TECHNICAL SERVICE BULLETIN

Date July, 1980

ADMINISTRATION

ITEM 80A/17
SUBJECT: ALTERNATOR DAMAGE - FAULT DIAGNOSIS
MODELS: Jaguar (w/ Lucas Alternators), TR7, TR8, MGB, Midget

A number of alternators returned under warranty have been checked by the suppliers and found to have been damaged through misuse. The following procedures will ensure accurate fault diagnosis.

1. Rectifier Pack Damage - This may be caused by a large current being allowed to pass through the diodes. Such a condition occurs when:-

(a) The vehicle battery is installed with the connections reversed.
(b) An attempt is made to jump start a vehicle, or boost-charge a battery in a vehicle with the battery charger leads or battery cables reversed.
(c) A battery that has been reverse-charged is installed in a vehicle.
(d) When the vehicle harness is improperly connected to the alternator.

Such damage is usually characterized by at least one of the following symptoms; beads of solder emerging from one or more of the individual diodes and travelling up the stem; a burning or charring of a diode; melting and burning of the "petals" which connect to the diode stems and one or more diode stems lifting from the rectifier plates and overheating of the main output lead.

2. Regulator Damage - The regulator mounted inside a Lucas ACR alternator is manufactured with electronic devices which operate at normal battery voltage. The regulator can be damaged if subjected to high voltage which may be generated on the vehicle in the following ways:-

(a) Loose, corroded or intermittent connections in the charging system.
(b) Operation of the vehicle with the battery disconnected.
(c) Battery or alternator becoming disconnected while engine is running.
(d) Improper procedures when testing the charging system.

Damage resulting from the above is usually confined to the internal components of the regulator itself. Symptoms include alternator supplying maximum output continuously or no output at all.

3. Surge Protection Diode - The surge protection diode which is connected between the 'IND' terminal and ground will help protect the regulator from occasional high voltage conditions, but only strict avoidance of the above conditions will ensure trouble-free regulator and alternator operation.

Under normal charging voltage levels the surge protection diode is open circuit. However, if for any reason a high voltage surge occurs, the diode will provide an alternative path to ground for this damaging voltage instead of allowing it to pass through the regulator components and alternator diodes causing irreparable damage.

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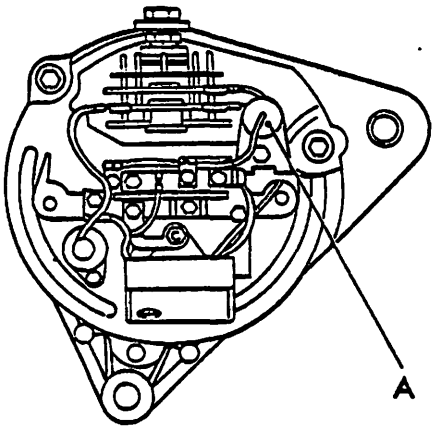

If the alternator output falls to zero, the fault may be caused by a short circuit of the surge protection diode (A); to check this, proceed as follows:-(NOTE 18 ACR ILLUSTRATED)

(a) Check that all circuit connections are clean and tight.
(b) Disconnect surge protection device lead.
(c) Run alternator. If the alternator reading is now normal, replace the surge protection device.

If a regulator failure is experienced after a surge protection device is fitted, replace the complete alternator.

4. Bearing Failure - An alternator bearing failure is usually the result of over-tightening the fan belt. Damage can be avoided by following the recommendations for belt tensioning.

5. Brush Gear - Care should be taken when installing pulleys and fans to prevent the rotor shaft being forced towards the brush gear. Damage can result in erractic operation of the alternator and possible regulator damage.

6. Stator and Rotor - Damage to the stator or rotor is usually due to the introduction of foreign objects into the alternator. A severe or prolonged battery reversal will also burn the rotor and stator. An obvious symptom of this damage is a "burning" smell issuing from the alternator.

7. Housing - Housing damage is invariably the result of physical abuse of the alternator which may be caused by:-

(a) Dropping the alternator.
(b) Mounting bolts becoming loose.

TO SUMMARIZE: -
A. ALWAYS ENSURE THAT THE BATTERY IS CONNECTED IN THE CORRECT MANNER.
B. BE VERY CAREFUL WHEN USING JUMP LEADS - CONNECT POSITIVE TO POSITIVE - NEGATIVE TO NEGATIVE.
C. DISCONNECT THE BATTERY BEFORE BOOST CHARGING.
D. NEVER DISCONNECT THE BATTERY OR ALTERNATOR WHILE THE ENGINE IS RUNNING.
E. ALWAYS DISCONNECT THE ALTERNATOR BEFORE CARRYING OUT ELECTRIC WELDING ON THE VEHICLE
F. ALWAYS FOLLOW THE INSTRUCTIONS GIVEN IN THE RO MANUAL WHEN ADJUSTING THE FAN BELT.

Alternators found to be damaged for any of the afore listed reasons will not be considered acceptable under warranty and will result in claim rejection.

H.C.T.