

SERVICE INSTRUCTION - PAC

External alternator for ROTAX® Engine Type 915 i (Series)

ATA System: 24-30-00 External alternator

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

1.2) Concurrent ASB/SB/SI and SL

None.

1.3) Reason

An external alternator is not included in the scope of delivery for 915 i Series aircraft engines. An external alternator set part no. 887259 is available which includes brackets for 915 i Series gearbox mounting.

1.4) Subject

External alternator for ROTAX® Engine Type 915 i (Series).

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 - - - see section 3.1).

Moment of inertia - - - to be calculated by aircraft manufacturer.

1.9) Electrical load data

See Chapter 3.

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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)
- 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 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

- Not affected

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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	887259	1	Alternator set	915 i Series

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

2.4) Material requirement and credit per spare part

None.

2.5) Rework of parts

None.

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

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

Safety notice



WARNING

Identifies an instruction which, if not followed, may cause serious injury or even fatal injury.



CAUTION

Identifies an instruction which, if not followed, may cause minor or moderate injury.

NOTICE

Identifies an instruction which, if not followed, may severely damage the engine or could void any warranty.

ENVIRONMENTAL NOTE

Environmental notes give you tips on environmental protection.

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

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3.1) Installation - related information

Optional extras - External alternator (as option if the output of the integrated generator is inadequate).

3.1.1) Technical data

General note NOTE: The voltage regulator is integrated in the alternator.
Output Max. 550 W/DC at 6000 r.p.m. (complies ~ 4800 r.p.m. crankshaft speed).
Output voltage 14.2 V - 14.8 V.
Ambient temp. Ambient temperature range:

Min.	Max.
-30 °C (-22 °F)	+90 °C (194 °F)

Weight Weight: 3.0 kg (6.61 lbs).

3.1.2) Connections

See Fig. 1.

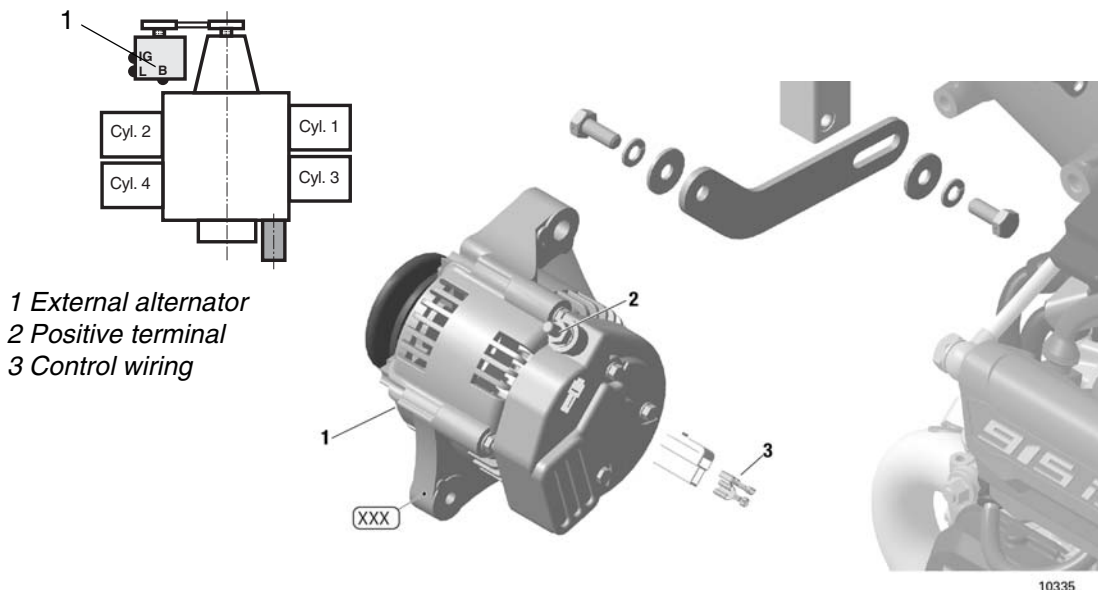
Power supply wires Power supply wires to external alternator (1) have to be installed depending on the mounting position and according to the regulations of the aircraft manufacturer.

Positive terminal Positive terminal (2):
M6 screw connection suitable for cable terminal according to DIN 46225 (tightening torque 4 Nm (35 in. lb)).

Ground Via engine block.

Control wiring Control wiring (3): Via supplied standard plug (Sumitomo 6111-2568) and 6.3x0.8 Faston connectors (female).

Fig. 1.



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3.1.3) Requirements for correct operation of the integrated rectifier regulator

- Fuse** The rectifier regulator must be protected by a slow blowing fuse or circuit breaker. Fuse or circuit breaker rating must be determined by load, wire size and length.
- Load distribution** Due to slightly different output voltages of the regulators (alternator and regulator A/B of fuse box) the power is drawn by the generator with the higher output voltage at low load.
- Amperage** See Fig. 2.

NOTICE

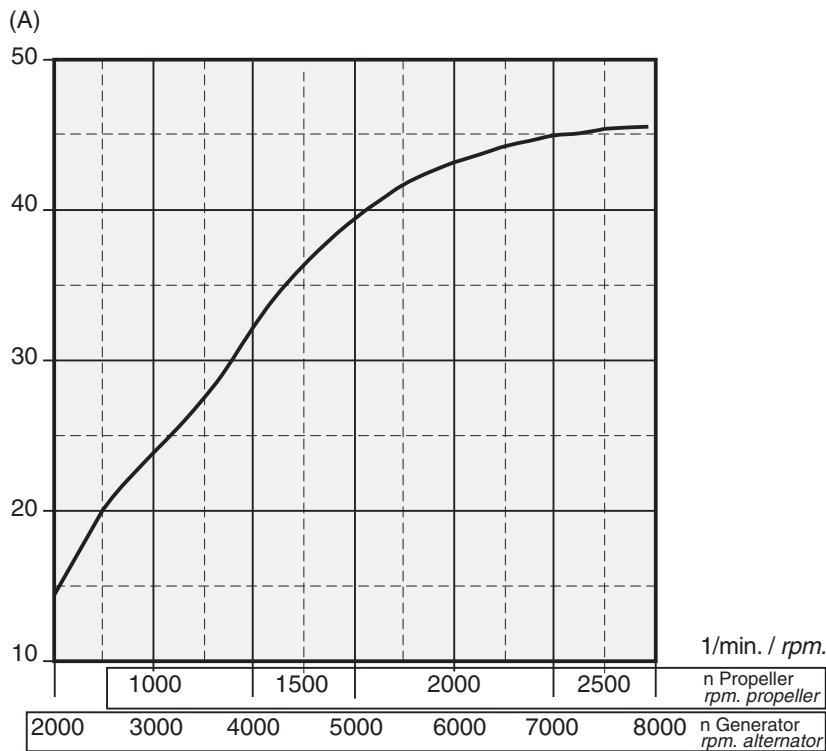
The current over engine speed graph was determined and is only effective under the following conditions.

- Ambient temperature: 20 °C (68 °F)
- Voltage: constant 13.5 V
- Tolerance: max. ± 5 %

NOTE: The speed of the external alternator is 1.18 times the crankshaft speed or 3 times the propeller speed.

Fig. 2

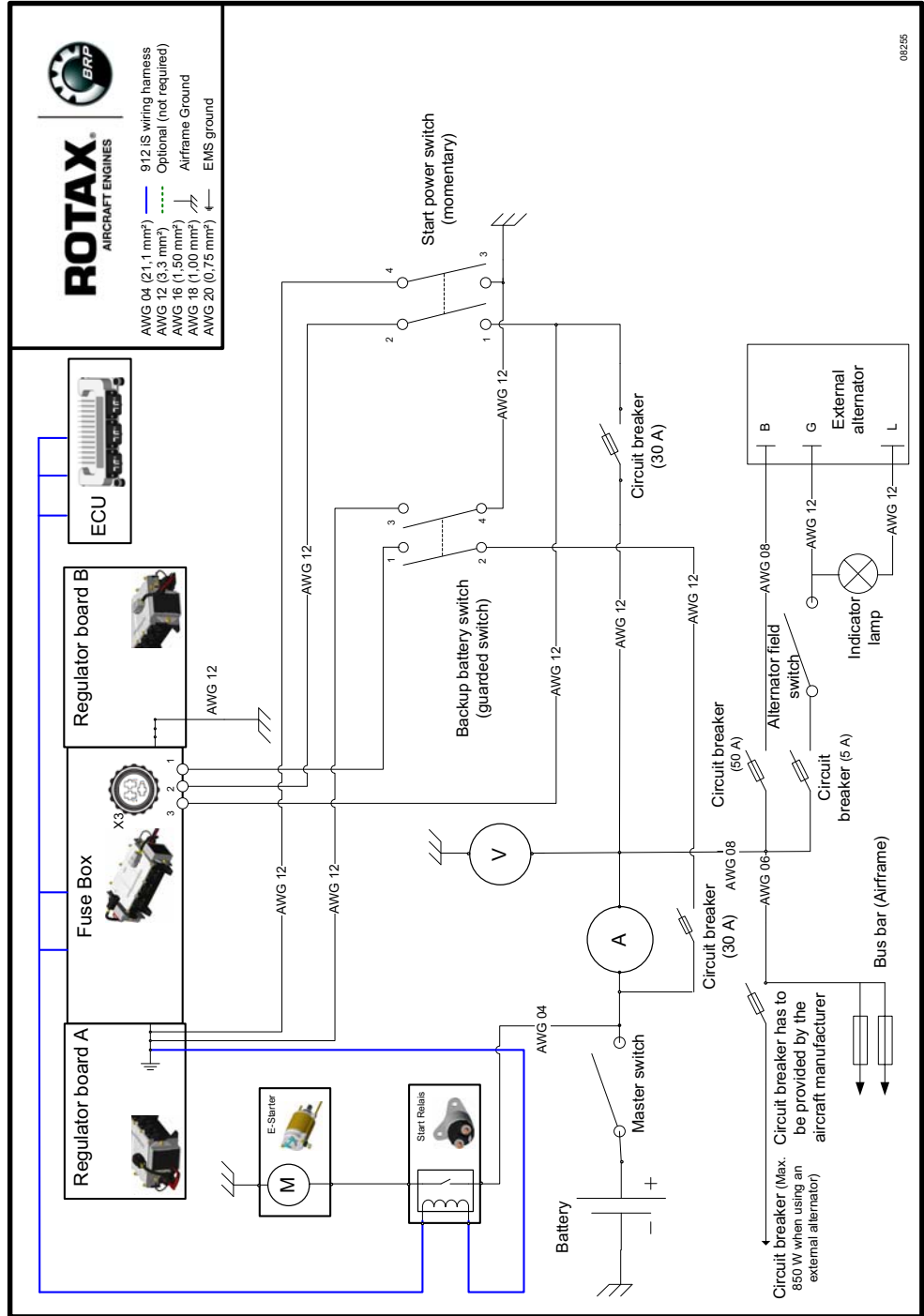
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Wiring diagram

Fig. 3. External alternator



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3.2) Operation - related information

General The external alternator is a state-of-the-art, electromechanical three-phase generator (compact generator) with small outer dimensions. It has the task of supplying the electric consumers with energy and charging the starter battery with the least possible fuel consumption and low noise levels during operation of the aircraft.

Drive Drive is provided by the engine by means of a V-belt.

External alternator

Mechanical power consumption of the external alternator	
Max.	1200 W

Switch and warning lamp requirements

Switch The representation of components (such as switches, protection devices etc.) that are not included in the scope of engine delivery is purely symbolic. It does not constitute a specification of the version and shall therefore only be seen functionally. The actual interpretation / selection of the corresponding regulations is the task of the aircraft manufacturer.

EXTERNAL ALTERNATOR SWITCH	Requirement	Connector/slot
Switch type	Single Pole, Single Throw (SPST) switch	
Nominal voltage	28 VDC	
Nominal current	5 A	
Number of poles	1-pole	
Designation on wiring harness	Not connected to the wiring harness.	

Warning lamps

EXTERNAL ALTERNATOR INDICATOR LAMP	Requirement	Connector/slot
Lamp colour	In accordance with the regulations	
Nominal voltage	12 V	
Nominal current	Maximum 300 mA	
Designation on wiring harness	Not connected to the wiring harness.	

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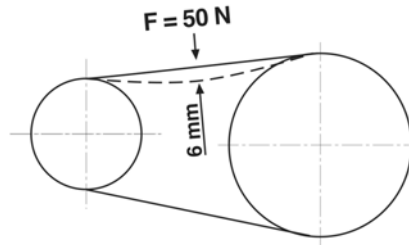
3.3) Maintenance (Line) - related information

3.3.1) Checking the V-belt tension

General note In the case of configurations with additional external alternator, inspect attachment and V-belt tension.

Checking the V-belt tension Inspect V-belt tension as per drawing below.

Fig. 4.



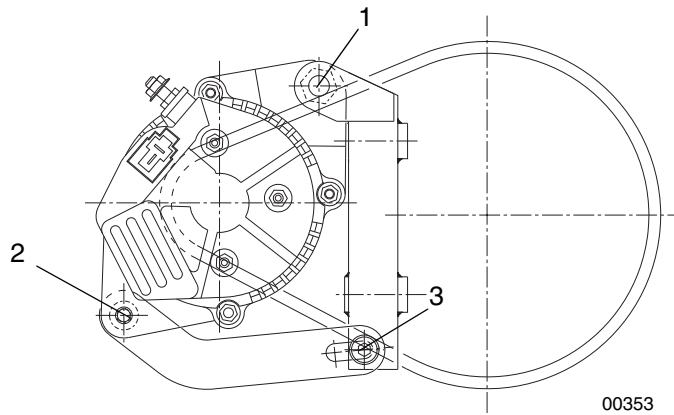
3.3.2) Adjust the V-belt tension

Belt tension To adjust the belt tension:

Step	Procedure
1	Loosen the hex. screw M10 (1) and the 2 Allen screw M8 (2 and (3)).
2	Press the alternator upwards and tighten Allen screw (3).
3	Then tighten Hex. screw M10 (1) with tightening torque 40 NM (30 ft.lb) and Allen screw M8 (2) with tightening torque 22 Nm (195 in.lb).

Fig. 5.

- 1 Hex. screw M10
- 2 Allen screw M8
- 3 Allen screw M8



NOTICE

Deflection of the V-belt must not exceed 6 mm (1/4") with al load of 50 N (11 lb) at center.

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3.4) Maintenance (Heavy) - related information

Safety information



WARNING

Danger of damage to engine!

There is a risk of short circuits and cable fires during work on the electric system. All installation work on the electric system should be carried out with the engine switched "OFF" and the battery (negative terminal) disconnected.

Ignition, main and Lane selector switches must be "OFF".

3.4.1) Preparation

- Loosen pulley tension
- Remove the propeller. See "Documentation of aircraft manufacturer".

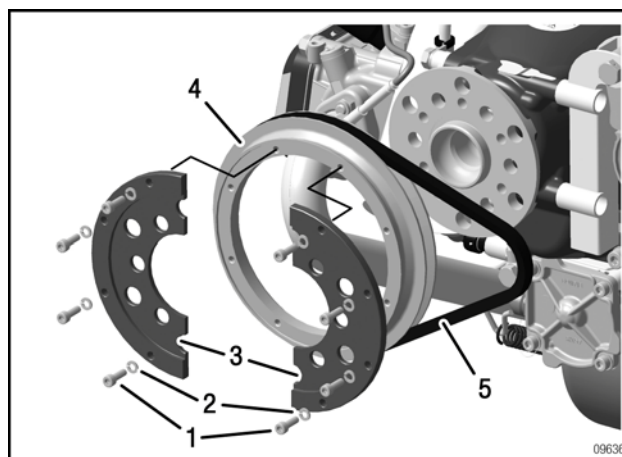
3.4.2) V-Belt pulley -removal

See Fig. 6.

Step	Procedure
1	Loosen 8 Allen screws M5x16 with lock washers.
2	Remove pulley carries, V-belt pulley and V-belt.

Fig. 6.

- 1 Allen screw M5x16
- 2 Lock washer A5
- 3 Pulley carries
- 4 V-belt pulley
- 5 V-belt



3.4.3) Alternator - removal

See Fig. 7 to Fig. 10.

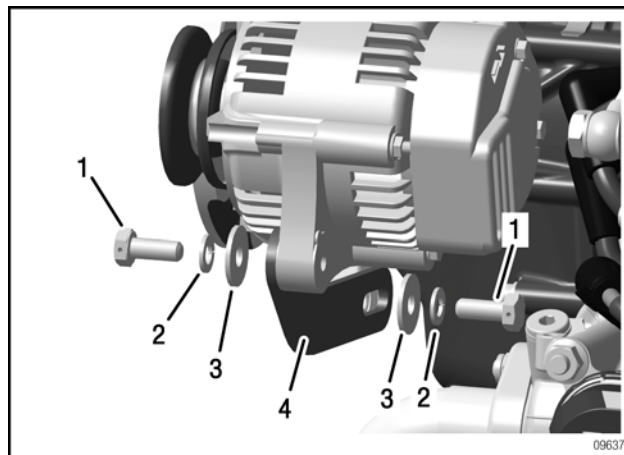
Step	Procedure
1	Loosen 2 hex. screws M8x20 along with lock washers and washers.
2	Remove the tension bar underneath the external alternator.

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Fig. 7.

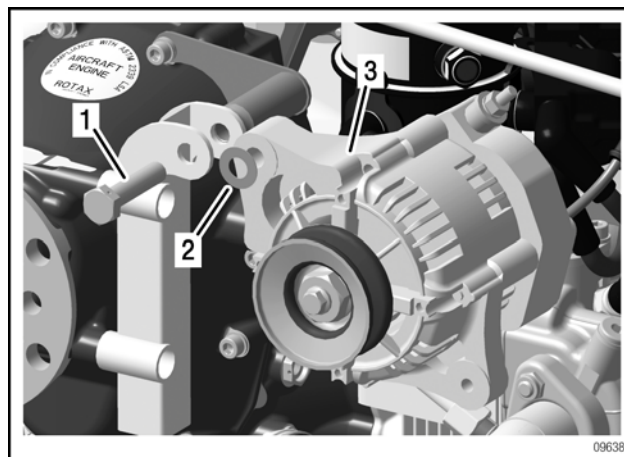
- 1 Hex. screws M8x20
- 2 Lock washer A8
- 3 Washer 8.4
- 4 Tension bar



Step	Procedure
3	Loosen hex. screw M10x45 and remove the alternator and thrust washer.

Fig. 8.

- 1 Hex. screws M10x45
- 2 Thrust washer 10.1/20/0.5
- 3 External alternator



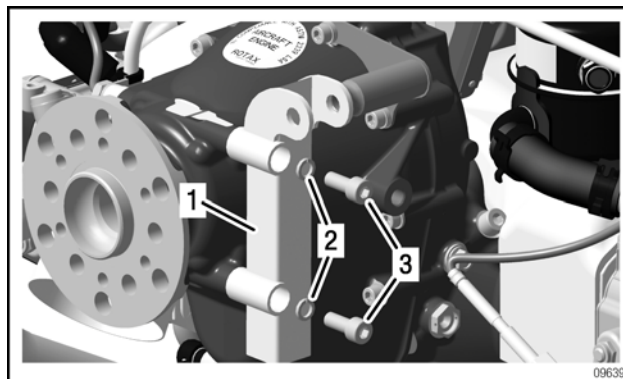
Step	Procedure
4	Loosen Allen screws M8x20 along with lock washers and remove the alternator bracket.

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Fig. 9.

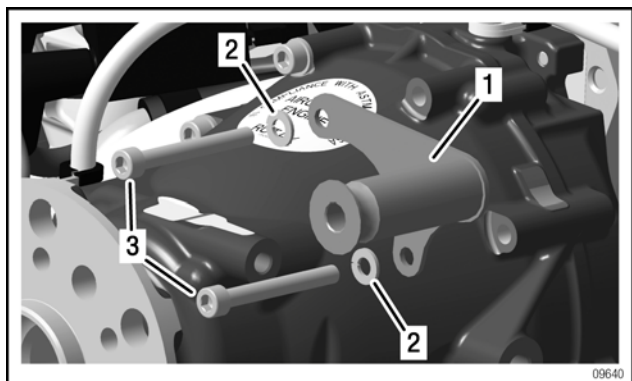
- 1 Alternator bracket assy.
- 2 Lock washer VHZ 8
- 3 Allen screw M8x20



Step	Procedure
5	Remove 2 Allen screws M6x50 along with lock washers and washers from the gear-box housing and alternator support assy..

Fig. 10.

- 1 Alternator support assy.
- 2 Lock washer A6
- 3 Allen screw M6x50



3.4.4) Fitting of the V-belt

See [Fig. 11](#).

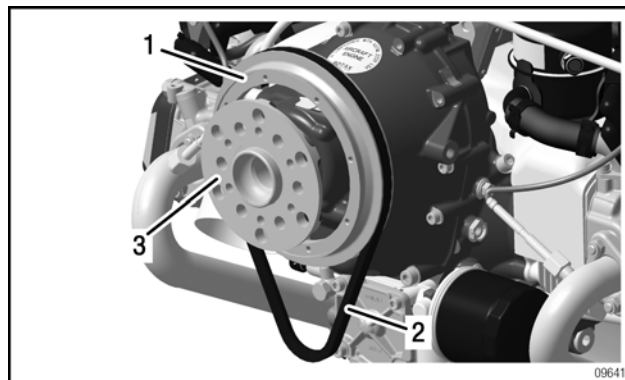
Step	Procedure
1	Clean and inspect propeller flange.
2	Place V-belt pulley completely over propeller flange and insert the 9.5x675 V-belt loosely into the V-belt pulley.

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Fig. 11.

- 1 V-belt pulley
- 2 V-belt 9.5x675
- 3 Propeller flange



NOTICE

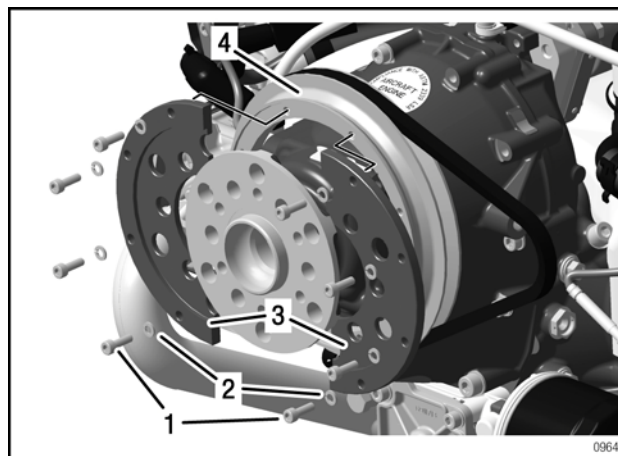
The two pulley carriers must sit with the centring exactly on the inner side of the propeller flange.

See .

Step	Procedure
2	Insert both pulley carriers with the centring towards the inner side of the propeller flange,
3	Push the V-belt pulley onto the two pulley carries and tighten with 8 Allen screws M5x16 and lock washers. Tightening torque 6 Nm (53.09 in. lb).

Fig. 12

- 1 Allen screws M5x16
- 2 Lock washer M5
- 3 Pulley carrier



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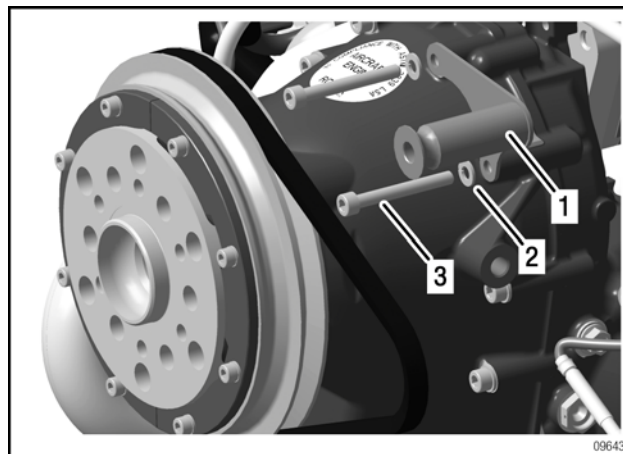
3.4.5) Installation of the alternator

See Fig. 13.

Step	Procedure
1	Fix the alternator support finger-tight by means of 2 Allen screws M6x50 and lock washers.

Fig. 13.

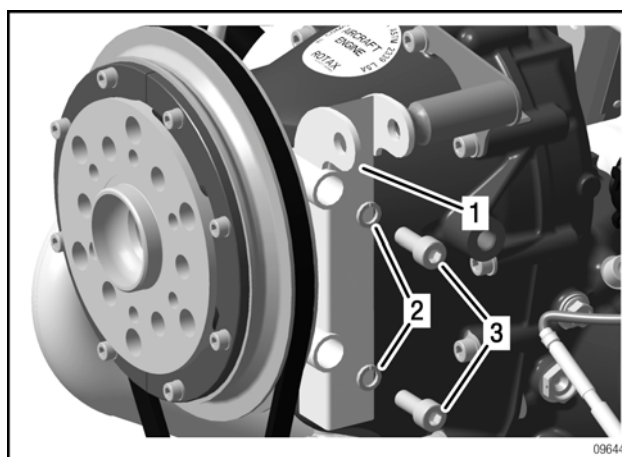
- 1 Alternator support assy.
- 2 Lock washer A6
- 3 Allen screws M6x50



Step	Procedure
2	Attach the alternator bracket finger-tight to the gearbox housing using the 2 Allen screws M8x20 and lock washers VHZ 8.

Fig. 14.

- 1 Alternator bracket assy.
- 2 Allen screws M8x20
- 3 Lock washers VHZ 8



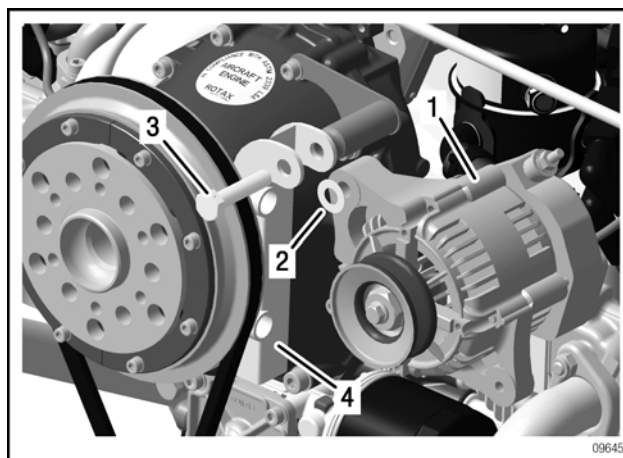
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Step	Procedure
3	Push the alternator into the lug of the alternator bracket and fix initially finger-tight with hex. screws M10x45 and thrust washer 10.1/20/0.5.

Fig. 15.

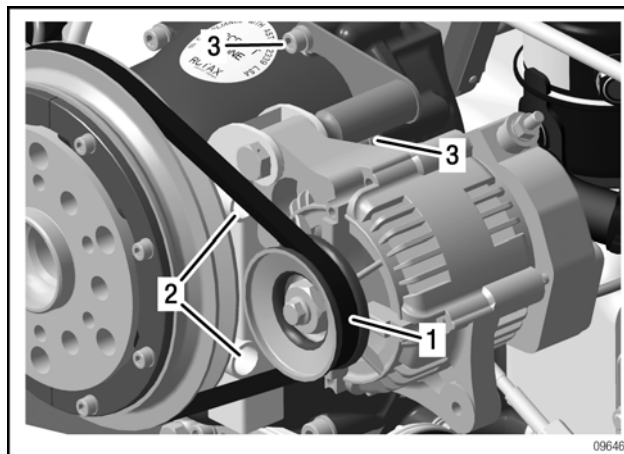
- 1 Alternator
- 2 Washer 10.1/20/0.5
- 3 Hex. screw M10x45



Step	Procedure
4	Tighten the pre-mounted Allen screws M6 and M8. Tightening torque 10 Nm (89 in. lb).
5	Place the V-belt in the V-belt pulley of the alternator.

Fig. 16.

- 1 V-belt 9.5x675
- 2 Allen screw M8x20
- 3 Allen screws M6x50



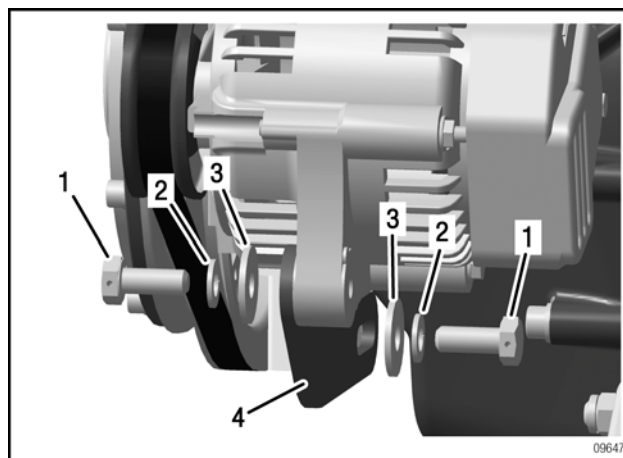
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Step	Procedure
6	Attach the tension bar finger-tight to the alternator bracket using 2 hex. screws M8x20 with a lock washer and a washer.

Fig. 17.

- 1 Hex. screws M8x20
- 2 Lock washer A8
- 3 Washer 8.4
- 4 Tension bar



Step	Procedure
7	Adjust the pulley tension and tighten M10 and M8 hex. screws with safety wire. Tightening torque M10: 40 Nm (354 in.lb). Tightening torque M8: 22 Nm (194.7 in.lb).

3.4.6) V-belt tension

See Chapter 3.3) Maintenance (Line) section [3.3.2](#)) Adjust the V-belt tension.

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3.5) Connecting the external alternator into the electric circuit

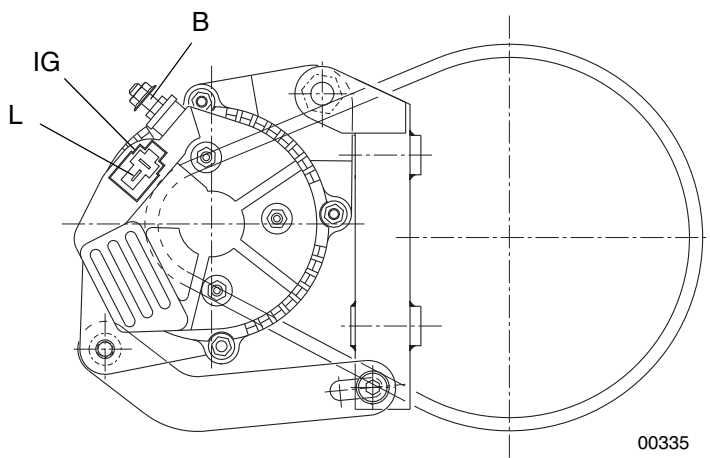
There are two options for connection of the external alternator:

OPTION A: Connection to main switch at battery. See Fig. 18.

Step	OPTION A - Procedure
1	Connect alternator terminal "B" to the main switch at the battery with a flexible multi-strand wire with proper cross-section according to the requirements in the relevant aircraft installation and a 50 A fuse.
2	Connect terminals "IG" and "L" into the circuit in accordance with the wiring diagram (Fig. 3) using connectors and housing provided.

Fig. 18

L = Terminal "L"
IG = Terminal "IG"
B = Terminal "B"



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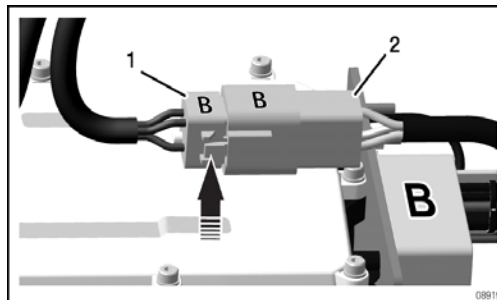
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OPTION B: Connection as **replacement** of generator B and rectifier regulator B.
See Fig. 19.

Step	OPTION B - Procedure
1	Dis-connect the generator connector (1) from regulator B (2) by pressing on the plastic tab and pulling the connectors apart.

Fig. 19

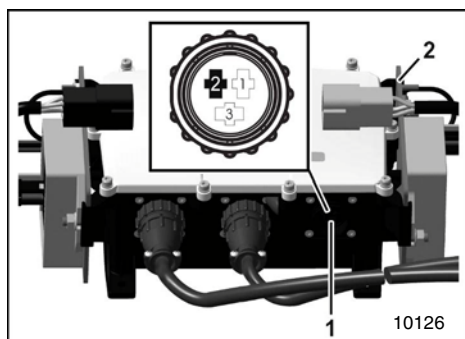
- 1 Connection socket
- 2 Controller connector



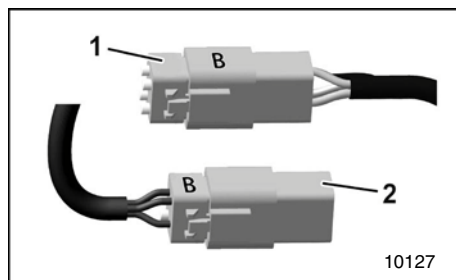
See Fig. 20

Step	OPTION B - Procedure
2	Insert DEUTSCH dummy plug (1) into open connector on rectifier regulator and DEUTSCH dummy plug into the open Generator B connector (2).
3	Connect alternator terminal "B" to pin 2 (1) of the fusebox "X3" connector.
4	Ensure that ground stud (2) for regulator rectifier B is connected to airframe ground with flexible multi-strand wire of min. 4 mm ² cross section (12 AWG).

Fig. 20



- 1 Pin 2
- 2 Ground stud



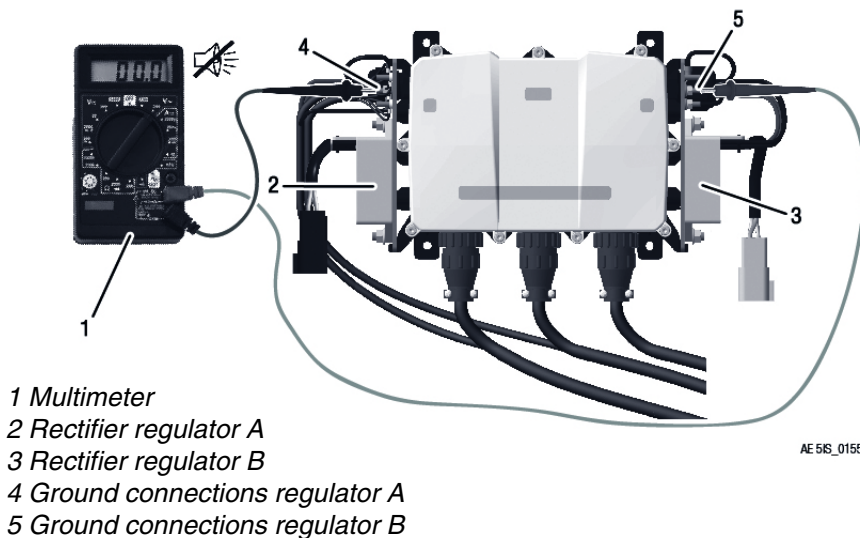
- 1 Connection socket
- 2 Controller connector

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Step	OPTION B - Procedure
5	Connect terminals "IG" and "L" into the circuit in accordance with the wiring diagram (Fig. 3) using connectors and housing provided.
6	Using a multimeter (1), check for continuity between the ground connections regulator A (2) and the ground connections regulator B (3). Continuity must NOT be present.

Fig. 21



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Dynamic propeller balance

Dynamic propeller balancing is required after external alternator set installation. Max tolerated imbalance is 0.5 gram (0.0011 lb) or industry standard of max. 0.05 IPS.

NOTICE

Engine vibrations can be caused by an improperly balanced propeller. Operation without dynamic propeller balancing may cause engine damage.

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

3.6) Test run

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

3.7) 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.

3.8) 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.

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4) Appendix

The following drawing should convey additional information:

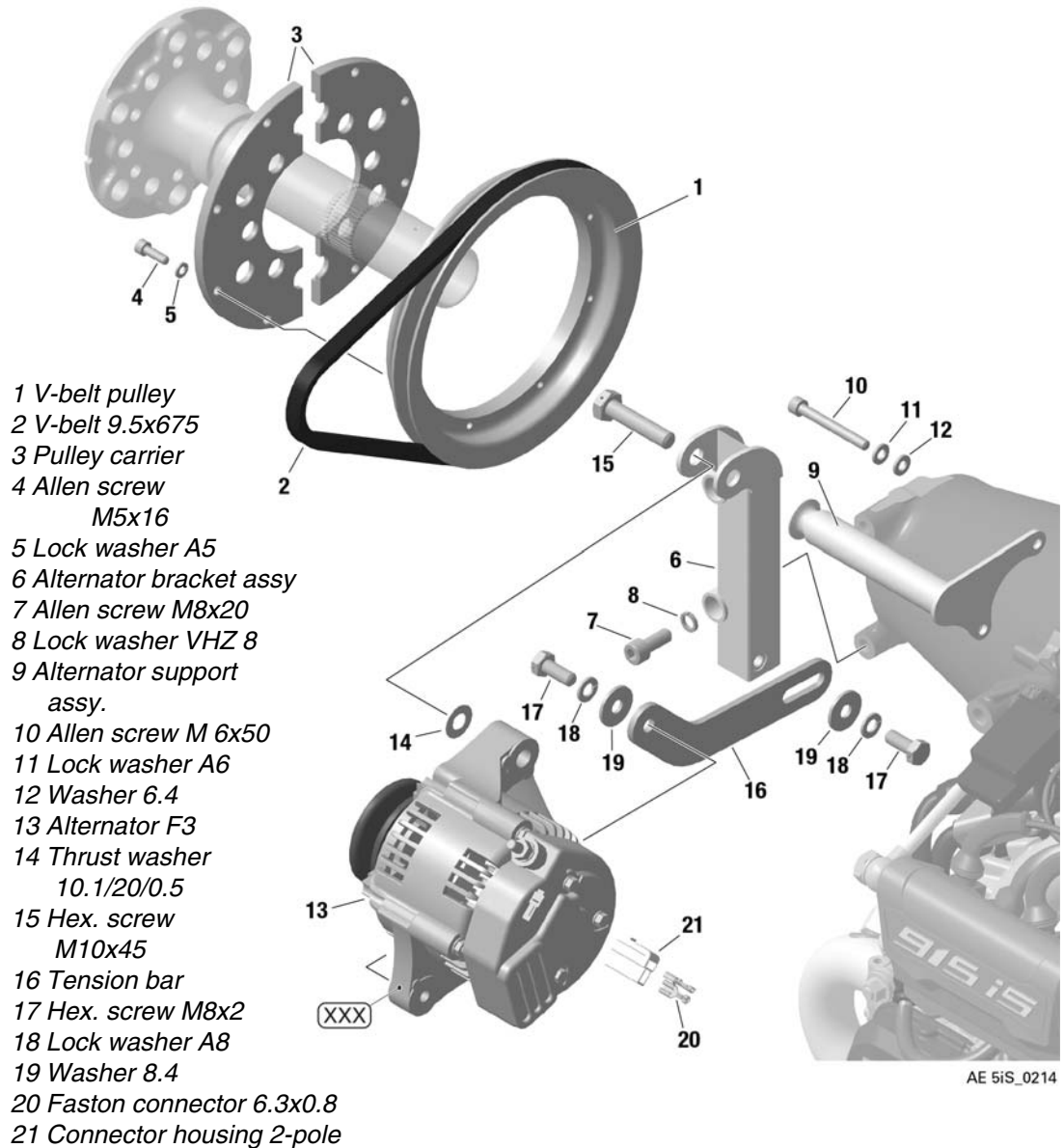


Fig. 22

Parts description

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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