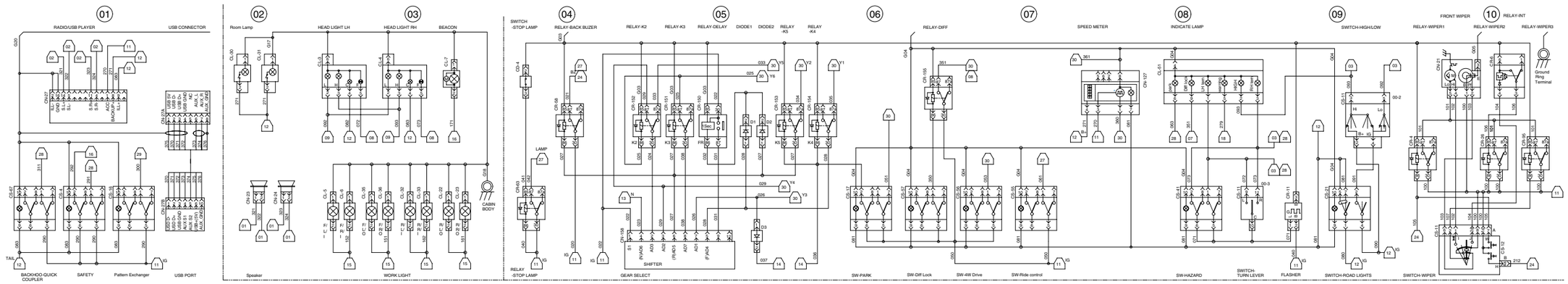
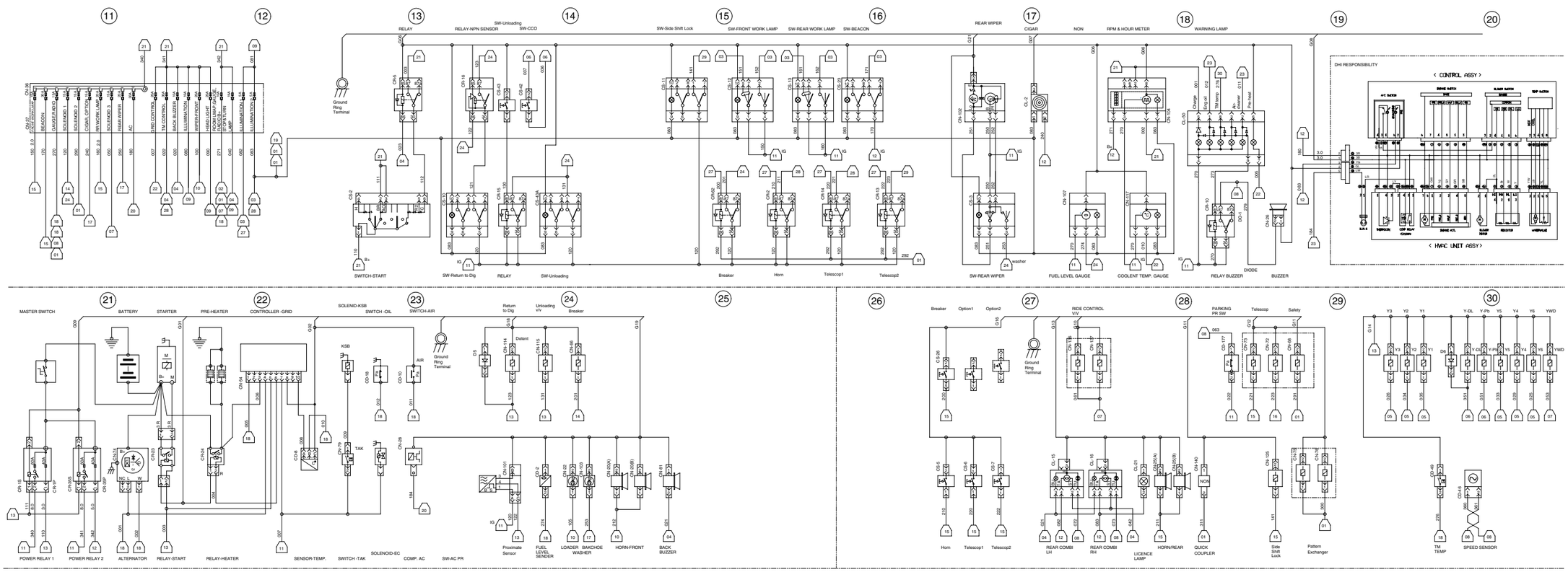
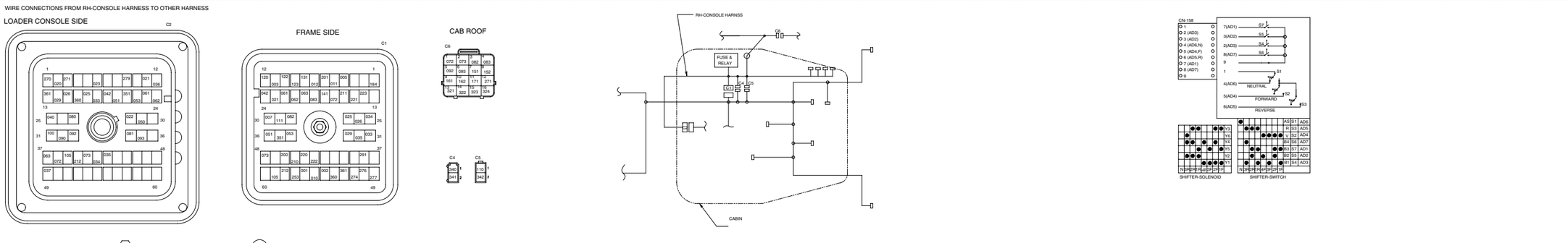
GROUP 2 ELECTRICAL CIRCUIT





WIRE CONNECTIONS FROM RH-CONSOLE HARNESS TO OTHER HARNESS



※ Note : The number in ⬠ indicates the number in ◯.

HB100EL01

MEMORANDUM


Robex
HYUNDAI HEAVY INDUSTRIES CO., LTD.
CONSTRUCTION EQUIPMENT DIV.

1. ILLUMINATION CIRCUIT

1) OPERATING FLOW

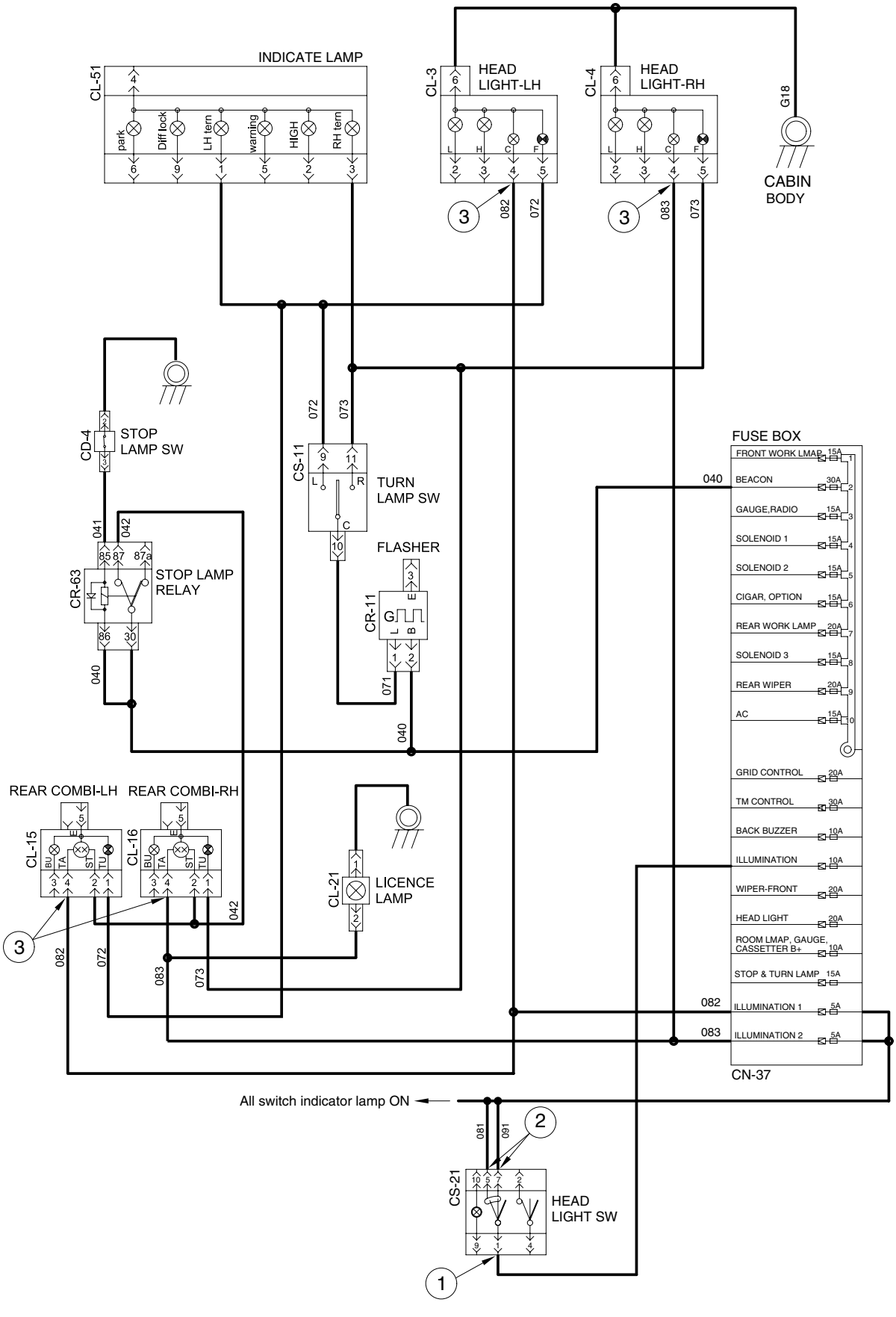
Fuse box [CN-37] → Head light switch [CS-21 (3)] → Switch ON, 1st step
→ [CS-21 (5, 7)] → All switch indicator lamp ON
→ Fuse box [CN-37, ILL 1] → LH Rear combi lamp ON [CL-15 (4)]
→ LH Head lamp ON [CL-3 (4)]
→ Fuse box [CN-37, ILL 2] → RH Rear combi lamp ON [CL-16 (4)]
→ License lamp [CL-21 (2)]
→ RH Head lamp ON [CL-4 (4)]

2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (switch input) ② - GND (switch output) ③ - GND (to light)	12V

※ GND : Ground

ILLUMINATION CIRCUIT



HB100EL03

2. HEAD LIGHT CIRCUIT

1) OPERATING FLOW

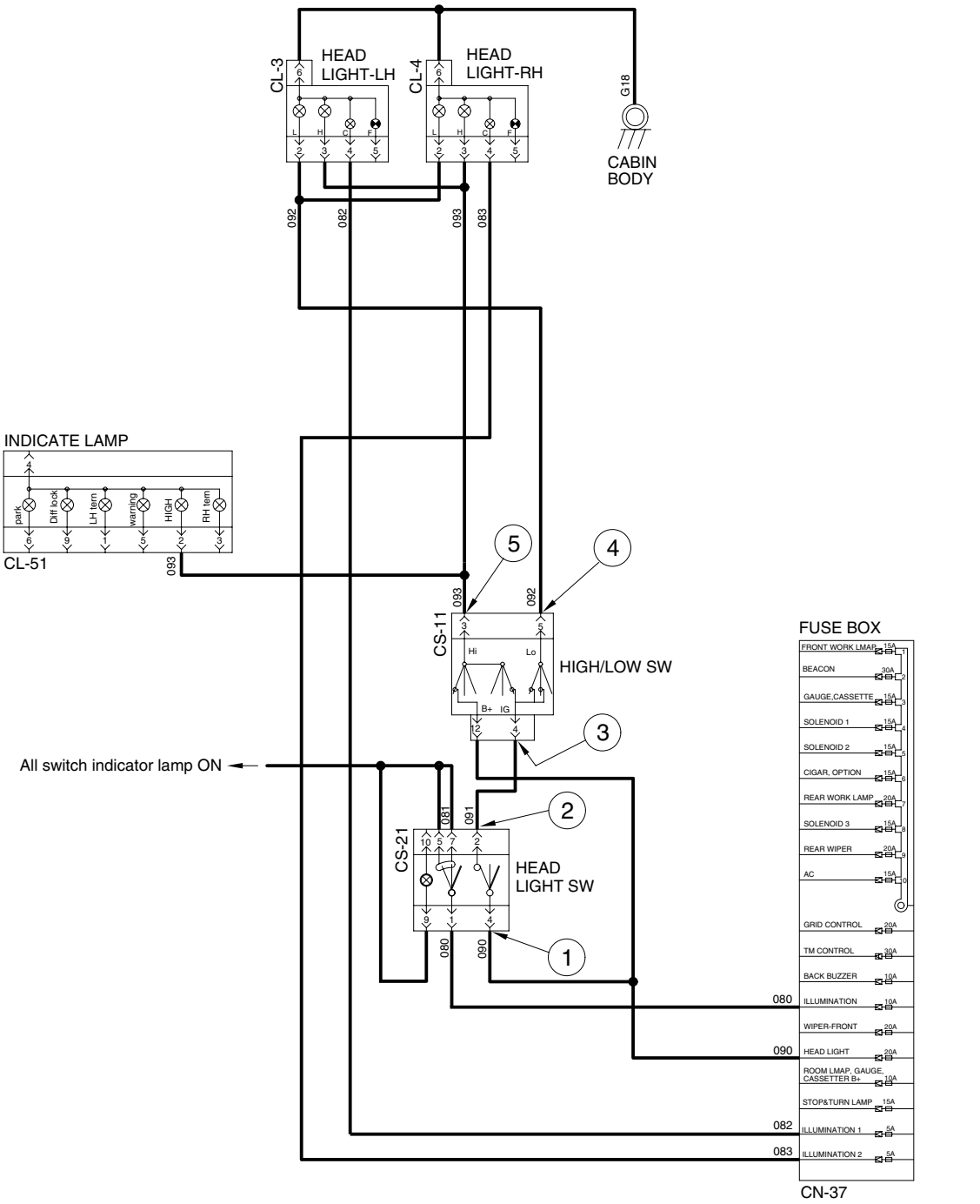
Fuse box [CN-37] → Head light switch [CS-21 (4)] → Light switch ON, 2nd step [CS-21 (2)]
→ Multi function switch [CS-11 (4)]
→ Multi function switch MIDDLE [CS-11(5)] → LH Head light low beam ON [CL-3 (2)]
→ RH Head light low beam ON [CL-4 (2)]
→ Multi function switch DOWN [CS-11(3)] → LH Head light high beam ON [CL-3 (3)]
→ RH Head light high beam ON [CL-4 (3)]
→ Cluster high beam pilot lamp ON [CL-51 (2)]

2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (switch input) ② - GND (switch output) ③ - GND (multi function input) ④ - GND (multi function output, low beam) ⑤ - GND (multi function output, high beam)	12V

※ GND : Ground

HEAD LIGHT CIRCUIT



HB100EL04

3. WORK LIGHT SWITCH

1) OPERATING FLOW

(1) Work lamp switch ON (1st step)

Front work lamp switch [CS-12 (1)→(5)] → LH Front work lamp, outside [CL-35 (2)]
→ RH Front work lamp, outside [CL-36 (2)]

Rear work lamp switch [CS-13 (1)→(5)] → LH Rear work lamp, outside [CL-22 (2)]
→ RH Rear work lamp, outside [CL-23 (2)]

(2) Work lamp switch ON (2nd step)

Front work lamp switch [CS-12 (4)→(2)] → LH Front work lamp, inside [CL-5 (2)]
→ RH Front work lamp, inside [CL-6 (2)]

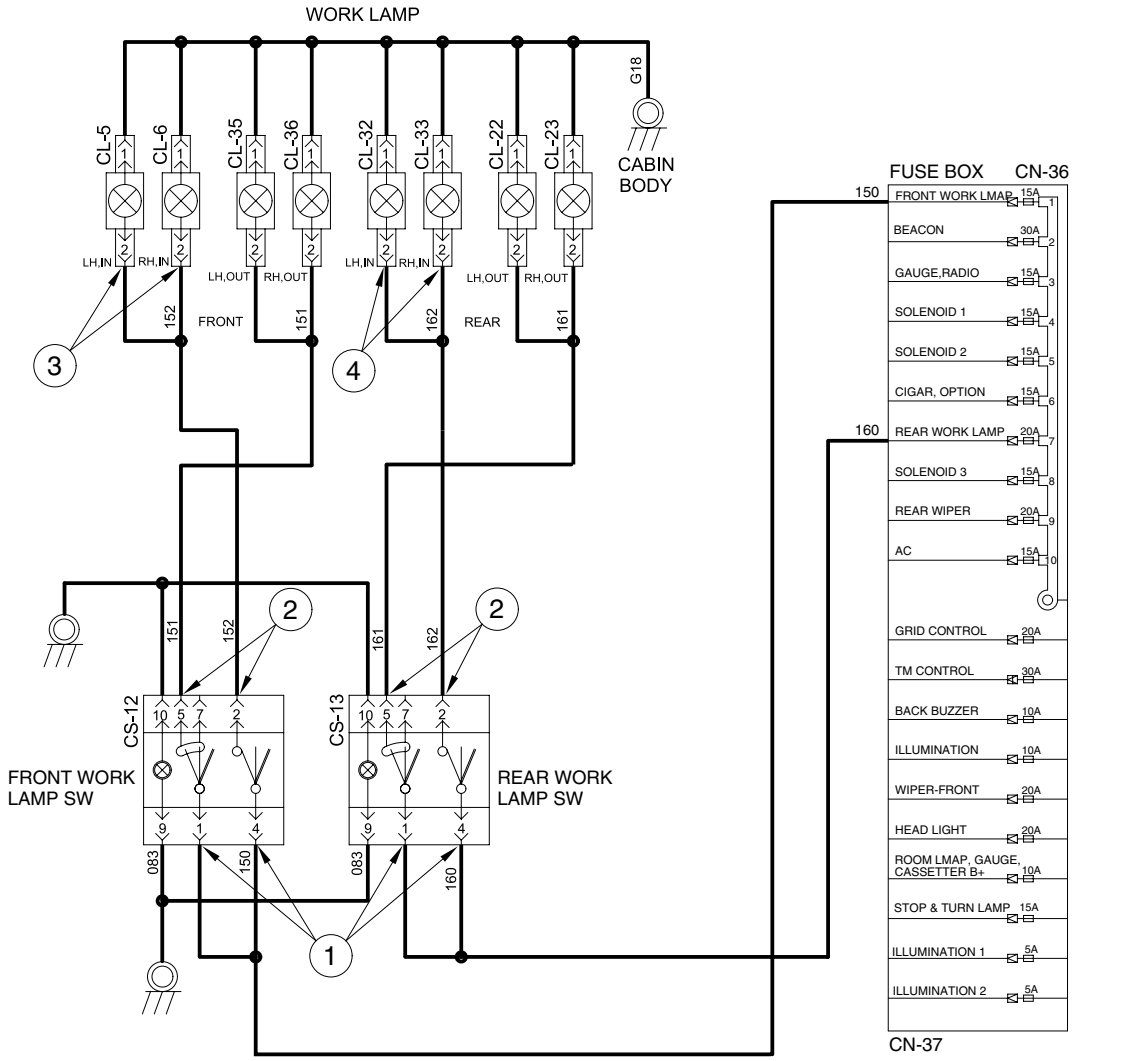
Rear work lamp switch [CS-13 (4)→(2)] → LH Rear work lamp, inside [CL-32 (2)]
→ RH Rear work lamp, inside [CL-33 (2)]

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)	12V

※ GND : Ground

WORK LIGHT SWITCH



HB100EL05

4. STARTING CIRCUIT

1) OPERATING FLOW

Battery(+) terminal → Master switch
→ Power relay 1 [CR-1P] → Start switch [CS-2 (1)]
→ Power relay 2 [CR-35P] → Fuse box [CN-37]

※ 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 → Start switch [CS-2 (2, 3)]
→ Power relay 1 [CR-1S(1) → (2)] → Fuse box [CN-36]
→ Power relay 2 [CR-35S(1) → (2)] → Fuse box [CN-37]

(2) When start key switch is in START position

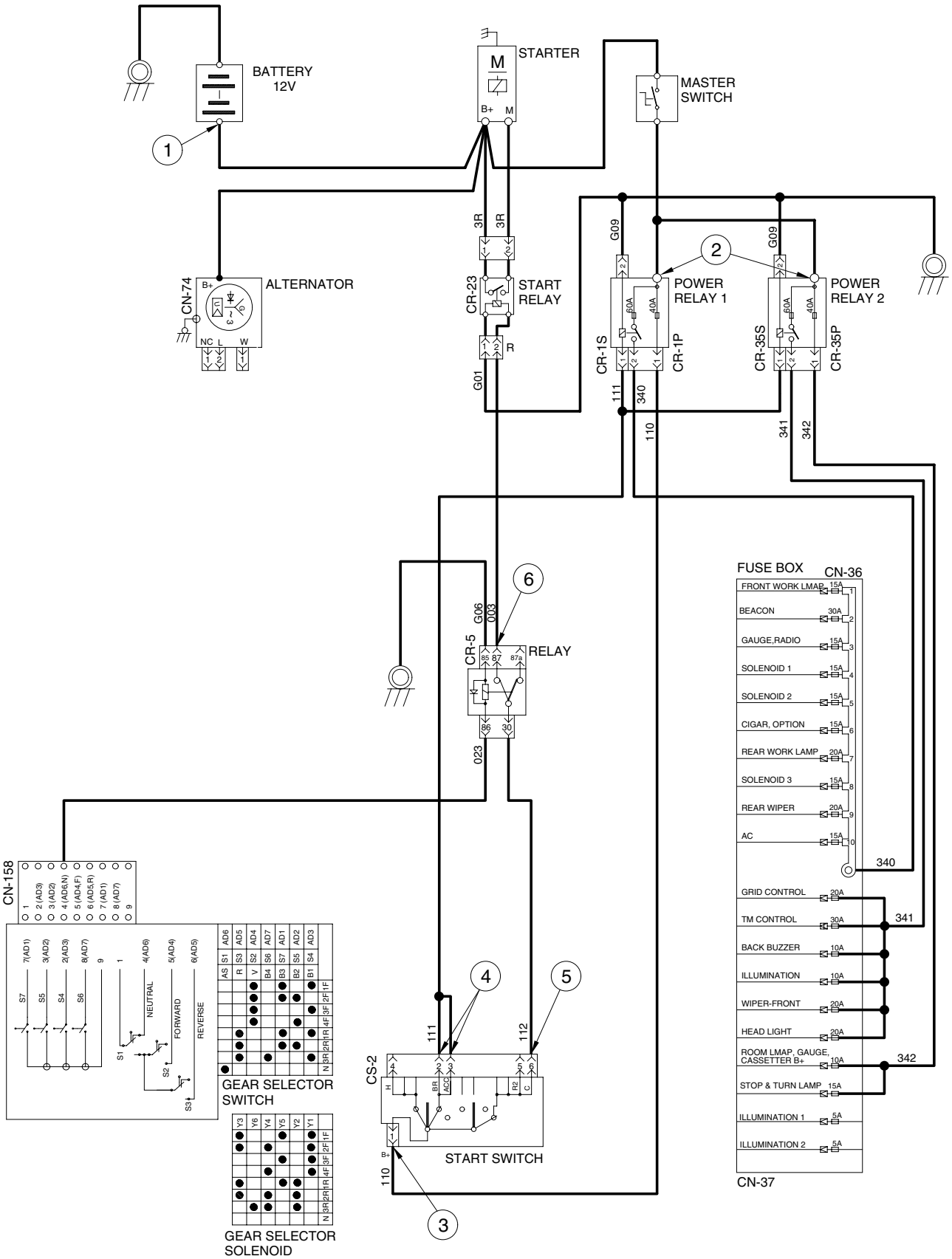
Start switch START [CS-2 (6)] → Start safety relay [CR-5 (87a)→(87)] →
Start relay [CR-23] → Starter (terminal B^+ and M connector of start motor)

2) CHECK POINT

Engine	Key switch	Check point	Voltage
Running	ON	① - GND (battery B^+) ② - GND (Power relay) ③ - GND (start key B terminal) ④ - GND (start key BR, ACC terminal) ⑤ - GND (start key C terminal) ⑥ - GND (start safety relay output)	12 V

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

STARTING SWITCH



HB100EL06

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.

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 (2)] → Charge warning lamp ON [CL-50 (5)]

(2) Charging flow

Alternator → Starter (B^+) → Battery(+) terminal → Charging

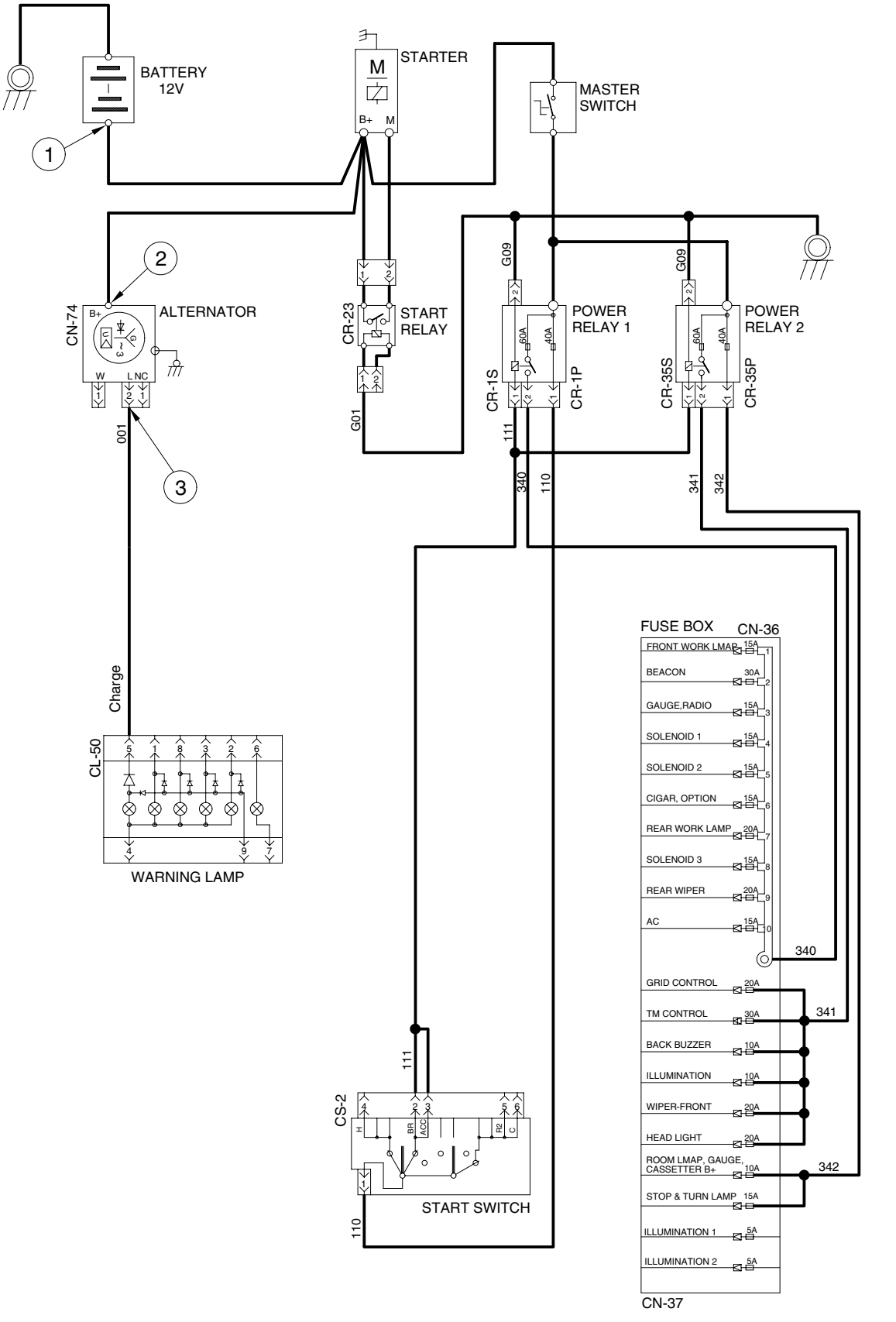
2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (battery) ② - GND (alternator B^+) ③ - GND (alternator 2)	12V

※ GND : Ground

※ MCU : Machine control unit

CHARGING CIRCUIT



HB100EL07

6. PREHEATING CIRCUIT

Combustion chamber glow plugs are used in order to give satisfactory starting of low ambient temperatures.

1) OPERATING FLOW

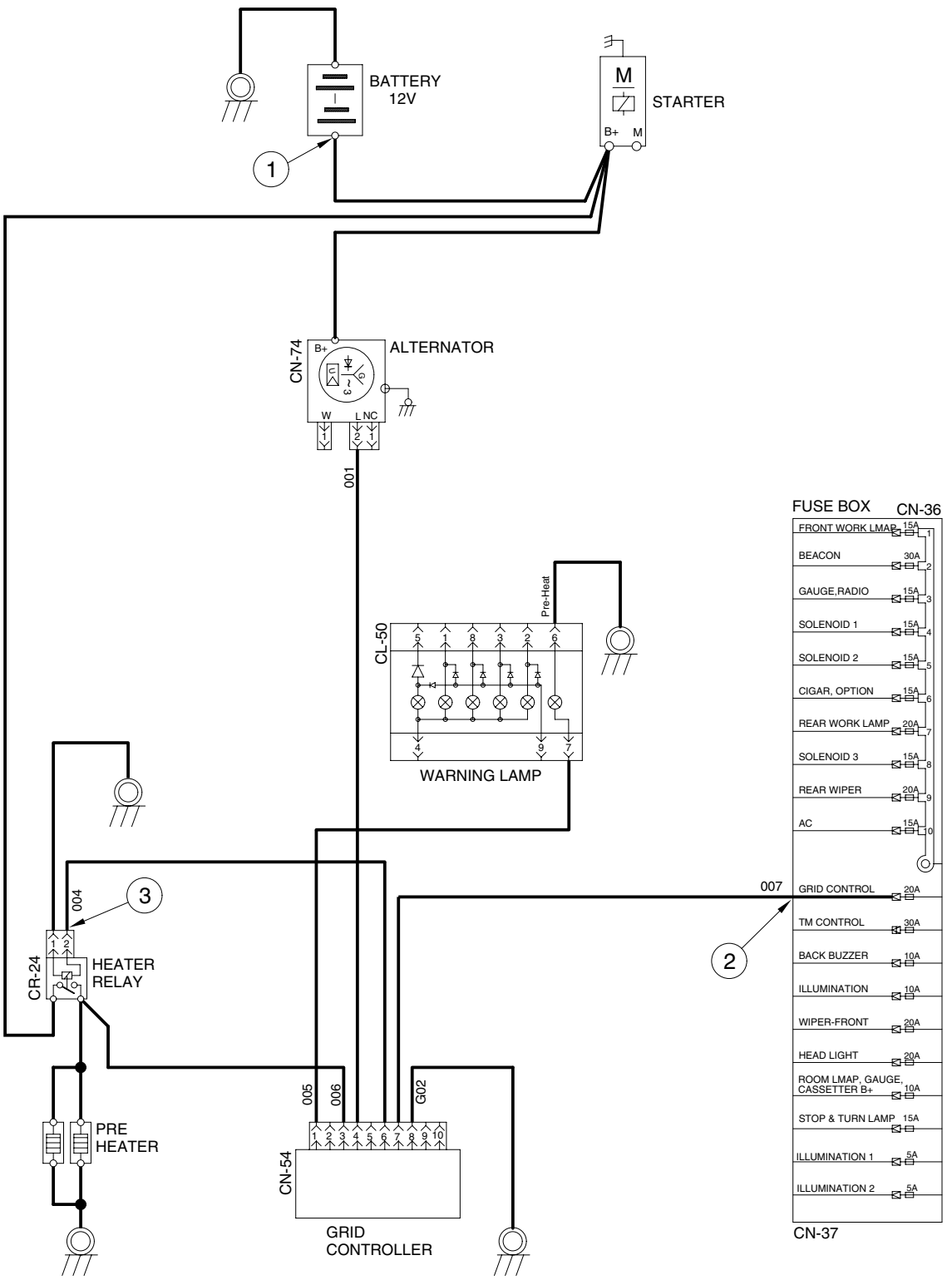
Fuse box [Grid control] → Grid controller [CN-54 (7)]
→ (6) → Heater relay [CR-24 (2)] → Pre-heater ON
→ (1) → Warning lamp ON [CL-50 (7)]

2) CHECK POINT

Engine	Key switch	Check point	Voltage
STOP	HEAT	① - GND (battery B^+) ② - GND (fuse box) ③ - GND (heater relay)	12V

※ GND : Ground

PREHEATING CIRCUIT



HB100EL07-1

7. ELECTRIC PARKING, DECLUTCH CIRCUIT

1) OPERATING FLOW

(1) Parking OFF

Fuse box [No.8] → Parking switch OFF [CS-17 (7)] → T/M solenoid valve ON (activated) [Y-PB(1)]
→ Parking brake released (by hydraulic pressure)

(2) Parking ON

Fuse box [No.8] → Parking switch ON → [CS-17 (2)] → Relay-K4 [CR-154 (86)→(87)]
→ Relay-K5 [CR-153 (86)→(87)]
→ Parking brake applied (by spring force)

(3) Declutch ON

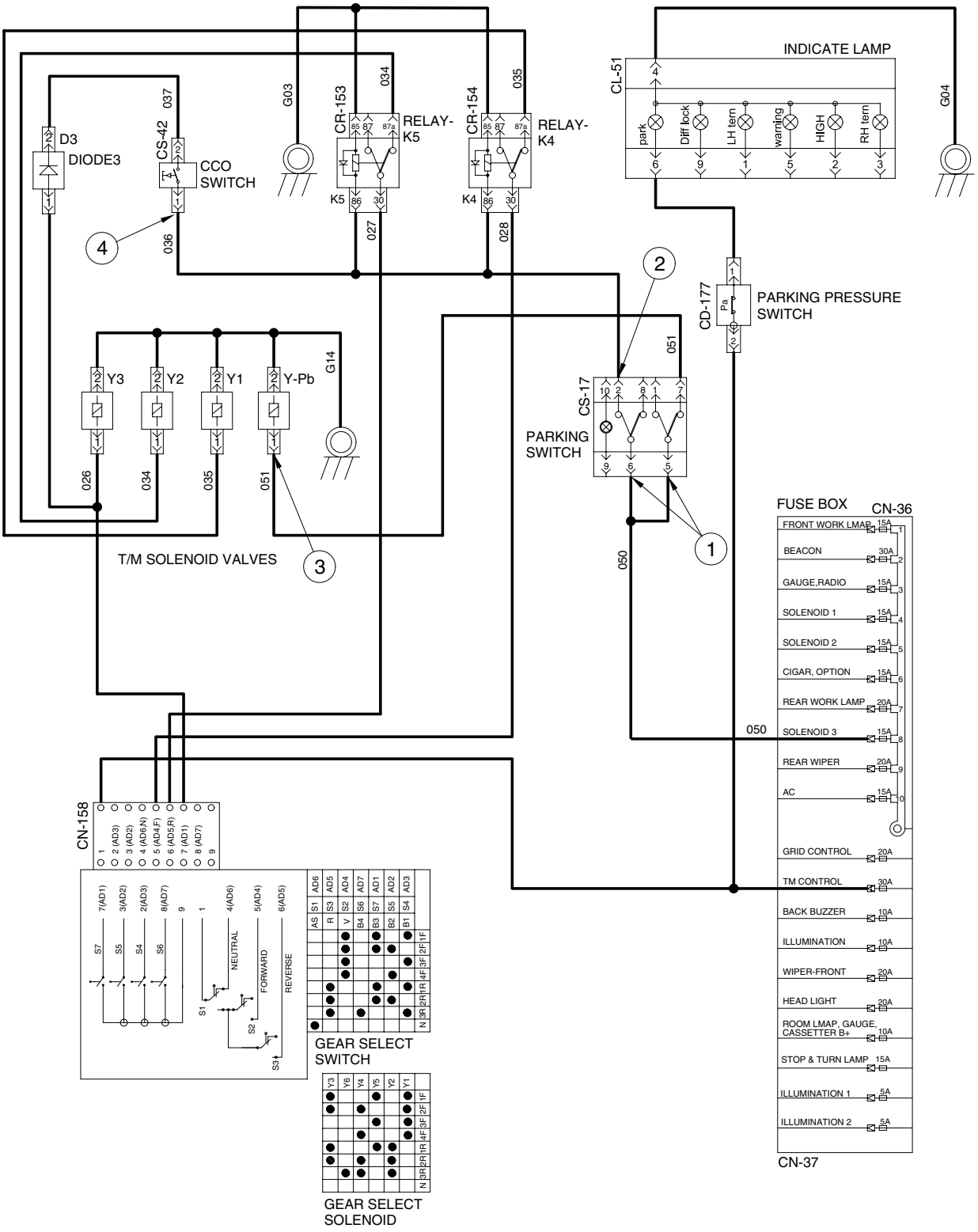
Fuse box [No.8] → Clutch cut-off switch ON → Clutch cut-off switch [CS-42 (1)→(2)]
→ DIODE 3 [(2)→(1)] → T/M solenoid valve [Y3] → Gear selector lever [CN-158 (7)]

2) CHECK POINT

Engine	Key switch	Check point	Voltage
Running	ON	① - GND (parking switch input) ② - GND (parking switch output) ③ - GND (parking solenoid) ④ - GND (clutch cut-off switch input)	12V

※ GND : Ground

ELECTRIC PARKING, PILOT CUT OFF CIRCUIT



HB100EL08

8. WIPER AND WASHER CIRCUIT

1) OPERATING FLOW

Fuse box[CN-37] → Wiper relay 1 [CR-4 (30)]
- → Wiper relay 2 [CR-26 (30), (86)]
- → Wiper relay 3 [CR-95 (30)]
- → Front wiper motor [CN-21 (1)]
- → Multi function switch [CS-12 (8), (1a)]

Fuse box[No.9] → Rear wiper switch [CS-3 (1)]
- → Rear wiper motor [CN-102 (3)]

(1) Front washer switch ON

① Washer switch ON [CS-12 (1a)→(7)] → Washer operating
- → Wiper relay 1 [CR-4 (86)→(87)]
  - → Front wiper motor [CN-21 (5)]
  - → Wiper motor operating (low)

(2) Front wiper switch ON

① **INT position**

Wiper switch ON [CS-12 (8)→(2a)] → INT relay [CR-6 (4)→(3)] →
Wiper relay 2 [CR-26 (85)→(87)] → Front wiper motor [CN-21(5)] →
Front wiper motor intermittently operating

② **Lo position**

Wiper switch ON [CS-12 (8)→(2)] → Wiper relay 3 [CR-26 (86)→(87)] →
Front wiper motor [CN-21 (5)] → Front wiper motor operating (low)

③ **Hi position**

Wiper switch ON [CS-12 (8)→(1)] → Front wiper motor [CN-21(4)] →
Front wiper motor operating (high)

(3) Auto-parking (when switch OFF)

Switch OFF → Fuse box [CN-37] → Front wiper motor [CN-21 (1)→(2)] →
Multi function switch [CS-12 (6)→(2)] → Wiper relay 3 [CR-26 (86)→(87)] →
Front wiper motor [CN-21 (5)] → Wiper motor stop

(4) Rear wiper and washer switch

① **Wiper switch ON** (1st step)

Wiper switch ON [CS-3 (1)→(6)] → Rear wiper motor [CN-102(4)] →
Rear wiper motor operating

② **Washer switch ON** (2nd step)

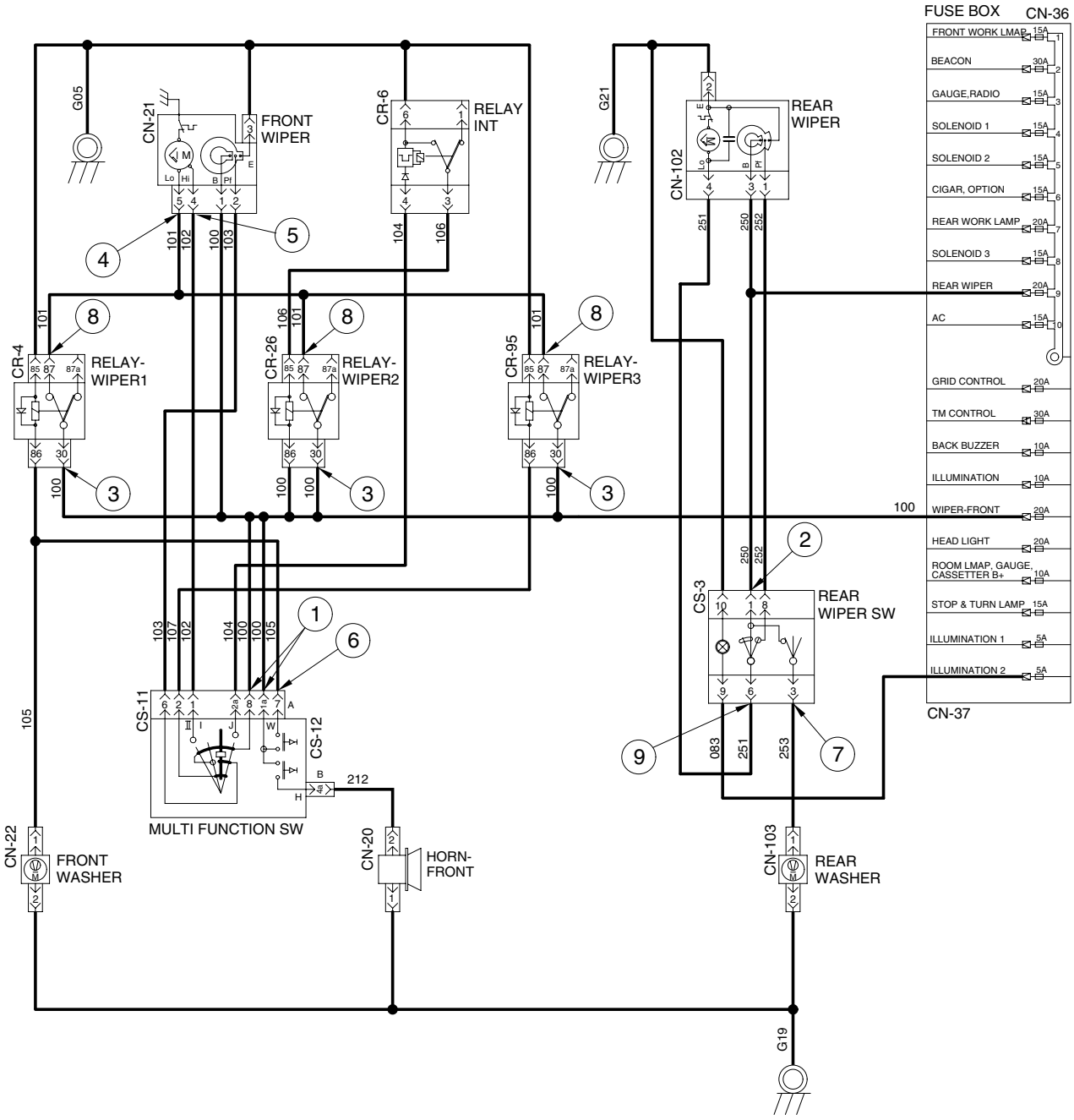
Washer switch ON [CS-3 (1)→(3)] → Rear washer tank [CN-103(1)] → Washer operating

2) CHECK POINT

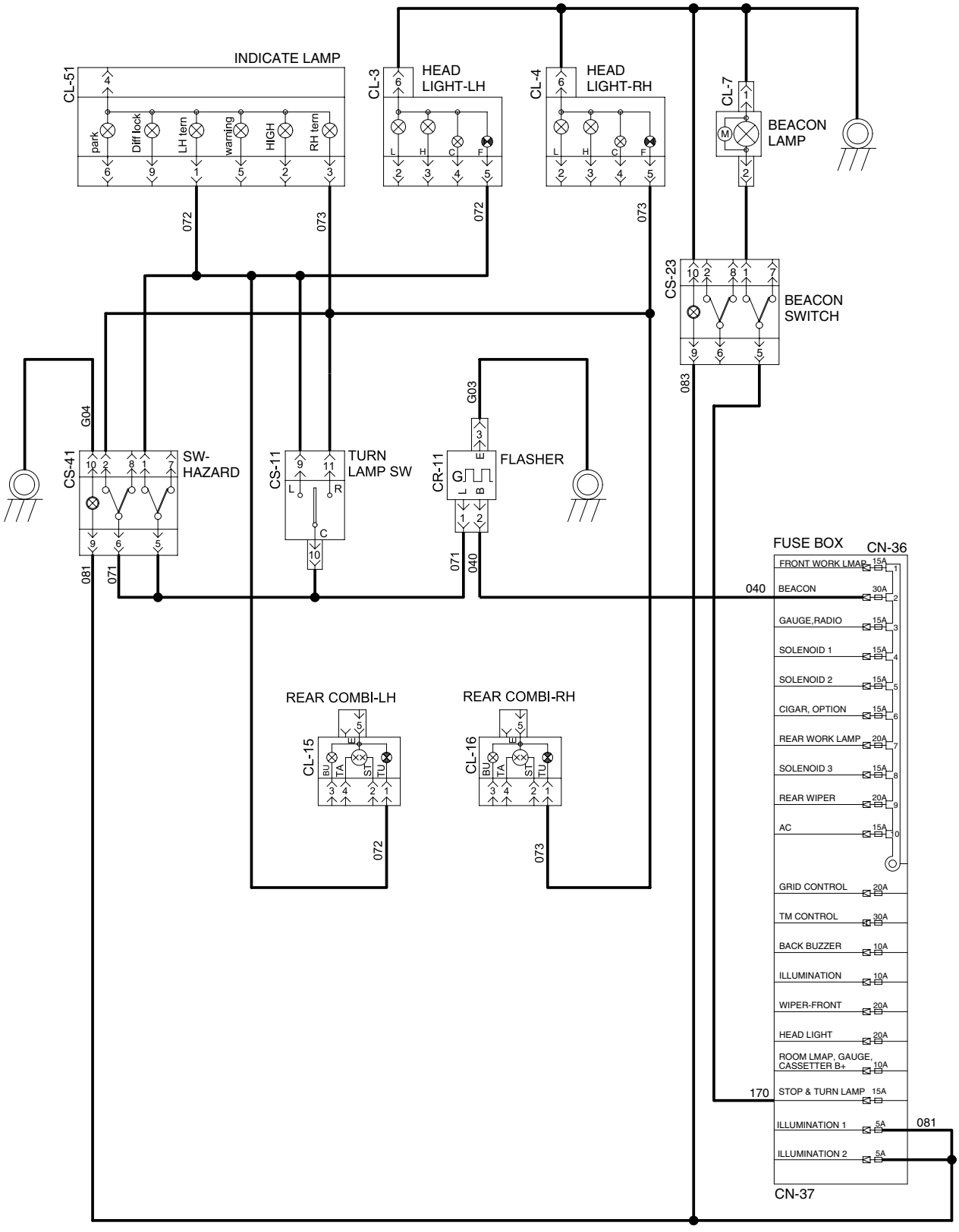
Condition	Check point	
Engine : Stop Key switch : ON Voltage : 12V	① - GND (front wiper switch power input) ② - GND (rear wiper switch power input) ③ - GND (wiper relay power input) ④ - GND (front wiper motor Lo power input) ⑤ - GND (front wiper motor High power input)	⑥ - GND (front washer power output) ⑦ - GND (rear washer power output) ⑧ - GND (front wiper motor power output) ⑨ - GND (rear wiper motor power output)

※ GND : Ground

WIPER AND WASHER CIRCUIT



HAZARD, TURN AND ROTARY CIRCUIT



HB100EL10