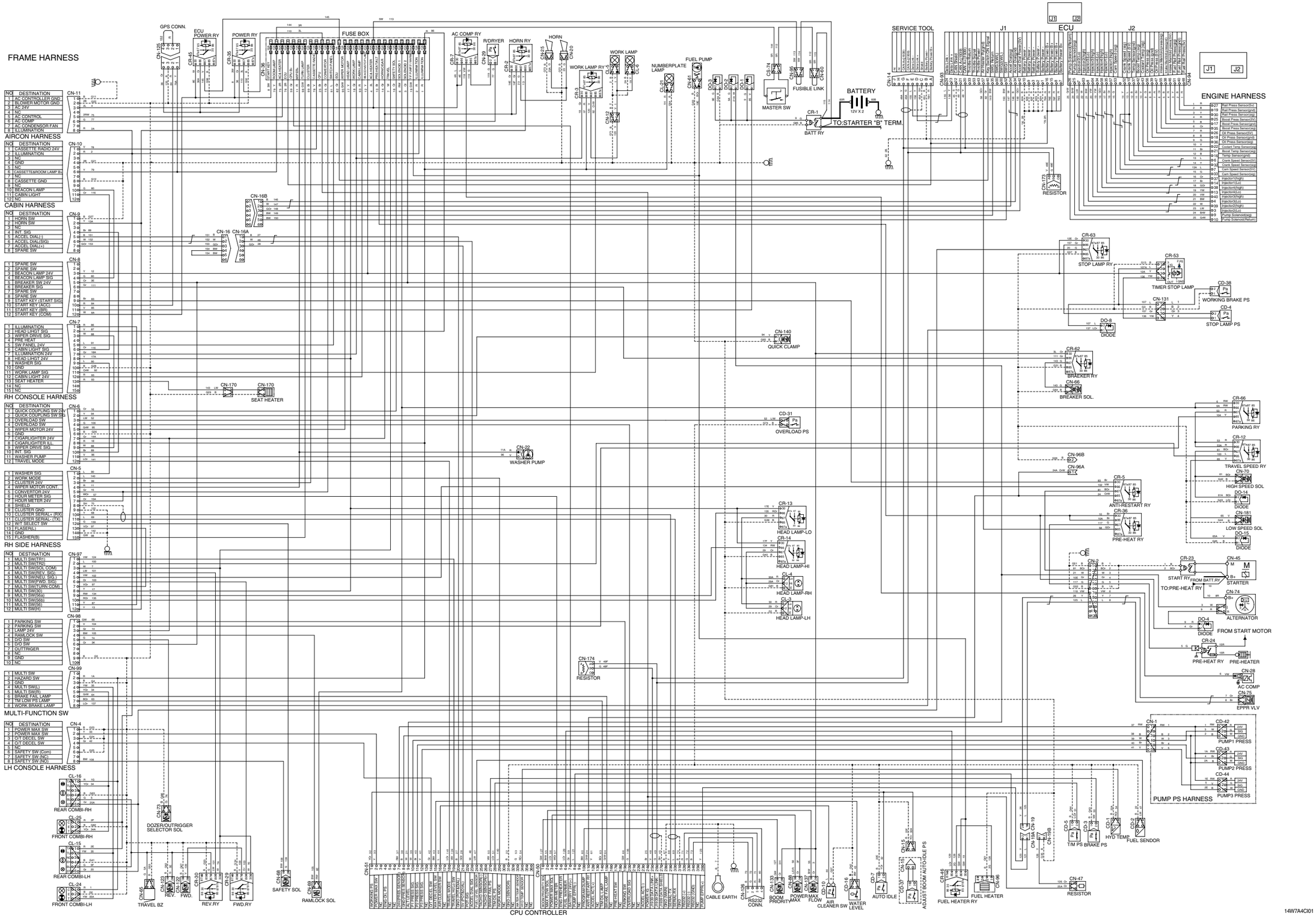
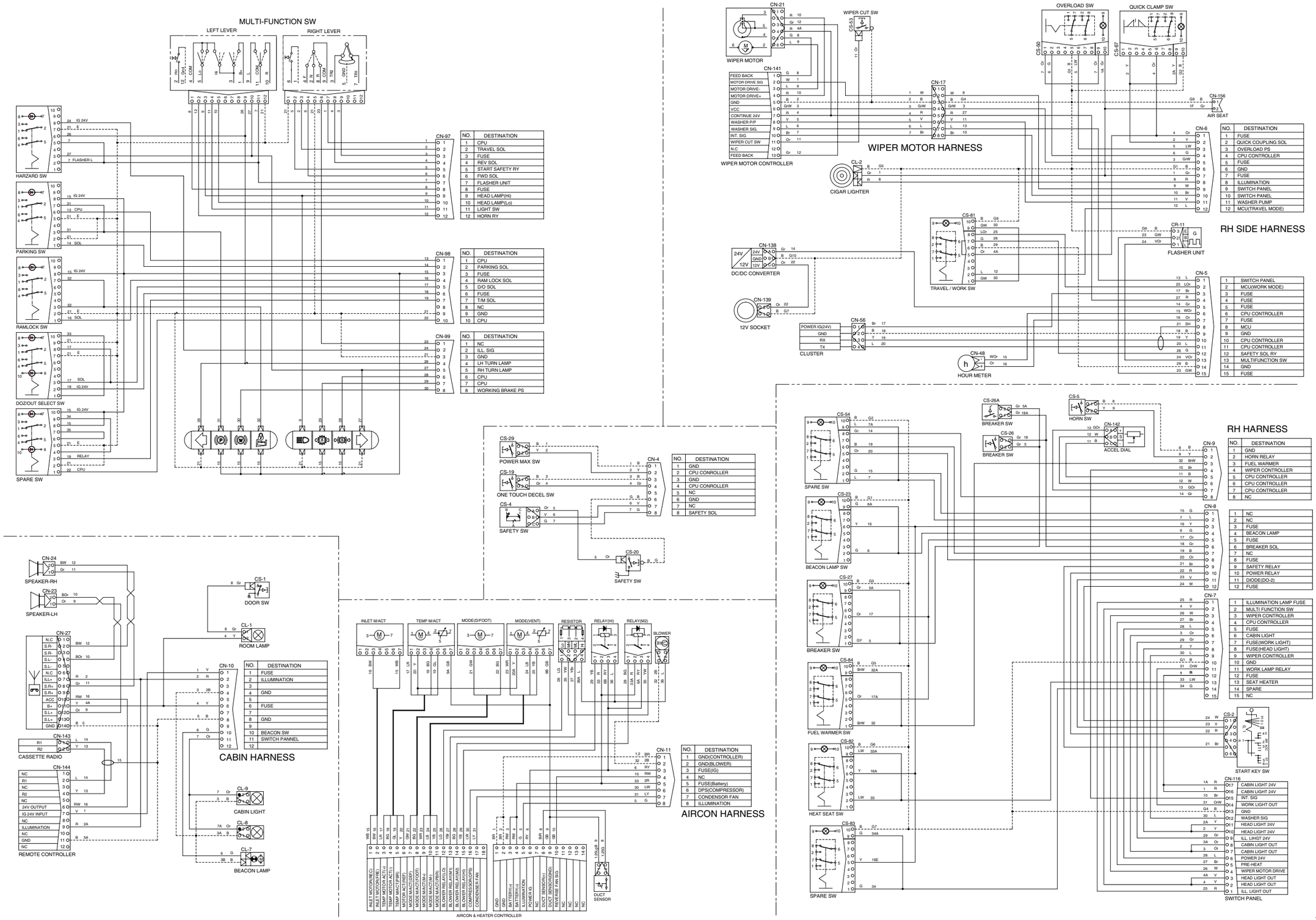
GROUP 2 ELECTRICAL CIRCUIT (1/2)





NO.	DESTINATION
1	CPU
2	TRAVEL SOL
3	FUSE
4	REV SOL
5	START SAFETY RY
6	FWD SOL
7	FLASHER UNIT
8	FUSE
9	HEAD LAMP(Hi)
10	HEAD LAMP(Lo)
11	LIGHT SW
12	HORN RY

NO.	DESTINATION
1	CPU
2	PARKING SOL
3	FUSE
4	RAM LOCK SOL
5	D/O SOL
6	FUSE
7	T/M SOL
8	NC
9	GND
10	CPU

NO.	DESTINATION
1	NC
2	ILL. SIG
3	GND
4	LH TURN LAMP
5	RH TURN LAMP
6	CPU
7	CPU
8	WORKING BRAKE PS

NO.	DESTINATION
1	FUSE
2	QUICK COUPLING SOL
3	OVERLOAD PS
4	CPU CONTROLLER
5	FUSE
6	GND
7	FUSE
8	ILLUMINATION
9	SWITCH PANEL
10	SWITCH PANEL
11	WASHER PUMP
12	MCU(TRAVEL MODE)

NO.	DESTINATION
1	SWITCH PANEL
2	MCU(WORK MODE)
3	FUSE
4	FUSE
5	FUSE
6	CPU CONTROLLER
7	FUSE
8	MCU
9	GND
10	CPU CONTROLLER
11	CPU CONTROLLER
12	SAFETY SOL RY
13	MULTIFUNCTION SW
14	GND
15	FUSE

NO.	DESTINATION
1	GND
2	HORN RELAY
3	FUEL WARMER
4	WIPER CONTROLLER
5	CPU CONTROLLER
6	CPU CONTROLLER
7	CPU CONTROLLER
8	NC

NO.	DESTINATION
1	NC
2	NC
3	FUSE
4	BEACON LAMP
5	FUSE
6	BREAKER SOL
7	NC
8	FUSE
9	SAFETY RELAY
10	POWER RELAY
11	DIODE(DO-2)
12	FUSE

NO.	DESTINATION
1	ILLUMINATION LAMP FUSE
2	MULTI FUNCTION SW
3	WIPER CONTROLLER
4	CPU CONTROLLER
5	FUSE
6	CABIN LIGHT
7	FUSE(WORK LIGHT)
8	FUSE(HEAD LIGHT)
9	WIPER CONTROLLER
10	GND
11	WORK LAMP RELAY
12	FUSE
13	SEAT HEATER
14	SPARE
15	NC

NO.	DESTINATION
1	GND
2	CPU CONROLLER
3	GND
4	CPU CONROLLER
5	NC
6	GND
7	NC
8	SAFETY SOL

NO.	DESTINATION
1	FUSE
2	ILLUMINATION
3	
4	GND
5	
6	FUSE
7	
8	GND
9	
10	BEACON SW
11	SWITCH PANNEL
12	

NO.	DESTINATION
1	GND(CONTROLLER)
2	GND(BLOWER)
3	FUSE(IG)
4	NC
5	FUSE(Battery)
6	DPS(COMPRESSOR)
7	CONDENSOR FAN
8	ILLUMINATION

NO.	DESTINATION
1	GND
2	CPU CONROLLER
3	GND
4	CPU CONROLLER
5	NC
6	GND
7	NC
8	SAFETY SOL

14W7A4CI02

MEMORANDUM


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

1. POWER CIRCUIT

The negative terminal of battery is grounded to the machine chassis through master switch.
When the start switch is in the OFF position, the current flows from the positive battery terminal as shown below.

1) OPERATING FLOW

Battery → Battery relay → Fusible link 〔CN-60〕 → Master switch 〔CS-74〕

- Fuse box 〔No.1〕 → I/conn 〔CN-8(12)〕 → Start switch 〔CS-2(1)〕
  - Power relay 〔CR-35(30)]
  - ECU power relay 〔CR-45(30)〕
- Fuse box 〔No.2〕 → I/conn 〔CN-10(6)〕 → Room lamp 〔CL-1(2)〕 → Door switch 〔CS-1〕
  - Cassette radio 〔CN-27(11)〕
- Fuse box 〔No.3〕 → I/conn 〔CN-11(5)〕 → AC & Heater controller 〔CN -116(3, 4)〕
  - Relay(Hi, M2)
- Fuse box 〔No.4〕 → ECU earth 〔CN -93(7, 8, 15, 16)〕
- Fuse box 〔No.5〕 → CPU controller 〔CN-50(7)〕
- Fuse box 〔No.6〕 → I/conn 〔CN - 5(4)〕 → I/conn 〔CN -17(5)〕 → Wiper motor controller 〔CN-141(7)〕
  - Wiper motor 〔CN-21(4)〕

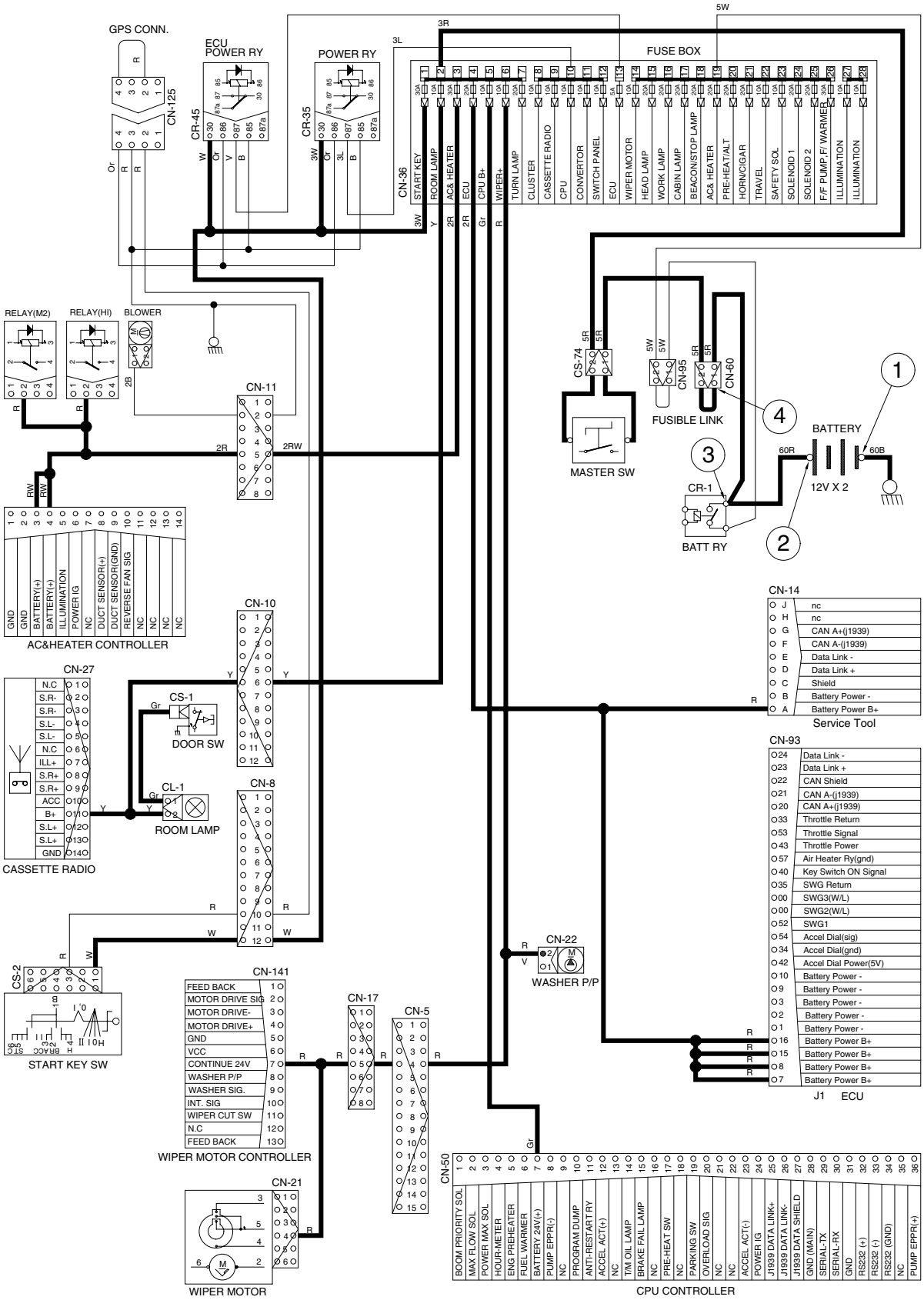
※ I/conn : Intermediate connector

2) CHECK POINT

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

※ GND : Ground

POWER CIRCUIT



14W7A4EL03

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(12)〕 → 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)〕 → Power relay 〔CR-35(86) → (87)〕
→ Fuse box 〔No.10〕

(2) When start key switch is in START position

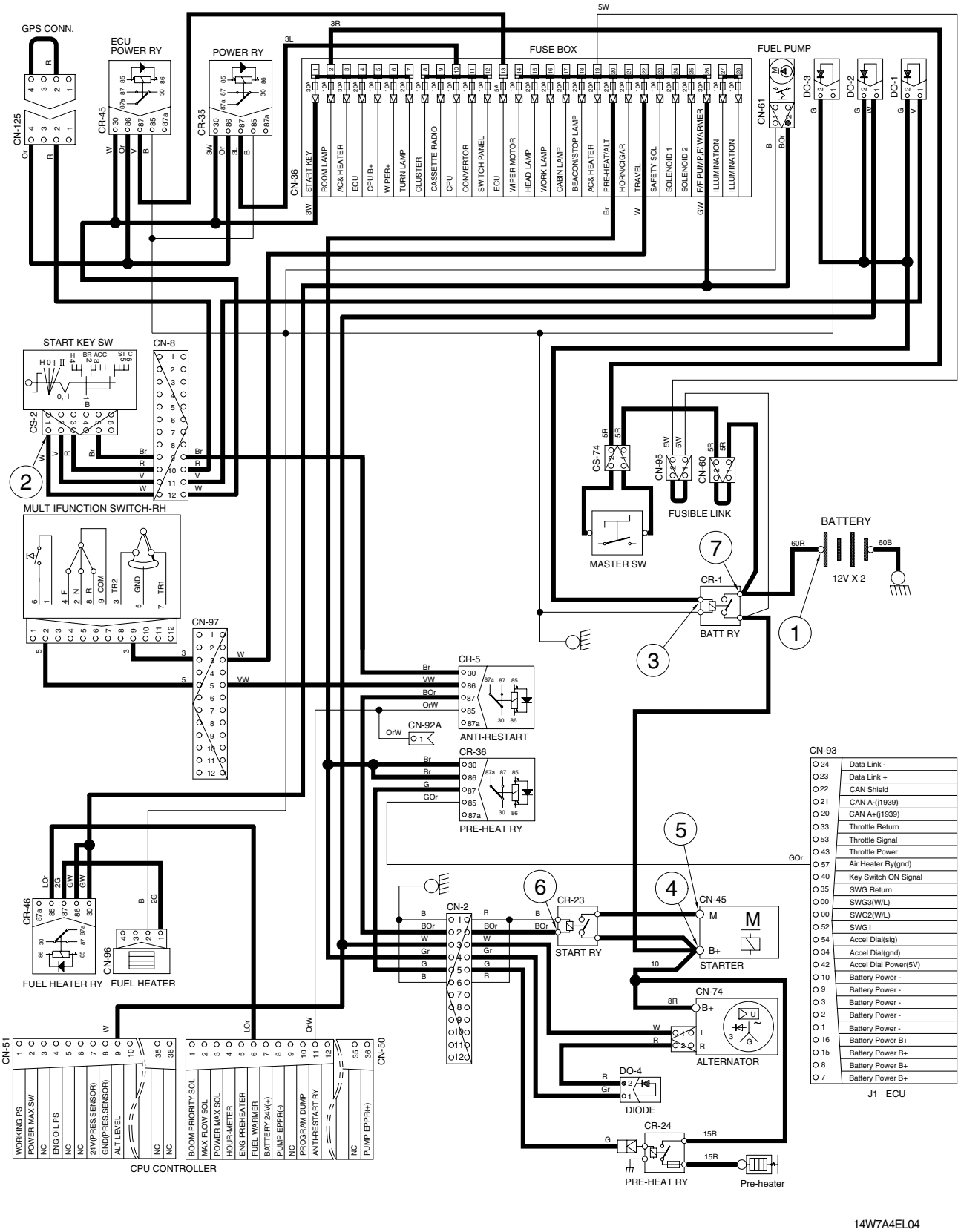
Start switch START 〔CS-2(5)〕 → I/conn 〔CN-8(9)〕 → Anti-restart relay 〔CR-5(86) → (87)〕
→ I/conn 〔CN-2(2)〕 → Start relay 〔CR-23〕

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〕

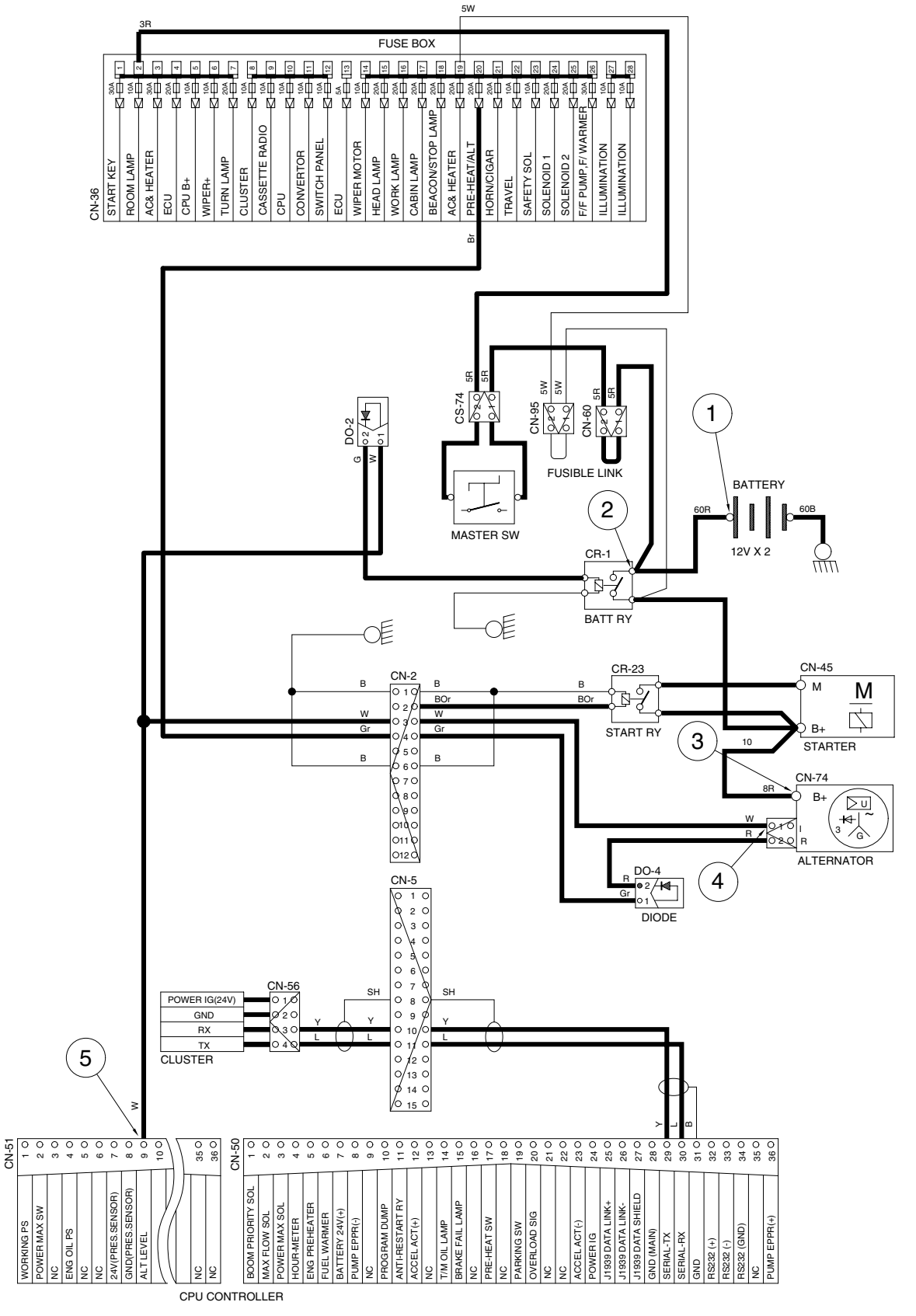
→ Fuse box

2) CHECK POINT

Engine	Start switch	Check point	Voltage
Run	ON	① - GND(Battery voltage) ② - GND(Battery relay) ③ - GND(Alternator B^+ 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.15) → I/conn〔CN-7(8)〕→ Switch panel〔CN-116(10,11)〕
Fuse box (No.16) → I/conn〔CN-7(7)〕→ Switch panel〔CN-116(9)〕

(1) Main light switch ON : 1st step

Head light switch ON〔CN-116(2,3)〕→ I/conn〔CN-7(2)〕→ I/conn〔CN-97(11)〕→
Multifunction sw left lever(4) → (5) →〔CN-97(10)〕→ Head light relay〔CR-13(86)→(87)〕→
Head light ON〔CL-3(1), CL-4(1)〕: Head lamp ON

(2) Main light switch ON : 2nd step

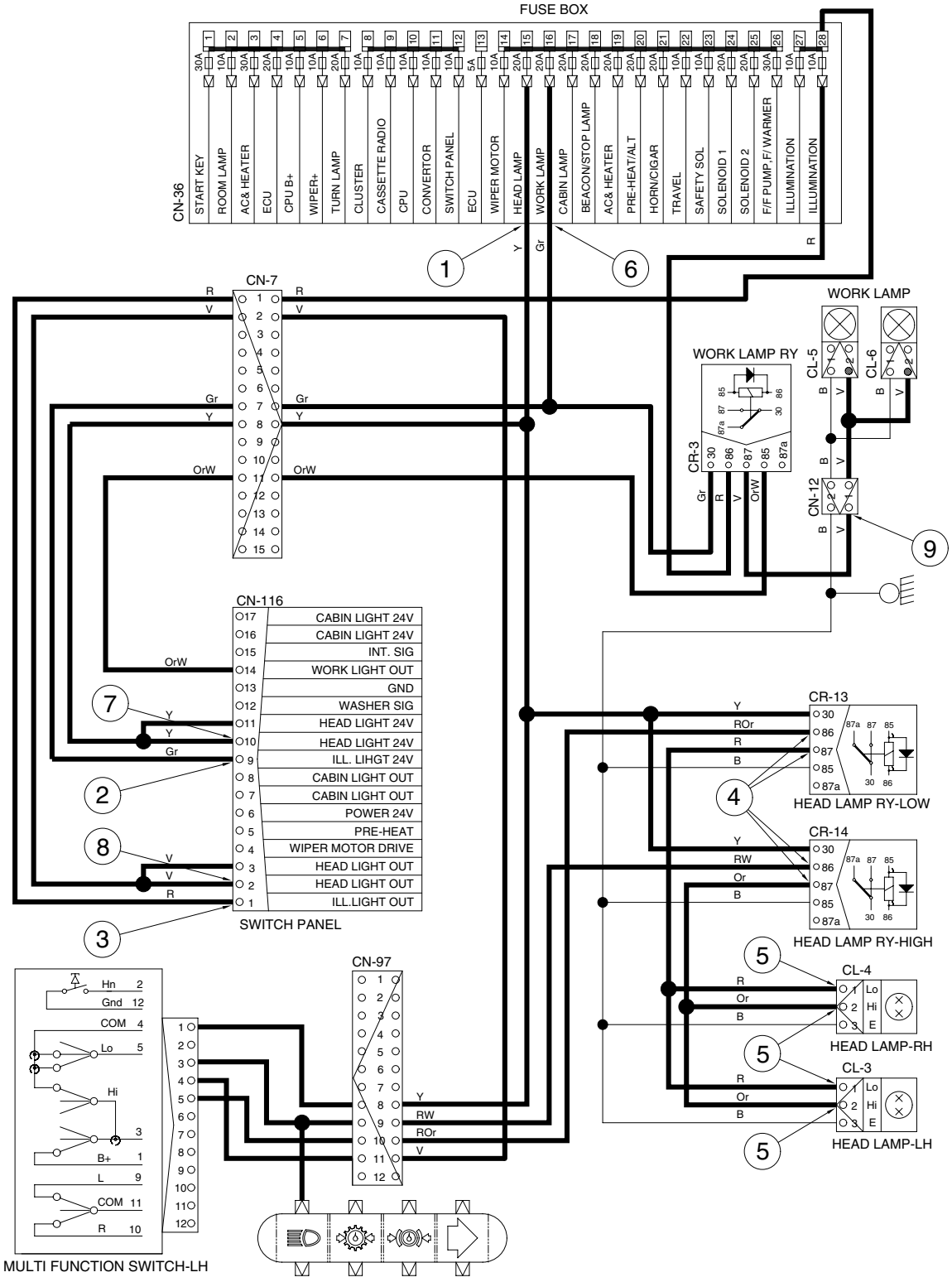
Work light switch ON〔CN-116(14)〕→ I/conn〔CN-7(11)〕→ Work light relay〔CR-3(86)→(87)〕
→ I/conn〔CN-12(1)〕→ Work light ON〔CL-5(2), CL-6(2)〕

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)	20~25V

※ GND : Ground

HEAD AND WORK LIGHT CIRCUIT



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5. BEACON LAMP AND CAB LIGHT CIRCUIT

1) OPERATING FLOW

Fuse box (No.18) → I/conn 〔CN-8(3)〕 → Beacon lamp switch 〔CS-23(6)〕
Fuse box (No.17) → I/conn 〔CN-7(12)〕 → Switch panel 〔CN-116(16, 17)〕

(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

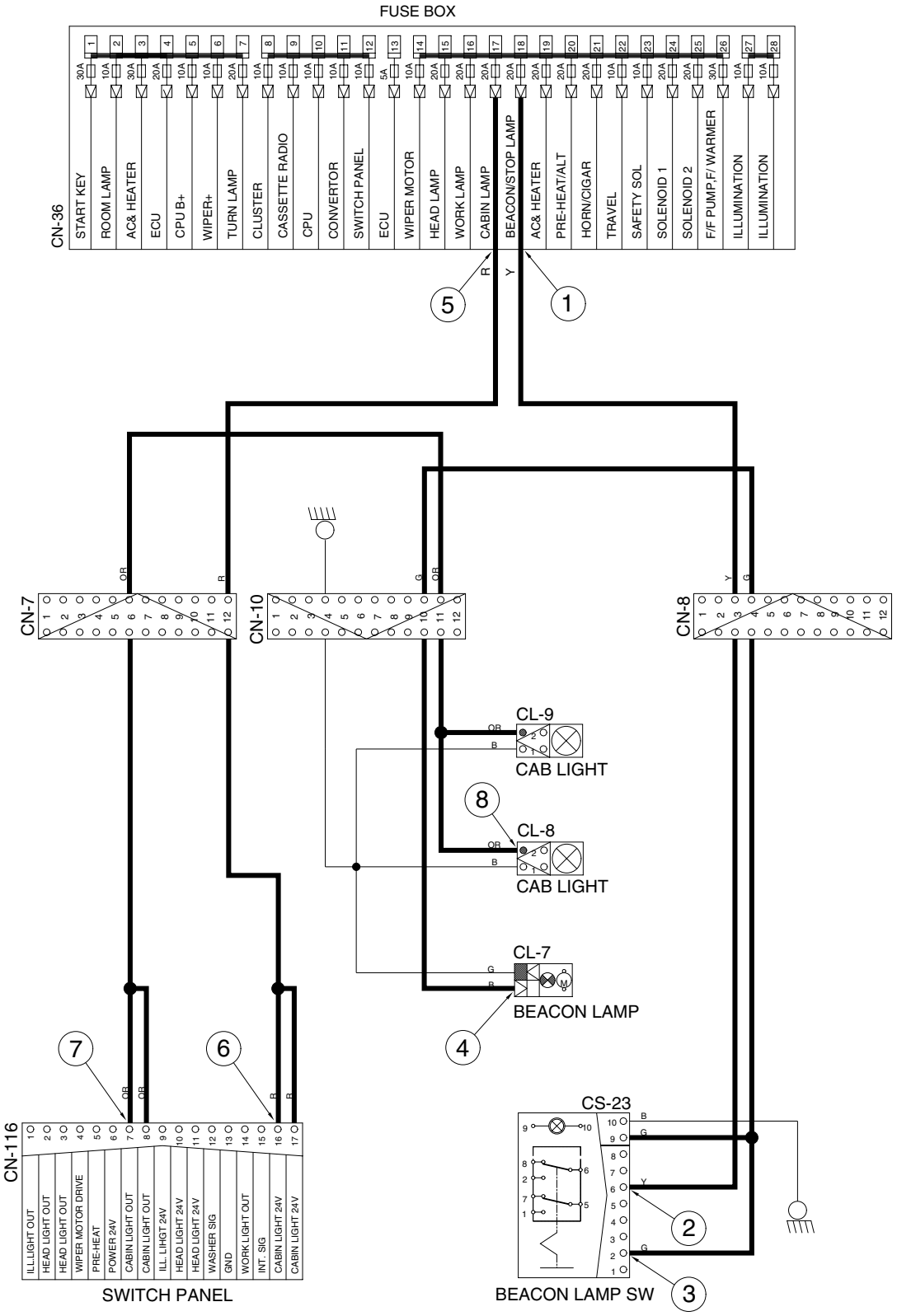
Cab light switch ON 〔CN-116(7, 8)〕 → I/conn 〔CN-7(6)〕 → I/conn 〔CN-10(11)〕
→ Cab light ON 〔CL-8(2), CL-9(2)〕

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

Fuse box (No.12) → I/conn [CN-7(5)] → Switch panel [CN-116(6)]

Fuse box (No.6) → I/conn [CN-5(4)] → I/conn [CN-17(5)] → Wiper motor controller [CN-141(7)]

→ Wiper motor [CN-21(4)]

→ Washer pump [CN-22(2)]

Fuse box (No.14) → I/conn [CN-6(5)] → I/conn [CN-17(4)] → Wiper motor controller [CN-141(6)]

(2) Wipe switch ON : 1st step(Intermittent)

Wiper switch ON [CN-116(15)] → I/conn[CN-9(4)] → I/conn[CN-6(10)] → I/conn[CN-17(8)] →
Wiper motor controller [CN-141(10) → (3)] → Wiper motor intermittently operating [CN-21(6)]

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

Wiper switch ON [CN-116(4)] → I/conn [CN-7(3)] → I/conn [CN-6(9)] → I/conn[CN-17(2)] →
Wiper motor controller [CN-141(2) → (4)] → Wiper motor operating [CN-21(2)]

(4) Washer switch ON

Washer switch ON [CN-116(12)] → I/conn [CN-7(9)] → I/conn [CN-5(1)] → I/conn [CN-17(7)]
→ Wiper motor controller [CN-141(9) → (8)] → I/conn [CN-17(6)] → I/conn [CN-6(11)]
→ Washer pump[CN-22(1)] → Washer operating

Wiper switch ON [CN-116(4)] → I/conn [CN-7(3)] → I/conn [CN-6(9)] → I/conn[CN-17(2)] →
Wiper motor controller [CN-141(2) → (4)] → Wiper motor operating [CN-21(2), Low speed]

(5) Auto parking(When switch OFF)

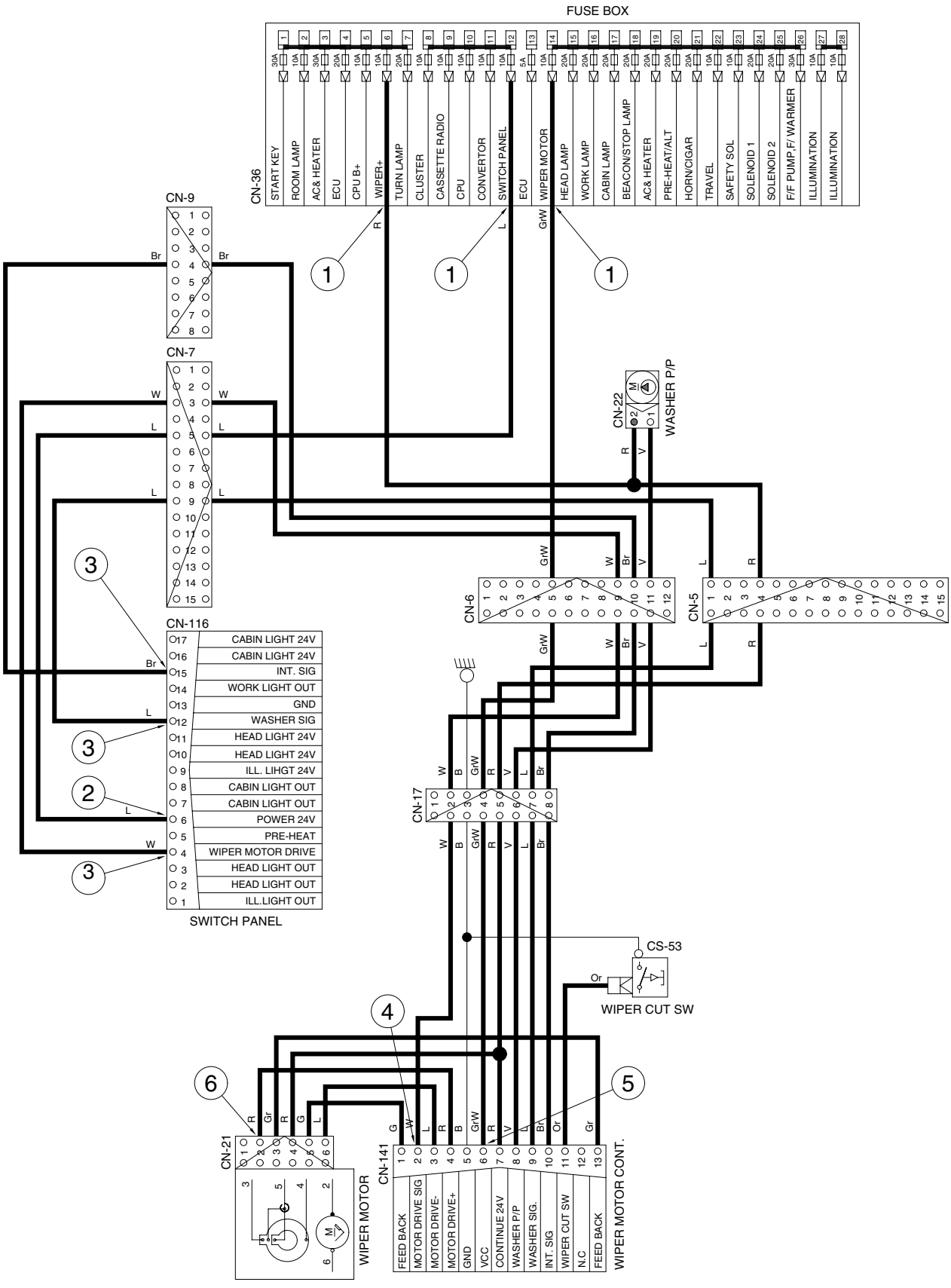
Switch OFF [CN-116(15)] → Wiper motor parking position by wiper motor controller

2) CHECK POINT

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

※ GND : Ground

WIPER AND WASHER CIRCUIT



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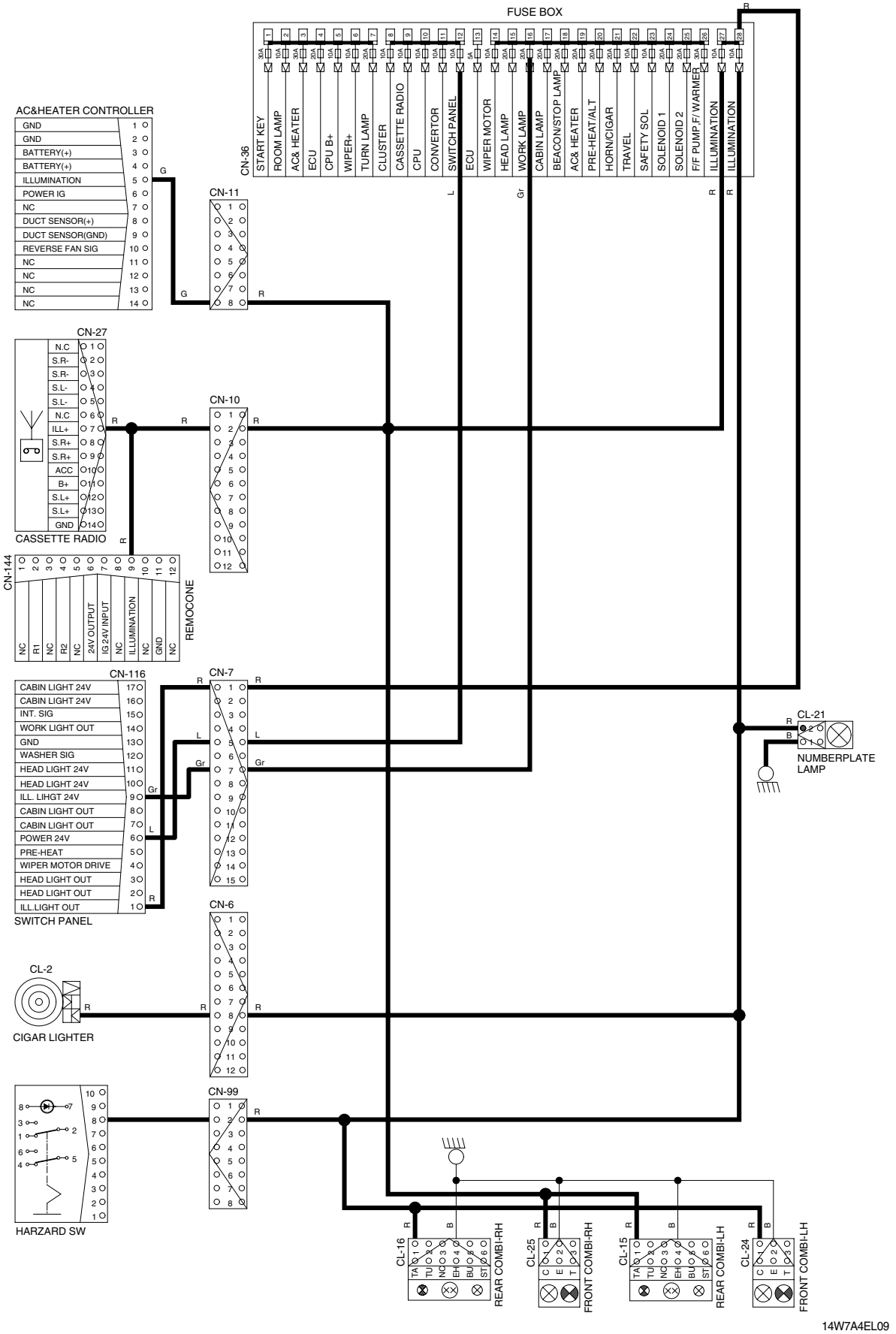
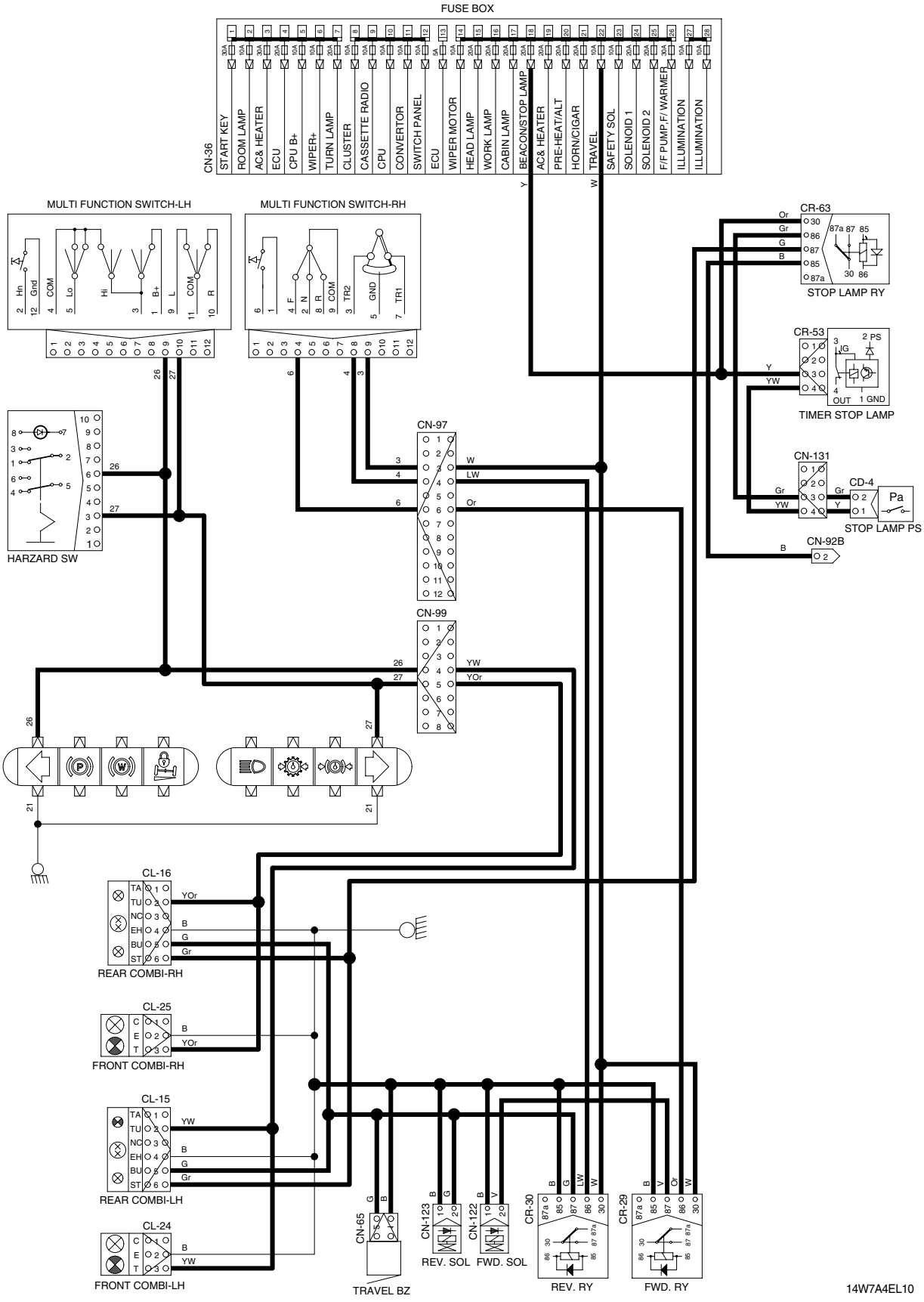
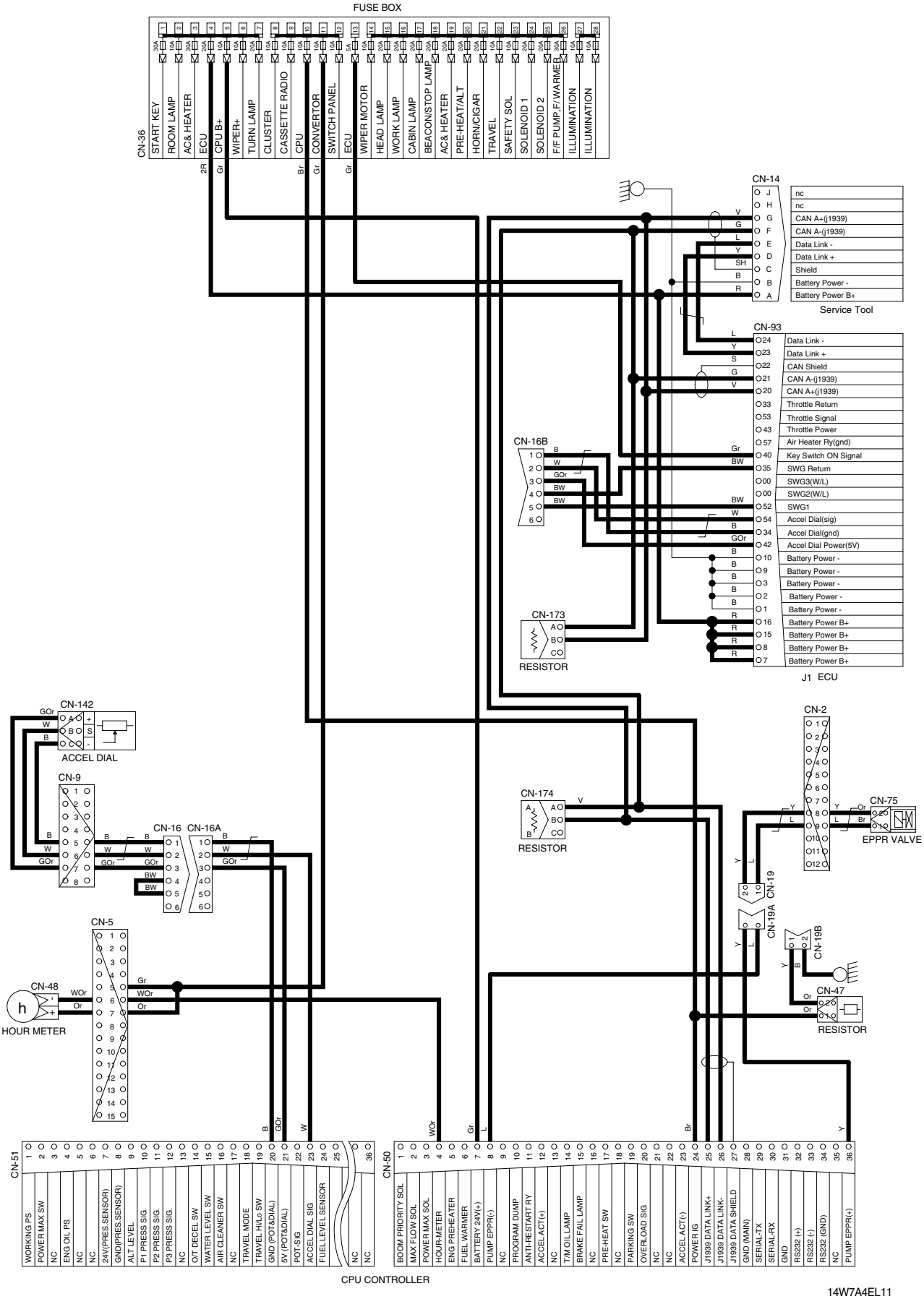
ILLUMINATION CIRCUIT



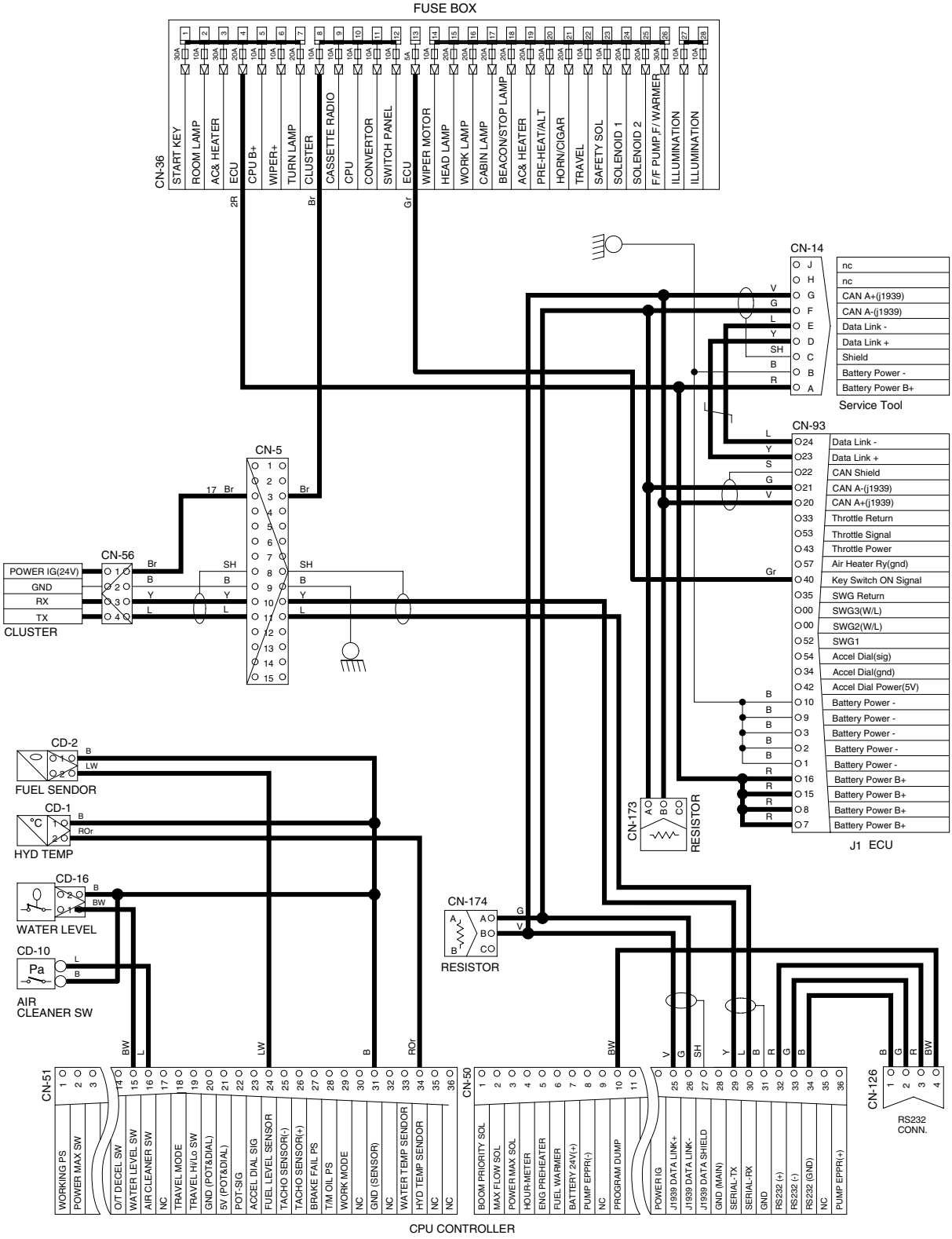
COMBINATION LAMP CIRCUIT



CONTROLLER CIRCUIT



MONITORING CIRCUIT



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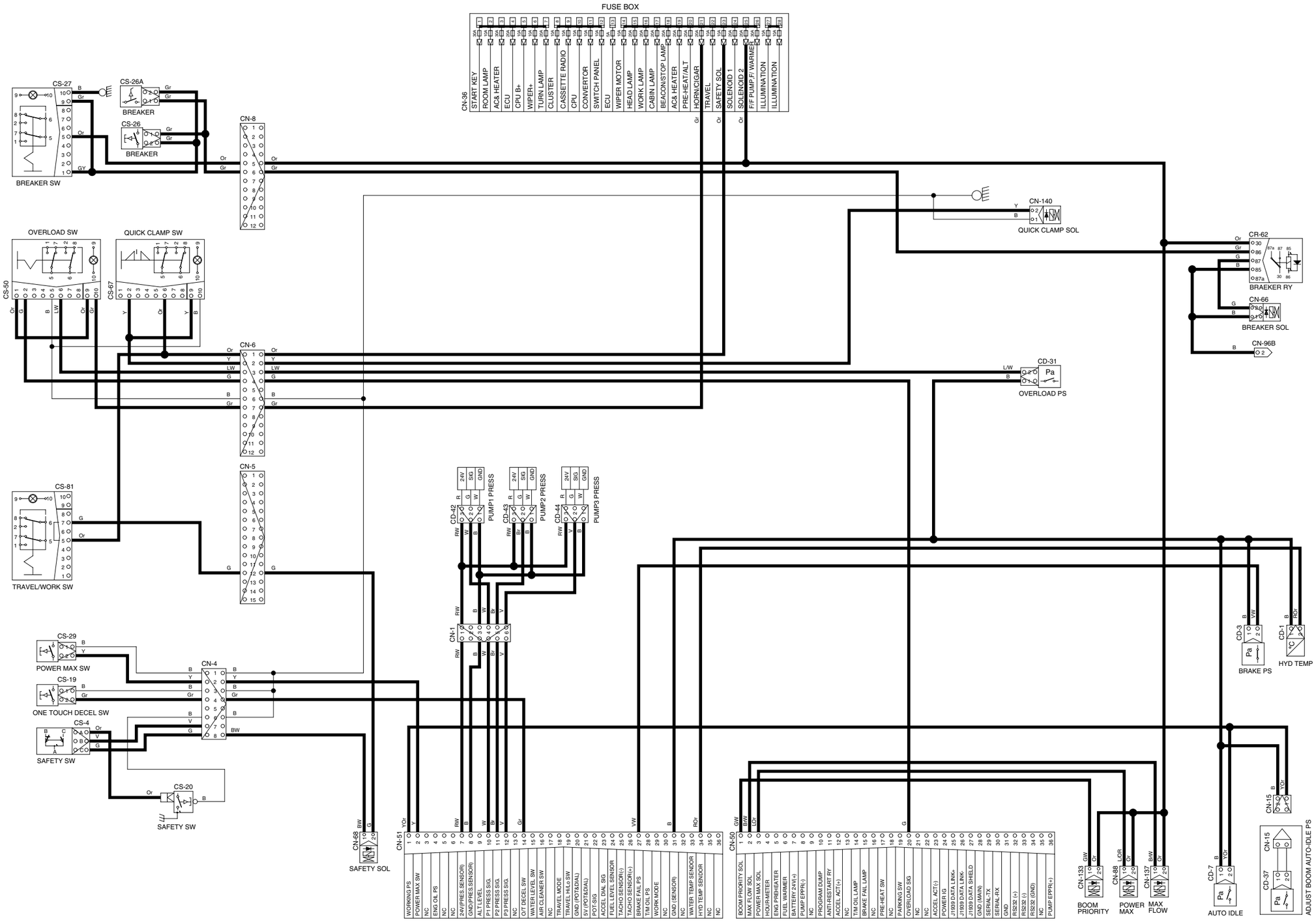
ELECTRIC CIRCUIT FOR HYDRAULIC



14W7A4EL13