

0.1 RECORD OF REVISION

Any revisions or amendments to the present manual shall be issued in the form of bulletins with attached new pages. It is in the interests of every user to enter such revision into the table of revisions and to replace the existing page by the new one. The revised or corrected text shall be indicated by a vertical line on page fore-edge and the page shall bear revision number and date of its issue.

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1.6.6. Powerplant

1.6.6.1. Model Club "FG912 configuration"

Powerplant of model Club "FG912 configuration" consists of engine Rotax 912 ULS and propeller EVRA PERFORMANCE LINE 175/xxx/805.5.

1.6.6.1.1. Engine Rotax 912 ULS

Rotax 912 ULS is 4-stroke, 4-cylinder horizontally opposed, spark ignition engine, one central camshaft-push-rods-OHV. Liquid cooled cylinder heads, ram air cooled cylinders. Dry sump forced lubrication. The engine is fitted with electric starter, AC generator, mechanical fuel pump. Propeller is driven via integrated gearbox with mechanical shock absorber and overload clutch.

For more details see the Maintenance Manual for Rotax Engine Type 912 Series, Ref. No.: MML-912.

Engine power (ISA)	
Max. take-off power	73,5 kW / 100 hp (at 5800 min ⁻¹)
Max. continuous power	69,0 kW / 94 hp (at 5500 min ⁻¹)
Engine limitations	
Engine speed	
Maximum take-off	5800 min ⁻¹ (max. 5 min)
Maximum continuous	5500 min ⁻¹
Idling	≈1400 min ⁻¹
Cylinder head coolant temperature	
Max.	120 °C
Coolant temperature	
Max.	120 °C
Oil temperature	
Min.	50 °C
Normal	90-110 °C
Max.	130 °C
Oil pressure	
Min.	0,8 bar / 12 psi (below 3500 min ⁻¹)
Normal	2-5 bar / 29-73 psi (above 3500 min ⁻¹)
Max.	7 bar / 102 psi (for short period admissible at cold start)
Fuel pressure	
Min.	0,15 bar / 2,20 psi
Max.	0,50 bar / 7,26 psi
Engine start, operating temperature	
Min.	-25 °C
Max.	+50 °C

Air and water-cooling system:

Engine has combined air and water cooling system.

Water cooling system consists of water thermostat and water radiator through which the coolant flows to a water pump and then is distributed to the water-cooled engine parts inside of engine. Water radiator is attached in the holder fixed in the middle of lower engine cowling. Overflow bottle is attached at firewall and connected by a hose with the expansion tank. Expansion tank located on top of the engine allows coolant expansion.

Cooling air is received through the two upper engine cowling intakes and is baffled to the engine compartment.

The coolant temperature sensor is located in the tube between expansion tank and water thermostat.

The cylinder head coolant temperature sensor is installed at the cylinder head of right rear cylinder (in flight direction). This system allows for accurate measurement of engine temperature, even in event of fluid loss (fig. 1.6.6.1.2-5).

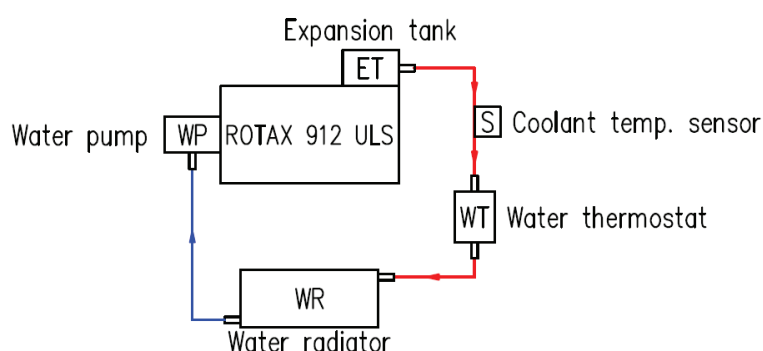


Fig. 1.6.6.1.2-5 Engine water cooling system, model Club

Induction system:

Air intake is located on the left side from spinner. The cold air flows through the ram air tunnel (glued at the lower engine cowling) and air hose to the air filter holder with preheating. From the shroud installed on the muffler is taken the hot air for the air filter holder with preheating. Air filter holder with preheating is fitted with two flaps operated by controller in the central tunnel (see Chapter 1.6.7.1.1) for adjusting of intake air temperature. From the air filter holder with preheating follows the air through the air filter to the airbox and then to the carburetors.

Fuel system:

Fuel system is identical with the model Club "FG912 configuration". For more information refer to the Chapter 1.6.6.1.2.

Oil system:

Oil system is identical with the model Club "FG912 configuration". For more information refer to the Chapter 1.6.6.1.2.

Air and water-cooling system:

The engine has combined air and water cooling system.

Water cooling system consists of water thermostat and water radiator with increased efficiency through which the coolant flows to a water pump and then is distributed to the water-cooled engine parts inside of engine. Water radiator is attached in the holder fixed in the middle of lower engine cowling. Overflow bottle is attached at firewall and connected by a hose with the expansion tank. Expansion tank located on top of the engine allows coolant expansion.

Cooling air is received from the left side of spinner and distributes to the cylinders by means of cooling air distributor. There are also two upper engine cowling's intakes through which the cooling air intakes to the engine compartment.

The coolant temperature sensor is located in the tube between expansion tank and water thermostat.

The cylinder head coolant temperature sensor is installed at the cylinder head of right rear cylinder (in flight direction). This system allows for accurate measurement of engine temperature, even in event of fluid loss (fig. 1.6.6.1.2-5).

Induction system:

Induction system is identical with the model Club "FG912 configuration". For more information refer to the Chapter 1.6.6.1.2.

Exhaust system:

Exhaust system is identical with the model Club "FG912 configuration". For more information refer to the Chapter 1.6.6.1.2.

1.6.6.3. Model Speed “RG914 configuration”

Powerplant of model Speed “RG914 configuration” consists of engine Rotax 914 UL and propeller WOODCOMP SR3000/2N.

1.6.6.3.1. Engine Rotax 914 UL

Rotax 914 UL is 4-stroke, 4-cylinder horizontally opposed, spark ignition engine, one central camshaft-push-rods-OHV. Liquid cooled cylinder heads, ram air cooled cylinders. Dry sump forced lubrication. The engine is fitted with electric starter, AC generator. Propeller is driven via integrated gearbox with mechanical shock absorber and overload clutch. Engine is fitted with turbo charger. For more detail see the Maintenance Manual for Rotax Engine Type 914 Series, Ref. No.: MML-914.

Engine power (ISA)	
Max. take-off power	84,5 kW / 115 hp (at 5800 min ⁻¹)
Max. continuous power	73,5 kW / 100 hp (at 5500 min ⁻¹)
Engine limitations	
Engine speed	
Maximum take-off	5800 min ⁻¹ (max. 5 min)
Maximum continuous	5500 min ⁻¹
Idling	≈1400 min ⁻¹
Manifold pressure	
At take-off power	Max. 1350 hPa
At continuous power	Max. 1200 hPa
Cylinder head coolant temperature	
Max.	120 °C
Coolant temperature	
Max.	120 °C
Oil temperature	
Min.	50 °C
Normal	90-110 °C
Max.	130 °C
Oil pressure	
Min.	0,8 bar / 12 psi (below 3500 min ⁻¹)
Normal	2-5 bar / 29-73 psi (above 3500 min ⁻¹)
Max.	7 bar / 102 psi (for short period admissible at cold start)
Fuel pressure	
Min.	0,15 bar / 2,18 psi
Normal	0,25 - 0,75 bar / 3,63 -10,88 psi
Max.	0,85 bar / 12,33 psi
Critical flying altitude	
At take-off power	Max. 2450 m (8000 ft) ASL
At continuous power	Max. 4875 m (16000 ft) ASL
Airbox temperature	
Intervention temperature	72 / 88* °C
Engine start, operating temperature	
Min.	-25 °C
Max.	+50 °C

* 914 UL starting with S/N 4,417.598 (TCU TNr. 966471)

Oil system:

The engine Rotax 914 UL has a dry sump forced lubrication system. The oil pump is driven by means of camshaft. The oil accumulates at the bottom of crankcase and it is forced back to the oil tank by energy of gassed in the crankcase. The oil pump sucks the engine oil from the oil tank, through the oil thermostat and oil filter and ensures the engine lubrication. In dependence of temperature, the oil thermostat opens the circuit of oil cooler. The oil tank is equipped with a venting hose (fig. 1.6.6.3.2-3).

The oil temperature sensor for reading of the oil inlet temperature is screwed into the oil pump housing.

The oil pressure sensor is screwed into the crankcase on the right side of engine.

Use only oil with API classification „SG“ or higher! Due to the high stresses in the reduction gears, oils with gear additives such as good quality 4 stroke motorcycle oils are highly recommended. Heavy duty semi- or fully synthetic (depending on fuel type used) brand name oils are recommended.

Oil system capacity: Approx. 3,5 litres

Oil consumption: Max. 0,06 l/h

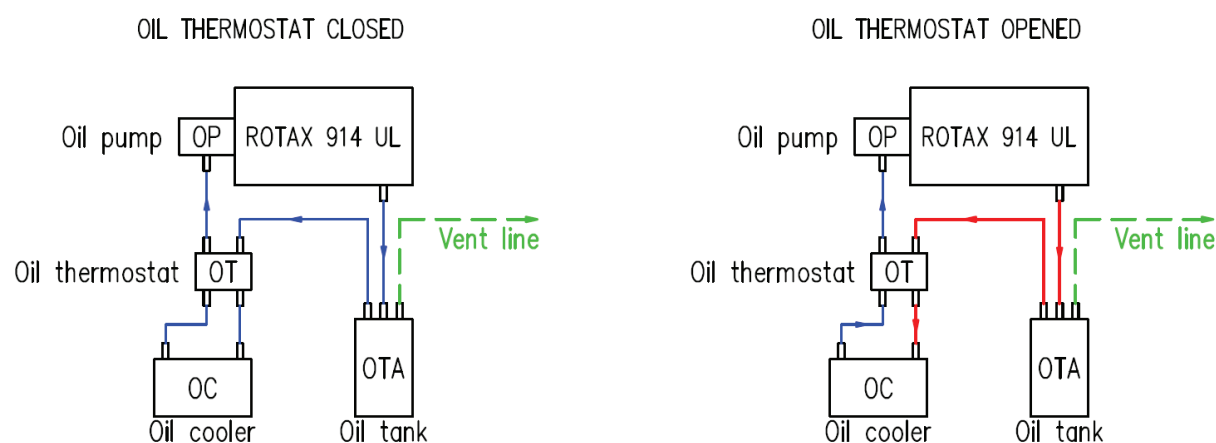


Fig. 1.6.6.3.2-3 Oil system, model Speed "RG914 configuration"

Refer to the Maintenance Manual for Rotax Engine Type 914 Series, Ref. No.: MML-914 for additional information.

WARNING

Do not use AVGAS 100 LL with fully synthetic engine oils!

Air and water-cooling system:

Engine has combined air and water cooling system.

Water cooling system consists of water thermostat and water radiator through which the coolant flows to a water pump and then is distributed to the water-cooled engine parts inside of engine. Water radiator is attached in the holder fixed on the right side of lower engine cowling. Overflow bottle is attached at firewall and connected by a hose with the expansion tank. Expansion tank located on top of the engine allows coolant expansion.

Cooling air is received through the two upper engine cowling intakes and is baffled to the engine compartment. There is also cooling air distributor installed on the engine that distributes the cooling air to the cylinders.

The coolant temperature sensor is located in the tube between expansion tank and water thermostat.

The cylinder head coolant temperature sensor is installed at the cylinder head of right rear cylinder (in flight direction). This system allows for accurate measurement of engine temperature, even in event of fluid loss (fig. 1.6.6.3.2-4)

2.2.9. Winter operation

2.2.9.1. General

As a winter operation can be considered the conditions if outside temperature falls below +5 °C. The aircraft must be prepared for winter operation.

2.2.9.2. Preparing the aircraft for winter operation

Airframe:

- Lubricate the aircraft per Lubricating Chart, if from the last 100 hrs. inspection passed more than 6 months.
- Check fuel tanks venting.
- Check attachment of wing, ailerons, flaps and tail units; lubricate per Lubricating Chart.

Powerplant:

- Check the condition of coolant in the water cooling system to avoid of water freezing in the system and engine.
- Check electrodes of the spark plugs and adjust as necessary.

Pre-flight inspection:

In addition during the pre-flight inspection in winter operation must be done:

- Remove the ice from the aircraft surfaces.
- Check control surfaces free movement and cleanness of slots of control surfaces and flaps.
- Check cleanness of the fuel tank venting.
- Check the fuel for water presence prior filling the tanks.
- For model Club during winter operation on the frozen or harden surface of the runway is recommended to remove the wheel fairings to avoid of their damages by accumulated snow and ice.

Engine and oil pre-heating:

There is possible to start an engine without need of pre-heating if outside temperature is not below +5 °C. It is recommended to pre-heat the engine and oil if temperature falls below +5 °C. Use suitable air heater or a dryer.

Blow the hot air from the front into the hole around the propeller hub. Temperature of hot air should not exceed 100 °C. Pre-heat until cylinder head coolant temperature and oil temperature exceed +20 °C.

WARNING

Never use open fire to pre-heat an engine!

CAUTION

If cylinder heads coolant and oil temperatures fall during parking among flights than is recommended to start and warm up engine from time to time. Do not open choke when starting hot engine!