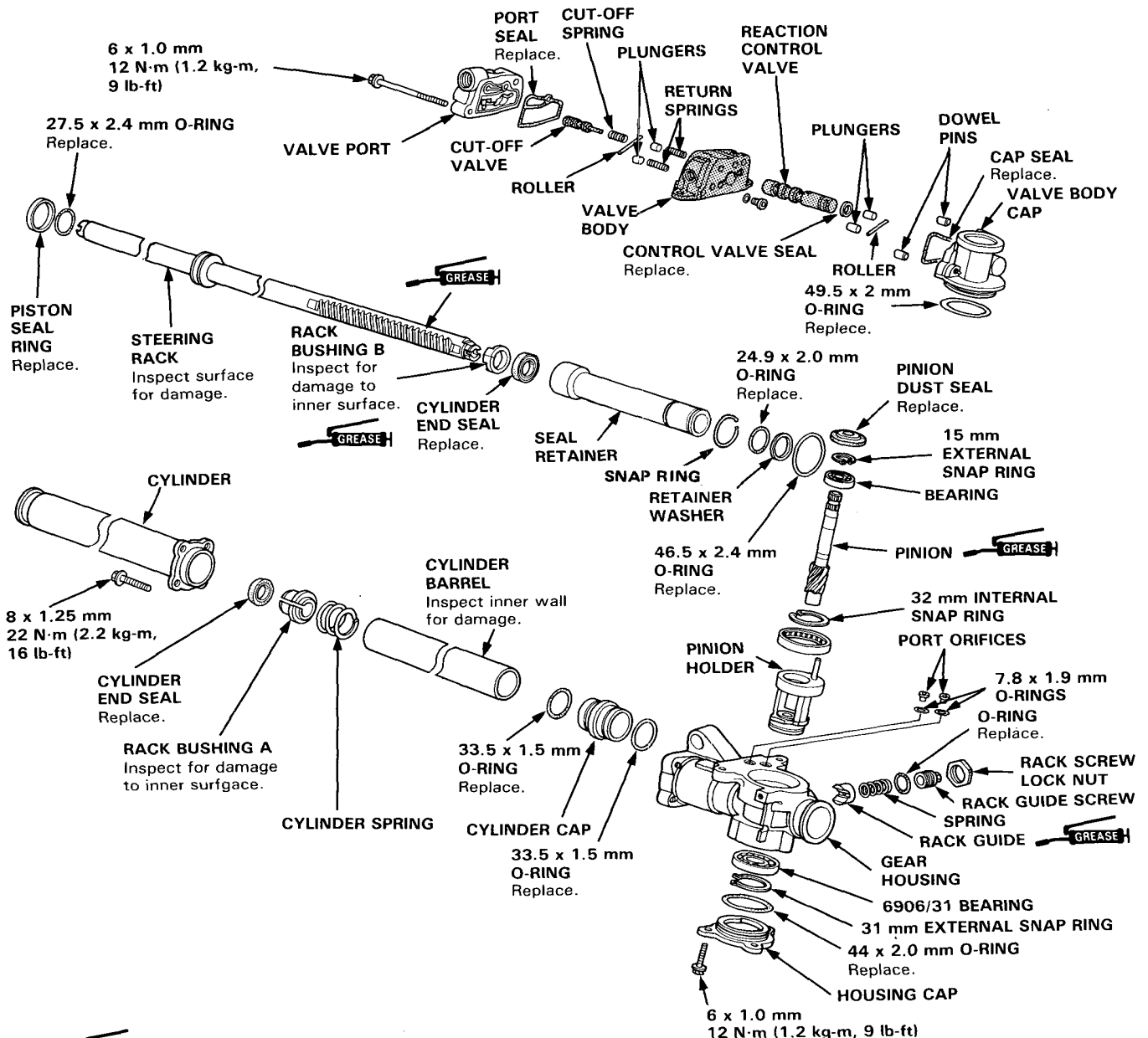


## Gearbox

## Index

**CAUTION:**

- Before disassembling the gearbox, wash it off with solvent.
- Thoroughly clean all disassembled parts.
- Always replace O-rings and seals.
- Replace parts with damaged sliding surfaces.
- Do not dip seals and O-rings in solvent; coat O-rings with grease, and make sure they stay in position during reassembly.
- The shaded parts (valve body, reaction control valve, cut-off valve) are a matched set; if the valve body is faulty, replace the complete valve body unit.



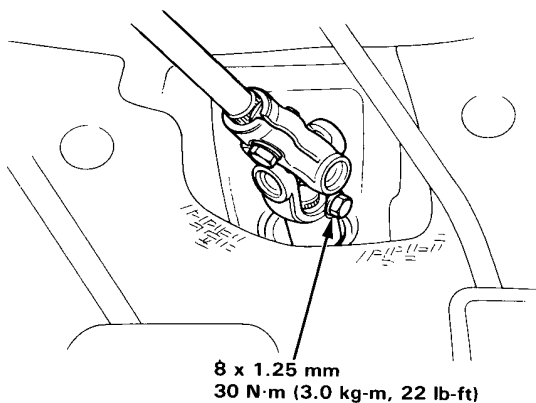
**GREASE** STEERING GREASE...Honda parts number 08740-99969

NOTE: L/H shown, R/H is symmetry.

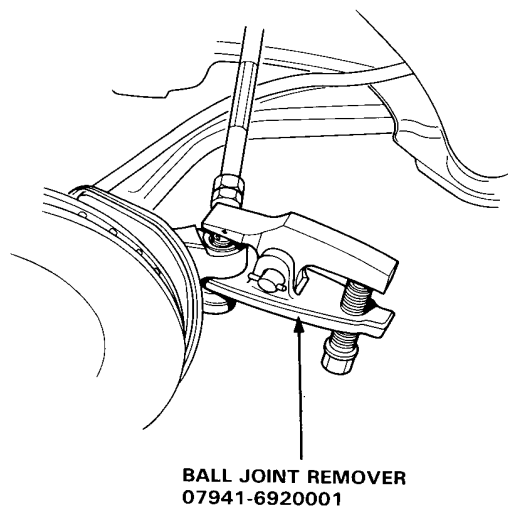


## Removal/Installation

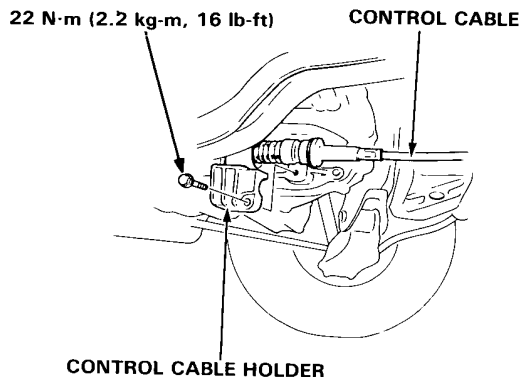
1. Turn the steering wheel all the way to the left.
2. Remove the bottom bolt in the steering shaft connector, and pull the connector up off the pinion shaft.



3. Drain the power steering fluid as described on 19-11.
4. Raise the front of car on jack stands and remove the front wheels.
5. Remove the cotter pins, and unscrew the tie-rod end ball joint nuts halfway.
6. Break the ball joints loose using the Ball Joint Remover.
7. Then, remove the nuts, and lift the tie-rod ends out of steering knuckles.



8. Manual Transmission Only:
  - Disconnect the shift lever torque rod from the clutch housing.
  - Slide the pin retainer out of way, drive out the spring pin with pin punch, then disconnect the shift rod.
9. Honda matic Transmission Only:
  - Remove the shift cable holder and pull the shift cable down by hand.

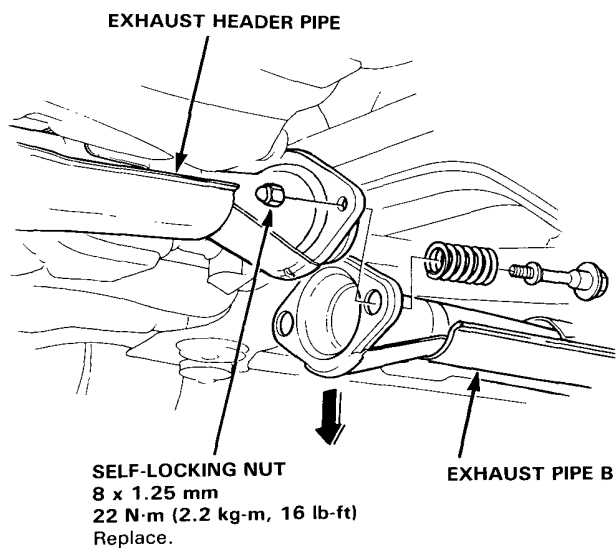


(cont'd)

# Gearbox

## Removal/Installation (cont'd)

9. Remove the self-locking nuts connecting the exhaust header pipe to exhaust pipe B, then separate exhaust pipe B from the header pipe.



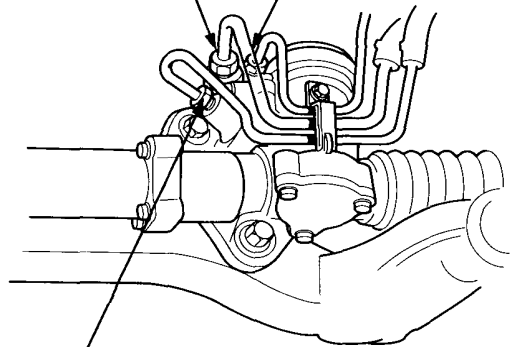
10. Remove exhaust pipe B.

11. Clean the gearbox and surrounding area thoroughly.

12. Disconnect fluid lines from the valve body unit.

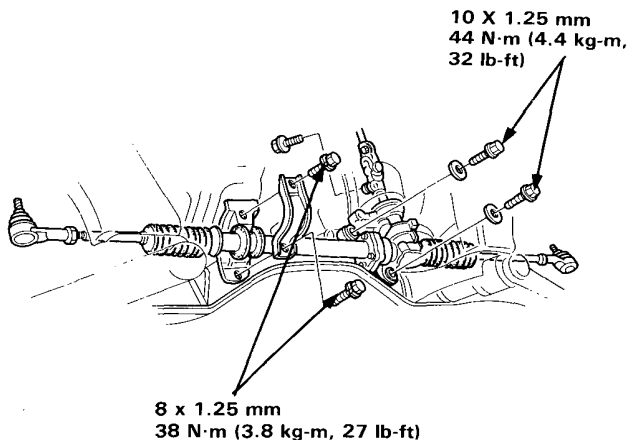
to COOLER PIPE  
USE 17 mm WRENCH  
33 N·m (3.3 kg-m, 24 lb-ft)

from PUMP  
use 14 mm WRENCH  
38 N·m (3.8 kg-m, 27 lb-ft)

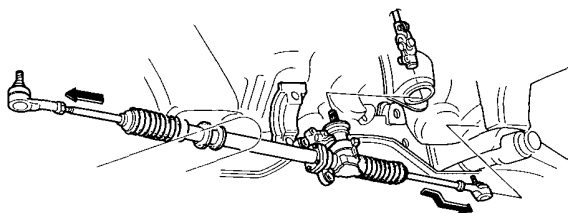


to PUMP RESERVOIR  
use 12 mm WRENCH  
13 N·m (1.3 kg-cm, 9 lb-ft)

13. Remove the gearbox mounting bolts.



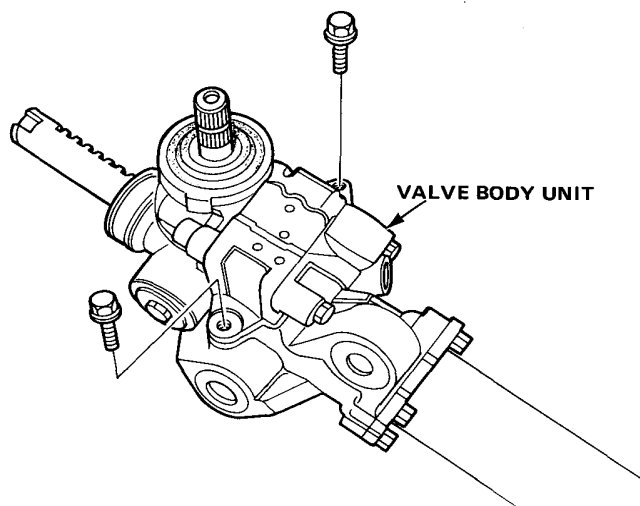
14. Drop the gearbox far enough so the end of the pinion shaft comes out of its hole in the frame channel, then rotate it forward until the shaft is pointing to the rear. Slide the gearbox to the right (L/H) or left (R/H) until the left (L/H) or right (R/H) tie rod clears the rear beam, then drop it down and out of the car to the left.



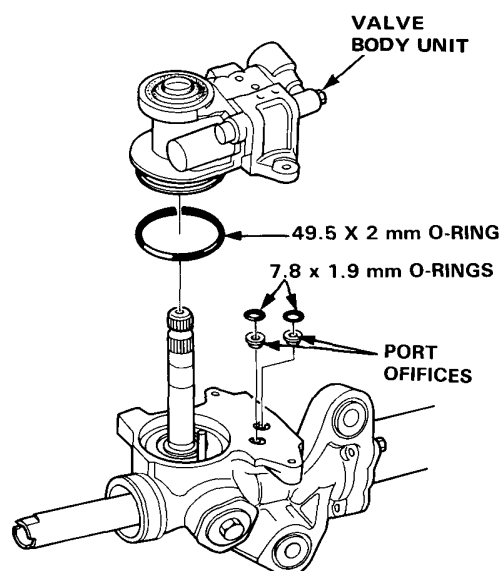
15. Gearbox installation is in the reverse order of removal.

## Valve Body Unit Disassembly

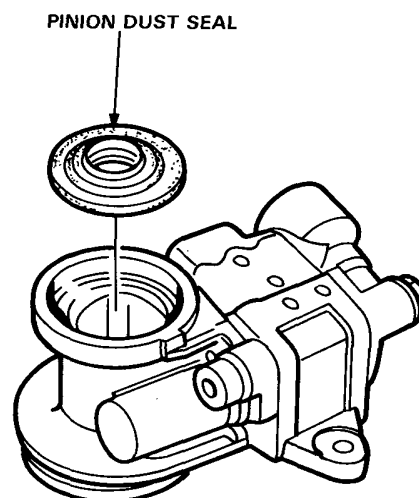
1. Remove the two 6 mm bolts holding the valve body unit to the gear housing.



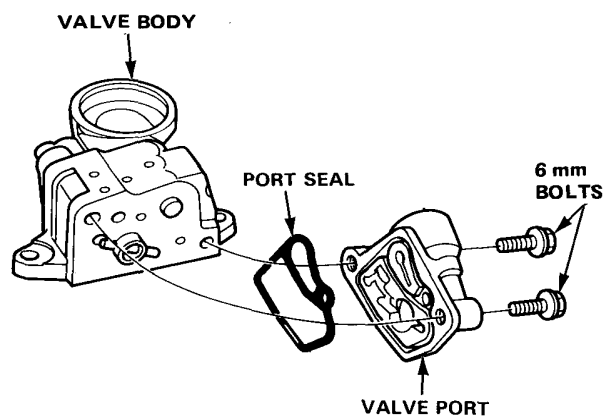
2. Remove the 7.8 x 1.9 mm O-rings and port orifices from the gear housing.
3. Remove the 49.5 x 2 mm O-ring from the valve body unit.



4. Remove the pinion dust seal from the valve body unit.



5. Remove the two 6 mm bolts and remove the valve port from the valve body.
6. Remove the port seal.

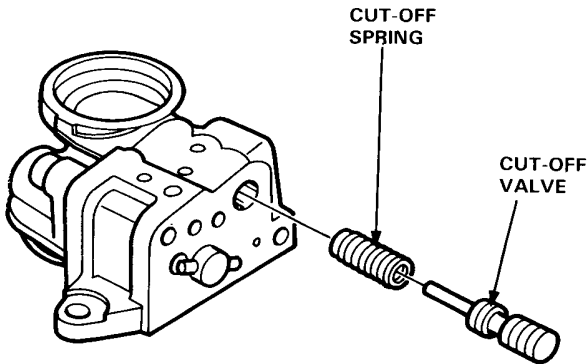


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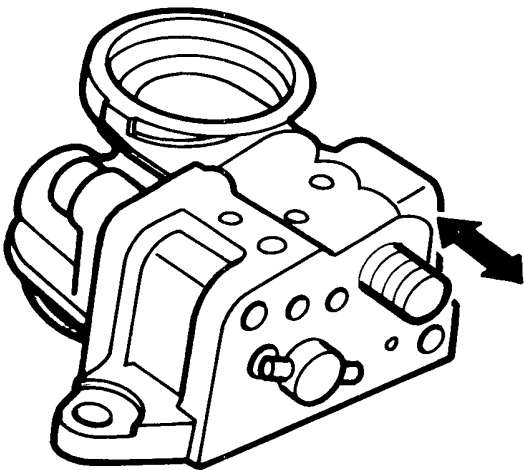
# Gearbox

## Valve Body Unit Disassembly (cont'd)

7. Remove the cut-off valve and spring from the valve body.

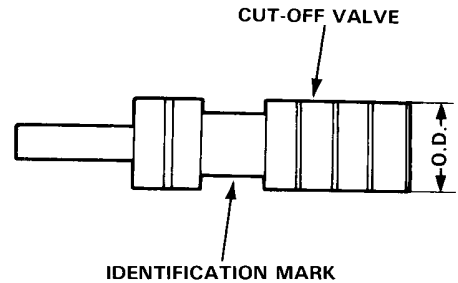


8. Check the cut-off valve:
- Inspect its surface for scoring or scratches.
  - Slip it back into the valve body, and make sure it slides smoothly without drag and without side play.



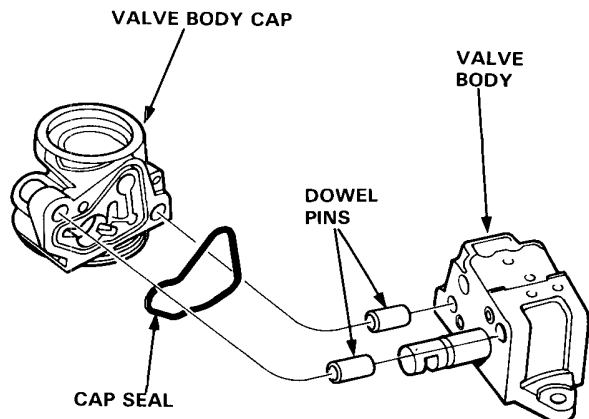
### NOTE:

- The cut-off valve is sized to fit the valve body, so, if you replace it, make sure the new valve has the same identification mark on it.
- If the valve body is damaged, replace the valve body unit as a set.



Identification Mark	Outside Diameter	Part Number
A	10.000–10.005 mm (0.3937–0.3939 in.)	53650–SB4–950
B	9.995–10.000 mm (0.3935–0.3937 in.)	53651–SB4–950
C	9.990–9.995 mm (0.3933–0.3935 in.)	53652–SB4–950

9. Remove the valve body cap from the valve body.
10. Remove the cap seal.
11. Remove the dowel pins.

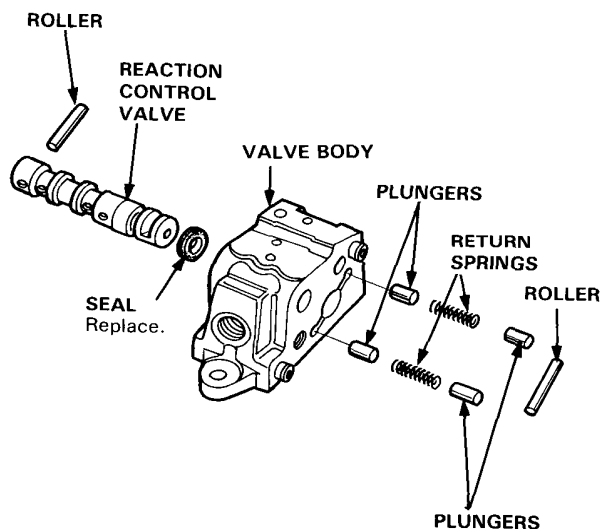


12. Remove the rollers from the valve body by pushing the valve out one side of the valve body, and then the other.

NOTE: When removing the rollers, hold the plungers with your fingers to keep them from popping out.

13. Remove the plungers, return springs and reaction control valve.

14. Remove the control valve seal from the reaction control valve.



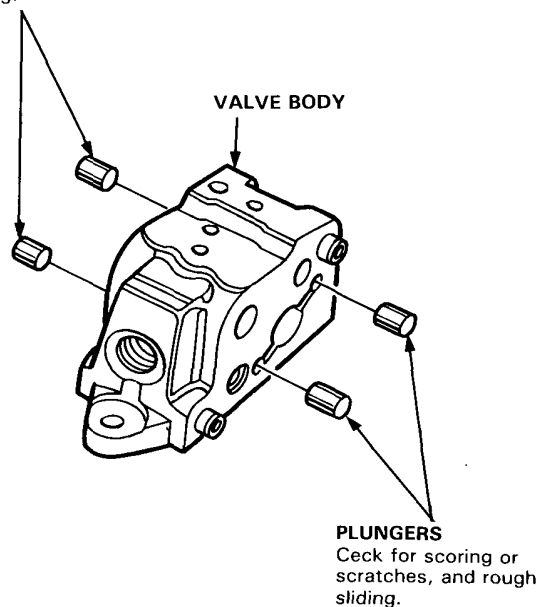
15. Check the plungers.

- Inspect their surface for scoring or scratches.
- Slip each plunger into the valve body, and make sure it slides smoothly, without drag or side play. If any plunger is damaged, replace it.

NOTE: If the valve body is damaged, replace the valve body unit as a set.

#### PLUNGERS

Check for scoring or scratches, and rough sliding.



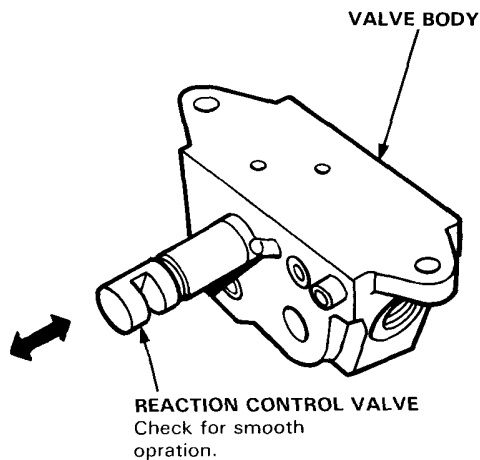
(cont'd)

# Gearbox

## Valve Body Unit Disassembly (cont'd)

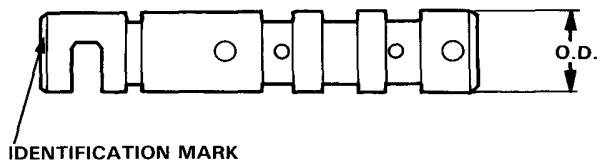
16. Check the reaction control valve.

- Inspect its surface for scoring or scratches.
- Slip it into the valve body, and make sure it slides smoothly, without drag or side play.



### NOTE:

- The reaction control valve is sized to fit the valve body, so, if you replace it, make sure the new valve has the same identification mark on it.
- If the valve body is damaged, replace the valve body unit as a set.



Identification Mark	Outside Diameter	Part Number
X	13.998 – 14.003 mm (0.5511 – 0.5513 in.)	53646 – SB4 – 950
Y	13.993 – 13.998 mm (0.5509 – 0.5511 in.)	53647 – SB4 – 950
Z	13.988 – 13.993 mm (0.5507 – 0.5509 in.)	53648 – SB4 – 950



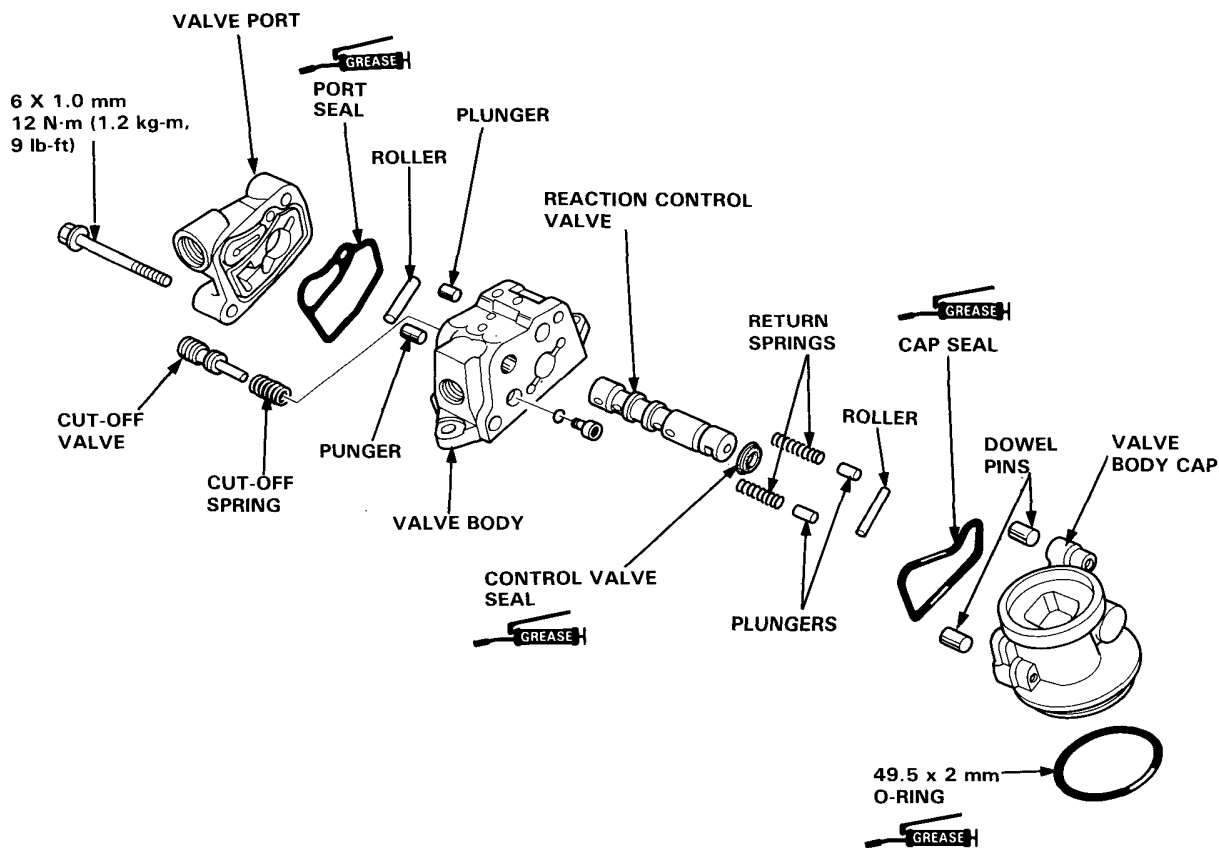
## Valve Body Unit Assembly

1. Thoroughly clean the disassembled parts shown below.
2. Coat the plungers, cut-off valve and reaction control valve surfaces with power steering fluid.
3. Reassemble the parts in reverse order of disassembly.

### CAUTION:

- Replace the O-rings and seals with new ones.
- Do not dip the O-rings and seals in solvent.
- Apply grease in the cap seal and port seal grooves to keep the seals in place.
- Apply grease to the O-ring for valve body cap and reaction control valve seal to keep them in place.

NOTE: L/H shown, R/H similar



(cont'd)

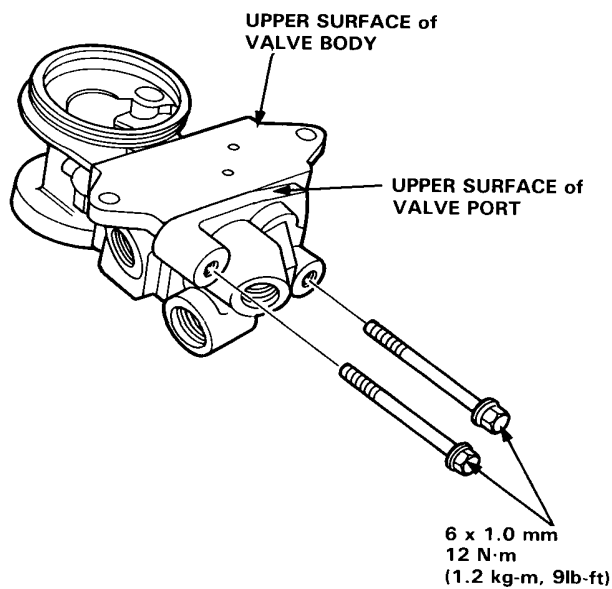


# Gearbox

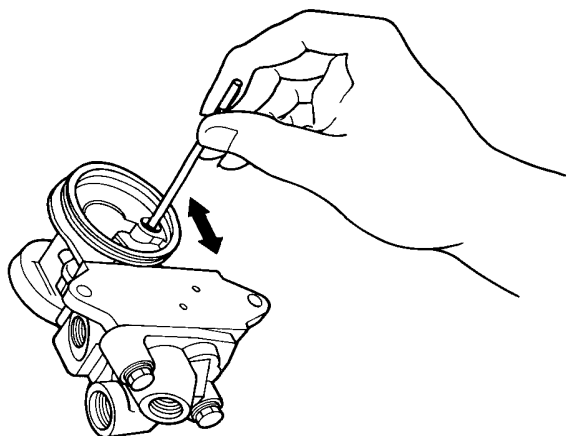
## Valve Body Unit Assembly (cont'd)

4. Tighten the 6 mm bolts in the valve body unit.

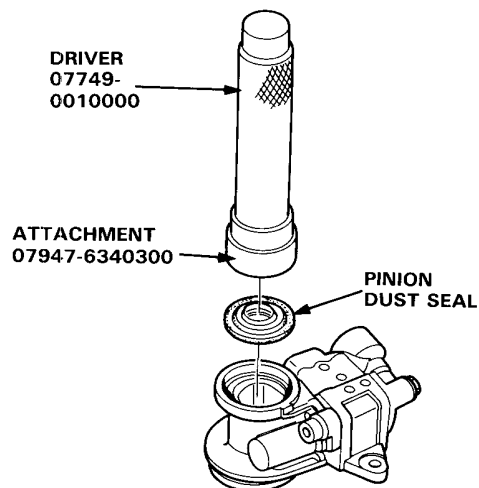
**CAUTION:** Make sure that the upper surface of the valve port does not exceed the upper surface of the valve body.



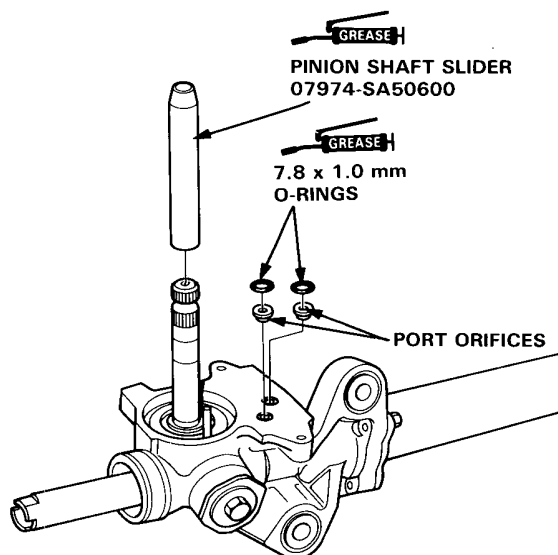
5. Make sure the reaction control valve moves smoothly, and returns to a neutral position.



6. Install the pinion dust seal with the special tool.



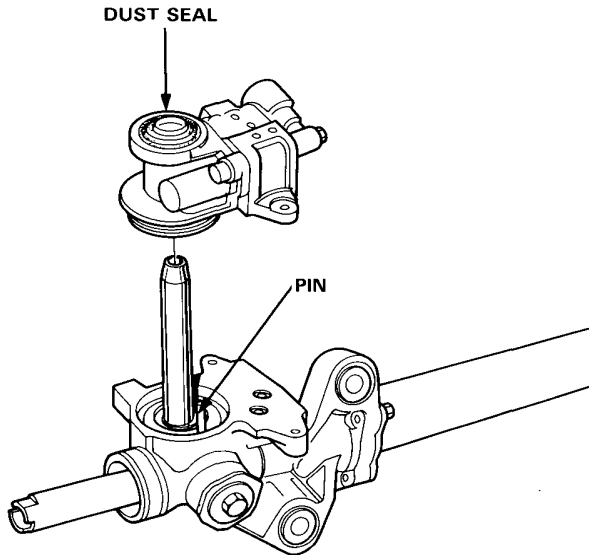
7. Apply grease in the O-ring grooves of the gear housing.
8. Install the port orifices and 7.8 x 1.0 mm O-rings.
9. Apply grease to surface of special tool and install the special tool on the pinion.



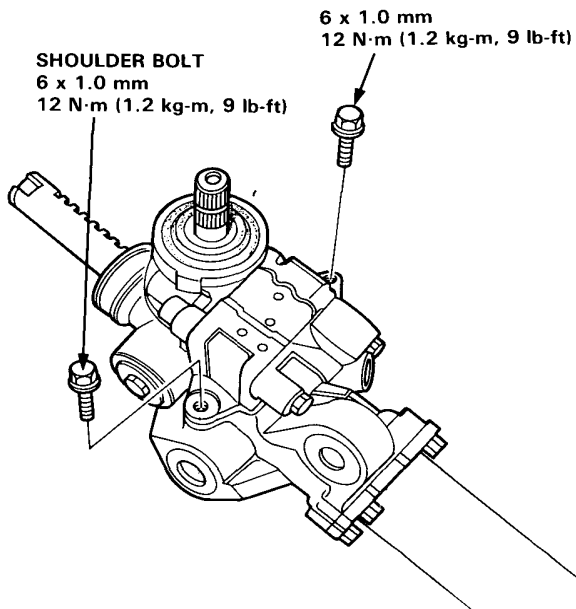
10. Install the valve body unit on the gearbox housing.

**CAUTION:**

- Be careful not to damage or distort the lip of dust seal, or it may be dislodged.
- Install the valve body unit carefully to avoid damaging the pin in the pinion holder
- Make sure the 49.5 x 2.0 mm O-ring is positioned properly and is not pinched when installing the valve body unit.



11. Tighten the 6 mm bolts.

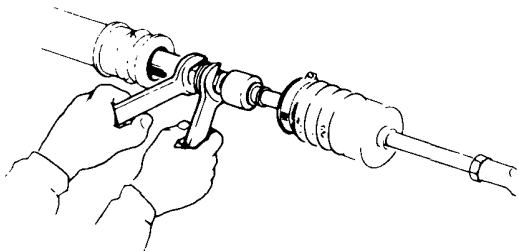


**CAUTION:** For proper assembly, the shoulder bolt must be installed in the rear hole; toward the rear of the car.

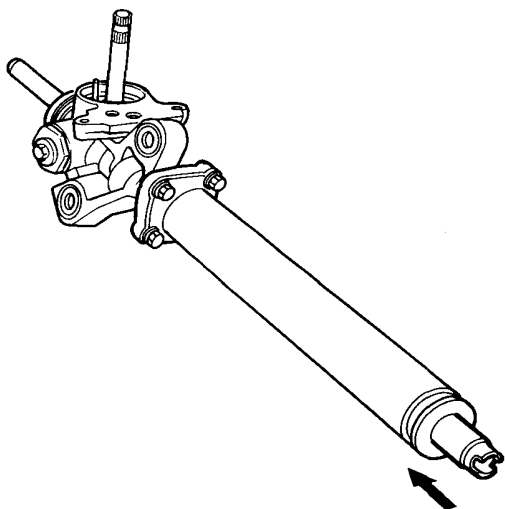
# Gearbox

## Gearbox Disassembly/Reassembly

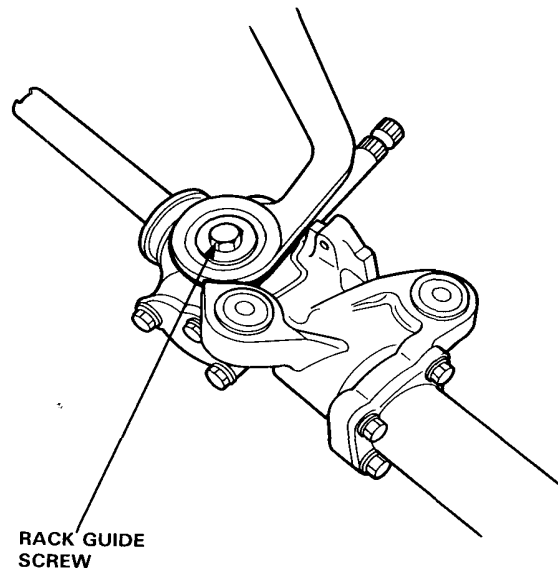
1. Remove the gearbox assembly from the rear beam (page 19-26).
2. Remove the valve body unit from the gearbox housing (page 19-27).
3. Bend back the tie-rod lock washers.
4. Hold the rack with a 19 mm wrench and unscrew the tie-rods with a 17 mm wrench.



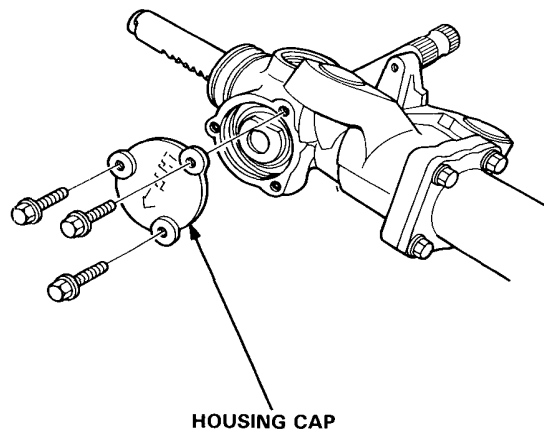
5. To prevent damage to the sealing surface of the steering rack, push the rack into its cylinder.



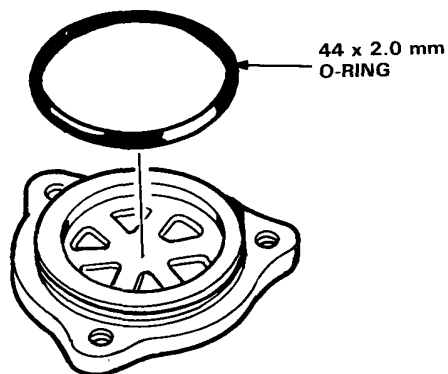
6. Loosen the rack screw locknut and remove the rack guide screw, spring and rack guide.



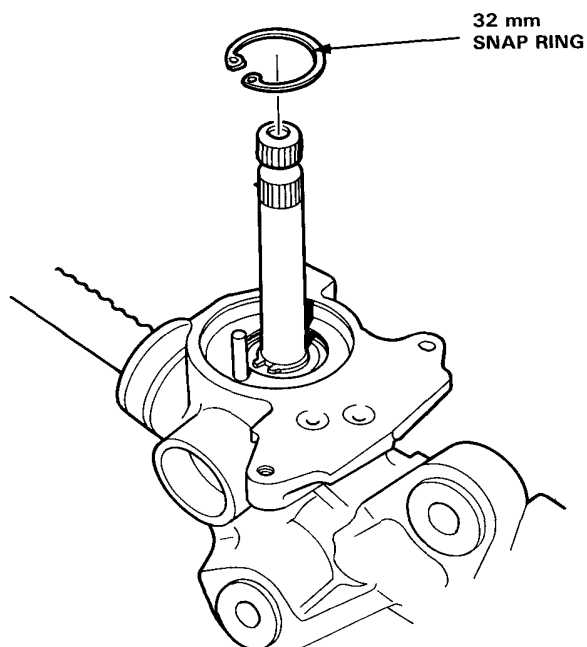
7. Remove the three 6 mm bolts and housing cap.



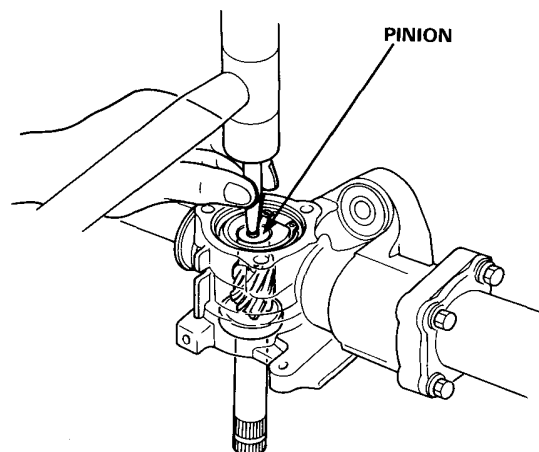
8. Remove the 44 x 2.0 mm O-ring from the housing cap.



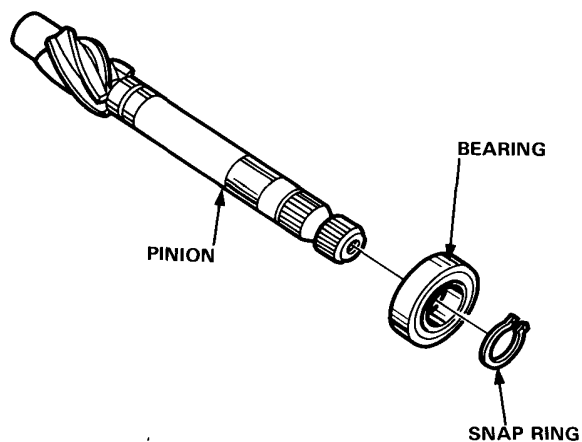
9. Remove the 32 mm snap ring.



10. Remove the pinion from the gear housing by tapping it lightly.



11. Remove the 15 mm snap ring and bearing if necessary.

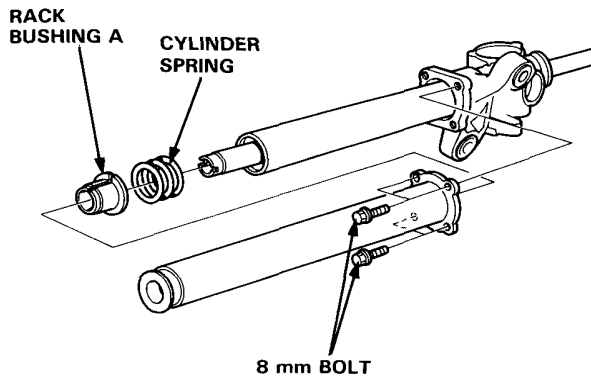


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# Gearbox

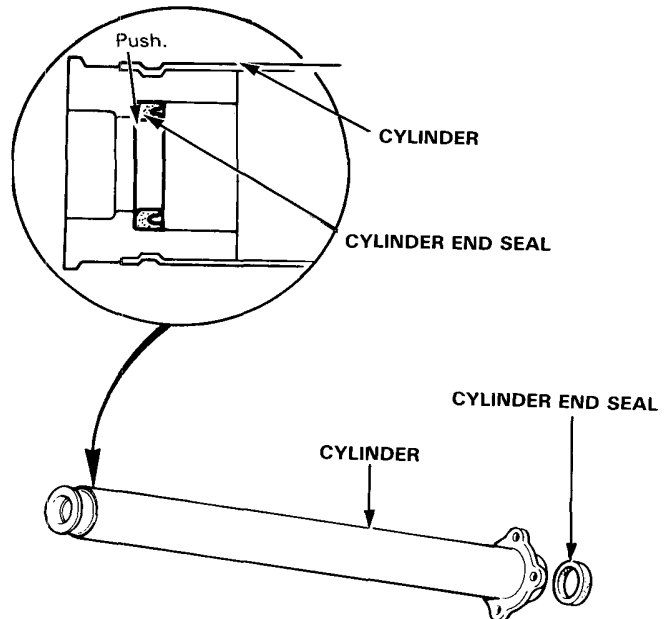
## Gearbox Disassembly/Reassembly (cont'd)

12. Remove the four 8 mm bolts.
13. Remove the cylinder.
14. Remove the rack bushing A and cylinder spring.

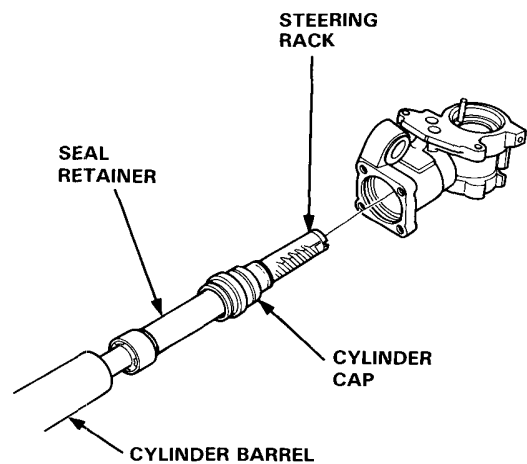


15. Remove the cylinder end seal from the cylinder.

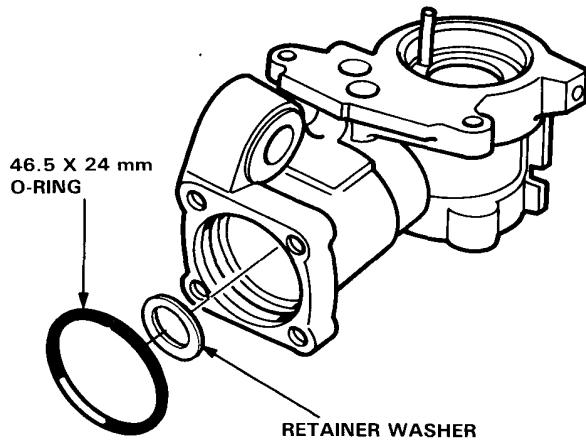
**CAUTION:** Do so by hand to avoid damaging the housing.



16. Remove the cylinder barrel, seal retainer, cylinder cap and steering rack from the gear housing.

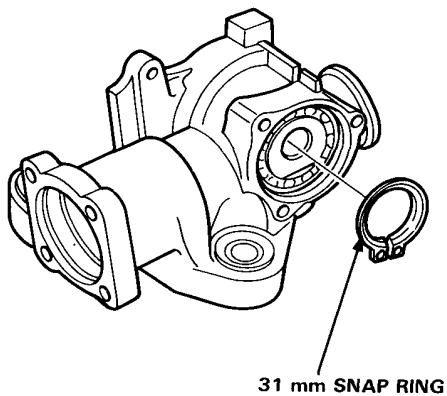


17. Remove 46.5 x 2.4 mm O-ring and retainer washer from the gear housing.

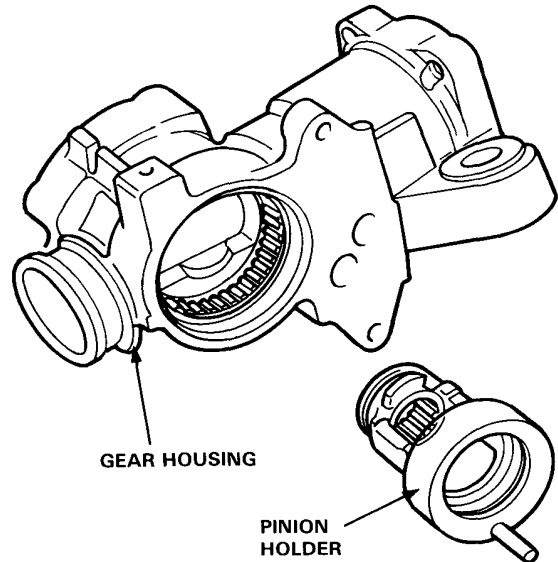


18. Check the bearing and pinion holder for faulty movement and excessive play. If they are OK and the grease in the bearing is clean, go on step 19. If they are damaged, or if there is dirt in the grease, proceed as follows:

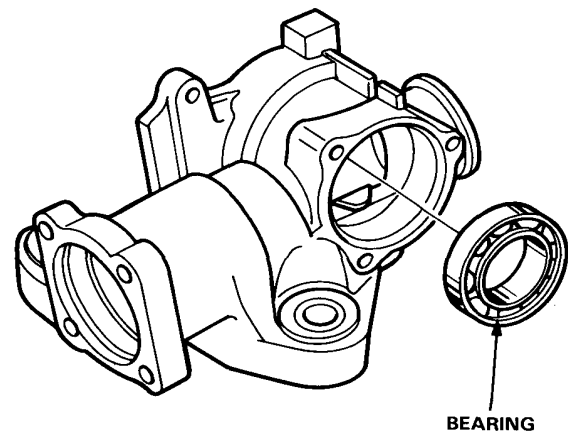
- Remove the 31 mm snap ring.



- Remove the pinion holder from the gear housing.



- Remove the bearing from the gear housing.

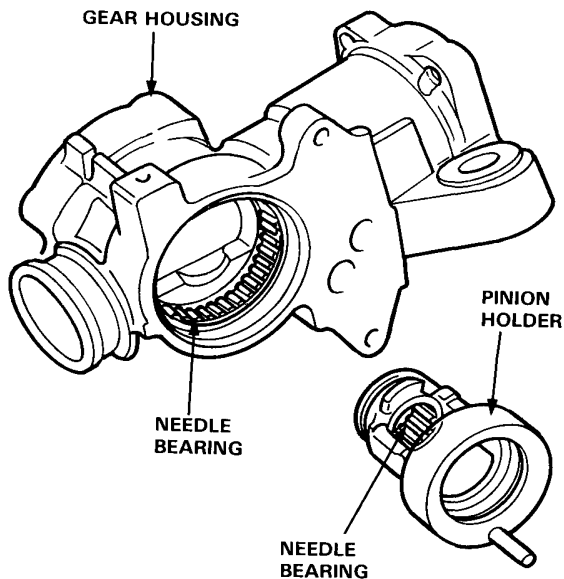


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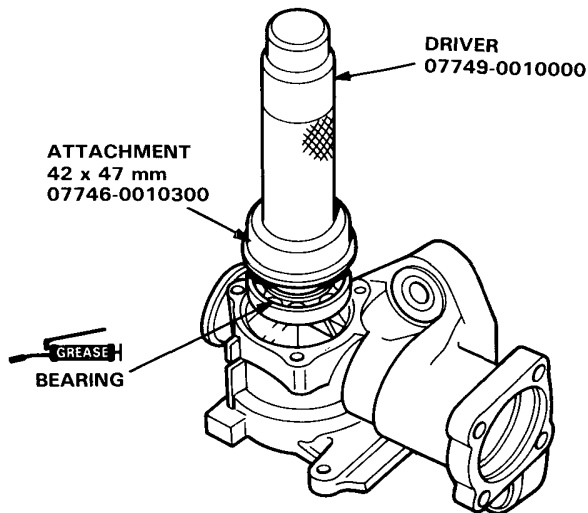
# Gearbox

## Gearbox Disassembly/Reassembly (cont'd)

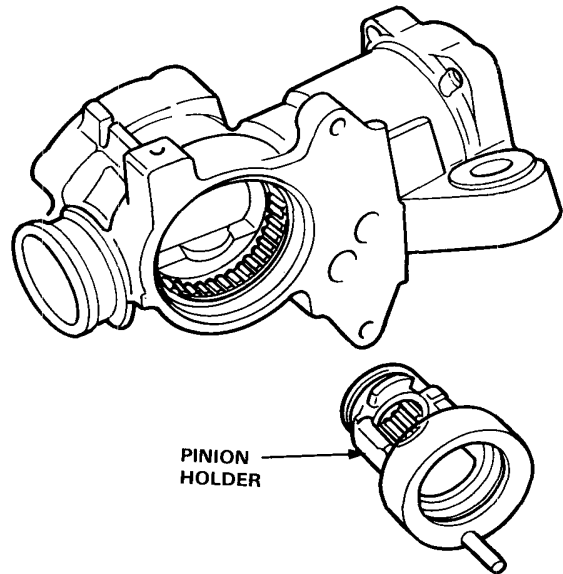
- Check the needle bearings in the pinion holder and in the gear housing for damage. If they are OK, pack with grease. If the bearings are damaged replace the gearbox assembly as a set.



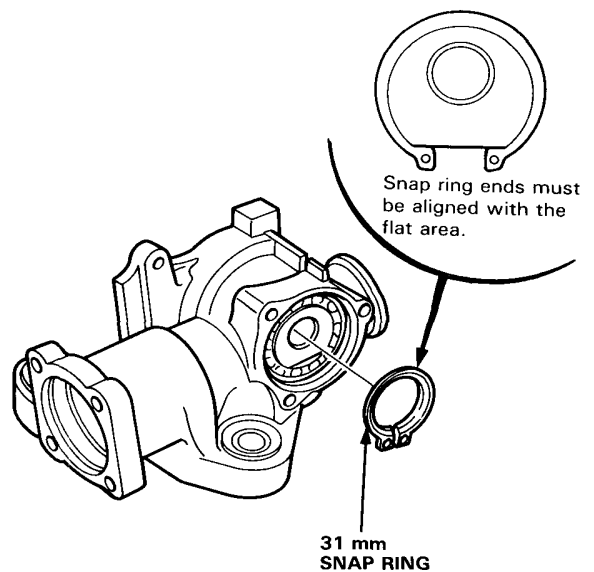
- Pack a new bearing with grease, then install with special tool, as shown.



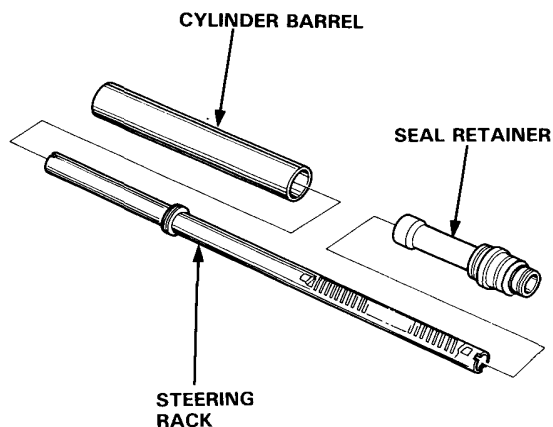
- Install the pinion holder in the gear housing.



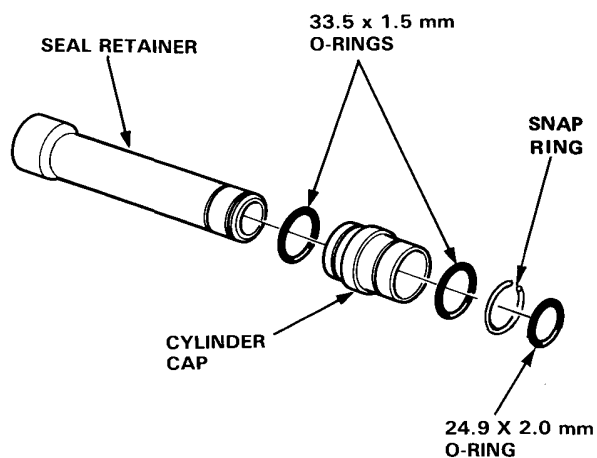
- Install the 31 mm snap ring with the taper side facing out.



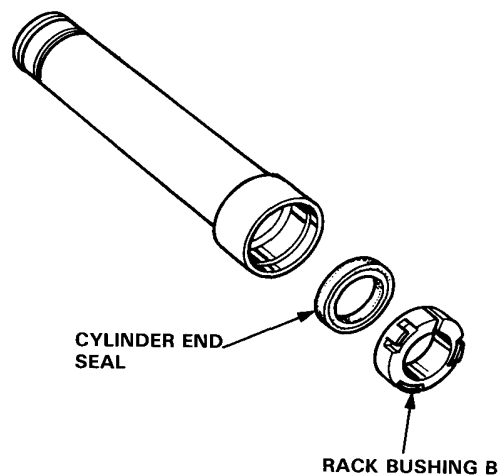
19. Remove the cylinder barrel and seal retainer from the steering rack.



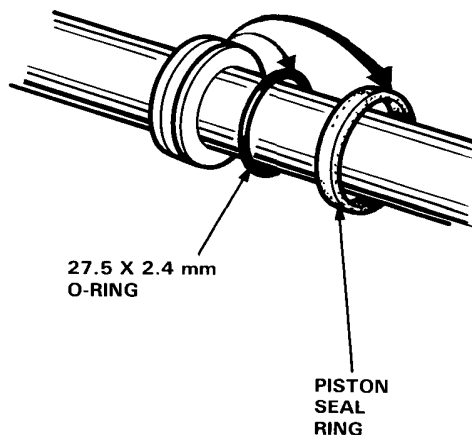
20. Remove the 24.9 x 2.0 mm O-ring, the snap ring and the cylinder cap from the seal retainer. Remove 33.5 x 1.5 mm O-rings from the cylinder cap.



21. Remove rack bushing B from the seal retainer. Then remove the cylinder end seal.



22. Carefully pry off the piston seal ring with a small screwdriver, then remove the 27.5 x 2.4 mm O-ring.



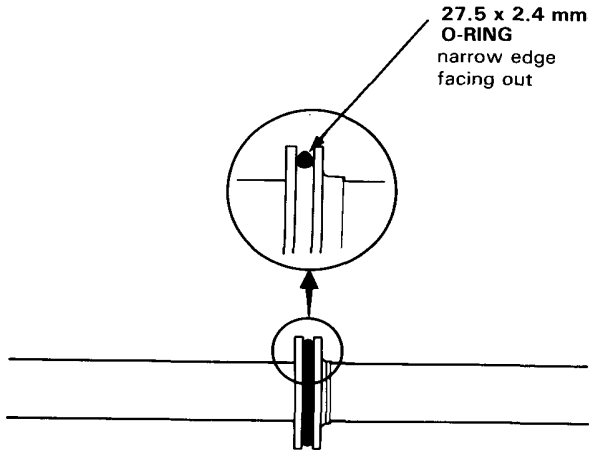
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# Gearbox

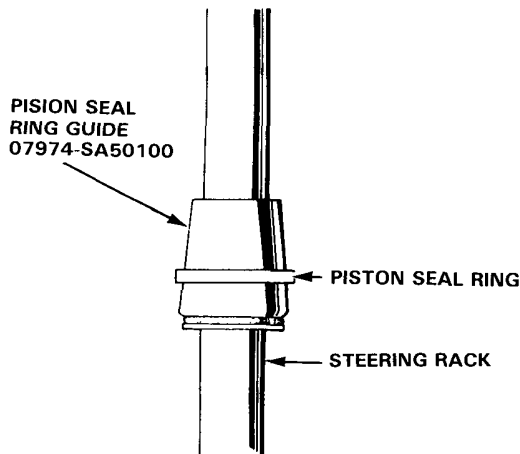
## Gearbox Disassembly/Reassembly (cont'd)

23. Install a new O-ring on the rack.



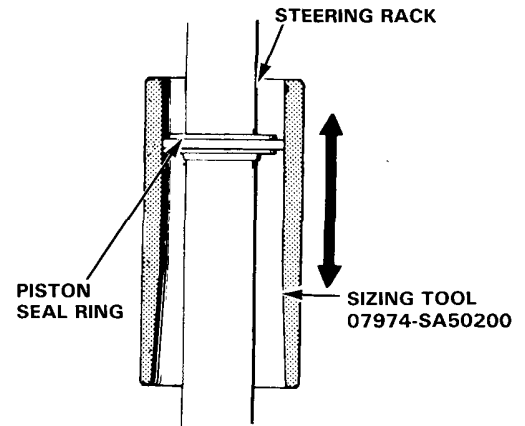
24. Install a new piston seal ring.

- Coat the piston seal ring guide tool with power steering fluid, and slide it onto the rack, big end first.

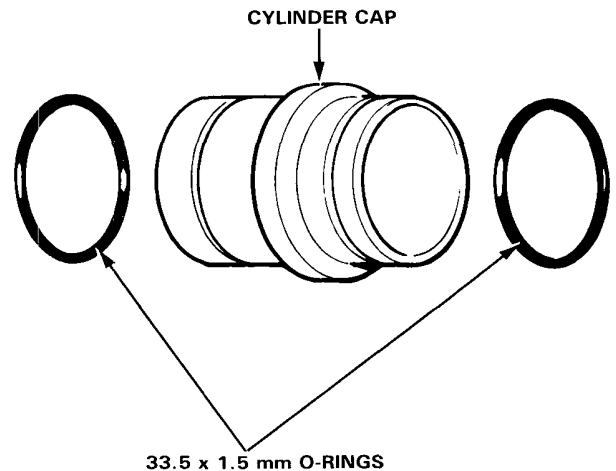


- Slide the new piston seal ring onto the guide tool, work it down to the big end of the tool, and then pull it off into the piston groove, on top of the O-ring.

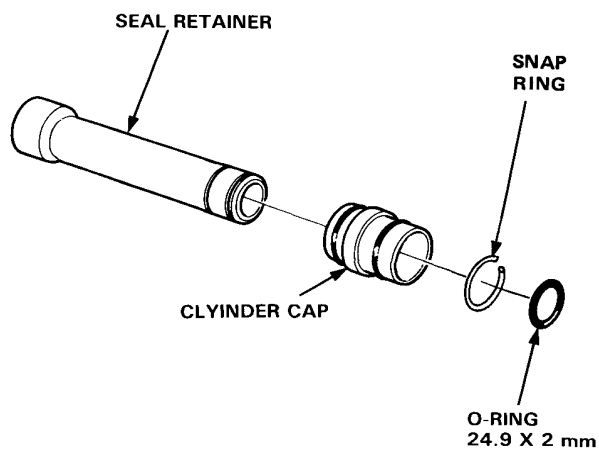
25. Coat the piston seal ring and the inside of the sizing tool with power steering fluid. Carefully slide the tool onto the rack and over the piston seal ring, then rotate the tool as you move it up and down to break-in the piston ring.



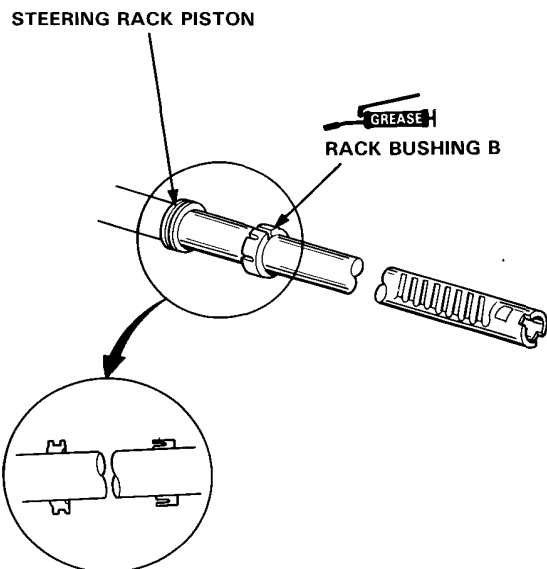
26. Coat new O-rings with grease and install them on the cylinder cap.



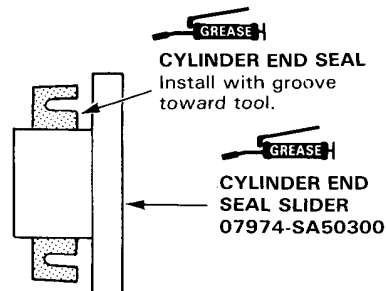
27. Slide the cylinder cap onto the seal retainer.
28. Install the snap ring on the seal retainer.
29. Install a new 24.9 x 2 mm O-ring on the seal retainer.



30. Install the rack bushing B with the groove toward the steering rack piston.

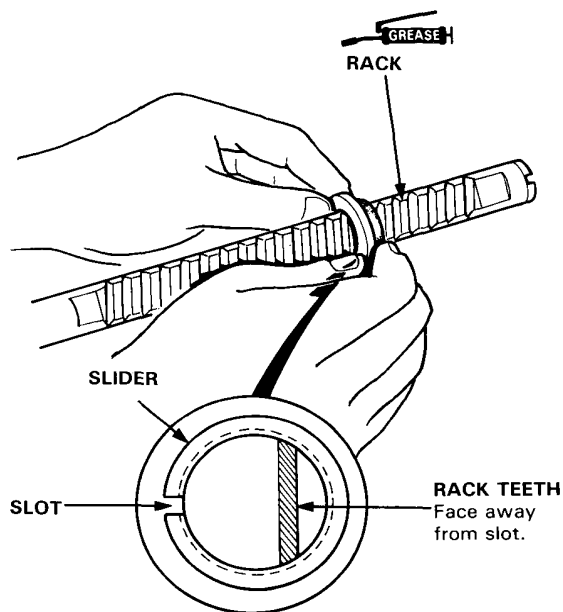


31. Coat the end seal slider tool and cylinder end seal with grease, and install the cylinder end seal on the seal slider tool with the groove toward the tool.



32. Coat the rack and fill its teeth with grease then slide the tool onto the steering rack.

**CAUTION:** Make sure the rack teeth do not face the slot in the slider tool.

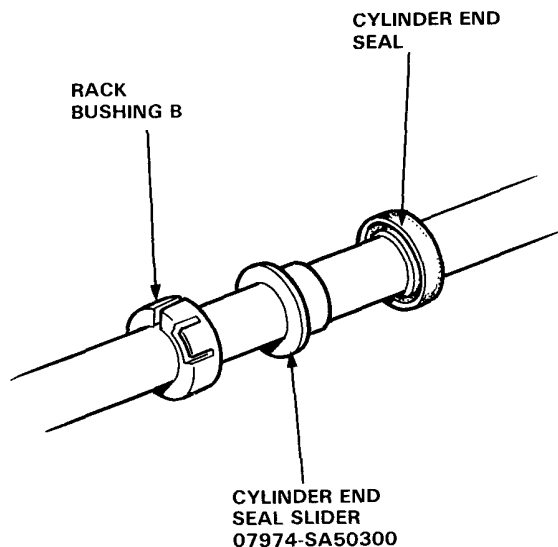


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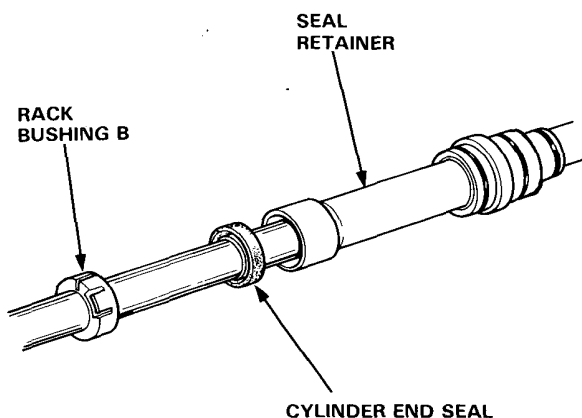
# Gearbox

## Gearbox Disassembly/Reassembly (cont'd)

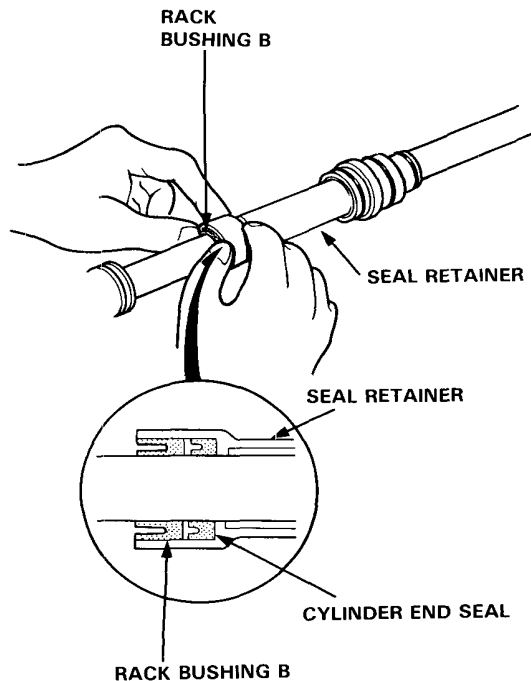
33. Remove the cylinder end seal slider from the steering rack.



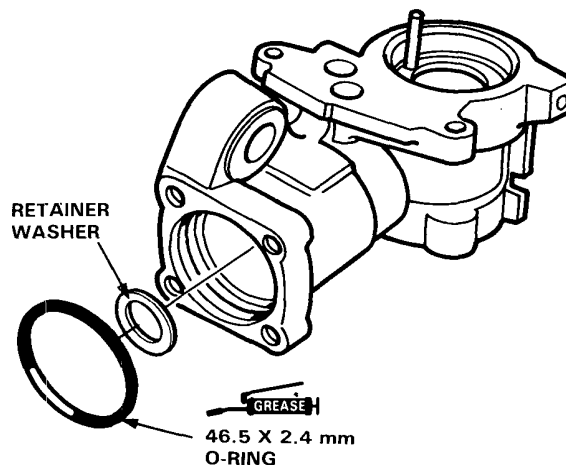
34. Slide the seal retainer onto the steering rack.



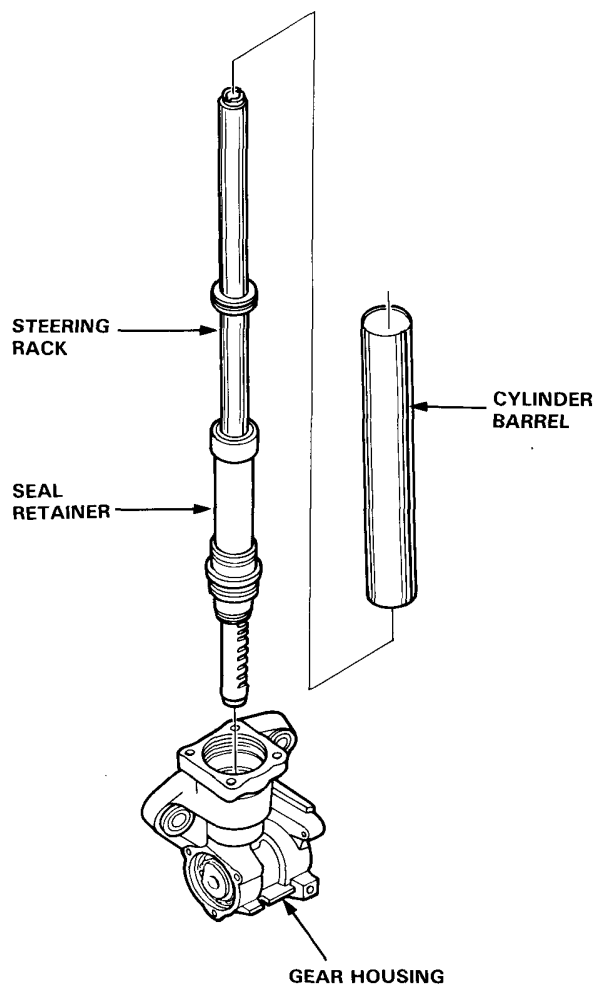
35. Push the rack bushing B into the seal retainer so as to contact the cylinder end seal with the seal retainer.



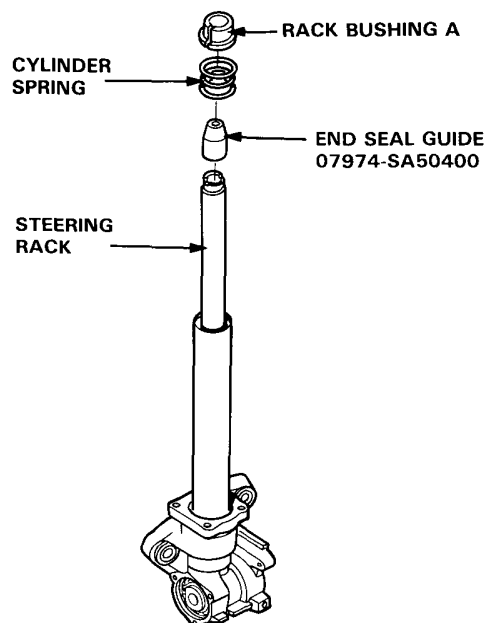
36. Install the 46.5 x 2.4 mm O-ring and retainer washer into the gear housing.



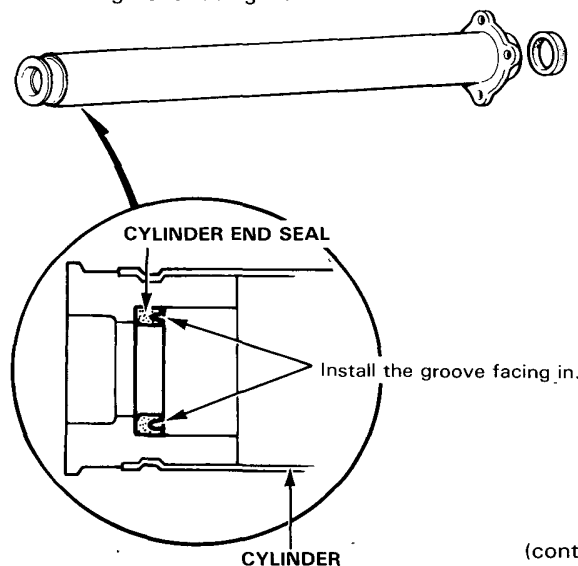
37. Stand the gear housing on the work bench and press the seal retainer and steering rack into the gear housing.
38. Coat the inside surface of the cylinder barrel with power steering fluid, slide it over the rack and into the gear housing; press it into the housing until it seats.



39. Install the end seal guide tool on the steering rack.
40. Install the cylinder spring over the rack, then coat the rack bushing A with power steering fluid, and install it on the spring.



41. Coat the inside surface of the cylinder with power steering fluid and install the cylinder end seal with the groove facing in.



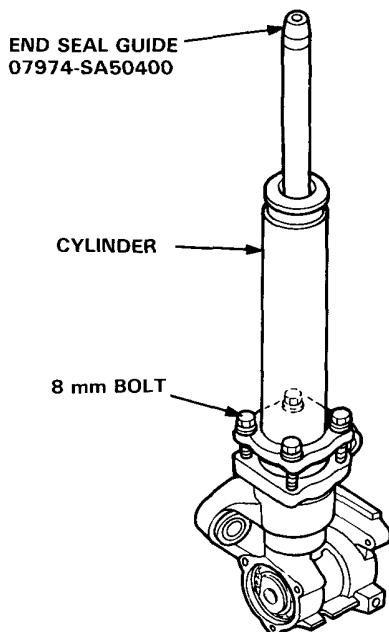
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# Gearbox

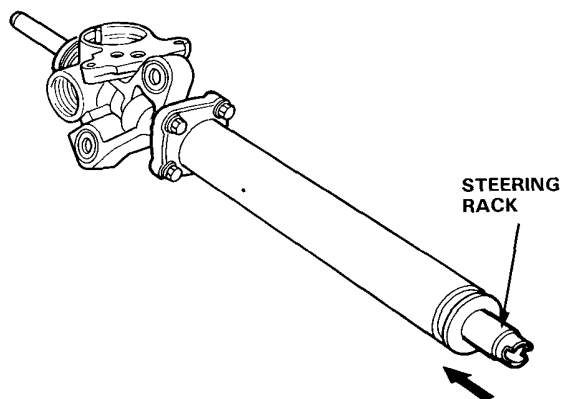
## Gearbox Disassembly/Reassembly (cont'd)

42. Coat the end seal guide tool with grease.
43. Carefully slide the cylinder over the rack and install it on the gear housing.

**CAUTION:** Be carefull not to damage the cylinder end seal in the cylinder.

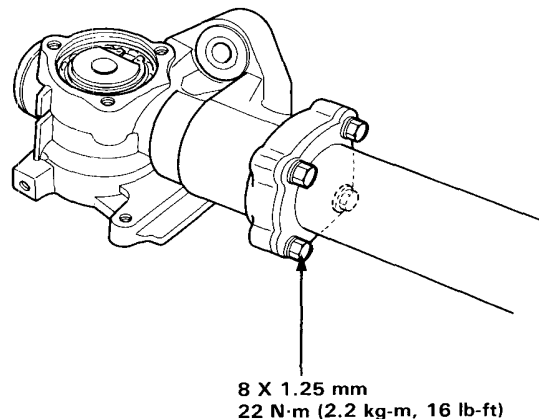


44. Push the steering rack until the rack is in the cylinder to prevent damage to the sliding surface of the steering rack.

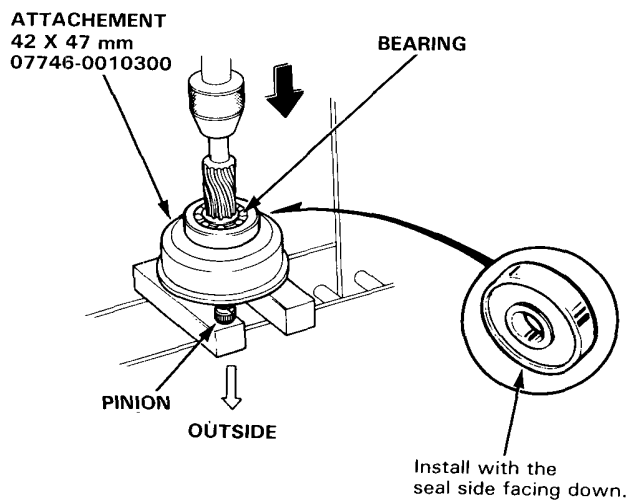


45. Secure the cylinder to the gear housing with the four 8 mm bolts.

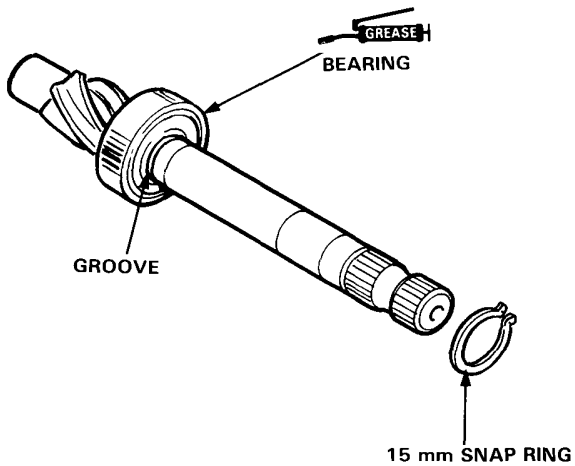
**NOTE:** Before tightening, make sure the mating surface of the cylinder and gear housing fit properly. Push and hold them together while you tighten the bolts.



46. Using a press, install the bearing on the pinion, with its seal side facing down (out).

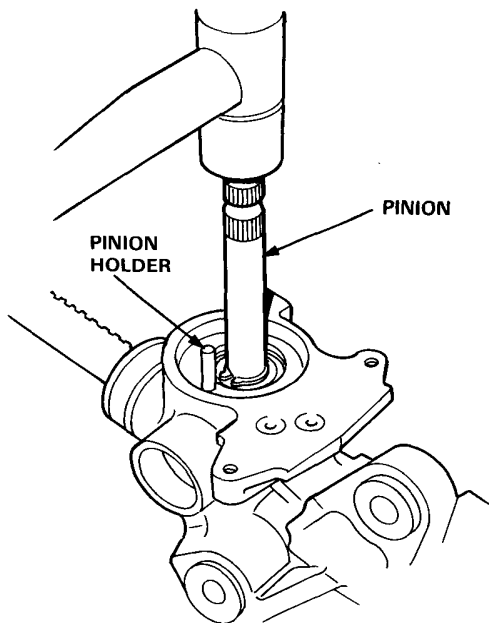


47. Install the 15 mm snap ring on the pinion.

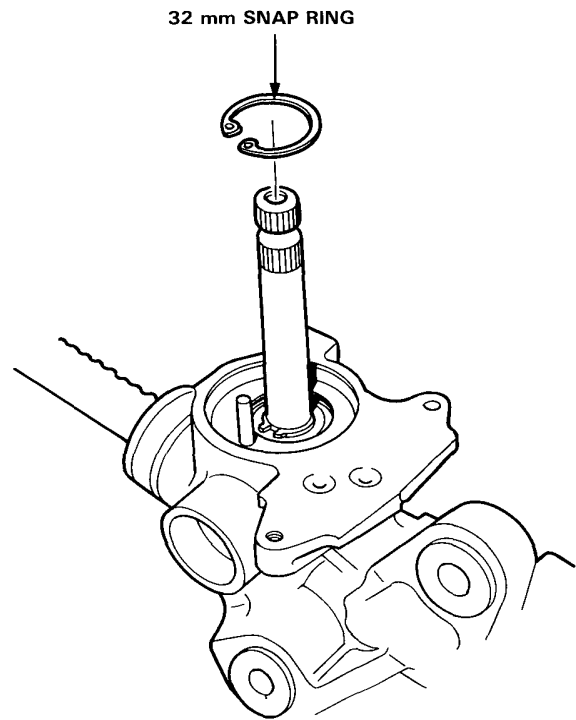


48. Grease the bearing and make sure that it turns smoothly.

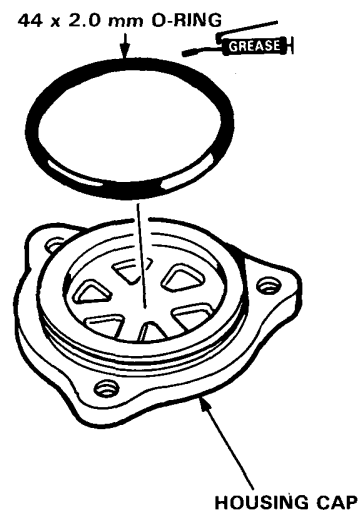
49. Insert the pinion into the pinion holder in the gear housing.



48. Install 32 mm snap ring in the groove in the pinion holder, with its taper side facing out.



49. Coat the 44 x 2.0 mm O-ring with grease and install it in the groove in the housing cap.



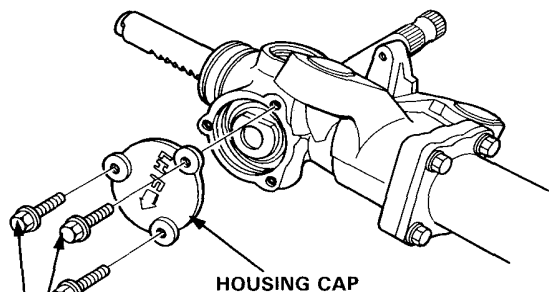
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# Gearbox

## Gearbox Disassembly/Reassembly (cont'd)

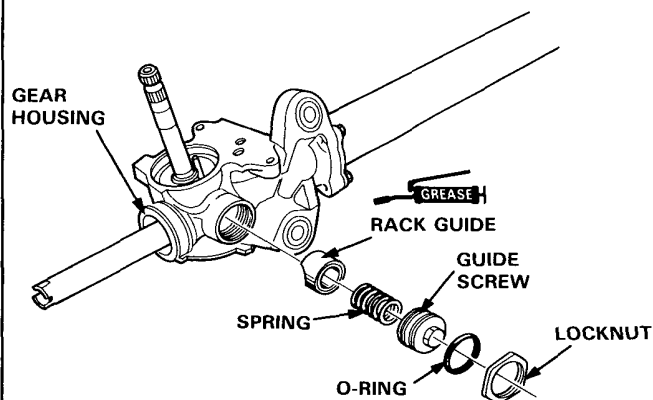
50. Tighten the three 6 mm bolts to secure the housing cap to the gear housing.

NOTE: The arrow on the housing cap must face toward the front of the car when the gearbox is installed.



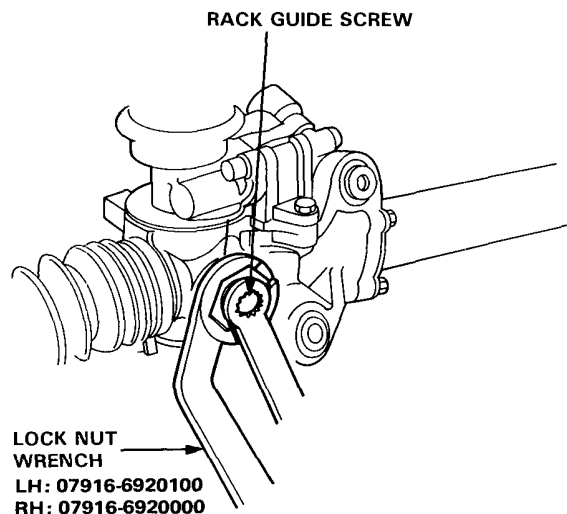
6 X 1.0 mm  
12 N·m (1.2 kg-m, 9 lb-ft)

51. Coat the rack guide with grease.  
52. Install the rack guide, spring, O-ring and rack guide screw in the gear housing.  
53. Install the locknut on the rack guide screw, finger tight.

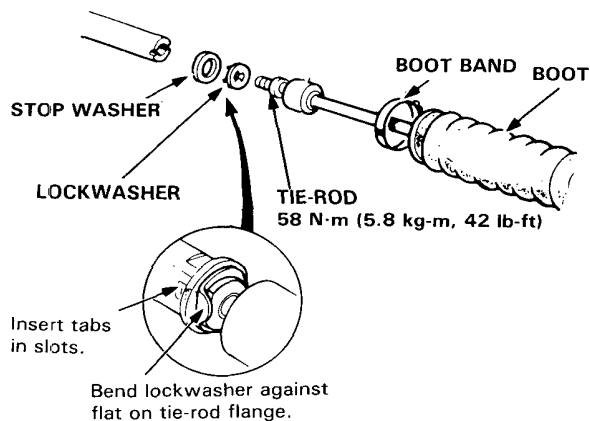


54. Tighten the guide screw until it compresses the spring and seats against the guide, then loosen it. Retighten it to 4 N·m (0.4 kg-m, 3 lb-ft) and back off about 35° (about 1/10 of a turn).

While holding the guide screw in its position, tighten the locknut to 25 N·m (2.5 kg-m, 18 lb-ft) with the locknut wrench.



55. Screw each tie-rod into the rack while holding the lockwasher so its tabs are in the slots in the rack end. Tighten the tie-rod securely, then bend the lockwasher back against the flat on the flange as shown. Install the boots and bands.



56. Make sure that the boots move smoothly while sliding the steering rack.