially the leading edges of the wing.
- B. Information on preventive and protection measures, such as waxing specific surfaces, is also given.

2. Safety Precautions

- A. Read and adhere to all manufacturer's instructions, warnings and cautions on cleaning/solvent compounds used.
- B. Do not use silicone-based wax to polish the aircraft exterior.
- C. Do not clean the aircraft at ambient temperatures close to 0°C with water.
- D. Cover all lubricated parts during any cleaning process.
- E. During the application of cleaners containing solvents (e.g. cleaning the engine), the other surfaces must be covered carefully or otherwise protected.

3. Cleaning and Care of the Canopy

CAUTION: NEVER USE GASOLINE, BENZENE, ALCOHOL, ACETONE, CARBON TETRACHLORIDE, LACQUER THINNER OR GLASS CLEANER. THESE MATERIALS WILL SOFTEN THE PLASTIC AND MAY CAUSE IT TO CRAZE.

CAUTION: DO NOT USE CLEANERS WITH CHEMICAL SUPPLEMENTS WHOSE EFFECT ON THE ACRYLIC SURFACE IS UNKNOWN.

- A. Cleaning Canopy
 - (1) Park the aircraft in a hangar or in the shadows, avoid places with a lot of dust caused by wind or vehicles.
 - (2) To prevent scratches, wash the canopy carefully with plenty of mild soap and water, using the palm of the hand to feel and dislodge dirt and mud. A soft cloth, chamois leather or sponge should be used.
 - (3) Rinse thoroughly and then dry with a clean moist chamois.
- B. Care of the Canopy
 - (1) As a protection from mechanical and chemical actions and to cover slight cuts in the canopy, a polish or a wax for acrylic glass can be applied in accordance with the manufacturer's specifications.

NOTE: Clean surfaces before applying polish or wax.

4. Cleaning and Care of the Aircraft Exterior Surfaces

A. Procedure for cleaning the exterior surface of the aircraft

- (1) Park the aircraft in a hangar or in the shadows, avoid places with a lot of dust caused by wind or vehicles.
- (2) Close the canopy, close access / inspection doors.

CAUTION KEEP WATER AWAY FROM PITOT AND STATIC PORTS AND ELECTRICAL AND AVIONIC EQUIPMENT.

- (3) Flush away loose dirt with water.

CAUTION: DO NOT USE HARSH ABRASIVES, ALKALINE SOAPS OR DETERGENTS.

DO NOT USE CLEANING OR POLISHING AGENTS WHICH CONTAIN SILICONE.

- (4) Using a soft cleaning cloth or a sponge, wash with a mild, non-alkaline soap and water solution.
- (5) Rinse thoroughly with clean water and then dry with a soft cloth or chamois.

B. Care of the Aircraft Exterior Surface

- (1) To protect against corrosion, mechanical and chemical actions during operation, the exterior surfaces can be waxed with a good polish or aircraft wax in accordance with the manufacturer's instructions.

NOTE: Clean aircraft exterior before applying polish or wax.

- (2) After using cleaners containing any solvent or chemical, the relevant surfaces should always be waxed.
- (3) If the aircraft is operated in a coastal or other salt-water environment, it must be washed and waxed more frequently.
- (4) A heavier wax layer on the leading edges of the wings and tail and on the cowl nose and propeller spinner will reduce abrasion in these areas.

5. Cleaning and Care of Navigation / Position / Anti-Collision Lights

- A. Lights can be polished with a good wax and/or a liquid polishing compound. Refresh polish and hand buff once or twice a month.

- B. After using a polishing compound, the lights should be waxed.

CAUTION: UNDER NO CIRCUMSTANCES USE ANY PETROLEUM BASED PRODUCT TO CLEAN THE LIGHTS.

6. Cleaning the Engine

A. Safety and Maintenance Precautions

- (1) The engine should be cleaned during every 100-hour inspection.
- (2) Handle chemical cleaners and solvents with caution. Always read the manufacturer's instruction and follow them carefully.
- (3) Cleaning should be performed in the open air or in a well ventilated hangar.
- (4) Suitable fire fighting and safety equipment should be available.
- (5) If compressed air is used to apply solvents or to dry components, the lowest practical pressure level should be used.

B. Engine Cleaning Procedures

WARNING: DO NOT SMOKE OR EXPOSE A FLAME WITHIN 100 FEET OF THE CLEANING AREA.

- (1) Remove cowling (refer to 71-10).

WARNING: DO NOT USE GASOLINE OR OTHER HIGHLY FLAMMABLE SUBSTANCES.

DO NOT ATTEMPT TO WASH AN ENGINE WHEN IT IS STILL HOT OR RUNNING.

CAUTION: DO NOT DIRECT CLEANING SOLVENTS OR WATER STREAMS AT OPENINGS OF THE ALTERNATOR OR THE STARTER.

- (2) Carefully cover the openings of the alternator and the starter.
- (3) If the engine is contaminated with salt or corrosive chemicals, first flush engine compartment with water.
- (4) Apply a suitable solvent or cleaning agent to the engine compartment in accordance with the manufacturer's instructions.
- (5) Leave the solvent on the engine for approx. ten minutes.

CAUTION: CLEANING AGENTS SHOULD NEVER BE LEFT IN ENGINE COMPARTMENT. CLEANER OR SOLVENT RESIDUE MAY CAUSE DAMAGE TO COMPONENTS SUCH AS NEOPRENE SEALS AND SILICONE FIRE SLEEVES.

- (6) Rinse thoroughly with clean warm water.
- (7) Allow engine to dry or dry it using compressed air.
- (8) Remove all protection coverings.
- (9) Re-lubricate all control arms and moving parts as required.
- (10) Reinstall cowling (refer to 71-10).

WARNING: DO NOT OPERATE THE ENGINE UNTIL EXCESS SOLVENT HAS EVAPORATED OR OTHERWISE BEEN REMOVED.

BEFORE ROTATING THE PROPELLER BY HAND, ENSURE IGNITION SWITCH IS OFF AND THE THROTTLE IS CLOSED.

CAUTION: DO NOT ROTATE THE PROPELLER CLOCKWISE.

- (11) Before starting the engine, rotate the propeller by hand no less than five complete revolutions.

7. Cleaning and Care of the Propeller

- A. Clean propeller if necessary with any car wash solution or equivalent. This should be done at least every 50 hours.
Remove grease and dirt with a commercial detergent, which is suitable for polyurethane-lacquers.

CAUTION: IT IS IMPORTANT TO AVOID MOISTURE PENETRATING INTO THE WOODEN CORE.

Small scratches and nicks should be dealt with during routine maintenance applying a coating of water-resistant varnish, preferably Polyurethane.
Replace damaged or missing PU strips on the propeller leading edge as soon as possible.

8. Cleaning the Landing Gear

- A. The landing gear struts and wheel fairings should be washed with clear water or with a mild detergent and water.
- B. Wheels, axles, spacers and brake parts are protected from corrosion with an anodizing coating. This thin coating does not protect against basic agent with pH > 9.

CAUTION: CLEANING THE WHEEL AND BRAKE PARTS WITH BASIC AGENT MAY REMOVE TOTALLY THE ANODIZING COATING. ACID AGENT MAY ALSO ATTACK THE ANODIZING.

Wheel and brake parts should be cleaned using water and soap or dry clothes only.

- C. After cleaning, the tires can be treated with standard tire protection.
- D. Protect the disc and pads from brake fluid contamination. Brake pads are porous and cannot be cleaned if contaminated by brake fluid, they must be replaced by new ones. Clean the disc separately from the brake calipers, using thinner directly on the brake caliper may cause damage to the seals.
- E. Depending on operating conditions, additional corrosion protection of wheels and brakes is recommended. Refer to Beringer Aero maintenance working card MM-00-004 for further information.

AIRCRAFT INTERIOR - CLEANING AND CARE**1. General**

- A. This section provides the information required to clean the aircraft interior properly. Several recommended types of cleaning agents for different materials and the relevant cleaning and care procedures are also described below.

2. Aircraft Interior Cleaning

- A. Interior panels such as sidewalls, door panels etc. may be cleaned using a mild detergent solution. Stubborn deposits may be removed using a suitable material cleaner in accordance with manufacturer's instructions. If in doubt, apply a small amount of cleaner to a small unobtrusive part and test it for reaction.

3. Cleaning the Instrument Panel

- A. The instrument panel, center pedestal and instruments/displays can be cleaned with a soft cotton cloth dampened with clean water. Ensure that the ALT1/BAT switch is in OFF position. Switch on the electrical systems and components of the aircraft only after the instrument panel has dried completely.

CAUTION: DO NOT USE ANY CHEMICAL CLEANING AGENTS. CARE SHOULD BE TAKEN TO AVOID SCRATCHING THE SURFACE OF DISPLAYS.

4. Cleaning the Cabin Floor

- A. The floor area, the area under the seats and the baggage compartment should be cleaned regularly with a vacuum.
- B. The carpet is made of high-quality, dirt repellant material and usually requires only a minimum of maintenance. If it becomes soiled, a standard carpet cleaner can be used.

5. Cleaning the Seats

- A. Seat upholstery is made of a dirt repellant, hardwearing material. They should, however, be cleaned regularly to keep them in good condition. The following recommendations should be followed.
- B. To remove dust and loose dirt from the seats, first clean with a vacuum.

For cleaning and care use a foam type detergent, such as is available for car seats. Follow the manufacturer's instructions.

- C. Blot up any liquid spilled promptly with an absorbent tissue or cloth. Press the blotting material firmly against the upholstery and hold for several seconds. Continue blotting until no more liquid is absorbed.

Scrape off sticky materials cautiously with a dull knife, then clean area as required.

Oil spots may be removed with household spot removers. Before using, read the instructions, test it on an obscure place on the seat and use it sparingly.

UNSCHEDULED SERVICING**1. General**

- A. This section contains those instructions necessary to carry out unscheduled servicing for example: removing ice and snow from a parked aircraft.

2. Removing Snow and Ice

CAUTION: DO NOT REMOVE SNOW AND ICE FROM SURFACES USING SHARP-EDGED INSTRUMENTS.

NEVER USE DE-ICING FLUIDS TO REMOVE SNOW OR ICE DEPOSITS FROM AIRCRAFT SURFACES.

HEATED DE-ICING FLUIDS CAN DAMAGE COMPOSITE STRUCTURES DUE TO EXTREME TEMPERATURE CHANGE. SOME DE-ICING FLUIDS MAY ALSO DAMAGE THE ACRYLIC GLASS OF THE CANOPY.

- A. After snowfall, the snow should be removed immediately from the surface of the aircraft to prevent it from refreezing on the surface and/or in slits and gaps after it has started to thaw.

B. Procedure

- (1) Remove loose snow from the wing surface with a broom, working outwards from the wing root.

NOTE: The areas between wings and ailerons and stabilizers and rudders must be treated particularly carefully.

CAUTION: DO NOT DAMAGE THE ANTENNAE.

- (2) Free canopy of snow.
(3) Remove snow from cowling, fuselage and empennage.
- C. In the case of ice, it is recommended to defrost the aircraft in a heated hangar. Allow all aircraft surfaces to completely dry prior to flight to prevent control surfaces from freezing.



AQUILA AT01-100/200/300 MAINTENANCE MANUAL

CHAPTER 28

FUEL

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FUEL - GENERAL**1. Introduction**

- A. This chapter covers those units and components which are not part of the engine but store or deliver fuel to the engine or indicate fuel quantity and pressure. For further information on the internal engine fuel system components, refer to applicable ROTAX publications.

2. General Description

- A. The fuel system consists of two main fuel tanks which are integral parts 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 metal fuel-lines. Fuel quantities are:

Total fuel:	120 liters (31.7 gallons)
Usable fuel:	109,6 liters (28.9 gallons)
Unusable fuel:	10,4 liters (2.8 gallons)

B. **Fuel Supply**

Fuel is delivered to the carburetors by the engine driven fuel pump from the fuel tank that is pre-selected by the fuel selector / shut-off valve. An electrical fuel pump is provided in case of failure of the engine driven fuel pump. Excessive fuel flows through return lines and the fuel selector valve back to the same tank.

C. **Fuel Indication**

Fuel quantity is measured by resistive float type fuel level sensors located on the inboard fuel tank rib. Fuel pressure is measured at the engine and indicated either by a warning light or the optional engine monitoring system.

D. **Fuel System Ventilation**

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**

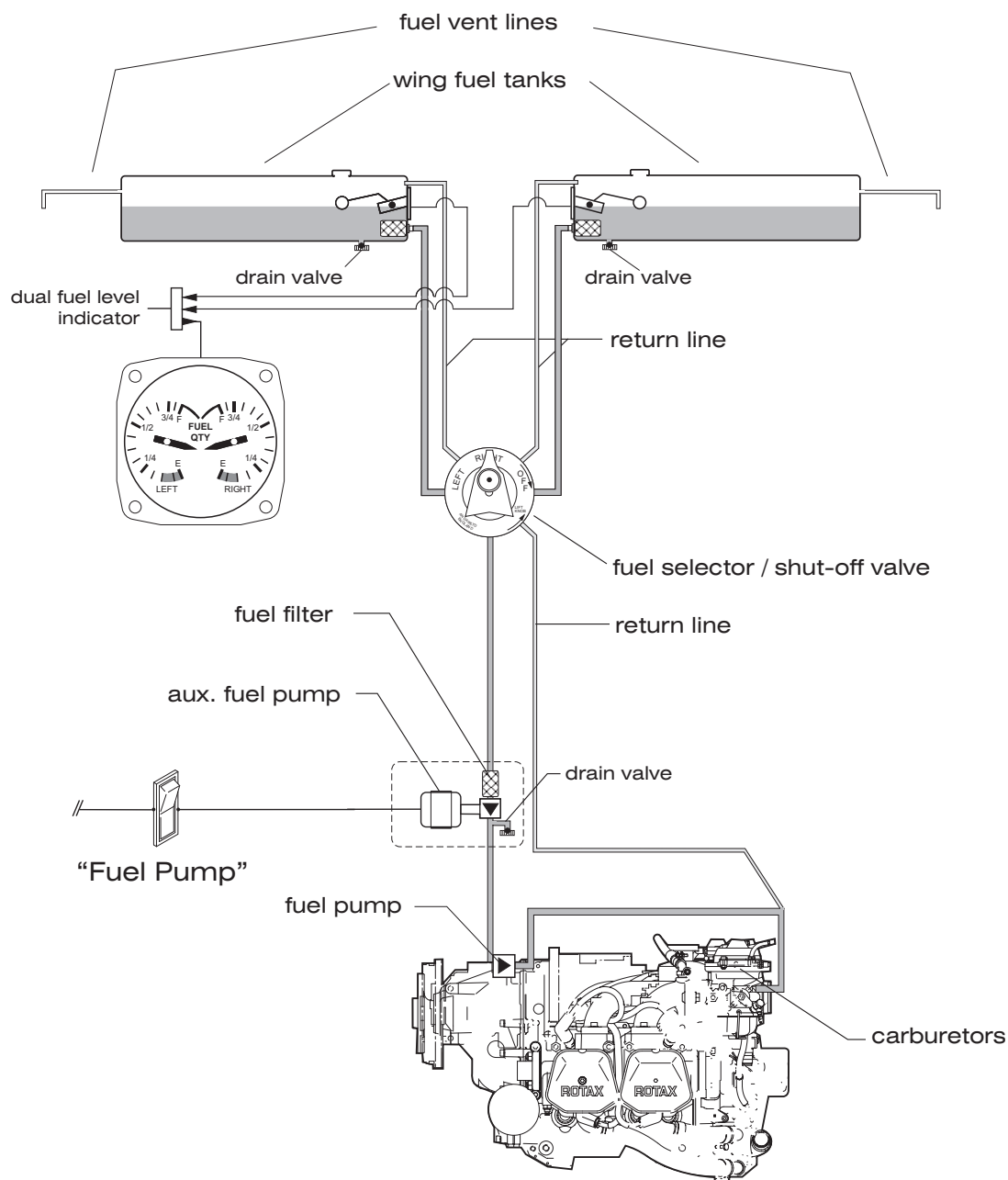
Each tank has a manually operated drain at the bottom, inboard rear corner. A further drain valve is installed at the fuel system's lowest point, namely at the base of electrical fuel pump.

F. **Fuel Lines**

Fuel lines are made of aluminum tubing behind the firewall and stainless steel in the engine compartment. Flexible hoses are made of Teflon with steel fittings and silicone-coated fire sleeves.

EFFECTIVITY

Aircraft equipped with Rotax 912S engine



Fuel System (Schematic)
Figure 1

EFFECTIVITY

Aircraft equipped with Rotax 912S engine

28-00-01

Page 2
19.11.25

FUEL - GENERAL**1. Introduction**

- A. This chapter covers those units and components which are not part of the engine but store or deliver fuel to the engine or indicate fuel quantity and pressure. For further information on the internal engine fuel system components, refer to applicable ROTAX publications.

2. General Description

- A. The fuel system consists of two main fuel tanks which are integral parts of the wings, a fuel selector / shut-off valve on the center console, two redundant electric fuel pumps that are bypassed with check valves and a combined fuel filter / water trap (gascolator) in the fuselage, a fuel pressure regulator and two single-barrel float type carburetors on the engine as well as flexible hoses and metal fuel-lines. Fuel quantities are:

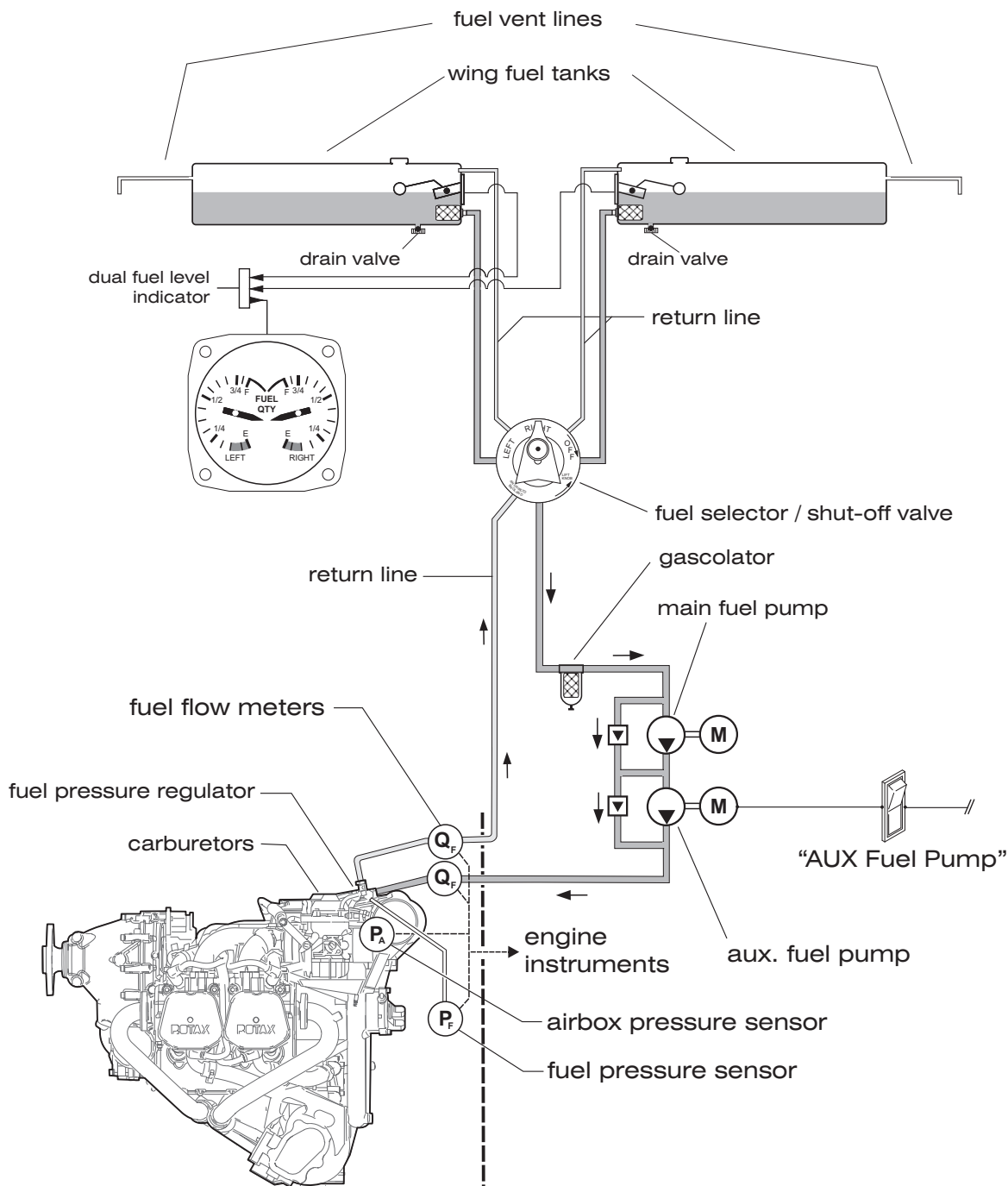
Total fuel:	120 liters (31.7 gallons)
Usable fuel:	109,6 liters (28.9 gallons)
Unusable fuel:	10,4 liters (2.8 gallons)

- B. **Fuel Supply**
Fuel is delivered to the carburetors by the electric MAIN fuel pump from the fuel tank that is pre-selected by the fuel selector / shut-off valve. An electric AUX fuel pump is provided in case of failure of the MAIN fuel pump. Fuel pressure is maintained by a pressure regulator on the engine. Excessive fuel flows through return lines and the fuel selector valve back to the same tank.
- C. **Fuel Indication**
Fuel quantity is measured by resistive float type fuel level sensors located on the inboard fuel tank rib. Fuel flow is measured by sensors in the fuel supply and return lines. Both sensors are installed on a bracket in the engine compartment. Fuel pressure is indicated as difference between the absolute fuel pressure at the pressure regulator and the boost pressure in the airbox. Both pressures are measured either by a differential pressure sensor (Garmin G3X) or by two separate sensors and the differential pressure is calculated by the engine monitoring system (MVP-50).
- D. **Fuel System Ventilation**
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 a manually operated drain at the bottom, inboard rear corner. A further drain valve is installed at the fuel system's lowest point, namely at the gascolator on the bottom side of the fuselage.
- F. **Fuel Lines**
Fuel lines are made of aluminum tubing behind the firewall and stainless steel in the engine compartment. Flexible hoses are made of Teflon with steel fittings and silicone-coated fire sleeves.

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Aircraft equipped with Rotax 914F engine

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Fuel System (Schematic)
Figure 1

EFFECTIVITY

Aircraft equipped with Rotax 914F engine

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FUEL - GENERAL

1. Introduction

- A. This chapter covers those units and components which are not part of the engine but store or deliver fuel to the engine or indicate fuel quantity and pressure. For further information on the internal engine fuel system components, refer to applicable ROTAX publications.

2. General Description

- A. The fuel system consists of two main fuel tanks which are integral parts of the wings, a fuel selector / shut-off valve on the center console, two redundant electric fuel pumps that are bypassed with check valves, a combined fuel filter / water trap (gascolator) in the fuselage, a fine filter, a fuel pressure regulator and the injection valves on the engine as well as flexible hoses and metal fuel-lines. Fuel quantities are:

	up to S/N 408	from S/N 409
Total fuel:	120 liters (31.7 gallons)	120 liters (31.7 gallons)
Usable fuel:	97 liters (25.6 gallons)	109,6 liters (28.9 gallons)
Unusable fuel:	23 liters (6.1 gallons)	10,4 liters (2.8 gallons)

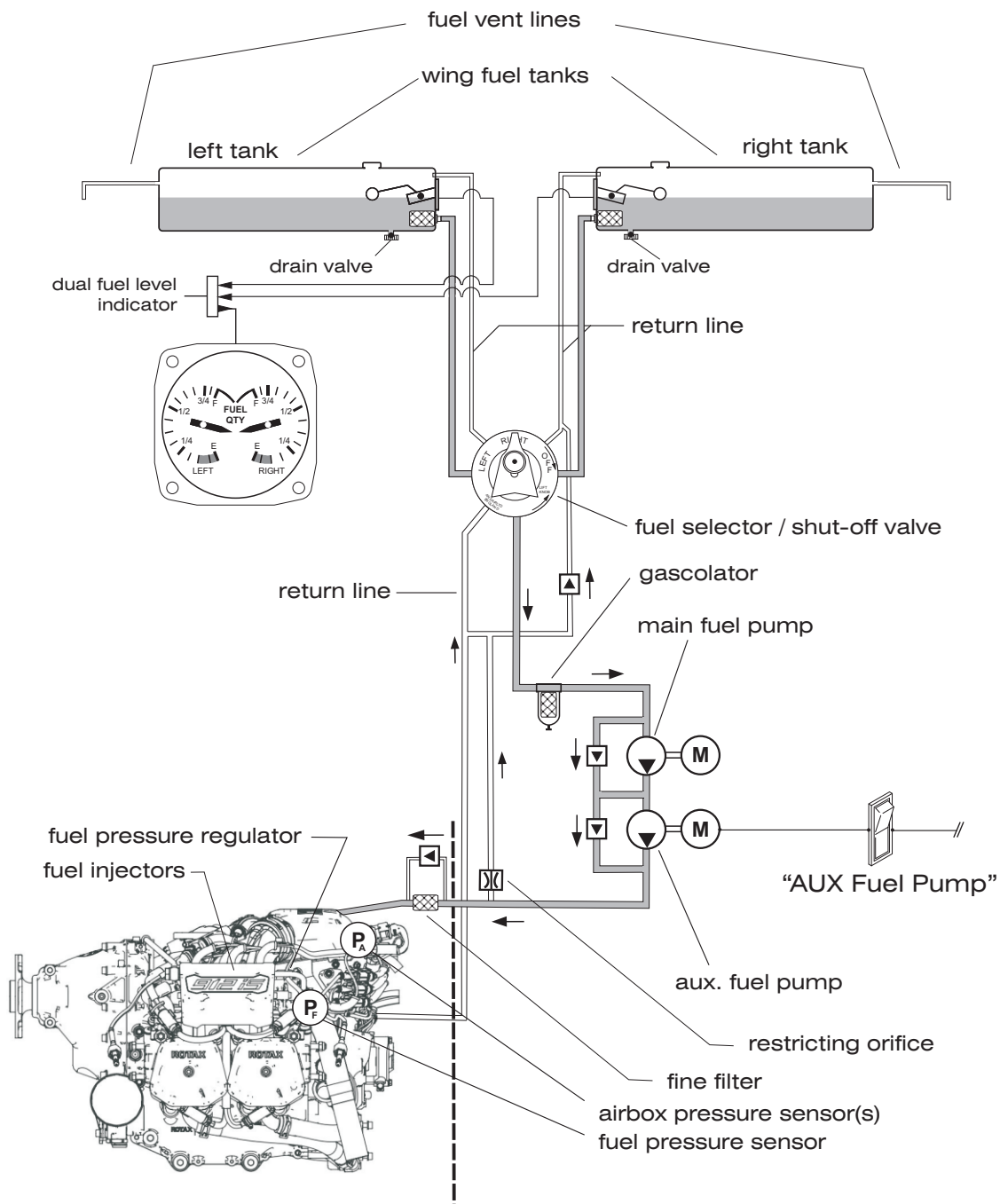
- B. Fuel Supply
Fuel is delivered to the injection valves by the electric MAIN fuel pump from the fuel tank that is pre-selected by the fuel selector / shut-off valve. An electric AUX fuel pump is provided in case of failure of the MAIN fuel pump. Fuel pressure is maintained by a pressure regulator on the engine. Excessive fuel flows through return lines and the fuel selector valve back to the same tank.
- C. Fuel Indication
Fuel quantity is measured by resistive float type fuel level sensors located on the inboard fuel tank rib. Fuel flow is calculated by the engine control unit (ECU) based on the injection times. Fuel pressure is indicated as difference between the absolute fuel pressure at the pressure regulator and the intake air pressure in the airbox. Both pressures are measured by separate sensors and the differential pressure is calculated / indicated by the engine monitoring system.
- D. Fuel System Ventilation
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 a manually operated drain at the bottom, inboard rear corner. A further drain valve is installed at the fuel system's lowest point, namely at the gascolator on the bottom side of the fuselage.
- F. Fuel Lines
Fuel lines are made of aluminum tubing behind the firewall and stainless steel in the engine compartment. Flexible hoses are made of Teflon with steel fittings and silicone-coated fire sleeves. Fine filter and fuel selector valve have bypass lines with check valves, which open at a pressure difference of approx. 0,8 - 1,2 bar (12 - 17 psi).

EFFECTIVITY

Aircraft equipped with Rotax 912iS engine

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Fuel System (Schematic)
Figure 1

EFFECTIVITY

Aircraft equipped with Rotax 912iS engine

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FUEL STORAGE - MAINTENANCE

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

1. General

- A. The fuel storage system consists of two integral fuel tanks, located at the inboard portion of each wing in front of the main spar. They are bounded by the upper and lower wing skins which are reinforced in this area, the main spar web, and the inboard and outboard fuel tank ribs. Each fuel tank has a lockable fuel filler cap which is grounded to the airframe. The inner surfaces of the composite integral tanks are sealed with a special fuel tank sealing material to protect the composite fiber structure. A fuel baffle rib is provided to reduce fuel slosh in the fuel outlet and the fuel quantity sensor areas. 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 the sump level that is equipped with a removable mesh strainer.

The inboard fuel tank ribs are easily accessible for maintenance work through access panel 610 BB / 510 BB in the lower wing skin.

- B. The wing fuel tanks are maintenance-free. However, if a leak is suspected, AQUILA Aviation should be consulted.

2. Wing Fuel Tank Leakage Test

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

- (1) Ensure electrical power to aircraft is OFF.
- (2) Disconnect battery (refer to 24-30).
- (3) Drain fuel from wing fuel tank.
- (4) Open access plate 610 BB (510 BB).
- (5) Disconnect fuel outlet line from fuel tank.
- (6) Disconnect fuel return line from fuel tank.
- (7) Cap fuel tank vent line.
- (8) 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.

- (9) Connect a well-regulated supply of air (1.0 psi maximum) to the return line fitting.
- (10) Make sure filler cap is installed and sealed.
- (11) Apply pressure slowly until 1.0 psi is obtained.
- (12) Shut off air supply.
- (13) If fuel tank holds pressure for 15 minutes, the tank with vent line is sealed.

FUEL DISTRIBUTION - MAINTENANCE

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

1. General

- A. The fuel distribution system consists primarily of the fuel selector / shut-off valve, electrical fuel pump(s), fuel filter(s), check valves, fuel lines and the AUX fuel pump switch.

The fuel selector handle is located in the center console between the seats. The red, arrow shaped handle has a LEFT, RIGHT and OFF position. To switch the valve to the OFF position a knob located at the top of the handle must be pulled while the handle is rotated simultaneously. With the valve in this position fuel flow from and to the tanks is stopped. In both operating positions the fuel supply / return lines of the selected fuel tank are open while the fuel supply / return lines of the other one are closed.

Aircraft equipped with Rotax 912iS engine have a fuel selector bypass line with check valve to avoid high fuel pressures with closed fuel selector valve. This check valve opens if the pressure difference exceeds 0,8 - 1,2 bar (12 - 17 psi) and connects the fuel lines on the engine side with the fuel return line to the RH fuel tank.

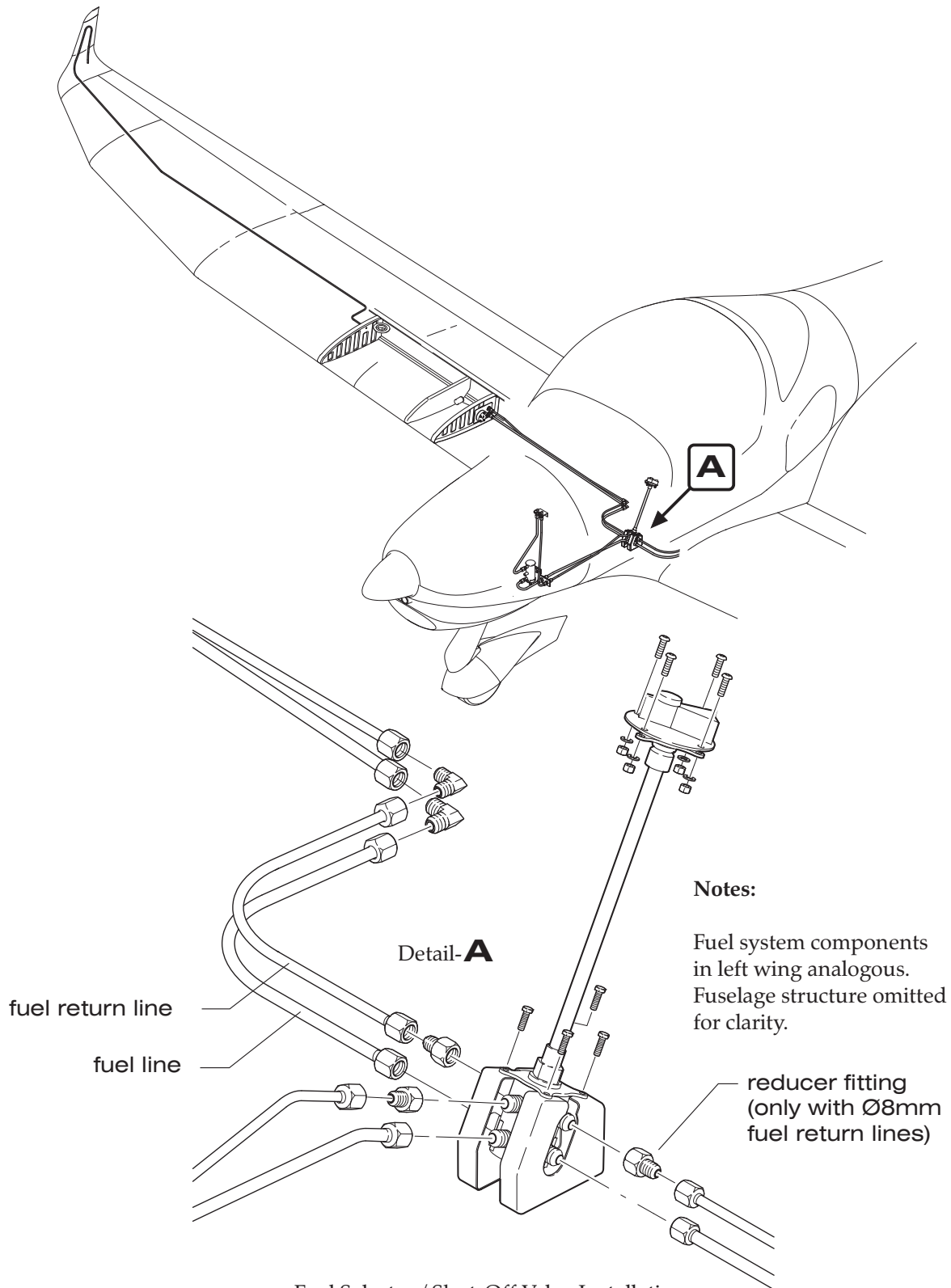
Rotax 912S:

The electrical fuel pump is incorporated into the system without a 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 right firewall.

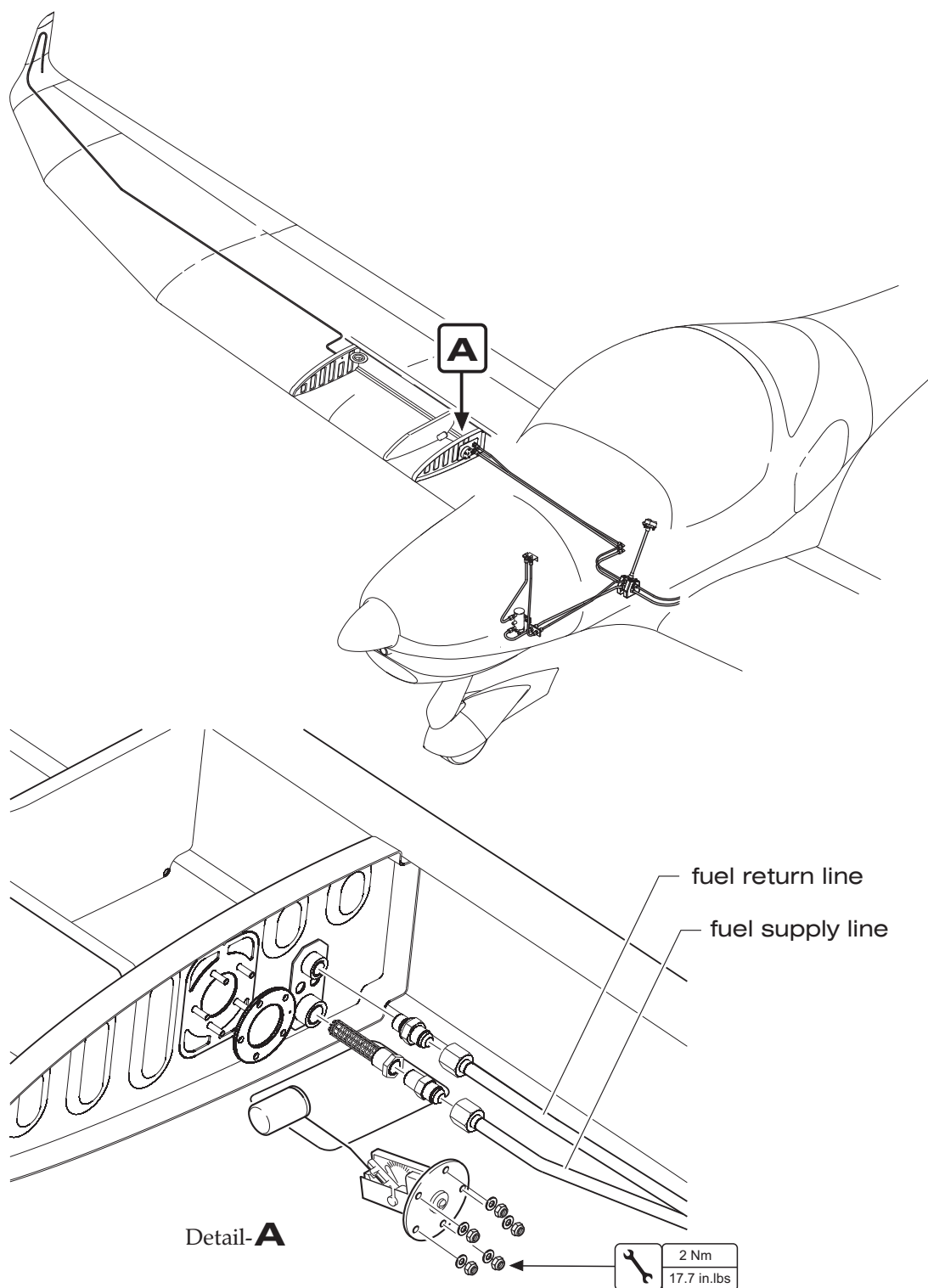
Rotax 912iS / 914F:

The electrical fuel pumps are located in a separate compartment below the cockpit floor. Both pumps are connected in series to offer maximum reserves against vapor lock at high altitudes and temperatures. Separate check valves are installed parallel to the fuel pumps to allow operation with only one pump. Fuel flows from the tanks via a combined fuel filter / water trap (gascolator) to the electric fuel pumps and from there to the pressure regulator on the engine. The gascolator is accessible via inspection cover from outside the fuselage, whereas the inspection cover for the fuel pump package is located under the cockpit floor.

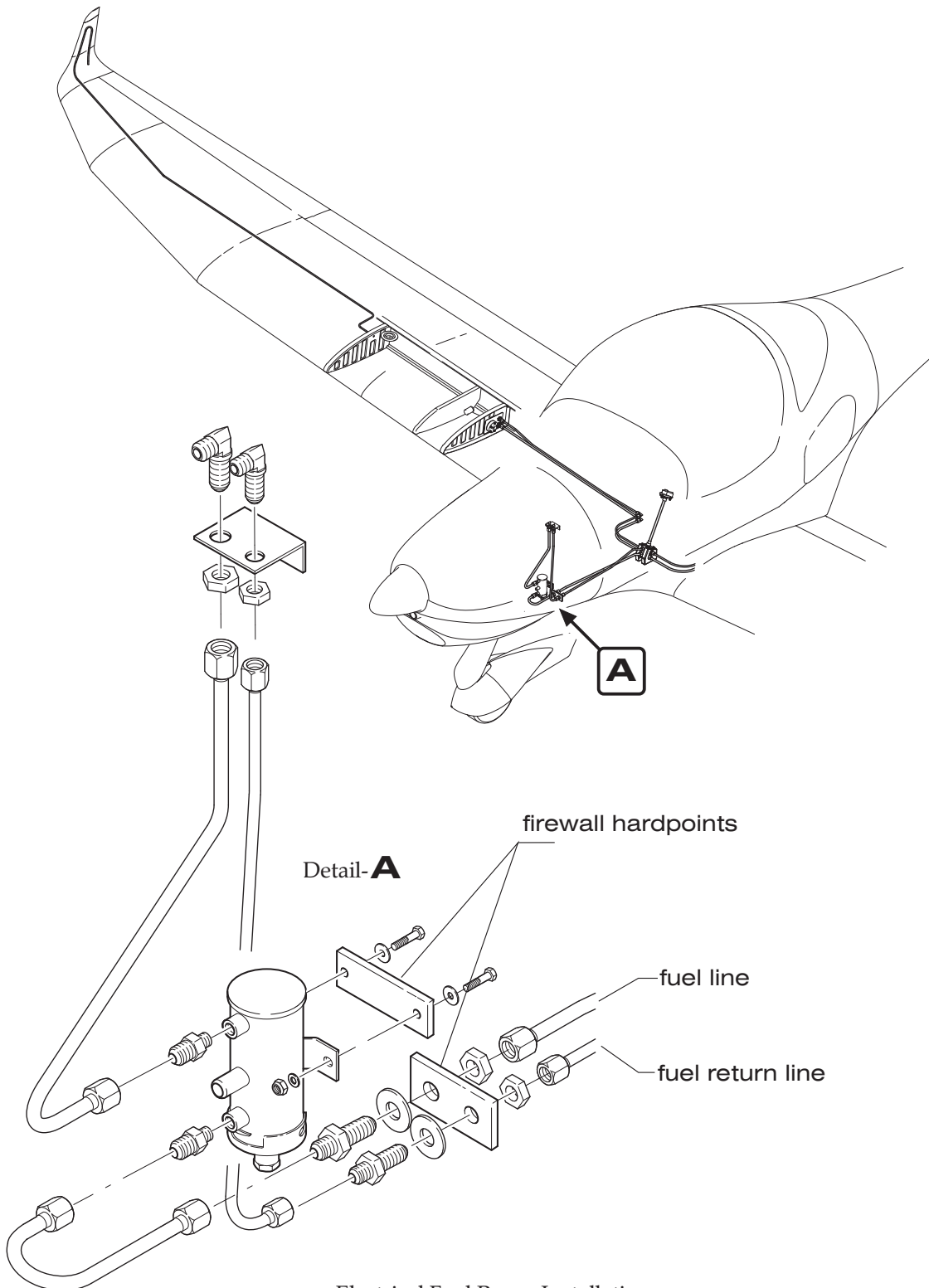
Aircraft equipped with Rotax 912iS engine have an additional fine filter located in the engine compartment at the lower right firewall. A bypass line with check valve allows fuel supply even if the filter is blocked. This check valve opens if the pressure drop of the filter exceeds 0,8 - 1,2 bar (12 - 17 psi).



Fuel Selector / Shut-Off Valve Installation
Figure 201



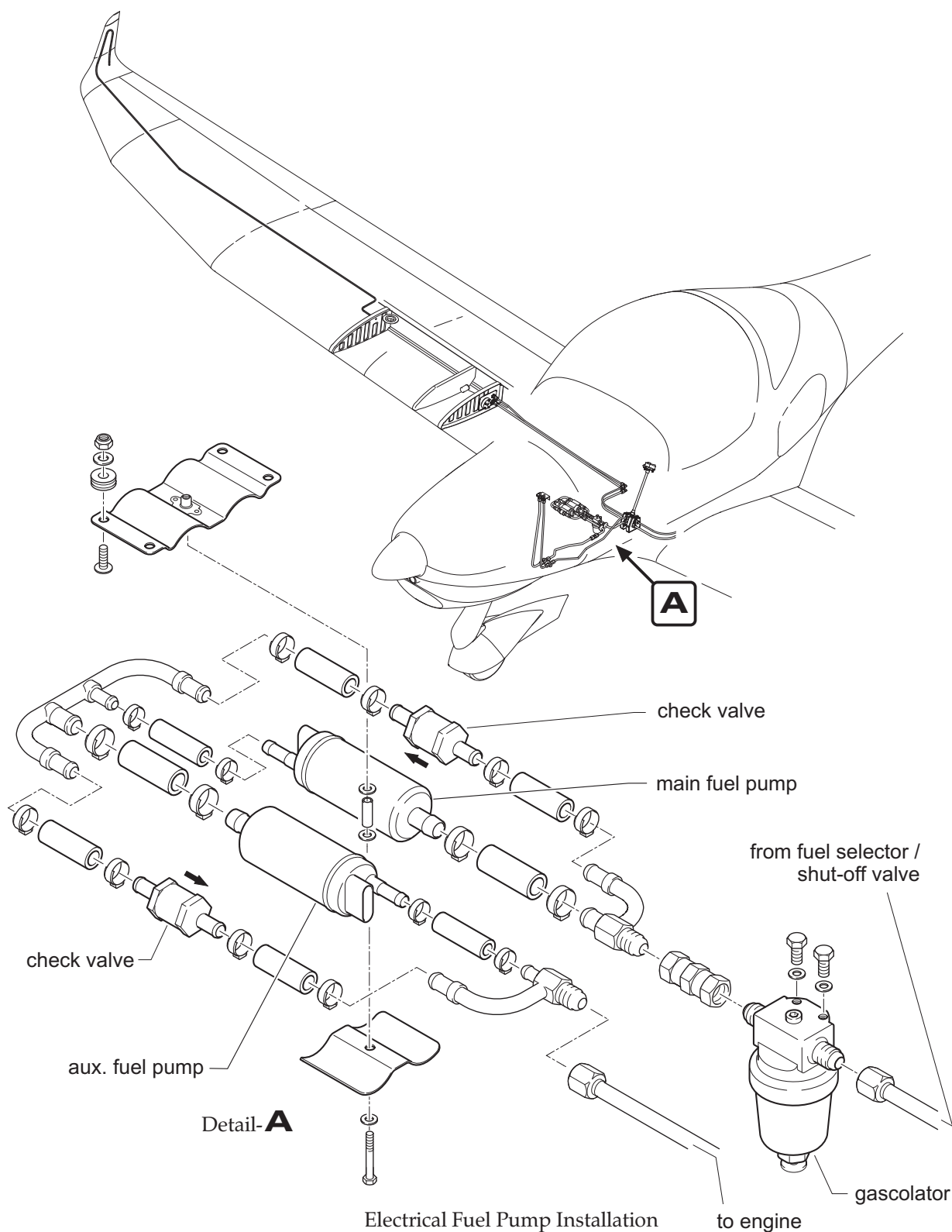
Fuel Level Sensor / Fuel Tank Outlet Strainer Installation
Figure 202



Electrical Fuel Pump Installation
Figure 203

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Aircraft equipped with Rotax 912S engine



Electrical Fuel Pump Installation
Figure 203

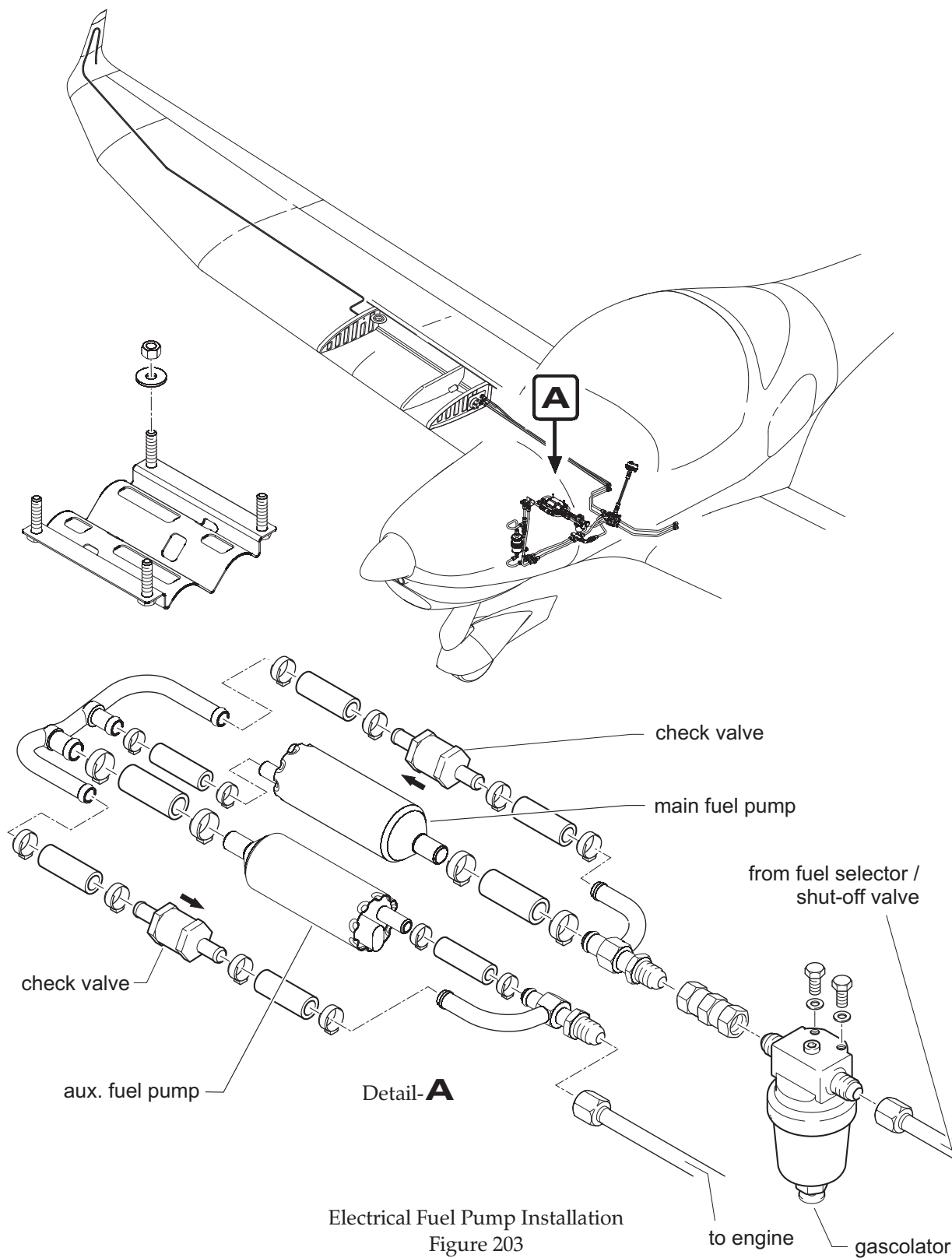
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Aircraft equipped with Rotax 914F engine

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Aircraft equipped with Rotax 912iS engine

- B. A clean fuel distribution system is very important for the secure and continuous supply of fuel to the engine. The fuel system is equipped with drain valves with which fuel in the system can be examined for contamination and grade.
- (1) The electrical fuel pump (Rotax 912S) / gascolator (Rotax 912iS / 914F) has a filter screen which must be cleaned regularly. The filter screen can be removed for maintenance. The fine filter (Rotax 912iS only) has to be replaced regularly.
 - (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 610 BB / 510 BB. 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 system has a drain valve at it's lowest point, namely at the base of the electrical fuel pump (Rotax 912S) / gascolator (Rotax 912iS / Rotax 914F). The drain valve is accessible from outside the nose section without removing any component. It should be used regularly to check fuel for water and contamination.
 - (4) Each wing fuel tank has a drain-valve at it's base. The drain valves are accessible from outside at the bottom of the wings in the wing root area. They should be used regularly to check fuel for water and contamination.

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

A. Remove Fuel Selector / Shut-Off Valve

- (1) Ensure electrical power to aircraft is OFF.
- (2) Disconnect battery (refer to 24-30).
- (3) Drain fuel from fuel system completely using the wing fuel tank drains and the drain at the electrical fuel pump (Rotax 912S) / gascolator (Rotax 912iS / Rotax 914F).
- (4) Remove access panels 211 BB and 211 HL/HR in the cabin (refer to 25-12).
- (5) Remove access panel 211 GT with fuel selector / shut-off valve control lever and connecting shaft (refer to 25-12).
- (6) Disconnect the fuel supply and return lines at valve.
- (7) 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 and electrical power to aircraft is OFF.
- (2) Place fuel selector / shut-off valve in 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. Make sure that both the valve and the valve control lever are set to OFF and install access panel 211 GT with fuel selector / shut-off valve control lever and connecting shaft (refer to 25-12).
- (5) Refuel the aircraft.
- (6) Pressure check complete fuel system (refer to "Fuel System Pressure Test" below).
- (7) Inspect fuel selector / shut-off valve and enclosure for any signs of fuel leakage.
- (8) Reconnect battery (refer to 24-30).
- (9) Perform operational check of the fuel distribution system.
- (10) Install all items removed for access.

3. Electrical Fuel Pump Removal/Installation (Rotax 912S only)

A. Remove Electrical Fuel Pump

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

B. Install Electrical Fuel Pump

- (1) Verify battery is disconnected and electrical power to aircraft is OFF.
- (2) Secure electrical fuel pump to firewall using bolts, washers and nuts.
- (3) Reconnect fuel lines to electrical fuel pump.
- (4) Reconnect the pump electrical wires.
- (5) Reconnect battery (refer to 24-30).

4. Electrical Fuel Pump Removal/Installation (Rotax 912iS / Rotax 914F only)

A. Remove Electrical Fuel Pumps

- (1) Ensure electrical power to aircraft is OFF.
- (2) Close fuel selector / shut-off valve.
- (3) Disconnect battery (refer to 24-30).
- (4) Drain fuel from system with drainer at bottom of gascolator.
- (5) Remove access panels 210BB (refer to 06-30) and 211BB (refer to 25-12).
- (6) Disconnect electrical wires to fuel pump package at connector inside the fuselage.
- (7) Disconnect fuel lines to/from fuel pump package through access panel 210BB from below the fuselage.
- (8) Remove screws securing access panel 211LT to fuselage (refer to 25-12).
Don't remove the 4 nuts attaching the fuel pump package to the access panel.
- (9) Remove access panel 211LT from fuselage together with the fuel pump package.
- (10) Remove clamp(s) attaching fuel pump assembly to access panel.
- (11) Disconnect electrical wires, fuel hoses and circuit board with interference-suppression capacitor (Rotax 914F only) from fuel pumps and remove fuel pumps.

B. Install Electrical Fuel Pumps

- (1) Verify battery is disconnected and electrical power to aircraft is OFF.
- (2) Arrange the position of fuel pumps, check valves, hose clamps and new fuel hoses to fit into the fuel pump housing.
- (3) Attach electrical fuel pumps to access panel 211LT using clamp(s).

NOTE: Rotax 912iS: Do not overtighten the 1-ear clamps, otherwise the fuel pump rotor may stick and pump does not work.

- (4) Crimp 1-ear clamps on fuel hose connections.

- (5) Perform leakage check: Plug outlet of fuel pump assembly. Connect inlet to air compressor and pressure gauge. Rotax 914F: Apply 2 bar (29 psi) / Rotax 912iS: Apply 6 bar (87 psi) air pressure and check system for leaks. No pressure loss is allowed.
- (6) Reconnect electrical wires and circuit board with interference-suppression capacitor (Rotax 914F only) to fuel pumps and bonding wires to fuel lines.
- (7) Position access panel 211LT in fuselage together with the fuel pump assembly and secure with screws.
- (8) Reconnect fuel lines to/from fuel pump package through access panel 210BB.
- (9) Reconnect electrical wires to fuel pump package at connector inside the fuselage.
- (10) Reconnect battery (refer to 24-30).
- (11) Perform operational check of the fuel distribution system.
- (12) Inspect fuel pump assembly and connections for any signs of fuel leakage.
- (13) Install all items removed for access.

5. Fuel Filter Maintenance (Rotax 912S only)

A. Maintenance is accomplished by the following procedure:

- (1) Ensure electrical power to aircraft is OFF.
- (2) Close fuel selector / shut-off valve.
- (3) Disconnect battery (refer to 24-30).
- (4) Drain fuel from system with drainer at bottom of electrical fuel pump.
- (5) Remove engine cowling (refer to 71-10).
- (6) Remove locking wire at lower fuel pump cap.
- (7) Remove lower fuel pump cap.
- (8) Remove filter element and clean by washing.
- (9) Check disk magnet for metal particles.
- (10) Reassemble filter and cap.

CAUTION: ENSURE CORRECT ORIENTATION OF THE FILTER. THE SMALLER FILTER OPENING SHOULD FACE UPWARDS.

- (11) Secure cap using locking wire.
- (12) Reconnect battery (refer to 24-30).
- (13) Perform operational check of the fuel distribution system.
- (14) Inspect system for any signs of fuel leakage.
- (15) Install all items removed for access.

6. Fuel Filter Maintenance (Rotax 912iS / Rotax 914F only)

A. Maintenance is accomplished by the following procedure:

- (1) Ensure electrical power to aircraft is OFF.
- (2) Close fuel selector / shut-off valve.
- (3) Disconnect battery (refer to 24-30).
- (4) Drain fuel from system with drainer at bottom of gascolator.
- (5) Remove access panel 210BB (refer to 06-30).
- (6) Remove locking wire from black retaining ring at gascolator.
- (7) Remove gascolator sediment bowl by gripping the black retaining ring and unscrewing until it is free of the bowls threads.

- (8) Inspect bowl and clean if required.
- (9) Gently grip at the top of the filter element and unscrew to remove.
- (10) Clean filter element by washing in fuel or blowing off contaminant with air.
- (11) Reinstall filter element. Gently grip at the top of the filter element and screw to hand tight.
- (12) Fit new O-ring to the bowl.
- (13) Line up arrow on sediment bowl and engraved line on the gascolator body. Carefully push bowl into gascolator body and tighten the retaining ring.
- (14) Secure retaining ring using locking wire.
- (15) Reconnect battery (refer to 24-30).
- (16) Perform operational check of the fuel distribution system.
- (17) Inspect system for any signs of fuel leakage.
- (18) Install all items removed for access.

7. Fuel Fine Filter Removal/Installation (Rotax 912iS only)

A. Remove Fuel Fine Filter

- (1) Ensure electrical power to aircraft is OFF.
- (2) Close fuel selector / shut-off valve.
- (3) Disconnect battery (refer to 24-30).
- (4) Drain fuel from system with drainer at bottom of gascolator.
- (5) Remove engine cowling (refer to 71-10).
- (6) Disconnect fuel lines from fine filter fittings.
- (7) Open clamp and remove fine filter from aircraft.
- (8) Remove fittings from fine filter.

B. Install Fuel Fine Filter

- (1) Verify battery is disconnected and electrical power to aircraft is OFF.
- (2) Install fittings to fine filter inlet and outlet.
- (3) Position fine filter and clamp at lower right firewall. Install clamp screw and nut.
- (4) Reconnect fuel lines to fine filter fittings.
- (5) Reconnect battery (refer to 24-30).
- (6) Perform operational check of the fuel distribution system.
- (7) Inspect fine filter and connections for any signs of fuel leakage.
- (8) Install all items removed for access.

FUEL QUANTITY INDICATION - MAINTENANCE

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

1. General

- A. The fuel quantity indicating system consists of two resistive float type fuel quantity sensors, one in each tank, a dual fuel quantity indicator and wiring connecting the components. The fuel quantity indicator is located on the right side of the instrument panel and has been calibrated during installation. The fuel quantity sensors are easily accessible for maintenance or replacement through access panels in the lower wing skin.
- B. Maintenance is limited to the removal and installation of the system components.

2. Fuel Quantity Indicator Removal/Installation

- A. Check SI-AT01-018 (annex 1) when installing a new indicator. The pin assignment of the indicator may have changed.
- B. Remove Fuel Quantity Indicator
 - (1) Ensure electrical power to aircraft is OFF.
 - (2) Disconnect battery (refer to 24-30).
 - (3) Remove glare shield (refer to 31-10).
 - (4) Remove cable connector from back of indicator.
 - (5) While supporting indicator, remove screws attaching indicator to instrument panel.
 - (6) Remove indicator from aircraft.
- C. Install Fuel Quantity Indicator.
 - (1) Position indicator to instrument panel hole and secure with screws.
 - (2) Install cable connector at back of indicator.
 - (3) Reconnect battery (refer to 24-30).
 - (4) Perform a fuel quantity indicating system test / calibration (refer to "Test/Calibration" below).
 - (5) Install glare shield (refer to 31-10).

3. Fuel Quantity Sensor Removal/Installation

- A. Remove Fuel Quantity Sensor
 - (1) Ensure electrical power to aircraft is OFF.
 - (2) Disconnect battery (refer to 24-30).
 - (3) Drain wing fuel tank with sensor that is to be removed (refer to 12-11).
 - (4) Open access / inspection plate 510 BB / 610 BB to gain access to sensor (refer to 06-30).
 - (5) Remove nuts securing sensor to inboard fuel tank rib.
 - (6) Disconnect electrical cables from sensor.
 - (7) Carefully withdraw sensor from wing tank.

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Aircraft equipped with analog fuel quantity gauge

B. Install Fuel Quantity Sensor

- (1) Verify battery is disconnected and electrical power to aircraft is OFF.
- (2) Check ease of movement of the float arm before installing the sensor.
- (3) Place sensor with new gasket on to the threaded studs at inboard fuel tank rib.

CAUTION: THE FUEL QUANTITY SENSOR SHOULD BE FED CAREFULLY INTO THE FUEL TANK. A BENT FLOAT ARM MAY CAUSE ERRONEOUS READINGS.

- (4) Connect electrical cables to sensor.
- (5) Secure sensor with washers and nuts. Torque nuts crosswise to 2 Nm (17.7 in.lbs).
- (6) Reconnect battery (refer to 24-30).
- (7) Perform a fuel quantity indicating system calibration (refer to "Test/Calibration" below).

4. Fuel Quantity Indicating System Test/Calibration

NOTE: When a fuel quantity sensor is replaced, the fuel quantity indicating system must be calibrated. When a fuel quantity indicator is replaced, the system must be at least functionally tested and recalibrated as necessary.

NOTE: Due to the dihedral angle of the wing and the position of the fuel quantity sensor (total) fuel levels above approx. 50 liters (13.21 gallons) are not gaugeable.

NOTE: If a replacement wing has been installed on the aircraft, the procedure according to S/N from AT01-327 applies.

A. Fuel Quantity Indicating System Test

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks (refer to 12-11).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (refer to 08-10).
- (2) Ensure ALT1 / BAT switch is in the OFF position.
- (3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
- (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (5) Turn BAT switch to the ON position.
- (6) Wait until pointer settles in it's final position. Check that fuel quantity indicator reads empty for both tanks (<"E" up to S/N AT01-326).
- (7) Turn BAT switch to the OFF position.
- (8) Add 13,7 liters (3.62 gallons) of fuel to each wing fuel tank.
- (9) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (10) Turn BAT switch to the ON position.
- (11) Wait until pointer settles in it's final position. Check that fuel quantity indicator reads "1/4" $\pm 1/2$ scale line for both tanks.
- (12) Turn BAT switch to the OFF position.
- (13) Add 41,1 liters (10.86 gallons) of fuel to LH wing fuel tank.
- (14) Turn BAT switch to the ON position.
- (15) Wait until pointer settles in it's final position.
Check that LH fuel quantity indicator reads full (>"3/4" from S/N AT01-327).

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Aircraft equipped with analog fuel quantity gauge

- (16) Turn BAT switch to the OFF position.
- (17) Repeat steps (13) thru (16) for RH wing fuel tank.

B. Fuel Quantity Indicating System Calibration

NOTE: A calibration module is necessary to perform the steps described below.
The calibration module is installed at the back of the fuel quantity indicator.
For further information on fuel tank calibration or if no calibration module is installed refer to SI-AT01-018, latest revision.

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks (refer to 12-11).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (refer to 08-10).
 - (d) Remove glare shield (refer to 31-10).
- (2) Ensure ALT1 / BAT switch is in the OFF position.

Up to S/N AT01-326:

- (3) Fill 18,9 liters (4.99 gallons) of fuel into each wing fuel tank.
- (4) Gently shake wing to assure fuel quantity sensors settle in their final position.
- (5) Turn BAT switch to the ON position.
- (6) Use the two potentiometers of the calibration module at the back of the fuel quantity gauge to set the pointers of the gauge to "1/4". Pay attention to the delayed indication of the gauge.
- (7) Turn BAT switch to the OFF position and drain fuel from wing tanks (refer to 12-11).
- (8) Perform fuel quantity indicating system test as described above.
- (9) Reinstall glare shield (refer to 31-10).

From S/N AT01-327:

- (3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
- (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (5) Turn BAT switch to the ON position.
- (6) Use the two potentiometers of the calibration module at the back of the fuel quantity gauge to set the pointers of the gauge to "E". Pay attention to the delayed indication of the gauge.
- (7) Turn BAT switch to the OFF position and drain fuel from wing tanks (refer to 12-11).
- (8) Perform fuel quantity indicating system test as described above.
- (9) Reinstall glare shield (refer to 31-10).

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Aircraft equipped with analog fuel quantity gauge

FUEL QUANTITY INDICATION - MAINTENANCE

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

1. General

- A. Fuel quantity indication is included in the Garmin G3X Touch system.
Fuel quantity is measured by two resistive type fuel quantity sensors, one in each tank, electrically connected to the GEA 24 engine interface at the back of the instrument panel. The fuel quantity sensors are easily accessible for maintenance or replacement through access panels in the lower wing skin.
- B. Maintenance is limited to the removal and installation of the system components.
Refer to 34-25 for further information on maintenance of the Garmin G3X Touch system.

2. Fuel Quantity Sensor Removal/Installation

- A. Remove Fuel Quantity Sensor
- (1) Ensure electrical power to aircraft is OFF.
 - (2) Disconnect battery (refer to 24-30).
 - (3) Drain wing fuel tank with sensor that is to be removed (refer to 12-11).
 - (4) Open access / inspection plate 510 BB / 610 BB to gain access to sensor (refer to 06-30).
 - (5) Remove nuts securing sensor to inboard fuel tank rib.
 - (6) Disconnect electrical cables from sensor.
 - (7) Carefully withdraw sensor from wing tank.
- B. Install Fuel Quantity Sensor
- (1) Verify battery is disconnected and electrical power to aircraft is OFF.
 - (2) Check ease of movement of the float arm before installing the sensor.
 - (3) Place sensor with new gasket on to the threaded studs at inboard fuel tank rib.

CAUTION: THE FUEL QUANTITY SENSOR SHOULD BE FED CAREFULLY INTO THE FUEL TANK. A BENT FLOAT ARM MAY CAUSE ERRONEOUS READINGS.

- (4) Connect electrical cables to sensor.
- (5) Secure sensor with washers and nuts. Torque nuts crosswise to 2 Nm (17.7 in.lbs).
- (6) Reconnect battery (refer to 24-30).
- (7) Perform a fuel quantity indicating system calibration (refer to "Test/Calibration" below).

EFFECTIVITY

Aircraft equipped with Garmin G3X Touch

3. Fuel Quantity Indicating System Test/Calibration

NOTE: When a fuel quantity sensor is replaced, the fuel quantity indicating system must be calibrated.

NOTE: Due to the dihedral angle of the wing and the position of the fuel quantity sensor (total) fuel levels above approx. 50 liters (13.2 gallons) are not gaugeable.

A. Fuel Quantity Indicating System Test

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks (refer to 12-11).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (refer to 08-10).
- (2) Ensure electrical power to aircraft is OFF.
- (3) Fill unusable amount of fuel into each wing fuel tank.
- (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (5) Turn BAT switch to the ON position.
- (6) Check that fuel level indication reads 0 liters (0 gallons) for both tanks.
- (7) Turn BAT switch to the OFF position.
- (8) Depending on unusable amount of fuel per tank:
 - 5,2 liter: Add 27,4 liters (7.23 gallons) of fuel to each wing fuel tank.
 - 11,5 liter: Add 24,3 liters (6.41 gallons) of fuel to each wing fuel tank.
- (9) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (10) Turn BAT switch to the ON position.
- (11) Depending on unusable amount of fuel per tank:
 - 5,2 liter: Check that fuel level indication reads 27 ± 3 liters (7.2 ± 0.8 gallons) for both tanks.
 - 11,5 liter: Check that fuel level indication reads 24 ± 3 liters (6.4 ± 0.8 gallons) for both tanks.
- (12) Turn BAT switch to the OFF position.
- (13) Depending on unusable amount of fuel per tank:
 - 5,2 liter: Add 27,4 liters (7.23 gallons) of fuel to LH wing fuel tank.
 - 11,5 liter: Add 24,3 liters (6.41 gallons) of fuel to LH wing fuel tank.
- (14) Turn BAT switch to the ON position.
- (15) Depending on unusable amount of fuel per tank:
 - 5,2 liter: Check that fuel level indication reads 55 liters (14.5 gallons) for LH fuel tank.
 - 11,5 liter: Check that fuel level indication reads 48 liters (12.8 gallons) for LH fuel tank.
- (16) Turn BAT switch to the OFF position.
- (17) Repeat steps (13) thru (16) for RH wing fuel tank.

B. Fuel Quantity Indicating System Calibration

NOTE: Refer to Garmin G3X Touch EFIS Part 23 AML STC Maintenance Manual for further information on the fuel tank calibration procedure.

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks (refer to 12-11).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (refer to 08-10).

EFFECTIVITY

Aircraft equipped with Garmin G3X Touch

- (2) Ensure electrical power to aircraft is OFF.
- (3) Fill unusable amount of fuel into each wing fuel tank.
- (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (5) Turn BAT switch to the ON position.
- (6) Call up the G3X fuel quantity calibration page.
- (7) Select "Fuel Quantity 1/L", "Calibrate", "Flight". Enter 0,0 liters (0.0 gallons) in the "Actual Fuel Quantity" field. Select "Store Calibration Point" to save the first point.
- (8) Select "Fuel Quantity 2/R", "Calibrate", "Flight" and repeat step (7) for the RH wing fuel tank.
- (9) Depending on unusable amount of fuel per tank:
5,2 liter: Add 13,7 liters (3.62 gallons) of fuel to each wing fuel tank.
11,5 liter: Add 12,1 liters (3.20 gallons) of fuel to each wing fuel tank.
- (10) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (11) Select "Fuel Quantity 1/L", "Calibrate", "Flight".
Depending on unusable amount of fuel per tank:
5,2 liter: Enter 13,7 liters (3.62 gallons) in the "Actual Fuel Quantity" field.
11,5 liter: Enter 12,1 liters (3.20 gallons) in the "Actual Fuel Quantity" field.
Select "Store Calibration Point" to save the second point.
(The sensor value displayed in the "Input Voltage" field should change when fuel is added.)
- (12) Select "Fuel Quantity 2/R", "Calibrate", "Flight" and repeat step (11) for the RH wing fuel tank.
- (13) Repeat steps (9) thru (12) for the remaining 3 calibration points:

Calibration points with 5,2 liters unusable fuel per tank: (Rotax 912S / Roax 914F / Rotax 912iS from S/N 409)

Calibration Point	Actual Fuel Qty. [liters (gallons)]	Total Fuel [liters (gallons)]	Usable Fuel [liters (gallons)]
1	0,0 (0.0)	5,2 (1.37)	0,0 (0.00)
2	13,7 (3.6)	18,9 (4.99)	13,7 (3.62)
3	27,4 (7.2)	32,6 (8.61)	27,4 (7.24)
4	41,1 (10.9)	46,3 (12.23)	41,1 (10.86)
5	54,8 (14.5)	60,0 (15.85)	54,8 (14.48)

Calibration points with 11,5 liters unusable fuel per tank: (Rotax 912iS up to S/N 408)

Calibration Point	Actual Fuel Qty. [liters (gallons)]	Total Fuel [liters (gallons)]	Usable Fuel [liters (gallons)]
1	0,0 (0.00)	11,5 (3.04)	0,0 (0.00)
2	12,1 (3.20)	23,6 (6.24)	12,1 (3.20)
3	24,3 (6.41)	35,8 (9.44)	24,3 (6.41)
4	36,4 (9.61)	47,9 (12.65)	36,4 (9.61)
5	48,5 (12.81)	60,0 (15.85)	48,5 (12.81)

EFFECTIVITY

Aircraft equipped with Garmin G3X Touch

FUEL QUANTITY INDICATION - MAINTENANCE

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

1. General

- A. Fuel quantity indication is included in the engine monitoring system.
Fuel quantity is measured by two resistive type fuel quantity sensors, one in each tank, electrically connected to the engine data converter (EDC) via an interface module (RFLM-4) at the back of the instrument panel. The fuel quantity sensors are easily accessible for maintenance or replacement through access panels in the lower wing skin.
- B. Maintenance is limited to the removal and installation of the system components.
Refer to 77-40 for further information on maintenance of the engine monitoring system.

2. Fuel Quantity Sensor Removal/Installation

- A. Remove Fuel Quantity Sensor
- (1) Ensure electrical power to aircraft is OFF.
 - (2) Disconnect battery (refer to 24-30).
 - (3) Drain wing fuel tank with sensor that is to be removed (refer to 12-11).
 - (4) Open access / inspection plate 510 BB / 610 BB to gain access to sensor (refer to 06-30).
 - (5) Remove nuts securing sensor to inboard fuel tank rib.
 - (6) Disconnect electrical cables from sensor.
 - (7) Carefully withdraw sensor from wing tank.
- B. Install Fuel Quantity Sensor
- (1) Verify battery is disconnected and electrical power to aircraft is OFF.
 - (2) Check ease of movement of the float arm before installing the sensor.
 - (3) Place sensor with new gasket on to the threaded studs at inboard fuel tank rib.

CAUTION: THE FUEL QUANTITY SENSOR SHOULD BE FED CAREFULLY INTO THE FUEL TANK. A BENT FLOAT ARM MAY CAUSE ERRONEOUS READINGS.

- (4) Connect electrical cables to sensor.
- (5) Secure sensor with washers and nuts. Torque nuts crosswise to 2 Nm (17.7 in.lbs).
- (6) Reconnect battery (refer to 24-30).
- (7) Perform a fuel quantity indicating system calibration (refer to "Test/Calibration" below).

EFFECTIVITY

Aircraft equipped with MVP-50

3. Resistive Fuel Module Removal/Installation

A. Remove Resistive Fuel Module

- (1) Ensure electrical power to aircraft is OFF.
- (2) Disconnect battery (refer to 24-30).
- (3) Remove glare shield (refer to 31-10).
- (4) Disconnect electrical connectors from back of module.
- (5) While supporting the module, remove screws securing module to instrument panel.
- (6) Remove module from aircraft.

B. Install Resistive Fuel Module

- (1) Position module at back of instrument panel and attach with screws.
- (2) Connect electrical connectors to module.
- (3) Install glare shield (refer to 31-10).
- (4) Reconnect battery (refer to 24-30).
- (5) Perform a fuel quantity indicating system test (refer to "Test/Calibration" below).

4. Fuel Quantity Indicating System Test/Calibration

NOTE: When a fuel quantity sensor is replaced, the fuel quantity indicating system must be calibrated. When a resistive fuel module is replaced, the system must be functionally tested.

NOTE: Due to the dihedral angle of the wing and the position of the fuel quantity sensor (total) fuel levels above approx. 50 liters (13.21 gallons) are not gaugeable.

A. Fuel Quantity Indicating System Test

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks (refer to 12-11).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (refer to 08-10).
- (2) Ensure ALT1 / BAT switch is in the OFF position.
- (3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
- (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (5) Turn BAT switch to the ON position.
- (6) Check that engine monitoring system reads 0 liters (0 gallons) for both tanks.
- (7) Turn BAT switch to the OFF position.
- (8) Add 27,4 liters (7.23 gallons) of fuel to each wing fuel tank.
- (9) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (10) Turn BAT switch to the ON position.
- (11) Check that engine monitoring system reads 27 ± 3 liters (7.2 ± 0.8 gallons) for both tanks.
- (12) Turn BAT switch to the OFF position.
- (13) Add 27,4 liters (7.23 gallons) of fuel to LH wing fuel tank.
- (14) Turn BAT switch to the ON position.
- (15) Check that engine monitoring system reads > 52 liters (13.7 gallons) for LH fuel tank.
- (16) Turn BAT switch to the OFF position.
- (17) Repeat steps (13) thru (16) for RH wing fuel tank.

EFFECTIVITY

Aircraft equipped with MVP-50

B. Fuel Quantity Indicating System Calibration

NOTE: Refer to Electronics International MVP-50 operating instructions for further information on the fuel tank calibration procedure. The necessary password can be obtained from AQUILA Aviation on request.

- (1) Prepare aircraft
 - (a) Drain fuel from wing tanks (refer to 12-11).
 - (b) Verify fuel selector / shut-off valve is in OFF position.
 - (c) Level the aircraft laterally and longitudinally (refer to 08-10).
- (2) Ensure ALT1 / BAT switch is in the OFF position.
- (3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
- (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (5) Turn BAT switch to the ON position.
- (6) Call up the MVP-50 "Fuel Tank Calibration Screen" (level 1 password required).
- (7) Select "Fuel Tank" - "FUEL L", "Calibration Point" - "Empty" and "Use Current Count" - "Yes" to transfer the current sensor count to the sensor count field of this calibration point.
- (8) Select "Fuel Tank" - "FUEL R" and repeat step (7) for the RH wing fuel tank.
- (9) Add 13,7 liters (3.62 gallons) of fuel to each wing fuel tank.
- (10) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
- (11) Select "Fuel Tank" - "FUEL L" and "Calibration Point" - "2".
Set "Qty" to "3.6 GAL" and select "Use Current Count" - "Yes" for this calibration point.
(The tanks must be calibrated in U.S. gallons.)
- (12) Select "Fuel Tank" - "FUEL R" and repeat step (11) for the RH wing fuel tank.
- (13) Repeat steps (9) thru (12) for the remaining 3 calibration points:

Calibration Point	Qty. [gallons]	Total Fuel [liters (gallons)]	Usable Fuel [liters (gallons)]
Empty	0.0	5,2 (1.37)	0,0 (0.00)
2	3.6	18,9 (4.99)	13,7 (3.62)
3	7.2	32,6 (8.61)	27,4 (7.24)
4	10.9	46,3 (12.23)	41,1 (10.86)
Full	14.5	60,0 (15.85)	54,8 (14.48)

EFFECTIVITY

Aircraft equipped with MVP-50

FUEL PRESSURE INDICATION - MAINTENANCE

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

1. General

- A. Low fuel pressure is indicated by a warning light.
- B. Fuel pressure is measured by a pressure switch at the fuel manifold on top of the engine.
- C. Maintenance is limited to the removal and installation of the fuel pressure switch.
- D. Refer to SI-AT01-028 for further information on the optional retrofit of a fuel pressure sensor.
- E. The fuel pressure switch is equipped with a restricting orifice to dampen fuel pressure fluctuations. In older sensors, this was integrated into a rivet in the sensor head. Newer sensors require a special adapter with integrated orifice.

2. Fuel Pressure Switch Removal/Installation (Figure 201)

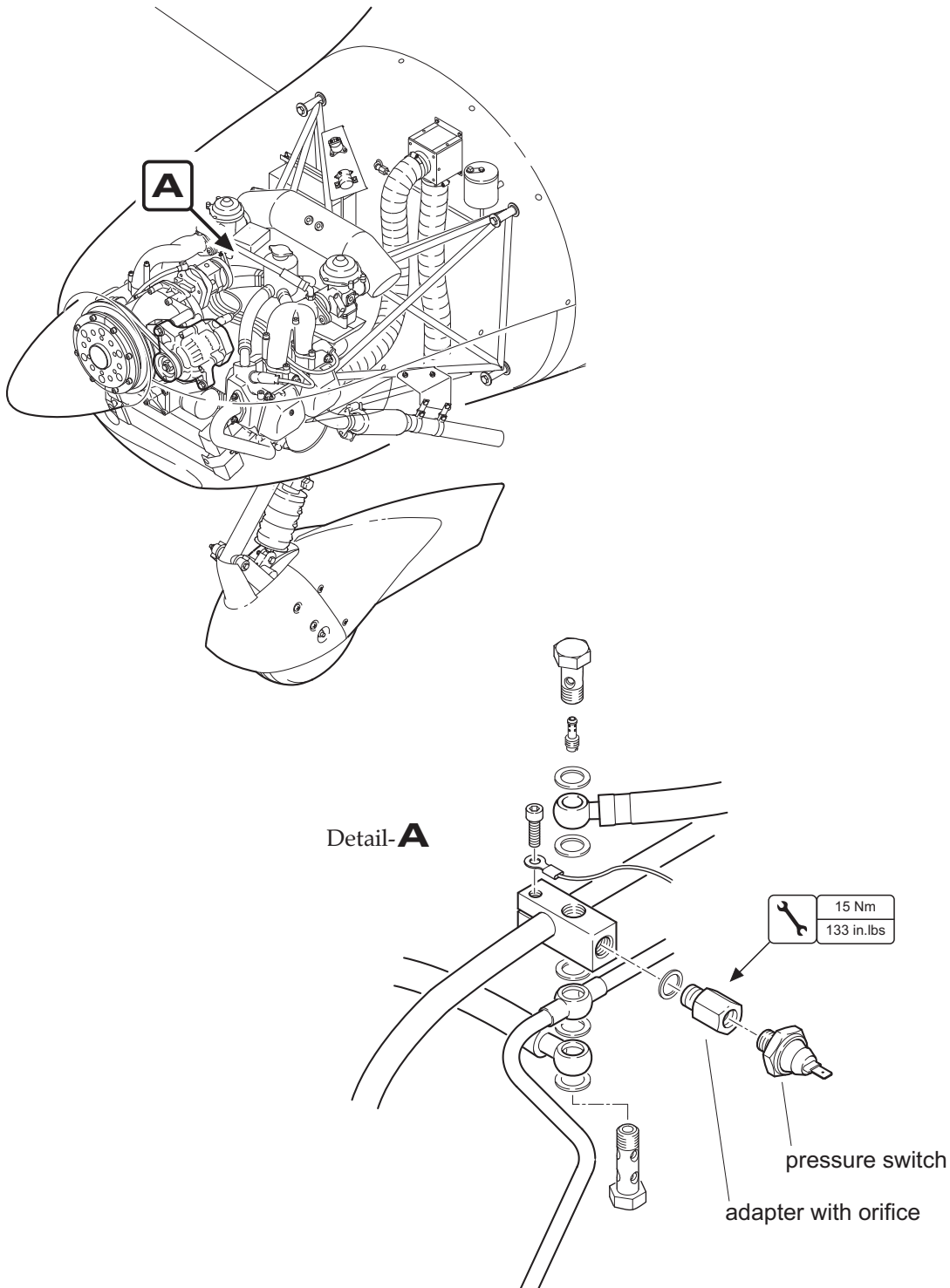
- A. Remove Fuel Pressure Switch
 - (1) Ensure electrical power to aircraft is OFF.
 - (2) Close fuel selector / shut-off valve.
 - (3) Remove engine cowling (refer to 71-10).
 - (4) Disconnect battery (refer to 24-30).
 - (5) Disconnect electrical connector from pressure switch.
 - (6) Unscrew pressure switch from fuel manifold / adapter.
 - (7) Plug fuel manifold port to avoid entry of any material.
- B. Install Fuel Pressure Switch
 - (1) Ensure battery is disconnected and electrical power to aircraft is OFF.
 - (2) Clean all parts carefully.
 - (3) If adapter has to be installed: Apply Loctite (medium strength) on adapter thread and install adapter with new sealing washer to manifold block. Torque to 15 Nm (133 in.lbs).

CAUTION: EXTREME CARE MUST BE TAKEN TO AVOID THREAD LOCKER ENTERING THE FUEL SYSTEM! BLOCKED NOZZLES MAY CAUSE ENGINE STOPPAGE!

- (4) Apply Loctite (medium strength) on pressure switch thread and install pressure switch to fuel manifold / adapter (1/2 turn past hand tight).
- (5) Reconnect electrical connector to pressure switch.
- (6) Reconnect battery (refer to 24-30).
- (7) Run AUX fuel pump and check system for leaks and fuel pressure warning. Warning light should be OFF with fuel pump running and ON without fuel pressure.
- (8) Install engine cowling (refer to 71-10).

EFFECTIVITY

Aircraft equipped with analog engine instruments or Rotax 912S engine and Garmin G3X Touch



Fuel Pressure Switch Installation
Figure 201

EFFECTIVITY

Aircraft equipped with analog engine instruments or Rotax 912S engine and Garmin G3X Touch

FUEL PRESSURE INDICATION - MAINTENANCE

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

1. General

- A. Fuel pressure indication is included in the Garmin G3X Touch. It is indicated as difference between the absolute fuel pressure and the boost pressure in the airbox.
- B. Maintenance is limited to the removal and installation of the fuel pressure sensor. Refer to 34-25 for further information on maintenance of the Garmin G3X Touch system.
- C. Fuel pressure is measured by a differential pressure sensor electrically connected to the GEA 24 engine interface. To avoid damages caused by vibrations, the pressure sensor is not mounted directly on the engine but on an intercooler strut. On the wet side it is connected to the fuel pressure regulator via a flexible fuel hose and a restricting orifice. On the dry side it is connected to the airbox via a flexible fuel hose. The following sensor is used:
 - UMA T1EU07D (G3X setting: UMA 1EU07D)

2. Fuel Pressure Sensor Removal/Installation

- A. Remove Fuel Pressure Sensor
 - (1) Ensure electrical power to aircraft is OFF.
 - (2) Close fuel selector / shut-off valve.
 - (3) Remove engine cowling (refer to 71-10).
 - (4) Disconnect battery (refer to 24-30).
 - (5) Disconnect electrical connector from sensor.
 - (6) Remove clamp and fuel hose from dry side of sensor.
 - (7) Remove fuel hose from wet side of sensor.
 - (8) Unscrew nut and remove sensor from intercooler strut.
 - (9) Unscrew fittings from sensor.
 - (10) Plug sensor ports and fuel hoses to avoid entry of any material.
- B. Install Fuel Pressure Sensor
 - (1) Ensure battery is disconnected and electrical power to aircraft is OFF.
 - (2) Clean all parts carefully. Apply Loctite (medium strength) on fitting threads.
 - (3) Install fittings to both sides of sensor (max. torque 10 Nm [89 in.lbs.] or two full turns past hand tight, whichever happens first).
 - (4) Install sensor on intercooler strut and secure with nut.
 - (5) Reconnect fuel hose to wet side sensor fitting (max. torque 15 Nm [133 in.lbs]).
 - (6) Reconnect fuel hose to dry side sensor fitting and secure with clamp.
 - (7) Reconnect electrical connector to sensor.
 - (8) Reconnect battery (refer to 24-30).
 - (9) Run both fuel pumps and check system for leaks and fuel pressure indication.
 - (10) Install engine cowling (refer to 71-10).

EFFECTIVITY

Aircraft equipped with Rotax 914F engine and
Garmin G3X Touch

FUEL PRESSURE INDICATION - MAINTENANCE

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

1. General

- A. Fuel pressure indication is included in the engine monitoring system. Fuel pressure is measured by a pressure sensor (PT-30GA) electrically connected to the engine data converter (EDC). To avoid damages caused by vibrations, the pressure sensor is not mounted directly on the engine. It is installed on the engine mount and connected via a flexible fuel hose. The fuel hose is connected to the fuel system via a restricting orifice. Fuel pressure is measured at the fuel manifold (Rotax 912S) / fuel pressure regulator (Rotax 914F) on top of the engine. With the Rotax 914F fuel pressure is indicated as difference between the absolute fuel pressure and the boost pressure in the airbox. Therefore an additional pressure sensor (PT-30GA) for airbox pressure is needed. The difference is calculated / indicated by the engine monitoring system.
- B. Maintenance is limited to the removal and installation of the fuel pressure sensor. Refer to 77-40 for further information on maintenance of the engine monitoring system.

2. Fuel Pressure Sensor Removal/Installation

- A. Remove Fuel Pressure Sensor
- (1) Ensure electrical power to aircraft is OFF.
 - (2) Close fuel selector / shut-off valve.
 - (3) Remove engine cowling (refer to 71-10).
 - (4) Disconnect battery (refer to 24-30).
 - (5) Disconnect electrical connector from sensor.
 - (6) Remove fuel hose from sensor fitting.
 - (7) Open clamp and remove sensor from engine mount.
 - (8) Unscrew fitting from sensor.
 - (9) Plug sensor ports and fuel hoses to avoid entry of any material.
- B. Install Fuel Pressure Sensor
- (1) Ensure battery is disconnected and electrical power to aircraft is OFF.
 - (2) Clean all parts carefully. Apply Loctite (medium strength) on sensor thread.
 - (3) Install fitting to sensor (max. torque 10 Nm [89 in.lbs.] or two full turns past hand tight, whichever happens first).
 - (4) Reconnect fuel hose to sensor fitting (max. torque 15 Nm [133 in.lbs]).
 - (5) Install sensor on engine mount with clamp.
 - (6) Reconnect electrical connector to sensor.
 - (7) Reconnect battery (refer to 24-30).
 - (8) Run electrical fuel pump(s) and check system for leaks and fuel pressure indication.
 - (9) Install engine cowling (refer to 71-10).

EFFECTIVITY

Aircraft equipped with MVP-50

FUEL PRESSURE INDICATION - MAINTENANCE

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

1. General

- A. Fuel pressure indication is included in the Garmin G3X Touch. It is indicated as difference between the absolute fuel pressure and the pressure in the airbox. Airbox pressure measurement is included in the engine management system (EMS).
- B. Maintenance is limited to the removal and installation of the fuel pressure sensor. Refer to 34-25 for further information on maintenance of the Garmin G3X Touch system. Refer to 77-10 for further information on maintenance of the airbox pressure sensors.
- C. Fuel pressure is measured by a pressure sensor installed in the fuel line at the fuel pressure regulator and electrically connected to the GEA 24 engine interface.
The following sensor is used:
 - Rotax 664365
(G3X setting: custom / calibration: 0.5 V - 1.0 bar; 2.5 V - 6.0 bar / reference: manifold pressure)

2. Fuel Pressure Sensor Removal/Installation

- A. Remove Fuel Pressure Sensor
 - (1) Ensure electrical power to aircraft is OFF.
 - (2) Close fuel selector / shut-off valve.
 - (3) Remove engine cowling (refer to 71-10).
 - (4) Disconnect battery (refer to 24-30).
 - (5) Disconnect electrical connector from sensor.
 - (6) Hold the banjo bolt at fuel pressure regulator with a wrench to prevent it from turning. Then unscrew and remove sensor from banjo bolt.
 - (7) Plug sensor and banjo bolt ports to avoid entry of any material.
- B. Install Fuel Pressure Sensor
 - (1) Ensure battery is disconnected and electrical power to aircraft is OFF.
 - (2) Clean sensor thread carefully. Apply Loctite (medium strength) on sensor thread.
 - (3) Install sensor to banjo bolt at fuel pressure regulator. Torque to 15 Nm (133 in.lbs) while holding the banjo bolt with a wrench to prevent it from turning.
 - (4) Reconnect electrical connector to sensor.
 - (5) Reconnect battery (refer to 24-30).
 - (6) Run both fuel pumps and check system for leaks and fuel pressure indication.
 - (7) Install engine cowling (refer to 71-10).

EFFECTIVITY

Aircraft equipped with Rotax 912iS engine

FUEL FLOW INDICATION - MAINTENANCE

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

1. General

- A. Fuel flow is measured by two FT-60 fuel flow sensors: One installed in the fuel supply line, the other one in the return line. Both sensors are mounted on a bracket located on the engine side of the firewall. Fuel flow indication is included in the engine monitoring system.
MVP-50: Both fuel flow sensors are electrically connected to a FFDM-1 fuel flow differential module, located in the instrument panel. The differential module is electrically connected to the engine data converter (EDC). G3X: Both fuel flow sensors are electrically connected to the GEA 24 engine interface.
- B. Maintenance is limited to the removal and installation of the fuel flow sensor and the fuel flow differential module. Refer to 77-40 for further information on maintenance of the engine monitoring system.

2. Fuel Flow Sensor Removal/Installation

- A. Remove Fuel Flow Sensor
- (1) Ensure electrical power to aircraft is OFF.
 - (2) Close fuel selector / shut-off valve.
 - (3) Remove engine cowling (refer to 71-10).
 - (4) Disconnect battery (refer to 24-30).
 - (5) Disconnect electrical connector from sensor.
 - (6) Remove fuel hose from sensor fitting.
 - (7) Remove 2 screws securing sensor to mounting bracket.
 - (8) Remove elbow fitting from sensor fitting.
 - (9) Remove sensor from aircraft and unscrew fittings from sensor.
 - (10) Plug sensor ports and fuel lines to avoid entry of any material.
- B. Install Fuel Flow Sensor
- (1) Ensure battery is disconnected and electrical power to aircraft is OFF.
 - (2) Ensure hoses and fittings are free of any loose material. If required, clean them.
Remove caps from sensor and fuel lines immediately before installation.

CAUTION: DO NOT ALLOW HIGH AIR PRESSURE TO PASS THROUGH THE FLOW SENSOR!

- (3) Install fittings to sensor (max. torque 20 Nm [177 in.lbs.] or two full turns past hand tight, whichever happens first).
- (4) Position sensor on mounting bracket and connect sensor fitting to fuel line elbow fitting (max. torque Ø10mm line 30 Nm [266 in.lbs] / Ø8mm line 20 Nm [177 in.lbs]).
- (5) Secure sensor to mounting bracket using 2 screws, washers and nuts.
- (6) Reconnect fuel hoses to sensor fittings (max. torque 30 Nm [266 in.lbs]).

EFFECTIVITY

Aircraft equipped with Rotax 914F engine and fuel flow indication

- (7) Reconnect electrical connector to sensor.
- (8) Reconnect battery (refer to 24-30).
- (9) Run both fuel pumps and check system for leaks and fuel flow indication. Fuel flow indication should read zero with fuel pumps running and the engine switched OFF.

NOTE: Fuel flow sensors are calibrated by a K-factor. The K-factor represents the number of electrical pulses output by the fuel flow sensor per gallon of fuel. If readings are inaccurate, the K-factor may need to be adjusted (K-factor initial value is 68.000).

- (10) Install engine cowling (refer to 71-10).
- (11) Perform ground run and check fuel flow indication is proper for engine operation.
- (12) Check sensor and connections for leaks, loose fittings, security of attachment and other damage.

3. Fuel Flow Differential Module Removal/Installation (MVP-50 only)

A. Remove Fuel Flow Differential Module

- (1) Ensure electrical power to aircraft is OFF.
- (2) Disconnect battery (refer to 24-30).
- (3) Remove glare shield (refer to 31-10).
- (4) Disconnect electrical connector from differential module.
- (5) Remove screws securing differential module to instrument panel.
- (6) Remove differential module from aircraft.

B. Install Fuel Flow Differential Module

- (1) Position differential module on instrument panel and attach with screws.
- (2) Connect electrical connector to differential module.
- (3) Install glare shield (refer to 31-10).
- (4) Reconnect battery (refer to 24-30).
- (5) Run both fuel pumps and check fuel flow indication. Fuel flow indication should read zero with fuel pumps running and the engine switched OFF.
- (6) Perform ground run and check fuel flow indication is proper for engine operation.

EFFECTIVITY

Aircraft equipped with Rotax 914F engine and fuel flow indication

FUEL FLOW INDICATION - MAINTENANCE

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

1. General

- A. Fuel flow is calculated by the engine control unit (ECU) based on the injection times and forwarded to the G3X Touch system via CAN interface.
- B. No sensors are installed for fuel flow measurement. The following setting is used for fuel flow indication on the Garmin G3X Touch:
 - Rotax FADEC

EFFECTIVITY

Aircraft equipped with Rotax 912iS engine

