AUDIO SYSTEMS

CONTENTS

GENERAL INFORMATION

INTRODUCTION

An audio system is standard factory-installed equipment on this model, unless the vehicle is ordered with an available radio delete option. Refer to 8W-47 - Audio System in Group 8W - Wiring Diagrams for complete circuit descriptions and diagrams.

DESCRIPTION AND OPERATION

RADIO

Available factory-installed radio receivers for this model include an AM/FM (RAL sales code), and an AM/FM/cassette (RAS sales code). All factory-installed radio receivers are stereo Electronically Tuned Radios (ETR), and include an electronic digital clock function.

The radio can only be serviced by an authorized radio repair station. Refer to the latest Warranty Policies and Procedures manual for a current listing of authorized radio repair stations.

For more information on radio features, setting procedures, and control functions refer to the owner's manual in the vehicle glove box.

IGNITION-OFF DRAW FUSE

All vehicles are equipped with an Ignition-Off Draw (IOD) fuse that is removed when the vehicle is shipped from the factory. This fuse feeds various accessories that require battery current when the ignition switch is in the Off position, including the clock and radio station preset memory functions. The fuse is removed to prevent battery discharge during vehicle storage.

When removing or installing the IOD fuse, it is important that the ignition switch be in the Off position. Failure to place the ignition switch in the Off position can cause the radio display to become scrambled when the IOD fuse is removed and replaced. Removing and replacing the IOD fuse again, with the ignition switch in the Off position, will correct the scrambled display condition.

The IOD fuse should be checked if the radio is inoperative. The IOD fuse is located in the Power Distribution Center (PDC). Refer to the PDC label for IOD fuse identification and location.

SPEAKER

The standard equipment speaker system includes two full-range speakers. Each speaker is mounted behind a removable bezel located on the outboard ends of the lower instrument panel.

The sound bar option adds two full-range speakers to the standard speaker system, for a total of four speakers. Each of the additional speakers is mounted behind a grille located on the outboard ends of the sound bar, which is attached from side-to-side to the sport bar above the rear seating area of the vehicle.

ANTENNA

All models use a fixed-length stainless steel rod-type antenna mast, installed on the right front cowl side panel of the vehicle. The antenna mast is connected to the center wire of the coaxial antenna cable, and is not grounded to any part of the vehicle.

To eliminate static, the antenna base must have a good ground. The antenna coaxial cable shield (the

DESCRIPTION AND OPERATION (Continued)

outer wire mesh of the cable) is grounded to the antenna base and the radio chassis.

The antenna coaxial cable has an additional disconnect, located behind the right end of the instrument panel between the radio and the right cowl side panel. This additional disconnect allows the instrument panel assembly to be removed and installed without removing the radio.

The factory-installed Electronically Tuned Radios (ETRs) automatically compensate for radio antenna trim. Therefore, no antenna trimmer adjustment is required or possible when replacing the receiver or the antenna.

RADIO NOISE SUPPRESSION

DESCRIPTION

Radio Frequency Interference (RFI) and Electro-Magnetic Interference (EMI) noise suppression is accomplished primarily through circuitry internal to the radio receivers. These internal suppression devices are only serviced as part of the radio receiver.

External suppression devices that are used on this vehicle to control RFI or EMI noise include the following:

- Radio antenna base ground
- Radio receiver chassis ground wire or strap
- Engine-to-body ground strap
- Engine-to-frame ground strap
- Resistor-type spark plugs
- Radio suppression-type secondary ignition wiring.

For more information on the spark plugs and secondary ignition components, refer to **Ignition System** in the Description and Operation section of Group 8D - Ignition System.

DIAGNOSIS AND TESTING

AUDIO SYSTEM

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

DIAGNOSIS AND TESTING (Continued)

Audio System Diagnosis		
CONDITION	POSSIBLE CAUSE	CORRECTION
NO AUDIO.	1. Fuse faulty.	1. Check radio fuses in Power Distribution Center. Replace fuses, if required.
	2. Radio connector faulty.	2. Check for loose or corroded radio connector. Repair, if required.
	3. Wiring faulty.	3. Check for battery voltage at radio connector. Repair wiring, if required.
	4. Ground faulty.	4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required.
	5. Radio faulty.	5. Exchange or replace radio, if required.
	6. Speakers faulty.	6. See speaker diagnosis, in this group.
NO DISPLAY.	1. Fuse faulty.	1. Check radio fuses in Power Distribution Center. Replace fuses, if required.
	2. Radio connector faulty.	2. Check for loose or corroded radio connector. Repair, if required.
	3. Wiring faulty.	3. Check for battery voltage at radio connector. Repair wiring, if required.
	4. Ground faulty.	4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required.
	5. Radio faulty.	5. Exchange or replace radio, if required.
CLOCK WILL NOT KEEP SET TIME.	1. Fuse faulty.	1. Check ignition-off draw fuse. Replace fuse, if required.
	2. Radio connector faulty.	2. Check for loose or corroded radio connector. Repair, if required.
	3. Wiring faulty.	3. Check for battery voltage at radio connector. Repair wiring, if required.
	4. Ground faulty.	4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required.
	5. Radio faulty.	5. Exchange or replace radio, if required.
POOR RADIO RECEPTION.	1. Antenna faulty.	1. See antenna diagnosis, in this group. Repair or replace antenna, if required.
	2. Ground faulty.	2. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required.
	3. Radio faulty.	3. Exchange or replace radio, if required.
NO/POOR TAPE OPERATION.	1. Faulty tape.	1. Insert known good tape and test operation.
	2. Foreign objects behind tape door.	2. Remove foreign objects and test operation.
	3. Dirty cassette tape head.	3. Clean head with Mopar Cassette Head Cleaner.
	4. Faulty tape deck.	4. Exchange or replace radio, if required.
NO COMPACT DISC OPERATION	1. Faulty CD.	1. Insert known good CD and test operation.
	2. Foreign material on CD.	2. Clean CD and test operation.
	3. Condensation on CD or optics.	3. Allow temperature of vehicle interior to stabilize and test operation.
	4. Faulty CD player.	4. Exchange or replace radio, if required.

RADIO

For circuit descriptions and diagrams, refer to 8W-47 - Audio System in Group 8W - Wiring Diagrams.

DIAGNOSIS AND TESTING (Continued)

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CAUTION: The speaker output of the radio is a "floating ground" system. Do not allow any speaker lead to short to ground, as damage to the radio may result.

(1) Check the fuse(s) in the Power Distribution Center (PDC). If OK, go to Step 2. If not OK, repair the shorted circuit or component as required and replace the faulty fuse(s).

(2) Check for battery voltage at the fuse(s) in the PDC. If OK, go to Step 3. If not OK, repair the open circuit to the battery and/or the ignition switch as required.

(3) Disconnect and isolate the battery negative cable. Remove the radio, but do not unplug the radio wire harness connectors. Check for continuity between the radio chassis and a good ground. There should be continuity. If OK, go to Step 4. If not OK, repair the open radio chassis ground circuit as required.

(4) Connect the battery negative cable. Turn the ignition switch to the On position. Check for battery voltage at the fused ignition switch output (accessory/run) circuit cavity of the left (gray) radio wire harness connector. If OK, go to Step 5. If not OK, repair the open circuit as required.

(5) Turn the ignition switch to the Off position. Check for battery voltage at the fused B(+) circuit cavity of the left (gray) radio wire harness connector. If OK, replace the faulty radio. If not OK, repair the open circuit to the Ignition-Off Draw (IOD) fuse as required.

SPEAKER

For circuit descriptions and diagrams, refer to 8W-47 - Audio System in Group 8W - Wiring Diagrams.

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CAUTION: The speaker output of the radio is a "floating ground" system. Do not allow any speaker lead to short to ground, as damage to the radio may result.

(1) Turn the ignition switch to the On position. Turn the radio on. Adjust the balance and fader controls to check the performance of each individual speaker. Note the speaker locations that are not performing correctly. Go to Step 2.

(2) Turn the radio off. Disconnect and isolate the battery negative cable. Remove the radio. Unplug the wire harness connectors at the radio. Check both the speaker feed (+) circuit and return (–) circuit cavities for the inoperative speaker location(s) at the radio wire harness connectors for continuity to ground. In each case, there should be no continuity. If OK, go to Step 4. If not OK, go to Step 3.

(3) Leave the radio wire harness connectors unplugged. Unplug the wire harness connector at the inoperative speaker. Check both the speaker feed (+) circuit and return (–) circuit cavities of the speaker wire harness connector for continuity to ground. In each case, there should be no continuity. If OK, replace the shorted speaker. If not OK, repair the shorted circuit as required.

(4) Plug in the speaker wire harness connector. Check the resistance between the speaker feed (+) circuit and return (–) circuit cavities of the radio wire harness connectors for the inoperative speaker location(s). The meter should read between 3 and 8 ohms (speaker resistance). If OK, go to Step 5. If not OK, go to Step 6.

(5) Install a known good radio. Connect the battery negative cable. Turn the ignition switch to the On position. Turn on the radio and test the speaker operation. If OK, replace the faulty radio. If not OK, replace the faulty speaker.

(6) Turn the radio off. Turn the ignition switch to the Off position. Disconnect and isolate the battery negative cable. Remove the test radio. Unplug the speaker wire harness connector at the inoperative speaker. Check the resistance between the speaker feed (+) circuit cavities of the radio wire harness connector and the speaker wire harness connector. Repeat the check between the speaker return (–) circuit cavities of the radio wire harness connector and the speaker wire harness connector. In each case, there should be no measurable resistance. If OK, replace the faulty speaker. If not OK, repair the speaker wire harness circuit(s) as required.

DIAGNOSIS AND TESTING (Continued)

ANTENNA

WARNING: ON VEHICLES EQUIPPED WITH AIRBAGS, REFER TO GROUP 8M - PASSIVE RESTRAINT SYSTEMS BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

The following four tests are used to diagnose the antenna with an ohmmeter:

- **Test 1** - Mast to ground test
- **Test 2** - Tip-of-mast to tip-of-conductor test
- **Test 3** - Body ground to battery ground test
- **Test 4** - Body ground to coaxial shield test.

The ohmmeter test lead connections for each test are shown in Antenna Tests (Fig. 1).

NOTE: This model has a two-piece antenna coaxial cable. Tests 2 and 4 must be conducted in two steps to isolate a coaxial cable problem; from the coaxial cable connection under the right end of the instrument panel near the right cowl side inner panel to the antenna base, and then from the coaxial cable connection to the radio chassis connection.

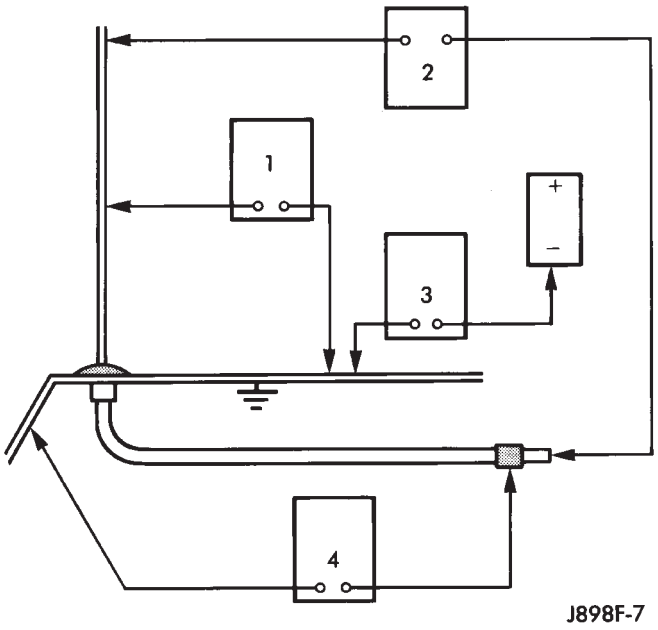

Fig. 1 Antenna Tests

TEST 1

Test 1 determines if the antenna mast is insulated from the base. Proceed as follows:

(1) Unplug the antenna coaxial cable connector from the radio chassis and isolate.

(2) Connect one ohmmeter test lead to the tip of the antenna mast. Connect the other test lead to the antenna base. Check for continuity.

(3) There should be no continuity. If continuity is found, replace the faulty or damaged antenna base and cable assembly.

TEST 2

Test 2 checks the antenna for an open circuit as follows:

(1) Unplug the antenna coaxial cable connector from the radio chassis.

(2) Connect one ohmmeter test lead to the tip of the antenna mast. Connect the other test lead to the center pin of the antenna coaxial cable connector.

(3) Continuity should exist (the ohmmeter should only register a fraction of an ohm). High or infinite resistance indicates damage to the base and cable assembly. Replace the faulty base and cable, if required.

TEST 3

Test 3 checks the condition of the vehicle body ground connection. This test should be performed with the battery positive cable removed from the battery. Disconnect both battery cables, the negative cable first. Reconnect the battery negative cable and perform the test as follows:

(1) Connect one ohmmeter test lead to the vehicle fender. Connect the other test lead to the battery negative post.

(2) The resistance should be less than one ohm.

(3) If the resistance is more than one ohm, check the braided ground strap connected to the engine and the vehicle body for being loose, corroded, or damaged. Repair the ground strap connection, if required.

TEST 4

Test 4 checks the condition of the ground between the antenna base and the vehicle body as follows:

(1) Connect one ohmmeter test lead to the vehicle fender. Connect the other test lead to the outer crimp on the antenna coaxial cable connector.

(2) The resistance should be less then one ohm.

(3) If the resistance is more then one ohm, clean and/or tighten the antenna base to fender mounting hardware.

DIAGNOSIS AND TESTING (Continued)

RADIO FREQUENCY INTERFERENCE

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For complete circuit diagrams, see Group 8W - Wiring Diagrams. Inspect the ground paths and connections at the following locations:

- Blower motor
- Electric fuel pump
- Engine-to-body ground strap
- Engine-to-frame ground strap
- Generator
- Ignition module
- Radio antenna base ground
- Radio receiver chassis ground wire or strap
- Wiper motor.

If the source of RFI or EMI noise is identified as a component on the vehicle (i.e., generator, blower motor, etc.), the ground path for that component should be checked. If excessive resistance is found in any ground circuit, clean, tighten, or repair the ground circuits or connections to ground as required before considering any component replacement.

For service and inspection of secondary ignition components, refer to the Diagnosis and Testing section of Group 8D - Ignition Systems. Inspect the following secondary ignition system components:

- Distributor cap and rotor
- Ignition coil
- Spark plugs
- Spark plug wire routing and condition.

Reroute the spark plug wires or replace the faulty components as required.

If the source of the RFI or EMI noise is identified as two-way mobile radio or telephone equipment, check the equipment installation for the following:

- Power connections should be made directly to the battery, and fused as closely to the battery as possible.
- The antenna should be mounted on the roof or toward the rear of the vehicle. Remember that magnetic antenna mounts on the roof panel can adversely affect the operation of an overhead console compass, if the vehicle is so equipped.
- The antenna cable should be fully shielded coaxial cable, should be as short as is practical, and should be routed away from the factory-installed vehicle wire harnesses whenever possible.
- The antenna and cable must be carefully matched to ensure a low Standing Wave Ratio (SWR).

Fleet vehicles are available with an extra-cost RFI-suppressed Powertrain Control Module (PCM). This unit reduces interference generated by the PCM on some radio frequencies used in two-way radio communications. However, this unit will not resolve complaints of RFI in the commercial AM or FM radio frequency ranges.

REMOVAL AND INSTALLATION

RADIO

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(1) Disconnect and isolate the battery negative cable.

(2) Remove the instrument panel top cover from the instrument panel. Refer to Instrument Panel Top Cover in Group 8E - Instrument Panel Systems for the procedures.

(3) Remove the ash receiver from the ash receiver housing in the lower instrument panel center bezel.

(4) Remove the one screw located in the back of the ash receiver housing that secures the center bezel to the lower instrument panel (Fig. 2).

(5) Remove the two screws that secure the center bezel to the top of the instrument panel.

(6) Using a trim stick or another suitable wide flat-bladed tool, gently pry the lower edge of the center bezel away from the instrument panel.

(7) Lift the lower edge of the center bezel upwards to release the four snap clip retainers that secure it to the instrument panel.

(8) Remove the center bezel from the instrument panel.

(9) Remove the two screws that secure the radio to the instrument panel (Fig. 3).

(10) Pull the radio out from the instrument panel far enough to access the wire harness connectors and the antenna coaxial cable connector (Fig. 4).

(11) Unplug the wire harness connectors and the antenna coaxial cable connector from the rear of the radio.

(12) Remove the screw that secures the ground strap to the radio chassis.

(13) Remove the radio from the instrument panel.

REMOVAL AND INSTALLATION (Continued)

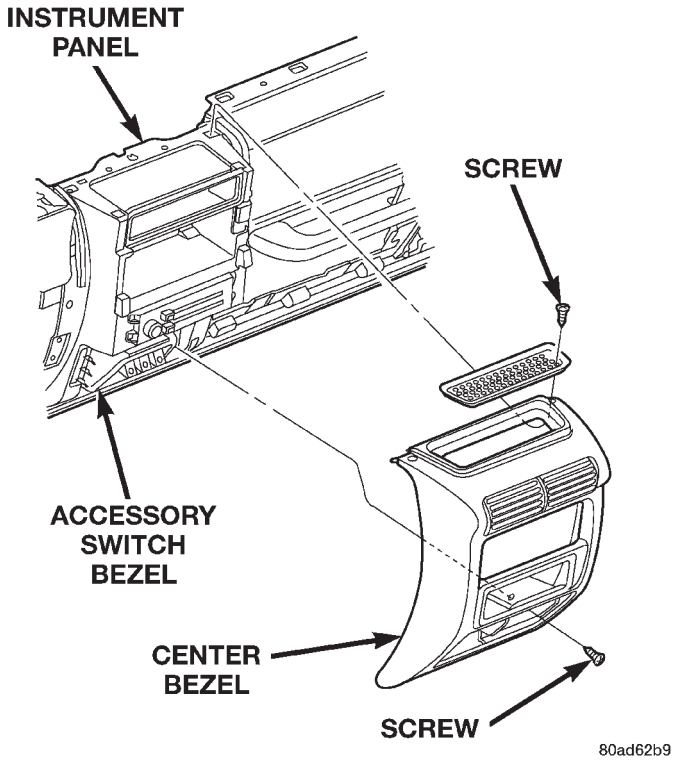

Fig. 2 Center Bezel Remove/Install

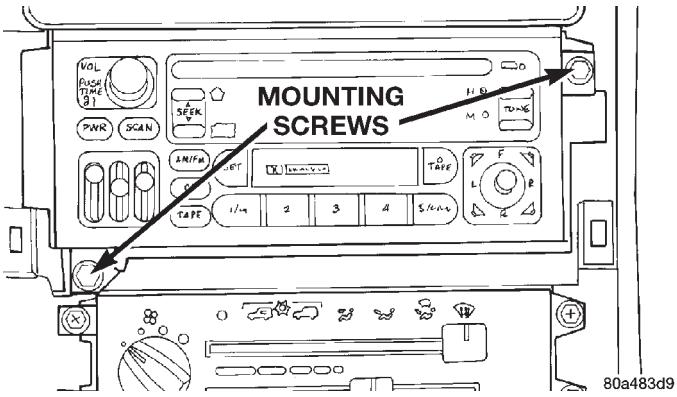

Fig. 3 Radio Remove/Install

(14) Reverse the removal procedures to install. Tighten the radio mounting screws to 5 N·m (45 in. lbs.). Tighten the instrument panel center bezel mounting screws to 2.2 N·m (20 in. lbs.).

SPEAKER

INSTRUMENT PANEL

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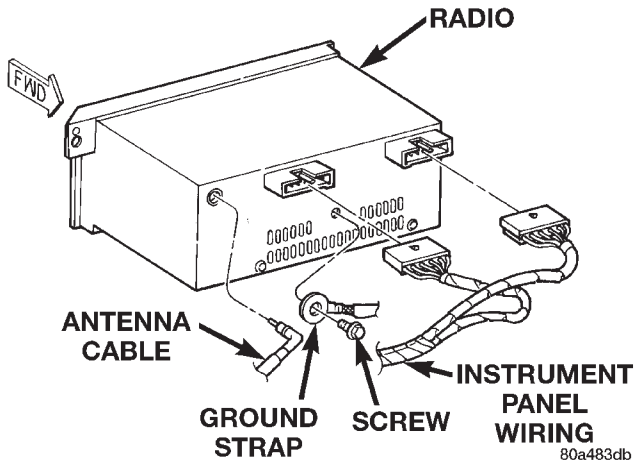

Fig. 4 Radio Connections - Typical

(1) Disconnect and isolate the battery negative cable.

(2) Remove the two screws that secure the outboard end of the speaker bezel to the instrument panel (Fig. 5).

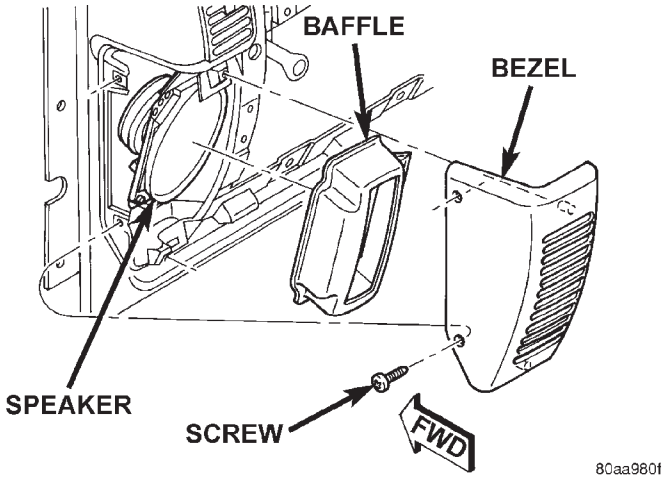

Fig. 5 Instrument Panel Speaker Bezel Remove/Install

(3) Using a trim stick or another suitable wide flat-bladed tool, gently pry at the top and bottom edges of the speaker bezel to release the two snap clip retainers that secure the bezel to the instrument panel.

(4) Remove the speaker bezel from the instrument panel.

(5) Remove the foam rubber speaker baffle from the speaker.

(6) Remove the four screws that secure the speaker to the instrument panel armature (Fig. 6).

(7) Pull the speaker away from the instrument panel far enough to access the speaker wire harness connector.

REMOVAL AND INSTALLATION (Continued)

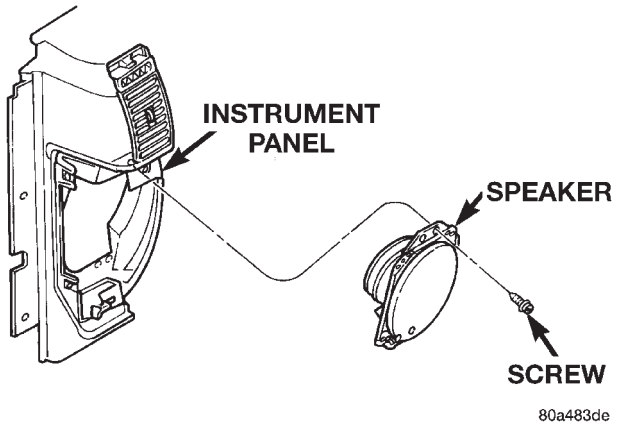

Fig. 6 Instrument Panel Speaker Remove/Install

(8) Unplug the wire harness connector from the speaker.

(9) Remove the speaker from the instrument panel.

(10) Reverse the removal procedures to install. Tighten the speaker mounting screws to 1.1 N·m (10 in. lbs.). Tighten the speaker bezel mounting screws to 2.2 N·m (20 in. lbs.).

SOUND BAR

(1) Disconnect and isolate the battery negative cable.

(2) Remove the four screws that secure the speaker grille and speaker to the sound bar.

(3) Lower the speaker and grille from the sound bar far enough to access the speaker wire harness connector.

(4) Unplug the wire harness connector from the speaker.

(5) Remove the speaker and grille from the sound bar.

(6) Remove the speaker grille from the speaker.

(7) Reverse the removal procedures to install. Tighten the mounting screws to 1.1 N·m (10 in. lbs.).

SOUND BAR

(1) Disconnect and isolate the battery negative cable.

(2) If the vehicle is equipped with the optional hard top, remove the hard top from the vehicle. Refer to Hard Top in Group 23 - Body for the procedures.

(3) If the vehicle is equipped with the standard soft top, lower the soft top. Refer to Folding Down the Fabric Top in the Owner's Manual for the procedures.

(4) Release the hook and loop closure on each outboard end flap of the sound bar trim cover.

(5) Lift the left outboard end flap of the sound bar trim cover over the top of the sport bar far enough to access the wire harness connector (Fig. 7).

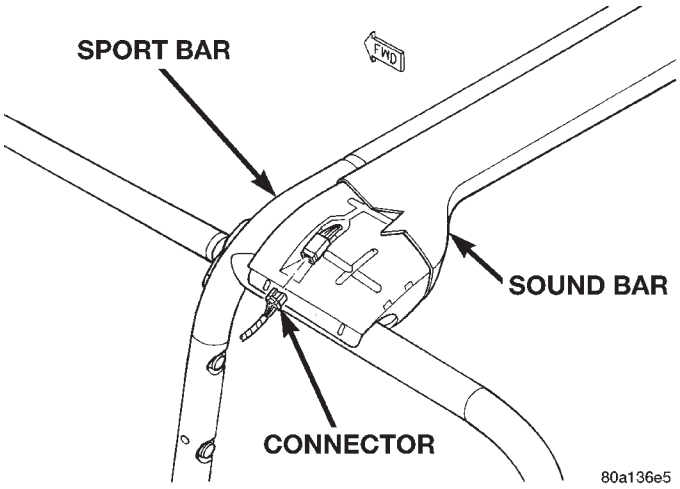

Fig. 7 Sound Bar Wire Harness Connector Remove/Install

(6) Unplug the sound bar wire harness connector.

(7) Lift each outboard end flap of the sound bar cover over the top of the sport bar far enough to access the mounting screws (Fig. 8).

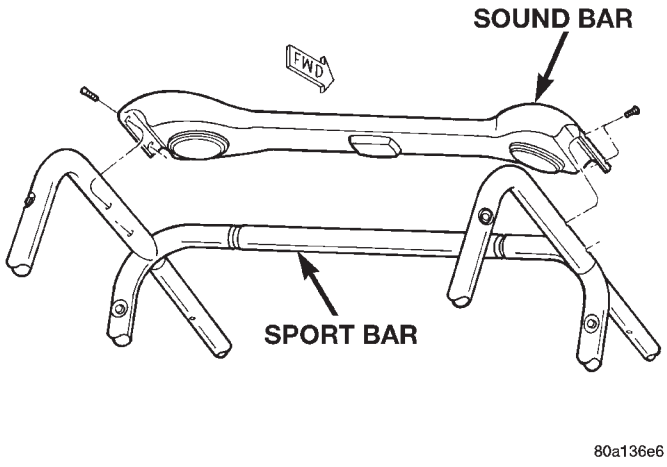

Fig. 8 Sound Bar Remove/Install

(8) Remove the two screws that secure each end of the sound bar to the sport bar.

(9) Lift the sound bar up off of the sport bar to remove it from the vehicle.

(10) Reverse the removal procedures to install. Tighten the sound bar mounting screws to 11 N·m (100 in. lbs.).

REMOVAL AND INSTALLATION (Continued)

ANTENNA

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(1) Disconnect and isolate the battery negative cable.

(2) Remove the glove box from the instrument panel. Refer to Glove Box in Group 8E - Instrument Panel Systems for the procedures.

(3) Reach through the instrument panel glove box opening to unplug the antenna coaxial cable connector. Unplug the connector by pulling it apart while twisting the metal connector halves. Do not pull on the cable.

(4) From inside the passenger compartment, push the coaxial cable grommet on the antenna body half of the coaxial cable out through the hole in the right inner cowl side panel (Fig. 9).

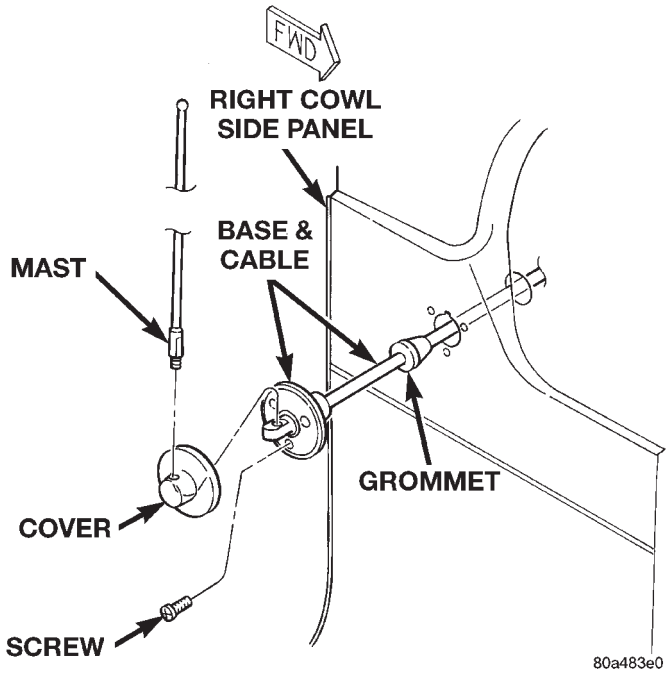

Fig. 9 Antenna Remove/Install

(5) Unscrew the antenna mast from the antenna body base on the right outer cowl side panel.

(6) Using a trim stick or another suitable wide flat-bladed tool, gently pry the edge of the antenna base trim cover to unsnap it from the antenna body base.

(7) Remove the three screws that secure the antenna body base to the right outer cowl side panel.

(8) From the outside of the vehicle, pull the antenna body base and cable assembly out through the hole in the right outer cowl side panel.

(9) Reverse the removal procedures to install. Tighten the antenna body base mounting screws to 2 N·m (17 in. lbs.). Tighten the antenna mast to 3.3 N·m (30 in. lbs.).

RADIO NOISE SUPPRESSION COMPONENTS

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REMOVAL

ENGINE-TO-BODY GROUND STRAP

(1) Remove the screw that secures the engine-to-body ground strap eyelet to the hood panel center reinforcement (Fig. 10).

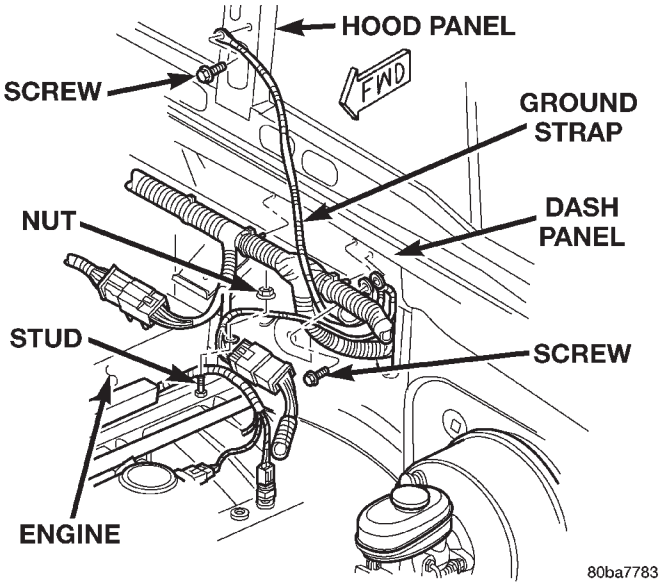

Fig. 10 Engine-To-Body Ground Strap Remove/Install

(2) Remove the screw that secures the engine-to-body ground strap eyelet to the dash panel.

(3) Remove the nut that secures the engine-to-body ground strap eyelet to the stud on the left upper rear corner of the engine cylinder head.

REMOVAL AND INSTALLATION (Continued)

(4) Remove the engine-to-body ground strap eyelet from the stud on the left upper rear corner of the engine cylinder head.

(5) Remove the engine-to-body ground strap from the engine compartment.

ENGINE-TO-FRAME GROUND STRAP

(1) Remove the nut that secures the engine-to-frame ground strap eyelet to the forward ignition coil mounting stud on the right side of the engine (Fig. 11) or (Fig. 12).

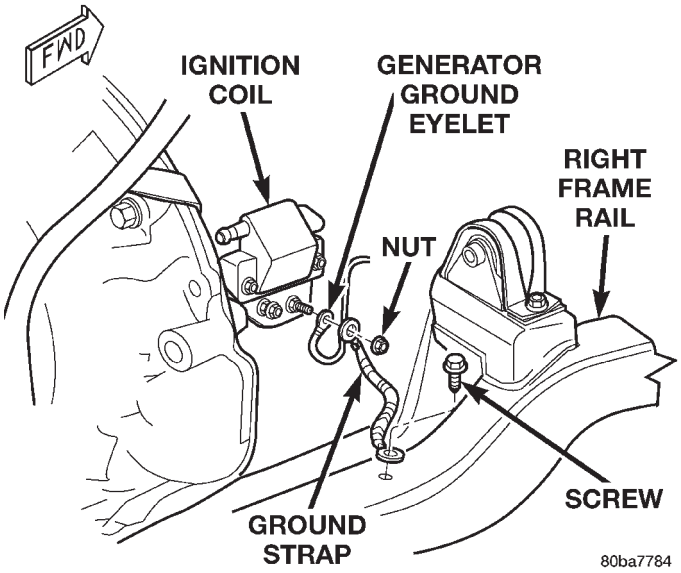

Fig. 11 Engine-To-Frame Ground Strap Remove/ Install - 2.5L Engine

(2) Remove the engine-to-frame ground strap eyelet from the forward ignition coil mounting stud on the right side of the engine.

(3) Remove the screw that secures the engine-to-frame ground strap eyelet to the top of the right frame rail.

(4) Remove the engine-to-frame ground strap from the engine compartment.

INSTALLATION

ENGINE-TO-BODY GROUND STRAP

(1) Position the engine-to-body ground strap in the engine compartment.

(2) Position the engine-to-body ground strap eyelet over the stud on the left upper rear corner of the engine cylinder head.

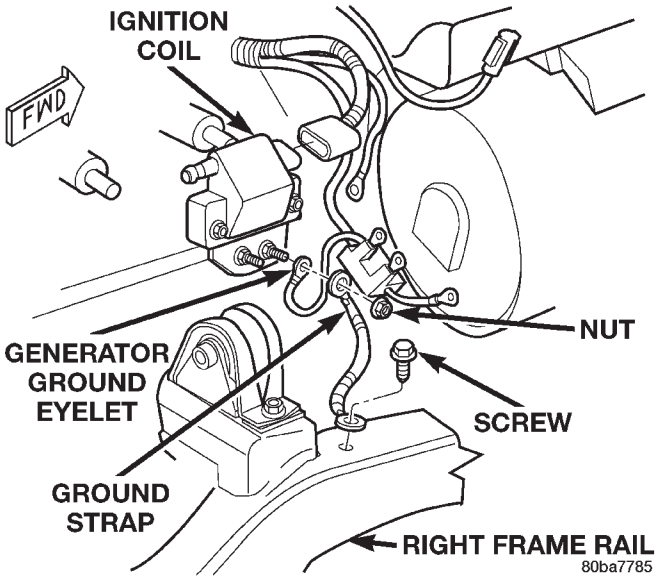

Fig. 12 Engine-To-Frame Ground Strap Remove/ Install - 4.0L Engine

(3) Install and tighten the nut that secures the engine-to-body ground strap eyelet to the stud on the left upper rear corner of the engine cylinder head. Tighten the nut to 5.6 N·m (50 in. lbs.).

(4) Install and tighten the screw that secures the engine-to-body ground strap eyelet to the dash panel. Tighten the screw to 48.5 N·m (430 in. lbs.).

(5) Install and tighten the screw that secures the engine-to-body ground strap eyelet to the hood panel center reinforcement. Tighten the screw to 1.9 N·m (17 in. lbs.).

ENGINE-TO-FRAME GROUND STRAP

(1) Position the engine-to-frame ground strap into the engine compartment. The ground strap eyelet with a 45 degree bend in it is to be mounted on the right frame rail.

(2) Install and tighten the screw that secures the engine-to-frame ground strap eyelet to the top of the right frame rail. Tighten the screw to 22.6 N·m (200 in. lbs.).

(3) Install the engine-to-frame ground strap eyelet over the forward ignition coil mounting stud on the right side of the engine.

(4) Install and tighten the nut that secures the engine-to-frame ground strap eyelet to the forward ignition coil mounting stud on the right side of the engine. Tighten the nut to 22.6 N·m (200 in. lbs.).