

CARCO®

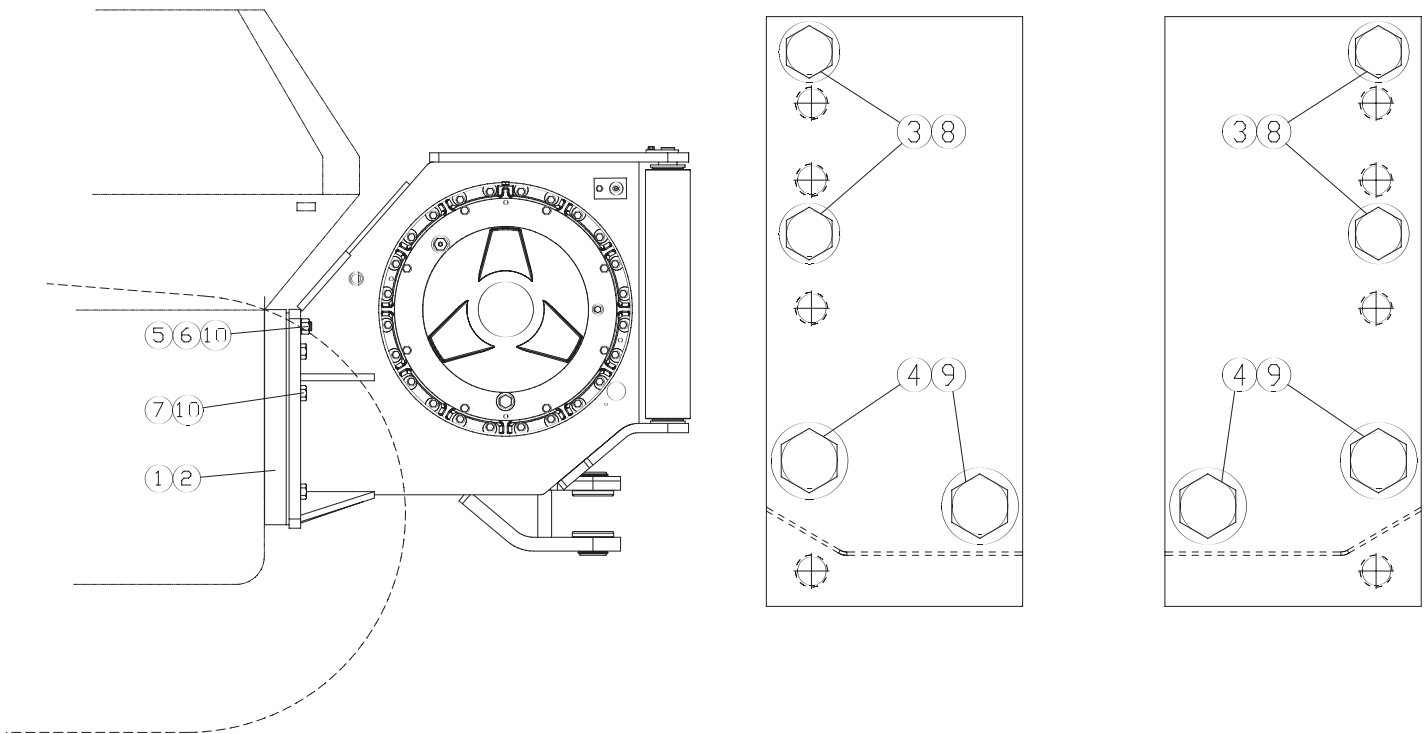
INSTALLATION AND PARTS MANUAL MODEL H90VS FOR KOMATSU D65EX-15 TRACTORS

NOTE: This manual covers winch installation and parts, specific to the tractor or tractors listed above. For all other common winch parts, refer to Carco Winch Parts Manual LIT2234.

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**H90VS
MOUNTING GROUP
KOMATSU D65EX-15**



ITEM	PART NO.	DESCRIPTION	QTY.
1	104766	MOUNTING ADAPTER, RH	1
2	104765	MOUNTING ADAPTER, LH	1
3	31809	CAPSCREW, HEX M24-3.0 X 60 GD. 10.9	4
4	69779	CAPSCREW, HEX M33-3.0 X 70 GD. 10.9	4
5	33460	STUD, 1 1/4 -7 X 5 GD. 8	2
6	70176	NUT, HEX 1 1/4-7	2
7	101872	CAPSCREW, HEX 1 1/4-7 X 3 1/2 GD. 8 Z	6
8	103685	WASHER, M24 HARD, Z	4
9	102886	WASHER, 1 1/2 HARD, Z	4
10	101206	WASHER, 1 1/4 HARD Z	8

INSTALLATION INSTRUCTIONS

1. Clean all paint, oil, grease, rust and dirt from the mounting surfaces of the winch housing, mounting plates and tractor. Inspect the tapped holes in the rear face of the tractor to make sure they are clean to a depth of approximately 60 mm. Use a 24-3.0 and 33-3.0 tap to clean the threads as required. Do not apply oil to the tapped holes.



Winch mounting plates (1, 2) weigh 117 pounds (53 kg). Use suitable lifting equipment.

2. Install the winch mounting plates to the tractor using metric capscrews (3, 4) and hard washers (8, 9). Apply Loctite 272 to the clean, dry threads of the capscrews and tighten as follows:

M24 - 3.0 790 lb.-ft. (1080 N-m)

M33 - 3.0 1630 lb.-ft. (2210 N-m)

i **NOTE:** For ease of access to area above tractor transmission and below fuel tank, complete control group installation before installing winch onto tractor.

3. Apply Loctite 272 to the clean, dry threads of studs (5) and install into winch mounting plates to the full depth of the threads. 3 ¼ in. (82.5 mm) of the stud should extend beyond the mounting surface.



The winch weighs approximately 3,300 pounds (1500 kg). Ensure your lifting equipment has adequate capacity and use proper lifting techniques to eliminate the possibility of damage or injury.

4. Install the winch onto the spacers and studs. Secure the winch to the tractor using nuts, capscrews and washers (6, 7, 10). Apply Loctite 243 to the clean, dry threads of the fasteners and evenly tighten as follows:

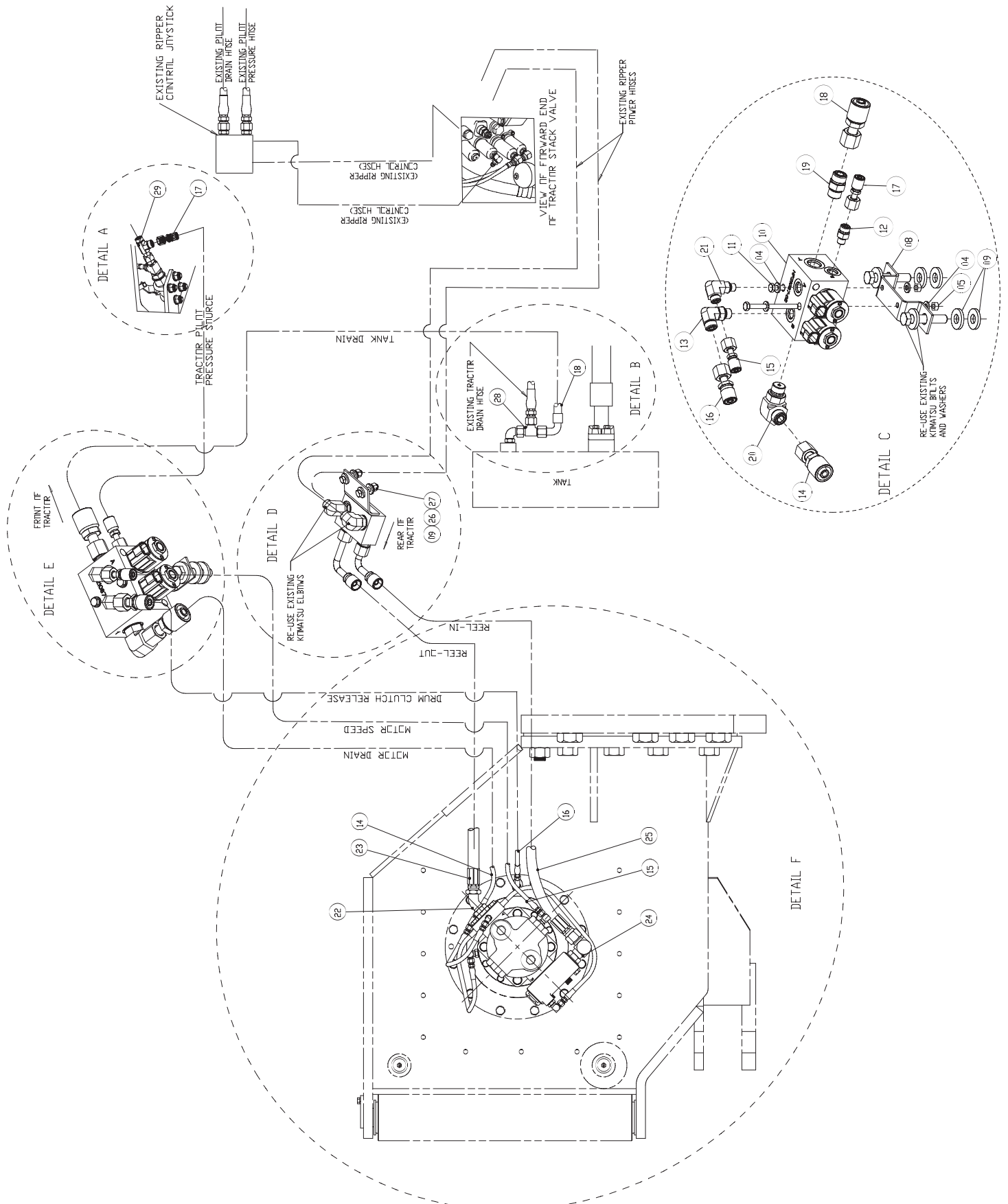
1 ¼ - 7 nut 1120 lb.-ft. (1520 N-m)

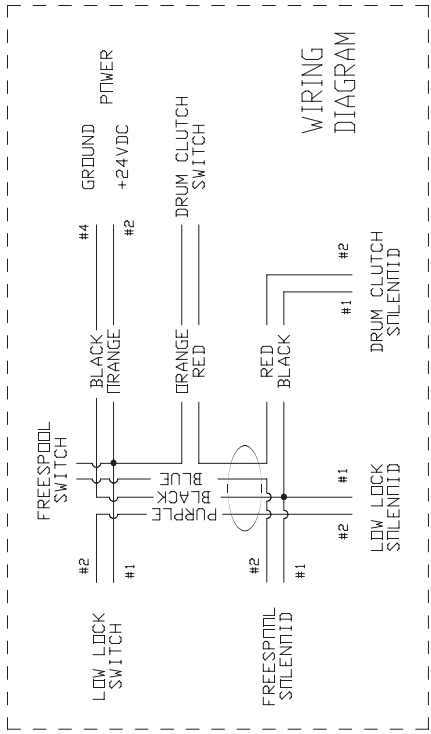
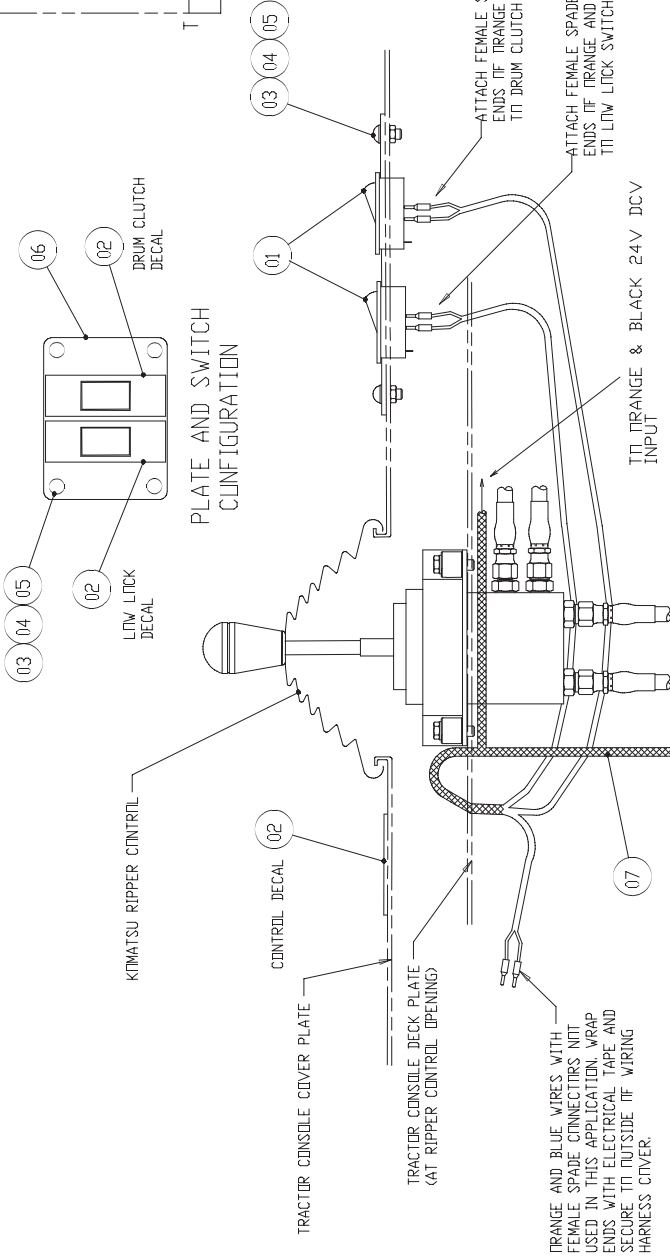
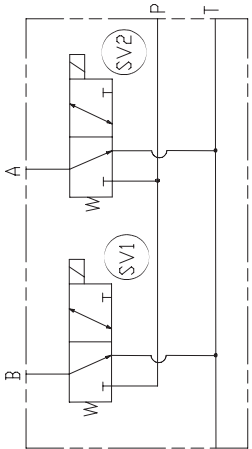
1 ¼ - 7 capscrew 1820 lb.-ft. (2440 N-m)



Fill winch to the proper level with recommended oil BEFORE operating the winch. Component damage will occur if the winch is operated without oil.

**H90VS
CONTROL GROUP
KOMATSU D65EX-15**





VIEW FOR CONNECTION DEFINITION ONLY
 NOT TO SCALE
 NOTE: PART ORIENTATION AND SCALE IS NOT NECESSARILY REPRESENTATIVE OF FINAL PRODUCT

DETAIL G

INSTALLATION INSTRUCTIONS

i **NOTE:** *The tractor must be equipped with the Komatsu ripper control valve section, joystick and all associated plumbing in order to operate the winch.*

Refer to the appropriate Komatsu service literature for additional information regarding the ripper hydraulic control system. For winch use, the Komatsu ripper control lever **MUST** operate winch Reel-In when the control lever is pulled toward the operator and winch Reel-Out when the control lever is pushed away from the operator.



Cleanliness is of utmost importance when working on hydraulic equipment. Contamination may cause damage to close tolerances of the hydraulic components which may result in erratic operation and reduced service life.

1. Into a suitable container, drain the hydraulic oil from the reservoir as instructed by the Komatsu service literature. Reuse the oil only if absolute cleanliness is maintained and the oil is filtered before reuse. Recycle or dispose of used oil in an environmentally responsible manner.
2. Remove the operator's seat and cab floor plate, arm rest, RH consol side and top cover plates to gain access to the hydraulic components.
3. Locate the pilot control supply line directly below the operator's blade control lever inside the RH console, operator's side access panel. Install adapter tee (29) to the pilot pressure supply line and install hose (17) onto the branch port of the tee. Install the tractor hose onto the open run of the tee. Refer to Detail A.
4. Locate the pilot circuit return port on the side of the hydraulic reservoir and install tee (28) onto the reservoir adapter elbow. Attach the existing tractor hose to the branch port of the tee. Install hose (18) onto the run of the tee. Refer to Detail B.
5. Assemble the hose adapters to the dual solenoid manifold valve as shown in Detail C. Install mounting bracket (8) onto the top of the transmission housing using the existing Komatsu capscrews and washers. Use additional washers (9) between the mounting bracket and transmission housing as needed to fill the spot-face in the housing. Install the solenoid valve sub-assembly onto the mounting bracket using capscrews, nuts and washers (4, 5, 11).
6. Remove the ripper hose manifold from under the fuel tank and remove the weld-nuts from the mounting flange. Install the manifold onto the fuel tank upper support rail using capscrews, washers and nuts (9, 26, 27). Install the Komatsu ripper manifold supply hoses back onto the manifold elbows. Refer to Detail D.
7. Attach the tractor pilot supply hose (17) onto the adapter installed in the P port of the dual solenoid manifold valve. Attach the pilot circuit drain hose (18) onto the adapter installed in the T port of the dual solenoid manifold valve. Refer to Detail E.
8. Install the drum clutch release hose (16) onto the adapter installed in the B port of the dual solenoid manifold valve. Attach the other end of the hose to the drum clutch release port located at the 3 o'clock position on the winch brake housing. Refer to Detail E and F.
9. Install the motor speed control hose (15) onto the adapter installed in the A port of the dual solenoid manifold valve. Attach the other end of the hose to the motor speed control port located at the 4 o'clock position on the motor end cap. Refer to Detail E and F.
10. Install the motor case drain hose (14) onto the adapter installed in the side T port of the dual solenoid manifold valve. Attach the other end of the hose to the motor case drain port located at the 2 o'clock position of the motor near the motor mounting flange. Refer to Detail E and F.
11. Install elbow (24) into the brake valve port. Install the reel-in supply hose (25) from the right hand ripper manifold port to the elbow in the brake valve. Install the 45 degree elbow (22) into the winch motor reel-out port. Install the reel-out supply hose (23) from the left hand ripper manifold to the elbow in the motor reel-out port. Refer to Detail E and F.
12. The dual solenoid manifold valve is operated by two rocker switches that will be installed into the top of the right hand console, mid-way between the blade control and the ripper/winch control levers. Select a location that provides ample room for the control function decal to be installed next to the switch mounting plate. Use the rocker switch mounting plate (6) as a template and mark the four mounting holes and two switch holes onto the right hand console top cover. Drill the mounting bolt holes and enlarge the switch cut-out holes in the console by approximately 1/16 in. (2 mm) in each direction. Install the two rocker switches into the mounting plate.

13. Insure that the tractor master switch is in the off position. Install the wiring harness (7) as illustrated in Detail G. The orange and purple spade connectors attach to the low-lock rocker switch (2). The orange and red spade connectors attach to the drum clutch rocker switch (2). The black wire without a spade connector is the ground wire and the orange wire without a spade connector must be attached to a 24 VDC circuit that is energized only when the key switch is turned on and is protected by a 10 amp fuse. The orange and blue spade connectors are not used and must be insulated from accidental contact and secured to the harness. Install the switch mounting plate into the console with capscrews, nuts and washers (3, 4, 5).
14. Pass the wiring harness back to the dual solenoid manifold valve. Make certain the harness is routed away from moving shafts and levers that may damage the wiring harness or have movement restricted by the harness. Safely secure the harness with plastic tie straps.
15. Install the wiring harness onto the dual solenoid manifold valve as illustrated in Detail G. Attach the plug with red and black wires to the drum clutch solenoid valve at port B. Attach the plug with purple and black wires to the motor speed control solenoid valve at port A. The plug with blue and black wires is not used and must be insulated from accidental contact and secured to the harness.
16. Install the console cover plates, arm rest, trim and operator's seat. Install the rocker switch decal next to the rocker switches paying attention to orient the decal with the correct rocker switch function. Install the reel-in/reel-out decal next to the control lever.
17. Fill the winch gear cavity to the level plug located at the center of the gear case cover. Use recommended lubricant; see chart on page 7 of the H90VS Operation and Preventive Maintenance Manual, publication LIT2233.
18. Fill hydraulic reservoir with oil recommended by Komatsu. Refer to the appropriate Komatsu D65EX15 service literature.
19. Start tractor engine and let idle while you check for hydraulic oil leaks. Stop engine to correct oil leaks as required. Operate winch functions beginning with slow reel-in for approximately 30 seconds before attempting to operate in reel-out or lock in low and drum clutch release. Monitor the hydraulic oil reservoir level and refill as required to maintain the correct oil level.

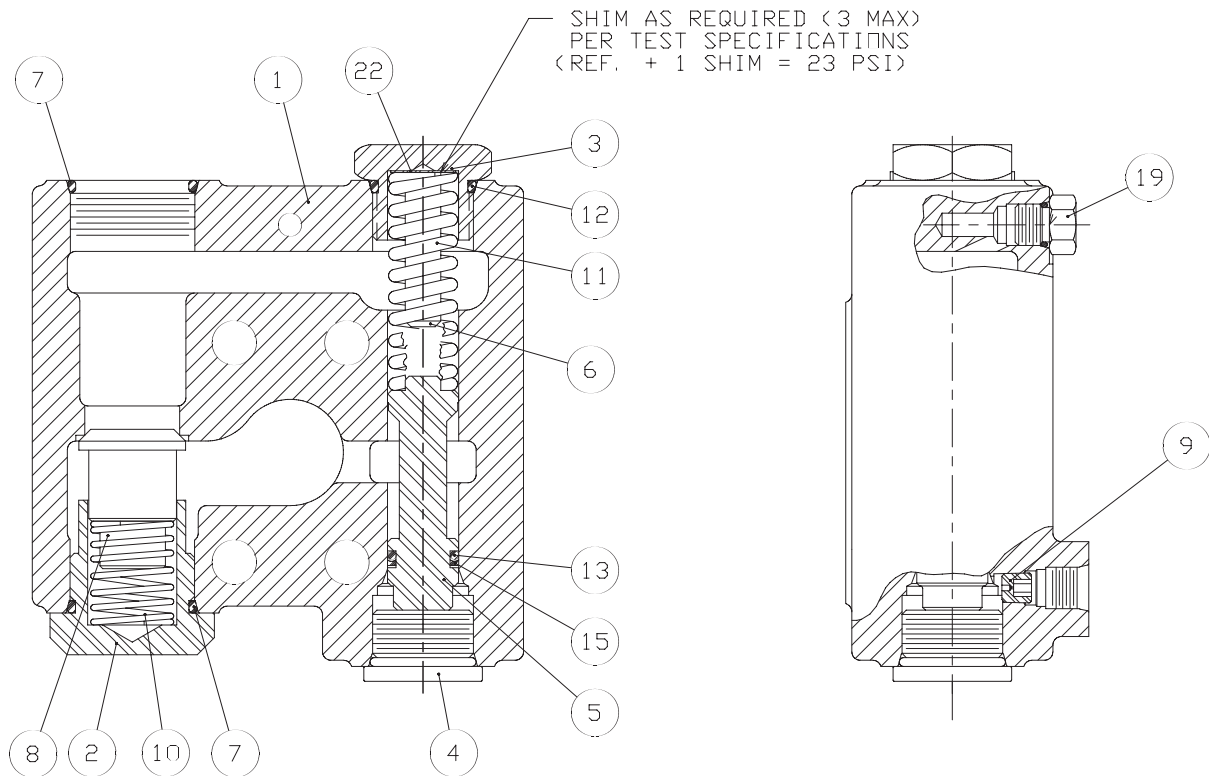


Hydraulic component damage will occur if the tractor engine is run with low hydraulic oil level.

H90VS
CONTROL GROUP
KOMATSU D65EX-15

ITEM	PART NO.	DESCRIPTION	QTY.
1	105672	ROCKER SWITCH	2
2	105680	DECAL	1
3	40240	CAPSCREW, BTN. HD., 1/4-20 X 1, SS	4
4	100857	WASHER, 1/4 HARD, Z	8
5	105012	NUT, 1/4-20, GD.8, Z	6
6	105753	SWITCH MOUNTING PLATE	1
7	105600	WIRING HARNESS	1
8	105831	BRACKET	1
9	102987	WASHER, 1/2 HARD, Z	8
10	104372	DUAL SOLENOID MANIFOLD VALVE	1
	106377	CARTRIDGE VALVE W/O COIL	2
	29821	CARTRIDGE SEAL KIT	2
	106378	SOLENOID VALVE COIL - 24VDC	2
11	26863	CAPSCREW, HEX 1/4-20 X 3.25, GD.8, Z	2
12	26676	ADAPTER, -6 ORB to -4 ORF	1
13	40107	ELBOW, -6 ORB to -6 ORF	1
14	103711	HOSE, -8 ORF X 43 in. (1092 mm)	1
15	103709	HOSE, -4 ORF X 41.5 in.(1054 mm)	1
16	40104	HOSE. -6 ORF X 40 in. (1016 mm)	1
17	102187	HOSE, -4 ORF X 63 in. (1600 mm)	1
18	105843	HOSE, -8 ORF X 63 in. (1600 mm)	1
19	101284	ADAPTER, -8 ORB to -8 ORF	1
20	101282	ELBOW, -8 ORB to -8 ORF	1
21	26680	ELBOW, -6 ORB to -4 ORF	1
22	105842	ELBOW, -12 ORB to -12 ORF	1
23	104753	HOSE, -12 ORF X 22 in. (559 mm)	1
24	102608	ELBOW, -12 ORB to -12 ORF	1
25	104752	HOSE, -12 ORF X 24 in. (610 mm)	1
26	104137	CAPSCREW, HEX 1/2-13 X 2.25, GD.8, Z	2
27	101439	NUT, 1/2-13, GD.8, Z	2
28	105293	TEE, -8 ORF	1
29	104204	TEE, -4 ORF	1

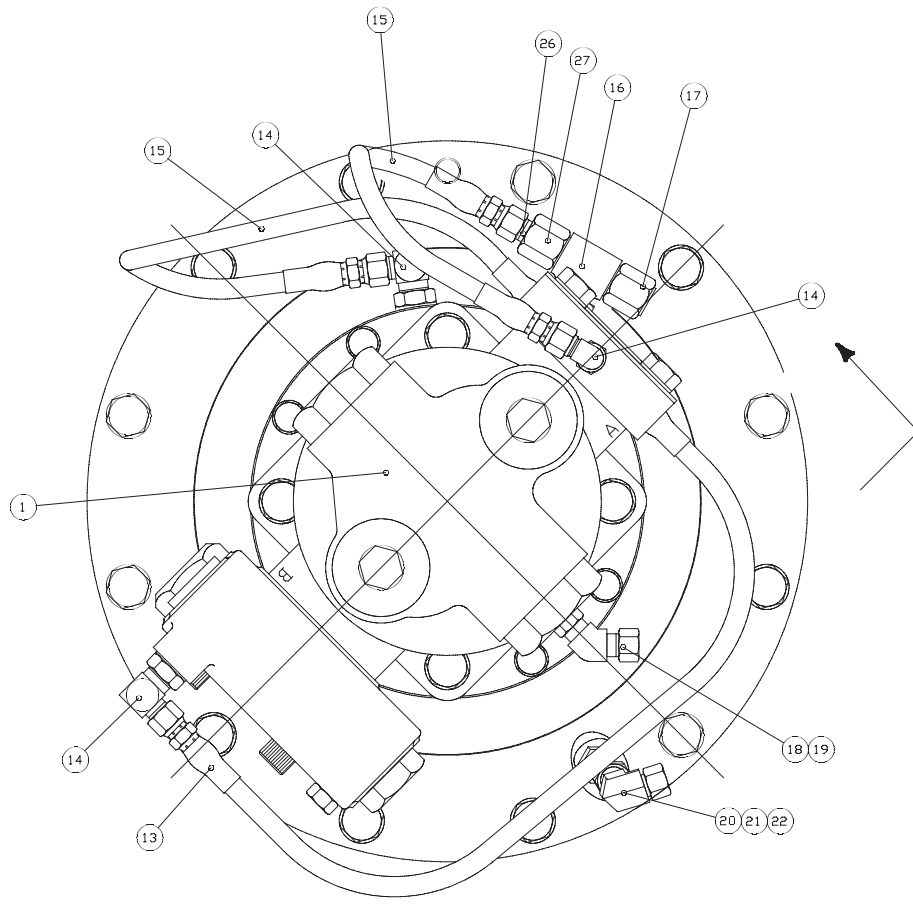
**H90VS
BRAKE VALVE ASSEMBLY
KOMATSU D65EX-15**



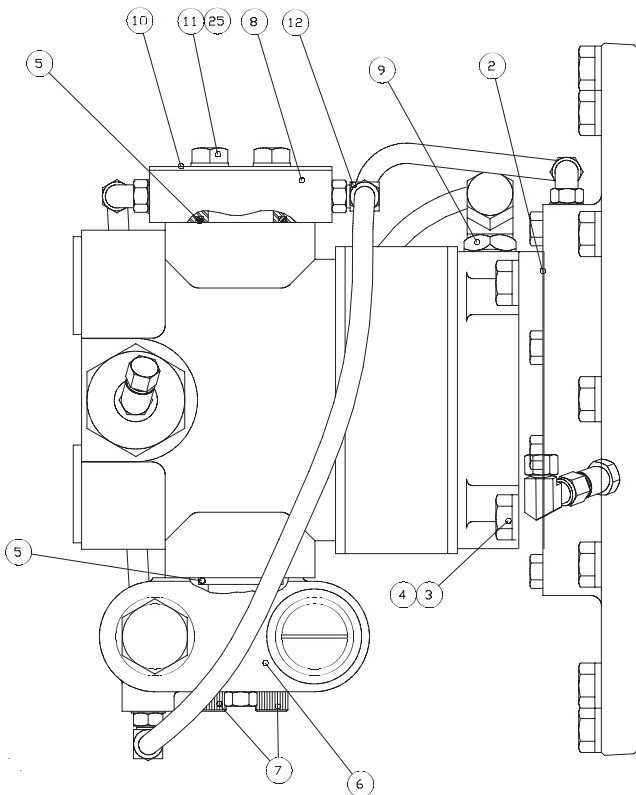
ITEM	PART NO.	DESCRIPTION	QTY.
	83150	BRAKE VALVE ASSEMBLY (1-22)	1
1	NSS	VALVE HOUSING	1
2	24424	SPRING RETAINER	1
3	104733	SPRING RETAINER	1
4	22450	PLUG, -12 ORB	1
5	NSS	SPOOL	1
6	29993	SPOOL STOP	1
7	24186	O-RING	2
8	24423	CHECK VALVE POPPET	1
9	24200	PILOT ORIFICE	1
10	24190	CHECK VALVE SPRING	1
11	104732	MAIN SPOOL SPRING	1
12	23601	O-RING	1
13	24193	O-RING	1
15	24195	BACK-UP RING	1
19	25663	PLUG, -4 ORB	1
20	25403	PLUG, -4 ORB Shipping	1
21	75288	PLUG, -16 ORB Shipping	1
22	25661	SHIM, .080 in. (2 mm)	1-3

NSS = Not Serviced Separately

**H90VS
HYDRAULIC MOTOR GROUP
KOMATSU D65EX-15**



NOTE:
MOTOR COVER, ITEM 23, AND CAPSCREWS
ITEM 24 NOT SHOWN.



**H90VS
HYDRAULIC MOTOR GROUP
KOMATSU D65EX-15**

ITEM	PART NO.	DESCRIPTION	QTY.
1	103190	HYDRAULIC MOTOR	1
2	13684	GASKET	1
3	104174	CAPSCREW, HEX, 1/2-13X1.25, GD.8, Z	4
4	100859	WASHER, 1/2, HARD, Z	18
5	13838	O-RING	2
6	83150	BRAKE VALVE	1
7	29399	CAPSCREW, SOC. HD. 7/16-14X2.75 GD.8	4
8	104760	ADAPTER BLOCK ASSEMBLY	1
	104758	ADAPTER BLOCK	1
	76494	ORIFICE PLUG	2
9	105684	ADAPTER, -6 ORB to -8 ORF	1
10	76478	FLANGE COVER (Shipping use only)	1
11	104318	CAPSCREW, HEX, 7/16-14X1.75 GD. 8 Z	4
12	101268	TEE, -4 ORB BRANCH TO -4 ORF RUN	1
13	101271	HOSE, -4 ORF X 20in. (508 mm)	1
14	27430	ELBOW, -4 ORB to -4 ORF	3
15	101270	HOSE, -4 ORF X 17in. (432 mm)	2
16	104503	TEE, -8 ORF	1
17	101274	CAP, -8 ORF (Shipping use only)	1
18	102990	ELBOW, -4 ORB to -4 ORF	1
19	101273	CAP, -4 ORF (Shipping use only)	1
20	102194	ADAPTER, -6 ORB to -8 ORF	1
21	100945	ELBOW, -6 ORF	1
22	101581	CAP, -6 ORF (Shipping use only)	1
23	102794	MOTOR COVER (not shown)	1
24	104322	CAPSCREW, HEX 1/2-13X1.5 GD.8, Z (for motor cover, Item 23)	14
25	101432	WASHER, 7/16 HARD, Z	4
26	104790	REDUCER, -8 ORF to -4 ORF	1
27	104809	NUT, -8 ORF	1