

STEERING GEAR - POWER RACK & PINION

Article Text

1993 Volkswagen EuroVan
For Volkswagen Technical Site
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Saturday, March 18, 2000 10:37PM

ARTICLE BEGINNING

1993 STEERING
Volkswagen - Power Rack & Pinion

EuroVan

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 approximately 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 idle. Fluid level should be between MIN and MAX marks on reservoir.

HYDRAULIC SYSTEM BLEEDING

- 1) Start engine and let idle. Ensure fluid is at proper level. Turn steering wheel from 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" (10 mm).

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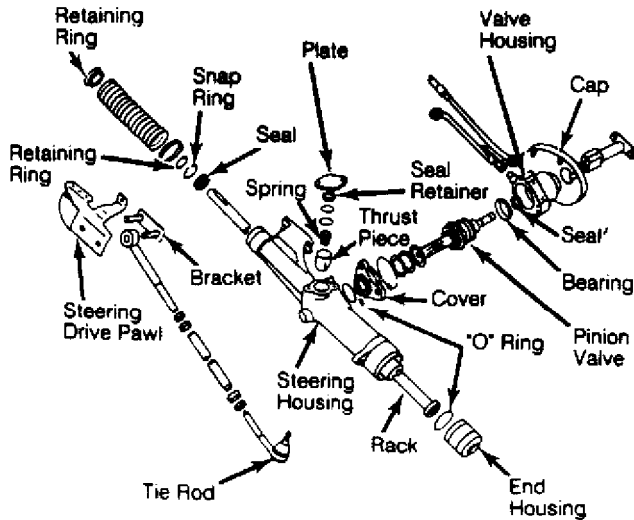


Fig. 1: Identifying Typical Power Rack & Pinion Components
Courtesy of Volkswagen United States, Inc.

ADJUSTMENTS

POWER STEERING PUMP BELT

Loosen nuts on pump mounting bracket. Turn adjuster bolt until belt deflection is 3/8" (10 mm) at center of belt. Tighten nuts to specification.

TESTING

HYDRAULIC SYSTEM INSPECTION

Ensure fluid level is okay. Check service belt condition and adjustment. Ensure hoses are not kinked or leaking.

PUMP PRESSURE TEST

Install Pressure Gauge (US 1074 B) between pressure hose and pressure line of valve housing. Start engine and let idle. Close valve. Leave valve closed for no longer than 5 seconds. Pressure should be within specification. See POWER STEERING SYSTEM PRESSURE table. If pump pressure is not within specification, replace pump.

POWER STEERING SYSTEM PRESSURE TABLE

AA

Model	Pressure psi (bar)
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EuroVan	1233-1378 (85-95)
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AA

STEERING GEAR INSPECTION

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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.

REMOVAL & INSTALLATION

POWER STEERING PUMP

Removal

Remove alternator 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 table at end of article. Fill and bleed hydraulic system. See HYDRAULIC SYSTEM BLEEDING. Start engine and check for leaks.

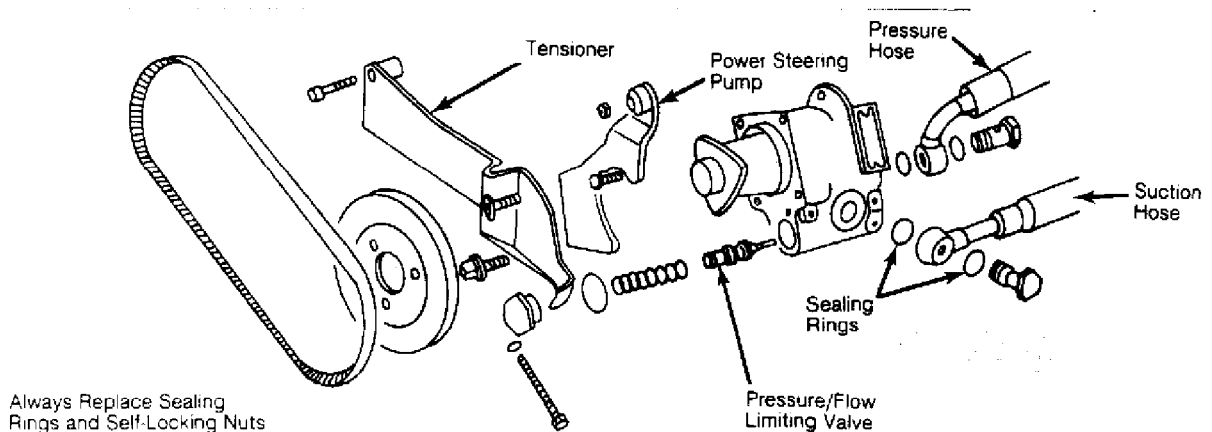


Fig. 2: Identifying Typical Power Steering Pump Components
Courtesy of Volkswagen United States, Inc.

POWER RACK & PINION

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

Removal

1) Remove lower insulation pan. Remove front exhaust pipe. Remove heat shield located above power steering gear (if equipped). Remove hoses from pump. Drain fluid from pump and hoses.

2) Disconnect tie rod ends from steering knuckles. Remove stabilizer clamps from subframe. Push stabilizer upward. Move rack toward right side to disengage pinion from "U" joint. Move rack left and then toward the rear of vehicle to remove.

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Installation

To install, reverse removal procedure. Tighten nuts and bolts to specification. See TORQUE SPECIFICATIONS table at end of article. Fill and bleed hydraulic system. See HYDRAULIC SYSTEM BLEEDING. Check wheel alignment. See WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES article in the 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)
End Housing Bolt	.....	37 (50)
Power Steering Pump Bolt	.....	18 (25)
Pressure-Flow Limiting Valve Cap	.....	42 (57)
Pressure Line Fitting	.....	29 (39)
Return Line Fitting		
On Pump	.....	29 (39)
On Valve Housing	.....	22 (30)
Steering Gear Retaining Bolt	.....	24 (33)
Subframe Bolt		
Long	.....	96 (130)
Short	.....	59 (80)
Tie Rod Lock Nut	.....	42 (55)
Tie Rod-To-Steering Arm	.....	32 (44)
Valve Housing Bolt	.....	15 (20)

END OF ARTICLE