

SERVICE INSTRUCTION - PAC

Optional heat sink set for rectifier regulator / fuse box for ROTAX® Aircraft Engines

ATA System: 76-10-00 Fuse Box

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 heat sink set is not a part of the Engine Type Design. The heat sink set 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 heat sink set is the responsibility of the aircraft manufacturer and must be carried out jointly with the aircraft.

1.2) Concurrent ASB/SB/SI and SL

In addition to this Service Instruction - PAC the following Service Bulletin must be observed and complied with:

Service Bulletin-SB-912 i-004iS, title “Replacement of regulator A and regulator B“, current issue.

1.3) Reason

As specified in the Installation Manual (IM) section Approval of electronic components, maximum permissible component temperature for each regulator is 80 °C (176 °F). Field experience has shown that in some aircraft installations and their relevant operating profiles, the temperature of the regulators can exceed the maximum limit due to these installation specifics.

WARNING

Continuous operation above maximum component temperature limits can result in engine damage, personal injuries or even fatal injury.

NOTICE

It is the responsibility of the aircraft OEM to measure maximum component temperatures during all operation profiles and to ensure adequate cooling during all operation profiles including “hot day” conditions.

1.4) Subject

Optional heat sink set for rectifier regulator / fuse box for ROTAX® Aircraft Engines.

1.5) Compliance

NONE - For Information Only.

1.6) Approval

None.

1.7) Labor time

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.

1.10) Software modifications

No change.

1.11) References

In addition to this technical information refer to current issue of

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

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 the one 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

2) Material Information

2.1) Material

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 per engine

Parts requirement for installation of heat sink set:

Fig.no.	part no.	Qty/ engine	Description	Application
1	481490	1	Heat sink set	Regulator
consist of:				
	244211	2	Washer 6.4	Regulator
	842041	2	Lock nut M6	Regulator
	282870	1	Heat transfer pad 65x80x0.5 mm	Regulator

NOTE: Additional heat sink set installation could be caused by variations in fuse box installation location, cowling design, airflow etc.; If additional measures are required to reduce regulator temperatures, the aircraft OEM must design a proper solution and source their own components.

2.4) Material requirement per spare part

None.

2.5) Rework of parts

If a regulator requires removal from the fuse box and re-location elsewhere (for example into an area of greater airflow), the mounting distance from the fuse box is limited by the length of the wiring harness and plugs. Due to potential high current load, the length of the wires must not be increased.

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

None.

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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) are entitled to carry out this work

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

3.1) Spare Parts - related information

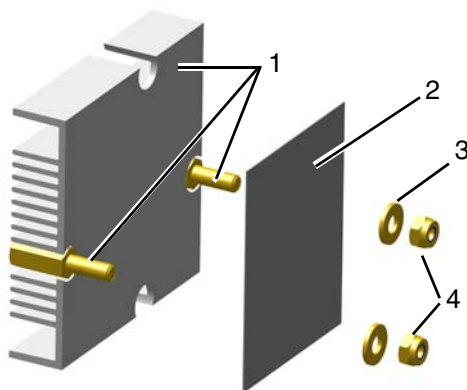


Fig. 1

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Pos.	Description	Part no.	Pos.	Description	Part no.
1	Heat sink set	481490	2	Heat transfer pad 65x80x0.5	282870
3	Washer 6.4	244211	4	Lock nut M6	842041

3.2) Operation - related information



See relevant Operators Manual (OM) for the respective engine type.

3.3) Installation - related information



See relevant Installation Manual (IM) for the respective engine type.

The fuse box with regulators attached should be mounted in an area that provides adequate air-flow to provide cooling to both regulators.

3.3.1) Component temperature measurement at first installation

See Fig. 2.

The component temperature of both regulators must be measured during all operational conditions including, but not limited to:

- "Hot day" conditions
- Ground run and prolonged taxi conditions
- In-flight conditions
- For typical as well as for maximum electric load

The regulator temperature measurement area is shown in Fig. 2 (pos. 2).

Temperature probes attached to a data-capture device will allow the monitoring of component temperatures while operational tests are conducted. Fig. 3 shows an example graph of temperature data captured during operational condition tests.

NOTE: The example graph indicates that all measured temperatures are within 10 °C (50 °F) of the maximum temperature limit. In other condition that the one shown by exceeding the maximum temperature limits, additional cooling of the regulators must be addressed.

1 Regulator
2 Component temperature measurement area

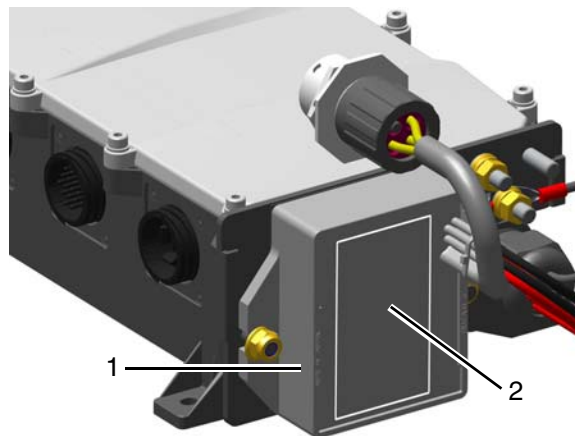


Fig. 2
Regulator

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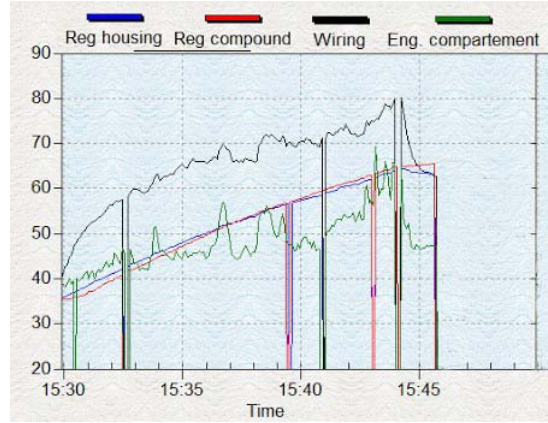


Fig. 3

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Example graph - measured temperatures

3.3.2) Reducing component temperature in course of aircraft design

If the temperatures measured at any point during multiple operational conditions approach the maximum limit of 80 °C (176 °F), the regulators will require additional cooling. Aircraft OEM must consider options for how additional cooling will be provided.

Options for additional cooling include:

- Addition of heat sinks
- Introduction of cooling air flow
- Relocation of regulators

See Fig. 6 for an example of a heat sink (1) attached between the regulator and the fuse box mounting plate. For such purpose BRP-Rotax does offer a heat sink set, see section 2.1) Material requirement per engine.

NOTE: The addition of a heat sink will extend the overall width of the fuse box assembly. Depending upon fuse box location, sufficient clearance may not be available.

3.4) Maintenance (Line) - related information

Points of inspection	Interval Operating hours		Chapter Reference
	200 h	600 h	
Check the FUSE BOX and its mounting.		x	See relevant Maintenance Manual (Line) for the respective engine type and its periodical maintenance information.

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3.5) Maintenance (Heavy) - related information

To the installation of the heat sink the following steps are necessary:

See Fig. 4 up to Fig. 6.

Step	Procedure
1	Remove the regulator B. Remove the 2 M6 lock nut with washer. Wrench size: A/F 10. NOTE: Previous versions of the fuse box may have M4 lock nuts on Regulator B, new versions have M6 lock nuts.
2	Clean the fuse box and regulator plate: Remove residues of the thermal paste or the heat transfer pads.

NOTICE

The adhesive surface on the back of the regulator must be cleaned before applying the heat transfer pads. Remove the protective film with caution, because rapid stripping can damage the heat transfer pad.

Step	Procedure
3	Bonding the heat transfer pad to the regulator: Remove the protective film from heat transfer pad and stick the heat transfer pad with the adhesive surface onto the regulator (avoid any folds or bubbles).

NOTE: When using a heat transfer pad, no additional application of a thermal compound is required.

- 1 Heat transfer pad
- 2 Regulator B

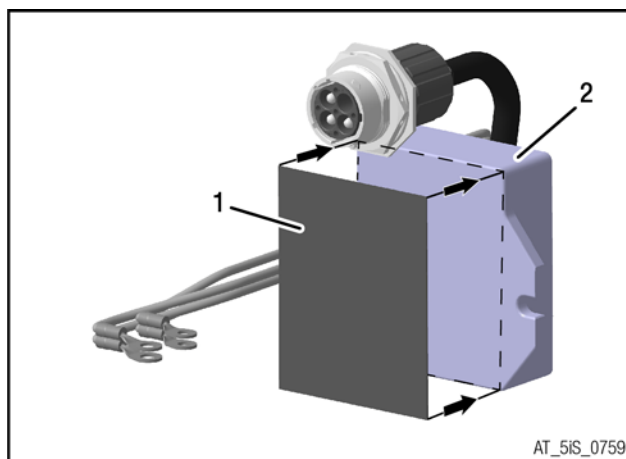


Fig. 4

Bonding - Heat transfer pad

See Fig. 5.

Step	Procedure
4	Fasten 2 adapter to the fuse box. Tightening torque: 6 Nm (53 in.lb).
5	Install heat sink to the fuse box.

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3 Adapter M6
4 Heat sink

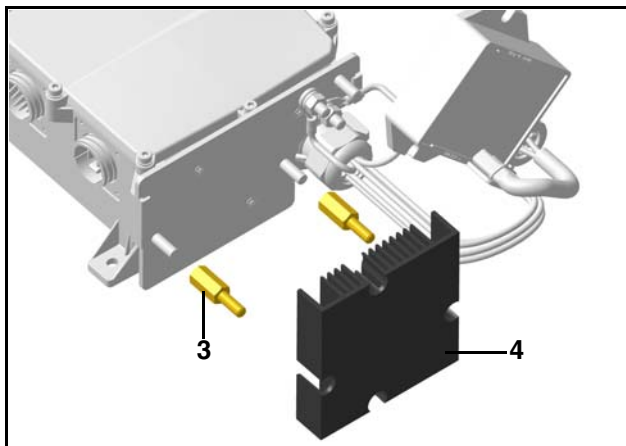


Fig. 5
Adapter and heat sink

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See Fig. 6

Step	Procedure
6	Fasten regulator to the fuse box with 2 lock nuts M6 and washers. Tightening torque: 6 Nm (53 in.lb). Wrench size: A/F 10.

NOTE: Tighten the two lock nuts M6 alternately to ensure a smooth seat of regulator on the regulator plate.

5 Washer 6.4
6 Lock nut M6

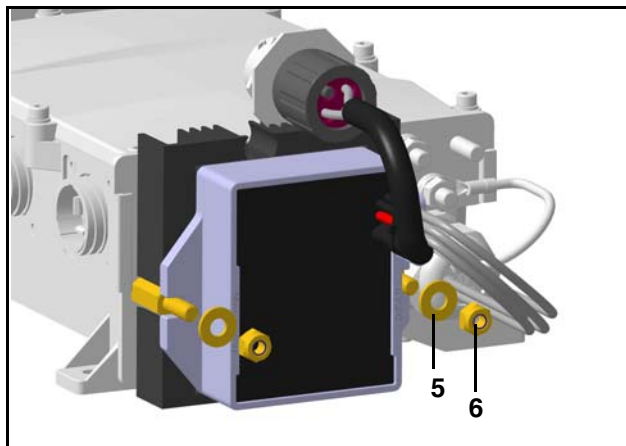


Fig. 6

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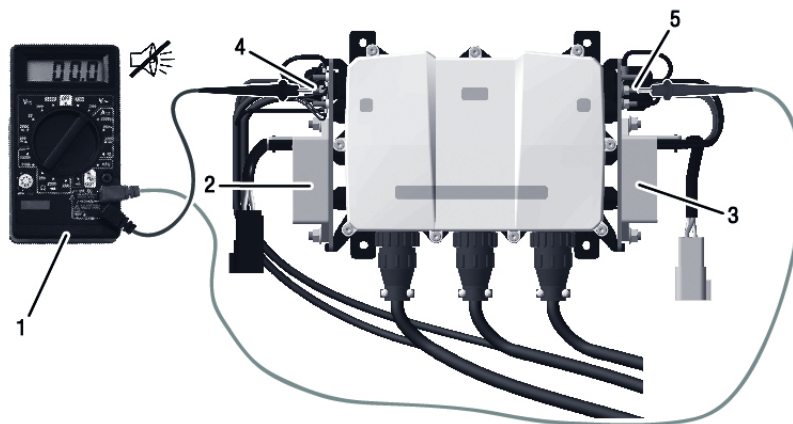
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3.6) Relocation of regulators (if heat sink(s) and optimization of air flow is found insufficient)

The regulators may be relocated elsewhere within the limitations of the wiring harness length.

NOTE: The regulators will require mounting to a heat sink.

NOTE: The isolation of regulator ground from engine / airframe ground must be respected. See Installation Manual (IM) for the respective engine type, Chapter 24-00-00, section 2 and/or validation of installation for details. See Fig. 7.



- 1 Multimeter
 2 Regulator A (black wire connector)
 3 Regulator B (grey connector (or circular type connector))
 4 Ground connections regulator A
 5 Ground connections regulator B

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Fig. 7

TYPICAL - Continuity check

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

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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.

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.

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.