BOSCH & NIPPONDENSO

Chrysler Corp
Horizon & Omni

DESCRIPTION

Horizon and Omni models use either a Bosch or Nippondenso direct drive type starter with an over-running clutch. Starters are 12 volt with an enclosed solenoid mounted on starter. On automatic transaxle models, the rear mounting bracket attaches to the engine block. On manual transaxle models, the bracket is mounted on the transaxle.

TESTING (ON VEHICLE)

AMPERAGE DRAW TEST

1) Engine should be at normal operating temperature and battery should be at full charge. A voltmeter and ammeter will be required.

2) Adjust voltmeter selector to 16 volts. Connect positive voltmeter lead to positive battery terminal and negative voltmeter lead to negative battery terminal.

3) Connect positive ammeter lead to positive battery terminal and negative ammeter lead to negative battery terminal. Disconnect coil wire from distributor cap and attach to a good ground to prevent engine from starting.

4) Crank engine with a remote starter switch. Note exact reading on voltmeter. Stop cranking engine. Turn voltmeter knob until that reading is obtained on the scale.

5) Observe ammeter reading. Ammeter should indicate starter amperage draw. Specified amperage draw is 120-160 amps.

STARTER RESISTANCE TEST

1) Make sure battery is at full charge. Disconnect positive battery cable at battery. Connect an ammeter (0 to 300 scale) between disconnected lead and battery terminal.

2) Connect a 10 scale voltmeter between positive battery post and starter relay terminal on starter solenoid.

3) Crank engine over and check reading on voltmeter and ammeter. Voltage reading should not exceed .3 volt.

4) A reading higher than this indicates a high resistance caused by loose circuit connections, defective cable, burned starter relay or solenoid switch contacts.

5) If current is high and starter cranks slowly, starter is defective and should be replaced.

INSULATED CIRCUIT TEST

1) Make sure battery is at full charge. Adjust voltmeter switch to 4 volt position. Disconnect coil wire at distributor cap.

2) Connect voltmeter positive lead to positive battery terminal. Connect voltmeter negative lead to solenoid connector that connects to starter field coils.

NOTE – *It will be necessary to peel back rubber boot to gain access to connector. Also, the voltmeter will read off scale until engine is cranked over.*

3) Crank engine over with a remote starter switch. Check voltmeter reading. A voltage drop of .3 volt or less indicates voltage drop is normal.

4) If voltmeter reads more than .3 volt, high resistance is indicated in starter insulated circuit.

5) Disconnect voltmeter from solenoid connector. Reconnect to the following points and repeat test at each connection.

- Solenoid starter terminal.
- Solenoid battery terminal.
- Starter relay.
- Battery cable connection.

6) A small change will occur each time a portion of the circuit is removed from test. A definite change in voltmeter reading indicates the last part eliminated in test is at fault.

STARTER GROUND CIRCUIT

1) Connect voltmeter positive lead to starter housing. Connect voltmeter negative lead to battery negative terminal. Crank engine over with a remote starter switch.

2) Voltmeter reading should not exceed .2 volt. A reading less than .2 volt indicates a voltage loss in ground cable which is normal.

3) A voltage loss of more than .2 volt indicates excessive voltage loss in starter ground circuit.

4) Disconnect voltmeter. Reconnect to the following points and repeat test at each connection.

- Starter drive housing.
- Cable terminal at engine.
- Battery cable clamp.

5) A small change will occur each time a portion of the circuit is removed from test. A definite change in voltmeter indicates last part eliminated in test is at fault.

OVERHAUL

DISASSEMBLY

1) Disconnect field coil wire from solenoid terminal. Remove mounting screws and on but Bosch automatic transaxle starter, work solenoid off shift fork and remove solenoid.

2) On Bosch automatic transaxle starters, slide solenoid off plunger and then work solenoid off shift fork. On Nippondenso starters, remove rubber gasket and metal plate.

3) Remove end shield bearing cap, "C" washer, flat washer, through bolts and starter end shield. On Nippondenso, also remove spring and seal.

BOSCH & NIPPONDENSO (Cont.)

4) Remove both field brushes and brush plate. Slide field frame off starter over armature. On Bosch starters, remove rubber gasket and metal plate.

5) Remove clutch shift lever pivot bolt. On Nippondenso starters and Bosch automatic transaxle starter, remove armature assembly and shift lever from drive end housing. Press collar off snap ring and remove snap ring, stop collar and clutch.

6) On Bosch manual transaxle starter, press stop collar off snap ring, remove snap ring and clutch, and remove drive end housing from armature.

TESTING (BENCH)

STARTER NO LOAD TEST

1) Place starter in a vise. Use a fully charged 12 volt battery. Connect an ammeter (0 to 100 scale) with a carbon pile rheostat in series with battery positive terminal and starter terminal.

2) Connect a voltmeter across starter. Rotate rheostat to full resistance position. Connect battery cable from negative battery terminal to starter housing.

3) Adjust rheostat until voltage shown on voltmeter is 11 volts. Current draw should be 47 amperes at 6600 RPM.

ARMATURE FOR SHORT CIRCUIT

Place armature in a growler and hold a thin steel blade parallel and just above core while rotating armature slowly. If armature is shorted, blade will vibrate and be attracted to the core. Replace shorted armature.

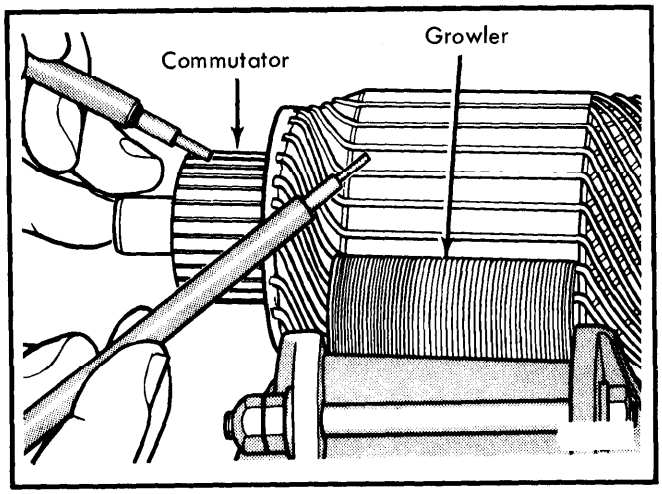

Fig. 1 Testing Armature for Short & Ground

ARMATURE FOR GROUND

Use a test lamp and touch one lead to armature shaft and other lead to each commutator bar. If lamp lights, replace armature.

FIELD COILS FOR GROUND

1) Use test lamp and touch one probe to series field coil lead and other probe to field frame. If lamp lights, replace field coil housing assembly.

2) Touch each of brush holders with one probe, while holding other probe against brush plate. Two brush holders are grounded 180° apart and should cause test lamp to light. Other two brush holders should not cause lamp to light, as they are insulated. If these brush holders are grounded, replace brush plate assembly.

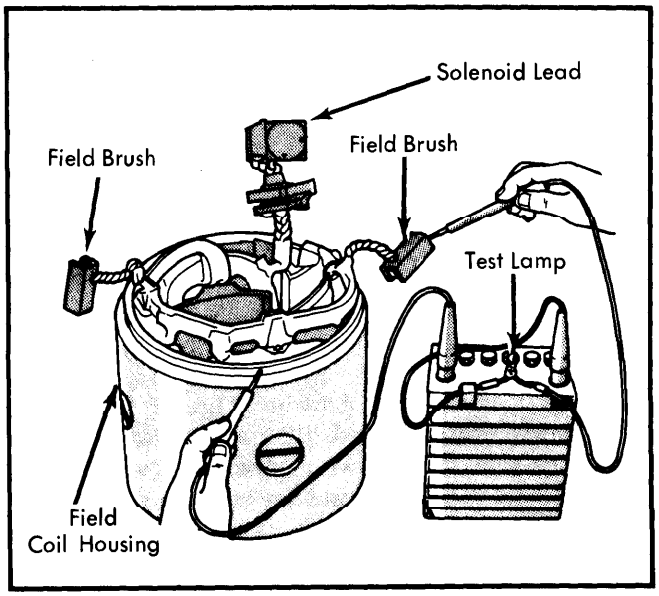

Fig. 2 Testing Field Coils

REASSEMBLY

Starter is reassembled by reversing disassembly procedure, except, a battery cable pulling tool should be used to pull clutch stop ring over snap ring.