

SERVICE BULLETIN

SPECIAL INSPECTION TO INCREASE THE TBO FOR ROTAX® ENGINE TYPE 912 (SERIES) SB-912-005UL

OPTIONAL

Repeating symbols

Please, pay attention to the following symbols throughout this document emphasizing particular information:

- ▲ **WARNING:** Identifies an instruction, which if not followed, may cause serious injury or even death.
- **CAUTION:** Denotes an instruction which if not followed, may severely damage the engine or could lead to suspension of warranty.
- ◆ **NOTE:** Information useful for better handling.

| || A revision bar outside of the page margin indicates a change to text or graphic.

1) Planning information

1.1) Engine affected

- a) Extension of TBO is already valid for engine type 912 UL (Series) from 600 h to 1200 h or to 15 years period of operation:
 - 912 UL up to S/N 4,152.666
- b) On all engines up to S/N 4,152.666 the 600 h examination has to be carried out to obtain the TBO of 1200 h or to 15 years.
- c) From engine S/N 4,152.667 onwards the 1200 h TBO is covered by SB-912-004UL.

1.2) Concurrent ASB/SB/SI and SL

In addition to this Service Bulletin the following additional Service Bulletins/Service Instructions must be observed:

- SI-10-1991, "Water distributor for ROTAX 912 A and 912 UL", current issue.
- SI-01-1992, "Ignition unit with resistor spark plug", current issue.
- SI-02-1992, "Coolant expansion tank ROTAX 912", current issue.
- SI-03-1993, "Ignition unit of ROTAX 912 UL", current issue.
- SI-08-1993, "General overhaul of ROTAX 912 A/UL", current issue.
- SI-01-1994, "Electronic box for ROTAX 912 A/UL", current issue.
- SI-05-1994, "Banjo Bolt for ROTAX 912 Series", current issue.
- SI-20-1994, "Lubrication system for ROTAX 912", current issue.
- SB-912-004UL, "TBO for ROTAX Motor Type 912 UL Series", current issue.
- SB-912-030UL, "Cracks, wear and distortion on the carburetor flange on ROTAX engines type 912 and 914 Series", current issue.

1.3) Reason

A program for extending the period of operation was carried out in agreement with the type Certificate Authority Austro Control GmbH (ACG). The TBO (engines concerned see section 1.1) can be extended on account of the positive results of the examined engines.

1.4) Subject

Special inspection to increase the TBO for ROTAX® Engine Type 912 (Series).

1.5) Compliance

At release of this Service Bulletin.

1.6) Approval

The technical content is approved under the authority of DOA No. EASA.21J.048.

1.7) Manpower

none

1.8) Mass data

change of weight - - - none.
moment of inertia - - - unaffected.

1.9) Electrical load data

no change

1.10) Software accomplishment summary

no change

1.11) References

In addition to this technical information refer to current issue of:

- Operators Manual (OM)
- all relevant Service Bulletins (SB)
- Maintenance Manual (MM)

◆ 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.

1.12) Other publications affected

The following Service Instruction as a consequence of these Service Bulletin will become invalid thus.

- SI-27-1994, "Special inspection to increase the TBO for ROTAX engine type 912 UL (Series), current issue.

For complete instructions and compliance to this Service Bulletin refer to Service Bulletin-SB -912-005, latest edition section 1.2 onward.

◆ NOTE: Section 1.6) Approval: Is not required for engines of the type UL (series).
Section 3) Accomplishment: In addition: persons with adequate type-specific training.

1.13) Interchangeability of parts

not affected

2) Material Information

2.1) Material - cost and availability

Price and availability will be supplied on request by ROTAX® Authorized Distributors or their Service Center.

2.2) Company support information

- Shipping cost, down time, loss of income, telephone costs etc. or cost of conversion to other engine versions or additional work, as for instance simultaneous engine overhaul is not covered in this scope and will not be borne or reimbursed by ROTAX®.

2.3) Material requirement per engine

Parts requirement:

Depending on the engine modification state (see chapter. 3).

2.4) Material requirement per spare part

none

2.5) Reworks of parts

none

2.6) Special tooling/lubricant-/adhesives-/sealing compound

Price and availability will be supplied on request by ROTAX® Authorized Distributors or their Service Centers.

parts requirement:

- according relevant Maintenance Manual.

■ CAUTION: When using special tools observe the manufacturer's specifications.

3) Accomplishment / Instructions

Accomplishment

All the measures must be taken and confirmed by the following persons or facilities:

- ROTAX® -Airworthiness representative
- ROTAX® -Distributors or their Service Centers
- Persons approved by the respective Aviation Authority

▲ **WARNING:** Proceed with this work only in a non-smoking area and not close to sparks or open flames. Switch off ignition and secure engine against unintentional operation. Secure aircraft against unauthorized operation. Disconnect negative terminal of aircraft battery.

▲ **WARNING:** Risk of scalds and burns! Allow engine to cool sufficiently and use appropriate safety gear while performing work.

▲ **WARNING:** Should removal of a locking device (e.g. lock tabs, self-locking fasteners, etc.) be required when undergoing disassembly/assembly, always replace with a new one.

◆ **NOTE:** All work has to be performed in accordance with the relevant Maintenance Manual.

3.1) General

A program for extending the period of operation (extension of the TBO) for engines from a certain manufacturing period and onward has been introduced. For engines which have already been accepted into this program, see section 1.1a).

However, engines not listed in section 1.1a) and b) can increase the TBO according to the following instructions.

3.2) Extension of the TBO

An extension of the TBO for applicable is basically possible according to table 1. A necessary prerequisite would be the implementation of all relevant Service Bulletins or Service Instructions. See section 1.2.

■ **CAUTION:** An engine may be affected again by a previous modification. Retrieve the necessary information from the respective maintenance documents or the engine log book.

The SB's or SI's to be performed are assigned to the respective engine S/N ranges. All SB's or SI's need to be carried out in ascending order.

◆ **NOTE:** You need to keep the correct sequence and order to attain an extension of the TBO according to the respective engine types (600 h to 1200 h, 1200 h to 1500 h and 1500 h to 2000 h).

3.3) State of amendments

The following modifications as per list of amendments have to be carried out.

Subject	up to and including engine S/N
Introduction of friction washer at drive gear	3,792.880
Length of oil pump rotor increased from 13 mm (.51 in.) to 16 mm (.63 in.)	3,792.943
Conversion to modified compression spring in oil pump to improve pressure control	4,005.185
Change to inside centering of disk springs in the gear box	4,005.323
Oil tank of steel with a drain plug	4,005.537
Shim to adjust pressure of relief valve on oil pump	4,152.274
Rubber plate for protection of expansion tank	May 1993
Change to steel bush in dog gear	4,152.533
Three disk springs 3 mm (.12 in.) thick instead of two with 3 mm (.12 in.) and one with 2,5 mm (.10 in.)	December 1993
Washer in water pump out of stainless steel	4,152.606
Thrust washer behind retaining ring in gear box out of wear resistant plastic	4,152.659
Ring halves for propeller shaft consist of low-sulfur material	4,152.666

3.4) Propeller gear

Remove of the propeller gear in according to current Maintenance Manual (Heavy Maintenance).

3.4.1 Friction washer

See Fig. 1

If hex. nut is still secured by a lock washer, it has to be exchanged for the friction washer (1) according to current Maintenance Manual (Heavy Maintenance).

3.4.2 Replace of oil seal and roller bearing

According to current Maintenance Manual (Heavy Maintenance).

As on type 912 version configuration 3 no oil seal is used on this location, only renewal of roller bearing at detection of pittings on bearing rollers is necessary.

Installation of the propeller gear in according to current Maintenance Manual (Heavy Maintenance).

3.5) Oil pump

See Fig. 2 and 3.

Detailed inspection in according to current Maintenance Manual (Heavy Maintenance).

From engine S/N 4,005.186 onwards, to improve oil pressure control the following parameters of the relief valve were changed. Free length of the compression spring (3) was reduced from 46 mm (1.81 in.) to 39 mm (1.55 in.). Spring rate was changed by increase of wire dia. from 0,8 mm (.031 in.) to 0,9 mm (.035 in.), and dia. of ball was increased from 8 mm (.31 in.) to 8,5 mm (.33 in.). If existing, remove shim (4), but if specified oil pressure can't be reached, adjust pressure by adding shim again.

◆ NOTE: Starting with engine S/N 3,792.944 the oil pump housing and oil pump cover is in pressure die cast. On this occasion capacity of the pump was increased by lengthening of the rotary piston assy. from 13 mm (.51 in.) to 16 mm (.63 in.) along with the respective changes of oil pump housing, pump shaft and O-rings.

From engine S/N 4,152.101 onward the follower in the oil pump shaft (6) was changed to notched pin (5) instead of the former dowel tube.

At a renewal of components change oil pump to the version with the 16 mm (.63 in.) long rotors.

3.5.1 Oil tank

Starting with the engine S/N 4,005.537 on oil tank out of steel instead of aluminium is installed. On this occasion a drain plug was fitted too. Exchange aluminium tank for steel tank to comply with thermic specifications.

■ CAUTION: After the installation of the oil tank connect oil lines **correctly**, wire secure drain plug, fill up with engine oil according to specification in Manual and vent lubrication system.

3.5.2 Venting of lubrication system

In according to current Maintenance Manual (Heavy Maintenance) or SI-912-018, "Purging of lubrication system for ROTAX type 912 and 914 (Series)", current issue.

3.6) Rubber plate

To prevent chafing of the expansion tank a protective rubber plate is glued to underside of expansion tank since May 1993. Inspect expansion tank and stick rubber plate to underside of tank.

3.7) Water pump

See Fig. 4

Operation of the engine without antifreeze in the coolant is not permitted since increased formation of corrosion. Therefore the material of the pump shaft was changed with engine S/N 4,152.414. Because of galvanic reactions, caused by the use of various materials, the washer (1) and the screw (2) are of stainless steel since engine S/N 4,152.607.

Remove, checking and installation in according to current Maintenance Manual (Heavy Maintenance).

3.8) Check of float chamber, float and float needle valve

See Fig. 5 and 6.

Check of float chamber, float and float needle valve in according to current Maintenance Manual (Heavy Maintenance).

Remove float chamber and lift out both floats. If float chamber is still without distance pieces (1), part no. 861920, add them now, thus avoiding possible sticking of the floats in the float chamber.

Check support pin (2) of floats. At heavy wear of float bracket contact faces, caused by excessive vibration, exchange these floats to floats of modified shape and renew float bracket as required.

3.9) Check of valve spring tension

Check in according to current Maintenance Manual (Heavy Maintenance) or SB-912-004UL,“ TBO for ROTAX engine type 912 UL (Series)“, current issue.

- Restore aircraft to original operating configuration.
- Connect negative terminal of aircraft battery.

3.10) Test run

Conduct test run including ignition check and leakage test.

3.11) Summary

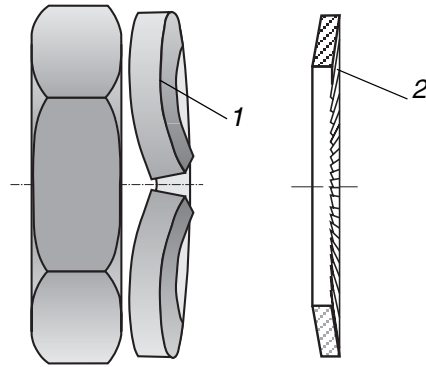
These instructions (section 3) have to be conducted in accordance with compliance in section 1.5. The execution of the Service Bulletin must be confirmed in the logbook.

▲ WARNING: Non-compliance with these instructions/recommendations/could result in engine damage, personal injury or death!

Approval of translation to best knowledge and judgement - in any case the original text in German language and the metric units (SI-system) are authoritative.

4) Appendix

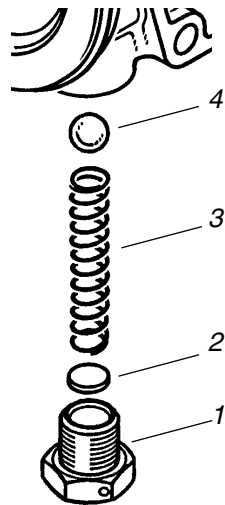
the following drawings should convey additional information:



- 1 lock washer
- 2 friction washer

00798, 00799

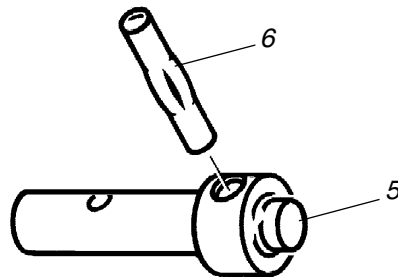
Fig. 1
Friction washer



- 1 plug screw
- 2 shim
- 3 pressure spring
- 4 ball

00371

Fig. 2
Improved oil pressure control

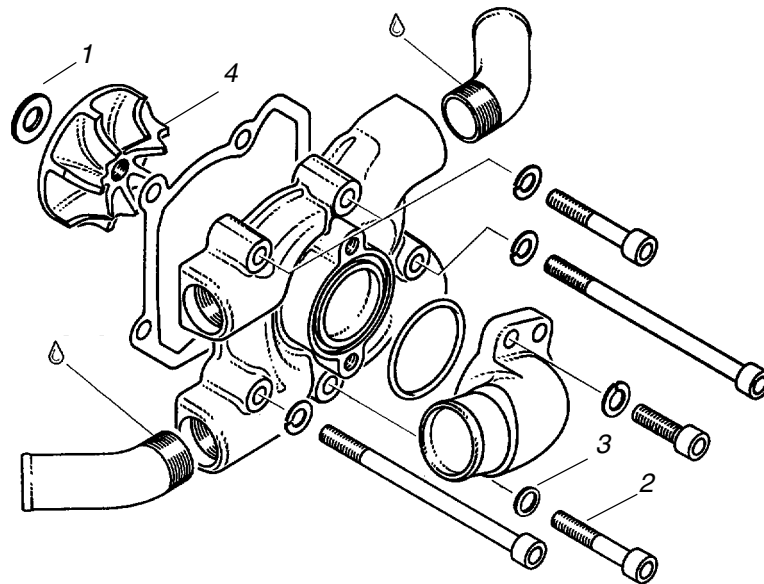


- 5 oil pump shaft
- 6 notched pin

00832

Fig. 3
Oil pump shaft

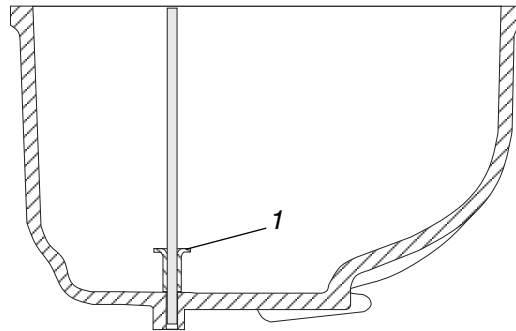
- 1 washer
- 2 allen screw
- 3 gasket ring
- 4 impeller



00377

Fig. 4
Water pump

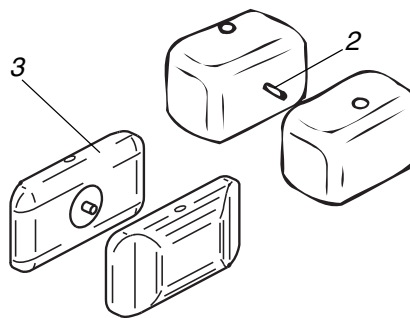
- 1 distance pieces



00359

Fig. 5
Check of float chamber

- 2 support pin
- 3 modified shape



00626

Fig. 6
Check of float

◆ **Note:** The illustrations in this document show the typical construction. They may not represent full detail or the exact shape of the parts which have the same or similar function. Exploded views are **no technical drawings** and are for reference only. For specific detail, refer to the current documents of the respective engine type.

SERVICE BULLETIN

SPECIAL INSPECTION TO INCREASE THE TBO FOR ROTAX® ENGINE TYPE 912 A (SERIES) SB-912-005 R3

OPTIONAL

Repeating symbols

Please, pay attention to the following symbols throughout this document emphasizing particular information:

- ▲ **WARNING:** Identifies an instruction, which if not followed, may cause serious injury or even death.
- **CAUTION:** Denotes an instruction which if not followed, may severely damage the engine or could lead to suspension of warranty.
- ◆ **NOTE:** Information useful for better handling.

| || A revision bar outside of the page margin indicates a change to text or graphic.

1) Planning information

1.1) Engine affected

a) Extension of TBO is already valid for engine type 912 A (Series) from 600 h to 1000 h or to 10 years period of operation for all engines of type:

- 912 A up to S/N 4,076.191

Not affected: V912/1983, V912/1920, 3,792.605, 3,792.701, 3,792.788, 3,792.789, 3,792.790, 4,005.013, 4,005.083, 4,005.133

b) On all engines up to S/N 4,076.191 the 600 h examination has to be carried out to obtain the TBO of 1000 h or to 10 years.

c) From engine S/N 4,076.192 onwards the 1000 h TBO is covered by SB-912-004.

1.2) Concurrent ASB/SB/SI and SL

In addition to this Service Bulletin the following additional Service Bulletins must be observed and complied with:

- SB-912-001, "Ignition unit with resistor spark plug", current issue.
- SB-912-002, "Ignition unit of ROTAX 912 A", current issue.

1.3) Reason

A program for extending the period of operation was carried out in agreement with the type Certificate Authority Austro Control GmbH (ACG). The TBO (engines concerned see section 1.1) can be extended on account of the positive results of the examined engines.

1.4) Subject

Special inspection to increase the TBO for ROTAX® Engine Type 912 A (Series).

1.5) Compliance

At release of this Service Bulletin.

1.6) Approval

The technical content is approved under the authority of DOA No. EASA.21J.048.

1.7) Manpower

none

1.8) Mass data

change of weight - - - none.
moment of inertia - - - unaffected.

1.9) Electrical load data

no change

1.10) Software accomplishment summary

no change

1.11) References

In addition to this technical information refer to current issue of:

- Operators Manual (OM)
- all relevant Service Bulletins (SB)
- Maintenance Manual (MM)

◆ 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.

1.12) Other publications affected

not affected

1.13) Interchangeability of parts

not affected

2) Material Information

2.1) Material - cost and availability

Price and availability will be supplied on request by ROTAX® Authorized Distributors or their Service Center.

2.2) Company support information

- Shipping cost, down time, loss of income, telephone costs etc. or cost of conversion to other engine versions or additional work, as for instance simultaneous engine overhaul is not covered in this scope and will not be borne or reimbursed by ROTAX®.

2.3) Material requirement per engine

Parts requirement:

Depending on the engine modification state (see chapter. 3).

2.4) Material requirement per spare part

none

2.5) Reworks of parts

none

2.6) Special tooling/lubricant-/adhesives-/sealing compound

Price and availability will be supplied on request by ROTAX® Authorized Distributors or their Service Centers.

parts requirement:

- according relevant Maintenance Manual.

■ CAUTION: When using special tools observe the manufacturer's specifications.

3) Accomplishment / Instructions

Accomplishment

All the measures must be taken and confirmed by the following persons or facilities:

- ROTAX® -Airworthiness representative
- ROTAX® -Distributors or their Service Centers
- Persons approved by the respective Aviation Authority

▲ **WARNING:** Proceed with this work only in a non-smoking area and not close to sparks or open flames. Switch off ignition and secure engine against unintentional operation. Secure aircraft against unauthorized operation. Disconnect negative terminal of aircraft battery.

▲ **WARNING:** Risk of scalds and burns! Allow engine to cool sufficiently and use appropriate safety gear while performing work.

▲ **WARNING:** Should removal of a locking device (e.g. lock tabs, self-locking fasteners, etc.) be required when undergoing disassembly/assembly, always replace with a new one.

◆ **NOTE:** All work has to be performed in accordance with the relevant Maintenance Manual.

3.1) General

A program for extending the period of operation (extension of the TBO) for engines from a certain manufacturing period and onward has been introduced. For engines which have already been accepted into this program, see section 1.1a) and b).

However, engines not listed in section 1.1a) and b) can increase the TBO according to the following instructions.

3.2) Extension of the TBO

An extension of the TBO for applicable is basically possible according to table 1. A necessary prerequisite would be the implementation of all relevant Service Bulletins or Service Instructions. See section 1.2.

■ **CAUTION:** An engine may be affected again by a previous modification. Retrieve the necessary information from the respective maintenance documents or the engine log book.

The SB's and/or SI's to be performed are assigned to the respective engine S/N ranges. All SB's and/or SI's need to be carried out in ascending order.

◆ **NOTE:** You need to keep the correct sequence and order to attain an extension of the TBO according to the respective engine types (600 h to 1000 h, 1000 h to 1200 h, 1200 h to 1500 h and 1500 h to 2000 h).

3.3) State of amendments

The following modifications as per list of amendments have to be carried out.

AM No.	Subject	up to and including engine S/N
15	Introduction of friction washer at drive gear	3,792.880
17	Length of oil pump rotor increased from 13 mm (.51 in.) to 16 mm (.63 in.)	3,792.943
22	Conversion to modified compression spring in oil pump to improve pressure control	4,005.185
28	Change to inside centering of disk springs in the gear box	4,076.009
32-01	Oil tank of steel with a drain plug	4,076.023
32-17	Shim to adjust pressure of relief valve on oil pump	4,076.098
32-19	Rubber plate for protection of expansion tank	May 1993
34	Change to steel bush in dog gear	4,076.171
35-01	Three disk springs 3 mm (.12 in.) thick instead of two with 3 mm (.12 in.) and one with 2,5 mm (.10 in.)	4,076.173
35-02	Washer in water pump out of stainless steel	4,076.178
35-04	Thrust washer behind retaining ring in gear box out of wear resistant plastic	4,076.191
35-10	Ring halves with hardness specification HV10 600+100	4,380.556
36-04	Step collar out of wear improved material	4,380.649
36-10	Spacer out of wear improved material	4,380.693

Table 1

3.4) Propeller gear (amendment no. 28, 34, 35-01, 35-04 and 35-05)

Remove of the propeller gear in according to current Maintenance Manual (Heavy Maintenance).

3.4.1 Friction washer (amendment no. 15)

See Fig. 1

If hex. nut is still secured by a lock washer, it has to be exchanged for the friction washer (1) according to current Maintenance Manual (Heavy Maintenance).

3.4.2 Replace of oil seal and roller bearing on type A1 and A2

According to current Maintenance Manual (Heavy Maintenance).

As on type 912 version A3 no oil seal is used on this location, only renewal of roller bearing at detection of pittings on bearing rollers is necessary.

Installation of the propeller gear in according to current Maintenance Manual (Heavy Maintenance).

3.5) Oil pump (amendments no. 17, 22 and 32-17)

See Fig. 2 and 3.

Detailed inspection in according to current Maintenance Manual (Heavy Maintenance).

From engine S/N 4,005.186 onwards, to improve oil pressure control the following parameters of the relief valve were changed. Free length of the compression spring (3) was reduced from 46 mm (1.81 in.) to 39 mm (1.55 in.). Spring rate was changed by increase of wire dia. from 0,8 mm (.031 in.) to 0,9 mm (.035 in.), and dia. of ball was increased from 8 mm (.31 in.) to 8,5 mm (.33 in.). If existing, remove shim (4), but if specified oil pressure can't be reached, adjust pressure by adding shim again.

◆ NOTE: Starting with engine S/N 3,792.944 the oil pump housing and oil pump cover is in pressure die cast. On this occasion capacity of the pump was increased by lengthening of the rotary piston assy. from 13 mm (.51 in.) to 16 mm (.63 in.) along with the respective changes of oil pump housing, pump shaft and O-rings.

From engine S/N 4,076.068 onward the follower in the oil pump shaft (6) was changed to notched pin (5) instead of the former dowel tube.

At a renewal of components change oil pump to the version with the 16 mm (.63 in.) long rotors.

3.5.1 Oil tank (amendments no. 32-01)

Starting with the engine S/N 4,076.024 on oil tank out of steel instead of aluminium is installed. On this occasion a drain plug was fitted too. Exchange aluminium tank for steel tank to comply with thermic specifications.

■ CAUTION: After the installation of the oil tank connect oil lines **correctly**, wire secure drain plug, fill up with engine oil according to specification in Manual and vent lubrication system.

3.5.2 Venting of lubrication system

In according to current Maintenance Manual (Heavy Maintenance) or SI-912-018, "Purging of lubrication system for ROTAX type 912 and 914 (Series)", current issue.

3.6) Rubber plate (amendments no. 32-19)

To prevent chafing of the expansion tank a protective rubber plate is glued to underside of expansion tank since May 1993. Inspect expansion tank and stick rubber plate to underside of tank.

3.7) Water pump (amendments no. 35-02)

See Fig. 4

Operation of the engine without antifreeze in the coolant is not permitted since increased formation of corrosion. Therefore the material of the pump shaft was changed with engine S/N 4,076.122. Because of galvanic reactions, caused by the use of various materials, the washer (1) and the screw (2) are of stainless steel since engine S/N 4,076.178.

Remove, checking and installation in according to current Maintenance Manual (Heavy Maintenance).

3.8) Check of float chamber, float and float needle valve

See Fig. 5 and 6.

Check of float chamber, float and float needle valve in according to current Maintenance Manual (Heavy Maintenance).

Remove float chamber and lift out both floats. If float chamber is still without distance pieces (1), part no. 861920, add them now, thus avoiding possible sticking of the floats in the float chamber.

Check support pin (2) of floats. At heavy wear of float bracket contact faces, caused by excessive vibration, exchange these floats to floats of modified shape (3), part no. 861183 as per amendment no. 37-01 and re-new float bracket as required.

3.9) Check of valve spring tension

■ CAUTION: On engines from number S/N 4,076.220 onwards this check is not required anymore and can be dropped therefore for this engine.

Check in according to current Maintenance Manual (Heavy Maintenance) or SB-912-004, "TBO for ROTAX engine type 912 A (Series)", current issue.

- Restore aircraft to original operating configuration.
- Connect negative terminal of aircraft battery.

3.10) Test run

Conduct test run including ignition check and leakage test.

3.11) Summary

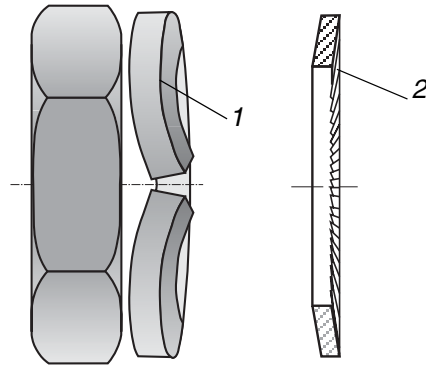
These instructions (section 3) have to be conducted in accordance with compliance in section 1.5. The execution of the Service Bulletin must be confirmed in the logbook.

▲ WARNING: Non-compliance with these instructions/recommendations/could result in engine damage, personal injury or death!

Approval of translation to best knowledge and judgement - in any case the original text in German language and the metric units (SI-system) are authoritative.

4) Appendix

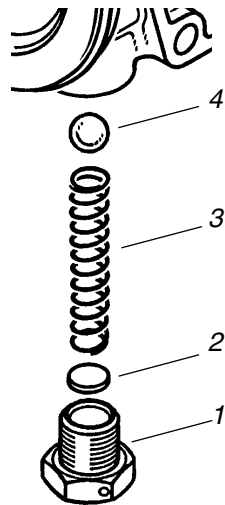
the following drawings should convey additional information:



- 1 lock washer
- 2 friction washer

00798, 00799

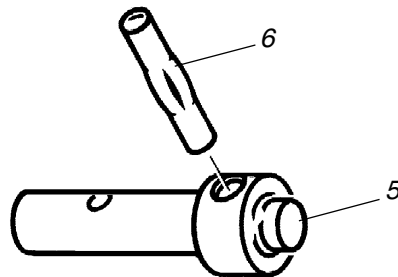
Fig. 1
Friction washer



- 1 plug screw
- 2 shim
- 3 pressure spring
- 4 ball

00371

Fig. 2
Improved oil pressure control

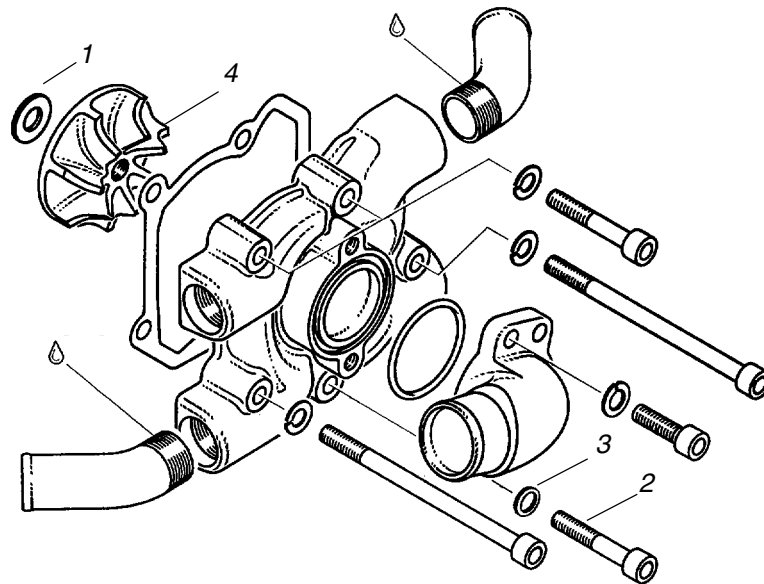


- 5 oil pump shaft
- 6 notched pin

00832

Fig. 3
Oil pump shaft

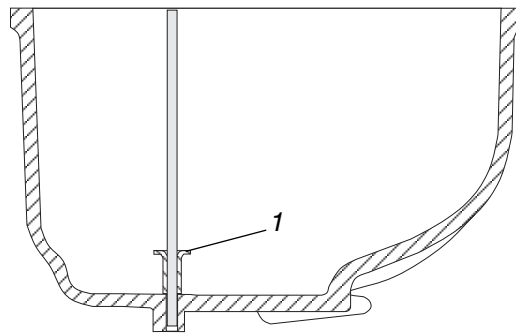
- 1 washer
- 2 allen screw
- 3 gasket ring
- 4 impeller



00377

Fig. 4
Water pump

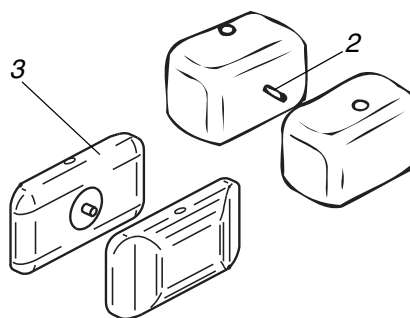
- 1 distance pieces



00359

Fig. 5
Check of float chamber

- 2 support pin
- 3 modified shape



00626

Fig. 6
Check of float

◆ **Note:** The illustrations in this document show the typical construction. They may not represent full detail or the exact shape of the parts which have the same or similar function. Exploded views are **no technical drawings** and are for reference only. For specific detail, refer to the current documents of the respective engine type.