

27. TWO GEAR PSP PTO DRIVEN





W.S. Darley & Co.
REPAIR SERVICE INSTRUCTIONS
TYPE TWO GEAR PSP PTO DRIVEN FIRE PUMP
WITH INJECTION PACKING

REMOVAL OF PUMP AND TRANSMISSION
FROM TRUCK CHASSIS
Refer to Drawings DPC0605, DPC0304 & DPC0355

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

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

1. Remove the drive shaft from the pump transmission.
2. Disconnect the following items from the pump:
 - Heater Piping
 - Gage Line Tubing
 - Primer Tubing
 - Drain Line Tubing
 - Tachometer Drive Cable
3. Remove any other accessory that will prevent lowering the pump and transmission assembly.
4. Drain oil from gear case. Inspect oil for debris, or cloudiness (entrapped water).
5. Provide a jack or overhead hoist to support pump weight of 500 pounds for removing pump from chassis.
6. NOTE: If pump is to be lowered for removal, the floor jack must be positioned to securely support the pump. Also tie two loops of rope around the pump casing discharge flange. Loop the rope around the discharge manifold or a beam above the truck. The rope will be used to keep the pump upright on the jack while lowering.
7. Remove the twelve 3/8-16NC nuts that hold the discharge to the pump casing.
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 discharge and pump, and the suction and pump. Lowering the pump will require a coordinated effort between the man operating the floor jack and the man on top with the rope that is holding the pump upright.
10. Unless the truck is raised with approximately three feet of clearance at the running boards, the pump will have to be tipped to get it out from under the truck.

PSP PUMP DISASSEMBLY FOR OVERHAUL

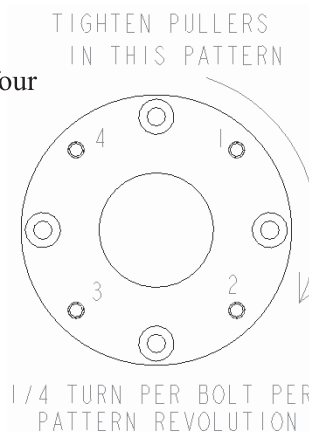
1. Remove four 3/8-16NC cap screws and remove bearing cap (113) by using the 5/16-18NC puller holes. Discard gasket (22).
2. Remove three 1/2-13NC cap screws holding the volute (30) and spacers (17) to the gear case (27). Separate the volute and impeller shaft assembly (99) from the gear case while keeping the parts square with each other to avoid 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 puller 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) from impeller shaft (99) and remove impeller nut (37) and washer (41).
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), keeping the shaft square with the bore to avoid damage to parts.
8. Pull or pry the oil seal (18) out of volute (30). 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 impeller shaft (99) all at once.
12. Remove pinion gear key (20).
13. Press bearing (108) off impeller shaft (99).
14. Remove backup washer and retaining ring 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.]



GEAR CASE DISASSEMBLY FOR OVERHAUL

15. Remove three 5/16-18NC socket head cap screws and remove the bearing cap (1) from the gear case (27). Discard gasket (2).
16. Remove four 3/8-16NC cap screws and remove bearing cap (47) by using the 5/16-18NC puller holes. Discard gasket (48).
17. Remove eight 3/8-16NC cap screws and remove oil pan (3). Discard gasket (4).

18. Press transmission shaft (11) out of drive gear (5), spacer (49), bearing (6), and gear case (27).

19. Remove drive gear key (50).

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

20. If present, remove retaining ring (10) from transmission shaft (11).

21. If present, remove tachometer worm (8) from transmission shaft (11).

22. If present, remove tachometer drive key (55).

23. Press bearing (6), and spacer (7) off the transmission shaft (11).

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

24. If present, tap the drive lock pin (95) out of the tachometer gear (14).

25. If present, remove tachometer shaft (13) from gear (14) and bushing (12). Remove tachometer gear.

26. If present, press or tap tachometer bushing (12) and tachometer plug (96) out of bearing cap (1).

PARTS INSPECTION AND MEASUREMENT

1. Clean all parts and carefully examine for wear or deterioration. Replace any questionable parts.

2. Measure the impeller seal rings and the 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 use 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 1.3753 - 1.3762". The original tachometer worm bore is 1.3765 - 1.3770" providing from 0.0003 to 0.0017" clearance. The parts are still serviceable up to 0.0022" clearance. [**Note:** Prior to Jan 2002, the original transmission shaft diameter under the tachometer worm is 1.3778 - 1.3789". The original tachometer worm bore is 1.3765 - 1.3770" providing from 0.0008 to 0.0024" press. The parts are still serviceable up to 0.0004" press.]

**ASSEMBLY OF TYPE TWO GEAR
PSP PTO DRIVEN FIRE PUMP
TRANSMISSION ASSEMBLY**

1. If present, press the tachometer bushing (12) into bearing cap (1), flush with inside of gear pocket.
2. If present, place tachometer gear (14) into position.
3. If present, insert tachometer shaft (13) through bushing (12) and into tachometer gear (14) with .104" square key drive hole end facing tachometer cable pocket.
4. If present, tap a 3/32" x 7/16" drive lock pin (95) into tachometer gear (14) through the tachometer shaft (13).
5. If present, press the tachometer plug (96) into bearing cap (1). Allow .015" gap between the tachometer gear (14) and the tachometer plug (96).
6. If present, gear (14) and shaft (13) must rotate freely. Fill tachometer gear teeth, and tachometer pocket 1/3 - 1/2 full with grease.
7. Press oil seal (9) into bearing cap (1) with lip spring of seal facing tachometer pocket. Fill grease cavity of oil seal 1/3 - 1/2 full with grease and lubricate oil seal lips.
8. Place gear case (27) on a sturdy work bench to support the weight of the pump (500 pounds).
9. Place drive gear (5) into gear case (27).
10. 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.
11. Apply a light coating of oil to both the inside and outside diameters of bearing (6). With the use of a sleeve to apply even pressure to both races, press the bearing onto the transmission shaft (11), and into the gearcase (27) on the tachometer side until the bearing is tight against shaft shoulder.
12. If present, slide spacer (7) onto the transmission shaft (11).

13. If present, place the woodruff key (55) into the slot in the transmission shaft (11) and slide the tachometer worm (8) onto the transmission shaft until the worm, spacer (7), and inner race of bearing (6) are tight together. Install the retaining ring (10) to hold the components in place.
14. Slide the bearing cap (1) and gasket (2) over the transmission shaft (11) and into position against gear case (27). Apply Loctite 243 or equivalent to the threads of three 5/16-18NC cap screws and attach the bearing cap to the gear case using these cap screws and three lock washers. Torque to 13 ft-lb.
15. Slide spacer (49) onto transmission shaft (11).
16. Apply a light coating of oil to both the inside and outside diameters of bearing (6). With the use of a sleeve to apply even pressure to both races, press the bearing onto transmission shaft (11), and into gear case (27) until shaft shoulder, drive gear (5), spacer (49), and bearing are tight together.
17. Apply Loctite 243 or equivalent to the threads of four 3/8-16NC x 7/8" cap screws and attach bearing cap (47) and gasket (48) with these cap screws and lock washers. Torque to 23 ft-lb.
18. Attach the oil pan (3) and gasket (4) to gear case (27) with eight 3/8-16NC x 7/8" cap screws and lock washers. Use Loctite 243 or equivalent on the threads, and torque to 23 ft-lb.

PUMP ASSEMBLY

19. 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.

20. Apply a silicone lubricant to stuffing box o'ring (129), and place in groove of volute (30).
21. 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. Stake the screws so they will not back out.
22. Slide impeller shaft (99) into volute (30), through stuffing box (39).
23. 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" .)
24. 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).
25. 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 for retaining water slinger position during assembly only.
26. Press oil seal (18) into volute (30) with lip spring of seal facing bearing cavity. Fill grease cavity 1/3 - 1/2 full with grease and lubricate oil seal lips.

27. 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.
28. Place retaining ring in groove on impeller shaft (99) with sharp edge towards pinion gear (24), and slide bearing backup washer into place. Retaining ring should be tight in groove. Replace ring if it is loose. **[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.]
29. Press bearing (108) onto impeller shaft (99) against shaft shoulder.
30. Slide spacer (103) onto impeller shaft (99).
31. 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.
32. 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.
33. Slide impeller (36) and impeller washer (41) onto impeller shaft (99).
34. Temporarily tighten impeller nut (37) finger tight until it contacts the impeller washer (41)
35. Apply a thin layer of Loctite Master Gasket 518 or equivalent to the flange surface of the volute (30) where it engages the gear case (27).
36. Apply oil to the outer diameter of bearing (6) on the impeller shaft (99).
37. 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 243 or equivalent applied to the threads. Torque to 57 ft-lb. **[NOTE:** Tighten the cap screws in the opposing arms first, then tighten the third one.
38. Apply Loctite 243 or equivalent 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.
39. Remove impeller nut (37).
40. 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.)
41. Apply Loctite 243 or equivalent thread-locker to impeller shaft (99) thread.
42. 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.**
43. Install a 1/8" x 1" STAINLESS STEEL cotter key (38) through the impeller nut (37) and impeller shaft (99) cotter key hole.
44. Press outboard seal ring (35) into suction head (31).
45. 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).

46. Apply Loctite 243 or equivalent 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.

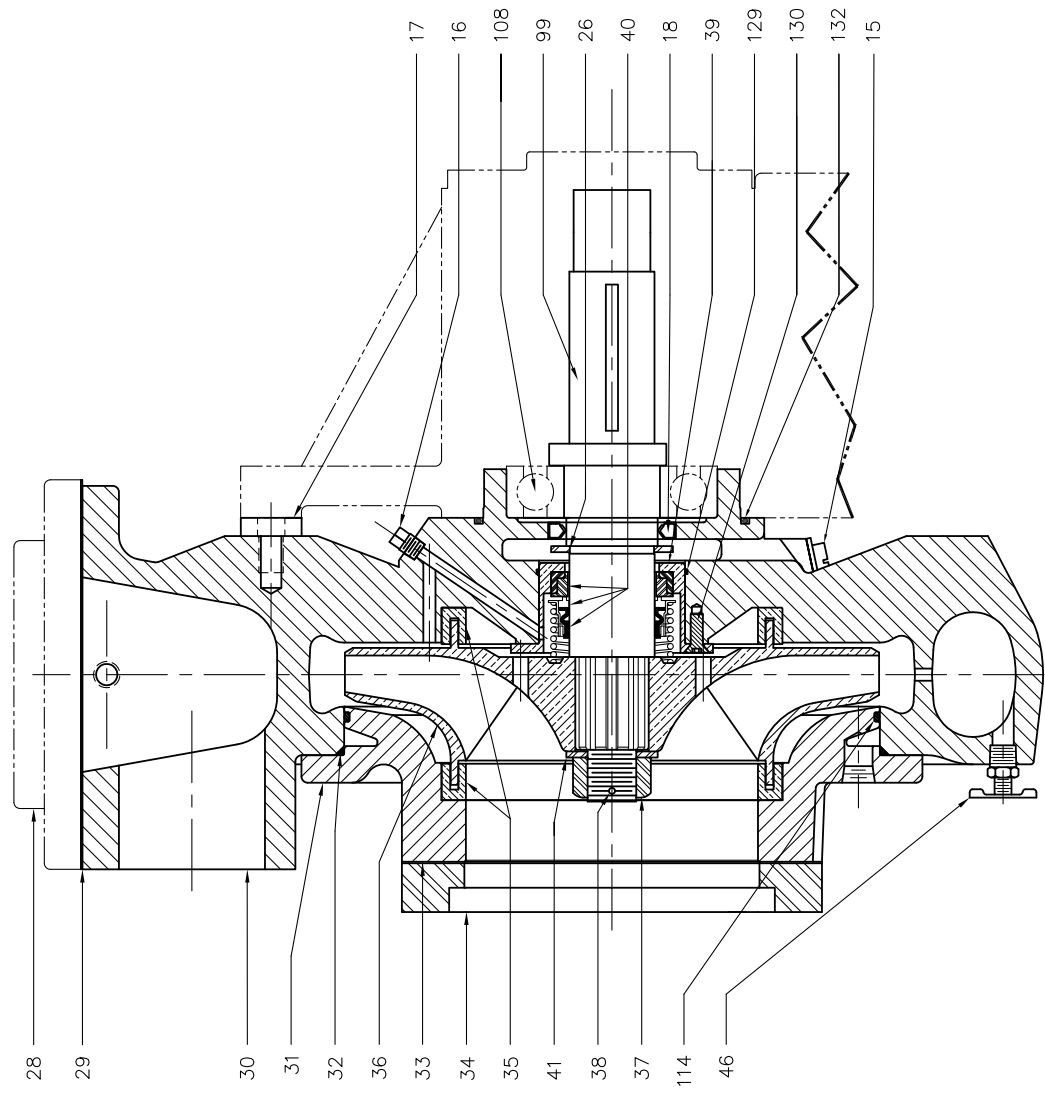
INSTALLING PUMP IN TRUCK CHASSIS

1. Reverse the procedures outlined under removal instructions.
2. Lubricate universal joint slip yoke on pump drive shaft.
3. Fill gear case with SAE 80W/90 Gear Lube oil to the bottom of the oil level plug located on the 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 - PS PUMP, MECH SEAL - REMOVABLE
CROSS SECTION
DATE NOV27,01
SCALE 1/2

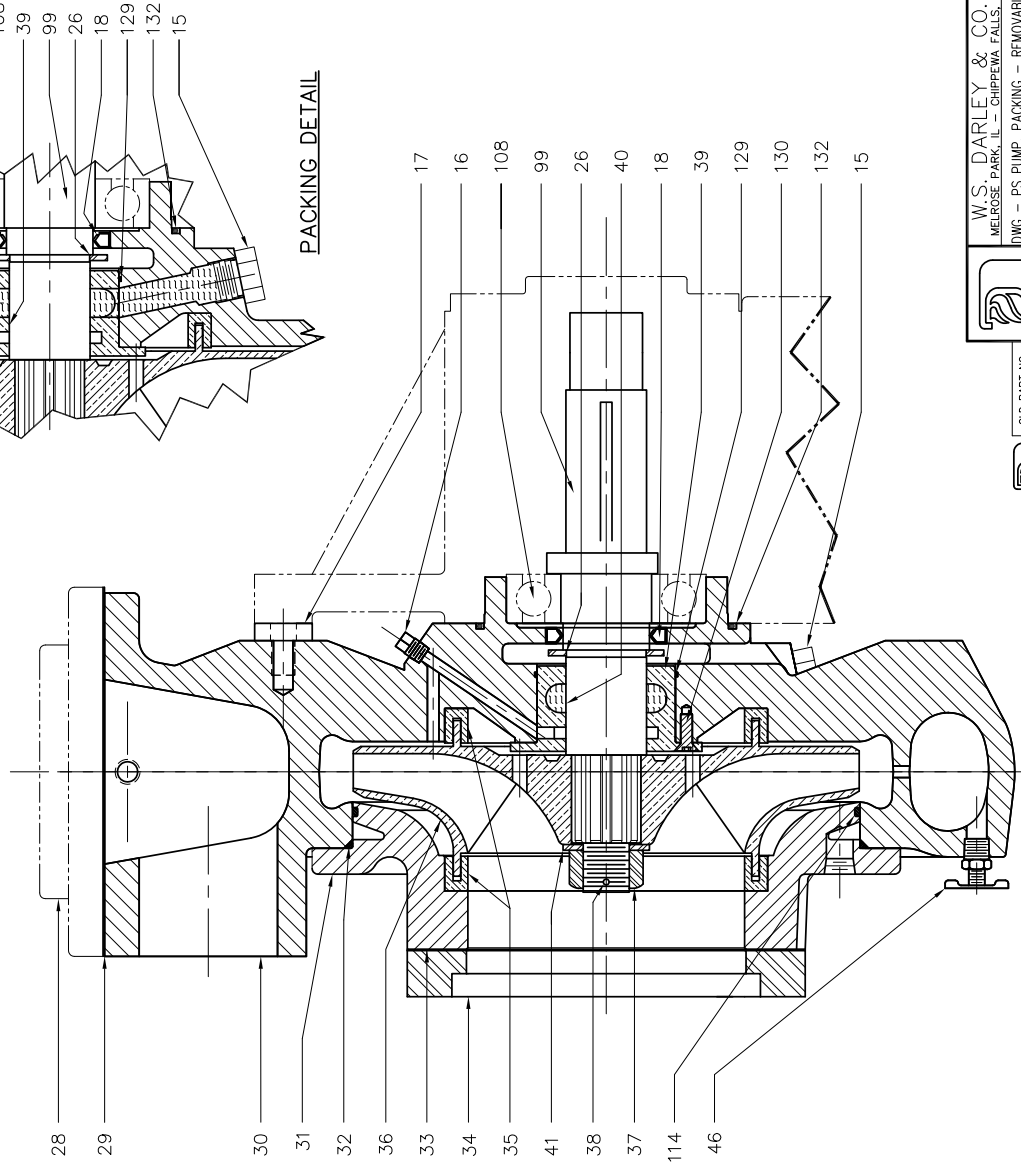
OLD PART NO.
P224-2
DO NOT SCALE PRINT

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W.S. DARLEY & CO.
MELROSE PARK, IL - CHIPPEWA FALLS, WI
DWG - PS PUMP, MECH SEAL - REMOVABLE
CROSS SECTION
DATE NOV27,01
SCALE 1/2
DPC0604

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, ILL. - CHIPPewa FALLS, WI.
 DWG - PS PUMP, PACKING - REMOVABLE
 CROSS SECTION
 DATE NOV27.01
 DRN WAH
 CHK DMD
 TRCD
 SCALE 1/2

OLD PART NO.
 P224-3
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DPC0605
 DATE NOV27.01
 SCALE 1/2

REVISIONS			
LTR	DESCRIPTION	DATE	CHG. NO. APPROD.
A	ADDED GEARCASE COVER O-RING	10/JAN/03	003-051 HAL

TACH. DRIVE DETAIL
SCALE: 1=1

REP.#	NAME OF PART	QTY
1	BEARING CAP - TACHOMETER	1
3	GEARCASE COVER	1
4	O-RING	1
5	DRIVE GEAR	1
6	BEARING - DRIVE/IMPELLER SHAFT	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	VENT - GEAR CASE	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	1
113	BEARING CAP - IMPELLER SHAFT	1
110	GEARCASE RETAINING BOLT	3
117	LOCKWASHER	3
120	SPACER - PINION GEAR	1
131	7/16 FROST PLUG - REF	2

LTR	DESCRIPTION	DATE	CHG. NO. APPROD.
17			
27			
117			
110			
18			
108			
120			
20			
23			
24			
103			
99			
113			
6			
49			
50			
6			
131			
9			
11			
1			
47			
6			
5			
4 (A)			
3			
51			

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INCHES UNLESS NOTED

SCALE 1/2

OLD PART NO. -

WASH INGS

DATE 01/JAN/2002

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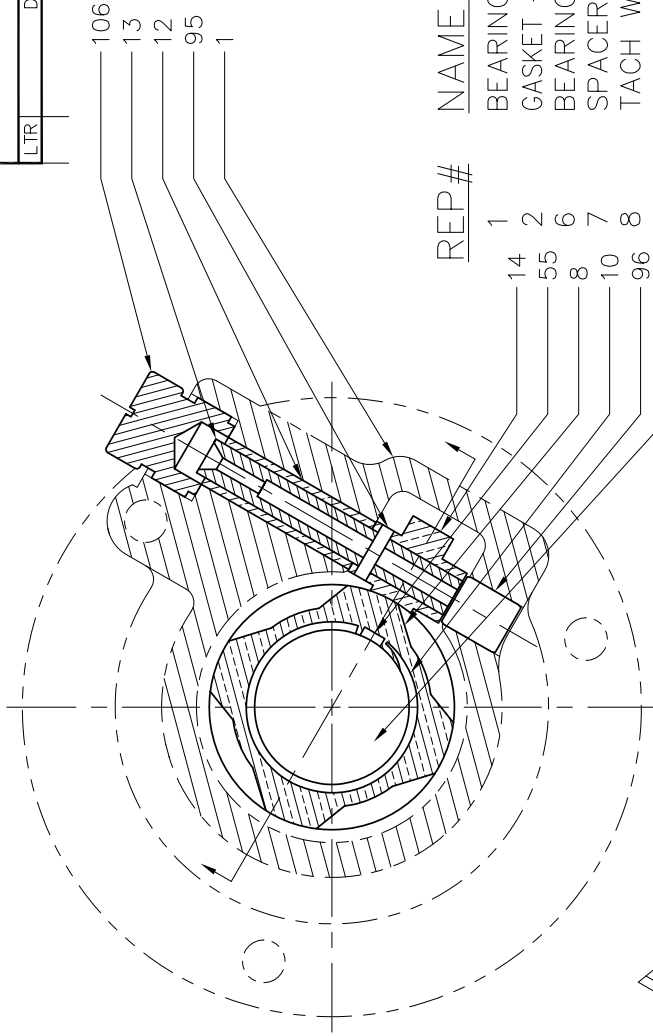
SCALE 1/2

DPC0304

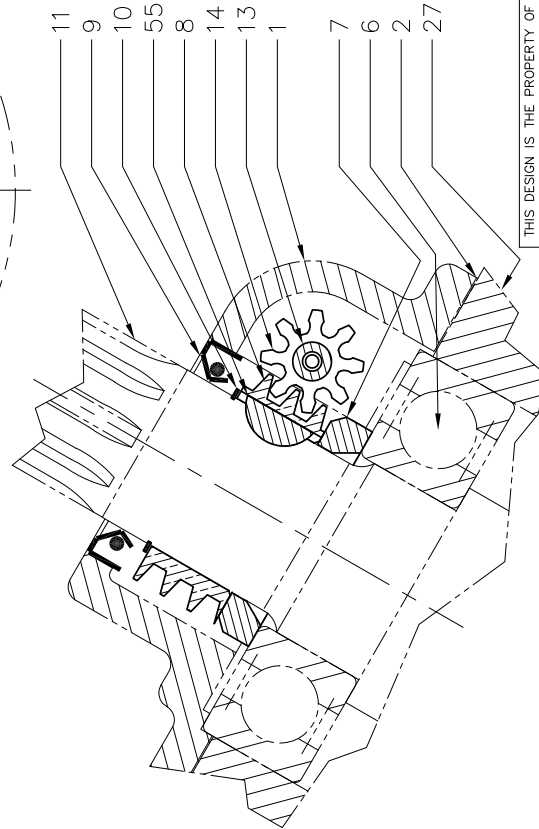
W.S. DARLEY & CO.
MELROSE PARK, IL - CHIPPENVA FALLS, WI

DWG - PSP TRANS - W/CARB. GEAR,
NO TACH, CROSS SECTION

REVISIONS			
LTR	DESCRIPTION	DATE	CHG NO.



REP#	NAME OF PART	QTY
1	BEARING CAP TACH -- REF	1
2	GASKET -- BEARING CAP -- TACH -- REF	1
6	BEARING -- REF	3
7	SPACER -- TACH	1
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 -- OPT. PSP TACH, SLIP YOKE CROSS SECTION	
DRN	WAH	DATE 03/JAN/2002
CHKD	DMD	SCALE 1/1
TRGD		DPC0355

OLD PART NO.	DO NOT SCALE PRINT
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SPEC NO.	ALL DIMENSIONS IN INCHES UNLESS NOTED
AT00311	

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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.

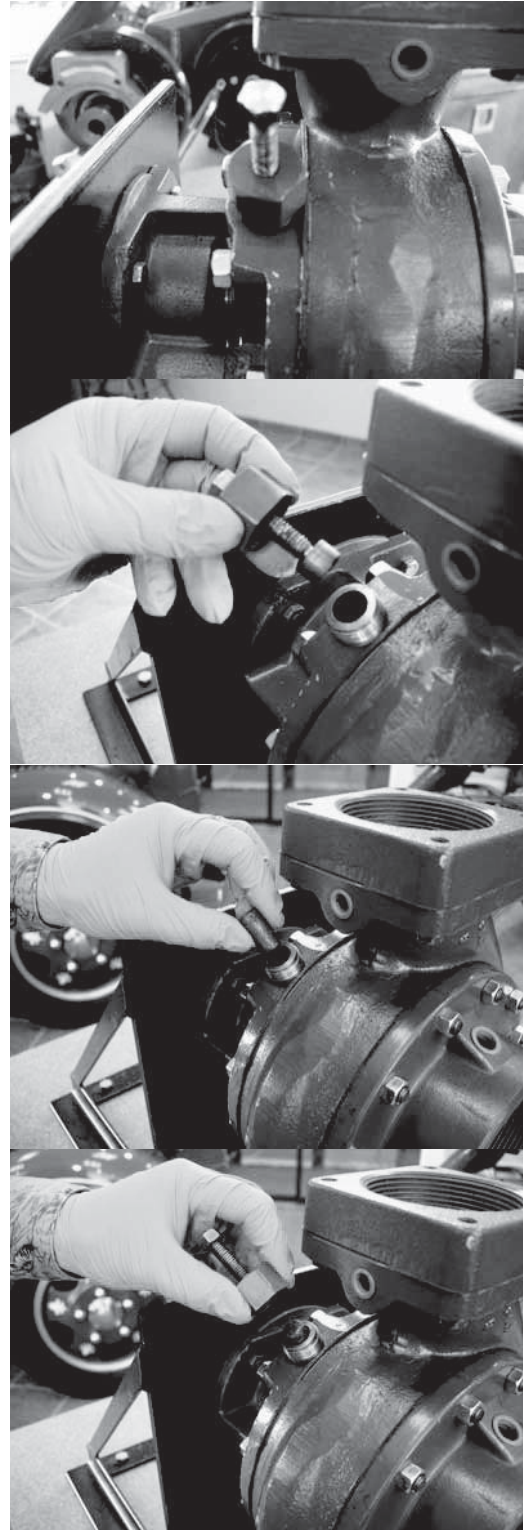
⚠ Caution: Do not attempt to use anything but Darley injection packing. Using the wrong packing material in your pump may cause catastrophic failure of the pump shaft sealing components.

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

