PART NO. TODBS50-EN-00

HITACHI

Reliable solutions

Technical Manual
Operational Principle

ZX
190LC-6
190LCN-6

Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TODBS50-EN
Technical Manual (Troubleshooting)	: Vol. No.TTDBS50-EN
Workshop Manual	: Vol. No.WDBS50-EN
Engine Manual	: Vol. No.ETDC150-EN, EWDC150-EN

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Group 3 Component Specifications

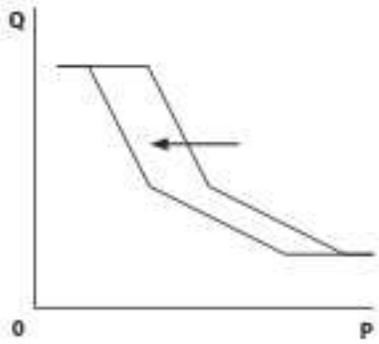
SWING DEVICE	Type	Two-Stage Reduction Planetary Gear
	Reduction Gear Ratio	17.53
SWING MOTOR	Type	Swash-Plate Type, Fixed Displacement Axial Plunger Motor
VALVE UNIT	Type	Non Counterbalance Valve Type
	Relief Set-Pressure	24.9 MPa at 80 L/min
SWING PARKING BRAKE	Type	Wet-Type Spring Set Hydraulic Released Multi-Disc Brake
	Release Pressure	1.9 to 2.8 MPa
TRAVEL DEVICE	Type	Three-Stage Reduction Planetary Gear
	Reduction Gear Ratio	ZX190LC-6: 58.702
		ZX190LCN-6: 57.505
TRAVEL MOTOR	Type	Swash-Plate Type Variable Displacement Axial Plunger Motor
	Maximum Flow (Theoretical Value) (Fast/Slow)	79/122.5 cm^3/rev
TRAVEL BRAKE VALVE	Type	Counterbalance Valve Type
	Relief Set-Pressure	34.8 MPa
TRAVEL PARKING BRAKE	Type	Wet-Type Spring Set Hydraulic Released Multi-Disc Brake
	Release Starting Pressure	0.97±0.07 MPa

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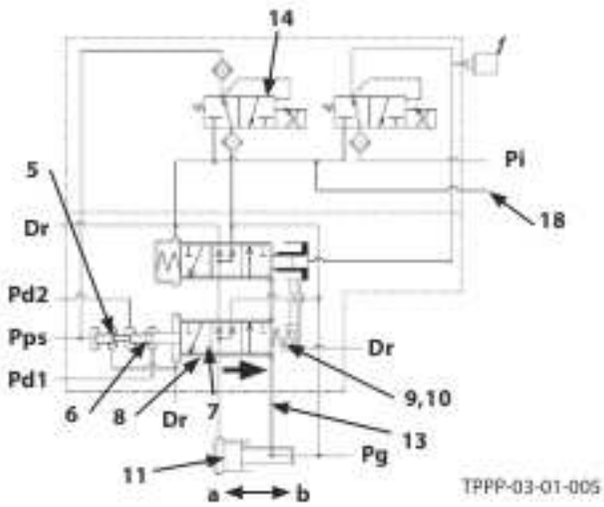
Control by Pilot Pressure from Torque Control Solenoid Valve

NOTE: As an example, the pump 2 regulator is explained here.

- Flow Rate Decrease
  1. The torque control solenoid valve (14) is activated by the signals from MC (main controller), and torque control pressure Pps increases.
  2. Torque control pressure Pps adding to pump delivery pressure acts on load piston 1 (5).
  3. Load piston 1 (5) pushes load piston 2 (6), spool B (7), inner spring (9), and outer spring (10). Spool B (7) is moved toward the direction of the arrow.
  4. Primary pilot pressure Pg is routed to the large chamber of servo piston (11).
  5. Due to the difference in the pressure receiving areas between the large and small chambers, servo piston (11) is moved toward the direction of the arrow. The cylinder block is rotated in the minimum inclination direction and the pump delivery flow rate decreases.
  6. The movement of cylinder block is transmitted to sleeve B (8) via link (13). Sleeve B (8) is moved in the same direction as spool B (7).
  7. When sleeve B (8) is moved with the same stroke as spool B (7), the open part between sleeve B (8) and spool B (7) is closed. Primary pilot pressure Pg routed to the large chamber of servo piston (11) is blocked.
  8. Servo piston (11) is stopped and the pump delivery flow rate decreasing operation is completed.



Q- Flow Rate
P- Pressure



Pd1- Pump 1 Delivery Pressure
Pd2- Pump 2 Delivery Pressure
Dr- Returning to Hydraulic Oil Tank
Pi- Pump Control Pressure

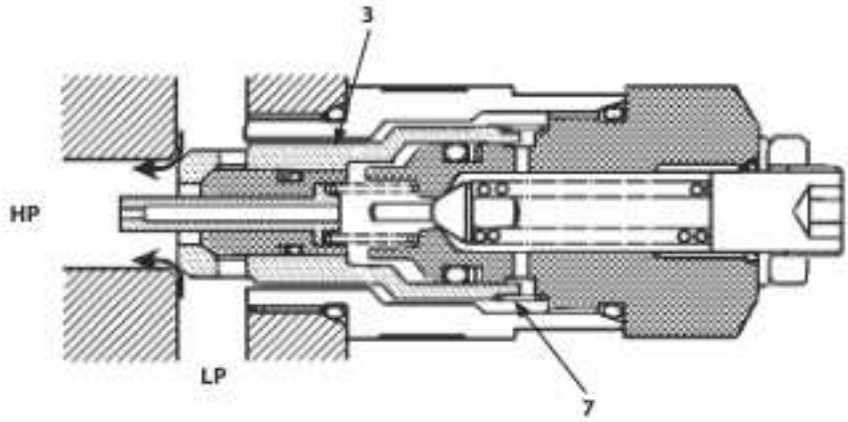
Pps- Torque Control Pressure
Pg- Primary Pilot Pressure (From Pilot Pump)
a- Displacement Angle Increase
b- Displacement Angle Decrease

5- Load Piston 1
6- Load Piston 2
7- Spool B
8- Sleeve B
9- Inner Spring
10- Outer Spring

11- Servo Piston
13- Link
14- Pump 1 and 2 Torque Control Solenoid Valve
18- Air Bleeding Circuit

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When Performing Make-Up Operation:

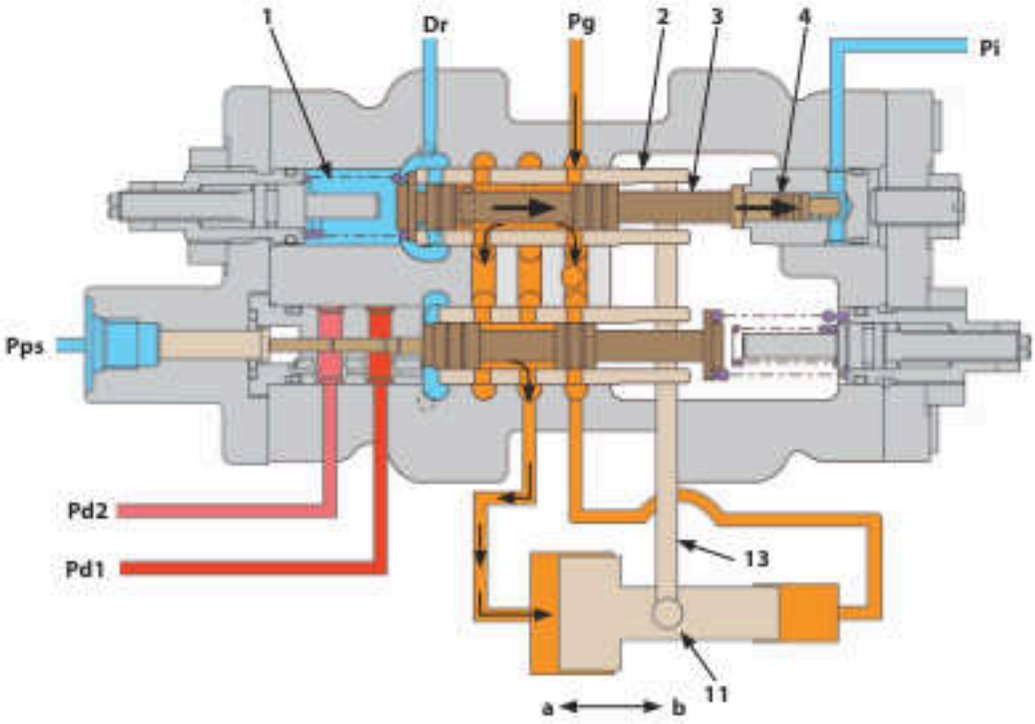


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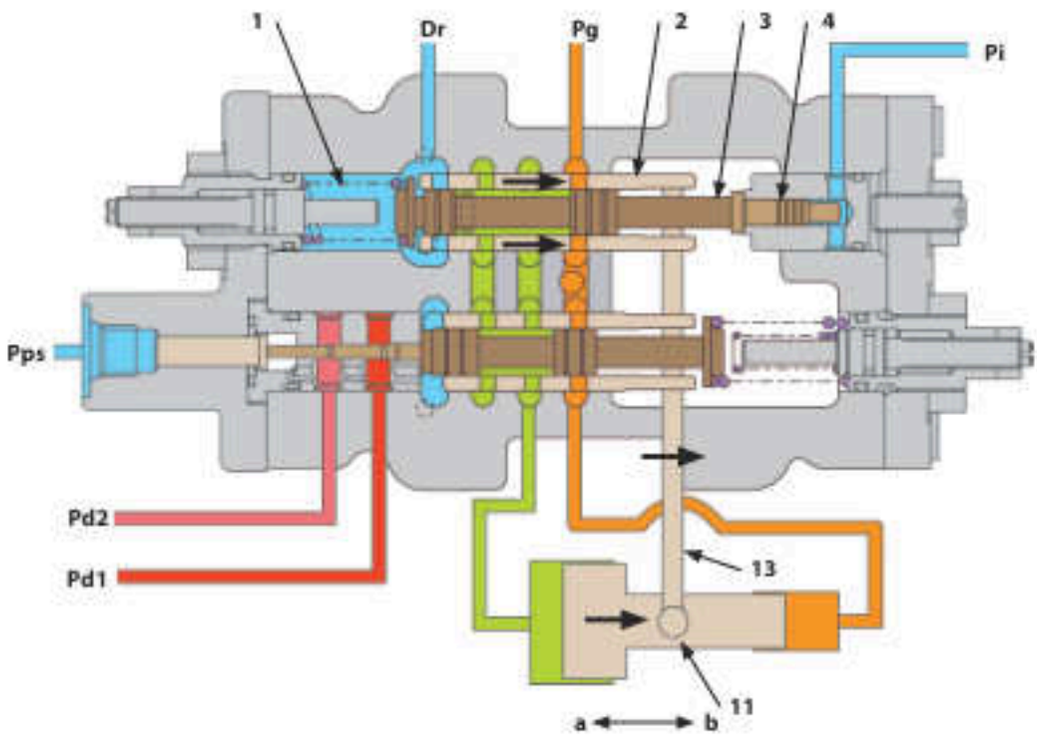
HP- Actuator Circuit
LP- Hydraulic Oil Tank
3- Sleeve
7- Spring C

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NOTE: The illustration shows the pump1 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

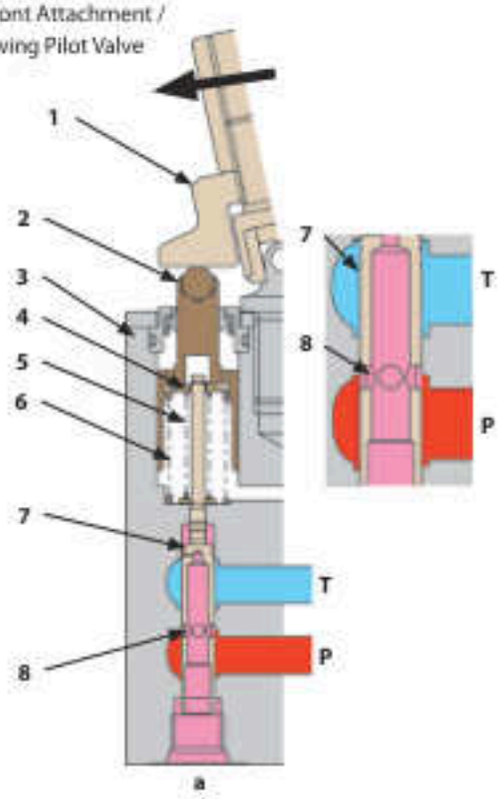
3- Spool A
4- Piston

11- Servo Piston

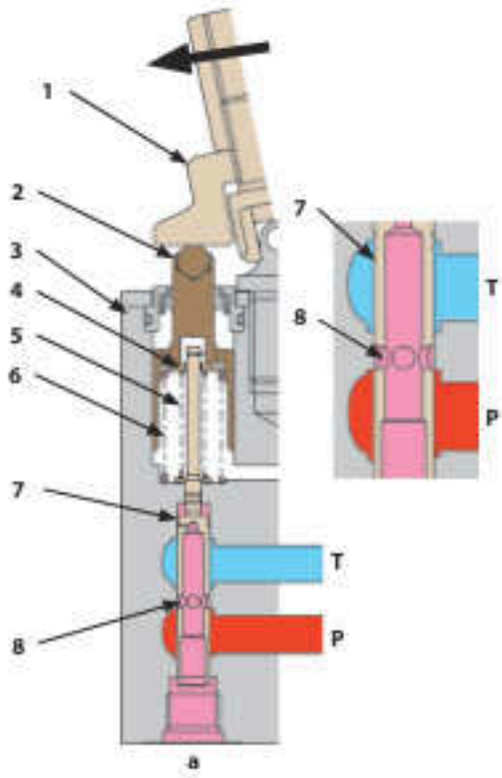
13- Link

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Front Attachment / Swing Pilot Valve

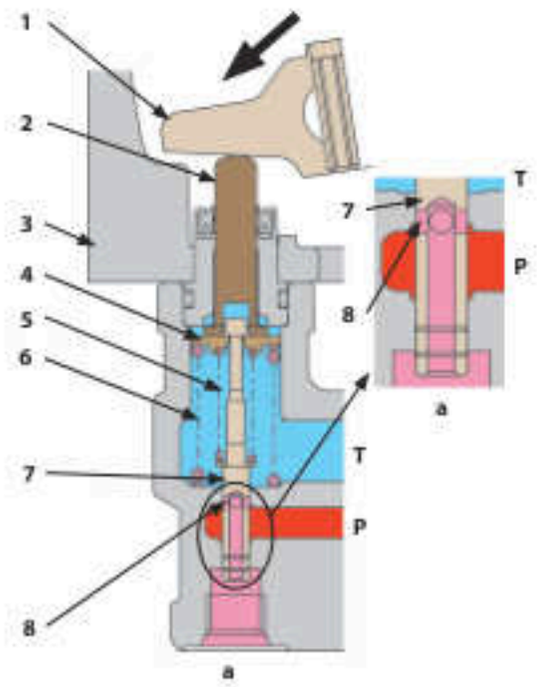


TPPP-03-04-007

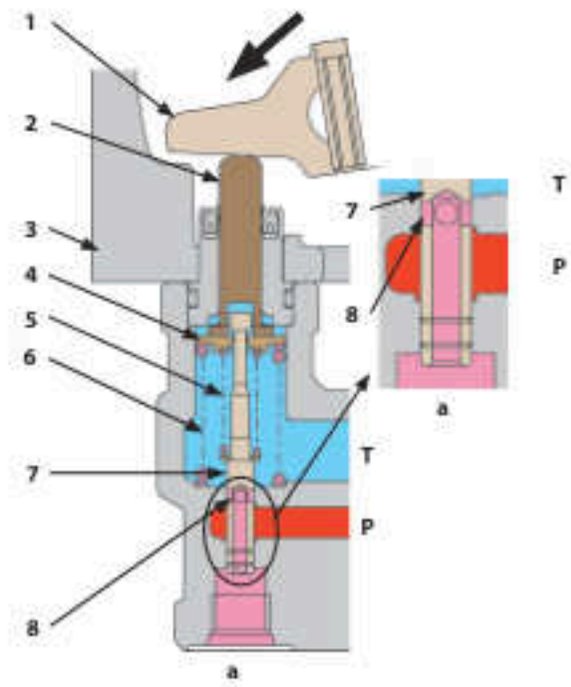


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Travel Pilot Valve



TPPP-03-04-012



TPPP-03-04-013

P- Port P
T- Port T
a- Output Port

1- Cam
2- Pusher
3- Casing
4- Spring Guide
5- Balance Spring
6- Return Spring
7- Spool
8- Hole

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