

15H871 Reducer Seal Replacement Kit

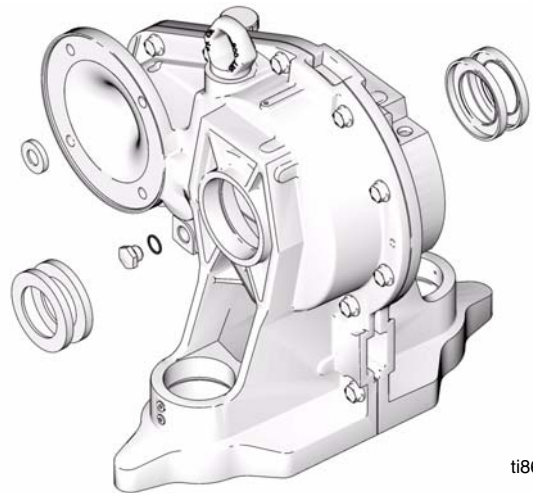
311597 rev.A

To replace gear reducer seals on E-Flo™ Plus Electric Circulation Pumps.



Important Safety Instructions

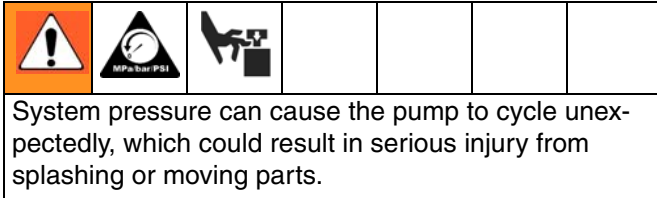
Read all warnings and instructions in this manual and in E-Flo Plus Repair-Parts manual 311594. Save these instructions.



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Pressure Relief Procedure



1. Set START/STOP switch to STOP.
2. Push in SECURE DISABLE switch.
3. Open the back pressure regulator and all fluid drain valves in the system, having a waste container ready to catch drainage. Leave open until you are ready to pressurize system again.
4. Check that pressure gauges on fluid supply and return lines read zero. If gauges do not read zero, determine cause and carefully relieve pressure by VERY SLOWLY loosening a fitting. Clear obstruction before pressurizing system again.

Kit Parts

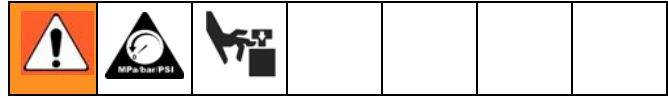
 Gear Reducer Seal Replacement Kit 15H871 includes parts to replace all gear reducer seals. Parts included in the kit are marked with an asterisk, for example (5*). Use all the new parts in the kit.

Output Shaft Seal Tool Kit 15J926 is available for removal and installation of the output shaft seals.

Ref. No.	Part No.	Description	Qty
5*	n/a	SCREW, cap, socket-head; 5/8-11 x 3 in. (76 mm)	4
12*	116719	SCREW, 8-32 hex washer head	4
31*	100664	SCREW, set, socket-head; 1/4-20 x 1/2 in. (13 mm)	2
37	n/a	SCREW, cap, flange-head; 1/2-13 x 1.25 in. (31 mm)	4
109*	n/a	SEAL, input shaft	1
116*	n/a	SEAL, output	4
119*	120395	GASKET, oil plug	1

Parts designated n/a are not available separately.

Kit Installation

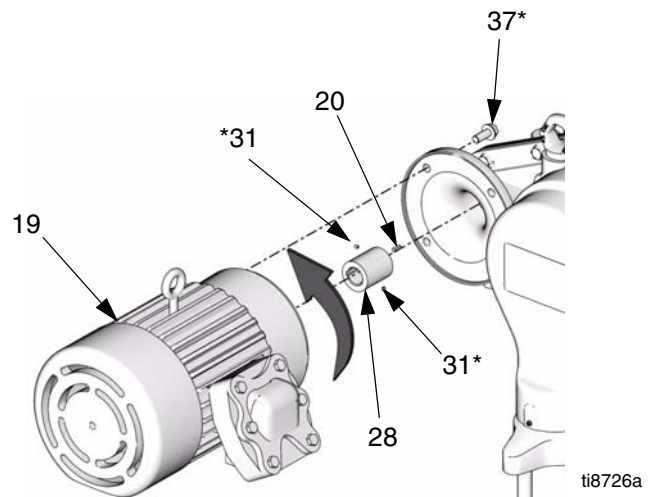


1. Jog the motor to bring the motor-side pump to the bottom of its stroke.



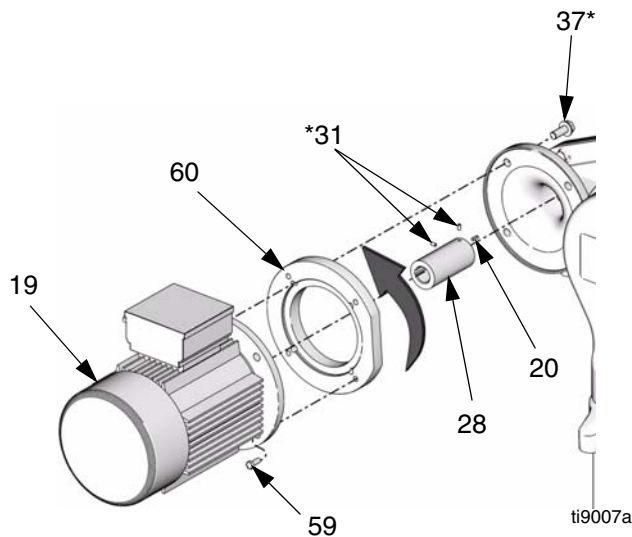
Repair the motor side seals first, as follows.

2. Relieve pressure, page 2.
3. Shut off electrical power to the unit.
4. Remove the motor and coupler as follows:
 - a. See FIG. 1 for NEMA 184 TC Frame electric motors. See FIG. 2 for IEC 112M/B5 Frame electric motors. While one person supports the motor (19), remove the screws (37). Pull the motor away from the gear reducer.



Motor Rotation
(counter-clockwise as viewed from fan end)

FIG. 1. NEMA 184 TC Frame Electric Motors



Motor Rotation
(counter-clockwise as viewed from fan end)

FIG. 2. IEC 112M/B5 Frame Electric Motors

- b. See FIG. 3. Loosen both setscrews (31). Insert the coupler removal tool (T) into the coupler (28). Turn nut clockwise until tight, then pull the coupler off the gear reducer input shaft (105) by turning hex-head screw (HS) clockwise.

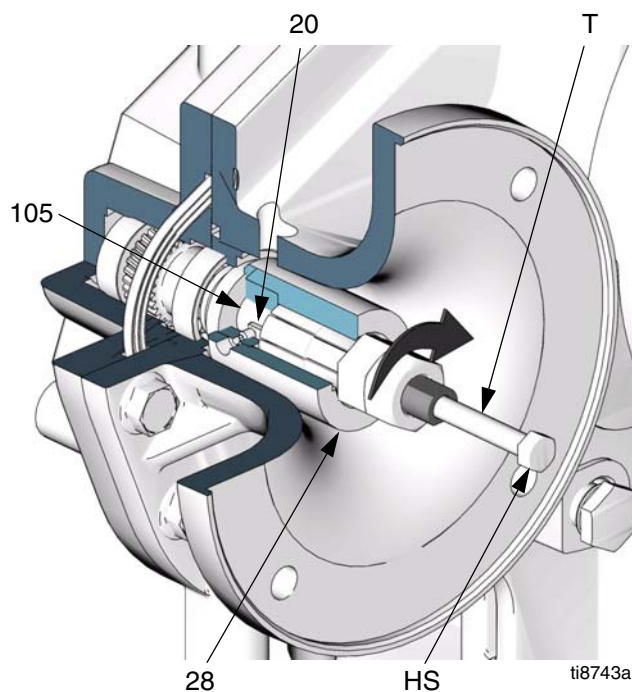


FIG. 3. Motor Coupler Removal

5. Remove four screws (12) and both covers (21, 32). FIG. 5 shows the cover (32) on the stand side; the motor side cover is (21).
6. See FIG. 4. On the motor side of the gear reducer, unscrew the oil drain plug (118) and remove the gasket (119). Pierce the input seal (109) with a hardened sheet metal screw and pull it out.

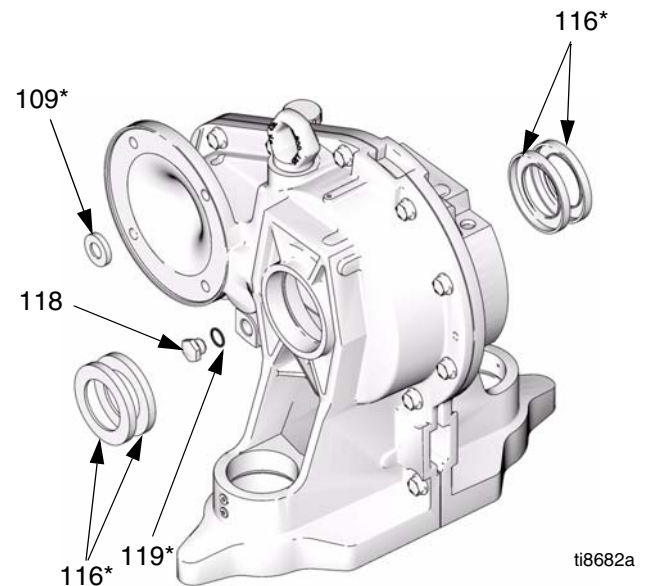




FIG. 4. Gear Reducer Seals

7. Place tape over the input shaft keyway, to prevent damage to the new seal. Pack the input shaft seal cavity with Part No. 107411 Grease. Install the input seal (109*) with the lip facing in, until the seal contacts the shoulder of the gear reducer housing. Remove the tape.
8. Install the gasket (119*) on the oil drain plug (118) and screw the plug into the gear reducer. Tighten securely.

9. Disconnect the crank arm as follows:

- Place a clean rag over the top of the slider cylinder (2) to prevent debris from falling into the slider assembly during disassembly.
- Place a 3/4 in. wrench on the slider piston (9) flats (just above the coupling nut), to keep the slider piston/connecting rod from turning when you are loosening the coupling nut (14). Orient the wrench so it is braced against one of the tie rods (3). Applying excessive force to the slider piston/connecting rod can shorten the life of the lower pin bearing.
- Using a 1-5/8 in. open-end wrench, unscrew the coupling nut (14) from the slider piston (9) and let it slide down onto the pump piston rod. Be careful not to lose the collars (13).
- See FIG. 6. Using a 1/2 in. hex driver, unscrew the two cap screws (5). Remove the crank arm cap (38) and key (39). If necessary, use a plastic hammer to break these parts loose.
- See FIG. 7. Rotate the crank arm (4) to allow it to be removed from the output shaft (OS).

 Place clean rag over slider cylinder (2).

 Apply antiseize lubricant to screw (5) threads. Torque key-side screw to 210-230 ft-lb (283-310 N•m) first, then torque gap side screw to 210-230 ft-lb (283-310 N•m).

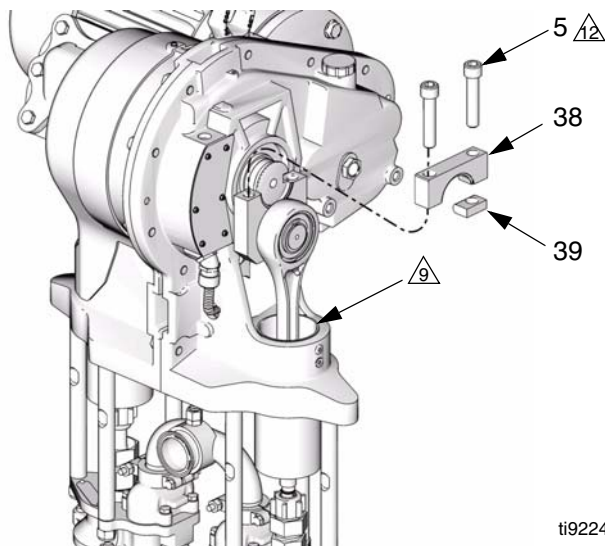




FIG. 6. Remove Crank Arm Cap

 Place clean rag over slider cylinder (2).

 Hold slider piston (9) flats with 3/4 in. wrench, and brace against tie rod (3).

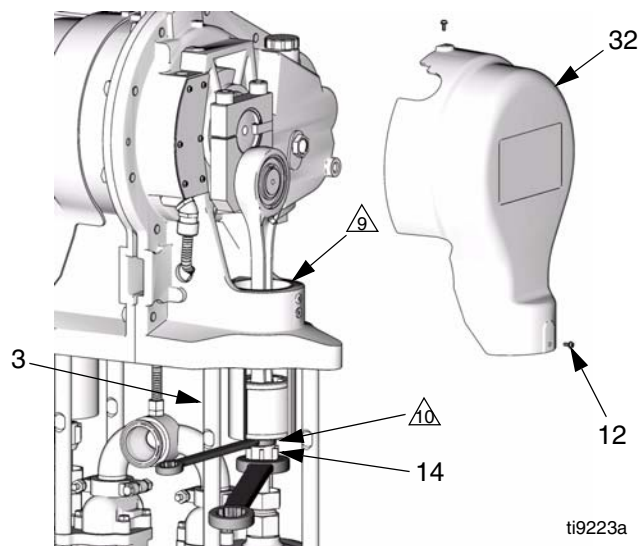


FIG. 5. Remove Coupling Nut (Stand Side Shown)

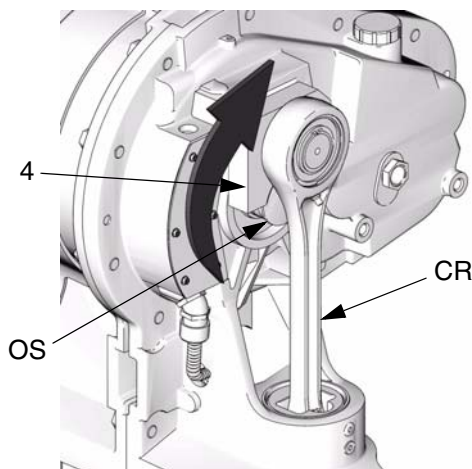


FIG. 7. Rotate Crank Arm

10. Remove the two output seals (116) as follows:

- See FIG. 8. Place the tool (C) onto the output shaft (OS). Turn the tool 90°. Install and tighten the two 0.5 in. (13 mm) screws (G) to lock the tool in place.

- b. Drill 1/8 in. (3 mm) diameter (maximum) pilot holes in the seals (116), using the holes for the sheet metal screws (D) as a template. Install the sheet metal screws (D) through the tool and into the seals (116).
- c. Tighten screws (D) evenly to pull both seals out.

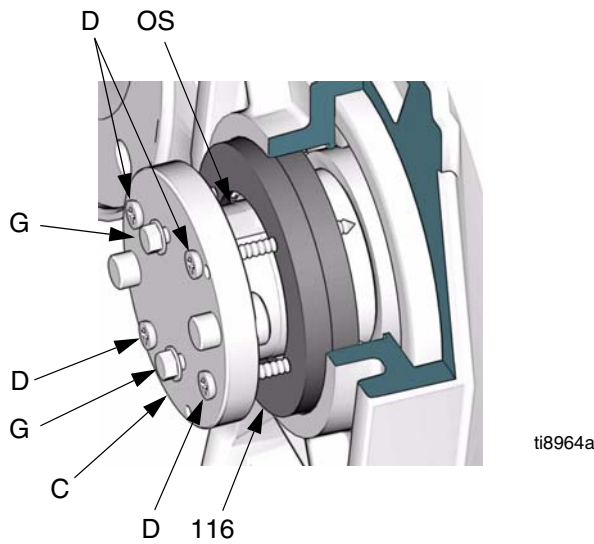


FIG. 8. Remove Output Shaft Seals

11. Install the two output seals (116) as follows:
 - a. Place tape over the output shaft keyway, to prevent damage to the new seals. Pack the output shaft seal cavity with Part No. 107411 Grease.
 - b. See FIG. 9. Place **one** output seal (116) over the output shaft (OS), with the lips facing in.
 - c. Remove the sheet metal screws from the tool (C). Place the tool (C) onto the output shaft (OS), fitting one screw (A) into the slot of the shaft. Turn the tool 90°. Tighten the screws (G) to lock it onto the shaft.
 - d. Place the installation tool (E) against the seal (116) as shown.
 - e. Install the tool cover (F) and evenly tighten the screws (J) to seat the seal on the output shaft (OS).
 - f. Remove the tools. Take three measurements 120° apart, from the surface of the seal to the face of the housing (H). The three measurements must be within .020 in. (0.5 mm). If not, repeat steps c through e.
 - g. Repeat for the second seal (116). Remove the tape.

1. Pack cavity with grease before installing seal.
4. Insert until 109 contacts shoulder.
5. Insert until 116 contacts shoulder.

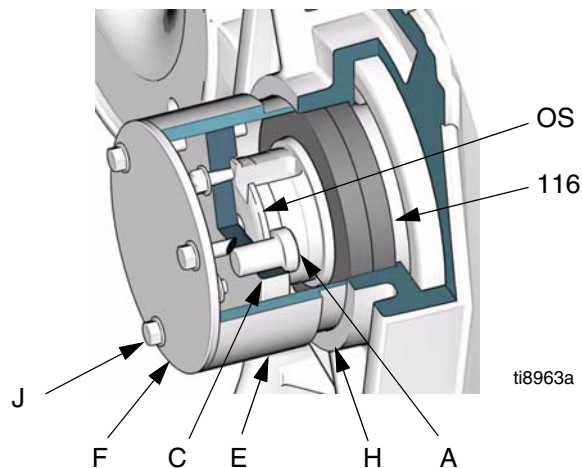
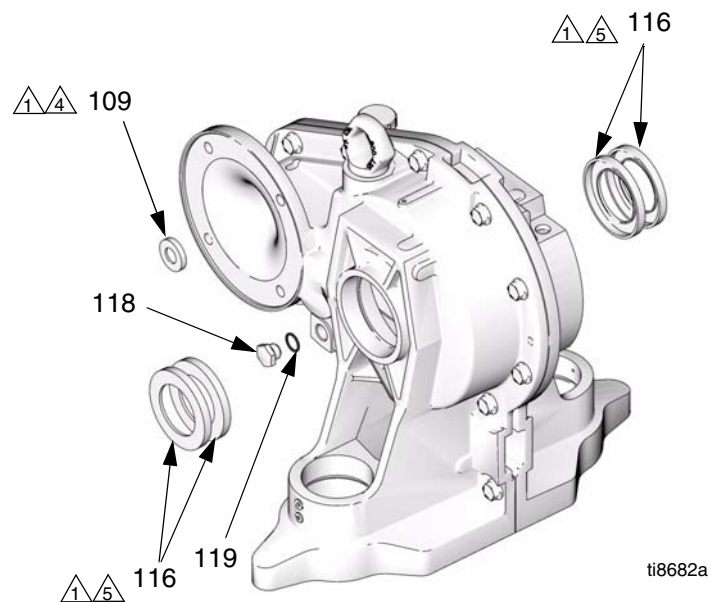


FIG. 9: Gear Reducer Seal Kit



12. Reconnect the crank arm and shaft as follows:

- a. Position the crank arm (4) to engage the output shaft (OS), and rotate it to the bottom of the output shaft.
- b. Place a clean rag over the top of the slider cylinder (2) to prevent debris from falling into the slider assembly during reassembly.
- c. See FIG. 6. Apply antiseize lubricant to the threads of the cap screws (5). Install the key (39), crank arm cap (38), and cap screws (5), oriented as shown. While the gap-side screw is still loose, torque the key-side screw to 210-230 ft-lb (283-310 N•m). Then torque the gap-side screw to 210-230 ft-lb (283-310 N•m).
- d. Ensure that the collars (13) are in place in the coupling nut (14).
- e. Place a 3/4 in. wrench on the flats of the slider piston (9), to keep it from turning when you are tightening the coupling nut (14). Orient the wrench so it is braced against one of the tie rods (3) or the stand. Tighten the coupling nut (14) onto the slider piston (9) and torque to 75-80 ft-lb (102-108 N•m).

13. Reinstall the coupler and motor as follows:

- To install a NEMA 184 TC Frame electric motor, order Motor Coupler Kit 15H880. See manual 311605.
 - To install an IEC 112M/B5 Frame electric motor, order Motor Adapter Kit 15J893. See manual 311605.
- f. See FIG. 10. Assemble the key (20) and two setscrews (31) in the coupler (28). Slide the coupler into the gear reducer so the key mates with the input shaft (105). Slide on until coupler and key bottom. Tighten setscrews to 66-78 in-lb (7.5-8.8 N•m). Apply antiseize lubricant to bore of coupling.

 Apply antiseize lubricant to bore of coupling (28).

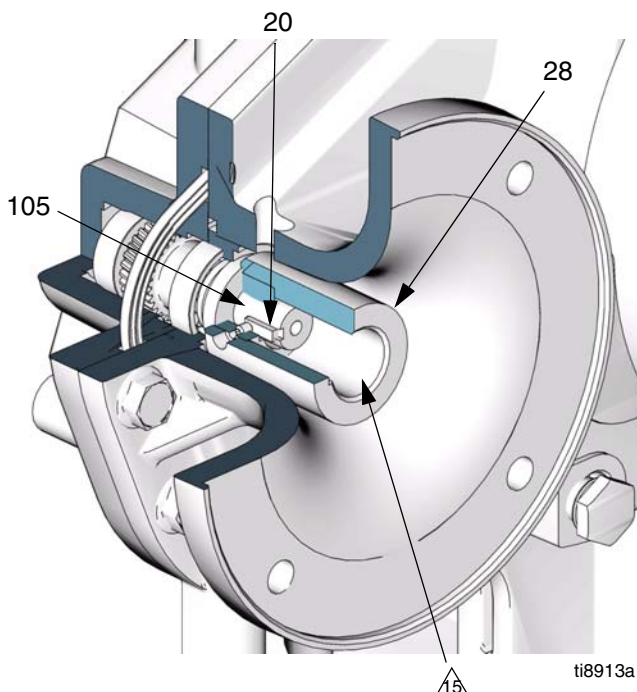



FIG. 10. Motor Coupler Installation

 When installing an IEC 112M/B5 Frame electric motor, ensure that the motor adapter (60) and screws (59) are in place before mounting the motor on the gear reducer. See FIG. 2.

- g. Lift the motor (19) into position. Align the key on the motor shaft with the mating slot of the motor coupler, and the four mounting holes with the holes in the gear reducer (1). Slide the motor into place.
 - h. While one person supports the motor (19), install the screws (37). Tighten securely.
14. Turn on electrical power to the unit.
 15. Jog the motor to bring the stand-side pump to the bottom of its stroke.
 16. Shut off electrical power to the unit.
 17. Repeat steps 9-12 to replace the output seals on the stand side.
 18. Reinstall the covers (21, 32) and screws (12).
 19. Refill with gear oil.

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