

LUCAS ALTERNATOR WITH INTEGRAL REGULATOR

Jaguar
MG
Triumph

NOTE — Some Jaguar models may be fitted with Motorola alternators.

DESCRIPTION

Lucas "ACR" model alternators have an integral voltage regulator mounted in the slip ring end bracket. The stator consists of star-connected, three phase windings on a ring end cover and drive end bracket. The rotor is either an eight or twelve pole type with the field windings connected to two face-type slip rings, and is supported in drive-end bracket by a ball bearing and in the end cover by needle roller bearings. One positive and one negative carbon brush ride against concentric brass slip rings. The heatsink-rectifier, terminal block assembly incorporate six silicon diodes, forming a full wave rectifier bridge circuit, and three diodes which supply current to the rotor windings. **NOTE** — Up to a ten milliamp battery drain is normal, even with the ignition in the "OFF" position.

APPLICATION

Model	Type No.
Jaguar	
XJ-6 Without Air Cond.	18 ACR
XJ-6 With Air Cond.	20 ACR or 25 ACR
XJ-12, XJS	20 ACR
MG	
Midget	16 ACR
MGB	18 ACR
Triumph	
Spitfire 1500	16 ACR
TR-7	
Without Air Cond.	17 ACR
With Air Cond.	20 ACR

SPECIFICATIONS

Nominal Output

Alternator	Amps @ RPM	Voltage
16 ACR	34 @ 6000	12
17 ACR	36 @ 6000	12
18 ACR	45 @ 6000	12
20 ACR	66 @ 6000	12
25 ACR	66 @ 6000	12

TESTING

ON CAR TESTING

NOTE — Alternator drive belt must be properly adjusted, battery and connections in good condition and charge warning bulb and circuit continuous in order to test charging system. Polarity of alternator and battery terminals **MUST** be observed to prevent system damage. Warm engine 3-4 minutes before testing. (Output may be slightly higher when alternator is cold.) Battery ground cable should be disconnected when attaching jumper wires to alternator and regulator.

Alternator Output Test — 1) Disconnect multi-socket connector and remove molded cover from rear of alternator. (Cover

may be pierced with a probe on some models in order to ground the field winding brush and by-pass the regulator.) Provide a test circuit as illustrated.

2) Start engine and run to give 1,500 alternator RPM (approximately 650-800 engine RPM). Test circuit bulb should be out.

3) Increase engine speed to 2500-3,000 RPM to give 6,000 alternator RPM. Adjust variable resistor so voltmeter reads 14 volts and note ammeter reading equal to the nominal output rating for the appropriate alternator. If readings are not correct, alternator requires overhaul or replacement.

NOTE — Do not connect variable resistor across battery for longer than is necessary to complete the test.

Regulator Test — 1) Provide Regulator Test Circuit as shown and gradually increase engine speed to approximately 640 RPM (1,550 alternator RPM). Test lamp should go out.

2) Increase engine speed to approximately 2,500 RPM (6,000 alternator RPM). Voltmeter should be steady at 13.6-14.4 volts. If reading is not steady and satisfactory Output Test has been performed, regulator should be replaced.

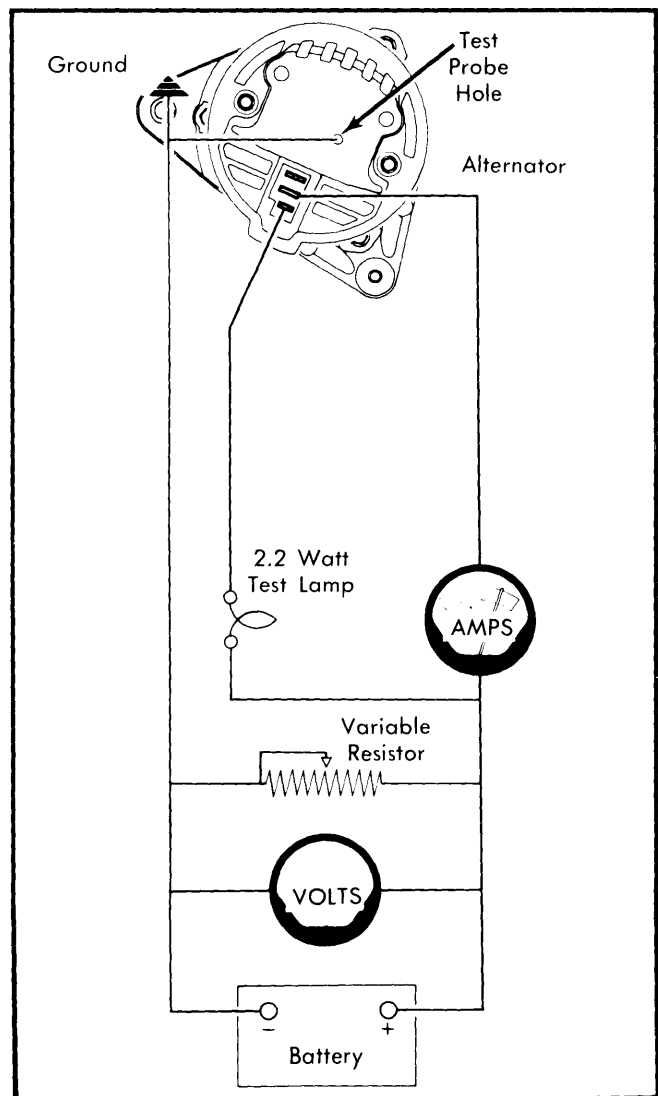


Fig. 1 Alternator Output Test Circuit (Spitfire 1500 Shown)

Alternators & Regulators

LUCAS ALTERNATOR WITH INTEGRAL REGULATOR (Cont.)

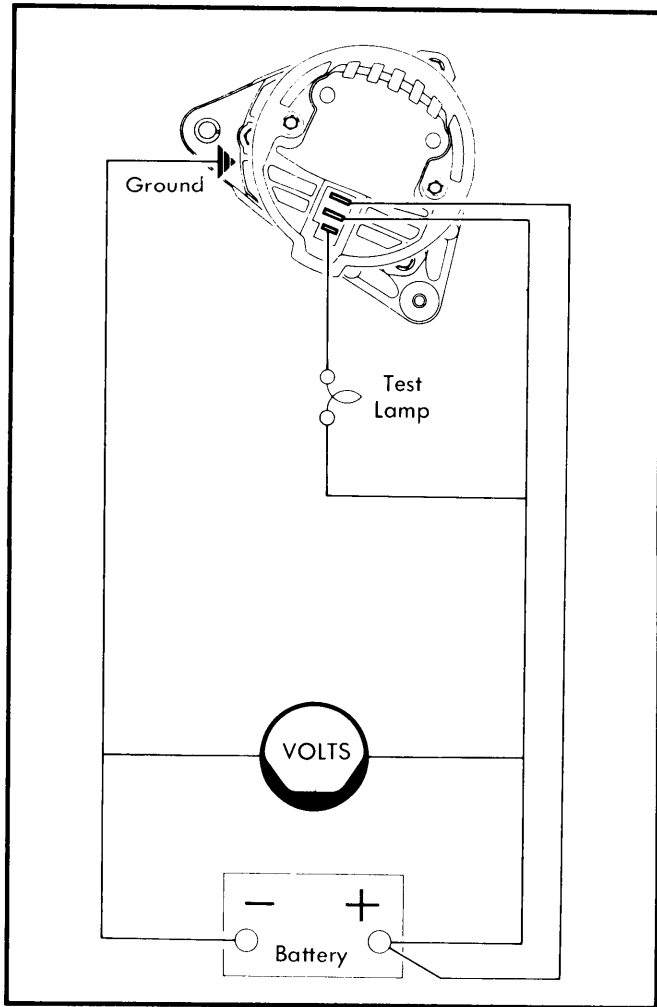


Fig. 2 Regulator Test Circuit
(Spitfire 1500 Shown)

OVERHAUL

DISASSEMBLY

1) Remove end cover and note wire positions and color. Remove screws attaching surge protection diode and brush assembly. Lift out brush assembly and surge protection diode. Regulator may be removed if desired.

2) Unsolder stator wire connections and remove rectifier pack grounding strip. Withdraw rectifier pack. Remove through bolts.

CAUTION — When necessary to solder or unsolder leads from diodes, use pliers as a heat sink by pinching diode pin with jaws of pliers. Solder connections quickly to prevent heat damage to diodes.

3) Remove through bolts from alternator frame and carefully slip end bracket and stator off of rotor. (It may be necessary to

tap lightly on an extractor or tube placed against outer bearing journal to separate rotor from end bracket.)

4) Complete disassembly, if required, by removing pulley and drive key. Press rotor from drive end bracket and remove screws retaining end bearing in position. Replace as necessary.

NOTE — Position of all washers, spacers and insulators must be noted for proper assembly.

TESTING

Rotor — Connect an ohmmeter and read resistance of field coil (across slip rings). Using a 110-volt A.C. supply and 15-watt test lamp, check for insulation between one of the slip rings and any rotor pole. If lamp lights, rotor is shorted.

Stator — Connect 12-volt battery and 36-watt test lamp to two of the stator connections. Then repeat test using any other combination of two of the three connections. If lamp fails to light in either test, stator has an open coil. Using a 110-volt A.C. supply and a 15-watt test lamp, check for insulation between any one of the three stator connections and stator laminations. If lamp lights, stator should be replaced.

Diodes — Connect a 12-volt battery and a 1.5-watt test lamp in turn to each of the nine diode pins and its corresponding heat sink on the rectifier pack, then reverse the connections. Lamp should light (with current flow) in one direction only. If lamp lights in both directions or fails in either, rectifier pack must be renewed.

PARTS REPLACEMENT

Regulator — Aluminum casing of control unit must not make contact with alternator body when installed. (Shorted field circuit could result in maximum alternator output at all times regardless of battery condition.)

Diodes — In event of defective diodes, heatsink and rectifier assembly should be replaced. Protect diodes from excess heat when soldering by using pliers on diode pin as a thermal shunt.

Brushes — Installed brushes must extend at least .2" (5 mm) from housing and springs should indicate 9-13 oz. tension when brush is pushed back flush with housing. If beyond limits, replace brush assembly.

REASSEMBLY

Reverse disassembly procedure, noting the following: When installing slip ring end bearing, ensure it is fitted with open side facing rotor and that it is seated fully. When replacing rotor to drive end bracket, support inner track of bearing with suitable piece of tubing. DO NOT use drive end bracket as the only support for bearing when fitting rotor.