

SERVICE INSTRUCTION - PAC

Fuel pump service kit for ROTAX® Aircraft Engines

ATA System: 73-00-00 Fuel system

1) Planning information

“PAC” Service Instruction Documents provide detailed information on non-certified ROTAX® Aircraft Engine Parts and Accessories. Referenced parts and accessories are provided without EASA certification or ASTM compliance. Certification / Compliance of referenced Parts and Accessories must be completed by the aircraft OEM.

To obtain satisfactory results, procedures specified in this publication must be accomplished with accepted methods in accordance with prevailing legal regulations.

BRP-Rotax GmbH & Co KG cannot accept any responsibility for the quality of work performed in accomplishing the requirements of this publication.

1.1) Applicability

Refer to the latest issue of the relevant Illustrated Parts Catalog.

NOTICE

The fuel pump service kit is part of the fuel system on aircraft-side and not a part of the Engine Type Design. The fuel pump service kit has been tested and released by BRP-Rotax, but it is not certified. The correct function in conjunction with the entire system and the certification of the fuel pump service kit is the responsibility of the aircraft manufacturer.

1.2) Concurrent ASB/SB/SI and SL

None.

1.3) Reason

In the course of product maintenance and expansion of our spare parts program for the ROTAX® Aircraft Engines a fuel pump service kit can be offered.

1.4) Subject

Fuel pump service kit for ROTAX® Aircraft Engines.

1.5) Compliance

NONE - For Information Only.

1.6) Approval

None.

1.7) Labor time and credit

Estimated labor hours:

Engine installed in the aircraft - - - labor time will depend on airframe installation and therefore no estimate is available from the engine manufacturer.

1.8) Mass data

Change of weight - - - none.

Moment of inertia - - - unaffected.

1.9) Electrical load data

No change.

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1.10) Software modifications

No change.

1.11) References

In addition to this technical information refer to current issue of

- Illustrated Parts Catalog (IPC)
- Installation Manual (IM)
- Maintenance Manual Heavy (MMH)
- Maintenance Manual Line (MML)

NOTE: The status of the Manuals can be determined by checking the table of amendments. The 1st column of this table shows the revision status. Compare this number to that listed on the ROTAX website:
www.FLYROTAX.com. Updates and current revisions can be downloaded for free.

1.12) Other Publications affected

None.

1.13) Interchangeability of parts

- All parts are interchangeable

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2) Material Information

2.1) Material- cost and availability

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

2.2) Company support information

- Any possible support by BRP-Rotax will be provided on request by ROTAX® Authorized Distributors or their independent Service Centers

2.3) Material requirement and credit per engine

Parts requirement:

Fig.no.	Part no.	Qty/ engine	Description	Application
1	889537	1	Fuel pump service kit	Fuel system

2.4) Material requirement and credit per spare part

None.

2.5) Rework of parts

None.

2.6) Special tooling/lubricants- /adhesives- /sealing compounds

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

Part no.	Description	Application
-	CRC Leak Detector (14503). Non-flammable water based formula. No oils, silicones or harmful solvents.	Crimp connection leak detection.
-	BERNER Leckfinder (148383). Water based formula, non-corrosive, silicone free.	Crimp connection leak detection.

NOTE: There are many third party commercial leak detection products available. Ensure that the leak detection solution used is non-corrosive and does not contain harmful solvents.

NOTICE

If using these special tools and adhesives, observe the manufacturer's directions.

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3) Accomplishment/Instructions

- ROTAX® reserves the right to make any amendments to existing documents which might become necessary due to this standardization, at the time of next revision or issue.

NOTE: Before maintenance, review the entire documentation to make sure you have a complete understanding of the procedure and requirements.

Accomplishment

All measures must be implemented and confirmed by at least one of the following persons or organizations:

- ROTAX® - Authorized Distributors or their independent Service Centers
- Persons with approved qualifications for the corresponding engine types. Only authorized persons (iRMT, Level Heavy Maintenance) are entitled to carry out this work.



All work has to be performed in accordance with the relevant Maintenance Manuals for the respective engine type.

Safety notice

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

During work on the fuel distribution system/fuel pump there is a risk of injury due to pressure and fuel! Before starting repair work on the fuel system, ensure that it is no longer pressurized!

ENVIRONMENTAL NOTE

All the operating fluids and cleaning agents can damage the environment if not disposed of properly. Dispose of operating fluids in an eco-friendly manner!

NOTE: Indicates supplementary information which may be needed to fully complete or understand an instruction.

Preparation

- Drain fuel according to the relevant aircraft Maintenance Manual

3.1) Installation - related information

NOTE: Ensure that check valves and fuel pumps remain in their original orientation. See Fig. 5 and see the current version of the respective engine Installation Manual (IM), Chapter 73-00-00.

ENVIRONMENTAL NOTE

Work with the utmost care to ensure that no water pollutants can penetrate into the soil, water or the sewerage system.
Dispose of fuel at the respective collecting point or hand it over to an approved disposal company.

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3.2) Maintenance (Line) - related information



See relevant Maintenance Manual Line for the respective engine type and its periodical maintenance information.

3.3) Maintenance (Heavy) - related information



See relevant Maintenance Manual Heavy for the respective engine type. See Chapter 73-10-00 "Fuel pump and distribution".

3.4) Disassembly

See [Fig. 3](#).

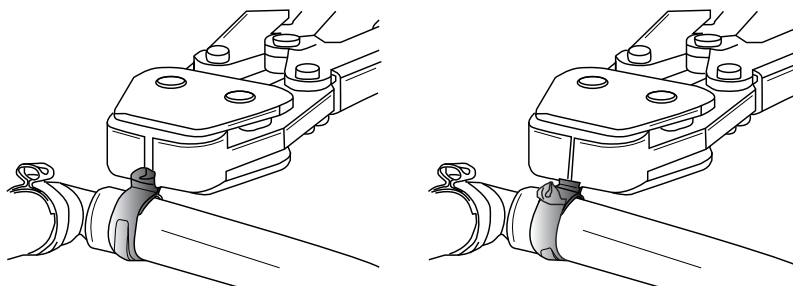
Step	Procedure
1	If still installed: Disconnect the fuel lines from aircraft fuel system.
2	Remove fuel pump cover (4) by disassembly of the 4 Allen screws M5x12 (7).
3	Disconnect electrical connectors from MAIN and AUX fuel pump (8).
4	Disassemble the wiring and rubber grommet (6) from fuel pump housing (1).
5	Remove hex. nuts M6 (3).
6	Remove complete fuel pump module assy. (pump bracket assy. (2) with fuel pumps (8) etc.) from fuel pump housing.
7	Remove 1-ear clamps (9) (11) (13). NOTE: Use e.g. ear clamp pliers KNIPEX 1099. Position jaws of the pliers on the edge of ear and cut through the ear of each clamp. Then use pliers to spread and remove the clamp. See Fig. 1 .

CAUTION

Do not damage fuel pump and check valve connectors during disassembly process.

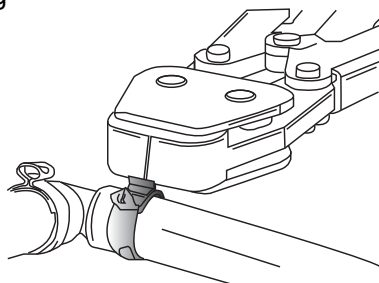
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1. Place jaw tips on each side of clamp ear or single leg

2. Squeeze handles



3. Cut through and remove clamp

Fig. 1

Step	Procedure
8	Remove pump bracket assy. (2).
9	Disassemble the fuel hose suction line, pressure line, connecting line, check valve, fuel pumps assy.. NOTE: Do not use a knife or sharp object as this may cut, scratch or otherwise damage the fitting.

3.5) Checks

Step	Procedure
1	Check the fuel pump connectors for deformation, cuts or scratch marks. NOTE: Longitudinal cuts or scratches are not allowed. If such marks are found the fuel pump must be replaced.
2	Check the suction line, pressure line, connecting line and check valve for deformation or scratch marks. NOTE: Longitudinal cuts or scratches are not allowed. If such marks are found the check valve or connecting line must be replaced.
3	Check the entire system for deposits and/or contamination in the lines, fuel pumps etc..
4	Visual check of all fuel pump module components (cover, brackets, housing, heat protection mat etc.).

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3.6) Assembly

NOTICE

Only use GENUINE ROTAX® parts for part replacement!

- NOTE: Always use new hoses for assembly.
- NOTE: For easier hose assembly, fuel or brake cleaner can be used to lubricate the inside of the hose. Do not use oil, silicone or any type of grease!
- NOTE: Make sure that all 1-ear- clamps are crimped with 1.5 mm (0.06 in.) distance from hose end and are not positioned directly over the connector barb (see Fig. 2).
- NOTE: Always use full slip on length of the hoses (see Fig. 2).

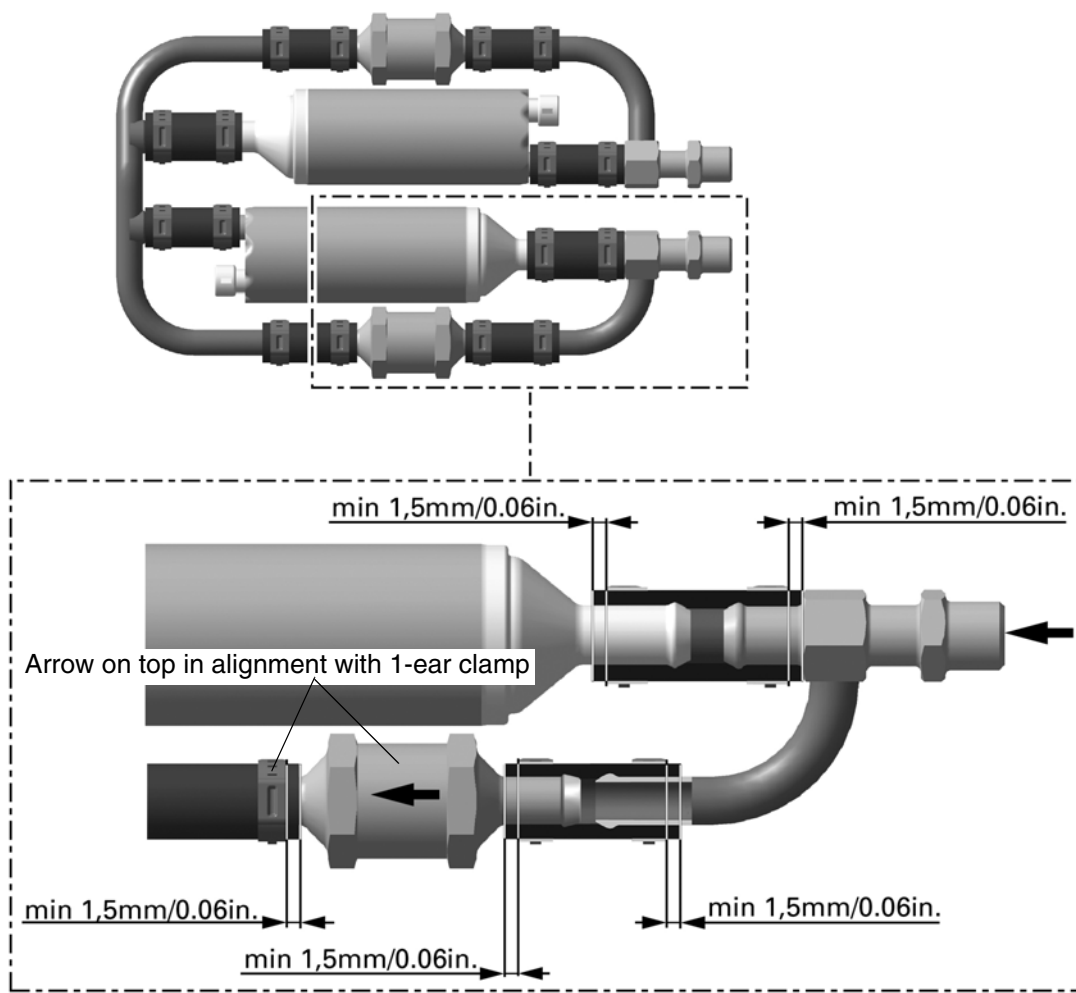


Fig. 2
Slip on length

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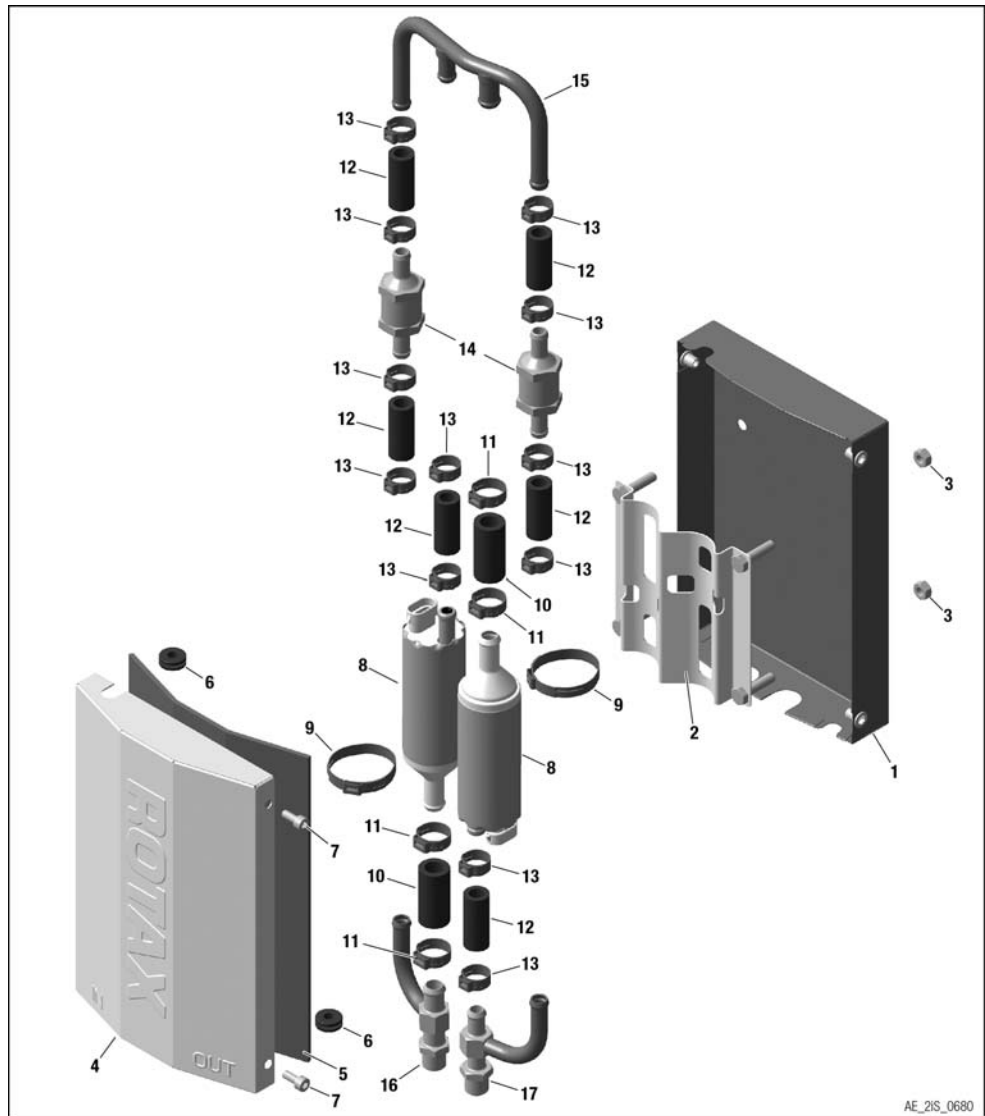
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See Fig. 3.

Step	Procedure
1	Position new hoses (12) (10) on connection line (15).
2	Slip on new 1-ear-clamps (13) (11).
3	Install the check valves (14) and the fuel pumps (8).
4	Position new hoses (12) (10) on check valves (14) and the fuel pumps (8).
5	Install new 1-ear-clamps (9) on the pump bracket assy. (2).
6	Slide in the check valves and fuel pumps accordingly.
7	Slip on new 1-ear-clamps (13) (11).
8	Install suction line (17).
9	Install pressure line (16).
10	Temporarily position complete fuel pump module assy. (pump bracket assy. (2) with fuel pumps (8) etc.) in the fuel pump housing (1).
11	Arrange the position of the fuel pumps, check valves, hoses etc. accordingly to fit within the fuel pump housing.
12	Mount and crimp the two fuel pump 1-ear-clamps (9). NOTE: Use e.g. ear clamp pliers KNIPEX 1099.
13	For easier work on the consequent job tasks, remove the complete fuel pump module assy. from the fuel pump housing without relocating hoses, check valves, fuel pumps etc..
14	Mount and crimp 1-ear-clamps (11) (13). NOTE: Use e.g. ear clamp pliers KNIPEX 1099.
15	Place complete fuel pump module assy. (pump bracket assy. (2) with fuel pumps (8) etc.) in the fuel pump housing.
16	Install hex. nuts M6 (3). Tightening torque 10 Nm (90 in. lb.).
17	Before installing the fuel pump cover, perform a leakage check (see section 3.7).
18	Install the wiring and rubber grommets (6) into fuel pump housing (1).
19	Connect electrical connectors to MAIN and AUX fuel pump (8).
20	Install fuel pump cover (4) using 4 Allen screw M5x12 (7). Tightening torque 6 Nm (55 in. lb.).
21	If still installed in aircraft: Connect the fuel lines from aircraft fuel system.

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|---|-------------------------|----|-----------------|
| 1 | Fuel pump housing | 10 | Hoses |
| 2 | Fuel pump bracket assy. | 11 | 1-ear-clamp |
| 3 | Hex. nut M6 | 12 | Hoses |
| 4 | Fuel pump cover | 13 | 1-ear-clamp |
| 5 | Heat protection mat | 14 | Check valves |
| 6 | Rubber grommet | 15 | Connection line |
| 7 | Allen screw M5x12 | 16 | Pressure line |
| 8 | Main and Aux fuel pump | 17 | Suction line |
| 9 | 1-ear-clamp | | |

Fig. 3

Fuel pump assy. - single parts

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3.6.1) Leakage check

See Fig. 4.



See also latest Maintenance Manual Heavy for the respective engine type.

Once all rubber hoses have been replaced with new and all clamps are properly crimped, the fuel pump assembly must be tested for the security of connections.

NOTICE

Make sure not to mix up IN(-LET) and OUT(-LET) of fuel pump assembly in the following tasks.

NOTICE

For this leakage check disconnect electrical connectors to MAIN and AUX fuel pump.

See Fig. 4.

Step	Procedure
1	Block the OUTLET of the fuel pump assembly with suitable threaded pressure cap (e.g. AN929-6).
2	Connect the INLET of the fuel pump assembly to a differential pressure gauge.
3	Apply 6 bar (87psi) to the fuel pump assembly (see Fig. 4).
4	NO pressure loss is allowed on the differential pressure gauge.
5	With the fuel system temporarily pressurized with air, use an appropriate leak detector solution at each hose and clamp connection to verify proper sealing. <div style="background-color: #0070C0; color: white; padding: 2px; display: inline-block;">NOTICE</div> Follow leak detector solution manufacturer's instructions for its use, clean up and safety information.
6	If any air bubbles are present at rubber hose connections, replace the clamp and ensure proper crimp. An extra clamp of each size is provided in the service kit.

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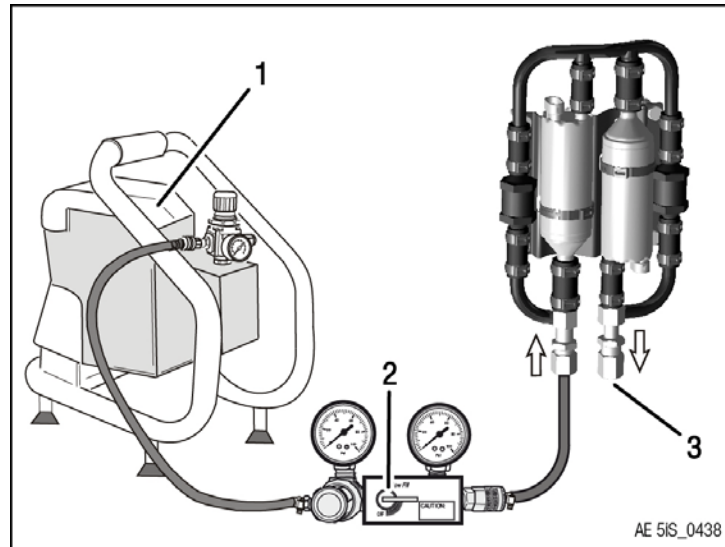


Fig. 4

- 1 Air compressor 2 Differential pressure tester
3 Cap on "outlet"

NOTE: Assemble with clean parts only in a clean environment!

NOTE: Ensure that check valves and fuel pumps are in their correct orientation. See Fig. 5.

NOTICE

The fuel pumps and check valves must not be dismantled.
Replace at maintenance interval or when contaminated.

- Connect negative terminal of aircraft battery

3.7) Test run

In case of uninstalled engines test run can be skipped as this is covered by the mandatory test run after installation.



Conduct test run and perform leakage check. See Chapter 12-20-00 of the latest Maintenance Manual Line for the respective engine type.

3.8) Summary

The execution of the Service Instruction - PAC must be confirmed in the logbook.



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

Translation into other languages might be performed in the course of language localization but does not lie within ROTAX' scope of responsibility.

In any case the original text in English language and the metric units are authoritative.

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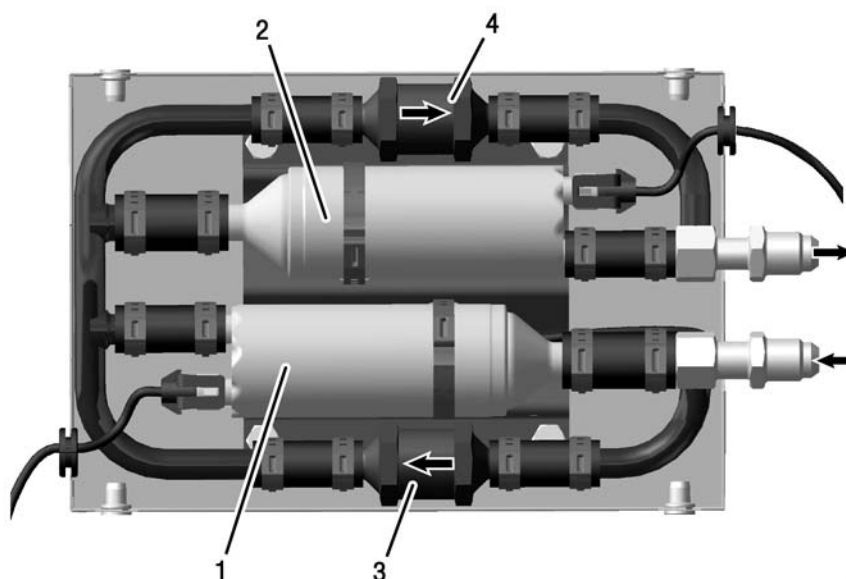
3.9) Inquiries

Inquiries regarding this Service Instruction - PAC should be sent to the ROTAX® Authorized Distributor of your area.

A list of all ROTAX® Authorized Distributors or their independent Service Centers is provided on www.FLYROTAX.com.

4) Appendix

The following figures should provide additional information:



- 1 Main pump (main)
- 2 Auxiliary pump (AUX)
- 3 Check valve
- 4 Check valve

Fig. 5

Fuel pump assy. - TYPICAL

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 **not technical drawings** and are for reference only. For specific detail, refer to the current documents of the respective engine type.

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