LUCAS

Austin (1968-73)
Capri (1970-73)
Cortina (1970)
Cricket (1971-72)
Jaguar (1969-73)
MG (1968-73)
Rover (1967-73)
Sunbeam (1968-70)
Triumph (1968-73)

▸ CHANGES, CAUTIONS, CORRECTIONS

▸ *BATTERY INSTALLATION & OTHER ELECTRICAL SYSTEM REPAIR CAUTIONS* – Reverse 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 (if negative ground system) and positive terminal to starter. DO NOT reverse battery leads.

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

Circuit Interruption – Battery must NEVER be disconnected while alternator is running.

Alternator Removal – Always disconnect battery ground before replacement of alternator.

High Voltage – DO NOT use a high voltage source to test diodes.

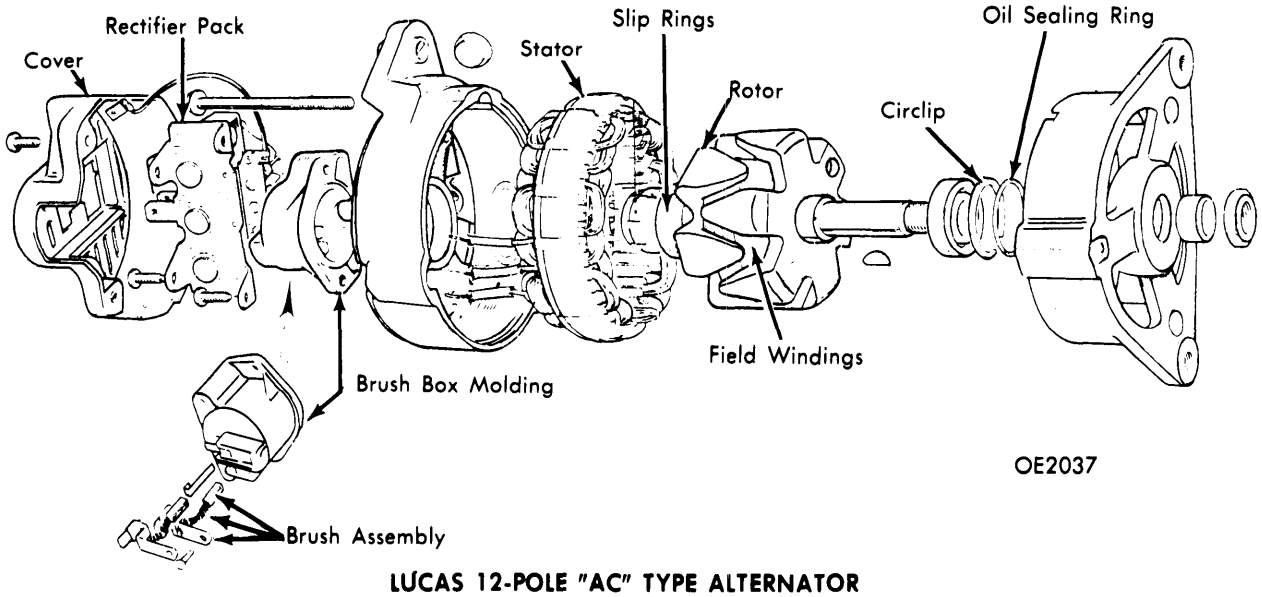
Booster Battery (For Engine Start) – Booster battery must be connected with negative lead to negative terminal of battery and positive lead to positive terminal of battery. DO NOT reverse battery leads.

DESCRIPTION

Construction of the Lucas "AC" type alternators is similar to the "ACR" type, except that a voltage regulator of micro-circuit construction is incorporated as an integral part of the "ACR" alternator. "AC" type alternators use an external regulator. Both type alternators have stators consisting of three-phase, star-connected windings on a ring end cover and drive end bracket. The rotor is of eight or 12-pole construction (depending on model) and carries a field winding connected to two face-type slip rings. It is supported by a ball bearing in the drive end bracket and a needle roller bearing in the slip ring end cover. Two carbon brushes, one positive and one negative, bear against a pair of concentric brass slip rings. Slip ring end cover also carries six silicon diodes, connected in a three-phase bridge circuit to provide rectification of the generated alternating current output. On some models, field windings are isolated by means of a relay incorporated in the ignition switch circuit.

APPLICATION

Model	Lucas Model No. (Part No.)
Austin America (1968-71)	16ACR (....)
Austin Marina (1973)	17ACR (....)
Capri (1970-73)	
1600cc (1970-72)	
28 Amp.	15ACR (23593-B)
35 Amp.	17ACR (23647-A)
2000cc (1971-73)	16ACR (23653-A)
Cortina (1970)	15ACR (....)
Cricket (1971-72)	16ACR (....)
Jaguar (1969-73)	
6 Cyl.	
1969 Early	11AC (23579)
1969 Late	11AC (23580)
1970	
XJ6	11AC (23579-A)
XKE	11AC (23580-B)
1971	11AC (23579-A)
1972-73	
W/O AC	18ACR (....)
W/AC	20ACR (....)
12 Cyl.	
1971 XKE W/O AC	11AC (....)
1973 XJ12	11AC (....)
MG (1968-73)	
MGB & MGB GT	
1968-71	16ACR (23566-A)
1972-73	16ACR (....)



LUCAS 12-POLE "AC" TYPE ALTERNATOR

LUCAS (Cont.)

APPLICATION (Cont.)

Model	Lucas Model No. (Part No.)
Rover (1967-73)	
2000 TC & SC	
1967-68	(54021162)
1969	(23549)
1970	(23541-F)
3500S (1970-71)	11AC (23545-D)
Land Rover	
1971	11AC (23549-D)
1972	①16ACR (23685)
1973	①16ACR (....)
Sunbeam (1968-70)	
1968-69	(23548)
1970	(23606)
Triumph (1968-73)	
Stag (1971-73)	11AC (....)
Spitfire Mk IV	
1971-72	15ACR (23634-A)
1973	16ACR (219267)
GT6+ (1969-70)	15ACR (23562-A)
GT6 Mk III (1971-73)	15ACR (23636)
TR250 (1968-69)	15AC (23544)
TR6	
1970	15ACR (23636)
1971-73	17ACR (23635)

① – Standard, optional type number is 18ACR.

SPECIFICATIONS

Nominal Output

Alternator	Amps. @ RPM	①Volts
11AC	43 @ 6000	12
15ACR	28 @ 6000	12
16ACR	34 @ 6000	12
17ACR	36 @ 6000	12
18ACR	45 @ 6000	12
20ACR	66 @ 6000	12

① – Charging Voltage; 14.

Resistance Values (Ohms)

Alternator	Stator Coil	Rotor Coil
11AC	0.127	3.8
15ACR	0.198	①4.3
16ACR	0.138	①4.3
17ACR	0.133	4.2
18ACR	0.087-0.097	3.2
20ACR	0.180-0.200	3.6

① – With pink windings. Purple windings are 3.3 ohms.

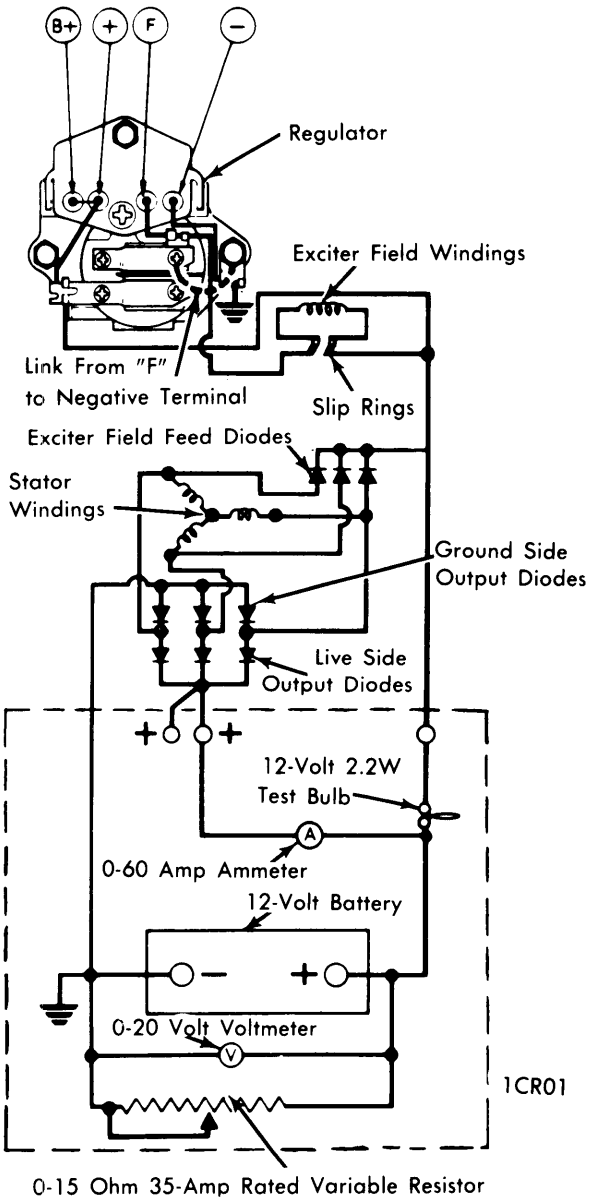
TESTING

ON CAR TESTING ("ACR" TYPE)

Testing Alternator Output With Regulator Inoperative – 1) Disconnect alternator harness connector. Unscrew molded cover from rear of alternator. Link together regulator negative terminal and "F" terminal. Connect an external test circuit as shown in lower half of illustration. *CAUTION – Be aware of proper connections to avoid reversed polarity.*

2) *NOTE – Variable resistor across battery terminals must not be left connected any longer than necessary to complete the test.* Start engine and run at 800 RPM (1500 alternator RPM). The test circuit bulb should now be out.

3) Inscrease engine speed to 3200 RPM (6000 alternator RPM) and adjust variable resistance until voltmeter reads 14 volts. Ammeter reading should then be approximately specified rated output. If obvious variance from specifications is encountered, alternator necessitates removal and overhaul or replacement.



"ACR" ALTERNATOR OUTPUT TEST CIRCUIT

Regulator Test – *NOTE – The following test assumes alternator is satisfactory.* – 1) Disconnect variable resistor and remove link bridging regulator negative and "F" terminals. With remainder of test circuit still connected, start engine and run up to 3200 RPM (6000 alternator RPM), until ammeter registers output current of less than 10 amps. Voltmeter should then read 13.6-14.4 volts. Any variation necessitates regulator replacement.

LUCAS (Cont.)

2) If regulator is still shown to be satisfactory, disconnect entire external test circuit and reconnect alternator harness connector. Attach a low-range voltmeter between either positive alternator terminal and positive battery terminal.

3) Turn on headlights, start engine and increase engine speed to 3200 RPM. Record voltmeter reading. Transfer voltmeter connection to alternator frame and negative battery terminal. Record reading. If reading exceeds 0.5 volt on positive side or 0.25 volt on negative side, there is a high resistance in charging circuit which must be traced and corrected. *See further testing on Overhaul procedure.*

ON CAR TESTING (11AC)

1) Check alternator belt and adjust tension. Disconnect battery negative terminal lead. Disconnect the 35-amp output lead from alternator and connect an ammeter between output terminal and output lead. Disconnect leads from alternator field terminals and connect them to battery terminals. Then reconnect battery negative terminal.

2) Start engine and run up to 4000 alternator RPM. Ammeter should register 40 amps, indicating a good alternator and output lead. If zero or low reading is obtained, check output circuit and wiring by connecting a voltmeter between alternator output terminal and battery positive terminal. Note reading, then transfer voltmeter to alternator frame and battery negative terminal and note this reading. If either reading exceeds 0.5 volt, there is a high resistance is circuit which must be traced and corrected.

3) If a high resistance is not found, but alternator output is low, remove and examine alternator brush assembly. Retest, and if low output remains, replace or overhaul alternator.

4) If alternator output is satisfactory, disconnect battery terminal, remove ammeter, and connect alternator output cable to its terminal. Connect battery negative terminal. Switch on ignition and check for proper battery voltage at cable ends by connecting a voltmeter across them. A suitable battery voltage reading indicates field isolating relay circuit and wiring is satisfactory. A low or zero reading indicates a fault in field isolating relay or isolating contacts in ignition switch. *See further testing in Overhaul procedure.*

OVERHAUL

DISASSEMBLY

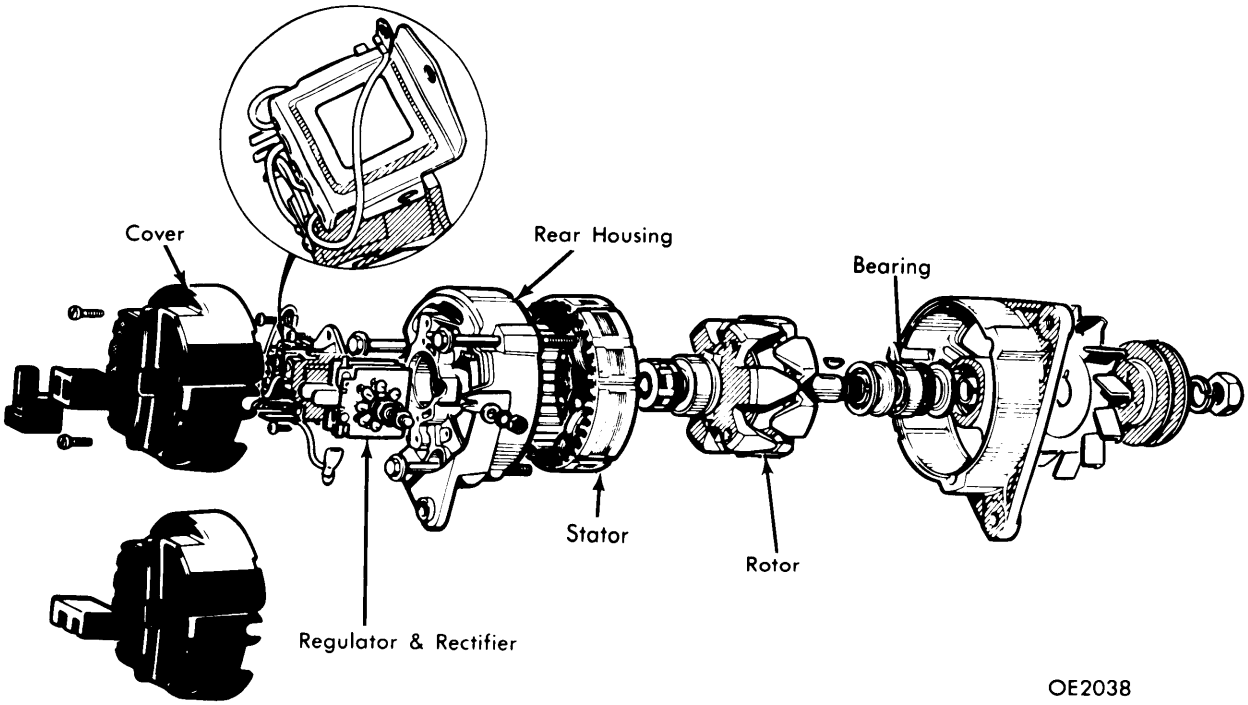
"AC" & "ACR" – 1) Except for regulator removal, both alternators can be disassembled as follows: Unscrew cover retaining screws and remove cover. Unsolder three stator connections from rectifier pack, noting positions. Remove two brush molding securing screws. Loosen rectifier pack retaining nuts and withdraw brush molding and rectifier pack.

2) Remove three through bolts. Remove bearing, by slipping a tube over slip ring molding until it is even with outer track of slip ring end bearing, then drive bearing from its housing. Remove shaft nut, pulley, and shaft key. Press rotor from drive end bracket. Remove circlip retaining the drive end bearing and remove bearing. Unsolder field connections from slip ring assembly and withdraw assembly from rotor shaft. Remove slip ring end bearing.

Regulator Removal "ACR" – Disconnect colored tag lead connectors from brush box and detach ground lead after removing lower mounting screw or brush box retaining screw. Remove other retaining screw and withdraw regulator.

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.



LUCAS INTERGRAL REGULATOR ALTERNATOR ("ACR" TYPE)

LUCAS (Cont.)

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

Diodes – If a defective diode is detected, the rectifier pack must be replaced as a unit.

Brushes – If length of brush protruding beyond brush box molding is .2" (5 mm) or less, the brush must be replaced. Check brush spring pressure, using a push type spring gauge. Gauge should registor 7-10 oz. (when brush is pushed back flush with housing). If gauge is outside limits, renew 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.