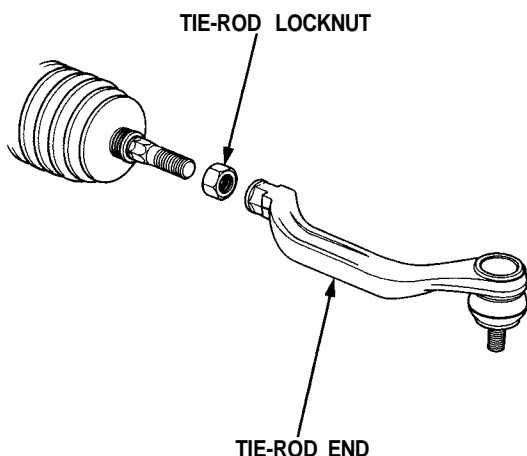




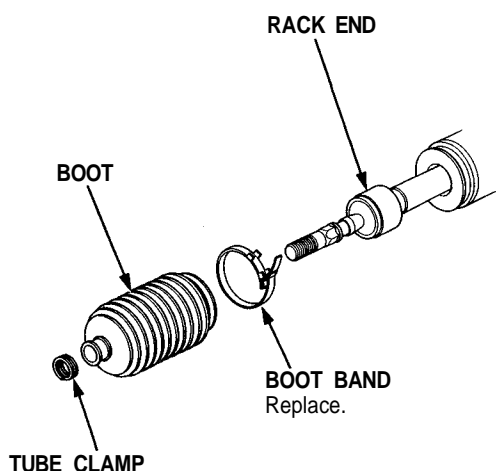
Steering Gearbox

Overhaul

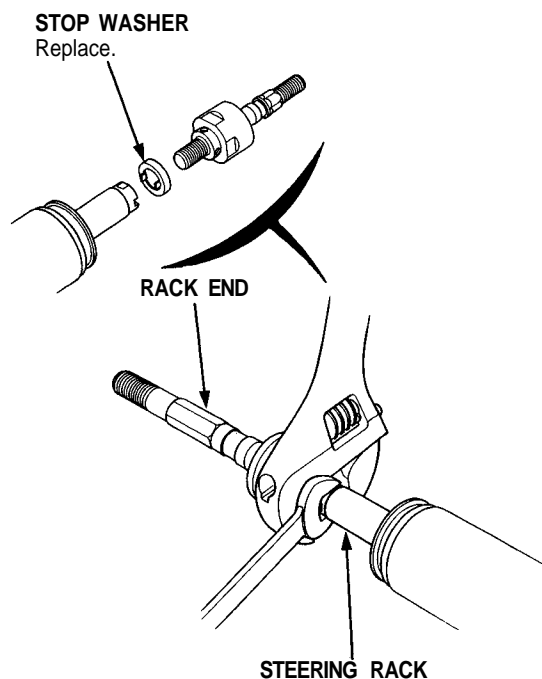
1. Remove the valve body unit as described on page [17-45](#).
2. Carefully clamp the gearbox in a vise with soft jaws.
3. Remove the tie-rod end.



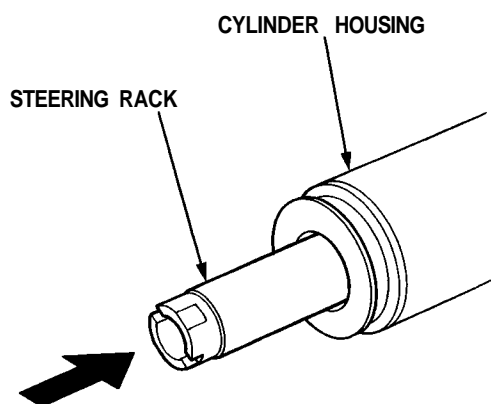
4. Remove the boot bands and tube clamps. Pull the boots away from the ends of the gearbox.



5. Hold the steering rack with a wrench and unscrew the rack end with a wrench..
6. Remove the stop washer.



7. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.

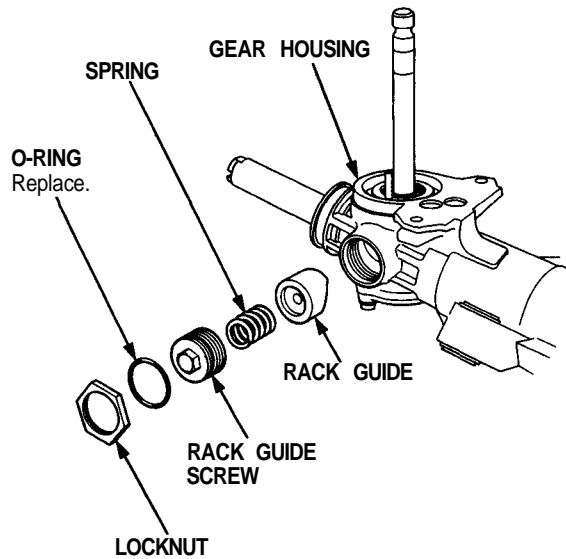


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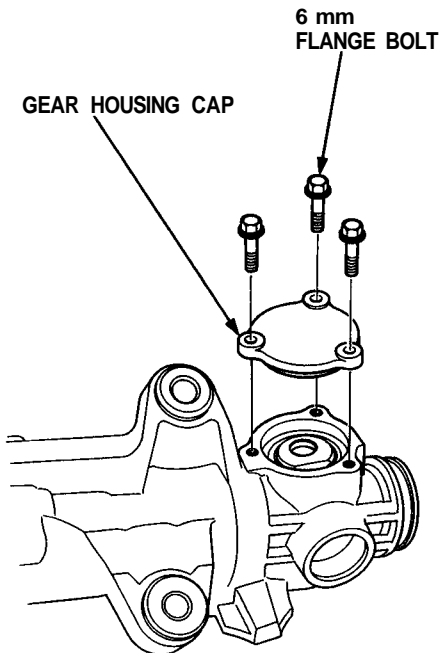
Steering Gearbox

Overhaul (cont'd)

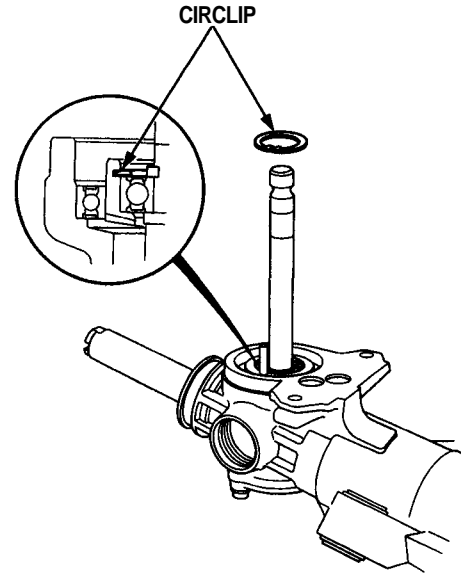
8. Loosen the rack screw lockout and remove the rack guide screw.
9. Remove the spring and rack guide from the gear housing.



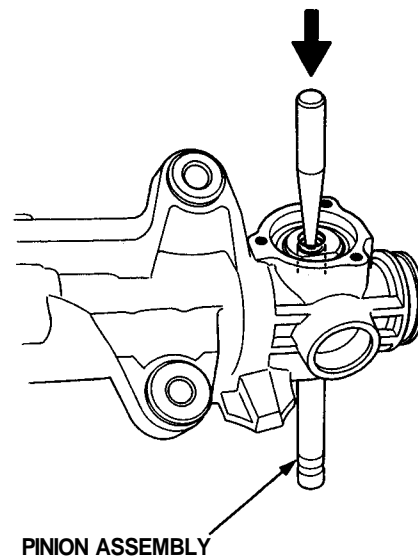
10. Remove the gear housing cap from the gear housing by removing the three 6 mm flange bolts.



11. Remove the circlip from the bottom of the gear housing.



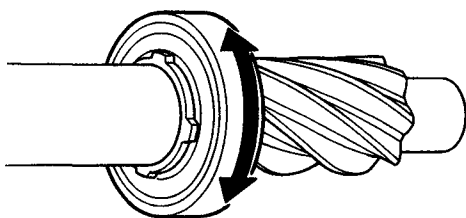
12. Remove the pinion from the gear housing by tapping it lightly with a punch.



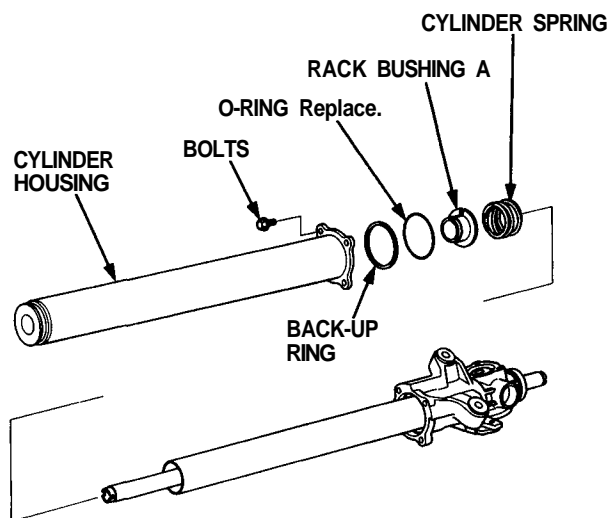


13. Check the pinion lower ball bearing for play; if it is good go on next step.

If the bearing is noisy or has excessive play, or the grease is contaminated, replace the pinion assembly.



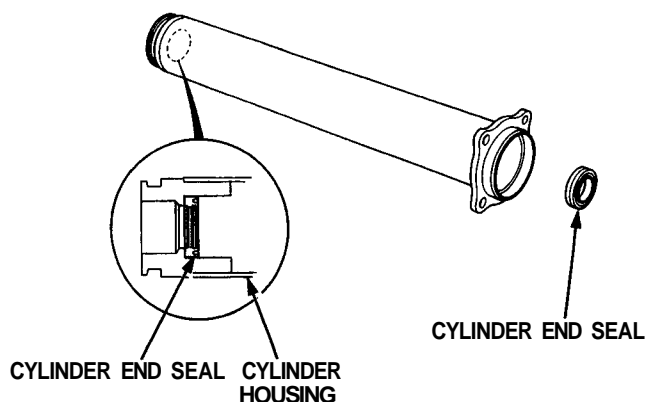
14. Remove the four bolts from the end of the cylinder housing, then slide the housing off the rack.



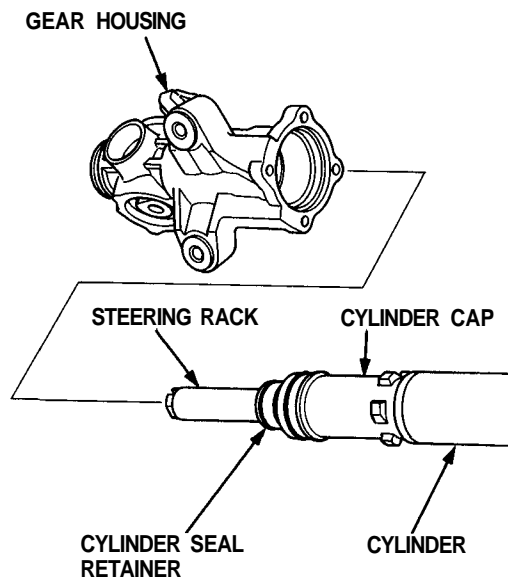
15. Remove the O-ring, back-up ring, rack bushing A and cylinder spring.

16. Remove the cylinder end seal from the cylinder housing.

NOTE: Use your fingers or a wooden stick to avoid damaging the housing.



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

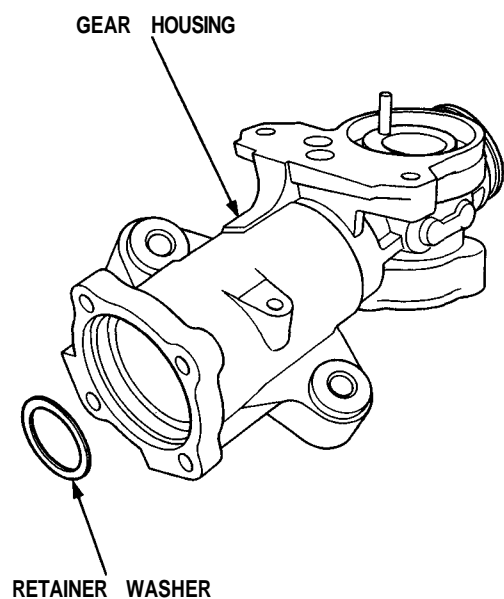


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Steering Gearbox

Overhaul (cont'd)

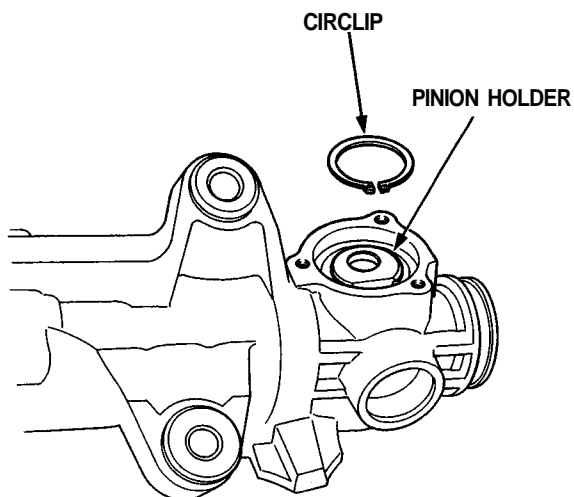
18. Remove the retainer washer from the gear housing.



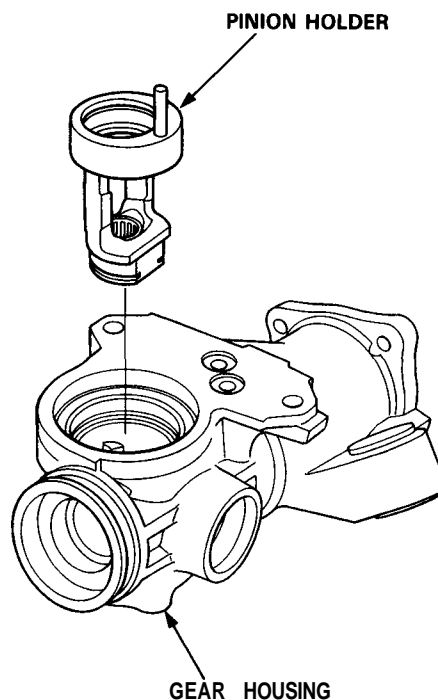
19. Check the pinion holder for free movement and excessive play; if it is in good condition, go on step 20.

If it is damaged, or if dirt has gone past the seal into the grease, replace the bearing.

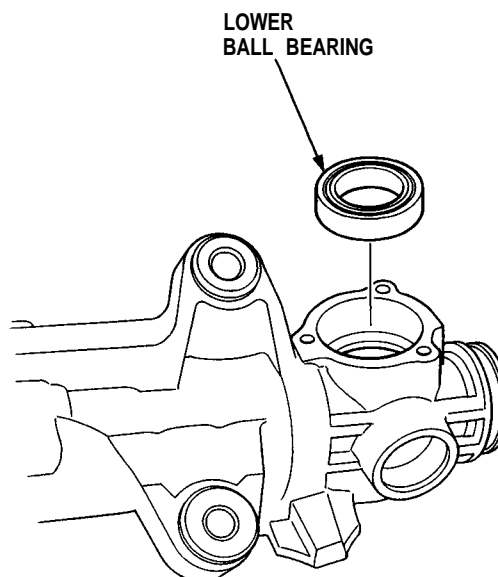
- Remove the circlip from the pinion holder.



- Remove the pinion holder from the gear housing.

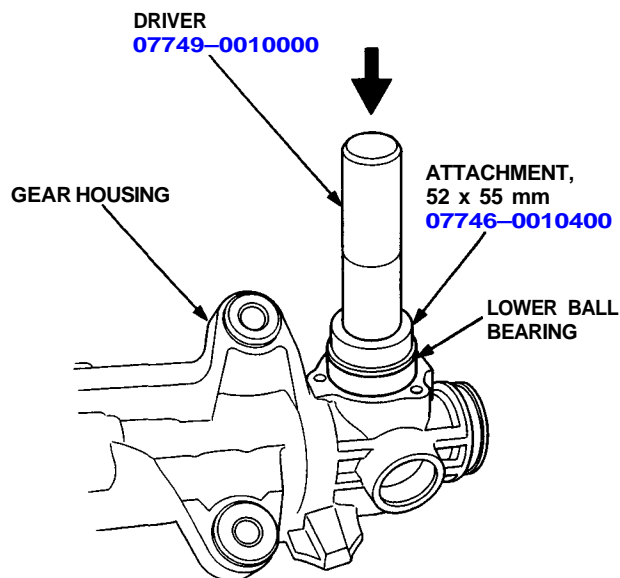


- Remove the lower ball bearing from the gear housing.

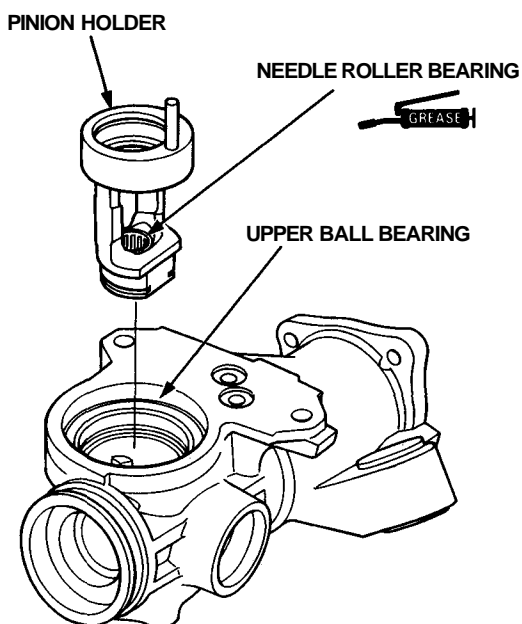




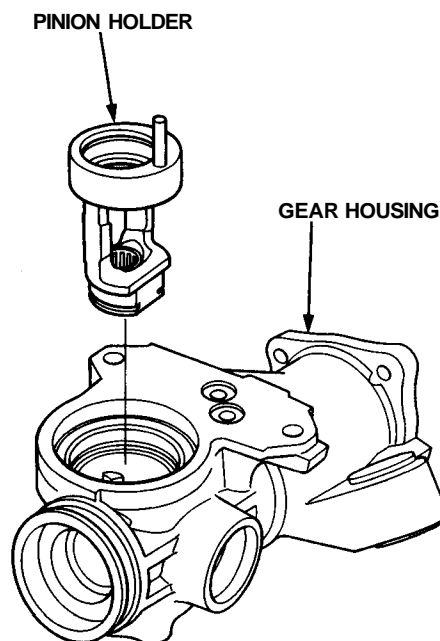
- Drive the bearing into the gear housing using the special tools.



- Check the needle roller bearing in the pinion holder and the upper ball bearing in the gear housing for damage; if OK, pack the needle roller bearing with grease. If the bearings are damaged, replace them as a set.

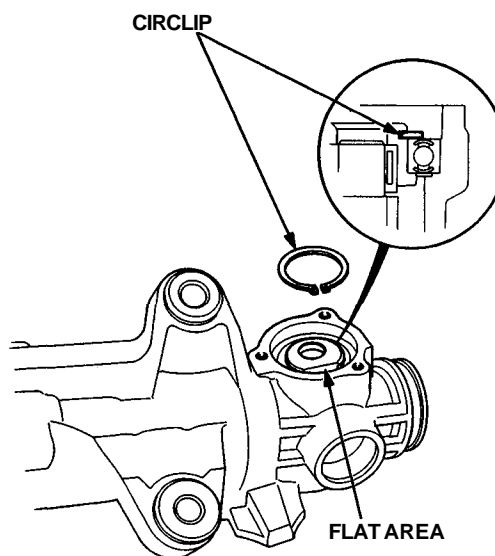


- Install the pinion holder in the gear housing.



- Reinstall the circlip with its tapered side facing out.

NOTE: Circlip ends must be aligned with the flat area.

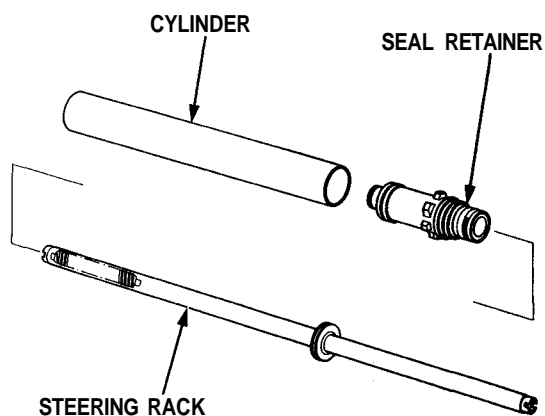


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Steering Gearbox

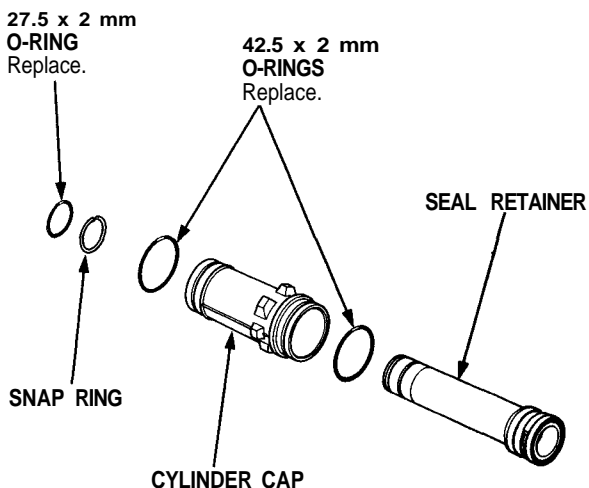
Overhaul (cont'd)

20. Remove the cylinder and seal retainer from the steering rack.



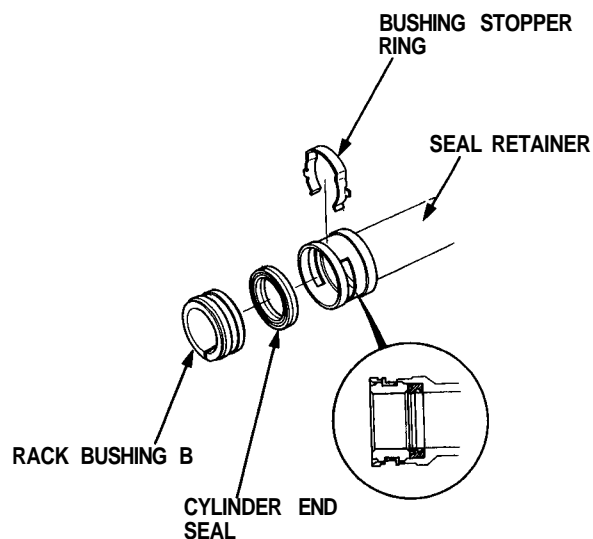
21. Remove the O-ring and snap ring from the seal retainer, then remove the cylinder cap from the seal retainer.

22. Remove the O-rings from the cylinder cap.

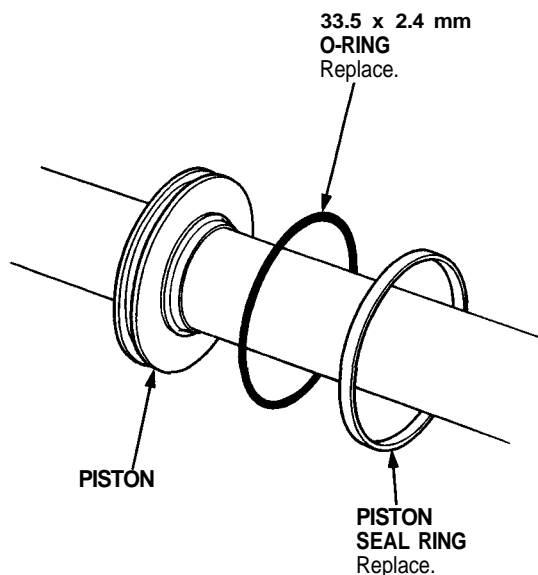


23. Remove the bushing stopper ring from the seal retainer.

24. Remove the cylinder end seal and rack bushing B.



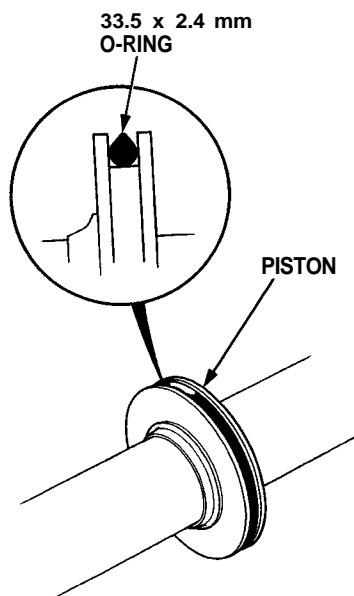
25. Carefully pry the piston seal ring and O-ring off the piston.



NOTE: Before reassembling any parts, inspect them as described on page 17-50 and make sure they are clean. Replace worn or damaged parts.

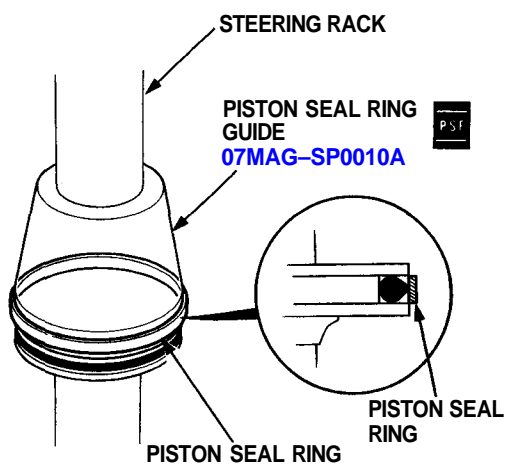


26. Install a new O-ring on the piston with its narrow edge facing out.



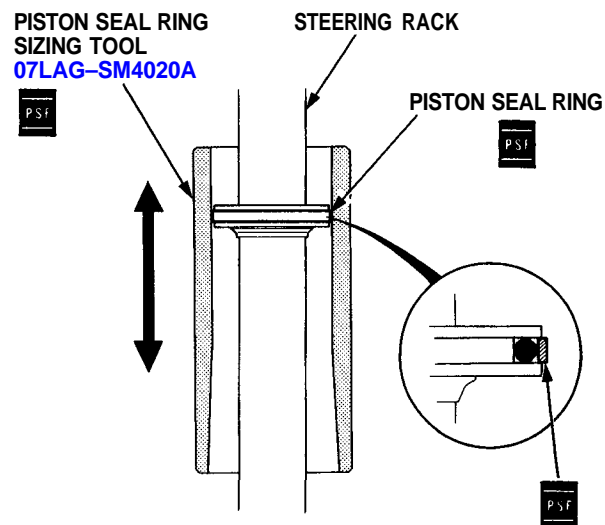
27. Coat the piston seal ring guide with power steering fluid, then slide it onto the rack, big end first.

28. Position the new piston seal ring on the special tool, slide it down onto the big end of the tool, then pull it off into the piston groove on top of the O-ring.

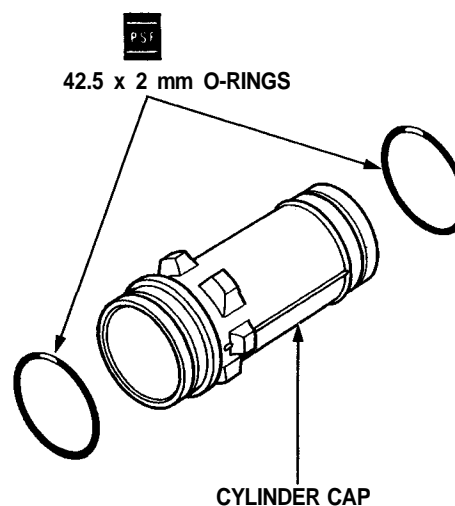


29. Coat the piston seal ring and inside of the special tool with power steering fluid.

30. Carefully slide the tool onto the steering rack and over the piston seal ring, then rotate the tool as you move it up and down to seat the piston seal ring.



31. Coat new O-rings with power steering fluid and install them on the cylinder cap.

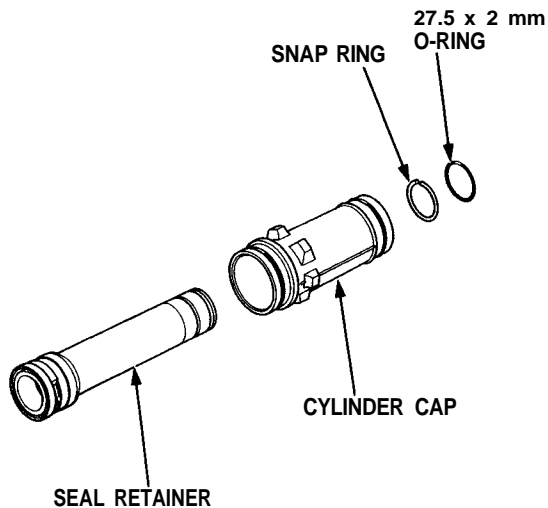


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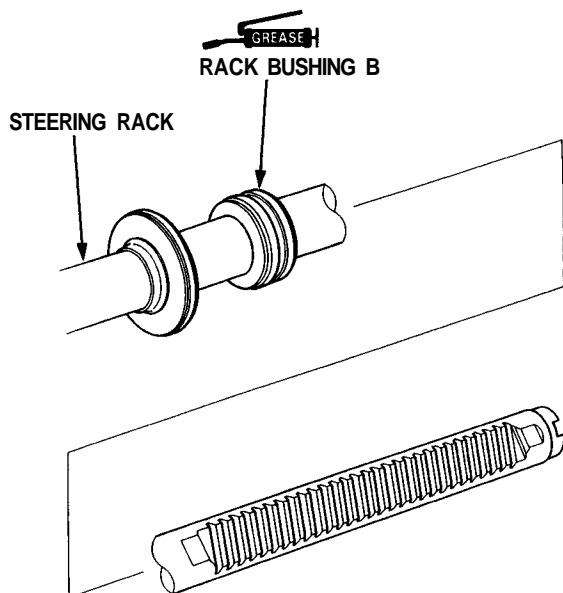
Steering Gearbox

Overhaul(cont'd)

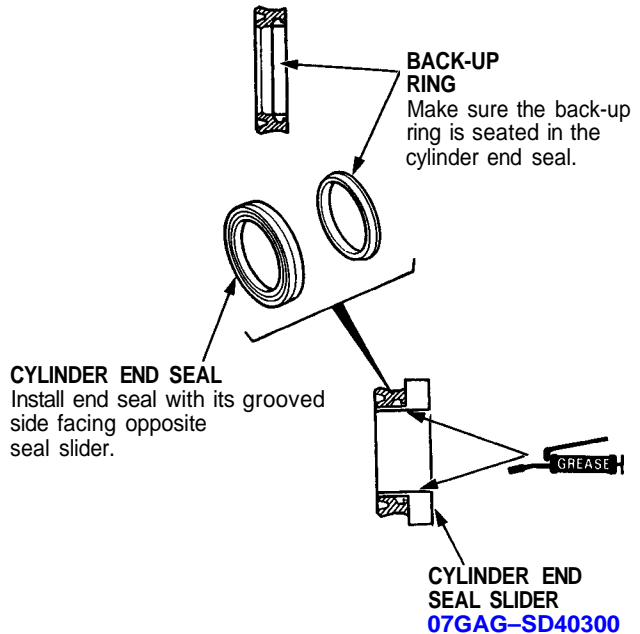
32. Slide the cylinder cap onto the seal retainer.
33. Install the snap ring and O-ring on the seal retainer.



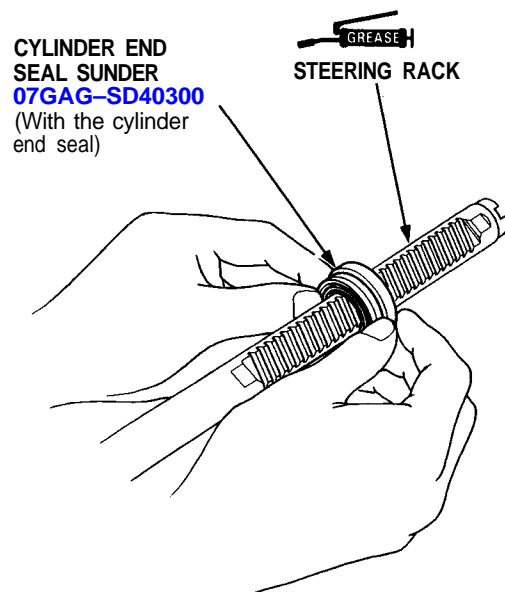
34. Grease the sliding surface of the new rack bushing B, and install the bushing on the steering rack.



35. Grease the sliding surfaces of the new cylinder end seal and the special tool, then place the seal on the special tool with its grooved side facing opposite the slider.

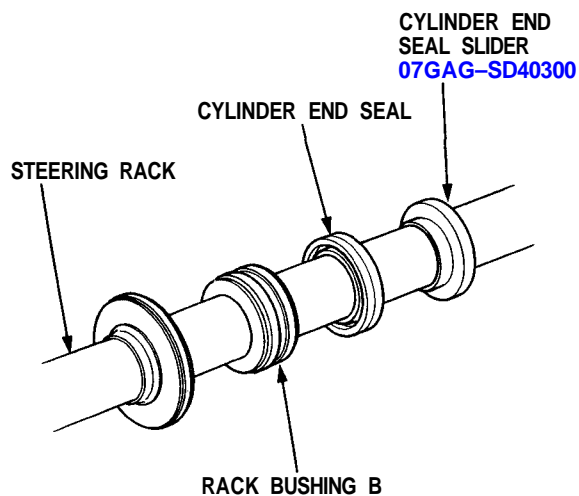


36. Install the special tool and cylinder end seal.

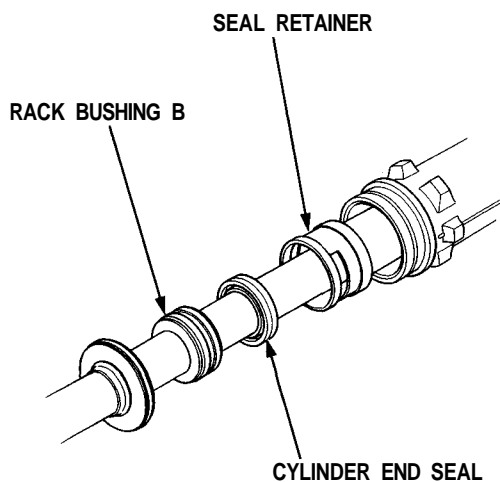




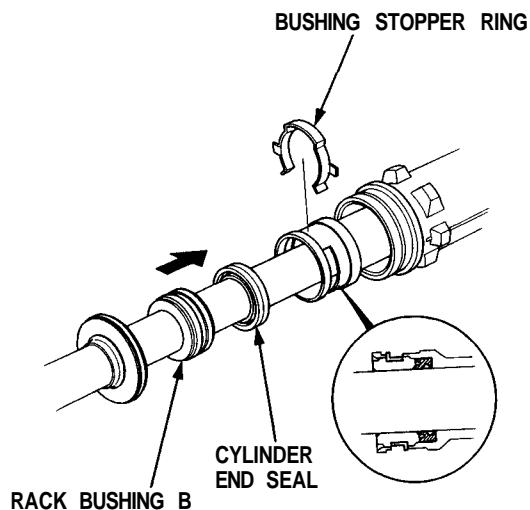
37. Separate the cylinder end seal from the special tool, then remove the tool from the rack.



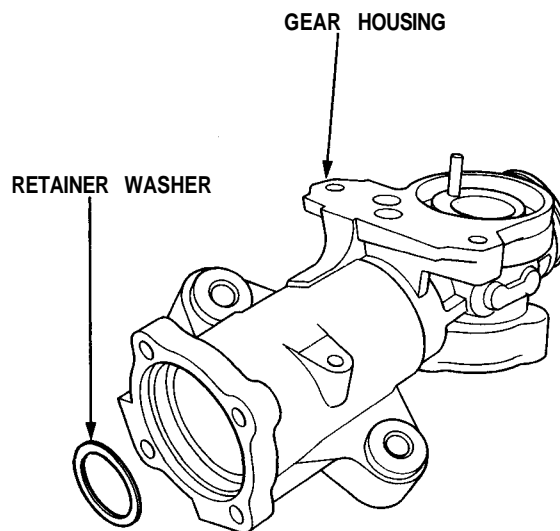
38. Fit the seal retainer on the steering rack.



39. Push the rack bushing B toward the seal retainer by hand until the cylinder end seal is seated in the retainer. Fit the bushing stopper ring in the groove of the seal retainer securely. Then grease the steering rack.



40. Install the retainer washer on the gear housing.

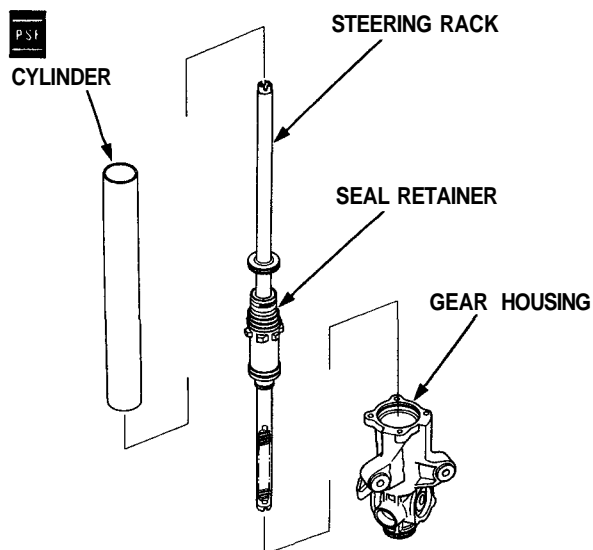


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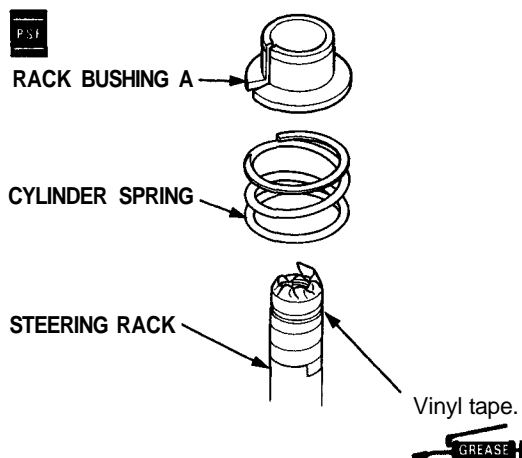
Steering Gearbox

Overhaul (cont'd)

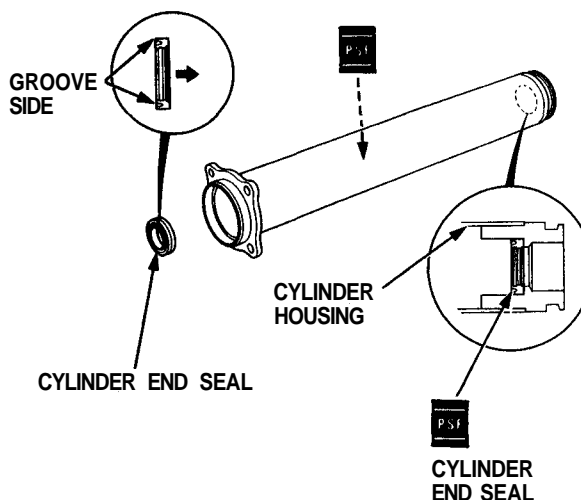
41. Place the gear housing on the work bench and insert the seal retainer and steering rack into the gear housing.
42. Coat the inside surface of the cylinder with power steering fluid, slide it over the rack and into the gear housing; press it into the housing until it seats.



43. Install the cylinder spring over the rack, then coat the rack bushing A with power steering fluid and install it on the spring.
44. Wrap the end of the steering rack with vinyl tape. Coat the tape with grease.

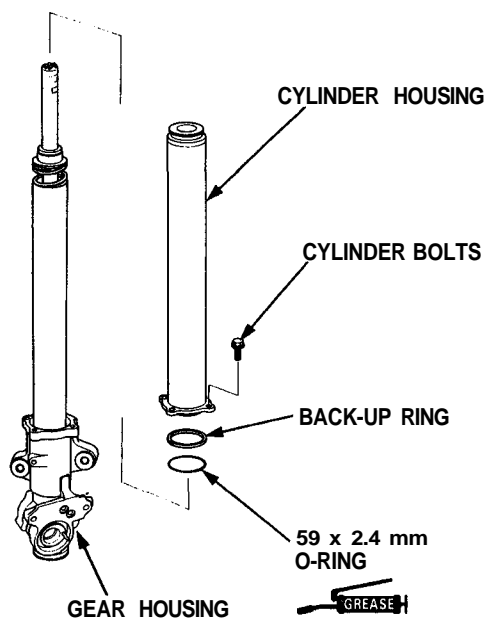


45. Coat the inside surface of the cylinder with power steering fluid and install the cylinder end seal with its grooved side facing out.



46. Coat the new O-ring with the grease, then install the O-ring and back-up ring on the gear housing.
47. Carefully position the cylinder housing on the gear housing and loosely install with four bolts.

CAUTION: Be careful not to damage the end seal in the cylinder housing.

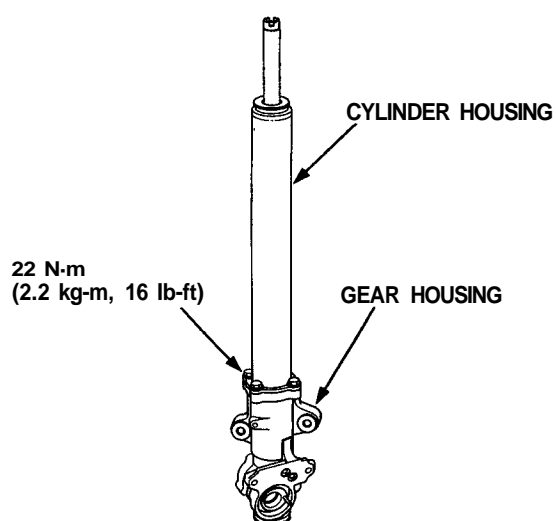




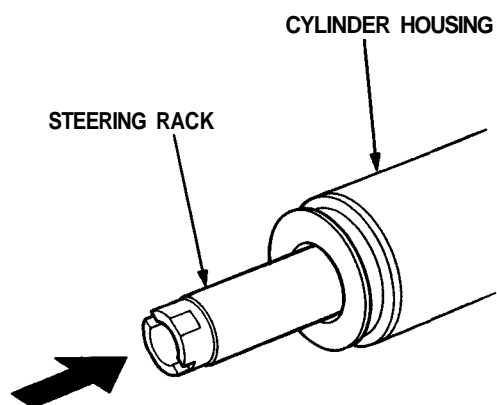
48. Remove the vinyl tape from the steering rack.

49. Tighten the cylinder housing to the gear housing.

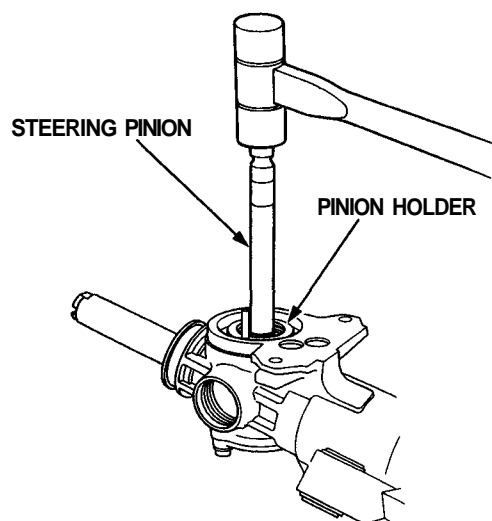
NOTE: Before tightening the bolts, make sure the mating surfaces of the cylinder and gear housing fit properly by pushing them together; hold them together while tightening the bolts.



50. Insert the steering rack into the cylinder housing, being careful not to damage the steering rack sliding surface.

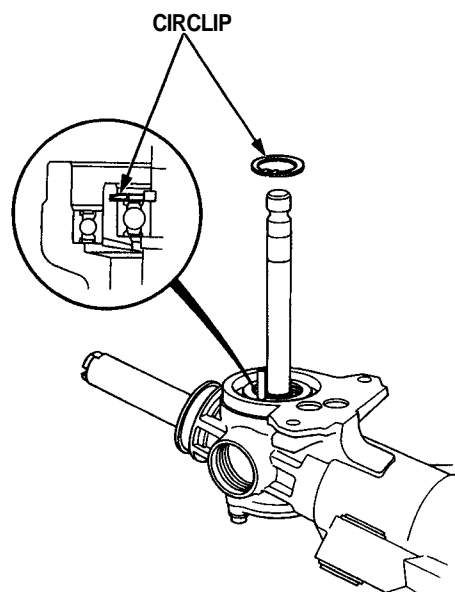


51. Install the steering pinion in the pinion holder.



52. Install the circlip securely in the pinion holder groove.

NOTE: Install the circlip with its tapered side facing out.

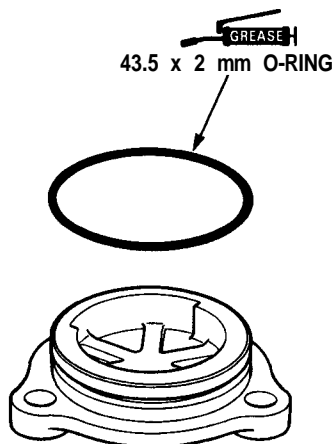


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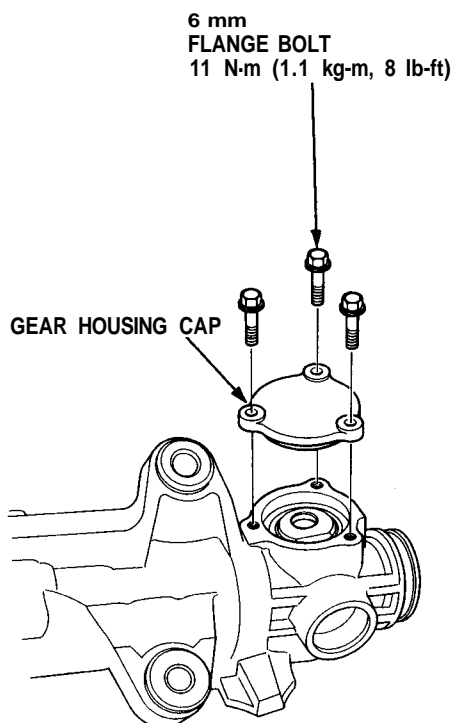
Steering Gearbox

Overhaul (cont'd)

53. Grease the new O-ring and install it in the groove in the gear housing cap.



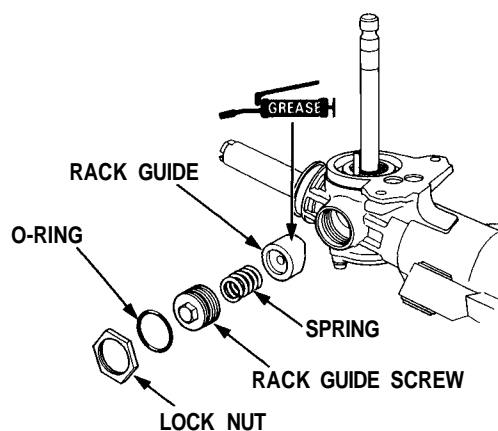
54. Install the gear housing cap on the gear housing.



55. Install the O-ring on the rack guide screw.

56. Coat the rack guide sliding surface with grease.

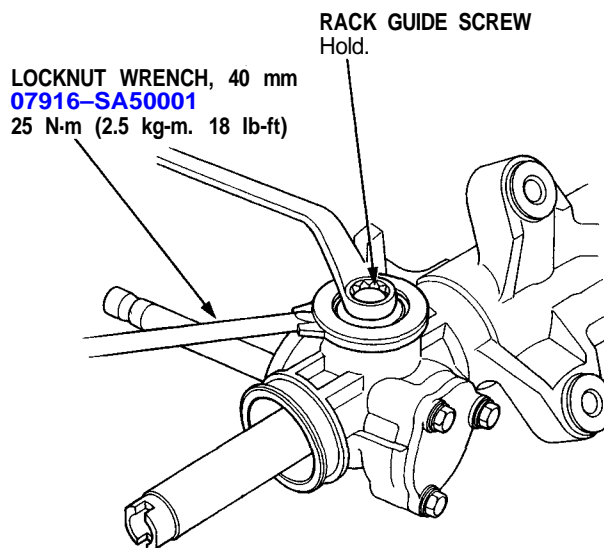
57. Install the rack guide, spring and rack guide screw on the gear housing.



58. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.

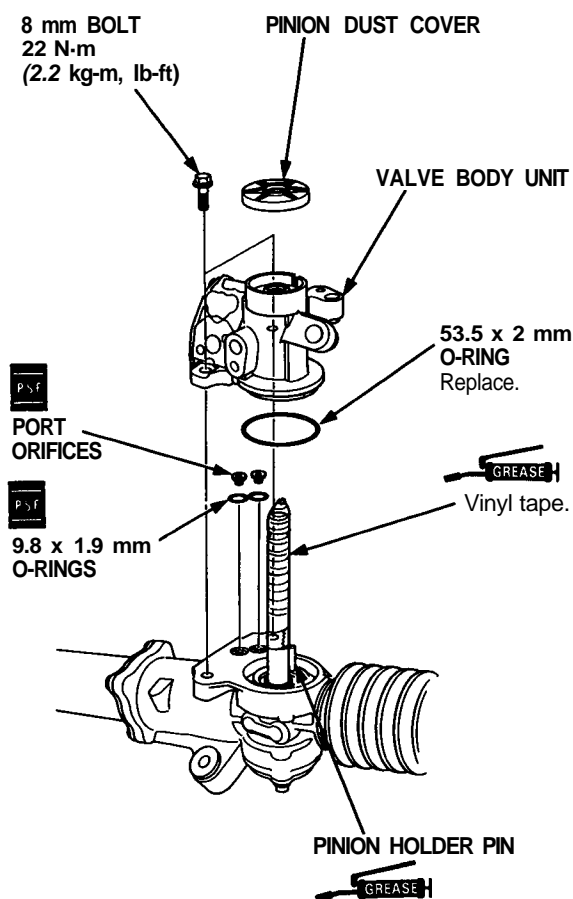
59. Retighten it to 4 N·m (0.4 kg-m, 2.9 lb-ft), back off about $20^{\circ} \pm 5^{\circ}$ and install the locknut on the rack guide screw.

60. Tighten the locknut while holding the rack guide screw with the special tool.





61. Coat the 9.8 x 1.9 mm O-rings with power steering fluid, and install them together with the orifices.
62. Apply vinyl tape to the pinion shaft, and coat the vinyl tape with grease.
63. Coat the 53.5 x 2 mm O-ring and pinion holder pin with grease, and install the valve body unit.
64. Install the valve body unit on the gear housing with the two 8 mm bolts.

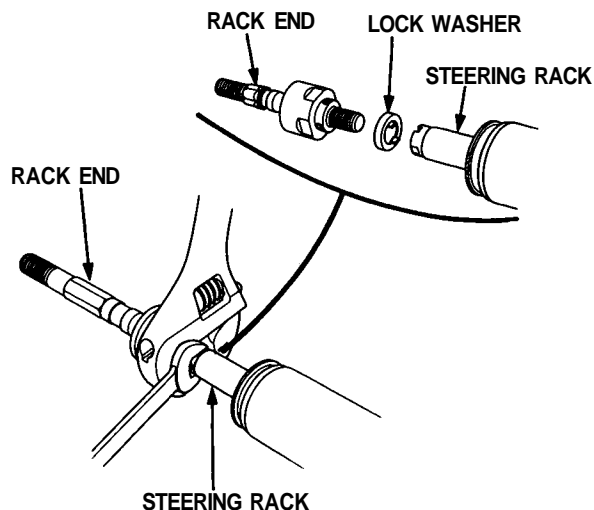


65. Remove the vinyl tape and install the pinion dust cover.

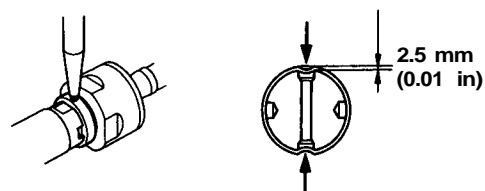
CAUTION:

- When installing, be careful not to hit the pinion holder pin.
- Make sure the O-rings are in place and not pinched.

66. Install the new lock washer in the groove in the steering rack.
67. Hold the steering rack with a wrench and tighten the rack end to 80 N-m (8.0 kg-m, 58 lb-ft).



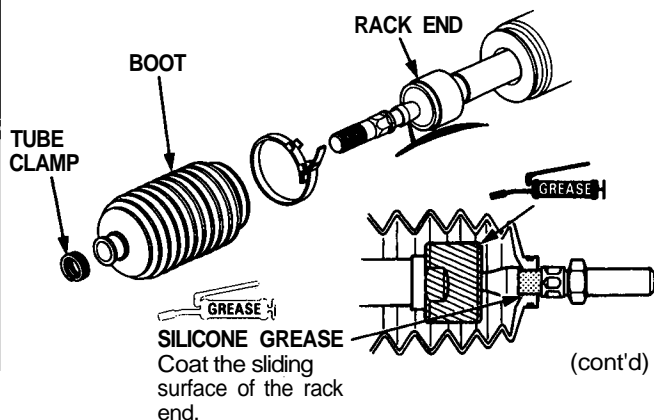
68. After tightening the rack end, stake the two sections of the lock washer.



69. Apply grease to the circumference of the rack end housing.
70. Install the boots on the rack end with the tube clamps.

NOTE:

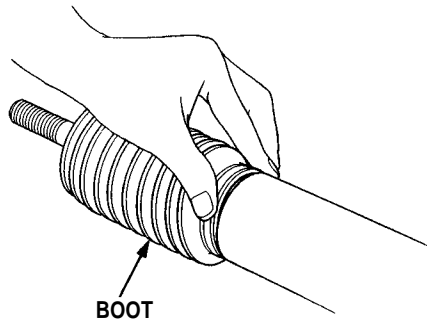
- Coat the rack end groove and inside of the boot with silicone grease.



Steering Gearbox

Overhaul (cont'd)

71. Before installing the boot band, turn up the right and left boots at the gear housing side and adjust the pressure inside the boots to atmospheric pressure.

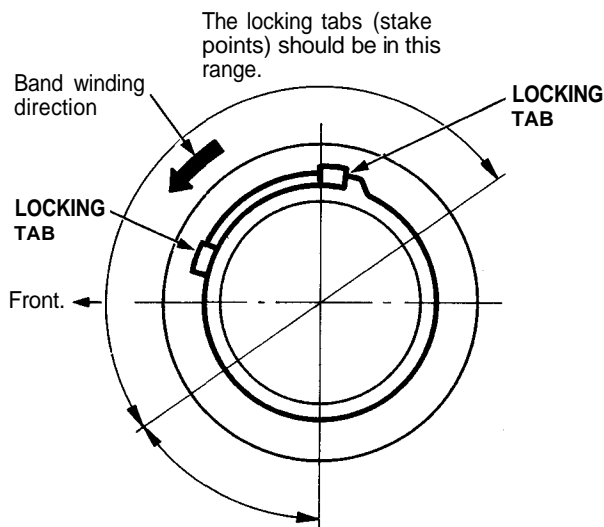


NOTE: Install the boot band with the rack in the straight ahead position (i.e. right and left tie-rods are equal in length).

72. Install the boot band so that the locking tabs of the band (stake points) are in the range shown below. (Tabs should face up and slightly forward.)

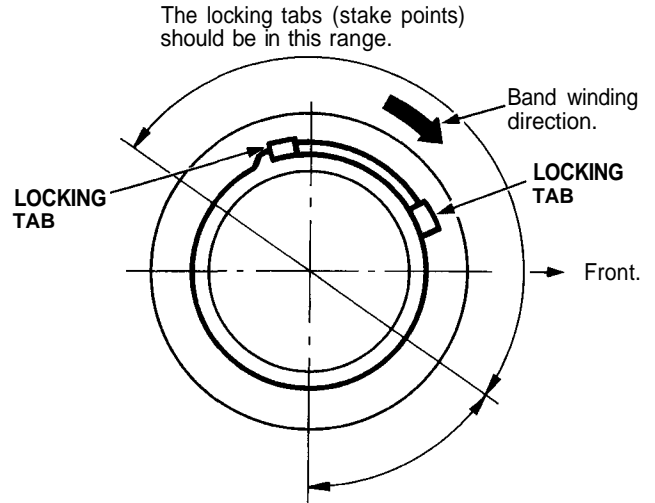
Left Dust Seal Installation:

NOTE: Viewed from the left side (gearbox side):



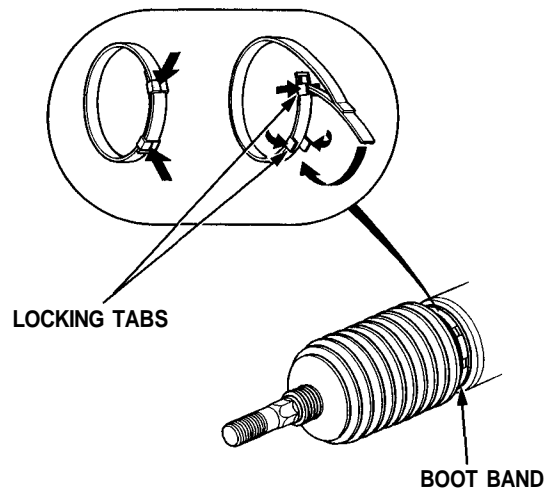
Right Dust Seal Installation:

NOTE: Viewed from the right side (cylinder side):



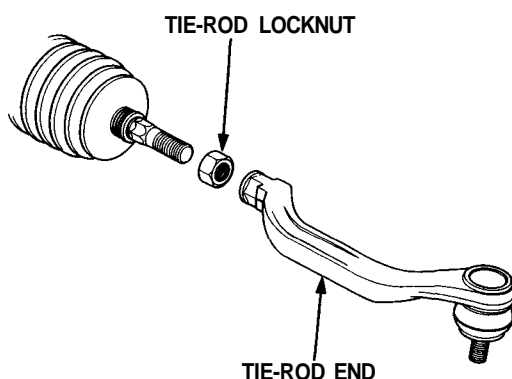
CAUTION: Stake the band locking tabs firmly.

73. Install new boot bands on the boot and bend both sets of locking tabs.
74. Lightly tap on the doubled-over portions to reduce their height.
75. After assembling, slide the rack right and left to be certain that the boots are not deformed or twisted.





76. Install the right and left tie-rod ends on the right and left rack ends.

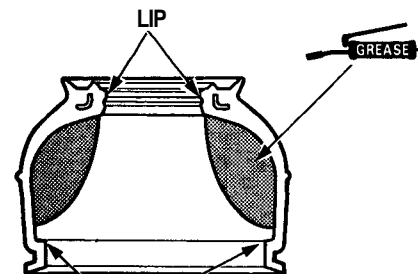


Ball Joint Boot Replacement

1. Remove the set ring and the boot.

CAUTION: Do not contaminate the boot installation section with grease.

2. Pack the interior of the boot and lip with grease.

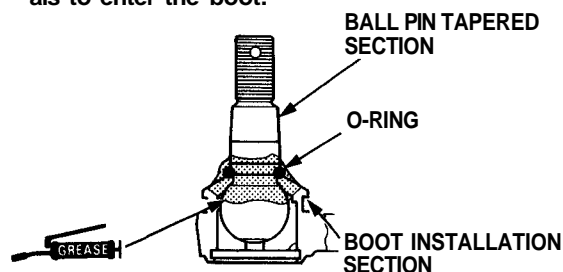


BOOT INSTALLATION SECTION

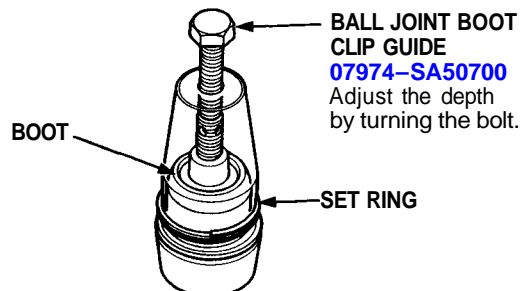
3. Wipe the grease off the sliding surface of the ball pin, then pack the lower area with fresh grease.

CAUTION:

- Keep grease off the boot installation section and the tapered section of the ball pin.
- Do not allow dust, dirt, or other foreign materials to enter the boot.



4. Install the boot in the groove of the boot installation section securely, then bleed air.
5. Insert the special tool into the threads in the ball pin and align the end of the bolt with the groove in the boot.
6. Slide the set ring over the tool and into position.



CAUTION: After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.