

WARRANTY INFORMATION

SERVICE INFORMATION

## Testing Alternators

### Models

All MerCruiser engines.

### No Trouble Found

We receive alternators returned for warranty that function properly when tested. The first test that should be done on an engine with a charging problem is to check the condition and tightness of the alternator drive belt. Next, check the condition of the cranking battery. If the fault is not with the belt or battery, test the alternator as outlined in this bulletin.

**NOTE:** Each time an engine is started, the alternator has to reach about 1000 engine rpm before it will put out charging current.

### Testing the Charging System

Perform this test before removing the alternator from the engine.

1. An analog or digital voltmeter can be used, but the digital meter is best.

**NOTE:** Be sure to '0' meter before making the test and that the boat's battery is fully charged.

2. Connect voltmeter positive (+) lead directly on the battery positive (+) post, not the battery cable ring terminal
3. Connect voltmeter negative (-) lead directly on the battery negative (-) post, not the battery cable ring terminal.
4. Start the engine, increase rpm to 1300, and observe voltmeter reading.
  - a. Most systems will give a reading of 13.8 to 14.2 volts. Some gel cell batteries have a lower voltage setting of 13.5 to 13.8v.
5. If the voltmeter is within range, leave the engine running, and switch voltmeter to the AC volt position and observe voltmeter reading.
  - a. A reading of 0.25 AC volt or less while charging indicates the diodes are good.
  - b. A reading of more than 0.25 AC volt indicates that the alternator has defective diodes.

6. If voltmeter reading stays above 15v all the time, the alternator is over charging the battery and alternator needs to be repaired.
7. If the voltmeter reading is below 13.5v, the alternator is not charging properly.
  - a. Check for battery voltage at the RED/PUR wire at the alternator.
  - b. Check for battery voltage at the PUR wire at the alternator with the key switch 'ON'.

**NOTE:** Make sure engine wiring harness leads and the alternator leads are not reversed.

- c. If both wires have battery voltage, go to step 8.
8. If voltmeter reading is below 13.5v, connect voltmeter (+) lead to output terminal on the alternator and the voltmeter (-) lead to the ground terminal on the alternator.
9. Repeat step 4. If reading now is within range, resistance in the charging circuit is the problem.
10. Test for resistance on the alternator output circuit first. Loose or corroded connections in the alternator output circuit can cause charging system problems.
  - a. Discharge the battery by grounding the ignition coil high tension wire and crank the engines over for 10-15 seconds.
  - b. Turn off all accessories.
  - c. Connect voltmeter (+) lead directly to the alternator output terminal, not the ORN wire ring terminal. Connect voltmeter (-) lead directly to the battery (+) post.
  - d. Start engine, increase rpm to 1300, and observe voltmeter reading.

The maximum allowed is 0.5v.

- e. To find the point where the resistance is highest, leave the voltmeter (-) lead on the battery post and move the voltmeter (+) lead to the alternator ORN wire ring terminal.
  - f. Next, move voltmeter (+) lead to the ORN wire itself that is inside the crimped ring terminal.
  - g. Test each alternator output wire connection in this manner all the way back to the battery (+) post. If a battery switch is used, check between the battery cable ring terminal and the switch's terminal.
11. Test for resistance on the alternator ground next.
  - a. Repeat 'a' and 'b' in step 10.
  - b. Connect voltmeter (-) lead to ground terminal on the alternator, not the BLK wire ring terminal. Connect voltmeter (+) lead directly to the battery (-) post.

**NOTE:** If alternator does not have a BLK wire connected to it, it is grounded internally. Connect voltmeter (-) lead to unpainted surface of the alternator.

- c. Start engine, increase rpm to 1300, and observe voltmeter reading.

The maximum allowed is 0.5v.

- d. To find the point where the resistance is highest, leave the voltmeter (+) lead on the battery post and move the voltmeter (-) lead to the alternator BLK wire ring terminal.

**NOTE:** *If alternator does not have a BLK wire connected to it, go to 'f'.*

- e. Then move voltmeter (-) lead to the BLK wire itself that is inside the crimped ring terminal.
- f. Next, move voltmeter (-) lead to the ground stud where the battery (-) cable is connected.
- g. Move the voltmeter (-) lead to the battery (-) cable ring terminal, that is on the ground stud.
- h. Move voltmeter (-) lead to the battery cable itself that is inside the crimped battery cable ring terminal.
- i. Test each battery cable connection in this manner all the way back to the battery post.

## Replacing Alternators

When an alternator is replaced, retest the voltage at the battery posts to ensure that the alternator is charging the battery.

If a complete alternator is needed for warranty replacement, it must be ordered from Mercury Parts. The use of any other company's alternator as a warranty replacement is not allowed.

## Warranty

Any alternator returned for warranty that has a "no trouble found condition", will have the warranty claim rejected and the part returned to the dealer.