

# STEERING SYSTEM - POWER RACK & PINION

## Article Text

1996 Volkswagen Golf

For Volkswagen Technical Site

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Thursday, August 19, 1999 11:56PM

### ARTICLE BEGINNING

1995-96 STEERING

Volkswagen - Power Rack & Pinion

Golf III

### DESCRIPTION & OPERATION

System consists of a vane pump, rack and pinion steering gear, and an oil reservoir. Vane pump draws fluid from reservoir and supplies it to flow control valve. Control valve directs fluid to appropriate side of rack piston.

### LUBRICATION

#### CAPACITY

Fluid capacity is about 1 qt. (.95L).

#### FLUID TYPE

Recommended fluid type is VW Hydraulic Oil No. G 002 000.

#### FLUID LEVEL CHECK

Remove reservoir cover. Start engine and let it idle. Fluid level should be between MIN and MAX marks on reservoir.

#### HYDRAULIC SYSTEM BLEEDING

1) Start engine and let it idle. Fill fluid reservoir to MAX mark. Turn steering wheel left and right several times to bring fluid to normal operating temperature.

CAUTION: DO NOT hold steering wheel to left or right lock for longer than 5 seconds, or oil pump damage may occur.

2) Add fluid to MAX mark as needed during bleeding procedure. Turn steering wheel from lock to lock. Repeat procedure until air bubbles are no longer present in fluid and fluid level stabilizes. Shut off engine.

### ADJUSTMENTS

#### POWER STEERING PUMP BELT

NOTE: VR6 engines are equipped with a serpentine belt which is automatically adjusted by tensioner.

4-Cylinder

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Loosen nuts on pump mounting bracket. Turn adjuster bolt until belt deflection is 62 INCH lbs. (7 N.m) on new belt, or 35 INCH lbs. (4 N.m) on used belt.

## TESTING

### HYDRAULIC SYSTEM INSPECTION

Ensure fluid level is okay. See FLUID LEVEL CHECK under LUBRICATION. Check power steering pump belt condition and adjustment. See POWER STEERING PUMP BELT under ADJUSTMENTS. Ensure hoses are not kinked or leaking.

### PUMP PRESSURE TEST

1) Install Pressure Gauge (US 1074 B) between pressure hose and pressure line of valve housing. See Fig. 1. Start engine and let it idle.

2) Close pressure gauge valve. Leave valve closed for no longer than 5 seconds. Pressure should be 85-95 bar (1232-1378 psi). If pump pressure is not within specification, replace pump.

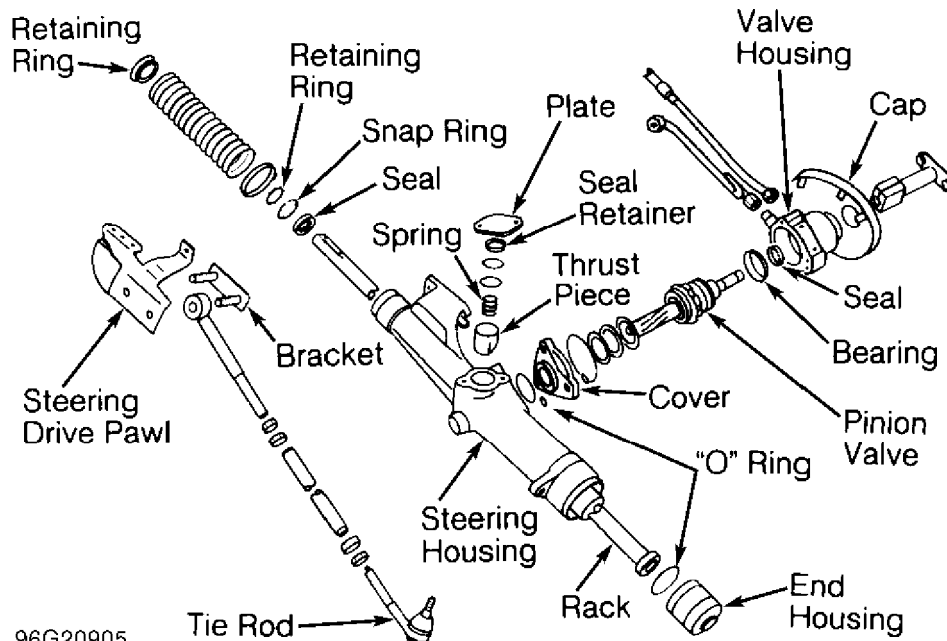


Fig. 1: Identifying Power Rack & Pinion Components (Typical)  
Courtesy of Volkswagen United States, Inc.

### STEERING GEAR INSPECTION

Remove rack and pinion assembly. See POWER RACK & PINION under REMOVAL & INSTALLATION. Loosen lock nut. Turn adjuster bolt until pinion shaft can be turned by hand without binding. Hold adjuster bolt in position while tightening lock nut.

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## REMOVAL & INSTALLATION

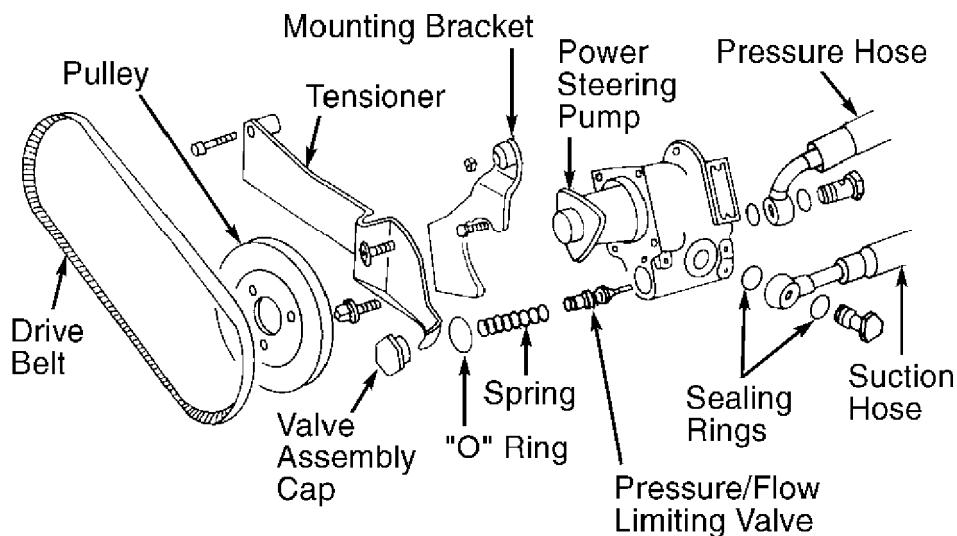
### POWER STEERING PUMP

#### Removal

Remove generator and pump belts. Disconnect hydraulic lines from pump. Cap lines to prevent contamination. Remove bracket bolts. Remove pump. See Fig. 2.

#### Installation

To install, reverse removal procedure. Adjust belt tension. See POWER STEERING PUMP BELT under ADJUSTMENTS. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS. Fill and bleed hydraulic system. See HYDRAULIC SYSTEM BLEEDING under LUBRICATION. Start engine and check for leaks.



NOTE: Always replace sealing rings & self-locking nuts.

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Fig. 2: Identifying Power Steering Pump Components (Typical)  
Courtesy of Volkswagen United States, Inc.

### POWER RACK & PINION

NOTE: Refer to illustration for exploded view of power rack and pinion components. See Fig. 1.

#### Removal

- 1) Disconnect return line from pump. Drain fluid from pump and line. Disconnect tie rod ends from steering knuckles.
- 2) Support engine and transmission with Engine Support (10-222A and 10-222A/1 on 4-cylinder engine, or 10-222A and 10-222A/3 on VR6 engine). Remove steering gear boot. Remove transmission mount bolts.
- 3) Disconnect hydraulic lines from steering gear. Plug openings. Remove steering gear nuts. Remove steering gear. Lower

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engine/transmission sufficiently to separate steering shaft halves.

### Installation

To install, reverse removal procedure. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS. Fill and bleed hydraulic system. See HYDRAULIC SYSTEM BLEEDING. Check wheel alignment. See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in WHEEL ALIGNMENT section.

### OVERHAUL

Manufacturer recommends that power steering pump and steering gear be replaced, rather than be repaired.

### TORQUE SPECIFICATIONS

#### TORQUE SPECIFICATIONS TABLE

Application		Ft. Lbs. (N.m)
Lower Valve Body Nut		
4-Cyl. ....	22	(30)
VR6 ....	30	(40)
Power Steering Pump		
Banjo Bolt		
4-Cyl. ....	26	(35)
VR6 ....	22	(30)
Mounting Bolt		
4-Cyl. ....	15	(20)
VR6 ....	18	(25)
Pressure Line Fitting .....	22	(30)
Steering Gear		
Adjusting Plug .....	44	(60)
Bracket/Bushing Clamp Nut .....	22	(30)
Tie Rod Lock Nut .....	42	(55)
Tie Rod-To-Steering Arm Nut .....	52	(70)

END OF ARTICLE