CAV

Workshop Manual

AC7B NINE-DIODE ALTERNATOR

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CAV and SIMMS PARTS AND SERVICE LONDON W3

CONTENTS

LIST OF ILLUSTRATIONS

AC7B NINE-DIODE ALTERNATOR

GENERAL DESCRIPTION

All the AC7B nine-diode alternators are three phase machines of the revolving field and stationary armature type. Fig 1 shows an exploded view of a standard 24 volt ventilated machine.

Built-in rectification of the generated alternating current is achieved by means of six silicon diodes contained within the slip ring end shield and connected in a three phase bridge circuit between the three stator coil leads and the output terminals. A second rectifier bridge is formed by using three additional low current diodes also mounted in the slip ring end shield. These auxiliary diodes provide the current for the alternator field coil.

All AC7B alternators are self limiting in current output but in the case of the totally enclosed model, an additional current limiting circuit is included to avoid overheating. This circuit takes the form of a resistor mounted inside the alternator on the rear of the terminal block and a thermostat sealed into one of the diode heat sinks. When the temperature reaches a pre-determined level, the thermostat operates and connects the resistor into the field circuit. This reduces the alternator output current and allows the temperature of the machine to drop.

On early ventilated machines, a capacitor was mounted on the rear of the terminal block and permanently connected across the main terminals. This offers some protection to the regulator solid state components against high voltage surges caused by switching transient loads within the system.

Rotor and stator are housed between the two end shields and the rotor shaft is carried in a roller bearing at the drive end and a ball bearing at the slip ring end.

The electrical output of the machine is delivered through a five position terminal block housed in a recess formed in the slip ring end shield. These terminals are marked as follows:

D+	(Main positive dc output)
D-	(Main negative dc output)
A or F+	(Field positive connection)
F-	(Field negative connection)
R	(Single phase ac output for auxiliary purposes)

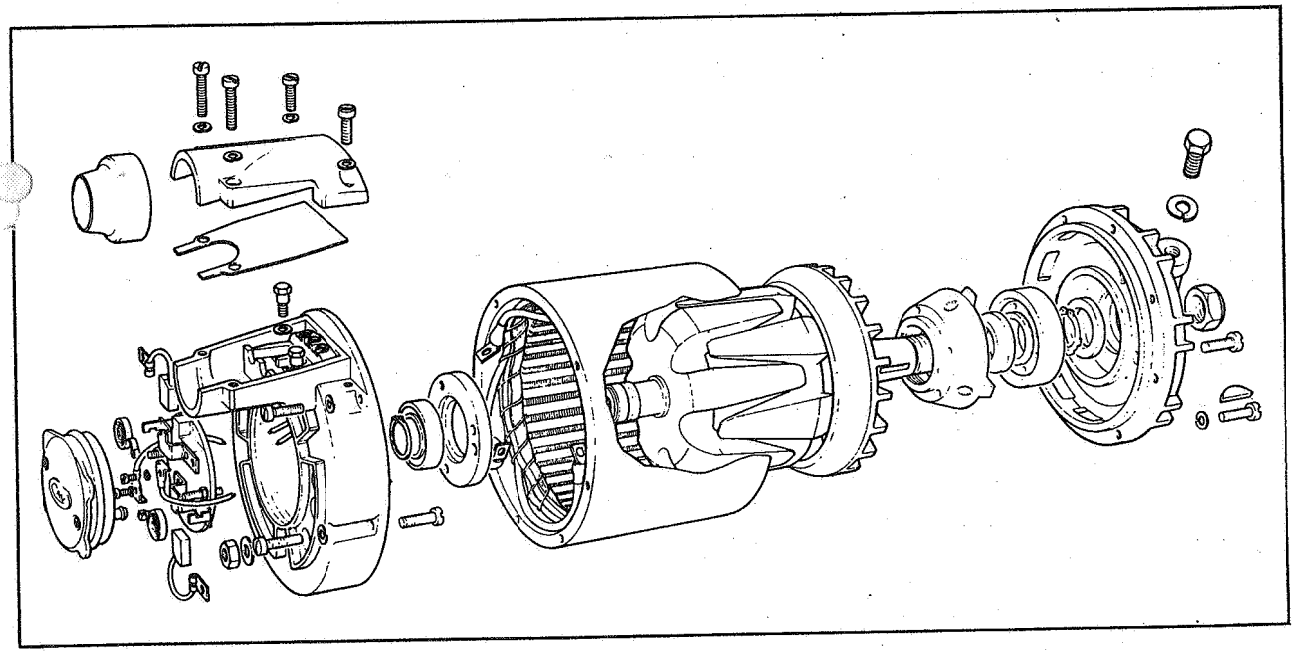

Fig 1 Exploded view of AC7B alternator

DISMANTLING

GENERAL

The instructions given in this section and the section headed 'Component Testing and Renewal' cover the complete dismantling of the AC7B nine-diode alternator. However, except in the case of a complete overhaul, full dismantling is not always necessary. When an alternator requires attention, it is recommended that it is first tested to locate specific faults – see section headed 'Testing The Alternator' on Page 9.

Before attempting to dismantle the unit, remove all surface dirt and grease with a rag or brush dipped in kerosene or suitable cleaning fluid, taking care to prevent an excess of liquid from entering the machine through any gaps in the casing.

Where possible use the special service tools and test equipment specified in CAV service literature to obtain the closest possible approach to factory standards. A clamping device similar to that shown in Fig 2 will prove to be extremely helpful in carrying out the following operations.

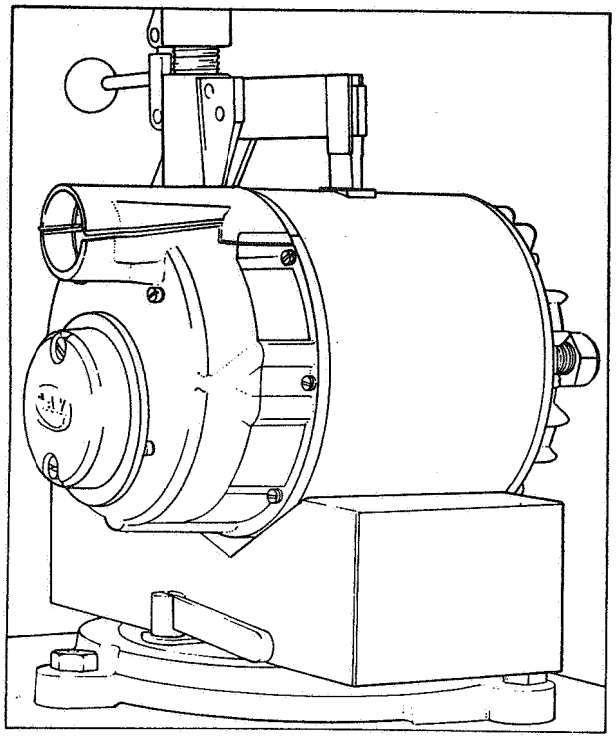

Fig 2 Bench clamp

BRUSHGEAR

Unscrew and remove the 'Nyloc' nut securing the drive pulley, (a castellated nut and split pin on early models) and withdraw the drive pulley from the end of the drive shaft using a pulley extractor. Remove the 'Woodruff' key by tapping it out with a suitable drift.

Unscrew and remove the two baffle or filter retaining screws (1) Fig 3 and lift off the baffle or filter (2). Unscrew the four 'captive' screws (3) and remove the cowl (4). On totally enclosed machines, a sealing cover is fitted instead of a cowl.

Note: Certain versions of the AC7 alternator are not fitted with baffles, filters or cowls.

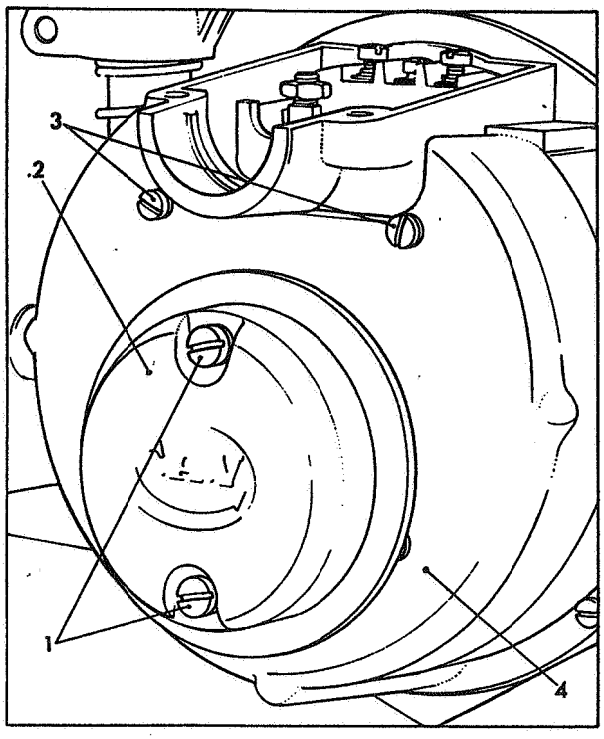

Fig 3 Removing baffle and cowl

Unscrew the two captive screws and prise off the brush cover from the slip ring end shield. Discard the sealing ring.

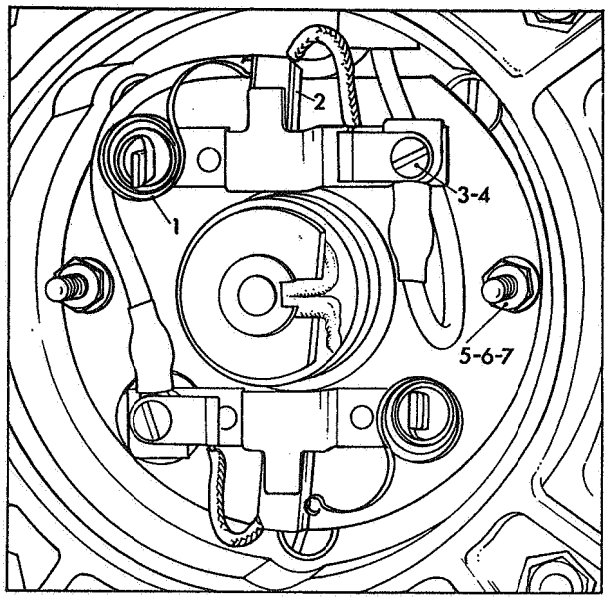

Fig 4 Removing brushgear

Lift each brush spring (1) Fig 4, pull the brushes (2) well clear of the slip rings and let the brush springs wedge against the side of the brushes to keep them in place as shown. Remove the two screws and washers (3 & 4). Identify both field leads relative to front or rear brush boxes so they can be replaced in the same position on assembly, then unscrew and remove the two nuts (5), spring washers (6) and plain washers (7). Remove the complete brush holder plate.

ROTOR

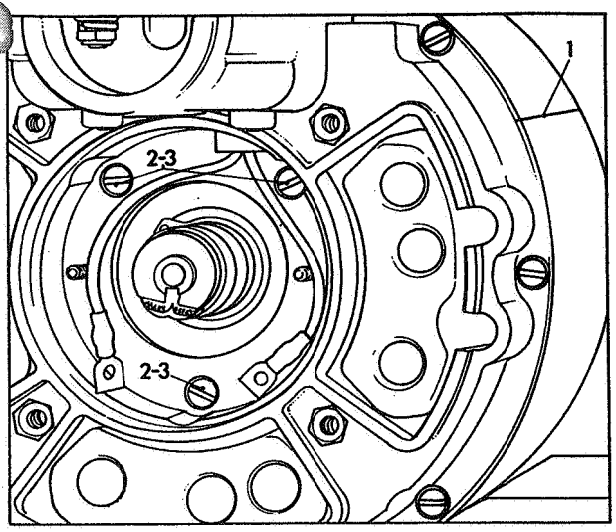

Fig 5 Releasing slip ring bearing

Before dismantling, lightly scribe a guide line (1) Fig 5 across the stator and the edges of both end shields to ensure correct alignment when assembling.

Unscrew and remove the three screws (2) and spring washers (3) from the recess in the slip ring end shield.

Unscrew and remove the eight drive end shield retaining screws and spring washers, then gently prise the drive end shield complete with rotor away from the stator using two screwdrivers placed in the notches provided.

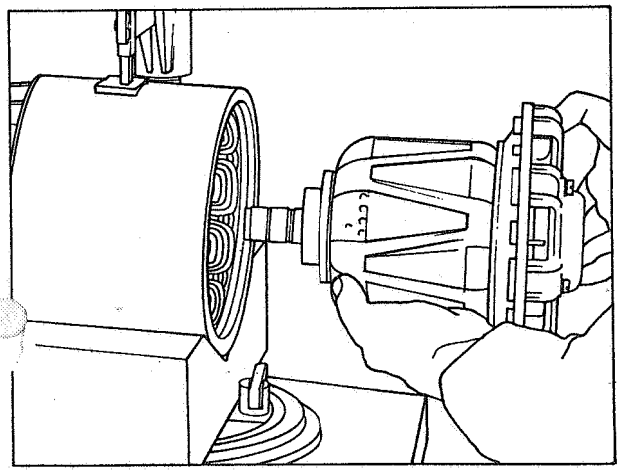

Fig 6 Removing rotor

When removing the rotor and drive end shield assembly, support the rotor as shown in Fig 6 to prevent it from dropping and damaging the slip ring surfaces. Place the rotor on a wooden 'V' block or similar support.

DRIVE END SHIELD

Remove the four screws (1) Fig 7 and washers (2) securing the drive end shield (3) to the bearing clamp plate and separate the drive end shield from the rotor assembly. The outer race of the drive end roller bearing will be retained in the drive end shield.

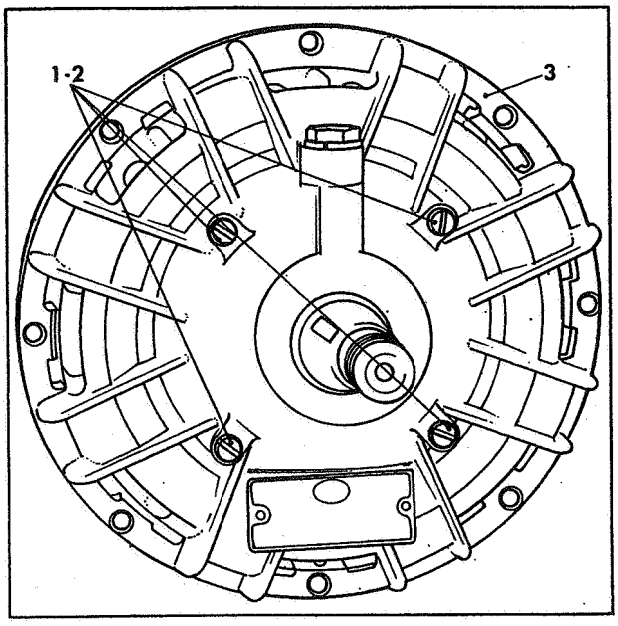

Fig 7 Removing drive end shield

Note: Do not remove this outer race unless the bearing requires renewal – see under heading 'Bearings' on Page 4.

Lever out the oil seal from the inside of the drive end shield and discard the seal.

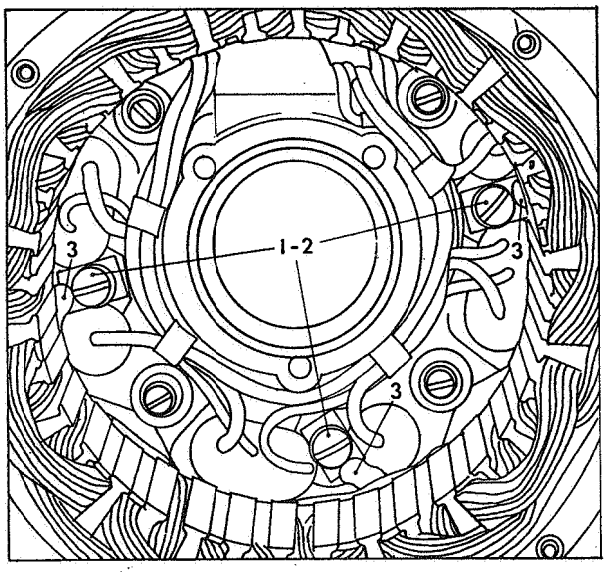

Fig 8 Removing stator leads

SLIP RING END SHIELD

Working inside the stator, unscrew and remove each of the three screws and washers (1 & 2) Fig 8 that secure the stator leads (3) to the heat sinks.

Working from the outside, unscrew and remove the seven screws and spring washers and remove the slip ring end shield.

Note: Do not attempt to remove heat sinks unless the diodes are faulty – see under heading 'Diodes' on Page 6.

COMPONENT INSPECTION & RENEWAL

GENERAL

All components should be thoroughly cleaned with an approved cleansing agent before examination. The stator frame and rotor shaft should be wiped clean using a non-fluffy rag moistened with white spirit, care being taken to avoid the spirit coming into contact with the winding insulation and stator leads.

Examine all components visually for signs of cracking, corrosion, local discoloration and any other signs of damage or excessive wear. Check all internal and external threads. The 'Nyloc' pulley securing nut can be used again, provided that the nylon insert is in reasonable condition.

It is essential to remove all traces of carbon dust with a compressed air line before carrying out any insulation tests. Do ***NOT*** 'spin' ball or roller bearings with a compressed air line as this can cause damage.

In addition to the usual workshop facilities, the following electrical equipment will be required:—

1 First grade moving coil dc ammeter having a range of 0 to 100 ampere.

2 'Avometer' or similar test meter.

3 100 volt 'Megohm' test meter or similar non-destructive 100 volt 'Flash' tester.

4 24 volt battery of 50 ampere hour minimum capacity.

5 Adjustable resistor capable of carrying a current of 40 ampere at 24 volt.

6 24 volt 44/48 watt lamp and single pole ON/OFF switch.

ROTOR

Check the rotor and fan visually for any sign of damage or rubbing. Examine field windings for damage or deterioration to the insulation and ensure that they are held securely in place.

Ensure that the slip rings are clean and free from grease, then check for continuity by measuring the resistance between the slip rings with the 'Avometer'. The resistance should be between 14,3 and 16 ohm on 24V machines. On later 24V production models, the resistance should be between 9,5 and 10,5 ohm. Because of the wide difference between these two sets of figures, it should be immediately apparent which model is being tested. On 32V alternators, the resistance should be between 24,6 and 26,6 ohm.

Check the insulation between each slip ring and the drive shaft with the 100 volt 'Megohm' test meter or 100 volt 'Flash' tester. The resistance should be 10 megohm minimum if the 'Megohm' test meter is being used.

If the resistance is below this figure, clean and thoroughly dry the rotor then check the insulation again.

Check the slip ring surfaces for any pitting or scoring. If skimming is necessary, remove both bearings as detailed under the heading 'Bearings' on Page 4 , then mount the rotor in a lathe using the bearing journals for location. Remove the minimum amount of metal necessary, using a diamond or tungsten carbide tipped tool to obtain a fine even finish. The minimum permissible slip ring diameter is 22,22 mm (0,875 in) and the slip rings must be concentric with the rotor shaft to within 0,05 mm (0,002 in). Replace both bearings as detailed under the heading 'Bearings' on Page 4.

Great care must be taken when handling the rotor to avoid damaging the slip ring surfaces.

BEARINGS

It is recommended that new bearings are fitted as normal routine when the alternator is being completely overhauled.

Drive End Bearing

Wash both parts of the drive end bearing in kerosene or white spirit; take care not to allow the spirit to come into contact with the field coil insulation.

Inspect tracks, rollers and cage for any signs of damage or excessive wear. Offer up the outer race to the inner race and check for excessive play. Should the bearing need renewing, proceed as follows:—

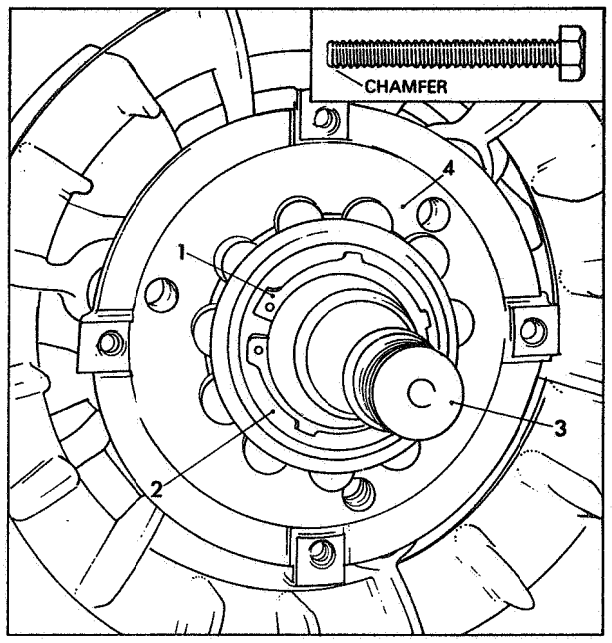

Fig 9 Removing drive end bearing

Remove the circlip (1) Fig 9, then draw the inner race (2) off the shaft (3) by inserting three ¼ UNF screws with a thread length of 50 mm (2 in) into the three ***INNER*** holes tapped in the bearing clamp plate (4). To ensure that these screws do not foul the ends of screws securing the fan to the rotor claws, the end of each screw should have a chamfer of 0,8 mm (0,030 in) as shown in inset. Progressively tighten each alternate screw in turn until the roller bearing inner race is freed from the rotor shaft.

Remove the three ¼ UNF screws and detach the bearing spacer and clamp plate.

The outer race may be removed by striking the drive end shield

sharply downwards onto a suitable soft wood block. The bearing race is a slide fit and after several sharp blows in this manner will separate from the end shield.

Before fitting the new drive end bearing, pack the annular groove in the drive end of the rotor with Shell Alvania No 2 grease.

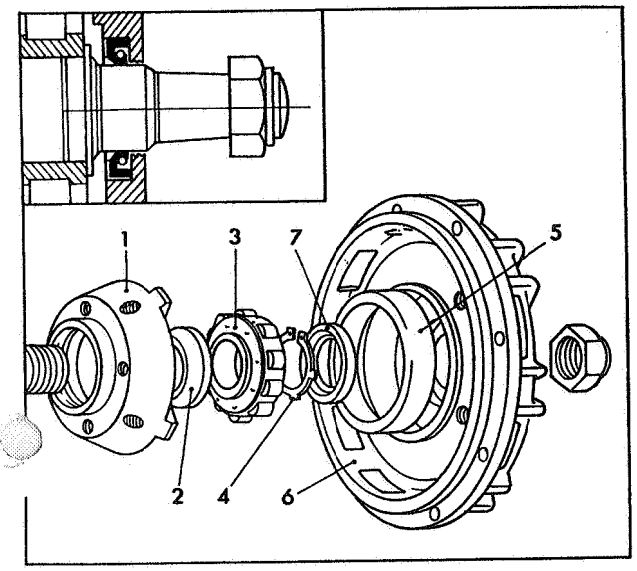

Fig 10 Replacing drive end bearing

Place the bearing clamp plate (1) Fig 10 over the drive end of the rotor shaft with the cone shaped side facing the rotor, then position the bearing spacer (2) on the drive shaft with the chamfered side facing the clamp plate.

Thoroughly smear the inner race of the bearing (3) with Shell Alvania No 2 grease, then place it on the drive shaft and press or tap it fully home using a piece of tubing of the right diameter to clear the drive shaft and locate on the end of the inner race. Secure the inner race in position with a new circlip (4).

Place the bearing outer race (5) into the drive end shield (6) and lightly tap it fully home using a brass or copper drift to avoid damage. Smear the inner race with Shell Alvania No 2 grease.

Press a new oil seal (7) into position in the drive end shield with the lip of the seal facing outwards and away from the bearing as shown in inset. Smear the lip of the oil seal with the same grease used to pack the inner and outer races of the bearing.

Slip Ring End Bearing

Since the slip ring end bearing is a sealed type it should be wiped clean externally and then spun ***BY HAND*** to check for harsh running or stiffness. Check also for excessive play. If the bearing requires renewing, it should be removed in the following manner:—

Bind both slip rings (1) Fig 11 with one or two turns of insulating tape to protect the surfaces.

Remove the bearing circlip (2) and ease it carefully over the slip rings.

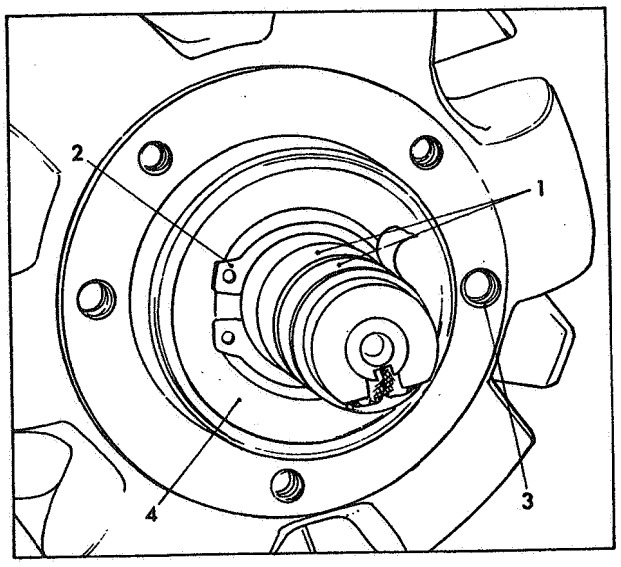

Fig 11 Removing slip ring bearing

Insert two ¼ UNF screws with a thread length of 50 mm (2 in) into the two holes tapped in the bearing clamp plate (3). Progressively tighten each screw and draw the bearing (4) off the shaft. Be careful not to damage the slip rings during this operation.

Remove the two ¼ UNF screws and detach the bearing clamp plate from the rotor.

Before proceeding to fit the new bearing, ensure that the slip rings are still protected by the insulating tape.

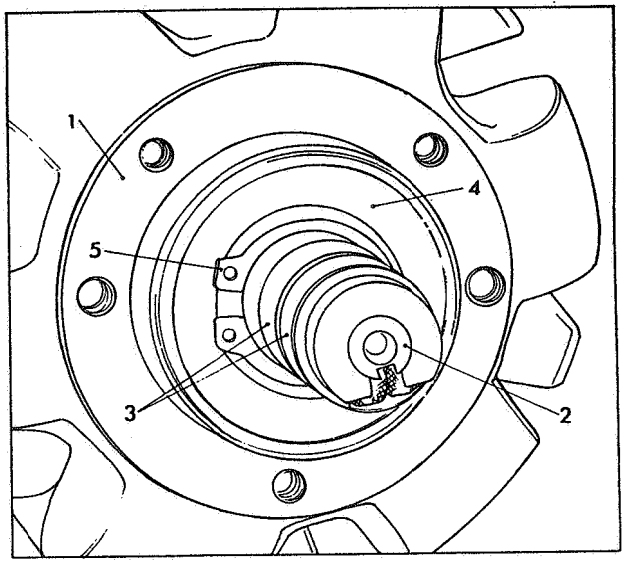

Fig 12 Replacing slip ring bearing

Position the bearing clamp plate (1) Fig 12 onto the rotor shaft (2) with the recessed side of the plate facing outwards towards the slip rings (3) as shown, taking care not to damage the slip ring surfaces. Place the bearing (4) into position on the shaft and press or lightly tap it fully home using a piece of tubing of the right size to clear the shaft and slip rings.

Secure the bearing in place with a new circlip (5).

BRUSHGEAR

Examine the brushgear base for cracks and any other signs of damage or 'tracking'.

Check the brush springs visually for any sign of damage and renew if necessary.

Brushes should be renewed if worn below the minimum length of 7,90 mm (0,312 in). It is recommended that new brushes are fitted when a complete overhaul is being undertaken.

STATOR

Check the stator visually for signs of damage or deterioration to the insulation of windings and leads. Ensure that windings are held securely in place and that all bindings are tight and in good condition.

Check the insulation between the frame and each of the three coil leads in turn using the 100 volt 'Megohm' test meter or 100 volt 'Flash' tester. A minimum resistance of 10 megohm should be indicated if the 'Megohm' test meter is being used. If the resistance is below this figure, clean and thoroughly dry the stator and then check the insulation again.

Check for continuity and correct resistance by wiring the 24 volt battery in series with the adjustable resistor and ammeter and connecting across one pair of coil leads. Adjust the resistor until a current of 40 ampere flows, then measure the voltage across these two same coil leads. Repeat this complete test on the remaining two pairs of leads. The indicated voltage should be the same each time and within the range of 6,2 to 6,4 volt. If the result is not the same in each test, renew the stator.

DIODES

All the diodes can be tested while the three heat sinks are still assembled in the slip ring end shield. Using the 24 volt 44/48 watt lamp connected in series between a probe and the positive terminal of the 24 volt battery supply and a second probe connected to the negative side of the battery, carry out the tests detailed in the following table Fig 13.

TEST	POSITION OF TEST PROBES		TEST LAMP
	POSITIVE PROBE	NEGATIVE PROBE	INDICATION
1	Each Heat Sink in Turn	Terminal D+	ON
2	Terminal D+	Each Heat Sink in Turn	OFF
3	Terminal D-	Each Heat Sink in Turn	ON
4	Each Heat Sink in Turn	Terminal D-	OFF
5	Each Heat Sink in Turn	Terminal A	ON
6	Terminal A	Each Heat Sink in Turn	OFF

Fig 13 Diode tests

Should a lamp indication be obtained that does not agree with the table, then the heat sink being tested contains a faulty diode. Since it is not possible to change individual diodes, the complete heat sink must be replaced.

Note: A broken lead between diode and terminal or a high resistance solder joint could indicate a faulty diode. Check for either of these faults before removing a heat sink.

HEAT SINK RENEWAL

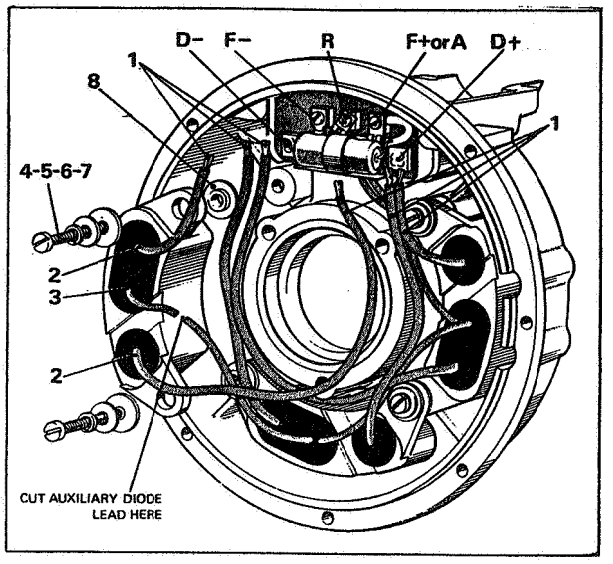

Fig 14 Removing heat sink

Removing Heat Sink

Scrape away the plastic potting compound from the main terminals D- and D+ shown in Fig 14. Unsolder and separate the three main diode leads (1) from both main terminals.

Free the leads of the main diodes (2) in the faulty heat sink from any securing sleeves or binding and cut the lead from the auxiliary diode (3) at about 25 mm (1,0 in) from the diode. If the heat sink is fitted with a thermostat, make a note of its terminations, then unsolder both its leads and free them from any securing sleeve or binding.

Note: On totally enclosed machines, a different terminal block is fitted containing a resistor and no potting compound is used.

Remove retaining screws (4), spring washers (5), plain washers (6) and insulating washers (7). Lift out the faulty heat sink and remove insulating bushes (8). Remove the loose nuts from other side of end shield.

Assembling Heat Sink

Place the new heat sink (1) Fig 15, complete with insulating bushes (2), into its correct position in the end shield. Insert the loose nuts from the rear then secure the heat sink with screws (3), spring washers (4), plain washers (5) and insulating washers (6). Tighten screws to the correct torque value of 2,7 to 3,4 N m (280 to 340 g m or 25 to 30 lb in).

Note: The heat sink retaining screw nearest to terminal D+

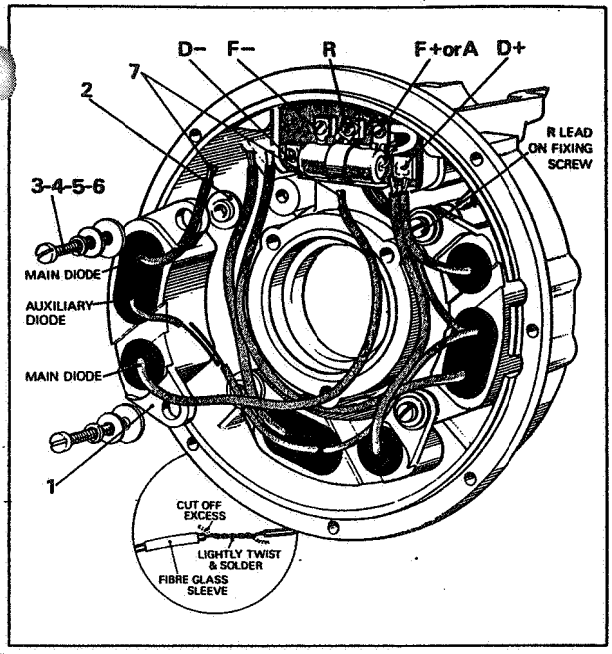

Fig 15 Replacing heat sink

also secures the lead from terminal R. It has only one insulating bush and spacer.

Position the two main diode leads (7) so that one goes to the right and the other to the left, passing them through any existing securing sleeves. If replacing a heat sink with a thermostat fitted, ensure that its leads are also passed through any existing securing sleeves.

Cut the two main diode leads to the correct length and bare their ends so that they can be soldered to the two main terminals together with the existing main diode leads. Where a capacitor is fitted, its leads are also soldered to the two main terminals.

Note: If a thermostat is fitted, cut its leads and bare them so that one end can be soldered to terminal F- and the other end soldered to the junction of the resistor and brush box leads.

no securing sleeves are fitted, tie all the new leads to the xisting wiring using an approved binding.

Refer to the inset in Fig 15 when connecting the auxiliary diode as detailed in the following instructions.

Cut the leads from the new auxiliary diode so that they are long enough to overlap the loose ended wires from the next diodes. Where only one lead is required, cut off the unwanted lead close to the diode. Bare both ends for the distance of the overlap then slide a piece of fibre glass sleeving of sufficient length to cover the overlap onto the longest lead. Lightly twist the ends together as shown and solder. Cut off any excess wire ends then slide the tubing over the joint and seal the ends with ICI 'Silcoset 151' compound.

Fill the terminal block and capacitor with the same ICI 'Silcoset 151' potting compound to cover the terminals.

Note: Do *NOT* use 'Silcoset 151' compound on totally enclosed machines.

ASSEMBLY

SLIP RING END SHIELD

Position the slip ring end shield on the stator so that the lines scribed when dismantling now align and secure with the seven screws and spring washers tightened to the correct torque value of 2,7 to 3,4 N m (280 to 340 g m or 25 to 30 lb in).

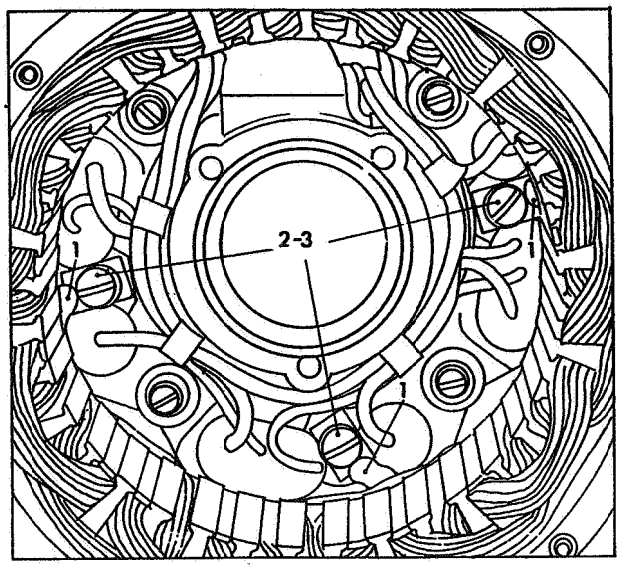

Fig 16 Replacing stator leads

Working inside the stator, secure each of the three stator leads (1) Fig 16 with a screw (2) and spring washer (3) tightened to the correct torque value of 2,7 to 3,4 N m (280 to 340 g m or 25 to 30 lb in).

DRIVE END SHIELD

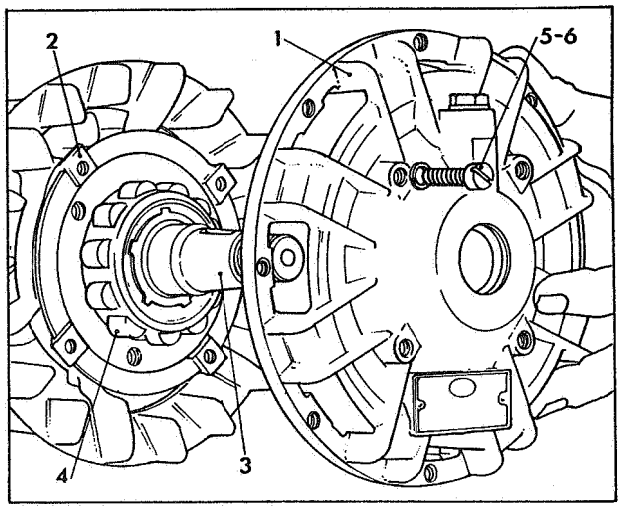

Fig 17 Replacing drive end shield

Offer up the drive end shield (1) Fig 17 to the rotor assembly so that the four screw holes align with the four holes in the bearing clamping plate (2). Ensure that the drive shaft (3) slides smoothly through the oil seal without damaging it and that the outer race locates correctly over the bearing rollers (4). Secure the bearing clamp plate to the drive end shield with the four screws and spring washers (5 & 6), tightening each

diametrically opposite pair half a turn at a time to pull the bearing clamp plate squarely into position. Tighten screws to correct torque value of 3,4 to 4,1 N m (340 to 415 g m or 30 to 35 lb in).

ROTOR

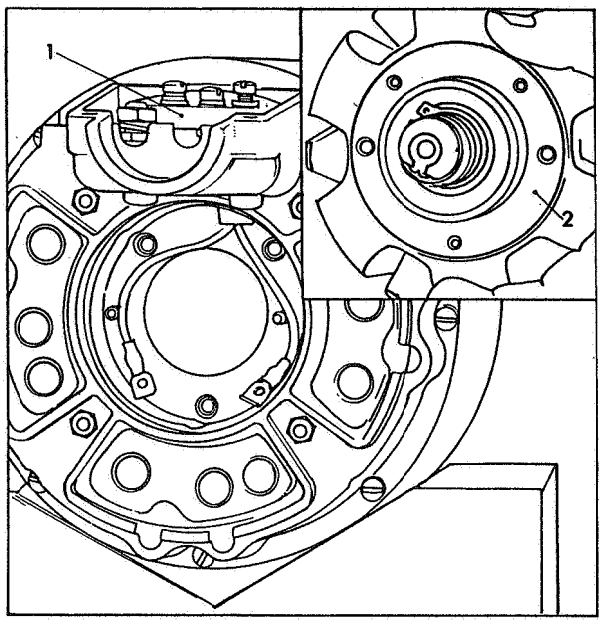

Fig 18 Replacing rotor

Lay the assembled stator and slip ring end shield lengthways in the clamp with the terminal block (1) Fig 18 uppermost. Hold the rotor so that the two large holes in the slip ring bearing clamp plate (2) are horizontal as shown in inset, and the other three holes are at 2 o'clock, 6 o'clock and 10 o'clock respectively. Keeping it in this position, insert the rotor, slip ring end first, into the stator. Carefully guide the slip rings through the bearing to avoid damaging the slip ring surfaces. The lines scribed on the stator and drive end shield should align. Secure the drive end shield with the eight screws and spring washers, tightening each pair of diametrically opposed screws a little at a time until the end shield is fully in position. Tighten all eight screws to the correct torque value of 2,7 to 3,4 N m (280 to 340 g m or 25 to 30 lb in).

Check that the three holes in the slip ring bearing clamp plate and the slip ring end shield are aligned. If they are not, stand the complete unit on the end of the drive shaft and rotate the stator while holding the shaft until the holes align. Insert the three screws with their spring washers and progressively tighten each one in turn to pull the clamping plate up squarely. Tighten the three screws to the correct torque value 2,7 to 3,4 N m (280 to 340 g m or 25 to 30 lb in), then check that the rotor spins freely.

BRUSHGEAR AND PULLEY

Lift each brush spring in turn, insert the brush partly into its box and let the spring rest against the side of the brush to keep it wedged in place.

Wipe out any surplus grease that may have found its way into the brush compartment. Remove the insulating tape then inspect the slip rings and ensure that they are clean and undamaged. (Any damage to these will necessitate dismantling and rectification as laid down in the section headed 'Rotor' on Page 4).

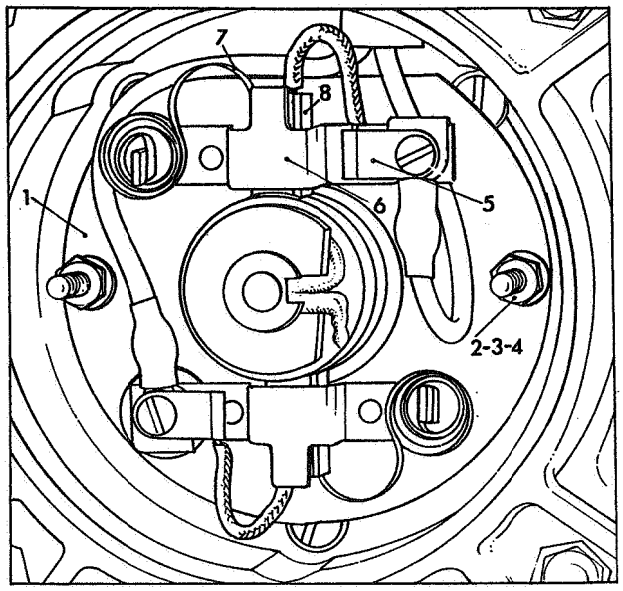

Fig 19 Assembling brushgear

Position the brush holder plate (1) Fig 19, straight edge towards the field lead entry, into the brush compartment and secure it in place with the two nuts (2), plain washers (3) and spring washers (4). Tighten the two nuts to the correct torque value of 1,13 to 1,70 N m (113 to 150 g m or 10 to 14 lb in).

Clean the connecting tags on the brush leads (5) and connect the brush leads and the field leads correctly to the brush boxes (6) as shown, ensuring that both the marked leads go in the same positions they occupied prior to dismantling. Make certain that the connections are secure and electrically sound. Lift the brush springs (7) and push the brushes (8) fully into the holders. Release the brush springs and check that each brush slides smoothly in its holder and bears correctly on the slip ring. The brush spring loading should be 227 to 285 g (8 to 10 oz).

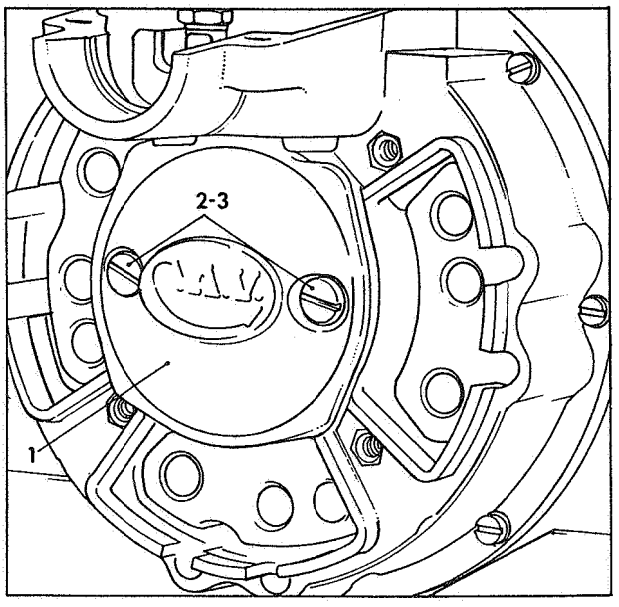

Fig 20 Replacing brush cover

Fit a new sealing ring to the brush cover (1) Fig 20 and secure the cover firmly in place on the slip ring end shield by means of two captive screws and washers (2 & 3).

Where applicable, assemble the cowl or sealing plate to the slip ring end shield and secure in place with the four captive screws tightened to the correct torque value of 2,7 to 3,4 N m (280 to 340 g m or 25 to 30 lb in). Place the baffle or filter in position on the cowl and secure with the two screws tightened to the correct torque value of 2,7 to 3,4 N m (280 to 340 g m or 25 to 30 lb in).

Press or tap the 'Woodruff' key into its groove on the rotor shaft and slide the drive pulley over the key, engaging the key in the slot in the pulley bore.

Fit the 'Nyloc' nut and firmly tighten it to press the pulley home on the tapered shaft. Hold the pulley and securely tighten the nut to the correct torque value of 47,5 N m (4,85 kg m or 35 lb ft). On early models a castellated nut is used locked with a split pin.

TESTING THE ALTERNATOR

EQUIPMENT REQUIRED

1 Test machine with variable speed drive capable of driving the alternator at speeds of up to 4 000 rpm.

2 24 or 32 volt battery.

3 Carbon pile or similar variable electrical load capable of carrying a current of 60 ampere at system voltage.

4 24 or 32 volt Type 440A Regulator.

5 100 volt 'Megohm' test meter or similar non-destructive 100 volt 'Flash' tester.

6 First grade moving coil dc ammeter with a range of 0 to 100 ampere.

First grade moving coil dc voltmeter with a range of 0 to 50 volt.

8 Avometer' or similar test meter.

9 24 or 32 volt 2 watt MINIMUM warning lamp and single pole ON/OFF switch.

10 3 ampere fuse and holder.

STATIC TESTS

Check for insulation faults with the 100 volt 'Megohm' test meter or the 100 volt 'Flash' tester. Secure one of the leads to the alternator frame and attach the other lead to each of the five terminals in turn. If the Megohm test meter is used a minimum resistance of 10 megohm should be indicated. Do ***NOT*** apply this test between any two terminals or serious damage will be caused to the diodes.

Check for field coil circuit continuity with the 'Avometer'. Attach the probes to terminals A or F+ and F-. A low resistance should be indicated that will vary slightly when the rotor is turned slowly by hand. Large variations usually mean sticking brushes or dirty slip rings. On totally enclosed alternators, a high resistance can indicate that the thermostat is faulty and that consequently, the current limiting resistor is still connected into the field coil circuit. See under heading 'Rotor' on Page 4 for the correct field coil resistance figures.

Rectify any faults before proceeding with any further tests.

PERFORMANCE TESTING

Checking Cutting in Speed

Mount the alternator on the test machine and connect the F- terminal to the D- terminal through the 3 ampere fuse. Connect the test meter across the two main terminals D- and D+ and select a high voltage range. The battery and regulator are ***NOT*** required for this test.

Start up the test machine and slowly increase speed until the alternator produces output voltage. Care should be taken while carrying out this test as the alternator is not under regulator control and excessive speed will produce a voltage well above the system voltage.

Note: If no voltage output is obtained, it may be necessary to polarize the rotor. To do this, stop the test machine and connect a battery of the correct voltage briefly across the field terminals; ensure that battery negative is connected to terminal F- and that battery positive is connected to terminal A or F+. Disconnect the battery and start up the test machine again.

Type of Alternator	24V Std	24V Low CIS	24V High CIS	24V Enc	32V Std
Cutting-in Speed in rpm	750 @ 28V	600 @ 28V	900 @ 28V	*850 @ 28V	1000 @ 36V
Current Output at 1 500 rpm	43A	37A	49A	*26A	38A
Current Output at 2 500 rpm	52A	42A	63A	*35A	52A
Current Output at 3 500 rpm	54A	43A	69A	*35A	54A

* These figures apply when the current limiting circuit is operating

Fig 21 Performance data

Adjust the speed until the voltage stated in the table Fig 21 is obtained. The speed at this point should be approximately the same as the CIS figure given in the same table. Stop the test machine, disconnect the test meter and remove the fused link from terminals D- and F-.

Checking Alternator Output

Wire the alternator to the regulator, warning lamp, ON/OFF switch, voltmeter, ammeter, battery and adjustable load as shown in Fig 22.

The adjustable load must be set so that the battery is discharged sufficiently to allow the alternator to develop its full output; if the battery is in a fully charged condition, the voltage regulator will taper off the alternator output and prevent the following test from being carried out correctly.

Close the warning lamp switch then run the machine up to the first speed stated in the table Fig 21; compare the alternator current output with the figure given. Check the output for each of the other speeds given in the table.

In the case of the totally enclosed models, the initial performance will be identical to the standard 24V machine. When the temperature reaches the pre-determined level the internal thermostat operates and switches the built-in resistor into circuit. The reduced output should then match the performance figures given for the totally enclosed machines.

Some variation from the stated outputs is permissible, but failure to reach within 10% of the required figure indicates a faulty alternator. Do not continue with the testing until the fault has been found and rectified.

DO NOT REMOVE ANY CONNECTIONS WHILE THE ALTERNATOR IS RUNNING

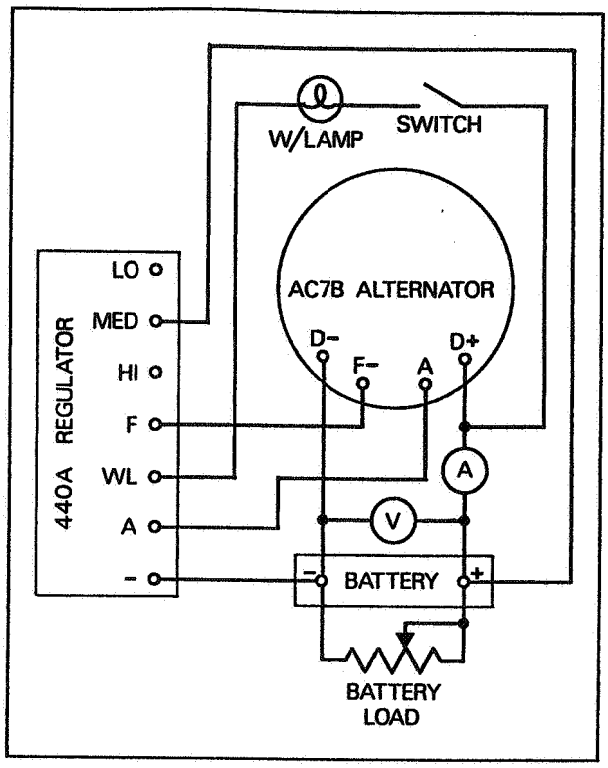

Fig 22 Test circuit