



Service Repair Manual

Model

287B MULTI TERRAIN LOADER

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Product: MULTI TERRAIN LOADER

Model: 287B MULTI TERRAIN LOADER ZSA

Configuration: 267B, 277B and 287B Multi Terrain Loader ZSA00001-UP (MACHINE) POWERED BY 3044C Engine

Disassembly and Assembly 267B, 277B and 287B Multi Terrain Loaders Power Train

Media Number -REN4884-09

Publication Date -01/04/2010

Date Updated -15/04/2010

i02277873

Piston Pump (Hydrostatic) - Remove

SMCS - 5070-011-H7

S/N - CYC1000-UP

S/N - MDH400-UP

S/N - ZSA1600-UP

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	247-4296	Handle Assembly	1
	FT-2999	Weight	1
B	159-3327	Wrench Adapter	1
C	138-7575	Link Bracket	1
ZZ	6V-9507	Face Seal Plug (9/16 - 1 THD)	5
	6V-9828	Cap As (9/16 - 1 THD)	5
	6V-9508	Face Seal Plug (11/16 - 16 THD)	1
	6V-9829	Cap As (11/16 - 16 THD)	1
	6V-9509	Face Seal Plug (13/16 - 16 THD)	1
	6V-9830	Cap As (13/16 - 16 THD)	1
	6V-9511	Face Seal Plug (1 3/16 - 12 THD)	4

6V-9832	Cap As (1 3/16 - 12 THD)	4
9U-7077	Plug	1
9U-7079	Plug	1

Start By:

- A. Remove the gear pump. Refer to Disassembly and Assembly, "Gear Pump - Remove and Install".

Note: SERVICE DATA: TOOLING (ZZ) WILL NOT BE IDENTIFIED IN PHOTOGRAPHS IN THE REMOVAL OR THE INSTALLATION. THIS TOOLING IS SHOWN IN ORDER TO ASSIST THE EXPERIENCED SERVICEMAN.

Note: Put identification marks on all hoses, on all hose assemblies, on all wires, and on all tube assemblies for installation purposes. Plug all hose assemblies and all tube assemblies. This helps to prevent fluid loss, and this helps to keep contaminants from entering the system.



Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Turn the disconnect switch OFF when draining and/or removing any fuel system components.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

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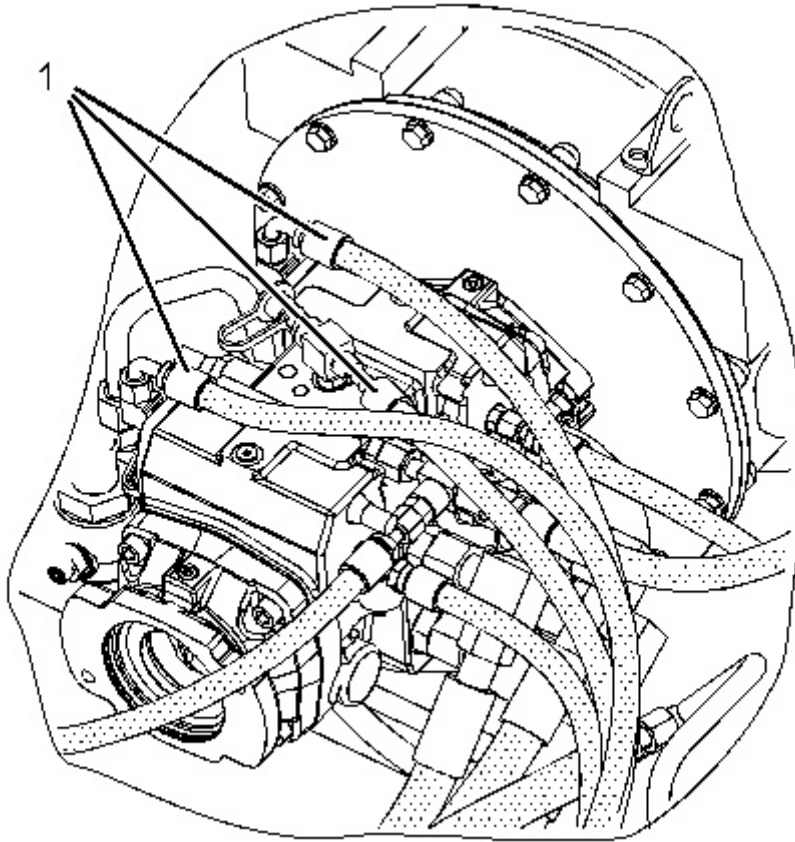


Illustration 1

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1. Disconnect hose assemblies (1) .
-

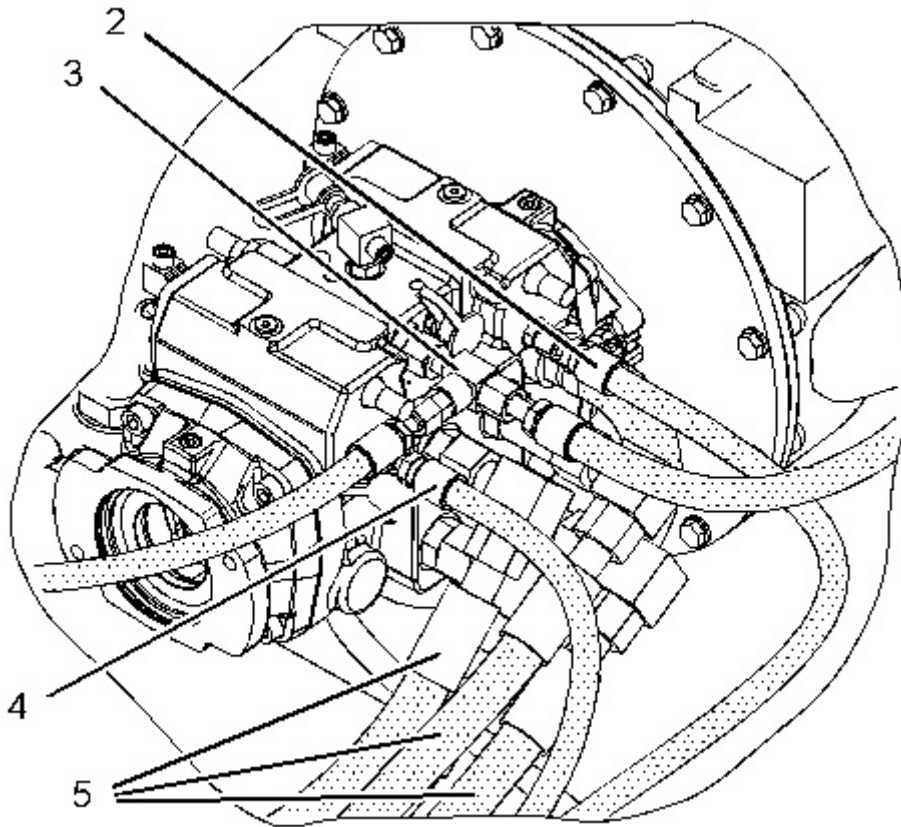


Illustration 2

g01140948

2. Disconnect hose assemblies (2), fitting (3), and hose assembly (4) .
 3. Disconnect hose assemblies (5) .
-

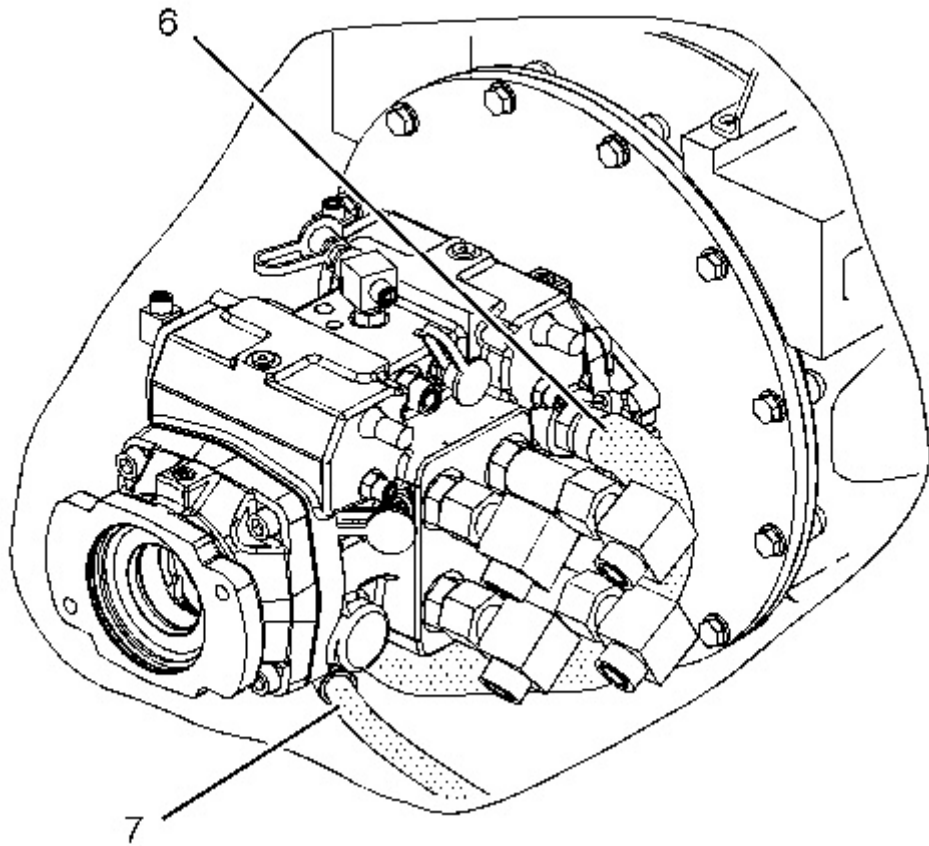


Illustration 3

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4. Disconnect hose assemblies (6) and (7) .
-

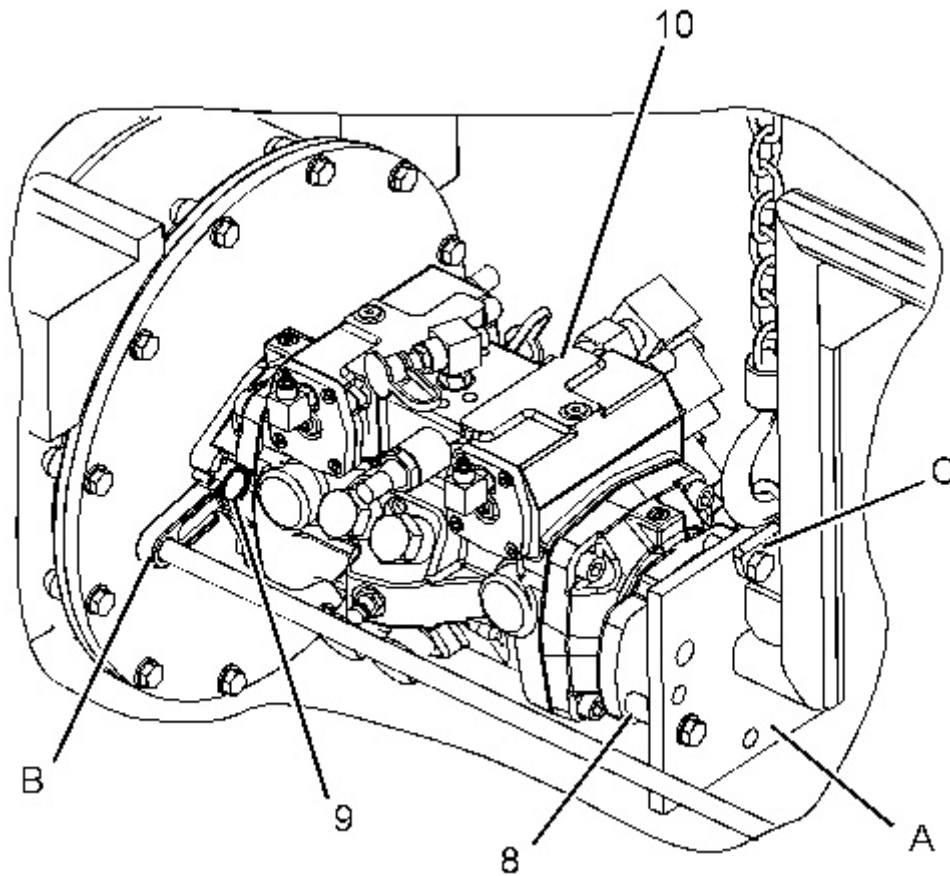


Illustration 4

g01140951

5. Attach Tooling (A) and (C) to the pump, as shown.

Note: Install approximately 50 mm (2 inch) of spacers (8). This will allow you to remove the pump without removing the hydraulic tank.

6. Use Tooling (B) in order to remove bolts (9) .
7. Use Tooling (A), Tooling (C) and a suitable lifting device to remove piston pump (10). The weight of piston pump (10) is approximately 91 kg (200 lb).

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Disassembly and Assembly 267B, 277B and 287B Multi Terrain Loaders Power Train

Media Number -REN4884-09

Publication Date -01/04/2010

Date Updated -15/04/2010

i02362806

Piston Pump (Hydrostatic) - Disassemble

SMCS - 5070-015-H7

S/N - CYC1-999

S/N - MDH1-399

S/N - ZSA1-1599

Disassembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	2
B	1P-1861	Retaining Ring Pliers	1
C	1P-1862	Retaining Ring Pliers	1
D	147-3497	Spring Compressor	1
E	1U-7600	Slide Hammer Puller Gp	1
F	1P-1859	Retaining Ring Pliers	1
G	8H-0663	Bearing Puller Gp	1

Start By:

- A. Remove the piston pumps. Refer to Disassembly and Assembly, "Piston Pumps (Hydrostatic) - Remove" for the correct procedure.

Note: Regular maintenance and frequent inspections are routine precautions. Practice preventive maintenance before damage occurs. Preventive maintenance can help to avoid a failure. If a failure occurs, an accurate diagnosis of the cause can prevent a recurrence. Information is available to analyze failures for piston pumps and motors. Refer to Special Publication, SEBD0641, "Analyzing Axial Piston Pump and Motor Failures".

Note: Many times, the installation of new parts is not necessary. The installation of used parts during reconditioning is acceptable. Used parts can result in a substantial cost reduction. Reusable information is available on piston pumps and motors. Refer to Special Publication, SEBF8032, "Guideline For Reusable Parts - Piston Pumps and Motors". During reconditioning, correct any conditions that might have caused the original failure.

Note: Cleanliness is an important factor. Before the disassembly procedure, the exterior of the component should be thoroughly cleaned. This will help to prevent dirt from entering the internal mechanism. Dirt and contaminants can damage precision components that are in pumps and motors. All disassembly and assembly procedures must be performed on a clean work surface. Clean all the interior components in clean solvent. Dry all the interior components with compressed air. Plug ports and plug hoses on the machine during repair.

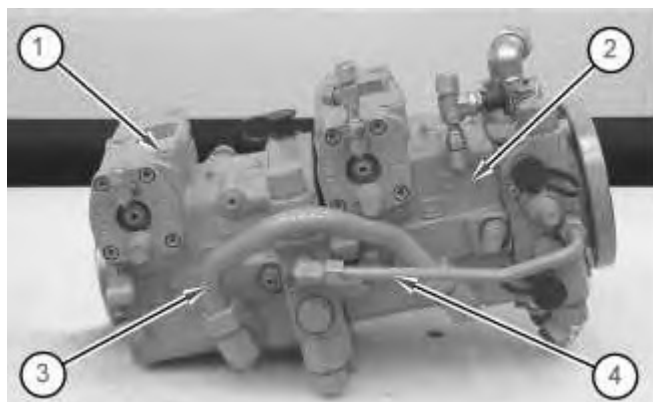
NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Note: The hydraulic oil must be contained in the proper manner. Refer to Special Publication, NENG7004, "Contamination Control Catalog".



1. The combined weight of the piston pumps is approximately 84 kg (185 lb).

Note: Both pump housings (1) and (2) are identical. Only one pump will be disassembled and assembled.

2. Remove tube assemblies (3) and (4) from the pumps.

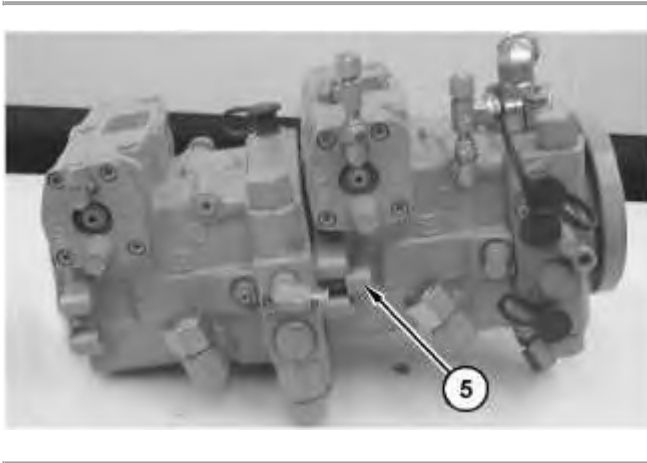


Illustration 2

3. Remove bolts (5) .

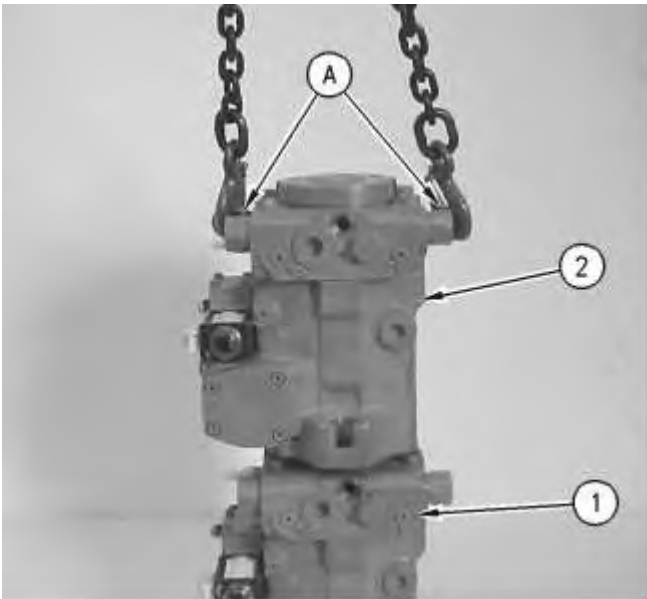


Illustration 3

4. Use Tooling (A) and a suitable lifting device in order to separate pump housing (2) from pump (1) . The weight of pump housing (2) is approximately 42 kg (93 lb).

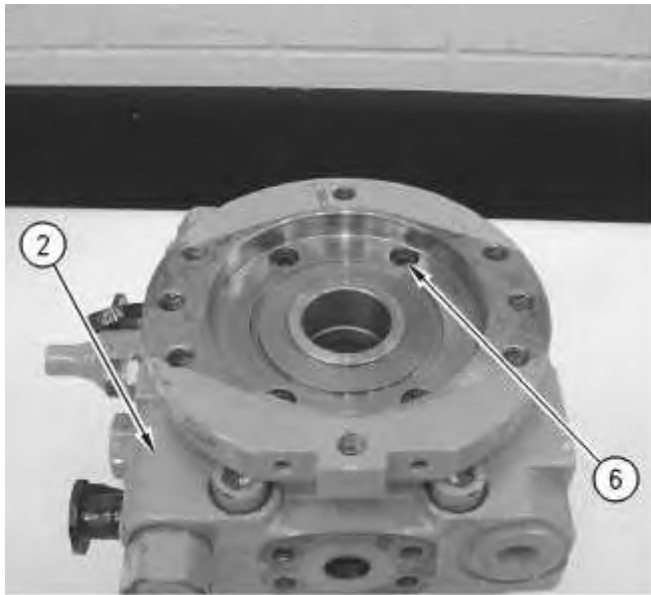


Illustration 4

g00996028

5. Remove bolts (6) from pump housing (2) .

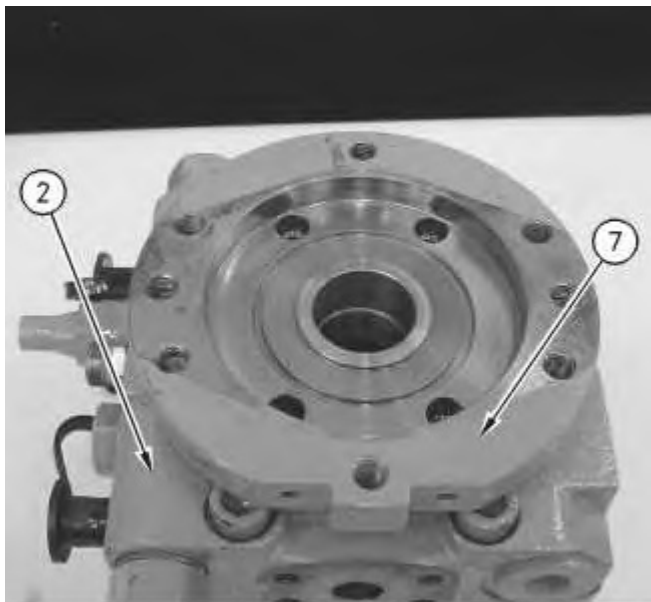


Illustration 5

g00996030

6. Place marks on housing (7) for assembly purposes. Remove housing (7) .
-

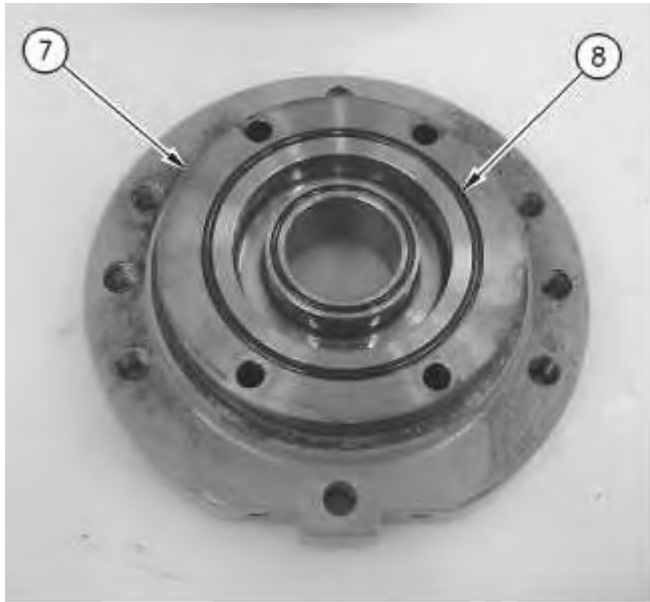


Illustration 6

g00996225

7. Remove O-ring seals (8) from housing (7) .

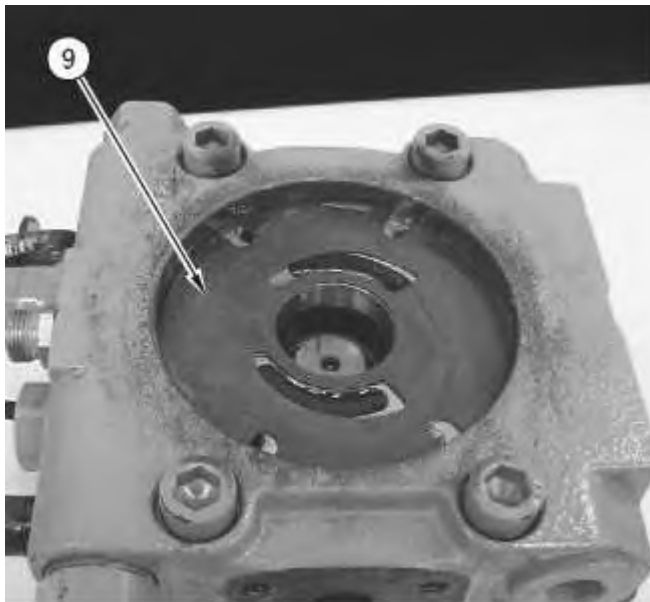


Illustration 7

g00996031

Note: Mark wear plate (9) for assembly purposes.

8. Remove wear plate (9) .

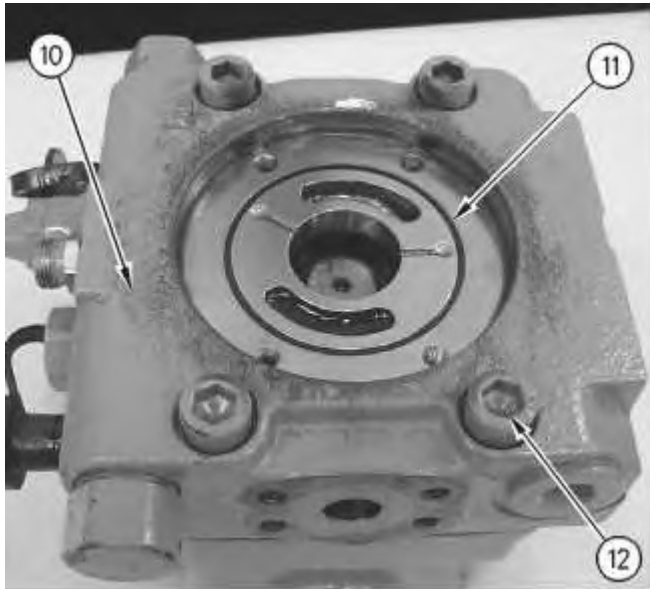


Illustration 8

g00996032

9. Remove O-ring seal (11) from head (10) .
10. Remove bolts (12) from head (10) .
11. Remove head (10) carefully. Port plate (13) may separate from head (10) .

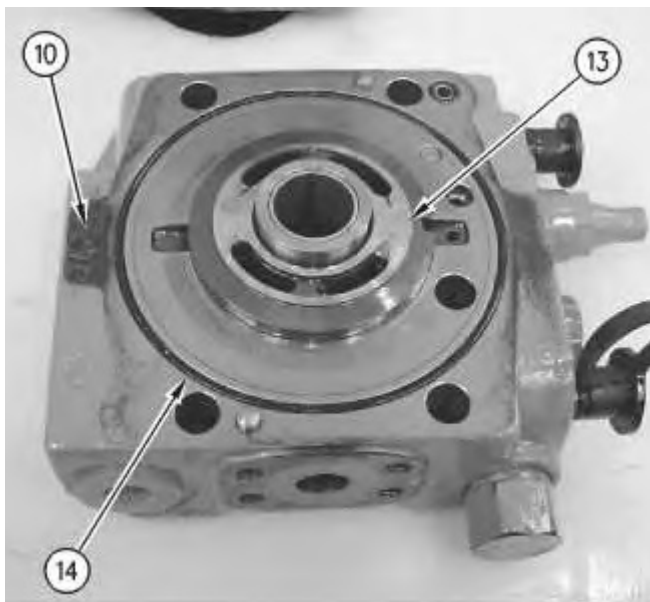


Illustration 9

g00996033

12. Rotate head (10) . Place alignment marks on port plate (13) . Remove port plate (13) from head (10) .
13. Remove O-ring seals (14) from head (10) .

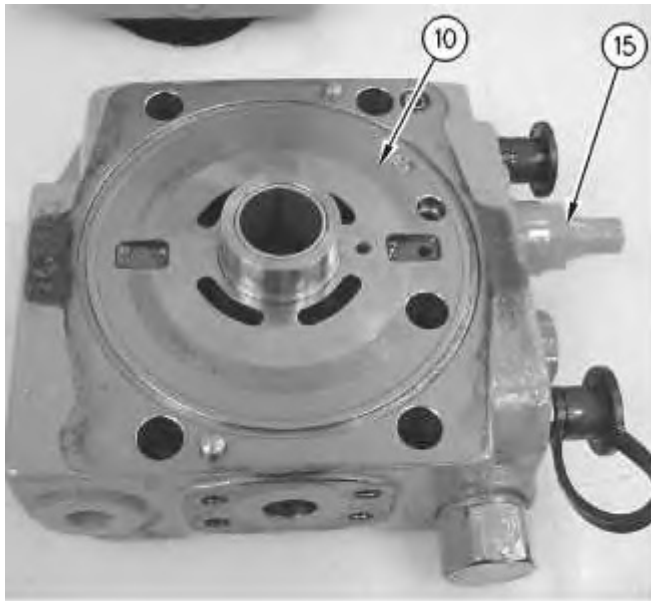


Illustration 10

g00996284



WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

14. Remove relief valve (15) from head (10) .
-

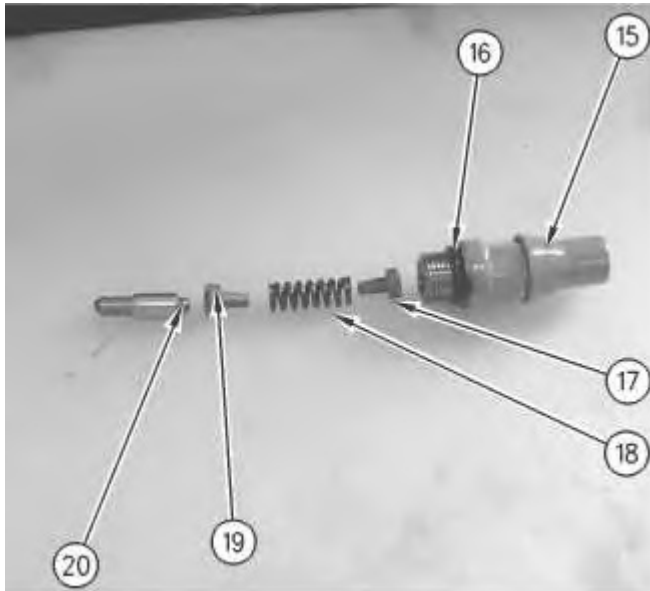


Illustration 11

g00996287

15. Remove O-ring seal (16) from relief valve (15) .
16. Remove retainer (17) , spring (18) , retainer (19) , and control piston (20) from relief valve (15) .



Illustration 12

g00996350

WARNING

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Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

17. Remove valve assembly (21) from head (10) .

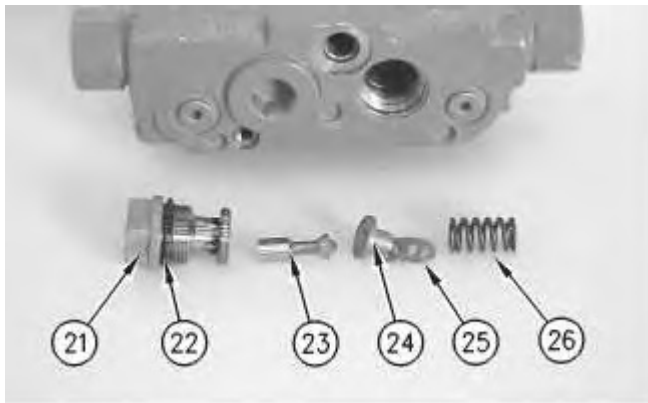


Illustration 13

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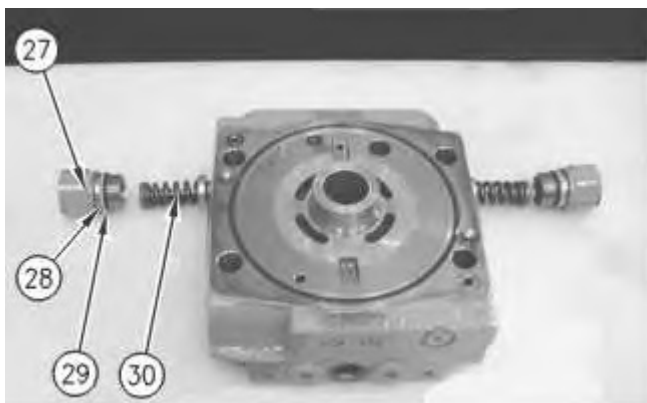
! WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

18. Remove O-ring seal (22) , spool (23) , retainer (24) , shims (25) , and spring (26) from valve assembly (21) .



! WARNING

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Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

19. Remove relief valves (27) .

Note: Both relief valves are identical.

20. Remove backup ring (28) , O-ring seals (29) , and spring assembly (30) from relief valves (27) .

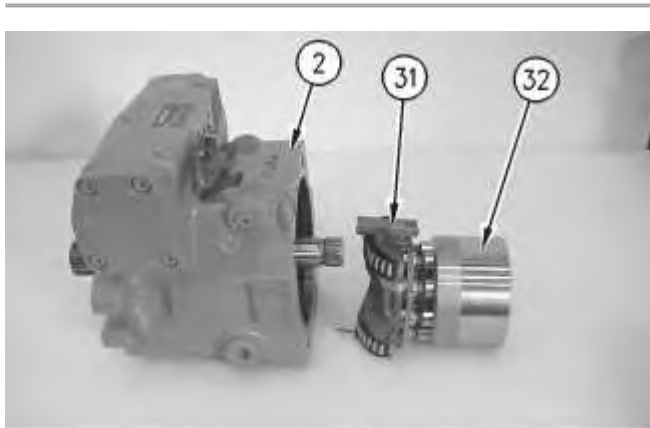


Illustration 15

g00996884

21. Move pump housing (2) to the HORIZONTAL position.
22. Remove swashplate assembly (31) and the rotating assembly (32) as a unit from pump housing (2) .
23. Separate swashplate assembly (31) from rotating group (32) .
-



Illustration 16

g00996885

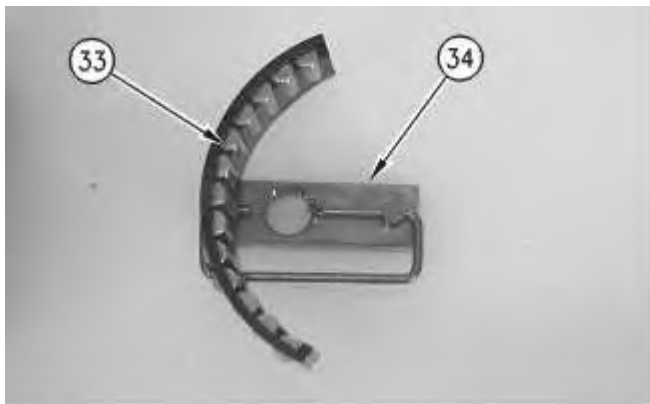


Illustration 17

g00996886

24. Remove pin (34) and bearing (33) from one side of the swashplate assembly.

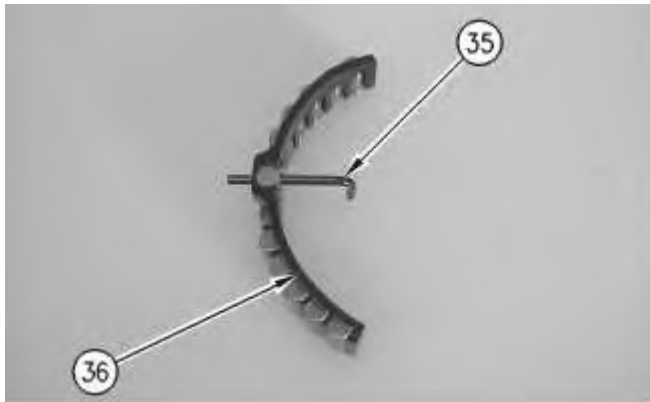


Illustration 18

g00996887

25. Remove pin (35) and bearing (36) from the other side of the swashplate assembly.

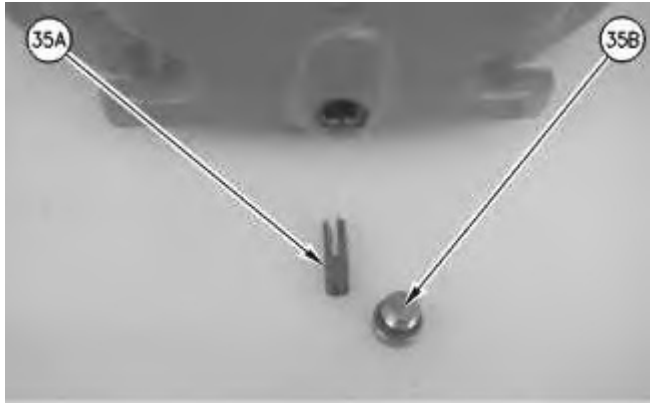


Illustration 19

g00997254

26. Remove the plug and O-ring seal (35B) . Remove pin (35A) .

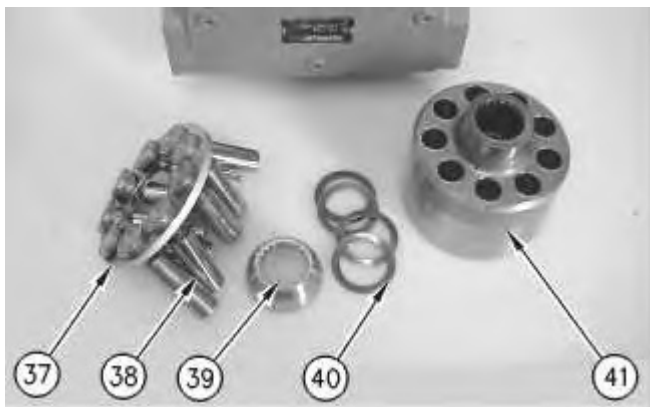


Illustration 20

g00996900

WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

27. Place a mark on pistons (38) and barrel (41) for assembly purposes. The pistons must be installed in the same position.
28. Remove reaction plate (37) , pistons (38) , and retainer (39) from barrel (41) . Remove springs and shims (40) from barrel (41) .

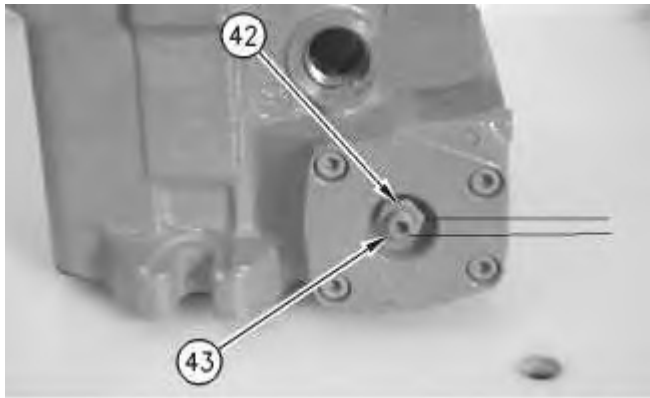


Illustration 21

g00996901

29. Measure the distance from the top of locking nut (42) to the top of allen head screw (43) . Record this dimension for assembly purposes.

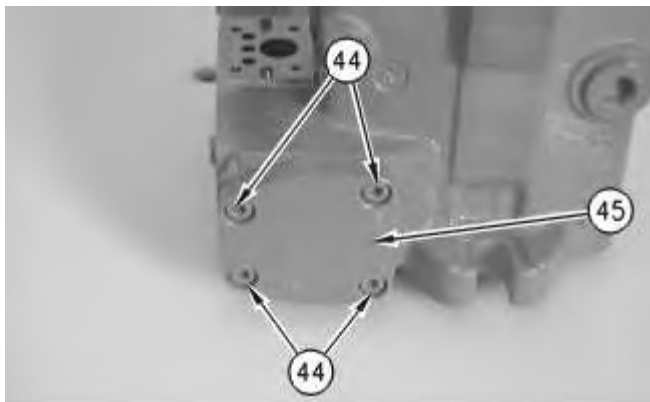
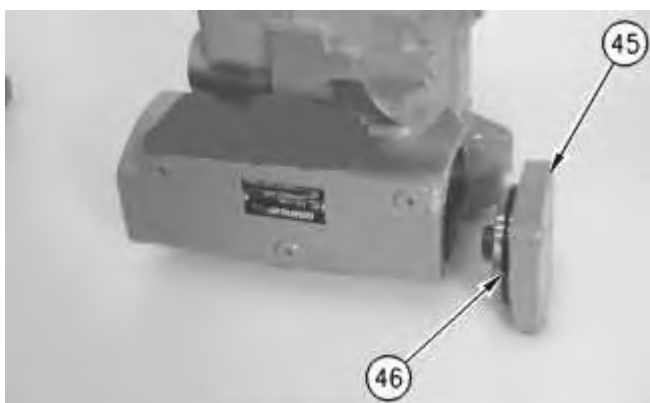


Illustration 22

g00996904

30. Remove bolts (44) . Remove cover (45) .



31. Remove O-ring seal (46) from cover (45) .

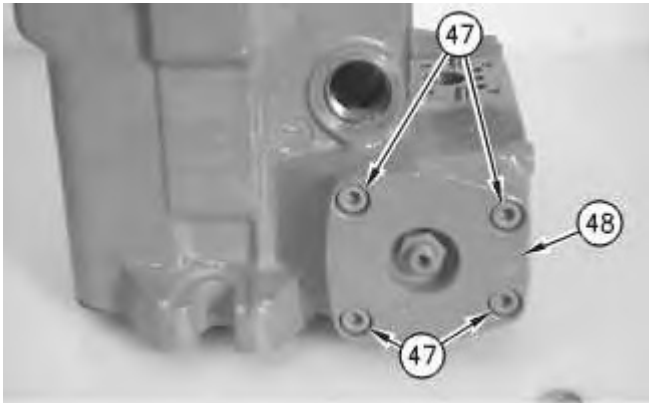


Illustration 24

32. Remove bolts (47) from cover (48) .

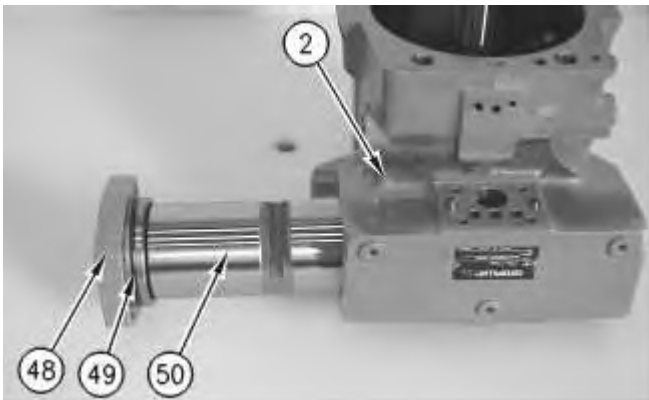


Illustration 25

33. Remove actuator (50) from pump housing (2) .
 34. Separate cover (48) from actuator (50) .
 35. Remove O-ring seal (49) from cover (48) .
-



Illustration 26

g00997149

! WARNING

Personal injury can result from parts and/or covers under spring pressure.

Spring force will be released when covers are removed.

Be prepared to hold spring loaded covers as the bolts are loosened.

36. Use Tooling (C) and a suitable press in order to remove retaining ring (51) .



Illustration 27

g00997154

! WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

37. Use a suitable press and Tooling (D) in order to remove ring assembly (52) .

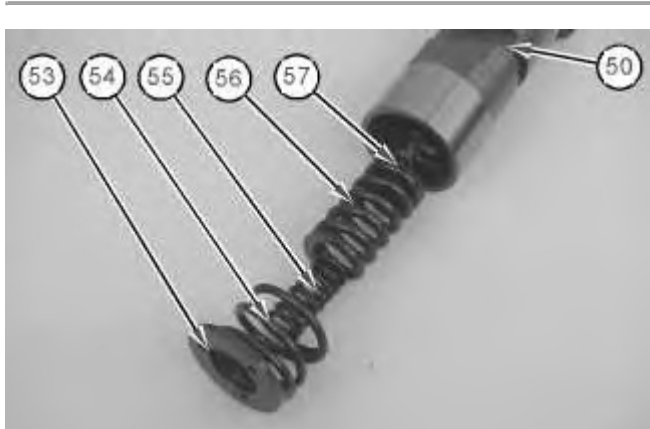


Illustration 28

g01063606

38. Remove spring retainer (53) from actuator (50) . Remove springs (54) , (55) , and (56) from actuator (50) . Remove spring retainer (57) from actuator (50) .



Illustration 29

g00997159

 **WARNING**

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

39. Rotate actuator (50) to the other side. Use Tooling (C) and a suitable press in order to remove retaining ring (58) .

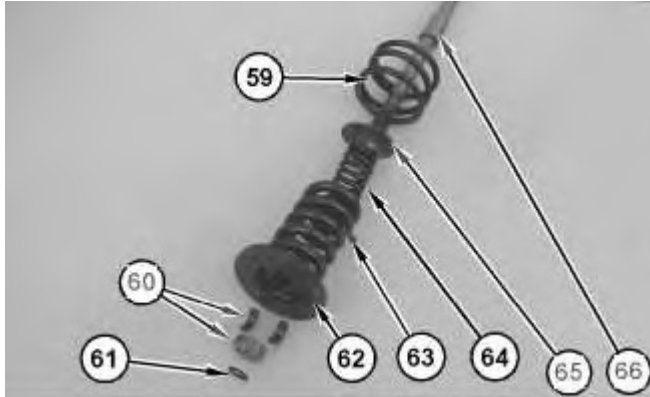


Illustration 30

g01063610

! WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

40. Remove O-ring seal (61) and ring assembly (60) . Remove spring retainer (62) . Remove springs (63) , (64) , and (59) . Remove spring retainer (65) and rod (66) .
-



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Illustration 31

g01038447

41. Remove seal (67) from pump housing (2) .
42. Remove liner (68) from pump housing (2) .

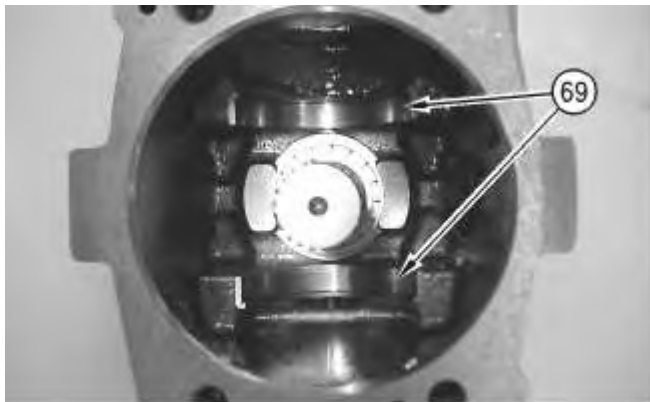


Illustration 32

g00997165

43. Remove bearing races (69) from inside pump housing (2) .

Note: Bearing races (69) have a ridge on one side of the bearing. The ridge faces the OUTSIDE of the pump. Damage will occur if the bearing races are removed or installed incorrectly.

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