

STEERING SYSTEM - POWER

Article Text

1993 Honda Prelude

For Cadi Centre Nsk CA 95051

Copyright © 1998 Mitchell Repair Information Company, LLC

Sunday, July 08, 2001 11:37AM

ARTICLE BEGINNING

1993 STEERING

Honda - Power Steering

Prelude

DESCRIPTION & OPERATION

The power steering system consists of a power rack and pinion steering gear, hydraulic pump, fluid reservoir, valve body unit, vehicle speed sensor and hoses. Power assist is proportional to vehicle speed and steering load. Assist is high when vehicle speed is low, and lower as vehicle speed increases.

The vehicle speed sensor is a trochoid-rotor hydraulic pump, driven by a speedometer gear in the transmission. When the vehicle is in motion, the speed sensor pump relieves a portion of the hydraulic pressure, reducing power steering assist.

LUBRICATION

CAPACITY

POWER STEERING FLUID CAPACITIES TABLE

Application		Qts. (L)
Prelude	1.8 (1.7)

FLUID TYPE

Use only Honda (08208-311-61F) power steering fluid.

CAUTION: Using ATF or other power steering fluids will damage system.

FLUID LEVEL CHECK

Check fluid when engine is cold and not running. Fluid level should be between upper and lower marks on fluid reservoir. If fluid level is excessively low, check for leaks. Add fluid (if needed) and recheck. DO NOT overfill.

HYDRAULIC SYSTEM BLEEDING

Fill reservoir to proper level. Start engine and run at fast idle. Turn steering wheel from lock-to-lock, 2 or 3 times to bleed

trapped air. Recheck fluid level.

ADJUSTMENTS

POWER STEERING PUMP BELT

BELT ADJUSTMENT SPECIFICATIONS TABLE

AA

Application (1) Deflection - In. (mm)

Prelude 9/16-5/8 (14-16)

(1) - Deflection is with 22 lbs. (10 kg) pressure applied
midway on longest belt run.

AA

PINION ROTATING FORCE & RACK SLIDING FORCE

Using Lock Nut Wrench (07916-SA500001), loosen guide screw lock nut. See Fig. 1 for component location. Using a 14-mm wrench, tighten guide screw to 36 INCH lbs. (4.1 N.m). Loosen guide screw according to GUIDE SCREW ADJUSTMENT SPECIFICATIONS table. Holding rack guide screw in place, tighten lock nut.

GUIDE SCREW ADJUSTMENT SPECIFICATIONS TABLE

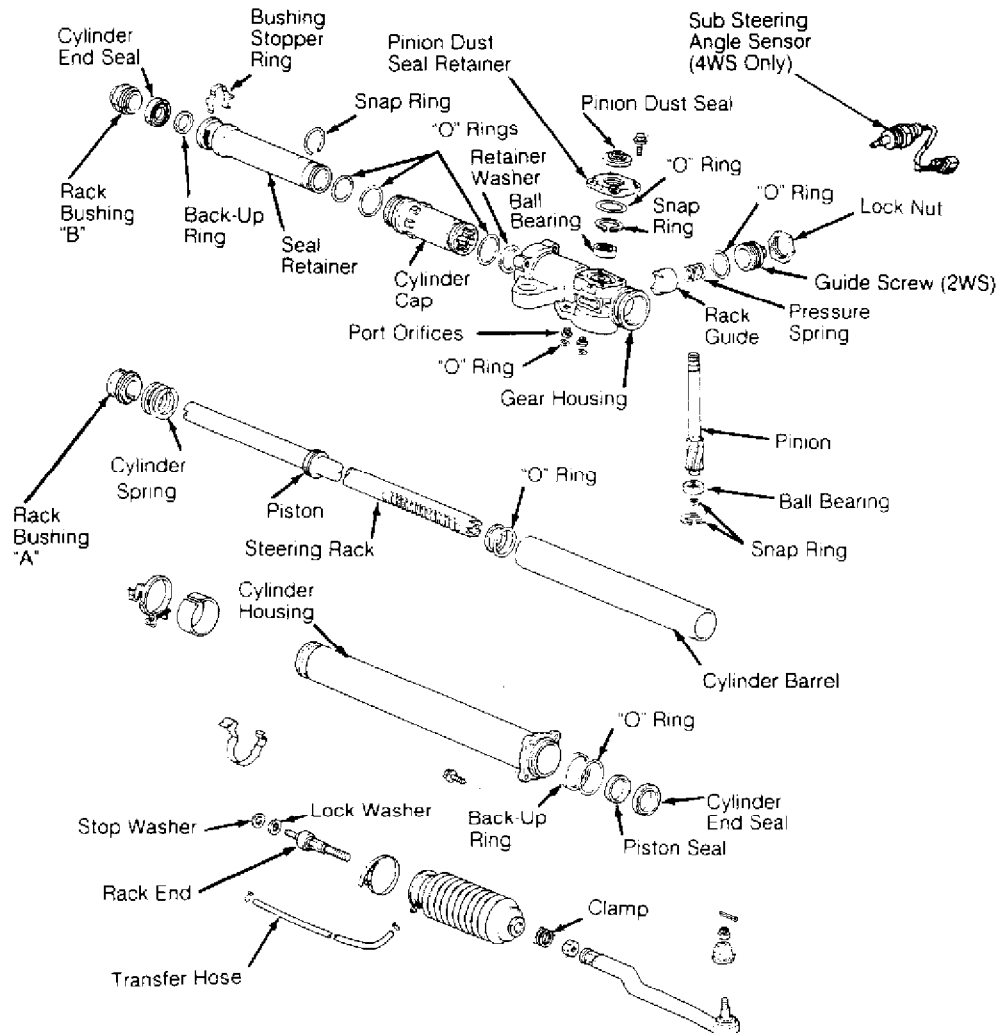
AA

Application (1) Counter-Rotation
(Degrees)

Prelude (2WS) 15-25

(1) - After rack guide screw has been tightened to 36 INCH
lbs.(4.1 N.m).

AA



93H00361

STEERING SYSTEM - POWER Article Text (p. 3) 1993 Honda Prelude For. Cadi Centre Nsk CA 95051 Copyright ©
 Exploded View of Power Rack & Pinion (Typical)
 Courtesy of American Honda Motor Co., Inc.

TESTING

HYDRAULIC SYSTEM PRESSURE TEST

1) Check fluid level and belt tension. Adjust as necessary. Disconnect outlet hose from pump. Install Pressure Gauge Set (07406-0010001). Fully open shutoff and pressure control valves.

2) Start and idle engine. Turn steering wheel from lock to lock several times to warm fluid to operating temperature. Completely close shutoff valve.

CAUTION: DO NOT close shutoff valve for more than 5 seconds or pump will be damaged.

3) Gradually close pressure control valve until pressure gauge needle stabilizes. Read pressure. Fully open shutoff valve. Pump pressure should be 995-1138 psi (70-80 kg/cm²). Replace pump if pressure is too low.

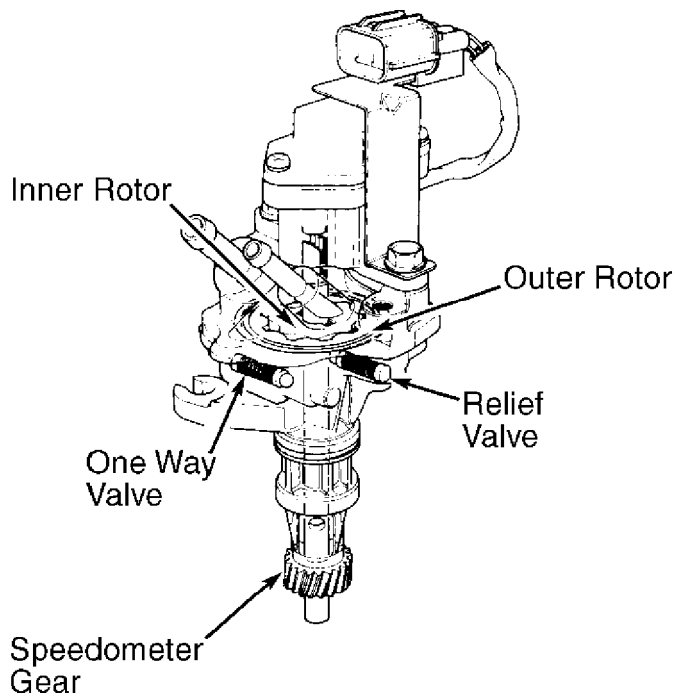
STEERING WHEEL TURNING FORCE

Low Speed Assist

1) Check fluid level and belt tension. Start and idle engine. Turn steering wheel from lock to lock several times to warm fluid. Attach a spring-tension scale to outer end of steering wheel spoke.

2) Ensure vehicle is on a clean, dry surface. With engine idling, pull on spring-tension scale until tires move. Reading should be less than 6.6 lbs. (3.0 kg.). If reading is more than specified, stop engine and disconnect hose between control unit and speed sensor at sensor. See Fig. 2. Plug hose and sensor fitting.

3) Start and idle engine. Pull on spring-tension scale until tires move. If reading is less than specified, replace speed sensor. If reading is more than specified, check rack and pinion.



91E03152

Fig. 2: Identifying Speed Sensor Components (Typical)

Courtesy of American Honda Motor Co., Inc.

Simulated High Speed Assist

1) Check fluid level and belt tension. Start and idle engine. Turn steering wheel from lock to lock to warm fluid. Stop engine. Disconnect hoses at speed sensor.

2) Connect By-Pass Tube Connector (07406-0010101) to hoses at speed sensor. See Fig. 3. This connects cut-off valve and control unit to reservoir hose, simulating speed sensor operation at more than 30 MPH.

3) Attach spring-tension scale to outer end of steering wheel spoke. With vehicle on clean, dry floor, start and idle engine. Pull on spring-tension scale until tires move.

4) If turning force is less than 11 lbs. (5.0 kg), speed sensor is okay. If turning force is greater than specification, check for a faulty speed sensor or sensor feed line restriction. Check power steering pump and steering gear for restrictions.

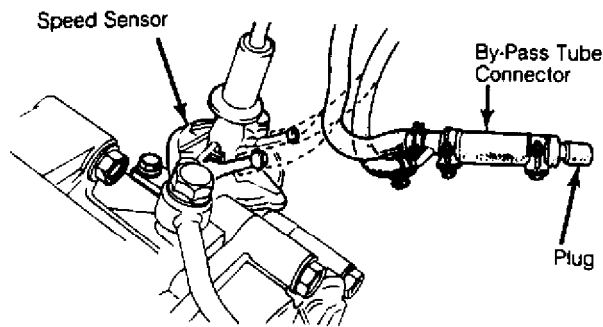


Fig. 3: Simulating High Speed Assist With By-Pass Tube Connector
Courtesy of American Honda Motor Co., Inc.

REMOVAL & INSTALLATION

POWER STEERING PUMP

Removal

Drain fluid. Disconnect inlet, outlet and return hoses at pump. Remove belt by loosening pump pivot and adjusting bolts. Remove pump retaining bolts and pump.

Installation

To install, reverse removal procedure. Adjust belt tension. Fill reservoir with new fluid. Bleed air from system. Check for leaks.

STEERING GEAR

2) Remove center beam bolts and center beam. Disconnect oxygen sensor connector. Disconnect exhaust pipe at exhaust manifold. Remove steering gear splash guard. Clean steering gear and surrounding areas. Disconnect and plug fluid lines from control unit.

Installation

SPEED SENSOR

Remove speed sensor mounting bolts and pull speed sensor from transmission housing. Raise speedometer cable boot and remove retaining clip. Remove cable. Disconnect and plug speed sensor hoses and plug fittings.

OVERHAUL

Remove pump from vehicle. See POWER STEERING PUMP under REMOVAL & INSTALLATION. Hold pulley using spanner wrench. Remove pulley nut and pulley. See Fig. 4. Loosen pump front cover bolts in a diagonal pattern. Remove cover. Using a screwdriver, pry out housing seal.

1) Ensure oil passage in front cover is clear. Using a 19-mm socket, install ~~SPRING SYSTEM~~ install front cover bolts. Tighten bolts

diagonally to specification. See TORQUE SPECIFICATIONS TABLE. Install pulley. Tighten bolt to specification.

2) Turn pulley bolt using torque wrench to measure preload. Preload should be 71 INCH lbs. (8 N.m). Install and adjust belt. Add fluid. Bleed air from system. Check for leaks.

POWER STEERING PUMP

Disassembly

1) Remove pump from vehicle. See POWER STEERING PUMP under REMOVAL & INSTALLATION. Mount pump in vise. Hold pulley using spanner wrench. Remove bolt. If pulley is damaged, separate pulley from hub. Loosen front cover (flange) bolts. See Fig. 4. Remove cover. Pry oil seal from front cover.

2) Remove flow control valve from pump housing. Remove inlet joint, pump cover and "O" ring. Remove pump cam ring from housing. Remove pump rotor and vanes. Remove 2 rollers from side plate. Remove side plate and preload springs. Remove pump hosing "O" rings, circlip and driveshaft. Remove seal spacer, seal and pump shaft bearing.

NOTE: Replace power steering pump as an assembly if damage or excessive wear exist on pump hosing, side plate, rotor, vanes or pump cam ring,

Inspection

1) Ensure oil passage in front cover is clear. Inspect control valve and filter. Check control valve for wear, burrs or damage to edges of groove. Slip control valve into bore and check for smooth movement. Replace valve (if necessary).

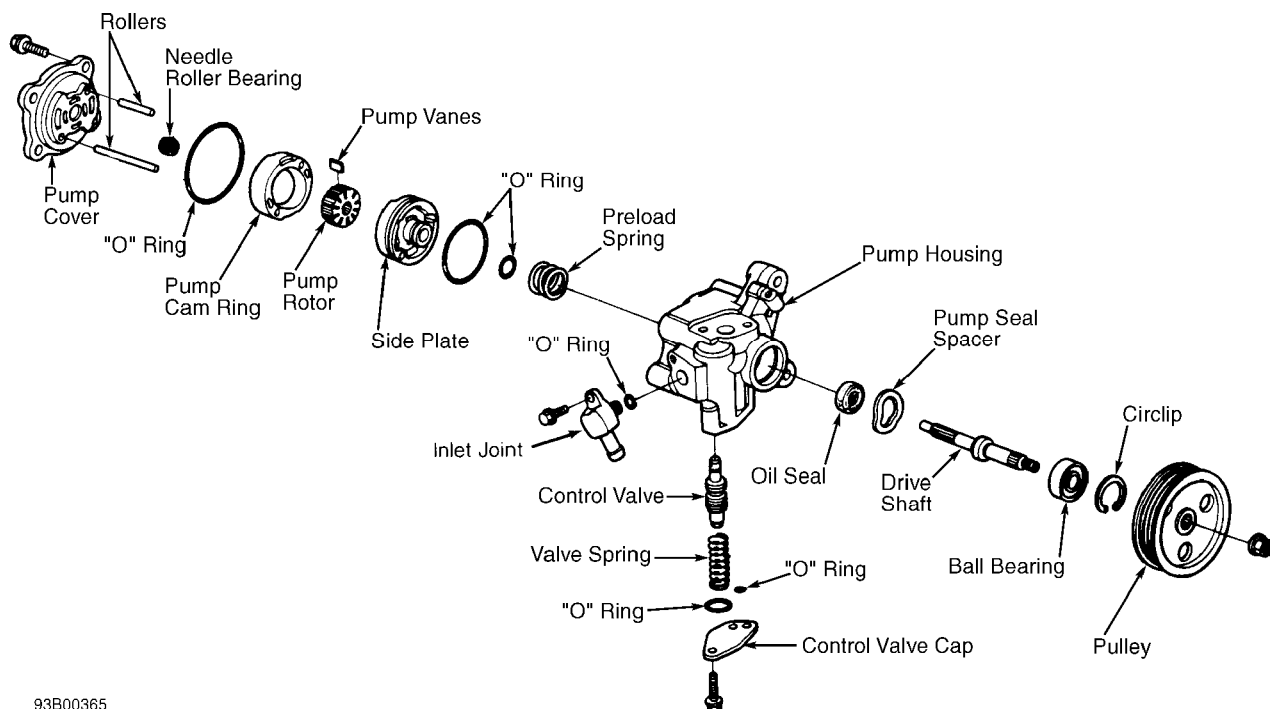
2) Pressure check control valve. Attach a hose to hexagonal side of control valve. Submerge valve in Honda power steering fluid. Using no more than 14.2 psi (1 kg/cm²), blow into hose and check for leakage.

3) If leak is found, disassemble and clean valve. Replace any shims found during disassembly. Retest for leakage. Replace valve if leak persists. Note if valve has an identification mark to determine correct replacement valve.

Reassembly

1) To reassemble, reverse disassembly procedure. Lubricate all "O" rings and seals before installing.

2) Lubricate gears and shafts with power steering fluid. Install front cover. Tighten front cover bolts diagonally. Using a 19-mm socket, install seal into front cover.



93B00365
Fig. 4: Exploded View Of Power Steering Pump
 Courtesy of American Honda Motor Co., Inc.

STEERING GEAR

Disassembly

1) Remove valve body from gear housing. See Fig. 1. Loosen dust boot clamps. Pull dust boots away from cylinder barrel. Bend back tie rod lock washer tabs. Remove tie rod from rack.

2) Push rack into cylinder to protect rack from scratching. Loosen guide screw lock nut. Remove guide screw, spring and rack guide. Remove 4 pinion dust seal cap bolts.

3) Remove pinion dust seal cap (gear housing cap). Remove 28-mm snap ring from bottom of housing. Working from top of pinion (shaft), use a drift and mallet and lightly tap pinion from housing.

4) Remove snap ring from pinion. Using a bearing puller, remove bearing from pinion. Remove 4 cylinder housing-to-gear housing bolts. Remove cylinder housing, rack bushing and spring from housing. Pry out cylinder end seal.

5) Remove cylinder barrel, seal retainer, cylinder cap and steering rack from housing. Remove "O" ring and retainer washer from gear housing. Remove snap ring. Remove pinion holder and bearing from gear housing.

6) Remove cylinder barrel and seal retainer from steering

STEERING SYSTEM - POWER STEERING (p. 8)
 Remove "O" rings from cylinder cap. 1993 Honda Prelude For Radi Centre NSK OA 55054 Copyright ©

NOTE: Back-up rings in seal retainer are color coded. Always

replace with correct color code.

7) Remove rack bushing "B", back-up ring and end seal from seal retainer. Using a small screwdriver, carefully pry piston seal ring from steering rack. Remove "O" ring from steering rack.

Inspection

Check pinion holder and bearing for excessive play. Replace as necessary. Inspect needle bearings in gear housing for damage. If needle bearings are damaged, replace steering gear assembly.

Reassembly

Grease bearings and sliding surfaces before reassembly. Install pinion holder into housing. Install snap ring with tapered side facing out away from housing. Align snap ring ends with flat part of pinion holder. Adjust rack guide. See PINION ROTATING FORCE & RACK SLIDING FORCE under ADJUSTMENTS.

VALVE BODY UNIT

Disassembly

1) Remove 2 valve body-to-gear housing bolts. Remove "O" rings and port orifices from gear housing. Remove pinion shaft dust seal from valve body. See Fig. 5.

2) Remove 2 valve body cap flange bolts. Remove valve port and seal from side of valve body. Pull cut-off valve and spring from valve body. Remove valve body cap, cap seal and dowels from valve body.

3) Pushing reaction control valve to one side of valve body, remove roller from reaction control valve. Repeat procedure on other side of valve body to remove opposite roller. Remove control valve seal.

NOTE: Hold plungers with fingers to keep plungers from falling out when removing rollers.

4) Remove sensor orifice and "O" ring from valve body. Using a 1/16" drill bit filed flat on shank end, pry orifice from valve body.

5) Using same drill bit used for orifice, insert bit through valve body and push out damping orifice and "O" ring from behind.

Inspection

1) Check cut-off valve for signs of scratching and/or scoring. Insert cut-off valve into valve body, and ensure it slides smoothly in and out. If valve body is damaged, replace valve body and cut-off valve as a unit.

NOTE: Cut-off valve, control valve and plungers are sized to fit valve body. If any of these need replacement, ensure new part has same identification letter.

2) Inspect plungers for scoring or scratching. Insert plungers into valve body and check for smooth operation. Replace any damaged plunger. If valve body is damaged, replace valve body as a unit.

3) Check control valve for scoring or scratches. Insert reaction control valve into valve body and check for smooth operation. If valve body is damaged, replace valve body as a unit.

Reassembly

1) Clean all parts before reassembly. Coat plungers, cut-off valve and control valve with Honda power steering fluid. Replace "O" rings and seals.

2) Grease cap seal and port seal grooves to hold seals in place during reassembly. Use grease to hold "O" rings in place during reassembly. To complete reassembly, reverse disassembly procedure.

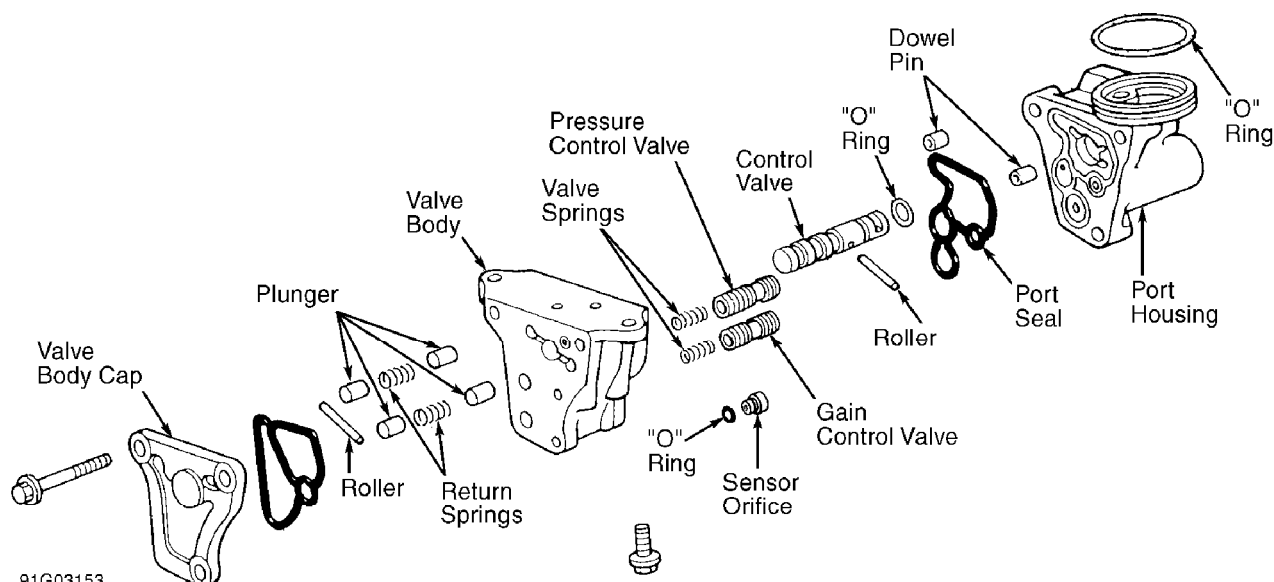


Fig. 5: Exploded View Of Valve Body Unit
Courtesy of American Honda Motor Co., Inc.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
-------------	----------------

Cylinder Rack-To-Gear Housing Bolt 16 (22)

14-mm	28 (38)
17-mm	20 (27)
Pump Pulley Nut	48 (65)
Pump-To-Bracket Bolt	33 (45)
Speed Sensor Mounting Bolts	13 (18)
Steering Gear Mounting Bolts	29 (39)
Tie Rod End Nuts	33 (45)
Tie Rod-To-Rack	41 (55)

INCH Lbs. (N.m)

All 6-mm Bolts	89 (10)
Hydraulic Fittings (12-mm)	106 (12)
Pump Front Cover Bolt	106 (12)

AA

END OF ARTICLE