PART NO. TOPTC50-EN-01

HITACHI

Reliable solutions

Technical Manual
Operational Principle

ZW

150-6
150PL-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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- ZW150-6

CYLINDER		Lift Arm (Right, Left)	Bucket	Steering	Quick Coupler (OPT)
	Rod Diameter	65 mm (2.6")	85 mm (3.3")	40 mm (1.5")	25 mm (1.0")
	Cylinder Bore	125 mm (4.9")	150 mm (5.9")	65 mm (2.6")	45 mm (1.8")
	Stroke	760 mm (30")	495 mm (1'8")	419 mm (1'5")	200 mm (7.9")
	Fully Retracted Length	1254 mm (4'1")	960 mm (38")	728 mm (2'5")	390 mm (1'3")
	Plating Thickness	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)

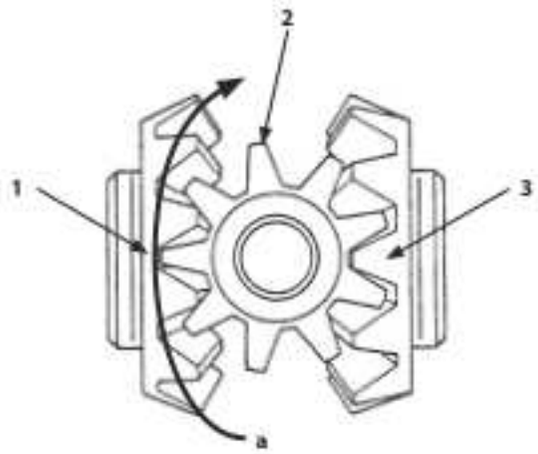
- ZW150PL-6

		Lift Arm (Right, Left)	Bucket (Right, Left)	Steering	Quick Coupler
CYLINDER	Rod Diameter	65 mm (2.6")	65 mm (2.6")	40 mm (1.5")	25 mm (1.0")
	Cylinder Bore	125 mm (4.9")	110 mm (4.3")	65 mm (2.6")	45 mm (1.8")
	Stroke	760 mm (30")	1005 mm (1'8")	419 mm (1'5")	200 mm (7.9")
	Fully Retracted Length	1254 mm (4'1")	1580 mm	728 mm (2'5")	390 mm (1'3")
	Plating Thickness	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)

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Torque Proportioning Differential (TPD)

Wheel loader is operated mostly on roads of bad conditions. When the tires slip, working efficiency and tire lives are lowered. In order to avoid lowering of working efficiency and tire lives, the axle is provided with the torque proportioning differential.
Differential pinion gear (2) of the torque proportioning differential has an odd number of teeth, and differential pinion gear (2) and side gears (1, 3) have special tooth profiles. Therefore, the difference of the road resistances to the left and right tires causes deviation of the gearing locations between differential pinion gear (2) and left and right side gears (1, 3), and the drive force transferred to the left and right tires changes.



T487-03-06-015

a- Forward Rotation

1- Left Side Gear
2- Differential Pinion Gear
3- Right Side Gear

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Overload Relief Valve

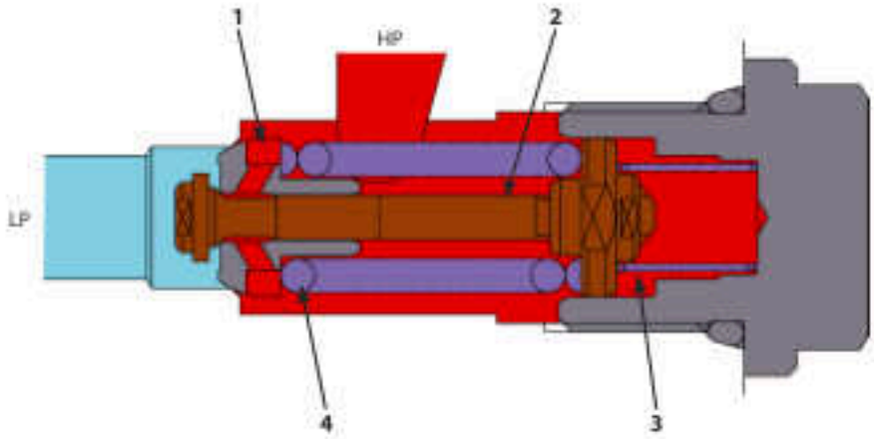
The overload relief valve prevents the hoses and the ride control accumulator from being damaged in case pressure in the bottom side circuit of the lift arm cylinder is suddenly raised by an external force or something during operation of the lift arm cylinder.

Relief Operation

1. Pressure in port HP (actuator circuit) is routed to pilot poppet (8) through orifice A (2) in main poppet (1) and orifice B (3) in seat (4).
2. When pressure in port HP reaches the set force of spring B (6), pilot poppet (8) is opened and pressure oil flows to port LP (the hydraulic oil tank) through passage A (5) and the periphery of sleeve (11).
3. At this time, a pressure difference is caused between port HP and spring chamber (10) due to orifice A (2).
4. When this pressure difference reaches the set pressure of spring A (9), main poppet (1) is opened and pressure oil from port HP flows to port LP.
5. Consequently, the actuator circuit pressure decreases.
6. When the actuator circuit pressure decreases to the specified pressure, main poppet (1) is closed by the force of spring A (9).

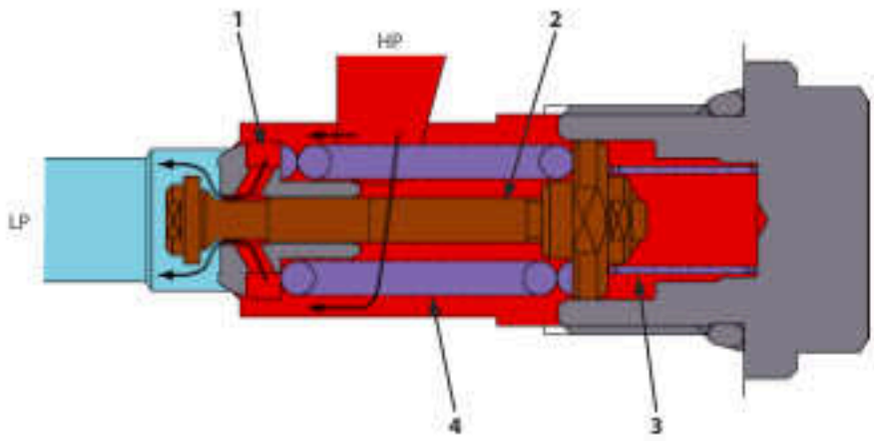
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Normal Operation:



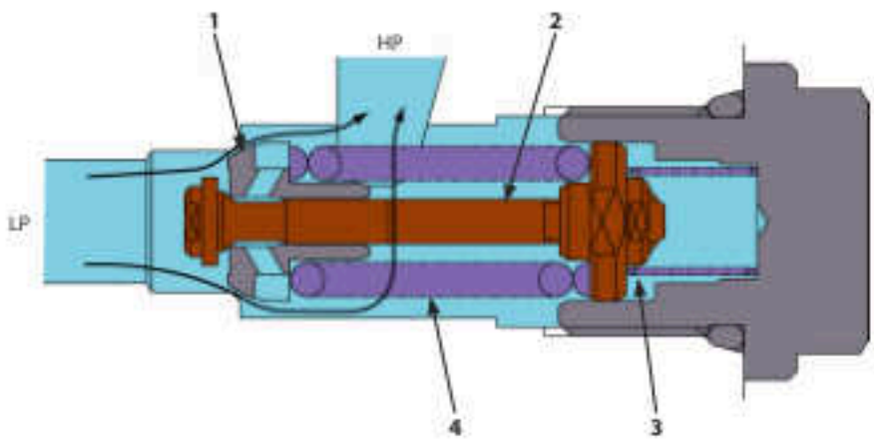
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During Relief Operation:



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During Make-Up Operation:



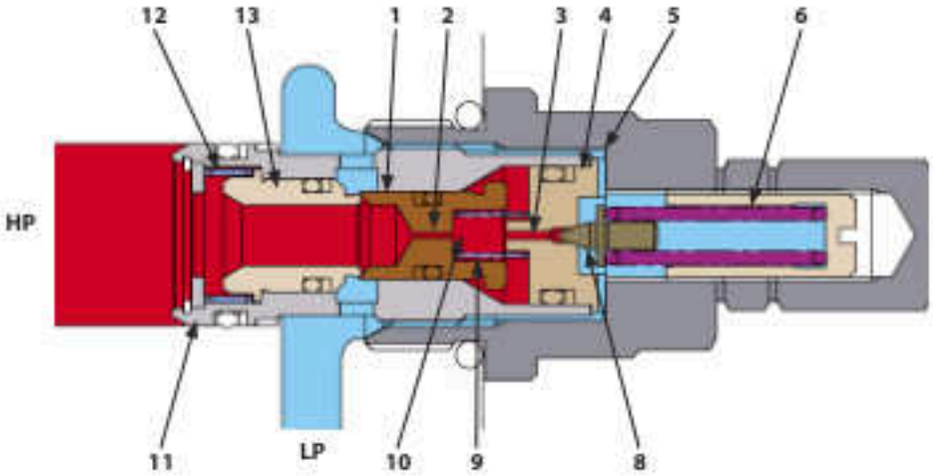
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HP- Actuator Circuit; LP- Hydraulic Oil Tank

1- Seat; 2- Shaft; 3- Spring B; 4- Spring A

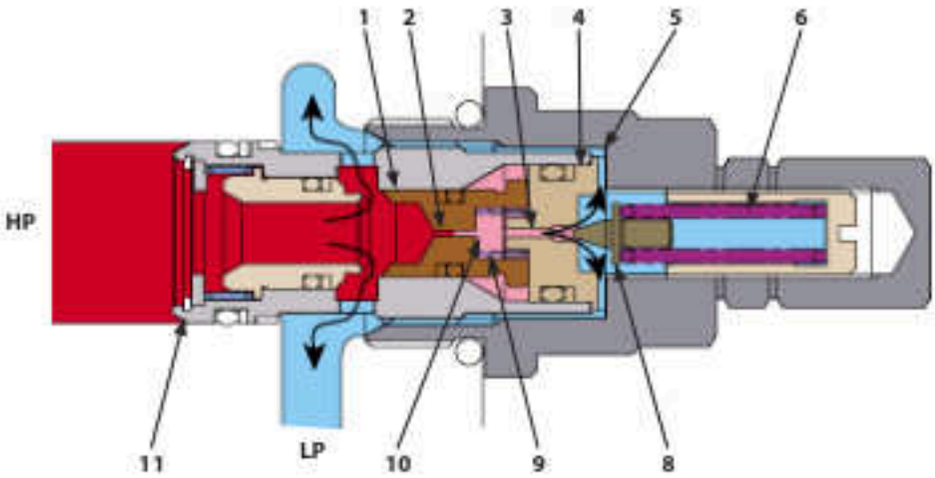
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Normal Operation:



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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