ROTAX
AIRCRAFT ENGINES

OPERATORS MANUAL

FOR ROTAX® ENGINE TYPE 914 SERIES

ROTAX® **914 UL 3** WITH OPTIONS

part no.: 899643

⚠ WARNING

Before starting the engine, read the Operator´s Manual, as it contains important safety relevant onformation. Failure to do so may result in personal injuries including death. Consult the original equipment manufacturer´s handbook for additional instructions!

Approval of translation has been done to best knowledge and judgement - in any case the original text in german language is authoritative.

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2) Index

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3) Introduction

Congratulations on your decision to purchase a ROTAX aircraft engine.

Before operating the engine, carefully read this Operator's Manual. The Manual provides you with basic information on the safe operation of the engine.

If any passages of the Manual are not clearly understood or in case of any questions, please, contact an authorized Distribution- or Service Center for ROTAX aircraft engines.

We wish you much pleasure and satisfaction flying your aircraft with this ROTAX engine.

3.1) Remarks

The purpose of this Operator's Manual is provided to familiarize the owner/ user of this aircraft engine with basic operating instructions and safety information.

For more detailed maintenance, safety and flight information, consult the documentation provided by the aircraft manufacturer and dealer.

For further information on maintenance and spare parts service, contact the nearest ROTAX distribution Center (see Chapter 13).

3.2) Engine serial number

On all enquiries or parts orders, always indicate the engine serial number, as the manufacturer makes modifications to the engine for product improvement. The engine serial number should always be used when ordering parts to ensure correct part selection prior to shipment.

The engine serial number is located on the top of the crankcase, magneto side. See fig. 2.

NOTES

4) Safety

Although the mere reading of these instructions will not eliminate a hazard, the understanding and application of the information herein will promote the proper use of the engine.

The information and components-/system descriptions contained in this Operator's Manual are correct at the time of publication. ROTAX however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on its products previously manufactured.

ROTAX reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring obligation.

The illustrations in this Manual show the typical construction. They may not represent in full detail or the exact shape of the parts which have the same or similar function.

Specifications are given in the SI metric system with the USA equivalent in parenthesis. Where precise accuracy is not required, some conversions are rounded off for easier use.

This document has been translated from the German language and the original German text shall be deemed authoritative.

4.1) Repeating symbols

This Manual uses the following symbols to emphasize particular information:

▲ WARNING: Identifies an instruction which, if not followed, may cause serious injury including the possibility of death.

■ CAUTION: Denotes an instruction which, if not followed, may severely damage the engine or other component.

◆ NOTE: Indicates supplementary information which may be needed to fully complete or understand an instruction.

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4.2) Safety information

▲ WARNING: Never fly the aircraft equipped with this engine at locations, airspeeds, altitudes, or other circumstances from which a successful no-power landing cannot be made, after sudden engine stoppage.

Unless correctly equipped to provide enough electrical power for night VFR (according latest requirement as ASTM), the ROTAX 914 UL is restricted to DAY VFR only.

— This engine is not suitable for acrobatics (inverted flight, etc.).

— This engine shall not be used on rotor wing aircraft (helicopters) or any similar aircraft.

— 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, ROTAX grants no warranty or representation on the suitability of its engine's use on any particular aircraft. Further, ROTAX 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.

— Whether you are a qualified pilot or a novice, complete knowledge of the aircraft, its controls and operation is mandatory before venturing solo. Flying any type of aircraft involves a certain amount of risk. Be informed and prepared for any situation or hazard associated with flying.

A recognized training program and continued education for piloting an aircraft is absolutely necessary for all aircraft pilots. Make sure you also obtain as much information as possible about your aircraft, its maintenance and operation from your dealer.

— You should be aware that any engine may seize or stall at any time. This could lead to a crash landing and possible severe injury or death. For this reason, we recommend strict compliance with the maintenance and operation and any additional information which may be given to you by your dealer.

— Respect all government or local rules pertaining to flight operation in your flying area. Fly only when and where conditions, topography, and airspeeds are safest.

— Select and use proper aircraft instrumentation. This instrumentation is not included with the ROTAX engine package. Only approved instrumentation may be installed.

— Before flight, ensure that all engine controls are operative. Make sure all controls can be easily reached in case of an emergency.

— Unless in a run up area, never run the engine with the propeller turning while on the ground. Do not operate engine if bystanders are close.

— In the interst of safety, the aircraft must not be left unattended while the engine is running.

— Keep an engine log and respect engine and aircraft maintenance schedules. Keep the engine in top operating condition at all times. Do not operate any aircraft which is not properly maintained or has engine operating irregularities which have not been corrected.

  Since special tools and equipment may be required, engine servicing should only be performed by an authorized ROTAX engine dealer or a qualified trained mechanic approved by the local airworthiness authority.

— 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.

— Certain areas, altitudes and conditions present greater risk than others. The engine may require carburetor recalibration or humidity or dust/sand preventative equipment, or additional maintenance may be required.

  Consult your aircraft dealer or manufacturer and obtain the necessary information, especially before flying in new areas.

— Never operate the engine and gearbox without sufficient quantities of lubricating oil.

— Periodically verify level of coolant.

— Never exceed maximum rated r.p.m.
Allow the engine to cool at idle for several minutes before turning off the engine.

— This engine may be equipped with an Airborne vacuum pump. The safety warning accompanying the vacuum pump must be given to the owner/ operator of the aircraft into which the vacuum pump is installed.

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4.3) Technical documentation

These documents form the instructions for continued airworthiness of ROTAX aircraft engines:

- Installation Manual 914 F / UL
- Operators Manual 914 Series
- Maintenance Manual 914 F / UL
- Overhaul Manual 914 Series
- Illustrated Parts Catalog 914 F / UL
- Alert Service Bulletins
- Service Bulletins
- Service Instructions
- Service Letters

Any reference to a document refers to the latest edition issued by ROTAX, if not stated otherwise.

◆ NOTE: The status of Manuals can be determined by checking the table of amendments of the Manual. The 1st column of this table is the revision status. Compare this number to that listed on the ROTAX WebSite: www.rotax-aircraft-engines.com. Updates and current revisions can be downloaded for free.

The information given in the are based on data and experience that are considered applicable for professionals under normal conditions.

The fast technical progress and variations of installation might render present laws and regulations inapplicable or inadequate.

The illustrations in this Manual are mere sketches and show a typical arrangement. They may not represent the actual part in all its details but depict parts of the same or similar function. Therefore deduction of dimensions or other details from illustrations is not permitted.

All necessary documentation is available from the ROTAX Distribution- and Service Centers (see Chapter 13).

◆ NOTE: The Illustrations in this Operator´s Manual are stored in a graphic data file and are provided with a consecutive irrelevant number.

This number (e.g. 00277) is of no significance for the content.

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5) Index of pages

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6) List of amendments

Approval*

The technical content is approved under the authority of DOA Nr. EASA.21J.048.

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Currt no.	Chap-ter	Pages	Date of modification	Note of approval	Date of approval by authority	Date of insertion	Marks / Signature
0	1÷13	all	01 01 2007	DOA*			

NOTES

7) Description of design

4-stroke, 4 cylinder horizontally opposed, spark ignition engine,with turbo charger and electronic control of boost pressure (TCU = turbocharge control unit), one central camshaft - push-rods - OHV

Liquid cooled cylinder heads

Ram air cooled cylinders

Dry sump forced lubrication

Dual breakerless capacitor discharge ignition

2 constant depression carburetors

2 electric fuel pumps (12V DC)

Prop drive via reduction gear with integrated shock absorber and overload clutch

◆ NOTE: The overload clutch is installed on all **serial production** aircraft engines which are certified and on non-certified aircraft engines of the configuration 3.

Stainless steel exhaust system

Engine suspension frame

Electric starter (12V 0,6 kW)

Electric starter (12V 0,9 kW), **optional**

Integrated AC generator with ext. rectifier-regulator (12V 20A DC)

External alternator (12V 40A DC), **optional**

Vacuum pump: (only for configuration 2 and configuration 4 possible), **optional**

Hydraulic constant speed propeller governor: (for configuration 3 only), **optional**

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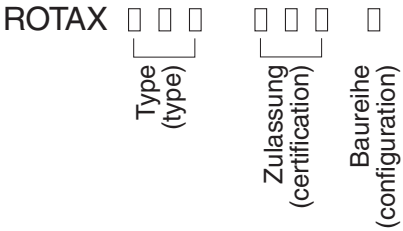
7.1) Type description

e.g. ROTAX 914 F 2

◆ NOTE: The type designation is of the following composition.



Type: **914** ..... 4-cyl. horizontalle opposed, normal aspirated engine

Certification: **F, S** ..... certified to FAR 33/ JAR-E (TW10 - ACG)

UL ..... non-certified aircraft engines

Configuration: **2 .....** Prop shaft with flange for fixed pitch prop, P.C.D. 75 mm, P.C.D. 80 mm and 4" P.C.D.

3 ..... Prop shaft with flange for constant speed propeller P.C.D. 75 mm, P.C.D. 80 mm, P.C.D. 4" and drive for hydraulic governor for constant speed propeller.

4 ..... Prop flange for fixed pitch propeller P.C.D. 75 mm, P.C.D. 80 mm, P.C.D. 4" and prepared for retrofit of a hydraulic governor for constant speed propeller.

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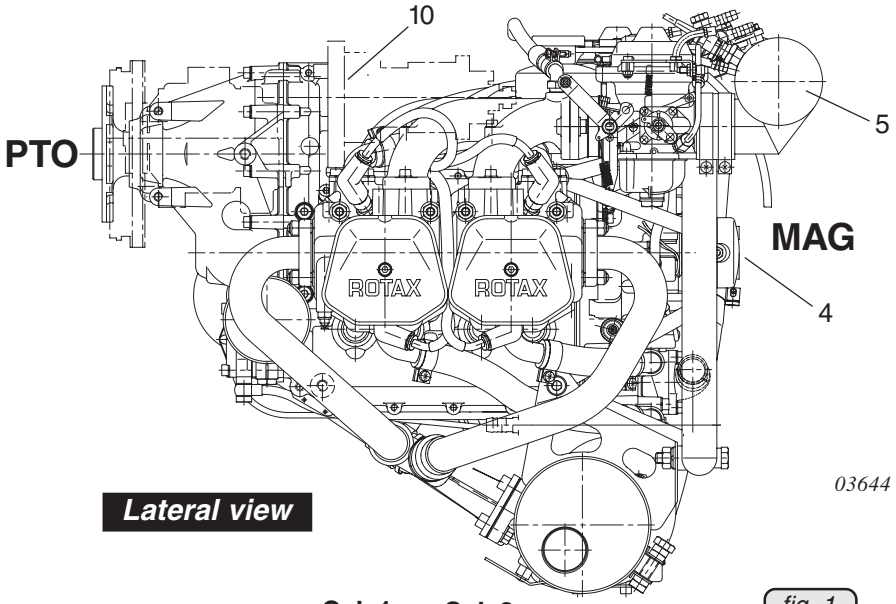
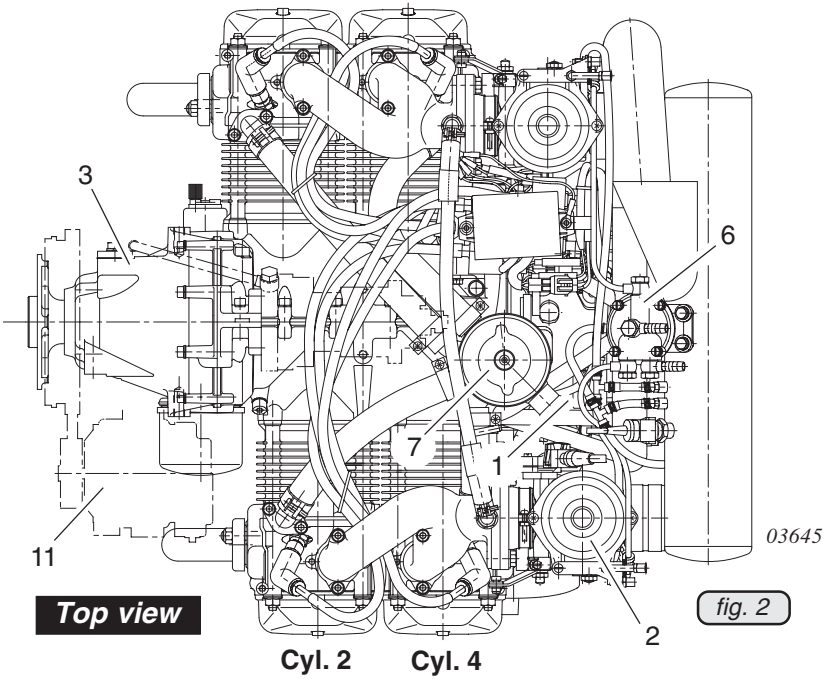
7.2) Denomination of cylinders:



Lateral view

fig. 1



Top view

fig. 2

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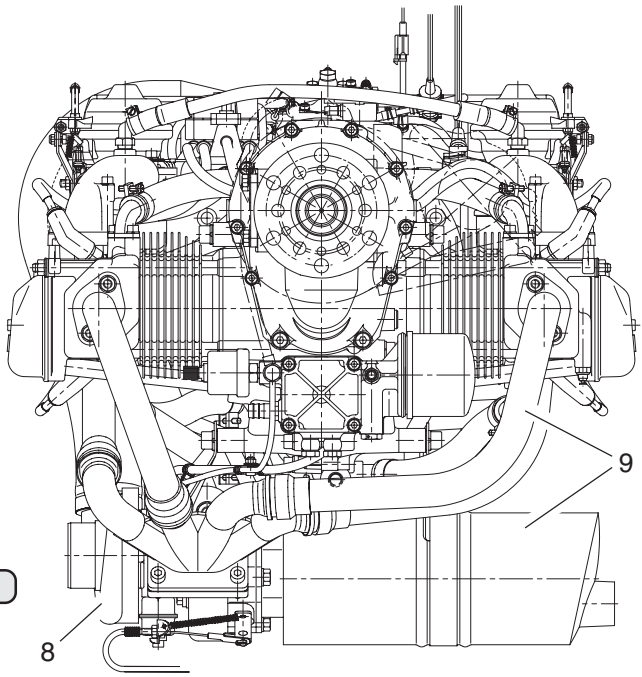

fig. 3

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front view

PTO power take off side

MS magneto side

Cyl. 1_____Cylinder 1

Cyl. 2_____Cylinder 2

Cyl. 3_____Cylinder 3

Cyl. 4_____Cylinder 4

(1) engine serial number

(2) CD carburetor

(3) propeller gearbox

(4) electric starter

(5) intake air distributor "Airbox"

(6) fuel pressure control "Airbox"

(7) expansion tank with excess pressure valve

(8) turbocharger

(9) exhaust system

(10) vacuum pump or hydraulic governor for constant speed propeller

(11) external generator

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8) Technical data

8.1) Dimensions

Description	914 UL / F
Bore	79,5 mm (3,13 in.)
Stroke	61 mm (2,40 in.)
Displacement	1211 cm3 (73,9 in^3)
Compression ratio	9,0 : 1

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8.2) Weights

◆ NOTE: The stated weights are dry weights (without operating fluids)

with: carburetors, generator, ignition unit and oil container, electric starter, stainless steel muffler, engine suspension frame, turbo charger and TCU (turbocharge control unit)

without: radiator and fuel pump

Weight in kg (lb)	914 UL	914 F
Configuration 2/4	71,7 (158) with overload clutch	71,7 (158)
	70,0 (154) without clutch	
Configuration 3	74,4 (164)	

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Equipment (optional):

External alternator: ..... 3,0 kg (6,6 lb)

Vacuum pump: ..... 0,8 kg (1,8 lb)

Overload clutch: ..... 1,7 kg (3,7 lb)

◆ NOTE: The overload clutch is installed on all certified aircraft engines and on non-certified aircraft engines of the configuration 3.

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8.3) Fuel consumption

Fuel consumption in l/h (USgal/h	914 UL / F
at take-off performance	33,0 (8,7)
at max. continuous performance	27,2 (7,2)
at 75 % continuous performance	20,4 (5,4)
specific fuel consumption at max. continuous performance	276 g/kWh (0,458 lb/hph)

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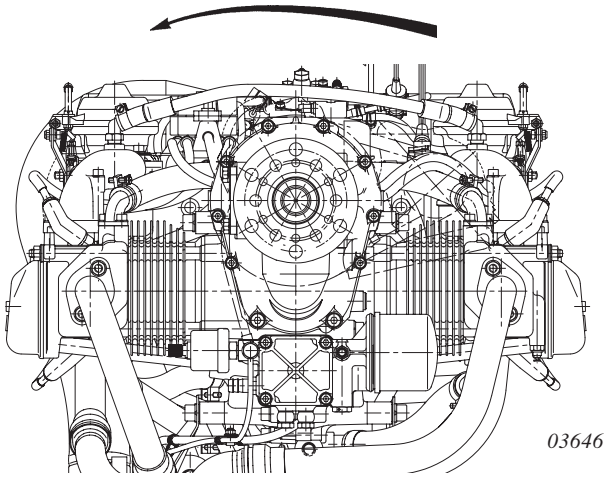
8.4) Direction of rotation

Direction of rotation on propeller shaft: ..... counter-clockwise, looking at p.t.o. side of engine.

◆ NOTE: Propeller shouldn't be turned reverse the normal direction of engine rotation.

normal direction of propeller rotation (engine)



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9) Description of systems

9.1) Cooling system

See fig. 4.

The cooling system of the ROTAX 914 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.

The coolant flow is forced by a water pump, driven from the camshaft, from the radiator to the cylinder heads. From the top of the cylinder heads the coolant passes on to the expansion tank (**1**). Since the standard location of the radiator (**2**) is below engine level, the expansion tank located on top of the engine allows for coolant expansion.

The expansion tank is closed by a pressure cap (**3**) (with excess pressure valve and return valve). At temperature rise of the coolant the excess pressure valve opens and the coolant will flow via a hose at atmospheric pressure to the transparent overflow bottle (**4**). When cooling down, the coolant will be sucked back into the cooling circuit.

◆ NOTE: Coolant temperatures are measured by means of temperature probes installed in cylinder heads 2 and 3.

Readings are taken on measuring point of the hottest cylinder head, depending on engine installation.

Coolant, see Chapter 10.2.1).

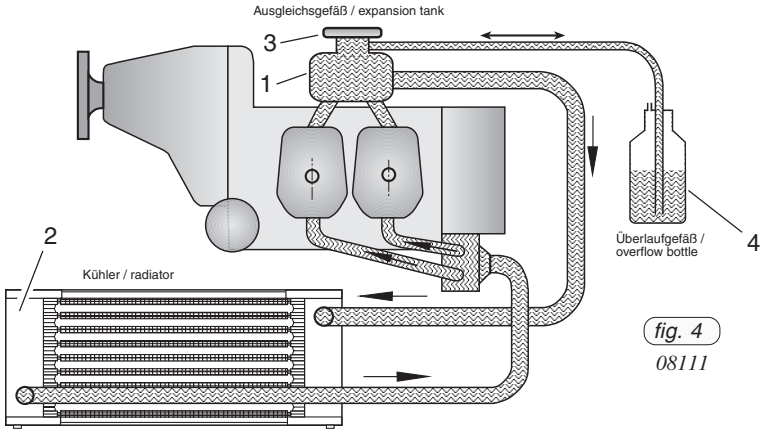

fig. 4
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9.2) Fuel system

See fig. 5.

The fuel flows from the tank (**1**) via a coarse filter/water trap (**2**) to the two electric fuel pumps (**3**) connected in series. From the pumps fuel passes on via the fuel pressure control (**4**) to the two carburetors (**5**).

◆ NOTE: Parallel to each fuel pump a separate check valve (**6**) is installed.

Via the return line (**7**) surplus fuel flows back to the fuel tank.

■ CAUTION: The return line must not present flow resistance. Pay attention to possible constriction of diameter or obstruction, to avoid overflowing of carburetors.

◆ NOTE: The fuel pressure control ensures that the fuel pressure is always maintained approx. 0,25 bar (3,63 psi) above the variable boost pressure in the "airbox" and thus ensures proper operation of the carburetors.

Fuel, see Chapter 10.2.2).

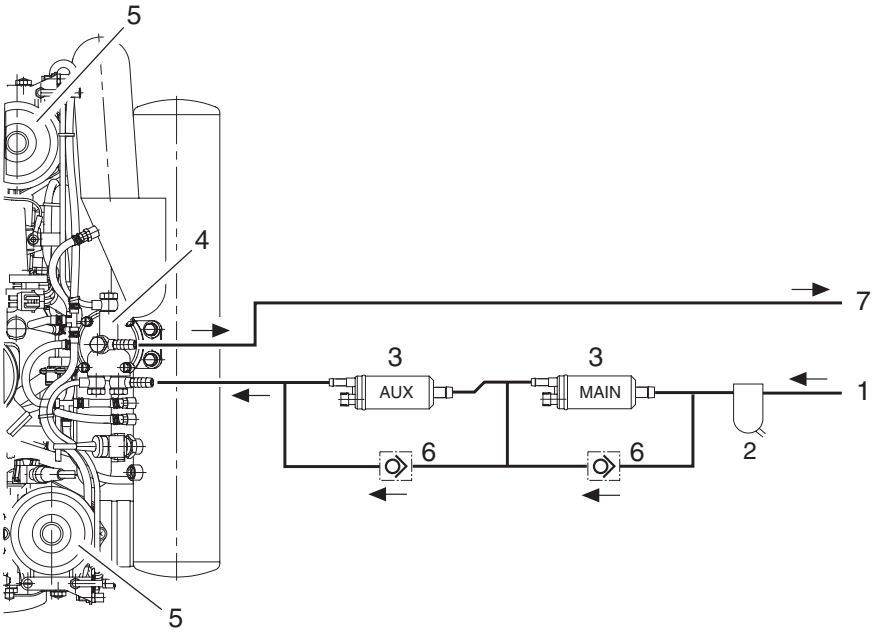

fig. 5

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9.3) Lubrication system

See fig. 6.

The ROTAX 914 engine is provided with a dry sump forced lubrication system with a main oil pump with integrated pressure regulator and an additional suction pump.

◆ NOTE: The oil pumps are driven by the camshaft.

The main oil pump sucks the motor oil from the oil tank (**1**) via the oil cooler (**2**) and forces it through the oil filter to the points of lubrication (lubricates also the plain bearings of the turbo charger and the propeller governor).

The surplus oil emerging from the points of lubrication accumulates on the bottom of crankcase and is forced back to the oil tank by the blow-by gases.

The turbo charger is lubricated via a separate oil line (from the main oil pump.

The oil emerging from the lower placed turbo charger collects in the oil sump by a separate pump and is pumped back to the oil tank via the oil line (**3**).

◆ NOTE: The oil circuit is vented via bore (**5**) in the oil tank.

◆ NOTE: There is an oil temperature sensor in the oil pump flange, for reading of the oil temperature.

Lubricants, see Chapter 10.2.3).

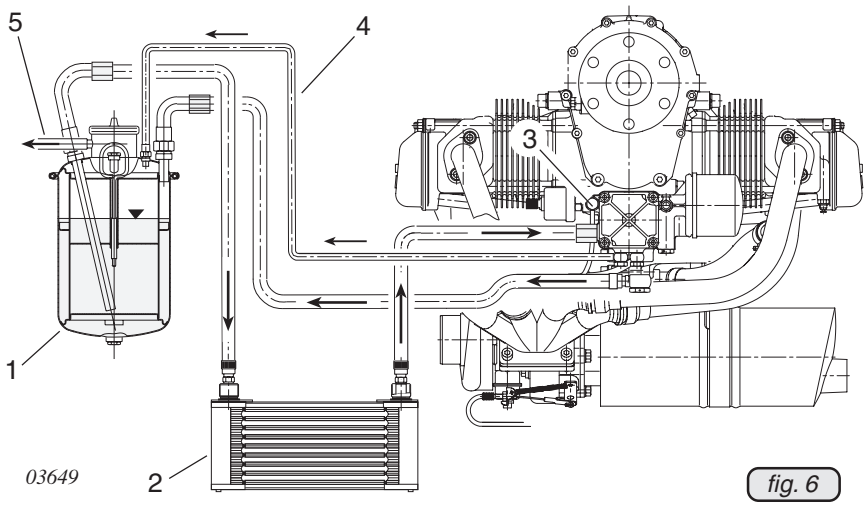

fig. 6

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9.4) Electric system

See fig. 7.

The ROTAX 914 engine is equipped with a dual ignition unit of a breakerless, capacitor discharge design, with an integrated generator.

The ignition unit is completely free of maintenance and needs no external power supply.

Two independent charging coils (**1**) located on the generator stator supply one ignition circuit each. The energy is stored in capacitors of the electronic modules (**2**). At the moment of ignition 2 each of the 4 external trigger coils (**3**) actuate the discharge of the capacitors via the primary circuit of the dual ignition coils (**4**).

Firing order: 1-4-2-3.

◆ NOTE: The 5th trigger coil (**5**) is planned for rev. counter signal.

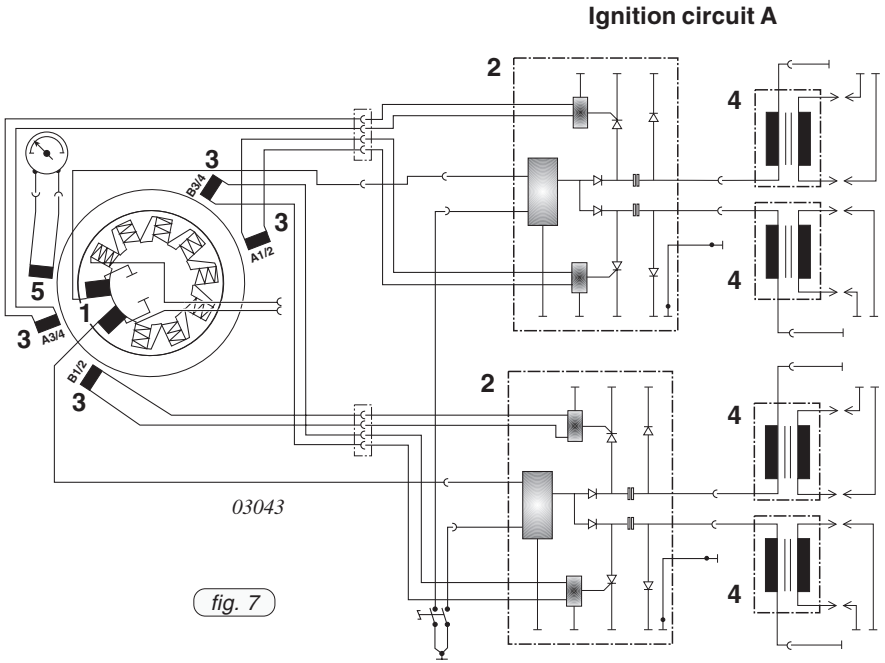

fig. 7

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9.5) Turbo charge and control system

See fig. 8 and 9.

The ROTAX 914 engine is equipped with an exhaust gas turbo charger, making use of the energy in the exhaust gas for precompression of the intake air (boost pressure).

The boost pressure in the airbox is controlled by means of an electronically controlled flap (wastegate) in the exhaust gas turbine.

◆ NOTE: The wastegate regulates the speed of the turbo charger and consequently the boost pressure in the airbox.

The required nominal boost pressure in the airbox is determined by the throttle position sensor mounted on the carburetor 2/4. The sensor's transmitted position is linear from 0 to 115% corresponding to a throttle position from idle to full power. See fig. 8.

For correlation between throttle position and nominal boost pressure in the airbox, refer to the diagram (fig. 9).

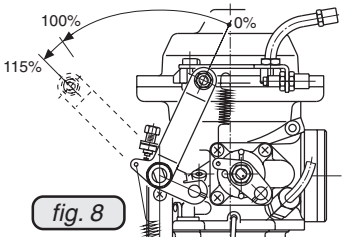

fig. 8

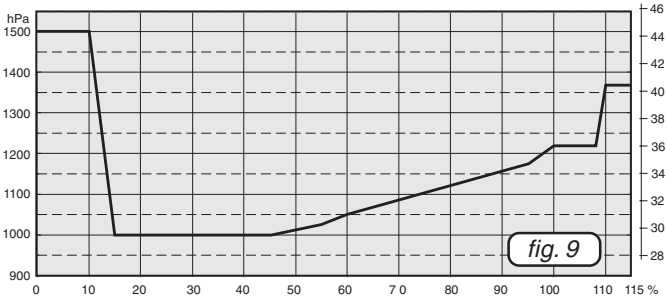

fig. 9

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The most important points for engine operation:

engine performance	throttle position	nominal airbox pressure
idling of engine	~ 0 %	1500 hPa (44,3 in. HG)
max. continuous performance	100 ÷ 108 %	1220 hPa (36,0 in. HG)
take-off performance	110 ÷ 115 %	1370 hPa (40,5 in.HG)

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◆ NOTE: In the course of model refinement some parameters have been slightly changed. Diagram and table show the current state of software.

■ CAUTION: As shown in the diagram, the throttle position at 108 ÷ 110 % results in a rapid rise of nominal boost pressure. To avoid unstable boost, the throttle should be moved smoothly through this area either to full power (115 %) or, on a power reduction, to max. continuous power.

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In this range (108 - 110 % throttle position) small changes in throttle position have a big effect on engine performance and speed, but are virtually not apparent for the pilot from the throttle lever position.

■ CAUTION: The exact setting for a specific performance is virtually impossible in this range and has to be prevented, as it might cause control fluctuations (surging).

Besides the throttle position, overspeeding of the engine and too high intake air temperature have an effect on the nominal boost pressure.
If one of the stated factors exceeds the specified limits, the boost pressure is automatically reduced, thus protecting the engine against overload.

The TCU (Turbo Control Unit) is furnished additionally with output connections for an external **"red"** boost lamp and an **"orange"** caution lamp for indication of function of the TCU.

When switching on the voltage supply, the two lamps are automatically subject to a function test. Both lamps illuminate for 1 - 2 seconds, then they extinguish. If they do not, a check as per Maintenance Manual is necessary.

▲ **WARNING:** The engine must not be taken into operation before having corrected the cause of deficiency.

Orange caution lamp:

The non-illuminated orange caution lamp signals that TCU is ready for operation.

If the lamp is blinking, this indicates a malfunction of the TCU or its periphery. See Chapter 10.4.6.

Red boost lamp:

— Exceeding of the admissible boost pressure will activate the red boost lamp, being continuously illuminated (see Chapter 10.4.4).

— The TCU registers the time of full throttle operation (boost pressure). Full throttle operation for longer than 5 minutes will make the red boost lamp blinking. See Chapter 10.4.5).

■ CAUTION: The red boost lamp helps the pilot to avoid full power operation for longer than 5 minutes as otherwise the engine would be thermally and mechanically overstressed.

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9.6) Propeller gearbox

See fig. 10.

For the engine type 914 two reduction ratios are available.

reduction ratio	914 UL/F
crankshaft : propeller shaft	2,43 : 1

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Depending on engine type, certification and configuration the propeller gearbox is supplied with or without an overload clutch.

◆ NOTE: The overload clutch is installed on **serial** production on all certified aircraft engines and on the non-certified aircraft engines of configuration 3.

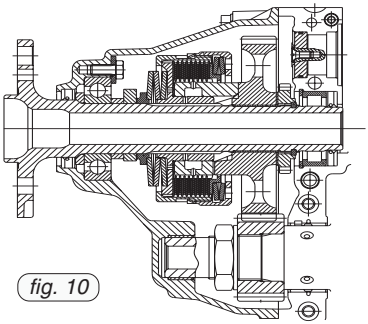

fig. 10

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◆ NOTE: Fig. 10 shows a propeller gearbox of configuration 2 with the integrated overload clutch.

The design incorporates a torsional shock absorber. The shock absorbing is based on progressive torsional cushioning due to axial spring load acting on a dog hub.

On the gearbox version with overload clutch the design incorporates a friction damped free play at the dogs to warrant proper engine idling. Due to this backlash at the dogs a distinct torsional impact arises at start, stop and at sudden load changes, but due to the built-in overload clutch it will remain harmless.

◆ NOTE: This overload clutch will also prevent any undue load to the crankshaft in case of ground contact of the propeller.

Alternatively **either** a vacuum pump **or** a hydraulic governor for constant speed propeller can be used. The drive is in each case via the propeller reduction gear.

9.6.1) Hydr. governor for const. speed propeller, vacuum pump:

Alternatively **either** a vacuum pump **or** a hydraulic governor for constant speed propeller can be used. The drive is in each case via the propeller reduction gear.

Gear ratio:

gear ratio	
crankshaft : propeller shaft	2,43 : 1
propeller shaft : hydraulic governor/vacuum pump	0,758 : 1
crankshaft : hydraulic governor/vacuum pump	1,842 : 1

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◆ NOTE: Transmission ratio between crankshaft and hydraulic governor or vacuum pump is 1,842 i.e. the speed of the hydraulic governor or vacuum pump is 0,54 of engine speed.

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10) Operating instructions

The data of the certified engines are based on type certificate of type 914 F (TW10 - ACG).

10.1) General limits of operation

10.1.1) Operating speeds and limits

1. Speed:

Take-off speed ..... 5800 rpm (5 min.)
Max. continuous speed ..... 5500 rpm
Idle speed ..... approx. 1400 rpm

2. Manifold pressure:

Take-off performance ..... max. 1350 hPa (39,9 in.HG)
Max. continuous performance ..... max. 1200 hPa (35,4 in.HG)

■ CAUTION: Due to the control behavior an overshooting of the manifold pressure is possible. But within 2 seconds this pressure has to stabilize within the allowance.

3. Acceleration:

Limit of engine operation at zero gravity and in **negative "g"** conditions

max. ..... 5 seconds at max. -0,5 g

4. Critical flying altitude:

Take-off performance ..... up to max. 2450 m (8000 ft.) above sea level
Continuous performance ..... up to max. 4500 m (16000 ft.) above sea level

■ CAUTION: Up to the stated critical flight altitude the respective manifold pressure is available.

5. Oil pressure:

max. ..... 7 bar (102 psi)

■ CAUTION: For a short period admissible at cold start.

min. ..... 0,8 bar (12 psi) (below 3500 rpm)
**1,5 bar (22 psi)*
normal ..... 2,0 ÷ 5,0 bar (29 ÷ 73 psi) (above 3500 rpm)
**1,5 ÷ *5,0 bar* (22 ÷ 73 psi)
**914 UL starting with S/N 4,417.665*
**914 F starting with S/N 4,420.085*

6. Oil temperature:

max. ..... 130 °C ..... (266 °F)
min. ..... 50 °C ..... (120 °F)
normal operating temperature ..... approx. 90 ÷ 110 °C (190÷230 °F)

7. Coolant
See Operating media Chapter 10.2.1

- In use of conventional coolant:

  Coolant temperature: (coolant exit temperature)

  max.....120 °C (248 °F)

  Cylinder head temperature:

  max.....135 °C (275 °F)

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

- In use of waterless coolant:

  Cylinder head temperature:

  max.....135 °C (275 °F)

  Permanent monitoring of cylinder head temperature is necessary.

8. Airbox temperature:

*intervention temperature ..... 72 °C (160° F)
*intervention temperature ..... 88 °C (190° F)

**914 UL commencing with S/N 4,417.598 (TCU part no. 966 471)*
** 914 F commencing with S/N 4,420.200 (TCU part no. 966 741)*

9. Fuel pressure:

max. ..... Airbox pressure + 0,35 bar (5,08 psi)
min. ..... Airbox pressure + 0,15 bar (2,18 psi)
normal ..... Airbox pressure + 0,25 bar (3,63 psi)

◆ NOTE: Exceeding the max. admissible fuel pressure will override the float valve of the carburetor.

10. Power consumption of the hydraulic propeller governor:
max. ..... 600 W

11. Power consumption of the vacuum pump:
max. ..... 300 W

12. Power consumption of the external alternator:
max. ..... 1200 W

13. Deviation from bank angle
max. ..... 40°

◆ NOTE: Up to this value the dry sump lubrication system warrants lubrication in every flight situation.

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10.1.1.1) Performance graphs for standard conditions ISA (International Standard Atmosphere)

Take-off performance ..... 84,5 kW at 5800 rpm
1300 hPa (38,4 in.HG)
*1320 hPa (39,0 in.HG)

Max. continuous performance ..... 73,5 kW at 5500 1/min
1150 hPa (34,0 in.HG)
*1180 hPa (34,9 in.HG)

◆ NOTE: The stated pressure in the suction tube is always lower by the pressure loss in the carburetors than the TCU controlled airbox pressure and may be therefore subject to bigger deviations.

** 914 UL starting with engine no. 4,417.598 (TCU part no. 966 471)*

** 914 F starting with engine no. 4,420.200 (TCU part no. 966 741)*

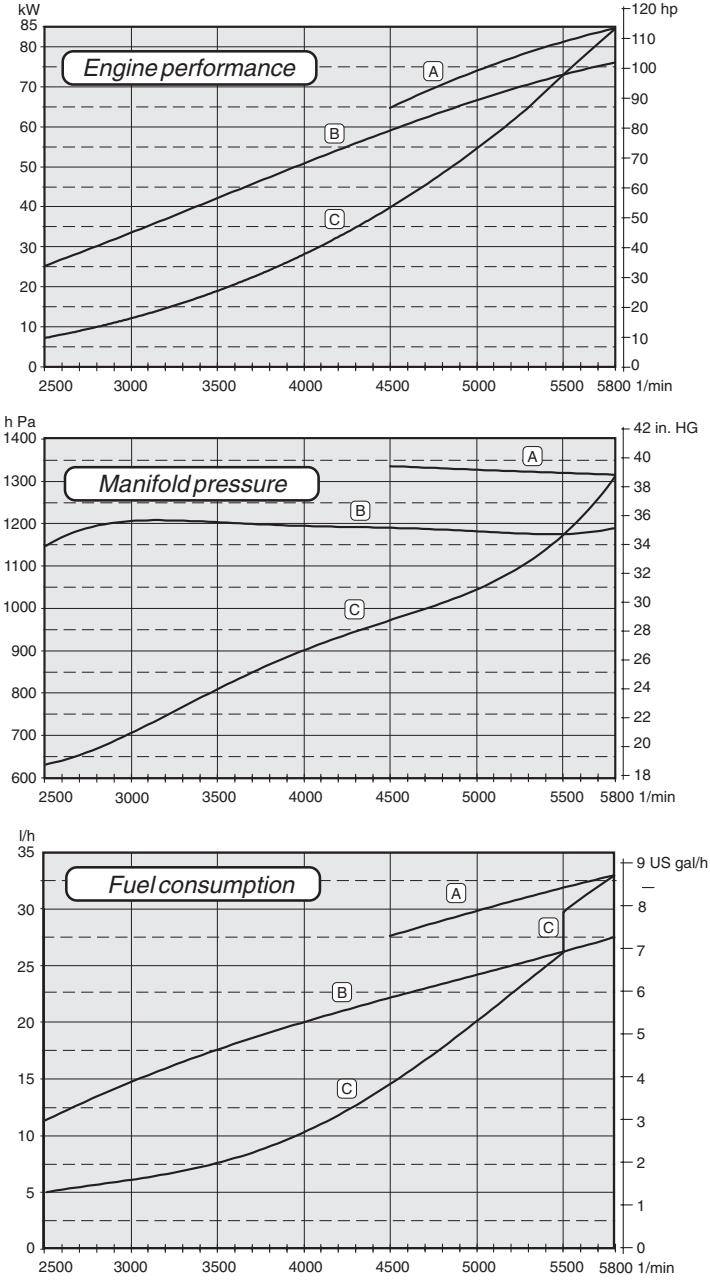

fig. 11

A: Engine curve (take-off performance)
B: Engine curve (continuous full throttle performance)
C: Propeller curve (power requirement of propeller)

d04024

Performance data for variable pitch propeller:

Engine operation is permitted without restriction between full throttle performance and power requirement of propeller, providing engine speed over 5500 r.p.m. is restricted to 5 minutes.

However, for economic reasons it is recommended to run the engine in accordance with the following table:

Power-Setting	Engine speed [rpm]	Performance [kW]	Torque [Nm][ft.lb.]		Manifold pres. [in.HG]	Throttle position [%]
Take-off power	5800	84,5	139	102	39	115,0
max. continuous power	5500	73,5	128	93	35	100,0
75%	5000	55,1	105	77	31	approx. 67
65%	4800	47,8	95	69	29	approx. 64
55%	4300	40,4	90	65	28	approx. 59

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Take-off performance (kW)

Altitude	Temperature ISA		Temperature difference to ISA																
(ft)	(°C)	(°K)	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35
-2000	19	292	101	99	97	95	94	92	90	89	87	86	84	83	81	80	79	78	76
0	15	288	100	98	96	94	93	91	89	88	86	85	83	82	80	79	78	77	
2000	11	284	99	97	95	93	92	90	88	87	85	84	82	81	79	78	77	76	
4000	7	280	98	96	94	92	91	89	87	86	84	83	81	80	78	77	76		
6000	3	276	97	95	93	91	90	88	86	85	83	81	80	79	77	76			
8000	-1	272	96	94	92	90	88	87	85	83	82	80	79	78	76				

Max. Continuous power (kW)

Altitude	Temperature ISA		Temperature difference to ISA																
(ft)	(°C)	(°K)	-45	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35
-2000	19	292	88	86	85	83	81	80	78	77	76	74	73	72	71	70	69	67	66
0	15	288	87	85	84	82	80	79	78	76	75	74	72	71	70	69	68	67	66
2000	11	284	87	85	83	81	80	78	77	76	74	73	72	70	69	68	67	66	65
4000	7	280	86	84	82	81	79	78	76	75	73	72	71	70	68	67	66	65	64
6000	3	276	85	83	82	80	78	77	75	74	73	71	70	69	68	66	65	64	
8000	-1	272	84	82	81	79	77	76	74	73	72	70	69	68	67	66	64	63	
10000	-5	268	83	82	80	78	77	75	74	72	71	69	68	67	66	65	63		
12000	-9	264	82	81	79	77	76	74	72	71	70	68	67	66	65	64			
14000	-13	260	81	79	77	76	74	73	71	70	68	67	66	65	63				
16000	-17	256	80	78	76	75	73	72	70	69	67	66	65	64					

fig. 12

03123

Example:

Max. continuous power at 10 000 ft?

Temperature ISA at 10 000 ft ..... -5 °C
Ambient temperature at 10 000 ft ..... -15 °C
Temperature difference to ISA ..... -10 °C

Max. continuous power as per diagram ..... 72 kW

10.2) Operating media

10.2.1) Coolant

In principle, 2 different types of coolant are permitted.

- Conventional coolant based on ethylene glycol
- Waterless coolant based on propylene glycol

■ CAUTION: Obey the manufacturer's instructions about the coolant.

	mixture ratio %	
designation	**concentrate**	**water**
conventional e.g. BASF Glysantine anticorrosion	50	50
waterless e.g. EVANS NPG+	100	0

07032

Conventional coolant mixed with water has the advantage of a higher specific thermal capacity than waterless coolant.

◆ NOTE: The important advantage of waterless coolant is its higher boiling point than a conventional mixture.

When correctly applied, there is sufficient protection against vapor bubble formation, freezing or thickening of the coolant within the operating limits.

Use the coolant specified in the manufacturer's documentation.

■ CAUTION: Obey the latest edition of Service Instruction SI-914-019 for the selection of the correct coolant.

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10.2.2) Fuel

The following fuels can be used.

	Usage / Description
	914 UL / F
MOGAS	
European standard	
	EN 228 Super [1]
	EN 228 Super plus [1]
Canadian standard	CAN/CGSB-3.5 Quality 3 [2]
US standard	ASTM D4814
AVGAS	
US standard	AVGAS 100 LL (ASTM D910)

08316

[1] min. ROZ 95

[2] min. AKI 91

AVGAS 100LL places greater stress on the valve seats due to its high lead content and forms increased deposits in the combustion chamber and lead sediments in the oil system. Thus it should only be used in case of problems with vapor lock or when other types of gasoline are unavailable.

■ CAUTION: Use only fuel suitable for the respective climatic zone.

◆ NOTE: Risk of vapour formation if using winter fuel for summer operation.

■ CAUTION: Obey the latest edition of Service Instruction SI-914-019 for the selection of the correct fuel.

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10.2.3) Lubricants

Oil: **Motorcycle oil of a registered brand with gear additives**. If using aircraft engine oil; than only blended one.

■ CAUTION**:** At the selection of suitable lubricants refer to the additional information in the Service Information SI-914-019, current issue.

Oil specification

— Use only oil with API classification "**SG**" or higher!

— Due to the high stresses in the reduction gears, oils with gear additives such as high performance motor cycle oils are required.

— Because of the incorporated friction clutch, oils with friction modifier additives are unsuitable as this could result in a slipping clutch during normal operation.

— Heavy dury 4-stroke motor cycle oils meet all the requirements. These oils are normally no mineral oils but semi- or full synthetic oils.

— Oils primarity for Diesel engines are due to **insufficient high temperature properties and additives which favour clutch slipping, generally unsuitable.**

■ CAUTION**:** If the engine is mainly run on AVGAS **more frequent** oil changes will be required. See Service Information SI-914-019, current issue.

Oil consumption: ..... max 0,06 l/h (0.13 liq pt/h)

Oil viscosity:

Use of multi-grade oils is recommended.

◆ NOTE: Multi-viscosity grade oils are less sensitive to temperature variations than single grade oils. They are suitable for use throughout the seasons, ensure rapid lubrication of all engine components at cold start and get less fluid at higher temperatures.

Table of lubricants (See fig. 13)

Since the temperature range of neighbouring SAE grades overlap, there is no need for change of oil viscosity at short duration of ambient temperature fluctuations.

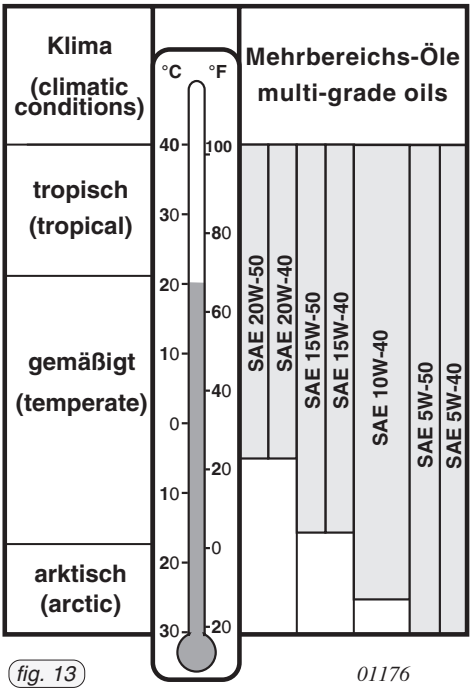

fig. 13 01176

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NOTES

10.3) Standard operation

To warrant reliability and efficiency of the engine, meet and carefully observe all the operating and maintenance instructions.

10.3.1) Daily checks

▲ WARNING: **Risk of burnings and scalds!**
Conduct checks on the cold engine only!

▲ WARNING: **Ignition "OFF".** Before cranking the propeller switch off both ignition circuits and anchor the aircraft. Have the cockpit occupied by a competent person.

■ CAUTION: If established abnormalities (e.g. excessive resistance of the engine, noises etc.) inspection in accordance with the relevant Maintenance Manual is necessary. Do not release the engine into service before rectification.

Coolant level:

■ CAUTION: The coolant specifications of the section 10.2 Operating media are to be observed.

— Verify coolant level in the **expansion tank**, replenish as required up to top.

The coolant level must be at least 2/3 of the expansion tank.

— Verify coolant level in the **overflow bottle**, replenish as required.

The coolant level must be between max. and min. mark or at least 0.2 litre (0.4 liq pt).

Check of mechanical components:

Turn propeller by hand in direction of engine rotation several times and observe engine for odd noises or excessive resistance and normal compression.

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Gear box:

— **Version without overload clutch:**

No further checks are necessary.

— **Version with overload clutch:**

Turn the propeller by hand to and fro, feeling the free rotation of 15 ° or 30 ° before the crankshaft starts to rotate.

If the propeller can be turned between the dogs with practically **no friction** at all (less than 25 Nm / 222 in.lb) further investigation is necessary.

Carburetor:

— Verify free movement of throttle cable and starting carburetor over the complete range. Check from the cockpit.

Exhaust system and trubocharger:

— Inspect for cracks, damages, leakage and general condition.

10.3.2) Before engine start

Carry out pre-flight checks.

10.3.3) Pre-flight checks

▲ WARNING: **Ignition "OFF"** Before cranking the propeller switch off both ignition circuits and anchor the aircraft. Have the cockpit occupied by a competent person.

Operating media:

▲ WARNING: Carry out pre-flight checks on the cold or luke warm engine only! **Risk of burning and scalds**.

Check for any oil-, coolant- and fuel leaks.

If leaks are evident, rectify before flight.

■ CAUTION: The coolant specifications of the section 10.2 Operating media are to be observed.

— Verify coolant level in the **overflow bottle**, replenish as required.

The coolant level must be between min. and max. mark or at least 0.2 litre (0.4 liq pt).

■ CAUTION: The oil specifications of the section 10.2 Operating media are to be observed.

— Check oil level and replenish as required.

◆ NOTE: Propeller shouldn't be turned reverse the normal direction of engine rotation.

— Prior to oil check, turn the propeller by hand in direction of engine rotation several times to pump oil from the engine into the oil tank, or let the engine idle for 1 minute.

This process is finished when air is returning back to the oil tank and can be noticed by a murmur from the open oil tank.

◆ NOTE: Oil level should be between max. and min. mark of the oil level gauge but must never be below min. mark. Before longer periods of operation ensure that oil level is at least up to mid-position.

Difference between max.- and min.- mark = 0,45 litre (0.95 liq pt)

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10.3.4) Engine start

▲ WARNING! Do not take the engine into operation if any person is near the aircraft.

Fuel cock. ..... open

Starting carb. ..... activated

◆ NOTE: If the engine is already in operating temperature, start the engine without choke.

Throttle lever. ..... set to idle position

Master switch. ..... on

Function test of TCU:

◆ NOTE: When switching on the voltage supply, both lamps are automatically subject to a function test.

For approx. 1 - 2 seconds both lamps illuminate and then extinguish. If not, a check as per Maintenance Manual is necessary.

▲ WARNING: Do not take the engine into operation before having rectified the cause of deficiency.

electric fuel pump ..... on

Ignition. ..... both circuits switched on

Starter button. ..... actuate

■ CAUTION: Activate starter for max. 10 sec. only (without interruption), followed by a cooling period of 2 minutes!

As soon as engine runs, adjust throttle to achieve smooth running at approx. 2500 r.p.m.

Check if oil pressure has risen within 10 seconds and monitor oil pressure. Increase of engine speed is only permitted at steady oil pressure readings above 2 bar (30 psi).

At an engine start with low oil temperature, continue to observe the oil pressure as it could drop again due to the increased flow resistance in the suction line. The number of revolutions may be only so far increased that the oil pressure remains steady.

De-activate starting carb.

■ CAUTION: Since the engine comprises a reduction gear with shock absorber, take special care of the following:

To prevent impact load, start with throttle lever in idle position or at the most up to 10% open.

For the same reason, wait for around 3 sec. after throttling back to partial load to reach constant speed before re-acceleration.

For checking the two ignition circuits, only one circuit may be switched off and on at times.

■ CAUTION: Do not actuate starter button (switch) as long as the engine is running. Wait until complete stop of engine!

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10.3.5) Prior to take-off

Warming up period:

Start warming up period at 2000 r.p.m. for approx. 2 minutes, continue at 2500 r.p.m., duration depending on ambient temperature, until oil temperature reaches 50 °C (120° F).

— Check temperatures and pressures.

Throttle response:

— Short full throttle ground test (consult Aircraft Operator's Manual since engine speed depends on the propeller used).

■ CAUTION: After a full-load ground test allow a short cooling run to prevent vapour formation in the cylinder head.

Ignition check:

Check the two ignition circuits at **4000 r.p.m.** (approx. 1700 r.p.m. propeller).

— Speed drop with only one ignition circuit must not exceed **300 r.p.m.** (approx. 130 r.p.m. propeller).

|| — **115 r.p.m.** (approx. 50 r.p.m. propeller) max. difference of speed by use of either circuit, A or B.

◆ NOTE: The propeller speed depends on the actual reduction ratio.

Check of hydraulic propeller governor:

Check control of the hydraulic propeller governor to specifications of the manufacturer.

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10.3.6) Take-off

■ CAUTION: If the national Aviation Authority demands the software classification "D" according to RTCA DO 178 B for the TCU software a special starting procedure is laid down which renders any influence of the TCU ineffective during the take-off, see section 10.3.6.2).

Climbing with engine running at take-off performance is permissible (max. 5 minutes). See Chapter 10.1), 10.1.1) and 10.1.2).

▲ WARNING: Monitor oil temperature, cylinder head temperature and oil pressure. Limits must not be exceeded! See Chapter 10.1) Operating Limits.

■ CAUTION: Respect "cold weather operation" recommendations, see Chapter 10.3.9).

10.3.6.1) Take-off (standard - with active TCU)

— Switch on the auxiliary fuel pump at take-off.
— Switch throttle lever to 115 % (take-off performance).
— The auxiliary fuel should be switched off after the take-off.

10.3.6.2) Take-off (as per RTCA DO 178 B - with inactive TCU)

— Take-off performance until the boost pressure stabilizes within the limits of operation.

— TCU-switch in "OFF" position.

— Switch on the auxiliary fuel pump at take-off.

— Shift throttle lever to 115 % (take-off performance).

— After reaching the critical altitude switch on the TCU.

■ CAUTION: Any improper use of the TCU-switch will be recorded by the TCU. At exceeding of the limits of operation will render any claims on Rotax null and void.

— The auxiliary fuel pump may be switched off after the take-off.

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10.3.7) Cruising

Set performance as per performance specifications and respect operating limits as per Chapter 10.1), 10.1.1) and 10.1.2).

Avoid operation below normal operation oil temperature (90 ÷110 °C / 194 ÷ 230 °F), as possible formation of condensation water in the lubrication system badly influences the oil quality.

To evaporate possibly accumulated condensation water, at least once a day 100 °C (212°F) oil temperature must be reached.

10.3.8) Engine shut-off

Normally the cooling down of the engine during descending and taxiing will be sufficient to allow the engine to be shut off as soon as the aircraft is stopped.

At increased operating temperatures to make an engine cooling run of at minimum 2 minutes.

10.3.9) Cold weather operation

Generally, an engine service should be carried out before the start of the cold season.

Coolant:

For selection of coolant and mixing ratio, see "Coolant", Chapter 10.2.1).

Lubricant:

For selection of oil, see Table of Lubricants (Chapter 10.2.3).

Cold start:

— With throttle closed and choke activated (open throttle renders starting carb ineffective).

— Be aware, no spark below crankshaft speed of 220 rpm. (propeller speed of 90 rpm.).

— As performance of electric starter is greatly reduced when hot, limit starting to periods not much longer than 10 sec. With a well charged battery, adding a second battery will not improve cold starts.

Remedy:

— Use of multigrade oil with the low end viscosity code of 5 or 10.

— Gap electrode on spark plug to the minimum or fit new spark plugs.

— Preheat engine using hot air.

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Beyond that observe following advices for operation at extremely low temperatures:

◆ NOTE: Distinguish between two kinds of carb icing:

1) Icing due to water in fuel

2) Icing because of high air humidity

Addendum to note 1)

Water in fuel will accumulate at the lower parts of the fuel system and leads to freezing of fuel lines, filters or jets.

Remedy:

— Use non-contaminated fuel (filtered through suède)

— Generously sized water separators

— Fuel lines routing inclined

— Prevent condensation of humidity, i.e. avoid temperature differences between aircraft and fuel.

▲ WARNING**:** Fuels containing alcohol always carry a small amount of water in solution. In case of temperature changes or increase of alcohol content, water or a mixture of alcohol and water may settle and could cause troubles.

Addendum to note 2)

Carburetor icing due to humidity may occur on the venturi and on the throttle valve due to fuel evaporation and leads to performance loss and change in mixture. Intake air pre-heating is the only effective remedy.

10.4) Abnormal operation

▲ **WARNING:** **At unusual engine behaviour conduct checks as per Chapter 10.4.1) through 10.4.13) below, and as per Maintenance Manual before the next flight.**

◆ NOTE: Further checks - see Maintenance Manual.

10.4.1) Sudden drop of boost pressure and speed

— Loud noise or bang:

A fracture of the turbo is likely.

Look for landing possibility. Flight with reduced performance may be possible. **Monitor oil pressure.**

— The orange caution lamp of TCU (turbo control unit) is blinking.

Limited flying operation as possibly wastegate does not close any more.

■ NOTE: A minimum performance of approx. 66 kW remains available.

Any exceeding of the max. admissible operating limits and/or blinking of orange caution lamp must be recorded by the pilot in the logbook, stating the duration, exact time and extent of exceeding.

10.4.2) Sudden rise of boost pressure and speed

— Orange caution lamp of TCU is blinking:

Immediately reduce engine speed until boost pressure and speed are within operating limits.

Limited flying operation as wastegate may be fully closed and control of the boost pressure is only possible via throttle lever.

— Bowden cable(s) for actuation of throttle valve(s) broken:

Due to spring pressure the throttle valve(s) will be fully open - **full throttle!**

Limited flying operation as wastegate may be fully closed and control of the boost pressure is only possible via throttle lever.

Any exceeding of the max. admissible engine speed or boost pressure has to be recorded by the pilot in the logbook, stating the duration, exact time and extent of exceeding.

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10.4.3) Periodical rise and drop of boost pressure and speed (boost pressure control is surging)

Orange caution lamp of TCU is not blinking.

Switch off servo motor **for a moment** (max. 5 sec.). After a short regulating time operation should stabilize.

■ CAUTION: If this action does not stabilize operation, **swith off** servo motor **completely**. If need be, reduce engine speed until boost pressure and speed are within the operating limits again.

Limited flying operation, as boost pressure control is no more possible.

Switching off the servo motor momentarily or permanently, has to be recorded by the pilot in the logbook, stating the duration, exact time and duration of switching off.

10.4.4) Red boost lamp of TCU permanently illuminating

The maximum admissible boost pressure was exceeded.

Reduce speed and boost pressure manually to be within the operating limits.

Limited flying operation, as boost pressure control is no more or insufficiently possible.

■ CAUTION: The boost pressure will not be reduced automatically.

In case of exceeding the max. admissible boost pressure, this has to be recorded by the pilot in the logbook, stating the duration and exact time of exceeding of limits.

10.4.5) Red boost lamp of TCU blinking

The maximum "take-off" time limitation was exceeded.

Reduce speed and boost pressure at least to maximum continuous speed.

■ CAUTION: The boost pressure will not be reduced automatically.

In case of exceeding the "take-off" time limits, this has to be recorded by the pilot in the logbook, stating the duration and exact time of exceeding of limits.

10.4.6) Orange caution lamp of TCU blinking

Indicates a failure of a sensor, sensor wiring, TCU, or leakage in the airbox.

Reduce speed and boost pressure manually to be within the operating limits.

Limited flying operation, as this may indicate that boost pressure control is no more or insufficiently possible and may affect engine performance.

In case of blinking of the orange caution lamp of TCU, this has to be recorded by the pilot in the logbook, stating the duration, exact time and extent of exceeding limits.

10.4.7) Failure of the voltage supply to the TCU

At a failure of voltage supply the servo motor will remain in its momentary position.

Limited flight operation as boost pressure control is not possible any more.

Any exceeding of the max. admissible operating limits must be recorded by the pilot in the logbook, stating the duration, exact time and extent of exceeding.

10.4.8) Engine stop - Start during flight

Starting procedure same as on ground, however, on a warm engine without choke.

10.4.9) Exceeding of max. admissible engine speed

Reduce engine speed. Any exceeding of the max. admissible engine speed has to be entered by the pilot into the logbook, stating duration and extent of overspeed.

10.4.10) Exceeding of max. admissible cyl. head temperature

▲ WARNING: Reduce engine power setting to the minimum necessary and carry out precautionary landing.

Any exceeding of the max. admissible cylinder head temperature has to be entered by the pilot into the logbook, stating duration and extent of over-temperature condition.

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10.4.11) Exceeding of max. admissible oil temperature

▲WARNING: Reduce engine power setting to the minimum necessary and carry out precautionary landing.

Any exceeding of the max. oil temperature must be entered by the pilot in the logbook, stating duration and extent of over-temperature condition.

10.4.12) Oil pressure below minimum - during flight

▲WARNING: Reduce engine power setting to the minimum necessary and carry out precautionary landing.

Check oil system.

10.4.13) Oil pressure below minimum - on ground

Immediately stop the engine and check for reason. Check oil system.

— Check oil quantity in oil tank.

— Check oil quality (see section 10.2.3).

10.4.14) Engine on fire of fire in the engine compartment

In the event of fire or signs, e.g. heavy smoke both electric fuel pumps and the main switch must be switched off and the fuel tap has to be closed.

If the fire should extinguish it may be tried again to actuate the main fuel pumps and to start the engine (see section 10.3.4).

If the fire starts anew the fuel system has to be interrupted again at once.

Any shut-off of the fuel system for short periods or permanent has to be entered by the pilot into the logbook starting date and duration of shut-off.

NOTES

11) Checks

All checks to be carried out as specified in the current Maintenance Manual (last revision).

▲ **WARNING**: **Only qualified staff (authorized by the Aviation Authorities) trained on this particular engine, is allowed to carry out maintenance and repair work.**

■ CAUTION: Carry out all directives of Service Bulletins, according to their **priority.**

11.1) Engine preservation

Due to the special material of the cylinder wall, there is no need for extra protection against corrosion. At extreme climatic conditions and for long out of service periods we recommend the following to protect the valve guides against corrosion:

– Let engine run until warm, then change oil.

– Remove the air intake filters and insert approx. 30 cm^3 (1 fl oz) of corrosion inhibiting oil into the carburetor throat with the engine running at increased idle speed. Shut off engine.

– Drain carburetor float chamber.

– Apply oil to all joints on carburetors.

– Close **all** openings on the cold engine, such as exhaust end pipe, venting tube, air filter etc. against entry of dirt and humidity.

– Spray all steel external engine parts with corrosion inhibiting oil.

Engine back to operation

– Remove all plugs and fasteners.

– Clean spark plugs with plastic brush and solvent.

– If preservation including oil change took place within a year of storage, oil renewal will not be necessary. For longer storage periods repeat preservation annually.

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NOTES

d00425

12) Trouble shooting

▲ **WARNING**: **Only qualified staff (authorized by the Aviation Authorities) trained on this particular engine, is allowed to carry out maintenance and repair work.**

If the following hints regarding remedy do not solve the problem, contact an authorized workshop. The engine must not be operated until the problem is rectified.

Engine does not start

POSSIBLE CAUSE:	REMEDY:
a - ignition off	switch on.
b - closed fuel tap or clogged filter	open tap, clean or renew filter, check fuel system for leaks.
c - no fuel in tank	refuel.
d - starting speed too low, faulty or discharged battery	fit fully charged battery.
e - starting speed too low, start problems on cold engine	use top quality, low friction oil; allow for sufficient cooling period to counter for performance drop on hot starter; pre-heat engine.
f - carb to rich	start without pumps

Engine idles rough after warm-up period, smoky exhaust emission

POSSIBLE CAUSE:	REMEDY:
a - starting carb activated	close starting carb.

Low oil pressure

POSSIBLE CAUSE:	REMEDY:
a - not enough oil in oil tank	check oil return line for free passage, renew oil seal.

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Engine keeps running with ignition off

POSSIBLE CAUSE:	REMEDY:
a - overheating of engine	let engine cool down at idling at approx. 2000 r.p.m.

Oil level is increasing

POSSIBLE CAUSE:	REMEDY:
a - oil too cold during engine operation	cover oil cooler surface, maintain the oil temperature prescribed.

Knocking under load

POSSIBLE CAUSE:	REMEDY:
a - Octane rating of fuel too low	use fuel with higher octane rating.

Engine hard to start at low temperature

POSSIBLE CAUSE:	
a - starting speed too low	REMEDY:
b - low charge battery	preheat engine.
c - high oil pressure	fit fully charged battery.
d - oil pressure too low after cold start	at cold start a pressure reading of up to around 7 bar (102 psi) does not indicate a malfunction.
	too much resistance in the oil suction tube at low temperatures. Stop engine and preheat oil.
	At oil pressure reading too low than 1 bar oils with lower viscosity are to be used.
	See SI-914-019, current issue.
◆ NOTE:	Oil pressure must in the idle operation with an oil temperature of min. 50 °C (120°F) to be measured.

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NOTES

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12.1) Reporting

According to the regulation of JAR / FAR 21.3 the manfacturer shall evaluate field information and report to the authority. In case of any relevant occurrences that may involve malfunction of the engine, the form on the next page should be filled out and sent to the responsible authorized ROTAX distributor.

◆ NOTE: The form is also available from the official ROTAX AIRCRAFT ENGINES Homepage

www.rotax-aircraft-engines.com

in electronic version.

d00426

ROTAX®
AIRCRAFT ENGINES

CUSTOMER SERVICE INFORMATION REPORT

OPER. Control No.	
ATA Code	
1. **A/C Reg. No.**	

Enter pertinent data	**MANUFACTURER**	**MODEL/SERIES**	**SERIAL NUMBER**
2. AIRCRAFT			
3. POWERPLANT	ROTAX		
4. PROPELLER			

5. SPECIFIC PART *(of component)* CAUSING TROUBLE

Part Name	MFG. Model or Part No.	Serial No.	Part/Defect Location

6. ENGINE COMPONENT *(Assembly that includes part)*

Engine/Comp. Name	Manufacturer	Model or Part No.	Serial Number

Engine TSN	Engine TSO	Engine Condition	7. Date Sub.

8. Comments *(Describe the malfunction or defect and the circumstances under which it occurred. State probable cause and recommendations to prevent recurrence.)*

Optional Information:

Check a box below, if this report is related to an aircraft

☐ Accident; Date _____ ☐ Incident; Date _____

DISTRICT OFFICE	OPERATOR DESIGNATOR
OTHER	
COMMUTER	
ACG	
MFG	
AIR TAXI	
MECH	
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