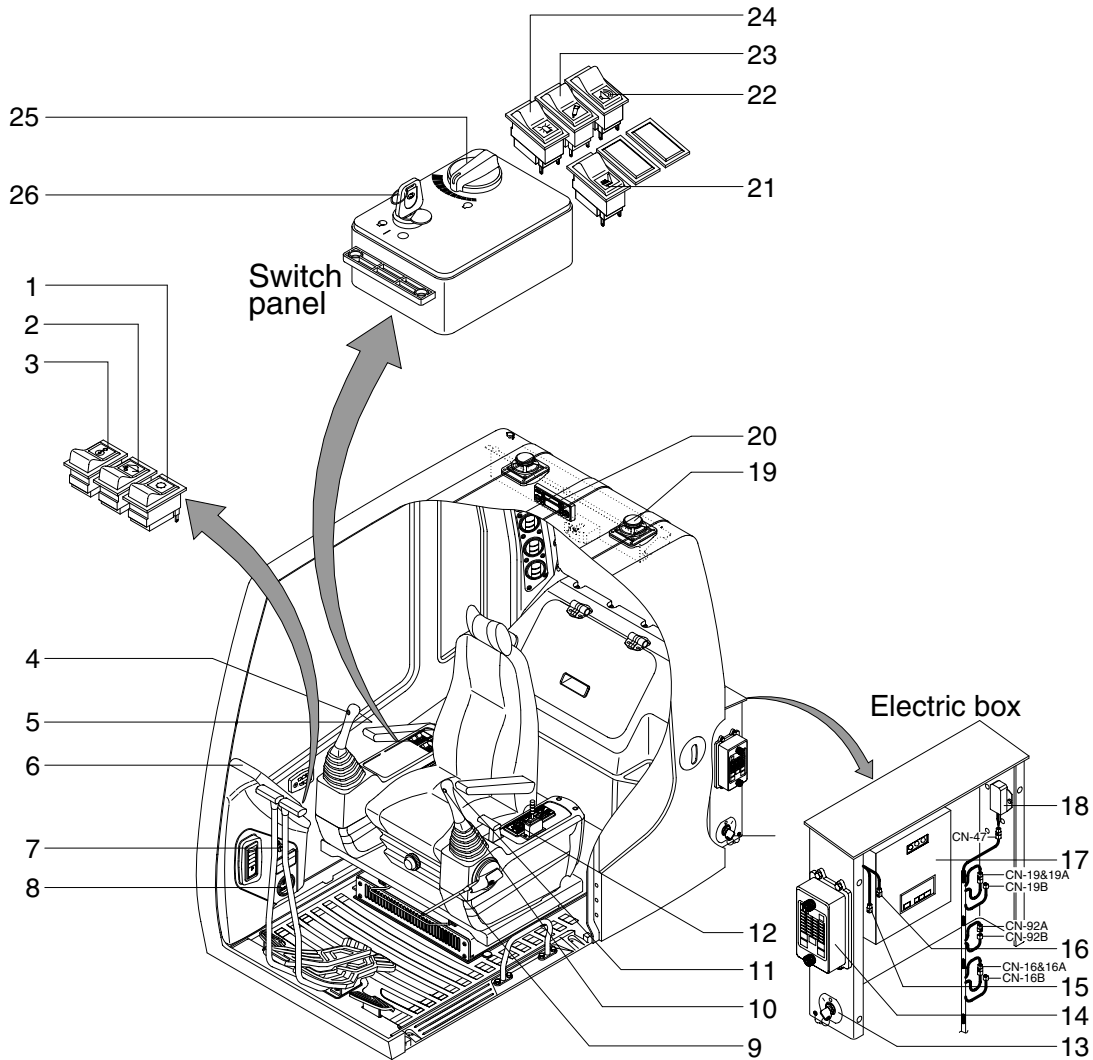


# SECTION 4 ELECTRICAL SYSTEM

## GROUP 1 COMPONENT LOCATION

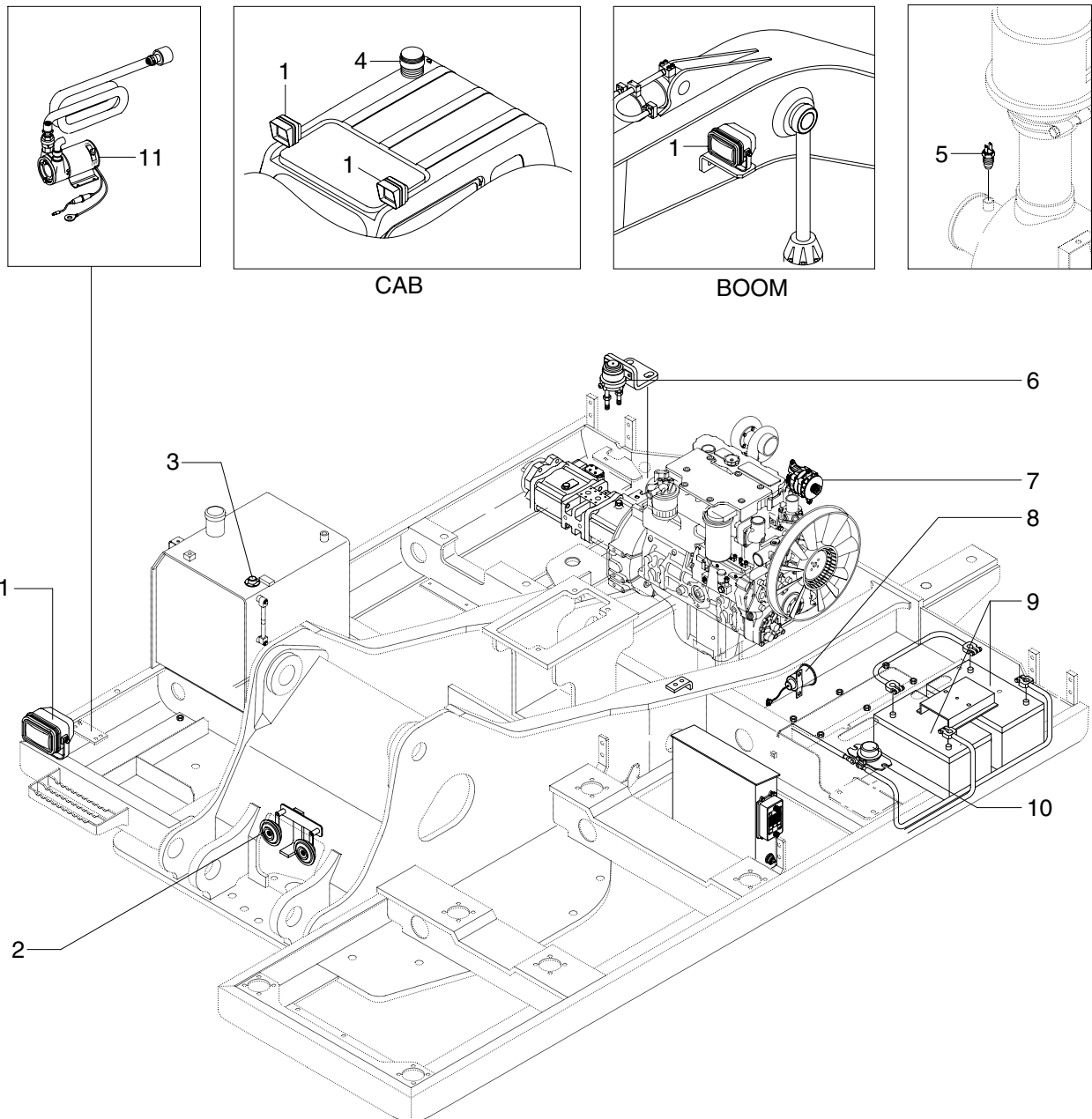
### 1. LOCATION 1



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- |   |                          |    |                        |    |                          |
|---|--------------------------|----|------------------------|----|--------------------------|
| 1 | Main light switch        | 10 | Power max switch       | 19 | Speaker                  |
| 2 | Quick clamp switch       | 11 | One touch decel switch | 20 | Cassette radio           |
| 3 | Overload switch          | 12 | Air-conditioner switch | 21 | Heated seat switch       |
| 4 | Breaker operation switch | 13 | Master switch          | 22 | Travel alarm stop switch |
| 5 | Horn switch              | 14 | Fuse box               | 23 | Breaker selection switch |
| 6 | Cluster                  | 15 | J1939 serial connector | 24 | Beacon switch            |
| 7 | Cigar lighter            | 16 | RS232 serial connector | 25 | Accel dial               |
| 8 | Hour meter               | 17 | MCU controller         | 26 | Start switch             |
| 9 | Safety lever             | 18 | Prolix resistor        |    |                          |

## 2. LOCATION 2



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- |   |             |   |                     |    |                  |
|---|-------------|---|---------------------|----|------------------|
| 1 | Lamp        | 5 | Air cleaner switch  | 9  | Battery          |
| 2 | Horn        | 6 | Heater relay        | 10 | Battery relay    |
| 3 | Fuel sender | 7 | Alternator          | 11 | Fuel filler pump |
| 4 | Beacon lamp | 8 | Travel alarm buzzer |    |                  |

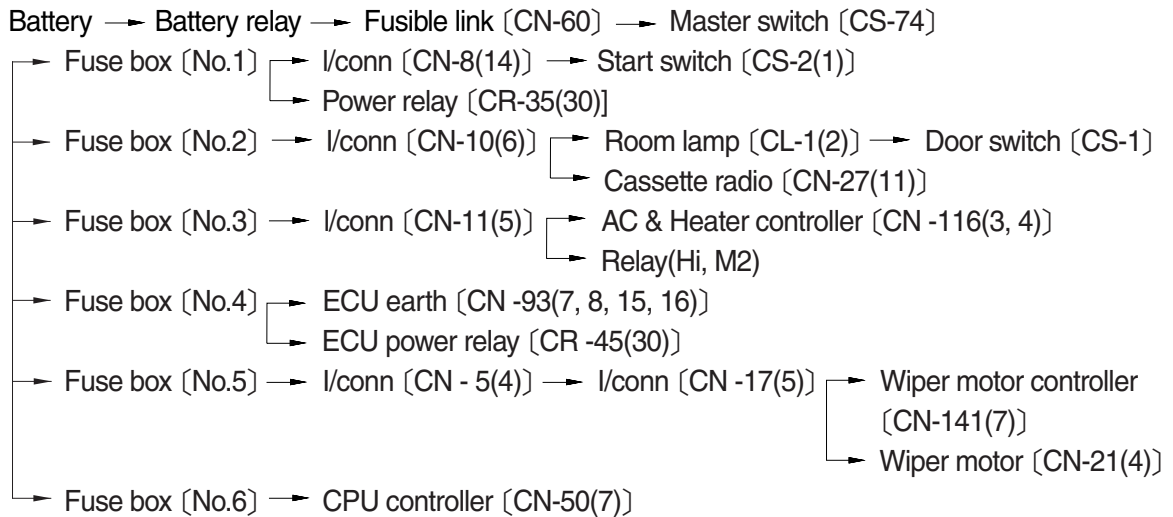


## 1. POWER CIRCUIT

The negative terminal of battery is grounded to the machine chassis.

When the start switch is in the OFF position, the current flows from the positive battery terminal as shown below.

### 1) OPERATING FLOW



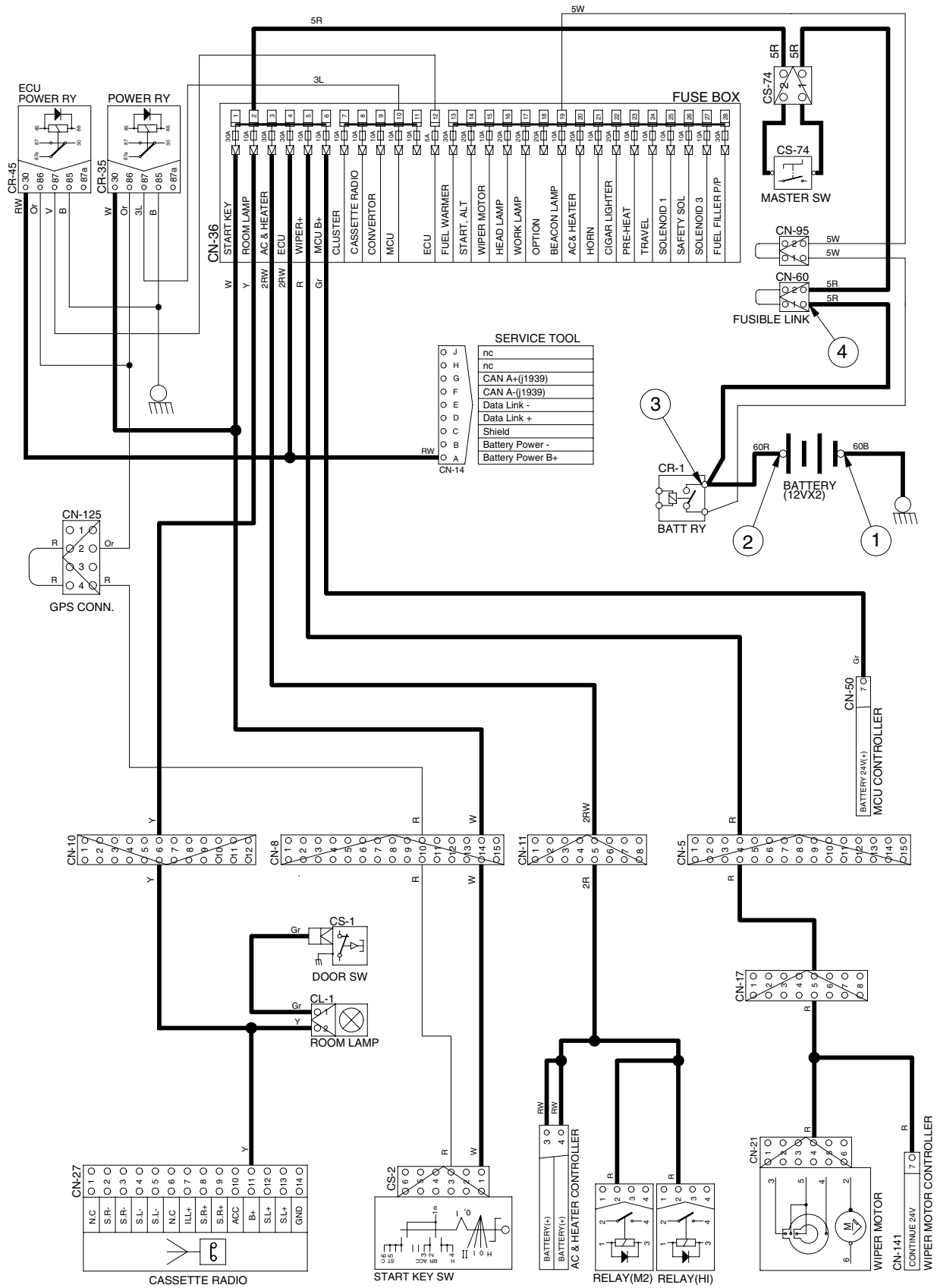
※ I/conn : Intermediate connector

### 2) CHECK POINT

Engine	Start switch	Check point	Voltage
OFF	OFF	① - GND (Battery 1EA) ② - GND (Battery 2EA) ③ - GND (Battery 2EA) ④ - GND (Fusible link)	10~12.5V 20~25V 20~25V 20~25V

※ GND : Ground

# POWER CIRCUIT



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## 2. STARTING CIRCUIT

### 1) OPERATING FLOW

Battery(+) terminal → Battery relay〔CR-1〕 → Fusible link 〔CN-60〕 → Master switch〔CS-74〕  
 → Fuse box 〔No.1〕 → I/conn 〔CN-8(14)〕 → Start switch 〔CS-2(1)〕

#### (1) When start key switch is in ON position

→ Start switch ON 〔CS-2(2)〕 → I/conn 〔CN-8(11)〕 → Battery relay 〔CR-1〕  
 → Battery relay operating (All power is supplied with the electric component)  
 → Start switch ON 〔CS-2(3)〕 → I/conn 〔CN-8(10)〕 → GPS conn〔CN-125(4) →(2)〕  
 → Power relay 〔CR-35(86) → (87)〕 → Fuse box 〔No.10〕

#### (2) When start key switch is in START position

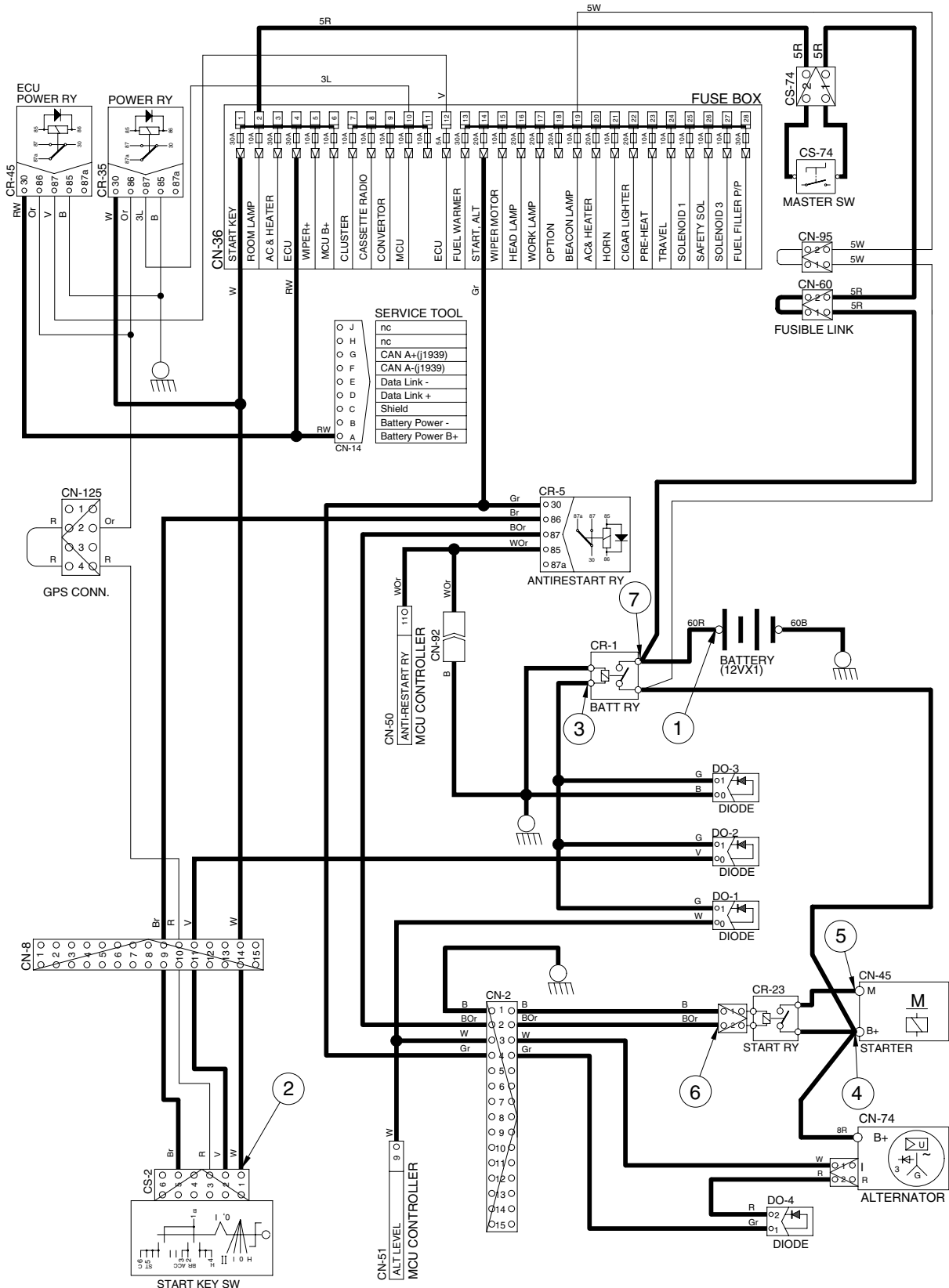
Start switch START 〔CS-2(5)〕 → I/conn 〔CN-8(9)〕 → Anti-restart relay 〔CR-5(86) →(87)〕  
 → I/conn 〔CN-2(2)〕 → Start relay 〔CR-23〕

### 2) CHECK POINT

Engine	Start switch	Check point	Voltage
OPERATING	START	① - GND(Battery) ② - GND(Start key) ③ - GND(Battery relay M4) ④ - GND(Starter B+) ⑤ - GND(Starter M) ⑥ - GND(Start relay) ⑦ - GND(Battery relay M8)	20~25V

※ GND : Ground

# STARTING CIRCUIT



### 3. 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

Alternator "I" terminal → I/conn [CN-2(3)] → CPU alternator level [CN-51(9)]

Cluster charging warning lamp(Via serial interface)

##### (2) Charging flow

Alternator "B+" terminal → Battery relay(M8) → Battery(+) terminal  
 → Fusible link [CN-60] → Master switch[CS-74]  
 → Fuse box

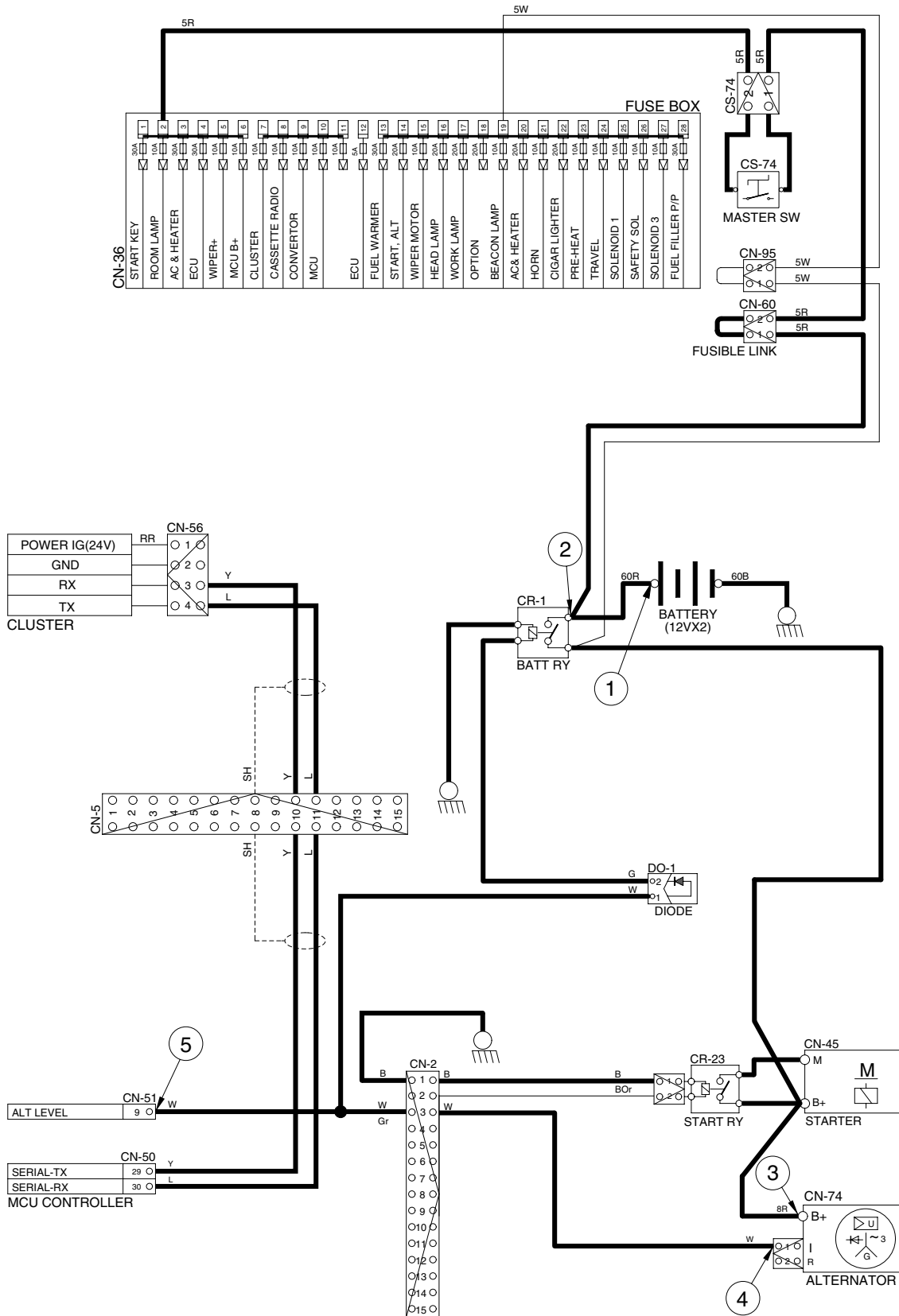
#### 2) CHECK POINT

Engine	Start switch	Check point	Voltage
Run	ON	① - GND(Battery voltage) ② - GND(Battery relay) ③ - GND(Alternator B <sup>+</sup> terminal) ④ - GND(Alternator I terminal) ⑤ - GND(CPU)	20~30V

※ GND : Ground



# CHARGING CIRCUIT



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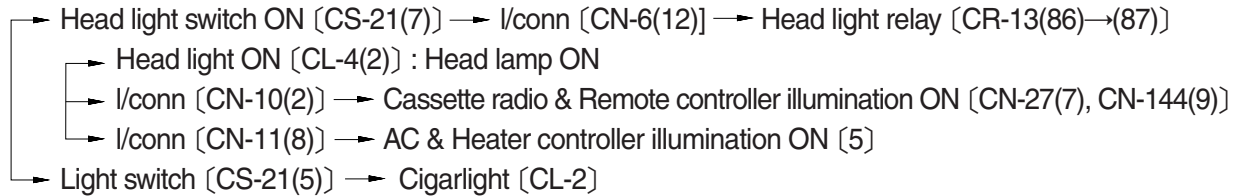
## 4. HEAD AND WORK LIGHT CIRCUIT

### 1) OPERATING FLOW

Fuse box (No.16) → I/conn [CN-5(15)] → Light switch[CS-21(1)]

Fuse box (No.17) → I/conn [CN-5(14)] → Light switch[CS-2(4)]

#### (1) Head light switch ON



#### (2) Work light switch ON

Work light switch ON [CS-21(2)] → I/conn [CN-5(2)] → Work lamp relay [CR-3(86)→(87)]

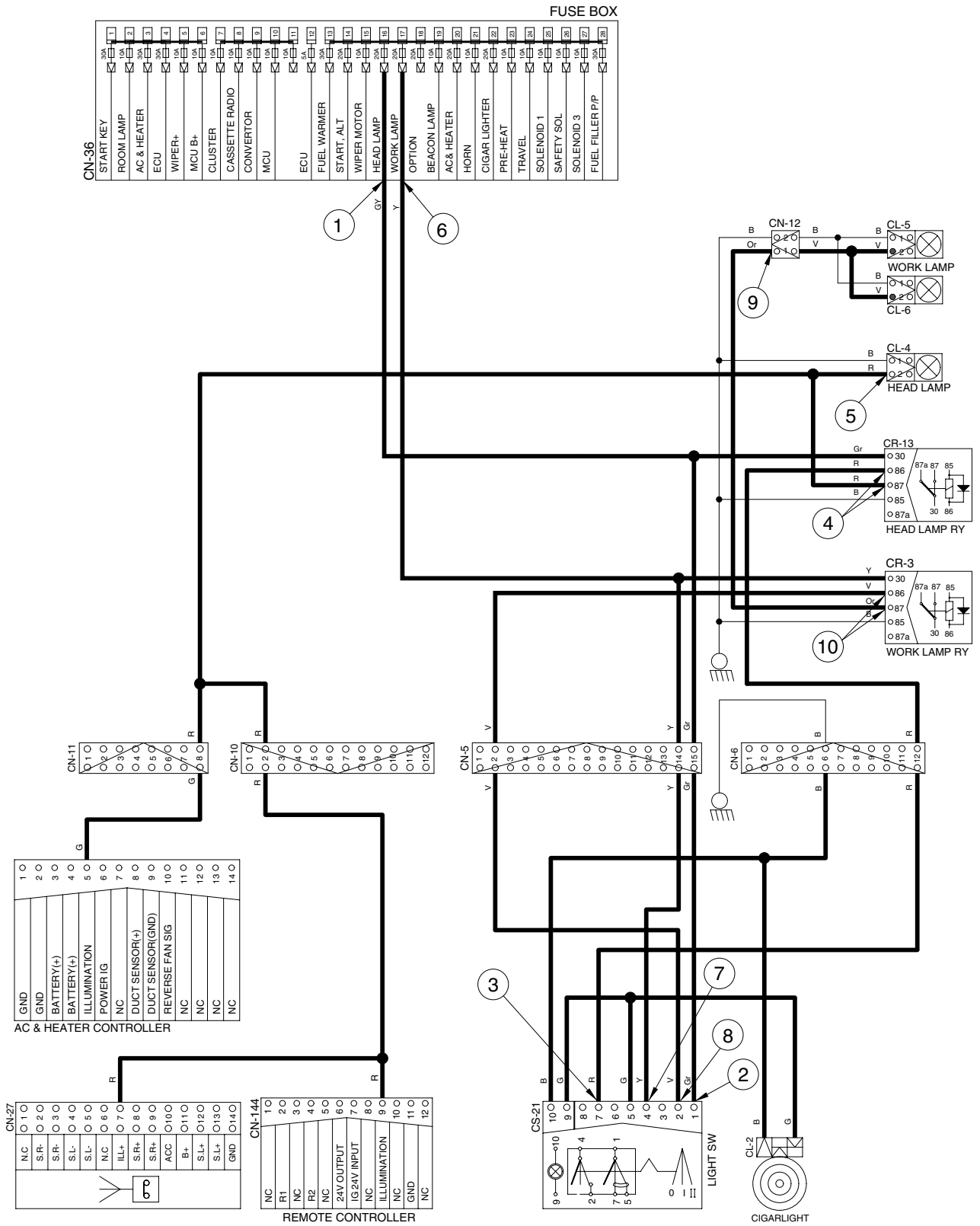
→ I/conn [CN-12(1)] → Work light ON [CL-5(2), CL-6(2)]

### 2) CHECK POINT

Engine	Start switch	Check point	Voltage
STOP	ON	① - GND(Fuse box) ② - GND(Switch power input) ③ - GND(Switch power output) ④ - GND(Head light relay)	20~25V
STOP	ON	⑤ - GND(Head light) ⑥ - GND(Fuse box) ⑦ - GND(Switch power input) ⑧ - GND(Switch power output) ⑨ - GND(Work light) ⑩ - GND(Work light relay)	20~25V

※ GND : Ground

# HEAD AND WORK LAMP CIRCUIT



## 5. BEACON LAMP AND CAB LIGHT CIRCUIT

### 1) OPERATING FLOW

Fuse box (No.19) → I/conn [CN-8(8)] → Beacon lamp switch [CN-23(6)]

Fuse box (No.17) → I/conn [CN-5(14)] → Light switch [CN-2(4)]

#### (1) Beacon lamp switch ON

Beacon lamp switch ON [CS-23(2)] → Switch Indicator lamp ON [CS-23(9)]  
 → I/conn [CN-8(4)] → I/conn [CN-10(10)]  
 → Beacon lamp ON [CL-7]

#### (2) Cab light switch ON

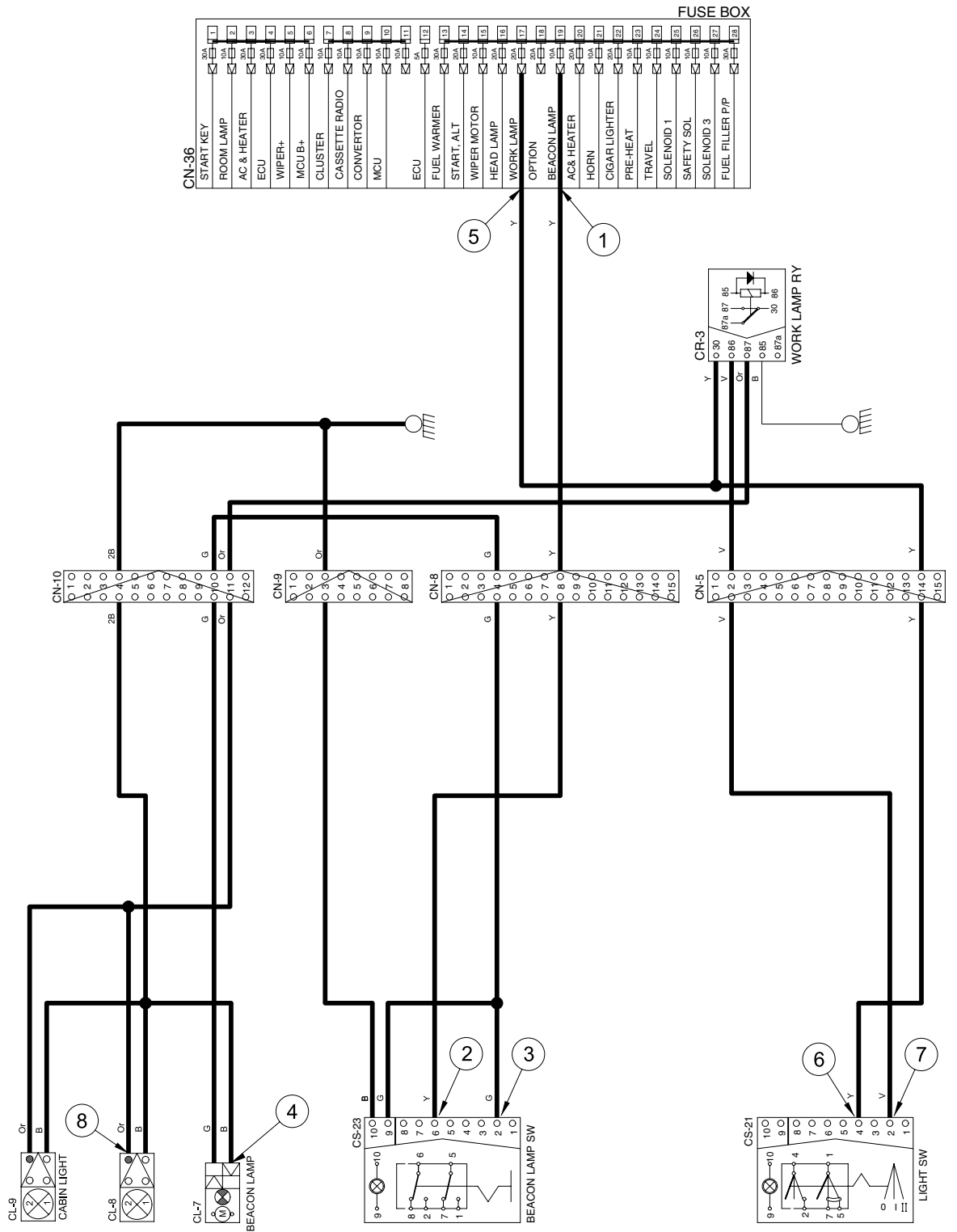
Cab light switch ON [CS-21(2)] → I/conn [CN-5(2)] → Work light relay [CR-3(86)→(87)]  
 → I/conn [CN-10(11)] → Cab light ON [CL-8(2), CL-9(2)]

### 2) CHECK POINT

Engine	Start switch	Check point	Voltage
STOP	ON	① - GND(Fuse box) ② - GND(Switch power input) ③ - GND(Switch power output) ④ - GND(Beacon lamp)	20~25V
STOP	ON	⑤ - GND(Fuse box) ⑥ - GND(Switch power input) ⑦ - GND(Switch power output) ⑧ - GND(Cab light)	20~25V

※ GND : Ground

# BEACON LAMP AND CAB LIGHT CIRCUIT

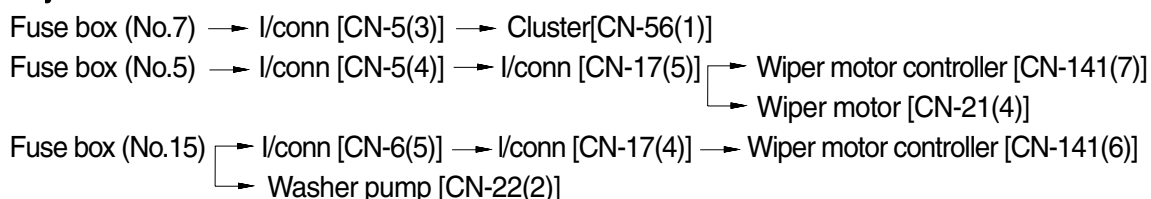


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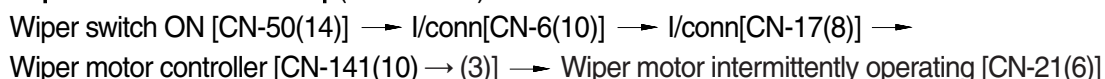
## 6. WIPER AND WASHER CIRCUIT

### 1) OPERATING FLOW

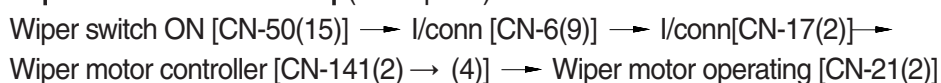
#### (1) Key switch ON



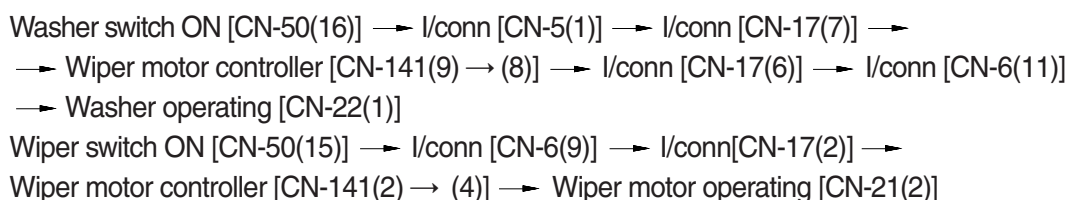
#### (2) Wiper switch ON : 1st step(Intermittent)



#### (3) Wiper switch ON : 2nd step(Low speed)



#### (4) Washer switch ON



#### (5) Auto parking(When switch OFF)

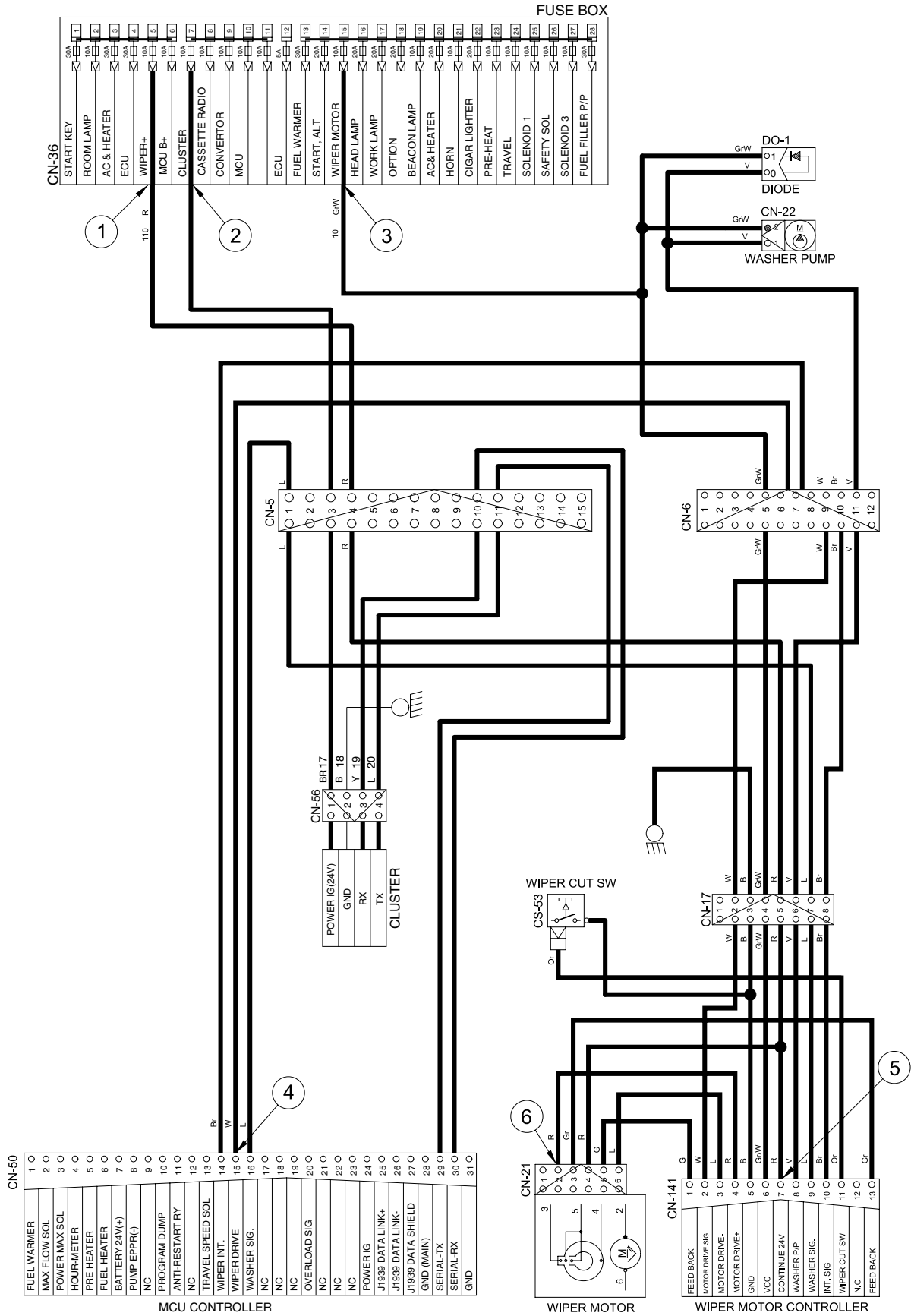


### 2) CHECK POINT

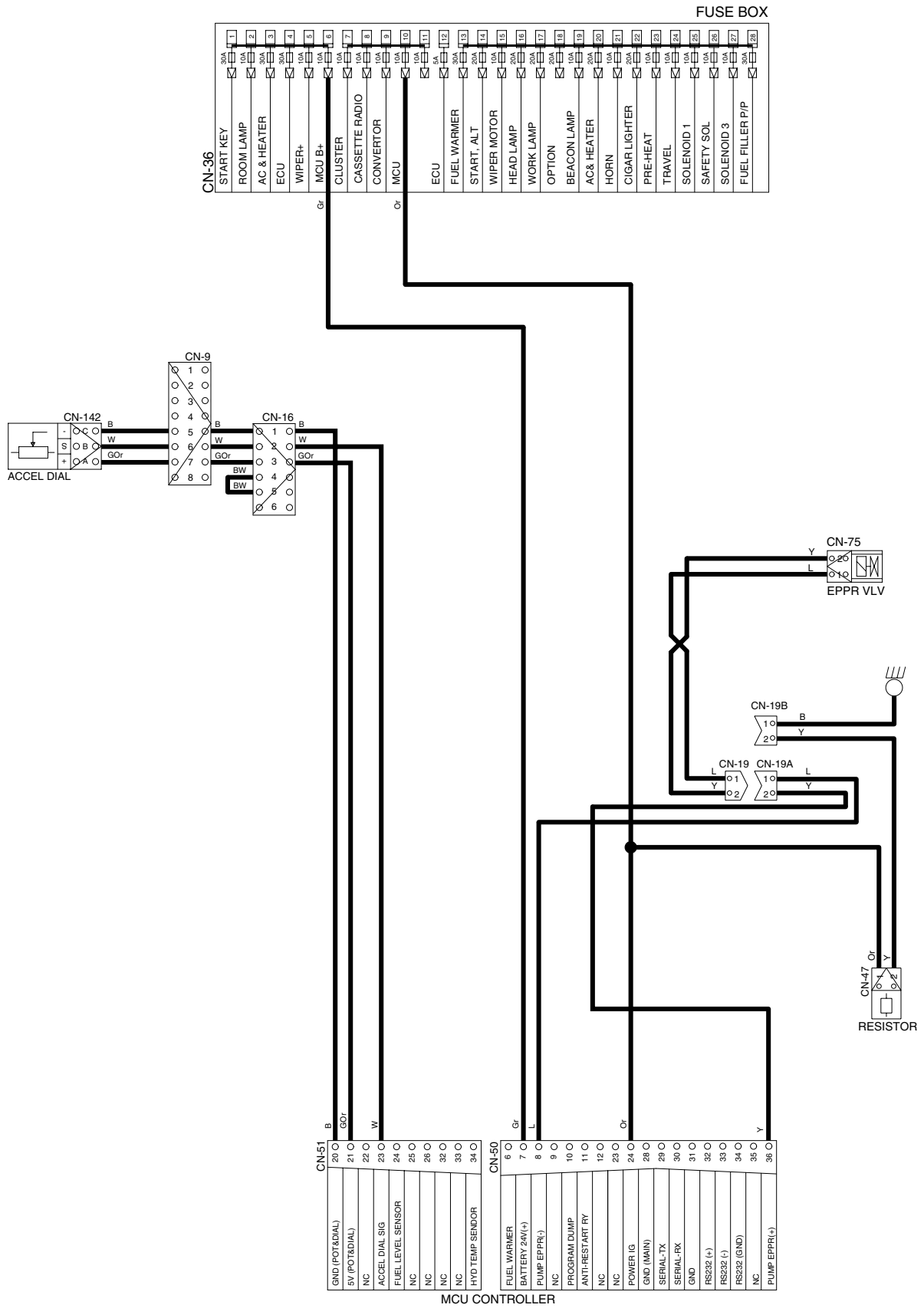
Engine	Start switch	Check point	Voltage
STOP	ON	① - GND(Fuse box)	24V
		② - GND(Switch power input)	
		③ - GND(Switch power output)	0~5V
		④ - GND(Wiper Power input)	
		⑤ - GND(Wiper power output)	24V
		⑥ - GND(Wiper motor)	0 or 24V

※ GND : Ground

# WIPER AND WASHER CIRCUIT



# CONTROLLER CIRCUIT



1107A4EL12