

AUDI 5000 POWER-ASSISTED RACK & PINION

DESCRIPTION

A power-assisted rack and pinion steering gear is used. 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 as the steering wheel is turned.

The pump is belt driven and mounted on the front of the engine. The reservoir is located near the firewall.

LUBRICATION

CAPACITY

1 qt. (.95L)

FLUID TYPE

ATF Dexron

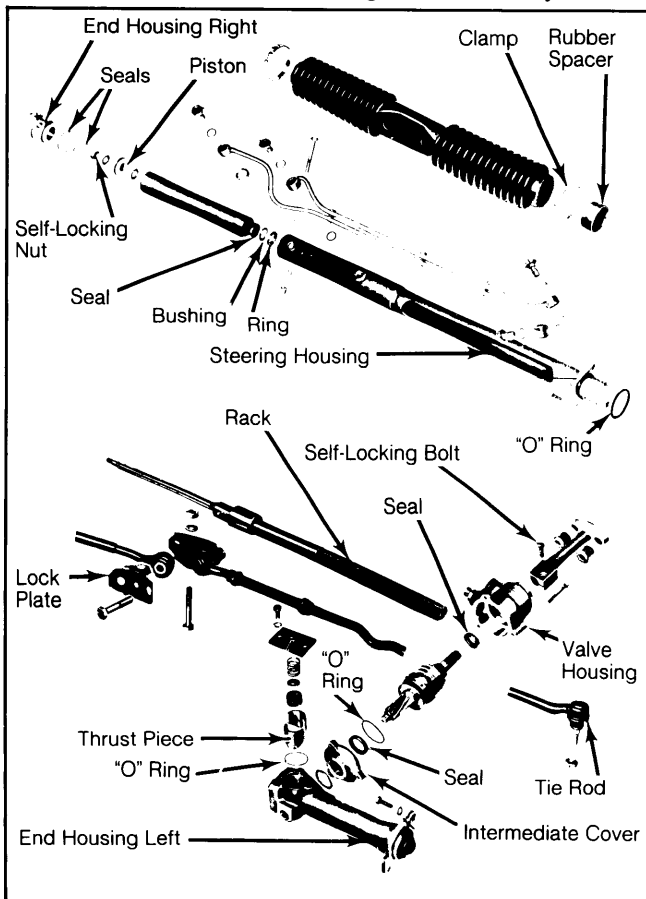
FLUID LEVEL CHECK

Remove reservoir cover, start engine and check fluid level. Fluid level should be at mark on upper inside of reservoir.

HYDRAULIC SYSTEM BLEEDING

1) Start engine and allow to idle. Check that fluid is at proper level. Turn steering wheel lock to lock several times quickly. Continue until fluid level remains at reservoir mark.

Fig. 1: Exploded View of Steering Gear Assembly



2) Make sure that no bubbles appear in reservoir when steering wheel is turned. Shut off engine and check that fluid level does not rise more than 3/8" (9.5 mm) above mark.

OIL FILTER REPLACEMENT

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

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

ADJUSTMENT

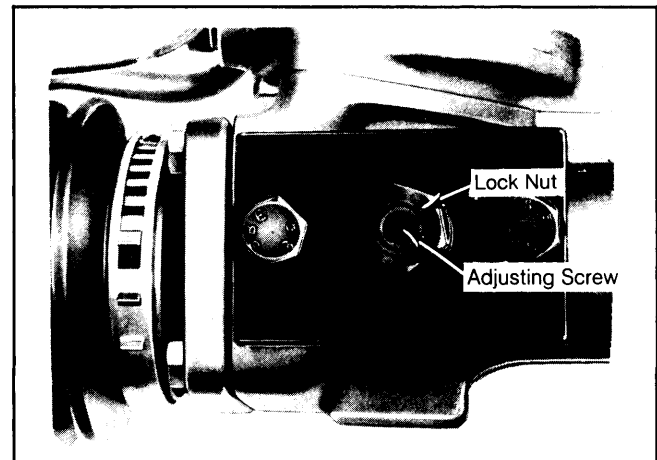
PUMP BELT

Remove belt from alternator and air conditioning compressor. Loosen nuts on pump mounting bracket. Turn adjusting nut on bracket until belt deflection is 3/8" (9.5 mm) at center. Tighten nuts and reinstall belt.

STEERING GEAR

Loosen lock nut on steering gear. Hand tighten adjusting screw until it touches the thrust plate. Hold adjusting screw and tighten lock nut. Check adjustment with engine idling. Readjust if necessary.

Fig. 2: Steering Gear Adjustment



No play should be felt.

TESTING

SYSTEM PRESSURE TEST

1) Install pressure gauge (US1070) between expansion hose and connecting pipe of valve housing, with valve open. Run engine at idle. Turn steering wheel lock to lock several times.

2) Check pressure. Correct pressure is 986-1189 psi (68-84 kg/cm²). If pressure is not within limits, replace steering gear.

PUMP PRESSURE TEST

1) With pressure gauge installed, start engine and idle. Close valve (no longer than 5 seconds) and check pressure.

Power Steering

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2) Correct pressure is 986-1189 psi (68-84 kg/cm²). If pressure is different, check pressure/flow limiting valve. If valve is good, replace power steering pump.

3) To check limiting valve, inspect bores in valve and piston for obstructions. Check that piston moves freely in housing. Install new valve if necessary.

LEAKAGE TEST

1) With engine idling, turn steering wheel to full lock and hold in position. Inspect all connections and tighten, if necessary.

2) If leak shows at steering pinion, replace pinion housing seal and both intermediate cover seals.

3) If piston rod is leaking, fluid will have entered steering 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 pressure hose and return line. Cap openings. Remove tie rod lock plate and both tie rod retaining bolts.

2) Separate tie rods off steering gear. Disconnect steering damper. Disconnect flange tube clamp from steering gear and remove flange tube.

3) Remove steering gear retaining bolts from body. Turn wheels to the right lock and remove steering gear through opening in right wheel well.

Installation

To install, reverse removal procedures. Replace tie rod lock plate before reinstallation. To facilitate tie rod installation, install one tie rod to steering gear and tighten before installing other tie rod.

VANE PUMP

Removal

Remove alternator "V" belt and vane pump "V" belt. Disconnect pressure and suction lines from pump and cover openings. Remove retaining bolts from bracket and lift pump from engine.

Installation

To install, reverse removal procedures. Adjust "V" belt deflection to 3/8" (9.5 mm) at center. After reinstalling pressure and suction lines, start engine. Turn steering wheel to full lock and check for leaks in connections.

OVERHAUL

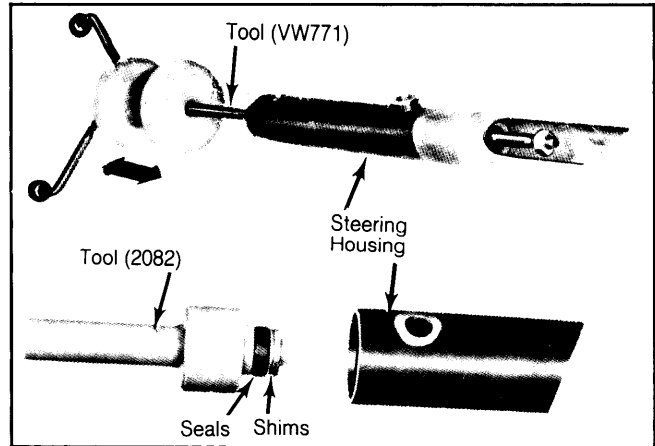
NOTE: Manufacturer does not recommend overhaul of steering gear. Leaking seals may be replaced, however. Check output and system pressure before removing steering gear. Steering gear must be removed to replace seals.

PINION HOUSING SEAL

Disassembly

1) Remove retaining bolts from valve housing and remove housing. Remove pinion gear and intermediate cover.

Fig. 3: Steering Housing Oil Seal



Remove one seal from each side.

2) Remove "O" rings from intermediate cover and, using removal tool, drive out intermediate cover oil seal. Anchor housing in padded vise and drive out oil seal from the back.

3) Install new seals from the inside cover and housing. Make sure that seal lip on housing faces intermediate cover, and seal lip of cover seal faces valve housing. Replace both intermediate cover "O" rings.

Reassembly

To install, reverse removal procedures. Protect pinion teeth on shaft when replacing intermediate cover. Do not damage "O" rings during reinstallation.

STEERING HOUSING SEAL

Disassembly

1) With steering gear removed from vehicle, drive out right end of steering housing with drift. Remove seals and "O" ring.

2) Clamp rack in vise, remove self-locking nut and piston. Insert removal tool (VW771) into right steering housing and remove oil seal and shims.

Reassembly

Using installer tool (2082), install shims and seal with thin shim behind seal, and seal lip facing piston. Replace piston and self-locking nut. Tighten to specification. Replace seals, "O" ring, and end housing.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Pulley-to-Pump Shaft	14 (19)
Pump Retaining Bolts	14 (19)
Pinion Shaft Nut	14 (19)
Steering Damper	29 (39)
Tie Rod-to-Steering Gear	43 (58)
Tie Rod Locking Nut	43 (58)
Steering Housing Locking Nut	29 (39)
Expansion Hose	29 (39)
Suction Hose	29 (39)
Flange Tube-to-Steering Gear	22 (30)
Valve Housing Bolts	7 (10)