KOBELCO

SERVICE MANUAL

HYDRAULIC EXCAVATOR

MD200C

S5YQU0104E

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ELECTRICAL SYSTEM

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3) When the RY contacts turn ON:

Current flows from the solenoid relay Ⓑ to RY, solenoid relay Ⓒ, and the solenoid, activating the solenoid and starting the engine.

4) As the engine starts and starter switch is placed in the ON position, voltage to the solenoid relay Ⓑ is cut off; however, T_1 and TR_2 stay ON for approximately another 30 seconds by the discharge current of the capacitor C. During capacitor C's discharging, the oil pressure builds up as the engine speed increases, causing the oil pressure switch to turn ON.

This cause a voltage to develop at:

Starter switch Ⓐ →Oil pressure switch→Thermo switch→
Solenoid relay Ⓑ→Resistor R_1→Ground
→Resistor R_5→TR_3 base

And current flows from TR_3 collector to TR_3 emitter, resistor R_4, and ground, keeping the RY contacts in ON state.

(b) Automatic stop circuit

When the thermo switch and oil pressure switch detect an abnormal condition, each switch turns OFF and the RY contacts open, deactivating the solenoid and stopping the engine.

(c) Pushbutton stop

To stop the engine during operation, operate the stop switch, and the stop operation is performed just as when the automatic stop is performed.

2. SPECIFICATIONS

<D3>

Item		Specification	
Voltage-polarity		<Standard>	<Option>
		24 V – ⊖ earth	12 V – ⊖ earth
		(Mitsubishi Electric Corp. products)	
Starter		<Standard>	<Option>
	Type	Overhang electromagnetic push-in type reduction starter	Front nose electromagnetic push-in type reduction starter
	Model	M2T78371	
	(Output)	(24 V – 5 kW)	(12 V – 3 kW)
	Reduction mechanism	Single external spur gear	Single internal spur gear
Starter relay			
	Model	U1T07075	
Alternator		<Standard>	<Option>
	Type	Alternator with built-in IC regulator (Idle-speed efficient type)	Alternator with built-in IC regulator (Idle-speed efficient type)
	Model	A2T72988	A5T70383
	(Output)	(24 V – 30 A)	(24 V – 25 A)
Safety relay			
	Model	R8T30172	R8T30171
Intake air heater		<Standard>	<Option>
	Type	Electric heating type	Electric heating type
	Capacity	22 V – 2.86 kW	11 V – 1.41 kW
Heater relay			
	Fuse capacity	164 A	164 A
Automatic stop device			
Stop solenoid		(Nippondenso Co., Ltd. products)	
	Type	Electromagnetic type	
Solenoid relay		(Nikko Denki products)	
		<Run off type>	<Run on type>
	Model	0-25000-5592 <24 V type> 0-25000-6361 <12 V type>	0-25000-6720 <24 V type> 0-25000-6990 <12 V type>
Oil pressure switch			
	Type	Diaphragm, built-in electric contact	
Thermo switch			
	Type	Wax type, built-in electric contact	

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Trouble	Cause	Remedy
6. Swing priority function does not occur.	1) Malfunctioning logic valve. Refer to item 2. 4) above.	1) Refer to item 2. 4) above.
	2) Clogged orifice in pilot circuit.	2) Remove foreign matter.
7. Swing does not occur.	1) Malfunctioning neutral cut-off valve. Refer to item 2. 3) above.	1) Refer to item 2. 3) above.
	2) Malfunctioning shuttle valve. Refer to item 2. 2) above.	2) Refer to item 2. 2) above.
8. Boom or arm oil recirculation does not occur.	1) Malfunctioning conflux valve. Refer to item 2. 3) above.	1) Measure pilot pressure. Refer to item 2. 3) above.
9. Despite lever being in neutral, negative control does not occur, failing to minimize flow.	1) Malfunctioning low pressure relief valve. • Foreign matter between poppet and seat. • Broken or deformed spring. • Clogged poppet throttle. • Damaged filter.	1) Measure low pressure relief valve pressure. • Disassemble and clean. If heavily damaged, replace the assembly as a unit. • Replace spring. • Disassemble and clean. Remove foreign matter. • Disassemble and clean. Replace filter.

5.2 RELIEF VALVE

Trouble	Cause	Remedy
1. No pressure rise whatsoever.	Main or pilot poppet of relief valve is sticking and valve is open, or there is foreign matter on valve seat.	• Check for foreign matter on each poppet. • Confirm that each component slides smoothly. • Clean all components thoroughly.
2. Unstable relief pressure.	Damaged pilot poppet seat of relief valve. Pilot piston sticks against main poppet.	• Replace damaged component. • Clean all components thoroughly. • Smooth surface damage.
3. Irregular relief pressure.	1) Wear due to foreign matter.	1) Disassemble and clean.
	2) Loosened lock nut or adjusting screw.	2) Adjust pressure.
4. Oil leak.	1) Damaged seat. Worn out O ring.	1) Replace damaged or worn component. Confirm that each component operates smoothly before reassembling.
	2) Sticking component due to foreign matter.	2) Confirm that there are no scratches, nicks, or foreign matter present before reassembling.

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4.2.4 INDEPENDENT TRAVEL SYSTEM WHEN IN 1ST SPEED FORWARD

(1) Pilot circuit

1) When the independent travel switch is ON

[When travel action is taken]

As the travel lever is moved, the primary pilot pressure for the travel passes through the orifice block (38) and enters port PiT of the independent travel valve, where it pushes the reducing valve spool (303), thereby reducing the secondary pressure coming from port PZ. As the secondary pressure drops, the bypass spool (301) closes, and all the oil from the pump flows to the control valve.

Secondary pressure from port a2 is also reduced along with the drop in secondary pressure in the reducing valve, and this reduces the negative control pressure, increasing pump discharge.

[Switching to independent travel function position]

When the independent travel switch is turned ON, the pressure from port A2 of the solenoid valve enters port PZ of the independent travel valve (as previously described) and port Pi3 of the control valve, closing the logic valve (612), switching the neutral cut-off valve (306A).

Also, the primary pilot pressure, from port A2 of the solenoid valve flows to the side bypass circuit, but the closed logic valve (mentioned above) raises the circuit pressure, switching the straight travel valve and switching the neutral cut-off valve (306B) too.

(2) Main circuit

Because, with the independent travel switch turned ON, the straight travel valve is switched to the independent travel function position, the pressurized oil entering port P1 of the control valve branches off to the right-hand and left-hand spools, driving the right-hand and left-hand motors.

The oil discharged by the No.1 pump is reduced under negative control action, and passes through port P1 of the bypass valve in the independent travel valve and returns to the tank.

Consequently, travel speed is halved, but a constant speed is maintained even during simultaneous travel and attachment operation.

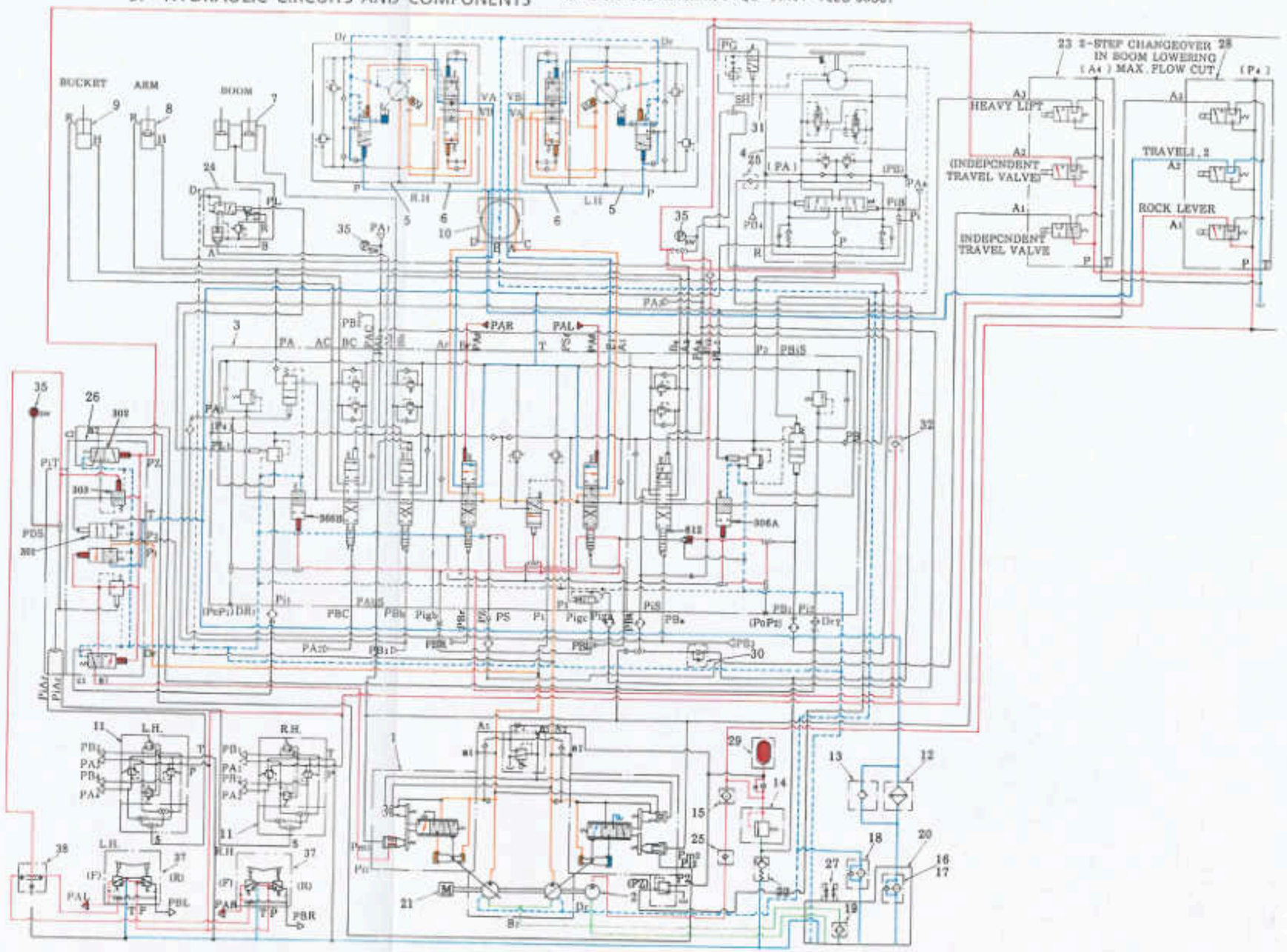


Fig. 10 Independent Travel in 1st Speed Forward

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