STEERING

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GENERAL INFORMATION

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GENERAL INFORMATION

STEERING SYSTEM AND COMPONENT DESCRIPTION

This vehicle comes with power steering as standard equipment and is the only steering system available.

The power steering system consists of these six major components. Power Steering Pump, Power Steering Gear, Power Steering Reservoir, Power Steering Supply and Pressure Hoses, and Power Steering Fluid Return Hose. 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. 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.

DIAGNOSIS AND TESTING

STEERING SYSTEM DIAGNOSIS CHARTS

STEERING NOISE

There is some noise in all power steering systems. One of the most common is a hissing sound evident at standstill parking. 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 in high velocity fluid passing valve orifice edges. There is no relationship between this noise and performance of the steering. Hiss may be expected when steering wheel at end of travel or slowly turning at standstill.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
Objectionable Hiss Or Whistle	1. Damaged or mispositioned steering column coupler to dash panel seal. 2. Noisy valve in power steering gear.	1. Check for proper seal between steering column coupler and dash seal. 2. Replace steering gear assembly.
Rattle Or Clunk	1. Steering gear loose on front suspension crossmember. 2. Front suspension crossmember to frame bolts or studs loose. 3. Loose tie rod (outer or inner). 4. Loose lower control arm to front suspension crossmember bolts. 5. Loose strut assembly to body attaching bolts or nuts. 6. Power steering fluid pressure hose touching the body of the vehicle. 7. Noise internal to power steering gear. 8. Damaged front suspension crossmember.	1. Check steering gear to front suspension crossmember mounting bolts. Tighten to the specified torque if found to be loose. 2. Tighten the front suspension crossmember attaching bolts or studs 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. Check upper strut mount to body attaching bolts or nuts for looseness. If required, tighten 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 steering gear assembly. 8. Replace front suspension crossmember.
Chirp or squeal (in the area of the power steering pump). Particularly noticeable at full wheel travel and during standstill parking.	1. Loose power steering pump drive belt.	1. Adjust power steering pump drive belt to specified tension.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
Power steering pump growl results from the development of high pressure fluid flow. Normally this noise should not be high enough to be objectionable. Abnormal situations, such as a low oil level causing aeration or hose touching the vehicle body, can create a noise level that could bring complaints.		
Whine Or Growl (Pump Noise)	1. Low fluid level. 2. Power steering hose touching vehicle body or frame. 3. Extreme wear of power steering pump internal parts.	1. Fill power steering fluid reservoir to proper level and perform leakage diagnosis. (Recheck fluid level after power steering fluid is free of air.) 2. Reposition power steering hose. Replace hose if tube ends are bent. 3. Replace power steering pump and flush system.
Sucking Air Sound	1. Loose clamp on power steering fluid low pressure 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 perform leakage diagnosis. 4. Inspect and or replace power steering fluid reservoir as required.
SQUEAK OR RUBBING SOUND	1. Sound coming from steering column. 2. Sound internal to steering gear.	1.Check for squeak in steering column. Inspect for contact between shroud, intermediate shaft, column, and steering wheel. Realign if necessary. 2. Check for lack or grease on steering column dash panel to lower coupler seal. 1. Replace steering gear assembly.
SCRUBBING OR KNOCKING SOUND	1. Incorrect tire size. 2. Check clearance between tires and other vehicle components, through the full travel of the suspension. 3. Check for interference between steering gear and other components. 4.Incorrect steering gear supplied.	1. Verify that tire size on vehicle is the same as originally supplied. 2. Correct as necessary. 3.Correct as necessary. 4. Replace steering gear with correct steering gear for specific vehicle.

DIAGNOSIS AND TESTING (Continued)

BINDING STICKING SEIZED

CONDITION	POSSIBLE CAUSES	CORRECTION
CATCHES, STICKS IN CERTAIN POSITIONS OR IS DIFFICULT TO TURN.	1. Low power steering fluid level.	1. Fill power steering fluid reservoir to specified level and perform leakage diagnosis.
	2. Tires not inflated to specified pressure.	2. Inflate tires to the specified pressure.
	3. Lack of lubrication in front suspension control arm ball joints.	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. Lack of lubrication in front suspension outer tie rod ends.	4. 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.
	5. Loose power steering pump drive belt.	5. Tighten the power steering pump drive belt to the specified tension. See accessory drive in service manual.
	6. Faulty power steering pump flow control. (Verify cause using Power Steering Pump Test Procedure.)	6. Replace power steering pump.
	7. Excessive friction in steering column or intermediate shaft.	7. Correct condition. (See Steering Column Service Procedure)
	8. Steering column coupler binding.	8. Realign the steering column to eliminate the binding condition.
	9. Binding upper strut bearing.	9. Correct binding condition in strut bearing.
	10 Excessive friction in steering gear.	10 Replace steering gear assembly.

DIAGNOSIS AND TESTING (Continued)

SHAKE SHUDDER VIBRATION

CONDITION	POSSIBLE CAUSES	CORRECTION
VIBRATION OF THE STEERING WHEEL AND/OR DASH DURING DRY PARK OR LOW SPEED STEERING MANEUVERS.	1. Air in the fluid of the power steering system.	1. Steering shudder can be expected in new vehicles and vehicles with recent steering system repairs. Shudder should improve after the vehicle has been driven several weeks.
	2. Tires not properly inflated.	2. Inflate tires to the specified pressure.
	3. Excessive engine vibration.	3. Ensure that the engine is running properly.
	4. Loose tie rod end.	4. Check that the inner to outer tie rod jam nut for is tight. If required, tighten the jam nut to the specified torque.
	5.Overcharged air conditioning system.	5.Check air conditioning pump head pressure. (See Air Conditioning Refrigerant System Diagnosis)

LOW ASSIST, NO ASSIST, HARD STEERING

CONDITION	POSSIBLE CAUSES	CORRECTION
STIFF, HARD TO TURN, SURGES, MOMENTARY INCREASE IN EFFORT WHEN TURNING.	1. Tires not properly inflated.	1. Inflate tires to specified pressure.
	2. Low power steering fluid level.	2. Add power steering fluid as required to power steering fluid reservoir to obtain proper level. Perform leakage diagnosis on power steering system.
	3. Loose power steering pump drive belt.	3. Adjust the power steering pump drive belt to the specified tension. If drive belt is defective replace and correctly tension.
	4. Lack of lubrication in control arm ball joints.	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. Low power steering pump pressure. (Verify using Power Steering System Test Procedure)	5. Verify cause using the Power Steering System Test Procedure. Replace the power steering pump if necessary.
	6. High internal leak in steering gear assembly.	6. Check steering system using the Power Steering System Test Procedure. If steering gear is defective replace steering gear.

DIAGNOSIS AND TESTING (Continued)

POOR RETURN TO CENTER

CONDITION	POSSIBLE CAUSES	CORRECTION
STEERING WHEEL DOES NOT WANT TO RETURN TO CENTER POSITION.	1. Tires not inflated to specified pressure.	1. Inflate tires to specified pressure.
	2. Improper front wheel alignment.	2. Check and adjust as necessary.
	3. Lack of lubrication in front suspension control arm ball joints.	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. Steering column U-joints misaligned.	4. Realign steering column U-joints.
	5. Mispositioned dash cover.	5. Reposition dash cover.
	6. Steering wheel rubbing.	To evaluate items 6 and 7, disconnect the intermediate shaft. Turn the steering wheel and feel or listen for internal rubbing in steering column. 6. Adjust steering column shrouds to eliminate rubbing condition.
	7. Damaged, mis-positioned or un-lubricated steering column coupler to dash seal.	7. Determine condition which exists and correct.
	8. Binding upper strut bearing.	8. Correct binding condition in strut bearing.
	9. Tight shaft bearing in steering column assembly.	9. Replace the steering column assembly.
	10. Excessive friction in steering column coupler.	10. Replace steering column coupler.
	11. Excessive friction in steering gear.	11. Replace steering gear.

DIAGNOSIS AND TESTING (Continued)

LOOSE STEERING

CONDITION	POSSIBLE CAUSES	CORRECTION
EXCESSIVE STEERING WHEEL KICKBACK OR TO MUCH STEERING WHEEL FREE PLAY.	1. Air in the fluid of the power steering system.	1. Fill power steering fluid reservoir to the specified level. Perform procedure to bleed the air out of the power steering system. Perform leakage diagnosis.
	2. Steering gear loose on front suspension crossmember.	2. Check steering rear to front suspension crossmember mounting bolts. Tighten to specified torque if found to be loose.
	3. Worn, broken or loose steering column to steering gear coupler.	3. Check for worn universal joint, broken isolator or loose fasteners.
	4. Free play in steering column.	4.Check components of the steering system and repair or replace as required.
	5. Loose front suspension control arm ball joints.	5. Check and or replace the ball joint or control arm as required.
	6. Loose steering knuckle to ball joint stud pinch bolt.	6. Check pinch bolts and tighten if required to specified torque.
	7. Front wheel bearings loose or worn.	7. Tighten hub nut to specified torque or replace with new parts as necessary.
	8. Loose outer tie rod ends.	8. Check free play of outer tie rod ends and replace if required.
	9. Loose inner tie rod ends.	9. Replace steering gear assembly.
	10 Defective steering gear rotary valve.	10. Replace steering gear assembly.

DIAGNOSIS AND TESTING (Continued)

VEHICLE LEADS TO THE SIDE

CONDITION	POSSIBLE CAUSES	CORRECTION
STEERING WHEEL DOES NOT WANT RETURN TO CENTER POSITION.	1. Radial tire lead.	1.Rotate tires as recommended in the Tire And Wheel Group of this service manual.
	2. Front suspension misaligned.	2. Align the front suspension as required. Refer to the Wheel Alignment Procedure in the Suspension Group of this service manual for the required wheel alignment procedure.
	3. Wheel braking.	3. Check for dragging brakes. Refer to the procedures in the Brake Group of this service manual.
	4. Unbalanced steering gear valve. (If this is the cause, the steering efforts will be very light in direction of lead and heavier in the opposite direction.	4. Replace steering gear.
STEERING WHEEL HAS FORE AND AFT LOOSENESS.	1. Steering wheel to steering column shaft retaining nut not properly tightened and torqued.	1. Tighten the retaining nut to its specified torque specification.
	2. Steering column lower bearing spring retainer slipped on steering column shaft.	2. Replace steering column.

DIAGNOSIS AND TESTING (Continued)

POWER STEERING FLUID LEAK

CONDITION	POSSIBLE CAUSES	CORRECTION
LOW FLUID LEVEL WITH: NO VISIBLE SIGNS OF A LEAK ON THE STEERING GEAR, POWER STEERING PUMP, FLOOR OR ANYWHERE ELSE.	1. Overfilled power steering pump fluid reservoir.	1. Adjust the power steering fluid fill to the correct level.
LOW FLUID LEVEL WITH: VISIBLE LEAK ON STEERING GEAR, POWER STEERING PUMP, FLOOR OR ANYWHERE ELSE.	2. Power steering hose connections at the power steering pump or steering gear.	2. Check for loose fittings and if found, tighten the fitting to its specified torque. If fittings are tight examine the fittings for damaged or missing O-ring seals and replace as required.
	3. Power steering pump or power steering gear leaking.	3. Identify the location of the leak and repair or replace the component as required. Refer to Power Steering Pump and/or Power Steering Gear in this group of the service manual for required procedures.

FOAMY OR MILKY POWER STEERING FLUID

CONDITION	POSSIBLE CAUSES	CORRECTION
AERATION AND OVERFLOW OF FLUID.	1. Air leaks.	1. Check for an air leak into the power steering system as described under Sucking Air Diagnosis and correct condition.
	2. Low fluid level.	2. Extremely cold temperatures may cause power steering fluid aeration if the power steering fluid is low. Add power steering fluid as required to bring level up to specification.
	3. Cracked power steering pump housing.	3. Remove power steering pump from vehicle and inspect the power steering pump housing for cracks. If a defect in the housing is found, replace the power steering pump.
	4. Water contamination.	4. Drain the power steering fluid from the system if there is evidence of contamination. Then refill the system with fresh clean power steering fluid.

POWER STEERING PUMP

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DESCRIPTION AND OPERATION

POWER STEERING PUMP

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). The TTA power steering pump is a constant flow rate and displacement, vane type pump.

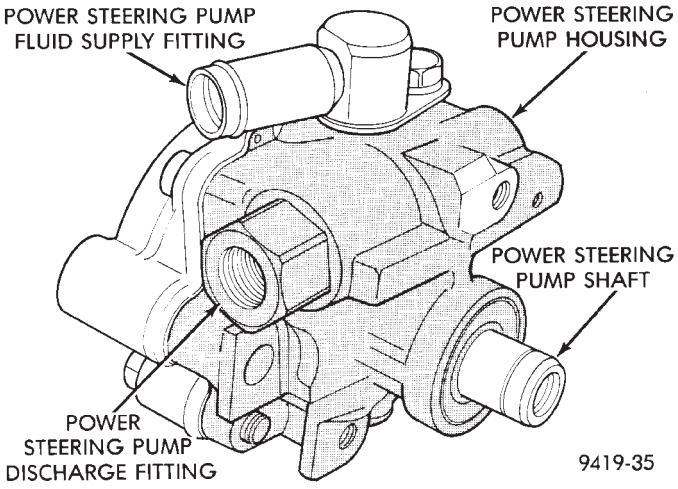


Fig. 1 TTA Power Steering Pump Assembly

In the event of a power steering pump drive belt failure, manual steering control of the vehicle can still be maintained. However, under these conditions, steering effort will be significantly increased.

All vehicles equipped with power steering use a remote mounted reservoir for the power steering fluid. The power steering fluid remote reservoir is mounted to the rear of the cylinder head on the passenger side of the vehicle.

The service procedures for the TTA power steering pump are limited to the areas and components listed below. **No repair procedures are to be done on internal components of the TTA power steering pumps.**

- Repair of power steering fluid leaks from areas of the power steering pump sealed by O-rings is allowed (See Pump Leak Diagnosis). However power steering pump shaft seal leakage will require replacement of the pump.
- Power steering fluid reservoirs, related components and attaching hardware.
- Power steering fluid reservoir filler cap/dipstick assemblies.

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 all power steering pumps are only replaced with a pump that is the correct replacement for that specific application.

Hydraulic pressure is provided for operation of the power steering gear by the belt driven power steering pump id (Fig. 1). It is a constant displacement, vane type pump. The power steering pump is connected to the steering gear by a power steering fluid pressure hose and return hose.

DESCRIPTION AND OPERATION (Continued)

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 pickup residual oil. This oil is then forced into the high pressure area. As more oil is picked up by the vanes, the additional oil 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, oil 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, oil is forced out from between the vanes. When excess oil flow is generated during high-speed operation, a regulated amount of oil 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.

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. The high pressure lifts the relief valve ball from its seat and allows oil 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 oil to return to the intake side of the pump. This action limits maximum pressure output of the pump to a safe level.

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

DIAGNOSIS AND TESTING

POWER STEERING SYSTEM TEST PROCEDURE

The following procedure can be used to test the operation of the power steering system on the 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 pressure and flow test is performed using Pressure/Flow Tester, Special Tool 6815 (Fig. 2).

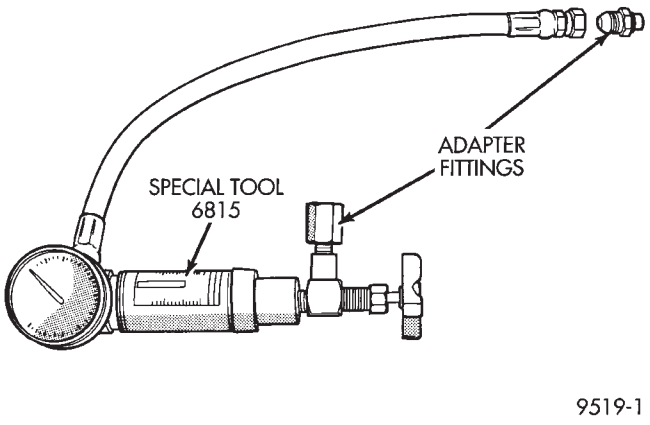


Fig. 2 Power Steering Pump Flow/Pressure Tester

POWER STEERING PUMP FLOW AND PRESSURE TEST PROCEDURE

(1) Check power steering pump drive belt tension and adjust as necessary.

(2) Disconnect power steering fluid pressure hose, at power steering pump. Use a container for dripping fluid.

(3) Connect Pressure Gauge, Special Tool from kit 6815 (Fig. 3) to both hoses using adapter fittings. Connect spare pressure hose, to power steering pump pressure hose banjo fitting.

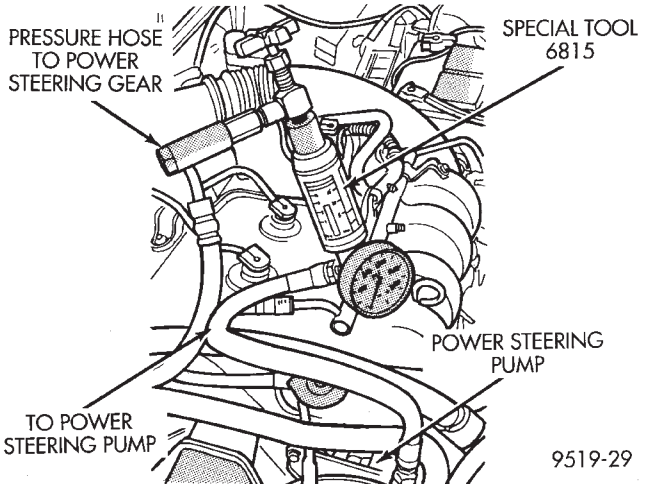


Fig. 3 Power Steering Pump Flow/Pressure Tester Connected To Power Steering Pump

(4) Completely open valve on Special Tool 6815 (Fig. 3).

(5) Start engine and let idle long enough to circulate power steering fluid through flow/pressure test and get air out of fluid. Then shut off engine.

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

(7) Pressure gauge should read below 862 kPa (125 psi), if above, inspect the hoses for restrictions and repair as necessary. The initial pressure reading

DIAGNOSIS AND TESTING (Continued)

should be in the range of 345-552 kPa (50-80 psi). The flow meter should read between 1.3 and 1.4 GPM

CAUTION: The following test procedure involves testing power steering pump maximum pressure output and flow control valve operation. Do not leave valve closed for more than 5 seconds as the pump could be damaged.

(8) 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.).

- If power steering pump pressures above specifications but not within 345 kPa (50 psi) of each other, then replace power steering pump.
- If pressures within 345 kPa (50 psi) of each other but below specifications, then replace power steering pump.

CAUTION: Do not force the pump to operate against the stops for more than 5 seconds at a time because, pump damage will result.

(9) Open test valve. Turn steering wheel to the extreme left and right positions until against the stops, recording the highest indicated pressure at each position. Compare pressure gauge readings to power steering pump specifications. If highest output pressures are not the same against either stop, the steering gear is leaking internally and must be replaced.

SERVICE PROCEDURES

POWER STEERING SYSTEM FLUID LEVEL CHECK

WARNING: FLUID LEVEL SHOULD BE CHECKED WITH ENGINE OFF TO PREVENT INJURY FROM MOVING PARTS. DO NOT USE AUTOMATIC TRANSMISSION FLUID IN THE POWER STEERING SYSTEM. DO NOT OVERFILL THE POWER STEERING SYSTEM.

Wipe reservoir filler cap free of dirt. Then check fluid level. The dipstick should indicate COLD when fluid is at normal ambient temperature, approximately 21°C to 27°C (70°F to 80°F). In all pumps add fluid as necessary, use only **Mopar Power Steering Fluid, or equivalent. DO NOT USE ANY TYPE OF AUTOMATIC TRANSMISSION FLUID.**

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 overfill.

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.

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

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

POWER STEERING PUMP FLOW CONTROL VALVE SEAL

The power steering pump does not require removal from the engine for removal and replacement of the flow control valve fitting O-Ring.

REMOVE

(1) Remove the power steering fluid pressure hose from the power steering pump pressure fitting (Fig. 4).

(2) Remove the flow control valve fitting from the power steering pump housing (Fig. 5). **Prevent flow control valve and spring from sliding out of housing bore.**

(3) Remove and discard O-ring seal from fitting.

INSTALL

(1) If necessary, clean and install flow control valve and spring in pump housing bore.

(2) Install new O-ring seal on fitting.

(3) Install fitting in pump housing and tighten to 75 N·m (55 ft. lbs.)

(4) Install power steering fluid pressure hose on flow control valve fitting.

SERVICE PROCEDURES (Continued)

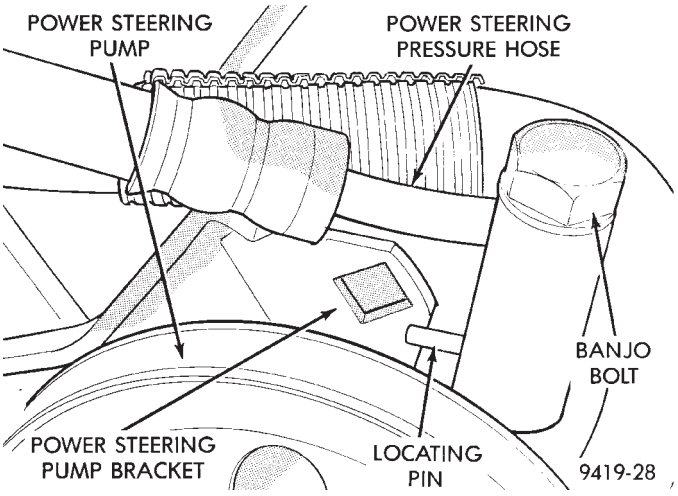


Fig. 4 Pressure Hose Attachment To Power Steering Pump

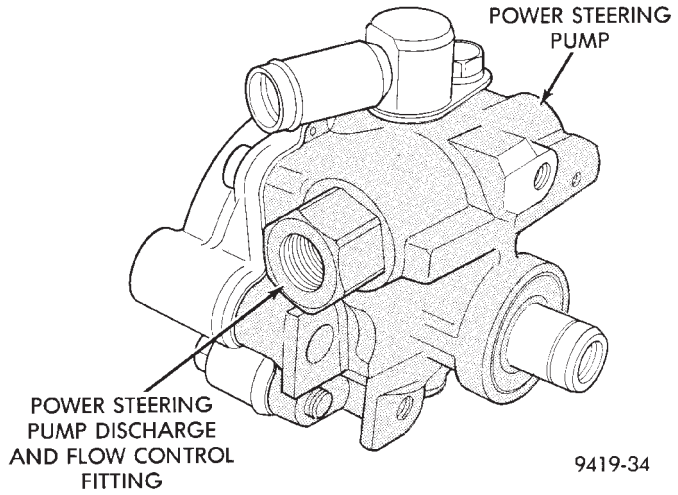


Fig. 5 Pump Discharge And Flow Control Valve Fitting

(5) Position locating pin on power steering pressure hose banjo fitting so it is against power steering pump mounting bracket (Fig. 4). While holding locating pin against power steering pump bracket, torque banjo bolt to 34 N·m (25 ft. lbs.).

POWER STEERING PUMP SUCTION PORT SEAL

The power steering pump does not require removal from the engine for removal and replacement of the suction port O-Ring seal.

REMOVE

(1) Remove power steering fluid supply hose from power steering pump suction port fitting (Fig. 6).

(2) Remove bolt (Fig. 6) attaching power steering pump suction port fitting to the power steering pump.

(3) Remove the suction port fitting (Fig. 6) from the power steering pump.

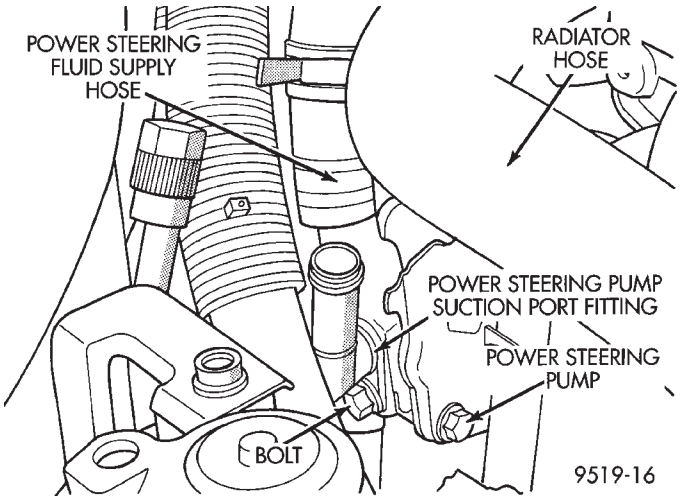


Fig. 6 Power Steering Pump Suction Port Fitting

(4) Remove and discard O-ring seal from suction port fitting.

INSTALL

(1) Install new O-ring seal on suction fitting.

(2) Install suction port fitting in power steering pump. Install and securely tighten the suction port fitting attaching bolt.

(3) Install power steering fluid supply hose on suction port fitting, being sure hose clamp is installed on hose past upset bead on suction port fitting.

REMOVAL AND INSTALLATION

POWER STEERING PRESSURE SWITCH

On vehicles equipped with power steering, a power steering pressure switch is used to improve the vehicle's idle quality. The pressure switch improves vehicle idle quality, by controlling engine idle speed when required.

The pressure switch functions by signaling the power train 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 is increased. This increase in engine idle speed compensates for the additional load, thus maintaining the require engine idle speed and idle quality.

The power steering pressure switch (Fig. 7) is mounted directly to the power steering gear on vehicle's requiring its usage.

REMOVAL AND INSTALLATION (Continued)

REMOVE

CAUTION: When removing and installing the power steering pressure switch, the use of a 7/8 inch deep well socket is required. The deep well socket will prevent damage to the plastic, electrical connector area, of the power steering pressure switch.

(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. 7) on back side of power steering gear.

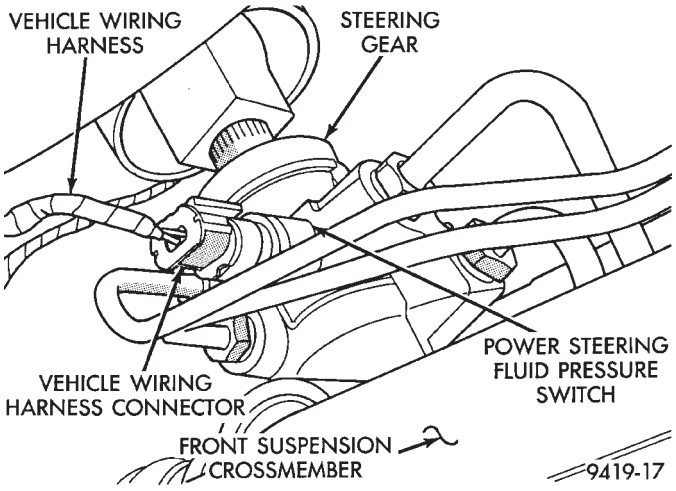


Fig. 7 Power Steering Pressure Switch Location On Steering Gear

(4) Remove vehicle wiring harness connector (Fig. 7), from power steering pressure switch.
(5) Remove power steering pressure switch, from power steering gear.

INSTALL

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

(1) By hand, install the power steering pressure switch into the power steering gear until fully seated. Then tighten the power steering pressure switch to a maximum torque of 8 N·m (70 in. lbs.).
(2) Install vehicle wiring harness connector (Fig. 7) 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.

POWER STEERING FLUID PRESSURE HOSE

CAUTION: Cap all open ends of hoses, power steering pump fittings and steering gear ports to prevent entry of foreign material into the components.

WARNING: POWER STEERING OIL, 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.

For part reference and part location on the vehicle being serviced, refer to the following figure numbers. These figures show the hose bracket locations, hose routings and fitting locations. Use these figure numbers when referring to the removal or installation procedures for the power steering hoses listed below.

REMOVE

(1) Raise vehicle.
(2) Remove bolt attaching power steering hose routing bracket to front suspension crossmember (Fig. 8).

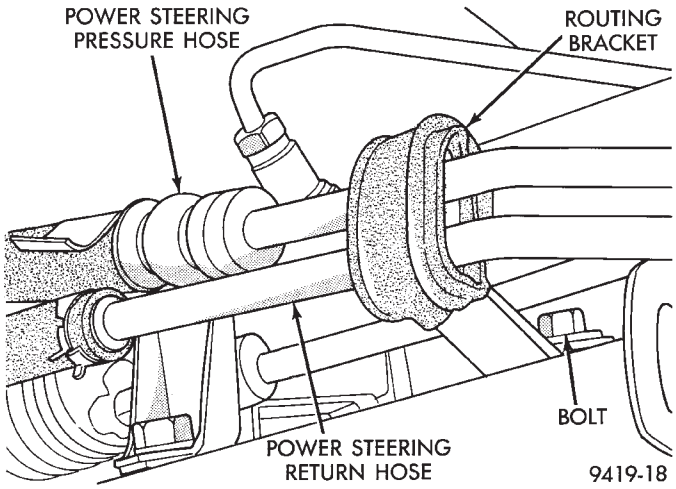


Fig. 8 Power Steering Hose Routing Bracket

REMOVAL AND INSTALLATION (Continued)

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

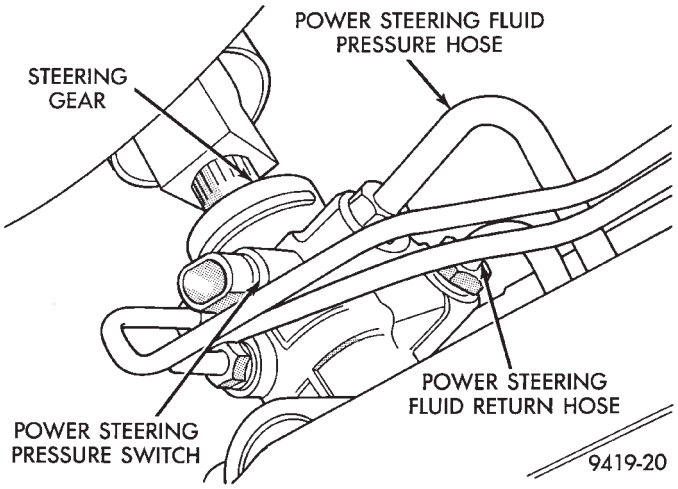


Fig. 9 Power Steering Pressure Hose At Steering Gear

(4) Remove power steering pressure hose from routing clip on generator shield (Fig. 10).

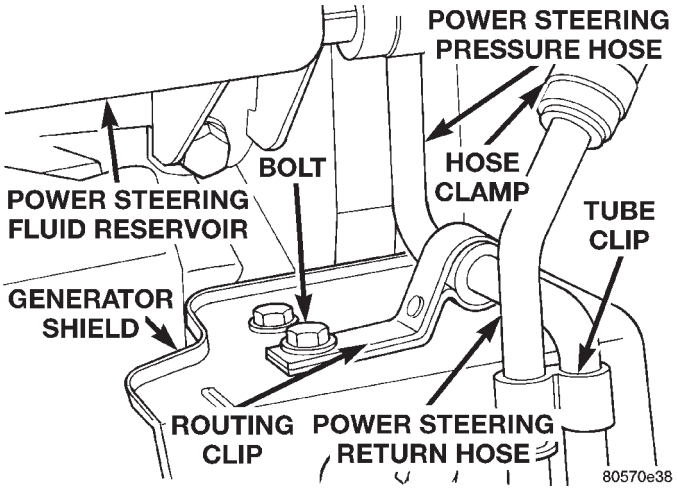


Fig. 10 Power Steering Pressure Hose Routing Clip At Generator Shield

(5) Lower vehicle.

(6) Remove bolt, attaching power steering pressure hose routing clip, to generator shield (Fig. 11).

(7) Loosen and remove Banjo bolt, and power steering pressure hose from pressure fitting on power steering pump (Fig. 12).

(8) Power steering fluid pressure hose is removed from the vehicle from the top of the engine compartment.

(9) Discard all used O-rings located at ends of power steering pressure hose and Banjo bolt.

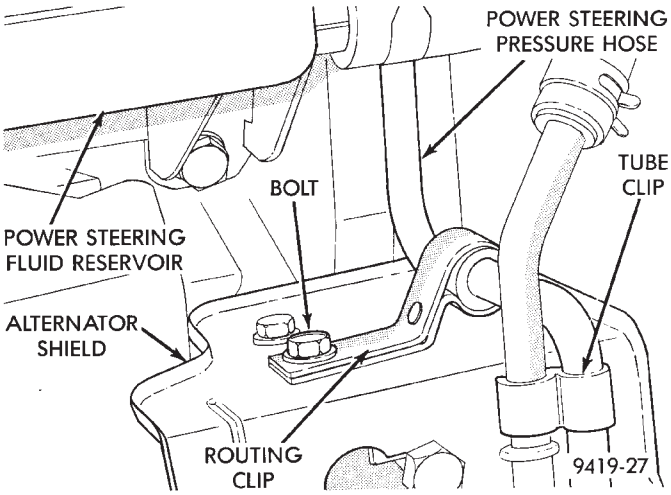


Fig. 11 Power Steering Hose Attachment To Generator Shield

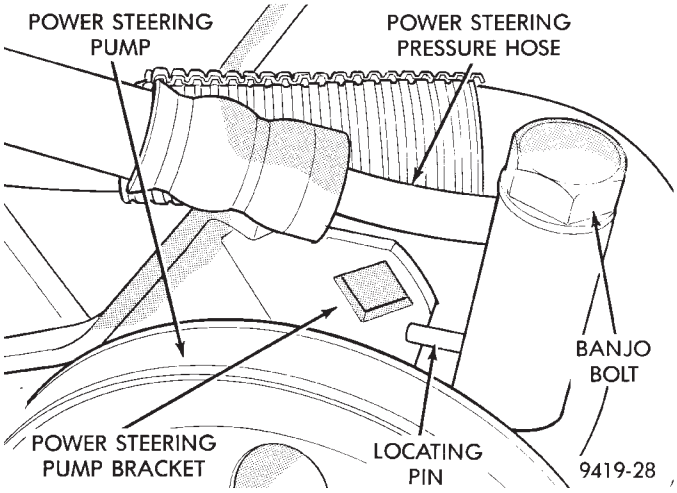


Fig. 12 Power Steering Hose Attachment To Power Steering Pump

INSTALL

(1) Install power steering pressure hose in vehicle from top of engine compartment.

(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-ring on end of power steering pressure hose banjo fitting (Fig. 13).

(4) Install a new O-ring (Fig. 14) on power steering pressure hose banjo fitting bolt.

(5) Lubricate both O-rings using fresh clean power steering fluid.

(6) Install banjo bolt into the power steering pressure hose banjo fitting (Fig. 14).

(7) Attach power steering pressure hose to outlet fitting on power steering pump (Fig. 12). **Do not tighten or torque pressure fitting Banjo bolt at this time.**

REMOVAL AND INSTALLATION (Continued)

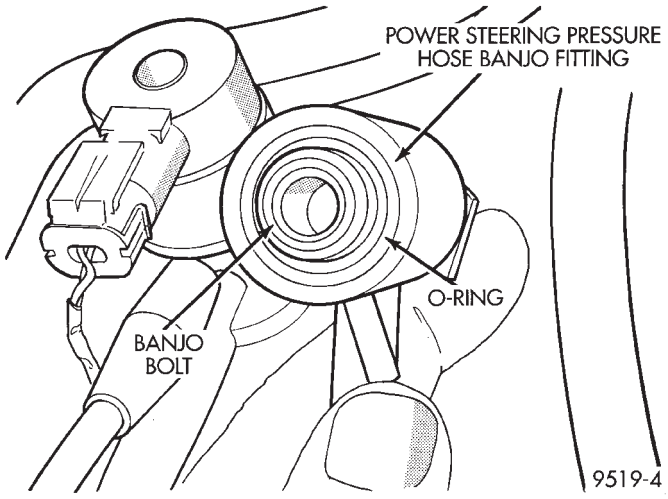


Fig. 13 O-ring Installed On Power Steering Hose Banjo Fitting

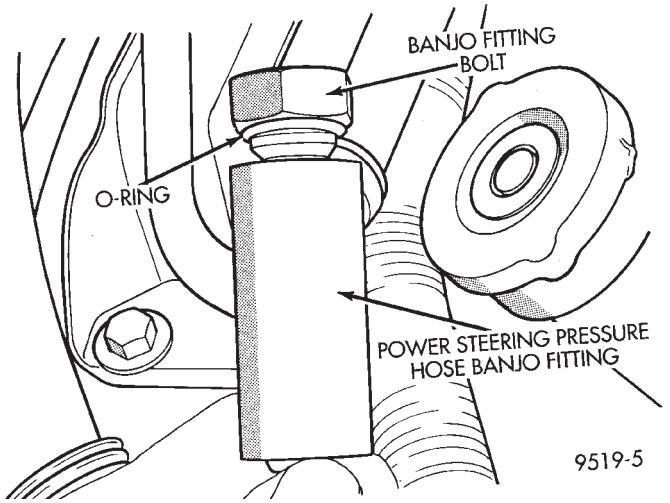


Fig. 14 O-ring Installed On Banjo Fitting Bolt

(8) Correctly route power steering pressure hose avoiding tight bends or kinking of the hose. Install power steering pressure hose to generator shield routing clip attaching screw (Fig. 11) **but do not tighten at this time.**

(9) Raise vehicle.

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

(10) 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 (Fig. 9). **Tighten and torque tube nut after routing bracket is installed, correctly positioning hoses in vehicle.**

(11) Install the power steering pressure and return hose routing clip on hoses (Fig. 8). Install bolt attaching routing clip to front suspension crossmember. Torque routing clip to front suspension crossmember attaching bolt to 23 N·m (17 ft. lbs.)

(12) Torque power steering pressure hose to steering gear tube nut to 34 N·m (25 ft. lbs.).

(13) Install power steering pressure hose in routing clip on generator shield (Fig. 10).

(14) Lower Vehicle.

(15) Position locating pin on power steering pressure hose banjo fitting so it is against power steering pump mounting bracket (Fig. 12). While holding locating pin against power steering pump bracket, torque pump end Banjo bolt to 34 N·m (25 ft. lbs.).

(16) Securely tighten bolt attaching power steering pressure hose bracket to generator shield.

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

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

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

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

(21) Add power steering fluid if necessary.

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

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

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

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

POWER STEERING FLUID RETURN HOSE

CAUTION: Cap all open ends of hoses, power steering pump fittings and steering gear ports to prevent entry of foreign material into the components.

WARNING: POWER STEERING OIL, 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.

REMOVE

(1) Raise vehicle.

(2) Remove hose clamp, attaching return hose to steel tube at power steering gear (Fig. 15). Let power

REMOVAL AND INSTALLATION (Continued)

steering fluid, drain from return hose and power steering fluid reservoir, until reservoir is empty.

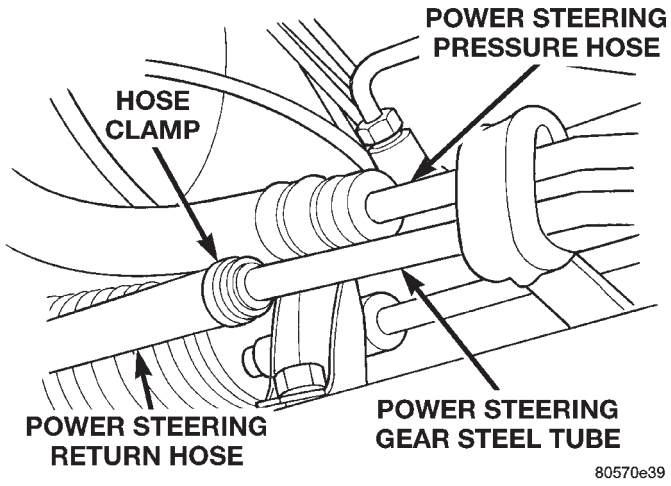


Fig. 15 Power Steering Return Hose At Steering Gear

(3) Remove power steering return hose from routing clip on generator shield (Fig. 16).

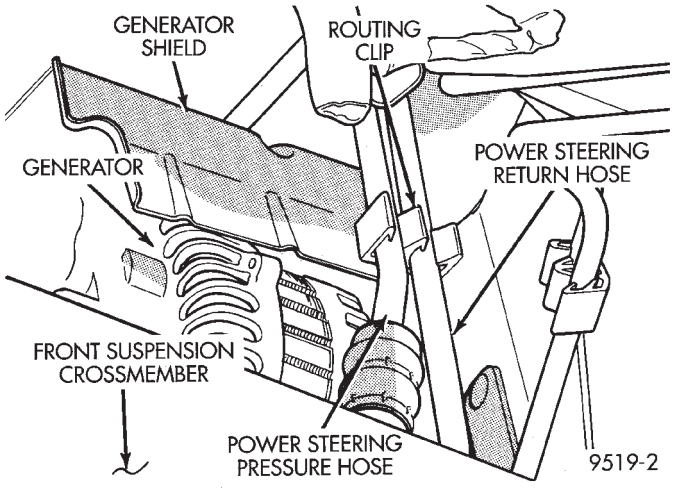


Fig. 16 Power Steering Hose Routing Clip At Generator Shield

(4) Lower vehicle.

(5) Remove tube clip at generator shield (Fig. 17) attaching power steering fluid return hose to power steering fluid pressure hose.

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.

(6) Remove hose clamp, attaching power steering return hose to power steering fluid reservoir (Fig. 18). Then remove power steering return hose from power steering fluid reservoir.

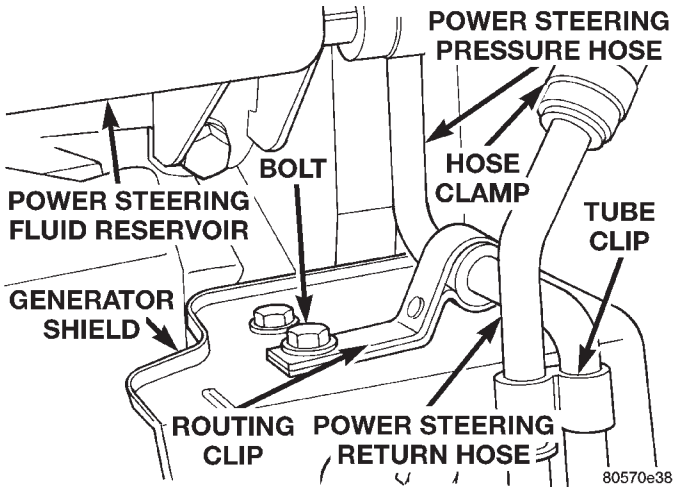


Fig. 17 Tube Clip At Generator Shield

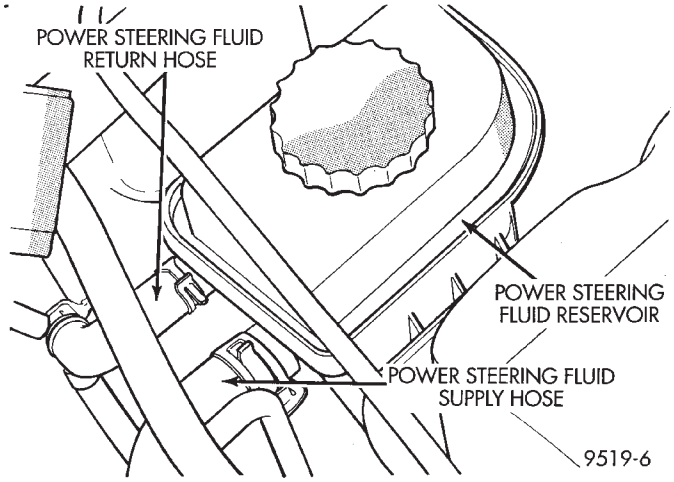


Fig. 18 Power Steering Return Hose At Reservoir

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

INSTALL

(1) Install power steering return hose on vehicle. Power steering return hose is installed from the top of the vehicles engine compartment.

CAUTION: Care must be used when installing power steering fluid return 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.

(2) 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. 18). **Be sure hose clamp is**

REMOVAL AND INSTALLATION (Continued)

installed on return hose past upset bead on power steering fluid reservoir.

(3) Raise vehicle.

(4) Clip power steering return hose and pressure hose together (Fig. 17).

(5) Install power steering return hose on steel tube at power steering gear (Fig. 15). Install hose clamp on power steering return hose at power steering gear (Fig. 15). **Be sure hose clamp is installed on return hose past upset bead on steel tube at power gear.**

(6) Install power steering return hose on routing clip at generator shield (Fig. 16).

(7) Lower vehicle.

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

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

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

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

(12) Add power steering fluid if necessary.

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

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

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

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

POWER STEERING FLUID SUPPLY HOSE RESERVOIR TO POWER STEERING PUMP

WARNING: POWER STEERING OIL, 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.

REMOVE

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.

(1) Remove hose clamp, attaching power steering fluid supply hose to power steering fluid reservoir (Fig. 19). Then remove power steering fluid supply hose from power steering fluid reservoir.

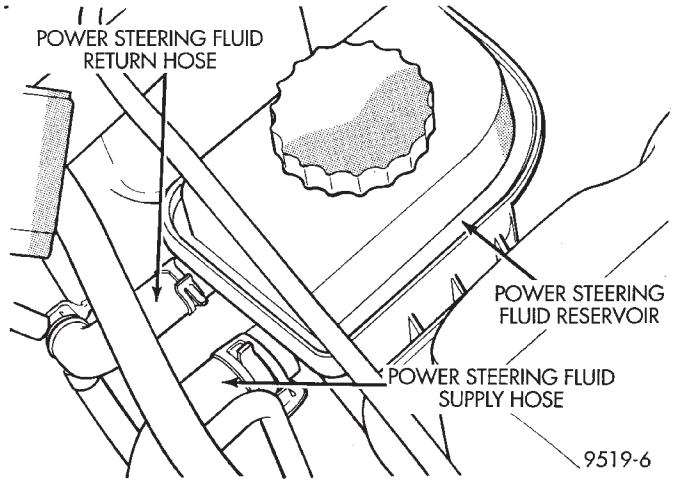


Fig. 19 Power Steering Fluid Supply Hose At Reservoir

(2) Remove hose clamp, attaching power steering fluid supply hose to the power steering pump (Fig. 20). Then remove power steering fluid supply hose from power steering pump fitting.

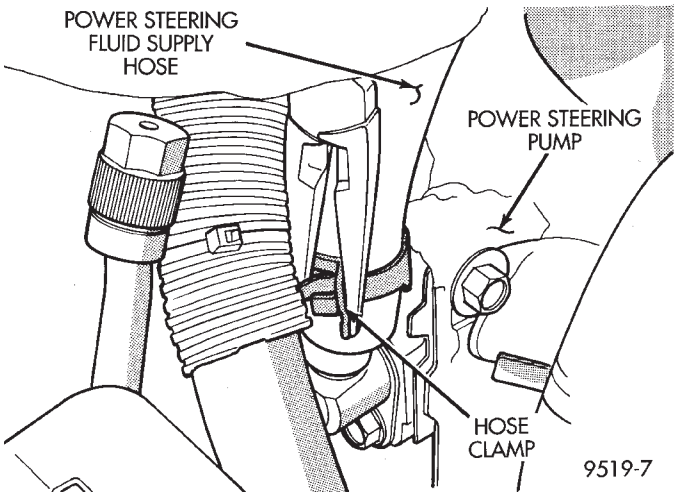


Fig. 20 Power Steering Fluid Supply Hose At Power Steering Pump

(3) Remove power steering fluid supply hose from engine.

INSTALL

(1) Install power steering fluid supply hose back on engine making sure it is correctly routed.

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.

REMOVAL AND INSTALLATION (Continued)

(2) Install power steering fluid supply hose on power steering fluid reservoir fitting. Install hose clamp on power steering fluid supply hose at power steering fluid reservoir (Fig. 19). **Be sure hose clamp is installed on return hose past upset bead on power steering fluid reservoir.**

(3) Install power steering fluid supply hose on power steering pump fitting. Install hose clamp on power steering fluid supply hose at power steering pump fitting (Fig. 20). **Be sure hose clamp is installed on power steering fluid supply hose past upset bead on power steering pump fitting.**

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

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

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

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

(8) Add power steering fluid if necessary.

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

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

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

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

POWER STEERING PUMP (ALL ENGINES)

WARNING: POWER STEERING OIL, 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.

The power steering pump removal procedure and pump and bracket fastener locations are the same for both engine applications used for this vehicle. The front power steering pump bracket must be removed as an assembly with the power steering pump and removed from the pump after removing the pulley from the power steering pump.

REMOVE

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

(2) Remove Banjo Bolt and power steering fluid pressure hose from pressure fitting on power steering pump (Fig. 21).

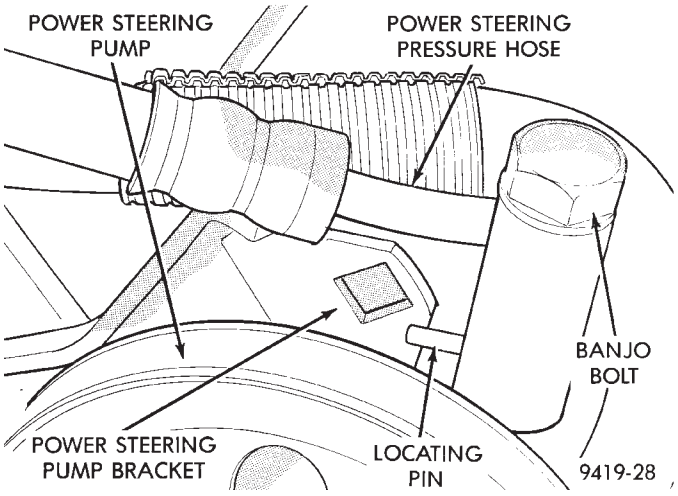


Fig. 21 Power Steering Hose Attachment To Power Steering Pump

(3) Discard all used O-rings on the power steering pressure hose Banjo fitting and Banjo bolt.

(4) Remove hose clamp attaching power steering fluid supply hose to the power steering pump suction fitting (Fig. 22). Remove power steering fluid supply hose from power steering pump fitting.

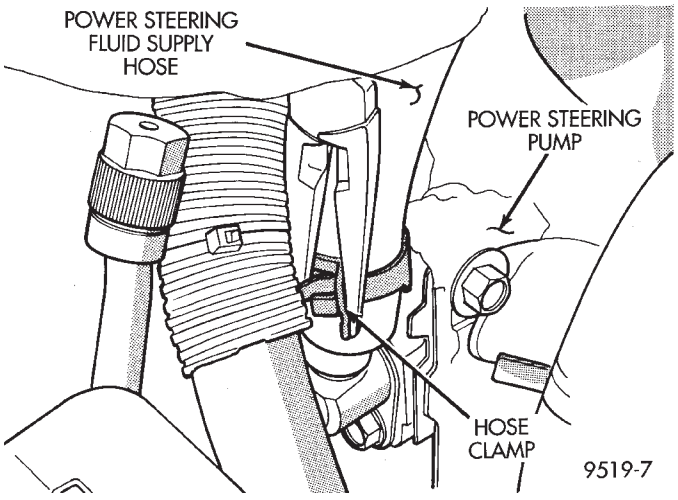


Fig. 22 Power Steering Fluid Supply Hose At Power Steering Pump

(5) Raise vehicle on jackstands or centered on a frame contact type hoist. See hoisting in the Lubrication And Maintenance Section of this service manual for the required lifting procedure to be used for this vehicle.

NOTE: If the vehicle is equipped with a dual overhead cam engine, the bolt attaching the coolant tube to the intake manifold needs to be removed. Refer to following step for required procedure.

(6) Remove the bolt attaching the coolant tube (Fig. 23) to the bottom of the intake manifold. **The**

REMOVAL AND INSTALLATION (Continued)

bolt requires removal to allow the coolant tube to be moved out of the way for access to the power steering pump mounting bolt. The coolant tube does not need to be removed or the cooling system drained.

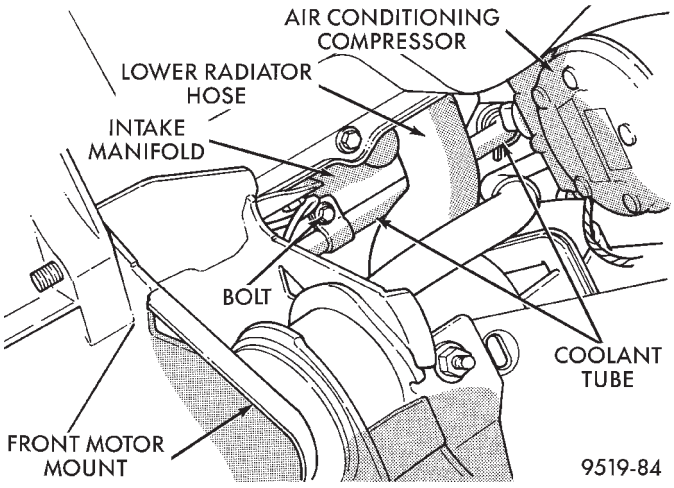


Fig. 23 Coolant Tube To Intake Manifold Attachment

(7) Remove the 2 power steering pump to cast bracket mounting and adjustment bolts (Fig. 24).

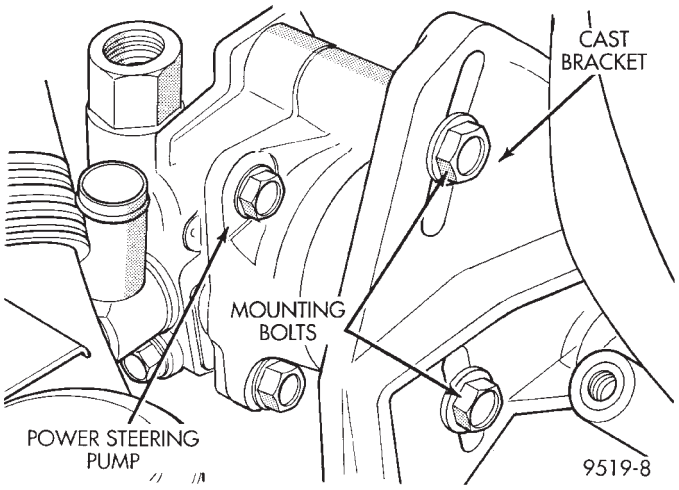


Fig. 24 Power Steering Pump Mounting Bolts (Rear)

NOTE: The power steering pump front mounting bracket is slotted at the bolt attaching it to the front engine mount (Fig. 25). This bolt only needs to be loosened to remove mounting bracket from engine.

(8) Loosen bolt (Fig. 25) attaching the power steering pump front mounting to the front engine mount only far enough to slide the bracket out from under the bolt.

(9) Remove power steering pump drive belt from power steering pump pulley.

(10) Remove power steering pump and front mounting bracket as an assembly from the engine (Fig. 26).

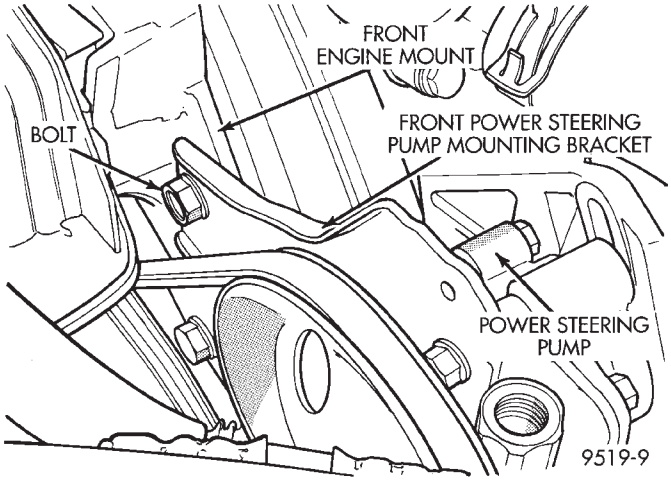


Fig. 25 Power Steering Pump Front Mounting Bracket Bolt

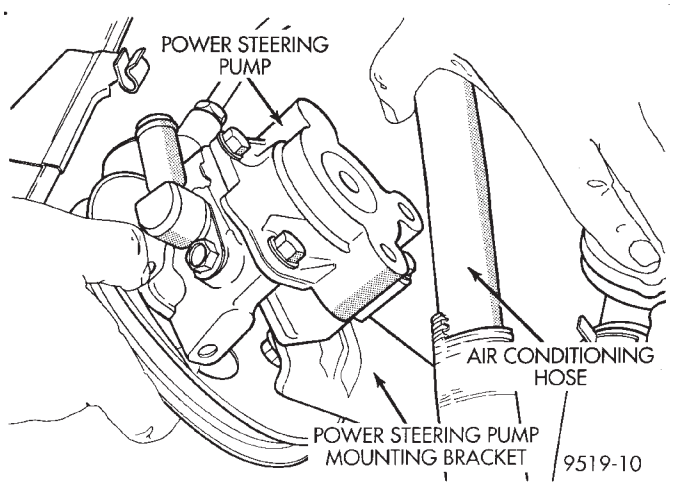


Fig. 26 Power Steering Pump And Bracket

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

INSTALL

(1) Install power steering pump and mounting bracket as an assembly (Fig. 26) back on the engine using reverse of removal procedure.

(2) Slide front power steering pump bracket between bracket mounting bolt and front engine mount (Fig. 25). **Be sure washer on bolt is between the head of the bolt and bracket and does not get trapped between bracket and engine mount.**

(3) Install the 2 power steering pump to cast mounting bracket attaching bolts (Fig. 24). **Do not tighten bolts at this time.**

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

(5) Install a 1/2 in. breaker bar in the square hole in the front power steering pump mounting bracket (Fig. 27). Then rotate pump in to obtain the correct

REMOVAL AND INSTALLATION (Continued)

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 torque the 2 bolts at the power steering pump cast mounting bracket (Fig. 24) to 54 N·m (40 ft. lbs.). Then torque the front power steering pump mounting bracket bolt (Fig. 25) to 54 N·m (40 ft. lbs.).

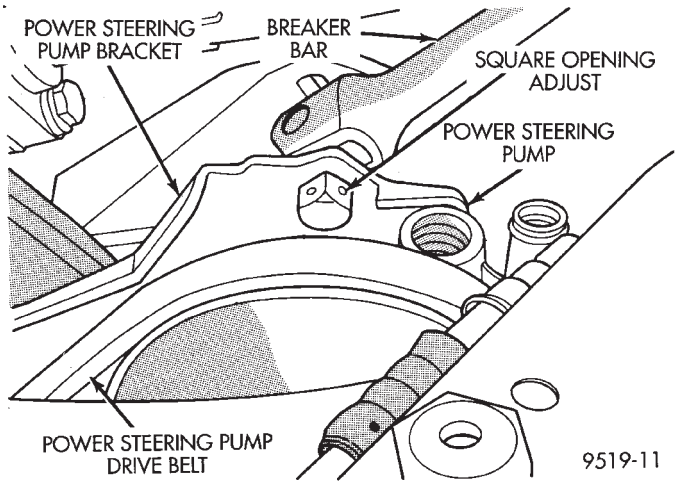


Fig. 27 Setting Power Steering Pump Drive Belt Tension

(6) Install power steering supply hose on power steering pump suction fitting (Fig. 22). Install hose clamp on hose, being sure hose clamp is installed on hose past upset bead on power steering pump tube.

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

(8) Install a new O-ring on the end of the power steering pressure hose banjo fitting (Fig. 28).

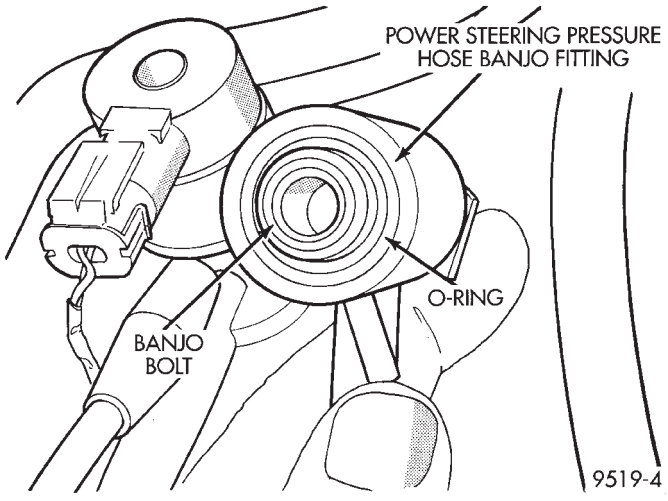


Fig. 28 O-Ring Installed On Power Steering Hose Banjo Fitting

(9) Install a new O-ring (Fig. 29) on power steering fluid pressure hose banjo fitting bolt.

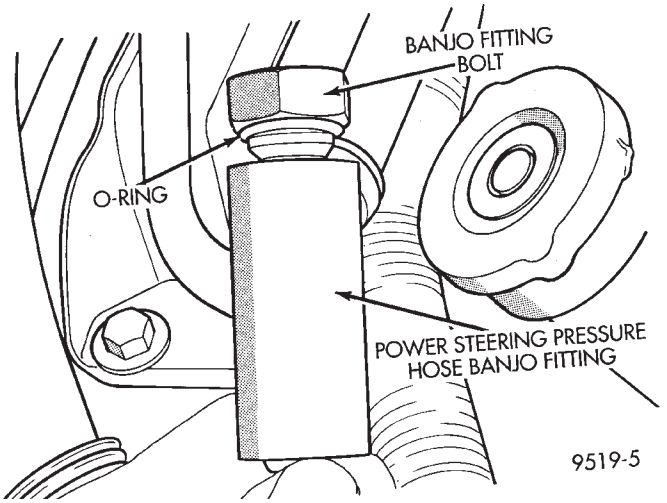


Fig. 29 O-Ring Installed On Banjo Fitting Bolt

(10) Lubricate both O-rings using fresh clean power steering fluid.

(11) Install banjo bolt into the power steering pressure hose banjo fitting.

(12) Attach power steering pressure hose on outlet fitting of the power steering pump (Fig. 21).

(13) Position locating pin on power steering pressure hose banjo fitting so it is against power steering pump mounting bracket (Fig. 21). While holding locating pin against power steering pump bracket, torque pump end Banjo bolt to 34 N·m (25 ft. lbs.).

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

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

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

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

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

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

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

(20) Add power steering fluid if necessary.

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

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

REMOVAL AND INSTALLATION (Continued)

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

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

POWER STEERING FLUID RESERVOIR

REMOVE

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

(2) Remove hose clamp, attaching return hose to steel tube at power steering gear (Fig. 30). Let power steering fluid drain from return hose and power steering fluid reservoir, until reservoir is empty.

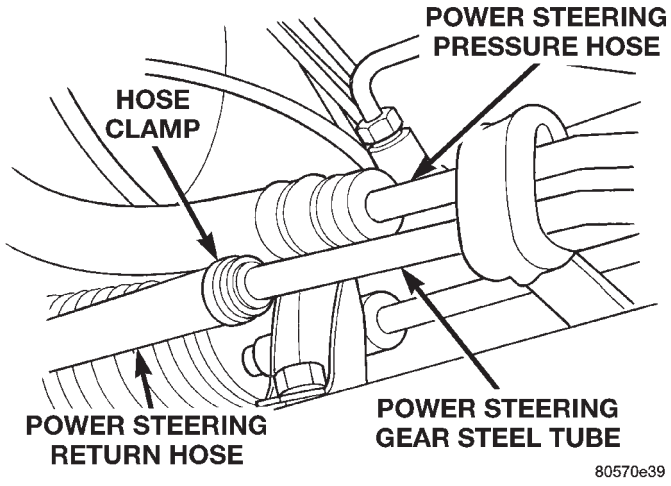


Fig. 30 Power Steering Return Hose At Steering Gear

(3) Lower vehicle.

(4) Remove the coolant overflow hose from the coolant recovery system (CRS) tank (Fig. 31).

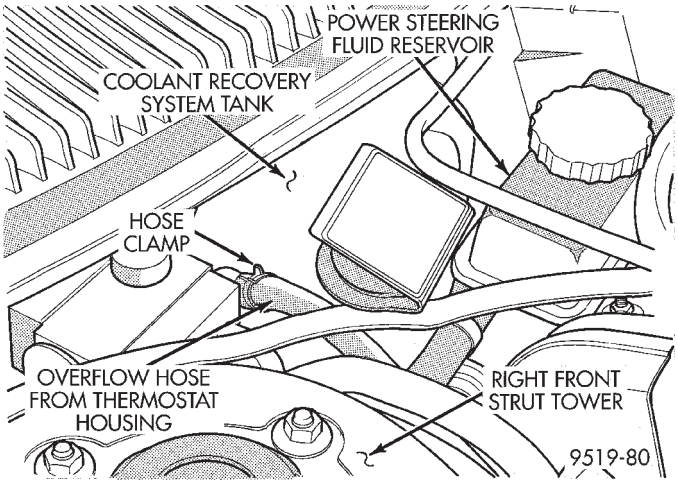


Fig. 31 Overflow Hose Connection At CRS Tank

NOTE: Removal of the CRS tank improves access to the power steering fluid reservoir attaching bolts.

(5) Remove the nut and screw attaching the CRS tank to the dash panel (Fig. 32). Remove the CRS tank from the dash panel and lower it down on top of the steering gear toward the center of the vehicle.

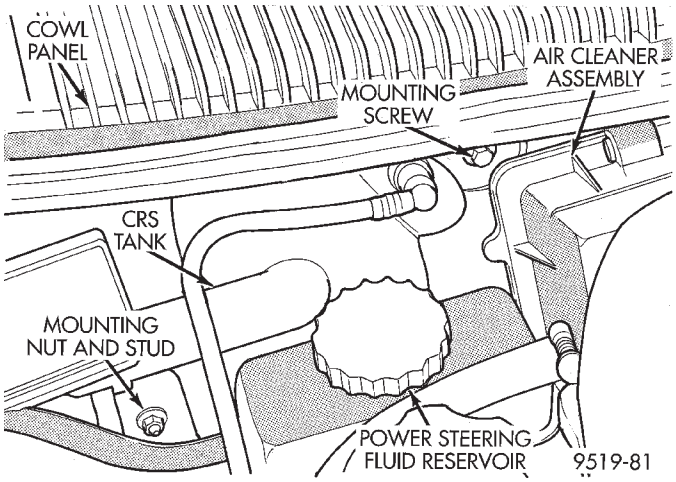


Fig. 32 CRS Tank Mounting Bolt And Screw

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.

(6) Remove the power steering fluid return and supply hose from the power steering fluid reservoir (Fig. 33).

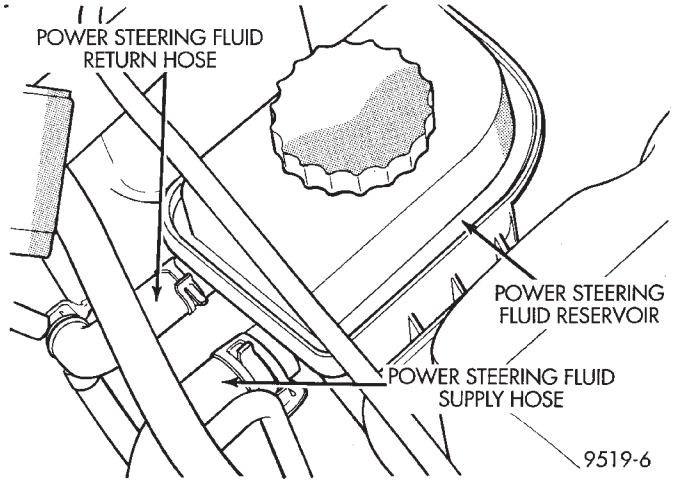


Fig. 33 Power Steering Fluid Hoses At Reservoir

(7) **If vehicle is equipped with the single overhead cam engine,** remove the 3 bolts (Fig. 34) attaching the power steering fluid reservoir to the cylinder head.

REMOVAL AND INSTALLATION (Continued)

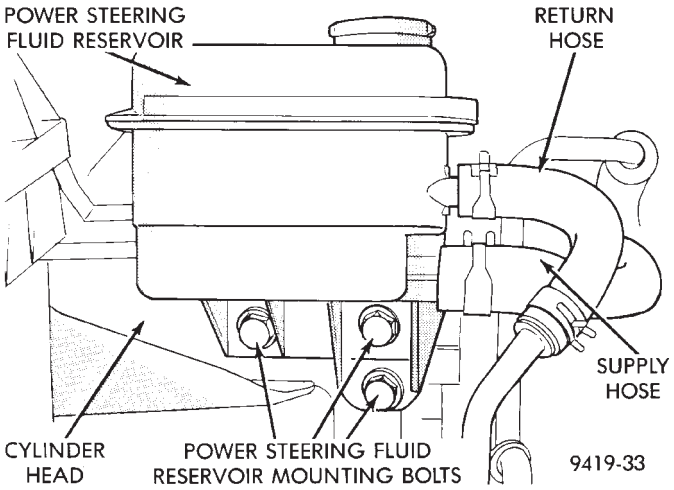


Fig. 34 Power Steering Fluid Reservoir Hoses And Mounting

(8) **If vehicle is equipped with the dual overhead cam engine,** remove the 2 nuts (Fig. 35) attaching the power steering fluid reservoir to the cylinder head.

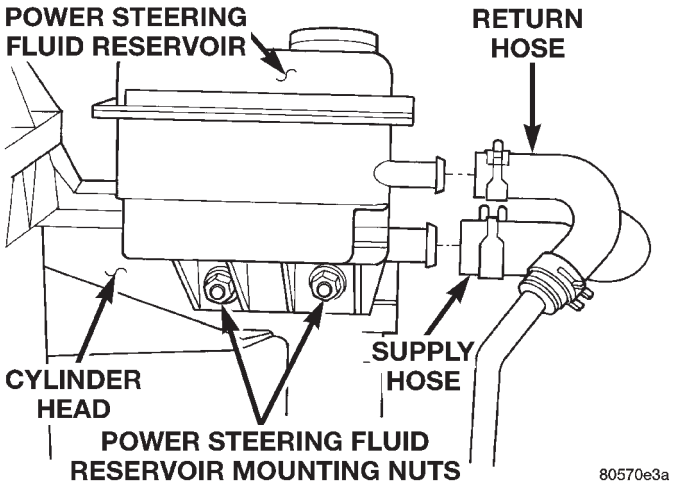


Fig. 35 Power Steering Fluid Reservoir Mounting

(9) Remove power steering fluid reservoir from vehicle.

INSTALL

(1) Install power steering fluid reservoir on cylinder head. Install and securely tighten the power steering fluid reservoir to cylinder head attaching bolts (Fig. 34) or. (Fig. 35)

(2) Install the power steering fluid return and supply hose, on the power steering fluid reservoir fittings (Fig. 33). **Be sure both hose clamps are installed on hose past upset bead on power steering reservoir fittings.**

(3) Install engine coolant recovery system tank on dash panel of vehicle. Install and securely tighten attaching bolts (Fig. 32).

(4) Install the coolant overflow hose from the coolant recovery system (CRS) tank (Fig. 31)

(5) Raise vehicle.

(6) Install power steering return hose, on the steel tube at the power steering gear (Fig. 30). **Be sure hose clamp is installed on hose past upset bead on power steering gear steel tube.**

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

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

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

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

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

(12) Add power steering fluid if necessary.

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

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

(15) 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.

REMOVE

(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 power steering pump in a vise using the power steering pump mounting bracket (Fig. 36). Install Puller, Special Tool C-4333 or C- 4068 on power steering pump pulley (Fig. 36). Remove the power steering pump pulley from the power steering pump shaft.

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

DISASSEMBLY AND ASSEMBLY (Continued)

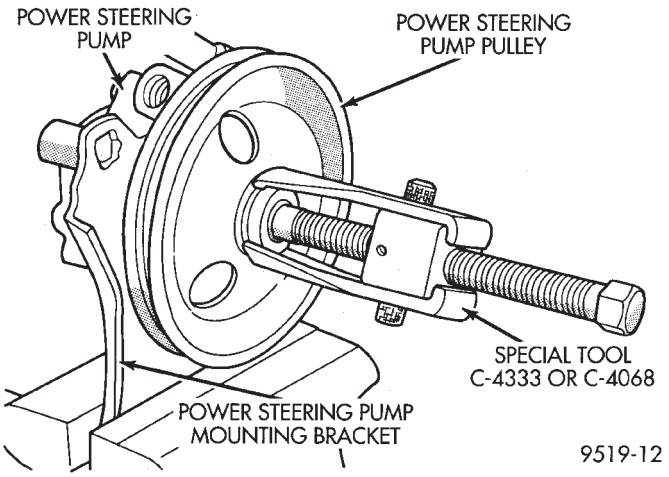


Fig. 36 Pulley Removal From Power Steering Pump Shaft

INSTALL

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.

(1) Mount power steering pump in a vise using the power steering pump mounting bracket (Fig. 37). Then place power steering pump pulley squarely on end of power steering pump shaft. Mount Installer, Special Tool C-4063 in internal threads of the power steering pump shaft and against power steering pump pulley (Fig. 37).

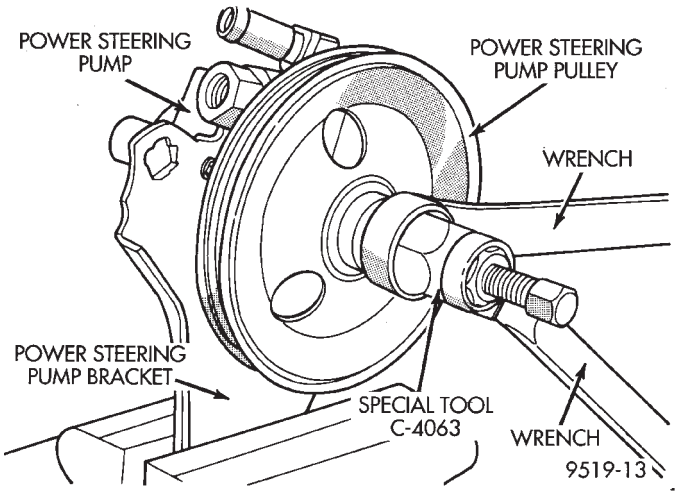


Fig. 37 Pulley Installation On Power Steering Pump Shaft

(2) Ensuring that special tool and pulley remain aligned with pump shaft, force pulley onto power steering pump shaft until flush with the end of the shaft (Fig. 38). **When pulley is flush with shaft tool will no longer be able to be turned.**

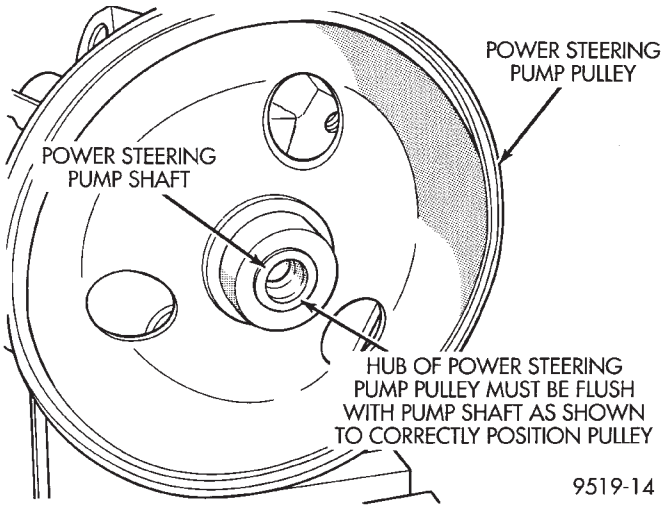


Fig. 38 Correctly Installed Power Steering Pump Pulley

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

(4) 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 And Installation in the Power Steering Pump 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 the power steering pump in a vise using the power steering pump mounting bracket (Fig. 39). Mount Puller, Special Tool C-4333 or C- 4068 on power steering pump pulley (Fig. 39). Remove the power steering pump pulley from the power steering pump shaft.

(3) Remove the 3 bolts attaching the power steering pump to the mounting bracket (Fig. 40).

(4) Remove power steering pump from mounting bracket.

ASSEMBLE

(1) Install power steering pump on mounting bracket. Install the 3 power steering pump mounting bolts (Fig. 40). Torque the 3 mounting bolts to 54 N·m (40 ft. lbs.).

DISASSEMBLY AND ASSEMBLY (Continued)

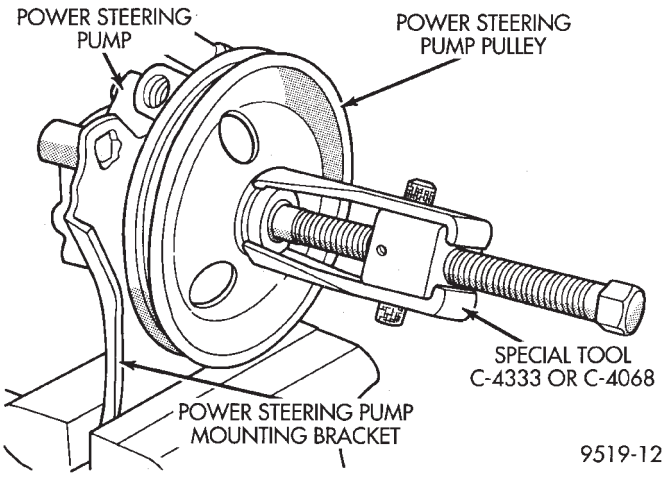


Fig. 39 Pulley Removal From Power Steering Pump Shaft

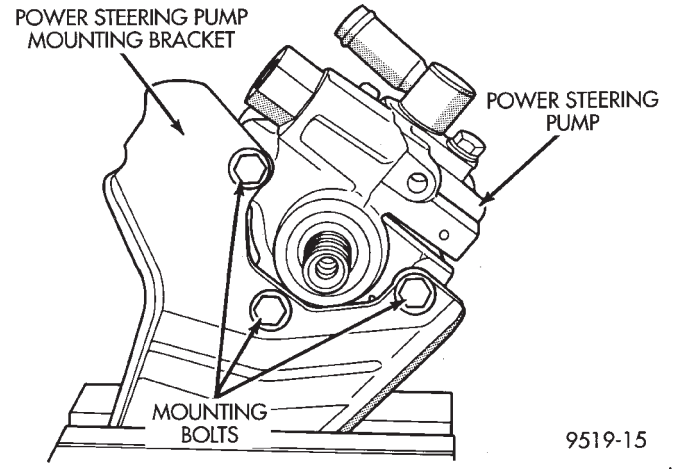


Fig. 40 Power Steering Pump Mounting Bolts

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. Mount Installer, Special Tool C-4063 in internal threads of the power steering pump shaft and against power steering pump pulley (Fig. 41).

(3) Ensuring that special tool and pulley remain aligned with pump shaft, force pulley onto power steering pump shaft until flush with the end of the shaft (Fig. 42). **When pulley is flush with shaft tool will no longer be able to be turned.**

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

(5) 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.

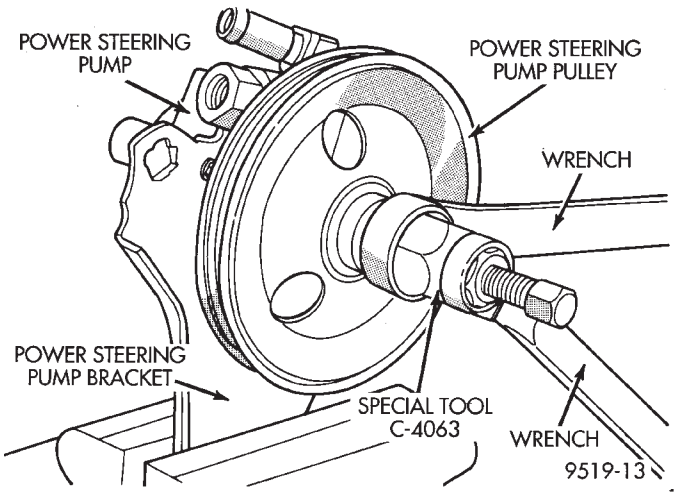


Fig. 41 Installing Pulley On Power Steering Pump Shaft

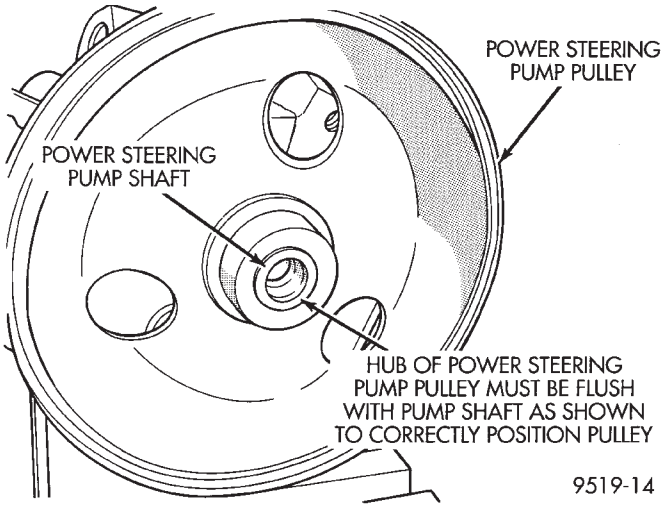


Fig. 42 Correctly Installed Power Steering Pump Pulley

SPECIFICATIONS

POWER STEERING PUMP FLOW SPECIFICATIONS

Power Steering Pump Flow:	
At 1500 RPM And Minimum	
Pressure	4.9 to 5.3 Liters/Min (1.3 to 1.9 GPM)
Control Valve Pressure	
Relief	8240 to 8920 kPa (1195 to 1293 psi)

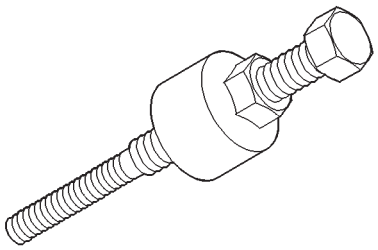
SPECIFICATIONS (Continued)

POWER STEERING PUMP FASTENER TORQUE SPECIFICATIONS

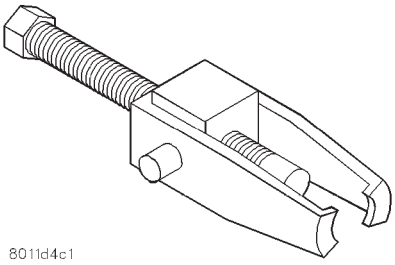
DESCRIPTION	TORQUE
Power Steering Hose:	
Tube Nuts Pressure And Return	31 N·m (275 in. lbs.)
Bracket To Front Crossmember Attaching Bolt	23 N·m (17 ft. lbs.).
Power Steering Pump:	
Pressure Hose Banjo Bolt	34 N·m (25 ft. lbs.).
Discharge Fitting	75 N·m (55 ft. lbs.)
To Bracket Mounting Bolts	54 N·m (40. ft. lbs.)
Brackets To Engine Mounting Bolts	54 N·m (40 ft. lbs.)

SPECIAL TOOLS

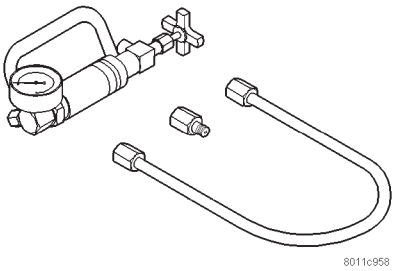
POWER STEERING PUMP



Installer C-4063B



Puller C-4333



P/S System Analyzer 6815

STEERING GEAR

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STEERING GEAR	27	OUTER TIE ROD END	33
DIAGNOSIS AND TESTING		**SPECIFICATIONS**	
POWER STEERING SYSTEM TEST PROCEDURE	28	STEERING GEAR FASTENER TORQUE SPECIFICATIONS	34
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MANUAL AND POWER STEERING GEAR	29	POWER STEERING GEAR	34

DESCRIPTION AND OPERATION

STEERING GEAR

The power steering system consists of these four major components. Power Steering Gear (Fig. 1), Power Steering Pump, Pressure Hose, and Return Line. 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 oil 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 oil behind the integral rack piston, which, in turn, builds up hydraulic pressure and assists in the turning effort.

The drive tangs on the pinion of the power steering pump 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.

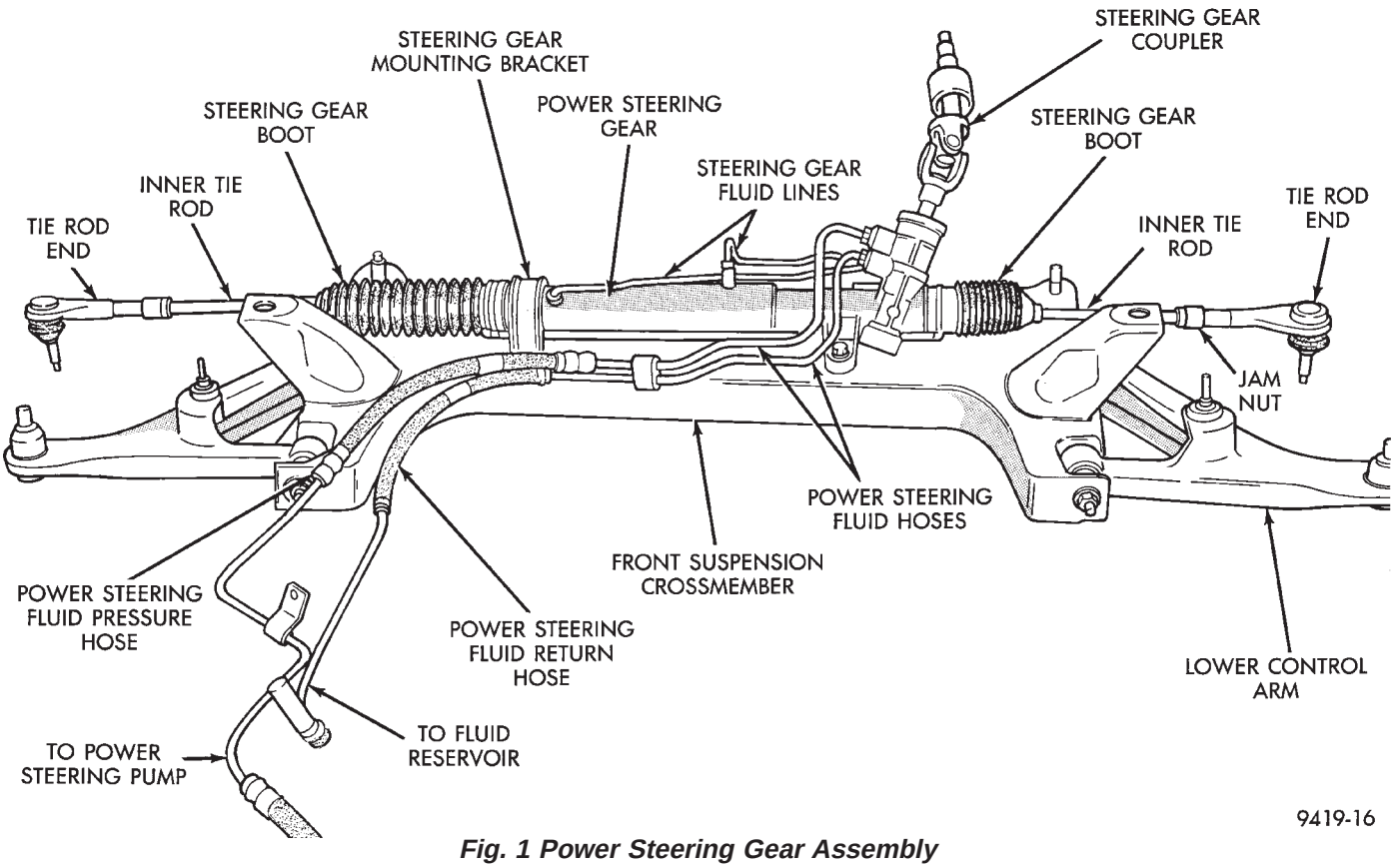


Fig. 1 Power Steering Gear Assembly

DESCRIPTION AND OPERATION (Continued)

NOTE: The power steering gear (Fig. 1) should NOT be serviced or adjusted. If a malfunction or oil leak occurs with the steering gear, the complete steering gear needs to be replaced.

DIAGNOSIS AND TESTING

POWER STEERING SYSTEM TEST PROCEDURE

The following procedure can be used to test the operation of the power steering system on the 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 pressure and flow test is performed using Pressure/Flow Tester, Special Tool 6815 (Fig. 2).

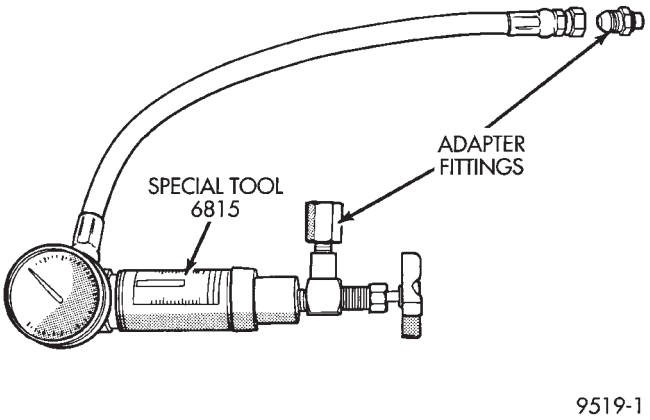


Fig. 2 Power Steering Pump Flow/Pressure Tester

POWER STEERING PUMP FLOW AND PRESSURE TEST PROCEDURE

(1) Check power steering pump drive belt tension and adjust as necessary.

(2) Disconnect power steering fluid pressure hose, at power steering pump. Use a container for dripping fluid.

(3) Connect Pressure Gauge, Special Tool from kit 6815 (Fig. 3) to both hoses using adapter fittings. Connect spare pressure hose, to power steering pump pressure hose banjo fitting.

(4) Completely open valve on Special Tool 6815 (Fig. 3).

(5) Start engine and let idle long enough to circulate power steering fluid through flow/pressure test and get air out of fluid. Then shut off engine.

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

(7) Pressure gauge should read below 862 kPa (125 psi), if above, inspect the hoses for restrictions and repair as necessary. The initial pressure reading should be in the range of 345-552 kPa (50-80 psi). The flow meter should read between 1.3 and 1.4 GPM

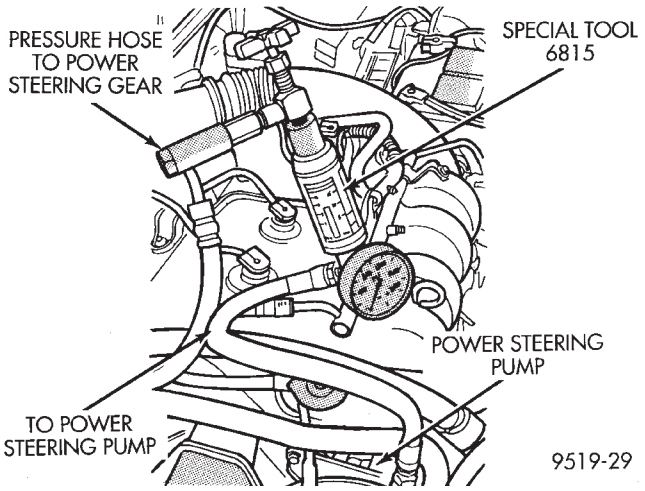


Fig. 3 Power Steering Pump Flow/Pressure Tester Connected To Power Steering Pump

CAUTION: The following test procedure involves testing power steering pump maximum pressure output and flow control valve operation. Do not leave valve closed for more than 5 seconds as the pump could be damaged.

(8) 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.).

- If power steering pump pressures above specifications but not within 345 kPa (50 psi) of each other, then replace power steering pump.
- If pressures within 345 kPa (50 psi) of each other but below specifications, then replace power steering pump.

CAUTION: Do not force the pump to operate against the stops for more than 5 seconds at a time because, pump damage will result.

(9) Open test valve. Turn steering wheel to the extreme left and right positions until against the stops, recording the highest indicated pressure at each position. Compare pressure gauge readings to power steering pump specifications. If highest output pressures are not the same against either stop, the steering gear is leaking internally and must be replaced.

REMOVAL AND INSTALLATION

MANUAL AND POWER STEERING GEAR

The removal and replacement procedure for both the manual and power steering gears is the same. The only additional steps of the procedure for the power steering gear, is the removal and replacement of the power steering fluid lines at the steering gear.

REMOVE

(1) From interior of vehicle, disconnect the steering gear coupler, from the steering column shaft coupler (Fig. 4).

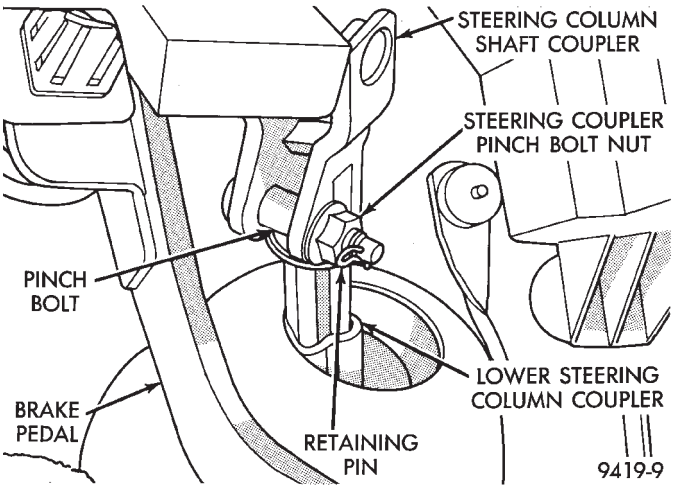


Fig. 4 Steering Column To Steering Gear Coupler

(2) 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.

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

(4) Remove engine/transaxle bobble dampener, on vehicles so equipped, from front suspension crossmember (Fig. 5). Bobble strut does not need to be removed from transaxle assembly.

(5) Remove nuts attaching both outer tie rod ends to the steering knuckles (Fig. 6). **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.**

(6) Remove both tie rod end studs, from the steering knuckles, using Remover, Special Tool MB-990635 (Fig. 7).

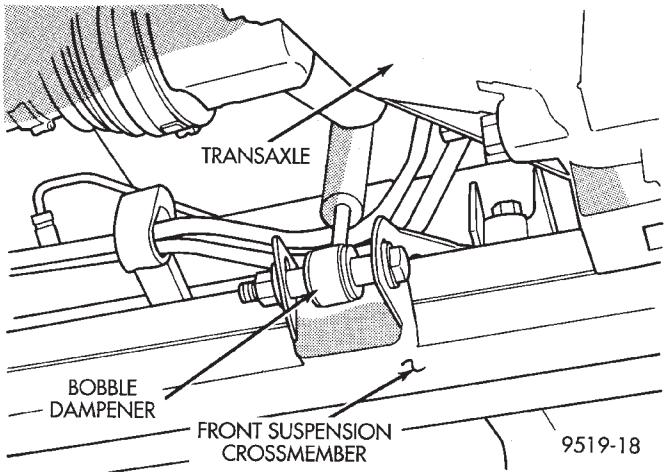


Fig. 5 Engine/Transaxle Bobble Dampener

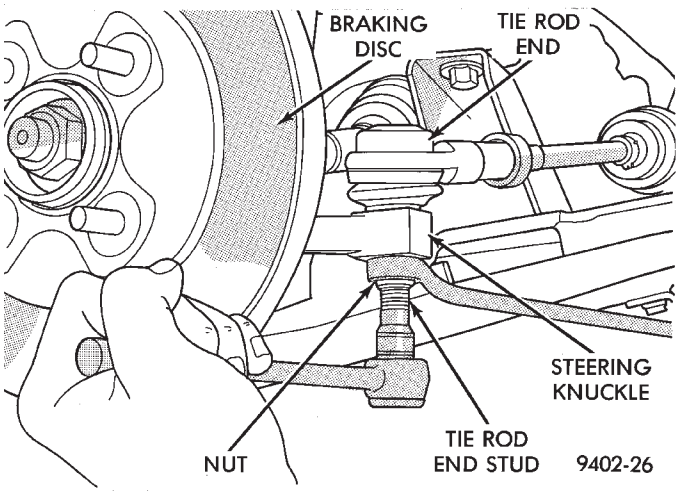


Fig. 6 Removing Tie Rod End Attaching Nut

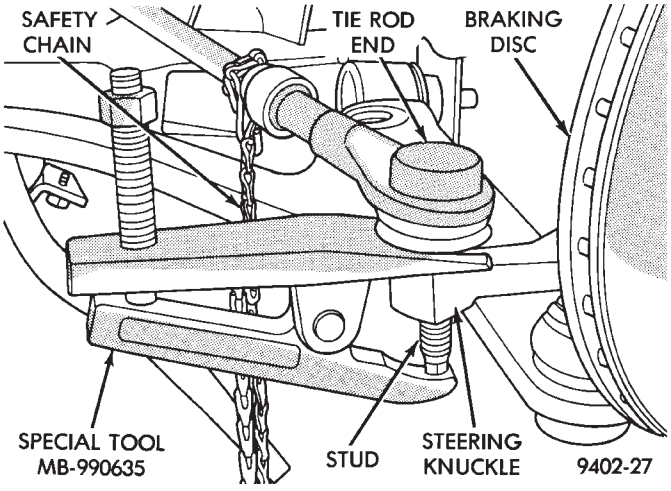


Fig. 7 Tie Rod End Removal From Steering Knuckle

REMOVAL AND INSTALLATION (Continued)

(7) If equipped, remove vehicle wiring harness connector from the power steering fluid pressure switch (Fig. 8).

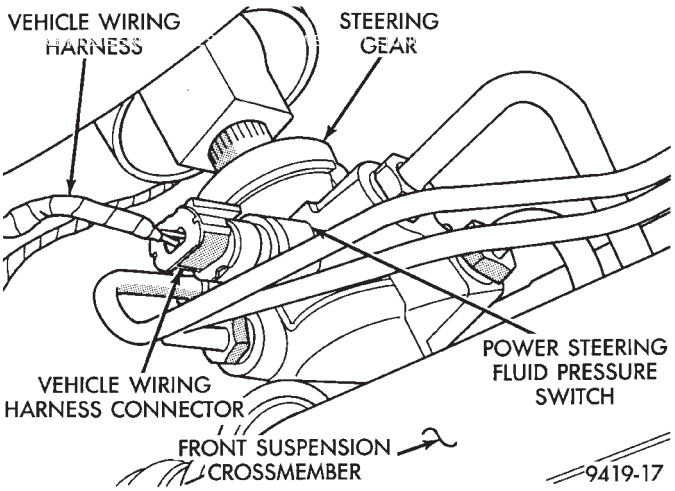


Fig. 8 Power Steering Fluid Pressure Switch Electrical Connector

(8) If vehicle is equipped with power steering, remove power steering pressure and return hose routing bracket from front suspension crossmember (Fig. 9). **The hose routing bracket does not have to be removed from the power steering pressure and return hoses.**

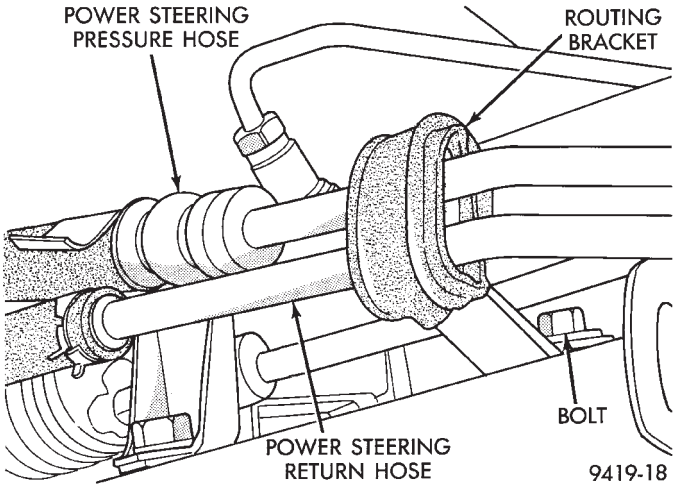


Fig. 9 Power Steering Pressure And Return Hose Routing Bracket

(9) If vehicle is equipped with power steering, remove power steering fluid, pressure and return hoses (Fig. 10) from the power steering gear assembly.

NOTE: This vehicle 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 possible to adjust a vehicles front suspension alignment settings to the required specifications. Due to this, 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.

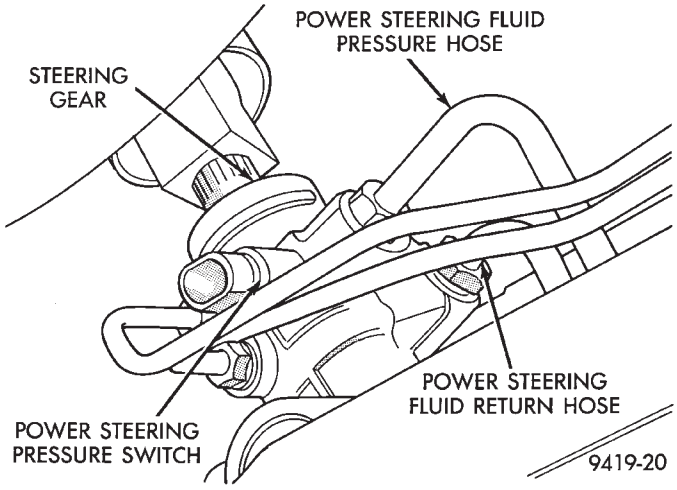


Fig. 10 Power Steering Fluid Pressure And Return Hoses

CAUTION: Before removing front suspension crossmember from the vehicle, the location of the front suspension crossmember MUST be scribbed on body of vehicle per (Fig. 9). This must be done so crossmember can be relocated against body of vehicle in the same location when it is reinstalled. 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.

(10) Using an awl, scribe a line (Fig. 11) marking the location of where front suspension crossmember is mounted against the body of the vehicle.

(11) Position a transmission jack under the center of the front suspension crossmember (Fig. 12). Transmission jack is used to lower, support and raise front suspension crossmember when removing steering gear assembly.

(12) Loosen and fully remove the front 2 bolts (Fig. 13) attaching front suspension crossmember to frame rails of vehicle. Then loosen the 2 rear bolts (Fig. 13)

REMOVAL AND INSTALLATION (Continued)

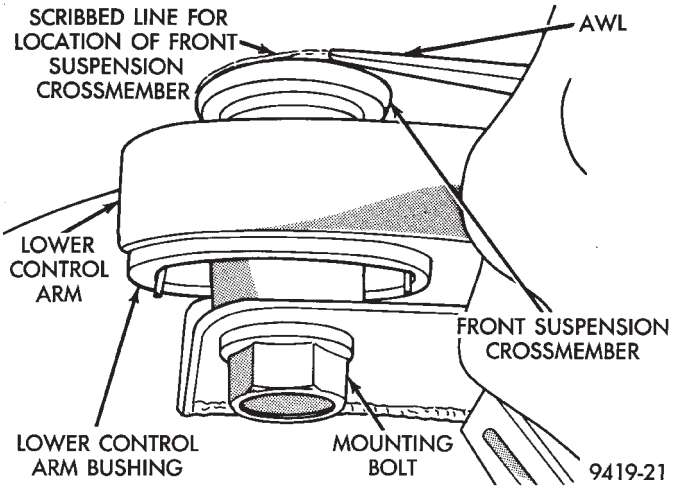


Fig. 11 Marking Front Suspension Crossmember Location

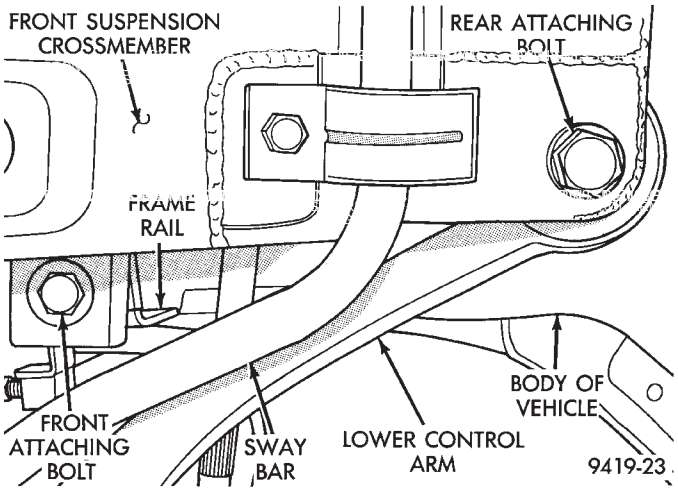


Fig. 13 Front Suspension Crossmember Mounting Bolts

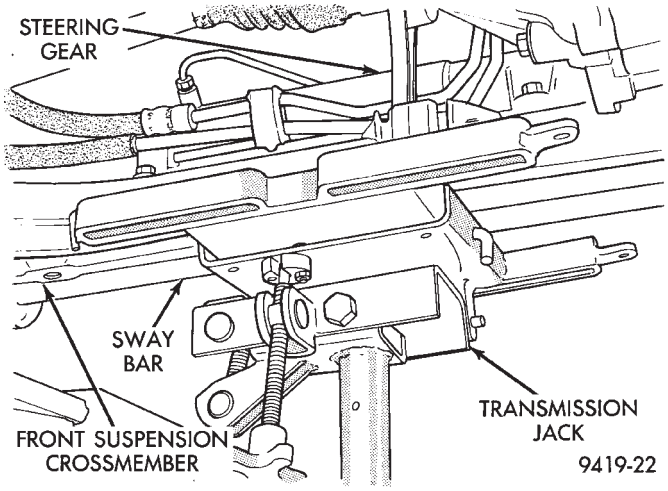


Fig. 12 Supporting Front Suspension Crossmember

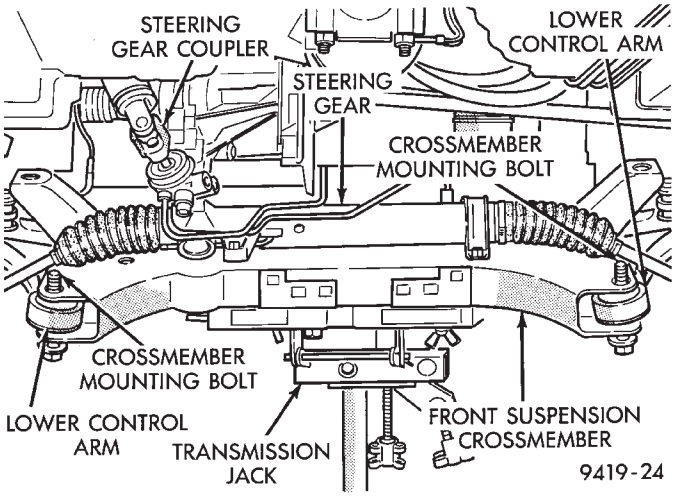


Fig. 14 Crossmember Lowered For Removal Of Steering Gear

attaching front suspension crossmember and lower control arm to body of vehicle. **Lower front suspension crossmember while loosening rear bolts, but do not remove rear bolts from crossmember.**

(13) Using transmission jack, lower front suspension crossmember enough to allow steering gear to be removed from crossmember (Fig. 14). **When lowering front suspension crossmember, do not let crossmember hang from lower control arms weight of crossmember should be supported by transmission jack.**

(14) Loosen and remove the 4 bolts (Fig. 15), attaching steering assembly to front suspension crossmember. Then remove the steering gear assembly from the front suspension crossmember.

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

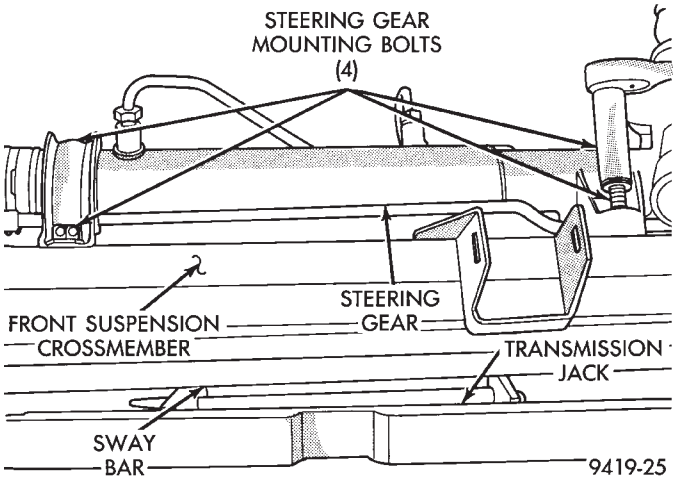


Fig. 15 Steering Gear Assembly Mounting Bolts

REMOVAL AND INSTALLATION (Continued)

INSTALL

(1) Install steering gear assembly on front suspension crossmember. Install the 4 steering gear assembly to front crossmember mounting bolts (Fig. 15). Torque the 4 steering gear mounting bolts to 68 N·m (50 ft. lbs.).

(2) Using the transmission jack, raise front suspension crossmember and steering gear against body and frame rails of vehicle. Start the 2 rear bolts into tapping plates, attaching front suspension crossmember to body of vehicle (Fig. 13). Then install the 2 front bolts, attaching front suspension crossmember to frame rails of vehicle (Fig. 13). Tighten the 4 mounting bolts, 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 scribbed into body of vehicle (Fig. 16). This MUST be done to maintain NET BUILD front suspension alignment settings.

(3) Using a soft face hammer, tap front suspension crossmember into position, until it is aligned with the 2 previously scribbed positioning marks on body of vehicle (Fig. 16). When front suspension crossmember is correctly positioned, torque the 2 rear crossmember/lower control arm 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.) (Fig. 13).

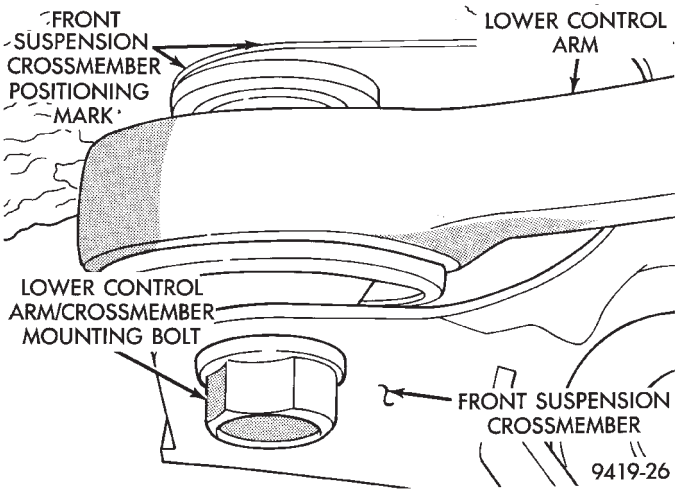


Fig. 16 Crossmember Aligned With Positioning Marks

(4) If vehicle is equipped with power steering, install power steering fluid pressure and return hoses into correct fluid ports on power steering gear assembly (Fig. 10). Torque power steering fluid pressure and return lines to steering gear tube nuts (Fig. 10) to 31 N·m (275 in. lbs.).

(5) If vehicle is equipped with power steering, install power steering pressure and return hose routing bracket and attaching screw on front suspension crossmember (Fig. 9). Torque hose routing bracket to crossmember attaching bolt (Fig. 9) to 23 N·m (17 ft, lbs.).

(6) If the vehicle is equipped with power steering, install vehicle wiring harness connector onto power steering fluid pressure switch on steering gear assembly (Fig. 8). Be sure locking tab on wiring harness connector is securely latched to pressure switch.

(7) 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. 6). Then using a crowfoot and 11/32 socket (Fig. 17), torque tie rod end attaching nut to 55 N·m (40 ft. lbs.).

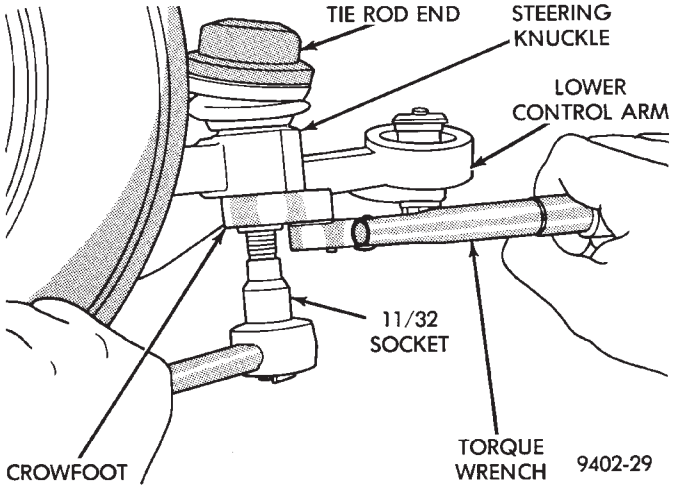


Fig. 17 Torquing Tie Rod End Attaching Nut

(8) Install engine/transaxle bobble strut (Fig. 5) back on front suspension crossmember bracket. Install and securely tighten the dampener to crossmember attaching bolt.

(9) Install the wheel and tire assemblies back on vehicle. Tighten the wheel nuts to 135 N·m (100 ft. lbs.) torque.

(10) Lower vehicle.

(11) From interior of vehicle, reconnect the steering gear coupler with the steering column shaft coupler. Install steering gear coupler retaining pinch bolt and torque to 28 N·m (250 in. lbs.). **Be sure to install the upper to lower steering coupler retaining bolt, retention pin (Fig. 4).**

CAUTION: Do not use automatic transmission fluid.

REMOVAL AND INSTALLATION (Continued)

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

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

(14) Add fluid if necessary.

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

(16) 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.

(17) 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).

(18) 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.

(19) Tighten tie rod jam nut (Fig. 18) to 61 N·m (45 ft.lbs.) torque.

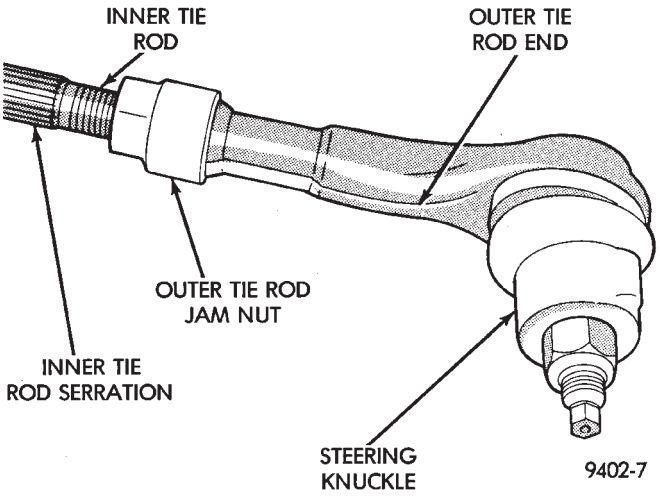


Fig. 18 Outer Tie Rod End Jam Nut

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

DISASSEMBLY AND ASSEMBLY

OUTER TIE ROD END

DISASSEMBLE

(1) Loosen the inner tie rod to outer tie rod jam nut (Fig. 19).

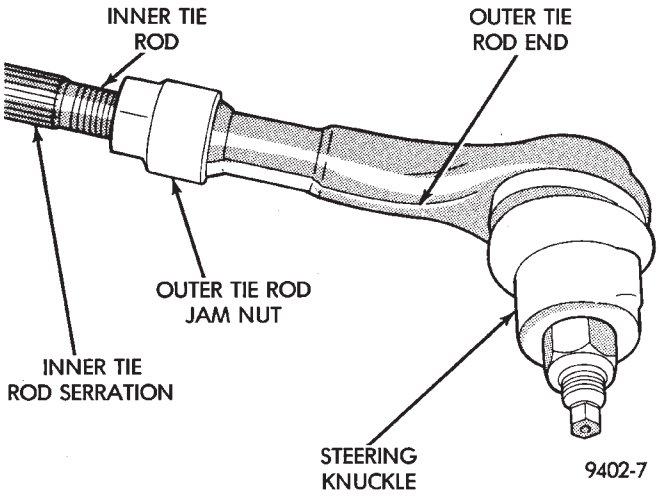


Fig. 19 Outer Tie Rod

(2) Remove the nut attaching the outer tie rod end to steering knuckle (Fig. 20). **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.**

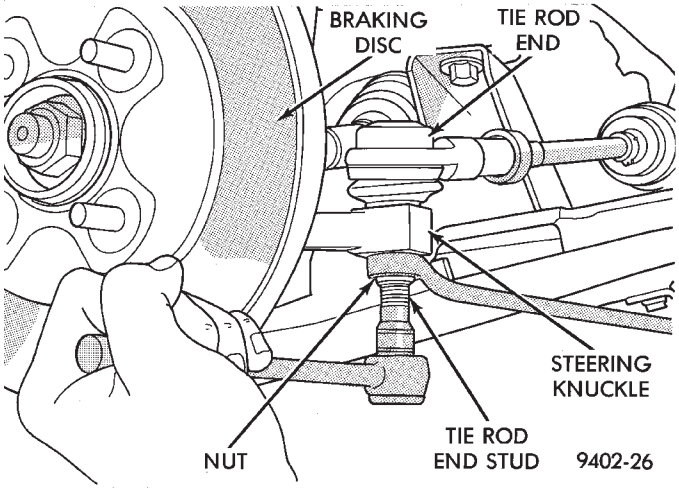


Fig. 20 Removing /Installing Tie Rod End Attaching Nut

(3) Remove the tie rod end stud from steering knuckle arm, using Remover, Special Tool MB-990635 (Fig. 21).

(4) Remove the outer tie rod end from the 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 (Fig. 19).**

(2) Do not tighten jam nut.

(3) Install the 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 steer-

DISASSEMBLY AND ASSEMBLY (Continued)

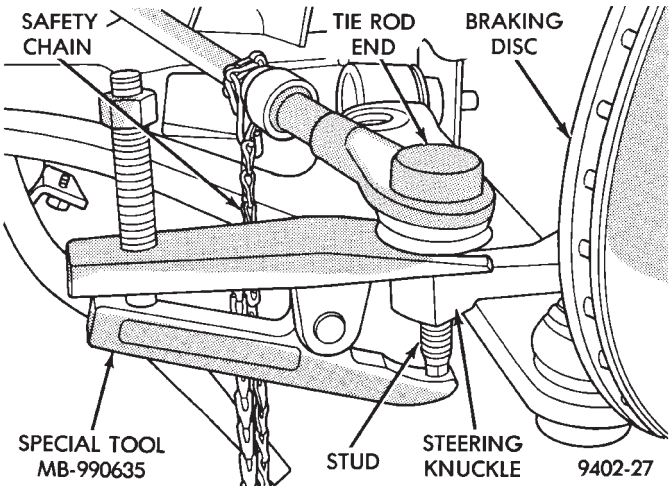


Fig. 21 Tie Rod End Removal From Steering Knuckle

ing knuckle attaching nut (Fig. 20). Then using a crowfoot and 11/32 socket (Fig. 22), torque the tie rod end attaching nut to 61 N·m (45 ft. lbs.).

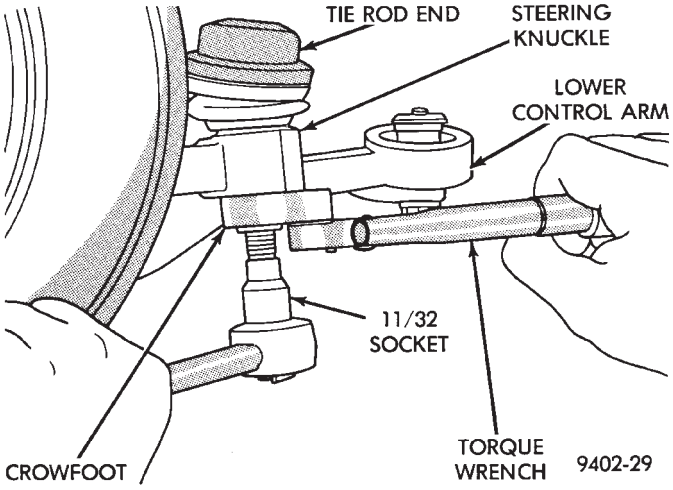


Fig. 22 Torquing Tie Rod End Attaching Nut

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).

(4) 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.

(5) Torque the tie rod jam nut (Fig. 19) to a torque of 55 N·m (40 ft. lbs.) torque.

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

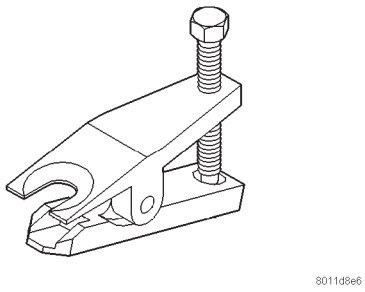
SPECIFICATIONS

STEERING GEAR FASTENER TORQUE SPECIFICATIONS

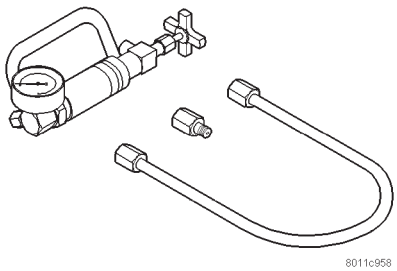
DESCRIPTION	TORQUE
FRONT SUSPENSION CROSSMEMBER:	
To Body Mounting Bolts	163 N·m (120 ft. lbs.)
STEERING GEAR:	
To Crossmember Mounting Bolts	68 N·m (50 ft. lbs.)
OUTER TIE ROD:	
To Steering Knuckle Nut	55 N·m (40 ft. lbs.)
To Inner Tie Rod Jam Nut	61 N·m (45 ft. lbs.)
POWER STEERING HOSE:	
Tube Nuts	31 N·m (275 in. lbs.)
Routing Bracket At Crossmember	23 N·m (17 ft. lbs.)

SPECIAL TOOLS

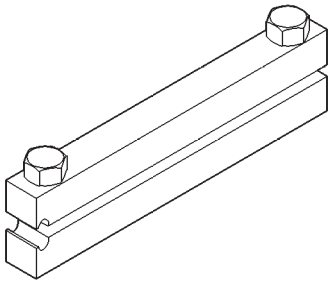
POWER STEERING GEAR



Remover Tie Rod End MB–990635



P/S System Analyzer 6815



Installer Boot Clamp C-4975A

STEERING COLUMN

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DESCRIPTION AND OPERATION

STEERING COLUMN ASSEMBLY

Both the standard non-tilt and tilt steering columns (Fig. 1) have been designed to be serviced only as complete assemblies, if a component of the steering column is defective. The only replaceable components of the steering column assembly, are the key cylinder, ignition switch, multi- function switch, clock spring, trim shrouds and steering wheel. These replaceable components of the steering column can be serviced without requiring removal of the steering column from the vehicle.

DESCRIPTION AND OPERATION (Continued)

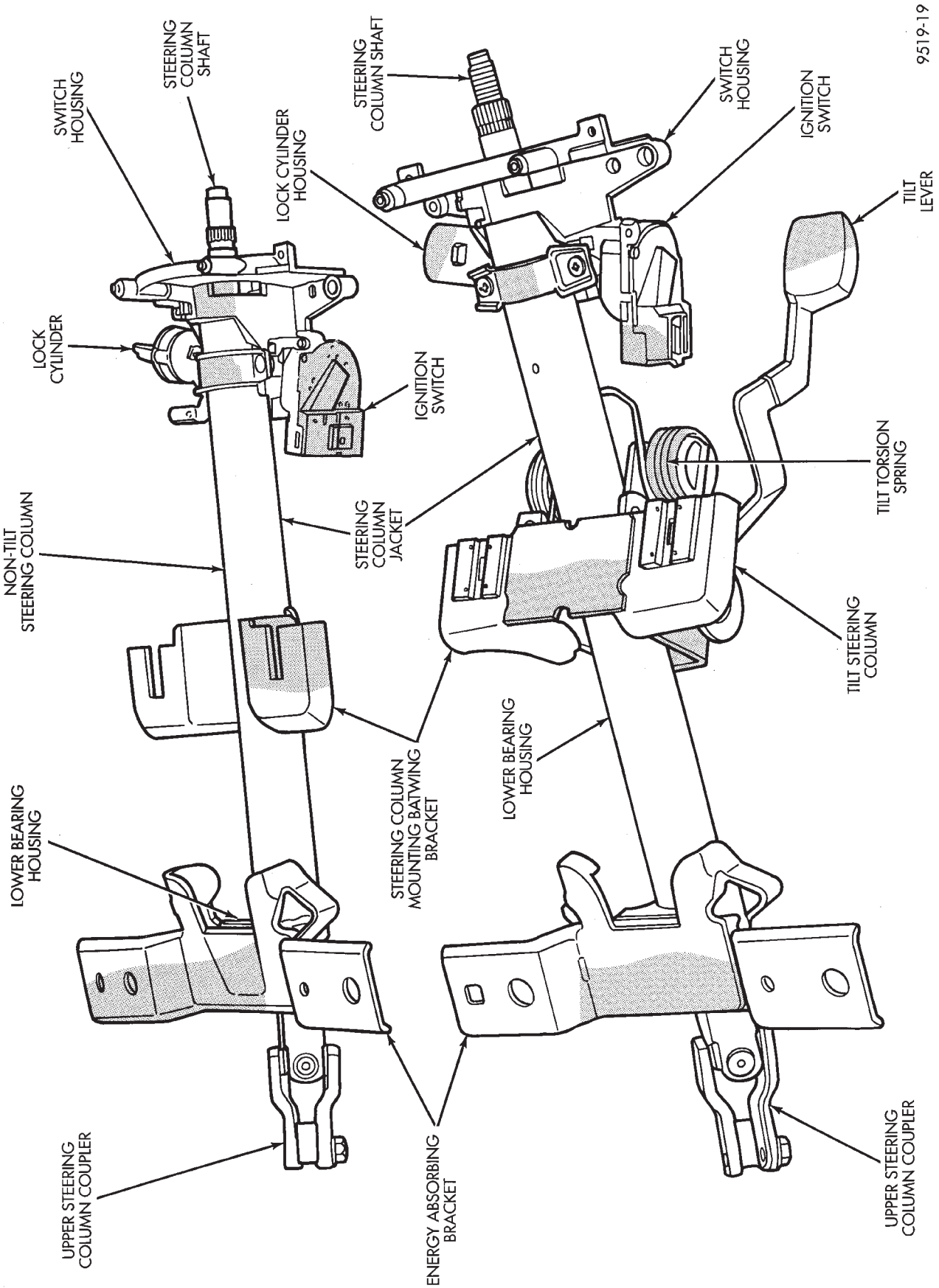

Fig. 1 Non-Tilt And Tilt Steering Column Assemblies

DESCRIPTION AND OPERATION (Continued)

STEERING GEAR TO STEERING COLUMN COUPLING

This vehicle uses a differently designed coupling for connecting the steering column to the steering gear (Fig. 2).

This coupling (Fig. 2) is different in its appearance and in the way it functions than the previous coupling used on this vehicle and couplings used on other Chrysler vehicles. This coupling functions by bending at the bellows section (Fig. 2) of the coupling on impact, where as the previous coupling separated at its detachable joint on an impact.

This coupling incorporates a hollow convoluted tube (Fig. 2) which allows the coupling to bend as required when a vehicle is involved in a collision. The previous coupling used on this vehicle incorporated 2 release washers which allowed the coupling to separate into 2 pieces, if necessary, when a vehicle was involved in a collision.

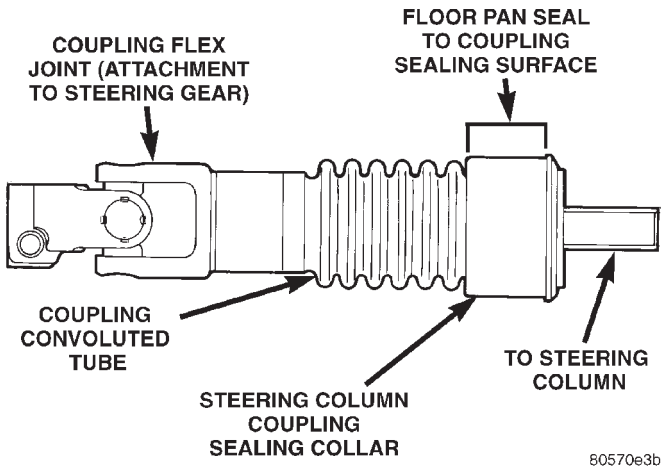

Fig. 2 Steering Column Coupler

DIAGNOSIS AND TESTING

STEERING COLUMN

For diagnosis of conditions relating to the steering column, refer to the steering system diagnosis charts, in the diagnosis and testing section at the beginning of this group.

STEERING COLUMN TO STEERING GEAR COUPLING

STEERING COLUMN COUPLING INSPECTION

The steering column coupling **MUST** be inspected whenever a vehicle is involved in an impact or whenever any of the following conditions exist.

(1) The steering column coupling must be inspected whenever a vehicle is involved in a collision which deploys the air bag, regardless of the extent of damage done to the vehicle.

(2) If a vehicle is involved in an impact of the vehicles front suspension or under carriage, which results in any type of damage to the front suspension crossmember.

(3) 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 or rearward in a vehicle.

STEERING COUPLING INSPECTION PROCEDURE

(1) Remove the pinch bolt safety pin from the steering column shaft coupling pinch bolt (Fig. 3).

(2) Loosen the coupling pinch bolt retaining nut and remove pinch bolt (Fig. 3) from steering coupler. **(Pinch bolt nut is caged to coupler and is not removable.)** Then separate the steering column shaft coupling from the steering column to steering gear coupling.

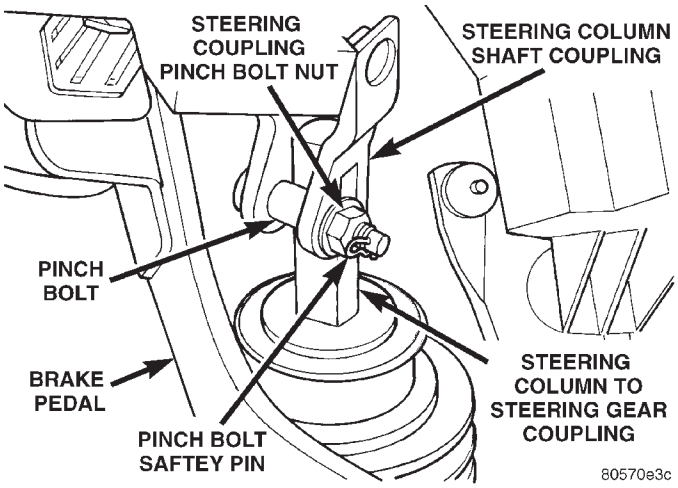

Fig. 3 Steering Column To Coupling Attachment

(3) Remove the silencer seal (Fig. 4) enclosing the steering column coupling.

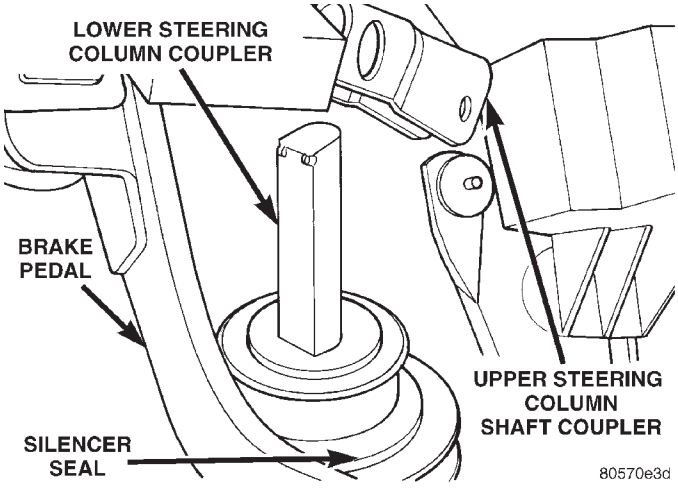

Fig. 4 Steering Column Coupling Seal

DIAGNOSIS AND TESTING (Continued)

(4) Inspect steering column coupling in the following areas for signs of damage:

- Inspect the sealing collar on the steering column coupling (Fig. 5) to ensure the it is not cracked, broken, or otherwise damaged requiring coupling replacement.
- Inspect the convoluted section (Fig. 5) of the steering column coupling for the following conditions or any other visible signs of damage.
  - Uneven spacing between the convolutes on the coupling.
  - Dings or dents in the convolutes of the coupling or anywhere else on the coupling wall.
  - A bend in the convoluted section of the coupling.

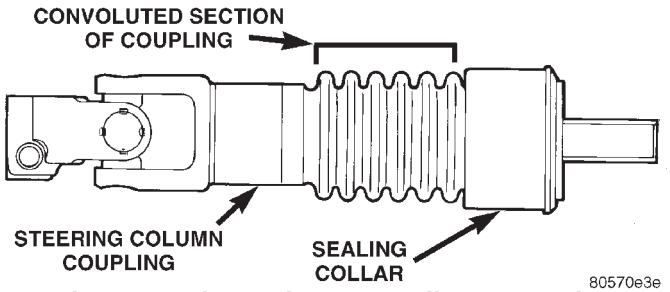

Fig. 5 Steering Column Coupling Inspection

If any of the preceding conditions exist the steering coupling **MUST** be replaced.

The steering gear must be removed from the vehicle to allow access for replacement of the steering coupling. Refer to Steering Gear Service Procedures in this group of the service manual for the required steering gear removal procedure.

(5) If steering coupling does not require replacement, install steering column coupling silencer seal (Fig. 4) back on vehicle.

(6) Ensure front wheels of vehicle are positioned straight-ahead and then align and attach steering column to steering coupling (Fig. 3). Install the coupling pinch bolt (Fig. 3). Tighten the pinch bolt nut to a torque of 28 N·m (250 in. lbs.). **Be sure to install upper to lower steering coupling pinch bolt safety pin (Fig. 3).**

REMOVAL AND INSTALLATION

STEERING COLUMN SERVICE PROCEDURE WARNINGS

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 AIR BAG SYSTEM IS A SENSITIVE, COMPLEX ELECTRO-MECHANICAL UNIT. BEFORE ATTEMPTING TO DIAGNOSE, REMOVE OR INSTALL THE AIR BAG SYSTEM COMPONENTS YOU MUST FIRST DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE. 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.

NOTE: 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

REMOVE

(1) Disconnect the negative (ground) cable from the battery and isolate cable.

(2) Before beginning removal of steering column assembly from vehicle, be sure front wheels of vehicle are in the **straight ahead** position.

(3) Remove the 4 screws attaching steering column cover, to lower instrument panel. Then remove the trim panel from the instrument panel (Fig. 6).

(4) Remove 3 screws (Fig. 7) attaching the steering column cover liner to the instrument panel. Remove the liner from the lower instrument panel.

(5) If vehicle is equipped with speed control, remove the speed control switches from the steering wheel (Fig. 8). If vehicle is not equipped with speed control, remove the trim covers from the sides of the steering wheel.

REMOVAL AND INSTALLATION (Continued)

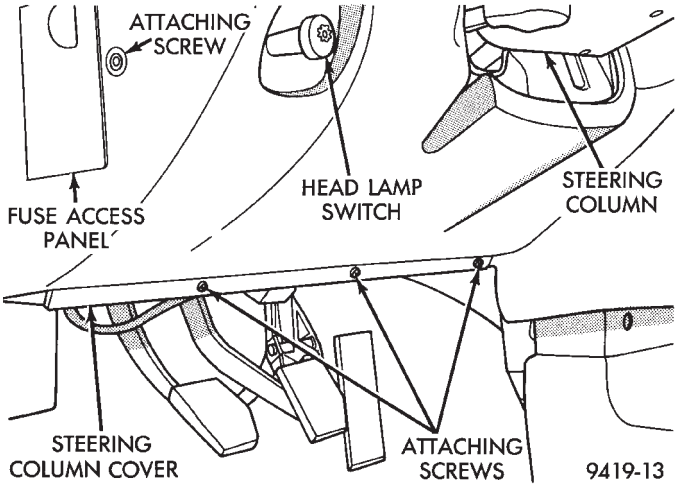

Fig. 6 Steering Column Cover

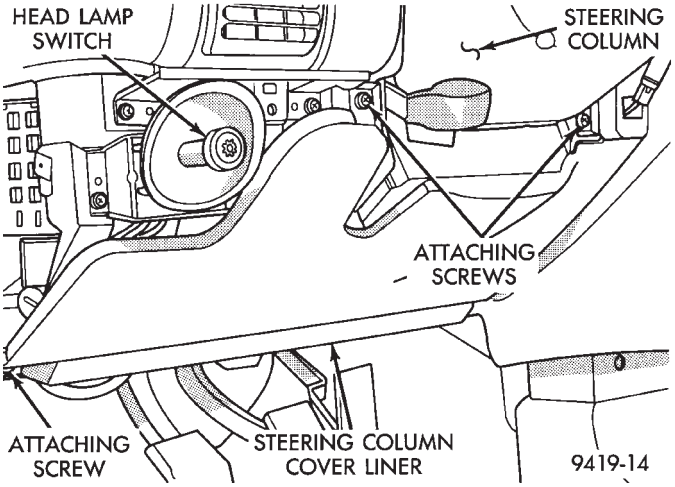

Fig. 7 Steering Column Cover Liner

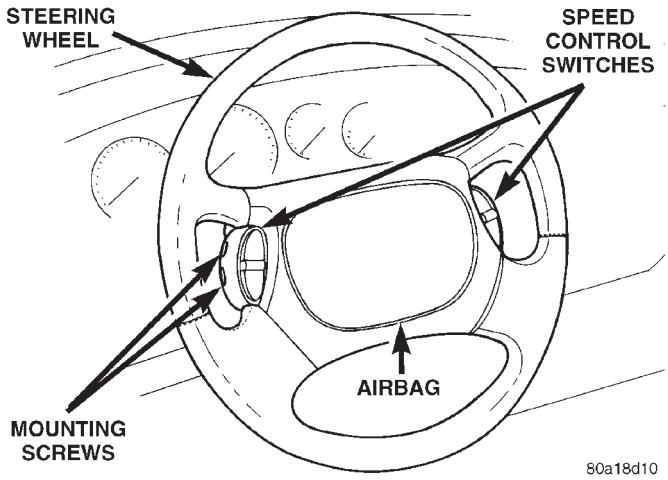

Fig. 8 Speed Control Switches

WARNING: WHEN AN UNDEPLOYED AIR BAG 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 AIR BAG REMOVAL.

(6) Remove the 2 fasteners, 1 on each side of steering wheel, attaching the air bag module to the steering wheel (Fig. 9).

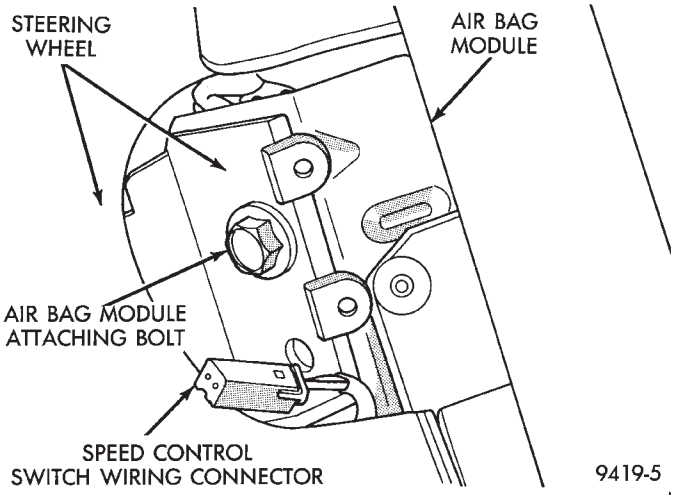

Fig. 9 Air Bag Module Mounting Bolts

WARNING: WHEN HANDLING AN UNDEPLOYED AIR BAG 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 AIR BAG MODULE. WHEN CARRYING A LIVE MODULE, THE TRIM COVER SHOULD BE POINTED AWAY FROM THE BODY TO MINIMIZE INJURY IF MODULE ACCIDENTLY DEPLOYS. IF AIR BAG 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)

(7) Remove air bag module from center of steering wheel. Then disconnect the clock spring electrical lead from the back of the air bag module (Fig. 10).

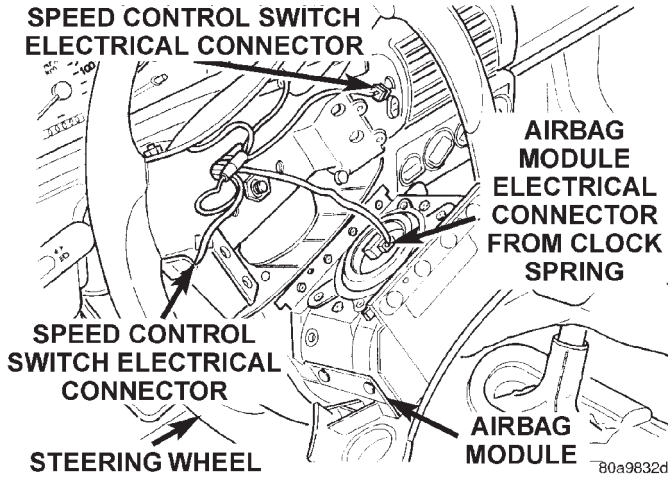

Fig. 10 Air Bag Module Electrical Connection

(8) Disconnect the wiring lead for the horn switch in the airbag module from the wiring lead coming from the clockspring (Fig. 11).

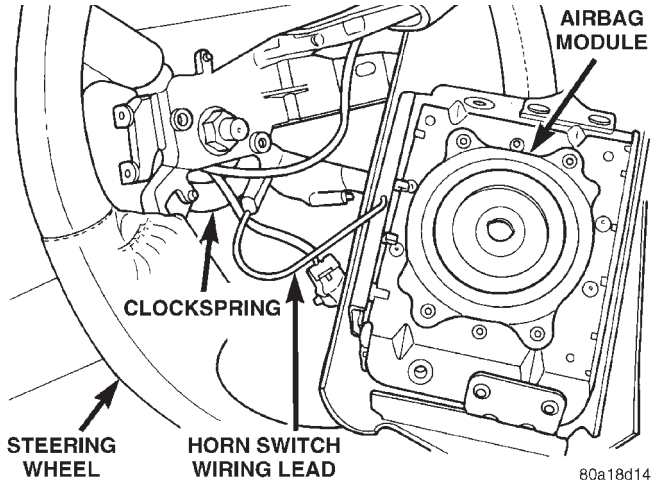

Fig. 11 Clock Spring To Horn Switch Wiring Connection

(9) Turn the lock cylinder to the **off** position and remove the key from the lock cylinder

(10) Turn the steering wheel to the left 1/2 a turn (180°) until the steering column lock is engaged (Fig. 12).

(11) Remove the steering wheel retaining nut, from the steering column shaft (Fig. 12).

CAUTION: When installing Puller, Special Tool C-3428-B on steering wheel be sure puller bolts are fully seated in threaded puller holes on steering wheel. If bolts are not fully seated in threaded holes, threads may be stripped out when puller is tightened to remove steering wheel.

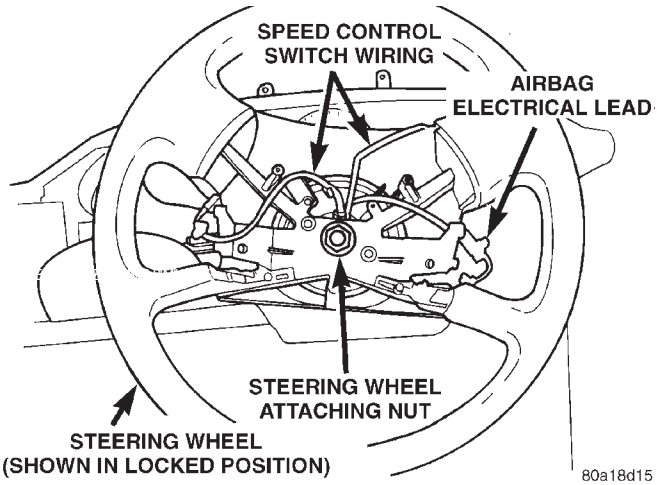

Fig. 12 Steering Wheel Attaching Nut

(12) Install Puller, Snap-On CJ2001P or an equivalent on the steering wheel (Fig. 13).

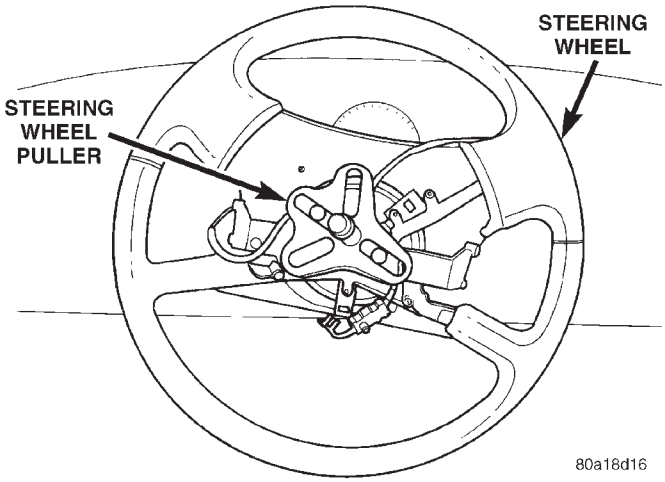

Fig. 13 Steering Wheel Puller Installed

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

(13) Remove steering wheel assembly from steering column shaft using Puller, Special Tool C-3428-B or equivalent.

(14) Remove key lock cylinder from steering column. Key lock cylinder is removed from steering column using the following procedure. Place the key lock cylinder in the Run position. Then through the hole in lower shroud, (Fig. 14) depress lock cylinder retaining tab and remove key lock cylinder.

(15) Remove the 3 screws attaching the upper and lower shroud to the steering column (Fig. 15). First remove lower shroud from steering column, then release tilt lever and tilt steering column to its lowest point. Then remove upper shroud from steering column.

REMOVAL AND INSTALLATION (Continued)

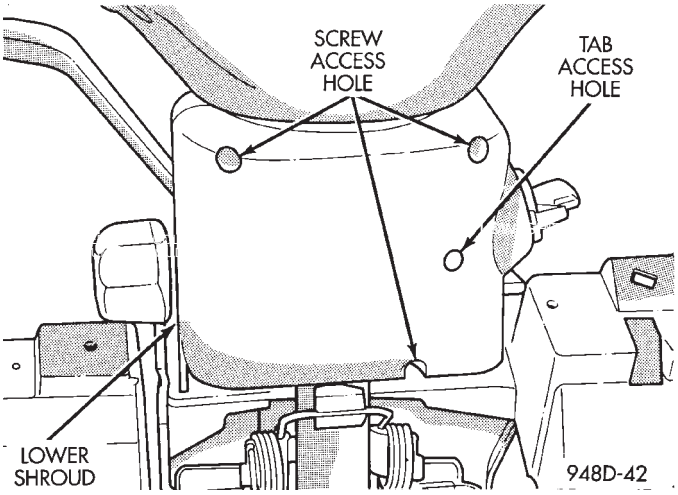

Fig. 14 Key Lock Cylinder Access Hole In Steering Column Shrouds

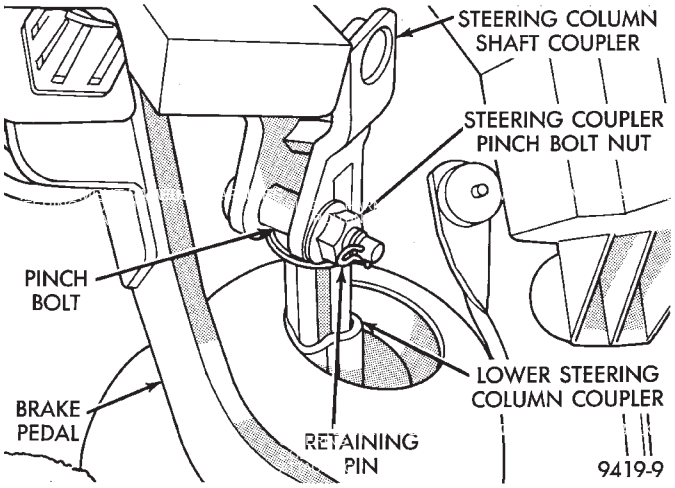

Fig. 16 Upper To Lower Steering Column Coupler Disassembly

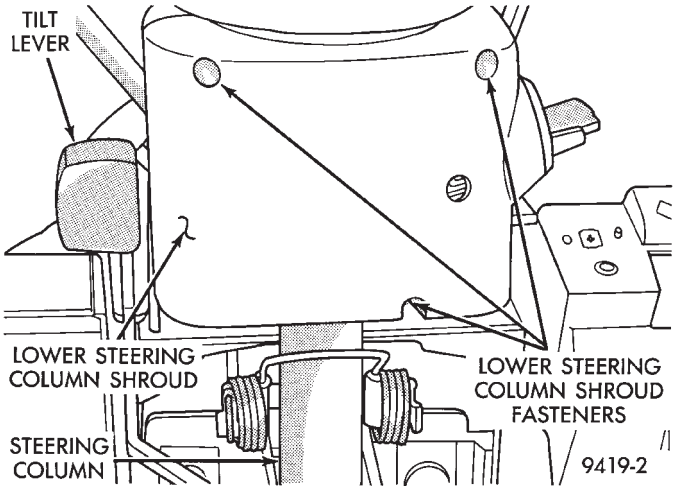

Fig. 15 Upper And Lower Steering Column Shrouds

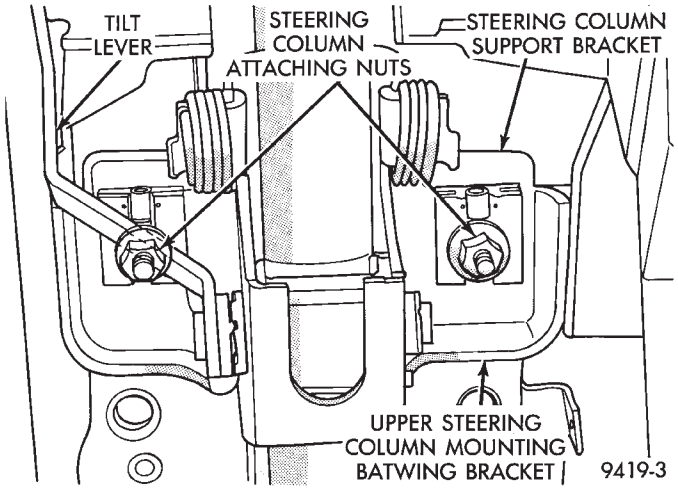

Fig. 17 Steering Column Upper Support Bracket Attaching Nuts

(16) Remove retaining pin in the upper to lower steering column coupler pinch bolt (Fig. 16).

(17) Loosen the upper to lower steering coupler pinch bolt retaining nut and remove pinch bolt (Fig. 16) from steering coupler. **(Pinch bolt nut is caged to coupler and is not removable.)** Then separate upper steering coupler from lower steering coupler shaft.

(18) Remove the 4 nuts attaching the lower mounting bracket of the steering column to the boby mounting bracket for the steeing column.

(19) Remove the 2 steering column assembly upper bat wing bracket to support bracket nuts (Fig. 17).

(20) Lower steering column assembly in the steering column access opening of the lower instrument panel.

(21) Remove routing clip (Fig. 18) holding wiring harness to jacket of steering column. Then remove wiring harness connectors from the multi- function switch and the windshield wiper switch (Fig. 18).

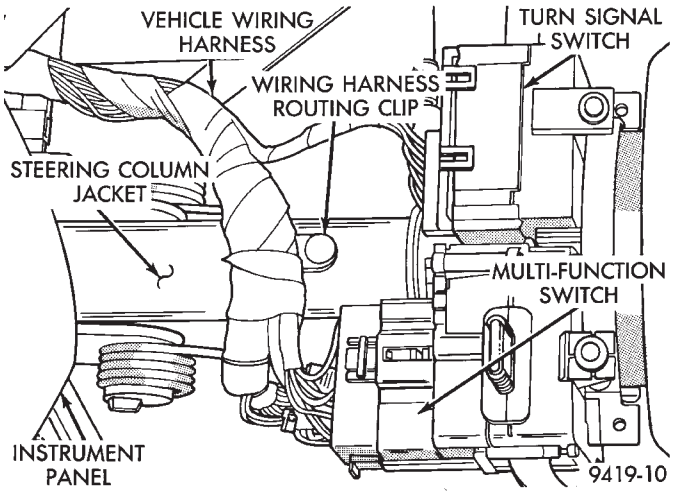

Fig. 18 Steering Column Wiring Connections

REMOVAL AND INSTALLATION (Continued)

(22) Remove the vehicle wiring harness connectors from the ignition switch and clock spring (Fig. 19).

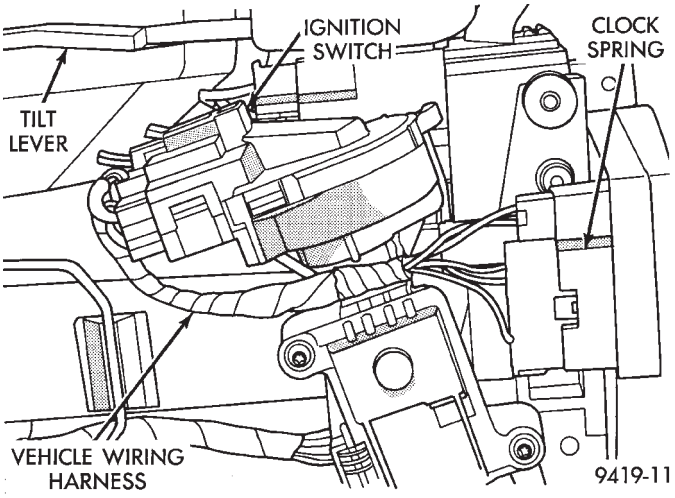

Fig. 19 Steering Column Wiring Connections

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

INSTALL

(1) Install steering column into steering column access opening in lower instrument panel.

(2) Install the vehicle wiring harness connectors, into the ignition switch and clock spring assembly (Fig. 19).

(3) Install vehicle wiring harness connectors into multi-function switch and turn signal switch (Fig. 18) on steering column assembly. Install routing clip (Fig. 18) holding wiring harness to jacket of steering column.

(4) Install the studs in the steering column support bracket, into the slots in the plastic capsules of the upper mounting bracket of the steering column (Fig. 17). Partially install the 2 upper steering column assembly mounting bracket to support bracket attaching nuts (Fig. 17). **Do not tighten the 2 mounting nuts at this time.**

(5) Align the bolt holes in the steering column lower mounting bracket with the threaded holes in the boby mounting bracket for the steeing column. Install and loosely tighten the steering column lower mounting bracket bolts.

(6) Install the upper and lower steering column shrouds onto the lock housing of the steering column assembly. Install and securely tighten the 3 upper to lower steering column shroud to lock housing attaching screws (Fig. 15).

(7) Be sure both breakaway capsules are still fully seated in the slots of the upper steering column mounting bracket. Equally tighten both steering column mounting nuts, until upper steering column mounting bracket is seated against support bracket. Then tighten the 2 steering column upper mounting bracket nuts to a torque of 17 N·m (150 in. lbs.).

(8) Tighten the steering column lower mounting bracket nuts (2) to a torque of 17 N·m (150 in. lbs.).

(9) Assemble the steering column flex coupler to the intermediate steering coupler (Fig. 16). Install the steering coupler pinch bolt. Torque the pinch bolt nut to 28 N·m (250 in. lbs.). **Be sure to install upper to lower steering coupler pinch bolt retaining pin (Fig. 16).**

(10) Install the lower instrument panel steering column cover liner onto lower instrument panel. Install and securely tighten the 3 liner to instrument panel attaching screws (Fig. 7).

(11) Install lower instrument panel steering column cover (Fig. 6) on lower instrument panel. Install and securely tighten the 4 screws (Fig. 6) attaching steering column cover, to lower instrument panel.

CAUTION: Clock spring centering procedure MUST be performed prior to installing steering wheel assembly. If clock spring is not centered it may be overextended, causing clock spring assembly to become inoperative.

(12) 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 travel, rotate the rotor 2 full turns and an additional half turn in the counterclockwise direction. (The horn wire should end up at the top and the squib wire at the bottom.) 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.

REMOVAL AND INSTALLATION (Continued)

(13) Feed clock spring wiring leads through hole in steering wheel (Fig. 20). 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.

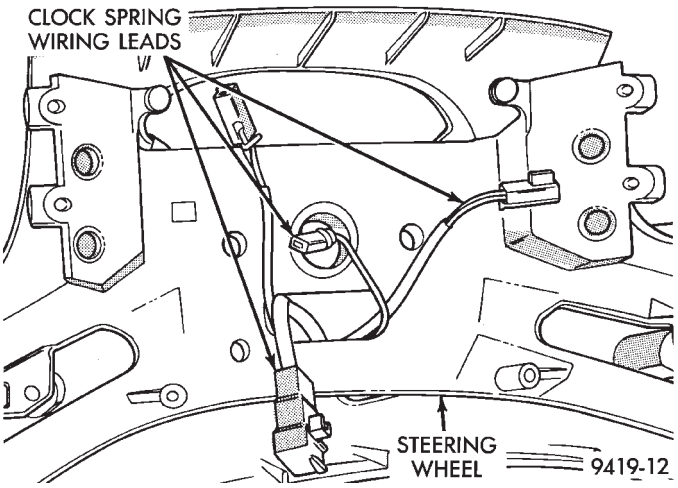

Fig. 20 Steering Wheel Installation

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

(15) Connect the clockspring electrical leads to components such as horn switches and speed control switches located in the steering wheel (Fig. 11).

(16) Install air bag electrical lead from clock spring, into connector on back of air bag module (Fig. 10). **Be sure electrical connector from clockspring is securely latched into air bag module connector.**

CAUTION: The fasteners, screws, and bolts, originally used for the air bag components are specifically designed for the air bag 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.

(17) Install air bag module into center of steering wheel. Align air bag module mounting holes with bolt holes in steering wheel. Install **only the 2 original or correct replacement** air bag module attaching bolts (Fig. 9). Torque the 2 air bag module attaching bolts to 10 N·m (90 in. lbs.).

(18) Install key lock cylinder into lock housing. Key lock cylinder is installed by positioning key cylinder in the run position so retaining tab can be depressed and the pushing key cylinder into lock hosing until retaining tab locks into key lock cylinder.

(19) Reconnect ground cable to Negative post of the battery. **When reconnecting battery on a vehicle that has had the air bag module removed, the following procedure should be used.**

- Remove forward console or cover as necessary.
- Connect DRB II to ASDM diagnostic 6-way connector, located at right side of the ASDM module.
- Turn ignition key to ON position. Exit vehicle with the DRB II. Install the latest version of the proper diagnostic cartridge into the DRB II.
- Ensuring that their are no occupants in the vehicle, connect negative cable to negative post of the battery.
- Using the DRB II read and record active fault codes. Also read and record any stored fault codes. Refer to the Passive Restraint 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 air bag lamp. It should go on for six to eight seconds, then go out. This will indicate that the air bag system is functioning normally.

(20) **If air bag warning lamp fails to light, blinks on and off or goes on and stays on, there is an air bag system malfunction.** Refer to the Passive Restraint Diagnostic Test Manual to diagnose the system malfunction.

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

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

SPECIFICATIONS

STEERING COLUMN FASTENER TORQUE SPECIFICATIONS

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

STEERING

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POWER STEERING PUMP

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SERVICE PROCEDURES

POWER STEERING SYSTEM FLUID LEVEL CHECK

WARNING: FLUID LEVEL SHOULD BE CHECKED WITH ENGINE OFF TO PREVENT INJURY FROM MOVING PARTS. DO NOT USE AUTOMATIC TRANSMISSION FLUID IN THE POWER STEERING SYSTEM. DO NOT OVERFILL THE POWER STEERING SYSTEM.

Wipe reservoir filler cap free of dirt (Fig. 1). Then check fluid level. The dipstick should indicate COLD when fluid is at normal ambient temperature, approximately 21°C to 27°C (70°F to 80°F). In all pumps add fluid as necessary, use only **Mopar Power Steering Fluid, or equivalent. DO NOT USE ANY TYPE OF AUTOMATIC TRANSMISSION FLUID.**

REMOVAL AND INSTALLATION

POWER STEERING PRESSURE SWITCH

A power steering fluid pressure switch is used to improve the vehicle's idle quality. The power steering fluid pressure switch improves vehicle idle quality, by controlling engine idle speed when required.

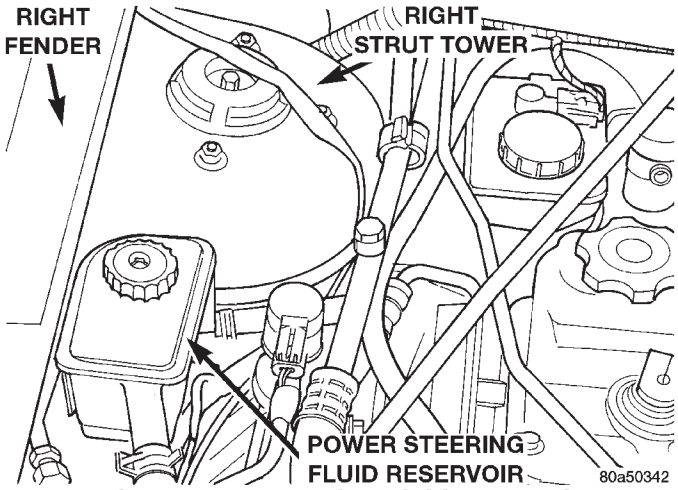


Fig. 1 Power Steering Fluid Reservoir

The pressure switch functions by signaling the power train 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 is increased. This increase in engine idle speed compensates for the additional load, thus maintaining the require engine idle speed and idle quality.

REMOVAL AND INSTALLATION (Continued)

The pressure switch (Fig. 2) is mounted directly to the power steering gear on vehicle's requiring its usage.

REMOVE

CAUTION: When removing and installing the power steering pressure switch, the use of a 7/8 inch deep well socket is required. The deep well socket will prevent damage to the plastic, electrical connector area, of the power steering pressure switch.

(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. 2) on back of power steering gear.

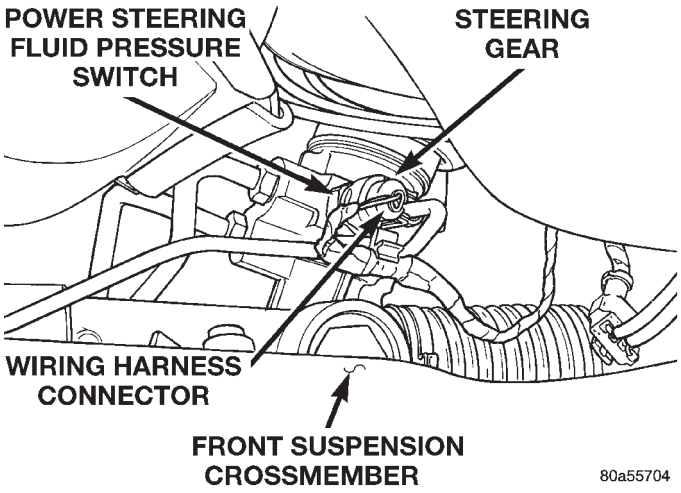


Fig. 2 Power Steering Pressure Switch Location On Steering Gear

(4) Remove wiring harness connector (Fig. 2), from power steering pressure switch.
(5) Remove power steering pressure switch, from 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 torque power steering pressure switch to 8 N·m (70 in. lbs.).
(2) Install vehicle wiring harness connector (Fig. 2) 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.

POWER STEERING FLUID PRESSURE HOSE

CAUTION: Cap all open ends of hoses, power steering pump fittings and steering gear ports to prevent entry of foreign material into the components.

WARNING: POWER STEERING OIL, 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.

For part reference and part location on the vehicle being serviced, refer to the following figure numbers. These figures show the hose bracket locations, hose routings and fitting locations. Use these figure numbers when referring to the removal or installation procedures for the power steering hoses listed below.

REMOVE

(1) Raise vehicle.
(2) Disconnect power steering pressure hose (Fig. 3) at power steering gear. Drain power steering fluid from power steering pump and hose through open end of hose.

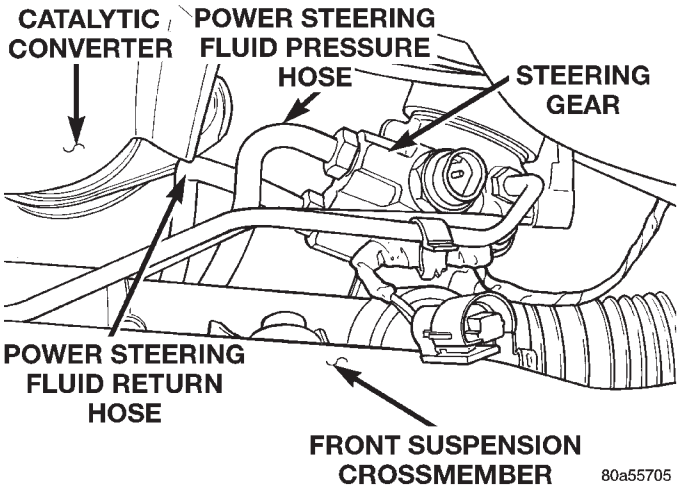


Fig. 3 Power Steering Pressure Hose At Steering Gear

REMOVAL AND INSTALLATION (Continued)

(3) Remove power steering pressure hose from routing clip on generator shield (Fig. 4).

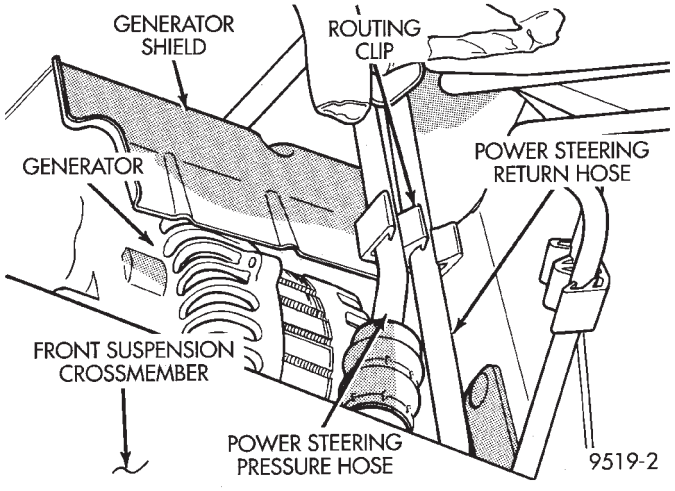


Fig. 4 Power Steering Pressure Hose Routing

(4) Lower vehicle.

(5) Remove bolt, attaching power steering pressure hose routing clip, to generator shield (Fig. 5).

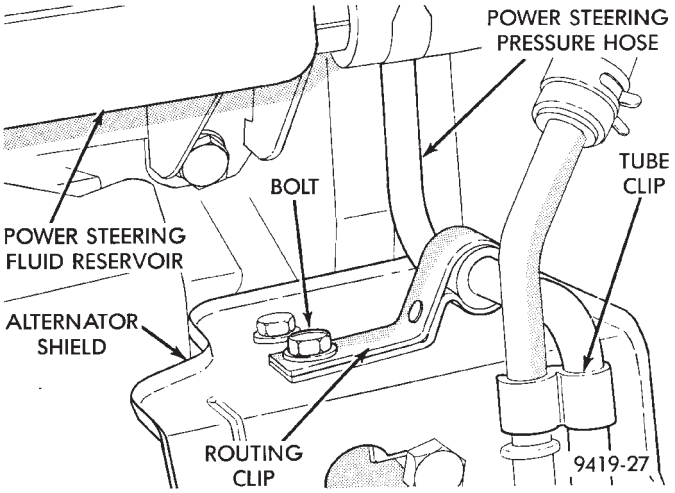


Fig. 5 Power Steering Hose Attachment To Generator Shield

(6) Remove Banjo bolt, and power steering pressure hose from pressure fitting on power steering pump (Fig. 6).

(7) Power steering fluid pressure hose is removed from the vehicle from the top of the engine compartment.

(8) Discard all used O-rings located at ends of power steering pressure hose and Banjo bolt.

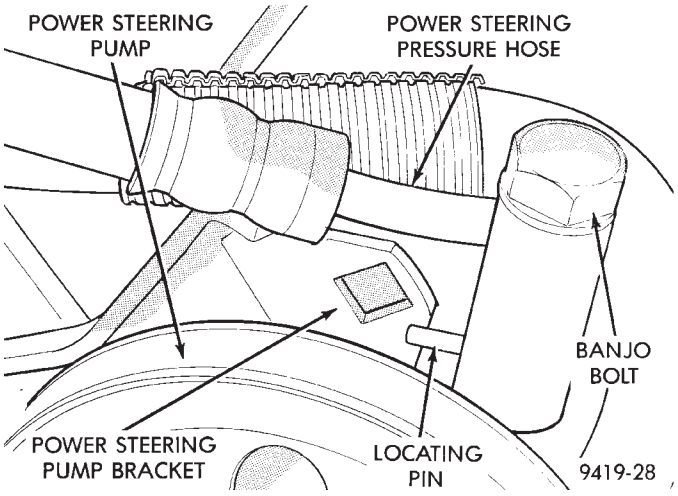


Fig. 6 Pressure Hose Attachment To Power Steering Pump

INSTALL

(1) Install power steering pressure hose in vehicle from top of engine compartment.

(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-ring on end of power steering pressure hose banjo fitting (Fig. 7).

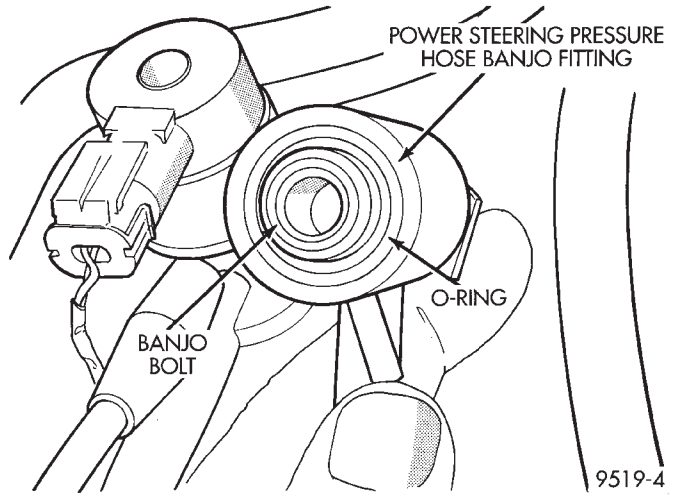


Fig. 7 O-ring Installed On Power Steering Hose Banjo Fitting

REMOVAL AND INSTALLATION (Continued)

(4) Install a new O-ring (Fig. 8) on power steering pressure hose banjo fitting bolt.

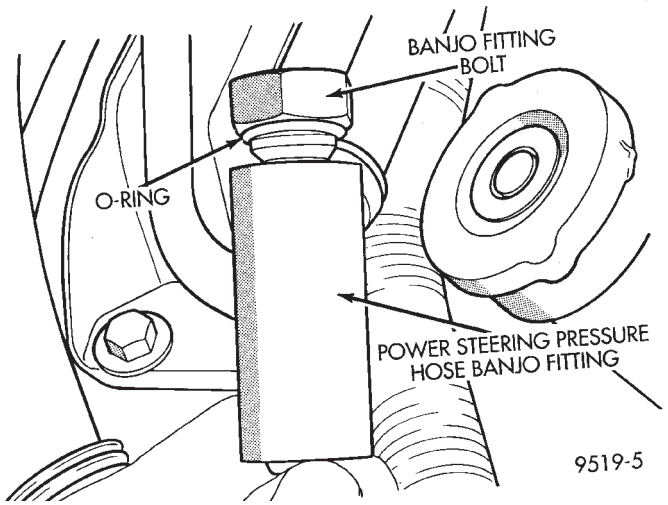


Fig. 8 O-ring Installed On Banjo Fitting Bolt

(5) Lubricate both O-rings using fresh clean power steering fluid.

(6) Install banjo bolt into the power steering pressure hose banjo fitting (Fig. 8).

(7) Attach power steering pressure hose to outlet fitting on power steering pump (Fig. 6). **Do not tighten or torque pressure fitting Banjo bolt at this time.**

(8) Correctly route power steering pressure hose avoiding tight bends or kinking of the hose. Install power steering pressure hose to generator shield routing clip attaching screw (Fig. 5) **but do not tighten at this time.**

(9) Raise vehicle.

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

(10) 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 (Fig. 3). **Tighten and torque tube nut after routing bracket is installed, correctly positioning hoses in vehicle.**

(11) Install power steering pressure hose in routing clip on generator shield (Fig. 4).

(12) Torque power steering pressure hose to steering gear tube nut to 34 N·m (25 ft. lbs.).

(13) Lower Vehicle.

(14) Position locating pin on power steering pressure hose banjo fitting so it is against power steering pump mounting bracket (Fig. 6). While holding locating pin against power steering pump bracket, torque pump end Banjo bolt to 34 N·m (25 ft. lbs.).

(15) Securely tighten bolt attaching power steering pressure hose bracket to generator shield.

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

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

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

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

(20) Add power steering fluid if necessary.

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

(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.

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

POWER STEERING FLUID RETURN HOSE

CAUTION: Cap all open ends of hoses, power steering pump fittings and steering gear ports to prevent entry of foreign material into the components.

WARNING: POWER STEERING OIL, 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.

REMOVE

(1) Remove fill cap from power steering fluid reservoir.

(2) Raise vehicle.

(3) Remove hose clamp, attaching return hose to steel tube at power steering gear (Fig. 9). Let power steering fluid, drain from return hose and power steering fluid reservoir, until reservoir is empty.

(4) Remove power steering return hose from routing clip on generator shield (Fig. 10).

(5) Lower vehicle.

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 the reservoir.

REMOVAL AND INSTALLATION (Continued)

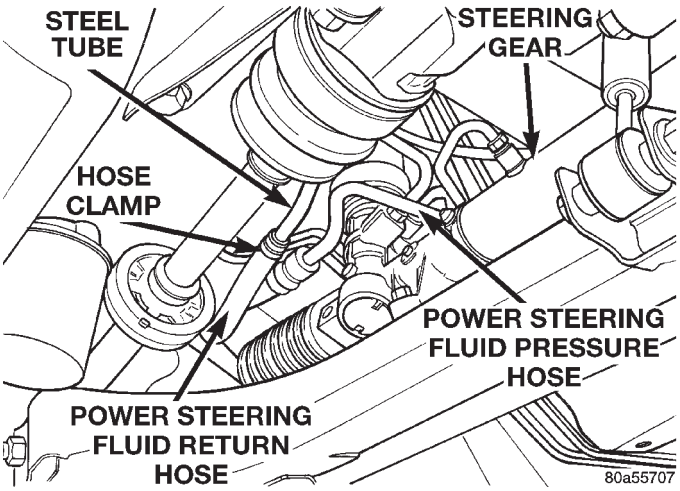


Fig. 9 Power Steering Return Hose At Steering Gear

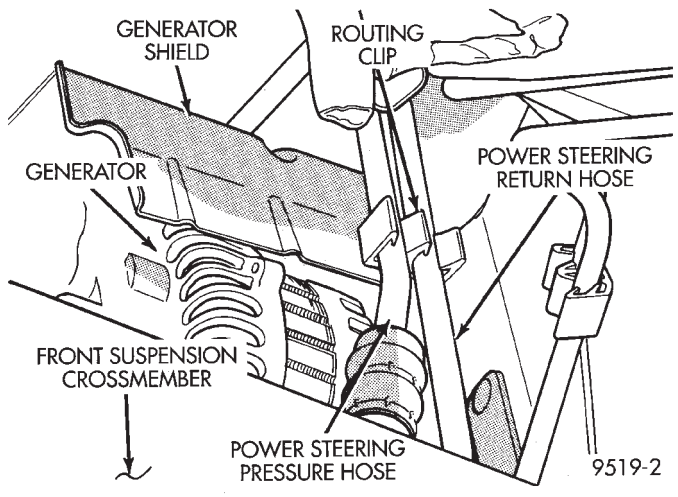


Fig. 10 Power Steering Hose Routing Clip At Generator Shield

(6) Remove hose clamp, attaching power steering return hose to power steering fluid reservoir (Fig. 11). Then remove power steering return hose from power steering fluid reservoir.

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

INSTALL

(1) Install power steering return hose on vehicle. Power steering return hose is installed from the top of the vehicles engine compartment.

CAUTION: Care must be used when installing power steering fluid return 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.

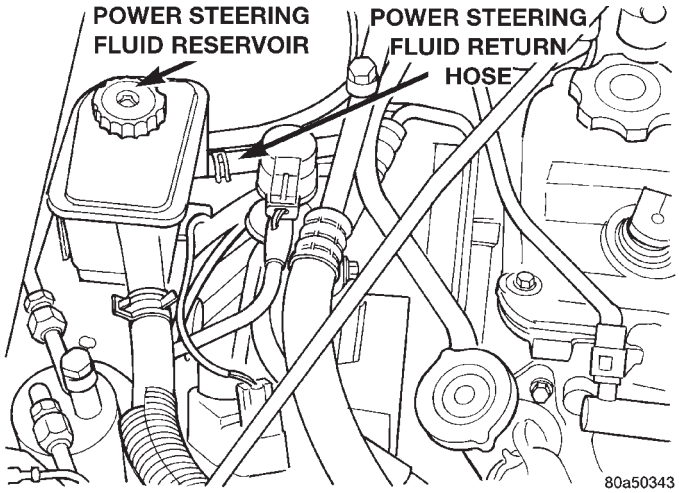


Fig. 11 Power Steering Return Hose At Reservoir

(2) 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. 11). **Be sure hose clamp is installed on return hose past upset bead on power steering fluid reservoir.**

(3) Raise vehicle.

(4) Install power steering return hose in routing clip on rear of generator shield (Fig. 10).

(5) Install power steering return hose on steel tube at power steering gear (Fig. 9). Install hose clamp on power steering return hose at power steering gear (Fig. 9). **Be sure hose clamp is installed on return hose past upset bead on steel tube at power gear.**

(6) Lower vehicle.

(7) Add power steering fluid to the reservoir until the fluid level is at the full cold mark on the dipstick.

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

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

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

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

(12) Add power steering fluid if necessary.

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

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

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

(16) Check for leaks at all hose connections.

REMOVAL AND INSTALLATION (Continued)

POWER STEERING FLUID SUPPLY HOSE RESERVOIR TO POWER STEERING PUMP

WARNING: POWER STEERING OIL, 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.

REMOVE

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.

(1) Remove fill cap from power steering fluid reservoir.

(2) Raise vehicle.

(3) Remove hose clamp, attaching return hose to steel tube at power steering gear (Fig. 12). Let power steering fluid, drain from return hose and power steering fluid reservoir, until reservoir is empty.

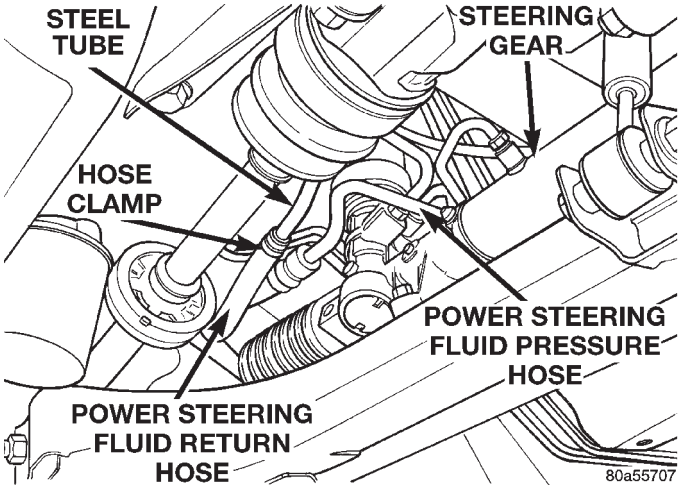


Fig. 12 Power Steering Return Hose At Steering Gear

(4) Install power steering return hose on steel tube at power steering gear (Fig. 12). Install hose clamp on power steering return hose at power steering gear (Fig. 12). **Be sure hose clamp is installed on return hose past upset bead on steel tube at power gear.**

(5) Lower vehicle.

(6) Remove hose clamp, attaching power steering fluid supply hose to power steering fluid reservoir (Fig. 13). Then remove power steering fluid supply hose from power steering fluid reservoir.

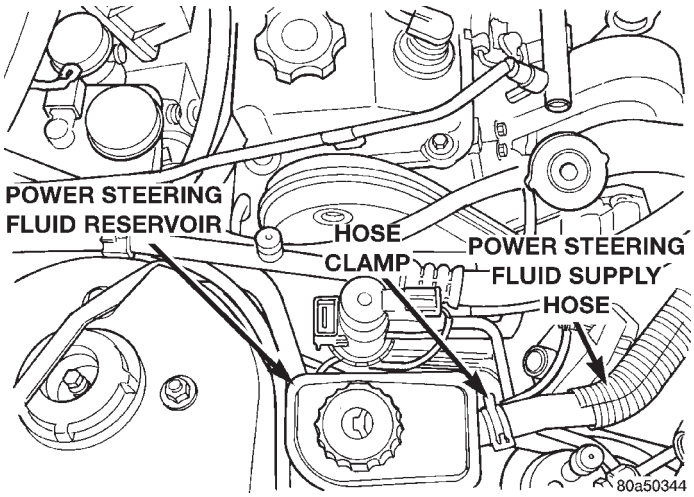


Fig. 13 Power Steering Fluid Supply Hose At Reservoir

(7) Remove hose clamp, attaching power steering fluid supply hose to power steering pump (Fig. 14). Then remove power steering fluid supply hose from power steering pump fitting.

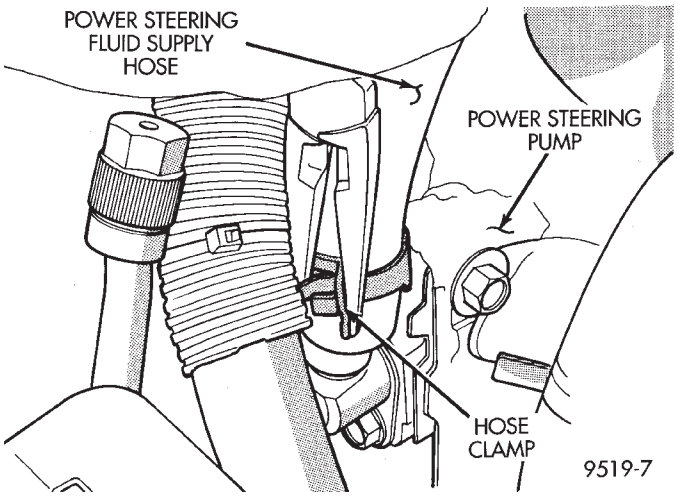


Fig. 14 Power Steering Fluid Supply Hose At Power Steering Pump

(8) Remove power steering fluid supply hose from vehicle.

INSTALL

(1) Install power steering fluid supply hose on power steering pump fitting. Install hose clamp on power steering fluid supply hose at power steering pump fitting (Fig. 14). **Be sure hose clamp is installed on power steering fluid supply hose past upset bead on power steering pump fitting.**

(2) Correctly route the power steering fluid supply hose from the power steering pump to power steering fluid reservoir.

REMOVAL AND INSTALLATION (Continued)

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 the power steering fluid supply hose on power steering fluid reservoir fitting. Install hose clamp on power steering fluid supply 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.**

(4) Add power steering fluid to the reservoir until the fluid level is at the "Full Cold" mark on the dipstick.

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

(6) If necessary, add power steering fluid to the reservoir. Repeat the above procedure until the fluid level in the reservoir 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 several times, lightly contacting the wheel stops. Then turn the engine off.

(9) If necessary, add power steering fluid to the reservoir.

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

(11) Stop the engine. Check the fluid level in the reservoir 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) Check all hose connections for leaks.

POWER STEERING PUMP

WARNING: POWER STEERING OIL, 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.

The front mounting bracket for the power steering pump must be removed with the power steering pump and then removed from the power steering pump after removing the pulley.

REMOVE

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

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

(3) Raise vehicle.

(4) Remove hose clamp, attaching power steering fluid return hose to steel tube at power steering gear (Fig. 15). Let power steering fluid, drain from power steering fluid reservoir, until reservoir is empty.

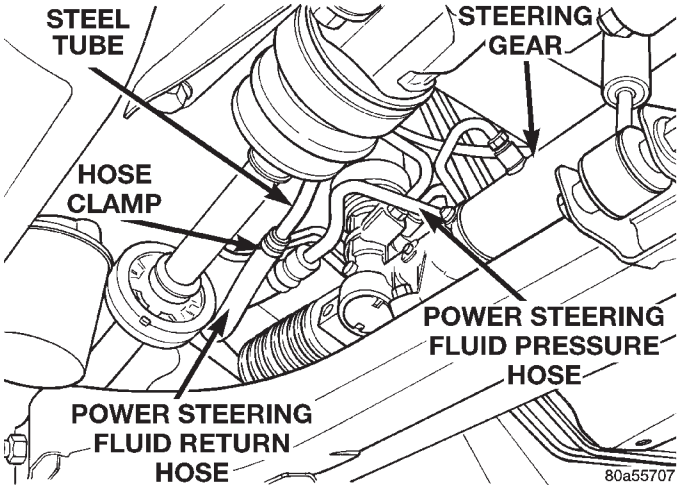


Fig. 15 Power Steering Return Hose At Steering Gear

(5) Install power steering return hose on steel tube at power steering gear (Fig. 15). Install hose clamp on power steering return hose at power steering gear (Fig. 15). **Be sure hose clamp is installed on return hose past the upset bead on steel tube.**

(6) Lower vehicle.

(7) Remove Banjo Bolt and power steering fluid pressure hose from power steering pump (Fig. 16).

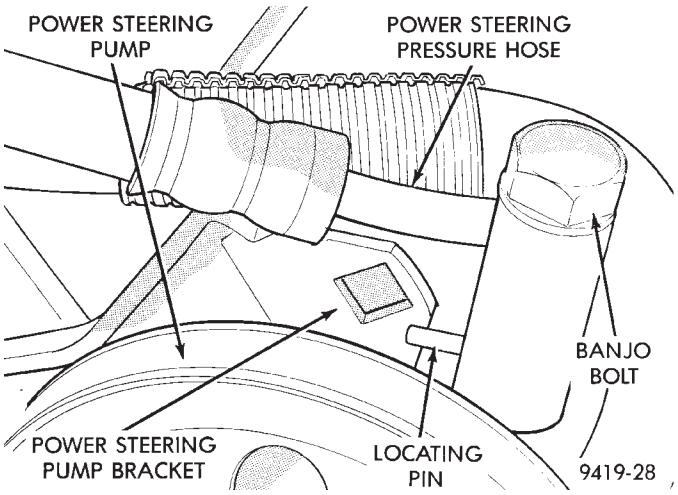


Fig. 16 Power Steering Hose Attachment To Power Steering Pump

(8) Discard the used O-rings on the power steering pressure hose Banjo fitting and Banjo bolt.

REMOVAL AND INSTALLATION (Continued)

(9) Remove clamp attaching the power steering fluid supply hose to the suction fitting on the power steering pump (Fig. 17). Remove the power steering fluid supply hose from the power steering pump fitting.

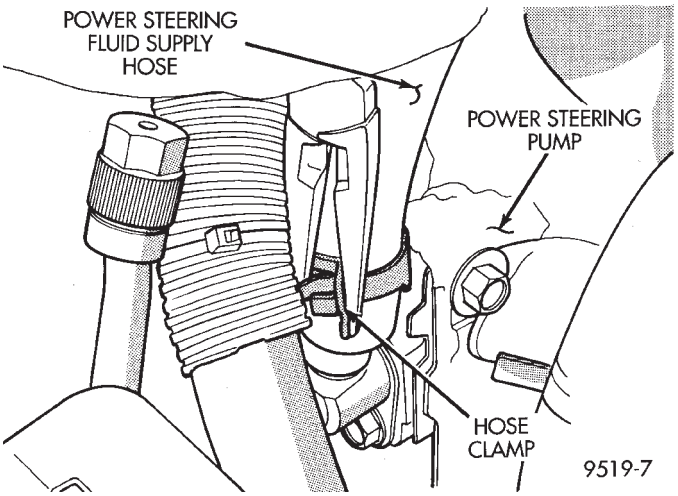


Fig. 17 Power Steering Fluid Supply Hose At Power Steering Pump

(10) Remove the 2 bolts mounting the back of the power steering pump to the cast bracket (Fig. 18).

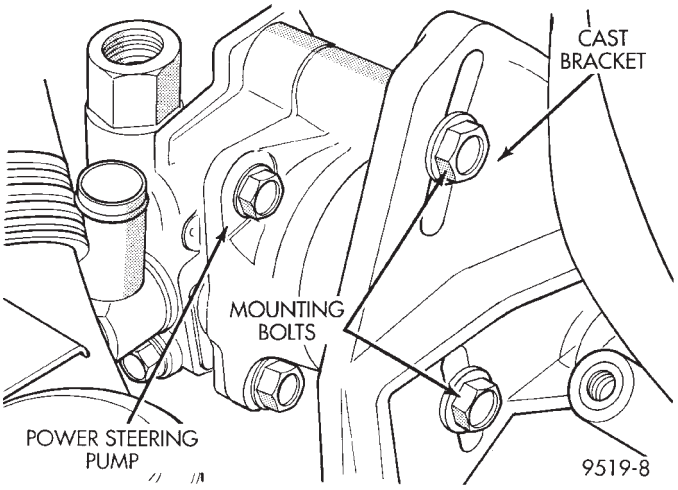


Fig. 18 Power Steering Pump Mounting Bolts (Rear)

NOTE: The power steering pump front mounting bracket is slotted at the bolt attaching it to the front engine mount (Fig. 19). This bolt only needs to be loosened to remove the mounting bracket from the engine.

(11) Loosen bolt (Fig. 19) attaching the power steering pump front mounting bracket to the front engine mount. The bolt only needs to be loosened far enough to slide the bracket out from under the bolt.

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

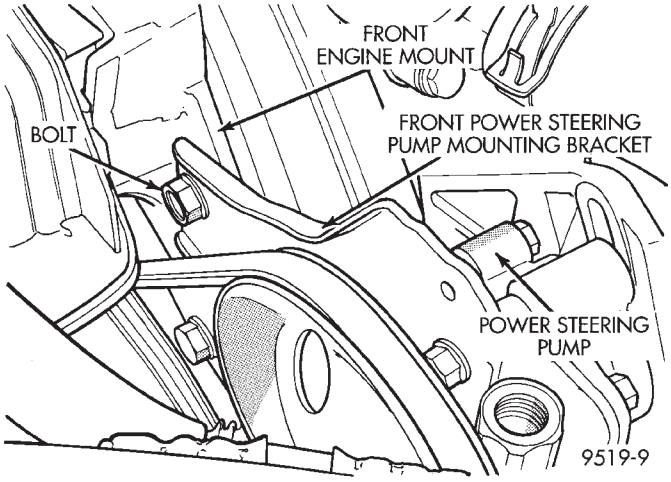


Fig. 19 Power Steering Pump Front Mounting Bracket Bolt

(13) Remove power steering pump and front mounting bracket as an assembly from the engine (Fig. 20).

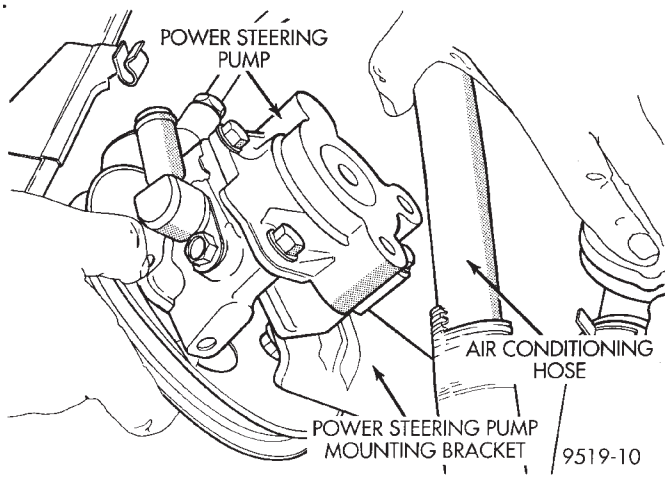


Fig. 20 Removing Power Steering Pump And Bracket

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

INSTALL

(1) Install power steering pump and mounting bracket as an assembly (Fig. 20) back on the engine using reverse of removal procedure.

(2) Slide front power steering pump bracket between bracket mounting bolt and front engine mount (Fig. 19). **Be sure washer on bolt is between the head of the bolt and bracket and does not get trapped between bracket and engine mount.**

(3) Install the 2 bolts mounting the rear of the power steering pump to the cast mounting bracket (Fig. 18). **Do not tighten bolts at this time.**

REMOVAL AND INSTALLATION (Continued)

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

(5) Install a 1/2 in. breaker bar in the square hole in the front power steering pump mounting bracket (Fig. 21). Then rotate pump in 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 torque the 2 bolts at the power steering pump cast mounting bracket (Fig. 18) to 54 N·m (40 ft. lbs.). Then torque the front power steering pump mounting bracket bolt (Fig. 19) to 54 N·m (40 ft. lbs.).

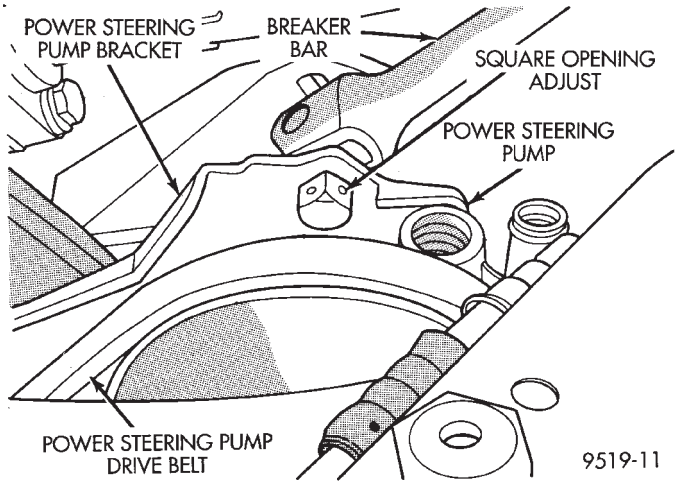


Fig. 21 Setting Power Steering Pump Drive Belt Tension

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

(7) Install power steering fluid supply hose on suction fitting of power steering pump (Fig. 17). Install hose clamp on hose. **Be sure hose clamp is installed on hose past upset bead on power steering pump suction fitting.**

(8) Install a new O-ring on the end of the power steering pressure hose banjo fitting (Fig. 22).

(9) Install a new O-ring (Fig. 23) on the Banjo Bolt for the power steering fluid pressure hose banjo fitting.

(10) Lubricate both O-rings using fresh clean power steering fluid.

(11) Install banjo bolt into the power steering pressure hose banjo fitting.

(12) Attach power steering pressure hose on outlet fitting of the power steering pump (Fig. 16).

(13) Position locating pin on power steering pressure hose banjo fitting so it is against power steering pump mounting bracket (Fig. 16). While holding locating pin against power steering pump bracket, torque pump end Banjo bolt to 34 N·m (25 ft. lbs.).

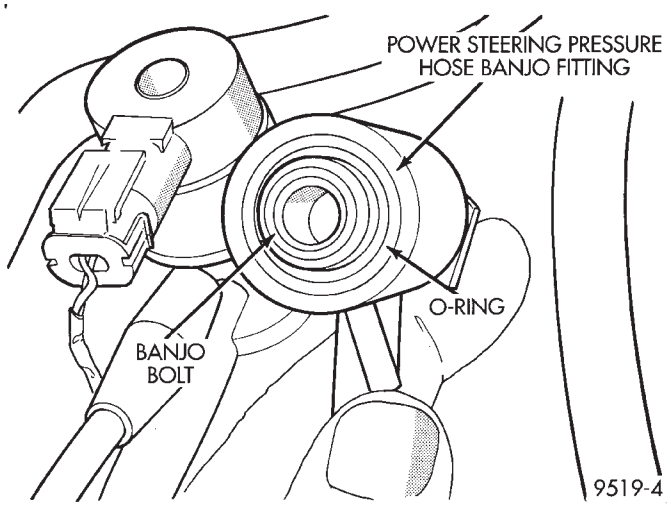


Fig. 22 O-Ring Installed On Power Steering Hose Banjo Fitting

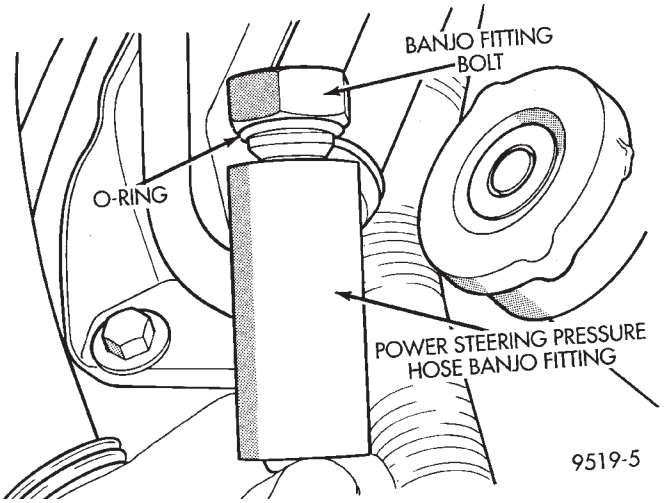


Fig. 23 O-Ring Installed On Banjo Fitting Bolt

(14) Install negative cable on battery.

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

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

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

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

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

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

(20) Add power steering fluid if necessary.

REMOVAL AND INSTALLATION (Continued)

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

(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.

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

POWER STEERING FLUID RESERVOIR

REMOVE

(1) Remove the battery cable from the negative (-) terminal on the battery.

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

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

(4) Remove hose clamp, attaching return hose to steel tube at power steering gear (Fig. 24). Let power steering fluid drain through return hose until power steering fluid reservoir is empty.

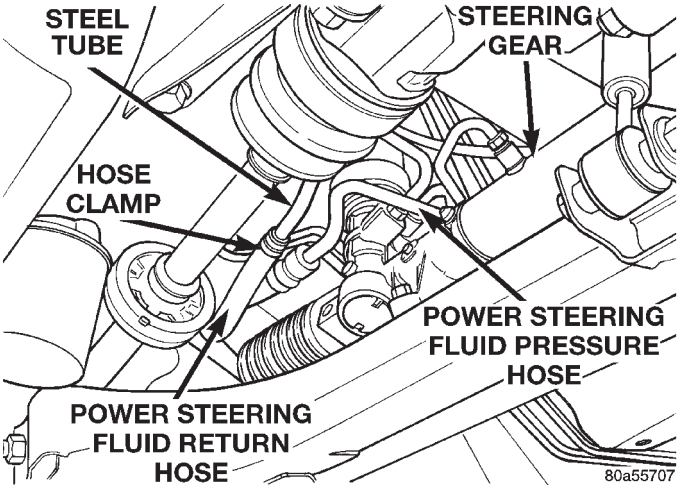


Fig. 24 Power Steering Return Hose At Steering Gear

(5) Install power steering return hose on the steel tube at the power steering gear (Fig. 24). Install hose clamp on power steering return hose at power steering gear (Fig. 24). **Be sure hose clamp is installed on return hose past the upset bead on steel tube.**

(6) 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.

(7) Remove the power steering fluid, return and supply hose, from the power steering fluid reservoir (Fig. 25).

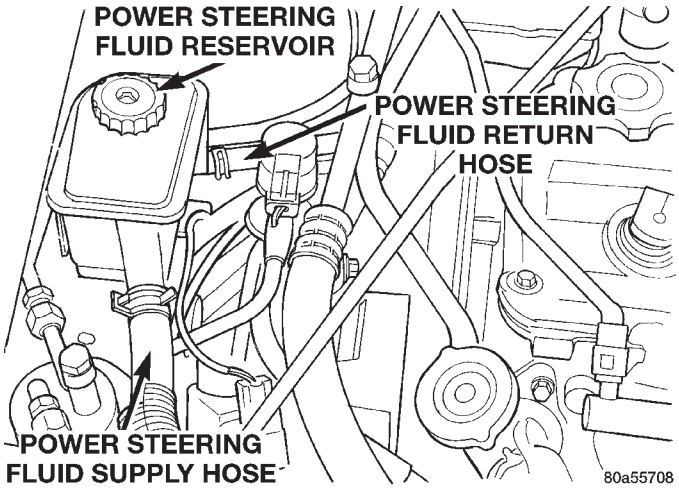


Fig. 25 Power Steering Fluid Hoses At Reservoir

(8) Remove the power steering fluid reservoir from the mounting bracket. Reservoir is removed from bracket by lifting the reservoir straight up out of the bracket.

(9) If removal of the mounting bracket is required, remove the bolts attaching it to the inner fender and remove from vehicle.

INSTALL

(1) If power steering fluid reservoir was removed, install on inner fender. Install and securely tighten the bracket mounting bolts.

(2) Install power steering fluid reservoir on mounting bracket using the reverse procedure of removal.

(3) Install the power steering fluid return and supply hose, on the power steering fluid reservoir fittings (Fig. 25). **Be sure both hose clamps are installed on hoses past the upset bead on the power steering reservoir fittings.**

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

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

(6) Add additional power steering fluid as necessary to bring level up to the full cold mark on the dipstick. Repeat the above procedure until the fluid level remains constant after running the engine.

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

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

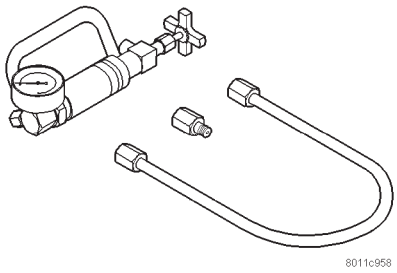
(9) Add power steering fluid if necessary.

REMOVAL AND INSTALLATION (Continued)

(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.

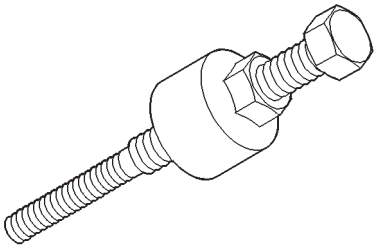
(12) If the fluid is extremely foamy, allow the vehicle to stand a few minutes and repeat the above procedure.



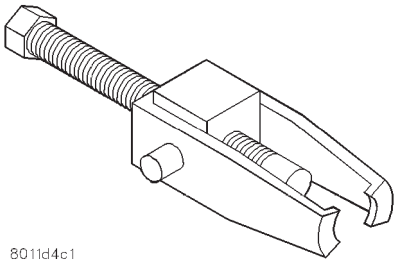
P/S System Analyzer 6815

SPECIAL TOOLS

POWER STEERING PUMP



Installer C-4063B



Puller C-4333

STEERING GEAR

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DESCRIPTION AND OPERATION

POWER STEERING GEAR

NOTE: The power steering gear and front suspension crossmember used on the Right Hand Drive and Left Hand Drive versions of this vehicle are unique to the vehicle they are used on. If a steering gear and/or front suspension crossmember needs to be replaced, be sure to verify by part number listed in the Mopar Parts Catalog that the correct replacement part for the vehicle being serviced is installed.

The power steering system used on this vehicle consists of these four major components. Power Steering Gear (Fig. 1), Power Steering Pump, Pressure Hose, and Return Hose. 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 oil 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 oil behind the integral rack piston, which, in

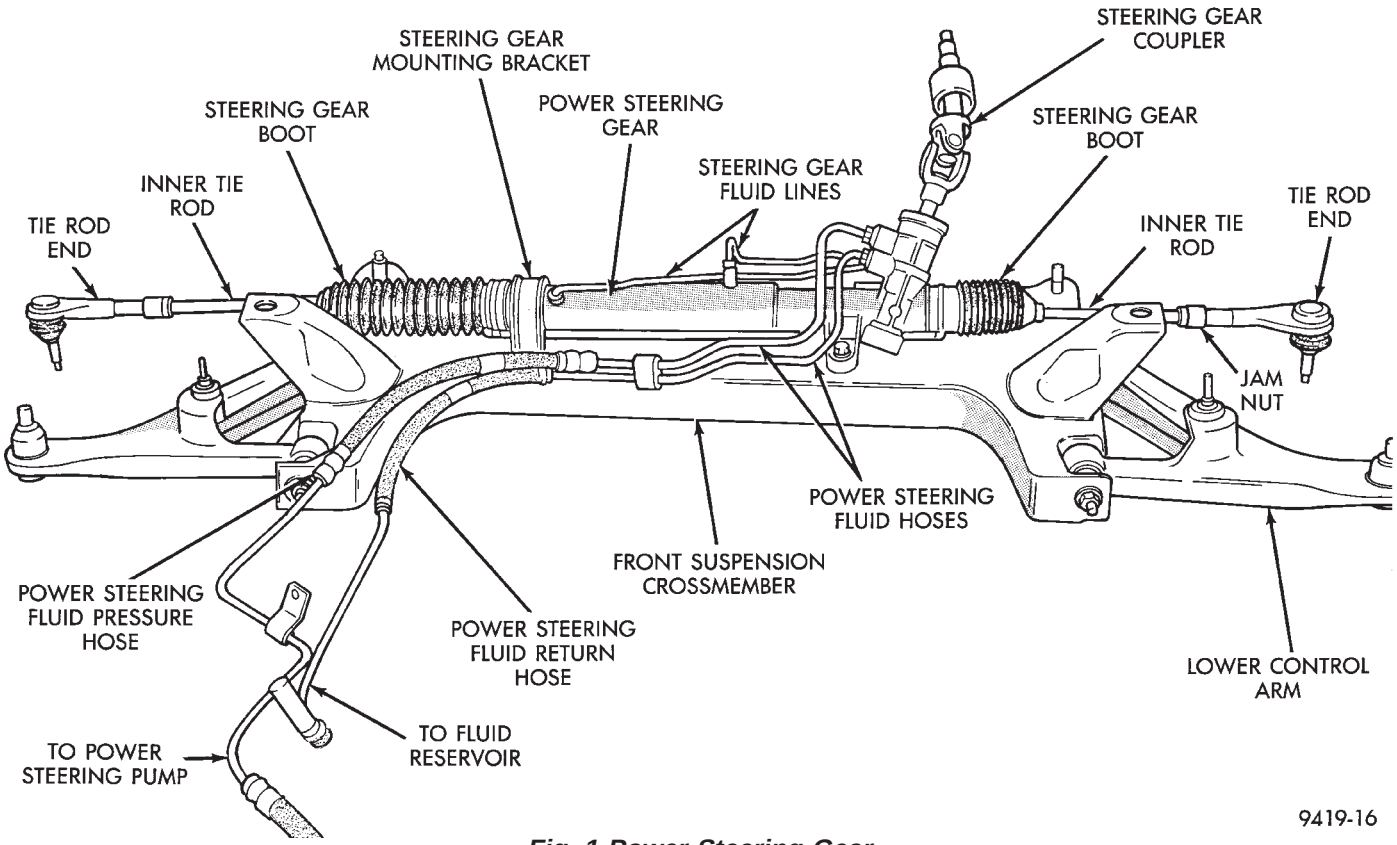


Fig. 1 Power Steering Gear

DESCRIPTION AND OPERATION (Continued)

turn, builds up hydraulic pressure and assists in the turning effort.

The drive tangs on the pinion of the power steering pump 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.

NOTE: The power steering gear (Fig. 1) should NOT be serviced or adjusted. If a malfunction or oil leak occurs the complete steering gear must be replaced.

REMOVAL AND INSTALLATION

STEERING GEAR

REMOVE

(1) From the interior of the vehicle, disconnect the steering gear coupling from the flex coupling of the steering column shaft (Fig. 2).

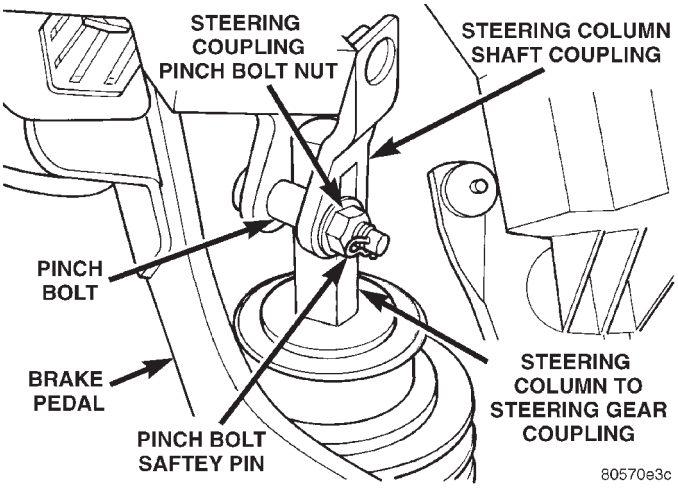


Fig. 2 Steering Column To Steering Gear Coupler

(2) 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.

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

(4) Remove engine/transaxle bobble dampener, on vehicles so equipped, from front suspension crossmember (Fig. 3). Bobble strut does not need to be removed from transaxle assembly.

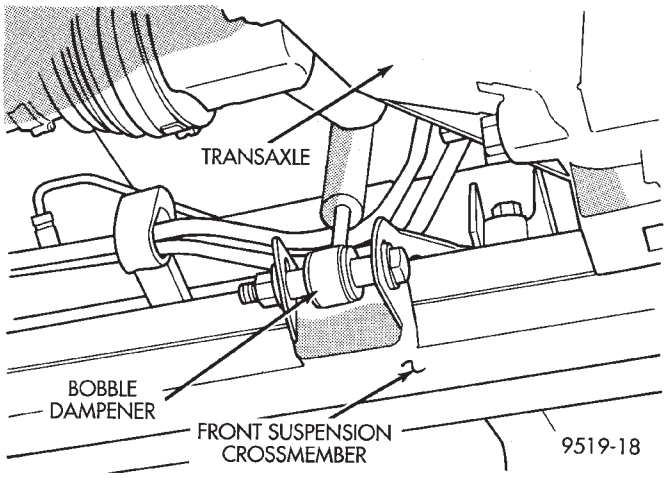


Fig. 3 Engine/Transaxle Bobble Dampener

(5) Remove both outer tie rod ends to the steering knuckles. **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. 4).**

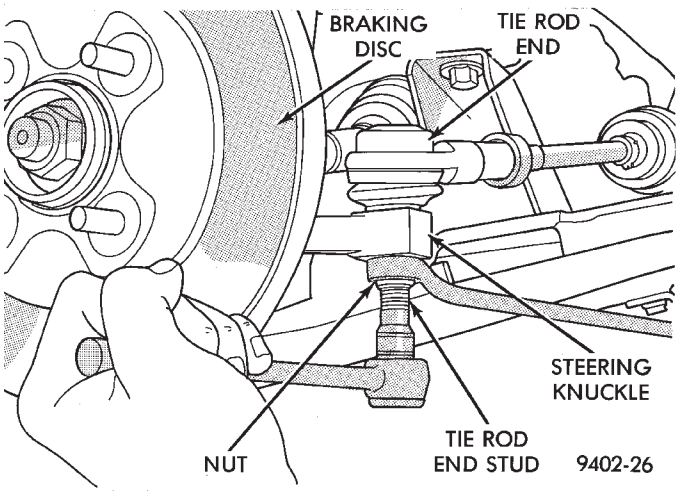


Fig. 4 Removing Tie Rod End Attaching Nut

REMOVAL AND INSTALLATION (Continued)

(6) Remove both tie rod end studs from the steering knuckles, using Remover, Special Tool MB-990635 (Fig. 5).

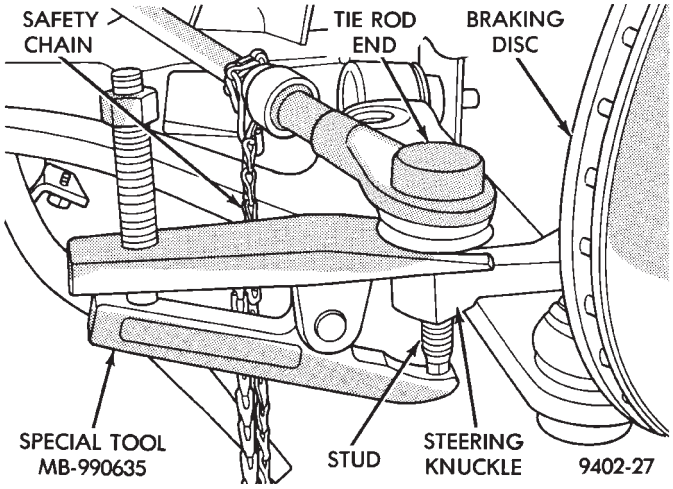


Fig. 5 Tie Rod End Removal From Steering Knuckle

(7) If equipped, remove vehicle wiring harness connector from the power steering fluid pressure switch (Fig. 6).

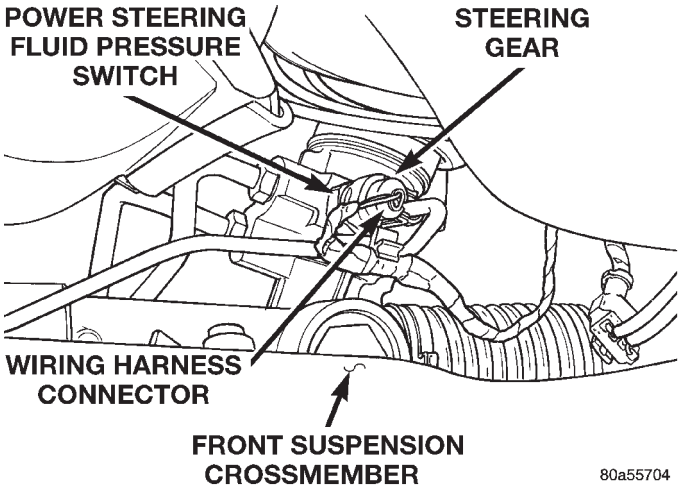


Fig. 6 Power Steering Fluid Pressure Switch Electrical Connector

(8) Remove the power steering fluid, pressure and return hoses (Fig. 7) from the steering gear.

NOTE: This vehicle 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 possible to adjust a vehicles front suspension alignment settings to the required specifications. Due to this, 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.

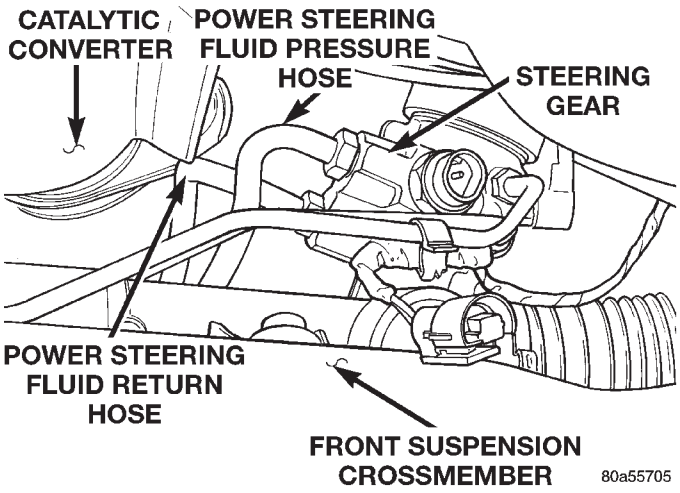


Fig. 7 Power Steering Fluid Pressure And Return Hoses

CAUTION: Before removing front suspension crossmember from the vehicle, the location of the front suspension crossmember MUST be scribbed on body of vehicle per (Fig. 9). This must be done so crossmember can be relocated against body of vehicle in the same location when it is reinstalled. 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.

(9) Using an awl, scribe a line (Fig. 8) marking the location of where front suspension crossmember is mounted against the body of the vehicle.

(10) 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.

(11) Remove the front 2 bolts (Fig. 9) attaching the front of the front suspension crossmember to the frame rails of the vehicle. Then loosen the 2 bolts (Fig. 9) attaching the rear of the front suspension crossmember and lower control arms to the body of the vehicle. **Lower front suspension crossmember while loosening rear bolts. Do not remove the rear bolts from the front suspension crossmember or the rear bushings of the lower control arms.**

REMOVAL AND INSTALLATION (Continued)

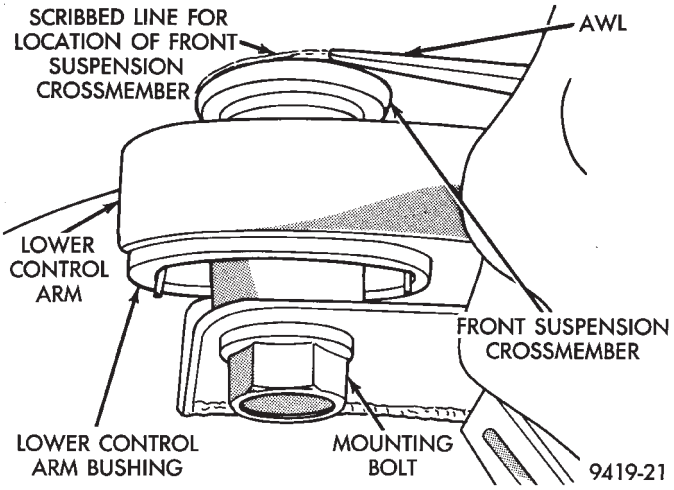


Fig. 8 Marking Front Suspension Crossmember Location

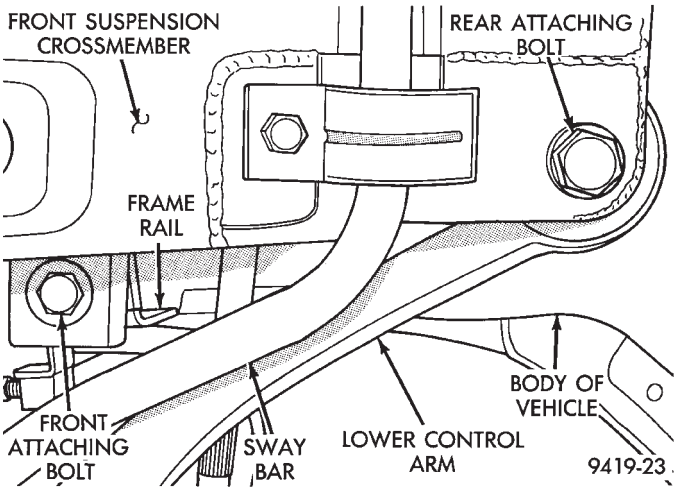


Fig. 9 Front Suspension Crossmember Mounting Bolts

(12) Using transmission jack, lower front suspension crossmember enough to allow steering gear to be removed from crossmember (Fig. 10). **When lowering front suspension crossmember, do not let crossmember hang from lower control arms weight of crossmember should be supported by transmission jack.**

(13) Remove the 4 bolts (Fig. 11), attaching the steering gear to the front suspension crossmember. Then, remove the steering gear from the front suspension crossmember.

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

INSTALL

(1) Install steering gear on front suspension crossmember. Install the 4 steering gear to front suspension crossmember mounting bolts (Fig. 11). Torque

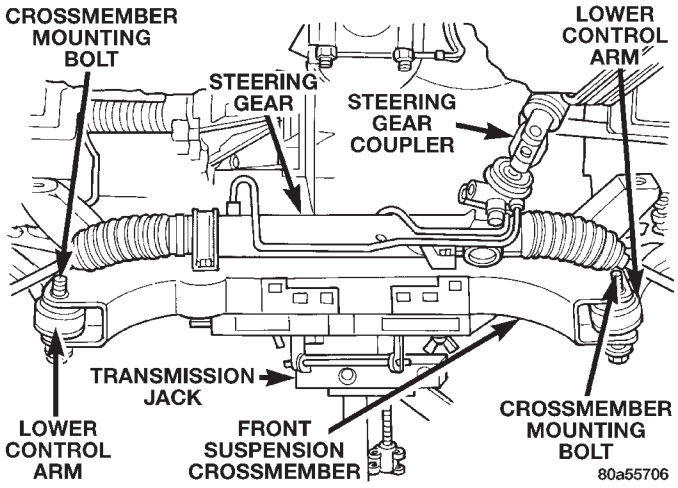


Fig. 10 Crossmember Lowered For Removal Of Steering Gear

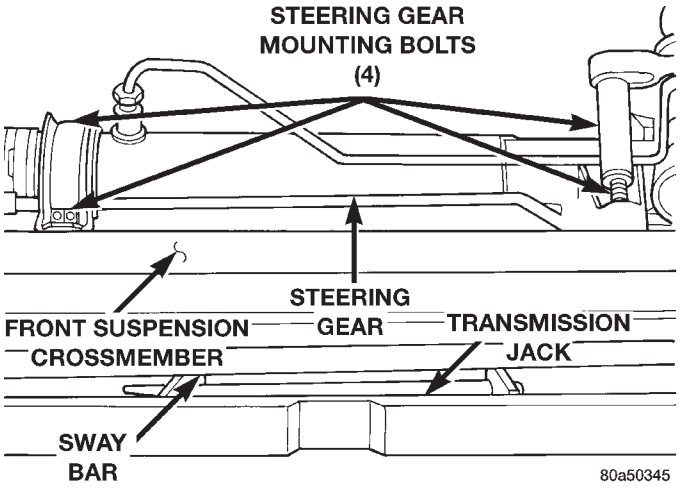


Fig. 11 Steering Gear Mounting Bolts

the 4 steering gear mounting bolts to 68 N·m (50 ft. lbs.).

(2) Using the transmission jack, raise front suspension crossmember and steering gear against body and frame rails of vehicle. Start the 2 rear bolts into tapping plates, attaching front suspension crossmember to body of vehicle (Fig. 9). Then install the 2 front bolts, attaching front suspension crossmember to frame rails of vehicle (Fig. 9). Tighten the 4 mounting bolts, 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 scribbed into body of vehicle (Fig. 12). This MUST be done to maintain NET BUILD front suspension alignment settings.

REMOVAL AND INSTALLATION (Continued)

(3) Using a soft face hammer, tap front suspension crossmember into position, until it is aligned with the 2 previously scribbed positioning marks on body of vehicle (Fig. 12). When front suspension crossmember is correctly positioned, torque the 2 rear crossmember/lower control arm 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.) (Fig. 9).

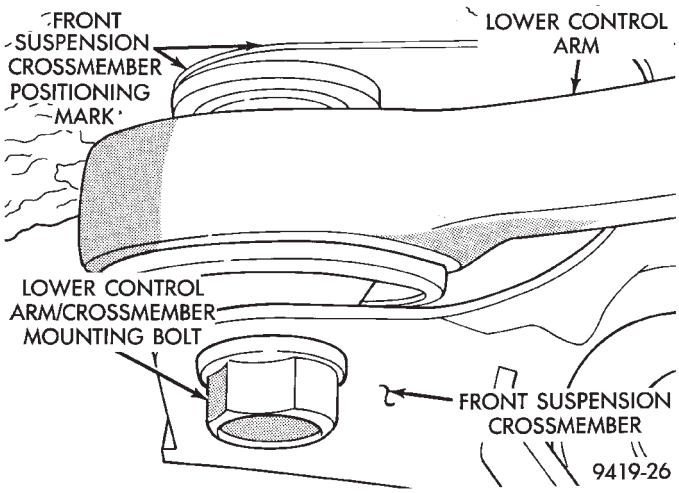


Fig. 12 Crossmember Aligned With Positioning Marks

(4) Install the power steering fluid pressure and return hoses into correct fluid ports on power steering gear assembly (Fig. 7). Torque power steering fluid pressure and return lines to steering gear tube nuts (Fig. 7) to 31 N·m (275 in. lbs.).

(5) Install wiring harness connector on the power steering fluid pressure switch on the steering gear assembly (Fig. 6). Be sure locking tab on wiring harness connector is securely latched to pressure switch.

(6) 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. 4). Then using a crowfoot and 11/32 socket (Fig. 13), torque tie rod end attaching nut to 55 N·m (40 ft. lbs.).

(7) Install engine/transaxle bobble dampener (Fig. 3) on front suspension crossmember bracket. Install and securely tighten the dampener to crossmember attaching bolt.

(8) Install the wheel and tire assemblies back on vehicle. Tighten the wheel nuts to 135 N·m (100 ft. lbs.) torque.

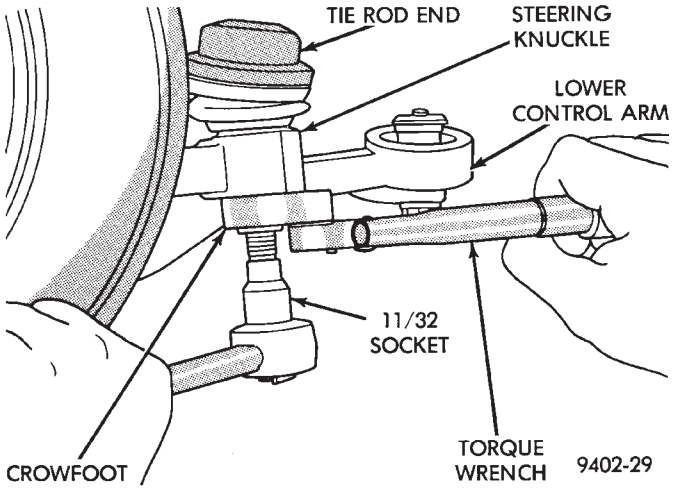


Fig. 13 Torquing Tie Rod End Attaching Nut

(9) Lower vehicle.

(10) From interior of vehicle, reconnect the steering gear coupler with the steering column shaft coupler. Install steering gear coupler retaining pinch bolt and torque to 28 N·m (250 in. lbs.). **Be sure to install the upper to lower steering coupler retaining bolt, retention pin (Fig. 2).**

CAUTION: Do not use automatic transmission fluid.

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

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

(13) Add fluid if necessary.

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

(15) 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.

(16) 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).

(17) 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.

REMOVAL AND INSTALLATION (Continued)

(18) Tighten tie rod jam nut (Fig. 14) to 61 N·m (45 ft. lbs.) torque.

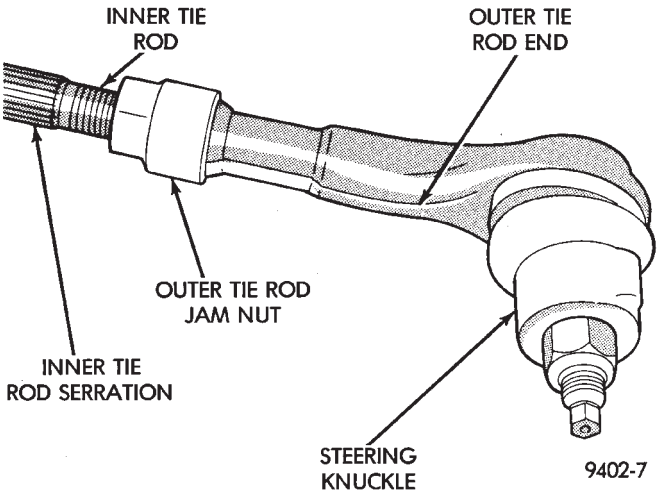


Fig. 14 Outer Tie Rod End Jam Nut

(19) Adjust steering gear to tie rod boots at tie rods to remove any twisting that may have occured during Toe adjustment.

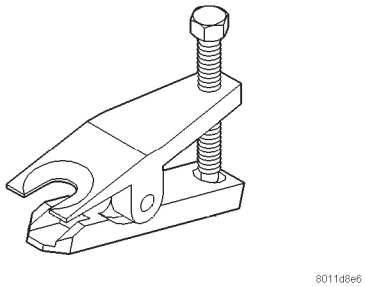
SPECIFICATIONS

STEERING GEAR FASTENER TORQUE SPECIFICATIONS

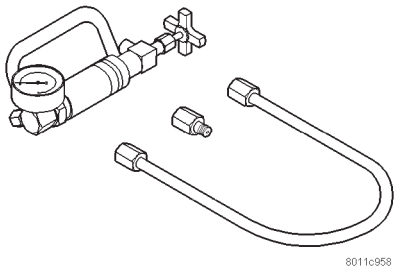
DESCRIPTION	TORQUE
FRONT SUSPENSION CROSSMEMBER:	
To Body Mounting Bolts	163 N·m (120 ft. lbs.)
STEERING GEAR:	
To Crossmember Mounting Bolts	68 N·m (50 ft. lbs.)
OUTER TIE ROD:	
To Steering Knuckle Nut	55 N·m (40 ft. lbs.)
To Inner Tie Rod Jam Nut	61 N·m (45 ft. lbs.)
POWER STEERING HOSE:	
Tube Nuts	31 N·m (275 in. lbs.)
Routing Bracket At Crossmember	23 N·m (17 ft. lbs.)

SPECIAL TOOLS

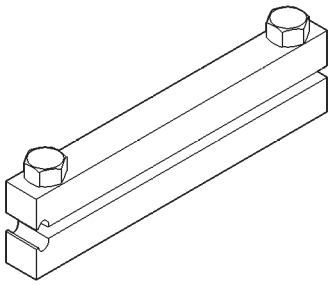
POWER STEERING GEAR



Remover Tie Rod End MB–990635



P/S System Analyzer 6815



Installer Boot Clamp C-4975A

STEERING COLUMN

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DESCRIPTION AND OPERATION

STEERING COLUMN

The tilt steering column (Fig. 1) used in this vehicle has been designed to be serviced only as a complete assembly, if a component of the steering column is determined to be defective. The only replaceable components of the steering column assembly, are the key cylinder, ignition switch, multi- function switch, clock spring, trim shrouds and steering wheel. These replaceable components of the steering column can be serviced without requiring removal of the steering column from the vehicle.

STEERING GEAR TO STEERING COLUMN COUPLING

This vehicle uses a different design for the coupling used to connect the steering column to the steering gear (Fig. 2).

This coupling has a hollow convolouted tube (Fig. 2) which allows the coupling to bend rather then colapse when a vehicle is involved in a collision. The previous coupling used on this vehicle incorporated 2 release washers which allowed the coupling to separate into 2 pieces, if necessary, when a vehicle was involved in a collision.

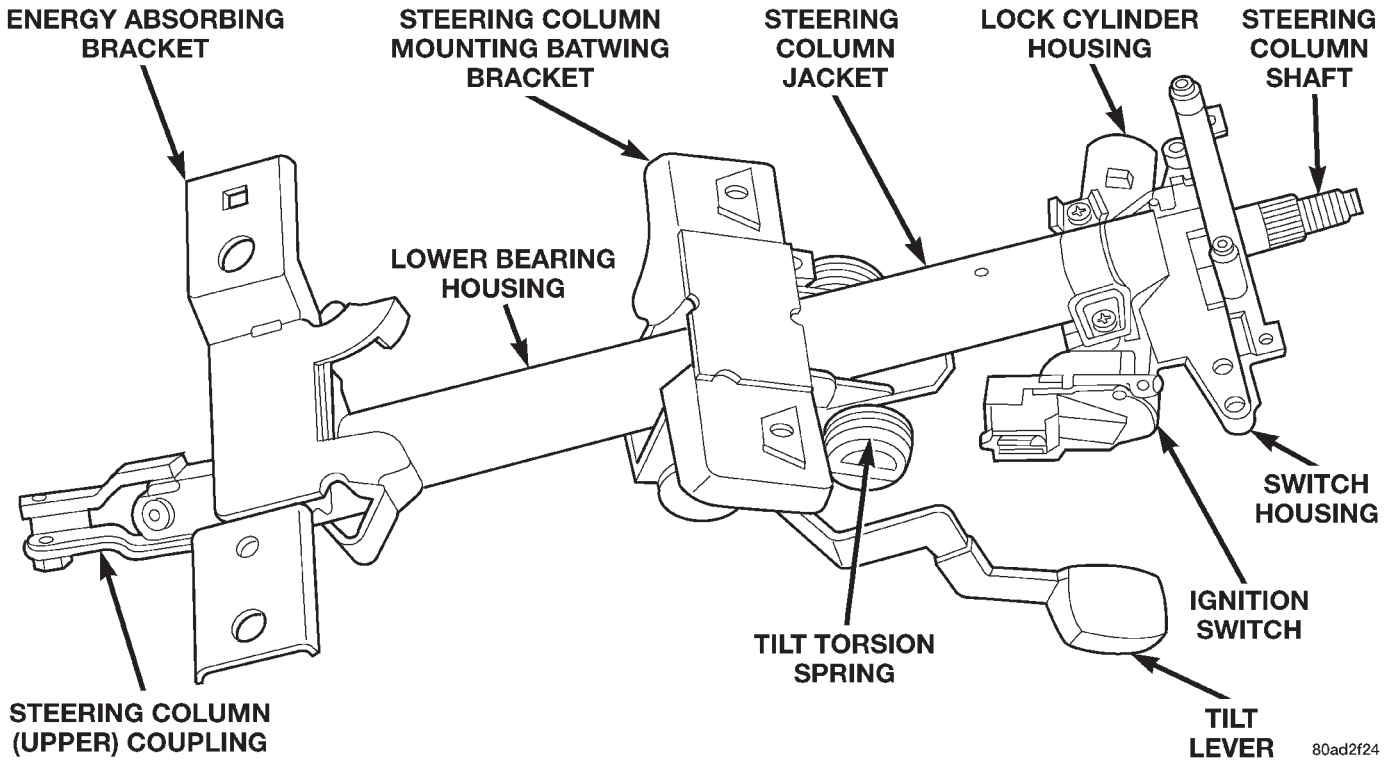

Fig. 1 Tilt Steering Column

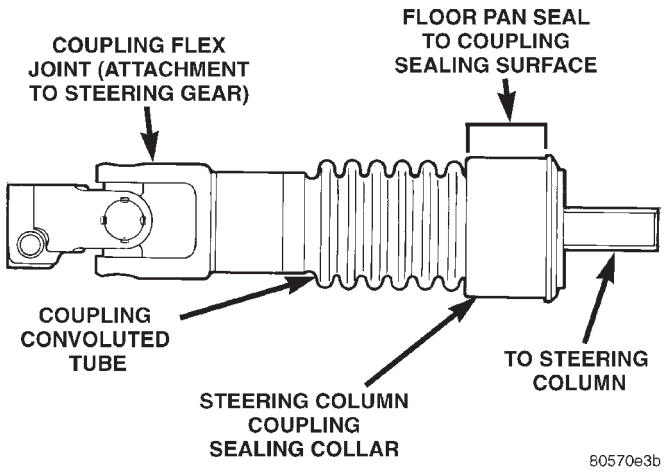

Fig. 2 Steering Column Coupling

DIAGNOSIS AND TESTING

STEERING COLUMN

For diagnosis of conditions relating to the steering column, refer to the steering system diagnosis charts, in the diagnosis and testing section at the beginning of this group.

STEERING COLUMN TO STEERING GEAR COUPLING

STEERING COLUMN COUPLING INSPECTION

The steering column coupling **MUST** be inspected whenever a vehicle is involved in an impact or whenever any of the following conditions exist.

(1) The steering column coupling must be inspected whenever a vehicle is involved in a collision which deploys the air bag, regardless of the extent of damage done to the vehicle.

(2) If a vehicle is involved in an impact of the vehicles front suspension or under carriage, which results in any type of damage to the front suspension crossmember.

(3) 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 or rearward in a vehicle.

STEERING COUPLING INSPECTION PROCEDURE

(1) Remove the pinch bolt safety pin from the steering column shaft coupling pinch bolt (Fig. 3).

(2) Loosen the coupling pinch bolt retaining nut and remove pinch bolt (Fig. 3) from steering coupler. **(Pinch bolt nut is caged to coupler and is not removable.)** Then separate the steering column upper coupling from the lower coupling.

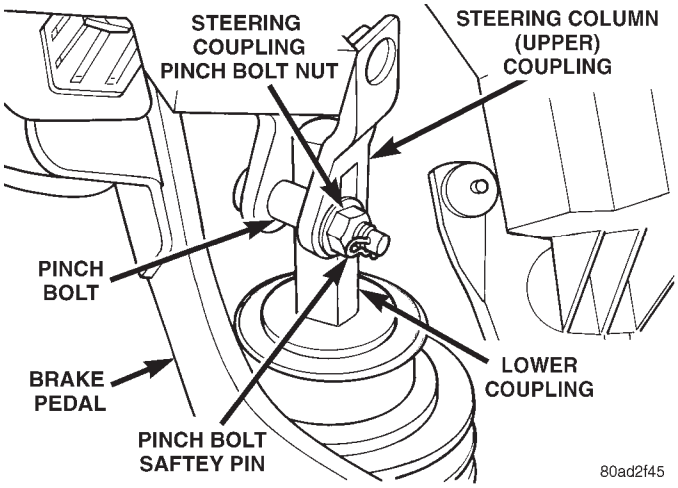

Fig. 3 Steering Column To Coupling Attachment

(3) Remove the silencer seal (Fig. 4) enclosing the steering column coupling.

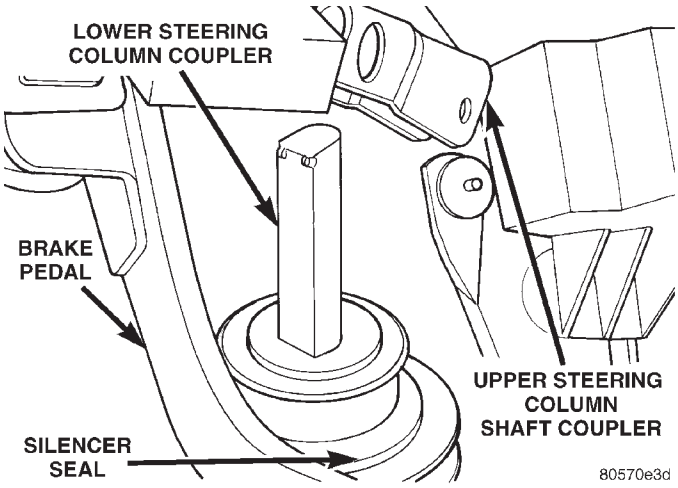

Fig. 4 Lower Coupling Seal

(4) Inspect steering column coupling in the following areas for signs of damage:

- Inspect the sealing collar on the lower coupling (Fig. 5) to ensure that it is not cracked, broken, or otherwise damaged requiring coupling replacement.
- Inspect the corrugated section (Fig. 5) of the lower coupling for the following conditions or any other visible signs of damage.

DIAGNOSIS AND TESTING (Continued)

- Uneven spacing between the corrugations on the coupling.
- Dings or dents in the corrugations of the coupling or anywhere else on the coupling wall.
- A bend in the corrugated section of the coupling.

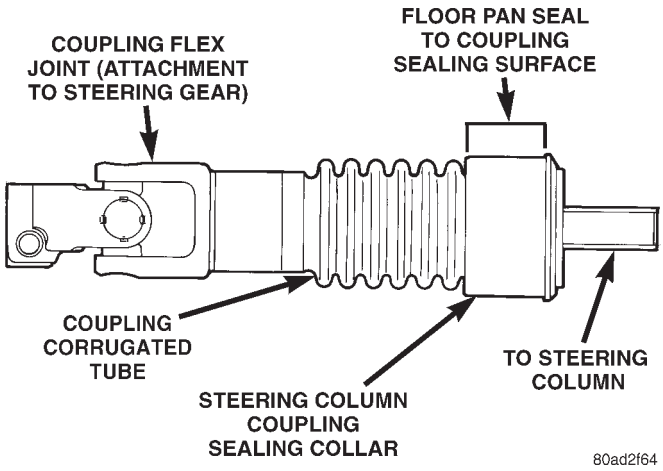

Fig. 5 Lower Coupling Inspection

If any of the preceding conditions exist the steering coupling **MUST** be replaced.

The steering gear must be removed from the vehicle to allow access for replacement of the steering coupling. Refer to Steering Gear Service Procedures in this group of the service manual for the required steering gear removal procedure.

(5) If steering coupling does not require replacement, install steering column coupling silencer seal (Fig. 4) back on vehicle.

(6) Ensure front wheels of vehicle are positioned straight-ahead and then align and attach steering column upper coupling to lower coupling (Fig. 3). Install the coupling pinch bolt (Fig. 3). Tighten the pinch bolt nut to a torque of 28 N·m (250 in. lbs.). **Be sure to install upper to lower steering coupling pinch bolt safety pin (Fig. 3).**

REMOVAL AND INSTALLATION

STEERING COLUMN SERVICE PROCEDURE WARNINGS

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 AIR BAG SYSTEM IS A SENSITIVE, COMPLEX ELECTRO-MECHANICAL UNIT. BEFORE ATTEMPTING TO DIAGNOSE, REMOVE OR INSTALL THE AIR BAG SYSTEM COMPONENTS YOU MUST FIRST DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE. 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.

NOTE: 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 ASSEMBLY

REMOVE

(1) Disconnect the negative (ground) cable from the battery and isolate cable.

(2) **Before beginning removal of steering column from vehicle, be sure front wheels of vehicle are in the straight ahead position.**

(3) Remove the fuse access panel (Fig. 6) from the steering column cover.

(4) Remove the 4 screws attaching the steering column cover, to the lower instrument panel (Fig. 7). Then remove the steering column cover.

(5) Remove 3 screws (Fig. 8) attaching the steering column cover liner to the instrument panel. Remove the liner from the lower instrument panel.

(6) Remove the 2 covers (Fig. 9) from the steering wheel. Covers need to be removed to access the mounting bolts for the air bag module.

REMOVAL AND INSTALLATION (Continued)

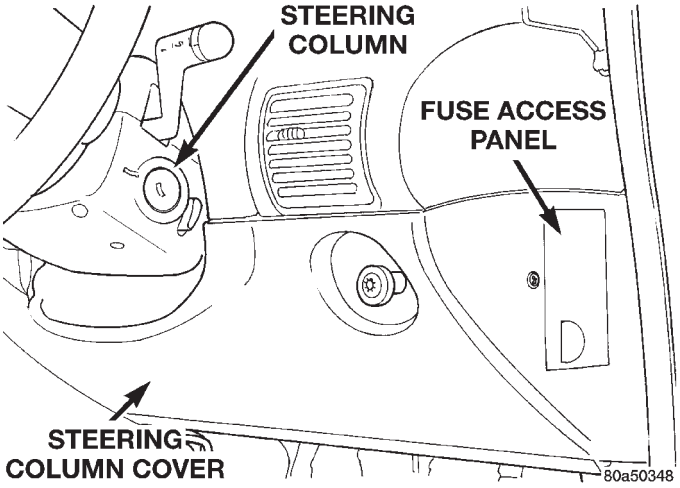

Fig. 6 Fuse Access Panel

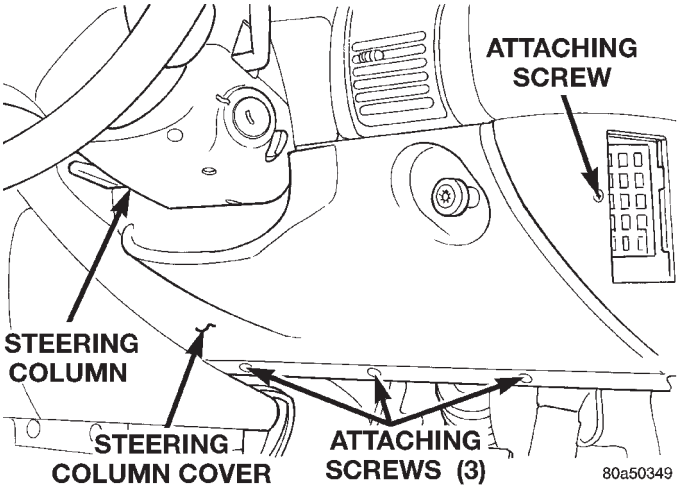

Fig. 7 Steering Column Cover Attachment

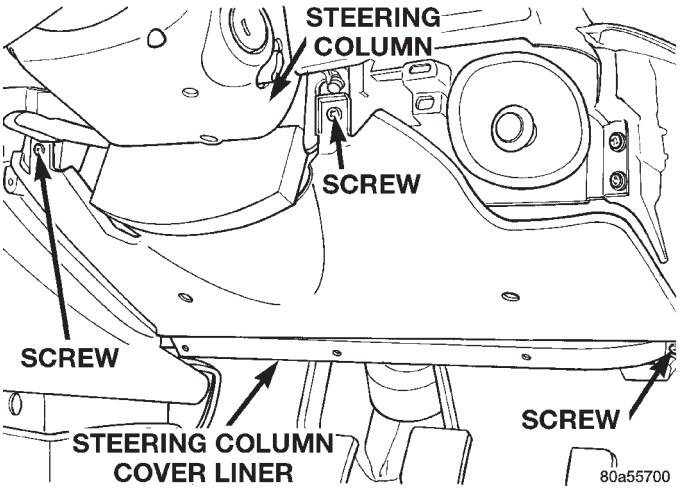

Fig. 8 Steering Column Cover Liner Attaching Screws

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

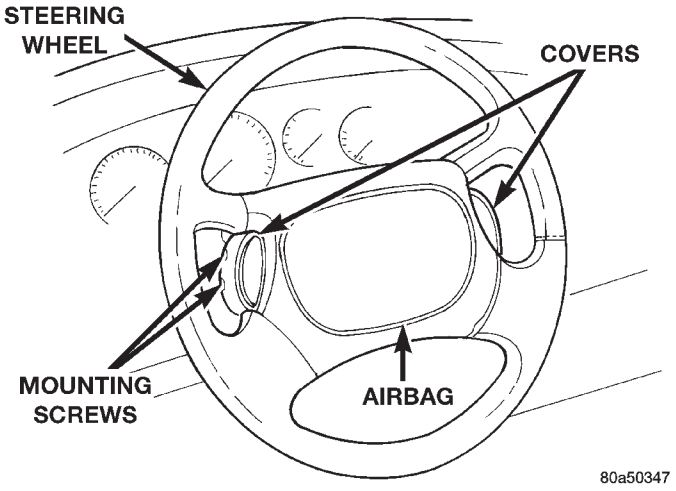

Fig. 9 Steering Wheel Covers

(7) Remove the 2 fasteners, 1 on each side of steering wheel, attaching air bag module to steering wheel (Fig. 10).

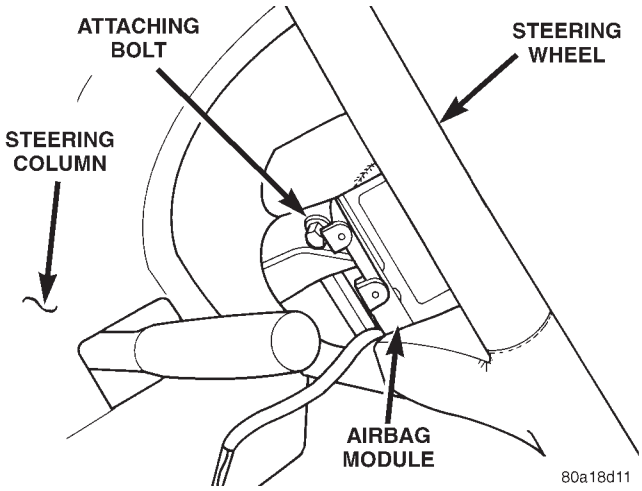

Fig. 10 Air Bag Module Mounting Bolts

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 AIRBAG 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)

(8) Remove airbag module from center of steering wheel.

(9) Disconnect the clock spring electrical lead from the back of the airbag module (Fig. 11).

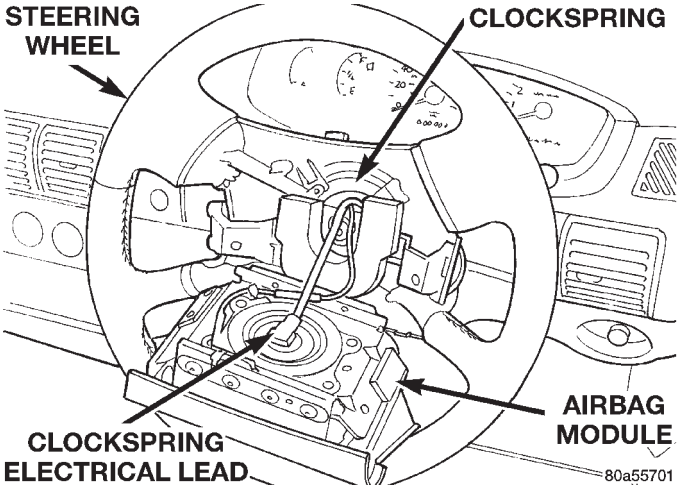

Fig. 11 Airbag Module Electrical Connector

(10) Disconnect the clockspring electrical lead from the wire to the airbag module horn switch (Fig. 12).

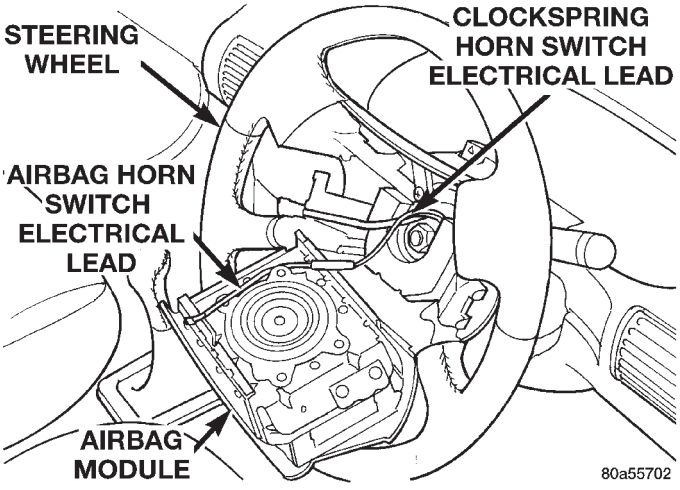

Fig. 12 Clockspring To Horn Switch Wire

(11) Remove the steering wheel retaining nut, from the steering column shaft (Fig. 13). Remove the steering wheel damper weight (Fig. 13) from the steering wheel.

CAUTION: When installing Puller, Snap On CJ2001P or an equivalent on steering wheel, be sure puller bolts are fully seated in threaded holes on steering wheel. If bolts are not fully seated in threaded holes, threads may be stripped out when puller is tightened to remove steering wheel.

(12) Install Puller, Snap On CJ2001P or an equivalent on steering wheel (Fig. 14).

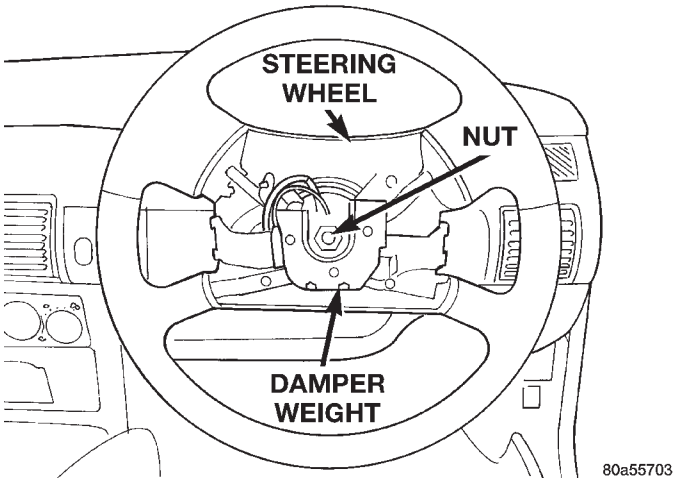

Fig. 13 Steering Wheel Attaching Nut

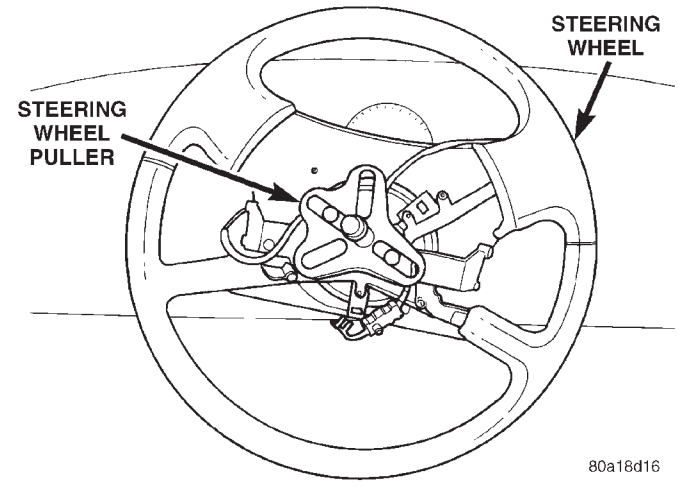

Fig. 14 Steering Wheel Puller Installed

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

(13) Remove steering wheel assembly from steering column shaft using Puller, Snap On CJ2001P or an equivalent.

(14) Remove key lock cylinder from steering column. Key lock cylinder is removed from steering column using the following procedure. Place the key lock cylinder in the Run position. Then through the hole in lower shroud, (Fig. 15) depress lock cylinder retaining tab and remove key lock cylinder.

(15) Remove the 3 screws attaching the upper and lower shroud to the steering column (Fig. 16). First remove lower shroud from steering column, then release tilt lever and tilt steering column to its lowest point. Then remove upper shroud from steering column.

(16) Remove retaining pin from pinch bolt in steering column upper coupling (Fig. 17).

REMOVAL AND INSTALLATION (Continued)

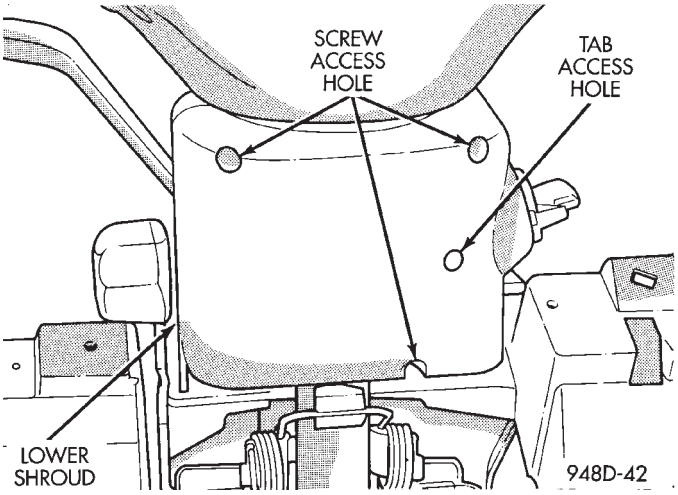

Fig. 15 Key Lock Cylinder Access Hole In Steering Column Shrouds

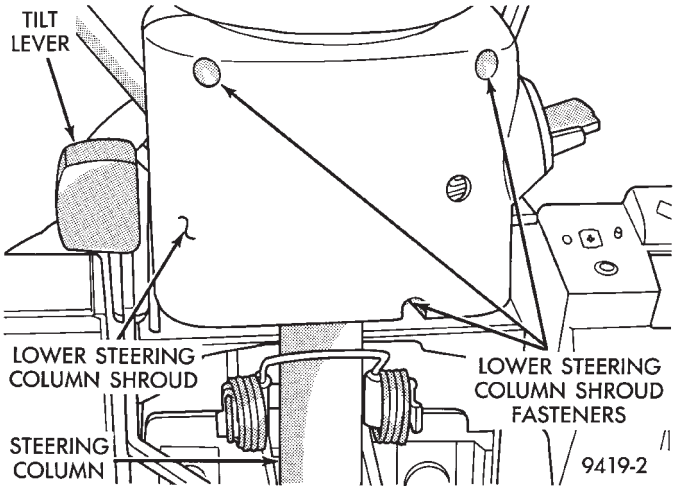

Fig. 16 Upper And Lower Steering Column Shrouds

(17) Loosen the steering column upper coupling pinch bolt retaining nut and remove pinch bolt (Fig. 17) from coupling. **(Pinch bolt nut is caged to coupling and is not removable.)** Then separate steering column shaft coupling from lower steering coupler.

(18) Remove steering column lower bearing housing to lower steering column mounting bracket through bolt (Fig. 18).

(19) Remove the 2 steering column assembly upper bat wing bracket to support bracket nuts (Fig. 19).

(20) Lower steering column assembly in the steering column access opening of the lower instrument panel.

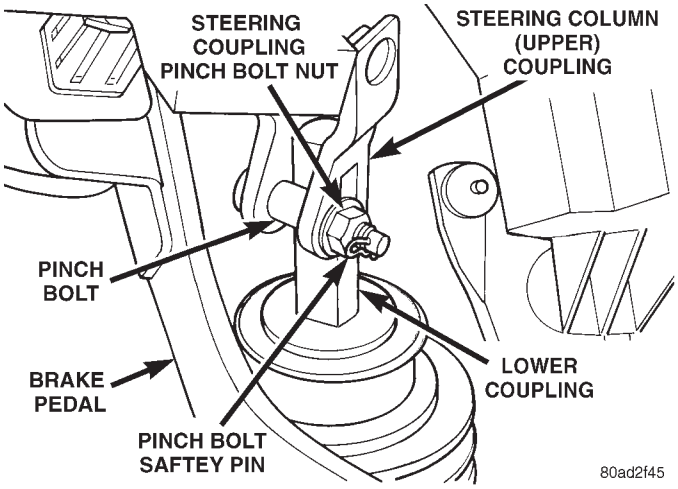

Fig. 17 Steering Column Coupling

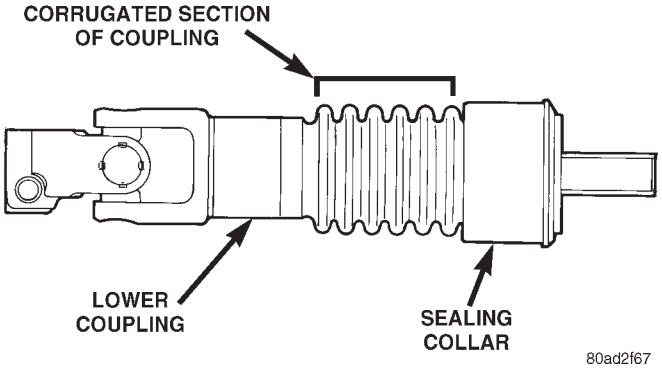

Fig. 18 Steering Column Lower Attaching Bolt

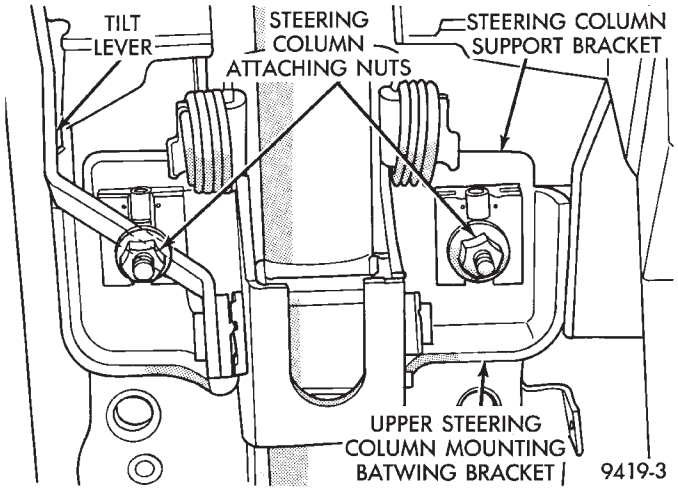

Fig. 19 Steering Column Upper Support Bracket Attaching Nuts

REMOVAL AND INSTALLATION (Continued)

(21) Remove routing clip (Fig. 20) holding wiring harness to steering column jacket. Then remove wiring harness connectors from the multi- function switch and the windshield wiper switch (Fig. 20).

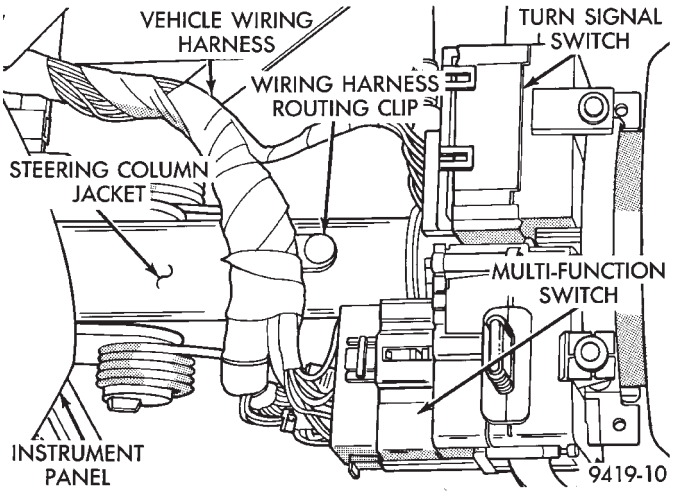

Fig. 20 Steering Column Wiring Connections

(22) Remove the vehicle wiring harness connectors from the ignition switch and clock spring (Fig. 21).

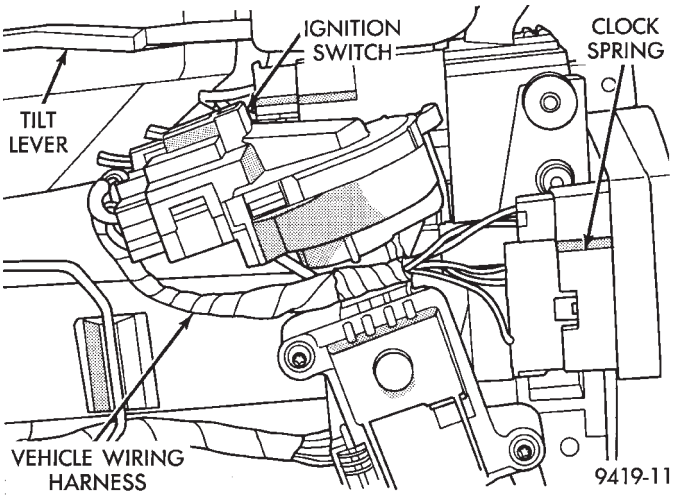

Fig. 21 Steering Column Wiring Connections

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

INSTALL

(1) Install steering column into steering column access opening in lower instrument panel.

(2) Install the vehicle wiring harness connectors, into the ignition switch and clock spring assembly (Fig. 21).

(3) Install vehicle wiring harness connectors into multi-function switch and turn signal switch (Fig. 20) on steering column assembly. Install routing clip (Fig. 20) holding wiring harness to jacket of steering column.

(4) Install the studs in steering column support bracket into the slots in the plastic capsules located in steering column upper mounting bracket (Fig. 19). Partially install the 2 upper steering column assembly mounting bracket to support bracket attaching nuts (Fig. 19). **Do not tighten the 2 mounting nuts at this time.**

(5) Align lower steering column bearing housing with lower steering column mounting bracket. Install and securely tighten the lower bearing housing to steering column mounting bracket thru-bolt (Fig. 18).

(6) Install the upper and lower steering column shrouds onto the lock housing of the steering column. Install and securely tighten the 3 upper to lower steering column shroud to lock housing attaching screws (Fig. 16).

(7) Be sure both breakaway capsules are still fully seated in the slots of the upper steering column mounting bracket. Equally tighten both steering column mounting nuts, until upper steering column mounting bracket is seated against support bracket (Fig. 19). Then tighten the 2 steering column upper mounting bracket nuts to a torque of 12 N·m (105 in. lbs.).

(8) Ensure front wheels of vehicle are positioned straight-ahead. Align and assemble steering column shaft coupling to lower steering coupling (Fig. 17). Install the upper to lower steering coupler pinch bolt. Torque the pinch bolt nut to 28 N·m (250 in. lbs.). **Be sure to install upper to lower steering coupler pinch bolt retaining pin (Fig. 17).**

(9) Install the lower instrument panel steering column cover liner onto lower instrument panel. Install and securely tighten the 3 liner to instrument panel attaching screws (Fig. 8).

(10) Install lower instrument panel steering column cover (Fig. 7) on lower instrument panel. Install and securely tighten the 4 screws (Fig. 7) attaching steering column cover, to lower instrument panel.

CAUTION: Clock spring centering procedure MUST be performed prior to installing steering wheel assembly. If clock spring is not centered it may be overextended, causing clock spring assembly to become inoperative.

(11) 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.

REMOVAL AND INSTALLATION (Continued)

• From the end of travel, rotate the rotor 2 full turns and an additional half turn in the counterclockwise direction. (The horn wire should end up at the top and the squib wire at the bottom.) 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.

(12) Feed clock spring wiring leads through hole in steering wheel. Position steering wheel on shaft of steering column, making sure to fit flat on hub of steering wheel with flat on hub of clockspring.

(13) Install damper weight on steering wheel.

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

(15) Install horn switch electrical lead from clock spring into the connector from the air bag module horn switch (Fig. 12).

(16) Install air bag electrical lead from clock spring, into connector on back of air bag module (Fig. 11). **Be sure electrical connector from clockspring is securely latched into air bag module connector.**

CAUTION: The fasteners, screws, and bolts, originally used for the air bag components are specifically designed for the air bag 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.

(17) Install air bag module into center of steering wheel. Align air bag module mounting holes with bolt holes in steering wheel. Install **only the 2 original or correct replacement** air bag module attaching bolts (Fig. 10). Torque the 2 air bag module attaching bolts to 10 N·m (90 in. lbs.).

(18) Install key lock cylinder into lock housing. Key lock cylinder is installed by positioning key cylinder in the run position so retaining tab can be depressed and the pushing key cylinder into lock hosing until retaining tab locks into key lock cylinder.

(19) Reconnect ground cable to Negative post of the battery. **When reconnecting battery on a vehicle that has had the air bag module removed, the following procedure should be used.**

• Remove forward console or cover as necessary.

• Connect DRB Scan Tool to ASDM diagnostic 6-way connector, located at right side of the ASDM module.

• Turn ignition key to ON position. Exit vehicle with the DRB Scan Tool. Install the latest version of the proper diagnostic cartridge into the DRB Scan Tool.

• Ensuring that their 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 Passive Restraint 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 air bag lamp. It should go on for six to eight seconds, then go out. This will indicate that the air bag system is functioning normally.

(20) **If air bag warning lamp fails to light, blinks on and off or goes on and stays on, there is an air bag system malfunction.** Refer to the Passive Restraint Diagnostic Test Manual to diagnose the system malfunction.

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

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

SPECIFICATIONS

STEERING COLUMN FASTENER TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
Steering Wheel	
Retaining Nut	61 N·m (45 ft. lbs.)
Steering Column Assembly	
Upper and Lower Mounting Bracket Attaching Nuts	17 N·m (150 in. lbs.)