

Group:	AB210R Alternator	Notes:
Form:	SM4003A_AB210 (1287170)	To be used in conjunction with part listing SP4020_AB210 and relevant outline drawing.
Rev:	Rev.1 22 Nov 2017	
File:	Alternator service manual section	

SERVICE MANUAL

AB210 HIGH OUTPUT ALTERNATOR

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Important notice regarding this manual.

This manual serves as a guide to overhaul and repair the Prestolite AB210 type alternator, part numbers 1287170. This procedure requires a high skill level (auto electrical / mechanical assembly) and also requires specialised tooling for assembly. Failure to use appropriate tooling could result in damage to components, substandard performance and poor heat dissipation, which could in turn result in product failure.

As a manufacturer Prestolite cannot anticipate the circumstances surrounding service / repair or the resource available. Certain items contained herein are considered by the manufacture non-serviceable, however individual situations may vary and may determine otherwise. It lies with the individual(s) concerned to decide from the prevailing circumstances what is deemed cost effective and acceptable service life using the information provided.

Caution:

The AB210R alternator weighs 42kg (93lbs). Ensure suitable lifting gear is available to prevent operator injury and handling damage.

If any doubt, please seek advise from your Prestolite representative.

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DISASSEMBLY

1. Pulley & fan removal

Tooling required:

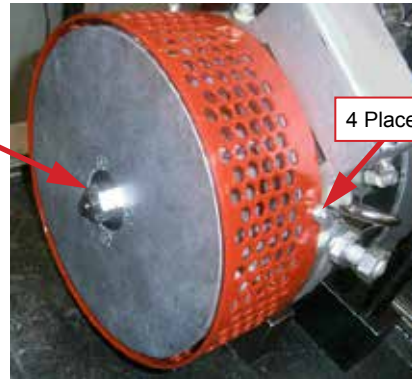
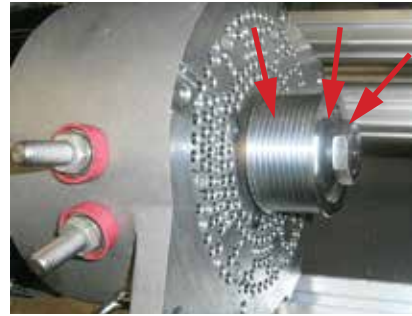
Impact wrench

36mm socket

22mm socket

4mm T-bar Allen key

1.1	Use impact wrench and remove pulley shaft nut. Remove belleville washer, pulley and key. Place aside for reuse, if required.
1.2	Use impact wrench to remove fan end shaft nut. Remove fan guard screws and washers (4 off screws). Remove fan guard. Remove fan. Place removed components aside for reuse, if required.



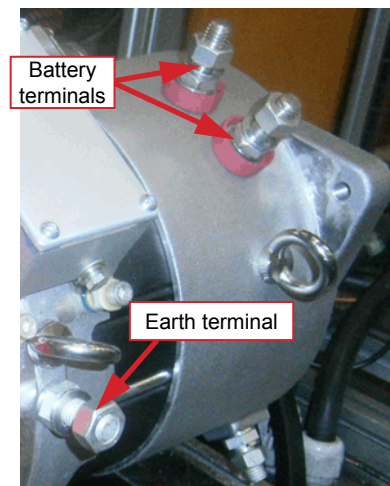
2. Battery terminal removal

Tooling required:

Socket wrench

19mm socket

2.1	Remove Battery terminal nuts, spring washers, spacers, insulators, suppression capacitor (not shown) and terminals. Place aside for reuse, if required.
2.2	Remove Earth terminal nut, spring washer and terminal. Place aside for reuse, if required.



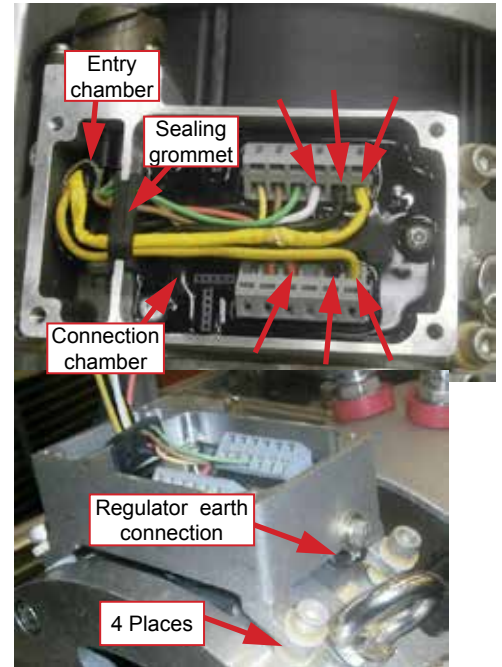
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3. Regulator removal

Tooling required:
6mm T-bar Allen key
Long nose pliers
Lead insertion key, Wago 236-332 (RS180-9347)
Flat screw driver

3.1	Remove regulator cover screws and cover. (Not shown) Retain for reuse, if required.
3.2	Use lead insertion tool to open connector block and remove the leads passing through the sealing gland. Carefully remove leads from the regulator connection chamber. Remove one lead at a time, do not damage the rubber sealing grommet.
3.3	Remove the regulator earth connection on the side of the regulator. Remove the regulator mounting screws and insulators. Retain for reuse, if required.
3.4	Carefully remove the regulator, pulling regulator off the leads removed in step 3.2. Remove the regulator earth connection underneath the regulator. Place regulator aside for testing or reuse.



4. Alternator body disassembly

Tooling required:
6mm T-bar Allen key
5mm T-bar Allen key
Socket Wrench
8mm Socket
End shield pulling tool (Special)

4.1	Use assembly fixture 2. Place alternator body on the front housing face.
4.2	Scribe (mark) the front housing, stator and rear housing to aid reassembly. Remove the 4 off through bolts. Retain for reuse.

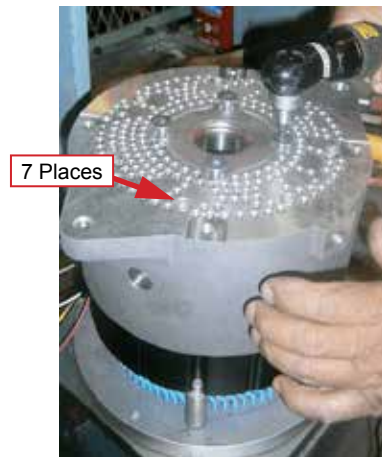


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4. Alternator body disassembly (continued)

4.3	Remove 2 off coil retainer screws (opposing screws) Use special end shield pulling tool and fit to the shaft and 2 screws in place the removed coil retianer screws. Extract rear housing from the alternator body assembly.
4.4	Test the coil for earthing / short circuit faults. (See specifications) To remove the coil from the rear housing, remove the remaining 2 coil retainer screws. Turn housing over, carefully extract coil leads from the groove (Silcoset in position). Remove coil assembly from the housing.
4.5	Remove 2 opposing screws from the front bearing retainer plate. Fit end shield pulling tool, and "jack" (push) rotor off the internal bearing journal. Remove the rotor from the body assembly. Inspect for damage, check bearing journals. See specifications.
4.6	Remove remaining 2 off retainer plate screws. Place plate and screws aside for reuse.
4.7	Remove the 7 off rectifier mounting screws. Carefully prise front housing from stator / rectifier assembly. Press out the bearing and discard. Place housing aside for inspection and reuse.

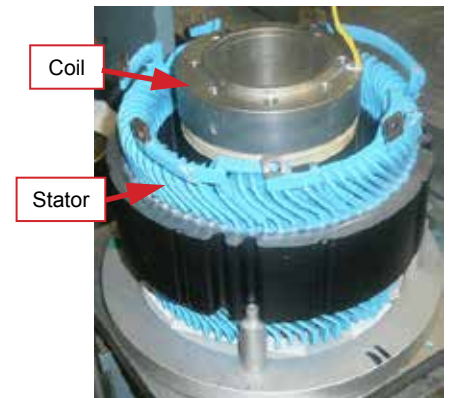
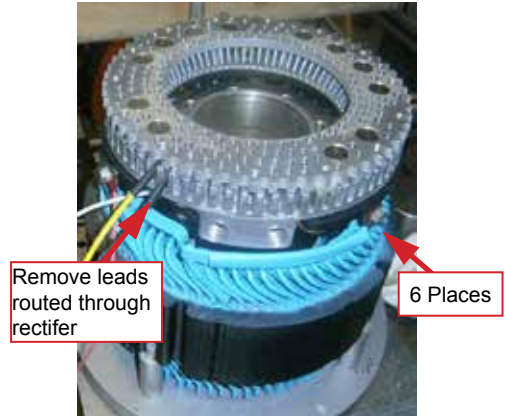


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4. Alternator body disassembly (continued)

4.8	<p>Remove long tube from the coil and rectifier lead assembly. Pull leads out through rectifier assembly.</p> <p>Remove 6 off stator / rectifier mounting screws. Remove rectifier. Perform open & short circuit checks on diodes. The rectifier is serviced by replacement.</p>
4.9	<p>Remove stator, and perform insulation, open and short circuit checks. The stator is serviced by replacement.</p>
4.10	<p>Remove front coil. Test the coil for earthing / short circuit faults. (See specifications)</p>



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INSPECTION AND SERVICING

1.1	Front coil assembly. Test for open and short circuit condition, using DMV set to Diode alarm setting. Service by replacement.
1.2	Rear coil assembly. Test for open and short circuit condition, using DMV set to Diode alarm setting. Service by replacement.
1.3	Stator assembly. Test for open and short circuit condition. Visually inspect hairpin welded joints. Service by replacement.
1.4	Rectifier assembly. Test each diode bank for open and short circuit condition, using DMV set to Diode alarm setting. Service by replacement.
1.5	Rotor assembly. Check for damage to shaft and threads. Check for damage to claws (cage). Check bearing journal diameters. (See specifications) Service by replacement.
1.6	Front housing. Inspect for crack or damage to the casting. Ensure the internal insulation band is in good working condition. Check bearing journal for excessive wear or damage. (See specifications) Clean internal rectifier mating surface thoroughly before reuse.
1.7	Rear housing. Inspect for crack or damage to the casting. Check bearing journal for excessive wear or damage. (See specifications)
1.8	Bearings (front and rear). Replace bearings.
1.9	Fan and guard. Inspect for damage. Service by replacement.
1.10	Regulator The regulator cannot be tested as a standalone item. In field testing is only possible while alternator is in operational condition. Service by replacement.
1.11	Sundry parts. Inspect nuts, bolts, washers, keys, pulleys, insulators for damage. Service by replacement.

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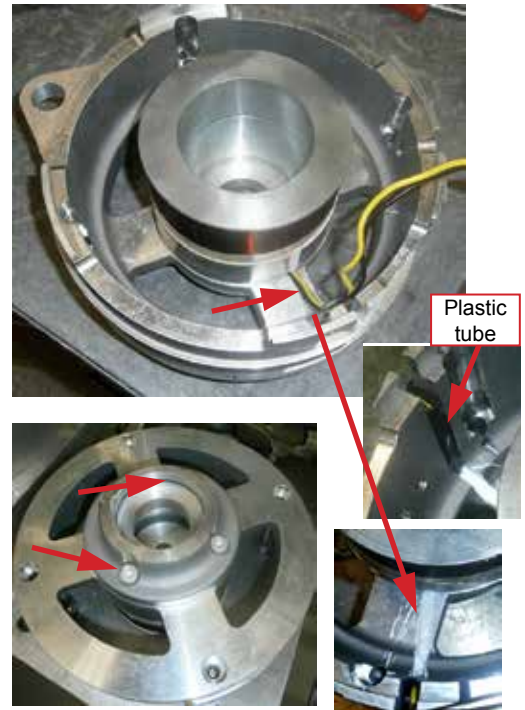
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ASSEMBLY

1. Rear housing (SRE) assembly

Components required:
Rear housing, 6531-182
Rear coil, 6531-315A
Sundries kit, 6531-209B
Rear bearing kit, 6531-202
Silcoset 1515

1.1	Locate coil assembly in register of rear housing. Ensure correct lead orientation, align with groove. Gently press the coil assembly into the housing.
1.2	Turn assembly over, ensuring the coil assembly doesn't fall out. Fit screws and spring washers and fasten coil to rear housing. Fasteners from sundries kit 6531-209B. Torque to 10-12 Nm.
1.3	Fit o-ring (from bearing kit 6531-202) to rear housing and lightly grease bearing recess.
1.4	Fit split bush (from sundries kit 6531-209) to rear housing mounting bracket, if required. (Not shown in images)
1.5	Turn assembly over. Dress leads into machined recess in the housing and assemble short tubing (from sundries kit). Fill the recess with silcoset and allow to set.
1.6	Place assembly aside.



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Prestolite Electric Ltd
Unit 48, The Metropolitan Park
12-16 Bristol Road, Greenford,
Middlesex
UB6 8UP, United Kingdom

Tel: +44 (0) 20 8231 1000
Fax: +44 (0) 20 8575 9575
eu_info@prestolite.com

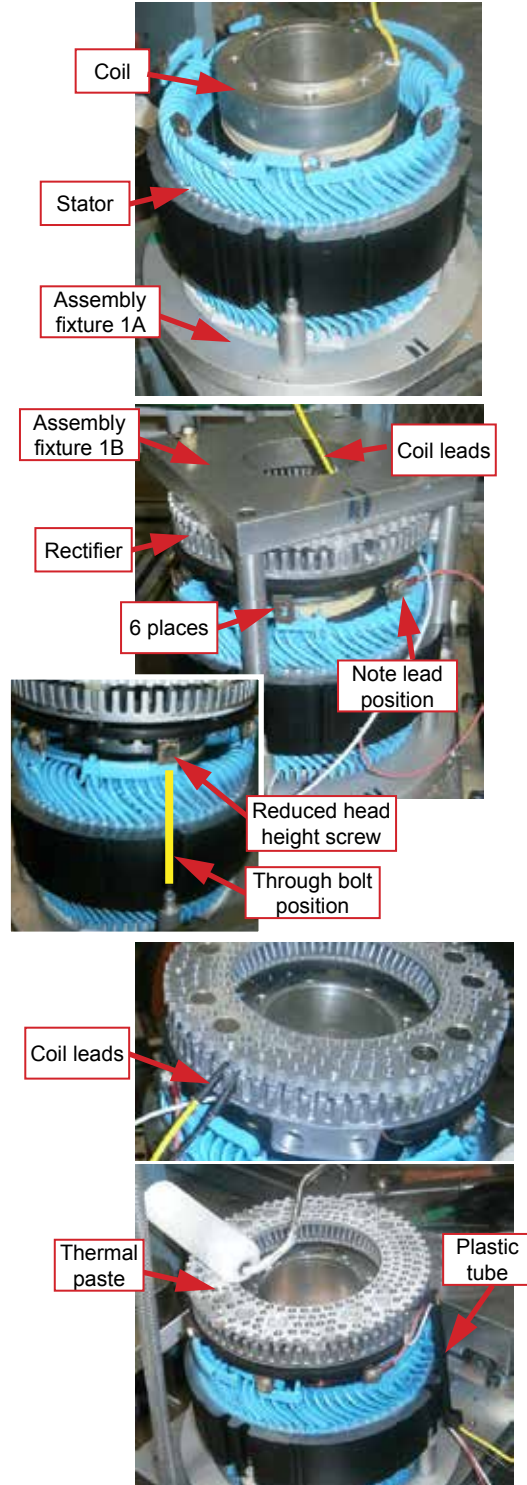
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2. Stator, Rectifier, Coil & Front (DE) housing assembly

Components required:

- Front coil, 6531-104
- Stator, 6531-79
- Rectifier, 6531-426A
- Front housing, 6531-244
- Front bearing, 6531-251
- Front bearing retainer kit, 6531-200
- Sundries kit, 6531-209B
- Assembly fixture 1A & 1B

2.1	Locate coil in the assembly fixture 1A. Locate stator over the coil, onto the assembly fixture.
2.2	Locate and fix rectifier assembly to assembly fixture 1B.
2.3	Locate rectifier / fixture 1B onto stator / fixture 1A. Feed coil leads through centre of assembly, and keep out the way. The fixtures ensures correct alignment of coil / stator & rectifier. This also ensures correct rectifier height position (critical).
2.4	Carefully form and manipulate the rectifier and stator tags. Fix with hex screws and spring washers (from rectifier kit 6531-426A) Fit AC lead (red lead from sundries kit 6531-209B) Note that this is fitted to stator terminal closest to the white rectifier lead. Note that 1 off hex screw has a reduced height head, this is used where the stator terminal is in line with through bolt. Remove assembly fixture 1B, and place aside.
2.5	Sleeve the coil (black and yellow) and rectifier leads (red and white) with terminal protective sleeving (approx 70mm long) and feed the leads through the rectifier heatsink.
2.6	Feed leads through plastic tubing (long) and locate tubing in the slot in the stator stack.
2.7	Apply thermal transfer paste to rectifier heatshield.

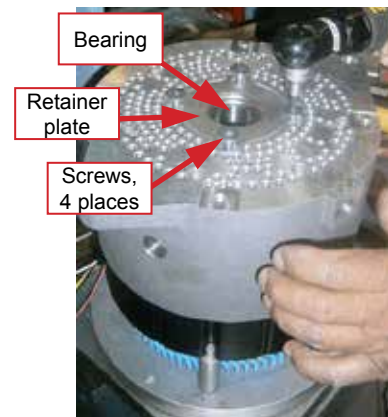
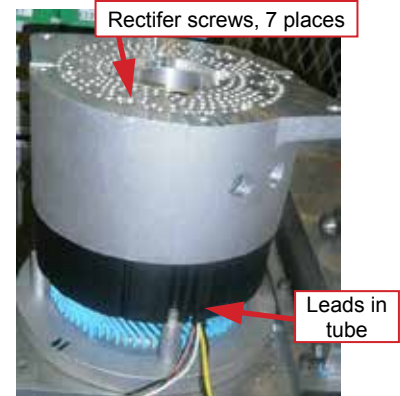


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2. Stator, Rectifier, Coil & Front (DE) housing assembly (continued)

2.8	Carefully locate front housing (6531-244) onto the stator / rectifier assembly. Ensure correct alignment. Tap into place with a mallet.
2.9	Fit rectifier assembly screws and spring washers (from sundries kit 6531-209B). Torque to 6-8 Nm.
2.10	Test leads for earth faults and open / short circuit condition using DMV. (See specifications)
2.11	Apply light layer of grease to front bearing recess. Fit bearing (6360-251) and press into place.
2.12	Fit retainer plate, and mounting screws (front bearing retainer kit 6531-200). Ensure screws align with coil housing, and fasten. Torque to 12-14 Nm.
2.13	Test leads for earth faults and open / short circuit condition using DMV. (See specifications)
2.14	Remove sub assembly from fixture.



3. Alternator assembly

Components required:

Rear housing and coil assembly (from step 1).

Front housing / stator / rectifier assembly (from step 2).

Positive terminal kit, 6531-207B

Negative terminal kit, 6531-207C

Earth stud kit, 6531-208A

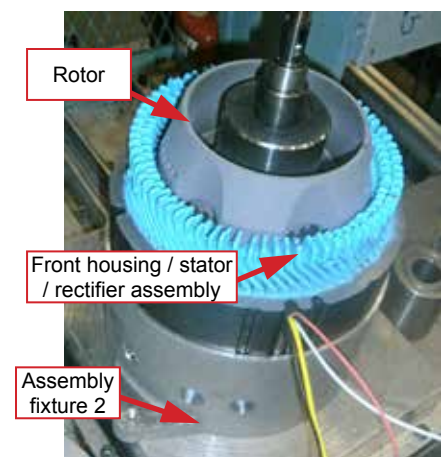
Rotor, 6531-2

Rear bearing kit, 6531-202

Sundries kit, 6531-209B

Assembly fixture 2

3.1	Use front housing / stator / rectifier assembly (from step 2), turn it over with outer face down, and fit to assembly fixture 2.
3.2	Test leads for short circuits using DMV.
3.3	Carefully locate rotor (6531-2) in DE sub assembly.
3.4	To press rotor to correct position, first fit the rotor shaft nut, to protect the shaft head. Press home using assembly press. (Not shown) Remove shaft nut and put aside.



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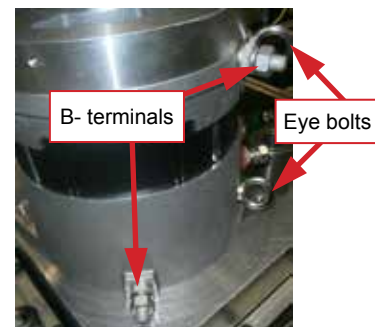
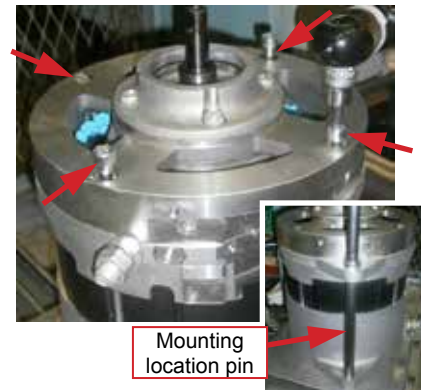
Prestolite Electric Ltd
Unit 48, The Metropolitan Park
12-16 Bristol Road, Greenford,
Middlesex
UB6 8UP, United Kingdom

Tel: +44 (0) 20 8231 1000
Fax: +44 (0) 20 8575 9575
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3. Alternator assembly (continued)

3.5	Fit Battery terminals, insulators, sleeves, washers, suppression capacitor and nuts. Fit Earth stud. Torque first set of nuts (half nuts) to 10-12 Nm. Fit spring washers, and full nuts. Hand tightened.
3.6	Use rear housing and coil assembly (from step 1), carefully align with rest of alternator assembly to ensure correct bracket alignment. Fit to assembly. Tap in place with mallet.
3.7	Fit through bolts (from sundries kit 6531-209B), and run down. Use mounting lug location pin and ensure correct bracket alignment. Adjust with mallet if required. Torque through bolts to 20-22 Nm.
3.8	Fit Earth terminal, washers & nut. (Earth terminal kit) Fasten terminals to 10-12 Nm, and hand tighten customer interface nuts.
3.9	Fit lifting eyebolts (from sundries kit 6531-209B), if required. In 2 places.
3.10	Fit rear bearing (kit 6531-202) and press into place.
3.11	Check alternator rotates freely. If the rotor does not rotate freely, loosen the through bolts and re tighten evenly, checking at regular intervals that the rotor still rotates freely.



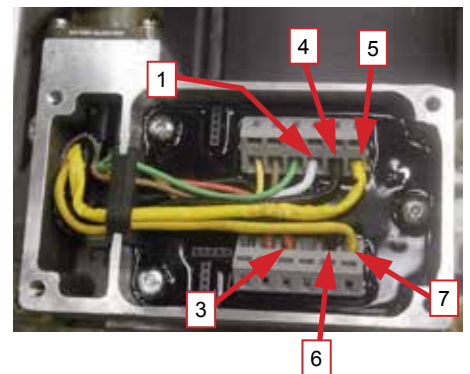
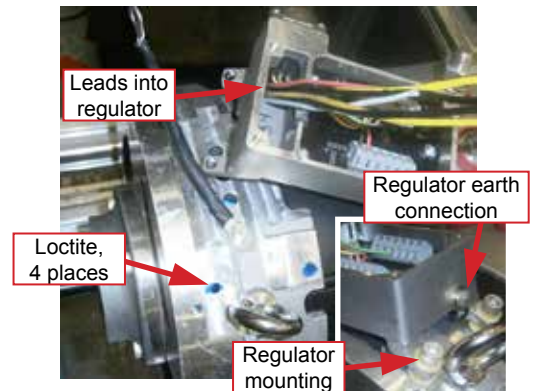
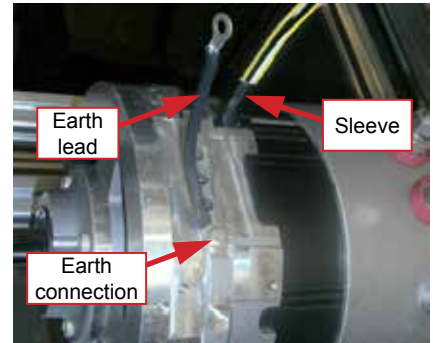
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4. Regulator assembly

Components required:
 Alternator assembly (from step 3)
 Regulator kit, 6531-205D
 Sundries kit, 6531-209B
 Lead insertion key, Wago 236-332 (RS180-9347)
 Loctite 243

4.1	Transfer alternator assembly and place on side, with access to coil leads. Sleeve all leads from coils and rectifier (sleeve approx 30mm long).
4.2	Fit regulator earth lead (from sundries kit 6531-209B) to alternator. Torque to 3-5 Nm.
4.3	Carefully feed leads (from 5.1) through regulator housing.
4.4	Apply Loctite to regulator mounting holes. Mount regulator using insulators and mounting cap screw (from regulator kit 6531-205D) Torque to 4-5 Nm. Form and fit regulator earth lead. Torque to 3-5 Nm.
4.5	Feed leads through the sealing grommet. Form the individual leads, and prepare for termination. Crop to required length, remove insulation from leads. Note the coil leads are varnished copper wire. Varnish must be removed on the interface. Terminate are as follows: 1. Yellow (0.75mm ²) - Rectifier phase 2. Black (1.0mm ²) - Rectifier negative 3. Red (1.0mm ²) - Rectifier positive 4. Black (1.5mm ²) - Field coil 5. Black/Yellow (1.5mm ²) - Field coil 6. Black (1.5mm ²) - Field coil 7. Black/Yellow (1.5mm ²) - Field coil Use lead insertion key to insert leads into the termination block. Check to insure the leads are securely inserted.
4.6	Fit regulator cover (fitted with gasket), secure with cover mounting screws and spring washers. Torque to 2-3 Nm.



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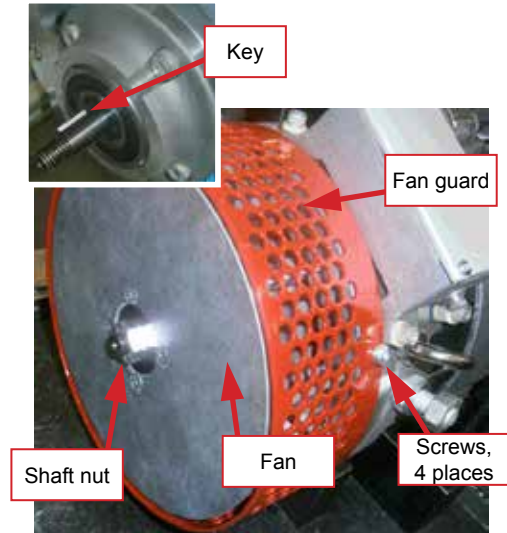
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5. Fan and guard assembly

Components required:
Alternator assembly (from step 4)
Fan kit, 6531-203
Fan guard kit, 6531-204A
Assembly fixture 2

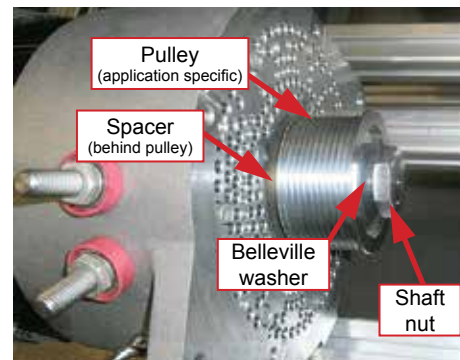
5.1	Continued on from alternator assembly in step 4. Fit shaft key (from fan kit 6531-203).
5.2	Fit fan and shaft nut (from fan kit 6531-203) Torque shaft nut to 50-55 Nm.
5.3	Locate fan guard and fit spring washers and button head screws. Torque to 3-5 Nm.
5.4	Check alternator rotates freely.



6. Pulley fitment.

Components required:
Alternator assembly (from step 5)
Pulley kit, 6531-206

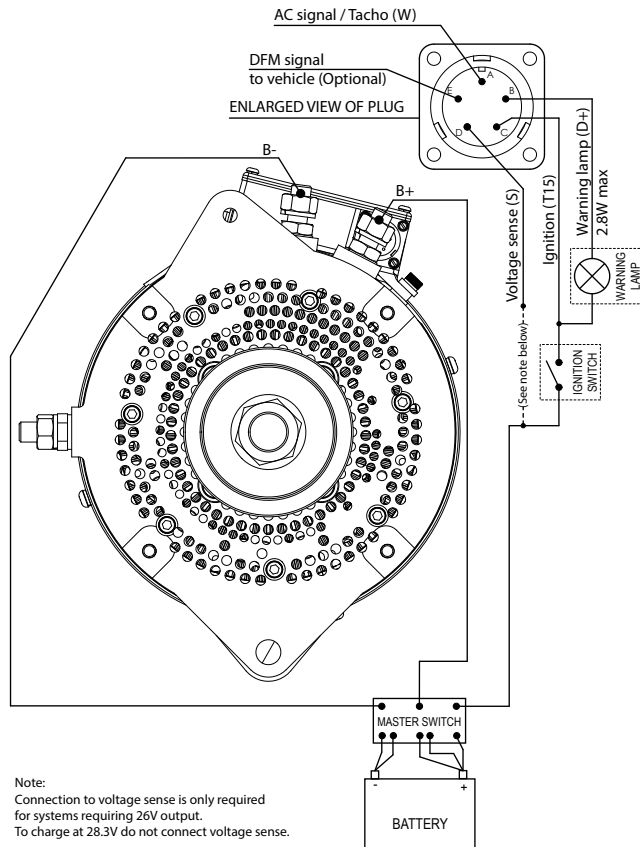
6.1	Fit front housing shaft spacer (from pulley kit 6531-206).
6.2	Fit shaft key (from pulley kit 6531-206).
6.3	Fit pulley, belleville washer and shaft nut (from pulley kit) Torque to 100-110 Nm.
6.4	Check alternator rotates freely.
6.5	Alternator build complete.



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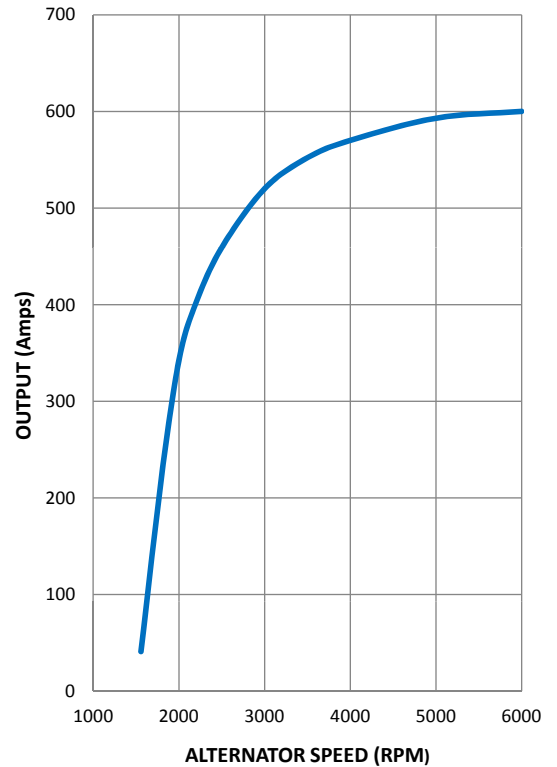
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TESTING



PERFORMANCE CURVE

(@25°C Ambient & 100% Load)



SPECIFICATIONS

Torque values		
Through bolts	M8 x 220 long Socket head cap screws (4 off)	20-22 Nm
Front bearing / coil retainer screws	M8 x 60 long Socket countersunk screw (4 off)	12-14 Nm
Rear coil retainer screws	M8 x 35 long Socket head cap screw (4 off)	10-12 Nm
Rectifier mounting screws	M6 x 10 long Socket head cap screw (7 off)	6-8 Nm
Rectifier / stator mounting screws	M5 x 10 long Hex screw (5 off)	3-5 Nm
	M5 x 10 long Hex screw with reduced head height (1 off)	3-5 Nm
Battery terminals	M12 x 72mm long Special stud, and nuts (2 off)	10-12 Nm
Earth stud	M12 x 44 long Special stud (1 off)	10-12 Nm
Regulator earth lead mount screws	M5 x 10 Cheese head screw (2 off)	3-5 Nm
Regulator mounting screws	M6 x 16 long Socket head cap screw (4 off)	4-5 Nm
Regulator cover screws	M4 x 12 long Socket button head screw (4 off)	2-3 Nm
Fan guard screws	M6 x 12 long Socket button head screw (4 off)	3-5 Nm
Fan shaft screw	M14 Nut (1 off)	50-55 Nm
Pulley shaft screw	M24 Nut (1 off)	100-110 Nm

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eu_info@prestolite.com

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SPECIFICATIONS (continued)

Bearing journal specifications	
Front (drive end) bearing journal, housing	71.997 / 72.014 mm
Rear (slip ring end) bearing journal, housing	62.001 / 62.018 mm
Front (drive end) bearing journal, rotor	25.002 / 25.010 mm
Rear (slip ring end) bearing journal, rotor	30.002 / 3.010 mm
Electrical specifications (Resistance values at room temperature)	
Front coil resistance	2.2 Ohm
Rear coil resistance	2.2 Ohm
Stator test	Perform earthing and short circuit test.
Insulation tests (coils)	
Using a megger type device:	500vac for 10 seconds.
Diode continuation test	
Use a digital volt meter (DVM), set to Diode alarm setting.	
Test each bank of the rectifier for short circuit / open circuit. The rectifier is serviced by replacement.	
Assembly electrical checks	
Rectifier continuation / insulation test. DVM set to Diode alarm setting.	
Test rectifier positive and negative banks for open / short circuit condition while assembling the alternator to ensure the leads are not damaged or trapped during assembly.	
Coil continuation / insulation test. DVM set to Diode alarm setting.	
Check coil leads for short / open circuit across leads, and also check between each lead and frame of alternator.	
AC lead (white lead from rectifier / stator assembly) test. Use DVM set to 2k Ω .	
Red DVM probe to white AC lead, black DVM probe to B+. Reading should be 0.70. Black DVM probe to white AC lead, red DVM probe to B+. Reading should be 0.	

Important: The information contained in this bulletin is intended for use by trained, professional technicians who have the proper tools, equipment, and training to perform the required maintenance described above. This information is NOT intended for 'do-it-yourselfers', and you should not assume that this information applies to your equipment. If you have any questions regarding this information please visit our website at www.prestolite.com, or contact our technical service department at: