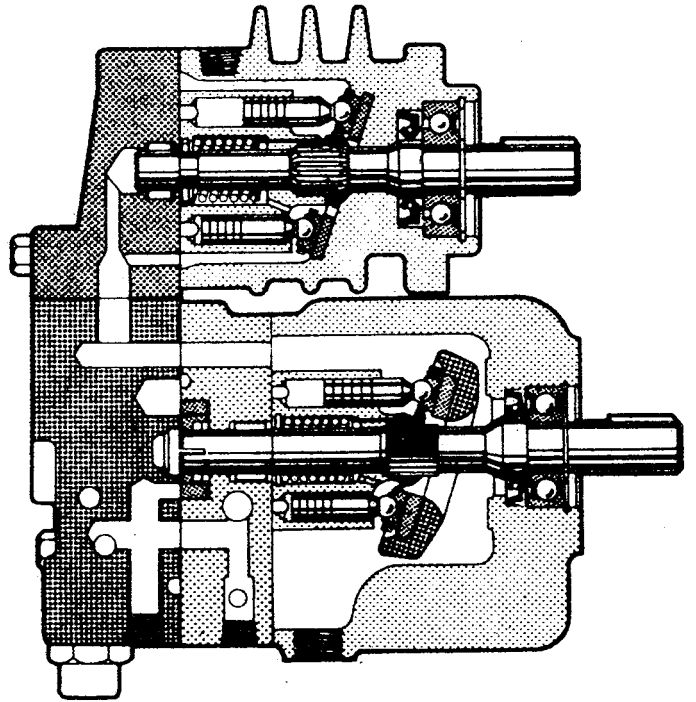


assembly & disassembly

Simplicity[®]

VICKERS



**HYDROSTATIC
TRANSMISSION**

(166097)

1. The hydrostatic unit is mounted on the left rear section of the tractor, as shown here. Visible major components are the motor and pump assembly, reservoir, fluid lines and cooler. The unit is dismantled in the following sequence of operations.

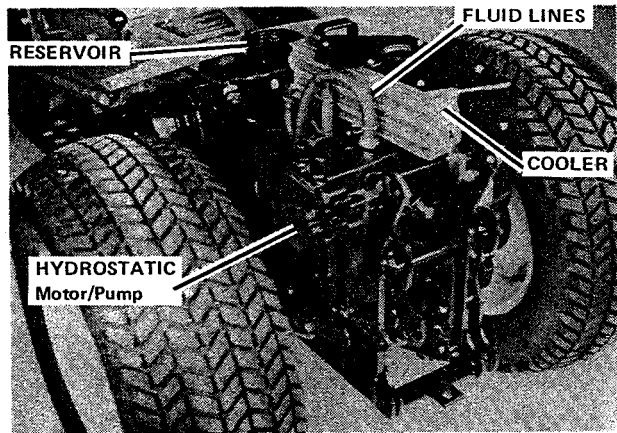


Figure 1.

2. The cooler and its shroud are removed by loosening the mounting screws and disengaging the spring, pull the cooler assembly away from the pump assembly.

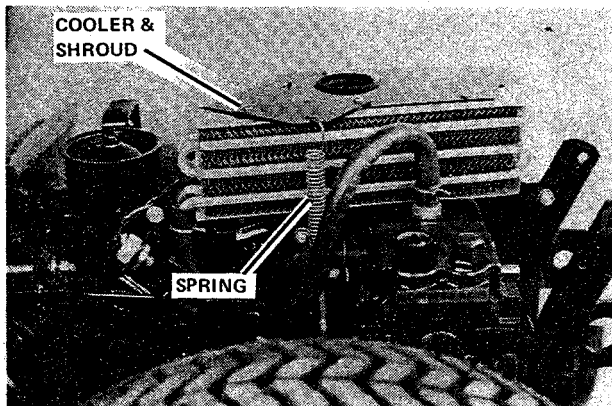


Figure 2.

3. Loosen the retaining screw on the cover of the fluid reservoir. This will serve to release pressure and prevent hydraulic fluid from spurting when the low pressure lines are disconnected. Place a drain pan below the tractor. Now disconnect the low pressure hose lines at the bottom of the oil reservoir by releasing their loop clamps. Place the lines in a lowered position to establish a gravity bleed of hydraulic fluid from the system. Remove the cover of the reservoir and remove the filter, this can be simplified by using two pieces of wire, bent into a "L" shape. This filter **MUST** be replaced with a new one on reassembly.

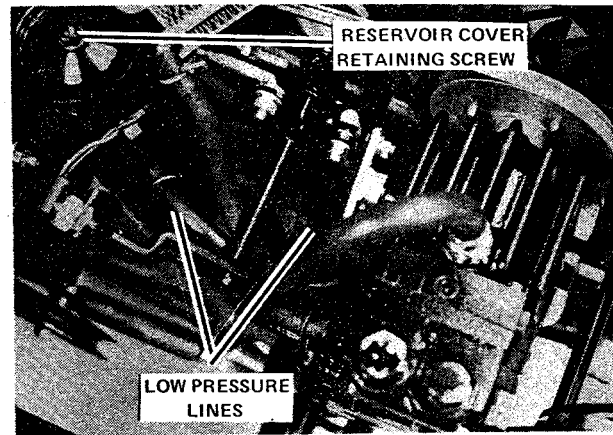


Figure 3.

4. Remove the control arm and ball linkage from the hydrostatic pump. Remove the rear lift mechanism if installed.

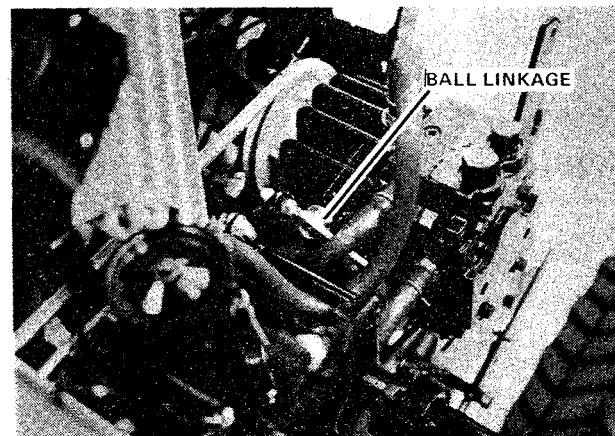


Figure 4.

5. Before proceeding with this step, set the tractor parking brake and depress the foot clutch to release drive belt tension. Loosen the setscrew on the pulley and remove the pulley from the hydrostatic pump input shaft.

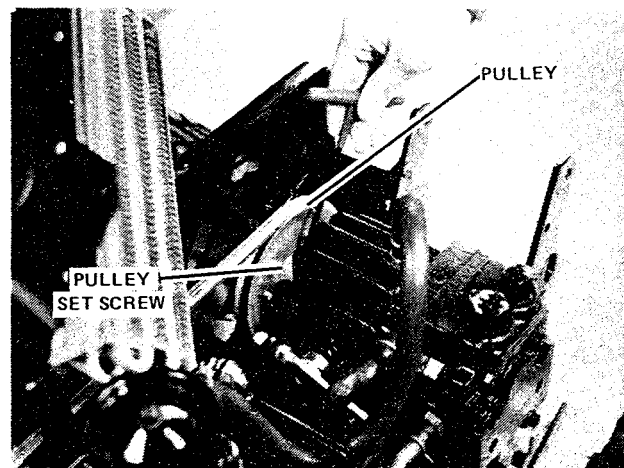


Figure 5.

6. Remove the two pump mounting bolts. The pump may now be removed from the tractor, but care must be taken to prevent damage to the fins on the hydrostatic pump. This is done by rotating the pump on removal, slowly and carefully. Once the pump is removed from the tractor, remove the gear from the pump "output" shaft. By this time, the reservoir and low pressure lines will have drained sufficiently. Remove the reservoirs. Now flush the reservoir system with a clean solvent and blow dry with an air hose. Then flush and blow dry the cooler, making sure the external fins of the cooler are clean.

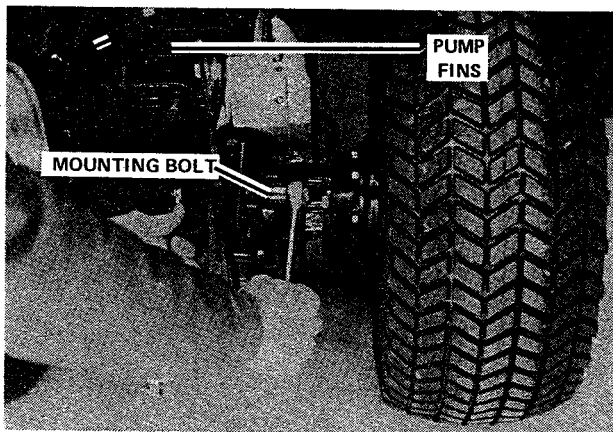


Figure 6.

BEFORE ANY INSPECTION, STONING OR MACHINING OPERATION, THOROUGHLY CLEAN ALL PARTS WITH MINERAL SPIRITS.

7. Begin the disassembly process by removing the four motor mounting bolts.

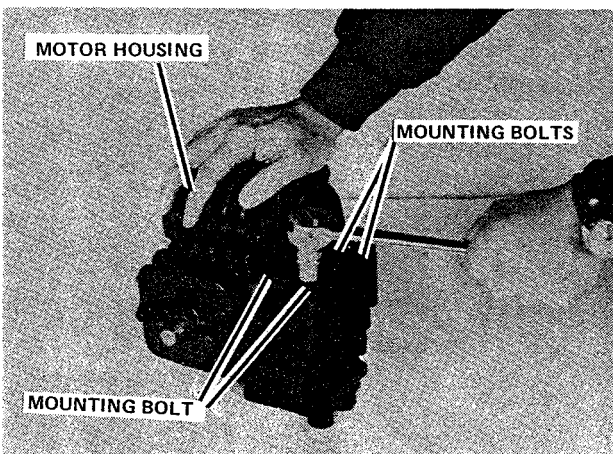


Figure 7.

8. Separate the motor housing from the pump assembly. Remove the "O" rings from the transfer block.

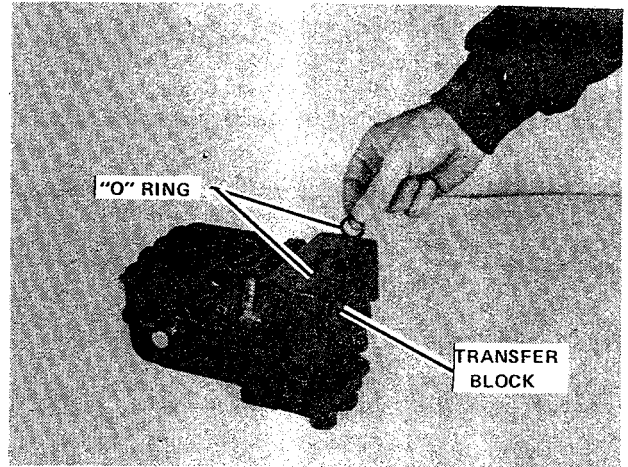


Figure 8.

9. Remove the four valve plate mounting bolts.

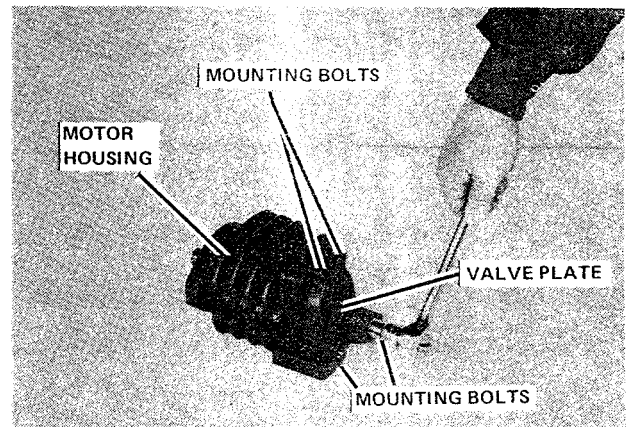


Figure 9.

10. The valve plate can be removed from the motor housing by tapping it with a soft faced hammer. Inspect the flat surface of the valve plate for wear or scoring. Remove minor defects by lightly stoning the surface with a hard Arkansas stone that is flat within .001 inch. Be sure to stone lightly; the surface is hardened and excessive stoning will remove the hardened surface. If wear or damage is excessive, replace the valve plate.

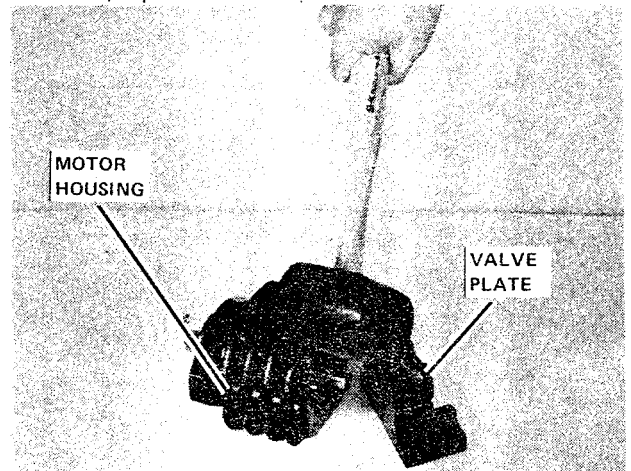


Figure 10.

11. Remove the rotating group by placing the motor housing in an upright position, allowing the rotating group to drop out. A light film of hydrostatic fluid may cause the swash plate to remain in the housing. If this occurs, flush the housing with solvent and use compressed air to "pop" the plate out.

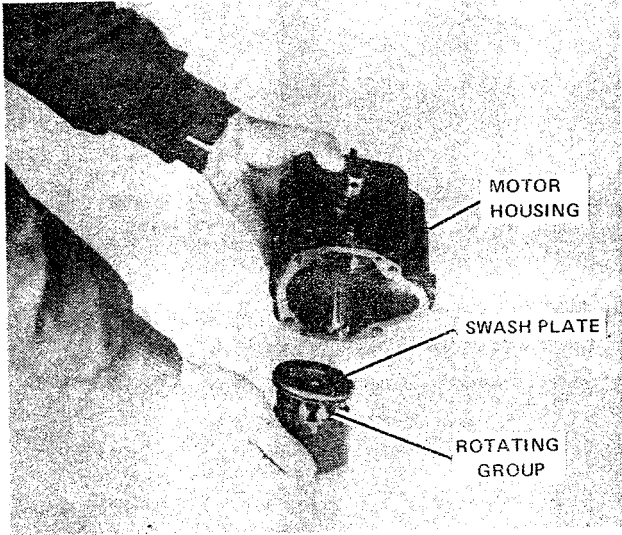


Figure 11.

12. Remove the snap ring in the end of the motor housing.

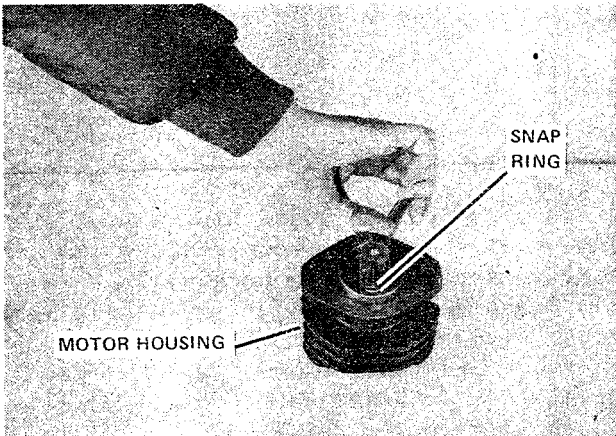


Figure 12.

13. Use a soft faced mallet to tap the shaft and bearing assembly from the motor housing.

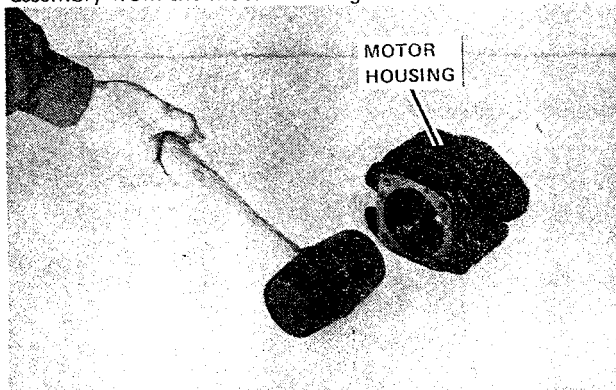


Figure 13.

14. This is what the parts will look like when disassembled. If the bearing needs replacing, it is removed from the shaft with a puller, or by using a press.

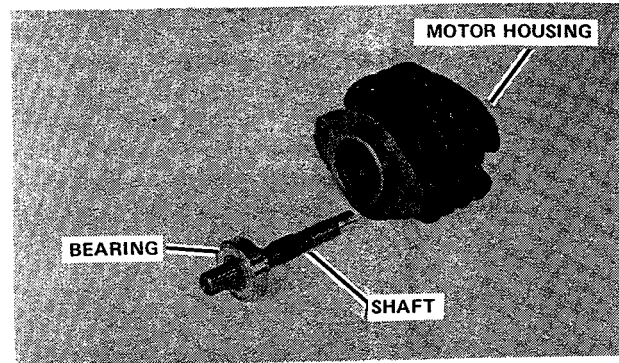


Figure 14.

15. If not already done, remove the swash plate from the top of the rotating group.

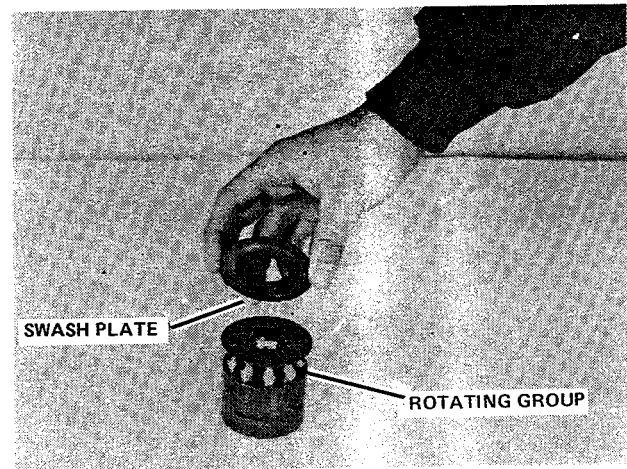


Figure 15.

16. Remove the piston assembly from the cylinder assembly.

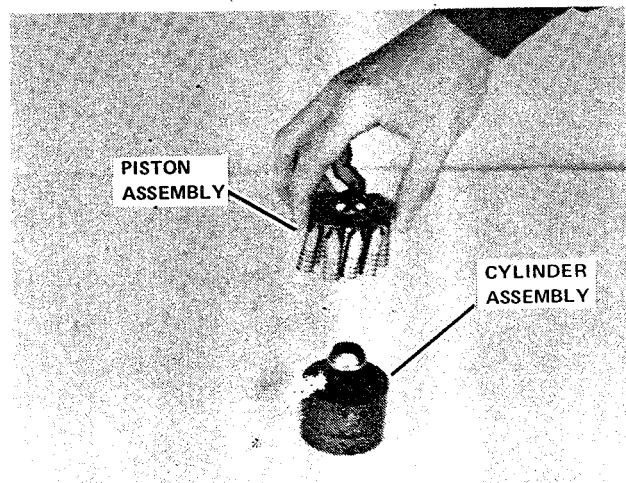


Figure 16.

17. Remove the spherical washer and three support pins from the cylinder.

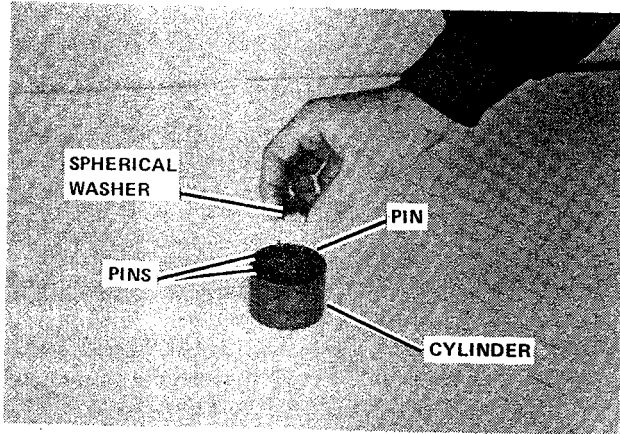


Figure 17.

NOTE

On some units you will find a washer located between the spherical washer and the three support pins.

18. Inspect the bores and the valve plate mating surface of the cylinder for wear and scoring. Remove minor defects on the running face by lightly stoning or tapping the surface. If the defect cannot be removed by these methods, replace the cylinder.

If one or more piston and shoe subassemblies needs to be replaced, check that all piston and shoe subassemblies in the unit ride properly on the swash plate (See Figure 18). In a set of nine pistons, variations in thickness greater than .001 of an inch from one shoe to another will result in excessive internal leakage and shoe wear. The replacement of all nine piston and shoe subassemblies in the pump and motor, as well as the cylinder, is recommended for maximum service between overhauls.

If necessary, hand tap the shoes with 500A emery paper backed up by a tapping plate. Good results may be obtained by dipping the emery paper in kerosene and keeping it wet during polishing.

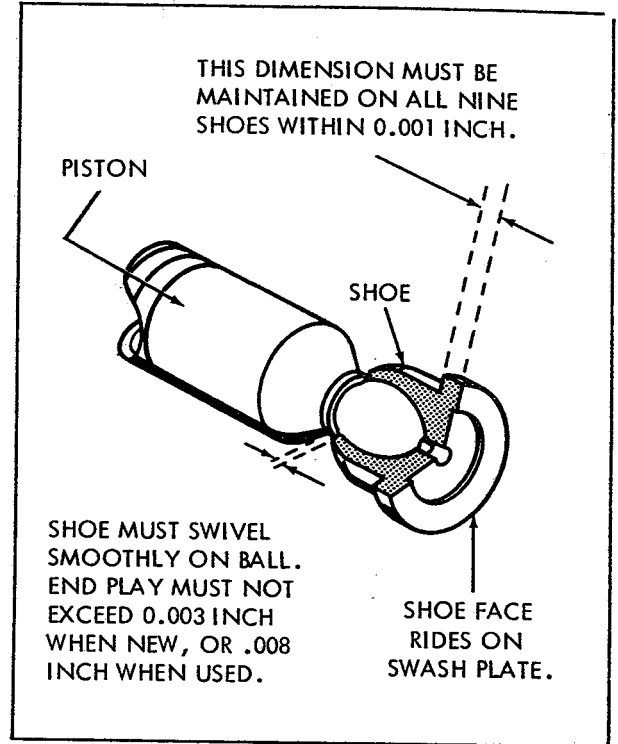


Figure 18.

19. To remove the spring from the cylinder, proceed as outlined.

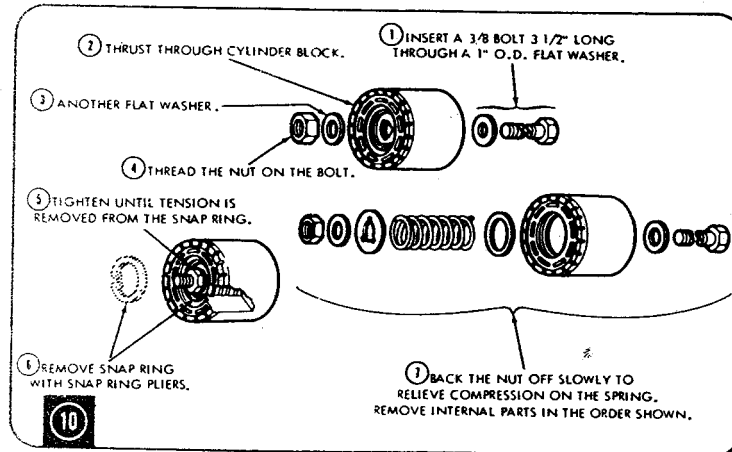


Figure 19.

20. Separate the transfer block from the pump housing by removing the two capscrews and two allen head screws.

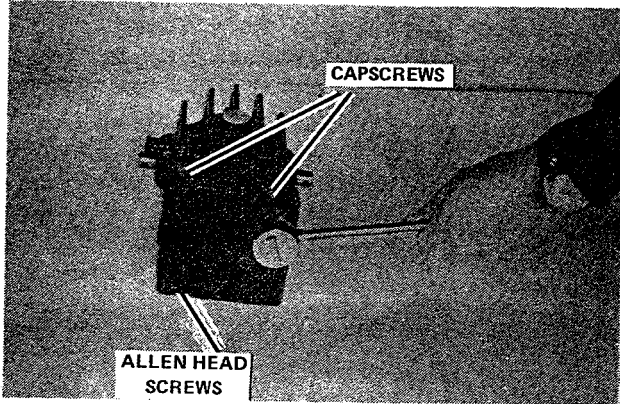


Figure 20.

21. Use a soft faced mallet to help separate the two components.

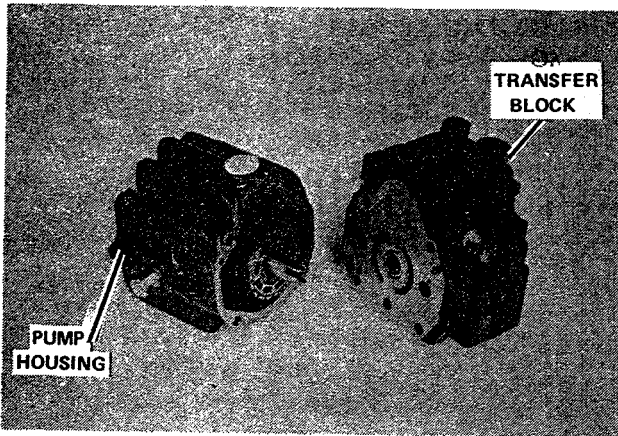


Figure 21.

22. The rotating group and swash plate is removed from the pump housing in the same manner as the rotating group was removed from the motor housing.

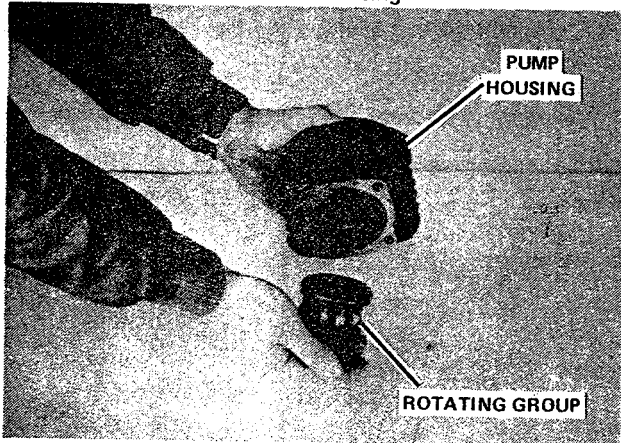


Figure 22.

23. Remove the snap ring from the top of the pump housing

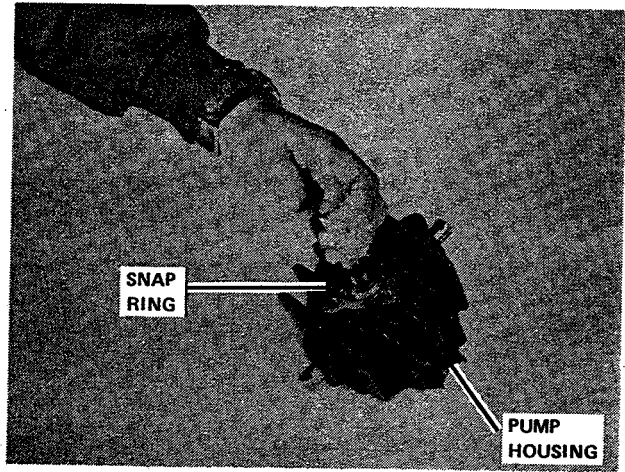


Figure 23.

24. Use a soft faced mallet and tap out the shaft and bearing assembly as was previously done on the motor housing.

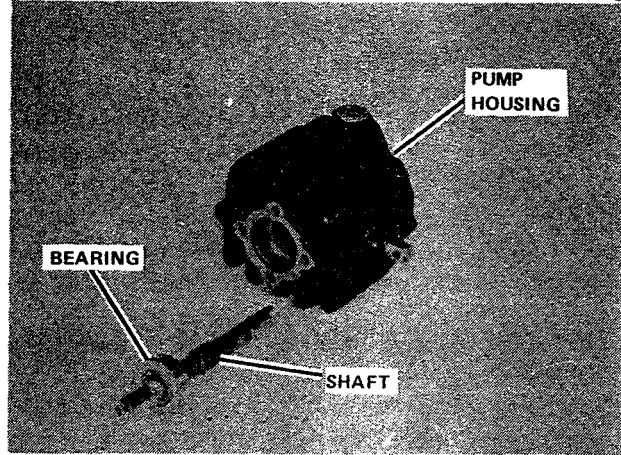


Figure 24.

25. Use a punch to drive the roll pins down into the pintle shaft.

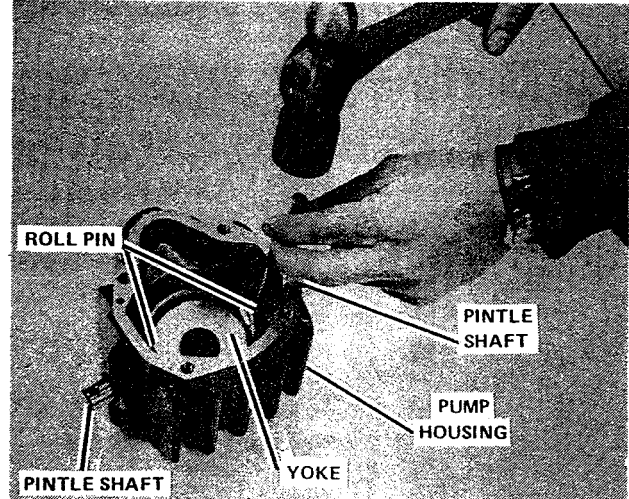


Figure 25.
CAUTION

These roll pins are not driven all the way through the pintle shaft, but only down far enough to clear the yoke. (See Figure 25A).

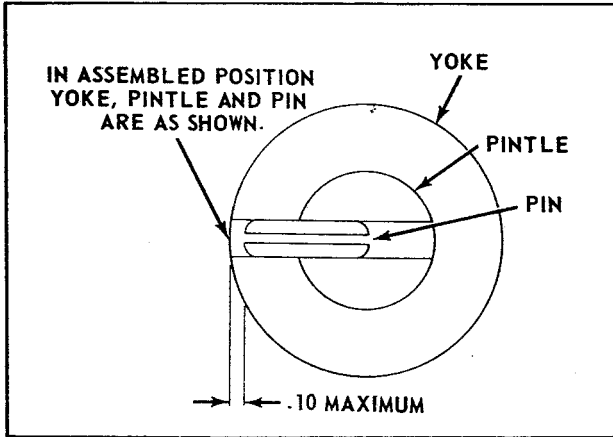


Figure 25a.

26. Use a soft mallet or brass drift to drive the pintle shaft completely into the housing. Once the pintle shaft clears the yoke, it can be removed. Repeat the process for the other pintle shaft.

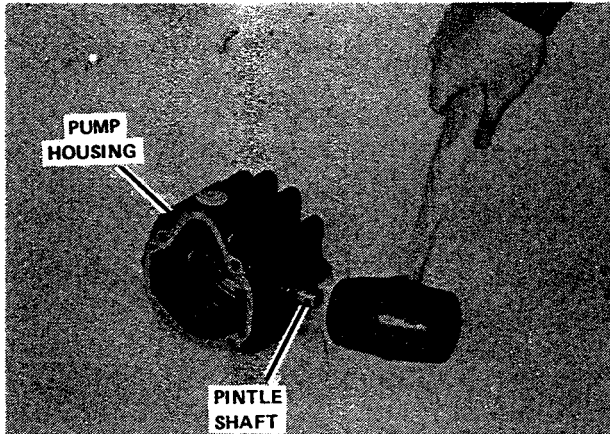


Figure 26.

27. Figure 27 illustrates how the items removed in step 26 will appear.

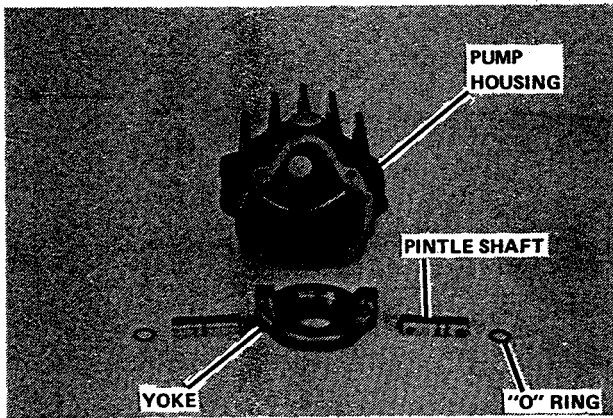


Figure 27.

28. Remove the two allen head screws from the transfer block.

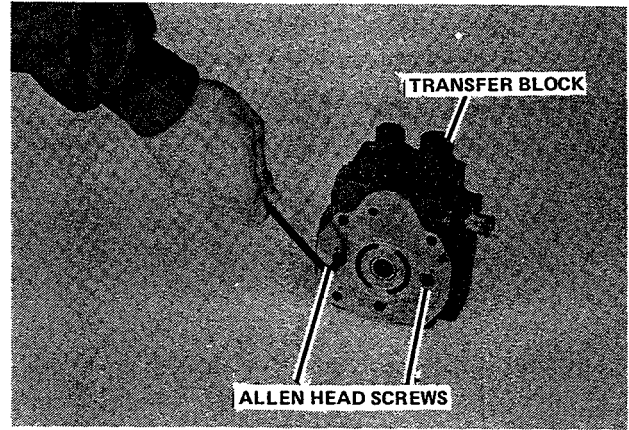


Figure 28.

29. Separate the two halves of the transfer block using a soft faced mallet to tap the halves apart. Remove the "O" rings from the halves.

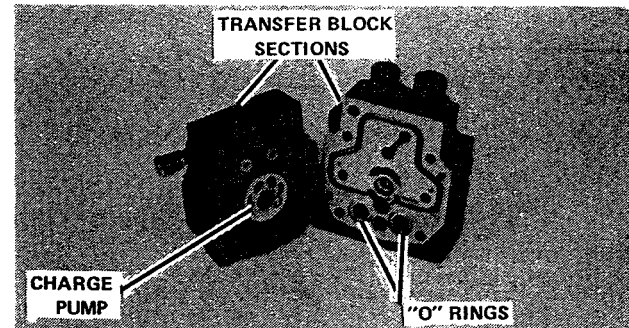


Figure 29.

30. Remove the charge pump and its key from the transfer block. Inspect the surface of all parts subject to wear. Remove light scoring from the face of the inner and outer rotor with crocus cloth laid over a flat surface, with a medium India stone or by tapping.

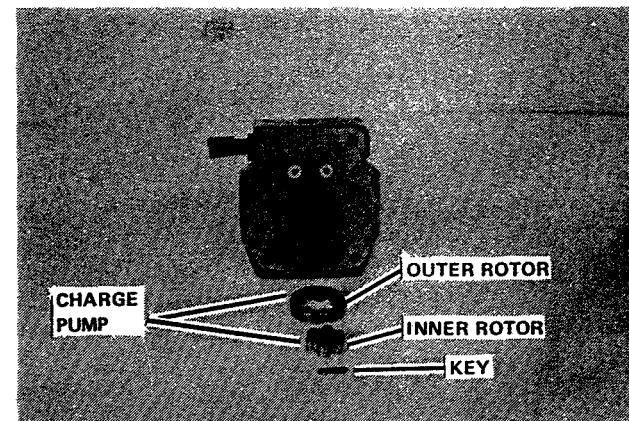


Figure 30.

31. When reassembling, the charge pump must be assembled with the three dots meshing as shown. The charge pump is then inserted in the transfer block in such a position that the dots are not visible (face down).

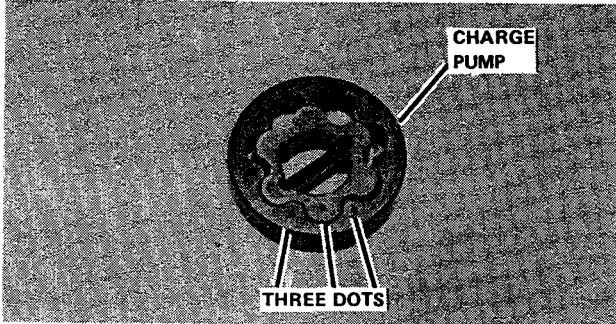


Figure 31.

32. Use an allen head wrench to remove the two plugs on each side of the transfer block half.

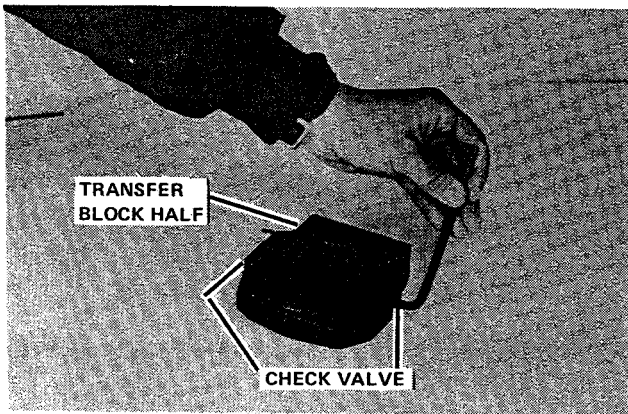


Figure 32.

33. Remove the replenishing valves located under each plug.

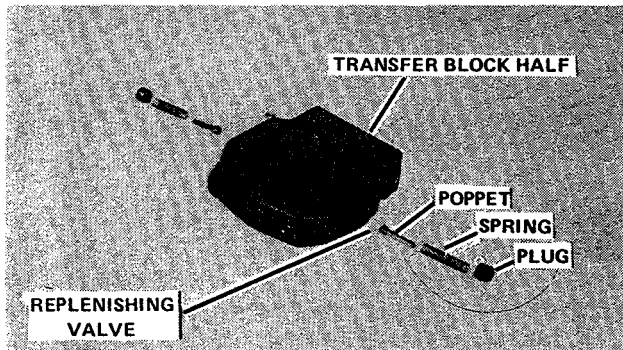


Figure 33.

34. Remove the plug over the relief valve and the hose fitting over the heat exchanger valve.

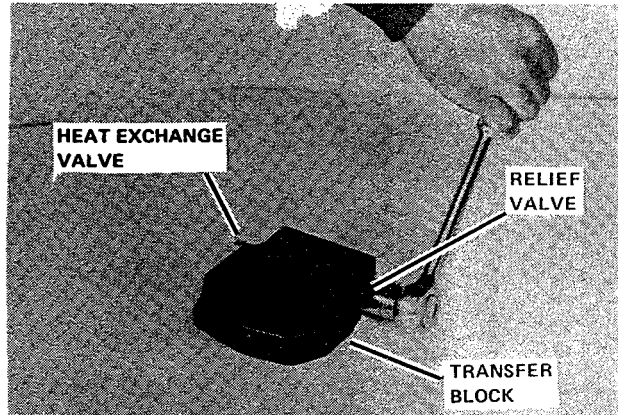


Figure 34.

35. Remove the poppet mechanisms located under each fitting.

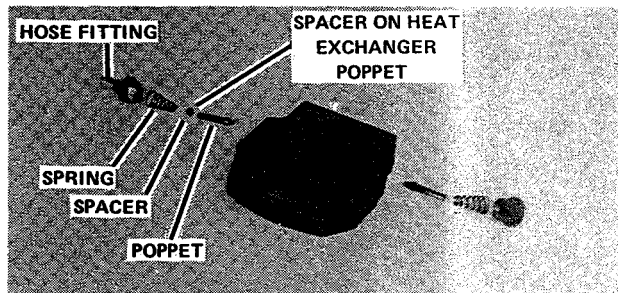


Figure 35.

36. Use a socket wrench to loosen both plugs on top of the transfer block.

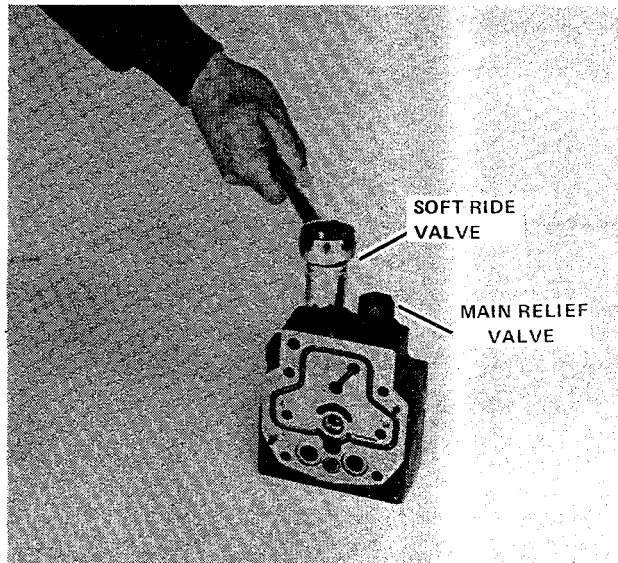


Figure 36.

37. Remove the components of the main relief valve.

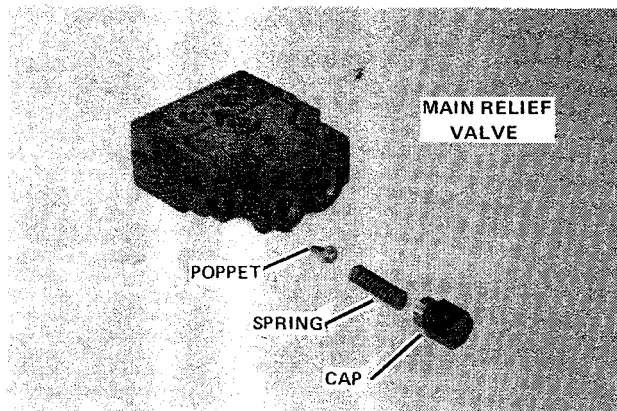


Figure 37.

38. Remove the components of the soft ride valve.

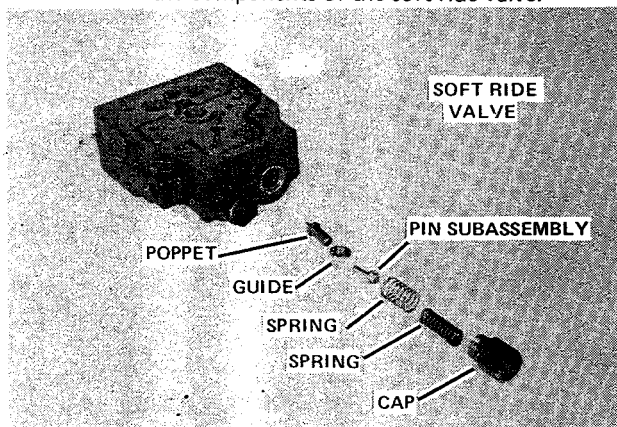


Figure 38.

39. Use an allen wrench to remove the two plugs which secure the high pressure relief valves. Remove the valve components.

The disassembly of the entire pump has been completed. The disassembly was done in five major steps.

1. Separation of the motor from the valve plate.
2. Disassembly of the motor.
3. Separation of the transfer block from the pump housing.
4. Disassembly of the pump.
5. Disassembly of the transfer block after inspection of its two sections.

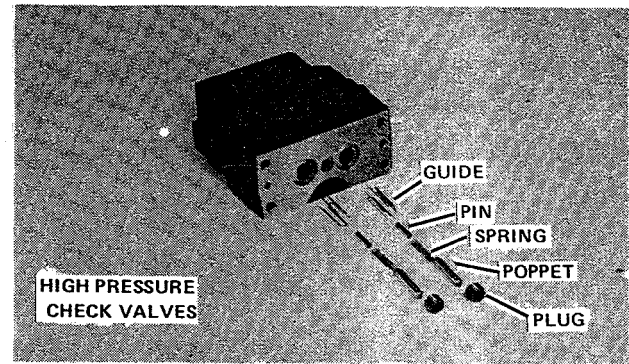


Figure 39.

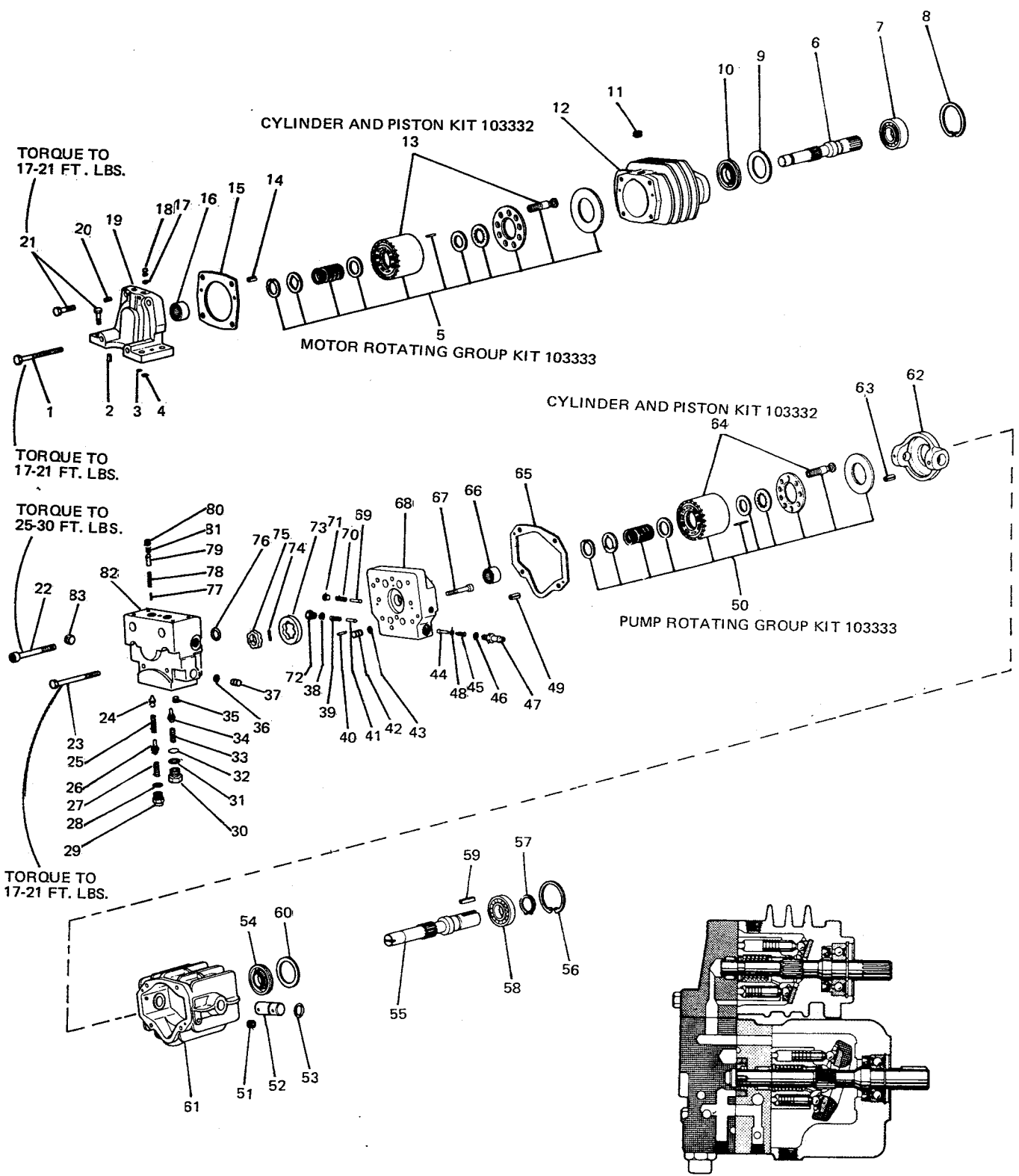
REASSEMBLY

Every component of the pump should be thoroughly cleaned and inspected if not already done. If any damage is located, it should be corrected by installing new components.

CAUTION

KEEP ALL COMPONENTS CLEAN AND FREE OF CONTAMINATION OF FOREIGN MATTER TO PREVENT ANY MALFUNCTION OF THE REASSEMBLED UNIT.

Once the pump has been reassembled and completely installed in the tractor, the system must be bled of air before the tractor can be returned to service. To accomplish this, fill the reservoir with clean hydrostatic fluid. Disengage the transmission lever at the rear of the tractor. Remove the spark plug from the engine. Using only the electric starter, turn the engine over, moving the hydrostatic control lever from full forward to full reverse. Add fluid as necessary to retain a proper reservoir level (proper level is to the plastic plug). Once the unit no longer needs fluid and no air bubbles can be seen coming up in the reservoir, the reservoir can be capped, the spark plug reinstalled and the tractor will be ready for service.



| Ref. No. | Simplicity Number | Description | Special Notes | Qty. Req. | Ref. No. | Simplicity Number | Description | Special Notes | Qty. Req. |
|----------|-------------------|------------------------------------|---------------|-----------|----------|-------------------|-----------------------------|---------------|-----------|
| 1 | 1650063 | Screw | | 2 | 56 | 1650104 | Snap Ring | | 1 |
| 2 | 1650064 | Pin | | 2 | 57 | 1650105 | Snap Ring | | 1 |
| 3 | 1650065 | "O" Ring | 1-4 | 1 | 58 | 1650106 | Bearing | | 1 |
| 4 | 1650066 | "O" Ring | 1-4 | 2 | 59 | 1650107 | Key | | 1 |
| 5 | 103333 | Motor Rotating Group Kit | | 1 | 60 | 1650108 | Spacer | | 1 |
| 6 | 1650067 | Shaft | | 1 | 61 | 1650109 | Pump Housing | | 1 |
| 7 | 1650068 | Bearing | | 1 | 62 | 1650110 | Yoke | | 1 |
| 8 | 1650069 | Snap Ring | | 1 | 63 | 1650111 | Pin | | 2 |
| 9 | 1650070 | Spacer | | 1 | 64 | 103332 | Cylinder Block & Piston Kit | | 1 |
| 10 | 1650071 | Shaft Seal | 4 | 1 | 65 | 1650112 | Gasket | 1-4 | 1 |
| 11 | 1650072 | Plug | | 1 | 66 | 1650142 | Bearing | 1 | 1 |
| 12 | 1650073 | Motor Housing | | 1 | 67 | 1650113 | Screw | 1 | 2 |
| 13 | 103332 | Cylinder Block & Piston Kit | | 1 | 68 | 1650114 | Valve Plate | 1 | 1 |
| 14 | 1650074 | Pin | | 2 | 69 | 1650115 | Valve | 1 | 2 |
| 15 | 1650075 | Gasket | 4 | 1 | 70 | 1650116 | Spring | 1 | 2 |
| 16 | 1650096 | Bearing | | 1 | 71 | 1650072 | Plug | 1 | 2 |
| 17 | 1650065 | "O" Ring | 4 | 2 | 72 | 1650117 | Plug | 1 | 1 |
| 18 | 1650076 | Plug | | 2 | 73 | | Outer Rotor * | 1-3 | 1 |
| 19 | 1650077 | Valve Plate (Includes Bearings 16) | | 1 | 74 | 1650118 | Key | 1-3 | 1 |
| 20 | 1650078 | Pin | | 2 | 75 | | Inner Rotor * | 1-3 | 1 |
| 21 | 1650079 | Screw | | 6 | 76 | 1650066 | "O" Ring | 1-4 | 2 |
| 22 | 1650080 | Screw | 1 | 2 | 77 | 1650119 | Pin | 1-2 | 2 |
| 23 | 1650081 | Screw | 1 | 2 | 78 | 1650122 | Spring | 1-2 | 2 |
| 24 | 1650082 | Poppet Sub-assembly | 1 | 1 | 79 | 1650123 | Valve | 1-2 | 2 |
| 25 | 1650083 | Spring | 1 | 1 | 80 | 1650124 | Plug | 1-2 | 2 |
| 26 | 1650084 | Pin Sub-assembly | 1 | 1 | 81 | 1650125 | Guide | 1-2 | 2 |
| 27 | 1650085 | Spring | 1 | 1 | 82 | 1650126 | Transfer Block | 1 | 1 |
| 28 | 1650086 | "O" Ring | 1-4 | 1 | 83 | 1650072 | Plug | 1 | 1 |
| 29 | 1650087 | Cap | 1 | 1 | | | | | |
| 30 | 1650088 | Cap | 1 | 1 | | | | | |
| 31 | 1650089 | "O" Ring | 1-4 | 1 | | | | | |
| 32 | 1650090 | Shim | 1 | 1 | | | | | |
| 33 | 1650091 | Spring | 1 | 1 | | | | | |
| 34 | 1650092 | Poppet | 1 | 1 | | | | | |
| 35 | 1650072 | Plug | 1 | 1 | | | | | |
| 36 | 1650065 | "O" Ring | 1-4 | 2 | | | | | |
| 37 | 1650093 | Plug | 1 | 1 | | | | | |
| 38 | 1650086 | "O" Ring | 1-4 | 1 | | | | | |
| 39 | 1650094 | Spring | 1 | 1 | | | | | |
| 40 | 1650064 | Pin | 1 | 2 | | | | | |
| 41 | 1650095 | Valve | 1 | 1 | | | | | |
| 42 | 1650076 | Plug | 1 | 2 | | | | | |
| 43 | 1650065 | "O" Ring | 1-4 | 2 | | | | | |
| 44 | 1650095 | Poppet | 1 | 1 | | | | | |
| 45 | 1650094 | Spring | 1 | 1 | | | | | |
| 46 | 1650086 | "O" Ring | 1-4 | 1 | | | | | |
| 47 | 1650097 | Connector | 1 | 1 | | | | | |
| 48 | 1650098 | Spacer | 1 | 1 | | | | | |
| 49 | 1650099 | Pin | | 2 | | | | | |
| 50 | 103333 | Pump Rotating Group Kit | | 1 | | | | | |
| 51 | 1650100 | Plug | | 2 | | | | | |
| 52 | 1650101 | Pintle | | 2 | | | | | |
| 53 | 1650102 | "O" Ring | 4 | 2 | | | | | |
| 54 | 1650071 | Shaft Seal | 4 | 1 | | | | | |
| 55 | 1650103 | Shaft | | 1 | | | | | |

* Cannot be ordered separately, order 103331 or 103330.

SPECIAL NOTES:

The above parts which have a number or numbers in the "special notes" column may be ordered in one of two ways. The parts may be ordered separately or as a part of one or more of four kits. The four kits are listed below. Example: The number 1-4 behind a part would indicate it is part of kit one and four.

| | | |
|---|--------|------------------------------|
| 1 | 103331 | Transfer Block & Valve Assy. |
| 2 | 103247 | Repair Kit |
| 3 | 103330 | Charge Pump Kit |
| 4 | 103248 | Seal Kit |

SYSTEM TROUBLESHOOTING GUIDE

| Trouble | Cause | Remedy |
|--|--|--|
| I. Excessive noise in hydrostatic transmission | Air in the system | <ol style="list-style-type: none"> 1. Check for air leaks on suction line. 2. "Bleed" hydraulic lines at highest point downstream of replenishing pump and while system is under pressure. |
| | Vacuum condition | <ol style="list-style-type: none"> 1. Check inlet (suction) lines and fittings for air leaks. 2. Check replenishing pump function. |
| | Oil too thick | Be certain correct type of oil is used for refilling or adding to the system. |
| | Cold weather | Run hydraulic system until unit is warm to the touch and noise disappears. |
| II. Hydraulic transmission overheating | Heat exchanger not functioning | Locate trouble and repair and replace. |
| | Cooling fan not operating | Repair. |
| | Cooling fins packed with accumulated debris | Remove material from between fins. |
| | Fluid level low | Add oil to operating level. |
| III. System not developing pressure | <ol style="list-style-type: none"> 1. Sheared shaft key 2. Misadjusted or broken control linkage 3. Disconnected or broken drive mechanisms | Locate and repair. |
| IV. Loss of fluid | <ol style="list-style-type: none"> 1. Ruptured hydraulic lines 2. Loose fittings 3. Leaking gaskets or seals in hydrostatic transmission | <ol style="list-style-type: none"> 1. Check all external connections, tubing, and hoses. Tighten connections, replace ruptured tube or hose. 2. Observe mating sections of hydrostatic transmission for leaks. Replace seals or gaskets if possible. |