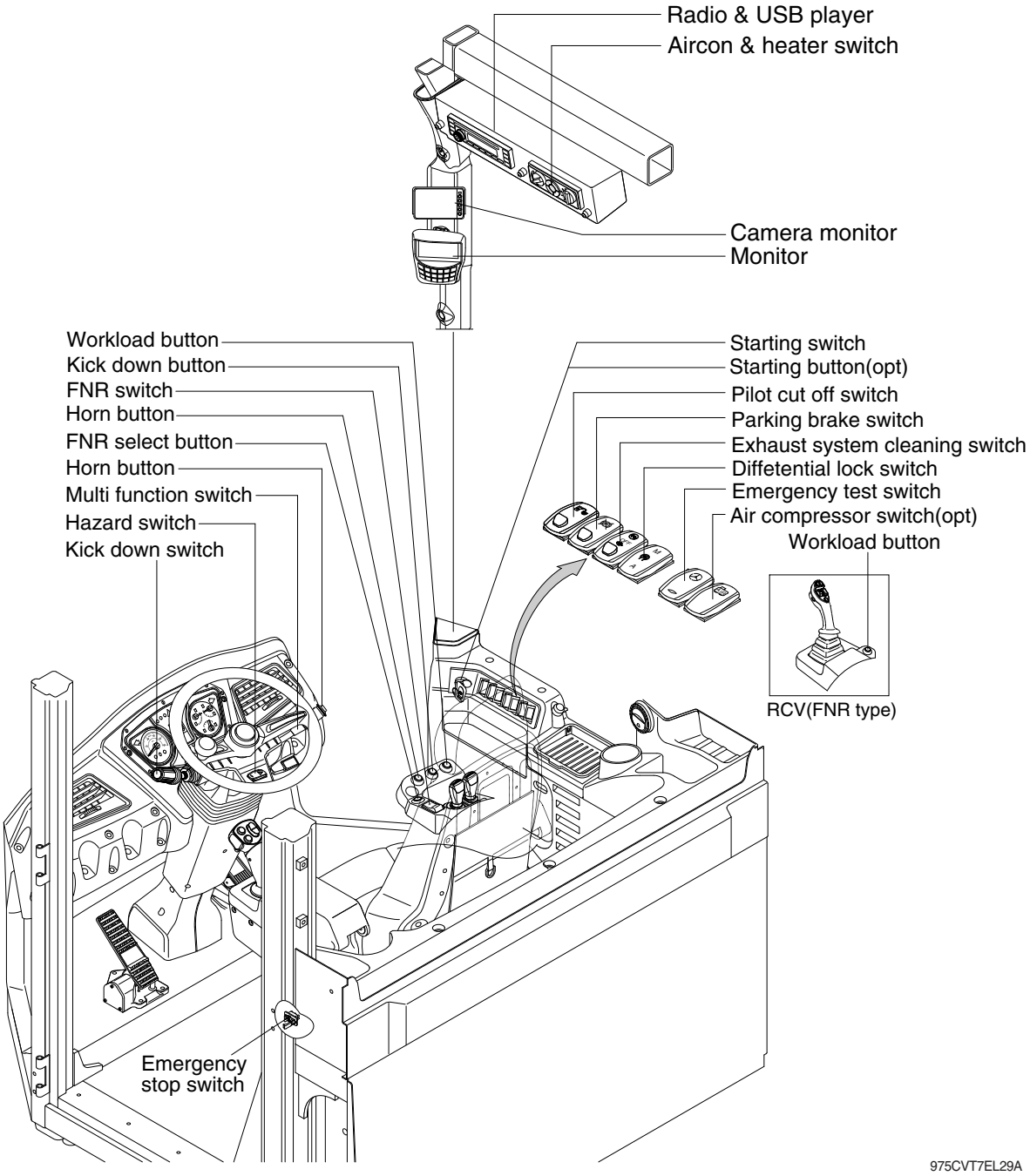
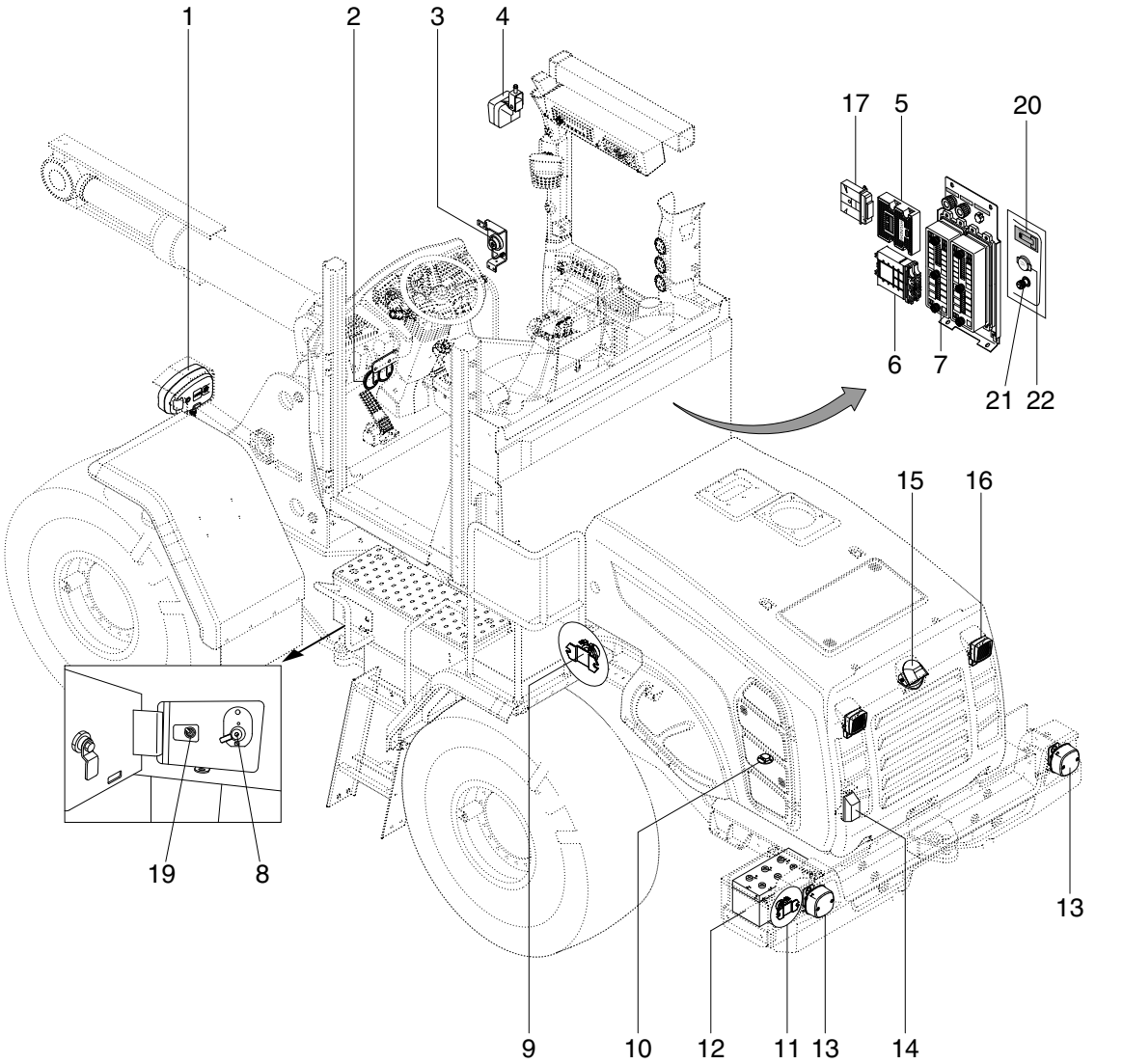
SECTION 7 ELECTRICAL SYSTEM

GROUP 1 COMPONENT LOCATION

1. LOCATION 1

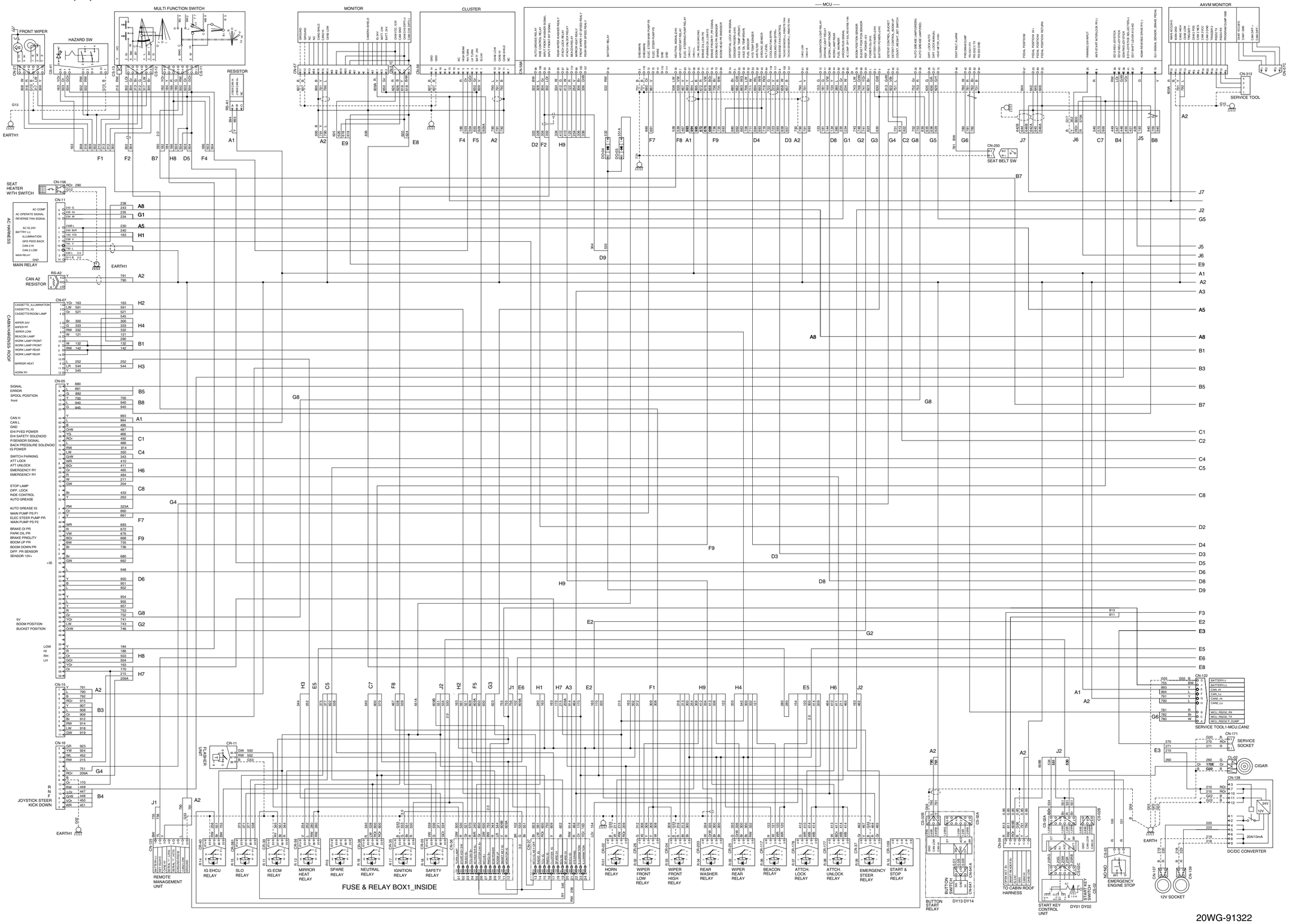


2. LOCATION 2

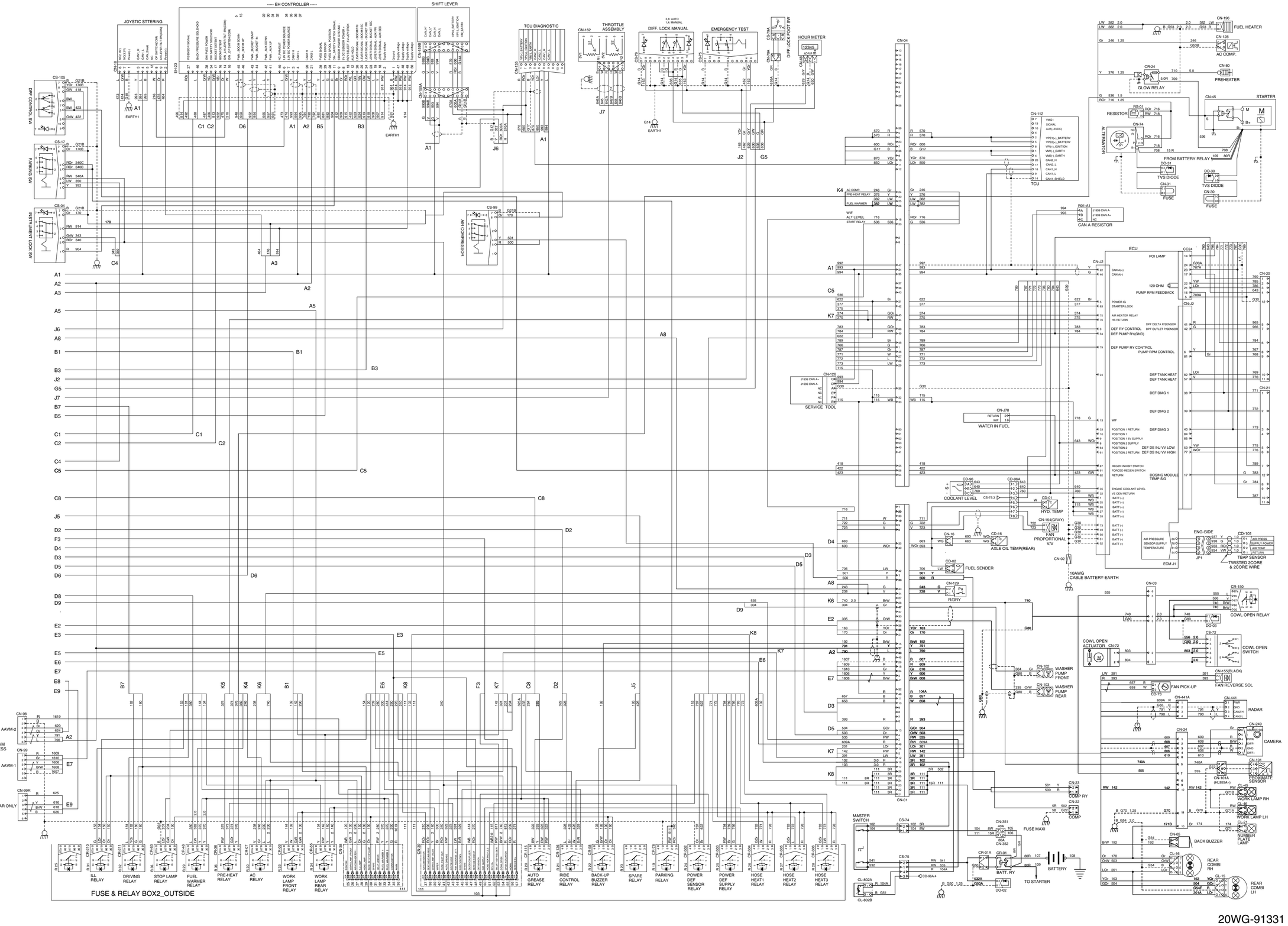


1	Head lamp	9	Start relay	17	Control unit (electro hydraulic & joystick steering)
2	Horn	10	Fuel sender		
3	Angle sensor	11	Battery relay	19	Engine hood open switch
4	Work lamp	12	Battery	20	Service meter
5	Machine control unit (MCU)	13	Rear combi lamp	21	Cigar lighter
6	Transmission control unit (TCU)	14	Number plate lamp	22	12V socket
7	Fuse and relay box	15	Camera (opt)		
8	Master switch	16	Work lamp		

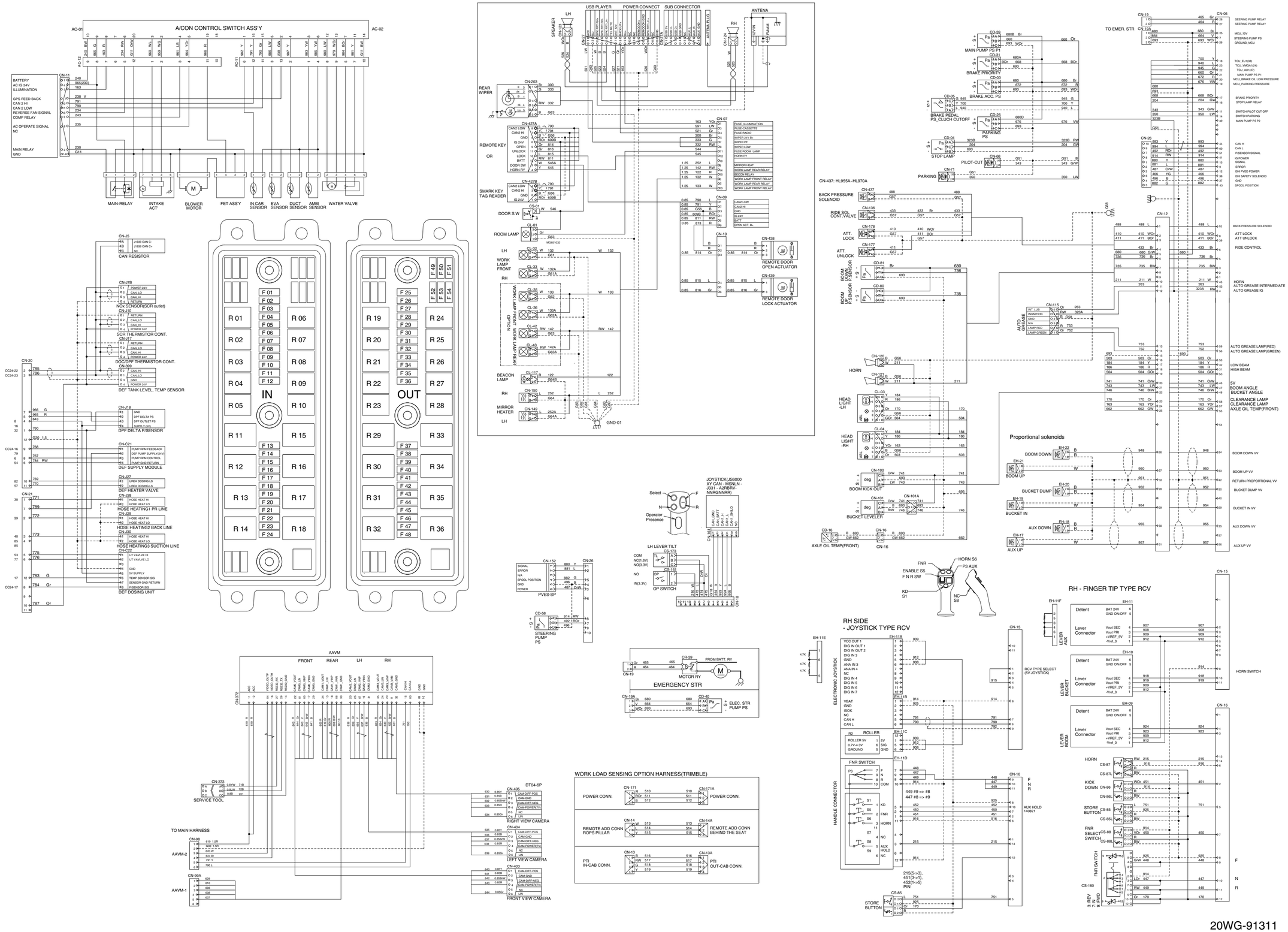
1. ELECTRICAL CIRCUIT (1/3)



· ELECTRICAL CIRCUIT (2/3)



· ELECTRICAL CIRCUIT (3/3)



MEMORANDUM

1. ILLUMINATION CIRCUIT

1) OPERATING FLOW

Main light switch on monitor → Switch ON, Select position lamp → MCU [CN-58A (12)]

→ Illumination relay [CR-210 (87)]

- → Fuse box [CN-37 (23)]
  - → Switch and button indicator lamp
  - → Cigar lighter lamp [CL-02]
  - → I/conn [CN-01 (31)]
    - → I/conn [CN-24 (10)]
      - → Number plate lamp [CL-21 (2)]
      - → RH Combi clearance lamp ON [CL-16 (4)]
  - → I/conn [CN-05 (58)] → LH Head lamp ON [CL-03 (3)]
- → Fuse box [CN-37 (24)]
  - → Switch indicator lamp
  - → Radio & USB player [CL-27 (9)]
  - → I/conn [CN-01 (36)] → LH Combi clearance lamp ON [CL-15 (4)]
  - → I/conn [CN-05 (57)] → RH Head lamp ON [CN-04 (3)]

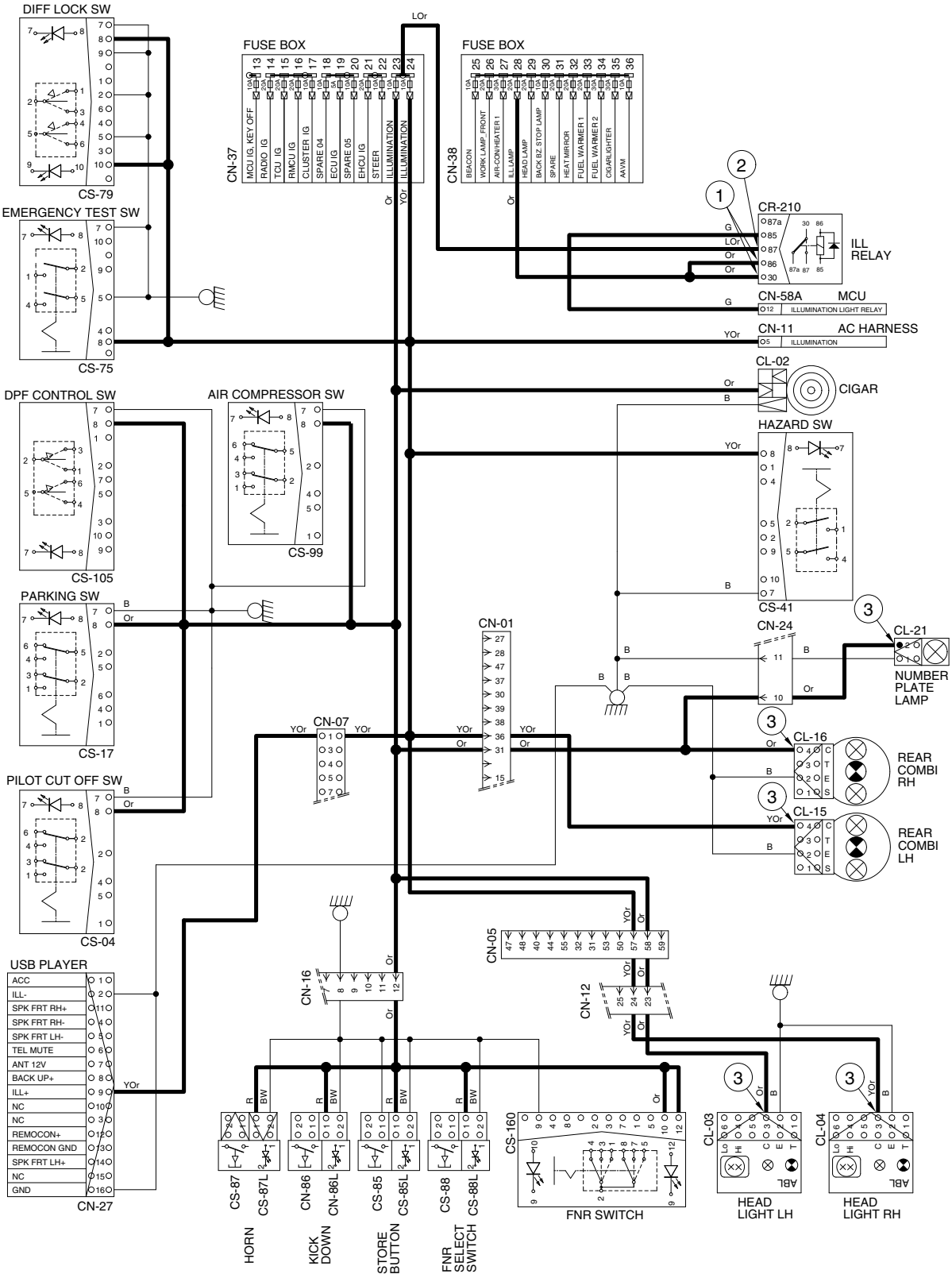
2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (relay input) ② - GND (relay output) ③ - GND (to light)	20~25V

※ GND : Ground

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

ILLUMINATION CIRCUIT



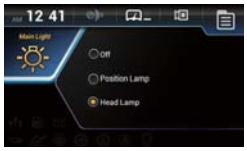
975CVT7EL04

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

2. HEAD LIGHT CIRCUIT

1) OPERATING FLOW

Main light switch on monitor → Switch ON, Select head lamp → MCU [CN-58A (11)]
→ Driving relay [CR-211 (87)] → Multi function switch [CS-11(8)]
→ Multi function switch MIDDLE [CS-11(7)] → I/conn [CN-05 (32)]
→ LH Head light low beam ON [CL-03 (6)]
→ RH Head light low beam ON [CL-04 (6)]
→ Multi function switch DOWN [CS-11(6)] → I/conn [CN-05 (31)]
→ LH Head light high beam ON [CL-03 (4)]
→ RH Head light high beam ON [CL-04 (4)]
→ Cluster high beam pilot lamp ON [CN-56 (5)]



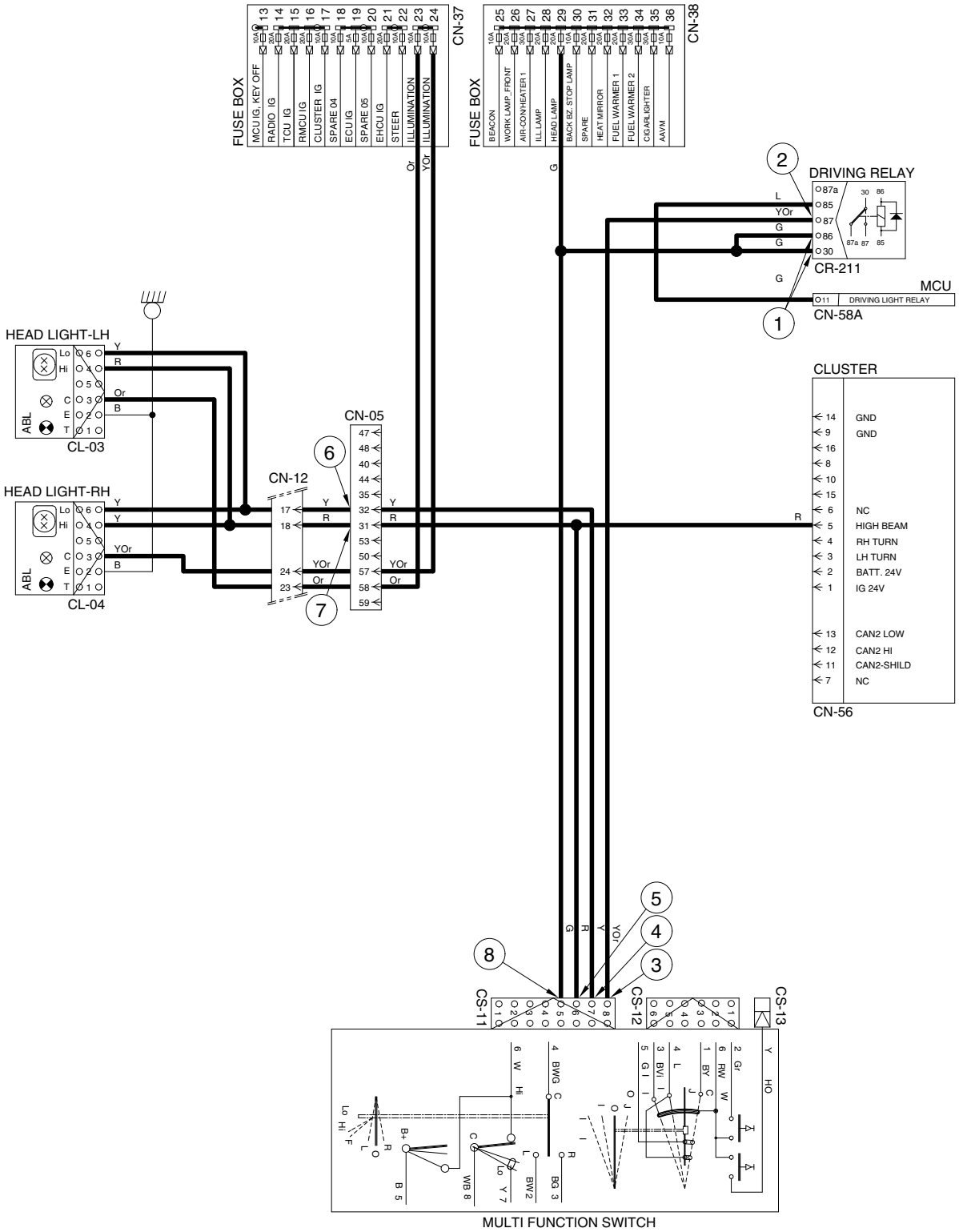
2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (relay input) ② - GND (relay output) ③ - GND (multi function input) ④ - GND (multi function output) ⑤ - GND (multi function output) ⑥ - GND (low beam) ⑦ - GND (high beam) ⑧ - GND (passing B^+)	20~25V

※ GND : Ground

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

HEAD LIGHT CIRCUIT



975CVT7EL05

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

3. WORK LIGHT SWITCH

1) OPERATING FLOW

※ Main light switch on monitor : Select position lamp.

(1) Work lamp switch (select Front)

MCU [CN-58A (88)] → Front work lamp relay [CR-03 (87)] → I/conn [CN-07 (06)]

→ LH Front work lamp ON [CL-32 (1)]

→ RH Front work lamp ON [CL-33 (1)]

(2) Work lamp switch (select Rear)

MCU [CN-58A (44)] → Rear work lamp relay [CR-55 (87)] → I/conn [CN-01 (5)]

→ I/conn [CN-24 (12)] → LH Rear work lamp ON [CL-46 (1)]

→ RH Rear work lamp ON [CL-45 (1)]

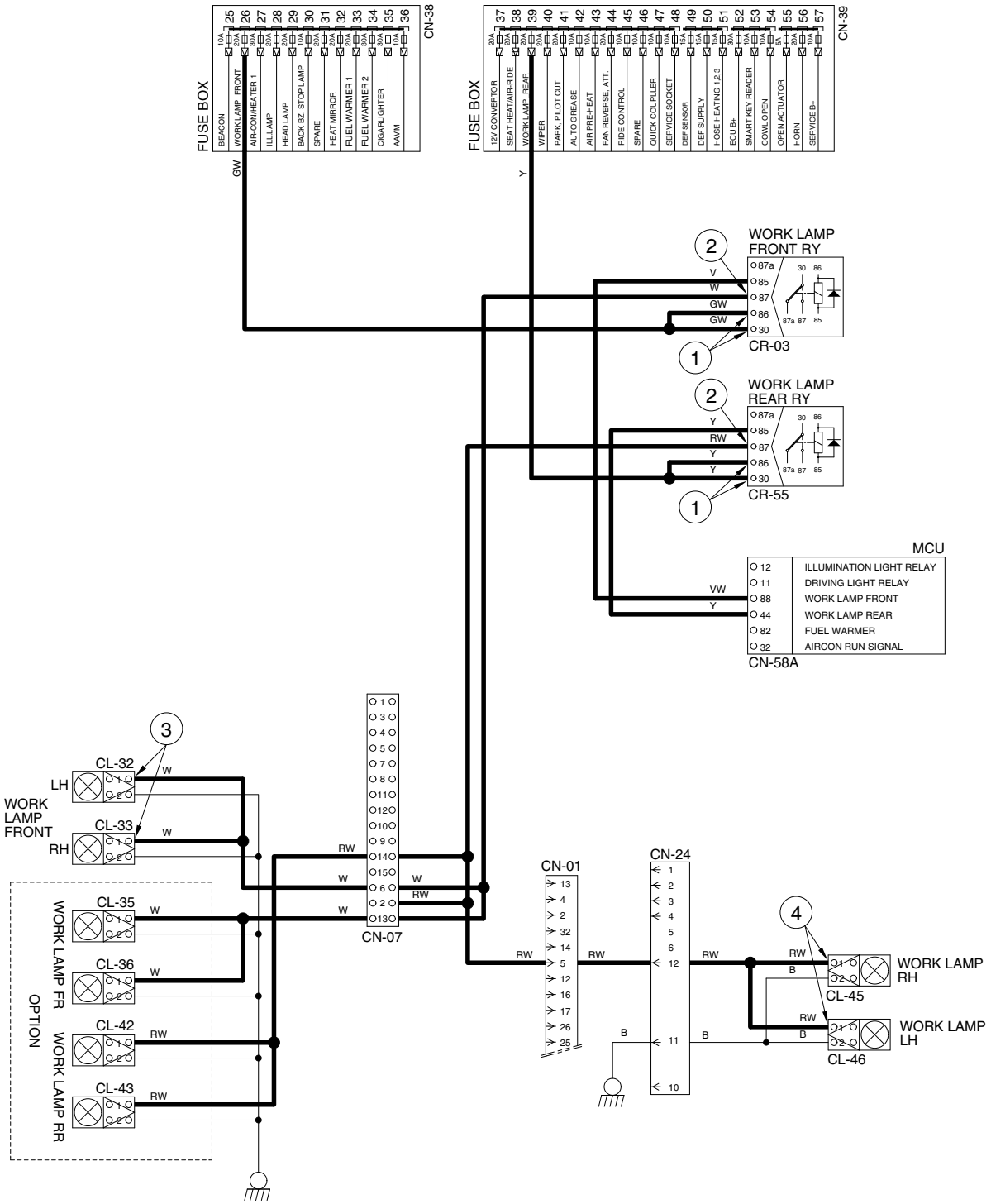
2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (work lamp power input) ② - GND (work lamp power output) ③ - GND (front work lamp) ④ - GND (rear work lamp)	20~25V

※ GND : Ground

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

WORK LIGHT SWITCH



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

4. STARTING CIRCUIT

1) OPERATING FLOW

Battery(+) terminal → Fusible link [CN-351 (40A)] → Master switch [CS-74 (1) → (2)]
→ I/conn [CN-01 (16, 17)] → Fuse box [CN-36] → Start switch [CS-02 (1)]
→ ECM power relay [CR-30 (30)]
→ Power relay [CR-35 (30)]

※ The gear selector lever is neutral position. It is necessary condition before the starting.
The gear selector has an output signal which is activated whenever the shift lever is in the neutral position. This signal can be used to control a relay and prevent engine from starting whenever the shift lever is not in the neutral position.

(1) When start key switch is in ON position

Start switch ON [CS-02 (2, 3)] → I/conn [CN-01(2)] → Master switch [CS-75 (1) → (2)]
→ Battery relay [CR-1]
→ Battery relay operating (All power is supplied with the electric component)
→ ECM power relay [CR-30 (30) → (87)] → Fuse box [CN-37 (19)]
→ I/conn [CN-04 (31)] → ECM [CN-J2 (5)]
→ Fuse box [CN-37 (13)] → MCU [CN-58A (1)]
→ Power relay [CR-35 (30) → (87)] → Fuse box [CN-37 (15)]
→ I/conn [CN-04 (7)] → TCU [CN-112 (8)]

(2) When start key switch is in START position

Start switch START [CS-2 (6)] → Start safety relay [CR-05 (30) → (87)] → I/conn [CN-04 (20)] → Starter (terminal B^+ and M connector of start motor)

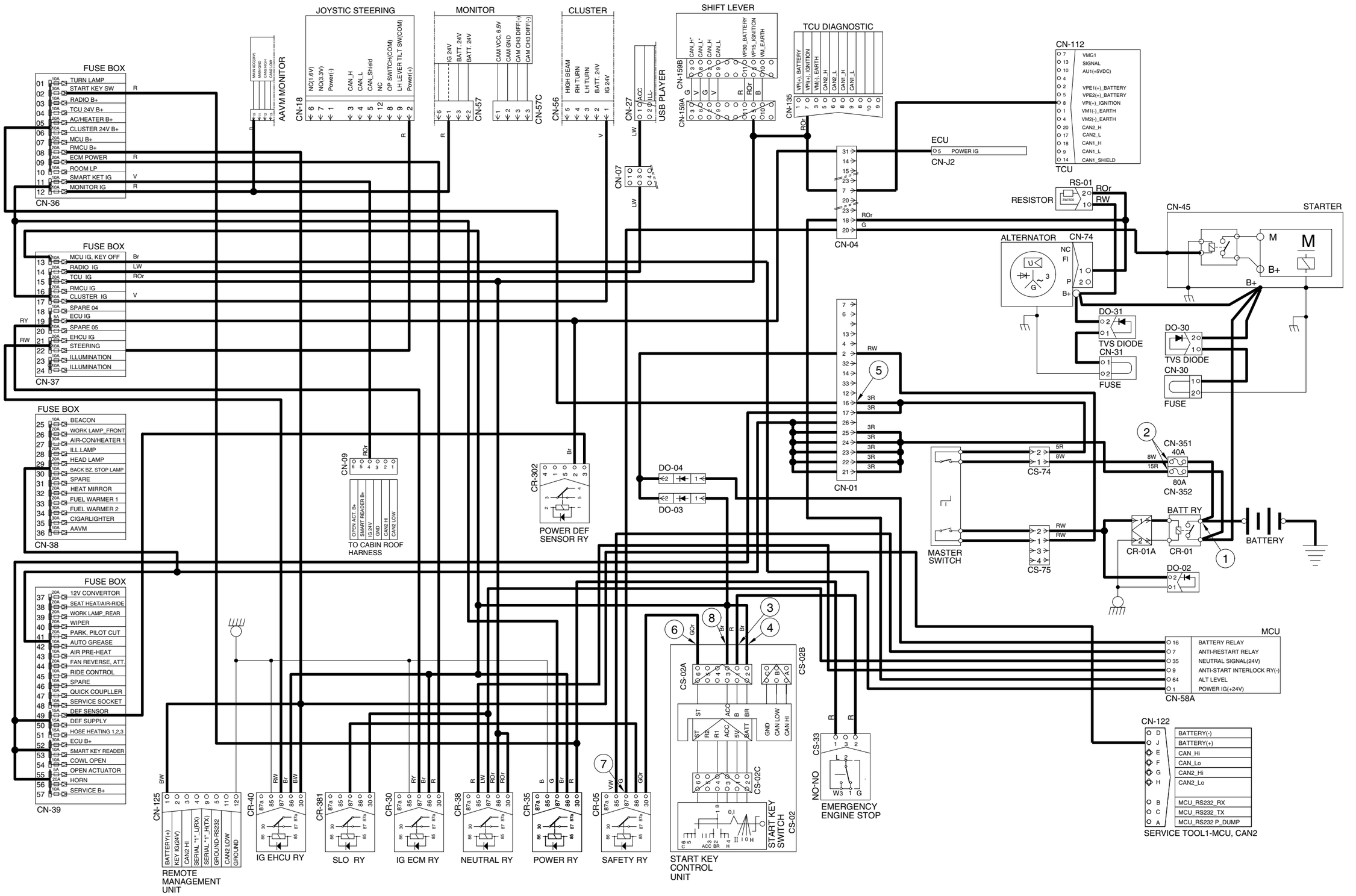
2) CHECK POINT

Engine	Key switch	Check point	Voltage
Running	ON	① - GND (battery B^+) ② - GND (fusible link) ③ - GND (start key B terminal) ④ - GND (start key BR terminal) ⑤ - GND (i/conn CN-01 (16)) ⑥ - GND (start key C terminal) ⑦ - GND (start safety relay output) ⑧ - GND (start key ACC terminal)	20~25 V

※ GND : Ground
※ ECM : Electronic control module
※ MCU : Machine control unit
※ TCU : Transmission control unit

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

STARTING CIRCUIT



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

5. CHARGING CIRCUIT

When the starter is activated and the engine is started, the operator releases the key switch to the ON position.

Charging current generated by operating alternator flows into the battery through the battery relay (CR-01).

The current also flows from alternator to each electrical component and controller through the fuse box.

1) OPERATING FLOW

(1) Warning flow

Altermator [CN-74 (1)] → I/conn [CN-04 (18)] → MCU [CN-58A (64)]
→ Cluster charge warning lamp ON

(2) Charging flow

Alternator → Starter [CN-45 (B^+)] → Battery relay [CR-01]
→ Battery (+) terminal → Charging
→ Fusible link [CN-351 (40A)] → Master switch [CS-74 (1)→(2)] → I/conn [CN-01 (16, 17)]
→ Fuse box [CN-36, 39]
→ Fusible link [CN-352 (80A)] → I/conn [CN-01 (21~26)] → Fuse box [CN-38, 39]

2) CHECK POINT

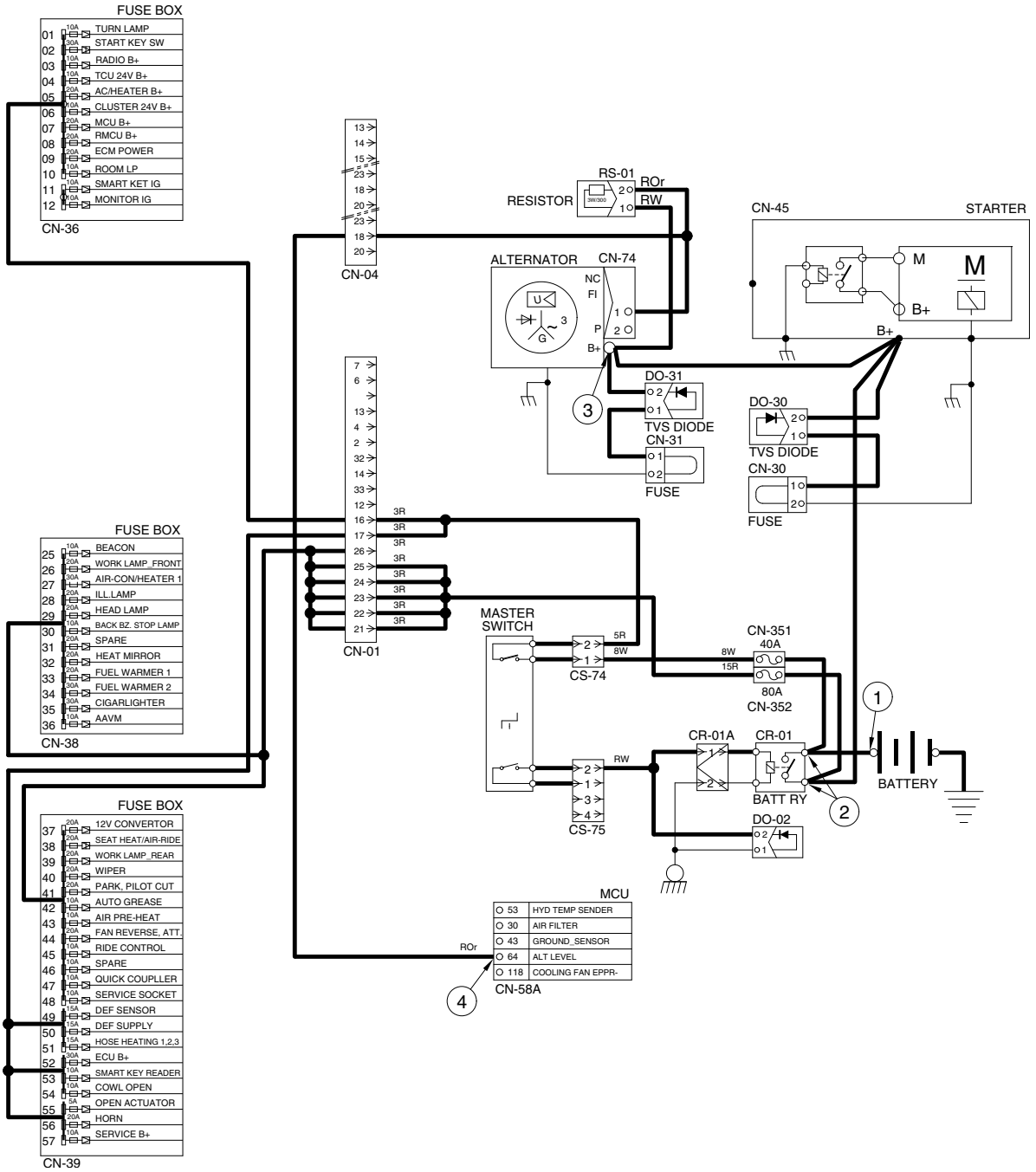
Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (battery) ② - GND (battery relay) ③ - GND (alternator B^+) ④ - GND (MCU)	20~28V

※ GND : Ground

※ MCU : Machine control unit

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

CHARGING CIRCUIT



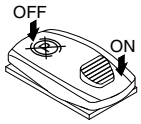
※ The circuit diagram may differ from the equipment, so please check before a repair.

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)]
→ Parking solenoid ON (activated)
→ Parking brake released (by hydraulic pressure)



→ [CS-17 (2)→(1)] → MCU [CN-58A (25)]

(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)] → 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

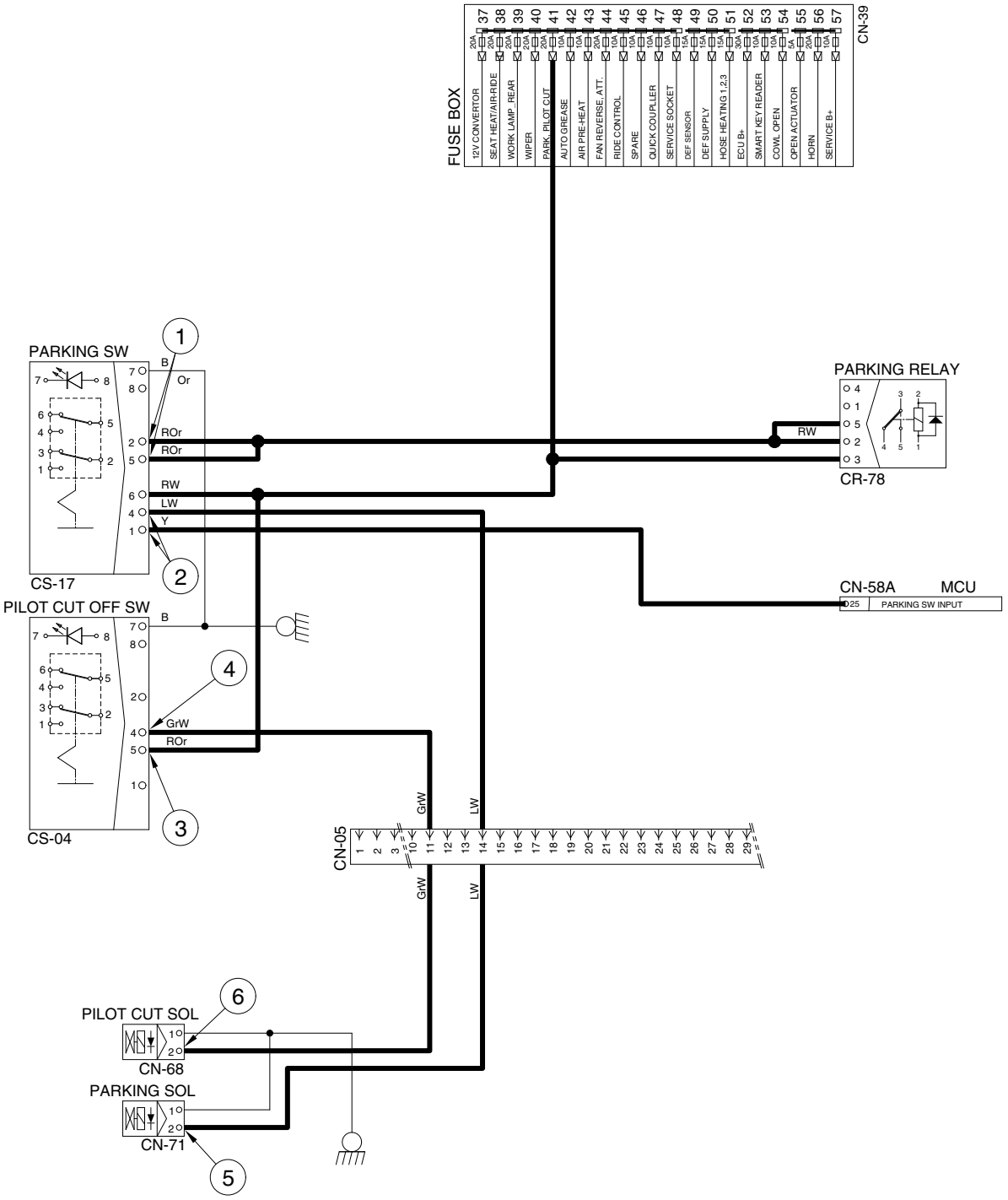
2) CHECK POINT

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.

ELECTRIC PARKING, PILOT CUT OFF CIRCUIT



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

7. WIPER AND WASHER CIRCUIT

1) OPERATING FLOW

Fuse box [CN-39 (40)]
- → Wiper relay Hi [CR-4 (3)→(4)]
  - → Front wiper motor [CN-21 (1)]
  - → Wiper relay Lo [CR-26 (5), (2)]
- → Multi function switch [CS-12 (6)]
- → Rear washer relay [CR-203 (2, 3)]
- → Rear wiper relay [CS-25 (2, 5)]
- → I/conn [CN-07 (5)] → Rear wiper motor [CN-203 (1)]

(1) Front washer switch ON

① Washer switch ON [CS-12(6)→(2)]
- → Front washer [CN-102 (1)] → Washer operating
- → MCU [CN-58A (33) →(105)] → Front wiper relay Lo [CR-26 (5)→(3)] → Front wiper motor [CN-21 (5)] → Wiper motor operating (low)

(2) Front wiper switch ON

① INT position

Wiper switch ON [CS-12 (6)→(1)] → MCU [CN-58A (34)→(105)] → Wiper relay Lo [CR-26 (5)→(3)] → Front wiper motor [CN-21(5)] → Front wiper motor intermittently operating

② Lo position

Wiper switch ON [CS-12 (6)→(4)] → Wiper relay Lo [CR-26 (4)→(3)] → Front wiper motor [CN-21 (5)] → Front wiper motor operating (low)

③ Hi position

Wiper switch ON [CS-12 (6)→(3)] → Wiper relay Hi [CR-4(3)→(5)] → Front wiper motor [CN-21(4)] → Front wiper motor operating (high)

(3) Auto-parking (when switch OFF)

Switch OFF → Fuse box [CN-39 (40)] → Wiper relay Hi [CR-4 (3)→(4)] → Front wiper motor [CN-21 (1)→(2)] → Multi function switch [CS-12 (5)→(4)] → Wiper relay Lo [CR-26 (4)→(3)] → Front wiper motor [CN-21 (5)] → Wiper motor stop

(4) Rear wiper and washer switch

Rear wiper switch on monitor
- → MCU [CN-58A (107)] → Rear wiper relay [CR-25 (5)→(3)] → I/conn [CN-07 (8)] → Rear wiper motor [CN-203 (5)] → Rear wiper motor operating
- → MCU [CN-58A (90)] → Rear washer relay [CR-203 (3)→(5)] → I/conn [CN-01 (39)] → Rear washer pump [CN-103 (1)] → Washer operating

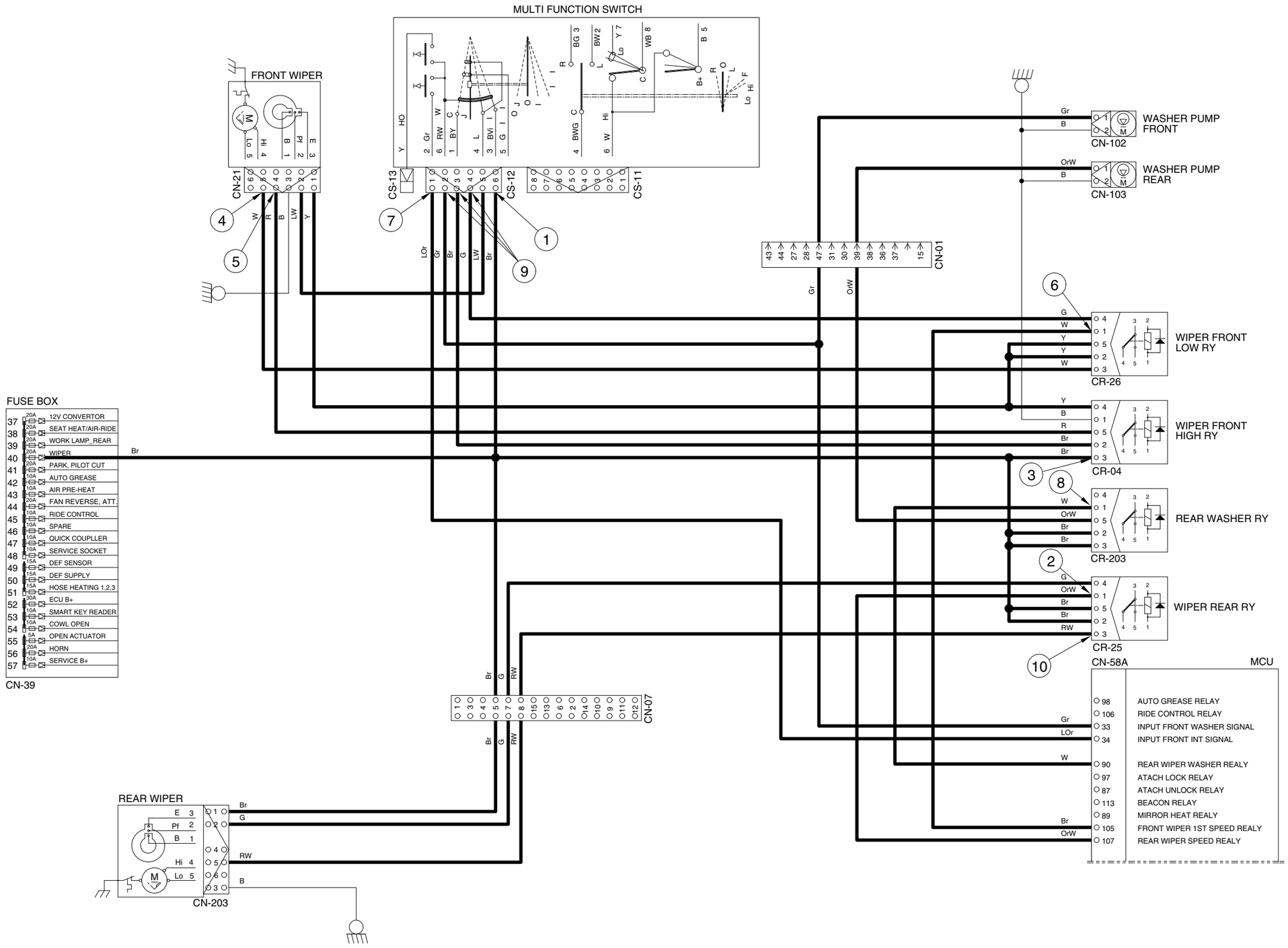
2) CHECK POINT

Condition	Check point	
Engine : Stop Key switch : ON Voltage : 20~25V	① - GND (front wiper switch power input) ② - GND (rear wiper relay power input) ③ - GND (wiper relay power input) ④ - GND (front wiper motor Lo power input) ⑤ - GND (front wiper motor High power input)	⑥ - GND (wiper relay power input) ⑦ - GND (front washer power output) ⑧ - GND (rear washer power output) ⑨ - GND (front wiper motor power output) ⑩ - GND (rear wiper motor power output)

※ GND : Ground

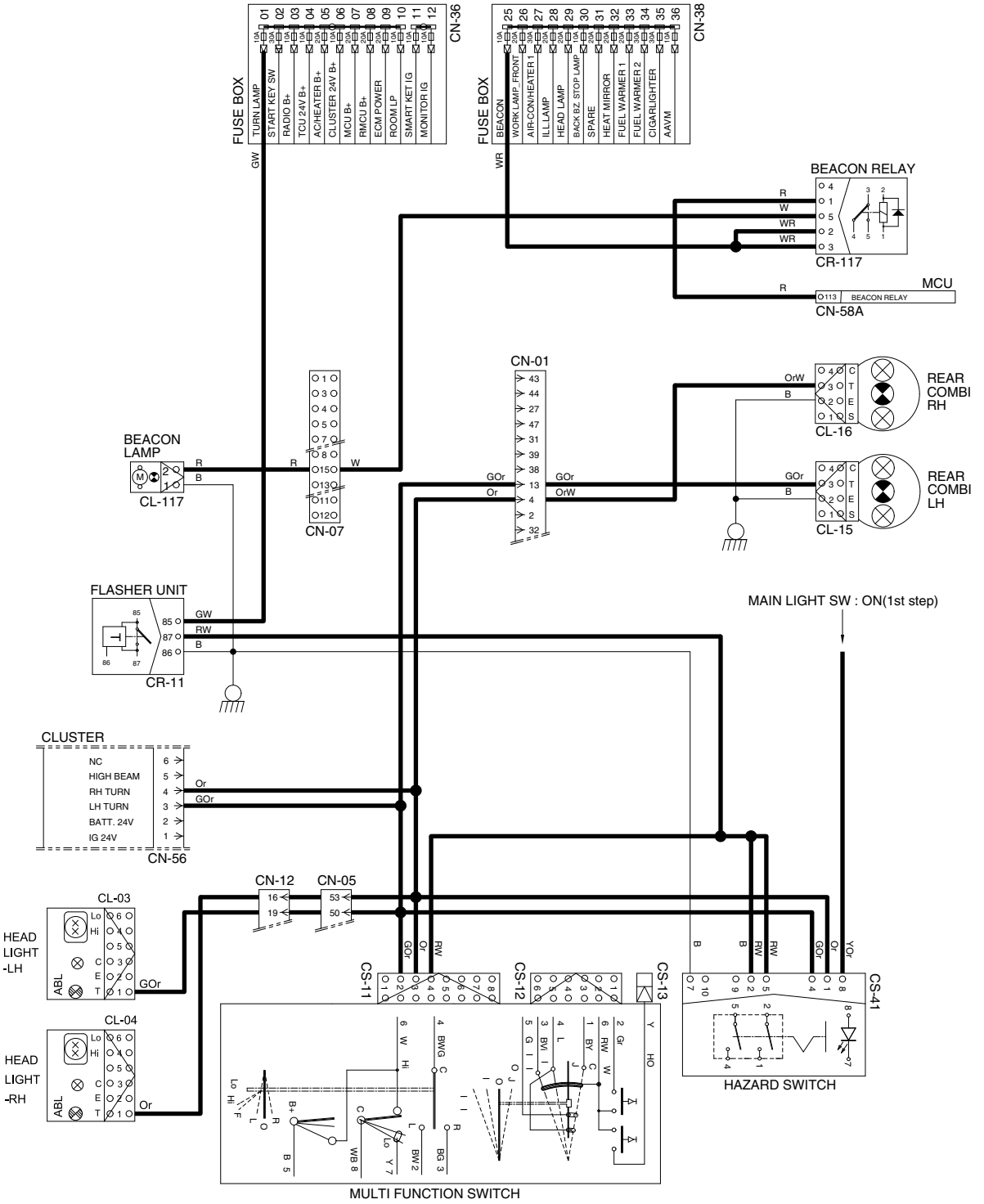
※ The circuit diagram may differ from the equipment, so please check before a repair.

WIPER AND WASHER CIRCUIT



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

HAZARD, TURN AND ROTARY CIRCUIT



975CVT7EL11

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

GROUP 3 MONITORING SYSTEM

1. CLUSTER

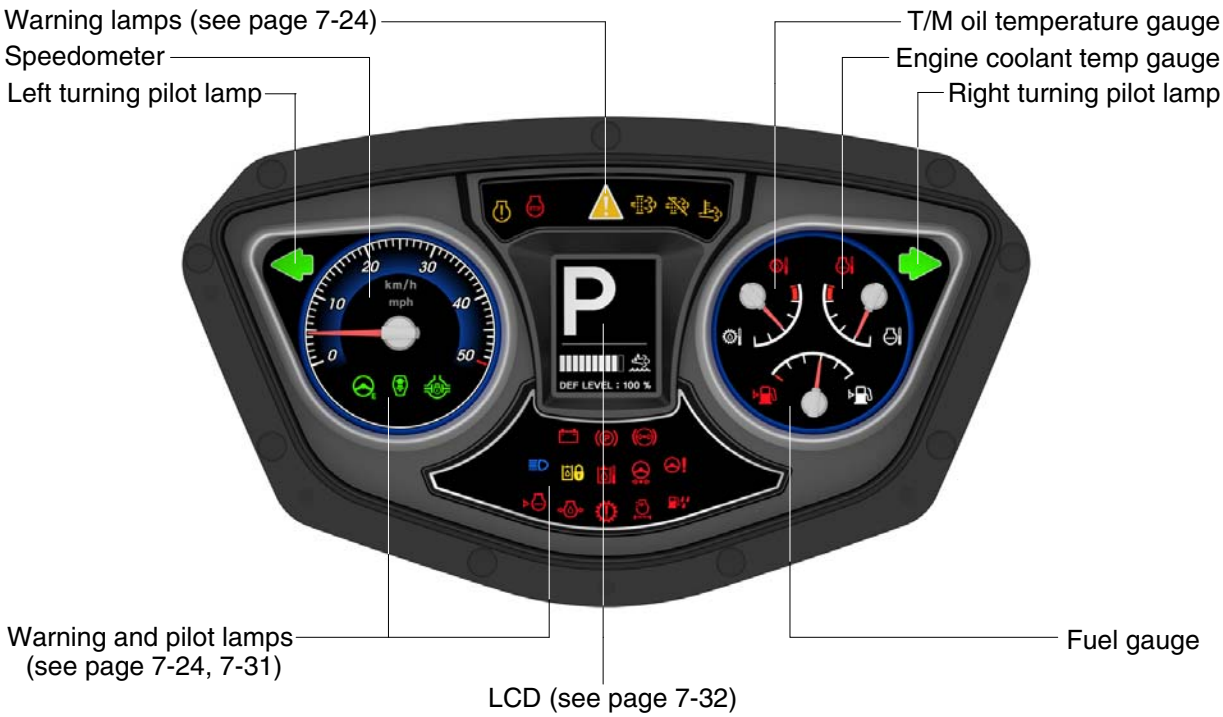
1) STRUCTURE

The cluster consists of gauges, lamps and LCD as shown below, to warn the operator in case of abnormal machine operation or conditions for the appropriate operation and inspection.

- Gauges : Indicate operating status of the machine.
- Warning lamps : Indicate abnormality of the machine.
- Pilot lamps : Indicate operating status of the machine.
- LCD : Indicates selected the driving speed and direction.

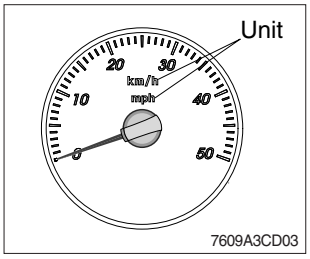
※ **The cluster installed on this machine does not entirely guarantee the condition of the machine. Daily inspection should be performed according to chapter 6, MAINTENANCE.**

※ **When the cluster provides a warning immediately check the problem, and perform the required action.**



2) GAUGE

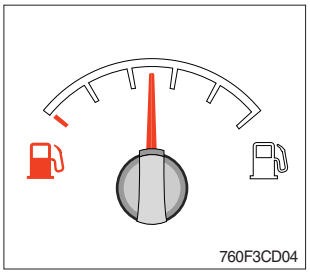
(1) Speedometer



① The speedometer displays the speed of machine in mph and km/h.

※ **The unit (km/h or mph) can be set by the display set up menu of the monitor and selected unit is displayed.**
Refer to page 7-55.

(2) Fuel gauge

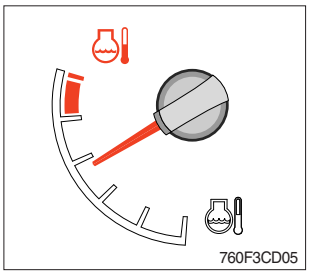


① This gauge indicates the amount of fuel in the fuel tank.

② Fill the fuel when the indicator moves red range or lamp blinks in red, refuel as soon as possible to avoid running out of fuel.

※ If the gauge indicates red range even though the machine is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.

(3) Engine coolant temperature gauge



① This gauge indicates the temperature of coolant.

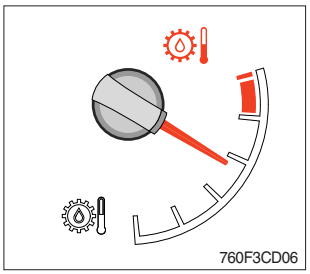
· White range : 40~102˚C (104~215˚F)

· Red range : Above 102˚C (215˚F)

② If the indicator is in the red range or lamp blinks in red, turn OFF the engine and check the radiator and engine.

※ If the gauge indicates red range even though the machine is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.

(4) Transmission oil temperature gauge



① This gauge indicates the temperature of transmission oil.

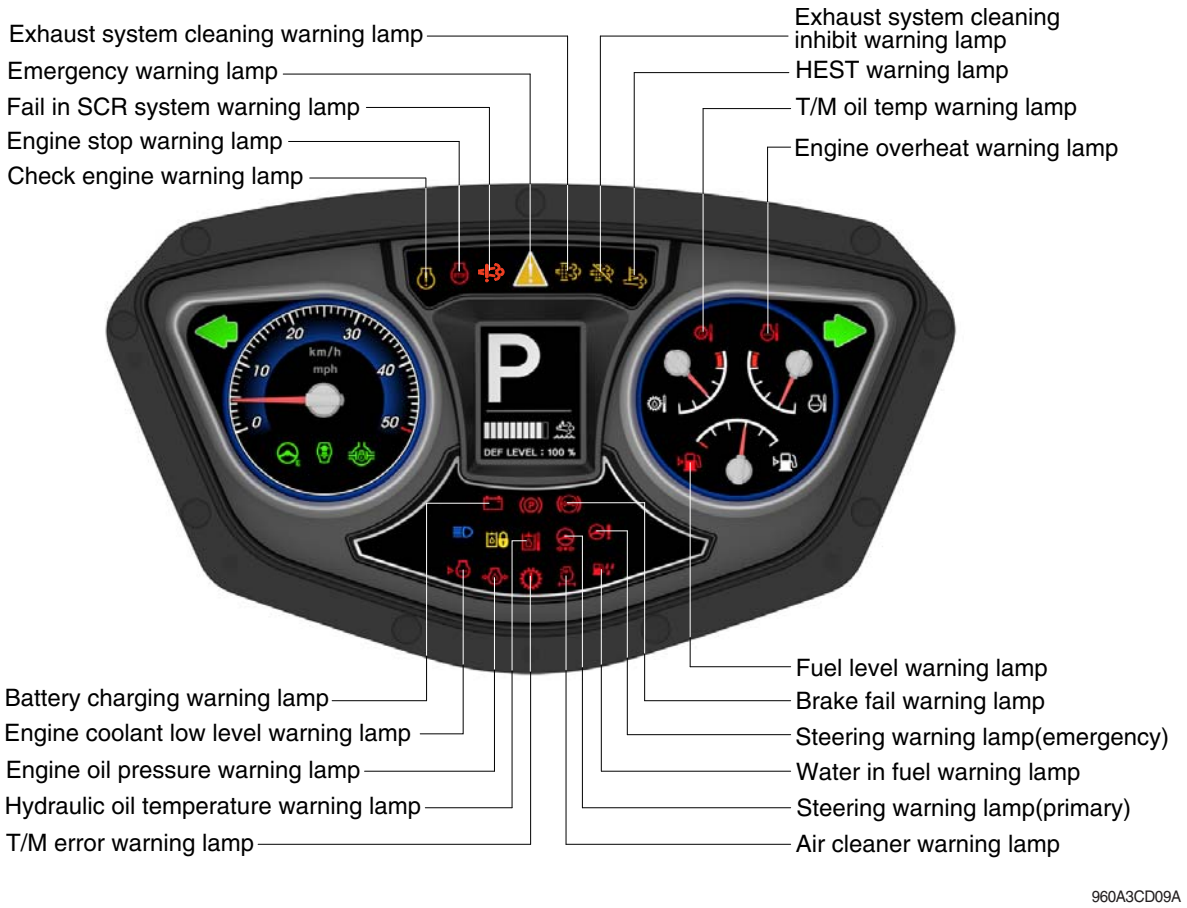
· White range : 40~90˚C (104~194˚F)

· Red range : Above 90˚C (194˚F)

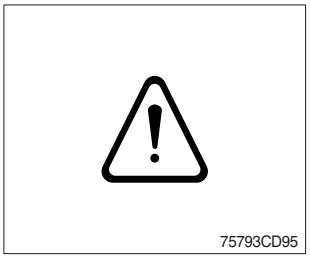
② If the indicator is in the red range or lamp blinks in red, it means the transmission is overheated. Be careful that the indicator does not move into the red range.

※ If the gauge indicates red range even though the machine is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.

3) WARNING LAMPS



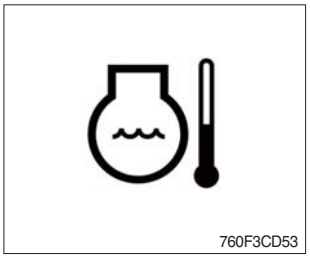
(1) Emergency warning lamp



① This lamp blinks when each of the below warnings is happened.
- Warning lamps light ON
- MCU input voltage abnormal
- Monitor communication data error
- Engine ECM and TCU communication data error

② When this warning lamp blinks, machine must be checked and service immediately.

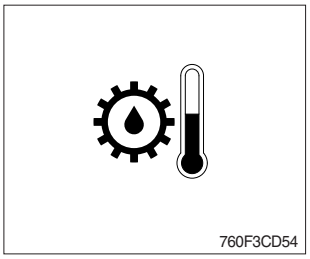
(2) Engine overheat warning lamp



① This lamp is turned ON when the temperature of coolant is over the normal temperature (102˚C, 215˚F).

② Check the cooling system when the lamp is ON.

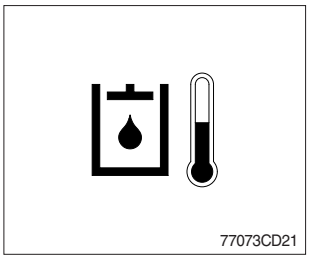
(3) Transmission oil temperature warning lamp



① This lamp is turned ON when the temperature of transmission oil is over the normal temperature (90˚C, 194˚F).

② When this lamp lights up during operation, stop the engine and check the machine.

(4) Hydraulic oil temperature warning lamp



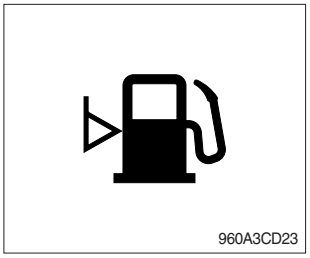
① This warning lamp operates and the buzzer sounds when the temperature of hydraulic oil is over 106˚C (223˚F).

② Check the hydraulic oil level when the lamp is turned ON and the buzzer sounds.

③ Check for debris between oil cooler and radiator.

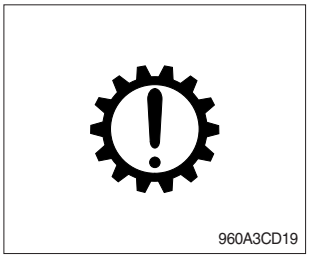
※ **If you want to stop buzzer sound, just touch the icon.**

(5) Fuel level warning lamp



① This warning lamp lights ON when the fuel level is low.
Refuel the machine as soon as possible.

(6) Transmission error warning lamp



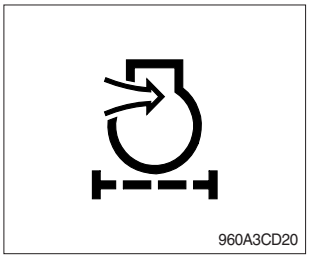
① This lamp lights ON and the LCD display show the error codes when an error occurs in the transmission.

② Immediately pull the machine to a convenient stop. Stop the engine. Investigate the cause.

※ **Consult a HD Hyundai Construction Equipment dealer to investigate the cause.**

※ **Do not operate until the cause has been corrected.**

(7) Air cleaner warning lamp



① This lamp lights ON and the buzzer sounds when the filter of air cleaner is clogged.

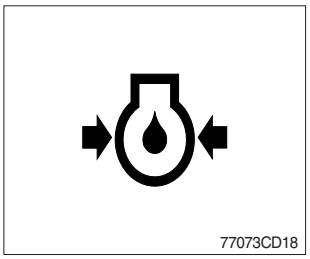
② When the air cleaner warning lamp is ON and the buzzer sounds, check and clean the primary element.

※ **If you want to stop buzzer sound, just touch the icon.**

※ **The primary element should be replaced if the warning lamp is ON after installation of a clean primary element.**

※ **Replace the primary element after 4 times cleanings.**

(8) Engine oil pressure warning lamp

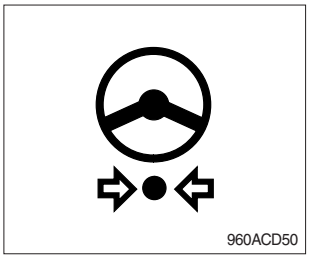


① This lamp is comes ON and the buzzer sounds after starting the engine because of the low engine oil pressure.

② If the lamp comes ON and the buzzer sounds during engine operation, shut OFF engine immediately. Check engine oil level.

※ **If you want to stop buzzer sound, just touch the icon.**

(9) Steering warning lamp

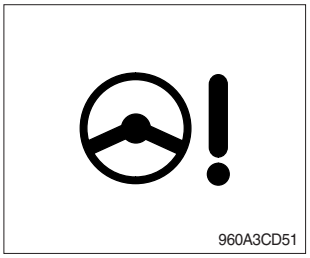


① **Primary**

This lamp indicates that the primary steering has failed. When the indicator comes ON and the action alarm sounds, steer the machine immediately to a convenient location and stop the machine. Stop the engine and investigate the cause.

※ **If you want to stop buzzer sound, just touch the icon.**

※ **Do not operate the machine until the cause has been corrected.**



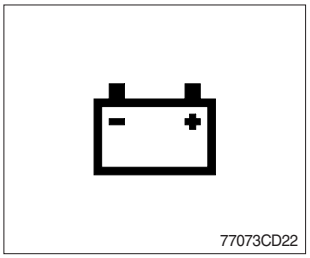
② **Emergency**

This lamp indicates the emergency steering system is active.

※ **Immediately pull the machine to a convenient stop and stop the engine.**

※ **The emergency steering system can be manually tested. Refer to page 7-68.**

(10) Battery charging warning lamp

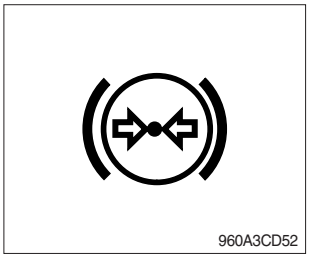


① This lamp is ON and the buzzer sounds when key ON, it is turned OFF after starting the engine.

② Check the battery charging circuit when this lamp comes ON and the buzzer sounds, during engine operation.

※ **If you want to stop buzzer sound, just touch the icon.**

(11) Brake fail warning lamp



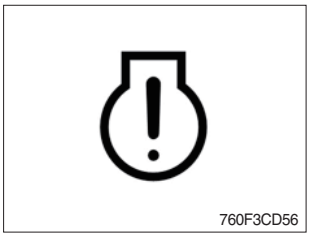
① The lamp lights ON and the buzzer sounds when the oil pressure of service brake drops below the normal range.

② When the lamp is ON and the buzzer sounds, stop the engine and check for its cause.

※ **If you want to stop buzzer sound, just touch the icon.**

※ **Do not operate until any problems are corrected.**

(12) Check engine warning lamp

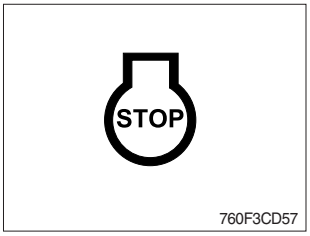


① This lamp lights ON and the buzzer sounds when the communication between MCU and engine ECM on the engine is abnormal, or if the cluster received specific fault code from engine ECM.

② Check the communication line between them.
If the communication line is OK, then check the fault codes on the monitor.

※ If you want to stop buzzer sound, just touch the icon.

(13) Engine stop warning lamp



① This warning lamp pops up and the buzzer sounds when 30 minutes elapsed with empty condition of the DEF/AdBlue® tank, stop the engine immediately and check the DEF/AdBlue® tank.

② Fill the DEF/AdBlue® immediately in the DEF/AdBlue® tank.

※ Refer to page 7-30.

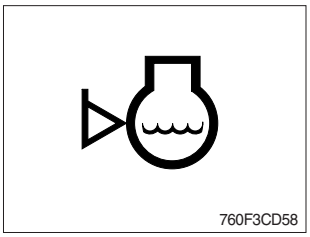
③ This lamp lights ON when the stationary exhaust system cleaning is not performed.

※ Refer to page 7-28.

※ Please contact your HD Hyundai Construction Equipment service center or local dealer.

※ "Engine shutdown" cluster message up when the exhaust gas temperature reaches above 800℃.

(14) Engine coolant low level warning lamp



① This warning lamp lights ON when the level of coolant is low.

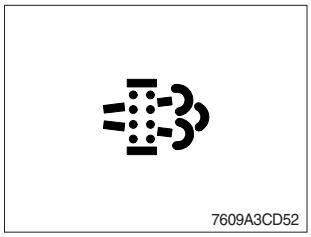
② Fill the coolant immediately when the lamp is ON.

(15) Water in fuel warning lamp

① This warning lamp lights ON when the water separator is full of water or malfunctioning.

※ When this lamp lights ON, stop the machine and spill water out of the separator.

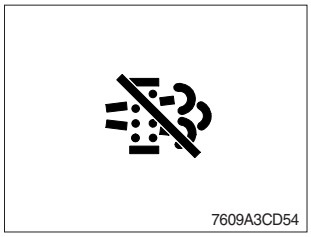
(16) Exhaust system cleaning warning lamp



① This warning lamp lights ON or blinks when the exhaust system cleaning is needed as table below.

Warning lamp			Description
Exhaust	Check engine	Stop engine	
Off	Off	Off	· Automatic exhaust system cleaning
Blink	Off	Off	· The status of a manual (stationary) exhaust system cleaning when the exhaust system cleaning switch has been activated. ※ **Refer to page 7-29.**
On	On	Off	· The aftertreatment exhaust system needs to be cleaned immediately. · Engine power will be reduced automatically if action is not taken. ※ The exhaust system cleaning can be accomplished by : - Changing to more challenging duty cycle. - Performing a manual exhaust system cleaning.
On	On	On	· These lamps will be ON when a stationary (manual) exhaust system cleaning is not performed. · Stop the engine immediatary. · Please contact your HD Hyundai Construction Equipment service center or local dealer.

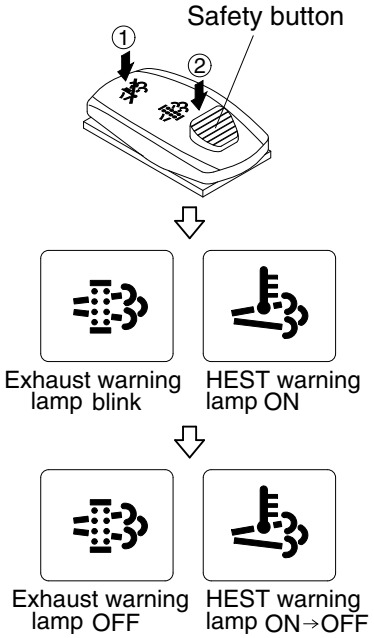
(17) Exhaust system cleaning inhibit warning lamp



① This warning lamp indicates, when illuminated, the exhaust system cleaning switch is pushed inhibit position, therefore automatic and manual exhaust system cleaning can not occur.

※ **Refer to the page 7-69 for the exhaust system cleaning switch.**

※ Manual exhaust system cleaning



※ **Manual exhaust system cleaning applies if the machine is in a fireproof area.**

※ **To stop a manual exhaust system cleaning before it has completed, set to the exhaust system cleaning switch to the inhibit position or turn OFF the engine.**

① Stop and park the machine.

② Pull the safety button and push the switch to position ② to initiate the manual exhaust system cleaning.

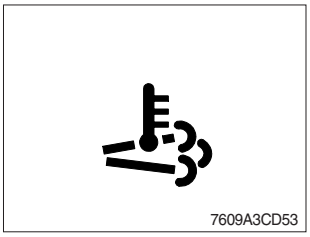
※ **Refer to the page 7-69 for the exhaust system cleaning switch operation.**

※ **The engine speed may increase to 950~1050 rpm and exhaust system cleaning begins and it will take approximately 20~30 minutes.**

③ The exhaust system cleaning warning lamp will blink and HEST warning lamp will light ON during the exhaust system cleaning is operating.

④ The exhaust system cleaning and/or HEST warning lamp will light OFF when the exhaust system cleaning is completed.

(18) HEST (High exhaust system temperature) warning lamp



① This warning lamp indicates, when illuminated, that exhaust temperatures are high due to exhaust system cleaning.

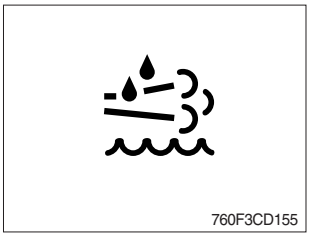
② The lamp will also illuminate during a manual exhaust system cleaning.

③ When this lamp is illuminated, be sure the exhaust pipe outlet is not directed at any surface or material that can melt, burn, or explode.

⚠ **When this lamp is illuminated, the exhaust gas temperature could reach 800˚C [1500˚F], which is hot enough to ignite or melt common materials, and to burn people.**

※ **The lamp does not signify the need for any kind of equipment or engine service; It merely alerts the equipment operator to high exhaust temperatures. It will be common for the lamp to illuminate on and off during normal equipment operation as the engine completes exhaust system cleaning.**

(19) DEF/AdBlue® level warning lamp

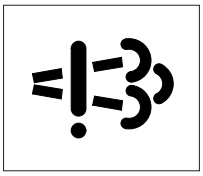


① This warning lamp indicates when ON or blinking, that the DEF/AdBlue® level is low as table below.

※ **It is recommended that the DEF/AdBlue® tank be filled completely full of the DEF/AdBlue® in order to correct any fault conditions.**

Warning lamp				Description
Fail in SCR system	DEF/AdBlue® level	Check engine	Stop engine	
On	On	Off	Off	· The DEF/AdBlue® level has fallen below the initial warning level (10%).
On	On	On	Off	· The DEF/AdBlue® level has fallen below the initial derate level (2.5%). · The engine power will be limited automatically.
On	Blink	On	On	· This is happened when 30 minutes elapsed with empty conditions (0%) of the DEF/AdBlue® tank. · The engine will enter the final derate level which may include low idle lock or engine shutdown with restart limitations. · In order to remove the final derate, the DEF/AdBlue® tank must be filled to above 10 persent gauge reading.

(20) Fail in SCR system warning lamp



① This warning lamp indicates there are faults related to SCR system.

② The lamp lights ON when each of the below warnings is happened.

a. Low DEF/AdBlue® level

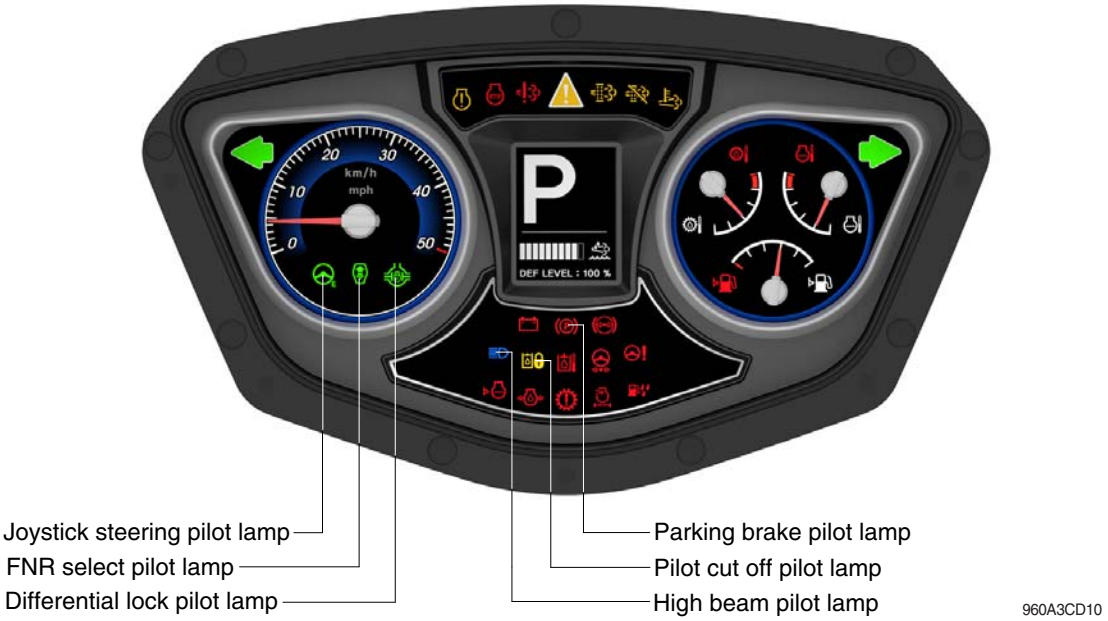
b. Poor quality of DEF/AdBlue®

c. Tempering or malfunction in the aftertreatment system

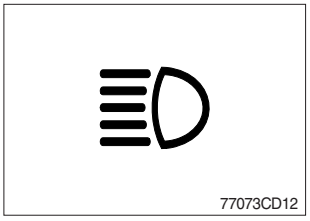
③ Once the lamp lights ON, the engine will derate shortly.

※ **Please contact your HD Hyundai Construction Equipment service center or local dealer.**

4) PILOT LAMPS



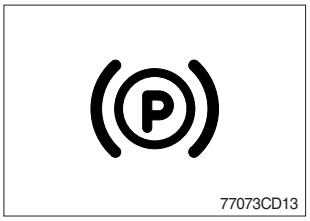
(1) High beam pilot lamp



① This lamp works when the illuminating direction is upward.

② This lamp comes ON when the dimmer switch is operated, e.g., when passing another vehicle.

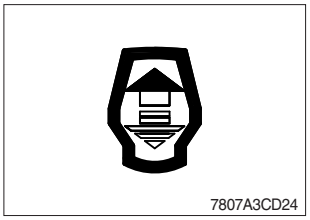
(2) Parking brake pilot lamp



① When the parking brake is actuated, the lamp lights ON.

※ **Check the lamp is OFF before driving.**

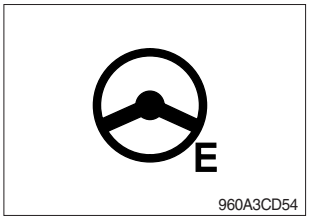
(3) FNR select pilot lamp (option)



① The lamp comes ON when FNR select button on the optional FNR remote control lever is pressed.

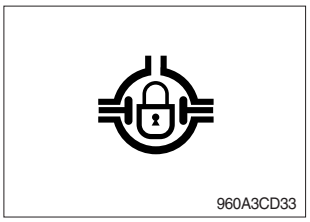
※ **Refer to page 7-70.**

(4) Joystick steering pilot lamp (option)



① This lamp lights ON when joystick steering is activated.
It is then possible to steer the machine and select gears from the armrest to the left of the operator's seat.

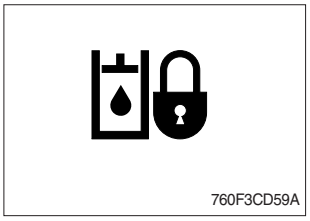
(5) Differential lock pilot lamp (option)



① This lamp lights ON when the differential lock function is operating.

※ **Refer to page 7-68.**

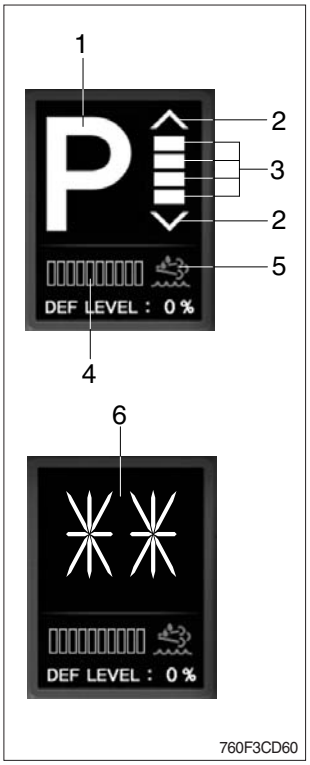
(6) Pilot cut off pilot lamp



① This lamp lights ON when the pilot cut off switch is pressed.

※ **Refer to page 7-68.**

5) LCD



(1) The LCD can be used with the gear selector.
It indicates speed, driving direction, DEF/AdBlue® level and transmission warning.

No	Symbol	Meaning	Remark
1	△, ▽, N	Virtual gear display	Forward, reverse, neutral
	1, 2, 3, 4		Actual gear
	P		Parking brake mode active
2	^, v	Forward, reverse	FWD 1 ~ FWD 4 / REV 1 ~ REV 4
3	≡	Gear range display	
4	▮▮▮▮▮▮▮▮▮▮	DEF/AdBlue® level	Dispaly the amount of liquid in the DEF/AdBlue® tank
5		DEF/AdBlue® level warning lamp	Fill the DEF/AdBlue® when the lamp ON or blinks in red. - ON : DEF/AdBlue® level 5~10% - Blink : DEF/AdBlue® level below 5% ※ If the lamp ON or blinks in red even though the machine is on the normal condition, check the electric device as that can be caused by the poor connection of electricity or sensor.
6	LF, LR	Limp home gear	-
	✳✳	Oil temperature is too low	Warm up transmission (drive is not possible)
	✳	Oil temperature is low	Warm up transmission (limited drive is possible)
	WS	Warning sump temperature	Alternate between WS and actual gear / direction while driving, in neutral only displayed WS if no fault is detected ※ Cool down transmission

2. MONITOR (7 inch touch screen)

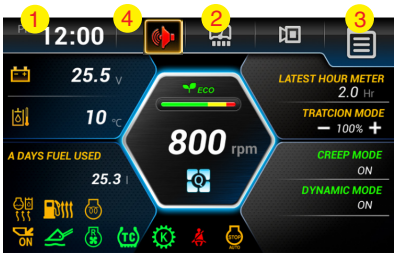
· The monitor is adjustable.
- Vertical : 30˚
- Horizontal : 15˚

1) MAIN DISPLAY

※ You can select or set the menu by the switches or touch screen.
※ Please refer to switch, page 7-62 for selection and change of menu and input value.
※ Display type can be changed by operator. See page 7-56 for details.

1	Clock	6	Machine monitoring	11	Engine rpm
2	Buzzer	7	Fuel rate	12	Quick menu
3	Wiper speed	8	Traction mode/Operation history	13	10 lamps
4	Camera screen	9	Driving modes		
5	Menu	10	ECO gauge		

(1) Menu bar



975CVT3CD07

※ In main display, you can move to right side menu by touching each icon.

① **Clock setting**

Set the time (hour, minute and AM or PM)

② **Wiper speed**

Set the wiper speed (slow, normal, fast and very fast)

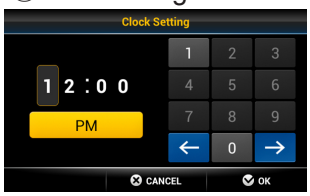
③ **Menu**

Move to main menu.

④ **Buzzer stop**

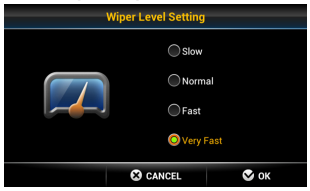
If you want to stop buzzer sound, just touch the icon.

① Clock setting



760F3CD07A-1

② Wiper speed

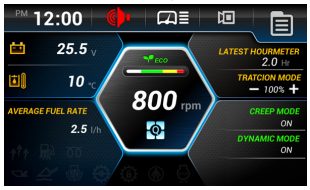


760F3CD07B-1

③ Menu

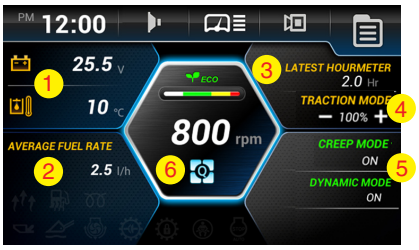
975CVT3CD07C

④ Buzzer stop



760F3CD07E-1

(2) Change display information



975CVT3CD08

※ In main display, you can check the data and setup what you want by touching each window area or icon.

① **Machine monitoring**

To display the item in main display, select two items of them.

※ **Priority in the machine monitoring display**

The priority of the weighing system is the highest.

If the weighing system is selected, the other items are not available.

To display the other items, the weighing system should not be selected.

※ **Weighing system : see page 7-42.**

① Machine monitoring

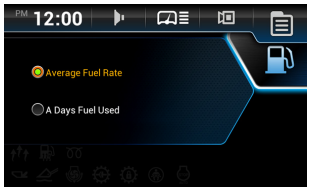
960A3CD08A

② Fuel rate

· Set average fuel rate or a days fuel used on main display screen.

· Refer to page 7-49.

② Fuel rate



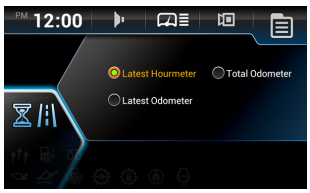
760F3CD08B-1

③ Operation history

· Set Hour meter / ODO meter.

· Refer to page 7-48.

③ Operation history



760F3CD08K-1

④ Traction mode

· Choose demanded traction by pushing either '+' or '-' in main display on monitor.

⑤ Creep mode / Dynamic mode

· Set creep and dynamic mode (ON / OFF)

· Refer to page 7-40 and 7-41.

⑥ Quick menu

960A3CD08F

※ Move the quick menu screen by touching .

ⓐ **User switching**

- When multiple users share a machine, it allows users to switch user settings of machine.
- User can apply or save the setting of monitor easily.

ⓑ **Active fault**

- Display the fault code of MCU/ECU/TCU/EHCU.
- Refer to page 7-48.

ⓒ **Maintenance**

- Elapsed time, change or replace cycle can be changed.
- Refer to page 7-52.

ⓓ **Help**

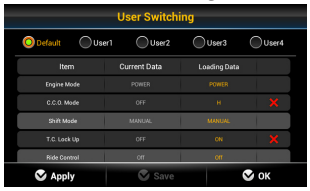
- Read the monitor manual as a PDF file on the monitor.

※ **Smart terminal**

- The menu features a smartphone and operates the miracast.

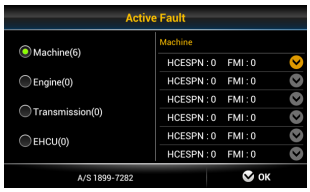
⚠ **Operation of screen mirroring can be dangerous while driving.**
Driver is responsible for accident or other damages.
Operate the screen mirroring while stopping for safety.

ⓐ User switching



760F3CD08H-1

ⓑ Active fault

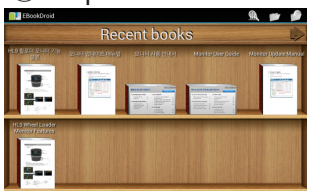


760F3CD16-1

ⓒ Maintenance

960A3CD08J

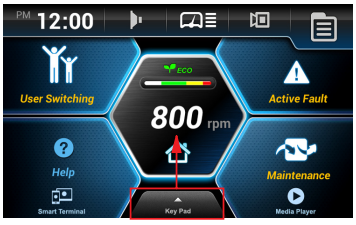
ⓓ Help



960A3CD08

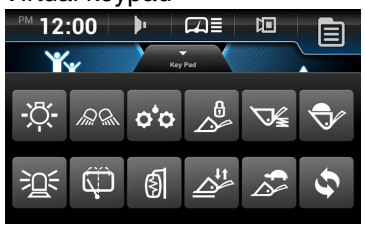
ⓔ **Virtual keypad**

To display the virtual keypad, drag the button ( ) to top of the screen.



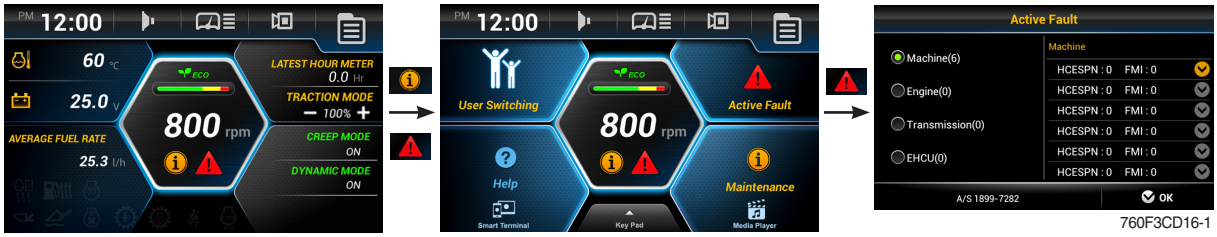
760F3CD68A-1

ⓔ Virtual keypad



760F3CD68B-1

(3) Fault and maintenance warning



975CVT3CD14 960A3CD15 760F3CD16-1

① If you touch the warning sign (red icon), move to the quick menu.

② You can check the fault message and move the maintenance screen by touching relevant area.

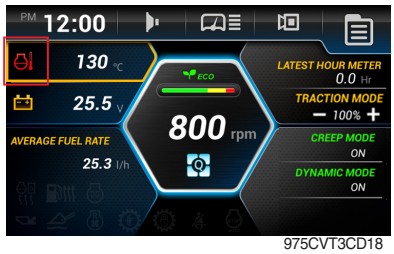
960A3CD08J

(4) Machine monitoring warning

① Warning sign (red icon) will be shown when the temperature of hydraulic oil, cooling water, transmission oil or battery voltage is not normal state.

② Case of warning sign

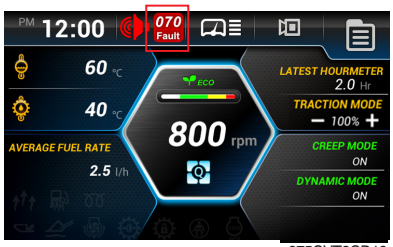
Icon	Description
	Above 106˚C of hydraulic oil temperature
	Above 102˚C of cooling water temperature
	Above 90˚C of transmission oil temperature
	Below 24.5 voltage of battery (for 3 minutes)
	Above 100˚C of axle oil temperature (option)



975CVT3CD18

(5) Communication error

① MCU could not communicate with monitor over 10 seconds, error message will be show on the screen.



975CVT3CD19

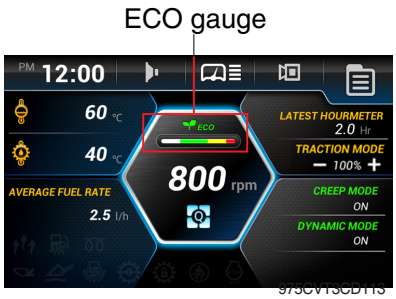
(6) Eco gauge

① This gauge indicates the fuel consumption rate and machine load status. So that operators can be careful with fuel economy.

② The fuel consumption rate or machine load is high, the segment is increased.

③ The color of Eco gauge indicates operation status.

- White : Idle operation
- Green : Economy operation
- Yellow : Non-economy operation at a medium level.
- Red : Non-economy operation at a high level.



2) MAIN AND SUB MENU

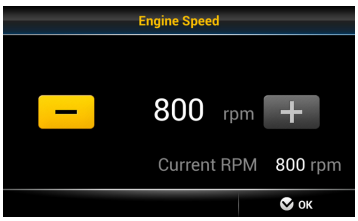
(1) Structure

No	Main menu	Sub menu	Description
1	Mode  760F3CD25A	Engine speed Traction mode Creep mode Dynamic mode Work load Boom/bucket detent mode Bucket priority Auxiliary attach max flow level Soft end stop Cooling fan reverse mode Wiper level setting Calibration Engine auto shutdown Electric steering speed setting	Engine speed Smooth~Rough Creep mode ON/OFF Dynamic mode ON/OFF Weighing system, Weighing display, Error detection Boom pressure calibration, Weighing system compensation Boom/bucket detent ON/OFF, Save position Bucket priority ON/OFF Max oil flow level setting Boom up/down, Bucket in/dump ON/OFF Off, Manual, Automatic Slow, Normal, Fast, Very fast Boom/bucket angle, Boom pressure, Brake pedal sensor, AEB Once, On/Always, Disable, ESL system setting Electric steering speed setting (Fast, Normal, Low)
2	Monitoring  760F3CD25B	Machine monitoring Operation history Fault history Fuel consumption history Machine information	Hyd, Coolant, axle and TM oil temp, Battery voltage Hour meter, ODO meter Active/Logged fault (MCU, ECU, TCU, EHCU, AAVM) General record, Hourly record, Daily record, Mode record, Operation efficiency record TCU, ECM, MCU, RMCU, EHCU, Monitor, Cluster
3	Management  760F3CD25C	Machine security Maintenance Service menu Change A/S phone number Software update Owner menu editing	ESL system setting, Change password Elapsed time, Cycle, Maintenance history Sensor monitoring, Speed limit setting, EHCU I/O information Check and change of contact information Update file in USB memory Owner menu editing, Menu list, Password change
4	Preference  760F3CD25D	Brightness setting Clock setting Unit setting Display style/Language Camera setting AAVM setting	Manual, Automatic Clock setting Temp (˚F/˚C), Distance (km, mile), Weight (ton, lb), Pressure (bar, Mpa, kgf/m^2, psi), Volume (l, gal) Type A, Type B, 14 multiple language Acive camera, Display order, Reverse mode AAVM camera reverse mode
5	Multimedia  760F3CD25E	Media player Smart terminal	Play video and audio files in USB. Operation of screen mirroring

(2) Mode

① Engine speed

975CVT3CD70C



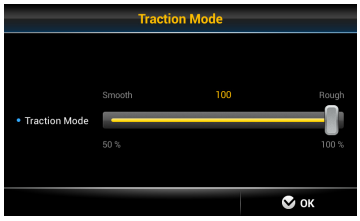
975CVT3CD24B

Engine speed

. Setting engine low idle rpm.

② Traction mode

975CVT3CD29A



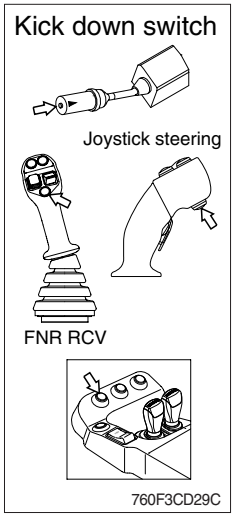
975CVT3CD29B

· **Traction mode**

- Allows operator to choose required traction depends on ground condition/material specific density to maximize fuel efficiency.
  Traction mode helps operator to prevent tire slippage in digging motion. (Controlled traction applies in digging motion only)
- Choose demanded traction by pushing either '+' or '-' on monitor. When traction is 100%, traction mode is deactivated. If traction is selected in 50~95% ragne, traction mode is now ready for applying selected traction in digging motion. Traction mode status can be monitored by seeing the symbol on monitor.
  . Traction mode deactivated : no symbol appears.
  . Traction mode is ready to be applied : White symbol appears.
  . Traction mode is applied : Green symbol appears.

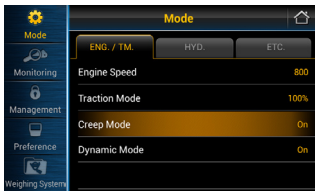
· **Kick down**

- Kick down function decreases maximum machine speed down to 8km/h.
- CVT doesn't have specific gear steps and maximum traction is applied in all gear range.
  Therefore, kick down function only helps operator to get ready for digging right before entering to material.

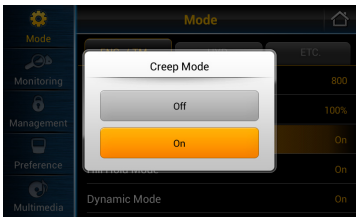


760F3CD29C

③ Creep mode



975CVT3CD26A



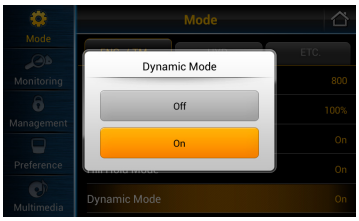
975CVT3CD26B

· Creep mode assist operator to have similar driving characterstic as Hydro-Dynamic Transmission.

- Creep mode ON : Maintains the machine speed 2km/hr in engaged gear without pressing accel pedal.
- Creep mode OFF : Stops the machine after release accel pedal in engaged gear condition.

④ Dynamic mode

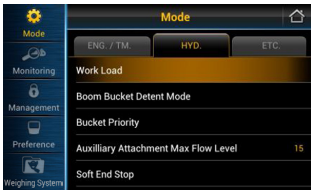
975CVT3CD32A



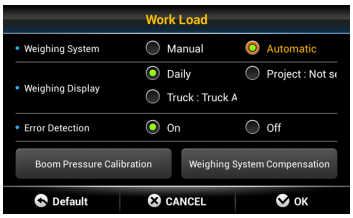
975CVT3CD32B

- Allows driver to use maximum allowed engine rpm from 1650 rpm to 1800 rpm for better dynamic motion during the operation. (Faster attachment speed)
- It turns out that operating performance is same as HL975 even without using dynamice mode. To save the fuel, dynamic mode should be carefully using in specific job handling where
- requires faster attachement movment, such as narrow job site.
  - ON : Allows to use engine speed up to 1800 rpm
  - OFF : Allows to use engine speed only up to 1650 rpm during the job cycle.

⑤ Work load

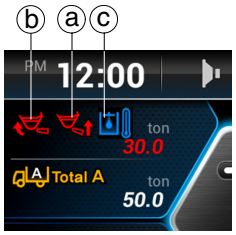


760F3CD33A



960A3CD33

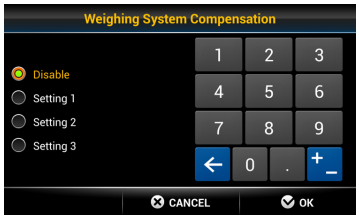
- Weighing system : Set the workload measurements.
- Weighing display : Set the display on main display screen.
- Error detection : Set error detection ON/OFF.
  - OFF : Errors are not displayed.
  - ON : ⓐ,ⓑ and ⓒ are displayed on main display screen.
    - ⓐ The boom lift was performed too fast.
    - ⓑ The bucket was not in the fully tilted back position while bucket was in the weigh range.
    - ⓒ The hydraulic temperature is low (below 40 ˚C).



760F3CD33CK

Today	Work weight (today)
D-1	Work weight (previous day)
Total A Total B Total C	Total weight accumulated in memory A, B, C individually redardless of date
	Current weight

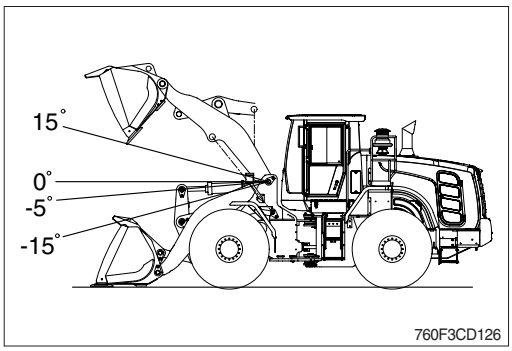
- Boom pressure calibration : See the page 7-46 for details.
- Weighing system compensation
  - Calibration workload depending on work tool.
  - ※ **Only for the service person. Do not adjust arbitrary.**



9603CD75G

※ Weighing system

- The weight indication in bucket is calculated by measuring boom position and boom pressure.
  - ⓐ The weight is '0.0 ton' when the boom is placed at below -15˚.
  - ⓑ The weight is indicated when the boom is placed at the range (-5˚→15˚).
  - ⓒ The weight is calculated when the boom is placed at above -5˚ and boom is lowered below -15˚ after dumping operation.



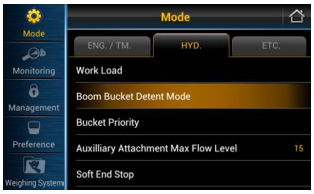
760F3CD126

In order to recheck weight, go to the ⓑ after changing boom position (below -15˚).

- Dump operation : It is checked by bucket cylinder's stroke change (below 250 mm).

※ The temperature for the hydraulic oil must be raised to at least 40 ˚C (104 ˚F) before operation.

⑥ Boom/bucket detent mode

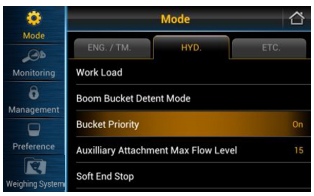


760F3CD35A

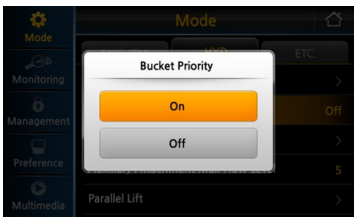
760F3CD35B

- OFF : Detent functions are not operated.
- ON : Boom or bucket detent functions are operated.
- Save position : Refer to page 4-22 in operator's manual.

⑦ Bucket priority mode (option)



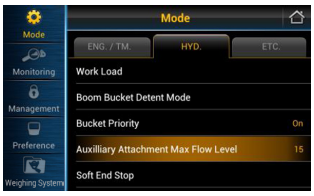
760F3CD34A



760F3CD34B

- Bucket priority function is to be more convenient for operator to load materials.
  Bucket-in (roll back) operation takes priority over the boom-up (raise) operation in case of using both operations at the same time and therefore boom (raise) operation is stopped and only bucket (roll back) is operated.
- Set the bucket priority function ON/OFF.

⑧ Auxiliary attachment max flow level mode (option)



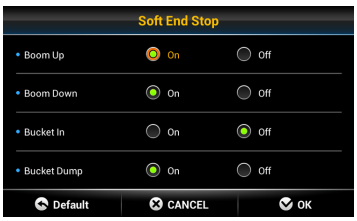
760F3CD36A

760F3CD36B

- If the machine is equipped with auxiliary attachment, auxiliary attachment flow can be easily adjusted and controlled.
- Set the oil flow level from 0 to 15 level by using +/- button.

⑨ Soft end stop mode (option)

760F3CD36C



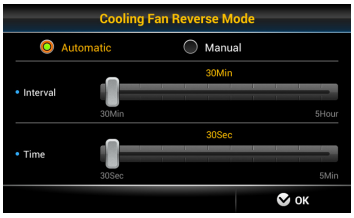
960A3CD36D

- This function gives shock free operation by reducing the speed of attachment near the end stroke.
- Set the soft end stop function ON/OFF.

⑩ Cooling fan reverse mode

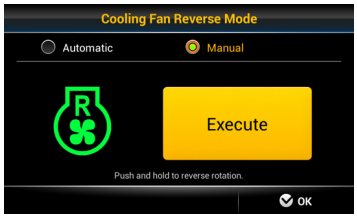
960A3CD142

Automatic



960A3CD40D

Manual

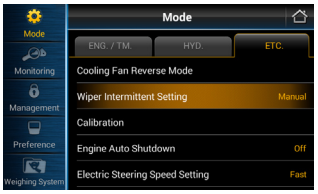


960A3CD40C

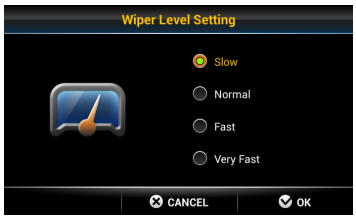
- **Manual** : Rotate the fan with reverse direction while pressing the button "Execute".
- **Automatic** : Rotate the fan with reverse direction by preset cycle.
  - Interval : 30 min ~ 5 hrs
  - Time : 30 sec ~ 5 min

※ **Default : Interval (60 min), time (120 sec)**

⑪ Wiper level setting (Intermittent mode)



960A3CD143

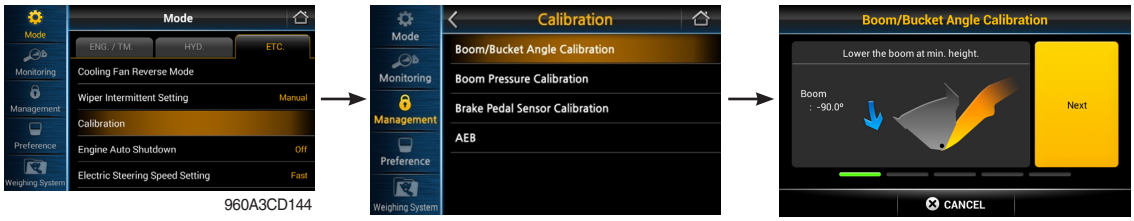


960A3CD36F

- Setting wiper speed in J position of multi fumction switch (slow, normal, fast and very fast)

※ Refer to the page 7-71.

⑫ Calibration



960A3CD144 760F3CD49B 960A3CD49C

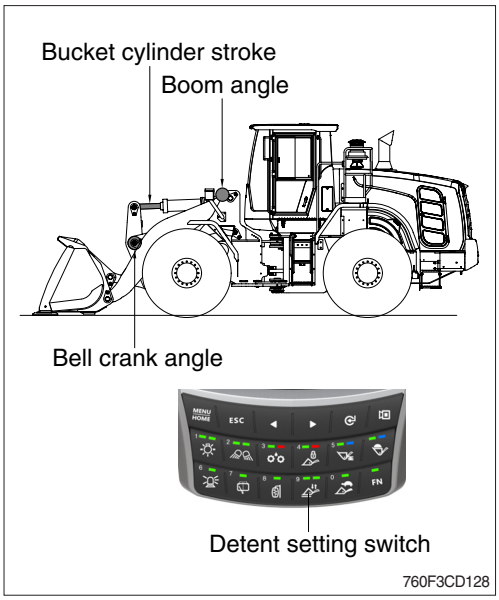
· You should turn OFF " Soft end stop " before start calibration.
· Press NEXT button after following the instruction at each step.
· If correction is right, NEXT button will be activated, then go to next stage.
· After following each step correctly, the message "Calibration completed" will be shown. Press OK button, then process be ended.

※ **Using switch**

- Using ⏎ instead of NEXT, complete button.

· **Boom / Bucket angle calibration**

- MCU get sensing signal from boom angle and bell crank angle and calculate bucket cylinder stroke and boom link position angle from ground real time basis.
- Boom angle position and bucket cylinder stroke is set by detent setting switch on monitor.
- Individual setting position is done by lever (detent, release operation).
- Angle sensor calibration is basically carried out before delivery of the machine.
  When angle sensor is replaced or actual value is different compared to setting value, this function can be done.



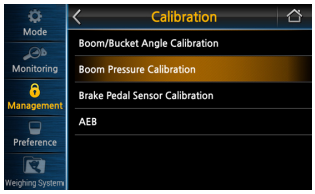
760F3CD128

- The calibration must be carried out as follows :

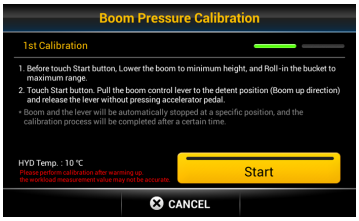
① Lower the boom at maximum low position and press NEXT button or ⏎ (bucket must be max tilting position).
② Raise boom at maximum high position and press NEXT button (or ⏎).
③ Position boom at -5˚ and press NEXT button (or ⏎).
④ Retract bucket cylinder length (to minimum position) at -5˚ boom position and press NEXT button (or ⏎).
⑤ Extend bucket cylinder length (to maximum position) at -5˚ boom position and press NEXT button (or ⏎).
⑥ In case above steps are carried normally, "Calibration is done" message is shown. Then angle sensor calibration is finished.

※ **Boom down / boom up / bucket position setting : Refer to page 4-22 in operator's manual.**

· **Boom pressure calibration**



760F3CD70A



Display A

960A3CD70B

- Press START button after following the instruction.
- After a few minutes, "Calibration failed" or "Calibration completed" message will be shown. Press OK button then process be ended.

※ **Using button**

- Using ⏎ instead of NEXT, complete button.

· **Boom pressure calibration**

- It is used when bucket weight is changed or measured weight is inaccurate.
- The calibration must be carried out as follows :

① Increase hydraulic temperature (about 40~60˚C).

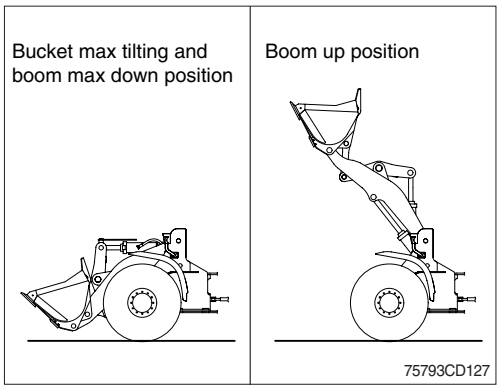
② Select "Boom-pressure".

③ Roll-in the bucket at maximum range and lower the boom at minimum height.

④ Press START button.

⑤ Raise boom to maximum position. Boom up must be finished before stepping advance in "display A".

⑥ If it show "Calibration success" message in a moment, press complete button (or ⏎).



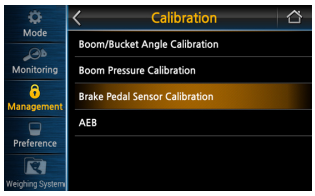
75793CD127

※ **Raise hydraulic temperature enough when checking work load / boom pressure sensor calibration (recommendation : about 40 ~ 60˚C).**

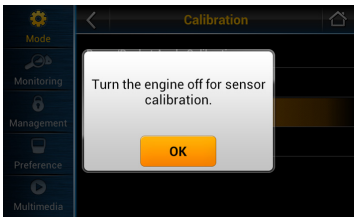
※ **Check if pressure sensor or angle sensor is in normal condition for accurate work load algorism or pressure sensor calibration [pressure sensors at boom cylinder head area and rod area, boom angle sensor (CD-80), bell crank angle sensor (CD-81)].**

※ **Sensor error message during pressure sensor calibration : sensor need to be checked.**

· **Brake pedal sensor calibration**



760F3CD71A

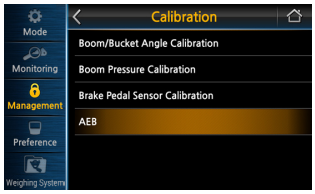


760F3CD71B-1

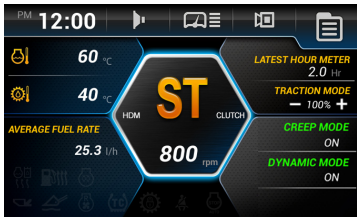
- Turn the engine OFF and turn the starting switch ON position.
- Press OK button, then calibration will be started.
- When display " IP ⇧ " on main display, press slowly the brake pedal completely.
- Release the brake pedal when display " IP ⇩ " on main display.
- For cancel, press MENU/HOME switch.

※ When the brake pedal or sensor is replaced, **brake pedal sensor calibration must be performed.**

· AEB



760F3CD72A



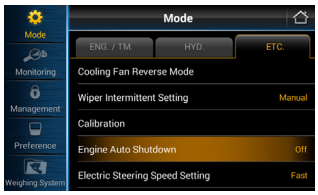
975CVT3CD72B

- AEB mode controls the disk clearance of the transmission, automatically.
- To start AEB setting, press AEB bar (or ⏎) for 3 seconds.
- If you press ⏎ or ESC, AEB setting will be canceled. Machine need to restart.
- If "OK" in actual gear window, press ⏎ to complete AEB setting.
- **Display during AEB mode**

Symbol	Meaning
ST	Start AEB
KV, KR, HYD	Calibration each clutch and hydraulic module respectively
OK*	Calibration for all clutches finished
Spanner and Kx*	Kx couldn't be calibrated, AEB finished
△E	Engine speed too low - Raise engine speed
▽E	Engine speed too high - Lower engine speed
△T	Transmission oil temperature too low - Heat up transmission
▽T	Transmission oil temperature too high - Cool down transmission
FO*	Output speed not zero
FN*	Shift lever not in neutral position
FP*	Parking brake not applied

* : Transmission stays in neutral, you have to restart the TCU (starting switch off/on).

⑬ Engine auto shutdown mode



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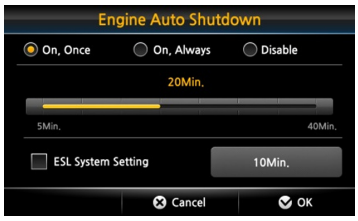

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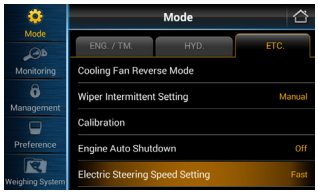
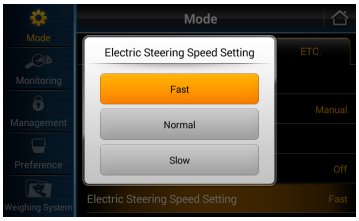
· The engine auto shutdown function can be activated or cancelled.
· If machine is idling for the setting time (2~40 minutes), then engine will be shutdown automatically.

⑭ Electric steering speed setting (option)



960A3CD146



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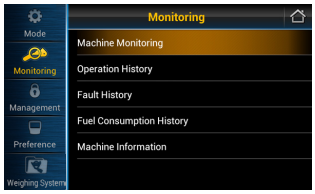
· This is a function that can adjust the electric steering speed in 3 steps (high/normal/low) only for equipment with electric steering option.

※ If step is changed during electric steering manipulation, the steering speed may change during steering, so it is recommended to operate in neutral state of the electric steering joystick (LH).

※ The electric steering speed setting function menu does not appear for equipment without electric steering option applied.

(3) Monitoring

① Machine monitoring



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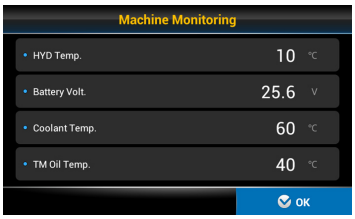

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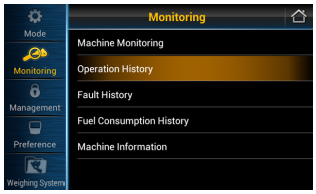
· Monitor the status of the machine.

② Operation history



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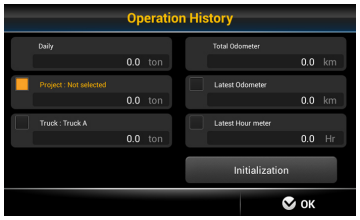

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· **Hour meter / ODO meter**

· **Total**

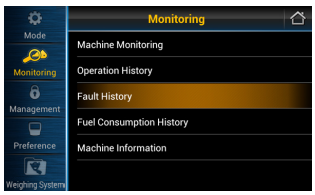
- Total distance (this item cannot be initialized).
- Total working hour can check on service meter.

· **Latest**

- Working hour/distance after reset.
- If you select **Initialization**, working hour/distance start zero.

· To display the item in main display, select the item in main display.

③ Fault history



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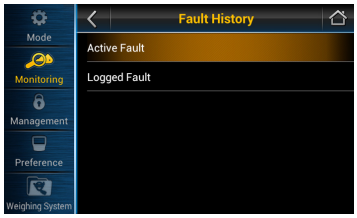

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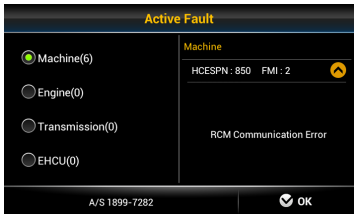

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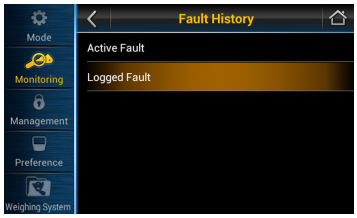

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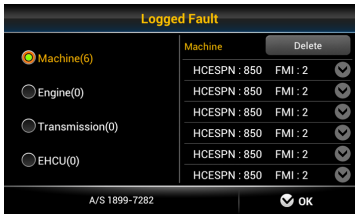


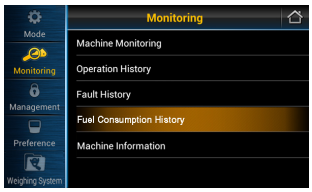
760F3CD44E-1

· Display the fault code of MCU/ECU/TCU/EHCU and delete logged fault.

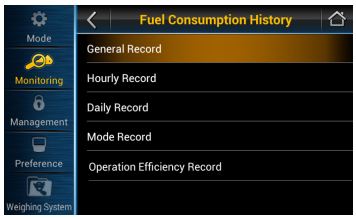
※ **Refer to service manual for SPN/FMI of engine and transmission.**

※ **EHCU : Electro Hydraulic Control Unit AAVM : All Around View Monitoring**

④ Fuel consumption history



760F3CD141



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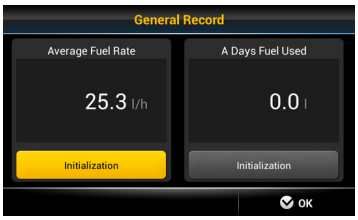

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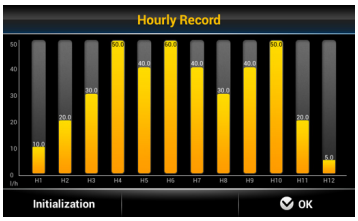

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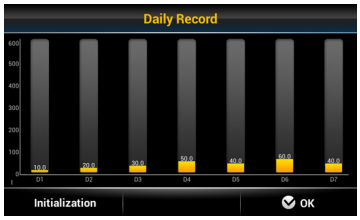
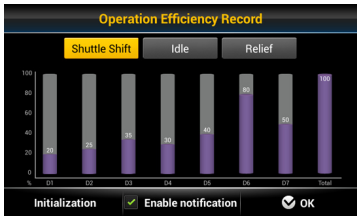


960A3CD141G

960A3CD141E



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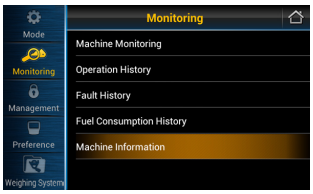
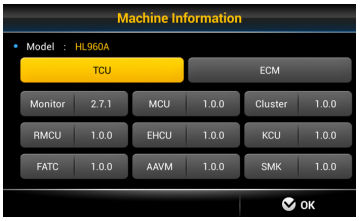
· Dispaly the fuel consumption history.
  - General record (average fuel rate and a days fuel used)
  - Hourly record - Daily record - Mode record : P, P(smart), E mode
  - Operation efficiency record (Shuttle shift, Idle, Relief)

⑤ Machine information



760F3CD46A-1



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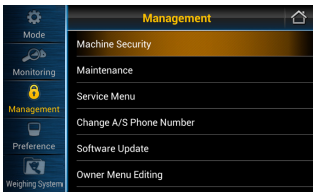
· Software versions of MCU, ECM, TCU, EHCU, RMCU, Cluster and monitor can be checked.

(4) Management

① Machine security



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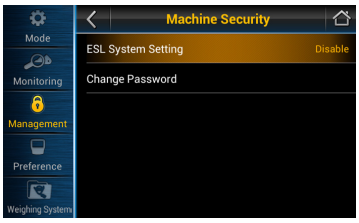

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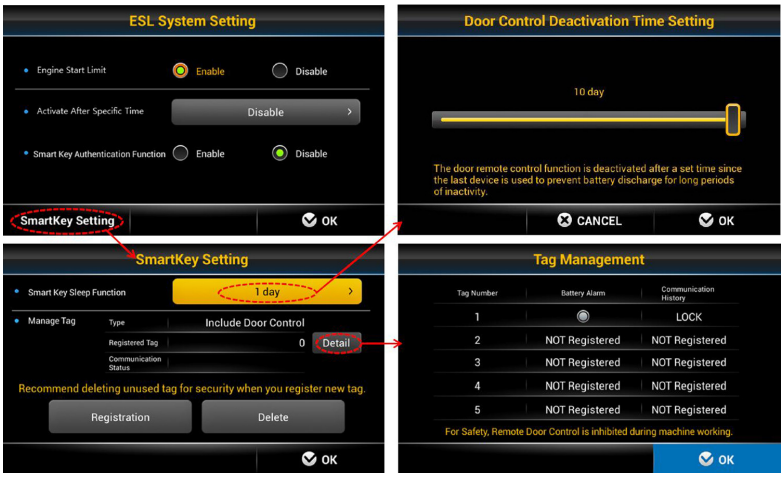
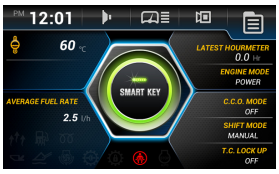


· **ESL system setting**

- ESL : Engine Starting Limit
- ESL mode is designed to be a theft deterrent or will prevent the unauthorized operation of the machine.
- If the ESL mode was selected ON, the password will be required when the start switch is turned ON.
- **Engine start limit**
  . **Disable** : Not used ESL function
  . **Enable :** The password is required whenever the operator start engine.
- **Activate after specific time**
  The password is required when the operator start engine first. But the operator can restart the engine within the specific time without inputting the password.
  The specific time can be set maximum 2 days.
- **Smart key authentication function (option)**
  . **Enable :** Set the using or not of smart key. If you using smart key, ESL function always be activated.
  . **Disable :** Register or delete user tag and display registered user tag. When delete user tag, all user tag will be deleted.

※ Using smart key

- Verification success
  Green smart key icon is displayed on the main display screen.
- Verification failure
  Red smart key icon and password input screen is displayed.



7609A3M50D

Verification success

7609A3M50E

Verification failure

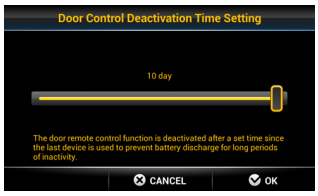
※ Remote door control system (option)

- It can control the cab door (lock/unlock/open) on ground safety. If you control remote key in 15 meters around of machine, door will be lock(or unlock/open) with horn sound.
- Only remote key tag which registered on remote key reader can control the door.

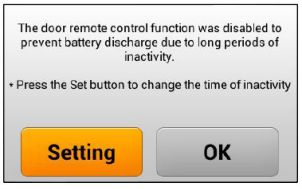
1 Door lock
2 Door unlock
3 Door open (press and hold for 2 seconds)
⚠ Do not activate this function if there is person nearby the door and when machine work or travel.

· Door control deactivation time setting

- Smart key sleep function is deactivating door control to prevent machine battery discharge.
- Operators can set door control deactivation time between 1 and 10 days. (default : 1 day)
- When door control is deactivated, reader lock the door once automatically for machine security.
- If operators turn on the machine after door control deactivated, there will be pop up.



960A3CD47G



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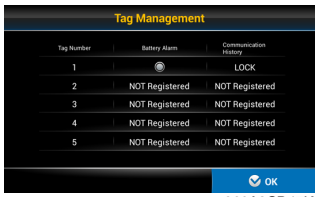
· Tag management

- Tag number
  . Max 5 tags can be registered.
- Battery alarm
  . Check tag's battery status. (normal or low)
- Communication history (check, lock, unlock, open)



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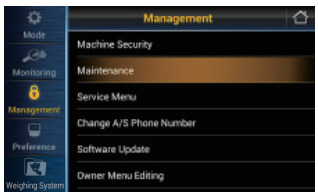
· **Engine Starting Condition**

Case	ESL Mode	Smart Key	Condition
1	Disable	Disable	- With registered tag : Engine can be started without password input. - Without registered tag : Engine can be started without password input.
2	Disable	Enable	If Smart Key is enabled, ESL Mode is automatically enabled. This Case 2 work the same as the Case 4.
3	Enable	Disable	- With registered tag : Engine can be started with password input. - Without registered tag : Engine can be started with password input.
4	Enable	Enable	- With registered tag : Engine can be started without password input. - Without registered tag : Engine can be started with password input.

② Maintenance



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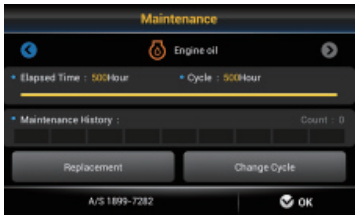

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· Replacement : The elapsed time will be reset to zero (0).
Change cycle : The change or replace cycle can be changed in the unit of 50 hours.

· Show the maintenance history below 10.
When history have more than 10, delete the old item.

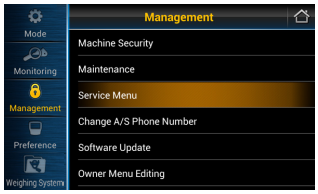
· **Change or replace interval**

No	Item	Interval
1	Engine oil	1000
2	Hydraulic oil	★1 2000 ★2 5000
3	Pilot line filter element	1000
4	Hydraulic oil return filter	1000
5	Engine oil filter	1000
6	Fuel filter element	1000
7	Fuel pre-filter element	1000
8	Hydraulic tank air breather	1000
9	Air cleaner element	2000
10	Radiator coolant	★1 2000 ★2 6000
11	Transmission oil	1000
12	Transmission oil filter (blue)	1000
13	Transmission hydraulic module oil filter (white)	4000
14	Axle oil (front and rear) and oil filter	1500
15	Aircon & heater outer filter	1000
16	Pressure filter element	1000
17	DEF/AdBlue® supply module filter	4500
18	DEF/AdBlue® Tank filter	2000
19	Aircon & heater inner filter	2000

★1 : Conventional

★2 : HD Hyundai Construction Equipment genuine long life

③ Service menu



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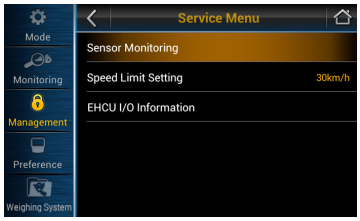

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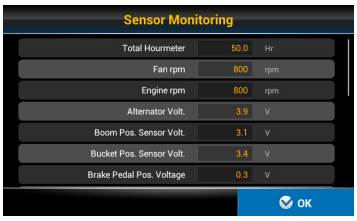

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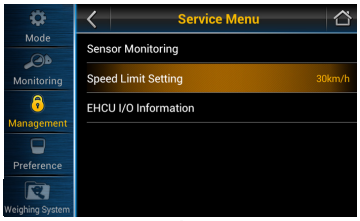

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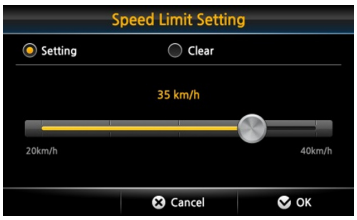

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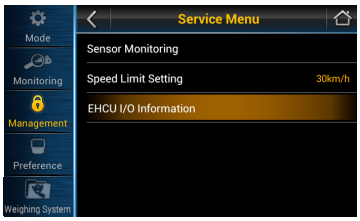

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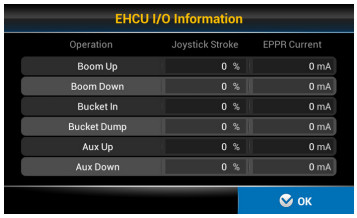

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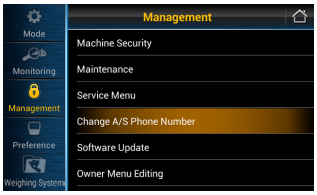
- **Sensor monitoring** : Display information of each sensors.
- **Speed limit setting** : 20~40 km/h (5 km/h intervals)
- **EHCU I/O information**
  - Real time monitoring (joystick stroke, EPPR current).

④ Change A/S phone number



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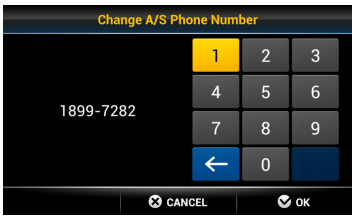

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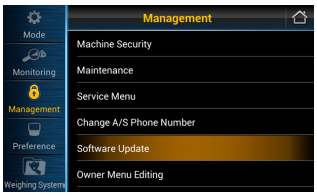
· Check and change of contact information for customer service.

Software update



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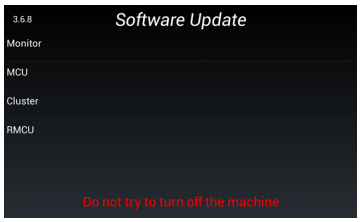

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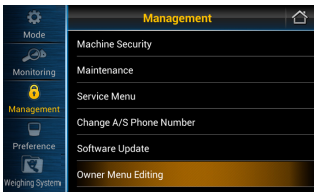
· Update file in USB memory.

⑤ Owner menu editing



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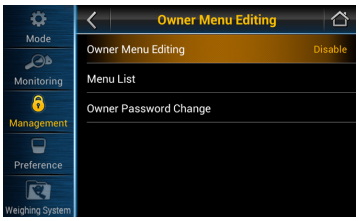

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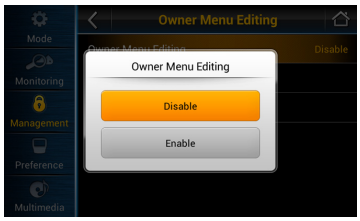

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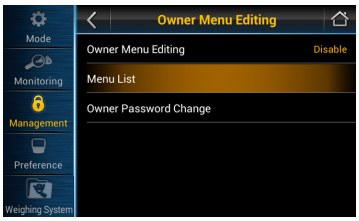

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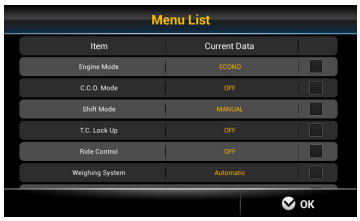
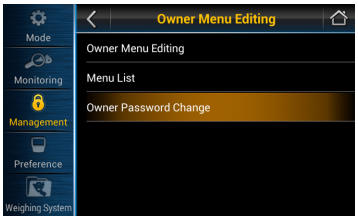
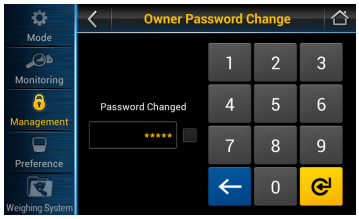


960A3CD7G-1



960A3CD74H

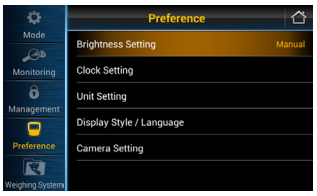


960A3CD74H-1

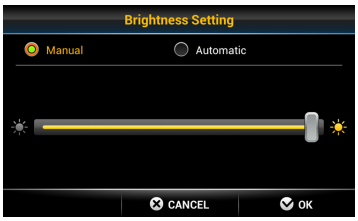
· **Owner menu editing** : Owner can set the status of the function. (Enable / Disable)
· **Menu list** : In the menu, owner can set the list of the function to lock or unlock it.
· **Owner passward change** (Default password : 11111)
  - Owner can manage and change the password.
  - Necessary to input the password to access the set of function.

(5) Preference

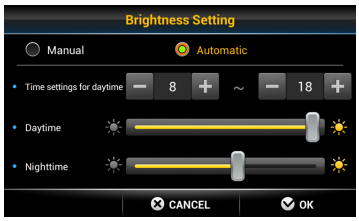
① Brightness setting



960A3CD76A



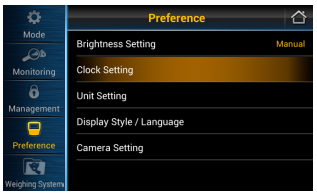
960A3CD76B



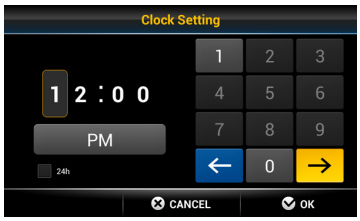
960A3CD76C

- **Manual**
  - Manual setting for LCD brightness.
- **Automatic**
  - Automatic control of LCD brightness as set level of day/night.
- **Setting day time**
  - Set the time for daylight.
  - If you set the time for daylight, the rest time will be night.

② Clock setting



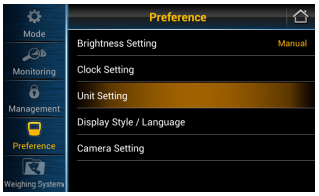
960A3CD77A



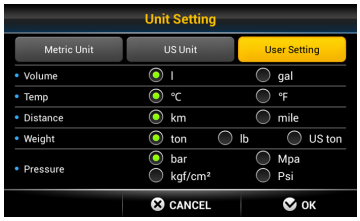
960A3CD77B

- Set the time (hour, minute and AM or PM)

③ Unit setting



960A3CD78A



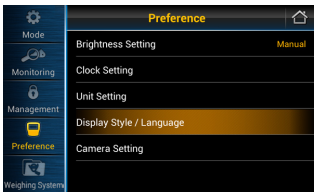
960A3CD78B

- Volume : ℓ ↔ gal
- Temperature : ˚C ↔ ˚F
- Distance : km ↔ mile
- Weight : ton ↔ lb
- Pressure : bar ↔ Mpa ↔ kgf/m² ↔ psi

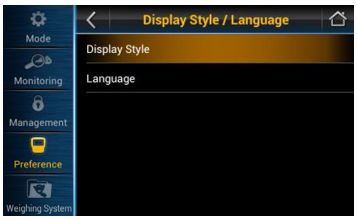
※ **Using button**

- Move to other item by ↵.

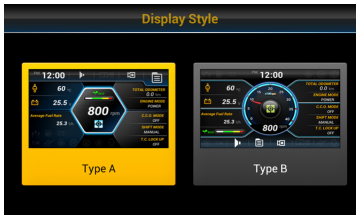
④ Display style/ Language



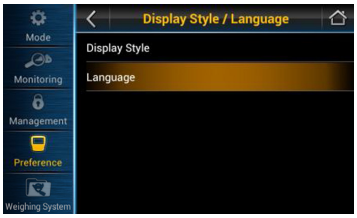
960A3CD81A



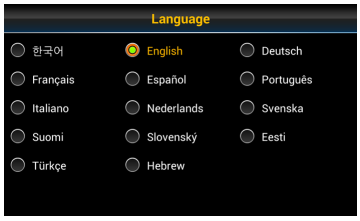
760F3CD81B



760F3CD81C-1



760F3CD81D

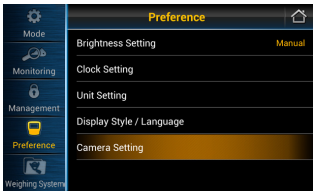


960A3CD81E

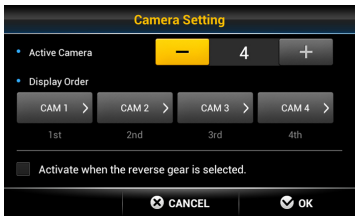
- Set the display type A or B.
- User can select preferable language and all display are changed the selected language.
- 14 multiple language available.

⑤ Camera setting

※ If the camera monitor is equipped, camera will showing on camera monitor only.



960A3CD39A



760F3CD39B-1

- **Active camera**
  - Four cameras can be installed on the machine.
- **Display order**
  - Set the channel sequence of each camera.
- **Active when the reverse gear is selected**
  - If transmission engages the reverse gear (R1~R3), the camera mode is displayed automatically in main display.

- If the camera was not equipped, this menu is not useful.
- If the camera monitor is equipped, camera will showing on camera monitor only. This menu is not useful.
- In main display, if the ▣ is touched (or ▣ switch is pushed), the first ordered display camera will be viewed.

※ **If AAVM is equipped, this menu will be changed to AAVM setting.**

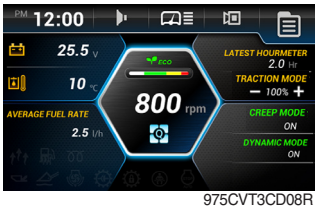
⑥ AAVM (Advance Around View Monitoring, option)

※ If the camera monitor is equipped, AAVM will showing on camera monitor only.

- The AAVM switchs of the cluster consist of Camera, ESC and Buzzer stop.

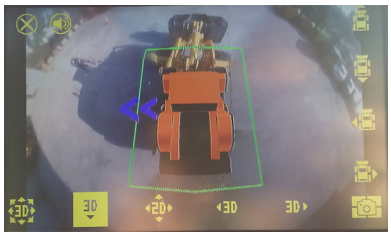
760F3CD95-5

- **Camera switch**
- It will enter into the AAVM mode from the main display if the AAVM is installed.
- If the camera monitor is equipped, AAVM will showing on camera monitor only. This menu is not useful. See the page 3-77.
- While in the AAVM mode, select the ESC switch to return to the main display.



975CVT3CD08R

Main display



760F3CD08S

AAVM mode

- **Buzzer stop switch**
- In AAVM mode, it detects surrounding pedestrians or objects and the warning buzzer sounds.
- User can turn OFF the warning sound by pressing buzzer stop switch.

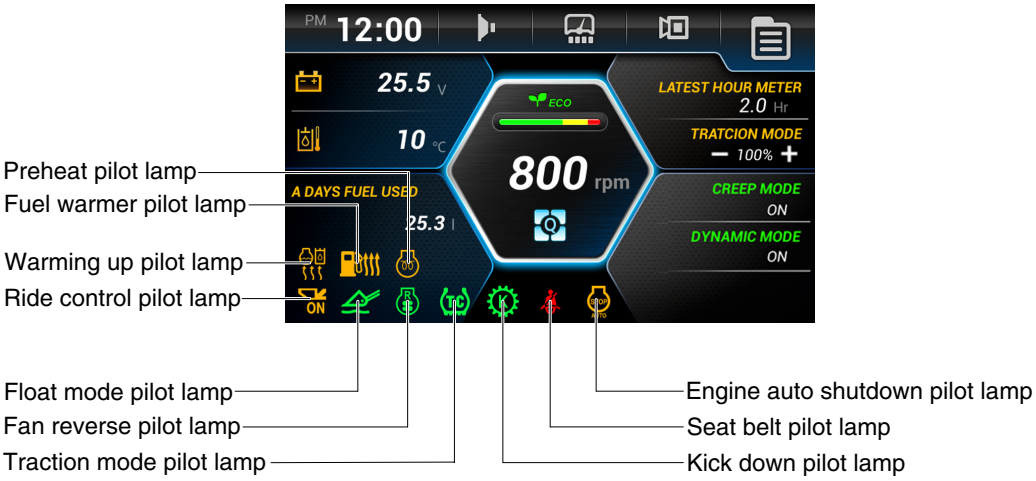
290F3CD246

· When the worker or pedestrian go near the danger area line (green, radius 3 m), an external danger area of equipping on the main display, the warning buzzer sounds and it displays the green rectangular box for the recognition of the worker and pedestrian. At this time, the operator should stop work immediately, and stop the buzzer by pressing the buzzer stop switch. And then, please work after you check whether the danger factors are solved.

290F3CD247

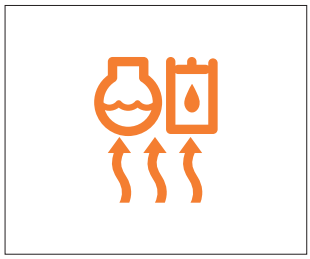
· When the worker or pedestrian go inside of the danger area line (red, radius 3 m), an internal danger area of equipping on the main display, the warning buzzer sounds and it displays the red rectangular box for the recognition of the worker and pedestrian. At this time, the operator should stop work immediately, and stop the buzzer by pressing the buzzer stop switch. And then, please work after you check whether the danger factors are solved.

3) PILOT LAMPS



975CVT3CD90

(1) Warming up pilot lamp



① This lamp lights ON when the coolant temperature is below 30˚C (86˚F).

② The automatic warming up is cancelled when the engine coolant temperature is above 30˚C, or when 10 minutes have passed since starting the engine.

(2) Seat belt pilot lamp

① This lamp lights ON for the first five seconds after starting the engine.

(3) Preheat pilot lamp

① This lamp lights ON when start switch is turned clockwise to the ON position. Light will turn off after approximately 5~45 seconds, depending on engine temperature, indicating that preheating is completed.

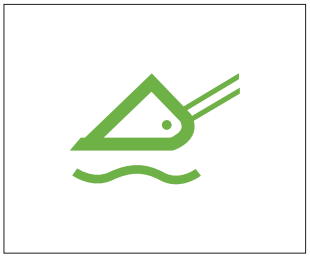
② When the lamp goes out the operator should start cranking the engine.

※ **Refer to page 4-5 in operator's manual.**

(4) Engine auto shutdown pilot lamp

① This lamp lights ON when the engine auto shutdown function is activated.

(5) Float mode pilot lamp



① This lamp lights ON when the boom float is activated.

(6) Ride control pilot lamp (option)

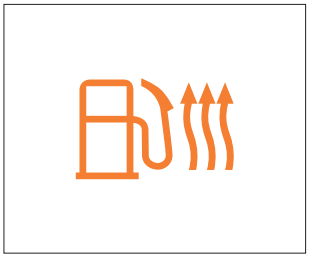
① **Auto ride control**
This lamp lights ON when the automatic ride control function is activated (**ON, Conditional speed** setting).

② **Manual ride control**
This lamp lights ON when the manual ride control function is activated (**ON, Always** setting).

(7) Fan reverse pilot lamp

① This lamp lights ON when the cooling fan reverse mode is activated

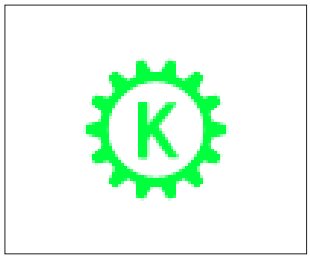
(8) Fuel warmer pilot lamp



① This lamp is turned ON when the coolant temperature is below 10˚C (50˚F) or the hydraulic oil temperature 20˚C (68˚F).

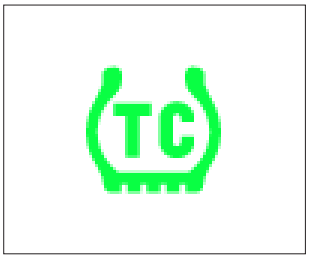
② The automatic fuel warming is cancelled when the engine coolant temperature is above 60˚C and the hydraulic oil temperature is above 45˚C since the start switch was ON position.

(9) Kick down pilot lamp



① This lamp lights ON when the kick down switch is activated.

(10) Traction mode pilot lamp



① This lamp lights ON when the traction mode is activated.

. Traction mode deactivated : no symbol appears.

. Traction mode is ready to be applied : White symbol appears.

. Traction mode is applied : Green symbol appears.

3) SWITCHES

975CVT3CD95

If ※ you push left or right switch (◀ ▶) on main display, show the select box on current time. Move to next item in order by using left / right button.
(① Time → ② Buzzer → ③ Wiper → ④ Camera → ⑤ Menu → ⑥ Machine monitoring → ⑦ Fuel rate → ⑧ Engine mode/Operation history → ⑨ Transmission mode → ⑩ Quick menu)

※ Move to selected setting screen by using enter switch (↵).

※ When keypad is not pressed for 3 seconds, convert screen to main display.

If ※ you push left and right switch (◀ ▶) at the same time, move language settings.

(1) Menu / Home switch

760F3CD21

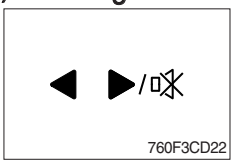
① Main display to main menu, main menu to main display.

(2) ESC switch

760F3CD23

① For other menu, this is used for cancellation (move to previous menu).
② AEB cancel or finish button in AEB.

(3) Left / Right move switch

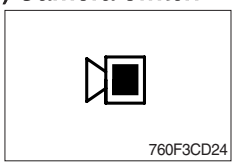


① Move in menu (left, up / right, down).
② Decrease / Increase input value.
③ Stop buzzer sound.

(4) Enter switch

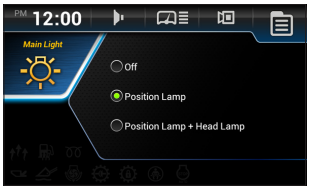
① Select menu (enter).

(5) Camera switch



① Enter camera or AAVM mode in main display.
② If the camera monitor is equipped, camera or AAVM will showing on camera monitor only. This switch is not useful.

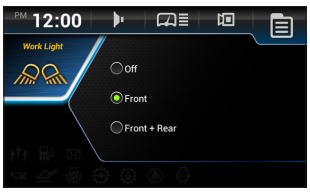
(6) Main light switch



760F3CD83-1

① This switch use to operates the clearance lamp and head light.
· **Position lamp** : Clearance lamp and cluster illumination lamp come ON. The green pilot lamp is turned ON.
· **Head lamp + Position lamp** : Clearance lamp, cluster illumination lamp and head light come ON. The green pilot lamp is turned ON.

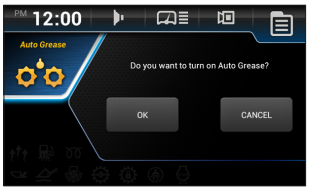
(7) Work lamp switch



760F3CD84-1

① This switch use to operates the front and rear work lamps.
· **Front** : Front work lamp located on the cab comes ON. The green pilot lamp is turned ON.
· **Front + Rear** : Front work lamp located on the cab and rear work lamp located on the cowl come ON. The green pilot lamp is turned ON.

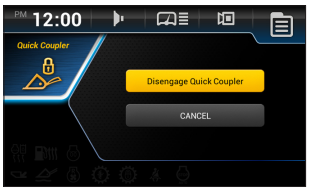
(8) Central grease lubrication switch (option)



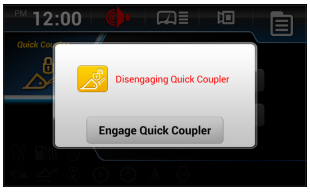
760F3CD85-1

① This switch is used to operate the central grease lubrication system.
② The central grease lubrication system is operated for set period. The green pilot lamp is turned ON.
※ **When malfunction occur in grease lubrication system, the red pilot lamp is turned ON.**
※ **Refer to page 8-1 in operator's manual.**

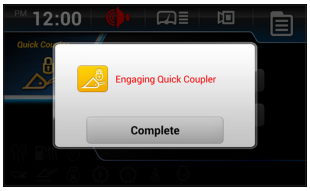
(9) Quick coupler switch (option)



960A3CD86A



960A3CD86C



960A3CD86B

① **Disengage quick coupler**

- The quick coupler pins move in the disengaged position and buzzer sounds.
- The red pilot lamp is turned ON.

⚠ **Always check that the attachment is properly secured to the attachment quick coupler by pressing the front part of the attachment against the ground.**

⚠ **Never use an attachment before you have checked its mounting.**

② **Engage quick coupler**

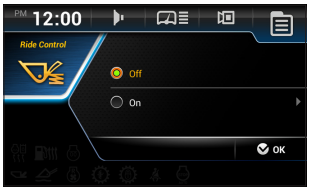
- The quick coupler pins move in the engaged position and buzzer sounds.
- The green pilot lamp is turned ON.

※ **Check for engagement as followings.**

a. Put down pressure on the attachment.

b. Back up the machine and make sure that there is no movement between the quick coupler and attachment.

(10) Ride control switch (option)



960A3CD87A

960A3CD87B

① **Forward / Backward 1~15 km/h**

- The ride control automatically turns on when the travel speed exceeds a preset speed. (forward / backward 1~15 km/h)
- The blue pilot lamp is turned ON.

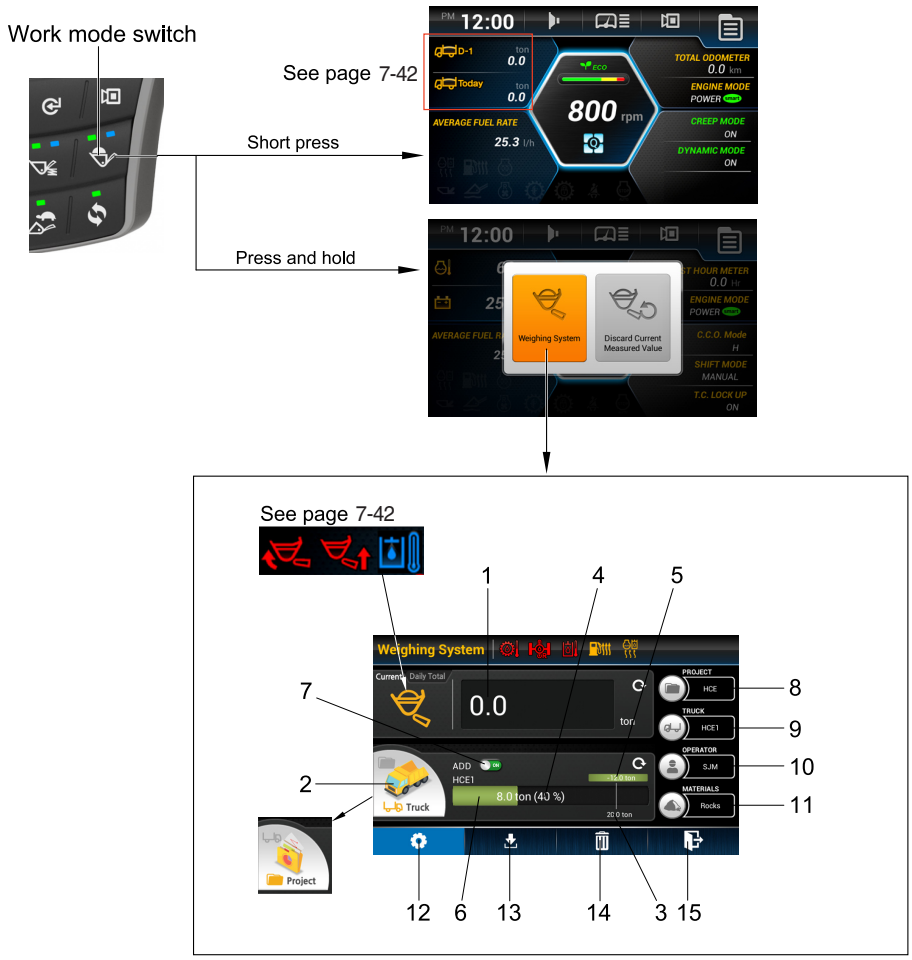
② **ON, Always**

- Select **ON, Always** in order to turn on the system for ride control regardless speed. The ride control will smooth the ride of the machine during travel.
- The green pilot lamp is turned ON.

③ **ON/OFF**

Select ON/**OFF** in order to turn on/off the system for the ride control.

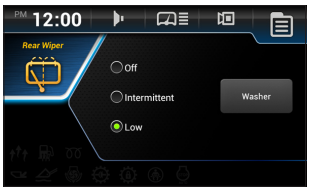
(11) Work mode switch



960A3CD115

1 Current weight in the bucket / Daily total weight
2 Select button (Click gray icon) for status (Project status / Truck status)
3 Target weight
4 Loaded weight
5 Remaining weight to complete job / Over weight to complete job
6 Progress bar / Total weight
7 Select button for mode (Standby mode / Weigh mode)
8 Project name
9 Truck name
10 Operator
11 Materials
12 Go to Work load setting menu
13 Save Work log to USB
14 Delete Work log
15 Go to Main menu

(12) Rear wiper and washer switch



760F3CD89-1

① This switch use to operates the rear wiper and washer.
When pressing the switch, the mode is changed sequence base.
(OFF → intermittent → Low → OFF)

- **Intermittent** : The rear wiper operates intermittently.
- **Low** : The rear wiper is operated lower speed.
- **Washer** : The washer liquid is sprayed while long pressing the button.

② The green pilot lamp is turned ON.

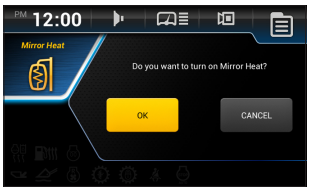
(13) Beacon lamp switch (option)

760F3CD88

① This switch turns ON the rotary light on the cab.

② The green pilot lamp is turned ON.

(14) Mirror defrost switch (option)



960A3CD65A

① ON
- In condition of ON, it operates for 15 minutes. After 15 minutes, the defrost function stops automatically.
- The green pilot lamp is turned ON.

② OFF
- Stops defrost function.

(15) Detent setting switch

760F3CD66

① Boom and bucket
- Set the boom and bucket detent function ON/OFF.

② Save position
- Set the boom kickout and bucket leveler.

※ The green pilot lamps are turned ON.

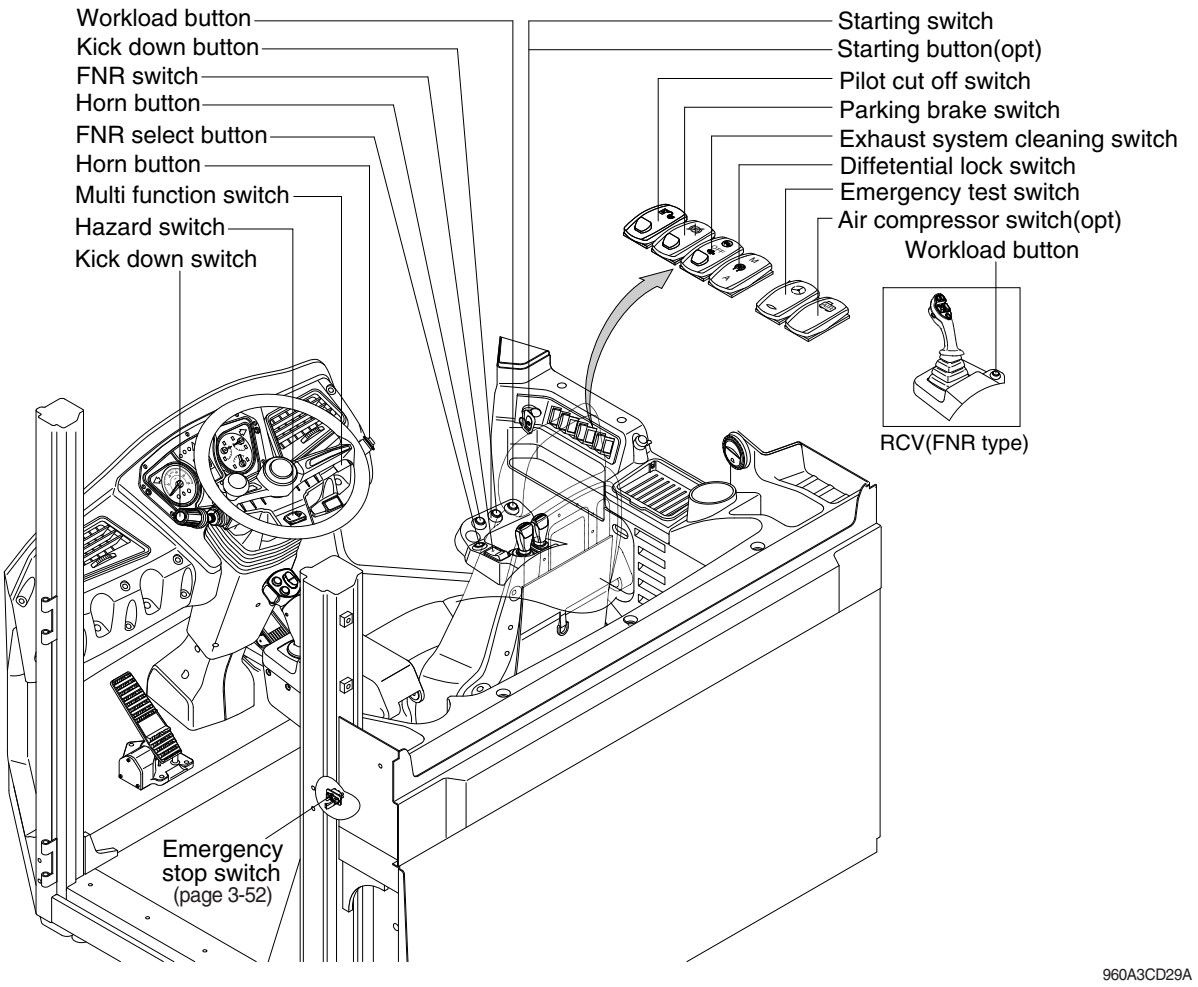
(16) Fine modulation switch

760F3CD67

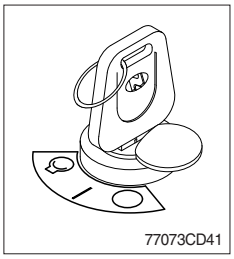
① ON
- Remote control lever provide the operator with precise control of the work equipment (bucket and boom cylinders can be controlled precisely).
- The green pilot lamp is turned ON.

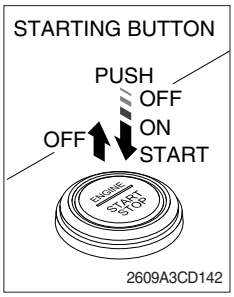
② OFF
- Turn off the function.

3. SWITCHES



1) STARTING SWITCH & STARTING BUTTON (OPT)





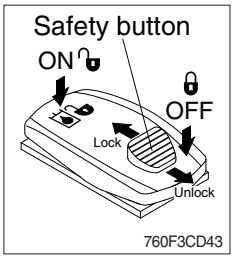
Starting button with smart key tag (opt)

(1) There are three positions, OFF, ON and START.
- ○ (OFF) : None of electrical circuits activate.
- | (ON) : All the systems of machine operate.
- (START) : Use when starting the engine.
  Release key immediately after starting.

※ **If you turn ON the starting switch in cold weather, the fuel warmer is automatically operated to heat the fuel by sensing the coolant temperature. Start the engine in 1~2 minutes after turning ON the starting switch. More time may take according to ambient temperature.**

※ **Key must be in the ON position with engine running maintain electrical and hydraulic function and prevent serious machine damage.**

2) PILOT CUT OFF SWITCH



(1) When the switch is pressed to OFF position, the hydraulic pilot line will be cut off, so the work equipment will not operate.

(2) Press the ON position in order to unlock the hydraulic pilot line.

※ **This switch can be set to ON or OFF position only when the safety button is pulled to the unlock position.**

3) PARKING BRAKE SWITCH

(1) When the switch is pressed to ON position, the parking brake will start to operate and the cluster warning lamp will comes ON.

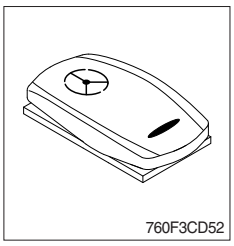
(2) Press the release position in order to disengage the parking brake.

※ **When operating the gear selector lever, be sure to release the parking brake. If the machine is operated with the parking brake engaged, the brake will overheat and may cause the brake system to go out of order.**

※ **This switch can be set to ON or Release position only when the safety button is pulled to the unlock position.**

※ **If you turn ON the starting switch with the parking brake disengaged (release position), the parking brake will be engaged.**
To release the parking brake, press the parking brake switch to ON and Release position.

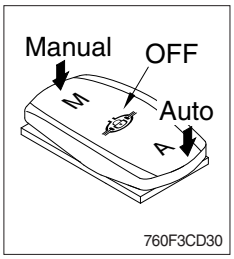
4) EMERGENCY TEST SWITCH (option)



(1) The emergency steering system can be manually tested. Push the switch in order to determine if the emergency steering and the emergency steering lamp are functional.

(2) When the switch is pressed, the emergency steering pump motor will run. The emergency steering lamp will light. If the emergency steering lamp does not light, do not operate the machine.

5) DIFFERENTIAL LOCK SWITCH (option)



(1) This switch is used to apply differential lock.
The differential lock gives equal power to both front wheels and is used in conditions when traction is poor.

(2) Manual mode
Press the **M** of the switch for the manual mode of the differential lock function. You press the switch, the differential lock will engage immediately and differential lock pilot lamp lights ON (buzzer sounds). Manual mode is temporarily engaged as long as the operator pushes the switch. When the switch is released, differential lock function is disengaged and the switch returns to OFF position.

(3) Auto mode
Press the **A** of the switch for auto mode of the differential lock function. If you press the switch, the axle differential lock will automatically engage when the differential function is used.

※ **While the axle differential lock function is operating, the differential lock pilot lamp lights ON.**

6) EXHAUST SYSTEM CLEANING SWITCH

(1) This switch is used to select the exhaust system cleaning.

(2) Inhibit position (①)

① The inhibit position disallows any automatic or manual exhaust system cleaning.

② This may be used by operator to prevent exhaust system cleaning when the machine is operating in a hazardous environment is concerned about high temperature.

③ It is strongly recommended that this position is only activated when high temperatures may cause a hazardous condition.

(3) Auto position (③)

This position will initate a automatic exhaust system cleaning.

(4) Manual position (②)

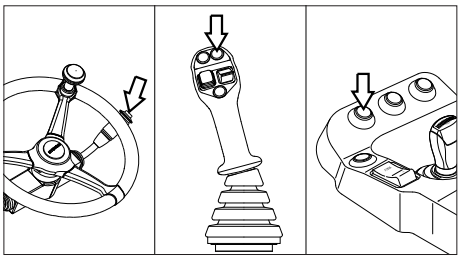
① This position will only initate a manual exhaust system cleaning when the machine is in non-mission condition, engine must run at low idle speed and exhaust system levels are high enough to allow cleaning.

② HEST lamp will be illuminated during the entire exhaust system cleaning.

※ This switch can be move to the manual position (②) only when the safety button is pulled to backward.

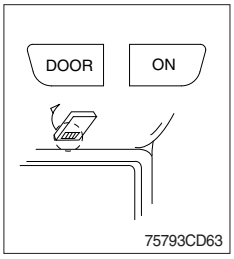
※ Also, this switch return to the auto position when released the manual position (②).

7) HORN BUTTON



(1) If you press the button, the horn will sound.

8) CAB LAMP SWITCH



(1) This switch turns ON the cab room lamp.

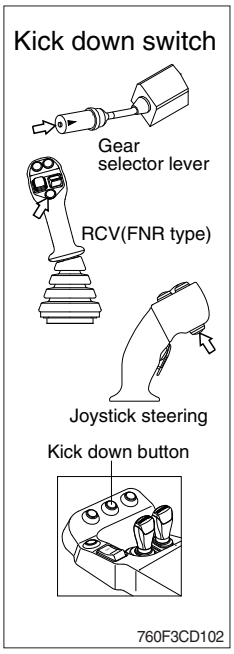
① **DOOR**

The lamp comes ON when the door is opened.
When the door is closed the lamp is OFF.

② **ON**

This switch is used to turn the lamp ON or OFF.

9) KICK DOWN SWITCH

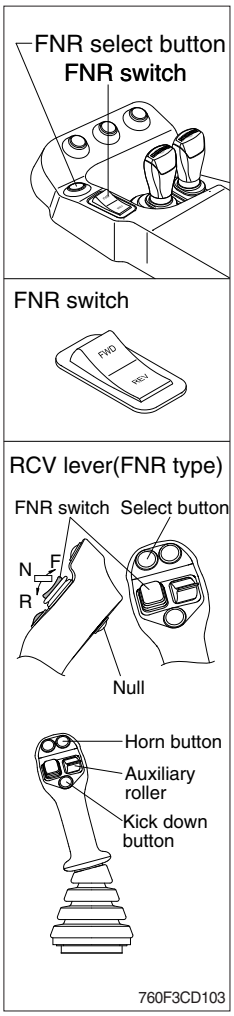


(1) Kickdown function decreases maximum machine speed down to 8 km/h.

(2) CVT doesn't have specific gear steps and maximum traction is applied in all gear range.

(3) Therefore, kickdown function only helps operator to get ready for digging right before entering to material.

10) FNR SELECT BUTTON AND SWITCH



(1) These button and switch are used for froward and backward drive.

※ **Gear range can be selected by gear selector lever.**

(2) FNR select button

① If the select button is pressed, the indication lamp on the cluster will be ON and this FNR switch will start to operate.

※ **When the engine is running, the machine is on standstill (0 speed), parking brake is released, gear selector lever is in the neutral position, you can use this function after pressing the select button.**

(3) FNR switch

· F : Forward drive

· N : Neutral

· R : Reverse drive

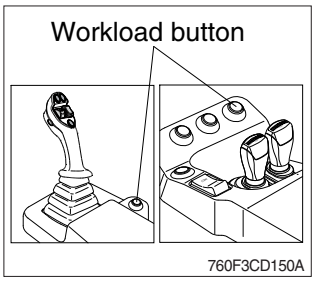
① If the upper side (F, FWD) of this switch is pushed, the machine moves forward.

② If the down side (R, REV) of this switch is pushed, the machine moves backward.

③ This function is automatically released when the engine is stopped, parking brake is ON or gear selector lever is out of neutral.

(4) Auxiliary roller : If the machine is equipped with auxiliary hydraulics, this roller is used for the attachments.

11) WORKLOAD BUTTON

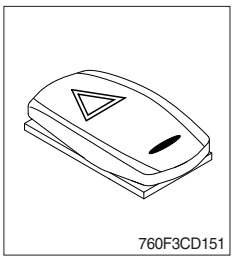


(1) This button is used to calculate the weight manually.
If the button is not pushed, the weight of the weighing system is not calculated.

(2) This button is pushed for one second more, calculated weight will be accumulated.

※ **Refer to the weighing system.**

12) HAZARD SWITCH

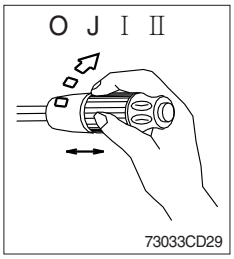


(1) Use for parking or loading the machine.

(2) Both turn signal lights will flash simultaneously.

※ **If the switch is left ON for a long time, the battery may be discharged.**

13) MULTI FUNCTION SWITCH



(1) Front wiper and washer switch

① When the switch is in **J** position, the wiper moves intermittently.

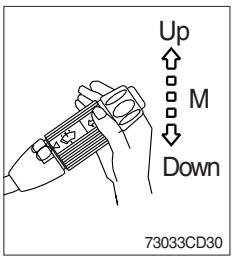
※ **Refer to the page 3-24 (Wiper level setting).**

② When placed in Ⅰ or Ⅱ position, the wiper moves continuously.

③ If you push the grip of the lever, washer liquid will be sprayed and the wiper will be activated 2-3 times.

※ **Check the quantity of washer liquid in the tank. If the level of the washer liquid is LOW, add the washer liquid (in cold, winter days) or water. The capacity of the tank is 1 liter.**

※ **If the wiper does not operate with the switch in ON (J, Ⅰ, Ⅱ) position, turn the switch OFF (O) immediately and check the cause. If the switch remains ON, motor failure can result.**



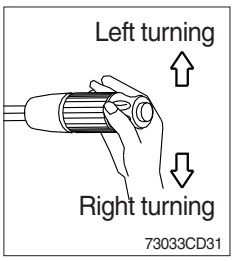
(2) Dimmer switch

① This switch is used to turn the head lights direction.

② Switch positions

- Up : To flash for passing
- Middle : Head lights low beam ON
- Down : Head lights high beam ON

③ If you release the switch when it's in up position, the switch will return to middle.

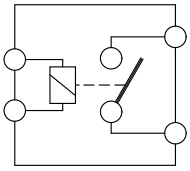
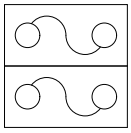
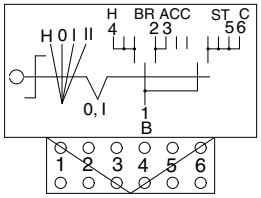
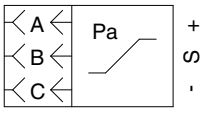
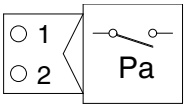


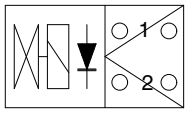
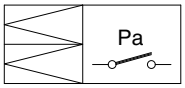
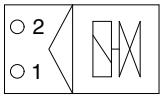
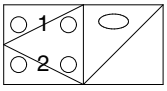
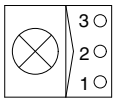
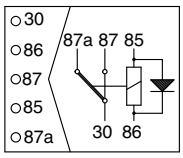
(3) Turning switch

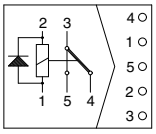
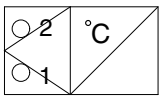
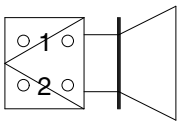
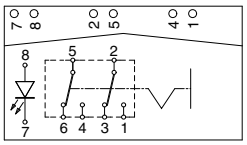
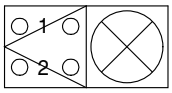
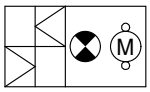
① This switch is used to warn or signal the turning direction of the machine to other vehicles or equipment.

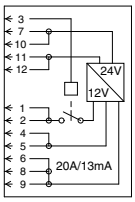
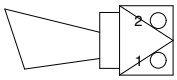
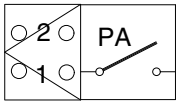
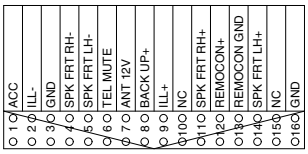
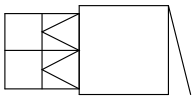
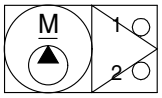
② Push the lever up for turning left, pull the lever down for turning right.

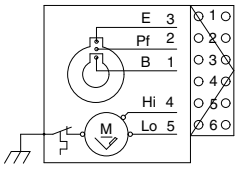
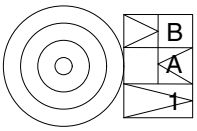
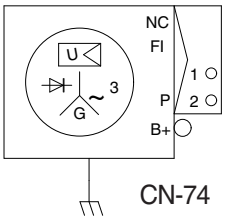
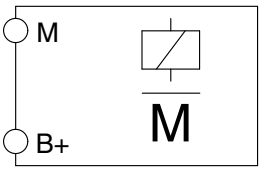
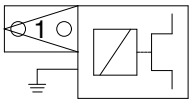
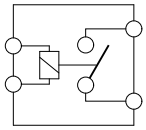
GROUP 4 ELECTRICAL COMPONENT SPECIFICATION

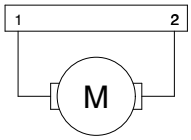
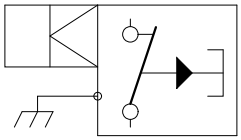
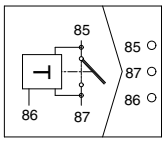
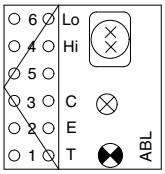
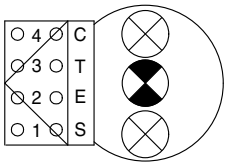
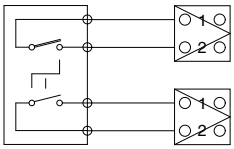
Part name	Symbol	Specifications	Check item
Battery		12V × 220Ah (2EA)	Gravity 1.280 over : over charged 1.280 ~ 1.250 : normal 1.250 below : discharged
Battery relay	 CR-1	Rated load : 24V 100A (continuity) 1000A (30seconds)	Coil resistance breaked : approx 50Ω connected : ∞Ω
Fusible link	 CN-351 (40A), CN-352 (80A)	24V	Resistance between ring terminal and each connector pin 0Ω : normal
Start key	 CS-2	B-BR : 24V 1A B-ACC : 24V 10A B-ST : 20V 40A	Resistance between each pin Key off : ∞Ω (for each pin) Key on : 0Ω (for pin 1-2 & 1-3) Start : 0Ω (for pin 1-5)
Pressure switch	 CD-3 CD-26 CD-31 CD-39 CD-40 CD-58 CD-79 CD-80 CD-81	N.C Type	Resistance 0Ω : normal (close)
Pressure switch	 CD-48 CD-129	N.O Type	Resistance ∞Ω : normal (open)

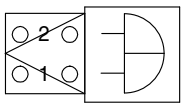
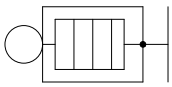
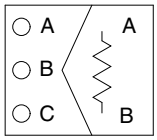
Part name	Symbol	Specifications	Check item
Pilot cut off, parking brake, diff lock, attach lock, unlock solenoid	 CN-68 CN-177 CN-71 CN-178 CN-79	24V 1A	Resistance normal : 15~25Ω
Air cleaner pressure switch	 CD-10	Max load : 6W N.O Type	Resistance ∞Ω : normal (open)
Lock-up, Ride control valve / Fan sole-noid	 CN-43 CN-136 CN-154 CN-155	24V 1.2A	※ Check LED lamp ※ Check resistance about 24Ω
Fuel sender	 CD-2	-	Resistance at fuel levels full level : 200Ω 9/12 level : 500Ω 6/12 level : 800Ω 3/12 level : 1100Ω empty : 1300Ω
Room lamp	 CL-1	24V 10W	Resistance normal : 1.2Ω
Relay (5pin)	 CR-3 CR-5 CR-7 CR-30 CR-35 CR-36 CR-38 CR-40 CR-46 CR-55 CR-56 CR-63 CR-210 CR-211 CR-381	24V 20A	Resistance normal : about 160Ω (for pin 85~86) 0Ω (for pin 30~87) ∞Ω (for pin 30~87)

Part name	Symbol	Specifications	Check item
Relay (5 pin)	 CR-2 CR-4 CR-25 CR-26 CR-37 CR-58 CR-79 CR-115 CR-117 CR-136 CR-302 CR-303	24V 20A	Resistance normal : about 160Ω (for pin 1~2) 0Ω(for pin 3~4) ∞Ω(for pin 3~5)
Hydraulic, transmission temperature	 CD-1 CD-49	–	Resistance normal : ∞Ω 105。C over : 0Ω
Speaker	 CN-123 (LH) CN-124 (RH)	4Ω 20W	Resistance normal : 4Ω
Switch (Locking type)	 CS-4 CS-17 CS-75	24V 8A	Resistance at switch off position ∞Ωbetween pin 1-5 and 2-6 0Ωbetween pin 5-7 and 6-8
Work lamp, Number plate lamp	 CL-21 CL-32 CL-33 CL-35 CL-36 CL-42 CL-43 CL-45 CL-46	Work lamp 24V 70W Number plate lamp 24V 10W	Resistance normal : 1.2Ω
Beacon lamp	 CL-117	24V 70W (H1 TYPE)	Resistance normal : 1.1Ω

Part name	Symbol	Specifications	Check item
DC/DC Converter	 CN-138	12V 3A	Resistance 8.8Ω(for pin A-B) 7.7Ω(for pin B-C)
Horn	 CN-120 CN-121	24V 2A	Operation by external power source - conncet 24V power to (+) terminal - ground the (-) terminal
Receiver dryer	 CN-29	24V 2.5A	Resistance 0Ω: 2.1±0.3~27±2kgf/cm² ∞Ω: ~2.1±0.3, 27±2~kgf/cm²
Radio & USB player	 CN-27	24V 20W+20W	Resistance Power ON : 4Ω+4Ω (for pin 1-6, 4-8)
Back up buzzer	 CN-65	24V 0.5A 110dB	Resistance normal : 5.2Ω
Washer pump	 CN-102 (FR) CN-103 (RR)	24V 2.5A	Resistance normal : 26.4 Ω (for pin1-2)

Part name	Symbol	Specifications	Check item
Wiper motor	 CN-21 (FR) CN-102 (RR)	24V 1.5A 2-speed Auto parking	-
Cigar lighter	 CL-2	24V 5A 1.4W	Coil resistance normal : about 1MΩ
Alternator	 CN-74	Dehong 24V 110A	Voltage normal : 24~28V
Starter	 CN-45	24V 7.5kW	Operating or not
Aircon compressor	 CN-28	24V 79W	Resistance normal : 13.4Ω
Start relay	 CR-23	24V 300A	Coil resistance normal : 1-2Ω Switch connection ∞Ω at normal open position 0Ω when engaged

Part name	Symbol	Specifications	Check item
Blower motor		24V 9.5A	Resistance at each switch position normal : 0.5-2Ω
Door switch	 CS-1 CS-55	24V 2W	Resistance normal : about 5MΩ
Flasher unit	 CR-11	24V 85 ~ 190 C/M 50dB	-
Head lamp	 CL-3 CL-4	24V 75W/70W (H4 TYPE) 24V 4W (T4W)	Resistance normal : a few Ω
Combi lamp (rear)	 CL-15 CL-16	24V 5W (R5W) 2×24V 21W (P21W)	-
Master switch	 CS-74 CS-75	Continuous capacity : 180Amp Push in capacity : 1000Amp	-

Part name	Symbol	Specifications	Check item
Warning buzzer	 CN-26	24V 200mA 90±5dB (ℓ m)	-
Preheater	 CN-80	24V 200A	Resistance 0.25~0.12Ω
Resistor	 CN-99	4W	Resistance A - B : 120Ω

GROUP 5 CONNECTORS

1. CONNECTOR DESTINATION

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-1	DEUTSCH	48	I/conn (Frame harness-Main harness)	DRB16-48SAE-L018	DRB12-48PAE-L018
CN-3	DEUTSCH	6	Tool box ext	DT06-4S	-
CN-4	DEUTSCH	60	I/conn (Engine harness-Main harness)	DRB16-60SAB-L018	DRB12-60PAE-L018
CN-5	DEUTSCH	60	I/conn (Front harness-Main harness)	DRB16-60SBE-L018	DRB12-60PBE-L018
CN-7	AMP	15	I/conn (Main harness-Cab harness)	2-85262-1	368301-1
CN-9	AMP	6	I/conn (Main harness-Cab harness)	2-85262-1	368301-1
CN-11	AMP	15	I/conn (Main harness-Aircon harness)	2-85262-1	368301-1
CN-12	DEUTSCH	35	I/conn (Front harness-Bottom harness)	HDP26-24-35SN	HDP24-24-35PN
CN-14	DEUTSCH	12	I/conn (Frame harness-Grill harness)	DT06-12S	DT04-12P
CN-15	KET	11	I/conn (RH console harness-Main harness)	MG651350	MG641353
CN-16	DEUTSCH	2	Axle oil temp sensor	DT06-2S	-
CN-18	DEUTSCH	12	LH seat console	DT06-12S	DT04-12P
CN-20	DEUTSCH	12	I/conn (Eng/TM harness-A/treat harness)	DT06-12S	DT04-12P
CN-21	DEUTSCH	12	I/conn (A/treat harness-Eng/TM harness)	DT04-12P	DT06-12S
CN-24	DEUTSCH	12	Grill harness	DT06-12S	-
CN-26	250	2	Warning buzzer	S810-002202	-
CN-26A	TYCO	10	Joystick steering	174661-2	368537-1
CN-27	KUM	16	Radio and USB player	PK145-16017	-
CN-27A	MK II	8	USB connector	174984-2	-
CN-31	DEUTSCH	3	Brake priority	DT06-3S	-
CN-36~39	-	-	Fuse box	21WG-12354	-
CN-43	AMP	2	Lock-up	282080	-
CN-45	Ring term	-	Starter	R14-12	ST 710246-2
CN-48	AMP	1	Hour meter	2-520193-2	-
CN-56	KUM	16	Cluster	PK145-16017	-
CN-57	AMP	20	Monitor	174047-2	-
CN-57C	DEUTSCH	4	Camera monitor	DT06-4S	-
CN-58A	DEUTSCH	40	MCU	DRC26-40-SA	-
CN-58B	DEUTSCH	40	MCU	DRC26-40-SB	-
CN-64	MOLEX	4	Smart key	39012040	-
CN-65	DEUTSCH	2	Back up buzzer	DT06-2S	-
CN-68	DEUTSCH	2	Pilot cut off	DT06-2S	-
CN-71	DEUTSCH	2	Parking solenoid	DT06-2S	-
CN-72	DEUTSCH	2	Cowl open activator	DT06-2S	-
CN-74	DELPHI	2	Alternator	13964572	-

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-79	DEUTSCH	2	Differential lock solenoid	DT06-2S-EP06	-
CN-79A	AMP	6	Differential lock solenoid(Hydrauric RCV)	S816-006002	S816-106002
CN-79A	DEUTSCH	2	Differential lock foot switch	DT06-2S-EP06	DT04-2P-E005
CN-83	NMWP	2	Aircon fan	PB625-02027	-
CN-99	DEUTSCH	6	Rear view camera	DT06-6S	
CN-100	DEUTSCH	3	Boom kick out	DT06-3S	-
CN-101	DEUTSCH	3	Bucket leveler	DT06-3S	DT04-3P
CN-102	KET	2	Front washer tank	MG640605	-
CN-103	KET	2	Rear washer tank	MG640605	-
CN-110	DEUTSCH	2	RCV lever	DT06-6S	-
CN-112	DELPHI	21	TCU	1-1534127-1	-
CN-114	DEUTSCH	6	Finger tip lever	DT06-6S	-
CN-115	DEUTSCH	6	Auto grease	DT06-6S	DT04-6P
CN-120	MOLEX	2	Horn	26825-0211	-
CN-121	MOLEX	2	Horn	26825-0211	-
CN-122	AMP	8	DEF dosing module	1-1418479-1	-
CN-123	YAZAKI	2	Speaker (LH)	7123-1520	-
CN-124	YAZAKI	2	Speaker (RH)	7123-1520	-
CN-125	DEUTSCH	12	Remote management control unit	DT06-12S	DT04-12P
CN-126	DEUTSCH	9	Data link	HD10-9-96P	-
CN-128	KEI	1	Aircon compressor	PB625-01027	-
CN-129	KET	2	Receiver drier	MG640795	-
CN-134	AMP	6	Diagnostic (TCU)	1-480705-0	-
CN-136	AMP	2	Ride control solenoid	85202-1	-
CN-136A	AMP	2	I/conn (Ride control harness-Front harness)	S816-002002	S816-102002
CN-137	AMP	2	12V socket	174198-1	-
CN-138	AMP	12	DC/DC Converter	1-967622-1	-
CN-139	AMP	2	12V socket	174198-1	-
CN-140	-	2	12V socket	S810-002202	-
CN-149	DEUTSCH	2	Mirror heat (LH)	DT06-2S	DT04-2P
CN-150	DEUTSCH	2	Mirror heat (RH)	DT06-2S	DT04-2P
CN-152	AMP	4	Proportional valve	2-967059-1	-
CN-154	DEUTSCH	2	Fan speed solenoid	DT06-2S	-
CN-155	DEUTSCH	2	Fan reverse solenoid	DT06-2S	-
CN-156	DEUTSCH	2	Seat heat (with switch)	DT06-2S	DT04-2P
CN-157	AMP	68	T/M control unit	963598-1	-
CN-158	PACKARD	4	Gear shift lever	1201-0974	-

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-159	DEUTSCH	12	Gear shift lever	DT06-12S	-
CN-160	CARLING	12	FNR joystick lever	LC3-01	-
CN-162	AMP	6	Pedal	174262-2	-
CN-163	AMP	2	ECO feeling switch	174352-2	-
CN-171	AMP	2	Service socket	174198-1	-
CN-177	DEUTSCH	2	Quick coupler unlock solenoid	DT06-2S-EP04	-
CN-177A	AMP	3	I/conn (Front harness-Quick coupler harness)	S816-003002	S816-103002
CN-178	DEUTSCH	2	Quick coupler lock solenoid	DT06-2S-EP04	-
CN-196	-	2	Fuel heater	15300027	-
CN-203	AMP	6	Rear wiper motor	936257-1	-
CN-246	KET	1	PTO power	-	MG620659-5
CN-249	DEUTSCH	4	Camera	DT06-4S	DT04-4P
CN-250	Econoseal J	4	Rear view camera	S816-004002	S816-104002
CN-252	TYCO	6	Differential lock	S816-006602	S816-106602
CN-271	DEUTSCH	3	AUX	DT06-3S	-
CN-399	DEUTSCH	4	DEF sensor	DT06-4S	-
CN-431	KET	20	AAVM monitor	MG653026	-
CN-641	KET	3	Button start switch	-	MG641035
CN-C21	AMP	4	DEF supply module	2-1418390-1	-
CN-J2	DELPHI	96	ECM	13964572	-
CN-J5	DEUTSCH	3	CAN I resister	DT04-3P	-
CN-J7A	AMP	4	Nox sensor engine inlet	2-1418390-1	-
CN-J7B	AMP	4	Nox sensor turbo pipe	1-1418390-1	-
CN-J10	AMP	4	SCR temp sensor	3-1418390-1	-
CN-J17	AMP	4	DOC temp sensor	4-1418390-1	-
CN-J18	DELPHI	4	DEF delta pressure sensor	54200410	-
CN-J27	AMP	4	DEF heater valve	1-967325-1	-
CN-J28	DEUTSCH	2	Hose heating PR line	DT06-2S	-
CN-J29	DEUTSCH	2	Hose heating back line	DT06-2S	-
CN-J30	DEUTSCH	2	Hose heating suction line	DT06-2S	-
CN-J31	BOSCH	2	DEF dosing inlet valve	1-928-403-874	-
CN-J78	DEUTSCH	2	Water in fuel	DT06-2S	-
EH-09	DEUTSCH	6	Boom lever	DT06-6S	-
EH-10	DEUTSCH	6	Bucket lever	DT06-6S	-
EH-11	DEUTSCH	6	Auxiliary lever	DT06-6S	DT04-6P
EH-23	DEUTSCH	50	Electro-hydraulic control unit	DRC26-505-01	-

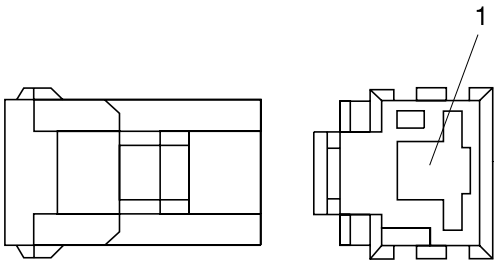
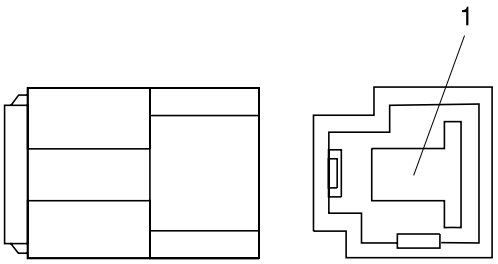
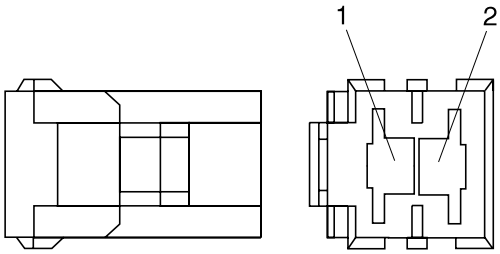
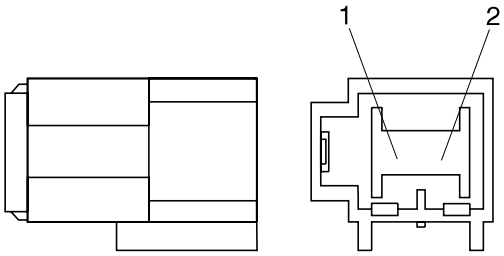
Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
Relay					
CR-1	Ring term	-	Battery relay	S820-104002	-
CR-2A	DEUTSCH	2	Battery relay	DT06-2S	-
CR-2	AMP	5	Horn relay	VCFM-1002	-
CR-3	AMP	5	Front work lamp relay	VCFM-1002	-
CR-4	AMP	5	Wiper relay (Hi)	VCFM-1002	-
CR-5	HELLA	5	Safety relay	8JA003526-001	-
CR-7	AMP	5	Aircon relay	VCFM-1002	-
CR-11	HES	3	Flasher unit	S810-003702	-
CR-23	Ring term	-	Start relay	ST 710289-2	ST 710384-2
CR-24	Shur	1	Preheater relay	S822-014000	-
CR-25	AMP	5	Rear wiper relay	VCFM-1002	-
CR-26	AMP	5	Wiper relay (low)	VCFM-1002	-
CR-30	HELLA	5	ECM power relay	8JA003526-001	-
CR-36	AMP	5	Preheater relay	VCFM-1002	-
CR-39	DEUTSCH	2	Emergency steering pump relay	DT06-2S	DT04-2P
CR-40	KET	5	EHCU power relay	MG610047-1	-
CR-46	HELLA	5	Fuel warmer relay	8JA003526-001	-
CR-55	AMP	5	Rear work lamp relay	VCFM-1002	-
CR-56	KET	5	Mirror heat relay	MG610047-1	-
CR-58	AMP	5	Back up relay	VCFM-1002	-
CR-63	AMP	5	Stop lamp relay	VCFM-1002	-
Switch					
CS-1	AMP	1	Door limit switch	ST730018-3	-
CS-2	AMP	6	Start key switch	S814-006000	-
CS-2A	AMP	6	Button start relay	S814-006000	-
CS-2B	DEUTSCH	3	BKCU	DT06-3S-EP06	-
CS-2C	KET	3	Button start relay	MG651032	-
CS-4	CARING	10	Pilot cut off switch	VC2-01	-
CS-11	KET	8	Multi function switch	MG610339-5	-
CS-12	KET	6	Multi function switch	MG610335-5	-
CS-13	KET	1	Multi function switch	S822-014000	-
CS-17	CARING	10	Parking switch	VC2-01	-
CS-33	AMP	6	Engine stop switch	174262-2	-
CS-41	CARING	10	Hazard switch	VC2-01	-
CS-74	-	2	Master switch	S813-030200	-
CS-75	CARING	10	Emergency steering test switch	VC2-01	-
CS-79	CARING	10	Differential lock switch	VC2-01	-

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CS-85, 85L	KET	2	Workload switch	MG610070	MG620074
CS-86, 86L	KET	2	Kick down switch	MG610070	MG620074
CS-87, 87L	KET	2	Horn switch	MG610070	MG620074
CS-88, 88L	KET	2	FNR select switch	MG610070	MG620074
CS-105	CARING	10	DPF switch	VC2-01	-
CS-160	-	9	Joystick lever switch	1-480706-0	-
Light					
CL-1	KET	3	Room lamp	MG651032	-
CL-2	KET AMP	1 2	Cigar lighter	S822-014000 174196-1	S822-114000 -
CL-3	DEUTSCH	6	Head light (LH)	DT06-6S	-
CL-4	DEUTSCH	6	Head light (RH)	DT06-6S	-
CL-15	YAZAKI	4	Combi lamp (RR, LH)	7232-7444	-
CL-16	YAZAKI	4	Combi lamp (RR, RH)	7232-7444	-
CL-21	KET	2	Number plate lamp	MG610320	MG640322
CL-22	DEUTSCH	2	Work light (LH)	DT06-2S	-
CL-23	DEUTSCH	2	Work light (RH)	DT06-2S	-
CL-32	DEUTSCH	2	Rear work light (LH)	DT06-2S	DT04-2P
CL-33	DEUTSCH	2	Rear work light (RH)	DT06-2S	DT04-2P
CL-35	DEUTSCH	2	Rear work light (LH, opt)	DT06-2S	DT04-2P
CL-36	DEUTSCH	2	Rear work light (RH, opt)	DT06-2S	DT04-2P
CL-42	DEUTSCH	2	Rear work light (opt)	DT06-2S	DT04-2P
CL-43	DEUTSCH	2	Rear work light (opt)	DT06-2S	DT04-2P
CL-45	DEUTSCH	2	Work light (RH)	DT06-2S-EP06	-
CL-46	DEUTSCH	2	Work light (LH)	DT06-2S-EP06	-
CL-117	AMP	2	Beacon lamp	174198-2	-
Sensor, sender					
CD-1	AMP	2	Hyduaulic oil temp sendor	85202-2	-
CD-2	YAZAKI	2	Fuel sendor	7123-7424	-
CD-3	DEUTSCH	3	Brake fail pressure switch	DT06-3S	-
CD-4	DEUTSCH	3	Stop lamp pressure switch	DT06-3S	-
CD-5A	DEUTSCH	3	Clutch cut off pressure switch	DT06-3S	-
CD-8	DEUTSCH	3	Boom up pressure switch	DT06-3S	-
CD-10	AMP	2	Air cleaner switch	85202-1	-
CD-16	TYCO	2	Axle temp	85202-1	-
CD-17	AMP	2	Engine pick-up sensor	85202-1	-
CD-18	DEUTSCH	3	Boom down pressure switch	DT06-3S	-

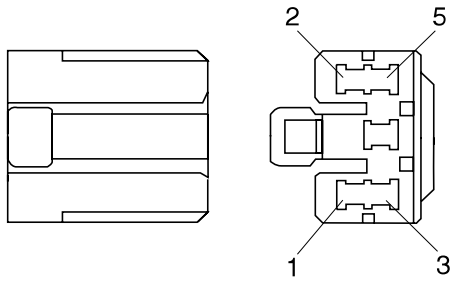
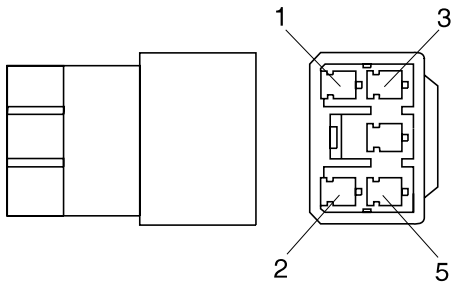
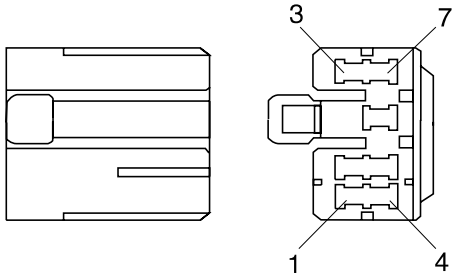
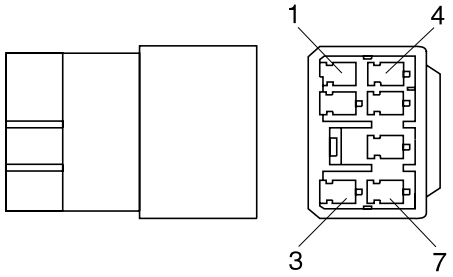
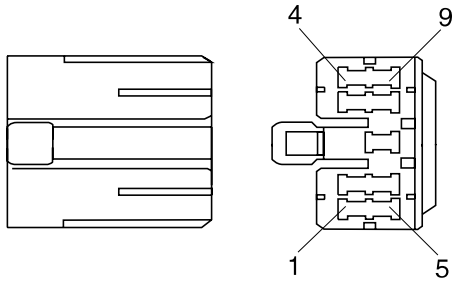
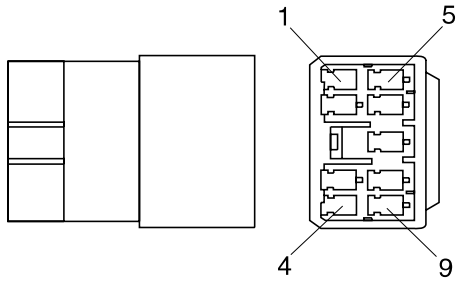
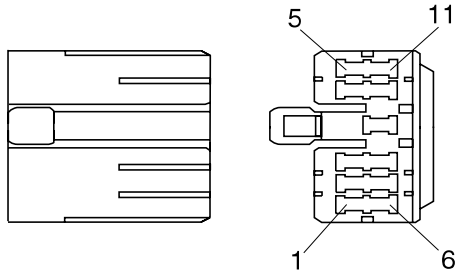
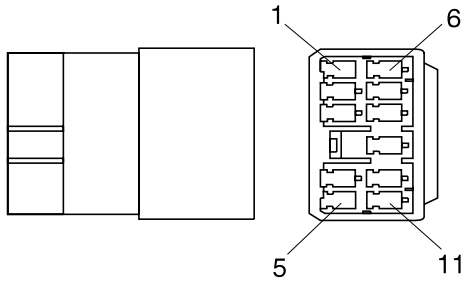
Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CD-26	DEUTSCH	3	Parking pressure switch	DT06-3S	-
CD-31	DEUTSCH	3	Brake priority	DT06-3S	-
CD-39	DEUTSCH	3	Main pump pressure switch	DT06-3S	-
CD-40	DEUTSCH	3	Steering pump pressure switch	DT06-3S	-
CD-43	AMP	2	Lock up proportional valve	282027	-
CD-45	DEUTSCH	2	WIF sensor	DT06-2S-EP06	-
CD-58	DEUTSCH	3	Steering pump pressure switch	DT06-3S	-
CD-73	AMP	2	Fan speed sendsor	174352-2	-
CD-79	DEUTSCH	3	Diff lock feed back sensor	DT06-3S-EP06	-
CD-80	DEUTSCH	3	Boom positioner sensor	DT06-3S	-
CD-81	DEUTSCH	3	Bucket positioner sensor	DT06-3S	-
CD-96	PACKARD	3	Coolant level sensor	12110293	-
CD-101	SUMITOMO	4	TBAP sensor	6098-0144	-

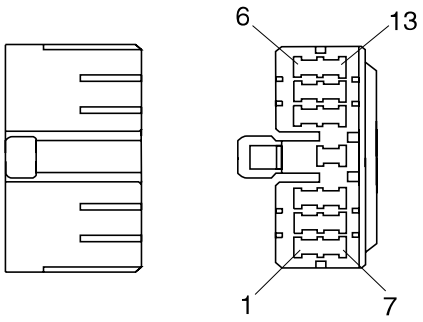
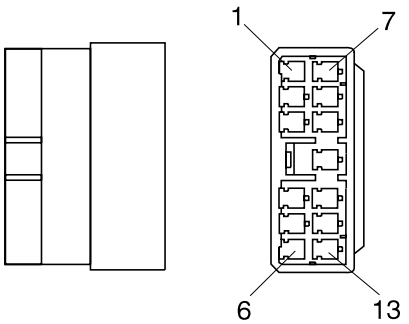
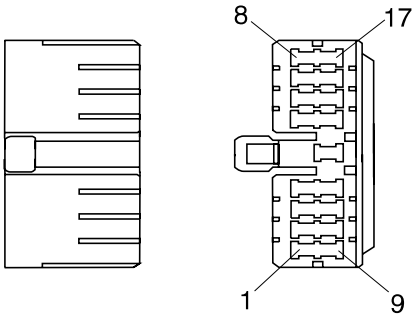
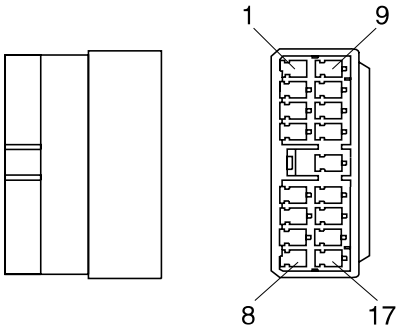
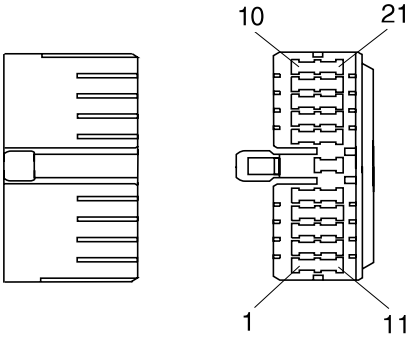
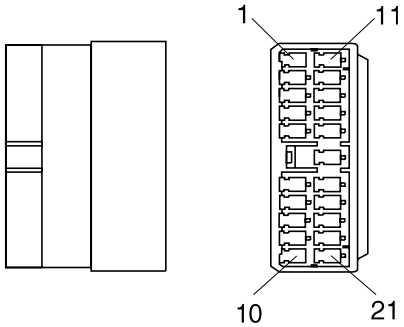
2. CONNECTION TABLE FOR CONNECTORS

1) 58-L TYPE CONNECTOR

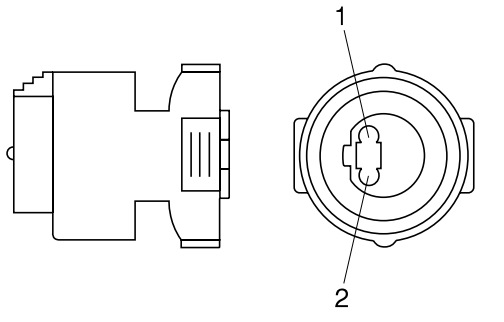
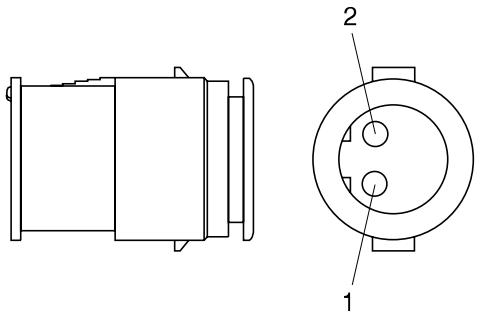
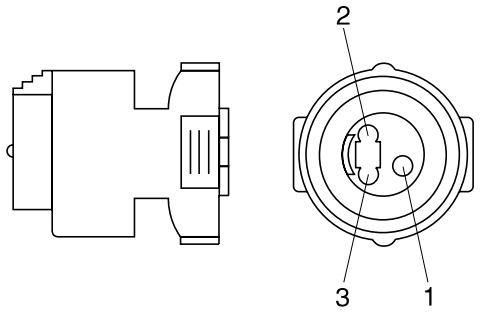
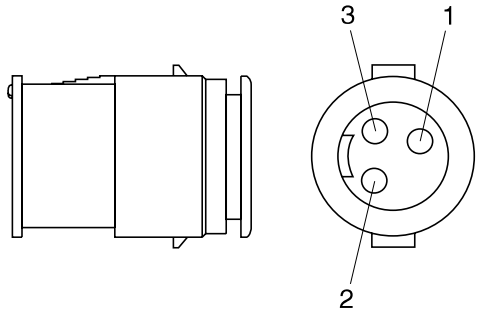
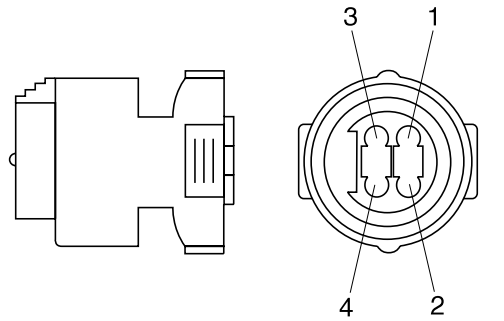
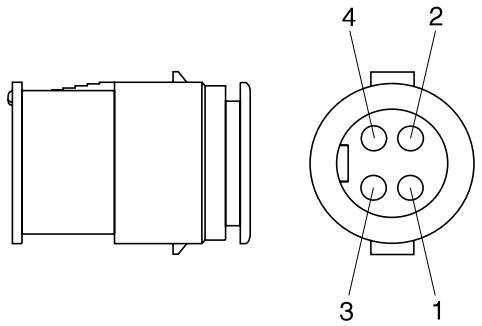
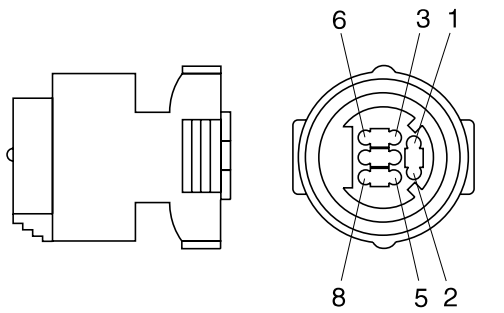
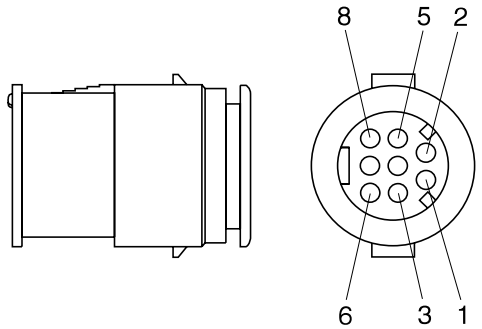
No. of pin	Receptacle connector (female)	Plug connector (male)
1	 S813-030100	 S813-130100
2	 S813-030200	 S813-130200

2) PA TYPE CONNECTOR

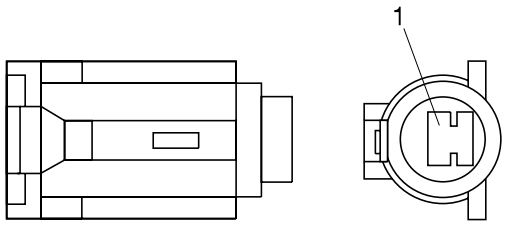
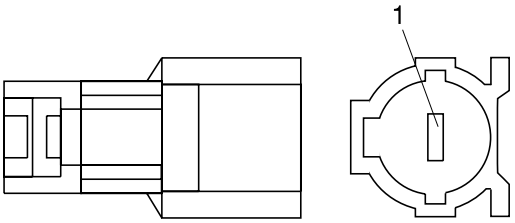
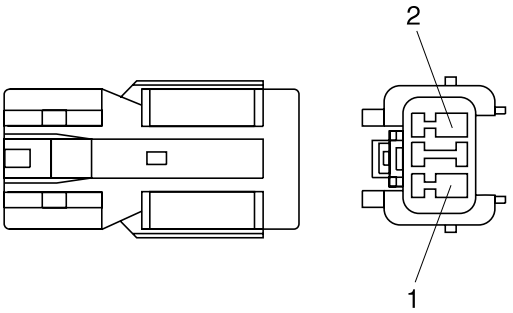
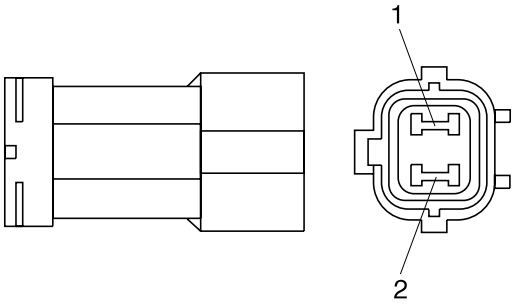
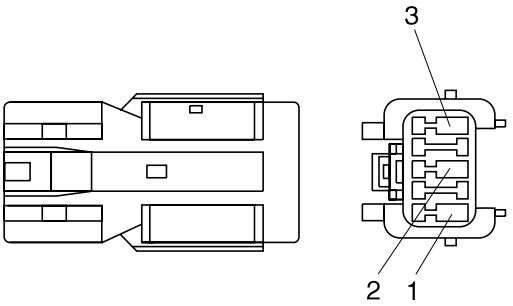
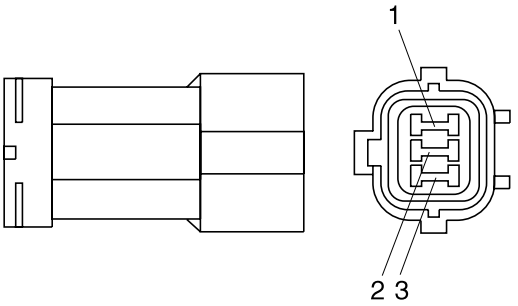
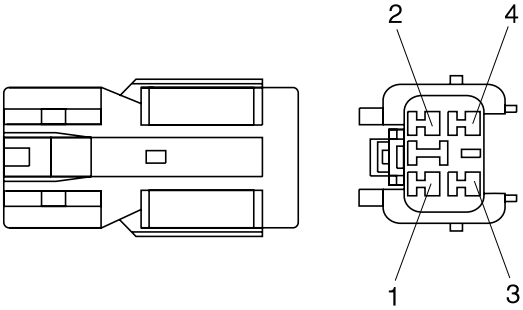
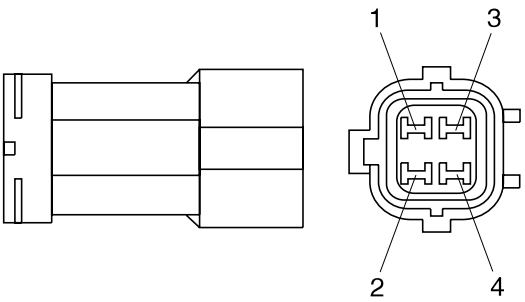
No. of pin	Receptacle connector (female)	Plug connector (male)
5	 S811-005002	 S811-105002
7	 S811-007002	 S811-107002
9	 S811-009002	 S811-109002
11	 S811-011002	 S811-111002

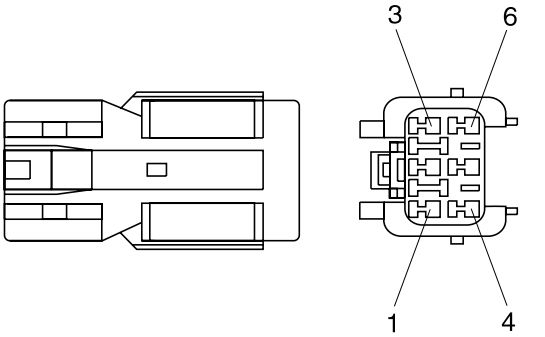
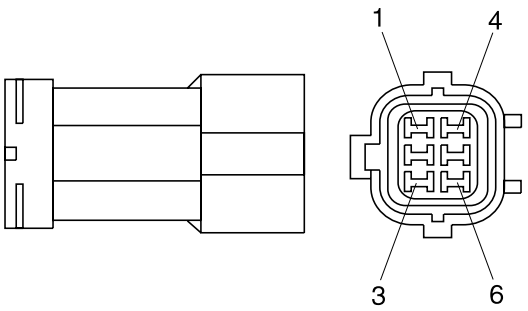
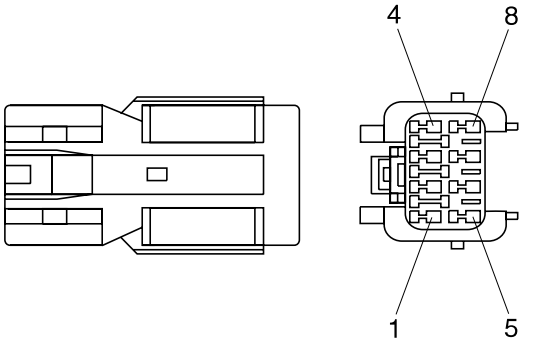
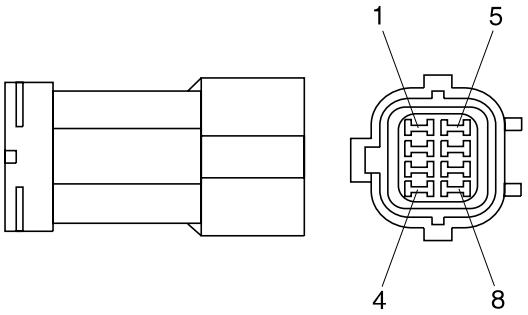
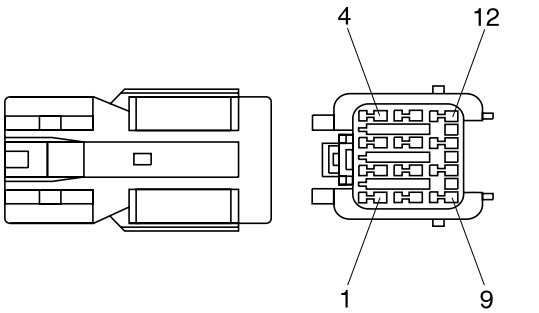
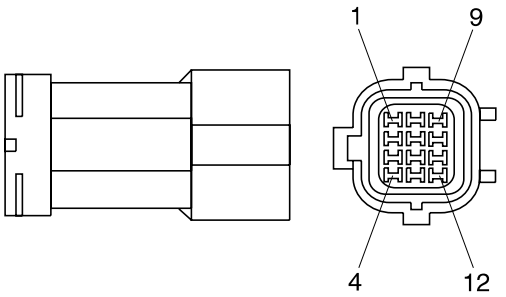
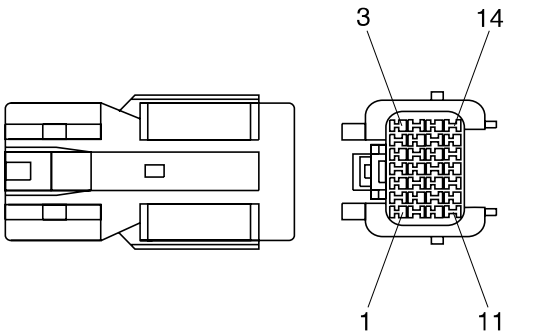
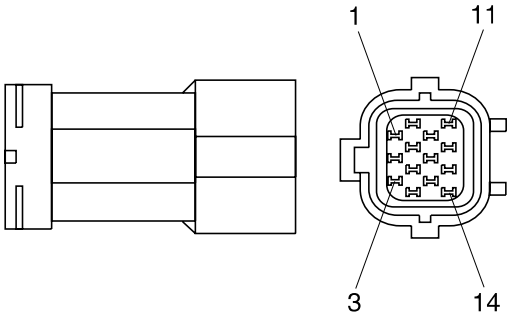
No. of pin	Receptacle connector (female)	Plug connector (male)
13	 S811-013002	 S811-113002
17	 S811-017002	 S811-117002
21	 S811-021002	 S811-121002

3) J TYPE CONNECTOR

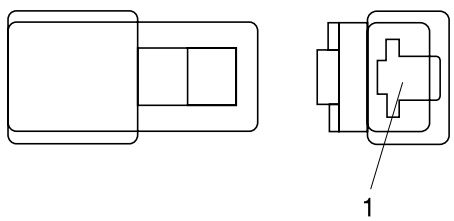
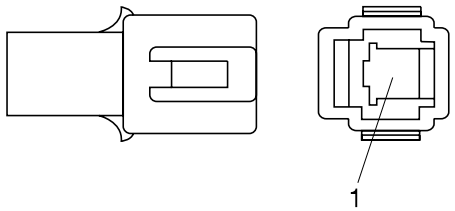
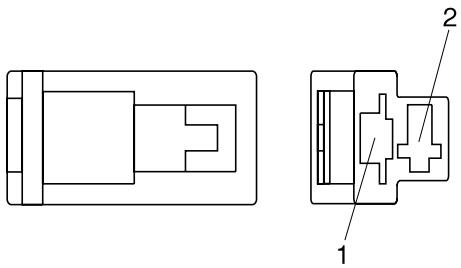
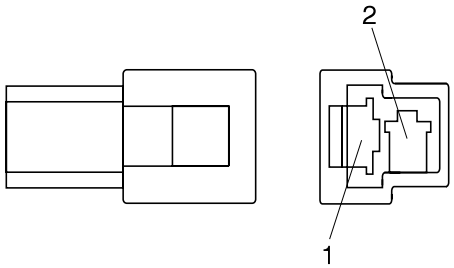
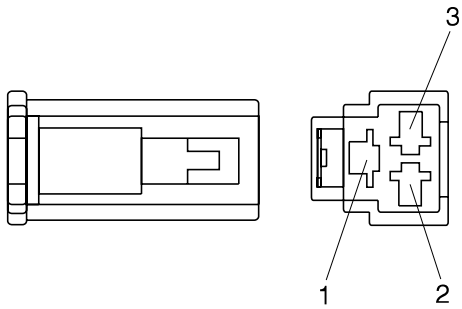
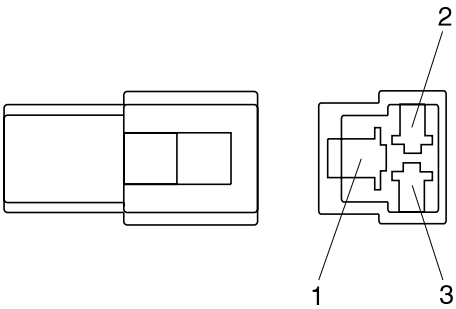
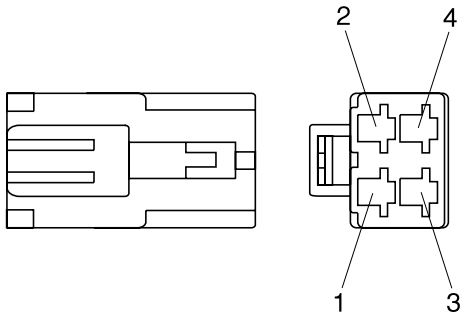
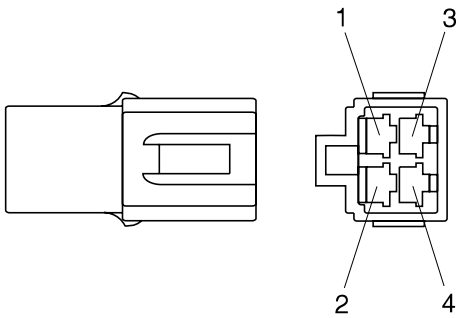
No. of pin	Receptacle connector (female)	Plug connector (male)
2	 S816-002001	 S816-102001
3	 S816-003001	 S816-103001
4	 S816-004001	 S816-104001
8	 S816-008001	 S816-108001

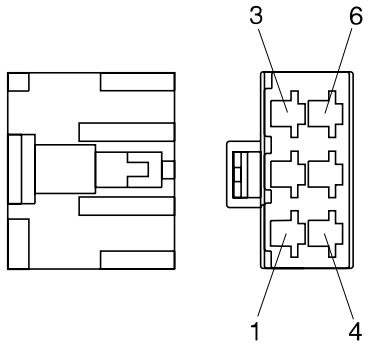
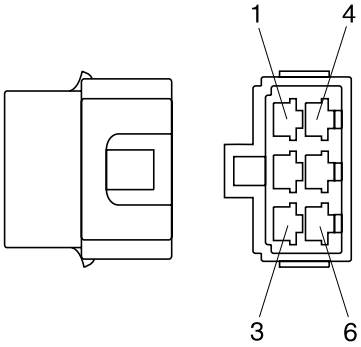
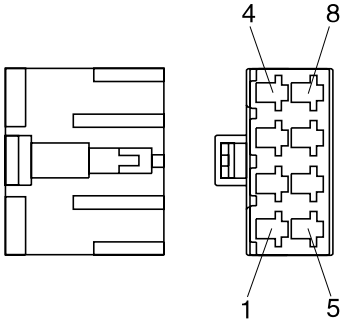
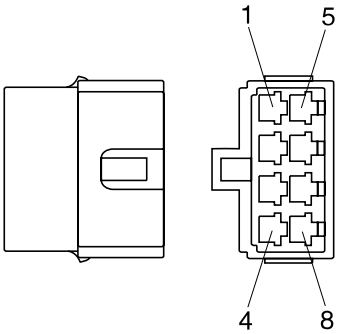
4) SWP TYPE CONNECTOR

No. of pin	Receptacle connector (Female)	Plug connector (male)
1	 S814-001000	 S814-101000
2	 S814-002000	 S814-102000
3	 S814-003000	 S814-103000
4	 S814-004000	 S814-104000

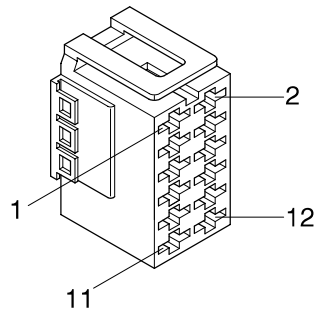
No. of pin	Receptacle connector (female)	Plug connector (male)
6	 S814-006000	 S814-106000
8	 S814-008000	 S814-108000
12	 S814-012000	 S814-112000
14	 S814-014000	 S814-114000

5) CN TYPE CONNECTOR

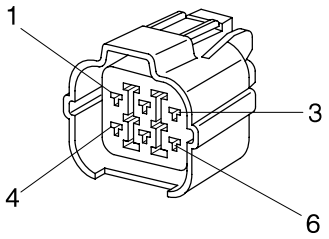
No. of pin	Receptacle connector (female)	Plug connector (male)
1	 S810-001202	 S810-101202
2	 S810-002202	 S810-102202
3	 S810-003202	 S810-103202
4	 S810-004202	 S810-104202

No. of pin	Receptacle connector (female)	Plug connector (male)
6	 S810-006202	 S810-106202
8	 S810-008202	 S810-108202

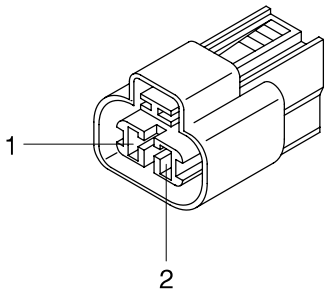
6) ITT SWF CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
10	 SWF589790	

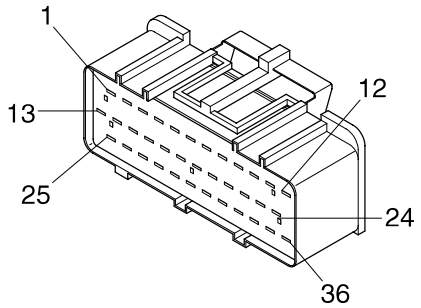
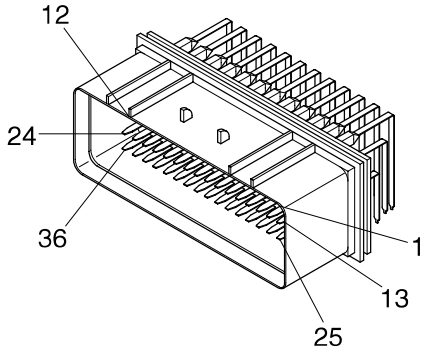
7) HW090 SEALED CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
6	 6189-0133	

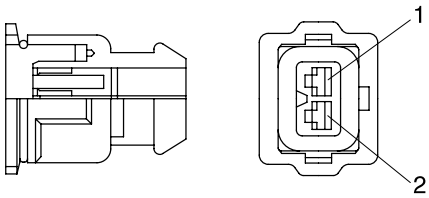
8) MWP02F-B CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
2	 PH805-02028	

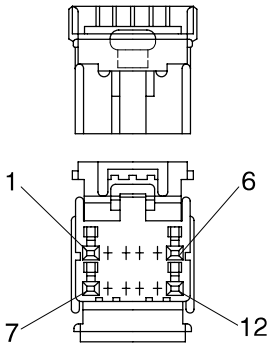
9) AMP ECONOSEAL CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
36	 344111-1	 344108-1

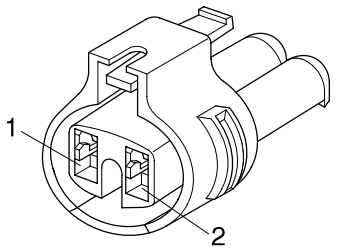
10) AMP TIMER CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
2	 85202-1	

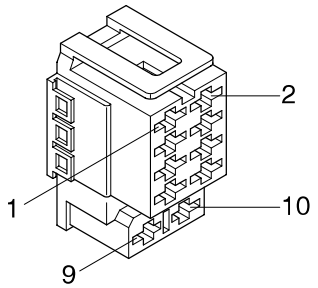
11) AMP 040 MULTILOCK CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
12	 174045-2	

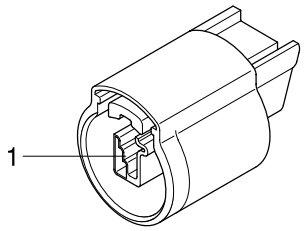
12) KET 090 WP CONNECTORS

No. of pin	Receptacle connector (female)	Plug connector (male)
2	 MG640795	

13) ITT SWF CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
10	 SWF593757	

14) MWP NMWP CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
1	 NMWP01F-B	

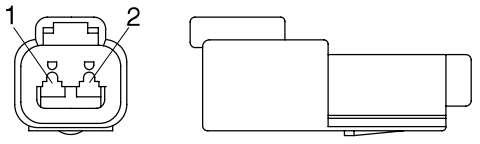
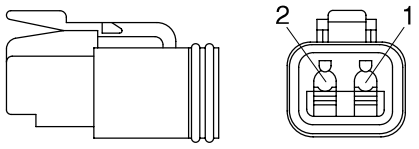
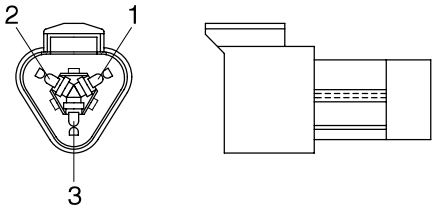
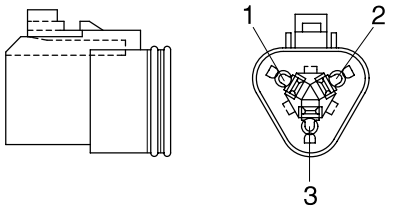
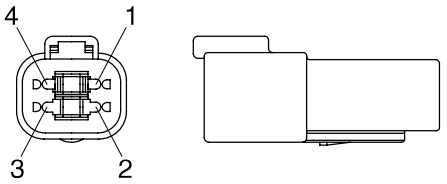
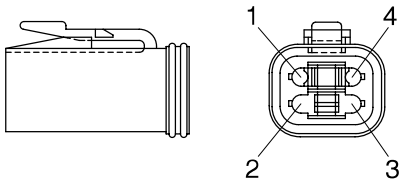
15) DEUTSCH DT CONNECTORS

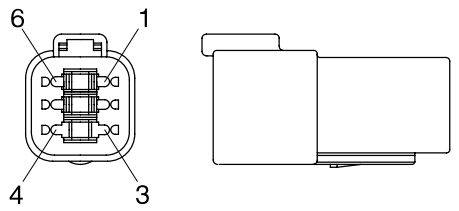
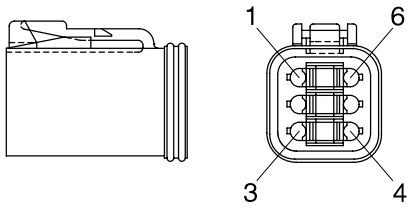
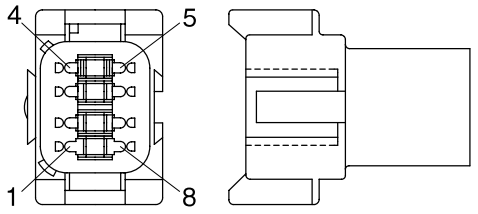
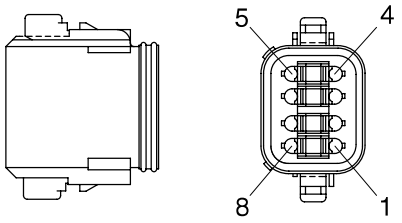
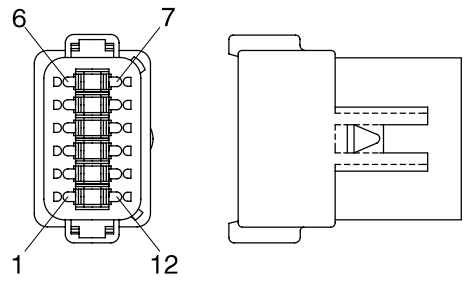
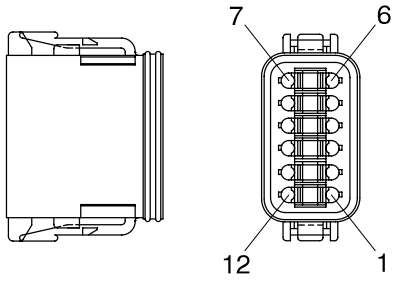
DT 06 - 3S - ★★★★

- ★★★★ — Modifications (see below)
- 3S — Number of contacts (P : Pin, S : Socket)
- 06 — 04 : Receptacle, 06 : Plug
- DT — Deutsch connetors

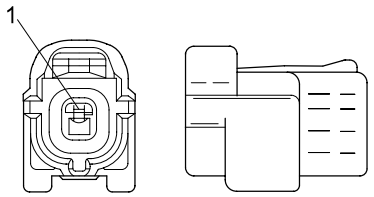
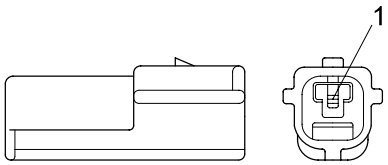
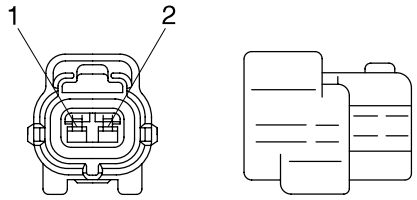
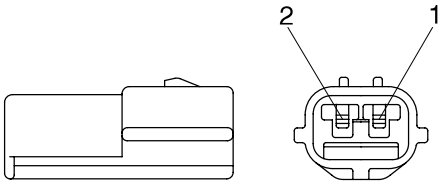
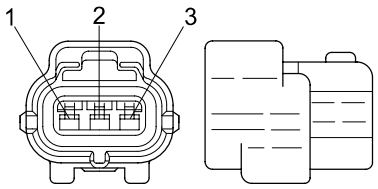
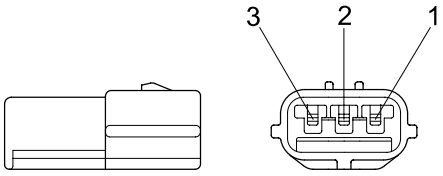
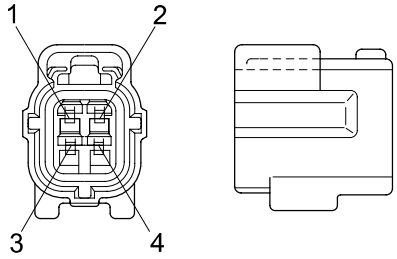
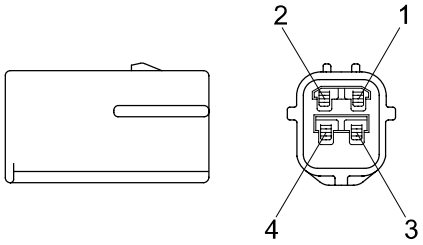
※ Modification

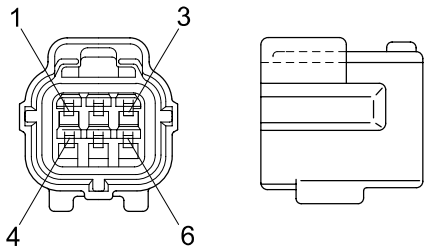
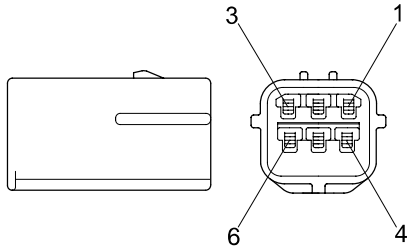
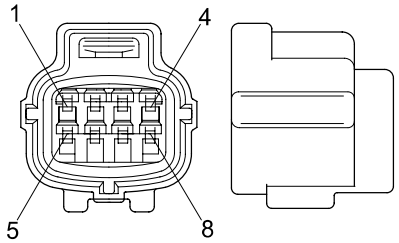
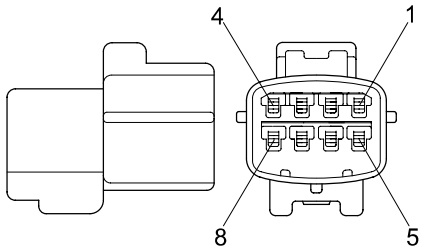
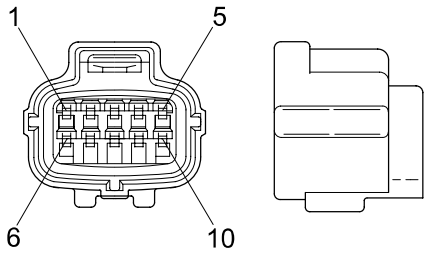
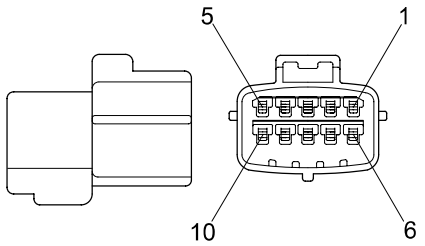
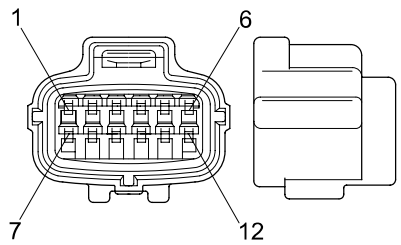
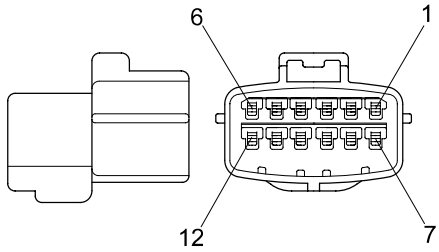
E003 : Standard end cap - gray
E004 : Color of connector to be black
E005 : Combination - E004 & E003
EP04 : End cap
EP06 : Combination P012 & EP04
P012 : Front seal enhancement - connectors color to black for 2, 3, 4 & 6pin

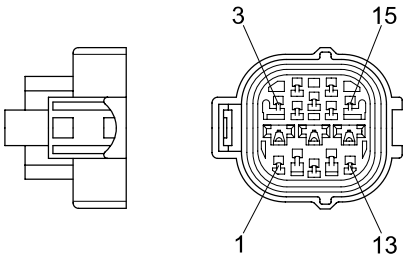
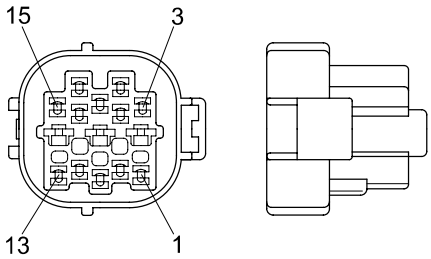
No. of pin	Receptacle connector (female)	Plug connector (male)
2	 DT06-2S	 DT04-2P
3	 DT06-3S	 DT04-3P
4	 DT06-4S	 DT04-4P

No. of pin	Receptacle connector (female)	Plug connector (male)
6	 DT06-6S	 DT04-6P
8	 DT06-8S	 DT04-8P
12	 DT06-12S	 DT04-12P

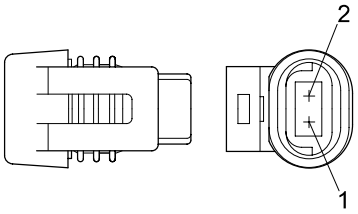
16) ECONOSEAL J TYPE CONNECTORS

No. of pin	Receptacle connector (female)	Plug connector (male)
1	 S816-001002	 S816-101002
2	 S816-002002	 S816-102002
3	 S816-003002	 S816-103002
4	 S816-004002	 S816-104002

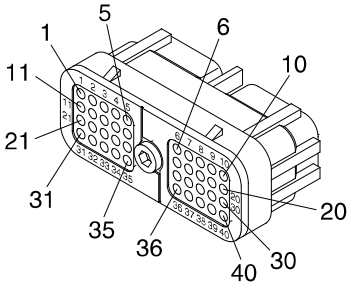
No. of pin	Receptacle connector (female)	Plug connector (male)
6	 S816-006002	 S816-106002
8	 S816-008002	 S816-108002
10	 S816-010002	 S816-110002
12	 S816-012002	 S816-112002

No. of pin	Receptacle connector (female)	Plug connector (male)
15	 368301-1	 2-85262-1

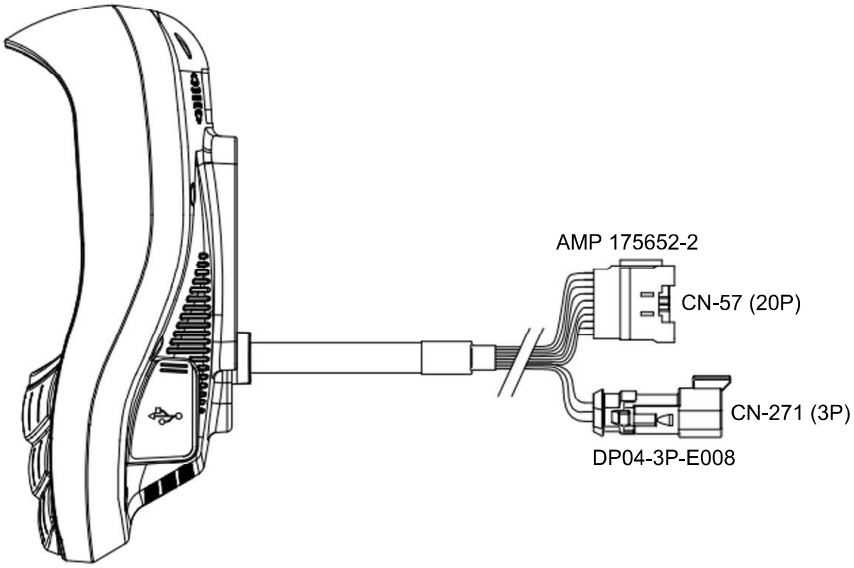
17) METRI-PACK TYPE CONNECTOR

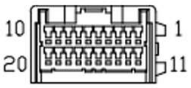
No. of pin	Receptacle connector (female)	Plug connector (male)
2	 12040753	

18) DEUTSCH MCU CONNECTOR

No. of pin	Receptacle connector (Female)	Plug connector (Male)
40	 DRC26-40SA/B/C	

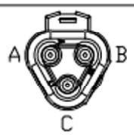
19) MONITOR CONNECTOR (21WD-11100, 21WD-11101, 21WD-11102)





PART NO. : AMP 175652-2

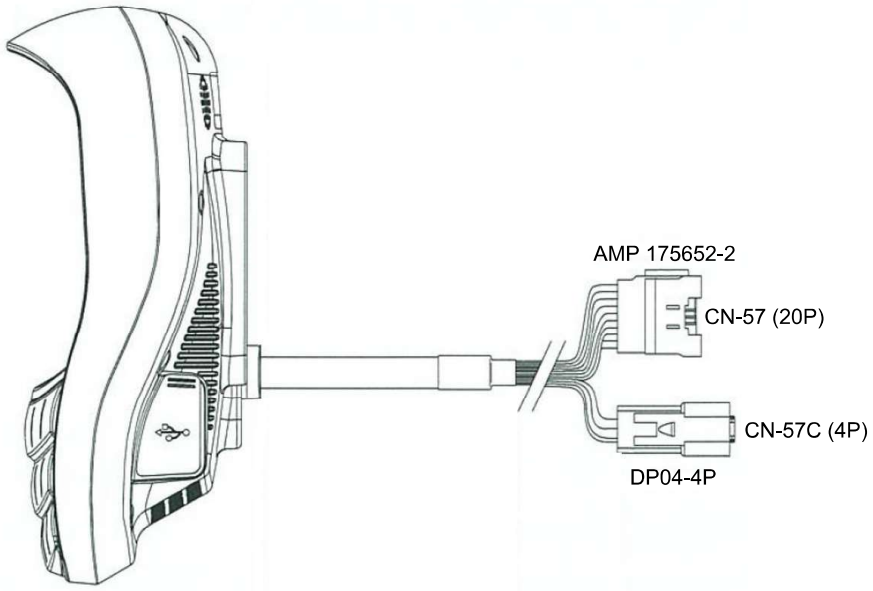
NO	PIN NAME	NO	PIN NAME
1	IG 24V	11	GND
2	BATTERY 24V	12	GND
3	BATTERY 24V	13	CAN1 H
4	CAMERA CH0	14	CAN2 L
5	CAMERA CH0 SIDE	15	CAN2 H
6	6.5V OUTPUT	16	CAN2 SHIELD
7	AVX LEFT	17	CAMERA SHIELD
8	AVX RIGHT	18	CAN1 LOW
9	CAMERA CH1	19	GND
10	CAMERA CH2	20	CAMERA CH3

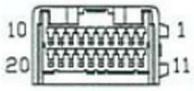


PART NO. : DP04-3P-E008

NO	PIN NAME	NO	PIN NAME
A	AUX GND	C	AUX RIGHT
B	AUX LEFT		

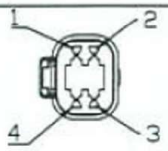
MONITOR CONNECTOR (21WD-11103, 21WD-11104)





PART NO. : AMP 175652-2

NO	PIN NAME	NO	PIN NAME
1	IG 24V	11	GND
2	BATTERY 24V	12	GND
3	BATTERY 24V	13	CAN1 H
4	CAMERA CH0	14	CAN2 L
5	CAMERA CH3 DIFF−	15	CAN2 H
6	6.5V OUTPUT	16	CAN2 SHIELD
7	N.C	17	CAMERA SHIELD
8	N.C	18	CAN1 L
9	CAMERA CH1	19	N.C
10	CAMERA CH2	20	CAMERA CH3 DIFF+



PART NO. : DT04−4P

NO	PIN NAME	NO	PIN NAME
1	CAM VCC	3	CAM CH3 +
2	CAM GND	4	CAM CH3 −

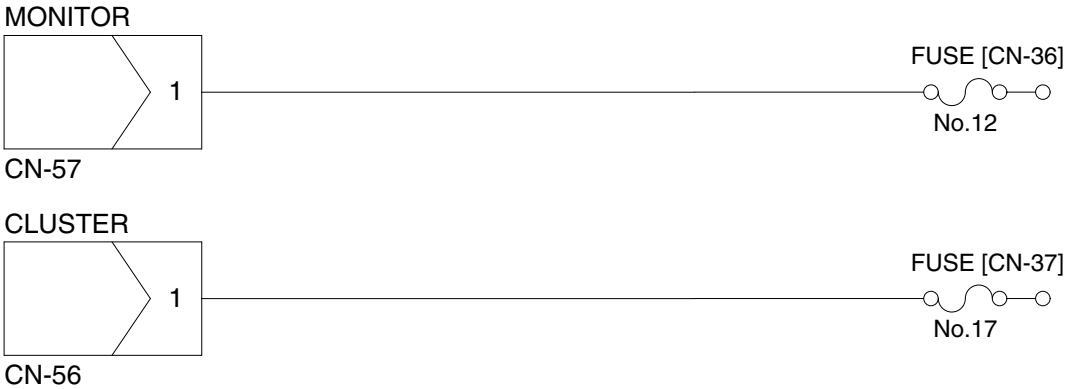
1. WHEN STARTING SWITCH IS TURNED ON, CLUSTER AND MONITOR LAMP DOES NOT LIGHT UP

· Before carrying out below procedure, check all the related connectors are properly inserted and the fuse No.12 and 17 is not blown out and ON/OFF of bulb.

· After checking, connect the disconnected connectors again immediately unless otherwise specified.

Check voltage between CN-56 (1), CN-57(1) and chassis

	Cause	Remedy
YES	Defective cluster Defective monitor	Replace Replace
NO	Disconnection in wiring harness or poor contact between CN-56 (1), CN-57 (1) and fuse No. 12 and 17.	Repair or replace (after clean)



Check voltage

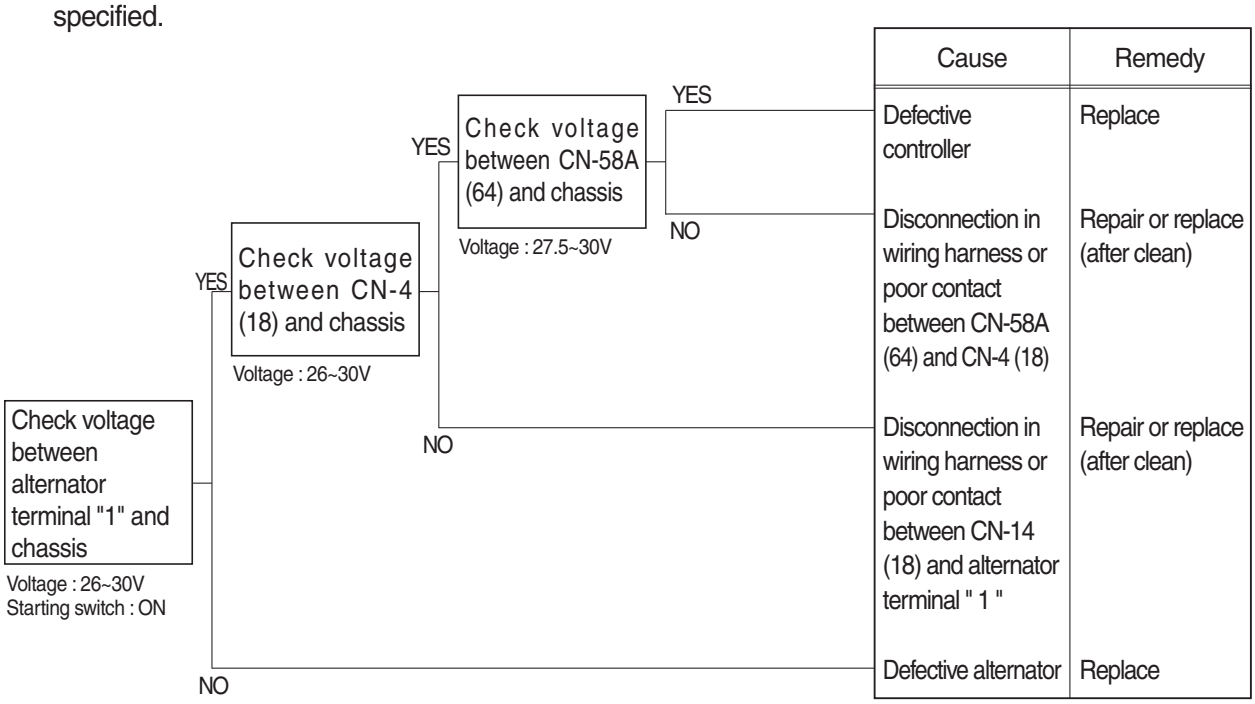
YES	20 ~ 30 V
NO	0 V

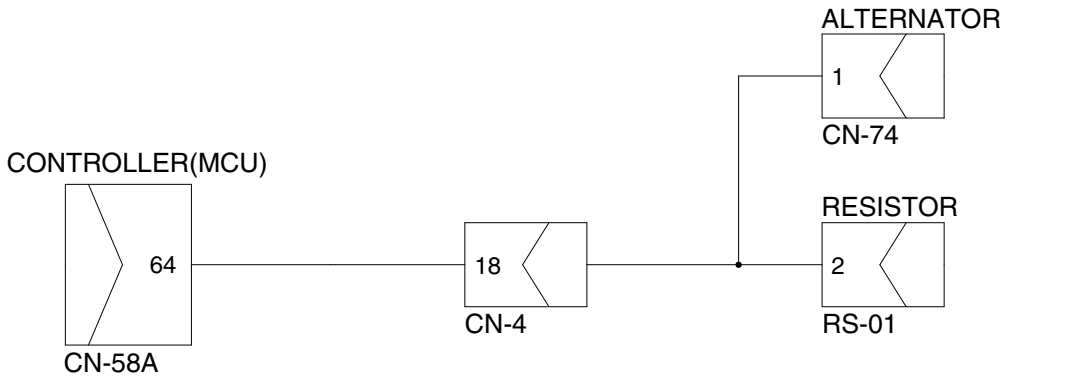
9757EL24

2. WHEN BATTERY LAMP LIGHTS UP (engine is started)

· Before carrying out below procedure, check all the related connectors are properly inserted.

· After checking, connect the disconnected connectors again immediately unless otherwise specified.





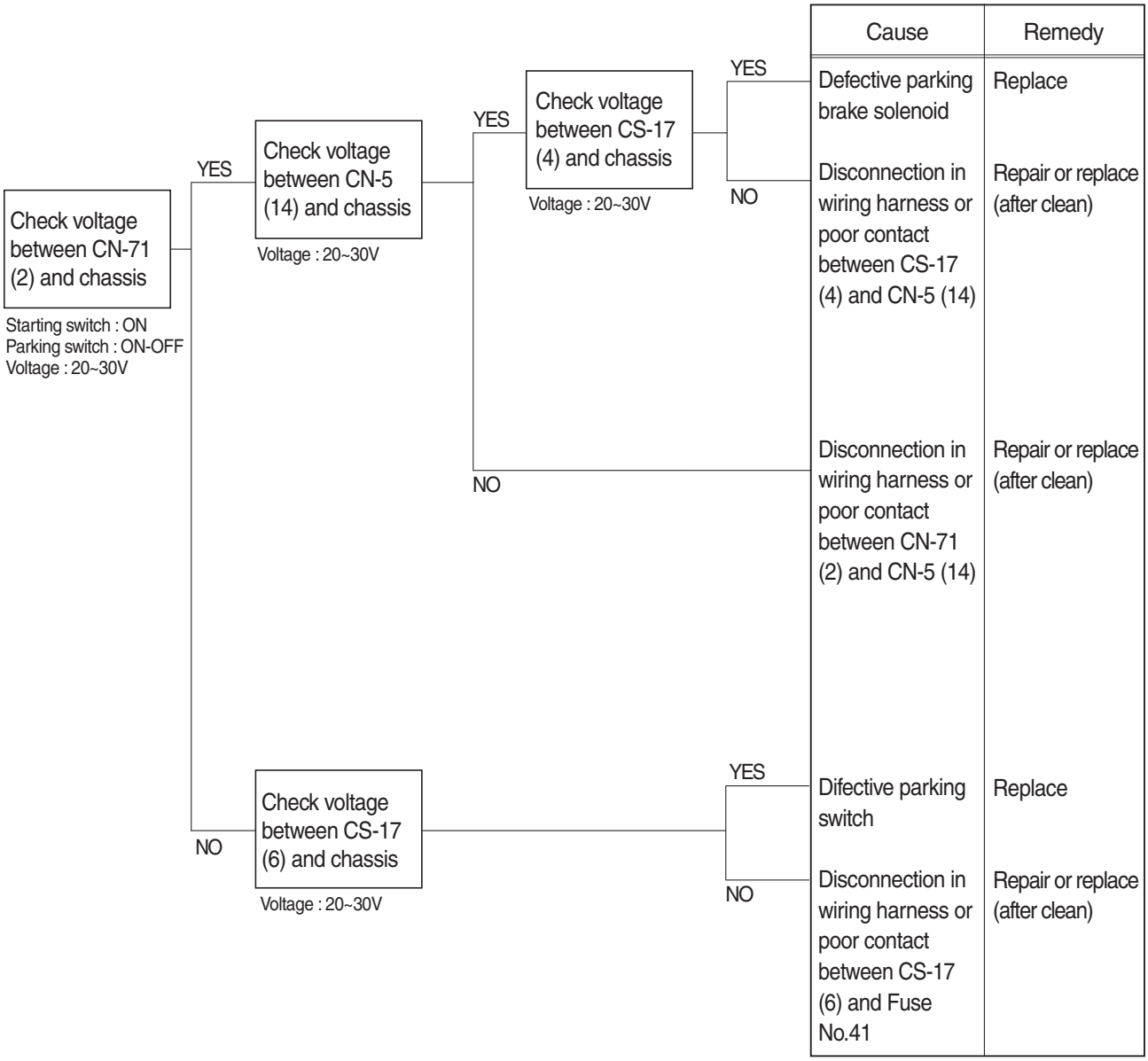
Check valtage

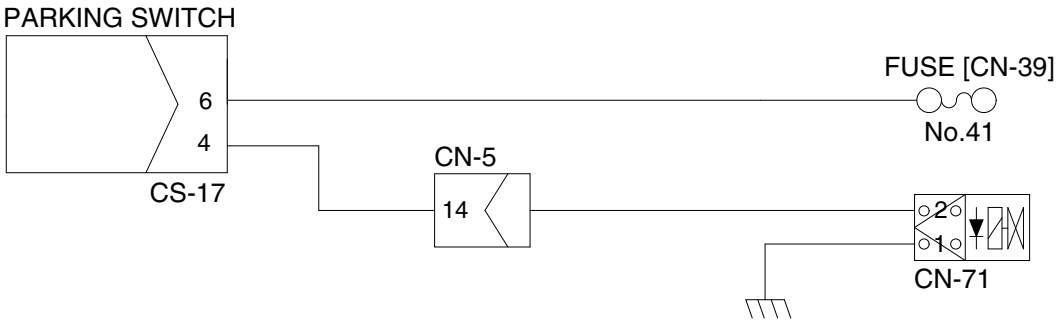
YES	20 ~ 30 V
NO	0 V

3. WHEN PARKING SOLENOID DOES NOT WORK

· Before carrying out below procedure, check all the related connectors are properly inserted and the fuse No.41 is not blown out.

· After checking, connect the disconnected connectors again immediately unless otherwise specified.

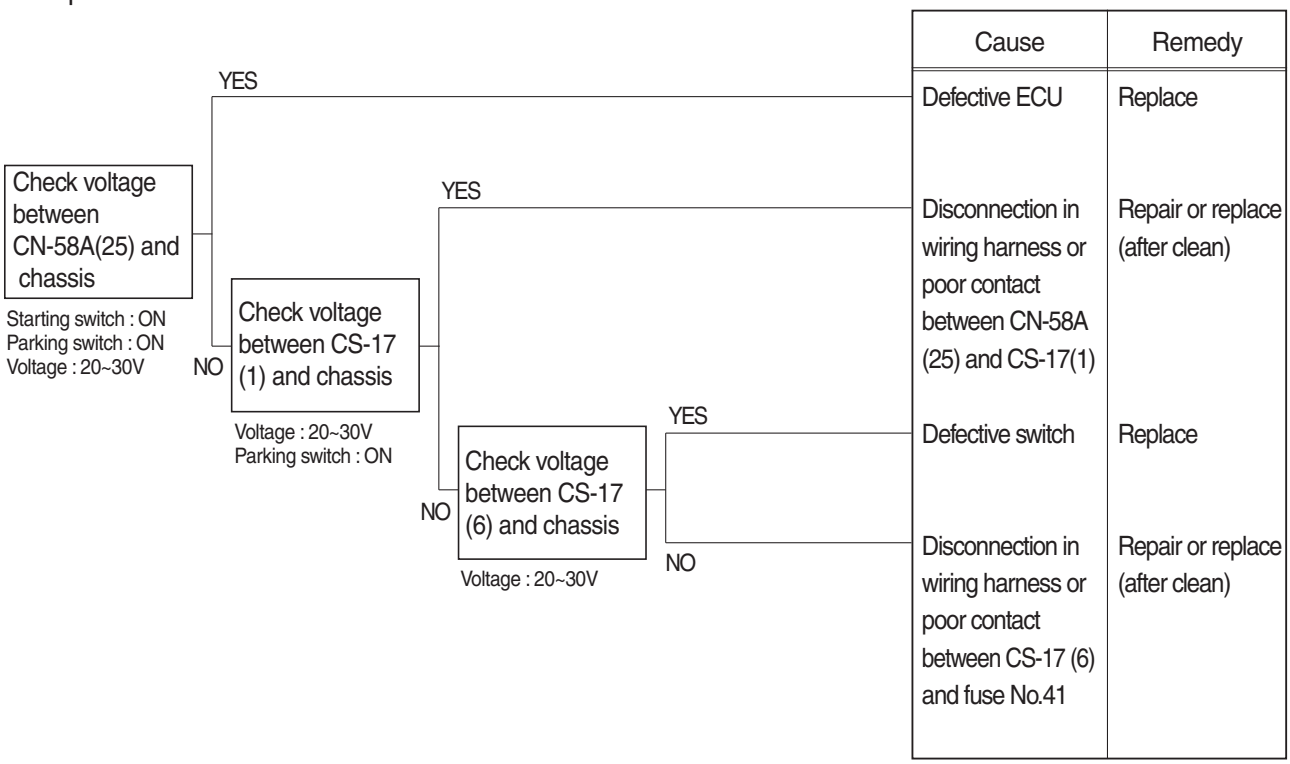


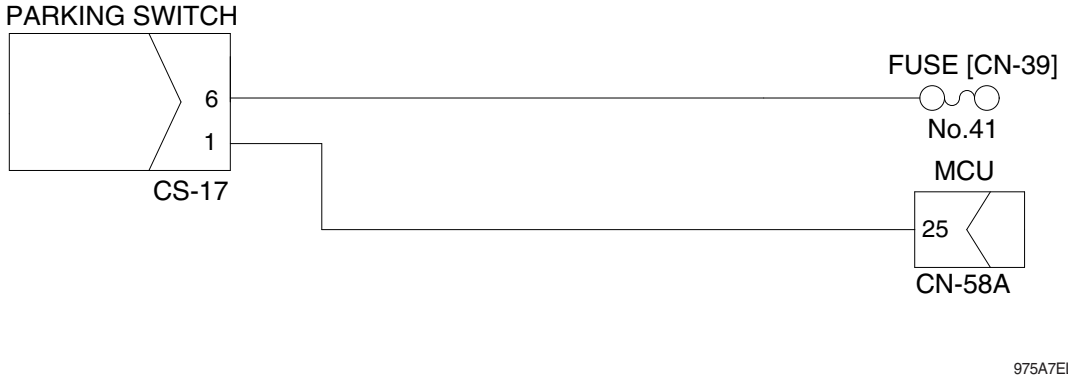


760F7EL39

4. TRANSMISSION IS NOT RETURNED TO NEUTRAL WHEN PARKING BRAKE IS APPLIED

- Before carrying out below procedure, check all the related connectors are properly inserted and the fuse No.41 are not blown out.
- After checking, connect the disconnected connectors again immediately unless otherwise specified.



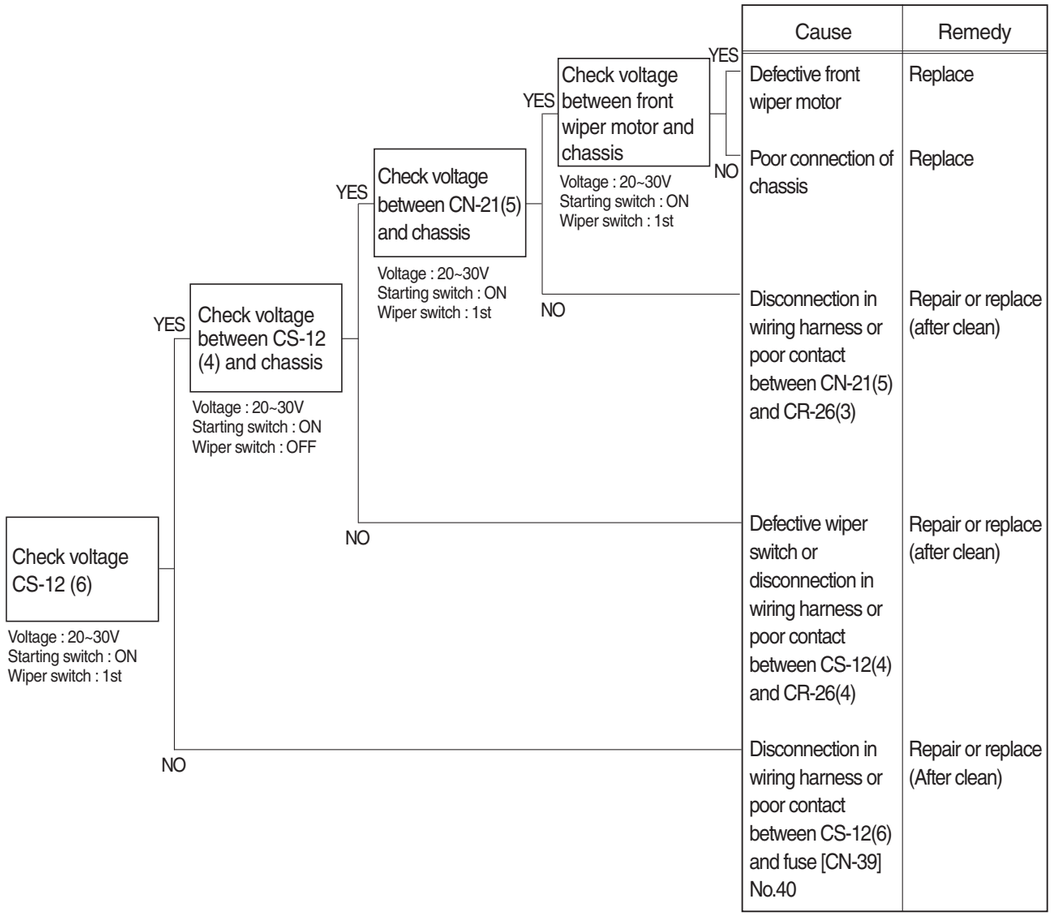


Check resistance

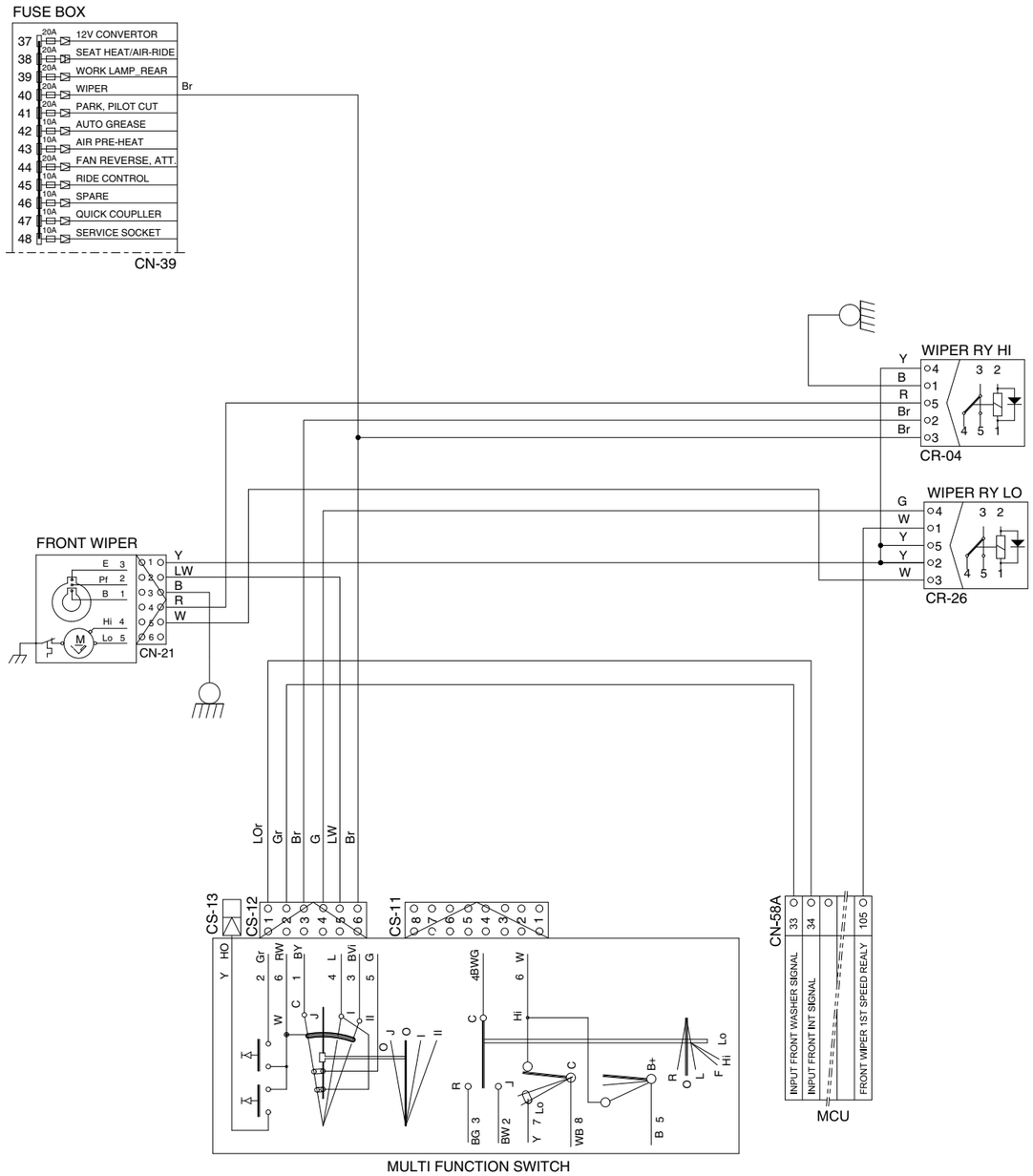
YES	MAX 1Ω
NO	MIN 1MΩ

5. WHEN STARTING SWITCH IS TURNED ON, WIPER MOTOR DOES NOT OPERATE

- Before carrying out below procedure, check all the related connectors are properly inserted and the fuse No.40 is not blown out.
- After checking, connect the disconnected connectors again immediately unless otherwise specified.



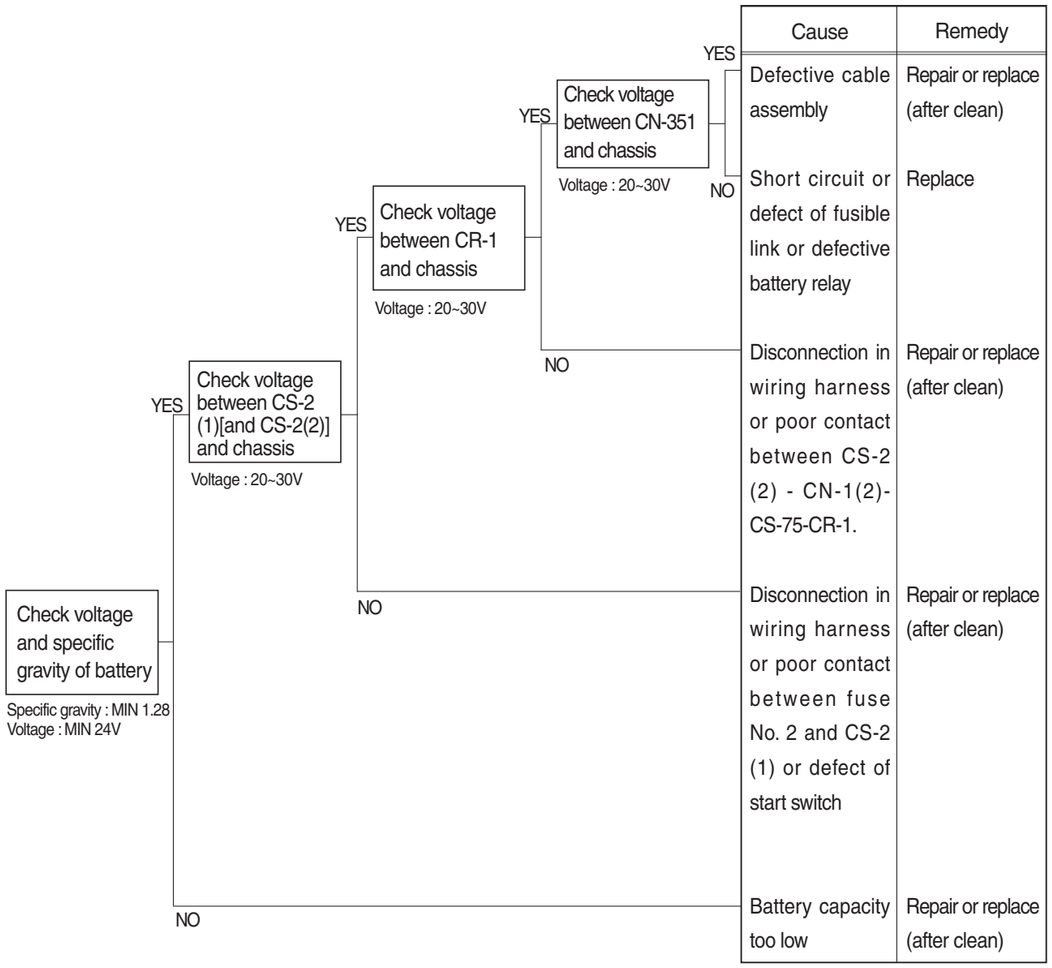
Cause	Remedy
Defective front wiper motor	Replace
Poor connection of chassis	Replace
Disconnection in wiring harness or poor contact between CN-21(5) and CR-26(3)	Repair or replace (after clean)
Defective wiper switch or disconnection in wiring harness or poor contact between CS-12(4) and CR-26(4)	Repair or replace (after clean)
Disconnection in wiring harness or poor contact between CS-12(6) and fuse [CN-39] No.40	Repair or replace (After clean)

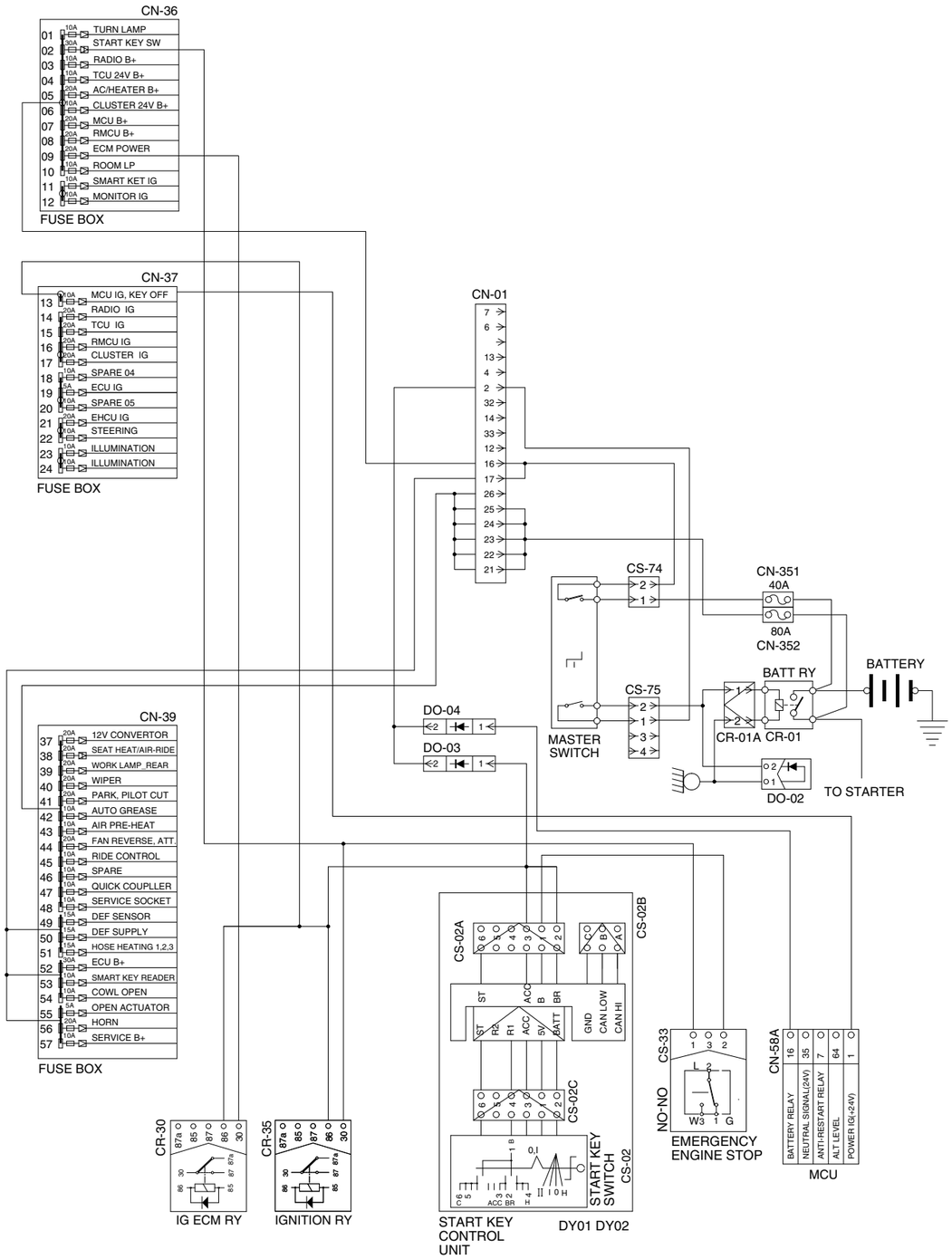


975A7EL41

6. WHEN STARTING SWITCH "ON" DOES NOT OPERATE

- Before carrying out below procedure, check all the related connectors are properly inserted the fuse No.2 is not blown out.
- After checking, connect the disconnected connectors again immediately unless otherwise specified.





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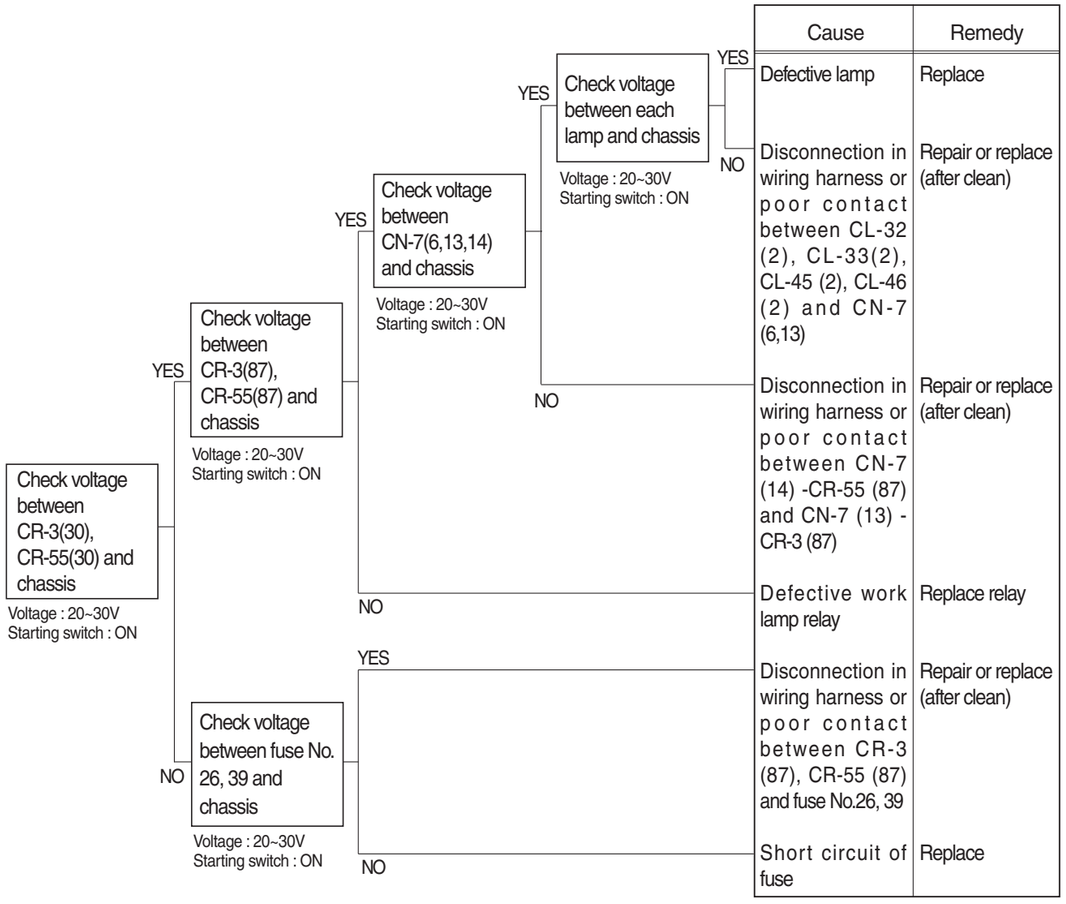
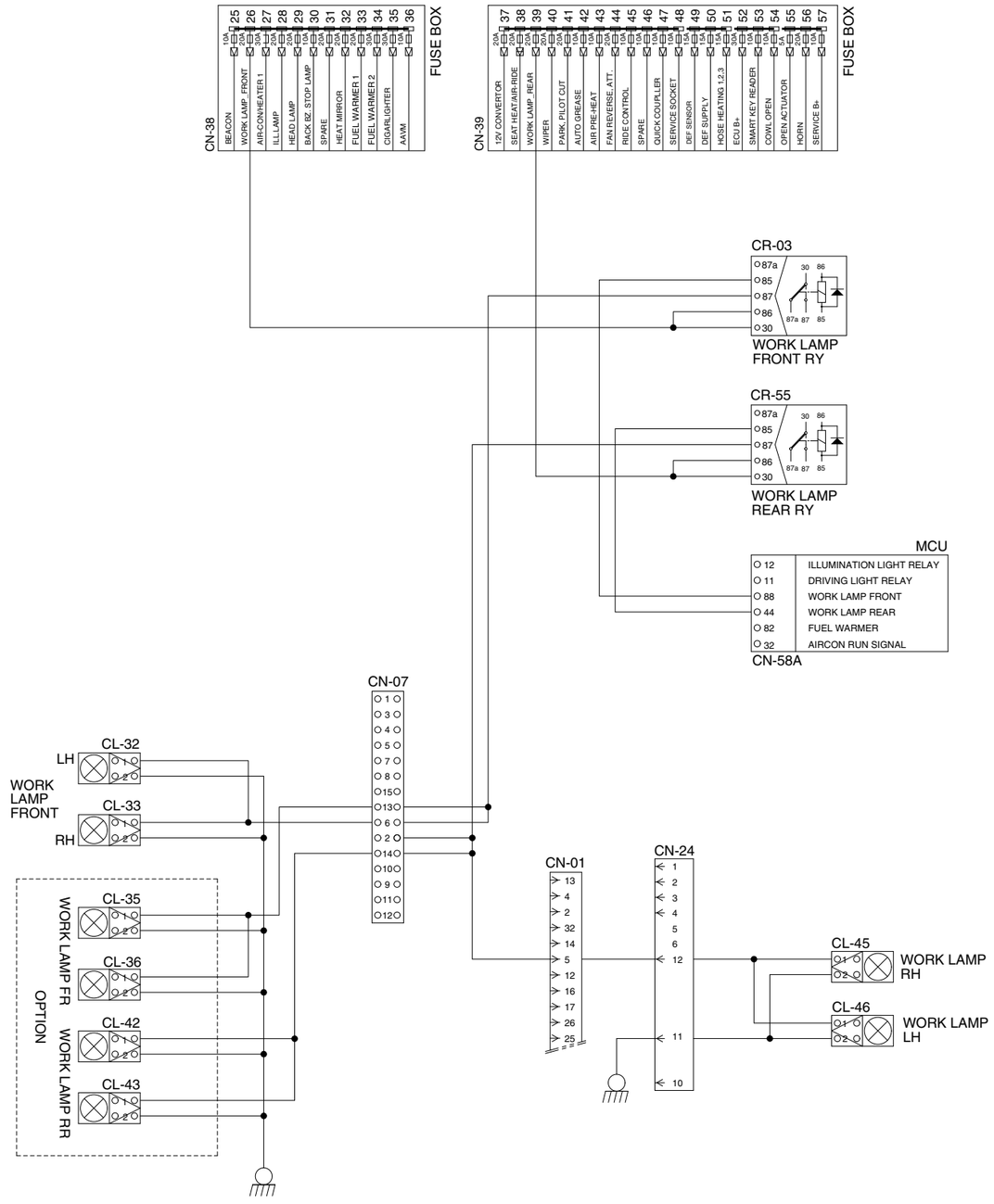
7. WHEN STARTING SWITCH IS TURNED ON, WORK LAMP DOES NOT LIGHTS UP

- Before carrying out below procedure, check all the related connectors are properly inserted, and the fuse No.26, 39 is not blown out.
- After checking, connect the disconnected connectors again immediately unless otherwise specified.



Cause	Remedy
Defective lamp	Replace
Disconnection in wiring harness or poor contact between CL-32 (2), CL-33(2), CL-45 (2), CL-46 (2) and CN-7 (6,13)	Repair or replace (after clean)
Disconnection in wiring harness or poor contact between CN-7 (14) -CR-55 (87) and CN-7 (13) - CR-3 (87)	Repair or replace (after clean)
Defective work lamp relay	Replace relay
Disconnection in wiring harness or poor contact between CR-3 (87), CR-55 (87) and fuse No.26, 39	Repair or replace (after clean)
Short circuit of fuse	Replace



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