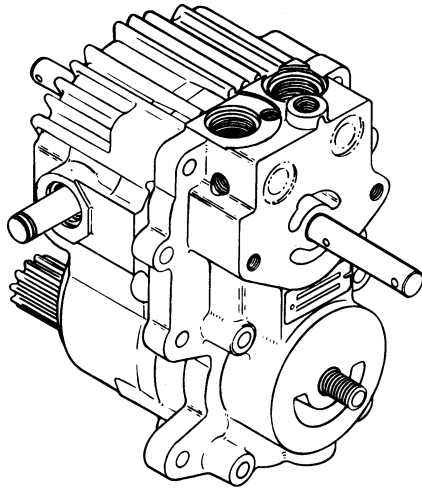


Axial Piston

Pumps, Motors and

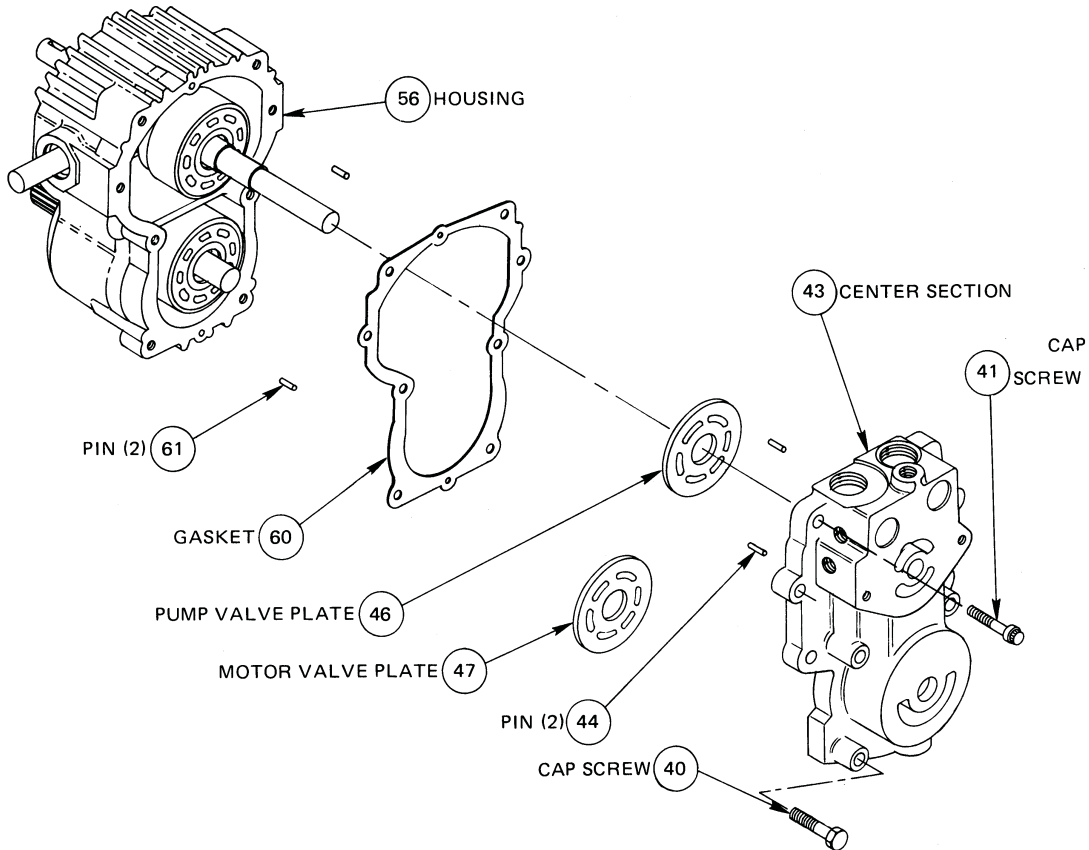
Transmissions

Repair Manual

MAJOR REPAIRS, U TYPE TRANSMISSION

The following procedures are for the Major repair of the U type transmission. These instructions begin with the removal of the center section as the procedure for Minor repairs. (Charge Pump, Seals, etc.) are not covered in this publication. (ref Bulletin 9646).

REPAIR PROCEDURE, 15 SERIES, U TYPE



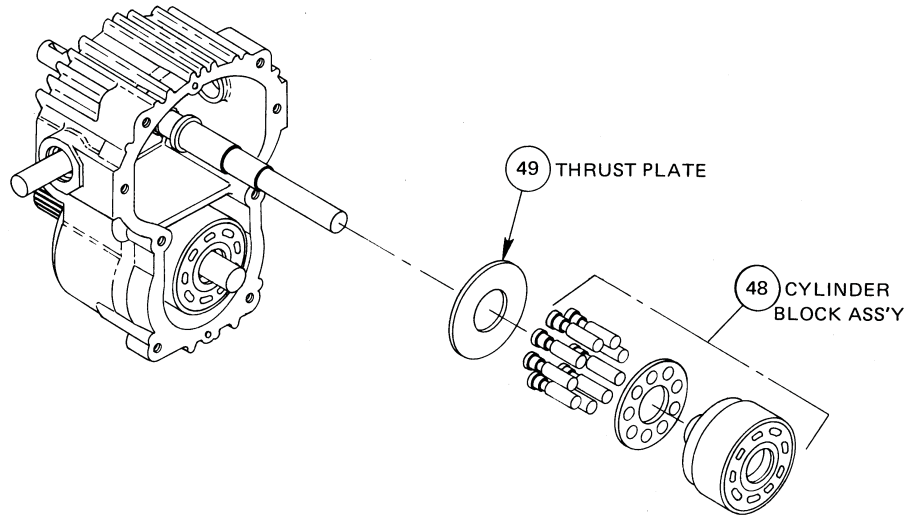
Prior to major disassembly, the Charge Pump must be removed (ref. Bulletin 9646).

Place the transmission with the shafts in a vertical position. Remove cap screws (40 & 41) from center section (43) and lift center section off transmission. Do not allow internal parts to fall when removing center section.

If valve plates (46 & 47) remain on center section, remove them. Keep the motor valve plate (47) separate from the pump valve plate (46) as they are not interchangeable. If the valve plates remain on the cylinder block, remove them at this time.

Remove gasket (60), valve plate pins (44) and locating pins (61).

CAUTION
All surfaces exposed are critical and caution must be used to avoid damage.

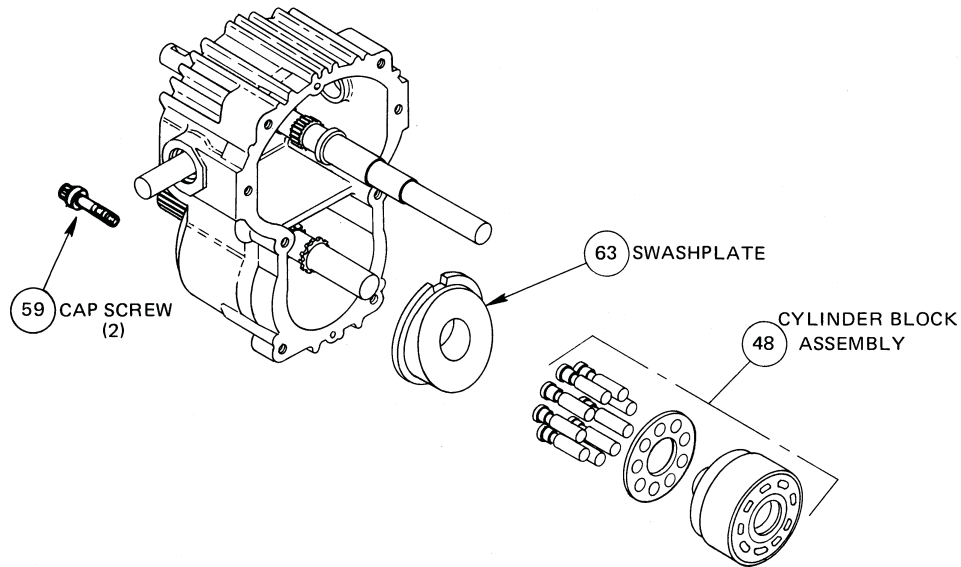
REPAIR PROCEDURE, 15 SERIES, U TYPE

Lift out the pump (upper) cylinder block assembly (48). This is the same for both pump and motor. The pistons may come out of the cylinder bores, however, there is no special orientation of piston to bore that needs to be maintained.

Do not attempt to disassemble the spring and other parts from the center bore of the cylinder block. The entire assembly (48) should be replaced if any of its components are damaged.

Visually inspect wear surfaces of valve plate, cylinder block and slippers for damage. Check to be sure pistons are free in bores.

Remove thrust plate (49) from counterbore in swashplate (51). Visually inspect both sides for damage and flatness.

REPAIR PROCEDURE, 15 SERIES, U TYPE

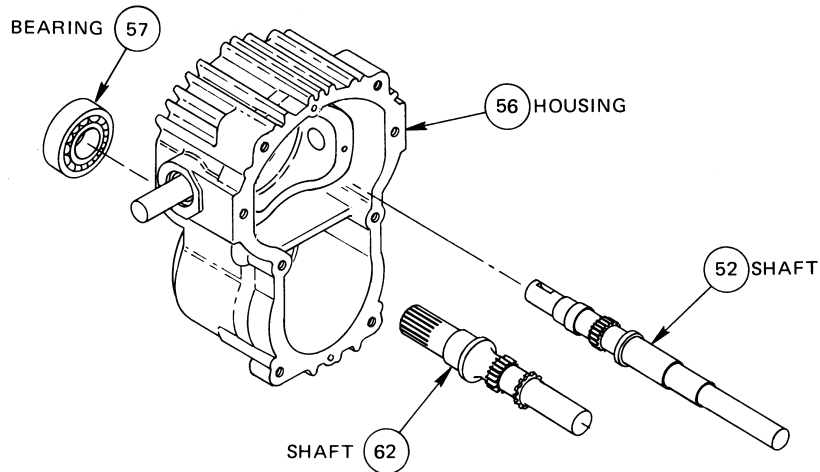
Lift out the motor (lower) cylinder block assembly (48). This is the same for both pump and motor. The pistons may come out of the cylinder bores, however, there is no special orientation of pistons to bore that needs to be maintained.

Do not attempt to disassemble the spring and other parts from the center bore of the cylinder block. The entire assembly (48) should be replaced if any of its components are damaged.

Visually inspect wear surfaces of valve plate, cylinder block and slippers for damage. Check to be sure pistons are free in bores.

Remove two (2) cap screws (59) then remove fixed swashplate (63) from counterbore in housing (56). Visually inspect wear surface for damage.

REPAIR PROCEDURE, 15 SERIES, U TYPE

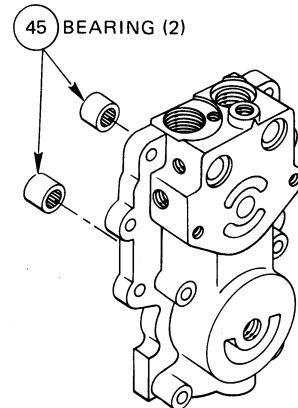


The pump shaft (52) and motor shaft (62) can be removed by pressing them out through the large cavity of housing (56).

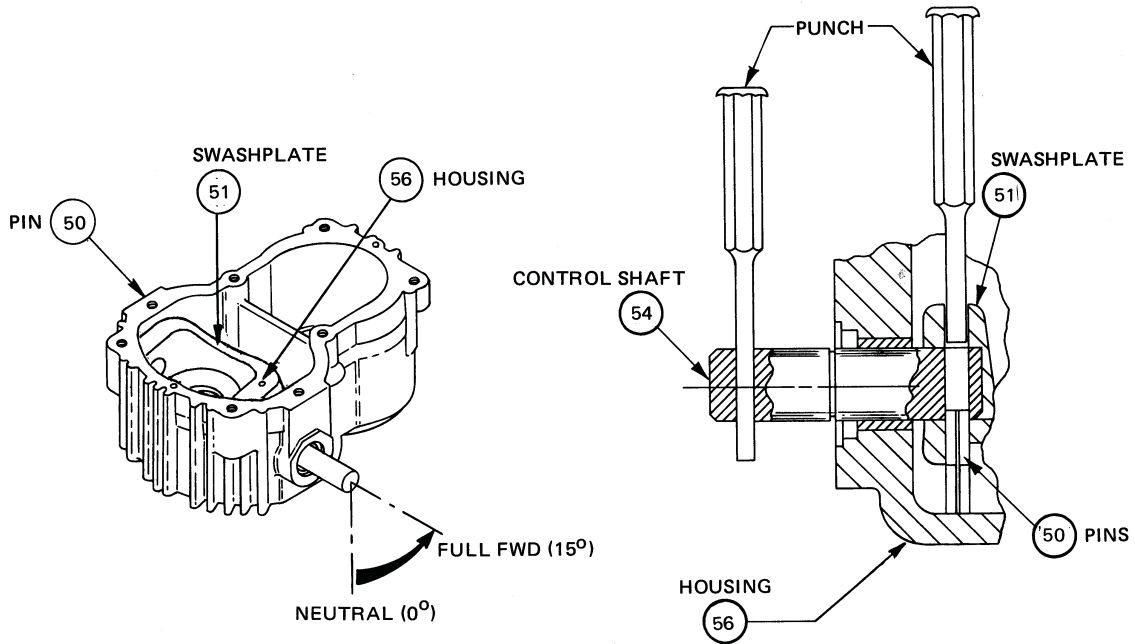
The motor shaft bearing (57) is removed by pressing out toward the front of housing. Replace bearing (57) if necessary.

Visually inspect needle bearings (45) and replace if necessary by pressing them out of center section.

When replacing bearings (45), press into center section leaving 3/32 to 1/8 inch of bearing protruding beyond face. The valve plates pilot on these bearings.



REPAIR PROCEDURE, 15 SERIES, U TYPE



Place housing (56) with large cavity up. Use care not to damage housing. Place a 3/16 dia punch in the control shaft (54) and tilt the swashplate (51) to its full angle (15°, full fwd).

Use a second 3/16 dia punch and drive out the single pin (50) in the trunnion shaft (58) until it hits the housing.

CAUTION

Do not continue to drive the pin or the housing will be damaged.

Tilt the swashplate back to its full angle (15°) and drive the second pin out of the control shaft until it hits the housing.

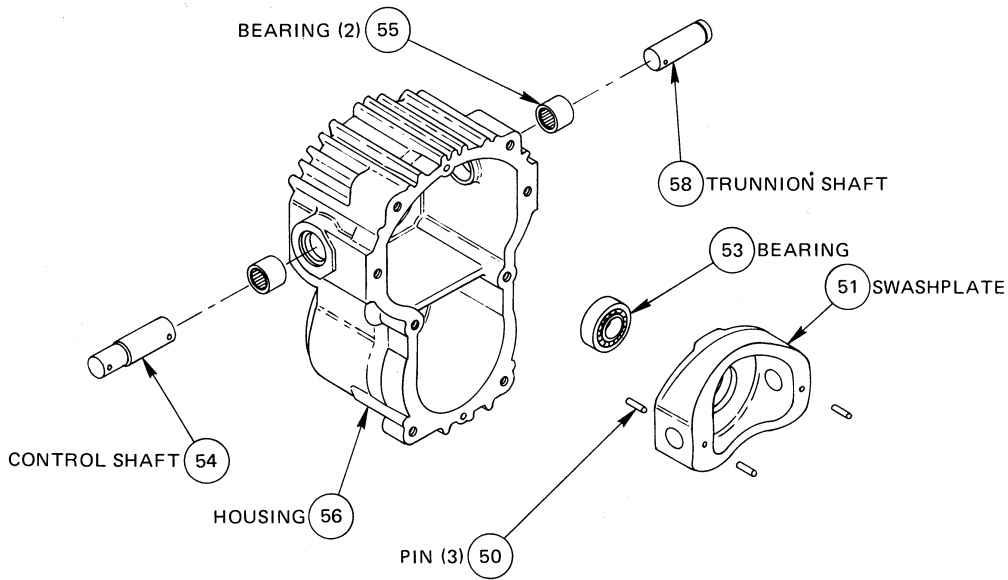
Note the orientation of swashplate in housing and mark parts accordingly to insure proper assembly.

CAUTION

In some units the swashplate angle is restricted in one direction (7-1/2° in reverse).

Drive both pins (50) out of the control shaft (54) until the first pin contacts the housing. Twist the swashplate (control shaft) back toward neutral and the first pin and the pin on trunnion shaft side should fall into the housing.

REPAIR PROCEDURE, 15 SERIES, U TYPE



Drive control shaft (54) out of swashplate bore toward outside of housing. Remove trunnion shaft (58) in the same manner. The swashplate (51) can be removed from the housing (56).

Inspect needle bearing (55) and remove by pressing toward outside of housing if replacement is necessary.

The pump shaft bearing (53) can be removed and replaced if necessary.

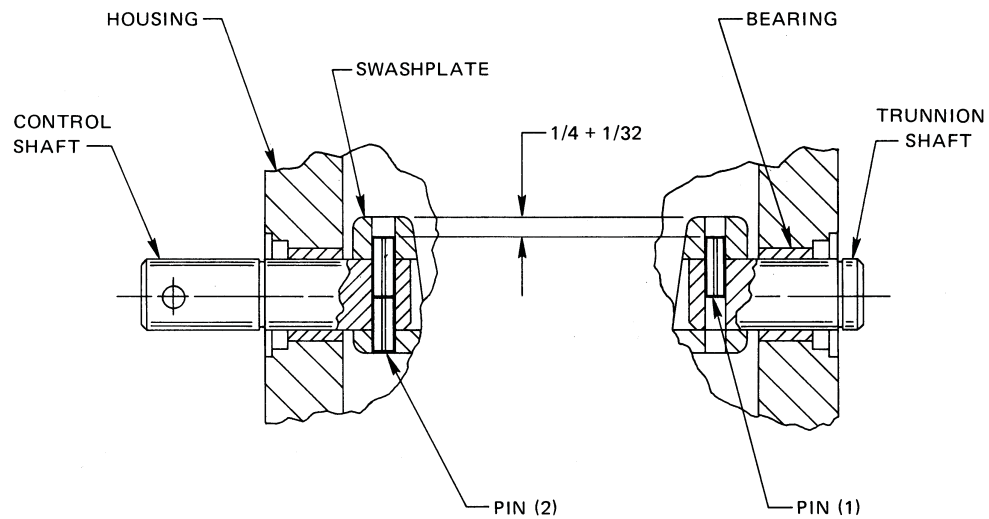
Place swashplate (51) into housing with

counterbore for thrust plate up. Refer to previously made assembly marks to insure proper orientation of swashplate in housing. Install control and trunnion shafts (54 & 58) being certain control shaft is on proper side. Align holes in swashplate and shafts.

Press shaft bearing (53) into housing (56).

Press needle bearings (55) into each side of housing until flush to 1/64 inch below counterbore for lip seals.

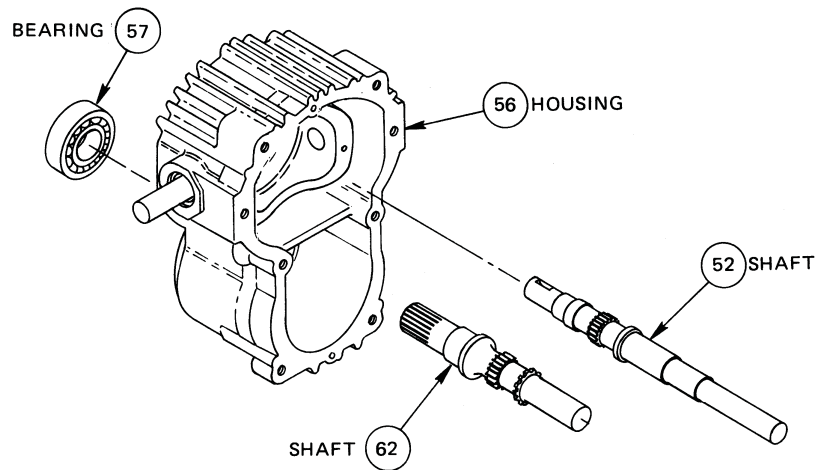
REPAIR PROCEDURE, 15 SERIES, U TYPE



Install new pins (50) through swashplate (51) and shafts (54 & 58). Use two (2) pins on control shaft, installing first pin until second pin can be started, then driving in both pins together until the last pin is 1/4 inch below swashplate.

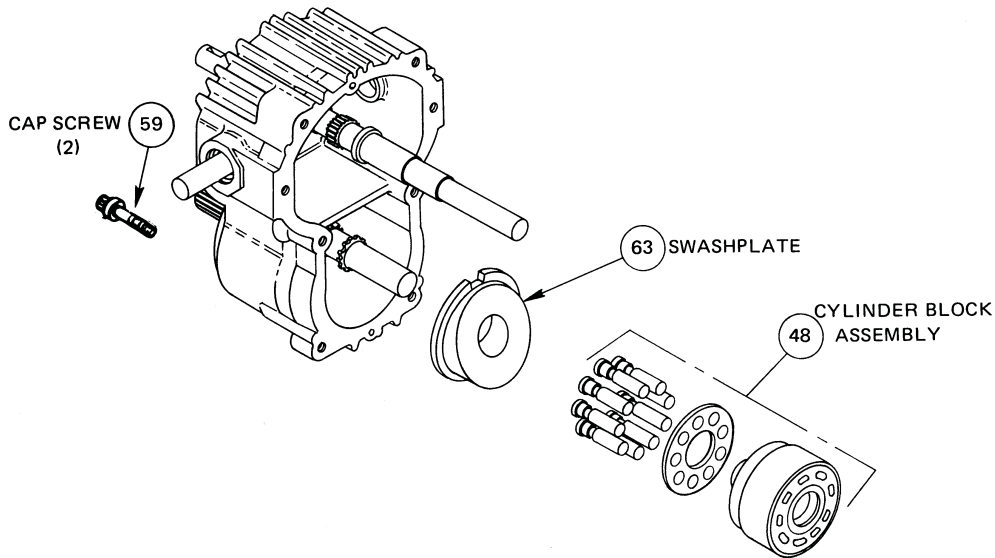
Install one (1) pin in the trunnion shaft, driving it in until it is 1/4 inch below the swashplate. The swashplate should swing freely in the pump housing to 15° each side of center. In some units the swashplate angle is restricted to 7-1/2° in one direction.

REPAIR PROCEDURE, 15 SERIES, U TYPE



Press pump shaft (52) into bearing (53) already assembled in housing.

Press bearing (57) into housing. Then press motor shaft (62) into bearing.

REPAIR PROCEDURE, 15 SERIES, U TYPE

Install fixed swashplate (63) into counterbore of housing (56). Orient swashplate so that notch is at top and high point of cam angle is toward the bottom and install screws (59).

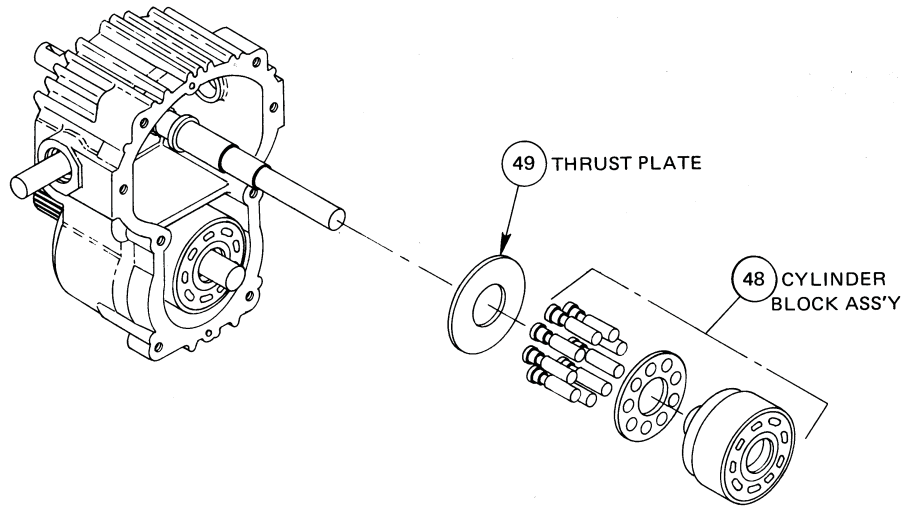
Assemble cylinder block parts if necessary and lubricate with clean hydraulic oil. There is no special orientation of piston to bore that needs to be maintained.

Place the housing assembly in a horizontal position.

Slide cylinder block assembly (48) over shaft and engage spline. Be certain that pistons and thrust plate remain in place. When properly installed a slight spring tension can be felt when pushing on cylinder block.

Lubricate exposed face of cylinder block with clean hydraulic oil.

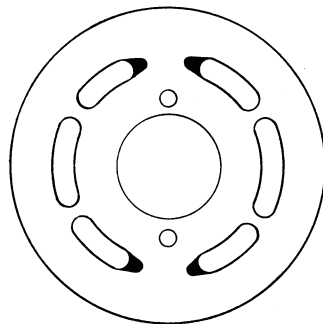
REPAIR PROCEDURE, 15 SERIES, U TYPE



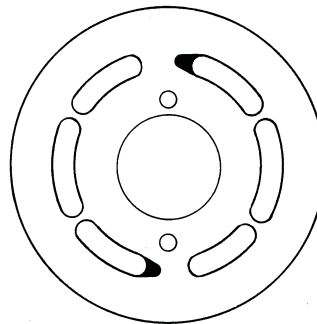
Lubricate thrust plate (49) and insert in counterbore of swashplate.

Install cylinder block assembly (48) using procedure from previous page.

VALVE PLATES

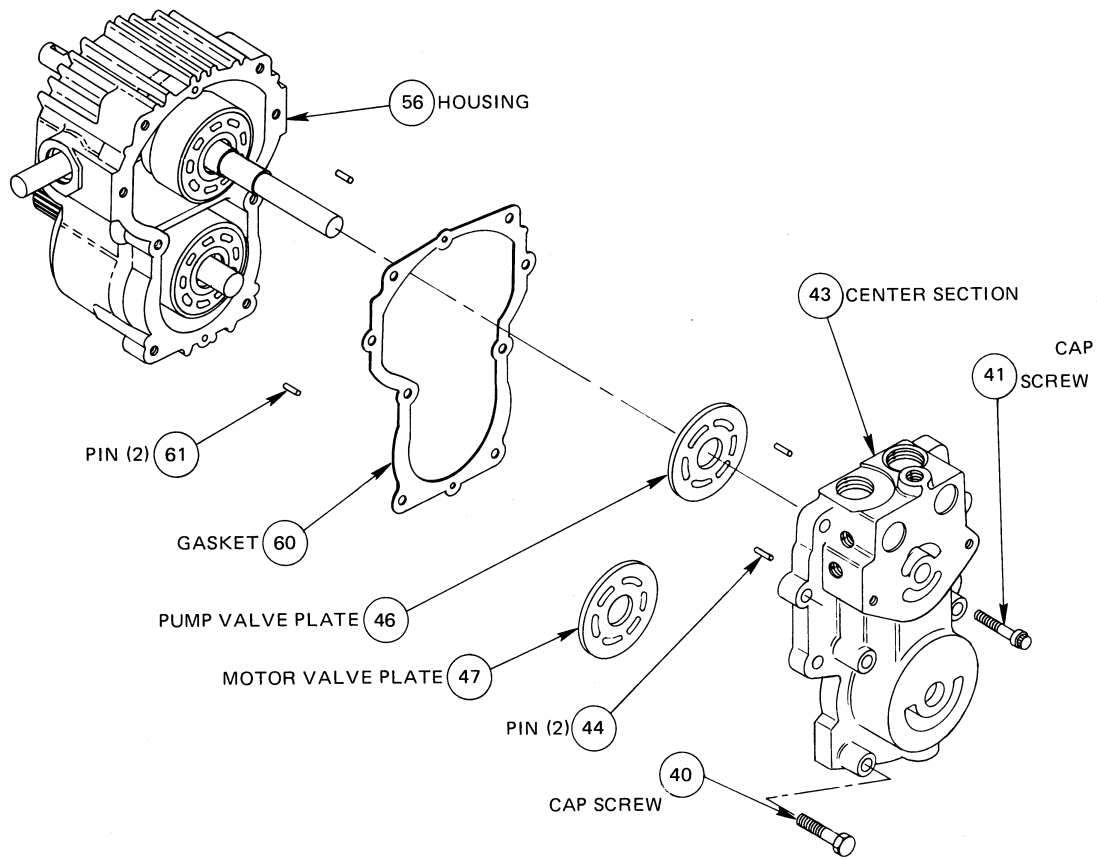


MOTOR



PUMP

REPAIR PROCEDURE, 15 SERIES, U TYPE



Insert locating pin (44) into pump portion (upper) of center section (43). Lubricate the slotted side of the pump valve plate (46) and slip it over locating pin (44) and protruding needle bearing (45).

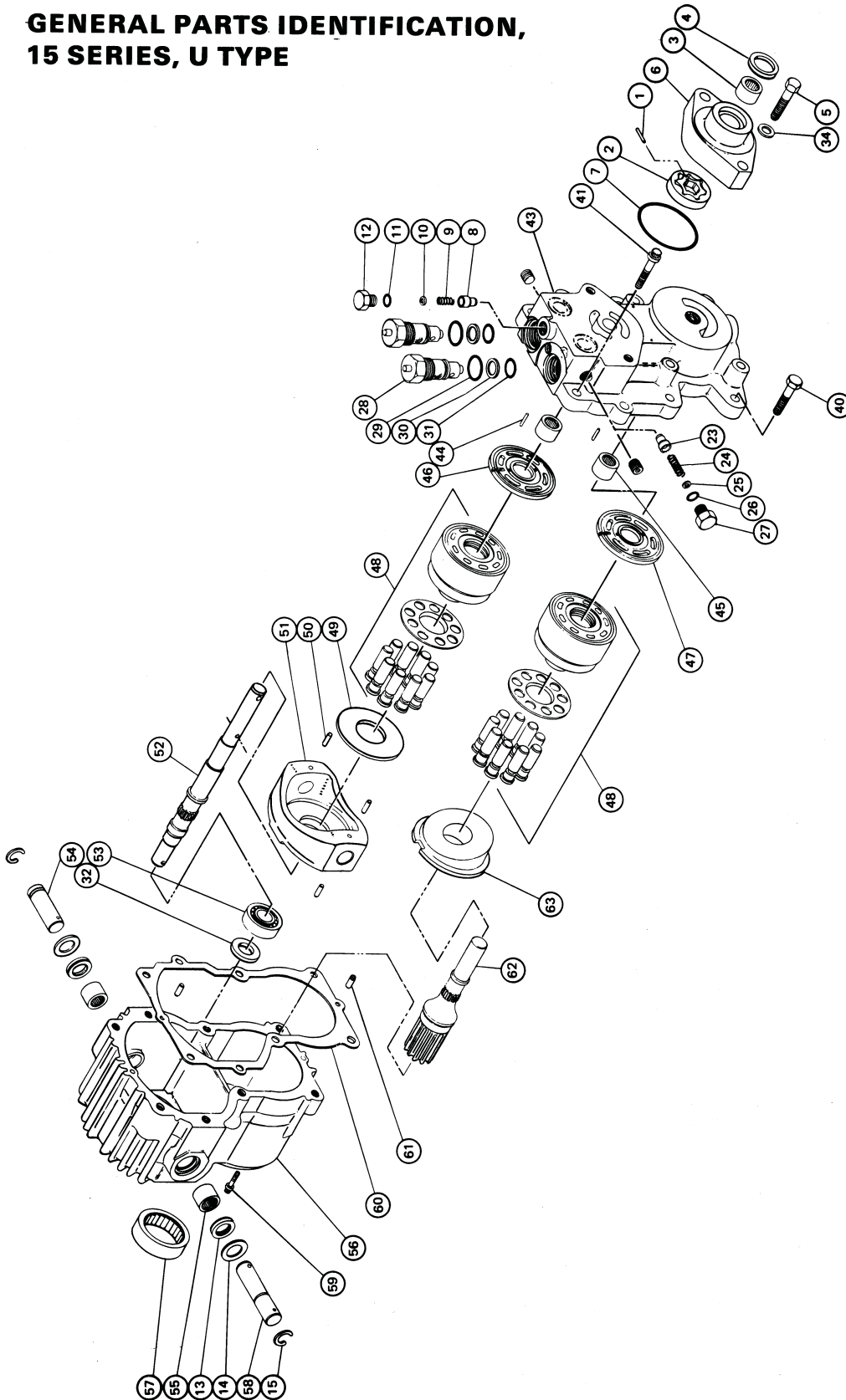
The pump valve plate (46) has two (2) vee notches. The motor valve plate (47) has four (4) vee notches.

Insert locating pin (44) into the motor portion (lower) of center section (43). Lubricate the slotted side of the motor valve plate (47) and slip over locating pin (44) and protruding needle bearing (45).

Place gasket (60) on center section using a small amount of oil to hold it in place. Place center section onto housing being careful that valve plates and cylinder block assemblies remain in place. Insert cap screws (40 & 41) and torque to 25-30 ft. lbs. Check for proper internal assembly by slowly rotating pump, motor and control shafts while tightening these screws.

The remaining components (charge check valves, charge relief valve, etc.) can now be assembled per Bulletin 9646.

**GENERAL PARTS IDENTIFICATION,
15 SERIES, U TYPE**



GENERAL PARTS IDENTIFICATION, 15 SERIES, U TYPE

NO.	DESCRIPTION	QTY
1	Pin - Drive	1
2	Charge Pump (Gerotor)	1
3	Bearing	1
4	Seal - Lip	1
5	Screw - Hex. Head	2
6	Housing - Charge Pump	1
7	O-Ring	1
8	Cone - Implement Relief	1
9	Spring - Implement Relief	1
10	Shims	A/R
11	O-Ring	1
12	Plug-Hex. Head	1
13	Seal - Lip	2
14	Washer	2
15	Retaining Ring	2
23	Cone - Charge Relief	1
24	Spring - Charge Relief	1
25	Shims	A/R
26	O-Ring	1
27	Plug-Hex. Head	1
28	Valve Assembly	2
29	O-Ring	2
30	Back Up Ring	2
31	O-Ring	2
34	Washer	2
40	Screw - Hex. Head	4
41	Screw - 12 Pt. Cap	2
43	Center Section	1
44	Pin - Locating	2
45	Bearing	2
46	Valve Plate - Pump	1
47	Valve Plate - Motor	1
48	Cylinder Block Kit	2
49	Thrust Plate	1
50	Spring Pin	3
51	Swashplate - Variable	1
52	Shaft - Pump	1
53	Bearing Input	1
54	Shaft - Control	1
55	Bearing	2
56	Housing	1
57	Bearing - Output	1
58	Shaft - Trunnion	1
59	Screw - 12 Pt. Cap	2
60	Gasket	1
61	Pin	2
62	Shaft - Output	1
63	Swashplate - Fixed	1

This list is for identification of parts only. Specific model and part numbers are necessary to order replacement parts. For part numbers consult the Parts List for the specific model number.