

# STARTING SYSTEMS

## CONTENTS

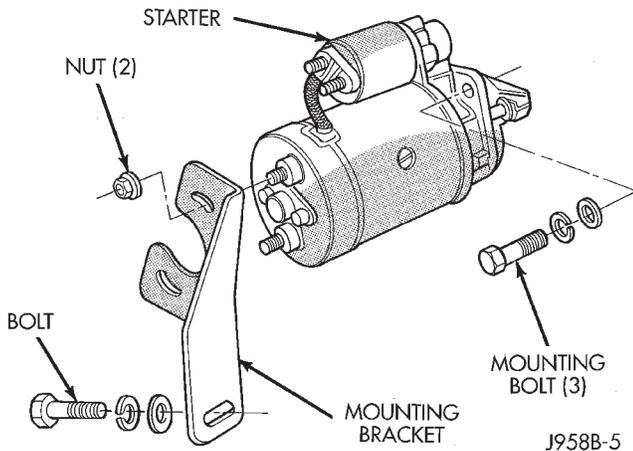
|                                 | page |                       | page |
|---------------------------------|------|-----------------------|------|
| <b>REMOVAL AND INSTALLATION</b> |      | <b>SPECIFICATIONS</b> |      |
| STARTER .....                   | 1    | STARTING SYSTEM ..... | 2    |
| STARTER RELAY .....             | 1    |                       |      |

## REMOVAL AND INSTALLATION

### STARTER

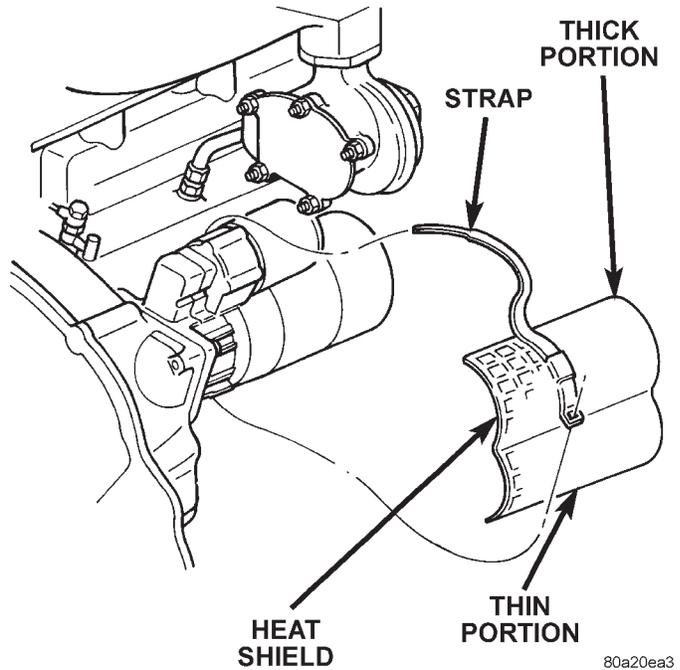
#### 2.5L DIESEL ENGINE

- (1) Disconnect and isolate the battery negative cable.
- (2) Raise and support the vehicle.
- (3) Remove the right front engine mount insulator and brackets. Refer to Group 9 - Engines for the procedures.
- (4) Remove the starter front support bracket (Fig. 1).



**Fig. 1 Starter Mounting - 2.5L Diesel Engine**

- (5) Remove the strap that secures the starter heat shield and remove the heat shield from the starter (Fig. 2).
- (6) Remove the three bolts that secure the starter mounting flange to the transmission adapter plate.
- (7) Lower the starter far enough to access and remove the wire harness connections from the solenoid.
- (8) Remove the starter from the vehicle.
- (9) Reverse the removal procedures to install. Tighten the starter hardware as follows:
  - Battery cable terminal nut - 27 N·m (20 ft. lbs.)
  - Starter mounting bolts - 27 N·m (20 ft. lbs.)



**Fig. 2 Starter Heat Shield Remove/Install**

- Front starter support bracket nuts - 10 N·m (90 in. lbs.)
- Front starter support bracket bolt - 47 N·m (35 ft. lbs.).

### STARTER RELAY

- (1) Disconnect and isolate the battery negative cable.
- (2) Remove the cover from the Power Distribution Center (PDC).
- (3) Refer to the label on the PDC for starter relay identification and location.
- (4) Unplug the starter relay from the PDC.
- (5) Install the starter relay by aligning the relay terminals with the cavities in the PDC and pushing the relay firmly into place.
- (6) Install the PDC cover.
- (7) Connect the battery negative cable.
- (8) Test the relay operation.

## SPECIFICATIONS

## STARTING SYSTEM

| <b>Starter and Solenoid</b>  |                          |
|--|--------------------------|
| Engine Application   | 2.5L Diesel              |
| Power Rating   | 2.2 Kilowatt             |
| Voltage  | 12 Volts                 |
| Number of Fields   | 4                        |
| Number of Poles  | 4                        |
| Number of Brushes  | 4                        |
| Drive Type   | Planetary Gear Reduction |
| Free Running Test Voltage  | 11.5 Volts               |
| Free Running Test Maximum Amperage Draw  | 160 Amperes              |
| Free Running Test Minimum Speed  | 5500 rpm                 |
| Solenoid Closing Maximum Voltage   | 7.8 Volts                |
| *Cranking Amperage Draw test   | 350 Amperes              |
| *Test at operating temperature. Cold engine, tight (new) engine, or heavy oil will increase starter amperage draw. |                          |