

STARTER - BOSCH/MITSUBISHI

1988 Jeep Cherokee

1988 Starters
BOSCH & MITSUBISHI

Jeep with 4.0L 6-Cyl.

DESCRIPTION

NOTE: Information on Jeep 2.5L starter not available from manufacturer.

Bosch and Mitsubishi use a permanent magnet starter. A planetary gear train transmits power between starter motor and pinion shaft. The starter magnetic field is produced by 6 permanent magnets. The Mitsubishi starter is a 12-volt unit that has the solenoid mounted on the starter housing. See Fig. 3.

TROUBLE SHOOTING

NOTE: See the TROUBLE SHOOTING - BASIC PROCEDURES article in the GENERAL TROUBLE SHOOTING section.

TESTING (ON VEHICLE)

AMPERAGE DRAW TEST

NOTE: Engine should be at operating temperature before performing this test. Heavy duty oil or a tight engine will increase starter draw amperage. Tests are performed with standard volt-ammeter tester.

- 1) Connect tester and remote starter switch. Set voltmeter selector to 16-volt position. Select function to 0-500-amp scale. Connect voltmeter leads to corresponding polarity battery terminals.
- 2) Connect ammeter leads to corresponding battery terminals. Disconnect coil wire from distributor cap and attach to ground to prevent engine from starting.
- 3) Crank engine and observe exact reading on voltmeter. Stop cranking engine. Turn tester control knob clockwise until voltmeter reads exactly the same as when engine was cranked with remote starter switch. Ammeter should indicate starter draw of about 150-220 amps.

STARTER RESISTANCE TEST

Use a voltmeter that will indicate tenths of a volt. Without disconnecting any starter connections, perform the following resistance tests:

- 1) Perform following tests with engine cranking and all terminals connected. Connect a voltmeter at following locations:
 - * Positive lead to battery positive post and negative lead to battery terminal on starter.
 - * Positive lead to starter housing and negative lead to negative post on battery.
 - * Positive lead to battery negative post and negative lead to battery cable connector on engine block.
- 2) Each of these 3 connections should show a voltmeter

reading of .2 volt or less. If reading exceeds .2 volt, clean or repair cables and connections in circuit. Connect a voltmeter at following locations:

- * Positive lead to battery positive post and negative lead to cable clamp.
- * Positive lead to battery negative post and negative lead to cable clamp.

3) If reading is other than zero on voltmeter, clean or repair cables and connections in circuit. Connect a voltmeter at following location:

- * Positive lead to battery positive post and negative lead to starter solenoid lead to the field coils.

4) If reading exceeds .3 volt, clean or repair cables and connections in circuit.

SOLENOID TEST

1) Connect a heavy jumper wire on starter relay between battery and solenoid terminals. If engine cranks, solenoid is okay. Go to RELAY TEST.

2) If engine does not crank, check wiring and connections from relay to starter. Repair or replace as necessary. If engine still fails to crank, starter is defective.

RELAY TEST

1) On automatic transmission/transaxle vehicles, put gear selector in "NEUTRAL" or "PARK". On manual transmission/transaxle vehicles, put gear selector in "NEUTRAL". Set parking brake and block wheels. DO NOT remove relay connector. Using a 12-volt test light, check for battery voltage between starter relay battery terminal and ground.

2) Use a jumper wire on starter relay between battery and ignition terminals. If engine cranks starter relay is good. If starter does not crank go to next step.

3) Connect another jumper wire to starter relay between ground terminal and ground. Repeat above test. If engine cranks, starter relay is good. Inspect transmission linkage for improper adjustment (automatic transmission), defective neutral safety switch (automatic transmission) or poor ground connection between relay housing and mounting surface.

TESTING (ON BENCH)

STARTER SOLENOID

1) With starter removed, disconnect field coil wire from field coil terminal on starter. Using an ohmmeter, check for continuity between solenoid and field coil terminals.

2) Check for continuity between solenoid terminal solenoid housing. Continuity should be present in both tests. If continuity is present, solenoid is good. If no continuity is present, replace solenoid. Reconnect field coil wire to field coil terminal.

ARMATURE FOR SHORT CIRCUIT

Place armature in a growler and hold a thin steel blade parallel 3/16" above core while rotating armature slowly. If armature

is shorted, blade will vibrate and be attracted to core. Replace shorted armature.

ARMATURE FOR GROUND

Using a self-powered test light and touch one lead to armature shaft and other lead to each commutator bar. See Fig. 1. If light glows, armature is grounded and should be replaced.

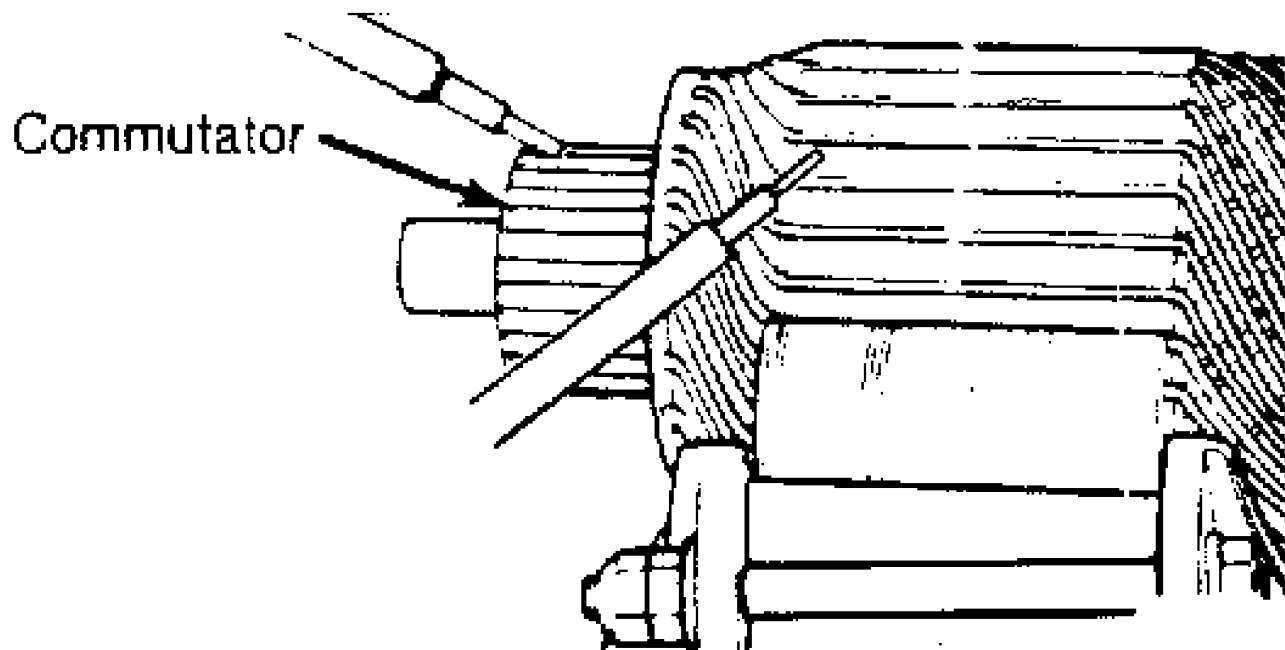


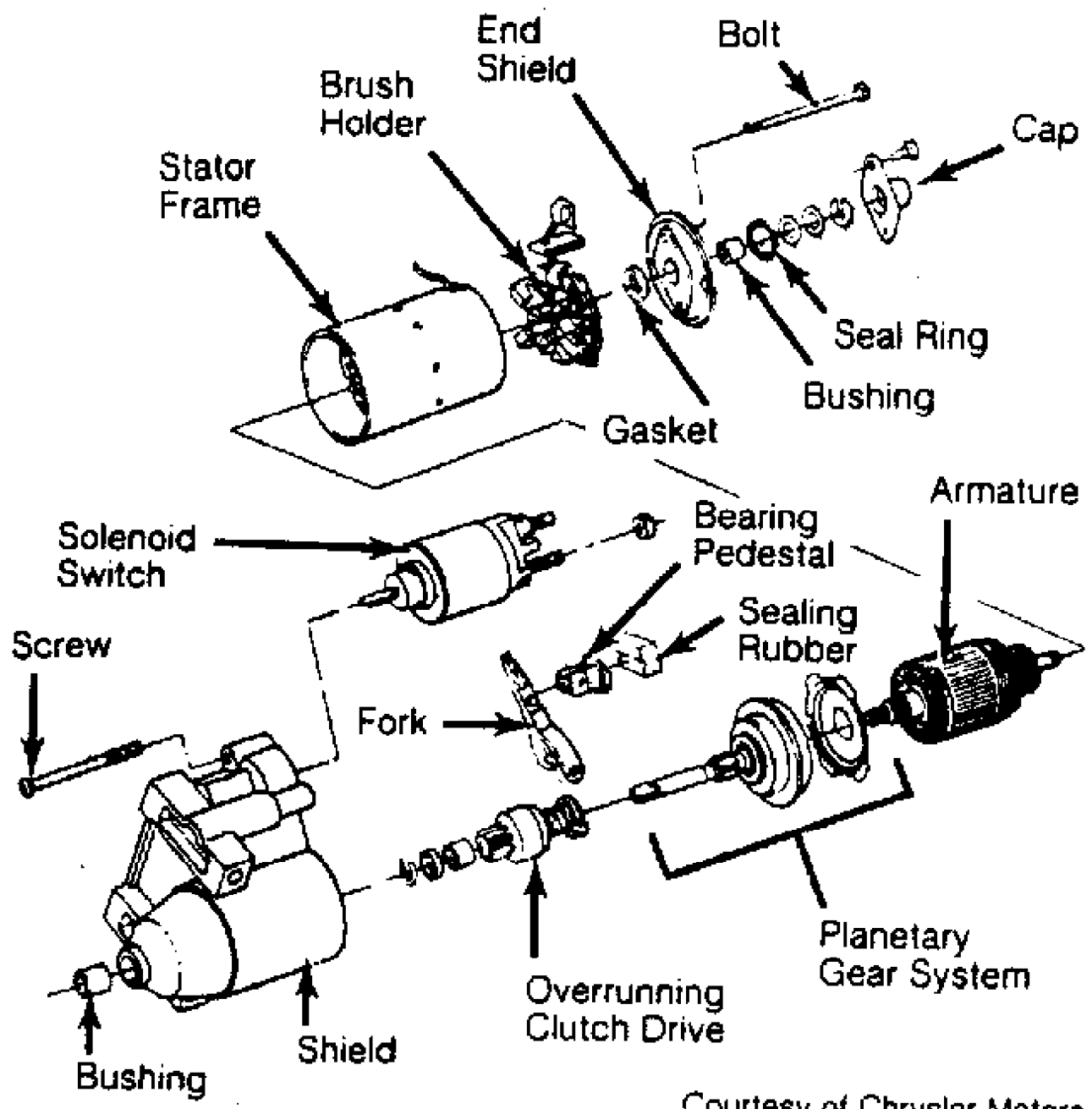
Fig. 1: Testing Starter Armature for Ground

FIELD COILS FOR GROUND

Using a self-powered test light and touch one probe to series field coil lead and other probe to field frame. If light glows, replace field coil housing assembly.

DRIVE CLUTCH UNIT

While holding clutch housing, rotate pinion. Drive pinion should rotate smoothly in one direction only (should not rotate in opposite direction). If drive unit does not operate properly, or if pinion is worn or burred, replace drive unit.



Courtesy of Chrysler Motors.

Fig. 2: Exploded View of Bosch Starter

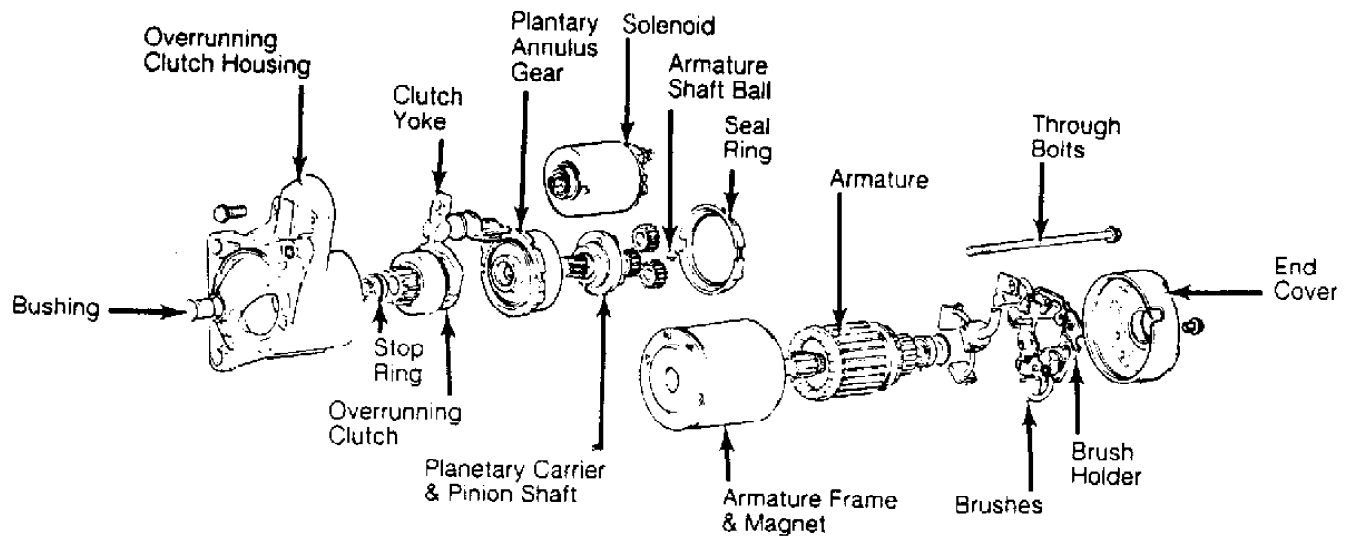


Fig. 3: Exploded View of Mitsubishi Starter

OVERHAUL

Overhaul information not available.

SPECIFICATIONS

BOSCH & MITSUBISHI STARTER SPECIFICATIONS

Application (1)	Specification
Cranking Amperage Draw	120-220 Amps
No Load Test Voltage	11-11.5 Volts
No Load Test Amperage Draw	75-85 Amps
No Load Test Minimum RPM	2500-3625
Solenoid Closing Voltage (All)	7.3-7.8 Volts

(1) - New brushes are 11/16" (17.5 mm) long.