WHEEL LOADER

SERVICE MANUAL

HL970

HYUNDAI

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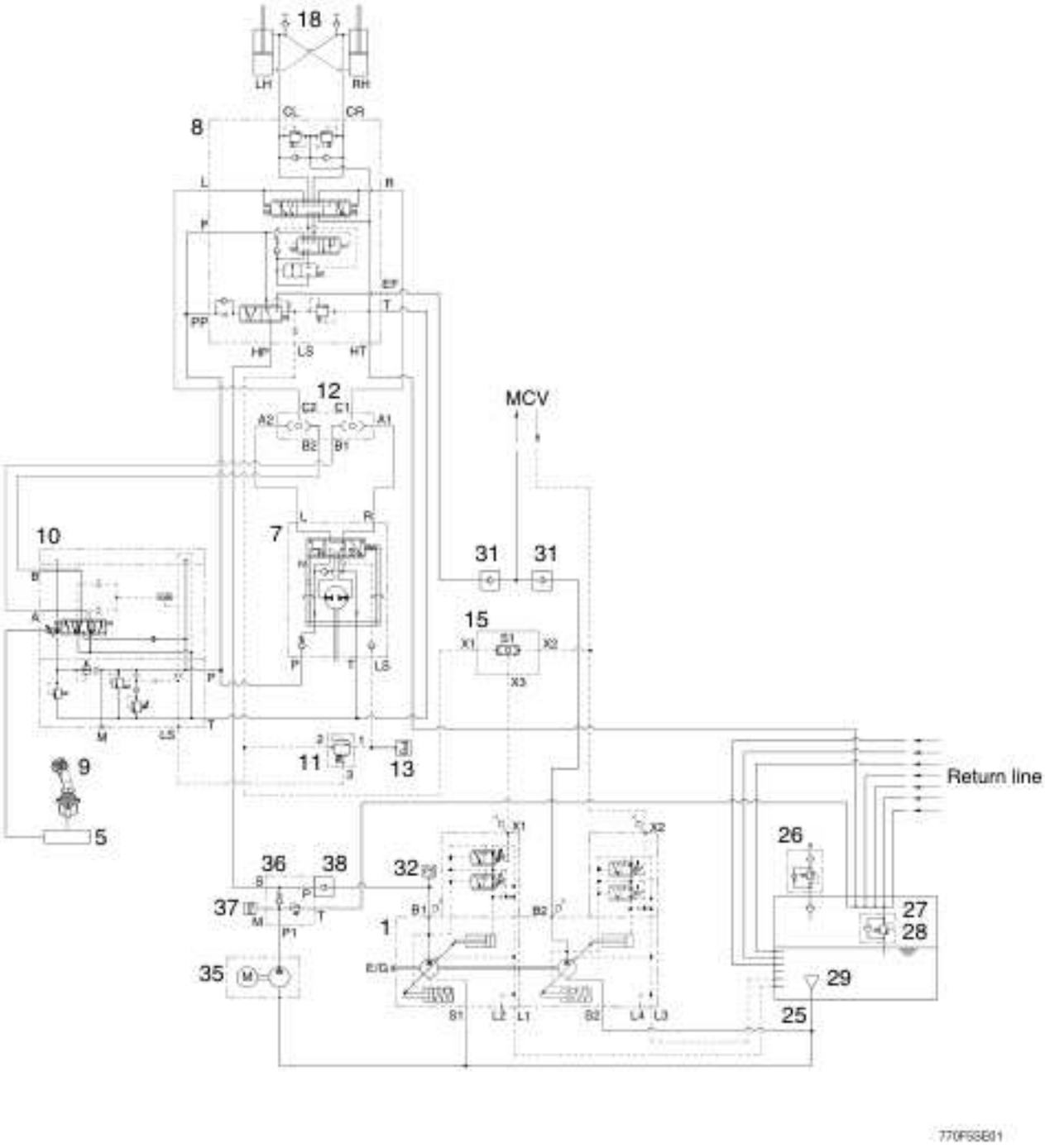
4) TRANSMISSION FAULT CODES

Fault code (Hex)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair
10	Logical error at direction select signal 3rd shift lever TCU detected a wrong signal combination for the direction · Cable from shift lever 3 to TCU is broken · Cable is defective and is contacted to battery voltage or vehicle ground · Shift lever is defective	TCU shifts transmission to neutral if selector active OP mode : Transmission shutdown if selector active	· Check the cables from TCU to shift lever 3 · Check signal combinations of shift lever positions F-N-R · If shift lever is a CAN shift lever check CAN cable/shifter/device ※ Fault is cleared if TCU detects a valid neutral signal for the direction at the shift lever
11	Logical error at gear range signal TCU detected a wrong signal combination for the gear range · Cable from shift lever to TCU is broken · Cable is defective and is contacted to battery voltage or vehicle ground · Shift lever is defective	TCU shifts transmission to neutral OP mode : Transmission shutdown	· Check the cables from TCU to shift lever · Check signal combinations of shift lever positions for gear range ※ Failure cannot be detected in systems with DW2/DW3 shift lever. Fault is taken back if TCU detects a valid signal for the position
12	Logical error at direction select signal TCU detected a wrong signal combination for the direction · Cable from shift lever to TCU is broken · Cable is defective and is contacted to battery voltage or vehicle ground · Shift lever is defective	TCU shifts transmission to neutral OP mode : Transmission shutdown	· Check the cables from TCU to shift lever · Check signal combinations of shift lever positions F-N-R ※ Fault is taken back if TCU detects a valid signal for the direction at the shift lever
13	Logical error at engine derating device TCU detected no reaction of engine while derating device active	After selecting neutral, TCU change to OP mode limp home	· Check engine derating device ※ This fault is reset after power up of TCU
15	Logical error at direction select signal 2 shift lever TCU detected a wrong signal combination for the direction · Cable from shift lever 2 to TCU is broken · Cable is defective and is contacted to battery voltage or vehicle ground · Shift lever is defective	TCU shifts transmission to neutral if selector active OP mode : Transmission shutdown if elector active	· Check the cables from TCU to shift lever 2 · Check signal combinations of shift lever positions F-N-R ※ Fault is taken back if TCU detects a valid neutral signal for the direction at the shift lever
17	S.C. to ground at customer specific function No. 1 (ride control) TCU detected a wrong voltage at the output pin, that looks like a S.C. to vehicle ground · Cable is defective and is contacted to vehicle ground · Customer specific function No. 1 device has an internal defect · Connector pin is contacted to vehicle ground	Customer specific	· Check the cable from TCU to customer specific function No. 1 device · Check the connectors from customer specific function No. 1 to TCU · Check the resistance of customer specific function No. 1 device

※ Some fault codes are not applied to this machine.

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2. HYDRAULIC CIRCUIT



770FSSE01

1	Main pump (steering)	13	Pressure sensor (opt)	31	Check valve
5	Control unit	15	Shuttle valve	32	Pressure sensor
7	Steering unit	18	Steering cylinder	35	Motor pump (option)
8	Flow amplifier	25	Hydraulic tank	36	Check block (option)
9	Joystick steering lever (opt)	26	Air breather	37	Pressure sensor (option)
10	Proportional valve (option)	27	Return filter	38	Check valve (option)
11	LS compensating valve (option)	28	Bypass valve		
12	Shuttle valve (option)	29	Strainer		

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6. LOADER SYSTEM AND PORT RELIEF VALVE PRESSURE TEST

- SPECIFICATION

Oil temperature (40~50°C)

Relief valve	Engine speed	Relief pressure
System (M)	Low	280±5 kg/cm² (3980±70 psi)
Boom raise (U)	Low	340±10 kg/cm² (4840±140 psi)
Boom down (W)	Low	340±10 kg/cm² (4840±140 psi)
Bucket rollback (R)	Low	340±10 kg/cm² (4840±140 psi)
Bucket dump (D)	Low	300±10 kg/cm² (4270±140 psi)

- Gauge and tool

Gauge 0~35 MPa (0~350 bar, 0~5000 psi)

M : System (main) relief valve

R : Bucket rollback relief

D : Bucket dump relief

U : Boom raise relief

W : Boom down relief

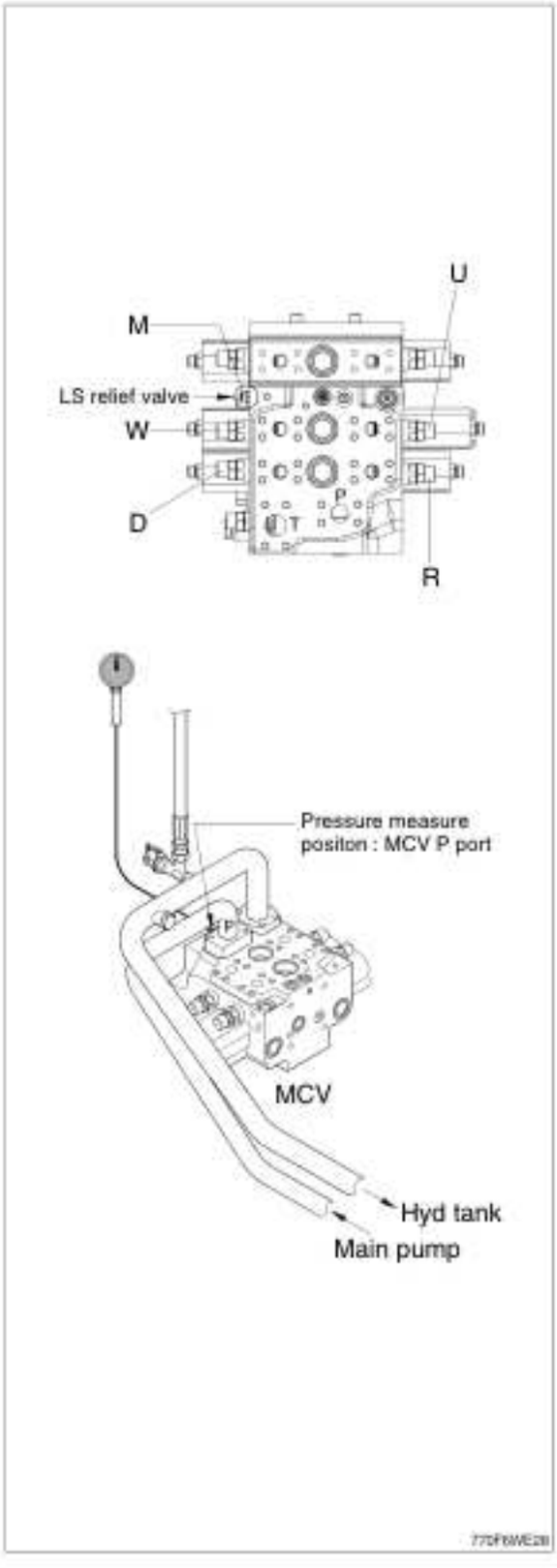
1) Install fitting and pressure gauge to test port in pump delivery line.

2) Install temperature reader.
(see temperature reader installation procedure in this group)

3) Heat hydraulic oil to specifications.
(see hydraulic oil warm up procedure in this group)

4) To check the system relief (M), run engine at low idle. Lower boom to bottomed position.
Slowly activate boom down function while watching pressure gauge. If pressure is not to specification, loosen lock nut on system relief valve (M) and adjust to specification.

※ Do not adjust the system relief valve above 280 kg/cm² (3980 psi). Damage to the pump will result from excessive pressure settings.



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5) DISASSEMBLY AND ASSEMBLY

(1) Spool

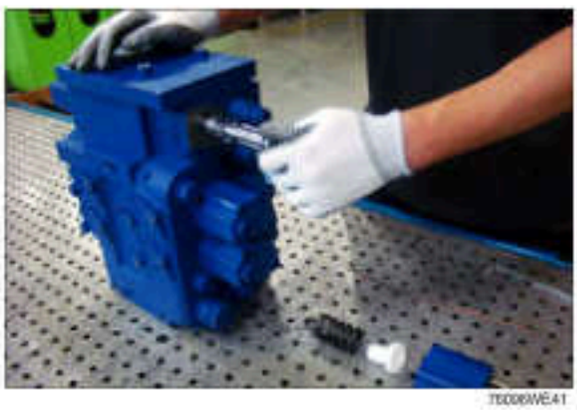
① Loosen the bolt (2EA).

- Tool : Wrench 5 mm
- Tightening torque : 0.85 kgf · m (6.1 lbf · ft)



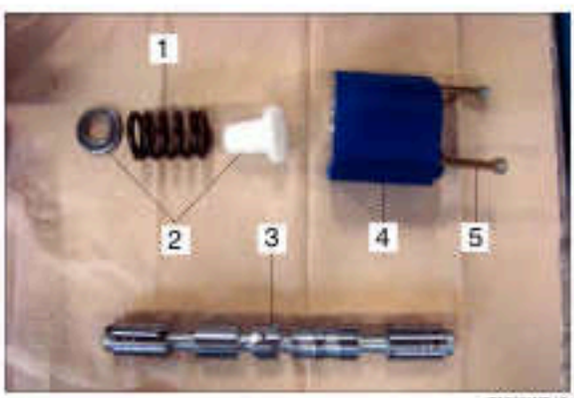
T609KWE40

② Remove the cover, spring retainer, spring and spool.



T609KWE41

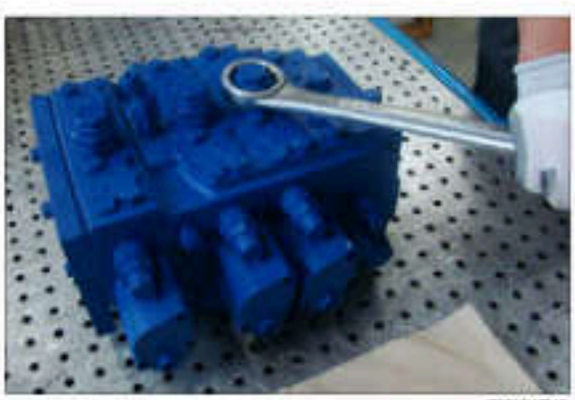
1 Spring
2 Spring ratainer
3 Spool
4 Cover
5 Bolt



T609KWE42

(2) Compensator valve

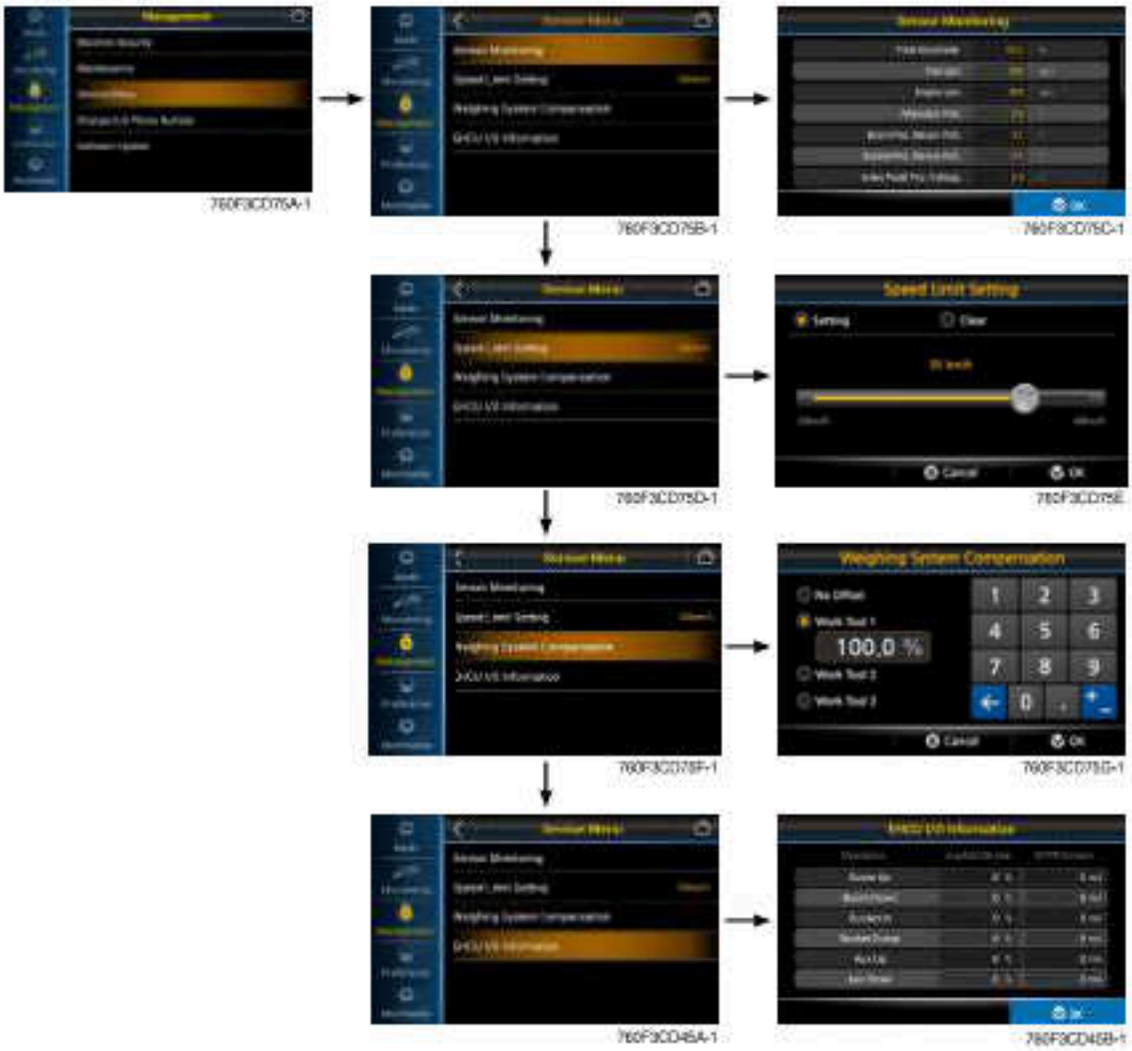
- Tool : Spanner 42 mm



T609KWE43

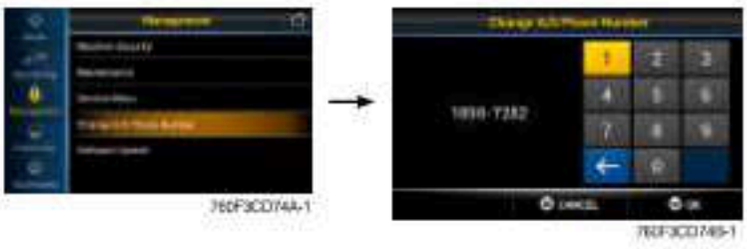
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③ Service menu



- **Sensor monitoring** : Display information of each sensors.
- **Speed limit setting** : 20~40 km/h (5 km/h intervals)
- **Weighing system compensation**
  - Calibration workload depending on work tool.
  - ※ **Only for the service person. Do not adjust arbitrary.**
- **EHCU I/O information**
  - Real time monitoring (joystick stroke, EPPR current).

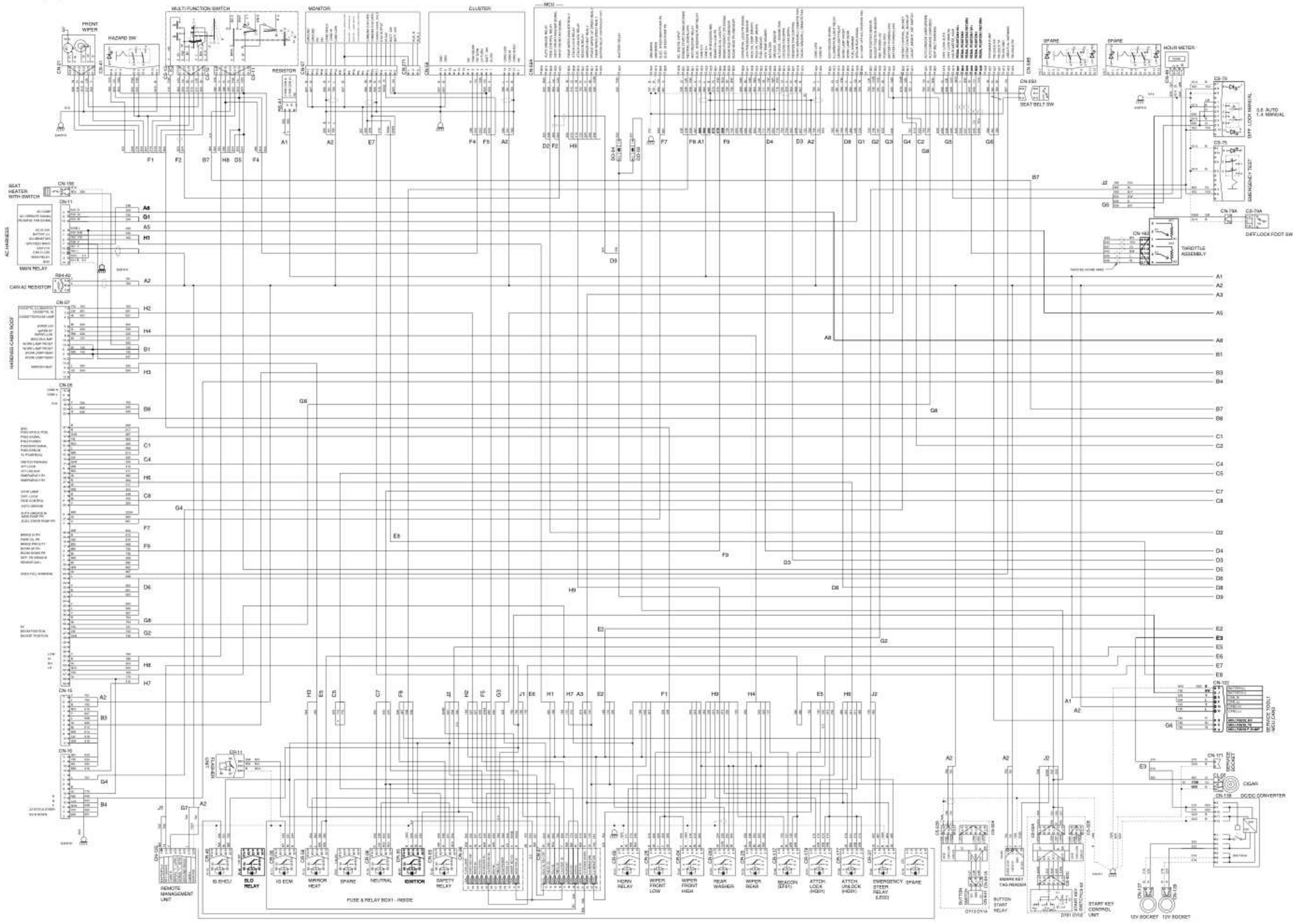
④ Change A/S phone number and software update



- Change A/S phone number : Check and change of contact information for customer service.
- Software update : Update file in USB memory.

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· ELECTRICAL CIRCUIT (1/3, machine serial number : #0248~)



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