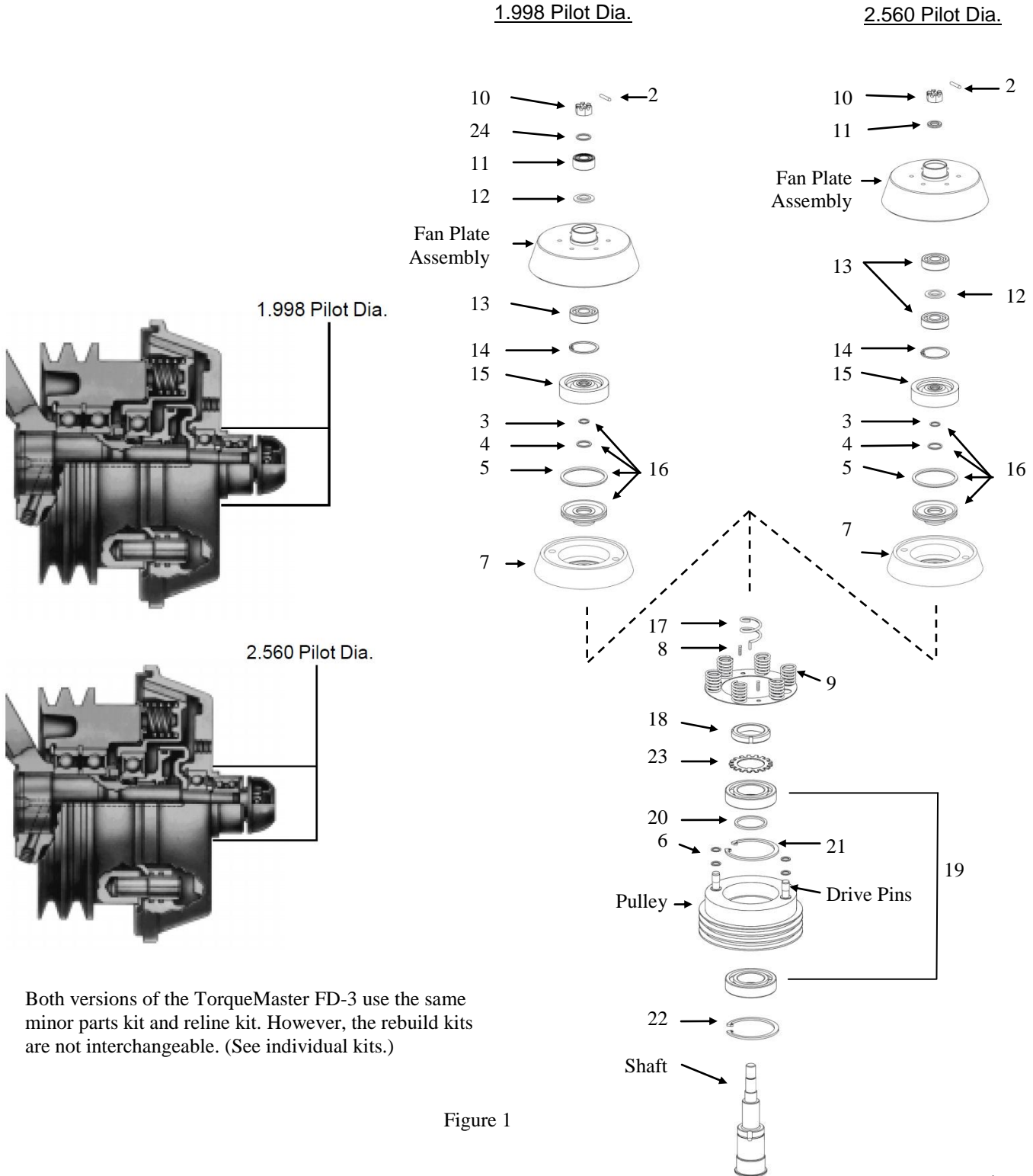


Installation Instructions



Both versions of the TorqueMaster FD-3 use the same minor parts kit and reline kit. However, the rebuild kits are not interchangeable. (See individual kits.)

Figure 1

FD-3 Fan Clutch Maintenance Kits No.
 104937, 104938, 104939, 104940, 104941, 104942 Rev 4

FD-3 Minor Parts Kit 104937:

Quantity	Description	Key
1	Cotter Pin	2
1	O-Ring	3
1	O-Ring	4
1	O-Ring	5
4	O-Ring	6

FD-3 Reline Parts Kit 104938:

Quantity	Description	Key
1	Minor Parts Kit 104937	-
1	Pressure Plate Complete	7
2	1/4 Sems Screw	8
1	Spring Pack	9

Rebuild Kit 104939 For Standard FD-3:

Quantity	Description	Key
1	Reline Kit 104938	-
1	Flange Nut	10
1	Ball Bearing	11
1	Spacer	12
1	Ball Bearing	13
1	Retaining Ring	14
1	Piston Housing	15
1	Piston Complete	16
1	Anti-Rotation Spring	17
1	Locknut	18
2	Ball Bearing	19
1	Spacer	20
1	Retaining Ring	21
1	Retaining Ring	22
1	Lockwasher (re-use original)	23
1	Red Spacer	24

**Rebuild Kit 104941 For FD-3
 With 2.56" Pilot Diameter:**

Quantity	Description	Key
1	Reline Kit 104938	-
1	Slotted Nut	10
1	Washer	11
1	Spacer	12
2	Ball Bearing	13
1	Retaining Ring	14
1	Piston Housing	15
1	Piston Complete	16
1	Anti-Rotation Ring	17
1	Locknut	18
2	Ball Bearing	19
1	Spacer	20
1	Retaining Ring	21
1	Retaining Ring	22
1	Lockwasher (re-use original)	23

REMOVAL OF FAN CLUTCH

It is recommended that the FD-3 TorqueMaster Fan Clutch be removed from the vehicle for service even though it is possible on some installations to install kits 104937 and 104938 without clutch removal.

1. Secure the vehicle on a level surface by means other than the brakes.
2. Drain **ALL** reservoirs to 0 psi. (0 kPa) air pressure.
3. Disconnect the air line from the fan clutch.
4. Remove the six cap screws and lockwashers that attach the fan to the fan plate of the FD-3.
5. Remove the fan. NOTE: Remove and retain any spacers that may be installed between fan and fan plate.
6. Loosen, remove and retain the vehicle's fan belts.
7. Remove the attaching hardware from the fan clutch mounting bracket and remove the fan clutch.

DISASSEMBLY

General

The following disassembly instructions cover the use of the Minor Parts Kit 104937, the Reline Kit (104938) and the four Rebuild Kits. Regardless of the kit being installed, begin disassembly with Step 1 under the Minor Parts Kit heading. Continue disassembly until instructed otherwise.

MINOR PARTS KIT #104937

1. Remove and save the dust cap(1) by pulling it out of the fan plate assembly.
2. Remove and discard the cotter pin(2) from lock nut(10).
3. Remove and retain the lock nut(10).
4. Remove and retain the fan plate assembly.
5. Slide the piston(16) and housing(15) off the shaft.
6. Separate the piston(16) from the piston housing(15) and remove and discard O-rings(4 & 5) from the piston. Retain the piston(16) and piston housing(15).
7. Remove and discard O-ring(3) from the shaft and the four O-rings(6) from the pressure plate(7).
8. No further disassembly is required if kit 104937 is being installed. Proceed to the Cleaning instructions. If other kits are being installed, continue disassembly.

RELINING KIT #104938

9. Remove and discard pressure plate(7) from the shaft.
10. Remove and discard the two 1/4"-20 Phillips head screws that secure the spring pack(9) to the pulley. Remove and discard the spring pack(9).
11. If your drive pins (fig. 2) have a plastic sleeve on them, use a pliers to remove the sleeve from the pin.
12. If your drive pins do not have plastic sleeves on them, use a micrometer to measure the diameter of each drive pin in four places around the circumference. Each measurement should be spaced 45°. If any of the four measurements on either drive pin is less than .615 in. (15.62 mm), the entire fan clutch including the previously disassembled components must be replaced.

13. No further disassembly is required when installing kit #104938. Proceed to the Cleaning instructions. If using one of the rebuild kits, continue disassembly.

REBUILD KIT #'S: 104939, 104940, 104941, 104942

14. Discard the following parts which were retained during previous disassembly; locknut(10) and piston(16) and piston housing(15).
15. Remove and discard the anti-rotation spring (17).
16. Disengage the lock tab of the lockwasher (23) from the notch of the locknut(18).

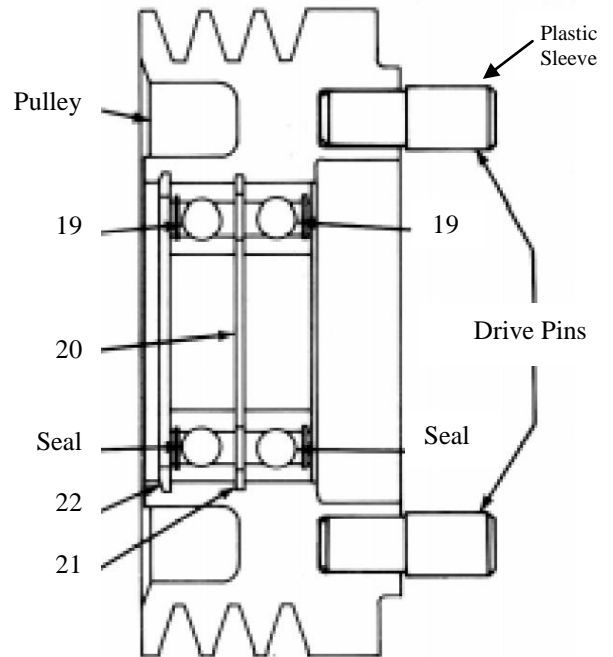


Figure 2

17. Remove and discard the locknut(18). Remove and save the lockwasher (23).
18. Support the pulley so that the shaft and bracket assembly can be pressed out of the pulley assembly. Press the shaft and bracket assembly out of the pulley assembly.
19. Support the pulley so that the tapered retaining ring (21) is visible. Displace the bearing spacer (20) so that it is eccentric to the bearing bore as far as possible. Insert a round pressing tool through the I.D. of the bearing (19) until it rests on the eccentrically displaced bearing spacer (20). Press out the lower bearing (19) and discard with spacer (20). NOTE: While pressing out the ball bearing, it may be necessary to reposition the spacer to assure the bearing is pressed out evenly.
20. Remove and discard the tapered retaining ring (22).
21. Turn the pulley assembly over and press the remaining bearing (19) out of the pulley and discard the bearing (19).

22. Remove and discard the retaining ring (21) from the pulley.

FAN PLATES WITH 1.998 PILOT DIAMETER

23. Support the fan mounting surface of the fan plate assembly making certain sufficient space is left beneath to permit the ball bearing(11) to be pressed out. Displace the bearing spacer(12) so that it is eccentric to the bearing bore as far as possible. Insert a round, loose fitting, pressing tool through the I.D. of the ball bearing(13) until it rests on the eccentrically displaced bearing spacer(12). Press out and discard the bearing spacer(12) and ball bearing(11). NOTE: While pressing out the ball bearing, it may be necessary to reposition the spacer to assure the bearing is pressed out evenly. Remove and discard the remaining retaining ring(14) and turn the fan plate over. Press out and discard the remaining ball bearing(13).

FAN PLATES WITH 2.560 PILOT DIAMETER

24. Remove and discard the retaining ring(14) from the fan plate assembly. Place the unit nose up on a firm surface and utilizing a round pressing tool press out and discard the two ball bearings(13) and the spacer(12).

CLEANING

1. Using a mild solvent such as mineral spirits, clean and **thoroughly dry** all parts retained during disassembly.
2. Inspect the FD-3 TorqueMaster shaft and bracket assembly, pulley, and fan plate for cracks, dents, and obvious physical damage. The entire fan clutch must be replaced if damage is noted in these parts.

ASSEMBLY

NOTE: If using any of the four rebuild kits, start with step 1 of Assembly instructions. If using reline kit #104938, start with step 14. If using minor kit #104937, start with step 17.

1. Install the retaining ring(21) in the pulley making certain it is **FULLY SEATED** in its groove.
2. Support the pulley on the drive pin side. Using a pressing tool that contacts **THE OUTER RACE**, press the ball bearing(19) into the pulley until it contacts the retaining ring(21).
3. Install the tapered retaining ring(22) with its flat side toward the ball bearing(19). Make certain the retaining ring is **FULLY SEATED** in its groove.
4. Support the pulley with the drive pins up and referring to Figure 1. Install the bearing spacer(20) concentric with the inner race of the previously installed bearing(19). Using a pressing tool that contacts both the **INNER AND OUTER RACE**, press the bearing(19), into the pulley until it contacts the retaining ring(21). NOTE: Before proceeding, make certain the bearing spacer(20) is still concentric with the I.D. of both bearings(19) and that the inner races of both bearings are **CLEAN** and **FREE OF OIL AND GREASE**.

5. Support the shaft and bracket assembly with the shaft pointing up. Make certain the shaft is **CLEAN** and **FREE OF OIL AND GREASE**. Apply one band of **LOCTITE 609** around the shaft for each of the ball bearings(19) previously installed in the pulley.
6. Slide the pulley assembly on the shaft making certain that the inner race of the bearing(19) bottoms against the bracket. NOTE: Continue assembly, however, 24 hours are required for proper curing of the **LOCTITE**.
7. Install the special lockwasher(23) on the shaft making certain the flat side is against the inner race of the bearing and the tang of the I.D. of the lockwasher engages the notch in the shaft.
8. Install the locknut(18) with its flat side against the lockwasher(23) and torque to between 100 and 150 foot. NOTE: When tightening the locknut, make certain that one of the lock tabs of the lockwasher(23) coincides with one of the four notches of the locknut.
9. Bend the appropriate lock tab of the lockwasher(23) into one of the four notches of the locknut(18).

ASSEMBLY OF FAN PLATE WITH 1.998 PILOT DIAMETER

10. Support the fan plate on the fan mounting surface (nose down) and press bearing (13) into the housing until it bottoms against the shoulder of the fan plate. **NOTE:** Use a pressing tool that contacts the outer race of the bearing, do not use a load greater than 1100 lbs. to press bearing into bore.
11. Turn fan plate over and fully support the previously installed bearing(13) both inner and outer race. Install spacer(12) concentric with the inner race of bearing(13). Press in bearing(11) with a tool that contacts both the inner and outer race and with a force no greater than 100 lbs. until the inner race contacts the spacer. The spacer(12) should be tight against both bearing inner races, yet be able to be moved by a finger load. Place the red spacer(24) on top of the bearing(11). Turn the fan plate over and install snap ring(14) with the flat side towards the bearing, making certain the snap ring is fully seated in its groove.

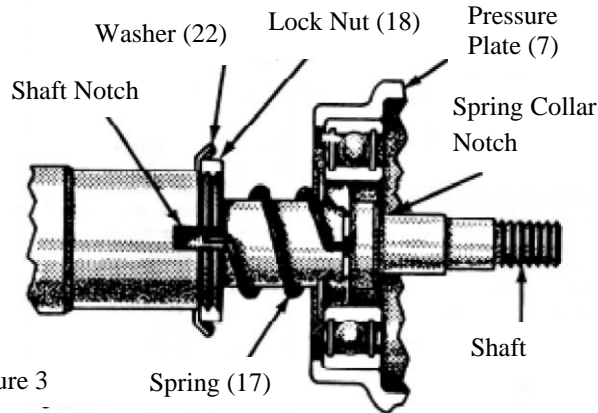


Figure 3

ASSEMBLY OF FAN PLATE WITH 2.560 PILOT DIAMETER

12. Support the fan plate on the fan mounting surface (nose down). Using a pressing tool that contacts the outer bearing race only, press ball bearing (13) into the fan plate until it contacts the fan plate shoulder. Install the bearing spacer(12) (as illustrated in Figure 1) concentric with the inner race of the ball bearing previously installed.
13. Continue to support the fan plate (nose down) and press bearing (11) using a pressing tool that contacts the outer race of the bearing only. Carefully press the bearing until the inner bearing race contacts spacer (12). Do not continue pressing the bearing once the inner race has touched the spacer; severe damage to the bearings may result. As a check after assembly, the bearing spacer should be tight against each bearing race yet able to be moved by a finger load.
14. Turn the fan plate over and install snap ring (14) with the flat side towards the bearing, making certain the snap ring is fully seated in its groove.
15. Install the spring pack(9) on the pulley and secure it using the two 1/4"-20 Sems screws(8) provided. Torque each screw to 50-75 inch pounds (5.6-8.5 N.M).
16. Apply a thin film of the lubricant provided to the four O-rings(6). Position the O-rings(6) in the grooves located in the drive pin holes of the pressure plate(7). Apply lubricant to each drive pin. Install the pressure plate assembly (7) after aligning the drive pins, and spring collar notch with the drive pins and the end of the anti-rotation spring(17). Gently but firmly depress the pressure plate assembly(7) against the spring pack(9) and visually check that the end of the antirotation spring(17) protrudes through the notch of the spring collar. (Refer to Figure 3)
17. Gently release the pressure on the pressure plate without disturbing the alignment of the anti-rotation spring and spring collar notch.
18. Using the lubricant provided, lubricate the piston O-rings (4 & 5) and the corresponding piston grooves. Install the piston O-rings (4 & 5) on the piston(16).
 NOTE: When installing rebuild kits, it is not necessary

- to install O-rings (4 & 5) since the piston complete (16) is supplied with the O-rings pre-installed. The separate piston O-rings(4 & 5) supplied in kit may be discarded.
19. Lubricate and install O-ring(3) on the shaft.
20. Using the lubricant provided, lubricate the inside of the piston housing(13).
21. Using the lubricant provided, lubricate the portion of the shaft that the piston(16) will slide on. Lubricate the I.D. of the piston(16).
22. Install the piston complete(16) and piston housing(15) on the shaft. NOTE: Do not disturb the alignment of the anti-rotation spring(17) and the notch of the spring collar in the pressure plate assembly(7).
23. Carefully install the fan plate assembly on the shaft making certain not to disturb the alignment of the antirotation spring(17) and the notch of the spring collar in the pressure plate assembly(7).
24. Gently depress the fan plate assembly and install the locknut(10). Torque the locknut to 90 foot pounds (101 N. M) making certain one of the locknut slots aligns with the hole in the shaft. Only tighten the nut further to align a slot with the hole in the shaft. Do not loosen the nut. NOTE: On FD-3 with 2.560 pilot diameter washer(11) must be installed prior to locknut(10).
25. Install the cotter pin(2) and secure it by bending the open ends.
26. Install the dust cap(1).
27. Perform the Operation and Leakage Tests before installing the fan clutch on the vehicle.

INSTALLATION

1. Inspect the fan and replace it if obvious damage is noted.
2. Mount the fan clutch on the vehicle engine using the mounting hardware retained during Removal.
3. Reconnect the air line and reinstall the fan belts.
4. Adjust the fan belt tension as instructed by the vehicle or engine manufacturer.
5. Install the fan on the FD-3 fan plate using the capscrews and lockwashers retained during Removal.
 NOTE: Reinstall the fan spacers if any were originally removed.