

STEERING SYSTEM - POWER

1994 STEERING Mazda - Power Rack & Pinion

DESCRIPTION

Steering system is a power-assisted rack and pinion. The system consists of a rack and pinion steering gear and power-assist pump/reservoir. The steering gear and pump/reservoir are connected by flexible lines.

TESTING

HYDRAULIC SYSTEM PRESSURE TEST

Pump Fluid Pressure Test

1. Disconnect pressure line from steering gear and steering pump. Connect pressure gauge/valve between steering pump and steering gear. See **Fig. 1** . Bleed air from system.
2. Completely open valve. Start engine and operate at idle. Turn steering wheel from lock to lock to increase fluid temperature to 122-140°F (50-60°C). To measure pump fluid pressure, close gauge valve completely.
3. Increase engine speed to 1000-1500 RPM. Measure oil pump fluid pressure. Ensure pump pressure is within specification. See **HYDRAULIC SYSTEM FLUID PRESSURE SPECIFICATIONS** table. If pressure is not within specification, replace pump.

CAUTION: DO NOT leave gauge valve closed for more than 15 seconds, or pump may be damaged.

1994 Mazda MX-5 Miata

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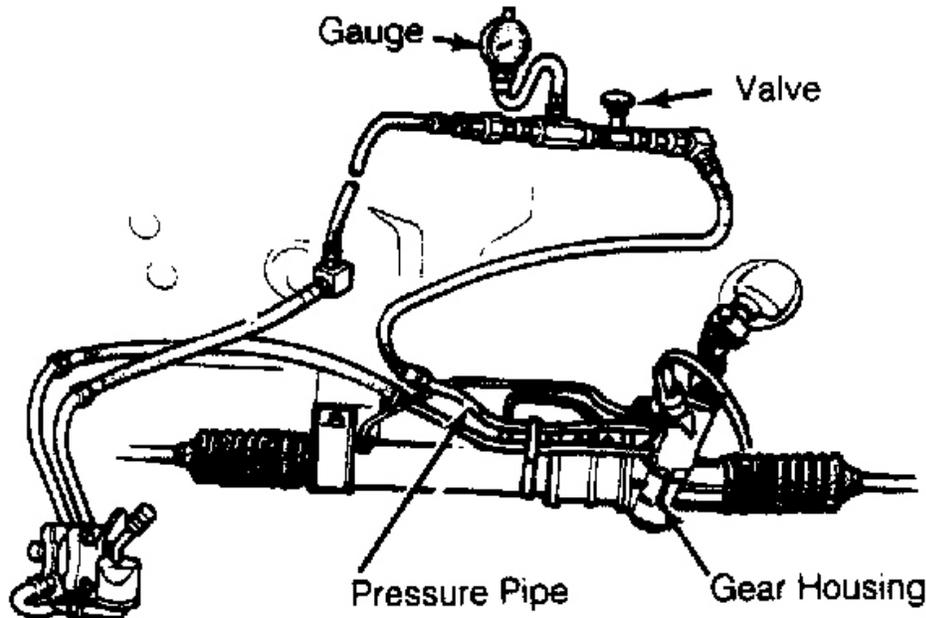


Fig. 1: Connecting Pressure Gauge/Valve
Courtesy of MAZDA MOTORS CORP.

Gear Fluid Pressure Test

1. Ensure steering pump pressure is within specification. To measure steering gear fluid pressure, open gauge valve completely. Increase engine speed to 1000-1500 RPM.
2. Turn steering wheel from lock to lock. Measure steering gear fluid pressure. Ensure gear pressure is within specification. See **HYDRAULIC SYSTEM FLUID PRESSURE SPECIFICATIONS** table. If pressure is not within specification, replace gear.

HYDRAULIC SYSTEM FLUID PRESSURE SPECIFICATIONS ⁽¹⁾

Application	psi (kg/cm ²)
Miata	1102-1209 (77-85)

(1) Specifications are measured at 1000-1500 RPM, with fluid temperature at 122-140°F (50-60°C).

LUBRICATION

FLUID CAPACITY

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POWER STEERING FLUID CAPACITY

Application	Qts. (L)
Miata	.85 (.80)

FLUID TYPE

Dexron-II or Mazda M-III fluids are recommended for all models.

FLUID LEVEL CHECK

Check fluid level on oil pump dipstick (if equipped) or reservoir. Fluid should be between marks on level gauge dipstick (if equipped) or reservoir. If fluid level is low, fill as necessary. Recheck fluid level. DO NOT overfill.

HYDRAULIC SYSTEM BLEEDING

1. Raise and support front of vehicle. With ignition off, turn steering wheel from lock to lock several times. Check fluid level. Add fluid as necessary. Repeat procedure until fluid level no longer decreases.
2. Start engine and operate at idle. Turn steering wheel from lock to lock 5 times. Check fluid level. Add fluid as necessary. Continue procedure until fluid is clear of air bubbles and does not decrease in level.

ADJUSTMENTS

NOTE: On-vehicle adjustment procedures are not available from manufacturer. For belt adjustment specifications, see POWER STEERING PUMP BELT .

POWER STEERING PUMP BELT

BELT ADJUSTMENT SPECIFICATIONS

Application	⁽¹⁾ Deflection In. (mm)
New Belt	.31-.35 (7.8-8.9)
Used Belt	.35-.39 (8.9-10.0)

(1) Belt deflection is measured at midpoint between idler pulley and pump, with 22 lbs. (10 kg.) of pressure applied.

REMOVAL & INSTALLATION

STEERING GEAR

NOTE: Use a suitable container or rags to collect fluid when disconnecting pressure and return lines.

Removal & Installation

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1. Disconnect negative battery cable. Raise and support front of vehicle. Remove front wheel assemblies. Remove cotter pins and castle nuts from tie rod ends.
2. Using Puller (49-0118-850C), separate tie rod ends from steering knuckles. Remove steering column intermediate shaft-to-steering gear pinion shaft bolt. Place reference marks on steering gear and pressure line fitting for reassembly.
3. Disconnect pressure and return line connections from steering gear. Remove steering gear-to-frame mounting bolts. Remove steering gear and linkage from vehicle.
4. To install, reverse removal procedure. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** table. Fill and bleed system. Check and adjust front wheel alignment. See **WHEEL ALIGNMENT SPECIFICATIONS & PROCEDURES** article in the WHEEL ALIGNMENT section.

POWER STEERING PUMP

NOTE: Use a suitable container or rags to collect fluid when disconnecting pressure and return lines.

Removal & Installation

1. Remove drive belt. Disconnect power steering pressure switch electrical connector (if equipped). Place reference marks on steering pump and pressure line fitting for reassembly. Disconnect pressure and return line connections from steering pump. Remove pump-to-bracket bolts and nuts. Remove pump from vehicle.
2. To install, reverse removal procedure. Tighten bolts and nuts to specification. See **TORQUE SPECIFICATIONS** table. Adjust belt tension. See **POWER STEERING PUMP BELT** under ADJUSTMENTS. Bleed air from system. Inspect system for leaks.

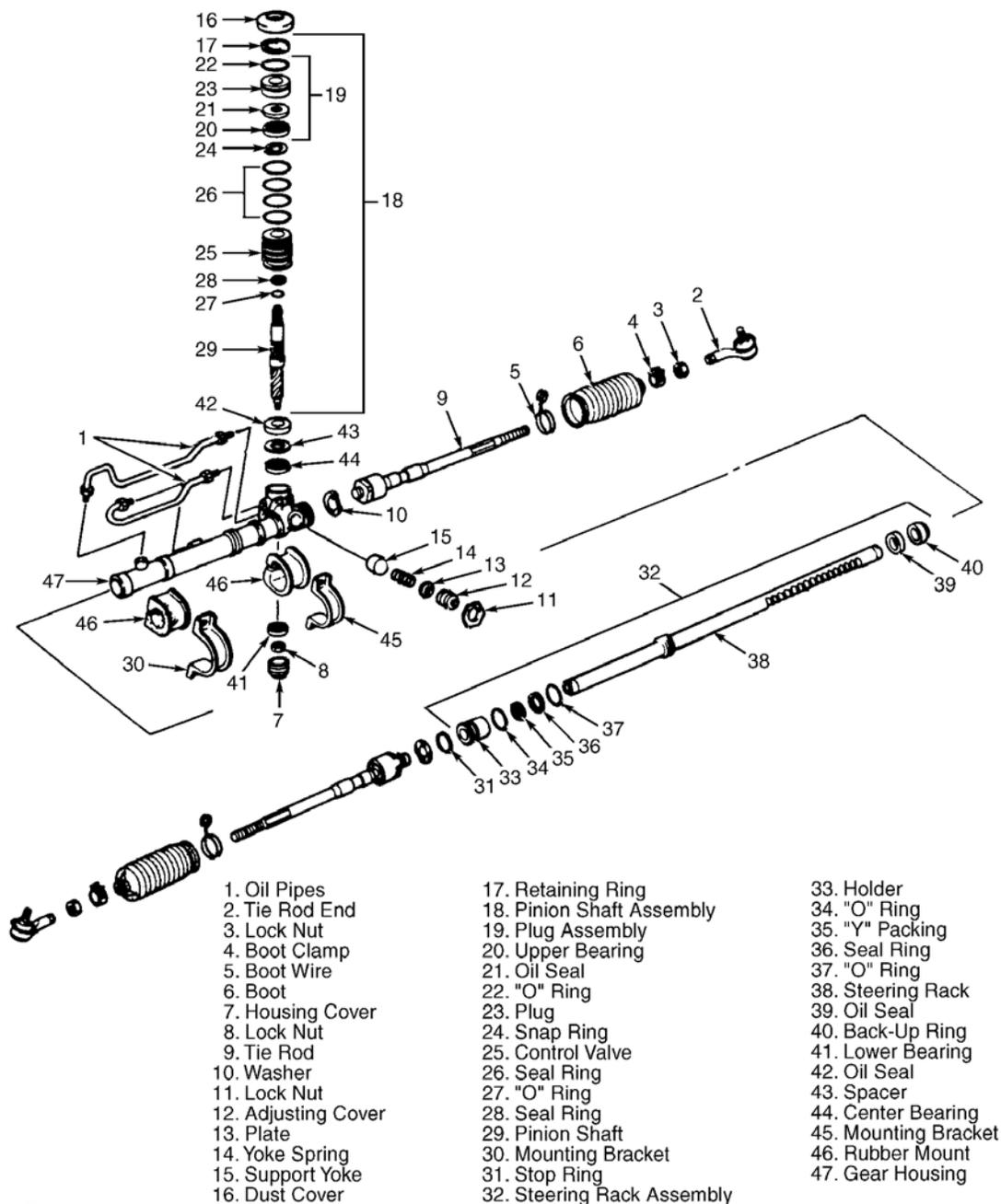
OVERHAUL

STEERING GEAR

NOTE: See **Fig. 2** for exploded views of rack and pinion steering gears.

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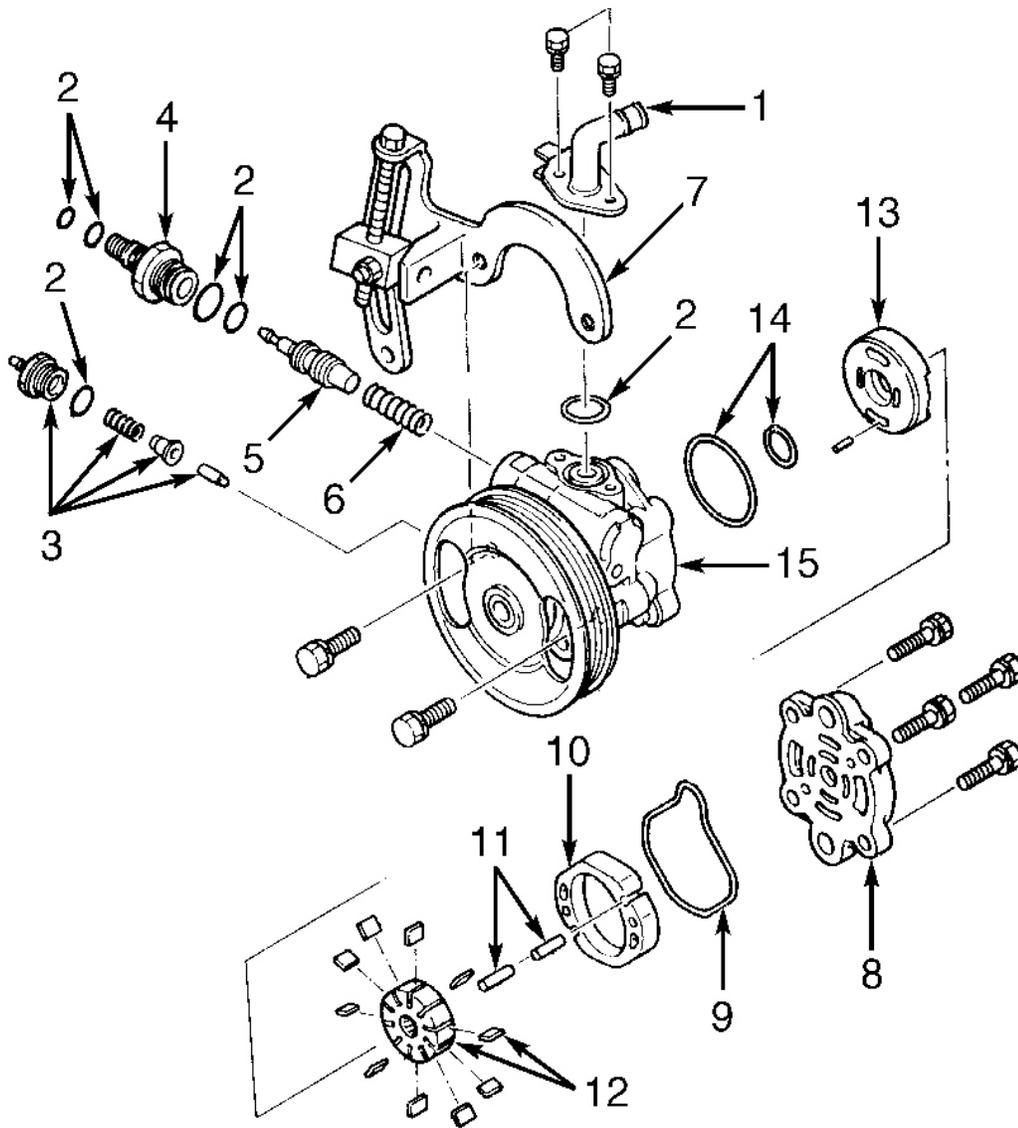
Fig. 2: Exploded View Of Rack & Pinion Steering Gear
 Courtesy of MAZDA MOTORS CORP.

POWER STEERING PUMP

NOTE: See Fig. 3 for exploded views of power steering pumps.

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|-----------------------------|---------------------|
| 1. Suction Pipe | 9. "O" Ring |
| 2. "O" Ring | 10. Cam Ring |
| 3. Pressure Switch Assembly | 11. Pins |
| 4. Connector | 12. Rotor & Vanes |
| 5. Control Valve | 13. Side Plate |
| 6. Spring | 14. "O" Ring |
| 7. Bracket | 15. Front Pump Body |
| 8. Rear Pump Body | |

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Fig. 3: Exploded View Of Power Steering Pump
Courtesy of MAZDA MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Intermediate Shaft-To-Pinion Shaft Bolt	13-19 (18-26)
Pinion Housing Lock Nut	33-40 (45-54)
Pinion Shaft Lock Nut	22-29 (30-39)
Power Steering Pump Mounting Bolts/Nuts	27-40 (37-54)
Pressure Line Fitting-To-Power Steering Pump	23-35 (31-47)
Pressure Line Fitting-To-Steering Gear	23-35 (31-47)
Steering Gear Mounting Bolts/Nuts	34-43 (46-58)
Steering Rack-To-Tie Rod	58-72 (79-98)
Tie Rod Castle Nuts	21-32 (28-43)
Tie Rod End-To-Tie Rod Lock Nut	25-29 (34-39)