these instructions. Never connect the wire from the terminal marked "BAT" to an open circuit.

When connecting a charger or another battery, connect the positive terminals to the positive terminal of the battery. Then connect the negative terminal to a clean metal part of the engine. Disconnect the charger or other battery in the reverse order. Problems in the charging circuit are indicated by one or more of the following:

a. The starter motor turns slowly. The battery voltage is low because of low alternator output or a bad battery.

b. The specific gravity readings are low. Battery is not fully charged or is damaged.

c. The battery uses more than 30 ml (one ounce) of water per cell per month. The alternator output is too high.

The two problems of the charging circuit are low output and high output. Low output causes a low battery and difficult starting. A high output causes heating of the battery and evaporation of water from the electrolyte. The following two checks will find out if the alternator, regulator or wiring has the charging fault. The two checks will also find out if the charging system has a correct output. Do the following two checks before removal, disassembly or replacement of alternator or regulator.

NOTE: Information on alternators manufactured outside the United States is in the SRM (service repair manual) sections for lift trucks that use those alternators.

CHECK THE ALTERNATOR FOR LOW OUTPUT (Type A or Type B) (See FIGURE 9. or FIGURE 10.)

⚠ CAUTION

Do not connect the wire from the "BAT" terminal to the electrical ground.

NOTE: Make sure the wire from the voltmeter makes contact with each terminal on the alternator.

1. Connect a voltmeter between the "BAT" terminal and the electrical ground. Turn the key switch to the "ON" position and check the reading.

2. Connect a voltmeter to the field terminal and the regulator terminal. Follow the procedure in Step 1 and check the readings.

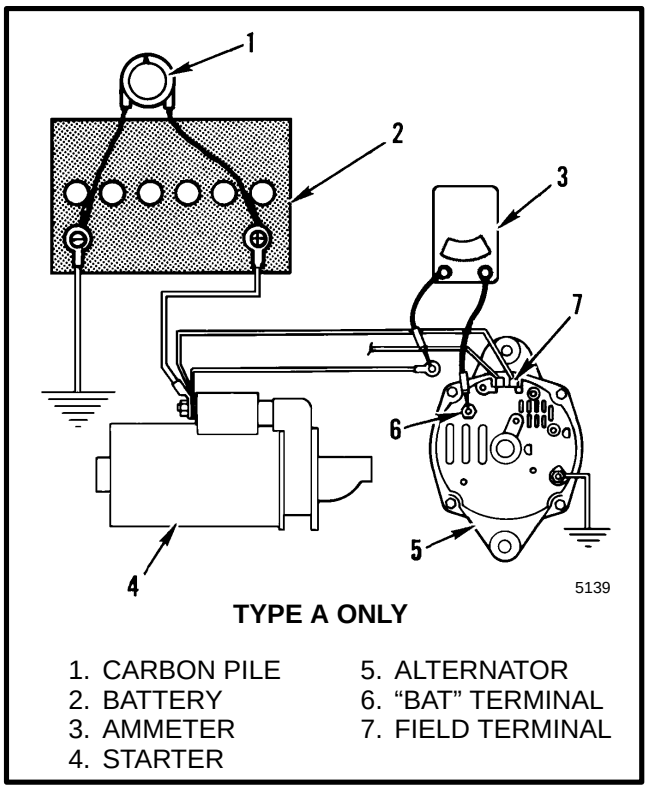


FIGURE 9. CHECK ALTERNATOR OUTPUT

3. If there are no readings on the voltmeter during Steps 1 and 2, check for an open circuit between each terminal and the battery.

4. If there are readings on the voltmeter during Steps 1 and 2, disconnect the cable for the electrical ground on the battery.

5. Make connections to the Type A alternator as shown in FIGURE 9. Make connections to the Type B alternator as shown in FIGURE 10.

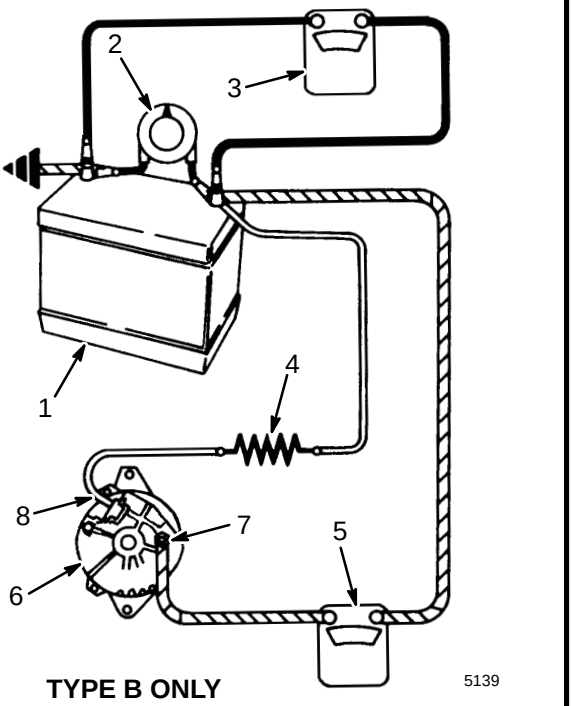
6. Connect the cable for the electrical ground on the battery.

7. Connect a carbon pile across the terminals of the battery.

8. Run the engine at 2000 to 2500 rpm. Adjust the carbon pile until the maximum charging rate is reached.

9. Read the value of the maximum charging rate shown on the alternator housing or in the section **CAPACITIES AND SPECIFICATIONS** for your lift truck. Read the

ammeter. The reading on the ammeter must be within 10% of the maximum value.



TYPE B ONLY

1. BATTERY
2. CARBON PILE
3. VOLTMETER
4. RESISTOR (35 ohm 5 watt to 500 ohm $^{1}/_{2}$ watt)
5. AMMETER
6. ALTERNATOR
7. "BAT" TERMINAL
8. CONNECT TO "L" TERMINAL

FIGURE 10. CHECK ALTERNATOR OUTPUT

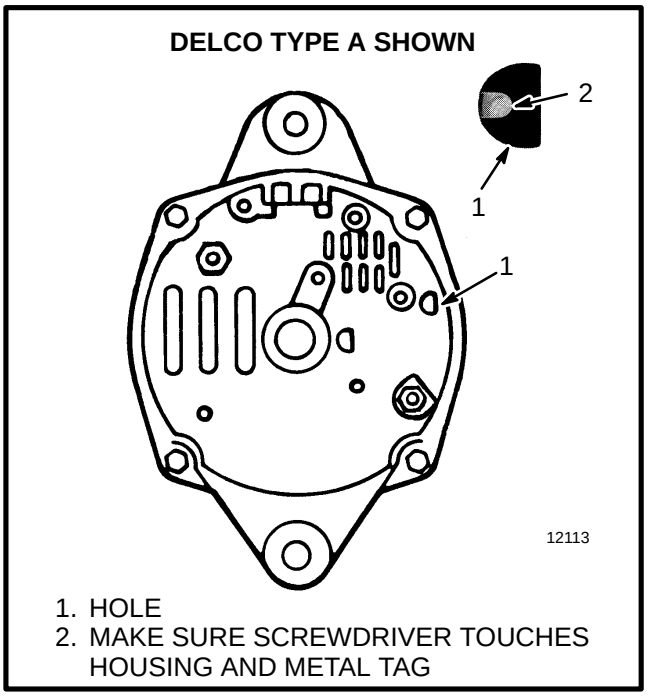
10. If the ammeter reading is within 10%, the alternator is in good condition. Check the starter or wires for problems. Some alternators on larger lift trucks have a voltage adjustment. See FIGURE 12. For alternators with the voltage adjustment do Step a to set the voltage:

a. The voltage setting can be increased by changing the position of the adjustment plug. "LO" is the lowest voltage setting. "2" is medium low and "3" is the medium setting. The voltage setting is highest when "HI" is aligned with the arrow on the alternator. Change the setting as necessary.

11. On Type A Delco alternators, do the following checks:

⚠ CAUTION

Do not push the screwdriver into the hole for more than 25 mm (1 in).



1. HOLE
2. MAKE SURE SCREWDRIVER TOUCHES HOUSING AND METAL TAG

FIGURE 11. ELECTRICAL GROUND ON THE FIELD WINDING

a. If the output shown is not within 10%, put a screwdriver into the hole shown in FIGURE 11.

b. Run the engine at 2000 to 2500 rpm. Adjust the carbon pile until the maximum charging rate is reached.

c. If the output is within 10%, check the field winding. If the field winding is in good condition, replace the voltage regulator.

d. If the output is not within 10%, check the wires to the brushes, diodes, diode bridge, field winding, and stator.

e. Remove the screwdriver, ammeter, and variable resistor.

CHECK THE ALTERNATOR FOR HIGH OUTPUT (Type A or Type B) (See FIGURE 9. or FIGURE 10.)

1. Connect a voltmeter from the regulator terminal to the electrical ground. Check the reading on the voltmeter.

2. If there are no readings, check for an open circuit between the regulator terminal and the battery.

3. If there is a reading, connect a voltmeter between the "BAT" terminal and the electrical ground.