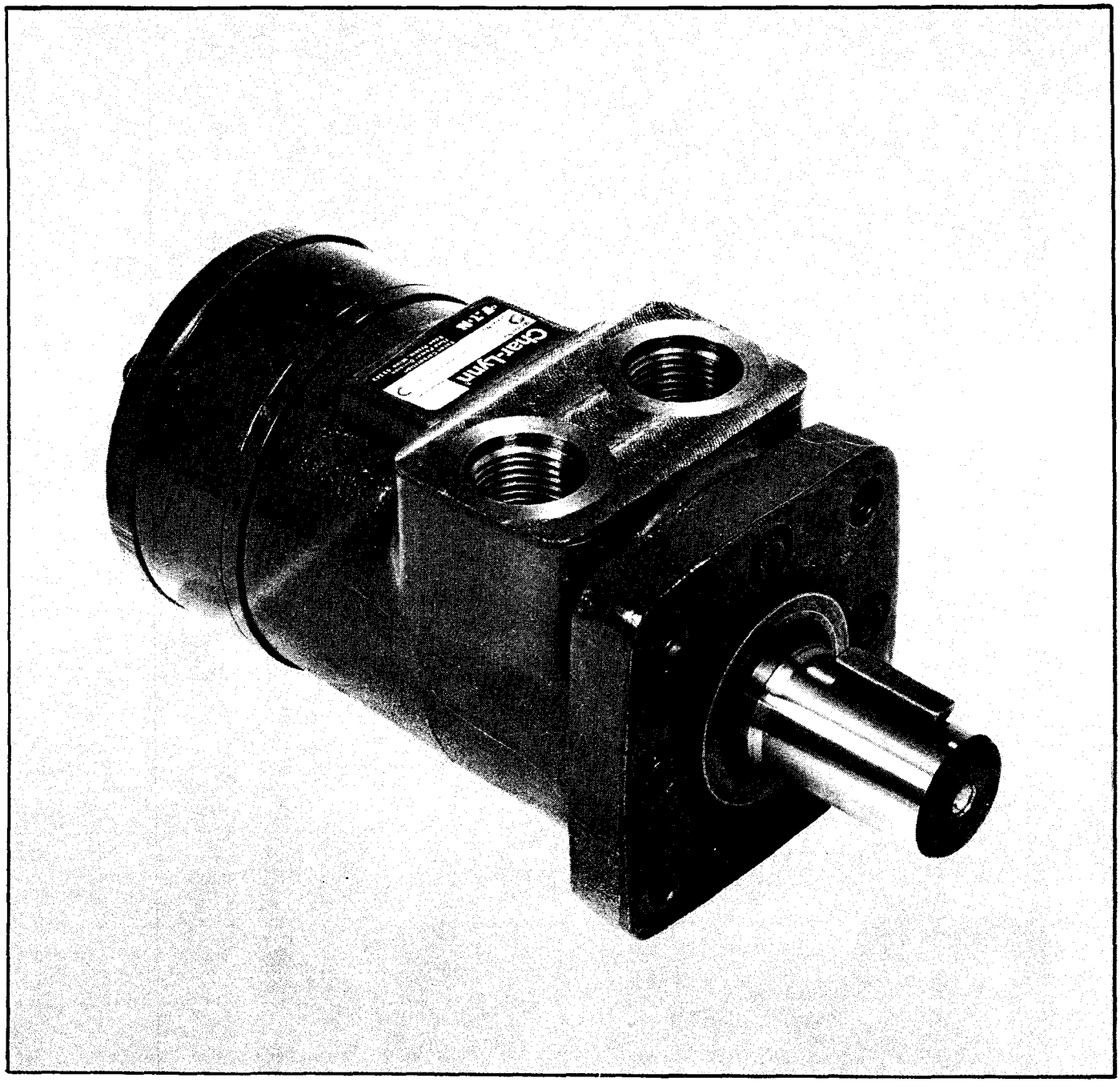
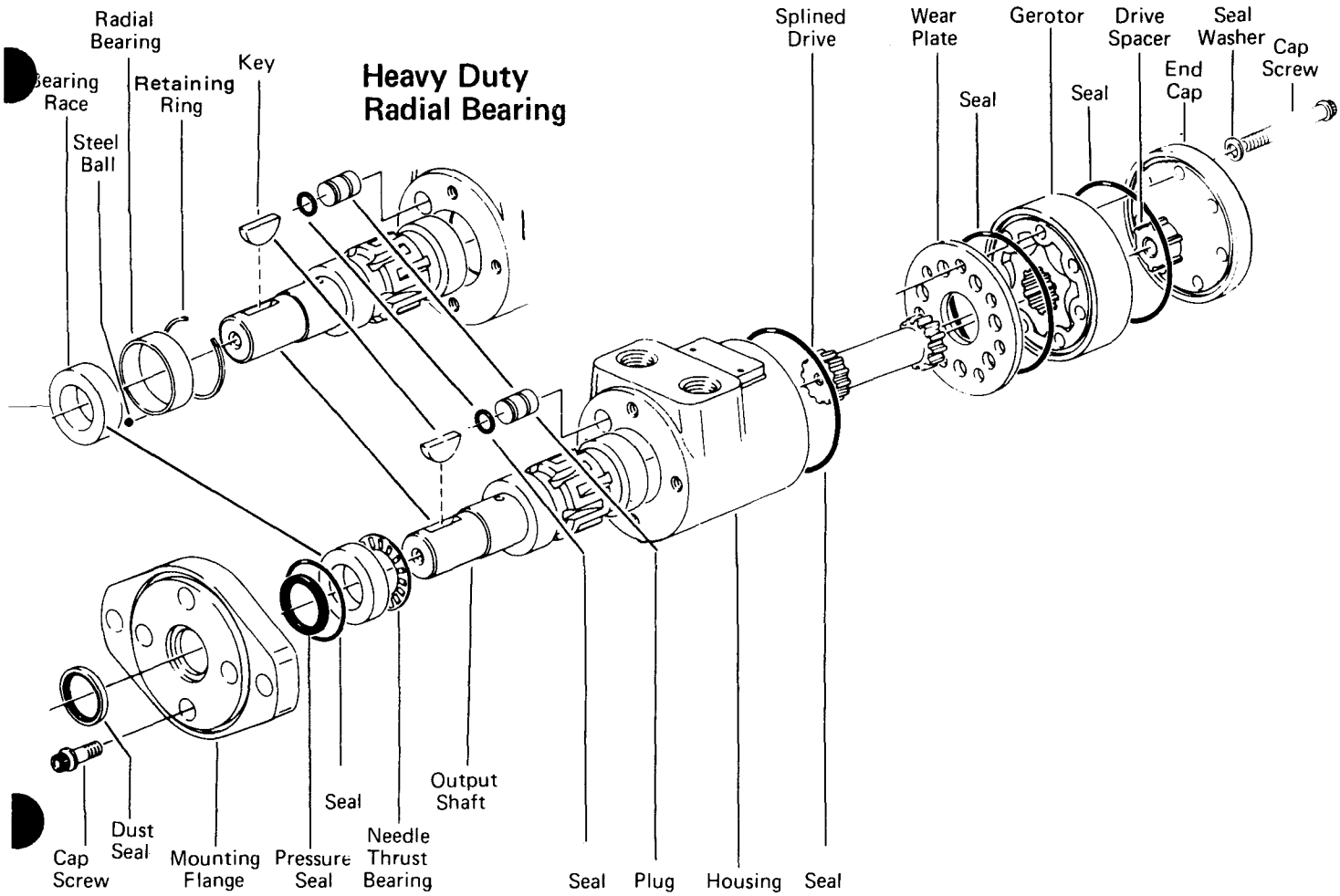
NO. 7-117

Char-Lynn®
Repair Manual
H Series Motors

007



EATON Fluid Power Products



Tools required for disassembly and reassembly.

- Torque wrench (300 inch pound capacity)
- 12" to 16" breaker bar
- * - 5/16"—12 point socket no. 5422 (Heavy Duty -- 500 in. lb. Capacity)
- Small screwdriver (6"—8" long with 1/4" flat blade), see page 5 for tooling information.
- 3/16" allen wrench
- * - Shaft pressure seal installation tool no. 600470

The following tools are not necessary for disassembly and reassembly but are extremely helpful.

- Seal sleeve or bullet

* Tools available ---by special order -- through our service department.

Disassembly

Instructions in this manual are for standard "H" Series motors (101-0000-007) and for "H" motors with heavy duty bearing (124-0000-007).

Cleanliness is extremely important when repairing these motors. Work in a clean area. Before disconnecting the lines, clean port area of motor. Remove key when used. Check shaft and key slot, remove burrs, nicks or sharp edges and polish around the key slot.

Before starting disassembly, drain oil from motor, then plug ports and thoroughly clean exterior of motor.

> Although not all drawings show the motor in a vise, we recommend that you keep the motor in the vise during disassembly. Follow the clamping procedures explained throughout the manual.

Gerotor End

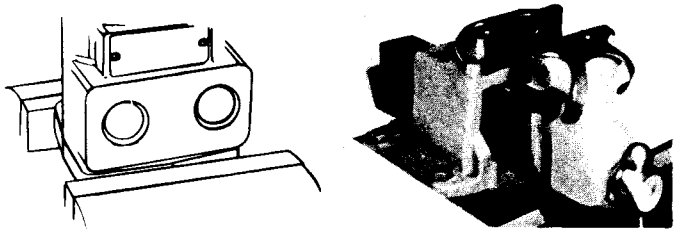


Figure 1

1 Place motor in vise, clamp across edge of flange with output shaft down. When clamping, use protective devise on vise, such as special soft jaws, pieces of hard rubber or board, see Fig. 1.

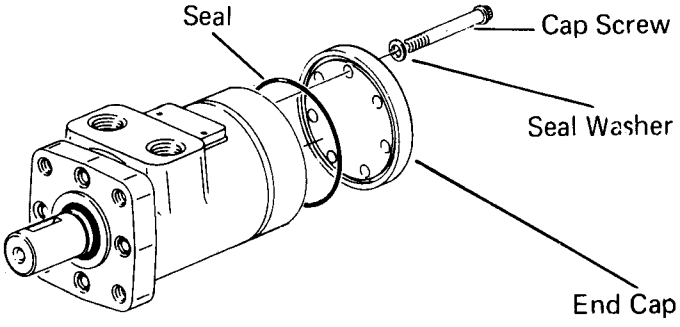


Figure 2

2 Remove cap screws and seal washers.

3 Remove end cap.

4 Remove seal from end cap.

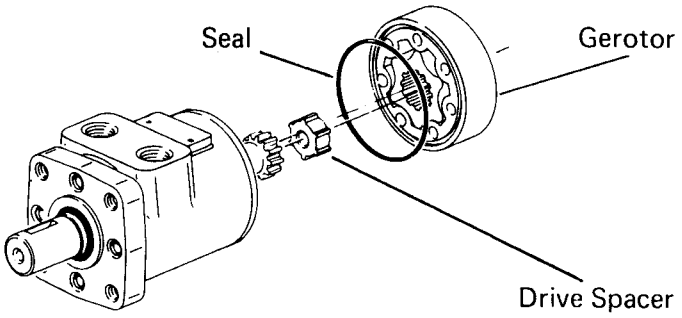


Figure 3

5 Remove gerotor.

6 Remove seal from gerotor.

7 Remove drive spacer (not used on 3.0 cu. in., 4.5 cu. in., or 6.2 cubic inch displacement).

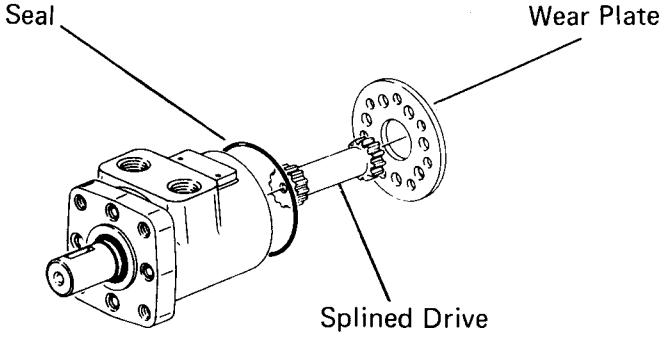


Figure 4

8 Remove splined drive, see Fig. 4.

9 Remove wear plate.

10 Remove seal from housing.

Earlier Models Only

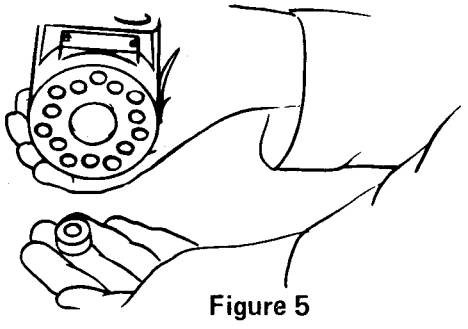


Figure 5

11 Some earlier models used a spacer inside the output shaft. If this spacer is present in the motor remove it.

Shaft End

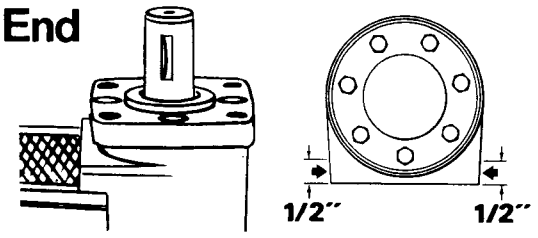


Figure 6

12 Reposition motor in vise. Clamp across ports as shown in Fig. 6, not on sides of housing. Excessive clamping pressure on side of housing causes distortion.

Attention: Shaft could drop from housing when clamped as shown in Fig. 6. Tilt bottom of housing toward vise throat or place something against bottom of housing to retain shaft.

13 Remove the 4 cap screws from the mounting flange. These motors are assembled using Loctite on the screws to hold them in place.
The screws will require approximately 300 to 400 inch pounds of torque to break loose and approximately 100 inch pounds torque to remove after they are broken loose. Do not use an impact wrench on Loctited screws, this may result in rounded heads or broken sockets.

Note: If higher torque than given above is required to break the screws loose, apply heat according to the following instructions. When heated the Loctite partially melts and the torque required to remove the screw is greatly reduced. Follow the instructions carefully, and be careful not to overheat and cause damage to the motor. Use a small flame propane torch to heat a small area of the housing, where the screw enters, see Fig. 7. Apply torque to the screw with a socket wrench gradually as heat is applied for 8 to 10 seconds. As soon as the screw breaks loose, remove heat from the housing and continue turning the screw until it is completely removed.

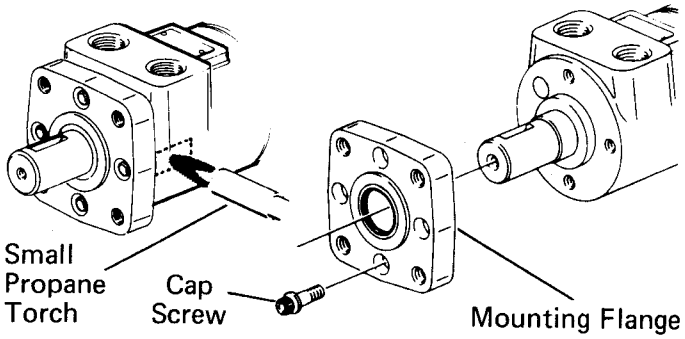


Figure 7

14 Remove motor from vise. Place motor on clean flat surface. Carefully remove flange from housing.

Important: Older motors have a quad seal and back-up washer in place of the pressure seal. The quad seal and back-up washer are no longer available and are replaced by the pressure seal. They are interchangeable, but some precautions must be taken to insure proper installation. Follow the reassembly instructions carefully.

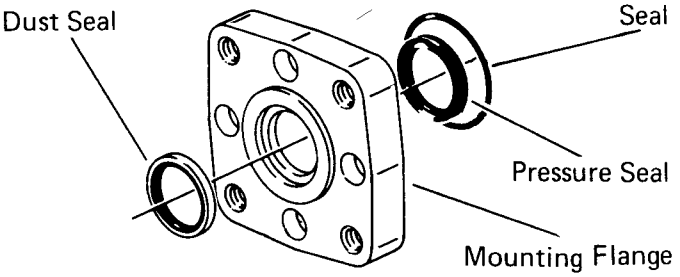


Figure 8

15 The dust seal, pressure seal and oil seal will come off with the flange. Use a seal remover tool, like one shown in Fig. 9, to remove the dust and pressure seal, as shown in Fig. 10.

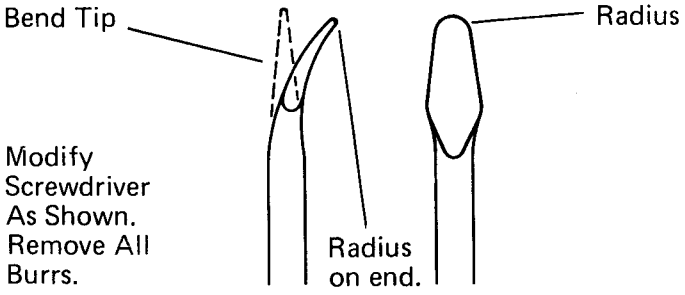
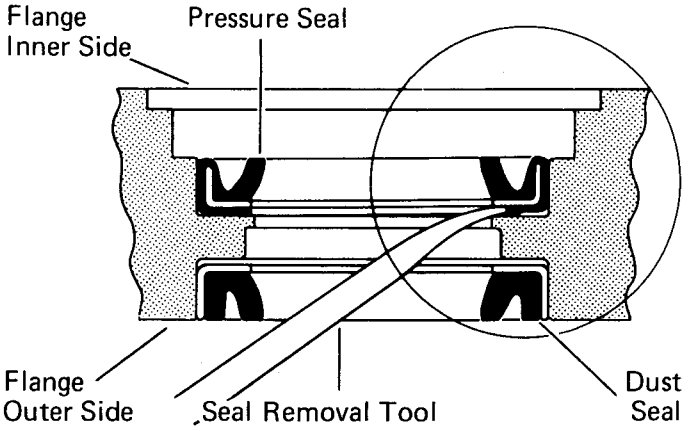


Figure 9



Work from outer side for both (either) seals.

Figure 10

Work nose of tool between pressure seal and flange. Pry seal partway. Remove tool and repeat at a point 180° away. Push seal completely out of cavity, see Fig. 10.

Disassembly

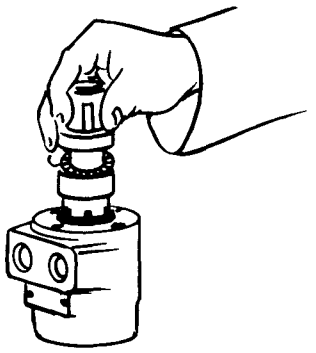


Figure 11

16 Remove output shaft from housing, see Fig.11.

17 Remove bearing race and needle thrust bearing from shaft.

Note: Steps 18 through 21 refer to 124-XXXX-007 motors with optional heavy duty bearing.

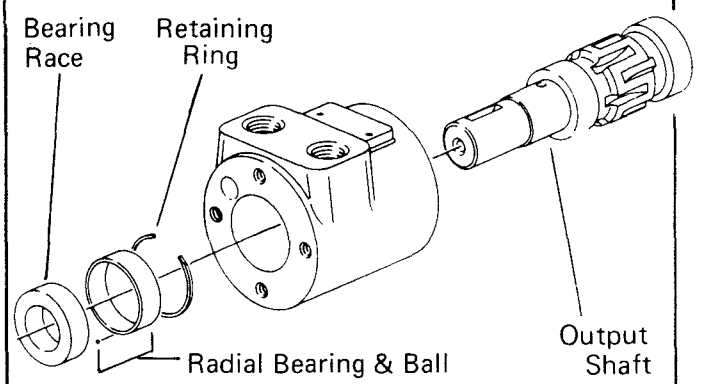


Figure 12

18 Pull output shaft up to free bearing race from housing then remove race.

19 Push output shaft from housing. Remove shaft from 14 hole end of housing, see Fig.12.

20 Remove radial bearing and ball from housing, be careful not to lose the ball.

21 Use a small screwdriver to remove retaining ring from housing. Do not damage housing.

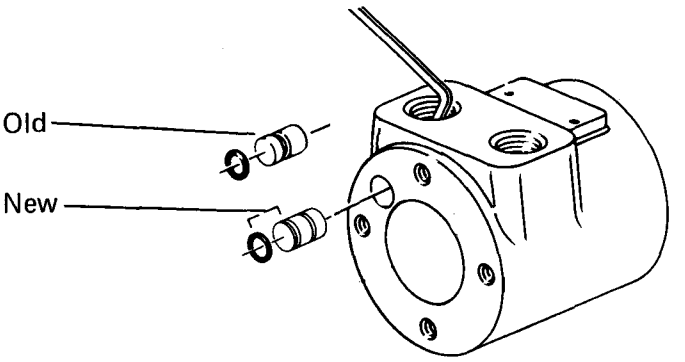


Figure 13

22 A metal plug, with seal, plugs a machining hole in the housing. It's not necessary to remove plug and replace seal unless leakage occurs around plug. To remove plug, insert 3/16" Allen wrench through port opening and push it out, see Fig. 13.

Notes:

Shaft End

Check all mating surfaces. Replace any parts that have scratches or burrs that could cause leakage or damage. Clean all metal parts in clean solvent. Blow dry with air. Do not wipe parts with cloth or paper towel because lint or other matter can get into the hydraulic system and cause damage. Check around the keyslot and chamfered area of the shaft for burrs, nicks or sharp edges that can damage the seals when reassembling. Remove nicks or burrs with a hard smooth stone (such as an Arkansas stone). Do not try to file or grind motor parts.

Note: Lubricate all seals with petroleum jelly such as Vaseline. Use new seals when reassembling the motor. Refer to parts list (6-121) for proper seal kit number

Important: Do not stretch seals before installing.

Cleanliness is extremely important in the successful application of Loctite. Use the following procedures to properly clean all parts.

A Wash the housing with non-petroleum base solvent to remove oil, grease and debris. Petroleum base solvents may leave residue detrimental to successful Loctiting. Pay particular attention to 4 tapped holes on the flange end.

Note: Fully cured Loctite resists most solvents, oils, gasoline, kerosene, and is not affected by cleaning operations.

B Blow dry with compressed air. Clean and dry the tapped holes.

Note: It is not necessary to remove the cured Loctite that is securely bonded in the tapped holes; however, any loose particles of cured Loctite should be removed.

C Wire brush the screw threads to remove cured Loctite and other debris. Discard any screws that have damaged threads or a corroded, damaged, or rounded head.

D Wash the screws with non-petroleum base solvent. Blow dry with compressed air jet.

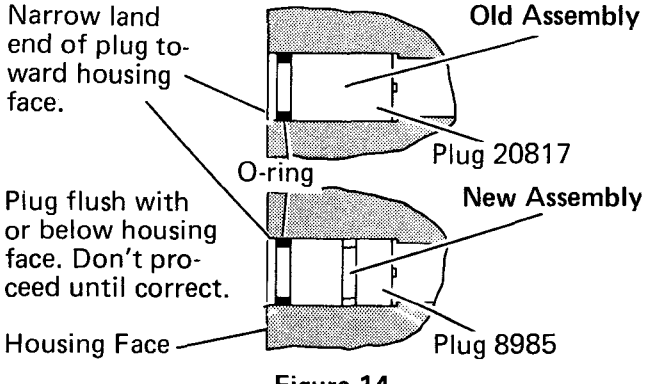


Figure 14

23 If you remove plug and seal, lubricate seal and install on plug. New plug has 2 o-ring grooves, though requires only 1 o-ring. Install o-ring in groove closest end of plug-- see Fig.14. Push plug into housing so plug and housing are flush. Be careful not to damage seal.

Note: To help with timing procedures, a timing dot is machined on output shaft and drive of motors produced after Nov. 1, 1976. For motors without timing dots, use a grease pencil to mark area shown in Fig. 15 before assembly.

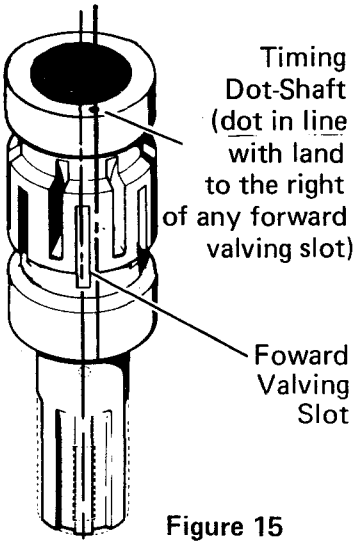
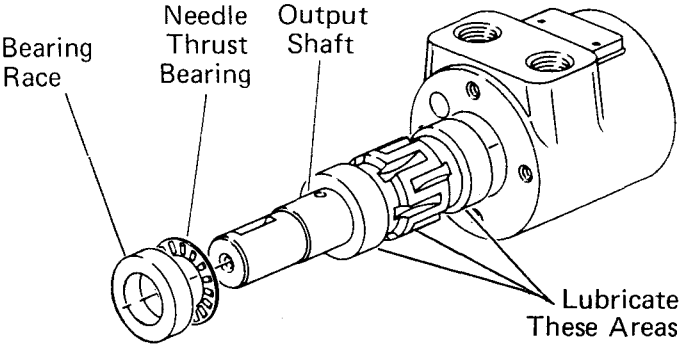


Figure 15



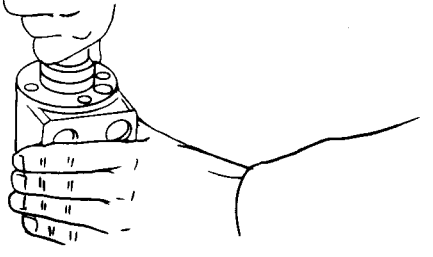


Figure 16

24 Lubricate output shaft with hydraulic oil, then install shaft in housing, see Fig. 16.

Important: Do not permit oil to get into the 4 tapped holes.

25 Install needle thrust bearing then bearing race on shaft. Pull shaft partially out of housing, then push all three parts in housing together, see Fig. 16. The bearing race must rotate freely when in position.

Reassembly

Note: Steps 26 through 29 refer to motors with optional heavy duty bearing only.

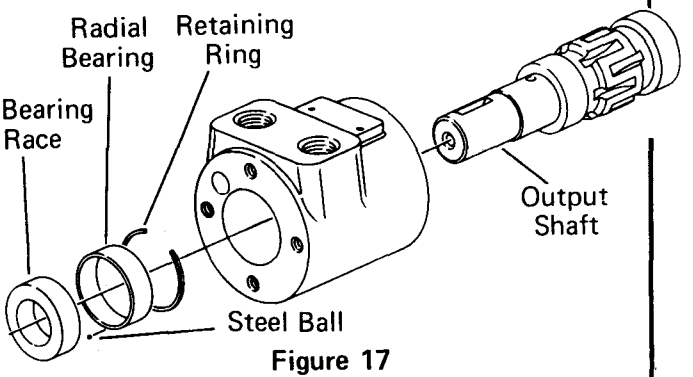


Figure 17

26 Install retaining ring in groove of housing, see Fig. 17.

27 Lubricate output shaft with light oil, then install shaft in 14 hole end of housing. Rotate shaft slightly while installing.

28 Install radial bearing and ball. Replace ball the same way you removed it, see Fig. 18.

29 Install bearing race on shaft, lift shaft slightly then push race and shaft in housing together. Bearing race should rotate freely when in position, see Fig. 18.

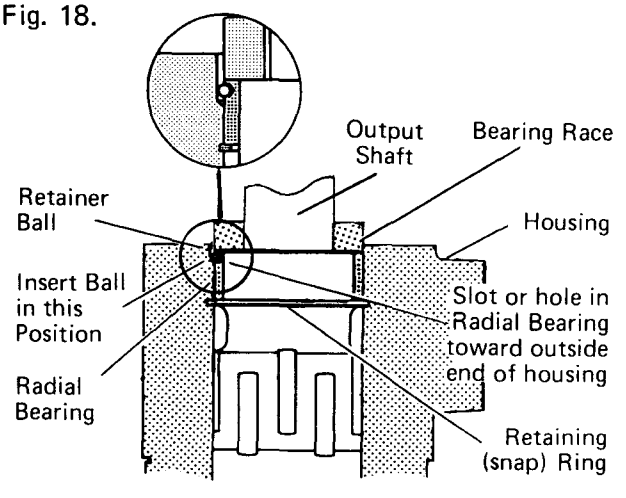


Figure 18

Note: When replacing a quad seal and back-up washer with a high pressure seal (9057-1), it is necessary to break the sharp corner of the flange seal seat (see Fig. 19) prior to installation of the high pressure seal. Use 400 grit paper to break corner.

30 Clean mounting flange of all loose metalic chips, particles, dirt or other contamination, including oil. During cleaning, visually check seal seat in mounting flange for scratches or other marks that might damage the pressure seal. Check for cracks in flange that might cause leakage, see Fig. 19.

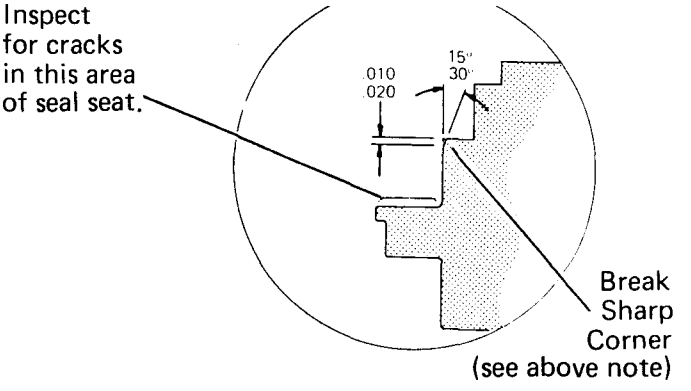


Figure 19

The pressure seals are marked "Pressure Seal—9057-1". Check the seals before installing to be sure they are installed in the correct places. The dust seal is smaller in diameter than the pressure seal. If installed in the wrong place, leakage around the shaft will occur.

Important: If a pressure seal installation tool isn't available, temporarily install flange without seals. Then install 2 cap screws to secure flange to housing. Install seals in flange, and apply loctite, after you reassemble gerotor end of motor(see step 49 thru 54 page 11).

Note: If you have a pressure seal installation tool, continue reassembly, starting with step 31.

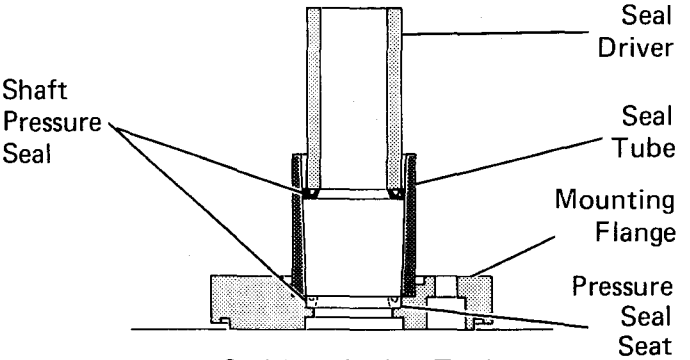


Figure 20

31 Lubricate I.D. of seal tube and O.D. of shaft pressure seal with a light film of clean petroleum jelly. Align small I.D. end of seal tube with seal seat in mounting flange. Install pressure seal in tube--lips of seal face up--see above. Then insert seal driver in tube to firmly push (by hand with rotating action) seal in seal seat.

Important: After installing seal in flange, examine seal condition. If cut, damaged, or improperly installed, you must replace it before continuing reassembly.

32 Install dust seal in flange, see Fig. 22. Press the dust seal into place carefully. To eliminate damage to rubber portion or distortion of metal container, use a tool (flat-round face 1-3/8/1-5/8 dia.) which provides proper guiding and positioning.

33 Install 1-15/16" I.D. seal in flange.

34 It is desirable to apply a light coat of Loctite Primer "NF" (Eaton part no. 9064-1) in tapped holes of housing. Allow primer to air dry for at least 1 minute. Do not force dry with air jet, the primer will blow away. Use of primer is optional. With primer, Loctite curing time is approximately 15 minutes. Without primer, curing time is approximately 6 hours.

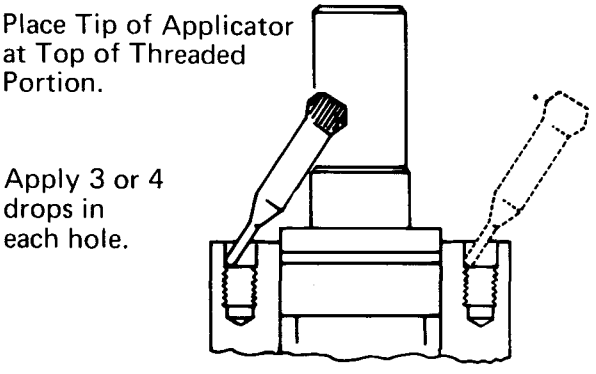


Figure 21

35 Apply 3 or 4 drops of Loctite adhesive (Eaton no. 9063-1) (Loctite no. 601 sealant) at top of threads in each of 4 holes in housing, see Fig. 21. Do not allow parts with Loctite applied to surface to contact any metal parts other than their proper assembly. Wipe off excess Loctite from housing face, using a non-petroleum base solvent. Do not apply Loctite to threads more that 15 minutes before installing screws. If housing stands for more than 15 minutes, repeat application. No additional cleaning or removal of previous Loctite is necessary.

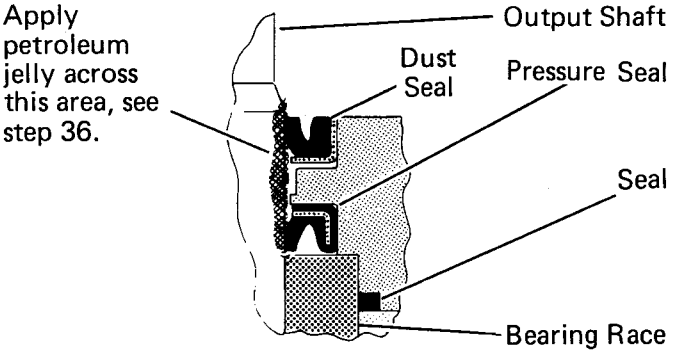


Figure 22

36 Before installing the flange and seal assembly over the shaft, place a protective sleeve or bullet over the shaft. Then, lubricate space between dust seal and pressure seal, as well as lips of both seals, see Fig. 22. Install flange. Rotate flange slowly while pushing down over shaft. Be careful not to invert or damage the seals.

37 Clamp motor in vise as outlined in step 12 and Fig. 6, then install dry screws and alternately torque immediately to 250 inch pounds. If you use primer, allow to cure for 10-15 minutes, without primer, allow 6 hours before subjecting motor to high torque reversals. On all other applications you can run the motor immediately. If you use new bolts, make sure they are the correct length, 7/8" under head length, (see parts list for correct part number). Longer screws will not permit proper seal between the flange and housing.

Gerotor End

38 Clamp housing in a vise, gerotor end up. See Step 1 for correct clamping procedure.

Important Note: To aid installation of seals, apply light coating of clean petroleum jelly to seals before installing.

Important Note: Do not stretch seals before installing in groove.

Earlier Models Only

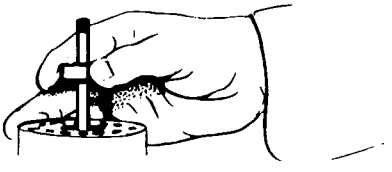


Figure 23

39 Install spacer inside output shaft (spacer used on earlier models). Use a pencil to keep spacer straight.

40 Pour approximately 35 cc of clean hydraulic oil in output shaft cavity.

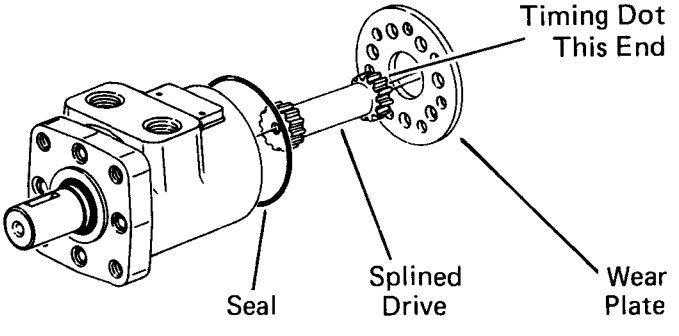


Figure 24

41 Install 2-7/8" I.D. seal in housing seal groove. Avoid twisting seal.

Reassembly

42. Install drive, observe proper timing procedure, see Fig. 26. Dot on drive end must extend out of shaft.

43 Install wear plate carefully on the housing. Align bolt holes. Be careful not to disengage housing seal when aligning wear plate.

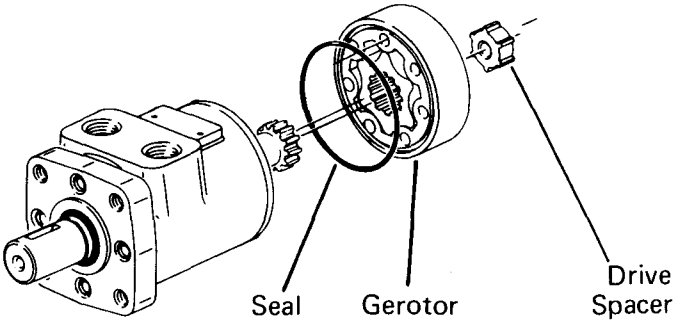


Figure 25

44 Install 2-7/8" I.D. seal in gerotor seal groove, see Fig. 25.

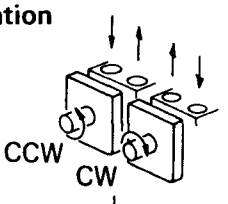
45 Carefully place the gerotor on the wear plate, seal side toward wear plate. Observe proper timing procedure, see Fig. 26.

Timing Procedures

Note: On motors produced after Nov. 1, 1976, timing dots are machined on the shaft and drive. The timing procedure outlined here uses these marks. For older motors withour timing dots, make dots on the parts indicated before assembling. (See Fig. 15 and 26).

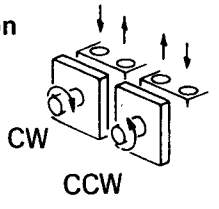
Install shaft in housing.
Before installing drive, note timing dot on one end of drive. Dot on drive end must extend out of shaft.
Install drive with timing dot on drive tooth aligned with timing dot on shaft.
Install wear plate.
Install gerotor with any star point aligned with timing dot on drive.
Turn the gerotor to line up the holes for bolts, be careful not to disengage star from drive or disturb gerotor seal.

Standard Rotation



When timing is orientated as shown in Fig. 26.

Reverse Rotation



When timing is orientated as shown in Fig. 27.

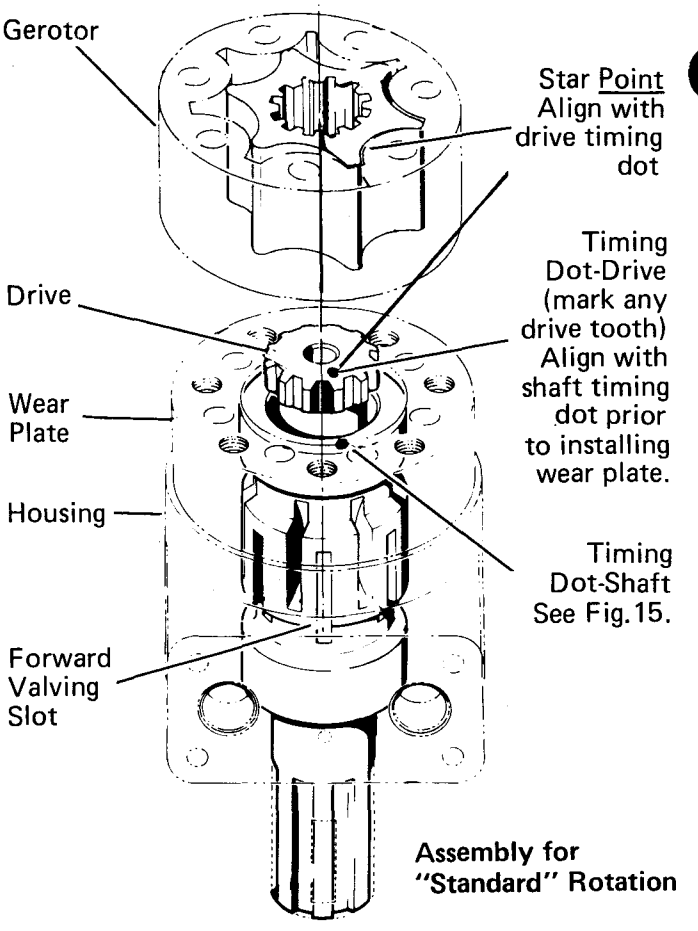


Figure 26

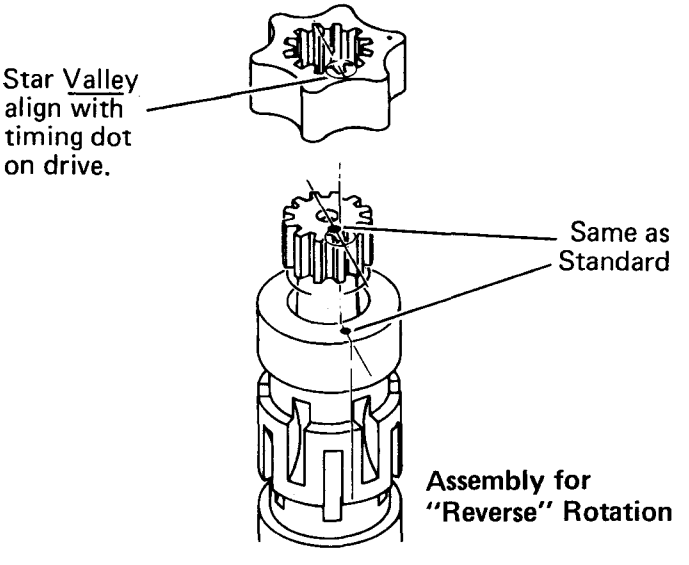


Figure 27

46 Install drive spacer (not used on 3.0 cu. in., 4.5 cu. in., or 6.2. cubic inch displacements).

47 Install 2-7/8" I.D. seal in end cap. Carefully place end cap on geroter.

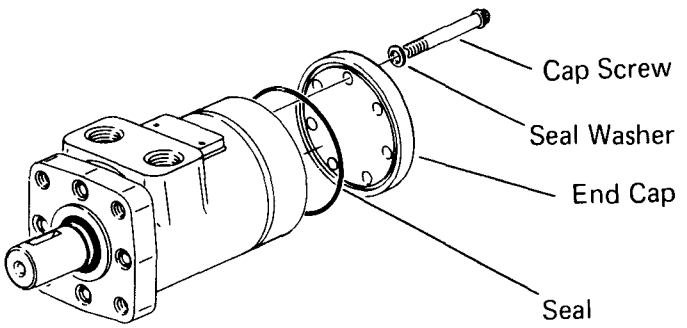
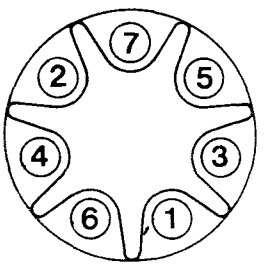


Figure 28

48 Install cap screws and seal washers in end cap. Pre-tighten all screws to 15-40 inch pounds. Make sure body seals are properly seated. Then torque screws 200 inch pounds in sequence, as shown in Fig. 29.



Bolt Torquing Sequence

Figure 29

Note: Steps 49 through 54 cover mounting flange seal installation without using a tool or press.

49 Clamp motor in vise with output shaft up, see Fig. 31. Remove cap screws and flange.

50 Prepare seal seat of flange, see step 30.

51 Lubricate dust seal O.D. Then install dust seal in flange. Make sure dust seal is flush with flange, see step 32.

52 Install pressure seal flush against bearing race, see Fig. 30. Lightly lubricate pressure seal O.D.

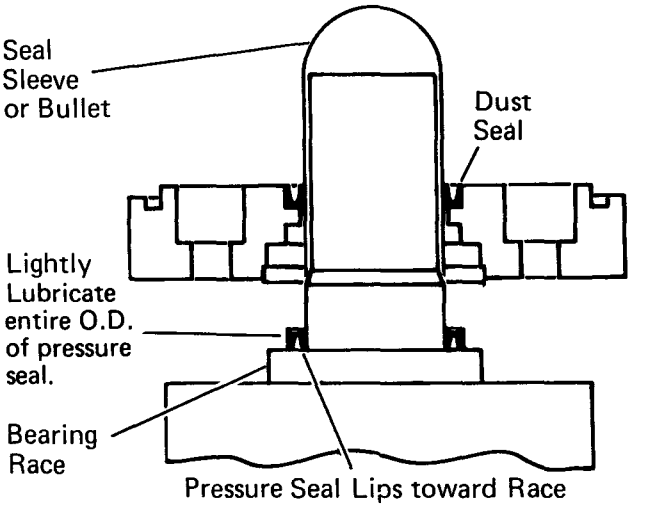


Figure 30

53 Place a seal sleeve or bullet over shaft. Twist flange down shaft until flush against pressure seal. Pressure seal must enter into seat evenly and gradually. Install 4 cap screws. Gradually and evenly finger tighten cap screws (criss-cross pattern). Then use a hand socket wrench to lightly snug tighten screws until flange is flush against housing. DON'T TIGHTEN SCREWS MORE THAN 1 FULL ROTATION AT A TIME--(criss-cross pattern).

54 With motor in vise, see Fig. 31. Use a hand torque wrench to gradually and evenly tighten cap screws (criss-cross pattern) until they reach 250 inch pounds, see caution and important notes below.

Caution: **Do not use air socket wrench on cap screws for this type of seal installation.**

Important: **Proper pressure seal installation is important. You must remove cap screws and flange to examine seal condition. If you've cut or damaged the pressure seal, you must replace it with a new one. If seal is in good condition continue flange reassembly--starting with procedure step 33, page 9.**

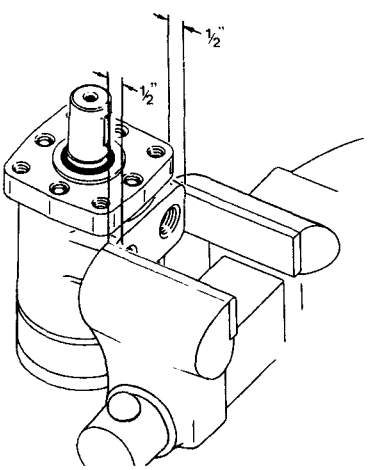


Figure 31

CHAR-LYNN®
HYDRAULIC MOTOR
H SERIES
REPAIR MANUAL
NO. 7-117

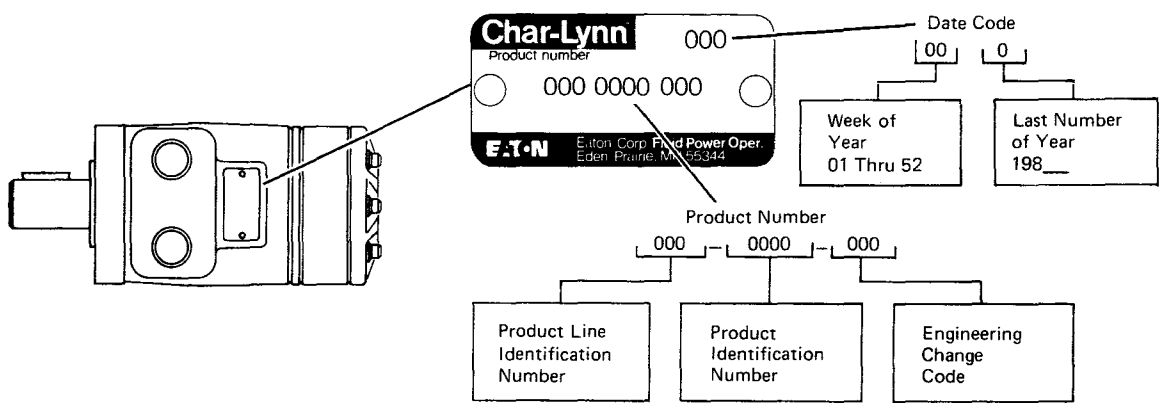
Each order must include the following information:

1. Product Number
2. Date Code
3. Part Name
4. Part Number
5. Quantity of Parts

Refer to parts list 6-121 for replacement parts.

Mtg. Prov.	Shaft	Port Connectors	Displacement (cu. in./rev.) Product Number							
			3.0	4.5	6.2	10.3	11.9	14.9	17.9	23.8
4 Bolt Flange	Straight Keyed	½ NPTF	101-1001	101-1002	101-1003	101-1004	101-1005	101-1006	101-1007	101-1008
		⅞-14	101-1009	101-1010	101-1011	101-1012	101-1013	101-1014	101-1015	101-1016
		Manifold	101-1017	101-1018	101-1019	101-1020	101-1021	101-1022	101-1023	101-1024
	Splined	½ NPTF	—	—	101-1051	101-1052	101-1053	101-1054	101-1055	101-1056
		⅞-14	—	—	—	101-1060	—	—	101-1063	101-1064
2 Bolt Flange	Straight Keyed	½ NPTF	101-1025	101-1026	101-1027	101-1028	101-1029	101-1030	101-1031	101-1032
		⅞-14	101-1033	101-1034	101-1035	101-1036	101-1037	101-1038	101-1039	101-1040
		Manifold	101-1041	101-1042	101-1043	101-1044	101-1045	101-1046	101-1047	101-1048
	Splined	½ NPTF	101-1073	101-1074	101-1075	101-1076	101-1077	101-1078	101-1079	101-1080
		⅞-14	—	—	101-1083	101-1084	—	101-1086	101-1087	101-1088

End cap part number 7611 can be ordered separately for field replacement with a 7/16-20 case drain port.



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EATON Fluid Power Products

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