

**MANDATORY INSPECTION REQUIREMENT FOR
STRESS CRACKS IN FUEL PUMP FITTINGS ON
912 F SERIES AND CONVERTED 912 A SERIES ENGINES
5 KUL 97**

ISSUE DATE: January 1998

(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
- ⇒ MAINTENANCE MANUAL 912 F

IMPORTANT INFORMATION

SUBJECT

In two recent cases, cracks were discovered on the outlet fittings of 912 series fuel pumps designed for use with stainless steel fuel lines. These cracks resulted in fuel leakage. Therefore an immediate inspection is required to check for possible stress cracking of fuel pump outlet fittings on all Rotax 912 A & Rotax 912 F engines equipped with stainless steel fuel lines.

ENGINES AFFECTED

- All Rotax Type 912 F engines.
- All Rotax Type 912 A engines that have been converted for the use of steel fuel lines.

REASON

Fatigue or stress cracks in the fuel pump fitting can be caused by:

- incorrect handling of the stainless steel fuel lines and fuel pump when removing the gear reduction unit.
- incorrect installation of stainless steel fuel lines.
- loose or improperly installed fuel distribution clamp block.
- improperly tightened or over tightened fuel line fittings.

COMPLIANCE

All owners and operators of ROTAX 912 F engines.

All owners and operators of ROTAX 912 A engines that have been converted for the use of stainless steel fuel lines.

ACTION

- **Warning!** - Fuel pumps of effected engines must be inspected for stress cracks and or fuel leakage before next flight as per the Fuel Pump Inspections Procedures found in this Service Information.
- Further, fuel pumps of all effected engines must be inspected for stress cracks and or fuel leakage before the beginning of daily flight operations. See Remedy section of this Service Information for recommended daily inspection procedures.

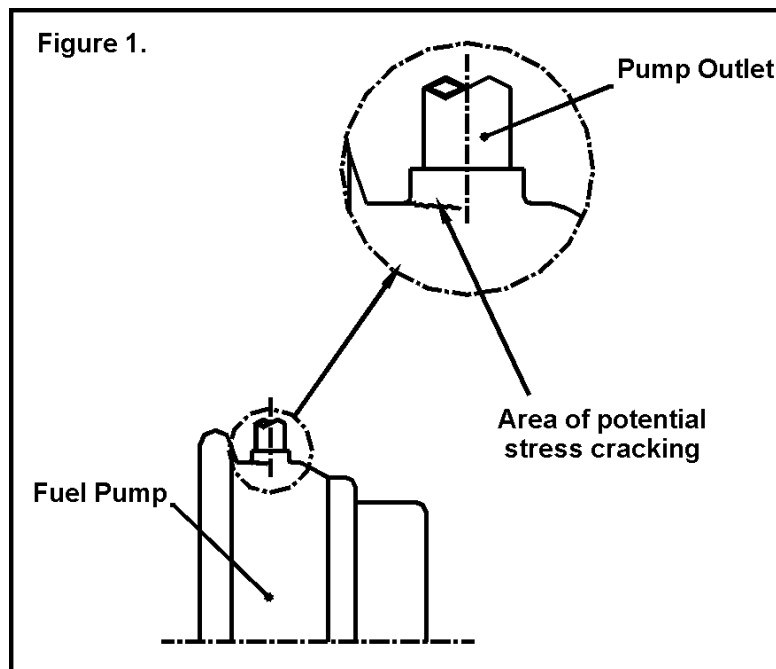
REMEDY

Until further notice, fuel pumps of effected engines must be inspected before the next flight and thereafter on a daily basis according to the following daily inspection procedures. These daily inspections must be carried out pending further investigation and determination of final action.

Daily Fuel Pump Inspection Procedures

The following checks of the fuel lines and fuel pump must be conducted on a daily basis:

- ◆ inspection of the clamp block for security.
- ◆ close inspection of the fuel pump fitting for signs of leakage, stress or fatigue cracking. (See Figure 1. below.)
- ◆ close inspection for signs of over tightening of the compression fittings.
- ◆ close inspection of the stainless steel fuel lines for damage, deformities or signs of mounting stress.



If any signs of fatigue or stress cracking is noted on the fuel pump fittings, the fuel pump must be immediately replaced.

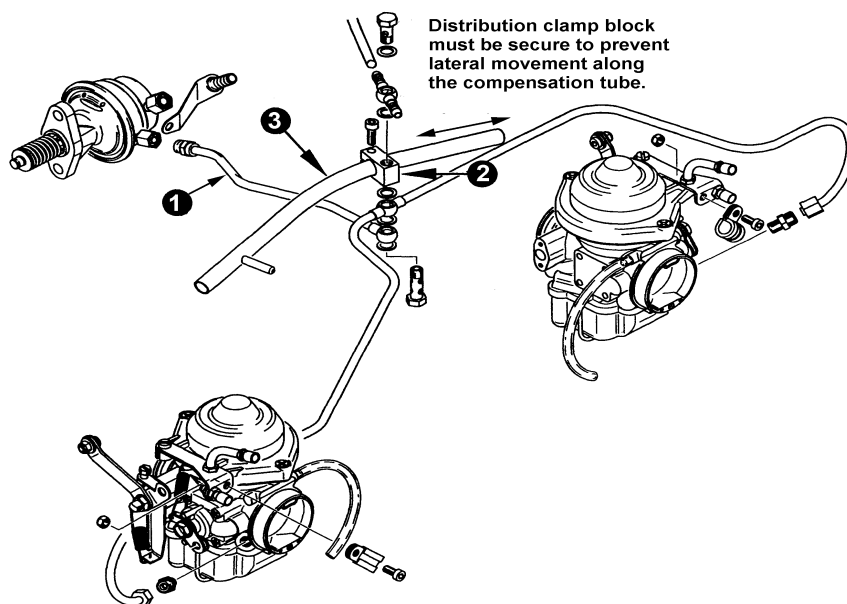
In addition, owners and operators of effected 912 series engines must continue to carefully follow all of the prescribed checks set out in the maintenance schedule found in Section 12.2 of the Maintenance Manual for ROTAX Engine Type 912 F. Section 12.3.3 of the 912 F maintenance manual requires the inspection of the engine installation for leaks in the lubrication, fuel and engine cooling systems. **Maintenance personnel should be very diligent in performing leakage check inspections to insure that any potential sources of leakage are detected and corrected at an early stage.**

SERVICE RECOMMENDATIONS

The following service recommendations should be carefully observed to reduce the risk of damage to fuel lines and fuel pump fittings during normal engine maintenance.

The fuel line running from the outlet of the fuel pump to the fuel line distribution clamp block (*Fig. 2 - #1*) must be carefully and completely removed from the fuel pump when the fuel pump is detached from the engine. Maintenance personnel may be tempted to simply pull the fuel pump away from the gear box housing with the fuel lines attached. This improper procedure can place excessive stress on the fuel pump outlet fitting and slightly deform the stainless steel fuel lines. **Never bend the stainless steel fuel lines by removing the fuel pump from the gear box housing with the stainless steel lines attached.** The resultant stresses placed on the fuel pump fittings coupled with normal engine vibration can cause fatigue cracking of the fuel pump fitting allowing fuel to escape into the engine compartment.

Figure 2.



When installing the stainless steel fuel lines from the fuel pump to the carburetors, always follow the instructions found in the 912 F maintenance manual (See sections 13.1.7 and 13.1.8 of the Maintenance Manual for ROTAX Engine Type 912 F.) and the amplified installation instructions found in this service information.

Amplified Instructions for the Installation of Fuel Pump - Rotax Type 912 F & 912 A Engines.

When installing the fuel lines, care must be taken to insure that the lines are not deformed or placed under mounting stress. Any mounting stress created can be passed on to the fuel pump fittings and create stress or fatigue cracks and the potential for fuel leakage. Always support the fuel lines carefully during installation. Do not introduce bends or other deformities to the fuel lines that may create unwanted stress on the fuel pump fittings. Always respect the tightening torque values of the banjo bolts on the fuel distribution block.

1. Check the mounting flange on the fuel pump. Flange must be perfectly flat and true for correct mounting. If the mounting flange is deformed in any way, discard fuel pump.
2. Attach fuel pump and mounting gasket to the gear box housing and tighten attachment nuts to specified torque value.
3. Loosely connect fuel lines to each carburetor. Loosely attach fuel line to outlet fitting of the fuel pump.
4. Loosely attach the fuel distribution clamp block to the compensation tube. The fuel line distribution clamp block (*Fig. 2 - #2*) joins the single fuel line from the fuel pump outlet fitting to the two fuel lines running to each carburetor. This distribution block fastens to the compensation tube (*Fig. 2 - #3*) that runs between the two intake manifolds. The fuel distribution block supports the fuel lines and prevents excessive vibration of the fuel line during engine operation. If the fuel distribution block becomes loose on the compensation tube, the fuel lines and distribution block can begin to move laterally on the compensation tube with engine vibration (*see Fig. 2*). This type of lateral vibration of the fuel line from the fuel pump to the fuel distribution block puts extreme stress on the fuel pump outlet fitting and fatigue cracks can develop quickly.
5. Check to insure that all fuel lines align precisely with the banjo bolt fitting on the fuel distribution block. Slide the distribution block on the compensation tube as required to achieve proper side to side alignment (*See Fig. 2*). If necessary, turn the angular tubes (*Fig. 3 - #3*) found at each end of the compensation tube (*Fig. 3 - #1*) with respect to the manifold (*Fig. 3 - #2*) to adjust the position of the compensation tube fore and aft (*See Fig. 3*). Use care when turning angular tubes in manifold to avoid damaging the threads. Application of gentle heat from heat gun may be required to soften thread sealant and allow movement of angular tube in manifold. Adjust fore and aft position of the compensation tube to give proper alignment of the fuel distribution block and fuel line banjo fittings.
6. Fit banjo bolt into fuel lines and distribution block and carefully tighten to the specified torque value.

7. Tighten distribution block on the compensation tube. Insure that the fuel line clamp block is properly installed on the compensation tube. The clamp block must grip the compensation tube tightly and prevent any movement or vibration of the stainless steel fuel lines during engine operation (See Fig. 2).

WARNING - A loose clamp block will allow excessive vibration of the fuel lines leading to rapid failure of the fuel pump fitting.

8. Tighten connections on carburetors and fuel pump. Always respect the specified maximum tightening torque values when tightening the collar nuts on the fuel line compression fittings. Over tightening of the compression fittings can deform the fuel pump fittings leading to stress and fatigue cracks. Never exceed the collar nut tightening torque values set out in Section 11.9 of the Maintenance Manual for ROTAX Engine Type 912 F.

Always use two open end wrenches when tightening compression fittings on the fuel pump (see Fig. 4). Failure to properly support both sides of the fuel pump / fuel line compression fitting during tightening will create stress on the fitting and may lead to fatigue cracking of the fuel pump.

Figure 3.

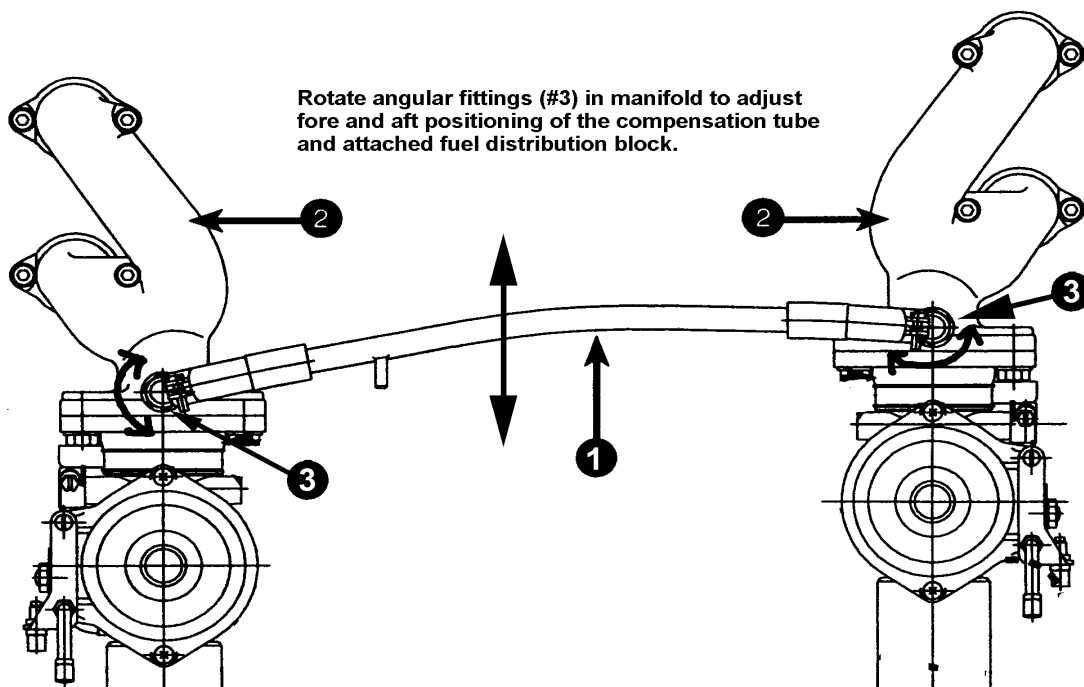
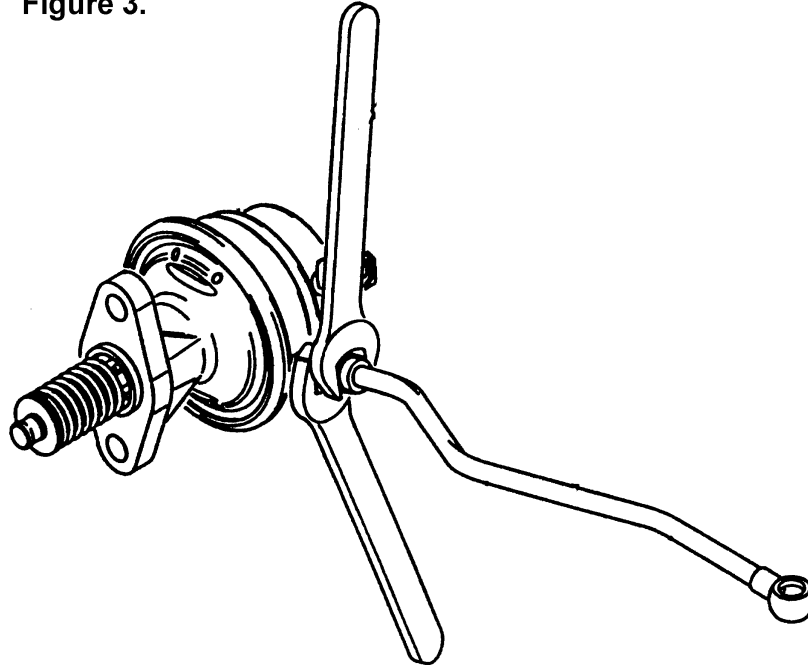


Figure 3.



SUMMARY

- **The fuel pumps on all effected 912 series engines must be inspected for stress and / or fatigue cracks before next flight and daily thereafter.** These daily inspections must be carried out pending further investigation and determination of final action.
- Improper installation and maintenance can cause stress and / or fatigue cracks to develop on the fuel line fittings on the 912 F fuel pump resulting in fuel leakage.
- Careful routine inspection as set out in the Maintenance Manual for ROTAX Engine Type 912 F is important in detecting possible fuel leakage difficulties.
- Replace fuel pump immediately at any sign of fatigue cracking or other damage on or near the fuel pump fittings.
- Always follow proper disassembly and assembly procedures when removing or installing the fuel pump and / or fuel lines. Always consult the appropriate sections of the Maintenance Manual for ROTAX Engine Type 912 F.
- Use care when installing fuel lines to minimize mounting stress.
- Insure that the fuel line clamp block remains securely attached to the compensation tube at all times to provide adequate security of the stainless steel fuel lines.
- Never over tighten collar nuts on fuel line compression fittings. Repeated over tightening can cause the fittings to crack and leak.
- Always use two open end wrenches when tightening fuel line compression fittings to avoid deforming or over stressing fittings.

WARNING!

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