PART NO. TOLCDE0-EN-00

HITACHI

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Technical Manual
Operational Principle

ZX210W-5A
Wheeled Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TOLCDE0-EN
Technical Manual (Troubleshooting)	: Vol. No.TTLCDE0-EN
Workshop Manual	: Vol. No.WLCDE0-EN
Engine Manual	: Vol. No.ETDCY-EN, EWDCY-EN

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Hydraulic Component

PUMP DEVICE	Drive Gear Ratio	Main Pump: 1, Pilot Pump: 1, Steering Pump: 1
MAIN PUMP	Type	Bent-Axis Type Variable Displacement Axial Plunger Pump
	Theoretical Displacement (Set-Capacity)	Pump 1: 114.5 cm^3/rev, Pump 2: 118 cm^3/rev ×2
	Rated Pressure	34.3 MPa
REGULATOR	Type	Hydraulic Pressure Operated Type
PILOT PUMP, STEERING PUMP	Type	Fixed Displacement Type Gear Pump
	Theoretical Displacement	Pilot Pump: 27.8 cm^3/rev, Steering Pump: 16.2 cm^3/rev
CONTROL VALVE	Type	Pilot Pressure Operated Type (4-Spools + 5-Spools)
	Main Relief Set-Pressure	Normal: 34.3 MPa at 110 L/min
		Power Digging: 36.3 MPa at 110 L/min
	Overload Relief Set-Pressure	37.3 MPa at 50 L/min (Boom Lower, Arm Roll-In, Bucket Roll-In, Blade/Outrigger Raise, Blade/Outrigger Lower) 39.2 MPa at 50 L/min (Boom Raise, Arm Roll-Out, Bucket Roll-Out) 28.0 MPa at 135 L/min (Auxiliary)

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Digging Torque-Up Control

Purpose:
The digging torque-up control increases driving torque of pumps 1, 2 and increases pump delivery flow rate during digging operation so that the front attachment operating speed becomes fast.

Operation:

1. When all following conditions exist, MC 1 (12) calculates the data including the signals from pump 1 delivery pressure sensor (26) and pump 2 delivery pressure sensor (25) and sends the signals to torque control solenoid valve (28).
2. Torque control solenoid valve (28) delivers the pilot pressure according to the signals to the regulator and increases the pump delivery flow rate.
3. Therefore, the front attachment operating speed becomes fast.

Condition:

- Pressure Sensor (Boom Raise) (6): Outputting signal
- Pressure Sensor (Arm Roll-In) (7): Outputting signal
- Pump Delivery Pressure: High

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Hydraulic Circuit

Main Circuit

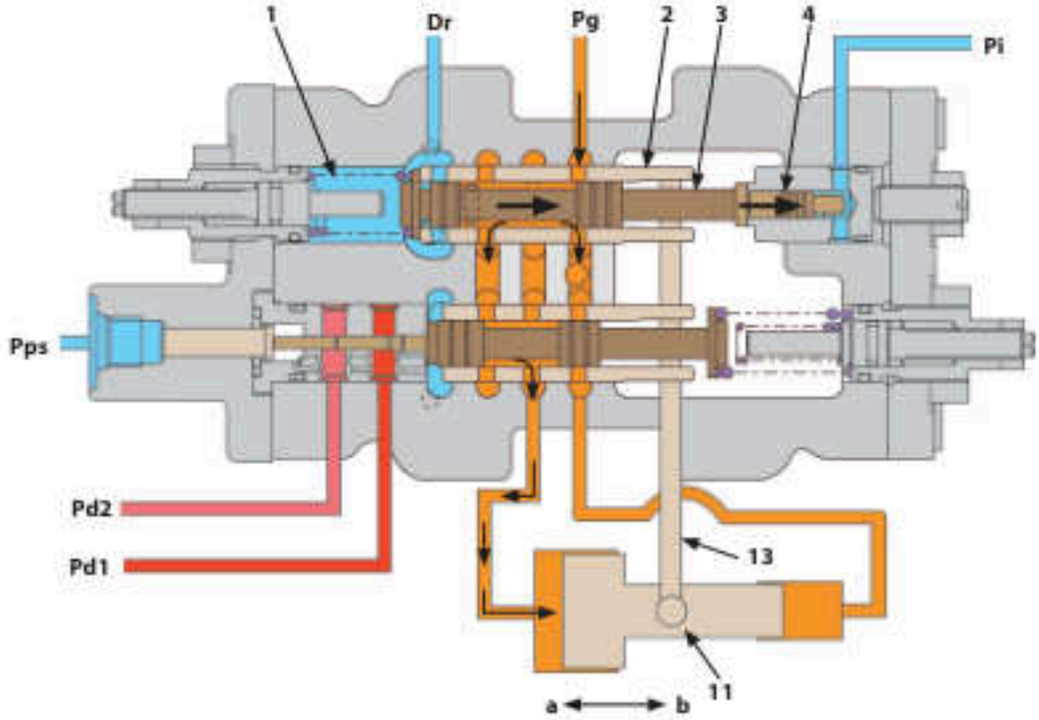
Pressure oil from pump 1 (16) flows to each spool (travel (3), bucket (6), boom 1 (10), and arm 2 (13)) in the 4-spool side (34) of the control valve. Pressure oil from pump 2 (17) flows to each spool (swing (18), arm 1(19), boom 2 (22), auxiliary (24), blade/outrigger (28)) in the 5-spool side (33) of the control valve.

Parallel circuits (9, 15) are provided in each main circuit of pump 1 (16) and pump 2 (17), and make the combined operation possible.
Flow combiner circuits (2, 14) are provided in both boom and arm circuits so that pressure oil from pump 1 (16) and pump 2 (17) are combined during a single operation.

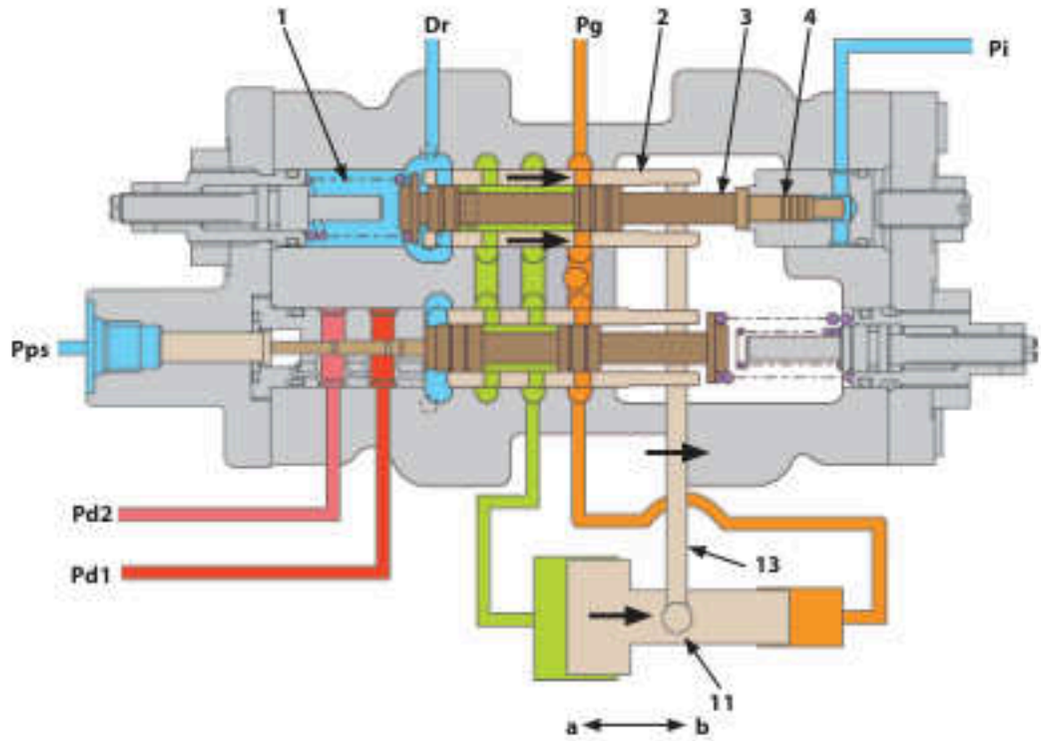
Main relief valve (1) is provided in the main circuit (between the pump and the actuator). Main relief valve (1) prevents the pressure in the main circuit from exceeding the set pressure when the spool is operated (or when the control lever is operated).
Overload relief valves (8, 12, 21, 25 and 29) are provided in the actuator circuits (between the control valve and the actuator) of boom, arm, bucket, blade/outrigger and auxiliary. Overload relief valves (8, 12, 21, 25 and 29) prevent surge pressure caused by external force in the actuator circuit from exceeding the set pressure when the spool is in neutral (when the control lever is in neutral).
Make-up valves (5) are is provided in the actuator circuit (between the control valve and the actuator) of travel. Make-up valve (5) draws hydraulic oil from the hydraulic oil tank and prevents the occurrence of cavitation when the actuator circuit pressure decreases.

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NOTE: *The figure shows the pump 2 regulator.*



TPPP-03-01-018



TPPP-03-01-019

Pd1- Pump 1 Delivery Pressure
Pd2- Pump 2 Delivery Pressure

Dr- Returning to Hydraulic Oil Tank
Pi- Pump Control Pressure

Pps- Torque Control Pressure
Pg- Primary Pilot Pressure (From Pilot Pump)

a- Displacement Angle Increase
b- Displacement Angle Decrease

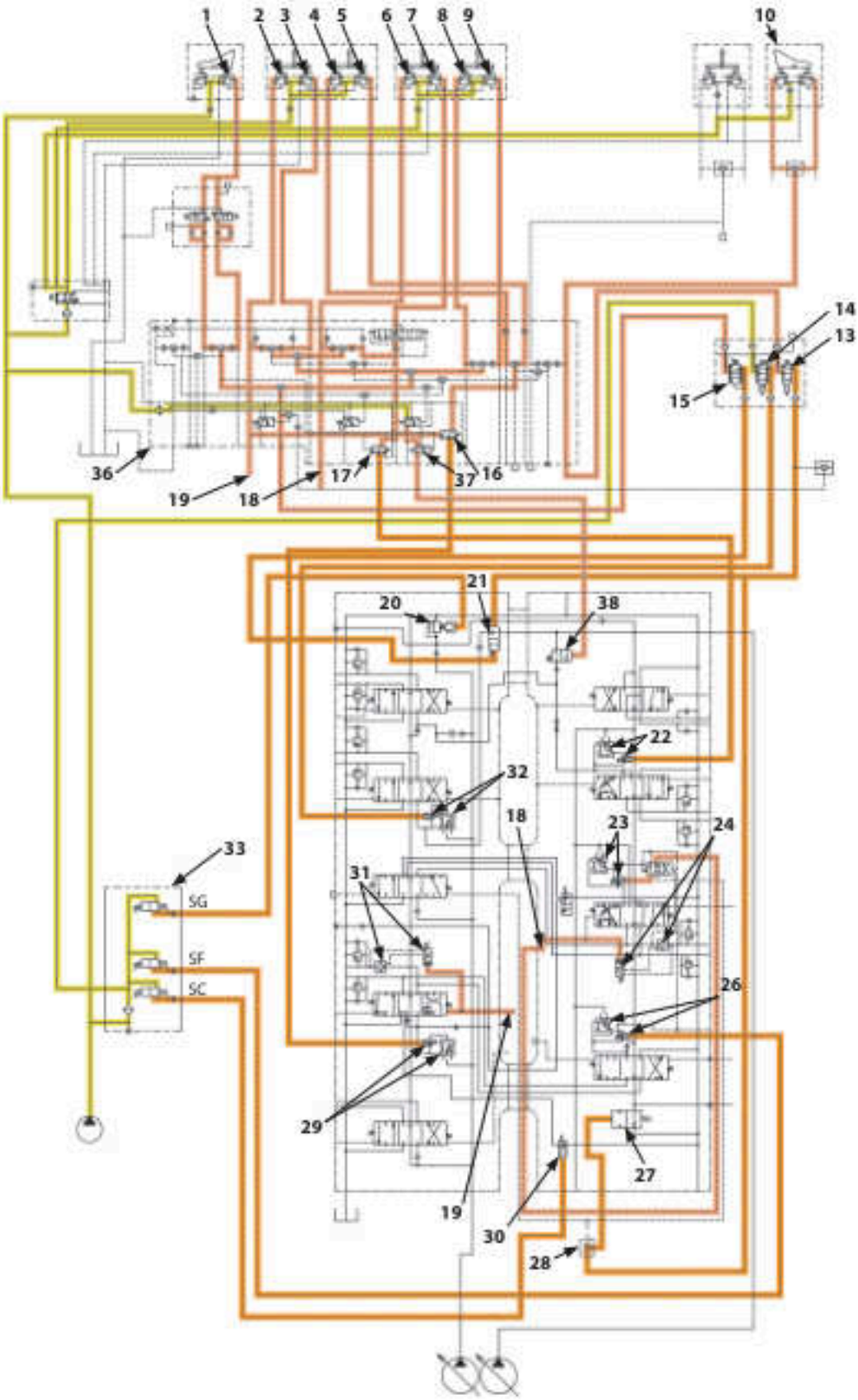
1- Spring
2- Sleeve A

3- Spool A
4- Piston

11- Servo Piston

13- Link

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