PART NO.

HITACHI

Technical Manual

Operational Principle

EX

EX1200-5

Hydraulic Excavator

Service Manual consists of the following separate Part No.
Technical Manual (Operational Principle)
Technical Manual (Troubleshooting)
Workshop Manual

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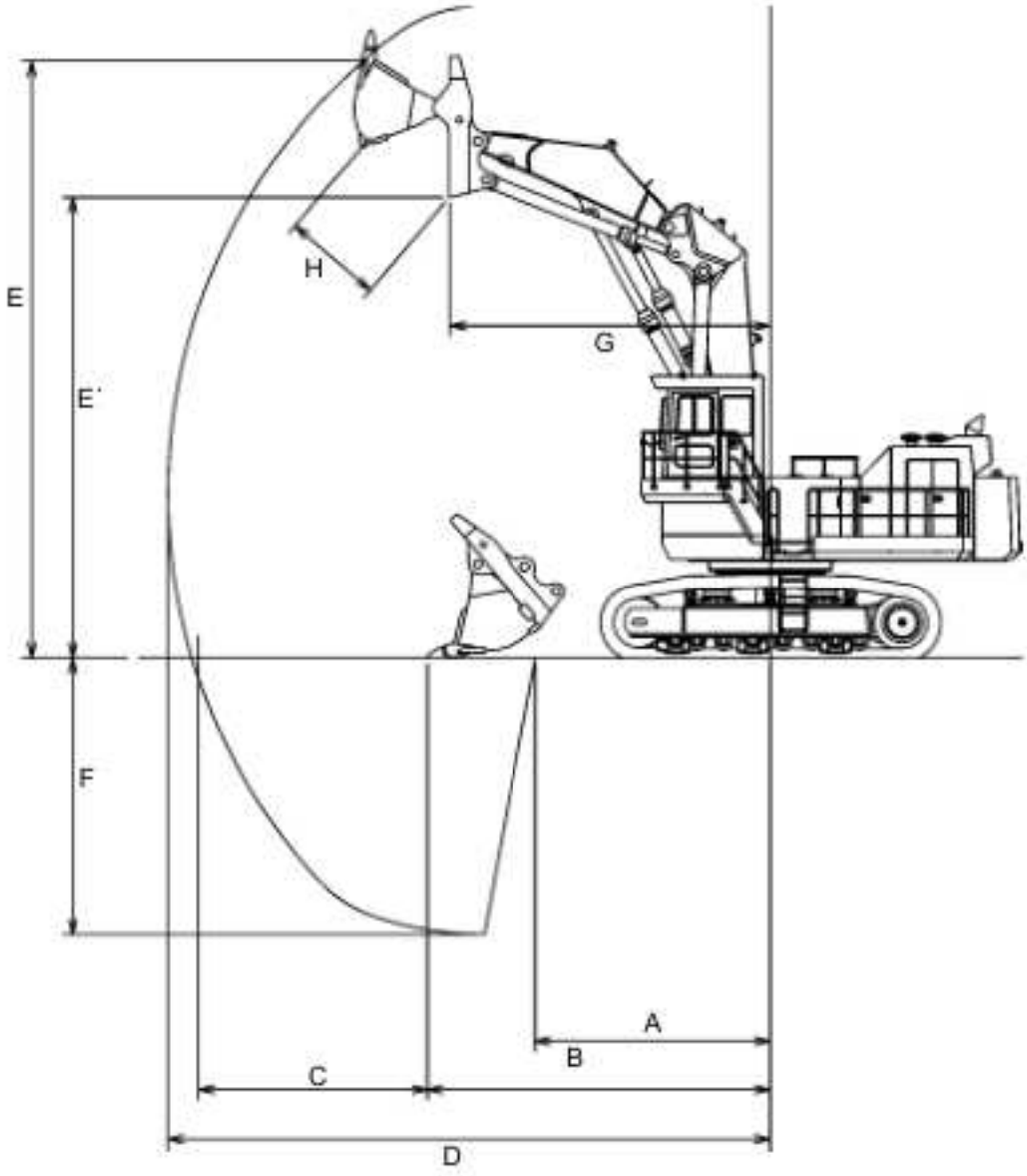
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WORKING RANGE (LOADING SHOVEL)



T183-01-01-005

A	: Minimum Digging Distance	4460 mm (14′ 8″)
B	: Minimum Level Crowding Distance	6520 mm (21′ 5″)
C	: Level Crowding Distance	4340 mm (13′ 10″)
D	: Maximum Digging Reach	11440 mm (37′ 6″)
E	: Maximum Cutting Height	*12350 mm (40′ 6″)
E'	: Maximum Dumping Height	*8740 mm (28′ 8″)
F	: Maximum Digging Depth	*5240 mm (17′ 2″)
G	: Working Radius at Maximum Dumping Height	*6090 mm (20′ 0″)
H	: Maximum Bucket Opening Width	1880 mm (6′ 2″)

*NOTE: * The dimensions do not include the height of the shoe lug.*

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Engine Protection Control

Purpose: Monitors engine operating condition according to input signals delivered from the overheat switch, engine oil pressure switches (high and low pressure), and coolant level switch, and reduces engine loads by decreasing pump drive power or stops the engine in case any engine trouble is detected.

Operation: Main controller A performs as described below to protect the engine from being damaged.

• Overheating

1. When coolant temperature increases over 101 °C (214 °F), the overheat switch is turned ON, sending a signal to main controller A.
2. Upon receiving the signal, main controller A instructs power increase solenoid valve ST so that power increase control is deactivated and only power decrease control by power decrease solenoid valves (SA and SB) are activated. (Refer to the Pump Control description pages.)
3. Then, pump drive torque is minimized, reducing the engine loads.
4. At the same time, main controller turns the overheat indicator ON and closes the ground line of power transistor 2.
5. Then, power transistor 2 magnetizes the engine protection relay and sends the torque decrease signal to the ECM.
6. Thereby, the ECM drives the governor so that engine speed and output torque are reduced.

• Abnormal Engine Oil Pressure

1. When the engine oil pressure switch (high or low) is turned ON, the signal from the switch is input to main controller A.

NOTE: When engine speed is more than 1500 min^{-1}, main controller A processes the signal from the engine oil pressure switch (High pressure).
When engine speed is 1500 min^{-1} or less, main controller A processes the signal from the engine oil pressure switch (Low Pressure).

2. Then, main controller A instructs power increase solenoid valve ST so that power increase control is deactivated and only power decrease control by power decrease solenoid valves (SA and SB) are activated. (Refer to the Pump Control description pages.)
3. Then, pump drive torque is minimized, reducing the engine loads.
4. At the same time, main controller turns the engine oil pressure indicator ON and closes the ground line of power transistor 2.
5. Then, power transistor 2 magnetizes the engine protection relay and sends the torque decrease signal to the ECM.
6. The ECM drives the governor in such a manner as to reduce the engine speed to 1655 min^{-1} when the engine speed is over 1655 min^{-1}, and keep the engine speed unchanged when the engine speed is 1655 min^{-1} or lower.
7. If reduction in engine oil pressure continues for 10 seconds or more, main controller A connects the line from power transistor 1 to ground.
8. Power transistor 1 activates the engine stop relay so that the engine is stopped by the engine stop solenoid relay and engine stop solenoid.

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OUTLINE

The hydraulic system consists of the main circuit, pilot circuit, pump transmission oil cooling circuit, and oil cooler fan motor circuit.

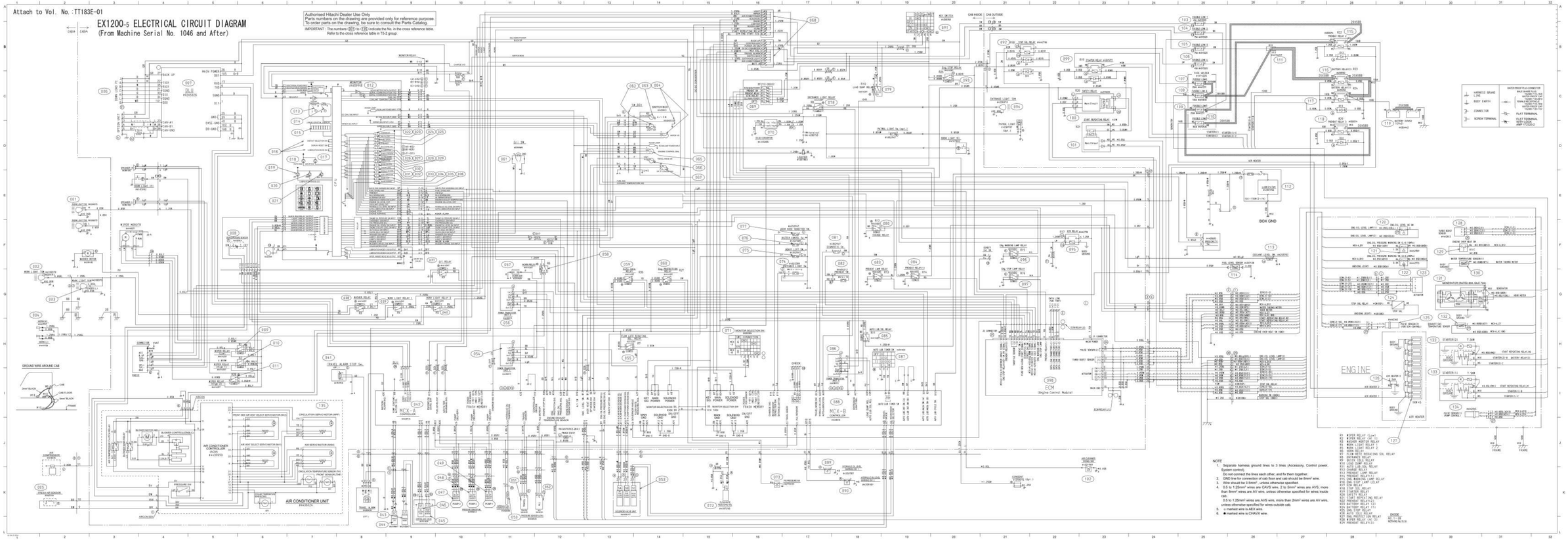
Pilot Circuit:
A hydraulic circuit that shifts the control valve spools, that controls the pumps, valves, and motors, and releases the parking brakes.

Main Circuit:
A hydraulic circuit that actuates cylinders, and motors by pressure oil delivered from the main pumps.

Pump Transmission Oil Cooling Circuit:
An oil circuit that cools the pump transmission oil by routing it through the oil cooler.

Oil Cooler Fan Motor Circuit:
A hydraulic circuit that drives the oil cooler fan motor with pressure oil from the oil cooler fan motor drive pump.
(Refer to the oil cooler fan motor control in Control System group.)

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