

1) Fuel system

1.1) Description of system

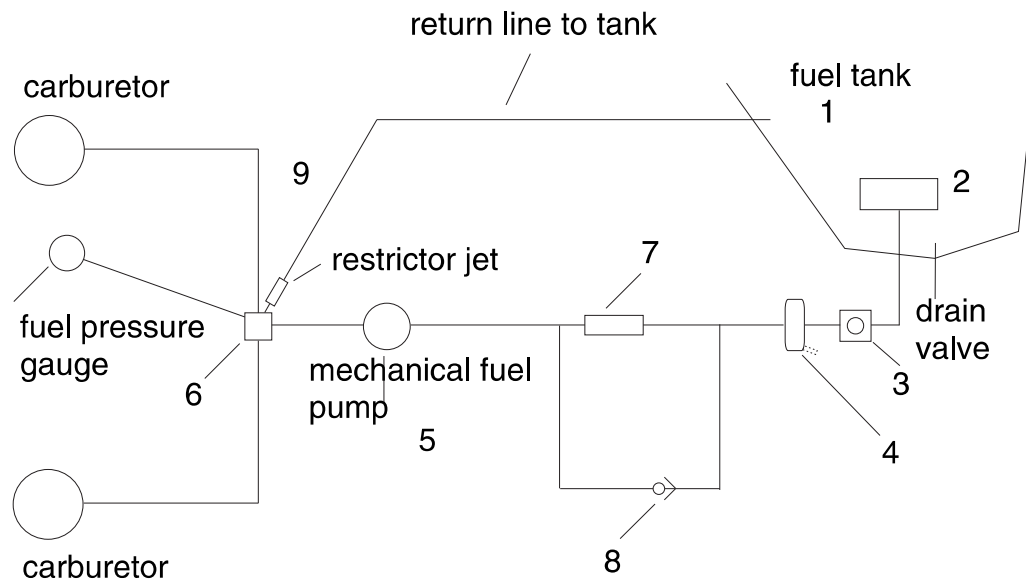
General note	See Fig. 2 . NOTE: The fuel system from tank to the inlet of engine-driven fuel pump has to be installed by the aircraft manufacturer.
Fuel	The fuel flows from the tank (1) via a coarse filter and fire cock (3) continue to water trap/fine (4) to the mechanical fuel pump (5), from the pumps fuel passes on via the fuel manifold (6) to the two carburetors.
Fuel lines	Depending on the configuration of the engine the fuel lines from fuel pump to the carburetors are already installed by the manufacturer (optional on some engine). Only the following connections per Fig. 2 have to be established: - Feeding lines to suction side of the mechanical fuel pump (5). - Lines from pressure side of the mechanical fuel pump to inlet of fuel manifold (6). - Returnline from fuel pressure control to fuel tank.
Return line	Via the return line (5) surplus fuel flows back to the fuel tank and suction side of fuel system. NOTE: The return line prevents malfunctions caused by the formation of vapor lock.
Components	The fuel system includes the following items: - Tank - Coarse filter - Fine filter/water trap - Fuel shut off valve - Electrical fuel pump - Manometer - Return line from engine to tank (with integrated adapter sleeve) as well as the required fuel lines and connections.

BRP-Powertrain

INSTALLATION MANUAL

Graphic

Fuel system



Part	Function
1	Fuel tank
2	Coarse filter
3	Fire cock
4	Fine filter/water trap
5	Mechanical fuel pump*
6	Fuel pressure control*
7	Electrical fuel pump
8	1x check valve
9	Return line from engine to tank (with integrated adapter sleeve)
	* Standard version

Fig. 2

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1.2) Operating limits

General note

NOTICE

The design and layout of the entire fuel system must ensure engine operation within the specified operating limits.

See 912 Series Operators Manual, section 2.1) Operating Limits.

1.2.1) Fuel pressure

General note

See Fig. 3.

⚠ WARNING

Non-compliance can result in serious injuries or death!
Fuel pressure in excess of stated limit can lead to an override of the float valve with subsequent engine stop.

NOTE:

Readings of the fuel pressure are taken at the pressure gauge connection on the fuel distributor piece (standard for ROTAX 912 F and 912 S, optional for other series).

Operating limits

Fuel pressure:

Max.	0.4 bar (5.8 psi) (0.5 bar (7.26 psi))*
Min.	0.15 bar (2.2 psi)

* applicable only for fuel pump from S/N 11.0036.

Graphic

Fuel pressure

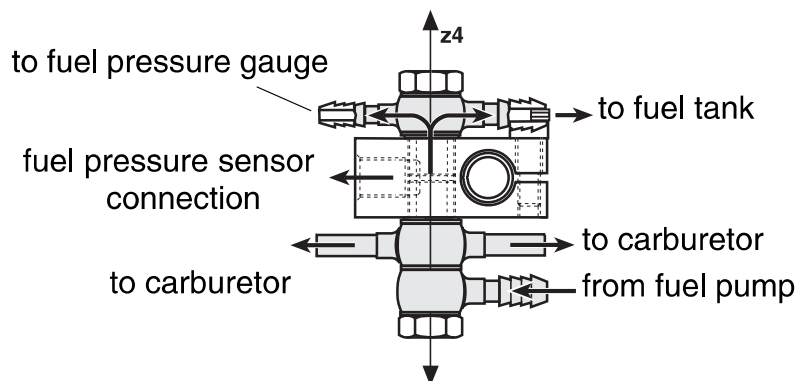


Fig. 3

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1.2.2) Electrical fuel pump

General note	The engine manufacturer requests the use of an electrical auxiliary fuel pump.	
	The electrical auxiliary fuel pump is not just required in case of a malfunction or defect of the mechanical fuel pump, but also provides required fuel supply e.g. in case of vapour formation at high altitudes and temperatures.	
Operating limits	NOTE:	If an electrical auxiliary fuel pump is installed, the whole fuel system has to be designed to warrant engine operation within the specified pressure limits.
	NOTICE	The fuel pressure of an additional auxiliary fuel pump should not exceed 0.3 bar (4.4 psi).

1.3) Requirements of the fuel system

Delivery rate	Electric or mechanical fuel pump: - Min. 35 l/h (8.2 US gal/h).	
Fuel lines	See Fig. 2.	
	NOTICE	Fuel lines have to be established to the latest requirements such as FAR or EASA by the aircraft manufacturer.
	NOTICE	For prevention of vapour locks, all the fuel lines on the suction side of the fuel pump have to be insulated against heat in the engine compartment and routed at distance from hot engine components, without kinks and protected appropriately. At very critical conditions e.g. problems with vapour formation the fuel lines could be routed in a hose with cold air flow.
	Secure fuel hoses with suitable screw clamps or by crimp connection.	
Fuel return line	NOTICE	The installation of a fuel return line is mandatory. If the fuel distributor piece with regulator from ROTAX is not available, the fuel pressure must be regulated by a restriction in the fuel return line, which ensures that the fuel pressure is under all operating conditions within the operating limits specified by ROTAX.

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Fuel filter See Fig. 2.

Fuel filter	
Coarse filter	On fuel tank as per valid certification.
Fine filter	In the feed line from tank to the fuel pumps an additional fine filter with meshsize 0.1 mm (.004 in.) has to be provided. The filter has to be controllable for service. A combination of filter/water-trap (gascolator) is recommended.

Water trap A suitable water trap must be installed at the lowest point of the fuel feed line.

Fuel temperature To avoid vapour locks keep the temperature of the fuel lines, float chamber and related devices below 45 °C (113 °F).
If you should encounter problems in this respect during the test period, then the affected components such as the supply line to the fuel pumps have to be cooled.

1.4) Connecting dimensions, location of joints and directives for installation

1.4.1) Fuel manifold

Return line See Fig. 4.

Return line (1) to tank:

Outside dia.	7 mm (.28 in.)
Slip-on length	Max. 17 mm (.67 in.)

Pressure gauge Pressure gauge connection (2):

Outside dia.	6 mm (.24 in.)
Slip-on length	Max. 17 mm (.67 in.)

Fuel pressure switch Fuel pressure switch connection (3):

Thread	M10
Thread length	Max. 9 mm (.35 in.)
Tightening torque	15 Nm (135 in.lb) und LOCTITE 221

Banjo bolt

NOTICE

At loosening or tightening of the banjo bolt (4) (tightening torque 10 Nm = 90 in.lb) support the fuel manifold appropriately.

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Connection nipple NOTE: The connection nipple (5) is furnished with an orifice (6) essential for operation of the fuel system.

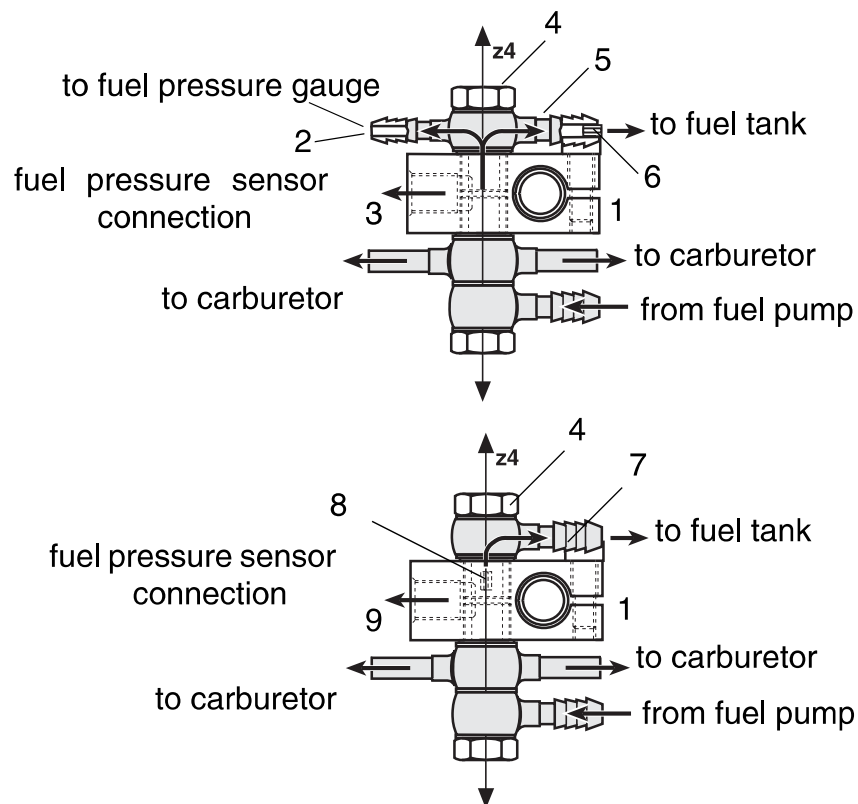
If the pressure gauge connection (2) is not used and a hose nipple (7) installed, the banjo bolt assy. (4) marked with a color dot or marked "FUEL" is furnished with an orifice (8). This is essential for operation of the fuel system as it prevent a loss in fuel pressure.

Coordinates Position of z4 axis of the fuel manifold:

NOTE: Dimensions always from point of reference (P).

	Coordinates [mm]		
	x-axis	y-axis	z-axis
Fuel distributor piece	-385.0 mm (-15.16 in.)	-50.0 mm (-1.97 in.)	approx 110 mm (4.33 in.)

Graphic Fuel manifold



Part	Function
1	Fuel manifold
2	Pressure gauge connection
3	Fuel pressure switch connection
4	Banjo bolt

BRP-Powertrain

INSTALLATION MANUAL

Part	Function
5	Connection nipple
6	Orifice (0.35 mm = 0.014 in.)
7	Hose nipple
8	Orifice (0.35 mm = 0.014 in.)

Fig. 4

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1.4.2) Fuel pump

General note

See also page 10A.

NOTICE

Ensure at installation of the supply line to fuel pump that no additional moments or load will rest on the pump!

NOTICE

Utilize max. slip on length. Secure hoses with suitable screw clamps or crimp.

Slip-on joint

Hose connection on fuel pump (1) inlet by slip-on joint.
Fuel intake connection (2):

Outside dia.	8 mm (.32 in.)
Slip-on length	Max. 22 mm (.87 in.)

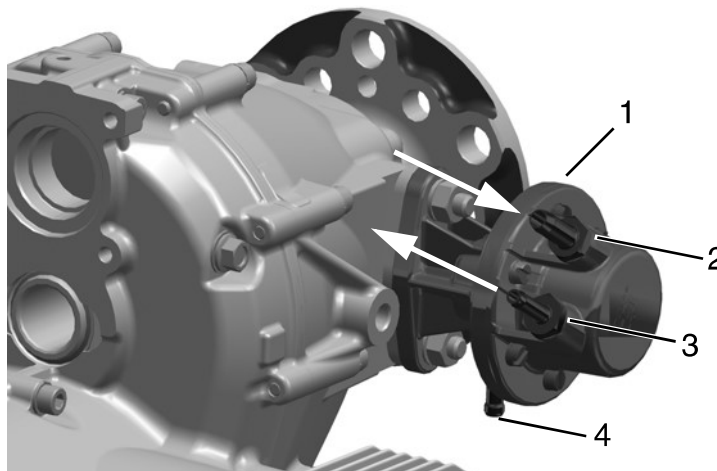
Fuel outlet connection (3):

Outside dia.	6 mm (.24 in.)
Slip-on length	Max. 22 mm (.87 in.)

Drainage (4):

Outside dia.	6 mm (.24 in.)
Slip-on length	Max. 22 mm (.87 in.)

Fig. 5.1



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BRP-Powertrain

INSTALLATION MANUAL

Sleeved lines

Hose connection on fuel pump (1) supplied with fire sleeved lines.
Fuel intake connection (2):

Fitting (5)	9/16-18 UNF (AN-6)
Tightening torque	15 Nm (135 in.lb)

Fuel outlet connection (3):

Hose nipple (6)	3/4 DIN 7642
Tightening torque	15 Nm (135 in.lb)

Drainage (4):

Outside dia.	6 mm (.24 in.)
Slip-on length	Max. 22 mm (.87 in.)

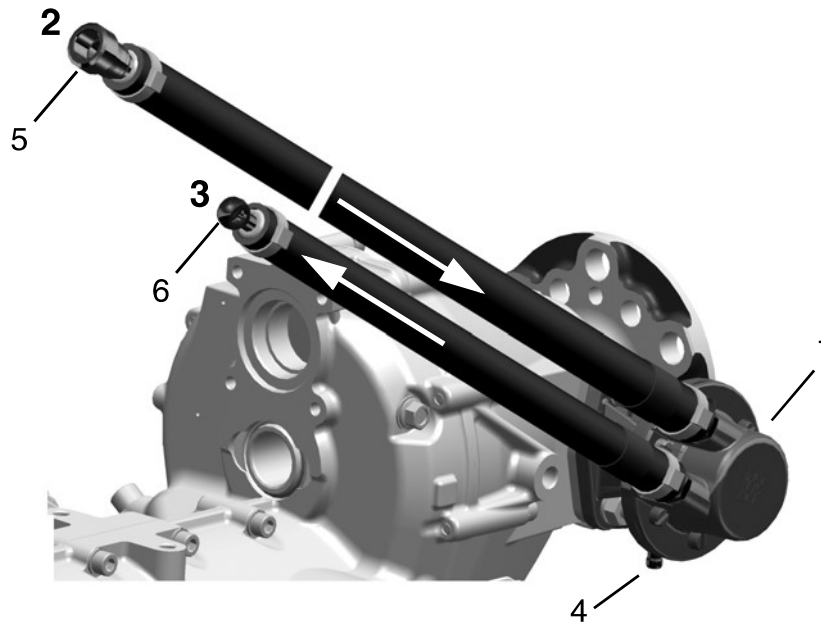


Fig. 5.2

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1.4.3) Check valve

Specification

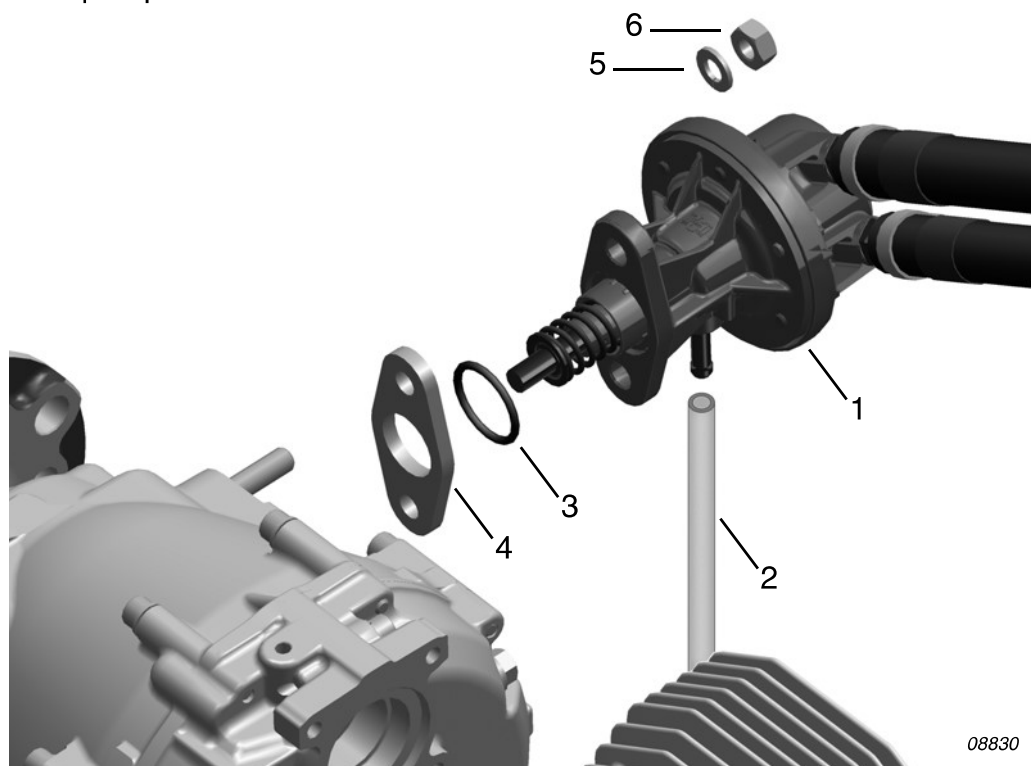
Opening pressure	0.1 bar - 0.15 bar (1.5 psi. - 2.2 psi.)
Permitted pressure in reverse-biasing	2 bar (29 psi.)
Burst pressure	5 bar (72.5 psi.)

BRP-Powertrain

INSTALLATION MANUAL

Grafik

Fuel pump



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Part	Function
1	Fuel pump
2	Drainage hose
3	O-ring
4	Insulating flange (gasket)
5	Lock washer A8
6	Hex. nut M8

ACHTUNG

Route the lines without kinks and avoid tight bends.

ACHTUNG

Drainage line have to be routed into a ram-air and vacuum free zone, according to the requirements and release of BRP-Powertrain. The drainage line must not be routed into the slipstream. Ram pressure or vacuum impair the fuel pressure

- The lines have to be routed such that in case of damage the surplus of fuel/oil is drained off suitably.
- Route the lines with a continuous decline.
- The lines have to be protected against any kind of blockage e.g. by formation of ice.

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2.1) Time limit for rubber parts

General note

NOTICE

This time limit must be followed **independently** and **in addition** to the visual inspections (see chap. 05-20-00 section: 5.1)) of the respective components.

Time limit

The following components and systems must be replaced every 5 years:

- venting hose of the carburetors	
- all rubber hoses of the cooling system	
- all rubber hoses of the fuel system (excluding all genuine ROTAX teflon hoses of the fuel system)	See SI-912-022, latest issue.
- venting hose of the fuel pump	
- all rubber hoses of the lubrication system which are part of the engine supply volume and if they are not in the maintenance schedule of aircraft manufacturer	
- carburetor sockets	
- connecting hose of the air intake system	
- diaphragm on both carburetors	
- rubber hoses on compensating tube	
- V-belt	

2.2) Time limit for fuel pump

General note

The fuel pump must be replaced every 5 years.

2.3) Time limit for the coolant

General note

Coolant must be replaced as per manufacturers instructions, at the latest during overhaul or when the engine is replaced.

2.4) Annual inspection

General note

A 100 hr. inspection is to be carried out periodically after every 100 hours of operation **or every 12 months**, whichever comes first.
See chap. 05-10-00 section: 2).