

# 25. PSF





## W.S. Darley & Co.

### REPAIR SERVICE INSTRUCTIONS TYPE PSF FRONT MOUNT FIRE PUMP

#### REMOVAL OF PUMP AND TRANSMISSION FROM TRUCK CHASSIS

Refer to Drawings DPC0605, DPC0105 & DPC0011

NOTE: It is beneficial to have a second person present to assist during removal and reinstallation of pump.

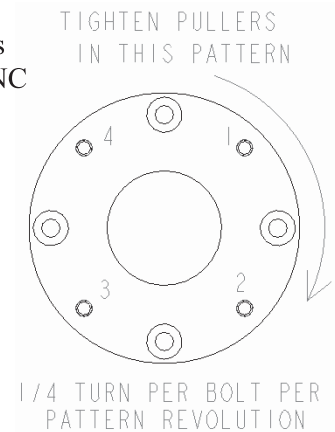
**CAUTION:** Always have chassis wheels sufficiently blocked with wheel chocks before working on the pump!

1. Remove the drive shaft from the electric drive clutch.
2. Disconnect the wiring to the electric drive clutch, and remove the clutch from the pump transmission.
3. Disconnect the following applicable items from the pump:
  - Heater Piping
  - Gage Line Tubing
  - Primer Tubing
  - Drain Line Tubing
  - Tachometer Drive Cable
4. Remove all other accessories that will prevent removal of pump and transmission assembly.
5. Drain oil from gear case. Inspect oil for debris, or cloudiness (entrapped water).
6. Provide an overhead hoist to support pump weight of 500 pounds. Place a nylon strap or a chain around the discharge flange of the volute and take up slack.
7. Remove the twelve 3/8-16NC nuts that hold the discharge to the pump casing. Remove discharge. Some prying may be required to loosen gasket between the discharge and pump.
8. Remove the eight 3/8-16NC cap screws that hold the suction adapter to the suction flange.
9. The pump is now ready for removal. Some prying may be required to loosen the gasket between the suction and pump.

#### PSF PUMP DISASSEMBLY FOR OVERHAUL

1. Remove four 3/8-16NC cap screws and remove bearing cap (113) by using the 5/16-18NC pusher holes. Discard gasket (22).
2. Remove three 1/2-13NC cap screws holding volute (30) and spacers (17) to gear case (27). Separate the volute and impeller shaft assembly (99) from the gear case while keeping the parts square with each other, avoiding damage to pinion gear (24) and impeller shaft. If prying is required, pry evenly on both sides.
3. Remove twelve 3/8-16NC cap screws and remove the suction head (31) from the volute (30) by using the two 3/8-16NC pusher holes. Discard o-rings (32) & (114).
4. If necessary to replace outboard seal ring (35), pry or tap it out of suction head (31).
5. Remove cotter key (38), impeller nut (37) and washer (41) from impeller shaft (99).
6. Push impeller (36) off impeller shaft (99) with the two 3/8-16NC holes in impeller hub.

7. Tap the impeller shaft assembly out of volute (30) while keeping the shaft square with the bore to avoid damage to parts.
8. Pull or pry the oil seal (18) out of volute (30), and remove water slinger (26) from cavity.
9. If necessary to replace, remove four 1/4-20NC stainless flush head machine screws (130) and remove the stuffing box (39) from the volute (30) using the four 1/4-20NC puller holes. To remove, apply pressure with puller screws in a circular pattern, one-quarter turn per bolt per pattern revolution. The flush head machine screws may be used as the puller screws for stuffing box removal. Discard stuffing box o'ring (129).



- Note:**  
 -Pumps older than Jan, 2002 may not have the stainless flush head machine screws. If this is the case with the pump you are repairing, press the stuffing box out of the volute.  
 -The number of puller holes was changed from two to four June 2006.
10. If necessary to replace, pry inboard seal ring (35) out of volute (30).
  11. Press bearing (6), spacer (103), and pinion gear (24) off the impeller shaft (99) all at once.
  12. Remove pinion gear key (20).
  13. Remove the retaining ring and backup washer from impeller shaft (99). **[NOTE: A shoulder has been added to the impeller shaft to eliminate the use of the retaining ring, and backup washer on pumps newer than Dec. 1995.]**
  14. Press bearing (108) off of impeller shaft (99).

### GEAR CASE DISASSEMBLY FOR OVERHAUL

15. Remove four 3/8-16NC cap screws and clutch adapter (1) from the gear case (27). Discard gasket (22).
16. Remove four 3/8-16NC cap screws and remove bearing cap (47) by using the 5/16-18NC pusher holes. Discard gasket (48).
17. Remove eight 3/8-16NC cap screws and the oil pan (3). Discard gasket (4).
18. Press transmission shaft (11) out of drive gear (5), spacer (49), bearing (6), and gear case (27) all at once.
19. Spacer will also be pressed out of the bore at the same time. **[NOTE: Spacer not present in pumps manufactured after Jan. 1996.]**
20. Remove drive gear key (50).
21. Press bearing (6) out of gearcase (27).

**Note:** After Jan 2002, the tachometer assembly became an option, it is possible that your pump does not have any tachometer parts.

22. If present, remove retaining ring (10), and slide tachometer worm (8) off transmission shaft (11).
23. If present, remove tachometer drive key (55).
24. Press bearing (6), and spacer off the transmission shaft (11). **[NOTE: Spacer not present in pumps manufactured after Jan. 1996.]**

NOTE: Tachometer disassembly is usually not required unless parts are severely worn.

25. If present, tap the drive lock pin (95) out of the tachometer gear (14).
26. If present, remove tachometer shaft (13) from gear (14) and bushing (12). Remove tachometer gear.
27. If present, press or tap tachometer bushing (12) and tachometer plug (96) out of clutch adapter (1).

## PARTS INSPECTION AND MEASUREMENT

1. Clean all parts and examine for wear or deterioration. Replace any questionable parts.
2. Measure impeller seal rings and seal rings for wear. Use the following table for comparison.
 

Impeller Seal Ring O.D. - original -----	6.623 - 6.625"
Impeller Seal Ring I.D. - original -----	6.315 - 6.317"
Seal Ring O.D. - original -----	6.639 - 6.641"
Seal Ring I.D. - original -----	6.299 - 6.301"
Clearance O.D. - original -----	0.014 - 0.018"
Clearance I.D. - original -----	0.014 - 0.018"

3. If clearance exceeds 0.025 on diameter, impeller seal rings can be restored to its original size by soldering a ring over trued surface which retains at least 0.090 wall thickness. Stationary seal rings should also be replaced or you may purchase undersize seal rings. Call customer service for details.

4. Measure the impeller shaft and stuffing box for wear. Use the following table for comparison
 

Impeller Shaft diameter at packing area -----	1.749 - 1.750"
Stuffing Box bore - original -----	1.759 - 1.760"
Stuffing Box bore - max. -----	1.765 - 1.760"
Clearance on Diameter - original -----	0.013 - 0.015"
Clearance on Diameter - max. allowable -----	0.020"

5. Measure bearing housing bores for proper size. Use the following table for comparison. If any bore exceeds the high limit by 0.0005, the part should be replaced.

PART	REP. NO.	ORIGINAL BORE DIAMETER
Bearing Cap -----	113 -----	3.5433 - 3.5442"
Gear Case -----	27 lower two bores-----	3.5433 - 3.5442"
Volute -----	30 -----	4.3307 - 4.3316"

6. Measure shaft bearing journals for proper size. Use the following table for comparison. The low limit under bearing is required to insure a press fit with inner bearing race.

PART	REP. NO.	ORIGINAL JOURNAL DIA.
Impeller Shaft -----	99 -----	small 1.5749 - 1.5753"
		large 1.7490 - 1.7495"
Transmission Shaft -----	11 -----	both 1.5749 - 1.5753"

7. The original impeller shaft diameter under the pinion gear is 1.7490 - 1.7495. The original pinion gear bore is 1.7495 - 1.7500 providing a 0.0000 to 0.0010 clearance. The parts are still serviceable up to 0.0015 clearance. The pinion gear may be reversed to work the other side of gear teeth.
8. The original transmission shaft diameter under the drive gear is 1.7490 - 1.7495. The original drive gear bore is 1.7500 - 1.7505 providing 0.0005 to 0.0015 clearance. The parts are still serviceable up to 0.0020 clearance. The drive gear may be reversed to work the other side of gear teeth.
9. The original transmission shaft diameter under the tachometer worm is 1.5605 - 1.5613. The original tachometer worm bore is 1.5616 - 1.5622 providing from 0.0003 to 0.0017 clearance. The parts are still serviceable up to 0.0030 clearance.

### ASSEMBLY OF TYPE TWO GEAR PSF FRONT MOUNT FIRE PUMP

#### TRANSMISSION ASSEMBLY

1. If present, press the tachometer bushing (12) into clutch adapter (1), until flush with the bottom face of the threaded tachometer cable pocket.
2. If present, place tachometer gear (14) into position.
3. If present, with the .104 square key drive hole end facing the threaded tachometer cable pocket, insert tachometer shaft (13) through bushing (12) and into tachometer gear (14).

4. If present, tap a 3/32 x 7/16 drive lock pin (95) into tachometer gear (14) through tachometer shaft (13).
5. If present, press the tachometer plug (96) into clutch adapter (1). Allow .015 gap between the tachometer gear (14) and the tachometer plug.
6. If present, gear (14) and shaft (13) must rotate freely.
7. If present, fill tachometer gear teeth (14), and tachometer gear pocket 1/3 - 1/2 full with grease.
8. Press oil seal (9) into clutch adapter (1) with lip spring of seal facing tachometer pocket. Fill oil seal grease cavity 1/3 - 1/2 full with grease and lubricate oil seal lips.
9. Place gear case (27) on a sturdy work bench to support the weight of the pump and gearcase (500 pounds).
10. Place drive gear (5) in the gear case (27).
11. Apply a light coating of oil to the transmission shaft (11). Place drive gear key (50) into transmission shaft keyway. Align with keyslot in drive gear (5); press shaft evenly into drive gear bore until shaft shoulder is tight against side of gear.
12. Apply a light coat of oil to both the inside and outside diameters of bearing (6). Use a sleeve to apply even pressure to both races, and press the bearing onto transmission shaft (11), and into gearcase (27) on the tachometer side until the bearing is tight against shaft shoulder.
13. Slide spacer onto the transmission shaft (11). [**NOTE:** Spacer not present in pumps manufactured after Jan. 1996.]
14. Tap spacer into gearcase (27). [**NOTE:** Spacer not present in pumps manufactured after Jan. 1996.]
15. If present, place woodruff key (55) into slot in transmission shaft (11) and slide tachometer worm (8) onto transmission shaft until worm, spacer (7), and inner race of bearing (6) are tight together.
16. If present, place retaining ring (10) with the sharp edge towards splined end of transmission shaft (11).
17. Apply a thin layer of Loctite Ultra Blue 587 to the flange area of the gear case (27) where it engages the clutch adapter (1).
18. Slide the clutch adapter (1) over the transmission shaft (11) and into position against the gear case (27). Apply Loctite 242 or equivalent to the threads of three 3/8-16NC hex headed cap screws and attach the clutch adapter to the gear case using these cap screws and three lock washers. Torque to 23 ft-lb.
19. Slide spacer (49) onto transmission shaft (11).
20. Apply a light coat of oil to both the inside and outside diameters of bearing (6). Use a sleeve to apply even pressure to both races, and press bearing onto transmission shaft (11), and into gear case (27) until shaft shoulder, drive gear (5), spacer (49), and bearing are tight together.
21. Apply Loctite 242 to the threads of four 3/8-16NC x 7/8 hex head cap screws and attach bearing cap (47) and gasket (48) with these cap screws and lock washers. Torque to 23 ft-lb.
22. Attach oil pan (3) and gasket (4) to gear case (27) with eight 3/8-16NC x 7/8 hex head cap screws and lock washers. Use Loctite 242 or equivalent on the threads, and torque to 23 ft-lb.

### **PUMP ASSEMBLY**

23. Press inboard seal ring (35) into volute (30) until seated.

**NOTE:** Pumps older than Jan, 2002 may not have the stainless flush head machine screws holding stuffing boxes in. If this is the case with the pump you are repairing, apply Loctite 603 to the outside of stuffing box (39) and press into volute (30) until seated. **CAUTION:** The packing gland holes in the stuffing box must be aligned with the packing gland hole(s) in the volute. The cooling holes in the stuffing box must also be aligned with the cooling line(s) in the volute.

24. Apply a silicone lubricant to stuffing box o'ring (129), and place in groove of volute (30).

25. Align stuffing box (39) with volute (30) by placing four 1/4-20 NC x 3 cap screws through mounting holes of stuffing box and screw into corresponding tapped holes of volute. Press stuffing box into position and remove alignment cap screws. Apply Loctite 243 (or equivalent) to threads of, and install four 1/4-20 NC stainless flush head machine screws (130) to secure stuffing box in volute. Torque to 72 in-lbs.
26. Slide impeller shaft (99) into volute (30), through stuffing box (39).
27. Pack the stuffing box (39) using only Garlock style #926-AFP plastallic packing material, which can be purchased from W. S. Darley as part no. 3817101. Other packing materials will void warranty. (For procedure to follow when packing the pump, see "DARLEY INJECTION TYPE STUFFING BOX ADJUSTMENT".)
28. Remove impeller shaft (99) and clean out any packing and/or debris that may have gotten into the 1/4 wide lantern groove in the stuffing box (39).
29. Press oil seal (18) into volute (30) with lip spring of seal facing bearing cavity. Fill oil seal grease cavity 1/3 - 1/2 full with grease and lubricate oil seal lips.
30. Apply grease to one side of water slinger (26). Firmly place greased side of water slinger into position against stuffing box (39). NOTE: Grease is only for retaining water slinger position during assembly.
31. Apply a light coating of oil to impeller shaft (99). Place pinion gear key (20) in impeller shaft keyway; align with keyslot in pinion gear (24) and press shaft evenly into pinion gear bore until shaft shoulder is tight against side of gear.
32. Place retaining ring in groove on impeller shaft (99) with sharp edge towards pinion gear (24). Retaining ring should be tight in groove. Replace ring if it is loose. Slide bearing backup washer onto impeller shaft. **[NOTE:** A shoulder has been added to the impeller shaft to eliminate the use of the retaining ring, and backup washer on pumps newer than Dec. 1995.]
33. Press bearing (108) onto impeller shaft (99) against shaft shoulder.
34. Slide spacer (103) onto impeller shaft (99).
35. Apply a light coating of oil to the inside diameter of bearing (6), and press it onto impeller shaft (99) until inner race of bearing, spacer (103), and pinion gear (24) are tight together.
36. Apply a light coating of oil to the outside diameter of bearing (108), and gently tap impeller shaft (99) through water slinger (26), and into volute (30) until the bearing is seated in bearing pocket of volute. Make sure oil seal (18) is seated. Slide water slinger into position in the groove in the impeller shaft.
37. Slide impeller (36) and impeller washer (41) onto impeller shaft (99).
38. Temporarily tighten impeller nut (37) finger tight until it contacts the impeller washer (41)
39. Apply a thin layer of Loctite Ultra Blue 587 or equivalent to the flange area of volute (30) where it engages gear case (27).
40. Apply oil to the outer diameter of bearing (6) on impeller shaft (99), as well as the inside diameter of the female pilot in the gear case (27) that pilots the volute (30).
41. Insert pinion gear (24) into gear case (27) and slide flange of volute (30) into the gear case pilot. With the three spacers (17) between the mounting pads of the volute and the mounting arms of the gear case, attach the volute to gear case with three 1/2-13NC x 1-1/2 cap screws and lock washers with Loctite 242 applied to the threads. Torque to 57 ft-lb.  
NOTE: Evenly tighten the cap screws in the opposing arms first, then tighten the third one.
42. Apply Loctite 242 to the threads of four 3/8-16NC x 7/8 cap screws and attach bearing cap (113) and gasket (22) with these cap screws and lock washers. Make sure that bearing (6) enters evenly into the bearing pocket in the bearing cap. Torque to 23 ft-lb.
43. Remove impeller nut (37).

44. Clean and dry the threads of both the impeller shaft (99) and impeller nut (37). All dirt, grease, and oil must be removed. (Loctite Klean N' Prime can be used to clean parts and shorten cure time of thread-locker.)
45. Apply Loctite 242 or equivalent thread-locker to the threads of impeller shaft (99).
46. Tighten impeller nut (37) finger tight until it contacts the impeller washer (41), then turn to the next cotter key hole. **DO NOT OVER TIGHTEN.**
47. Install a 1/8 x 1 STAINLESS STEEL cotter key (38) through the impeller nut (37) and impeller shaft (99) cotter key hole.
48. Press outboard seal ring (35) into suction head (31).
49. Apply a silicon lubricant, such as Dow Corning Compound 111 or equivalent to suction head o-rings (32) and (114) and place on suction head (31).
50. Apply Loctite 242 to the threads of the twelve suction head mounting studs in the volute (30). Tap the suction head (31) into position on the volute and attach with twelve 3/8-16NC nuts. Torque to 23 ft-lb.

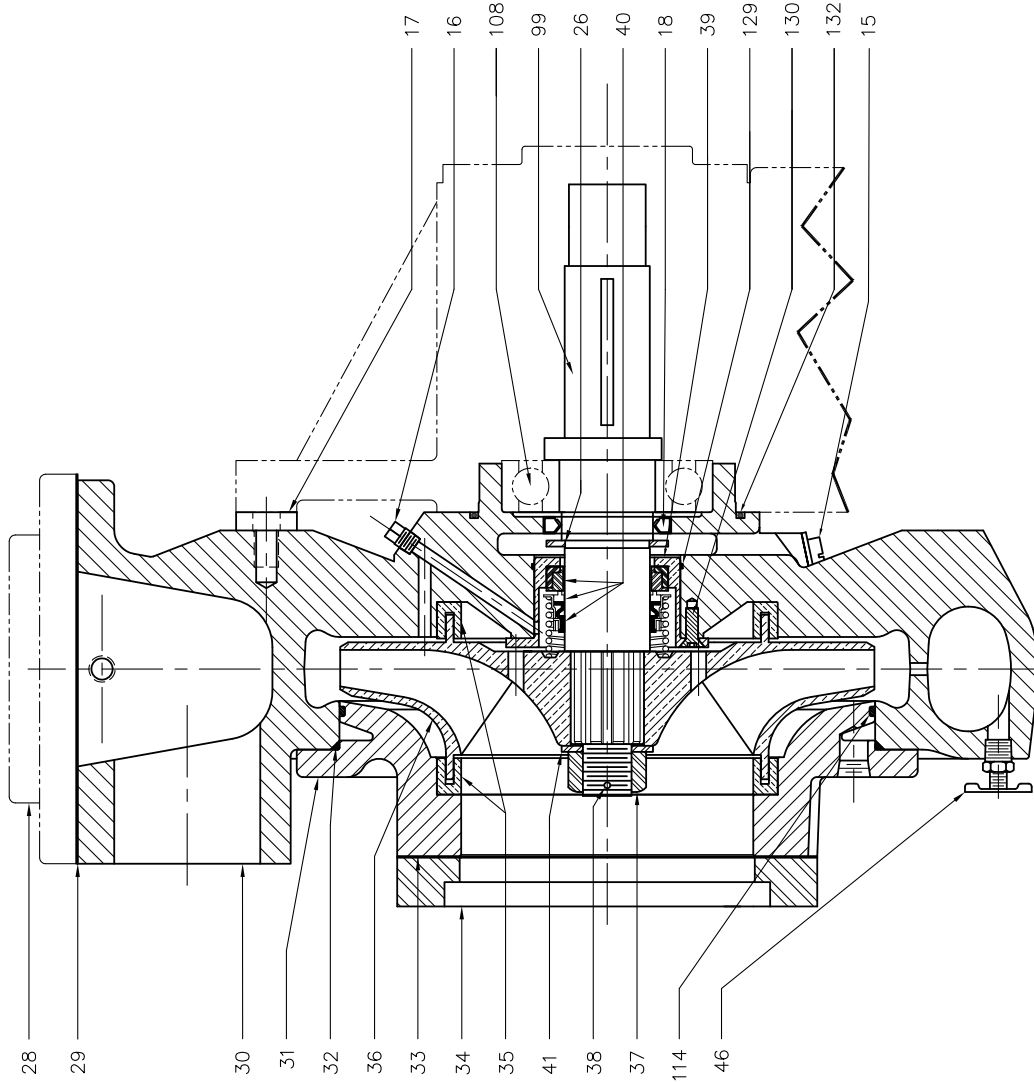
### **INSTALLING PUMP IN TRUCK CHASSIS**

1. Reverse the procedures outlined under removal instructions.
2. Lubricate pump drive line slip joint.
3. Fill gear case with SAE 80W/90 gear lube oil to the level of the 1/8" NPT gage plug located in the side of gear case.

**IF FURTHER INFORMATION IS NEEDED, CALL W.S. DARLEY & CO. AT  
CHIPPEWA FALLS, WI. AT 800-634-7812 or 715-726-2650**

REVISIONS

LTR	DESCRIPTION	DATE	CHG NO.	APPR'D
A	ADDED O-RING	2JUL2004	2004-192	DAB



REP#	NAME OF PART	QTY
15	PACKING HOLE PLUG	2
16	PLUG - 1/8 NPT	2
17	SPACER - GEARCASE	1
18	OIL SEAL - IMPELLER SHAFT	1
26	WATER SLINGER	1
28	DISCHARGE FLANGE	1
29	DISCHARGE GASKET	1
30	VOLUTE	1
31	SUCTION HEAD	1
32	PUMP CASING O-RING	1
33	SUCTION FLANGE GASKET	1
34	SUCTION FLANGE	1
35	SEAL RING	2
36	IMPELLER	1
37	IMPELLER NUT	1
38	COTTER KEY	1
39	MECHANICAL SEAL BOX - REMOVABLE	1
40	MECHANICAL SEAL	1
41	IMPELLER SHAFT WASHER	1
46	DRAIN COCK	1
99	IMPELLER SHAFT	1
108	BEARING - IMPELLER SHAFT	1
114	O-RING - HEATER CHAMBER	1
129	O-RING - 3.00 x 3.12 x 0.06	1
130	FHMS - .250-20 x 0.63, SS	4
132	O-RING - PUMP/GEARCASE	1

W.S. DARLEY & CO.  
MELROSE PARK, IL - CHIPPEWA FALLS, WI  
DWG - FS PUMP, MECH SEAL - REMOVABLE  
CROSS SECTION  
DATE NOV27,01  
SCALE 1/2

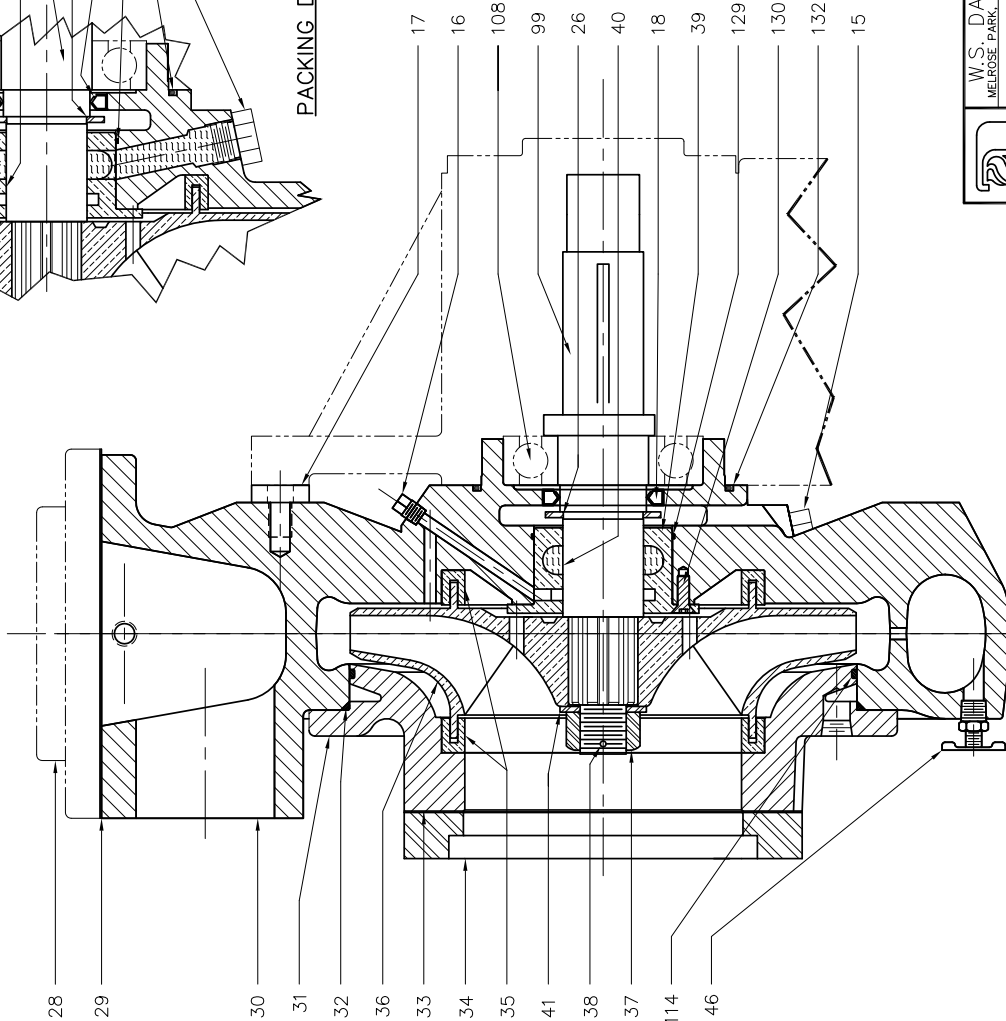
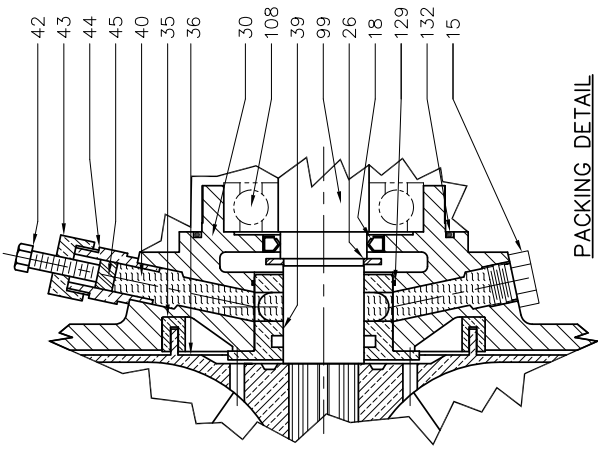
OLD PART NO.  
P224-2  
DO NOT SCALE PRINT  
ALL DIMENSIONS IN INCHES UNLESS NOTED  
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REVISIONS

LTR	DESCRIPTION	DATE	CHG NO.	APPR'D
A	ADDED O-RING TO DRAWING	2JUL2004	2004-192	DAB

REP#	NAME OF PART	QTY
15	PACKING HOLE PLUG	1
16	PLUG - 1/8 NPT	2
17	SPACER - GEARCASE	1
18	OIL SEAL - IMPELLER SHAFT	1
26	WATER SLINGER	1
28	DISCHARGE FLANGE	1
29	DISCHARGE GASKET	1
30	VOLUTE	1
31	SUCTION HEAD	1
32	PUMP CASING O-RING	1
33	SUCTION FLANGE GASKET	1
34	SUCTION FLANGE	1
35	SEAL RING	2
36	IMPELLER	1
37	IMPELLER NUT	1
38	COTTER KEY	1
39	PACKING BOX	1
40	PACKING	1
41	IMPELLER SHAFT WASHER	1
42	PACKING PLUNGER STUD	1
43	GLAND NUT	1
44	PACKING PLUNGER GUIDE	1
45	PACKING PLUNGER	1
46	DRAIN COCK	1
99	IMPELLER SHAFT	1
108	BEARING - IMPELLER SHAFT	1
114	O-RING - HEATER CHAMBER	1
129	O-RING - 3.00 x 3.12 x 0.06	1
130	FHMS - .250-20 x 0.63, SS	4
132	O-RING - PUMP/GEARCASE	1 (A)

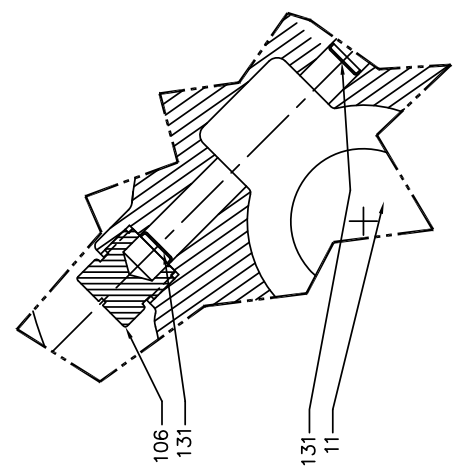
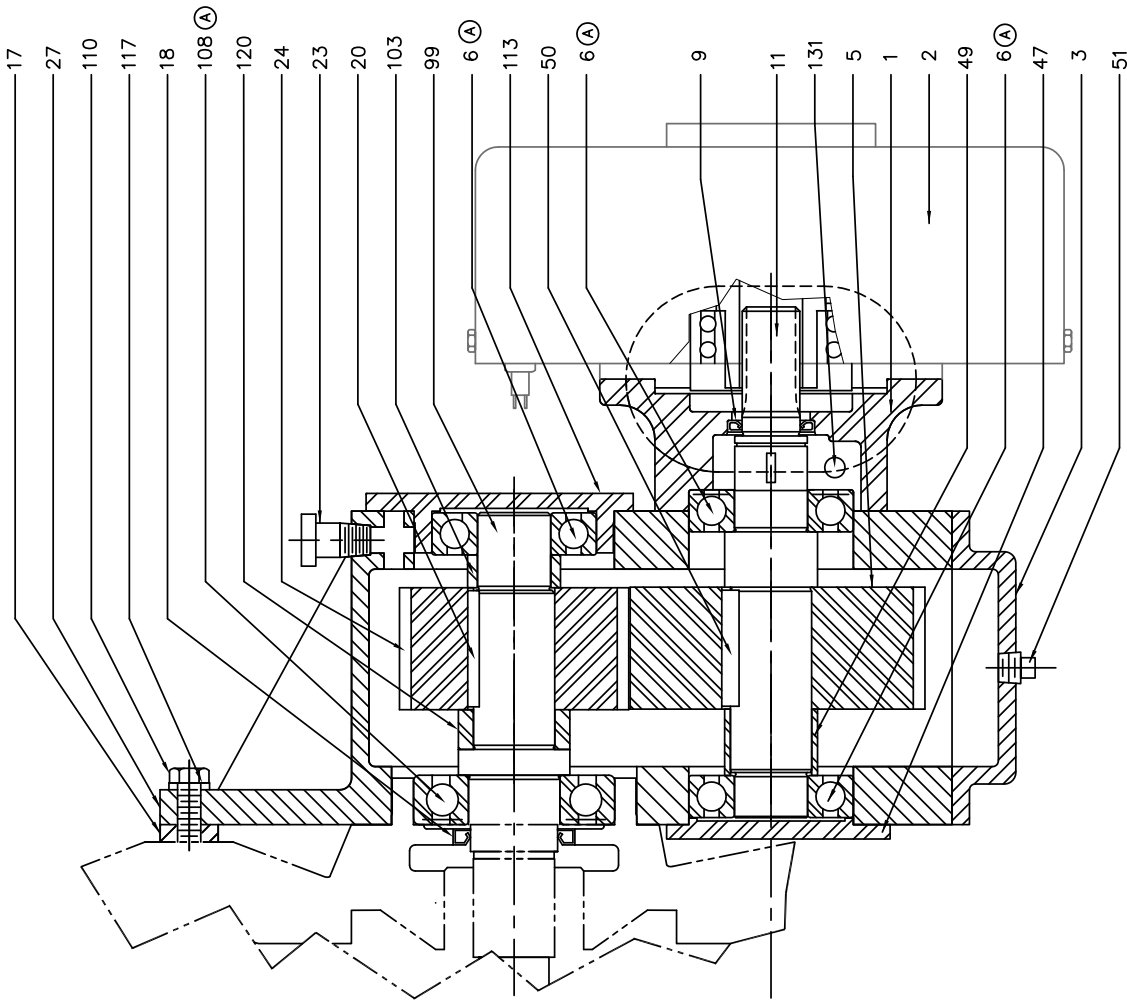



**W.S. DARLEY & CO.**  
 MELROSE PARK, IL - CHIPPEWA FALLS, WI  
 DWG - PS PUMP, PACKING - REMOVABLE  
 CROSS SECTION  
 DATE NOV27,01  
 SCALE 1/2  
**DFC0605**

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 DO NOT SCALE PRINT  
 OLD PART NO.  
 P224-3  
 BSN WASH  
 CHRD DMD  
 TRCD

REVISIONS			
LTR	DESCRIPTION	DATE	CHG. NO. / APPRD
A	UPDATED BEARINGS	1/28/08	2008-058 / AAN

REP.#	NAME OF PART	QTY
1	CLUTCH ADAPTER	1
2	ELECTRIC DRIVE CLUTCH	1
3	GEARCASE COVER	1
5	DRIVE GEAR	1
6	BEARING	3
9	OIL SEAL - DRIVE SHAFT	1
11	DRIVE SHAFT	1
17	GEARCASE SPACER	1
18	OIL SEAL - IMPELLER SHAFT	1
20	KEY - PINION GEAR	1
23	GEAR CASE VENT	1
24	PINION GEAR	1
27	GEARCASE	1
47	BEARING CAP - DRIVE SHAFT	1
49	SPACER - DRIVE GEAR	1
50	KEY - DRIVE GEAR	1
51	DRAIN PLUG - MAGNETIC	1
99	IMPELLER SHAFT	1
103	SPACER - PINION GEAR	1
106	PLUG - REF	1
108	BEARING - IMPELLER SHAFT	3
110	GEARCASE RETAINING BOLT	1
113	BEARING CAP - IMPELLER SHAFT	3
117	LOCKWASHER - GEARCASE	1
120	SPACER - PINION GEAR	2
131	7/16 FROST PLUG - REF	2

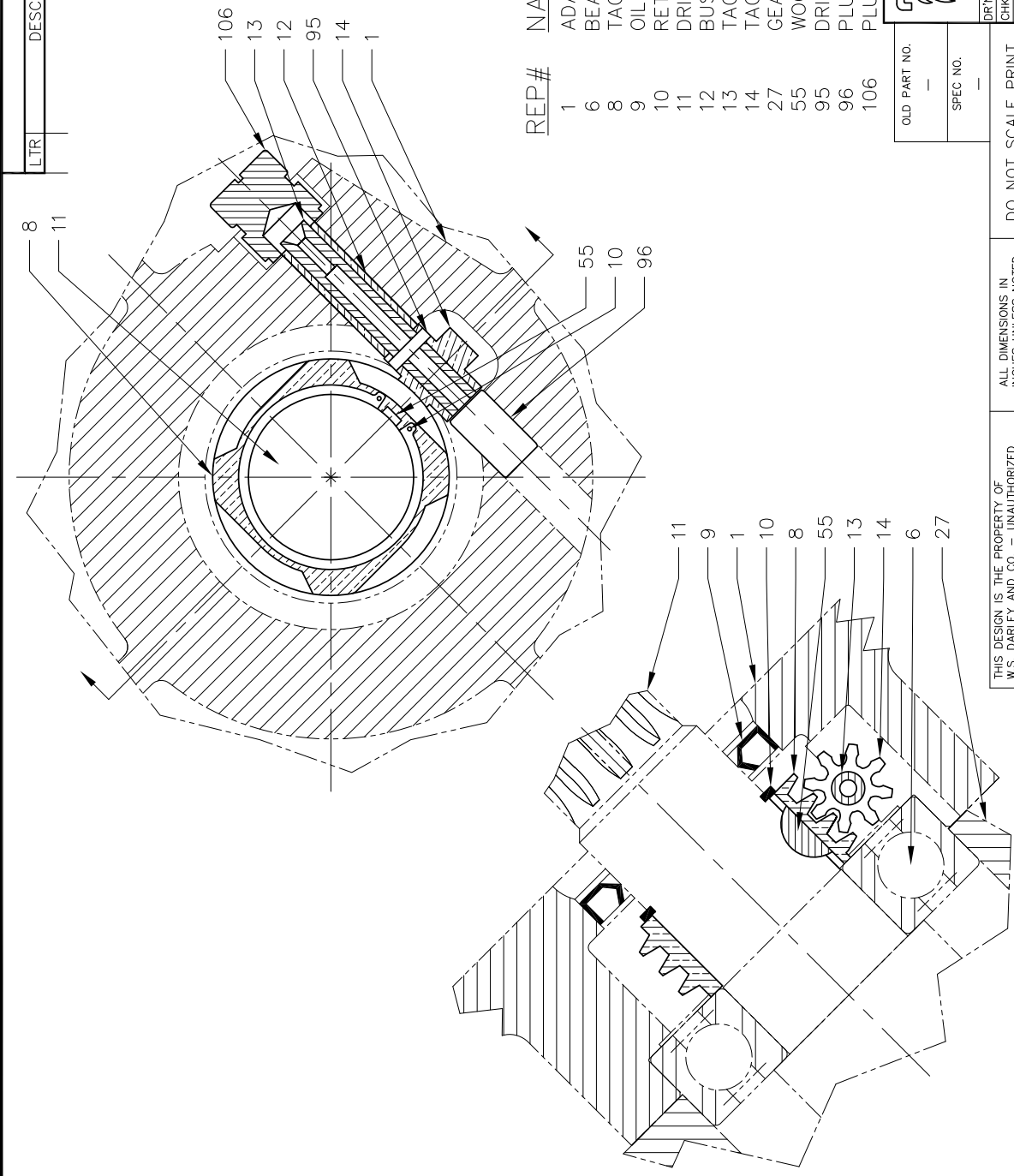


TACH. DRIVE DETAIL  
SCALE: 1=1


**W.S. DARLEY & CO.**  
 MELROSE PARK, IL - CHIPPENVA FALLS, WI  
 PSF TRANS ASSY W/ CARB GR,  
 NO TACH, CROSS SECTION  
 DATE 02JAN2002  
 DRN WAH  
 CHD TED  
 TRCD  
 SCALE 1/2  
**DPC0106**

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REVISIONS			
LTR	DESCRIPTION	DATE	CHG NO.
			APPR'D



REP#	NAME OF PART	QTY
1	ADAPTER - REF	1
6	BEARING - REF	3
8	TACH WORM	1
9	OIL SEAL - DRIVE SHAFT - REF	1
10	RETAINING RING - TACH WORM	1
11	DRIVE SHAFT - REF	1
12	BUSHING - TACH DRIVE	1
13	TACH DRIVE SHAFT	1
14	TACH GEAR	1
27	GEARCASE - REF	1
55	WOODRUFF KEY - TACH WORM	1
95	DRIVE LOCK PIN - TACH DRIVE	1
96	PLUG - TACH DRIVE	1
106	PLUG - TACH	1


**W.S. DARLEY & CO.**  
 MELROSE PARK, IL - CHIPPEWA FALLS, WI  
 DWG - OPTIONAL PSE & PSF TACH DRIVE  
 CROSS SECTION

OLD PART NO.	DRN	WAH	DATE	SCALE
---	CHKD	TED	03JAN2002	1/1
SPEC NO.	TRCD			
---				

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**DPC0011**



## W. S. DARLEY & CO.

### DARLEY INJECTION TYPE STUFFING BOX ADJUSTMENT

**⚠ Prop 65 Warning:** This product contains lead, a chemical known to the State of California to cause cancer, birth defects, and other reproductive harm. Wash hands after handling.

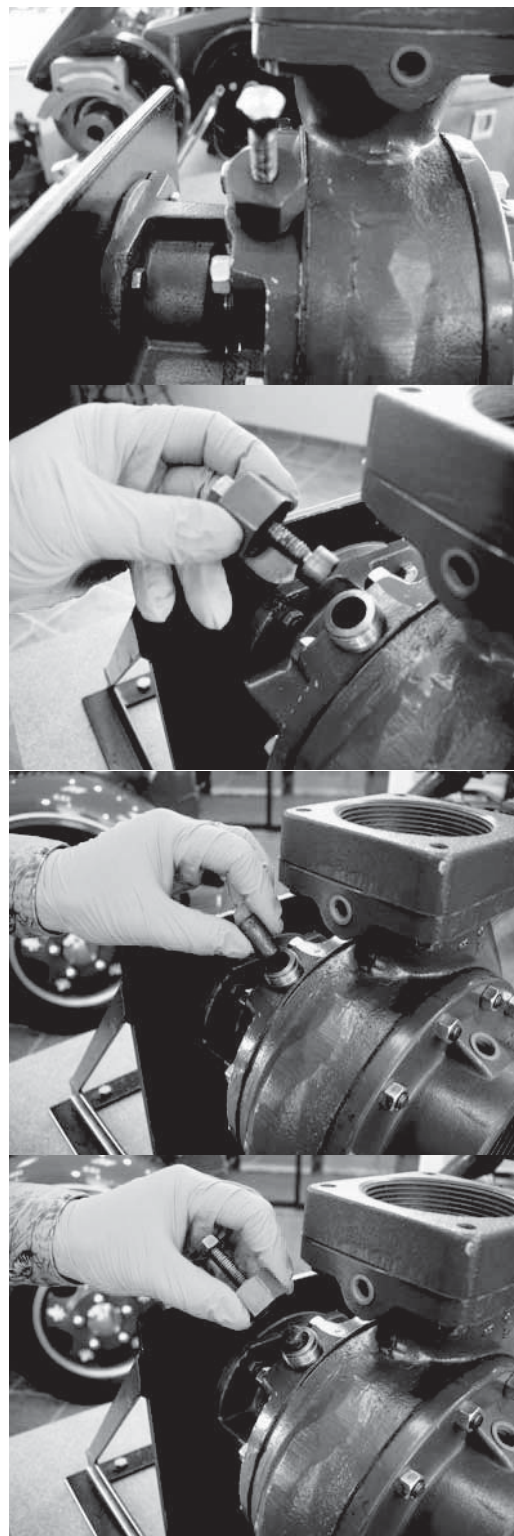
**⚠ Caution:** Do not attempt to use anything but Darley injection packing. Using the wrong packing material in your pump may cause catastrophic failure of the pump shaft sealing components.

Only use W.S. Darley & Co.'s plastallic injection packing material. It is made of a special composition of shredded fibers, and a special bonding and lubricating compound.

It is important that the stuffing box is completely filled solid with packing and compressed firm during adjustment to prevent formation of voids and excessive leakage.

To pack the stuffing box when empty and assembled in the pump, remove the packing screw and nut assembly, and insert pellet form packing into the packing plunger guide. Replace the packing screw assembly and use a hand speed wrench to force the pellets into the gland. **DO NOT USE A POWER TOOL!** Repeat pellet additions while turning the impeller shaft by hand until resistance to turning is felt when the stuffing box is almost full. Continue turning packing screw by hand using a standard 6" long 9/16" end wrench until 4 lb. of force is felt at the end of the wrench. This is equivalent to 2 ft-lb or 24 in-lb torque. Continue turning until a few flakes of packing are extruded out the opening between the impeller shaft and the stuffing box hole. The gland is now ready for pressure testing or pumping.

After priming the pump with water, start the pump and raise the discharge pressure to 50 psi. Tighten the packing screw using a 6" long 9/16" end wrench until 4 lb. force is felt at the end of the wrench (24 in-lb torque). Continue operating the pump at 50 psi for 5 minutes to dissipate packing pressure against the shaft and permit cooling water to flow between the shaft and stuffing box hole. Make sure that water actually does come through before operating pump at any higher pressure. The normal drip rate may vary between 5 and 60 drops per minute.



Operate the pump for 10 minutes at the highest normal operating pressure flowing sufficient water to prevent overheating. Do not run the pump blocked tight. Lower discharge pressure to 50 psi and repeat the packing screw tightening procedure outlined above.

The pump may now be operated for any time period required within its rated capacity. However, the drip rate should be monitored more frequently during the first few hours, and adjusted if necessary to achieve a stable flow rate. Several more adjustments may be required.



For a list of approximate quantity of packing pellets required by model (completely repacked), see below:

Model	Approximate # Packing Pellets
A	6
2BE	6
EM	15
H	8
JM	8
KD	10
KS	8
LD	15
LS	9
P	10
U2	5
U4	10

If further information is needed, call **W.S. DARLEY & CO.**  
at Chippewa Falls, WI. at 800-634-7812 or 715-726-2650