

STEERING

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STEERING

DESCRIPTION - POWER STEERING SYSTEM

This vehicle comes with power steering as standard equipment. The power steering system consists of these major components:

- POWER STEERING PUMP
- POWER STEERING GEAR
- POWER STEERING FLUID
- POWER STEERING FLUID COOLER (If Equipped)
- POWER STEERING FLUID RESERVOIR
- POWER STEERING FLUID SUPPLY HOSE
- POWER STEERING FLUID PRESSURE HOSE
- POWER STEERING FLUID RETURN HOSE

For information on the first two components, refer to their respective sections within this service manual group. Information on all other components can be found in POWER STEERING PUMP.

OPERATION - POWER STEERING SYSTEM

Turning of the steering wheel is converted into linear (side-to-side) travel through the meshing of the helical pinion teeth with the rack teeth within the steering gear. The lateral travel pushes and pulls the tie rods to change the direction of the vehicle's front wheels.

Power assist steering is provided by a belt driven rotary type pump. It directs fluid through power steering fluid hoses to the power steering gear where it is used to assist the driver's turning effort.

Manual steering control of the vehicle can be maintained if power steering assist is lost. However, under this condition, steering effort is significantly increased.

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING - POWER STEERING SYSTEM FLOW AND PRESSURE TEST

ALL ENGINES

The following procedure is to be used to test the operation of the power steering system on this vehicle. This test will provide the flow rate of the power steering pump along with the maximum relief pressure. This test is to be performed to determine if the power steering pump or power steering gear is not functioning properly. The following flow and pressure test is performed using the Power Steering Analyzer Kit, Special Tool 6815 (Fig. 1), hoses, Special Tools 6905 and 6959, and fittings from adapter kit, Special Tool 6893.

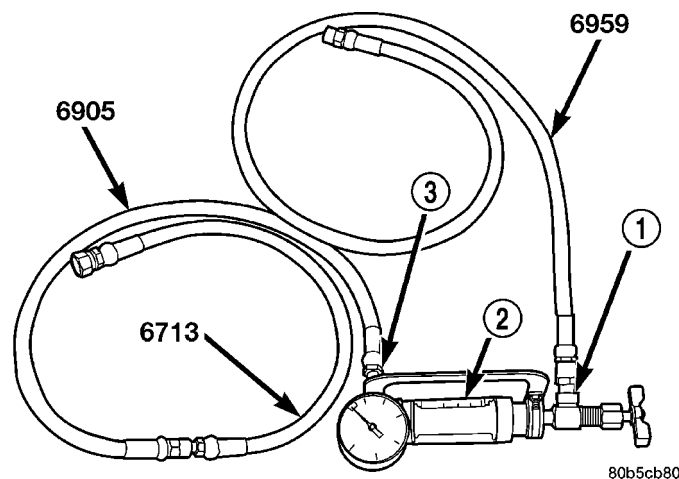


Fig. 1 Power Steering Analyzer With Hoses Installed

- 1 - OUTLET
- 2 - SPECIAL TOOL 6815
- 3 - INLET

STEERING (Continued)

Assemble hoses on Power Steering Analyzer, Special Tool 6815, as shown. Install Pressure Hose, Special Tool 6905 (in 6893 kit), in the inlet fitting on Power Steering Analyzer. Install Pressure Hose, Special Tool 6713 (in 6815 kit) on Pressure Hose, Special Tool 6905. Install Pressure Hose, Special Tool 6959, in the outlet fitting on Power Steering Analyzer.

Install the following adapters from Adapter Set, Special Tool 6893 (Fig. 2), on the analyzer hose ends: Install Adapter Fitting, Special Tool 6844, on Pressure Hose, Special Tool 6713. Install Adapter Fitting, Special Tool 6826, on Pressure Hose, Special Tool 6959.

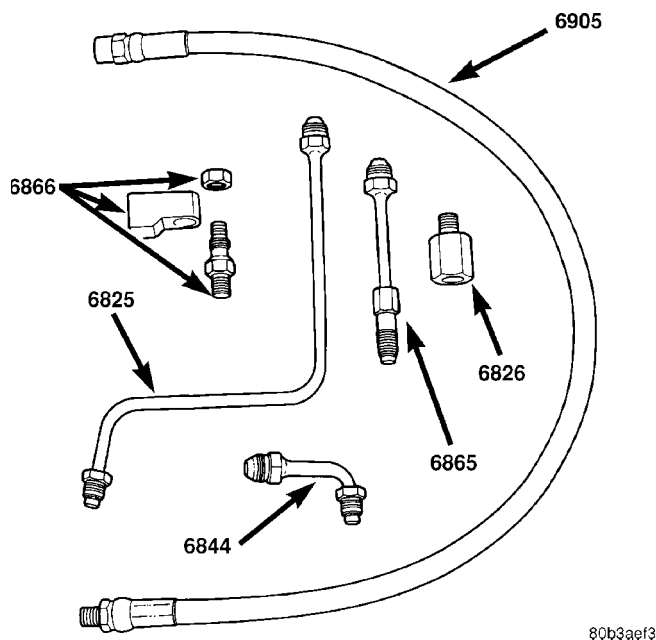


Fig. 2 Power Steering Analyzer Adapters 6893

CAUTION: To prevent personal injury, safety goggles should be worn at all times when performing any test procedures on the power steering pump or power steering gear.

The following procedure is to be used to test the operation of the power steering system on the vehicle.

- (1) Check belt tension and adjust as necessary.
- (2) Disconnect the power steering fluid pressure hose from the power steering pump (Fig. 3) (Fig. 4).
- (3) Connect Adapter Fitting, Special Tool 6844, attached to pressure hose from inlet (gauge end) of Power Steering Analyzer to the pressure fitting on the power steering pump.
- (4) Connect vehicle power steering fluid pressure hose to Adapter Fitting, Special Tool 6826, which should be already installed in the outlet hose (valve end) of Power Steering Analyzer.

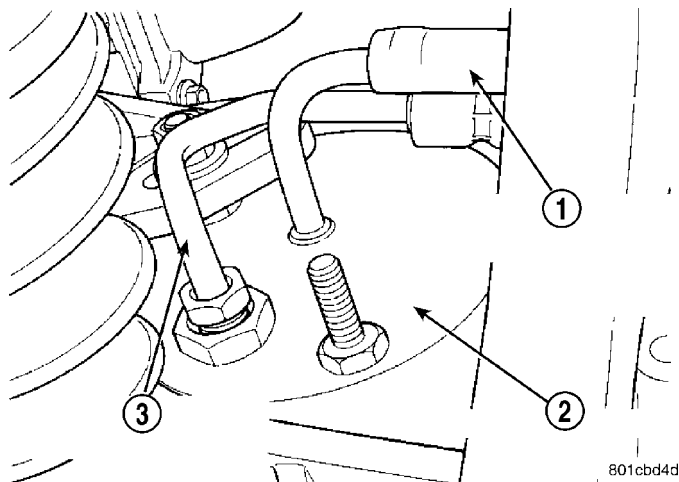


Fig. 3 Pressure Hose Connection To Power Steering Pump - 2.4L Engine

- 1 - POWER STEERING FLUID RETURN HOSE
- 2 - POWER STEERING PUMP
- 3 - POWER STEERING FLUID PRESSURE HOSE

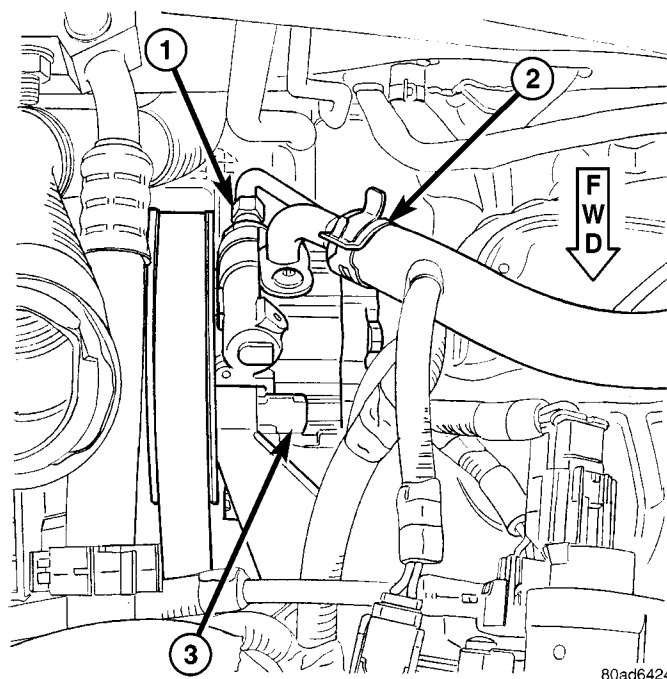


Fig. 4 Supply & Pressure Hoses At Pump - 3.3L/3.8L Engine

- 1 - PRESSURE HOSE AND FITTING
- 2 - SUPPLY HOSE AND CLAMP
- 3 - POWER STEERING PUMP

NOTE: During the next few steps, do not steer vehicle as air will be forced into the steering gear.

- (5) Completely open valve on Power Steering Analyzer.

STEERING (Continued)

(6) Start engine and let idle just long enough to circulate power steering fluid through the analyzer and hoses. Shut off engine.

(7) Check power steering fluid level and add fluid as necessary. Start engine again and let idle until the air is out of the fluid.

(8) Gauge should read below 300 psi (2068 kPa). If above, inspect the hoses for restrictions and repair as necessary. The initial pressure should be in the range of 100-275 psi (689-1896 kPa) depending on fluid temperature. The flow meter should read above 1.5 GPM.

CAUTION: The following test procedure involves testing maximum pump pressure output and flow control valve operation. Do not leave valve closed for more than four seconds as the pump could be damaged.

NOTE: Power steering pump maximum pressure for 2.4L engines is 1,200 – 1,350 psi (8,274 – 9,308 kPa). Power steering pump maximum pressure for all other engines is 1,400 – 1,500 psi (9,653 – 10,342 kPa).

(9) Close analyzer valve fully three times and record highest pressure indicated each time. All three readings must be within specifications. If any of the three power steering pump pressures are above or

below specifications, replace pump. (Refer to 19 - STEERING/PUMP - REMOVAL)

CAUTION: Do not force the steering to operate against the stops for more than 4 seconds at a time because pump damage can result.

(10) Once the pump has been verified as working correctly, completely open the valve on the Power Steering Analyzer. Turn the steering wheel to the extreme left until the stop in the steering gear is met. Hold it there for 2–4 seconds, then release it. Now turn the steering wheel to the right until the right stop is met. Hold it there for 2–4 seconds, then release it. Record the stabilized pressure at each position. Compare the recorded readings to the specifications. If the output pressures are not within 100 psi (689 kPa) of one another against either stop or are below specifications, the steering gear is leaking internally and must be replaced. (Refer to 19 - STEERING/GEAR - REMOVAL)

DIAGNOSIS AND TESTING - STEERING SYSTEM DIAGNOSIS CHARTS

NOTE: There are three diagnosis charts following that cover **POWER STEERING NOISE**, **STEERING WHEEL FEEL**, and **POWER STEERING FLUID**.

POWER STEERING NOISE

CONDITION	POSSIBLE CAUSES	CORRECTION
OBJECTIONABLE HISS OR WHISTLE*	1. Damaged or mispositioned steering column shaft/coupling dash panel seal. 2. Mis-routed power steering hose. 3. Noisy valve in power steering gear.	1. Reposition or replace steering column shaft/coupling dash panel seal. 2. Check routing of power steering hoses. Ensure hoses do not come in unwanted contact with other components and objects. 3. Replace power steering gear.
RATTLE OR EXCESSIVE CLUNK**	1. Power steering gear loose on front suspension crossmember. 2. Front suspension crossmember mounting fasteners loose at frame. 3. Loose tie rod (outer or inner).	1. Inspect power steering gear mounting bolts. Replace as necessary. Tighten to the specified torque. 2. Tighten the front suspension crossmember mounting fasteners to the specified torque. 3. Check tie rod pivot points for wear. Replace worn/loose parts as required.

STEERING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
	4. Loose lower control arm mounting bolts at front suspension crossmember. 5. Lower control arm pivot bushing worn. 6. Loose strut assembly mounting fasteners at tower or knuckle. 7. Power steering fluid hose touching the body of the vehicle. 8. Damaged front suspension crossmember. 9. Stabilizer bar link ball joints worn. 10. Lug nuts loose. 11. Excessive Wheel bearing free-play. 12. Internal power steering gear noise.	4. Tighten control arm mounting bolts to the specified torques. 5. Replace lower control arm pivot bushing. 6. Tighten strut assembly fasteners to the specified torque. 7. Adjust hose to proper position by loosening, repositioning, and tightening attachments to specified torque. Do not bend tubing. 8. Replace front suspension crossmember. 9. Replace stabilizer bar link. 10. Tighten lug nuts to specifications. 11. Verify correct halfshaft hub nut torque. Replace hub and bearing if torque is okay. 12. Replace power steering gear.
POPPING NOISE	1. Worn outer tie rod. 2. Loose inner tie rod.	1. Check ball joint for free-play; Replace outer tie rod. 2. Replace power steering gear.
CHIRP OR SQUEAL (POWER STEERING PUMP)	1. Loose power steering pump drive belt. 2. Malfunctioning belt auto-tensioner	1. Check and adjust power steering pump drive belt to specifications or replace automatic tensioner where applicable. Replace belt if worn or glazed. 2. Replace belt auto-tensioner.
WHINE, GROWL, MOAN OR GROAN (POWER STEERING PUMP)***	1. Low fluid level. 2. Power steering hose touching vehicle body or frame. 3. Extremely low ambient temperature. 4. Extreme wear of power steering pump internal components.	1. Fill power steering fluid reservoir to proper level and check for leaks (make sure all air is bled from the system fluid). 2. Adjust hose to proper position by loosening, repositioning, and tightening fitting to specified torque. Do not bend tubing. Replace hose if damaged. 3. Some noise can be expected, but will go away as vehicle warms. Replace pump if noise is excessive. 4. Replace power steering pump and flush system as necessary.

STEERING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
SUCKING AIR SOUND	1. Loose clamp on power steering fluid return hose. 2. Missing O-Ring on power steering hose connection. 3. Low power steering fluid level. 4. Loose clamp on fluid supply hose.	1. Tighten or replace hose clamp. 2. Inspect connection and replace O-Ring as required. 3. Fill power steering fluid reservoir to proper level and check for leaks. 4. Tighten or replace hose clamp.
SQUEAK OR RUBBING SOUND	1. Steering column shroud rubbing. 2. Steering column shaft rubbing. 3. Clockspring noisy. 4. Seal lubrication inadequate. 5. Steering gear internally noisy.	1. Realign shrouds as necessary. 2. Move or realign item rubbing shaft. 3. Remove clockspring. Reinstall wheel. If noise is gone, replace clockspring. 4. Lube seal (if external). 5. Replace steering gear (if no other cause can be found).
SCRUBBING OR KNOCKING NOISE.	1. Incorrect tire or wheel size. 2. Interference between steering gear and other vehicle components. 3. Steering gear internal stops worn excessively allowing tires to be steered excessively far.	1. Replace incorrect size tire or wheel with size used as original equipment. 2. Check for bent or misaligned components and correct as necessary. 3. Replace steering gear.

*** NOTE:** There is some noise in all power steering systems. One of the most common is a hissing sound evident when turning the steering wheel when at a standstill or when parking and the steering wheel is at the end of its travel. Hiss is a very high frequency noise similar to that experienced while slowly closing a water tap. The noise is present in every valve and results when high velocity fluid passes valve orifice edges. There is no relationship between this noise and the performance of the steering system.

**** NOTE:** A light clunk may be felt or heard during steering wheel reversal while vehicle is stationary. This results from internal steering gear rack movement at the bushings and in no way affects the performance of the steering system. This movement may be felt in the steering components during steering wheel reversal.

***** NOTE:** Power steering pump growl/moan/groan results from the development of high pressure fluid flow. Normally this noise level should not be high enough to be objectionable.

STEERING (Continued)

STEERING WHEEL FEEL

CONDITION	POSSIBLE CAUSES	CORRECTION
STEERING WHEEL/ COLUMN CLICKING, CLUNKING OR RATTLING.	1. Loose steering coupling pinch bolt. 2. Steering column bearings. 3. Excessive intermediate shaft coupling free-play.	1. Replace pinch bolt and torque to specifications. 2. Replace steering column. 3. Replace intermediate shaft.
STEERING WHEEL HAS FORE AND AFT LOOSENESS.	1. Steering wheel retaining nut not properly tightened and torqued. 2. Steering column lower bearing spring retainer slipped on steering column shaft. 3. Loose steering column to instrument panel fasteners.	1. Tighten the steering wheel retaining nut to its specified torque. 2. Replace steering column. 3. Tighten fasteners to specified torque.
STEERING WHEEL, DASH OR VEHICLE VIBRATES DURING LOW SPEED OR STANDSTILL STEERING MANEUVERS.	1. Air in the fluid of the power steering system. 2. Tires not properly inflated. 3. Excessive engine vibration. 4. Loose tie rod end jam nut. 5. Overcharged air conditioning system. 6. Grounded engine mount. 7. Loose outer tie rod.	1. Bleed air from system following the power steering pump initial operation service procedure.* 2. Inflate tires to the specified pressure. 3. Ensure that the engine is tuned properly. 4. Tighten the inner to outer tie rod jam nut to the specified torque. 5. Check air conditioning pump head pressure and correct as necessary. 6. Repair as necessary. 7. Replace outer tie rod.
STEERING CATCHES, SURGES OR STICKS IN CERTAIN POSITIONS OR IS DIFFICULT TO TURN. ***	1. Low power steering fluid level. 2. Tires not inflated to specified pressure. 3. Lack of lubrication in front lower control arm ball joints. 4. Worn or binding lower control arm ball joint. 5. Lack of lubrication in steering gear outer tie rod ends.	1. Fill power steering fluid reservoir to specified level and check for leaks. 2. Inflate tires to the specified pressure. 3. Lubricate ball joints if ball joints are not a lubricated-for-life type ball joint. If ball joint is a lubricated-for-life ball joint, replace ball joint. 4. Replace lower control arm ball joint. 5. Lubricate tie rod ends if they are not a lubricated-for-life type. If tie rod end is a lubricated-for-life type, replace tie rod end.

STEERING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
	6. Loose power steering pump drive belt. 7. Faulty power steering pump (Perform Power Steering Flow and Pressure Test). 8. Faulty power steering gear (Perform Power Steering Flow and Pressure Test). 9. Excessive friction in steering column or intermediate shaft/coupler. 10. Excessive friction in power steering gear. 11. Worn or binding seat and bearing in front strut assembly.	6. Tighten the power steering pump drive belt to specifications or replace automatic tensioner where applicable. If drive belt is worn or glazed, replace belt. 7. Replace power steering pump. 8. Replace power steering gear. 9. Isolate and correct condition. 10. Replace power steering gear. 11. Replace seat and bearing in front strut assembly.
STEERING WHEEL DOES NOT RETURN TO CENTER POSITION.	1. Tires not inflated properly. 2. Improper front wheel alignment. 3. Lack of lubrication causing binding in front lower control arm ball joints. 4. Steering column coupling joints misaligned. 5. Steering wheel rubbing.** 6. Damaged, mispositioned or unlubricated steering column coupler to dash seal.** 7. Binding mount bearing in front strut assembly. 8. Binding shaft bearing in steering column. 9. Excessive friction in steering column coupling. 10. Excessive friction in power steering gear.	1. Inflate tires to specified pressure. 2. Check and adjust wheel alignment as necessary. 3. Lubricate ball joints if ball joints are not a lubricated for life type of ball joint, then inspect ball joint for wear, replace lower control arm as necessary. If ball joint is a lubricated for life ball joint, replace lower control arm ball joint. 4. Realign steering column coupling joints. 5. Adjust steering column shrouds to eliminate rubbing condition. 6. Replace, reposition, or lubricate dash seal. 7. Replace mount bearing in front strut assembly. 8. Replace the steering column. 9. Replace steering column coupling. 10. Replace power steering gear.

STEERING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
EXCESSIVE STEERING WHEEL KICKBACK OR TOO MUCH STEERING WHEEL FREE PLAY.	1. Air in the fluid of the power steering system. 2. Power steering gear loose on cradle/crossmember. 3. Steering column coupling or intermediate shaft worn, broken or loose. 4. Free play in steering column. 5. Worn lower control arm ball joints. 6. Loose steering knuckle-to-ball joint stud pinch bolt. 7. Front wheel bearing loose or worn. 8. Loose outer tie rod end. 9. Loose inner tie rod. 10. Defective steering gear rotary valve.	1. Bleed air from system following the the power steering pump initial operation service procedure.* 2. Inspect power steering gear mounting bolts. Replace as necessary. Tighten to the specified torque. 3. Replace steering column coupling or intermediate shaft. 4. Check all components of the steering column and repair or replace as required. 5. Replace lower control arm ball joints as required. 6. Inspect pinch bolt, replace as necessary, and tighten to specified torque. 7. Replace hub and bearing as necessary. 8. Replace outer tie rod end that has excessive free play. 9. Replace power steering gear. 10. Replace power steering gear.

* NOTE: Steering shudder can be expected in new vehicles and vehicles with recent steering system repairs. Shudder should dissipate after the vehicle has been driven several weeks.

** NOTE: To evaluate this condition, it may be necessary to disconnect the coupling at the base of the steering column. Turn the steering wheel and feel or listen for internal rubbing in steering column. To avoid damaging the column clockspring, note the following. Before disconnecting coupling, place tires in the straight-ahead position and center steering wheel. Once disconnected, DO NOT rotate

steering wheel more than one revolution in either direction and place steering wheel in original location before reconnecting coupling. If this position is lost, the steering column clockspring must be recentered following the procedure found within the procedure for steering column installation in the steering column section.

*** NOTE: Increased low speed or stationary steering effort can be expected if the steering fluid is at a high temperature. High fluid temperature usually results from high engine rpm due to trailer towing, ascending grades, or racing the engine for prolonged periods of time.

POWER STEERING FLUID

CONDITION	POSSIBLE CAUSES	CORRECTION
LOW FLUID LEVEL WITH VISIBLE LEAK.	1. Loose power steering hose fittings. 2. Damaged or missing fitting seal, gasket, or O-ring. 3. Power steering component leaking.	1. Tighten the fitting to its specified torque. 2. Replace as necessary. 3. Repair or replace the leaking component as required.

STEERING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
AERATED FLUID.*	1. Low fluid level. 2. Air leak at supply hose, power steering fluid reservoir or pump. 3. Cracked power steering pump housing.	1. Fill power steering fluid reservoir to proper level. 2. Inspect for proper sealing. Repair as necessary. 3. Replace the power steering pump.
RESERVOIR FLUID OVERFLOW AND FLUID THAT IS MILKY IN COLOR	1. Water contamination of power steering fluid.	1. Drain the power steering fluid from the system. Flush the system with fresh clean power steering fluid, drain, then refill to the proper level.

* **NOTE:** Extremely cold temperatures may cause power steering fluid aeration. Aeration should subside as fluid warms.

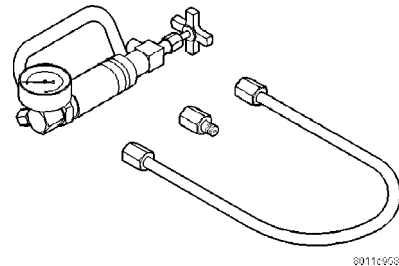
SPECIFICATIONS

POWER STEERING FASTENER TORQUE

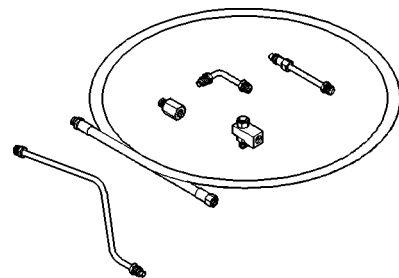
DESCRIPTION	TORQUE
Power Steering Pump:	
Flow Control Valve Pressure Fitting	75 N·m (55 ft. lbs.)
Mounting Bolts	54 N·m (40 ft. lbs.)
Rear Bracket To Engine Mounting Bolts	54 N·m (40 ft. lbs.)
Steering Gear:	
Mounting Bolt - Size-M14	183 N·m (135 ft. lbs.)
Mounting Bolts - Size-M12	95 N·m (70 ft. lbs.)
Tie Rod Steering Knuckle Nut	75 N·m (55 ft. lbs.)
Tie Rod Jam Nut	75 N·m (55 ft. lbs.)
Coupling Pinch Bolt	28 N·m (250 in. lbs.)
Power Steering Fluid Hoses:	
Hose Tube Nuts	31 N·m (275 in. lbs.)
Routing Bracket Bolts	23 N·m (200 in. lbs.)

SPECIAL TOOLS

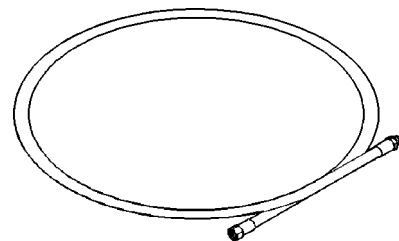
POWER STEERING



Power Steering Analyzer 6815



Adapters, Power Steering Analyzer 6893



Hose, Power Steering Analyzer 6959

COLUMN

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COLUMN

DESCRIPTION - STEERING COLUMN

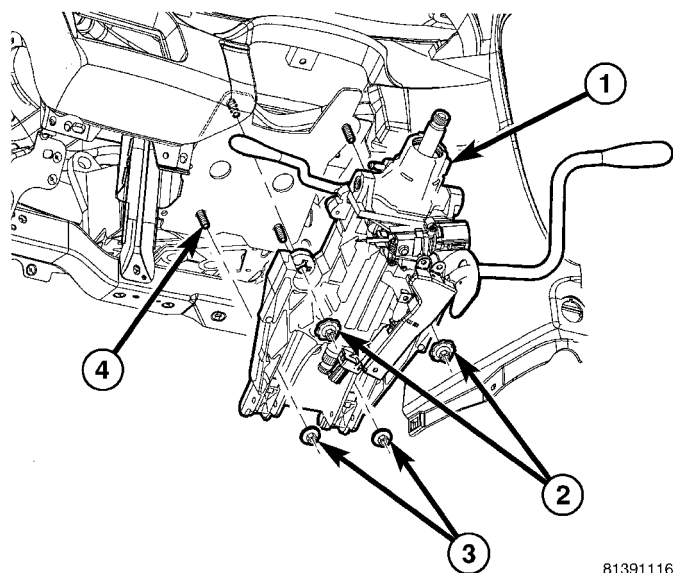


Fig. 1 Steering Column

- 1 - STEERING COLUMN
- 2 - UPPER MOUNTING NUTS
- 3 - LOWER MOUNTING NUTS
- 4 - MOUNTING STUDS

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- Key cylinder
- Ignition switch
- Multi-function switch
- Clockspring
- Halo
- Speed control switches
- Driver airbag
- Trim shrouds
- Steering wheel
- Intermediate shaft

These components of the steering column can be serviced without requiring removal of the steering column from the vehicle.

WARNING

WARNINGS AND CAUTIONS

(Refer to 8 - ELECTRICAL/RESTRAINTS - WARNING)

WARNING: BEFORE BEGINNING ANY SERVICE PROCEDURES THAT INVOLVES REMOVING THE AIR BAG. REMOVE AND ISOLATE THE NEGATIVE (-) BATTERY CABLE (GROUND) FROM THE VEHICLE BATTERY. THIS IS THE ONLY SURE WAY TO DISABLE THE AIR BAG SYSTEM. FAILURE TO DO THIS COULD RESULT IN ACCIDENTAL AIR BAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

The steering column has been designed to be serviced as a complete assembly (Fig. 1) except for the following serviceable components:

COLUMN (Continued)

WARNING: THE AIR BAG SYSTEM IS A SENSITIVE, COMPLEX ELECTRO-MECHANICAL UNIT. BEFORE ATTEMPTING TO DIAGNOSE, REMOVE OR INSTALL THE AIR BAG SYSTEM COMPONENTS YOU MUST FIRST DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE. THEN WAIT TWO MINUTES FOR THE SYSTEM CAPACITOR TO DISCHARGE. FAILURE TO DO SO COULD RESULT IN ACCIDENTAL DEPLOYMENT OF THE AIR BAG AND POSSIBLE PERSONAL INJURY. THE FASTENERS, SCREWS, AND BOLTS, ORIGINALLY USED FOR THE AIR BAG COMPONENTS, HAVE SPECIAL COATINGS AND ARE SPECIFICALLY DESIGNED FOR THE AIR BAG SYSTEM. THEY MUST NEVER BE REPLACED WITH ANY SUBSTITUTES. ANYTIME A NEW FASTENER IS NEEDED, REPLACE WITH THE CORRECT FASTENERS PROVIDED IN THE SERVICE PACKAGE OR FASTENERS LISTED IN THE PARTS BOOKS.

WARNING: SAFETY GOGGLES SHOULD BE WORN AT ALL TIMES WHEN WORKING ON STEERING COLUMNS.

CAUTION: Disconnect negative (ground) cable from the battery before servicing any column component.

CAUTION: Do not attempt to remove the pivot pins to disassemble the tilting mechanism. Damage will occur.

DIAGNOSIS AND TESTING - STEERING COLUMN

For diagnosis of conditions relating to the steering column, (Refer to 19 - STEERING - DIAGNOSIS AND TESTING).

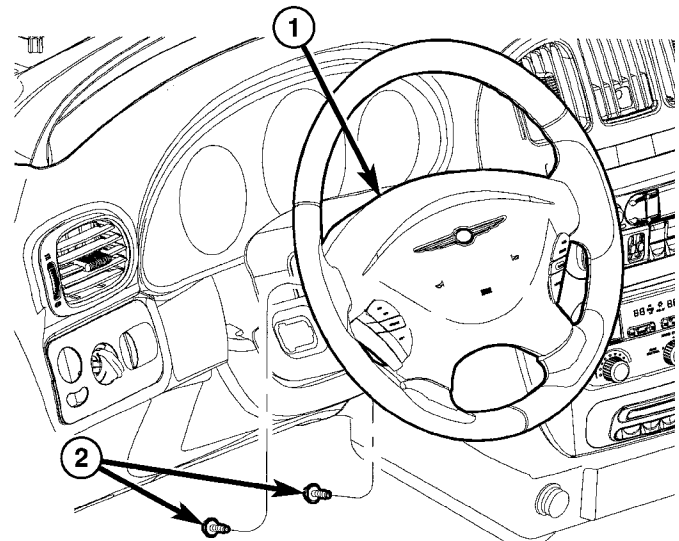
REMOVAL

NOTE: Before proceeding, (Refer to 19 - STEERING/COLUMN - WARNING)(Refer to 8 - ELECTRICAL/RESTRAINTS/DRIVER AIRBAG - REMOVAL).

(1) Make sure the front wheels of the vehicle are in the STRAIGHT AHEAD position before beginning the column removal procedure.

(2) Disconnect and isolate the negative (ground) cable from the battery. Wait at least two minutes for the airbag system reserve capacitor to discharge before beginning any steering column, instrument panel, or airbag system/component service.

WARNING: WHEN AN UNDEPLOYED AIRBAG IS TO BE REMOVED FROM THE VEHICLE, FIRST DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE. ALLOW THE AIRBAG SYSTEM RESERVE CAPACITOR TO DISCHARGE FOR TWO MINUTES BEFORE BEGINNING ANY AIRBAG SYSTEM OR COMPONENT SERVICE. PERSONAL INJURY MAY RESULT IF THIS PROCEDURE IS NOT FOLLOWED.



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Fig. 2 Driver Airbag Mounting

- 1 - DRIVER AIRBAG
- 2 - MOUNTING SCREWS

(3) Remove the driver airbag mounting screws (Fig. 2).

(4) Lift the airbag from its mount and disconnect two airbag squib, speed control and horn connectors (Fig. 3). Remove driver airbag. Properly store the driver airbag out of the way. (Refer to 8 - ELECTRICAL/RESTRAINTS - WARNING)

(5) Remove the steering wheel retaining bolt (Fig. 4).

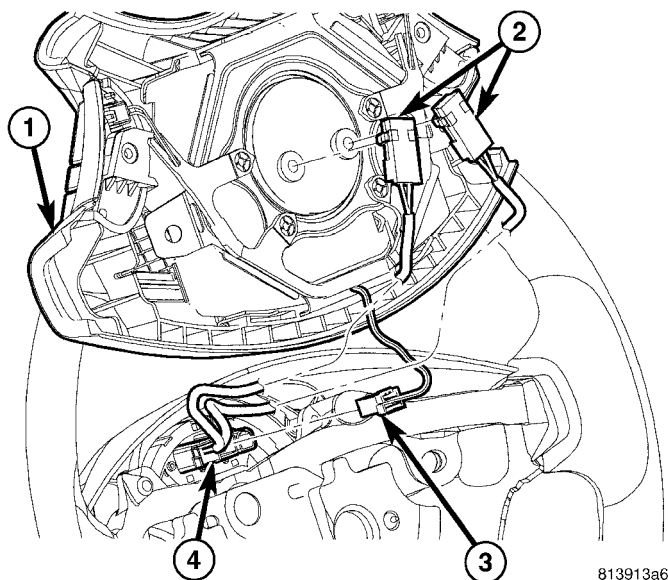
(6) Remove damper (Fig. 4).

(7) If equipped, disconnect the remote audio control switch wiring from the clockspring (Fig. 4).

CAUTION: Do not bump or hammer on steering column or steering column shaft when removing steering wheel from steering column shaft.

CAUTION: When installing steering wheel puller bolts in steering wheel, do not thread bolt into steering wheel more than a half inch. If the bolts are threaded into the steering wheel more than a half inch they will contact and damage the clockspring.

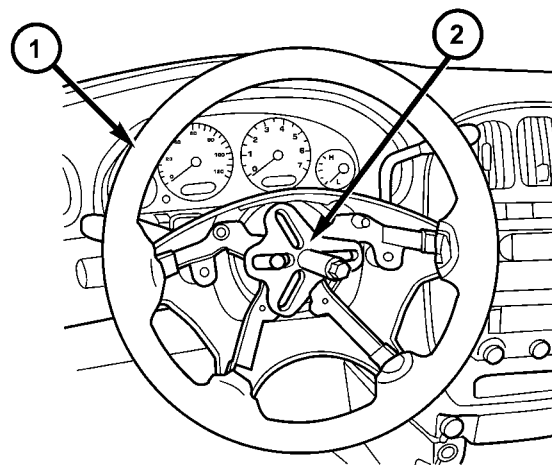
COLUMN (Continued)



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Fig. 3 Driver Airbag Wiring Connections

- 1 - DRIVER AIRBAG
- 2 - SQUIB CONNECTORS
- 3 - SPEED CONTROL/HORN WIRING CONNECTOR
- 4 - CLOCKSPRING



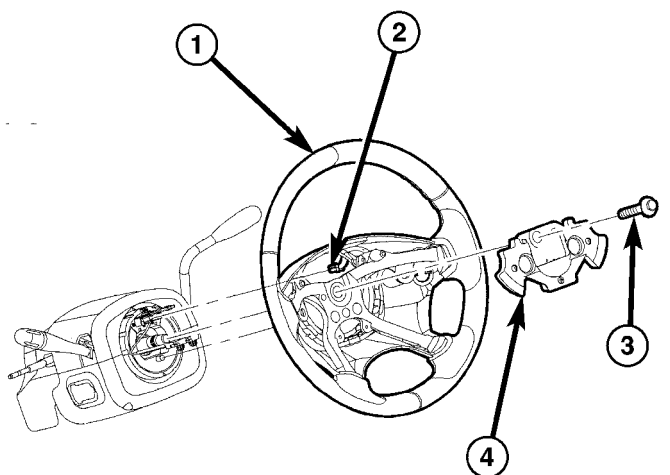
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Fig. 5 Steering Wheel Removal

- 1 - STEERING WHEEL
- 2 - PULLER

(10) Remove the parking brake release handle link.

(11) Remove the knee blocker/steering column cover plate (Refer to 23 - BODY/INSTRUMENT PANEL/KNEE BLOCKER - REMOVAL).



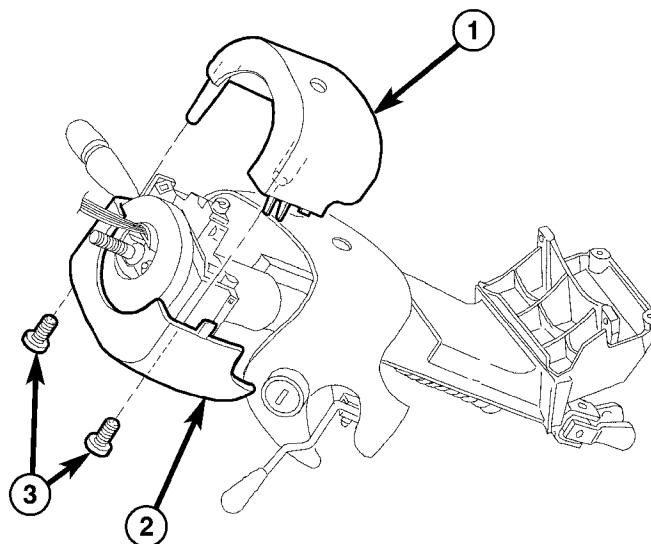
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Fig. 4 Steering Wheel Mounting

- 1 - STEERING WHEEL
- 2 - REMOTE AUDIO CONTROL WIRING CONNECTOR (IF EQUIPPED)
- 3 - RETAINING BOLT
- 4 - DAMPER

(8) Remove the steering wheel using a standard wheel puller (Fig. 5).

(9) Remove the knee blocker/steering column opening cover (Refer to 23 - BODY/INSTRUMENT PANEL/STEERING COLUMN OPENING COVER - REMOVAL).



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Fig. 6 Upper Shroud Mounting

- 1 - UPPER SHROUD
- 2 - LOWER SHROUD
- 3 - MOUNTING SCREWS

(12) Remove the upper shroud mounting screws (Fig. 6). Using hands on each side of the column, gently press inward at seams between the two shrouds at points of contact to disengage inner locking tabs, then remove upper shroud. If the vehicle is equipped with traction control, the lower shroud will need to be removed once the upper shroud is unfastened in order to disconnect the traction control wir-

COLUMN (Continued)

ing connector and remove the upper shroud with the traction control switch intact. Refer to the following steps.

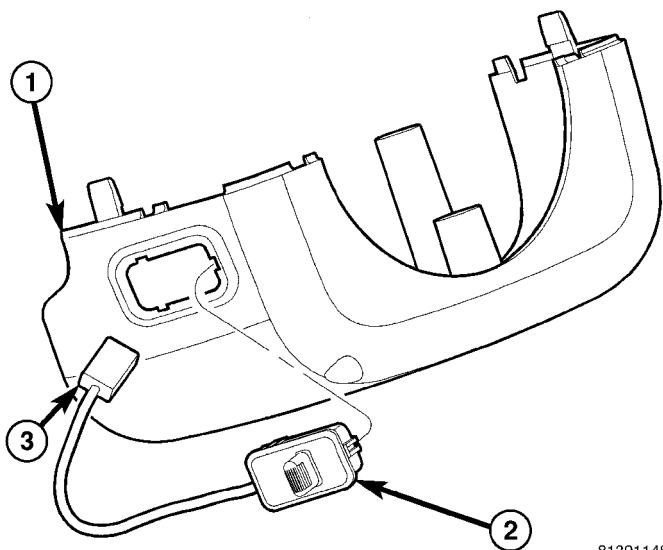


Fig. 7 Adjustable Pedals Switch Mounting

- 1 - LOWER SHROUD
- 2 - ADJUSTABLE PEDALS SWITCH
- 3 - WIRING CONNECTOR

(13) If equipped with adjustable pedals, disconnect the wiring connector for the switch (Fig. 7).

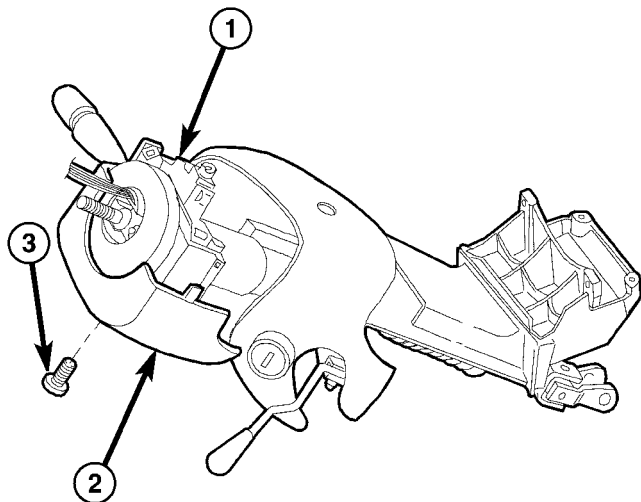


Fig. 8 Lower Shroud Mounting

- 1 - STEERING COLUMN
- 2 - LOWER SHROUD
- 3 - MOUNTING SCREW

(14) Remove the lower shroud mounting screw (Fig. 8), then remove the lower shroud.

(15) If equipped with traction control, disconnect the wiring connector from the column wiring harness

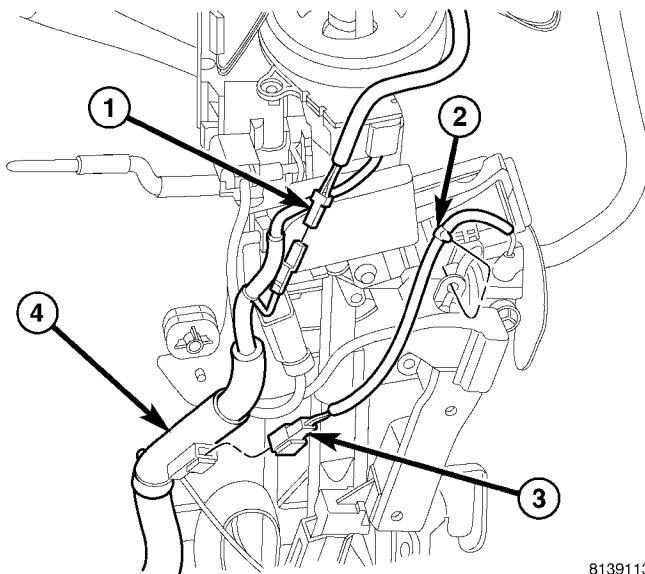


Fig. 9 Traction Control And Autostick Wiring Connections

- 1 - TRACTION CONTROL WIRING CONNECTOR
- 2 - ROUTING CLIP
- 3 - AUTOSTICK WIRING CONNECTOR
- 4 - COLUMN WIRING HARNESS

(Fig. 9). Remove the upper shroud with traction control switch.

(16) If equipped with Autostick, disconnect the wiring connector (Fig. 9).

(17) Remove the cluster trim bezel. (Refer to 23 - BODY/INSTRUMENT PANEL/CLUSTER BEZEL - REMOVAL)

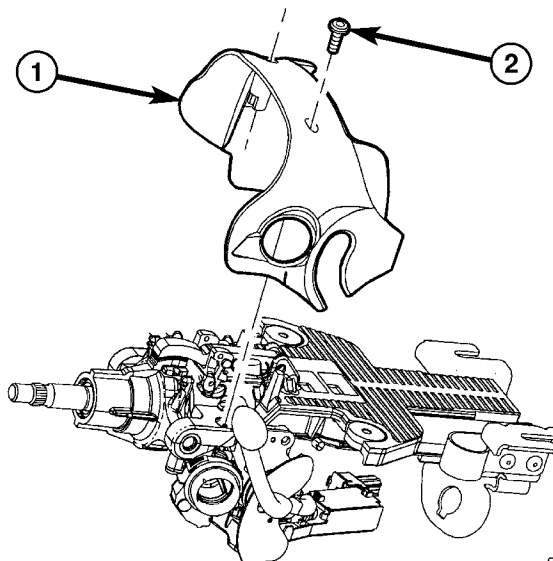
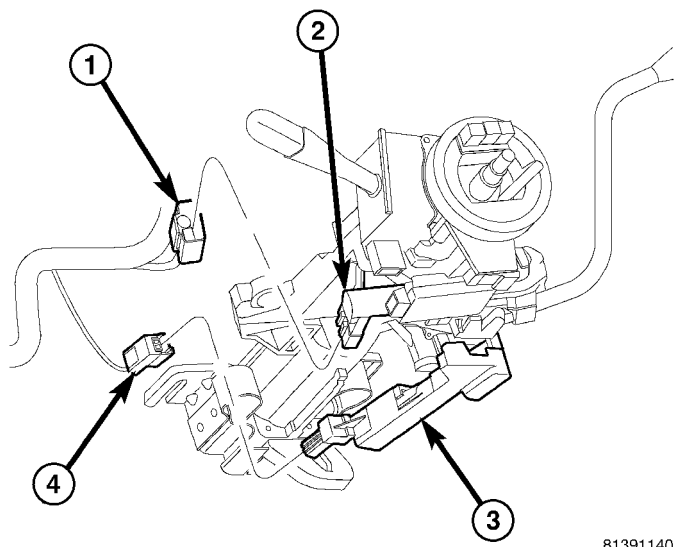


Fig. 10 Fixed Shroud Mounting

- 1 - FIXED SHROUD
- 2 - MOUNTING SCREWS

(18) Remove the screws fastening the fixed shroud in place (Fig. 10). Remove the fixed shroud.

COLUMN (Continued)

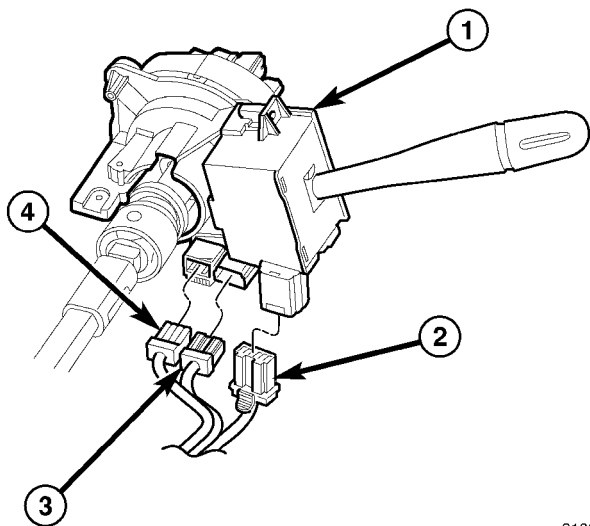


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Fig. 11 Ignition Switch And BTSI Wiring Connections

- 1 - WIRING CONNECTOR
- 2 - IGNITION SWITCH
- 3 - BTSI
- 4 - WIRING CONNECTOR

(19) Disconnect the column harness wiring connectors from the Brake Transmission Shift Interlock (BTSI) and ignition switch (Fig. 11).



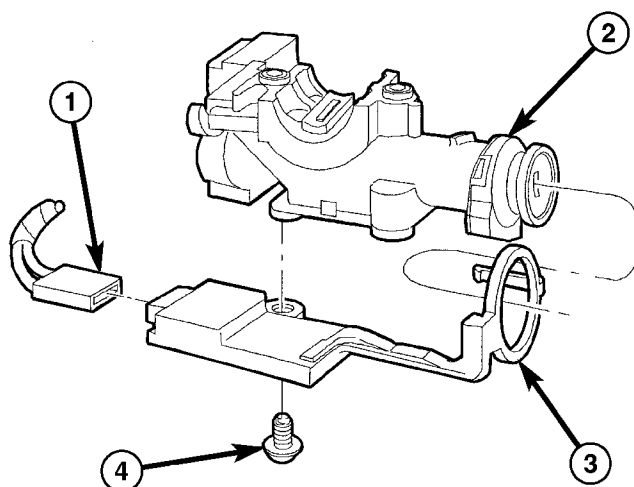
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Fig. 12 Multi-function And Clockspring Wiring Connections

- 1 - MULTI-FUNCTION SWITCH MOUNTING HOUSING
- 2 - MULTI-FUNCTION WIRING CONNECTOR
- 3 - CLOCKSPRING WIRING CONNECTOR
- 4 - CLOCKSPRING SQUIB WIRING CONNECTOR

(20) Disconnect the column harness wiring connector for the multi-function switch (Fig. 12).

(21) Disconnect the column harness wiring connectors for the clockspring and SQUIB (Fig. 12).

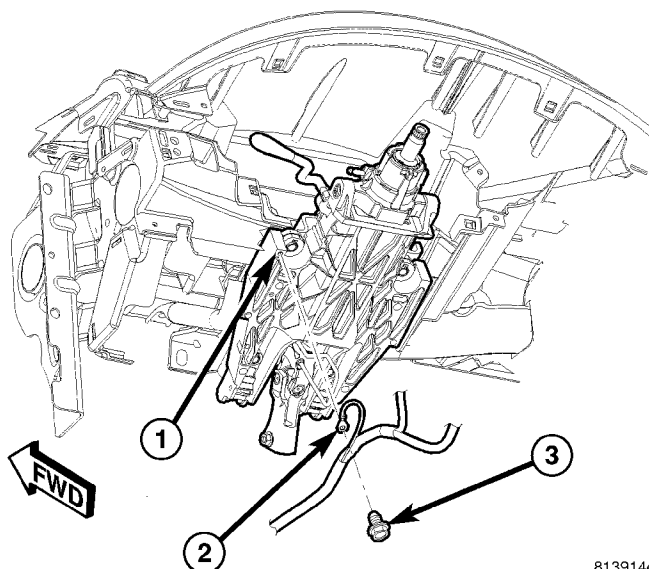


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Fig. 13 Sentry Key Immobilizer Module

- 1 - WIRING CONNECTOR
- 2 - IGNITION KEY CYLINDER HALO
- 3 - SKIM
- 4 - MOUNTING SCREW

(22) If equipped with Sentry Key Immobilizer, disconnect the wiring connector from the SKIM (Fig. 13).



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Fig. 14 Horn Ground At Column

- 1 - STEERING COLUMN
- 2 - HORN GROUND WIRE
- 3 - SCREW

(23) Remove screw fastening horn ground wire to column (Fig. 14).

COLUMN (Continued)

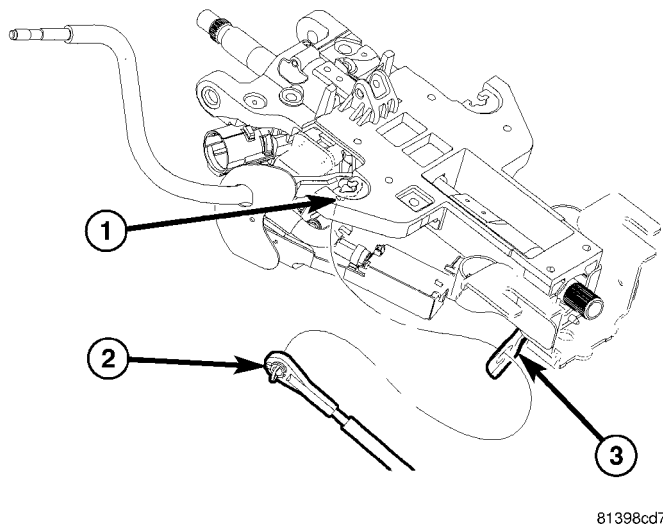


Fig. 15 Shift Cable Attachment To Column

- 1 - LEVER PIN
- 2 - SHIFT CABLE
- 3 - BRACKET

(24) Disconnect the shift cable at the lever pin (Fig. 15).

(25) Disconnect the shift cable at the bracket, then feed the cable out through bracket. (Fig. 15).

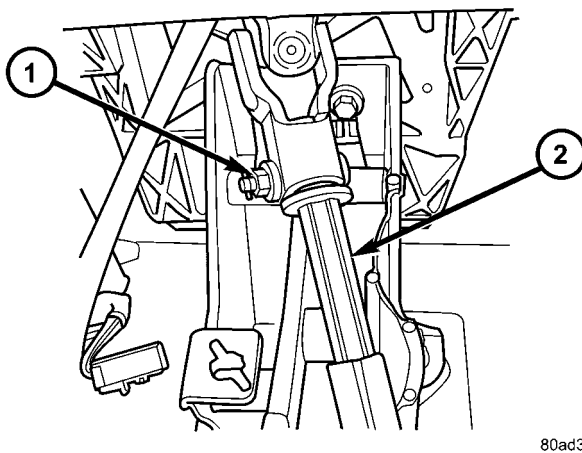


Fig. 16 Pinch Bolt

- 1 - PINCH BOLT
- 2 - STEERING COLUMN

(26) Remove the hair pin, then the pinch bolt (Fig. 16). Disconnect the column coupling.

(27) Loosen the column lower mounting nuts (Fig. 17).

(28) Remove the column upper mounting nuts (Fig. 17).

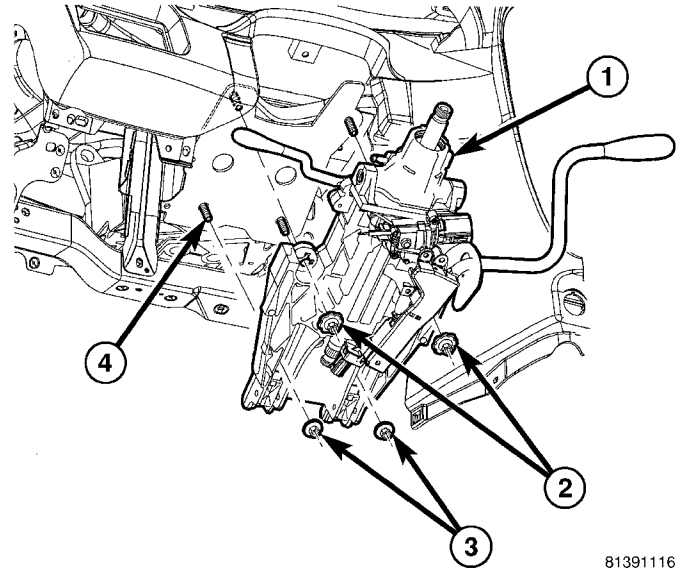


Fig. 17 Steering Column Mounting

- 1 - STEERING COLUMN
- 2 - UPPER MOUNTING NUTS
- 3 - LOWER MOUNTING NUTS
- 4 - MOUNTING STUDS

(29) Remove the steering column (Fig. 17).

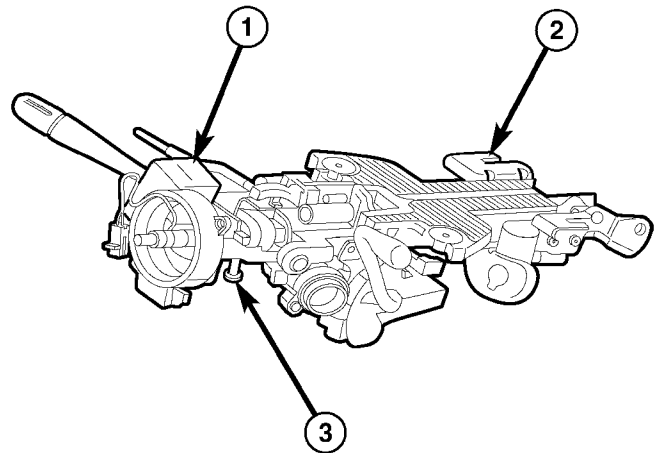
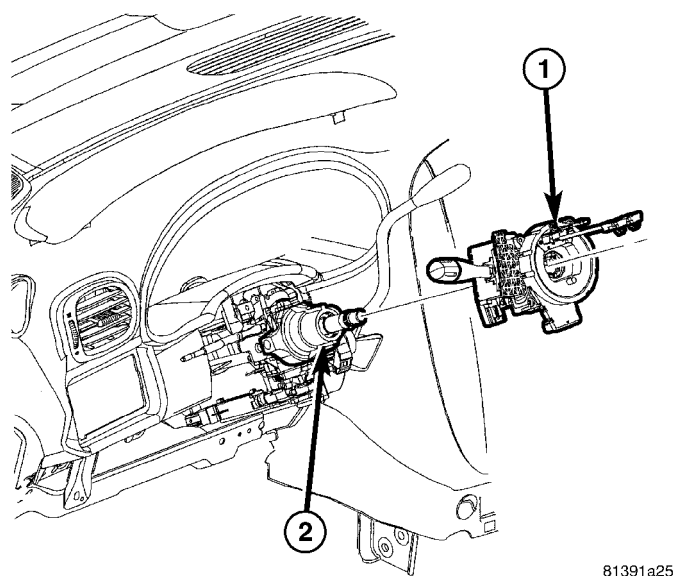


Fig. 18 Multi-Function Switch Mounting Housing Set-Screw

- 1 - MULTI-FUNCTION SWITCH MOUNTING HOUSING
- 2 - STEERING COLUMN
- 3 - SET-SCREW

(30) If the steering column is being replaced, remove the set-screw fastening the multi-function switch mounting housing to the column (Fig. 18).

COLUMN (Continued)

**Fig. 19 Multi-Function Switch Mounting Housing**

1 - MULTI-FUNCTION SWITCH MOUNTING HOUSING
2 - STEERING COLUMN

(31) If the steering column is being replaced, slide the multi-function switch mounting housing off the column (Fig. 19).

(32) If the steering column is being replaced, remove the mounting screw fastening the SKIM to the ignition key cylinder housing (Fig. 13). Remove the SKIM.

(33) If the steering column is being replaced, remove the halo from the ignition key cylinder housing (Fig. 13).

(34) If the steering column is being replaced, remove the ignition key lock cylinder (Refer to 19 - STEERING/COLUMN/KEY/LOCK CYLINDER - REMOVAL).

INSTALLATION

NOTE: Before proceeding, (Refer to 19 - STEERING/COLUMN - WARNING)(Refer to 8 - ELECTRICAL/RESTRAINTS/DRIVER AIRBAG - REMOVAL).

NOTE: Make sure the front wheels of the vehicle are still in the STRAIGHT AHEAD position before beginning the column installation procedure.

(1) If removed, install the ignition key lock cylinder (Refer to 19 - STEERING/COLUMN/KEY/LOCK CYLINDER - INSTALLATION).

(2) If removed, install the halo on the ignition key cylinder housing (Fig. 13).

(3) If removed, install SKIM (Fig. 13). Install the mounting screw fastening the SKIM to the ignition key cylinder housing. Tighten the screw to 4 N·m (30 in. lbs.) torque.

(4) If removed, slide the multi-function switch mounting housing onto the column (Fig. 19).

(5) If multi-function switch mounting housing is being installed, install the set-screw fastening the housing to the column (Fig. 18). Tighten the set-screw to 14 N·m (124 in. lbs.) torque.

(6) Install the steering column (Fig. 17). Slide the column lower mounting slots over the lower mounting studs (with nuts started) first, then lift column into place over the upper mounting studs.

(7) Install the two upper mounting nuts (Fig. 17). Tighten the two upper mounting nuts, then the two lower mounting nuts to 12 N·m (105 in. lbs.) torque.

(8) Match the column shaft coupling to the intermediate shaft and install the pinch bolt (Fig. 16). Tighten the pinch bolt nut to 28 N·m (250 in. lbs.) torque. Install the hair pin in the end of the pinch bolt.

(9) Feed the shift cable through the bracket on the column (Fig. 15), then install the clip fastening the cable housing to the bracket.

(10) Connect the shift cable to the lever pin (Fig. 15).

(11) Install the screw fastening the horn ground wire to the column (Fig. 14). Tighten the screw to 7 N·m (60 in. lbs.) torque.

(12) If equipped with Sentry Key Immobilizer, connect the wiring connector to the SKIM (Fig. 13).

(13) Connect the column harness wiring connectors for the clockspring and SQUIB (Fig. 12).

(14) Connect the column harness wiring connector for the multi-function switch (Fig. 12).

(15) Connect the column harness wiring connectors for the Brake Transmission Shift Interlock (BTSI) and ignition switch (Fig. 11).

(16) Install the fixed shroud (Fig. 10). Install the screws fastening the fixed shroud in place and tighten the screws to 3 N·m (23 in. lbs.) torque.

(17) If equipped with Autostick, connect the wiring connector (Fig. 9).

(18) If equipped with traction control, position the upper shroud above the column and route the switch wiring down around the column. Connect the wiring connector from the column wiring harness to the traction control switch wiring (attached to upper shroud) (Fig. 9).

COLUMN (Continued)

(19) Position the lower shroud on the column (Fig. 8). Install the lower shroud mounting screw. Tighten the screw to 2 N·m (17 in. lbs.) torque.

(20) If equipped with adjustable pedals, Connect the wiring connector for the switch (Fig. 7) to the column wiring harness.

(21) Position the upper shroud on top of the lower shroud and snap it into place. Install the upper shroud mounting screws (Fig. 6). Tighten the screws to 2 N·m (17 in. lbs.) torque.

(22) Inspect shroud mating surfaces for excessive gaps and correct as necessary.

(23) Install the cluster trim bezel (Refer to 23 - BODY/INSTRUMENT PANEL/CLUSTER BEZEL - INSTALLATION).

(24) Install the knee blocker/steering column cover plate. (Refer to 23 - BODY/INSTRUMENT PANEL/ KNEE BLOCKER - INSTALLATION)

(25) Install the parking brake handle link.

(26) Install the knee blocker/steering column opening cover. (Refer to 23 - BODY/INSTRUMENT PANEL/STEERING COLUMN OPENING COVER - INSTALLATION)

(27) Align the splines and install the steering wheel on the steering column shaft(Refer to 19 - STEERING/COLUMN/STEERING WHEEL - INSTALLATION).

(28) Install the damper over the steering column shaft (Fig. 4).

(29) Install the steering wheel retaining bolt (Fig. 4). Tighten the bolt to 61 N·m (45 ft. lbs.) torque.

(30) If the steering wheel is equipped with remote audio controls, connect the wiring connector to the clockspring (Fig. 4).

(31) Connect the two squib connectors to the driver airbag (Fig. 3). The connectors are color coded to avoid connector mix-up.

(32) Connect the speed control and horn connector to the clockspring (Fig. 3).

(33) Install the airbag to the steering wheel. Install the driver airbag mounting screws (Fig. 2). Tighten screws to 10 N·m (90 in. lbs.) torque.

(34) Connect the battery negative (ground) cable to battery post following special Diagnosis And Testing procedure. (Refer to 8 - ELECTRICAL/RESTRAINTS - DIAGNOSIS AND TESTING)

(35) Check operation of all steering column mounted components.

(36) Road test vehicle to ensure proper operation of steering.

SPECIFICATIONS

COLUMN FASTENER TORQUE

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Driver Airbag Mounting Screws	10	—	90
Multi-Function Switch Mounting Housing Set-Screw	14	—	124
Shroud Attaching Screws - Fixed	3	—	23
Shroud Attaching Screws - Lower/Upper	2	—	17
SKIM Attaching Screw	4	—	30
Steering Column Coupling Pinch Bolt	28	—	250
Steering Column Mounting Nuts	12	—	105
Steering Wheel Retaining Bolt	61	45	—

IGNITION SWITCH

REMOVAL

The ignition switch attaches to the lock cylinder housing on the end opposite the lock cylinder (Fig. 20). For ignition switch terminal and circuit identification, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

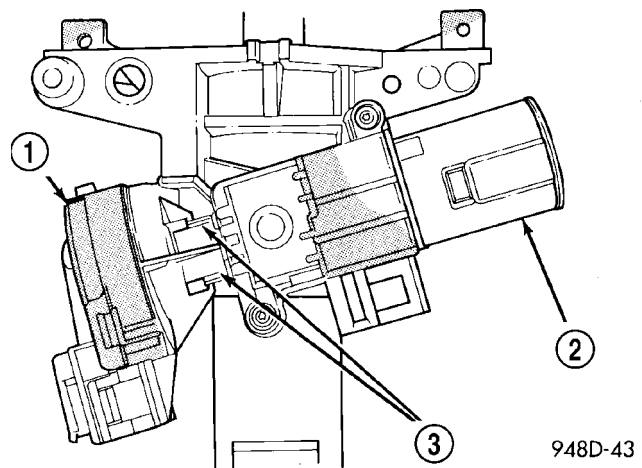


Fig. 20 Ignition Switch—Viewed From Below Column

- 1 - IGNITION SWITCH
- 2 - LOCK CYLINDER HOUSING
- 3 - RETAINING TABS

(1) Disconnect negative cable from battery.

IGNITION SWITCH (Continued)

(2) Remove steering column cover retaining screws (Fig. 21).

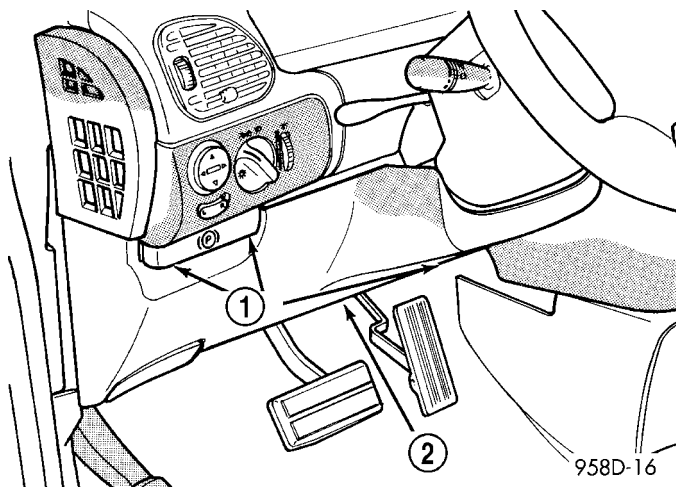


Fig. 21 Steering Column Cover

- 1 - SCREWS
- 2 - STEERING COLUMN COVER

(3) Remove parking brake release cable from handle (Fig. 22).

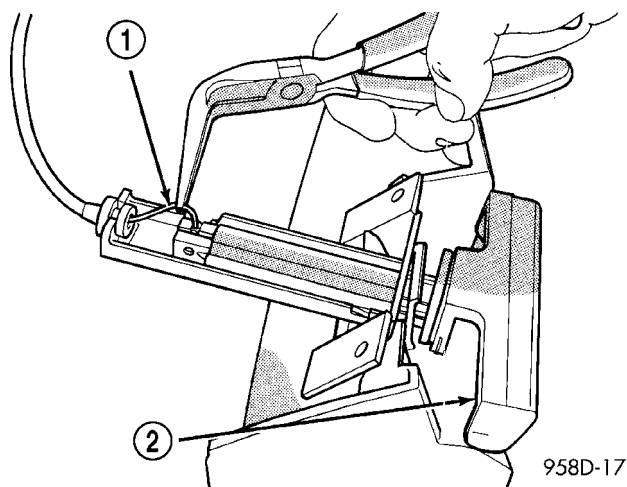


Fig. 22 Parking Brake Release Cable

- 1 - PARKING BRAKE CABLE
- 2 - PARKING BRAKE HANDLE

(4) Remove screws holding steering column shrouds (Fig. 23) and remove lower shroud.

(5) Place key cylinder in RUN position. Depress lock cylinder retaining tab and remove key cylinder (Fig. 24).

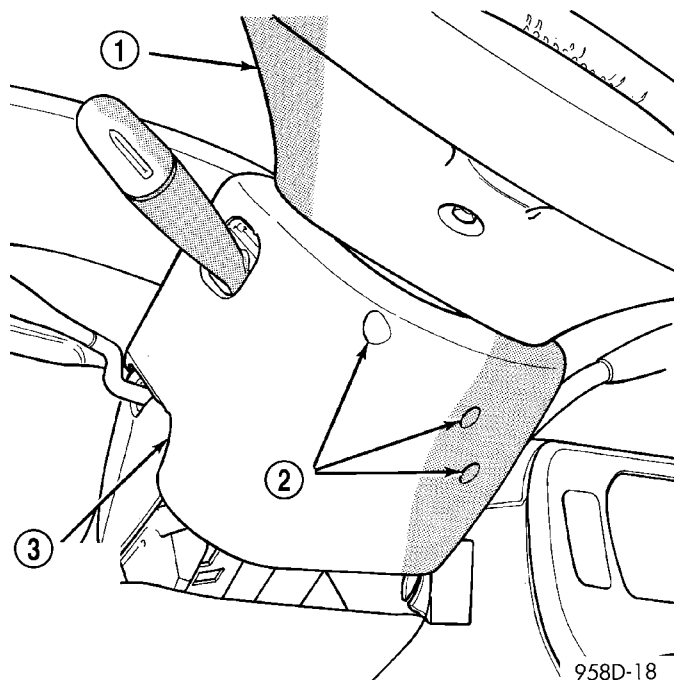


Fig. 23 Steering Column Shroud Screws

- 1 - STEERING WHEEL
- 2 - SCREWS
- 3 - LOWER STEERING COLUMN SHROUD

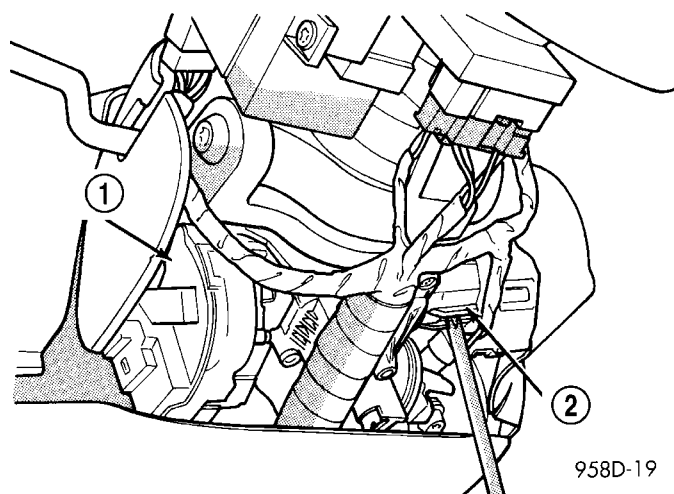


Fig. 24 Lock Cylinder Retaining Tab

- 1 - IGNITION SWITCH
- 2 - RETAINING TAB

IGNITION SWITCH (Continued)

(6) Remove ignition switch mounting screw (Fig. 25) with a #10 Torx® tamper proof bit.

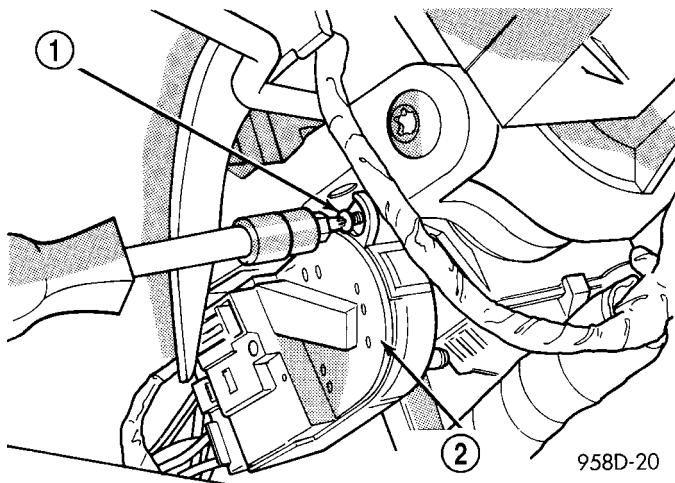


Fig. 25 Ignition Switch Mounting Screw

- 1 - MOUNTING SCREW
- 2 - IGNITION SWITCH

(7) Depress retaining tab (Fig. 21) or (Fig. 26) and gently pry ignition switch from steering column (Fig. 27).

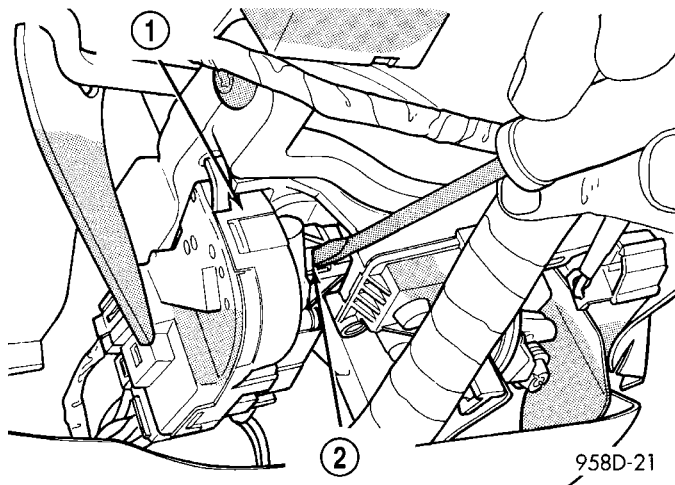


Fig. 26 Ignition Switch Retaining Tab

- 1 - IGNITION SWITCH
- 2 - RETAINING TAB

(8) Disconnect electrical connectors from ignition switch and remove switch (Fig. 28).

INSTALLATION

The ignition switch attaches to the lock cylinder housing on the end opposite the lock cylinder (Fig. 20). For ignition switch terminal and circuit identification, refer to the Wiring Diagrams section.

(1) Ensure the ignition switch is in the RUN position and the actuator shaft in the lock housing is in the RUN position.

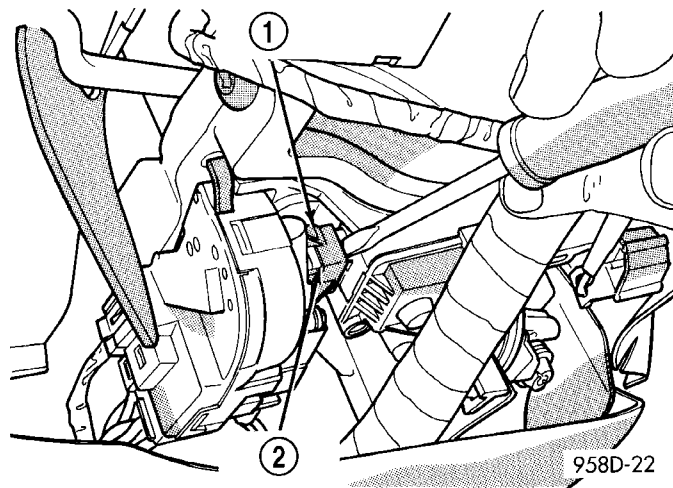


Fig. 27 Removing Ignition Switch

- 1 - IGNITION SWITCH
- 2 - RETAINING TAB

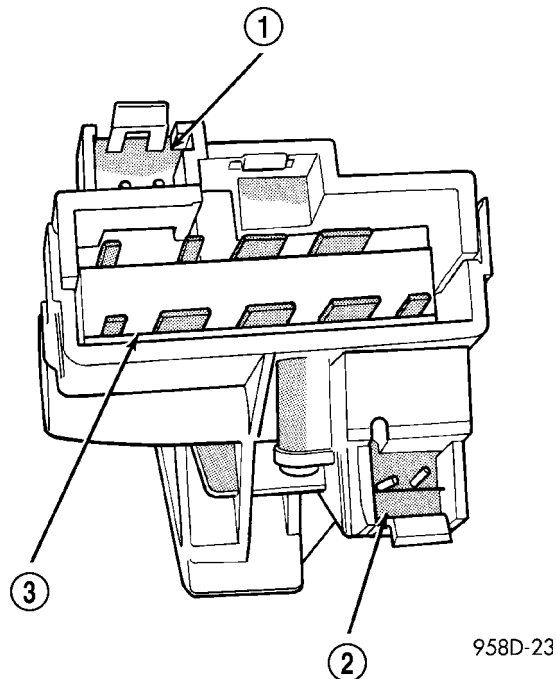


Fig. 28 Ignition Switch Connectors

- 1 - KEY IN SWITCH
- 2 - PRNDL SWITCH
- 3 - IGNITION SWITCH

(2) Install electrical connectors to ignition switch.

(3) Carefully install the ignition switch. The switch will snap over the retaining tabs (Fig. 29). Install mounting screw (Fig. 25).

(4) Install upper and lower shrouds.

(5) Install key cylinder (cylinder retaining tab will depress only in the RUN position).

IGNITION SWITCH (Continued)

(6) Connect negative cable to battery.

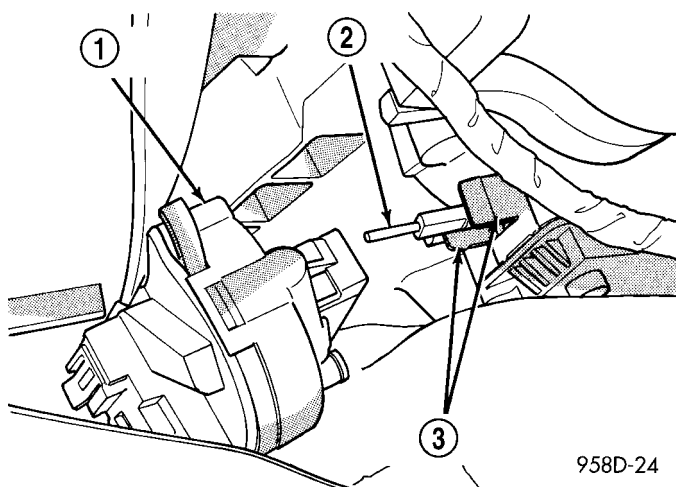


Fig. 29 Ignition Switch Installation

- 1 - IGNITION SWITCH
- 2 - ACTUATOR SHAFT
- 3 - RETAINING TABS

(7) Check for proper operation of ignition switch and key-in warning switch.

KEY/LOCK CYLINDER

DESCRIPTION

The lock cylinder is inserted in the end of the housing opposite the ignition switch.

OPERATION

The ignition key rotates the cylinder to 5 different detents (Fig. 30) :

- Accessory
- Off (lock)
- Unlock
- On/Run
- Start

REMOVAL

- (1) Disconnect negative cable from battery.
- (2) Remove steering column cover retaining screws.
- (3) Remove screws holding steering column shrouds and remove lower shroud.
- (4) Place key cylinder in RUN position. Depress lock cylinder retaining tab on the bottom of the lock housing and remove key cylinder.

INSTALLATION

- (1) Install key in lock cylinder. Turn key to run position (retaining tab on lock cylinder can be depressed).

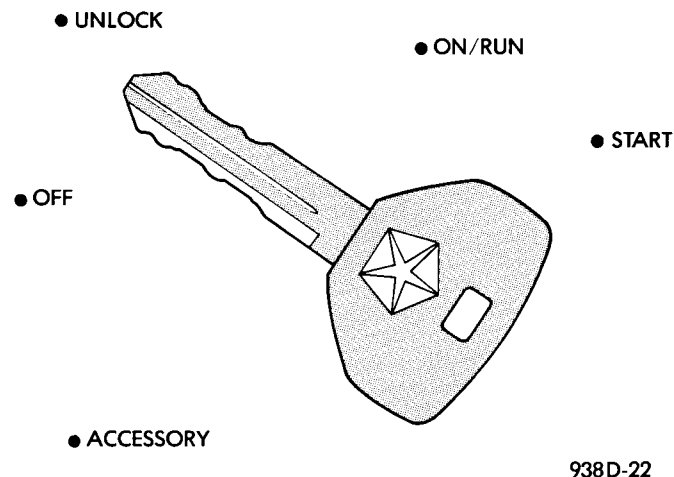


Fig. 30 Ignition Lock Cylinder Detents

(2) The shaft at the end of the lock cylinder aligns with the socket in the end of the housing. To align the socket with the lock cylinder, ensure the socket is in the Run position (Fig. 31).

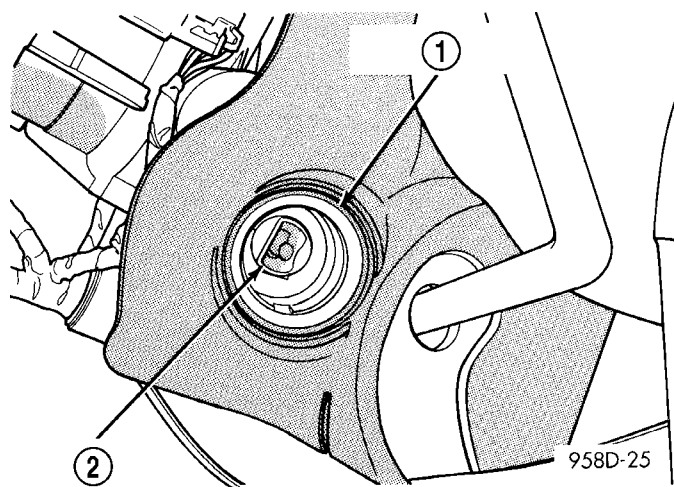


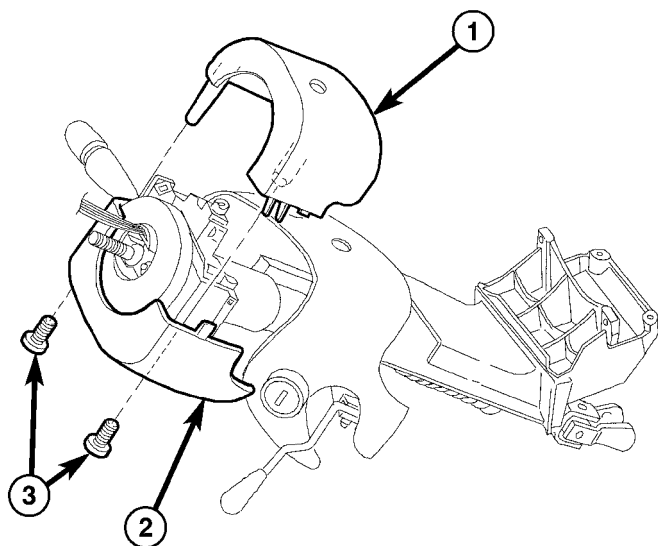
Fig. 31 Socket in Lock Cylinder Housing

- 1 - LOCK CYLINDER HOUSING
- 2 - SOCKET

- (3) Align the lock cylinder with the grooves in the housing. Slide the lock cylinder into the housing until the tab sticks through the opening in the housing.
- (4) Turn the key to the Off position. Remove the key.
- (5) Install lower steering column shroud.
- (6) Install steering column cover.
- (7) Connect negative cable to battery.

SHROUD - LOWER

REMOVAL



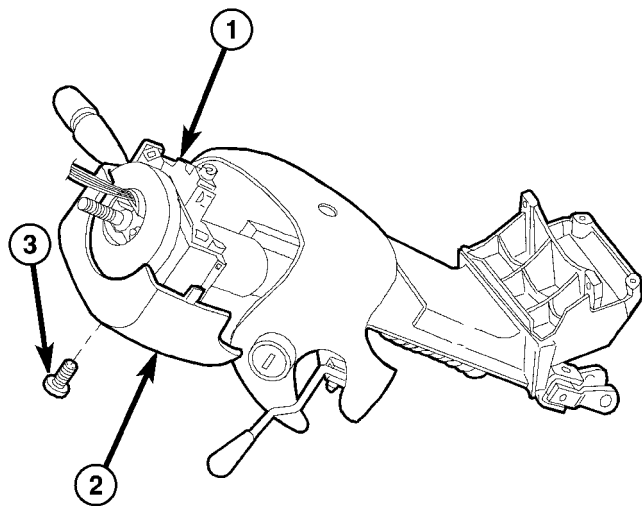
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Fig. 32 Upper Shroud Mounting

- 1 - UPPER SHROUD
2 - LOWER SHROUD
3 - MOUNTING SCREWS

(1) Remove the two shroud-to-shroud mounting screws fastening the upper to lower shrouds (Fig. 32).

(2) Using hands on each side of the column, gently press inward at seams between the two shrouds at points of contact to disengage inner locking tabs.

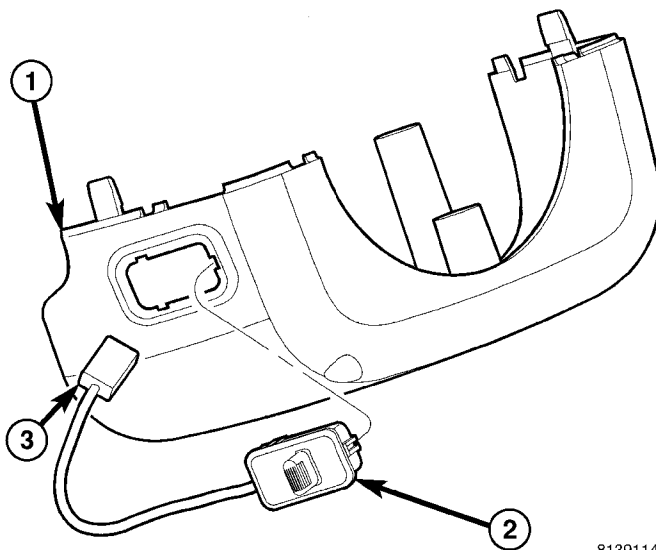


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Fig. 33 Lower Shroud Mounting

- 1 - STEERING COLUMN
2 - LOWER SHROUD
3 - MOUNTING SCREW

(3) Remove the lower shroud-to-column mounting screw (Fig. 33).



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Fig. 34 Adjustable Pedals Switch Mounting

- 1 - LOWER SHROUD
2 - ADJUSTABLE PEDALS SWITCH
3 - WIRING CONNECTOR

(4) If equipped with adjustable pedals, disconnect the wiring connector for the switch (Fig. 34).

(5) Remove the lower shroud from the steering column.

(6) If equipped with adjustable pedals, depress the retaining tabs on the switch and remove the switch from the lower shroud (Fig. 34).

INSTALLATION

(1) If the vehicle is equipped with adjustable pedals:

(a) Pass the wiring through the mounting hole and install the switch into the lower shroud (Fig. 34), snapping it into place.

(b) Connect the switch wiring connector to the column wiring harness.

(2) Position the lower shroud under the steering column and install the lower shroud-to-column mounting screw (Fig. 33). Tighten the screw to 2 N·m (17 in. lbs.) torque.

(3) Align the upper shroud with the lower, then snap shrouds together at locking tab locations on both sides of column.

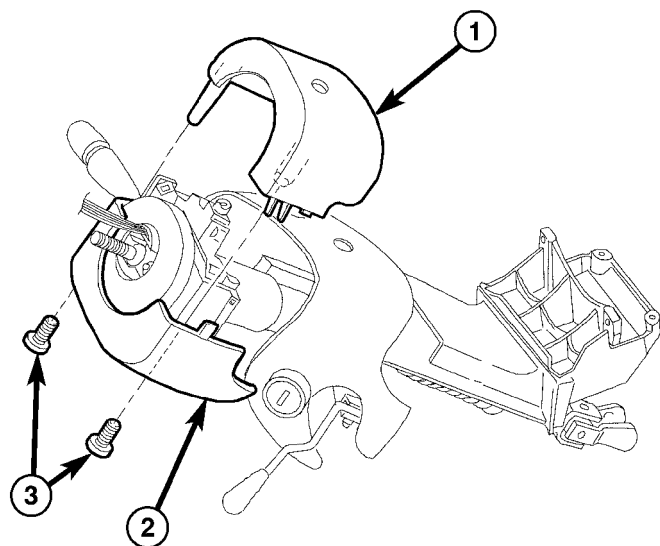
(4) Install the two shroud-to-shroud mounting screws (Fig. 32). Tighten the screws to 2 N·m (17 in. lbs.) torque.

(5) Inspect shroud mating surfaces for excessive gaps and correct as necessary.

(6) Check operation of any previously disconnected switches.

SHROUD - UPPER

REMOVAL



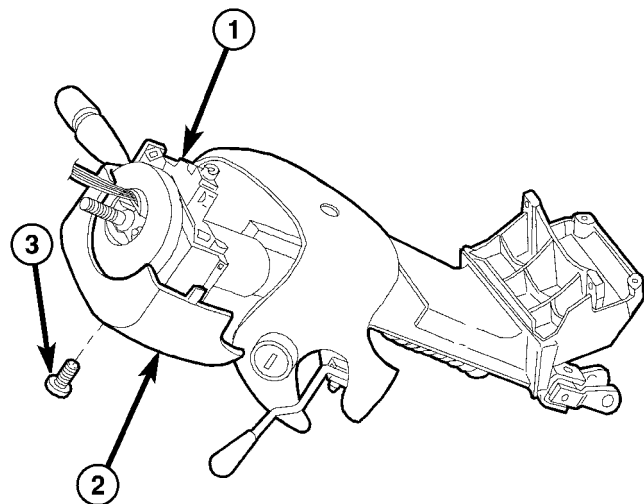
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Fig. 35 Upper Shroud Mounting

- 1 - UPPER SHROUD
- 2 - LOWER SHROUD
- 3 - MOUNTING SCREWS

(1) Remove the two shroud-to-shroud mounting screws fastening the upper to lower shrouds (Fig. 35).

(2) Using hands on each side of the column, gently press inward at seams between the two shrouds at points of contact to disengage inner locking tabs.

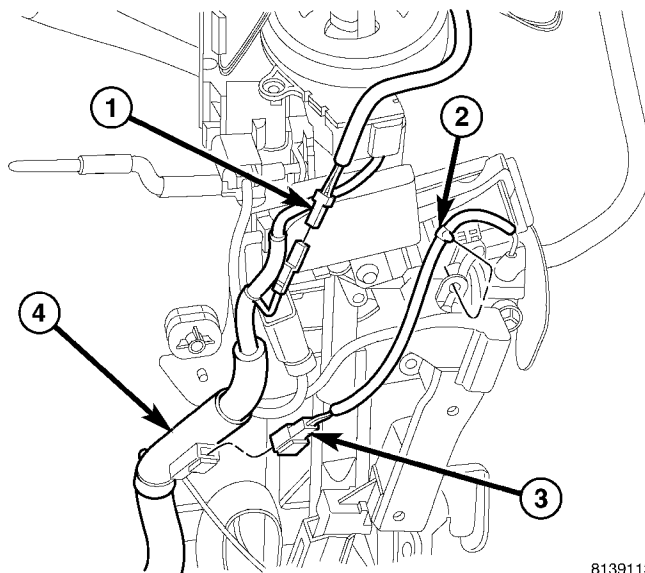


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Fig. 36 Lower Shroud Mounting

- 1 - STEERING COLUMN
- 2 - LOWER SHROUD
- 3 - MOUNTING SCREW

(3) If the vehicle is equipped with traction control, remove the lower shroud-to-column mounting screw (Fig. 36).



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Fig. 37 Traction Control And Autostick Wiring Connections

- 1 - TRACTION CONTROL WIRING CONNECTOR
- 2 - ROUTING CLIP
- 3 - AUTOSTICK WIRING CONNECTOR
- 4 - COLUMN WIRING HARNESS

(4) If the vehicle is equipped with traction control, disconnect the switch wiring connector from the column wiring harness (Fig. 37).

(5) If the vehicle is equipped with power foldaway mirrors (Export), disconnect wiring connector at mirror switch pig tail.

(6) Remove the upper shroud from the steering column.

(7) If the vehicle is equipped with traction control, remove the switch wiring from the routing clip attached to the upper shroud (Fig. 38).

(8) If the vehicle is equipped with traction control, remove the traction control switch from the upper shroud (Fig. 39).

(9) If the vehicle is equipped with power foldaway mirrors (Export), remove power foldaway switch from upper shroud.

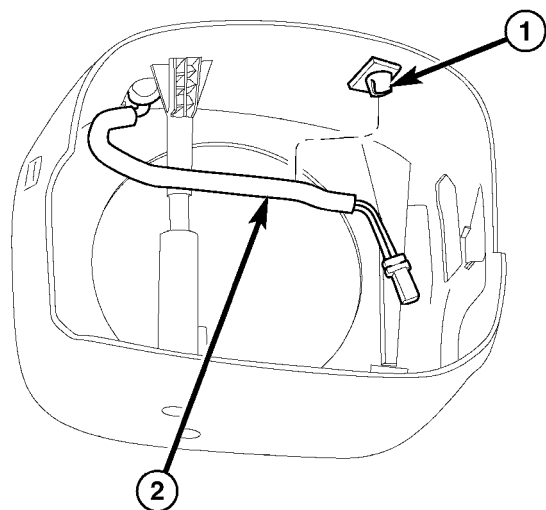
INSTALLATION

(1) If the vehicle is equipped with power foldaway mirrors (Export), install the power foldaway switch in the upper shroud.

(2) If vehicle is equipped with traction control, install the traction control switch in the upper shroud (Fig. 39).

(3) If the vehicle is equipped with traction control, attach the switch wiring to the routing clip attached to the upper shroud (Fig. 38).

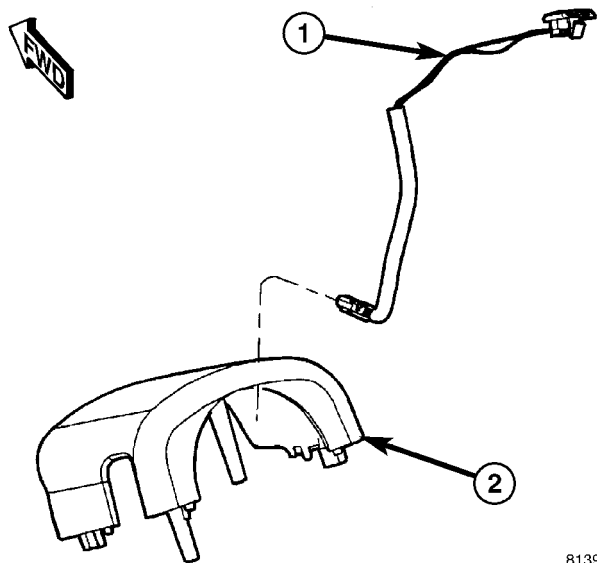
SHROUD - UPPER (Continued)



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Fig. 38 Traction Control Switch Routing Clip

- 1 - ROUTING CLIP
2 - SWITCH WIRING



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Fig. 39 Traction Control Switch Mounting

- 1 - TRACTION CONTROL SWITCH
2 - UPPER SHROUD

(4) Position the upper shroud on the column (Fig. 35).

(5) If equipped with traction control, route the switch wiring down around the column. Connect the wiring connector from the column wiring harness to the traction control switch wiring (attached to upper shroud) (Fig. 37).

(6) If removed, position the lower shroud on the column (Fig. 36). Install the lower shroud mounting screw. Tighten the screw to 2 N·m (17 in. lbs.) torque.

(7) Align the upper shroud with the lower, then snap shrouds together at locking tab locations on both sides of column.

(8) Install the two shroud-to-shroud mounting screws (Fig. 35). Tighten the screws to 2 N·m (17 in. lbs.) torque.

(9) Inspect shroud mating surfaces for excessive gaps and correct as necessary.

(10) Check operation of any previously disconnected switches.

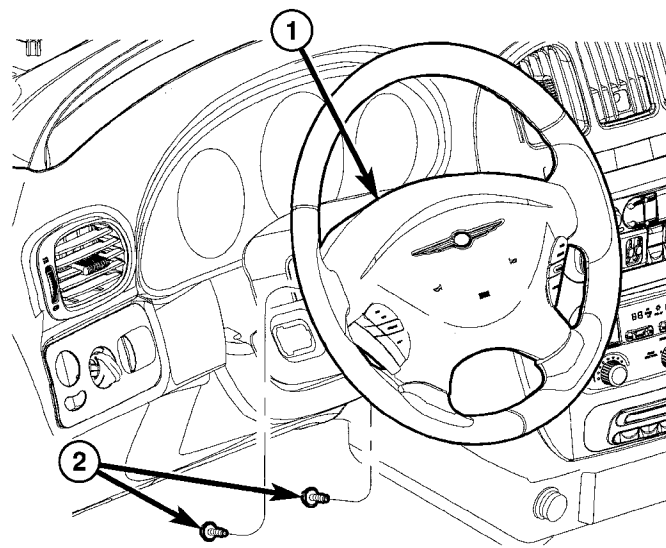
STEERING WHEEL

REMOVAL

NOTE: Before proceeding, (Refer to 19 - STEERING/COLUMN - WARNING)(Refer to 8 - ELECTRICAL/RESTRAINTS - WARNING).

(1) Disconnect and isolate the negative (ground) cable from the battery. Wait at least two minutes for the airbag system reserve capacitor to discharge before beginning any steering column, instrument panel, or airbag system/component service.

WARNING: WHEN AN UNDEPLOYED AIRBAG IS TO BE REMOVED FROM THE VEHICLE, FIRST DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE. ALLOW THE AIRBAG SYSTEM RESERVE CAPACITOR TO DISCHARGE FOR TWO MINUTES BEFORE BEGINNING ANY AIRBAG SYSTEM OR COMPONENT SERVICE. PERSONAL INJURY MAY RESULT IF THIS PROCEDURE IS NOT FOLLOWED.



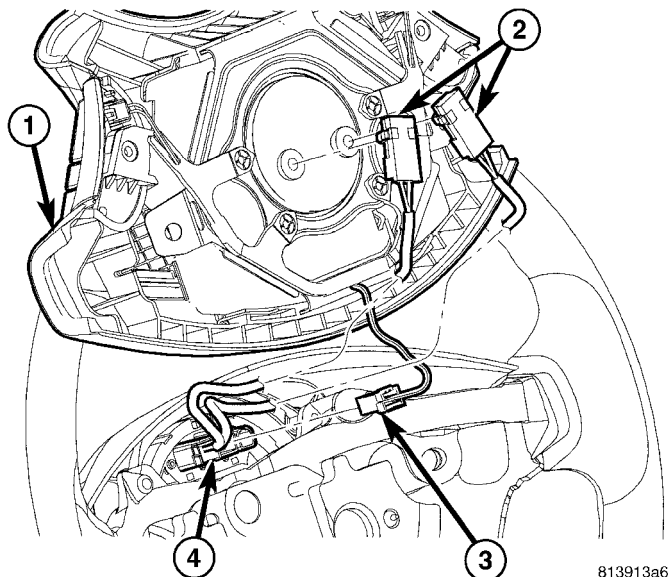
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Fig. 40 Driver Airbag Mounting

- 1 - DRIVER AIRBAG
2 - MOUNTING SCREWS

STEERING WHEEL (Continued)

(2) Remove the driver airbag mounting screws (Fig. 40).

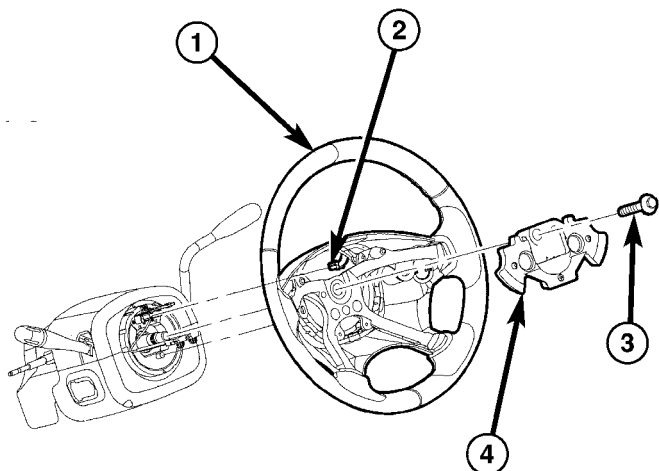


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Fig. 41 Driver Airbag Wiring Connections

- 1 - DRIVER AIRBAG
- 2 - SQUIB CONNECTORS
- 3 - SPEED CONTROL/HORN WIRING CONNECTOR
- 4 - CLOCKSPrING

(3) Lift the airbag from its mount and disconnect two airbag squib, speed control and horn connectors (Fig. 41). Remove driver airbag. Properly store the driver airbag out of the way. (Refer to 8 - ELECTRICAL/RESTRAINTS - WARNING)



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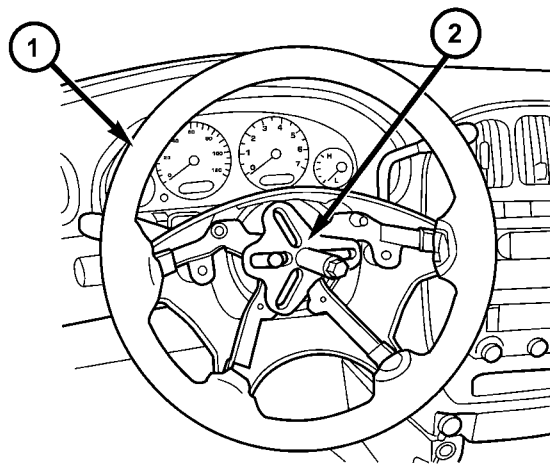
Fig. 42 Steering Wheel Mounting

- 1 - STEERING WHEEL
- 2 - REMOTE AUDIO CONTROL WIRING CONNECTOR (IF EQUIPPED)
- 3 - RETAINING BOLT
- 4 - DAMPER

(4) Remove the steering wheel retaining bolt (Fig. 42).

(5) Remove damper (Fig. 42).

(6) If equipped, disconnect the remote audio control switch wiring from the clockspring (Fig. 42).



80ad3ad3

Fig. 43 Steering Wheel Removal

- 1 - STEERING WHEEL
- 2 - PULLER

CAUTION: Do not bump or hammer on steering column or steering column shaft when removing steering wheel from steering column shaft.

CAUTION: When installing steering wheel puller bolts in steering wheel, do not thread bolt into steering wheel more than a half inch. If the bolts are threaded into the steering wheel more than a half inch they will contact and damage the clockspring.

(7) While holding the steering wheel firmly in the **straight-ahead** position, remove the steering wheel from steering column shaft using a steering wheel puller (Fig. 43).

(8) Remove the puller from the steering wheel.

(9) If the remote audio switches need removed from the steering wheel, (Refer to 8 - ELECTRICAL/AUDIO/REMOTE SWITCHES - REMOVAL).

INSTALLATION

(1) If the remote radio switches need to be installed on the steering wheel, (Refer to 8 - ELECTRICAL/AUDIO/REMOTE SWITCHES - INSTALLATION).

CAUTION: Do not force steering wheel onto steering column shaft by driving it on. Pull steering wheel down onto shaft using only the steering wheel retaining nut.

STEERING WHEEL (Continued)

(2) Feed and route wiring from clockspring through upper access hole in steering wheel.

(3) Align master serrations in steering wheel with omitted spline on steering column shaft (at 12 o'clock position). Slide the steering wheel onto the steering column shaft by hand (Fig. 42). Use care not to pinch any wiring.

NOTE: Before installing the damper on the steering wheel, inspect the damper to ensure the rubber isolator on the damper is not deteriorated or damaged. If the damper is installed with a damaged isolator, a buzz, squeak or rattle condition may develop.

(4) Install the damper on the steering wheel (Fig. 42).

(5) Install the steering wheel retaining bolt. Tighten the steering wheel retaining bolt to 61 N·m (45 ft. lbs.) torque.

(6) If the steering wheel is equipped with remote audio controls, connect the wiring connector to the clockspring (Fig. 42).

(7) Connect the airbag squib wiring connectors to the airbag and the horn and speed control switch connector to the clockspring (Fig. 41).

(8) Install the driver airbag in the steering wheel (Fig. 40). Install and tighten the airbag attaching screws to 10 N·m (90 in. lbs.) torque.

(9) Connect the battery negative (ground) cable to battery post following special Diagnosis And Testing procedure. (Refer to 8 - ELECTRICAL/RESTRAINTS - DIAGNOSIS AND TESTING)

(10) Check operation of all steering wheel mounted components.

(11) Road test vehicle to ensure proper operation of steering.

GEAR

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GEAR

DESCRIPTION

This vehicle is equipped with a rack and pinion power steering gear (Fig. 1). It is mounted to the underside of the front suspension cradle/crossmember.

The steering column is attached to the gear through the use of an intermediate shaft and couplers. The outer ends of the power steering gear's outer tie rods connect to the steering knuckles.

NOTE: The power steering gear should NOT be serviced or adjusted unless DaimlerChrysler Corporation authorizes. If a malfunction or oil leak occurs, the complete steering gear should be replaced. Only the outer tie rods may be replaced separately from the rest of the gear.

OPERATION

Turning of the steering wheel is converted into linear (side-to-side) travel through the meshing of the helical pinion teeth with the rack teeth in the steering gear. This travel pushes and pulls the tie rods to change the direction of the vehicle's front wheels.

Power assist steering provided by the power steering pump is controlled by an open center, rotary type control valve which directs oil from the pump to either side of the integral rack piston upon demand.

Road feel is controlled by the diameter of a torsion bar which initially steers the vehicle. As required steering effort increases, as in a turn, the torsion bar twists, causing relative rotary motion between the rotary valve body and the valve spool. This movement directs oil behind the integral rack piston which, in turn, builds hydraulic pressure and assists in the turning effort.

Manual steering control of the vehicle can be maintained if power steering assist is lost. However, under this condition, steering effort is significantly increased.

WARNING

WARNINGS AND CAUTIONS

WARNING: POWER STEERING FLUID, ENGINE PARTS AND EXHAUST SYSTEM MAY BE EXTREMELY HOT IF ENGINE HAS BEEN RUNNING. DO NOT START ENGINE WITH ANY LOOSE OR DISCONNECTED HOSES. DO NOT ALLOW HOSES TO TOUCH HOT EXHAUST MANIFOLD OR CATALYST.

WARNING: FLUID LEVEL SHOULD BE CHECKED WITH THE ENGINE OFF TO PREVENT PERSONAL INJURY FROM MOVING PARTS.

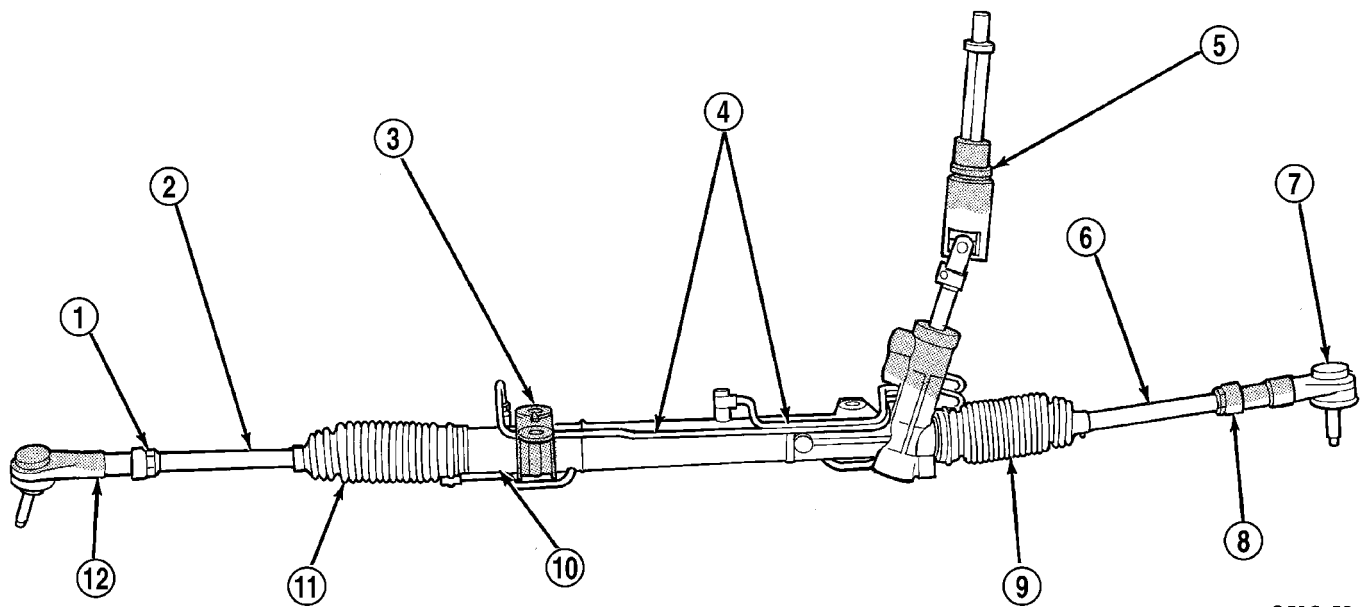
CAUTION: When the system is open, cap all open ends of the hoses, power steering pump fittings or power steering gear ports to prevent entry of foreign material into the components.

REMOVAL

REMOVAL - LHD GEAR

- (1) Remove cap from power steering fluid reservoir.
- (2) Using a siphon pump, remove as much fluid as possible from the power steering fluid reservoir. **Use care not to damage the filter mesh below the fluid surface.**

GEAR (Continued)



9519-53

Fig. 1 Power Steering Gear (Typical)

- | | |
|--|---------------------------------------|
| 1 - TIE ROD JAM NUT | 7 - OUTER TIE ROD |
| 2 - INNER TIE ROD | 8 - TIE ROD JAM NUT |
| 3 - STEERING GEAR MOUNTING BRACKET | 9 - BOOT/BELLOWS |
| 4 - POWER STEERING GEAR FLUID LINES | 10 - STEERING GEAR BOOT BREATHER TUBE |
| 5 - STEERING COLUMN INTERMEDIATE SHAFT | 11 - BOOT/BELLOWS |
| 6 - INNER TIE ROD | 12 - OUTER TIE ROD |

CAUTION: Locking the steering column in the straight-ahead position will prevent the clockspring from being accidentally over-extended when the steering column is disconnected from the intermediate steering coupler.

(3) Position the steering wheel in the STRAIGHT-AHEAD position. Lock the steering wheel in place using a steering wheel holding tool.

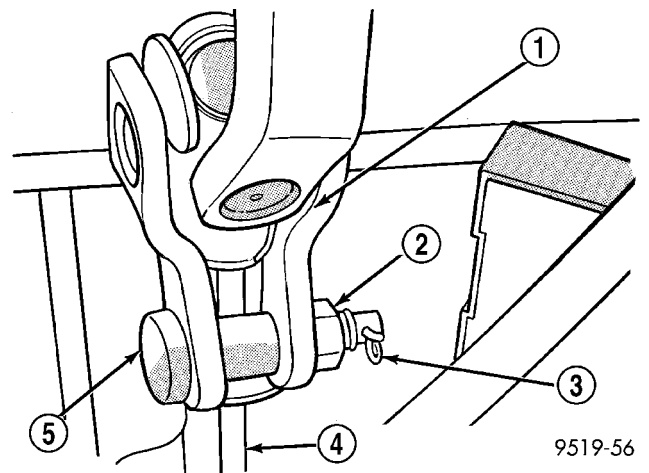
(4) With the vehicle on the ground, disconnect the steering column shaft coupler from the steering gear intermediate coupler (Fig. 2).

(5) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

(6) Remove front wheel and tire assemblies.

(7) Remove front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - REMOVAL)

(8) Remove a single hose at power steering cooler and allow fluid to drain.



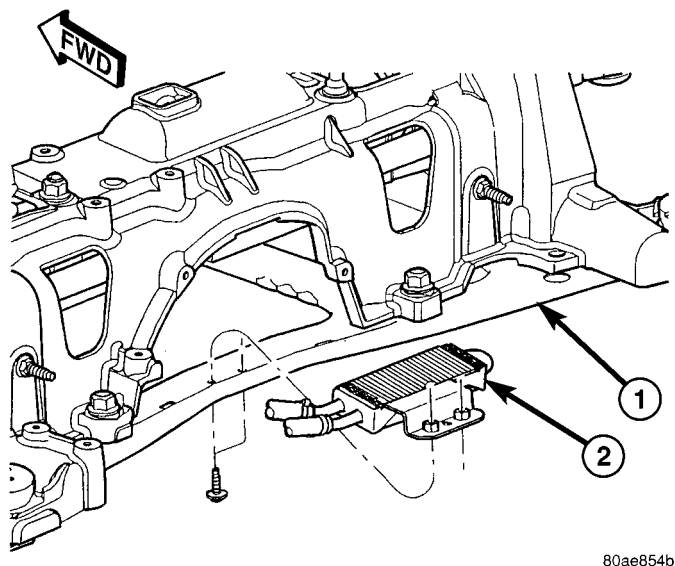
9519-56

Fig. 2 Steering Column Shaft To Intermediate Shaft Attachment

- | |
|-----------------------------------|
| 1 - STEERING COLUMN SHAFT COUPLER |
| 2 - NUT |
| 3 - SAFETY PIN |
| 4 - INTERMEDIATE SHAFT |
| 5 - PINCH BOLT |

GEAR (Continued)

(9) Remove 2 bolts attaching power steering cooler to cradle crossmember reinforcement (Fig. 3).

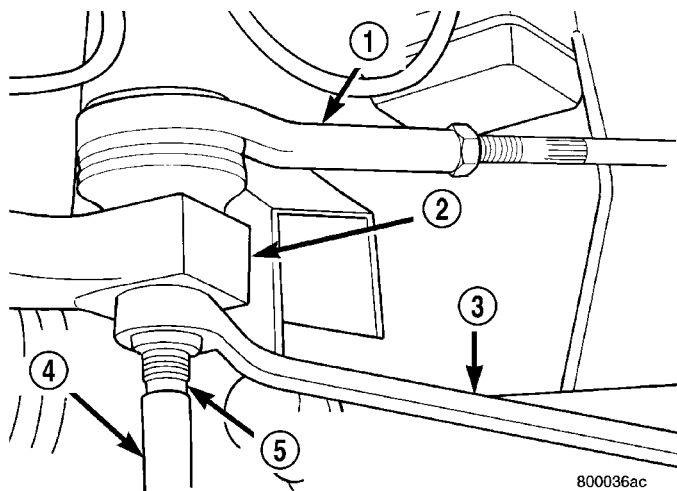


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Fig. 3 Power Steering Cooler

- 1 - CRADLE CROSSMEMBER REINFORCEMENT
- 2 - POWER STEERING COOLER

(10) On both sides of vehicle, remove nut attaching outer tie rod end to steering knuckle (Fig. 4). **Remove nut by holding tie rod end stud with a socket while loosening and removing nut with wrench.**



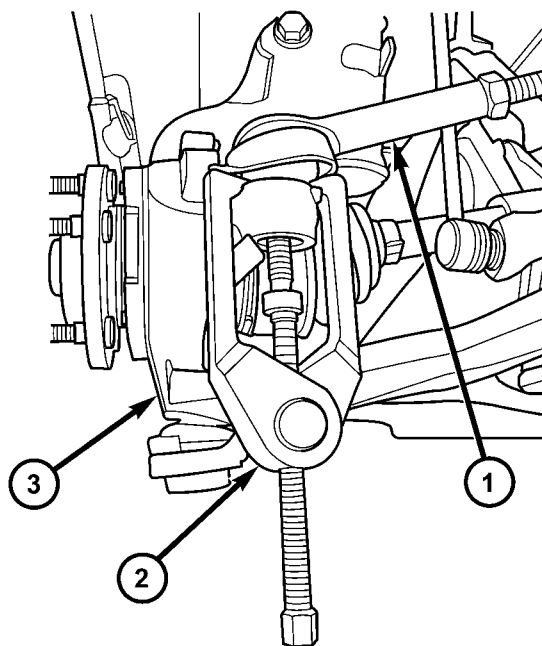
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Fig. 4 Removing/Installing Tie Rod End Attaching Nut

- 1 - TIE ROD END
- 2 - NUT
- 3 - WRENCH
- 4 - SOCKET
- 5 - TIE ROD END STUD

(11) Remove bolts fastening leak detection pump to cradle crossmember reinforcement. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/LEAK DETECTION PUMP - REMOVAL)

(12) Remove both outer tie rods from steering knuckles, using Puller, Special Tool C-3894-A (Fig. 5).



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Fig. 5 Tie Rod Removal With Tool C-3894-A

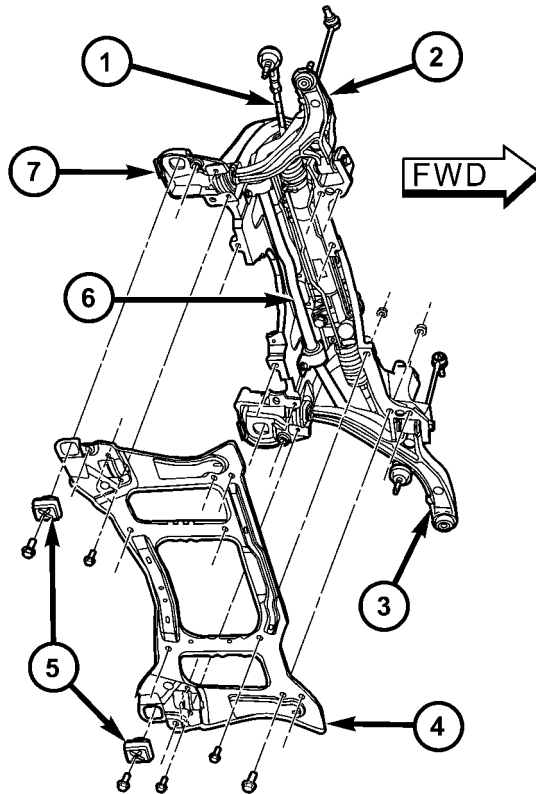
- 1 - OUTER TIE ROD
- 2 - SPECIAL TOOL C-3894-A
- 3 - STEERING KNUCKLE

(13) Remove the lower control arm rear bushing retainer bolts located on each side of each lower control arm rear bushing.

NOTE: The bolts fastening the cradle crossmember reinforcement are of two different thread sizes. Note the location of the various sizes.

GEAR (Continued)

(14) Remove the bolts attaching the cradle crossmember reinforcement to the front suspension cradle crossmember (Fig. 6). Remove the 2 bolts fastening the reinforcement and rear of cradle crossmember to the body of the vehicle. Remove lower rear bushings, then the reinforcement.



80aca152

Fig. 6 Cradle Crossmember Reinforcement Attachment

- 1 - STEERING GEAR
- 2 - RIGHT LOWER CONTROL ARM
- 3 - LEFT LOWER CONTROL ARM
- 4 - CRADLE CROSSMEMBER REINFORCEMENT
- 5 - REAR CRADLE CROSSMEMBER ISOLATOR BUSHING
- 6 - STABILIZER BAR
- 7 - CRADLE CROSSMEMBER

(15) If the vehicle is equipped with All-Wheel-Drive, remove the power transfer unit as necessary (Refer to 21 - TRANSMISSION/TRANSAXLE/POWER TRANSFER UNIT).

(16) Remove tube nuts and power steering pressure and return hoses from the power steering gear (Fig. 7).

(17) Remove the 3 bolts and nuts mounting the steering gear to the front suspension cradle (Fig. 8).

NOTE: The next step must be done to allow the removal of the steering gear from the front suspension cradle. The steering gear can not be removed from the vehicle with the intermediate coupler attached to the steering gear.

(18) Lower steering gear from suspension cradle enough to allow access to the intermediate coupler roll pin (Fig. 9). Install Remover/Installer Special Tool 6831A through the center of the roll pin, securing with the knurled nut (Fig. 9). Hold threaded rod stationary while turning nut, this will pull the roll pin out of the intermediate coupler.

(19) Separate the coupler from the shaft of the steering gear.

(20) Remove the power steering gear from the vehicle.

REMOVAL - RHD GEAR

(1) Remove cap from power steering fluid reservoir.

(2) Using a siphon pump, remove as much fluid as possible from the power steering fluid reservoir.

CAUTION: Locking the steering column in the straight-ahead position will prevent the clockspring from being accidentally over-extended when the steering column is disconnected from the intermediate steering coupler.

(3) Position the steering wheel in the STRAIGHT-AHEAD position. Lock the steering wheel in place using a steering wheel holding tool.

(4) With the ignition key in the locked position turn the steering wheel to the left until the steering wheel is in the locked position.

(5) With the vehicle on the ground, disconnect the steering column shaft coupler from the steering gear intermediate coupler (Fig. 2).

(6) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

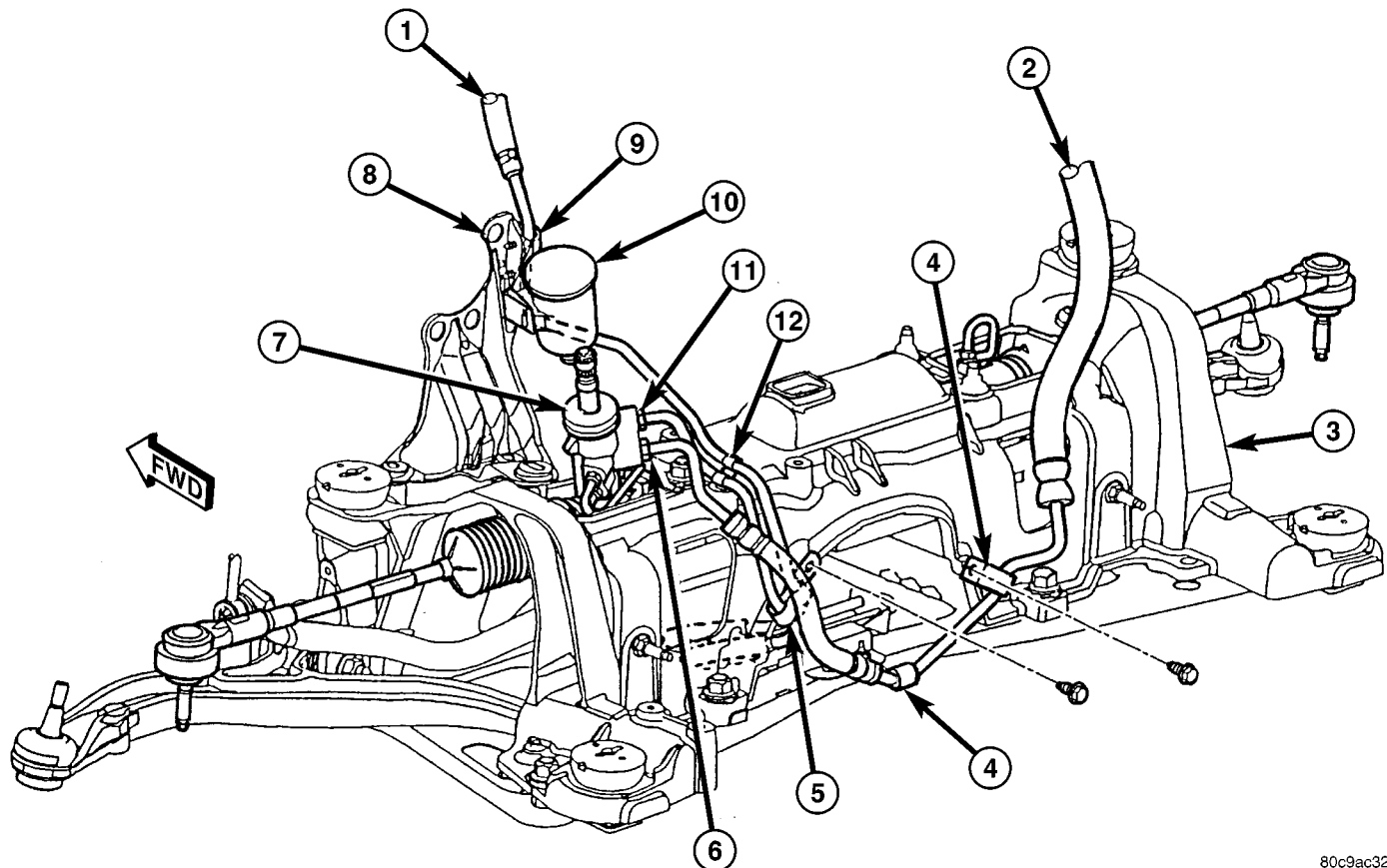
(7) Remove front wheel and tire assemblies.

(8) If power steering cooler equipped, remove a hose at power steering cooler and allow fluid to drain.

(9) Remove 2 bolts attaching power steering cooler to cradle crossmember reinforcement (Fig. 3).

(10) On both sides of vehicle, remove nut attaching outer tie rod end to steering knuckle (Fig. 4). **Remove nut by holding tie rod end stud with a socket while loosening and removing nut with wrench.**

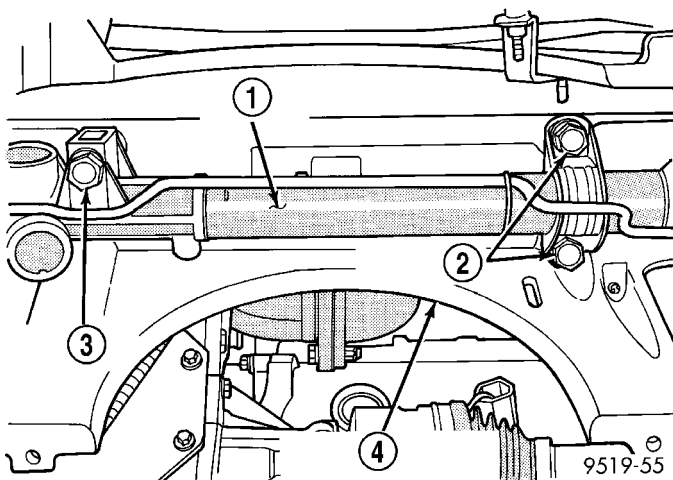
GEAR (Continued)



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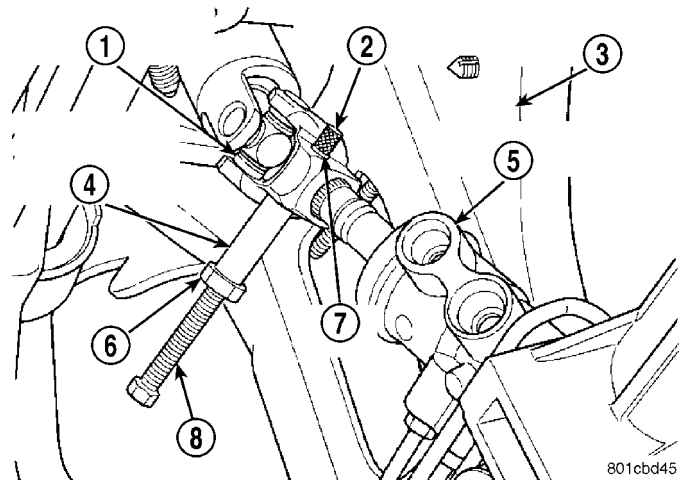
Fig. 7 Hoses To Power Steering Gear - 3.3L/3.8L Engine

- | | |
|---------------------------------|---------------------------------|
| 1 - RETURN HOSE (TO RESERVOIR) | 7 - POWER STEERING GEAR |
| 2 - PRESSURE HOSE (FROM PUMP) | 8 - ABS BRACKET |
| 3 - CRADLE CROSSMEMBER | 9 - ROUTING CLIP |
| 4 - PRESSURE HOSE ROUTING CLAMP | 10 - LEAK DETECTION PUMP FILTER |
| 5 - RETURN HOSE ROUTING CLAMP | 11 - RETURN HOSE TUBE NUT |
| 6 - PRESSURE HOSE TUBE NUT | 12 - ROUTING CLIP |

**Fig. 8 Steering Gear Mounting To Suspension Cradle**

- | |
|---|
| 1 - POWER STEERING GEAR |
| 2 - MOUNTING BOLTS (12 MM) |
| 3 - MOUNTING BOLT (14 MM) |
| 4 - FRONT SUSPENSION CRADLE CROSSMEMBER |

(11) Remove both tie rod ends from steering knuckles using Puller, Special Tool C-3894-A (Fig. 5).

**Fig. 9 Removing Roll Pin From Intermediate Coupler**

- | |
|--------------------------------|
| 1 - INTERMEDIATE COUPLER |
| 2 - KNURLED NUT |
| 3 - SUSPENSION CRADLE |
| 4 - REMOVER SPECIAL TOOL 6831A |
| 5 - STEERING GEAR |
| 6 - NUT |
| 7 - ROLL PIN |
| 8 - THREADED ROD |

GEAR (Continued)

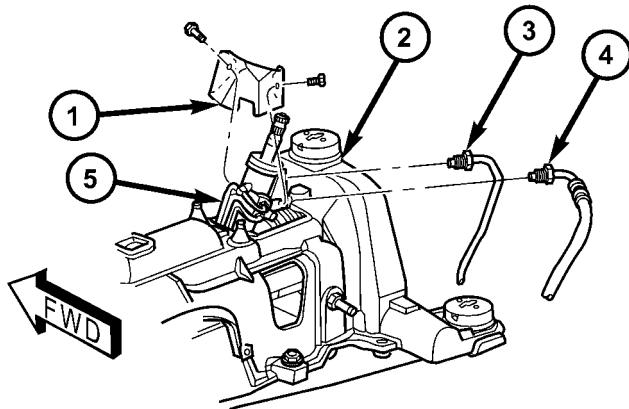
(12) Remove the lower control arm rear bushing retainer bolts located on each side of each lower control arm rear bushing.

NOTE: The bolts fastening the cradle crossmember reinforcement are of two different thread sizes. Note the location of the various sizes.

(13) Remove the bolts attaching the cradle crossmember reinforcement to the front suspension cradle crossmember (Fig. 6). Remove the 2 bolts fastening the reinforcement and rear of cradle crossmember to the body of the vehicle. Remove the reinforcement.

(14) If the vehicle is equipped with All-Wheel-Drive, remove the power transfer unit (Refer to 21 - TRANSMISSION/TRANSAXLE/POWER TRANSFER UNIT - REMOVAL).

(15) Remove the power steering fluid pressure and return hoses from the power steering gear (Fig. 10).



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Fig. 10 RHD Gear Heat Shield And Hose Fittings

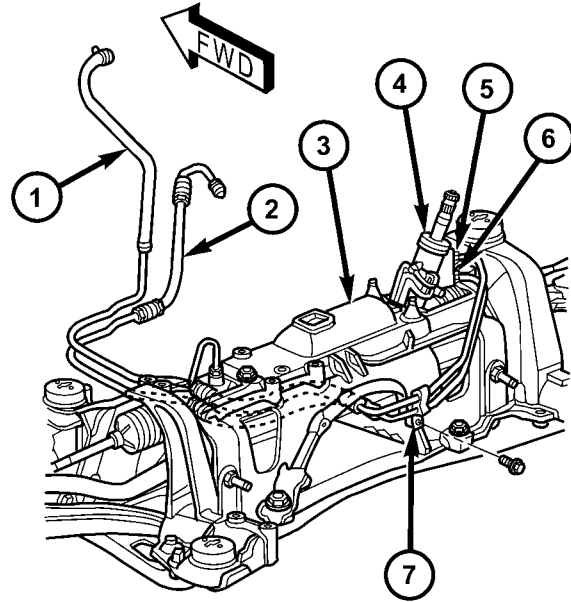
- 1 - HEAT SHIELD
- 2 - CRADLE CROSSMEMBER
- 3 - RETURN HOSE FITTING
- 4 - PRESSURE HOSE FITTING
- 5 - POWER STEERING GEAR

(16) Remove the routing clamp bolt securing the power steering fluid hoses to the rear of the cradle crossmember (Fig. 11). Allow the hoses to hang down out of the way.

(17) Remove the heat shield from the steering gear (Fig. 10).

(18) Remove the 2 bolts and nuts mounting the steering gear to the front suspension cradle.

NOTE: The next step must be done to allow the removal of the steering gear from the front suspension cradle. The steering gear cannot be removed from the vehicle with the intermediate coupler attached to the steering gear.



80c670e

Fig. 11 RHD Power Steering Gear - 2.5L Diesel Shown

- 1 - RETURN HOSE
- 2 - PRESSURE HOSE
- 3 - CRADLE CROSSMEMBER
- 4 - POWER STEERING GEAR
- 5 - RETURN HOSE FITTING
- 6 - PRESSURE HOSE FITTING
- 7 - HOSE ROUTING CLAMP

(19) Lower steering gear from suspension cradle enough to allow access to the intermediate coupler roll pin (Fig. 9). Install Remover/Installer, Special Tool 6831A, through the center of the roll pin, securing with the knurled nut (Fig. 9). Hold threaded rod stationary while turning nut, this will pull the roll pin out of the intermediate coupler.

(20) Separate the coupler from the steering gear shaft.

(21) Remove the power steering gear from the vehicle.

INSTALLATION

INSTALLATION - LHD GEAR

(1) Install the power steering gear up in the front suspension cradle, leaving room to install intermediate coupler.

(2) Start the roll pin into the intermediate coupler before installing coupler on steering gear shaft. Start roll pin into coupler, using a hammer and tapping it into the coupler. Then install the intermediate coupler on the shaft of the steering gear.

GEAR (Continued)

(3) Install Remover/Installer Special Tool 6831A through the center of the roll pin, securing it with the knurled nut (Fig. 12). Hold threaded rod stationary while turning nut, this will pull the roll pin into the intermediate coupler.

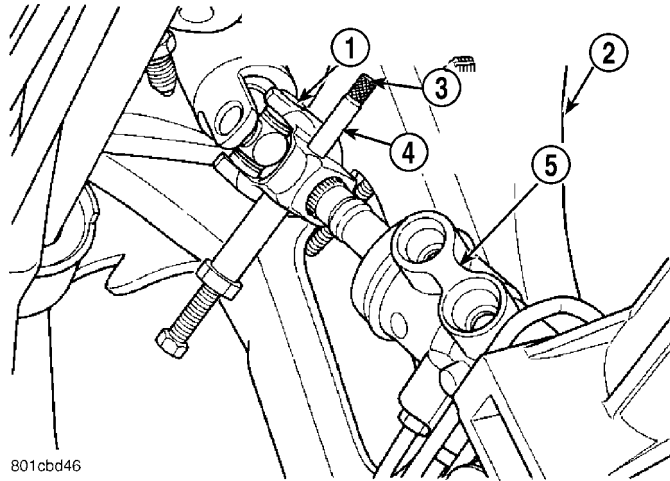


Fig. 12 Installing Roll Pin In Intermediate Coupler

- 1 - INTERMEDIATE SHAFT COUPLER
- 2 - SUSPENSION CRADLE CROSSMEMBER
- 3 - KNURLED NUT
- 4 - ROLL PIN
- 5 - POWER STEERING GEAR

CAUTION: Proper torque on the steering gear to suspension cradle mounting bolts is very important.

(4) Install steering gear on the front suspension cradle. Install the 3 steering gear mounting bolts and nuts (Fig. 8). Tighten the 3 mounting bolts to the following torque values:

- 14 mm bolt – 183 N·m (135 ft. lbs.) torque
- 12 mm bolt – 95 N·m (70 ft. lbs.) torque

(5) Attach the power steering fluid pressure and return hoses to the correct ports on the power steering gear (Fig. 7). Tighten the hose tube nuts at the gear to a torque of 31 N·m (275 in. lbs.).

(6) If the vehicle is equipped with All-Wheel-Drive, install the power transfer unit as necessary (Refer to 21 - TRANSMISSION/TRANSAXLE/POWER TRANSFER UNIT).

CAUTION: Proper torque on the cradle reinforcement to suspension cradle mounting bolts is very important.

(7) Install the reinforcement on the front suspension cradle crossmember and install the bolts attaching the reinforcement to the cradle crossmember (Fig. 6). Tighten the M-14 size bolts to a torque of 153 N·m (113 ft. lbs.). Tighten the M-12 size bolts to a torque of 106 N·m (78 ft. lbs.).

(8) Install the lower control arm rear bushing retainer bolts (M-10 size) through reinforcement on each side of each lower control arm rear bushing. Tighten bolts to a torque of 61 N·m (45 ft. lbs.).

(9) Install the two bolts and bushings attaching the reinforcement and rear of cradle crossmember to body of vehicle (Fig. 6). Tighten bolts to a torque of 163 N·m (120 ft. lbs.).

(10) Install outer tie rod end into steering knuckle. Start outer tie rod to steering knuckle attaching nut onto stud of tie rod end. While holding stud of tie rod end stationary using a socket (Fig. 4), tighten tie rod end to steering knuckle attaching nut. Then using a crowfoot and socket (Fig. 13), tighten the tie rod end attaching nut to a torque of 75 N·m (55 ft. lbs.).

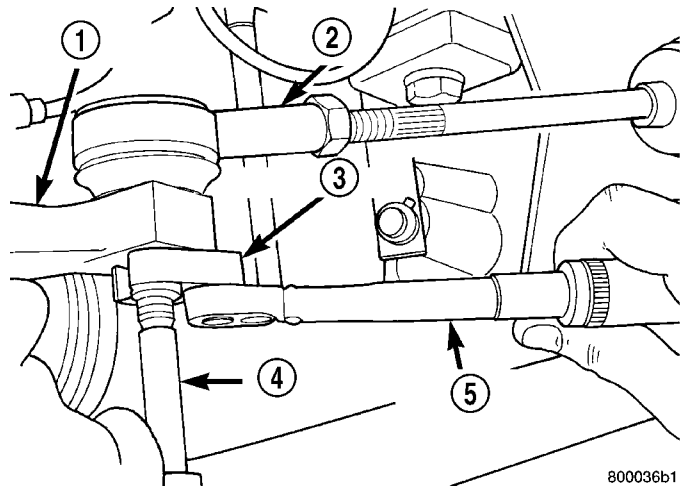


Fig. 13 Torquing Tie Rod End Attaching Nut

- 1 - STEERING KNUCKLE
- 2 - TIE ROD END
- 3 - CROWFOOT
- 4 - SOCKET
- 5 - TORQUE WRENCH

(11) Install leak detection pump on cradle crossmember reinforcement. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/LEAK DETECTION PUMP - INSTALLATION)

(12) Install the power steering fluid cooler on the cradle crossmember reinforcement (Fig. 3). Install the mounting bolts and tighten to 11 N·m (100 in. lbs.). When installing mounting bolts, include pressure hose routing clamp.

(13) Reconnect previously disconnected hose at power steering cooler and install clamp.

(14) Install the front tire and wheel assemblies on vehicle. Install the wheel lug nuts and torque to 135 N·m (100 ft. lbs.).

(15) Install front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - INSTALLATION)

(16) Lower the vehicle to a level where the interior of vehicle is accessible.

GEAR (Continued)

(17) With the wheels pointed approximately STRAIGHT-AHEAD, align the intermediate shaft with the steering column coupler. Assemble the steering column shaft coupler onto the steering gear intermediate coupler (Fig. 2). Install steering column coupler to intermediate shaft retaining pinch bolt. Tighten the pinch bolt nut to a torque of 28 N·m (250 in. lbs.).

(18) Remove the steering wheel holding tool.

(19) Fill and bleed the power steering system using the Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

(20) Inspect system for leaks.

(21) Adjust front toe (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

INSTALLATION - RHD GEAR

(1) Install the steering gear up in the front suspension cradle crossmember, leaving room to install intermediate coupler.

(2) Start the roll pin into the intermediate coupler before installing coupler on steering gear shaft. Start roll pin into coupler, using a hammer and tapping it into the coupler. Then install the intermediate coupler on the shaft of the steering gear.

(3) Install Remover/Installer Special Tool 6831A through the center of the roll pin, securing it with the knurled nut (Fig. 12). Hold threaded rod stationary while turning nut. This will pull the roll pin into the intermediate coupler.

(4) Install power steering gear on the front suspension cradle. Install the 2 steering gear mounting bolts and nuts. Tighten the M-14 size steering gear to suspension cradle mounting bolt to a torque of 183 N·m (135 ft. lbs.). Tighten the M-12 size steering gear to suspension cradle mounting bolt to a torque of 95 N·m (70 ft. lbs.).

CAUTION: Proper torque on the steering gear to suspension cradle mounting bolts is very important.

(5) Install the heat shield on the steering gear (Fig. 10).

(6) Attach the power steering fluid pressure and return hoses to the proper fittings on the steering gear (Fig. 10). Do not fully tighten the fittings at this time.

(7) Install the routing clamp with the bolt securing the power steering fluid hoses to the rear of the cradle crossmember (Fig. 11).

(8) Using a crowfoot wrench on a torque wrench, tighten the power steering fluid hose tube nuts at the gear to a torque of 31 N·m (275 in. lbs.).

(9) Install tie rod end into steering knuckle. Start tie rod end to steering knuckle attaching nut onto

stud of tie rod end. While holding stud of tie rod end stationary using a socket (Fig. 4), tighten tie rod end to steering knuckle attaching nut. Then using a crowfoot and socket (Fig. 13), tighten the tie rod end attaching nut to a torque of 75 N·m (55 ft. lbs.).

(10) If the vehicle is equipped with All-Wheel-Drive, install the power transfer unit (Refer to 21 - TRANSMISSION/TRANSAXLE/POWER TRANSFER UNIT - INSTALLATION).

CAUTION: Proper torque on the cradle reinforcement to suspension cradle mounting bolts is very important.

(11) Install the reinforcement on the front suspension cradle crossmember and install the bolts attaching the reinforcement to the cradle crossmember (Fig. 6). Tighten the M-14 size bolts to a torque of 163 N·m (120 ft. lbs.). Tighten the M-12 size bolts to a torque of 108 N·m (80 ft. lbs.).

(12) Install the lower control arm rear bushing retainer bolts through reinforcement on each side of each lower control arm rear bushing. Tighten bolts to a torque of 61 N·m (45 ft. lbs.).

(13) Install the two bolts and bushings attaching the reinforcement and rear of cradle crossmember to body of vehicle (Fig. 6). Tighten bolts to a torque of 163 N·m (120 ft. lbs.).

(14) If power steering cooler equipped, install the previously disconnected power steering cooler hose on the cooler. Install the clamp.

(15) If power steering cooler equipped, install the power steering fluid cooler on the cradle crossmember reinforcement (Fig. 3). Install the mounting bolts and tighten to 11 N·m (100 in. lbs.).

(16) Install the front tire and wheel assemblies on vehicle. Install the wheel mounting lug nuts and tighten to a torque to 135 N·m (100 ft. lbs.).

(17) Lower the vehicle to a level where the interior of vehicle is accessible (keeping tires off the ground).

(18) With the wheels pointed approximately STRAIGHT-AHEAD, align the intermediate shaft with the steering column coupler. Assemble the steering column shaft coupler onto the steering gear intermediate coupler (Fig. 2). Install steering column coupler to intermediate shaft retaining pinch bolt. Tighten the pinch bolt nut to a torque of 28 N·m (250 in. lbs.).

(19) Remove the steering wheel holding tool.

(20) Perform the POWER STEERING PUMP INITIAL OPERATION procedure to properly fill and bleed the power steering system. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

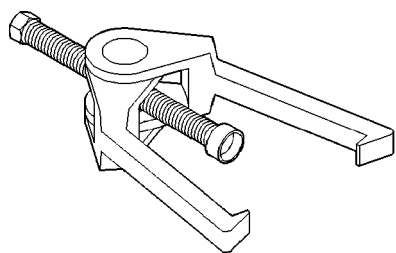
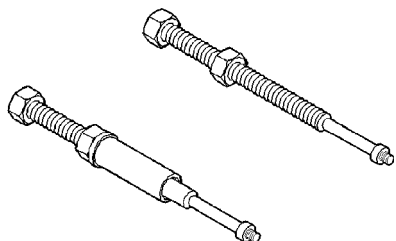
(21) Inspect for leaks.

(22) Adjust front wheel toe (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

GEAR (Continued)

SPECIAL TOOLS

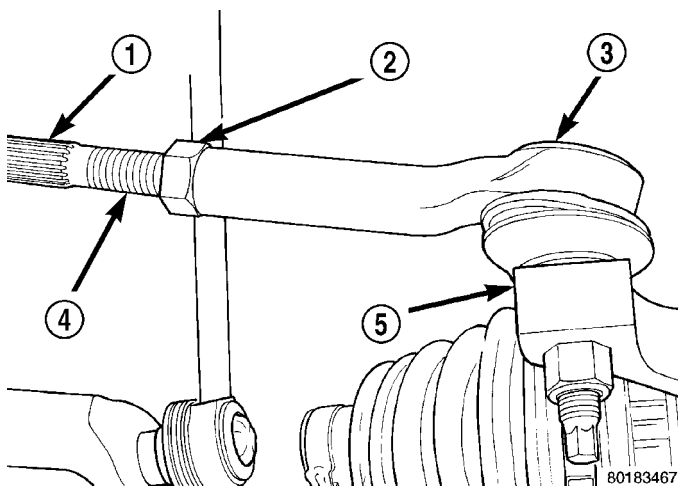
POWER STEERING GEAR

**Puller C-3894A****Remover/Installer Steering Shaft Roll Pin 6831A**

OUTER TIE ROD

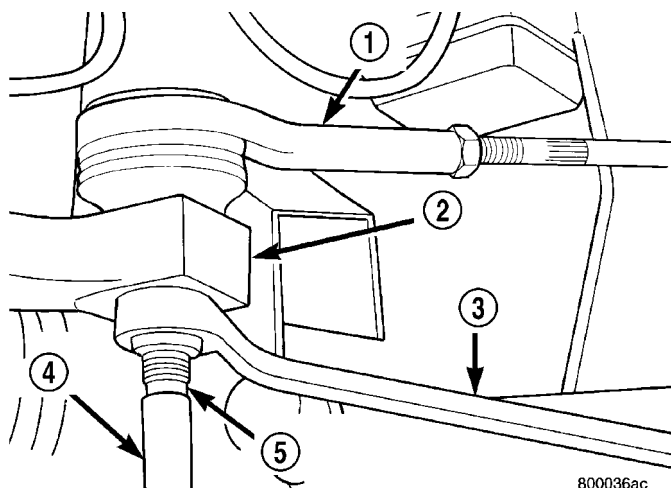
REMOVAL

(1) Loosen inner tie rod to outer tie rod jam nut (Fig. 14).

**Fig. 14 Inner To Outer Tie Rod Jam Nut**

- 1 - INNER TIE ROD SERRATION
- 2 - OUTER TIE ROD JAM NUT
- 3 - OUTER TIE ROD END
- 4 - INNER TIE ROD
- 5 - STEERING KNUCKLE

(2) Remove nut attaching outer tie rod end to steering knuckle (Fig. 15). The nut is to be removed from tie rod end by holding tie rod end stud with a 11/32 socket while loosening and removing nut with a wrench.

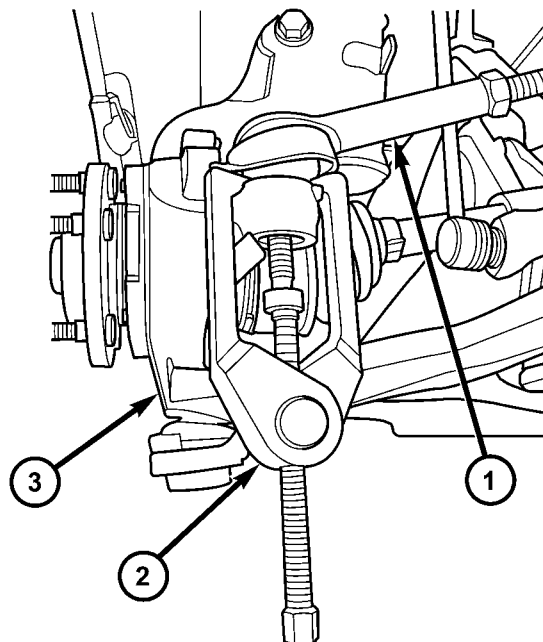


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Fig. 15 Tie Rod End Attaching Nut (Typical)

- 1 - TIE ROD END
- 2 - STEERING KNUCKLE
- 3 - WRENCH
- 4 - SOCKET
- 5 - TIE ROD END STUD

(3) Remove the tie rod end stud from steering knuckle arm, using Remover, Special Tool C-3894-A (Fig. 16).



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Fig. 16 TIE ROD REMOVAL WITH TOOL C-3894-A

- 1 - OUTER TIE ROD
- 2 - SPECIAL TOOL C-3894-A
- 3 - STEERING KNUCKLE

OUTER TIE ROD (Continued)

(4) Remove outer tie rod end by un-threading it from the inner tie rod.

INSTALLATION

NOTE: Before installing the outer tie rod, make sure the jam nut is on inner tie rod (Fig. 14).

- (1) Install outer tie rod onto inner tie rod.
- (2) Do not tighten jam nut.
- (3) Install tie rod end into the steering knuckle. Start tie rod end to steering knuckle attaching nut onto stud of tie rod end. While holding stud of tie rod end stationary, tighten tie rod end to steering knuckle attaching nut (Fig. 15). Then using a crow-foot and 11/32 socket (Fig. 17), torque tie rod end attaching nut to 75 N·m (55 ft. lbs.).
- (4) Tighten tie rod jam nut (Fig. 14) to 75 N·m (55 ft. lbs.) torque.

CAUTION: During this procedure do not allow the steering gear boot to become twisted.

- (5) Adjust the front toe setting on the vehicle (Refer to 2 - SUSPENSION/WHEEL ALIGNMENT - STANDARD PROCEDURE).

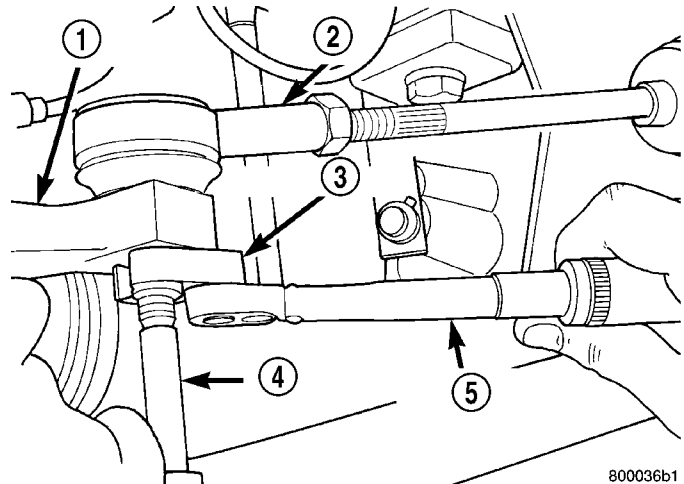


Fig. 17 Torquing Tie Rod End Attaching Nut

- 1 - STEERING KNUCKLE
- 2 - TIE ROD END
- 3 - CROWFOOT
- 4 - SOCKET
- 5 - TORQUE WRENCH

PUMP

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PUMP

DESCRIPTION

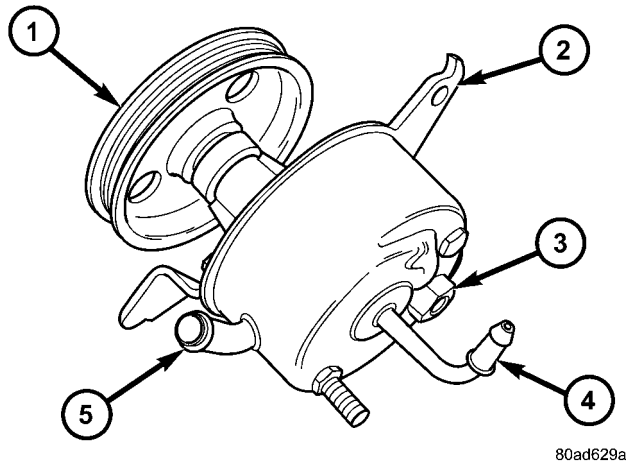
DESCRIPTION - PUMP (2.4L/3.3L/3.8L ENGINE)

Hydraulic pressure for the operation of the power steering gear is provided by a belt driven power steering pump. The power steering pump is mounted on the back side of the engine on all engine applications. The pumps are different depending on the engine option. The pump for the 2.4L engine is made

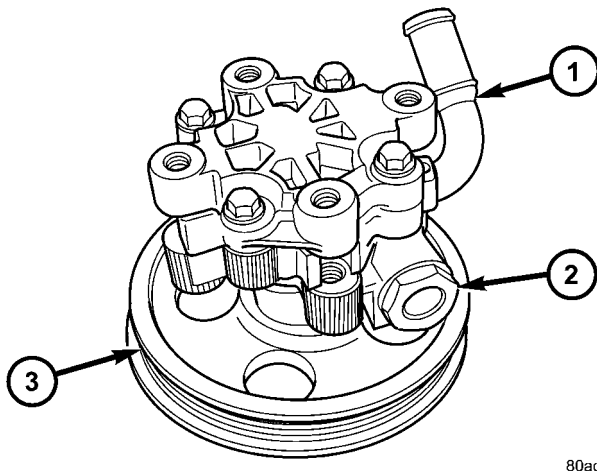
out of cast iron and steel (Fig. 1). The pump used on the 3.3L/3.8L engine is made of aluminum (Fig. 2).

The pump for the 3.3L/3.8L engine does not have a return fitting as the pump for the 2.4L engine does. The power steering return hose on the 3.3L/3.8L engine goes to the reservoir instead of the pump.

PUMP (Continued)

**Fig. 1 POWER STEERING PUMP (2.4L)**

- 1 - PULLEY
- 2 - BRACKET
- 3 - PRESSURE FITTING
- 4 - RETURN FITTING
- 5 - SUPPLY FITTING

**Fig. 2 POWER STEERING PUMP (3.3L/3.8L)**

- 1 - SUPPLY FITTING
- 2 - PRESSURE FITTING
- 3 - PULLEY

DESCRIPTION - PUMP (DIESEL)

Hydraulic pressure for the operation of the power steering gear is provided by a belt driven power steering pump. The power steering pump is mounted front lower right corner of the engine (Fig. 13).

The pump has a supply fitting for fluid coming from the reservoir and a pressure port for exiting fluid that is headed for the steering gear.

OPERATION

The power steering pump is a constant displacement vane type pump. The 2.4L pump has an integral fluid reservoir and there is a secondary remote non-flow reservoir which acts only as a fluid fill and check point. The 3.3L/3.8L pump houses very little fluid and is therefore supplied by a remote flow through reservoir.

WARNING

WARNING: POWER STEERING FLUID, ENGINE PARTS AND EXHAUST SYSTEM MAY BE EXTREMELY HOT IF ENGINE HAS BEEN RUNNING. DO NOT START ENGINE WITH ANY LOOSE OR DISCONNECTED HOSES. DO NOT ALLOW HOSES TO TOUCH HOT EXHAUST MANIFOLD OR CATALYST.

WARNING: FLUID LEVEL SHOULD BE CHECKED WITH THE ENGINE OFF TO PREVENT PERSONAL INJURY FROM MOVING PARTS.

CAUTION

CAUTION: When the system is open, cap all open ends of the hoses, power steering pump fittings or power steering gear ports to prevent entry of foreign material into the components.

STANDARD PROCEDURE - POWER STEERING PUMP INITIAL OPERATION

WARNING: FLUID LEVEL SHOULD BE CHECKED AND ADJUSTED WITH ENGINE OFF TO PREVENT INJURY FROM MOVING ENGINE COMPONENTS.

CAUTION: Use only Mopar® Automatic Transmission Fluid (MS-9602) in power steering system. Use of other Mopar® power steering fluids (MS5931 and MS9933) should be avoided to ensure peak performance of the power steering system under all operating conditions. Do not overfill.

PUMP (Continued)

Read the fluid level through the side of the power steering fluid reservoir. The fluid level should indicate **"FILL RANGE"** when the fluid is at a temperature of approximately 21°C to 27°C (70°F to 80°F).

(1) Wipe the filler cap and area clean, then remove the cap.

(2) Fill the fluid reservoir to the proper level and let the fluid settle for at least two (2) minutes.

(3) Start the engine and let run for a few seconds, then turn the engine off.

(4) Add fluid if necessary. Repeat the above steps until the fluid level remains constant after running the engine.

(5) Raise the front wheels off the ground.

(6) Start the engine.

(7) Slowly turn the steering wheel right and left, lightly contacting the wheel stops.

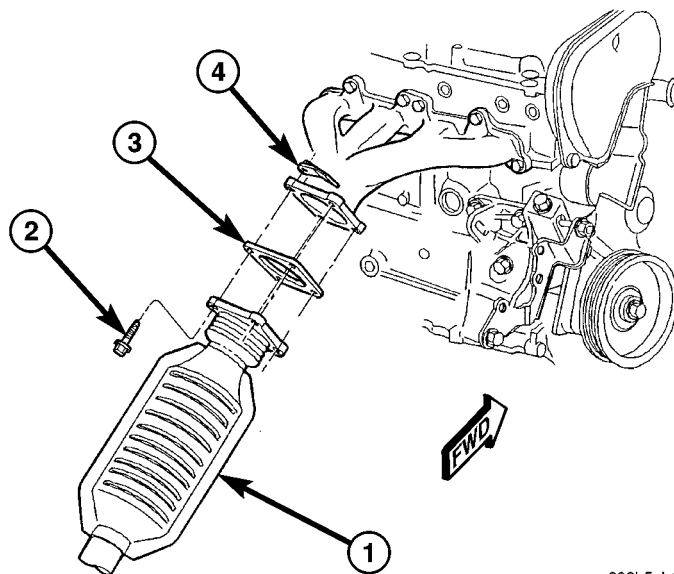
(8) Add fluid if necessary.

(9) Lower the vehicle, then turn the steering wheel slowly from lock-to-lock.

(10) Stop the engine. Check the fluid level and refill as required.

(11) If the fluid is extremely foamy, allow the vehicle to stabilize a few minutes, then repeat the above procedure.

(6) Remove the four bolts and flag nuts securing the catalytic converter from the exhaust manifold (Fig. 3).



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Fig. 3 Catalytic Converter to Exhaust Manifold

- 1 - CATALYTIC CONVERTER
- 2 - BOLT
- 3 - GASKET
- 4 - FLAG NUT

REMOVAL

REMOVAL - PUMP (2.4L ENGINE)

(1) Remove the (-) negative battery cable from the battery and isolate cable.

(2) Remove the cap from the power steering fluid reservoir.

(3) Using a siphon pump, remove as much power steering fluid as possible from the power steering fluid reservoir.

(4) Raise the vehicle on jack stands or centered on a frame contact type hoist. See Hoisting in Lubrication and Maintenance.

(5) Disconnect the oxygen sensor wiring harness from the vehicle wiring harness at the rear engine mount bracket.

NOTE: The exhaust system needs to be removed from the engine to allow for an area to remove the power steering pump from the vehicle.

(7) Disconnect all the exhaust system isolators/hangers from the brackets on the exhaust system (2 at the mufflers and 1 at the resonator) (Fig. 4).

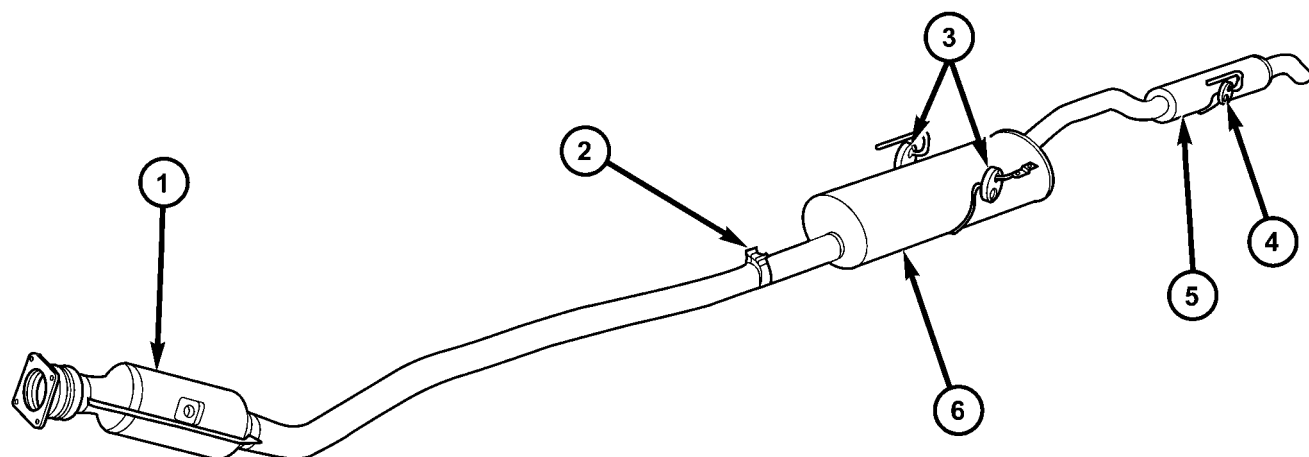
(8) Remove the exhaust system by moving it as far rearward, then lowering the front below the cross-member and out of the vehicle.

(9) Remove the power steering fluid supply hose from the fitting on the power steering pump. Drain off excess power steering fluid from hose.

(10) Move the heat sleeve on the power steering return hose to expose the hose connection at the pump (Fig. 5). Remove the hose from the power steering Pump. Allow the remaining power steering fluid to drain from the power steering pump and reservoir through the removed return hose.

(11) Remove the power steering fluid pressure line from the power steering pump (Fig. 6). Drain excess power steering fluid from tube.

PUMP (Continued)

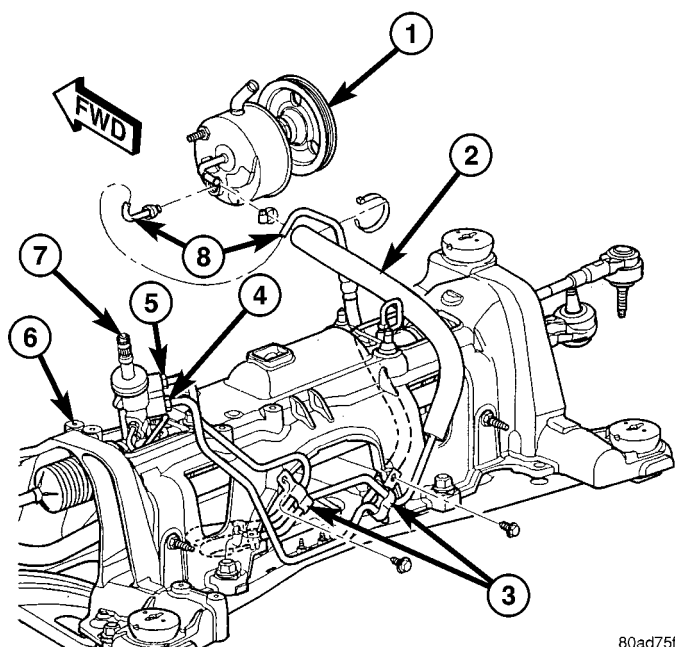


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Fig. 4 Exhaust System - Typical (All Vehicles)

- 1 - CATALYTIC CONVERTER
- 2 - BAND CLAMP
- 3 - SUPPORTS - MUFFLER

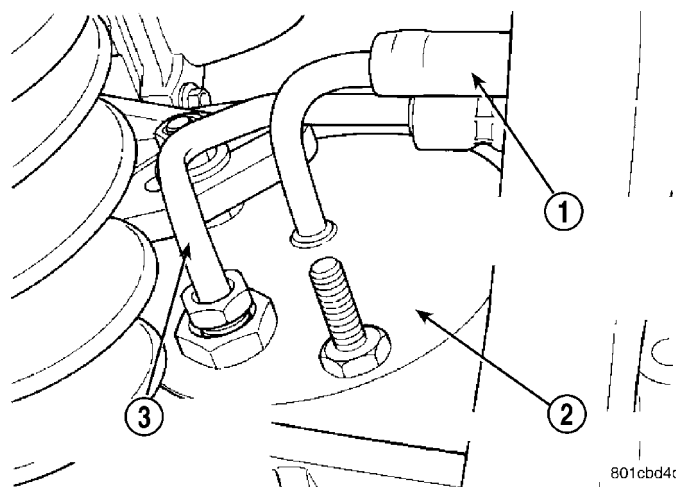
- 4 - SUPPORT - RESONATOR
- 5 - RESONATOR
- 6 - MUFFLER



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Fig. 5 Pressure And Return Hoses - 2.4L

- 1 - POWER STEERING PUMP
- 2 - RETURN HOSE (HEAT SLEEVE COVERED)
- 3 - ROUTING CLAMPS
- 4 - PRESSURE HOSE TUBE NUT
- 5 - RETURN HOSE TUBE NUT
- 6 - CRADLE CROSSMEMBER
- 7 - POWER STEERING GEAR
- 8 - PRESSURE HOSE



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Fig. 6 Power Steering Fluid Pressure And Return Hose

- 1 - POWER STEERING FLUID RETURN HOSE
- 2 - POWER STEERING PUMP
- 3 - POWER STEERING FLUID PRESSURE HOSE

PUMP (Continued)

(12) Remove the fasteners, then the accessory drive splash shield.

(13) Remove the adjuster nut attaching rear of power steering pump to the cast mounting bracket. (Fig. 7)

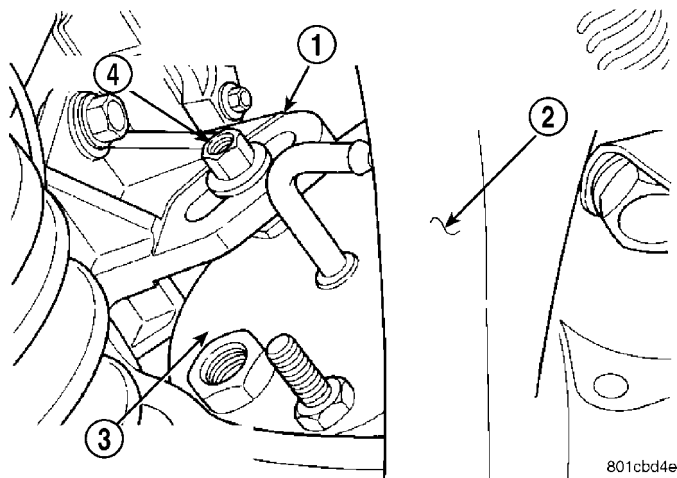


Fig. 7 Power Steering Pump Attaching Nut

- 1 - POWER STEERING PUMP MOUNTING BRACKET
- 2 - FRONT SUSPENSION CRADLE
- 3 - POWER STEERING PUMP
- 4 - ADJUSTER NUT

(14) Remove the front adjuster nut and the lower pivot bolt (Fig. 8) attaching power steering pump bracket to cast bracket.

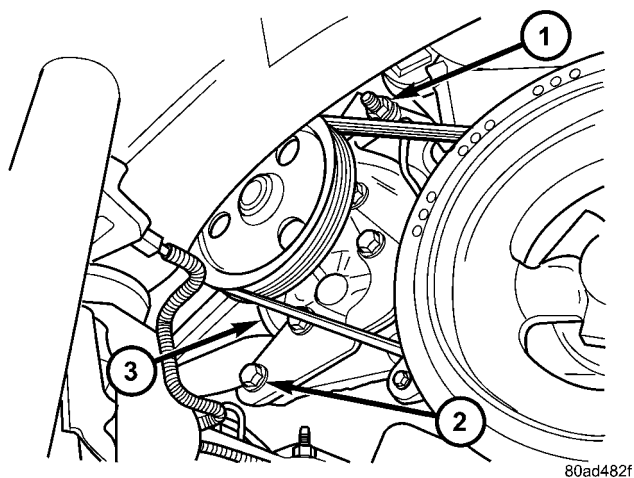


Fig. 8 Pump Front Mounting

- 1 - ADJUSTER NUT
- 2 - PIVOT BOLT
- 3 - PUMP

(15) Remove the drive belt from the power steering pump pulley.

(16) Remove the power steering pump and the front bracket from the cast bracket on the engine as an assembly through the exhaust tunnel.

(17) Remove the 3 bolts attaching the front bracket to the power steering pump and separate the power steering pump from the front bracket.

(18) If the power steering pump pulley needs to be transferred, (Refer to 19 - STEERING/PUMP - DIS-ASSEMBLY).

REMOVAL - PUMP (3.3L/3.8L ENGINE)

(1) Remove the (-) negative battery cable from the battery and isolate cable.

(2) Remove the wiper module (unit)(Refer to 8 - ELECTRICAL/WIPERS/WASHERS/WIPER MODULE - REMOVAL).

(3) Raise the vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

(4) Remove the drive belt splash shield.

(5) Remove the pressure hose routing bracket bolt (Fig. 9).

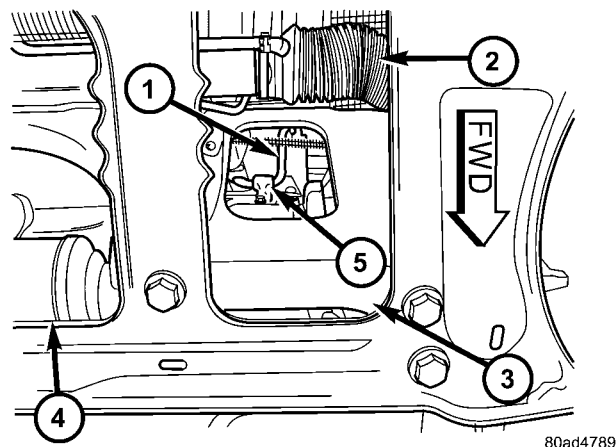


Fig. 9 Pressure Hose Routing Clamp

- 1 - PRESSURE HOSE TUBE
- 2 - STEERING GEAR
- 3 - CRADLE CROSSMEMBER
- 4 - DRIVESHAFT
- 5 - ROUTING CLAMP BRACKET

(6) lower the vehicle.

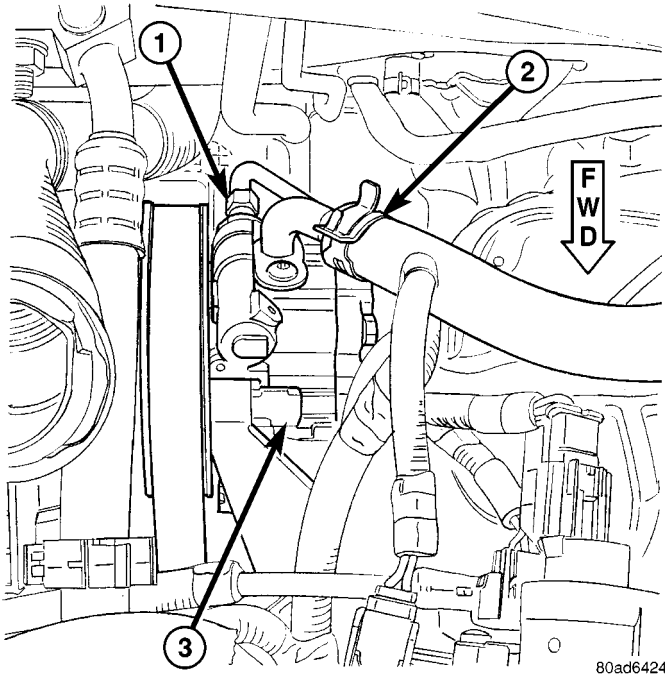
(7) Remove cap from power steering fluid reservoir.

(8) Using a siphon pump, remove as much power steering fluid as possible from the power steering fluid reservoir.

(9) Disconnect the pressure hose from the pump (Fig. 10).

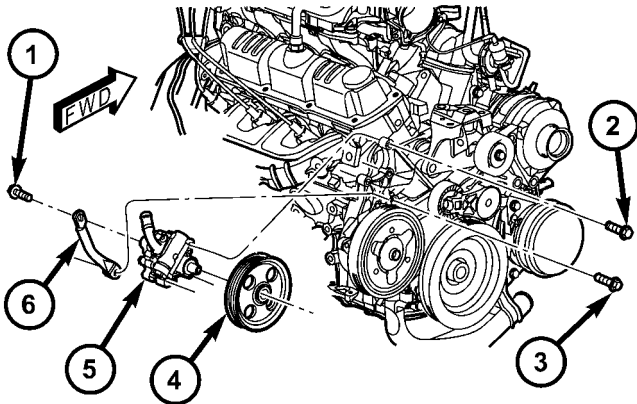
(10) Disconnect the fluid supply hose from the pump (Fig. 10).

PUMP (Continued)

**Fig. 10 Supply And Pressure Hoses At Pump**

- 1 - PRESSURE HOSE AND FITTING
 2 - SUPPLY HOSE AND CLAMP
 3 - POWER STEERING PUMP

(11) Remove the three front mounting bolts through the pulley (Fig. 11)

**Fig. 11 Pump Mounting**

- 1 - PUMP REAR MOUNTING BOLT (2001 ONLY)
 2 - PUMP FRONT MOUNTING BOLT (3)
 3 - TIMING CHAIN COVER AND PUMP BRACKET THRU BOLT (2001 ONLY)
 4 - PUMP BELT PULLEY
 5 - POWER STEERING PUMP
 6 - BRACKET (2001 ONLY)

(12) Remove the pump (with pulley) through the engine compartment rocking it over the aluminum bracket.

REMOVAL - PUMP (DIESEL)

(1) Remove the negative (-) battery cable from the battery and isolate cable.

(2) Remove the fill cap from the power steering fluid reservoir.

(3) Using a siphon pump, remove as much power steering fluid as possible from the fluid reservoir.

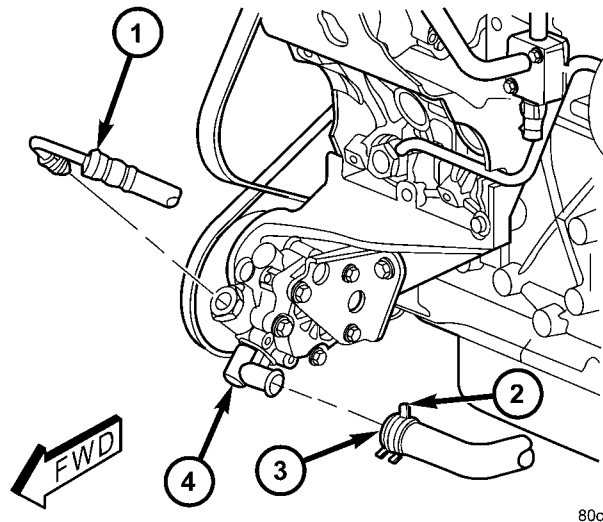
(4) Raise the vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

(5) Remove the splash shields from below the engine compartment.

(6) Remove the accessory drive belt from the power steering pump pulley. (Refer to 7 - COOLING/ACCESSORY DRIVE/DRIVE BELTS - REMOVAL)

(7) Disconnect the fluid supply hose from the pump (Fig. 12).

(8) Disconnect the pressure hose from the pump (Fig. 12).

**Fig. 12 Power Steering Pump - Diesel**

- 1 - PRESSURE HOSE
 2 - HOSE CLAMP
 3 - SUPPLY HOSE
 4 - POWER STEERING PUMP

(9) Remove the bolt fastening the stamped bracket on the rear of the pump to the cast bracket (Fig. 13).

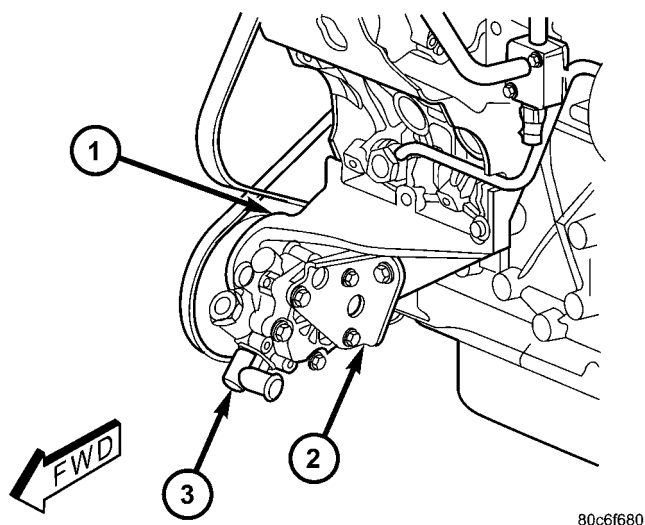
(10) Remove the three front mounting bolts through the pulley.

(11) Remove the pump from the cast bracket and vehicle.

DISASSEMBLY - PUMP (PULLEY)

The only serviceable part of the power steering pump is the pulley. The procedure following is for removal and installation of the pulley from the pump once the pump is removed from the vehicle.

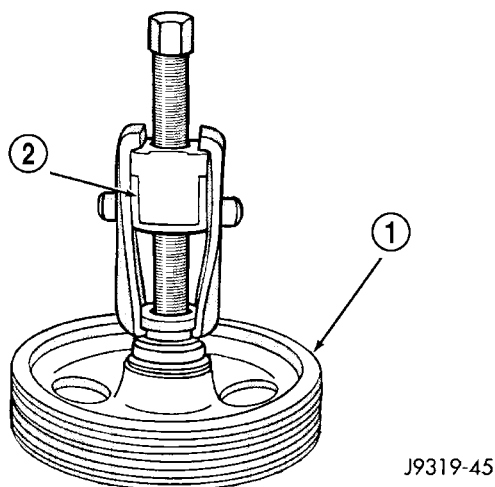
PUMP (Continued)

**Fig. 13 Pump And Brackets - Diesel**

- 1 - CAST BRACKET
- 2 - STAMPED BRACKET
- 3 - POWER STEERING PUMP

(1) Remove the power steering pump from the vehicle. Refer to Removal And Installation in this section of the service manual.

(2) Remove the pulley from the shaft of the power steering pump using Puller C-4333 (Fig. 14).

**Fig. 14 Pulley Removal**

- 1 - POWER STEERING PUMP DRIVE PULLEY
- 2 - SPECIAL TOOL C-4333

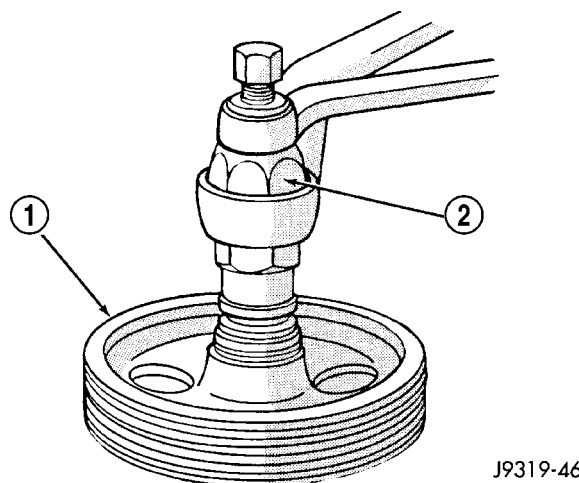
CAUTION: Do not hammer on power steering pump pulley. This will damage the pulley and the power steering pump.

(3) Replace pulley if it is found to be bent, cracked, or loose.

ASSEMBLY - PUMP (PULLEY)

The only serviceable part of the power steering pump is the pulley. The procedure following is for removal and installation of the pulley from the pump once the pump is removed from the vehicle.

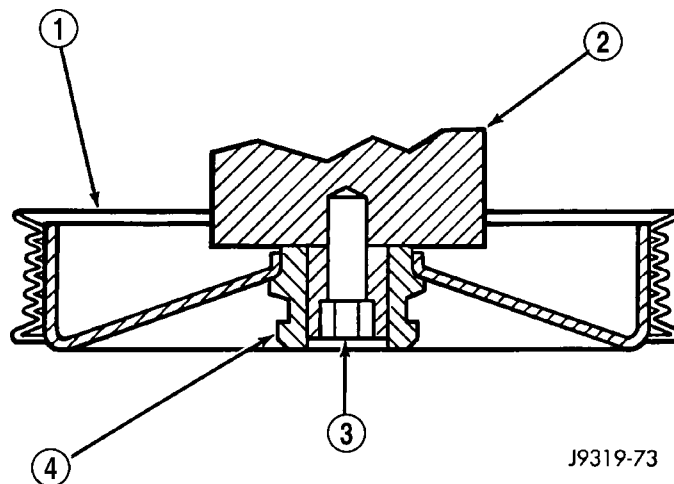
(1) Install the pulley with Installer C-4063 (Fig. 15). Do not use the tool adapters.

**Fig. 15 Pulley Installation**

- 1 - POWER STEERING PUMP DRIVE PULLEY
- 2 - SPECIAL TOOL C-4063-A

(2) Ensure that the tool and the pulley remain aligned with the pump shaft. Prevent the pulley from being cocked on the shaft.

(3) Install the pulley until it is flush with the end of the power steering pump shaft (Fig. 16).

**Fig. 16 Pulley To Pump Shaft Location**

- 1 - PULLEY
- 2 - PUMP BODY
- 3 - PUMP SHAFT
- 4 - HUB

(4) Install the power steering pump on the vehicle.

PUMP (Continued)

INSTALLATION

INSTALLATION - PUMP (2.4L ENGINE)

(1) Install power steering pump back in vehicle using the reverse order of its removal through the exhaust tunnel of the vehicle.

(2) Install the power steering pump on its cast mounting bracket (Fig. 7), then install the nut and bolt attaching the front bracket to the cast bracket (Fig. 8). **Do not fully tighten at this time..**

(3) Install the rear nut (Fig. 7).

(4) Install the power steering pump drive belt on pulley and adjust (Refer to 7 - COOLING/ACCESSORY DRIVE/DRIVE BELTS - INSTALLATION).

(5) Tighten the two adjustment slot bolts and the one pivot bolt to 54 N·m (40 ft. lbs.) torque.

(6) Install the accessory drive splash shield.

NOTE: Before installing power steering fluid pressure hose on power steering pump, inspect the O-ring on the pressure hose for damage and replace if necessary.

(7) Install the power steering fluid pressure line onto the output fitting of the power steering pump (Fig. 6). Tighten the pressure line to pump fitting tube nut to a torque of 31 N·m (275 in. lbs.).

(8) Install the power steering fluid low pressure return hose on the power steering pump low pressure fitting (Fig. 6). **Be sure hose clamps are properly reinstalled.**

(9) Install the power steering fluid supply hose on the power steering pump fluid fitting. **Be sure hose is clear of accessory drive belts all hose clamps are properly reinstalled.**

CAUTION: Heat sleeve must cover entire rubber portion of return hose to ensure desired thermal protection from exhaust.

(10) Properly position the protective heat sleeve over the power steering return hose. Securely tie strap the heat sleeve to the power steering hose to keep in it's proper position.

(11) Install the exhaust system (Fig. 4). Install all exhaust system isolators/hangers on the exhaust system brackets, then the four bolts and flag nuts (Fig. 3).

(12) Connect the oxygen sensor wiring harness to the vehicle wiring harness.

(13) Lower vehicle.

(14) Connect the negative battery cable on the negative battery post.

(15) Perform the POWER STEERING PUMP INITIAL OPERATION procedure to properly fill and bleed the power steering system. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

(16) Inspect for leaks.

INSTALLATION - PUMP (3.3L/3.8L ENGINE)

(1) Install power steering pump back in vehicle using the reverse order of its removal through the engine compartment of the vehicle.

(2) Install the power steering pump on its mounting bracket.

(3) Install the 3 front power steering pump mounting bolts (Fig. 11). Tighten the 3 front power steering pump mounting bolts to a torque of 54 N·m (40 ft. lbs.).

NOTE: Before installing power steering pressure hose on power steering pump, inspect the O-ring on the power steering pressure hose for damage and replace if required.

(4) Install the power steering fluid pressure line into the pressure output fitting of the power steering pump (Fig. 10). **Do not fully tighten tube nut at this time.**

(5) Install the power steering fluid supply hose on the power steering pump supply fitting (Fig. 10). **Be sure hose clamp is properly installed.**

(6) Raise the vehicle.

(7) Install the routing clip on the engine for the pressure hose (Fig. 9) and tighten fastener.

(8) Install the serpentine drive belt (Refer to 7 - COOLING/ACCESSORY DRIVE/DRIVE BELTS - INSTALLATION).

(9) Install the drive belt splash shield.

(10) Lower the vehicle.

(11) Tighten the pressure line to pump pressure fitting tube nut to a torque of 31 N·m (275 in. lbs.).

(12) Install the wiper module (unit)(Refer to 8 - ELECTRICAL/WIPERS/WASHERS/WIPER MODULE - INSTALLATION).

(13) Connect the negative battery cable on the negative battery post.

(14) Fill and bleed the power steering system using the Power Steering Pump Initial Operation Procedure (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE).

(15) Inspect for leaks.

INSTALLATION - PUMP (DIESEL)

(1) Install the power steering pump on its cast mounting bracket.

(2) Install the three front power steering pump mounting bolts. Tighten the mounting bolts to a torque of 54 N·m (40 ft. lbs.).

(3) Install the rear mounting bolt fastening the stamped bracket to the cast bracket (Fig. 13). Tighten the mounting bolt to a torque of 54 N·m (40 ft. lbs.).

PUMP (Continued)

NOTE: Before installing power steering pressure hose on power steering pump, inspect the O-ring on the power steering pressure hose for damage and replace if required.

(4) Install the power steering fluid pressure hose fitting into the pressure port of the power steering pump (Fig. 12). Tighten the pressure line to pump fitting tube nut to a torque of 31 N·m (275 in. lbs.).

(5) Install the power steering fluid supply hose on the power steering pump supply fitting (Fig. 12). **Be sure hose clamp is properly reinstalled.**

(6) Install the accessory drive belt (Refer to 7 - COOLING/ACCESSORY DRIVE/DRIVE BELTS - INSTALLATION).

(7) Install the splash shields below the engine compartment.

(8) Lower the vehicle.

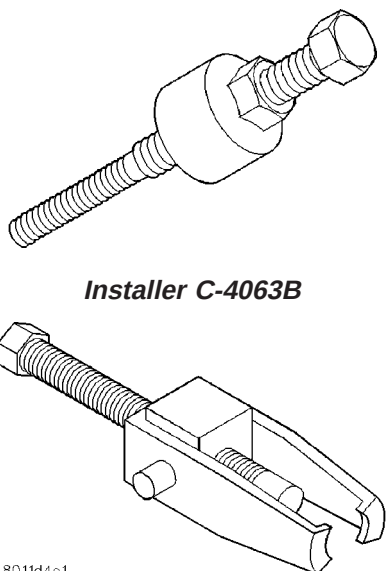
(9) Connect the negative (-) battery cable on the negative battery post.

(10) Fill and bleed the power steering system using the Power Steering Pump Initial Operation Procedure (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE).

(11) Inspect for leaks.

SPECIAL TOOLS

POWER STEERING PUMP



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Puller C-4333

FLUID

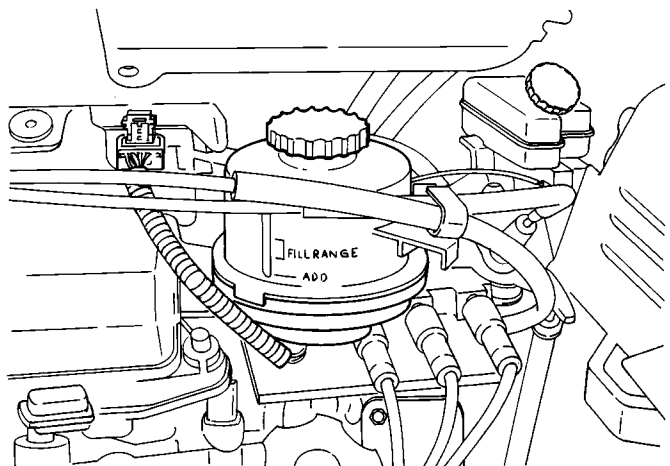
STANDARD PROCEDURE - POWER STEERING FLUID LEVEL CHECKING

WARNING: FLUID LEVEL SHOULD BE CHECKED WITH THE ENGINE OFF TO PREVENT INJURY FROM MOVING PARTS AND TO ENSURE ACCURATE FLUID LEVEL READING.

The fluid level can be read on the exterior of the power steering fluid reservoir. The fluid level should be within the "FILL RANGE" when the fluid is at normal ambient temperature, approximately 21°C to 27°C (70°F to 80°F) (Fig. 17).

Before removing the power steering filler cap, wipe the reservoir filler cap free of dirt and debris. Do not overfill the power steering system. **Use only Mopar® ATF+4 Automatic Transmission Fluid (MS-9602) in the power steering system.** For additional information on Automatic Transmission Fluid, (Refer to LUBRICATION & MAINTENANCE/ FLUID TYPES - DESCRIPTION).

CAUTION: Use only Mopar® ATF+4 Automatic Transmission Fluid (MS-9602). Use of other Mopar® power steering fluids (MS5931 and MS9933) should be avoided to ensure peak performance of the power steering system under all operating conditions.



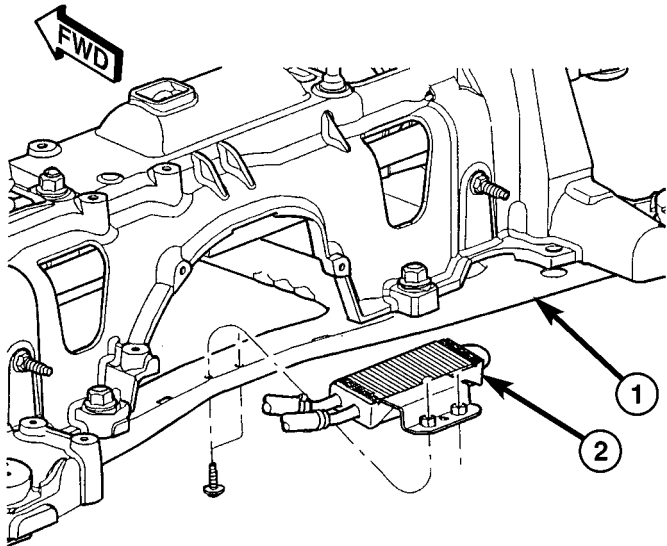
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Fig. 17 Power Steering Fluid Reservoir

FLUID COOLER

DESCRIPTION

Trailer Tow equipped vehicles are supplied with a cooler for the power steering system fluid. The power steering fluid cooler is located on the front suspension cradle crossmember reinforcement (Fig. 18).



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Fig. 18 Power Steering Cooler

- 1 - CRADLE CROSSMEMBER REINFORCEMENT
- 2 - POWER STEERING COOLER

OPERATION

The purpose of the power steering fluid cooler is to keep the temperature of the power steering system fluid from rising to a level that would affect the performance of the power steering system.

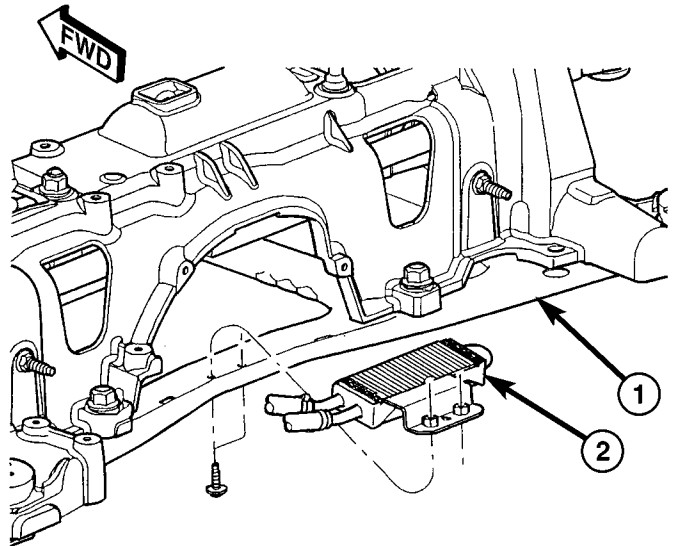
The cooler used on this vehicle is referred to as a fluid-to-air type cooler. This means that the air flow across the tubes (and fins surrounding them) of the cooler is used to extract the heat from the cooler which it has absorbed from the power steering fluid flowing through it. The cooler is placed in the power steering fluid return line, between the steering gear and the power steering fluid reservoir.

REMOVAL

- (1) Using a siphon pump, remove as much fluid as possible from the power steering fluid reservoir.
- (2) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

(3) Remove the hose clamps at the cooler and remove the hoses from the cooler inlet and outlet tubes.

(4) Remove the 2 bolts attaching the power steering cooler cradle crossmember reinforcement (Fig. 19). Remove the cooler.



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Fig. 19 Power Steering Cooler

- 1 - CRADLE CROSSMEMBER REINFORCEMENT
- 2 - POWER STEERING COOLER

INSTALLATION

(1) Install the power steering fluid cooler on the cradle crossmember reinforcement (Fig. 19). Install the mounting bolts and tighten to 11 N·m (100 in. lbs.).

(2) Install power steering fluid hoses on the cooler. **Be sure hose clamps are installed on hose past the upset bead on the power steering cooler tubes.**

(3) Lower the vehicle to a point where front tires are just off the ground.

(4) Perform Power Steering Pump Initial Operation procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

HOSE - POWER STEERING PRESSURE

REMOVAL

REMOVAL - 2.4L ENGINE

NOTE: Before proceeding, review all **WARNINGS** and **CAUTIONS**. (Refer to 19 - **STEERING/PUMP - WARNING**)(Refer to 19 - **STEERING/PUMP - CAUTION**)

(1) Remove cap from power steering fluid reservoir.

(2) Using a siphon pump, remove as much power steering fluid as possible from power steering fluid reservoir.

(3) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

(4) Remove front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - REMOVAL)

(5) Place an oil drain pan under vehicle to catch power steering fluid.

(6) Back out pressure hose tube nut at power steering pump pressure fitting and remove hose from pump (Fig. 20).

(7) Remove bolt attaching right routing clamp to front suspension cradle crossmember (Fig. 20). Remove pressure hose from clamp.

(8) Back out pressure hose tube nut at power steering gear and remove hose from gear (Fig. 20).

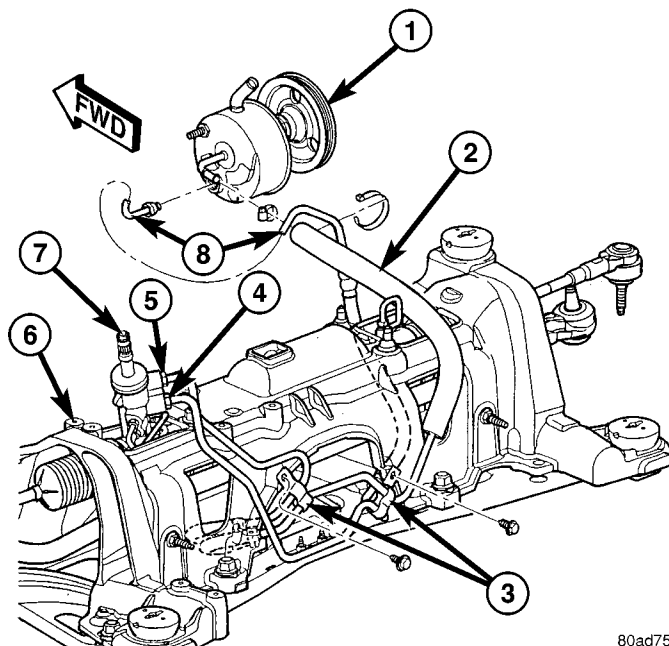
(9) Remove power steering fluid pressure hose from vehicle.

REMOVAL - 3.3L/3.8L ENGINE

NOTE: Before proceeding, review all **WARNINGS** and **CAUTIONS**. (Refer to 19 - **STEERING/PUMP - WARNING**)(Refer to 19 - **STEERING/PUMP - CAUTION**)

(1) Remove cap from power steering fluid reservoir.

(2) Using a siphon pump, remove as much power steering fluid as possible from power steering fluid reservoir.



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Fig. 20 PRESSURE AND RETURN HOSES - 2.4L

- 1 - POWER STEERING PUMP
- 2 - RETURN HOSE (HEAT SLEEVE COVERED)
- 3 - ROUTING CLAMPS
- 4 - PRESSURE HOSE TUBE NUT
- 5 - RETURN HOSE TUBE NUT
- 6 - CRADLE CROSSMEMBER
- 7 - POWER STEERING GEAR
- 8 - PRESSURE HOSE

(3) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

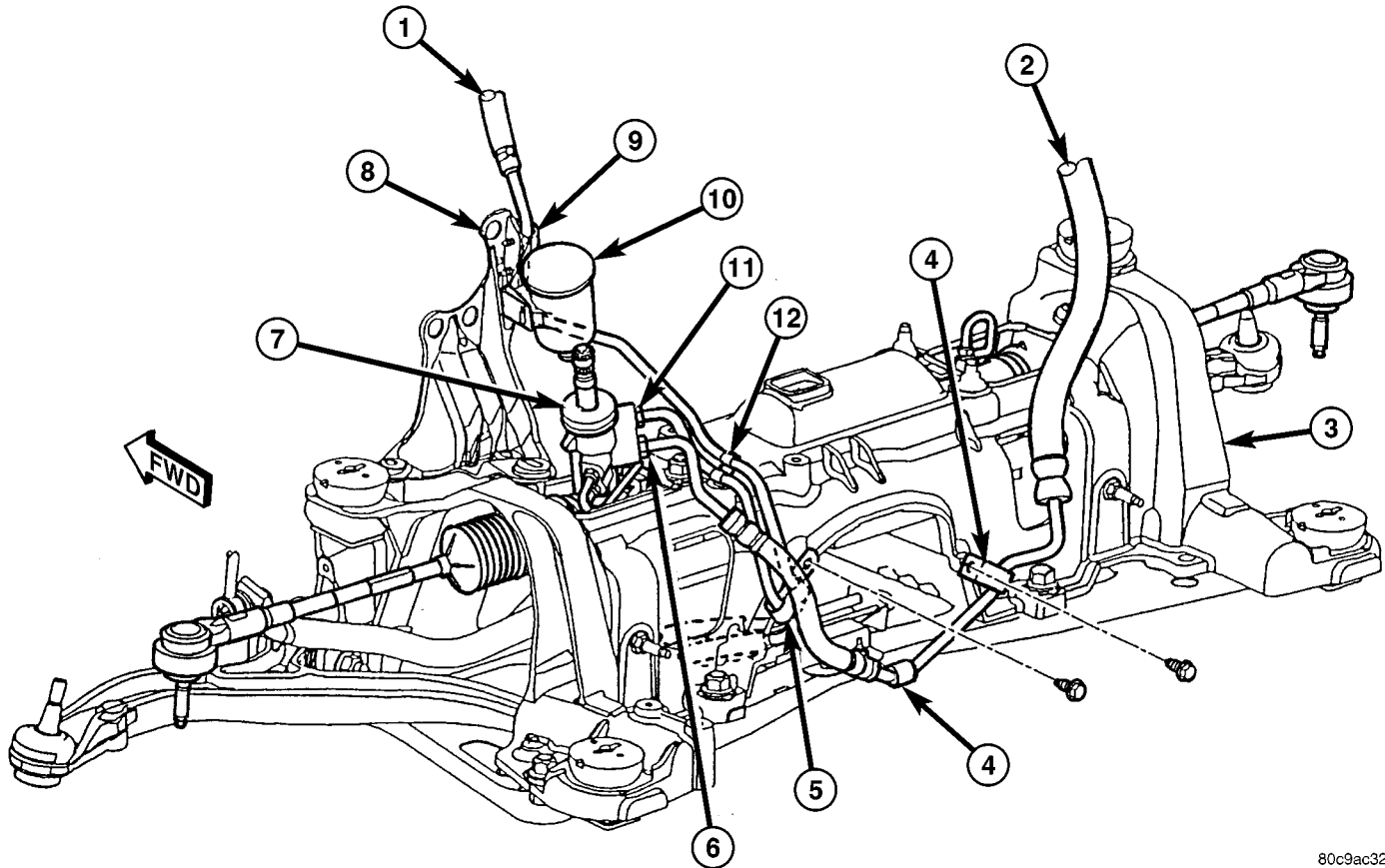
(4) Remove front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - REMOVAL)

(5) Remove two bolts securing pressure hose routing clamps to suspension cradle crossmember and steel reinforcement (Fig. 21).

(6) Place an oil drain pan under vehicle to catch draining power steering fluid.

(7) Disconnect pressure hose at power steering gear (Fig. 21).

HOSE - POWER STEERING PRESSURE (Continued)



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Fig. 21 HOSES TO POWER STEERING GEAR - 3.3L/3.8L ENGINE

- | | |
|---------------------------------|---------------------------------|
| 1 - RETURN HOSE (TO RESERVOIR) | 7 - POWER STEERING GEAR |
| 2 - PRESSURE HOSE (FROM PUMP) | 8 - ABS BRACKET |
| 3 - CRADLE CROSSMEMBER | 9 - ROUTING CLIP |
| 4 - PRESSURE HOSE ROUTING CLAMP | 10 - LEAK DETECTION PUMP FILTER |
| 5 - RETURN HOSE ROUTING CLAMP | 11 - RETURN HOSE TUBE NUT |
| 6 - PRESSURE HOSE TUBE NUT | 12 - ROUTING CLIP |

(8) Remove pressure hose routing bracket bolt at engine (Fig. 22). Bolt can be accessed through hole in cradle crossmember (Fig. 23).

(9) Disconnect pressure hose tube nut at power steering pump (Fig. 22).

(10) Remove power steering fluid pressure hose from vehicle.

CAUTION: Use care not to bend tube ends of power steering hoses when installing. Leaks and restrictions may occur.

CAUTION: Power steering fluid hoses must remain away from exhaust system and must not come in contact with any unfriendly surfaces on vehicle.

INSTALLATION

INSTALLATION - 2.4L ENGINE

(1) Remove any used O-rings from ends of power steering hose.

(2) Using a lint free towel, wipe clean hose ends, power steering pump pressure outlet fitting and steering gear port.

(3) Install new O-rings on ends of power steering fluid pressure hose. Lubricate O-rings using clean power steering fluid.

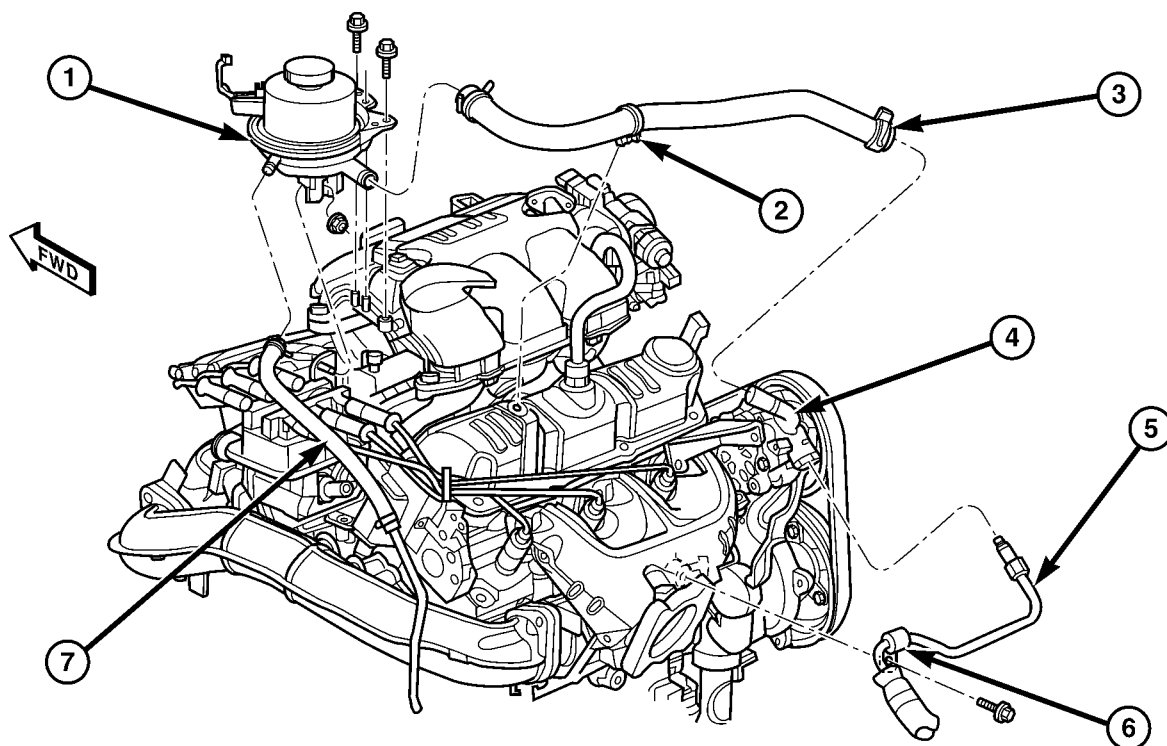
(4) Route hose up through cradle crossmember toward power steering pump avoiding tight bends or kinking.

(5) Install power steering pressure hose end into pump pressure outlet fitting (Fig. 20). Thread tube nut into outlet fitting, but do not tighten at this time.

(6) Route hose behind cradle crossmember and start hose end into gear port. Do not tighten hose tube nut at this time.

(7) Install hose into right routing clamp (Fig. 20), then install mounting bolt into cradle crossmember. Tighten bolt to 23 N·m (200 in. lbs.) torque.

HOSE - POWER STEERING PRESSURE (Continued)

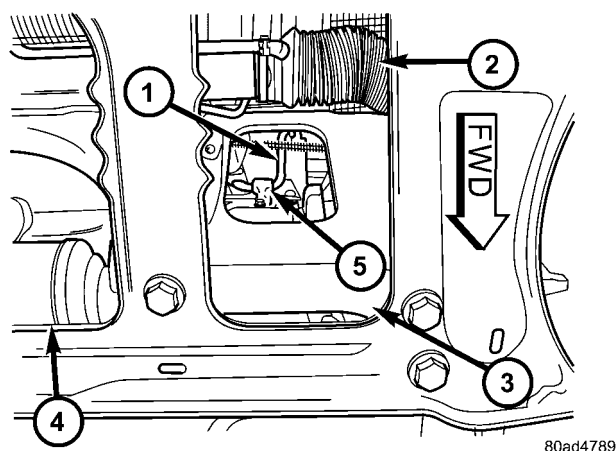


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Fig. 22 RESERVOIR AND HOSES - 3.3L/3.8L

- 1 - RESERVOIR
- 2 - ROUTING CLIP (2001 ONLY)
- 3 - SUPPLY HOSE
- 4 - POWER STEERING PUMP

- 5 - PRESSURE HOSE (TO GEAR)
- 6 - ROUTING BRACKET
- 7 - RETURN HOSE (FROM GEAR)



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Fig. 23 PRESSURE HOSE ROUTING CLAMP

- 1 - PRESSURE HOSE TUBE
- 2 - STEERING GEAR
- 3 - CRADLE CROSSMEMBER
- 4 - DRIVESHAFT
- 5 - ROUTING CLAMP BRACKET

CAUTION: When tightening and torquing the pressure hose at the power steering pump, the pressure hose is to be rotated against the fluid return hose fitting on the pump.

(8) Tighten pressure hose tube nuts at pump and gear to 31 N·m (275 in. lbs.) torque.

(9) Install front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - INSTALLATION)

(10) Lower vehicle.

(11) Fill and bleed the power steering system using the Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

(12) Inspect system for leaks.

INSTALLATION - 3.3L/3.8L ENGINE

(1) Remove any used O-rings from ends of power steering hose.

(2) Using a lint free towel, wipe clean hose ends, power steering pump pressure outlet fitting and steering gear port.

HOSE - POWER STEERING PRESSURE (Continued)

(3) Install new O-rings on ends of power steering fluid pressure hose. Lubricate O-rings using clean power steering fluid.

CAUTION: Use care not to bend tube ends of the power steering hoses when installing. Leaks and restrictions may occur.

CAUTION: Power steering fluid hoses must remain away from the exhaust system and must not come in contact with any unfriendly surfaces on the vehicle.

(4) Route hose up behind engine toward pump avoiding tight bends or kinking.

(5) Install power steering pressure hose end into pump pressure outlet fitting (Fig. 22). Thread tube nut into outlet fitting, but do not tighten at this time.

(6) Attach pressure hose routing bracket to engine (Fig. 22). Tighten bolt to 23 N·m (200 in. lbs.) torque.

(7) Tighten hose tube nut at pump outlet fitting to 31 N·m (275 in. lbs.) torque.

(8) Route hose behind cradle crossmember and start hose end into gear port. Do not tighten hose tube nut at this time.

(9) Attach hose to suspension cradle crossmember and steel reinforcement using two routing clamps and bolts (Fig. 21). Tighten clamp bolt at steel reinforcement to 11 N·m (100 in. lbs.) torque. Tighten clamp bolt at cradle crossmember to 23 N·m (200 in. lbs.) torque.

(10) Tighten hose tube nut at power steering gear port to 31 N·m (275 in. lbs.) torque.

(11) Install front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - INSTALLATION)

(12) Lower vehicle.

(13) Fill and bleed the power steering system using the Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

(14) Inspect system for leaks.

HOSE - POWER STEERING RETURN

REMOVAL

REMOVAL - 2.4L ENGINE

NOTE: Before proceeding, review all WARNINGS and CAUTIONS. (Refer to 19 - STEERING/PUMP - WARNING)(Refer to 19 - STEERING/PUMP - CAUTION)

(1) Remove cap from power steering fluid reservoir.

(2) Using a siphon pump, remove as much power steering fluid as possible from power steering fluid reservoir.

(3) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

(4) Remove front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - REMOVAL)

(5) Place an oil drain pan under vehicle to catch power steering fluid.

(6) Cut tie-strap securing insulating heat sleeve to power steering fluid return hose near power steering pump. Pull back heat sleeve to expose hose clamp.

(7) Remove clamp, then return hose from power steering pump (Fig. 20).

(8) Remove 2 bolts attaching power steering cooler to cradle crossmember reinforcement (Fig. 24).

(9) Remove bolts attaching routing clamps to front suspension cradle crossmember (Fig. 20). Remove return hose from clamps.

(10) Back out return hose tube nut at power steering gear and remove hose (Fig. 20).

REMOVAL - 3.3L/3.8L ENGINE

NOTE: Before proceeding, review all WARNINGS and CAUTIONS. (Refer to 19 - STEERING/PUMP - WARNING)(Refer to 19 - STEERING/PUMP - CAUTION)

(1) Remove cap from power steering fluid reservoir.

(2) Using a siphon pump, remove as much power steering fluid as possible from power steering fluid reservoir.

(3) Place an oil drain pan under vehicle to catch any draining power steering fluid.

(4) Remove clamp attaching return hose to power steering fluid reservoir. Disconnect hose from reservoir (Fig. 22).

(5) Follow return hose downward and open retainer at ABS bracket (Fig. 21). Remove hose tube from retainer.

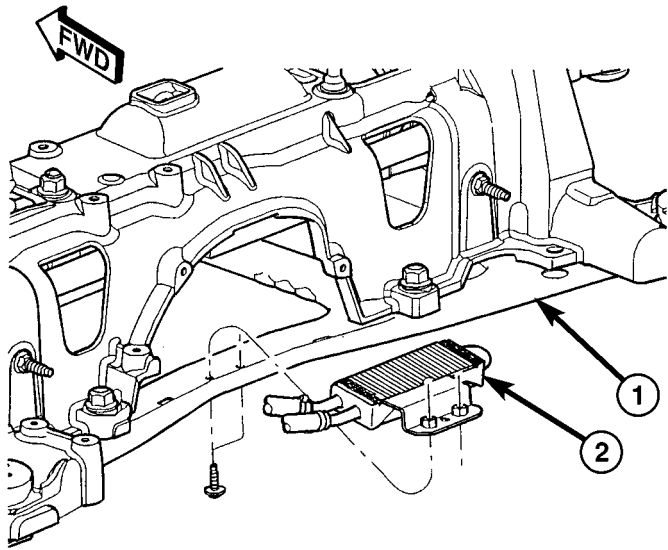
(6) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)

(7) Remove front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - REMOVAL)

(8) Remove bolt securing return hose routing clamp to suspension cradle crossmember (Fig. 21).

HOSE - POWER STEERING RETURN (Continued)

(9) Remove 2 bolts attaching power steering cooler to cradle crossmember reinforcement (Fig. 24).



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Fig. 24 POWER STEERING COOLER

- 1 - CRADLE CROSSMEMBER REINFORCEMENT
2 - POWER STEERING COOLER

(10) Disconnect return hose at power steering gear (Fig. 21).

(11) Remove power steering fluid return hose with cooler from vehicle.

INSTALLATION

INSTALLATION - 2.4L ENGINE

(1) Remove any used O-rings from ends of power steering hose.

(2) Using a lint free towel, wipe clean hose ends, power steering pump fitting and steering gear port.

(3) Install new O-ring on power steering gear end of return hose. Lubricate O-ring using clean power steering fluid.

CAUTION: Use care not to bend tube ends of the power steering hoses when installing. Leaks and restrictions may occur.

CAUTION: If a new return hose is being installed and it does not have an insulating heat sleeve installed, the heat shield from the original hose must be transferred before hose installation.

(4) Route hose along rear of cradle crossmember and start gear end of hose into gear port. Do not tighten hose tube nut at this time.

(5) Attach hose to suspension cradle crossmember using two routing clamps and bolts (Fig. 20). Tighten clamp bolts to 23 N·m (200 in. lbs.) torque.

(6) Tighten return hose tube nut at power steering gear port to 31 N·m (275 in. lbs.) torque.

(7) Install the power steering fluid cooler on the cradle crossmember reinforcement (Fig. 24). Install the mounting bolts and tighten to 11 N·m (100 in. lbs.).

CAUTION: Power steering fluid hoses must remain away from the exhaust system and must not come in contact with any unfriendly surfaces on the vehicle.

(8) Route pump end of hose over cradle crossmember toward pump avoiding tight bends or kinking.

(9) Install return hose onto power steering pump return fitting and secure with hose clamp (Fig. 20). Tighten the screw-type clamp to a torque of 2 N·m (18 in. lbs.).

CAUTION: To prevent overheating of power steering fluid return hose, protective heat shield sleeve must cover entire rubber hose.

(10) Slide insulating heat shield up over the clamp on the return hose and tie-strap it in place.

(11) Install front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - INSTALLATION)

(12) Lower vehicle.

(13) Fill and bleed the power steering system using the Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

(14) Inspect system for leaks.

INSTALLATION - 3.3L/3.8L ENGINE

(1) Remove any used O-rings from ends of power steering hose.

(2) Using a lint free towel, wipe clean hose ends and power steering gear hose port.

(3) Install a new O-ring on gear port end of power steering fluid hose. Lubricate O-ring using clean power steering fluid.

CAUTION: Use care not to bend tube ends of the power steering hoses when installing. Leaks and restrictions may occur.

CAUTION: Power steering fluid hoses must remain away from the exhaust system and must not come in contact with any unfriendly surfaces on the vehicle.

HOSE - POWER STEERING RETURN (Continued)

- (4) Route hose (with cooler attached) up toward reservoir avoiding tight bends or kinking.
- (5) Start steering gear end of hose into gear port. Do not tighten hose tube nut at this time.
- (6) Attach return hose tubes to suspension cradle crossmember using routing clamp and bolt (Fig. 21). Tighten clamp bolt to 23 N·m (200 in. lbs.) torque.
- (7) Install the power steering fluid cooler on the cradle crossmember reinforcement (Fig. 24). Install the mounting bolts and tighten to 11 N·m (100 in. lbs.). When installing mounting bolts, include pressure hose routing clamp.
- (8) Tighten hose tube nut at power steering gear port to 31 N·m (275 in. lbs.) torque.
- (9) Install front emissions vapor canister. (Refer to 25 - EMISSIONS CONTROL/EVAPORATIVE EMISSIONS/VAPOR CANISTER - INSTALLATION)
- (10) Lower vehicle.
- (11) Install return hose tube into retainer on ABS bracket (Fig. 21). Close the bracket.
- (12) Install return hose onto reservoir (Fig. 22). Slide the hose clamp into position on fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**
- (13) Fill and bleed power steering system using the Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)
- (14) Inspect system for leaks.

HOSE - POWER STEERING SUPPLY

REMOVAL

REMOVAL - 2.4L ENGINE

- (1) Remove filler cap from power steering fluid reservoir.
- (2) Using a siphon pump, remove as much power steering fluid as possible from the power steering fluid reservoir.
- (3) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)
- (4) Remove hose clamp securing supply hose to power steering pump, then remove supply hose from pump fitting.
- (5) Lower vehicle.
- (6) Remove hose clamp attaching power steering fluid supply hose to power steering fluid reservoir, then remove supply hose.
- (7) Remove the power steering fluid supply hose from the vehicle.

REMOVAL - 3.3L/3.8L ENGINE

NOTE: Before proceeding, review all WARNINGS and CAUTIONS. (Refer to 19 - STEERING/PUMP - WARNING)(Refer to 19 - STEERING/PUMP - CAUTION)

- (1) Remove cap from power steering fluid reservoir.
- (2) Using a siphon pump, remove as much power steering fluid as possible from power steering fluid reservoir.
- (3) Place an oil drain pan under vehicle to catch any draining power steering fluid.
- (4) Remove clamp attaching supply hose to power steering fluid reservoir. Disconnect hose from reservoir (Fig. 22).
- (5) Pull upward on hose routing clip releasing it from bracket on cylinder head cover (Fig. 22).

NOTE: It may be necessary to remove air cleaner housing to gain greater access to supply hose at power steering pump. (Refer to 9 - ENGINE/AIR INTAKE SYSTEM/AIR CLEANER HOUSING - REMOVAL)

- (6) Remove clamp attaching supply hose to power steering pump. Disconnect hose from pump and remove from vehicle (Fig. 22).

INSTALLATION

INSTALLATION - 2.4L ENGINE

- (1) Install and correctly route power steering fluid supply hose from remote fluid reservoir to power steering pump.
- (2) Install fluid supply hose onto power steering fluid reservoir. Install hose clamp. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**
- (3) Raise vehicle. (Refer to LUBRICATION & MAINTENANCE/HOISTING - STANDARD PROCEDURE)
- (4) Install power steering fluid supply hose on power steering pump supply fitting. Install hose clamp. **Be sure hose clamp is installed past bead on pump fitting.**
- (5) Lower vehicle.
- (6) Fill and bleed power steering system using Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)
- (7) Inspect system for leaks.

HOSE - POWER STEERING SUPPLY (Continued)

INSTALLATION - 3.3L/3.8L ENGINE

(1) Install supply hose onto supply fitting on power steering pump (Fig. 22). Slide the hose clamp into position on fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**

(2) Align routing clip located toward center of supply hose with hole in bracket on cylinder head cover and push into place (Fig. 22).

(3) Install supply hose onto reservoir (Fig. 22). Slide the hose clamp into position on fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**

(4) Fill and bleed power steering system using Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

(5) Inspect system for leaks.

RESERVOIR - POWER STEERING FLUID**DESCRIPTION****DESCRIPTION - 2.4L/3.3L/3.8L ENGINE**

All vehicles use a remote mounted power steering fluid reservoir. The power steering fluid reservoir is mounted to the engine near the battery (Fig. 25).

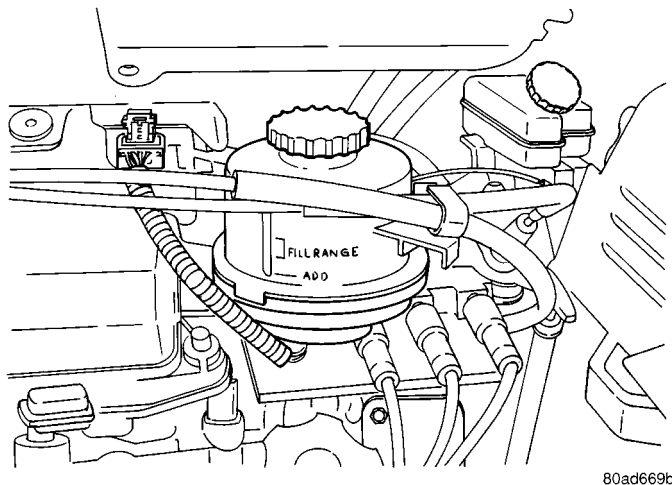


Fig. 25 Power Steering Fluid Reservoir (Typical)

DESCRIPTION - DIESEL

All vehicles use a remote mounted power steering fluid reservoir. The power steering fluid reservoir is mounted to a bracket on the engine manifold (Fig. 26).

OPERATION

The power steering fluid reservoir stores and supplies power steering fluid for the power steering system.

REMOVAL**REMOVAL - 2.4L ENGINE**

(1) Remove cap from power steering fluid reservoir.

(2) Using a siphon pump, remove as much power steering fluid as possible from power steering fluid reservoir.

(3) Open retainer on side of reservoir and remove cables from retainer.

(4) Remove clamp attaching supply hose to power steering fluid reservoir. Disconnect hose from reservoir.

(5) Remove bolts and nut securing reservoir in place.

(6) Remove reservoir.

REMOVAL - 3.3L/3.8L ENGINE

(1) Remove cap from power steering fluid reservoir.

(2) Using a siphon pump, remove as much power steering fluid as possible from power steering fluid reservoir.

(3) Open retainer on side of reservoir and remove cables from retainer.

(4) Remove clamp attaching supply hose to power steering fluid reservoir. Disconnect hose from reservoir (Fig. 22).

(5) Remove clamp attaching return hose to power steering fluid reservoir. Disconnect hose from reservoir (Fig. 22).

(6) Remove bolts and nut securing reservoir in place (Fig. 22).

(7) Remove reservoir.

REMOVAL - DIESEL

(1) Open hood.

(2) Remove engine cover.

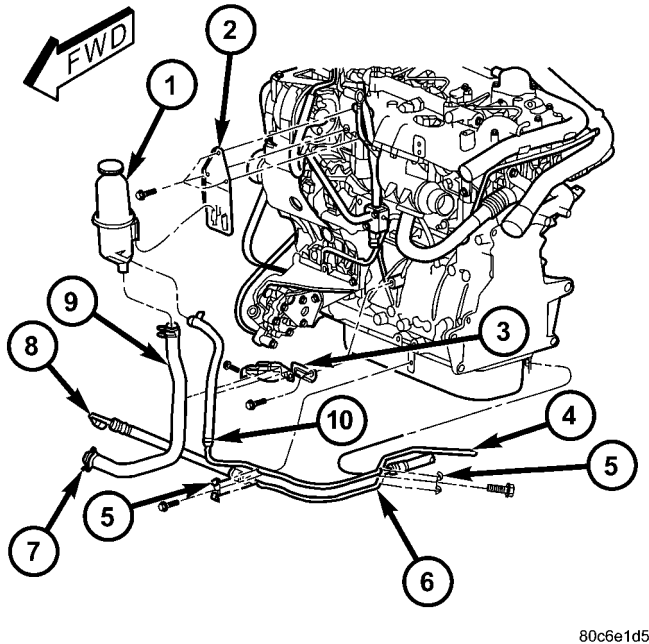
(3) Remove the filler cap from remote power steering fluid reservoir.

(4) Siphon as much fluid as possible from the fluid reservoir.

(5) Remove the clamp attaching the return hose to the power steering fluid reservoir. Disconnect hose from reservoir (Fig. 26).

(6) Remove the clamp attaching the supply hose to the power steering fluid reservoir. Disconnect hose from reservoir (Fig. 26).

RESERVOIR - POWER STEERING FLUID (Continued)

**Fig. 26 Reservoir And Hoses - Diesel**

- 1 - POWER STEERING FLUID RESERVOIR
- 2 - RESERVOIR BRACKET
- 3 - SUPPLY HOSE BRACKET
- 4 - RETURN HOSE FROM GEAR
- 5 - ROUTING CLIP
- 6 - PRESSURE HOSE TO GEAR
- 7 - SUPPLY HOSE (PUMP END)
- 8 - PRESSURE HOSE (PUMP END)
- 9 - SUPPLY HOSE
- 10 - RETURN HOSE

(7) Press the tang on the reservoir mounting bracket retaining the reservoir to the bracket, then pull upward on reservoir and remove it from the bracket.

INSTALLATION**INSTALLATION - 2.4L ENGINE**

- (1) Place reservoir into position on engine.
- (2) Install reservoir mounting bolts and nut. Tighten fasteners to 12 N·m (105 in. lbs.) torque.
- (3) Install supply hose onto reservoir. Slide the hose clamp into position on fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**

(4) Fill and bleed power steering system using Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)

(5) Inspect system for leaks.

INSTALLATION - 3.3L/3.8L ENGINE

- (1) Place reservoir into place on engine (Fig. 22).
- (2) Install reservoir mounting bolts and nut (Fig. 22). Tighten fasteners to 12 N·m (105 in. lbs.) torque.
- (3) Install supply hose onto reservoir (Fig. 22). Slide the hose clamp into position on fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**
- (4) Install return hose onto reservoir (Fig. 22). Slide the hose clamp into position on fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**
- (5) Fill and bleed power steering system using Power Steering Pump Initial Operation Procedure. (Refer to 19 - STEERING/PUMP - STANDARD PROCEDURE)
- (6) Inspect system for leaks.

INSTALLATION - DIESEL

- (1) Align the guide on the rear of the reservoir with the mounting bracket and push reservoir downward until reservoir clicks into place in the bracket.
- (2) Install the supply hose onto the reservoir (Fig. 26). Slide the hose clamp into position on the fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**
- (3) Install the return hose onto the reservoir (Fig. 26). Slide the hose clamp into position on the fluid reservoir and attach it. **Be sure hose clamp is installed past bead on fluid reservoir fitting.**
- (4) Fill the fluid reservoir to the proper level with the correct Mopar® power steering fluid or equivalent.
- (5) Start the engine and let run for a few seconds, then turn the engine off.
- (6) Add fluid as necessary.
- (7) Install the filler cap.
- (8) Install engine cover.