PART NO. TOPTC50-EN-00

HITACHI

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Technical Manual
Operational Principle

ZW

150-6
Wheel Loader

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TOPTC50-EN
Technical Manual (Troubleshooting)	: Vol. No.TTPTC50-EN
Workshop Manual	: Vol. No.WPTC50-EN

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Hydraulic Component

HST PUMP	Type	Swash Plate Type (Two-Direction Displacement Angle) Variable Displacement Plunger Pump
	Maximum Flow Rate (Theoretical Value)	0 to 242.9 L/min^{-1} at 2200 min^{-1}
	Theoretical Displacement	0 to 110.4 cm^3/rev
	High-Pressure Relief Valve Set-Pressure	44.5±1.0 MPa (454±10 kgf/cm^2, 6454 psi), Differential Pressure 42.0 MPa (428 kgf/cm^2, 6092 psi)
	Low-Pressure Relief Valve Set-Pressure	2.5±0.1 MPa (25±1 kgf/cm^2, 363 psi)
	Cutoff Valve Set-Pressure	41.2±1.0 MPa (420±10 kgf/cm^2), Differential Pressure 38.7 MPa (395 kgf/cm^2, 5613 psi)
	Control System	Direct-Drive-Type Proportional Solenoid control
HST CHARGING PUMP	Type	Internal Gear Pump
	Rated Current (Theoretical Value)	53.9 L/min^{-1} at 2200 min^{-1}
	Theoretical Displacement	24.5 cm^3/rev
PUMP DEVICE	Type	Fixed Displacement Type Gear Pump
	Speed Ratio	Steering Pump: 1, Main Pump: 1, Transmission Charge Pump: 1
	Function (At the HST Pump Side)	Steering Pump, Main Pump, Pilot Pump, Transmission Charge Pump
	Rated Current (Theoretical Value)	Steering Pump: 132 L/min^{-1} at 2200 min^{-1}
		Main Pump: 57.2 L/min^{-1} at 2200 min^{-1}
		Transmission Charge Pump 17.6 L/min^{-1} at 2200 min^{-1}
	Theoretical Displacement	Steering Pump: 60.8 cm^3/rev
		Main Pump: 27.8 cm^3/rev
		Transmission Charge Pum: 8 cm^3/rev
HST MOTOR 1	Type	Bent-Axis Type Variable Displacement Axial Plunger Motor
	Function	For Low Speed (Clutch Disconnecting Side)
	Maximum Flow Rate	0 to115.6 cm^3/rev
	Control System	Proportional Solenoid Control
HST MOTOR 2	Type	Bent-Axis Type Variable Displacement Axial Plunger Motor
	Function	High Speed (Normally Connected Side)
	Theoretical Displacement	30 to115.6 cm^3/rev
	Control System	Proportional Solenoid Control

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Engine Output Restriction Control Level	Malfunction of the urea SCR system	Engine Torque	Engine Speed	Urea Alarm	Buzzer
Step 1 Warning 1	(Restriction starts.)	No restriction	No restriction	Light ON	Sounds once
Step 2 Warning 2	2 hours after starting the step 1	Restriction: Reduced by 25 %	No restriction	Indicator blinks slowly, being turned on/off every 0.6 seconds.	Long intermittent 2 (Sounds for 1.2 seconds and stops for 3.8 seconds and then repeats the sequence.)
Step 3 Initial	30 minutes after starting the step 2	Restriction: Reduced by 25 %	Restriction: Reduced by 40 %	Indicator blinks slowly, being turned on/off every 0.6 seconds.	Long intermittent 1 (Sounds for 1.2 seconds and stops for 1.2 seconds and then repeats the sequence.)
Step 4 Secondary	75 minutes after starting the step 3	Restriction: Reduced by 50 %	Restriction: Reduced by 40 %	Indicator blinks fast, being turned on/off every 0.3 seconds.	Short intermittent (Sounds for 0.3 seconds and stops for 0.3 seconds and then repeats the sequence.)
Step 5 Final	15 minutes after starting the step 4	-	Slow Idle Fixed	Indicator blinks fast, being turned on/off every 0.3 seconds.	Short intermittent (Sounds for 0.3 seconds and stops for 0.3 seconds and then repeats the sequence.)

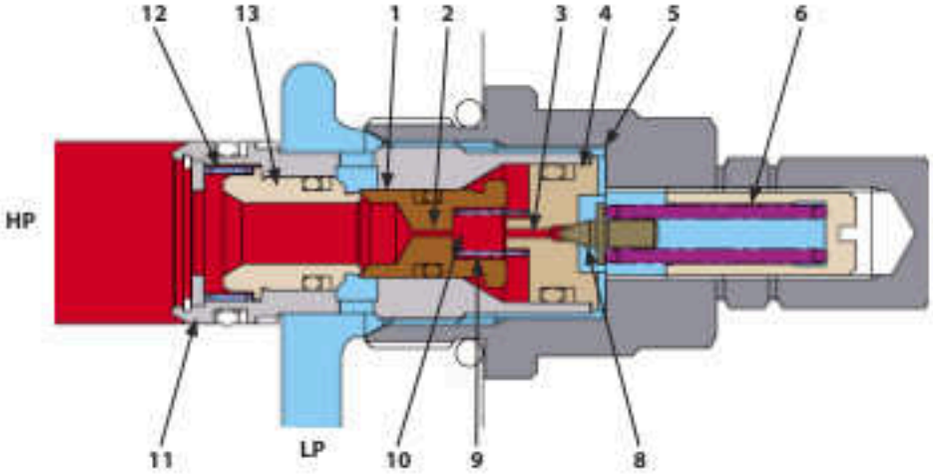
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Make-Up Operation

1. When pressure in port HP (actuator circuit) decreases lower than pressure in port LP (hydraulic oil tank), make-up valve (13) moves left.
2. Hydraulic oil in port LP flows to port HP and cavitation is prevented.
3. When pressure in the port HP side increases to the specified pressure, make-up valve (13) is closed by the force of spring C (12).

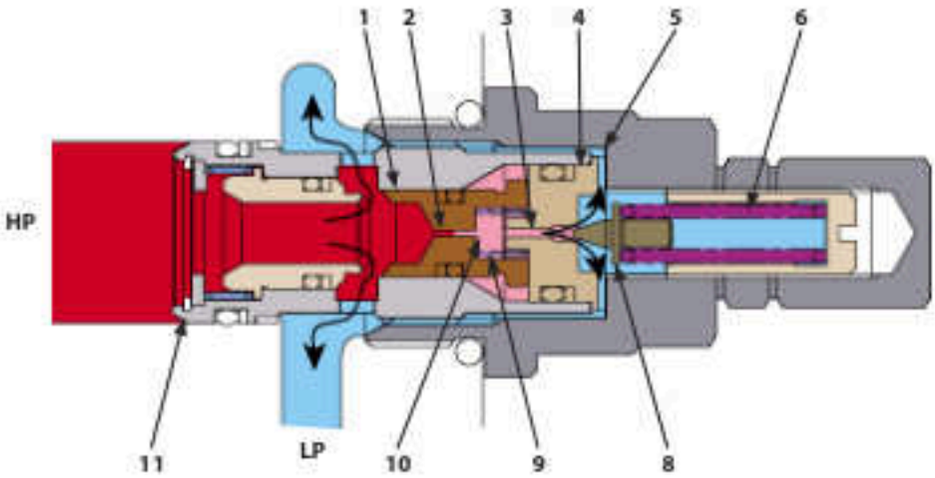
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Normal Operation:



T176-03-03-012

Relief Operation:

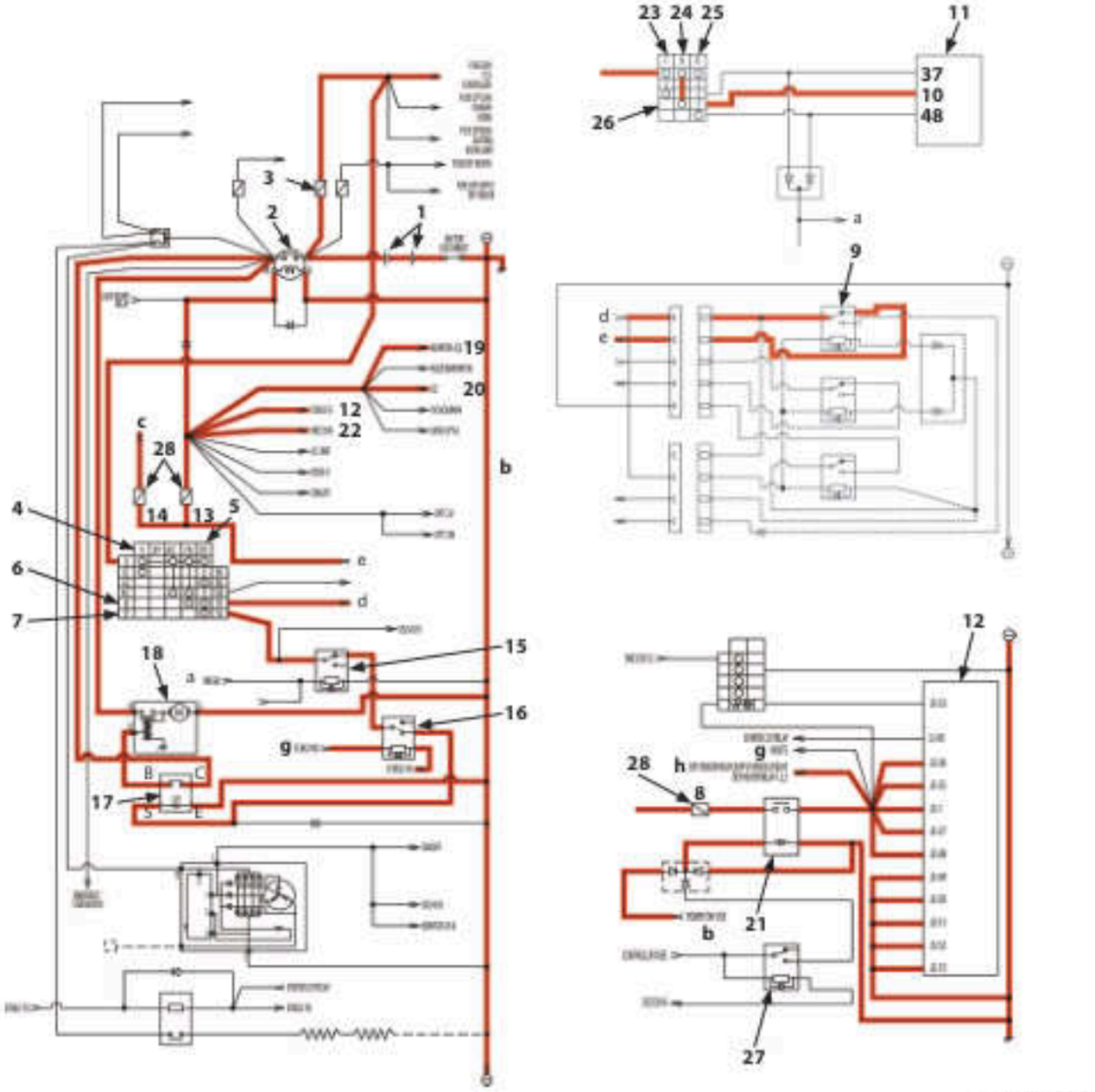


T176-03-03-013

HP- Actuator Circuit
LP- Hydraulic Oil Tank

1- Main Poppet
2- Orifice A
3- Orifice B
4- Seat
5- Passage A
6- Spring B
8- Pilot Poppet
9- Spring A
10- Spring Chamber
11- Sleeve
12- Spring C
13- Make-Up Valve

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TPTC-02-05-002

h- Various Relays (h) of Urea SCR System
g- From Terminal J2-83 in ECM

1- Battery
2- Battery Relay
3- Fuse A (65 A)
4- Key Switch
5- START Position
6- Terminal M
7- Terminal ST
9- Key Switch ON Cut Relay (Option)
11- HST Controller
12- ECM
15- Neutral Relay
16- Starter Cut Relay
17- Starter Relay
18- Starter
19- Column Display Controller
20- Information Controller
21- ECM Main Relay
22- MC
23- Forward (F) Position
24- Neutral (N) Position
25- Reverse (R) Position
26- Forward/reverse lever
27- ECM Timer
28- Fuse Box B

NOTE: The illustration shows the circuit with auto shut-down circuit (optional) attached.

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