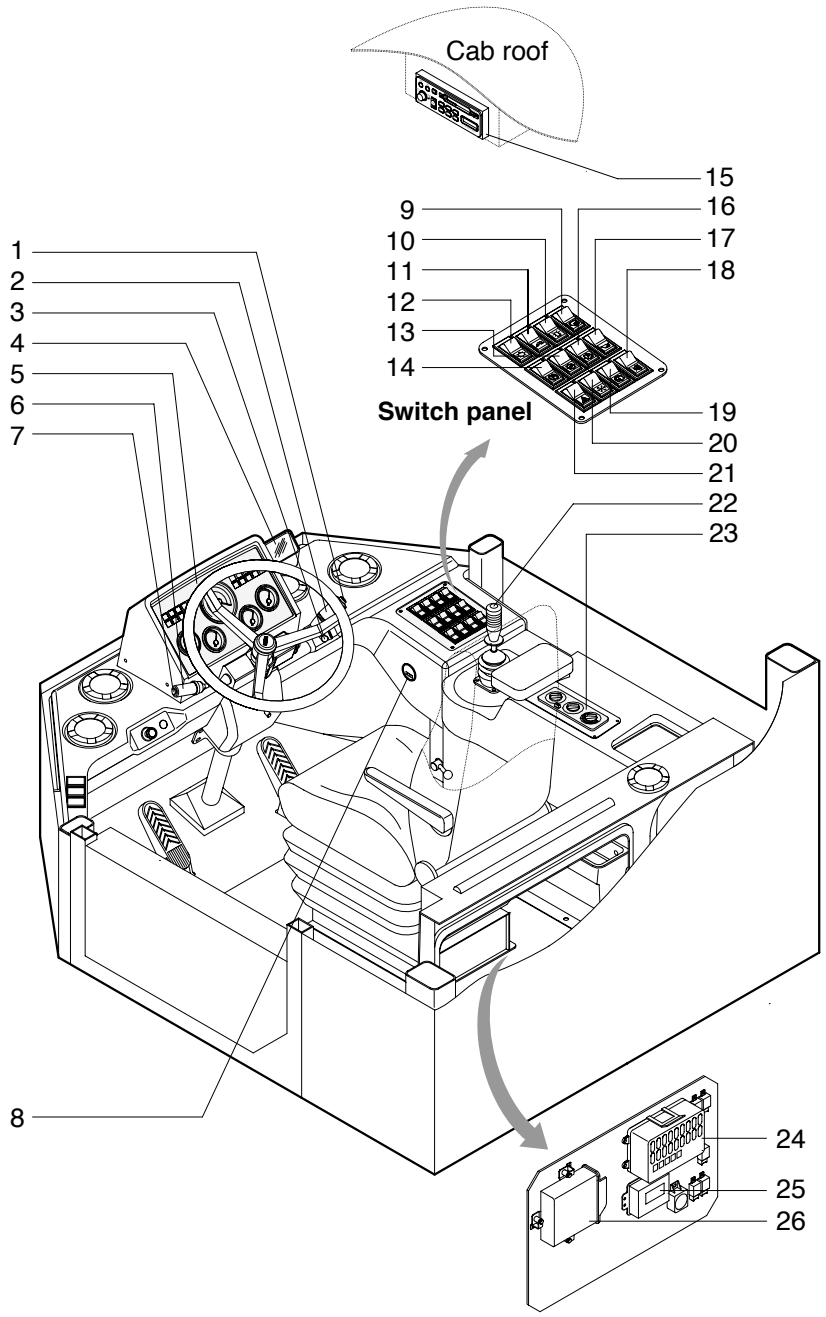
SECTION 7 ELECTRICAL SYSTEM

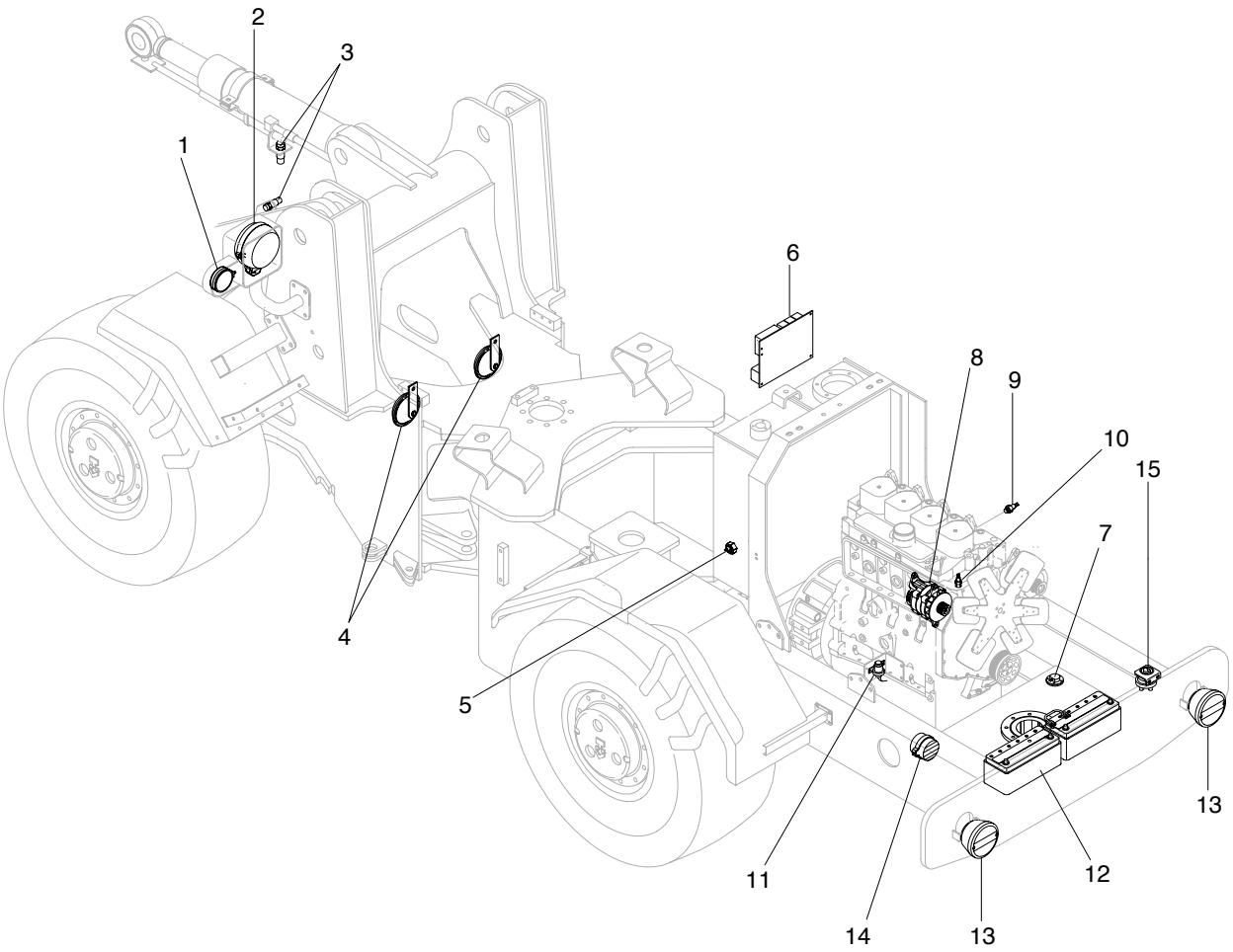
GROUP 1 COMPONENT LOCATION

1. LOCATION 1



1	Horn button	10	Beacon switch(Option)	18	Buzzer stop switch
2	Multi function switch	11	Work lamp switch	19	Rear wiper/washer switch
3	Starting switch	12	Main light switch	20	Air conditioner switch
4	Transmission error display	13	Clutch cut off switch	21	Hazard switch
5	Cluster	14	Parking brake switch	22	Kick down switch
6	Gear selector lever	15	Radio and cassette	23	Aircon & heater switch
7	Kick down switch	16	Full automatic switch	24	Fuse box
8	Service meter	17	Ride control switch(Option)	25	Check unit
9	Cold start switch(Option)			26	Control unit

2. LOCATION 2



1	Front combination lamp	6	Relay board	11	Start relay
2	Light	7	Fuel sender	12	Battery
3	Proximate switch	8	Alternator	13	Rear combination lamp
4	Air horn	9	Engine oil pressure switch	14	Back up buzzer
5	Overheat switch	10	Water temperature switch	15	Master switch(Option)

1. ILLUMINATION CIRCUIT

1) OPERATING FLOW

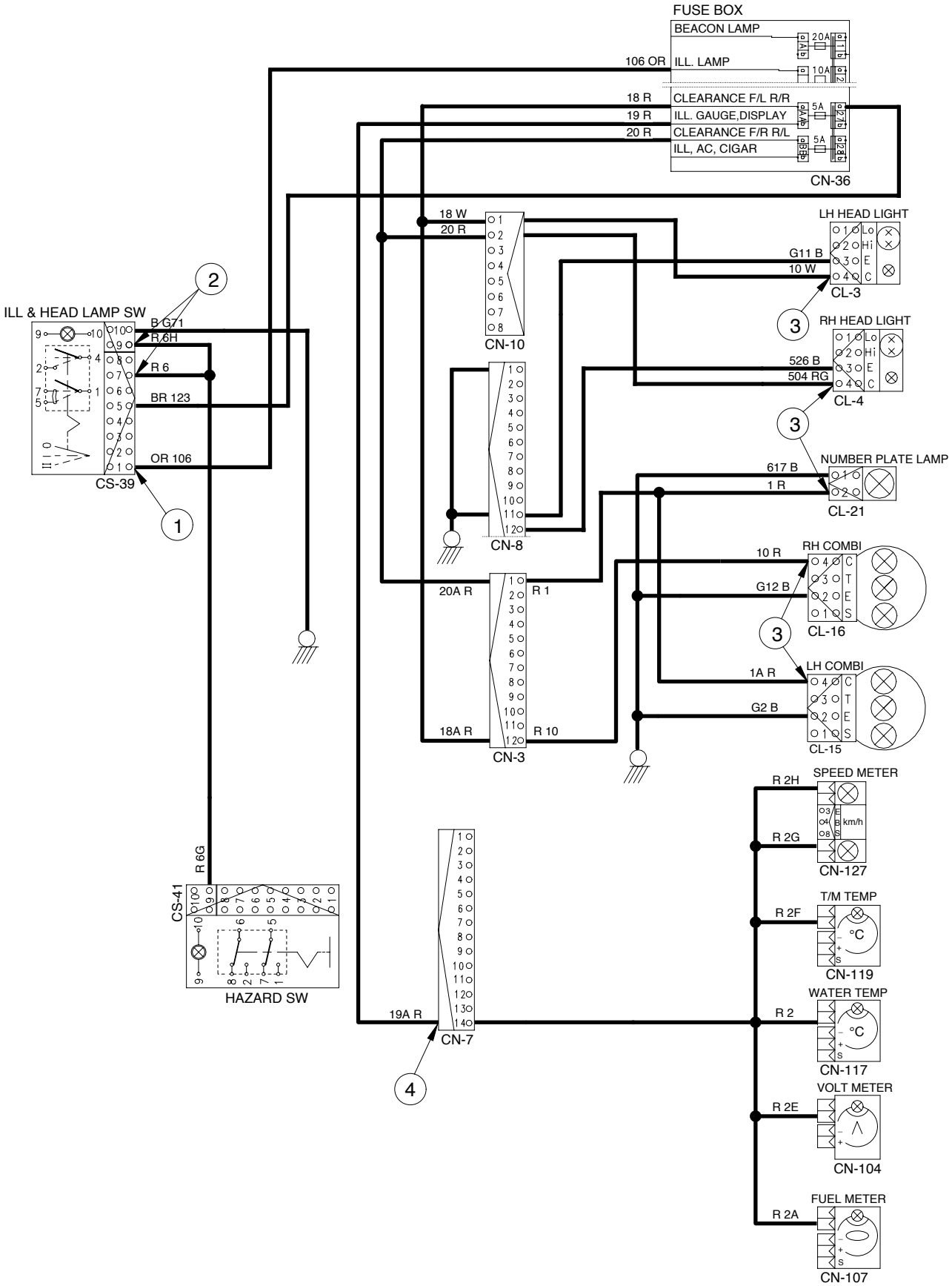
Fuse box (No.2) → Illumination switch [CS-39(1)] → Switch ON, 1st step
- [CS-39(7)] → Hazard and illumination switch indicator lamp ON
- [CS-39(5)] → Fuse box(27)
  - I/conn [CN-3(12)] → RH Combi clearance lamp ON [CL-16(4)]
  - I/conn [CN-10(1)] → LH Head lamp ON [CL-3(4)]
  - I/conn [CN-7(14)] → All cluster guage lamp ON
- [CS-39(5)] → Fuse box(28)
  - I/conn [CN-3(1)]
    - No. plate lamp ON [CL-21(2)]
    - LH Combi clearance lamp ON [CL-15(4)]
  - I/conn [CN-10(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) ④ - GND (To gauge lamp)	20~25V

※ GND : Ground

ILLUMINATION CIRCUIT



2. HEAD LIGHT CIRCUIT

1) OPERATING FLOW

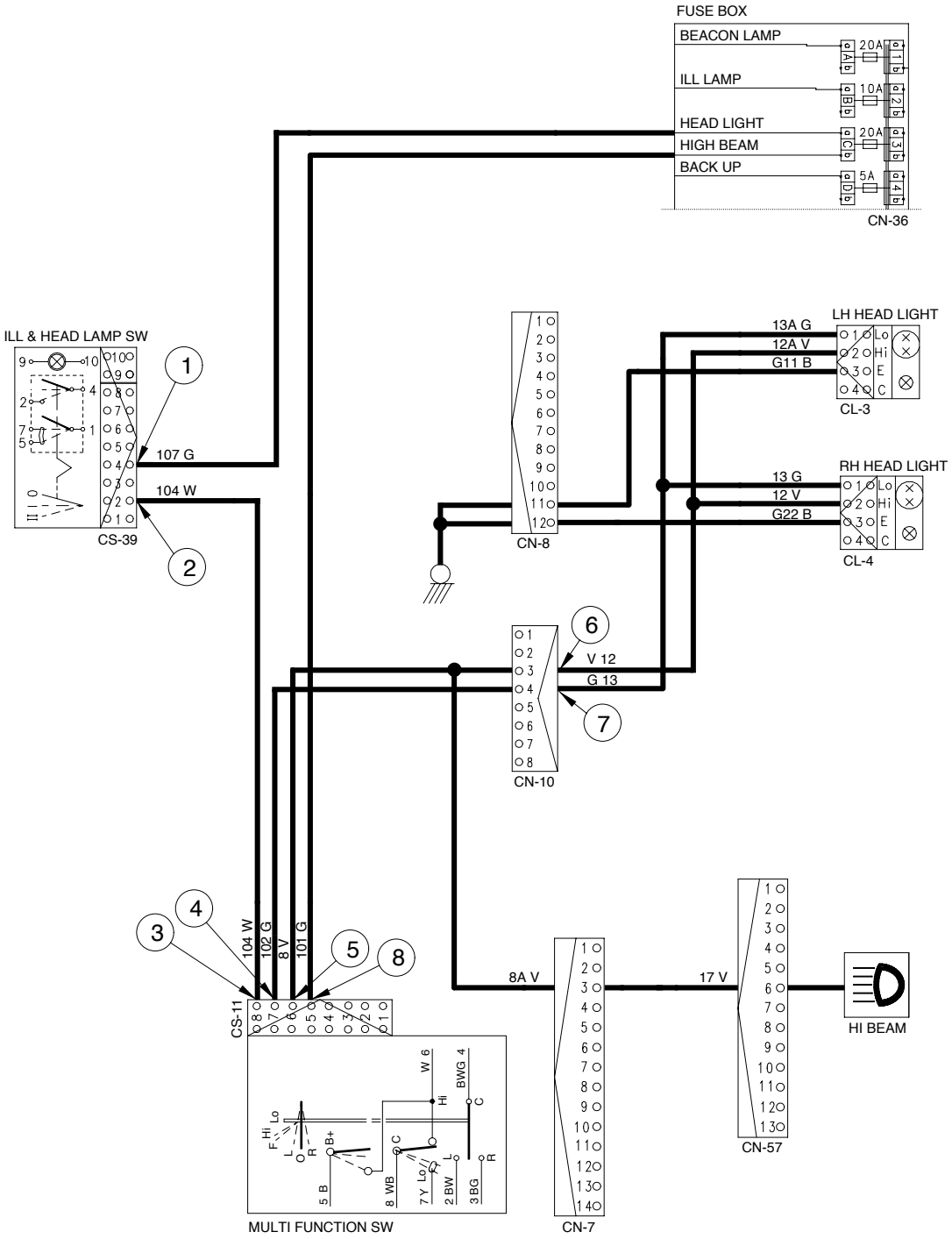
Fuse box(No.3) → Head light switch [CS-39(4)] → Light switch ON, 2nd step [CS-39(2)]
→ Multi function switch [CS-11(8)]
→ Multi function switch MIDDLE [CS-11(7)] → I/conn [CN-10(4)] → LH Head light low beam ON [CL-3(1)]
→ RH Head light low beam ON [CL-4(1)]
→ Multi function switch DOWN [CS-11(6)] → I/conn [CN-10(3)] → LH Head light high beam ON [CL-3(2)]
→ RH Head light high beam ON [CL-4(2)]
→ I/conn [CN-7(3)] → I/conn [CN-57(6)]
→ Cluster high beam pilot lamp ON

2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	ON	① - GND (Switch input) ② - GND (Switch output) ③ - GND (Multi function switch input) ④ - GND (Multi function switch output) ⑤ - GND (Multi function switch output) ⑥ - GND (Low beam) ⑦ - GND (High beam) ⑧ - GND (Passing B^+)	20~25V

※ GND : Ground

HEAD LIGHT CIRCUIT



3. WORK LIGHT CIRCUIT

1) OPERATING FLOW

※ Illumination switch : ON position

① Work lamp switch ON(Ist step)

ILL & head lamp switch [CS-39(7)] → Work lamp switch [CS-20(1)]

→ (5) → Front work lamp relay [CR-3(2) → (4)] → I/conn [CN-5(4)] → LH Front work lamp ON [CL-6(2)]

→ RH Front work lamp ON [CL-5(2)]

→ (7) → Work lamp switch indicator lamp ON

② Work lamp switch ON(2nd step)

Work lamp switch [CS-20(4) → (2)] → Rear work lamp relay [CR-6(2) → (4)]

→ I/conn [CN-5(3)] → LH Rear work lamp ON [CL-22(2)]

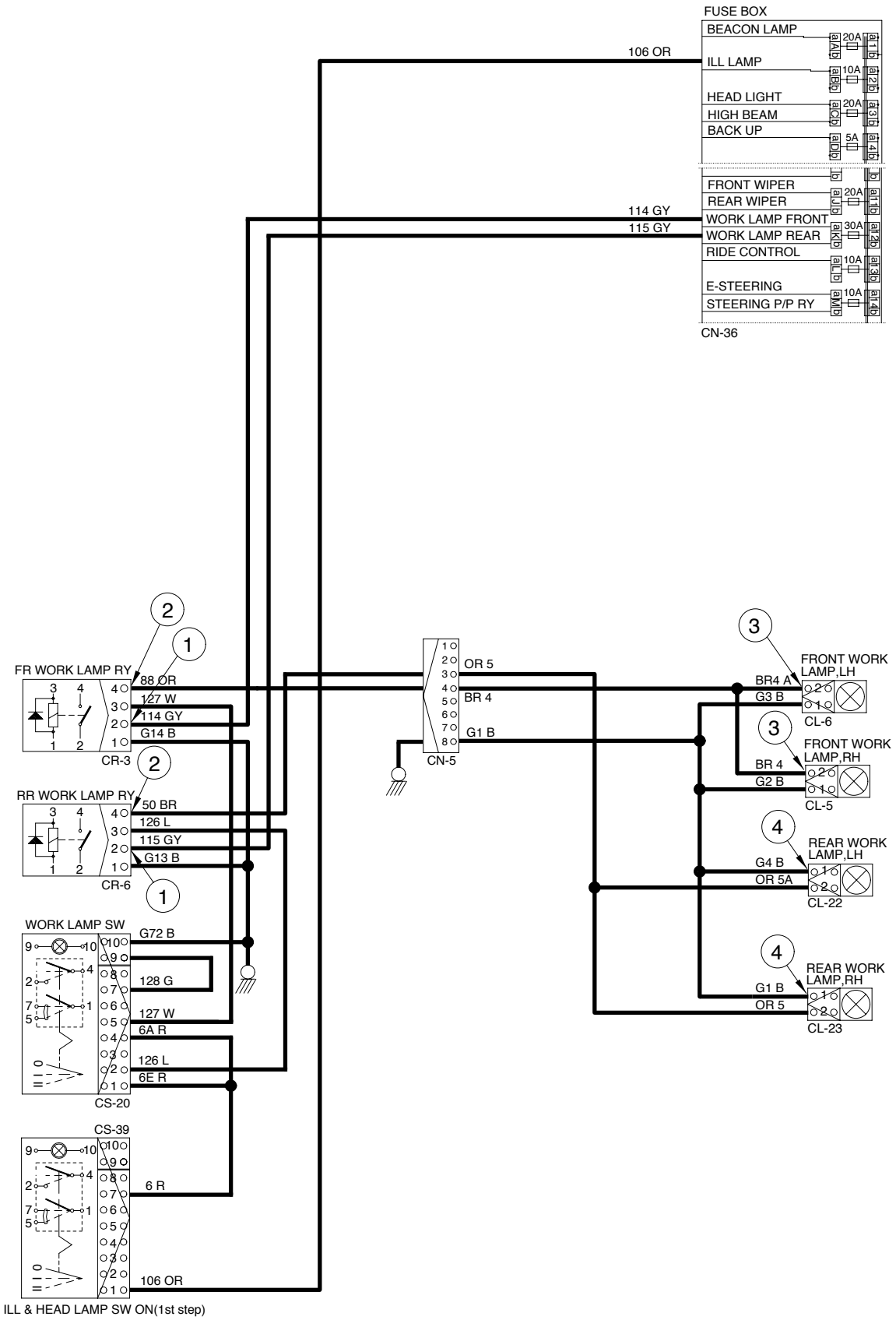
→ RH Rear work lamp ON [CL-23(2)]

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)	20~25V

※ GND : Ground

WORK LIGHT SWITCH



4. STARTING CIRCUIT

1) OPERATING FLOW

Battery(+) terminal → Battery relay(M8, B^+ terminal) → Fusible link [CN-60(1)]
→ I/conn [CN-1(1)] → Fuse box (No.18) → Start switch [CS-2(1)]

※ The gear selector lever is neutral position. It is necessary condition before the starting.
The gear selector lever 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)] → I/conn [CN-3(6)] → Battery relay [CR-1]
→ Battery relay operating(All power is supplied with the electric component)
→ Start switch [CS-2(3)] → Fuse box [No.20] → I/conn [CN-2(4)]
→ I/conn [CN-4(6)] → Fuel shut off solenoid [CN-79(1)]

(2) When start key switch is in START position

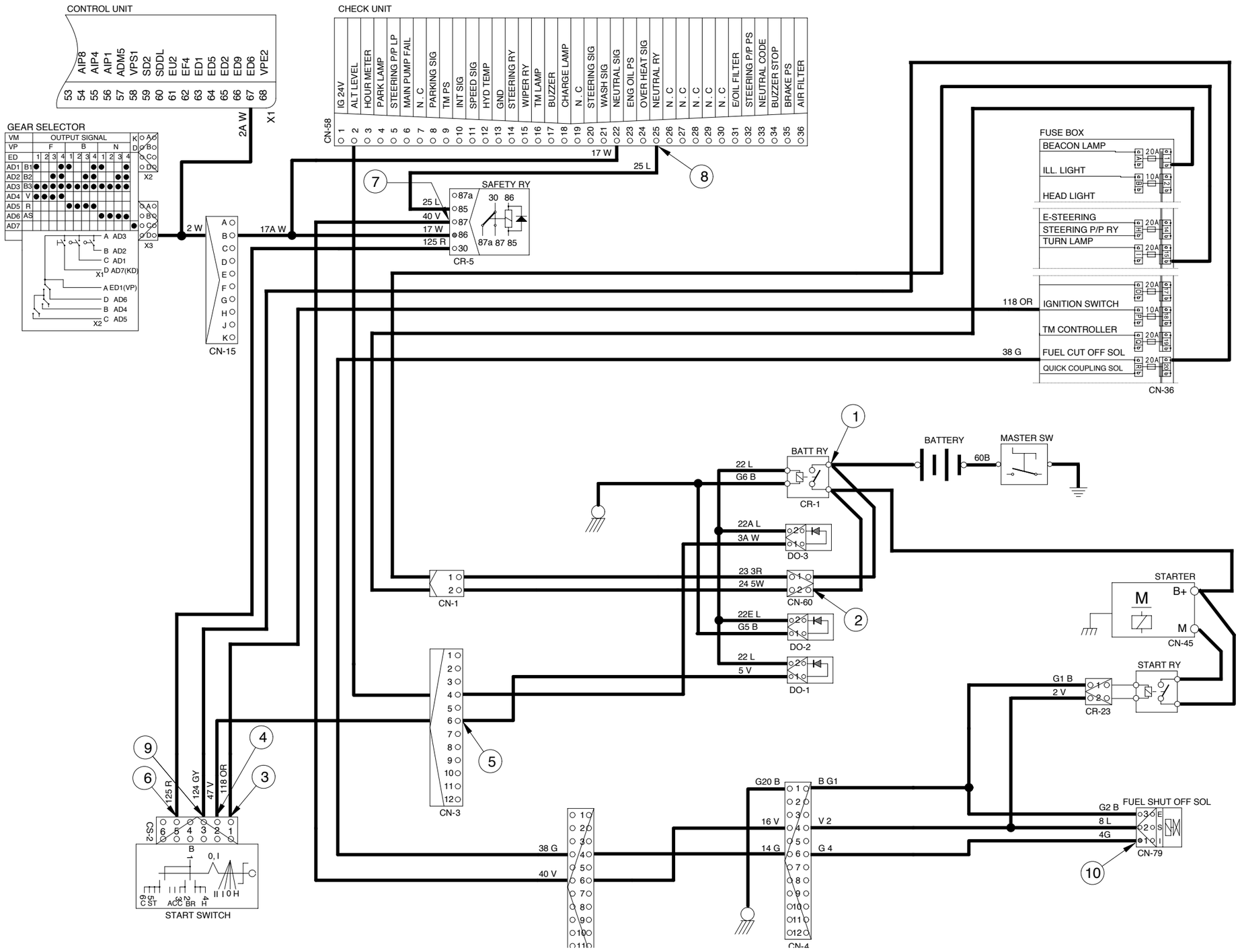
Start switch START [CS-2(5)] → Start safety relay [CR-5(30)] → Start safety relay [CR-5(87)]
→ I/conn [CN-2(6)] → I/conn [CN-4(4)] → Start relay [CR-23(2)]
→ Starter(Terminal B^+ and M connector of start motor)

2) CHECK POINT

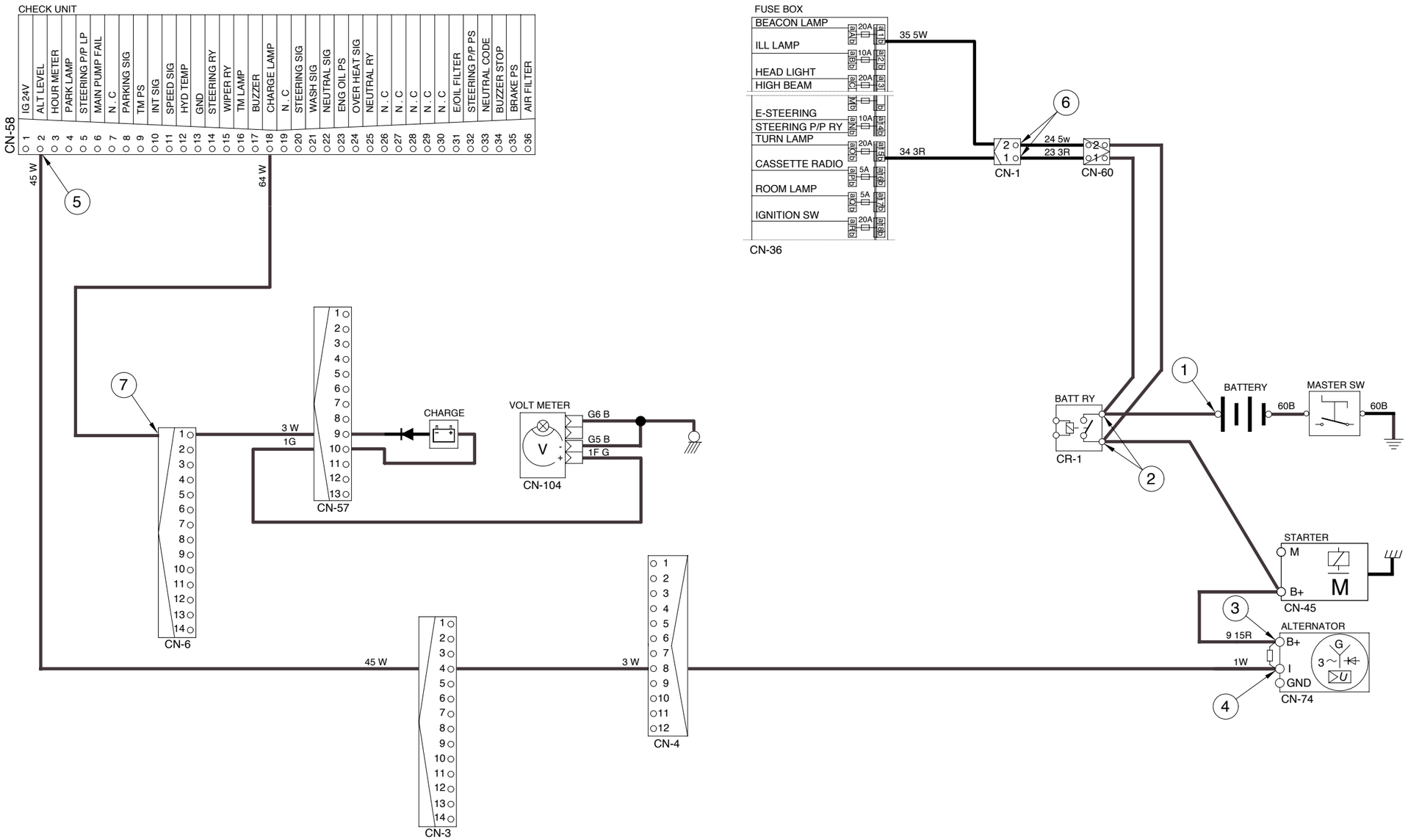
Engine	Key switch	Check point	Voltage
Running	ON	① - GND (Battery B^+) ② - GND (Fusible link) ③ - GND (Start key B^+) ④ - GND (Start key BR terminal) ⑤ - GND (I/conn CN-3(6)) ⑥ - GND (Start key ST terminal) ⑦ - GND (Start safety relay output) ⑧ - GND (Check unit) ⑨ - GND (Start key ACC terminal) ⑩ - GND (Fuel shut off solenoid)	20~28V

※ GND : Ground

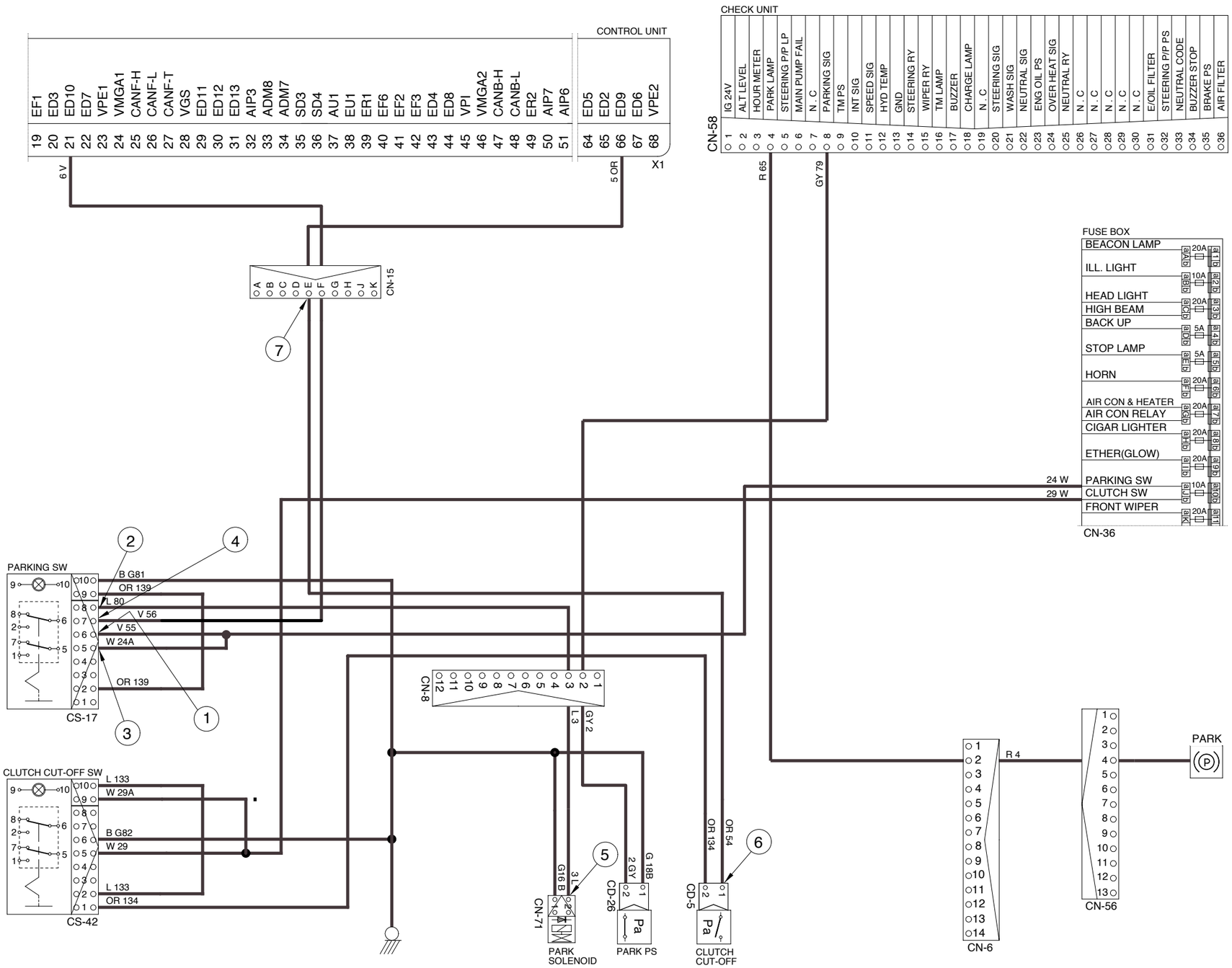
STARTING CIRCUIT



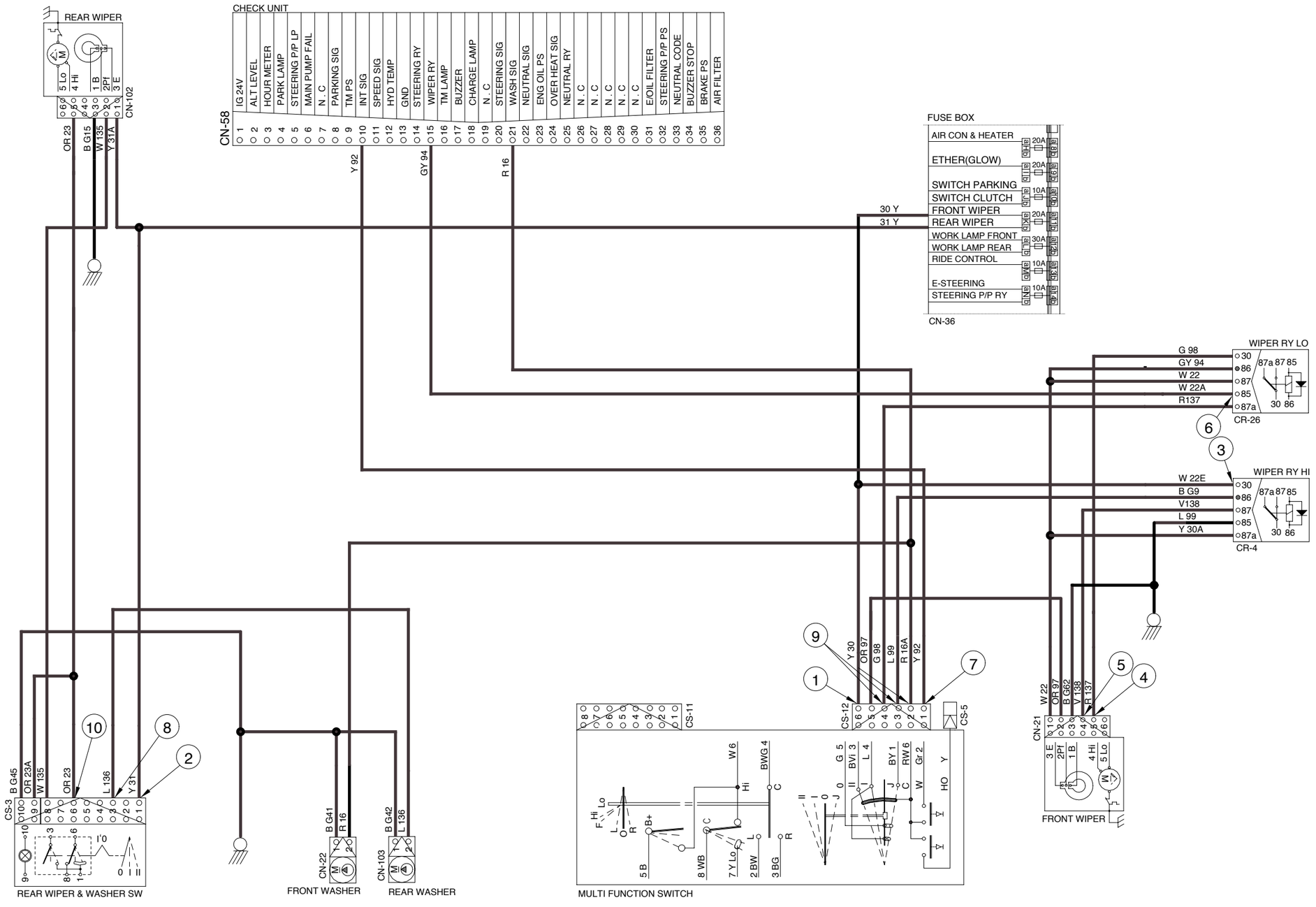
CHARGING CIRCUIT



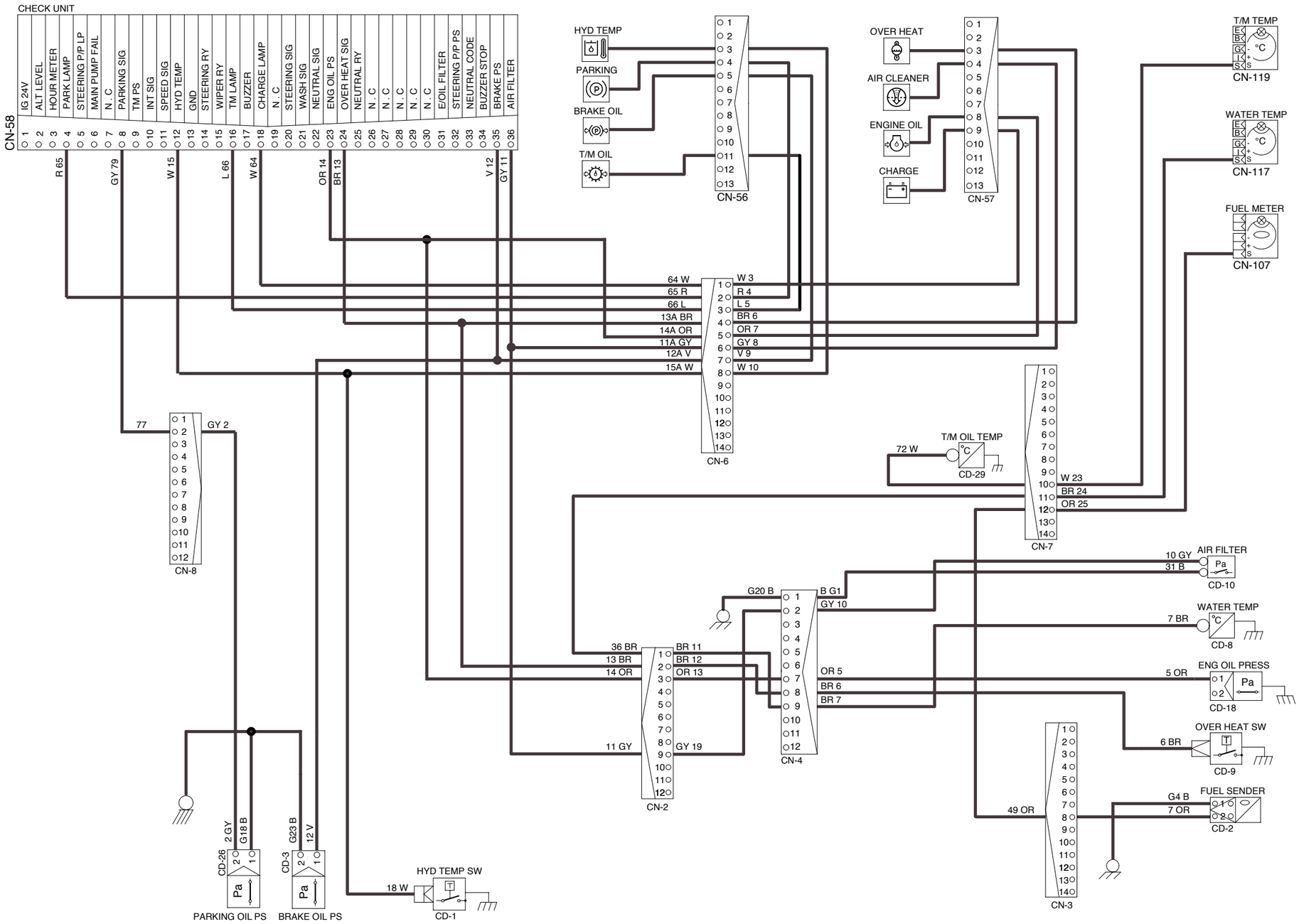
ELECTRIC PARKING, DECLUTCH CIRCUIT



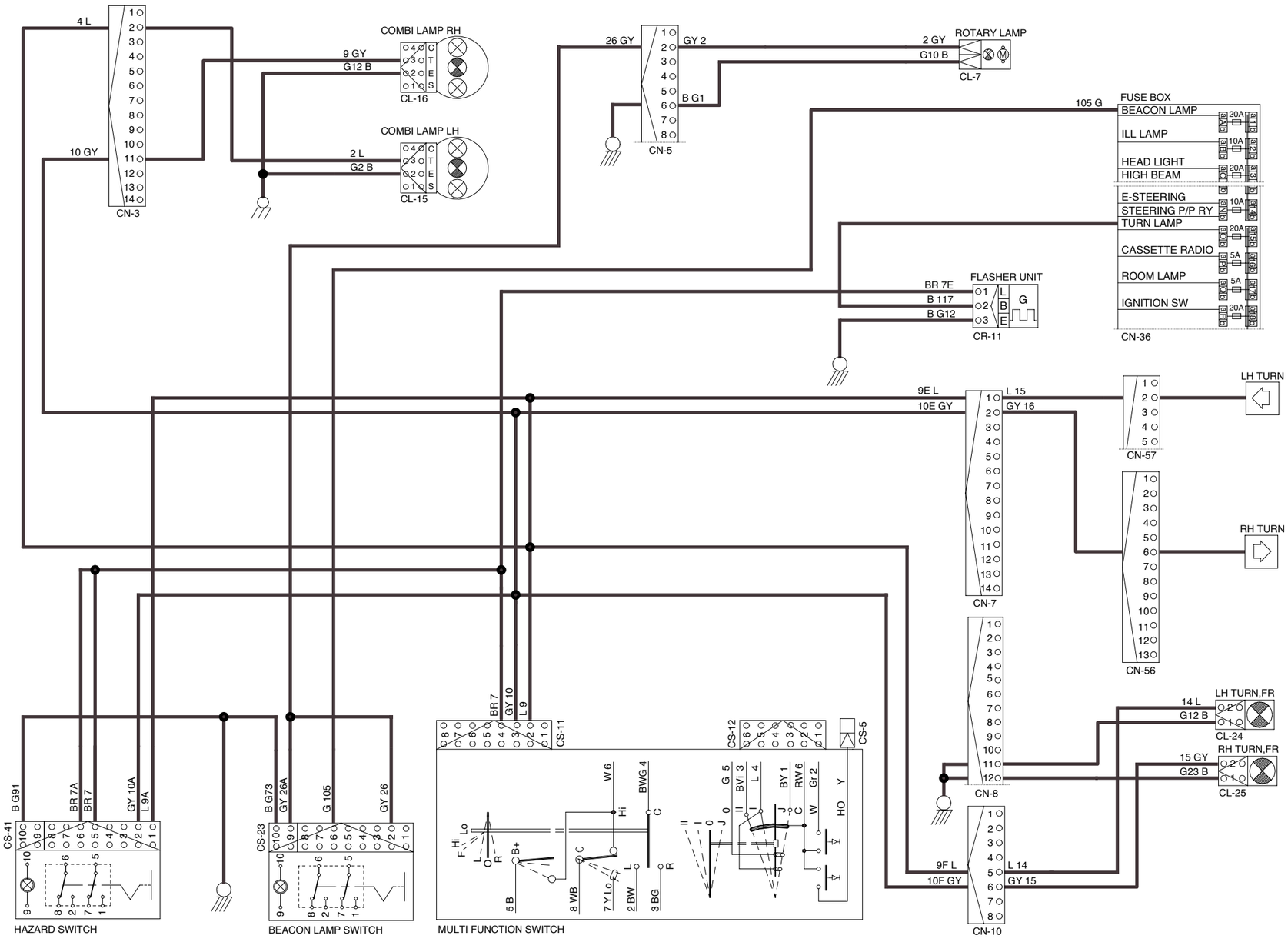
WIPER AND WASHER CIRCUIT



MONITORING CIRCUIT



HAZARD, TURN AND ROTARY CIRCUIT



5. FUEL SHUT OFF CIRCUIT

1) OPERATING FLOW

Start key OFF [CS-2(3)] → Fuse box (No.20) → I/conn [CN-2(4)] → I/conn [CN-4(6)] → Fuel shut off solenoid [CN-79(1)]

2) CHECK POINT

Engine	Key switch	Check point	Voltage
OFF	OFF	⑨ - GND (Start key ACC terminal) ⑩ - GND (Fuel shut off solenoid)	0V

※ GND : Ground

3) WIRING DIAGRAM - See page 7-12.

6. 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-1).

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(Ⅰ)] → I/conn [CN-4(8)] → I/conn [CN-3(4)]
→ Check unit [CN-58(2)→(18)] → I/conn [CN-6(1)] → I/conn [CN-57(9)]
→ Cluster charge warning lamp ON (Below 24V) → I/conn [CN-57(10)]
→ Volt meter [CN-104(+)]

(2) Charging flow

Alternator [CN-74(B^+)] → Starter [CN-45(B^+)] → Battery relay [CR-1]
→ Battery(+) terminal → Charging
→ I/conn [CN-60(1),(2)] → I/conn [CN-1(1),(2)] → Fuse box

2) CHECK POINT

Engine	Key switch	Check point	Voltage
Running	ON	① - GND (Battery) ② - GND (Battery relay) ③ - GND (ALT B^+) ④ - GND (ALT Ⅰ) ⑤ - GND (Check unit) ⑥ - GND (Fuse box)	20~28V

Engine	Key switch	Check point	Resistance
Running	ON	⑦ - GND (Cluster)	∞Ω

※ GND : Ground

7. ELECTRIC PARKING, DECLUTCH CIRCUIT

1) OPERATING FLOW

(1) Parking OFF

Fuse box (No.10) → Parking switch OFF[CS-17(5)隊(7)] → I/conn[CN-15(F)] → Control unit[X1(21)]
Fuse box (No.10) → Parking switch OFF[CS-17(6)隊(8)] → I/conn[CN-8(3)] →
Parking solenoid ON(Activated) → Parking brake released(By hydraulic pressure)

(2) Parking ON

Fuse box (No.10) → Parking switch ON → Parking solenoid [CN-71] OFF
→ Parking brake applied [By spring force]
→ [CS-17(6)隊(2)] → Parking switch indicator lamp ON

(3) Declutch ON

Fuse box (No.10) → Clutch cut-off switch ON → Clutch cut-off switch [CS-42(6)隊(2)]
→ Clutch cut-off switch indicator lamp ON
→ Clutch cut-off switch [CS-42(5)隊(1)]
→ Service brake applied
→ Clutch oil pressure switch ON [CD-5]
→ I/conn [CN-15(E)] → Control unit [X1(66)]
→ Declutch

2) CHECK POINT

Engine	Key switch	Check point	Voltage
Running	ON	① - GND (Parking switch input) ② - GND (Parking switch output) ③ - GND (Parking switch input) ④ - GND (Parking switch output) ⑤ - GND (Parking solenoid) ⑥ - GND (Clutch cut-off press switch) ⑦ - GND (Declutch input signal)	20~28V

※ GND : Ground

8. WIPER AND WASHER CIRCUIT

1) OPERATING FLOW

Fuse box (No.11) → Wiper relay Hi [CR-4(30)隊(87a)] → Front wiper motor [CN-21(1)]
Wiper relay Hi [CR-4(30)隊(87a)] → Front relay Lo [CR-26(86), (87)]
Fuse box (No.11) → Multi function switch [CS-12(6)]
Fuse box (No.11) → Rear wiper & washer switch [CS-3(1)]
Fuse box (No.11) → Rear wiper motor [CN-102(1)]

(1) Front washer switch ON

① Washer switch ON [CS-12(6)隊(2)] → Washer tank [CN-22(2)] → Washer operating
Washer switch ON [CS-12(6)隊(2)] → Check unit [CN-58(21)隊(15)] → Wiper relay Lo [CR-26(87)隊(30)] → Front wiper motor [CN-21(5)] → Wiper motor operating(Low)

(2) Front wiper switch ON

① **INT position**

Wiper switch ON [CS-12(6)隊(1)] → Check unit [CN-58(10)隊(15)] → Wiper relay Lo [CR-26(87)隊(30)] → Front wiper motor [CN-21(5)] → Front wiper motor intermittently operating

② **Lo position**

Wiper switch ON [CS-12(6)隊(4)] → Wiper motor Lo [CR-26(87a)隊(30)] → Front wiper motor [CN-21(5)] → Front wiper motor operating (Low)

③ **Hi position**

Wiper switch ON [CS-12(6)隊(3)] → Wiper relay Hi [CR-4(30)隊(87)] → Front wiper motor [CN-21(4)] → Front wiper motor operating(High)

(3) Auto-parking(When switch OFF)

Switch OFF → Fuse box (No.11) → Wiper relay Hi [CR-4(30)隊(87a)] → Front wiper motor[CN-21(1)隊(2)] → Multi function switch [CS-12(5)隊(4)] → Wiper relay Lo [CR-26(87a)隊(30)] → 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)隊(6)] → Wiper motor [CN-102(5)] → Wiper motor operating
Wiper switch ON [CS-3(1)隊(6)] → Rear wiper and washer switch indicator lamp ON

② **Washer switch ON**(2nd step)

Washer switch ON [CS-3(1)隊(3)] → Rear washer tank [CN-103(2)] → Washer operating

2) CHECK POINT

Engine	Key switch	Check point	Voltage
Stop	ON	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 (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)	20~25V

※ GND : Ground