

STEERING

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POWER STEERING

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DESCRIPTION AND OPERATION

POWER STEERING SYSTEM

DESCRIPTION

This vehicle is equipped with either standard power steering or speed-sensitive variable-assist power steering. Early production vehicles are equipped with speed-sensitive variable-assist power steering only, while later production vehicles are equipped with standard power steering only. The variable-assist feature on the early production vehicles is built into the power steering pump. Refer to POWER STEERING PUMP for additional information on speed-sensitive variable-assist power steering.

The power steering system consists of these major components:

- POWER STEERING PUMP
- POWER STEERING GEAR

- POWER STEERING FLUID RESERVOIR
- POWER STEERING FLUID SUPPLY HOSE
- POWER STEERING FLUID PRESSURE HOSE
- POWER STEERING FLUID RETURN HOSE
- POWER STEERING FLUID COOLER
- POWER STEERING FLUID COOLER TUBES

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

OPERATION

Turning of the steering wheel is converted into linear travel through the meshing of the helical pinion teeth with the rack teeth. Power assist steering is provided by an open center, rotary type control valve.

DESCRIPTION AND OPERATION (Continued)

It is used to direct oil from the power steering pump to either side of the integral steering rack piston.

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

Refer to POWER STEERING PUMP for information on the operation of the speed-sensitive variable-assist power steering.

POWER STEERING FLUID HOSES**DESCRIPTION**

The power steering fluid hoses connect the components of the power steering system.

The power steering fluid supply hose is a special rubber hose that connects the power steering fluid reservoir to the power steering pump. The hose is secured at each end using a standard adjustable clamp.

The power steering fluid pressure hose is a high pressure hose that connects the power steering pump to the gear. At both ends of the flexible hose portion are steel fittings that are pressure crimped to the flexible hose. A standard tube nut fitting with an O-ring is used at each end to connect it to either the power steering pump or the gear.

The power steering fluid return hose is a special rubber hose that connects the power steering gear and the power steering fluid cooler, back to the fluid reservoir. A standard tube nut fitting with an O-ring is used to connect it to the power steering gear. The hose is secured to the cooler and reservoir using standard adjustable clamps.

OPERATION

The power steering fluid hoses transfer fluid from one power steering system component to the next.

POWER STEERING FLUID COOLER**DESCRIPTION**

The purpose of the power steering 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 is placed in series with the power steering fluid return hose, between the steering gear fluid outlet port and the power steering fluid reservoir. It is mounted to the bumper reinforcement in front of the radiator (Fig. 1). The cooler is secured to the power steering fluid return hose using standard adjustable clamps or crimp clamps.

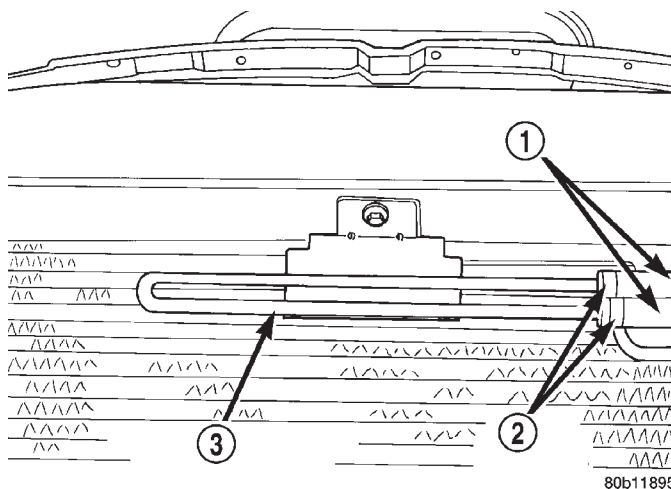


Fig. 1 Power Steering Fluid Cooler

- 1 - POWER STEERING FLUID HOSES
- 2 - CRIMP CLAMPS
- 3 - POWER STEERING FLUID COOLER

OPERATION

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 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 temperature of the power steering fluid is lowered prior to it entering the power steering fluid reservoir where it is resupplied to the power steering pump.

DESCRIPTION AND OPERATION (Continued)

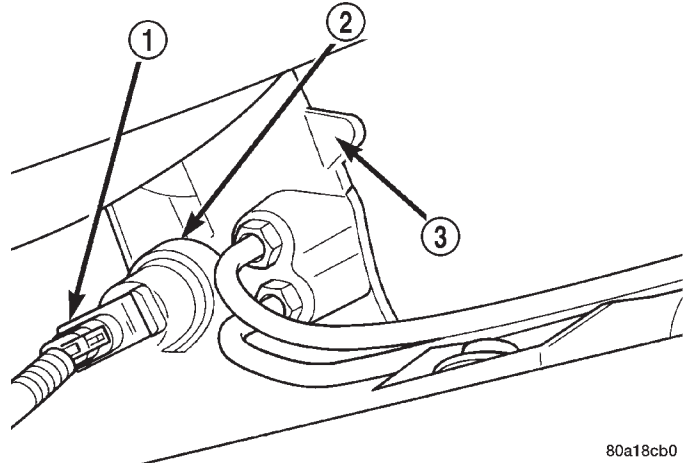
POWER STEERING FLUID PRESSURE SWITCH**DESCRIPTION**

On vehicles equipped with power steering, a power steering pressure switch (Fig. 2) is used to improve the vehicle's idle quality when required. When a demand for power assist is put on the power steering system at idle, pump pressure puts additional load on the engine, thus decreasing engine idle speed. The pressure switch improves vehicle idle quality by maintaining the required engine idle speed when the pressure rises in the power steering system.

The power steering pressure switch is mounted directly to the power steering gear (Fig. 2).

OPERATION

The pressure switch functions by signaling the powertrain control module that the power steering system is putting additional load on the engine. This type of condition exists when turning the front tires of the vehicle when the vehicle is stationary and the engine is at idle speed. When this condition is sensed by the power train control module, through a signal from the power steering pressure switch, engine idle speed will be maintained. The maintained engine idle



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Fig. 2 Power Steering Pressure Switch Location

- 1 – WIRING HARNESS CONNECTOR
- 2 – POWER STEERING PRESSURE SWITCH
- 3 – POWER STEERING GEAR

speed compensates for the additional load, thus maintaining the require engine idle speed and idle quality.

DIAGNOSIS AND TESTING

STEERING SYSTEM DIAGNOSIS CHARTS

POWER STEERING NOISE

CONDITION	POSSIBLE CAUSES	CORRECTION
OBJECTIONABLE HISS OR WHISTLE*	1. Damaged or mispositioned steering column shaft/coupling dash panel seal. 2. Noisy valve in power steering gear.	1. Reposition or replace steering column shaft/coupling dash panel seal. 2. Replace power steering gear.
RATTLE OR 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). 4. Loose lower control arm mounting bolts at front suspension crossmember. 5. Loose shock assembly mounting fasteners at shock tower. 6. Power steering fluid pressure hose touching the body of the vehicle. 7. Internal power steering gear noise. 8. Damaged front suspension crossmember.	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. 4. Tighten control arm mounting bolts to the specified torques. 5. Tighten shock assembly fasteners to the specified torques. 6. Adjust hose to proper position by loosening, repositioning, and tightening fitting to specified torque. Do not bend tubing. 7. Replace power steering gear. 8. Replace front suspension crossmember.
POPPING NOISE	1. Worn outer tie rod.	1. Replace outer tie rod.
CHIRP OR SQUEAL (POWER STEERING PUMP)	1. Loose power steering pump drive belt.	1. Check and adjust power steering pump drive belt to specifications. Replace belt if worn or glazed.
WHINE OR GROWL (POWER STEERING PUMP)**	1. Low fluid level. 2. Power steering hose touching vehicle body or frame. 3. 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. Replace power steering pump and flush system as necessary.

DIAGNOSIS AND TESTING (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. Air leak between power steering fluid reservoir and power steering pump.	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. Replace power steering pump (with reservoir).
SQUEAK OR RUBBING SOUND	1. Steering column shroud rubbing. 2. Steering column shaft rubbing. 3. Clockspring noisy. 4. 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. Replace steering gear.
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:** Power steering pump growl results from the development of high pressure fluid flow. Normally this noise level should not be high enough to be objectionable.

DIAGNOSIS AND TESTING (Continued)

STEERING WHEEL FEEL

CONDITION	POSSIBLE CAUSES	CORRECTION
STEERING WHEEL/ COLUMN CLICKING, CLUNKING OR RATTLING.	1. Steering column preload is not set properly. 2. Loose steering coupling pinch bolt. 3. Steering column bearings.	1. Loosen steering column coupling pinch bolt to reset steering column preload. Replace pinch bolt and torque to specifications. 2. Replace pinch bolt and torque to specifications. 3. Replace steering column.
STEERING WHEEL HAS FORE AND AFT LOOSENESS.	1. Steering wheel retaining nut not properly tightened and torqued. 2. Steering column preload is not set properly. 3. Steering column lower bearing spring retainer slipped on steering column shaft.	1. Tighten the steering wheel retaining nut to its specified torque. 2. Loosen steering column coupling pinch bolt to reset steering column preload. Replace pinch bolt and torque to specifications. 3. Replace steering column.
STEERING WHEEL OR DASH 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.	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 running 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.
STEERING CATCHES, 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 suspension control arm ball joints. 4. Worn upper or 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 or control arm. 4. Replace ball joint or control arm. 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.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
	6. Loose power steering pump drive belt. 7. Faulty power steering pump flow control (Follow Power Steering System Flow and Pressure Test procedure). 8. Excessive friction in steering column or intermediate shaft. 9. Binding upper or lower control arm ball joint. 10. Excessive friction in power steering gear.	6. Tighten the power steering pump drive belt to specifications. If drive belt is worn or glazed, replace belt. 7. Replace power steering pump. 8. Isolate and correct condition. 9. Replace the upper or lower ball joint. 10. Replace power steering gear.
STIFF, HARD TO TURN, SURGE, MOMENTARY INCREASE IN EFFORT WHEN TURNING.	1. Tires not properly inflated. 2. Low power steering fluid level. 3. Loose power steering pump drive belt. 4. Lack of lubrication in control arm ball joints. 5. Low power steering pump pressure (Follow Power Steering System Flow and Pressure Test procedure). 6. High internal leak in power steering gear (Follow Power Steering System Flow and Pressure Test procedure).	1. Inflate tires to specified pressure. 2. Add power steering fluid as required to power steering fluid reservoir to obtain proper level. Check for leaks. 3. Tighten the power steering pump drive belt to specifications. If drive belt is worn or glazed, replace belt. 4. 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 or control arm. 5. Replace the power steering pump as necessary. 6. Replace power steering gear.
STEERING WHEEL DOES NOT RETURN TO CENTER POSITION.	1. Tires not inflated properly. 2. Improper front wheel alignment. 3. Lack of lubrication in front suspension control arm ball joints. 4. Steering column coupling joints misaligned. 5. Steering wheel rubbing.**	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. If ball joint is a lubricated for life ball joint, replace ball joint or control arm. 4. Realign steering column coupling joints. 5. Adjust steering column shrouds to eliminate rubbing condition.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
	6. Damaged, mis-positioned or un-lubricated steering column coupler to dash seal.** 7. Binding upper or lower control arm ball joint. 8. Tight shaft bearing in steering column. 9. Excessive friction in steering column coupling. 10. Excessive friction in power steering gear.	6. Replace, reposition, or lubricate dash seal. 7. Replace the upper or lower control arm ball joint. 8. Replace the steering column. 9. Replace steering column coupling. 10. Replace power steering gear.
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 front suspension crossmember. 3. Steering column coupling worn, broken or loose. 4. Free play in steering column. 5. Worn control arm ball joints. 6. Loose steering knuckle to ball joint stud pinch bolt. 7. Front wheel bearings loose or worn. 8. Loose outer tie rod ends. 9. Loose inner tie rod ends. 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. 4. Check all components of the steering system and repair or replace as required. 5. Replace ball joint or control arm as required. 6. Inspect pinch bolts, replace as necessary, and tighten to specified torque. 7. Replace wheel bearing or knuckle as necessary. 8. Replace outer tie rod ends that have 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.

DIAGNOSIS AND TESTING (Continued)

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 pump or power steering gear leaking.	1. Tighten the fitting to its specified torque. 2. Replace as necessary. 3. Repair or replace the leaking component as required.
AERATED FLUID.	1. Low fluid level.* 2. Air leak between power steering fluid reservoir and pump. 3. Cracked power steering pump housing.	1. Fill power steering fluid reservoir to proper level. 2. Inspect for proper sealing. Replace the power steering pump (with reservoir). 3. Replace the power steering pump.
RESERVOIR FLUID OVERFLOW AND FLUID THAT IS MILKY IN COLOR	1. Water contamination.	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 if the power steering fluid is low.

POWER STEERING SYSTEM FLOW AND PRESSURE TEST

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 any time a power steering system problem is present 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. 3), hoses, Special Tools 6905 and 6959, adapters, Special Tool's 6972 and 8354, and fittings from adapter kit, Special Tool 6893.

(1) 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.

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

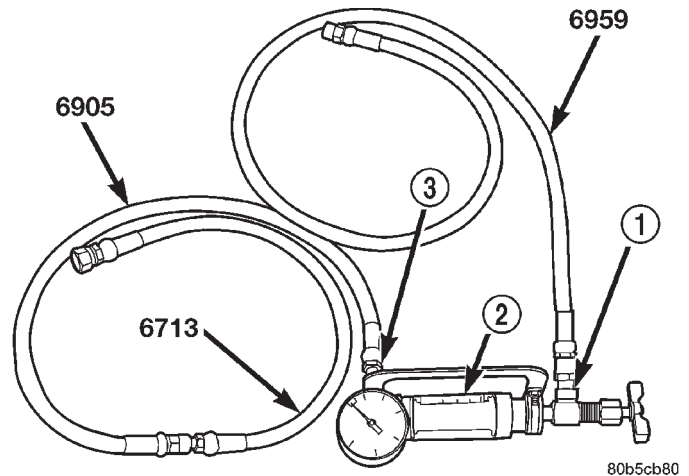


Fig. 3 Power Steering Analyzer With Hoses Installed

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

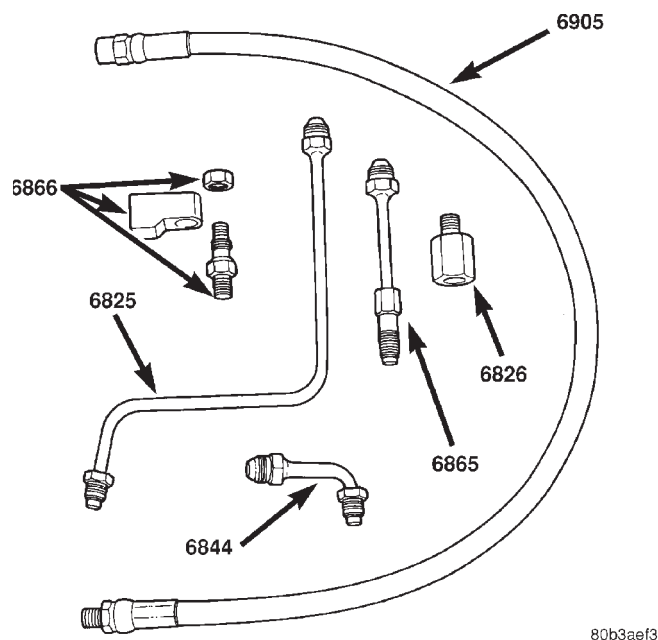
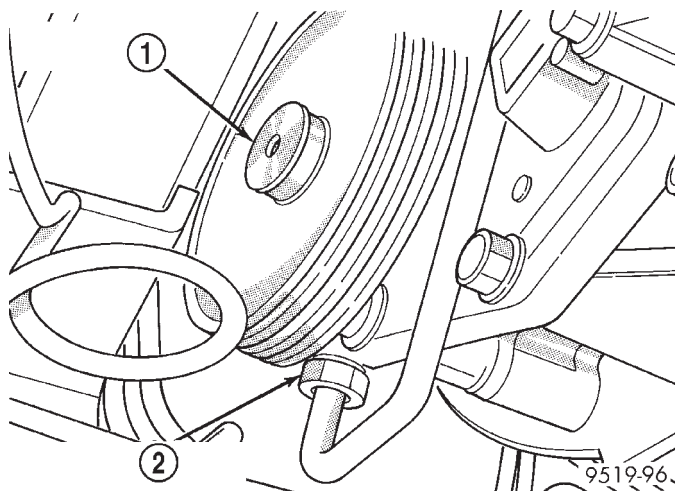
VEHICLES WITHOUT VARIABLE-ASSIST POWER STEERING

(1) Install the following adapters from Adapter Set, Special Tool 6893 (Fig. 4), 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.

(2) Disconnect the power steering fluid pressure hose from the power steering pump (Fig. 5).

DIAGNOSIS AND TESTING (Continued)

**Fig. 4 Power Steering Analyzer Adapters 6893****Fig. 5 Power Steering Pump Pressure Hose**

- 1 - POWER STEERING PUMP
2 - POWER STEERING PUMP PRESSURE HOSE

(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.

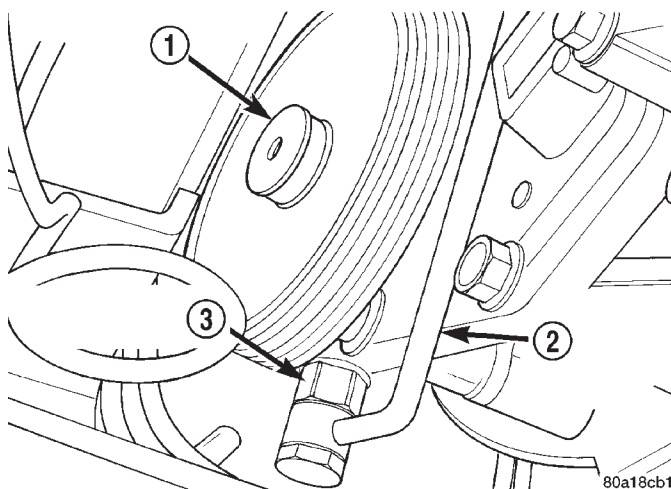
(5) Follow the test procedure listed after VEHICLES WITH VARIABLE-ASSIST POWER STEERING.

VEHICLES WITH VARIABLE-ASSIST POWER STEERING

Install the following adapters from Adapter Set, Special Tool 6893, and Special Tool 8354, on the analyzer hose ends:

- Install Adapter Fitting (Banjo Fitting), Special Tool 6866, on Pressure Hose and Adapter Fitting, Special Tool 6713.
- Install the Adapter Fitting Quick Connect for Special Tool 6972 on Pressure Hose, Special Tool 6959.

(1) Disconnect the power steering fluid pressure hose from the power steering pump (Fig. 6).

**Fig. 6 Power Steering Pump Pressure Hose**

- 1 - POWER STEERING PUMP
2 - POWER STEERING PRESSURE HOSE
3 - FLOW CONTROL VALVE FITTING

(2) Install Adapter, Special Tool 6972-1 in the pressure fitting on the power steering pump. Install Adapter Fitting Banjo Fitting, Special Tool 6866, attached to the analyzer, on Special Tool 6972-1. Install the supplied nut and tighten.

(3) Attach Adapter, Special Tool 8354, to the banjo fitting on the power steering fluid pressure hose. Connect the Adapter Fitting Quick Connect for Special Tool 6972 (attached to the analyzer) onto Special Tool 8354.

(4) Follow the test procedure below.

TEST PROCEDURE

- (1) Check belt tension and adjust as necessary.
- (2) Completely open valve on Power Steering Analyzer.
- (3) Start engine and let idle long enough to circulate power steering fluid through the analyzer and hoses, until the air is completely bled out of the fluid. Shut off engine.

DIAGNOSIS AND TESTING (Continued)

(4) Check power steering fluid level and add fluid as necessary. Start engine again and let idle.

(5) The analyzer gauge should read below 862 kPa (125 psi). If above, inspect the hoses for restrictions and repair as necessary. The initial pressure should be in the range of 345-552 kPa (50-80 psi). The flow meter should read between 1.3 and 1.6 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 five seconds as the pump could be damaged.

(6) Close valve fully three times and record highest pressure indicated each time. **All three readings must be above specifications and within 345 kPa (50 psi) of each other.**

NOTE: Power steering pump maximum relief pressure is 8240 to 8920 kPa (1195 to 1293 psi.).

- Power steering pump pressure's are above specifications, but not within 345 kPa (50 psi) of each other, replace pump.
- Pressure's are within 345 kPa (50 psi) of each other, but below specifications, replace pump.

CAUTION: Do not force the pump to operate against the stops for more than 2 to 4 seconds at a time because pump damage will result.

(7) 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, then turn the steering wheel to the right until the right stop is met. Record the highest indicated pressure at each position. Compare the recorded readings to the specifications. If the highest output pressures are not the same against either stop, the steering gear is leaking internally and must be replaced.

SERVICE PROCEDURES

POWER STEERING FLUID LEVEL CHECK

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

CAUTION: Do not use automatic transmission fluid in the power steering system.

before removing the power steering filler cap, wipe the reservoir filler cap free of dirt and debris. Remove the cap and check the fluid level on its dip-

stick. The dipstick should indicate COLD when the fluid is at normal ambient temperature, approximately 21°C to 27°C (70°F to 80°F). Do not overfill the power steering system. Use only Mopar Power Steering Fluid, or an equivalent.

REMOVAL AND INSTALLATION

POWER STEERING FLUID SUPPLY HOSE (2.5L ENGINE)

REMOVAL

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

CAUTION: Care must be used when removing the power steering fluid supply hose from power steering fluid reservoir. If excessive force is used when trying to remove hose from nipple on power steering fluid reservoir, nipple can break off of the reservoir.

(2) Remove hose clamp, attaching power steering fluid supply hose to the power steering fluid reservoir. Then remove power steering fluid supply hose from power steering fluid reservoir (Fig. 7).

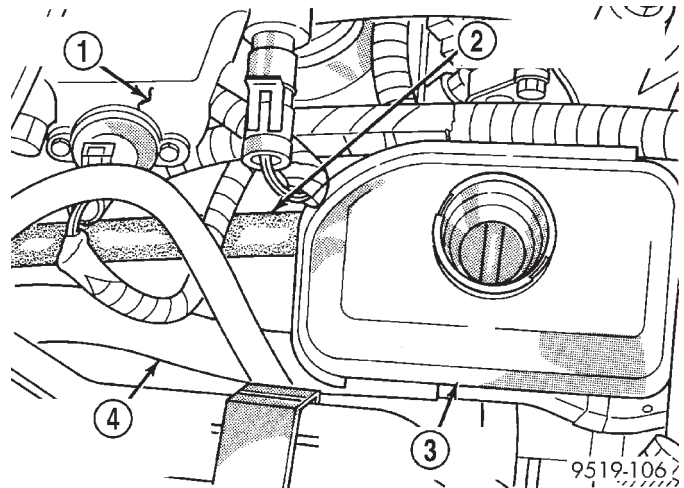


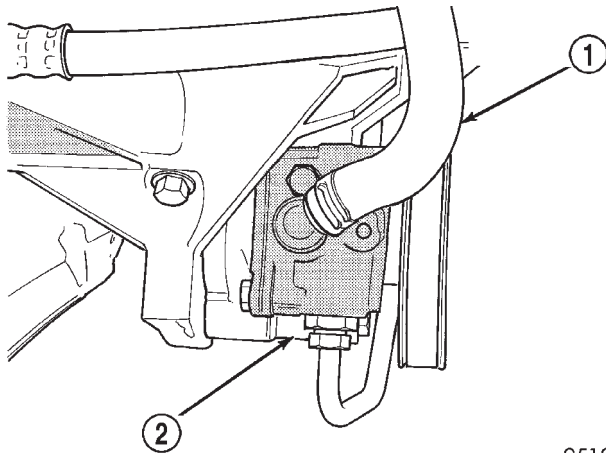
Fig. 7 Power Steering Fluid Supply Hose At Reservoir

- 1 - INTAKE MANIFOLD
- 2 - POWER STEERING FLUID RETURN HOSE
- 3 - POWER STEERING FLUID RESERVOIR
- 4 - POWER STEERING FLUID SUPPLY HOSE (TO PUMP)

(3) Raise vehicle.

(4) Remove hose clamp, attaching power steering fluid supply hose to the power steering pump. Then remove power steering fluid supply hose from power steering pump fitting (Fig. 8).

REMOVAL AND INSTALLATION (Continued)



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Fig. 8 Fluid Supply Hose At Power Steering Pump

- 1 - POWER STEERING FLUID SUPPLY HOSE
2 - POWER STEERING PUMP

INSTALLATION

(1) Install power steering fluid supply hose on power steering pump fitting, making sure it is correctly routed up to the power steering fluid reservoir. Install hose clamp on power steering fluid supply hose at power steering pump fitting (Fig. 8). **Be sure hose clamp is installed on power steering fluid supply hose past upset bead on power steering pump fitting.**

(2) Lower vehicle.

CAUTION: Care must be used when installing power steering fluid supply hose on power steering fluid reservoir. If excessive force is used when trying to install hose on nipple of power steering fluid reservoir, nipple can be broken off the reservoir.

(3) Install power steering fluid supply hose on power steering fluid reservoir fitting (Fig. 7). Install hose clamp on power steering fluid supply hose at power steering fluid reservoir. **Be sure hose clamp is installed on return hose past upset bead on power steering fluid reservoir.**

CAUTION: Do not use automatic transmission fluid in power steering system. Only use Mopar®, Power Steering Fluid, or equivalent.

- (4) Fill power steering fluid reservoir.
- (5) Start the engine and let run for a few seconds. Then turn the engine off.
- (6) Add fluid if necessary. Repeat the above procedure until the fluid level remains constant after running the engine.
- (7) Raise front wheels of vehicle off the ground.

(8) Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops. Then turn the engine off.

(9) Add power steering fluid if necessary.

(10) Lower the vehicle and turn the steering wheel slowly from lock to lock.

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

(12) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

(13) After hose is installed, check for leaks at all hose connections.

POWER STEERING FLUID PRESSURE HOSE

Service all power steering hoses with the vehicle raised on a hoist. Cap all open ends of hoses, power steering pump fittings and steering gear ports to prevent the entry of foreign material into the components.

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.

REMOVAL

NOTE: To service the power steering pressure hose on this vehicle, the front suspension crossmember and steering gear will need to be lowered away from the body of the vehicle. This is required for access to the power steering hose connections on the side of the steering gear. Refer to the steering gear service procedure in this group of the service manual for the required procedure for removal of the front suspension crossmember.

(1) Raise vehicle on jack stands or centered on a frame contact type hoist. See Hoisting in the Lubrication And Maintenance section in this manual, for the required lifting procedure to be used for this vehicle.

CAUTION: When lowering the front suspension crossmember, its installed position on the vehicle's body must be marked on the crossmember before it is lowered. Use the procedure for the removal and replacement of the steering gear that is in this group of the service manual for the required procedure to locate and lower the crossmember.

REMOVAL AND INSTALLATION (Continued)

(2) Lower the front suspension crossmember far enough to gain access to the high and low pressure ports on the steering gear.

(3) Disconnect the power steering pressure hose (Fig. 9) at the power steering gear. Drain power steering fluid from power steering pump and hose through open end of hose.

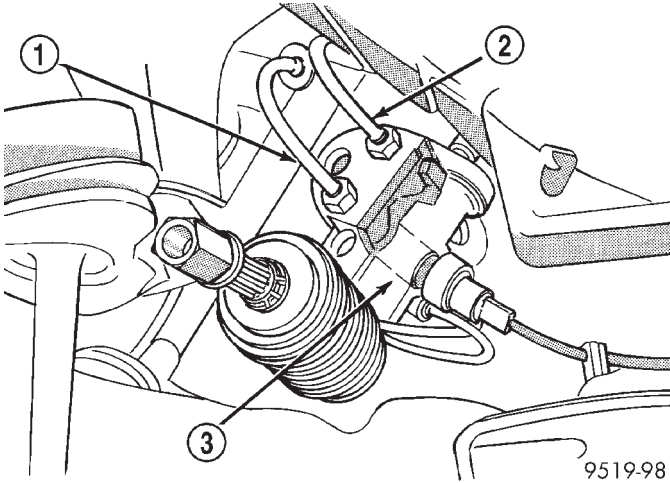


Fig. 9 Power Steering Hose Connections At Steering Gear

- 1 - POWER STEERING PRESSURE HOSE
- 2 - POWER STEERING RETURN HOSE
- 3 - POWER STEERING GEAR

(4) Remove the 2 routing brackets (Fig. 10) attaching the power steering return hose to the power steering pressure hose routing brackets. Then remove the 2 bolts attaching the power steering pressure hose routing brackets to the cylinder head (Fig. 10).

(5) Remove the power steering pressure hose from the pressure fitting on power steering pump (Fig. 11).

(6) Remove the power steering fluid pressure hose from the vehicle through the bottom rear of the engine compartment.

(7) Discard all used O-rings located at ends of power steering pressure hose fittings.

INSTALLATION

(1) Install power steering pressure hose in vehicle from bottom of engine compartment using the reverse order of removal.

(2) Using a lint free towel, wipe clean all open power steering hose ends and the power steering pump and steering gear ports.

(3) Install new O-rings on the power steering pressure hose fittings. Lubricate O-rings using fresh clean power steering fluid.

(4) Attach the power steering pressure hose to outlet fitting on the power steering pump. **Do not tighten or torque pressure fitting at this time.**

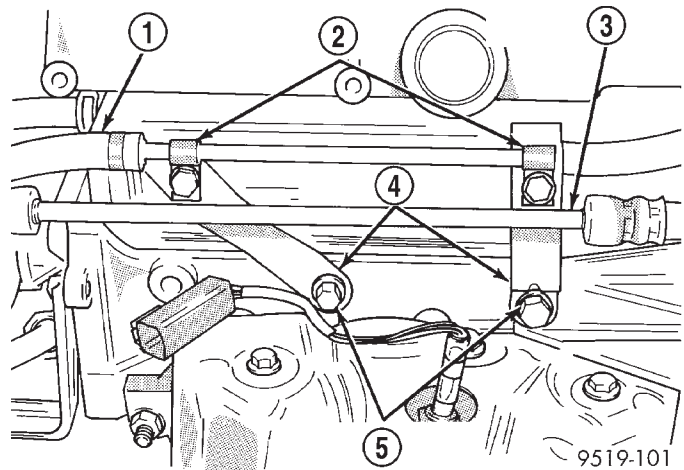


Fig. 10 2.5 Liter Power Steering Hose Routing

- 1 - POWER STEERING RETURN HOSE
- 2 - ROUTING BRACKETS
- 3 - POWER STEERING PRESSURE HOSE
- 4 - ROUTING BRACKETS
- 5 - ROUTING BRACKET ATTACHING BOLTS

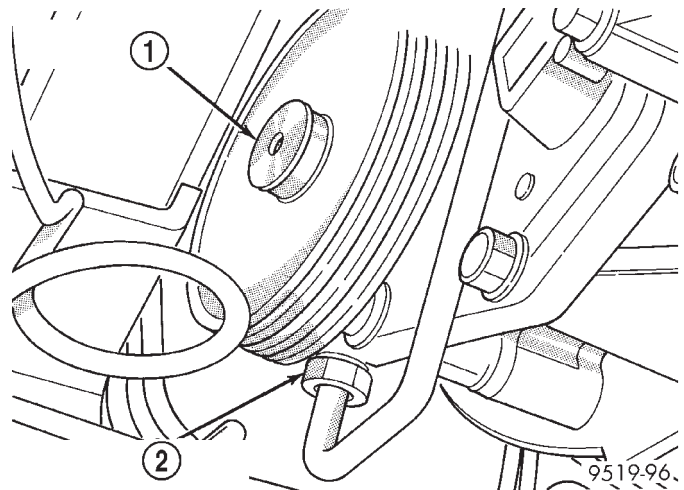


Fig. 11 Power Steering Pump Pressure Fitting

- 1 - POWER STEERING PUMP
- 2 - POWER STEERING PUMP PRESSURE HOSE

CAUTION: Hoses must remain away from exhaust system, vehicle components and unfriendly surfaces causing possible damage to power steering hoses.

(5) Correctly route power steering pressure hose avoiding tight bends or kinking of the hose. Install power steering pressure hose routing brackets and attaching bolts on engine (Fig. 10).

(6) Route power steering pressure hose to pressure port on power steering gear. Install power steering pressure hose, on steering gear and loosely install tube nut into steering gear. Then using a crow foot,

REMOVAL AND INSTALLATION (Continued)

(Fig. 12) tighten the power steering pressure hose tube nut to a torque of 31 N·m (275 in. lbs.).

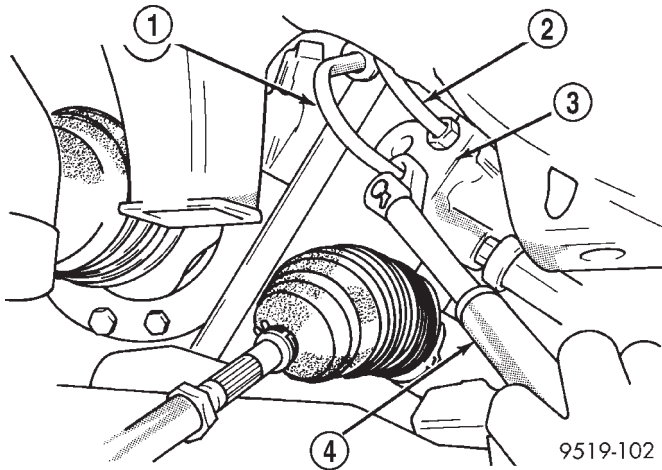


Fig. 12 Power Steering Pressure Hose Tube Nut

- 1 - POWER STEERING PRESSURE HOSE
- 2 - POWER STEERING RETURN HOSE
- 3 - STEERING GEAR
- 4 - TORQUE WRENCH

CAUTION: When installing the front suspension crossmember, it must be installed back in the same location on the vehicle's body as when it was originally installed when the vehicle was built. Use procedure for installing the steering gear that is in this group of the service manual for the required procedure to install and locate crossmember.

(7) Raise the front suspension crossmember and steering gear back up into the vehicle. Refer to the steering gear service procedure in this group of the service manual for the required procedure to install the front suspension crossmember.

(8) Lower the vehicle.

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

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

(11) Raise front wheels of vehicle off the ground.

(12) Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops. Then turn the engine off.

(13) Add power steering fluid if necessary.

(14) Lower the vehicle and turn the steering wheel slowly from lock to lock.

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

(16) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

(17) After hose is installed, check for leaks at all hose connections.

POWER STEERING FLUID RETURN HOSE

Service all power steering hoses with the vehicle raised on a hoist. Cap all open ends of hoses, power steering pump fittings and steering gear ports to prevent the entry of foreign material into the components.

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.

REMOVAL

NOTE: To remove the power steering return hose on this vehicle, the front suspension crossmember and steering gear will need to be lowered away from the body of the vehicle. This is required for access to the power steering hose connections on the side of the steering gear. Refer to the steering gear service procedure in this group of the service manual for the required procedure to remove the front suspension crossmember.

(1) Siphon all power steering fluid from the power steering fluid reservoir.

CAUTION: Care must be used when removing power steering fluid return hose from power steering fluid reservoir. If excessive force is used when trying to remove hose from nipple on power steering fluid reservoir, nipple can break off of the reservoir.

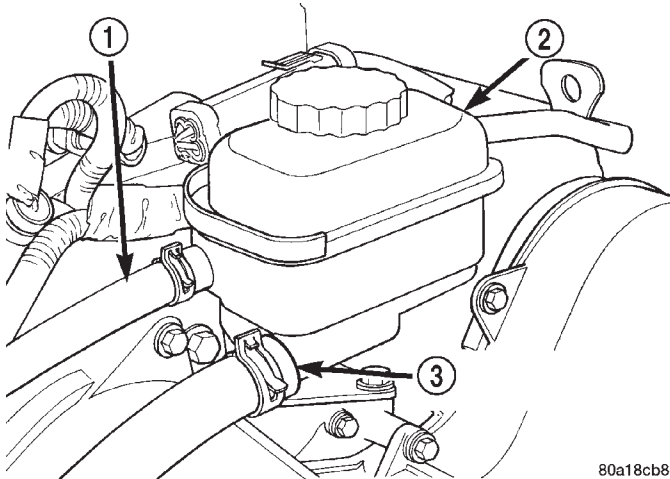
(2) Remove power steering fluid return hose from nipple on power steering fluid reservoir (Fig. 13).

(3) Raise vehicle on jack stands or centered on a frame contact type hoist. See Hoisting in the Lubrication And Maintenance section in this manual, for the required lifting procedure to be used for this vehicle.

CAUTION: When lowering the front suspension crossmember, its installed position on the vehicle's body must be marked on the crossmember before it is lowered. Use procedure for the removal and replacement of the steering gear that is in this group of the service manual for the required procedure to locate and lower crossmember.

(4) Lower the front suspension crossmember far enough to gain access to the high and low pressure ports on the steering gear.

REMOVAL AND INSTALLATION (Continued)

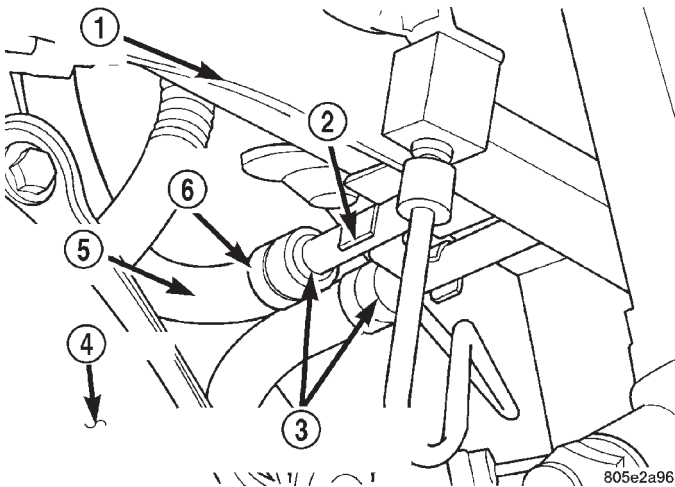


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Fig. 13 Fluid Return Hose At Reservoir

- 1 - POWER STEERING FLUID RETURN HOSE
- 2 - POWER STEERING FLUID RESERVOIR
- 3 - POWER STEERING FLUID SUPPLY HOSE

(5) Disconnect power steering fluid return hose at power steering cooler line (Fig. 14). Drain power steering fluid from hose.



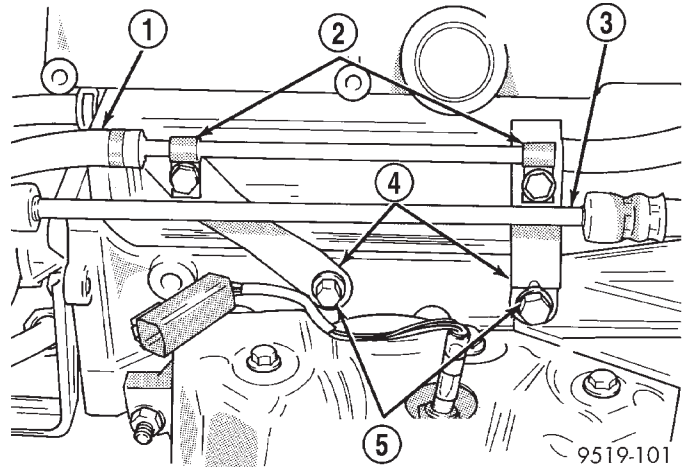
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Fig. 14 Power Steering Hose Connections At Cooler Lines

- 1 - LEFT FRAME RAIL
- 2 - CLIP
- 3 - POWER STEERING COOLER LINES
- 4 - TRANSAXLE
- 5 - RETURN HOSE
- 6 - HOSE CLAMP

(6) Remove the 2 routing brackets (Fig. 15) attaching the power steering return hose to the power steering pressure hose routing brackets.

(7) Remove the power steering return hose from the vehicle. The power steering return hose is removed from the bottom of the engine compartment.



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Fig. 15 2.5 Liter Power Steering Hose Routing

- 1 - POWER STEERING RETURN HOSE
- 2 - ROUTING BRACKETS
- 3 - POWER STEERING PRESSURE HOSE
- 4 - ROUTING BRACKETS
- 5 - ROUTING BRACKET ATTACHING BOLTS

INSTALLATION

(1) Install power steering return hose on vehicle. Power steering return hose is installed from the bottom of the vehicles engine compartment using the reverse steps of removal.

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

(3) Install a new O-ring on the power steering return hose to steering gear fitting.

(4) Lubricate O-ring using fresh clean power steering fluid.

(5) Install the power steering return hose, on the cooler lines (Fig. 14).

CAUTION: Hoses must remain away from exhaust system, vehicle components and unfriendly surfaces causing possible damage to power steering hoses.

(6) Correctly route power steering return hose up to the power steering fluid reservoir, avoiding tight bends or kinking of the hose.

(7) Install the 2 routing brackets (Fig. 15) attaching the power steering return hose to the power steering pressure hose routing brackets.

CAUTION: When installing the front suspension crossmember, it must be installed back in the same location on the vehicle's body as when it was originally installed when the vehicle was built. Use procedure for installing the steering gear that is in this group of the service manual for the required procedure to install and locate crossmember.

REMOVAL AND INSTALLATION (Continued)

(8) Raise the front suspension crossmember and steering gear back up into the vehicle. Refer to the steering gear service procedure in this group of the service manual for the required procedure to install the front suspension crossmember.

(9) Lower the vehicle.

CAUTION: Care must be used when installing power steering fluid return hose on power steering fluid reservoir fitting. If excessive force is used when trying to install hose on nipple of power steering fluid reservoir, nipple can be broken off the reservoir.

(10) Install power steering return hose on power steering fluid reservoir fitting. Install hose clamp on power steering return hose at power steering fluid reservoir (Fig. 13). **Be sure hose clamp is installed on return hose past upset bead on power steering fluid reservoir.**

(11) Start the engine and let run for a few seconds. Then turn the engine off.

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

(13) Raise front wheels of vehicle off the ground.

(14) Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops. Then turn the engine off.

(15) Add power steering fluid if necessary.

(16) Lower the vehicle and turn the steering wheel slowly from lock to lock.

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

(18) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

(19) After hose is installed, check for leaks at all hose connections.

POWER STEERING FLUID COOLER

REMOVAL

(1) Raise vehicle using a frame contact type hoist or supported as required using jack stands. See Hoisting in the Lubrication And Maintenance group of this service manual for the required hoisting or jacking procedure to be used for this vehicle.

(2) Remove the hose clamps (Fig. 16) from the power steering fluid hoses. Drain power steering fluid from the hoses and the power steering fluid cooler.

(3) Remove the 2 bolts (Fig. 17) attaching the power steering fluid cooler to the radiator lower crossmember (Fig. 17).

(4) Remove the power steering fluid cooler and mounting brackets as an assembly (Fig. 16) from the radiator lower crossmember. It is removed by rolling

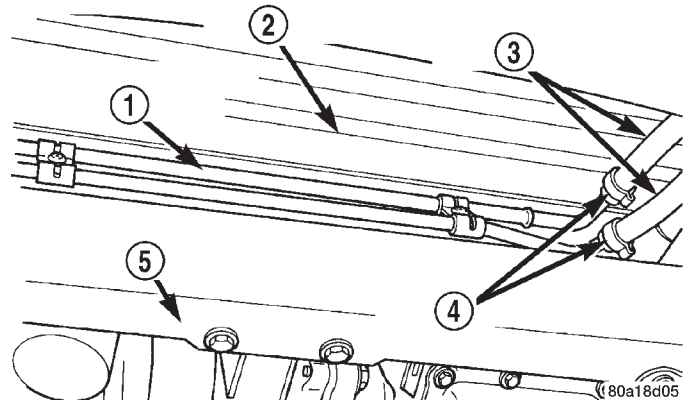


Fig. 16 Hose Clamps At Power Steering Fluid Cooler

- 1 - POWER STEERING OIL COOLER
- 2 - RADIATOR
- 3 - POWER STEERING FLUID HOSES
- 4 - HOSE CLAMPS
- 5 - RADIATOR LOWER CROSSMEMBER

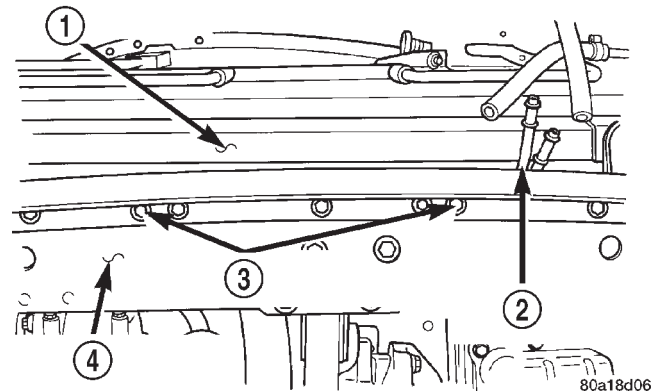


Fig. 17 Power Steering Fluid Cooler Attachment

- 1 - RADIATOR
- 2 - POWER STEERING OIL COOLER
- 3 - OIL COOLER ATTACHING BOLTS
- 4 - RADIATOR LOWER CROSSMEMBER

the bottom of the power steering fluid cooler and mounting brackets upward removing the tabs on the brackets from the radiator lower crossmember.

INSTALLATION

(1) Install tabs on mounting brackets into the holes in the radiator lower crossmember. Then rotate cooler upward into position on crossmember.

(2) Install the 2 bolts (Fig. 17) attaching the power steering fluid cooler to the radiator lower crossmember. Tighten the attaching bolt to a torque of 7 N·m (60 in. lbs.).

REMOVAL AND INSTALLATION (Continued)

CAUTION: Only the original equipment crimp style clamp can be used when installing the power steering fluid hoses on the power steering oil cooler. Use of a different style clamp may not provide proper retention of the hose to the power steering oil cooler. Refer to the Mopar Parts Catalog for the required replacement hose clamp.

(3) Install the hose clamps on the power steering fluid hoses.

(4) Install power steering fluid hoses on the power steering fluid cooler. (Fig. 16). **Be sure hose clamps are installed on hose past the upset bead on the power steering oil cooler.**

(5) Using Crimper, Hose Clamp, Special Tool C-4124 properly crimp the clamps on the power steering fluid hoses at the power steering oil cooler.

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

(7) Start the engine and let run for a few seconds. Then turn the engine off.

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

(9) Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops.

(10) Add power steering fluid if necessary.

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

(12) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

POWER STEERING FLUID COOLER LINES

REMOVAL

(1) Secure the steering wheel in the STRAIGHT AHEAD position using a steering wheel holding tool.

(2) Under the instrument panel, disconnect the intermediate shaft from the steering gear shaft. To do so, perform one of the following that applies:

(a) On early production vehicles, remove the "E" clip from the steering column intermediate shaft coupler pinch bolt (Fig. 18). Next, remove the pinch bolt from the intermediate shaft coupler by backing off the nut, then separate the intermediate shaft from steering gear shaft.

(b) On later production vehicles, remove the pinch bolt from the intermediate shaft coupler (Fig. 19), then slide the intermediate shaft up and off the steering gear shaft.

(3) Siphon as much power steering fluid as possible from the power steering fluid reservoir.

(4) Raise the vehicle using a frame contact type hoist or supported as required using jack stands. See Hoisting in the Lubrication and Maintenance group

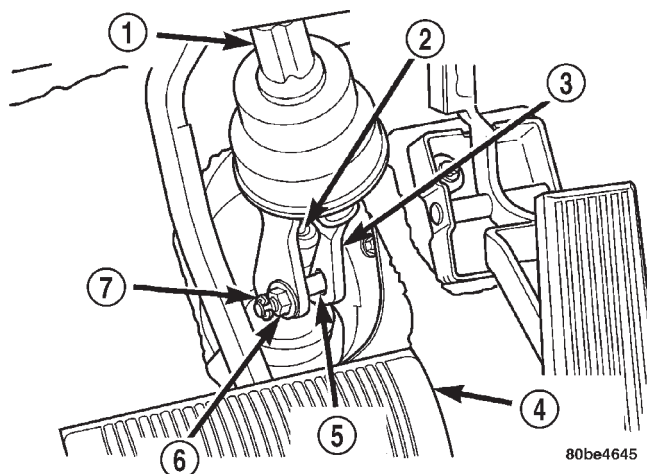


Fig. 18 Early Intermediate Shaft Attachment

- 1 - INTERMEDIATE SHAFT
- 2 - STEERING GEAR SHAFT
- 3 - COUPLER
- 4 - BRAKE PEDAL
- 5 - PINCH BOLT
- 6 - NUT
- 7 - "E" CLIP

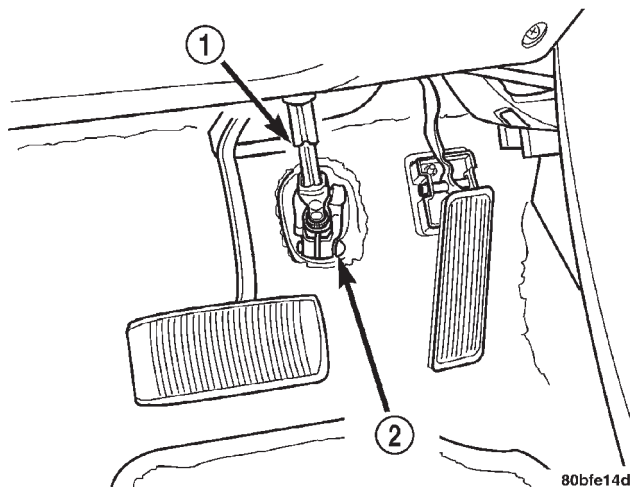


Fig. 19 Later Intermediate Shaft Attachment

- 1 - INTERMEDIATE SHAFT
- 2 - PINCH BOLT

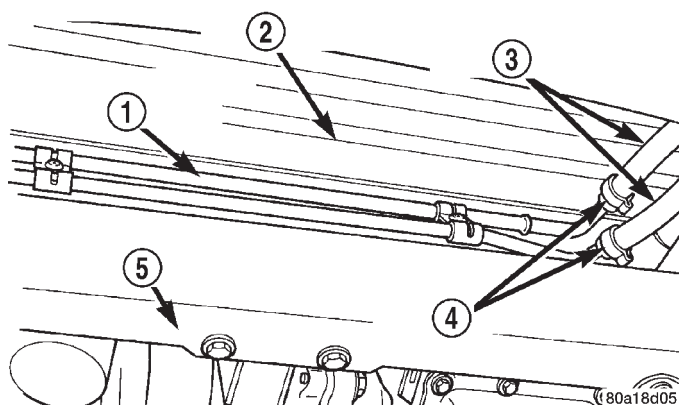
of this service manual for the required hoisting or jacking procedure to be used for this vehicle.

(5) Remove the left front wheel/tire.

(6) Remove the front fascia and the grill as an assembly from the vehicle. Refer to Front Bumper/Fascia in Group 13 of this service manual for the proper procedure.

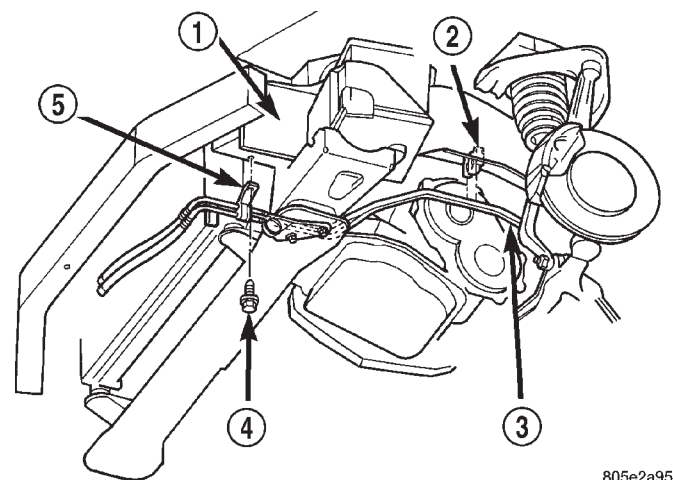
(7) Remove the hose clamps (Fig. 20) from the power steering fluid hoses. Drain power steering fluid from the hoses and the power steering fluid cooler.

REMOVAL AND INSTALLATION (Continued)

**Fig. 20 Hose Clamps At Power Steering Fluid Cooler**

- 1 - POWER STEERING OIL COOLER
- 2 - RADIATOR
- 3 - POWER STEERING FLUID HOSES
- 4 - HOSE CLAMPS
- 5 - RADIATOR LOWER CROSSMEMBER

(8) Remove the bracket attaching the power steering fluid cooler lines to the left front frame rail (Fig. 21).

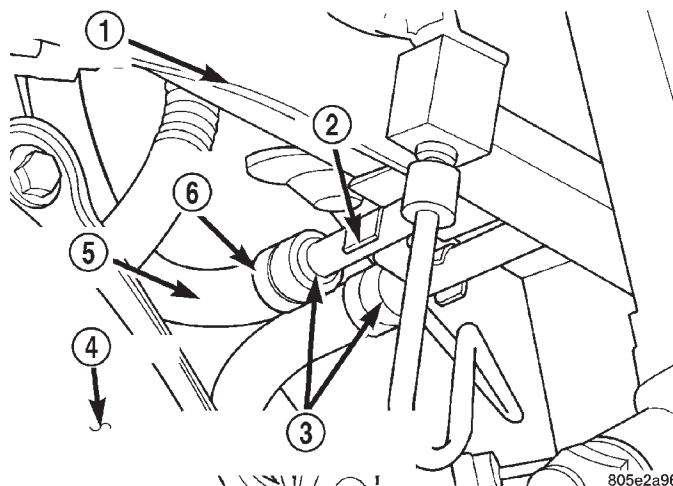
**Fig. 21 Power Steering Cooler Line Attachment**

- 1 - LEFT FRAME RAIL
- 2 - ROUTING CLIP
- 3 - POWER STEERING FLUID COOLER LINES
- 4 - BOLT
- 5 - BRACKET

(9) Lower the front suspension crossmember. Refer to the steering gear service procedures in this group of the service manual for the required procedure for the removal of the front suspension crossmember.

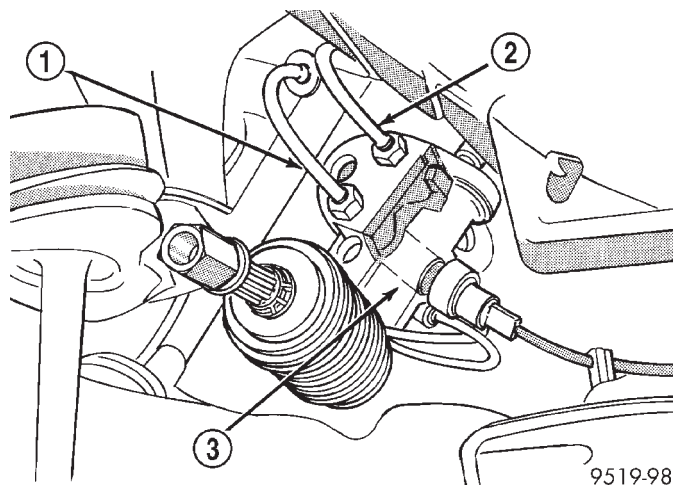
(10) Remove the clip (Fig. 22) holding the power steering fluid cooler lines together.

(11) Remove the hose clamp (Fig. 22) attaching the power steering fluid return hose from the engine, (Fig. 22) to the power steering fluid cooler lines.

**Fig. 22 Power Steering Cooler Line Clip**

- 1 - LEFT FRAME RAIL
- 2 - CLIP
- 3 - POWER STEERING COOLER LINES
- 4 - TRANSAXLE
- 5 - RETURN HOSE
- 6 - HOSE CLAMP

(12) Remove the power steering fluid return hose (Fig. 23) from the power steering gear.

**Fig. 23 Power Steering Hose Connections At Steering Gear**

- 1 - POWER STEERING PRESSURE HOSE
- 2 - POWER STEERING RETURN HOSE
- 3 - POWER STEERING GEAR

(13) Remove the power steering fluid cooler lines from the routing clip on the left front frame rail (Fig. 21).

(14) Separate the power steering cooler line assembly into 2 separate pieces.

(15) Remove each cooler line separately from the vehicle. The cooler lines are removed out through the front of the vehicle in the area between the radiator and the closure panel.

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

(1) Install the cooler lines individually using the reverse procedure of their removal.

(2) Install the cooler lines in the routing clip on the left frame rail

CAUTION: Only the original equipment crimp style clamp can be used when installing the power steering fluid hoses. Use of a different style clamp may not provide proper retention of the hose to the power steering oil cooler. Refer to the Mopar Parts Catalog for the required replacement hose clamp.

(3) Install the hose clamps on the power steering fluid hoses.

(4) Install the power steering fluid return hose coming from the engine on the power steering cooler line (Fig. 22). **Be sure hose clamp is installed on hose past the upset bead on the power steering cooler line.**

(5) Using Crimper, Hose Clamp, Special Tool C-4124 properly crimp the clamps on the power steering fluid hoses at the power steering oil cooler line.

(6) Install the power steering fluid return hose on the steering gear. Then using a crow foot and torque wrench (Fig. 24) tighten the tube nut to a torque of 31 N·m (275 in. lbs.).

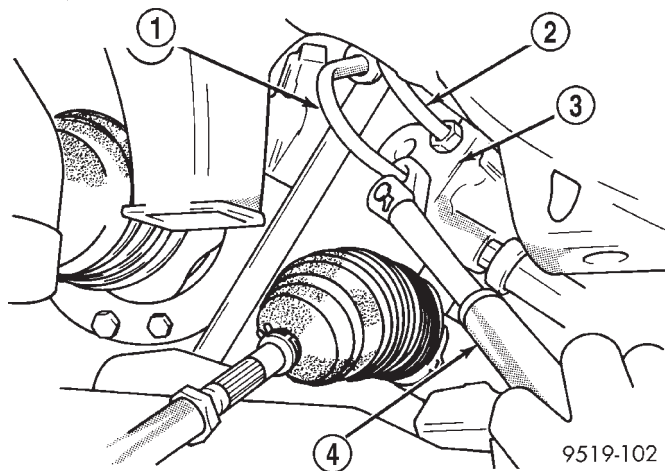


Fig. 24 Torquing Power Steering Fluid Hose Tube Nuts

- 1 - POWER STEERING PRESSURE HOSE
- 2 - POWER STEERING RETURN HOSE
- 3 - STEERING GEAR
- 4 - TORQUE WRENCH

(7) Install the clip (Fig. 22) holding the 2 power steering fluid cooler lines together.

(8) Install the front suspension crossmember. Refer to the steering gear service procedures in this group

of the service manual for the required procedure for the installation of the front suspension crossmember.

(9) Install the left front wheel/tire.

(10) Install the bracket attaching the power steering cooler lines to the left frame rail (Fig. 21). Install bracket attaching bolt and tighten to a torque of 7 N·m (60 in. lbs.).

CAUTION: Only the original equipment crimp style clamp can be used when installing the power steering fluid hoses on the power steering fluid cooler. Use of a different style clamp may not provide proper retention of the hose to the power steering fluid cooler. Refer to the Mopar Parts Catalog for the required replacement hose clamp.

(11) Install the hose clamps on the power steering fluid hoses.

(12) Install power steering fluid hoses on the power steering fluid cooler. (Fig. 20). **Be sure hose clamps are installed on hose past the upset bead on the power steering fluid cooler.**

(13) Using Crimper, Hose Clamp, Special Tool C-4124 properly crimp the clamps on the power steering fluid hoses at the power steering fluid cooler.

(14) Install the front fascia and grill on the vehicle. Refer to Front Bumper/Fascia in Group 13 of this service manual for the proper procedure.

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

(16) Under the instrument panel, reconnect the intermediate shaft to the steering gear shaft. To do so, perform one of the following that applies:

(a) On early production vehicles, reconnect the steering column intermediate shaft to the steering gear shaft (Fig. 18). Install a **new** intermediate shaft coupler pinch bolt through the coupler and into its nut, then tighten the nut and pinch bolt to a torque of 27 N·m (240 in. lbs.).

(b) On later production vehicles, align the flats and slide the intermediate shaft onto the steering gear shaft aligning the pinch bolt hole with the notch formed into the steering gear shaft. Install a **new** pinch bolt in the intermediate shaft coupler (Fig. 19), then tighten the pinch bolt to a torque of 34 N·m (300 in. lbs.).

(17) On early production vehicles, install a **new** "E" clip on the end of the pinch bolt (Fig. 18).

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

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

(20) Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops.

(21) Add power steering fluid if necessary.

REMOVAL AND INSTALLATION (Continued)

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

(23) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

POWER STEERING FLUID PRESSURE SWITCH**REMOVE**

(1) Disconnect negative battery cable from the negative post of the battery. Be sure cable is isolated from negative post on battery.

(2) Raise vehicle.

(3) Locate power steering pressure switch (Fig. 25) on the back side of the power steering gear.

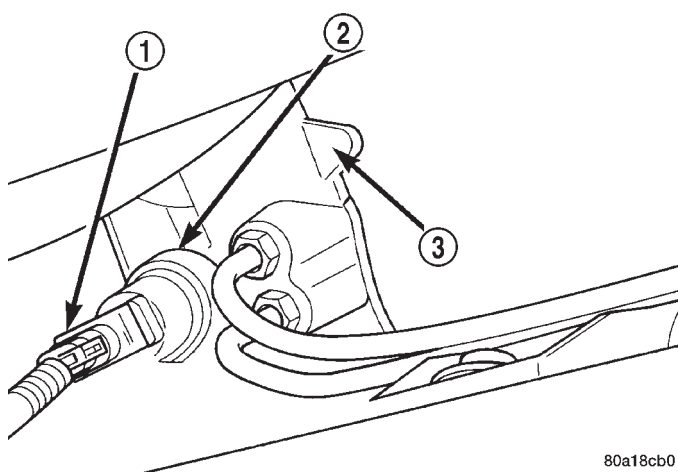


Fig. 25 Power Steering Pressure Switch Location On Steering Gear

- 1 - WIRING HARNESS CONNECTOR
2 - POWER STEERING PRESSURE SWITCH
3 - POWER STEERING GEAR

(4) Remove the vehicle's wiring harness connector (Fig. 25) from the power steering pressure switch.

(5) Using a crow foot and a long extension, remove the power steering pressure switch, from the power steering gear.

INSTALL

CAUTION: When tightening the power steering pressure switch after installation in steering gear, do not exceed the torque specification shown in step 1 below. Over-tightening may result in stripping the threads out of the pressure switch port on the steering gear.

(1) Install power steering pressure switch into power steering gear by hand until fully seated. Then using a crow foot and extension, tighten power steering pressure switch to a torque of 16 N·m (12 ft. lbs.).

(2) Install vehicle wiring harness connector onto power steering pressure switch. Be sure latch on wiring harness connector is fully engaged with locking tab on power steering pressure switch.

CAUTION: Do not use automatic transmission fluid in power steering system. Only use Mopar®, Power Steering Fluid, or equivalent.

(3) Fill power steering reservoir to correct fluid level.

(4) Connect negative cable back on negative post of battery.

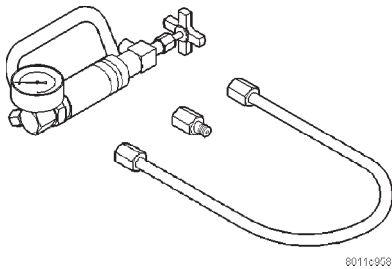
(5) Start engine and turn steering wheel several times from stop to stop to bleed air from fluid in system. Stop engine, check fluid level, and inspect system for leaks. See Checking Fluid Level.

SPECIFICATIONS**POWER STEERING FASTENER TORQUE SPECIFICATIONS**

DESCRIPTION	TORQUE
POWER STEERING PUMP:	
Discharge Fitting	75 N·m (55 ft. lbs.)
Rear Bracket Mounting Bolts	54 N·m (40 ft. lbs.)
Front Bracket Mounting Bolts	54 N·m (40 ft. lbs.)
Bracket To Engine Mounting Bolts	54 N·m (40 ft. lbs.)
POWER STEERING FLUID HOSES:	
Hose Tube Nuts	31 N·m (275 in. lbs.)
Return Hose Bracket To Head	28 N·m (21 ft. lbs.)
Pressure Hose To Return Hose Bracket	9 N·m (75 in. lbs.)
POWER STEERING FLUID RESERVOIR:	
Reservoir To Mounting Bracket	
Or Engine	28 N·m (21 ft. lbs.)
Reservoir Bracket To	
Engine	28 N·m (21 ft. lbs.)

SPECIAL TOOLS

POWER STEERING



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Power Steering Analyzer 6815

POWER STEERING PUMP

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DESCRIPTION AND OPERATION

POWER STEERING PUMP

DESCRIPTION

On all vehicles equipped with power steering, the hydraulic pressure for operation of the power steering gear is provided by a belt driven power steering pump (Fig. 1). It is mounted on the back side of the engine, above the front suspension crossmember.

Early production vehicles are equipped with variable-assist power steering pumps. Later production vehicles are equipped with standard power steering pumps only.

Vehicles that are equipped with variable-assist power steering use a droop flow style power steering pump. The droop flow power steering pump is a constant displacement vane type, but has a variable flow rate. This provides the speed-sensitive variable-assist power steering. The variable-assist power steering pump can be easily identified by the type of power steering fluid pressure hose fitting connection. While standard pumps use a standard tube fitting, variable-assist power steering pumps use a banjo style fitting (Fig. 2).

The power steering pump uses a remote mounted reservoir for storage of the power steering fluid.

Because of unique shaft bearings, flow control levels or pump displacements, power steering pumps may be used only on specific vehicle applications. Be sure that the power steering pump is only replaced with a pump that is the correct replacement for that specific application.

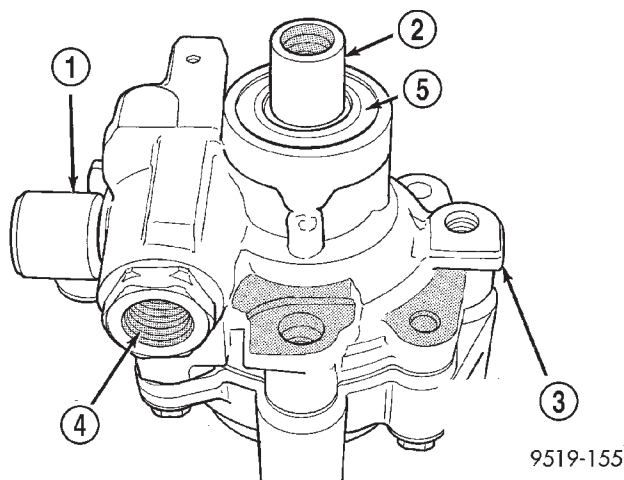


Fig. 1 Power Steering Pump

- 1 - POWER STEERING PUMP FLUID SUPPLY FITTING
- 2 - POWER STEERING PUMP SHAFT
- 3 - POWER STEERING PUMP HOUSING
- 4 - POWER STEERING PUMP DISCHARGE FITTING
- 5 - POWER STEERING PUMP SHAFT SEAL

OPERATION

Hydraulic pressure is provided for operation of the power steering gear by the belt driven power steering pump. The power steering pump is connected to the steering gear by a power steering fluid pressure hose, return hose, power steering fluid cooler and remote power steering fluid reservoir.

Rectangular pumping vanes in the shaft driven rotor move power steering fluid from the intake to the cam ring pressure cavities of the power steering pump. As the rotor begins to turn, centrifugal force throws the vanes against the inside surface of the cam ring to pick up residual fluid. This fluid is then

DESCRIPTION AND OPERATION (Continued)

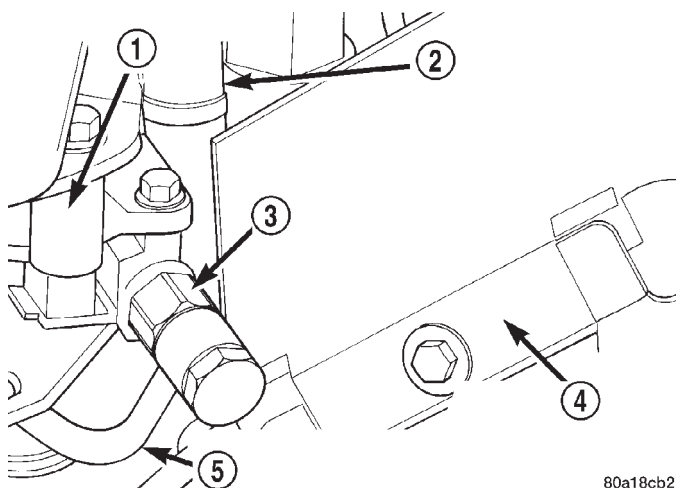


Fig. 2 Pressure Hose Fitting

- 1 – POWER STEERING PUMP
- 2 – POWER STEERING FLUID SUPPLY HOSE
- 3 – FLOW CONTROL VALVE FITTING
- 4 – ABS HYDRAULIC CONTROL UNIT HEAT SHIELD
- 5 – POWER STEERING PRESSURE HOSE

forced into the high pressure area. As more fluid is picked up by the vanes, the additional fluid is forced into the cavities of the thrust plate through two crossover holes in the cam ring and pressure plate. The crossover holes empty into the high pressure area between the pressure plate and the housing end cover.

As the high pressure area is filled, fluid flows under the vanes in the rotor slots, forcing the vanes to follow the inside surface of the cam ring. As the vanes reach the restricted area of the cam ring, fluid is forced out from between the vanes. When excess fluid flow is generated during high-speed operation, a regulated amount of fluid returns to the pump intake side through a flow control valve. The flow control valve reduces the power required to drive the pump and holds down temperature build-up.

The speed-sensitive variable-assist power steering which is built into the early power steering pump provides full power steering assist at engine idle. As engine speed is increased, power assist is gradually reduced by varying the pump flow rate to provide a firm, responsive feel to the steering system at higher vehicle speeds.

When steering conditions exceed maximum pressure requirements, such as when the wheels are turned against the stops, the pressure built up in the steering gear exerts pressure on the spring end of the flow control valve inside the pump. The high pressure lifts the relief valve ball from its seat and allows fluid to flow through a trigger orifice located in the outlet fitting. This reduces pressure on the spring end of the flow control valve which then opens and

allows the fluid to return to the intake side of the pump. This action limits maximum pressure output of the power steering pump.

Under normal power steering pump operating conditions, pressure requirements of the pump are below maximum, causing the pressure relief valve to remain closed.

In the event of a power steering pump drive belt failure, manual steering control of the vehicle can still be maintained without pump assistance. However, under these conditions, steering effort will be significantly increased.

POWER STEERING FLUID RESERVOIR

DESCRIPTION

All vehicles equipped with power steering use a remote mounted reservoir for storage of the power steering fluid. The power steering fluid remote reservoir on the 2.5L engine is mounted to the front side of the engine above the drive belts, between the cylinder heads.

OPERATION

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

SERVICE PROCEDURES

POWER STEERING PUMP INITIAL OPERATION

CAUTION: The fluid level should be checked with engine off to prevent injury from moving components. Use only Mopar® Power Steering Fluid. Do not use automatic transmission fluid. Do not over-fill.

Wipe filler cap clean, then check the fluid level. The dipstick should indicate **FULL COLD** when the fluid is at normal temperature of approximately 21°C to 27°C (70°F to 80°F).

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

(2) Start the engine and let run for a few seconds. Then turn the engine off.

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

(4) Raise the front wheels off the ground.

(5) Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops.

(6) Add power steering fluid if necessary.

(7) Lower the vehicle and turn the steering wheel slowly from lock to lock.

SERVICE PROCEDURES (Continued)

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

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

REMOVAL AND INSTALLATION

POWER STEERING PUMP (2.5L ENGINE - EARLY PRODUCTION)

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

REMOVAL

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

(2) Siphon as much power steering fluid as possible out of the remote power steering fluid reservoir.

(3) Remove the power steering fluid supply hose from the power steering fluid reservoir (Fig. 3). Fluid supply hose will be removed with the power steering pump.

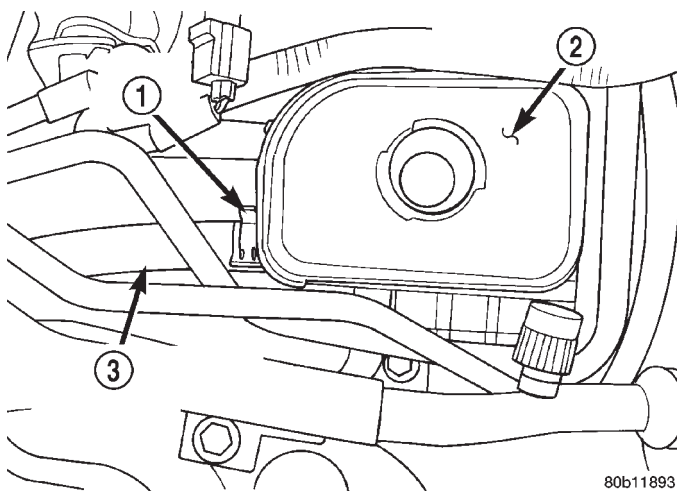


Fig. 3 Supply Hose At Power Steering Fluid Reservoir

- 1 - HOSE CLAMP
- 2 - POWER STEERING FLUID RESERVOIR
- 3 - POWER STEERING FLUID SUPPLY HOSE

- (4) Raise vehicle.
- (5) Remove right front tire from vehicle.
- (6) Remove accessory drive splash shield (Fig. 4).
- (7) Remove the heat shield for the antilock brakes hydraulic control unit (Fig. 5).

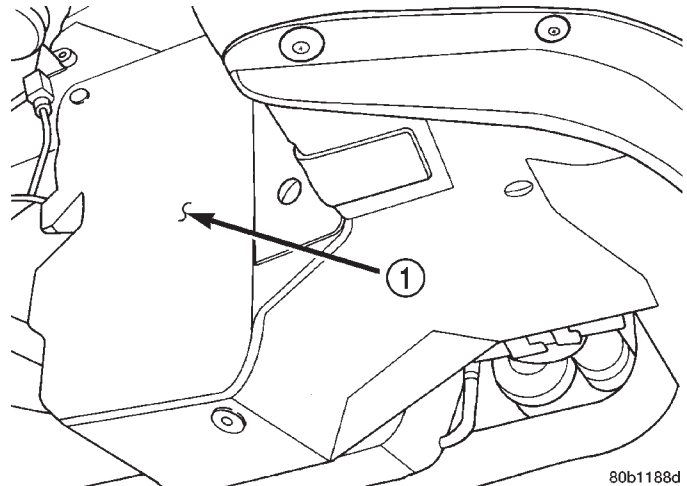


Fig. 4 Accessory Drive Splash Shield

- 1 - SPLASH SHIELD

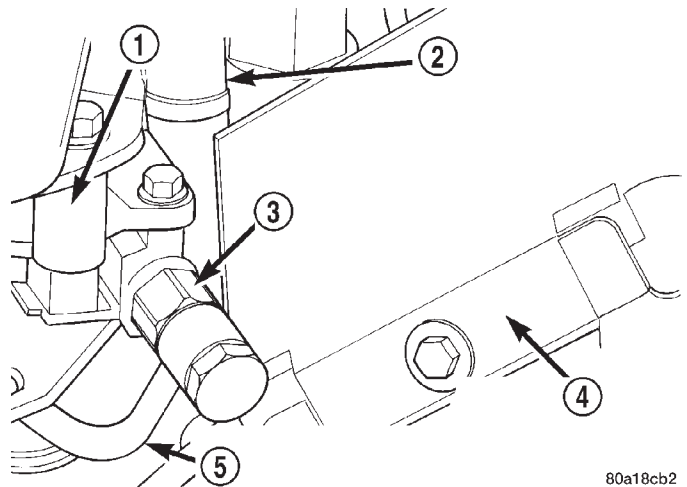


Fig. 5 Heat Shield

- 1 - POWER STEERING PUMP
- 2 - POWER STEERING FLUID SUPPLY HOSE
- 3 - FLOW CONTROL VALVE FITTING
- 4 - ABS HYDRAULIC CONTROL UNIT HEAT SHIELD
- 5 - POWER STEERING PRESSURE HOSE

(8) Loosen bolt at adjusting slot in accessory drive mounting bracket, (Fig. 6) attaching back of power steering pump to the bracket.

(9) Loosen bolt (Fig. 7) at top of power steering pump front mounting bracket, attaching it to the accessory drive bracket.

(10) Loosen bolt at adjustment slot, (Fig. 7) attaching the power steering pump front mounting bracket to cast aluminum accessory drive bracket on engine.

(11) Move the power steering pump toward the engine as far as possible.

(12) Remove the power steering fluid pressure hose from pressure fitting on power steering pump (Fig. 8). Be careful not to loose the copper sealing

REMOVAL AND INSTALLATION (Continued)

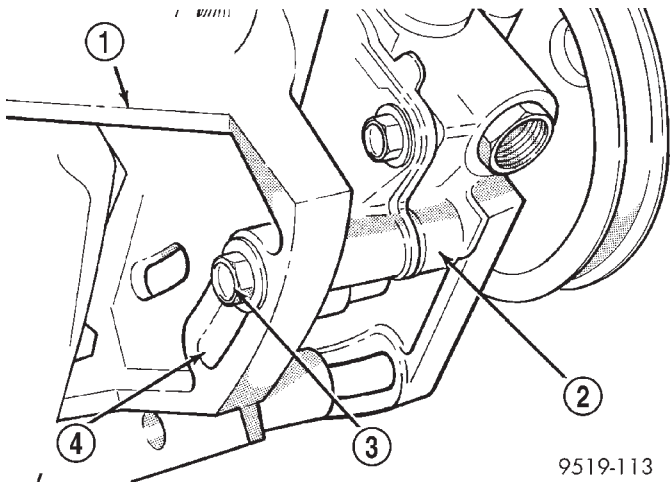


Fig. 6 Power Steering Pump Rear Mounting Bolt

- 1 - ACCESSORY DRIVE MOUNTING BRACKET
- 2 - POWER STEERING PUMP
- 3 - BOLT
- 4 - ADJUSTING SLOT

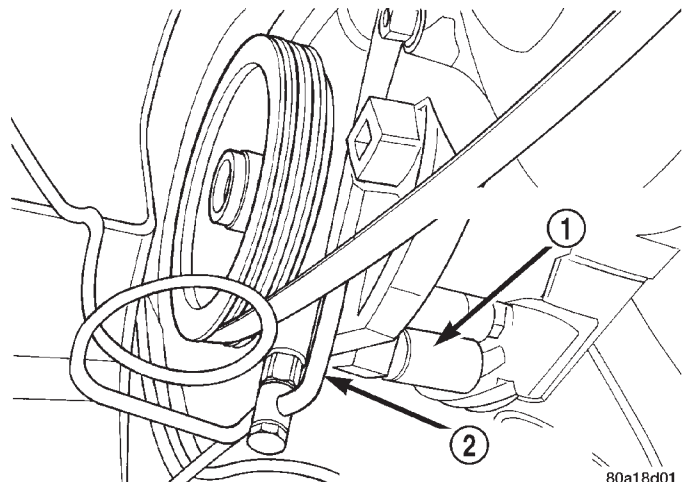


Fig. 8 Power Steering Pressure Hose Attachment To Pump

- 1 - POWER STEERING PUMP
- 2 - POWER STEERING PRESSURE HOSE

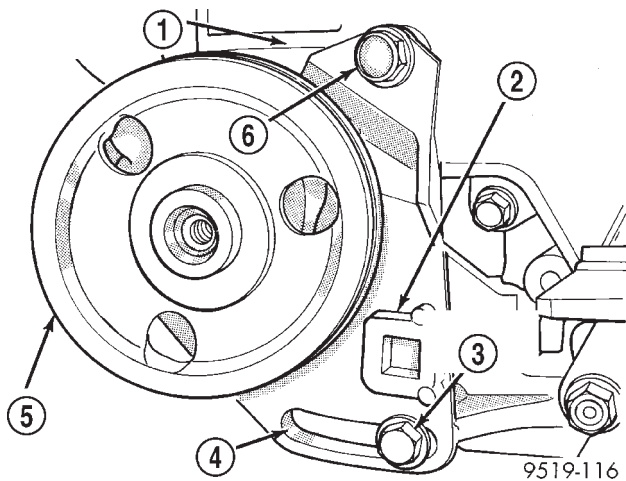


Fig. 7 Power Steering Pump Front Bracket Attachment

- 1 - ENGINE ACCESSORY DRIVE BRACKET
- 2 - POWER STEERING PUMP FRONT MOUNTING BRACKET
- 3 - BOLT
- 4 - ADJUSTING SLOT
- 5 - POWER STEERING PUMP
- 6 - BOLT

washers on both sides of the hose banjo fitting once the flow bolt is removed. Let the remaining power steering fluid drain out of the power steering fluid supply hose, power steering pump and power steering fluid pressure hose. **After power steering fluid has drained out of pump and hose, install a cap on the power steering pressure hose and a plug in the power steering pump pressure fitting.**

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

(14) Remove bolt at adjusting slot in accessory drive mounting bracket, (Fig. 6) attaching back of power steering pump to the bracket.

(15) Remove bolt at adjustment slot, (Fig. 7) attaching the power steering pump front mounting bracket to cast aluminum accessory drive bracket on engine. Then remove bolt (Fig. 7) at top of power steering front mounting bracket, attaching it to the accessory drive bracket.

(16) Remove power steering pump, supply hose and its front mounting bracket as an assembly from the engine mounted power steering pump mounting bracket. Place the power steering pump on top of the antilock brakes hydraulic control unit.

NOTE: The power steering pump can not be removed from the vehicle without first removing the power steering pump mounting bracket from the engine.

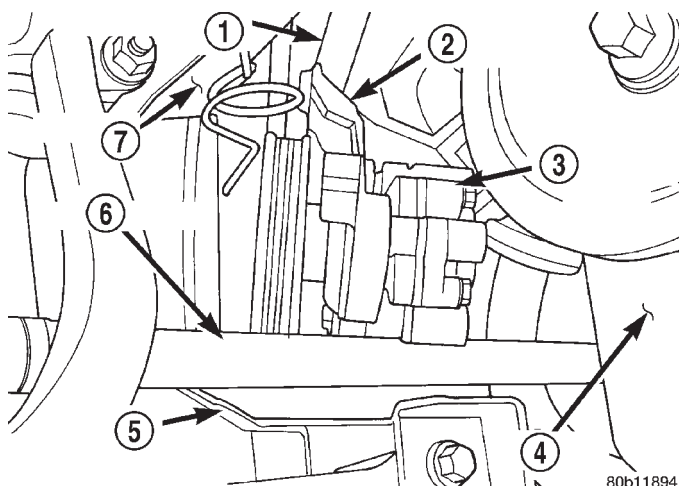
(17) Remove the 4 bolts mounting the power steering pump mounting bracket to the engine.

(18) Remove the power steering pump mounting bracket from the engine. Position the power steering pump mounting bracket where it will not be in the way when removing power steering pump from the vehicle.

(19) Remove power steering pump, fluid supply hose and front mounting bracket as an assembly from the engine and vehicle. Pump, fluid supply hose and mounting bracket is removable by bringing it out through area between rear of engine, frame drive-shaft and front suspension crossmember (Fig. 9).

(20) Transfer required parts from removed power steering pump, to replacement power steering pump.

REMOVAL AND INSTALLATION (Continued)

**Fig. 9 Power Steering Pump Removal/Installation**

- 1 - SUPPLY HOSE
- 2 - MOUNTING BRACKET
- 3 - POWER STEERING PUMP
- 4 - ENGINE
- 5 - FRONT SUSPENSION CROSSMEMBER
- 6 - DRIVESHAFT
- 7 - FRAME

INSTALLATION

(1) Install power steering pump, mounting bracket and fluid supply hose as an assembly back in vehicle, using the reverse of the removal procedure. **Be sure power steering fluid supply hose is correctly routed up to the power steering fluid reservoir when installing power steering pump.**

(2) Place the power steering pump on top of the antilock brakes hydraulic control unit.

(3) Install the power steering pump mounting bracket on the rear of the engine. Tighten the mounting bracket attaching bolts to a torque of 54 N·m (40 ft. lbs.).

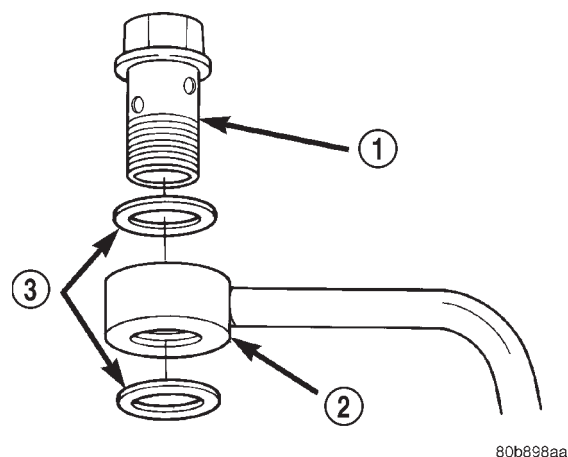
(4) Install power steering pump and front bracket on engine mounted power steering pump mounting bracket. Loosely install bolt at adjusting slot and top of power steering pump front bracket (Fig. 7) mounting pump bracket to accessory drive bracket.

(5) Loosely install the bolt mounting power steering pump to its rear mounting bracket (Fig. 6).

(6) Using a lint free towel, wipe clean all open power steering hose ends, and power steering pump fittings.

(7) Install a copper washer on each side of the power steering pressure hose banjo fitting, then install the flow bolt through the center (Fig. 10).

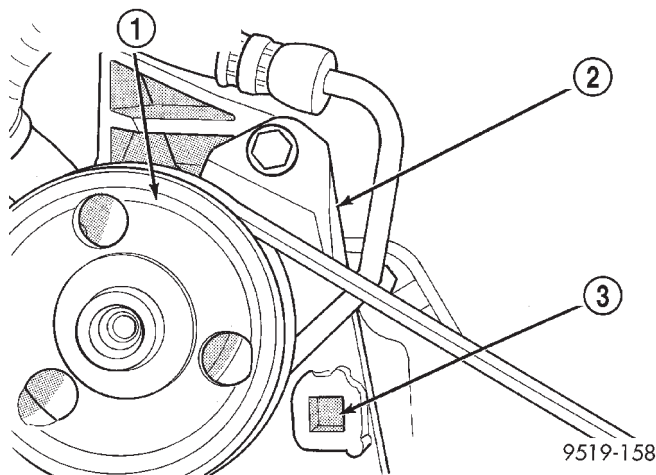
(8) Install the power steering pressure hose to the power steering pump pressure fitting. Loosely install the flow bolt into the power steering pump. **Pressure hose must be installed between the front bracket of the power steering pump and the back side of the power steering pump pulley.**

**Fig. 10 Pressure Fitting And Washers**

- 1 - FLOW BOLT
- 2 - FITTING
- 3 - COPPER WASHERS

(9) Install power steering pump drive belt on power steering pump pulley.

(10) Install a 1/2 in. breaker bar in the square adjusting hole in the front power steering pump mounting bracket (Fig. 11) Then rotate pump to obtain the correct drive belt tension. See Accessory Drive Belts in Group 7 Cooling System of this service manual for the correct drive belt tension specification. When correct drive belt tension is obtained first tighten the bottom 2 adjusting slot bolts at the power steering pump cast mounting bracket to a torque of 54 N·m (40 ft. lbs.). Then tighten the power steering pump mounting bracket top pivot bolt to a torque of 54 N·m (40 ft. lbs.).

**Fig. 11 Power Steering Pump Front Mounting Bracket Adjusting Hole**

- 1 - POWER STEERING PUMP
- 2 - POWER STEERING PUMP MOUNTING BRACKET
- 3 - ADJUSTING HOLE

REMOVAL AND INSTALLATION (Continued)

(11) Position power steering pressure hose so hose is not contacting the power steering pump pulley or the drive belt. Tighten the banjo fitting flow bolt to a torque of 47 N·m (35 ft. lbs.).

(12) Install heat shield on hydraulic control unit (Fig. 5).

(13) Install accessory drive splash shield (Fig. 4).

(14) Install wheel and tire. Tighten the wheel lug nuts in proper sequence until all lug nuts are torqued to half specification. Then repeat tightening sequence to full specified torque of 129 N·m (95 ft. lbs.).

(15) Lower vehicle.

(16) Install power steering fluid supply hose (Fig. 3) on power steering fluid reservoir fitting. Install hose clamp on hose. Be sure hose clamp is installed on hose past upset bead on power steering fluid reservoir.

CAUTION: Do not use automatic transmission fluid in power steering system. Only use Mopar®, Power Steering Fluid, or equivalent.

(17) Fill power steering reservoir to correct fluid level.

(18) Connect negative cable back on negative post of battery.

(19) Start the engine and let run for a few seconds. Then turn the engine off.

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

(21) Raise front wheels of vehicle off the ground.

(22) Start engine, then slowly turn steering wheel right and left several times until lightly contacting the wheel stops. Then turn the engine off.

(23) Add power steering fluid if necessary.

(24) Lower the vehicle. Start engine again and turn the steering wheel slowly from lock to lock.

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

(26) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

(27) After power steering pump is installed, check for leaks at all hose connections and power steering pump fittings.

**POWER STEERING PUMP
(2.5L ENGINE - LATER PRODUCTION)**

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

REMOVAL

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

(2) Siphon as much power steering fluid as possible out of the remote power steering fluid reservoir.

(3) Remove the power steering fluid supply hose from the power steering fluid reservoir (Fig. 12). Fluid supply hose will be removed with the power steering pump.

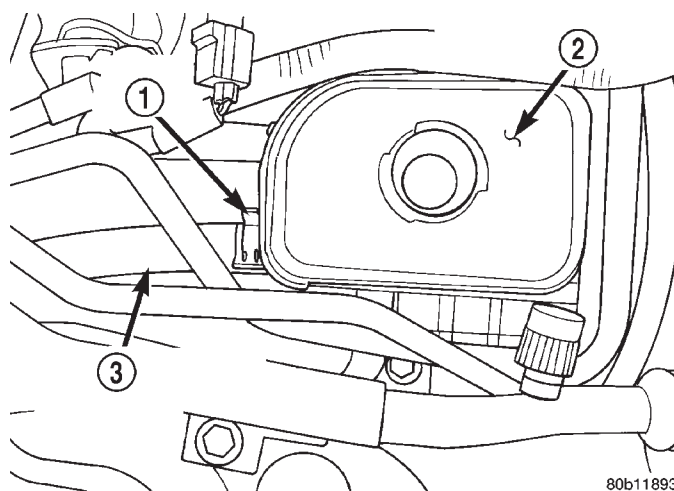


Fig. 12 Supply Hose At Power Steering Fluid Reservoir

- 1 - HOSE CLAMP
- 2 - POWER STEERING FLUID RESERVOIR
- 3 - POWER STEERING FLUID SUPPLY HOSE

(4) Raise vehicle.

(5) Remove right front tire from vehicle.

(6) Remove accessory drive splash shield (Fig. 13).

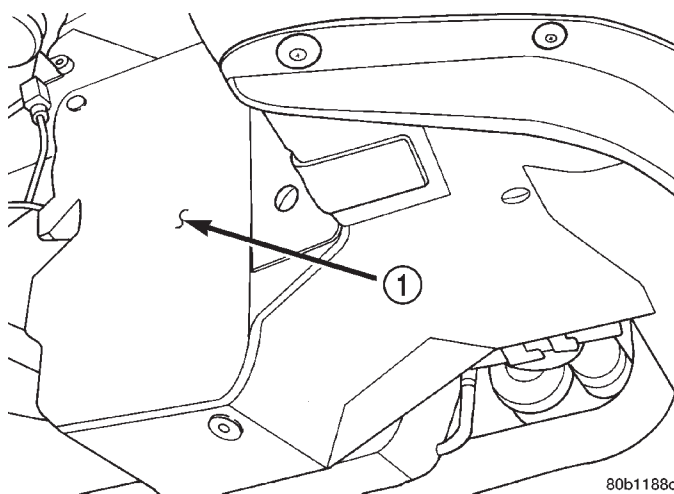
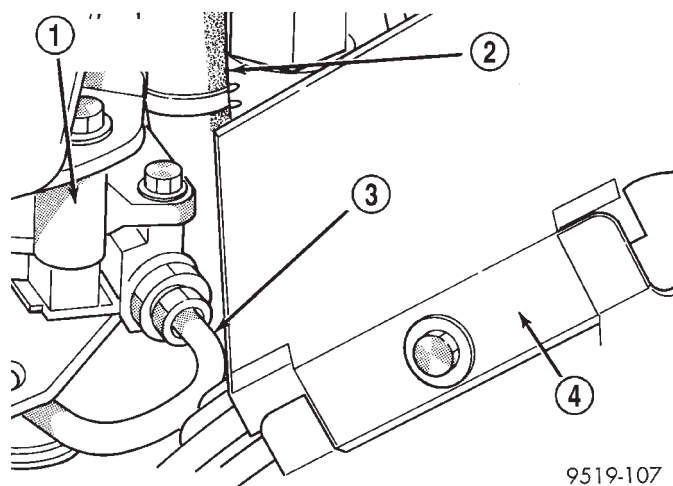


Fig. 13 Accessory Drive Splash Shield

- 1 - SPLASH SHIELD

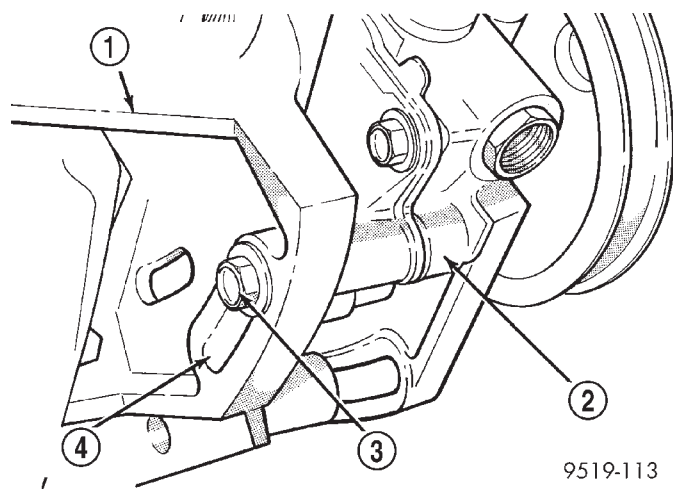
(7) Remove the heat shield for the antilock brakes hydraulic control unit (Fig. 14).

REMOVAL AND INSTALLATION (Continued)

**Fig. 14 Hydraulic Control Unit Heat Shield**

- 1 - POWER STEERING PUMP
- 2 - POWER STEERING FLUID SUPPLY HOSE
- 3 - POWER STEERING FLUID PRESSURE HOSE
- 4 - ABS HYDRAULIC CONTROL UNIT HEAT SHIELD

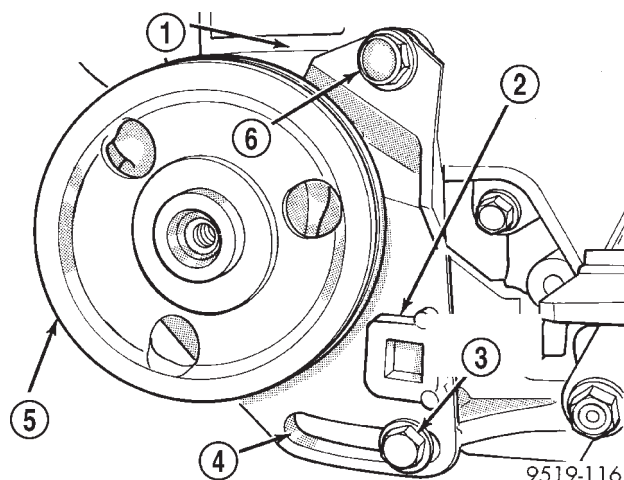
(8) Loosen bolt at adjusting slot in accessory drive mounting bracket (Fig. 15) attaching back of power steering pump to the bracket.

**Fig. 15 Power Steering Pump Rear Mounting Bolt**

- 1 - ACCESSORY DRIVE MOUNTING BRACKET
- 2 - POWER STEERING PUMP
- 3 - BOLT
- 4 - ADJUSTING SLOT

(9) Loosen bolt (Fig. 16) at top of power steering pump front mounting bracket, attaching it to the accessory drive bracket.

(10) Loosen bolt at adjustment slot, (Fig. 16) attaching the power steering pump front mounting bracket to cast aluminum accessory drive bracket on engine.

**Fig. 16 Power Steering Pump Front Bracket Attachment**

- 1 - ENGINE ACCESSORY DRIVE BRACKET
- 2 - POWER STEERING PUMP FRONT MOUNTING BRACKET
- 3 - BOLT
- 4 - ADJUSTING SLOT
- 5 - POWER STEERING PUMP
- 6 - BOLT

(11) Move the power steering pump toward the engine as far as possible.

(12) Remove the power steering fluid pressure hose from pressure fitting on power steering pump (Fig. 17). Be careful not to loose the copper sealing washers on both sides of the hose banjo fitting once the flow bolt is removed. Let the remaining power steering fluid drain out of the power steering fluid supply hose, power steering pump and power steering fluid pressure hose. **After power steering fluid has drained out of pump and hose, install a cap on the power steering pressure hose and a plug in the power steering pump pressure fitting.**

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

(14) Remove bolt at adjusting slot in accessory drive mounting bracket, (Fig. 15) attaching back of power steering pump to the bracket.

(15) Remove bolt at adjustment slot, (Fig. 16) attaching the power steering pump front mounting bracket to cast aluminum accessory drive bracket on engine. Then remove bolt (Fig. 16) at top of power steering front mounting bracket, attaching it to the accessory drive bracket.

(16) Remove power steering pump, supply hose and its front mounting bracket as an assembly from the engine mounted power steering pump mounting bracket. Place the power steering pump on top of the antilock brakes hydraulic control unit.

REMOVAL AND INSTALLATION (Continued)

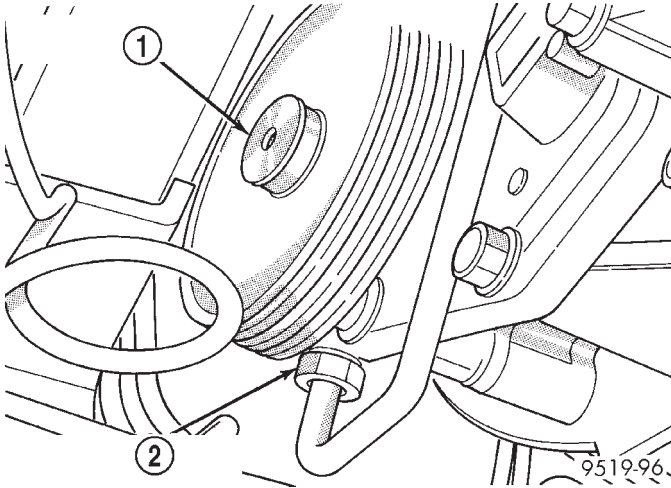


Fig. 17 Pump Pressure Hose At Fitting

- 1 - POWER STEERING PUMP
- 2 - POWER STEERING PUMP PRESSURE HOSE

NOTE: The power steering pump can not be removed from the vehicle without first removing the power steering pump mounting bracket from the engine.

(17) Remove the 4 bolts mounting the power steering pump mounting bracket to the engine.

(18) Remove the power steering pump mounting bracket from the engine. Position the power steering pump mounting bracket where it will not be in the way when removing power steering pump from the vehicle.

(19) Remove power steering pump, fluid supply hose and front mounting bracket as an assembly from the engine and vehicle. Pump, fluid supply hose and mounting bracket is removable by bringing it out through area between rear of engine, frame drive-shaft and front suspension crossmember (Fig. 18).

(20) Transfer required parts from removed power steering pump to replacement power steering pump.

INSTALLATION

(1) Install power steering pump, mounting bracket and fluid supply hose as an assembly back in vehicle, using the reverse of the removal procedure. **Be sure power steering fluid supply hose is correctly routed up to the power steering fluid reservoir when installing power steering pump.**

(2) Place the power steering pump on top of the antilock brakes hydraulic control unit.

(3) Install the power steering pump mounting bracket on the rear of the engine. Tighten the mounting bracket attaching bolts to a torque of 54 N·m (40 ft. lbs.).

(4) Install power steering pump and front bracket on engine mounted power steering pump mounting

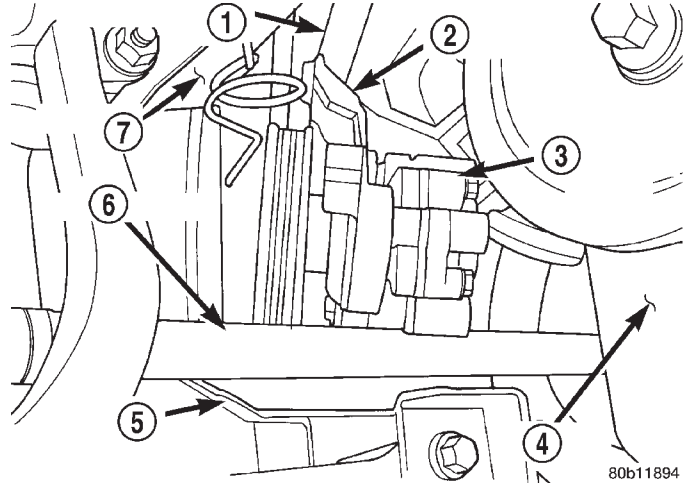


Fig. 18 Power Steering Pump Removal/Installation

- 1 - SUPPLY HOSE
- 2 - MOUNTING BRACKET
- 3 - POWER STEERING PUMP
- 4 - ENGINE
- 5 - FRONT SUSPENSION CROSSMEMBER
- 6 - DRIVESHAFT
- 7 - FRAME

bracket. Loosely install bolt at adjusting slot and top of power steering pump front bracket (Fig. 16) mounting pump bracket to accessory drive bracket.

(5) Loosely install the bolt mounting power steering pump to its rear mounting bracket (Fig. 15).

(6) Using a lint free towel, wipe clean all open power steering hose ends, and power steering pump fittings.

(7) Install a new O-ring on end of power steering pressure hose fitting. Lubricate all O-rings using fresh clean power steering fluid.

(8) Install the power steering pressure hose on the power steering pump pressure fitting. Loosely install tube nut into pressure fitting on power steering pump (Fig. 17). **Pressure hose must be installed between the front bracket of the power steering pump and power steering pump pulley.**

(9) Install power steering pump drive belt on power steering pump pulley.

(10) Install a 1/2 inch breaker bar in the square adjusting hole in the front power steering pump mounting bracket (Fig. 19), then rotate pump to obtain the correct drive belt tension. Refer to COOLING SYSTEM (Group 7) of this service manual for the correct drive belt tension specification. When correct drive belt tension is obtained, first tighten the bottom 2 adjusting slot bolts at the power steering pump cast mounting bracket to a torque of 54 N·m (40 ft. lbs.), then tighten the power steering pump mounting bracket top pivot bolt to a torque of 54 N·m (40 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

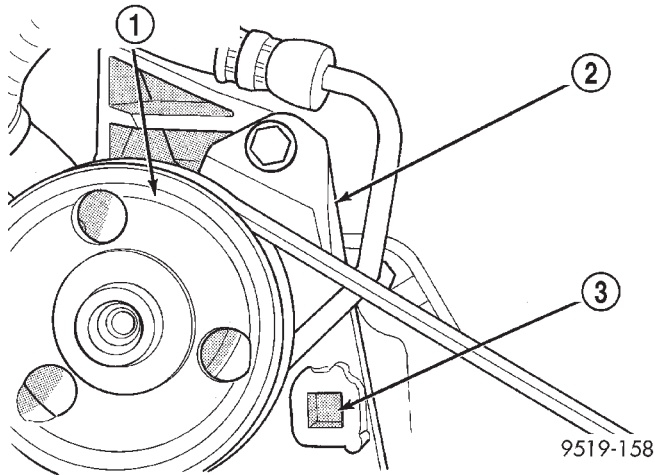


Fig. 19 Power Steering Pump Front Mounting Bracket Adjusting Hole

- 1 - POWER STEERING PUMP
2 - POWER STEERING PUMP MOUNTING BRACKET
3 - ADJUSTING HOLE

(11) Position power steering pressure hose, so hose is not contacting the power steering pump pulley or the drive belt. Tighten the tube nut to a torque of 31 N·m (275 in. lbs.).

(12) Install heat shield on hydraulic control unit (Fig. 14).

(13) Install accessory drive splash shield (Fig. 13).

(14) Install wheel and tire. Tighten the wheel lug nuts in proper sequence until all lug nuts are torqued to half specification. Then repeat tightening sequence to full specified torque of 129 N·m (95 ft. lbs.).

(15) Lower vehicle.

(16) Install power steering fluid supply hose (Fig. 12) on power steering fluid reservoir fitting. Install hose clamp on hose. Be sure hose clamp is installed on hose past upset bead on power steering fluid reservoir.

CAUTION: Do not use automatic transmission fluid in power steering system. Only use Mopar®, Power Steering Fluid, or equivalent.

(17) Fill power steering reservoir to correct fluid level.

(18) Connect negative cable back on negative post of battery.

(19) Start the engine and let run for a few seconds. Then turn the engine off.

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

(21) Raise front wheels of vehicle off the ground.

(22) Start engine, then slowly turn steering wheel right and left several times until lightly contacting the wheel stops. Then turn the engine off.

(23) Add power steering fluid if necessary.

(24) Lower the vehicle. Start engine again and turn the steering wheel slowly from lock to lock.

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

(26) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

(27) After power steering pump is installed, check for leaks at all hose connections and power steering pump fittings.

POWER STEERING FLUID RESERVOIR

REMOVAL

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

(2) Raise vehicle.

(3) Remove hose clamp attaching power steering fluid supply hose to fitting on power steering pump. Let power steering fluid drain from supply hose and power steering fluid reservoir, until reservoir is empty.

(4) Lower vehicle.

CAUTION: Care must be used when removing and installing power steering fluid hoses on the power steering fluid reservoir. If excessive force is used when trying to remove or install hoses on nipples of power steering fluid reservoir, nipples can be broken off the reservoir.

(5) Remove power steering fluid return and supply hose, from power steering fluid reservoir.

(6) Remove bolts attaching power steering fluid reservoir to engine.

(7) Remove power steering fluid reservoir from vehicle.

INSTALLATION

(1) Install power steering fluid reservoir on cylinder head. Install and securely tighten the power steering fluid reservoir attaching bolts.

(2) Install power steering fluid return and supply hose, on power steering fluid reservoir fittings. **Be sure both hose clamps are installed on hose past upset bead on power steering reservoir fittings.**

(3) Raise vehicle.

(4) Install power steering supply hose, on suction fitting of the power steering pump. **Be sure hose clamp is installed on hose past upset bead on power steering gear steel tube.**

REMOVAL AND INSTALLATION (Continued)

(5) Fill power steering pump fluid reservoir to the proper level.

(6) Start the engine and let run for a few seconds. Then turn the engine off.

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

(8) Raise front wheels of vehicle off the ground.

(9) Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops. Then turn the engine off.

(10) Add power steering fluid if necessary.

(11) Lower the vehicle and turn the steering wheel slowly from lock to lock.

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

(13) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.

DISASSEMBLY AND ASSEMBLY

POWER STEERING PUMP DRIVE PULLEY

The power steering pump must be removed from the vehicle for removal of the power steering pump pulley. Refer to Power Steering Pump Removal in the Power Steering Pump Service Procedures section in this group of the service manual.

DISASSEMBLE

(1) Remove power steering pump from engine. Refer to Power Steering Pump Removal in the Power Steering Pump Service Procedures section in this group of the service manual for required procedure.

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

(2) Mount Puller, Special Tool C-4333 or C-4068 on power steering pump pulley. Mount power steering pump and puller in a vise (Fig. 20) to keep shaft of power steering pump from turning when removing pulley.

(3) Remove the drive pulley from the shaft of the power steering pump.

(4) Replace power steering pump pulley if bent, cracked, or loose.

ASSEMBLE

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

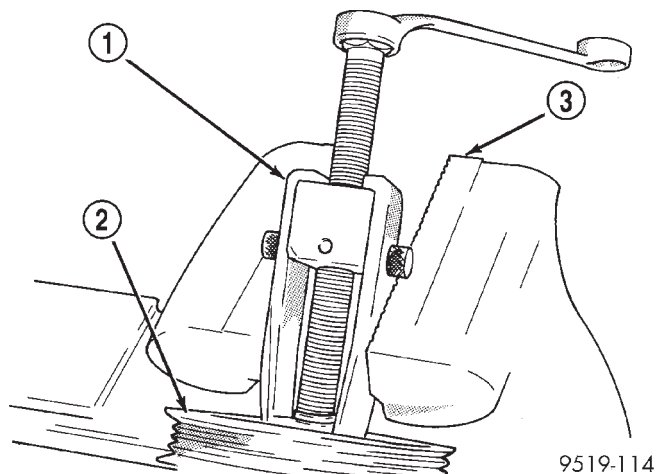


Fig. 20 Removing Pulley From Power Steering Pump Shaft

- 1 - SPECIAL TOOL C-4333 OR C-4068
- 2 - POWER STEERING PUMP PULLEY
- 3 - VISE

(1) Mount power steering pump in a vise using the power steering pump mounting bracket.

(2) Place power steering pump pulley squarely on end of power steering pump shaft (Fig. 21).

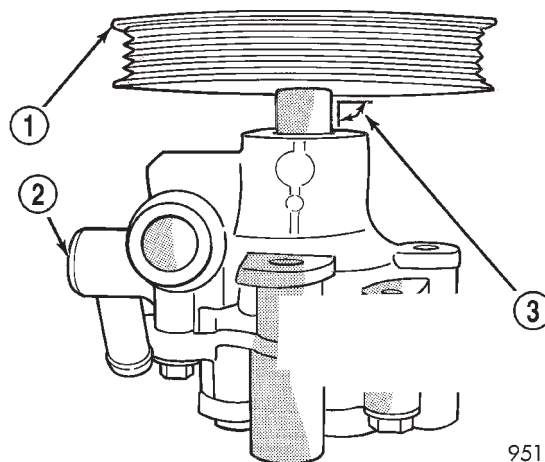


Fig. 21 Pulley Positioned On Shaft Of Power Steering Pump

- 1 - POWER STEERING PUMP PULLEY
- 2 - POWER STEERING PUMP
- 3 - POWER STEERING PUMP PULLEY MUST BE STARTED SQUARELY ON SHAFT OF POWER STEERING PUMP AS SHOWN

(3) Place Installation Spacer, Special Tool 6936, (Fig. 22) on top of the power steering pump pulley.

(4) Mount Installer, Special Tool C-4063 in internal threads of the power steering pump shaft and against Special Tool 6936 on power steering pump pulley (Fig. 23).

DISASSEMBLY AND ASSEMBLY (Continued)

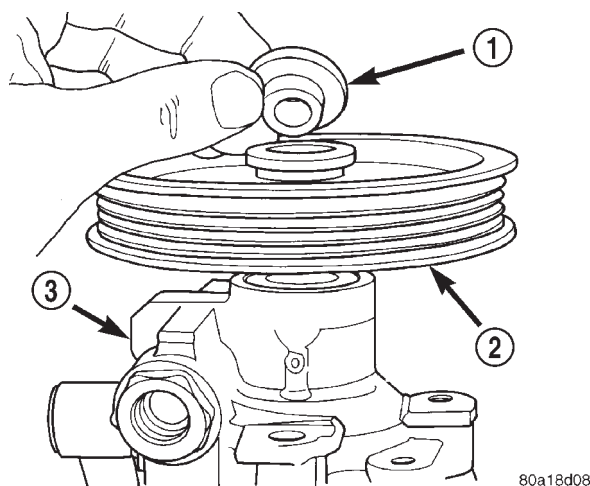


Fig. 22 Special Tool 6936 Correctly Installed On Power Steering Pump Pulley

- 1 - SPECIAL TOOL 6936
- 2 - POWER STEERING PUMP PULLEY
- 3 - POWER STEERING PUMP

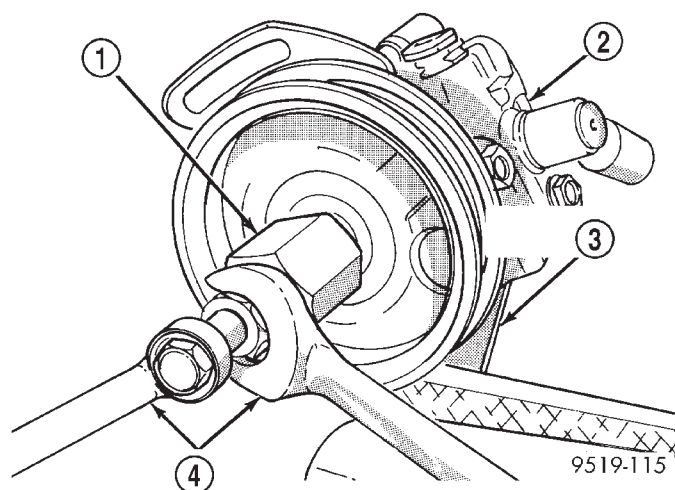


Fig. 23 Installing Pulley On Shaft Of Power Steering Pump

- 1 - SPECIAL TOOL C-4063
- 2 - POWER STEERING PUMP
- 3 - POWER STEERING PUMP BRACKET
- 4 - WRENCHES

(5) Ensuring that special tool and pulley remain aligned with pump shaft, force pulley onto power steering pump shaft until Special Tool 6936 is against the end of the power steering pump shaft. **When Special Tool 6936 is against the shaft of the power steering pump Special Tool C-4063 will no longer be able to be turned.**

(6) Remove Installer, Special Tool C-4063 from power steering pump.

(7) Install power steering pump and mounting bracket back on engine. Refer to Power Steering Pump Installation in the Power Steering Pump Service Procedures section in this group of the service manual for required procedure.

POWER STEERING PUMP MOUNTING BRACKET

DISASSEMBLE

(1) Remove power steering pump from engine. Refer to Power Steering Pump Removal in the Power Steering Pump Service Procedures section in this group of the service manual for required procedure.

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

(2) Mount Puller, Special Tool C-4333 or C-4068 on power steering pump pulley. Mount power steering pump and puller in a vise (Fig. 24) to keep shaft of power steering pump from turning when removing pulley.

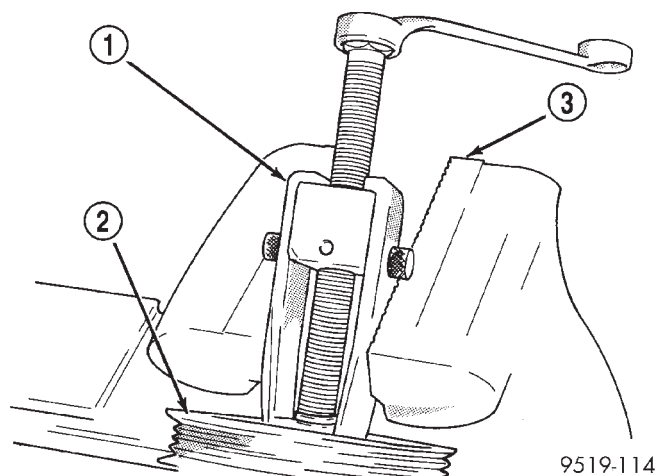


Fig. 24 Removing Pulley From Power Steering Pump Shaft

- 1 - SPECIAL TOOL C-4333 OR C-4068
- 2 - POWER STEERING PUMP PULLEY
- 3 - VISE

(3) Remove the drive pulley from the shaft of the power steering pump.

(4) Remove bolts attaching power steering pump to mounting bracket.

(5) Remove power steering pump from mounting bracket.

DISASSEMBLY AND ASSEMBLY (Continued)

ASSEMBLE

(1) Install power steering pump on mounting bracket. Install the power steering pump to mounting bracket attaching bolts. Torque the mounting bolts to 54 N·m (40 ft. lbs).

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

(2) Place power steering pump pulley squarely on end of power steering pump shaft (Fig. 25).

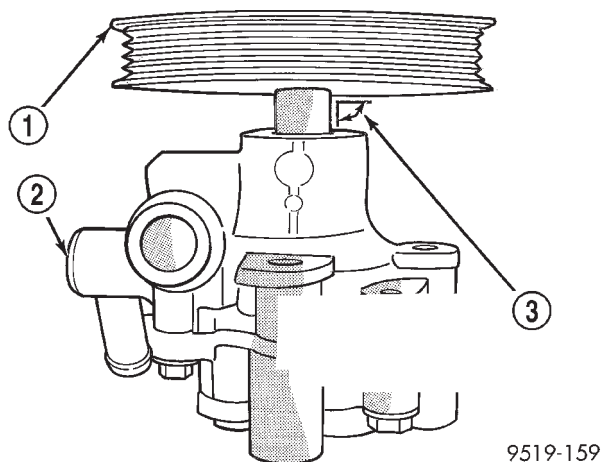


Fig. 25 Pulley Positioned On Shaft Of Power Steering Pump

- 1 – POWER STEERING PUMP PULLEY
- 2 – POWER STEERING PUMP
- 3 – POWER STEERING PUMP PULLEY MUST BE STARTED SQUARELY ON SHAFT OF POWER STEERING PUMP AS SHOWN

(3) Place Installation Spacer, Special Tool 6936 on top of the power steering pump pulley (Fig. 26).

(4) Mount Installer, Special Tool C-4063 in internal threads of the power steering pump shaft and against Special Tool 6936 on power steering pump pulley (Fig. 27).

(5) Ensuring that special tool and pulley remain aligned with pump shaft, force pulley onto power steering pump shaft until Special Tool 6936 is against the end of the shaft. **When Special Tool 6936 is against the shaft of the power steering pump, Special Tool C-4063 will no longer be able to be turned.**

(6) Remove Installer, Special Tool C-4063 from power steering pump.

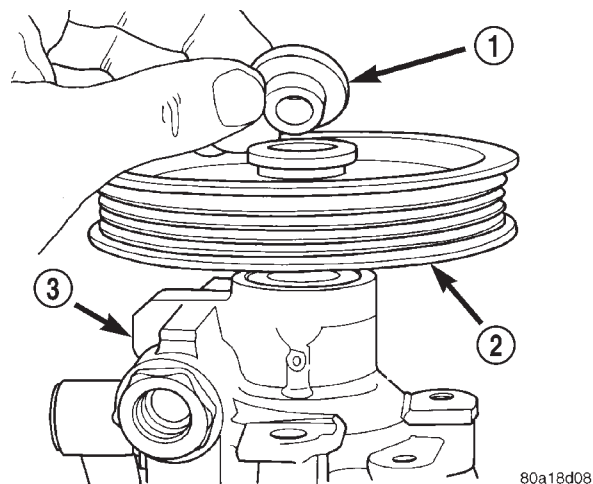


Fig. 26 Spacer Correctly Installed On Power Steering Pump Pulley

- 1 – SPECIAL TOOL 6936
- 2 – POWER STEERING PUMP PULLEY
- 3 – POWER STEERING PUMP

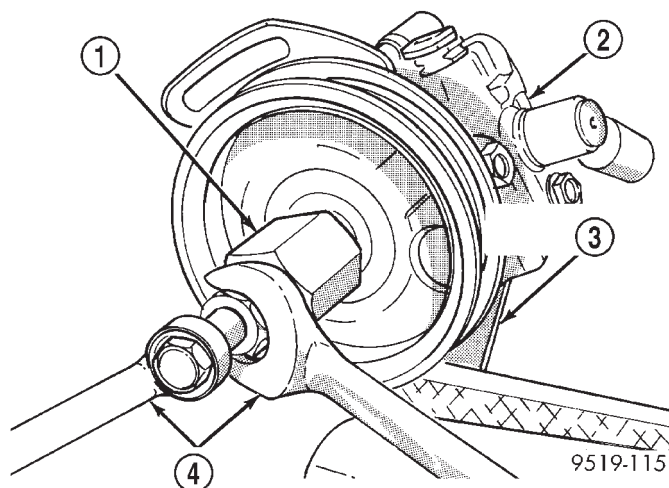


Fig. 27 Installing Pulley On Shaft Of Power Steering Pump

- 1 – SPECIAL TOOL C-4063
- 2 – POWER STEERING PUMP
- 3 – POWER STEERING PUMP BRACKET
- 4 – WRENCHES

(7) Install power steering pump and bracket assembly back on engine. Refer to Power Steering Pump Installation in the Power Steering Pump Service Procedures section in this group of the service manual for required procedure.

SPECIFICATIONS

POWER STEERING PUMP FLOW SPECIFICATIONS

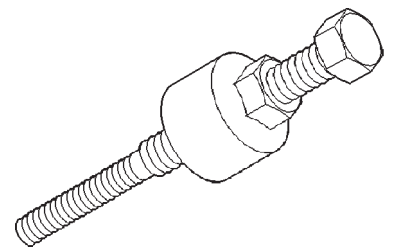
Flow At 1500 RPM And Minimum	
Pressure	4.9 to 5.3 Liters/Min (1.3 to 1.4 GPM)
Control Valve Pressure Relief . . .	8240 to 8920 kPa (1195 to 1293 psi)

POWER STEERING PUMP FASTENER TORQUE SPECIFICATIONS

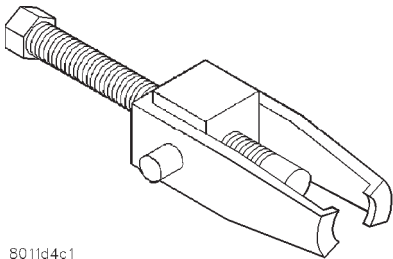
DESCRIPTION	TORQUE
POWER STEERING PUMP:	
Discharge Fitting	75 N·m (55 ft. lbs.)
Rear Bracket Mounting Bolts	54 N·m (40 ft. lbs.)
Front Bracket Mounting Bolts	54 N·m (40 ft. lbs.)
Bracket To Engine Mounting Bolts	54 N·m (40 ft. lbs.)
POWER STEERING FLUID HOSES:	
Hose Tube Nuts	31 N·m (275 in. lbs.)
Pressure Hose To Cylinder Head 2.5L . . .	54 N·m (40 ft. lbs.)
Return Hose To Pressure Hose	
Bracket 2.5L	9 N·m (75 in. lbs.)
POWER STEERING FLUID RESERVOIR:	
Reservoir To Mounting Bracket	
Or Engine	28 N·m (21 ft. lbs.)
Reservoir Bracket	
To Engine	28 N·m (21 ft. lbs.)

SPECIAL TOOLS

POWER STEERING PUMP



Installer C-4063B



8011d4c1

Puller C-4333

POWER STEERING GEAR

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DESCRIPTION AND OPERATION

POWER STEERING GEAR

DESCRIPTION

The steering gear on this vehicle is a rack and pinion unit with power assist (Fig. 1). It is mounted on the front suspension crossmember. The steering column connects to the steering gear shaft on top of the gear. The outer tie rod ends of the gear connect to each suspension steering knuckle to steer the vehicle.

Depending on the vehicle production date, the vehicle could use one of two power steering gears. There is an early production steering gear and a later production gear. Externally, the power steering gears appear the same. Without a parts book, the easiest way to identify whether your car is equipped with an early or later production steering gear is to identify what type of steering column intermediate shaft the vehicle has. Early models use a intermediate shaft with a slap coupler connection at the steering gear pinion shaft (Fig. 2). Later models use a slider-stage style intermediate shaft (Fig. 3).

An easy way to identify an isolated steering gear is to look at the very end of the pinion shaft. Early

models have 2 parallel flats on the end where the steering column intermediate shaft would bolt up (Fig. 4). Later models have 2 flats that are at 60 degree angles to one another where the steering column intermediate shaft would bolt up (Fig. 4).

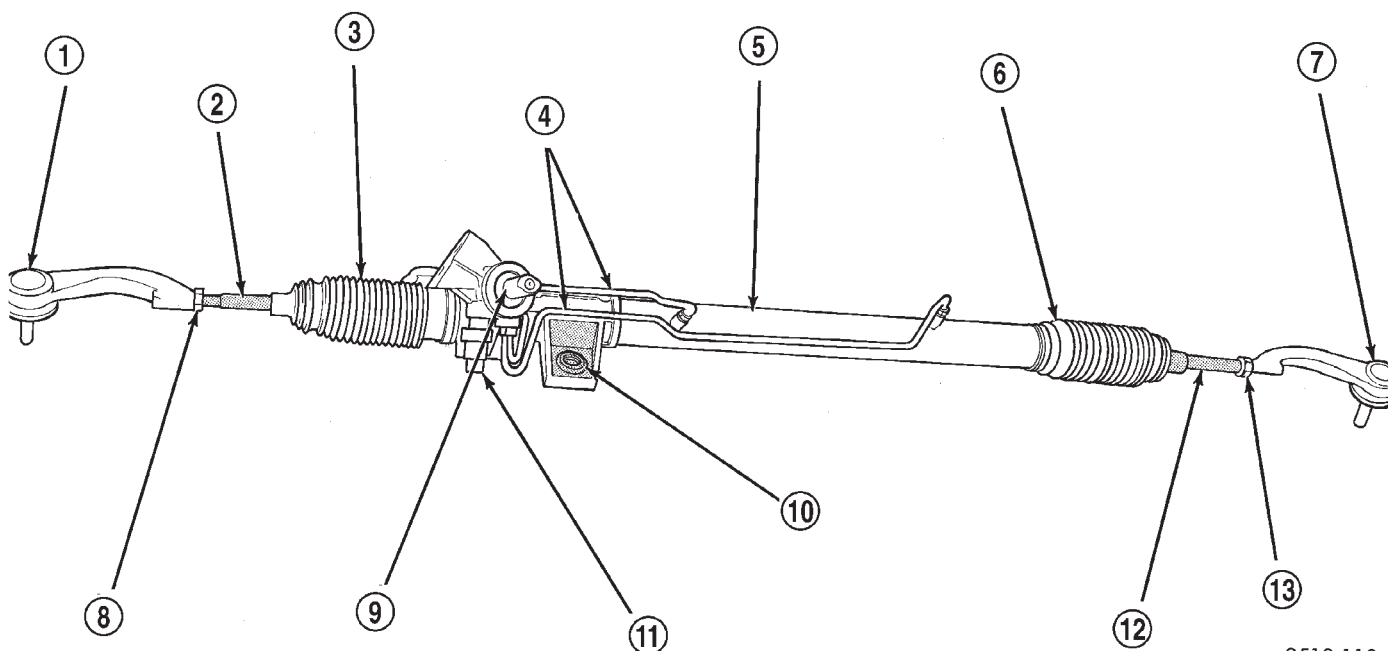
OPERATION

Turning of the steering wheel is converted into linear travel through the meshing of the helical pinion teeth with the rack teeth. Power assist steering is provided by an open center, rotary type control valve which directs fluid from the pump to either side of the integral rack piston.

Road feel is controlled by the diameter of a torsion bar which initially steers the vehicle. This movement directs fluid behind the integral rack piston, which, in turn, builds up hydraulic pressure and assists in the turning effort.

The drive tangs on the gear pinion mate loosely with a stub shaft. This is to permit manual steering control to be maintained if the drive belt on the power steering pump should break. However, under these conditions, steering effort will be increased.

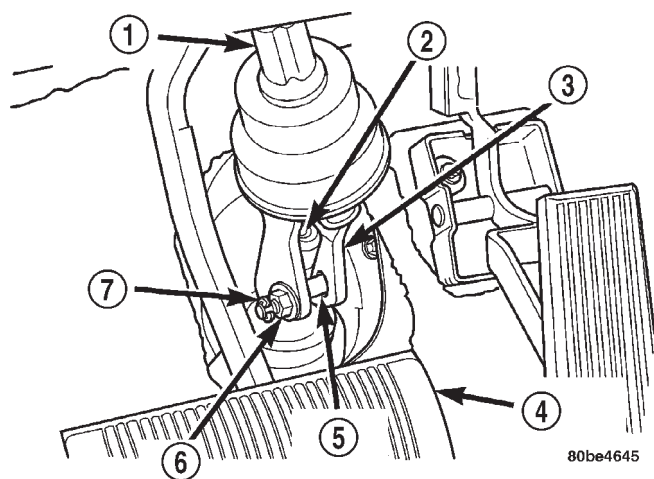
DESCRIPTION AND OPERATION (Continued)



9519-118

Fig. 1 Power Steering Gear

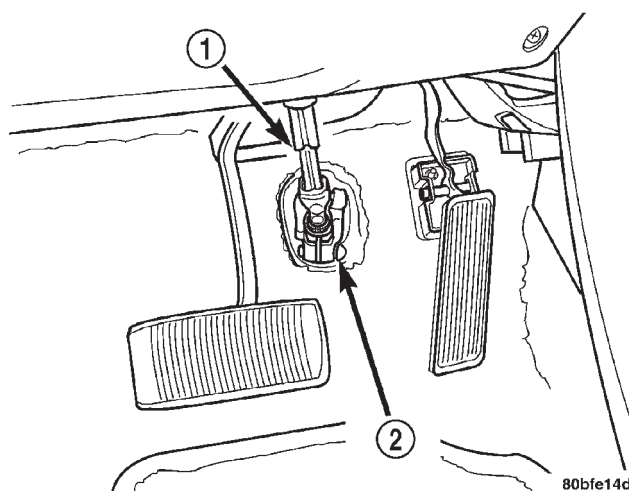
- | | |
|---------------------------------|-------------------------------------|
| 1 - TIE ROD END | 8 - JAM NUT |
| 2 - INNER TIE ROD | 9 - STEERING GEAR SHAFT |
| 3 - STEERING GEAR BOOT | 10 - MOUNTING BUSHING |
| 4 - STEERING GEAR FLUID LINES | 11 - POWER STEERING PRESSURE SWITCH |
| 5 - POWER STEERING GEAR HOUSING | 12 - INNER TIE ROD |
| 6 - STEERING GEAR BOOT | 13 - JAM NUT |
| 7 - TIE ROD END | |



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Fig. 2 Slap Coupler Intermediate Shaft

- | |
|-------------------------|
| 1 - INTERMEDIATE SHAFT |
| 2 - STEERING GEAR SHAFT |
| 3 - COUPLER |
| 4 - BRAKE PEDAL |
| 5 - PINCH BOLT |
| 6 - NUT |
| 7 - "E" CLIP |

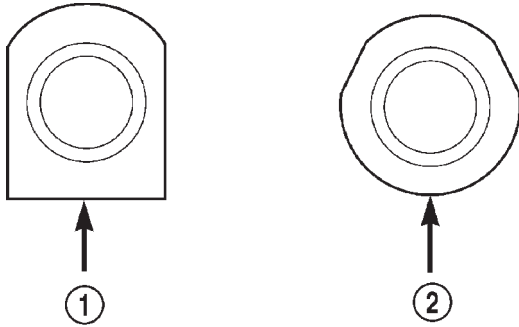


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Fig. 3 Slider-Stage Intermediate Shaft

- | |
|------------------------|
| 1 - INTERMEDIATE SHAFT |
| 2 - PINCH BOLT |

DESCRIPTION AND OPERATION (Continued)



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Fig. 4 Pinion Shaft Identification

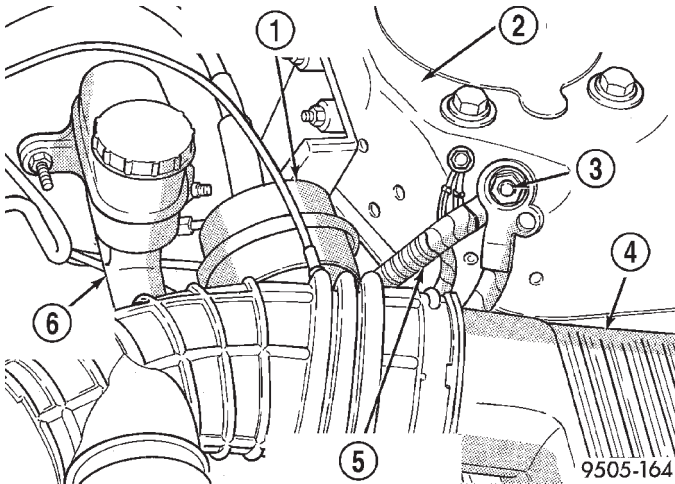
- 1 - EARLY PRODUCTION
- 2 - LATER PRODUCTION

REMOVAL AND INSTALLATION

POWER STEERING GEAR

REMOVAL

(1) Remove remote ground cable (Fig. 5) from ground stud on shock tower. Then correctly isolate ground cable from vehicle by installing isolator on stud (Fig. 6).



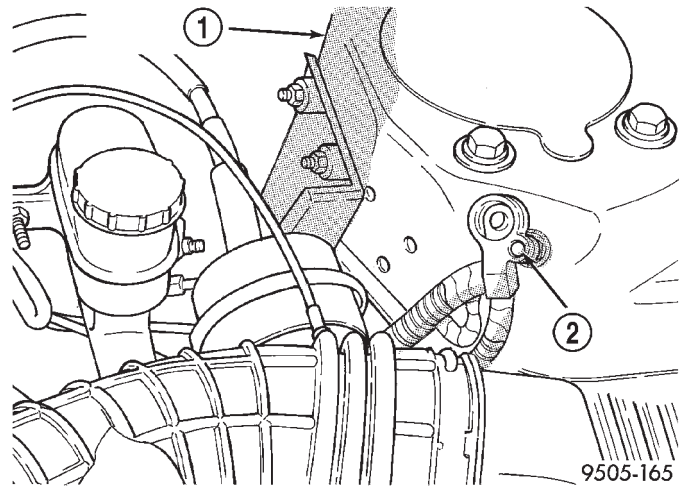
9505-164

Fig. 5 Remote Ground Cable At Shock Tower

- 1 - SPEED CONTROL SERVO
- 2 - LEFT STRUT TOWER
- 3 - GROUND STUD
- 4 - AIR CLEANER
- 5 - REMOTE GROUND CABLE
- 6 - MASTER CYLINDER

(2) Siphon as much power steering fluid as possible from the remote power steering fluid reservoir.

(3) Place the steering wheel and front wheels in the STRAIGHT-AHEAD position. Lock the steering wheel in this position using a steering wheel holder.



9505-165

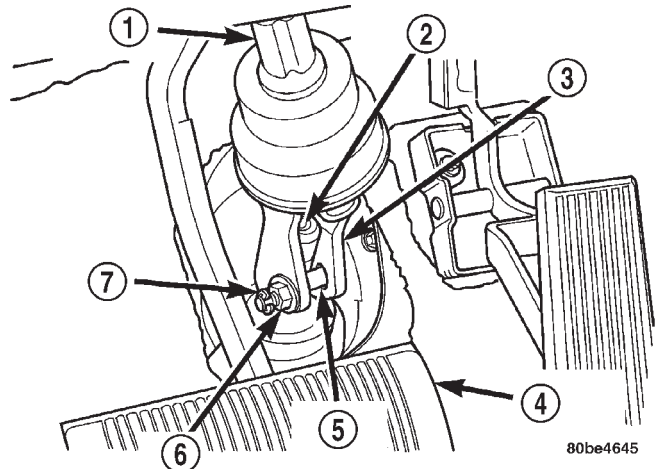
Fig. 6 Correctly Isolated Remote Ground Cable

- 1 - LEFT STRUT TOWER
- 2 - GROUND STUD

(4) Under the instrument panel, disconnect the intermediate shaft from the steering gear shaft. To do so, perform one of the following that applies:

(a) On early production vehicles, remove the "E" clip from the steering column intermediate shaft coupler pinch bolt. Next, remove the pinch bolt from the intermediate shaft coupler by backing off the nut, then separate the intermediate shaft from steering gear shaft.

(b) On later production vehicles, remove the pinch bolt from the intermediate shaft coupler (Fig. 8), then slide the intermediate shaft up and off the steering gear shaft.

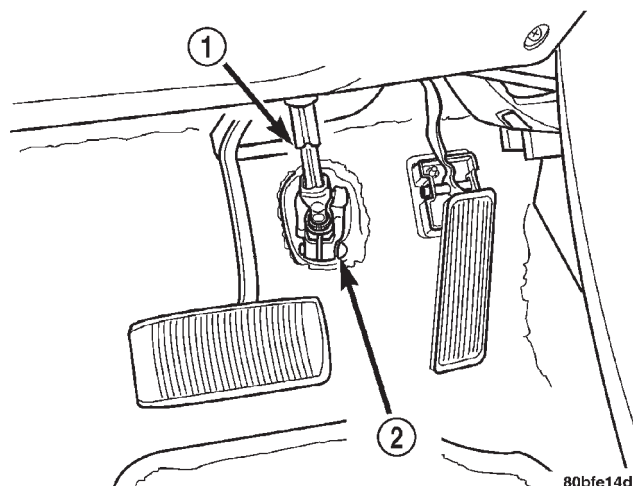


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Fig. 7 Early Intermediate Shaft Attachment

- 1 - INTERMEDIATE SHAFT
- 2 - STEERING GEAR SHAFT
- 3 - COUPLER
- 4 - BRAKE PEDAL
- 5 - PINCH BOLT
- 6 - NUT
- 7 - "E" CLIP

REMOVAL AND INSTALLATION (Continued)

**Fig. 8 Later Intermediate Shaft Attachment**

- 1 - INTERMEDIATE SHAFT
2 - PINCH BOLT

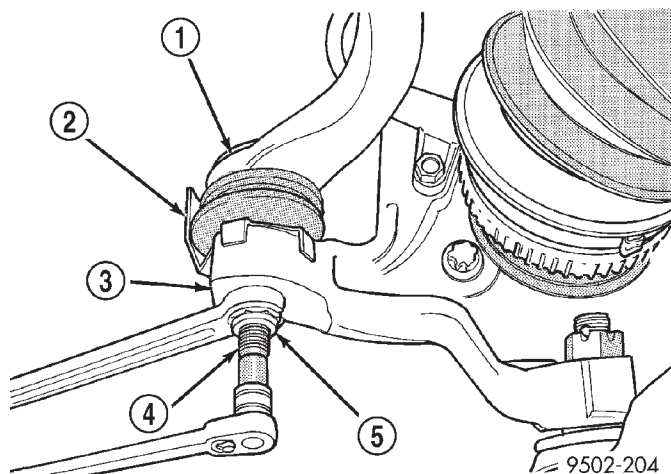
(5) Raise vehicle on jack stands or centered on a frame contact type hoist. See Hoisting in the Lubrication and Maintenance section of this manual, for the required lifting procedure to be used for this vehicle.

(6) Remove both front wheel and tire assemblies from the vehicle.

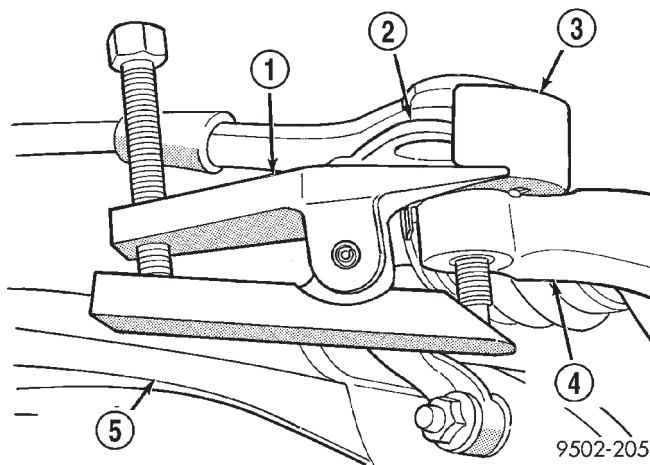
(7) Remove nuts attaching both outer tie rod ends to the steering knuckles (Fig. 9). **Nuts are to be removed from tie rod ends using the following procedure, hold tie rod end stud with an 11/32 socket, while loosening and removing nut with wrench (Fig. 9).**

(8) Remove both tie rod end studs, from the steering knuckles, using Remover, Special Tool MB-991113 (Fig. 10).

CAUTION: This vehicles is designed and assembled using NET BUILD front suspension alignment settings. This means that front suspension alignment settings are determined as the vehicle is designed by the location of front suspension components in relation to the vehicle body. This process is carried out when building the vehicle, by accurately locating the front suspension crossmember to master gage holes located in the underbody of the vehicle. With this method of designing and building a vehicle, it is no longer necessary or possible to adjust a vehicles front suspension alignment settings. Consequently, whenever the front suspension crossmember is removed from a vehicle, it **MUST** be replaced in the same location on the body of the vehicle it was removed from. Front suspension Toe settings though are still adjustable by the outer tie rod ends.

**Fig. 9 Removing Tie Rod End Nut**

- 1 - TIE ROD END
2 - HEAT SHIELD
3 - STEERING KNUCKLE
4 - TIE ROD END STUD
5 - NUT

**Fig. 10 Tie Rod End Removal From Steering Knuckle**

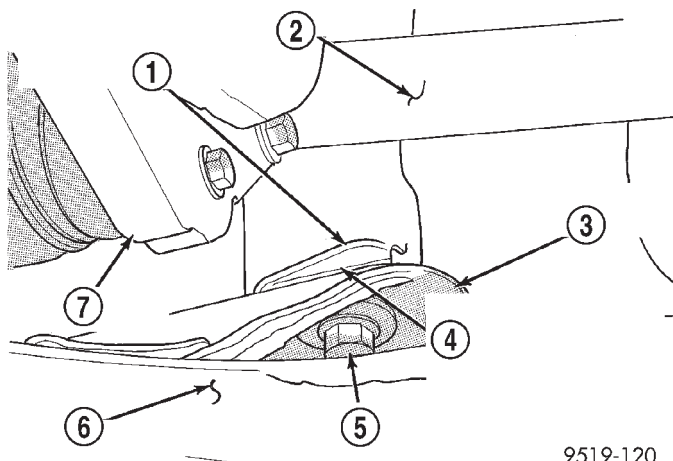
- 1 - SPECIAL TOOL MB-991113
2 - TIE ROD END
3 - HEAT SHIELD
4 - STEERING KNUCKLE
5 - LOWER CONTROL ARM

REMOVAL AND INSTALLATION (Continued)

CAUTION: Before removing the front suspension crossmember from the vehicle, locating marks for the front suspension crossmember **MUST** be scribed on the front suspension crossmember and body of vehicle. This must be done so front suspension crossmember can be located against body of vehicle, in the same location when it is installed back in vehicle. If location of front suspension crossmember to body of vehicle is not maintained when vehicle is assembled, **NET BUILD** front suspension alignment settings will not be obtained. This may lead to handling and or tire wear problems.

NOTE: Use the following procedure to mark the side to side and front to back installed location of the front suspension crossmember to the body of the vehicle.

(9) Using an awl, scribe a line on the body (Fig. 11) and (Fig. 12) marking the front to back installed location where the front suspension crossmember is mounted against the body of the vehicle. The line should be scribed at both the front and back of where the crossmember is mounted to the vehicle and on each side of the vehicle. In (Fig. 11) and (Fig. 12) the left side of the vehicle is shown.

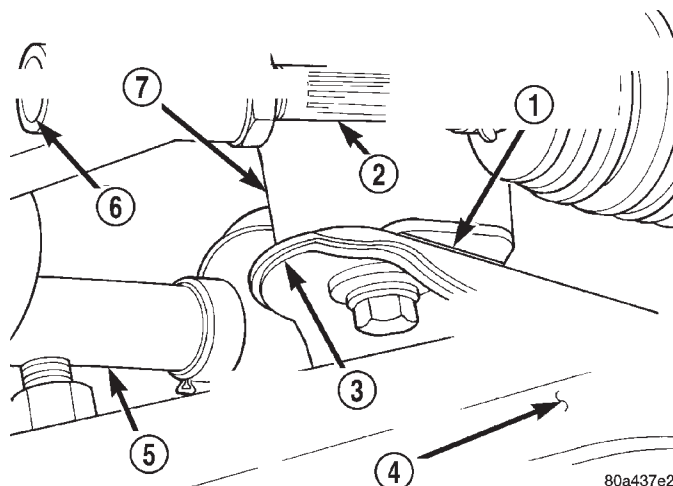


9519-120

Fig. 11 Front Suspension Crossmember Front To Back Locating Mark (Left Side Front)

- 1 - FRAME RAIL TO CROSSMEMBER ATTACHING BRACKET
- 2 - DRIVESHAFT
- 3 - FRONT SUSPENSION CROSSMEMBER
- 4 - FRONT SUSPENSION CROSSMEMBER TO BODY FRONT TO BACK LOCATING MARK
- 5 - FRONT SUSPENSION CROSSMEMBER MOUNTING BOLT
- 6 - FRONT LOWER CONTROL ARM
- 7 - TRANSAXLE

(10) Using an awl, scribe a line on the front suspension crossmember (Fig. 13) marking the side to side installed location where front suspension cross-

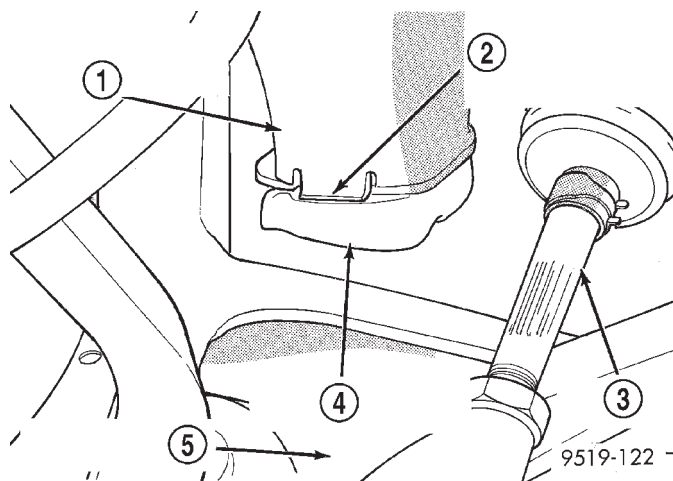


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Fig. 12 Front Suspension Crossmember Front To Back Locating Mark (Left Side Rear)

- 1 - FRONT SUSPENSION CROSSMEMBER TO BODY, FRONT TO BACK LOCATING MARK
- 2 - INNER TIE ROD
- 3 - FRONT SUSPENSION CROSSMEMBER
- 4 - LOWER CONTROL ARM
- 5 - DRIVESHAFT
- 6 - OUTER TIE ROD
- 7 - FRAME RAIL TO CROSSMEMBER ATTACHING BRACKET

member is mounted against the body of the vehicle. The line should be scribed at the side of the frame rail bracket (Fig. 13) where the crossmember is mounted to the vehicle. The locating mark is to be marked the same on each side of the vehicle. In (Fig. 13) the left side of the vehicle is shown.



9519-122

Fig. 13 Front Suspension Crossmember Side To Side Locating Mark

- 1 - FRAME RAIL TO CROSSMEMBER BRACKET
- 2 - FRONT SUSPENSION CROSSMEMBER TO BODY SIDE TO SIDE LOCATING MARK
- 3 - INNER TIE ROD
- 4 - FRONT SUSPENSION CROSSMEMBER
- 5 - LOWER CONTROL ARM

REMOVAL AND INSTALLATION (Continued)

(11) Remove the stabilizer bar bushing clamp to body attaching bolts only (Fig. 14). The sway bar bushing clamp to front suspension crossmember bolts (Fig. 14) do not need to be removed.

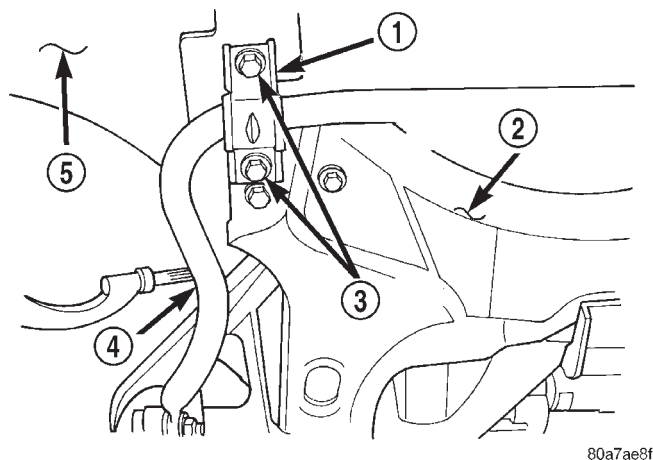


Fig. 14 Stabilizer Bar Bushing Clamp Attaching Bolts

- 1 - STABILIZER BAR BUSHING CLAMP
- 2 - FRONT SUSPENSION CROSSMEMBER
- 3 - ATTACHING BOLTS
- 4 - STABILIZER BAR
- 5 - VEHICLE BODY

(12) **If vehicle is equipped with antilock brakes, the hydraulic control unit can not hang from the brake tubes when lowering front suspension crossmember. Using wire, tie the antilock brakes hydraulic control unit to the body and engine so the wire will support it when the crossmember is lowered.**

(13) If vehicle is equipped with antilock brakes, remove the 3 bolts attaching the antilock brakes hydraulic control unit to the front suspension crossmember.

(14) Remove the bolts attaching the shock absorber clevis to the left and right lower control arms (Fig. 15).

(15) Remove the 2 bolts attaching the under engine support bracket (Fig. 16) to the front edge of the front suspension crossmember.

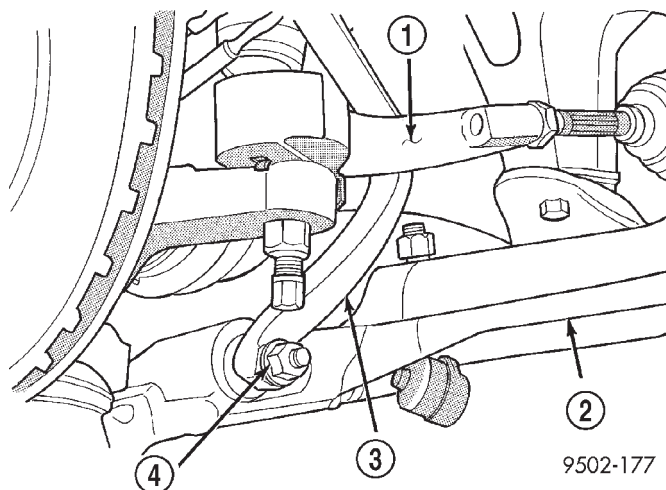


Fig. 15 Shock Clevis To Lower Control Arm Bolts

- 1 - TIE ROD END
- 2 - LOWER CONTROL ARM
- 3 - SHOCK ABSORBER CLEVIS
- 4 - THRU-BOLT

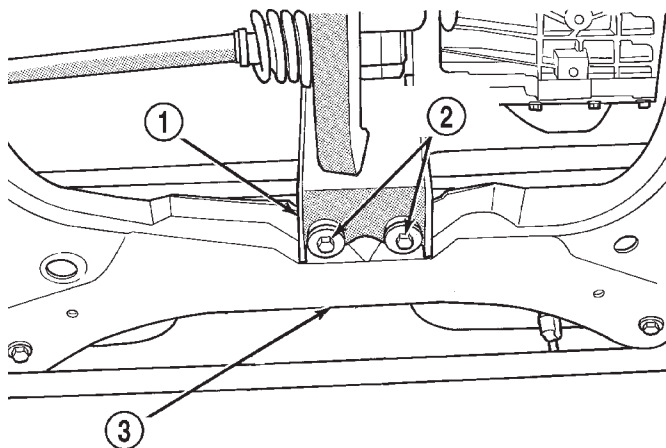


Fig. 16 Engine Support Bracket To Crossmember Attaching Bolts

- 1 - ENGINE SUPPORT BRACKET
- 2 - ATTACHING BOLTS
- 3 - FRONT SUSPENSION CROSSMEMBER

REMOVAL AND INSTALLATION (Continued)

(16) Remove the 2 attaching bolts from the rear support bracket (Fig. 17) at the rear of the front suspension crossmember.

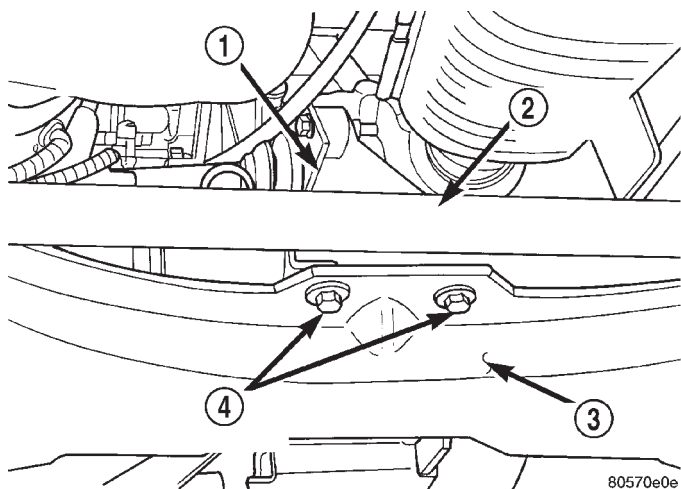


Fig. 17 Rear Support Bracket Attachment To Crossmember

- 1 - REAR SUPPORT BRACKET
- 2 - STABILIZER BAR
- 3 - CROSSMEMBER
- 4 - ATTACHING BOLTS

(17) Remove bolt (Fig. 18) attaching engine support bracket to the transaxle mounting bracket.

(18) Position a transmission jack under the center of the front suspension crossmember. Transmission jack is used to lower, support and raise front suspension crossmember when removing steering gear assembly.

(19) From each side of the vehicle, remove the 2 bolts attaching the front and rear of the front suspension crossmember to the frame rails of vehicle (Fig. 19).

(20) Using transmission jack, lower front suspension crossmember enough to allow steering gear to be removed from crossmember. **When lowering front suspension crossmember, do not let crossmember hang from lower control arms, weight of crossmember must be supported by the transmission jack.**

(21) Remove power steering fluid, pressure and return hoses from the power steering gear assembly (Fig. 20).

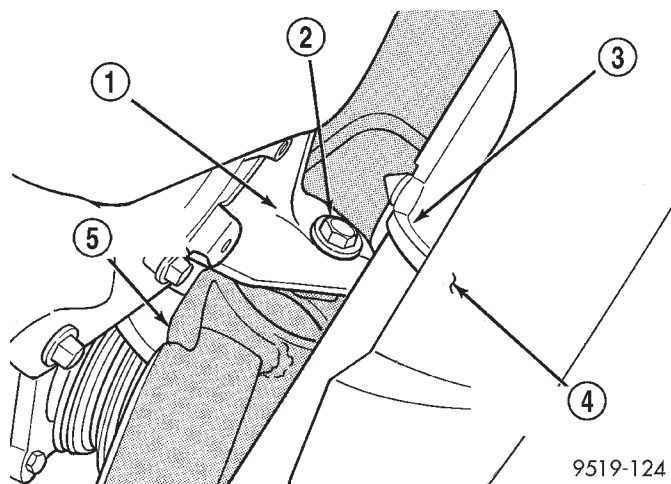


Fig. 18 Engine Support Bracket To Transaxle Bracket Bolt

- 1 - TRANSAXLE MOUNTING BRACKET
- 2 - BOLT
- 3 - STEERING GEAR
- 4 - FRONT SUSPENSION CROSSMEMBER
- 5 - ENGINE SUPPORT BRACKET

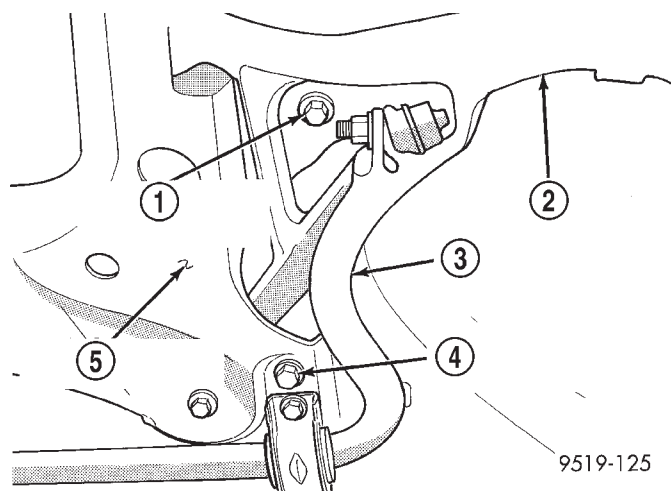


Fig. 19 Crossmember To Body Attaching Bolts

- 1 - CROSSMEMBER FRONT MOUNTING BOLT
- 2 - LOWER CONTROL ARM
- 3 - STABILIZER BAR
- 4 - CROSSMEMBER REAR MOUNTING BOLT
- 5 - FRONT SUSPENSION CROSSMEMBER

REMOVAL AND INSTALLATION (Continued)

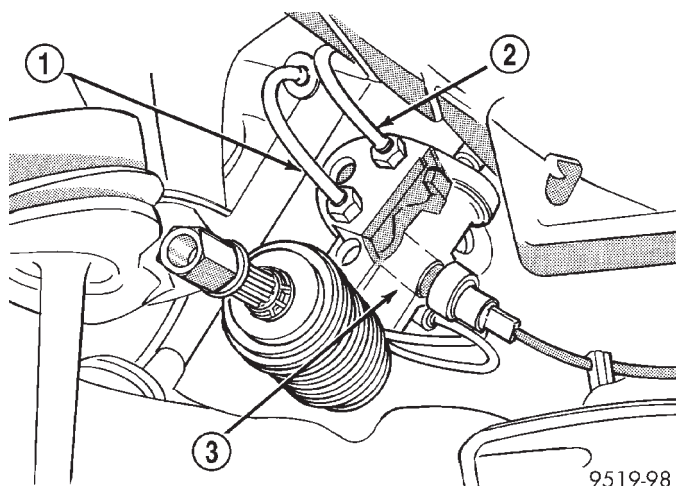


Fig. 20 Power Steering Pressure And Return Hose At Steering Gear

- 1 - POWER STEERING PRESSURE HOSE
- 2 - POWER STEERING RETURN HOSE
- 3 - POWER STEERING GEAR

(22) Remove wiring harness connector, (Fig. 20) from the power steering fluid pressure switch.

(23) Remove the 2 bolts, at the isolators (Fig. 21) and (Fig. 22) attaching the steering gear assembly to front suspension crossmember. Then remove the 2 bolts attaching the steering gear saddle bracket (Fig. 23) to the front suspension crossmember. Remove the steering gear assembly from the front suspension crossmember.

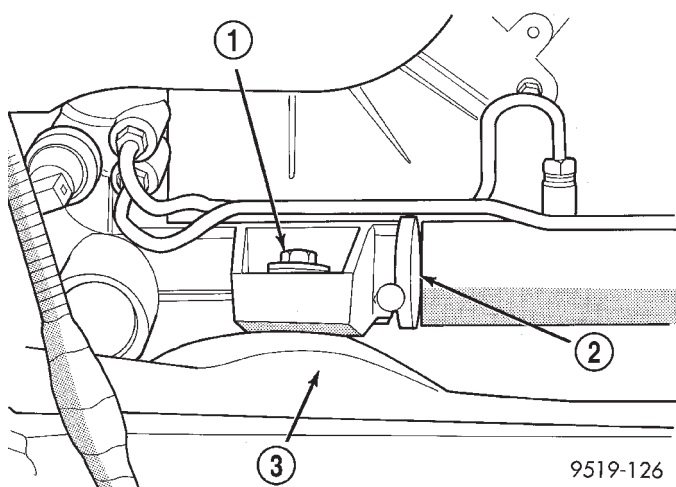


Fig. 21 Steering Gear Rear Mounting Isolator Bolt

- 1 - REAR MOUNTING BOLT
- 2 - STEERING GEAR
- 3 - FRONT SUSPENSION CROSSMEMBER

(24) Transfer required parts from removed steering gear assembly to the replacement steering gear, if a new steering gear is being installed.

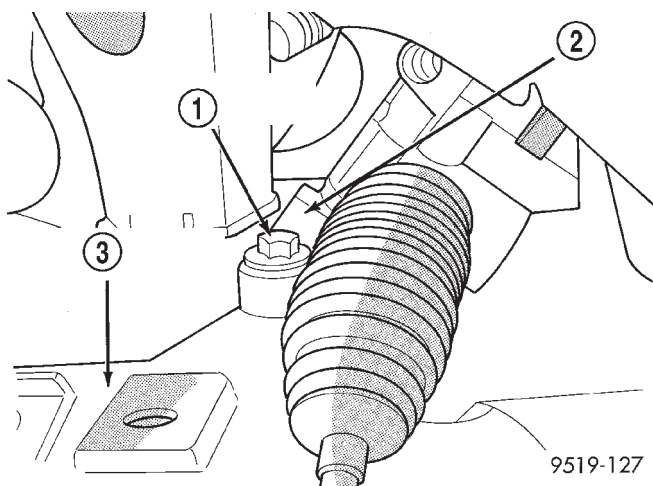


Fig. 22 Steering Gear Front Mounting Bolt

- 1 - FRONT MOUNTING BOLT
- 2 - STEERING GEAR
- 3 - FRONT SUSPENSION CROSSMEMBER

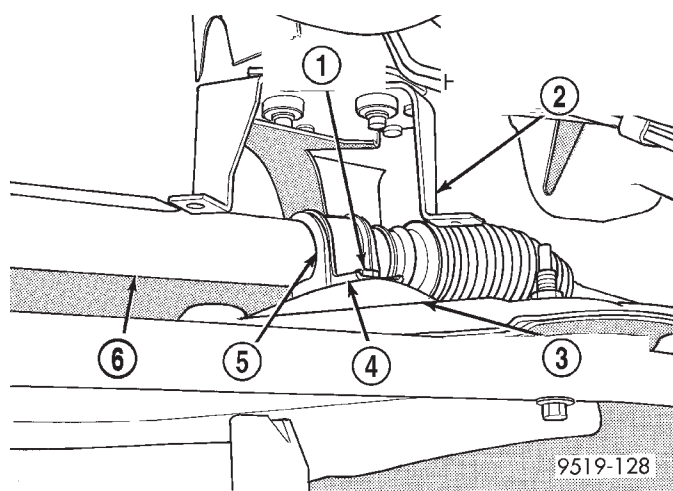


Fig. 23 Steering Gear Saddle Bracket Mounting Bolts

- 1 - ATTACHING BOLTS (2)
- 2 - SUPPORTED ANTILOCK BRAKES HYDRAULIC CONTROL UNIT
- 3 - FRONT SUSPENSION CROSSMEMBER
- 4 - SADDLE BRACKET
- 5 - ISOLATOR
- 6 - STEERING GEAR

INSTALLATION

(1) Install steering gear assembly on front suspension crossmember. Install the 2 long steering gear assembly to front crossmember mounting bolts (Fig. 21) and (Fig. 22) into the mounting isolators. Then install the 2 short bolts (Fig. 23) into the saddle bracket. Tighten the 4 steering gear mounting bolts to a torque of 68 N·m (50 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

(2) Install the power steering fluid pressure and return lines on the ports of the power steering gear (Fig. 20). Tighten power steering fluid pressure and return lines to steering gear tube nuts (Fig. 20) to a torque of 31 N·m (275 in. lbs.).

(3) Using transmission jack, raise front suspension crossmember and steering gear against body of vehicle. Start the 2 rear bolts (Fig. 19) into tapping plates, attaching front suspension crossmember to body of vehicle. Then install the 2 front bolts, (Fig. 19) attaching front suspension crossmember to frame rails of vehicle. Tighten the 4 mounting bolts evenly, until front suspension crossmember is against body of vehicle at the 4 mounting points. Then torque the 4 mounting bolts to 2 N·m (20 in. lbs.) to hold front suspension crossmember in position.

CAUTION: When front suspension crossmember is installed back in vehicle, crossmember **MUST** be aligned with positioning marks previously scribed into body of vehicle. This **MUST** be done to maintain **NET BUILD** front suspension alignment settings.

(4) Using a soft face hammer, tap front suspension crossmember into position, until it is aligned with the previously scribed positioning marks on body of vehicle (Fig. 11), (Fig. 12) and (Fig. 13). When front suspension crossmember is correctly positioned, torque the 2 rear crossmember mounting bolts to 163 N·m (120 ft. lbs.). Then torque the 2 front crossmember to frame rail attaching bolts to 163 N·m (120 ft. lbs.).

(5) Install the engine support bracket on the front of the front suspension crossmember (Fig. 16). Install the 2 support bracket to suspension crossmember attaching bolts and tighten to a torque of 75 N·m (55 ft. lbs.).

(6) Install bolt (Fig. 18) attaching engine support bracket to transaxle mounting bracket. Tighten bolt to a torque of 75 N·m (55 ft. lbs.).

(7) Install the 2 bolts attaching the rear support bracket, for the under engine support bracket (Fig. 17), to the rear of the front suspension crossmember. Tighten bolts to a torque of 75 N·m (55 ft. lbs.).

(8) Install vehicle wiring harness connector onto power steering fluid pressure switch on steering gear assembly (Fig. 20). **Be sure locking tab on wiring harness connector is securely latched to pressure switch.**

(9) Install the antilock brakes hydraulic control unit mounting bracket on the front suspension crossmember. Install the 3 mounting bracket to crossmember attaching bolts and tighten to a torque of 28 N·m (250 in. lbs.).

(10) Loosely install the 2 shock absorber clevis to lower control arm attaching nuts and bolts (Fig. 15).

(11) Install tie rod seal boot heat shield on tie rod end (Fig. 10).

(12) 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, tighten tie rod end to steering knuckle attaching nut (Fig. 10). Then using a crowfoot and 11/32 socket, torque tie rod end attaching nut to 61 N·m (45 ft. lbs.) (Fig. 24).

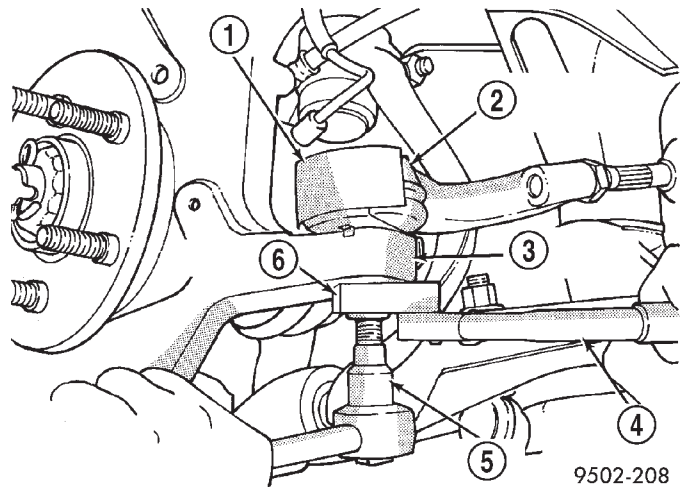


Fig. 24 Torquing Tie Rod End Attaching Nut

- 1 - HEAT SHIELD
- 2 - TIE ROD END
- 3 - STEERING KNUCKLE
- 4 - TORQUE WRENCH
- 5 - 11/32 SOCKET
- 6 - CROWFOOT

(13) Install and tighten the 2 stabilizer bar bushing clamp to body attaching bolts (Fig. 14).

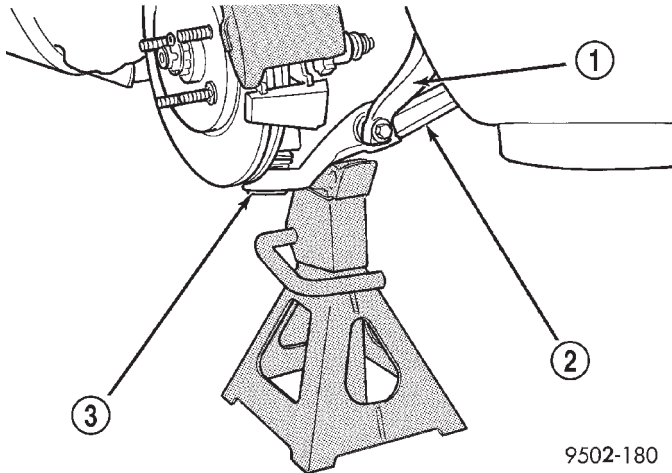
CAUTION: When supporting lower control arm with jack stand, do not position jack stand under the ball joint cap on the lower control arm. Position in area of lower control arm shown in (Fig. 25).

(14) Lower vehicle to the ground with a jack stand positioned under the lower control arm (Fig. 25). Continue to lower vehicle so the total weight of the vehicle is supported by the jack stand and lower control arm.

(15) Tighten the shock absorber clevis to lower control arm bushing thru-bolt to a torque of 92 N·m (68 ft. lbs.).

(16) Install the wheel and tire assemblies back on vehicle. Tighten the wheel nuts in proper sequence to a torque of 129 N·m (95 ft. lbs.) (Fig. 15).

REMOVAL AND INSTALLATION (Continued)



9502-180

Fig. 25 Lower Control Arm Correctly Supported By Jack Stand

- 1 - SHOCK ABSORBER CLEVIS
- 2 - LOWER CONTROL ARM
- 3 - BALL JOINT CAP

CAUTION: Before connecting the steering column intermediate shaft coupler to the steering gear shaft, position the front wheels **STRAIGHT-AHEAD**. The steering wheel must also be in the centered position.

(17) Under the instrument panel, reconnect the intermediate shaft to the steering gear shaft. To do so, perform one of the following that applies:

(a) On early production vehicles, reconnect the steering column intermediate shaft to the steering gear shaft (Fig. 7). Install a **new** intermediate shaft coupler pinch bolt through the coupler and into its nut, then tighten the nut and pinch bolt to a torque of 27 N·m (240 in. lbs.).

(b) On later production vehicles, align the flats and slide the intermediate shaft onto the steering gear shaft aligning the pinch bolt hole with the notch formed into the steering gear shaft. Install a **new** pinch bolt in the intermediate shaft coupler (Fig. 8), then tighten the pinch bolt to a torque of 34 N·m (300 in. lbs.).

(18) On early production vehicles, install a **new** "E" clip on the end of the pinch bolt (Fig. 7).

(19) Remove the steering wheel holder.

CAUTION: Do not use automatic transmission fluid in place of power steering fluid.

(20) Fill power steering pump fluid reservoir to the (Full-Cold) proper level.

(21) Start the engine and let it run for a few seconds to circulate the fluid.

(22) Turn the engine off.

(23) Add fluid if necessary.

(24) Raise front wheels of vehicle off the ground.

(25) Start engine and turn steering wheel several times from stop-to-stop to bleed air from fluid in system. Stop engine, check fluid level, and inspect system for leaks. **Fill pump reservoir to correct level with Mopar®, Power Steering Fluid, or equivalent.** See Checking Fluid Level.

(26) Lower front wheels of vehicle back on the ground.

CAUTION: During this procedure do not allow the steering gear inner tie rod boots to become twisted. (See Wheel Alignment in the suspension section of this service manual).

(27) Check front alignment and adjust the front Toe setting on the vehicle. Refer to the Toe Setting Procedure in Front Suspension Service Procedures in this group of the service manual. Refer to the Specifications Section at the end of this group for the desired front Toe specification.

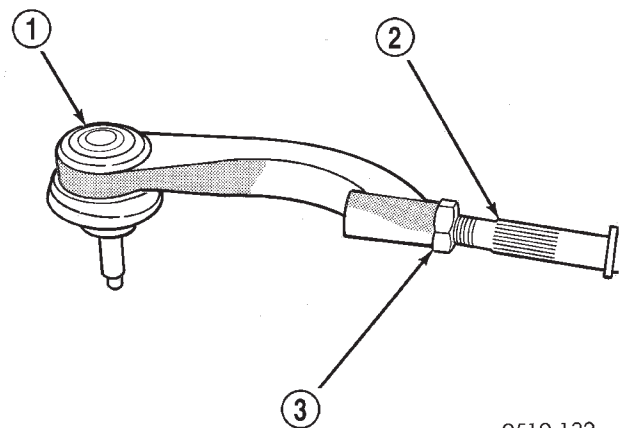
(28) Tighten tie rod jam nut to 74 N·m (55 ft. lbs.) torque.

(29) Adjust steering gear to tie rod boots at tie rods.

OUTER TIE ROD END

DISASSEMBLE

(1) Loosen inner tie rod to outer tie rod jam nut (Fig. 26).



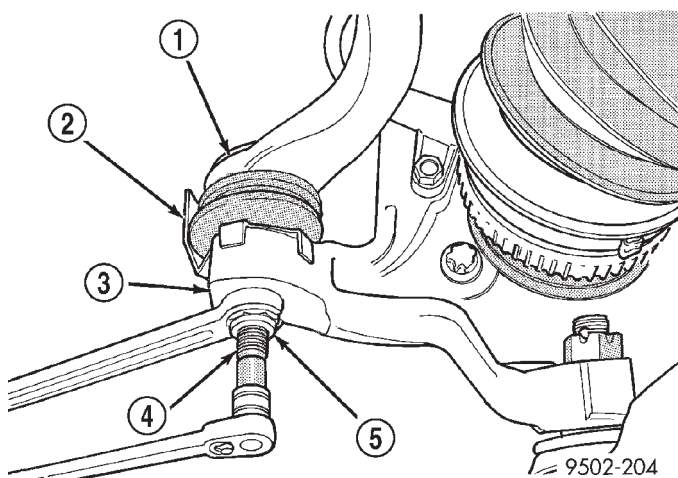
9519-132

Fig. 26 Inner To Outer Tie Rod Jam Nut

- 1 - OUTER TIE ROD
- 2 - INNER TIE ROD
- 3 - JAM NUT

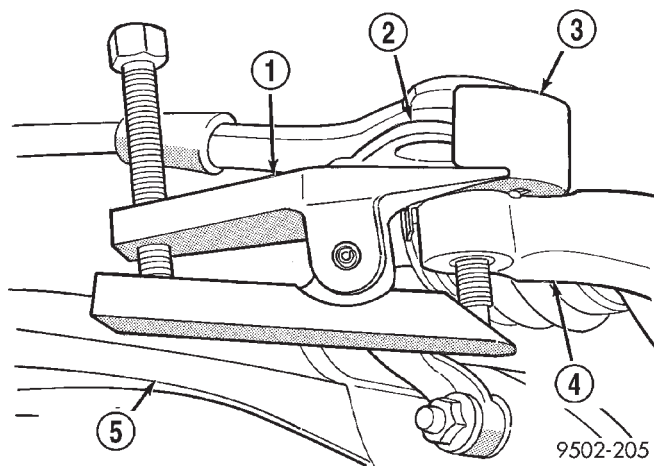
(2) Remove nut attaching outer tie rod end to steering knuckle (Fig. 27). **Nut is to be removed from tie rod end using the following procedure, hold tie rod end stud with a 11/32 socket while loosening and removing nut with wrench.**

REMOVAL AND INSTALLATION (Continued)

**Fig. 27 Removing Tie Rod End Nut**

- 1 - TIE ROD END
- 2 - HEAT SHIELD
- 3 - STEERING KNUCKLE
- 4 - TIE ROD END STUD
- 5 - NUT

(3) Remove tie rod end stud, from steering knuckle, using Remover, Special Tool MB-991113 (Fig. 28).

**Fig. 28 Tie Rod End Removal From Steering Knuckle**

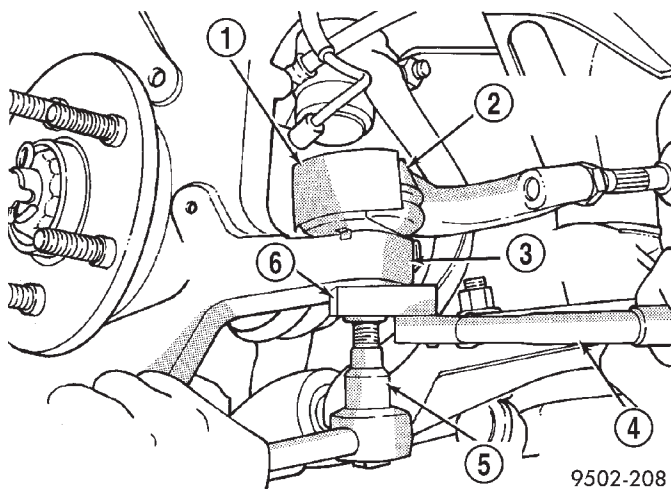
- 1 - SPECIAL TOOL MB-991113
- 2 - TIE ROD END
- 3 - HEAT SHIELD
- 4 - STEERING KNUCKLE
- 5 - LOWER CONTROL ARM

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

ASSEMBLE

(1) Install outer tie rod onto inner tie rod. **Make sure jam nut is on inner tie rod.**

- (2) Do not tighten jam nut.
- (3) Install tie rod end seal boot heat shield (Fig. 27) on the tie rod end.
- (4) 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. 27). Then using a crow-foot and 11/32 socket, (Fig. 29) torque tie rod end attaching nut to 61 N·m (45 ft. lbs.).

**Fig. 29 Torquing Tie Rod End Attaching Nut**

- 1 - HEAT SHIELD
- 2 - TIE ROD END
- 3 - STEERING KNUCKLE
- 4 - TORQUE WRENCH
- 5 - 11/32 SOCKET
- 6 - CROWFOOT

CAUTION: During this procedure do not allow the steering gear boot to become twisted. (See Wheel Alignment in the suspension section of this service manual).

(5) Adjust the front Toe setting on the vehicle. Refer to the Toe Setting Procedure in Front Suspension Service Procedures in this group of the service manual. Refer to the Specifications Section at the end of this group for the desired front Toe specification.

(6) Tighten tie rod jam nut (Fig. 26) to 75 N·m (55 ft. lbs.) torque.

(7) Adjust the steering gear to inner tie rod boots at inner tie rod if they became twisted during Toe adjustment.

DISASSEMBLY AND ASSEMBLY

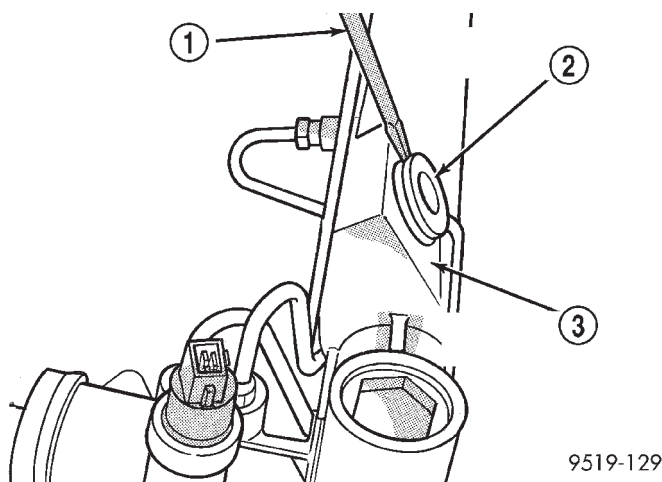
POWER STEERING GEAR MOUNTING BOLT ISOLATOR

The removal and installation of the mounting bolt isolator must be performed with the steering gear assembly removed from the vehicle.

The steering gear mounting bolt isolators (Fig. 30) are a serviceable component of the steering gear assembly. Both isolator bushing are serviced using the same procedure listed below but only the rear mounting bushing is shown.

DISASSEMBLY

(1) Using a screwdriver, pry the sleeve out of the mounting bolt isolator (Fig. 30).



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Fig. 30 Mounting Bolt Isolator Sleeve Removal

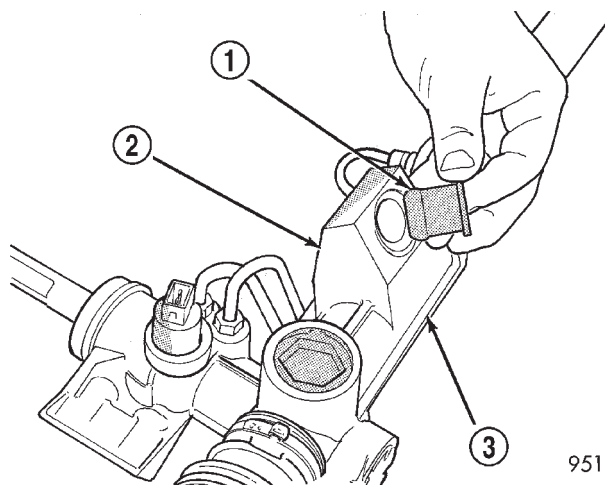
- 1 - SCREWDRIVER
- 2 - ISOLATOR BUSHING SLEEVE
- 3 - STEERING GEAR MOUNTING BRACKET

(2) Pry the mounting bolt isolator bushing from the steering gear mounting bracket.

ASSEMBLY

(1) Lubricate replacement mounting bolt isolator bushing using Mopar, Silicone Spray Lube or an equivalent.

(2) Install the mounting bolt isolator bushing into the steering gear mounting bracket from the bottom side of the bracket (Fig. 31).

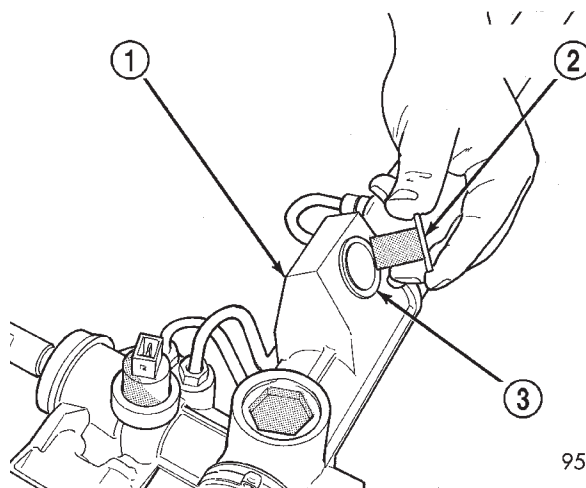


9519-130

Fig. 31 Installing Mounting Bolt Isolator Bushing

- 1 - STEERING GEAR MOUNTING BOLT ISOLATOR BUSHING
- 2 - STEERING GEAR MOUNTING BRACKET
- 3 - STEERING GEAR

(3) Install mounting bolt isolator bushing sleeve into isolator bushing by pressing the sleeve into the bushing by hand (Fig. 32).



9519-131

Fig. 32 Mounting Bolt Isolator Sleeve Installation

- 1 - STEERING GEAR MOUNTING BRACKET
- 2 - ISOLATOR BUSHING SLEEVE
- 3 - STEERING GEAR MOUNTING BOLT ISOLATOR BUSHING

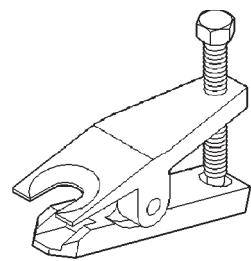
SPECIFICATIONS

STEERING GEAR FASTENER TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
STEERING GEAR:	
To Crossmember Bolts	68 N·m (50 ft. lbs.)
Tie Rod To Steering Knuckle Nut	61 N·m (45 ft. lbs.)
Outer To Inner Tie Rod Jam Nut	75 N·m (55 ft. lbs.)
Power Steering Hose Tube Nuts	31 N·m (275 in. lbs.)

SPECIAL TOOLS

POWER STEERING GEAR



8011090C

Remover Tie Rod End MB-991113

STEERING COLUMN

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DESCRIPTION AND OPERATION

STEERING COLUMN

DESCRIPTION

The steering column used in this vehicle is a tilt type (Fig. 1). It has been designed to be serviced only as an assembly if it is determined to be defective. The replaceable components mounted on the steering column assembly are the key cylinder, ignition switch, multi-function switch, clockspring, speed control switches, lock cylinder trim ring, SKIM module, trim shrouds, driver airbag and steering wheel. These replaceable components of the steering column can be serviced without requiring removal of the steering column from the vehicle. The steering column intermediate shaft can also be serviced separately from the steering column.

OPERATION

Turning of the steering wheel is transferred through the steering column and intermediate shaft, to the power steering gear pinion shaft. The gear then moves the steering knuckles, steering the vehicle.

STEERING COLUMN INTERMEDIATE SHAFT

DESCRIPTION

The steering column intermediate shaft is located between the steering column and the power steering gear. It has a flexible joint at each end. Later models have a slider stage in the center portion of the shaft. The steering column intermediate shaft fastens to the steering column's splined shaft using a roll pin. Depending on whether it is an early or later production model vehicle, the connection to the power steering gear differs. Early models use a intermediate shaft with a slap coupler connection at the steering gear pinion shaft (Fig. 2). Later models use a slider-stage style intermediate shaft (Fig. 3). The two intermediate shafts are not interchangeable because of the steering gear's pinion shaft shape. Both early and later shafts use a pinch bolt to secure the shafts to one another at the steering gear.

OPERATION

The steering column intermediate shaft connects the steering column shaft to the power steering gear's pinion shaft. It's flexible joints allow the shaft to flex when rotating.

DESCRIPTION AND OPERATION (Continued)

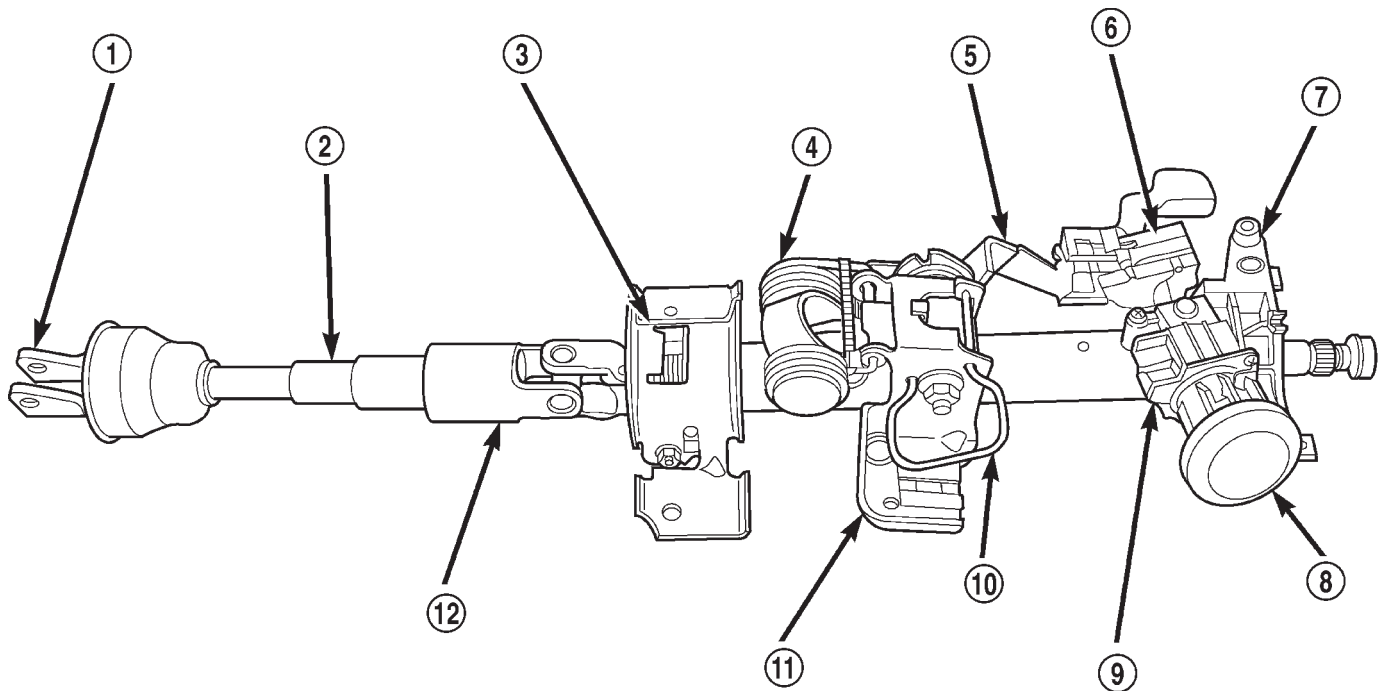


Fig. 1 Steering Column

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- | | |
|--|---|
| 1 – INTERMEDIATE SHAFT COUPLER | 7 – SWITCH HOUSING |
| 2 – INTERMEDIATE SHAFT | 8 – TRIM RING |
| 3 – LOWER STEERING COLUMN MOUNTING BRACKET | 9 – LOCK CYLINDER HOUSING |
| 4 – TILT TORSION SPRING | 10 – SHIPPING PIN |
| 5 – TILT LEVER | 11 – STEERING COLUMN UPPER MOUNTING BRACKET |
| 6 – IGNITION SWITCH | 12 – INTERMEDIATE SHAFT FLEX JOINT |

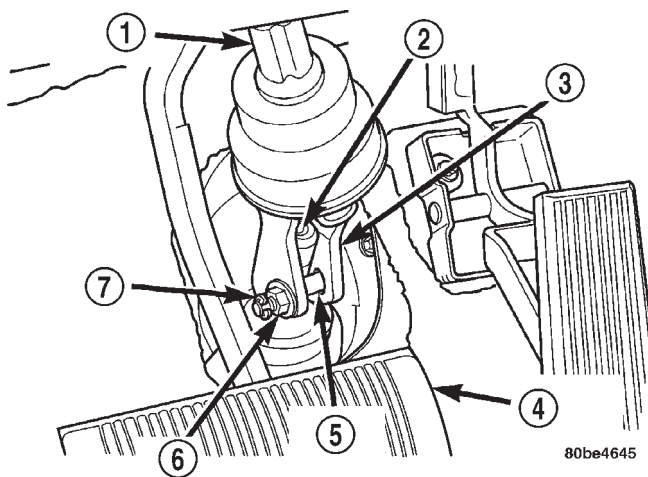


Fig. 2 Slap Coupler Intermediate Shaft

- | |
|-------------------------|
| 1 – INTERMEDIATE SHAFT |
| 2 – STEERING GEAR SHAFT |
| 3 – COUPLER |
| 4 – BRAKE PEDAL |
| 5 – PINCH BOLT |
| 6 – NUT |
| 7 – "E" CLIP |

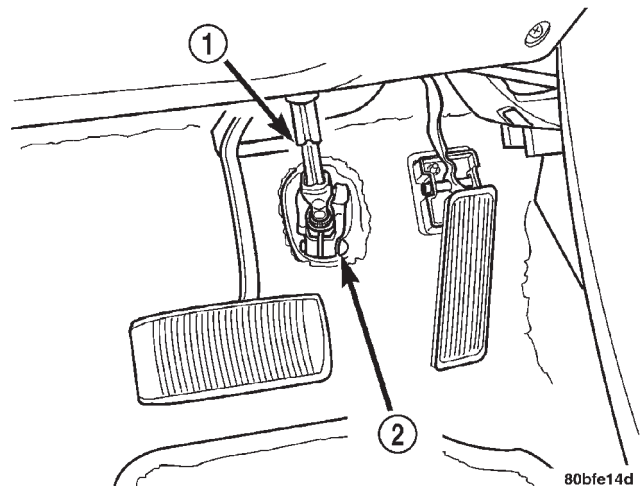


Fig. 3 Slider-Stage Intermediate Shaft

- | |
|------------------------|
| 1 – INTERMEDIATE SHAFT |
| 2 – PINCH BOLT |

DIAGNOSIS AND TESTING

STEERING COLUMN

For diagnosis of conditions relating to the steering column, refer to the STEERING SYSTEM DIAGNOSIS CHARTS in DIAGNOSIS AND TESTING in the POWER STEERING section of this service manual group.

STEERING COLUMN INTERMEDIATE SHAFT

The steering column intermediate shaft and its flexible joint couplers (Fig. 1) must be inspected whenever any of the following conditions exist:

- After the vehicle has been involved in a collision which deploys the airbag, regardless of the extent of damage done to the vehicle.
- After the vehicle has been involved in an under-carriage impact which results in any type of damage to the front suspension crossmember.
- Under any conditions which result in the steering column assembly or steering column shaft receiving a force great enough to move the steering column or shaft forward of rearward in a vehicle.

Inspect the intermediate shaft and its flexible joint couplers for any of the following conditions:

- seized or binding bearings
- loose bearing stakes
- bearings not fully seated in the coupler yoke
- bent intermediate shaft

Presence of any of the above faulty conditions call for replacement of the entire steering column intermediate shaft.

REMOVAL AND INSTALLATION

SERVICE WARNINGS AND CAUTIONS

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.

WARNING: THE AIRBAG 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. 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. BEFORE SERVICING A STEERING COLUMN EQUIPPED WITH AN AIR BAG, REFER TO GROUP 8M, ELECTRICAL FOR PROPER AND SAFE SERVICE PROCEDURES.

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.

STEERING COLUMN

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

REMOVAL

(1) Remove remote ground cable (Fig. 4) from ground stud on shock tower. Then correctly isolate ground cable from vehicle by installing isolator on stud (Fig. 5).

REMOVAL AND INSTALLATION (Continued)

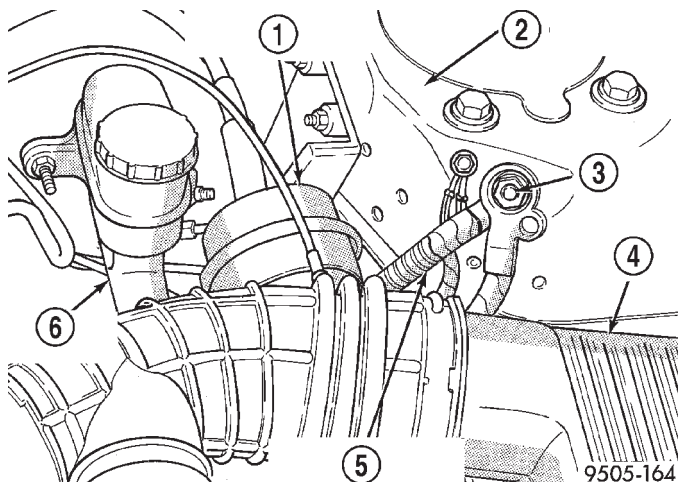


Fig. 4 Remote Ground Cable At Shock Tower

- 1 - SPEED CONTROL SERVO
- 2 - LEFT STRUT TOWER
- 3 - GROUND STUD
- 4 - AIR CLEANER
- 5 - REMOTE GROUND CABLE
- 6 - MASTER CYLINDER

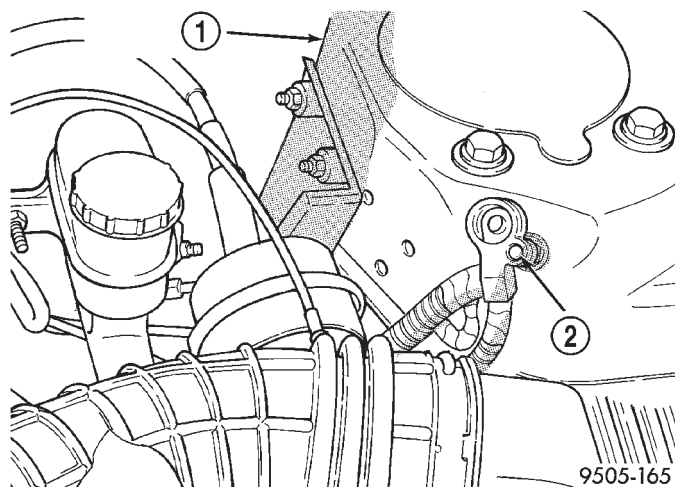


Fig. 5 Correctly Isolated Remote Ground Cable

- 1 - LEFT STRUT TOWER
- 2 - GROUND STUD

(2) **Wait for a minimum of 2 minutes before starting to remove airbag from steering wheel. This will allow the airbag system capacitor to de-energize.**

(3) Before beginning removal of steering column assembly from vehicle, be sure front wheels of vehicle are in the STRAIGHT AHEAD position.

(4) Remove fuse panel cover from left end of instrument panel (Fig. 6). Then remove the screw behind fuse panel cover, attaching the instrument panel top cover (Fig. 6).

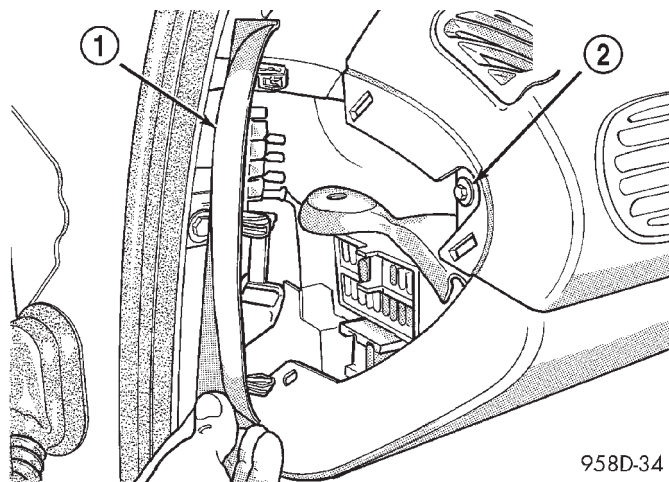


Fig. 6 Instrument Panel Top Cover Attaching Screw

- 1 - FUSE PANEL COVER
- 2 - TOP COVER SCREW

NOTE: When removing the center bezel, only use a soft tool such as a trim stick (Fig. 7) to pry the center bezel from the dash panel. Use of a hard tool will damage dash panel.

(5) Remove center bezel surrounding radio and climate control panel from top cover of dash panel (Fig. 7).

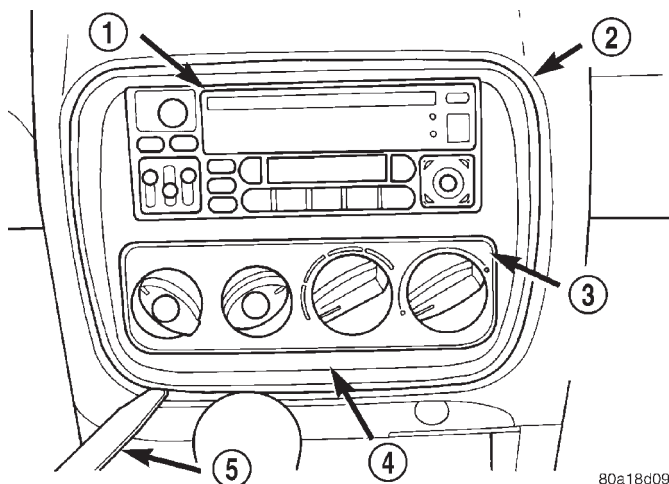


Fig. 7 Center Bezel

- 1 - RADIO
- 2 - DASH PANEL
- 3 - CLIMATE CONTROL PANEL
- 4 - CENTER BEZEL
- 5 - TRIM STICK

(6) Remove the 3 screws attaching the top cover to the dash panel (Fig. 8).

(7) Remove the top cover from the dash panel. Removal of the top cover is required to gain access to

REMOVAL AND INSTALLATION (Continued)

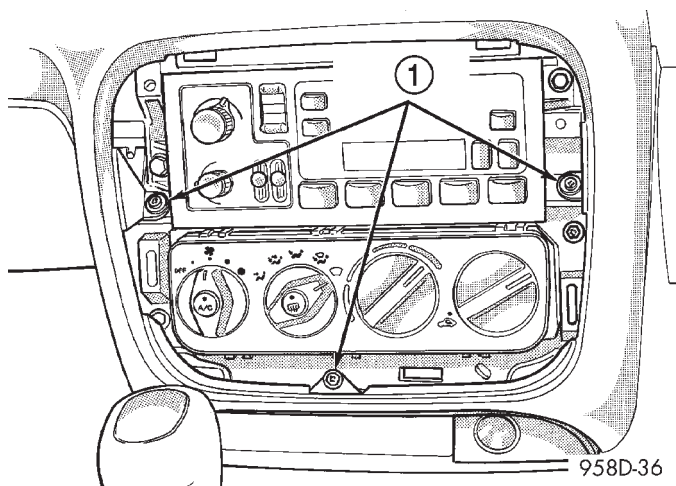


Fig. 8 Instrument Panel Top Cover Attaching Screws

1 - TOP COVER SCREWS

the screws (Fig. 9) attaching the top of the knee bolster to the dash panel.

(8) Remove screws attaching the knee bolster to the instrument panel (Fig. 9).

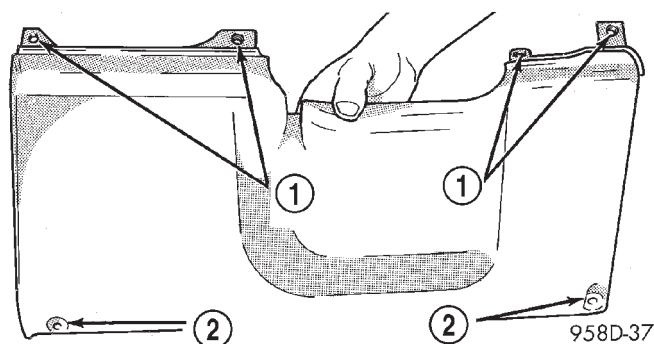


Fig. 9 Knee Bolster Attaching Screw Locations

1 - KNEE BOLSTER SCREW LOCATIONS UNDER TOP COVER
2 - LOWER SCREW LOCATIONS

WARNING: WHEN AN UNDEPLOYED AIRBAG ASSEMBLY IS TO BE REMOVED FROM THE STEERING WHEEL, DISCONNECT BATTERY GROUND CABLE AND ISOLATE. ALLOW SYSTEM CAPACITOR TO DISCHARGE FOR TWO MINUTES, THEN BEGIN AIRBAG REMOVAL.

(9) Remove the speed control switches (Fig. 10) from the steering wheel. The speed control switches are mounted to the steering wheel using 2 mounting screws in the side of each speed control switch (Fig. 10).

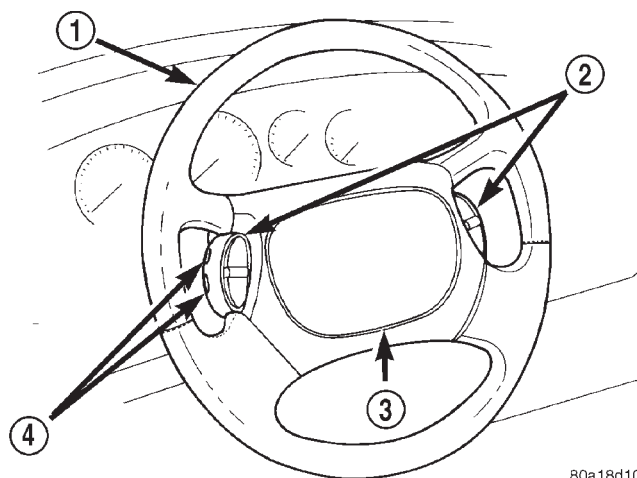


Fig. 10 Speed Control Switches

1 - STEERING WHEEL
2 - SPEED CONTROL SWITCHES
3 - AIRBAG
4 - MOUNTING SCREWS

(10) Remove both speed control switches from the wiring harness in the steering wheel.

WARNING: WHEN HANDLING AN UNDEPLOYED AIRBAG MODULE DURING SERVICING OF THE STEERING COLUMN THE FOLLOWING PRECAUTIONS SHOULD BE OBSERVED. AT NO TIME SHOULD ANY SOURCE OF ELECTRICITY BE PERMITTED NEAR THE INFLATOR ON THE BACK OF THE AIRBAG MODULE. WHEN CARRYING A LIVE MODULE, THE TRIM COVER SHOULD BE POINTED AWAY FROM THE BODY TO MINIMIZE INJURY IF MODULE ACCIDENTLY DEPLOYS. IF AIRBAG MODULE IS PLACED ON A BENCH OR OTHER SURFACE, PLASTIC COVER SHOULD BE FACE UP TO MINIMIZE MOVEMENT IN CASE OF ACCIDENTAL DEPLOYMENT.

REMOVAL AND INSTALLATION (Continued)

(11) Remove the 2 bolts, 1 on each side of the steering wheel, attaching the airbag module to the steering wheel (Fig. 11).

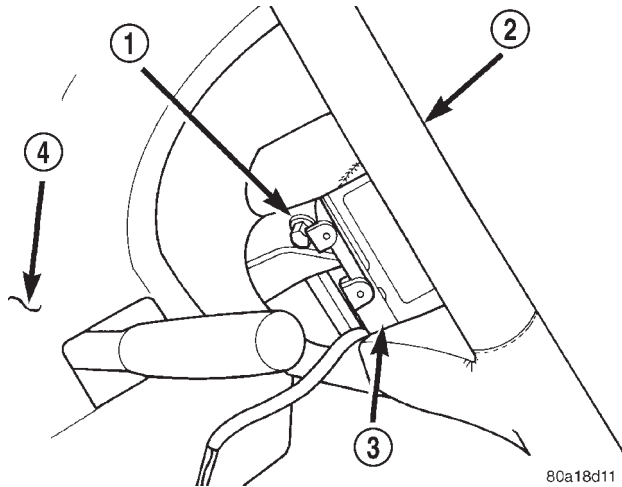


Fig. 11 Airbag Module Attaching Bolts

- 1 - ATTACHING BOLT
- 2 - STEERING WHEEL
- 3 - AIRBAG MODULE
- 4 - STEERING COLUMN

(12) Remove the airbag module from the center of the steering wheel.

(13) Remove the locking tab from clockspring airbag electrical lead connector (Fig. 12). Locking tab is removed by pulling it straight out of the airbag connector. **Do not twist the locking tab when removing it from the connector.**

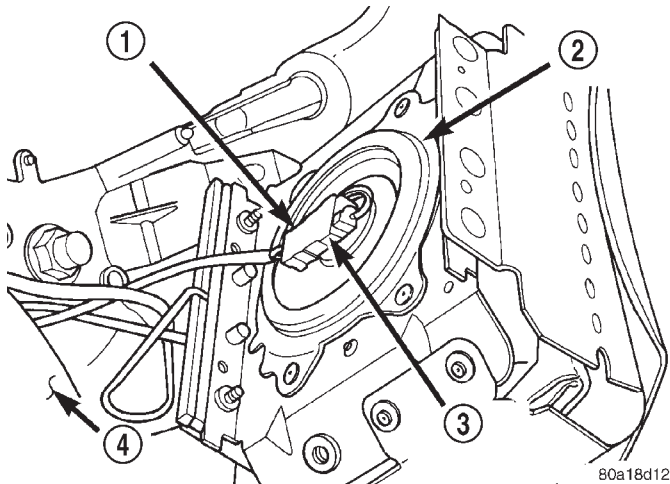


Fig. 12 Airbag Module Electrical Lead Locking Tab

- 1 - ELECTRICAL LEAD CONNECTOR
- 2 - AIRBAG MODULE
- 3 - LOCKING TAB
- 4 - STEERING WHEEL

(14) Disconnect the electrical connector (Fig. 13) from the back of the airbag module. Connector is removed by pulling it straight out of the airbag module. **Do not twist the connector when removing it from the airbag.**

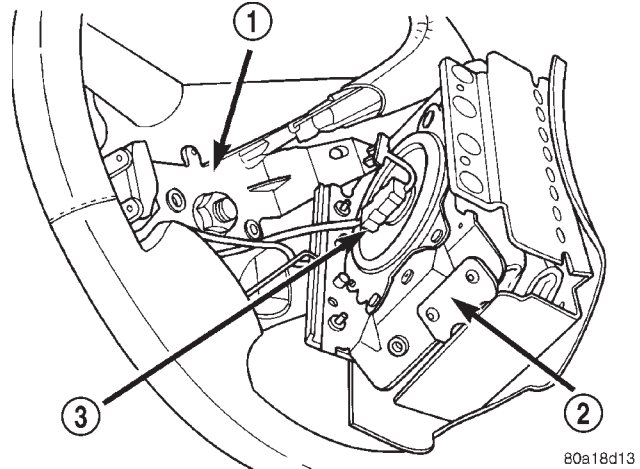


Fig. 13 Airbag Module Electrical Lead Connector

- 1 - STEERING WHEEL
- 2 - AIRBAG MODULE
- 3 - ELECTRICAL LEAD CONNECTOR

(15) Remove the wiring lead for the horn switch in the airbag module (Fig. 14) from the wiring lead coming from the clockspring.

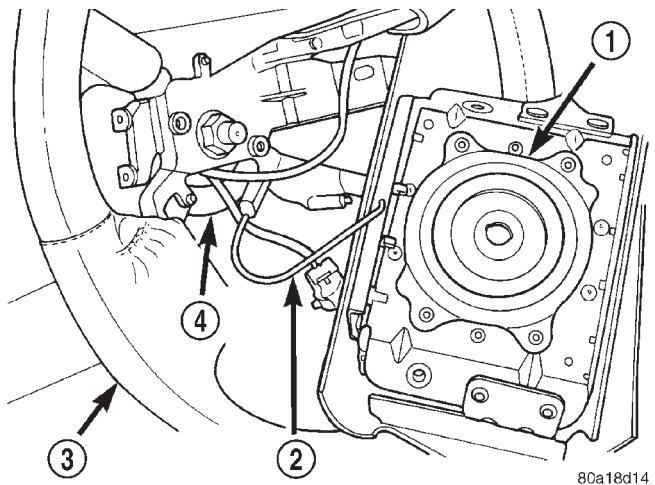


Fig. 14 Horn Switch Wiring Lead

- 1 - AIRBAG MODULE
- 2 - HORN SWITCH WIRING LEAD
- 3 - STEERING WHEEL
- 4 - CLOCKSPRING

(16) Turn the lock cylinder to the OFF position and remove the key from the lock cylinder.

(17) Turn the steering wheel to the left 1/2 a turn (180°) (Fig. 15) until the steering column lock is engaged.

REMOVAL AND INSTALLATION (Continued)

(18) Remove the steering wheel attaching nut (Fig. 15) from the steering column shaft.

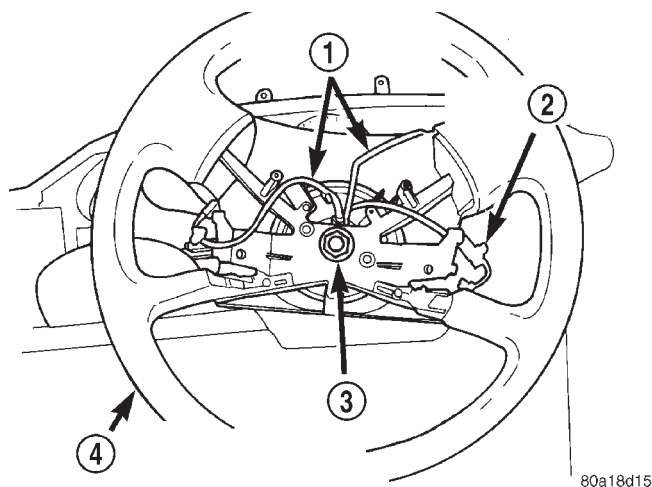


Fig. 15 Steering Wheel Attaching Nut

- 1 - SPEED CONTROL SWITCH WIRING
- 2 - AIRBAG ELECTRICAL LEAD
- 3 - STEERING WHEEL ATTACHING NUT
- 4 - STEERING WHEEL (SHOWN IN LOCKED POSITION)

CAUTION: When installing wheel puller on steering wheel, be sure puller bolts are fully seated in the threaded holes in the steering wheel. If bolts are not fully seated in the threaded holes, threads may be stripped out when removing the steering wheel.

(19) Install a steering wheel puller on the steering wheel (Fig. 16).

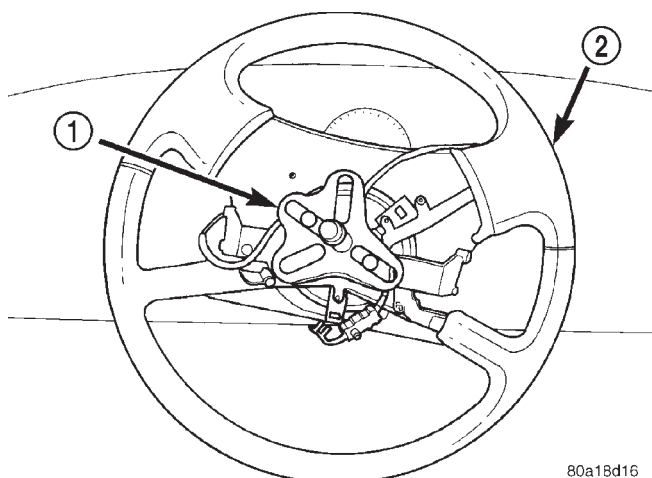


Fig. 16 Puller Installed On Steering Wheel

- 1 - STEERING WHEEL PULLER
- 2 - STEERING WHEEL

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

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

(20) Remove the steering wheel using the puller.

(21) Remove the 2 screws attaching the upper and lower shrouds to the steering column (Fig. 17). First remove upper shroud from steering column, then release tilt lever and tilt steering column to its highest point. Then remove lower shroud from steering column.

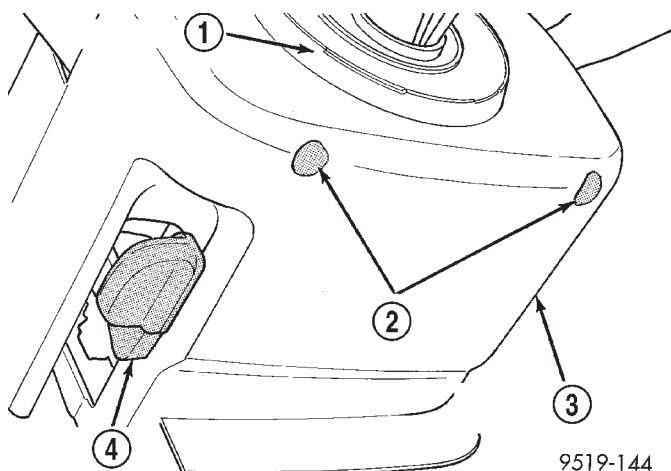


Fig. 17 Steering Column Shroud Attaching Screws

- 1 - CLOCKSPrING
- 2 - ATTACHING SCREWS
- 3 - STEERING COLUMN SHROUDS
- 4 - TILT LEVER

(22) Remove the 2 wiring harness connectors from the clockspring (Fig. 18).

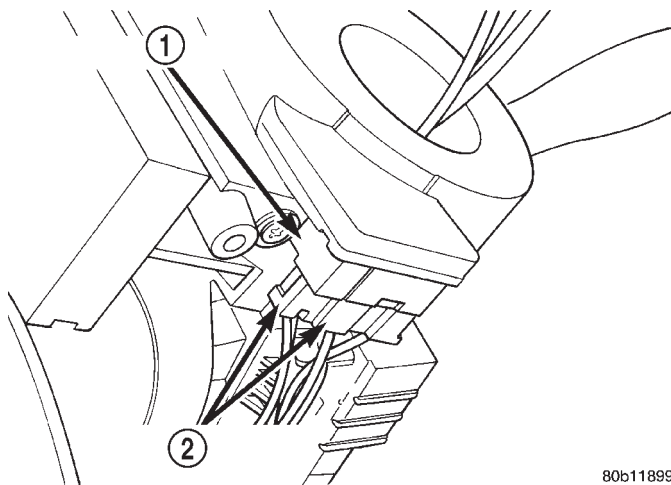


Fig. 18 Wiring Harness Connection To Clock Spring

- 1 - CLOCKSPrING
- 2 - WIRING HARNESS CONNECTORS

REMOVAL AND INSTALLATION (Continued)

(23) Remove the trim ring for the key cylinder from the lock cylinder housing.

(24) Remove the 2 wire wiring harness connectors from the back of the ignition switch (Fig. 19). Then remove the 2 wiring harness connector from the multi function switch (Fig. 19) and (Fig. 20).

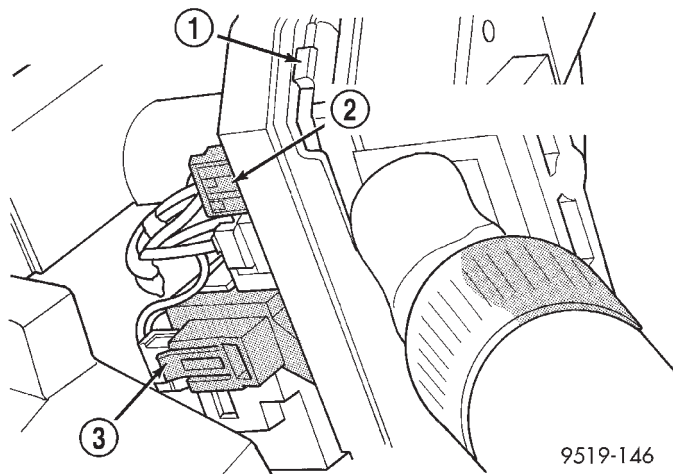


Fig. 19 Wiring Harness Connections To Ignition And Multi-Function Switch

- 1 - MULTI-FUNCTION SWITCH
- 2 - MULTI-FUNCTION SWITCH WIRING HARNESS CONNECTOR
- 3 - IGNITION SWITCH

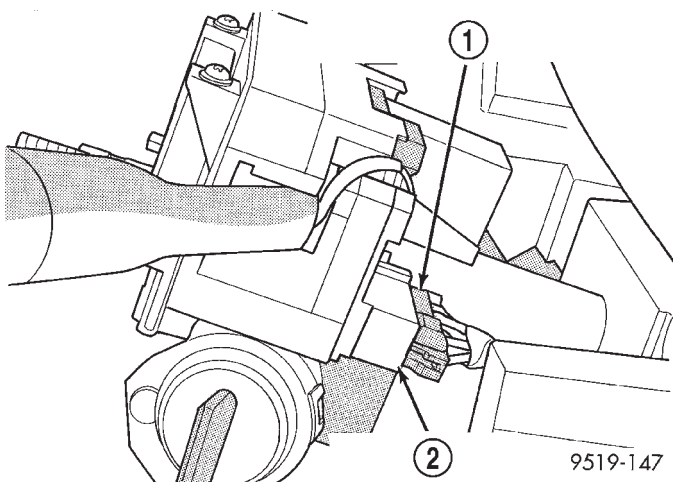


Fig. 20 Wiring Harness Connection To Multi-Function Switch

- 1 - MULTI-FUNCTION SWITCH WIRING HARNESS CONNECTOR
- 2 - MULTI-FUNCTION SWITCH

(25) Depress the locking tab on the shifter/ignition interlock cable (Fig. 21) and remove the cable from the key lock housing.

(26) Remove routing clip holding wiring harness to jacket of steering column.

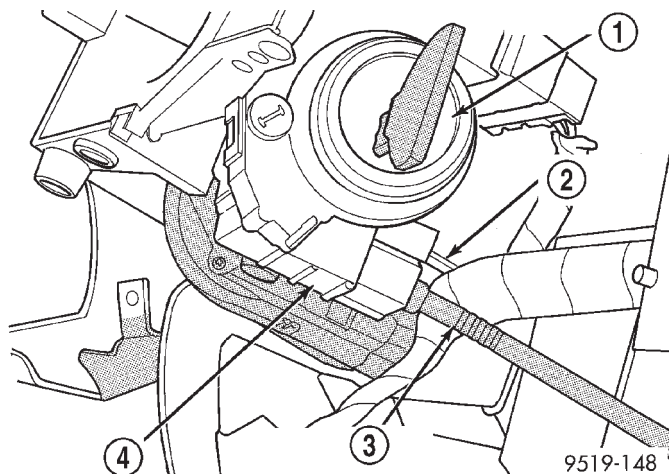


Fig. 21 Shifter/Ignition Cable At Lock Cylinder Housing

- 1 - KEY CYLINDER
- 2 - LOCKING TAB
- 3 - SHIFTER IGNITION INTERLOCK CABLE
- 4 - KEY LOCK HOUSING

(27) If equipped with the optional Sentry Key Immobilizer System, remove the SKIM module from the steering column (Fig. 22).

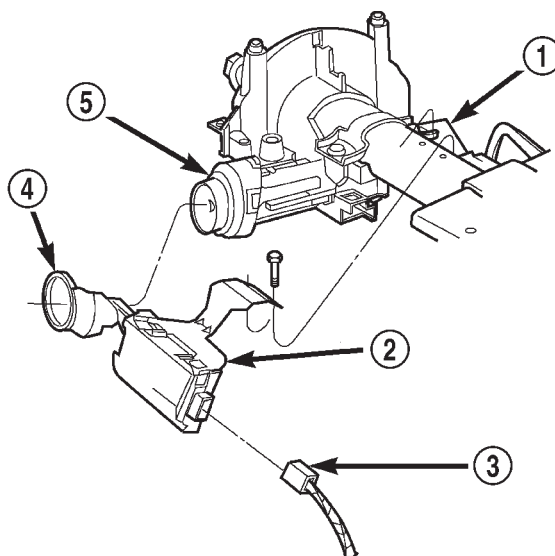


Fig. 22 Sentry Key Immobilizer Module

- 1 - STEERING COLUMN
- 2 - SENTRY KEY IMMOBILIZER MODULE
- 3 - SKIM CONNECTOR
- 4 - ANTENNA
- 5 - IGNITION KEY CYLINDER

(28) Under the instrument panel, disconnect the intermediate shaft from the steering gear shaft. To do so, perform one of the following that applies:

(a) On early production vehicles, remove the "E" clip from the steering column intermediate shaft

REMOVAL AND INSTALLATION (Continued)

coupler pinch bolt (Fig. 23). Next, remove the pinch bolt from the intermediate shaft coupler by backing off the nut, then separate the intermediate shaft from steering gear shaft.

(b) On later production vehicles, remove the pinch bolt from the intermediate shaft coupler (Fig. 24), then slide the intermediate shaft up and off the steering gear shaft.

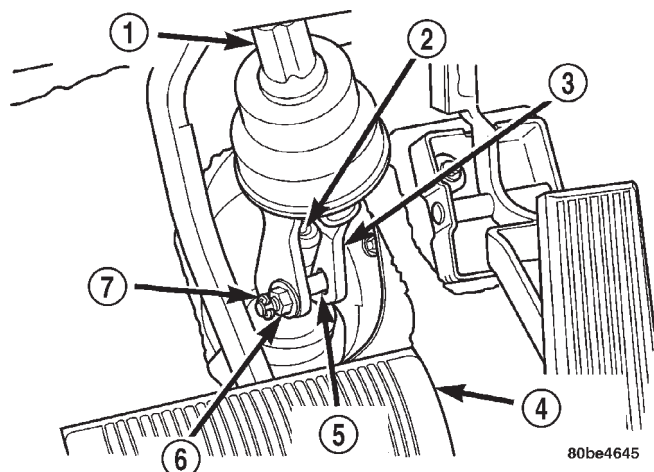


Fig. 23 Early Intermediate Shaft Attachment

- 1 - INTERMEDIATE SHAFT
- 2 - STEERING GEAR SHAFT
- 3 - COUPLER
- 4 - BRAKE PEDAL
- 5 - PINCH BOLT
- 6 - NUT
- 7 - "E" CLIP

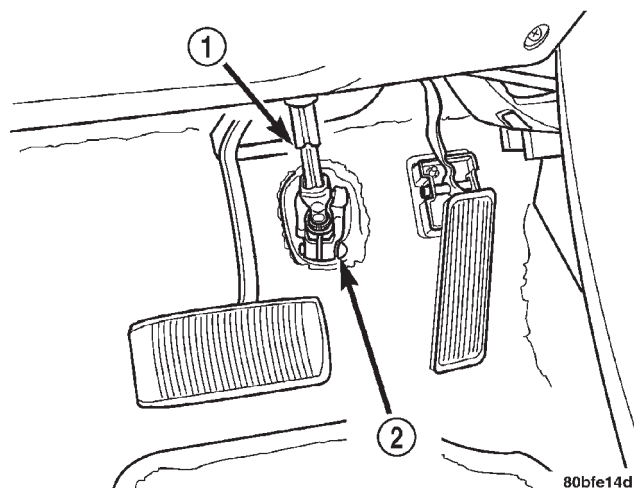


Fig. 24 Later Intermediate Shaft Attachment

- 1 - INTERMEDIATE SHAFT
- 2 - PINCH BOLT

CAUTION: Before loosening the upper and lower steering column mounting bracket attaching nuts, the following procedure to lock upper steering column mounting bracket from moving must be done. If upper steering column mounting bracket is not locked in its proper position before loosening the mounting nuts, the tilt steering column will not operate correctly when installed back in car. This is due to the alignment of the upper mounting bracket assembly slipping when the mounting bolts are loosened.

(29) Place steering column so it is positioned in the middle of its tilt range. Place the steering column assembly tilt lever in its fully locked position. Then insert a 5/32 inch drill bit in each locking pin hole on the upper steering column mounting bracket (Fig. 25).

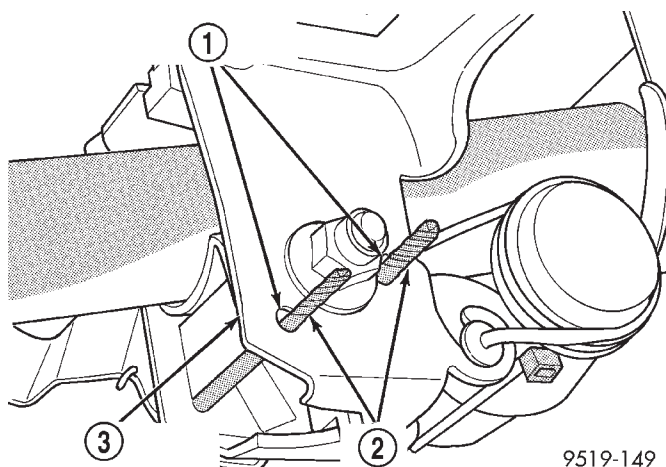


Fig. 25 Locking Pins Installed In Steering Column Bracket

- 1 - LOCKING PIN HOLES
- 2 - DRILL BITS
- 3 - UPPER MOUNTING BRACKET

(30) Remove the 2 upper steering column assembly mounting bracket to support bracket nuts. Then remove the 2 lower steering column assembly mounting bracket to support bracket nuts (Fig. 26).

(31) Remove steering column assembly from vehicle through the drivers door of the passenger compartment. Use care to avoid damaging the paint or interior trim.

INSTALLATION

(1) Install steering column on the studs in the steering column support bracket. Loosely install the 4 steering column assembly attaching nuts.

(2) Tighten the 2 lower steering column assembly mounting nuts (Fig. 26) to hold the steering column in place. Be sure both breakaway capsules are still

REMOVAL AND INSTALLATION (Continued)

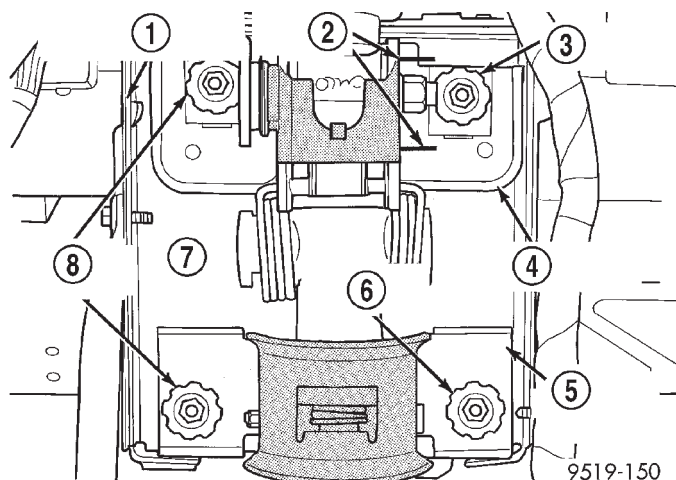


Fig. 26 Steering Column Upper And Lower Mounting Bracket Nuts

- 1 - STEERING COLUMN SUPPORT BRACKET
- 2 - DRILL BITS
- 3 - MOUNTING NUT
- 4 - UPPER MOUNTING BRACKET
- 5 - LOWER MOUNTING BRACKET
- 6 - MOUNTING NUT
- 7 - TILT LEVER
- 8 - MOUNTING NUTS

fully seated in the slots of the upper steering column mounting bracket and the mounting studs are centered for and aft in the plastic capsules (Fig. 27). Then equally tighten both steering column upper mounting nuts, (Fig. 26) until upper steering column mounting bracket is seated against support bracket. Tighten the 4 steering column bracket to support bracket nuts to 17 N·m (150 in. lbs.).

CAUTION: Be sure drill bits are removed from steering column upper mounting bracket.

(3) Remove the 2 drill bits (Fig. 25) from the steering column upper mounting bracket. **If a new steering column is being installed in the vehicle, remove the shipping pin from steering column upper mounting bracket.**

(4) Ensure front wheels of vehicle are positioned straight-ahead, and steering wheel master serration in steering column shaft is positioned at 12 O'clock.

(5) Under the instrument panel, reconnect the intermediate shaft to the steering gear shaft. To do so, perform one of the following that applies:

(a) On early production vehicles, reconnect the steering column intermediate shaft to the steering gear shaft (Fig. 23). Install a **new** intermediate shaft coupler pinch bolt through the coupler and into its nut, then tighten the nut and pinch bolt to a torque of 27 N·m (240 in. lbs.).

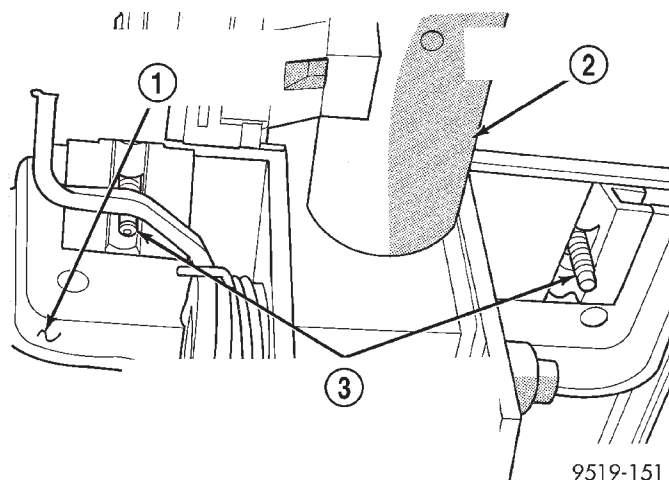


Fig. 27 Mounting Studs Correctly Positioned In Plastic Capsules

- 1 - STEERING COLUMN UPPER MOUNTING BRACKET
- 2 - STEERING COLUMN ASSEMBLY
- 3 - THESE 2 MOUNTING STUDS MUST BE IN THE CENTER OF THE MOUNTING CAPSULES AS SHOWN BEFORE TIGHTENING AND TORQUING THE UPPER MOUNT NUTS.

(b) On later production vehicles, align the flats and slide the intermediate shaft onto the steering gear shaft aligning the pinch bolt hole with the notch formed into the steering gear shaft. Install a **new** pinch bolt in the intermediate shaft coupler (Fig. 24), then tighten the pinch bolt to a torque of 34 N·m (300 in. lbs.).

(6) On early production vehicles, install a **new** "E" clip on the end of the pinch bolt (Fig. 23).

(7) If equipped with the optional Sentry Key Immobilizer System, install the SKIM module (Fig. 22) on the steering column.

(8) Install wiring harness connector on SKIM module.

(9) Install the shifter/ignition interlock cable (Fig. 21) in the lock cylinder housing.

(10) Route wiring harness on steering column and install routing clip in bottom of steering column jacket.

(11) Install multi and 2 wire wiring harness connectors on the back of the ignition switch (Fig. 19). Then install the 2 wiring harness connectors on the multi function switch (Fig. 19) and (Fig. 20).

(12) Install clockspring on switch housing. Install the 2 wiring harness connectors on the clockspring (Fig. 18).

(13) Install the trim ring for the key cylinder on the lock cylinder housing.

(14) Install the upper and lower steering column shrouds onto the lock housing of the steering column assembly. Install and securely tighten the 2 upper to lower steering column shroud to lock housing attaching screws (Fig. 17).

REMOVAL AND INSTALLATION (Continued)

CAUTION: Clockspring centering procedure **MUST** be performed prior to installing steering wheel assembly. If clockspring is not centered it may be overextended, causing clockspring assembly to become inoperative. The yellow centering indicator must be present in the centering window of the clockspring and the arrow on the clockspring rotor must be pointing at the centering window.

(15) Center the clock spring using the following procedure.

- Depress the 2 plastic locking pins to disengage clockspring locking mechanism.
- Keeping locking mechanism disengaged, rotate the clockspring rotor in the **CLOCKWISE DIRECTION** to the end of the travel. Do not apply excessive torque.
- From the end of clockwise travel, slowly rotate the rotor in the counterclockwise direction until yellow appears in the centering window of clockspring. When yellow appears in the centering window the arrow on the clockspring rotor will be pointing at yellow window on clock spring.
- Engage the clockspring locking mechanism.

CAUTION: Do not install steering wheel onto shaft of steering column assembly by driving it onto the shaft. Pull steering wheel down onto steering column shaft using **ONLY** the steering wheel retaining nut.

(16) Feed clockspring wiring leads through hole in steering wheel (Fig. 15). Position steering wheel on shaft of steering column assembly, making sure to fit flats on hub of steering wheel with formations on inside of clockspring.

(17) Install steering wheel to steering column shaft retaining nut and tighten until steering wheel is fully installed on shaft. Tighten steering wheel retaining nut to a torque of 61 N·m (45 ft. lbs.).

(18) Turn the key cylinder to the unlock position, unlocking the steering column shaft.

(19) Correctly route the speed control switch wiring leads from the clockspring to the speed control switch openings in steering wheel.

(20) Connect the horn switch wiring lead from the clockspring to the airbag module horn switch wiring lead (Fig. 14).

(21) Install the airbag electrical lead into connector on back of airbag module (Fig. 13). Insert locking tab into back of airbag connector (Fig. 12). **Be sure electrical connector from clockspring is securely latched into airbag module connector.**

CAUTION: The fasteners, screws, and bolts, originally used for the airbag components are specifically designed for the airbag system. They must never be replaced with any substitutes. Anytime a new fastener is needed, replace only with correct fasteners provided in service packages or fasteners listed in the parts book.

(22) Install airbag module into center of steering wheel. Install **only the 2 original or correct replacement** airbag module attaching bolts (Fig. 11). Torque the 2 airbag module attaching bolts to 10 N·m (90 in. lbs.).

(23) Connect the clockspring electrical leads to the speed control switches. Install the speed control switches in the steering wheel. Install and securely tighten screws attaching the speed control switches to the steering wheel (Fig. 10).

(24) Install lower instrument panel knee bolster onto the lower instrument panel. Install and securely tighten the knee bolster to instrument panel attaching screws (Fig. 9).

(25) Install the instrument panel top cover.

(26) Install screw behind fuse panel cover holding dash panel top cover (Fig. 6). Install fuse panel cover on left end of dash panel.

(27) Install the 3 screws holding dash panel top cover to the center dash panel (Fig. 8).

(28) Install center bezel surrounding radio and climate control (Fig. 28).

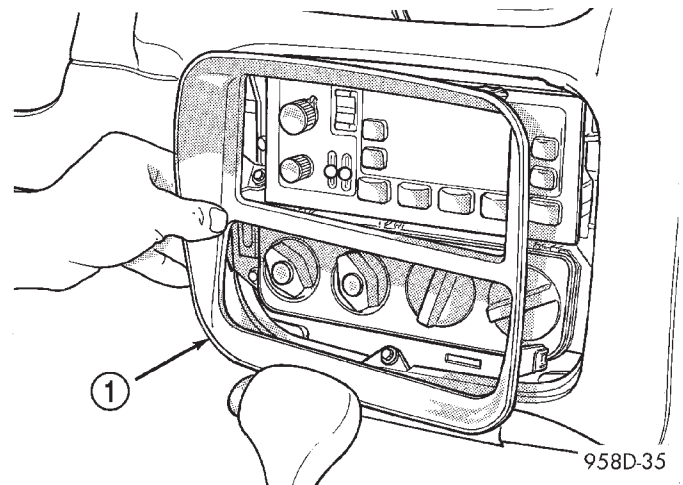


Fig. 28 Installing Center Bezel

1 - CENTER BEZEL

CAUTION: When reconnecting battery on a vehicle that has had the airbag module removed, ensure no occupants are in the vehicle and the following procedure is used.

REMOVAL AND INSTALLATION (Continued)

(29) Reconnecting of the battery negative cable is to be done using the steps in the procedure listed below.

- Remove forward console or cover as necessary.
- Connect DRB scan tool to diagnostic connector, located at right side of the ASDM module.
- Turn ignition key to ON position. Exit vehicle with the DRB scan tool.
- Ensuring that there are no occupants in the vehicle, connect negative cable to negative post of the battery.
- Using the DRB scan tool, read and record active fault codes. Also read and record any stored fault codes. Refer to the proper Body Diagnostic Test Manual if any faults are found.

• Erase stored faults if there are no active fault codes. If problems remain, fault codes will not erase.

• From the passenger side of the vehicle, turn ignition key to OFF and then ON observing instrument cluster airbag lamp. It should go on for six to eight seconds, then go out. This will indicate that the airbag system is functioning normally.

(30) **If airbag warning lamp fails to light, blinks on and off or goes on and stays on, there is an airbag system malfunction.** Refer to the Body Diagnostic Test Manual to diagnose any system malfunction.

(31) Test the operation of the horn, lights and any other functions that are steering column operated. If applicable reset the radio and the clock.

(32) Road test vehicle to ensure proper operation of the steering system and the speed control system.

STEERING COLUMN INTERMEDIATE SHAFT

The steering column assembly will need to be removed from the interior of the vehicle to allow for replacement of the steering column shaft coupler assembly.

REMOVAL

(1) Remove steering column assembly from vehicle. Refer to STEERING COLUMN in this section for the required removal procedure.

(2) Install Remover/Installer, Special Tool 6831-A, through center of roll pin in intermediate shaft's flex joint and install knurled nut (Fig. 29).

(3) While holding hex on end threaded rod, tighten the nut on threaded rod of Remover/Installer. This will pull the roll pin out of the intermediate shaft's flex joint.

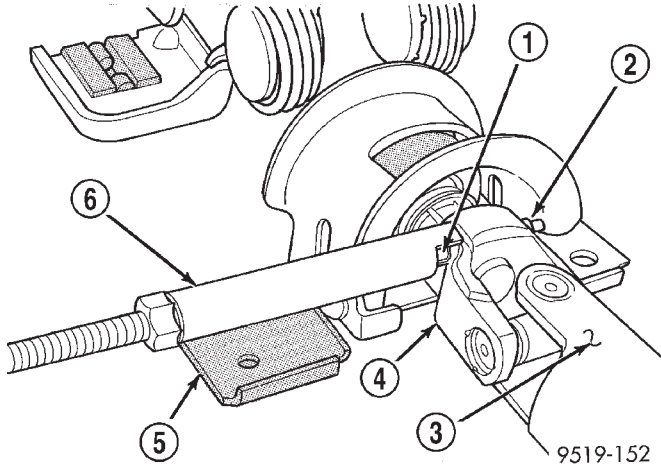


Fig. 29 Removing Roll Pin From Flex Joint

- 1 - ROLL PIN
- 2 - KNURLED NUT
- 3 - INTERMEDIATE SHAFT
- 4 - FLEX JOINT
- 5 - STEERING COLUMN LOWER MOUNTING BRACKET
- 6 - SPECIAL TOOL 6831-A

(4) Using a screwdriver inserted between the shaft's flex joint and the steering column lower mounting bracket (Fig. 30), pry intermediate shaft off steering column shaft.

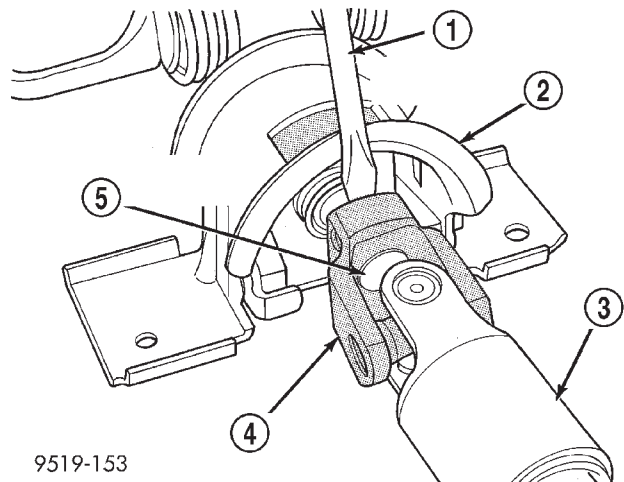


Fig. 30 Removing Intermediate Shaft

- 1 - SCREWDRIVER
- 2 - STEERING COLUMN LOWER MOUNTING BRACKET
- 3 - INTERMEDIATE SHAFT
- 4 - FLEX JOINT
- 5 - STEERING COLUMN SHAFT

REMOVAL AND INSTALLATION (Continued)

INSTALLATION

(1) Start roll pin into flex joint prior to installing intermediate shaft on steering column shaft. Install roll pin into just far enough to square roll pin to hole in flex joint. If roll pin is installed too far, flex joint will not slid onto steering column shaft.

(2) Install intermediate shaft on steering shaft until correctly positioned to allow roll pin to be installed in coupler.

(3) Install Remover/Installer, Special Tool 6831-A, through center of roll pin and install knurled nut as shown (Fig. 31).

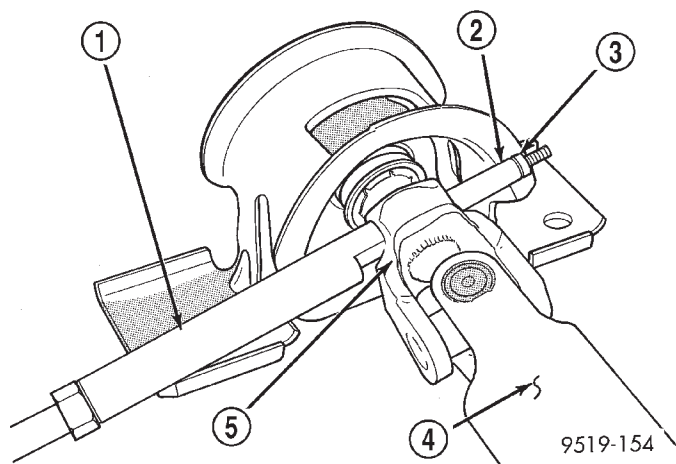


Fig. 31 Tool Set-Up For Installing Roll Pin

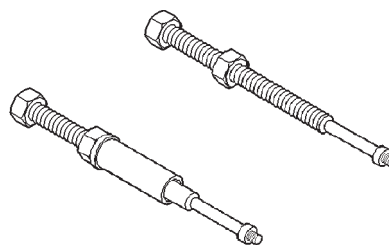
- 1 - SPECIAL TOOL 6831-A
- 2 - ROLL PIN
- 3 - KNURLED NUT
- 4 - INTERMEDIATE SHAFT
- 5 - FLEX JOINT

(4) Using Remover/Installer (Fig. 31), install roll pin into the coupler until roll pin is fully and evenly installed through both sides of the coupler assembly.

(5) Reinstall steering column as necessary back in vehicle. Refer to STEERING COLUMN in this section for the required procedure.

SPECIFICATIONS**STEERING COLUMN FASTENER TORQUE SPECIFICATIONS**

DESCRIPTION	TORQUE
Steering Wheel:	
Retaining Nut	61 N·m (45 ft. lbs.)
Steering Column Assembly:	
Mounting Bracket Attaching Nuts	17 N·m (150 in. lbs.)
Airbag Module Attaching Nuts	10 N·m (90 in. lbs.)

SPECIAL TOOLS**STEERING COLUMN**

Remover / Installer Steering Shaft Roll Pin 6831A