

**ALTERNATOR FAULT DIAGNOSIS**

Condition	Possible Cause	Correction
<b>Alternator fails to Charge (No output or Low Output)</b>	<ul style="list-style-type: none"> <li>a) Alternator drive belt loose.</li> <li>b) Regulator case not earthed. (When separate regulator fitted).</li> <li>c) Worn brushes and/or slip rings</li> <li>d) Sticking brushes.</li> <li>e) Open field circuit</li> <li>f) Open charging circuit</li> </ul>	<ul style="list-style-type: none"> <li>a) Adjust drive belt to specifications.</li> <li>b) Remake earth connection</li> <li>c) Install new brushes and/or slip rings.</li> <li>d) Clean slip rings and brush holders Install new brushes if necessary.</li> <li>e) Test all the field circuit connections, and correct as required.</li> <li>f) Inspect all connections in charging circuit, and correct as required.</li> </ul>
	<ul style="list-style-type: none"> <li>g) Open circuit in stator windings</li> <li>h) Open rectifiers</li> <li>i) Surge protection diode shorted.</li> </ul>	<ul style="list-style-type: none"> <li>g) Remove alternator and disassemble. Test stator windings. Install new stator if necessary.</li> <li>h) Remove alternator and disassemble. Test the rectifiers. Install new rectifiers if necessary.</li> <li>i) Disconnect and retest alternator.</li> </ul>
<b>Low unsteady charging rate.</b>	<ul style="list-style-type: none"> <li>a) High resistance in body to engine ground lead.</li> <li>b) Alternator drive belt loose</li> <li>c) High resistance at battery terminals.</li> <li>d) High resistance in charging circuit.</li> <li>e) Open stator winding</li> </ul>	<ul style="list-style-type: none"> <li>a) Tighten ground lead connections. Install new ground lead if necessary.</li> <li>b) Adjust alternator drive belt</li> <li>c) Clean and tighten battery terminals.</li> <li>d) Test charging circuit resistance. Correct as required.</li> <li>e) Remove and disassemble alternator. Test stator windings. Install new stator if necessary.</li> </ul>
<b>Low output and a low battery</b>	<ul style="list-style-type: none"> <li>a) High resistance in charging circuit.</li> <li>b) Shorted rectifier. Open rectifier.</li> <li>c) Grounded stator windings.</li> <li>d) Faulty voltage regulator.</li> </ul>	<ul style="list-style-type: none"> <li>a) Test charging circuit resistance and correct as required.</li> <li>b) Perform current output test. Remove and disassemble the alternator. Test the rectifiers and install new rectifiers as required.</li> <li>c) Remove and disassemble alternator. Test stator windings. Install new stator if necessary.</li> <li>d) Test voltage regulator.</li> </ul>



Condition	Possible Cause	Correction
Excessive charging rate to a fully charged battery	a) Faulty regulator	a) Test voltage regulator. Replace as necessary.
Noisy Alternator	a) Alternator mounting loose	a) Properly install and tighten alternator mounting
	b) Worn or frayed drive belt	b) Install a new drive belt and adjust to specifications.
	c) Worn bearings	c) Remove and disassemble alternator. Install new bearings as required.
	d) Rotor or rotor fan damaged	d) Remove and disassemble alternator. Install new rotor or fan.
	e) Open or shorted rectifier	e) Remove and disassemble alternator. Test rectifiers. Install new rectifiers as required.
	f) Open or shorted winding in stator.	f) Remove and disassemble alternator. Test stator windings. Install new stator if necessary.

### SPECIAL PRECAUTIONS

Alternators and associated regulators employ various solid state devices such as diodes and transistors. Owing to their fragile nature, particularly under test and repair conditions, special precautions must be observed to avoid inadvertent damage to these devices.

1. Never exceed the recommended test voltage.
2. Do not subject them to physical knocks or pressures.
3. As these devices are extremely temperature sensitive, any soldering operation should be completed in the minimum time possible.

The use of an electric gun is advisable, but failing that, use only a low heat electric iron of 25 watt maximum rating. Whenever possible during a soldering operation, grip the wire lead between the diode body and the soldering bit with a pair of long nosed pliers. The pliers will act as a heat 'shunt', diverting the heat away from the diode body into the plier jaws.

Always use a resin core solder never flux or spirit of salts.

4. Never alter the mounting of a remote regulator from the position originally fitted. Close proximity to a heat source such as the exhaust manifold or radiator will cause premature failure of the transistors.
5. Never run the engine with the battery disconnected.
6. Always disconnect battery leads prior to using a battery charger.
7. Always disconnect battery and alternator leads before doing any electric arc welding anywhere on the vehicle.
8. Always observe polarity when connecting battery, alternator and regulator. Failure to observe this precaution will destroy the solid state devices.