Chapter: LEP

LIST OF EFFECTIVE PAGES

d06095.fm

chapter	page	date
73-00-00	1	08 01 2012
	2	08 01 2012
	3	02 01 2015
	4	02 01 2015
	5	02 01 2015
	6	02 01 2015
	7	08 01 2012
	8	02 01 2015
	9	02 01 2015
	10	02 01 2015
	10A	02 01 2015
	10B	02 01 2015
	11	08 01 2012
	12	08 01 2012
	13	08 01 2012
	14	02 01 2015
	15	08 01 2012
	16	08 01 2012
	17	08 01 2012
	18	08 01 2012
	19	08 01 2012
	20	08 01 2012
	21	08 01 2012
	22	08 01 2012
	23	08 01 2012
	24	08 01 2012
	25	08 01 2012
	26	08 01 2012
	27	08 01 2012
	28	08 01 2012
	29	08 01 2012
	30	08 01 2012
75-00-00	1	08 01 2012
	2	08 01 2012
	3	02 01 2015
	4	08 01 2012
	5	02 01 2015
	6	08 01 2012
	7	02 01 2015
	8	02 01 2015
	9	02 01 2015
	10	02 01 2015
	11	02 01 2015
	12	02 01 2015
	13	02 01 2015
	14	02 01 2015
	15	02 01 2015
	16	02 01 2015

chapter	page	date
75-00-00	17	02 01 2015
	18	02 01 2015
	19	02 01 2015
	20	02 01 2015
	21	02 01 2015
	22	02 01 2015
	23	02 01 2015
	24	02 01 2015
	25	02 01 2015
	26	08 01 2012
	27	02 01 2015
	28	02 01 2015
76-00-00	1	02 01 2015
	2	08 01 2012
	3	02 01 2015
	4	02 01 2015
	5	02 01 2015
	6	02 01 2015
	7	02 01 2015
	8	02 01 2015
	9	02 01 2015
	10	02 01 2015
	11	02 01 2015
	12	02 01 2015
78-00-00	1	02 01 2015
	2	08 01 2012
	3	08 01 2012
	4	08 01 2012
	5	08 01 2012
	6	08 01 2012
	7	02 01 2015
	8	02 01 2015
	9	08 01 2012
	10	08 01 2012
	11	08 01 2012
	12	08 01 2012
79-00-00	1	02 01 2015
	2	08 01 2012
	3	08 01 2012
	4	08 01 2012
	5	08 01 2012
	6	08 01 2012
	7	08 01 2012
	8	08 01 2012
	9	08 01 2012
	10	08 01 2012
	11	08 01 2012

d06095.fm

chapter	page	date
79-00-00	12	08 01 2012
	13	08 01 2012
	14	08 01 2012
	15	08 01 2012
	16	08 01 2012
	17	08 01 2012
	18	08 01 2012
	19	08 01 2012
	20	08 01 2012
	21	08 01 2012
	22	08 01 2012
	23	08 01 2012
	24	08 01 2012
	25	08 01 2012
	26	08 01 2012
	27	08 01 2012
	28	08 01 2012
	29	08 01 2012
	30	08 01 2012
	31	08 01 2012
	32	08 01 2012
80-00-00	1	08 01 2012
	2	08 01 2012
	3	08 01 2012
	4	02 01 2015
	5	08 01 2012
	6	08 01 2012
	Rear page	

NOTES

Chapter: TOA

TABLE OF AMENDMENTS

Approval*

The technical content of this document is approved under the authority of DOA ref. EASA.21J.048

no.	chapter	page	date of change	remark for approval	date of approval from authorities	date of inclusion	sign.
0	INTRO	all	08 01 2012	DOA*			
0	LEP	all	08 01 2012	DOA*			
0	TOA	all	08 01 2012	DOA*			
0	00-00-00	all	08 01 2012	DOA*			
0	10-10-00	all	08 01 2012	DOA*			
0	24-00-00	all	08 01 2012	DOA*			
0	61-00-00	all	08 01 2012	DOA*			
0	72-00-00	all	08 01 2012	DOA*			
0	73-00-00	all	08 01 2012	DOA*			
0	75-00-00	all	08 01 2012	DOA*			
0	76-00-00	all	08 01 2012	DOA*			
0	78-00-00	all	08 01 2012	DOA*			
0	79-00-00	all	08 01 2012	DOA*			
0	80-00-00	all	08 01 2012	DOA*			
1	LEP	1-3	02 01 2015	DOA*			
1	TOA	1,3	02 01 2015	DOA*			
1	00-00-00	4,11	02 01 2015	DOA*			
1	10-10-00	4,10	02 01 2015	DOA*			
1	24-00-00	16,17,20	02 01 2015	DOA*			
1	61-00-00	4	02 01 2015	DOA*			
1	72-00-00	3-6, 9	02 01 2015	DOA*			
1	73-00-00	3-6,8-10,	02 01 2015	DOA*			
1		10A,10B,14	02 01 2015	DOA*			
1	75-00-00	3,5,7-25,27,28	02 01 2015	DOA*			
1	76-00-00	1,3-12	02 01 2015	DOA*			
1	78-00-00	1,7-8	02 01 2015	DOA*			
1	80-00-00	4	02 01 2015	DOA*			

NOTES

Chapter: TOA

SUMMARY OF AMENDMENTS

Content Summary of the relevant amendments in this context, but without requirement on completeness.

Current No.	chapter	page	date of change	Comment
0	all	all	08 01 2012	New Layout
0	24-00-00	6	08 01 2012	Graphic change, modify legend
0	61-00-00	4	08 01 2012	chap. 1.2) Wording of max. moment of inertia
0	73-00-00	6	08 01 2012	chap. 1.3) Requirements of the fuel system
0	73-00-00	14	08 01 2012	chap. 2.1.2) Drainage piping to the carburetor
0	73-00-00	22	08 01 2012	CO-Measurement for configuration with not GENUINE-ROTAX airbox
0	75-00-00	24	08 01 2012	chap. 4.1) Note added
0	78-00-00	3	08 01 2012	chap. 1) Caution added
0	78-00-00	11	08 01 2012	chap. 4.1) Muffler graphic change
1	10-10-00	4	02 01 2015	change of warranty for corrosion protection
1	24-00-00	16,17,20	02 01 2015	change of specification of capacitor (electric pump)
1	61-00-00	4	02 01 2015	change of graphic
1	72-00-00	3-6, 9	02 01 2015	change of position of temperature sensor, new cylinder head
1	73-00-00	3-6,8-10, 10A, 10B,14	02 01 2015	change of text, new text
1	75-00-00	3,5,7-25,27,28	02 01 2015	change from CHT to CT, new radiator
1	76-00-00	1,3-12	02 01 2015	change from CHT to CT
1	78-00-00	1,7,8	02 01 2015	new illustration of whole exhaust system

NOTES

1) General note

Purpose The purpose of this Installation Manual is to acquaint maintenance service staff (iRMT) approved by the local aviation authorities with some basic installation and safety information for service work.

Documentation For more detailed information regarding, installation, maintenance, safety- or flight operation, consult the documentation provided by the aircraft manufacturer and/or dealer.

For additional information on engines, maintenance or parts, you can also contact yout nearest authorized ROTAX-aircraft engine distributor.

ROTAX Distributors For ROTAX Authorized Distributors for Aircraft Engines see latest Operators Manual or on the Internet at the official Website www.FLYROTAX.com.

Engine serial number When making inquiries or ordering parts, always indicate the engine serial number, as the manufacturer makes modifications to the engine for product improvement. The engine serial number (1) is on the ignition cover, on the left, opposite the electric starter. See Fig. 1.

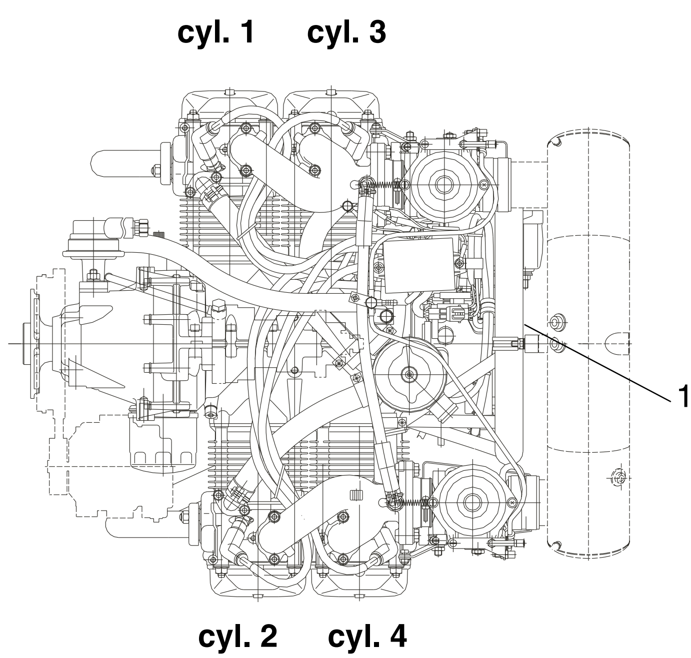


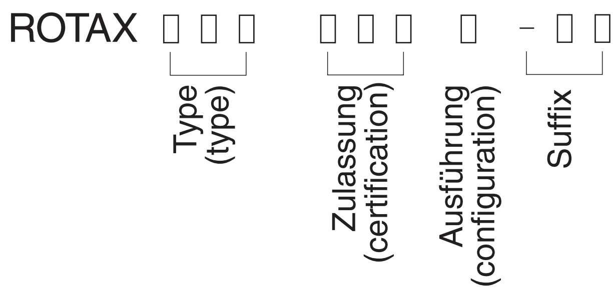
Fig. 1 08749

d06097.fm

2) Type description

e.g. ROTAX 912 A 2 -01

The type description is made up the following.



Designation

Designation		Description
Type	**912**	4-cyl. horizontally opposed, normal aspirated engine.
Certification	**A**	Certified to JAR 22 (TC No. EASA.E.121).
	F, S	Certified to FAR 33 (TC No. E00051 EN) JAR-E (TC No. EASA.E.121).
	UL, ULS	Non-certified aircraft engines.
Configuration	**2**	Prop shaft with flange for fixed prop.
	3	Prop shaft with flange for constant speed propeller and drive for hydraulic governor for constant speed propeller.
	4	With prop flange for fix pitch propeller, but prepared for retro-fit of hydraulic governor for constant speed prop (not supplied by manufacturer anymore.
Suffix	**-XX**	Explanation of the type designation suffix, see SB-912-068

Options

Available options (optional equipment) for the engine type mentioned above:

	External alternator	Vacuum-pump	Drive for rev counter/ hour meter	Governor
for configuration 2	yes	yes	yes	no
for configuration 3	yes	no	yes	yes
for configuration 4	yes	yes	yes	no

NOTE: Conversion of the configuration 2/4 to configuration 3 may be accomplished by ROTAX Authorized Distributors or their Service Center.

4.1) Safety information

Use for intended purpose

⚠ **WARNING** Non-compliance can result in serious injuries or death!
Only certified technicians (iRMT, see also Maintenance Manual Line) and trained on this product are qualified to work on these engines.

⚠ **WARNING** Non-compliance can result in serious injuries or death!
Never fly the aircraft equipped with this engine at locations, airspeeds, altitudes, of other circumstances from which a successful no-power landing cannot be made, after sudden engine stoppage.

- This engine is not suitable for acrobatics (inverted flight, etc.).
- This engine shall not be used on rotorcrafts with an in-flight driven rotor (e.g. helicopters).
- It should be clearly understood that the choice, selection and use of this particular engine on any aircraft is at the sole discretion and responsibility of the aircraft manufacturer, assembler and owner/user.
- Due to the varying designs, equipment and types of aircraft, BRP-Powertrain grants no warranty or representation on the suitability of its engine‘s use on any particular aircraft. Further, BRP-Powertrain grants no warranty or representation of this engine‘s suitability with any other part, component or system which may be selected by the aircraft manufacturer, assembler or user for aircraft application.

⚠ **WARNING** Non-compliance can result in serious injuries or death!
For each use of DAY VFR, NIGHT VFR or IFR in an aircraft, the applicable legal requirements and other existing must be adhered to.

- In addition to observing the instructions in our Manual, general safety and accident preventative measures, legal regulations and regulations of any aeronautical authority must be observed.
- Where differences exist between this Manual and regulations provided by any authority, the more stringent regulation should be applied.

- For continuing airworthiness see Maintenance Manual Line.
- Unauthorized modifications of engine or aircraft will automatically exclude any liability of the manufacturer for sequential damage.
- This engine may be equipped with an other than the GENUINE-ROTAX vacuum pump. The safety warning accompanying the air pump must be given to the owner/operator of the aircraft into which the air pump is installed.

Engine run

- In the interest of safety, the aircraft must not be left unattended while the engine is running.
- To eliminate possible injury or damage, ensure any loose equipment or tools are properly secured before starting the engine.
- When in storage protect the engine and fuel system from contamination and exposure.
- Never operate the engine and gearbox without sufficient quantities of lubricating oil.
- Never exceed the maximum permitted operational limits.
- Allow the engine to cool at idle for several minutes before turning off the engine.
- Propeller and its attachment with a moment of inertia in excess of the specified value must not be used and releases engine manufacturer from any liability.
- Improper engine installation and use of unsuitable piping for fuel-, cooling- and lubrication system releases engine manufacturer from any liability.

---

1) Preparations for engine installation

1.1) State of delivery

Attachment

NOTICE Risk of consequential damage to engine and aircraft as a result of corrosion and damage.
Under no circumstances is a corroded or damaged engine to be installed in an aircraft!

NOTICE The attachment screws are only for transport and must not be used in the aircraft.

The engine can be attached with steel angles anchored on a timber plate.

- When the engine is delivered, check that the GENUINE-ROTAX packing is not damaged.
- If the packing is damaged, contact the authorised sales and service partner for ROTAX aircraft engines.

1.2) Unpacking/handling of the engine

Unpacking the engine

To unpack a new engine, proceed as follows:

Step	Procedure
1	Remove the wooden cover.
2	Remove the protective packaging.
3	Remove the protective film around the engine.

After unpacking

To check the state of delivery, proceed as follows:

Step	Procedure
1	Check that the serial number and engine type designation on the type plate are identical to those shown on the delivery note.
2	Check the engine for damage or corrosion. If everything is deemed "OK", the engine can be accepted.

Suspension point

The engine to be lifted by two hooks or straps around the middle (A) of the intake manifolds.
See chapter engine views, numbering of cylinders and definitions of main axes.

1.3) Preservation and storage of the engine

General note The engine is preserved at BRP-Powertrain thus guaranteeing proper protection against corrosion damage for at least 12 months after the date of delivery from BRP-Powertrain.

Warranty This warranty is subject to the following conditions:

- The engine must be stored in the GENUINE-ROTAX packing as supplied by BRP-Powertrain.
- The covers on various openings must not be removed.
- The engine must be stored in a suitable place (at min. -40 °C/-40 °F and max. +80 °C/176 °F).
- The flat bag (blue) surrounding the engine must not be damaged or removed, as it protects the engine from corrosion and oxidation.

Storage If the engine is stored for a period longer than 12 months (not stored in the GENUINE-ROTAX packing) then maintenance tasks must be carried out every 3 months as per the currently valid Maintenance Manual, section “Preservation of a new engine“.

2.3) Definition of attachment points

General note

See Fig. 3.

⚠ WARNING Non-compliance can result in serious injuries or death!
The aircraft or fuselage manufacturer must design the engine suspension so that it can safely carry the maximum occurring operational loads without exceeding the max. allowable forces and bending moments on the engine housing and attachment points.

Tighten all engine suspension screws as specified by the aircraft manufacturer.

Graphic

Attachment points

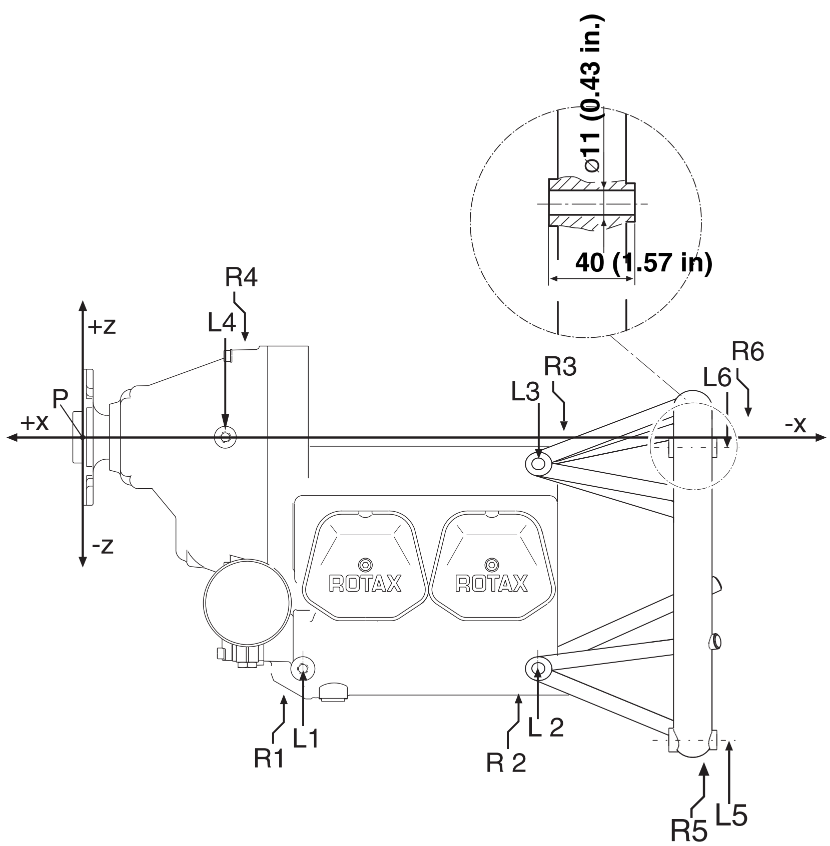


Fig. 3

attachment points	x-axis mm/in	y-axis mm/in	z-axis mm/in
L1	-200,8/-7.90 in.	71,0/2.80 in.	-211,0/-8.31 in.
R1	-200,8/-7.90 in.	-71,0/-2.80 in.	-211,0/-8.31 in.
L2	-414,3/-16.31 in.	71,0/2.80 in.	-211,0/-8.31 in.
R2	-414,3/-16.31 in.	-71,0/-2.80 in.	-211,0/-8.31 in.
L3	-414,3/-16.31 in.	75,0/2.96 in.	-22,0/-0.87 in.
R3	-414,3/-16.31 in.	-75,0/-2.96 in.	-22,0/-0.87 in.
L4	-128,3/-5.05 in.	87,0/3.43 in.	0
R4	-128,3/-5.05 in.	-87,0/3.43 in.	0
L5	-564,0/-22.20 in.	105,0/4.13 in.	-277,0/-10.91 in.
R5	-564,0/-22.20 in.	-105,0/-4.13 in.	-277,0/-10.91 in.
L6	-564,0/-22.20 in.	105,0/4.13 in.	-7,0/-0.28 in.
R6	-564,0/-22.20 in.	-105,0/-4.13 in.	-7,0/-0.28 in.

attachment points	max. permissible forces (secure load) in (N) lbf x, y and z axis	max. permissible bending moment (secure load) in (Nm) ft.lb x, y and z axis
L1	5000 N/1124 lbf	77 Nm /56.8 ft.lb
R1		
L2	5000 N/1124 lbf	77 Nm/56.8 ft.lb
R2		
L3	5000 N/1124 lbf	77 Nm/56.8 ft.lb
R3		
L4	1900 N/427 lbf	39 Nm/28.8 ft.lb
R4		

	max. permissible forces (secure load) in (N) lbf			max. permissible bending moment (secure load) in (Nm) ft.lb
attachment points	x axis	y axis	z axis	x, y, and z axis
L5	5000 N/ 1124 lbf	2000 N/ 450 lbf	3000 N/ 674 lbf	100 Nm/ 73.75 ft.lb
R5				
L6				
R6				

Amperage

NOTICE The current over speed graph was determined and is only effective under the following conditions:

- Ambient temperature: 20 °C (68 °F)
- Voltage: constant 13.5 V
- Tolerance: max. ± 5%

NOTE: The speed of the external generator is 1.24 times the crankshaft speed or 3 times the propeller speed.

Graphic

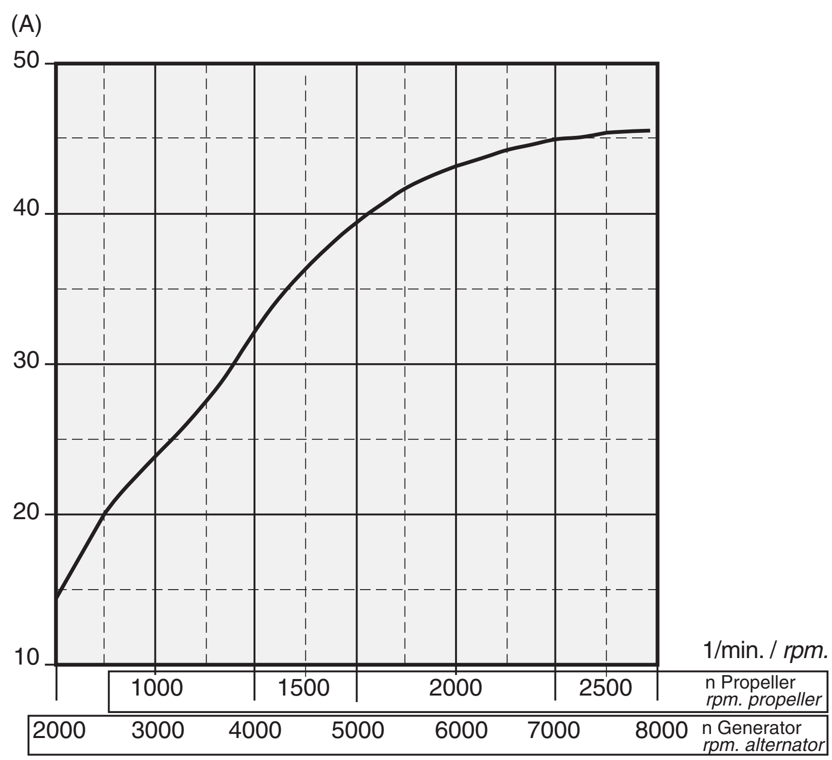


Fig. 8 *00547*

2.7) Connection of the electric rev counter (tachometer)

2.7.1) Technical data

Output signal

NOTICE The graphs depicting output signals have been determined and are effective only at the following conditions:

- Ambient temperature: 20 °C (68 °F)
- Tolerance: Max. ± 5%

NOTE: The pick-up for the rev counter generates one pulse per revolution.

2.7.2) Connection

General note

NOTICE BRP-Powertrain developed especially for this application a non-certified electric rev counter. Certification to the latest requirements such as FAR or EASA has to be conducted by the aircraft manufacturer. See also SI-13-1996, latest issue.

Feeding wiring

Feeding wiring to electric rev counter on left side of ignition housing.

- Length approx. 600 mm (24 in.) starting from ignition housing.

Connections

2 flexible cables 0.5 mm^2, white/yellow and blue/yellow (in insulation wrap).

2.8) Battery

General note

See Fig. 11.

NOTICE To warrant reliable engine start use a battery of at least 16 Ah capacity.

2.9) Capacitor (Option electrical fuel pump)

General note

See Fig. 11.

NOTICE To warrant reliable operation of the electrical fuel pump the use of capacitor of at least 1 µF/25 V is necessary.

2.10) Easy start function on the electronic module (optional)

General note

See Fig. 10.

In order to use the easy start function the relevant connections to the starter relays and ignition switch need to be made.

The start function can be used for aircraft, which have an engine start problem in cold conditions.

NOTE: In addition also a modified fly wheel hub is offered, which aids improved starting.

Graphic

Easy start function

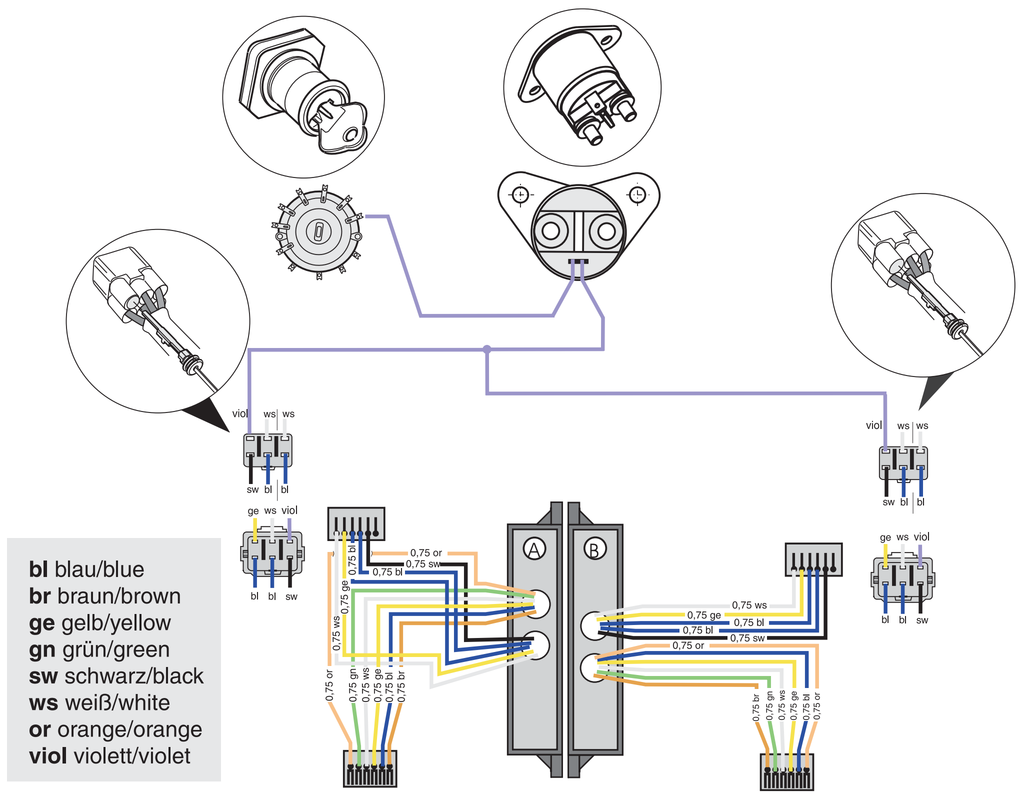


Fig. 10 08556

2.11) Wiring diagram

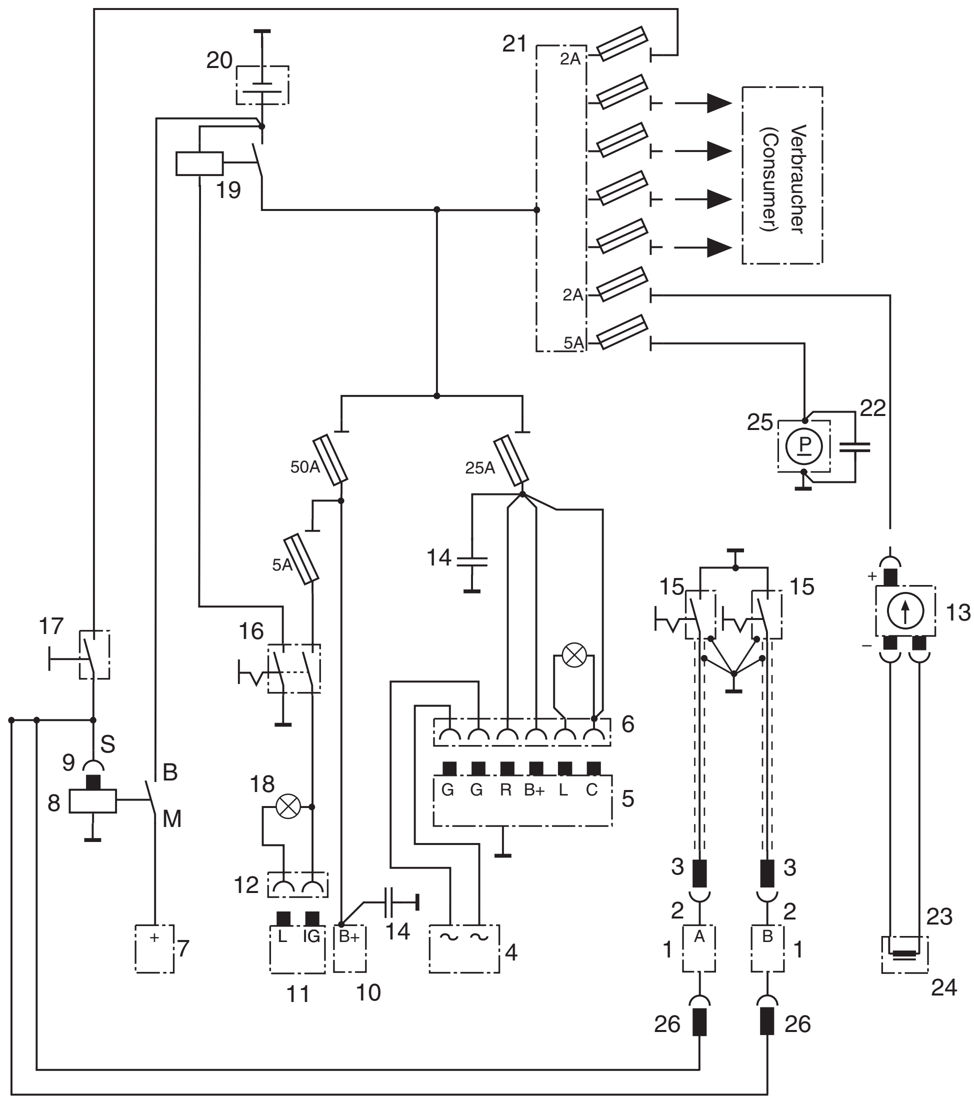
General note See Fig. 11.

Scope of delivery

NOTICE Items/components which are not included in the standard engine scope of delivery must be certified the aircraft or fuselage manufacturer in accordance with the latest regulation, such as FAR or EASA.

Position	Supply
1-9	Are included in the standard volume of supply of the engine.
22-24	Are included in the standard volume of supply of the engine.
10-14	Are available as accessory.
15-22	Can‘t be supplied by BRP-Powertrain.
25	Can‘t be supplied by BRP-Powertrain.

Graphic Wiring diagram



Legend to wiring diagram

Part	Function	Part	Function
1	2 Electronic modules (A and B)	17	Starter switch
2, 3	Plug connection for ignition switch	18	Control lamp
4	Integrated generator	19	Battery relay
5, 6	External regulator - rectifier with plug connections	20	Battery
7	Electric starter	21	Bus Bar
8, 9	Starter relay with plug connection	22	Capacitor 1 µF
10, 11, 12	External alternator with connection	23	Plug connection for trigger coil assy.
13	Electric rev counter	24	Trigger coil assy. (tachometer)
14	2 capacitor 1 µF	25	Electrical fuel pump
15	2 ignition switches	26	Starting equipment at the electronic modules
16	Masterswitch		

Fig. 11 08639

1) Propeller drive

General note

The propeller in tractor or pusher arrangement must be fitted on the propeller flange in accordance with applicable regulations. As required utilize one of the three possible pitch circle diameters (P.C.D) on the flange.

The propeller design must be certified in accordance with applicable regulations, such as FAR or EASA, by the aircraft manufacturer.

1.1) Technical data

Direction of rotation

See Fig. 1.

Direction of rotation of the propeller flange:

- left, counter clockwise, looking towards face of flange.

Graphic

Direction of rotation

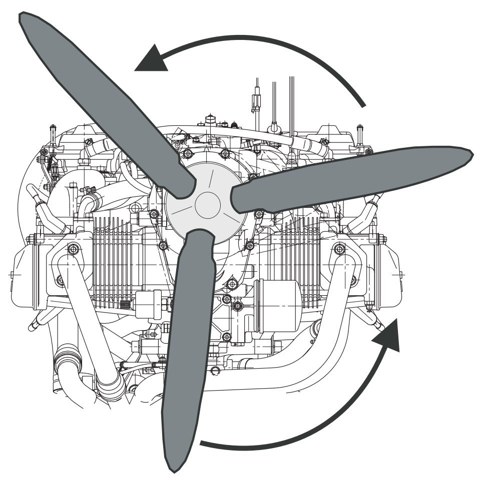


Fig. 1 08629

Transmission

Gear transmission:

- i= 2.2727 (50 **T**eeth/22 T)
- i= 2.4286 (51 **T**eeth/21 T)

Vibration analysis

NOTE: Vibration analysis of the whole system (engine, suspension, propeller etc.) should be carried out as part of the certification process.

If no limits are available in the technical literature, a max. of 1.0 IPS (inches per second) at 5000 rpm. can be assumed.

Propeller shaft flange

See Fig. 2.

Attachment of propeller on prop shaft flange:

Pitch circle diameter 75 mm (2.95 in.)	6x through holes 8 mm (0.31 in.)
Pitch circle diameter 80 mm (3.15 in.)	6x through holes 11.5 mm (0.45 in.)
Pitch circle diameter 101.6 mm (4“)	6x through holes 13 mm (0.51 in.)
Hub diameter	47 mm (1.85 in.)

Graphic

Propeller shaft flange

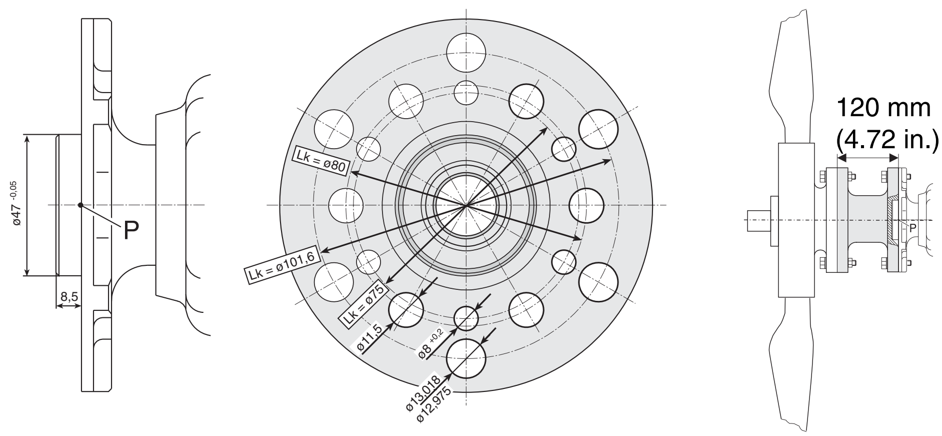


Fig. 2

02581, 09193

1.2) Operating limits

Torque

NOTICE Modification of the propeller shaft is not permitted.

Max. torque:

- ROTAX 912 A, F, UL for i=2.2727 — 238 Nm (176 ft.lb) (at propeller)
- ROTAX 912 A, F, UL for i=2.4286 — 255 Nm (188 ft.lb) (at propeller)
- ROTAX 912 S, ULS for i=2.4286 — 315 Nm (232 ft.lb) (at propeller)

Max. moment of inertia

Max. permissible moment of inertia on propeller:

- 6000 kg cm^2 (14.238 lb ft^2)
- Normal between 1500 kg cm^2 and 6000 kg cm^2 (3.559 lb ft^2 and 14.238 lb ft^2)

Extension of propeller shaft

- Max. extension of the propeller shaft: 120 mm (4.72 in.)

Out of balance

Dynamic balancing of the proppeller as specified by the propeller manufacturer must be carried out.

1) Engine components, engine views, cylinder designation and denomination of main axes

Regarding change of temperature sensor position, see Fig. 2 and Fig. 3.

NOTE: It is NOT mandatory to retrofit engines with the old cylinder heads. The different versions of the cylinder heads can be mixed installed, but make sure, if and at which position the cylinder head temperature and coolant temperature is measured. This also defines the naming of the indicating instrument with the appropriate temperature limit.

Suffix -01:

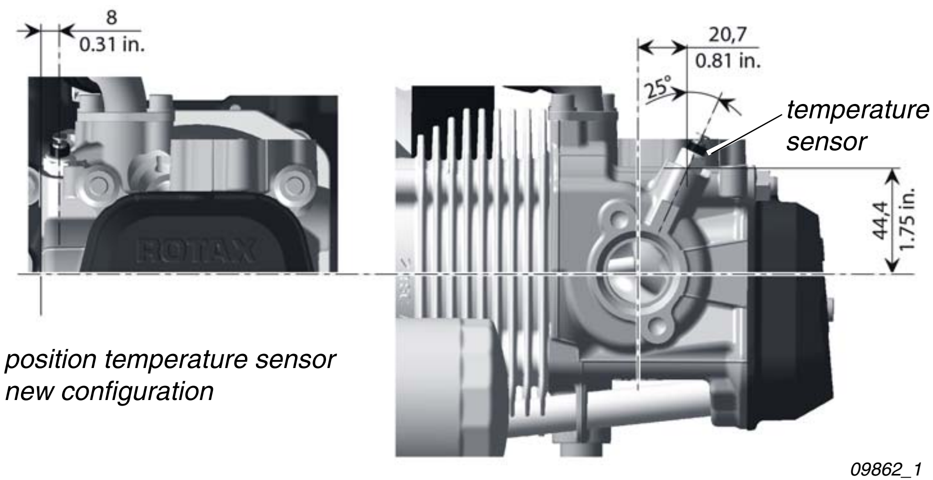


Fig. 2

without Suffix -01:

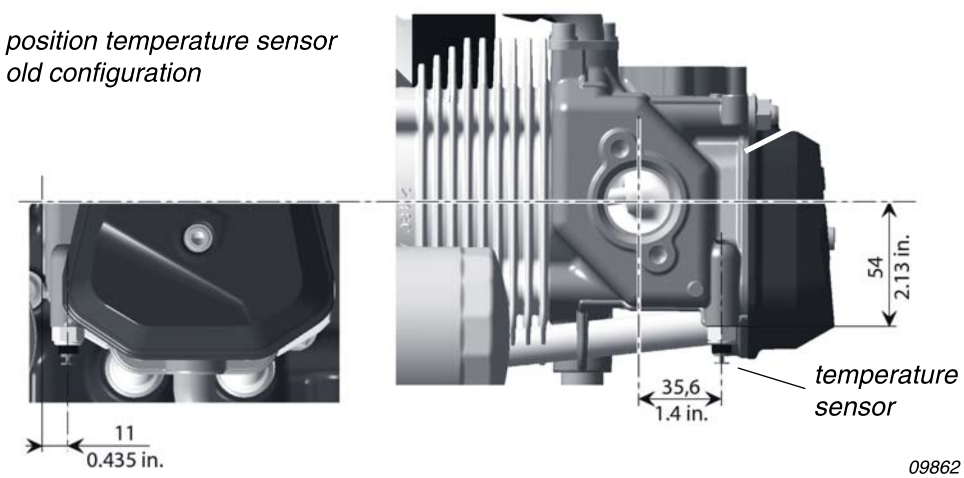


Fig. 3

General note

See Fig. 4.

PTO power take off side

MS magneto side

A points of attachment (for engine transport) - centre of gravity

P zero reference point for all dimensions

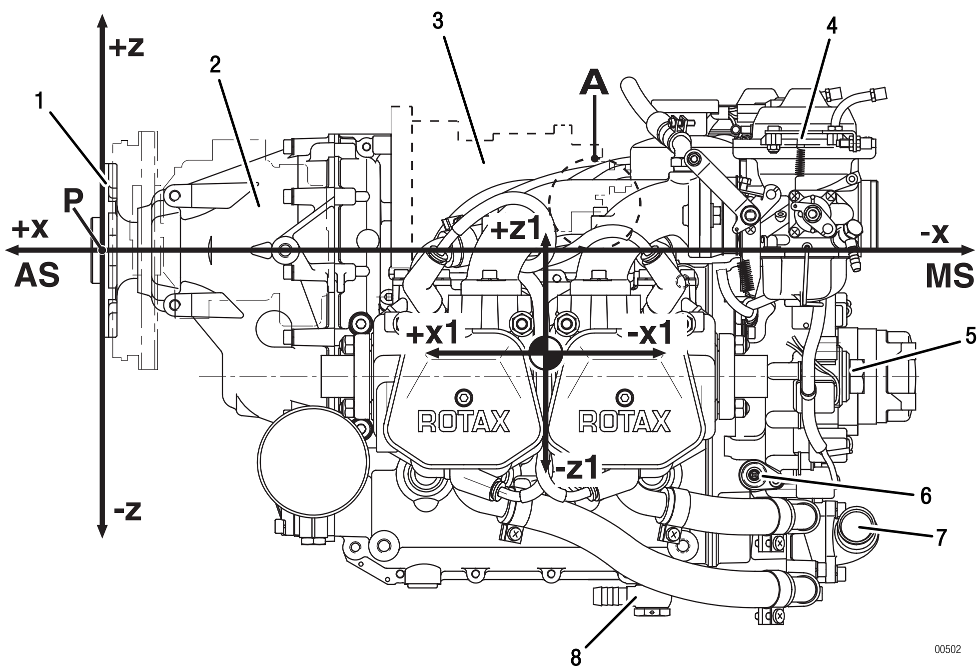
NOTE: Allow ± 1 mm on all stated dimensions as manufacturing tolerance.

x, **y**, **z** axes for system of coordinates

Cyl. 1 Cylinder 1 **Cyl. 3** Cylinder 3

Cyl. 2 Cylinder 2 **Cyl. 4** Cylinder 4

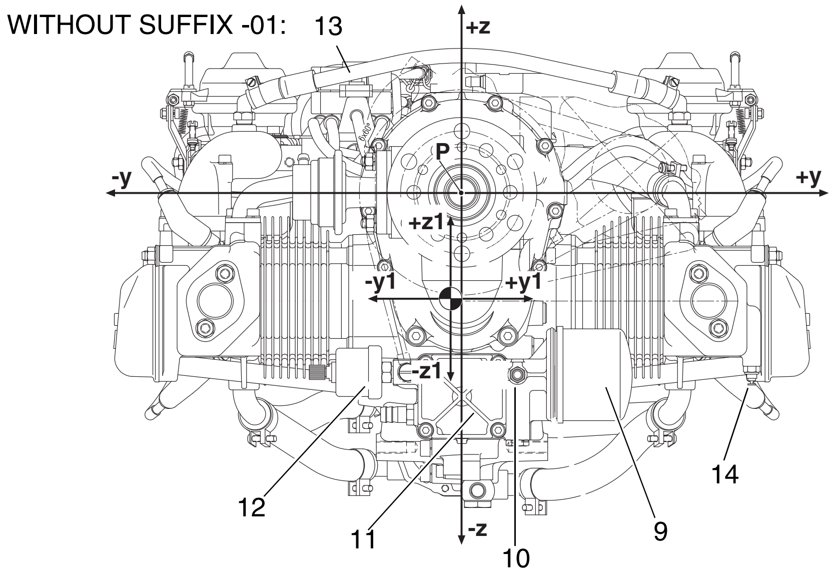
Side view

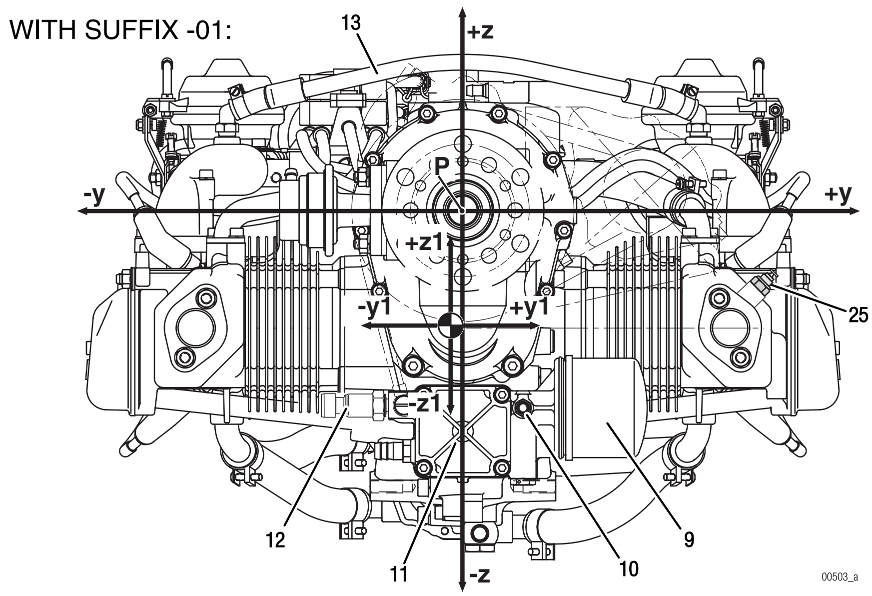


Part	Function
1	Propeller flange
2	Propeller gear
3	Vacuum pump or hydraulic governor for constant speed propeller
4	Constant depression carb
5	Ignition cover
6	Connection for mechanical rev counter
7	Coolant pump
8	Connection for oil return line

Fig. 4 *00502_a*

Front view



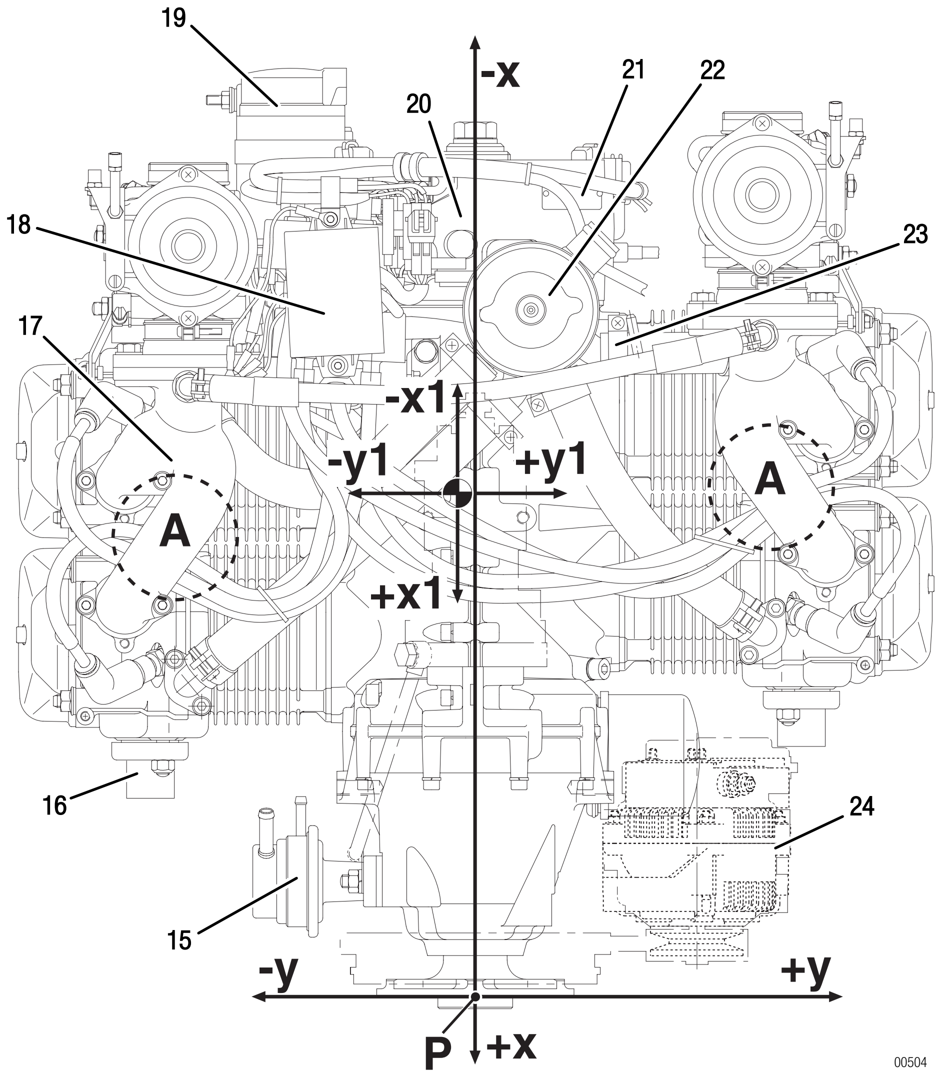


Part	Function
9	Oil filter
10	Sensor for oil temperature
11	Oil pump
12	Sensor for oil pressure
13	Compensation tube
14	Cylinder head temperature sensor
25	Coolant temperature sensor

Fig. 5

00503, 00503_a

Top view



Part	Function
15	Mechanical fuel pump
16	Exhaust socket
17	Intake manifold
18	Electronic module
19	Electric starter
20	Ignition housing
21	Engine number
22	Expansion tank
23	Connection for manifold pressure
24	External alternator

Fig. 6

00504_a

d06101.fm

3) Operating limits

Manuals Documentation overview:

Operating limits	Manual
Engine speed	See Operators Manual 912 Series, chap. 2.1
Acceleration	See Operators Manual 912 Series, chap. 2.1
Oil pressure	See Operators Manual 912 Series, chap. 2.1
Oil temperature	See Operators Manual 912 Series, chap. 2.1
Cylinder head temperature	See Operators Manual 912 Series, chap. 2.1
Coolant temperature	See Operators Manual 912 Series, chap. 2.1
Exhaust gas temperature	See chap. 78-00-00 section: Operating limits.
Ambient temperature for start up	See Operators Manual 912 Series, chap. 2.1
Ambient temperature for electronic module	See chap. 24-00-00 section: Electronic module.
Fuel pressure	See Operators Manual 912 Series, chap. 2.1
Governor	See Operators Manual 912 Series, chap. 2.1
External alternator	See Operators Manual 912 Series, chap. 2.1
Deviation from the apparent perpendicular	See Operators Manual 912 Series, chap. 2.1

3.1) Deviation from the apparent perpendicular

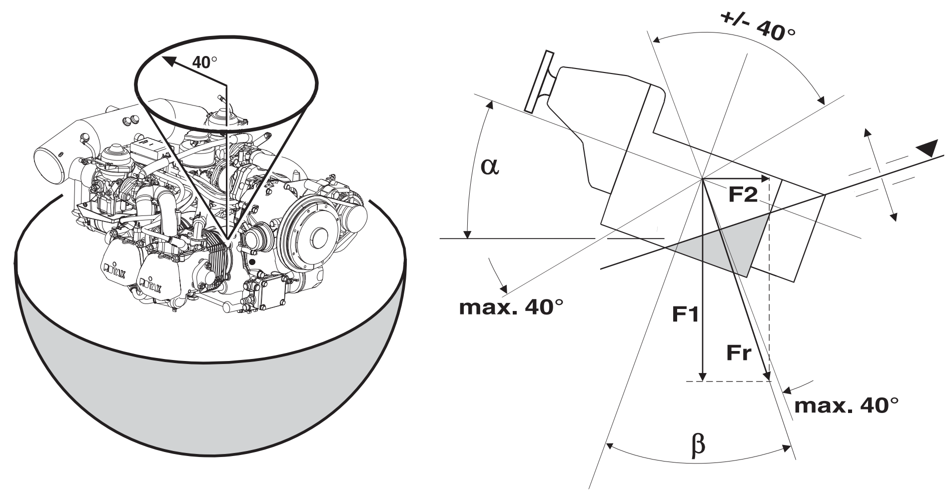
General note See Fig. 7.

The engine design is for a conventional, non-aerobatic, tractor or pusher configuration with the oil return port in the optimum position. Assuming these points are taken into consideration, the engine will be properly lubricated in all flight profiles.

Bank angle The resulting bank angle β (depending on acceleration/deceleration) may never exceed the max. bank angle.

NOTE: Pitch or role angle α is not equal with β, except stabilized condition (without acceleration).

Graphic Bank angle



α	Bank or rotation	**F1**	Gravity
β	Bank angle	**F2**	Acceleration
		Fr	Result of F1 and F2

Fig. 7 *07191, 08325*

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.

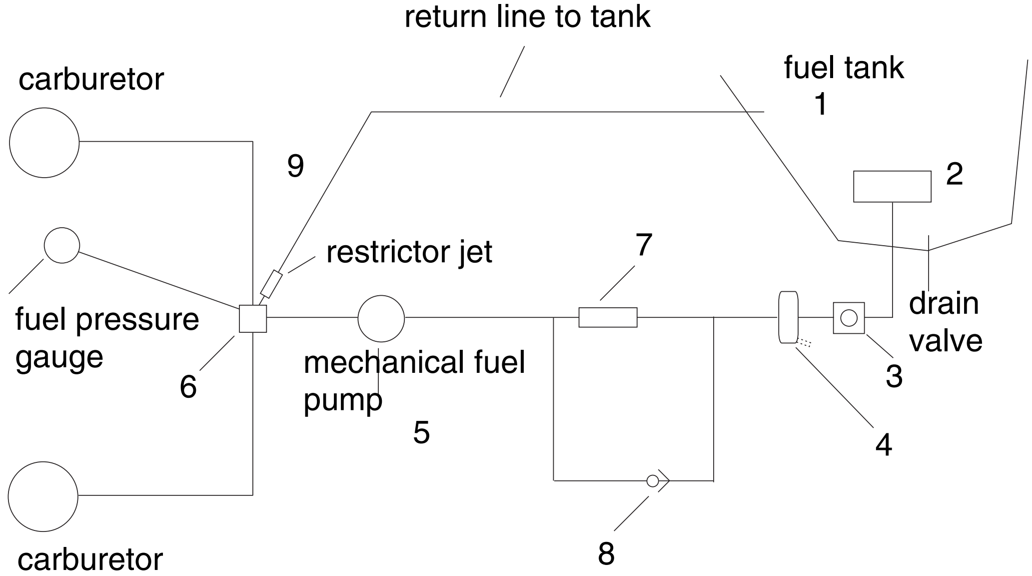
Components

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.

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 integrat-ed adapter sleeve)
	* Standard version

Fig. 2 07306

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

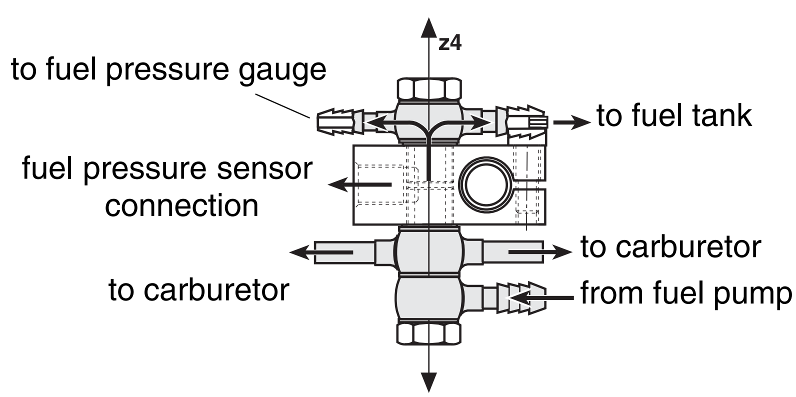


Fig. 3 09139

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.

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 deviced below 45 °C (113 °F).

If you should encounter problems in this respect during the test period, than 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.

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

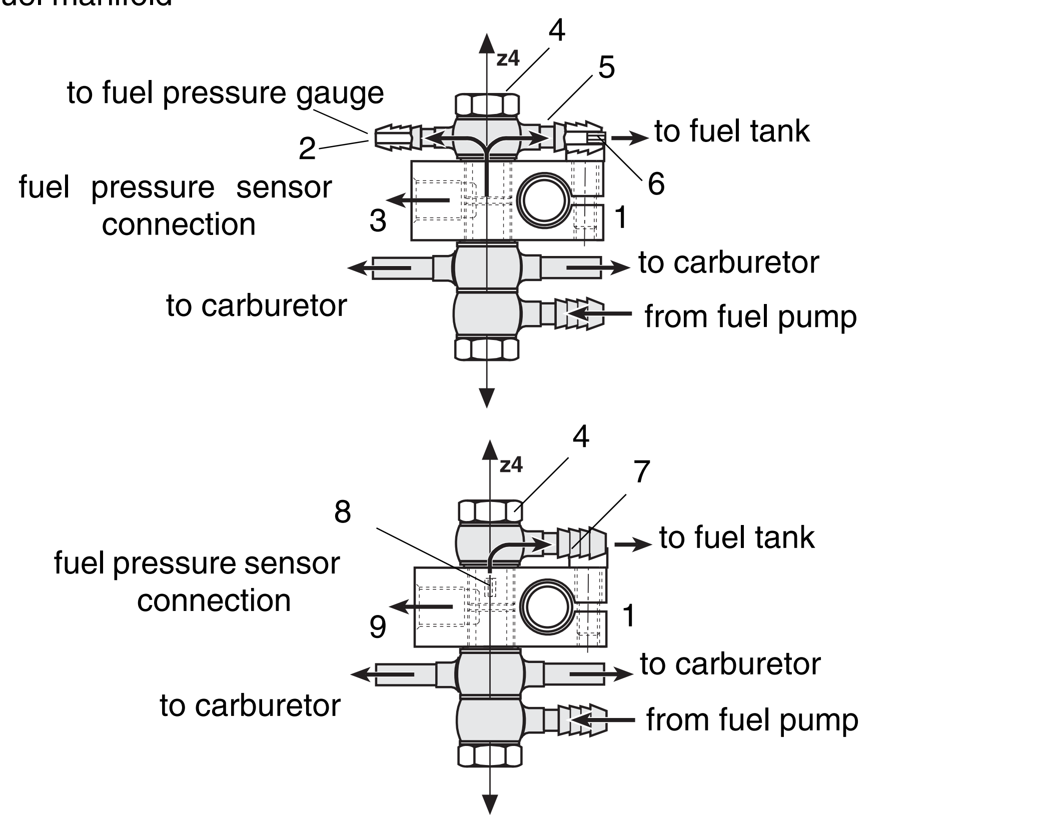
Position of z4 axis of the fuel manifold:

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

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 09192,09139

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.)

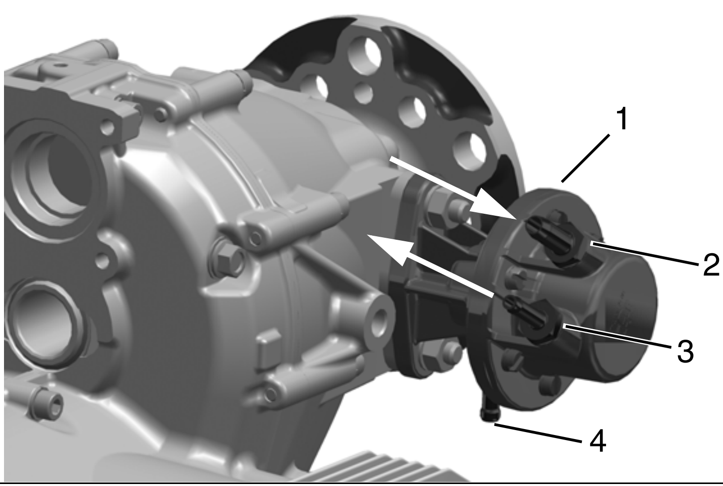
Fuel outlet connection (3):

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



08829

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.)

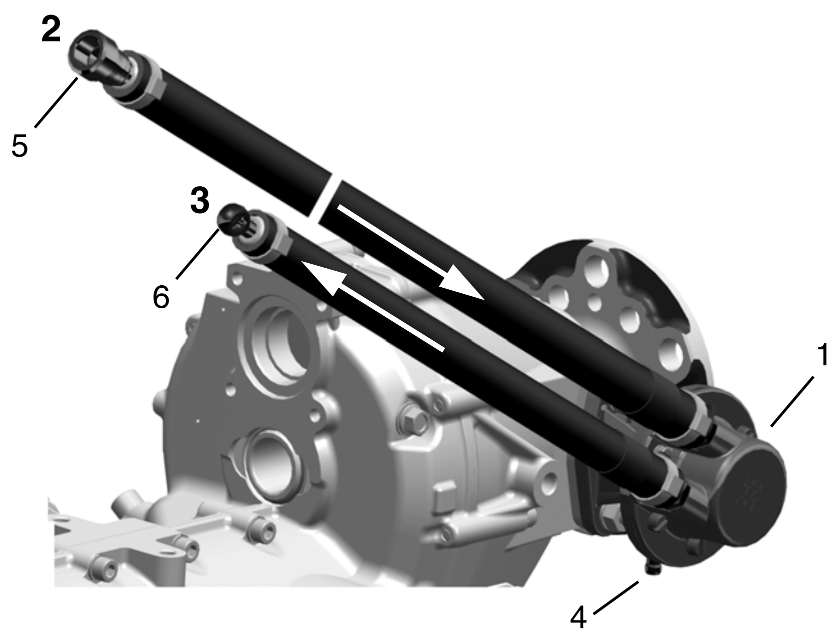


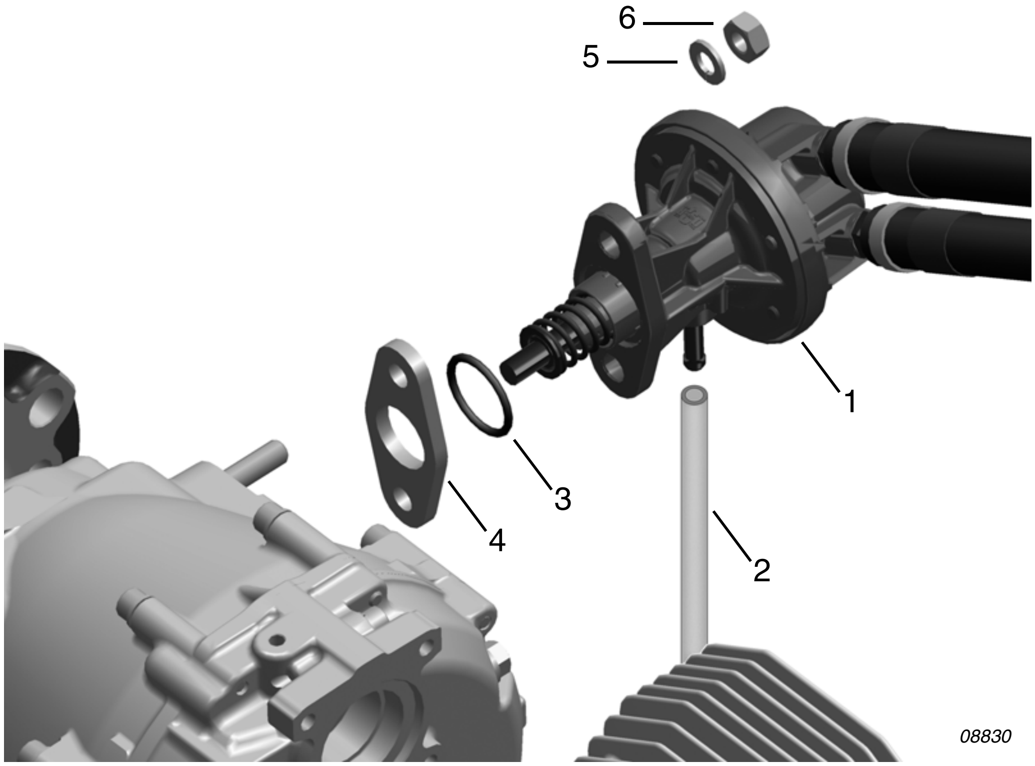
Fig. 5.2 08831

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.)

Grafik Fuel pump



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.

NOTES

2.1.1) Drainage piping on airbox and drip trays

General note

See Fig. 7

⚠ WARNING Non-compliance can result in serious injuries or death! Connect drainage lines, otherwise emerging fuel from a possible leakage could drip onto the exhaust system. RISK OF FIRE!

Drainage piping

Requirements on the drainage piping:

NOTICE With closed or blocked leakage piping, fuel could end up on exhaust system. RISK OF FIRE!

- The lines have to be routed such that in case of damage the surplus fuel is drained off suitably.
- Route the lines without kinks and avoid tight bends.
- Route the lines with a continuous decline.
- The lines have to be protected against any kind of blockage e.g. by formation of ice.

Float chamber venting lines

Float chamber venting lines:

NOTICE The float chamber venting lines (1) have to be routed into a ram-air and vacuum free zone or into the airbox, according to the requirements and release of BRP-Powertrain. See chapter “air intake system“.
These lines must not be routed into the slipstream or down the firewall.
Pressure differences between intake pressure and pressure in the carburetor chambers may lead to engine malfunction due to incorrect fuel supply.

Connecting nipple for leakage line

Connecting nipple (3) for leakage line:

Outside dia.	6 mm (1/4“‘)
Slip on length	Max. 17 mm (11/16“)

---

d06102.fm

2.1.2) Drainage piping on carburetor

General note

⚠ WARNING Non-compliance can result in serious injuries or death! Connect drainage lines, otherwise emerging fuel from a possible leakage could drip onto the exhaust system. RISK OF FIRE!

The primary function of the carburetor float chamber venting lines, is to provide ambient air pressure to the float bowl chambers. However, it is possible for fuel to be expelled from these lines. Normally these lines are connected to fitting on the ROTAX airbox to provide the ideal ambient air pressure and away of draining any expelled fuel overboard.

Drainage piping

If an airbox is not installed, the vent lines will need to be routed according to the following instructions:

- The lines have to be routed such that in case of fuel being expelled it is drained off suitably.
- Route the lines without kinks and avoid tight bends.
- Route the lines with a continuous decline.
- The lines have to be protected against any kind of blockage e.g. by formation of ice.

NOTICE The carburetor float chamber venting lines have to be routed into a ram-air and vacuum free zone (or into the airbox, according to the release of BRP-Powertrain. These lines must not be routed into the slipstream or any other location that is subject to ram-air or vacuum during flight or ground operations.
Pressure differences between intake pressure in the carburetor float chamber may lead to engine malfunction due to incorrect fuel supply.

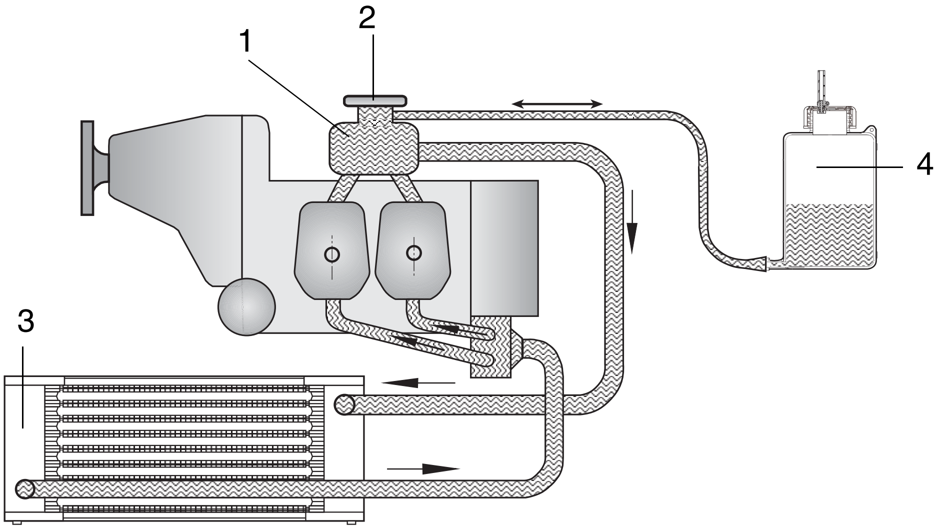
---

1) Cooling system

1.1) System description

Cooling	See Fig. 2. The engine cooling system 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 and overflow bottle.
Coolant	The coolant flow is forced by a water pump, driven from the camshaft, from the radiator to the individual cylinder heads. The coolant flows from the top of the cylinder heads to the expansion tank (1). Since the standard location of the radiator (3) is below engine level, the expansion tank located on top of the engine allows for coolant expansion.
Expansion tank	The expansion tank is closed with a pressure cap (2) (with pressure relief valve and return valve). As the coolant heats up and expands, the pressure relief valve opens and the coolant flows via a thin hose at atmospheric pressure to the transparent overflow bottle (4). As it cools down, the coolant is sucked back into the cooling circuit.
Shape, size and location	The shape, size and position of the radiator(s) depends mainly on the space available in the aircraft.
Measuring the coolant temp.	Readings are taken on measuring point of the hottest cylinder head, depending on engine installation. NOTE: The temperature sensors are located in cylinder head 2 and 3.
Radiator	If a GENUINE-ROTAX radiator is being used, then an oil-water heat exchanger must not be present. The radiator is dimensioned to cater for the heat of the coolant and cannot cope with the additional heat generated by the oil system.

Graphic Cooling system



Part	Function
1	Expansion tank
2	Pressure cap
3	Radiator
4	Overflow bottle

Fig. 2 *09152*

1.2) Operating Limits

General note

⚠ WARNING

Non-compliance can result in serious injuries or death! The cooling system must be designed so that operating temperatures will not exceed the maximum values.

Optional radiator

When correctly installed in the aircraft, the optionally available BRP-Powertrain radiator has enough cooling capacity to keep within the standard specified operating limits. The flow resistance of the radiator coolant is correctly adjusted to the cooling system. The tube size must be sufficient.

Boiling point of the coolant

Monitoring the cooling system is important for controlling engine cooling and prevent knocking combustion within the operating limits. It is important that the coolant circuit is designed so that the coolant does not reach boiling point under any conditions. If the temperature exceeds the boiling point, the engine can quickly overheat due to loss of coolant.

The boiling point of the coolant is mainly influenced by:

- the type of coolant (not for Suffix -01)
- mixture ratio (percentage water rate)
- the system pressure (opening pressure of radiator cap).

Coolant temperature, Suffix -01

Coolant temperature:	
Max.	120 °C (248 °F)
Permanent monitoring of coolant temperature is necessary.	

Coolant temperature, without Suffix -01

Using conventional coolant:

Coolant temperature:	
Max.	120 °C (248 °F)

Cylinder head temperature:	
912 A/F/UL	Max. 150°C (300 °F)
912 S/ULS	Max. 135°C (275 °F)
NOTE: Regarding to the necessary instrumentation, see section 2.1) Determination of operating limits, coolant and/or necessary modification on the radiator installation.	

Using waterless coolant:

Cylinder head temperature:	
912 A/F/UL	Max. 150 °C (300 °F)
912 S/ULS	Max. 135 °C (275 °F)
NOTE: Regarding to the necessary instrumentation, see section 2.1) Determination of operating limits, coolant and/or necessary modification on the radiator installation.	

Coolant temperature and cylinder head temperature

Correlation between coolant temperature and cylinder head temperature

There is in principle a regular relationship between coolant temperature and cylinder head temperature. The coolant transfers some of the combustion heat to the radiator. Thus, the coolant temperature is usually lower than the cylinder head temperature. But the temperature difference between coolant and cylinder head is not constant and can vary with different engine installation (cowling or free installation, tractor or pusher, flight speed, etc.).

NOTE: The basic requirement for safe operation is that boiling of conventional coolant must be prevented. The boiling point of conventional coolant is 120 °C (248 °F) with a 50/50 mixture proportion and a system pressure of 1.2 bar (18 psi).

1.3) Coolant types

1.3.1) Without Suffix -01

General note

In principle, 2 different types of coolant are permitted:

Description	
1	Conventional coolant based on ethylene glycol
2	Waterless coolant based on propylene glycol

NOTICE When selecting a suitable coolant, the information in Service Instruction SI-912-016, latest issue, must be observed.

Conventional coolant

Conventional coolant is recommended as it commonly available and has a greater thermal heat transfer capability. Its limitation is its lower boiling point.

Waterless coolant

Waterless coolant is recommended if the design of the aircraft can not maintain the coolant temperature limit 120 °C (248 °F).

Mixing ratio

NOTICE The manufacturers instructions regarding the coolant must be observed.

	Mixing ratio	
Description	**Concentrate**	**Water**
Conventional coolant	50 %	50 %
Some conventional coolant is available pre-mixed by the manufacturer. In this case do not mix with water, instead follow the manufacturers instructions.		
Waterless coolant	100 %	0

Boiling point

Conventional coolant:

Conventional coolant with a rate of 50 % water cannot boil at a temperature below 120 °C (248 °F) at a pressure of 1.2 bar (18 psi). The max. coolant temperature limit is therefore 120 °C (248 °F).

Permanent monitoring of coolant temperature and cylinder head temperature is necesssary.

Waterless coolant:

Waterless coolant has a very high boiling point that prevents coolant loss due to “boiling over“ (vapor loss), but not to prevent detonation, which can occur with cylinder head temperatures higher than 150 °C (300 °F) (for ROTAX 912 A/F/UL) and 135 °C (275 °F) (for ROTAX 912 S/ULS). It does not require pressure to maintain its boiling point. Due to a lower thermal conductivity the engine temperature will typically run about 5-10 °C (41-50 °F) higher with waterless coolant.

Permanent monitoring of cylinder head temperature is necessary.

Additional monitoring of the actual coolant temperature is possible but not necessary for waterless coolant.

NOTE: When using EVANS NPGR, NPG+ or added pure ethylene glycol as a coolant, note that these fluids have a flammability rating 1 (classification LOW at a scale from 0 to 4). The mentioned coolants are complying according to their material safety data sheet with a flammability classification, which has only low danger and a low risk of flammability. To date, no cases in engine operation or flight operation, laboratory conditions or from the field were reported, which show unsafe conditions of ROTAX aircraft engines in combination with the relevant coolants.

Marking

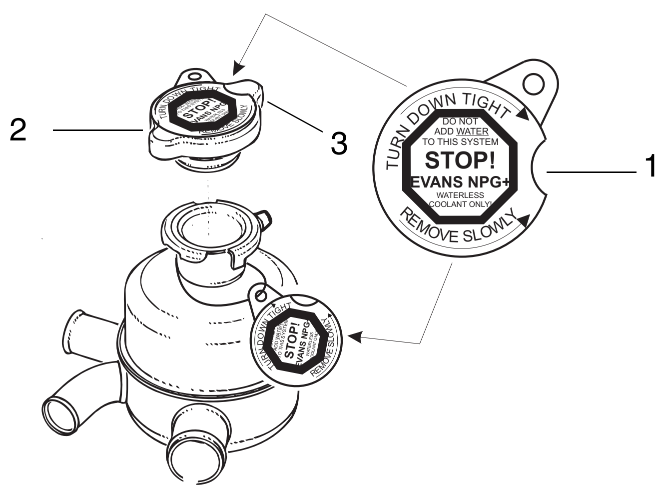
See Fig. 3.

Marking of the coolant to be used:

NOTICE The coolant to be used and its concentration (percentage water rate) must be correctly communicated to the owner.
Waterless coolant must not mix with water, as otherwise it will lose the advantages of a high boiling point.

Graphic

Marking



Part	Function
1	Warning sticker
2	Radiator cap
3	Opening pressure information of radiator cap

Fig. 3 08809

1.3.2) Suffix -01

General note

Description	
1	Conventional coolant based on ethylene glycol

NOTICE When selecting a suitable coolant, the information in Service Instruction SI-912-016, latest issue, must be observed.

Conventional coolant is recommended as it commonly available and has a greater thermal heat transfer capability. Its limitation is its lower boiling point.

NOTICE Permanent monitoring of coolant temperature is necessary.

Mixing ratio

NOTICE The manufacturers instructions regarding the coolant must be observed.

	Mixing ratio	
Description	**Concentrate**	**Water**
Conventional coolant	50 %	50 %
Some conventional coolant is available pre-mixed by the manufacturer. In this case do not mix with water, instead follow the manufacturers instructions..		

Boiling point

Conventional coolant:

Conventional coolant with a rate of 50 % water cannot boil at a temperature below 120 °C (248 °F) at a pressure of 1.2 bar (18 psi). The max. coolant temperature limit is therefore 120°C (248 °F).

NOTICE Permanent monitoring of coolant temperature is necessary.

Waterless coolant (cylinder head - new configuration):

NOTICE Are not authorized for ROTAX 912 Series with cylinder head - new configuration.

NOTE: Further all engines which have been equipped with new cylinder heads as spare part or during engine repair/general overhaul since March 1st, 2013 are also affected.

2) Checking the efficiency of the cooling system

2.0.1) Suffix -01

General note The maximum coolant temperature must be determined in order to check the efficiency of the cooling system.

See Fig. 4.

There are two temperature sensors (1) on the cylinder 2 and 3 for measuring the coolant temperature. During flight test the place with the highest coolant temperature must be found, this can vary with different engine installation (cowling or free installation, tractor or pusher, fight speed etc.).

Graphic Temperature sensor

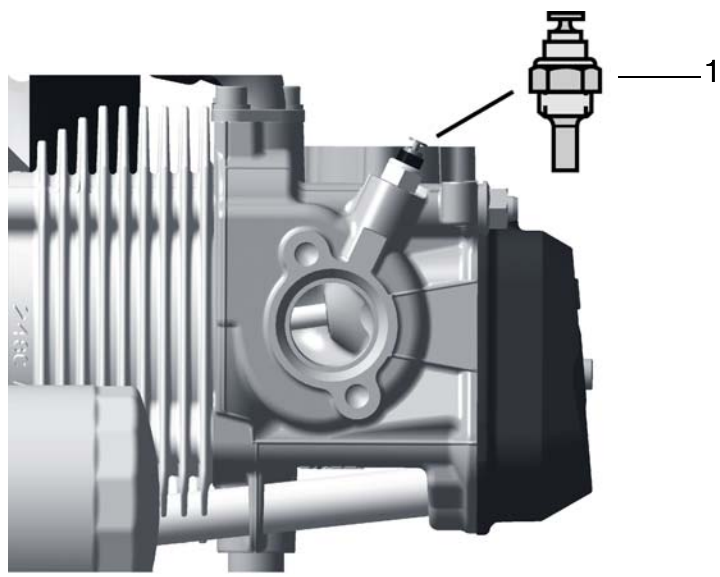


Fig. 4 09862_3

NOTE: At engines with cylinder heads of the new configuration, the cooling system must be designed so that the operating limits are not exceeded. A determination of the dependancy on coolant temperature and cylinder head temperature is not necessary any more.

2.0.2) Without Suffix -01

General note

The maximum coolant temperature must be determined in order to check the efficiency of the cooling system.

Cylinder head temperature

See Fig. 5.

There are two temperature sensors (1) on the cylinder 2 and 3 for measuring the cylinder head temperature. During flight test the place with the highest cylinder head temperature must be found, this can vary with different engine installation (cowling or free installation, tractor or pusher, fight speed etc.).

Graphic

Temperature sensors

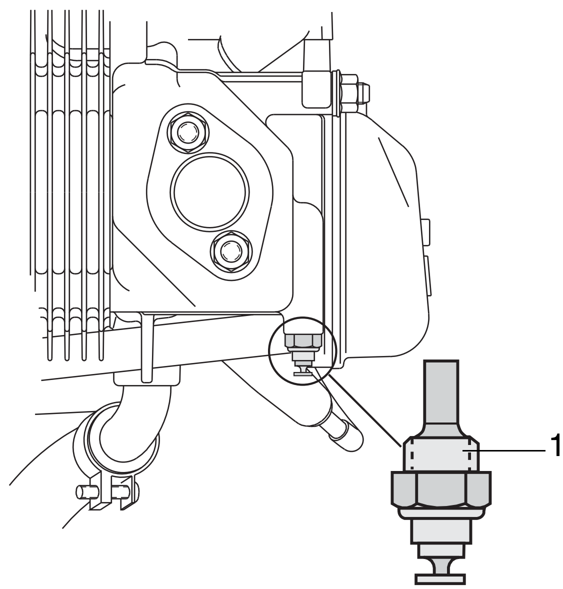


Fig. 5 00327

Coolant outlet temperature

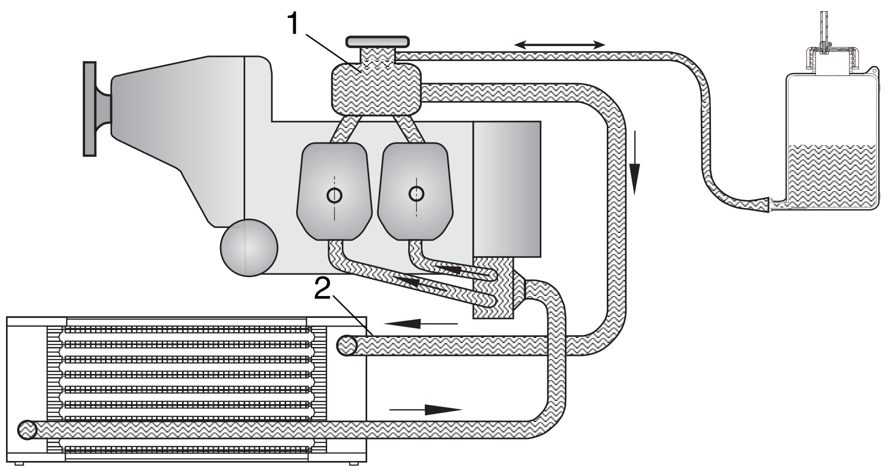
See Fig. 6.

⚠ WARNING Non-compliance can result in serious injuries or death! Do not restrict the coolant flow with the sensor.

NOTICE It is possible to record a false measurement when measuring fluid temperatures. If fluid volume is lost and the sensor is not fully submerged in the liquid, the indicating instrument could incorrectly display a lower temperature, by measuring the air temperature instead of the coolant temperature.

The measuring of the coolant outlet temperature is performed using a separate sensor, which has to be installed in the line between expansion tank (1) and radiator inlet (2).

Graphic Measurement of coolant outlet temperature



Part	Function
1	Expansion tank
2	Radiator inlet

Fig. 6 09152

Installation The sensor may be installed in a “TEE“ inline with the fluid hose or the expansion tank may be modified to attach the sensor (not supplied by BRP-Powertrain).

2.1) Determination of operating limits, coolant and/or necessary modification on the radiator installation on engines

2.1.1) Without Suffix -01

Maximum values

Depending on the achieved maximum values of the cylinder head temperature and the coolant temperature following action are necessary:

Maximum values for		**Coolant used for tests**	
Coolant temperature	**Cylinder head temperature**	**Conventional coolant**	**Waterless coolant**
less than 120 °C (248 °F)	less than 135 °C[1] (275 °F) (150 °C)[2] (300 °F)	Additional instruments for displaying coolant temperature is necessary. **b)**	Modifications to the instruments or limit not necessary. **a)**
more than 120 °C (248 °F)	less than 135 °C[1] (275 °F) (150 °C)[2] (300 °F)	Cooling capacity too low. Check of the installation necessary. **c)**	
less than 120 °C (248 °F)	more than 135 °C[1] (150 °C)[2] (300 °F)		Cooling capacity too low. Check of the installation necessary. **c)**
more than 120 °C (248 °F)	more than 135 °C[1] (275 °F) (150 °C)[2] (300 °F)		

1. engine type 912 S/ULS
2. engine type 912 A/F/UL

a) Maximum cylinder head temperature is below operating limits. Operating with waterless coolant, is permissible without modification to the installation.

b) Maximum cylinder head temperature and coolant exit temperature is below operating limit.
For operating with conventional coolant it is necessary to monitoring constantly cylinder head temperature and coolant exit temperature.

NOTE: For detection of possible indication error an additional monitoring of the cylinder head temperature is necessary which shows an exceeding in case of coolant loss.

Flight test

The aircraft manufacturer has the option of converting the coolant temperature and the cylinder head temperature to an aircraft specific cylinder head temperature. This is possible by calculating the difference between the head material and the coolant temperature.

See therefore the following flight test example (page 14).

Once the calculation is made and the indicating instrument re-labeled, it is acceptable to use the cylinder head temperature as the primary cockpit display instead of installing a sensor in the coolant flow.

The measurement is based on the maximum coolant temperature and cylinder head temperature according to the current requirement.

NOTICE In no case a cylinder head temperature higher than the limit of 150 °C (300 °F) (for ROTAX 912 A/F/UL) and 135 °C (275 °F) (for ROTAX 912 S/ULS) can be defined because detonation could not be sufficiently prevented.

Refer to the flight test example that follows.

c) Cooling capacity of the installation too low.

Flight test example

Calculated values (maximum values found for coolant temperature and cylinder head temperature. Refer to the current specification of the FAA and/or EASA).

Coolant temperature .... 102 °C (216 °F)

Cylinder head temperature .... 110 °C (230 °F)

The cylinder head temperature is 8 °C (46 °F) higher than the coolant temperature.

Thus:

Coolant temperature .... 120 °C (248 °F)

Difference cylinder head and coolant temperature ..... +8 °C (46 °F)

Total .... = 128 °C (262 °F)

The highest cylinder head temperature permitted is 128 °C (262 °F), so that the max. coolant temperature is kept.

With this special application, safe operation of the engine that prevents boiling of the coolant is possible up to a cylinder head temperature of 128 °C (262 °F).

NOTICE This cylinder head temperature with the limit found for this type must be displayed constantly in the cockpit. The indicating instrument and the Manuals must be changed to cylinder head temperature max. 128 °C (262 °F) geändert werden.

NOTICE The design of the radiator installation must be changed (example: cowl modifications), if the operating temperature exceeds the specified limits.

2.1.2) With Suffix -01

Not relevant.

3) Cooling system requirements

Safety

⚠ WARNING

Non-compliance can result in serious injuries or death! The cooling system must be designed so that the operating limits are not exceeded.
To minimize flow resistance, use radiators that have both a parallel flow and have a low flow resistance. A prime example would be the GENUINE-ROTAX radiators. Be sure to use short hoses and pipelines.

NOTICE

All components of the cooling system must be suitably secured.

Coolant hoses

See Fig. 7.

NOTICE

Hoses exposed to direct heat radiation from the exhaust system, must be suitably protected with heat-resistant protection tubes, for example.

NOTE: Aluminium tubes with an inner diameter of 25 mm (0.98 in.) can be used instead of longer hoses. These must have a bulge (1) in order to prevent coolant hoses working loose. Note as well that this will double the number of hose clips required!

- Temperature resistance, min. 125 °C (257 °F)
- Pressure durability: min. 5 bar (72 psi)
- Inner diameter: 25 mm (1“)
- Bending radius: min. 175 mm (6.89 in.) (except moulded hoses)
- Material: 100 % resistant to glycol, antifreeze and ozone.

Graphic

Drawing aluminium tube

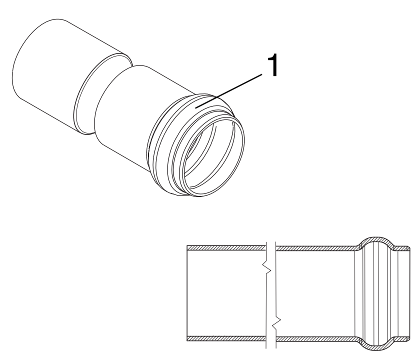


Fig. 7 09158

Hose connecting expansion tank

Hose from expansion tank to overflow bottle:

⚠ WARNING Non-compliance can result in serious injuries or death! A soft walled hose is not suitable as it can collapse and cause cooling system failure..

- The hose from the expansion tank to the overflow bottle must be rated for vacuum/suction for min. 125 °C (257 °F), e.g. it must be strong enough to withstand high temperatures and vacuum/suction during the cooling down period.

The aircraft manufacturer must give the possibility to the pilots to check the coolant level in the expansion tank. Also it is necessary to inform the pilots about the daily inspection of the coolant level in the aircraft manufacturers operators (pilots) manual or an adequate link to the ROTAX 912 Series Operators Manual.

It is recommended that adequate measures are taken for carrying out these inspections, e.g. a flap or panel on the cowling or a warning instrument in the cockpit for low coolant level.

3.1) Connecting size and position of connections

General note

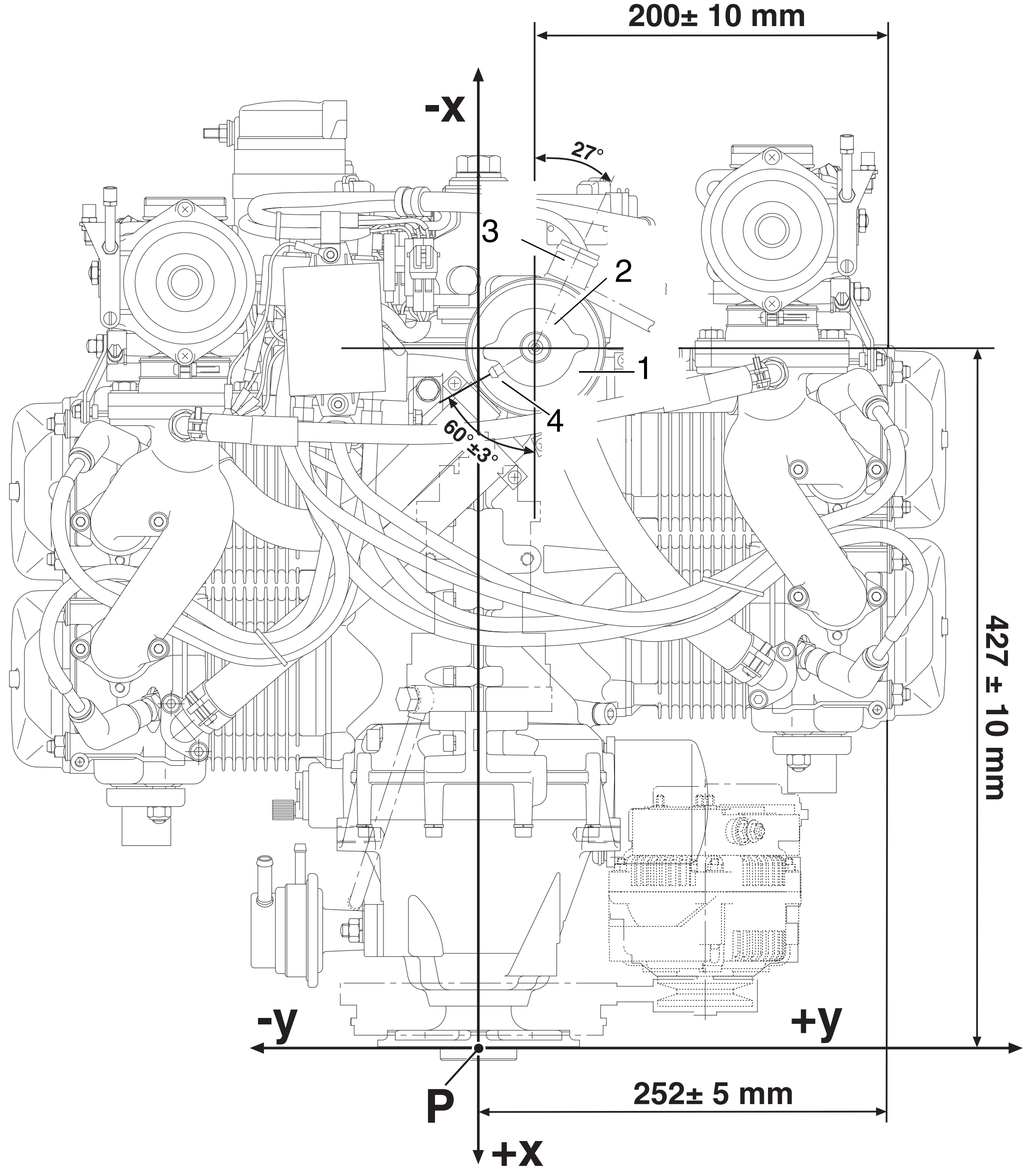
See Fig. 8 and Fig. 9.

NOTICE The hoses must be fixed with appropriate clips to prevent loss, e.g. with spring type hose clips, such as those used for the coolant hoses between the water pump and cylinder. Clips of this type have performed well in the field.

Expansion tank (1) with radiator cap (2)	
to radiator (3): Slip-on length	Outside dia. 25 mm (1“) Max. 22 mm (7/8“)
to overflow bottle (4): Slip-on length	Outside dia. 8 mm (3/8“) Max. 15 mm (9/16“)
water inlet elbow (5) Slip-on length	Outside dia. 27 mm (1 1/16“) Max. 19 mm (3/4“)

NOTE: See therefore also SI-912-020 “Running modifications“, latest issue.

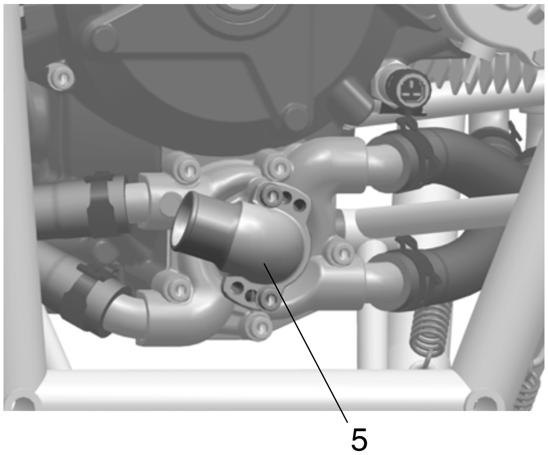
Graphic Connecting dimension

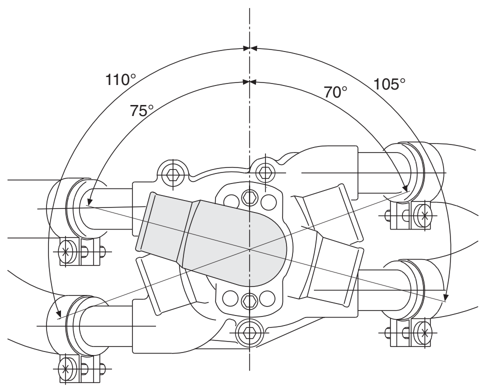


Part	Function
1	Expansion tank
2	Radiator cap
3	Connection to the radiator
4	Connection to the overflow bottle

Fig. 8 *07136*

Connecting dimension





Part	Function
5	Water inlet elbow

Fig. 9 *08788,05536*

Water inlet elbow

NOTICE Utilize total slip-on length for the water inlet elbow and expansion tank. Secure hoses with suitable spring or screw clamp.

NOTE: Choose between six possible installation positions of water inlet elbow (5) appropriate to specific installation (see illustration).

Use two M6x20 Allen screws and lock washers to attach the water inlet elbow. Tighten screws to 10 Nm (90 in.lb.).

3.2) Requirements, permissible location and installation position of the radiator/expansion tank/overflow bottle

Radiator

See Fig. 10.

⚠ WARNING

Non-compliance can result in serious injuries or death! The radiator must be designed and installed such that the permissible operating temperatures are maintained and the max. values are not exceeded.
This must also apply to "**Hot day conditions**".

NOTICE

If required, the radiator outlet (3) may be located max. 1.5 m (4.92 ft.) underneath the inlet elbow (4) of the water pump and no higher than the expansion tank (1). (see Fig. 10).

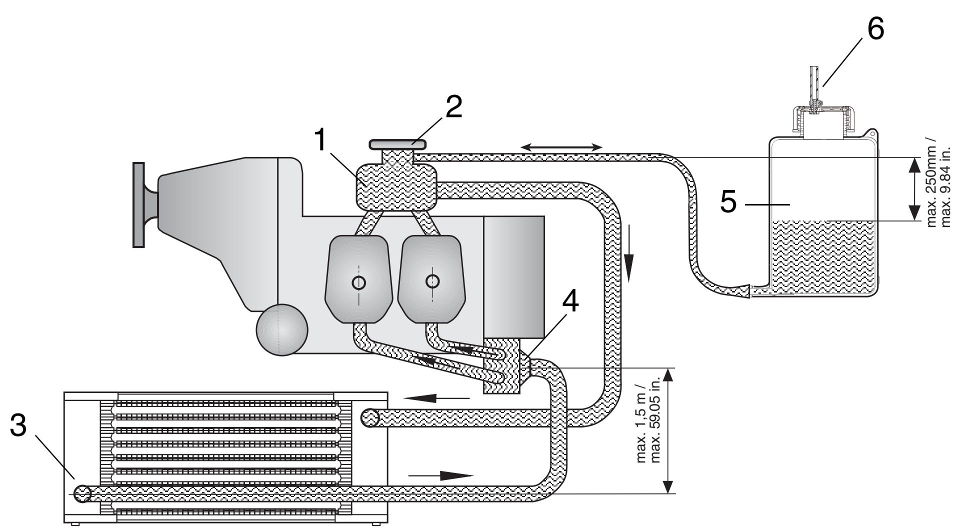
Expansion tank

To ensure proper operation of the cooling system, the expansion tank (1) with pressure cap (2) in the main operating systems must be installed on the highest point of the cooling circuit.

NOTE: The expansion tank (1) is fitted on top of the engine.

Graphic

Permissible position



Part	Function
1	Expansion tank
2	Radiator cap

Part	Function
3	Radiator outlet
4	Water inlet elbow
5	Overflow bottle
6	Purging

Fig. 10 08319

3.2.1) Overflow bottle

General note

See Fig. 11.

The system also needs an overflow bottle in which surplus coolant is collected and returned to the coolant circuit during the cooling down period.

NOTICE To ensure proper operation of the cooling system, the suction height between overflow bottle and expansion tank must not exceed 250 mm (10 in.).

NOTE: For proper operation ensure that the hose to the overflow bottle is as short as possible.

Overflow bottle requirements

- Transparent material
- Temperature resistant from -40 °C to +130 °C (-40 °F to 266 °F)
- 100 % resistant to glycol and suitable for all other antifreeze agents
- Volume approx. 0.5 l (.13 USgal)
- With vent (6), diameter 2.5 mm (0.1 in.)

NOTE: See also SB-912-039 “Modification of the overflow bottle“, latest issue.

NOTE: The overflow bottle should be furnished with a label indicating function and content.

Capacity

⚠ WARNING Non-compliance can result in serious injuries or death! The overflow bottle must never be empty, otherwise air will be sucked into the cooling circuit; this can have a negative effect on the safe operation of the engine.

Installation

NOTICE The overflow bottle and its supply and discharge must not be installed close to the exhaust system, as emerging coolant can be flammable under certain conditions.

3.3) ROTAX overflow bottle (optional)

General note

If the optional ROTAX overflow bottle is used, the purging system must be arranged as shown below.

NOTE: To vent coolant steam from the overflow bottle in case of overheating, the plastic cap can be retrofitted with a hose nipple and hose.

The purging line (5) must be routed so that coolant cannot come in contact with the hot exhaust system.

The vent line must be routed in a continuous decline or furnished with a drain bore at its lowest point to drain any condensation.

The line must be protected from any kind of ice formation from condensation, e.g. insulation protection or routing in a hose with hot air flow and furnishing the line with a by-pass opening before the cowling outlet.

Work instruction

See Fig. 11.

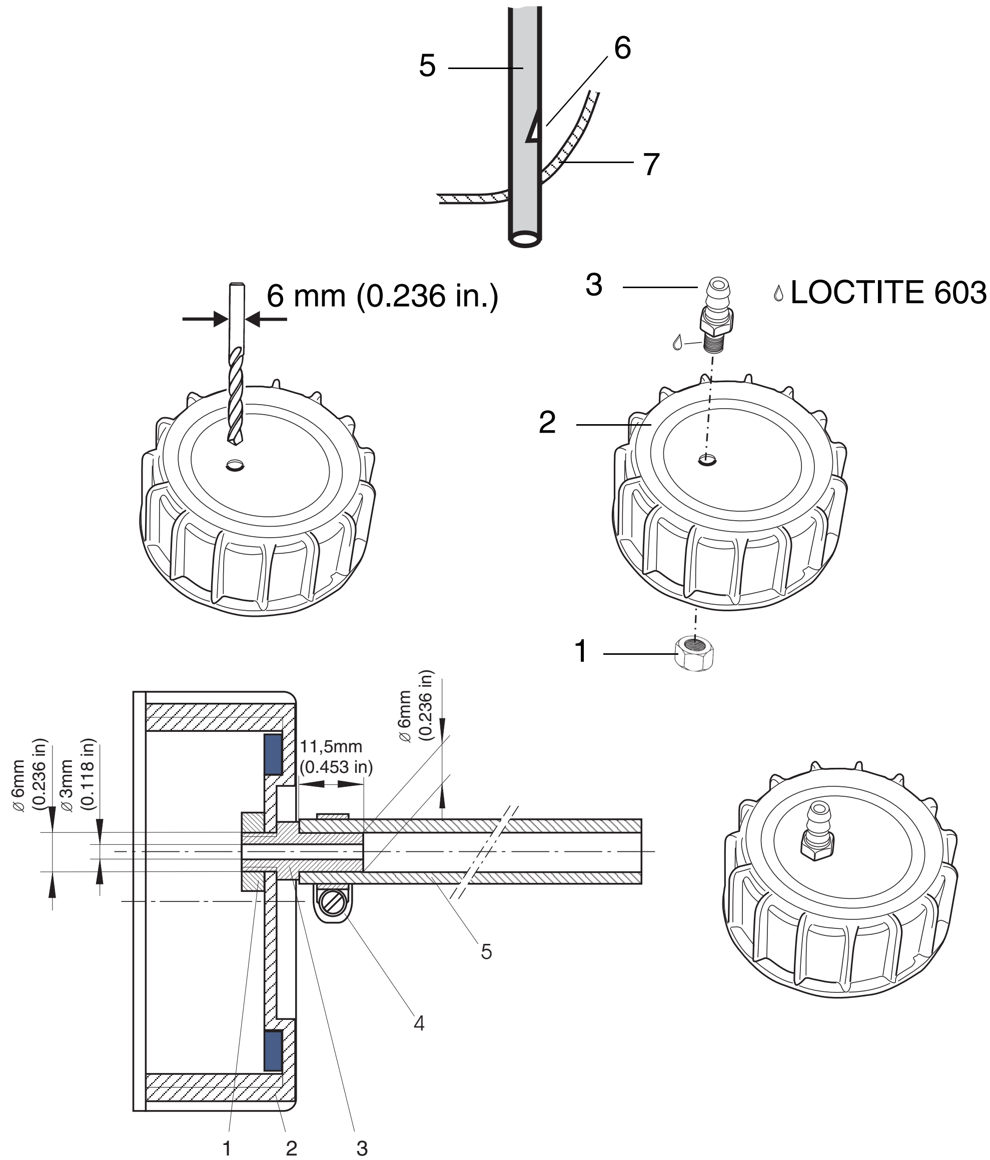
Procedure for attaching the hose nipple**:**

Step	Procedure
1	Unscrew the plug screw (2) from the overflow bottle.
2	Bore the existing purging hole from dia. 2.5 mm (0.10 in.) to dia. 6 mm (0.236 in.).
3	Apply LOCTITE 603 to the threads of the hose nipple (3).
4	Insert hose nipple (3) with the thread first into the vent hole.
5	Fix M6 hex. nut (1) onto the hose nipple (3). Tightening torque 5 Nm (3.69 lbft).
6	Screw the plug screw onto the overflow bottle.

Steps for attaching the hose:

Step	Procedure
1	Secure the hose with a gear-type hose clip (4) or spring type hose clip.
2	Secure and route the hose (5) without kinks.

Graphic Hose nipple



Part	Function
1	Nut M6
2	Cap
3	Hose nipple
4	Gear-type hose clamp
5	Hose
6	Bypass opening (slot)
7	Cowling

Fig. 11 *09132,05033,09126*

4) General notes on the cooling system

General note

⚠ WARNING

Non-compliance can result in serious injuries or death! Certification according to the latest regulations, such as FAR or EASA, must be conducted by the aircraft or fuselage manufacturer.

Essential parts of the cooling system, such as radiator, etc., are available for this engine from BRP-Powertrain.

Radiator

See Fig. 12.

NOTICE

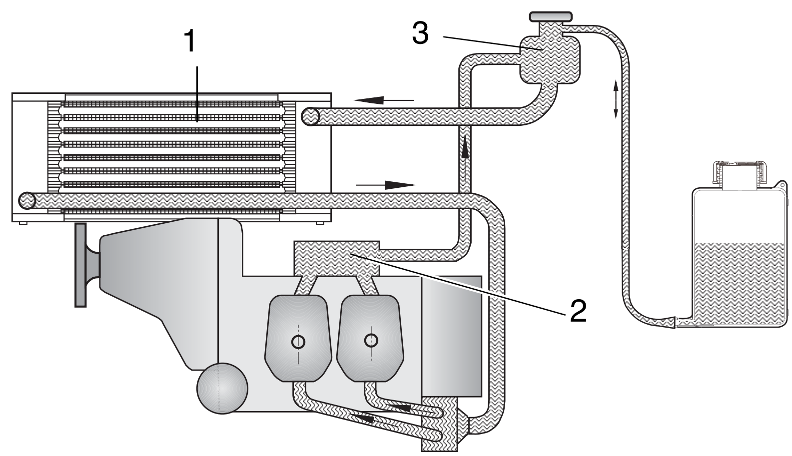
The size and type of radiator should be adequate to transfer thermal energy of approx. 25 kW (24 BTU/s) (for ROTAX 912 A/F/UL) or approx. 28 kW (26.5 BTU/s) (for ROTAX 912 S/ULS) at take-off power.

In an installation as depicted with the radiator (1) in a higher position than the standard supplied expansion tank, a water accumulator (2) has to be fitted instead of the expansion tank. Additionally a suitable expansion tank (3) has to be installed at the highest point of the cooling circuit.

NOTE: Experience has shown that with good airflow, a radiator with an area of 500 cm^2 (77.5 in^2) is required for troublefree operation.

Graphic

Radiator



Part	Function
1	Radiator
2	Water accumulator
3	Expansion tank

Fig. 12 08320

Flow rate

The flow rate in the coolant circuit is approx. 60 l/min (15.85 USgal/min.) at 5800 rpm. At full throttle, an approximate value of around 0.75 m^3/s (28.59 cu.ft/sec) can be assumed for the required cooling air flow.

Flow resistance

The flow resistance of the coolant in the optional ROTAX radiator is correctly adjusted for the cooling system.

If using other radiators, check the flow rate and cooling capacity.

Installation of the radiator

No provision has been made for attachment of the radiator(s) on the engine (rubber mounts are recommended).

NOTICE

The radiator must be installed without distortion or stress and free of vibrations.
If a GENUINE-ROTAX radiator is not being installed, ensure sufficient cooling capacity.

4.1) Coolant capacity

Description	Capacity
4 cylinder heads	560 cm^3 / 0.020 cu.ft (without Suffix -01)
	400 cm^3 / 0.016 cu.ft (Suffix -01)
Coolant pump	100 cm^3 / 0.004 cu.ft
Expansion tank	250 cm^3 / 0.009 cu.ft
Overflow bottle	ca. 0,5 l / 0.13 USgal
2 m coolant hose (inner dia.Ø 18 mm)	500 cm^3 / 0.018 cu.ft
Total coolant quantity for engine	ca. 1,5 l / 0.4 USgal

4.2) Cooling air ducts (optional)

General note Cooling air ducts are not required if the oil and coolant temperatures are within the prescribed operating limits. Otherwise following measurement must be performed for the first installation of an aircraft type (not in serial-production).

Hot day condition See Fig. 13.

In contrast to the cylinder heads, the cylinders are ram air cooled. Plan the cooling air ducts according to installation requirement.

⚠ WARNING Non-compliance can result in serious injuries or death! The cooling air ducts must be designed and built such that the operating temperatures are within the specified limits and maximum values are not exceeded. This must also apply to "**Hot day condition**".

Max. permitted cylinder wall temperature on hottest cylinder...200 °C (392 °F)

NOTE: If this temperature is exceeded, appropriate measures (e.g. cooling air ducts, modifications to cowling, etc.) must be taken to bring it within limits again.

NOTE: As long as the oil and coolant temperatures are within the operating limits, no cooling air ducts are necessary.

Graphic Cooling air duct

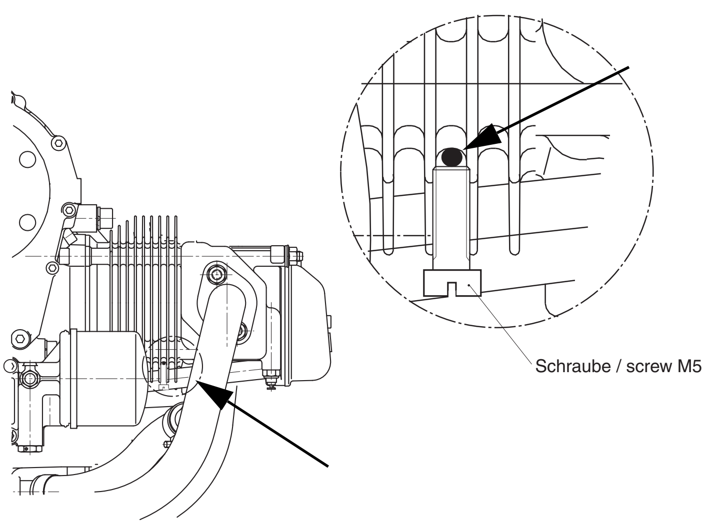


Fig. 13 02050

4.3) General notes on the cooling air ducts

Front installation

⚠ WARNING Non-compliance can result in serious injuries or death! Certification according to the latest regulations, such as FAR or EASA, must be conducted by the aircraft or fuselage manufacturer.

For front installation in a closed fuselage, ducting of cooling air to the cylinders is recommended. This removes the need for costly horizontal partitioning (baffles).

NOTE: It also means that the engine remains completely on the warm side of the engine compartment and is very easy to access. In special cases a separate cold air supply to the air filters must be provided.

BRP-Powertrain has developed a non-certified cooling air duct especially for this application.

Selecting cooling air ducts

The following recommendations should assist the aircraft or fuselage manufacturer in selecting suitable cooling air ducts.

Cooling capacity	The cooling air ducts must be designed such that they transfer thermal energy of approx. 6 kW (5.7 BTU/s) at take-off performance.
Cross section of air duct	Cross section of air duct under the airflow baffle min. 100 cm^2 (15.50 in^2).
Material	Glass fibre reinforced plastic or heat and fire resistant material.
Attachment options	Formlocking on engine block and mounting above the cylinder and the crankcase. NOTE: If formlocking attachment is not sufficient, additional attachment is possible using two M8 threaded lugs on the top of the engine block.

NOTICE The stated maximum permissible loads (per screw) are valid only if using the minimum specified thread length, and must never be exceeded.

Thread height 18 mm (0.71 in.)).

Permissible loads (per screw)

	x-axis	y-axis	z-axis
Attachment points	-300 mm (-11.81 in.)	-30 mm (-1.18 in.)	-14 mm (-0.55 in.)
	-300 mm (-11.81 in.)	-30 mm (-1.18 in.)	-14 mm (-0.55 in.)

	Attachment points
Max. permissible force (safe load) in (N) on x, y and z axis	2000 N (449.62 lb-force)
Max. permissible bending moment (safe load) in (Nm) in x, y and z axis	50 Nm (36.89 lbft)
Min. length of thread (mm)	15 mm (0.59 in.)

4.4) Data for optional components of cooling system

Overflow bottle See Fig. 14 and Fig. 16

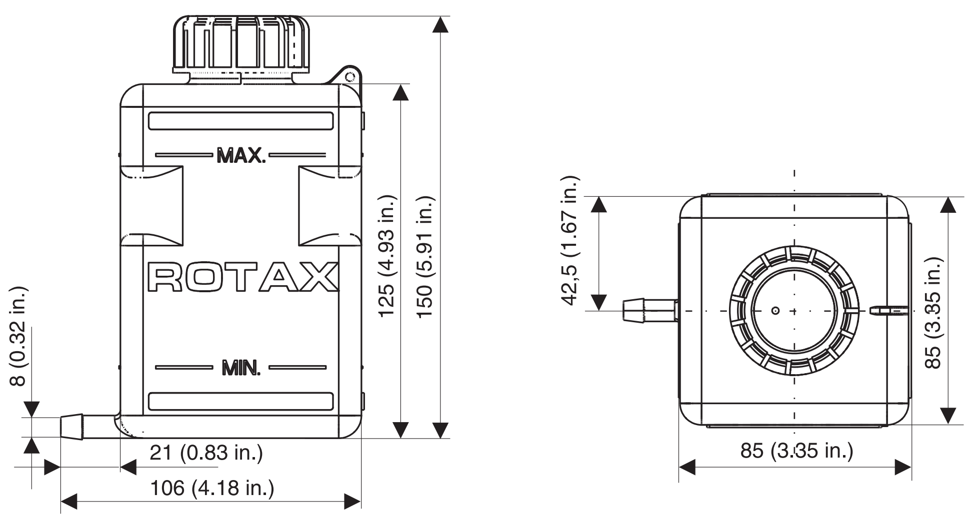


Fig. 14 09148

Radiator Weight: see also chap. 72-00-00 section: 2.1)

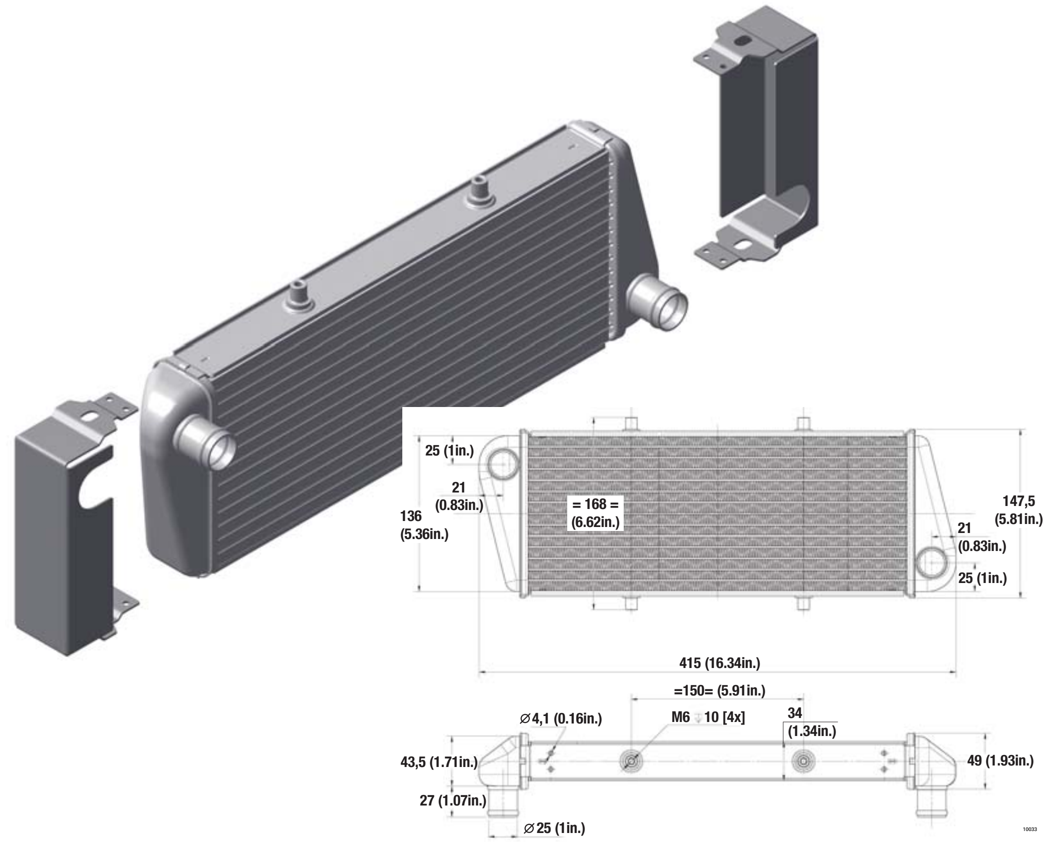


Fig. 15 10033

Cooling air baffle Weight: see also chap. 72-00-00 section: 2.1).

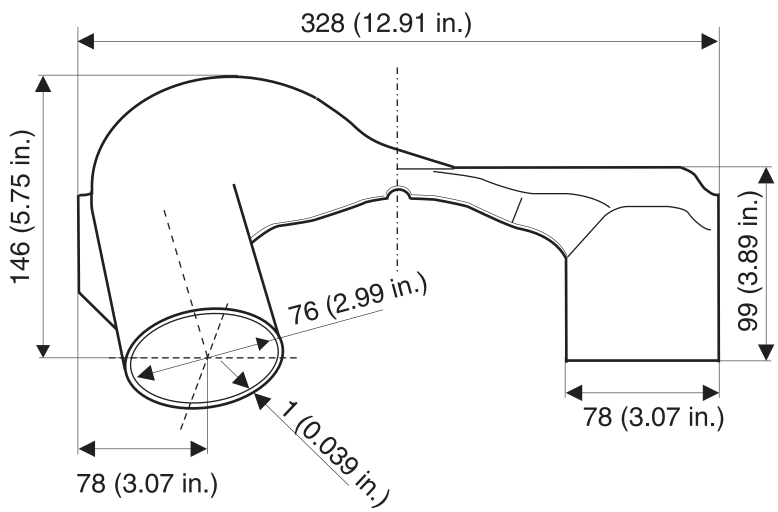


Fig. 16 09165

Chapter: 76-00-00

ENGINE MANAGEMENT

Introduction

NOTICE Obey the manufacturers instructions!

Table of contents

This section of the Installation Manual describes the engine management of the aircraft engines.

NOTES

1) Connections for instrumentation

General note

NOTICE These connections to be established in accordance to certification and/or national specifications.
The certification for connections and connection lines have to be conducted by the aircraft manufacturer to the latest requirements like FAR and EASA.

For notes regarding the electric rev counter consult the chap. Electric system.

1.1) Sensor for cylinder head temperature and coolant temperature

General note

See Fig. 1.

Depending on the cylinder head design (old or new version), there are different methods of measurement with either cylinder head temperature sensor (without Suffix -01) or coolant temperature sensor (Suffix -01).

1.1.1) Cylinder head temperature sensor (without Suffix -01)

Technical data

The temperature sensor (1) is directly fitted into cylinder head i.e. a direct temperature reading of the cylinder head material is taken.

Location	In the cylinder head of the cylinder 2 and 3
Connection	Spade terminal 6.3x0.8 DIN 46247
Grounding	Via engine block

Position

Position temperature sensor:

	Axes		
Cylinder head	x-axis	y-axis	z-axis
2	-200.0 mm (-7.88 in)	241.0 mm (9.49 in)	-157.0 mm (-6.18 in)
3	-387.0 mm (-15.24 in)	-241.0 mm (-9.49 in)	-157.0 mm (-6.18 in)

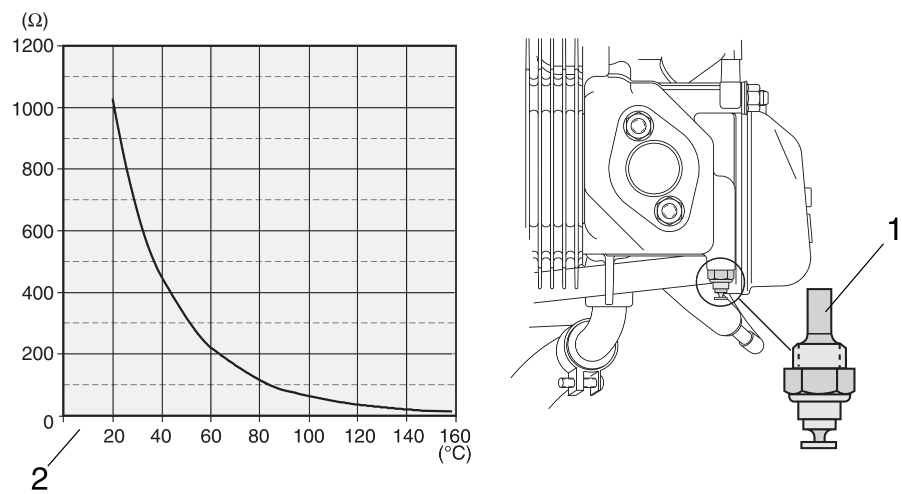
Graph resistance

Graph of sensor resistance over temperature:

See Fig. 1.

NOTICE The graph resistance over temperature has been determined, and is effective at the following conditions only:
Ambient temperature: 20 °C (68 °F)
Tolerance: Max ±10 %

Graphic Sensor for cylinder head temperature



Part	Function
1	Sensor for cylinder head temperature
2	Graph resistance over temperature

Fig. 1 *00227, 00327*

1.1.2)Sensor for coolant temperature (Suffix -01)

General See Fig. 2.

The temperature sensor is directly fitted into cylinder head i.e. a direct temperature reading of the coolant is taken.

Technical data

Location	In the cylinder head of the cylinder 2 and 3
Connection	Spade terminal 6.3x0.8 DIN 46247
Grounding	Via engine block

Position **Position temperature sensor:**

	Axes		
Cylinder head	x-axis	y-axis	z-axis
2	26.0 mm (1.02 in)	225.9 mm (8.90 in)	44.4 mm (1.74 in)
3	-173.0 mm (-6.81 in)	-225.9 mm (-8.90 in)	44.4 mm (1.74 in)

Graph resistance

Graph of sensor resistance over temperature:

See Fig. 2.

NOTICE The graph resistance over temperature has been determined, and is effective at the following conditions only:
Ambient temperature: 20 °C (68 °F)
Tolerance: Max ±10 %

Grafik

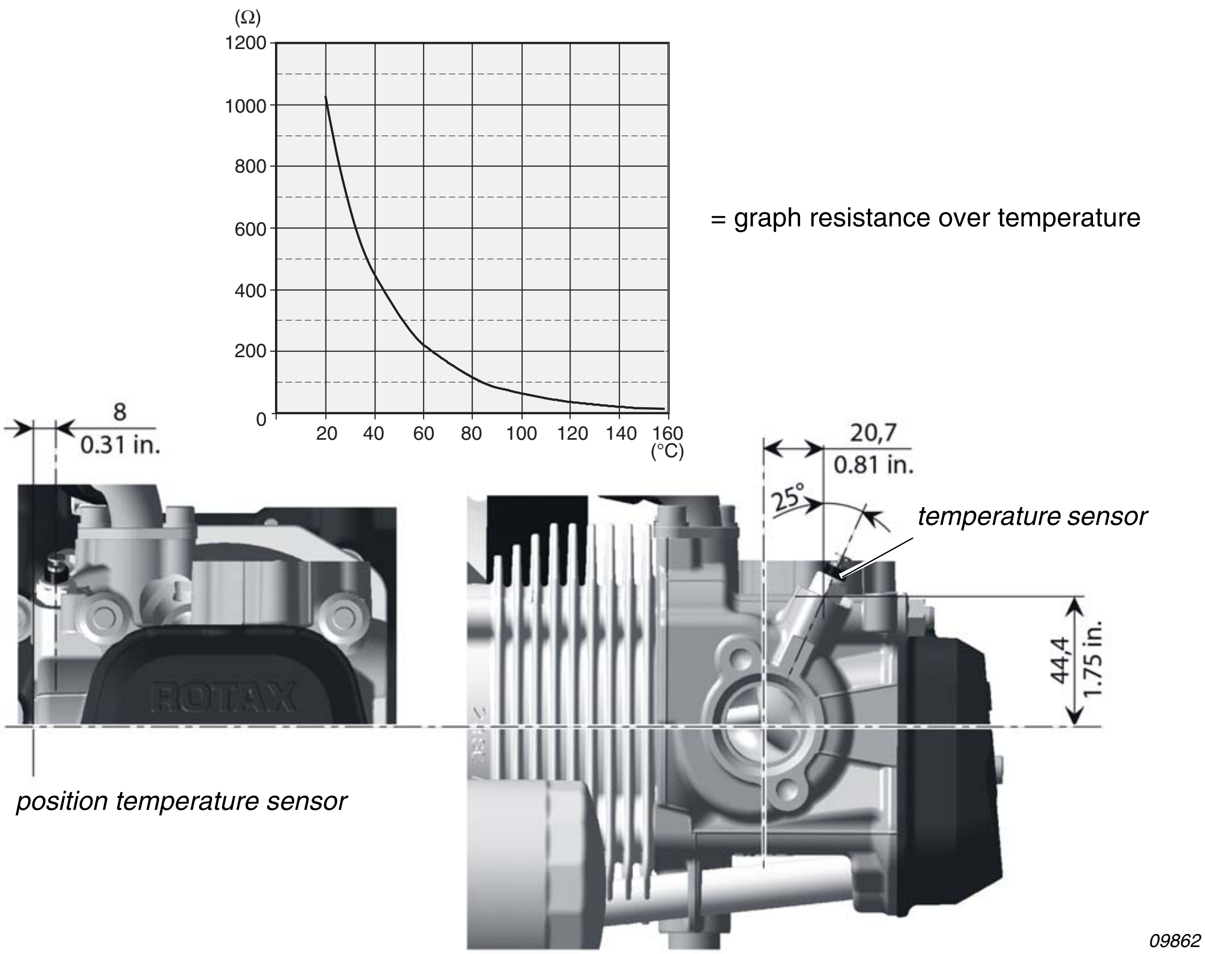


Fig. 2

1.2) Sensor for oil temperature

General note

See Fig. 3.

NOTICE Certification to the latest requirements such as FAR of EASA has to be conducted by the aircraft manufacturer.

BRP-Powertrain offers a non-certified temperature indicating instrument. Refer to Illustrated Parts Catalog, latest issue.

Marking

Marking (2): Marked with “TO“ (**T**emperature **O**el) on oil pump flange.

NOTICE To avoid any mix-up with indication wiring, mark this particular cable also with “TO“.

Position

Position of the temperature sensor (1) on the oil pump flange:

	Axes		
Point of support	x-axis	y-axis	z-axis
	-115.0 mm (-4.53 in)	46.0 mm (1.81 in)	-150.0 mm (-5.92 in)

Technical data

Anschlüsse für Öltemperaturgeber:

Location	Oil pump housing
Connection of sensor wiring	Spade terminal 6.3x0.8 DIN 46247
Grounding	Via engine block

Graph resistance

Graph of sensor resistance over temperature:

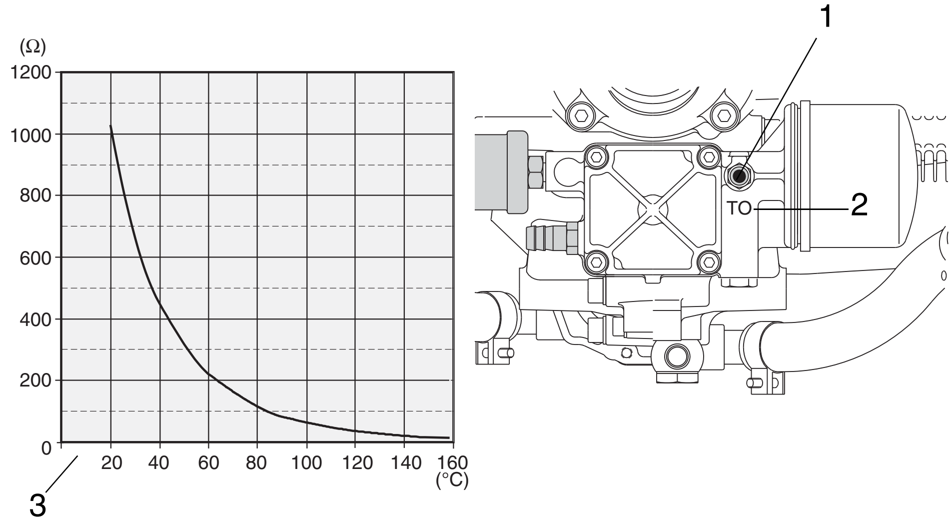
See Fig. 3.

NOTICE The graph resistance over temperature has been determined, and is effective at the following conditions only:
Ambient temperature: 20 °C (68 °F)
Tolerance: Max ±10 %

d06105.fm

Graphic

Sensor for oil temperature



Part	Function
1	Sensor for oil temperature
2	TO marking
3	Graph resistance over temperature

Fig. 3 *00227, 00327*

1.3) Oil pressure sensor

General note

See Fig. 4.

NOTICE Certification to the latest requirements such as FAR of EASA has to be conducted by the aircraft manufacturer.

As the instruments need a separate power supply and a different design for the electrical oil pressure sensor, the resistance type instrument (type VDO), which was supplied by BRP-Powertrain up to now, is not suitable anymore. Suitable instruments are offered by various instrument manufacturers (e.g. ROAD or Aviasport).

Technical data

Oil pressure sensor:

Location	Oil pump housing
Wire gauge	Standard wire 0.5 mm^2 (AWG 20)
Cable length	3 m (118 in)
Operating temperature range	Min. -40 °C (-40 °F) Max. +125 °C (+257 °F)
Grounding	Via engine block/airframe ground
Tightening torque	15 Nm (133 in.lb) and LOCTITE 243

Output signal

In contrary to the oil pressure sensor offered up to now, which was providing the signal on the basis of a sensor resistance variation, the new oil pressure sensor (1) operates on basis of a current variation. This has to be taken into account for the selection of the appropriate cockpit instrument.

Wiring connection

Wiring connection for instrument:

NOTE: The sensor cable can be modified in its length according to the installation situation, e.g. shortened or extended. For extension an appropriate, commercially available cable can be used. A resistance cable or similar is not necessary.

The sensor cable is approx. 3 m (118 in) long and has 3 leads. The **Black** lead is not to be connected and has no function.

- The **Red** lead from the sensor has to be connected to the positive bus via a fuse or circuit breaker.
- The **White** lead (output signal) has to be connected directly to the instrument.

See also the relevant instructions of the instrument supplier/aircraft manufacturer for correct connection and wiring.

Graph current over pressure

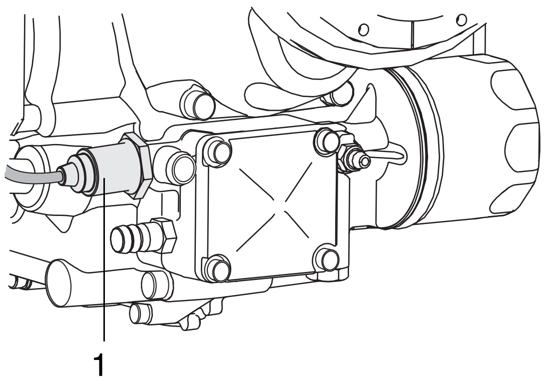
See Fig. 4.

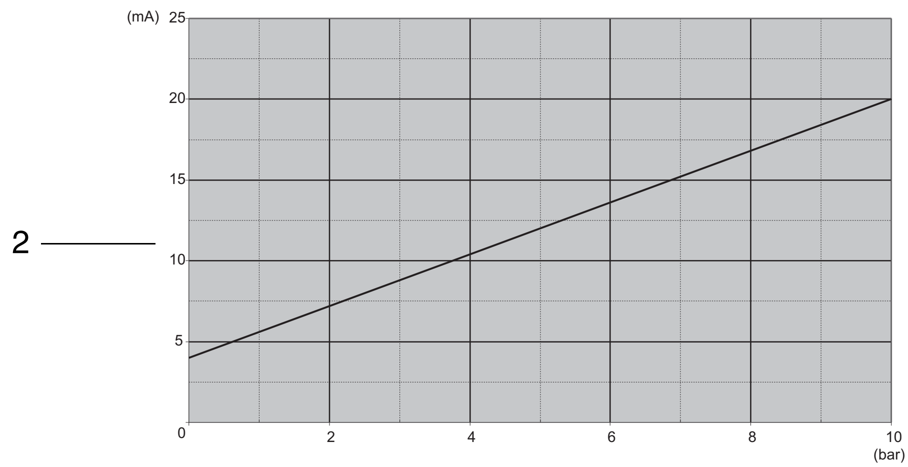
NOTICE

The graph current over pressure (2) has been determined, and is effectiva at the following conditions only:
Ambient temperature: 20 °C (68 °F)
Tolerance: Max ±3 %

Graphic

Oil pressure sensor





Part	Function
1	Oil pressure sensor
2	Graph current over pressure sensor

Fig. 4 08379,08442

1.4) Mechanical rev counter (tach driver) (optional)

General note See Fig. 5.

Technical data

Mechanical rev counter:

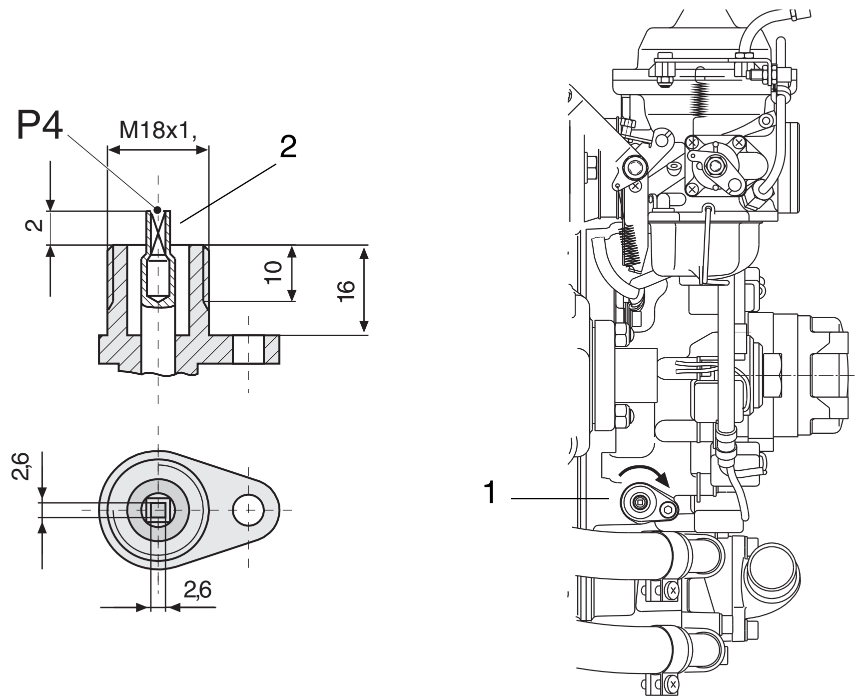
Location	Ignition housing (1)
Direction of rotation of the rev counter shaft (2)	Right (Clockwise)
Reduction ratio	i= 4 i.e. 1/4 of engine speed
Installation dimensions	See figures above

Position

Position mechanical rev counter:

	Axes		
point of engagement P4	x-axis	y-axis	z-axis
	-465,0 mm (-18.31 in)	87,0 mm (3.43 in)	-160,0 mm (-6.3 in)

Graphic Mechanical rev counter



Part	Function
1	Ignition housing
2	Rev counter shaft

Fig. 5

00560, 00562

d06105.fm

2) Monitoring of the intake manifold pressure

General note

See Fig. 6.

NOTICE Utilize the total slip-on length on all joints. Secure hose by suitable screw clamps or crimp connection.

Connection nipple

Connection nipple (1) to measure manifold pressure:

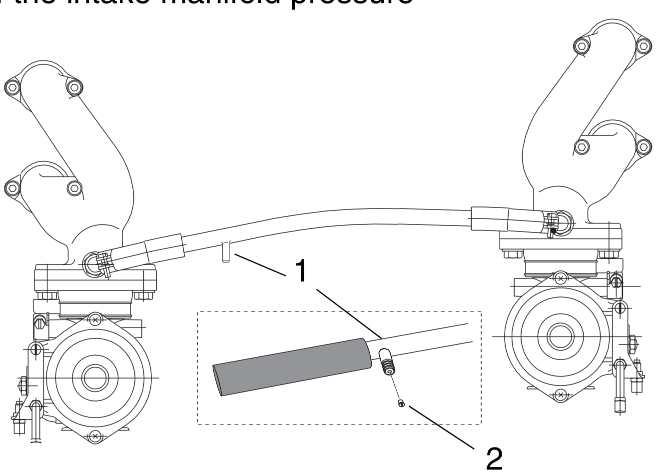
Outside dia.	6 mm (1/4“)
Slip-on length	Max. 17 mm (11/16“)

NOTICE Protective covering to be utilized for transport and at engine installation only. If connection for pressure reading is not employed it has to suitably plugged. New style compensating tubes have plugged this connection by a screw M3.5x6 (2).

NOTICE Flawless operation of the indicating instrument needs the installations of a water trap between engine and instrument for fuel condensate.

Graphic

Monitoring of the intake manifold pressure



Part	Function
1	Connection nipple
2	Screw M3.5x6

Fig. 6

02051

2.1) Air temperature in the airbox (optional)

General note

See Fig. 7.

To take air temperature readings in the airbox a connection is provided. This connection is closed on the standard engine by a plug screw.

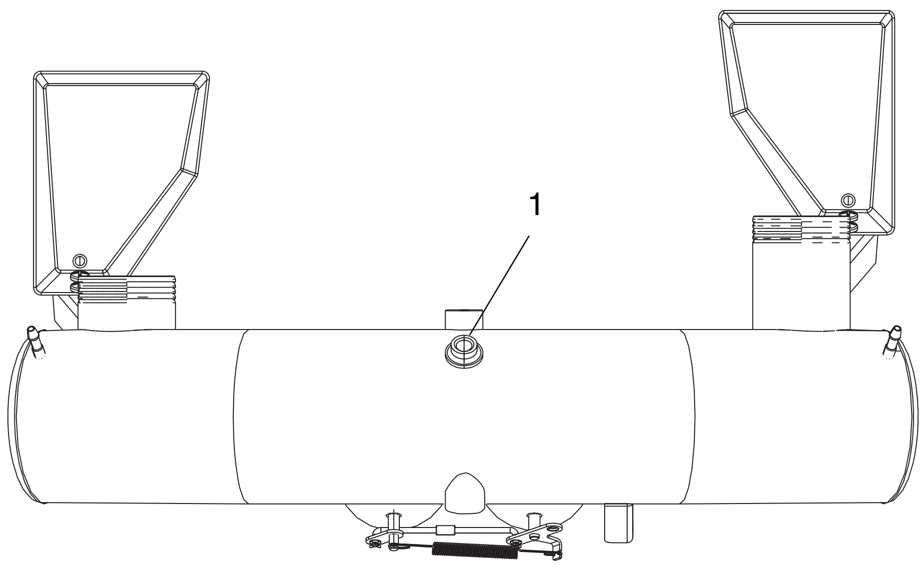
Plug screw

Connection:

Thread	M6
Thread length	approx. 9 mm (3/8“)

Graphic

Airbox



Part	Function
1	Plug screw

Fig. 7 08647

Chapter: 78-00-00

EXHAUST SYSTEM

General note

See Fig. 1.

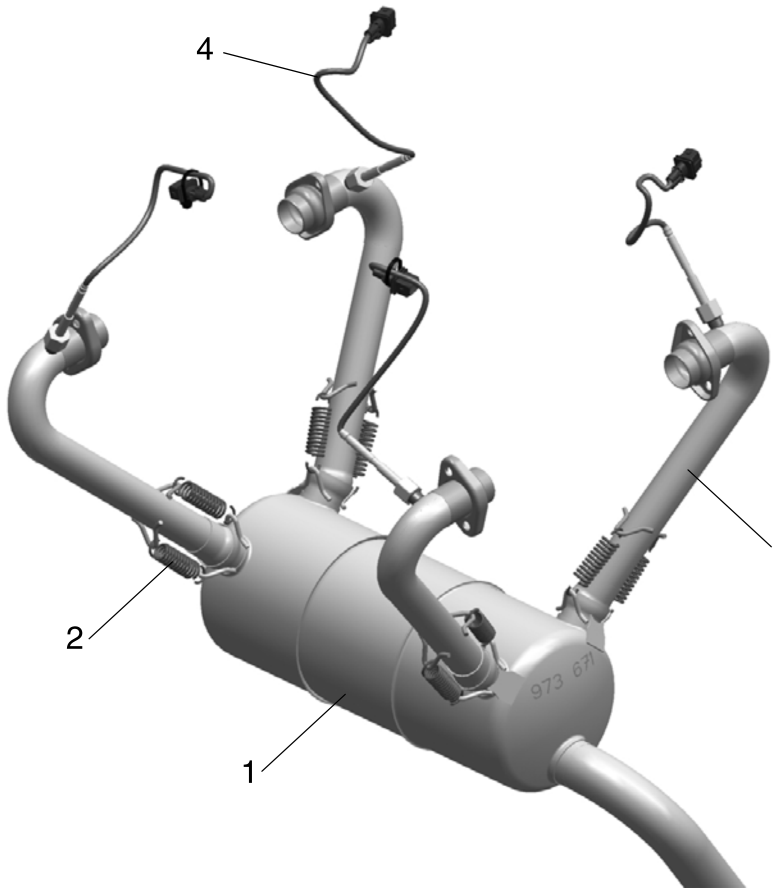
⚠ WARNING Non-compliance can result in serious injuries or death! Connect drainage lines, otherwise emerging fuel from a possible leakage could drip onto the exhaust system. RISK OF FIRE!

NOTICE The exhaust system must be designed by the aircraft or fuselage manufacturer such that the permissible loads and bending moments on the points of attachment are not exceeded. The exhaust system may require additional support.

Table of contents

This section of the Installation Manual contains information on the exhaust system of the aircraft engines.

Overview Exhaust system



Part	Function
1	Muffler
2	Tension spring
3	Exhaust tube
4	EGT temperature sensor

Fig. 1 *06303*

3) Attaching of the exhaust system

General note

See the following graphic.

The shape and configuration of the exhaust system is essentially determined by the free space available in the aircraft.

Two M8x23 studs are provided on each cylinder for attaching the exhaust system.

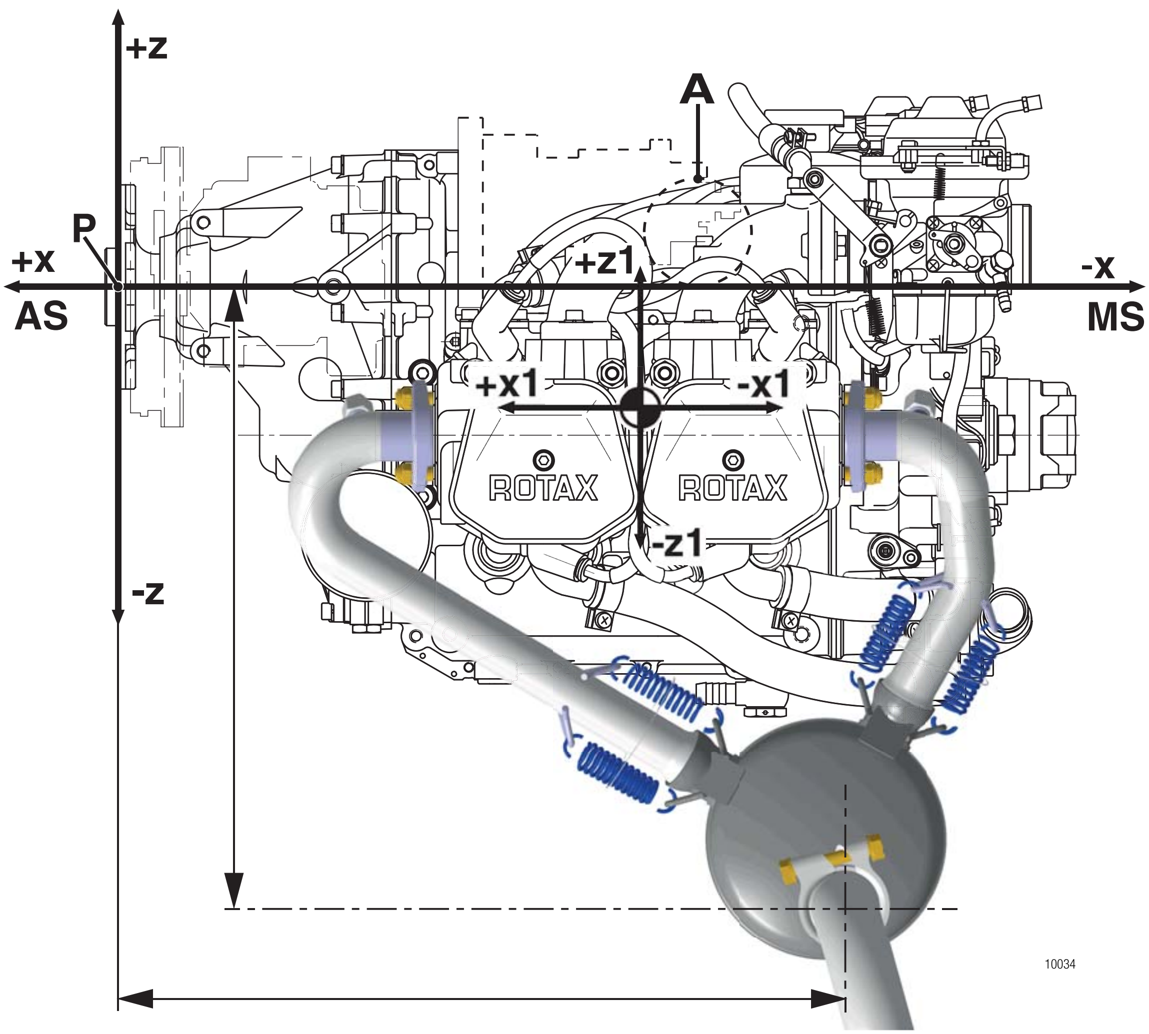
Location of the studs

NOTE: All dimensions from zero reference point (P).

	Coordinates		
Location	**x axis mm/in**	**y axis mm/in**	**z axis mm/in**
Cylinder 1	-160 mm (-6.3 in)	-196 mm (-7.72 in)	-82 mm (-3.23 in)
	-160 mm (-6.3 in)	-212 mm (-8.35 in)	-113 mm (-4.45 in)
Cylinder 2	-192 mm (-7.56 in)	196 mm (7.72 in)	-82 mm (-3.23 in)
	-192 mm (-7.56 in)	212 mm (8.35 in)	-113 mm (-4.45 in)
Cylinder 3	-408 mm (-16.06 in)	-196 mm (-7.72 in)	-82 mm (-3.23 in)
	-408 mm (-16.06 in)	-212 mm (-8.35 in)	-113 mm (-4.45 in)
Cylinder 4	-438 mm (-17.24 in)	196 mm (7.72 in)	-82 mm (-3.23 in)
	-438 mm (-17.24 in)	212 mm (8.35 in)	-113 mm (-4.45 in)

	Attachment points
Max. permissible forces (safe load) in (N/lb-force) on x, y and z axis	1000 N/224.81 lbf
Max. permissible bending moment (safe load) in (Nm) on x, y and z axis	40 Nm/30 ft.lb

Graphic Exhaust system assy.



1) Electric starter

General note

NOTICE Suitable for short starting periods only.

NOTICE Max. 80 °C (176 °F) ambient temperature by the electric starter housing. Activate starter for max. 10 sec. (without interruption), followed by a cooling period of 2 minutes!

1.1) Power supply wires from starter relay to the electric starter

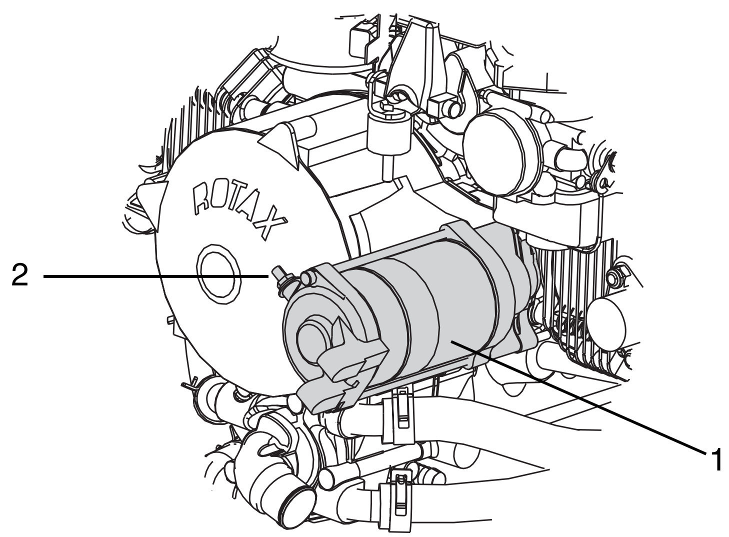
Cross section At least 16 mm² (2.48 in²).

Output 0.7 kW (0.9 kW optional)

Connection See Fig. 2.

Plus terminal (2): M6 screw connection (tightening torque 4 Nm (36 in.lb)) suitable for cable terminals according to DIN 46225 (MIL-T-7928; PIDG or equivalent).

Graphic Connection



Part	Function
1	Electric starter
2	Plus terminal

Fig. 2 00545

Grounding Grounding cable via engine block.

1.2) Starter relay assy. technical data

General note	See Fig. 3. **NOTICE** Activation of starter relay limited to short duration. The duty cycle over an interval of 4 minutes is 25%.
Nominal voltage	- 12 V/DC
Control voltage	- Min. 6 V - Max. 18 V
Switching current	- Max. 75 A 8 (permanent) - Max. 300 A/1 sec. (short duration)
Ambient temperature range	Ambient temperature range: - Min. -40 °C (-40 °F) - Max. +100 °C (212 °F)
Weight	See chap. 72-00-00 section: Technical data.
Connections	**Main current connections (1):** M6 screw connection (tightening torque 4 Nm (36 in.lb.)) suitable for cable terminals according to DIN 46225 (MIL-T-7928; PIDG or equivalent). **Control wiring (2):** 6.3x0.8 plug connector suitable for Faston connector (female) according to DIN 46247 (MIL-T-7928; (PIDG) or equivalent).