PART NO. TODCX90-EN-01

HITACHI

Reliable solutions

Technical Manual
Operational Principle

ZX
200-5A
200LC-5A
210H-5A
210LCH-5A
210K-5A
210LCK-5A
210LCN-5A
Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TODCX90-EN
Technical Manual (Troubleshooting)	: Vol. No.TTDCX90-EN
Workshop Manual	: Vol. No.WDCX90-EN
Engine Manual	: Vol. No.ETDCY-EN, EWDCY-EN

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GENERAL

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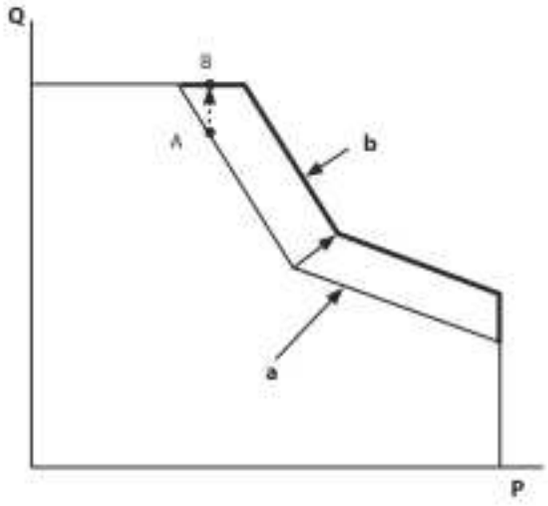
CYLINDER		Boom	Arm	Bucket (ZX200-5A, 200LC-5A, 210H- 5A, 210LCH-5A, 210LCN-5A)	Bucket (ZX210K-5A, 210LCK-5A)
	Rod Diameter	85 mm (3.35")	95 mm (3.74")	80 mm (3.15")	85 mm (3.35")
	Cylinder Bore	120 mm (4.72")	135 mm(5.32")	115 mm (4.53")	120 mm (4.72")
	Stroke	1260 mm (4'1")	1475 mm (4'10")	1060 mm (3'5")	1050 mm (3'5")
	Fully Retracted Length	1855 mm (6'1")	2007 mm (6'7")	1590 mm (5'2")	1600 mm (5'3")
	Plating Thickness	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)

HOSE RUPTURE VALVE	Relief Set-Pressure	$40.5^{+1.0}_{0}$ MPa (413^{+10}_{0} kgf/cm^2, 5873^{+145}_{0} psi) at 0.5±0.1 L/min

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Travel Torque-Up Control

Purpose:
The travel torque-up control effectively controls during the travel single operation.
When the travel operation is performed with the engine running at slow speed, normally, the hydraulic pump delivers pressure oil at the flow rate corresponding to point A on the P-Q curve as illustrated. At this time, if any difference exists between pump 1 and pump 2 flow rate, the machine will mistrack.
In order to prevent mistracking, when traveling the machine with the engine running at slow speed, the pump P-Q curve is raised and the pump delivers pressure oil at the flow rate corresponding to point B (maximum flow rate).
When the travel operation is made with the engine running at fast speed, the pump P-Q curve is raised in order to improve the travel function.



P - Pressure
a - Normal P-Q Curve
Q - Flow Rate
b - Increased Torque P-Q Curve

Operation:

1. When all following conditions exist, MC (8) calculates the data including the signals from pump 1 delivery pressure sensor (18) and pump 2 delivery pressure sensor (19) and sends the signal to torque control solenoid valve (22).
2. Torque control solenoid valve (22) delivers the pilot pressure according to the signal to the regulator and increases the pump delivery flow rate.

Condition:

- Engine control dial (26): Slow speed
- Pressure sensor (travel) (5): Outputting signal
- Pressure sensor (front attachment) (6): No signal

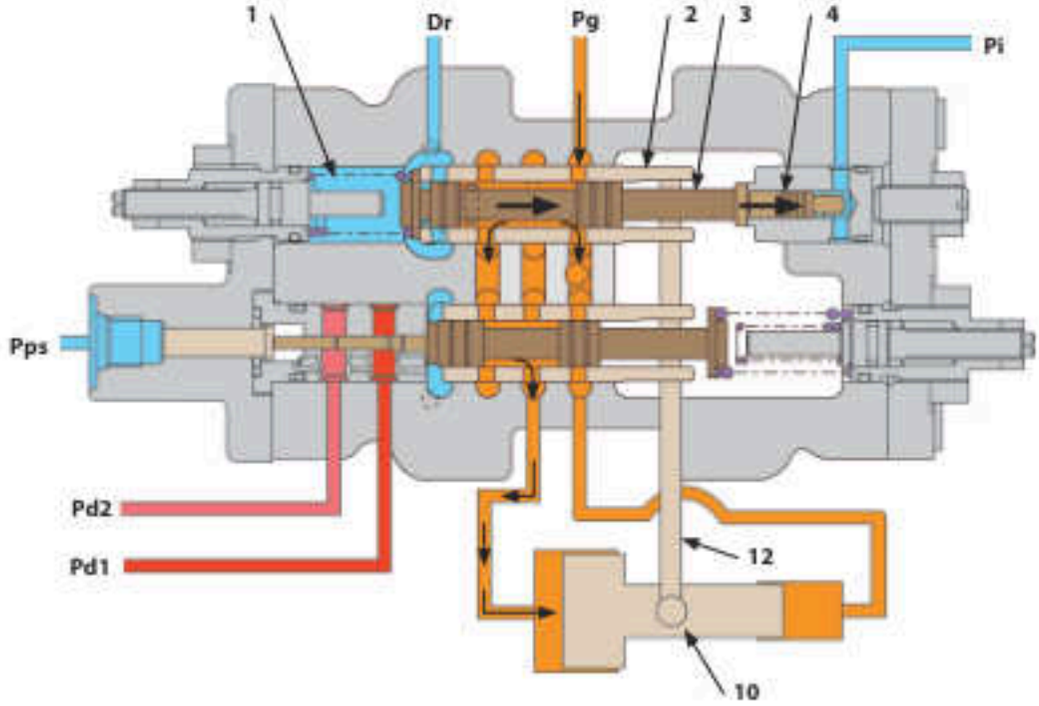
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CAN Circuit

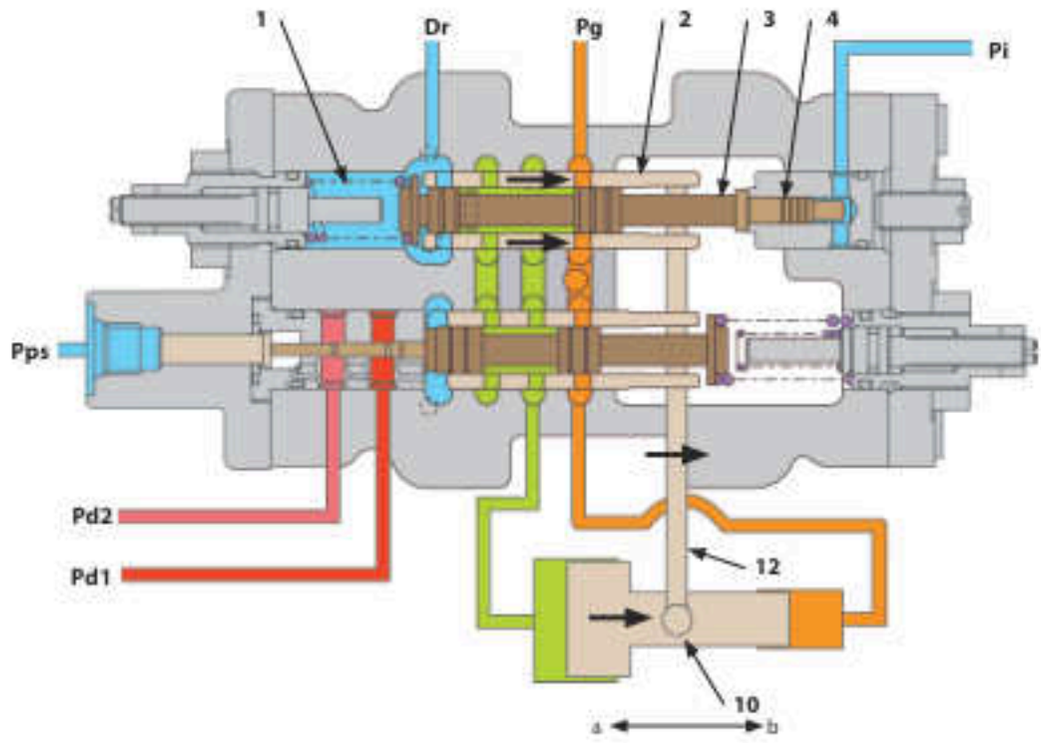
CAN (Controller Area Network) is ISO Standards of the serial communication protocol.
Two networks (CAN bus (4)), CAN 0 (1) and CAN 1 (5) are equipped for this machine.
CAN 0 (1) is used for the engine control. CAN 1 (5) is used for the accessories.
CAN bus (4) consists of two harnesses, CAN-H (High) (2) and CAN-L (Low) (3).
Each controller judges the CAN bus (4) level due to the potential difference between CAN-H (High) (2) and CAN-L (Low) (3).
Each controller arranges the CAN bus (4) level and sends the signal and data to other controllers.
In addition, termination resistors (120 Ω) (6) are installed to both ends of the CAN harness.

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NOTE: The illustration shows the pump 2 regulator.



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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)

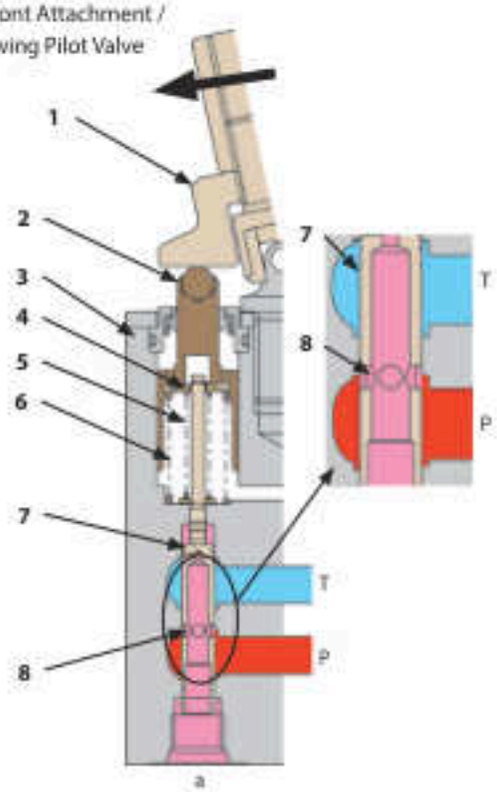
1- Spring
2- Sleeve A

3- Spool A
4- Piston

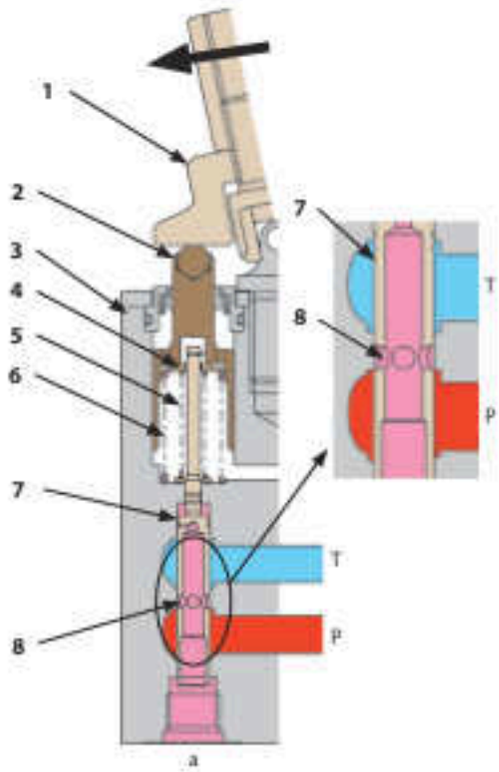
10- Servo Piston
12- Link

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Front Attachment / Swing Pilot Valve

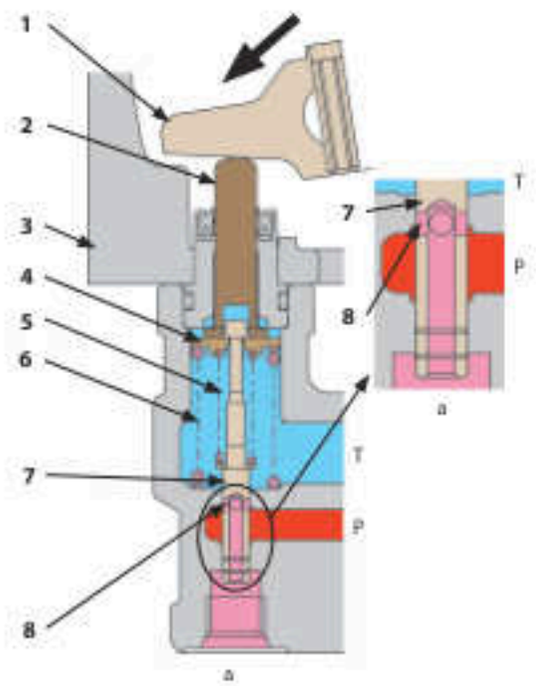


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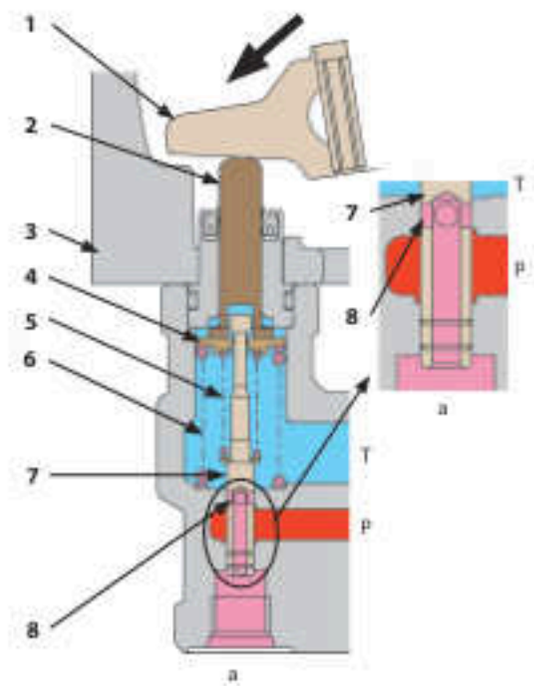


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Travel Pilot Valve



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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