PART NO. TTJAA-EN-01

HITACHI

Reliable solutions

Technical Manual
Troubleshooting

ZX
470-5B
470LC-5B
470H-5B
470LCH-5B
470R-5B
470LCR-5B
520LCH-5B
Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TOJAA-EN
Technical Manual (Troubleshooting)	: Vol. No.TTJAA-EN
Workshop Manual	: Vol. No.WJAA-EN
Engine Manual	: Vol. No.ETJAA-EN, EWJAA-EN

MidWestTech | Hitachi ZX470-5B, ZX470LC-5B, ZX470H-5B, ZX470LCH-5B, ZX470R-5B, ZX470LCR-5B, ZX520LCH-5B Excavator Troubleshooting Technical Service Manual | Publication TTJAA-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 T4-2-5
Fan Pump P-Q Diagram T4-2-6
MPDR. Monitor Indicating Values (MC) T4-2-8
MPDr. Monitor Indicating Values (ECM) T4-2-14
Sensor Activating Range T4-2-15

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

Group 4 Machine Performance Test
Travel Speed T4-4-1
Mistrack Check T4-4-3
Travel Motor Leakage T4-4-4
Swing Speed T4-4-5
Swing Function Drift Check T4-4-6
Swing Motor Leakage T4-4-7
Maximum Swingable Slant Angle T4-4-8
Swing Bearing Play T4-4-10
Hydraulic Cylinder Cycle Time T4-4-12
Dig Function Drift Check T4-4-14
Control Lever Operating Force T4-4-15
Control Lever Stroke T4-4-16
Boom Raise/Swing Combined Operation Check T4-4-17

Group 5 Component Test
Primary Pilot Pressure T4-5-1
Secondary Pilot Pressure T4-5-3
4-Spool Solenoid Valve Set Pressure T4-5-4
2-Spool Solenoid Valve Set Pressure T4-5-5
Main Pump Delivery Pressure T4-5-7
Fan Pump Delivery Pressure T4-5-8
Main Relief Valve Set Pressure T4-5-9
Overload Relief Valve Set Pressure T4-5-15
Main Pump Flow Rate Measurement T4-5-20
Fan Pump Flow Rate Measurement T4-5-26
Swing Motor Drainage T4-5-32
Travel Motor Drainage T4-5-34

Group 6 Adjustment
Pump Learning T4-6-1
Torque Adjustment T4-6-2
Connection T4-6-3
Measuring Method of No-Load-Max Differential Pressure T4-6-4
Muffler Filter Differential Pressure Sensor Learning T4-6-6
Rewrite of Muffler Filter Serial No. T4-6-7
Maintenance of Muffler Filter T4-6-8

MidWestTech | Hitachi ZX470-5B, ZX470LC-5B, ZX470H-5B, ZX470LCH-5B, ZX470R-... Order the manual at mid-west-tech.com >

Symptoms in Machine Operation When Trouble Occurs	Assumptive Conditions at Backup
The output power decreases	When starting: Coolant temperature is -20 °C When operating: Coolant temperature is 90 °C
The output power decreases	When starting: Coolant temperature is -20 °C When operating: Coolant temperature is 90 °C
The output power decreases	The MAF sensor value is 250 g/sec
The output power decreases	The MAF sensor value is 250 g/sec
Vibration of the engine may be large, rough idle, output power decrease may occur, faulty increasing of rotation speed, dark smoke may occur, output power may be too large.	Prevent fuel leaks
The engine may be stalled The output power decreases	Rail pressure is 80 MPa
The engine speed increases automatically and abnormally	Rail pressure is 80 MPa
Vibration of the engine may be large, rough idle, output power decrease may occur, faulty increasing of rotation speed, dark smoke may occur, output power may be too large.	Prevent fuel leaks
Vibration of the engine may be large, rough idle, output power decrease may occur, faulty increasing of rotation speed, dark smoke may occur, output power may be too large.	Prevent fuel leaks
The battery may be faulty	-
The output power decreases	Intake-air temperature is -10 °C
The output power decreases	Intake-air temperature is -10 °C

MidWestTech | Hitachi ZX470-5B, ZX470LC-5B, ZX470H-5B, ZX470LCH-5B, ZX470R-... Order the manual at mid-west-tech.com >

Fault Code	Trouble	Cause	Remedy
20100-2	Overheat Alarm	Coolant temperature is high while the engine runs.	Check the harness Replace the coolant temperature sensor
20101-2	Engine Trouble Alarm	Faulty engine system.	Refer to Engine Troubleshooting Manual.
20102-2	Engine Oil Pressure Alarm	Engine oil pressure is reduced.	Check the harness Replace the engine oil pressure sensor
20103-2	Alternator Alarm	Voltage at the regulator is high. Voltage at the regulator is low with the engine stopped.	Check the harness Check the battery Check the alternator
20104-2	Fuel Level Alarm	Fuel level is lowered.	Check the harness Replace the fuel sensor
20105-2	Hydraulic Oil Filter Restriction Alarm	Clogged hydraulic oil filter. Open circuit in harness.	Check the harness Replace the hydraulic oil filter restriction switch
20106-2	Air Cleaner Restriction Alarm	Clogged air filter.	Check the harness Replace the air filter restriction switch
20109-2	Pilot Control Shut-Off Lever Alarm	Faulty pilot shut-off switch.	Check the harness Replace the pilot shut-off switch
20110-2	Fuel Filter Restriction Alarm	Supply pump inlet pressure is reduced.	Check the harness Replace the fuel filter
20113-2	System Failure Alarm	Faulty CAN communication bus line.	Check the CAN harness
20114-2	Overheat Alarm	Coolant temperature is high within ten seconds after the engine starts.	Check the harness Replace the overheat switch
20133-2	Crane Function Alarm	Faulty crane related components.	Check the harness
20137-2	Muffler Filter Alarm	Faulty muffler filter.	Check the harness Replace the muffler filter differential pressure sensor.
20141-2	Exhaust Gas Temperature Alarm	Exhaust temperature around the muffler is high.	Check the harness Replace the exhaust temperature sensor
20142-2	Intake Air Temperature Alarm	Intake air temperature increases.	Check the harness Replace the intake-air temperature sensor
20145-2	Boost Temperature Alarm	Boost temperature increases.	Check the harness Replace the boost temperature sensor
20146-2	Fuel Temperature Alarm	Fuel temperature increases.	Check the harness Replace the fuel temperature sensor
20149-2	EGR Temperature Alarm	EGR gas temperature increases.	Check the harness Replace the intake manifold temperature sensor

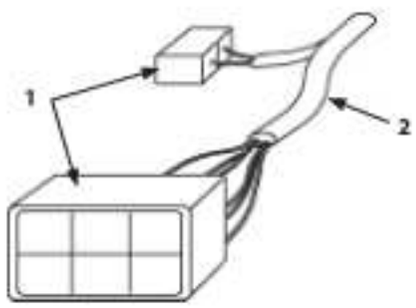
MidWestTech | Hitachi ZX470-5B, ZX470LC-5B, ZX470H-5B, ZX470LCH-5B, ZX470R-... Order the manual at mid-west-tech.com >

Troubleshooting B (Machine Diagnosis by Using Troubleshooting Symptom) Procedure

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

- Diagnosis Procedure
  - The diagnosis procedures for the displayed fault codes are explained in this group.
  - Perform diagnosis by using MPDr. or the service menu of monitor first.
  - In case any fault code has not been displayed by diagnosis, perform inspection according to the procedures when diagnosing.
  - When the fault code is displayed, refer to the troubleshooting A group and diagnose.
  - 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: Harness end connector viewed from the open end side by the all connectors image shown in this section.



T6L4-05-03-001

1- Harness End Connector 2- Harness

MidWestTech | Hitachi ZX470-5B, ZX470LC-5B, ZX470H-5B, ZX470LCH-5B, ZX470R-... Order the manual at mid-west-tech.com >

Rewrite of Muffler Filter Serial No.

When the muffler filter has been replaced, rewrite the serial No. of muffler filter and upload the data to e-Service.

1. Connect MPDr..
2. Set the key switch to the ON position.
3. Select Functions-Engine/Muffler Filter-Muffler Filter NO. with MPDr..
4. Input the following items of Oxidation Catalyst (DOC) and Filter (CSF).

- ASM
- SUB
- Serial No.

5. After inputting, select Setting.

IMPORTANT: After inputting Muffler Filter Serial No. is completed, upload the data to e-Service.

NOTE: When the input data is uploaded to e-Service, the M-Find product specification and history will be updated.



MidWestTech | Hitachi ZX470-5B, ZX470LC-5B, ZX470H-5B, ZX470LCH-5B, ZX470R-... Order the manual at mid-west-tech.com >