

582 / 618 CROSS SHAFT SEAL LEAKAGE

1 KUL 96 Revision 1

ISSUE DATE: Sept. 1999

(A) INTRODUCTION

THIS INFORMATION IS INTENDED TO ASSIST THE AIRCRAFT DESIGNER, MANUFACTURER AND BUILDER/OPERATOR TO ACHIEVE CORRECT OPERATING CONDITIONS AND ASSEMBLY FOR THE ENGINE AND CONSEQUENTLY OPTIMUM PERFORMANCE AND RELIABILITY.

(B) TECHNICAL DATA AND GENERAL INFORMATION

IN ADDITION TO THIS INFORMATION PLEASE REFER TO:

OPERATORS MANUAL
ENGINE DATA SHEET
POWER, TORQUE AND FUEL CONSUMPTION CURVES
SPARE PARTS LIST
ENGINE INSTALLATION MANUAL
ENGINE MAINTENANCE MANUAL

IMPORTANT INFORMATION

SUBJECT

Possible cross shaft seal leakage in the ROTAX 582 UL and 618 UL engines.

ENGINES AFFECTED

All Rotax type 582 UL and type 618 UL engines.

REASON

Random field reports have indicated possible contamination of the rotary valve shaft oil by engine coolant and/or excessive rotary valve oil consumption caused by leakage across the cross shaft seals.

Contamination of the rotary valve oil by engine coolant can lead to reduced bearing and gear lubrication and possible failure of the cross shaft bearings.

COMPLIANCE

All builders, operators, and manufacturers using or operating ROTAX Type 582 UL and Type 618 UL engines.

CAUSE

Cross shaft seal leakage can be caused by one or all of the following factors:

- Inadequate or poor cooling system design. (Use of non-ROTAX cooling system that does not comply with the requirements set out in the latest edition of the appropriate engine installation manual.)
- Improper cooling system installation. (Refer to engine operators manual and Service Instruction SI-09-1991 and engine installation checklist.)
- Inadequate cooling system maintenance. (Polluted engine coolant or improper water / anti-freeze ratio)

CAUSE continued...

- Cooling system pressure exceeds recommended values. (Defective or incorrect pressure cap, MAX 0.9 BAR 13 P.S.I.)
- Engine coolant does not provide adequate seal lubrication. (Insufficient quantity, poor quality or improperly mixed) Many antifreeze brands commonly available in North America may not recommend mixing ratios of 80% antifreeze and 20% water. It is recommended that owners and operators of Rotax type 582 and Rotax type 618 engines select a high quality brand name antifreeze with corrosion inhibiting additives. Selected antifreeze should be mixed with water as per the antifreeze manufacturer's recommendations. Coolant solutions (antifreeze / water mixture) should be prepared as necessary to provide adequate protection at temperatures above the maximum cooling liquid temperature limit of 80° C (175° F). The coolant solution should also provide protection against freezing and frost damage given local environmental conditions and the aircraft mission profile. Coolant solution should be checked with a tensiometer or glycol tester to verify protection level. In all cases, antifreeze to water ratios should not exceed the antifreeze manufacturer's recommendations. Exceeding the antifreeze manufacturers recommended ratios can lead to particulate formation in the coolant solution ("jelling"). Particulate formation or "jelling" may be harmful to cooling system components including the cross shaft seals. Coolant mixtures of 50% antifreeze, 50% water may be used, provided boil over after engine shut down is not present, and adequate protection against freezing and frost damage is achieved.
- Use of improper rotary valve oil. (Oil used must meet ROTAX minimum specifications.)

ACTION

- **Inspect rotary valve oil for coolant contamination and correct level before every flight.** Rotary valve oil in the rotary valve oil reservoir should be inspected directly for discoloration or other signs of contamination that may indicate cross shaft seal leakage. Increasing oil levels in the rotary valve oil reservoir is an indication that engine coolant is leaking past the cross shaft seals into the rotary valve system. Excessive rotary valve oil consumption (Maximum consumption: 1 C.C. per hour) may also indicate rotary valve oil leaking past the cross shaft seals into the engine cooling system.
- Type 618 and Type 582 Model 99 engines are equipped with a witness hole located near the water pump housing. Fluid escaping from this witness hole may indicate leakage past the cross shaft seal. **On engine types equipped with a witness hole, inspect this area of the engine prior to every flight for signs of fluid leakage.**

REMEDY

- Insure that cooling system design and installation meets engine specifications. Refer to the respective engine installation and operator manuals.
- Insure that cooling system is properly maintained, and the cooling system provides adequate protection against system overpressure. (Maximum cooling system pressure is 0.9 BAR or 13 PSI.)
- Insure that engine coolant is of good quality and aluminum compatible.
- Change engine coolant as per manufacturers recommendations.
- Always mix engine coolant solution as per the antifreeze manufacturers recommended ratios.
- Replace the rotary valve lubrication oil every 100 hours. Refer to the maintenance schedule in the respective engine operator manual. Use only high quality 2 stroke oil. (ASTM/CEC Standard API-TC)

Summary

- **Rotary valve oil must be inspected for contamination before every flight.**
- **On engine types equipped with a cross shaft witness hole, inspect the area around the witness hole for fluid leakage prior to every flight**
- The following items are indications of possible cross shaft seal leakage:

contamination of the rotary valve oil
increasing rotary valve oil levels
excessive rotary valve oil consumption
signs of fluid leakage from the cross shaft witness hole (Type 618 and Type 582 Model 99 engines only).

If any of these indications are observed, cease any further engine operation and contact your nearest ROTAX service center.

WARNING!

**FAILURE TO COMPLY WITH THIS RECOMMENDATION COULD RESULT IN ENGINE
DAMAGE AND PERSONAL INJURY OR DEATH!**