PART NO.

HITACHI

Technical Manual

Operational Principle

EX

EX5500-5

Hydraulic Excavator

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

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OUTLINE

The electrical system is roughly classified into the main, the control, and the monitor circuits.

Electrical Circuit
- Main Circuit: Engine and accessory circuits.
- Control Circuit: Machine operation control circuit.
- Monitor Circuit: Indicates machine operational conditions.

In this section, the functions and the systems of the following main circuits are explained.

- Power Supply Circuit: Power source circuit for the entire electrical system.
- Accessory Circuit: The electrical circuits that are activated with the key switch in the ACC position.
- Engine Start Circuit: Rotates the starter to start the engine after increasing the engine oil pressure to lubricate each section of the engine through the PRELUB system.
- Starting Aid Circuit: Helps the engine to start using ether in cold weather.
- Charging Circuit: Charges the batteries by allowing the alternator generated electrical current to flow to the battery positive terminal and supplies power to all electrical components while the engine is running.
- Engine Stop Circuit: Stops the engine by turning the key switch OFF.
- Surge Voltage Prevention Circuit: Protects the electrical components from the surge voltage developed when stopping the engine.
- Emergency Circuit: Stops the engine with the engine stop switch or the emergency engine stop switch. Also, prevents the engine from being started with the key switch.

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Torque Constant Control
(Main Pump, Fan Motor Drive Pump)

NOTE: The torque constant control has the following two functions.

· Overload Preventing Operation

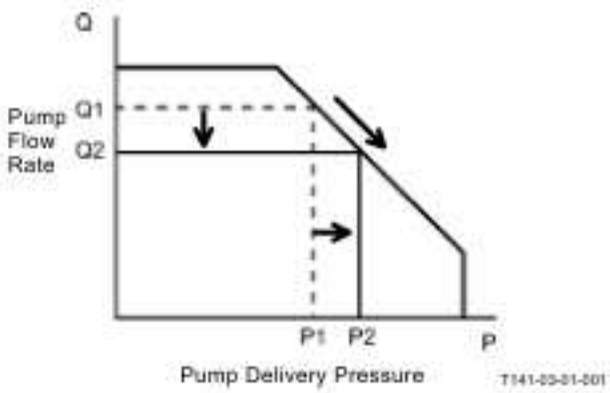
When pump load (pressure) increases, the pump delivery flow rate is reduced to prevent the engine from being overloaded.

· Flow Rate Increase Operation

When pump load (pressure) decreases, the delivery flow rate is increased to efficiently utilize the engine power.

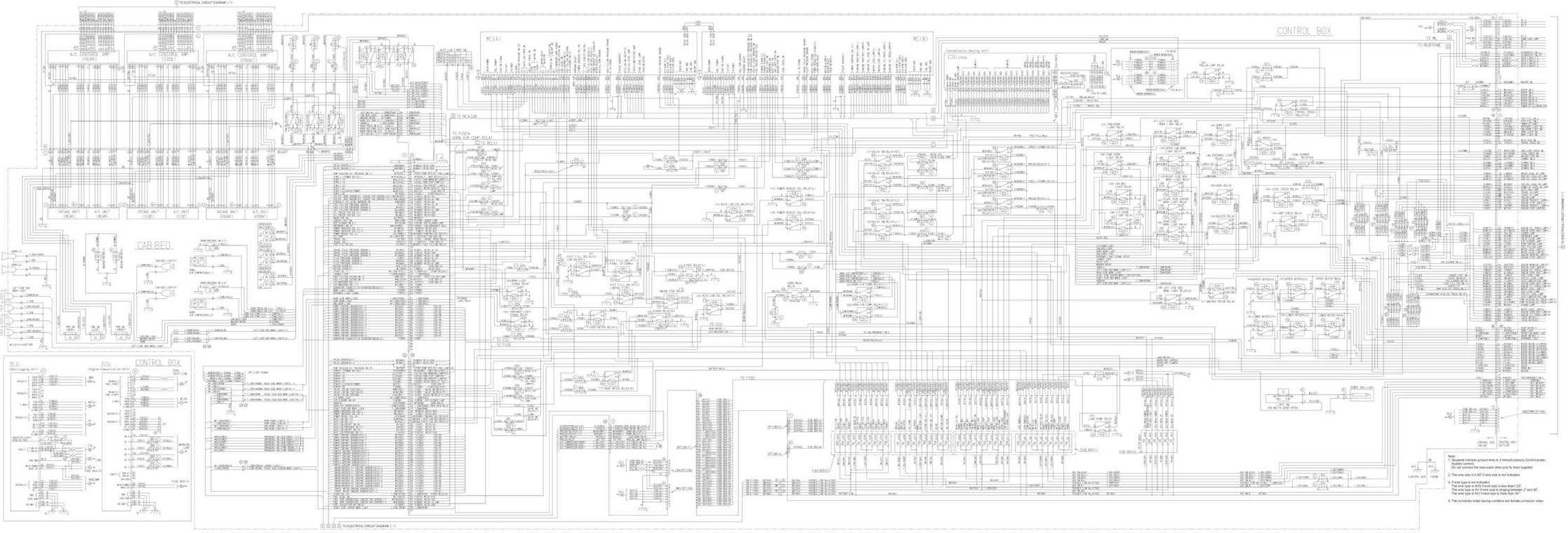
· Overload Preventing Operation

1. If pump delivery pressure P rises from P1 to P2, compensating piston (16) moves compensating rod (20) to the right until it balances with outer spring (21) and inner spring (22).
2. Movement of compensating rod (20) is transmitted to lever 2 (17) via pin (24), rotating lever 2 (17) counterclockwise around pin (18) (fixed to the housing).
3. Since pin (5), which is connected to feedback lever (12), is inserted into hole (19) on lever 2 (17), feedback lever (12) rotates around pin (13) clockwise as lever 2 (17) rotates, moving spool (3) to the right.
4. As spool (3) is moved, pump delivery pressure P is routed to the servo piston large chamber via spool (3). Although pump delivery pressure P is also routed to the servo piston small chamber, servo piston (14) is moved to the right due to the difference in pressure receiving area between the servo piston ends.
5. As servo piston (14) is moved to the right, the pump displacement angle decreases corresponding to the distance that servo piston (14) has moved, decreasing the pump delivery flow rate.
6. As servo piston (14) moves, feedback lever (12) moves via pin (13). Since compensating rod (20) and lever 2 (17) do not move, feedback lever (12) rotates counterclockwise around pin (5), shifting spool (3) to the left until the notches on spool (3) and sleeve (2) close completely. As the these notches close, the pump pressure stops acting on the servo piston large chamber. Consequently, the movement of servo piston (14) stops.
7. With the above operation, the pump delivery flow rate decreases from Q1 to Q2, reducing the pump load.



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EX5500-5 ELECTRICAL CIRCUIT DIAGRAM 2/3



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