PART NO. TTDBL90-EN-00

HITACHI

Reliable solutions

Technical Manual
Troubleshooting

ZX160LC-5A
Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TODBL90-EN
Technical Manual (Troubleshooting)	: Vol. No.TTDBL90-EN
Workshop Manual	: Vol. No.WDBL-EN
Engine Manual	: Vol. No.EDBL-EN

MidWestTech | Hitachi ZX160LC-5A Excavator Troubleshooting Technical Service Manual | Publication TTDBL90-EN-00

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 T4-2-9
Sensor Activating Range T4-2-11
MPDr. Monitor Indicating Values T4-2-12

Group 3 Engine Test
Engine Speed T4-3-1
Lubricant Consumption T4-3-4

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
Clearance of Front Attachment Connecting Part T4-4-23

Group 5 Component Test
Primary Pilot Pressure T4-5-1
Secondary Pilot Pressure T4-5-3
3-Spool Solenoid Valve Set Pressure T4-5-4
Main Pump Delivery Pressure T4-5-7
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

MidWestTech | Hitachi ZX160LC-5A Excavator Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

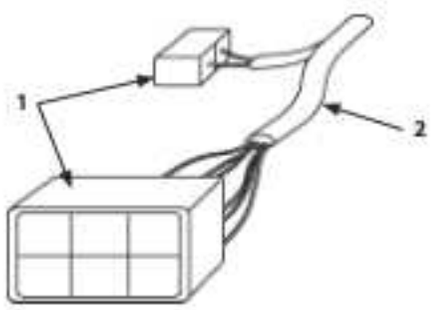
Troubleshooting A (Base Machine Diagnosis By Using Fault Codes) Procedure

Refer to troubleshooting A procedure in case any fault codes are displayed after diagnosing by using MPDr. or the service menu of the monitor.

- Diagnosis Procedure
  - The diagnosis procedures for the displayed fault codes are explained in this group.
  - In case more than one fault code are displayed at the same time, MC may be faulty or the power/ground of the sensor system may be faulty.
  - When the MC fault code is displayed with other fault code, replace MC.
  - When fault code 11003-3 (Abnormal Sensor Voltage) is displayed with other fault code, diagnose for fault code 11003-3 first.
  - In case more than one fault code other than those described above are displayed at the same time, diagnose for each fault code.
  - It may be required that the machine is operated or the test harness is connected at inspection. Check the items of preparation and perform inspection according to the procedures when diagnosing.

NOTE: All connector images in this section are viewed from the open end side of wire harness end.

NOTE: The engine controller (ECM) judges that the engine is faulty. After repairing the engine, perform Fault Code Clear of the setting for the engine. Then, delete the fault code of engine controller (ECM) by diagnosing. (Refer to TROUBLESHOOTING / Monitor.)



T6L4-05-03-001

1- Wire Harness End Connector 2- Wire Harness

MidWestTech | Hitachi ZX160LC-5A Excavator Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

Air Conditioner Controller Fault Codes 43 to 92

Preparation

- Check the wiring connections first.
- Before inspection, set the key switch to the ON position.

Fault Code	Trouble	Inspection Method	Evaluation	Cause
43	Abnormal air vent damper servo motor	Measure voltage between servo motor harness end #4 and body. (AUTO/OFF switch / blower switch: ON)	0 V	Faulty controller, or open circuit in wire harness between controller and air vent damper servo motor.
		Measure voltage between servo motor harness end #4 and #6. (AUTO/OFF switch/blower switch: ON)	0 V	Faulty controller, or open circuit in wire harness between controller and air vent damper servo motor.
		-	Normal in above check.	Faulty air vent damper servo motor.
44	Abnormal air mix damper servo motor	Measure voltage between servo motor harness end #4 and body. (AUTO/OFF switch / blower switch: ON)	0 V	Faulty controller, or open circuit in wire harness between controller and air mix damper servo motor.
		Measure voltage between servo motor harness end #4 and #6. (AUTO/OFF switch/blower switch: ON)	0 V	Faulty controller, or open circuit in wire harness between controller and air mix damper servo motor.
		-	Normal in above check.	Faulty air mix damper servo motor.
91	CAN communication error	Check continuity in CAN1 harness.	Normal	Faulty controller.
			Abnormal	Faulty CAN1 harness.
92	CAN bus off error	Continuity check in CAN1 harness.	Normal	Faulty controller.
			Abnormal	Faulty CAN1 harness.

MidWestTech | Hitachi ZX160LC-5A Excavator Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

F-3 Boom, arm, or bucket single operation is not operated. Boom, arm, or bucket single operation speed is slow.

Overload Relief Valve Set Pressure (MPa)	Specification	Remark
Boom, Arm Roll-Out, Bucket	$39.2^{+1.0}_{-0}$	

Preparation

- When other actuators (travel and swing motors) are operated normally, the pilot pump (primary pilot pressure) is considered to be normal.
- In case bucket single operation speed is slow, also refer to F-6.
- In case arm roll-in single operation speed is slow, also refer to F-7.
- In case boom lower single operation speed is slow, also refer to F-8.

Procedure	Inspection Method	Condition	Evaluation	Cause
1	Monitor Boom Raise Pilot Pressure and Arm Roll-In Pilot Pressure.	Fully operate boom raise and arm roll-in.	The measured values are not within the specification. (Specification: 3.4-4.0 MPa)	Faulty pilot valve or stuck spool of shockless valve in signal control valve (only boom raise)
2	Monitor Pump 1 Control Pressure and Pump 2 Control Pressure.	Slowly operate the control lever.	The measured values are not within the specification. (Specification: 2.9-3.9 MPa)	Faulty shuttle valve in signal control valve
3	Switch overload relief valves, of which the set pressure are same.	-	Symptom is reversed.	Faulty overload relief valve
4	-	-	The check mentioned above is normal.	Stuck control valve spool, or faulty cylinder (faulty seal kit)

MidWestTech | Hitachi ZX160LC-5A Excavator Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >