PART NO. TOJBL40-EN-00

HITACHI

Reliable solutions

Technical Manual
Operational Principle

ZX
870-6
870LC-6
890H-6
890LCH-6
890R-6
890LCR-6
Hydraulic Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TOJBL40-EN
Technical Manual (Troubleshooting)	: Vol. No.TTJBL40-EN
Workshop Manual	: Vol. No.WJBL40-EN
Engine Manual	: Vol. No.ETJBL40-EN, EWJBL40-EN

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX890LCR-6, Excavator Operational Principle Technical Service Manual | Publication TOJBL40-EN-00

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

SECTION 1

GENERAL

CONTENTS

Group 1 Specifications

Specifications T1-1-1
Working Ranges T1-1-3

Group 2 Component Layout

Main Component T1-2-1
Around Radiator T1-2-2
Electrical System (Overview) T1-2-3
Fuel Pump T1-2-4
Electrical System (Rear Tray) T1-2-5
Electrical System (Switch Panel) T1-2-6
Electrical System (Cab Behind Side) T1-2-7
Around Horn T1-2-8
Around Oil Cooler T1-2-9
Auto Lubricating System T1-2-9
Boom Upper Side T1-2-9
Engine T1-2-10
Aftertreatment Device T1-2-11
Aftertreatment Device T1-2-12
Pump Device T1-2-13
Control Valve T1-2-14
Check Valve T1-2-15
Signal Control Valve T1-2-15
4-Spool Solenoid Valve Unit T1-2-18
Fan Valve (Oil Cooler, Rdiator) T1-2-18
2-Spool Solenoid Valve Unit T1-2-18
DEF Tank T1-2-19
DEF Supply Module T1-2-19
Expansion Tank T1-2-20

Group 3 Component Specifications

Engine T1-3-1
Engine Accessories T1-3-5
Hydraulic Component T1-3-7

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX8... Order the manual at mid-west-tech.com >

SECTION 2

SYSTEM

CONTENTS

Group 1 Controller
Outline T2-1-1
CAN Circuit T2-1-2

Group 2 Control System
Outline T2-2-1
Engine Control T2-2-4
Pump Control T2-2-34
Valve Control (Standard) T2-2-62
Other Control T2-2-86

Group 3 Engine System
Outline T2-3-1
ECM System T2-3-2
Fuel Injection Control T2-3-4
Fuel Injection Amount Correction Control T2-3-12
EGR Control T2-3-14
Preheating Control T2-3-16
Variable Turbocharger Control T2-3-17
Alarm Control T2-3-18
Urea SCR System T2-3-19
Engine Output Restriction Control (INDUCEMENT) T2-3-30
Aftertreatment Device T2-3-34
Aftertreatment Device Regeneration Control T2-3-39

Group 4 Hydraulic System
Outline T2-4-1
Pilot Circuit T2-4-2
Main Circuit T2-4-18

Group 5 Electrical System
Outline T2-5-1
Main Circuit T2-5-2
Electric Power Circuit (Key Switch: OFF) T2-5-4
CAN Circuit T2-5-6
Accessory Circuit (Key Switch: ACC) T2-5-8
Starting Circuit (Key Switch: START) T2-5-10
Charging Circuit (Key Switch: ON) T2-5-12
Surge Voltage Prevention Circuit T2-5-16
Pilot Shut-Off Circuit (Key Switch: ON) T2-5-18
Auto Shut-Down Circuit/Automatic Engine Stop Circuit at Low Temperature T2-5-20
Engine Stop Circuit T2-5-22
Monitor Circuit T2-5-25
Security Circuit T2-5-26
Radio Circuit T2-5-28
Air Conditioner Circuit T2-5-28
Accessory Circuit T2-5-31
Work Light Circuit T2-5-32
Wiper/Washer Circuit T2-5-34
Cab Light Circuit T2-5-36

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX8... Order the manual at mid-west-tech.com >

SECTION 3

COMPONENT OPERATION

CONTENTS

Group 1 Pump Device
Outline T3-1-1
Main Pump T3-1-2
Regulator (Main Pump) T3-1-4
Pump Control Solenoid Valve (Main Pump) T3-1-12
Fan Pump T3-1-14
Regulator (Fan Pump) T3-1-16
Pump Control Solenoid Valve (Fan Pump) T3-1-24
Pilot Pump T3-1-26
Pump Delivery Pressure Sensor T3-1-26
Pump Control Pressure Sensor T3-1-26

Group 2 Swing Device
Outline T3-2-1
Swing Reduction Gear T3-2-2
Swing Motor T3-2-3
Swing Parking Brake T3-2-4
Valve Unit T3-2-6

Group 3 Control Valve
Outline T3-3-1
Hydraulic Circuit T3-3-18
Flow Combiner Valve T3-3-24
Main Relief valve T3-3-26
Overload Relief Valve (with Make-Up Function) T3-3-30
Boom Overload Relief Valve (Low Pressure) T3-3-36
Regenerative Valve T3-3-38
Anti-Drift Valve T3-3-44
Flow Rate Control Valve T3-3-48
Boom Lower Meter-In Cut Valve T3-3-56
Bypass Shut-Out Valve T3-3-58

Group 4 Pilot Valve
Outline T3-4-1
Operation (Front Attachment/Swing and Travel Pilot Valves) T3-4-3
Shockless Function (Only for Travel Pilot Valve) T3-4-11

Group 5 Travel Device
Outline T3-5-1
Travel Reduction Gear T3-5-2
Travel Motor T3-5-4
Parking Brake T3-5-6
Travel Brake Valve T3-5-8
Overload Relief Valve T3-5-12
Travel Mode Control T3-5-14

Group 6 Signal Control Valve
Outline T3-6-1
Pilot Port T3-6-2
Shuttle Valve T3-6-6
Shockless Valve T3-6-10
Pump 1 and Pump 2 Flow Rate Control Valves T3-6-14
Arm Flow Rate Control Valve Control Spool, Flow Combiner Valve Control Spool, Swing Parking Brake Release Spool T3-6-16

Group 7 Others (Upperstructure)
Pilot Shut-Off Solenoid Valve T3-7-1
Solenoid Valve T3-7-3
Fan Motor T3-7-6
Fan Valve T3-7-7
Pilot Relief Valve T3-7-13
Shockless Valve T3-7-14
Accumulator (Pilot Circuit) T3-7-16
Distribution Valve T3-7-17

Group 8 Others (Undercarriage)
Swing Bearing T3-8-1
Centerjoint T3-8-2
Track Adjuster T3-8-3

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX8... Order the manual at mid-west-tech.com >

Engine Accessories

RADIATOR ASSEMBLY	Type	Parallel Type

	Radiator	Intercooler
Capacity	30 L	–
Air-Tight Test Pressure	100 kPa	200 kPa
Cap Opening Pressure	90 kPa	–

	Oil Cooler
Capacity	27.6 L
Air-Tight Test Pressure	1500 kPa
Cap Opening Pressure	–

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX8... Order the manual at mid-west-tech.com >

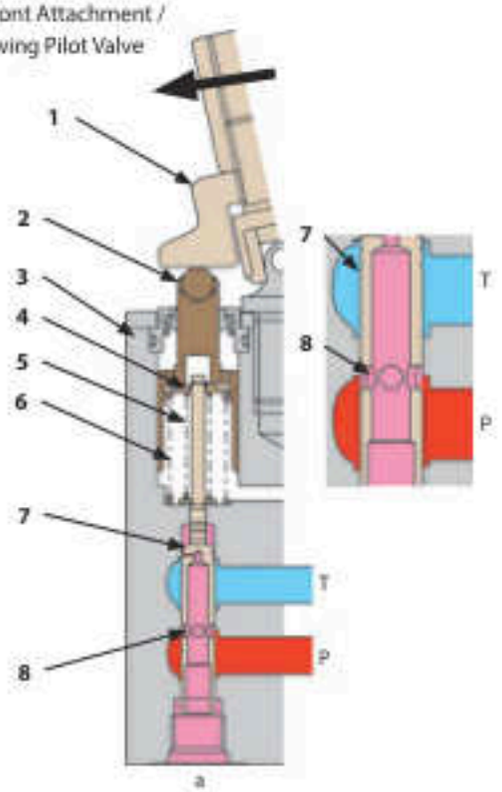
Outline

The electrical circuit is broadly divided into the main circuit, monitor circuit, accessory circuit, and control circuit.

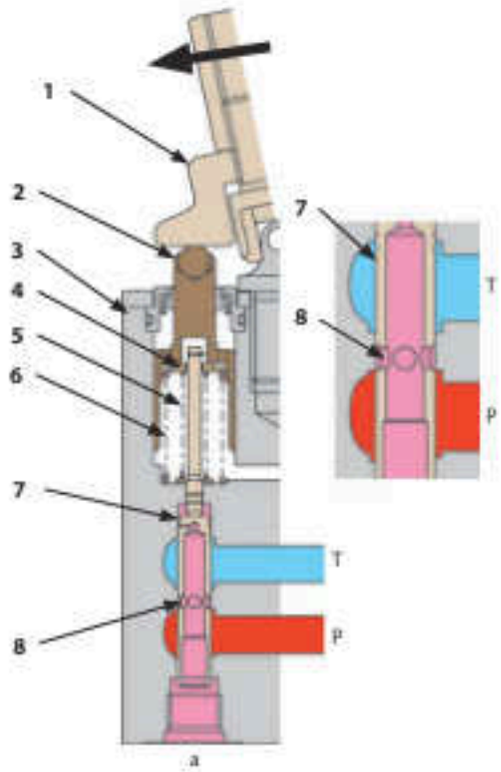
- The main circuit consists of the engine and the accessory related circuits.
- The monitor circuit displays the machine operating conditions. The monitor circuit consists of the monitor controller, monitor, relays, and switches.
- The accessory circuit controls the various lights, the wiper, and the washer. The accessory circuit consists of the wiper/light controller, relays, and switches.
- The control circuit controls the engine, pump, and valve. The control circuit consists of the actuators such as solenoid valves, MC, ECM, sensors, and switches.
  (Refer to SYSTEM/Control System.)

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX8... Order the manual at mid-west-tech.com >

Front Attachment / Swing Pilot Valve

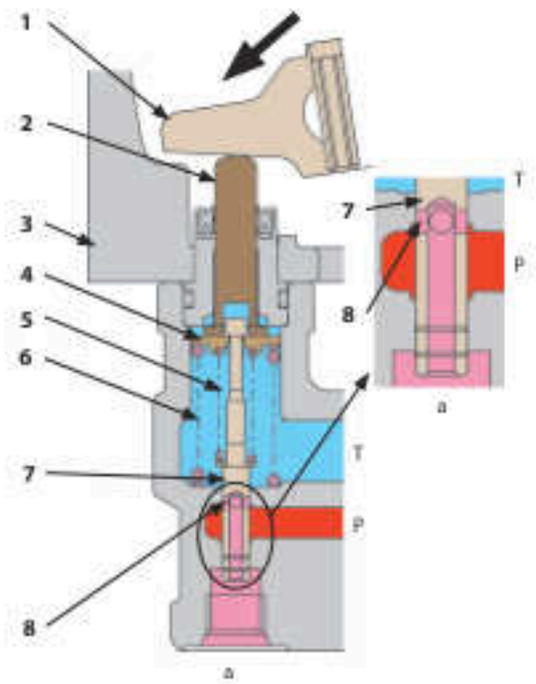


TPPP-03-04-007

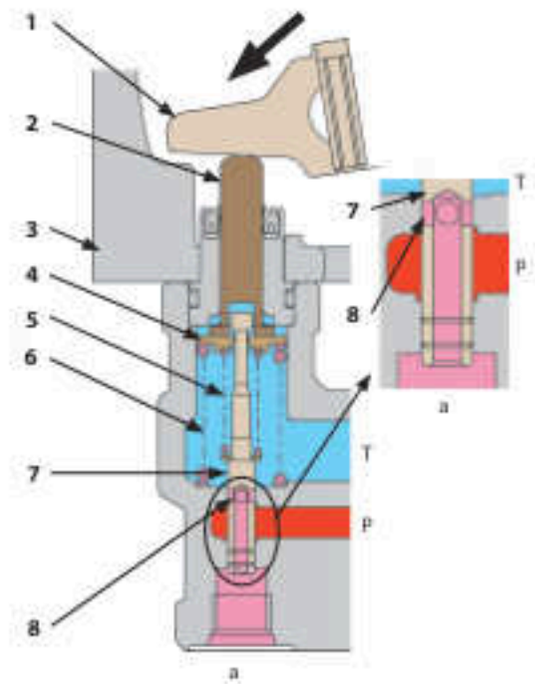


TPPP-03-04-008

Travel Pilot Valve



TPPP-03-04-012

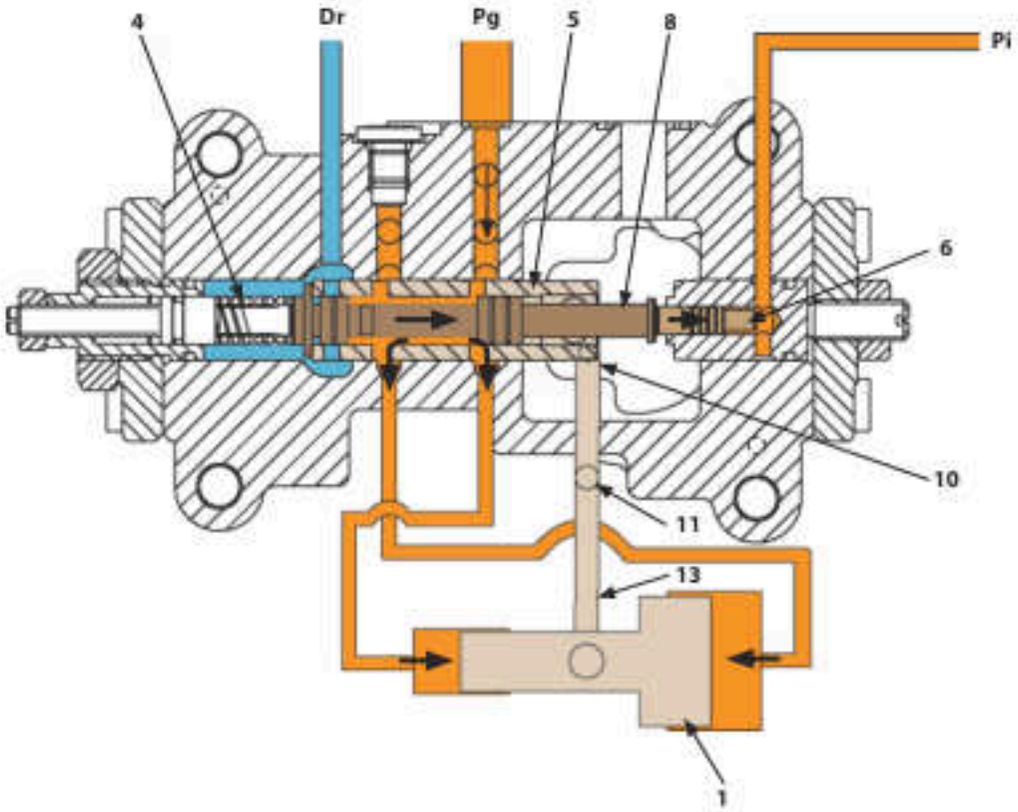


TPPP-03-04-013

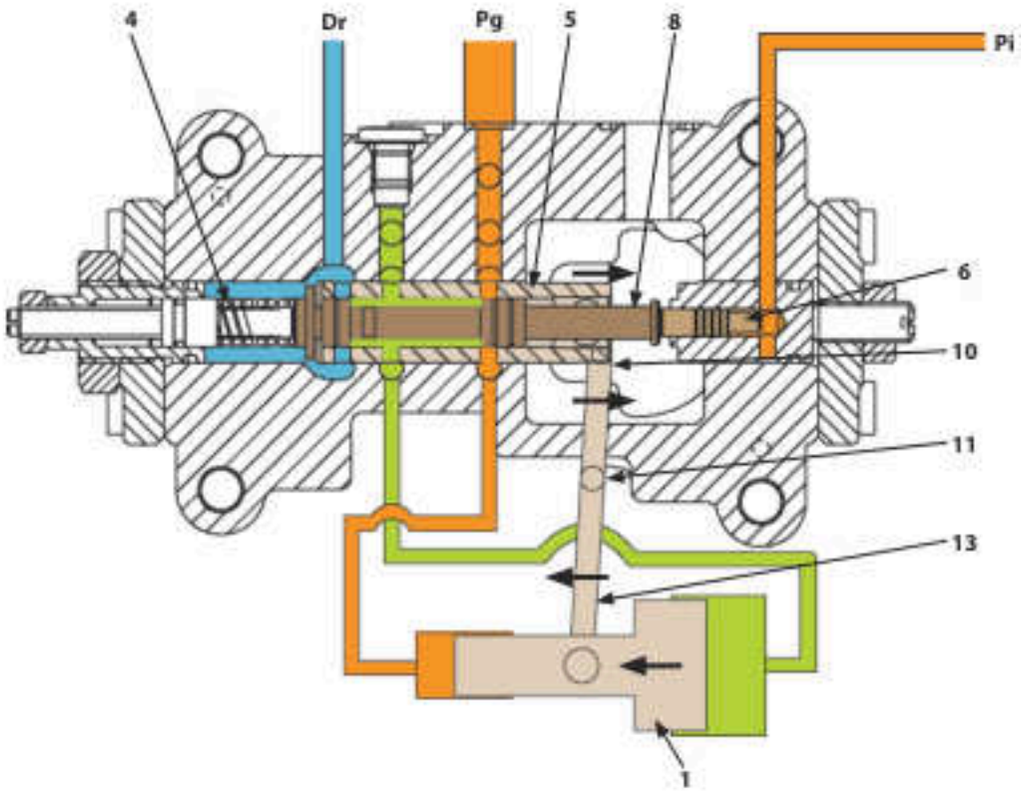
P- Port P
T- Port T
a- Output Port

1- Cam
2- Pusher
3- Casing
4- Spring Guide
5- Balance Spring
6- Return Spring
7- Spool
8- Hole

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX8... Order the manual at mid-west-tech.com >



TJBA-03-01-021



TJBA-03-01-022

Dr- Returning to Hydraulic Oil Tank
Pi- Flow Rate Control Pressure
Pg- Primary Pilot Pressure (From Pilot Pump)

1- Servo Piston
4- Spring
5- Sleeve
6- Piston
8- Spool
10- Pin
11- Pin
13- Link

MidWestTech | Hitachi ZX870-6, ZX870LC-6, ZX890H-6, ZX890LCH-6, ZX890R-6, ZX8... Order the manual at mid-west-tech.com >