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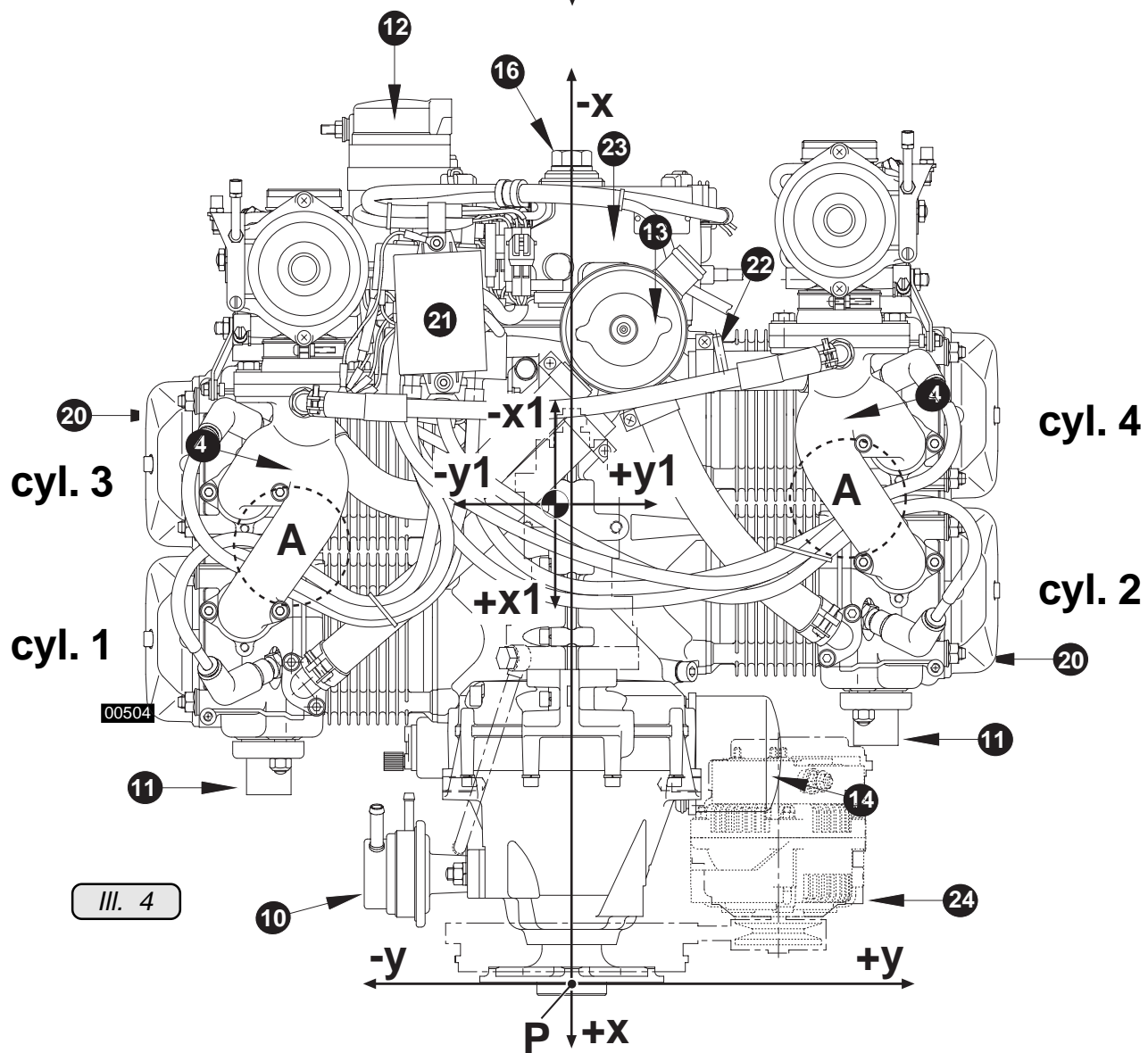
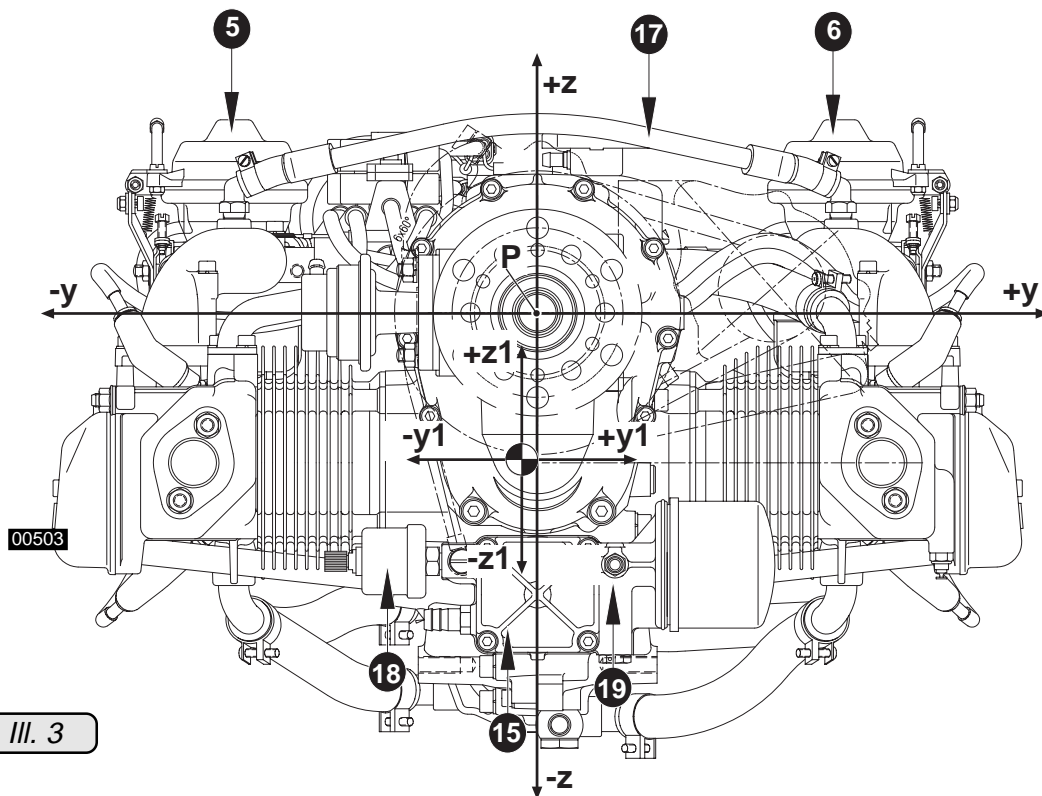
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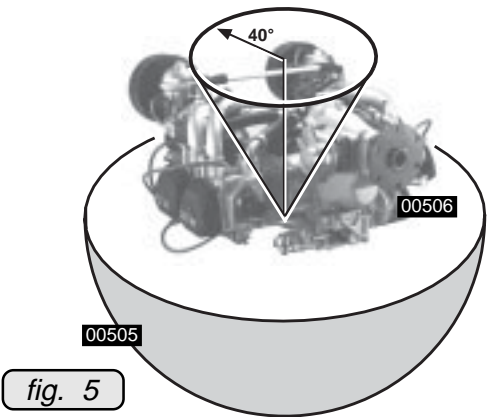
6) Technical data

To maintain clarify, only data relevant for engine installation and operation will be stated in the Manual.

◆ NOTE: Connecting dimensions, filling capacities, drive and reduction ratios, electric output etc. can be found in the respective chapter of engine installation.

6.1) Operating limits

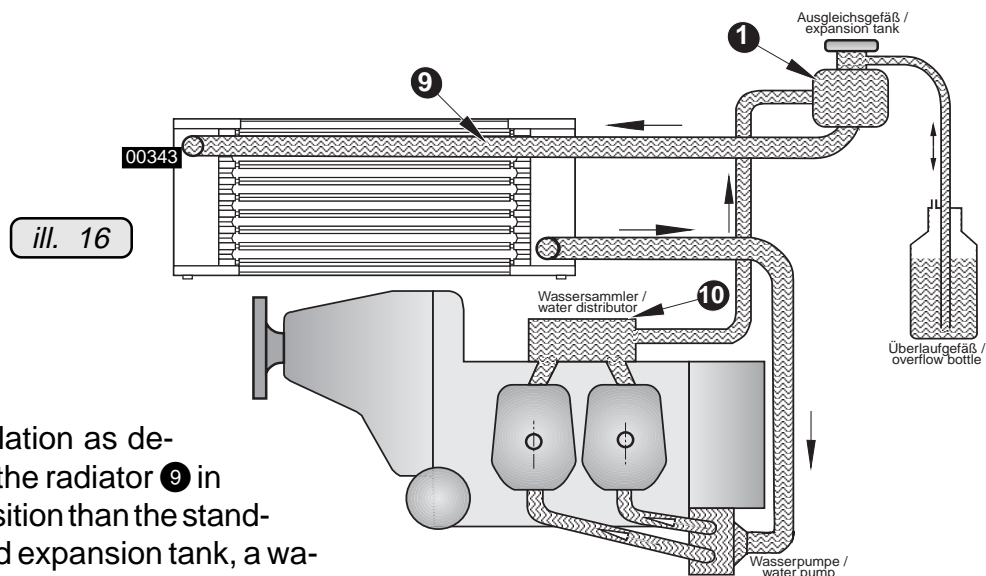
- 1. Takeoff speed: 5800 rpm. (5 min.)
max. continuous speed: 5500 rpm.
idle speed: around 1400 rpm.
- 2. Time limit for engine operation at weightless condition and with negative gravity acceleration: max. 5 sec at max. -0,5 g
- 3. Oil pressure: see fig. 46 1,5 ÷ 5 bar (22 ÷ 73 psi)
at cold start a pressure of up to 7 bar (100 psi) is permitted for a short period min. 1,5 bar.
- 4. Oil temperature (see fig. 45) reading
in feed line to engine: min. 50° C (120° F)
max. 140° C (285° F)
normal operating temperature: 90 ÷ 110° C (190 ÷ 250° F)
- || 5. Cylinder head temperature: see section 10.6.2
- 6. Exhaust gas temperature (EGT): max. 850° C (1562° F) at take off
max. 800° C (1472° F) normal
operat.
reading c. 70 mm = 2,75 in. after
exhaust flange
- 7. Range of operating temperature: -25° C (-13° F) to effective
boiling point of fuel
- 8. Ambient temperature for
electric components: (fig.4, pos. 20) max. 80° C (176° F)
- 9. Fuel pressure: 0,15 ÷ 0,4 bar (2,2 ÷ 5,8 psi.)
(see fig. 22 and 23) max. 0,4 bar (5,8 psi.)
- 10. Banking of plane: (if not stated otherwise)
deviation from the effective vertical max. 40°
Up to this inclination the dry sump lubrication system warrants adequate lubrication in every flight situation.



10.5) General directives for the cooling system

See illustration 16.

ROTAX offers essential parts of the cooling system for this engine such as radiator, overflow bottle etc. (see spare parts list) in the non-certified state. Certification to the latest requirements to FAR or JAR has to be conducted by the aircraft or airframe builder.



In an installation as depicted with the radiator ⑨ in a higher position than the standard supplied expansion tank, a water accumulator ⑩ has to be fitted instead

of the expansion tank. Additionally a suitable expansion tank ① has to be installed at the highest point of the cooling circuit.

■ **ATTENTION:** The size and type of radiator should be adequate to transfer thermal energy of c. 25 kW (24 BTU/s) at takeoff power.

◆ **NOTE:** Assessment data by experience. For troublefree operation at good airflow a radiator of at least 500 cm² (78 in²) area has to be used. The flowrate of coolant in the cooling system can be assumed with c. 55 l/min (16 US gal/min) at 5500 rpm.

10.6) Operating Limits

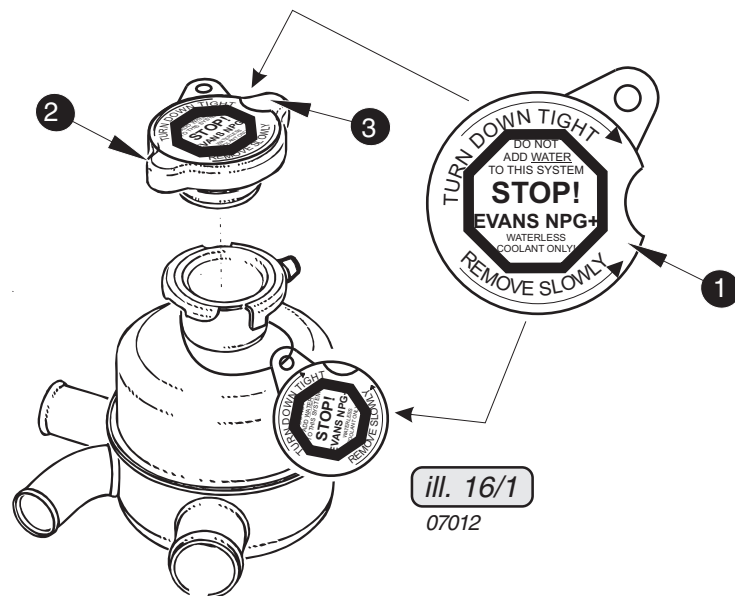
The operating limits (max. permissible cylinder head temperature) are dependent on the engine design but also essentially on the coolant used.

The hottest measuring point (cylinder 2 or 3) is to be specified by testing. For this purpose, see section 6.3 Engine Views. This is dependent on the installation (pulling or pushing propeller design).

The coolant to be used is defined clearly in the Operators Manual. Depending on the installation conditions, conventional coolants can also be used. The provision of proof about the max. reachable cylinder head temperature and thus the coolant to be used is the responsibility of the airplane manufacturer in regard to 10.6.1 and 10.6.2

■ **CAUTION:** The coolant to be used and its concentration is to be communicated in written form to the owner.

◆ **NOTE:** From ROTAX® a warning sticker is to be delivered for the water-free coolant which is mounted separately on the expansion tank. When using this coolant, the warning sticker is to be mounted on the radiator cap in such a manner prior to delivery that the opening pressure (3) applied on the radiator cap remains visible. For this purpose, see fig. 16/1.



- 1 Warning sticker
- 2 Radiator cap
- 3 Excess-pressure information of radiator cap

10.6.1) Water-free Coolant

- max. permissible cylinder head temperature
see Operator's Manual section 10.1) Operating Limits.
- Coolant
see Operator's Manual section 10.2.1) Coolant.

10.6.2) Conventional Glycol / Water Coolant Mixture

The boiling point of conventional glycol / water coolant concentrate depends on the mixture ratio and on the system pressure, i.e. radiator cap.

Corresponding to the following table, the max. permissible cylinder head temperature is limited depending on the coolant concentrate used and may not be exceeded.

radiator cap	max. permissible cylinder head temperature	07030
0.9 bar (13psi)	115 °C (239 °F)	
1.2 bar (17.5psi)	120 °C (248 °F)	

During exclusive operation within the max. permissible cylinder head temperature, the following coolant can be used in the corresponding mixture ratio:

Description	Mixture ratio %**		07001
	concentrate	water	
BASF Glysantine Anticorrosion*	50	50	

* or equivalent

** 50% antifreeze concentrate and 50% pure water, or an equivalent pre-mixed liquid

■ CAUTION: The antifreeze (frost protection) of this mixture is to be observed according to the manufacturer's specifications.

■ CAUTION: The correct mixture ratio is to be observed since otherwise the coolant can thicken and as a result can lead to damages to the cooling system.

11) Cooling air ducting

Contrary to the cylinder heads, the cylinders are ram air cooled. Plan cooling air ducting according to installation requirement.

▲ **WARNING:** The cooling air ducting has to be designed and built such, that the operating temperatures are kept within the specified limits, warranted even at **hot day conditions**.

11.1) General directives for ducting of the cooling air

See fig. 2, 3 and 4.

For front installation in a closed fuselage, ducting of cooling air to the cylinders is recommended. In this case a costly horizontal partitioning can be avoided.

◆ **NOTE:** The engine remains in this case completely on the warm side of the engine compartment and is very well accessible. In special cases a separate cold air supply to the air intake filters has to be provided.

ROTAX developed especially for this application a non-certified cooling air ducting. Certification to the latest requirement like FAR or JAR has to be conducted by the aircraft builder.

The following recommendations should assist the aircraft builder at the planning of a suitable cooling air ducting.

◆ **NOTE:** These recommendations derive from years of experience and the result achieved are generally very good.

■ **ATTENTION:** The cooling air ducting to be adequate to transfer thermal energy of c. 6 kW (5,7 BTU/s) at takeoff power.

☞ required cross section of air duct: at least 100 cm² (16 in²)

☞ material:
glass fibre reinforced plastic or heat resistant non-inflammable material.

☞ attachment:
formlocking on engine case and cylinders

◆ **NOTE:** In case formlocking attachment won't be adequate, additional attachment is possible on two threaded lugs M8 on top side of engine.

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attachment points	axis			attachment points	
	x axis	y axis	z axis	max. allowable forces (limit load) in (N) in x,y and z axis	2 000
	-300,0	-30,0	-14,0	max. allowable moment moment (limit load) in (Nm) in x,y and z axis	50
	-300,0	30,0	-14,0	min. length of thread engagement (mm)	15

■ **ATTENTION:** The stated limit loads are valid only at utilization of min specified thread length, and must never be exceeded.

Depth of thread 18 mm (.71 in.).

23) ROTAX Authorized Distributors for Aircraft Engines

See current issue of Operator's Manual section 14 or in the Internet on the official website www.rotax-aircraft-engines.com.

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