BUTEC

Jaguar XJ-6 W/Air Conditioning
Jaguar XKE Series 3 V-12

▶ CHANGES, CAUTIONS, CORRECTIONS

▶ *BATTERY INSTALLATION, BATTERY CHARGING, OR USING A BOOSTER BATTERY FOR ENGINE START* – Reversed polarity or excessive voltage will result in extensive damage to alternator system. Note the following to prevent damage:

Battery Installation – Negative battery terminal must be connected to ground. Positive terminal must be connected to starter lead. DO NOT reverse battery leads.

Battery Charging – If a Quick Charger is used, both battery cables must be disconnected from battery. DO NOT use a Quick Charger to provide starting voltage.

Booster Battery (For Engine Start) – Booster battery must be connected with negative lead to negative terminal and positive lead to positive terminal. DO NOT reverse battery leads.

DESCRIPTION

Butec alternator is a three-phase unit with six silicon rectifying diodes. A 0.15 micro-farad capacitor is connected to heat sinks for the purpose of smoothing transients. The field windings are isolated by a relay in the ignition switch/steering column lock circuit.

SPECIFICATIONS

Nominal Voltage	12 Volts
Maximum Output	60 Amps
Maximum Operating Speed	10,000 RPM
Rotor Resistance	3.6-4.0 Ohms
Minimum Brush Length	0.187" (4.76 mm)

TESTING

ON CAR TEST

NOTE – Off vehicle testing is described as part of Overhaul procedure in this article.

1) Remove sensing diode block from the alternator before making tests. Check stator phases for ground to alternator frame, using a 110 volt test lamp. This is a delta-connected stator, therefore if one phase shows ground, all phases will be similarly affected.

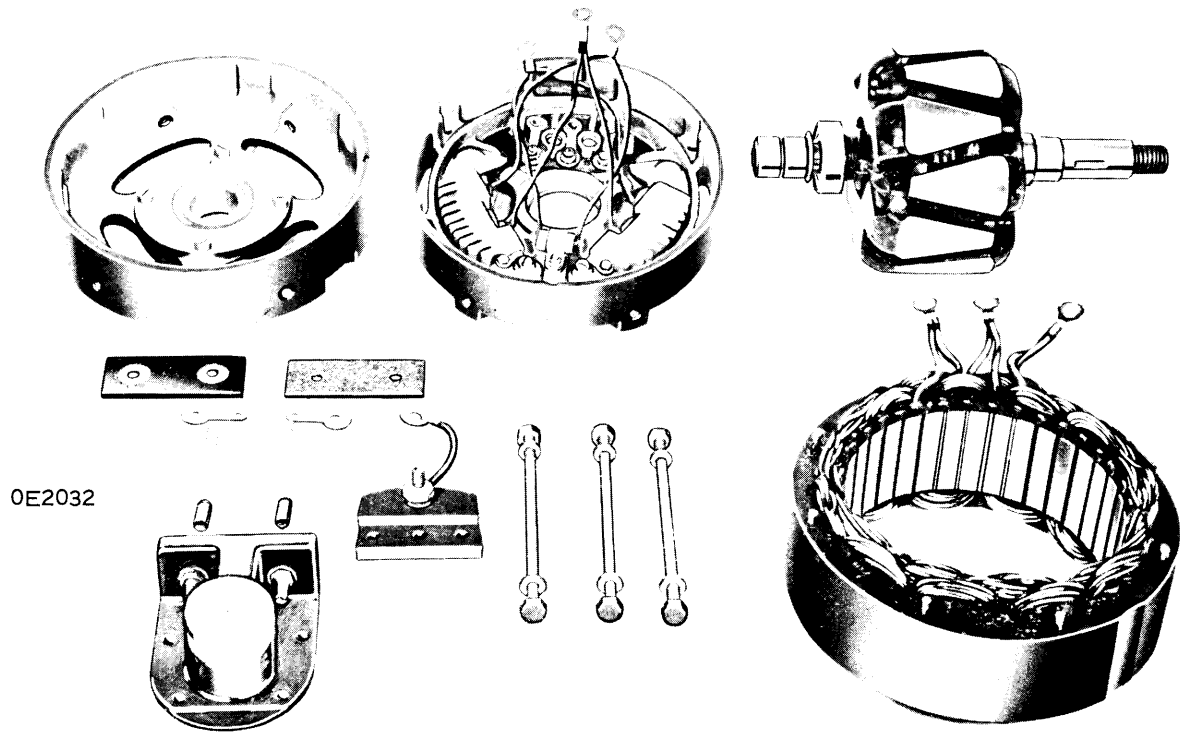
2) Check continuity of each phase. All readings should be approximately the same (check with ohmmeter). Start engine and run at 460 RPM (1,000 alternator RPM) and connect an A.C. voltmeter or 12 volt test lamp between two of the three A.C. terminals in turn. Voltage or lamp brilliancy should be the same across phases 1-2, 2-3, and 1-3. A pronounced difference in voltage reading or lamp brilliancy indicates shorted or ground stator terminals.

OVERHAUL

DISASSEMBLY

1) Remove the shaft nut and washer, use gear puller to remove fan assembly. Extract drive key from shaft. Remove brushes together with washers, insulating cover, cork gasket and jumper leads after removing the two field terminal nuts.

2) Remove four screws securing the plastic brush holder housing assembly and detach the assembly from slip-ring end housing. Remove three Nyloc nuts and through bolts which hold the unit together. With a brass drift held against the end of rotor shaft gently tap the drift with a hammer and remove slip-ring end housing and stator.



BUTEC ALTERNATOR

BUTEC (Cont.)

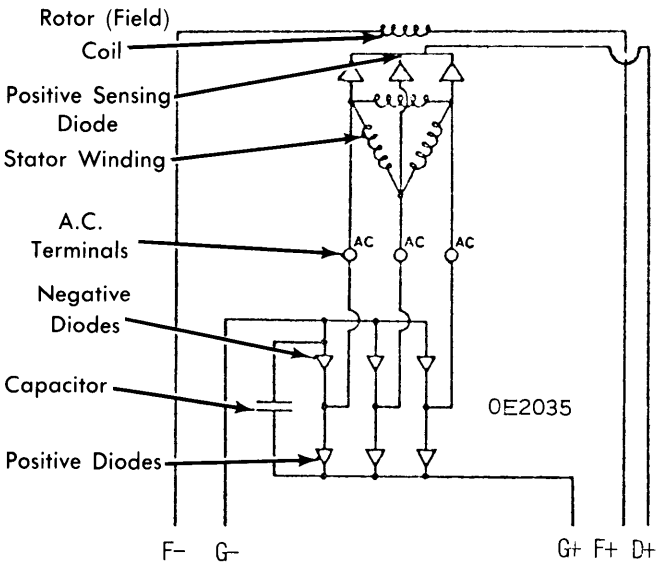
3) To disconnect stator from slip-ring end housing, remove three A.C. terminal nuts and stator connections and separate stator from housing with a lead or hide mallet. Using an arbor type press or gear puller remove rotor from the drive end housing.

TESTING

Positive Post Diodes – With negative probe of ohmmeter on terminal post of diode No. 1 and positive probe on corresponding heat sink, meter should indicate a low resistance. Next, with positive probe of ohmmeter on terminal post of diode terminal No. 1 and negative probe on corresponding heat sink, meter should indicate a very high resistance of infinity. Each positive post should be checked in the above manner.

Negative Post Diodes – All three diodes should be tested in a similar manner to above. With positive probe of meter on post of the diode and negative probe on corresponding heat sink, the meter should indicate a low resistance. A very high resistance should be indicated when the meter probes are reversed.

Field Diodes – Test in the same manner as above. Afterward, apply test probes between two of three diodes in turn. No reading should be obtained.



INTERNAL CIRCUIT DIAGRAM

Rotor – If the rotor bearing, slip-rings and coil are in good condition, further dismantling is unnecessary. If the rotor coil is open circuited, grounded or does not have correct resistance, the rotor is beyond repair and must be replaced.

Stator and Housing – Check stator windings for burned, broken, or damaged insulation. If windings are in good condition use an air hose to blow out any dust or dirt. Check the stator windings for continuity.

PARTS REPLACEMENT

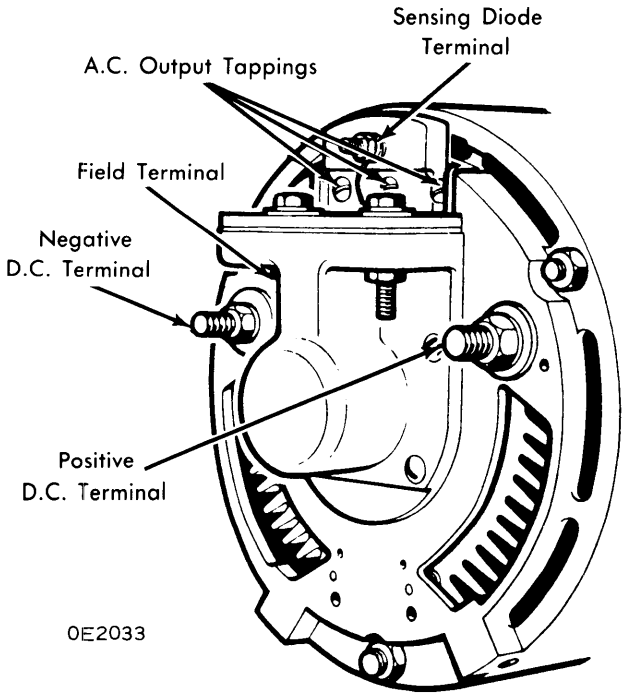
Rectifier Assembly – Remove screws which secure capacitor leads to rectifier assemblies. Cut three leads of one or both rectifier assemblies at the crimped terminals. Remove screws which secure rectifier assembly to end housing. Fit new rectifier assembly, ensuring it is of the same polarity, and that both ceramic insulators and fiber washers are in their correct relative positions. Remove three A.C. terminal nuts and connect rectifier. Reconnect the capacitor leads.

Slip-Rings – With a soldering iron, remove the wire which connects rotor coil to outer slip-ring. Bend wire so that it is parallel to the shaft and unsolder wire from inner slip-ring. With a gear puller, pull off slip-rings and insulating washer. The new slip-ring assembly should be kept in a warm place so that it will press on easily. Solder coil leads to new slip-rings. Place rotor assembly in lathe and take a light smooth cut from the face of the slip-rings to ensure concentricity with the bearing surfaces of shaft, which should be within 0.002".

Rotor Bearing – Rotor bearing may be removed, after slip-rings, with same gear puller. The bearing should be installed with a press.

REASSEMBLY

Reassemble alternator by reversing disassembly procedure. During assembly, always make sure that polarity of diodes is correct.



ALTERNATOR TERMINALS