

SECTION 8

ALTERNATOR BENCH TESTS

ALTERNATOR BENCH TEST PROCEDURES

When on-aircraft-testing determines an alternator malfunction. The following bench tests should be performed on the removed alternator. Alternator removal information is included in the Overhaul Procedures (Section 9).

An ohmmeter is the only equipment required for bench check. Ohmmeter should be "zeroed" when each resistance setting is selected. "Zeroing" is accomplished by touching the ohmmeter probes together and adjusting zero knob to align meter on full scale reading.

Rectifier Ground and Positive Diode Test

CAUTION

DO NOT use digital ohmmeter for this test, because it will give false indications.

1. Set the ohmmeter selector switch to resistance scale 10 and zero the meter.
2. Attach one ohmmeter lead to "BAT" terminal and the other to the "STA" terminal. Check for a reading of 60 ohms, it should be obtained in one direction and an infinite (no needle movement) in other direction (reverse leads to check opposite direction).

Test Conclusions

1. A reading of 60 ohms or less in both directions indicates
 - a. A defective positive diode.
 - b. A grounded positive diode plate.
 - c. A grounded alternator "BAT" terminal.
2. Infinite reading (no needle movement) in both directions indicates an open "STA" (Stator) terminal connection.

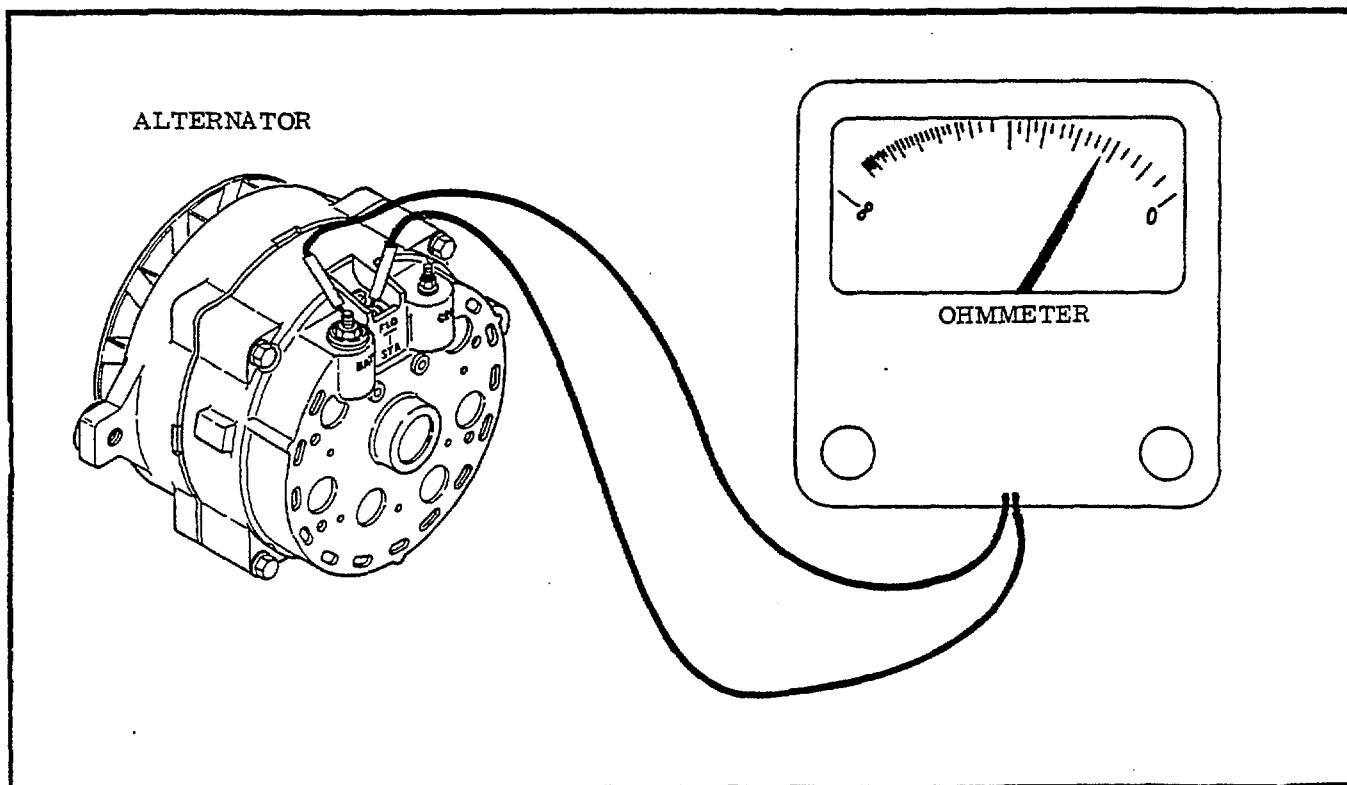


Figure 8-1. Rectifier Ground and Positive Diode Test

Stator Ground and Negative Diode Test

CAUTION

DO NOT use digital ohmmeter for this test, because it will give false indications.

1. Set the ohmmeter selector switch on resistance scale 10 and zero meter.
2. Connect one lead to the "STA" terminal and the other lead to the "GRD" terminal. A reading of approximately 60 ohms should be obtained in one direction and an infinite reading (no needle movement) in the other direction. Reverse leads and check in opposite direction.

Test Conclusions

1. A reading of 60 ohms or less in both direction.
 - a. A defective negative diode.
 - b. A grounded positive diode plate.
 - c. A grounded alternator "BAT" terminal.
 - d. A grounded "STA" terminal.
 - e. A grounded stator winding (laminations grounded or windings grounded to front or rear housing).
2. Infinite readings (no needle movement) indicates an open "STA" (Stator) terminal connection.

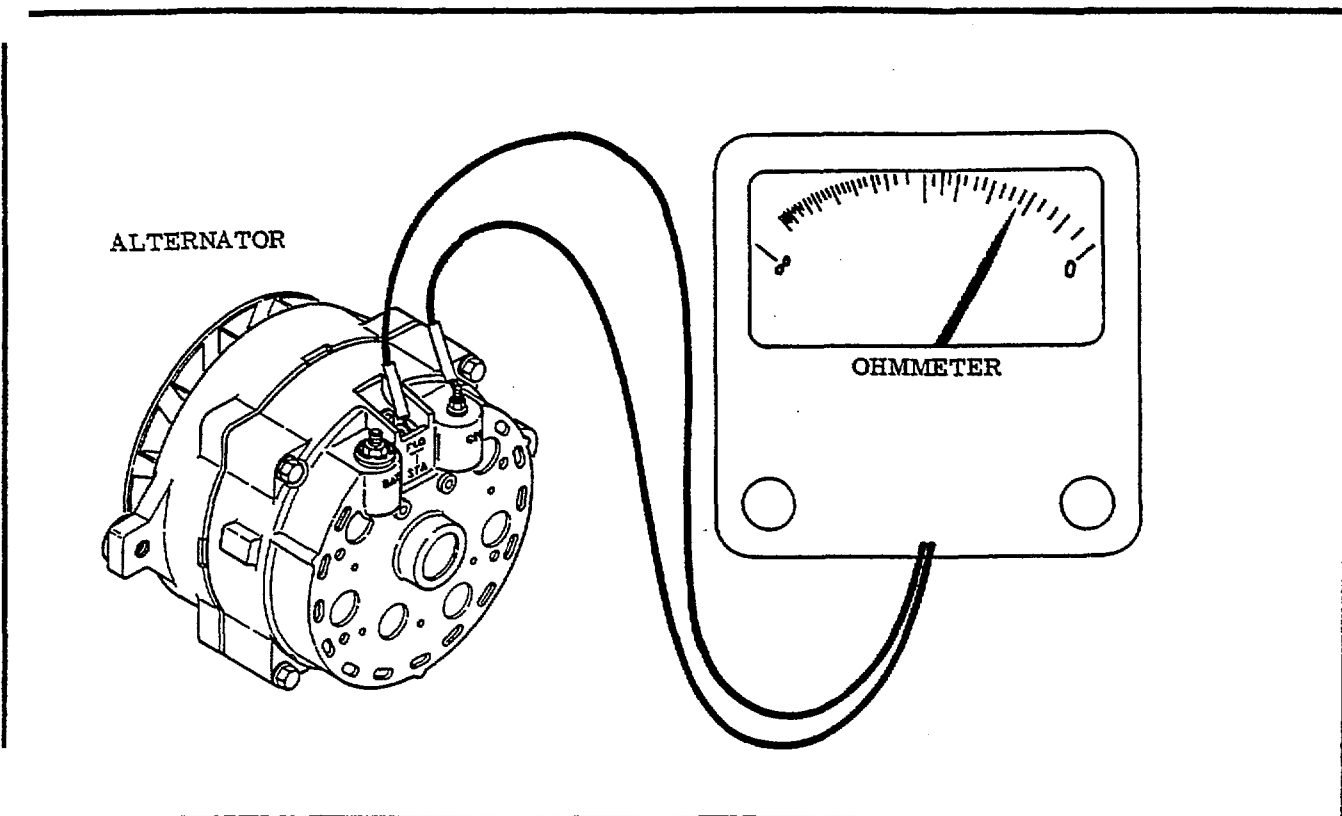


Figure 8-2. Stator Ground and Negative Diode Test

Field Circuit Open or Ground Test

1. Set ohmmeter selector switch to resistance scale 1 and zero meter.
2. Connect one lead to the "FLD" terminal and the other lead to the "GRD" terminal.
3. Spin the pulley and note ohmmeter reading. Meter should read between 10 and 25 ohms and not fluctuate while rotor is turning.

Test Conclusions

1. A reading lower than 4 ohms indicates:
 - a. A grounded positive brush.
 - b. A grounded field terminal.
 - c. A defective rotor.
2. A reading higher than 200 ohms indicates:
 - a. Worn out or hung brushes.
 - b. An open brush lead.
 - c. A defective rotor.

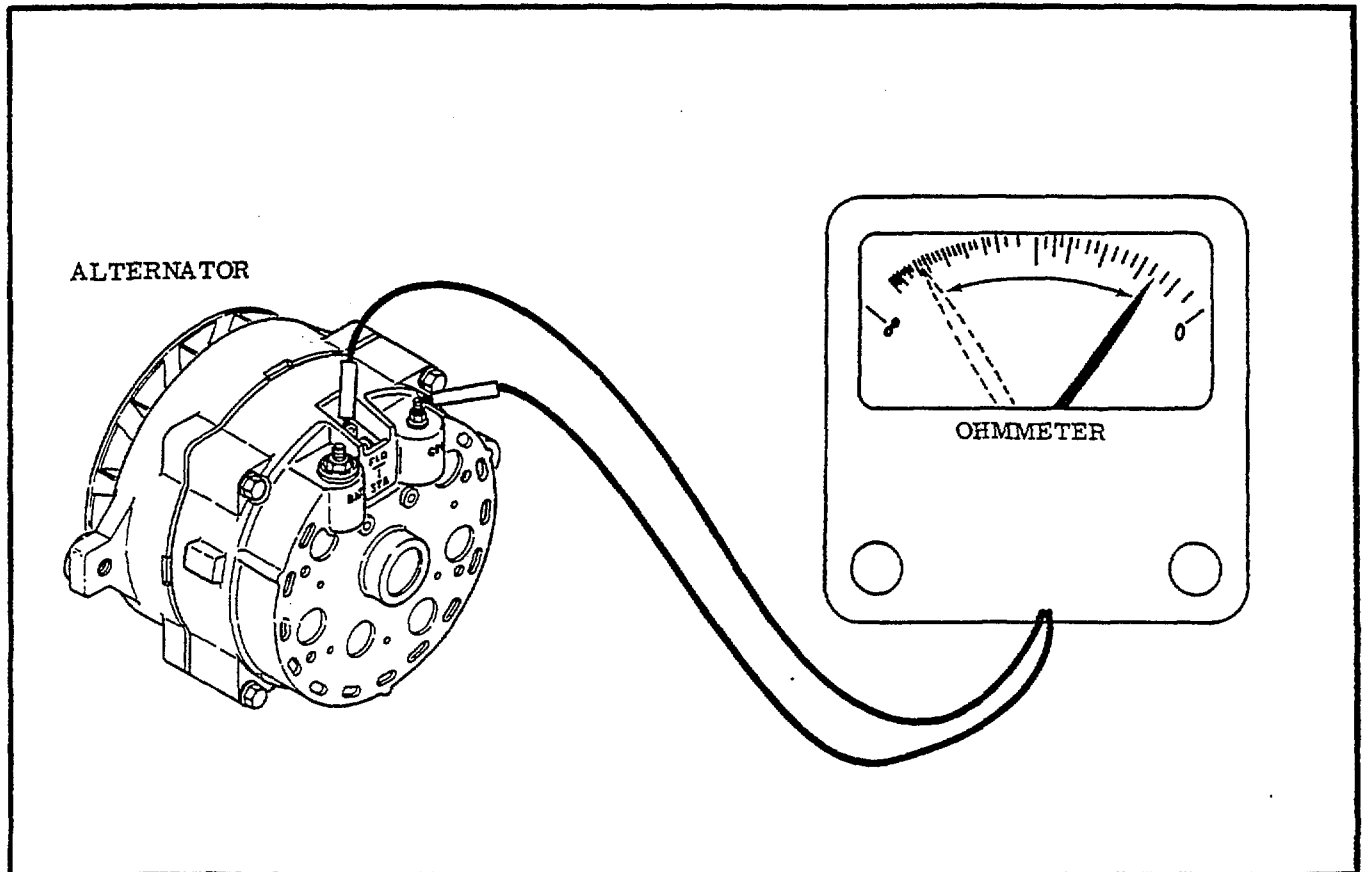


Figure 8-3. Field Circuit Open or Ground Test

Rotor Continuity Test

1. Separate the front housing and rotor assembly from rear housing by removing four housing-thru bolts and separate rear and front housings. The springs and brushes are not retained by brush holder when housings are separated.
2. Set the ohmmeter selector switch on resistance scale 1 and zero meter.
3. Touch one lead of ohmmeter to each segment of the slip ring. The meter should read 11.0 ohms to 14.0 ohms.

Test Conclusions

- a. Readings higher than 14.0 ohms indicate a damaged solder connection at the slip ring or a broken wire.
- b. Readings lower than 11.0 ohms indicate a shorted wire or slip ring.
- c. Replace the rotor if repairs cannot be made.

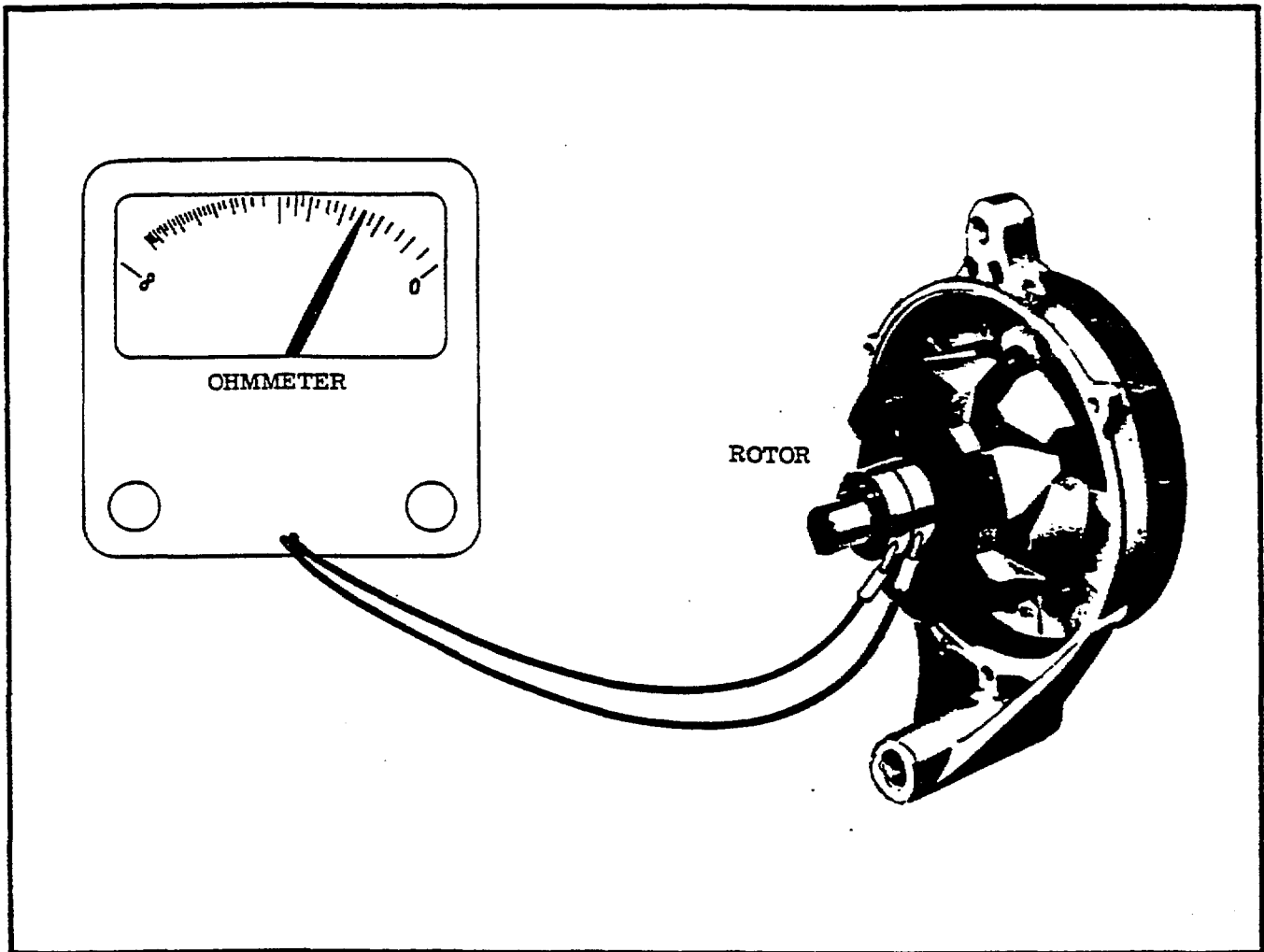


Figure 8-4. Rotor Continuity Test

Rotor Ground Test

1. Set the ohmmeter selector switch on 1000 scale and zero the meter.
2. Touch one lead to the rotor shaft and the other lead to first slip ring then to the other. The ohmmeter should read infinity (no needle movement) in both checks.

Test Conclusions

- a. If the meter shows a reading (needle moves) a short to ground exists. Check the soldered connections at the slip rings to make sure they are secure and not grounding against the rotor shaft, or that excess solder is not grounding the rotor coil.
- b. Replace the rotor if repairs cannot be made.

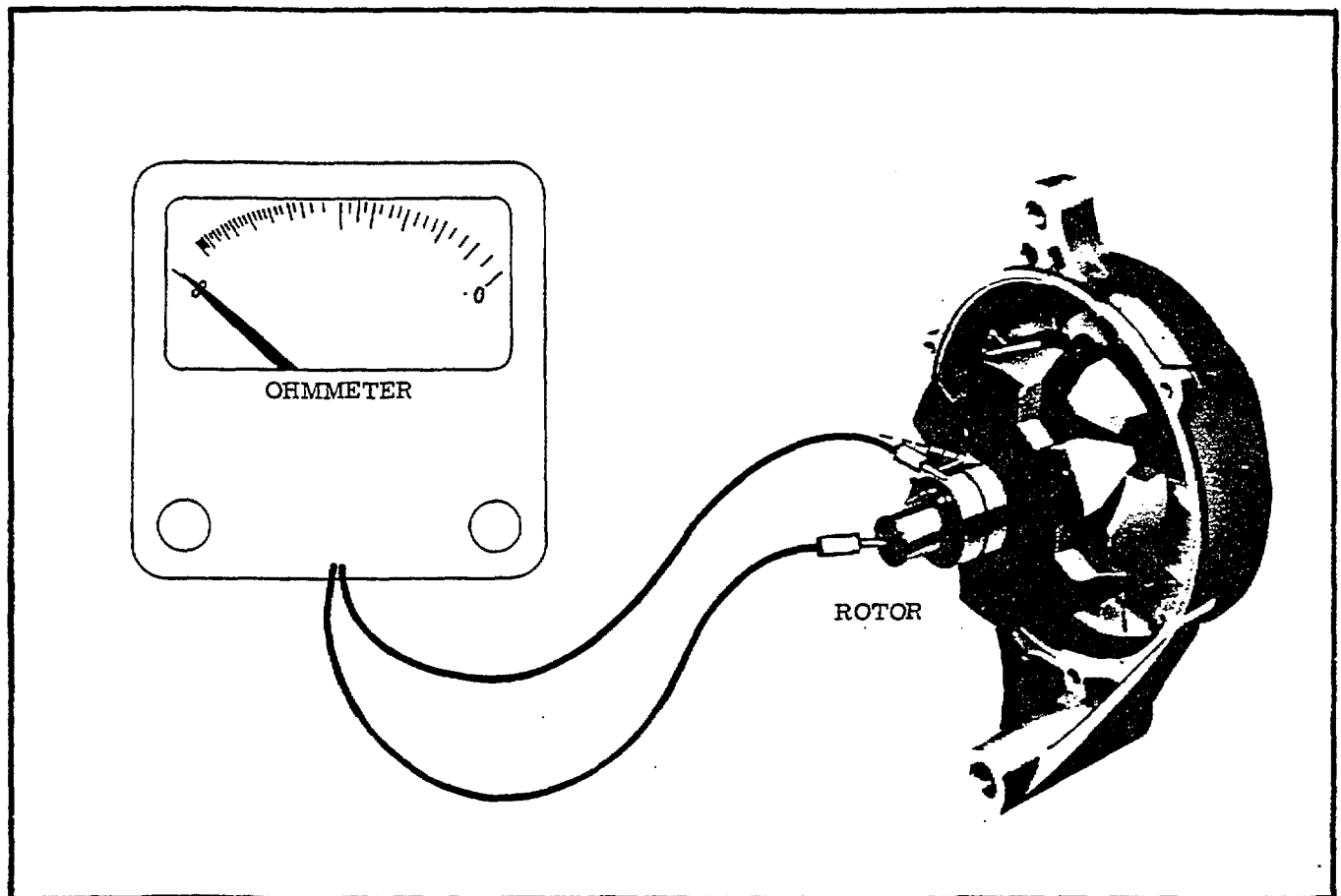


Figure 8-5. Rotor Ground Test

NOTE

If both the "Rotor Continuity Test" and the "Rotor Ground Test" prove satisfactory, and the "Field Circuit Open or Ground Test" showed trouble, the brushes are the cause.

Stator Continuity Test

1. Using a 100 watt soldering iron, disconnect the three stator wires from diode assembly, and remove stator from rear housing.
2. Set the ohmmeter selector switch on resistance scale 1 and zero the meter.
3. Connect ohmmeter leads alternately between all three sets of leads. Meter readings should be equal between any pair of stator leads.

Test Conclusions

If unequal readings are obtained, the stator winding is open. Check wiring junction. If breaks are found repair and recheck. If unequal reading still exist, replace the stator.

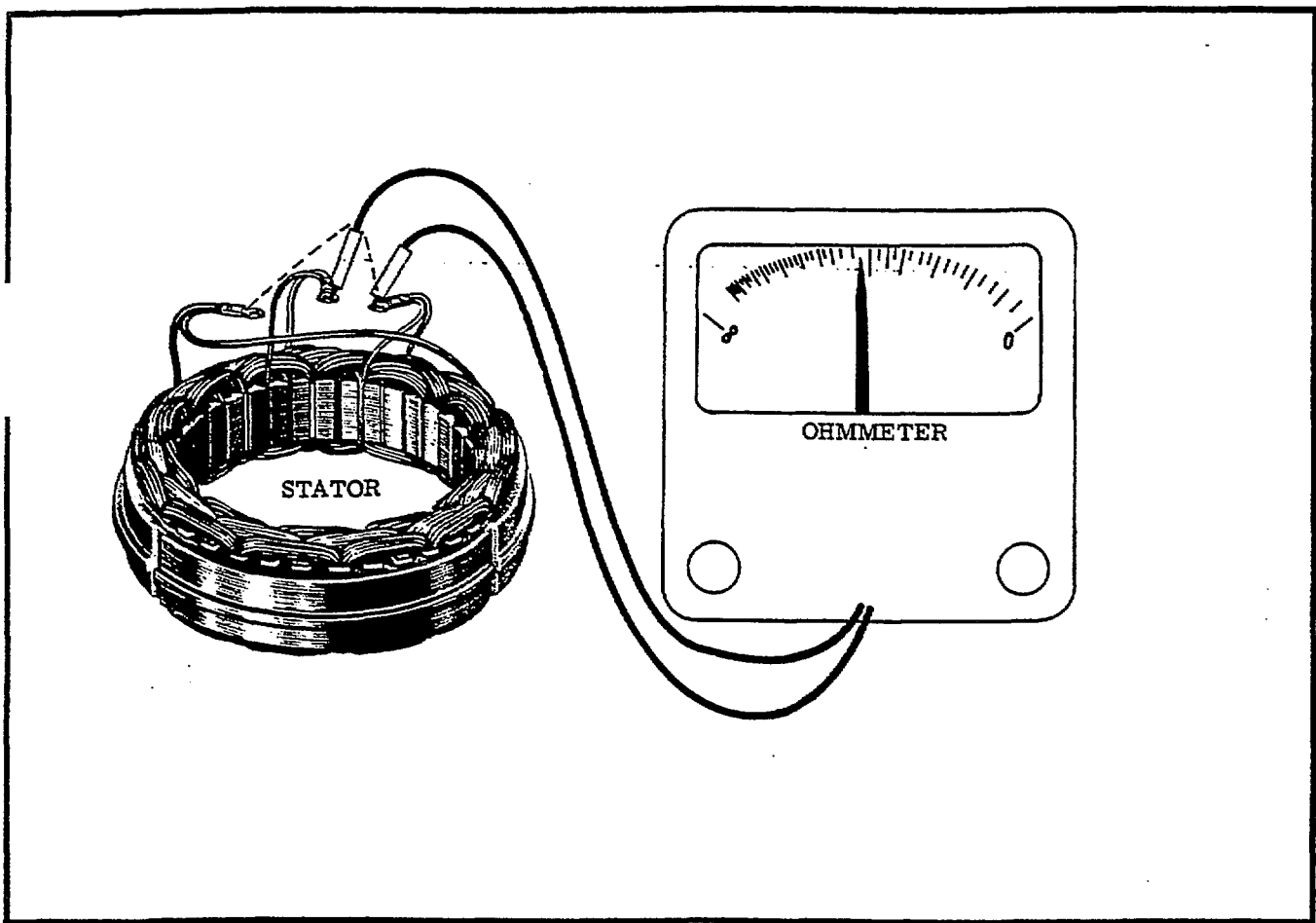


Figure 8-6. Stator Continuity Test

Stator Ground Test

1. Set ohmmeter selector switch on resistance scale 1000 and zero the meter.
2. Connect one meter lead to bare metal portion of stator core and other lead alternately to each of the stator leads. The ohmmeter should read infinity (no needle movement). Be sure lead is making good contact with stator core surface.

Test Conclusion

If meter shows any reading (needle moves) the stator is grounded and must be replaced.

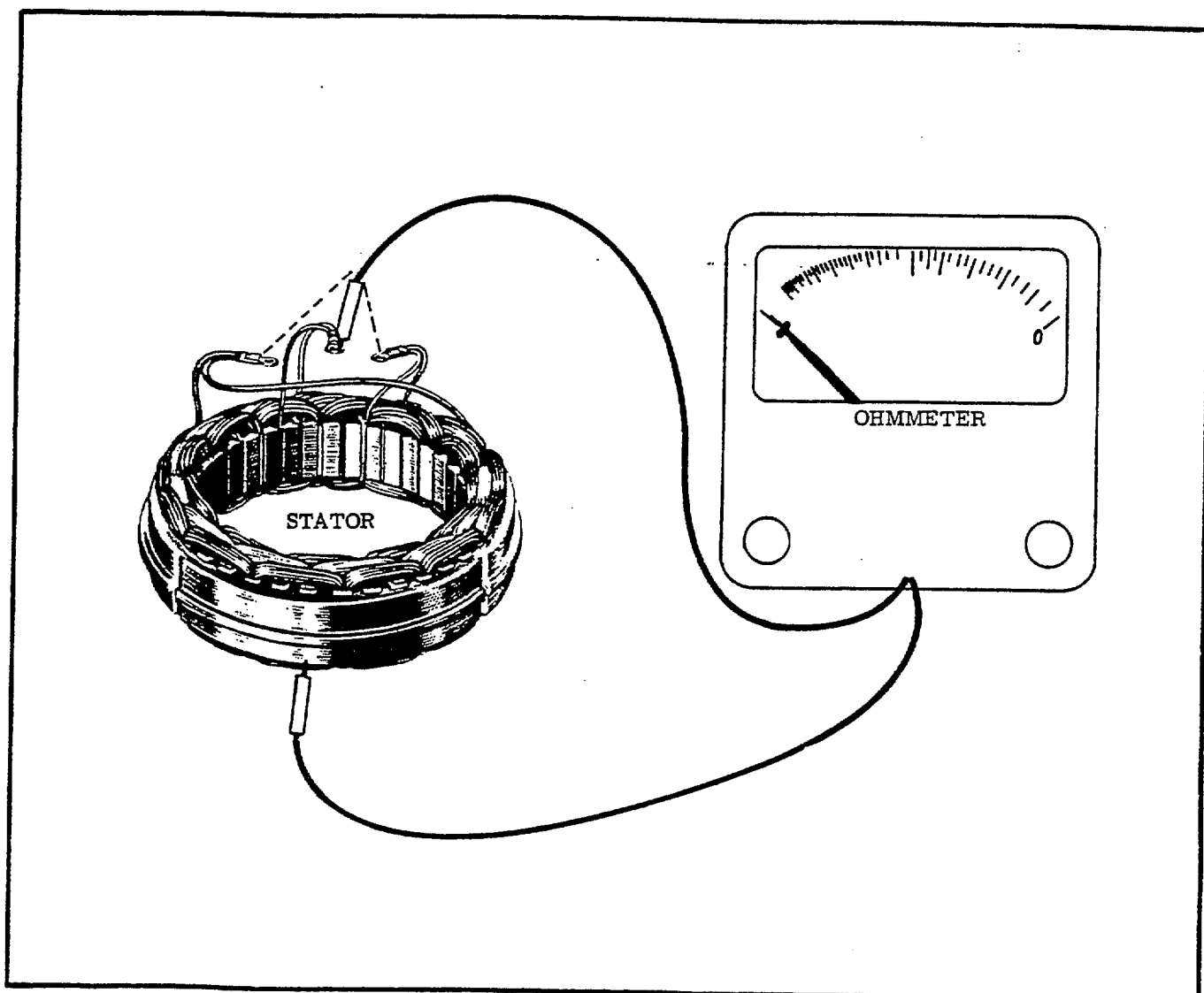


Figure 8-7. Stator Ground Test

Diode Testing

Stator must be disconnected from rectifier assembly to perform this test. Rectifier shown removed for clarity.

1. Set the ohmmeter selector switch on resistance scale 10 and zero the meter.
2. Test the negative diodes by connecting one ohmmeter lead to "GRD" post terminal on rectifier and connect other lead to each stator lead connection of rectifier momentarily. Reverse ohmmeter leads and check in opposite direction. Meter must show continuity in one direction and infinity (no needle movement) in other direction.
3. Test the positive diodes by connecting one ohmmeter lead to the "BAT" terminal on rectifier and other lead to each stator lead connection of rectifier momentarily. Reverse ohmmeter leads and check in the opposite direction. Meter must show continuity in one direction and infinity (no needle movement) in other direction.

Test Conclusion

- a. If continuity is observed in both directions, the diode(s) is shorted.
- b. If no continuity is observed in both directions, the diode(s) is open.
- c. Replace the rectifier assembly if open or shorted diodes are found.

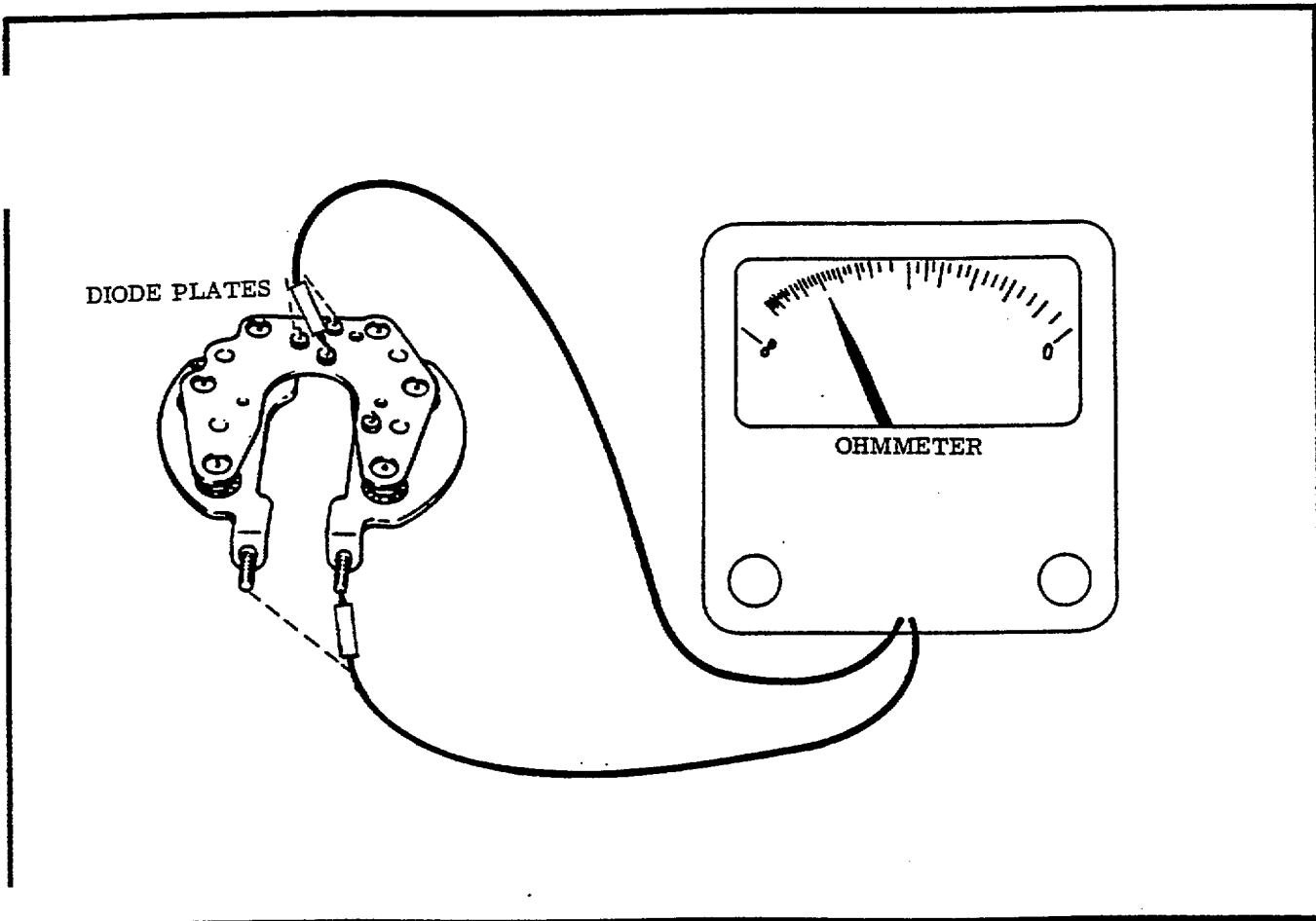


Figure 8-8. Diode Testing