

Klondike™ SERIES

Kysor-Style Fan Clutch Installation and Repair Kit Instructions



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10. On Rear-Air Units: Lubricate new shaft O-ring with grease* and reinstall clutch to hub using new coupler from kit.

***NOTE**

Use a high temperature rated wheel bearing grease, preferably a synthetic. DO NOT USE CHASSIS GREASE AND DO NOT USE GREASES THAT YOU ARE NOT SURE OF.

KLONDIKE Kysor-Style Fan Clutch: Hub Bearing Kit Instructions

Tools Required

Foot pound or Newton Meter torque wrench
3/8" drive flex head ratchet
3/8" drive 5/16" hex bit socket
1 5/8" socket
Loctite 271

NOTE

Protect the radiator from possible damage from the fan during fan removal and fan and clutch installation.

1. Remove clutch from hub. On Rear-Air Units: Remove and discard rear shaft O-ring and replace it with new one from kit.
2. Remove hub from engine.
3. Remove nut and washer from front of hub.
4. Remove pulley from hub shaft.
5. Remove bearing(s) and retaining ring(s) from pulley and discard.
6. Install new bearing(s) and retaining ring(s).
7. Press pulley back onto hub and reinstall washer.
8. Apply Loctite 271 to nut and torque to 170 ft.-lbs.
9. Reinstall hub to engine.

Introduction

Horton uses the following special notices to give warning of possible safety related problems which could cause serious injury and provide information to help prevent damage to equipment.

DANGER

Danger is used to indicate the presence of a hazard which will cause severe personal injury, death, or substantial property damage if the warning is ignored.

WARNING

Warning is used to indicate the presence of a hazard which can cause severe personal injury, death, or substantial property damage if the warning is ignored.

CAUTION

Caution is used to indicate the presence of a hazard which will or can cause minor personal injury or property damage if the warning is ignored.

NOTE

Note is used to notify people of installation, operation, or maintenance information which is important but not hazard related.

Pre-Installation

You must follow your company safety practices, which should adhere to or be better than Federal or State approved shop safety practices and procedures. Be sure you have all the required parts and have read and understand all the procedures and instructions before beginning work on the unit.

Torque Specifications

Clutch to Hub	45 ft.-lbs. (61.0 Newton Meters)
Fan to Clutch	26 ft.-lbs. (35.3 Newton Meters)
Cylinder Nut	84 in.-lbs. (9.5 Newton Meters)
Retaining Plate Screws	30 in.-lbs. (3.4 Newton Meters)

Optional Tools

In addition to the required tools listed in the kit instructions, the following tools will be helpful in expediting the repair of your fan drive:

- Foot pound or Newton Meter torque wrench
- Hydraulic or hand-operated press
- Scotchbrite® pad
- Brake Cleaner
- Fan clutch support tool and compressor



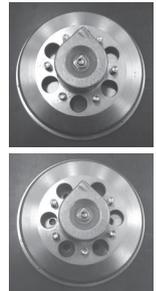
Support Tool
& Compressor

the shaft and push the cylinder onto clutch. Grasp the cylinder while tightening the new cylinder nut to prevent the shaft from turning. Torque the cylinder nut to 84 in.-lbs. (9.5 N-m).



Step 20

21. Remove clutch from press and turn cylinder. It may have a slight gritty feel due to the additives in the grease, but if it feels notched, or turns hard, you most likely lost the small O-ring. Disassemble and correct.
22. Apply 90-120 psi (6.2-8.2 bar) air to the clutch several times to test for free movement and leaks. With clutch disengaged, align the six access holes on the front of the clutch with the mounting holes on the back. Reinstall clutch to hub using the mounting screws included in the kit.



Step 22

spring retainer and then place it on the shaft. Use Brake Cleaner to remove any grease or fingerprints that may be on the disc where the lining touches.



17. Insert disc assembly into clutch housing. Place unit studs down into support tool. Place new lining into clutch. Use compressor tool to compress clutch **slowly** while pushing down on lining. When lining gets flush with outer edge of clutch, **stop**.

Step 16

18. Install lining plates, sharp edge down. Tighten screws to 30 in.-lbs. Take clutch out of press and set on bench, studs up.



Step 18

19. Lubricate the new small O-ring with grease from the kit and place it on the shoulder of the cylinder. Apply grease to the rest of the shoulder in front of the O-ring.



Step 19

20. Place new tab washer in the cavity of the cylinder. Align tab with key way on

(for use with hydraulic or hand-operated presses)*

- A selection of screwdrivers
- Lubricant (included in the repair kit)**

* The support tool and compressor can be made from pieces of pipe and flat steel.

** NOTE

If greases are substituted, you must insure that you use a high temperature rated wheel bearing grease, preferably a synthetic. **DO NOT USE CHASSIS GREASE AND DO NOT USE GREASES THAT YOU ARE NOT SURE OF.**

Emergency Lock-Up Procedures

If the lining wears to the point where the fan clutch will not engage, the fan clutch can be locked up, by doing the following:

1. Remove air supply from fan clutch (In most cases, disconnecting solenoid electric plug will work).
2. For Rear-Air: Remove the cylinder nut, cylinder, and seal washer.
For Front-Air: Remove the cylinder nut, tab washer, and cylinder.



Step 1-2

Klondike Rear-Air Kysor-Style Fan Clutch Installation Instructions

For some situations it will be necessary to tilt the radiator away from the engine in order to gain enough room to remove and repair the fan clutch. A few applications require removing the entire fan drive assembly. We recommend whenever possible to remove only the clutch, doing so will save substantial time and work.

NOTE

Protect the radiator from possible damage from the fan during fan removal and fan and clutch installation.

1. Remove the fan and place it inside the radiator shroud. Apply 90-120 psi (6.2-8.2 bar) air to the clutch to disengage it. Rotate the front of the clutch until the six access holes are aligned with the six 5/16" socket head cap screws. If the clutch won't disengage, put the fan back on the fan-mounting studs and try to force the clutch to slip by pulling on a blade. If this doesn't work, remove the entire fan drive assembly.



Step 1

the groove between the needle bearings and the rotary seal.

13. Use crocus cloth, sandpaper, or a Scotchbrite[®] pad to break the glaze on the disc and retaining plates. Wash the parts with Brake Cleaner and dry.
14. Take the cleaned up disc (inner part) and push it into the clutch housing. Turn it a few times to work the grease into the needles. Remove it and wipe off any grease that comes out with it on the front. Do this a couple of times until no more excess grease comes out. However if no grease came out, there wasn't enough grease in there to start with. The optimum grease application is to end up with a layer of grease from front to rear, even with the needles, and with plenty of grease worked in behind the needles, but no more than that.
15. Use Brake Cleaner, to clean any grease or greasy fingerprints from the inside of the clutch housing where lining touches. Also, make sure no grease is on the outside of the grease seal where it could get slung into the lining. Set clutch housing aside.
16. Place rear spring retainer onto the shaft. Place spring on shaft. Liberally lubricate inside rear of front

which are removed one at a time. Discard the wiper.

10. Set clutch housing nose down in support tool, and place in press. Use compressor tool to hold the clutch in the press while you pry out the rotary seal with a very large screwdriver. Use a rag, wet with Brake Cleaner, to thoroughly wash needle bearings and clutch housing. Do not let Brake Cleaner get into piston bearing.

NOTE

Do not use safety solvent to clean needle bearings.

11. With clutch in support tool, use a flat plate to press the new rotary seal in, lip down. Press until flush with edge of the housing bore.



Step 11

12. Lubricate the big O-ring, wiper, and the nose of the clutch housing where they are located with grease from the kit. Install big O-ring and wiper on clutch housing. Apply grease to the needle bearings, and pack the groove in front of the needle bearings (down in the bottom near the snap ring) and



Step 12

2. A long handled, 3/8" drive flex head ratchet and a short 5/16" hex bit socket works best for removing the six clutch mounting cap screws.
3. The short length of the socket keeps the ratchet close to the clutch, so you can easily get at the mounting screws from behind the fan
4. Remove the old coupler and install a new one on the hub shaft.
5. Reinstallation: Lubricate rear shaft O-ring with grease*. Stick one of the mounting screws into the clutch and hold it in place with the socket. Get the shaft of the clutch into the cavity of the coupler and start the one mounting screw so the clutch will hang. It is not necessary to get the flats of the shaft aligned with the coupler at this time.



Step 2



Step 3



Step 4



Step 5

* NOTE

If greases are substituted, you must insure that you use a high temperature rated wheel bearing grease, preferably a

synthetic. DO NOT USE CHASSIS GREASE AND DO NOT USE GREASES THAT YOU ARE NOT SURE OF.

6. Grab the front of the clutch and push it towards the hub. Now, slowly turn the cylinder until the flats of the shaft align with the coupler. The clutch should now pop into place on the hub. Install the other mounting screws and torque all six to 45 ft.-lbs. (61 N-m).



Step 6

5. Inspect needle bearing race on disc. It may be discolored and streaked, but as long as you can feel no damage with a fingernail, it's acceptable. It may be cleaned up with a Scotchbrite→ pad to make inspection easier. If damaged, discard clutch.
6. Inspect the fan studs on the clutch housing (outer part). If any are loose or missing, discard clutch. If any are damaged and cannot be repaired with a thread die, discard clutch.
7. Inspect piston bearing by turning piston. If bearing feels rough or spins freely, indicating no grease, discard clutch. If needle bearing inner race, studs and piston are acceptable, proceed with rebuild.



Step 8

8. Remove O-ring from piston and discard.
9. Remove wiper from front groove of housing. It may be the steel type, which has to be spiraled out like a piston ring. It may be the Teflon type, which is cut and comes out easily. It may be the two-piece; O-ring and square cut seal type,



Step 9

Remove the retaining plate screws, retaining plates, and friction liner. Discard the old screws and friction liner.

CAUTION

Do not over compress clutch or damage can occur.

3. Remove the cylinder nut. Grasp the cylinder while loosening the cylinder nut to prevent the shaft from turning. Carefully release pressure from clutch.



Step 3

4. Remove cylinder and tab washer. Remove the small O-ring from the cylinder and discard. Separate the disc assembly (inner part) from the clutch housing (outer part), then remove front spring retainer and spring. Inspect front spring retainer for signs of rubbing (it will be shiny). If found, stop and replace clutch.



Step 4

NOTE

A new cylinder is not included in the kit. If the old one is damaged, replace clutch.

Liner Replacement For Klondike Front-Air / Rear-Air Kysor-Style Fan Clutches

Tools Required

Inch pound or Newton Meter torque wrench

1/4" drive ratchet

1/4" drive T25 Torx® socket

1. Apply 90-120 psi (6.2-8.2 bar) air to the clutch to disengage it.



Step 1

2. Remove the six retaining plate screws and the three retaining plates. Discard the old screws.



Step 2

3. Remove the old friction liner. If the liner sticks to the clutch housing, free it by tapping on the dividing cut of the liner with a hammer and screwdriver.



Step 3

4. Inspect clutch disc. If liner residue is present or if surface appears glazed, temporarily release air pressure to the



Step 4

clutch to get a little more access to the clutch disc, and use crocus cloth, sandpaper, or a Scotchbrite® pad to break the glaze.

5. Reapply air pressure to the clutch, and install the new liner as shown.
6. Reinstall the retaining plates with the screws supplied in the kit and torque them to 30 in.-lbs. (3.4 N-m).



Step 5



Step 6

Tools Required

- Inch pound or Newton Meter torque wrench
- 3/8" drive flex head ratchet
- 3/8" drive 5/16" hex bit socket
- 3/8" drive 1/2" socket
- 1/4" drive ratchet
- 1/4" drive T25 Torx® socket

NOTE

Protect the radiator from possible damage from the fan during fan removal and fan and clutch installation.

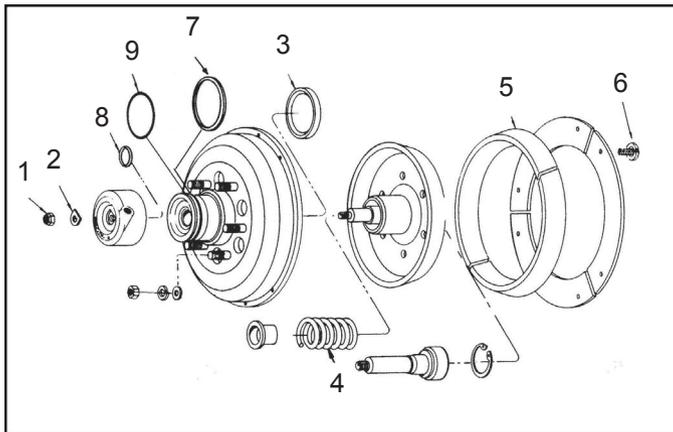
1. Disconnect air line from front of fan clutch. Remove the fan and place it inside the radiator shroud. Apply 90-120 psi (6.2-8.2 bar) air to the clutch to disengage it. Rotate the front of the clutch until the six access holes are aligned with the six 5/16" socket head cap screws and remove them with the flex head ratchet and 5/16" hex bit socket.
2. Using either a hydraulic press or two 4" long bolts with washers and wing nuts, compress clutch slightly.



Step 1

KLONDIKE Front-Air Kysor-Style Fan Clutch: Major Kit Instructions

Exploded View of Front-Air Fan Clutch



Item	Description
1	Cylinder Nut
2	Tab Washer
3	Rotary Seal
5	2 pc. Lining
6	Screw
7	Wiper
8, 9	O-Rings

Klondike Rear-Air Kysor-Style Fan Clutch: Seal Kit Instructions

Tools Required

Inch pound or Newton Meter torque wrench
 3/8" drive flex head ratchet
 3/8" drive 5/16" hex bit socket
 3/8" drive 1/2" socket
 5/8" open-end wrench

NOTE

Protect the radiator from possible damage from the fan during fan removal and fan and clutch installation.

1. Remove the fan and place it inside the radiator shroud. Apply 90-120 psi (6.2-8.2 bar) air to the clutch to disengage it. Rotate the front of the clutch until the six access holes are aligned with the six 5/16" socket head cap screws and remove them with the flex head ratchet and 5/16" hex bit socket.
2. Using either a hydraulic press or two 4" long bolts with washers and wing nuts, compress clutch slightly.



Step 1



Step 2

CAUTION

Do not over compress clutch or damage can occur.

3. Remove the cylinder and cylinder nut. Put the 5/8" open-end wrench on the flats of the shaft to prevent it from turning while loosening the cylinder nut.
4. Remove the seal washer from the front of the shaft.
5. Remove the U-cup seal from the piston, the O-ring from the front of the shaft, and the wiper from the housing. The wiper may be one of the three styles shown in the photo.
6. Install the new white Teflon[®] wiper, regardless of current wiper type. Place the new U-cup seal on the piston. Make sure the lip faces towards the front of the clutch. Install big O-ring on front of shaft. Liberally



Step 3



Step 4



Step 5



Step 6

5. Install the new white Teflon[→] wiper, regardless of current wiper type. Place the new large O-ring on the piston. Liberally grease the new large O-ring, wiper and area around the outside of the piston and wiper with grease from the kit.
6. Lubricate the new small O-ring with grease from the kit and place it on the shoulder of the cylinder. Apply grease to the rest of the shoulder in front of the O-ring.
7. Place new tab washer in the cavity of the cylinder. Align tab with key way on the shaft and push the cylinder onto clutch. Torque the new cylinder nut to 84 in.-lbs. (9.5 N-m). Remove the wing nuts, washers, and bolts from the clutch. Apply 90-120 psi (6.2-8.2 bar) air to the clutch several times to test for free movement and leaks. With clutch disengaged, align the six access holes on the front of the clutch with the mounting holes on the back.



Step 6



Step 7

- Using either a hydraulic press or two 4" long bolts with washers and wing nuts, compress clutch slightly.

! CAUTION

Do not over compress clutch or damage can occur.

- Remove the cylinder nut, tab washer and cylinder. Grasp the cylinder while loosening the cylinder nut to prevent the shaft from turning. Remove the small O-ring from the cylinder and discard.

NOTE

A new cylinder is not included in the kit. If the old one is damaged, replace clutch.

- Remove the large O-ring from the piston and the wiper from the housing. The wiper may be one of the three styles shown in the photo.



Step 3



Step 4



Step 5

grease the U-cup seal, O-ring, and wiper with the grease from the kit.

- Lubricate the new seal washer with grease from the kit and place it on the shaft.
- Align tab on cylinder with key way on the shaft and push the cylinder onto clutch. Place a 5/8" wrench on the flats of the shaft to prevent the cylinder from turning while tightening the new cylinder nut. Torque the cylinder nut to 84 in-lbs. (9.5 N-m).
- Remove the wing nuts, washers, and bolts from the clutch. Apply 90-120 psi (6.2-8.2 bar) air to the clutch several times to test for free movement and leaks. With clutch disengaged, align the six access holes on the front of the clutch with the mounting holes on the back.



Step 7



Step 8



Step 9

10. Remove old O-ring from rear of shaft and replace it with new one from kit. Lubricate O-ring with grease from the kit and reinstall clutch to hub using new coupler.

KLONDIKE Front-Air Kysor-Style Fan Clutch: Seal Kit Instructions

Tools Required

Inch pound or Newton Meter torque wrench
3/8" drive flex head ratchet
3/8" drive 5/16" hex bit socket
3/8" drive 1/2" socket

NOTE

Protect the radiator from possible damage from the fan during fan removal and fan and clutch installation.

1. Disconnect air line from front of fan clutch. Remove the fan and place it inside the radiator shroud. Apply 90-120 psi (6.2-8.2 bar) air to the clutch to disengage it. Rotate the front of the clutch until the six access holes are aligned with the six 5/16" socket head cap screws and remove them with the flex head ratchet and 5/16" hex bit socket.



Step 1



Step 2

the new cylinder nut. Torque the cylinder nut to 84 in.-lbs. (9.5 N-m).

22. Apply 90-120 psi (6.2-8.2 bar) air to the clutch several times to test for free movement and leaks. With clutch disengaged, align the six access holes on the front of the clutch with the mounting holes on the back.



Step 22

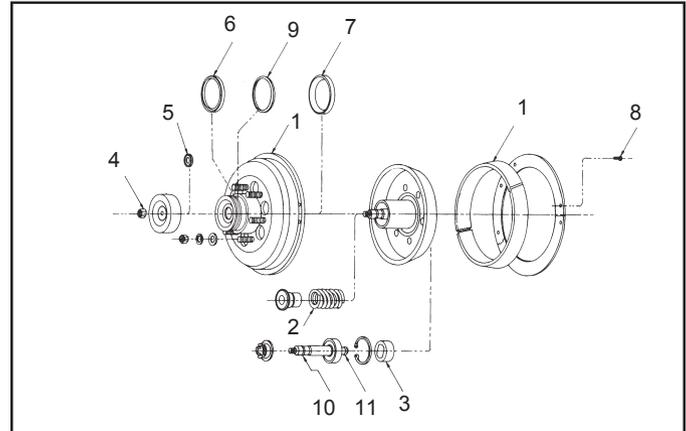
23. Lubricate rear shaft O-ring (small one) with grease from the kit and install on shaft. Reinstall clutch to hub using the new coupler and mounting screws included in the kit.



Step 23

Klondike Rear-Air Kysor-Style Fan Clutch - Major Kit Instructions

Exploded View of the Rear-Air Fan Clutch



Item	Description	Item	Description
1	2-Piece Lining	6	U-cup
2	Spring	7	Rotary Seal
3	Coupler	8	Screw
4	Cylinder Nut	9	Wiper
5	Seal Washer	10,11	O-rings

Tools Required

- Inch pound or Newton Meter torque wrench
- 3/8" drive flex head ratchet
- 3/8" drive 5/16" hex bit socket
- 3/8" drive 1/2" socket
- 5/8" open-end wrench
- 1/4" drive ratchet
- 1/4" drive T25 Torx® socket

NOTE

Protect the radiator from possible damage from the fan during fan removal and fan and clutch installation.

1. Remove the fan and place it inside the radiator shroud. Apply 90-120 psi (6.2-8.2 bar) air to the clutch to disengage it. Rotate the front of the clutch until the six access holes are aligned with the six 5/16" socket head cap screws and remove them with the flex head ratchet and 5/16" hex bit socket.
2. Using either a hydraulic press or two 4" long bolts with washers and wing nuts, compress clutch slightly. Remove the retaining plate screws,



Step 2

retainer and then place it on the shaft. Use Brake Cleaner to remove any grease or fingerprints that may be on the disc where the lining touches.

18. Insert disc assembly into clutch housing. Place unit studs down into support tool. Place new lining into clutch. Use compressor tool to compress clutch **slowly** while pushing down on lining. When lining gets flush with outer edge of clutch, **stop**.
19. Install lining plates, sharp edge down. Tighten screws to 30 in.-lbs. (3.4 N-m).
20. Lubricate the new seal washer with grease from the kit and place it on the shaft.
21. Align tab on cylinder with keyway on the shaft and push the cylinder onto clutch. Place a 5/8" wrench on the flats of the shaft to prevent the cylinder from turning while tightening



Step 19



Step 20



Step 21

14. Use crocus cloth, sandpaper, or a Scotchbrite→ pad to break the glaze on the disc and retaining plates. Wash the parts with Brake Cleaner and dry.
15. Take the cleaned up disc (inner part) and push it into the clutch housing. Turn it a few times to work the grease into the needles. Remove it and wipe off any grease that comes out with it on the front. Do this a couple of times until no more excess grease comes out. However if no grease came out, there wasn't enough grease in there to start with. The optimum grease application is to end up with a layer of grease from front to rear, even with the needles, and with plenty of grease worked in behind the needles, but no more than that.
16. Use Brake Cleaner, to clean any grease or greasy fingerprints from the inside of the clutch housing where lining touches. Also, make sure no grease is on the outside of the grease seal where it could get slung into the lining. Set clutch housing aside.
17. Place rear spring retainer onto the shaft. Place spring on shaft. Liberally lubricate inside rear of front spring



Step 17

retaining plates, and friction liner. Discard the old screws and friction liner.

CAUTION

Do not over compress clutch or damage can occur.

3. Remove the cylinder nut. Use a 5/8" wrench on the flats of the shaft to prevent the cylinder from turning. Carefully release pressure from clutch.
4. Remove cylinder and seal washer. Separate the disc assembly (inner part) from the clutch housing (outer part), then remove front spring retainer and spring. Inspect front spring retainer for signs of rubbing (it will be shiny). If found, stop and replace clutch.
5. Inspect needle bearing race on disc. It may be discolored and streaked, but as long as you can feel no damage with a fingernail, it's acceptable. It may be cleaned up with a Scotchbrite→ pad to make inspection easier. If damaged, discard clutch.



Step 3



Step 4

6. Inspect the fan studs on the clutch housing (outer part). If any are loose or missing, discard clutch. If any are damaged and cannot be repaired with a thread die, discard clutch.

7. Inspect piston bearing by turning piston. If bearing feels rough or spins freely, indicating no grease, discard clutch. If needle bearing inner race, studs and piston are acceptable, proceed with rebuild.

8. Remove all O-rings from shaft. Discard.

9. Remove wiper from front groove of clutch housing. It may be the steel type, which has to be spiraled out like a piston ring. It may be the Teflon type, which is cut and comes out easily. It may be the two-piece; O-ring and square cut seal type, which are removed one at a time. Discard the wiper.

10. Set clutch housing nose down in support tool, and place in press. Use compressor tool to hold the clutch in the press while



Step 8



Step 9

you pry out the grease seal with a very large screwdriver. Use a rag, wet with Brake Cleaner, to thoroughly wash needle bearings and clutch housing. Do not let Brake Cleaner get into piston bearing.

NOTE

Do not use safety solvent to clean needle bearings.

11. With clutch in support tool, use a flat plate to press the new rotary seal in, lip down. Press until flush with edge of the housing bore.



Step 11

12. Using specified grease, lubricate and install the wiper.



Step 12

13. Install and liberally lubricate the U-cup seal, the front shaft O-ring (big one) and the nose of the clutch housing where they are located with grease from the kit. Apply grease to the needle bearings, and pack the groove in front of the needle bearings (down in the bottom near the snap ring) and the groove between the needle bearings and the rotary seal.



Step 13