

Steering System

| | |
|--|--------|
| GENERAL | ST -2 |
| MECHANICAL POWER STEERING SYSTEM | ST -12 |



GENERAL

EPNC0100

SPECIFICATIONS

| Items | Specifications |
|--------------------|---------------------------|
| Steering gear type | Rack and pinion |
| Rack stroke | 146 ± 1 mm |
| Oil pump type | Vane type |
| Displacement | 9.6 cm ² /rev. |

SERVICE STANDARD

| Items | Specifications |
|----------------------------|--------------------------|
| Steering wheel free play | 0-30 mm (0-1.1 in.) |
| Steering angle | |
| Inner wheel | 39°53' ± 1°30' |
| Outer wheel | 32°10' |
| Stationary steering effort | 3.5kg |
| Belt deflection | 7-10mm |
| Oil pump pressure | 75-82 kg/cm ² |
| Total pinion preload | 0.06-0.13 kg·m |
| Tie rod swing resistance | 0.19-0.49 kg·m |
| Ball joint starting torque | 0.05-0.25 kg·m |

TIGHTENING TORQUE

EPNC0200

| Items | Tightening torque (kg·m) |
|---|--------------------------|
| Power steering column and shaft | |
| Steering column and shaft mounting bolt | 1.3 - 1.8 |
| Steering wheel lock nut | 3.5 - 4.5 |
| Pinion gear to joint assembly | 3.0 - 3.5 |
| Steering column and shaft to universal joint assembly | 3.0 - 3.5 |
| Dust cover mounting bolt | 0.4 - 0.6 |
| Power steering gear box | |
| Gear box mounting bolt (A) | 6.0 - 8.0 |
| Gear box mounting bolt (B) | 9.0 - 11.0 |
| Tie rod lock nut | 5.0 - 5.5 |
| Tie rod end ball joint to knuckle arm mounting nut | 1.6 - 3.4 |
| Feed tube to gear box | 1.2 - 1.8 |
| Gear box to valve body | 2.0 - 3.0 |
| Yoke plug lock nut | 5.0 - 7.0 |

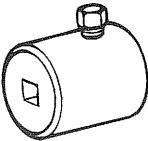
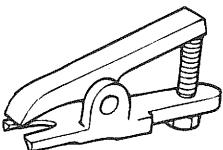
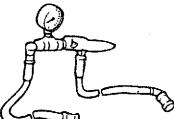
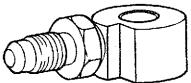
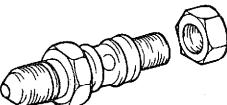
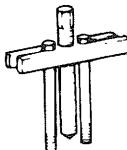
| Items | Tightening torque (kg·m) |
|--|--------------------------|
| Power steering oil pump | |
| Oil pump to pressure hose | 5.5 - 6.5 |
| Oil pump adjusting bolt | |
| 1.6 DOHC | 2.5 - 3.3 |
| 1.8 DOHC | 3.5 - 5.0 |
| Oil pump mounting bolt | |
| 1.6 DOHC | 2.0 - 2.7 |
| 1.8 DOHC | 3.5 - 5.0 |
| Oil pump bracket mounting bolt | |
| 1.6 DOHC | 2.0 - 2.7 |
| 1.8 DOHC | 3.5 - 5.0 |
| Power steering hose | |
| Power steering reservoir mounting bolt | 0.9 - 1.4 |
| Power steering hose mounting bolt | 0.8 - 1.2 |
| Power steering tube mounting bolt | 0.8 - 1.2 |

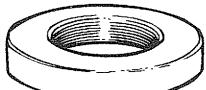
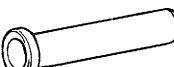
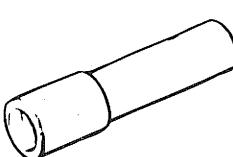
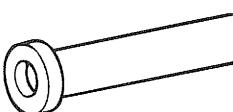
LUBRICANTS

EPNC0300

| Items | Recommended Lubricant | Quantity |
|--|--|------------------------------------|
| Horn contact ring of steering wheel | CENTOPLX278 (KLUBER KOREA) | 1.5g |
| Bearing of steering shaft | ALVANIA #2 OR #3 (KEUK DONG SHELL, KOREA) | As required |
| Ball joint of tie rod end | SHOWA SUNLIGHT MB-2 OR equivalent | 4g |
| Steering gear housing | ONE-LUBER RP GREASE (KYODOYUSHI, JAPAN) | As required |
| Inner ball joint of gear box | LONG TIME PD2 (OPTIMOL, GERMAN) | As required |
| Contact area of gear box bellows & tie rod | SILICON GREASE (SPEC NO : MS511-41) | As required |
| Power steering fluid | PSF-3 | 0.75-0.8 liter (0.79-0.84 qts.) |

SPECIAL TOOLS EPNC0400

| Tool (Number and name) | Illustration | Use |
|--|---|--|
| 09565-11100 Preload socket |  E6511100 | Measuring the main shaft preload |
| 09568-31000 Tie rod end puller |  E6831000 | Separating the tie rod end ball joint. |
| 09572-21000 Oil pressure gauge |  E7221000 | Measuring the power steering oil pressure (Use with 09572-22100, 09572-21200) |
| 09572-22100 Oil pressure gauge adapter (Pump side) |  E7222100 | Measuring the power steering oil pressure (Use with 09572-21000, 09572-21200) |
| 09572-21200 Oil pressure gauge adapter (Hose side) |  E7221200 | Measuring the power steering oil pressure (Use with 09572-21000, 09572-22100) |
| 09561-11002 Steering wheel puller |  E6111002 | Removing the steering wheel |

| Tool (Number and name) | Illustration | Use |
|--|---|---|
| 09573-21200 Oil seal guide |  E7321200 | 1. Removing the oil seal from the rack housing 2. Installing the oil seal to the rack housing |
| 09555-21000 Bar |  E5521000 | 1. Removing the oil seal from the rack housing 2. Installing the oil seal to the rack housing |
| 09573-21000 Oil seal installer guide |  E7321000 | Installing the oil seal to the rack housing |
| 09573-21100 Oil seal installer |  E7321100 | Installing the oil seal |
| 09432-21600 Bearing installer |  D3221600 | 1. Installing the needle bearing to the rack housing 2. Installing the ball bearing and oil seal to the valve body |
| 09222-32100 Valve stem oil seal installer |  B2232100 | 1. Installing the ball bearing to the rack housing 2. Installing the oil seal to the rack bushing and valve body |
| 09434-14200 Counter shaft bearing installer |  D3414200 | Installing the oil seal to the rack bushing and valve body. |

TROUBLESHOOTING

EPNC0500

| Symptom | Probable cause | Remedy |
|--|---|--|
| Excessive play in steering wheel | Loose yoke plug Loose steering gear mounting bolts Loose or worn tie rod end ball stud | Retighten Retighten Retighten or replace as necessary |
| Steering wheel operation is not smooth (Insufficient power assist) | V-belt slippage Damaged V-belt Low fluid level Air in the fluid Twisted or damaged hoses Insufficient oil pump pressure Sticky control valve Oil pump leakage Excessive oil leaks from rack and pinion in gear box Distorted or damaged gear box or valve | Inspect Replace Replenish Air bleeding Repair or replace Repair or replace the oil pump Replace Replace the damaged parts Replace the damaged parts Replace |
| Steering wheel does not return properly | Excessive turning resistance of tie rod ball joint Excessively tightened yoke plug Faulty inner tie rod and ball joint Loose connection between gear box and crossmember Worn steering shaft and body grommet Bent rack Damaged pinion bearing Twisted or damaged hoses Damaged oil pressure control valve Damaged oil pump pressure shaft bearing | Replace Adjust Replace Retighten Repair or replace Replace Replace Reposition or replace Replace Replace |
| Noise | Hissing Noise in Steering Gear There is some noise with all power steering systems. One of the most common is a hissing sound when the steering wheel is turned with the vehicle stopped. This noise will be most evident when turning the wheel with the brakes 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. | |
| Rattling or chucking noise in the rack and pinion | Interference between hoses and vehicle body Loose gear box bracket Loose tie rod end ball joint Worn tie rod end ball joint | Reposition Retighten Retighten Replace |
| Abnormal noise in the oil pump | Low fluid level Air in the fluid | Replenish Air bleeding |

SERVICE ADJUSTMENT PROCEDURE

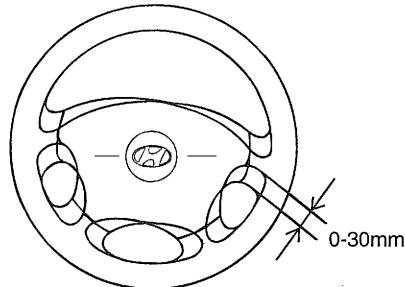
EPNC0600

CHECKING STEERING WHEEL FREE PLAY

1. Start the engine with the steering wheel in the straight ahead position.
2. Gently turn the steering wheel left and right and check the play at the circumference of the steering wheel.

Standard value

Steering wheel free play : 0-30 mm (0-1.1 in.)



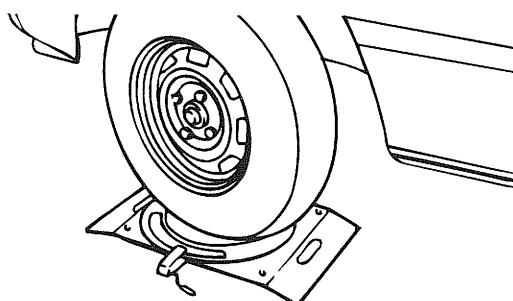
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3. If the play exceeds the standard value, inspect the steering shaft connection and steering linkage play.

CHECKING STEERING ANGLE

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

Wheel angle [Standard value]

Inner wheel : $39^{\circ}53' \pm 1^{\circ}30'$ Outer wheel : $32^{\circ}10'$ 

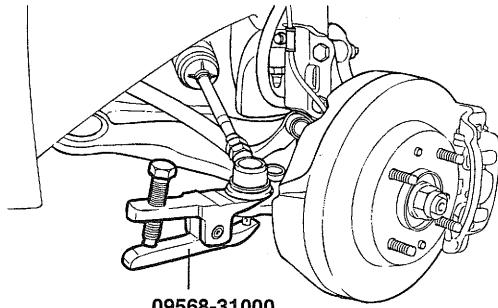
EPA9002A

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

CHECKING THE TIE ROD END BALL JOINT STARTING TORQUE

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1. Disconnect the tie rod and knuckle using the special tool.

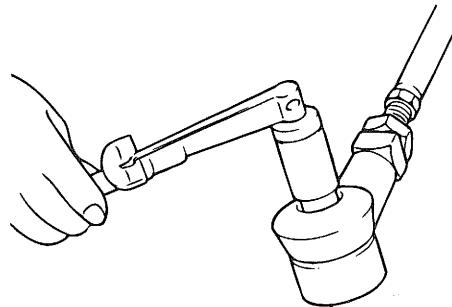


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2. Shake the ball joint stud several times, install the nut on the stud and adjust the ball joint starting torque.

Standard value : 0.05 - 0.25 kg·m



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3. If the starting torque exceeds the standard value, replace the tie rod end.
4. Even if the starting torque is below the standard value, check the ball joint play and installation.

CHECKING STATIONARY STEERING EFFORT

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1. Place the vehicle on a level surface and place the steering wheel in the straight ahead position.
2. Start the engine and keep the engine speed at 1000 ± 100 rpm.

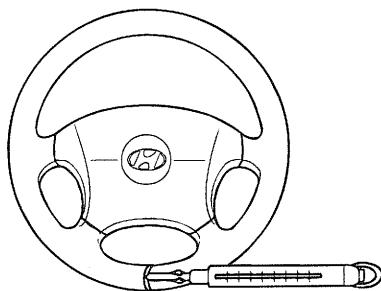
 **NOTE**

After checking, reset the engine speed to the standard value (idling speed).

3. Measure the turning force with a spring scale by turning the steering wheel clockwise and counterclockwise one and a half turns.

Standard value

Stationary steering effort : 3.5 kg



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4. Check that there is no sudden change of force while turning the steering wheel.
5. If the stationary steering effort exceeds the standard value, check and adjust the following points.
 - 1) Damage or cracks on the dust cover and tie rod end ball joint.
 - 2) Pinion preload of the steering gear box and starting torque of the tie rod end ball joint.
 - 3) Starting torque of the ball joint.

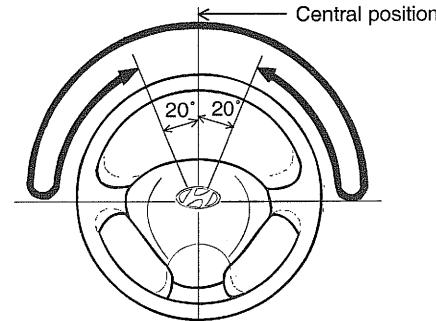
CHECKING STEERING WHEEL RETURN

Check the steering wheel return and confirm the following points:

1. The force required to turn the steering wheel and the wheel return should be the same for both left and right in case of moderate or sharp turns.
2. When the steering wheel is turned 90° and held for a couple of seconds while the vehicle is being driven at 35kph, the steering wheel should return to within 20° from the neutral 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.



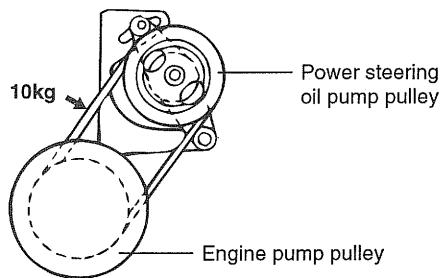
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CHECKING POWER STEERING BELT TENSION

EPNC0900

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

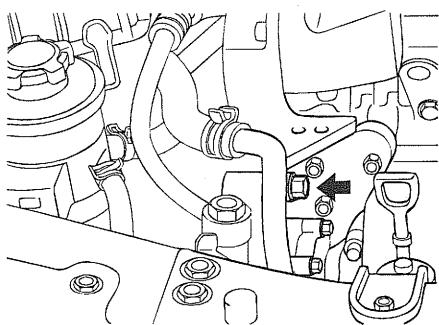
Standard value : V belt deflection : 6-9 mm



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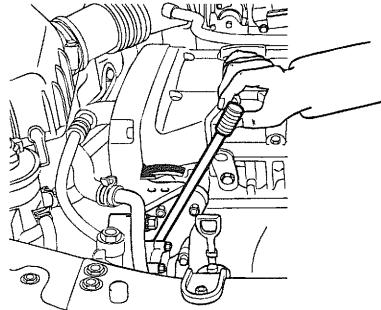
2. If the belt deflection is out of the standard value, adjust the belt tension as follows.

 - 1) Loosen the power steering "V" belt tension adjusting bolt.



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- 2) Put a bar or equivalent between the bracket and the oil pump and adjust the tension so that the belt deflection is within the standard value.



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- 3) Tighten the power steering "V" belt tension adjusting bolt.

- 4) Check the belt deflection and adjust it again if necessary.

CAUTION

After turning the V belt in the normal rotation direction more than once, recheck the belt deflection

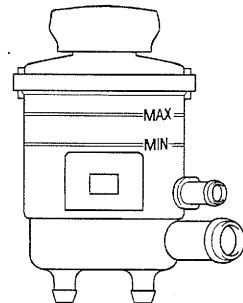
CHECKING POWER STEERING FLUID LEVEL

EPNC1000

1. Place 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 to 140°F).
3. With the engine at idle, turn the steering wheel fully clockwise and counterclockwise several times.
4. Make sure there is no foaming or cloudiness in the reservoir fluid.
5. Stop the engine to 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.
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.



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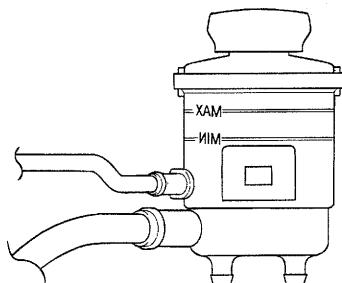
REPLACING POWER STEERING FLUID

EPNC1100

1. Jack up the front wheels of the vehicle and support them with a rigid rack.
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 oil into a container.
4. Disconnect the high-tension cables. While operating the starter motor intermittently, drain fluid by turning the steering wheel fully left and right several times.
5. Connect the return hose and fix it with a clip.
6. Fill the power steering fluid reservoir with the specified fluid.

PSF-3 : 0.75-0.8 lit.

7. Start the engine. Check for fluid leaks from the hose, then stop the engine.
8. Pour fluid into the bottom of the oil filter in the power steering fluid reservoir.
9. Air bleed the system.



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AIR BLEEDING

EPNC1200

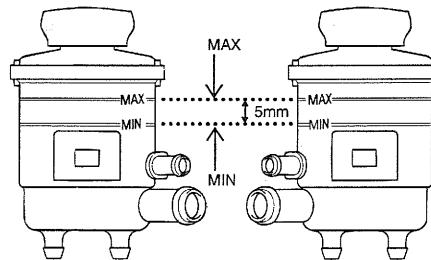
1. Disconnect the ignition coil high tension cable, and then, while operating the starter motor intermittently (for 15 to 20 seconds), turn the steering wheel fully to the left and right five or six times.

NOTE

1. When bleeding, replenish with fluid so that the level does not decrease fall below the bottom of the filter.
2. If air bleeding is done with the vehicle idling, the air will be decomposed and absorbed into the fluid. Be sure to do the bleeding only while cranking.
2. Connect the high tension cable, and then start the engine (idling).
3. Turn the steering wheel left and right until there are no air bubbles in the oil reservoir.
4. Confirm that the fluid is not milky and the level is between "MAX" and "MIN" mark on the reservoir.
5. Check that there is a little change in the fluid level when the steering wheel is turned left and right.

NOTE

1. If the fluid level varies 5mm (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.



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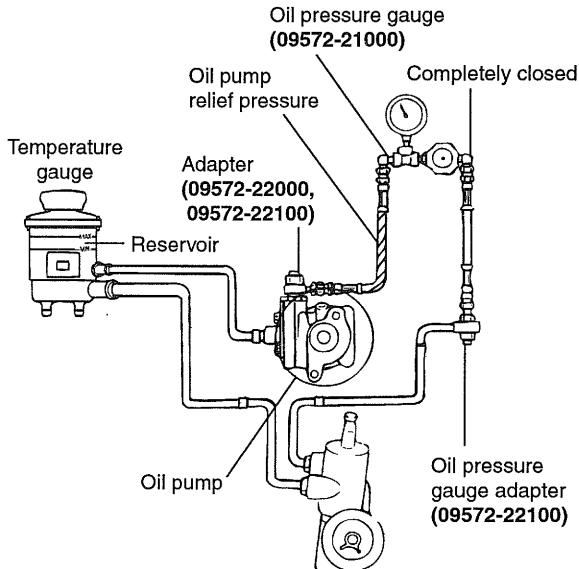
OIL PUMP PRESSURE TEST

EPNC1300

1. Disconnect the pressure hose from the oil pump and connect the special tool.
2. Air bleed and then start the engine. Turn the steering wheel several times so that the fluid temperature can rise to approximately 50°C (122°F).
3. Increase the engine speed up to 1,000 rpm \pm 100 rpm.
4. Close the shut-off valve and measure the fluid pressure to confirm that it is within the standard value.

Oil pump pressure [Standard value]Relief pressure : 75-82 kg·cm²

Do not keep the shut-off valve on the pressure gauge closed longer than 10 seconds.



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5. Remove the special tools, and tighten the pressure hose to the specified torque.

Tightening torque

Pressure hose : 5.5 - 6.5 kg·cm

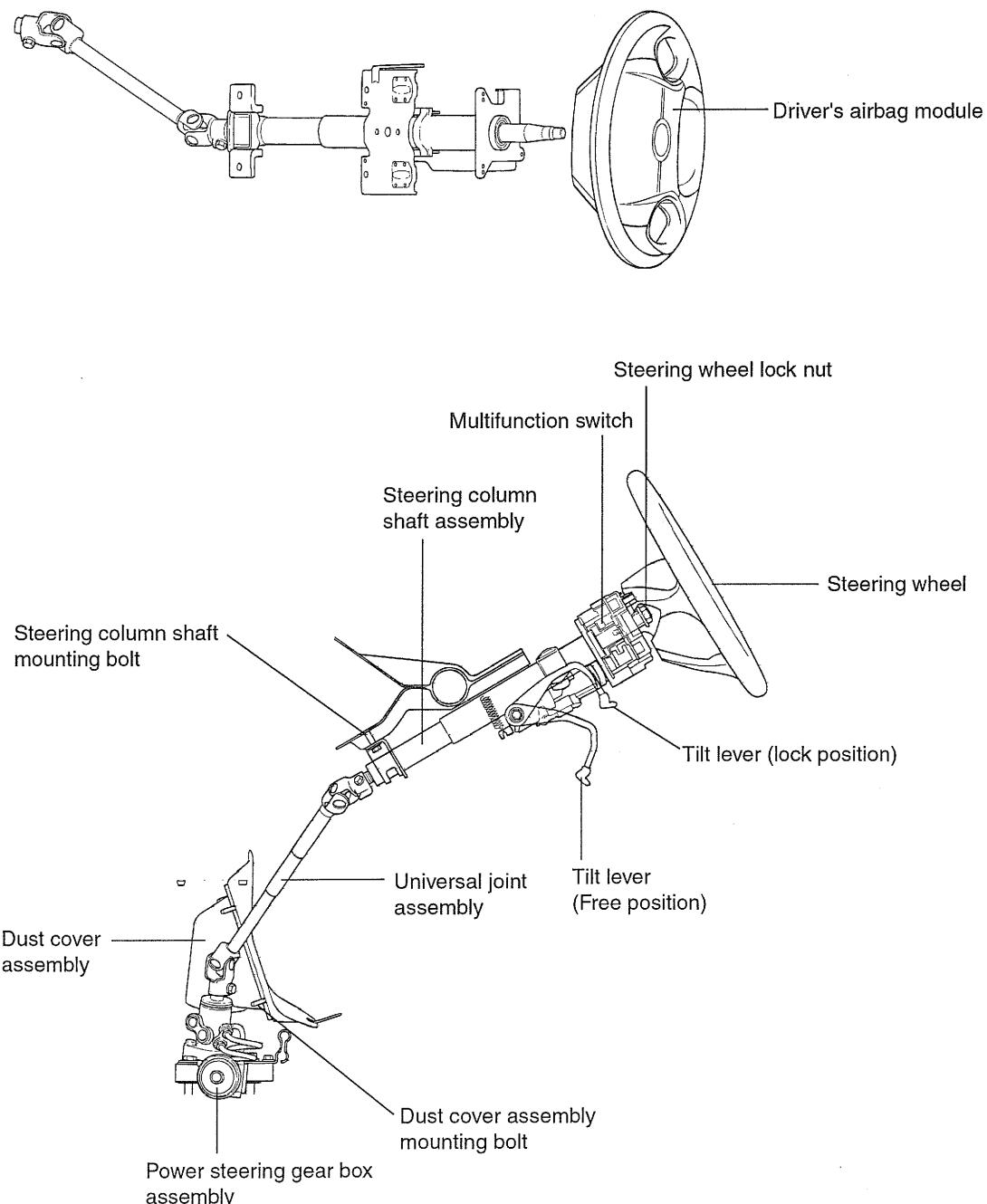
6. Air bleed the system.

MECHANICAL POWER STEERING SYSTEM

STEERING COLUMN/SHAFT

COMPONENTS

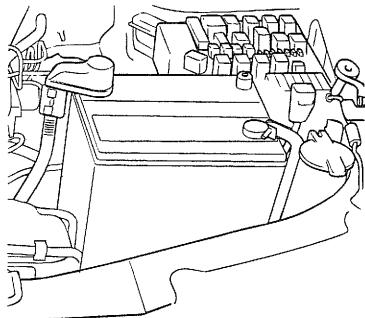
EPNC1500



EPNC150A

REMOVAL EPNC1600

1. Disconnect the negative (-) terminal from the battery.

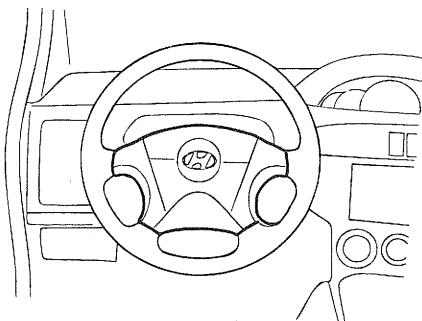


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2. After removing the bolt shown in the illustration, remove the airbag module.

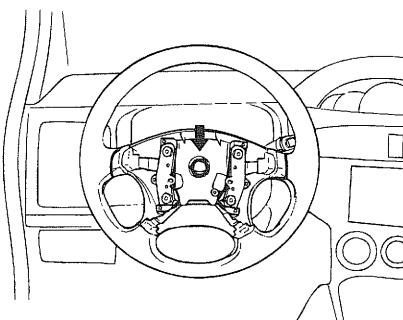
NOTE

For the vehicles not equipped with SRS airbag, remove the horn pad.



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3. Remove the steering wheel lock nut.

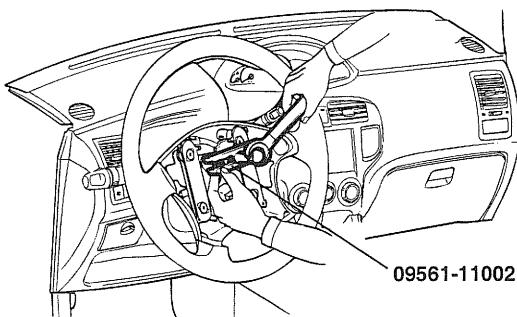


KPNB160C

4. After aligning the marks on the steering shaft and wheel, remove the steering wheel using the special tool.

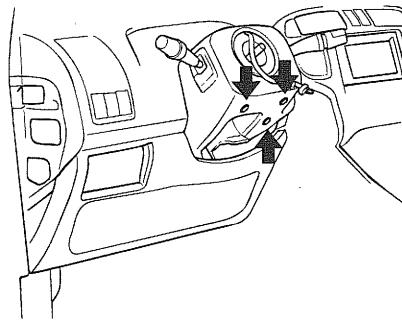
NOTE

Do not hammer on the steering wheel to remove the steering wheel. It may damage the steering column.



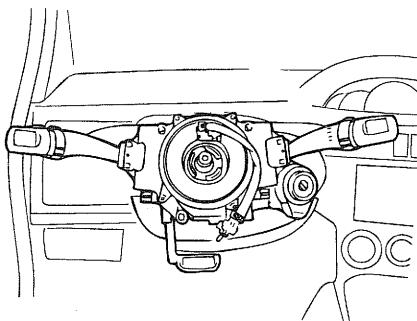
KPNB160D

5. After removing the bolt shown in the illustration, remove the column shrouds.



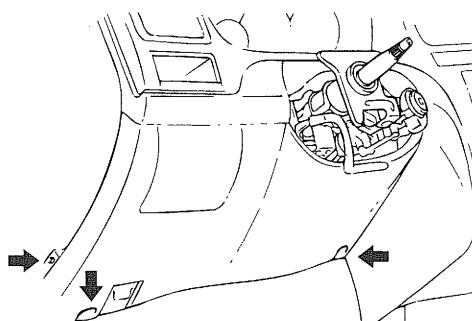
KPNB160E

6. After removing the connectors of the multifunction switch, remove the multifunction switch assembly.



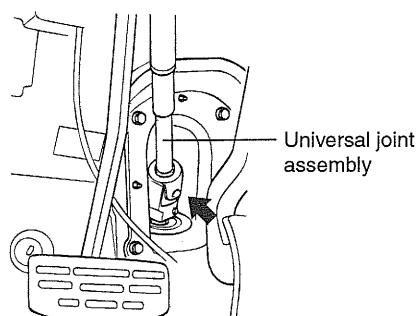
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7. After removing the mounting bolts, remove the lower crash pad.



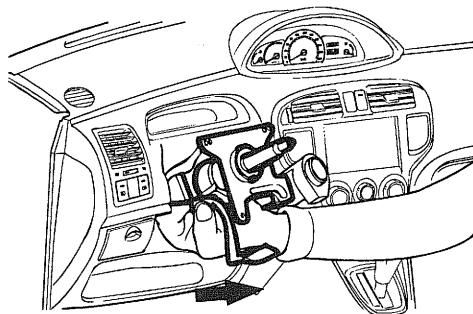
KPNB160G

8. Remove the bolt connecting the pinion and the universal joint.



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9. After removing the mounting bolts, remove the steering column and shaft assembly.



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INSPECTION

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1. Check the steering column shaft for damage and deformation.
2. Check connections for play, damage and smooth operation.
3. Check the ball joint bearing for wear and damage.

INSTALLATION

EPNC1900

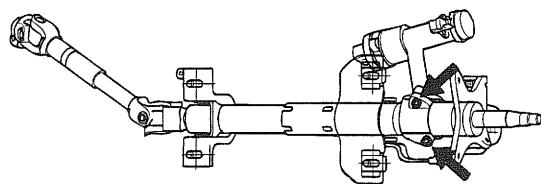
Installation is the reverse of removal.

DISASSEMBLY AND REASSEMBLY

EPKB1600

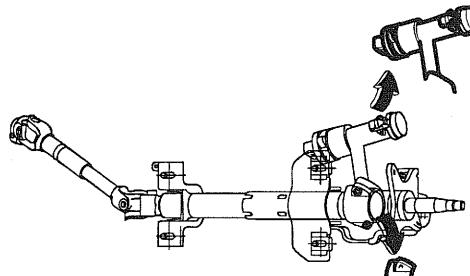
KEY LOCK ASSEMBLY

1. If it is necessary to remove the key lock assembly, use a punch to make a groove on the head of the special bolt, and then use a screwdriver to remove the key lock assembly mounting bracket.



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2. Disassemble the key lock assembly from the steering column and shaft assembly.

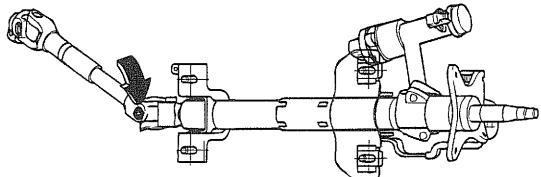


KPKA022A

3. Reassembly is the reverse of disassembly.

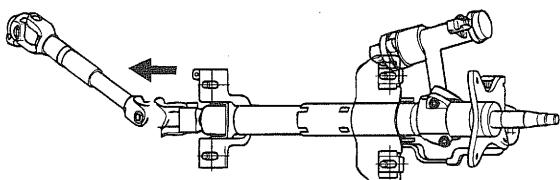
UNIVERSAL JOINT ASSEMBLY

1. Remove the bolt connecting the universal joint assembly and the steering column and shaft assembly.



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2. Remove the universal joint assembly from the steering column and shaft assembly.



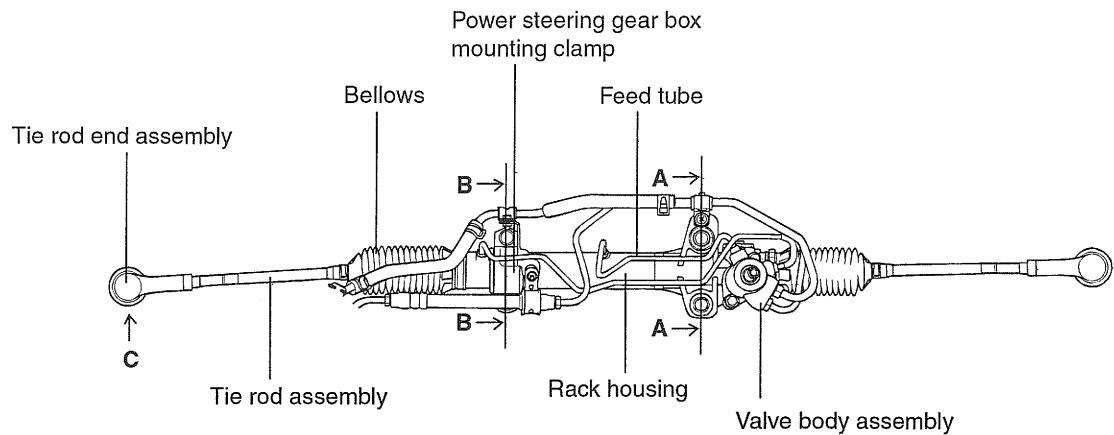
KPKA024A

3. Reassembly is the reverse of disassembly.

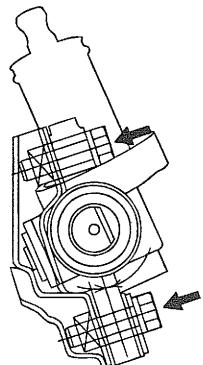
POWER STEERING GEAR BOX

COMPONENTS

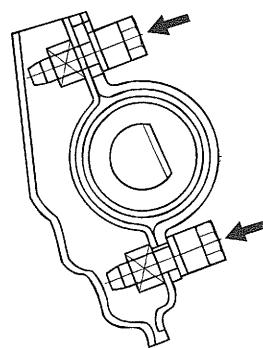
EPNC2000



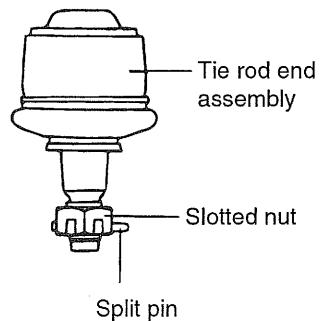
[VIEW A]



[VIEW B]

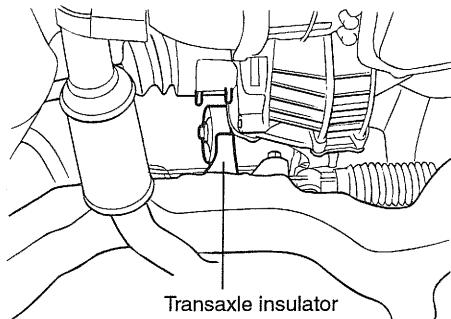


[VIEW C]



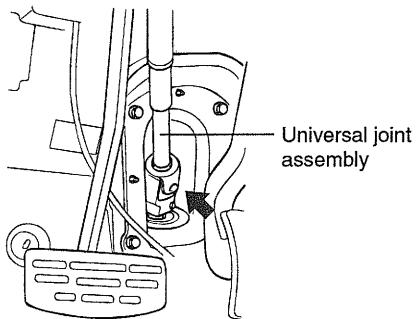
REMOVAL EPNC2100

1. Drain the power steering fluid.
2. Separate the transaxle mounting bracket and the transaxle insulator.



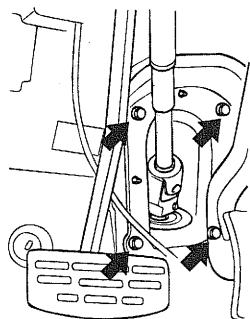
EPNC210A

3. Separate the universal joint assembly from the gear box of driver's seat side.



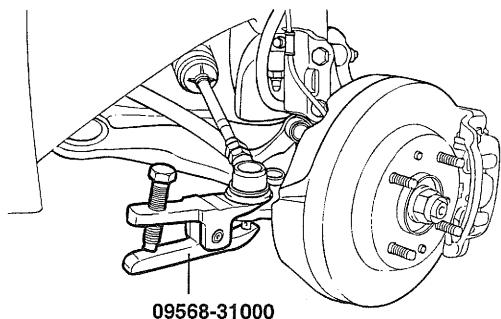
EPNC210B

4. After removing the four dust cover mounting bolt, remove the dust cover assembly.



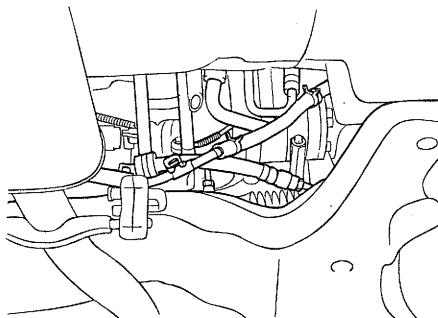
KPNB160J

5. Lift up the vehicle.
6. Remove the front tires (RH/LH).
7. After removing the split pin, disconnect the tie rod from the knuckle using the special tool (09568-31000).



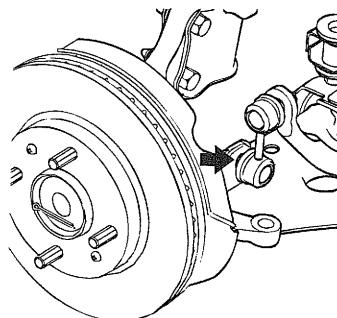
KPNB070A

8. Disconnect the pressure and return hoses.



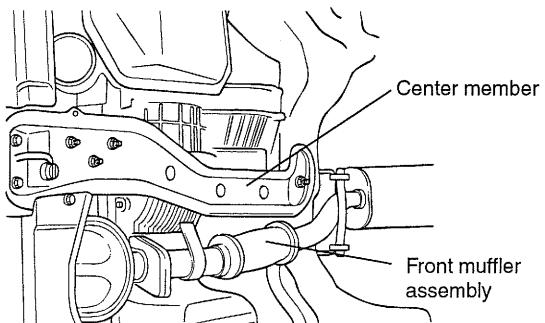
KPNB210B

9. Disconnect the stabilizer bar (RH/LH sides) from the link.



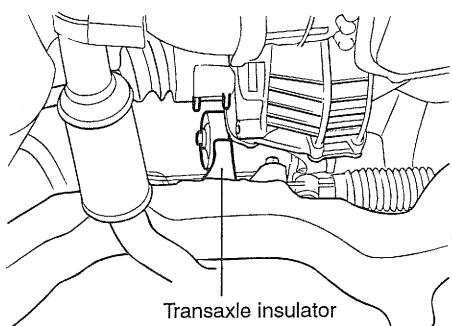
KPNB210C

10. Remove the center member and front muffler assembly.



EPNC210C

11. Remove the transaxle mounting insulator from the crossmember.

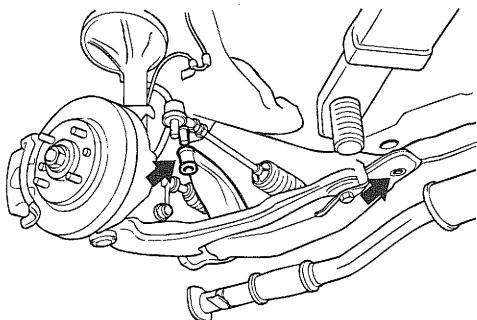


 **NOTE**

When removing the gear box, pull it out carefully and slowly so as not to damage the boots.

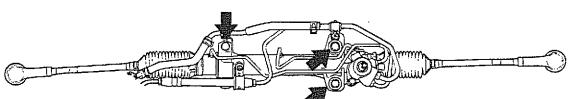
EPNC210A

12. Loosen the crossmember mounting bolts and nuts.



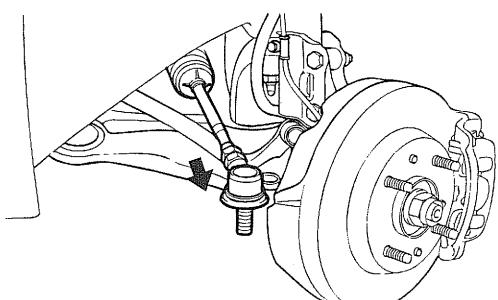
KPNB210E

13. Remove the power steering gear box mounting bolts and clamps.



KPNB210J

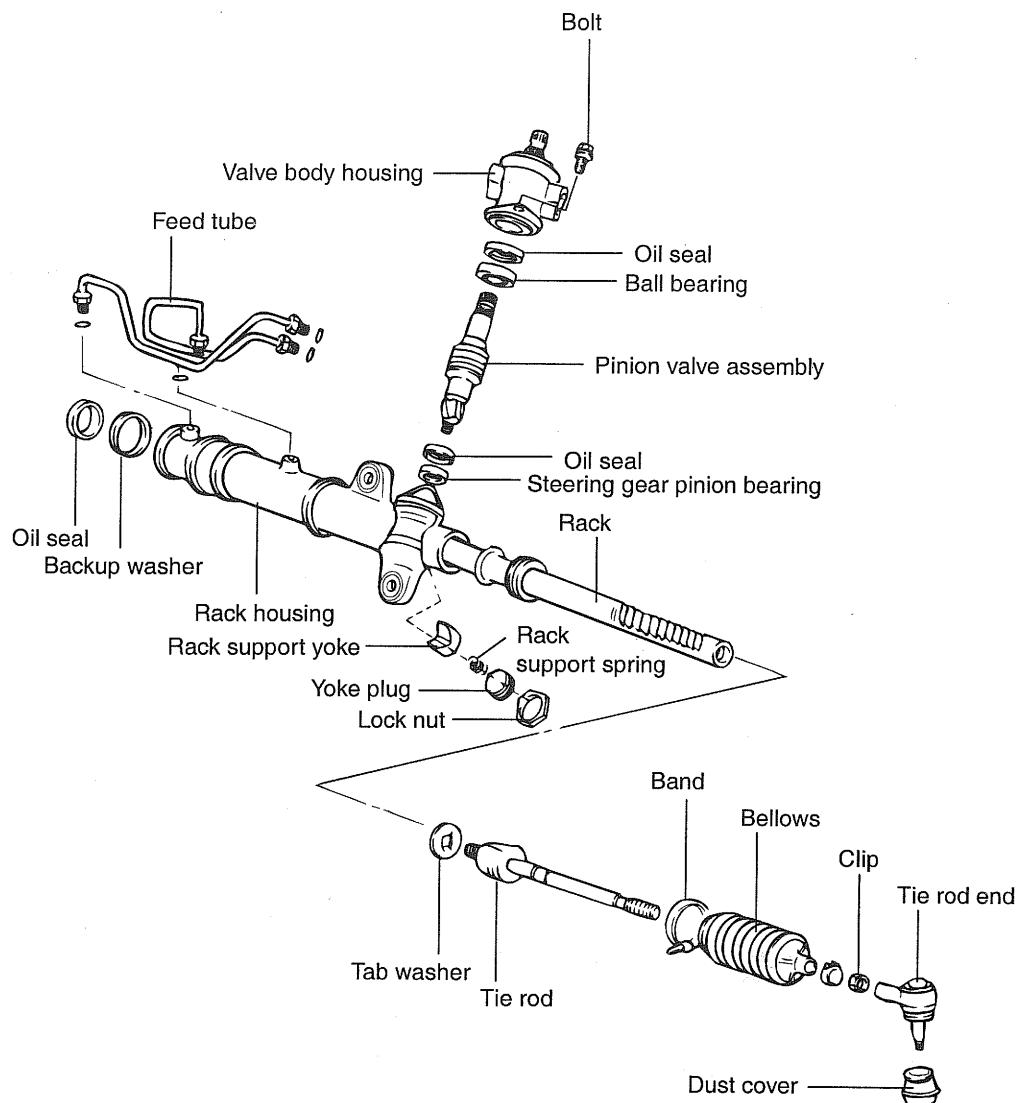
14. Remove the power steering gear box by pulling it toward the left side of the vehicle (driver's seat side).



KPNB210G

DISASSEMBLY AND ASSEMBLY

EPKB1900



KPKA033A

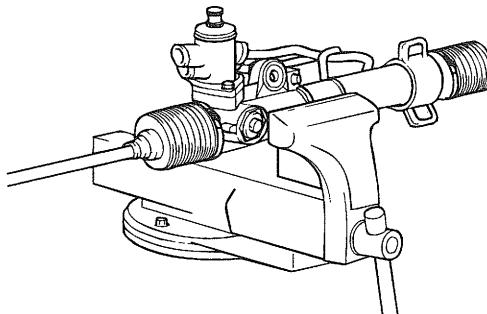
INSPECTION AND ADJUSTMENT BEFORE DISASSEMBLY

EPNC2300

Fix a brass plate or aluminum plate for protection to the jaws of a vise and mount the gear box in a vise.

⚠ CAUTION

When mounting the gear box in a vise, let the installation position of it be fixed to the jaws. If other position is fixed, the gear box may be damaged.



KPNB220B

TOTAL PINION PRELOAD

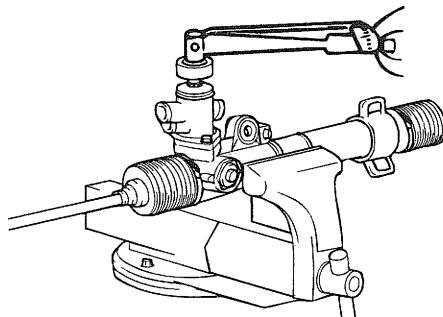
1. Rotate the pinion gear for approximately 4-6 seconds for one rotation to measure the total pinion preload.

Standard value

Total pinion preload : 0.06-0.13 kg·m

⚠ NOTE

Measure the pinion preload through the entire stroke of the rack.



KPNB220C

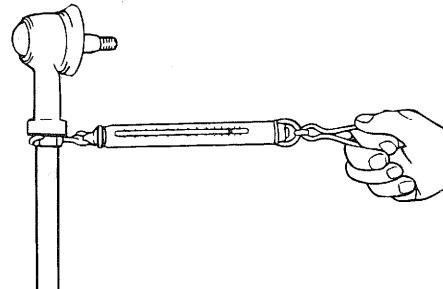
2. If the measured value is out of the standard value, adjust the yoke plug and then recheck the total pinion preload.
3. After re-checking the total pinion preload, if the value is still out of the standard value, inspect or replace the yoke plug components.

TIE ROD SWING RESISTANCE

1. Rotate the tie rod severely ten times.
2. Measure the tie rod swing resistance with a spring scale.
3. If the measured value exceeds the standard value, replace the tie rod assembly.

⚠ CAUTION

Even if the measured value is below the standard value, the tie rod that swings smoothly without excessive play may be used. If the measured value is below 0.44kg·m replace the tie rod.



EPKB200A

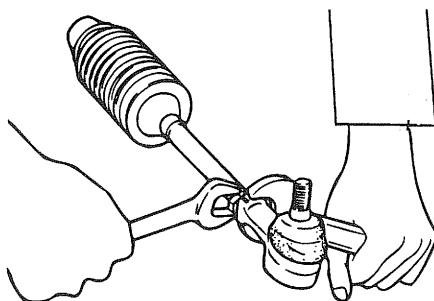
BELLOWS INSPECTION

1. Inspect the bellows for damage or deterioration.
2. Make sure the bellows are secured in the correct position.
3. If the bellows are defective, replace them with new ones.

DISASSEMBLY

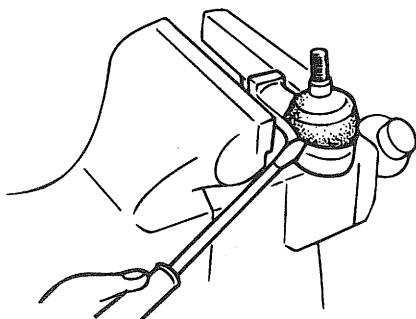
EPNC2400

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



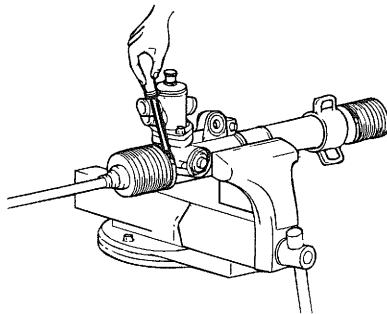
EPA9013F

2. After mounting the tie rod end in a vise, remove the dust cover from the ball joint.



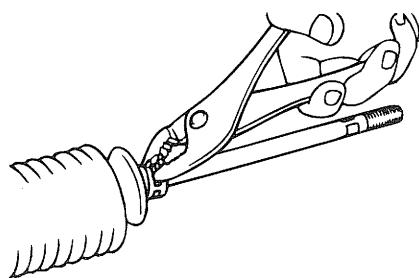
EPA9013G

3. Remove the bellows band.



KPNB240A

4. Remove the bellows clip.



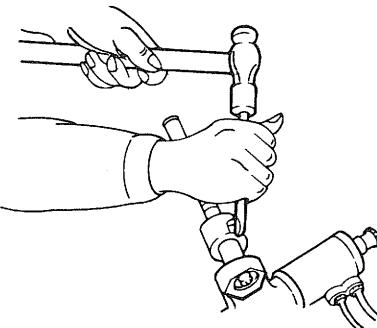
EPA9013I

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

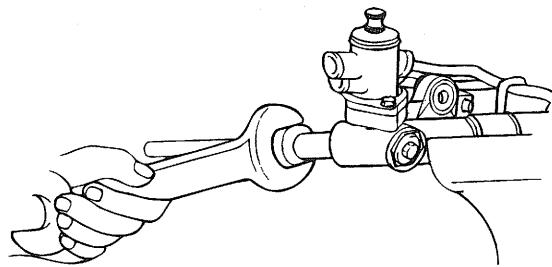


KPKA037A

9. Remove the tie rod from the rack.

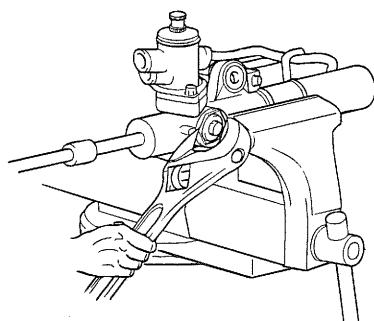
CAUTION

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



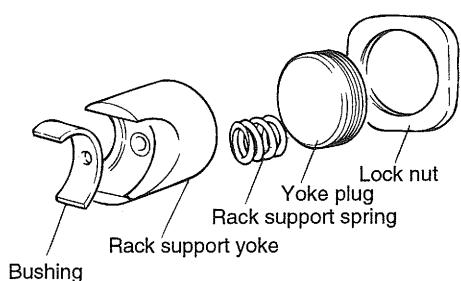
KPNB240B

10. After removing the yoke plug locking nut, remove the yoke plug.



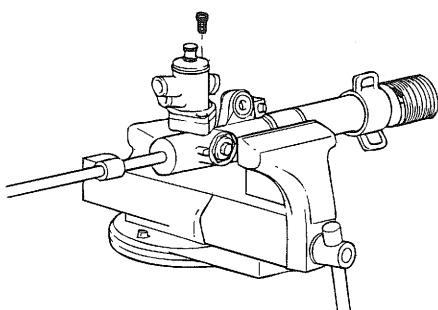
KPKA039A

11. Remove the lock nut, yoke plug, rack support spring, rack support yoke and bushing from the gear box.



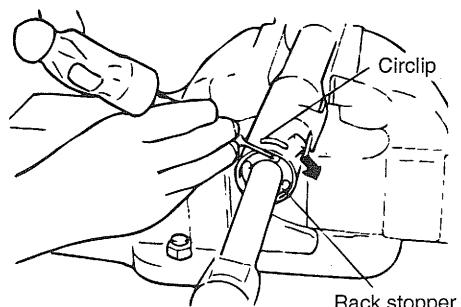
EPA9013N

12. Remove the valve body housing by loosening the two bolts.



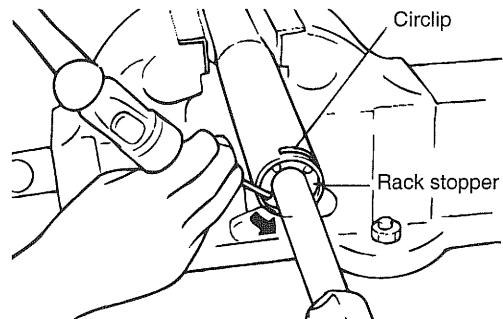
KPNB240C

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



EPA9013Q

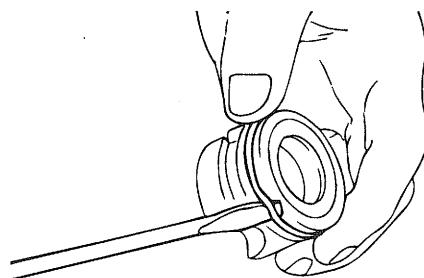
14. When the end of the circlip comes out of the notched hole of the housing rack cylinder, turn the rack stopper counterclockwise and remove the circlip.



EPA9013R

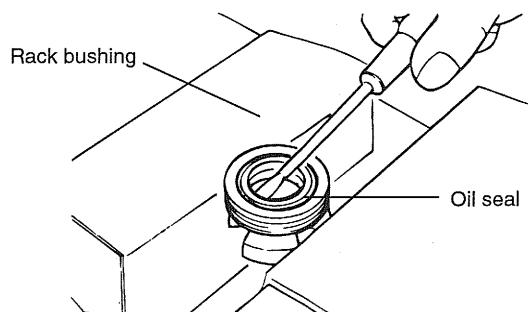
15. Remove the rack stopper, rack bushing and rack from the rack housing.

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



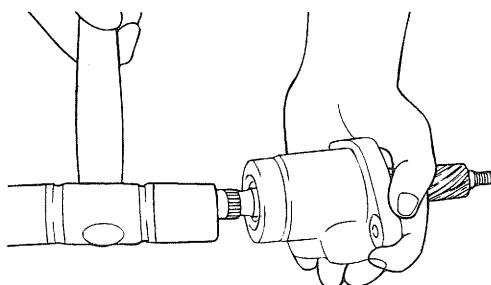
EPA9013T

17. Remove the oil seal from the rack bushing.



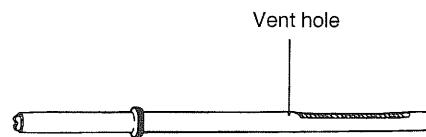
EPA9013U

18. Remove the valve body from the valve body housing with a soft hammer.



EPKB210A

5) Check the oil seal for damage or wear



EPA9014E

19. Using the special tool, remove the oil seal and ball bearing from the valve body housing.

20. Remove the oil seal and O-ring from the rack housing.



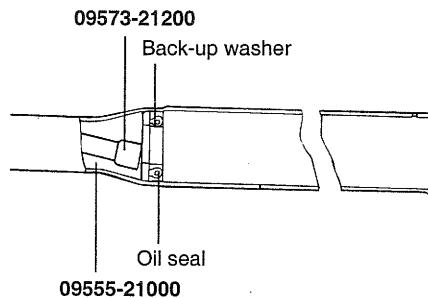
CAUTION

Be careful not to damage the pinion valve cylinder bore of the rack housing.

21. Using the special tool, remove the oil seal from the rack housing.



Be careful not to damage the rack cylinder bore of the rack housing.

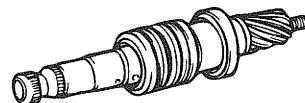


EPKB210B

EPA9013Z

2. Pinion valve

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



3. Bearing

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

4. Others

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

INSPECTION

EPNC2500

1. Rack

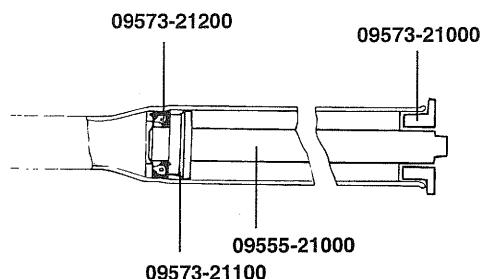
- 1) Check the rack tooth face for damage or wear
- 2) Check the oil seal contact surface for damage
- 3) Check the rack for bending or twisting
- 4) Check the oil seal ring for damage or wear

REASSEMBLY EPNC2600

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

Recommended fluid : PSF-3

2. Install the oil seal to the specified position in the rack housing.

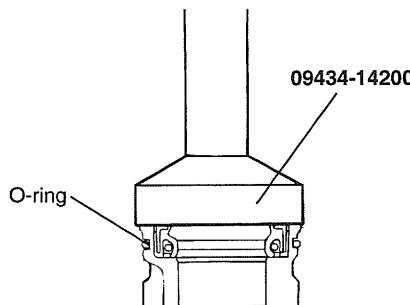


EPKB230A

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

Recommended fluid : PSF-3

4. Install the oil seal in the rack bushing.



EPKB230B

5. Apply the specified fluid to the entire surface of the O-ring and install it in the rack bushing.

6. Apply the specified grease to the rack teeth.

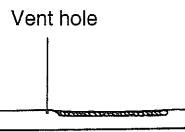
Recommended grease :

Multipurpose grease SAE J310 NLGI No.2EP

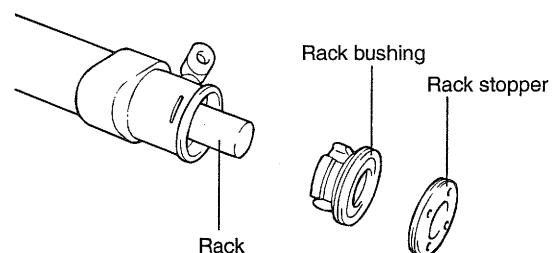


CAUTION

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



7. Insert the rack into the rack housing and install the rack bushing and rack stopper.



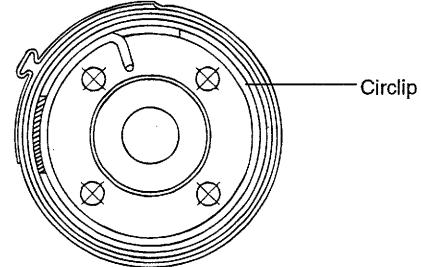
EPA9014E

8. Push in the rack stopper until the circlip groove of the rack stopper is aligned with the notched hole of the rack housing and install the circlip by turning the rack stopper.



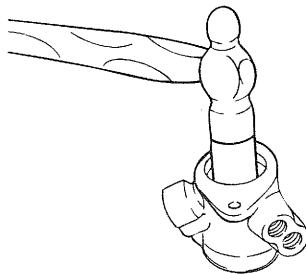
CAUTION

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



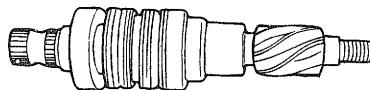
EPNC260B

9. Using the special tool, install the oil seal and the ball bearing in the valve body housing



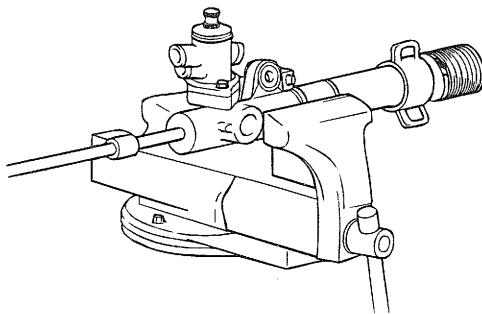
EPKB230D

10. After applying the specified fluid and grease to the pinion valve assembly, install it in the rack housing assembly.



EPKB230E

11. After applying the specified fluid to the oil seal, install it in the rack housing, and fix the valve body assembly and O-ring in the gear box.

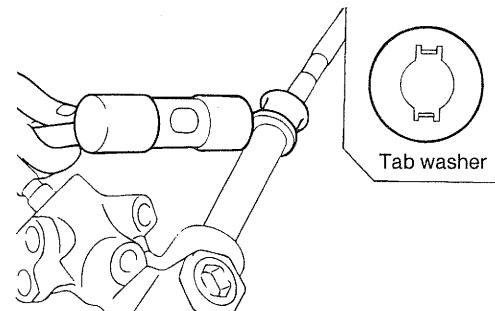


KPNB260A

12. Install the tab washer and the tie rod and plug the tab washer end at two points of the tie rod.

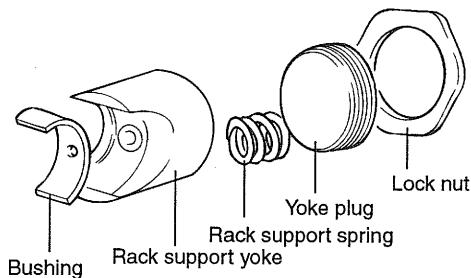
 **NOTE**

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



EPKB230F

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

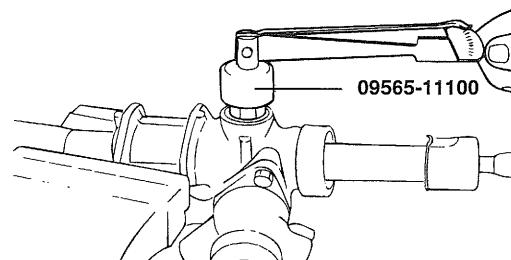


EPKB230K

14. With the rack placed in the center position, attach the yoke plug to the rack housing. Tighten the yoke plug to 15 Nm (150 kg·cm, 11 lb·ft), using the special tool. Loosen the yoke plug approximately from 30° to 60° and tighten the locking nut to the specified torque.

Tightening torque

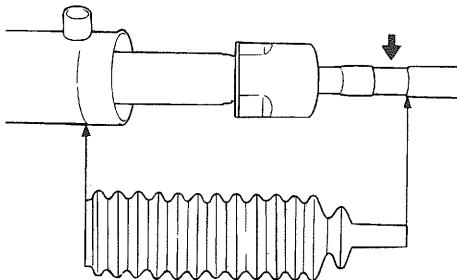
50-70 Nm (500-700 kg·cm, 37-52 lb·ft)



EPNC260C

15. Tighten the feed tube to the specified torque and install the mounting rubber using adhesive.
16. Apply the specified grease to the bellows mounting position (fitting groove) of the tie rod.

Recommended grease : Silicone grease



EPKB230H

17. Install the new attaching band to the bellows.



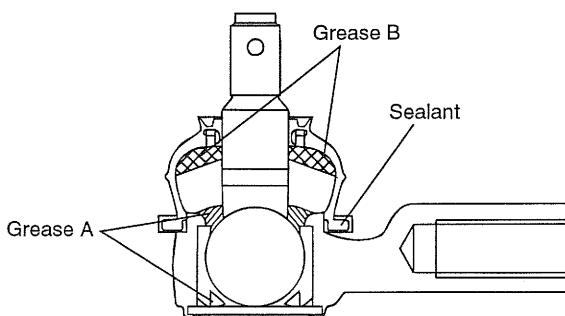
When the bellows are installed, a new band must be used.

18. Install the bellows in the exact position, taking care not to twist it.
19. Fill the dust cover inner side and lip with the specified grease, and fix the dust cover in position with the clip ring attached in the groove of the tie rod end.

Recommended grease

A : POLY LUB GLY 801K or equivalent
B : SHOWA SUNLIGHT MB2 or equivalent

Dust cover inner side and lip : THREE BOND

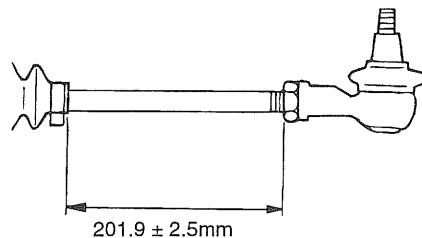


KPKA043A

20. Install the tie rods so that the length of the left and right tie rods meets the standard value.

Standard value

Tie rod free length : $201.9 \pm 2.5\text{mm}$



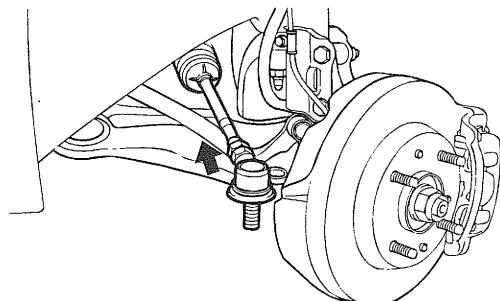
EPNC260A

21. Check for total pinion preload.

INSTALLATION

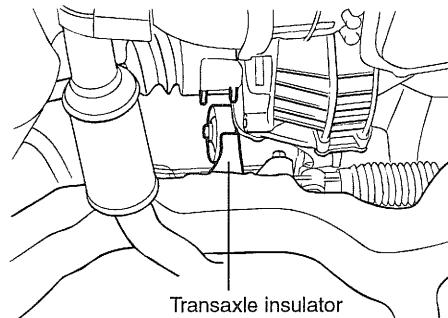
EPNC2700

1. Push in the power steering gear box assembly on the right side of the vehicle.



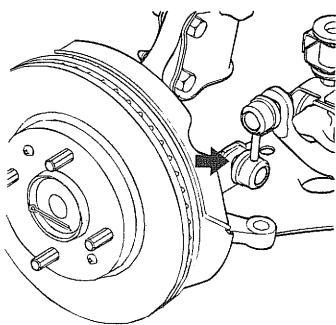
KPNB210K

2. Fix the power steering gear box assembly to the crossmember.
3. Fix the transaxle mounting insulator to the crossmember.



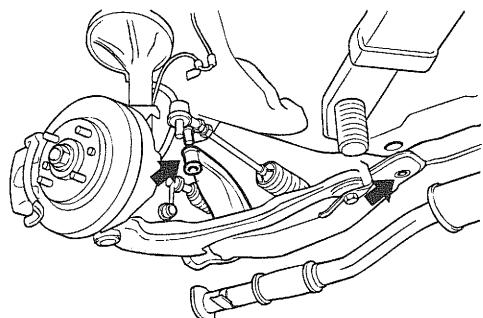
EPNC210A

4. Fix the stabilizer bar (LH/RH sides) to the link.



KPNB210C

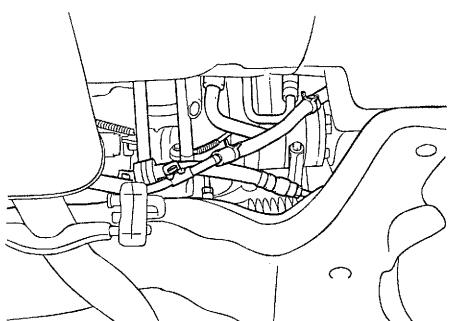
5. Install the crossmember (LH/RH sides) to the body.



KPNB210E

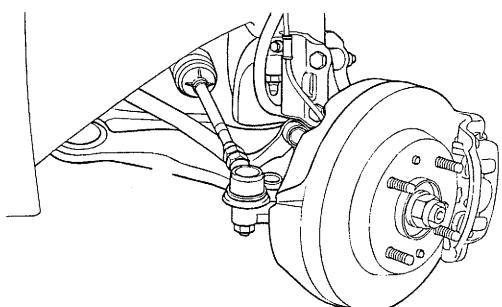
6. Fix the transaxle mounting insulator to the crossmember.

7. Install the return hose and the pressure hose.



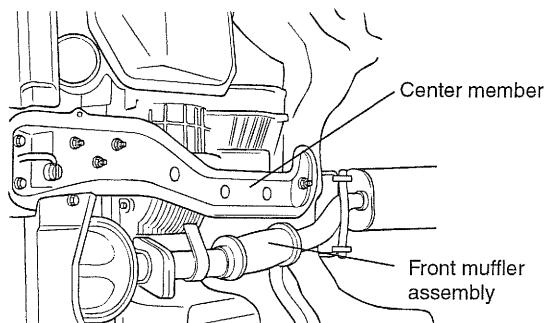
KPNB210B

8. Fix the tie rod end (LH/RH sides) to the knuckle.



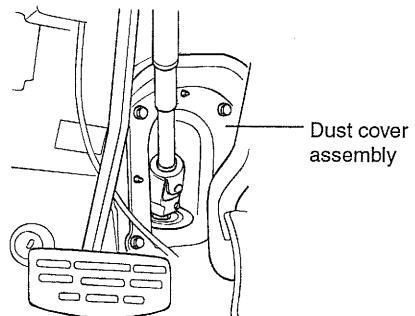
KPNB210I

9. Install the front muffler assembly and the center member.



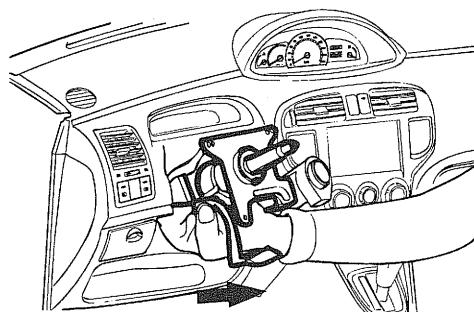
EPNC210C

10. Install the dust cover assembly.



EPNC270A

11. Connect the steering gear box in the driver's seat side with the universal joint.



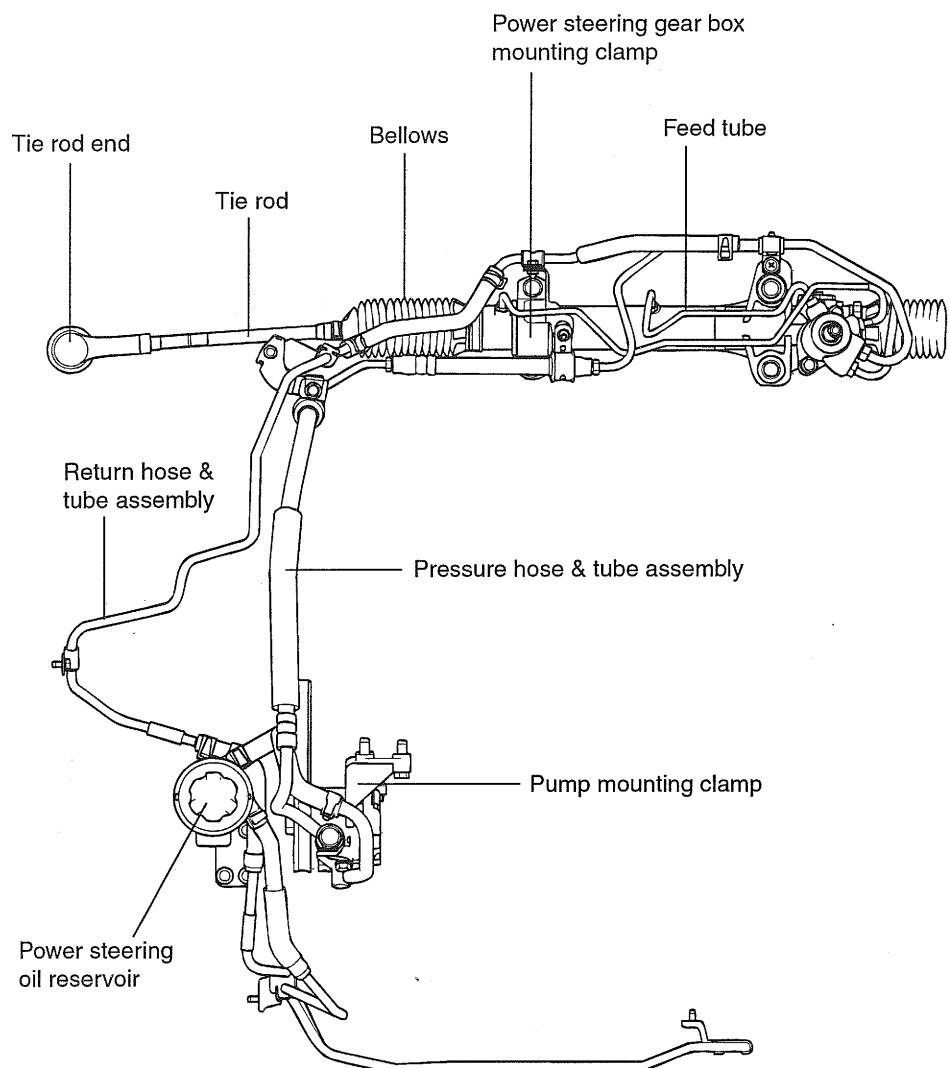
KPNB160I

12. After applying the power steering fluid, air-bleed the system.

POWER STEERING HOSES

COMPONENTS

EPNC2800



EPNC280A

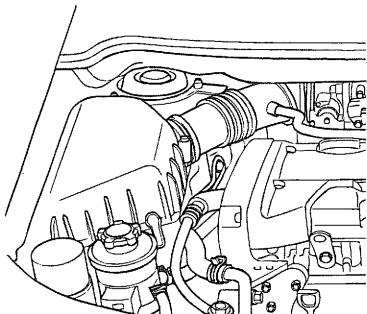
REMOVAL AND INSTALLATION

EPNC2900

While installing the tube and hose assembly, be sure to align painting marks on each fitting.

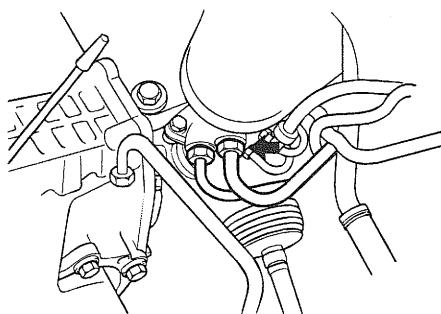
PRESSURE HOSE AND TUBE

1. Remove the air intake hose and air cleaner.



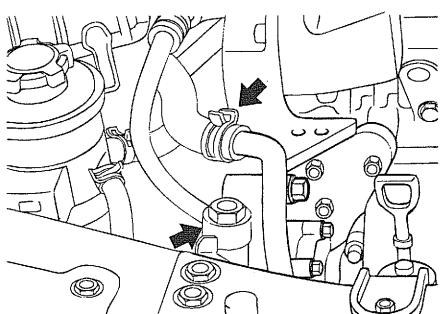
KPNB290A

2. Remove the pressure hose mounting clamp.
3. Lift up the vehicle and remove the pressure tube and the return tube mounting clamp.
4. Disconnect the pressure tube fittings from the gear box.



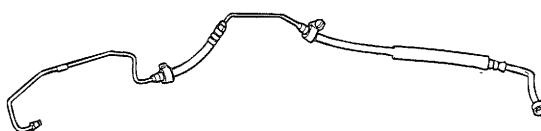
KPNB290D

5. Lower the vehicle and remove the connector.



KPNB090C

6. Remove the pressure hose and tube assembly



KPNB290B

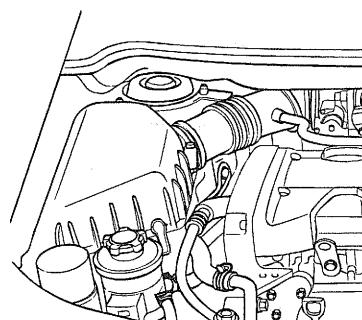
7. Installation is the reverse of removal.

NOTE

1. When installing hoses and tubes, be careful not to twist or come in contact with any other parts.
2. After installation, air bleed the system.

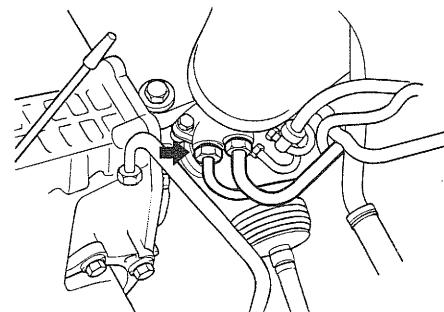
RETURN TUBE AND HOSE

1. After removing the air intake hose and air cleaner, detach the power steering fluid reservoir from the mounting bracket.



KPNB290A

2. Remove the return tube and hose mounting clamps.
3. Lift up the vehicle and remove the pressure tube and the return tube mounting clamp.
4. Disconnect the return tube fittings from the gear box.



KPNB290E

5. Lower the vehicle and disconnect the return tube and hoses.
6. Installation is the reverse of removal.

 **NOTE**

1. When installing hose and tubes, be careful not to twist or come in contact with any other parts.
2. After installation, air bleed the system.

INSPECTION EPNC3000

1. Twisting the hose by hand, check for cracks.
2. Check that the hose does not contact other components

HOW TO FILL WITH POWER STEERING FLUID

1. Fill the power steering reservoir with power steering fluid to the "Max." mark.
2. Lift the front wheels with a jack and turn the steering wheel fully to the left and right 5-6times while driving the pulley only by operating the start motor with the engine stopped.
3. Start the engine, let it idle and turn the steering wheel fully left and right several times until bubbles disappear from the power steering reservoir.
4. If the oil color does not become milk-white and the oil level is constant at the "MAX" mark, fluid level is O.K.

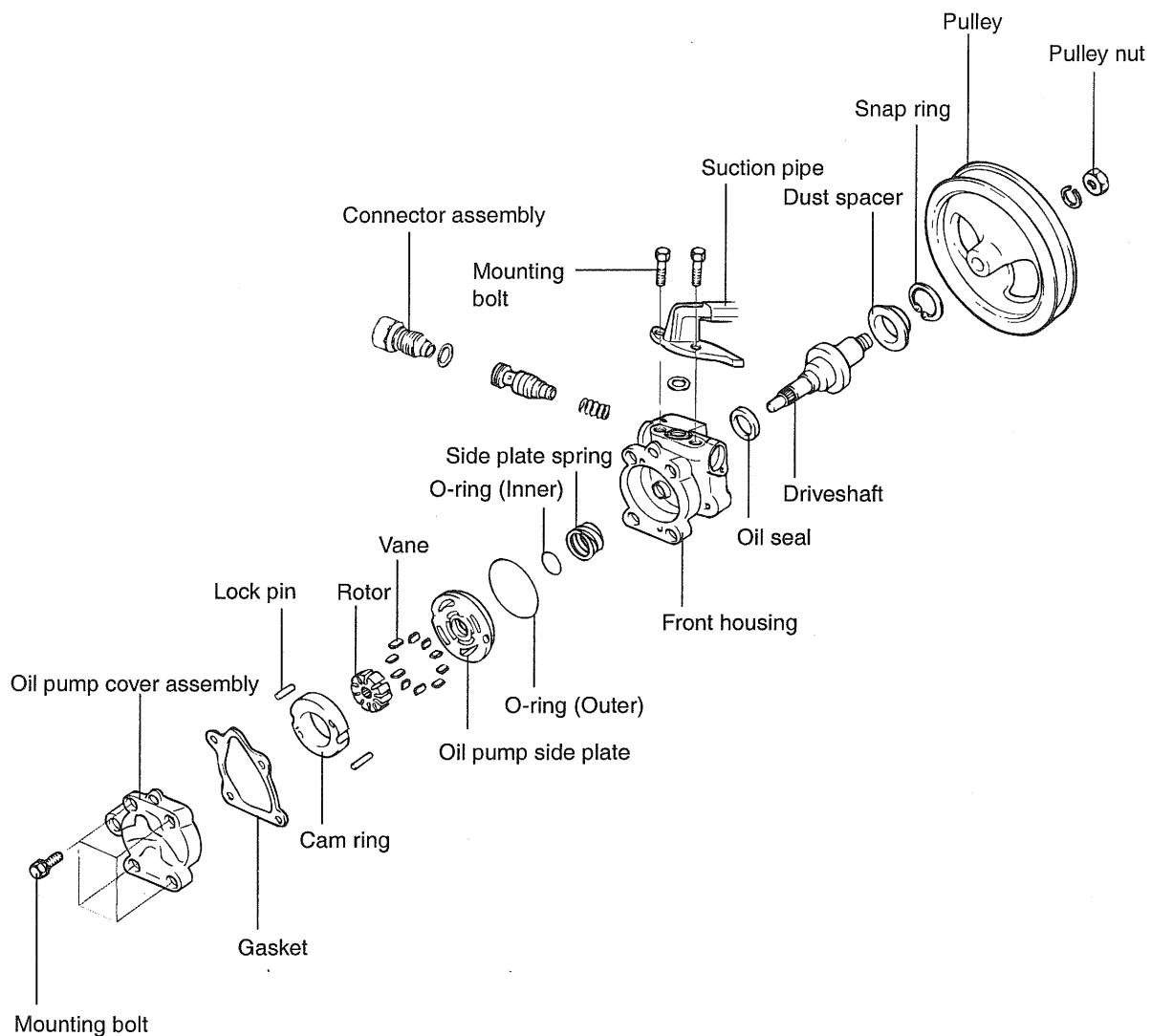
 **CAUTION**

If the oil level changes when turning the steering wheel, and the oil overflows when stopping the engine, it shows that air bleeding wasn't performed perfectly. As it can cause noise or early damage, you must repeat the above procedures.

POWER STEERING OIL PUMP

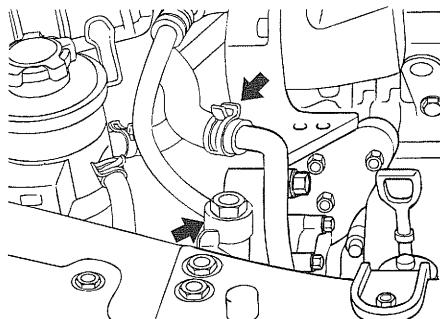
COMPONENTS

EPKB2700



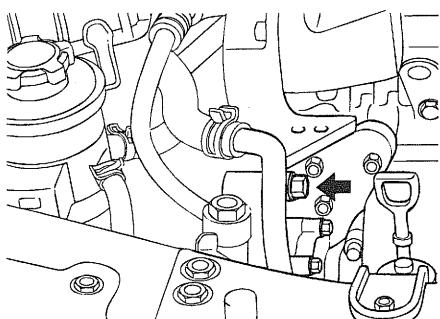
REMOVAL EPNC3200

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



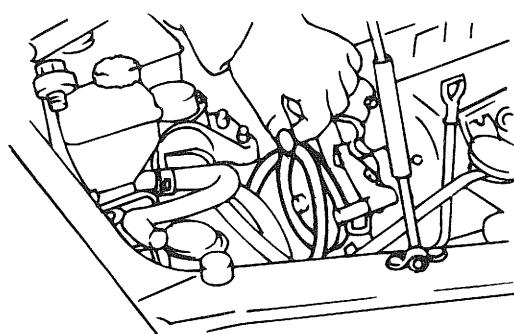
KPNB090C

2. Loosen the power steering V-belt tension adjusting bolt.



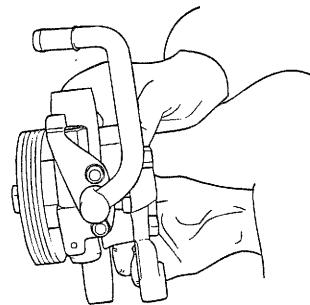
KPKA049A

3. Remove the V-belt from the power steering oil pump pulley.



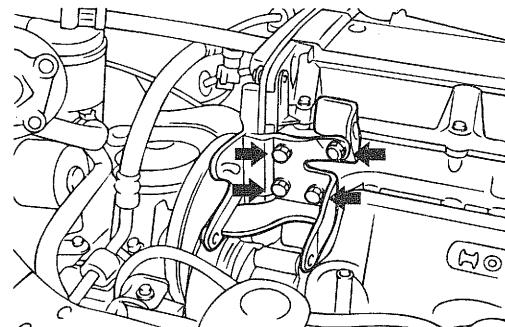
KPKA047A

4. After loosening the power steering oil pump mounting bolts and the tension adjusting bolt, remove the power steering oil pump assembly.



KPNB320C

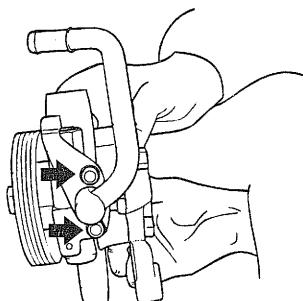
5. Remove the power steering oil pump mounting bracket.



KPKA049B

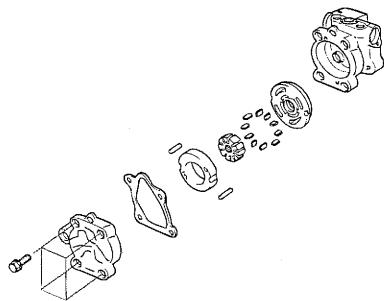
DISASSEMBLY EPNC3300

1. After removing the two bolts from the oil pump body, remove the suction pipe and the O-ring from the oil pump.

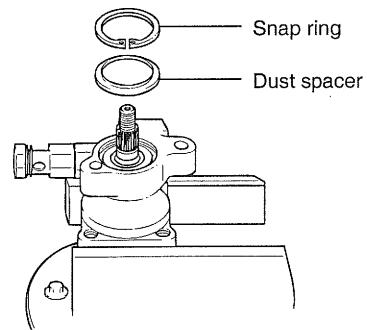


KPNB320D

2. Loosen the four bolts and remove the oil pump cover assembly.
3. Remove the cam ring.
4. Remove the rotor and vanes.
5. Remove the oil pump side plate.



KPKA046A

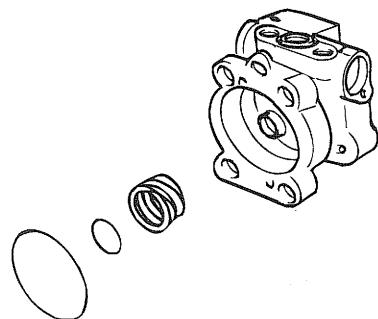


KPKA057A

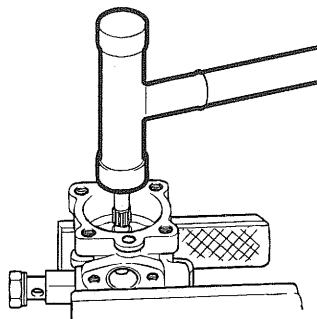
6. Remove the inner and outer O-ring.
7. Remove the side plate spring.

 **NOTE**

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

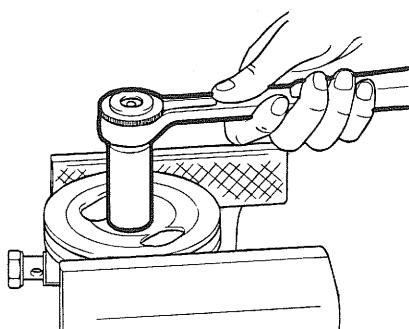


KPKA055A

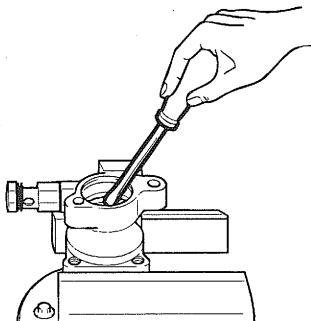


KPKA058A

8. Mount the pulley in a vise and remove the pulley nut and the spring washer.



KPKA056A



KPKA059A

9. Pull the pulley out.
10. After removing the snap ring of the shaft using a pair of snap ring pliers, remove the dust spacer.

11. Tap the rotor side of the shaft slightly with a plastic hammer to remove the shaft.

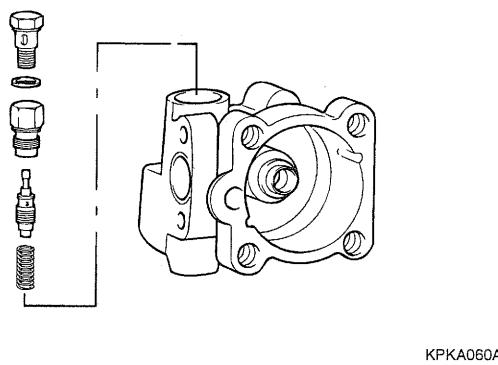
12. Remove the oil seal from the oil pump body.

 **CAUTION**

Do not disassemble the flow control valve.

13. Remove the connector from the oil pump body, and take out the flow control valve and the flow control spring.

14. Remove the O-ring from the connector.

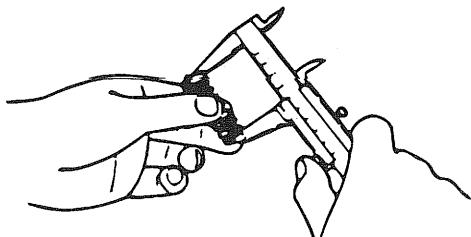


INSPECTION

EPNC3400

1. Check the free length of the flow control spring.

Free length of the flow control spring : 36.5mm



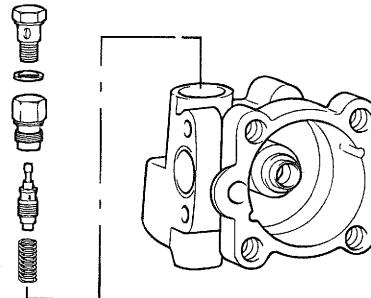
KPKA068A

2. Check the flow control valve for bending.
3. Check the shaft for wear and damage.
4. Check the V-belt for wear and deterioration.
5. Check the grooves of the rotor and vanes for stratified abrasion.
6. Check the contact surface of the cam ring and vanes for stratified abrasion.
7. Check vanes for damage.
8. Check that there is no striped wear in the side plate or in the contact part between the shaft and the pump cover surface.

REASSEMBLY

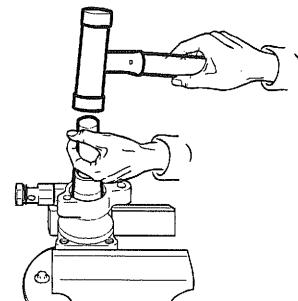
EPNC3500

1. Install the flow control spring, flow control valve and connector to the pump body.



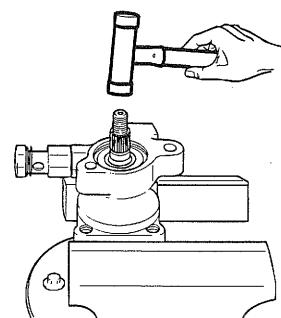
KPKA060A

2. Install the oil seal in the pump body by using the special tool.

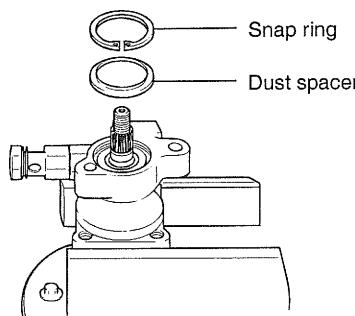


KPKA061A

3. After inserting the shaft assembly into the pump body smoothly, install the dust spacer and snap ring.

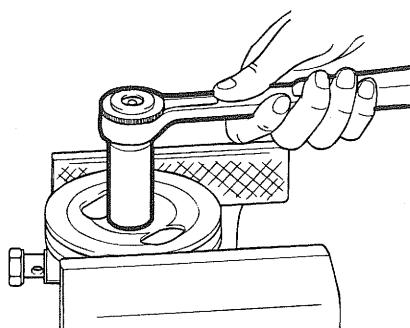


KPKA062A



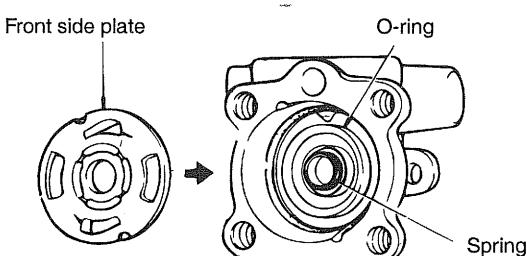
KPKA057A

4. Install the pump pulley.



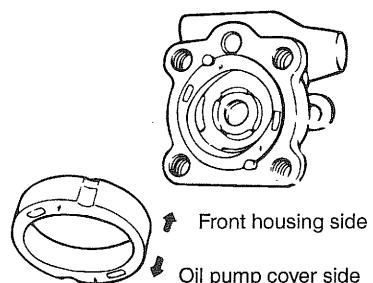
KPKA056A

5. Install the spring and inner O-ring.
 6. Insert the outer O-ring in the oil pump side plate and then install it in the pump body.



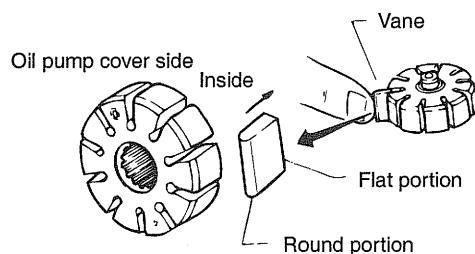
EPKB300A

7. After inserting the lock pin into the groove of the front housing, install the cam ring taking care to the direction.



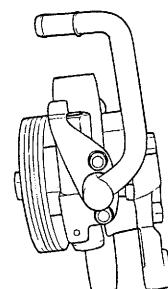
EPKB300B

8. Install the rotor.
 9. Install vanes letting the rounded portions face outward.



EPKB300C

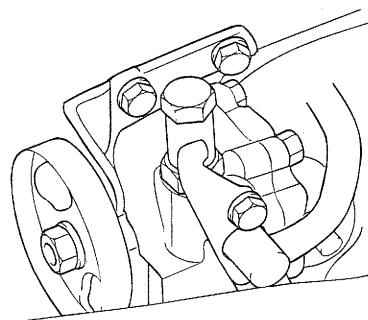
10. Install the gasket and oil pump cover assembly.
 11. Install the suction pipe and O-ring.



KPNB350A

INSTALLATION EPNC3600

1. After installing the oil pump to the oil pump bracket, install the "V" belt and tighten the tension adjusting bolt to the specified torque.



KPNB360A

2. Install the suction hose.

Oil pump adjusting bolt

1.6DOHC : 2.5-3.3

1.8DOHC : 3.5-5.0

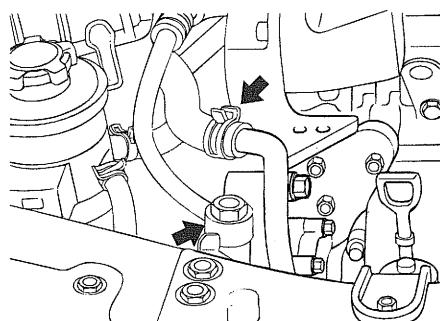
CAUTION

When installing, left the painting mark on hose face the oil pump.

3. Install the pressure hose to the oil pump.

NOTE

When installing the pressure hose, be careful not to twist or come in contact with other components.



KPNB090C

4. Apply the power steering fluid (PSF-3).

5. Air bleed the system.

6. Check the oil pump pressure.