PART NO. TTDEA-EN-01

HITACHI

Reliable solutions

Technical Manual
Troubleshooting

ZX
70-5G
70LC-5G
Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TODEA-E
Technical Manual (Troubleshooting)	: Vol. No.TTDEA-E
Workshop Manual	: Vol. No.WDEA-E
Engine Manual	: Vol. No.ETADB-EN, EWADB-EN

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SECTION 4

OPERATIONAL PERFORMANCE TEST

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Main Pumps 1, 2 Flow Rate

Summary:

Main pump performance is checked by measuring the pump flow rate by using a hydraulic tester installed at the main pump delivery port. Use MPDr. and a pressure gauge at the same time.

IMPORTANT: This measurement procedure is a simple method. The measured data will be lower by approx. 5 % than the accurately measured value. In order to measure accurately, disconnect the return circuit from the control valve and connect it to the hydraulic oil tank.

Preparation:

1. Stop the engine. Push the air bleed valve on top of the hydraulic oil tank and release any remaining pressure. Install the vacuum pump.

NOTE: Operate the vacuum pump while connecting the pump flow rate test line.

2. Remove the plug from pressure check ports (3, 5) on the main pump. Install the adapter (ST 6069), hose (ST 6943), and pressure gauge (ST 6941). (Fig. A)

   : 6 mm

3. Disconnect the hoses and remove the adapters of the main pump delivery ports. Install the plug (ST 6254) to the adapter of the disconnected hose.

   : 32 mm, 36 mm

4. Install hydraulic tester (9) between delivery ports (2, 4) of main pumps 1 and 2 and control valve (10). (Fig. B)

   : 32 mm, 36 mm, 41 mm, 71 mm

5. Fully open the loading valve of hydraulic tester (9).

6. Remove the vacuum pump. Loosen plug (1) on top of the pump. Start the engine. Bleed air from the pump until oil only comes out. At this time, check the connections for any oil leaks.

   : 10 mm

Measurement:

IMPORTANT: The delivery oil pressure from main pump 3 controls the flow rates of main pumps 1 and 2. Accordingly, measure the flow rates twice with main pump 3 in neutral (no load) and when relieving swing function (loading).

1. Maintain the hydraulic oil temperature at 50±5 °C (122±9 °F).

2. Select the following conditions.

Engine Control Dial	Power Mode	Auto-Idle Switch
Fast Idle	PWR	OFF

3. While gradually closing the loading valve of hydraulic tester (9), measure the flow rates, and engine speeds at the set oil pressures.

   Measure the flow rates twice with main pump 3 under no load and loading (relieving swing function).

4. Repeat the measurement three times and calculate the mean values.

Evaluation:

Convert the measured pump flow rate into the one for the rated pump speed. Refer to Operational Performance Standard.

Qc=Ns×Q/Ne

Qc : Converted Flow Rate
Q : Measured Flow Rate
Ns : Rated Pump Speed: 2100 min^{-1}
Ne : Measured Engine Speed: Values indicated on MPDr.

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5-Volt Circuit

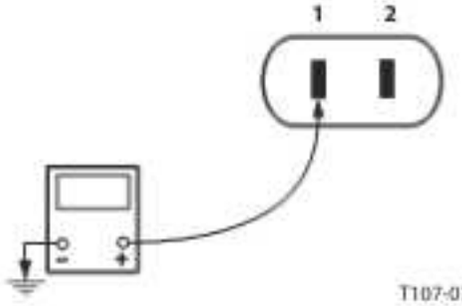
- Voltage between terminal #1 and the body

Disconnect the connector with the key switch OFF. Measure voltage between terminal #1 on the body harness end connector and the body (ground).

- Key Switch: ON
- Black (negative) probe terminal of circuit tester: To ground to the body
- Red (Positive) probe terminal of circuit tester: To terminal #1

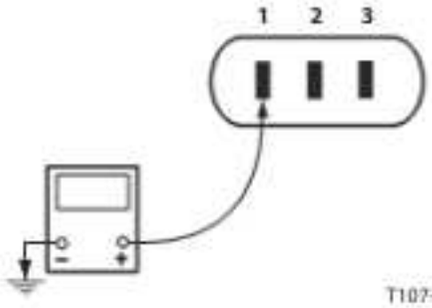
Evaluation: If the measuring voltage is within 5 ± 0.5 volts, the circuit up to terminal #1 is normal.

Two Polarities



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Three Polarities



T107-07-05-007

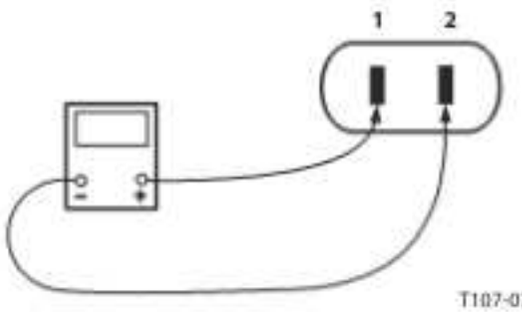
- Voltage between terminal #1 and the ground terminal

Turn OFF the key switch, and disconnect the sensor connector. Measure the voltage between terminal #1 (5 V power supply) on the body harness end connector and the ground terminal (terminal #2 for two-polarities or terminal #3 for three-polarities connector) under the following conditions.

- Key Switch: ON
- Black (negative) probe terminal of circuit tester: To ground terminal (Terminal #2 or #3)
- Red (Positive) probe terminal of circuit tester: To terminal #1

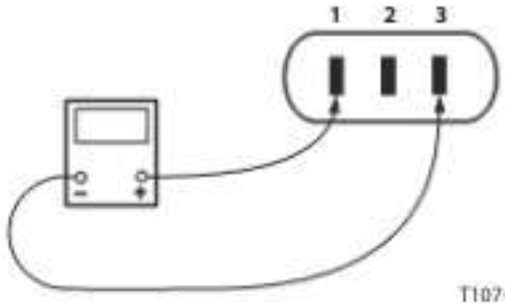
Evaluation: If the measuring voltage is within 5 ± 0.5 volts, the circuit up to terminal #1 and the ground terminal (terminal #2 or #3) is normal.

Two Polarities



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Three Polarities



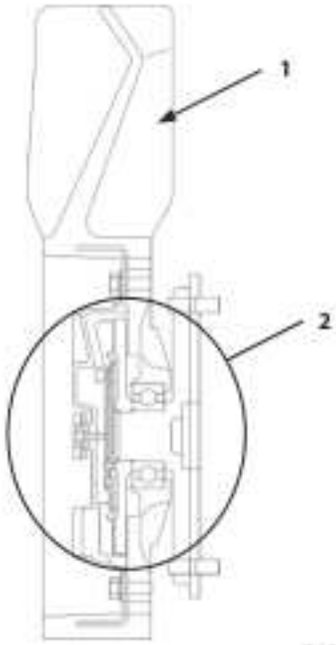
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E-5 Engine overheats.

Related Fault Code: None

- The machine is equipped with the engine fan clutch. Troubleshooting of the engine fan clutch is explained here. As for troubleshooting of the engine, refer to Engine Manual.
- Refer to COMPONENT OPERATION / Others (Upperstructure) / Engine Fan Clutch.
- Previously clean the radiator and the fan clutch (particularly, the center of the fan) by air blowing.



T1CF-03-06-006

1- Fan 2- Fan Clutch Part

Procedure	Inspection Method	Condition	Evaluation	Cause
1	Inspect the fan belt	-	There is abnormality	Faulty fan belt
2	Inspect the radiator sub-tank cap	-	There is abnormality	Faulty radiator sub-tank cap
3	Inspect the water pump	-	There is abnormality	Faulty water pump
4	Inspect the cylinder head or cylinder sealing cup	-	There is abnormality	Faulty sealing cup
5	Inspect the thermostat	-	There is abnormality	Faulty thermostat
6	Inspect the cooling system	-	There is abnormality	Clogging with scale or contaminant
7	Inspect the engine fan clutch	-	There is abnormality	Faulty engine fan clutch
8	-	-	The check mentioned above is normal	Find out cause of trouble by tracing other trouble symptoms

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