LUCAS ALTERNATORS

Jaguar
XJ6
Triumph
TR7
TR8

DESCRIPTION

Lucas ACR model alternators have an integral voltage regulator mounted in the slip ring end bracket. The stator consists of star-connected, 3 phase windings on a ring end cover and drive end bracket. The rotor is either an 8 or 12 pole type with the field windings connected to 2 face-type slip rings. It is supported in the drive-end bracket by ball bearings 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 incorporates 6 silicon diodes, forming a full wave rectifier bridge circuit, and 3 diodes which supply current to the rotor windings.

APPLICATION

Model	Type. No.
Jaguar XJ6	25 ACR
Triumph	
TR7	
Standard	17 ACR
Heavy Duty	20 ACR
With A/C	25 ACR
TR8	
Standard	17 ACR
With A/C	25 ACR

SPECIFICATIONS

Nominal Output

Alternator	Amps@6000 RPM	Voltage
17 ACR	36	14
20 ACR	66	14
25 ACR	65	14

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.

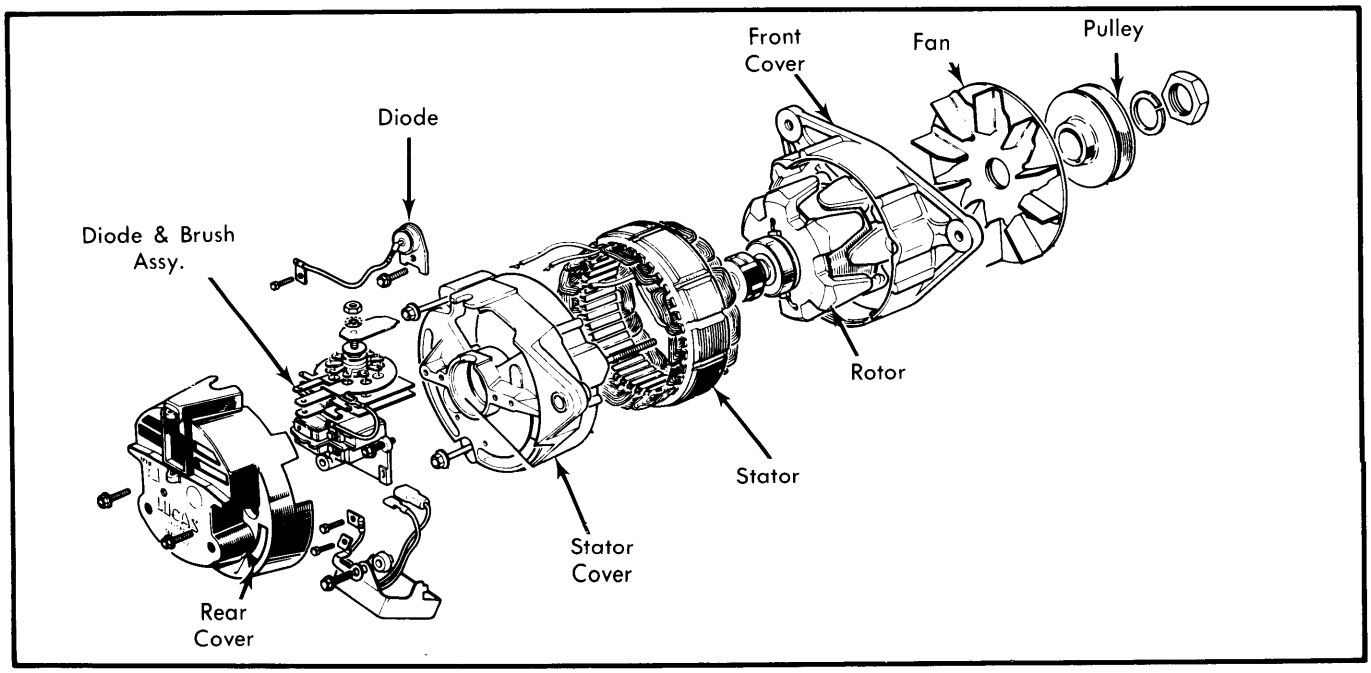

Fig. 1 Exploded View of Lucas 17 ACR Alternator with Integral Regulator

LUCAS ALTERNATORS (Cont.)

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.

NOTE – *Up to 10 milliamp battery drain is normal, even with the ignition in the "OFF" position.*

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 a 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 2 of the stator connections. Repeat test using any other combination of 2 of the 3 connections. If lamp fails to light in either test, stator has an open coil. Using 110-volt/15-watt test lamp, check for insulation between any one of the 3 stator connections and stator laminations. If lamp lights, stator should be relaced.

Diodes – Connect a 12-volt battery and a 1.5-watt test lamp in turn to each of the 9 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 and note the following: When intalling slip ring end bearing, ensure that 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 the bearing when fitting rotor.

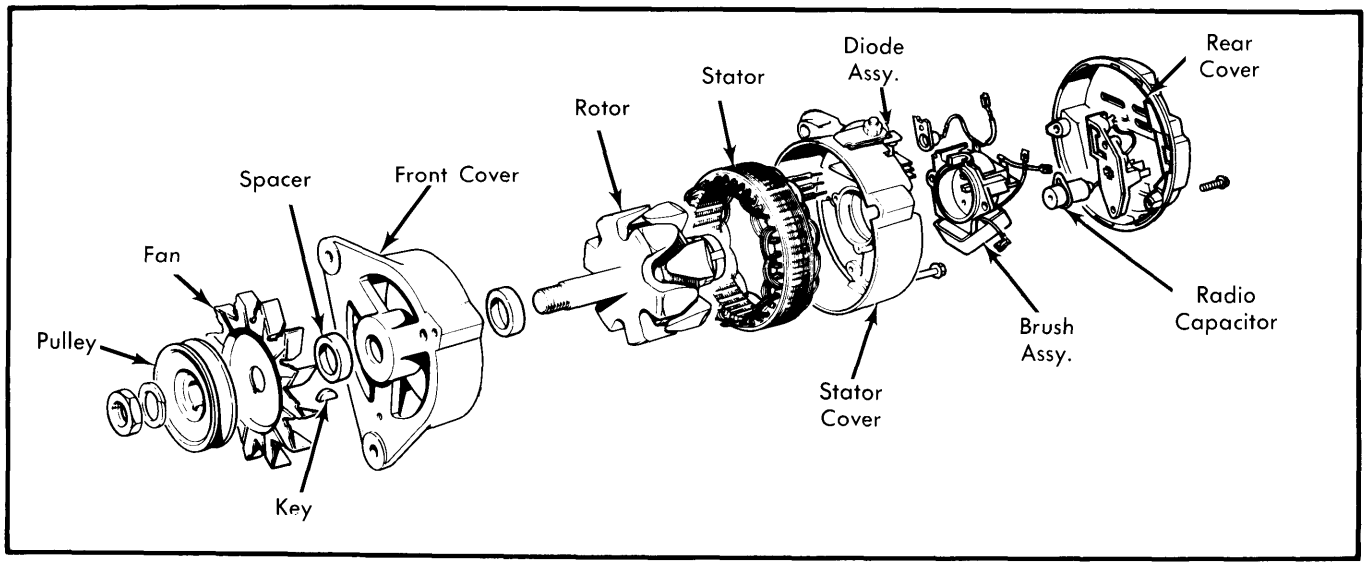

Fig. 2 Exploded View of Lucas 25 ACR Alternator with Integral Regulator