

Fan Clutch Major Rebuild

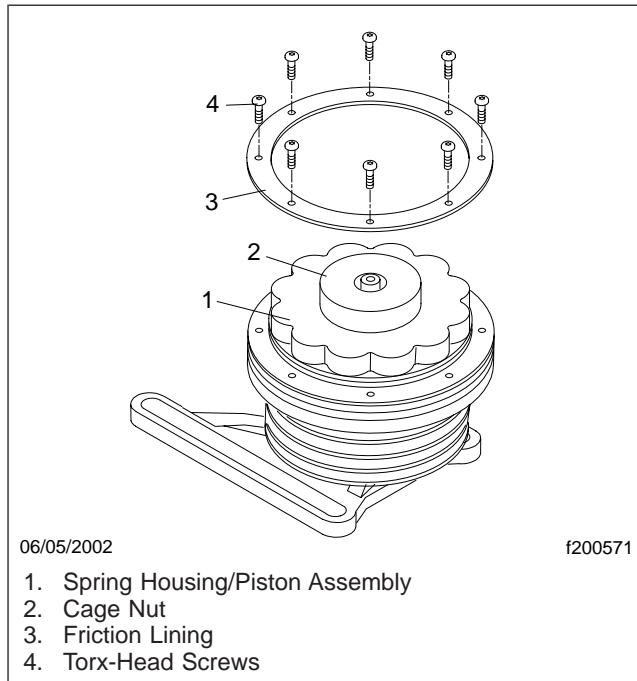


Fig. 4, Friction Lining Removal and Installation

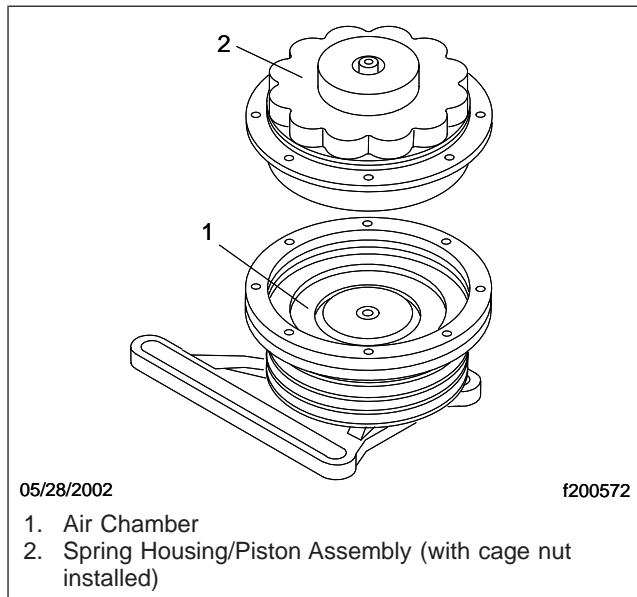


Fig. 5, Spring Housing/Piston Assembly Removal and Installation

19. Inspect the face seal for signs of wear. Wear indicates that dirt may exist in the air system

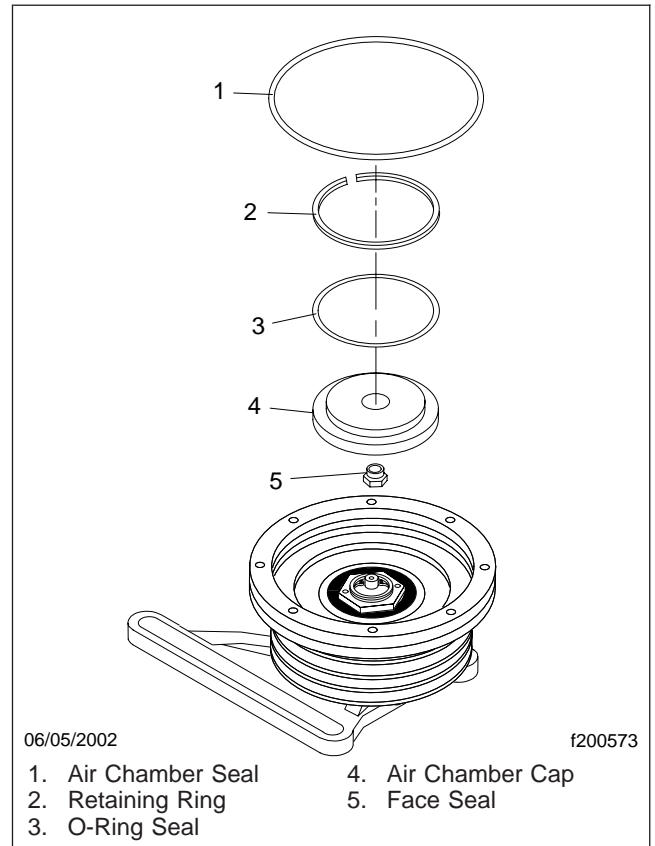


Fig. 6, Air Chamber Seal Removal and Installation

20. Remove the bearing nut from the mounting bracket. See [Fig. 7](#) .
21. Remove the sheave from the mounting bracket. See [Fig. 8](#) .
22. If replacing the bearings, support the sheave and press them out.
23. Clean and remove any dirt, debris, or corrosion that may be present.
24. Remove the air cartridge.
 - 24.1 Remove the retaining ring. See [Fig. 9](#) .
 - 24.2 Remove the air cartridge assembly. See [Fig. 10](#) .

Assembly

1. If necessary, clean the air cartridge bore in the mounting bracket.

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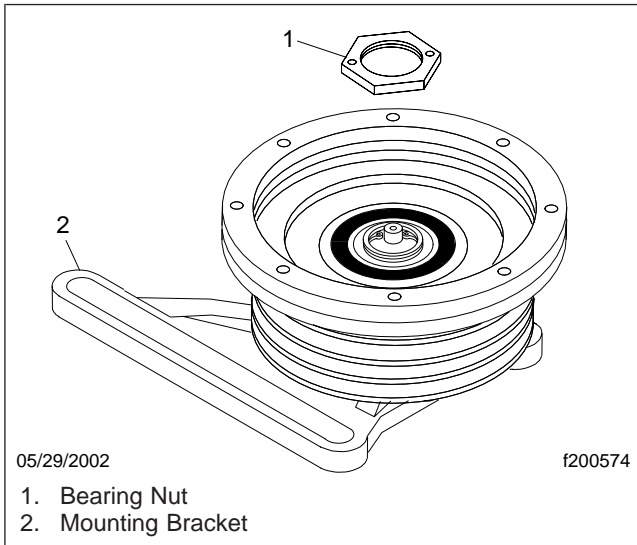


Fig. 7, Bearing Nut Removal and Installation

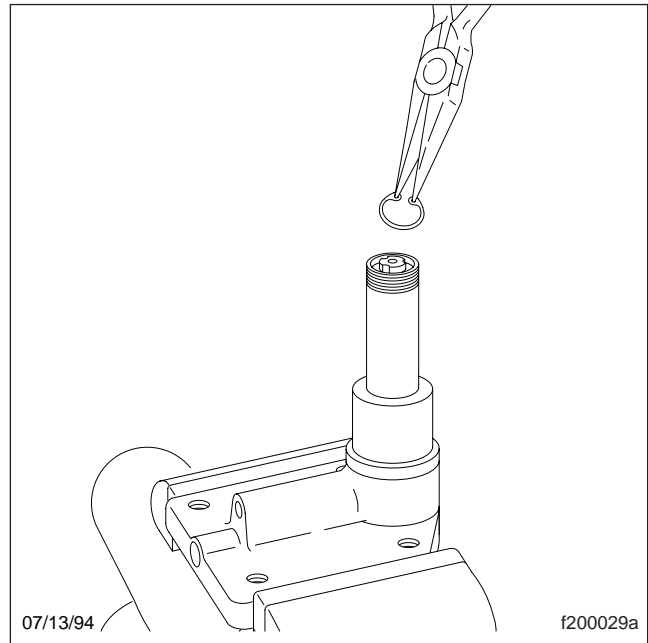


Fig. 9, Retaining Ring Removal and Installation

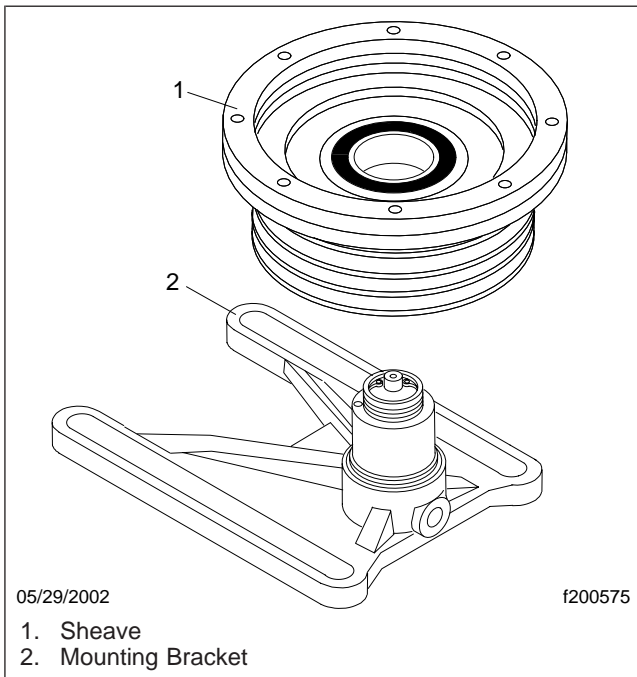


Fig. 8, Removing the Sheave

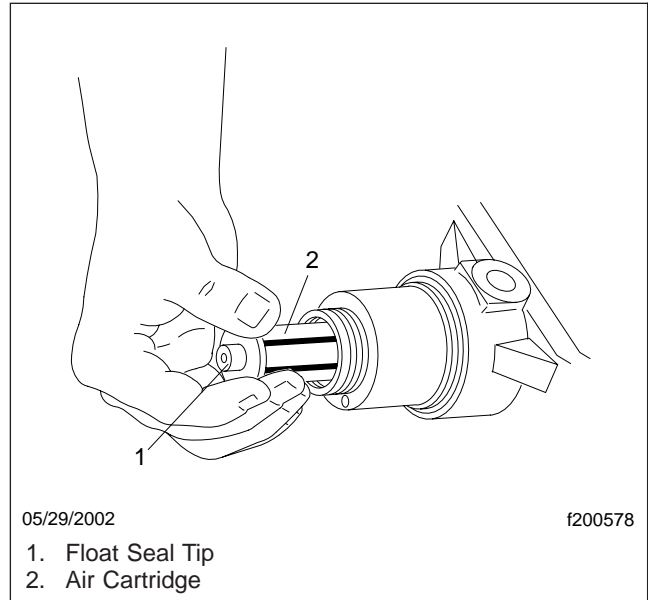


Fig. 10, Removing the Air Cartridge

NOTE: The sheave bearings do not require lubrication.

2. If replacing the sheave bearings, do the following:

- 2.1 If equipped with two bearings, assemble the bearings so the markings on their edges line up to form an arrow. See

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Fig. 11 . It doesn't matter which way the arrow faces when the bearings are installed.

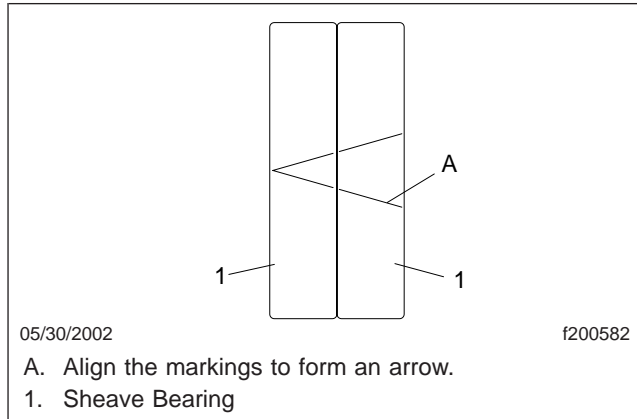


Fig. 11, Aligning the Bearings

IMPORTANT: If the fan clutch uses spacers, be sure to install them between the bearings.

- 2.2 Supporting the sheave, press the new sheave bearings — and spacers, if applicable — into place. Note the position of the lip inside the sheave.
- 2.3 Slide the sheave onto the mounting bracket. See **Fig. 8** .
- 2.4 Making sure that the bearing nut hex is facing up, install the bearing nut. See **Fig. 12** . Tighten 130 lbf-ft (176 N·m). See **Fig. 7** .

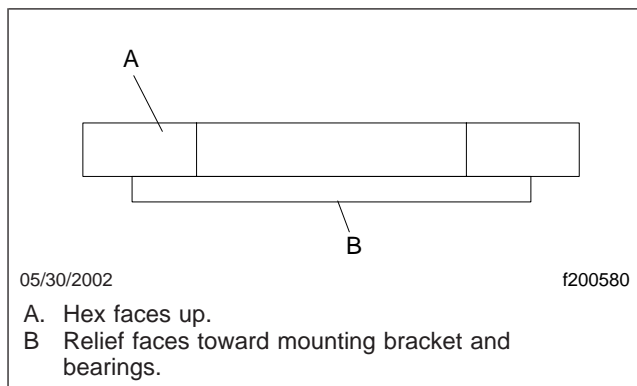


Fig. 12, Correct Bearing Nut Orientation

- 3. Apply O-ring lubricant from the kit to the outside O-rings of the new air cartridge assembly. See **Fig. 13** .

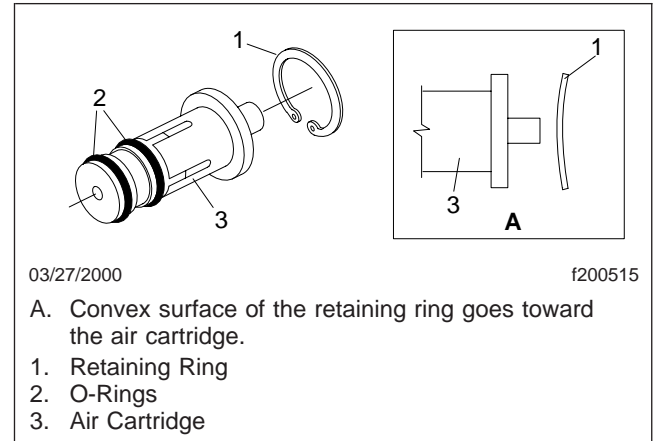
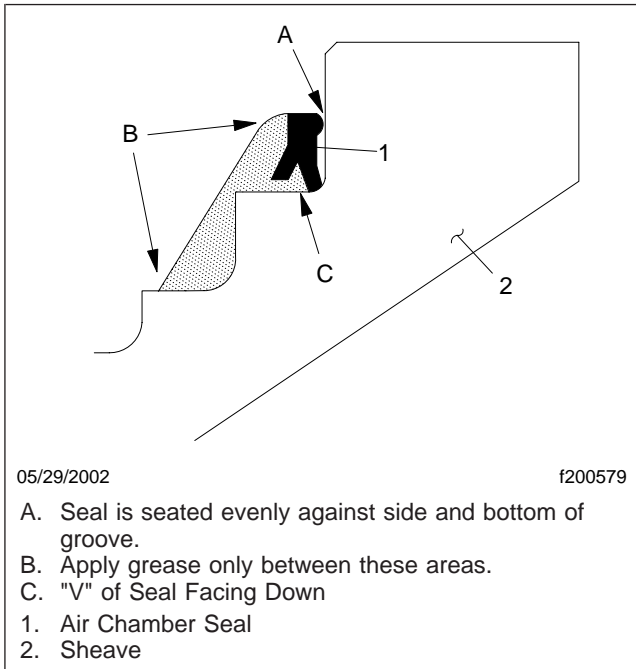


Fig. 13, Installing the Air Cartridge Retaining Ring

- 4. Install the new air cartridge assembly into the mounting bracket.
- 5. Install the retaining ring, making sure the convex surface of the ring is toward the air cartridge. See **Fig. 13** .
- 6. Using a clean, dry cloth, clean both the float seal tip of the air cartridge and the face seal of the air chamber cap.
- 7. Assemble the air chamber cap and face seal. See **Fig. 6** .
Tighten the face seal 75 to 100 lbf-in (850 to 1130 N·cm).
- 8. Lubricate the O-ring seal with the fresh lubricant from the kit.
- 9. Install the O-ring seal on the air chamber cap. See **Fig. 6** .
- 10. Carefully set the air chamber cap into the sheave. See **Fig. 6** .
- 11. Install the retaining ring. See **Fig. 6** .
- 12. Install the air chamber seal into the sheave. Be sure the seal is evenly seated against the side and bottom of the groove surfaces, and the "V" of the seal is facing down. See **Fig. 14** .
- 13. Lubricate contact surfaces with the fresh lubricant from the kit.

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**Fig. 14, Correct Installation of Air Chamber Seal
(cross-section view)**

⚠ WARNING

The new spring housing/piston assembly from the kit has a cage nut installed on it. Do not remove the cage nut. This will cause the spring housing to be forcibly ejected from the piston assembly, which could result in serious injury.

14. Carefully set the new spring housing/piston assembly into position. See [Fig. 6](#) . Note that the new assembly has a cage nut installed on it.
15. Rotate the new spring housing/piston assembly to align the mounting holes with those of the sheave.

IMPORTANT: Handle the new friction liner by the edges to avoid contamination.

16. Set the new friction liner from the kit into place, being careful to touch only the edges.
17. Using a T27 Torx bit, install the eight Torx-head screws. See [Fig. 4](#) . Tighten alternately 80 lbf-in (900 N·cm).
18. Apply a minimum of 80 psi (552 kPa) of clean air to the air inlet.

19. Remove the cage nut from the spring housing/piston assembly.
20. Install the new fan mounting disc from kit.

⚠ CAUTION

Use care when placing the pry bar onto the fan mounting disc. Make sure it is secure and flat on the surface. Failure to do so make cause the pry bar to slip, which could result in damage to studs or the fan mounting disc.

21. Using a suitable wrench, a T55 Torx bit, and a pry bar, tighten the jack bolt (left-hand thread) 100 lbf-ft (136 N·m). Turn the wrench clockwise and push the pry bar counterclockwise.
22. Using shop air, actuate the fan clutch and check for correct engagement and disengagement of the fan mounting disc. If there is a problem, it must be corrected before installing the fan clutch onto the engine.
23. Check for air leaks at the bleed hole and around the spring housing/piston assembly.
24. Install the fan clutch assembly onto the engine. See [Subject 100](#) for instructions.

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Disassembly

NOTE: This procedure involves a minor rebuild of the Horton DriveMaster® fan clutch, using parts from the manufacturer's Seal Kit. If a major rebuild of the fan clutch is needed, see [Subject 110](#).

1. Remove the fan clutch assembly from the vehicle. For instructions, see [Subject 100](#).
2. Put the fan clutch assembly in a vise.
3. Connect a shop air hose to the fan clutch air inlet.
4. Apply 80 to 120 psi (552 to 827 kPa) to the fan clutch to lift the fan mounting disc off the spring housing/piston assembly.

CAUTION

Use care when placing the pry bar onto the fan mounting disc. Make sure it is secure and flat on the surface. Failure to do so may cause the pry bar to slip, which could result in damage to studs or the fan mounting disc.

5. Using a pry bar, wrench, and a T55 Torx® bit, loosen the jack bolt (left-hand thread) by turning it counterclockwise. See [Fig. 1](#).
6. Unscrew the fan mounting disc from the jack bolt. See [Fig. 2](#).
7. Inspect the fan mounting disc for wear or damage.

WARNING

Do not disassemble the spring housing from the piston. The interior springs are very strong, and if released could eject the housing with considerable force, possibly resulting in serious injury. Always use the cage nut to hold the spring housing and the piston together.

8. Using a wrench and T55 Torx bit to hold the jack bolt, install the cage nut from the kit onto the jack bolt (left-hand thread). Hand tighten it onto the spring housing.

The cage nut will keep the spring housing and piston together as an assembly. It will also maintain pressure on the internal springs after the

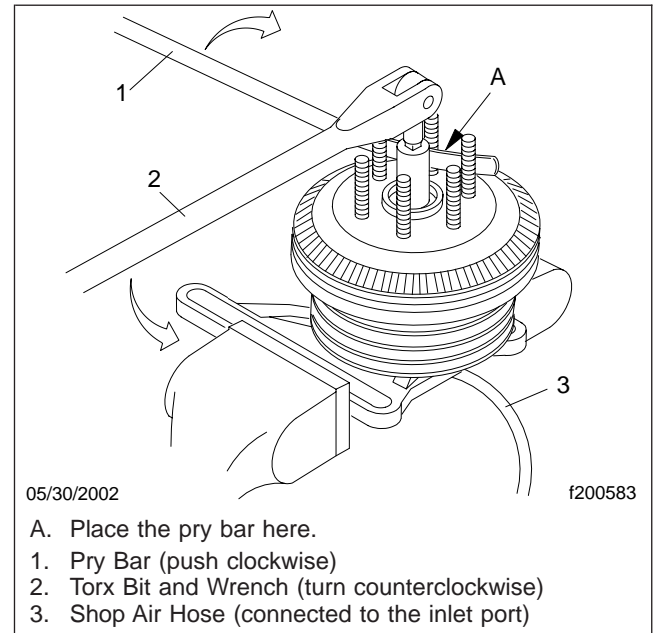


Fig. 1, Loosening the Jack Bolt

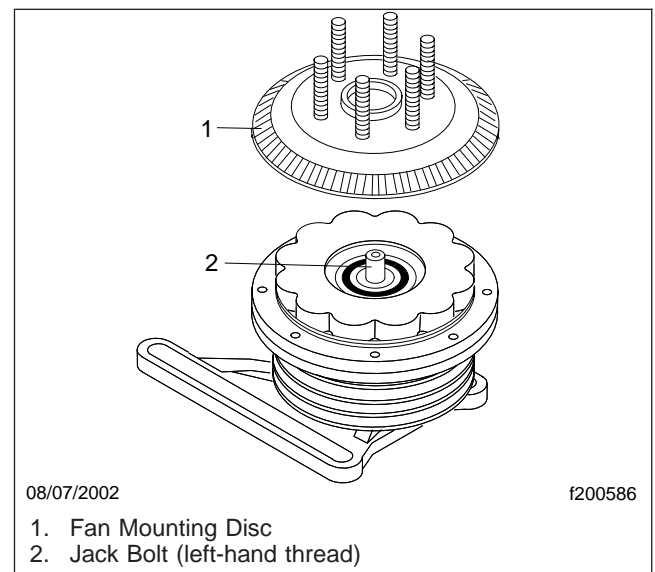


Fig. 2, Fan Mounting Disc Removal and Installation

Torx-head screws holding the friction lining in place are removed.

9. Release the air pressure from the fan clutch.

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WARNING

Release the air pressure from the fan clutch before removing the friction lining Torx-head screws. Failure to release the air pressure could result in the spring housing/piston assembly being ejected with force, which could result in personal injury.

10. Using a T27 Torx bit, remove the eight Torx-head screws holding the friction lining in place.
11. Remove the friction lining. See [Fig. 3](#).

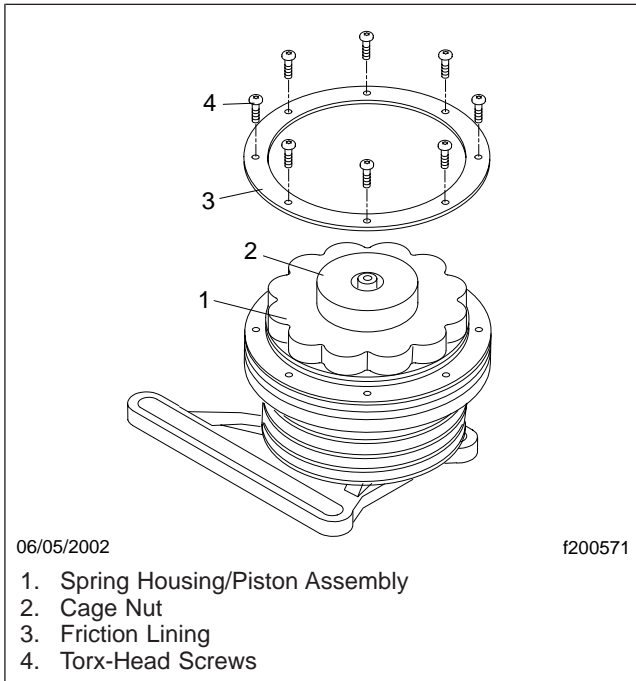


Fig. 3, Friction Lining Removal and Installation

12. *Keeping the cage nut installed and tightened*, remove the spring housing/piston assembly. See [Fig. 4](#).
13. Remove the air chamber seal. See [Fig. 5](#).
14. Examine the inside of the air chamber for signs of moisture and/or contaminants.
15. Remove the air chamber cap retaining ring. See [Fig. 5](#).
16. Using two small screwdrivers placed 180 degrees apart, gently and evenly pry the air chamber cap out of the sheave.

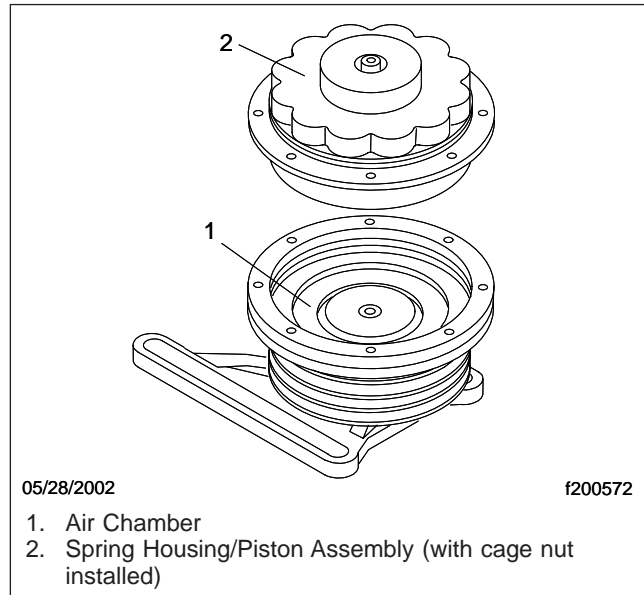


Fig. 4, Spring Housing/Piston Assembly Removal and Installation

17. Remove the O-ring seal from the air chamber cap. See [Fig. 5](#).
18. Remove the face seal. See [Fig. 5](#).
19. Inspect the face seal for signs of wear. Wear indicates that dirt may exist in the air system.
20. Remove the air cartridge.
 - 20.1 Remove the retaining ring. See [Fig. 6](#).
 - 20.2 Remove the air cartridge assembly. See [Fig. 7](#).

Assembly

1. Clean the mounting bracket bore if necessary.
2. Apply O-ring lubricant from the kit to the outside O-rings of the new air cartridge assembly. See [Fig. 8](#).
3. Install the new air cartridge assembly into the mounting bracket.
4. Install the retaining ring, making sure the convex surface of the ring is toward the air cartridge. See [Fig. 8](#).

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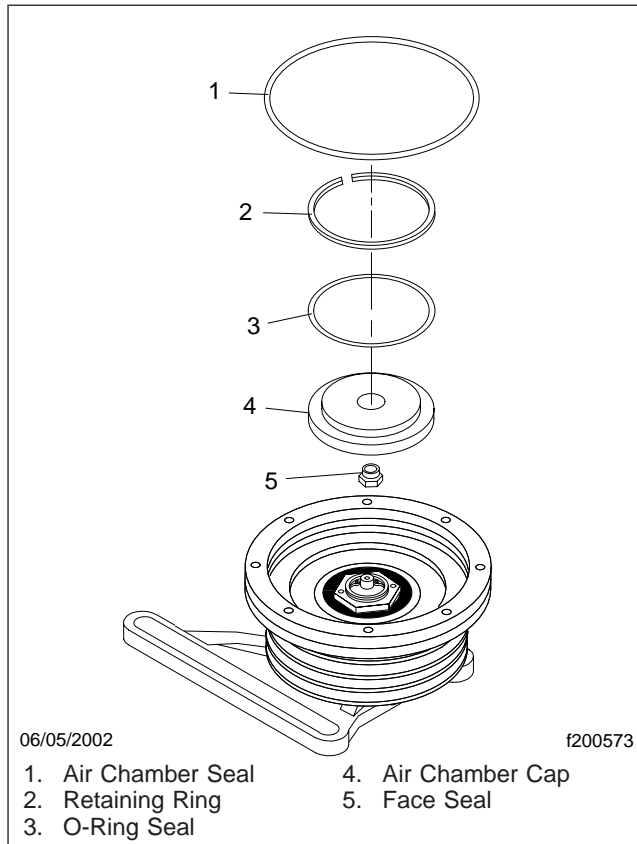


Fig. 5, Air Chamber Seal Removal and Installation

5. Using a clean, dry cloth, clean both the float seal tip of the air cartridge and the face seal of the air chamber cap.
6. Assemble the air chamber cap and face seal. See **Fig. 5**.
- Tighten the face seal 75 to 100 lbf-in (850 to 1130 N-cm).
7. Lubricate the O-ring seal with the fresh lubricant from the kit.
8. Install the O-ring seal on the air chamber cap. See **Fig. 5**.
9. Carefully set the air chamber cap into the sheave. See **Fig. 5**.
10. Install the retaining ring. See **Fig. 5**.
11. Install the air chamber seal into the sheave. Be sure the seal is evenly seated against the side

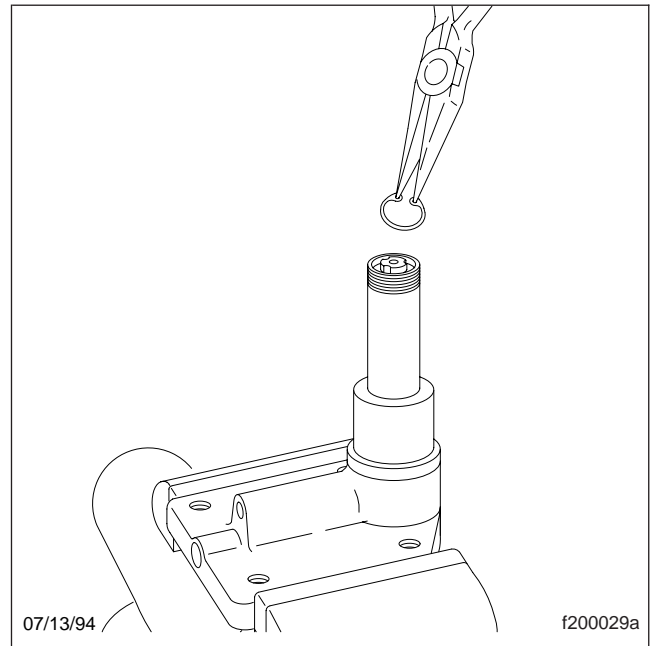


Fig. 6, Retaining Ring Removal and Installation (sheave not shown)

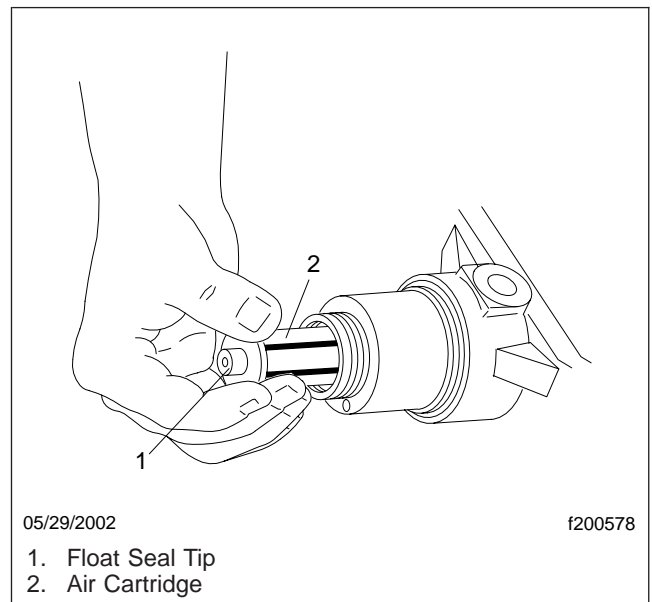


Fig. 7, Removing the Air Cartridge (sheave not shown)

- and bottom of the groove surfaces, and the "V" of the seal is facing down. See **Fig. 9**.
12. Lubricate contact surfaces with the fresh lubricant from the kit.

Fan Clutch Minor Rebuild

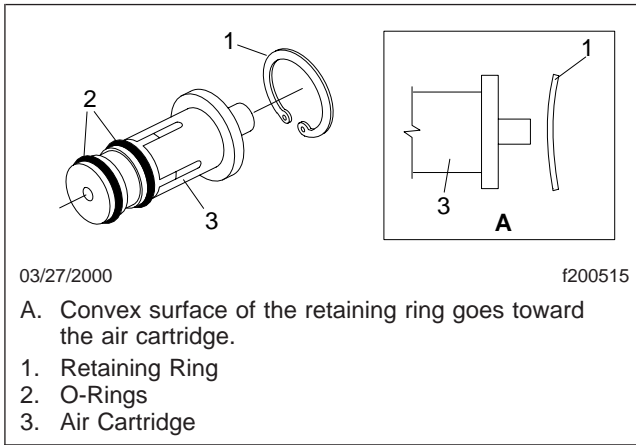


Fig. 8, Installing the Air Cartridge Retaining Ring

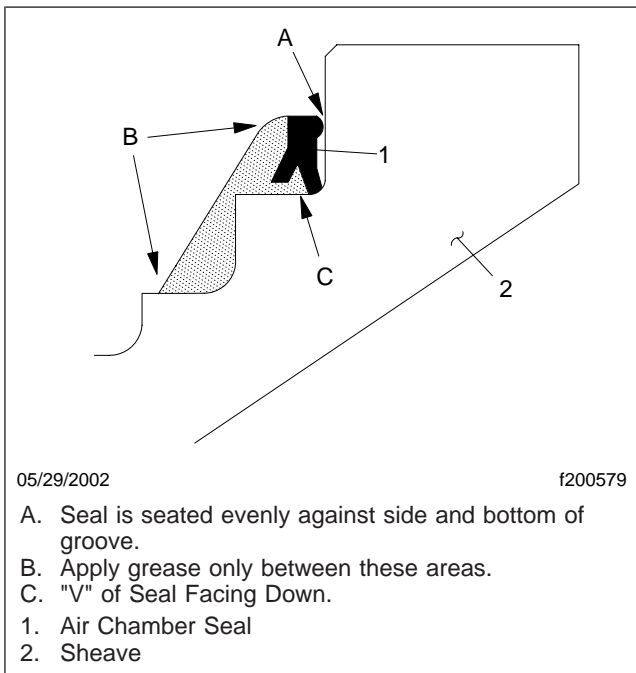


Fig. 9, Correct Installation of Air Chamber Seal (cross-section view)

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13. Carefully set the new spring housing/piston assembly into position. See [Fig. 4](#) . Note that the new assembly has a cage nut installed on it.
14. Rotate the new spring housing/piston assembly to align the mounting holes with those of the sheave.
15. Set the friction liner from the kit into place, being careful to touch only the edges.
16. Using a T27 Torx bit, install the eight Torx-head screws. See [Fig. 3](#) . Tighten alternately 80 lbf·in (900 N·cm).
17. Apply a minimum of 80 psi (552 kPa) of clean air to the air inlet.
18. Remove the cage nut from the spring housing/piston assembly.

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Use care when placing the pry bar onto the fan mounting disc. Make sure it is secure and flat on the surface. Failure to do so make cause the pry bar to slip, which could result in damage to studs or the fan mounting disc.

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22. Install the fan clutch assembly onto the engine. See [Subject 100](#) for instructions.