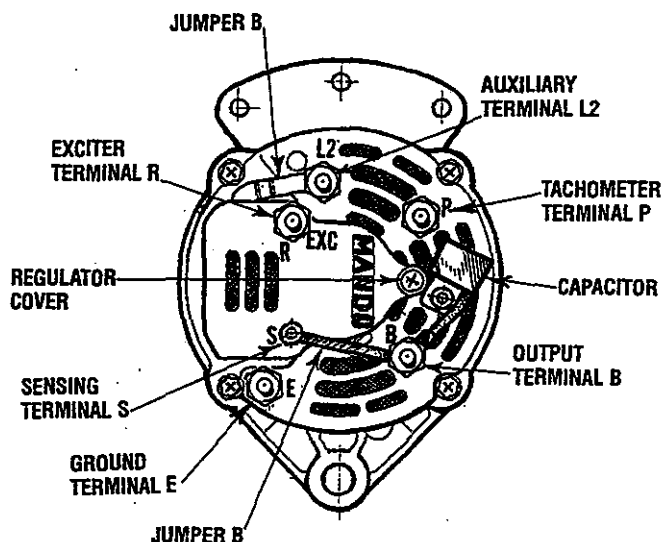
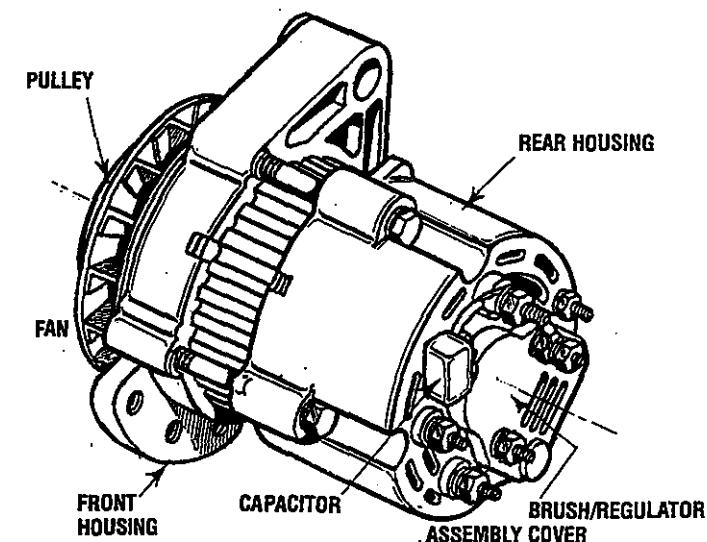


# WESTERBEKE 51A MANDO ALTERNATOR

## DISASSEMBLY AND TESTING



### TESTING THE OUTPUT CIRCUIT

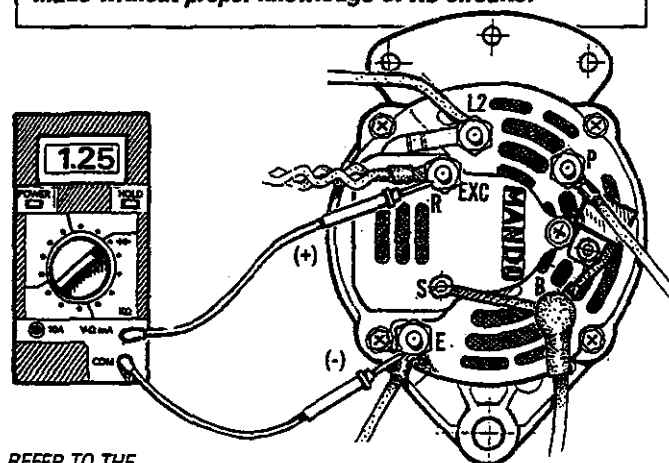
1. Connect the positive voltmeter lead to the output terminal B and connect the negative lead to the ground terminal E on the alternator.
2. Wiggle the engine wiring harness while observing the voltmeter. The meter should indicate the approximate battery voltage, and should not vary. If no reading is obtained, or if the reading varies, check the alternator output circuit for loose or dirty connections or damaged wiring.

**NOTE:** Prior to any alternator testing, inspect the entire alternator system wiring for defects. Check all connections for tightness and cleanliness, particularly battery cable clamps and battery terminals. Inspect the alternator drive belt for excessive wear and replace if necessary. Also adjust for proper belt tension.

**⚠ WARNING:** A failed alternator can become very hot. Do not touch until the alternator has cooled down.

**⚠ WARNING** Before starting the engine, make certain that everyone is clear of moving parts! Keep away from sheaves and belts during test procedures.

**⚠ WARNING** Multimeters and DC Circuits  
DC and AC circuits are often mixed together in marine applications. Always disconnect shore power cords, isolate DC and AC converters and shut down generators before performing DC testing. No AC tests should be made without proper knowledge of AC circuits.



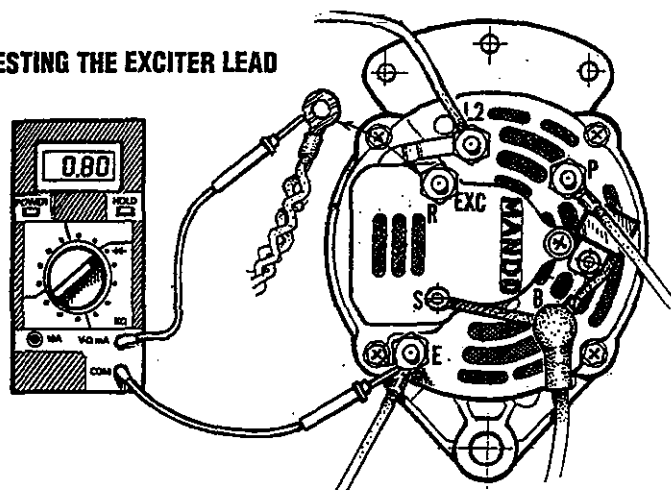
REFER TO THE  
WIRING DIAGRAMS FOR THE ABOVE  
WIRING HARNESS CONNECTIONS

### TESTING THE EXCITATION CIRCUIT

1. Connect the positive (+) voltmeter lead to the excitation terminal R on the alternator and the negative (-) lead to the ground terminal E on the alternator.
2. Turn the ignition switch to the on position and note the voltmeter reading. The reading should be 1.3 to 2.5 volts (see illustration).
3. If the reading is between .75 and 1.1 volts, the rotor field circuit probably is shorted or grounded. Disassemble the alternator and test the rotor as described under **CLEAN AND TEST ALTERNATOR COMPONENTS** in this section.
4. If the reading is between 6.0 and 7.0 volts, the rotor field circuit probably is open. Remove the regulator and inspect it for worn brushes or dirty slip rings. Replace the brushes if they are less than 1/4in. (6 mm) long. If the brushes and slip rings are in good condition, disassemble the alternator and test the rotor, as outlined under **CLEAN AND TEST ALTERNATOR COMPONENTS** in this section.

# MANDO ALTERNATOR SERVICE

## TESTING THE EXCITER LEAD



5. If no reading is obtained, an open exists in the alternator-excitation lead or in the excitation circuit of the regulator. Disconnect the lead from exc terminal R. Connect the positive voltmeter lead to the excitation lead and the negative voltmeter lead to ground terminal E. If the voltmeter now indicates an approximate battery voltage, the voltage regulator is defective and must be replaced. If no voltage is indicated, check the excitation circuit for loose or dirty connections or damaged wiring.

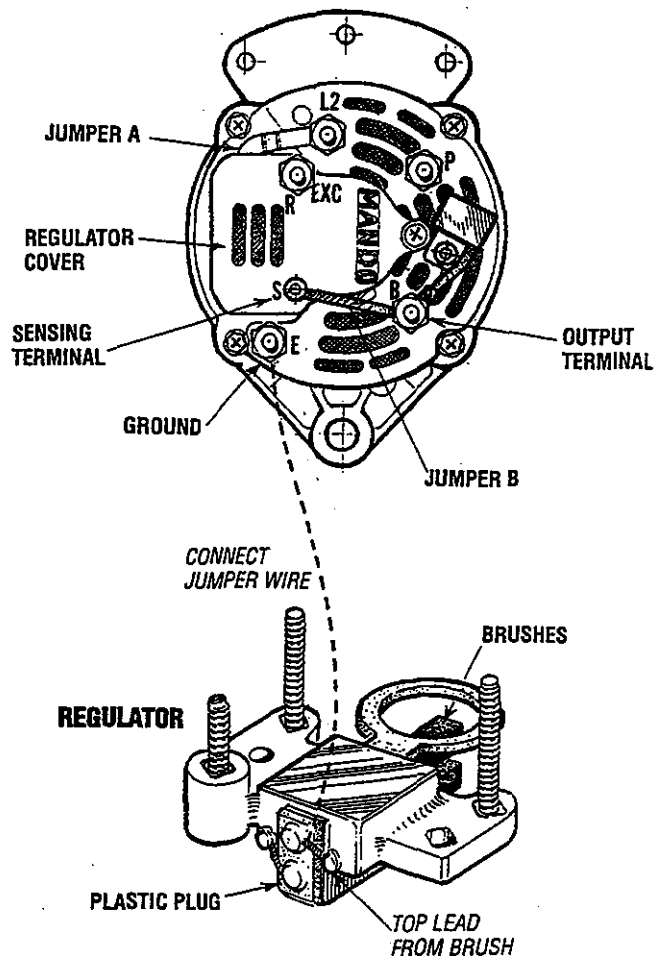
## TEST VOLTAGE REGULATOR

Perform this test to determine if the voltage regulator is operating correctly, using a 0 – 20 volt DC voltmeter.

**NOTE:** The battery must be fully charged to obtain a proper voltage reading in this test. If necessary, charge the battery with a battery charger or allow the engine to run a sufficient length of time to fully charge the battery before taking a reading.

1. Connect the positive (+) voltmeter lead to the positive battery terminal and the negative (-) voltmeter lead to the negative terminal.
2. Start the engine and run it at fast idle until the engine reaches its normal operating temperature. Adjust the engine speed to 1500 – 2000 rpm and observe the voltmeter for the highest reading. The reading should be between 13.7 and 14.7 volts.
3. If the reading is high, check for a loose or dirty alternator ground lead connection. If the connection is good, the voltage regulator is faulty and must be replaced. Be sure to disconnect the battery cables before attempting to remove the alternator.
4. If the reading is low:
  - a. Stop the engine and remove the alternator wiring connections.
  - b. Remove the Phillips cover screw from the regulator cover (see illustration).
  - c. Remove the nut from the output terminal and the nut from the sensing terminal, and remove Jumper (A).
  - d. Remove another nut from the sensing terminal, and the nut from the excitation terminal.

- e. Remove the regulator cover.
- f. Temporarily re-install Jumper (A) and all associated nuts. Leave Jumper (B) installed.
- g. Remove the plastic plug from the side of the regulator.
- h. Connect a jumper between the top brush lead and the ground.



- i. Repeat steps 1 and 2.

**NOTE:** Do not let the voltage exceed 16 volts.

- j. If a voltmeter reading of 14.5 volts or above is now obtained, the voltage regulator is faulty and must be replaced. If the voltmeter reading is below 14.5 volts, inspect the brushes and slip rings for wear, dirt or damage. If the brushes and slip rings are good, the alternator is fault internally. Disassemble the alternator and test the components, as outlined in this section.