PART NO. TODCF-EN-00

HITACHI

Reliable solutions

Technical Manual
Operational Principle

ZH
210-A
210LC-A
Hybrid Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TODCF-EN
Technical Manual (Troubleshooting)	: Vol. No.TTDCF-EN
Workshop Manual	: Vol. No.WDCF-EN
Engine Manual	: Vol. No.KM-4HK1-E

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GENERAL

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Pump Torque Decrease Control (Radiator Coolant Temperature)

Purpose:
When the target engine speed is the ECO mode engine speed or faster and coolant temperature increases, the pump torque decrease control (radiator coolant temperature) reduces the pump flow rate and pump driving torque so that the engine overheating is prevented.

Operation:

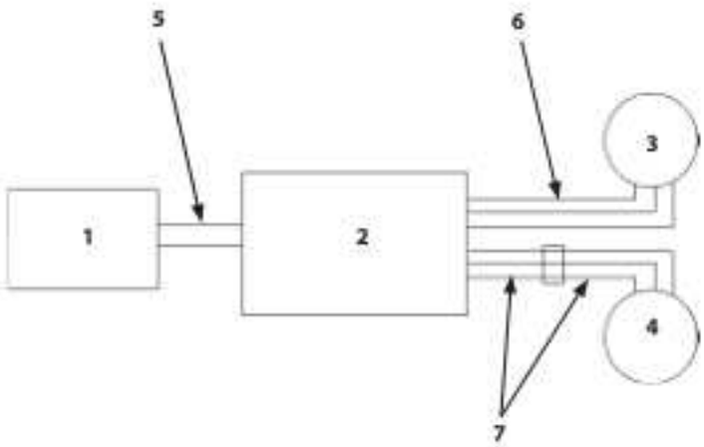
1. When the target engine speed is the ECO mode engine speed or faster and coolant temperature increases, MC (10) activates pump 1 and 2 torque control solenoid valve (26) and pump 3 torque control solenoid valve (27).
2. Pump 1 and 2 torque control solenoid valve (26) and pump 3 torque control solenoid valve (27) deliver the pilot pressure according to the signals to the regulator and reduces the pump delivery flow rate.
3. Therefore, the engine overheating is prevented when coolant temperature increases.

NOTE: The pump torque decrease control (radiator coolant temperature) can be made operable or inoperable by MPDr. (11).

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Power Electrical Circuit for Electric Components

Power electrical circuit for electric components which high voltage current flows is shown as illustrated. High voltage up to DC 180 V is applied to power harness (5) between PCU (2) and capacitor unit (1) when operating this machine. High voltage up to AC 200 V is applied to power harness (6) between swing electric motor (4) and PCU (2) and power harness (7) between assist alternator motor (3) and PCU (2).



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1- Capacitor Unit
2- PCU
3- Swing Electric Motor
4- Assist Alternator Motor
5- Power Harness
6- Power Harness
7- Power Harness

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Energy Management Control

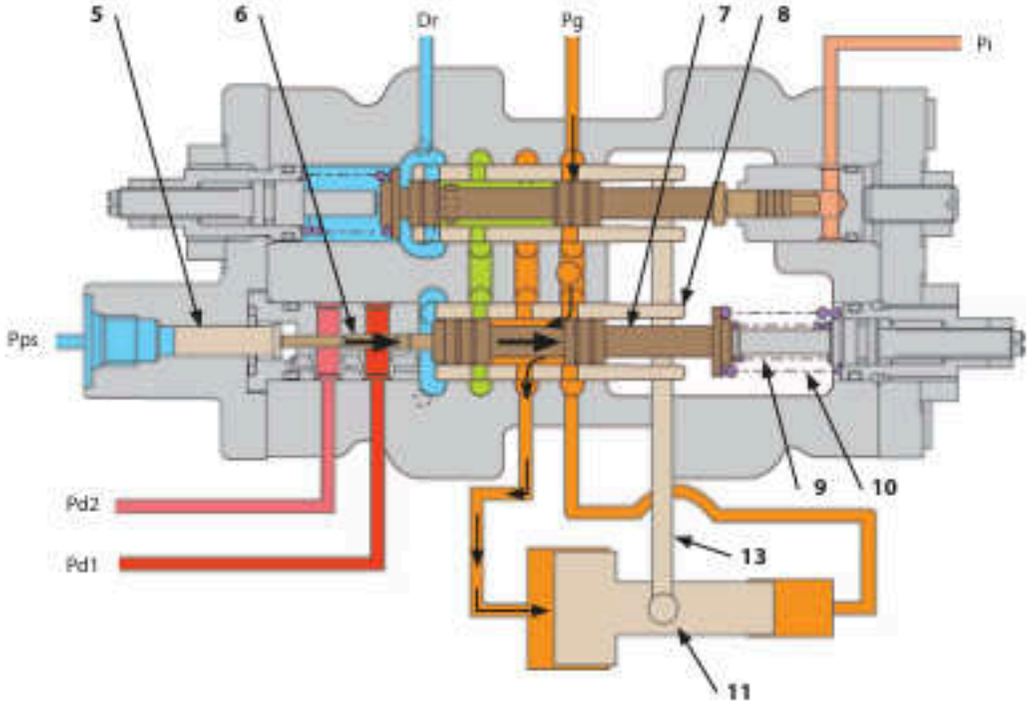
The energy management control manages the state of charge in the capacitor in order to recover and supply energy for swing operation efficiently.

- Capacitor Charge Control
- Capacitor Discharge Control

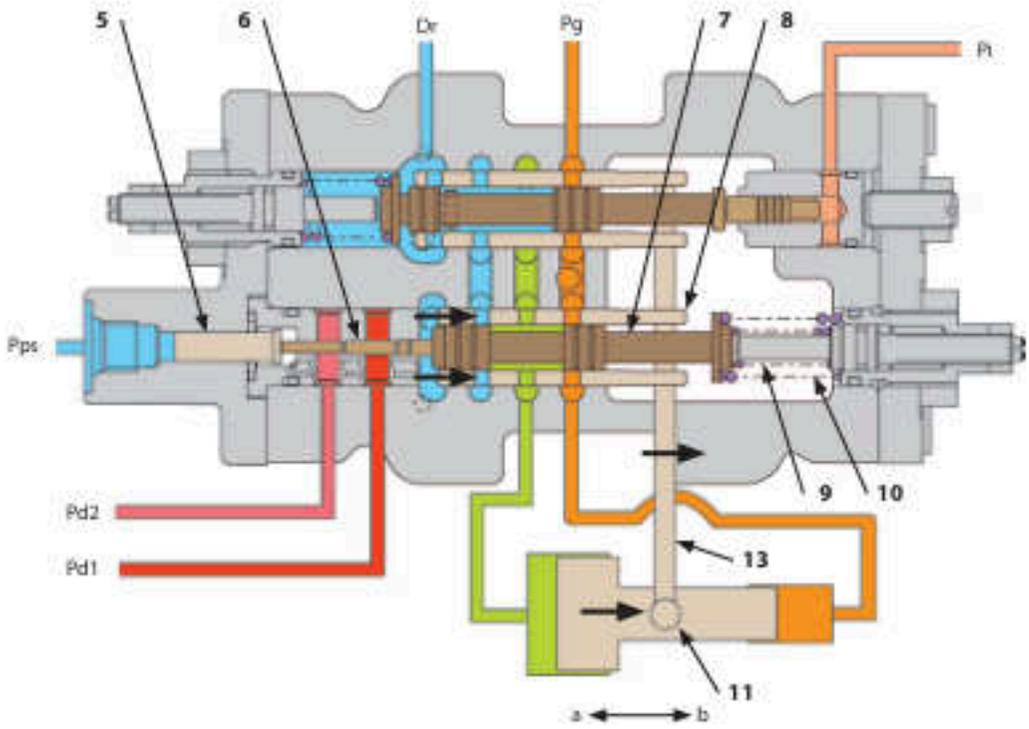
1. When HCU (40) performs hydraulic-electric complex swing control, PCU (39) checks the amount of charge in capacitor unit (38) through the power harness.
2. When the amount of charge in capacitor unit (38) is beyond the specified value, HCU (40) sends the signals that assist alternator motor (16) is activated as a motor to PCU (39) by using INV-CAN (41) communication.
3. PCU (39) activates assist alternator motor (16) as a motor and decreases the amount of charge in capacitor unit (38) to the specified value.
4. When the amount of charge in capacitor unit (38) is below the specified value, HCU (40) sends the signals that assist alternator motor (16) is activated as a generator to PCU (39) by using INV-CAN (41) communication.
5. PCU (39) activates assist alternator motor (16) as a generator and increases the amount of charge in capacitor unit (38) to the specified value.

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NOTE: The illustration shows the pump1 regulator.



TPPP-03-01-013



TPPP-03-01-014

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)

5- Load Piston 1
6- Load Piston 2

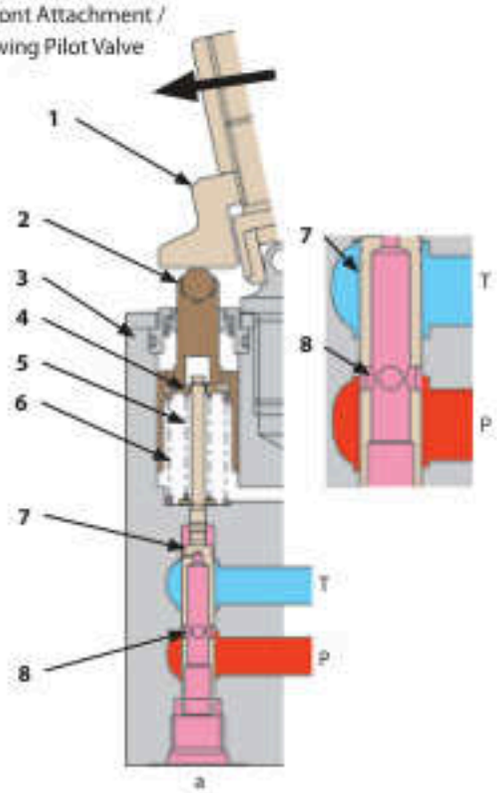
7- Spool B
8- Sleeve B

9- Inner Spring
10- Outer Spring

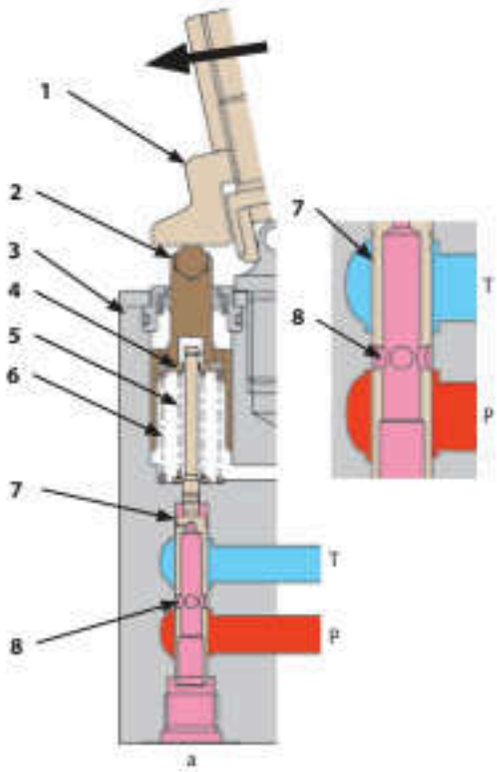
11- Servo Piston
13- Link

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Front Attachment / Swing Pilot Valve

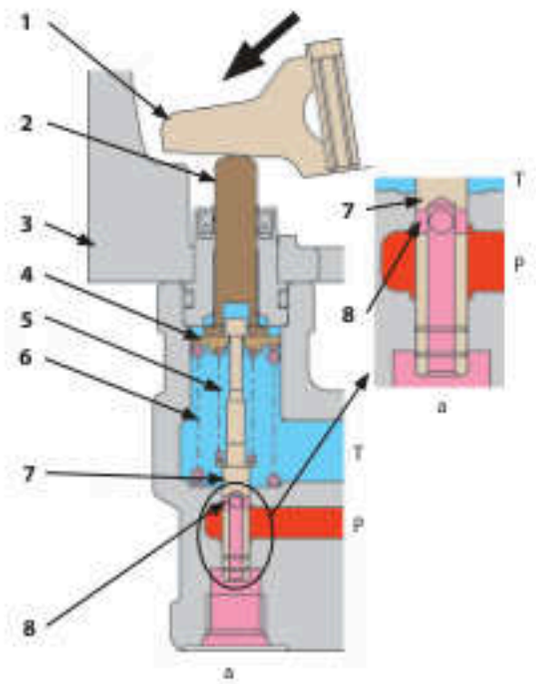


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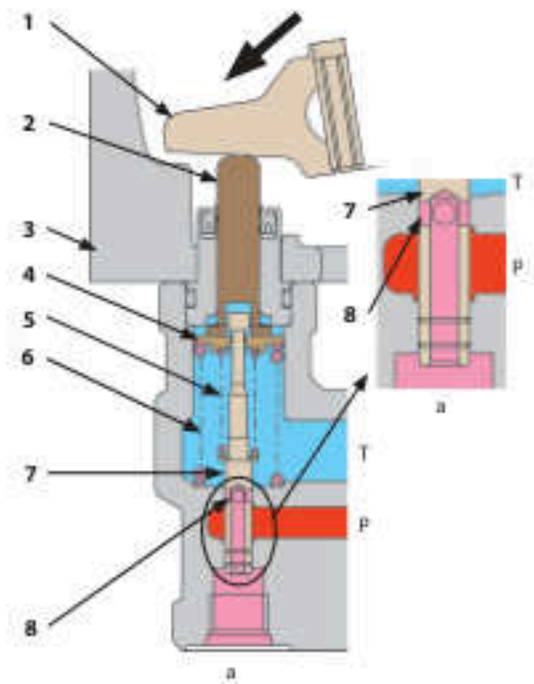


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Travel Pilot Valve



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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