

BEML LIMITED

(A Government of India Mini Ratna Company under Ministry of Defence)

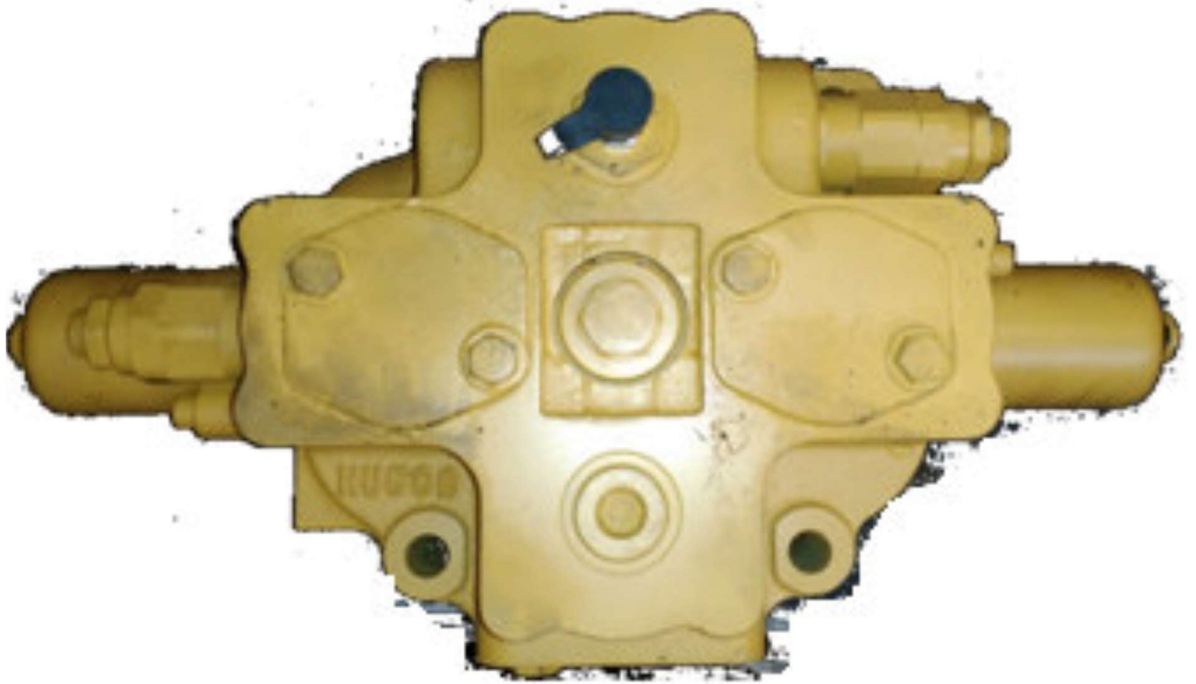
"BEML SOUDHA " 23/1, 4TH Main, S.R. Nagar, Bangalore 560027

Phone : 080 22963245 / 22963315. FAX: 080 22963283.

ANNEXURE-PTS

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‘HOIST VALVE ASSY’ to P/No. 955HS02961



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ANNEXURE-PTS

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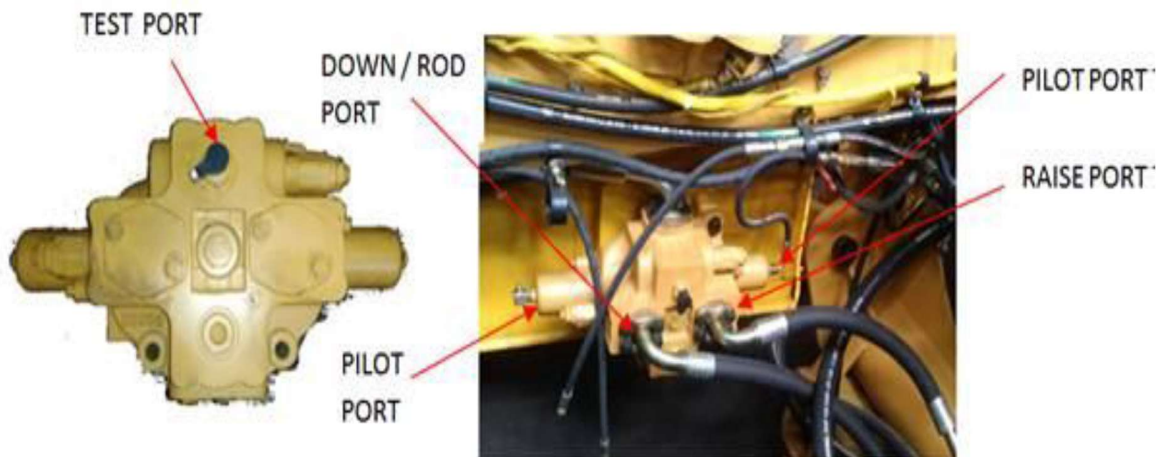
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ANNEXURE-PTS

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HOIST VALVE ASSY

- **Function & working principle**

The load from the truck is dumped with the help of hoist cylinders based on the flow from HOIST VALVE ASSY.

- **Valve actuation**

HOIST VALVE ASSY is actuated by pilot signal from pilot valve. Pilot valve is housed in manifold.

- **Number of ports**

HOIST VALVE ASSY has 2 main work ports (raise & down port) in addition to 2 pilot ports and inlet and tank / outlet ports. - Total 6 ports.

Inlet , Outlet , work ports are Code 61 split flange type ports, pilot ports are o-ring boss ports.

Further to above, ORB test ports of 9/16-18 unf size is inbuilt in HOIST VALVE ASSY

- **No. of positions**

Raise , Lower , float and hold

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ANNEXURE-PTS
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BRIEF TECHNICAL SPECIFICATIONS

- | | | |
|---|---|-------------------------|
| 1 | PUMP OUT PUT | - 94 GPM |
| 2 | OPERATING PRESSURE | - 2750 PSI |
| 3 | OPERATING TEMPERATURE | - 20° F TO +200° F |
| 4 | OIL TYPE | - C4 SAE30 |
| 5 | PILOT PRESSURE | - 150 PSI |
| 6 | MAIN RELIEF VALVE | - 2750 ± 50 PSI @ 90GPM |
| | TO BE SET AT | |
| 7 | CENTERING SPRINGS ARE ADEQUATE TO RETURN SPOOL TO NEUTRAL | |

Hoist cycle timing

- Hoist Raise time : 13 ±2 sec
- Power down time: 15 ~18 sec
- Float down time : 15~18 sec

Electrical interface details :

- Hoist system uses 3 position Joystick for hoist operation ,
- Actuation of joystick towards rear position, energizes raise solenoid through body limit switch.
- When the dump body is raised to maximum position the body limit switch detects the position and deenergizes the raise solenoid.
- When the joystick is moved toward forward position the lower solenoid is energized and allows the dump body to lower.
- When the Joystick is in neutral condition, none of the solenoids are energized.

Note : All solenoids are 24V and continuously rated.

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ANNEXURE-PTS

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955HS02961 Hoist Valve Specifications

1) Leakage specification .

LEAKAGE RATE @ 1000 PSI

=> AT SPOOLS : ALL PORTS : 78 CCPM

=> LOAD CHECK : ALL PORTS NOT TO EXCEED 492 CCPM

2) Oil flow rate during Raise, lower position etc.....

OIL FLOW RATE DURING RAISE : 346 lpm

OIL FLOW RATE DURING LOWER : 346 lpm

3) Testing criteria / qualification test etc....

TEST REQUIREMENT

OIL USED : SAE 10W / C4 SAE 30

OPERATING PRESSURE : 2750 PSI

OPERATING TEMPERATURE : - 29° C ~ + 100° C

MAX PILOT PRESSURE : 150 PSI

MAIN RELIEF SET @ 2750±50 PSI @ 90 GPM

CENTRING SPRING SHOULD BE ADEQUATE TO RETURN SPOOLS TO NEUTRAL POSITION

4) Duration of operation at different condition.

RESPONSE TIME : 0.5 ~ 1 SECOND

DURATION OF OPERATION : HOIST CYCLE TIMING

HOIST RAISE TIME : 13 ±2 SEC

POWER DOWN TIME : 15 ~18 SEC

FLOAT DOWN TIME : 15~18 SEC



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ANNEXURE-PTS

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HOIST VALVE ASSY:

The hoist valve is controlled by pilot pressure from the hoist pilot control valve in the Manifold and orifice check valves located in the pressure lines and hoist up / return line.

If the operator selects "Raise" to raise the dump body, pilot pressure from the Manifold repositions the spool in the hoist valve to direct oil flow through the over center valve to the hoist cylinder "Raise" ports.

An internal relief valve (in the hoist valve) is adjusted to limit maximum hoist pressure to 2750 psi (19.3 Mpa).

Oil for the hoist pilot circuit flows through a pressure reducing valve to reduce the pressure from 2750 psi (19.0 Mpa) to 150 psi. When the operator selects the "Raise" position on the hoist lever, a switch energizes the "Up" solenoid shifting the hoist pilot control valve spool to direct oil to the hoist valve and move the spool to the "Raise" position. When the operator selects "Power Down", the "Down" solenoid is energized to direct oil to the opposite end of the hoist valve spool.

The load can be held in position by placing the hoist valve in "Hold" when the operator releases the hoist lever. The hoist valve will go to the "Hold" position when pilot pressure is removed and the internal spring and detent assembly repositions the spool to block oil flow to and from the hoist cylinders and tank return.

An internal load check valve is used to hold pressure in the hoist cylinders, if the operator selects the "Raise" position after the valve has been in the "Hold" position. The check valve allows the pump to attain a pressure equal to or greater than the pressure in the hoist cylinders to prevent the body from dropping as the spool is shifted from the "Hold" to "Raise" position.

To lower the dump body, the operator selects the "Power Down" position which directs pilot pressure to the opposite end of the hoist valves spool. Oil then flows to the annulus area of the hoist cylinders to cause them to retract.

Maximum "Power Down" pressure is limited to 1000 psi (6.9 Mpa) by the adjustment on the end of the valve. After the body has started to descend, the operator can select the "Float" position by releasing the hoist lever and allows the internal spring and detent assembly to reposition the spool to allow oil to return from the hoist cylinders to the tank.
