PART NO. T4EK-E-01

HITACHI

Reliable solutions

Technical Manual

ZW 30 40 50

Wheel Loader

Service Manual consists of the following separate Part No.

Technical Manual : Vol. No.T4EK-E

Workshop Manual : Vol. No.W4EK-E

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ENGINE (ZW40/ZW50)

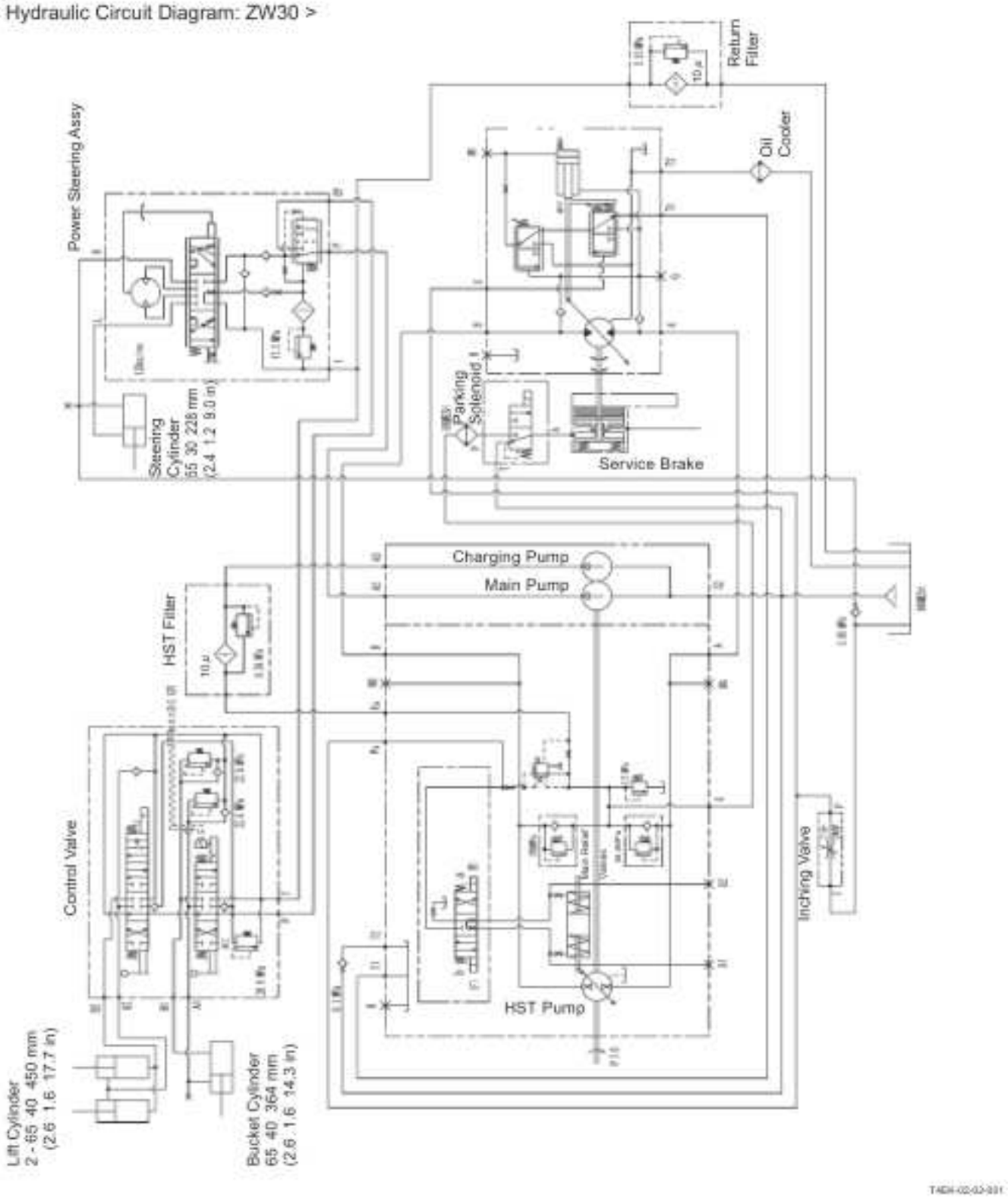
Item	Unit	Specification
Engine Model		KUBOTA V2403-M-DI-E3B
Engine Type		Four-Cycle Diesel Engine, Water-cooled
Cylinder No.-Bore x Stroke	mm (in)	4-87×102.4 (3.43×4.03)
Piston Displacement	L (US gal)	2.434 (0.6)
Combustion Chamber Type		Reentrant Type (Direct Injection)
Rated Output	kW (PS)/rpm	33.6(45.7)±5%/2400
Gross Output/Torque	kW (PS)/ N-m (lbf-ft)	34.1(46.4) ±5%/155.9 (115)
No Load Maximum Idle Speed/Idle Speed	rpm	$2670\ ^{0}_{-70}/1075^{+25}_{-25}$
Maximum Output Torque/Engine Speed	N-m (lbf-ft)/rpm	155.9 (115) ±5%/1400
Injection Order		1-3-4-2
Direction of Rotation		CCW (Viewed from Flywheel End Side)
Injection Nozzle		Bocch P Type Hose Nozzle
Injection Pump		Bocch K Type Mini Pump
Injection Pressure	MPa (kgf/cm^2, psi)	First: 18.6 (190, 2700) Second: 22.6 (230, 3280)
Injection Timing		TC-4.75p to -6.25p
Compression Ratio		20.2
Fuel		Diesel Fuel
Fuel Consumption Ratio	g/kW-h (g/ps-h)	238 (175)
Cooling System		Pressurized Radiator (Forced Circulation with Cooling Pump)
Lubrication System		Forced Lubrication with Trochoid Pump
Lubricant Oil		CD class and above 10W-30
Lubricant Oil Capacities	L (US gal)	7.6 (2)
Lubricant Oil Effective Dose	L (US gal)	1.8 (0.5)
Coolant Capacities	L (US gal)	3.7 (1) (Engine Only)
Air Cleaner		Cyclone Separator Type Filter
Regulator		IC Type (Built-in Alternator)
Dimension: Length×Width×Height	mm (in)	645.8×516.9×630.8 (25×20×25)
Weight (Dry)	kg (lb)	199 (440)
Starting Method		Starter (with Glow Plug)
Starter Motor	V-kW	12-2.0
Alternator	V-kW	12-720 (60A)
Battery Capacity	V-Ah	12-52 Ah (Genial Climate) 12-64 Ah (Cold Climate)

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OUTLINE

The hydraulic system consists of HST circuit, the brake circuit, the steering circuit and the main hydraulic circuit.

< Hydraulic Circuit Diagram: ZW30 >

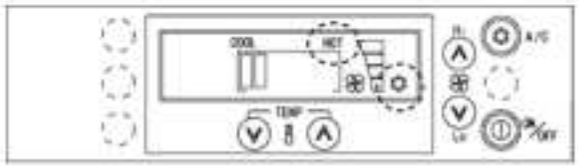


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Troubleshooting

Monitor Alarm

When any abnormality is detected with the motor actuator circuit or sensor input circuit, the control panel alarms by flashing the indicators as follows.
Replace/repair the defective parts and turn the starter key to OFF position to clear the alarm.



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NOTE: The alarm cannot be cleared by removing the cause of trouble. Make sure to restart the machine.

Indication	Symptom	Possible Cause
Flashing "HOT" mark	Temperature indicator does not light correctly. Servo motor does not stop	Motor actuator input/output circuit is dlsconnected or short-circuit.
	Servo motor does not rotate.	Motor speed is lower than the specified level. Motor is locked (disabled).
Flashing " " mark	Air does not blow. Compressor (clutch) does not work.	Thermistor cable is broken or short-circuit.

Abnormal Operation

- Evaporator

Symptom	Possible Cause	Action
Air quantity is small, and low pressure is low.	Blockage in filter. (Frozen evaporator)	Clean or replace filter.
Cooled air does not come.	The air conditioner was kept running for a long time at maximum COOL setting. (Frozen evaporator)	Turn off the air conditioner by pressing air conditioner switch (A/C) and run the blower only for a while at the highest level at higher temperature.

- Heater Radiator

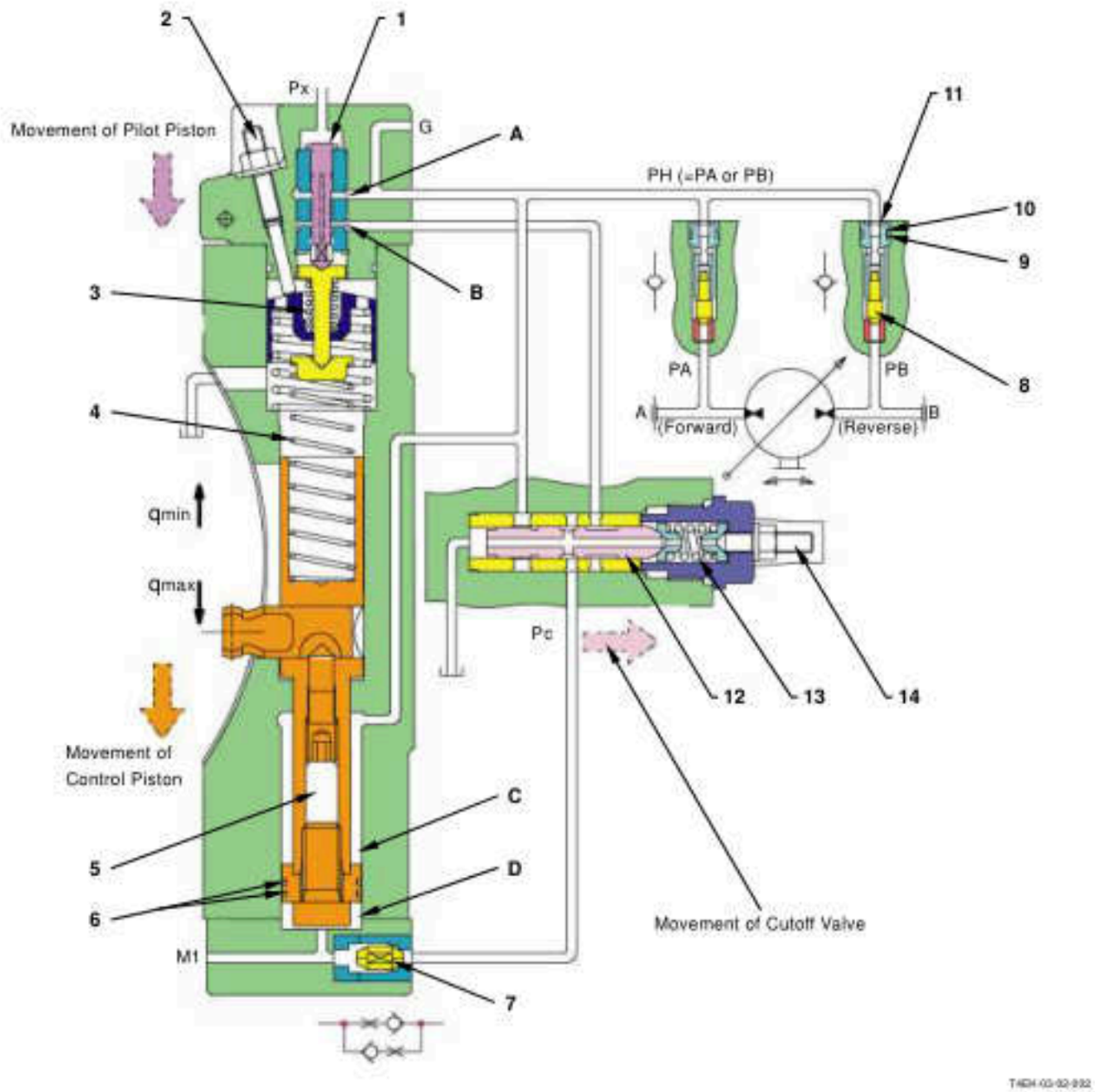
Symptom	Possible Cause	Action
Air quantity is small.	Blockage in fins.	Cleaning
Warm air does not come.	Blockage inside heater radiator	Replacement

- Blower

Symptom	Possible Cause	Action
Air is not blown at all. Air quantity does not change.	Blower motor or control unit is detective.	Replacement

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HD CONTROL



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1 - Pilot Piston
2 - Set Screw
3 - Adjust Spring
4 - Feedback Spring
5 - Control Piston
6 - O-Ring
7 - Restriction Valve
8 - Check Valve
9 - O-Ring
10 - Backup Ring
11 - O-Ring
12 - Cutoff Valve
13 - Adjust Spring
14 - Set Screw
A- Control Bushing Primary Side
B- Control Bushing Secondary Side
C- Control Piston Small Diameter (Cyclic) Side
D- Control Piston Large Diameter Side

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MAIN PUMP

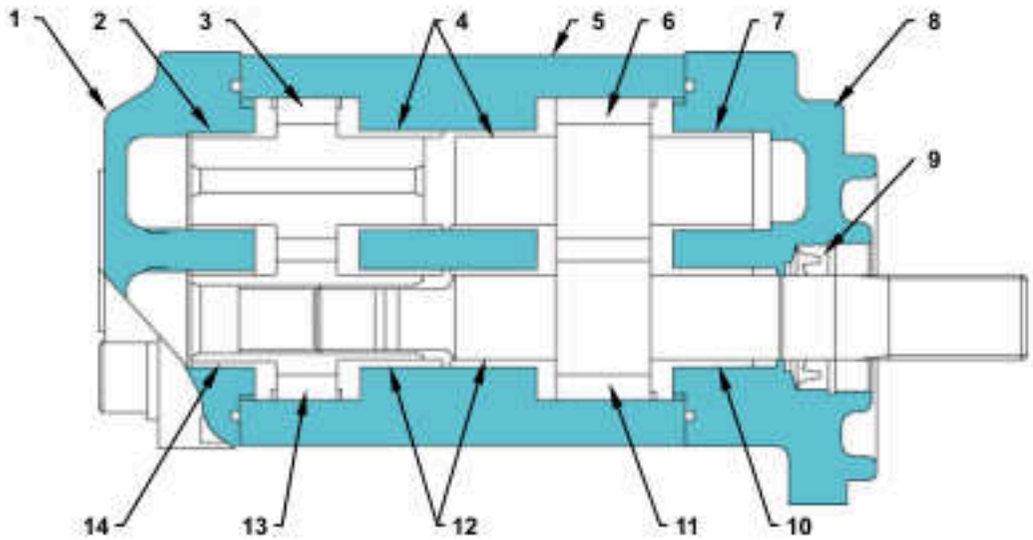
It is 2-spool gear pump consists of the 1st pump (main pump) and the 2nd pump (charging pump).

The charging pump is installed to HST pump through the coupling and rotates together with the engine.
The main (1st) pump doubles as the main hydraulic circuit and the steering hydraulic circuit.
The main (1st) pump draws hydraulic oil to the hydraulic tank and deliver through the priority valve.

Hydraulic oil is divided into the main hydraulic circuit and into the steering hydraulic circuit in the orbitrol assembly with the priority valve.

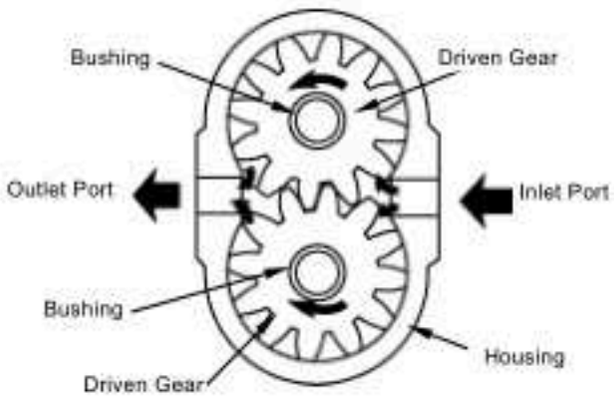
The main (1st) pump and the charging (2nd) pump draw hydraulic oil from the hydraulic tank and fill the spaces between the gear teeth bottom and the housing inner surface, which is made by the suction force when the drive gear and the driven gear are meshed and rotate together.
Hydraulic oil is delivered to the outlet port at the restart point to mesh.

In addition, the main pump uses bushing to prevent oil leaks from the gap between the gear and the side plate.
In order to increase the pump efficiency (volumetric efficiency), route delivery pressure to this bushing surface to balance pressure and reduce the gap.



T4EK-03-07-001

1 - Rear Cover
2 - Bushing
3 - Driven Gear (2nd Pump)
4 - Bushing
5 - Body
6 - Driven Gear (1st Pump)
7 - Bushing
8 - Front Cover
9 - Oil Seal
10 - Bushing
11 - Drive Gear (1st Pump)
12 - Bushing
13 - Drive Gear (2nd Pump)
14 - Bushing



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