PART NO. TOPD850-EN-00

HITACHI

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# Technical Manual
## Operational Principle

ZW

## 180-6
## Wheel Loader

Service Manual consists of the following separate Part No.

| | |
|---|---|
| Technical Manual (Operational Principle) | : Vol. No.TOPD850-EN |
| Technical Manual (Troubleshooting) | : Vol. No.TTPD850-EN |
| Workshop Manual | : Vol. No.WPD850-EN |

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## Electrical Component

| | | |
|---|---|---|
| FUEL LEVEL SENSOR | Resistance Value | Empty : $90^{+10}_{0}$ Ω, Full : $10^{0}_{-4}$ Ω |
| BATTERY RELAY | Voltage/Current | 24 V/100 A |
| STARTER RELAY 2 | Voltage | 24 V |
| GLOW RELAY | Voltage | 24 V |
| AIR FILTER RESTRICTION SWITCH | Operating Pressure | 6.2±0.6 kPa |
| HORN | Voltage/Current | 24 V-1.5±0.7 A |
| | Sound Pressure | 113±5 dB (A) at 2 m (6'6.7") |
| ILLUMINATION | Work Light | Halogen 24 V, 70 W |
| | Cab Light | 24 V, 10 W |
| | Head Light | Halogen 24 V, 75/70 W |
| | Turn Signal Light | 24 V, 25 W (Front), 21W (Rear) |
| | Clearance Light | 24 V, 4 W (EU)/24V, 5W |
| | License Light | 24 V, 10 W×2 pcs |
| | Tail Light | 24 V, 5 W (EU) |
| | Brake Light | 24 V, 21 W |
| AIR CONDITIONER | Refrigerant | 134 a |
| | Cooling Ability | 4.65 kW or More |
| | Cool Air Volume | 550 $m^3$/h or More |
| | Heating Ability | 5.81 kW or More |
| | Warm Air Volume | 400 $m^3$/h or More |
| | Temperature Adjusting System | Electronic Type |
| | Refrigerant Quantity | 900±50 g |
| | Compressor Oil Quantity | 160 $cm^3$ |
| EMERGENCY STEERING PUMP UNIT | Type | Electric Motor Operated Type |
| | Maximum Flow | 15 L/min (3.96 gpm) at 10.0 MPa (102 kgf/$cm^2$, 1450 psi) |
| ELECTRIC MOTOR | Voltage | 24 V, 2.4 kW |



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### Engine Torque Idle Speed-Up Control

Purpose:
In case the engine speed is slow and the engine load is large, for instance while the machine climbs on a slope, the engine torque idle speed-up control increases the engine speed in order to prevent the engine stall.

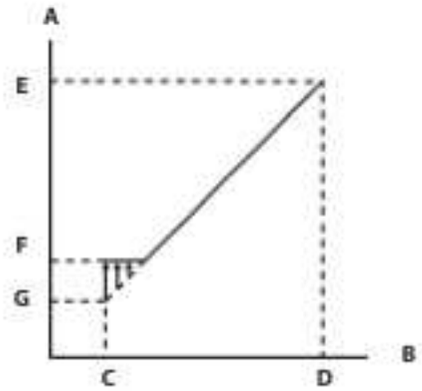
Operation:

1. When all following conditions exist, MC (3) sends the signal equivalent to the target engine speed to ECM (10) by using CAN communication (5).

- Forward/Reverse Lever (23): Operated
- Vehicle Speed: less than 20 km/h (12 mph)
- Accelerator Pedal (1) Depressing Amount: Lightly depressed (Engine Speed: less than 1100 min$^{-1}$)
- Engine Torque: over specified value (Reference: over 20 %)

2. ECM (10) increases the engine speed to engine torque idle speed-up speed (F).

*NOTE: The engine torque idle speed-up control is also activated when the signal of forward/reverse switch (27) is effective in case of the machine equipped with forward/reverse switch (27).*




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A - Engine Speed
B - Accelerator Pedal Depressing Amount
C - Accelerator Pedal Depressing Amount: Not depressed
D - Accelerator Pedal Depressing Amount: Fully depressed
E - Fast Idle Speed (2350 min$^{-1}$)
F - Engine Torque Idle Speed-Up Speed (Max. 1100 min$^{-1}$)
G - Slow Idle Speed (800 min$^{-1}$)

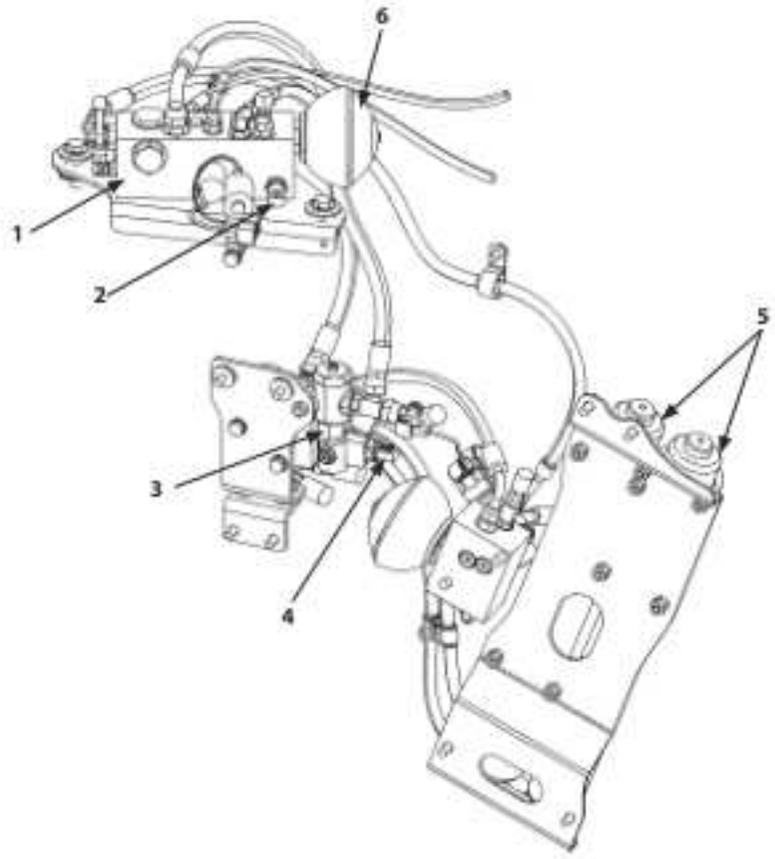


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## Outline

The charging circuit consists of brake charge valve (3) and manifold valve (1). (Refer to SYSTEM/Hydraulic System.) Brake charge valve (3) supplies the pressure oil from the pilot pump preferentially to service brake accumulator (5), the brake valve, and the parking brake. In addition, brake charge valve (3) also supplies pressure oil to manifold valve (1). Pressure sensor (brake primary pressure) (4) for the brake oil low pressure indicator is installed in brake charge valve (3).

Manifold valve (1) supplies the pressure oil from brake charge valve (3) to the, pump regulator, and ride control valve. In addition, when the control lever lock solenoid valve is shifted, manifold valve (1) also supplies the pressure oil to the pilot valve. Pressure sensor (primary pilot pressure) (2) for the control lever lock indicator is installed in manifold valve (1).

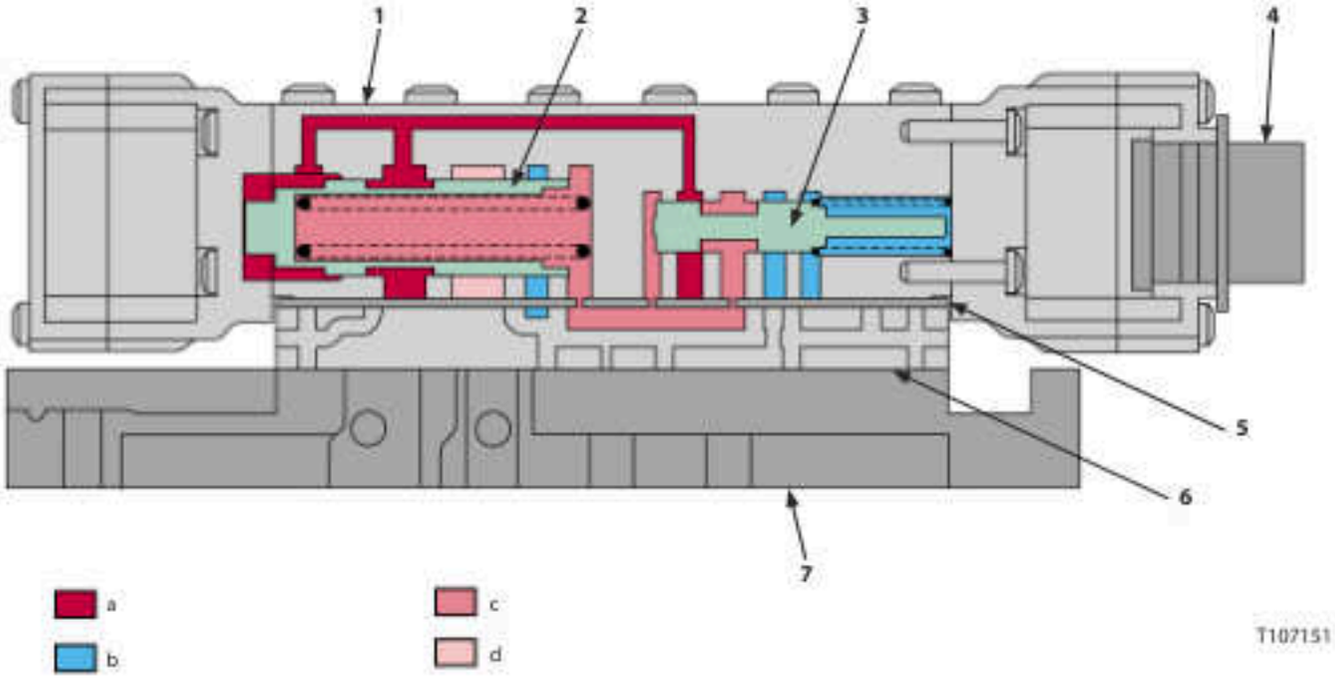



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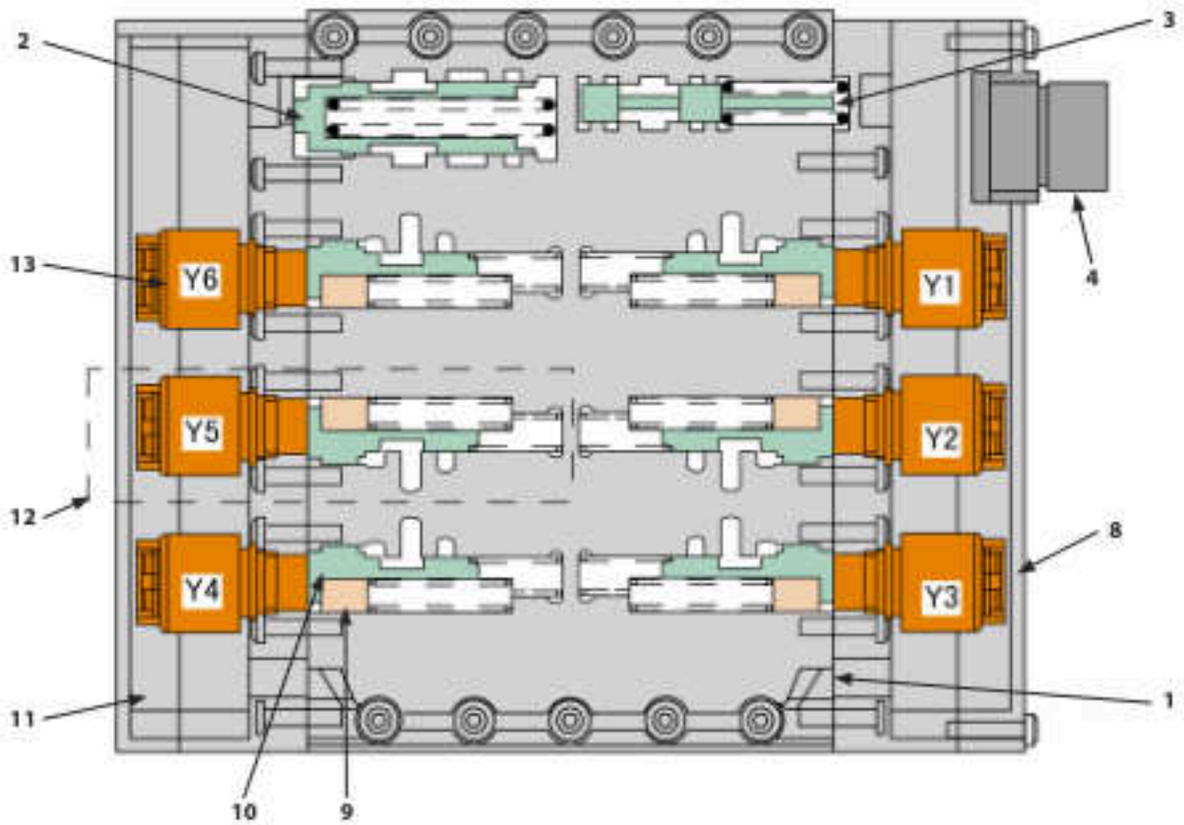
1- Manifold Valve
2- Pressure Sensor (Primary Pilot Pressure)
3- Brake Charge Valve
4- Pressure Sensor (Brake Primary Pressure)
5- Service Brake Accumulator (2 Used)
6- Pilot Accumulator (Front Attachment)



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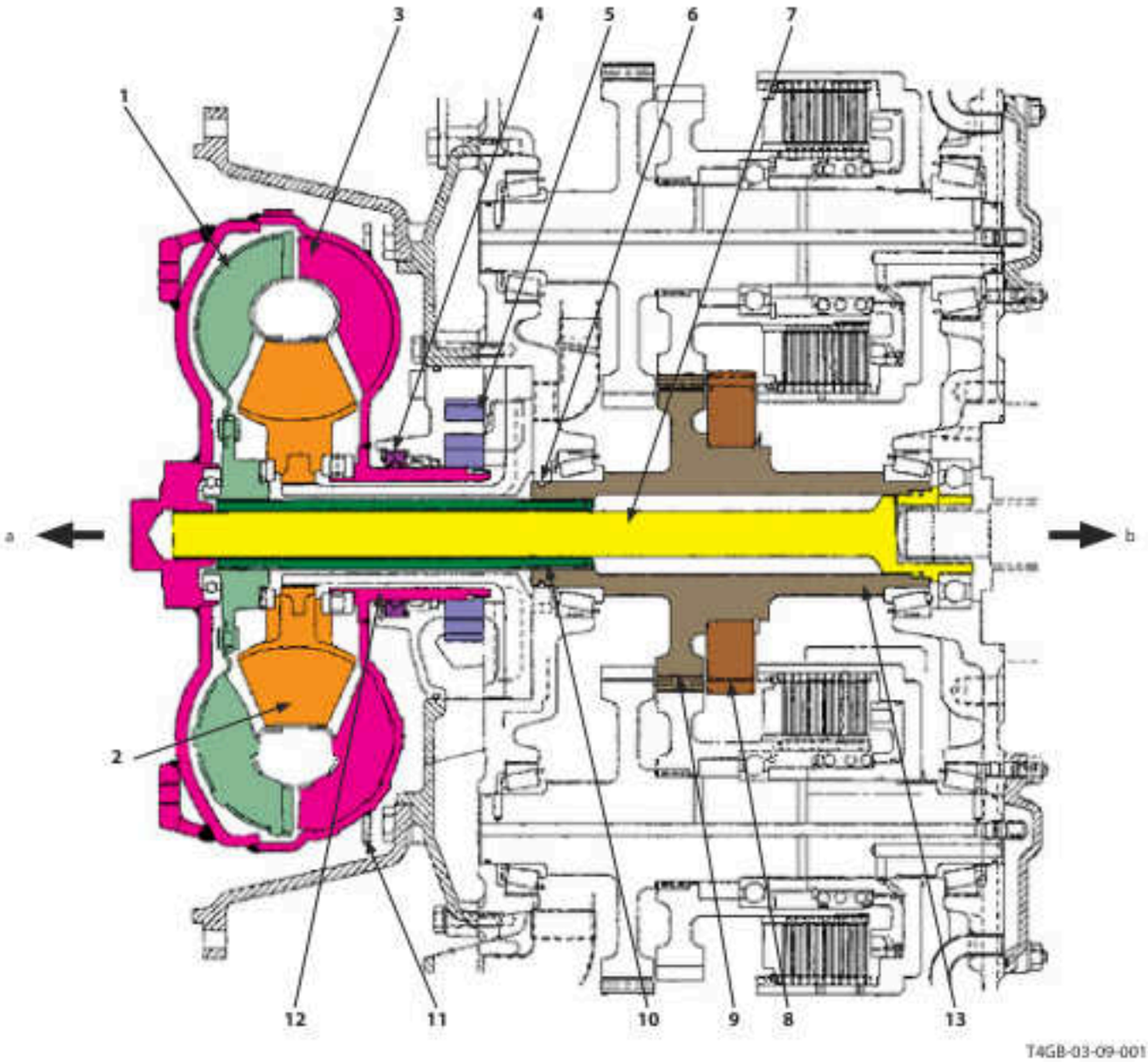

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a- System Main Pressure Oil
b- Returning Oil
c- Reduced Pressure Oil
d- Converter Pressure Oil (Return Oil)

1- Valve Body
2- Pressure Control Valve
3- Pressure Reducing Valve
4- Connector
5- Middle Plate
6- Channel Plate
7- Plate
8- Cover
9- Damper Valve
10- Spool
11- Housing
12- Modulation Circuit
13- Proportional Solenoid Valve



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a- Engine Side
b- Main Pump Side

1- Turbine
2- Stator
3- Impeller
4- Oil Seal
5- Transmission Pump
6- Seal Ring
7- Impeller Shaft
8- High-Speed Drive Gear
9- Low-Speed Drive Gear
10- Turbine Shaft
11- Notch Ring
12- Drive Tube
13- Torque Converter Input Shaft



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