

## **STEERING SYSTEM - POWER**

### **Article Text**

1987 Volkswagen Quantum/Quantum Syncro

For Volkswagen Technical Site

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Sunday, March 19, 2000 01:53AM

### **ARTICLE BEGINNING**

1987-88 STEERING

Volkswagen - Power-Assisted Rack & Pinion

1987; Cabriolet, GTI, Jetta GLI, Quantum, Quantum Syncro,  
Scirocco, Vanagon

1987-88; Jetta, Golf

### **DESCRIPTION**

The system consists of a vane pump, rotary piston pinion gear assembly and an oil reservoir. The vane pump draws fluid from the reservoir and supplies it to the flow control valve. The control valve supplies fluid to the proper side of the rack-piston.

### **LUBRICATION**

#### **CAPACITY**

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

#### **FLUID TYPE**

Recommended fluid type is ATF Dexron II.

#### **FLUID LEVEL CHECK**

Remove reservoir cover. Start engine and let idle. Fluid level should be at mark on upper inside of reservoir.

#### **HYDRAULIC SYSTEM BLEEDING**

1) Start engine and let idle. Ensure fluid is at proper level. Turn steering wheel lock-to-lock several times quickly.

2) Continue until fluid level remains at reservoir mark. Ensure no bubbles appear in reservoir when steering wheel is turned. Shut off engine. Ensure oil level does not rise more than 3/8" above mark.

#### **OIL FILTER REPLACEMENT**

Remove outer cover, gasket and spring from reservoir. Remove inner filter cover and filter insert. Install new filter, replace filter cover, spring, gasket, and top cover. Check fluid level.

**NOTE:** Oil filter insert must be replaced whenever repairs are made to power steering system.

## STEERING SYSTEM - POWER

### Article Text (p. 2)

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Sunday, March 19, 2000 01:53AM

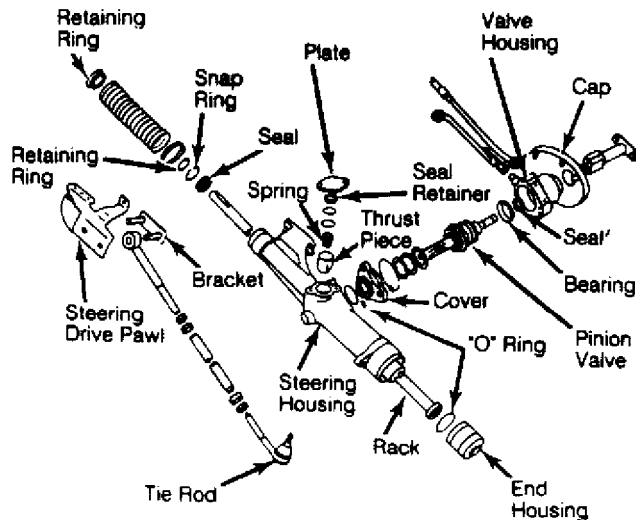


Fig. 1: Exploded View of Power Steering Gear  
Courtesy of Volkswagen United States, Inc.

## ADJUSTMENTS

### BELT TENSION

Loosen nuts on pump mounting bracket. Turn adjusting bolt on bracket until belt deflection is 3/8" at center of belt. Tighten nuts to specification.

### STEERING GEAR

With steering gear removed from vehicle, loosen lock nut on steering gear. Finger tighten adjusting screw until it just touches thrust plate. Hold adjusting screw while tightening lock nut. Rack should be able to be moved by hand without binding. Readjust if necessary.

## TESTING

### SYSTEM PRESSURE TEST

1) Install Pressure Gauge (US1074 B) between pressure hose and pressure pipe of valve housing. Open pressure gauge valve. Run engine at idle. Turn steering wheel lock-to-lock several times.

2) On Quantum, pressure is 986-1189 psi (69-84 kg/cm<sup>2</sup>). On all others, pressure is 1100-1200 psi (77.83-84.36 kg/cm<sup>2</sup>). If pressure is not within limits, check pump pressure. If pump is good, replace steering gear.

### PUMP PRESSURE TEST

1) Install pressure gauge. Start engine and let idle. Close valve (for no longer than 5 seconds). On Quantum, pressure is 986-1189

## **STEERING SYSTEM - POWER**

### **Article Text (p. 3)**

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psi (69-84 kg/cm<sup>2</sup>). On all others, pressure is 1100-1200 psi (77.83-84.36 kg/cm<sup>2</sup>).

2) If pressure is not to specification, check limiting valve by inspecting bores in valve and piston for obstructions. Ensure piston moves freely in housing. Install new valve if necessary.

### **LEAK TEST**

1) With engine idling, turn steering wheel to full lock and hold in position. Inspect all connections and tighten if necessary. If leak shows at steering pinion, replace housing seal and both intermediate cover seals.

2) If pinion shaft seal is leaking, fluid has entered gear housing. Check for fluid by loosening outer clamp on right steering boot and pushing boot in. If seal is leaking, disassemble steering gear and replace all seals.

### **REMOVAL & INSTALLATION**

#### **STEERING GEAR**

##### **Removal**

1) Drain fluid from system. Disconnect hydraulic pipes from valve housing. Disconnect lower steering shaft from pinion shaft. Disconnect tie rods from bracket.

2) Remove steering gear-to-body bolts. On all except Quantum, remove rear motor/transmission mount and exhaust pipe. Remove steering gear.

##### **Installation**

To install, reverse removal procedure. To install tie rods, install one tie rod to steering gear and tighten before installing the other tie rod.

#### **POWER STEERING PUMP**

##### **Removal**

Remove alternator and pump belts. Disconnect hydraulic lines from pump. Cap lines to prevent contamination. Remove bracket bolts. Remove pump.

##### **Installation**

To install, reverse removal procedure. Adjust belt tension. Start engine and check for leaks.

### **OVERHAUL**

Before disassembling steering gear, check output and system pressure. When overhauling steering gear, always use all parts in Repair Kit (811 498 020). Always use new self-locking nuts and "O" rings.

On all models except Quantum and Quantum Syncro,

## STEERING SYSTEM - POWER

### Article Text (p. 4)

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manufacturer recommends replacement of steering gear if pinion or piston-rod seals are leaking.

### PINION HOUSING SEAL

Disassembly (Quantum & Quantum Syncro)

1) Remove retaining bolts from pinion valve housing. Remove housing. Mark position of pinion gear for reassembly reference.

2) Remove pinion gear and intermediate cover. Remove "O" rings from intermediate cover. Place housing in padded vise. Drive out oil seal from back.

Inspection

Inspect seal mating surfaces for pitting or scoring. Check pinion and pinion valve surfaces for scratching or pitting. Discard old seals. Replace worn parts as necessary.

Reassembly

Install new seals. Ensure seal lip on housing seal faces intermediate cover. Replace both intermediate cover "O" rings. To complete reassembly, reverse disassembly procedure. Protect pinion teeth on shaft when replacing intermediate cover. Do not damage "O" rings during installation.

### STEERING GEAR

Disassembly (Quantum & Quantum Syncro)

1) With steering gear removed from vehicle, remove pinion valve housing. Remove pinion valve assembly. Remove plate, seal retainer, spring, and thrust piece from steering gear housing.

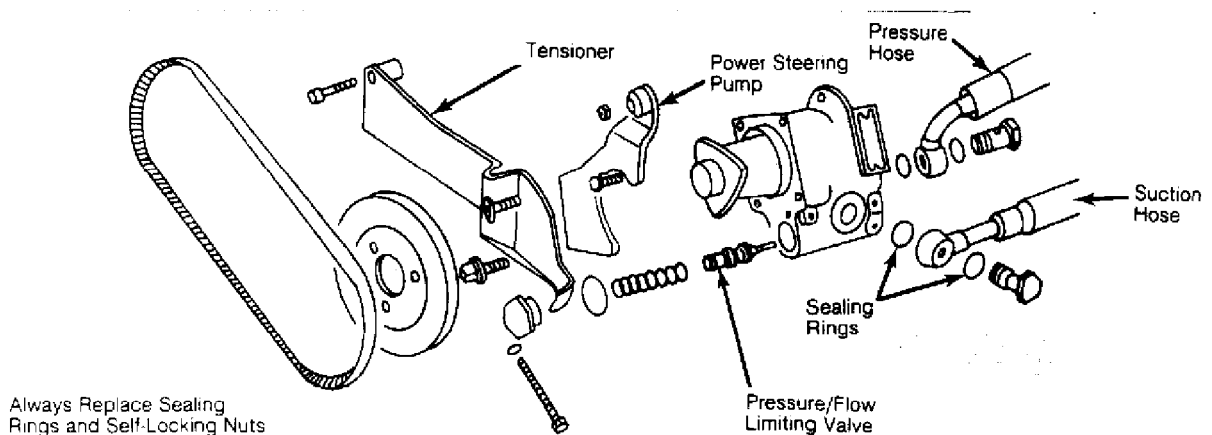


Fig. 2: Vane Pump Assembly  
Courtesy of Volkswagen United States, Inc.

2) Remove retaining ring, clamp and boot from steering housing. Remove retaining ring and snap ring from steering gear housing.

3) Remove end housing and "O" ring from steering gear

## STEERING SYSTEM - POWER

### Article Text (p. 5)

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housing. Pull rack out of housing. Using oil seal puller, remove oil seal from housing.

#### Reassembly

1) To install oil seal on housing, place oil seal on flat surface. Push sleeve (available in repair kit 811 498 020) into oil seal. Slide rack into housing.

2) Using Seal Installers (VW 426 and VW 4166), slide oil seal with sleeve over rack and into housing. Remove sleeve. Install snap ring and retaining ring.

3) Install end housing with new "O" ring. Lock in place with 2 punch marks 180 degrees apart. Install thrust piece, spring, "O" ring, seal retainer and plate. Install clamp, boot and retaining ring. Install pinion valve assembly as previously described.

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS TABLE

Application		Ft. Lbs. (N.m)
End Housing Bolt	.....	37 (50)
Pressure-Flow Limiting Valve Cap	.....	42 (57)
Pressure Pipe Fitting	.....	29 (39)
Return Pipe Fitting		
On Pump	.....	29 (39)
On Valve Housing	.....	22 (30)
Tie Rod-to-Steering Arm	.....	32 (44)
Valve Housing Bolt	.....	15 (20)

END OF ARTICLE