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ROTAX.
AIRCRAFT ENGINES

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* The note of approval of the Aviation Authority refers only to the certified engines of the Type 912 A (TW 8/89), 912 F / S (TW9 - ACG).

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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 blonded one.

■ **ATTENTION:** At the selection of suitable lubricants refer to the additional information in the Service Information 18 UL 97.

Oil specification

- Use only oil with API classification "**SF**" or "**SG**"!
 - 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 duty 4-stroke motor cycle oils meet all the requirements. These oils are normally no mineral oils but semi- or full synthetic oils.
 - Oils primarily for Diesel engines are due to **insufficient high temperature properties and additives which favour clutch slipping, generally unsuitable.**
- **ATTENTION:** If the engine is mainly run on AVGAS **more frequent** oil changes will be required. See Service Information 18 UL 97.

Oil capacity: 3 l (min. 2 l) (6.4 liq pt, min. 4.2 liq pt)

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

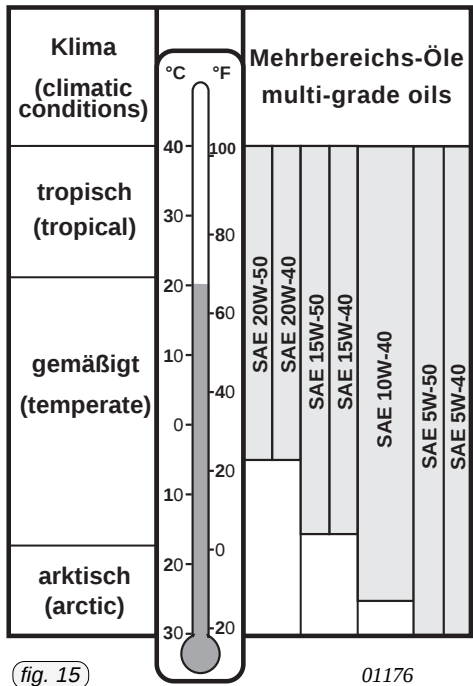
Oil viscosity:

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. 15)

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.



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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.
- **ATTENTION:** 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:

Verify coolant level in the expansion tank, replenish as required up to max. 2/3 in expansion tank.

- ◆ **NOTE:** The level in the overflow bottle should be between max. and min. mark.

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.

Gear box:

— **Version without overload clutch:**

No further checks are necessary.

— **Version with overload clutch:**

The propeller can be turned by hand approx. 15° to 30° against slight friction, without noticing any odd noises or resistance.

If the propeller can be turned between the dogs with practically **no friction** at all (less than 15 Nm = 135 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:

- Inspect for 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.

- Check coolant level in the overflow bottle.

- ◆ **NOTE:** The level in the overflow bottle should be between min. and max. mark.

- Check oil level and replenish as required.

- ▲ **WARNING:** Propeller may not be turned reverse the normal direction of rotation. See also section 10.1) General limits of operation.

- 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)

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

Ignition. both circuits switched on

Starter button. actuate

- **ATTENTION:** 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.

De-activate starting carb.

- **ATTENTION:** 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.

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

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