

SERVICE BULLETIN NUMBER 1

REPLACEMENT OF GEARS AND BEARINGS

Before starting work, read the instructions carefully and study the typical assembly drawings and parts list. Wash down gear drive and remove all loose dirt. A clean work area with ample room to lay out parts as they are dismantled is desirable, together with suitable tools including chain hoist, arbor press or bearing puller, Tru-arc pliers to remove snap rings, also non hardening Permatex, white lead or dry graphite lubricant and Loctite for reassembling drive.

(A) DISASSEMBLE GEAR DRIVE AS FOLLOWS:

1. Remove cap screws (24) and carefully pull horizontal assembly from gear drive. NOTE: It will be necessary to disconnect oil tube hose (60L) before you can completely remove this assembly on Models H110 and larger, also on larger units tapped holes are provided in top of large flange for eyebolt to be used for lifting. Shims (47) should be carefully removed and tied together.
2. Note position of oil tube to gears, having in mind that the pump runner must clear the tube as the hollow shaft assembly is removed. If necessary, loosen the locknut and turn the tube to one side. Some models will also require disconnection of the oil tube (67) to the thrust bearing, and either removal or turning of fitting (22) for clearance purposes.
3. Unscrew the cap screws (1) and then remove the vertical assembly, lifting with eyebolts. Shims (75) must be carefully removed and tied together. Keep separate from horizontal shims (47) removed under instruction # 1.
4. Clean and inspect interior of main housing including removing all old gaskets and Permatex form machined surfaces also replace any damaged oil lines or brittle hoses. Cover housing to keep it clean until required for reassembly.

(B) REPLACEMENT OF VERTICAL SHAFT, BEARINGS AND DRIVEN GEAR:

1. Remove external bevel snap ring (13) from lower coupling (5). Apply a few drops of penetrating oil in snap ring recess and let stand. Bolt small bar or plate across lower coupling, which has two tapped holes provided for this purpose. Insert bar or piece of head shaft through hollow shaft and press off lower coupling and remove key (15).
2. Place vertical assembly in vise and remove snap ring (53) from lower end. Slip off pump runner (51) and remove pump drive key (50).
3. After key (50) is removed, press off lower bearing (54).
4. Remove thrust-bearing cover (78).
5. Press hollow shaft out of thrust bearing assembly and remove vertical MD spacer (74) and shims (20) if provided previous to pressing off gears. When drive is furnished with hollow shaft shims (20) they should be reused.

CAUTION: Should gear be mounted on a hub, remove cap screws or nuts and slip gear off hub. Do not press gear hub off hollow shaft, as the two parts are machined as a unit. Remove thrust bearing by pressing on pins inserted through knockout holes in bottom of cage.

NOTE: Which side of the bearing was on the bottom: and when duplex bearings are used, study the arrangements carefully so that replacement bearings may be correctly installed.

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6. When replacing gears, compare the mounting distances of the old and new gears, and if this distance does not check within plus or minus .002, refer to gear adjustment instructions, Service Bulletin No. 2.

7. Press thrust bearing (4) into cage (19). See that the correct side of bearing is down or that the duplex bearings are stacked correctly. NOTE: When thrust bearing (4) is mounted in the DF position, the outer race of the top bearing must be held by the pads of the thrust cover (78).

8. Record backlash of new gear: then press gear on hollow shaft over key, using white lead as lubricant, or assemble gear on hub (72).

9. Slip correct mounting distance spacer (74) on shaft and press thrust bearing cage assembly on shaft. Proceed in accordance with illustration.

NOTE: In some older models shims (20) were used with spacer (74). If these shims are present they must be reinstalled. Final adjustment should be made with shims (75).

10. NOTE: In combination drives only, instruction 11 precedes instruction 10. Press lower coupling firmly on shaft and place shims (14) in position.

11. Install thrust bearing gasket (17) and cover (78) and bolt in place.

12. Press pump bearing in place (54) on shaft. Fit key (50) and slip pump runner in place with hub next to bearing and install snap ring (53).

(C.) REPLACEMENT OF HORIZONTAL SHAFT, BEARINGS AND DRIVE GEAR:

NOTE: For models H20-60 supplied without horizontal housing cover (35) follow instruction "1A-2A-7A-8A-9A." For models H80 and larger follow instruction "1B-2B-7B-8B."

CAUTION: Before dismantling, clean and check drive shaft extension and remove all burrs etc. which could cause damage to oil seal (32). Oil slinger (32S) supplied with older models no longer required when using new "double lip type" Oil Seal (32).

1A. Remove snap ring and washer (66) if furnished on drive, and then remove gear using arbor press or gear puller.

1B. Remove housing cover (35) pulling STRAIGHT off shaft to avoid cutting seal (32) on the keyway. Remove snap ring or locknut and washer (31).

2A. Remove bevel snap ring (26). Hold assembly by housing flange with shaft down and tap lightly on WOODEN block to remove drive shaft sub-assembly from housing.

2B. Hold assembly by the housing flange with the shaft down and tap lightly on WOODEN block to remove drive shaft sub-assembly from housing. If necessary, use a press. Remove bearing (37) from housing and wrap to exclude dirt.

3. Refer to typical assembly and parts list sheet attached when removing bearings, which from this point on is a simple procedure, not requiring detailed explanation.

4. Oil seal (32) should be inspected and replaced as needed.

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5. When replacing gears, compare the mounting distances of the old and new gears: and if this distance does not check within plus or minus .002 refer to gear adjustment instructions, Service Bulletin No. 2.

6. When installing new gears and bearings on shafts, be sure to use white lead as lubricant. Make certain that the adjacent parts are firmly seated and that no dirt is lodged between the parts and the parts or in the bearings.

7A. Install both Inner and Outer Bearings on Drive Shaft.

7B. Install Inner Bearing Only on Drive Shaft.

8A. Press drive shaft and bearing assembly back into horizontal housing and install bevel snap ring (26). Place correct gear mounting distance spacer (39) on shaft prior to pressing on gear.

NOTE: In some older models shims (40) were used with spacer (39). If these shims were present they must be reinstalled. Final adjustment should be made with shims (47).

8B. Press the assembled shaft and inner bearing into the housing and press outer bearing into shaft and housing. With all parts brought up snug, assemble lock washer and locknut (31). Wrap a piece of shim stock over end of shaft, and with gasket (29) in place, slide end cover (35) with oil seal (32) prior to pressing on gear. Do not turn shaft since this can damage oil seal, causing it to leak.

9A. Wrap a piece of shim stock over end of shaft and slide on oil seal (32), with lip of seal facing toward lubricant. Be careful not to turn seal, as keyway would cut sealing surface. Press into housing, using a piece of pipe over the shaft having an outside diameter equal to the outside of the seal.

(D) REASSEMBLE DRIVE AS FOLLOWS:

1. Place shims as required on housing and lower vertical assembly into place. Take care not to damage oil tube to gears (65), and be sure that oil tube (67) to the thrust bearing (4) is in its proper location. Be sure that the oil tube assembly (22 & 23) is directed toward horizontal opening, and positioned so that oil will flow into pocket of horizontal housing. Use new Lock washers and bolt assembly down, pulling up tight to an even tension.

2. Connect oil tubing and lock oil tube to gears (65) in position.

3. Observe the gears closely, noting that gears have an "X" mark etched on the teeth, and the other gear has an "X" mark on one tooth. The horizontal assembly must be entered into the housing so that the horizontal tooth with an "X" mark engages between the two teeth marked "X" in the mating gear. See gear setting and adjustment, Service Bulletin No. 2.

NOTE A: Oil pocket in horizontal housing must be on top and oil lube hose (60I) should be reconnected to Inner Bearing of horizontal assembly.

NOTE B: Some special gears are not marked and may be assembled without regard to the engagement of particular teeth. These are known as hunting tooth gears.

4. Check the correct meshing of the gears through the inspection hole and also note whether the oil tube (65) is correctly positioned to direct oil into entering mesh of the gears. Also that oil tube (23) is in oil pocket of horizontal housing and oil tube hose (60I) is not crimped.

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5. Use new lock washer and bolt the horizontal housing in place.
6. Test the mating of the gears for backlash and tooth marking. Refer to gear setting and adjustment, Service Bulletin no.2.
7. When the gears have been properly adjusted, fill the oil reservoir with recommended grade of oil (See list of approved oils) and test. Check oil feed to gears and check oiling of thrust bearing by observing oil draining from top of drive above gear on vertical shaft. On Models H20-60 remove pipe plug (36) to check oil circulation to outer horizontal bearing.