Modern Automotive Technology
Chapter 34
Charging System Diagnosis, Testing, and Repair
Learning Objectives

- Diagnose charging system troubles.
- Inspect a charging system.
- Test charging system output with a voltmeter or a load tester.
- Remove, test, repair, and replace an alternator.
- Adjust an alternator belt.
- Remove and replace a voltage regulator.
- Describe safety practices to follow when testing or repairing a charging system.
Chapter 34

1. WORN BRUSHES cause reduced spring tension and brush pressure on the slip rings.

2. WORN or DRY ALTERNATOR BEARINGS produces a rumbling or grinding noise during operation.
A stiff wire may be needed to retain spring-loaded brushes in position for assembly.
Do not clean electrical parts in solvent
3. A SHORTED DIODE will have a low resistance reading in both directions, and must be replaced.

4. To check for a BAD ALTENATOR STATOR, connect an ohmmeter to the stator leads and test for open or grounded windings.
Diode Test Connections
Each “lug” connector is attached to an individual diode.
Stator

Creates the magnate field
5. The LOAD TEST shows if the charging system is providing enough current for all electrical units, with enough current left over to recharge the battery.

6. To perform a GROUND-CURCUIT RESISTANCE TEST, place a voltmeter across the negative battery terminal and alternator housing.
Open Circuit Test

Measures resistance between slip rings
Ohmmeter should read low resistance (see manufacturer’s specifications)
Load Voltage

If reading is not at least 0.5 volts above base voltage, a system fault exists.
Ground Circuit Resistance Test

Ground-circuit resistance test
7. To perform an INSULATED-CURCUIT RESISTANCE TEST, place a voltmeter across the alternator output terminal and positive battery terminal.

8. The CURCUIT RESISTANCE TEST measures resistance in insulated and ground circuits of charging system.
Insulated Circuit
Resistance Test

Insulated-circuit resistance test
9. To perform a REGULATOR BYPASS TEST, connect full battery voltage to alternator field, leaving regulator out of circuit.

10. A CHARGING SYSTEM OUTPUT TEST measures current and voltage output under a load.
Regulator Bypass Test

Shorting tab should make this alternator produce maximum output
Electronic Voltage Regulator

Contains no moving (this is an “electronic” part) or internal serviceable parts
Charging System Output

Connect voltmeter leads across battery, inductive amps pickup on battery cable.
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