

# Steering System

|  |       |
|--|-------|
| GENERAL .....                          | ST -2 |
| MECHANICAL POWER STEERING SYSTEM ..... | ST -9 |

**GENERAL**

EPJB0100

**SPECIFICATIONS**


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|   |  |
|---|--|
| Shaft and joint type                    | Collapsible, universal joint with tilt column      |
| Steering gear type                      | Rack and pinion                                    |
| Rack stroke                             | 142 ± 5.5 mm                                       |
| Power steering pump type                | Vane type  |
| Maximum steering angle (In a empty car) | Inner wheel : 35.1° ± 1°30'<br>Outer wheel : 30.7° |
| Steering wheel turns                    | 2.93 turns   |

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**SERVICE STANDARD**


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|  |                           |                      |
|--|---------------------------|----------------------|
| Steering wheel free play               | 0-30 mm                   |                      |
| Tie rod end ball joint starting torque | 0.5-2.5 Nm                |                      |
| Adjusting belt tension                 | Tension (kgf)             | Belt deflection (mm) |
| New belt                               | 75 ± 10                   | 8.8 - 11.0           |
| Used belt                              | 50 ± 5                    | 12.5 - 14.3          |
| Checking tension                       | 50 ± 10                   | 11.7 - 15.3          |
| Oil pump pressure (Max.)               | 78-83 kgf/cm <sup>2</sup> |                      |

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## TIGHTENING TORQUE

EPJB0200

| Item  | Nm                                  | kg-cm              | lb-ft                  |
|---|-------------------------------------|--------------------|------------------------|
| <b>Steering column and shaft</b>                  |                                     |                    |                        |
| Airbag module mounting bolt                       | 4-6                                 | 40-60              | 3.0-4.4                |
| Steering column to column member mounting (upper) | 13-18                               | 130-180            | 9.6-13.3               |
| Steering column to column member mounting (lower) | 13-18                               | 130-180            | 9.6-13.3               |
| Steering wheel lock nut                           | 35-45                               | 350-450            | 25.8-33.2              |
| Joint assembly                                    | 15-20                               | 150-200            | 10.8-14.5              |
| <b>Steering gear box</b>                          |                                     |                    |                        |
| Pressure hose to gear box                         | 12-18                               | 120-180            | 8.9-13.3               |
| Return tube to gear box                           | 12-18                               | 120-180            | 8.9-13.3               |
| Tie rod rack                                      | 80-100                              | 800-1000           | 59.0-73.8              |
| Tie rod end lock nut                              | 50-55                               | 500-550            | 36.9-40.6              |
| Yoke plug lock nut                                | 50-70                               | 500-700            | 36.9-51.6              |
| Pinion and valve assembly self locking nut        | 50-70                               | 500-700            | 36.9-51.6              |
| End plug  | 50-70                               | 500-700            | 36.9-51.6              |
| Feed tubes  | 10-16                               | 100-160            | 7.4-11.8               |
| Tie rod end to knuckle                            | 24-34                               | 240-340            | 17.7-25.1              |
| Crossmember mounting bracket                      | 60-80                               | 600-800            | 44.3-59.0              |
| Crossmember and steering gear box                 | 90-110                              | 900-1100           | 66.4-81.1              |
| <b>Oil pump</b>                                   |                                     |                    |                        |
| Pressure hose to oil pump                         | 55-65                               | 550-650            | 40.6-47.9              |
| Oil pump mounting bolt                            | 22-23(Long one)<br>17-26(Short one) | 220-230<br>170-260 | 16.2-24.3<br>12.5-19.2 |
| Oil pump pressure switch                          | 17-23                               | 170-230            | 12.5-17.0              |
| Oil pump bracket mounting bolt                    | 39-60                               | 390-600            | 28.8-44.3              |
| Pump cover to pump body                           | 33-43                               | 330-430            | 24.3-31.7              |
| Suction connector to oil pump body                | 13.6-18.4                           | 136-184            | 10.0-13.6              |
| Flow control valve connector to pump body         | 70-80                               | 700-800            | 51.6-59.0              |
| <b>Steering hoses and oil reservoir</b>           |                                     |                    |                        |
| Oil reservoir bracket mounting bolt               | 4-6                                 | 40-60              | 3.0-4.4                |
| Cooler tube clamp mounting bolt                   | 4-6                                 | 40-60              | 3.0-4.4                |
| Tube clip and tube bracket                        | 4-6                                 | 40-60              | 3.0-4.4                |
| Pressure hose bracket mounting bolt               | 4-6                                 | 40-60              | 3.0-4.4                |
| Clamp hose  | 4-6                                 | 40-60              | 3.0-4.4                |

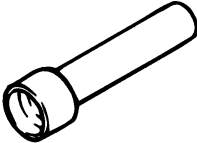
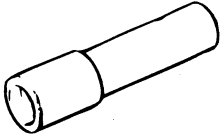
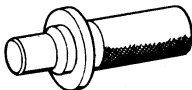
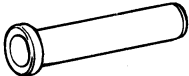

## LUBRICANTS

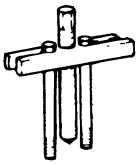
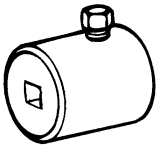

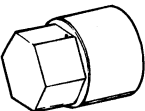
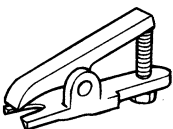
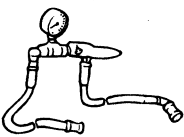
EPA0150

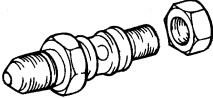

| Items                                    | Specified lubricant                      | Quantity            |
|--|--|---------------------|
| Steering column bearing                  | Multipurpose grease SAE J310a, NLGI No.2 | As required         |
| Steering gear box rack, pinion gear part | Multipurpose grease SAE J310a, NLGI No.2 | As required         |
| Bellows                                  | Silicone grease                          | As required         |
| Oil pump                                 | Power steering fluid (PSF-3)             | As required         |
| Power steering fluid                     | Power steering fluid (PSF-3)             | 1.0 lit (0.88 qts.) |

## SPECIAL TOOLS

EPA0200

| Tool (Number and Name)                       | Illustration  | Use  |
|--|---|--|
| 09222-21100<br>Valve stem oil seal installer | <br>HCT56-01   | Installation of the pinion gear bearing  |
| 09222-32100<br>Valve stem oil seal installer | <br>HCT56-02  | Installation of the oil pump oil seal  |
| 09431 - 11000<br>Front oil seal installer    | <br>EPA9005C | Installation of the pinion gear oil seal   |
| 09432-21601<br>Bearing installer             | <br>EPA9005D | Installation of the pinion gear bearing  |
| 09517-21400<br>Drift                         | <br>EPA9005E | <ol style="list-style-type: none"> <li>1. Removal of the pinion gear bearing</li> <li>2. Removal of the pinion bearing outer race</li> </ol> |

| Tool (Number and Name)                              | Illustration   | Use   |
|---|--|---|
| 09561-11001<br>Steering wheel puller                |  <p style="text-align: right; margin-right: 20px;">HCT56-07</p>   | Removal of the steering wheel                                       |
| 09565-11100<br>Preload socket                       |  <p style="text-align: right; margin-right: 20px;">EPA9005G</p>   | Measurement of the main shaft preload                               |
| 09565-21000<br>Pinion bearing remover and installer |  <p style="text-align: right; margin-right: 20px;">EPA9005H</p>   | Removal and installation of the pinion gear bearing                 |
| 09565-31300<br>Yoke plug torque wrench socket       |  <p style="text-align: right; margin-right: 20px;">EPA9005I</p> | Removal, installation and adjustment of the steering gear yoke plug |
| 09568-31000<br>Tie rod end puller                   |  <p style="text-align: right; margin-right: 20px;">EPA9005J</p> | Separation of the tie rod end ball joint                            |
| 09572-21000<br>Oil pressure gauge                   |  <p style="text-align: right; margin-right: 20px;">EPA9005K</p> | Measurement of the oil pressure (use with 09572-33100, 09572-21200) |

| Tool (Number and Name)                    | Illustration  | Use   |
|---|---|---|
| 09572-21200<br>Oil pressure gauge adapter |  <p>EPA9005L</p> | Measurement of the oil pressure (use with 09572-21000, 09572-33100) |
| 09572-33100<br>Oil pressure gauge adapter |  <p>EPA9005M</p> | Measurement of the oil pressure (use with 09572-21000, 09572-21200) |

## TROUBLESHOOTING

EPJB0500

| Symptom                                 | Probable cause   | Remedy  |
|---|--|---|
| Excessive play in steering wheel        | Loose universal joint<br>Loose steering gear mounting bolts<br>Loose or worn tie rod end   | Retighten<br>Retighten<br>Retighten or replace as necessary   |
| Steering wheel operation is not smooth  | V-belt slippage<br>Damaged V-belt<br>Low fluid level<br>Air in the fluid<br>Twisted or damaged hoses<br>Insufficient oil pump pressure<br>Sticky flow control valve<br>Oil leakage in the oil pump<br>Deteriorated or damaged gear box or valve body seals   | Readjust<br>Replace<br>Replenish<br>Bleed air<br>Reposition or replace hoses<br>Repair or replace oil pump<br>Replace<br>Replace the damaged parts<br>Replace |
| Steering wheel does not return properly | Excessive turning resistance of tie-rod end ball joint<br>Universal joint excessively tight<br>Inner tie rod and/or ball joint cannot turn smoothly<br>Loose mounting of gear box to gear box mounting bracket<br>Worn steering shaft joint and/or body grommet<br>Distorted rack<br>Damaged pinion bearing<br>Twisted or damaged hoses<br>Damaged oil pressure control valve<br>Damaged oil pump input shaft bearing  | Replace<br>Adjust<br>Replace<br>Retighten<br>Correct or replace<br>Replace<br>Replace<br>Reposition or replace<br>Replace<br>Replace                          |
| Noise                                   | <p><b>Hissing Noise in Steering Gear</b><br/>There is some noise with all power steering systems. One of the most common is a hissing sound when the steering wheel is turned and the car is not moving. This noise will be most evident when turning the wheel while the brakes are being applied. There is no relationship between this noise and steering performance. Do not replace the valve unless the "hissing" noise becomes extreme. A replaced valve will also make a slight noise, and is not always a solution for the condition.</p> |   |

| Symptom   | Probable cause                            | Remedy     |
|---|---|------------|
| Rattling or chucking noise in the rack and pinion | Interference with hoses from vehicle body | Reposition |
|   | Loose gear box bracket                    | Retighten  |
|   | Loose tie rod end and/or ball joint       | Retighten  |
|   | Worn tie rod and/or ball joint            | Replace    |
| Noise in the oil pump                             | Low fluid level                           | Replenish  |
|   | Air in the fluid                          | Bleed air  |
|   | Loose pump mounting bolts                 | Retighten  |

**NOTE**

A slight "grinding noise" may be heard immediately after the engine is started in extremely cold weather conditions (below -20°C). This is due to power steering fluid characteristics in extreme cold conditions and is not an indication of a malfunction.



## MECHANICAL POWER STEERING SYSTEM

### SERVICE ADJUSTMENT

#### PROCEDURE EPJB0600

#### CHECKING STEERING WHEEL FREE PLAY

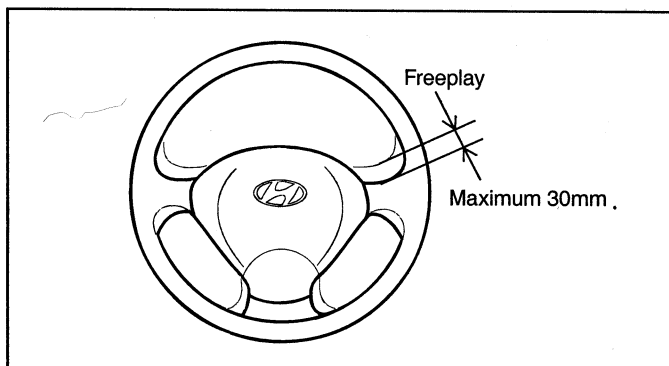
1. Start the engine with the steering wheel in the straight ahead position.
2. Measure the play while turning the steering wheel to the left and right.

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Steering wheel free play [Standard value] : 30 mm (1.1 in.)

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3. If the play exceeds the standard value, inspect the connection between the steering shaft and steering linkage.



EPJA010A

#### CHECKING STEERING ANGLE

1. Place the front wheel on a turning radius gauge and measure the steering angle.

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Wheel angle [Standard value]

Inside wheel :  $35.1^\circ \pm 1^\circ 30'$

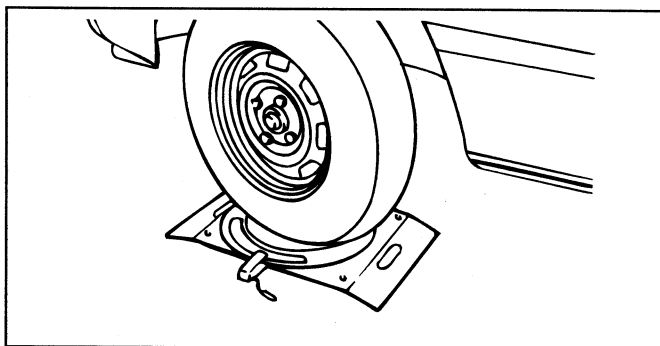
Outside wheel :  $30.7^\circ$

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2. If the measured value is not within the standard value, adjust the toe and inspect again.

#### NOTE

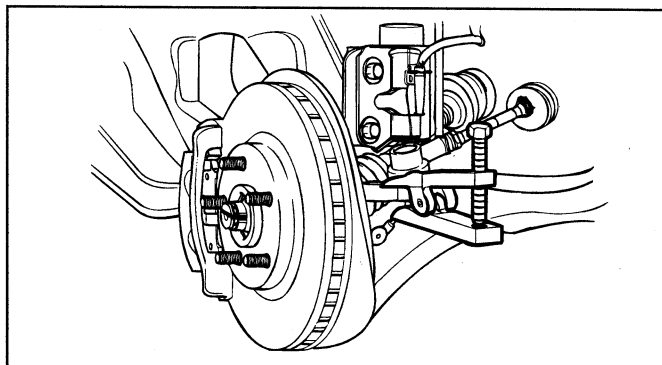
1. After adjusting the tie rod, assemble the bellows so they are not twisted.
2. The inner steering angle is changed  $0.86^\circ$  per each rotation of the tie rod.



EPA9002A

#### CHECKING THE TIE ROD END BALL JOINT STARTING TORQUE EPJB0700

1. Disconnect the tie rod and knuckle with the special tool (09568-31000).



EPJA020J

2. Shake the ball stud several times to check for looseness.
3. Mount two jam nuts on the ball joint, and then measure the ball joint starting torque.

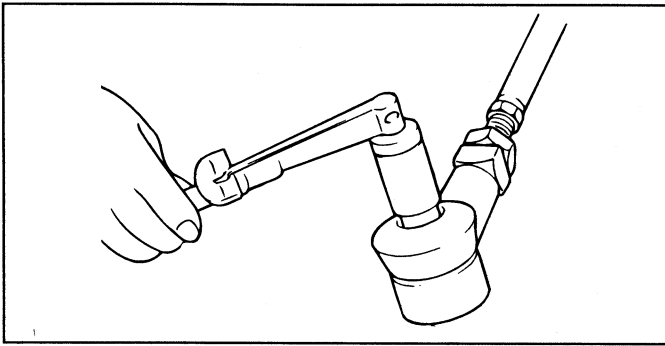
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Standard value :

0.5-2.5 Nm (5-25 kg-cm, 0.36-1.78 lb-ft)

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4. If the starting torque exceeds the upper limit of the standard value, replace the tie rod end.
5. Even if the starting torque is below the lower limit of the standard value, check the play of the ball joint and replace if necessary.



EPA9003A

## CHECKING STEERING WHEEL RETURN

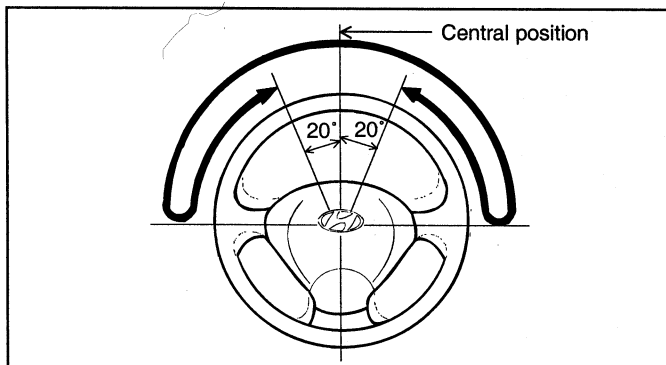
EPJB0800

Check the steering wheel return and confirm the following points:

1. The force required to turn the steering wheel and then return should be the same for both moderate turns and sharp turns.
2. When the steering wheel is turned 90° and held for a couple of seconds while the vehicle is being driven under 23-30kph (12-19 mph), the steering wheel should return to within 20° from its central position when it is released.

## NOTE

If the steering wheel is turned very quickly, steering may be momentarily difficult. This is not a malfunction because the oil pump output will be somewhat decreased.



EPJB080A

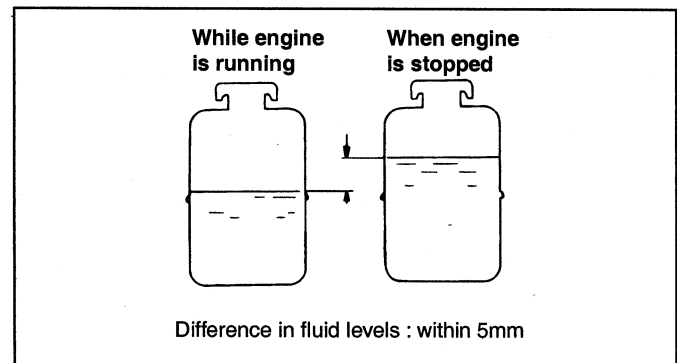
## CHECKING POWER STEERING FLUID LEVEL

EPJB0900

1. Position the vehicle on a level surface.
2. Start the engine. With the vehicle kept stationary, turn the steering wheel several times continuously to raise the fluid temperature to 50-60°C (122-140°F).
3. With the engine at idle, turn the steering wheel fully clockwise and counter-clockwise several times.
4. Make sure that there is no foaming or cloudiness in the reservoir fluid.
5. Stop the engine and check for any difference in fluid level between a stationary and a running engine.

## NOTE

1. If the fluid level varies 5 mm (0.2 in.) or more, bleed the system again.
2. If the fluid level suddenly rises after stopping the engine, further bleeding is required.
3. Incomplete bleeding will produce a chattering sound in the pump and noise in the flow control valve, and lead to decreased durability of the pump.

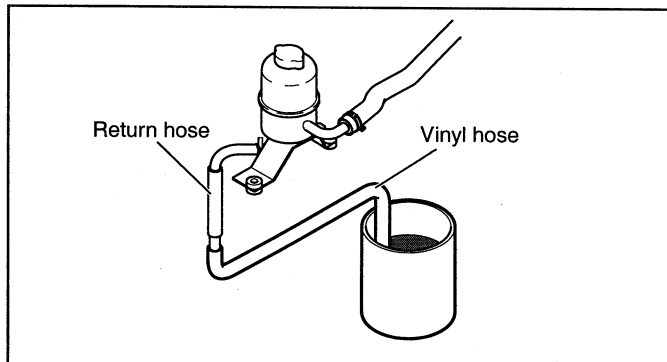


H7ST012A

## REPLACING POWER STEERING FLUID

EPJB1000

1. Jack up the front wheels and support them with jack stands.
2. Disconnect the return hose from the oil reservoir and plug the oil reservoir.
3. Connect a vinyl hose to the disconnected return hose, and drain the oil into a container.



KGXC006A

4. Disconnect the high-tension cables and ignition coils.

While operating the starter motor intermittently, turn the steering wheel to the limit of left and then to the limit of right several times to drain the fluid.

After that, connect the high-tension cables and coils.

5. Connect the return hoses securely, and then fill the oil reservoir with the specified fluid.
6. Start the engine.  
Check for oil leakage.
7. Stop the engine.

Power steering fluid

Type : PSF-3

Total quantity : Approx. 1.0 liter (0.88 qts)

## AIR BLEEDING

EPJB1100

1. Fill the power steering fluid reservoir up to the "MAX" position with specified fluid.

### NOTE

1. When bleeding fluid, replenish the fluid so that the level never falls below the bottom of the filter.
2. If air bleeding is done while the vehicle is idling, the air will be broken up and absorbed into the

fluid. Be sure to do the bleeding only while cranking.

2. Jack up the front wheels.
3. Disconnect the ignition coil high tension cable, and then, while operating the starter motor intermittently (for 15 to 20 seconds), turn the steering wheel to the limit of left and then to the limit of right five or six times.
4. Connect the high tension cable, and then start the engine (idling).
5. Turn the steering wheel to the left and then to the right, until there are no air bubbles in the oil reservoir.

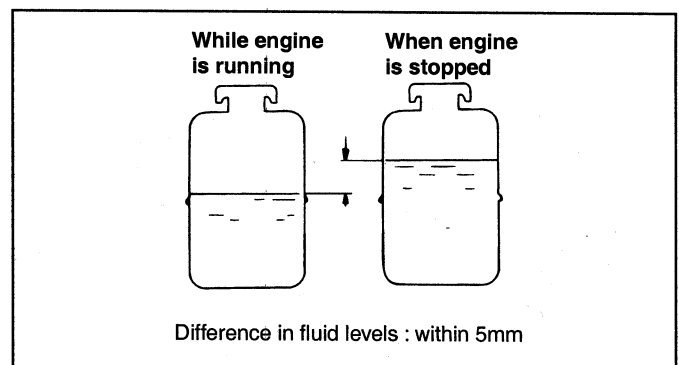
### NOTE

Do not hold the steering wheel turned to either side for more than ten seconds.

6. Confirm that the fluid is not milky, and that the level is between "MAX" and "MIN" marks on the reservoir.
7. If the fluid level changes up and down considerably when the steering wheel is turned left and right or fluid overflows from the reservoir when the engine is stopped, air bleeding should be done again.

### NOTE

1. If the fluid level varies 5mm (0.2 in.) or more, bleed the system again.



H7ST012A

2. If the oil level changes up and down when the steering wheel is turned or the fluid overflows from the reservoir when the engine is stopped, further air bleeding is required. If the air isn't removed, it can cause cavitation in the pump, noise and may damage the pump.

## CHECKING POWER STEERING BELT TENSION

EPJB1200

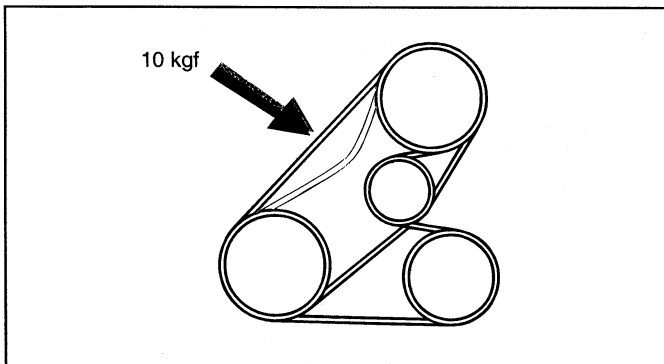
1. Press the V-belt, applying a pressure of 98 N (10 kg, 22 lb) at the specified point, and measure the deflection to confirm that it is within the standard value range.

### V-belt deflection [Standard value]

Regular inspection : 11.7-15.3 mm (0.46-0.60 in.)

New belt : 8.8-11.0 mm (0.35-0.43 in.)

Used belt : 12.5-14.3mm (0.49-0.56 in.)



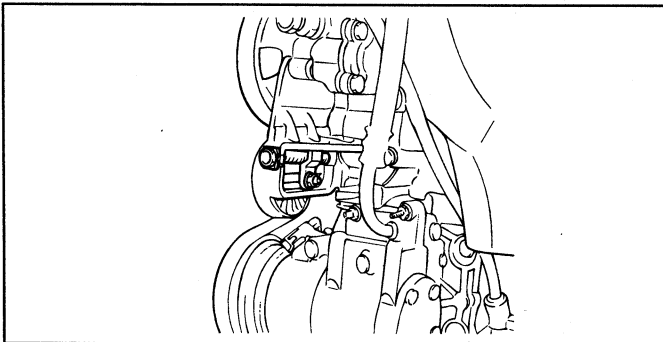
EPJA015A

2. Install the V-belt. Loosen the adjusting bolt and then adjust the tension of the V-belt.

After that, tighten the hinge bolt and flange nut to the specified value.

## NOTE

When adjusting tension of the V-belt, tighten the hinge bolt and flange nut temporarily so that the pulley does not lean to one side, then adjust the tension.

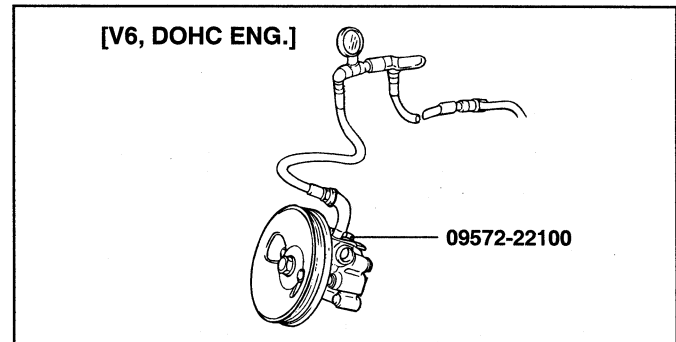


EPA9016D

## OIL PUMP PRESSURE TEST

EPJB1300

1. Disconnect the pressure hose from the pump, and then connect the special tool between the pump and the pressure hose as illustrated.



EPA9006A

2. Bleed the air. Start the engine and turn the steering wheel several times so that the fluid temperature rises to approximately 50~60°C (122~132°F) operating temperature.
3. Increase the engine speed to 1,000 rpm.
4. Close the shut-off valve of the special tool and measure the fluid pressure to confirm that it is within the standard value range.

### Oil pump pressure [Standard value]

Relief pressure : 7.6~8.1 MPa (78~83 kg/cm,  
1102~1175 psi)

## CAUTION

**Don't keep the shut-off valve on the pressure gauge closed for more than ten seconds.**

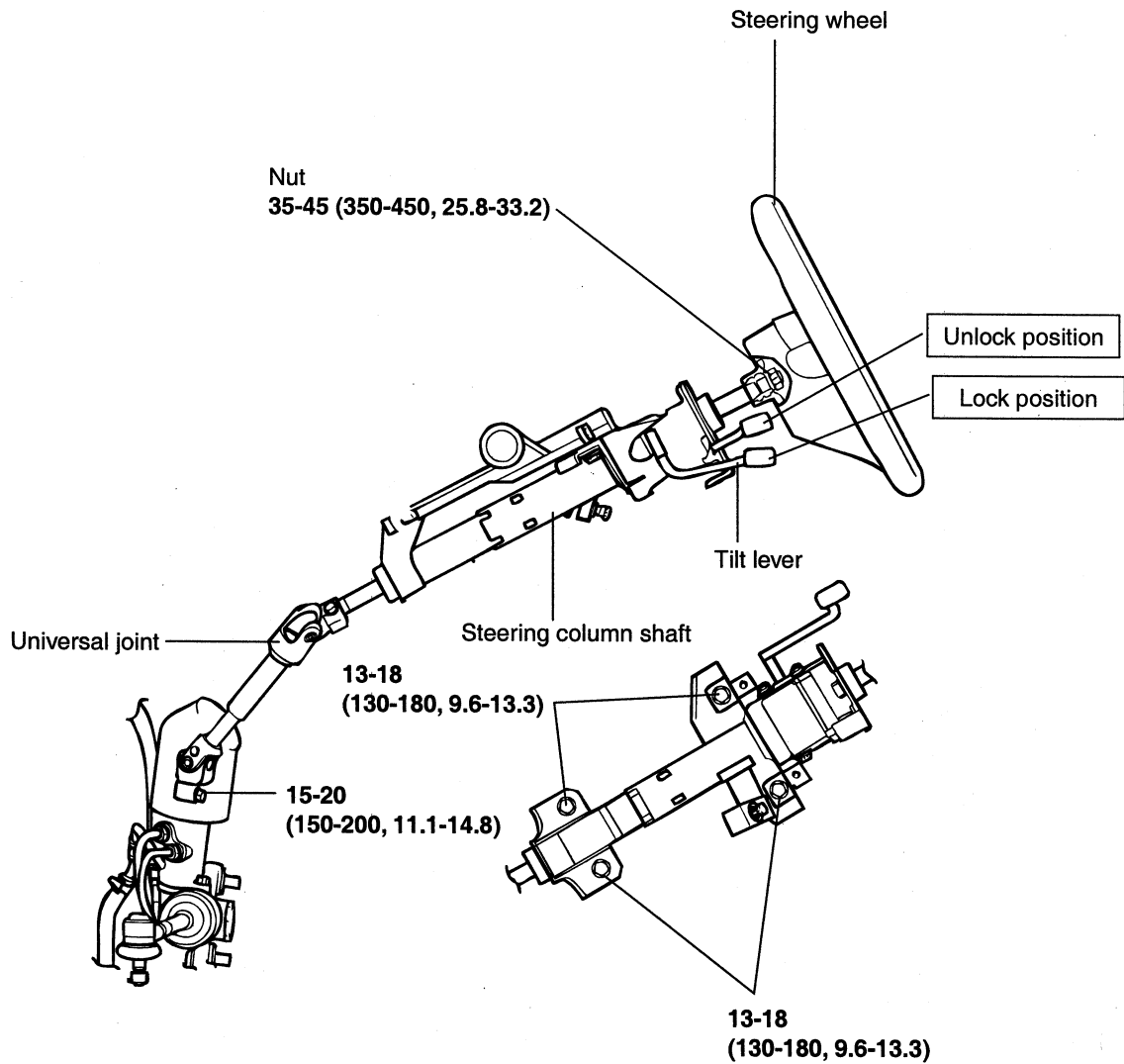
5. Remove the special tool and then tighten the pressure hose to the specified torque.

Tightening torque : 55~69 Nm (550~690 kg.cm,  
40.6~50.9 lb.ft)

6. Bleed the system.

STEERING COLUMN/SHAFT

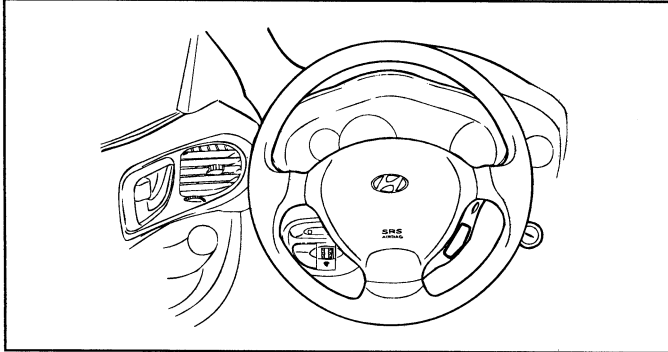
COMPONENTS EPJB1400



**TORQUE : Nm (kg.cm, lb.ft)**

**REMOVAL** EPJB1500

1. Remove the cover on both sides under the steering wheel.
2. Remove two bolts by using a hexagonal wrench.

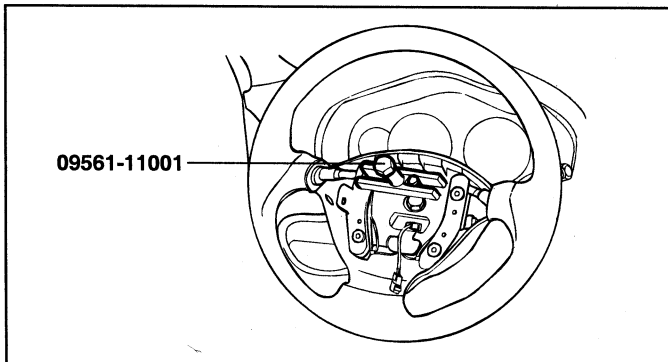


EPJA020K

3. Disconnect the DAB and horn connector, and remove the steering wheel lock nut.
4. Using the SST, remove the steering wheel.

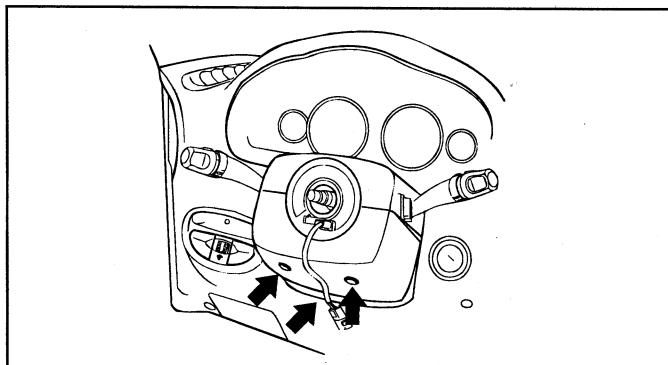
**CAUTION**

Do not hammer on the steering wheel to remove it; doing so may damage the collapsible shaft.



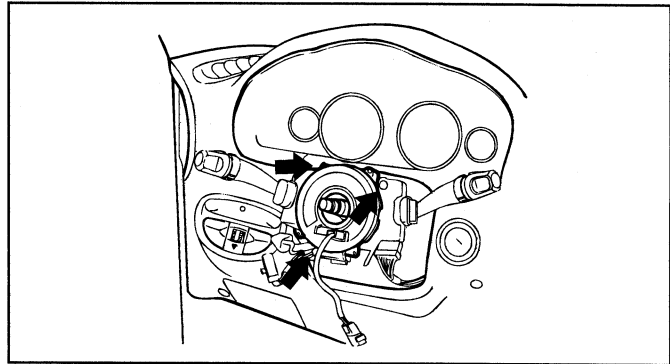
EPJA020B

5. Remove steering column lower shroud and upper shroud.



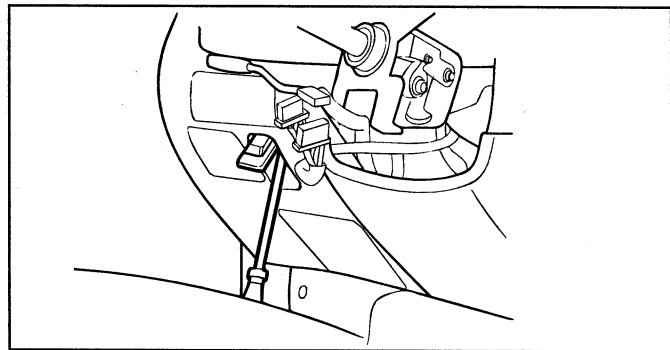
EPJA020C

6. Disconnect connectors and remove the multifunction switch.



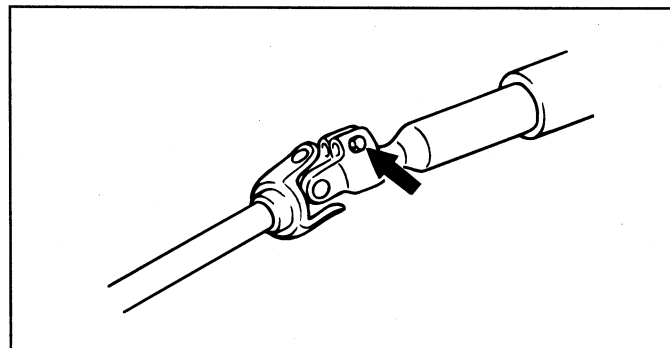
EPJB150A

7. Remove the switch on the left side of the lower crash pad.
8. Remove the lower cover.
9. After removing all connectors, remove the steering column shaft.



EPHA002C

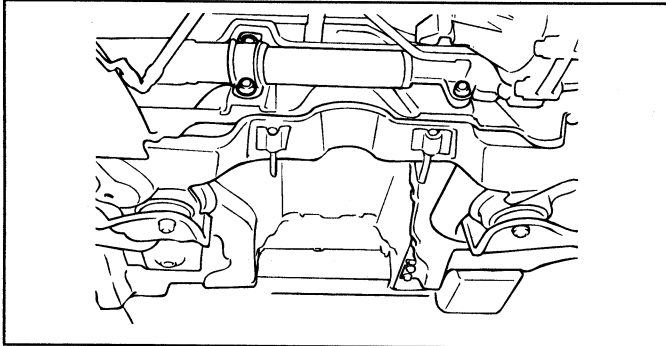
10. Remove the bolt that couples the universal joint and the pinion. Pull out the universal joint from the gear box.



HEW56-10

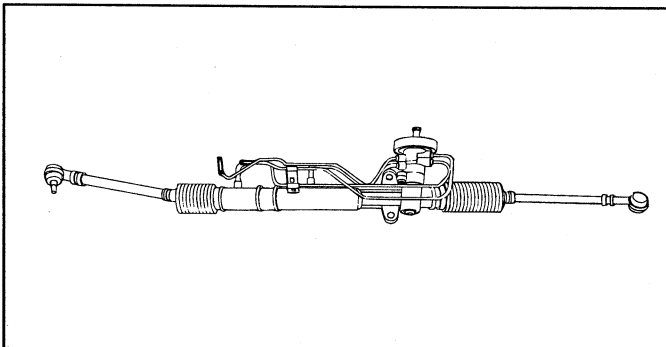
11. Remove the bolts mounting the dust cover.

- Remove 4 bolts mounting the steering column.



EPHA002D

- Drain the power steering fluid and disconnect the return hose and pressure hose.



EPHA002F

- Remove the steering column and shaft with the universal joint and dust cover.

**INSPECTION** EPHA0800

- Check the steering shaft for damage or distortion.
- Check the upper and lower bearing for wear or damage.
- Check the joints for play, damage or rough movement.
- Check the tilt bracket for cracks or damage.
- Check the cover or boot for damage.
- Check that the steering lock mechanism operates properly. If necessary, replace.

**ASSEMBLY** EPJB1700

- Assembly is the reverse of disassembly.
- When installing the steering lock, align the hook and shaft groove with the steering column.

**INSTALLATION** EPJB1800

- Before installation, apply multipurpose grease to the groove inside the bearing and contracting surfaces of the boot and cover assembly.
- Connect the steering lower shaft and joint assembly.

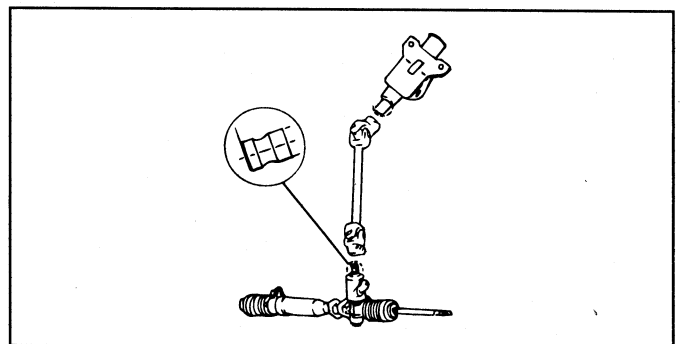
**NOTE**

When installing, mount the U-joint to the gear box first, then to the steering column shaft.

- Install the dust cover to the column shaft assembly.
- Install the steering column assembly to the column member assembly.
- Install the multifunction switch and connect the connectors.
- Install the lower cover and steering column upper and lower shroud.
- Install the steering wheel.

**NOTE**

When installing, do not use a hammer because the collapsible column shaft could be damaged.

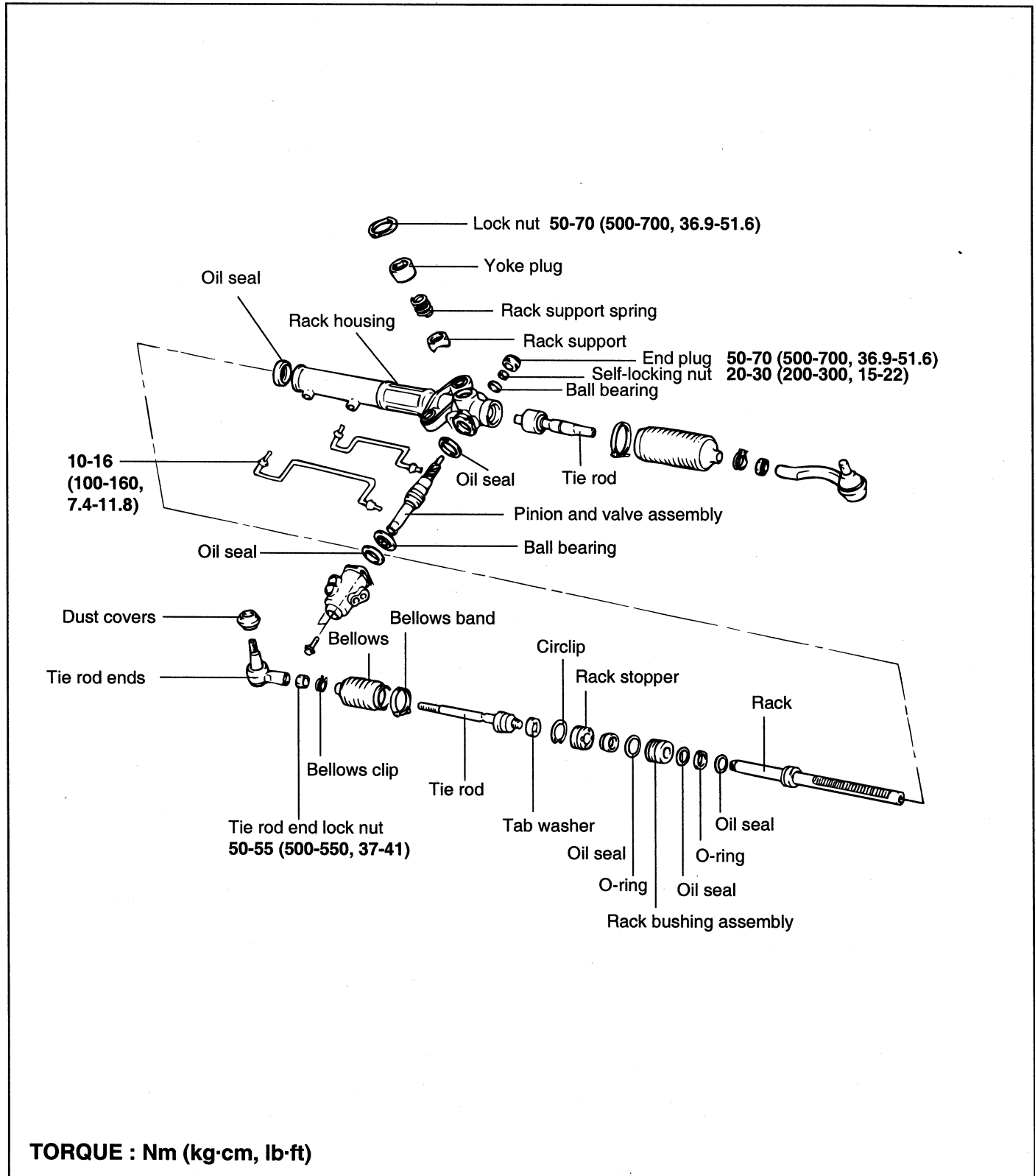


HCT56-39

POWER STEERING GEAR BOX

COMPONENTS

EPJB1900

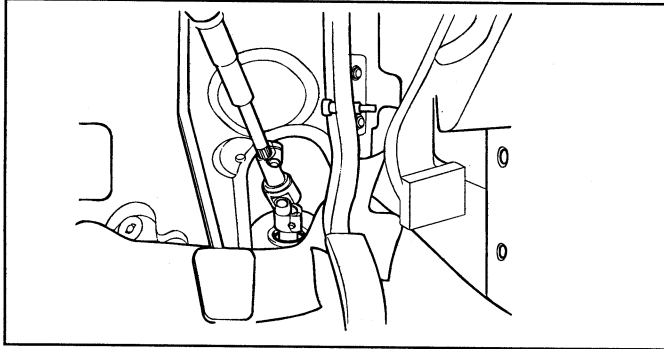


TORQUE : Nm (kg-cm, lb-ft)



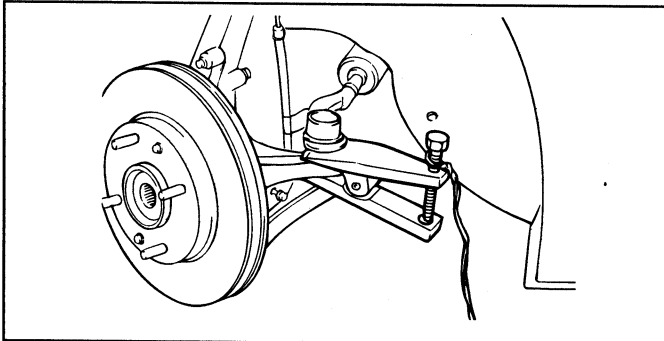
**REMOVAL** EPJB2000

1. Drain the power steering fluid.
2. Disconnect the pressure hose and return tube.
3. Remove the joint assembly connecting bolt.



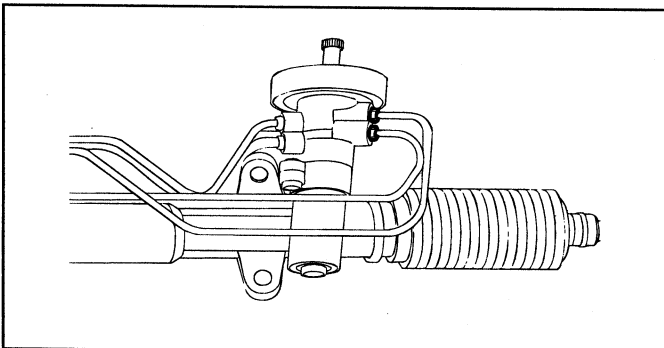
EPAH003A

4. Using the special tool (09568-31000), disconnect the tie rod end from the knuckle arm.



EPA9020F

5. Remove the feed tube.

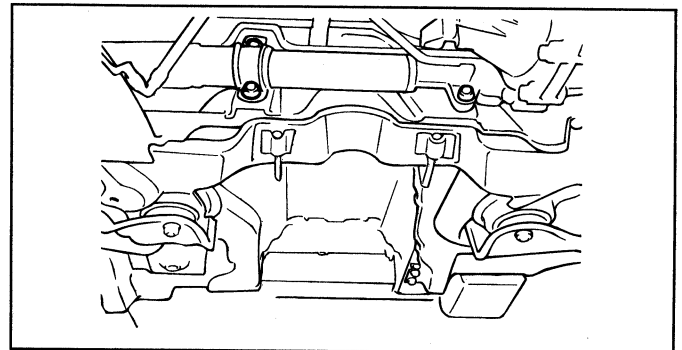


EPAH003B

6. Remove the steering gear box mounting bolts and remove the steering gear box assembly together with mounting rubber.

**CAUTION**

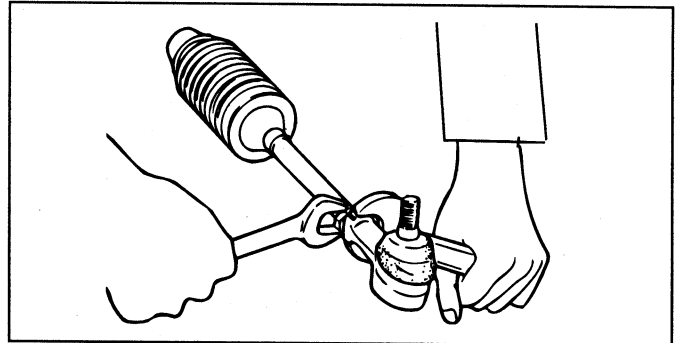
When removing the gear box, pull it out carefully and slowly to avoid damaging the boot.



EPAH002D

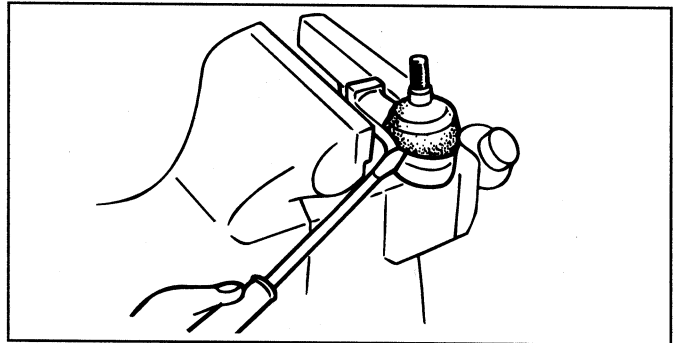
**DISASSEMBLY** EPJB2100

1. Remove the tie rod end from the tie rod.



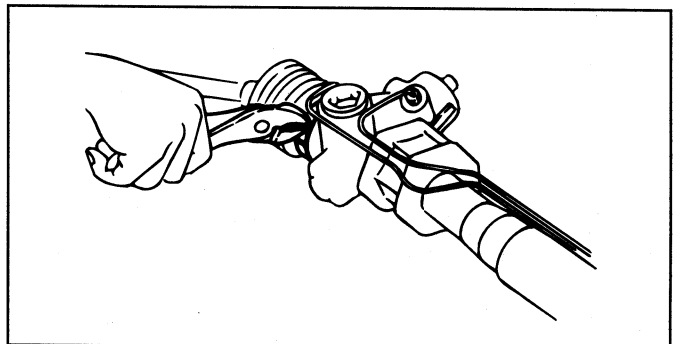
EPA9013F

2. Remove the dust cover from the ball joint.



EPA9013G

3. Remove the bellows band.



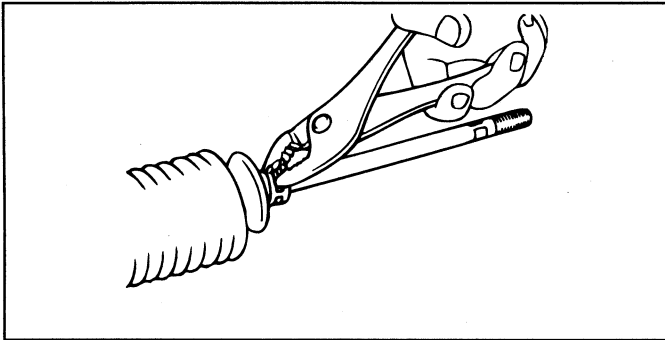
EPA9013H

4. Remove the bellows clip.
5. Pull the bellows out toward the tie rod.

**NOTE**

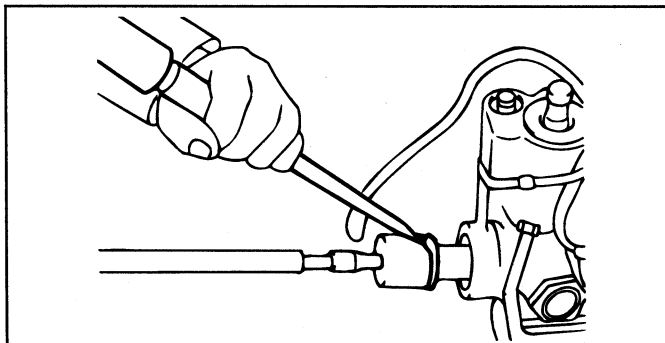
Check for rust on the rack when the bellows are replaced.

6. Remove the feed tube from the rack housing.



EPA9013I

7. While moving the rack slowly, drain the fluid from the rack housing.
8. Unstake the tab washer which fixes the tie rod and rack with a chisel.

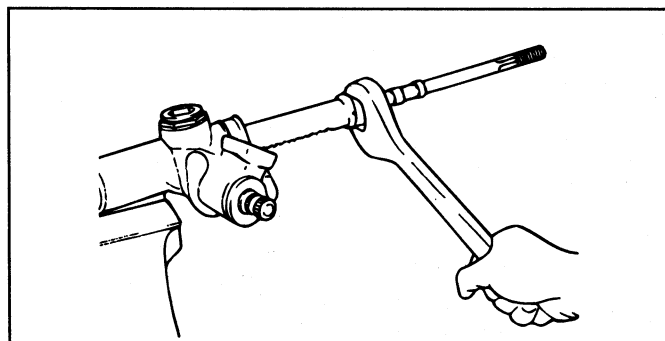


EPA9013J

9. Remove the tie rod from the rack.

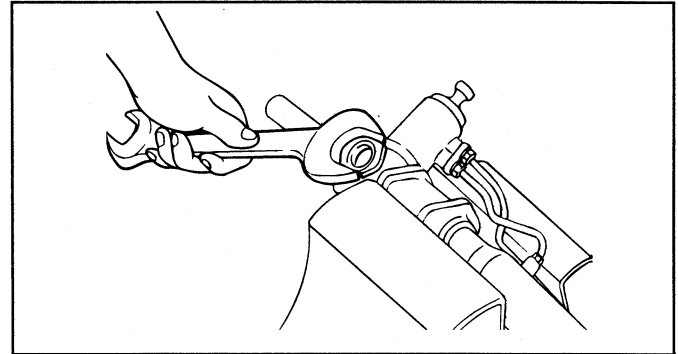
**CAUTION**

Remove the tie rod from the rack, taking care not to twist the rack.



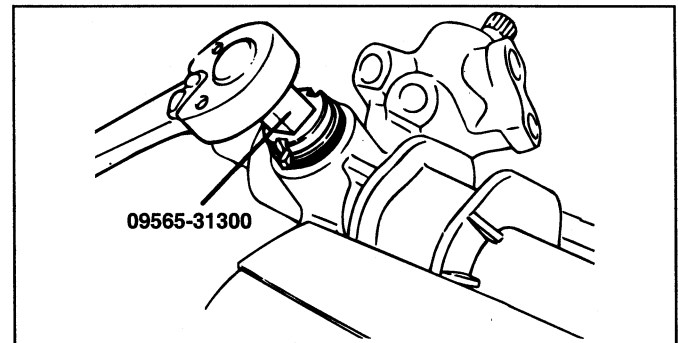
EPA9013K

10. Remove the yoke plug lock nut.



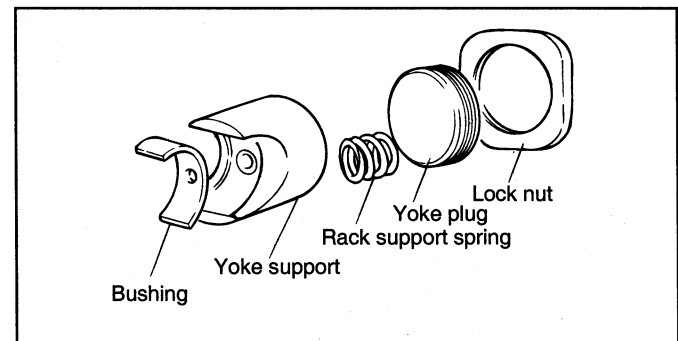
EPDA036H

11. Using the special tool (09565-31300), remove the yoke plug.



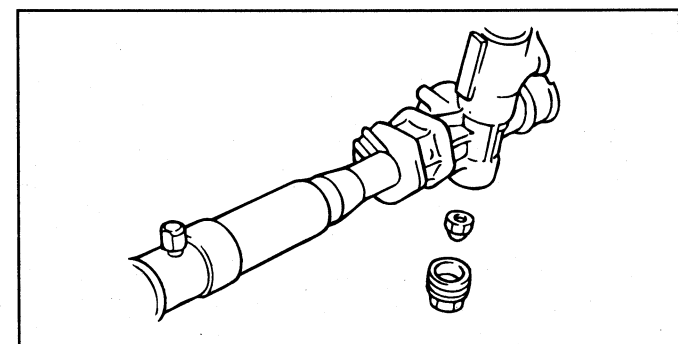
EPA9013M

12. Remove the rack support spring, yoke support and bushing from the gear box.



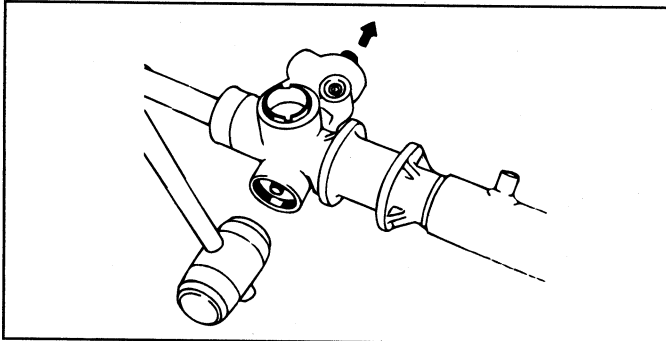
EPA9013N

13. Remove the end plug and self-locking nut.



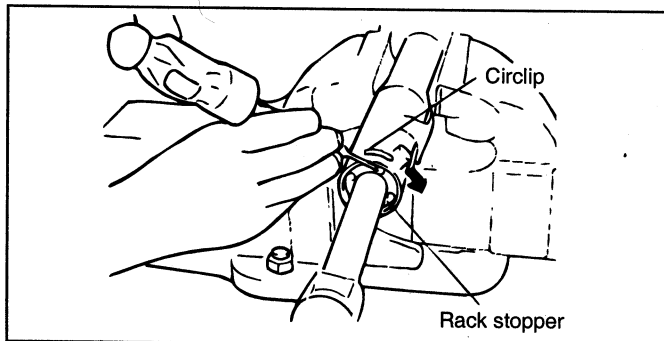
EPA9013O

14. Detach the dust seal.
15. Remove the snap ring with snap ring pliers.
16. Remove bolts mounting the valve assembly to the rack housing.
17. Remove the pinion and valve assembly together with the oil seal (upper) using a soft hammer.



EPA9013P

18. Turn the rack stopper clockwise until the end of the circlip comes out of the slot in the gear housing.

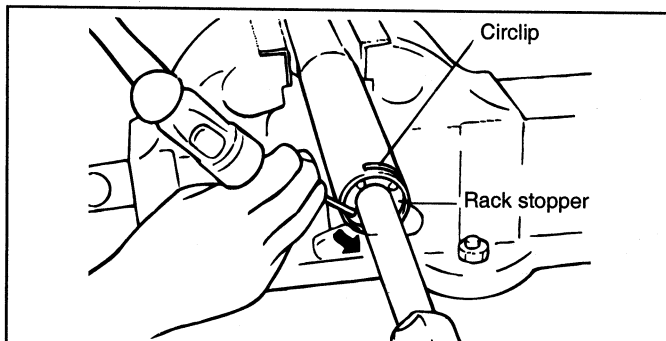


EPA9013Q

19. When the end of the circlip comes out from the notched hole of the housing rack cylinder, turn the rack stopper counter clockwise and remove the circlip.

**CAUTION**

**Do not damage the rack when disassembling.**

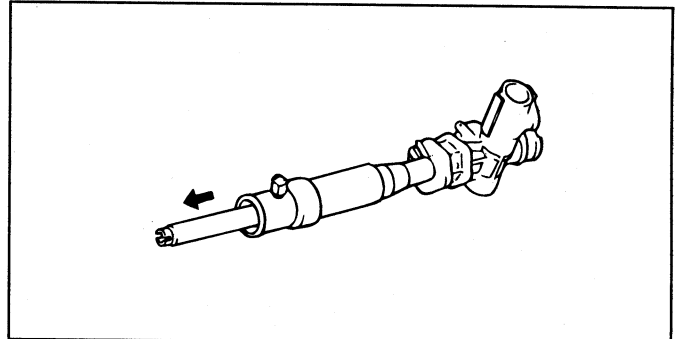


EPA9013R

20. Remove the rack stopper, rack bushing and rack from the rack housing by moving it toward the piston side.

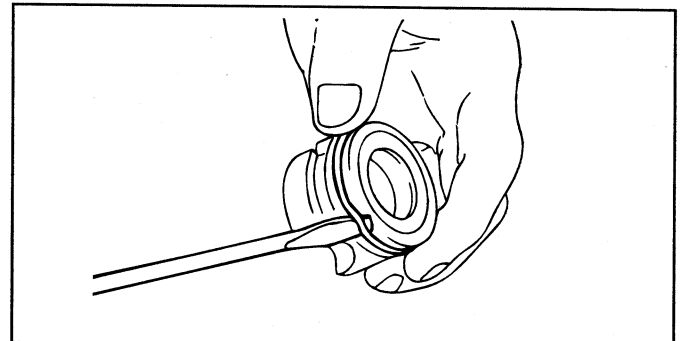
**CAUTION**

**When the rack has been removed, be sure to replace the housing side oil seal with a new one.**



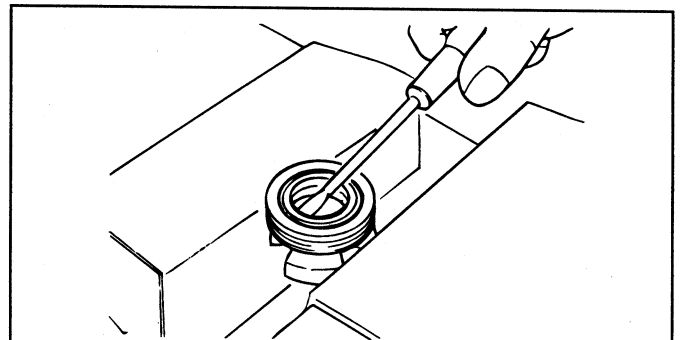
EPA9013S

21. Remove the O-ring from the rack bushing.



EPA9013T

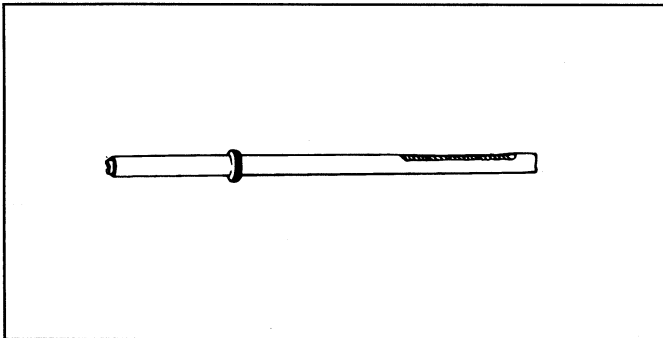
22. Remove the oil seal from the rack bushing.



EPA9013U

**INSPECTION** EPJB2200**1. Rack**

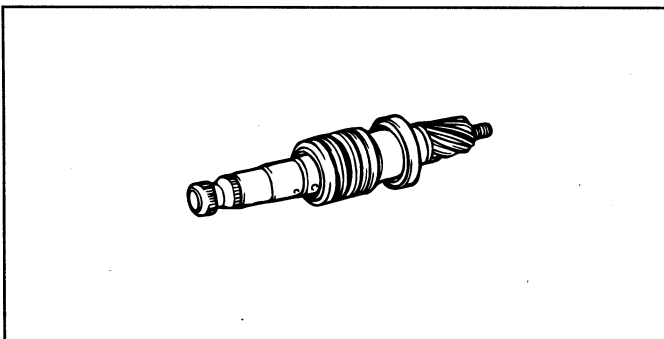
- 1) Check for rack tooth face damage or wear
- 2) Check for oil seal contact surface damage or wear
- 3) Check for bending or twisting of rack
- 4) Check for oil seal ring damage or wear
- 5) Check for oil seal damage or wear



EPA9013Y

**2. Pinion valve**

- 1) Check for pinion gear tooth face damage or wear
- 2) Check for oil seal contact surface damage
- 3) Check for seal ring damage or wear
- 4) Check for oil seal damage or wear



EPA9013Z

**3. Bearing**

- 1) Check for seizure or abnormal noise during bearing rotation
- 2) Check for excessive play
- 3) Check for missing needle bearing rollers

**4. Others**

- 1) Check for damage of the rack housing cylinder bore
- 2) Check for boot damage, cracking or ageing

**ASSEMBLY** EPJB2300

1. Apply the specified fluid to the entire surface of the oil seal.

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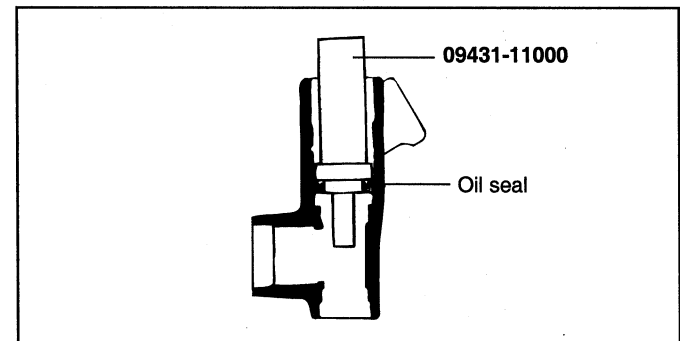
Recommended fluid :Power steering fluid (PSF-3)

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2. Using the special tool (09431-11000), install the oil seal to the specified position in the rack housing.

**CAUTION**

1. Note the direction of the oil seal.
2. Use a new oil seal.



EPA9014C

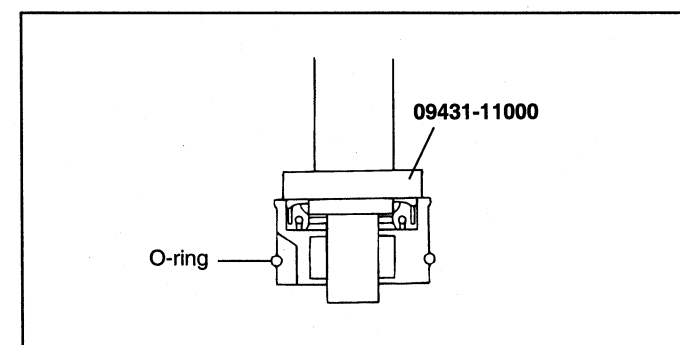
3. Apply the specified fluid to the entire surface of the rack bushing oil seal.

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Recommended fluid :Power steering fluid (PSF-3)

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4. Install the oil seal in the rack bushing.
5. Apply the specified fluid to the entire surface of the O-ring and install the rack bushing using the special tool (09431-11000).

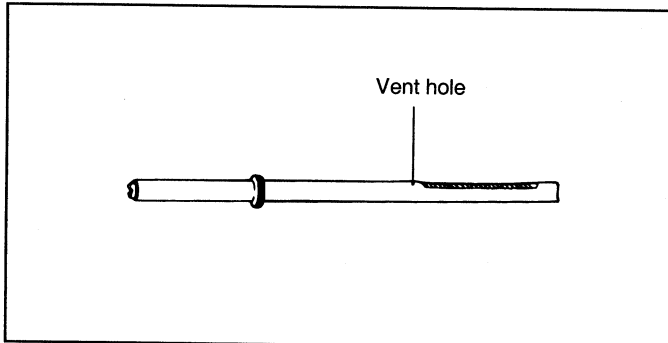


EPA9014D

- Apply the specified grease to the rack teeth.

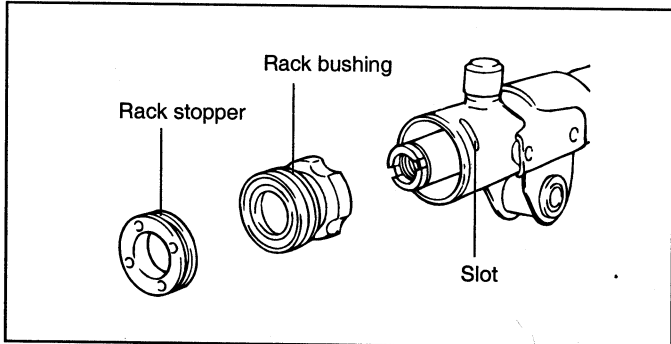
**CAUTION**

**Do not plug the vent hole in the rack with grease.**



EPA9014E

- Insert the rack into the rack housing. Install the rack bushing and rack stopper.

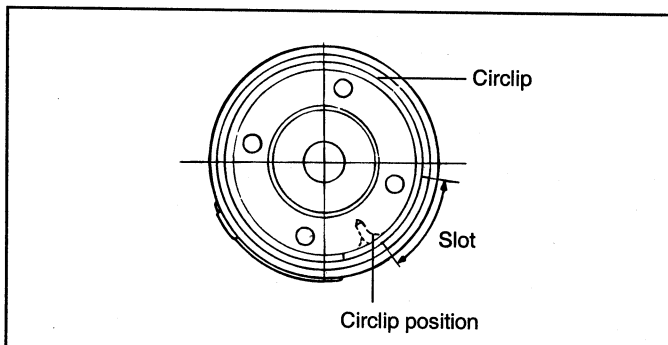


EPA9014F

- Push the rack stopper until the circlip groove of the rack stopper is aligned with the notched hole of the rack housing and then install the circlip while turning the rack stopper.

**CAUTION**

**The circlip end should not be visible through the notched hole of the rack housing.**



EPA9014G

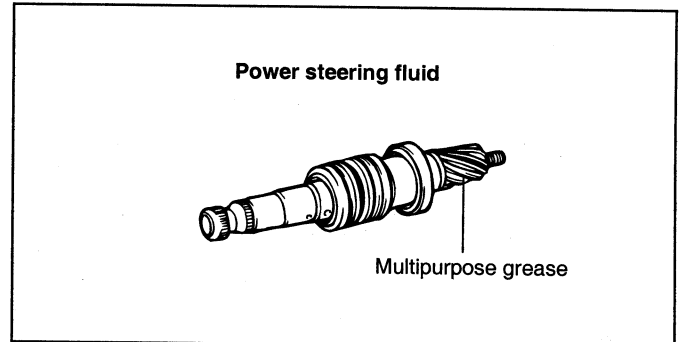
- Apply the specified fluid and grease to the pinion valve assembly and install the rack housing assembly.

Recommended fluid :

Power steering fluid (PSF-3)

Recommended grease :

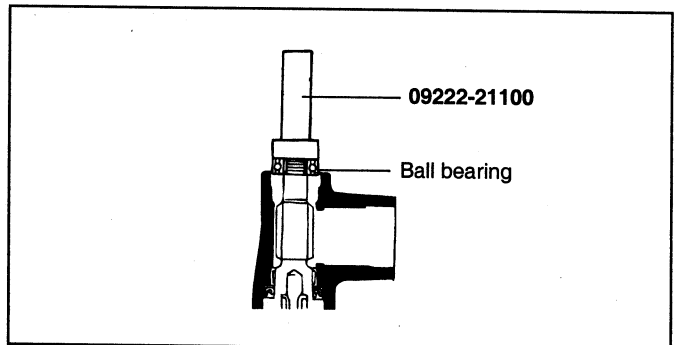
Multipurpose grease SAE J310a, NLGI #2 EP



EPA9014H

- Install the ball bearing using the special tool (09222-21100).

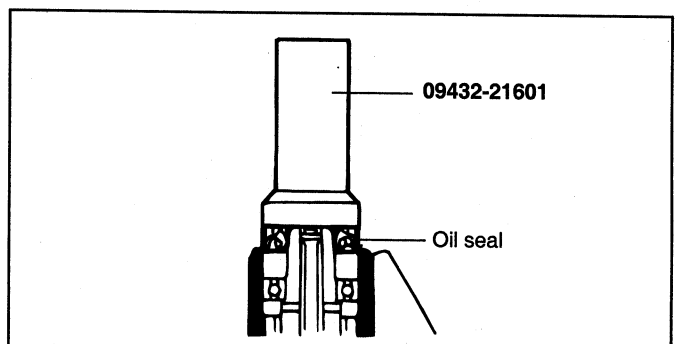
- Install the pinion and valve assembly to the valve housing.



EPA9014I

- Install the oil seal using the special tool (09432-21601).

- Install the snap ring with snap ring pliers.

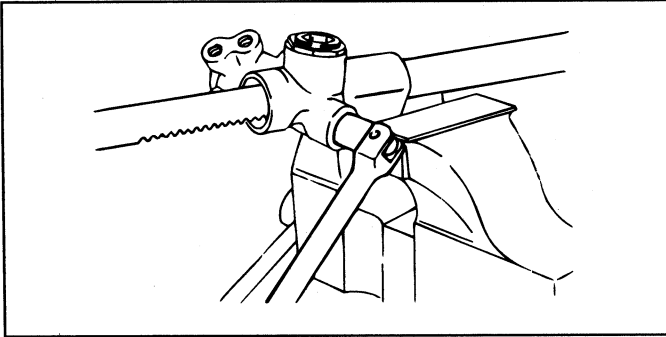


EPA9014J

14. With the pinion turned completely clockwise, tighten the self-locking nut.

### CAUTION

Always replace the self-locking nut with a new one.



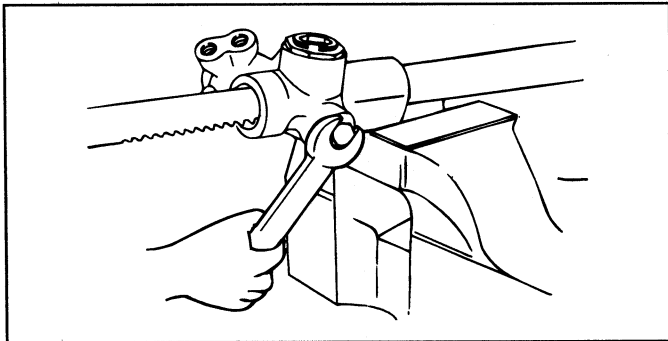
EPA9014K

15. Apply semi-drying sealant to the threaded section of the end plug and tighten to the specified torque.

Tightening torque :

End plug : 50-70 Nm

16. Stake the end plug at two points on its circumference with a punch.

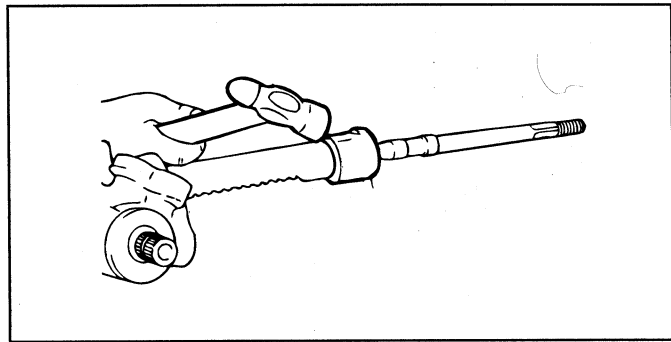


EPA9014L

17. Install the tab washer and then the tie rod and hammer the tab washer end at two points lightly to the tie rod.

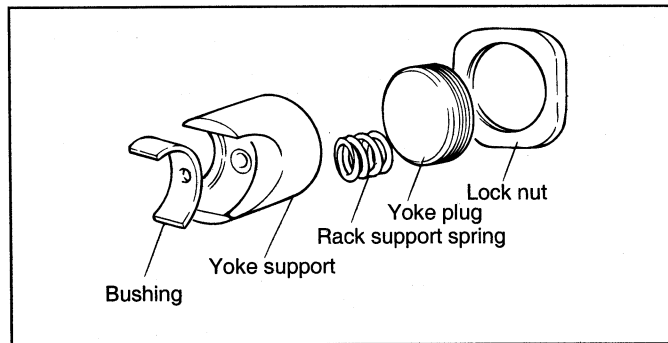
### CAUTION

1. Align the tab washer pawls with the rack grooves.
2. Use a new tab washer.



EPA9014M

18. Install the bushing, rack support yoke, rack support spring and yoke plug in the order shown. Apply semi-drying sealant to the threaded section of the yoke plug before installation.



EPA9013N

19. With the rack placed at the center position, attach the yoke plug to the rack housing. Tighten the yoke plug within the range of 20-25 Nm (200-250 kg.cm, 14.5-18 lb.ft), using the special tool. Loosen the yoke plug for approximately 20° and tighten the locking nut to the standard value.

Tightening torque

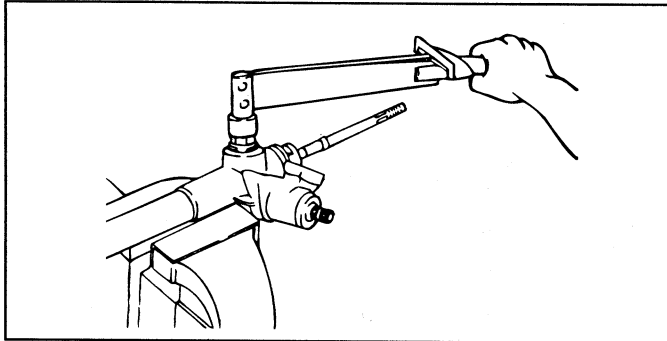
Locking nut : 50-70 Nm (500-700 kg.cm, 36-51 lb.ft)

20. After adjusting, install the yoke plug with a lock nut.

### NOTE

When it cannot be adjusted within the specified return angle, check the rack support plug components or replace.

21. Tighten the feed tube to the specified torque and install the mounting rubber with adhesive.



EPA9014O

22. Apply the specified grease to the bellows mounting position (fitting groove) of the tie rod.

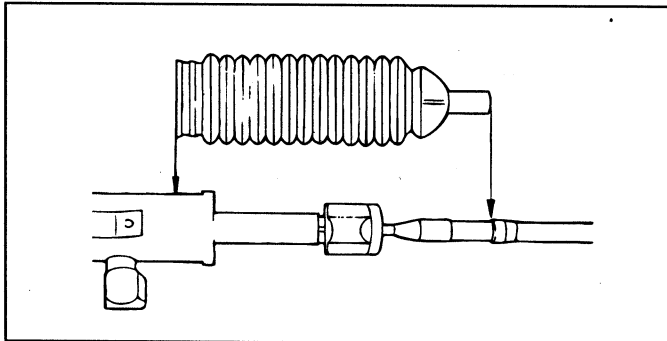
Recommended grease

Multipurpose grease SAE J310a, NLGI #2 EP

23. Install the new attaching band to the bellows.

**CAUTION**

When the bellows are installed, a new band must be used.



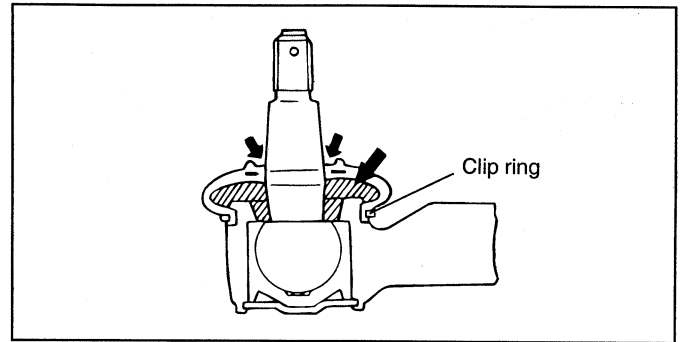
EPA9014P

24. Install the bellows in position, taking care not to twist it.

25. Fill the dust cover inner side and lip with the specified multipurpose grease, and place the dust cover in position with the clip ring attached in the groove of the tie rod end.

Recommended grease

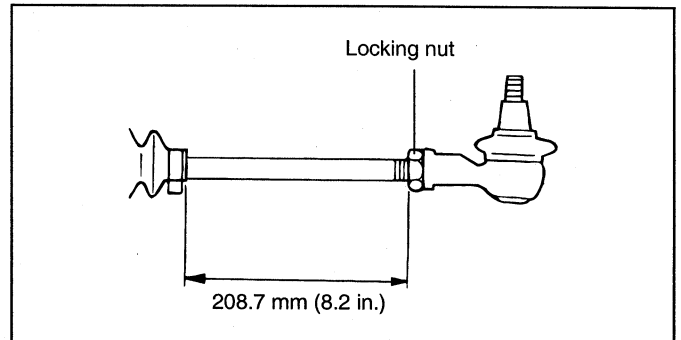
Multipurpose grease SAE J310a, NLGI #2 EP



EPA9014Q

26. Install the tie rods so that the length of the left and right tie rods equals the standard value.

Tie rod free length [Standard value] :208.7 mm (8.2 in.)

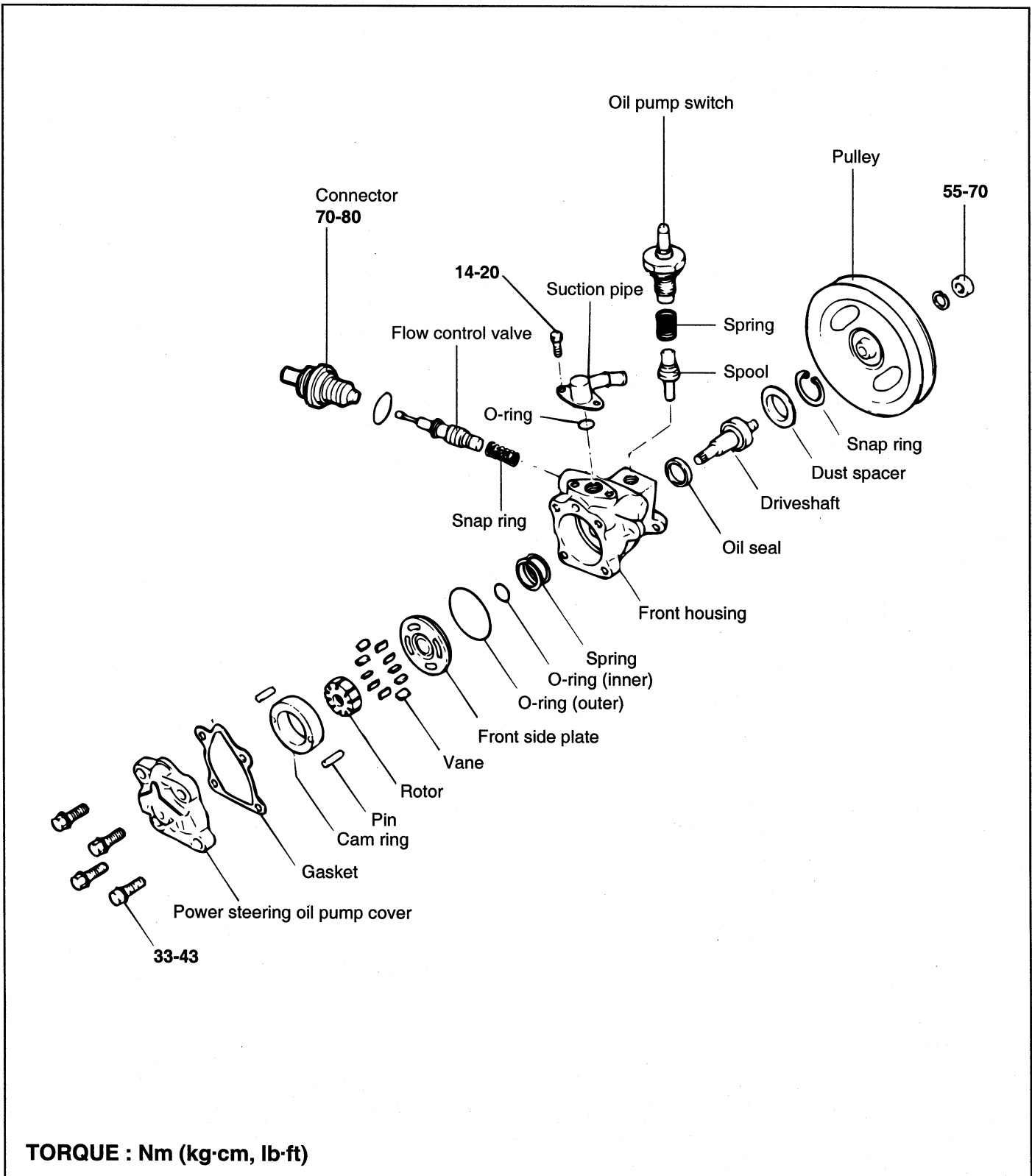


EPA115A

27. Install the powersteering gear box assembly to the vehicle.

POWER STEERING OIL PUMP

COMPONENTS EPJB2400

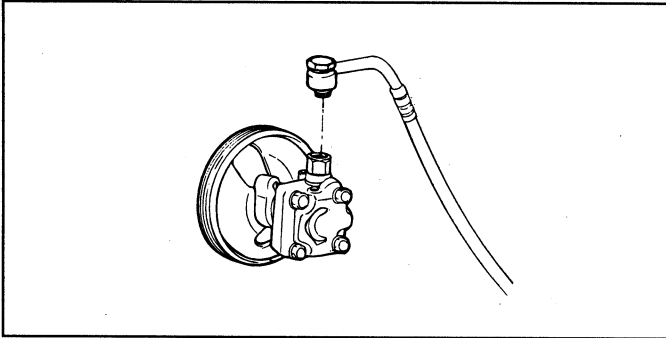


TORQUE : Nm (kg-cm, lb-ft)



**REMOVAL** EPHA1250

1. Remove the pressure hose from the oil pump.
2. Disconnect the suction hose from the suction connector and drain the fluid into a container.

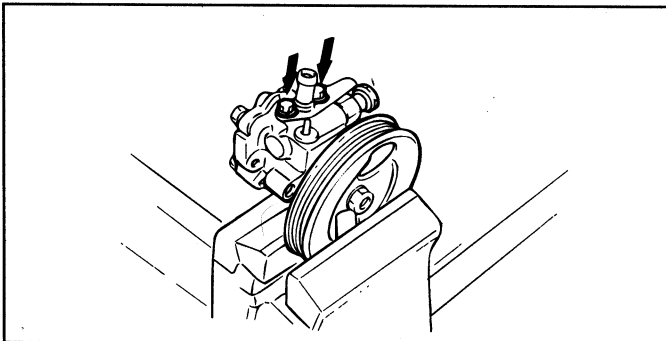


EPA9016A

3. To remove the drive belt, loosen the oil pump mounting bolt.
4. Remove the oil pump mounting bolts and disconnect the pressure switch connector.

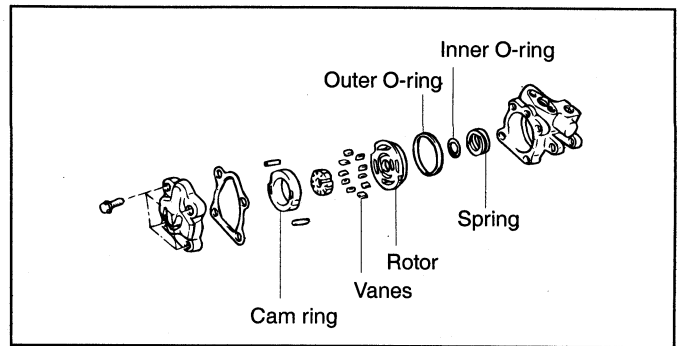
**DISASSEMBLY** EPJB2600

1. Remove the suction pipe and the O-ring from the oil pump.



EPA9017A

2. Remove the rear cover with its gasket and pin.
3. Remove the cam ring.
4. Remove the rotor and vanes.
5. Remove the front side plate.

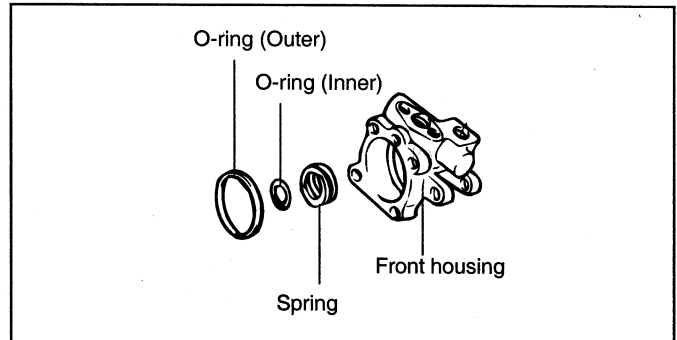


EPA9017B

6. Remove the inner and outer O-ring.
7. Remove the spring.

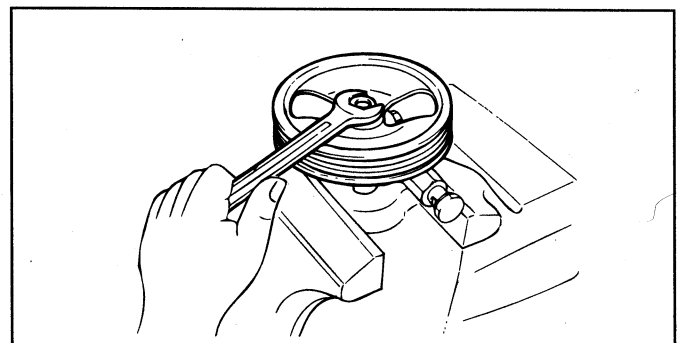
**NOTE**

When assembling, use a new gasket and O-ring.



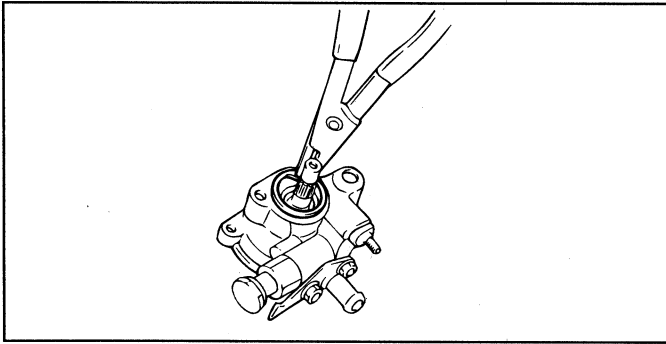
EPA9017C

8. Remove the pulley nut and the spring washer.
9. Pull off the pulley and the woodruff key.



EPA9017D

10. Remove the snap ring using snap ring pliers.
11. Remove the drive shaft and bearing using a plastic hammer.

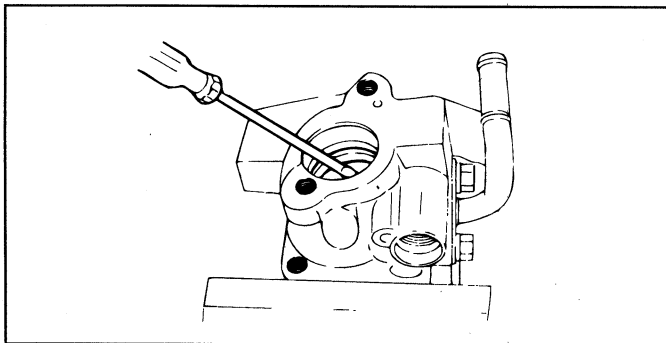


EPA9017E

12. Remove the oil seal from the oil pump body.

### NOTE

When assembling, use a new oil seal.



HCT56-94

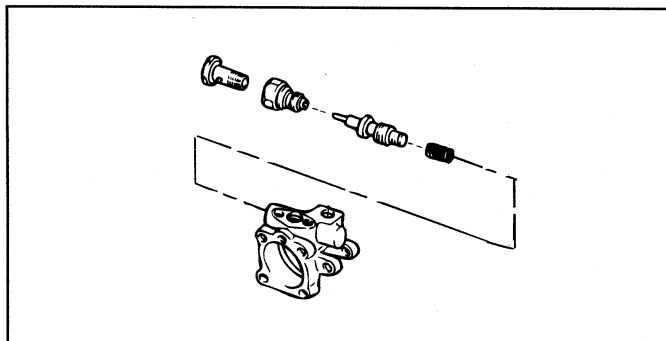
13. Remove the guide bracket and nut.

14. Remove the connector from the oil pump body, and then remove the flow control valve and flow control spring.

15. Remove the O-ring from the connector.

### CAUTION

Do not disassemble the flow control valve.

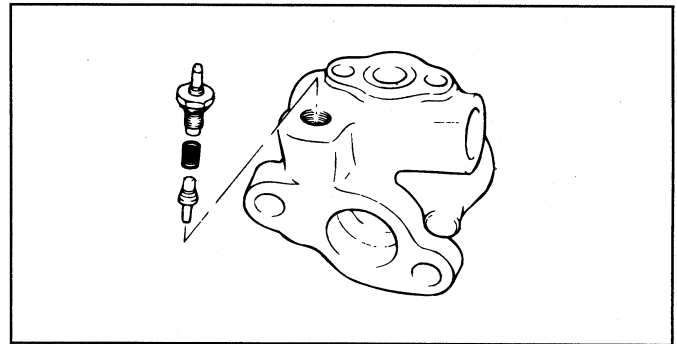


EPA9017G

16. Remove the oil pump switch.

17. Take the spring and the spool out.

18. Remove the O-ring from the oil pump switch.



HCT56-96

### INSPECTION

EPJB2700

1. Clean all disassembled parts with a suitable cleaning solvent.
2. If any inside parts of the oil pump have been damaged, replace the pump as an assembly.
3. If the pulley is cracked or deformed, replace it.
4. If oil leaks around the drive shaft oil seal, replace the oil seal.
5. If the serrations of the pulley or drive shaft are deformed or worn out, replace them.

### ASSEMBLY

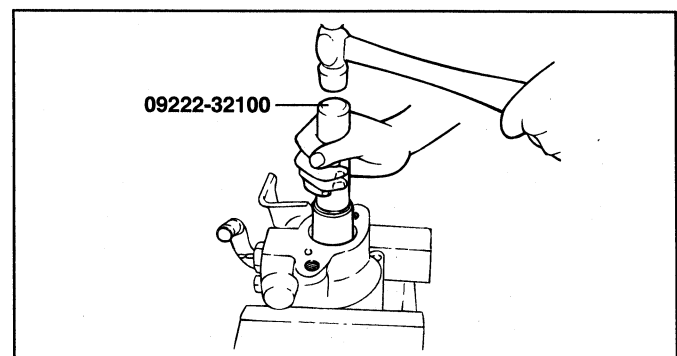
EPJB2800

1. Install the oil pump switch.
2. Install the flow control valve spring, valve and connector in the pump body.

### NOTE

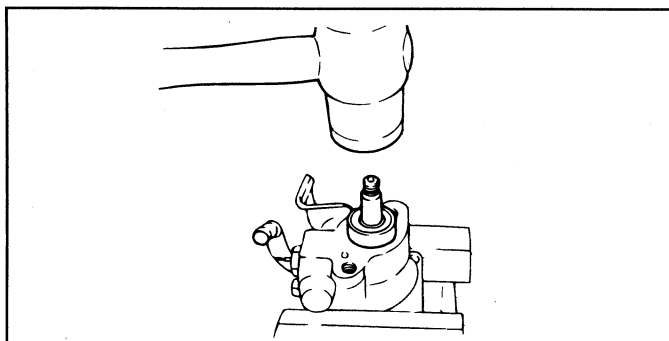
Apply a thin coat of power steering fluid to all parts including the oil seal and O-ring.

3. Install the guide bracket and nut.
4. Using the special tool (09222-32100), install the oil seal into the pump body.



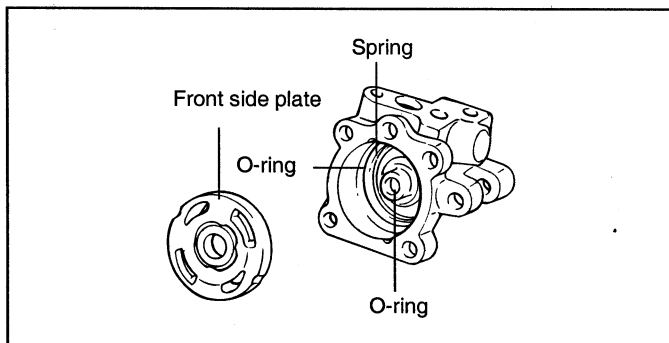
EPDA044A

5. Gently insert the shaft assembly and install the snap ring.
6. Install the pump pulley with the woodruff key in position.



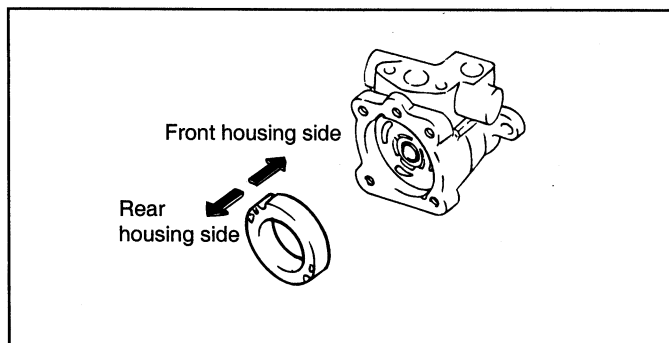
HCT56-98

7. Install the spring and the inner and outer O-rings.
8. Install the front side plate.



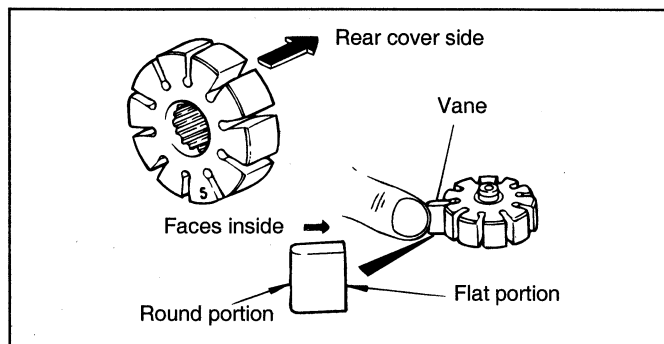
EPA9018C

9. Insert the pins into the pin grooves of the front housing, then install the cam ring, paying attention to its direction.



EPA9018D

10. Install the rotor with its punch-marked side facing towards the front side plate.
11. Install the vane plates with the round end facing outward.



EPA9018E

12. Install the gasket and rear cover.
13. Tighten the suction connector.

### INSTALLATION EPJB2900

1. Install the oil pump to the oil pump bracket.
2. Install the suction hose.
3. Install the ribbed V-belt and adjust its tension.
4. Connect the pressure hose to the oil pump, and the suction hose to the oil reservoir.

### NOTE

**Install the hoses so that they are not twisted and they do not come in contact with any other parts.**

5. Replenish the reservoir.

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Recommended fluid :

Power steering fluid (PSF-3)

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6. Bleed the system.
7. Check the oil pump pressure.
8. Install parts by referring to the torque specification.