WHEEL LOADER

SERVICE MANUAL

HL970 Tier 3

HYUNDAI

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2) ENGINE FAULT CODE

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
111 629 12	Engine control module critical internal failure - Bad intelligent device or component. Error internal to the ECM related to memory hardware failures or internal ECM voltage supply circuits.	Possible no noticeable performance effects, engine dying, or hard starting.
115 612 2	Engine magnetic crankshaft speed/position lost both of two signals - Data erratic, intermittent, or incorrect. The ECM has detected the primary and backup speed sensor signals are connected backwards.	The engine will shut down or will not start.
122 102 3	Intake manifold 1 pressure sensor circuit - Voltage above normal, or shorted to high source. High signal voltage detected at the intake manifold pressure circuit.	Engine power derate.
123 102 4	Intake manifold 1 pressure sensor circuit - Voltage below normal, or shorted to low Source. Low signal voltage or open circuit detected at the intake manifold pressure circuit.	Engine power derate.
124 102 16	Intake manifold 1 pressure - Data valid but above normal operational range - Moderately severe level. Intake manifold pressure is above the maximum operating limit.	Engine power derate.
125 102 18	Intake Manifold 1 Pressure - Data valid but below normal operating range - Moderately severe level. Intake manifold pressure is below the minimum operating limit.	Engine power derate.
131 91 3	Accelerator pedal or lever position sensor 1 circuit - Voltage above normal, or shorted to high source. High voltage detected at accelerator pedal position number 1 circuit.	The engine will operate in limp home mode.
132 91 4	Accelerator pedal or lever position sensor 1 circuit - Voltage below normal, or shorted to low source. Low voltage detected at accelerator pedal position number 1 signal circuit.	The engine will operate in limp home mode.
133 974 3	Remote accelerator pedal or lever position sensor 1 circuit - Voltage above normal, or shorted to high source. High voltage detected at remote accelerator pedal position signal circuit.	Remote accelerator will not operate.
134 974 4	Remote accelerator pedal or lever position sensor 1 circuit - Voltage below normal, or shorted to low source. Low voltage detected at remote accelerator pedal position signal circuit.	Remote accelerator will not operate.
143 100 18	Engine oil rifle pressure - Data valid but below normal operational range - Moderately severe level. Engine oil pressure signal indicates engine oil pressure is below the engine protection warning limit.	Engine power derate.

※ Some fault codes are not applied to this machine.

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(3) Turn out the plug gauge and determine Dimension II (also see figure 378).

Dimension II e.g ..... 30.10 mm



Figure 379

Example "A_1" :

Dimension II		30.10 mm
Dimension X ($0.5^{-0.3}$ mm)	-	0.60 mm
Results in installation dimension A		= 29.50 mm

Example "A_2" :

Dimension I		30.00 mm
Installation dimension A	-	29.50 mm
Results in shim ring (s)	s =	0.50 mm

(4) Install the adequate shim ring (s) and wet the thread (arrow) with loctite (type No. 574).



Figure 380

(5) Install the inductive transmitter n-Engine (9), see arrow.

· Torque limit : 3.06 kgf · m (22.1 lbf · ft)

Set and install the inductive transmitter n-Turbine (14) and n-internal speed input (5) analogously.

※ Observe the different setting dimensions. Installation position of the single inductive transmitters, also see page 3-197.



Figure 381

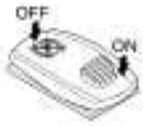
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6. ELECTRIC PARKING, PILOT CUT OFF CIRCUIT

1) OPERATING FLOW

(1) Parking OFF

Fuse box [CN-39 (41)] → Parking switch OFF → [CS-17 (5)→(4)] → I/conn [CN-05 (14)]
→ I/conn [CN-12 (13)]
→ Parking solenoid ON (activated)
→ Parking brake released (by hydraulic pressure)
→ [CS-17 (2)→(1)] → T/M control unit [CN-157 (21)]



(2) Parking ON

Fuse box [CN-39 (41)] → Parking switch ON → Parking solenoid [CN-71] OFF
→ Parking brake applied [By spring force]

(3) Pilot cut off ON

Fuse box [CN-39 (41)] → Pilot cut off switch ON → Pilot cut off switch [CS-4 (5) → (4)]
→ I/conn [CN-05 (11)] → I/conn [CN-12 (12)] → Pilot cut off solenoid ON [CN-68] (activate)
→ Pilot cut off released

(4) Pilot cut off OFF

Fuse box [CN-39 (41)] → Pilot cut off switch OFF → Pilot cut off solenoid [CN-68] OFF
→ Pilot cut off applied

2) CHECK POINT

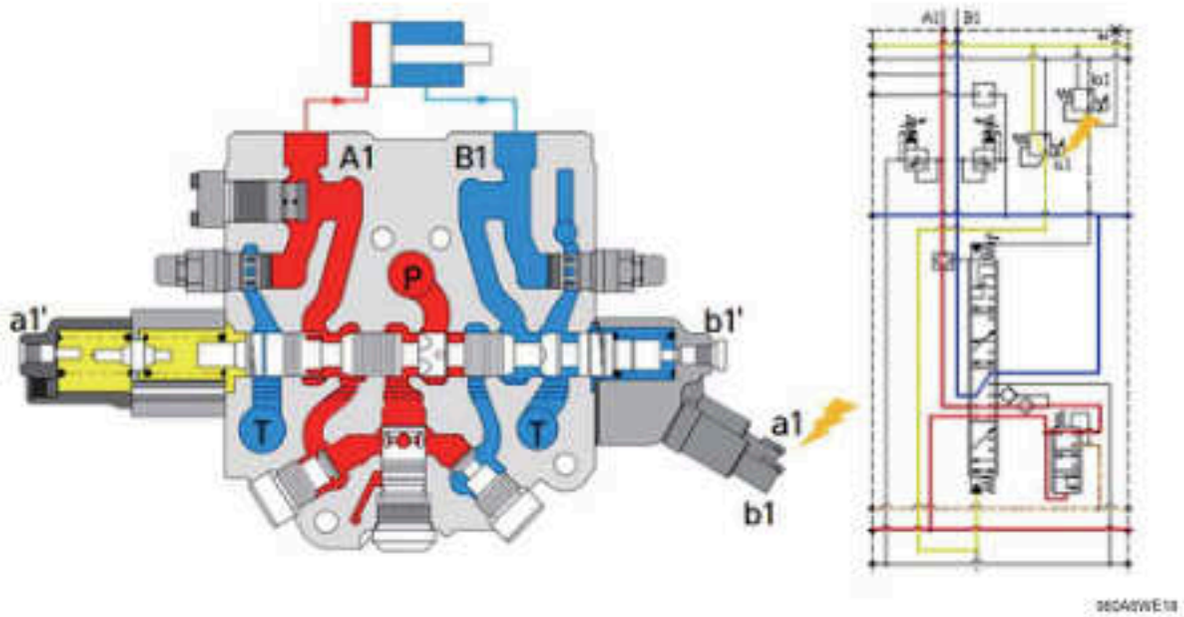
Engine	Key switch	Check point	Voltage
Running	ON	① - GND (parking switch input) ② - GND (parking switch output) ③ - GND (pilot cut off switch input) ④ - GND (pilot cut off switch output) ⑤ - GND (parking solenoid) ⑥ - GND (pilot cut off solenoid)	20-25V

※ GND : Ground

※ The circuit diagram may differ from the equipment, so please check before a repair.

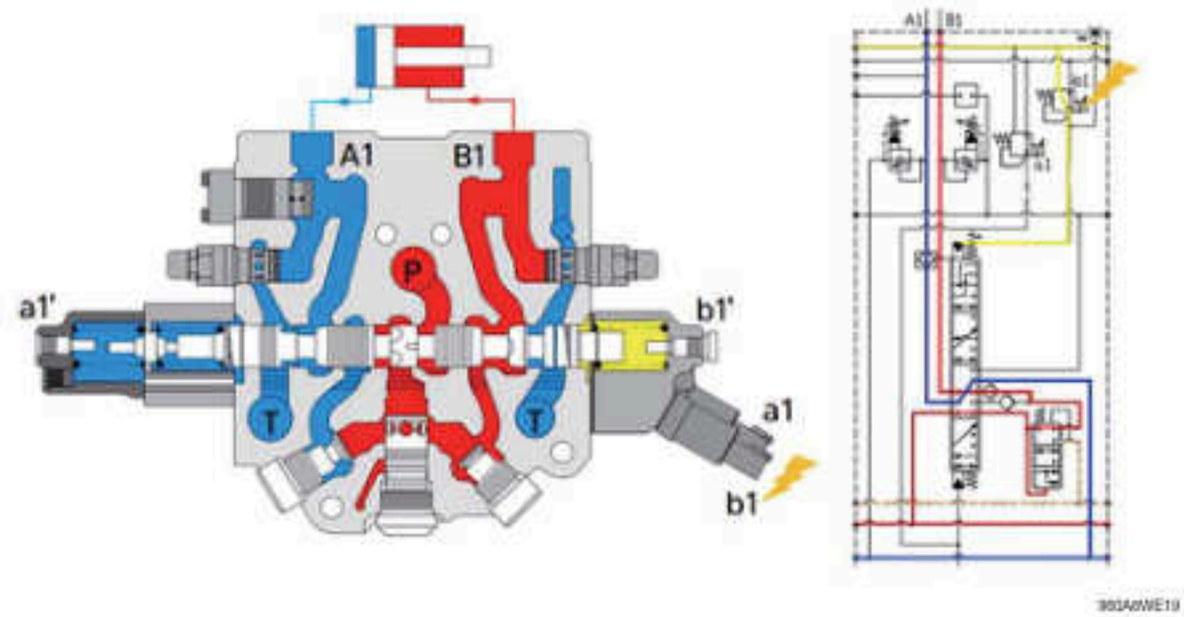
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6) BOOM UP DESCRIPTION



When the pilot pressure from EPPR valve (a1) is led to the port a1', the oil from the pump flows to the boom cylinder (LC) port A1 and oil from the boom cylinder (SC) flows into the tank through the boom cylinder (SC) port B1.

7) BOOM DOWN DESCRIPTION

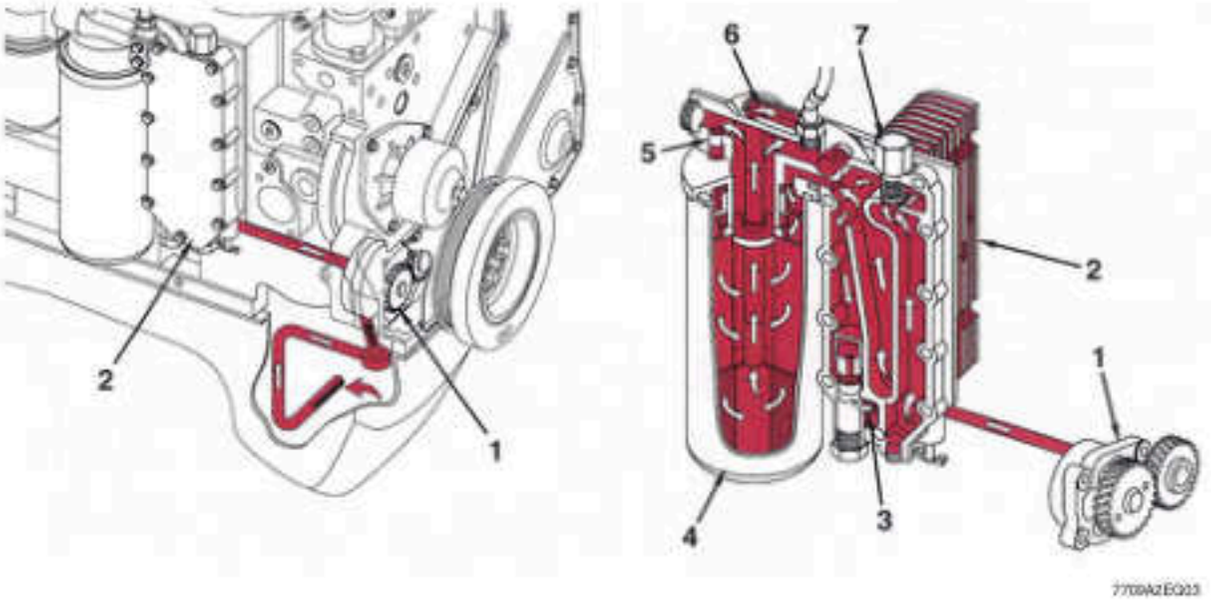


When the pilot pressure from EPPR valve (b1) is led to the port b1', the oil from the pump flows to the boom cylinder (SC) port B1 and oil from the boom cylinder (LC) flows into the tank through the boom cylinder (LC) port A1.

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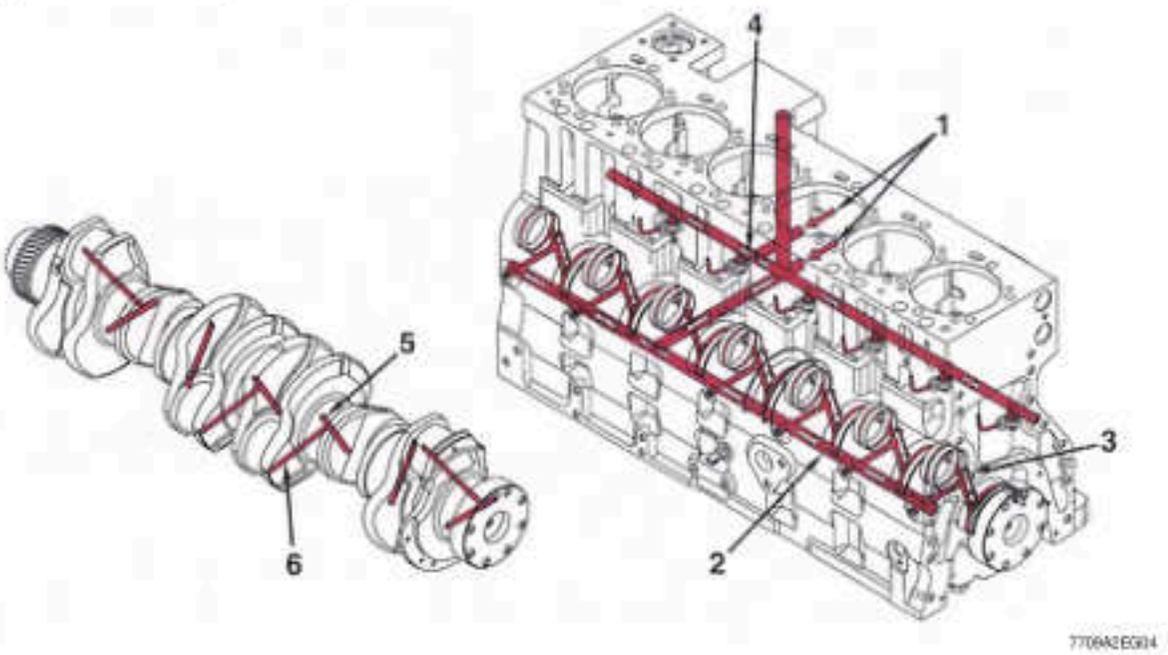
2) LUBRICATING OIL SYSTEM

(1) Lubricating oil cooler flow



1 Gerotor lubricating oil pump
2 Lubricating oil cooler
3 Bypass oil to lubricating oil pan
4 Full flow lubricating oil filter
5 Filter bypass valve
6 From lubricating oil filter to main oil rifle
7 Oil thermostat

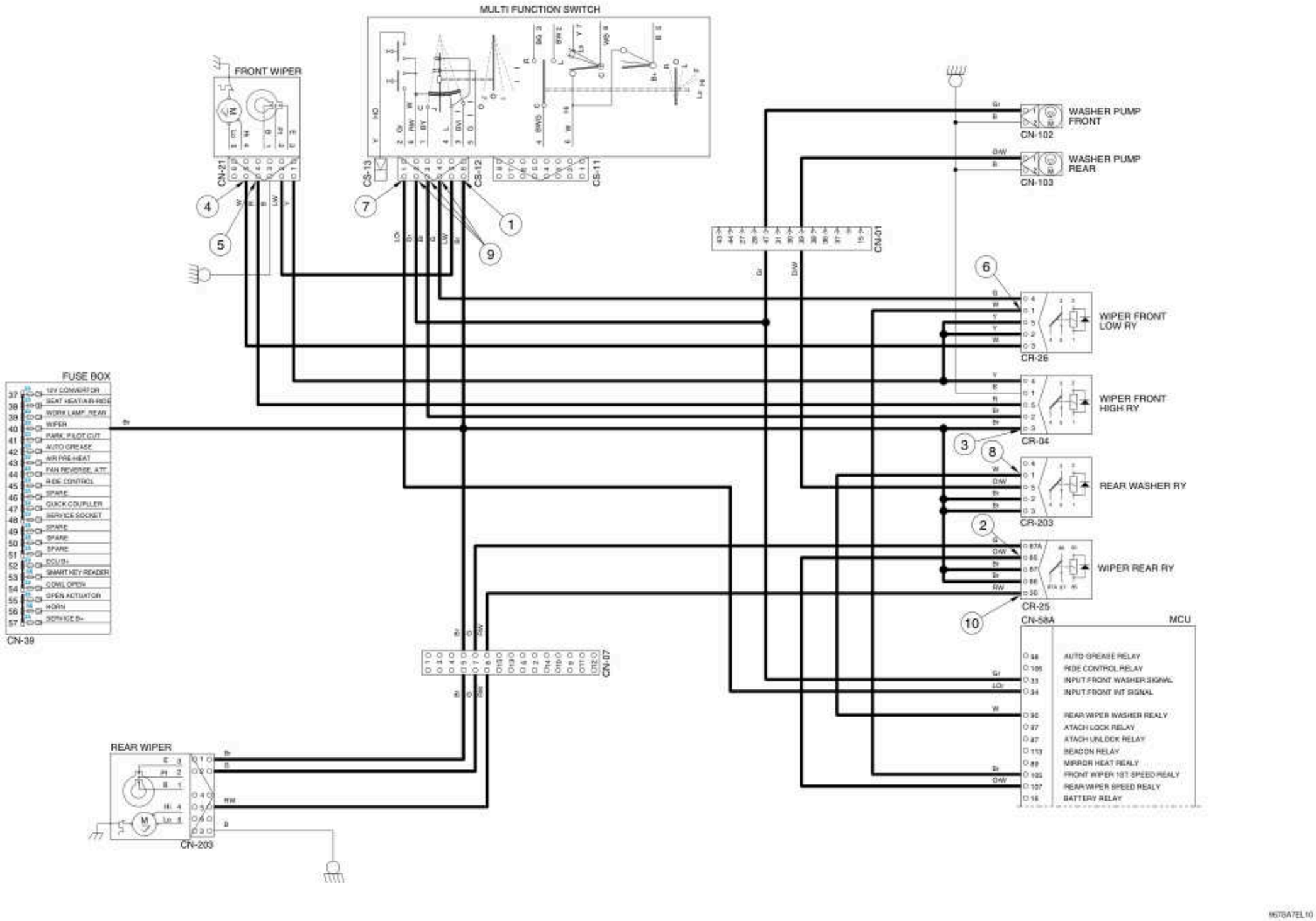
(2) Lubrication for power components



1 From lubricating oil filter
2 Main lubricating oil rifle
3 To camshaft
4 To piston cooling nozzle
5 From main lubricating oil rifle
6 To connecting rod bearing

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WIPER AND WASHER CIRCUIT



※ The circuit diagram may differ from the equipment, so please check before a repair.

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