22. LDM
AFTER JAN. 1, 2006

W. S. DARLEY & CO.
REPAIR SERVICE INSTRUCTIONS
TYPE LDM MIDSHIP FIRE PUMP
REMOVAL OF PUMP AND TRANSMISSION FROM TRUCK CHASSIS

NOTE: It will be beneficial to have assistance 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. 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.
2. Remove the vehicle drive shafts from the pump transmission.
3. Remove all accessories that will prevent lowering the pump and transmission assembly.
4. Drain oil from gear case. Inspect oil for debris, or moisture.
5. Provide a jack or overhead hoist to support pump weight of 800 pounds for removing the pump.
6. Loosen four 5/8" bolts that fasten the suction extensions to the support brackets on the truck frame rails.
7. Loosen all pony suction, tank to pump lines, etc. by unbolting the companion flanges at the suction extensions.
8. Remove the forty 3/8" cap screws that hold the suction heads to the suction extensions.
9. Remove the twelve 3/8" nuts that hold the discharge head to the pump casing.
10. **The pump is ready to be lowered from position.** Some prying may be required to loosen the gasket between the discharge head and pump, and the suction extensions and pump.

LDM PUMP DISASSEMBLY FOR OVERHAUL
Refer to Drawings DLC1404 (pump)

1. Remove Relief Valve and Elbow together. Remove four 3/8-16 NC cap screws and four hex nuts.
2. Remove four 1/4-20 NC cap screws (15) and remove bearing cap (6).
3. Remove bearing (4) using a suitable puller.
4. Make alignment marks to align the inboard and outboard heads (11 and 12) with the pump casing (31).
5. Remove twelve 1/2-13 NC nuts holding outboard suction head to pump casing (31).
6. Pry outboard suction head off pump casing (11). Keep head square with casing bore to avoid damage to parts. Three 5/16-18 NC tapped pusher holes in flange will help flange separation.
7. Remove o-rings (23 and 24) from outboard suction head.
8. Press oil seal (25) out of outboard suction head.
9. If necessary to replace outboard stuffing box (42), remove three 1/4-20 NC stainless steel flat head screws (9) and press outboard stuffing box out of outboard suction head. Discard stuffing box o-ring (19).
10. If necessary to replace, remove seal ring (35) from outboard suction head (11).
11. Remove impeller retaining ring (32) from impeller shaft (36).
12. Mark outboard side of impeller (16). Slide impeller off impeller shaft (36).

13. Remove second impeller retaining ring (32).
14. Remove twelve 1/2-13 NC nuts holding pump casing (31) to inboard suction head (12).
15. Pry pump casing (31) away from inboard suction head (12). Three 5/16-18 NC pusher holes in flange will help separation.
16. Remove o-rings (23 and 24) from inboard suction head.
17. Remove four 3/8-16 NC cap screws (14) and bearing cap (12) from gear case (2). Two 5/16-18 NC tapped pusher holes in flange will help separation. Discard o-ring (11).
18. Remove three 1/2-13 NC and two 3/8-16 NC cap screws holding inboard suction head to gear case (2). Separate the two parts and slide the inboard head/impeller shaft assembly away from gear case.
19. Remove impeller shaft assembly (36) from inboard suction head.
20. Press oil seal (26) out of inboard suction head.
21. If necessary to replace inboard stuffing box (41), remove three 1/4-20 NC stainless steel flat head screws (9) and press stuffing box out of inboard head. Discard stuffing box o-ring (19).
22. If necessary to replace, remove seal ring (35) from inboard suction head.
23. Press bearing (5) off impeller shaft (36).
24. Press pinion gear (8) and pinion spacers (7 and 9) off impeller shaft (36). Note spacer locations.

LDM TRANSMISSION DISASSEMBLY FOR OVERHAUL
Refer to Drawings DLC0608

1. Remove air power shift option if equipped.
2. Place the gear case assembly on a bench.
3. Remove twelve 5/16 NC cap screws and transmission cover (103) from side of gear case (2). Discard gasket.
4. Remove lock nuts (31) and slide universal joint yokes (32) from input shaft (51) and output shaft (55). Discard lock nuts (31).
5. Remove eight 3/8-16 NC socket head cap screws and separate rear bearing bracket (58) assembly from gear case.
6. Cut safety wire (47) and remove lock bolt (46) from shift yoke (45). Remove yoke and shift bar (43) from gear case.
7. Tap bearing (54) off transmission shaft (51) with sliding clutch gear (53) or using a suitable puller.
8. Remove four 3/8-16 NC cap screws (35) and separate front bearing bracket (36) from gear case. Discard o-ring (11).
9. Press oil seal (34) out of bearing bracket (36).
10. Remove retaining ring (49) from drive gear (52).
11. Push transmission shaft (51) out of drive gear toward input side of transmission.
12. Press bearing (37), spacer (48) and bearing (50) off transmission shaft (51) all at once.
13. Press second bearing (50) off transmission shaft (51).
14. Remove eight 3/8-16 NC cap screws and bearing caps (21 and 29). Discard o-rings (22).
15. Place gear case with tail shaft side down on an arbor press table and push idler gear shaft (25) through idler gear (26), spacers (27 and 28), and bearing (23). Use a pusher 1-5/32 O.D. or less by 3-5/8 long.
16. Press bearing (23) off idler gear shaft (25).

REAR BEARING BRACKET DISASSEMBLY

17. Press rear drive shaft (55) out of bearing bracket (58) which removes bearing (62) from shaft.
18. Remove four 3/8 – 16NC cap screws (65) and separate bearing cap (64) from rear bearing bracket (58). Discard o-ring (63).
19. Press bearing (56) off rear drive shaft (55).
20. Remove oil seals (57) out of rear bearing bracket (58).
21. Press bearing (62) out of bearing cap (64).
22. Press oil seal (34) out of bearing cap (64).

PUMP PARTS INSPECTION AND MEASUREMENT

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

Impeller Seal Ring O.D.	5.235 - 5.237
Impeller Seal Ring I.D.	4.999 – 5.001
Stationary Seal Ring O.D.	5.249 – 5.251
Stationary Seal Ring I.D.	4.985 – 4.987
Clearance O.D.	0.012 – 0.016
Clearance I.D.	0.012 – 0.016

3. If clearance exceeds 0.025" on diameter, impeller seal rings can be restored to original size by soldering a ring over trued surface which retains 0.090" min. 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 boxes for wear. Use the following table for comparison:

	Outboard	Inboard
Impeller Shaft Diameter	1.561 – 1.562	1.749 – 1.750
Stuffing Box Bore - new	1.571 – 1.572	1.759 – 1.760
Stuffing Box Bore - max	1.575	1.763
Clearance - original	0.005 – 0.008	0.009 – 0.011
Clearance - max	0.014	0.014

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 must be replaced.

Part	Rep. Number	Original Diameter
Bearing Cap	29	2.4409 – 2.4416
Bearing Cap	21	2.4409 – 2.4416
Bearing Cap	12	2.8346 – 2.8353
Front Bearing Bracket	36	4.7244 – 4.7252
Drive Gear	52	3.9370 – 3.9379
Rear Bearing Bracket	58	4.3307 – 4.3316
		4.7244 – 4.7253
Output Shaft	55	2.4409 – 2.4416
Outboard Bearing Cap	6	2.8346 – 2.8353
Suction Head	11 & 12	4.3307 – 4.3316

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

Part	Rep. Number	Original Diameter
Impeller Shaft	36	1.1812 – 1.1816
		1.9686 – 1.9690
		1.5749 – 1.5753
Idler Gear Shaft	25	1.1812 – 1.1816
Transmission Shaft	51	0.9844 – 0.9848
		2.5592 – 2.5597
Output Shaft	55	2.7560 – 2.7565

7. The original impeller shaft diameter under the pinion gear is 1.7490 to 1.7495. The original pinion gear bore is 1.7495 to 1.7500 providing a 0.0000 to 0.0010 clearance. The parts are still serviceable up to 0.0015 clearance. Pinion gear may be reversed to work other side of gear teeth.
8. The original idler gear shaft diameter under the idler gear is 1.7495 to 1.7500. The original idler gear bore is 1.7495 to 1.7500 providing a 0.0005 press fit to 0.0005 clearance. The parts are still serviceable up to 0.0010 clearance. Idler gear may be reversed to work other side of gear teeth.

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

LDM TRANSMISSION ASSEMBLY
Refer to Drawings DLC0608 (transmission)

1. If necessary to install, apply a light coat of oil to tachometer drive nut (17) and press it evenly into the hole at the end of idler gear shaft (25). The shoulder end of the idler shaft is at the output shaft side of gear case. Tachometer drive nut is opposite the pump side of gear case and extends 3/8 " beyond end of shaft.
2. Place gear case (2) on bench with pump side down and place idler gear (26) inside gear case. Tachometer side is opposite to pump mounting side.
3. Apply a light coat of oil to idler gear shaft (25). Place key (24) in idler gear shaft keyway. Align with key slot in gear (26) and press shaft evenly into idler gear bore until shaft shoulder is tight against side of gear.
4. Apply a light coat of oil to bore of bearing (23) on tachometer side and press evenly on idler gear shaft (25) until tight against shaft shoulder. Three bearing support washers X5144-2 will help the bearing from cocking.
5. Install dowel pin (20) into gear case.
6. Install bearing cap (21) and o-ring (22) with four 3/8-16 cap screws (18) lockwashers (19). Remove support washers. Torque to 23 ft/lb.
7. Turn gear case over and place spacers (27) and (28) on idler gear shaft (25).
8. Apply a light coat of oil to bore of second bearing (23) and press evenly onto idler gear shaft until spacers, idler gear, and inner race of bearing are tight together. Three bearing support washers X5144-2 will help the bearing from cocking.
9. Install bearing cap (29) and o-ring (22) with four 3/8-16 cap screws (18) lockwashers (19). Remove support washers. Torque to 23 ft/lb.
10. Place oil seal (56) on assembly plug X3852/X3852-1 and plug into end of tachometer drive nut (55). Press oil seal into bearing cap (57) with lip spring of seal facing bearing. Lubricate oil seal lip.
11. Press two bearings (50) onto transmission shaft (51) until inner races are tight against shaft shoulders.
12. Oil lubricate bore of drive gear (52) and place inside gear case. Clutch gear side to output side.
13. Slide transmission shaft (51) with bearings (50) into drive gear (52). Install retaining ring (49).
14. Slide spacer (48) over transmission shaft (51) and against bearing (50). Press bearing (37) onto transmission shaft against spacer.
15. Press oil seal (34) into front bearing bracket (36), flush with face of bracket, with lip spring of seal facing bearing. Lubricate oil seal lip.
16. Install o-ring (11) onto front bearing bracket (36). Tap bearing bracket over bearing (37) and against gear case. Tap transmission shaft from rear until bearing is seated in front bearing bracket. Torque to 23 ft/lb.
17. Lubricate bore and place sliding clutch gear (53) on spline of transmission shaft (51) with external gear teeth forward.
18. Press bearing (54) onto transmission shaft (51) until tight against shaft shoulder.
19. Apply silicone lubricant to o-ring (39) and install in groove in gear case shift bar hole. Lubricate shift bar hole.
20. Lubricate shift bar (43) with oil and slide into gear case.
21. Saturate oil wicks in shift yoke (44) ears with oil.

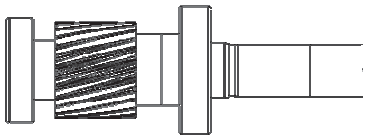
22. Place shift yoke (45) in groove of sliding clutch gear (53) and slide shift bar (43) through hole in yoke. Align groove in shift bar with bolt hole in yoke. Apply Loctite 243 (or equivalent) to the threads of lock bolt and install in shift yoke and torque to 23 ft/lbs. Attach safety wire through hole in head of lock bolt and in end groove of shift bar.
23. Install retaining rings on front side of shift bar outside of gear case (2). See drawing DGM0700 which shows sharp corner side of retaining ring in proper position to take thrust load.
24. Slide front yoke (32) with flinger (33) attached onto drive shaft (55). Install universal joint retaining nut (31).

REAR BEARING BRACKET ASSEMBLY

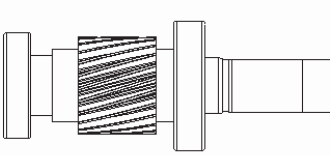
25. Press oil seal (57) into rear bearing bracket (58) with lip springs of seal facing bearings. Be sure to press the oil seals in until they are flush or slightly below the face of the rear bearing bracket they are sealing. Lubricate oil seal lip.
26. Press bearing (56) onto rear drive shaft (55) at truck gear end.
27. Place oil seal assembly sleeve X3851 over splined end of rear drive shaft (55) or wrap spline with shim stock to prevent damage to oil seals. Make sure the largest diameter step at splined end of shaft is covered. Slide shaft into rear bearing bracket (58). Remove sleeve or shim stock. Place bearing backup washer (62) on rear drive shaft.
28. Press the double shielded bearing (63) onto the rear drive shaft (55) against backup washer (62).
29. Apply a thin layer of Loctite Master Gasket 518 (or equivalent) to the flange of rear bearing bracket (58). Place rear bearing bracket assembly into position at rear of gear case so bearing (54) enters bore at gear end of tail shaft (55). Use two 3/8-16 NC x 1-1/2 cap screws (60), and lock washers (59) to draw flange up to gear case mounting surface. Apply Loctite 243 (or equivalent) to, and install remaining five 3/8-16 NC x 1-1/2 cap screws and lock washers and one 3/8-16 NC x 1 1/4 socket head cap screw (61) and high collar washer (59) at the housing extension flange. Torque to 23 ft/lb.
30. Press oil seal (34) into bearing retainer (65) with lip spring of seal facing bearing. Lubricate oil seal lip. Apply Loctite 603 (or equivalent) to bore of the bearing retainer (65), taking care not to spill any on the faces that touch the sides of the bearing (34).
31. Slide o-ring (64) over bearing (63) until it is touching the rear bearing bracket (58).
32. Attach bearing retainer (65) to rear bearing bracket (58) with four 3/8-16 NC x 1-3/4 cap screws (66), and lock washers (19). Torque to 23 ft/lb.
33. Slide rear yoke (32) with flinger (33) attached onto rear drive shaft (55). Install universal joint retaining nut (31), and torque both universal joint retaining nuts to 150 - 200 ft/lb.

LDM PACKING PUMP ASSEMBLY
Refer to Drawings DLC1404

1. Note spacer locations below for pump forward or pump rear configuration. Install spacer if required (7). Apply a light coat of oil to impeller shaft (36). Place pinion key (6) in impeller shaft keyway, align with keyway in pinion gear (8). Press shaft evenly into pinion gear until shaft shoulder is tight against side of gear.



pump forward of gear case



pump rear of gear case

2. Install spacer(s) (7 and 9) next to gear (8).
3. Apply a light coat of oil to bore of bearing (10). Press bearing evenly onto impeller shaft (36) until spacers and gear are tight to shoulder of shaft.
4. Apply a light coat of oil to bore or bearing (5). Press bearing onto impeller shaft (36) until inner race of bearing is tight against shaft shoulder..
5. Apply a silicone lubricant to stuffing box o-ring (19), and place in groove of inboard head.
6. Align stuffing box (41) with inboard suction head (12) by placing three 1/4-20 NC x 3 cap screws through mounting holes of stuffing box and screw into corresponding tapped holes of inboard head. Press stuffing box into position using tool X5950 and remove alignment cap screws. Apply Loctite 243 (or equivalent) to threads of, and install three 1/4-20 NC stainless steel flat head screws (14) to secure stuffing box in inboard suction head. Torque to 72 in-lbs.
7. Apply Loctite 609 to O.D. of seal ring (35), press into inboard suction head (12) until seated tight in pocket.
8. Place water slinger (37) in position on inboard stuffing box (41).
9. Press oil seal (26) into inboard suction head (12) with lip spring of seal facing bearing. Lubricate oil seal lip.
10. Insert impeller shaft (36) assembly into inboard stuffing box (41). Tap in until bearing (5) is seated in bearing pocket of inboard suction head.
11. Move water slinger (37) into its groove on impeller shaft (36).
12. Apply o-ring (22) to pilot of inboard suction head (12).
13. Slide impeller shaft-suction head assembly into position with gear case (2). Line up inboard suction head so it is square with gear case.
14. Attach inboard suction head to gear case with one 1/2-13 NC x 2 (5) cap screw and lock washer on top, two 1/2-13 NC x 1-1/2 cap screws (3) and lock washers at sides, and two 3/8-16 NC x 1 cap screws (14) and lock washers (19) at bottom. Use Loctite 243 (or equivalent) on the threads.
15. Position o-ring (11) against pilot of bearing cap (12).

16. Apply Loctite 243 (or equivalent) to four 3/8-16 NC x 1 (14) cap screws and attach bearing cap (12) to gear case (2).
17. Apply a silicon lubricant to suction head o-ring (23) and place on inboard suction head.
18. Place o-ring (24) on suction head pilot.
19. Push pump casing (31) into position on inboard suction head (12), stop before head is all the way on and start the nuts (14) on the studs (40). Snug up two nuts on top and two nuts on bottom.
20. Place impeller retaining ring (32) on impeller shaft (36) with sharp edge toward gear case.
21. Slide impeller (16) onto impeller shaft (36). Note rotation of impeller.
22. Place second impeller retaining ring (32) on impeller shaft (36) with sharp edge away from impeller (16).
23. Apply a silicone lubricant to stuffing box o-ring (19), and place in groove of outboard head (11)
24. Align stuffing box (42) with outboard suction head (11) by placing three 1/4-20 NC x 3 cap screws through mounting holes of stuffing box and screw into corresponding tapped holes of outboard head. Press stuffing box into position using tool X5950 and remove alignment cap screws. Apply Loctite 243 (or equivalent) to the threads of, and install three 1/4-20 NC stainless steel flat head screws (9) to secure stuffing box in outboard suction head. Torque to 72 in-lbs.
25. Apply Loctite 609 to O.D. of seal ring (35), press into outboard suction head (11) until seated tight in pocket.
26. Apply a silicon lubricant to suction head o-ring (23) and place on outboard suction head.
27. Place o-ring (24) on suction head pilot.
28. Push outboard suction head (11) onto pump casing (31). Start twelve 1/2-13 NC nuts (14) on the studs (40). Snug up two nuts on top and two nuts on bottom.
29. Line up alignment marks on suction heads (11 and 12) with marks on pump casing (31) or use a straightedge to align inboard and outboard heads. Tighten all nuts.
30. Push water slinger (38) onto impeller shaft (36).
31. Press oil seal (25) into outboard suction head (11). Insert with lip spring of seal facing bearing. Lubricate oil seal lip.
32. Apply oil to end of impeller shaft (36) and tap bearing (4) onto shaft.
33. Apply gasket eliminator to flange surface of bearing cap (6). Tap bearing cap over bearing (4) and attach to outboard suction head with four 1/4-20 NC x 7/8 cap screws (15) and lock washers (44).
34. Install relief valve if equipped.

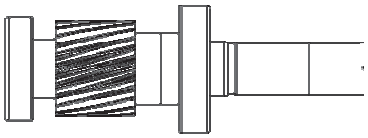
INSTALLING PUMP IN TRUCK CHASSIS

- Reverse the procedures outlined under removal instructions.
- Fill gear case with SAE80W/90 gear lube oil to the level located in the dipstick.

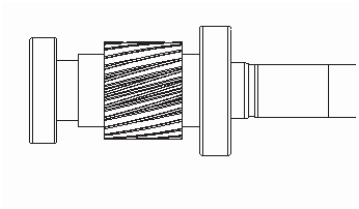
IF FURTHER INFORMATION IS NEEDED, CALL W.S. DARLEY & CO. AT CHIPPEWA FALLS, WI. AT 800-634-7812 or 715-726-2650

LDM MECHANICAL SEAL PUMP ASSEMBLY
Refer to Drawing DLC1402

1. Note spacer locations below for pump forward or pump rear configuration. Install spacer if required (7). Apply a light coat of oil to impeller shaft (36). Place pinion key (6) in impeller shaft keyway, align with keyway in pinion gear (8). Press shaft evenly into pinion gear until shaft shoulder is tight against side of gear.



pump forward of gear case



pump rear of gear case

2. Install spacer(s) (7 and 9) next to gear (8).
3. Apply a light coat of oil to bore of bearing (10). Press bearing evenly onto impeller shaft (38) until spacers and gear are tight to shoulder of shaft.
4. Apply a light coat of oil to bore or bearing (5). Press bearing onto impeller shaft (38) until inner race of bearing is tight against shaft shoulder..
5. Apply a silicone lubricant to stuffing box o-ring (22), and place in groove of inboard head.
6. Align mechanical seal housing (17) with inboard suction head (14) by placing three 1/4-20 NC x ¾" cap screws through mounting holes of housing and screw into corresponding tapped holes of inboard head. Press housing into position using tool X5950 and remove alignment cap screws. Apply Loctite 243 (or equivalent) to threads of, and install three 1/4-20 NC stainless steel flat head screws (12) to secure mechanical seal housing in inboard suction head. Torque to 72 in-lbs.
7. Carefully unwrap the inboard mechanical seal (36) using extreme care not to damage or contaminate the lapped surfaces of the mating or primary ring. While holding the mating ring by the inside diameter, lubricate the outside diameter o-ring with P-80 Rubber Lubricant, KY jelly or equivalent water-soluble lubricant. Insert mating ring into housing with mirror surface facing out. Place clean cardboard circle on ring and press squarely into housing. Confirm that mating ring has been seated firmly into pocket.
8. Apply Loctite 609 to O.D. of seal ring (37), press into inboard suction head (14) until seated tight in pocket.
9. Place water slinger (40) in position on inboard seal housing (17).
10. Press oil seal (29) into inboard head (14) with lip spring of seal facing bearing. Lubricate oil seal lip.

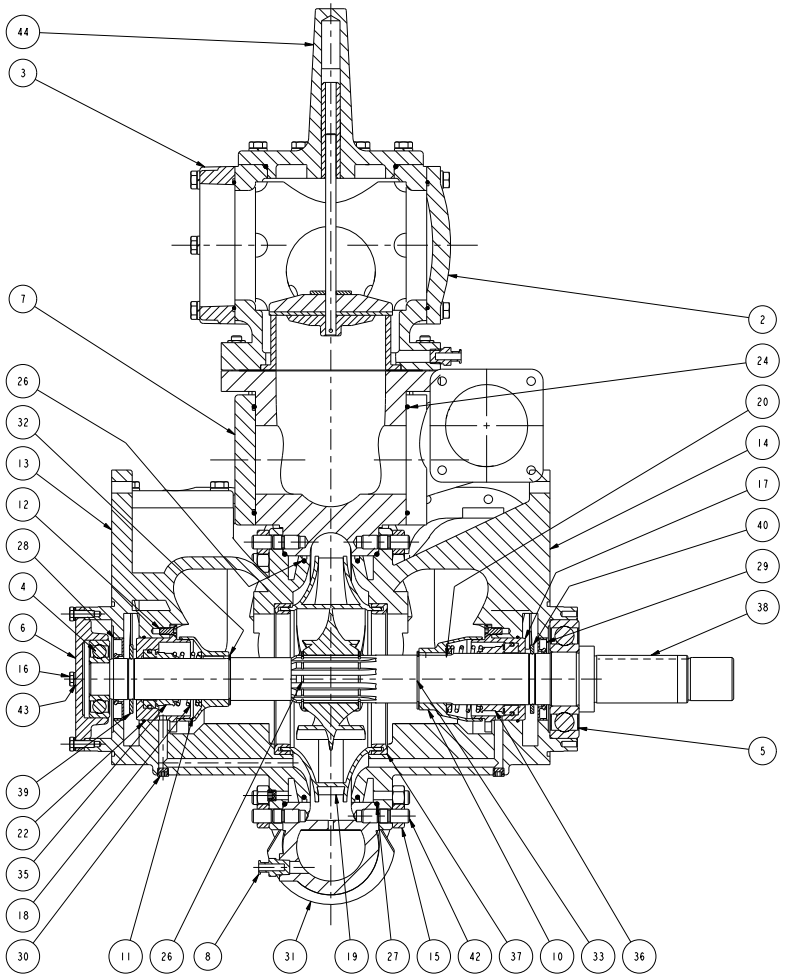
11. Insert impeller shaft-suction head assembly through water slinger and mechanical seal housing, being careful to avoid contact with the seal mating ring. Tap on end of pump shaft with a rubber mallet until bearing is seated in bearing pocket in inboard head. Position slinger (40) into groove.
12. Apply light grease or oil to head o-ring (11) and position in groove.
13. Slide suction head and shaft assembly into position in gear case. Make sure the pump shaft does not slide out of the outboard head while assembling the inboard suction head to the gear-case. Align head squarely with gear case.
14. Attach inboard suction head (14) to gear-case with one 1/2NC x 2 cap screw (5) on top, two 1/2NC x 1-1/2 cap screws (3) at sides, and two 3/8NC x 1 cap screws (14) on bottom.
15. Position o-ring (11) against pilot of bearing cap (12).
16. Apply Loctite 243 or equivalent to four 3/8NC x 1 cap screws (14), and attach bearing cap (12) to gear case.
17. Being careful not to damage or contaminate the lapped sealing surface, lubricate the inboard head primary ring (36) elastomer bellows with P-80 Rubber Lubricant, KY jelly or equivalent water-soluble lubricant. Apply thin coat of lubricant to impeller shaft where bellows (36) seats on the shaft. With lapped sealing surface facing mating ring, slide primary ring bellows assembly squarely onto shaft.
18. Using properly sized pusher tube, carefully push primary ring bellows (36) assembly onto the shaft until primary ring contacts the mating ring. Use care to avoid hard contact between the two surfaces.
19. Insert 3/16 sq. x .75 stainless steel key (20) into keyway.
20. Slide seal compression spring (discard thin brass spring holder) onto shaft and into position on primary ring.
21. Slide enclosure (10) onto shaft and align with drive key (20).
22. Using appropriately sized retaining ring pliers, expand retaining ring (33) just enough so it will slide over the shaft up to enclosure (10) with sharp edge of retaining ring facing impeller. Compressing spring, continue to slide enclosure and retaining ring toward the seal until retaining ring (33) snaps into groove. Confirm the proper placement and security of the retaining ring.
23. Apply silicone lubricant to pump casing seal o-rings (26) and (27) and position on inboard head.
24. Place inside impeller retaining ring (32) on impeller shaft with sharp edge of ring facing the gear case.
25. Place (1) 3/8NC x 1.25 HHCS through the passenger side suction extension-mounting flange. This is necessary due to reduced clearance once the pump casing is installed.
26. Apply a thin layer of silicone lubricant to pump casing (31) bore surfaces. Assemble casing (31) onto inboard head and secure with (12) ½-13NC hex nuts (15).

27. Slide impeller (19) onto shaft (38). Note rotation of impeller.
28. Place second impeller retaining ring (32) on impeller shaft (38) with sharp edge facing away from the impeller.
29. Apply a silicone lubricant to stuffing box o-ring (22), and place in groove of outboard head (13).
30. Align mechanical seal housing (18) with outboard suction head (13) by placing three 1/4-20 NC x 3 cap screws through mounting holes of housing and screw into corresponding tapped holes of inboard head. Press housing into position using tool X5950 and remove alignment cap screws. Apply Loctite 243 (or equivalent) to threads of, and install three 1/4-20 NC stainless steel flat head screws (12) to secure mechanical seal housing in outboard suction head. Torque to 72 in-lbs.
31. Carefully unwrap the inboard mechanical seal (35) using extreme care not to damage or contaminate the lapped surfaces of the mating or primary ring. While holding the mating ring by the inside diameter, lubricate the outside diameter o-ring with P-80 Rubber Lubricant, KY jelly or equivalent water-soluble lubricant. Insert mating ring into housing (18) with mirror surface facing out. Place clean cardboard circle on ring and press squarely into housing. Confirm that mating ring has been seated firmly into pocket.
32. Apply Loctite 609 to O.D. of seal ring (37), press into outboard suction head (13) until seated tight in pocket.
33. Apply silicone lubricate to casing seal o-rings (26) and (27) and position on outboard head.
34. Assemble retaining ring (32), sharp edge of retaining ring facing impeller (19).
35. Insert key (20), and enclosure (11) to shaft (38).
36. Slide mechanical seal (11) spring holder onto shaft up to the retaining ring (32).
37. Slide spring onto spring holder (11).
38. Being careful not to damage or contaminate the lapped sealing surface, lubricate the outboard primary ring (35) elastomer bellows with P-80 Rubber Lubricant, KY jelly or equivalent water-soluble lubricant. With lapped sealing surface facing away from the impeller, slide primary ring squarely onto shaft. Position spring on bellows pilot. Using a properly sized pusher tube, (ID larger than seal surface but smaller than brass seal holder), push the primary ring onto the shaft ¼" past the slinger groove.
39. Carefully position and assemble previously prepared outboard head assembly onto shaft and into pump casing. Do not allow shaft to disturb or contaminate already positioned mechanical seal mating ring. It is important to insert head pilot into casing squarely without cocking. Tighten nuts equally until all are tight.
40. Push water slinger (39) onto pump shaft (38) and position in groove.
41. Push oil seal (28) into head with open side toward outboard bearing (4). Lubricate oil seal lip.
42. Apply oil to end of pump shaft (38) and tap bearing (4) onto shaft until tight against shaft shoulder.
43. Lubricate bore of bearing cap (6). Apply gasket eliminator to flange surface of bearing cap (6). Tap bearing cap (6) over bearing (4) and attach to outboard head with four ¼-20NC x 7/8 cap screws and lock washers.

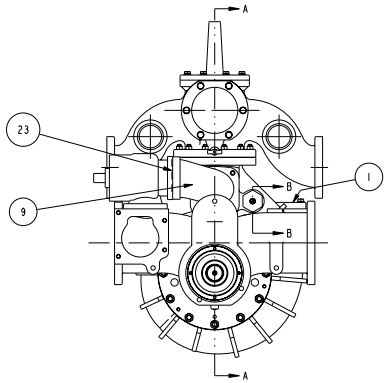
1200061

22.12

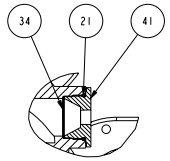
NO.	DESCRIPTION	PART NO.	QTY.
1	ASSY - FLANGE COVER, BLANK CI	-	1
2	ASSY - FLANGE CVR, BLNK, O-RING	-	1
3	ASSY - FLANGE, 4 NPT, CI	-	1
4	BEARING-BALL, 306SFF	-	1
5	BEARING-BALL, 310SFF	-	1
6	CAP - BEARING, LDM/E	-	1
7	COVER - RELIEF VALVE	-	1
8	DRAINCOCK - 0.250 NPTM, 9KC BR	-	1
9	ELBOW - RELIEF VALVE, LDM	-	1
10	ENCLOSURE - MECH SEAL, LDM	-	1
11	ENCLOSURE - MECH SEAL, LDM	-	1
12	FHMS - .250-20 x 0.63, SS	-	6
13	HEAD - SUCTION, LDM, MECH SEAL	-	1
14	HEAD - SUCTION, LDM, MECH SEAL	-	1
15	HEX NUT - .500-13, GR 2	-	24
16	HHCS - .250-20 x 0.75, GR5	-	4
17	HOUSING - MECH SEAL, LDM	-	1
18	HOUSING - MECH SEAL, LDM	-	1
19	IMPELLER - LDM, MIXED FLOW	-	1
20	KEY - SQ., 0.19 X 0.75 316SS	-	2
21	O-RING - 1.47 x 1.71 x 0.09	-	1
22	O-RING - 3.00 x 3.12 x 0.06	-	2
23	O-RING - 3.50 x 3.69 x 0.09	-	2
24	O-RING - 3.75 x 4.00 x 0.12	-	2
26	O-RING - 8.50 x 8.75 x 0.12	-	2
27	O-RING - 9.00 x 9.25 x 0.12	-	2
28	OIL SEAL - 1.500 ID X 3.005 OD	-	1
29	OIL SEAL - 1.875 ID X 3.005 OD	-	1
30	PLUG - PIPE, 0.125, SST SOC HD	-	4
31	PUMP CASING - LS	-	1
32	RING - RETAINER, 5100-150HSS2	-	1
33	RING - RETAINER, 5100-175HSS2	-	3
34	SCREEN STRAINER	-	1
35	SEAL - SHAFT, 1.500", WELD SPRG	-	1
36	SEAL - SHAFT, 1.875", WELD SPRG	-	1
37	SEAL RING - LDM	-	2
38	SHAFT - PUMP, LDM, MECH SEAL	-	1
39	SLINGER - WATER, 1.421	-	1
40	SLINGER - WATER, 1.786	-	1
41	STRAINER - FITTING	-	1
42	STUD - 0.500-13 X 1.750, GR5	-	24
43	WASHER - LOCK, 0.250 ID	-	4
44	HEAD ASSY - LDM DIS W/4" FLG	-	1



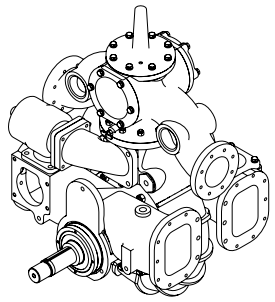
SECTION A-A



SCALE 3/16



SECTION B-B



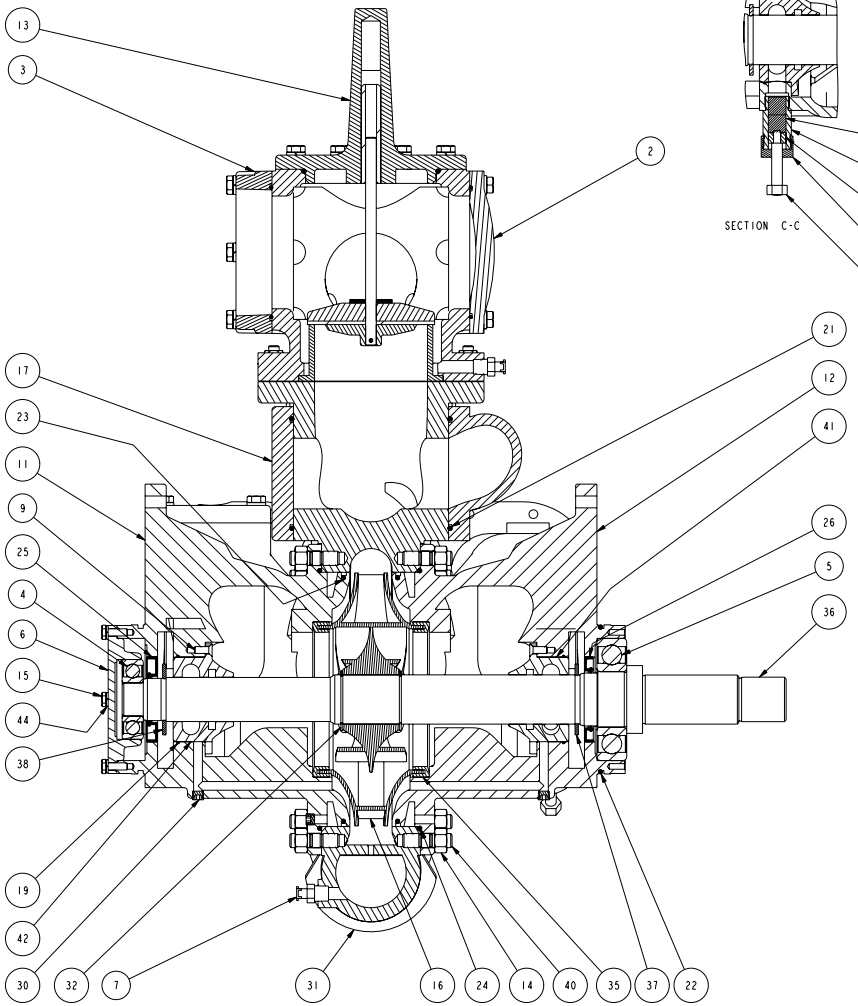
SCALE 3/16

REVISIONS				
LTR	DESCRIPTION	DATE	CHG NO.	APPR'D

MODEL NAME		WO. CREATED		SHEET	
PL00117		99-DEC-03		1/1	D
REMOVE SHARP EDGES	INCH (MILLIMETER)	THIRD ANGLE PROJECTION	OLD PART NO.	TOLERANCE (EXCEPT AS NOTED) .00 ±.03 .000 ±.010 ANGLES ±1°	W.S. Darley & Co. CHIPPEWA FALLS, WI - MELROSE PARK, IL
MATERIAL DESCRIPTION:		MATERIAL NO.	PATTERN NO.		DWG - LDM PUMP, MECH SEAL W/INBRD TANK TO PUMP
THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. - UNAUTHORIZED REPRODUCTION IS PROHIBITED	ALL DIMENSIONS IN INCHES UNLESS NOTED	DO NOT SCALE PRINT		DR'N GMS	DATE 09-Dec-03
				CHKD TED	
				TRCD	SCALE 1/2

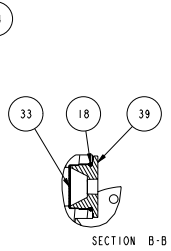
DLC1402

NO.	DESCRIPTION	PART NO.	QTY.
1	ASSY - FLANGE COVER, BLANK CI	-	1
2	ASSY - FLANGE CVR, BLNK, O-RING	-	1
3	ASSY - FLANGE, 4 NPT, CI	-	1
4	BEARING-BALL, 306SFF	-	1
5	BEARING-BALL, 310SFF	-	1
6	CAP - BEARING, LDM/E	-	1
7	DRAINCOCK - 0.250 NPTM, 9KC BR	-	1
8	ELBOW - RELIEF VALVE, LDM	-	1
9	FHMS - .250-20 x 0.63, SS	-	6
10	GLAND NUT - A	-	2
11	HEAD - SUCTION, LDM, PACKING	-	1
12	HEAD - SUCTION, LDM, PACKING	-	1
13	HEAD ASSY - LDM DIS W/4" FLG	-	1
14	HEX NUT - .500-13, GR 2	-	24
15	HHCS - .250-20 x 0.75, GR5	-	4
16	IMPELLER - LDM, MIXED FLOW	-	1
17	KIT - LDM, LS, RV FLANGE BLIND	-	1
18	O-RING - 1.47 x 1.71 x 0.09	-	1
19	O-RING - 3.00 x 3.12 x 0.06	-	2
20	O-RING - 3.50 x 3.69 x 0.09	-	2
21	O-RING - 3.75 x 4.00 x 0.12	-	1
22	O-RING - 5.00 x 5.25 x 0.12	-	1
23	O-RING - 8.50 x 8.75 x 0.12	-	2
24	O-RING - 9.00 x 9.25 x 0.12	-	2
25	OIL SEAL - 1.500 ID X 3.005 OD	-	1
26	OIL SEAL - 1.875 ID X 3.005 OD	-	1
27	PACKING #927 - PELLET	-	10
28	PACKING CYLINDER - B	-	2
29	PISTON-GLAND STUD, S	-	2
30	PLUG - PIPE, 0.125, SST SOC HD	-	4
31	PUMP CASING - LS	-	1
32	RING - RETAINER, 5100-175HSS2	-	2
33	SCREEN STRAINER	-	1
34	SCREW - PACKING	-	2
35	SEAL RING - LDM	-	2
36	SHAFT - PUMP, LDM	-	1
37	SLINGER - WATER	-	1
38	SLINGER - WATER, 1.421	-	1
39	STRAINER - FITTING	-	1
40	STUD - 0.500-13 X 1.750, GR5	-	24
41	STUFFING BOX - LDM	-	1
42	STUFFING BOX - LDM	-	1
43	VALVE - 3" R.V. BASIC	-	1
44	WASHER - LOCK, 0.250 ID	-	4

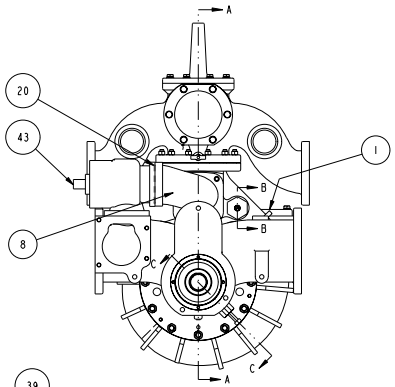


SECTION A-A

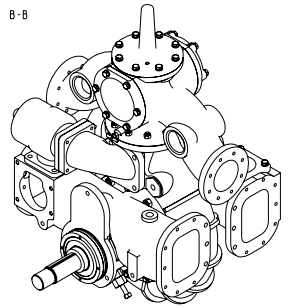
SECTION C-C



SECTION B-B



SCALE 3/16



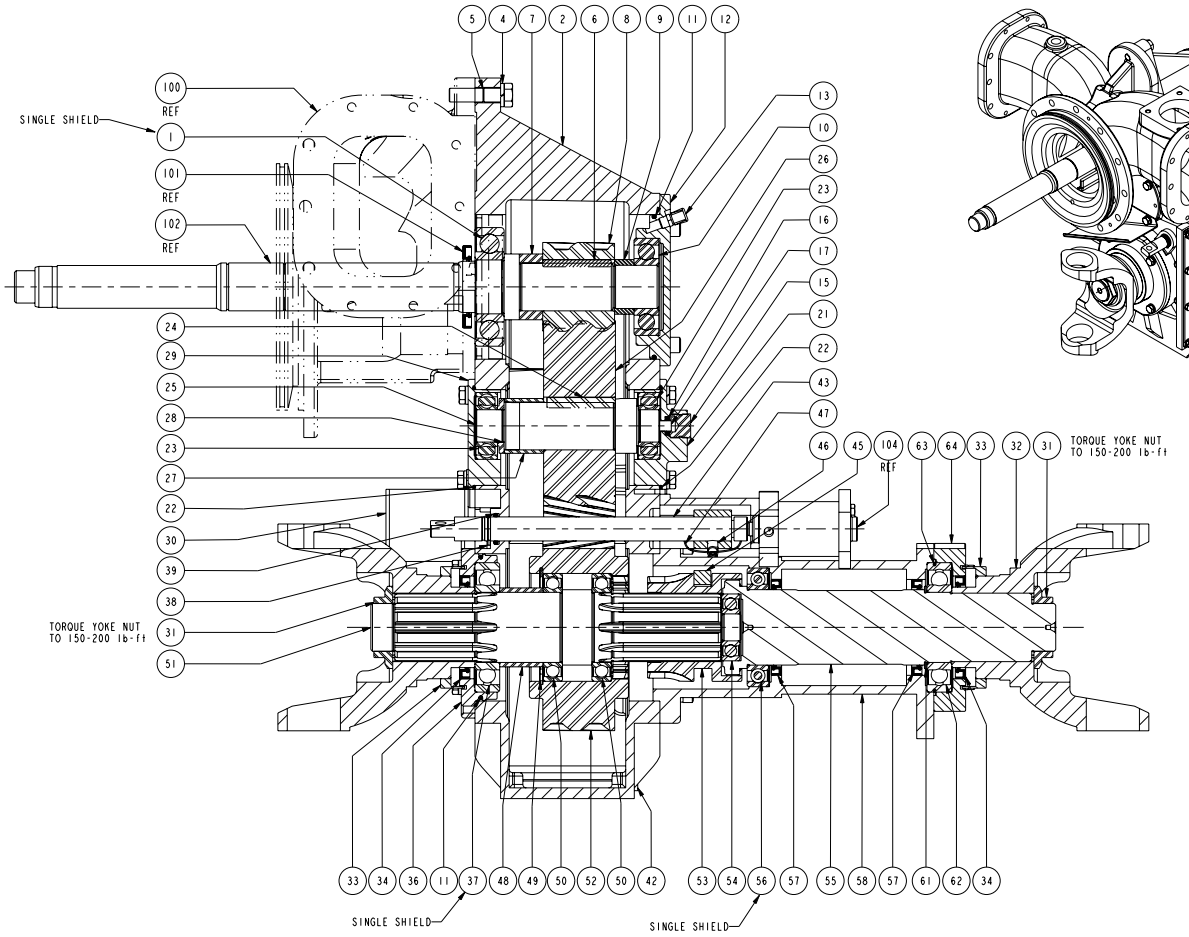
SCALE 3/16

REVISIONS				
LTR	DESCRIPTION	DATE	CHG NO.	APPR'D

MODEL NAME: PL80122	MDL CREATED: 12-DEC-03	SHEET: 1/1	D				
REMOVE SHARP EDGES	INCH [MILLIMETER]	THIRD ANGLE PROJECTION	OLD PART NO.	TOLERANCE EXCEPT AS NOTED .00 ± 0.03 .000 ± 0.010 ANGLES ±1°	W.S. Darley & Co. CHICAGO (LANSING, IL) MELROSE PARK, IL		
MATERIAL DESCRIPTION:		MATERIAL NO. -	PATTERN NO. -		DWG - LDM PUMP, PACKING W/INBRD TANK TO PUMP		
THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. - UNAUTHORIZED REPRODUCTION IS PROHIBITED	ALL DIMENSIONS IN INCHES UNLESS NOTED	DO NOT SCALE PRINT		DR'N JSS CHKD DMD TRCD	DATE 23-Dec-03 SCALE 1/2	DLC1404	

NO.	DESCRIPTION	PART NO.	QTY.
1	BEARING-BALL, 310SF	1722101	1
2	GEARCASE - LDWH/LDMC, PUMP FWD	1802300	1
3	HHCS - .500-13 x 1.75, GR5	5400068	2
4	WASHER - LOCK, 0.500 ID	3603505	3
5	HHCS - .500-13 x 2.00, GR5	5400069	1
6	KEY - SQ., 0.25 X 2.50 GR2	3602438	1
7	SPACER - 1.75 X 2.40 X 0.86	3306700	1
8	GEAR - PINION, N, 8DP, 20 PA	2712801	1
9	SPACER - 1.57 X 2.00 X 0.71	3303400	1
10	BEARING-BALL	1722003	1
11	O-RING - 5.00 x 5.25 x 0.12	3601227	2
12	CAP - BEARING, PUMP SHAFT	2304202	1
13	VENT	4403400	1
14	SHCS - .375-16 x 1.00, GR8	5401023	5
15	PLUG - TACH, .88-18UNS	1142101	1
16	OIL SEAL - 0.375 ID X 0.688 OD	3600524	1
17	NUT - CABLE DRIVE, KDM, 0.104	1141900	1
18	HHCS - .375-16 x 0.88, GR5	5400035	8
19	WASHER - LOCK, 0.375 ID	3603503	16
20	PIN - DOWEL, .250 X 0.62, GR8	3605401	2
21	CAP - BEARING, IDLER, TACH	2303833	1
22	O-RING - 3.50 x 3.69 X 0.09	3601124	2
23	BEARING - 22206 PC-3	1723600	2
24	KEY - SQ., 0.38 X 2.50	3602418	1
25	SHAFT - IDLER GEAR, N	5009201	1
26	GEAR - DRIVE, PSP, 8DP, 20DEG PA	2713310	1
27	SPACER - 1.75 X 2.0 X 1.43	3306702	1
28	SPACER - 1.19 x 2.00 x .25	3302204	1
29	BEARING CAP, IDLER	2303732	1
30	SHIELD - WATER, KDM/LDM/N	3203300	1
31	LOCKNUT	4814600	2
32	END YOKE	4813600	2
33	FLINGER - WATER	3206100	2
34	OIL SEAL - 2.938 ID X 3.756 OD	3600543	2
35	HHCS - .375-16 x 1.25, GR5	5400037	4
36	BRACKET - BEARING, FRONT, N	2304403	1
37	BEARING-BALL, 213SF	1721401	1
38	RING - RETAINER, 5160-87	3600403	1
39	O-RING - 0.88 x 1.12 x 0.12	3601212	1
40	DIPSTICK - M22x2.5 THR'D	4219000	1
41	O-RING - 20MM x 25MM x 2.5MM	3601702	1
42	PLUG - PIPE, 0.375, MAG SOC HD	1080510	1
43	SHIFT BAR - PSM	1183900	1
44	PELLET - OIL WICK	4400900	6
45	SHIFT YOKE	1183700	1
46	LOCK BOLT - SHIFT BAR	1184000	1
47	WIRE - SAFETY	1102619	1
48	SPACER - 2.56 x 2.88 x 1.58	3304704	1
49	RING - RETAINER, N5000-393	3600438	1
50	BEARING-BALL, 113KSFF	1723400	2
51	SHAFT - TRANSMISSION	5009701	1
52	GEAR - DRIVE, N, 8DP, 20 DEGREE PA	2716107	1
53	GEAR - SLIDING CLUTCH, N	2410800	1
54	BEARING-BALL, 305SFF	1721700	1
55	SHAFT - TRANSMISSION	5009500	1
56	BEARING-BALL, 114KSFC0	1723502	1
57	OIL SEAL - 2.750 ID X 3.505 OD	3600511	2
58	BRACKET - BEARING, REAR NO BRK	2304700	1
59	WASHER - LOCK, HC, 0.375 ID	3603512	8
60	SHCS - .375-16 x 1.25, GR8	5401024	7
61	WASHER - 2.56 x 3.00 x .09 STL	3603023	1
62	BEARING-BALL, 213SFF	1721400	1
63	O-RING - 4.50 x 4.69 x 0.09	3601105	1
64	REAR BEARING CAP, N	2305106	1
65	HHCS - .375-16 x 1.75, GR5	5400039	4
100	HEAD - SUCTION, LDM, MECH SEAL	2807700	1
101	OIL SEAL - 1.875 ID X 3.005 OD	3600540	1
102	SHAFT - PUMP, LDM	5008303	1
103	TRANSMISSION COVER ASSEMBLY	AM01301	1
104	AIR CYLINDER - 1.75 BORE	AY00201	1

REVISIONS				
LTR	DESCRIPTION	DATE	CHG NO.	APPR'D



NOTES:
- DIPSTICK, OIL WICK PELLETS, DOWEL PINS AND FASTENERS SHOWN ON EXPLODED VIEW (SHEET TWO)
- BEARINGS WITH SINGLE SHIELDS - SHIELDED SIDE GOES TOWARD OUTSIDE OF TRANSMISSION

MODEL NAME	MOD. CREATED	SHEET	
DLC0608	27-JUN-2005	1/2	D

REMOVE SHARP EDGES | INCH [MILLIMETER] | THIRD ANGLE PROJECTION | OLD PART NO. | TOLERANCE EXCEPT AS NOTED .00 ±.03 .000 ±.010 ANGLES ±1°

W.S. Darley & Co.
CHIPPEWA FALLS, WI - MELROSE PARK, IL

MATERIAL DESCRIPTION: - | MATERIAL NO. - | PATTERN NO. -

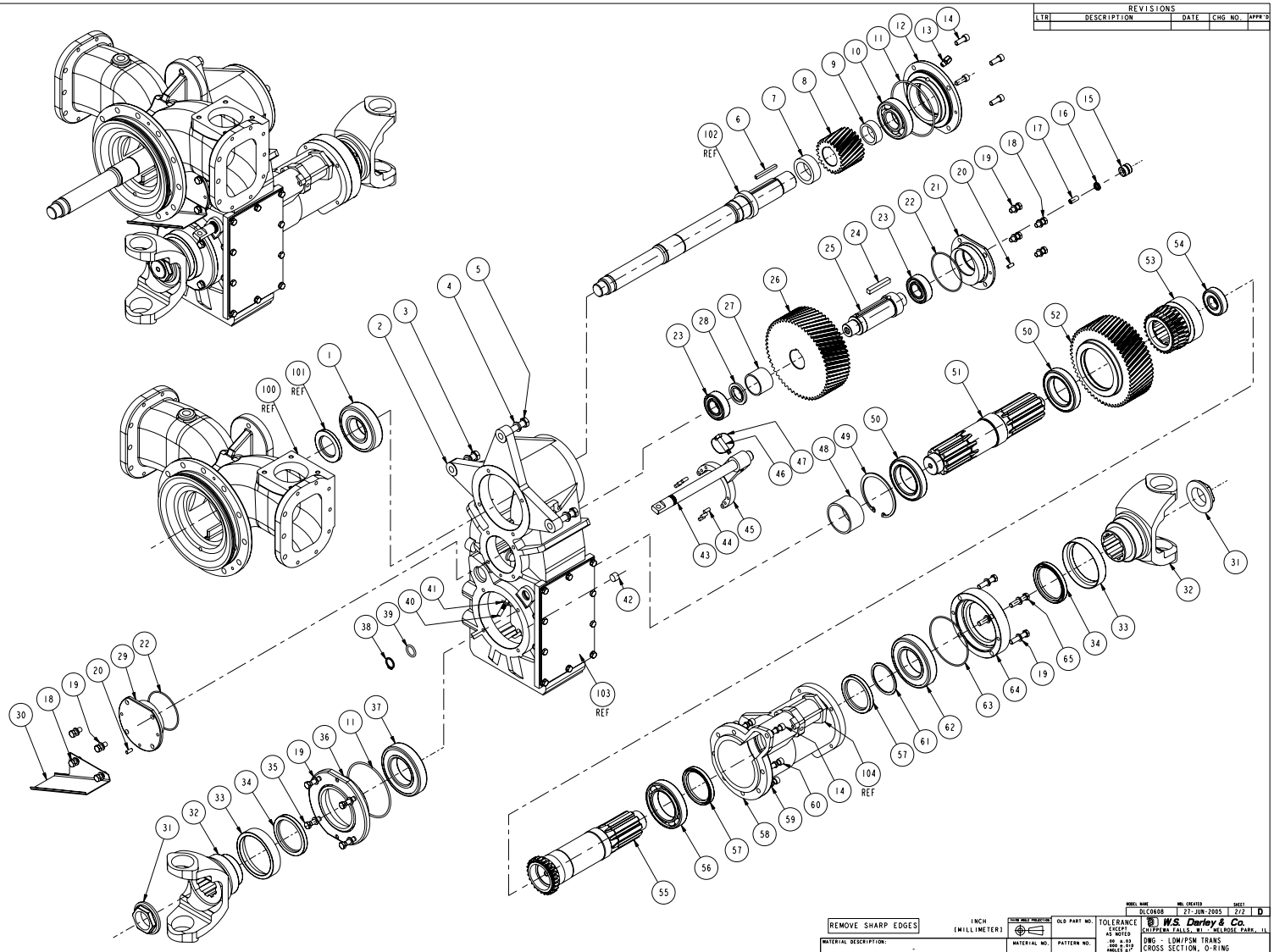
DWG - LDM/PSM TRANS CROSS SECTION, O-RING

THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. - UNAUTHORIZED REPRODUCTION IS PROHIBITED | ALL DIMENSIONS IN INCHES UNLESS NOTED | DO NOT SCALE PRINT

DR'N TMI | DATE 27-JUN-05 | CHKD BAH | SCALE 1/2 | TRCD

DLC0608

NO.	DESCRIPTION	PART NO.	QTY.
1	BEARING-BALL, 310SF	1722101	1
2	GEARCASE - LDMH/LDMC, PUMP FWD	1802300	1
3	HHCS - .500-13 x 1.75, GR5	5400068	2
4	WASHER - LOCK, 0.500 ID	3603505	3
5	HHCS - .500-13 x 2.00, GR5	5400069	1
6	KEY - SQ., 0.25 X 2.50 GR2	3602438	1
7	SPACER - 1.75 X 2.40 X 0.86	3306700	1
8	GEAR - PINION, N, 8DP, 20 PA	2712801	1
9	SPACER - 1.57 X 2.00 X 0.71	3303400	1
10	BEARING-BALL	1722003	1
11	O-RING - 5.00 x 5.25 x 0.12	3601227	2
12	CAP - BEARING, PUMP SHAFT	2304202	1
13	VENT	4403400	1
14	SHCS - .375-16 x 1.00, GR8	5401023	5
15	PLUG - TACH, .88-18UNS	1142101	1
16	OIL SEAL - 0.375 ID X 0.688 OD	3600524	1
17	NUT - CABLE DRIVE, KDM, 0.104	1141900	1
18	HHCS - .375-16 x 0.88, GR5	5400035	8
19	WASHER - LOCK, 0.375 ID	3603503	16
20	PIN - DOWEL, .250 X 0.62, GR8	3605401	2
21	CAP - BEARING, IDLER, TACH	2303833	1
22	O-RING - 3.50 x 3.69 X 0.09	3601124	2
23	BEARING - 22206 PC-3	1723600	2
24	KEY - SQ., 0.38 X 2.50	3602418	1
25	SHAFT - IDLER GEAR, N	5009201	1
26	GEAR - DRIVE, PSP, 8DP, 20DEG PA	2713310	1
27	SPACER - 1.75 X 2.0 X 1.43	3306702	1
28	SPACER - 1.19 x 2.00 x .25	3302204	1
29	BEARING CAP, IDLER	2303732	1
30	SHIELD - WATER, KDM/LDM/N	3203300	1
31	LOCKNUT	4814600	2
32	END YOKE	4813600	2
33	FLINGER - WATER	3206100	2
34	OIL SEAL - 2.938 ID X 3.756 OD	3600543	2
35	HHCS - .375-16 x 1.25, GR5	5400037	4
36	BRACKET - BEARING, FRONT, N	2304403	1
37	BEARING-BALL, 213SF	1721401	1
38	RING - RETAINER, 5160-87	3600403	1
39	O-RING - 0.88 x 1.12 x 0.12	3601212	1
40	DIPSTICK - M22x2.5 THR'D	4219000	1
41	O-RING - 20MM x 25MM x 2.5MM	3601702	1
42	PLUG - PIPE, 0.375, MAG SOC HD	1080510	1
43	SHIFT BAR - PSM	1183900	1
44	PELLET - OIL WICK	4400900	6
45	SHIFT YOKE	1183700	1
46	LOCK BOLT - SHIFT BAR	1184000	1
47	WIRE - SAFETY	1102619	1
48	SPACER - 2.56 x 2.88 x 1.58	3304704	1
49	RING - RETAINER, N5000-393	3600438	1
50	BEARING-BALL, 113KSFF	1723400	2
51	SHAFT - TRANSMISSION	5009701	1
52	GEAR - DRIVE, N, 8DP, 20 DEGREE PA	2716107	1
53	GEAR - SLIDING CLUTCH, N	2410800	1
54	BEARING-BALL, 305SFF	1721700	1
55	SHAFT - TRANSMISSION	5009500	1
56	BEARING-BALL, 114KSFCG	1723502	1
57	OIL SEAL - 2.750 ID X 3.505 OD	3600511	2
58	BRACKET - BEARING, REAR NO.BRK	2304700	1
59	WASHER - LOCK, HC, 0.375 ID	3603512	8
60	SHCS - .375-16 x 1.25, GR8	5401024	7
61	WASHER - 2.56 x 3.00 x .09 STL	3603023	1
62	BEARING-BALL, 213SFF	1721400	1
63	O-RING - 4.50 x 4.69 x 0.09	3601105	1
64	REAR BEARING CAP, N	2305106	1
65	HHCS - .375-16 x 1.75, GR5	5400039	4
100	HEAD - SUCTION, LDM, MECH SEAL	2807700	1
101	OIL SEAL - 1.875 ID X 3.005 OD	3600540	1
102	SHAFT - PUMP, LDM	5008303	1
103	TRANSMISSION COVER ASSEMBLY	AM01301	1
104	AIR CYLINDER - 1.75 BORE	AY00201	1



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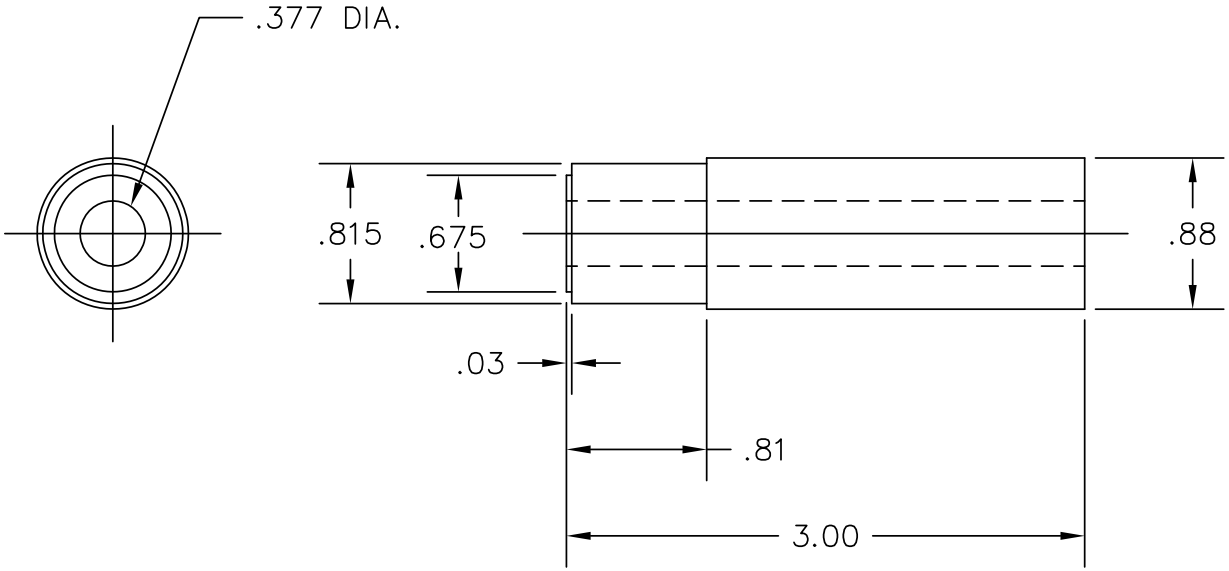
22.16

REVISIONS				
LTR	DESCRIPTION	DATE	CHG NO.	APPR'D

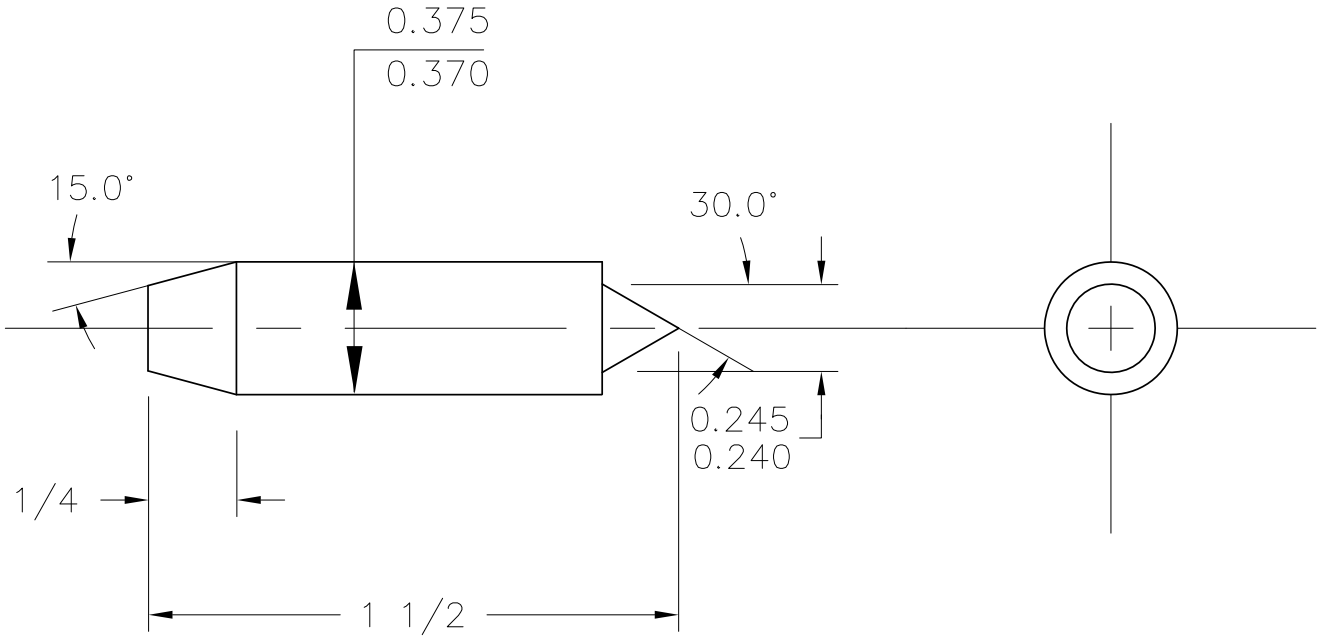


REMOVE SHARP EDGES

INCH
[MILLIMETER]

THIRD ANGLE PROJECTION

MATERIAL DESCRIPTION: .875 X 3.12 360 BRASS	MATERIAL NO. 1100613	OLD PART NO. — / PATTERN NO. —	TOLERANCE EXCEPT AS NOTED .00 ±.03 .000 ±.010 ANGLES ±1°	W.S. DARLEY & Co. MELROSE PARK, IL – CHIPPEWA FALLS, WI
				OIL SEAL ASSEMBLY TOOL
THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. – UNAUTHORIZED REPRODUCTION IS PROHIBITED	ALL DIMENSIONS IN INCHES UNLESS NOTED	DO NOT SCALE PRINT	DR'N S. LEE CHKD CKE TRCD	DATE MAY6,02 SCALE 1/1
				X3852-1



PART NO.	DATE	CHANGE

TOLERANCE EXCEPT AS NOTED
FRAC DIM ±.01
.00 ±.01
.000 ±.005
ANGLES ±1°

W.S. DARLEY & CO.
MELROSE PARK, IL – CHIPPEWA FALLS, WI

OIL SEAL ASSEMBLY PLUG

MATERIAL: 3/8" OD X 1 5/8" LG 360 BRASS

PATTERN NO. 1100606

DR'N JCM
CHKD
TRCD

DATE FEB9,88

SCALE 2/1

X3852

ALL DIMENSIONS IN INCHES UNLESS NOTED

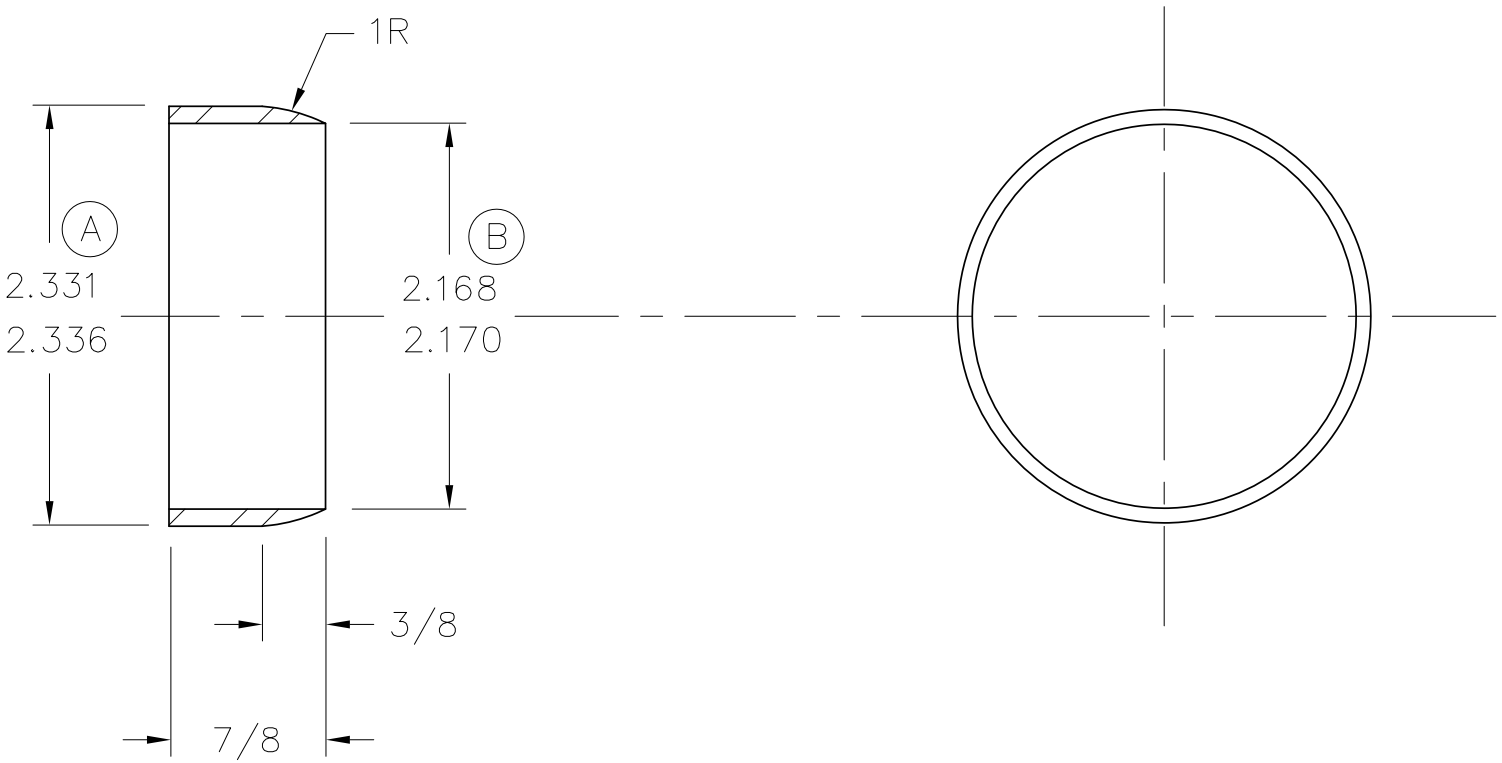
DO NOT SCALE PRINT

22.17

1200061

1200061

22.18



PART NO.	DATE	CHANGE
X3851–1	2–9–88	B=2.562/2.564 A=2.750/2.745

TOLERANCE EXCEPT AS NOTED
FRAC DIM ±.01
.00 ±.01
.000 ±.005
ANGLES ±1°

W.S. DARLEY & CO.
MELROSE PARK, IL – CHIPPEWA FALLS, WI

OIL SEAL ASSEMBLY
SLEEVE

MATERIAL: 2 3/8" OD X 1" LG CRS
2 3/4" OD X 1" LG CRS FOR –1

PATTERN NO.

DR'N JCM
CHKD
TRCD

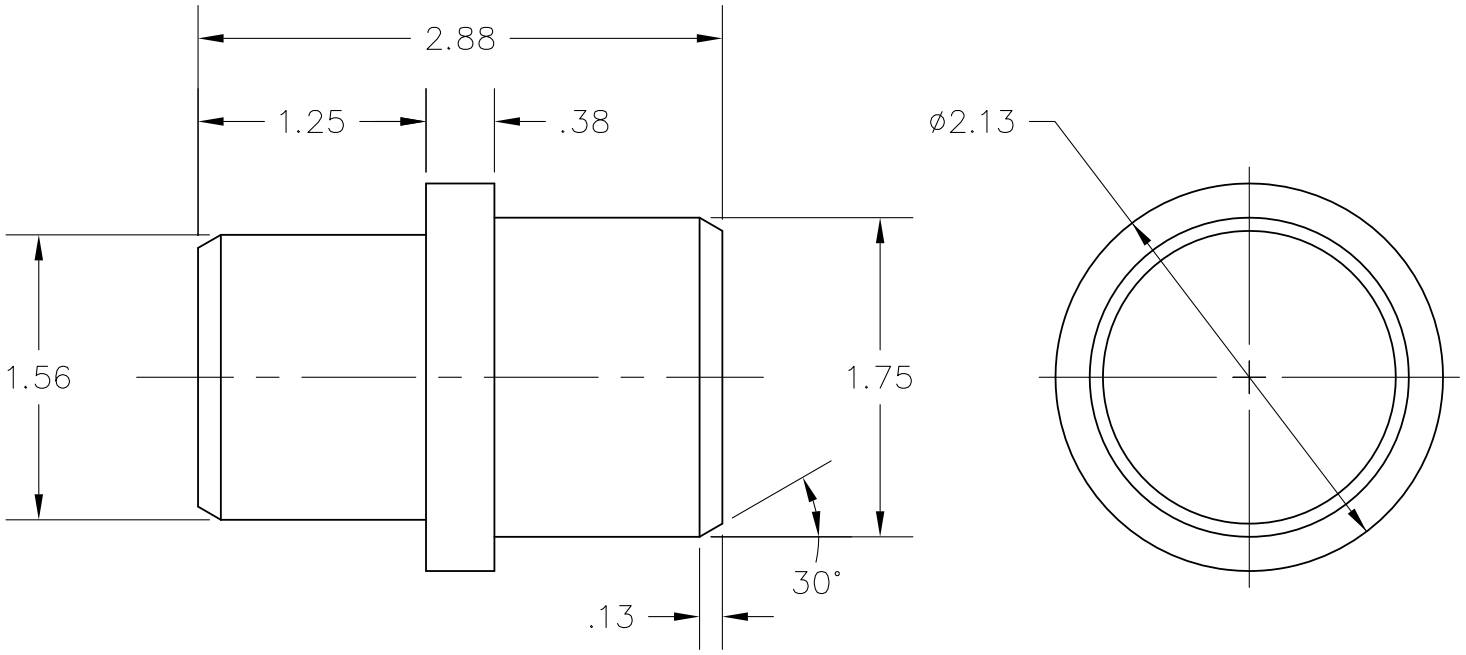
DATE FEB9,88
SCALE 1/1

X3851

ALL DIMENSIONS IN INCHES UNLESS NOTED

DO NOT SCALE PRINT

REVISIONS				
LTR	DESCRIPTION	DATE	CHG NO.	APPR'D



REMOVE SHARP EDGES

INCH
[MILLIMETER]

THIRD ANGLE PROJECTION

MATERIAL DESCRIPTION: BAR – ROUND, ø2.12 x 2.88 LONG, CRS	MATERIAL NO. –	OLD PART NO. –	PATTERN NO. –

TOLERANCE
EXCEPT AS NOTED
.00 ±.03
.000 ±.010
ANGLES ±1°

W.S. DARLEY & CO.
MELROSE PARK, IL – CHIPPEWA FALLS, WI

LDM STUFFING BOX ASSY TOOL
2153601 & 2153602

DR'N CKE
CHKD SJL
TRCD

DATE 12DEC,2003
SCALE 1/1

X5950

ALL DIMENSIONS IN INCHES UNLESS NOTED

DO NOT SCALE PRINT

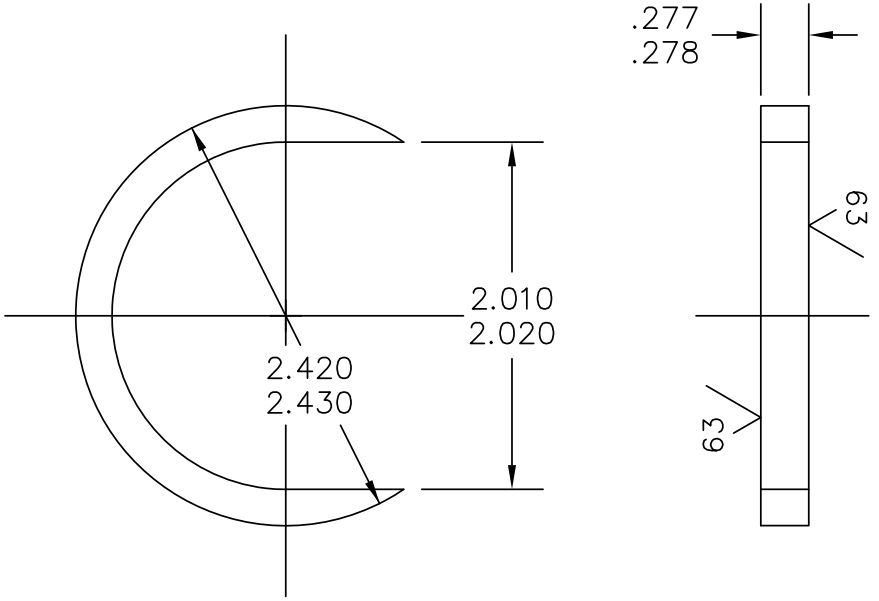
22.19

1200061

1200061

22.20

REVISIONS				
LTR	DESCRIPTION	DATE	CHG NO.	APPR'D



REMOVE SHARP EDGES

INCH
[MILLIMETER]

THIRD ANGLE PROJECTION

MATERIAL DESCRIPTION: 2.50 DIA CRS	MATERIAL NO. 1100013	OLD PART NO. — / PATTERN NO. —	TOLERANCE EXCEPT AS NOTED .00 ±.03 .000 ±.010 ANGLES ±1°	W.S. DARLEY & CO. MELROSE PARK, IL – CHIPPEWA FALLS, WI
				BEARING SUPPORT WASHER MIDSHIP ASSEMBLY TOOL
THIS DESIGN IS THE PROPERTY OF W.S. DARLEY AND CO. – UNAUTHORIZED REPRODUCTION IS PROHIBITED	ALL DIMENSIONS IN INCHES UNLESS NOTED	DO NOT SCALE PRINT	DR'N SJL CHKD GDZ TRCD	DATE 10NOV,05 SCALE 1/1

X5144-2

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.

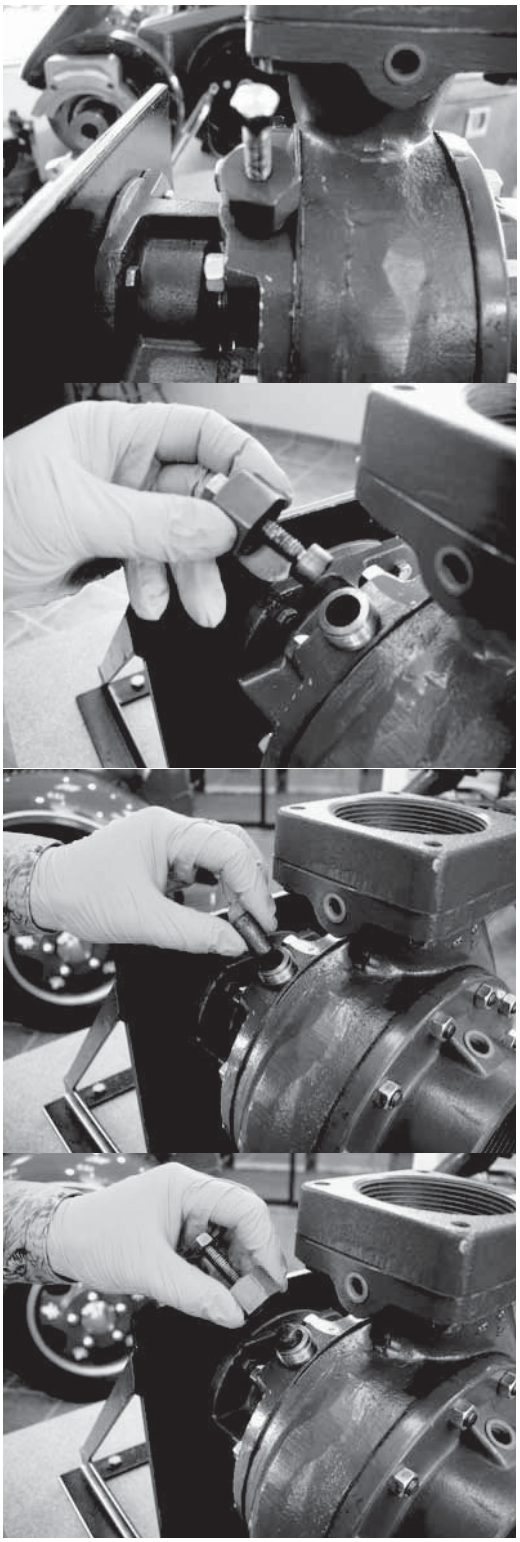
⚠ Caution: Do not attempt to use anything but Darley injection packing. Using the wrong packing material in your pump may cause catastrophic failure of the pump shaft sealing components.

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