GROUP

STEERING SYSTEM 11

(3000)

SECTION 11-00 Steering System—Service

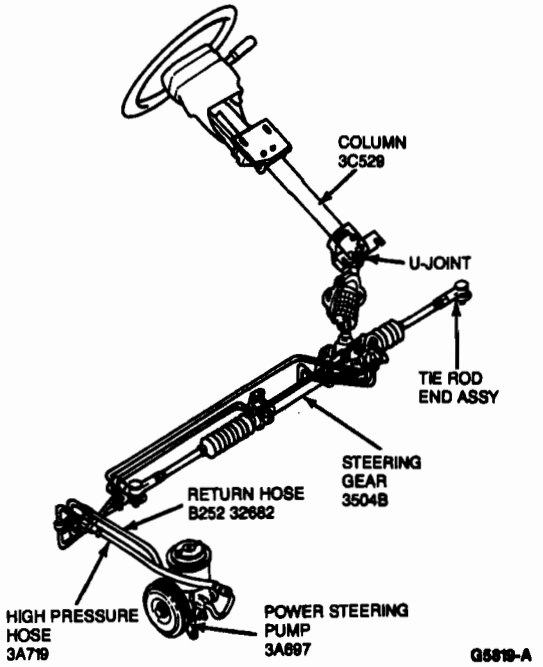
VEHICLE APPLICATION

Capri.

TESTING

Steering system concerns usually fall into one of four categories: leaks, noise, excessive steering effort, or handling problems. Handling problems include conditions such as wandering, loose feel, pulling to one side, or not returning freely to the straight ahead position when the wheel is released. Causes of steering system concerns can be found in any or all of four areas: Steering column, steering gear, power steering pump, or front suspension components, including wheels and tires.

NOTE: For diagnosis of handling concerns not related to the steering gear, linkage, or power steering pump, refer to Section 04-00.



CONDITION	POSSIBLE SOURCE	ACTION
Steering Wheel Movement Is Heavy	Loose or damaged belt. Low fluid level, or air in fluid. Crimped or twisted hose. Crimped pipe. Leakage of fluid. Low hydraulic pressure. (Check pressures using procedures in this section.) Insufficient tire pressure. Improperly adjusted wheel alignment. Linkage ball-joint does not operate smoothly. Steering shaft is contacting something.	Adjust or replace. Supply fluid, or bleed air. Replace. Service or replace. Service or replace. Service or replace power steering pump or steering gear. Adjust. Adjust. Service. Service or replace.
Poor Steering Wheel Return	Incorrect tire pressure. Improperly adjusted wheel alignment. Linkage ball-joint does not operate smoothly. Steering shaft is over tight or restricted or bent.	Adjust. Adjust. Service or replace. Replace.
Required Steering Effort Is Uneven	Loose belt. Steering shaft is restricted; loose installation bolt(s). Steering linkage does not operate smoothly. Malfunction of steering gear.	Adjust. Service or tighten. Service or replace. Replace.
Steering Wheel Pulls To One Side	Incorrect tire pressure. Improper preload adjustment, or wear of wheel bearings. Improperly adjusted wheel alignment. Malfunction of steering gear.	Adjust. Adjust or replace. Adjust. Replace.

TESTING (Continued)

CONDITION	POSSIBLE SOURCE	ACTION
Fluid Leakage	Concern at hose coupling. Damaged or clogged hose. Damaged reserve tank. Overflow. Malfunction of oil pump. Malfunction of steering gear.	Service or replace. Replace. Replace. Bleed air, or adjust fluid level. Replace. Replace.
Abnormal Noise	Loose oil pump. Loose steering gear. Loose oil pump bracket. Loose oil pump pulley nut. Belt either loose or too tight. Air intake. Malfunction of steering gear. Malfunction of oil pump. Obstruction near steering column or pressure hose. Play or looseness of steering linkage.	Tighten. Tighten. Tighten. Tighten. Adjust. Bleed air. Replace. Replace. Service or replace. Tighten, adjust or replace.

Excessive Noise

A high-pitched sound may be heard from the steering gear valve and/or oil pump when the steering wheel is turned to the left or right full lock position. The noise may also be heard when the steering wheel is turned slowly. This is caused by the flow of the power steering fluid, and in no way affects the performance or service of components within the system.

A slight rattling sound and vibration may occur when the steering wheel is turned slowly from or to the full lock position. This is caused by the contact of the control valve stopper and in no way affects the performance or service of components within the system.

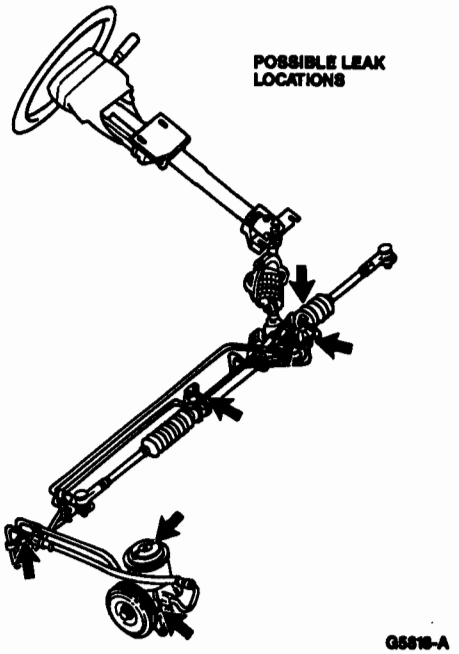
Fluid Leaks

The illustration shows the most common areas where leaks will occur. Perform the following checks to help isolate the leak:

1. Check for an overfilled power steering pump reservoir. Siphon off excess fluid if required.
2. Check for power steering pump overflow or aeration.
3. Wipe suspected area dry and check for exact source of leak. Oil may be running down from another area (such as the valve cover) and causing an oil drip.

   CAUTION: Do not hold the steering wheel against a stop for more than 10 seconds at a time.

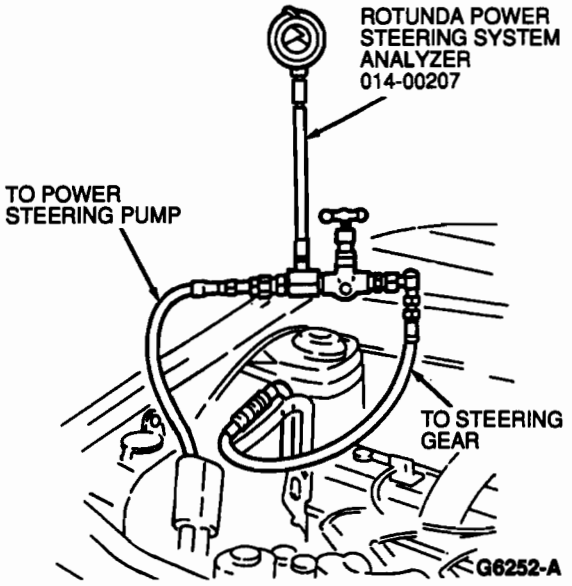
4. Some leaks are high pressure leaks and may require holding the steering wheel against the stop to permit oil to seep out. Cycle the steering wheel from stop to stop 10 times to check for leaks. The bellows may have to be moved away from the steering gear housing to detect the leak.



TESTING (Continued)

Pump Flow and Pressure Tests

1. Disconnect the pressure hose from the power steering pump where it connects to the tubing. Attach Rotunda Power Steering System Analyzer 014-00207 and Adapter 014-00454 or equivalent as shown. Tighten fittings to 39-49 N·m (29-36 lb-ft).



2. Place a thermometer in the power steering pump reservoir.

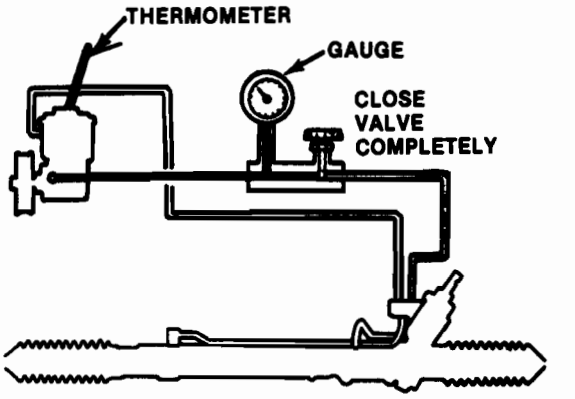
   CAUTION: Make sure valve on gauge set is OPEN to allow the system to function normally.

   CAUTION: Do not hold the steering wheel against a stop for more than ten seconds at a time.

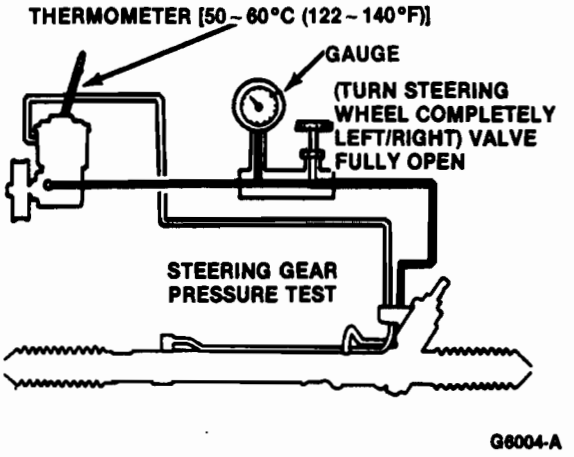
3. Bleed the system by starting the engine and slowly turning the steering wheel back and forth, stop to stop, ten times.
4. If necessary, turn the steering wheel fully left and right several times to raise the fluid temperature to 50-60°C (122-140°F).

   CAUTION: The valve on the gauge set must be briefly closed to read operating pressures. Do not leave the valve closed for more than fifteen seconds.

5. To measure the pump output pressure, close the valve on the gauge set and increase the engine rpm to 1000-1500 rpm. Read the pressure and open the valve. The correct pressure is 6,370 kPa (924 psi). If pressure is low, service or replace the power steering pump.



6. To measure the pressure at the steering gear, open the valve on the gauge set and increase engine rpm to 1000-1500 rpm. Turn the steering wheel all the way to the left or right and read the pressure. The correct pressure is 6,370 kPa (924 psi). If pressure is low, service or replace the steering gear.

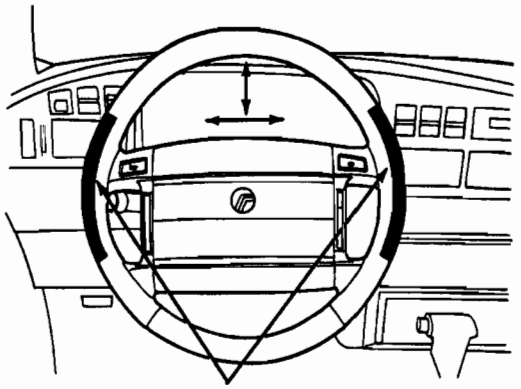


7. Remove the gauge set and adapter. Connect the high pressure hose and tighten.
8. Bleed the system by starting the engine and slowly turning the steering wheel back and forth, stop to stop, ten times.

TESTING (Continued)

Steering Wheel Free Play

With the wheels in the straight ahead position, gently turn the steering wheel to the left and right to check free play. Free play should be between 0 and 30mm (0 and 1.18 inch). If the free play exceeds this limit either the steering joints are worn or the backlash of the steering gear is excessive. Backlash can be adjusted after removing the steering gear. Refer to Section 11-02. Grasp the steering wheel firmly and move it up and down and to the left and right as shown, to check for column bearing wear, steering shaft joint play, steering wheel looseness, or column looseness.



G5312-A

Power Steering Effort Check

1. With the vehicle on a hard level surface, move the steering wheel to set the wheels in a straight-ahead position.
2. Place a thermometer in the power steering pump reservoir.

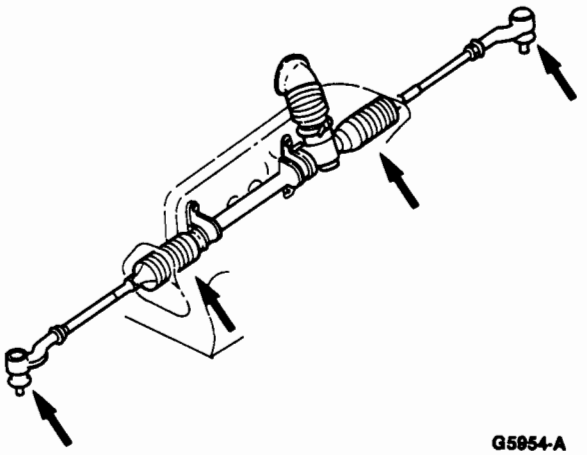
   CAUTION: Do not hold the steering wheel against a stop for more than ten seconds at a time.
3. Turn the steering wheel fully left and right several times to raise the fluid temperature to 50-60°C (122-140°F).
4. Using Spring Scale T74P-3504-Y or equivalent, turn steering wheel. Starting with the wheels in the straight ahead position, check the steering wheel effort required to turn the steering wheel one full turn to the left or right. The steering wheel effort should be 40N (9 lb) or less in either direction.
5. If the effort is greater than specified, check for low fluid level, air in the system or fluid leakage. If necessary, check the power steering pump and gear pressures as outlined.

Steering Linkage Check

Entry of water or dust into the rubber boots will seriously affect the operation and durability of the steering gear, including the tie rod ends.

CAUTION: Rubber boots must be handled carefully to avoid damage. Use new clamps when installing boots.

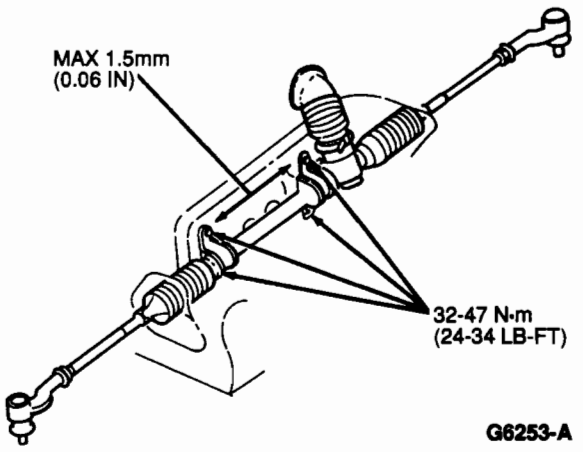
Inspect boots for cracks, cuts, deterioration, twisting, or distortion. Check boot clamps to make sure they are tight. Replace boot and/or clamps as required.



G5954-A

Steering Gear Mount Check

The steering gear housing is installed onto the dash panel with rubber insulators. The housing may move slightly when the steering wheel is turned. If movement is more than 1.5mm (0.06 inch) replace the rubber insulators. If movement of the mounting bracket is evident check the torque of the retaining bolts. Bolts should be tightened to 32-47 N·m (24-34 lb-ft).

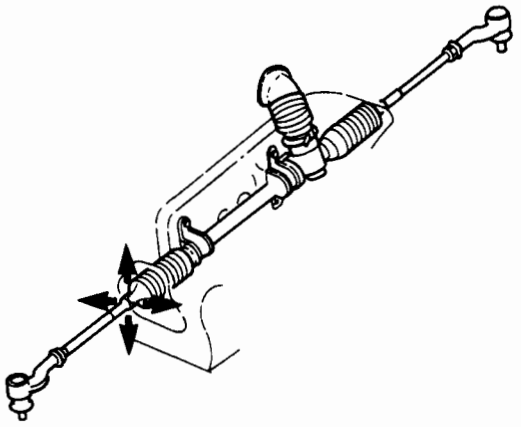


G6253-A

TESTING (Continued)

Steering Gear Bushing/Preload Check

Raise the vehicle and support on safety stands. Check for looseness (clatter) in the steering gear by moving the rack up and down and left to right as shown. If the gear side is excessively loose, adjust the preload. Refer to Section 11-02. If the rack side is loose, disassemble the steering gear and service the bushing in the housing assembly. Refer to Section 11-02.



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Power Steering Drive Belt Adjustment

Refer to Section 03-05.

Power Steering Fluid Level Check

Power steering fluid does not require changing, however it should be checked regularly. If fluid must be added regularly, refer to Fluid Leaks as outlined. For power steering fluid level check, refer to Section 11-02.

Power Steering Pressure (PSP) Switch Check—Idle-Up System

Perform the following steps to check the power steering pressure (PSP) (3N824) switch located in the power steering pump reservoir.

1. Unplug the connector at the power steering pressure switch.
2. Connect the positive lead of a circuit tester to the switch terminal and connect the negative lead to ground. There should be no continuity between the switch and ground with the engine not running.

   CAUTION: Do not hold the steering wheel against a stop for more than ten seconds at a time.
3. Start the engine and cycle the steering wheel from stop to stop. The switch should close under pressure and indicate continuity to ground.
4. Replace switch if it fails the above tests. Refer to Section 11-02.

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	N·m	Lb-Ft
Steering Gear to Dash Panel	32-47	24-34

Description	Specification
Gear Ratio	17.6:1
Backlash Between Rack and Pinion	0
Steering Effort	40 N (Lb)
Lubricant	Premium Power Steering Fluid E6AZ-19582-AA (ESW-M2C33-F)
Lubricant Capacity	0.6L (0.63 U.S. Quart)

SPECIAL SERVICE TOOLS

Tool Number	Description
T74P-3504-Y	Spring Scale

ROTUNDA EQUIPMENT

Model	Description
014-00207	Power Steering System Analyzer
014-00454	Adapter

SECTION 11-02 Steering System, Power

VEHICLE APPLICATION

Capri.

DESCRIPTION

CAUTION: The following steps should be taken to prevent system contamination or damage:

1. Always plug hoses and fittings as they are disconnected. This will prevent contaminants from entering the system.
2. Always use correct power steering fluid. Refer to Section 11-00.
3. Always maintain the fluid at the proper level. Refer to Section 11-00.
4. Do not hold the steering wheel on full lock for more than 10 seconds while the engine is running. If the steering wheel is on full lock in either direction, fluid is not circulating in the steering gear, only in the pump. This will cause overheating of the fluid and possible system damage.

Power Steering Pump

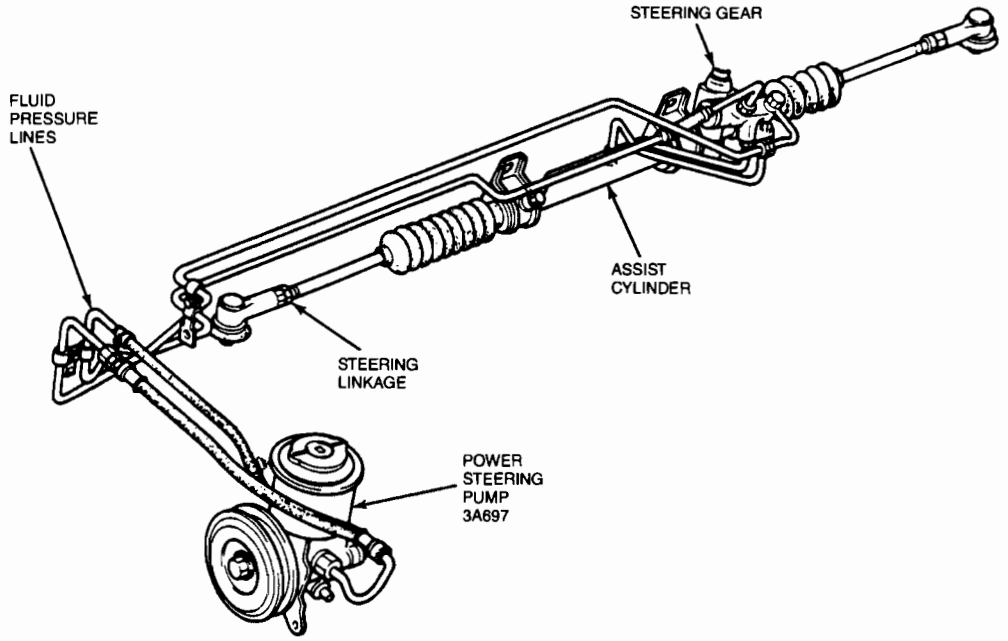
Power steering is a hydraulic-assisted system that greatly reduces the amount of effort required to turn the steering wheel. The system consists of a rack-and-pinion steering gear, a belt-driven pump and the necessary interconnecting hydraulic lines.

The power steering pump, which is driven by the engine crankshaft through a belt and pulleys, develops the hydraulic fluid flow necessary to operate the system. When the steering wheel is turned, the steering gear converts this hydraulic flow into mechanical motion. Fluid is drawn into the vane-type pump from the reservoir when the engine is running.

The fluid is pressurized by the power steering pump and forced into the steering gear. If pump pressure exceeds the limits of the system, a pressure regulator valve lifts and returns part of the fluid to the inlet side of the pump.

DESCRIPTION (Continued)

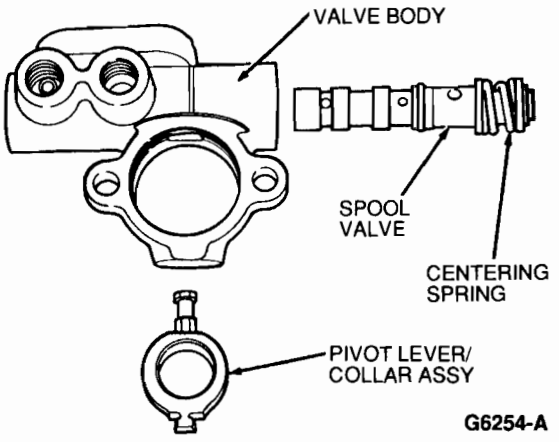
A power steering pressure (PSP) (3N824) switch is located on the pump. It sends a signal to the engine idle speed solenoid to increase idle speed when pump pressure is too low for steering assist.



Power Rack-and-Pinion Steering Gear

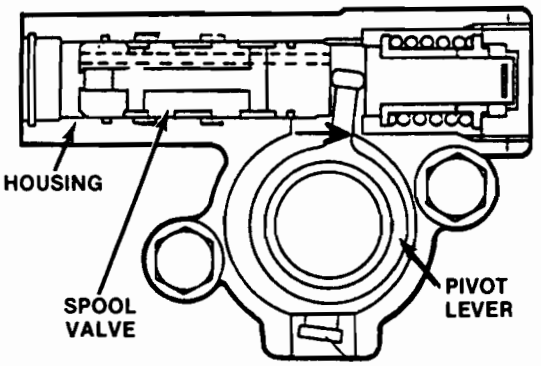
The power rack-and-pinion steering gear has an integral power assist system and valving.

The valve body bolts onto the rack housing at the upper pinion bearing. The pressure line and return line from the pump attach at the valve body. A sliding type spool valve directs high pressure hydraulic fluid through external oil lines to the correct side of the rack piston. The spool valve is moved by a pivot lever / collar assembly that fits over the upper pinion shaft.



DESCRIPTION (Continued)

When the steering wheel is turned hard to the right or left, it causes the pinion to lean to the right or the left. This in turn causes the pivot lever / collar assembly to move the spool valve.



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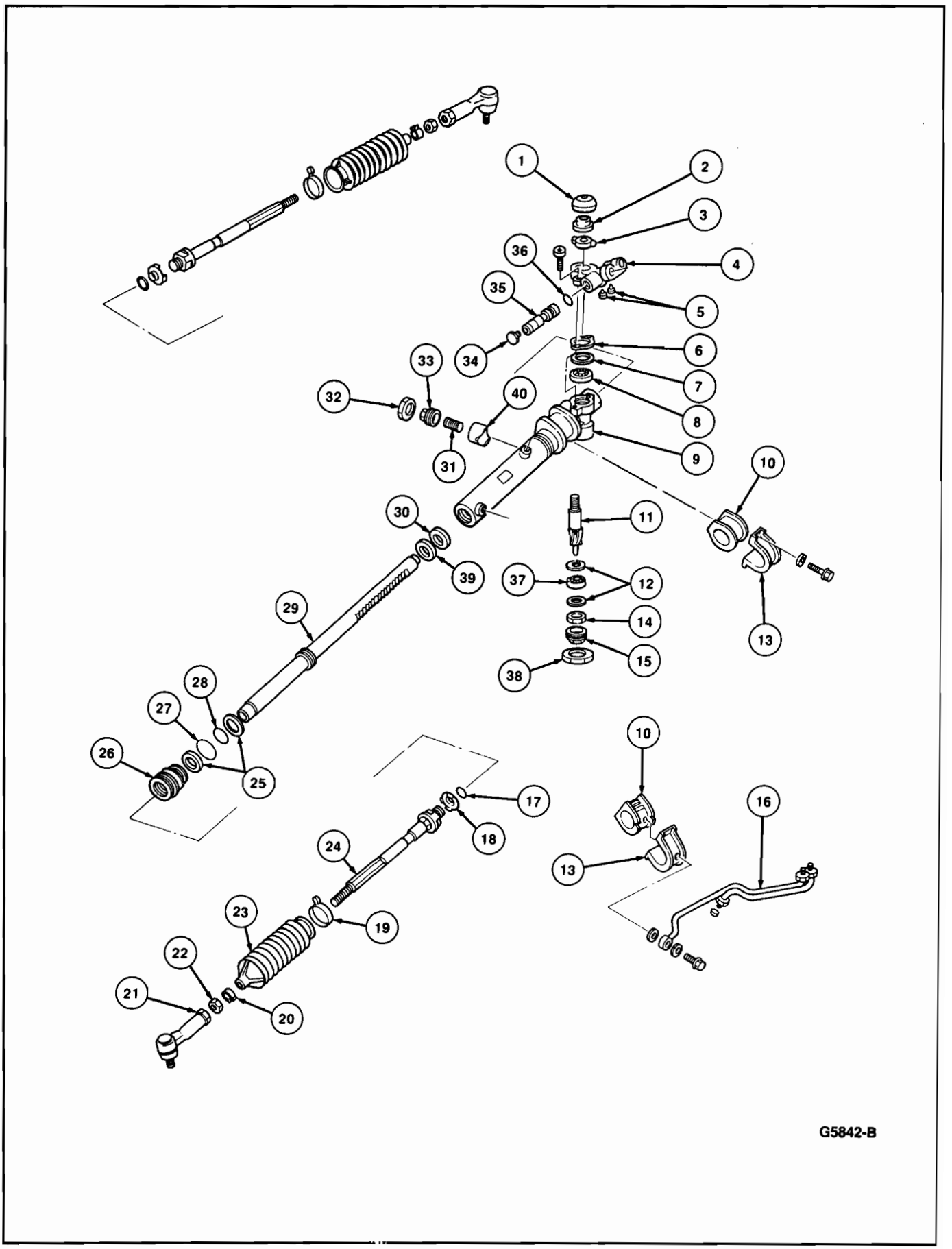
DESCRIPTION (Continued)

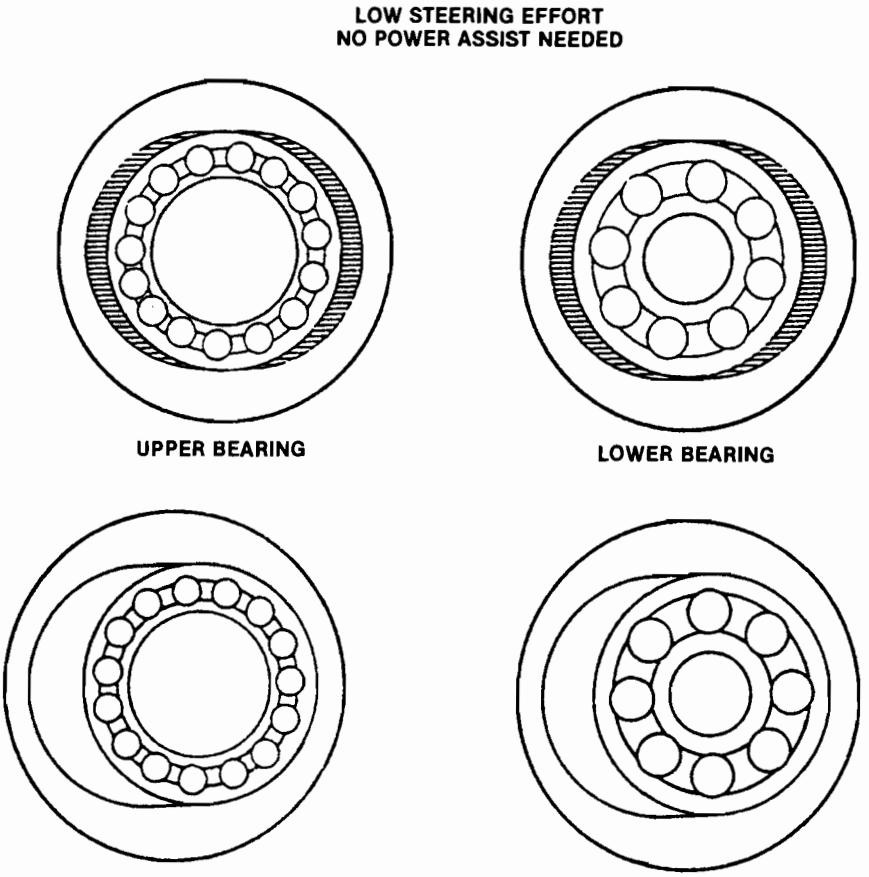


DESCRIPTION (Continued)

Item	Part Number	Description	Item	Part Number	Description
1	—	Dust Cover	21	—	Tie Rod End
2	—	Pinion Seal	22	—	Jam Nut
3	—	Pinion Lever	23	—	Boot
4	—	Valve Body	24	—	Tie Rod
5	—	Tubing Seats	25	—	Oil Seal
6	—	Gasket	26	—	Outer Bulkhead
7	—	Spacer	27	—	Bulkhead O-Ring
8	—	Upper Pinion Bearing	28	—	Rack O-Ring
9	—	Steering Gear Housing	29	—	Rack
10	—	Rack Mounting Bushing	30	—	Inner Guide
11	—	Pinion Shaft	31	—	Spring
12	—	Thrust Washer	32	—	Locknut
13	—	Rack Mounting Bracket	33	—	Adjusting Plug
14	—	Pinion Locknut	34	—	End Plug
15	—	Pinion Bearing Cover	35	—	Spool Valve
16	—	External Hydraulic Lines	36	—	O-Ring
17	—	Dampening Ring	37	—	Pinion Bearing
18	—	Tab Washer	38	—	Pinion Bearing Cover Locknut
19	—	Inner Boot Clamp	39	—	Inner Rack Seal
20	—	Outer Boot Clamp	40	—	Yoke

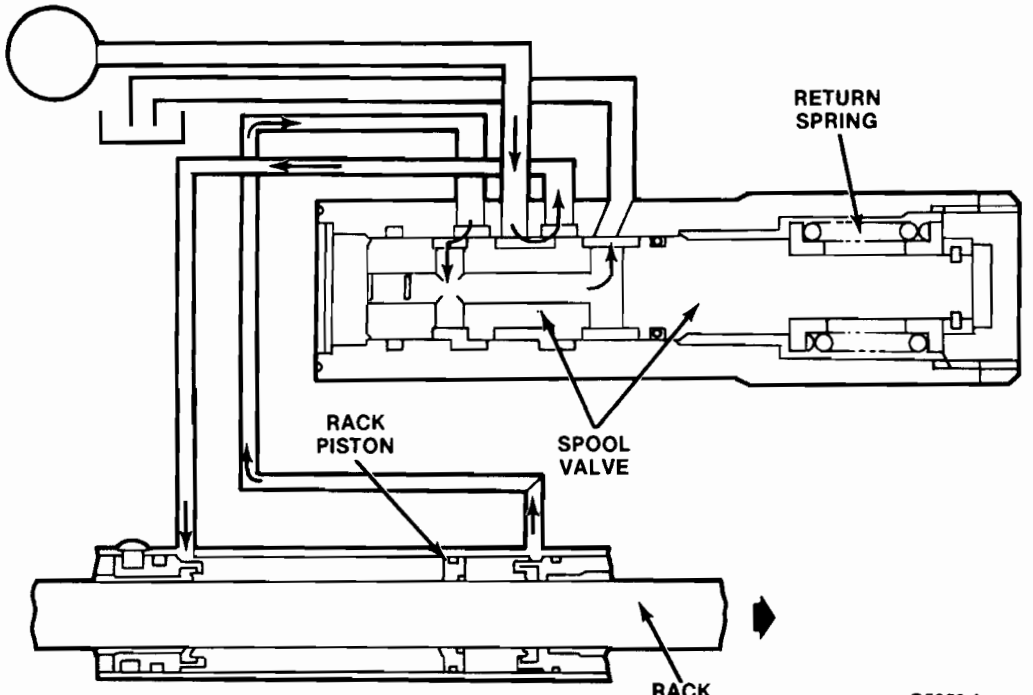
DESCRIPTION (Continued)

The pinion bearings ride in slightly oval shaped bores.



DESCRIPTION (Continued)

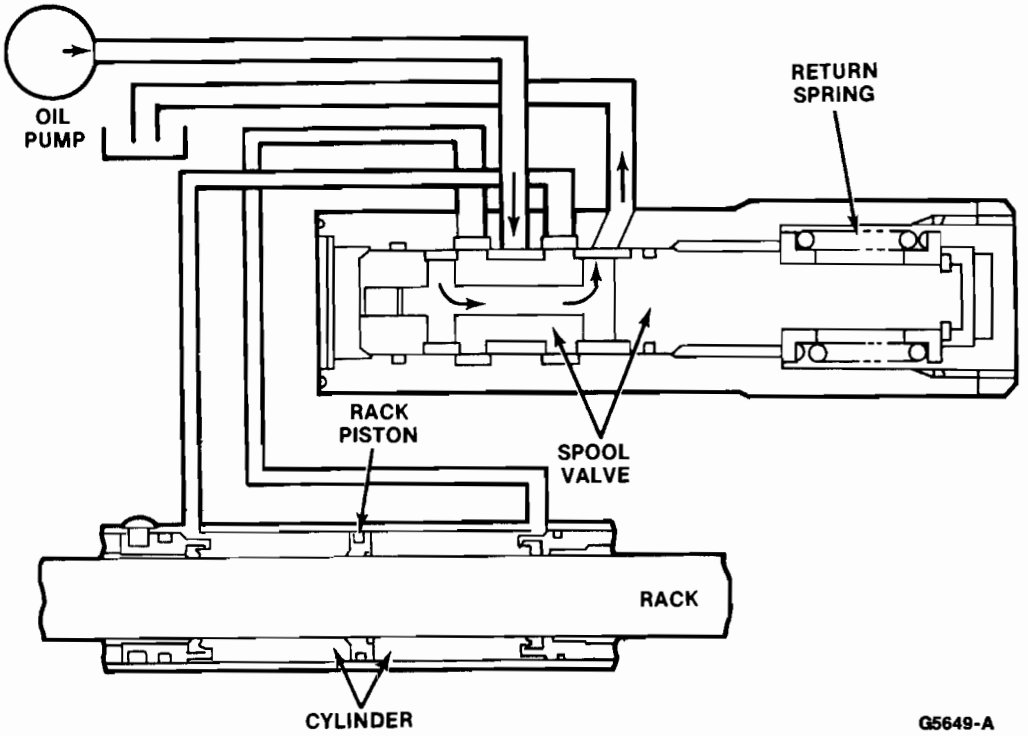
The spool valve then directs high pressure hydraulic fluid to one side of the rack piston while allowing fluid on the other side to return to the reservoir.



SCHEMATIC SHOWING RIGHT TURN POSITION

DESCRIPTION (Continued)

Under driving conditions where only very light steering effort is required, the spring pin on the bottom of the pinion and the return spring mounted on the spool valve keep the spool valve in the neutral position. High pressure hydraulic fluid from the pump flows through the spool valve and directly back to the reservoir through the return line.



SCHEMATIC SHOWING NO LOAD POSITION

A spring loaded plastic yoke assembly is used to keep the rack in constant contact with the pinion.

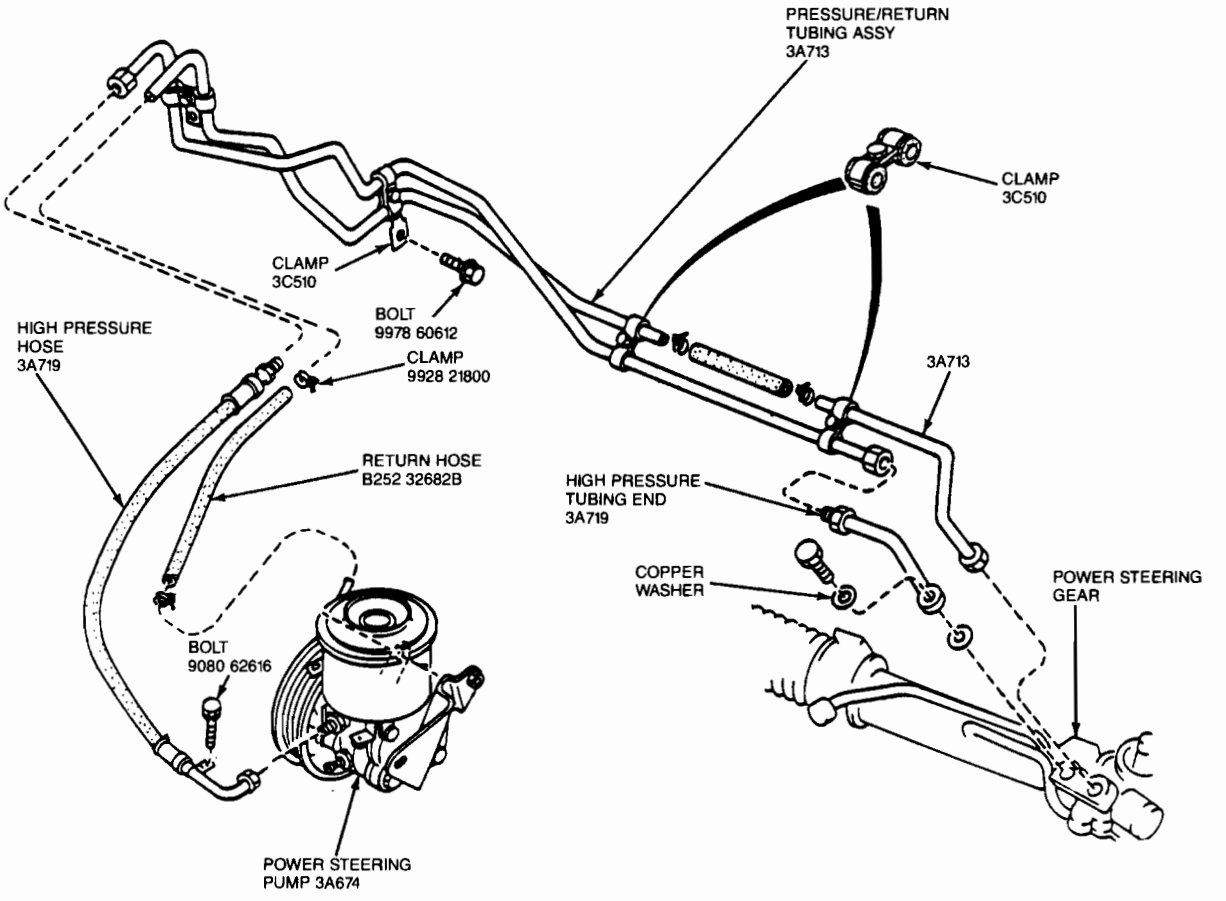
Rubber boots at each end of the rack seal out dust, dirt and contaminants. Since the rack is rifle drilled, no external breather tube connecting the boots is required.

The steering gear housing is mounted on the dash panel with a rubber bushing and mounting bracket at each end. The mounting brackets are attached to the dash panel with two bolts at each bracket.

DESCRIPTION (Continued)

Power Steering Hose

The power steering system is equipped with two hoses; a pressure hose and a return hose. Both hoses are used in combination with tubing to connect the power steering pump to the power steering gear. The hoses and tubing are routed along the dash panel and secured with clamps to prevent noise or damage from vibration.



REMOVAL AND INSTALLATION

Pressure Regulator Valve

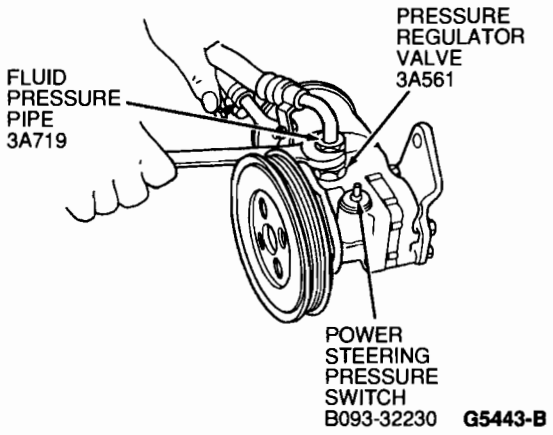
Control Valve

Removal

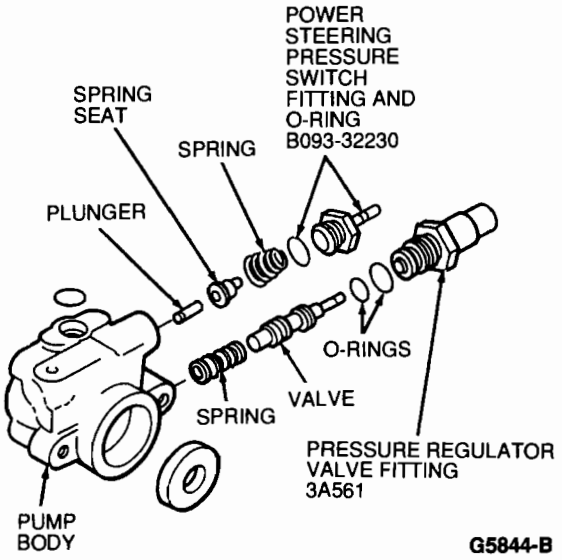
1. Remove RH radiator support and brace, if required.
2. Disconnect charge air cooler (CAC) (6K775) outlet hose at throttle inlet (if equipped), and position out of the way.
3. Remove the pressure hose from the pump fitting.

REMOVAL AND INSTALLATION (Continued)

4. Remove the hose connector adapter from the pump.



5. Remove the valve, spring and O-rings as necessary from the pump housing.
6. Clean and inspect all parts for wear, corrosion and damage.



Installation

1. Install the spring, valve and two O-rings on the fitting (hose connector adapter).
2. Screw the adapter into the pump body and tighten securely.
3. Install the outlet pressure hose and tighten.
4. Connect charge air cooler hose (if equipped).
5. Install RH radiator support and brace, if removed.

Power Steering Pressure Switch

Removal

1. Remove RH radiator support and brace, if required.
2. Disconnect charge air cooler outlet hose at throttle body (TB) (9E926) (if equipped), and position out of the way.
3. Remove the wire connector from the power steering pressure switch.
4. Remove the power steering pressure switch fitting from the pump body.
5. Remove the O-ring from the fitting.
6. Remove the spring and spring seat.
7. Remove the plunger rod from the pump body.
8. Inspect all parts for wear, corrosion or damage.

Installation

1. Install the plunger rod into the pump body with the rubber tip entering the body hole.
2. Install the spring seat over the plunger rod.
3. Install the spring onto the spring seat with the large end of the spring facing out.
4. Install a new O-ring onto the power steering pressure switch fitting and install the fitting.
5. Install the power steering pressure switch wire onto the terminal.
6. Connect charge air cooler hose (if equipped).
7. Install RH radiator support and brace, if removed.

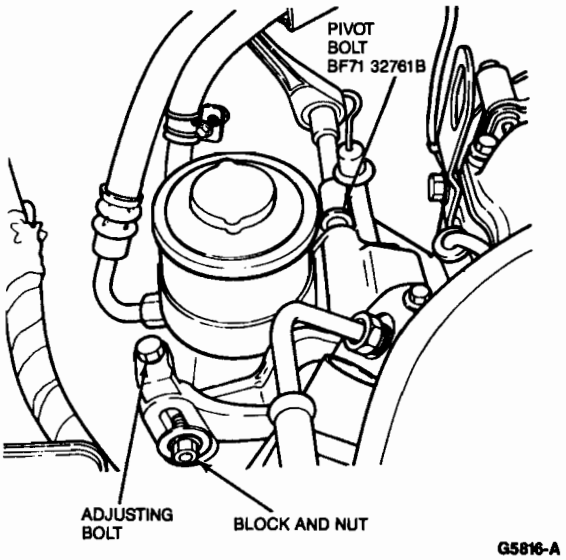
Pump Assembly

Removal

1. Remove RH radiator support and brace.
2. Remove the pump drive belt. Refer to Section 03-05.
3. Disconnect charge air cooler outlet hose at throttle body (if equipped) and position out of the way.
4. Remove the ground wire from the engine lifting eye.
5. Position a drain pan below the power steering pump.
6. Remove the inlet and return hoses from the pump and plug.
7. Remove the wire from the power steering pressure switch.

REMOVAL AND INSTALLATION (Continued)

8. Remove the adjusting screw, nut and block from the bracket.



9. Remove the pivot bolt.
10. Position pump below pump bracket in engine compartment. Remove pump bracket retaining nut, bolts and pump bracket.
11. Remove the pump.

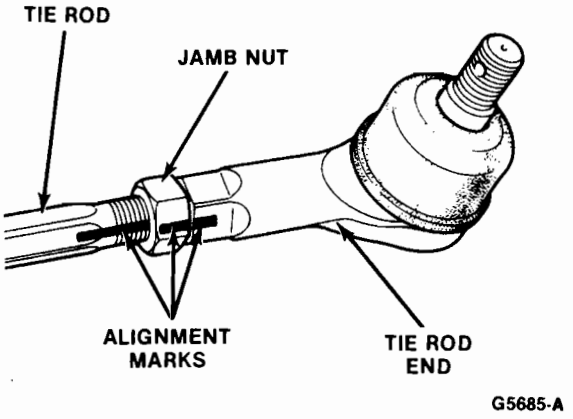
Installation

1. Position power steering pump in engine compartment below pump bracket mounting stud.
2. Install power steering pump bracket. Tighten retaining bolts and nut to 37-52 N·m (27-38 lb-ft).
3. Install the pump on pump bracket.
4. Install the pivot bolt finger-tight.
5. Install the adjusting screw block, nut and screw finger-tight.
6. Install the drive belt and tighten bolts to specification. Refer to Section 03-05.
7. Install the power steering pressure switch wire.
8. Install the pressure and return hoses.
9. Install the ground wire onto the engine lifting eye bracket.
10. Connect charge air cooler outlet hose (if equipped).
11. Install RH radiator support and brace.
12. Fill the system with fluid as outlined. Check for leaks and proper operation.

Tie Rod End

Removal

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Remove the tire and wheel assembly.
3. Remove the cotter pin and tie rod end retaining nut.
4. Separate the tie rod end from the steering knuckle using Tie Rod End Separator T85M-3395-A or equivalent. If the tie rod end does not separate easily, give the steering knuckle a sharp blow with a brass hammer or drift.
5. Paint or mark an aligning stripe on the tie rod end, jamb nut, and tie rod.



6. Loosen the jamb nut on the tie rod.
7. Remove the tie rod end.

Installation

1. Thread the jamb nut and tie rod end onto the tie rod.
2. Align the index mark on the tie rod end, jamb nut and tie rod. Tighten the jamb nut.
3. Install the tie rod end in the steering knuckle. Tighten the retaining nut to 35-40 N·m (26-29 lb-ft).

   NOTE: If the slots in the nut do not align with the hole in the ball joint stud, tighten the nut for proper alignment. Never loosen the nut.
4. Install cotter key.
5. Install the tire and wheel assembly. Tighten wheel lug nuts to 90-120 N·m (67-88 lb-ft).

Dust Boot

Removal

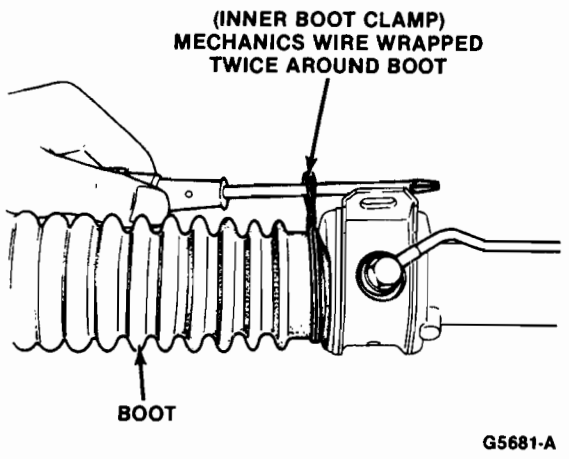
1. Remove the tie rod end from the tie rod as outlined.
2. Using a pair of pliers, remove the outer boot clamp from the dust boot and tie rod.
3. Cut the inner boot clamping wire from the dust boot with a pair of diagonal cutters.
4. Slide the dust boot off the tie rod.

Installation

1. Slide a new boot over the tie rod and onto the housing.

REMOVAL AND INSTALLATION (Continued)

2. Install a piece of wire around inner boot as shown.



3. Install the outer boot clamp.
4. Install the tie rod end as outlined.

Steering Gear

Removal

1. Position the vehicle on a hoist. Refer to Section 00-02.
2. Remove the battery. Refer to Section 14-01.
3. Raise the vehicle and remove both front tire and wheel assemblies.
4. Separate both tie rod ends from their steering knuckles as outlined.
5. Remove the plastic dust shield from the right side lower inner fender.
6. Lower the vehicle but do not allow anything but the rear wheels to touch the ground.
7. Using a pair of diagonal cutters, cut the plastic wire tie clamping the steering column dust boot to the steering gear.
8. Pull back the dust boot and have an assistant turn the steering column shaft until clamp bolt is accessible, then lock steering column.
9. Pull back the steering column dust boot and paint an aligning mark on the steering column pinion shaft and the intermediate shaft lower universal joint.
10. Remove the clamp bolt from the intermediate shaft lower universal joint.
11. Using a 17mm crowfoot line wrench, loosen and remove the power steering gear return hose.
12. Using a 14mm socket, loosen and remove the banjo bolt from the power steering gear pressure hose. Discard the two copper washers removed from the return line banjo fitting.
13. Position the hoses so they are out of the way.
14. Remove the steering gear retaining bolts.
15. Lower the steering gear until the steering shaft is clear of the intermediate shaft universal joint.
16. Carefully slide the steering gear out of the right side fender well through the tie rod opening.

Installation

1. Raise the vehicle on a hoist. Refer to Section 00-02. Slide steering gear into position through the right side lower inner fender well opening. Position the pinion shaft so it is just below the intermediate shaft universal joint.
2. Lower the vehicle enough to allow access beneath it. Raise the steering gear from under the vehicle and slide it into position.
3. Have an assistant guide the pinion shaft into the intermediate shaft lower universal joint while at the same time making sure the alignment marks line up.
4. Install the retaining bolts through the steering gear mounting bracket and into the dash panel.
5. Install the clamp bolt in the intermediate shaft lower universal joint. Tighten securely.
6. Attach the hoses from the power steering pump to the steering gear. Install new copper washers at the return line banjo fitting. Tighten the pressure hose fitting with a 17mm crowfoot line wrench.
7. Connect the tie rod ends to the steering knuckle arms as outlined.
8. Fill the reservoir with fluid.
9. Install the battery. Refer to Section 14-01.
10. Install both tire and wheel assemblies.
11. Bleed the hydraulic lines by starting the vehicle and slowly turning the steering wheel back and forth, stop-to-stop. Check the fluid level often.
12. Carefully check for leaks and add fluid if needed.
13. Install the plastic dust shield on the right side lower inner fender.

High Pressure Hose

Removal

1. Position a drain pan below ends of hose to catch fluid.
2. Using two tubing wrenches, disconnect high pressure hose from tubing. Allow fluid to drain.
3. Remove bolt from high pressure hose clamp.
4. Remove high pressure hose from power steering pump.

Installation

1. Connect high pressure hose to power steering pump. Tighten securely.
2. Install bolt to locate and secure high pressure hose.

REMOVAL AND INSTALLATION (Continued)

3. Using two tubing wrenches, connect high pressure hose to tubing. Tighten securely.
4. Disconnect ignition coil wire.
5. Fill reservoir and raise front wheels off floor.
6. Crank engine with starter, and add fluid until level remains constant.
7. While cranking the engine, rotate steering wheels from stop-to-stop. Front wheels must be off the floor during stop-to-stop rotation of steering wheel. Check the fluid level and add fluid if necessary.
8. Attach ignition coil wire and lower front wheels.
9. Start the engine and allow it to run for several minutes.
10. Rotate steering wheel from lock-to-lock.
11. Turn engine OFF, check and add fluid if necessary.

Return Hose

Removal

1. Position a drain pan below ends of hose to catch fluid.
2. Remove clamps from return hose and remove hose.

Installation

1. Install hose with two clamps.
2. Disconnect ignition coil wire.
3. Fill reservoir and raise front wheels off floor.
4. Crank engine with starter and add fluid until level remains constant.
5. While cranking the engine, rotate steering wheel from stop-to-stop. Front wheels must be off the floor during stop-to-stop rotation of steering wheel. Check the fluid level and add fluid if necessary.
6. Attach ignition coil wire and lower front wheels.
7. Start the engine and allow it to run for several minutes.
8. Rotate steering wheel from stop-to-stop.
9. Turn engine OFF, check and add fluid if necessary.

Pressure/Return Tubing

Removal

1. Position the vehicle on hoist.
2. Position a drain pan below ends of tubing to catch fluid.
3. Disconnect the pressure and return hoses from the tubing.
4. Remove battery if necessary. Refer to Section 14-01.
5. Using a 17mm crowfoot line wrench, loosen and remove the return line from the power steering gear.
6. Using a 14mm socket, loosen and remove the banjo bolt from pressure line at the power steering gear. Remove and discard two copper washers.
7. Remove pressure/return tubing as an assembly.
8. Remove clamps to separate pressure/return tubing.
9. If necessary, remove high pressure tubing end from tubing.

Installation

1. If removed, install high pressure end onto tubing.
2. Position pressure/return tubing together and install clamps.
3. Install pressure/return tubing assembly onto dash panel.
4. Connect high pressure line to steering gear with banjo bolt and two new copper washers. Tighten securely.
5. Connect return line to steering gear. Tighten securely.
6. Install battery, if removed. Refer to Section 14-01.
7. Connect high pressure and return hoses to tubing.
8. Disconnect ignition coil wire.
9. Fill reservoir and raise front wheels off floor.
10. Crank engine with starter, and add fluid until level remains constant.
11. While cranking the engine, rotate steering wheel from stop-to-stop. Front wheels must be off the floor during stop-to-stop rotation of steering wheel. Check and add fluid if necessary.
12. Attach ignition coil wire and lower front wheels.
13. Start the engine and allow it to run for several minutes.
14. Rotate steering wheel from stop-to-stop.
15. Turn engine OFF, check and add fluid if necessary.

DISASSEMBLY AND ASSEMBLY

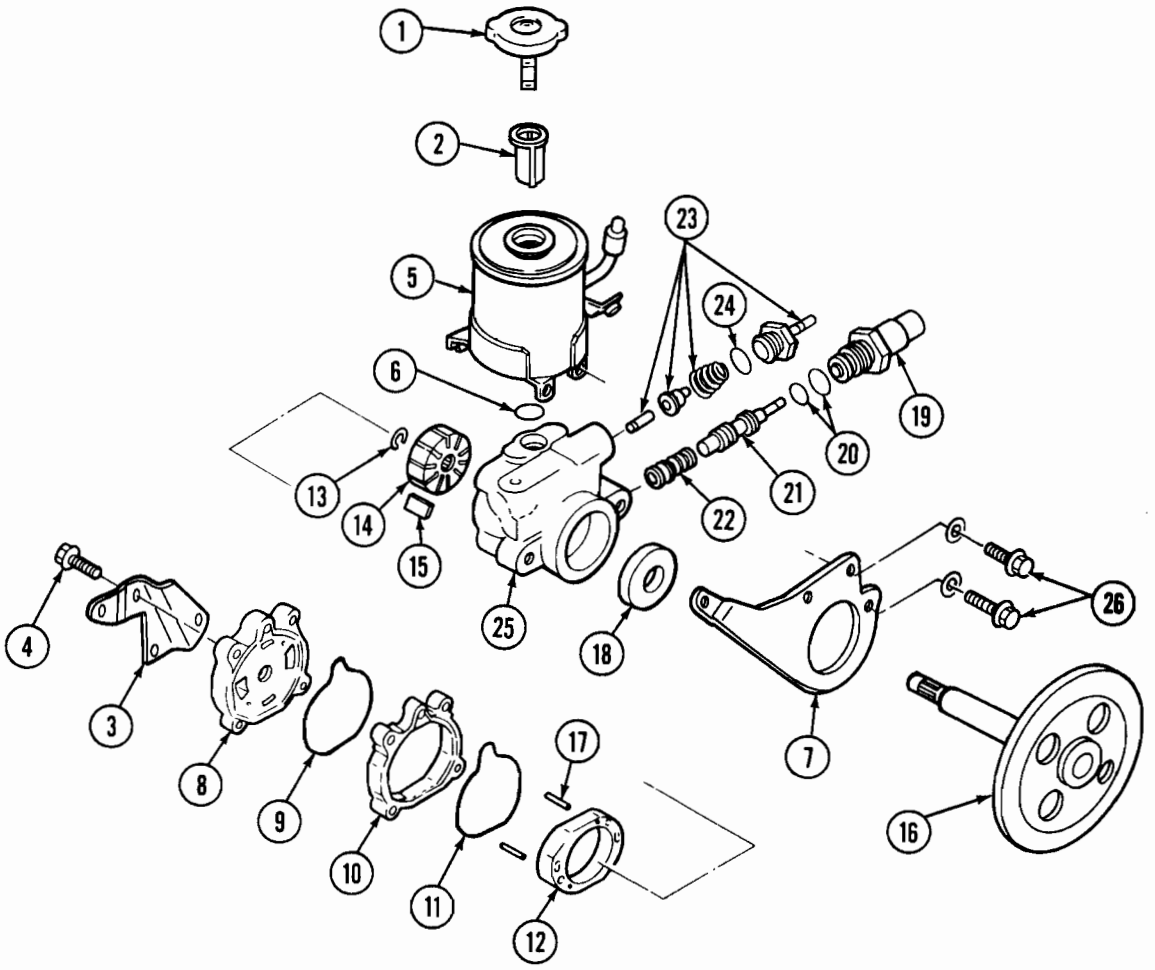
Power Steering Pump

Disassembly

1. Remove the cap and strainer, and drain the pump.
2. Remove the rear bracket, retaining bolts and brackets.
3. Remove oil reservoir and O-ring.
4. Remove the rear pump body and O-ring.

DISASSEMBLY AND ASSEMBLY (Continued)

5. Remove the pump center body and O-ring.
6. Remove dowel pins from pump body, if necessary.
7. Remove cam ring.
8. Remove pump shaft snap ring.
9. Remove the vanes from the rotor.
10. Remove the rotor from the shaft. Note the position of the rotor on the shaft.
11. Remove the pump shaft from the front of the pump.
12. Remove the front bracket retaining bolts and bracket.
13. Remove the shaft oil seal with a pry bar or similar tool. Do not damage the seal bore.
14. If necessary remove the pressure regulator valve as outlined.
15. If necessary remove the power steering pressure switch as outlined.



G5444-B

Item	Part Number	Description
1	3A006	Oil Level Gauge
2	3E550	Oil Strainer
3	3C511	Rear Bracket
4	—	Bolt
5	3A697	Oil Tank
6	3B584	O-Ring
7	3C511	Front Bracket
8	—	Pump Body Rear

(Continued)

Item	Part Number	Description
9	3B584	O-Ring
10	—	Pump Body Center
11	3B584	O-Ring
12	—	Cam Ring
13	—	Snap Ring
14	—	Rotor
15	—	Vane
16	3A733	Shaft and Pulley Assy

(Continued)

DISASSEMBLY AND ASSEMBLY (Continued)

Item	Part Number	Description
17	3B584	Dowel Pin
18	—	Oil Seal
19	3A561	Connector
20	3B584	O-Rings
21	—	Control Valve

(Continued)

Item	Part Number	Description
22	—	Spring
23	3N824	Power Steering Pressure Switch
24	3B584	O-Ring
25	—	Pump Body
26	32596	Bolt and Washer

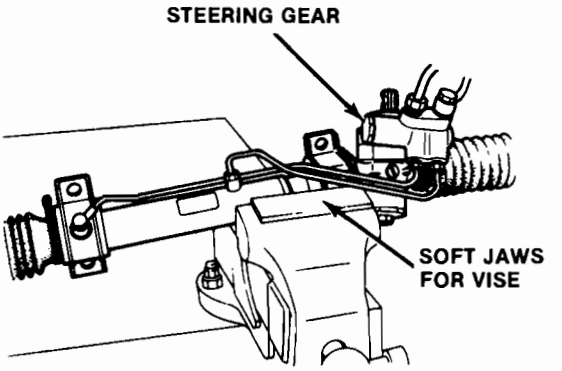
Assembly

1. If removed, install the power steering pressure switch as outlined.
2. If removed, install the pressure regulator valve as outlined.
3. Install a new shaft oil seal with a suitable arbor or socket. Grease the seal lip with lithium base grease.
4. Install the dowel pins in the pump body, if removed.
5. Install front bracket and retaining bolts.
6. Install the pump shaft from the front of the body.
7. Install rotor onto rear of the shaft in the same position as removed.
8. Install the pump shaft snap ring. Tap the shaft on the rear end to seat the snap ring onto the rotor splined hole below the rotor rear face.
9. Install the vanes in the rotor with the rounded edges facing out.
10. Install the cam ring onto the dowel pins.
11. Install the center pump body and front O-ring.
12. Install the rear pump body and O-ring.
13. Install the reservoir and O-ring onto the pump body.
14. Install the short bolt into the hole used by the tank bracket and tighten.
15. Install the rear mounting bracket and tighten bolts.
16. Rotate the pulley to check for free operation. If pump does not rotate freely, disassemble and check for the cause. Check shaft to rotor slip spline beyond the rotor rear face.
17. Perform the operations described under Fluid Level Check / or Start-Up Procedure.

Steering Gear

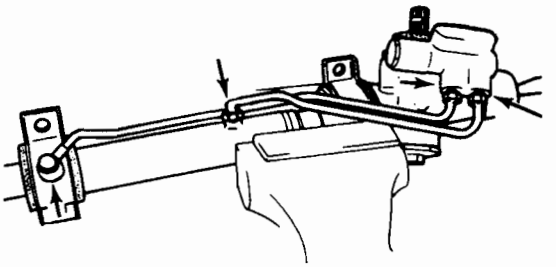
Disassembly

1. Remove the steering gear from the vehicle as outlined.
2. Mount the steering gear in a soft-jawed vise.



G5676-A

3. Remove the external hydraulic lines connecting the valve body to the steering gear housing. Store in a safe place.

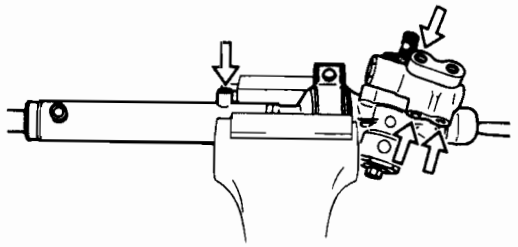


G5684-A

4. Remove the mounting brackets and rubber mounting bushings from the steering gear.

DISASSEMBLY AND ASSEMBLY (Continued)

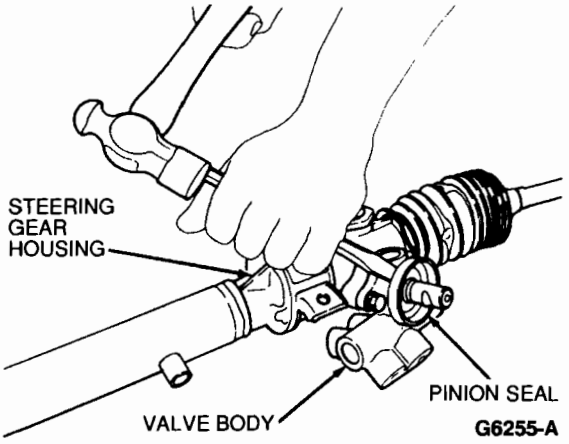
5. Remove the brass tubing seats from the steering gear using a self-tapping screw and two screwdrivers.



REMOVE TUBING SEATS WHERE INDICATED BY ARROWS

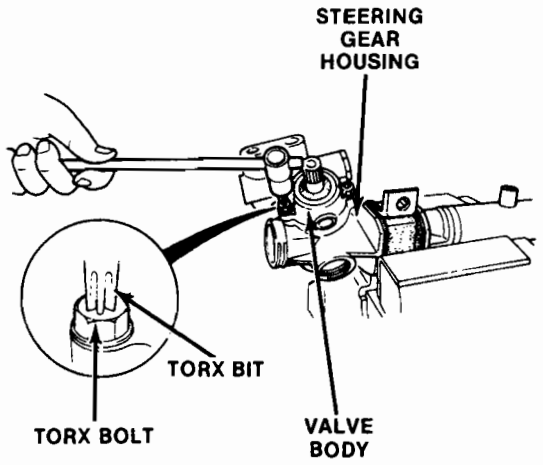
G5655-A

6. Using a cold chisel, remove the pinion seal.



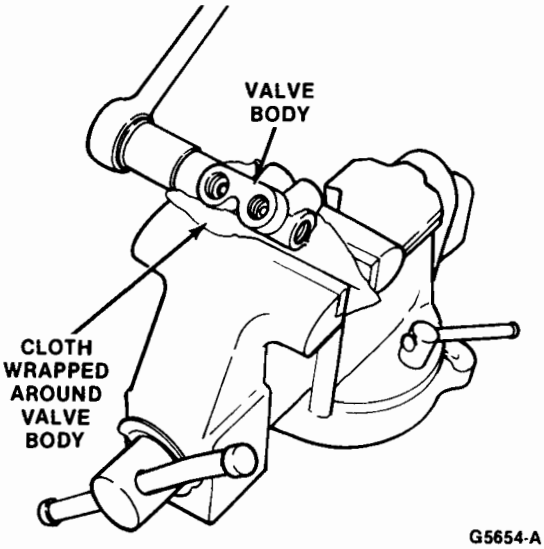
G6255-A

7. Using a No. 40 Torx® bit, remove the valve body retaining bolts.



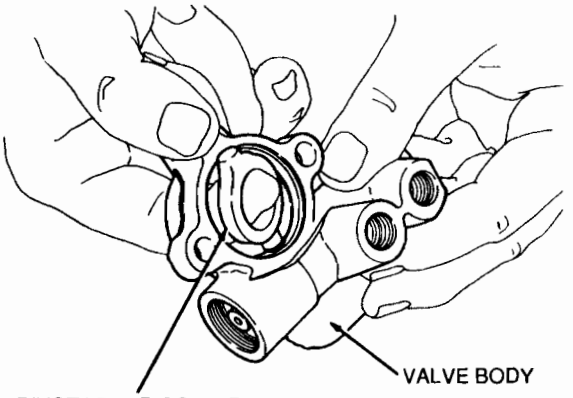
G5677-A

8. Wrap the valve body in a cloth to protect it and mount it in a vise. Remove the end plug from the valve body.



G5654-A

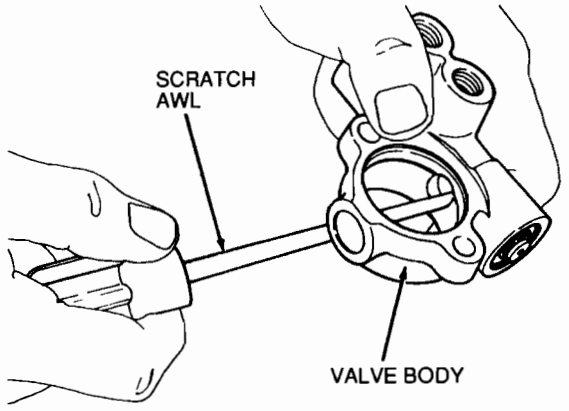
9. Remove the pivot lever / collar from the valve body.



G6256-A

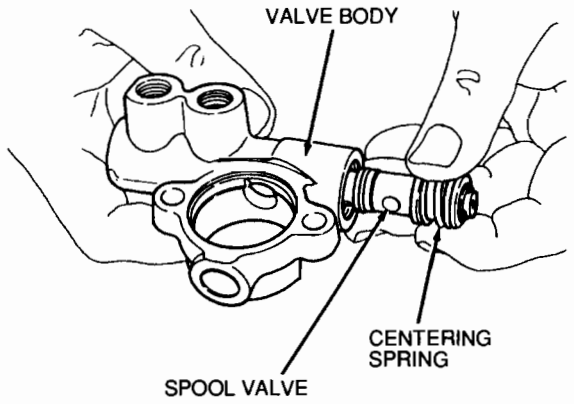
DISASSEMBLY AND ASSEMBLY (Continued)

10. Carefully insert an awl or punch in the pivot lever hole of the spool valve and slide the spool valve partially out of the valve body.



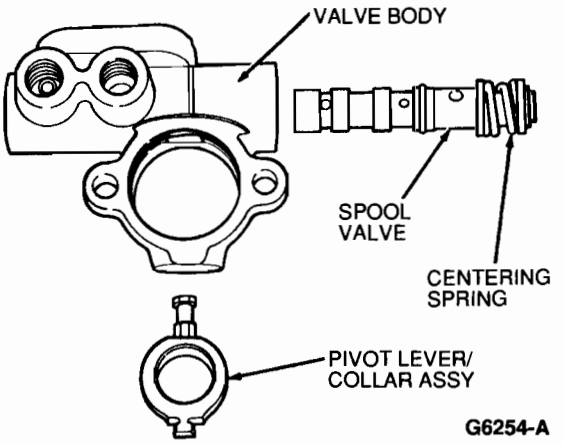
G6257-A

11. Remove the spool valve from the valve body.



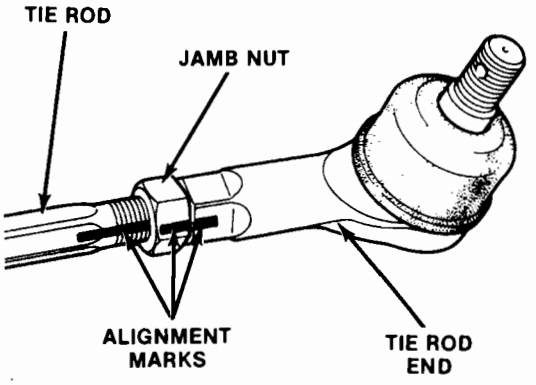
G6258-A

12. Carefully remove the spool valve O-ring.
13. Carefully clean the valve body and parts in solvent. Inspect all parts for wear. Check the spherical ends and the pinion shaft bushing on the pivot lever / collar for wear. Check the spool valve for burrs, scratches and wear. If necessary, polish the spool valve with crocus cloth.



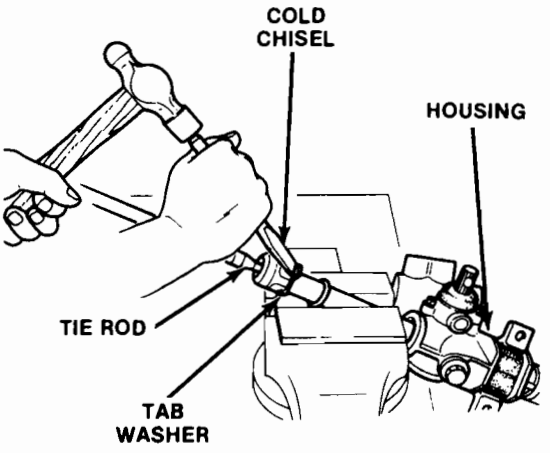
G6254-A

14. Mark or paint aligning marks on the tie rod, jamb nut and tie rod end so they can be installed in the same position.



G5685-A

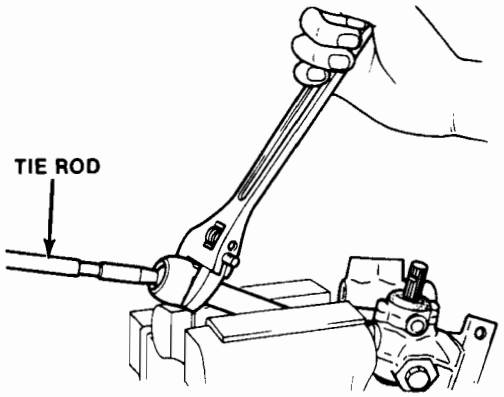
15. Remove the tie rod ends and jamb nuts.
16. Remove the tie rod dust boots from the steering gear housing.
17. Using a dull cold chisel, uncrimp the tie rod tab washers.



G5680-A

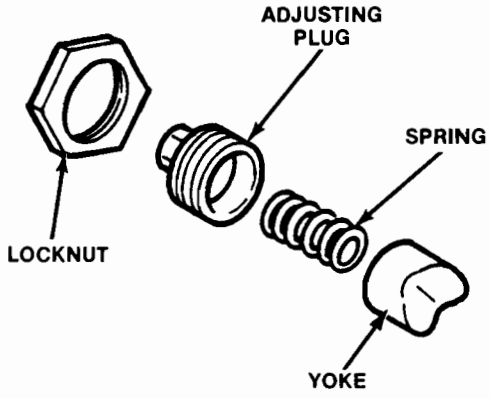
DISASSEMBLY AND ASSEMBLY (Continued)

18. Remove the tie rod from the rack. Be sure to use a back-up wrench on the rack so the rack teeth and pinion are not damaged.



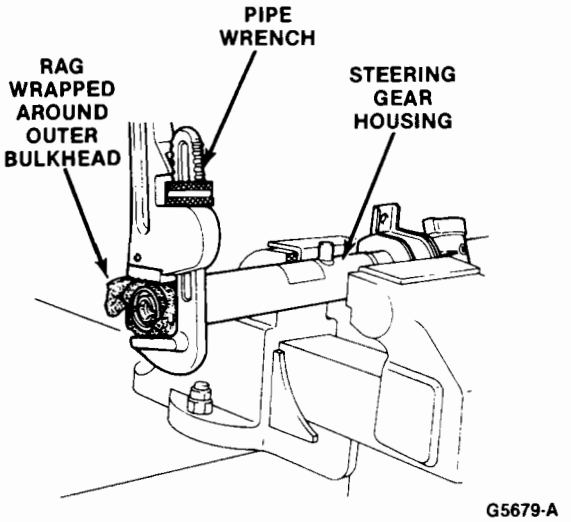
G5683-A

19. Loosen the locknut and remove the adjusting plug, spring and yoke from the steering gear housing.



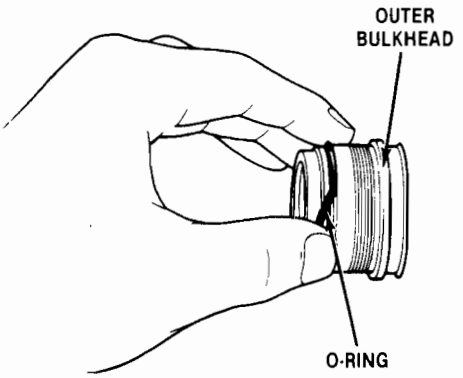
G5647-A

20. Protect the outer bulkhead with a cloth and remove with a pipe wrench.



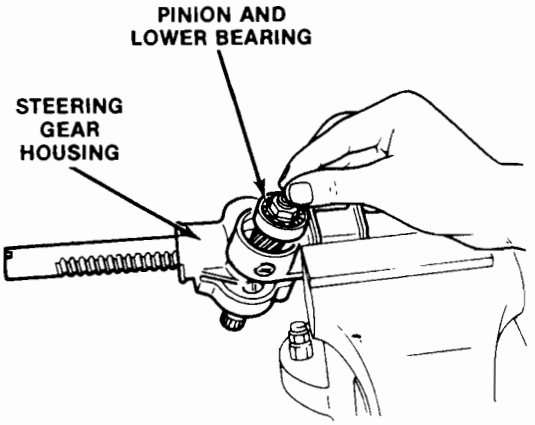
G5679-A

21. Remove the old O-ring from the outer bulkhead and discard.



G5696-A

22. Pull the pinion shaft assembly out from the lower bearing side.

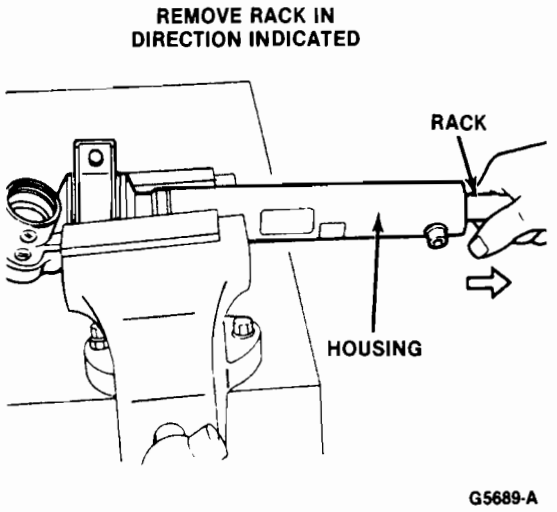


G5678-A

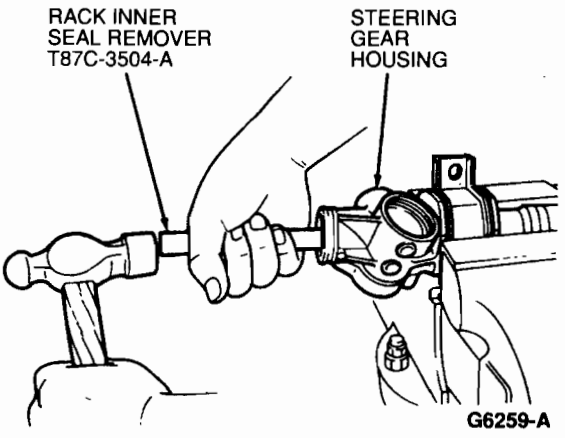
DISASSEMBLY AND ASSEMBLY (Continued)

23. Remove the upper pinion bearing by driving it out of the housing with a wooden dowel.
24. Remove the rack by taking it out in the direction indicated.

    CAUTION: If the rack is taken out opposite the direction indicated, the inside surface of the rack bushing may be damaged by the rack teeth.

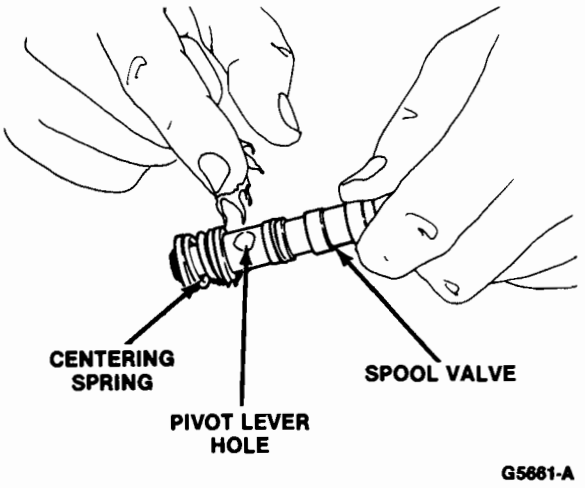


25. Remove the inner guide and inner rack seal using Rack Inner Seal Remover T87C-3504-A or equivalent.

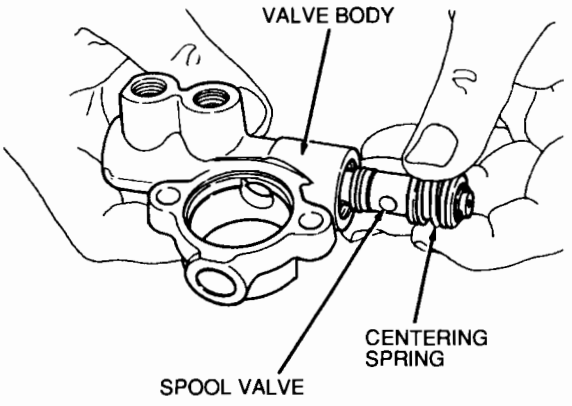


Assembly

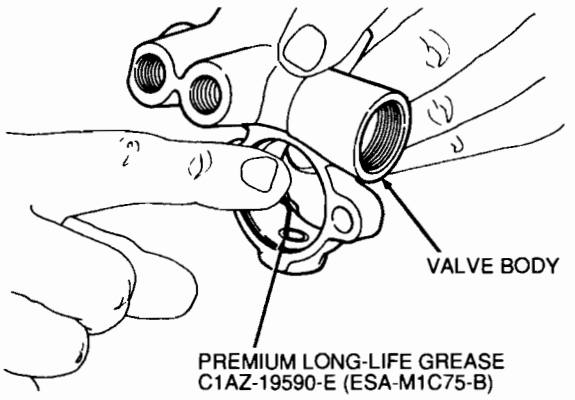
1. Inspect all parts.
2. Install a new O-ring on the spool valve. Then apply Premium Long-Life Grease C1AZ-19590-E (ESA-M1C75-B) or equivalent to the spool valve pivot lever hole and Premium Power Steering Fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent to the rest of the spool valve.



3. Install the spool valve in the valve body.

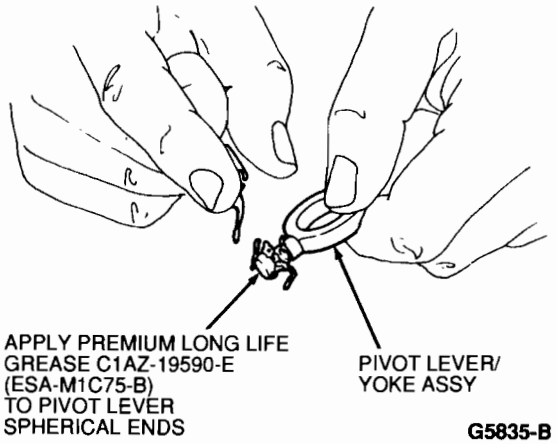


4. Apply Premium Long-Life Grease C1AZ-19590-E (ESA-M1C75-B) or equivalent to the pivot lever hole in the valve body.

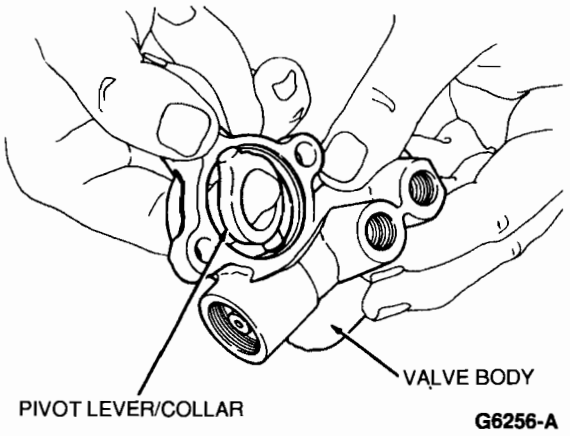


DISASSEMBLY AND ASSEMBLY (Continued)

5. Apply Premium Long-Life Grease C1AZ-19590-E (ESA-M1C75-B) or equivalent to the spherical ends of the pivot lever / collar and to the bushing.

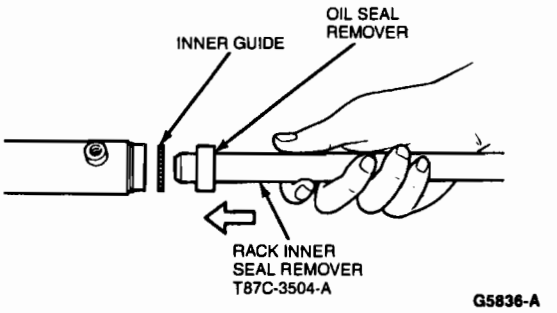


6. Install the pivot lever / collar in the valve body housing making sure that the spherical end of the pivot lever is seated in the spool valve.



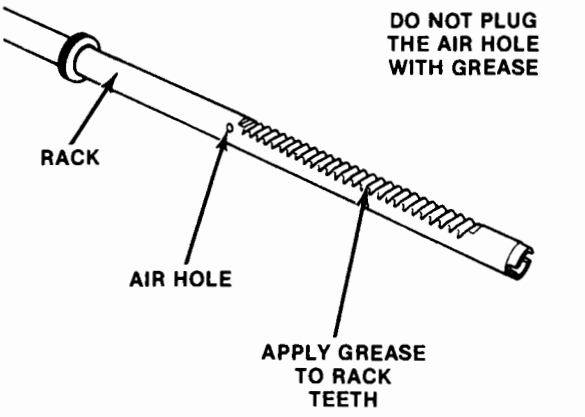
7. Install the end plug in the valve body.
8. Apply Premium Power Steering Fluid E6AZ-19582-AA to the inner guide.
9. Push the inner guide and the inner rack seal into the rack housing with Rack Inner Seal Remover T87C-3504-A or equivalent.

   CAUTION: Do not damage the inner surface of the rack housing.



10. Apply Premium Long-Life Grease C1AZ-19590-E (ESA-M1C75-B) or equivalent to the rack teeth. Install Rack Oil Seal Protector D83P-3504-K or equivalent.

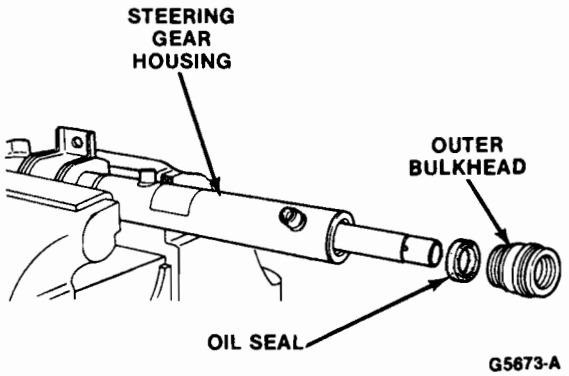
    CAUTION: Do not plug the air hole of the rack with grease.



11. Install a new rack piston seal on the rack, using Piston Seal Replacer T81P-3504-L with Seal Installation Set T75L-3517-A2 and Rack Piston Seal Sizer T81P-3504-K or equivalent, and apply Premium Power Steering Fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent to the rack piston and the electrical tape covering the rack.
12. Coat the housing cylinder bore with Premium Power Steering Fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent and carefully slide the rack into the housing.
13. Slide the rack as far as it will go into the housing. Remove rack seal protector tool.

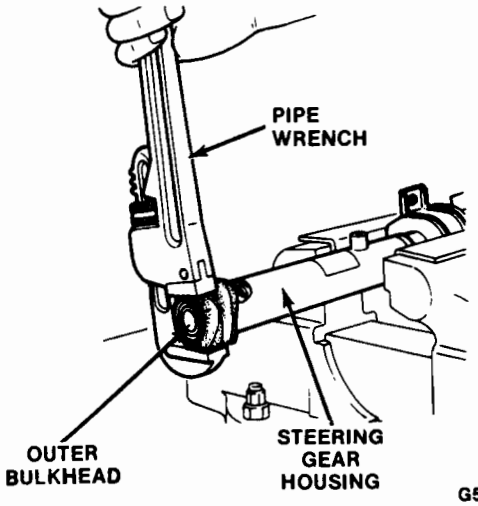
DISASSEMBLY AND ASSEMBLY (Continued)

14. Install a new bushing into the outer dash panel using Pinion Cover Centering Tool T81P-3504-Y or equivalent. Install a new sealing ring, oil seal, and new O-rings at the outer dash panel and install the outer dash panel. Be sure to liberally lubricate all parts with Premium Power Steering Fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent before installation.



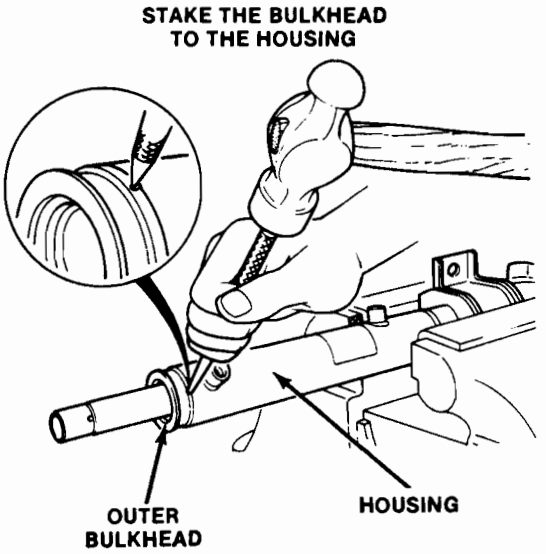
G5673-A

15. Wrap a cloth around the outer bulkhead and install it with a pipe wrench.



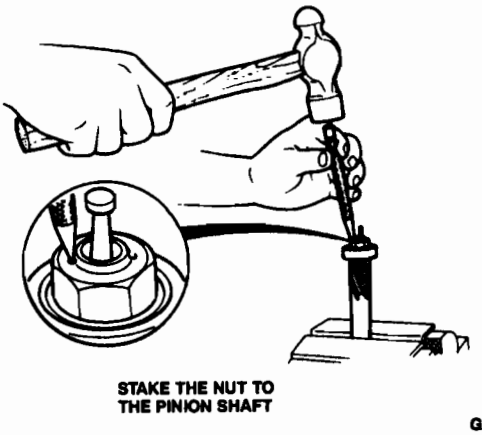
G5672-A

16. Stake the outer bulkhead to the rack housing by using a punch.



G5668-A

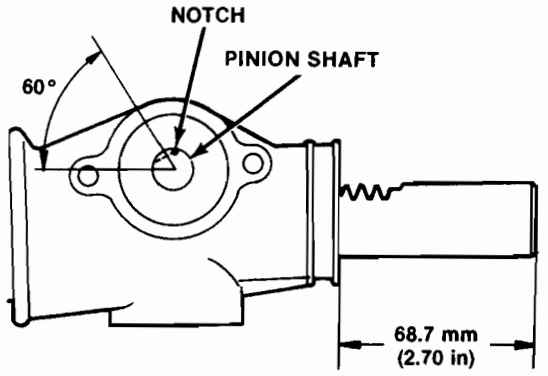
17. Install the lower bearing on the pinion shaft. Install the retaining nut, and tighten nut to 40-50 N·m (30-36 lb-ft). After tightening, stake the nut to the pinion shaft.



G5840-A

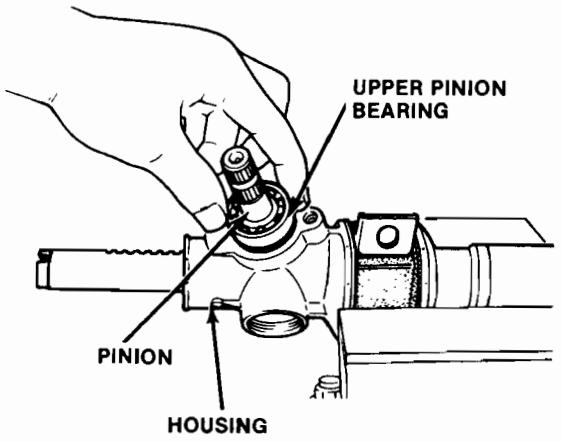
DISASSEMBLY AND ASSEMBLY (Continued)

18. Install the pinion shaft with the notch on the spline positioned as shown when the rack is positioned in the center of the rack housing (or with the rack protruding beyond the housing as specified).



G5663-A

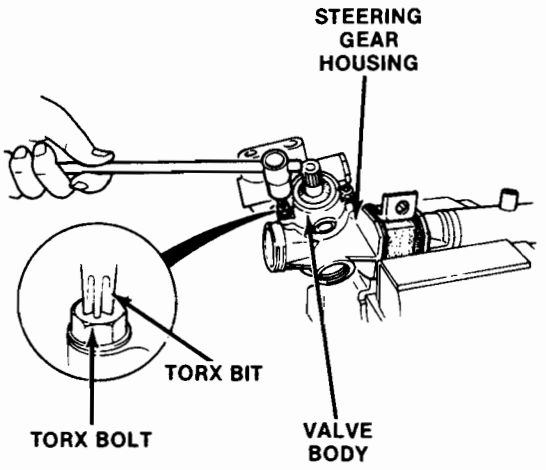
19. Grease the upper pinion bearing and install it in the housing using Upper Pinion Bearing / Seal Replacer T78P-3504-D or equivalent.



G5697-A

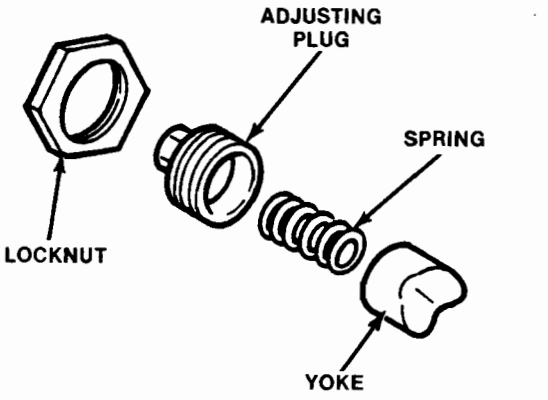
20. Tighten the pinion bearing cover to 5-9 N·m (45-79 lb-in). Then loosen it 10-20 degrees.
21. Lock the housing cover by tightening the locknut to 40-50 N·m (30-36 lb-ft).

22. Using a new gasket, position the valve body on the housing. Install the Torx® drive retaining bolts.



G5677-A

23. Install the yoke, spring, adjusting plug, and locknut. Tighten cover to 5-9 N·m (45-79 lb-in) and then loosen it 45 degrees.

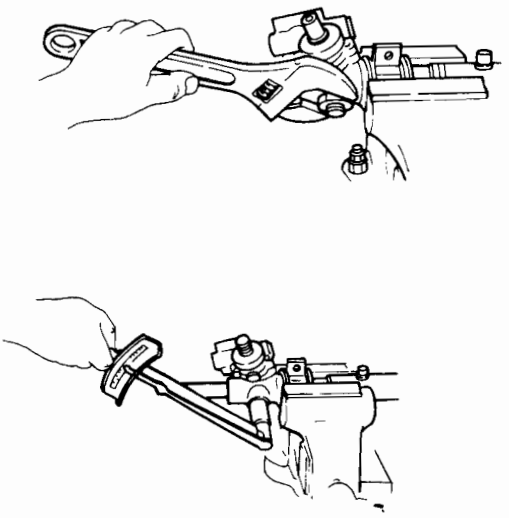


G5647-A

24. Measure the pinion torque using a lb-in torque wrench and Pinion Seal Replacer / Torque Adapter T87C-3504-C or equivalent. Tighten to 0.6-1.5 N·m (6-13 lb-in).

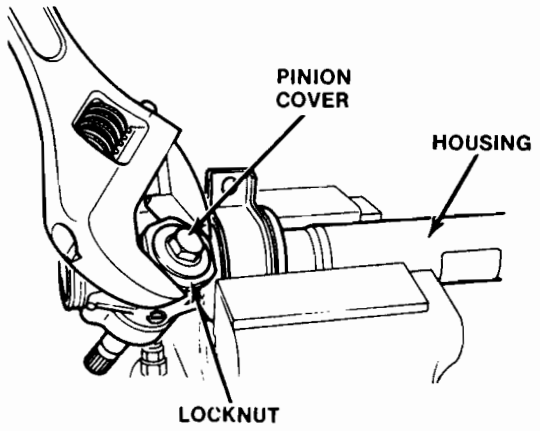
DISASSEMBLY AND ASSEMBLY (Continued)

25. If the pinion torque is not within specification, re-adjust by tightening or loosening the adjusting plug.



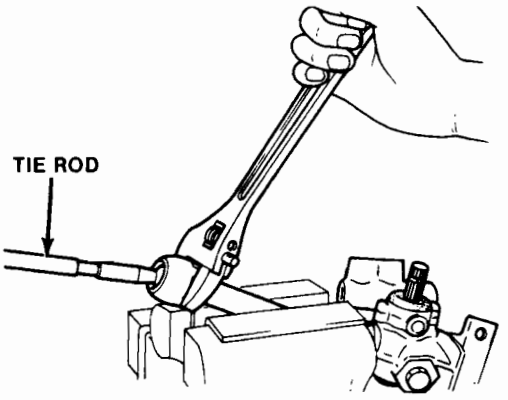
G5669-A

26. Lock the cover by tightening locknut to 40-50 N·m (30-36 lb-ft).



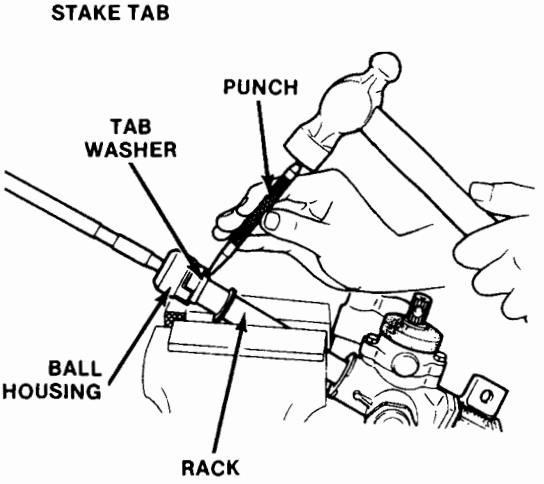
G5651-A

27. Mount the rack in a soft-jawed vise and install the damper ring, washer, and tie rod. Tighten tie rod to 60-80 N·m (45-59 lb-ft).



G5683-A

28. Stake the tab washer in two places using a punch. Position the damper ring in the washer. Install the other damper ring, washer, and tie rod.



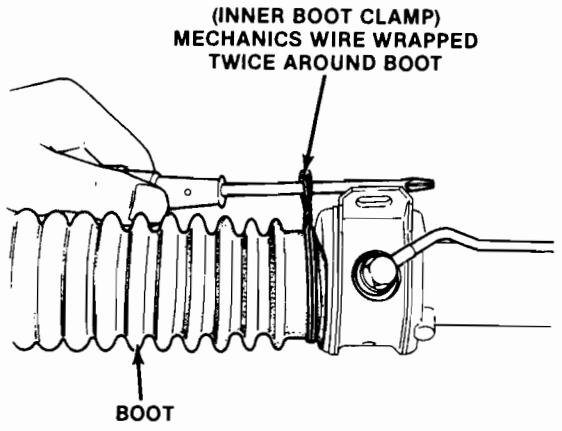
G5682-A

29. Slide a tie rod boot over the tie rod and position it on the steering gear. Wrap a new piece of mechanics wire twice around the inner boot and then around a Phillips screwdriver. Twist the wire four or five times with the screwdriver.

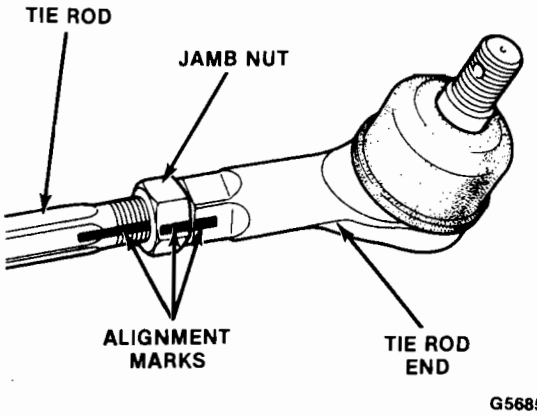
CAUTION: Be sure the boot is not twisted or dented.

DISASSEMBLY AND ASSEMBLY (Continued)

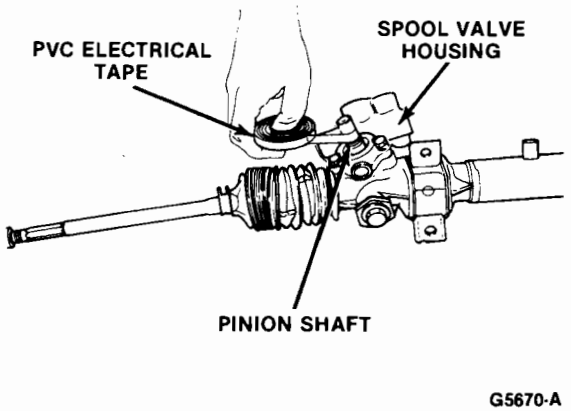
Install the other boot and then the outer boot clamps.



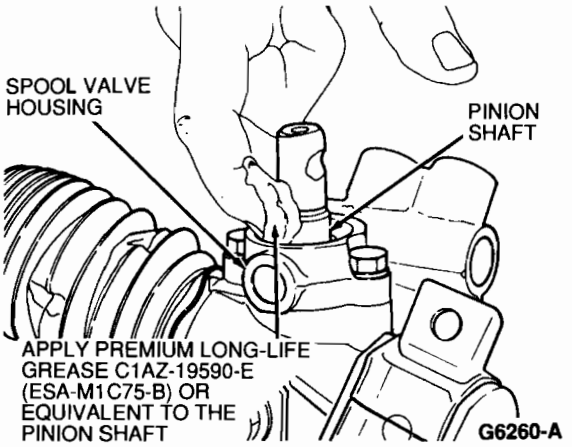
30. Install the tie rod ends and jamb nuts making sure the index marks align.



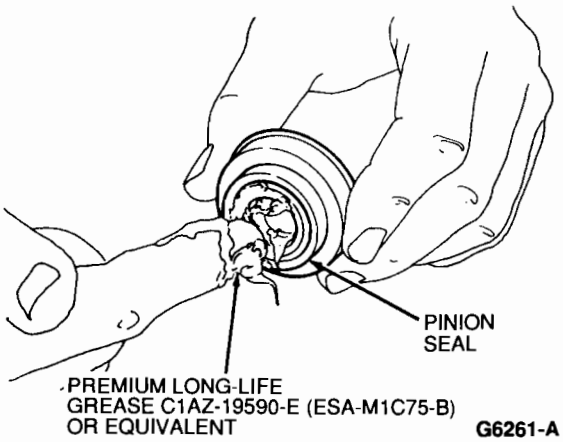
31. Wrap PVC electrical tape around the pinion shaft.



32. Apply Premium Long-Life Grease C1AZ-19590-E (ESA-M1C75-B) to the pinion shaft.



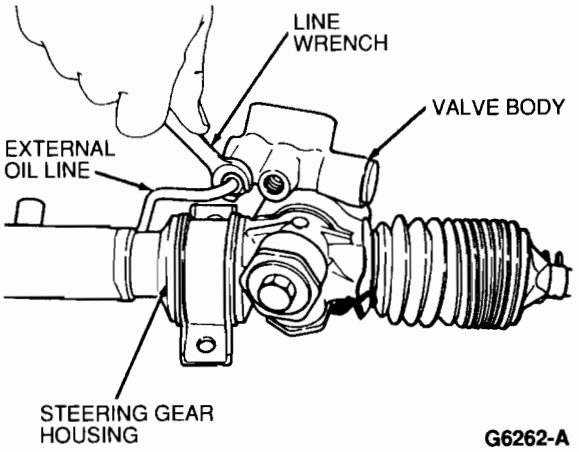
33. Apply Premium Long-Life Grease C1AZ-19590-E (ESA-M1C75-B) to the sealing lips of the pinion shaft seal.



34. Install the pinion shaft seal with Upper Pinion Bearing / Seal Replacer T78P-3504-D or equivalent.
35. Remove the PVC electrical tape from the pinion shaft.
36. Install the rubber rack support bushings on the housing and tap the rack support brackets in position over the bushings.
37. Install the two external oil lines connecting the valve body to the housing. Be sure to install two new copper sealing rings at each banjo fitting.

DISASSEMBLY AND ASSEMBLY (Continued)

38. Be sure to use a tubing wrench on the flare nut fittings.



Inspection

1. Inspect the rack teeth and the pinion gear for any signs of chipping, scoring or unusual wear. Replace the pinion gear and the rack as a set if any damage is found.
2. Mount the rack on V-blocks and check for runout with a dial indicator. Runout should be no more than 0.03mm (0.012 inch).
3. Check the bearings for looseness, abnormal noise, or poor operation. If the pinion bearing needs replacing, replace as an assembly.
4. Check the rack bushing inside the housing for wear. If replacement is necessary, replace the entire gear housing as an assembly.
5. Check the sliding surface of the yoke for abnormal wear.
6. Check for looseness or roughness in the tie rod ball housings.
7. Check for bent tie rods or tie rod ends.
8. Check the outer dash panel bushing for wear.
9. Check the pivot lever / collar for wear or damage. Be sure to check the spherical faces of the lever and the collar bushing for wear or damage.
10. Check the spool valve for cuts, nicks, burrs, and wear.
11. Check the tie rod boot for cracking, damage and deterioration.

Power Steering Pump

Wash all parts except seals in a chlorinated solvent, and dry with compressed air or allow to drip dry. Do not use cloth for drying. To determine when to replace power steering pump components, follow these guidelines. Some components must be replaced regardless of condition.

1. Re-use rotor and vanes only if there are no visible signs of wear. Inspect vanes individually and check rotor faces and outer periphery for scored or chipped surfaces. If wear or burring has occurred on vanes or rotor, replace the assembly. If vanes have become dislodged they must be inserted in the rotor with the rounded end contacting the cam.
2. Check the clearance between vane and rotor groove. The clearance should be between 0.01 and 0.06mm (0.0004 and 0.0024 inch).
3. Re-use rotor shaft if thrust faces, bushing diameter and shaft seal diameter are not excessively worn or scored.
4. If bushing is scored or excessively worn, or O-ring grooves are damaged, replace the housing. The clearance between the bushing and shafts should be between 0.03 and 0.1mm (0.001 and 0.004 inch).

CLEANING AND INSPECTION

Flushing Power Steering System

If the power steering pump has been replaced or overhauled, it is recommended that the power steering gear and lines be flushed before the pump is put into service. To remove possible contamination from the gear and lines, perform the following procedure:

1. Remove and flush the power steering pressure hose. After flushing, install the hose.
2. Place the fluid return line from the gear in a container, and plug the reservoir return line fitting at the reservoir.
3. Fill the reservoir with Premium Power Steering Fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent.
4. Disconnect the coil wire and raise the front wheels off the ground.
5. Add approximately 2 L (2 qt) of fluid while cranking the engine with the starter and turning the steering wheel from left to right.
6. When all the fluid has been added, stop cranking the engine.
7. Remove the plug from the reservoir return fitting and attach the line to the reservoir.
8. Fill the pump reservoir to the specified level as outlined.
9. Crank the engine with the starter, and add fluid until the level remains constant.
10. While cranking the engine, rotate the steering wheel from stop-to-stop.

    CAUTION: Front wheels must be off the ground during stop-to-stop rotation of the steering wheel.
11. Check the fluid level, and add fluid if necessary.
12. Connect the coil wire.

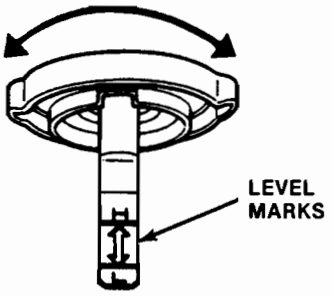
CLEANING AND INSPECTION (Continued)

13. Start the engine, and allow it to run for several minutes.
14. Rotate the steering wheel from stop-to-stop several times.
15. Turn OFF engine, and check the fluid level. Add fluid if necessary.

ADJUSTMENTS

Fluid Level Check

1. Fill the fluid reservoir to the "L" mark on the fill cap indicator rod with Premium Power Steering Fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent.
2. Run the engine until warm. Turn the steering wheel fully right and left about 10 times.
3. Shut the engine OFF with the wheels in the straight ahead position. Check the fluid level and fill to between the "L" and "H" marks on the dipstick.



G5702-A

Drive Belt Tension

Refer to Section 03-05 for adjustment procedures.

Start-Up Procedure

After Power Steering Pump or Gear Overhaul

Before engine start-up, follow these steps to eliminate excessive steering system noise due to air trapped in the system during service:

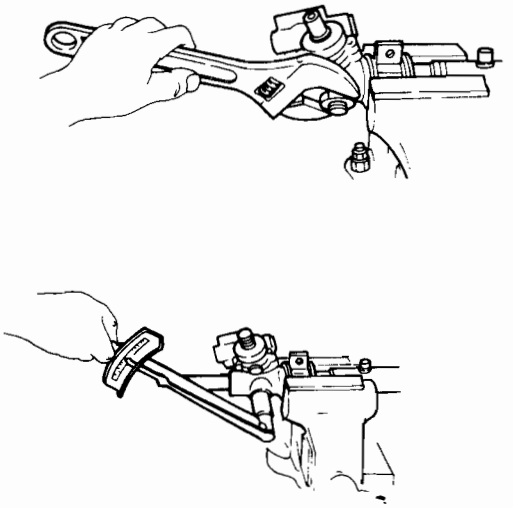
1. Disconnect the coil wire.
2. Fill the pump reservoir to the specified level.
3. Crank the engine with the starter. Add fluid until the level remains constant.
4. While cranking the engine, rotate the steering wheel from stop-to-stop.

   CAUTION: Front wheels must be off the ground during stop-to-stop rotation of the steering wheel.
5. Check the fluid level. Add fluid if necessary.
6. Connect the coil wire.
7. Start the engine and allow it to run for several minutes.
8. Rotate the steering wheel from far left to far right several times.
9. Turn OFF the engine and check fluid level. Add fluid if necessary.

Rack Yoke Preload

NOTE: Re-adjusting the rack yoke preload will seldom cure hard steering or poor steering wheel return following a turn. First, check for damage that would be caused by an impact with a curb. Then, check for tight universal joints in the steering column and for tight or binding suspension parts.

1. Remove the steering gear from the vehicle as outlined.
2. Measure the pinion torque using a lb-in torque wrench and Pinion Seal Replacer / Torque Adapter T87C-3504-C or equivalent. The torque should be 0.6-1.5 N·m (6-13 lb-in).
3. If the pinion torque is not within specification, re-adjust the pinion torque by tightening or loosening the adjusting plug.



G5669-A

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	N·m	Lb-Ft
Tie Rod End Retaining Nut	35-40	26-29
Pinion Shaft Nut	40-50	30-56

(Continued)

SPECIFICATIONS (Continued)

TORQUE SPECIFICATIONS (Cont'd)

Description	N·m	Lb-Ft
Pinion Bearing Cover	5-9	45-79 (Lb-In)
Tie Rod-to-Rack	60-80	45-59
Wheel Lug Nuts	90-120	67-88
Power Steering Pump Bracket Nut	37-52	27-38
Power Steering Pump Bracket Bolt	37-52	27-38
Housing Cover Locknut	40-50	30-36

SPECIAL SERVICE TOOLS

Tool Number	Description
T78P-3504-D	Upper Pinion Bearing / Seal Replacer
T81P-3504-Y	Pinion Cover Centering Tool

(Continued)

Tool Number	Description
T87C-3504-A	Rack Inner Seal Remover
T87C-3504-C	Pinion Seal Replacer / Torque Adapter
T81P-3504-K	Rack Piston Seal Sizer
T81P-3504-L	Piston Seal Replacer
D83P-3504-K	Rack Oil Seal Protector
T85M-3395-A	Tie Rod End Separator
T75L-3517-A2	Seal Installation Set

SECTION 11-04 Steering Column

VEHICLE APPLICATION

Capri.

DESCRIPTION

The steering column is of a modular construction. Column mounted switches are of an easily removable design. A clockspring-type slip ring is used for the air bag module electrical connections between the steering wheel and the column.

The combination switch mounted on the steering column contains switches for the turn signals, high and low beam, flash-to-pass feature, windshield wipers, windshield washers, and emergency flashers. The ignition switch / steering column lock and lock shield assembly is mounted to the column with provisions for servicing the ignition switch and lock shield separately from the column lock assembly.

Vehicles equipped with automatic transaxles have a brake-shift interlock mechanism attached to the steering column. Refer to Section 07-05.

CAUTION: Whenever the steering column is separated from the steering gear for any reason, the steering column must be locked to prevent the steering wheel from being rotated, which in turn will prevent damage to the air bag clockspring.

Air Bag Module

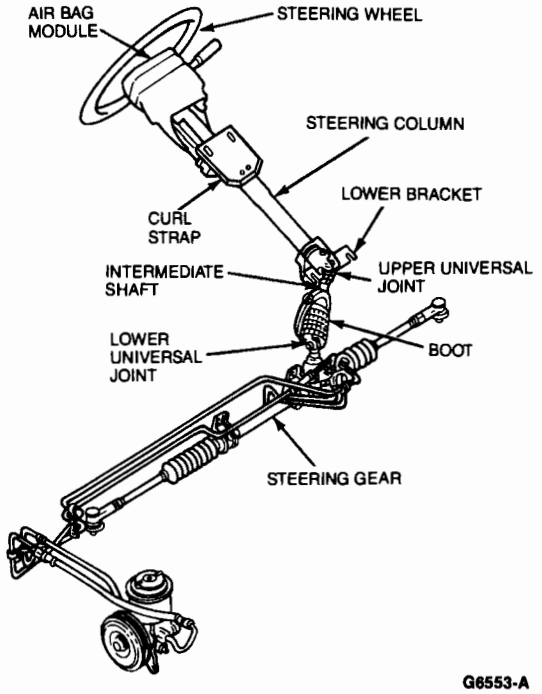
The steering wheel incorporates a driver's side air bag module. For information, refer to Section 01-20B.

Component Fasteners

CAUTION: All fasteners are important parts in that they affect the performance of vital parts and systems, and/or could result in major service expenses. They must be replaced with fasteners of the same part number if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during assembly to ensure proper function of these parts.

DESCRIPTION (Continued)

The steering column connects the steering wheel to the steering gear through an intermediate shaft.



G6553-A

The steering column is linked to the intermediate shaft by a universal joint assembly. A boot is used to seal the intermediate shaft where it passes into the engine compartment. The lower end of the intermediate shaft fits onto the steering gear using a universal joint. A clamp bolt is used to secure the joint.

The steering shaft is supported in the steering tube by a bearing in the column lock assembly, and by a bearing at the lower end. The lower bearing is not serviceable.

The steering column and shaft are designed to collapse under a heavy load, minimizing the risk of driver injury in an accident.

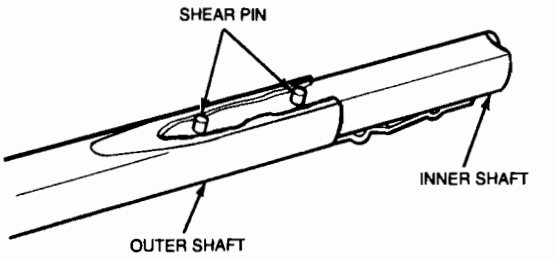
CAUTION: Once the steering column has been collapsed, a complete new steering column assembly must be installed.

The steering column is made up of the inner and outer tubes. The outer tube is sleeved over the inner tube by means of a ball cage assembly. This allows for a progressive collapsing action upon impact.

CAUTION: Care should be taken when handling the column assembly to ensure the inner and outer tubes do not rotate on each other. This will damage the telescopic action and the column may not collapse on impact as it is designed to do.

The upper column mounting also contributes to the collapsible design of the column by shear pins and a curl strap assembly. Upon impact, the shear pins release from the upper column mounting bracket. The curl strap unfolds to absorb driver impact.

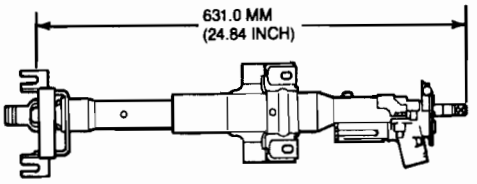
The steering shaft, located inside the column, consists of a lower outer shaft sleeved over the inner shaft. The steering shaft uses shear pins to allow the assembly to telescope on impact.



G6554-A

The steering shaft should measure 631mm ± 1mm (24.84 inch ±0.039 inch) as shown.

NOTE: THIS DIMENSION IS WITH THE LOWER MOUNTING BRACKET ROTATED TO THE IN-VEHICLE INSTALLATION POSITION. IF THE BRACKET IS SUCH THAT IT HAS THE MOUNTING SURFACES PARALLEL TO THE COLUMN CENTERLINE, THE DIMENSION IS 631.0MM (24.84 INCH)



G5841-A

REMOVAL AND INSTALLATION

Steering Wheel

Removal

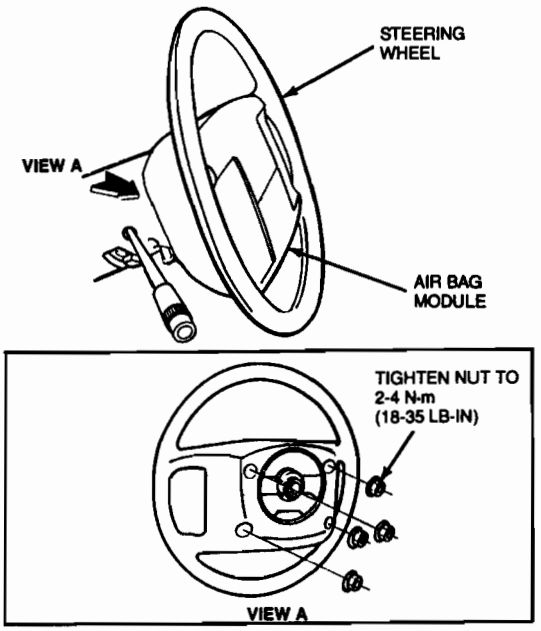
NOTE: If the steering wheel is not centered, check the toe adjustment. Refer to Section 04-00. Do not attempt to center the steering wheel by removing it and changing its position on the steering shaft.

1. Disconnect negative battery cable and air bag backup power supply. Refer to Section 01-20B.
2. Remove four nuts from back of steering wheel and remove air bag module.

   WARNING: THE BACKUP POWER SUPPLY MUST BE DISCONNECTED BEFORE ANY AIR BAG COMPONENT IS SERVICED.

REMOVAL AND INSTALLATION (Continued)

3. Disconnect air bag module connector.



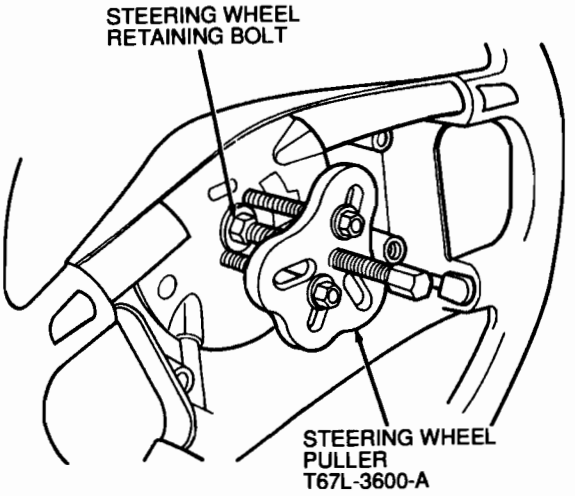
G5820-B

4. Loosen steering wheel retaining bolt four to six turns.

   CAUTION: Do not use a knock-off type steering wheel puller or strike the steering wheel or shaft with a hammer. A sudden impact could damage the bearing or start to collapse the steering column.

5. Position Steering Wheel Puller T67L-3600-A or equivalent on steering wheel. Tighten bolt on puller until steering wheel is loose.
6. Remove steering wheel puller, steering wheel retaining bolt and steering wheel.

   CAUTION: Use care when removing steering wheel so as not to damage clockspring or air bag module connector.



G5821-B

Installation

1. Install the steering wheel onto the shaft making sure to line index marks on wheel and shaft end.
2. Install a new steering wheel retaining bolt. Tighten to 31-45 N·m (23-33 lb-ft).
3. Connect air bag module connector and install air bag module. Tighten four retaining nuts to 2-4 N·m (18-35 lb-in).
4. Connect negative battery terminal and air bag backup power supply.
5. Check steering column for proper operation.

Turn Signal, High Beam and Hazard Flasher Switch

Refer to Section 11-05.

Steering Column Shroud

Refer to Section 11-05.

Ignition Switch/Steering Column Lock

Refer to Section 11-05.

Brake Shift Interlock Mechanism

Refer to Section 07-05.

REMOVAL AND INSTALLATION (Continued)

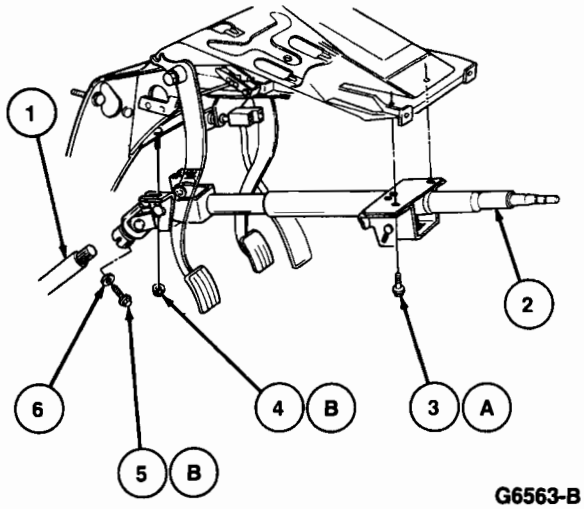
Steering Column

Removal

1. Position steering wheel in the straight ahead position.
2. Remove ignition key and rotate steering wheel slightly until it locks.
3. Disconnect negative battery terminal and air bag backup power supply. Refer to Section 01-20B.

   WARNING: THE BACKUP POWER SUPPLY MUST BE DISCONNECTED BEFORE ANY AIR BAG COMPONENT IS SERVICED.
4. Remove air bag module. Refer to Section 01-20B.
5. Remove steering column access panel and trim cover.
6. Remove defroster duct connecting hose.
7. Remove steering column lower shroud.
8. Loosen steering column lower retaining nuts.
9. Remove steering column upper retaining bolts.
10. With steering column resting on instrument panel brace, remove ignition lock shield, brake-shift interlock mechanism and ignition switch retaining screw.

    NOTE: Ignition switch will remove with shield.
11. Disconnect electrical connectors from turn signal and hazard switch.
12. Disconnect harness connectors from the air bag module, key warning, windshield wiper switch and slip ring assembly.
13. Remove steering shaft universal joint pinch bolt.
14. Carefully pull steering column out of instrument panel to avoid damage to any wiring or components.

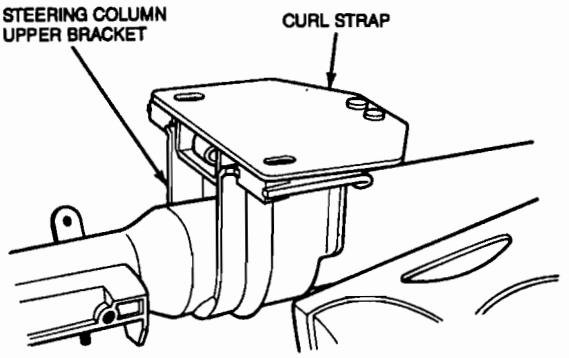


G6563-B

Item	Part Number	Description
1	—	Intermediate Shaft
2	—	Steering Column
3A	—	Bolt (2 Req'd)
4B	—	Nut (2 Req'd)
5B	—	Bolt (1 Req'd)
6	—	Spring Washer
A		Tighten to 23-31 N·m (17-22 lb-ft)
B		Tighten to 18-26 N·m (14-19 lb-ft)

Installation

1. Carefully guide column assembly into instrument panel. Ensure curl strap is installed correctly and retaining clips are tight.



G5831-A

2. Connect harness connectors for the air bag module, key warning, wiper switch and slip ring assembly.
3. Connect connectors to turn signal switch and hazard switch.
4. Install ignition switch and lock shield. Tighten retaining bolts and nut to 15-19 N·m (11-14 lb-ft).
5. Install brake-shift interlock mechanism.
6. Connect steering shaft universal joint and install pinch bolt. Do not tighten pinch bolt.
7. Ensure curl strap is in place with retaining clips and install upper column retaining bolts. Do not tighten bolts.
8. Tighten lower column retaining nuts to 18-26 N·m (14-19 lb-ft). Tighten upper bolts to 23-31 N·m (17-22 lb-ft). Tighten universal joint pinch bolt to 18-26 N·m (14-19 lb-ft).
9. Install defroster duct connecting hose.
10. Install lower column shroud.
11. Install access panel and trim cover.
12. Install air bag module. Refer to Section 01-20B.
13. Connect negative battery terminal and air bag backup power supply.

REMOVAL AND INSTALLATION (Continued)

14. Check column components for proper operation.

Intermediate Shaft

Removal

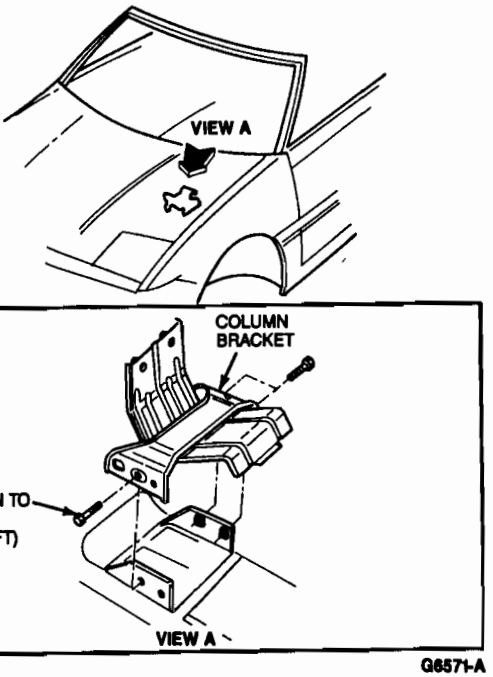
1. Place front wheels in the straight ahead position and lock steering wheel in position.
2. Lower steering column assembly. Refer to Steering Column, Removal, Steps 1 through 9. Let column rest on instrument panel brace.
3. Working from inside the vehicle, remove universal joint bolt and washer from steering shaft.
4. Pry universal joint clamp apart and remove universal joint from steering shaft.
5. Roll back carpet and remove five dust boot retaining nuts.
6. Working from the engine compartment side, remove dust boot retaining clip. Remove dust boot from inside the vehicle.
7. Remove universal joint bolt and washer from universal joint located at steering gear.
8. Pry universal joint clamp apart and remove intermediate shaft with universal joint from steering gear.

Installation

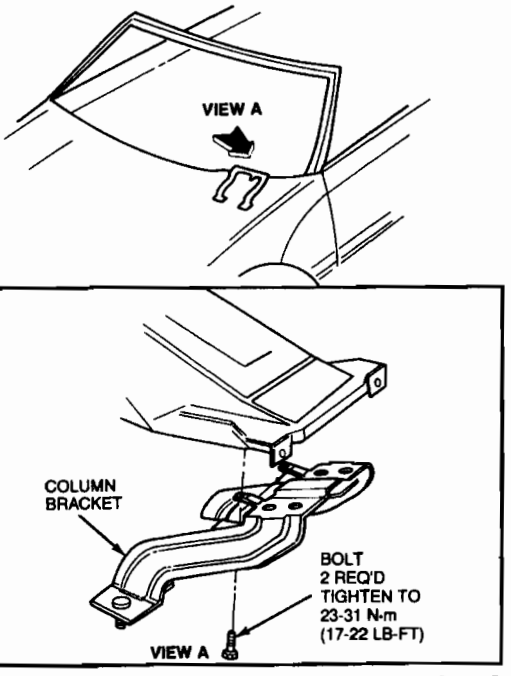
1. Place universal joint onto steering gear. Install washer and bolt. Tighten bolt to 18-26 N·m (14-19 lb-ft).
2. Install boot and five retaining nuts. Tighten to 6-9 N·m (54-79 lb-in).
3. Install steering column assembly. Refer to Steering Column, Installation, Steps 7 through 14.

Steering Column Support Brackets

Steering column support brackets are shown in the following illustrations. To service them, the instrument panel must be removed. Refer to Section 01-12. Use the specifications shown to tighten fasteners.

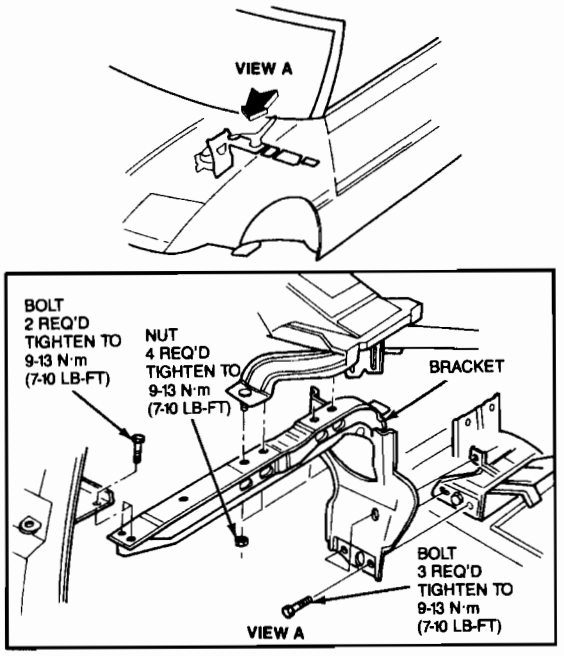


G6571-A



G6570-B

REMOVAL AND INSTALLATION (Continued)



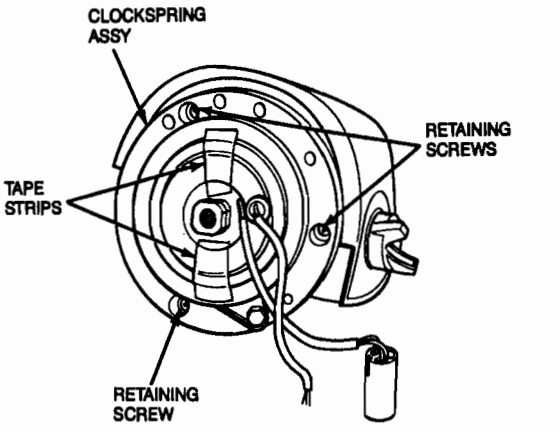
DISASSEMBLY AND ASSEMBLY

Steering Column

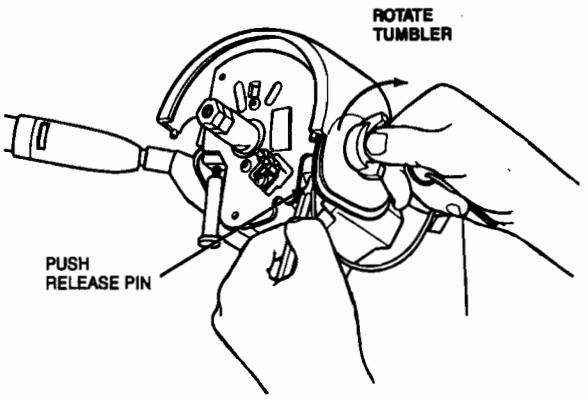
Disassembly

1. Remove steering column as outlined.
2. Position column assembly in soft-jawed vise.
3. Remove steering wheel using Steering Wheel Puller T67L-3600-A or equivalent.

   CAUTION: Do not use a knock-off type steering wheel puller, or strike the retaining bolt. This could cause damage to steering shaft bearings or shear pins, or otherwise damage the collapsible design of steering column.
4. Place two strips of tape on clockspring as shown, to avoid rotation or damage to clockspring.
5. Remove clockspring.



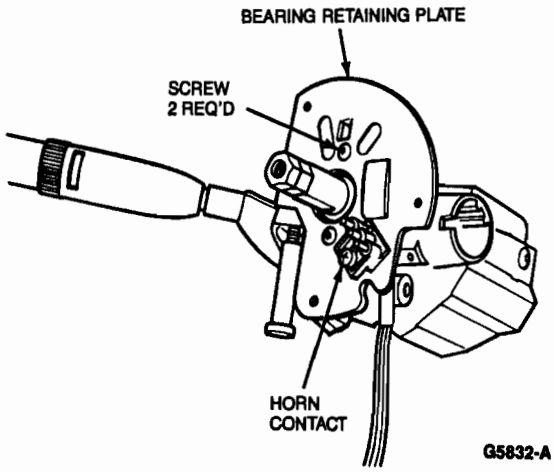
6. With ignition key installed, rotate tumbler assembly to the RUN position while pushing tumbler release pin using a 3.17mm (0.125 inch) drift. Remove tumbler assembly. Remove upper column shroud.



7. Remove key warning sensor.

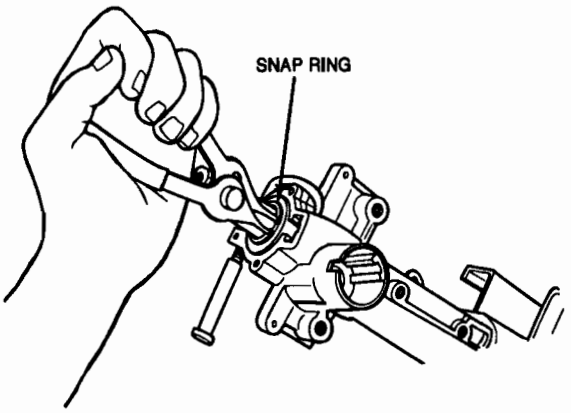
DISASSEMBLY AND ASSEMBLY (Continued)

8. Remove bearing retaining plate retaining screws and bearing plate.



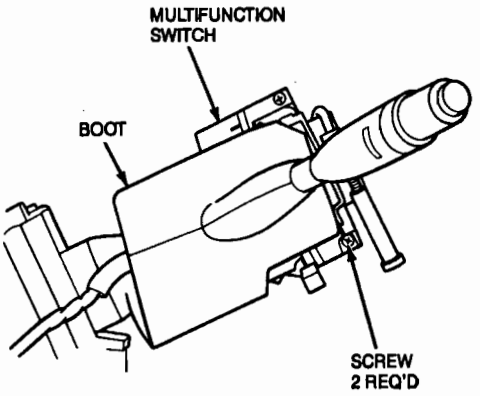
G5832-A

9. Remove snap ring and discard.



G5824-A

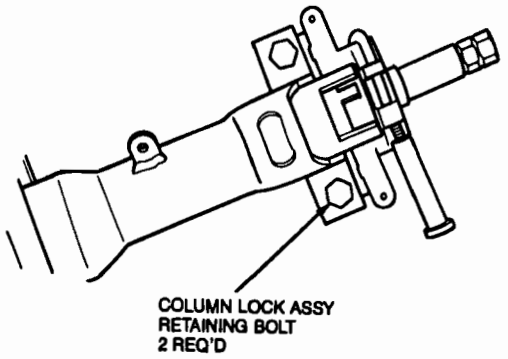
10. Remove multi-function switch retaining screws and switch.



G5826-A

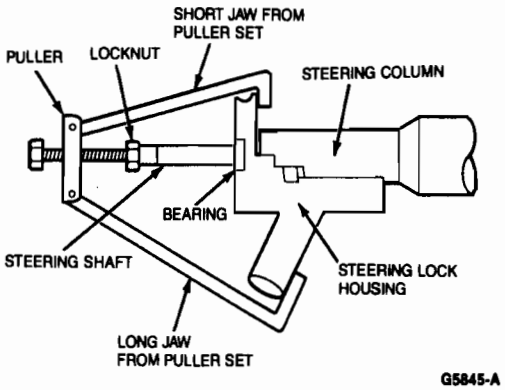
11. Remove column lock and upper bearing assembly using suitable puller as shown.

CAUTION: Should the steering shaft shear pins break during housing and bearing removal, the entire shaft and column must be replaced. To determine if the pins have sheared, measure steering shaft from top end of shaft to center of U-joint bearing. The dimension is 631mm ± 1mm (24.84 ± .039 inch). If less, the pins have sheared.



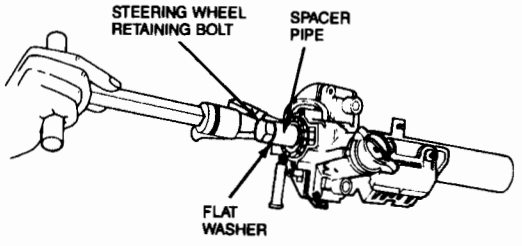
G5827-A

DISASSEMBLY AND ASSEMBLY (Continued)

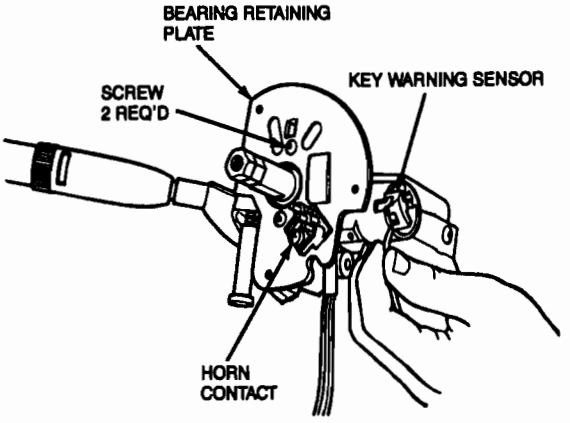


Assembly

1. Install steering column lock and upper bearing assembly. Tighten bolts to 16-28 N·m (12-20 lb-ft).
2. Prick punch steering column upper shaft serration diameter sufficiently to ensure an interference fit between bearing inner race and steering column upper shaft.
3. Position bearing and insulator on steering column upper shaft. Work bearing and insulator as far down steering column upper shaft as possible. Then, place a piece of pipe 19.05mm (0.75 inch) inside diameter x 38.1mm (1.5 inch) long over end of steering column upper shaft and install steering wheel retaining bolt with a flat washer.
4. Tighten steering wheel bolt until bearing is seated.
5. Remove bolt, washer and pipe.



6. Install new snap ring.
7. Install multi-function switch and retaining screws.
8. Install bearing retaining plate and screws.
9. Install key warning sensor.



10. Install upper column shroud.
11. Install tumbler assembly by turning tumbler and pressing retaining pin. Ensure tumbler operates properly.
12. Install clockspring assembly. Remove tape strips.
13. Install steering wheel. Tighten retaining bolt to 31-45 N·m (23-33 lb-ft).
14. Ensure curl strap is secured by retaining clips.
15. Install steering column assembly as outlined.

Turn Signal Cancel Cam Service

Removal and Installation

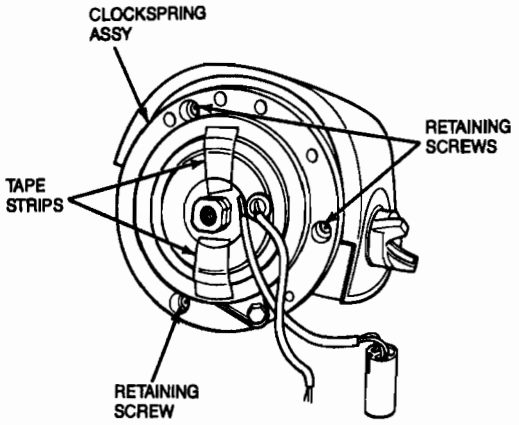
NOTE: Whenever a cracked turn signal cancel cam is encountered, it is not necessary to replace entire steering column assembly. Instead, a turn signal cancelling cam service sleeve, E1AZ-13B368-A is installed as follows:

1. Disconnect battery ground cable.
2. Remove steering column as outlined.

DISASSEMBLY AND ASSEMBLY (Continued)

3. Remove steering wheel as outlined.

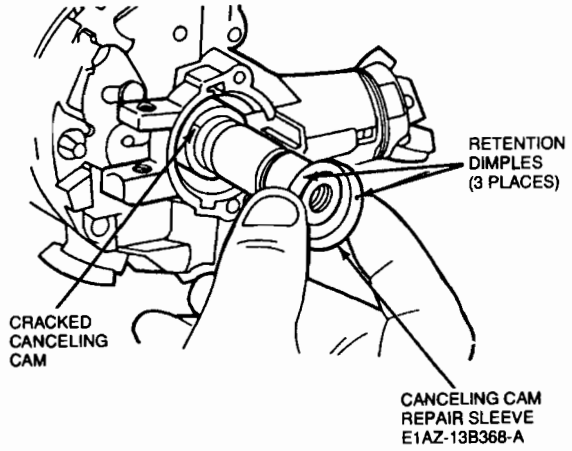
   CAUTION: Before removing air bag clockspring from steering shaft, clockspring must be taped to prevent clockspring from being turned accidentally and damaging clockspring.

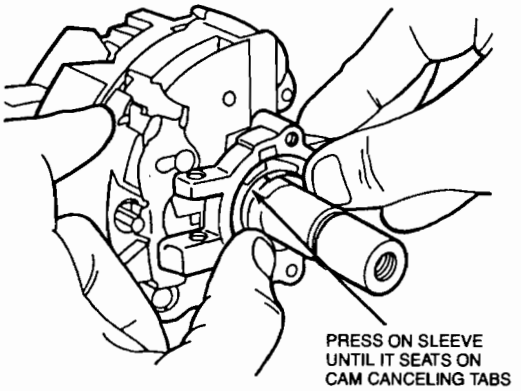


G5822-A

4. Remove clockspring.
5. Remove upper bearing retainer plate.
6. Remove upper bearing snap ring and discard.
7. Remove column lock and upper bearing assembly as outlined.
8. Place service sleeve over cracked canceling cam, and press on until sleeve bottoms on cam tabs.

   NOTE: The service sleeve has three retention dimples. Ensure sleeve is positioned on canceling cam, so a dimple is not directly over cam's crack.





G5847-B

9. Install column lock, upper bearing and new snap ring as outlined.
10. Install bearing retainer plate.
11. Install clockspring assembly, remove tape.
12. Install steering wheel, steering column and air bag module as outlined.
13. Connect battery ground cable.
14. Verify air bag warning lamp.

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	N·m	Lb-Ft
Steering Wheel Bolt	31-45	23-33
Air Bag Module Nut	2-4	18-35 (Lb-In)
Steering Column Nut	18-26	14-19
Steering Column Bolt	23-31	17-22
Universal Joint Bolt	18-26	14-19
Steering Column Bracket-to-Bolt	18-26	14-19
Steering Column Bracket-to-Nut	18-26	14-19

(Continued)

SPECIFICATIONS (Continued)

TORQUE SPECIFICATIONS (Cont'd)

Description	N·m	Lb-Ft
Steering Column Support Bracket Bolts	9-13	7-10
Ignition Switch and Lock Shield Retaining Bolts and Nut	15-19	12-14
Dust Boot Retaining Nuts	6-9	54-79 (Lb-In)
Steering Column Lock and Upper Bearing Assembly Retaining Bolts	16-28	12-20

SPECIAL SERVICE TOOLS

Tool Number	Description
T67L-3600-A	Steering Wheel Puller

SECTION 11-05 Steering Column Switches

VEHICLE APPLICATION

Capri.

DESCRIPTION AND OPERATION

Ignition Switch

The ignition switch is mounted on the lock cylinder housing and is controlled by the lock cylinder through a pin which is part of the actuator assembly.

The lock cylinder also controls the mechanism which provides a positive lock for the steering system. The locking mechanism is located in the lock cylinder housing at the upper end of the steering column.

On vehicles with an automatic transaxle, a brake-shift interlock cable connected to the steering system lock mechanism prevents the transaxle from being shifted out of PARK until the brake pedal is depressed. Refer to Section 07-05.

The lock cylinder positions are ACC, LOCK, OFF, RUN and START. The ACC position operates while the steering and transaxle systems remain locked. Turning the key to the OFF position shuts off the engine without locking the steering.

The switch has blade-type terminals that engage with one multiple connector. The multiple connector is secured to the switch by integral locking fingers.

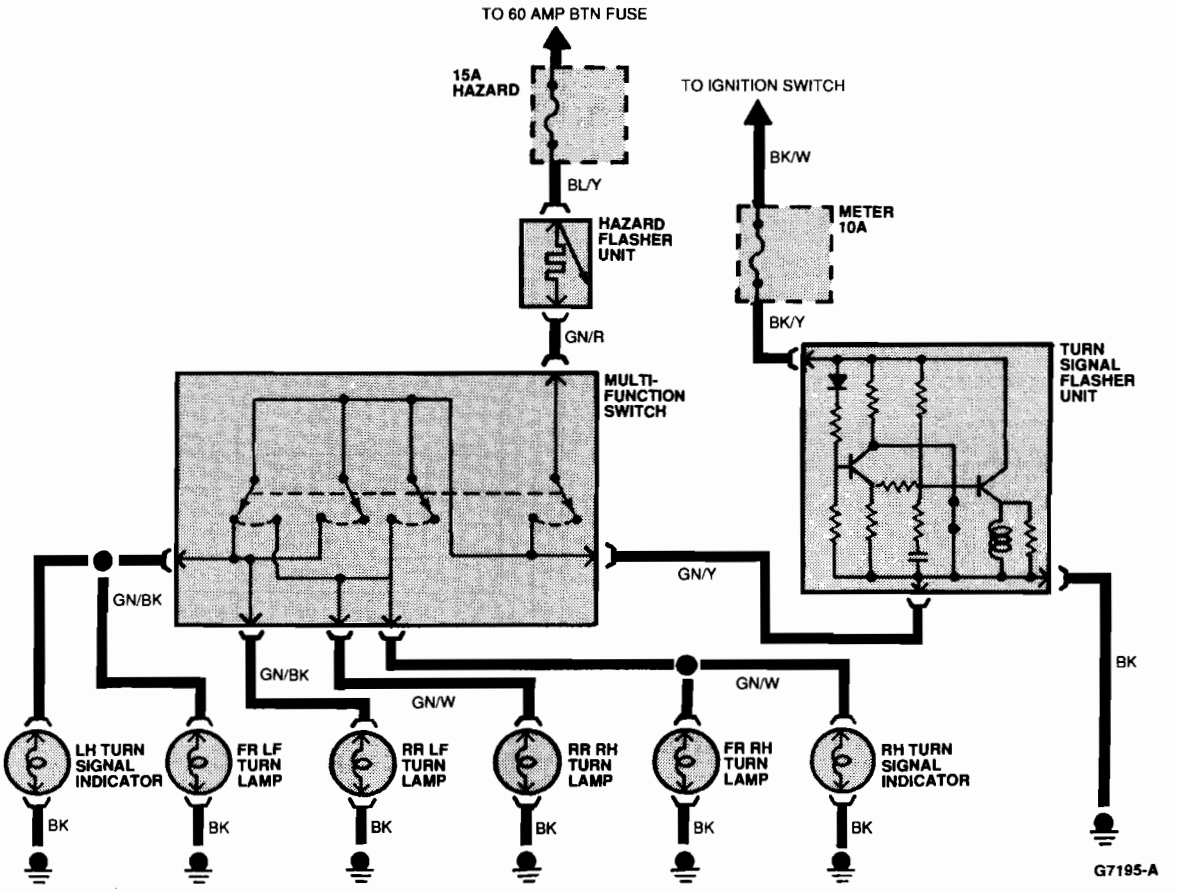
On vehicles with a manual transaxle, a push-button steering wheel lock mechanism is used. This button, on the LH side of the steering column, must be pushed in before the ignition key can be removed.

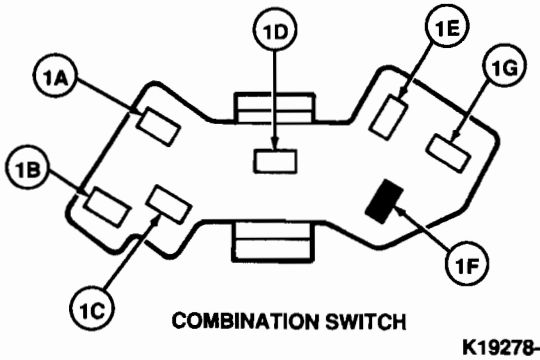
On vehicles with an automatic transaxle, no push-button lock mechanism is used. However, the transaxle must be in the PARK position before the key can be removed.

DESCRIPTION AND OPERATION (Continued)

Multi-Function Switch

The turn signal / hazard flasher / high beam switch is a multi-function switch which incorporates the windshield wiper switch, the turn signal switch, high beam switch, flash-to-pass switch and the hazard flasher switch. The wiper switch and turn signal / hazard flasher / high beam switch are replaced as an assembly. This assembly is located on the steering column. The steering column must be lowered to access the switch.



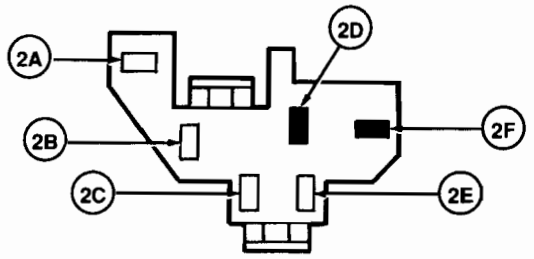


COMBINATION SWITCH

K19278-A

Pin Number	Wire Color	Circuit Function
1A	R / GN	Headlamp Switch
1B	R / BK	Low Beam
1C	R / W	High Beam
1D	R	Power Supply
1E	GN / BK	Left Turn Signal
1F	—	Not Used
1G	GN / BK	Left Turn Signal

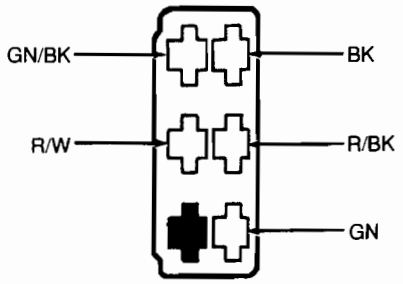
DESCRIPTION AND OPERATION (Continued)



COMBINATION SWITCH

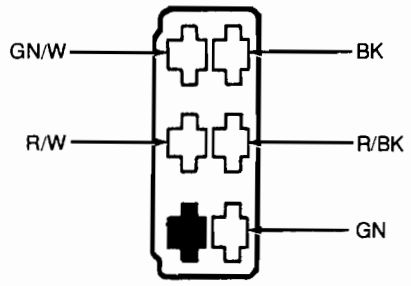
K19279-A

Pin Number	Wire Color	Circuit Function
2A	GN/W	Right Turn Signal
2B	GN/W	Right Turn Signal
2C	GN/Y	Turn Signal Flasher Unit
2D	—	Not Used
2E	GN/R	Hazard Flasher Unit
2F	—	Not Used



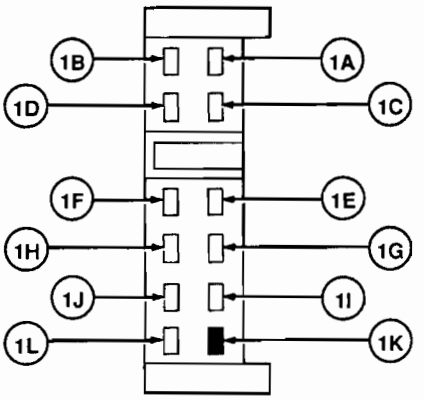
LEFT TAIL LAMP

K18700-A



RIGHT TAIL LAMP

K19276-A



INSTRUMENT CLUSTER K18632-A

Pin Number	Wire Color	Circuit Function
1A	BK	Ground
1B	GN/W	RH Turn Indicator
1C	BR/Y	Transaxle Control Module
1D	R/W	High Beam Indicator
1E	BK/Y	Warning Indicator Lamp Power Supply
1F	GN/BK	LH Turn Indicator
1G	Y/R	Oil Pressure Switch
1H	R/GN	Dimmer Control Switch
1I	BK	Ground
1J	BK	Ground
1K	—	Not Used
1L	Y/W	Temperature Gauge Sending Unit

DIAGNOSIS AND TESTING

Ignition Switch

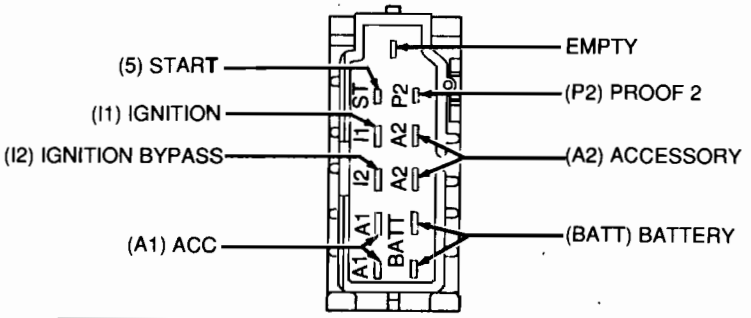
Continuity Test

Disconnect the multiple connector by spreading apart the locking fingers on each end of the connector shell while pulling to disengage it from the ignition switch. Test the switch continuity as described in the following illustration. Connect a self-powered test lamp or ohmmeter between the blade terminals indicated on the chart. No continuity between any blade and chassis ground should exist in any switch position except the proof circuit P2 in the START position only.

DIAGNOSIS AND TESTING (Continued)

For an "engine won't crank" condition, determine if the condition exists with the selector lever in both PARK and NEUTRAL positions before performing the ignition switch continuity tests. If the "no-crank" condition occurs in one shift lever position but not the other, a more probable cause is the manual lever position switch (4EAT only) located on the transaxle.

CONTINUITY TEST



SWITCH POSITION	CONTINUITY SHOULD EXIST ONLY BETWEEN
ACC	(BATT) AND A1
LOCK	NO CONTINUITY
OFF	NO CONTINUITY
RUN	BATT I1-A2-A1
START	P2 CHASSIS GROUND BATT-ST-I2

NOTE: CIRCUIT PAIRS 37, 687 AND 297 ARE CONNECTED TOGETHER INTERNALLY

J3447-B

Mechanical Test

Test the steering column ignition system mechanical operation by rotating the lock cylinder / key through all switch positions. The movement should feel smooth with no sticking or binding. The ignition switch should return from the START position back to the RUN position without assistance (spring return). If sticking or binding is encountered, check for the following.

- Burrs on the lock cylinder key.
- Shroud rubbing against lock cylinder.
- Burrs or foreign material around rack-and-pinion actuator in lock cylinder housing.
- Insufficient lubricant on actuator.
- Binding ignition switch.

NOTE: Do not apply lubricant to inside of the ignition switch.

Multi-Function Switch

Refer to Section 17-01.

REMOVAL AND INSTALLATION

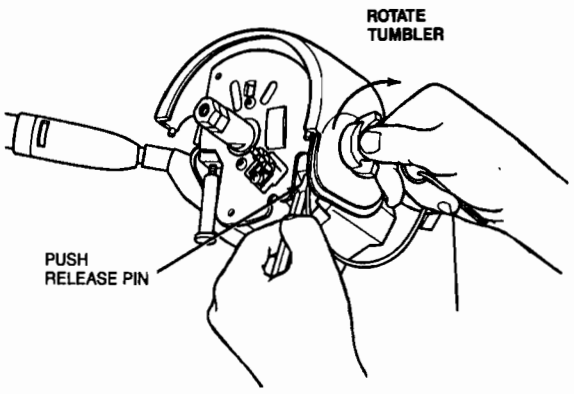
Ignition Lock Tumbler

Removal

1. Disconnect negative battery terminal.
2. Remove lower steering column shroud.
3. With ignition key installed, rotate tumbler while pushing release pin with a 3.17mm (0.125 inch) drift.

REMOVAL AND INSTALLATION (Continued)

4. Remove tumbler assembly by pulling it out of housing.



Installation

1. Install tumbler assembly with ignition key installed. Push release pin and rotate tumbler to install. Make sure tumbler is fully seated.
2. Install lower column shroud.
3. Connect negative battery terminal.
4. Check for proper operation.

Non-Functioning Locks

Removal

NOTE: The following procedure applies to vehicles in which the ignition lock is inoperative and the lock cylinder cannot be rotated due to a lost or broken lock cylinder key, the key number is not known, or the lock cylinder cap is damaged and/or broken to the extent that the lock cylinder cannot be rotated.

1. Remove lower steering column shroud.
2. Using a 1/8-inch diameter drill, drill out retaining pin, being cautious not to drill deeper than 12.7mm (1/2-inch).
3. Place a chisel at base of ignition lock cylinder cap, and using a hammer, strike chisel with sharp blows to break cap away from lock cylinder.
4. Using a 3/8-inch diameter drill, drill out middle of ignition lock key slot approximately 44mm (1-3/4 inches) until lock cylinder breaks loose from breakaway base of lock cylinder. Remove lock cylinder and remove drill shavings from lock cylinder housing.
5. Remove snap ring washer and steering column lock gear. Thoroughly clean all drill shavings and other foreign materials from casting.
6. Carefully inspect lock cylinder housing for damage. If any damage is apparent, housing must be replaced. Refer to Section 11-04.

Installation

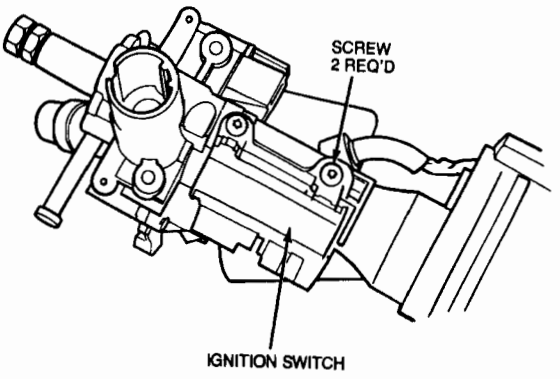
Install new ignition lock tumbler as outlined.

Ignition Switch

Removal

1. Disconnect negative battery terminal.
2. Remove lower steering column shroud.
3. Remove center access panel and trim cover beneath steering column.
4. Remove LH side defroster connector tube.
5. Remove steering column upper retaining bolts. Column will pivot downward and rest on instrument panel brace.

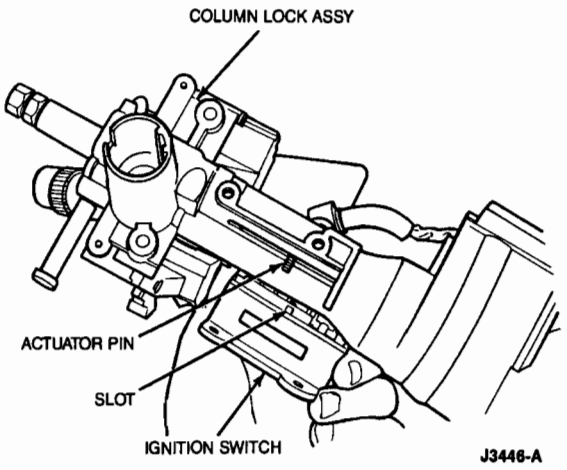
   CAUTION: Ensure that no wiring is pinched beneath the steering column when lowered.
6. Remove ignition lock tumbler as outlined.
7. Remove upper column cover.
8. Remove column lock shield.
9. Disconnect ignition switch connector.
10. Remove switch retaining screws and switch.



REMOVAL AND INSTALLATION (Continued)

Installation

1. Position ignition switch to column lock assembly. Make sure actuator pin of lock assembly fits into slot in ignition switch.



2. Install switch retaining screws. Tighten to 7-9 N·m (62-76 lb-in).
3. Connect ignition switch electrical connector.
4. Install column lock shield. Tighten screws and nut to 19-25 N·m (14-18 lb-ft).
5. Install upper column shroud and lock tumbler assembly as outlined. Make sure tumbler snaps in place.
6. Raise column and install upper retaining bolts. Tighten to 23-31 N·m (17-22 lb-ft).
7. Install defroster connector tube.
8. Install column lower shroud.
9. Install access panel and trim cover.
10. Connect negative battery terminal.
11. Check for proper operation.

Multi-Function Switch Assembly

Removal

1. Disconnect negative battery terminal.
2. Remove center trim panel and access cover beneath steering column.
3. Remove lower steering column shroud.
4. Remove column upper retaining bolts.

   NOTE: Steering column will rest on instrument panel brace.

CAUTION: Ensure no wires are pinched when lowering steering column.

5. Remove two switch retaining screws and remove switch.
6. Grasp switch and lever firmly and pull lever out of switch.
7. Disconnect electrical connectors from switch.

Installation

1. Align key with slot and install lever in switch assembly.
2. Connect connectors to switch assembly.
3. Position switch on steering column and install retaining screws.
4. Make sure column support bracket is in position. Raise column into position and install retaining bolts. Tighten to 23-31 N·m (17-22 lb-ft).
5. Install lower column shroud.
6. Install access cover and trim panel.
7. Connect negative battery terminal.
8. Check for proper operation.

Wiper Switch and Turn Signal/High Beam Lever

Removal

1. Remove center trim panel and access cover below steering column.
2. Remove lower steering column shroud.
3. Disconnect harness connector for wiper switch and remove from retaining clip.
4. Firmly grasp switch and lever and pull out to remove.

Installation

1. Install lever to switch. Make sure it is fully seated.
2. Route switch harness through retainer and connect connector.
3. Install lower steering column shroud.
4. Install access panel and center trim cover.

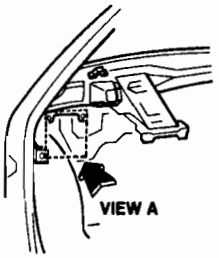
Turn Signal Flasher Unit

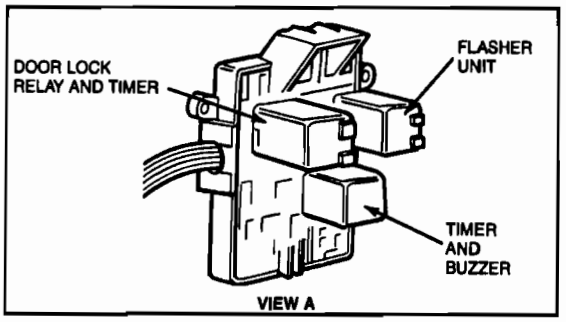
Removal and Installation

1. Pull turn signal flasher out of relay panel located above interior fuse panel.

REMOVAL AND INSTALLATION (Continued)

2. Install the new turn signal flasher by pushing it into the relay panel.





K14837-A

Hazard Flasher Unit

Removal and Installation

1. Pull hazard flasher out of connector located inside LH bottom edge of instrument panel.
2. Install new hazard flasher into connector.

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	N·m	Lb-Ft
Steering Column Upper Retaining Bolts	23-31	17-22
Ignition Switch Retaining Screws	7-9	62-76 (Lb-In)
Steering Column Lock Shield Screws and Nut	19-25	14-18