PART NO. TTNHK70-EN-00

HITACHI

Reliable solutions

Technical Manual
Troubleshooting
ZW550-6
Wheel Loader

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TONHK70-EN
Technical Manual (Troubleshooting)	: Vol. No.TTNHK70-EN
Workshop Manual	: Vol. No.WNHK70-EN

MidWestTech | Hitachi ZW550-6 Wheel Loader Troubleshooting Technical Service Manual | Publication TTNHK70-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
- Sensor Activating Range T4-2-10

Group 3 Engine Test
- Engine Speed T4-3-1

Group 4 Machine Performance Test
- Travel Speed T4-4-1
- Service Brake Function Check T4-4-4
- Service Brake Wear Amount T4-4-6
- Parking Brake Function Check T4-4-7
- Bucket Stopper Clearance, Lever (Bell Crank) Stopper Clearance T4-4-8
- Hydraulic Cylinder Cycle Time T4-4-10
- Cylinder Drift Check T4-4-12
- Bucket Levelness T4-4-13
- Control Lever Operating Force T4-4-14
- Control Lever Stroke T4-4-16

Group 5 Component Test
- Primary Pilot Pressure (Unloader Valve Setting Pressure) T4-5-1
- Secondary Pilot Pressure T4-5-3
- Solenoid Valve Set Pressure T4-5-4
- Main Pump Delivery Pressure T4-5-7
- Loading Circuit Main Relief Set Pressure T4-5-8
- Steering Circuit Main Relief Set Pressure T4-5-10
- Loading/Steering Overload Relief Valve Set Pressure T4-5-12
- Joystick Steering Secondary Pilot Pressure T4-5-15
- Service Brake Pressure (Front and Rear) T4-5-16
- Parking Brake Pressure T4-5-18
- Brake Accumulator Pressure T4-5-20
- Brake Warning Pressure (Pressure-Decreasing) T4-5-22
- Brake Warning Pressure (Pressure-Increasing) T4-5-24
- Transmission Clutch Pressure T4-5-26
- Torque Converter Pressure T4-5-28

Group 6 Adjustment
- Rewrite of Aftertreatment Device Serial No. T4-6-1

MidWestTech | Hitachi ZW550-6 Wheel Loader Troubleshooting Technical Service Man... 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
Electric 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 T5-1-12
Battery Voltage Check T5-1-13
Alternator Check T5-1-14
Continuity Check T5-1-15
Voltage and Current Measurement T5-1-16
Check by False Signal T5-1-23
Test Harness T5-1-24
Surge Voltage and Surge Suppression Diodes T5-1-26

Group 2 Monitor

Outline T5-2-1
Operating Procedures of Service Menu T5-2-2
Troubleshooting T5-2-4
Monitoring T5-2-6
Controller Version T5-2-16
Issued Warning Record T5-2-17
Communication Terminal Status T5-2-22
Machine Setting T5-2-24
Engine Setting T5-2-34
Aftertreatment Device No. T5-2-37
Engine Output Restriction Suspend T5-2-38
Engine Tachometer T5-2-40
Transmission Oil Temperature Gauge and DEF/AdBlue Level Gauge T5-2-41
Coolant Temperature Gauge T5-2-42

Group 3 e-Service

Outline T5-3-1
List of Operation Data T5-3-2
Snapshot Data T5-3-6
Communication System T5-3-7

Group 4 Component Layout

Main Component (Overview) T5-4-1
Main Component T5-4-2
Main Component T5-4-3
Electric Component Layout (Front Chassis) T5-4-4
Electric Component Layout (Rear Grill) T5-4-5
Electrical System (Cab) T5-4-6
Electrical System (Around Battery Box) T5-4-12
Electrical System (Around Hydraulic Tank) T5-4-13
Electrical System (Around Fuel Tank) T5-4-14
Electrical System (Rear Chassis Center Frame) T5-4-15
Engine T5-4-16
Aftertreatment Device T5-4-17
Hydraulic Pump T5-4-18
Transmission and Torque Converter Assembly T5-4-20
Multiple Control Valve T5-4-21
Unloader Valve (Brake Charge Valve) and Combination Valve (Brake Manifold Valve) T5-4-22
Steering Valve T5-4-23
Flow Regulator Valve T5-4-23
Ride Control Valve (Option) T5-4-24
Fuel Priming Pump (us Option) T5-4-24
Secondary Steering Pump (Option) T5-4-24

Group 5 Troubleshooting A

Troubleshooting A (Base Machine Diagnosis By Using Fault Codes) Procedure T5-5-1
MPDr. Fault Code List T5-5-3
MC Fault Code List T5-5-12
SC Fault Code List T5-5-28
Monitor Controller (Monitor) Fault Code List T5-5-41
Monitor Controller (Information) Fault Code List T5-5-43
Column Display Controller Fault Code List T5-5-44
Air Conditioner Controller Fault Code List T5-5-46
ECM Fault Code List T5-5-49
DCU Fault Code List T5-5-76
MC Fault Codes 111000 to 111002 ..... T5-5-80
SC Fault Codes 111000 to 111002 ..... T5-5-80
MC Fault Code 111003 ..... T5-5-80
SC Fault Code 111003 ..... T5-5-80
MC Fault Codes 111006, 111007, 111009, 111012 ..... T5-5-83
SC Fault Codes 111015, 111017, 111019, 111024 ..... T5-5-83
Monitor Controller (Monitor) Fault Codes 113002, 113003, 113005, 113010 ..... T5-5-84
CAN1 Harness Check T5-5-85
MC Fault Codes 111008, 111010, 111013, 111014, 111025 ..... T5-5-88
SC Fault Codes 111016, 111018, 111020, 111021, 111026 ..... T5-5-88

MidWestTech | Hitachi ZW550-6 Wheel Loader Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

Monitor Controller (Monitor) Fault Codes 113004, 113006, 113007, 113011 ..... T5-5-89
CAN2 Harness Check T5-5-90
MC Fault Codes 111103, 111105, 111106 ..... T5-5-93
CAN3 Harness Check T5-5-94
CAN4 Harness Check T5-5-97
SC Fault Codes 111205, 111207 ..... T5-5-100
SC Fault Codes 111200, 111202, 111203 ..... T5-5-101
MC Fault Codes 111204, 111312 ..... T5-5-102
SC Fault Codes 111206, 111217 ..... T5-5-103
SC Fault Code 111208 ..... T5-5-104
MC Fault Code 111313 ..... T5-5-105
MC Fault Codes 111600 to 111602 ..... T5-5-106
MC Fault Codes 111210 to 111212 ..... T5-5-107
MC Fault Codes 111214, 111215 ..... T5-5-108
SC Fault Codes 111309, 111310 ..... T5-5-109
SC Fault Code 111407 ..... T5-5-110
SC Fault Code 111410 ..... T5-5-111
SC Fault Code 111411 ..... T5-5-112
SC Fault Code 111412 ..... T5-5-113
MC Fault Code 111413 ..... T5-5-114
MC Fault Code 111414 to 111421 ..... T5-5-115
MC Fault Code 111408 ..... T5-5-117
SC Fault Code 111422 ..... T5-5-118
SC Fault Code 111423 ..... T5-5-119
MC Fault Codes 111502 to 111504, 111506, 111507 ..... T5-5-120
MC Fault Codes 111700 to 111704 ..... T5-5-121
SC Fault Code 111900 ..... T5-5-123
SC Fault Code 111901 ..... T5-5-124
MC Fault Code 111903 ..... T5-5-125
MC Fault Code 111906, 111907 ..... T5-5-126
MC Fault Codes 120014, 120101 to 120104, 120106 ..... T5-5-127
SC Fault Codes 120000 to 120005 ..... T5-5-128
Column Display Controller Fault Code 115001 ... T5-5-129
Monitor Controller (Monitor) Fault Code 120300 ..... T5-5-129
Monitor Controller (Information) Fault Code 113311 ..... T5-5-130
Column Display Controller Fault Codes 120500 to 120507 ..... T5-5-132
Air Conditioner Controller Fault Codes 11 to 22 ..... T5-5-133
Air Conditioner Controller Fault Codes 43 to 92 ..... T5-5-134

Group 6 Troubleshooting B

Troubleshooting B (Machine Diagnosis by Using Troubleshooting Symptom) Procedure T5-6-1
Relationship between Machine Trouble Symptoms and Related Parts T5-6-3
Correlation between Trouble Symptoms and Part Failures T5-6-27
Engine System Troubleshooting T5-6-47
All Actuator System Troubleshooting T5-6-54
Front Attachment System Troubleshooting T5-6-59
Steering System Troubleshooting T5-6-69
Travel System Troubleshooting T5-6-73
Brake System Troubleshooting T5-6-83
Other System Troubleshooting T5-6-87
Exchange Inspection T5-6-101
Air Bleeding Procedures for Brake (Axle) T5-6-102

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 ZW550-6 Wheel Loader Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

Test Harness

Prepare appropriate tools as shown.

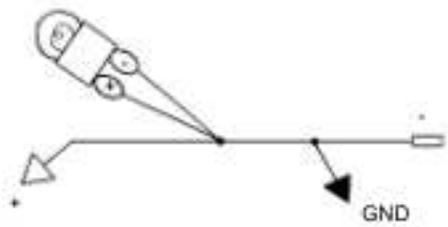
Install a test harness between connectors.
Check the circuit condition depending on whether the test harness lamp lights or extinguishes during operation.

- Check Lamp

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

- During Operation: Light is ON.

Check Lamp



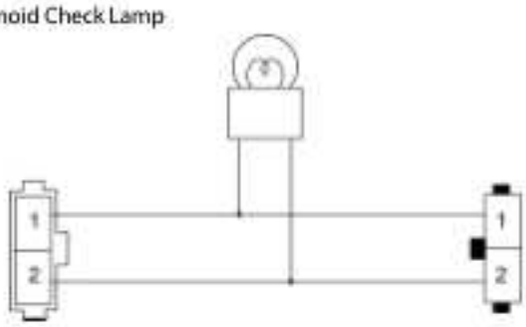
T107-07-05-012

- Solenoid Check Lamp

Use in order to check the solenoid valve unit circuits.

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

Solenoid Check Lamp



90T107-07-06-15

MidWestTech | Hitachi ZW550-6 Wheel Loader Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

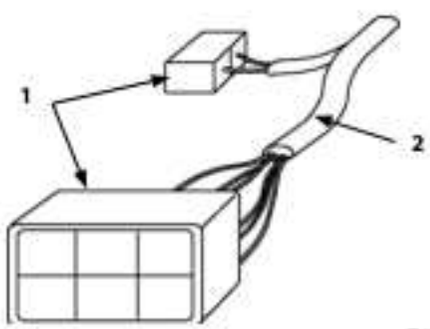
Troubleshooting A (Base Machine Diagnosis By Using Fault Codes) Procedure

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, Main Controller (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 111003-3 (Abnormal Sensor Voltage) is displayed with other fault code, diagnose for fault code 111003-3 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: Harness end connector viewed from the open end side by the all connectors image shown in this section.

NOTE: The engine controller (ECM) judges the engine malfunction. After the engine is repaired, select Fault Code Clear on Engine Setting. Then, delete the fault code of engine controller (ECM) on Troubleshooting. (Refer to TROUBLESHOOTING / Monitor.)



T6L4-05-03-001

1- Harness End Connector 2- Harness

MidWestTech | Hitachi ZW550-6 Wheel Loader Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

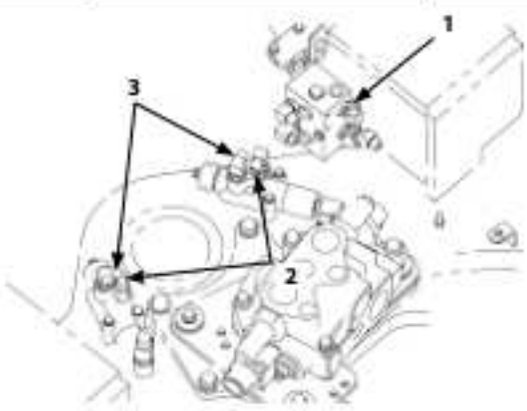
S-2 Steering operation is slow.

	Specification	Remark
Steering cylinder operation time (sec)	4.7 ± 0.5	Accelerator pedal: Fully depressed Power mode switch: ON Bucket: Empty

Preparation

- If speed of front attachment is also slow, the pilot system or main system may be faulty (A-2).
- If the pilot system is faulty, the circuit after the steering pilot valve may be faulty.
- Check that the steering wheel is not abnormal first.
- Refer to SYSTEM / Hydraulic System.

Procedure	Inspection Method	Condition	Evaluation	Cause
1	Measure Main Pump Pressure	Engine: Running Steering relief operation	The measured values are out of normal range (Normal range: 28.0 MPa (4061 psi) or more	Stuck or clogged bleed-off compensator (in multiple control valve)
2	Measure pressure at port B in reducing valve (for Orbitrol)	Engine: Running Accelerator pedal: Fully depressed	The measured values are out of normal range (Normal range: 3.5 ± 0.5 MPa (508 ± 73 psi)	Faulty reducing valve or shuttle valve Clogged filter
3	Measure pressure at port A in stop valve (left/right)	Engine: Running Steering (left or right) operation	The measured values are out of normal range (Normal range: 3.5 ± 0.5 MPa (508 ± 73 psi)	Faulty Orbitrol (steering pilot valve)
4	Measure pressure at port B in stop valve (left/right)	Engine: Running Steering (left or right) operation	The measured values are out of normal range (Normal range: 3.5 ± 0.5 MPa (508 ± 73 psi)	Faulty stop valve
5	-	-	The above checks resulted all normal.	Stuck steering valve spool or faulty steering cylinder (faulty seal kit)



95Z7-05-06-01



1- Reducing Valve Port B
2- Stop Valve Port A
3- Stop Valve Port B
4- Pilot Valve Output Ports 1,2

115Z7-05-06-02

MidWestTech | Hitachi ZW550-6 Wheel Loader Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >

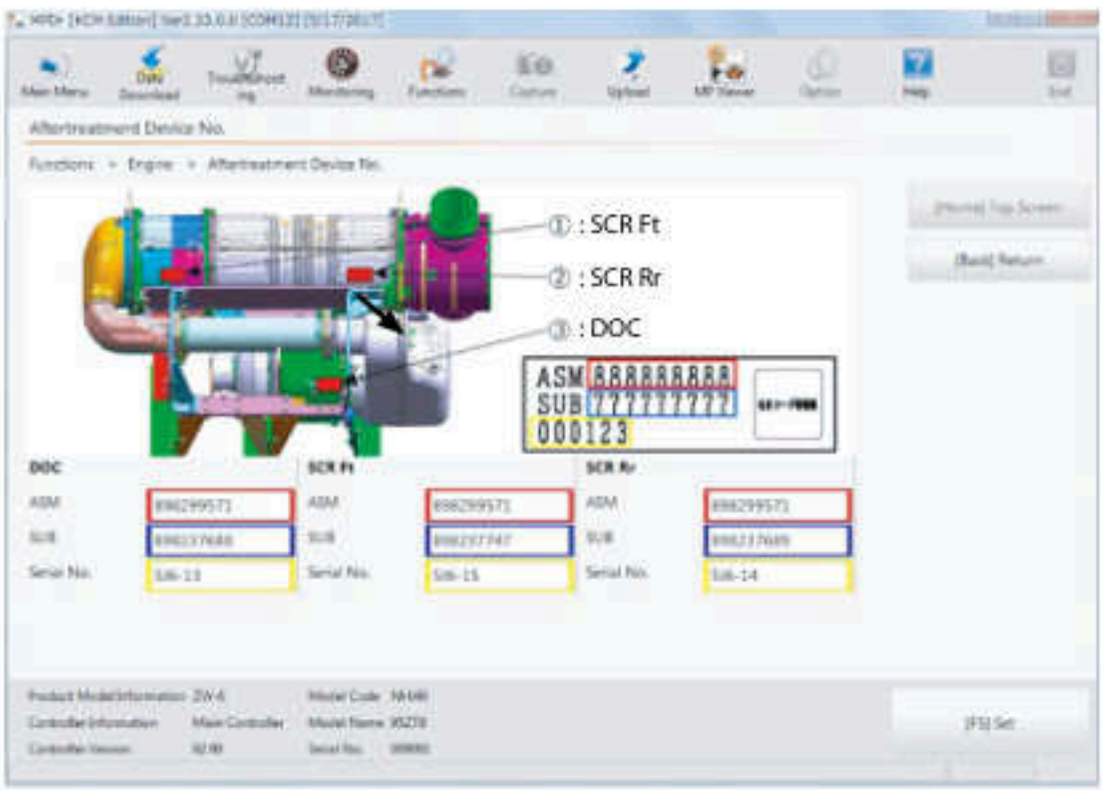
Rewrite of Aftertreatment Device Serial No.

After replacing the aftertreatment device (DOC/SCR), rewrite their serial Nos. and upload the data to e-Service.

1. Connect the Maintenance Pro Dr. (MPDr.)
2. Set the key switch to the ON position.
3. Select Functions - Engine - Aftertreatment Device No.
4. Input the following items of Oxidation Catalyst (DOC) and Front SCR (SCR Fr) and Rear SCR (SCR Fr).
   - ASM
   - SUB
   - Serial No.
5. After inputting, select [F5] Set.

IMPORTANT: After finishing aftertreatment device serial No. input, 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.



9SZ7BTT04-06-01

MidWestTech | Hitachi ZW550-6 Wheel Loader Troubleshooting Technical Service Man... Order the manual at mid-west-tech.com >