

SERVICE MANUAL

CRAWLER EXCAVATOR R210LC-3

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HYUNDAI

CRAWLER TYPE EXCAVATOR [R210LC-3]

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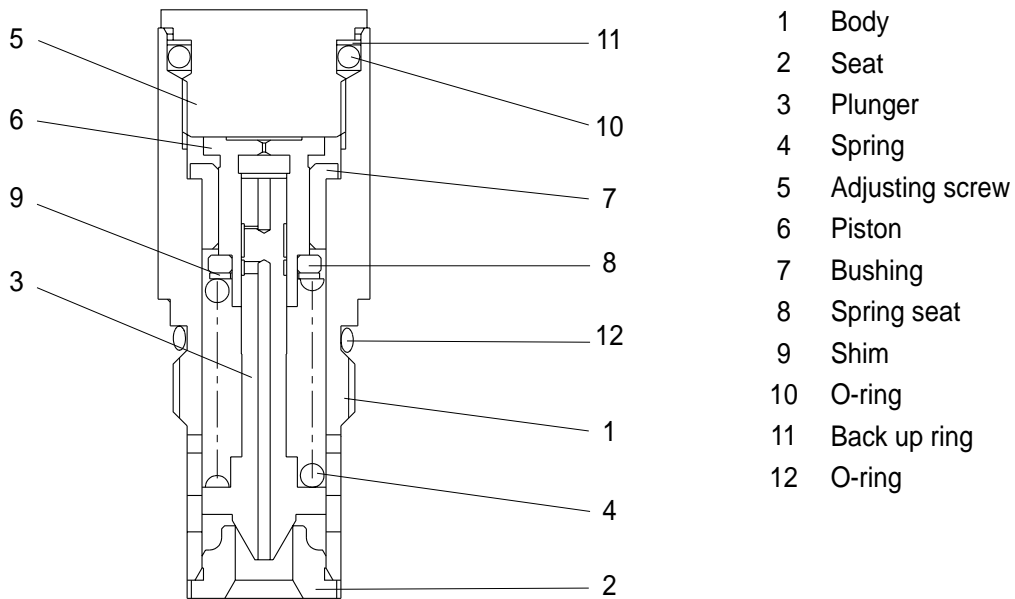
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3) RELIEF VALVE

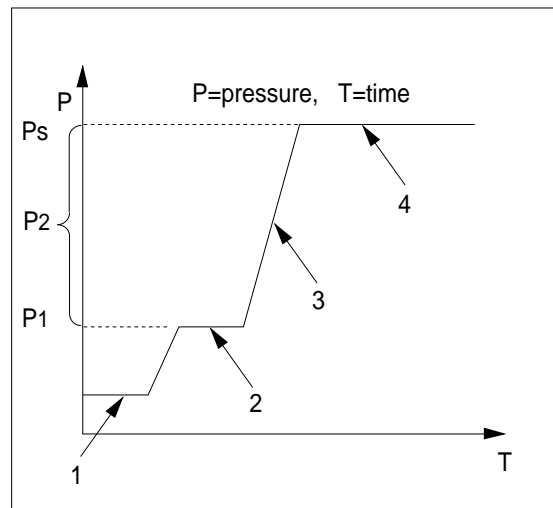


(1) Construction of relief valve

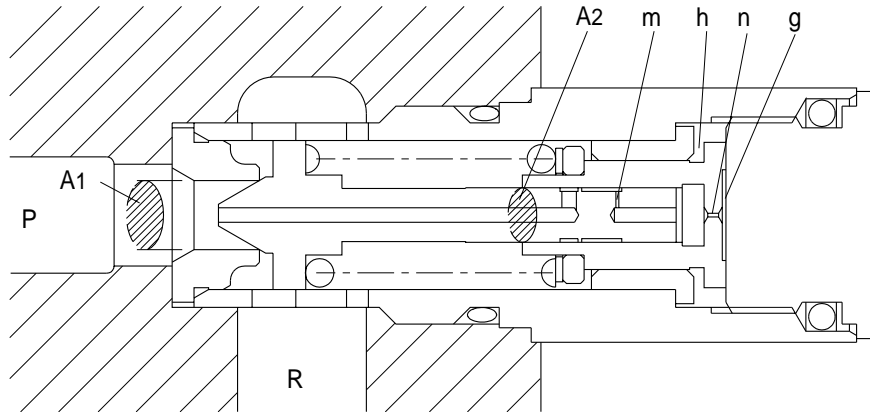
The valve casing contains two cartridge type relief valves that stop the regular and reverse rotations of the hydraulic motor. The relief valves relieve high pressure at start or at stop of swing motion and can control the relief pressure in two steps, high and low, in order to insure smooth operation.

(2) Function of relief valve

Figure illustrates how the pressure acting on the relief valve is related to its rising process. Here is given the function, referring to the figure following page.



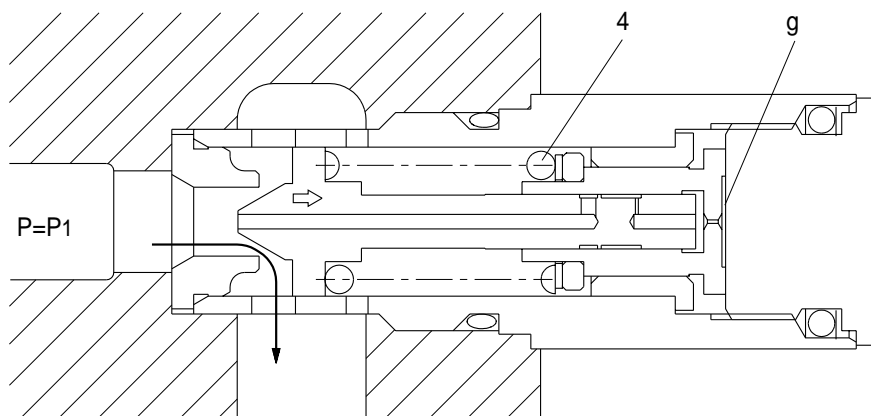
- ① Ports (P,R) at tank pressure.



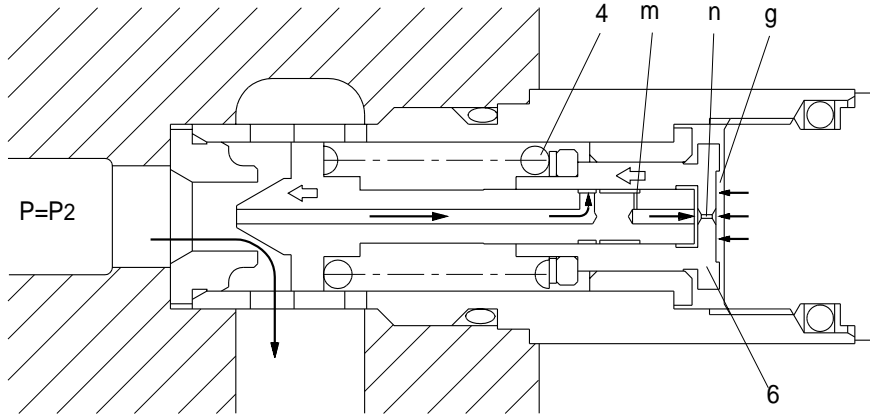
- ② When hydraulic oil pressure($P \times A_1$) reaches the preset force(F_{SP}) of spring(4), the plunger(3) moves to the right as shown.

$$P_1 \times A_1 = F_{SP} + P_g \times A_2$$

$$P_1 = \frac{F_{SP} + P_g \times A_2}{A_1}$$



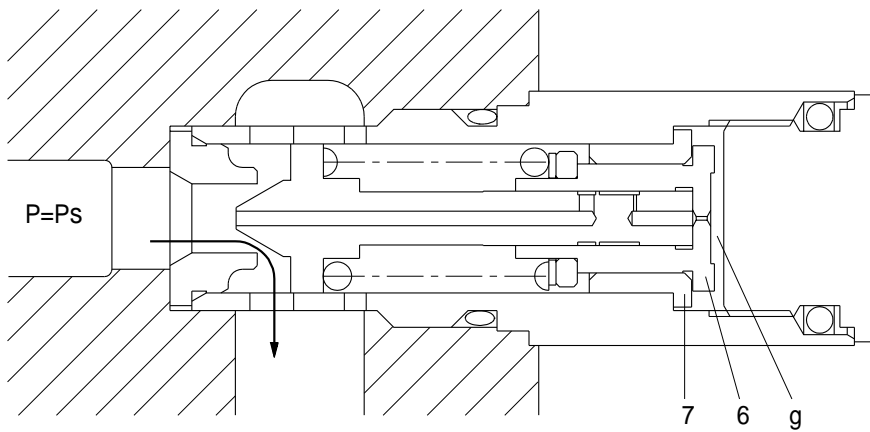
- ③ The oil flow chamber g via orifice m and n. When the pressure of chamber g reaches the preset force(F_{sp}) of spring(4), the piston(6) moves left and stop the piston(6) hits the bottom of bushing(7).



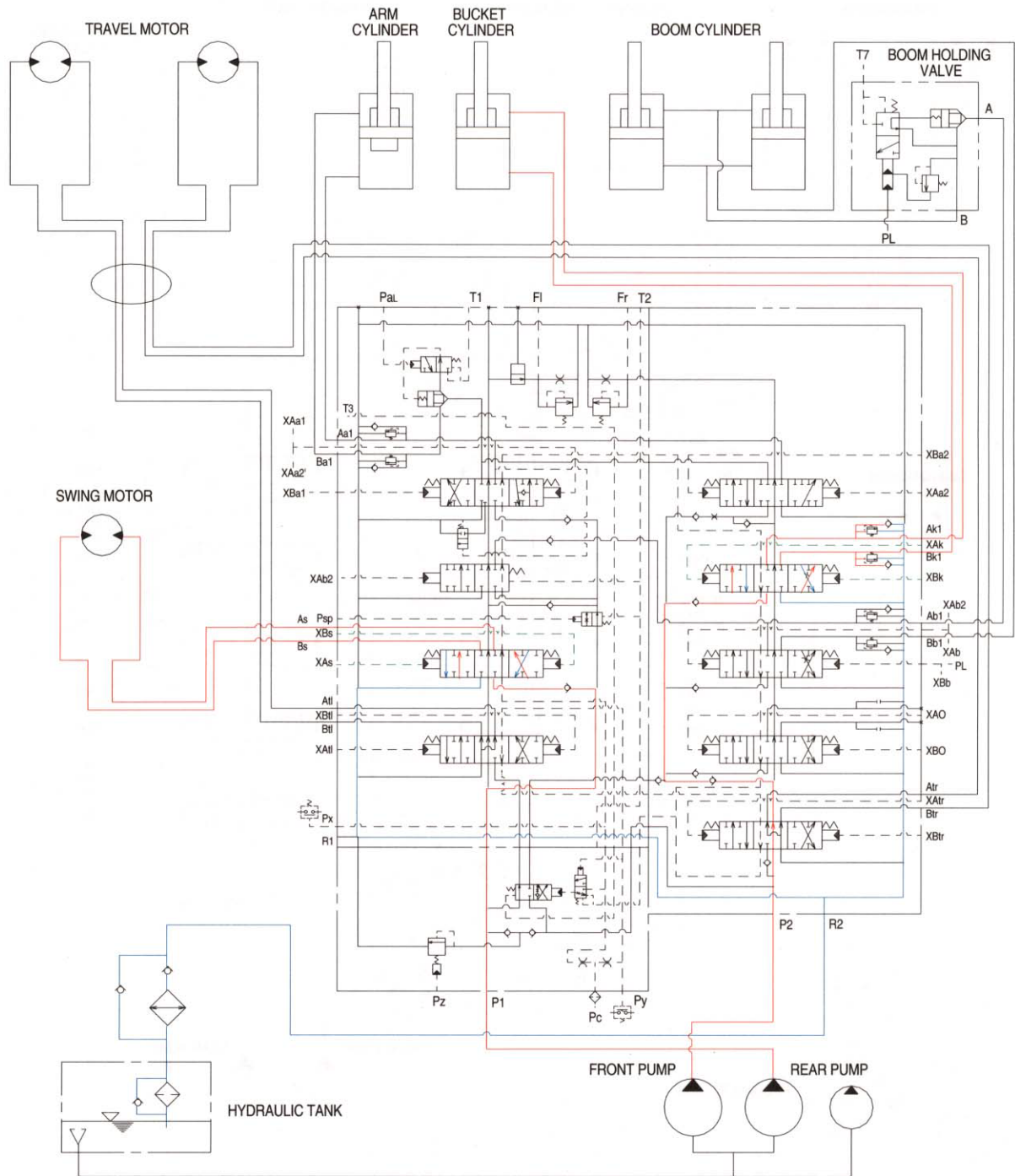
- ④ When piston(6) hits the bottom of bushing(7), it stops moving to the left any further. As the result, the pressure in chamber(g) equals(P_s).

$$P_s \times A_1 = F_{sp} + P_s \times A_2$$

$$P_s = \frac{F_{sp}}{A_1 - A_2}$$



4. COMBINED SWING & BUCKET OPERATION

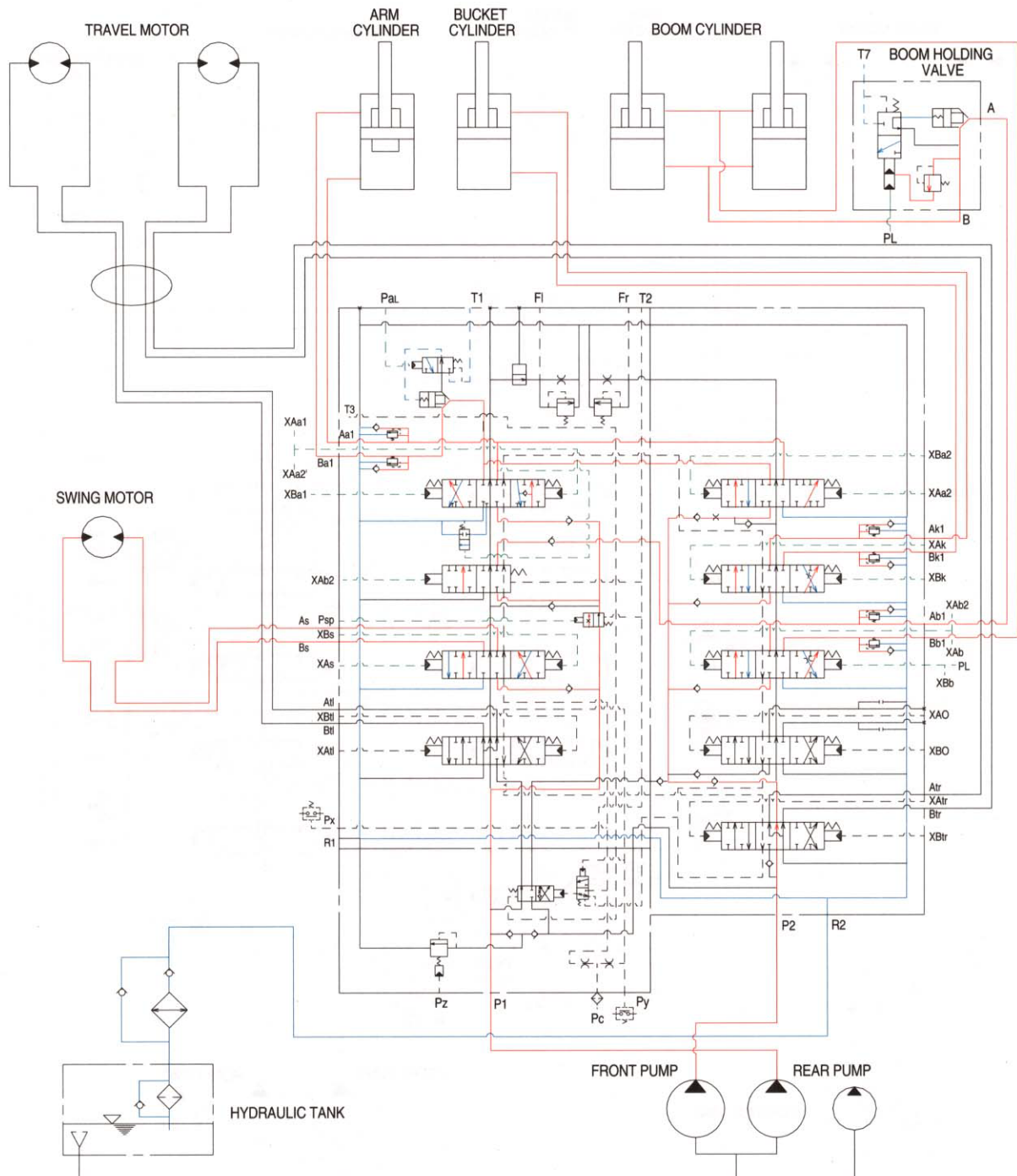


When the swing and bucket functions are operated, simultaneously the swing spool and bucket spool in the main control valve are moved to the functional position by the pilot oil pressure from the remote control valve.

The oil from the rear pump flows into the swing motor through the swing spool in the left control valve.

The oil from the front pump flows into the bucket cylinder through the bucket spool in the right control valve.

5. COMBINED SWING, BOOM, ARM & BUCKET OPERATION



When the swing, boom, arm and bucket functions are operated, simultaneously each spool in the main control valve is moved to the functional position by the pilot oil pressure from the remote control valve.

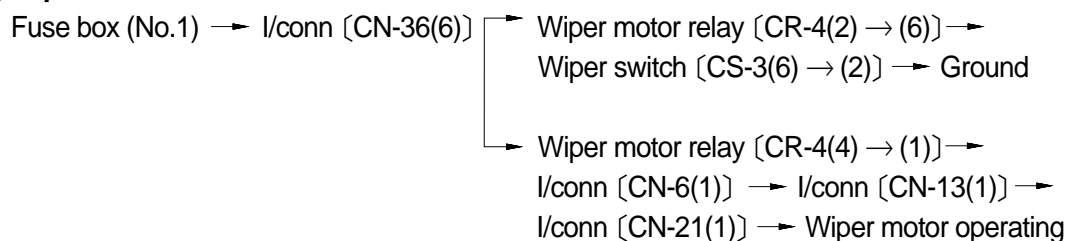
The oil from the rear pump flows into the swing motor, boom cylinders and arm cylinder through the swing spool, boom 2 spool, arm 1 spool, and the parallel and confluence oil passage in the left control valve. The oil from the front pump flows into the boom cylinders, arm cylinder and bucket cylinder through the boom 1 spool, arm 2 spool, bucket spool and the parallel and confluence oil passage in the right control valve.

The superstructure swings and the boom, arm and bucket are operated.

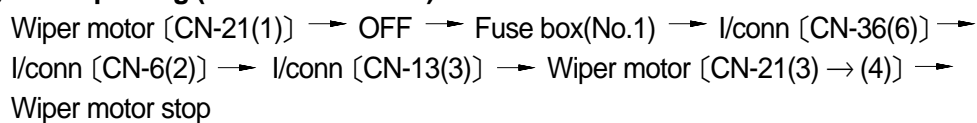
7. WIPER MOTOR CIRCUIT

1) OPERATING FLOW

(1) Wiper motor switch ON



(2) Auto - parking (When switch OFF)

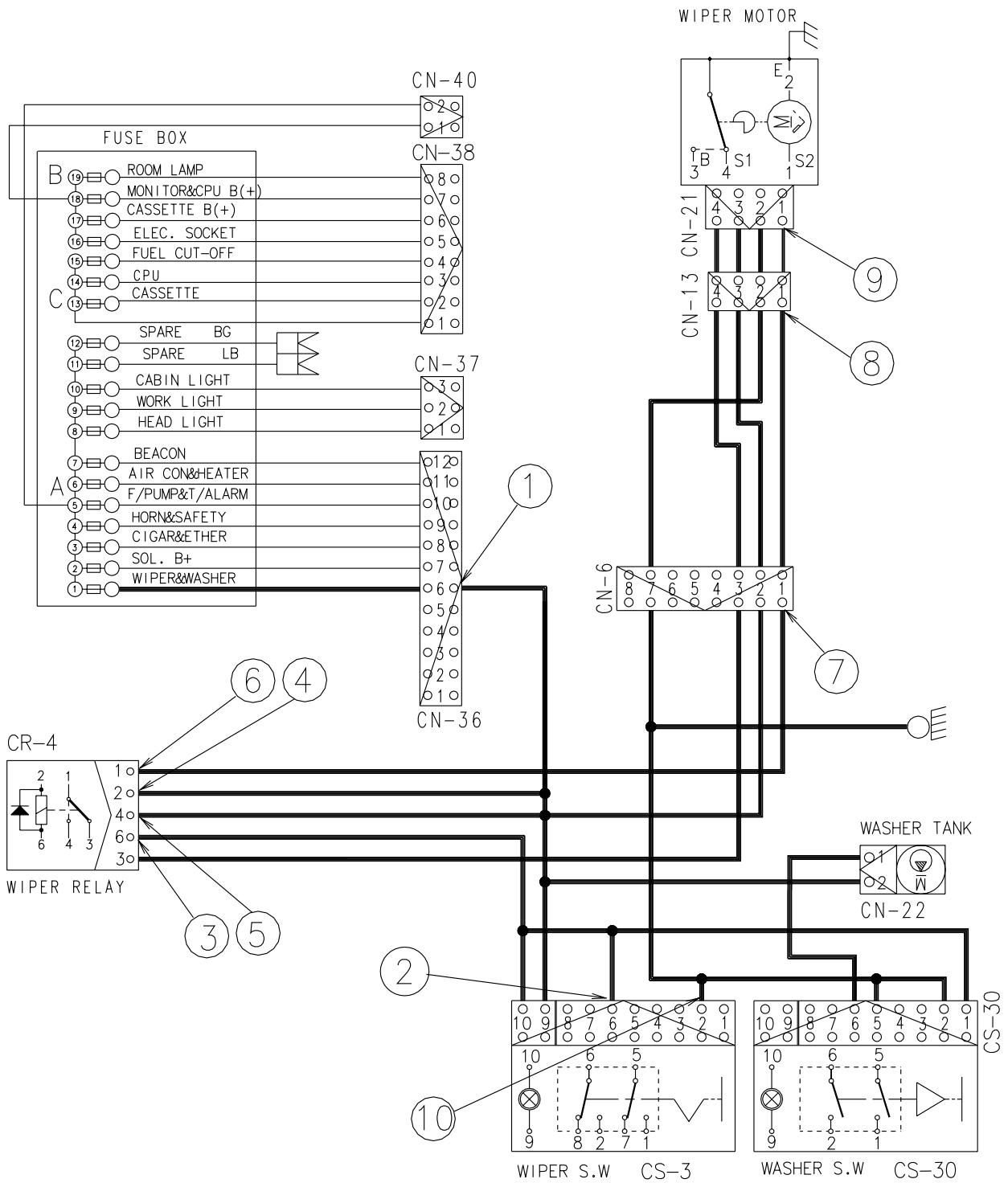


2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (Fuse box) ② - GND (Switch input) ③ - GND (Relay) ④ - GND (Relay coil) ⑤ - GND (Relay input) ⑥ - GND (Relay) ⑦ - GND (Wiper power input) ⑧ - GND (Wiper power input) ⑨ - GND (Wiper motor) ⑩ - GND (Switch output)	20 ~ 25V

※ GND : Ground

WIPER MOTOR CIRCUIT



CONTROLLER CIRCUIT

