PART NO. TOLAA-EN-01

HITACHI

Reliable solutions

Technical Manual
Operational Principle

ZX
140W-5B
Wheeled Excavator

Service Manual consists of the following separate Part No.

Technical Manual (Operational Principle)	: Vol. No.TOLAA-EN
Technical Manual (Troubleshooting)	: Vol. No.TTLAA-EN
Workshop Manual	: Vol. No.WLAA-EN
Engine Manual	: Vol. No.EDBE-EN

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SECTION 1

GENERAL

CONTENTS

Group 1 Specifications

Specifications ZX140W-5B (Rear Blade) T1-1-1
Specifications ZX140W-5B (Rear Outrigger) T1-1-2
Specifications ZX140W-5B (Front Blade Rear Outrigger) T1-1-3
Specifications ZX140W-5B (Front Outrigger Rear Blade) T1-1-4
Specifications ZX140W-5B (Front Outrigger Rear Outrigger) T1-1-5
Working Ranges ZX140W-5B Monoblock Boom T1-1-6
Working Ranges ZX140W-5B 2-Piece Boom T1-1-7

Group 2 Component Layout

Main Component Layout T1-2-1
Swing Shockless Valve T1-2-5
Electrical System (Overview) T1-2-6
Electrical System (Cab) T1-2-8
Electrical System (Switch Panel) T1-2-9
Electrical System (Controllers and Relays) T1-2-11
Electrical System (Around Air Cleaner) T1-2-13
Electrical System (Relays) T1-2-14
Electrical System (Lights) T1-2-15
Engine T1-2-16
Muffler Filter T1-2-17
Pump Device T1-2-18
Around Pump Device T1-2-19
Control Valve T1-2-20
Signal Control Valve T1-2-21
Swing Device T1-2-22
Travel Shockless Valve T1-2-22
Accumulator Charging Valve T1-2-22
Brake Valve T1-2-22
Solenoid Valve Unit T1-2-23
Transmission Changeover Solenoid Valve T1-2-25
Travel Device T1-2-25
Layout of Attachment Spec. Parts T1-2-26
Auxiliary Solenoid Valve Unit (Auxiliary Flow Rate Control) T1-2-27
Breaker Relief Solenoid Valve T1-2-27
Selector Valve T1-2-27

Group 3 Component Specifications

Engine T1-3-1
Engine Accessories T1-3-5
Hydraulic Component T1-3-6
Electrical Component T1-3-12

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			Boom	Arm	Bucket
CYLINDER	Monoblock Boom	Rod Outer Diameter	70 mm (2.8")	80 mm (3.1")	70 mm (2.8")
		Tube Inner Diameter	105 mm (4.1")	115 mm (4.5")	100 mm (3.9")
		Stroke	941 mm (3' 1")	1120 mm (3' 8")	875 mm (2' 10")
		Fully Retracted Length	1448 mm (4' 9")	1650 mm (5' 5")	1350 mm (4' 5")
		Plating Thickness	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)
		Weight	107 kg (236 lb)	157 kg (346 lb)	97 kg (214 lb)
	2-Piece Boom	Rod Outer Diameter	75 mm (3.0")	80 mm (3.1")	70 mm (2.8")
		Tube Inner Diameter	105 mm (4.1")	115 mm (4.5")	100 mm (3.9")
		Stroke	877 mm (2' 11")	1120 mm (3' 8")	875 mm (2' 10")
		Fully Retracted Length	1700 mm (5' 7")	1650 mm (5' 5")	1350 mm (4' 5")
		Plating Thickness	30 µm (1.18 µin)	30 µm (1.18 µin)	30 µm (1.18 µin)
		Weight	123 kg (272 lb)	157 kg (346 lb)	97 kg (214 lb)

			Positioning
CYLINDER	2-Piece Boom	Rod Outer Diameter	90 mm (3.5")
		Tube Inner Diameter	145 mm (5.9")
		Stroke	710 mm (2' 4")
		Fully Retracted Length	1215 mm (3' 12")
		Plating Thickness	30 µm (1.18 µin)
		Weight	183 kg (404 lb)

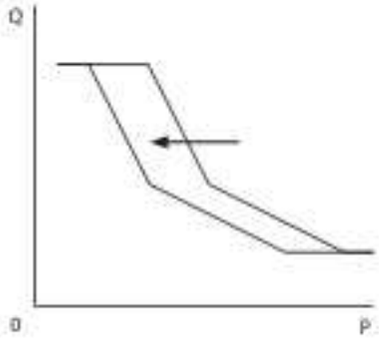
			Blade	Outrigger
CYLINDER	Optional	Rod Outer Diameter	60 mm (2.4")	60 mm (2.4")
		Tube Inner Diameter	105 mm (4.1")	854 mm (2' 10")
		Plating Thickness	30 µm (1.18 µin)	30 µm (1.18 µin)
		Weight	47 kg (104 lb)	67 kg (148 lb)

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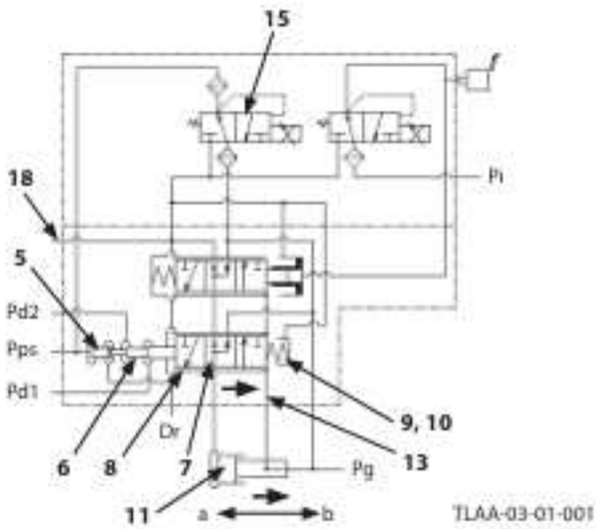
Control by Pilot Pressure from Torque Control Solenoid Valve

NOTE: The pump 2 regulator is explained here.

- Flow Rate Decrease
  1. Torque control solenoid valve (15) is activated by the signals from MC 1 (main controller 1) and torque control pressure Pps increases.
  2. Torque control pressure Pps adding to pump delivery pressure is routed to load piston 1 (5).
  3. Load piston 1 (5) pushes load piston 2 (6), spool B (7), inner spring (9), and outer spring (10). Spool B (7) is moved toward direction of the arrow.
  4. Due to the movement of spool B (7), primary pilot pressure Pg is routed to the large chamber of servo piston (11).
  5. Due to the difference in the pressure receiving areas between the large and small chambers, servo piston (11) is moved toward direction of the arrow. The cylinder block is rotated in the minimum inclination direction and the pump delivery flow rate decreases.
  6. The movement of cylinder block is transmitted to sleeve B (8) via link (13). Sleeve B (8) is moved in the same direction as spool B (7).
  7. When sleeve B (8) is moved by the same stroke as spool B (7), the open part between sleeve B (8) and spool B (7) is closed and primary pilot pressure Pg routed to the large chamber of servo piston (11) is blocked. Therefore, servo piston (11) is stopped and the flow rate decreasing operation is completed.



Q- Flow Rate
P- Pressure



Pd1- Pump 1 Delivery Pressure
Pd2- Pump 2 Delivery Pressure
Dr- Returning to Hydraulic Oil Tank
Pi- Pump Control Pressure
Pps- Torque Control Pressure
Pg- Primary Pilot Pressure (From Pilot Pump)
a- Displacement Angle Increase
b- Displacement Angle Decrease

5- Load Piston 1
6- Load Piston 2
7- Spool B
8- Sleeve B
9- Inner Spring
10- Outer Spring
11- Servo Piston
13- Link
15- Torque Control Solenoid Valve
18- Air Bleeding Circuit

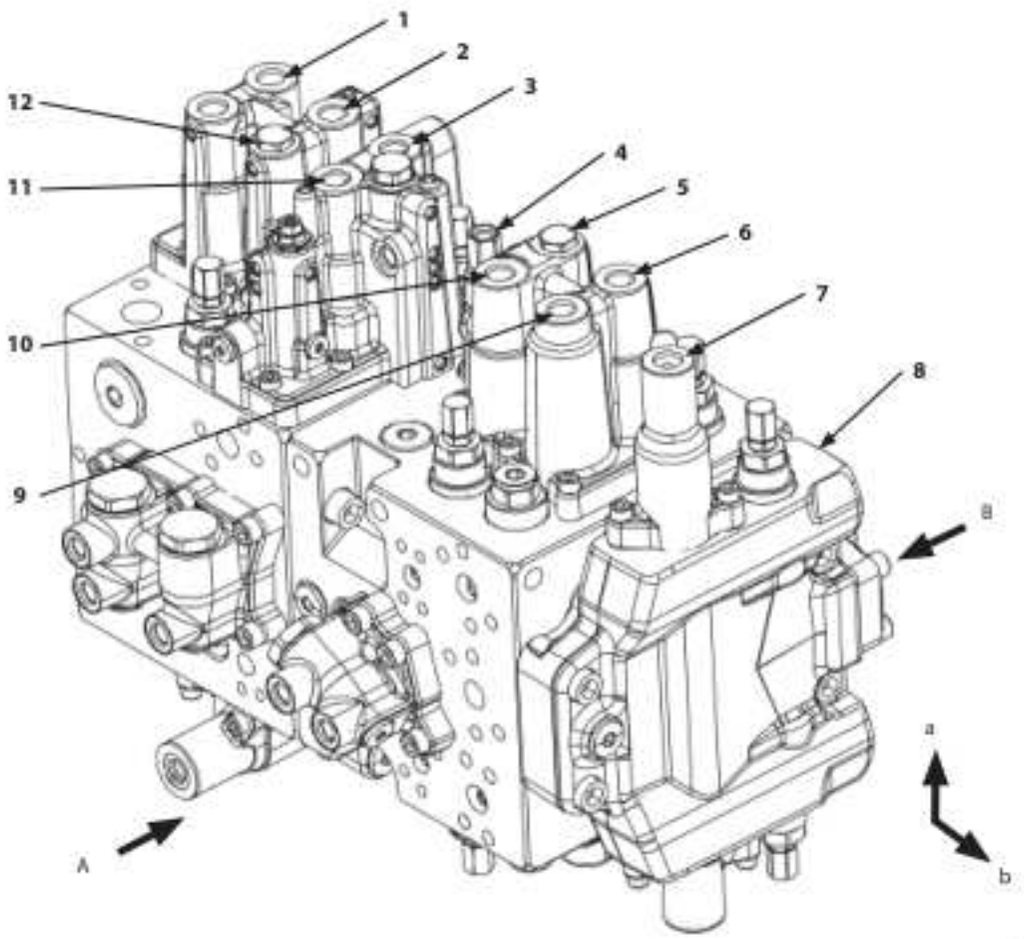
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Outline

The control valve controls the oil pressure, flow rate, and flow direction in the hydraulic circuit.
The major parts are the main relief valve, overload relief valve, anti-drift valve, flow rate control valve, regenerative valve, boom lower meter-in cut valve, auxiliary flow combiner valve, bypass shut-out valve, and spools. The spools are operated by the pilot oil pressure.

As for the spools, in the A side block, travel, bucket, boom 1, and arm 2 are arranged in that order as viewed from the machine front. In the B side block, blade/outrigger, auxiliary, boom 2, arm 1, and swing are arranged in that order as viewed from the machine front.
In addition, positioning/auxiliary 2 block (8) is added for the machine with the 2-piece boom or optional parts attached.

Control Valve



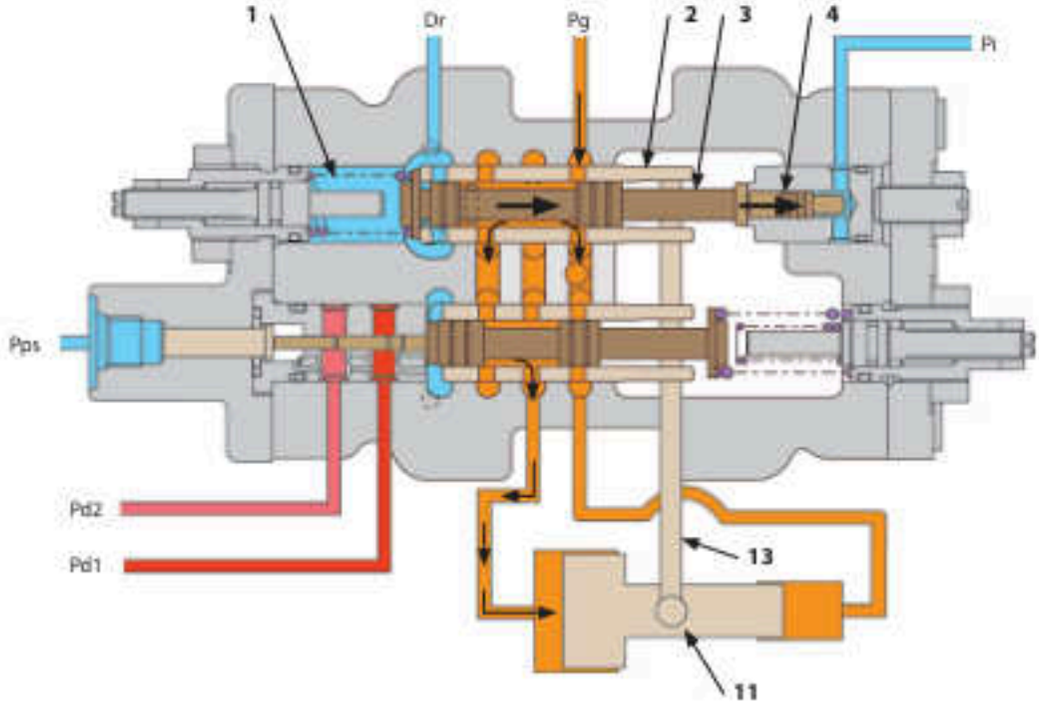
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a- Machine Upper Side
b- Machine Front

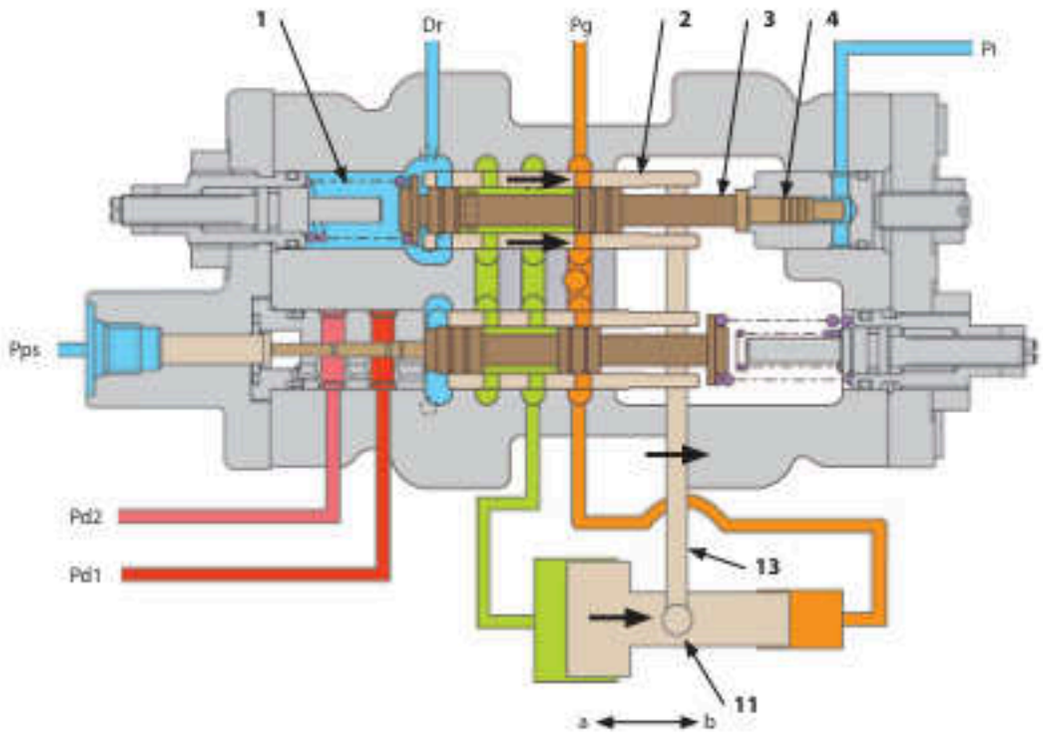
1- Swing
2- Arm 1
3- Boom 2
4- Main Relief Valve
5- Auxiliary
6- Blade/Outrigger
7- Positioning/Auxiliary 2
8- Positioning/Auxiliary 2 Block
9- Travel
10- Bucket
11- Boom 1
12- Arm 2

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NOTE: The illustration shows the pump1 regulator.



TPPP-03-01-018



TPPP-03-01-019

Pd1- Pump 1 Delivery Pressure
Pd2- Pump 2 Delivery Pressure

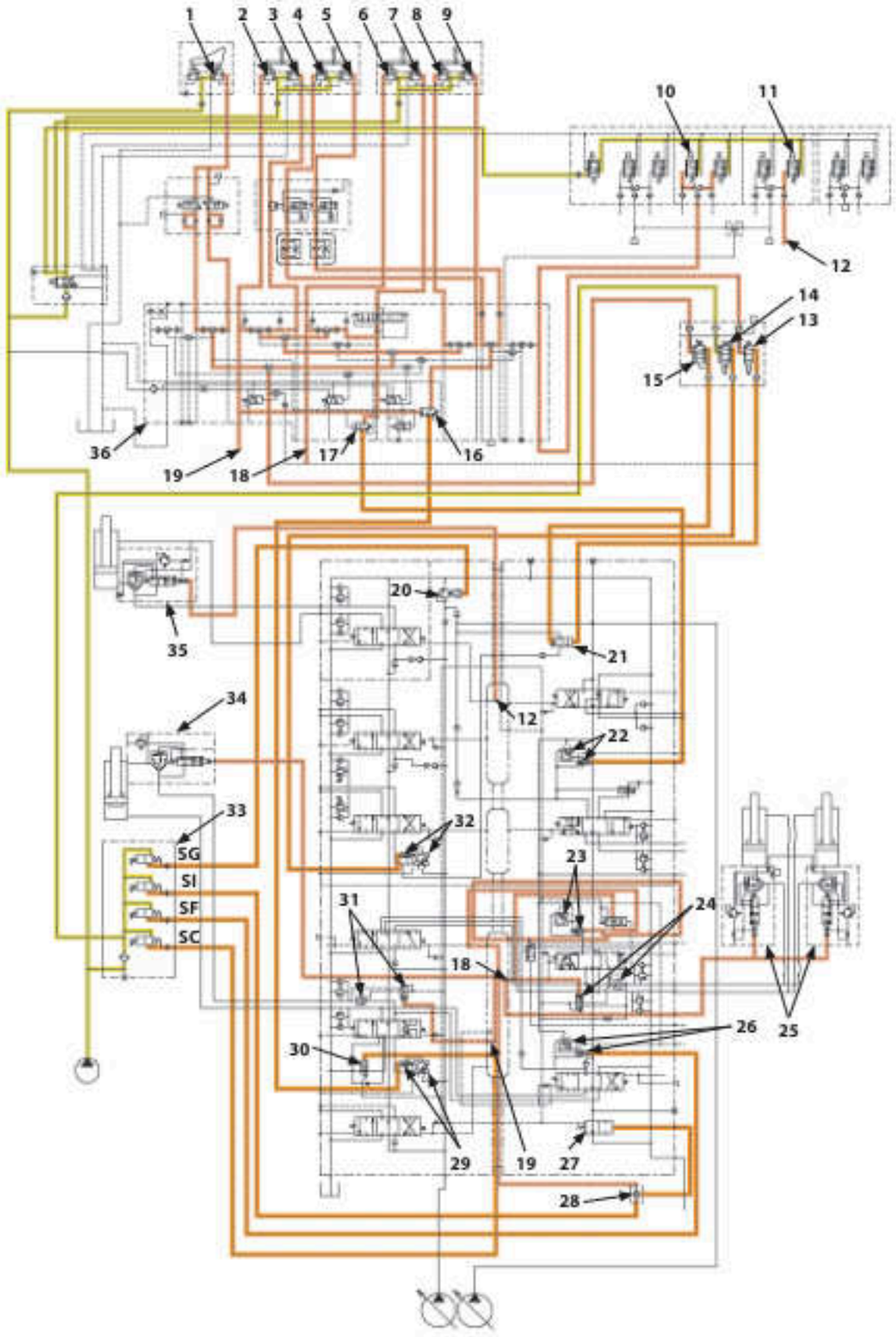
Dr- Returning to Hydraulic Oil Tank

Pi- Pump Control Pressure
Pps- Torque Control Pressure

Pg- Primary Pilot Pressure (From Pilot Pump)

1- Spring
2- Sleeve A
3- Spool A
4- Piston
11- Servo Piston
13- Link

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