

# STEERING SYSTEM - POWER RACK & PINION

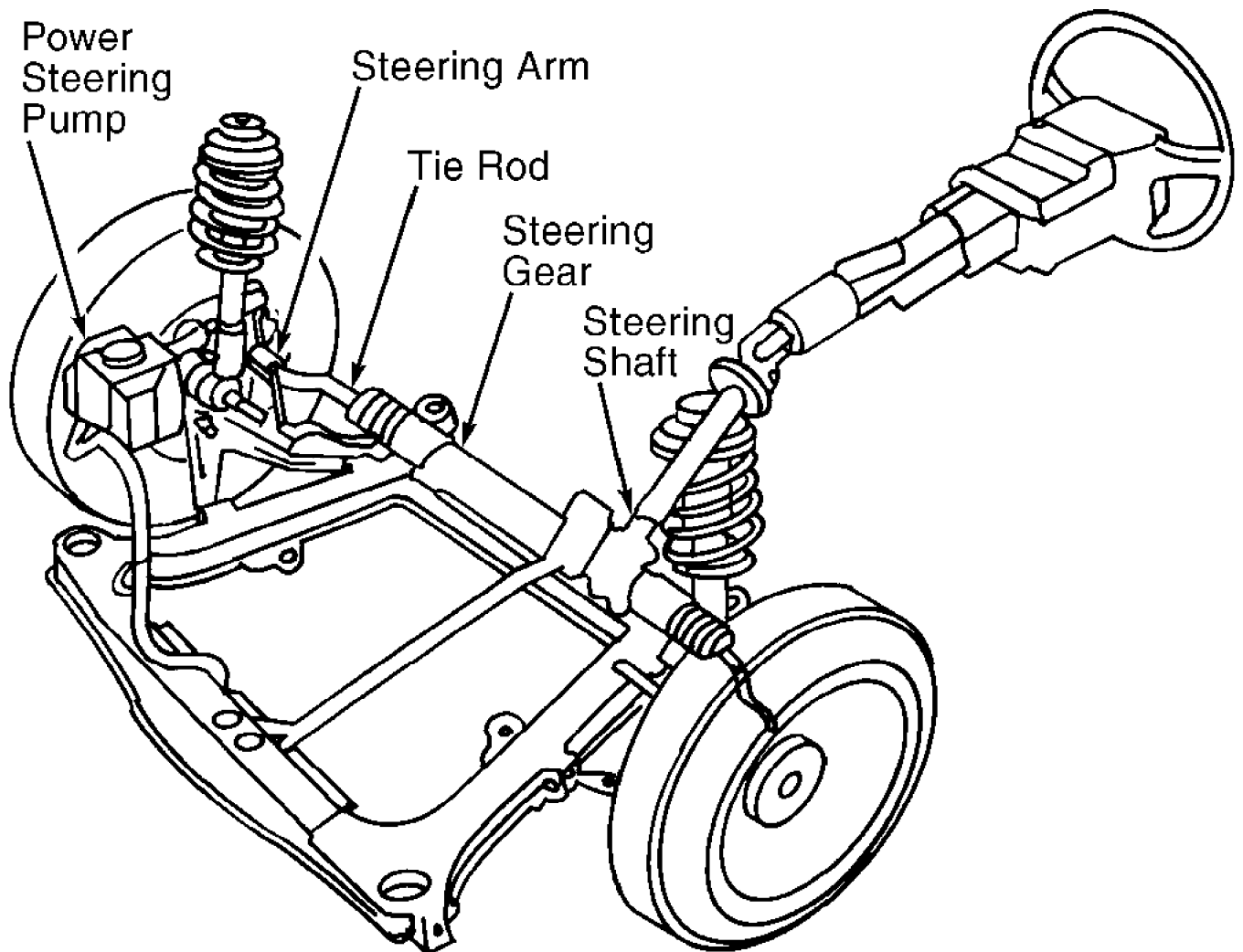
1995 Volvo 850

1995-96 STEERING  
Volvo - Power Rack & Pinion

850

## DESCRIPTION

Vehicles are equipped with an integral housing steering rack that is sealed and must be replaced if defective. See Fig. 1.



93J83112

Fig. 1: View Of Steering System  
Courtesy of Volvo Cars of North America

## LUBRICATION

CAPACITY

Fluid capacity is .75 qt. (.7L).

## FLUID TYPE

Power steering system uses Automatic Transmission Fluid (ATF).

## FLUID LEVEL CHECK

Check fluid level when fluid is cold with engine off. To check and fill, remove fluid level gauge from reservoir and check fluid level. Fluid level should be between MIN and MAX marks on gauge dipstick. Add fluid through dipstick opening as needed, and recheck fluid level. DO NOT overfill.

## HYDRAULIC SYSTEM BLEEDING

1) Fill reservoir with fluid. Start engine and let idle. Add fluid as level drops. Turn steering wheel from lock to lock in a slow, even motion to allow pump to operate at low pressure.

2) Continue turning steering wheel until fluid in reservoir is free of air bubbles. Ensure fluid is at level mark. Install reservoir cap.

## ADJUSTMENTS

### POWER STEERING PUMP PRESSURE

NOTE: Specification is not available at time of publication.

### POWER STEERING PUMP BELT

#### BELT ADJUSTMENT SPECIFICATIONS TABLE

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Application	(1) Deflection - In. (mm)
Power Steering Belt .....	.2-.4 (5-10)

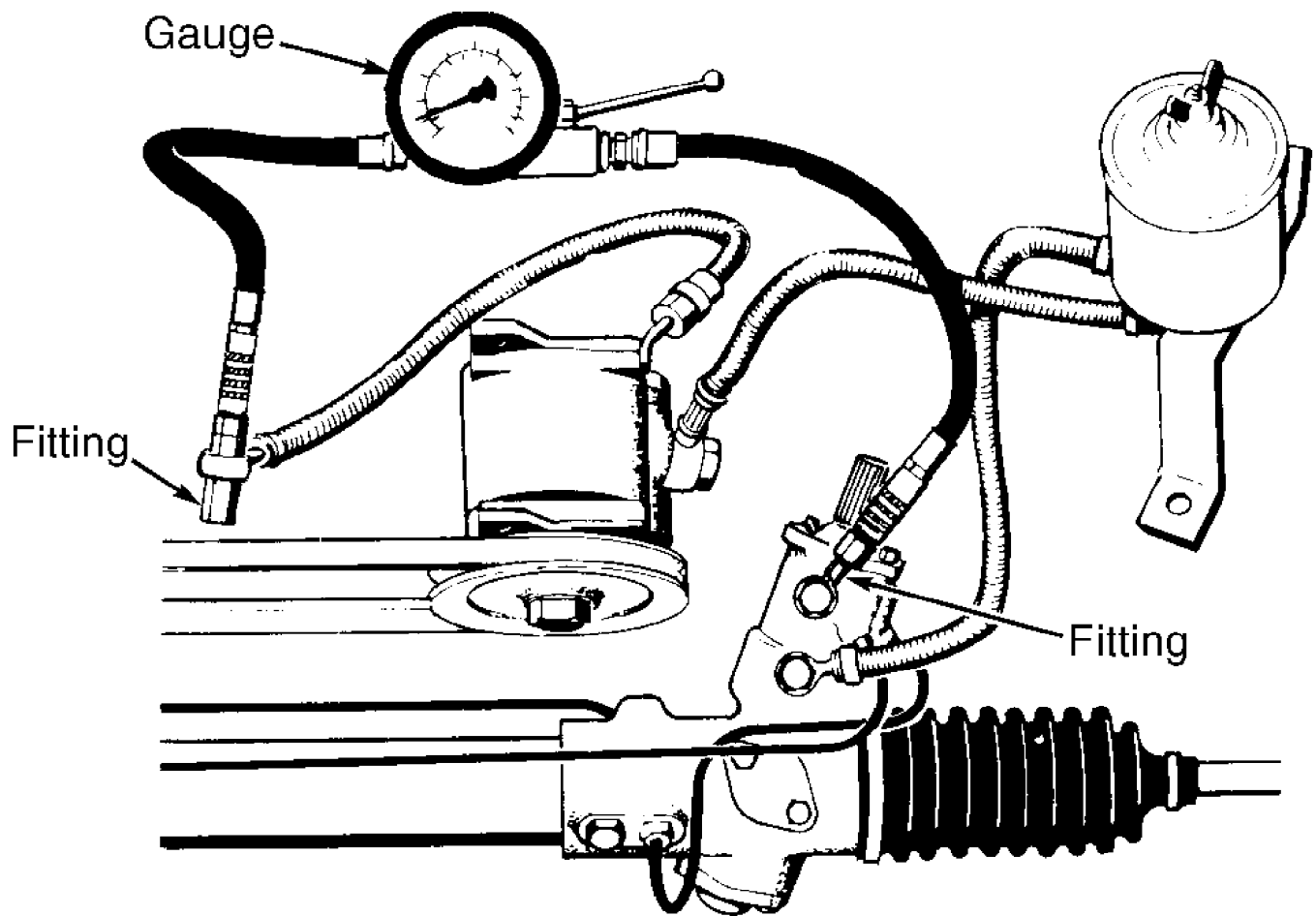
(1) - Deflection is measured with moderate thumb pressure applied midway on longest belt run.

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## TESTING

### HYDRAULIC SYSTEM PRESSURE TEST

1) Connect pressure gauge between steering pump and steering gear. See Fig. 2. Ensure gauge can be seen from driving position. Ensure reservoir is full. Start engine.



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Fig. 2: Installing Pressure Gauge  
 Courtesy of Volvo Cars of North America

2) Turn steering wheel to full left and hold for less than 10 seconds, then turn steering wheel to full right and hold for less than 10 seconds. Pressure should be 1081-1181 psi (76-83 kg/cm<sup>2</sup>).

### STEERING WHEEL TURNING FORCE

1) Raise front wheels off ground. Connect pressure gauge between steering pump and steering gear. See Fig. 2. Ensure gauge can be seen from driving position. Ensure reservoir is full.

2) Remove air bag module from steering wheel. See STEERING WHEEL & AIR BAG MODULE under REMOVAL & INSTALLATION in STEERING COLUMN article. Place torque wrench on steering wheel nut.

3) With engine at idle, turn steering wheel slowly to right. Read torque when pressure reaches 156 psi (10.9 kg/cm<sup>2</sup>).

4) Turn wheel to left. Torque should be 31-40 INCH lbs. (3.5-4.5 N.m) as gear approaches specified pressure. Turn steering wheel to right and read torque. Difference between both sides must not exceed 4.4 INCH lbs. (.5 N.m). If difference exceeds specification, repair or replace steering gear.

NOTE: For remaining steering gear adjustments, see OVERHAUL.

### REMOVAL & INSTALLATION

## POWER STEERING PUMP

### Removal

Remove pump bracket-to-pump retaining bolts. Place a drain pan below pump. Disconnect hydraulic connections at pump. Remove pump.

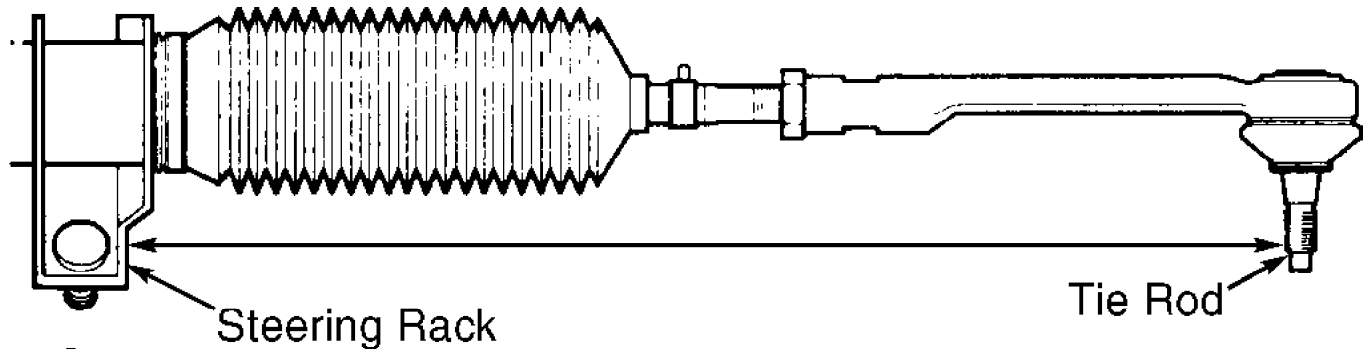
### Installation

To install, reverse removal procedure. Fill and bleed system. Check for leaks.

## POWER RACK & PINION

### Removal

1) Raise and support front of vehicle. Install Support Rails (5033), Bracket (5006), and Lifting Hook (5115). Lift engine slightly to release pressure on engine mounts. Remove front wheels. Using Puller (5259), remove ends of tie rods from tie rods. For reassembly reference, measure length of tie rod on one side in relation to steering gear housing. See Fig. 3.



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Fig. 3: Measuring Tie Rod Length  
Courtesy of Volvo Cars of North America

2) Remove splash guard under engine. Remove hydraulic fluid line brackets and clamps at front and rear edges. Remove 5 nuts holding steering gear to subframe.

3) Position jack under rear crossmember. Remove bolts holding subframe brackets to body, along with washers and brackets. Loosen front subframe bolts approximately 15-20 mm. Place a spacer between frame and body at rear edge so frame does not spring up, and lower subframe at rear edge.

4) Position an oil container under steering gear. Disconnect hydraulic fluid pipes from steering gear. Remove steering column joint bolt. Press joint up from steering gear. Remove steering gear-to-rear engine pad bolt. Remove steering gear to right of vehicle.

### Installation

1) Transfer heat shield and center attachment mount from old unit. Do not tighten mount bolts at this time. Install protective plugs in hydraulic pipe connections. Check to ensure tie rod is in same position as when removed.

2) Install steering gear from right side of vehicle. Hang steering gear in rear engine pad. Raise steering gear on right side so it hangs straight in relation to frame. Tighten engine pad bolt to specification. See TORQUE SPECIFICATIONS. Using NEW "O" rings, loosely install hydraulic fluid pipes in steering gear. Loosely install hydraulic fluid pipe front bracket. Align pipes in relation to bracket. Tighten pipes in steering gear.

3) Install steering gear into steering shaft joint. Torque steering shaft joint bolt to specification. See TORQUE SPECIFICATIONS. Install bolt lock clip. Using a jack, press subframe up at rear edge while aligning steering gear. Loosely install NEW bolts on subframe. Move jack to front edge of frame. Replace, but do not tighten, front frame bolts. Tighten left subframe bolts first, then tighten right subframe bolts. Tighten bracket bolts on both sides. See TORQUE SPECIFICATIONS.

4) Using NEW nuts, tighten steering gear. Tighten steering gear center mount bolt. See TORQUE SPECIFICATIONS. Install and tighten hydraulic fluid line brackets and clamps at front and rear edges.

5) Using NEW nuts, install tie rods on control arms. Install engine splash guard. Install wheels, ensuring contact surface between rotor and rim is free from dirt. Lubricate rim guide in hub. Loosely install wheel bolts, then tighten in a crosswise pattern. Fill hydraulic system with fluid. Lower vehicle and check toe-in. See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the section.

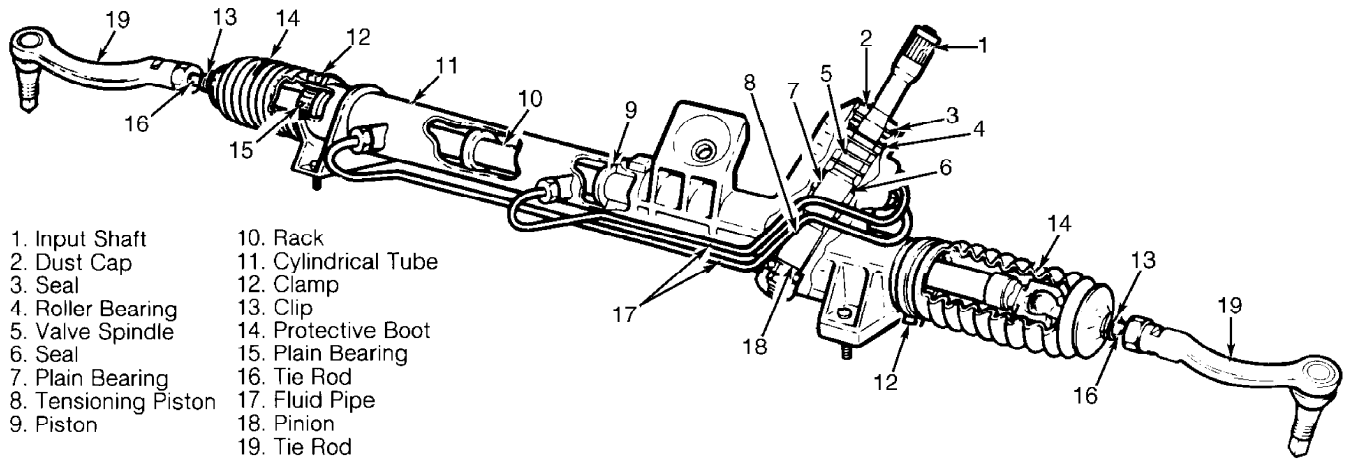
## OVERHAUL

### POWER STEERING PUMP

NOTE: Power steering pump overhaul information is not available from manufacturer at time of publication.

### STEERING GEAR

NOTE: Steering gear disassembly is not recommended by manufacturer. See Fig. 4.



- |                      |                      |
|----------------------|----------------------|
| 1. Input Shaft       | 10. Rack             |
| 2. Dust Cap          | 11. Cylindrical Tube |
| 3. Seal              | 12. Clamp            |
| 4. Roller Bearing    | 13. Clip             |
| 5. Valve Spindle     | 14. Protective Boot  |
| 6. Seal              | 15. Plain Bearing    |
| 7. Plain Bearing     | 16. Tie Rod          |
| 8. Tensioning Piston | 17. Fluid Pipe       |
| 9. Piston            | 18. Pinion           |
|                      | 19. Tie Rod          |

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Fig. 4: View Of Power Steering Gear Assembly  
Courtesy of Volvo Cars of North America

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Steering Gear	
Bracket Bolt .....	37 (50)
Engine Mount Bolt .....	37 (50)
Subframe Bracket Bolt .....	(1) 177 (105)
Tie Rod-To-Control Arm Nut .....	52 (70)

Wheel Lug Bolts ..... 81 (110)

(1) - Tighten an additional 120 degrees.

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