

PARTS & SERVICE NEWS

REF NO. AA00053A

DATE June 17, 2004

(C)

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This Parts and Service News supersedes AA00053 dated June 6, 2000 which should be discarded.

SUBJECT: INTRODUCTION OF PARTS AND INSTALLATION FOR THE GROUND-DRIVEN STEERING SYSTEM.

PURPOSE: To provide service information to the field.

APPLICATION: WA380-3L Wheel Loader Serial Number A50001 and UP

FAILURE CODE: 4A00Z9

DESCRIPTION: This Service News is meant to introduce optional ground driven steering system which enables the operator to continue proper steering at times of emergencies, such as when engine trouble occurs while the vehicle is traveling. The following parts lists are the serviceable parts for the ground-driven steering hydraulic lines, pumps, and valves. When installing this option, follow the procedures outlined in this service news.

MACHINE PREPARATION

1. Park the machine on a flat level surface; lower the work equipment to the ground. Shut off the engine and cycle the controls to remove any residual hydraulic pressure from the work equipment circuits. Turn the parking brake switch on and block the tires or tracks.
2. Remove the key from the ignition switch until the repairs are complete. Place a tag on the steering controls advising: "This machine is being repaired. It should not be started or moved for any reason until the tag is removed by the person doing the repairs."



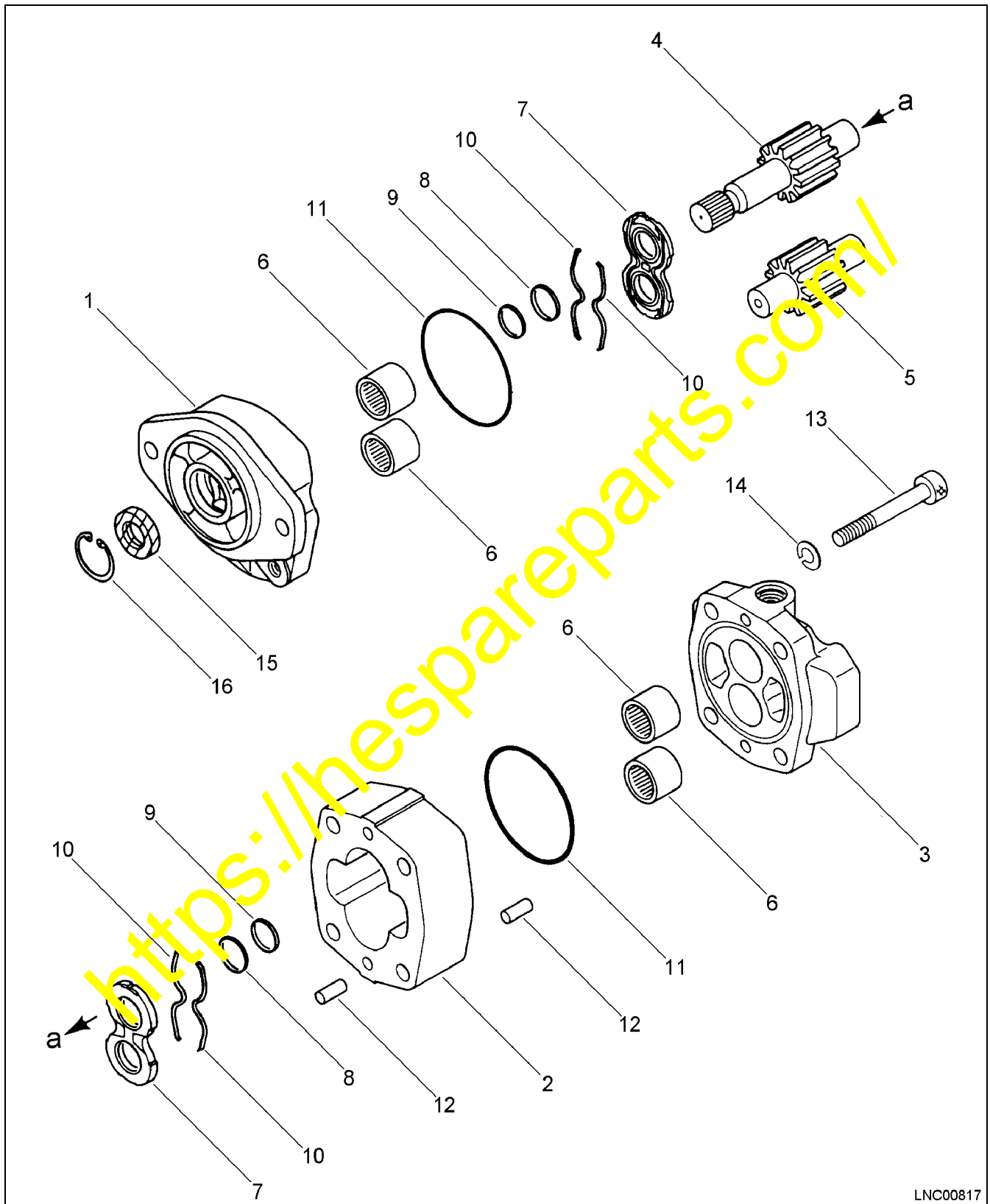
WARNING! Observe all safety and precautionary standards as dictated by the environment and work conditions under which the equipment will be inspected, reworked and repaired. Consult the "Shop Manual" and "Operator's and Maintenance Manual" and your "Komatsu district service manager" with any/all questions regarding safety.

Remark

These instructions are intended to supplement the service data contained in the appropriate "Shop Manual". Always refer to that manual for Removal, Installation, Disassembly and Reassembly instructions when not contained in this document.

PARTS LIST

★ Pump Assembly (Ground-driven Steering)

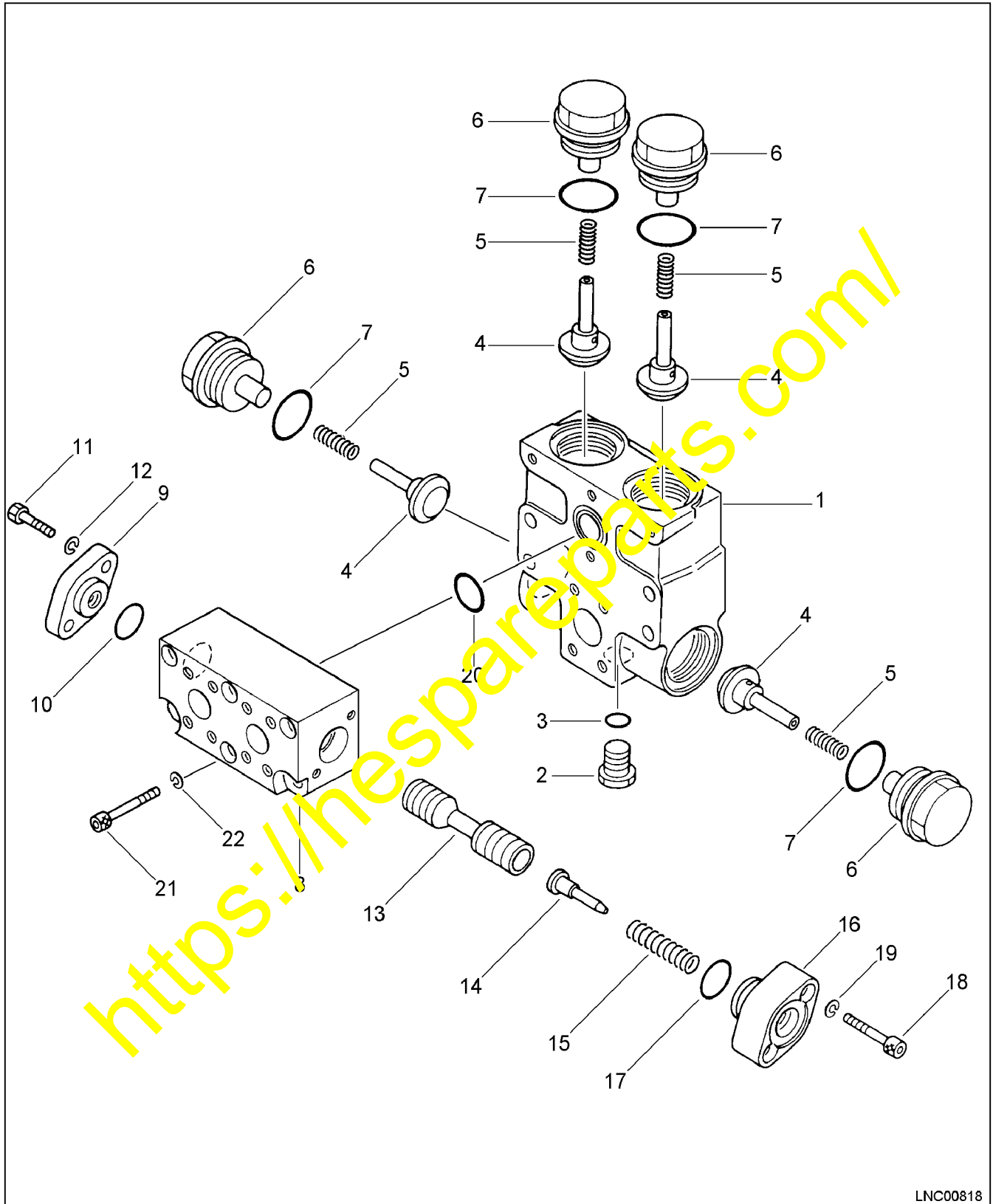


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Item	Part Number	Description	Qty.	Ref.
	704-30-32110	PUMP ASSEMBLY, SUPPLY.....	1	
1	704-37-02030	. BRACKET, MOUNTING	1	
2	704-38-32010	. CASE, GEAR	1	
3	704-37-02180	. COVER	1	
4	704-18-32412	. GEAR, DRIVE	1	
5	705-18-32512	. GEAR, DRIVEN	1	
6	704-37-02350	. BEARING	1	
7	704-37-26010	. PLATE, SIDE	2	
8	704-37-02440	. RING, SEAL	2	
9	704-37-02470	. RING, BACK-UP	2	
10	704-37-02450	. SEAL, BACK-UP	4	
11	07000-12100	. O-RING	2	
12	04020-01024	. PIN, DOWEL	4	
13	705-17-31495	. BOLT	4	
14	705-17-04980	. WASHER, SPRING	4	
15	705-17-02830	. SEAL, OIL	1	
16	04065-04018	. RING, RETAINING	1	

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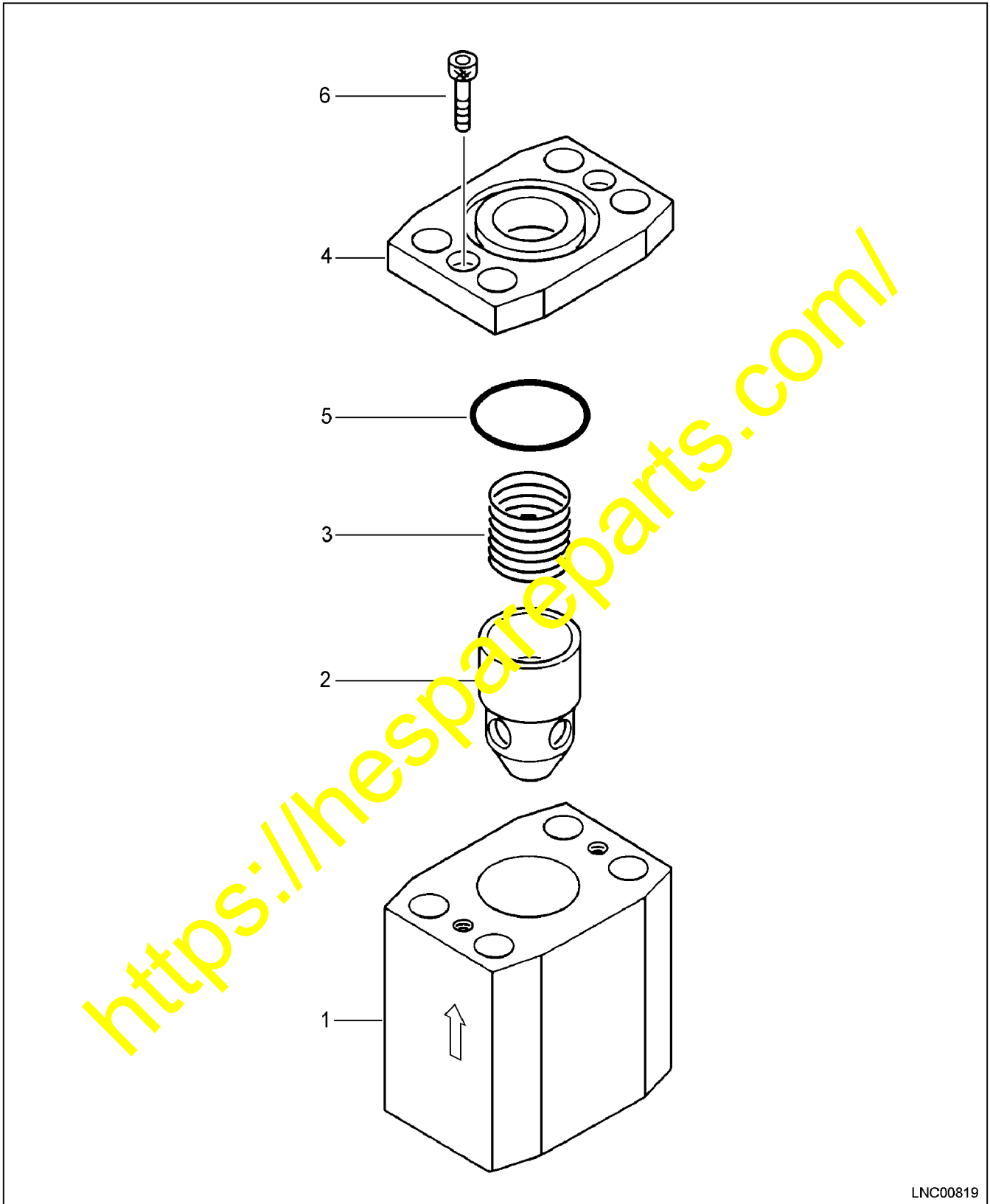
★ Diverter Valve Assembly (Ground-driven Steering)



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Item	Part Number	Description	Qty.	Ref.
	427-875-1101	VALVE ASSEMBLY, DIVERTER	1	
1	NSS	. BODY	1	
2	07040-12012	. PLUG	1	
3	07002-12034	. O-RING	1	
4	421-875-1130	. POPPET	4	
5	421-875-1140	. SPRING	4	
6	421-875-1150	. PLUG	4	
7	07002-14234	. O-RING	4	
8	NSS	. BODY	1	
9	421-875-1340	. COVER	1	
10	07000-13028	. O-RING	1	
11	01010-80825	. BOLT	2	
12	01602-20825	. WASHER, SPRING	2	
13	NSS	. SPOOL	1	
14	421-875-1360	. RETAINER	1	
15	421-875-1330	. SPRING	1	
16	421-875-1350	. COVER	1	
17	07000-13025	. O-RING	1	
18	01252-40830	. BOLT	2	
19	01602-20825	. WASHER, SPRING	2	
20	07000-13025	. O-RING	1	
21	01252-40830	. BOLT	4	
22	01602-20825	. WASHER, SPRING	4	

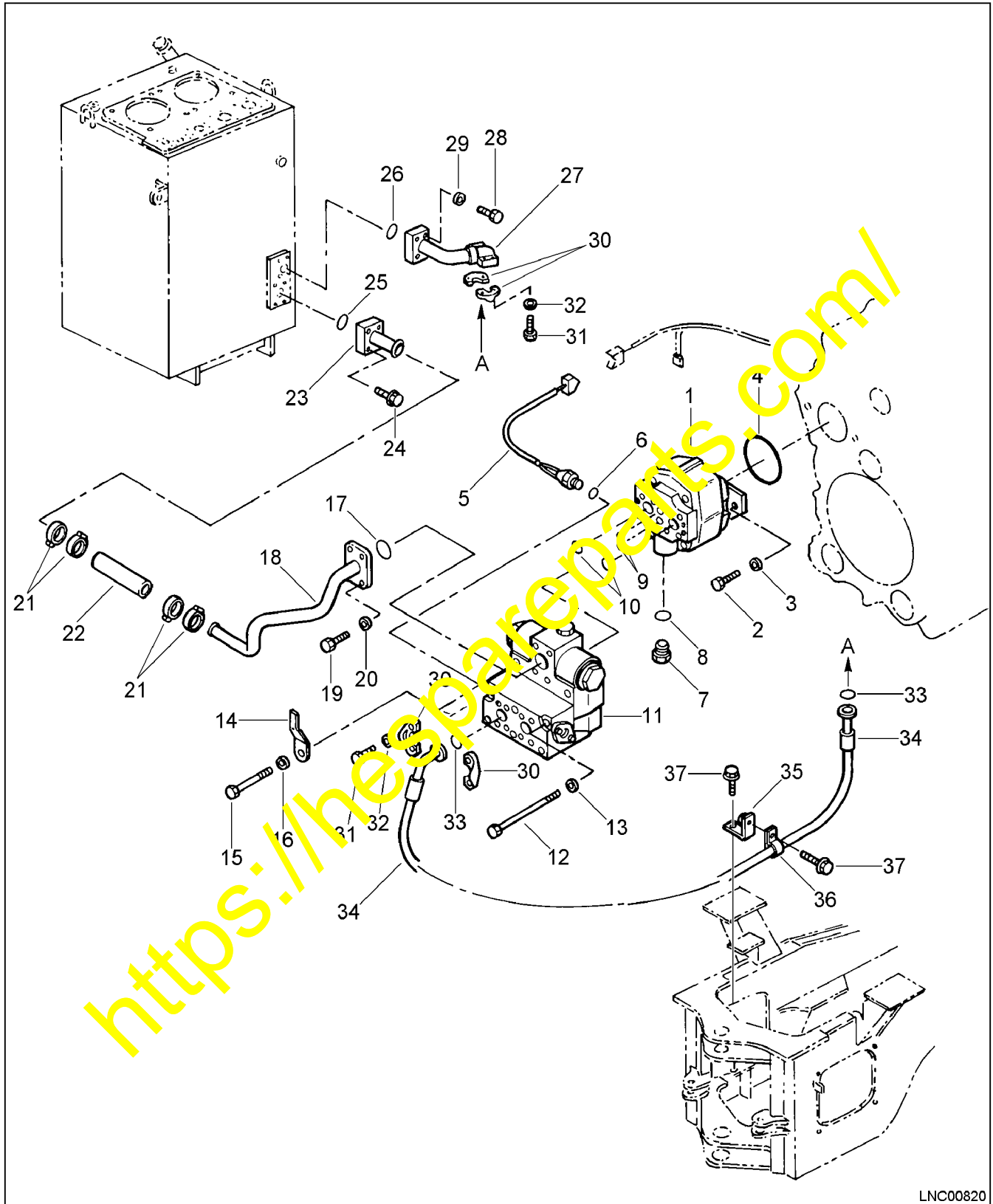
★ Check Valve Assembly (Ground-driven Steering)



Item	Part Number	Description	Qty.	Ref.
	702-13-23902	VALVE ASSEMBLY, CHECK	1	
1	702-13-22911	. BODY	1	
2	702-13-22921	. POPPET	1	
3	702-13-22940	. SPRING	1	
4	702-13-22931	. PLATE	1	
5	07000-23035	. O-RING	1	
6	708-25-12380	. BOLT	2	

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★ Piping - Hydraulic Tank To Ground-driven Steering Pump



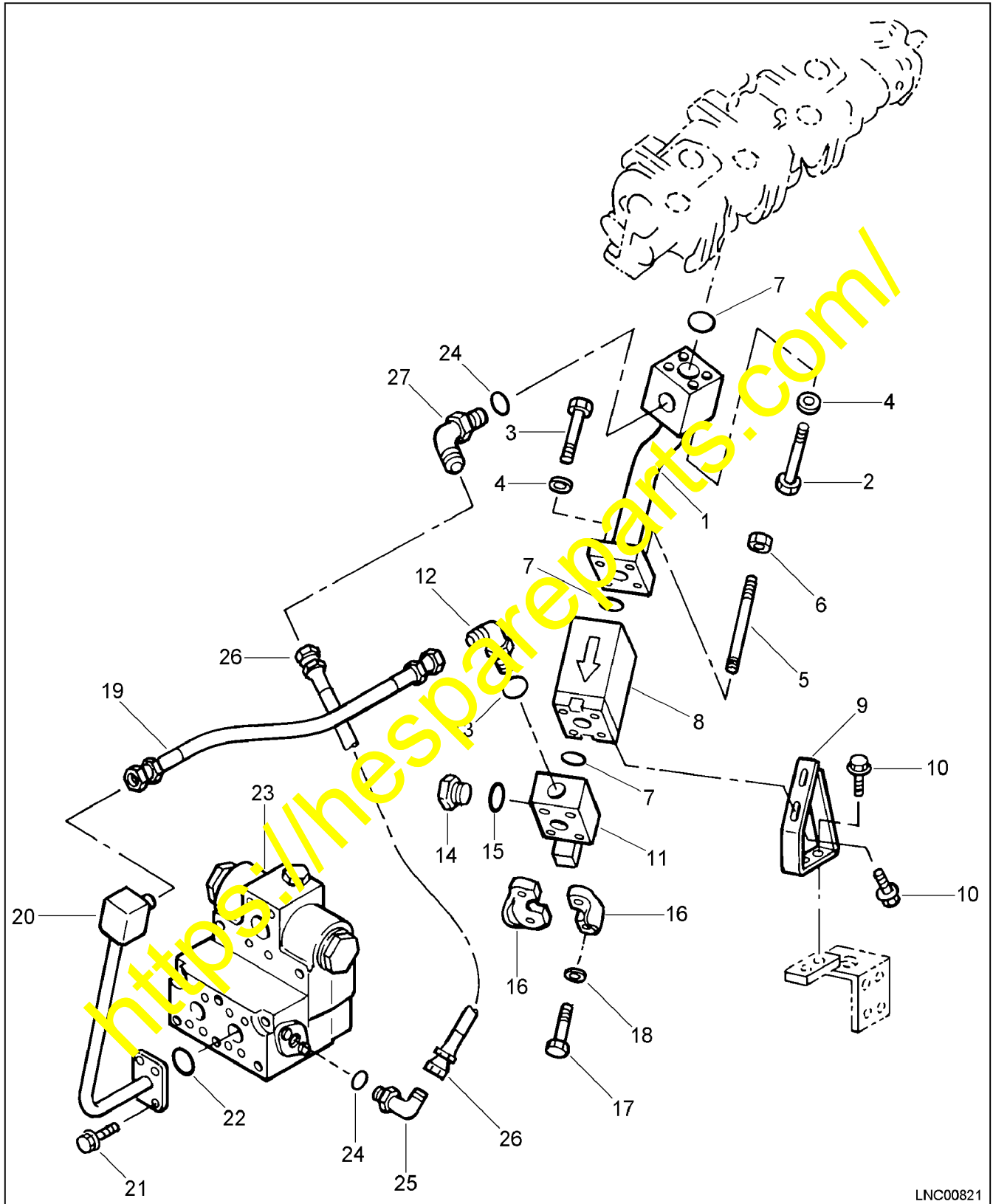
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Item	Part Number	Description	Qty.	Ref.
1	704-30-32110	PUMP ASSEMBLY, GDS (SEE PAGE 3).....	1	
2	01010-81235	BOLT, PUMP MOUNTING	2	
3	01643-31232	WASHER	2	
4	07000-12105	O-RING, PUMP MOUNTING	1	
5	421-06-21980	SENSOR, GROUND-DRIVEN STEERING	1	
6	07000-12034	O-RING	1	
7	07040-12012	PLUG	1	
8	07000-12034	O-RING	1	
9	07000-12012	O-RING	2	
10	07000-13040	O-RING	2	
11	421-875-1101	DIVERTER VALVE ASSEMBLY (SEE PAGE 5).....	1	
12	01011-81045	BOLT	2	
13	01643-31032	WASHER	2	
14	08053-01512	CLIP	1	
15	01010-81085	BOLT	2	
16	01643-31032	WASHER	2	
17	07000-13042	O-RING	1	
18	423-875-2290	TUBE	1	
19	07372-21035	BOLT	4	
20	01643-51032	WASHER	4	
21	690 063 C1	CLAMP, HOSE	4	
22	07260-04118	HOSE	1	
23	423-875-2250	TUBE	1	
24	01435-01230	BOLT	4	
25	07000-13048	O-RING	1	
26	07000-13035	O-RING	1	
27	423-875-2150	TUBE	1	
28	01010-81040	BOLT	4	
29	01643-51032	WASHER	4	
30	07371-31049	FLANGE	4	

Item	Part Number	Description	Qty.	Ref.
31	07372-21035	BOLT	8	
32	01643-51032	WASHER	8	
33	07000-13032	O-RING	2	
34	07298-01010	HOSE	1	
35	423-875-2280	BRACKET	1	
36	281-101-13180	CLAMP, HOSE	1	
37	01435-01016	BOLT	2	

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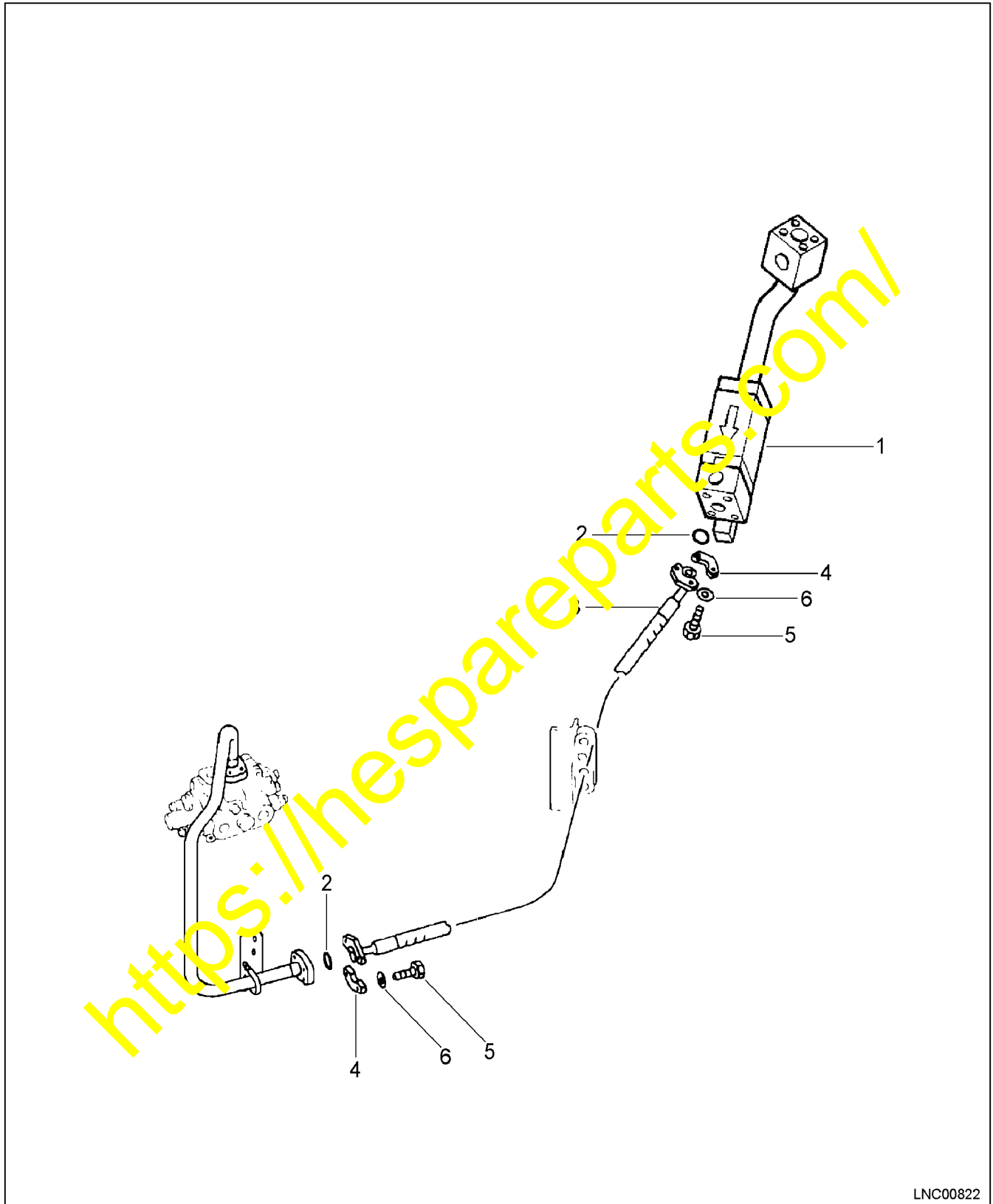
★ Piping - Hydraulic Pump To Diverter Valve



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Item	Part Number	Description	Qty.	Ref.
1	423-875-A210	TUBE	1	
2	07372-21060	BOLT	4	
3	01011-81010	BOLT	3	
4	01643-51032	WASHER	7	
5	01125-51000	STUD	1	
6	01580-11008	NUT	1	
7	07000-13035	O-RING	2	
8	702-13-23902	CHECK VALVE ASSEMBLY (ON PAGE 7)	1	
9	423-875-2141	BRACKET, CHECK VALVE MOUNTING	1	
10	01435-01020	BOLT, BRACKET AND VALVE MOUNTING	4	
11	423-875-2121	BLOCK	1	
12	07236-10628	ELBOW	1	
13	07002-12434	O-RING	1	
14	07040-11409	PLUG	1	
15	07002-11423	O-RING	1	
16	07371-31049	FLANGE, SPLIT	2	
17	07372-21035	BOLT	4	
18	01643-51032	WASHER	4	
19	423-875-2330	HOSE	1	
20	423-875-2321	TUBE	1	
21	01435-01075	BOLT	4	
22	07000-13032	O-RING	1	
23	423-875-1191	DIVERTER VALVE ASSEMBLY (ON PAGE 5)	1	
24	07002-11423	O-RING	2	
25	07235-10210	ELBOW	1	
26	07123-00208	HOSE	1	
27	07236-10210	ELBOW	1	

★ Piping - GDS Check Valve To Steering Demand Valve



Item	Part Number	Description	Qty.	Ref.
1		CHECK VALVE (SEE PG 12)	1	
2	07000-13032	O-RING	2	
3	423-875-2270	HOSE	1	
4	07371-31049	FLANGE, SPLIT	4	
5	07372-21035	BOLT	8	
6	01634-51032	WASHER	8	

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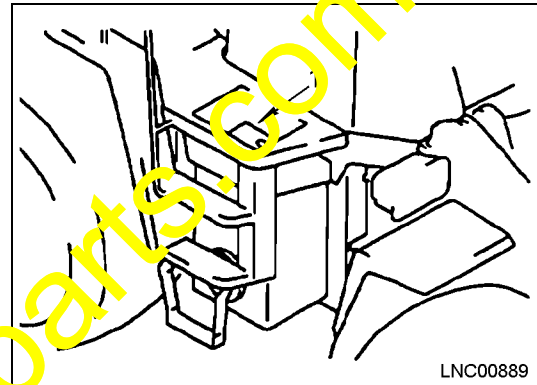
DRAIN THE HYDRAULIC OIL TANK

WARNING! Stop the machine on level ground and lower bucket to the ground and stop the engine, apply the parking brake and place blocks under wheels to prevent machine from moving. Then install the safety bar on the frame.

WARNING! The oil is at a high temperature immediately after the machine has been operated. Wait until the oil has cooled before draining.

WARNING! Loosen the oil filler cap to release pressure in the hydraulic tank. Then operate the steering wheel and control levers several times to release the remaining pressure in the hydraulic lines.

1. Open cover (1) and remove filler cap (2). When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it carefully.



2. Set a container under the hydraulic tank to catch the oil, then remove drain plug (3) and open drain valve (4) gradually to drain the oil.

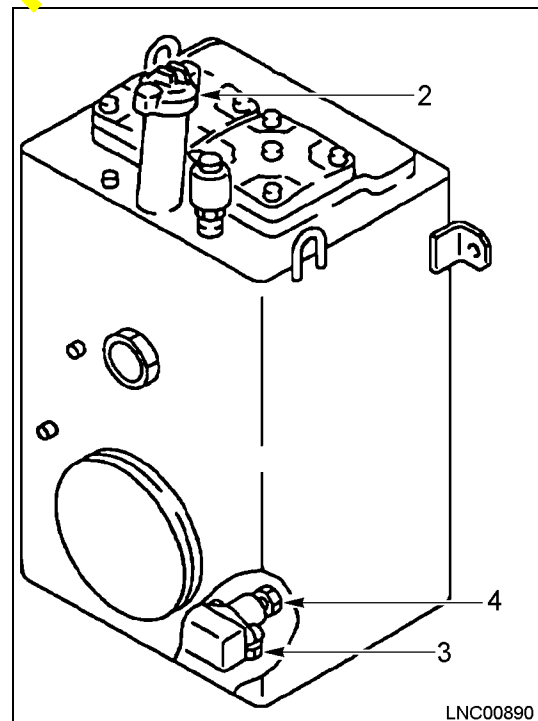
Drain: 138 liters (36.5 gal)

3. After the oil has drained, close valve (4), install plug (3) and filler cap (2).

Torque Values:

Drain Plug (3): $68.6 \pm 9.8 \text{ Nm}$ ($51 \pm 7 \text{ lbf ft}$)

Drain Valve (4): $61.7 \pm 14.7 \text{ Nm}$ ($47 \pm 11 \text{ lbf ft}$)



DRAIN THE TRANSMISSION OIL

WARNING! The oil is at a high temperature immediately after the machine has been operated. Wait until the oil has cooled before draining.

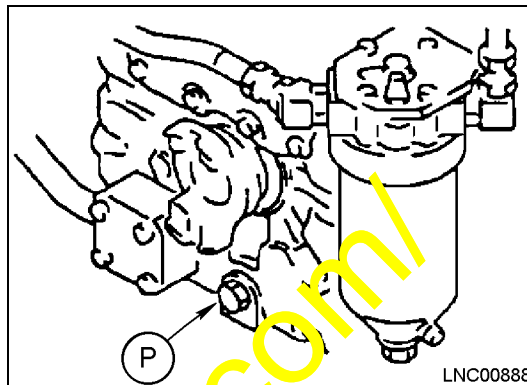
1. Place a container under the transmission and remove drain plug (P). Remove the plug slowly to prevent oil from spurting out.

Drain: 40 liters (10.6 gal)

2. After the oil has drained, install drain plug (P).

Torque Values:

Drain Plug (P): $68.6 \pm 9.8 \text{ Nm}$ ($51 \pm 7 \text{ lbf ft}$)



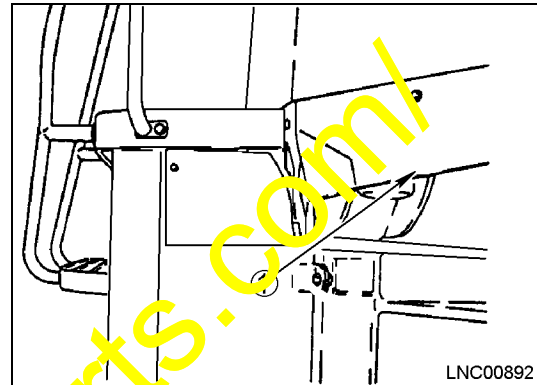
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PARTS TO BE REMOVED

WARNING! Make sure no foreign matter such as dirt and sand enters the hydraulic system. Plug all hoses, tubes, and ports that are disconnected. Komatsu recommends that removed O-rings are replaced with new O-rings and not used again.

WARNING! The working space is confined, so be extremely careful not to mash your fingers. Use two workers and lifting tools when ever possible.

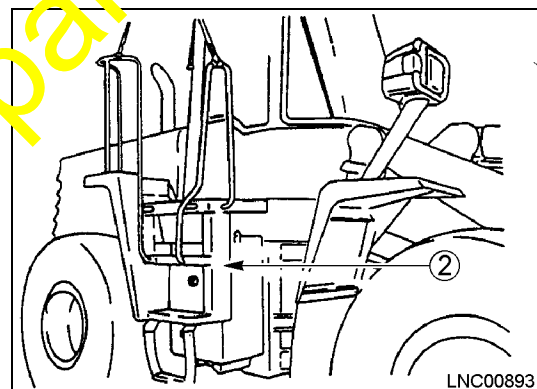
1. Remove covers (1), located on the right side of the floor.



2. Sling ladder (2), then remove the mounting bolts, and lift off the ladder.

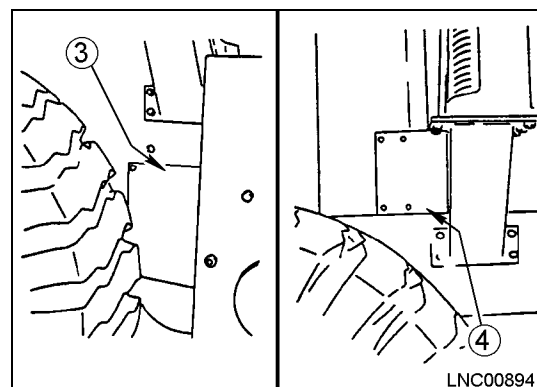
★ Attach sling to lift at two places.

★ Ladder: **60 kg (132 lbs)**

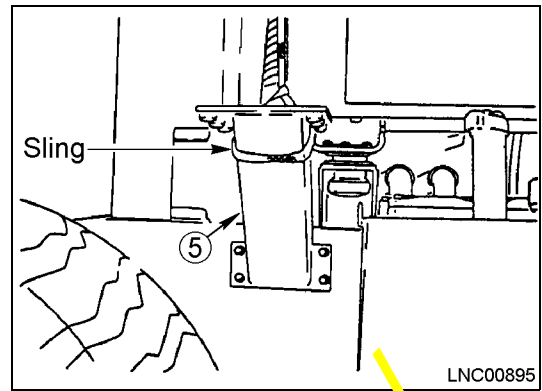


3. Remove inspection cover (3) and (4) on the right side of the machine.

★ The working space is confined, therefore you might want to remove the rear tire at this point. (Refer to shop manual.)

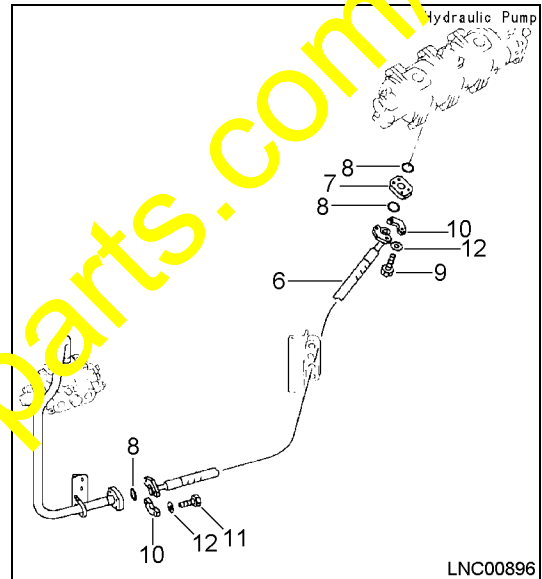


4. Sling right floor support (5) with nylon strap, then remove mounting bolts and lift off the floor support.
 ★ Support: 19 kg (42 lbs)



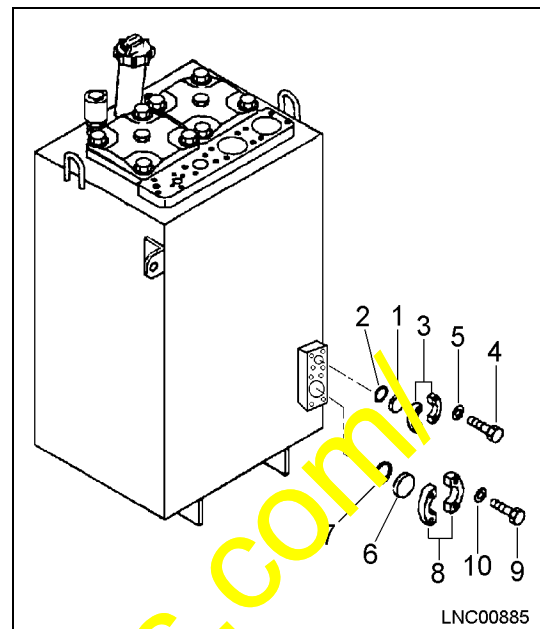
5. Remove these items from the steering piping between the hydraulic steering pump and steering demand valve, then discard.

Item	Description	Qty.
6	Hose	1
7	Spacer	1
8	O-ring	3
9	Bolt	4
10	Flange, split	2
11	Bolt	4
12	Washer	8



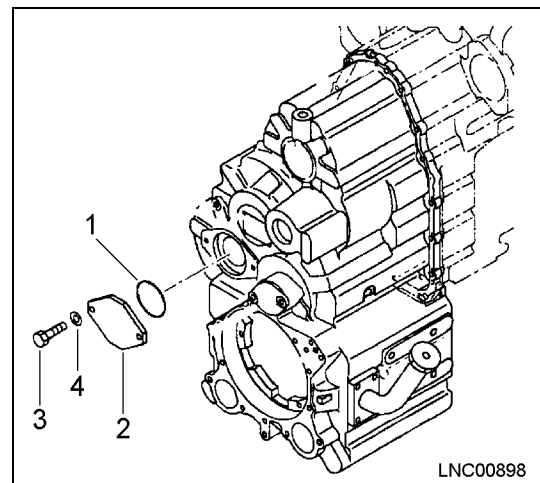
6. Remove these items from the hydraulic tank, then discard.

Item	Description	Qty.
1	Plug, sleeve head	1
2	O-ring	1
3	Flange, split	2
4	Bolt	4
5	Washer	4
6	Plug, sleeve head	1
7	O-ring	1
8	Flange, split	2
9	Bolt	4
10	Washer	4



7. Remove these items from the transmission, then discard.

Item	Description	Qty.
1	O-ring	1
2	Cover	1
3	Bolt	2
4	Washer	2



INSTALLATION OF GROUND-DRIVEN STEERING

WARNING! Make sure no foreign matter such as dirt and sand enters the hydraulic system. Komatsu recommends that removed O-rings are replaced with new O-rings and not used again.

WARNING! The working space is confined, so be extremely careful not to mash your fingers. Use two workers and lifting tools when ever possible.

WARNING! Fit O-rings securely into the grooves and be careful not to get them caught when assembling. Install hoses without twisting or interference.

1. Assemble the diverter valve assembly (4) to pump assembly (3).
 - a. Apply amber grease on to O-rings (1) and (2), then place them on the face of pump (3).
 - b. Secure valve (4) to the face of pump (3) with two bolts (5) and two washers (6).

Torque Values:

Bolt (5): **34 - 74 Nm (25 - 54 lbf ft)**

- c. Set one clip (7) into place and secure top of valve to pump with two bolts (8) and two washers (9).

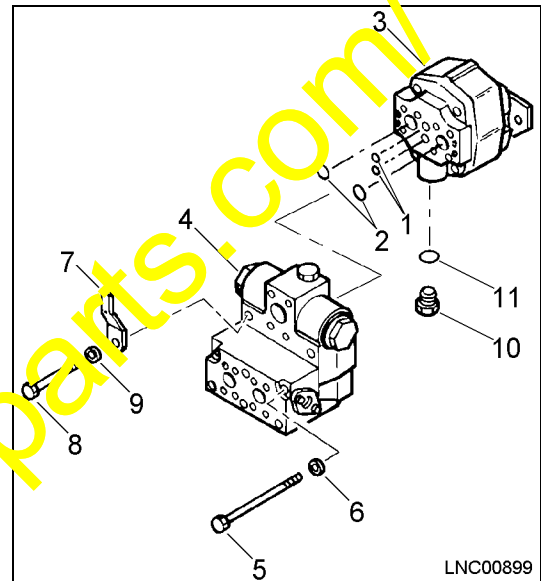
Torque Values:

Bolt (8): **34 - 74 Nm (25 - 54 lbf ft)**

- d. Attach plug (10) and O-ring (11) into the bottom of pump (3).

Torque Values:

Plug (10): **79 - 103 Nm (58 - 76 lbf ft)**

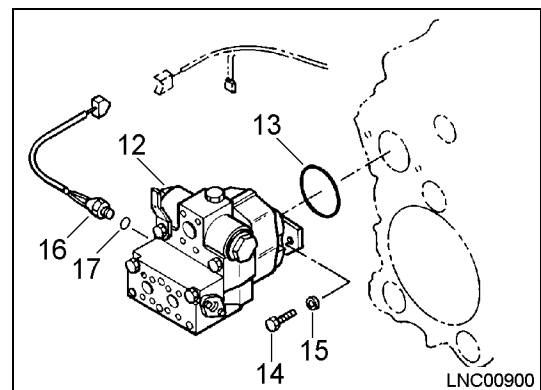


2. Attach diverter valve and pump assembly (12) to the transmission.
 - a. Clean mounting surface of the transmission thoroughly.
 - b. Fit O-ring (13) securely into the groove on the mating surface of pump, then attach to the transmission securing with two bolts (14) and two washers (15).

Torque Values:

Bolt (14): **54 - 123 Nm (40 - 90 lbf ft)**

- c. Attach sensor (16) and O-ring (17) into side of the diverter valve, then plug into the T11 connector of transmission harness.



3. Assemble the piping from the hydraulic steering pump to the diverter valve.

- a. Attach elbow (1) and O-ring (2) into top port of tube (3).

Torque Values:

Elbow (1): **29 - 39 Nm (22 - 29 lbf ft)**

- b. Attach check valve (4) with O-ring (5) to tube (3) and secure with three bolts (6), three washers (7), one stud (8), and one nut (9).

★ Make sure the direction of the arrow is correct when installing check valve (4).

Torque Values:

Bolt (6): **34 - 74 Nm (25 - 54 lbf ft)**

Nut (9): **34 - 74 Nm (25 - 54 lbf ft)**

- c. Attach block (10) with one O-ring (11) and secure with two split flanges (12), four bolts (13), and four washers (14).

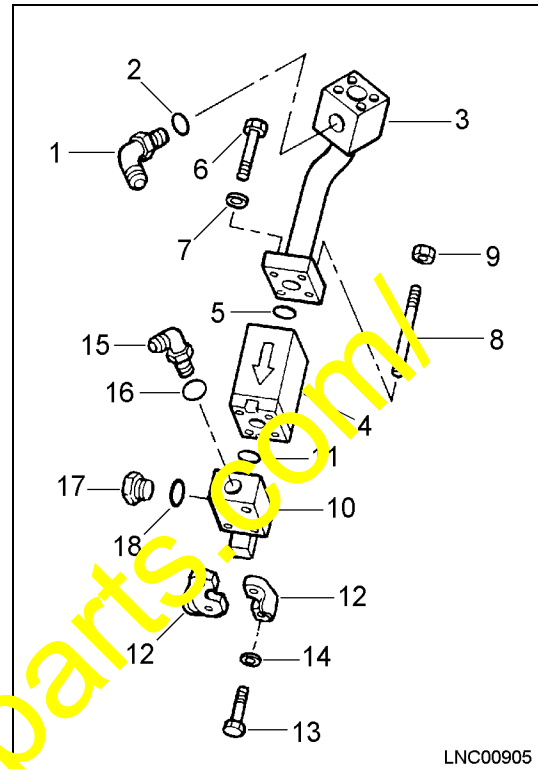
★ Hand tighten bolt (13) until hose from the block to the steering demand valve is attached.

- d. Attach elbow (15) and O-ring (16) to block (10).
Attach plug (17) and O-ring (18)

Torque Values:

Elbow (15): **118 - 162 Nm (87 - 119 lbf ft)**

Plug (17): **29 - 39 Nm (22 - 29 lbf ft)**



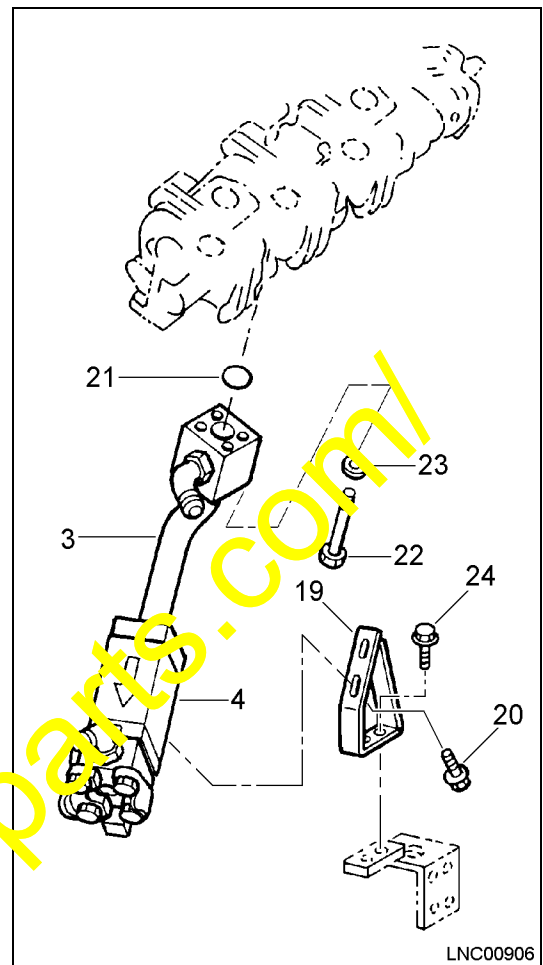
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- e. Attach mounting bracket (19) to check valve (4) with two bolts (20).
- f. Attach tube (3) with O-ring (21) to hydraulic steering pump, and secure with four bolts (22) and four washers (23).

Torque Values:

Bolt (22): 34 - 74 Nm (25 - 54 lbf ft)

- g. Secure bracket (19) to frame with two bolts (24).



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- h. Attach elbow (25) to side of diverter valve with O-ring (26).

Torque Values:

Elbow (25): 29 - 39 Nm (22 - 29 lbf ft)

- i. Attach tube (27) with O-ring (28) to bottom right hand port on the diverter valve and secure with four bolts (29).

Torque Values:

Bolt (29): 34 - 74 Nm (25 - 54 lbf ft)

- j. Attach hose (30) to elbow (25) on side of the diverter valve and elbow (15) on block under the check valve

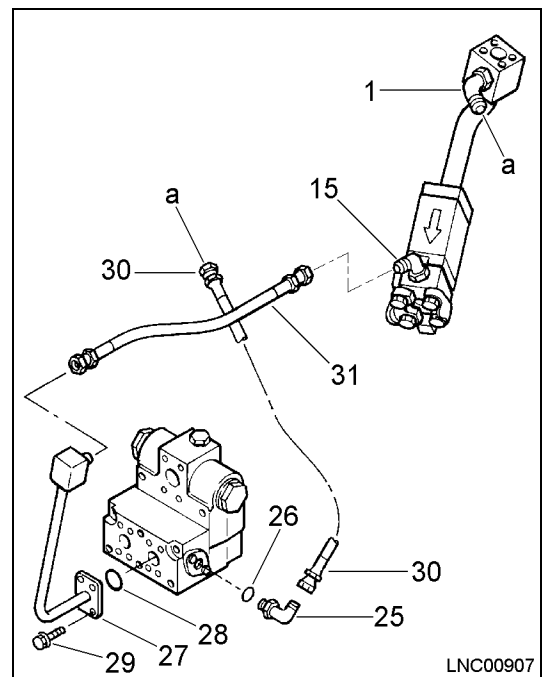
Torque Values:

Hose (30): 147 - 206 Nm (109 - 152 lbf ft)

- k. Attach hose (31) to tube (27) on face of the diverter valve and elbow (1) on tube above the check valve

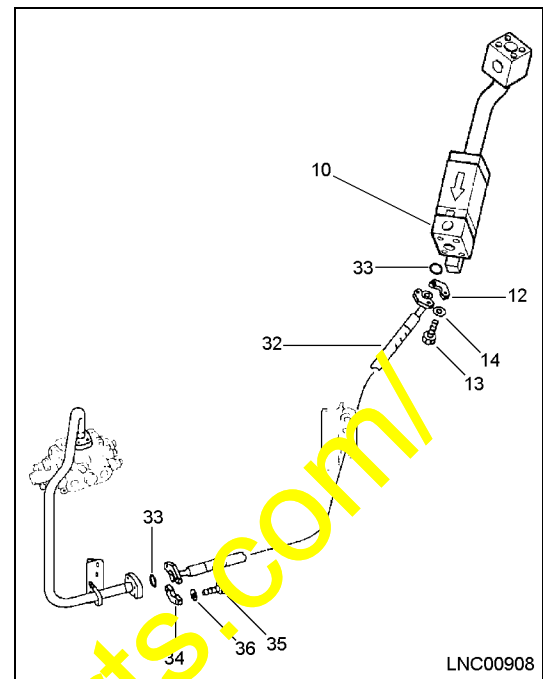
Torque Values:

Hose (31): 20 - 29 Nm (15 - 22 lbf ft)



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- l. Attach hose (32) with one O-ring (33) to block (10) using split flange (12) already temporarily installed to the block at the check valve. Secure with four bolts (13) and four washers (14).
- m. Attach the other end of hose (32) with one O-ring (33) to the tube attached to the steering demand valve, and secure with two split flanges (34), four bolts (35), and four washers (36).



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4. Assemble the piping from the hydraulic tank to the diverter valve.

- a. Attach tube (1) and O-ring (2) to the top port of the hydraulic tank, then secure with four bolts (3) and four washers (4).

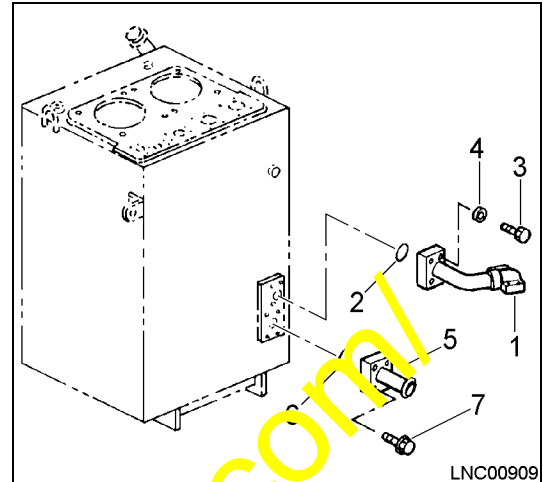
Torque Values:

Bolt (3): **34 - 74 Nm (25 - 54 lbf ft)**

- b. Attach tube (5) with O-ring (6) to the bottom port of the hydraulic tank, then secure with four bolts (7).

Torque Values:

Bolt (7): **54 - 123 Nm (40 - 90 lbf ft)**



- c. Attach tube (8) and O-ring (9) to top port on face of diverter valve, then secure with four bolts (10) and four washers (11).

Torque Values:

Bolt (10): **34 - 74 Nm (25 - 54 lbf ft)**

- d. Attach hose (12) and one O-ring (13) to bottom left port on face of diverter valve. Then secure with two split flanges (14), four bolts (15) and four washers (16).

Torque Values:

Bolt (15): **34 - 74 Nm (25 - 54 lbf ft)**

- e. Secure hose (12) and one O-ring (13) to upper tube (1) on hydraulic tank with two split flanges (14), four bolts (15) and four washers (16).

Torque Values:

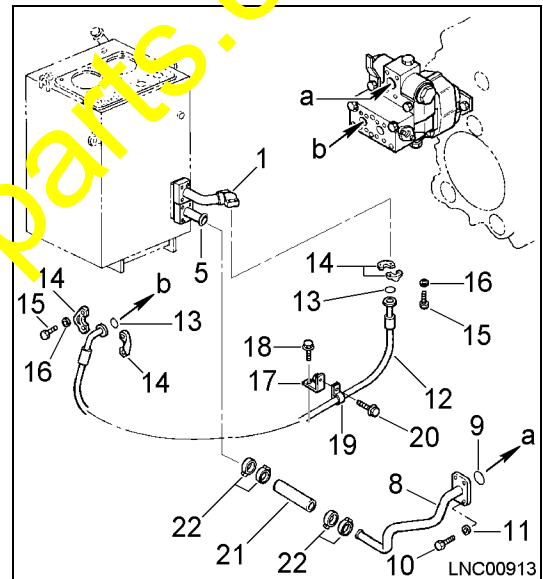
Bolt (15): **34 - 74 Nm (25 - 54 lbf ft)**

- f. Attach clip (17) to frame with bolt (18), then secure hose to clip with hose clamp (19) and bolt (20).

- g. Attach hose (21) with four hose clamps (22) to tube (8) and lower tube (5) on hydraulic tank.

Torque Values:

Clamp (22): **5 - 6 Nm (4 - 5 lbf ft)**



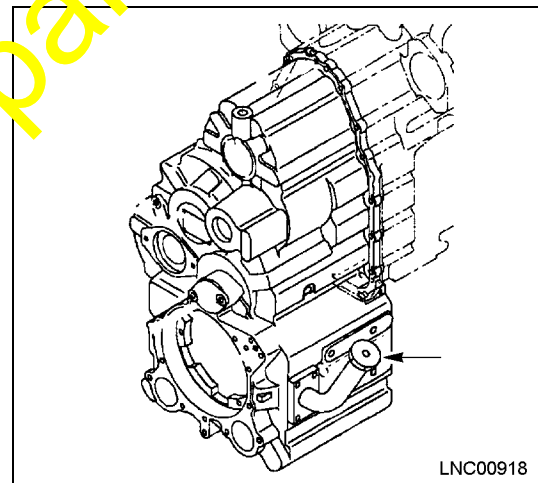
REFILLING HYDRAULIC TANK AND TRANSMISSION

WARNING! When refilling the hydraulic system, if the engine is run immediately at high speed or the cylinder is operated to the end of its stroke, the air inside the cylinder could cause damage to the piston pack.

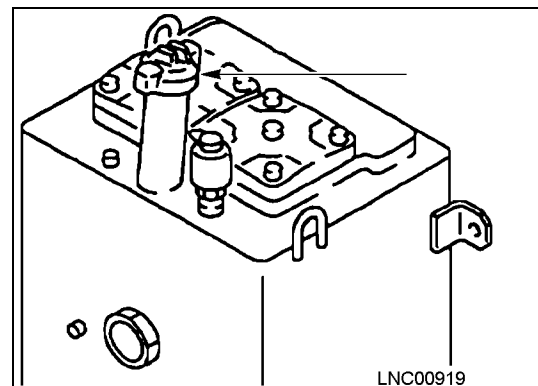
★ Refill capacities and type of oil

Reservoir	Kind of fluid	Ambient Temperature										Capacity	
		-22 -30	-4 -20	14 -10	32 0	50 10	68 20	86 30	104 40	122°F 50°C	Specified	Refill	
Transmission case	Engine oil	SAE 10W										42 liter 11.1 gal	40 liter 10.6 gal
		SAE 10W										90 liter 50 gal	138 liter 36.5 gal

1. Refill the transmission by adding oil to the specified level through the filler neck.

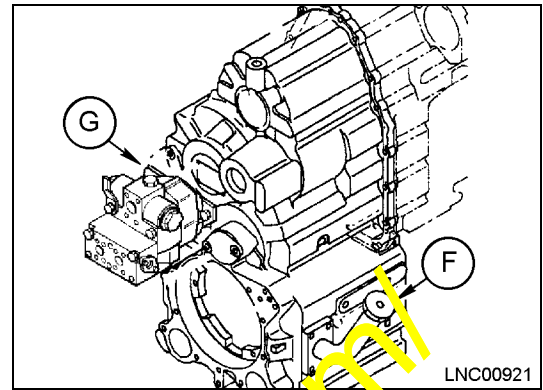


2. Refill the hydraulic tank adding oil to the specified level through the filler neck.

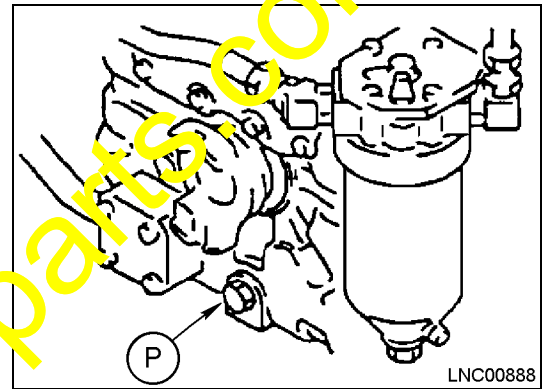


★ After the transmission has been filled to the specified levels with the proper oil:

3. Start the engine and run for at least 5 minutes to circulate oil through the transmission system.
4. With the engine running at a low idle, recheck the transmission oil level with dipstick in filler port (F). The oil level should be between the H and L marks.



5. Check for leaks around the drain plug (P) and ground-driven steering pump (G).



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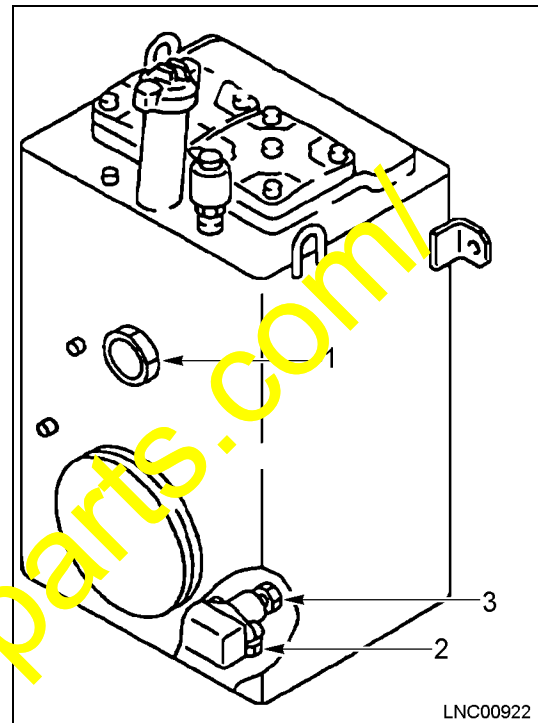
★ After the hydraulic tank has been filled to the specified levels with the proper oil:

WARNING! If the engine is run immediately at high speed or the cylinders are operated to the end of their stroke, the air inside the cylinders could cause damage to the piston packing.

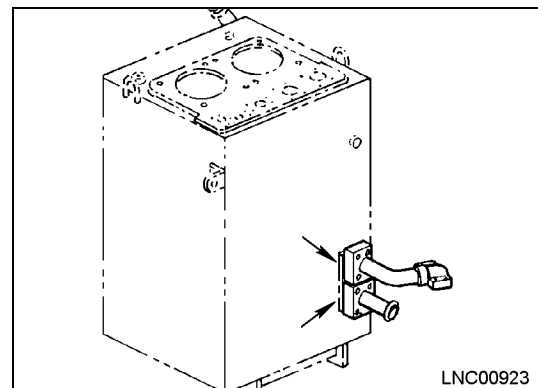
6. Run the engine at low idle and extend and retract the steering, bucket, and boom cylinders 4 - 5 times. Be careful not to operate cylinders to the end of their stroke (stop approximately 100 mm (4 in) before the end of their stroke).
7. Lower the bucket horizontally to the ground and shut the engine down. Wait 5 minutes, then check sight gauge (1).

WARNING! Do not overfill hydraulic tank. This will damage the hydraulic equipment and cause oil to spurt out.

8. Check for oil leaks at drain plug (2) and drain valve (3).



9. Check for oil leaks on lower back of tank where GDS tubes are attached.

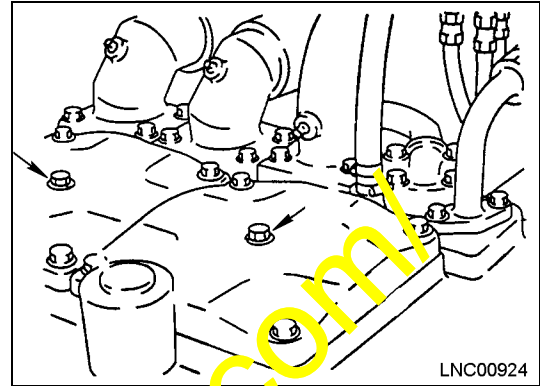


10. Check the following piping for oil leaks:
 - a. Hydraulic tank to ground-driven steering pump
 - b. Hydraulic steering pump to the diverter valve
 - c. Check valve to the steering demand valve

BLEEDING THE HYDRAULIC LINES

WARNING! If the engine is run immediately at high speed or the cylinders are operated to the end of their stroke, the air inside the cylinders could cause damage to the piston packing.

1. Run the engine at low idle and extend and retract the steering, bucket, and boom cylinders to the end of their stroke 3 - 4 times. Shut the engine down, loosen bleed plugs on the filter covers, then run the engine at low idle to bleed air from the hydraulic tank. After bleeding the air, shut the engine down and tighten the plugs.



2. Check the hydraulic oil level and add more if required.
3. Next, increase the engine speed and repeat the procedure in step 1 to bleed air. Continue this procedure until no more air comes out from bleed plugs.
4. Check the hydraulic oil level and add more if required.
5. Tighten the bleed plugs.

Torque Values:

Bleed Plugs: $11.3 \pm 1.5 \text{ Nm}$ ($8 \pm 1 \text{ lbf ft}$)

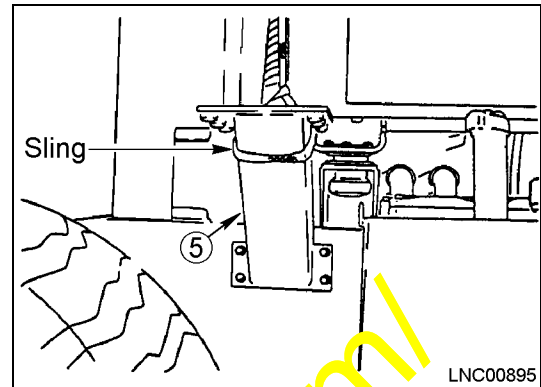
6. After bleeding the hydraulic and steering systems, check to be sure the respective function mechanisms move according to the control lever operations

INSTALLING LADDER, COVERS, AND FLOOR SUPPORT

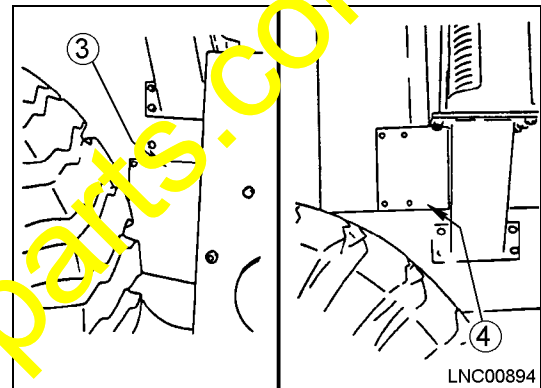
1. Sling right floor support (5) with nylon strap, set in place and secure with mounting bolts.
★ Support: 19 kg (42 lbs)

Torque Values:

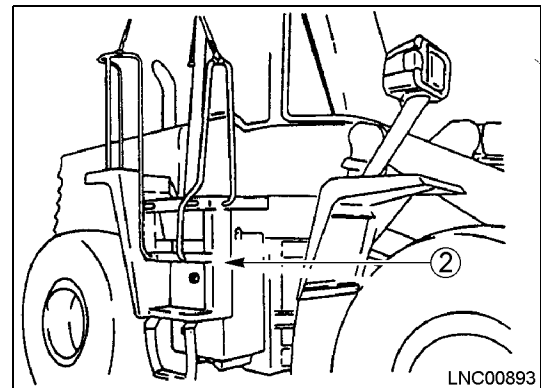
Bolt: 277 ± 31.9 Nm (204 ± 24 lbf ft)



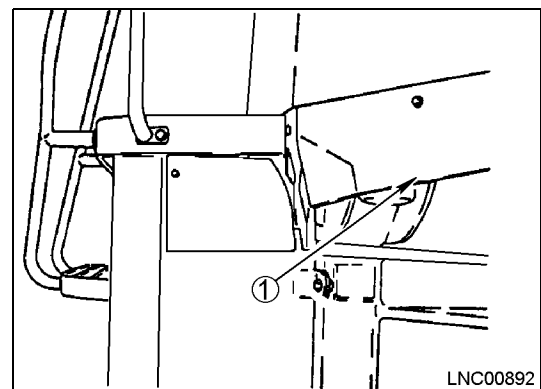
2. Attach inspection covers (3) and (4) on the right side of the machine.



3. Sling ladder (2), set in place and secure with mounting bolts.
★ Attach sling to lift at two places.
★ Ladder: 60 kg (132 lbs)

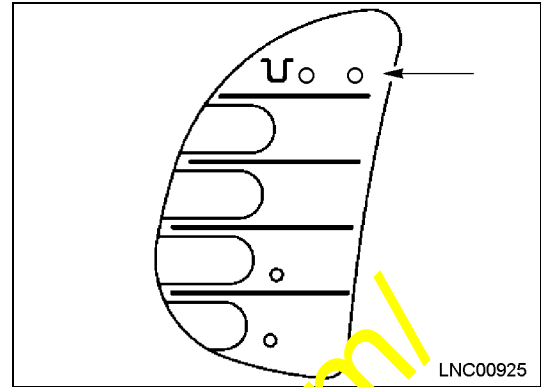


4. Attach covers (1) on the right side of the floor and secure with mounting bolts.



OPERATION CHECKS AFTER FINISHING THE ASSEMBLY

1. Turn the starting switch to the “ON” position, before starting the engine, and check to be sure the red LED on the monitor panel flashes.
2. Start the engine and check to be sure the red LED on the monitor panel turns off.
3. Run the vehicle on a level surface or on a downhill slope, then shut down the engine midway and turn the steering wheel before vehicle comes to a stop to see if the vehicle makes a correct turn.



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