PART NO. TTDBR50-EN-00

HITACHI

Reliable solutions

Technical Manual
Troubleshooting

ZX
160LC-6
Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TODBR50-EN
Technical Manual (Troubleshooting)	: Vol. No.TTDBR50-EN
Workshop Manual	: Vol. No.WDBR50-EN
Engine Manual	: Vol. No.EDBR50-EN

MidWestTech | Hitachi ZX160LC-6 Excavator Troubleshooting Technical Service Manual | Publication TTDBR50-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 T4-2-11
Sensor Activating Range T4-2-13
Monitor Indicating Values T4-2-14

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 and Swing Function Check T4-4-21
Combined Operation of Boom Raise and 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
2-Spool Solenoid Valve (Aftertreatment Device Regeneration Control) Set Pressure T4-5-5
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

Group 6 Adjustment
Rewrite of Aftertreatment Device Serial No. T4-6-1
How to Clear Fault Code T4-6-2
Procedure after Replacing DCU and ECM T4-6-3
Air Bleeding from the Diesel Exhaust Fluid Defrosting Piping T4-6-4
How to Check Manual Regeneration Switch T4-6-6
Remedy at DEF Pressure Decrease T4-6-8
Remedy at DEF Abnormal Quality T4-6-10
Clean DEF Tank T4-6-12
Remedy when Mixing Oil in DEF Tank T4-6-14

MidWestTech | Hitachi ZX160LC-6 Excavator Troubleshooting Technical Service Manu... Order the manual at mid-west-tech.com >

SECTION 5

TROUBLESHOOTING

CONTENTS

Group 1 Diagnosing Procedure

Introduction T5-1-1
Diagnosis Procedure T5-1-2
Electrical System Inspection T5-1-5
Precautions for Inspection and Maintenance T5-1-6
Instructions for Disconnecting Connectors T5-1-8
Fuse Inspection T5-1-10
Fusible Link Inspection T5-1-13
Battery Voltage Check T5-1-14
Alternator Check T5-1-15
Continuity Check T5-1-16
Voltage and Current Measurement T5-1-18
Check by False Signal T5-1-26
Test Wire Harness T5-1-27

Group 2 Monitor

Outline T5-2-1
Operating Procedures of Service Menu T5-2-2
Setting Menu T5-2-43
Inspection of Engine Oil Level, Coolant Level, Hour Meter, and Fuel Gauge T5-2-48
Fuel Gauge, Coolant Temperature Gauge, DEF Gauge T5-2-49

Group 3 e-Service

Outline T5-3-1
List of Operation Data T5-3-2
Communication System T5-3-4

Group 4 Component Layout

Main Component T5-4-1
Electrical System (Overview) T5-4-3
Electrical System (Rear Tray) T5-4-4
Electrical System (Switch Panel) T5-4-5
Electrical System (Around Air Cleaner) T5-4-6
Electrical System (Relays) T5-4-7
Engine T5-4-8
Aftertreatment Device T5-4-9
Aftertreatment Device T5-4-10
Pump Device T5-4-11
Around Pump Device T5-4-12
Control Valve T5-4-13
Signal Control Valve T5-4-13
Swing Device T5-4-15
Travel Device T5-4-15
3-Spool Solenoid Valve Unit T5-4-16
2-Spool Solenoid Valve Unit (for Aftertreatment Device Regeneration Control) T5-4-16
DEF Tank T5-4-17
DEF Supply Module T5-4-17
Layout of Attachment Spec. Parts T5-4-18
Boom Foot Part Lower Side T5-4-19
Utility Space Partition Cover T5-4-20
Control Valve Upper Side, Lower Side T5-4-20
Components in Control Valve T5-4-22
Pilot Port T5-4-36

Group 5 Troubleshooting A

Troubleshooting A (Base Machine Diagnosis By Using Fault Codes) Procedure T5-5-1
MC Fault Code List T5-5-3
ECM Fault Code List T5-5-22
DCU Fault Code List T5-5-36
Monitor Controller (Monitor) Fault Code List T5-5-44
Monitor Controller (Information) Fault Code List T5-5-45
Air Conditioner Controller Fault Code List T5-5-48
Communication Terminal Fault Code List T5-5-49
MC Fault Codes 11000 to 11002 ..... T5-5-51
MC Fault Code 11003 ..... T5-5-52
MC Fault Codes 11006, 11007,11009 ..... T5-5-55
Monitor Controller (Monitor) Fault Codes 13002, 13003, 13005 ..... T5-5-55
CAN0 Harness Check T5-5-56
ISO-CAN (Engine) Harness Check T5-5-60
MC Fault Codes 11008, 11010 ..... T5-5-63
Monitor Controller (Monitor) Fault Codes 13004, 13006, 13007 ..... T5-5-63
CAN1 Harness Check T5-5-64
MC Fault Code 11100 ..... T5-5-67
MC Fault Code 11101 ..... T5-5-68
MC Fault Codes 11200 to 11202 ..... T5-5-69
MC Fault Codes 11206 to 11208 ..... T5-5-70
MC Fault Codes 11301 to 11303 ..... T5-5-71
MC Fault Codes 11304, 11307, 11325 ..... T5-5-72
MC Fault Codes 11995, 11997 ..... T5-5-73
MC Fault Code 11400 ..... T5-5-74
MC Fault Code 11401 ..... T5-5-75
MC Fault Code 11402 ..... T5-5-76
MC Fault Code 11403 ..... T5-5-77
MC Fault Code 11407 ..... T5-5-78
MC Fault Code 11408 ..... T5-5-79

MidWestTech | Hitachi ZX160LC-6 Excavator Troubleshooting Technical Service Manu... Order the manual at mid-west-tech.com >

MC Fault Code 11409 ..... T5-5-80
MC Fault Code 11410 ..... T5-5-81
MC Fault Codes 11434, 11435 ..... T5-5-82
MC Fault Code 11436 ..... T5-5-83
MC Fault Codes 11458, 11459 ..... T5-5-84
MC Fault Code 11901 ..... T5-5-85
MC Fault Codes 20010 to 20012 ..... T5-5-86
Monitor Controller (Information) Fault Codes 13304, 13310 ..... T5-5-87
Monitor Controller (Information) Fault Code 13311 ..... T5-5-88
Monitor Controller (Information) Fault Codes 20100 to 20114 ..... T5-5-89
Monitor Controller (Information) Fault Codes 20109 to 20149 ..... T5-5-90
Air Conditioner Controller Fault Codes 11 to 22 ..... T5-5-91
Air Conditioner Controller Fault Codes 43 to 92 ..... T5-5-92

Group 6 Troubleshooting B

Troubleshooting B (Machine Diagnosis by Using Trouble Symptom) Procedure T5-6-1
Relationship between Machine Trouble Symptoms and Related Parts T5-6-3
Correlation between Trouble Symptoms and Part Failures T5-6-28
Engine System Troubleshooting T5-6-44
All Actuator System Troubleshooting T5-6-54
Front Attachment System Troubleshooting T5-6-63
Swing System Troubleshooting T5-6-76
Travel System Troubleshooting T5-6-78
Other System Troubleshooting T5-6-84
Exchange Inspection T5-6-89
How to Lowering Boom When Emergency and When Engine Stops without Hose Rupture Valve T5-6-92
How to Lowering Boom When Emergency and When Engine Stops with Hose Rupture Valve T5-6-93
Attachment Circuit Pressure Release Procedure T5-6-94

Group 7 Air Conditioner

Outline T5-7-1
Functions of Main Parts T5-7-4
Troubleshooting T5-7-9
Air Conditioner Controller Fault Code List T5-7-10
Air Conditioner Controller Fault Codes 11 to 22 ..... T5-7-11
Air Conditioner Controller Fault Codes 43 to 92 ..... T5-7-12
Work after Replacing Components T5-7-34
Refill Compressor Oil T5-7-35
Charge Air Conditioner with Refrigerant T5-7-36
Hose and Pipe Tightening Torque T5-7-44

MidWestTech | Hitachi ZX160LC-6 Excavator Troubleshooting Technical Service Manu... Order the manual at mid-west-tech.com >

Performance Test Designation		Unit	Performance Standard	Remark	Reference Page
DIG FUNCTION DRIFT CHECK (Mono Boom)		mm/5 min		2.58 m arm 0.6 m^3 (PCSA heaped) bucket	T4-4-16
Boom Cylinder	(Maximum Reach Position)		20 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		5 or less	Bucket: empty	
Arm Cylinder	(Maximum Reach Position)		20 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		15 or less	Bucket: empty	
Bucket Cylinder	(Maximum Reach Position)		20 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		10 or less	Bucket: empty	
Bucket Bottom	(Maximum Reach Position)		150 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		110 or less	Bucket: empty	
DIG FUNCTION DRIFT CHECK (2-Piece Boom)		mm/5 min		2.58 m arm 0.6 m^3 (PCSA heaped) bucket	
Boom Cylinder	(Maximum Reach Position)		20 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		5 or less	Bucket: empty	
Arm Cylinder	(Maximum Reach Position)		20 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		15 or less	Bucket: empty	
Bucket Cylinder	(Maximum Reach Position)		20 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		10 or less	Bucket: empty	
Positioning Cylinder	(Maximum Reach Position)		40 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		30 or less	Bucket: empty	
Bucket Bottom	(Maximum Reach Position)		200 or less	Bucket: loaded Weight: 825 kg	
	(Arm Roll-In Position)		150 or less	Bucket: empty	

MidWestTech | Hitachi ZX160LC-6 Excavator Troubleshooting Technical Service Manu... Order the manual at mid-west-tech.com >

Contents of Diagnosis

Fault Code

Preparation

Tools for a diagnosis and contents needing inspection beforehand are explained.

How to Read Table

Fault Code	Trouble	Procedure	Inspection Method	Evaluation	Cause
(A)	(B)	1	(C)	(D)	YES: (E)
					NO: (F)
		2	(G)	(H)	YES: (I)
					NO: (J)

- A: Fault code
- B: Trouble details
- Procedures 1, 2: Inspection order for the fault code
- C, G: Inspection method for trouble cause
- D, H: Evaluation specification of check results
- E, F, I, J: Trouble cause for the fault code

Procedure:

1. Check an applicable line depending on displayed fault code (A).
2. After checking or measuring of inspection method (C) of procedure (1), refer to evaluation (D) and judge the results.
3. When the results are satisfied (YES) with evaluation (D), the trouble cause is cause (E).
   If the results are not satisfied (NO) with evaluation (D), the trouble cause is cause (F) or check inspection method (G) of procedure 2.

Circuit Diagram of Test Harness

A connection point of the test harness and a point to check are explained.
(Only Pressure Sensor System Troubleshooting)

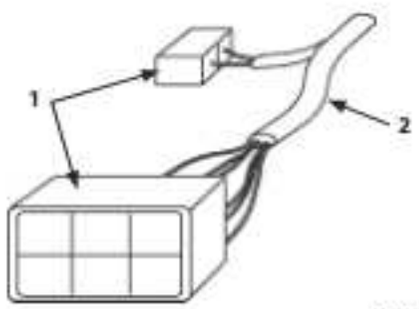
MidWestTech | Hitachi ZX160LC-6 Excavator Troubleshooting Technical Service Manu... Order the manual at mid-west-tech.com >

Troubleshooting B (Machine Diagnosis by Using Trouble Symptom) Procedure

Refer to troubleshooting B procedures for diagnosis by using trouble symptom when no fault codes are displayed.

- Diagnosis Procedure
  - Perform diagnosis by using MPDr. or the service menu of monitor first.
  - When the fault code is displayed, refer to the troubleshooting A group and diagnose.
  - In case any fault code has not been displayed by diagnosis, perform inspection according to the procedures in this group when diagnosing.
  - On the front section pages of this group, there are the tables indicating the relationship between machine trouble symptoms and related parts which may cause such trouble if failed. Start the troubleshooting with more probable causes selected by referring to these tables.

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



T6L4-05-03-001

1- Wire Harness End Connector 2- Wire Harness

MidWestTech | Hitachi ZX160LC-6 Excavator Troubleshooting Technical Service Manu... Order the manual at mid-west-tech.com >