PART NO. TTDDE-EN-01

HITACHI

Reliable solutions

Technical Manual
Troubleshooting

ZX
330-5G
330LC-5G
350H-5G
350LCH-5G
350K-5G
350LCK-5G
Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TODDE-EN
Technical Manual (Troubleshooting)	: Vol. No.TTDDE-EN
Workshop Manual	: Vol. No.WDDE-EN
Engine Manual	: Vol. No.EDDE-EN

MidWestTech | Hitachi ZX330-5G, ZX330LC-5G, ZX350H-5G, ZX350LCH-5G, ZX350K-5G, ZX350LCK-5G Excavator Troubleshooting Technical Service Manual | Publication TTDDE-EN-01

Order the manual at mid-west-tech.com >

SECTION 4

OPERATIONAL PERFORMANCE TEST

CONTENTS

Group 1 Introduction
Operational Performance Tests T4-1-1
Preparation for Performance Tests T4-1-2

Group 2 Standard
Operational Performance Standard Table T4-2-1
Main Pump P-Q Diagram T4-2-7
Sensor Activating Range T4-2-9
MPDr. Monitor Indicating Values T4-2-10

Group 3 Engine Test
Engine Speed T4-3-1
Engine Compression Pressure T4-3-4
Valve Clearance T4-3-6
Nozzle T4-3-10
Injection Timing T4-3-18
Lubricant Consumption T4-3-20

Group 4 Machine Performance Test
Travel Speed T4-4-1
Track Revolution Speed T4-4-2
Mistrack Check T4-4-3
Travel Parking Leakage T4-4-4
Swing Speed T4-4-5
Swing Function Drift Check T4-4-6
Swing Motor Leakage T4-4-8
Maximum Swingable Slant Angle T4-4-10
Swing Bearing Play T4-4-12
Hydraulic Cylinder Cycle Time T4-4-14
Dig Function Drift Check T4-4-16
Control Lever Operating Force T4-4-19
Control Lever Stroke T4-4-20
Combined Operation of Boom Raise / Swing Function Check T4-4-21
Combined Operation of Boom Raise / Arm Roll-In Function Check T4-4-22

Group 5 Component Test
Primary Pilot Pressure T4-5-1
Secondary Pilot Pressure T4-5-3
Solenoid Valve Set Pressure T4-5-4
Main Pump Delivery Pressure T4-5-6
Main Relief Set Pressure T4-5-8
Relief pressure (when relieving swing) T4-5-12
Overload Relief Valve Set Pressure T4-5-14
Main Pump Flow Rate Measurement T4-5-16
Swing Motor Drainage T4-5-24
Travel Motor Drainage T4-5-26

Group 6 Adjustment
Engine Speed Adjustment and Engine Learning T4-6-1
Governor Lever and Fuel Cut Lever Position T4-6-6

MidWestTech | Hitachi ZX330-5G, ZX330LC-5G, ZX350H-5G, ZX350LCH-5G, ZX350K-... Order the manual at mid-west-tech.com >

Main Pump Flow Rate Measurement

- P-Q Control (Torque Control)

Summary:

Main pump performance is checked by measuring the pump flow rate by using a hydraulic tester installed at the main pump delivery port to be measured. 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 and bleed air. Connect a vacuum pump to the oil filler port.

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

2. Disconnect the main pump delivery hose from the main pump to be measured. Connect pipe (1 or 2) to the main pump delivery port with the removed split flange and bolt.

: 41 mm

: 10 mm

3. Install pipe (1 or 2) to hydraulic tester (5) by using test hose (3) and adapter (4). Install adapter (6), joint (7), test hose (8) and flange (9) to hydraulic tester (5).

: 41 mm

: 10 mm

4. Install flange (9) and the disconnected hose with split flange (10) and bolt (11).

: 10 mm

5. Install a pressure gauge to the main pump to be measured. (Refer to "Main Relief Set Pressure".)

: 6 mm

6. Disconnect pipe (13) from the regulator. Connect hose (ST 6339) (14) to the disconnected pipe (13) hole on regulator to be measured. Install plug (ST 6212) to the disconnected pipe (13) hole on regulator not to be measured.

: 17 mm

7. Remove the vacuum pump. Loosen plug (12) on top of the pump casing. Bleed air from the casing until oil only comes out.

: 41 mm

8. Fully open the loading valve of hydraulic tester.
9. Start the engine. Check the pressure gauge connection for any oil leaks. Connect MPDr. and select the monitoring function.

Measurement:

1. Maintain the hydraulic oil temperature at 50±5 °C (122±9 °F)
2. Measure the maximum flow rate.
3. Select the following switch positions:

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

4. Adjust the relief set pressure of main relief valve in control valve to each pressure point specified along the main pump P-Q curve. (Refer to T4-2-7) Slowly restrict the loading valve of hydraulic tester while relieving pressure in the arm roll-in circuit. Measure the flow rates and engine speeds at each pressure point specified in the P-Q curve.
5. Repeat each measurement three times and calculate the mean values.

MidWestTech | Hitachi ZX330-5G, ZX330LC-5G, ZX350H-5G, ZX350LCH-5G, ZX350K-... Order the manual at mid-west-tech.com >

Test Harness

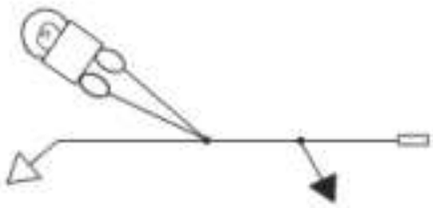
Install a test harness between connectors. Check the circuit condition depending on whether the test harness lamp lights or extinguishes during operation.

- Parts Number 4283594 (ST 7126)

Use in order to check a single-line (discontinuity and/or voltage).

+ During Operation: Light is ON.

Parts Number 4283594 (ST 7126)



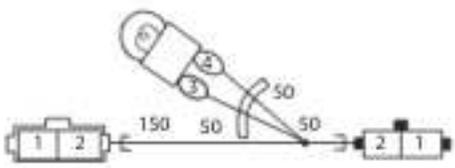
T107-07-05-012

- Parts Number (ST 7226)

Use in order to check the solenoid valve unit circuits.

+ When the corresponding control lever or switch is operated: Light is ON.

Parts Number (ST 7226)



T107-07-06-015

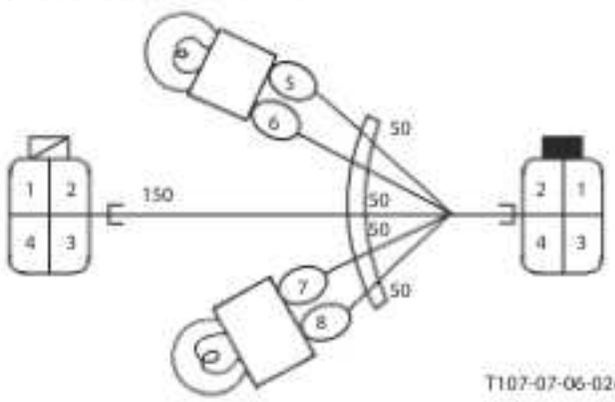
- Parts Number 4274589 (ST 7125)

Use to check the EC motor circuit.

When the engine control dial is rotated:

+ Both lamps ON: Normal
+ Only one lamp ON: Check for continuity of the circuit connected to the lamp OFF.
+ Both lamps OFF: Check the harness together with the relay.

Parts Number 4274589 (ST 7125)

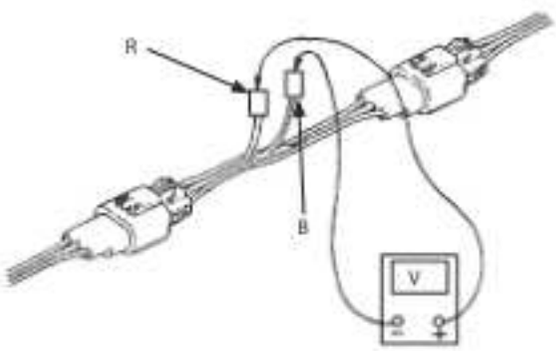


T107-07-06-024

- Parts Number 4284347 (ST 7129)

Use to measure the EC sensor circuit signal line voltage (between terminals #2 and #3).

Parts Number 4284347 (ST 7129)



T107-07-03-009

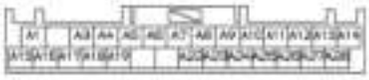
MidWestTech | Hitachi ZX330-5G, ZX330LC-5G, ZX350H-5G, ZX350LCH-5G, ZX350K-... Order the manual at mid-west-tech.com >

Monitor Controller (Monitor) Fault Codes 20100 to 20106

Fault Code	Trouble	Inspection Method	Evaluation	Cause
20100-2	Overheat Alarm	Disconnect a connector from the coolant temperature sensor. Retry by using MPDr.	Displayed fault code	Faulty monitor controller or shorted circuit in harness.
			Un-displayed fault code	Faulty coolant temperature sensor.
20101-2	Engine Trouble Alarm	Diagnose on fault codes of ECF.	-	-
20102-2	Engine Oil Pressure Alarm	Disconnect a connector from the engine oil pressure switch. Retry by using MPDr.	Displayed fault code	Faulty monitor controller or shorted circuit in harness.
			Un-displayed fault code	Faulty engine oil pressure switch.
20103-2	Alternator Alarm	Measurement of voltage between monitor controller harness end #A15 and body	13 V to 33.5 V	Faulty monitor controller.
		Measurement of voltage at alternator terminal L	13 V to 33.5 V	Open circuit in harness.
		-	Normal in above check.	Faulty alternator.
20104-2	Fuel Level Alarm	Disconnect a connector from the fuel sensor. Retry by using MPDr.	Displayed fault code	Faulty monitor controller or shorted circuit in harness.
			Un-displayed fault code	Faulty fuel sensor.
20105-2	Hydraulic Oil Filter Restriction Alarm	Disconnect a connector from hydraulic oil filter restriction switch. Retry by using MPDr.	Displayed fault code	Faulty monitor controller or shorted circuit in harness.
			Un-displayed fault code	Faulty hydraulic oil filter restriction switch.
20106-2	Air Cleaner Restriction Alarm	Disconnect a connector from air cleaner restriction switch. Retry by using MPDr.	Displayed fault code	Faulty monitor controller or shorted circuit in harness.
			Un-displayed fault code	Faulty air cleaner restriction switch.

Connector (Harness end)

- Monitor Controller-A Connector



TDAB-05-06-011

MidWestTech | Hitachi ZX330-5G, ZX330LC-5G, ZX350H-5G, ZX350LCH-5G, ZX350K-... Order the manual at mid-west-tech.com >