

NO.		355
MODEL Engines with 9, 12, 15, 20, or 25 Amp Charging Systems		
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9/12/15/20/25 Amp Charging System Diagnosis

This bulletin communicates a change in the diagnosis of our 9, 12, 15, 20, or 25 Amp charging systems. The following instructions supersede all other published diagnostic procedures for the listed charging systems.

This latest procedure will reduce incorrect diagnosis and replacement of charging system components under warranty, that aren't failed/bad.

9/12/15/20/25 Amp Battery Charging Systems

NOTE: Always zero digital volt-ohm meter (DVOM) on each scale before testing to ensure accurate readings. Voltage test should be made with engine running at specific test condition noted. Battery should be checked for state of charge (non-operating voltage 12.5 VDC or lower, battery should be charged or replaced).

When problems occur in keeping a battery fully charged or a battery charges at a high rate, battery or charging system may be cause of fault. Before performing any testing, battery must be fully charged.

To test charging system:

1. Visually inspect system components and wiring. Look for damaged or loose wire connections, including battery cables.
2. Set DVOM to DC volts, place red (positive) lead of tester on rectifier-regulator body and black (negative) lead to battery negative (-) terminal. Run engine and observe volt reading on meter. If voltage is 0.5 VDC or less, continue with testing. If voltage is higher than 0.5 VDC, inspect and repair wiring/connections as needed (insufficient ground).
3. Perform these output tests for charging system using DVOM set to DC volts.
 - a. With engine off and key switch in OFF position, measure voltage at battery. If less than 12.4 VDC, recharge battery and retest. If 12.5 VDC continue with tests.
 - b. Run engine at high speed no load (greater than 3000 RPM). After running 1 minute, measure voltage at battery.
 - i. If voltage increases to between 13-15 VDC, system is working correctly.
 - ii. If voltage increases to 15.5 VDC or higher, system is overcharging. Replace rectifier-regulator.
 - iii. If voltage stays at 12.5 VDC or decreases, charging system is NOT operating, proceed to step 4.

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4. With engine off, unplug rectifier-regulator connector and inspect connector terminals within connector body and rectifier-regulator terminals for corrosion/arching/damage. Repair/replace as needed. If OK, proceed to next test.
5. Set DVOM to AC volts, place test leads to each white stator wire. Run engine at 1200 RPM or greater and monitor voltage.

Condition	Conclusion
Voltage is 13 volts AC or more.	Stator is OK.
Voltage is less than 13 volts AC.	Stator is faulty. Continue with steps 6 and 7).

6. With engine off and stator unplugged from rectifier-regulator, check for resistance/continuity between across stator leads (white wires).

Condition	Conclusion
Resistance is 0.1/0.2 ohms.	Stator coil is OK.
Resistance is 0 ohms.	Stator is shorted; replace.
Resistance is infinity ohms/no continuity.	Stator is open; replace.

7. With engine off and stator unplugged from rectifier-regulator, check for resistance/continuity from stator leads (white wires) to ground.

Condition	Conclusion
Resistance is infinity ohms (no continuity).	Stator is OK (not shorted to ground).
Resistance (or continuity) measured.	Stator leads are shorted to ground; replace.

8. If stator tests good (steps 4-7), but system was identified in step 3 as not working, failure is likely with rectifier-regulator. Replace rectifier-regulator, retest system to confirm repairs (step 3).

This new testing procedure will be updated in the appropriate model service manuals. Once all manuals have been updated, we will then discontinue this bulletin.