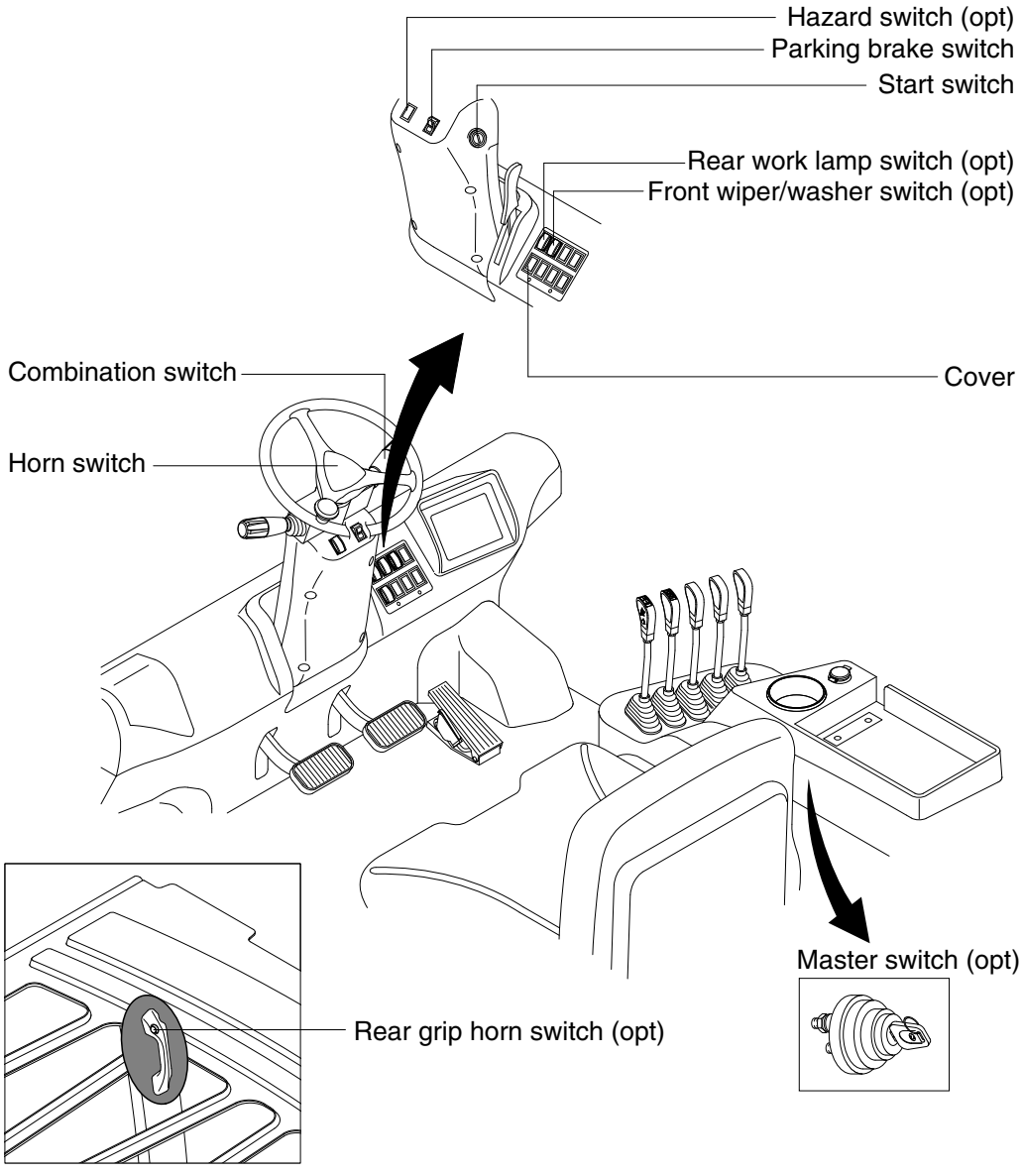
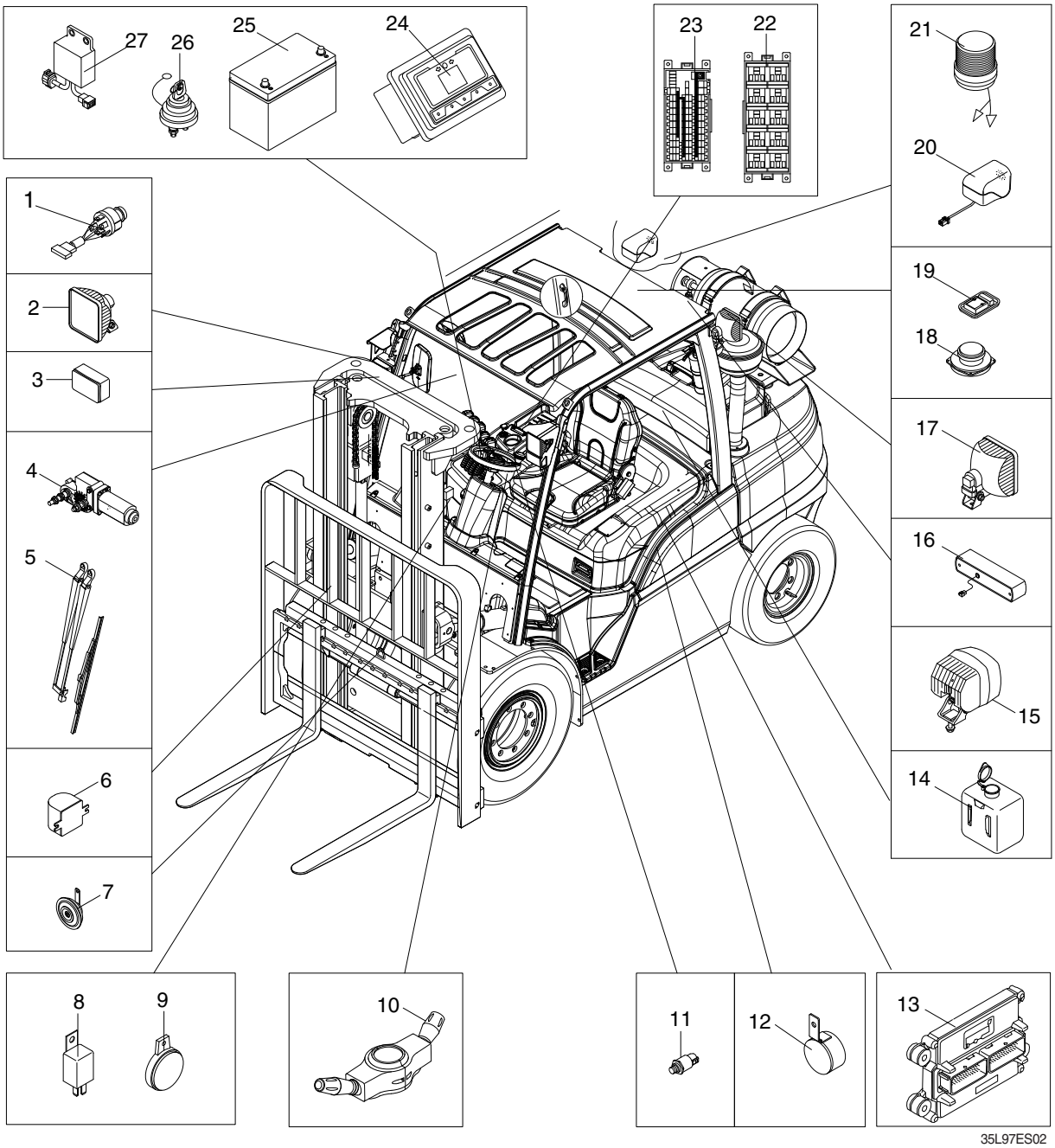
SECTION 7 ELECTRICAL SYSTEM

GROUP 1 COMPONENT LOCATION

1. LOCATION 1



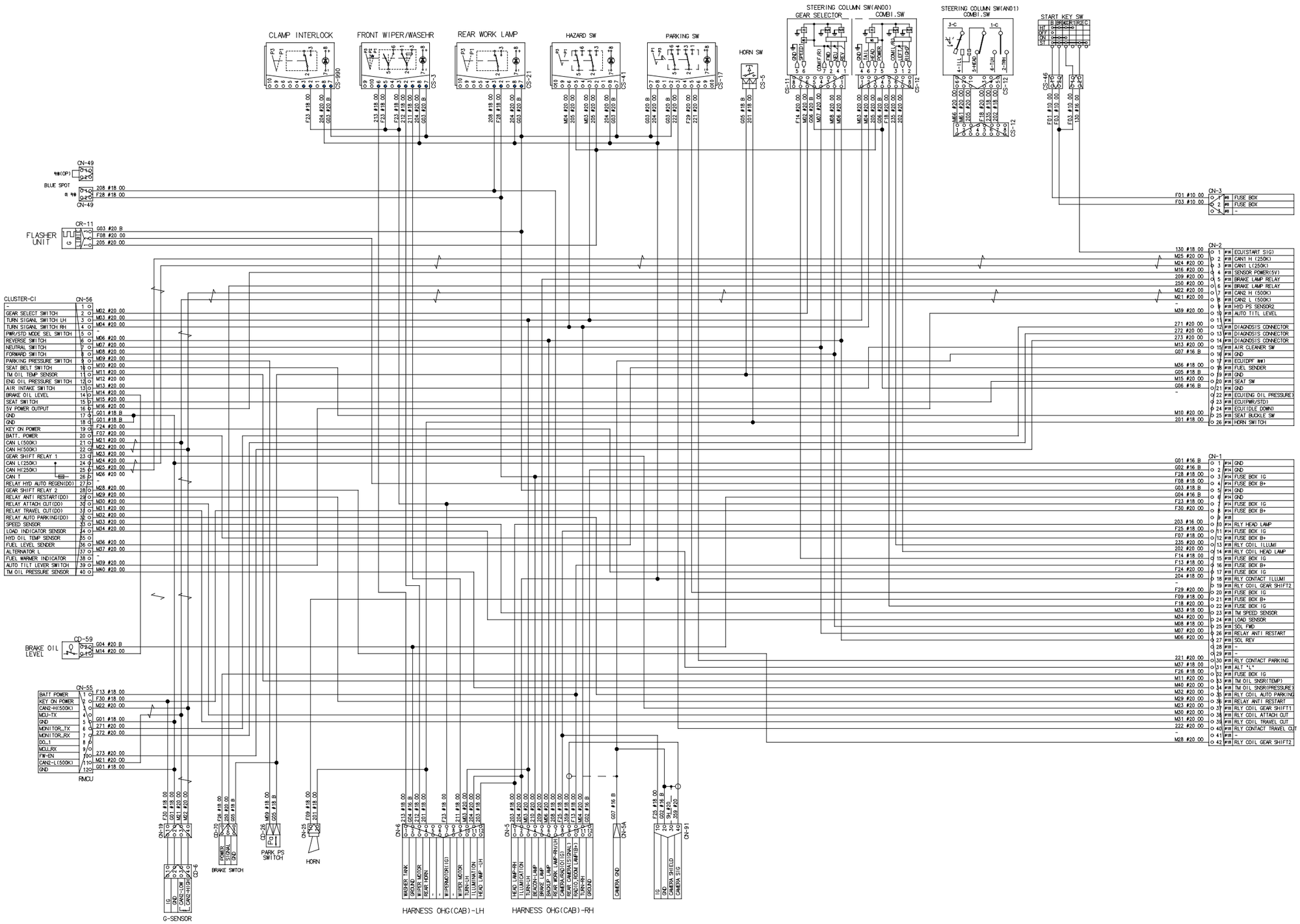
2. LOCATION 2



1	Start switch	10	Multifunction switch	19	Room lamp (opt)
2	Front work lamp	11	Load sensor (opt)	20	Camera (opt)
3	Front turn lamp	12	Back buzzer	21	Beacon lamp (opt)
4	Wiper motor (opt)	13	Engine control module	22	Relay box
5	Wiper arm and blade (opt)	14	Washer tank (opt)	23	Fuse box
6	G-sensor (opt)	15	Blue spot (opt)	24	Cluster CI
7	Horn	16	Rear combination lamp	25	Battery
8	Flusher unit	17	Rear work lamp (opt)	26	Master switch (opt)
9	Intermittent buzzer	18	Speaker (opt)	27	FNR controller (opt)

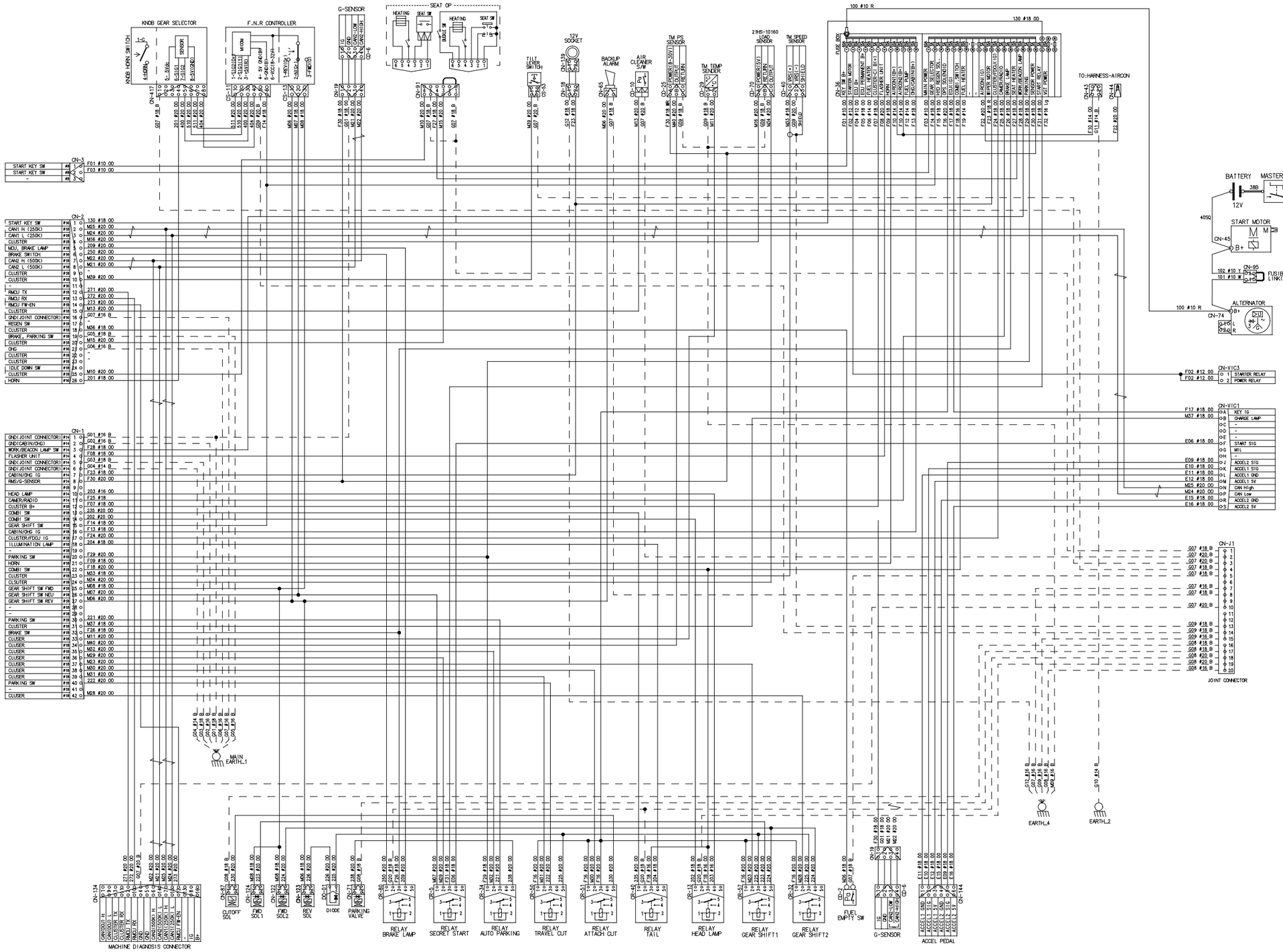
GROUP 2 ELECTRICAL CIRCUIT

· ELECTRICAL CIRCUIT (1/3, DASHBOARD)



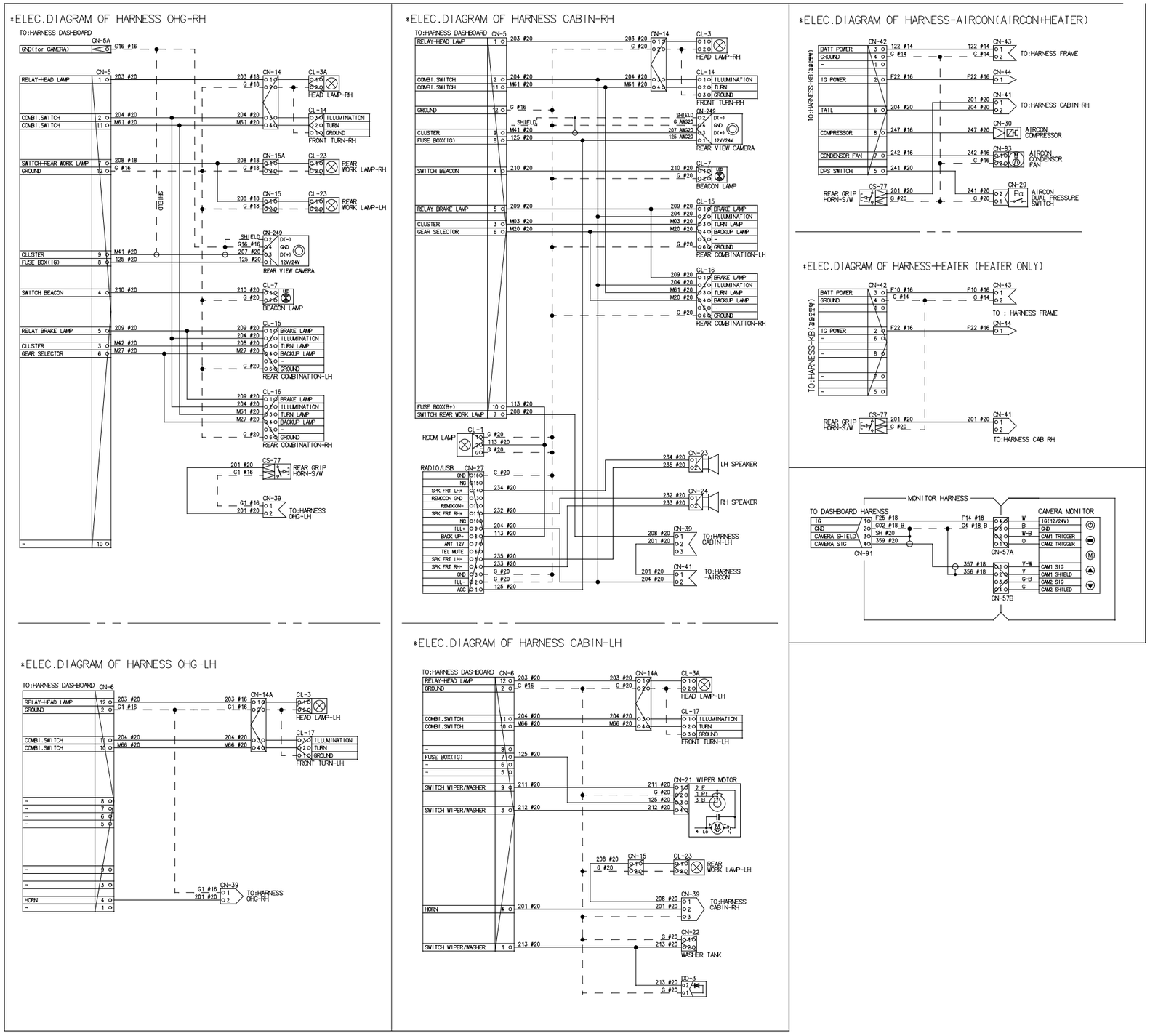
2YFH-10101-00 1OF3

· ELECTRICAL CIRCUIT (2/3, FRAME)



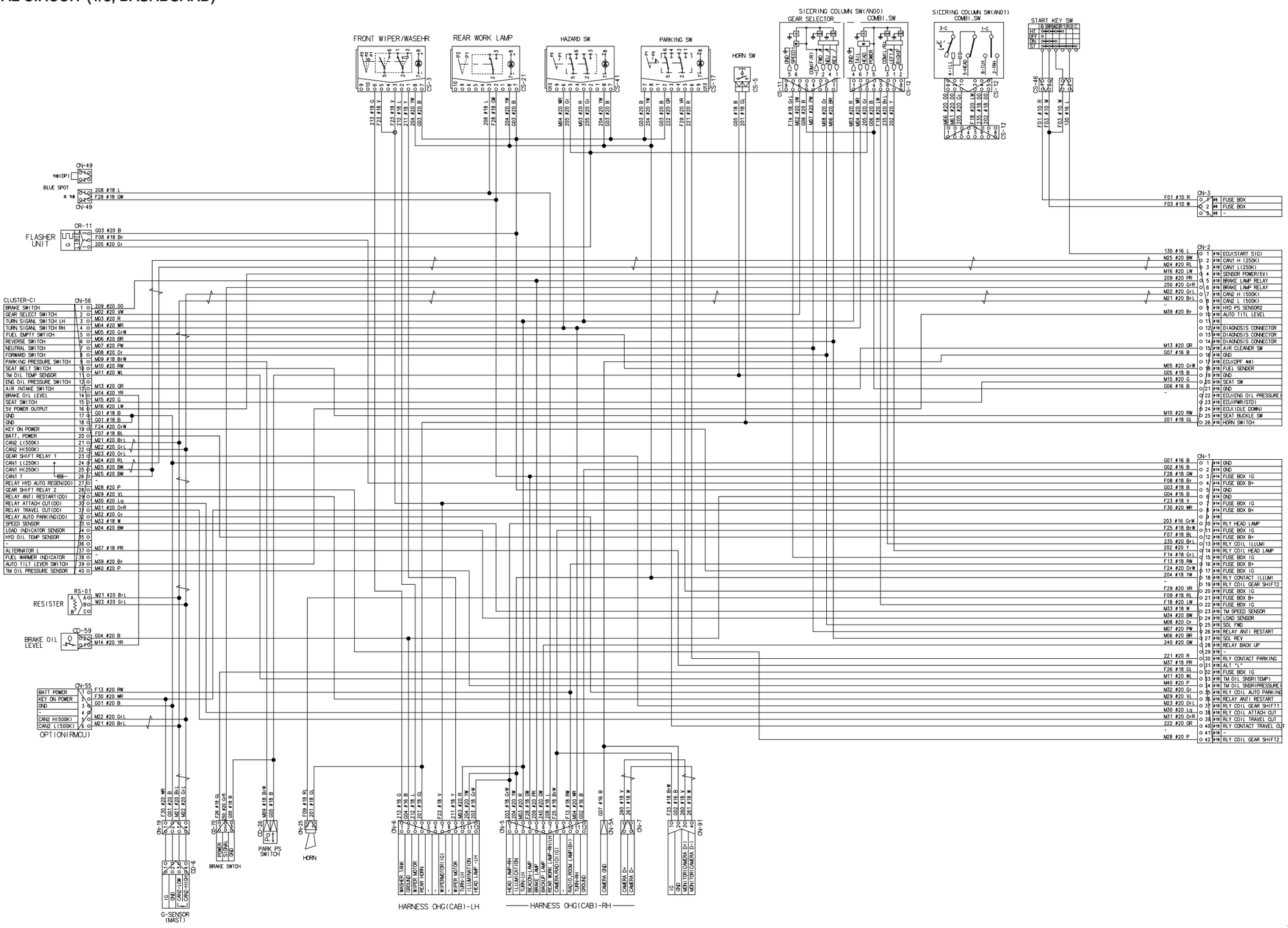
2YFH-10101-00 2OF3

· ELECTRICAL CIRCUIT (3/3, OHG, CABIN, AIRCON, HEATER)



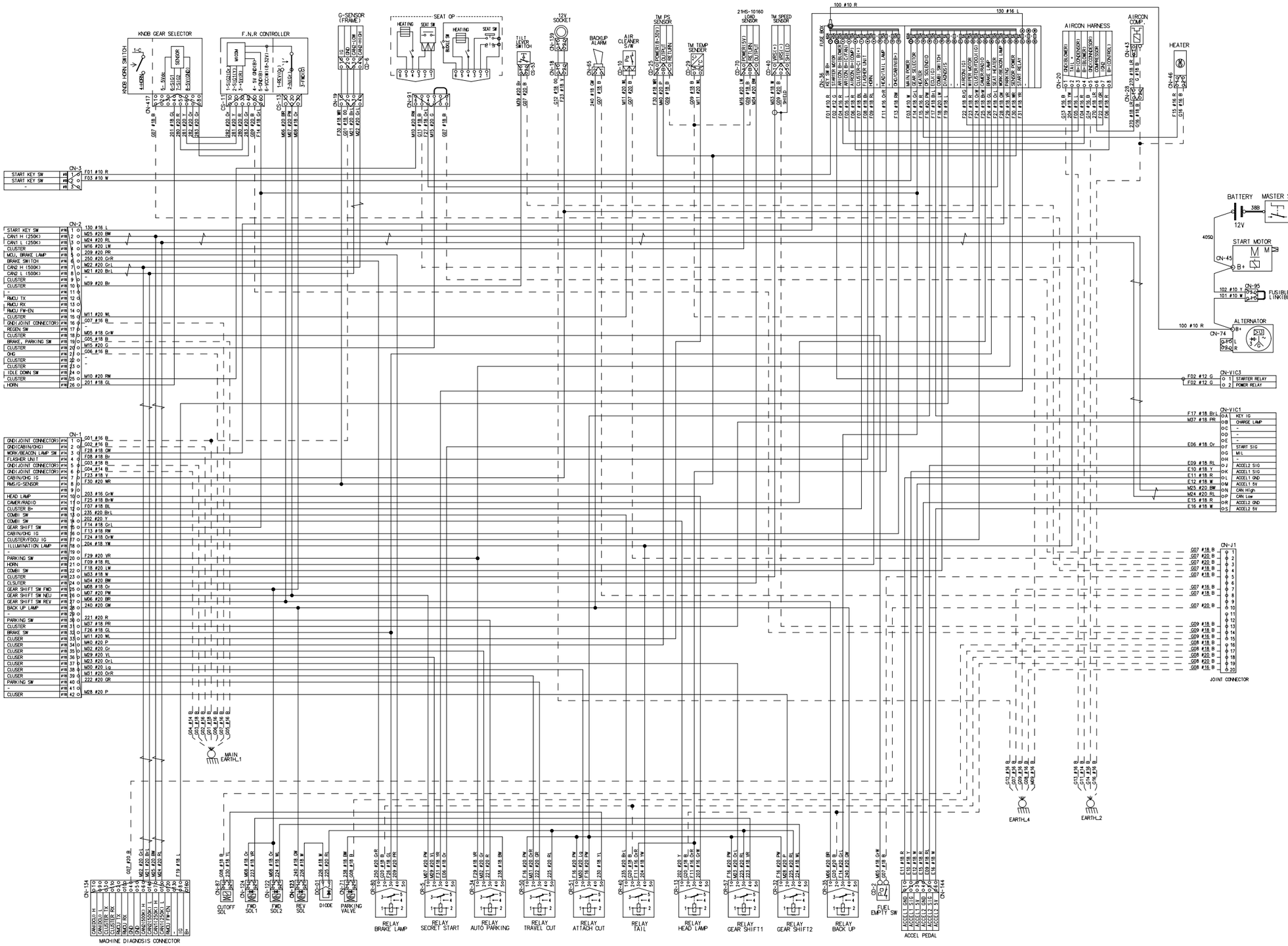
GROUP 2 ELECTRICAL CIRCUIT

· ELECTRICAL CIRCUIT (1/3, DASHBOARD)



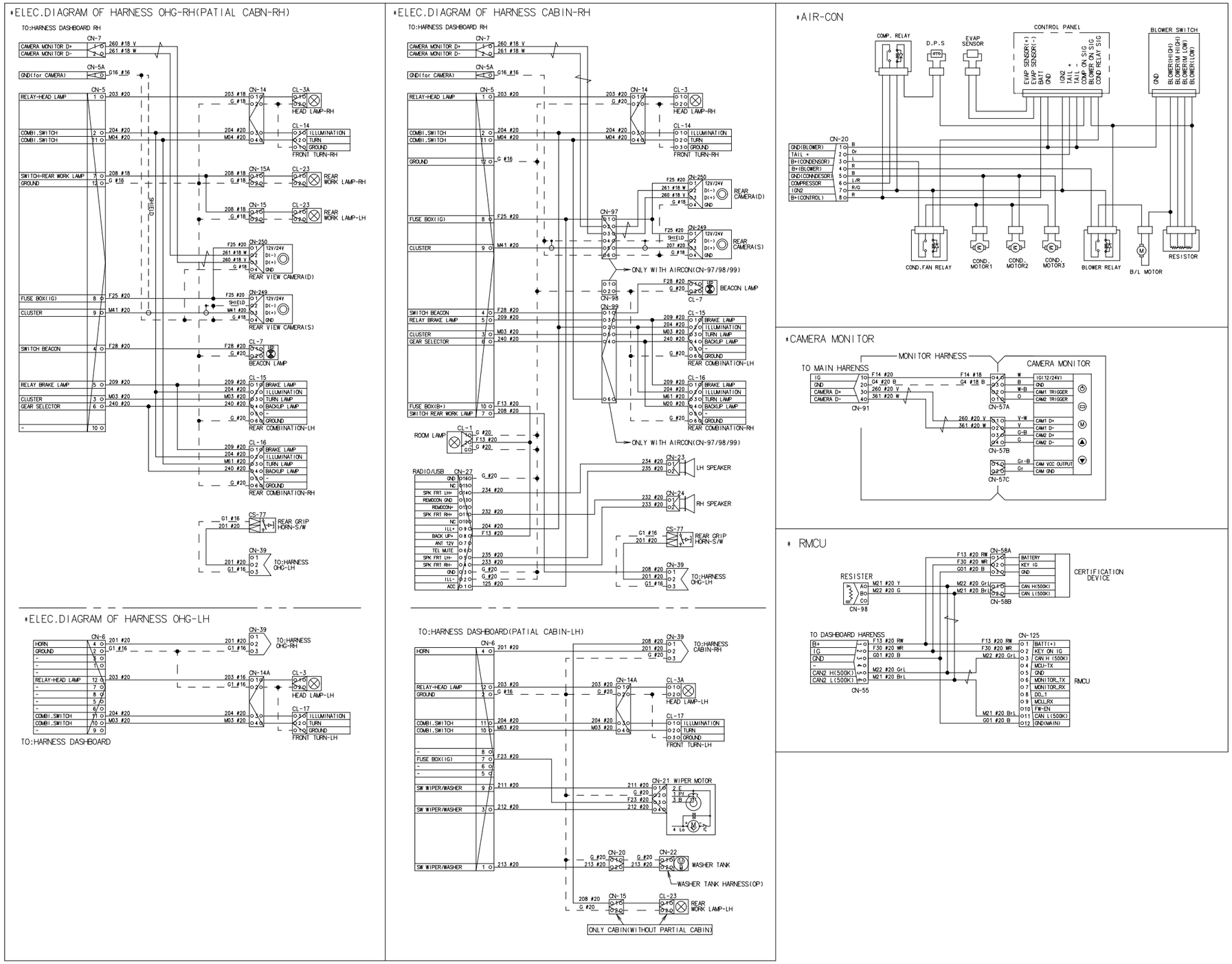
2YFH-10103-00 1OF3

· ELECTRICAL CIRCUIT (2/3, FRAME)



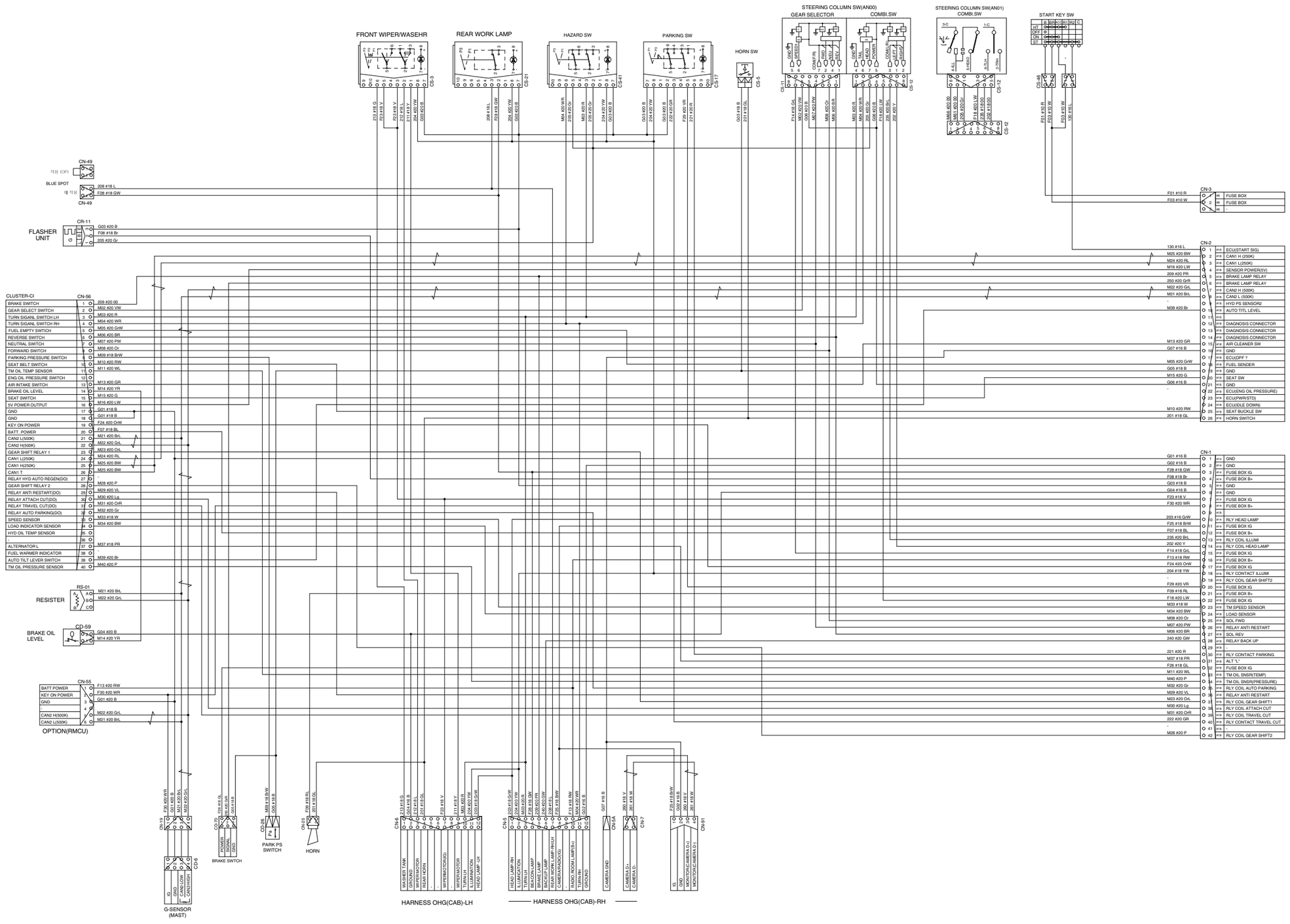
2YFH-10103-00 2OF3

· ELECTRICAL CIRCUIT (3/3, OHG, CABIN, AIRCON, HEATER)

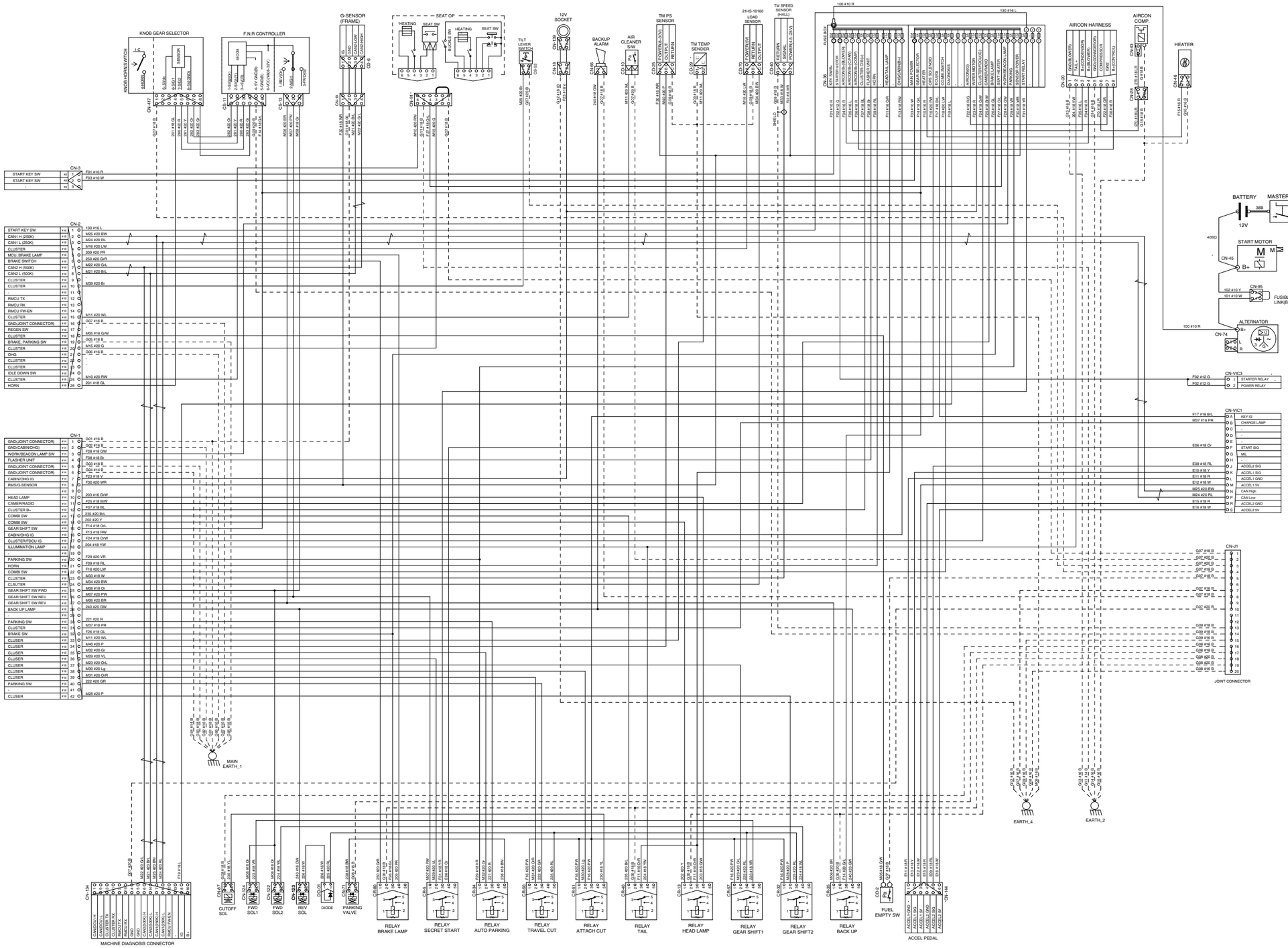


GROUP 2 ELECTRICAL CIRCUIT (NON-FUNCTINOAL SAFETY)

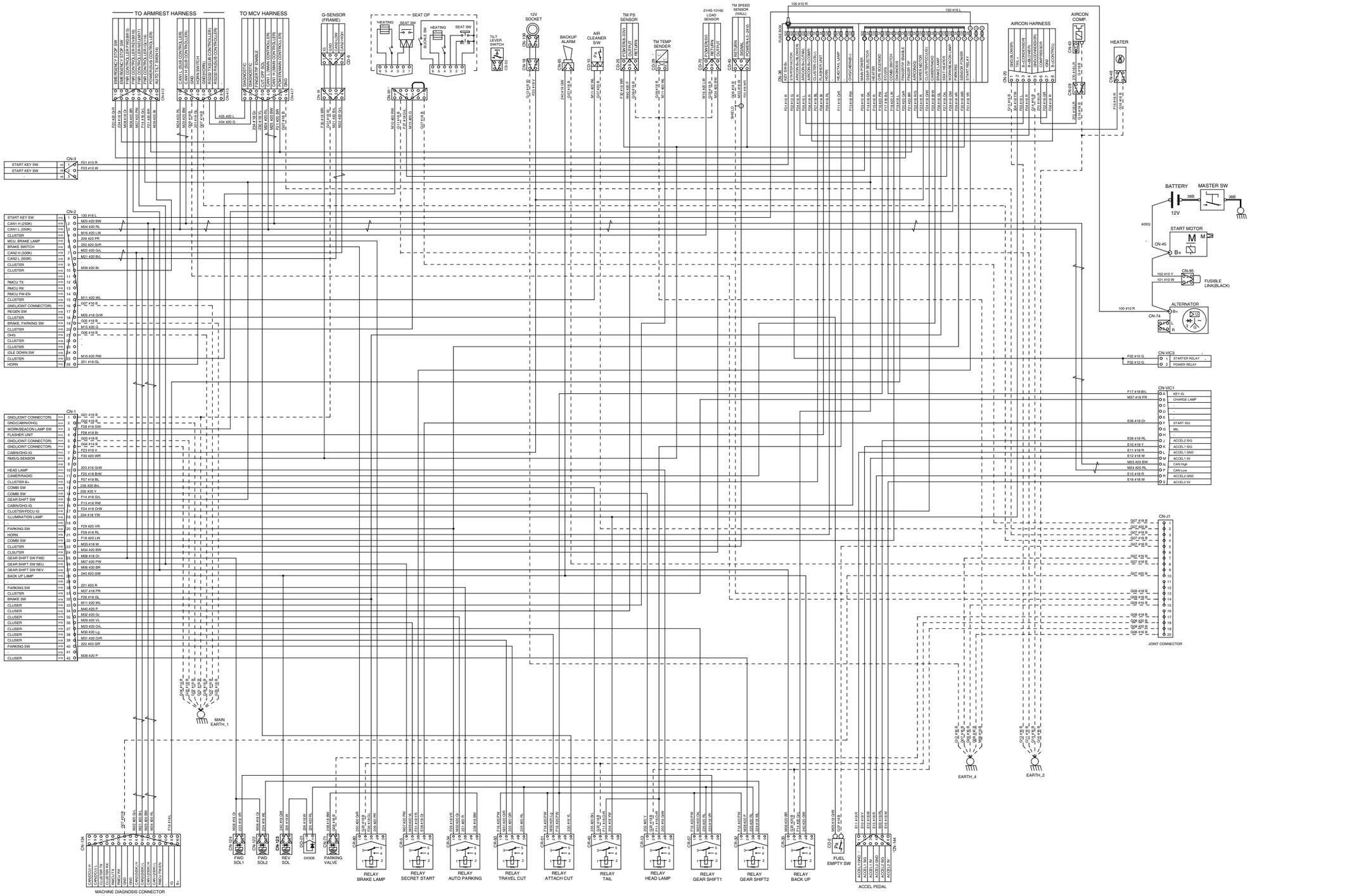
· ELECTRICAL CIRCUIT (DASHBOARD)



· ELECTRICAL CIRCUIT (FRAME)



· ELECTRICAL CIRCUIT (FRAME, FIGERTIP)



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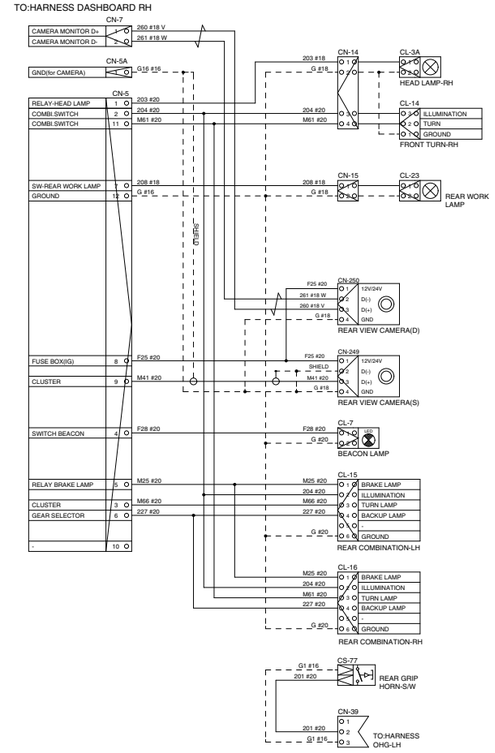
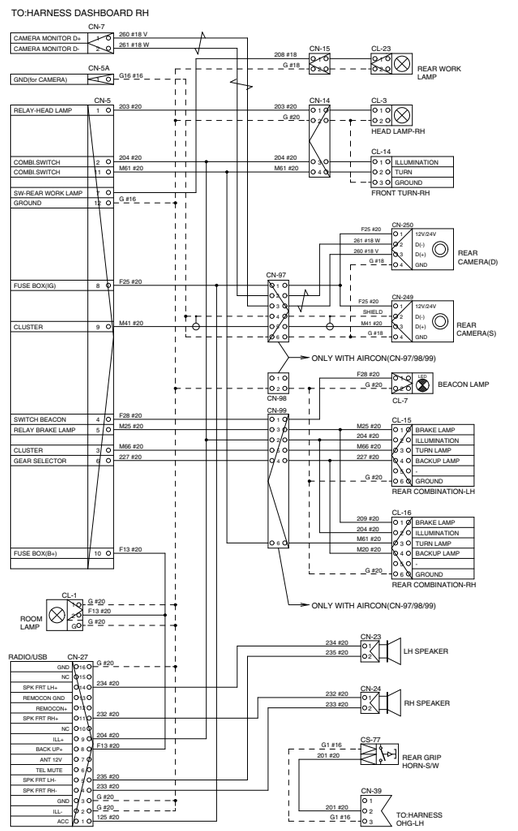
· ELECTRICAL CIRCUIT (CABIN, OHG, AIRCON, HEATER)

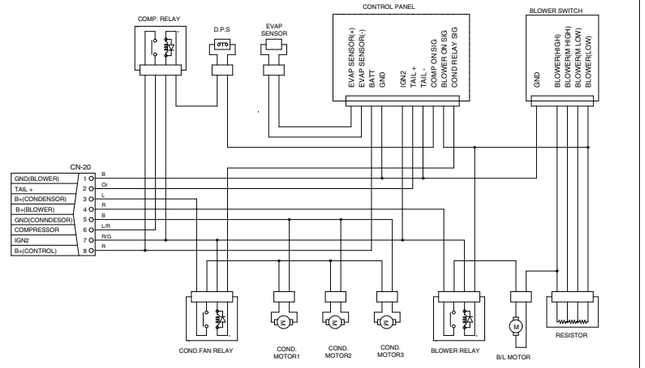
*ELEC.DIAGRAM OF HARNESS OHG-RH(PATIAL CABN-RH)



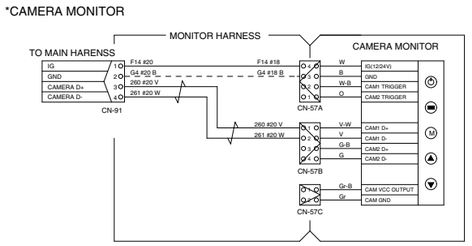
*ELEC.DIAGRAM OF HARNESS CABIN-RH



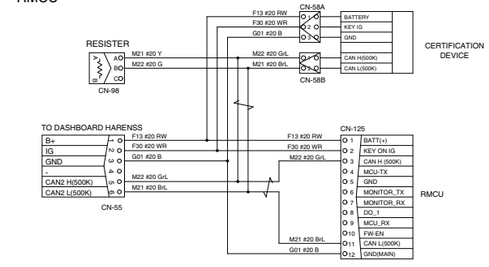
*AIR-CON



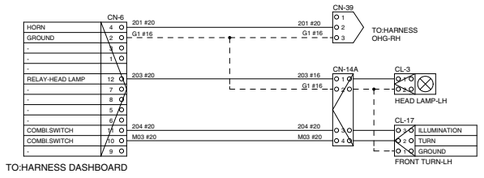
*CAMERA MONITOR



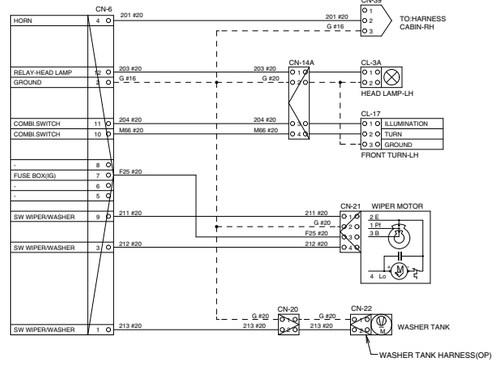
* RMCU



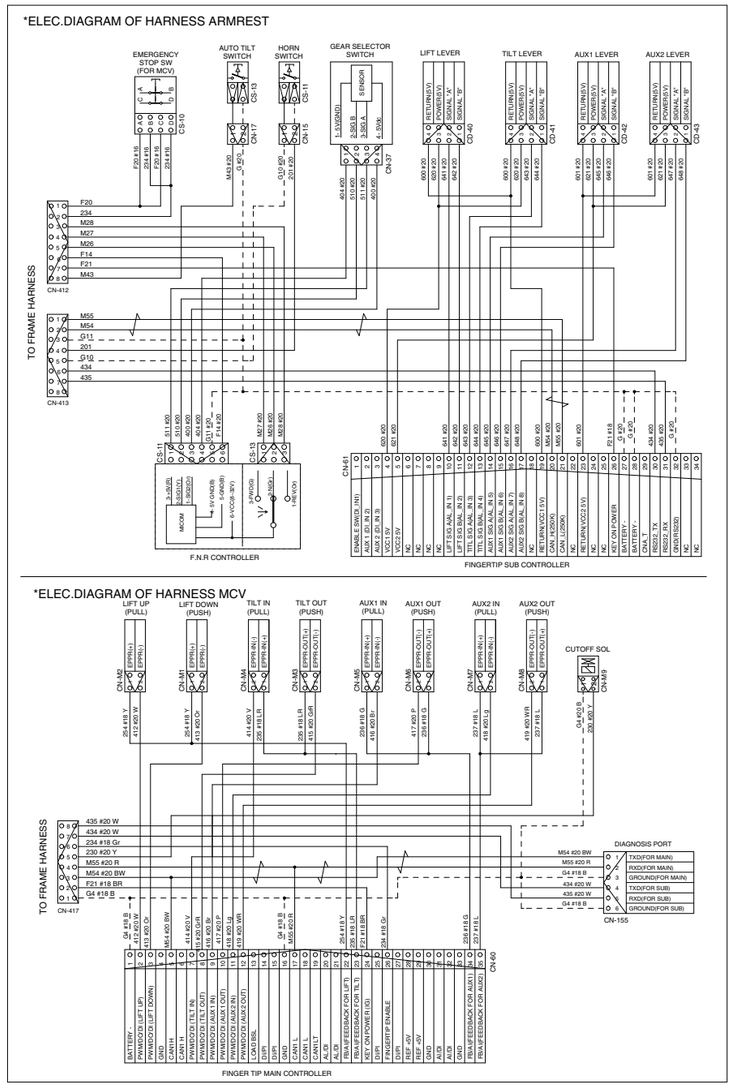
*ELEC.DIAGRAM OF HARNESS OHG-LH



*ELEC.DIAGRAM OF HARNESS CABIN-LH(PATIAL CABIN-LH)



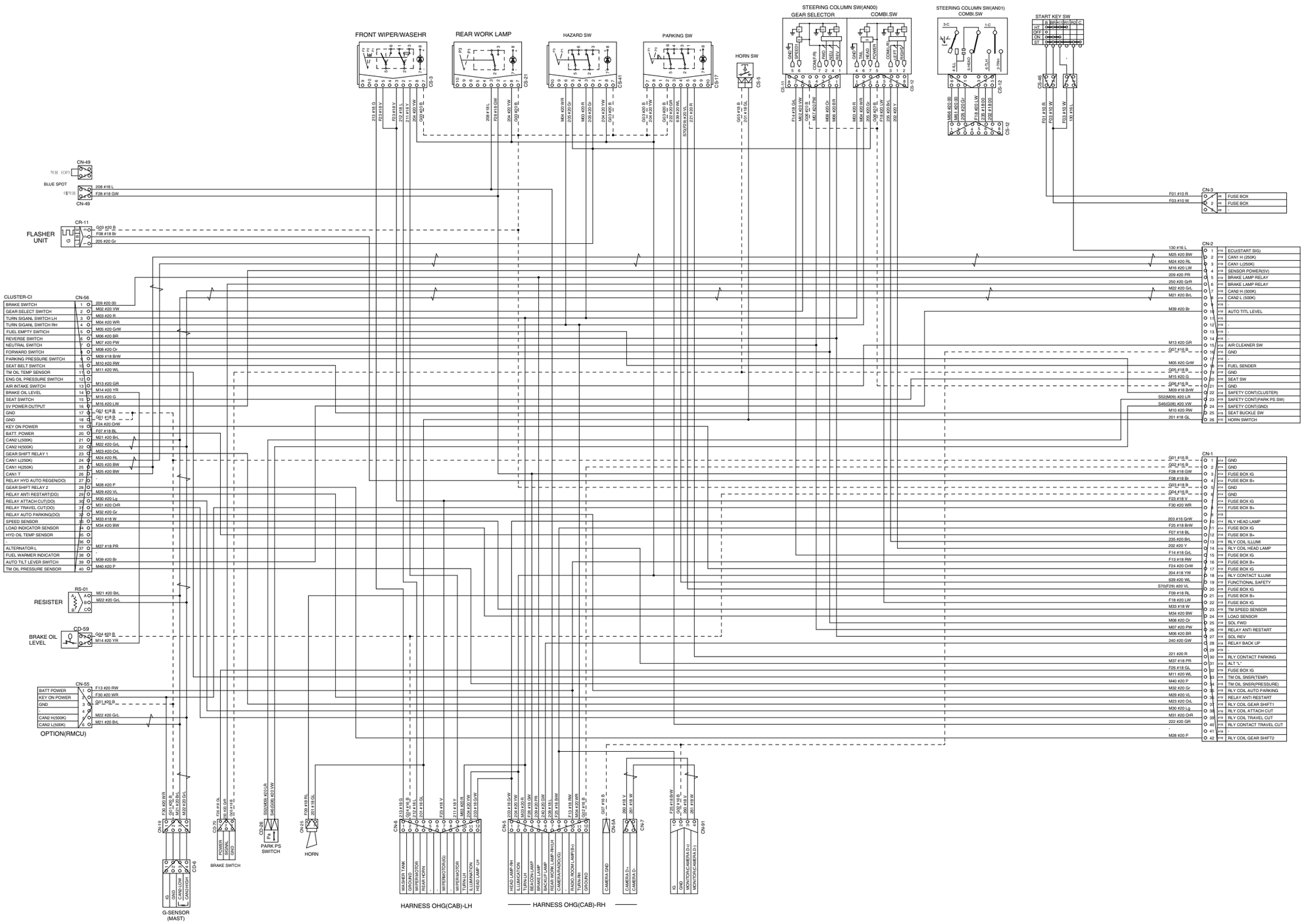
· ELECTRICAL CIRCUIT (ARMREST, MCV)



2YFH-10105-00 5OF5

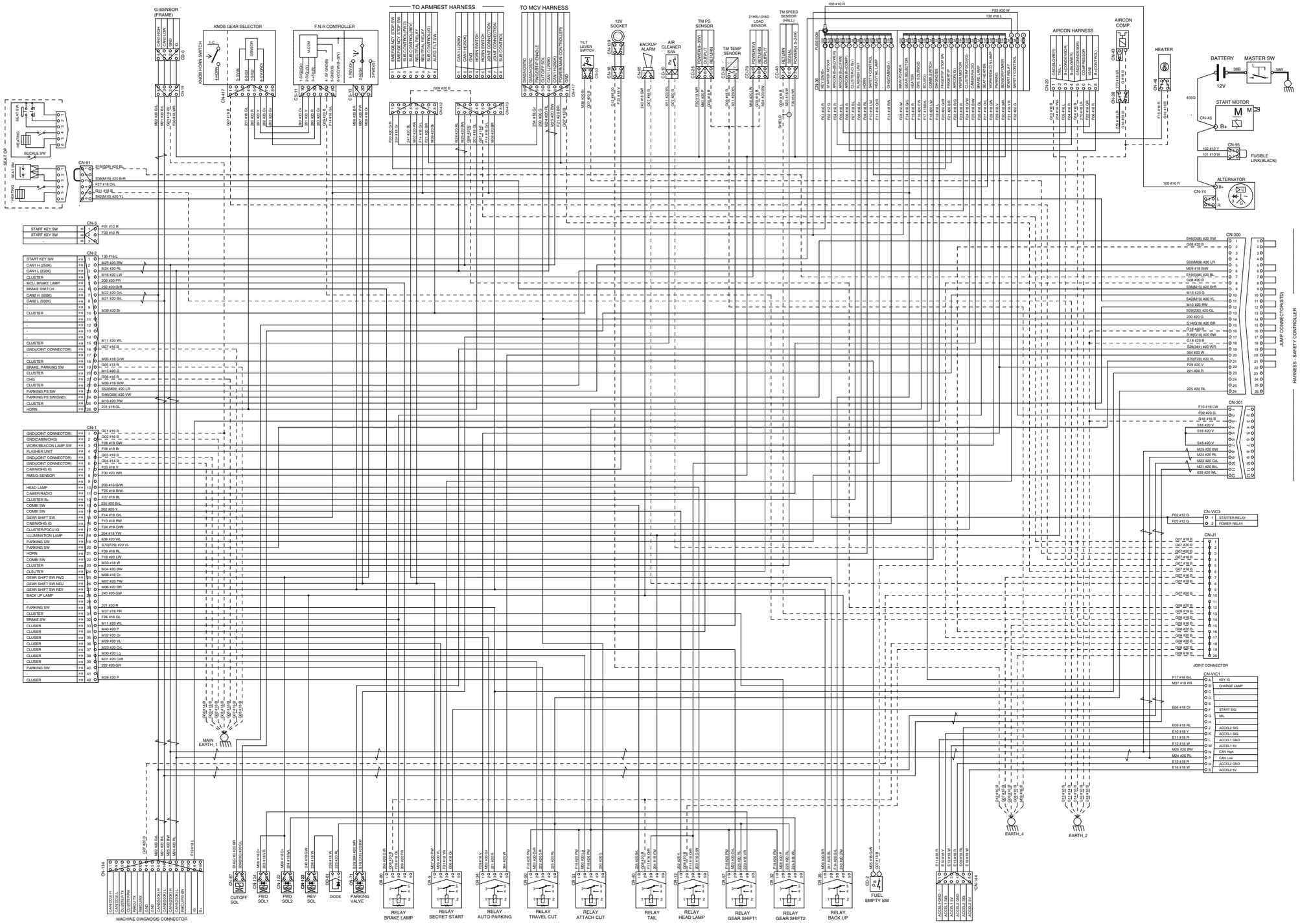
GROUP 2 ELECTRICAL CIRCUIT (FUNCTINOAL SAFETY)

· ELECTRICAL CIRCUIT (DASHBOARD)



2YFH-10106-00 1OF4

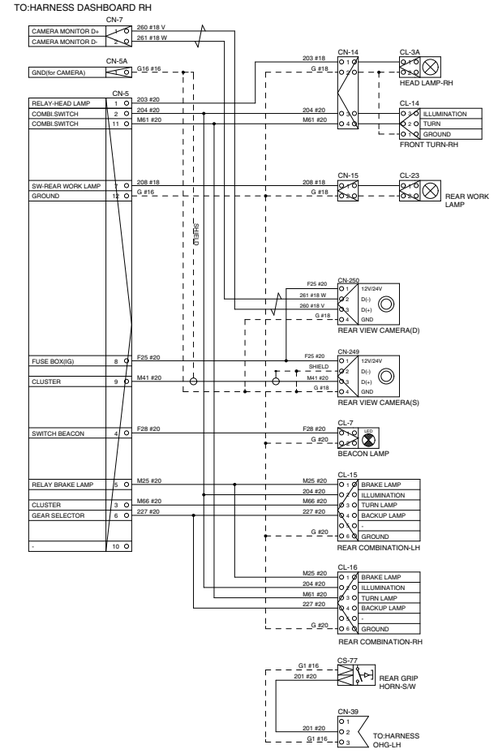
· ELECTRICAL CIRCUIT (FRAME)



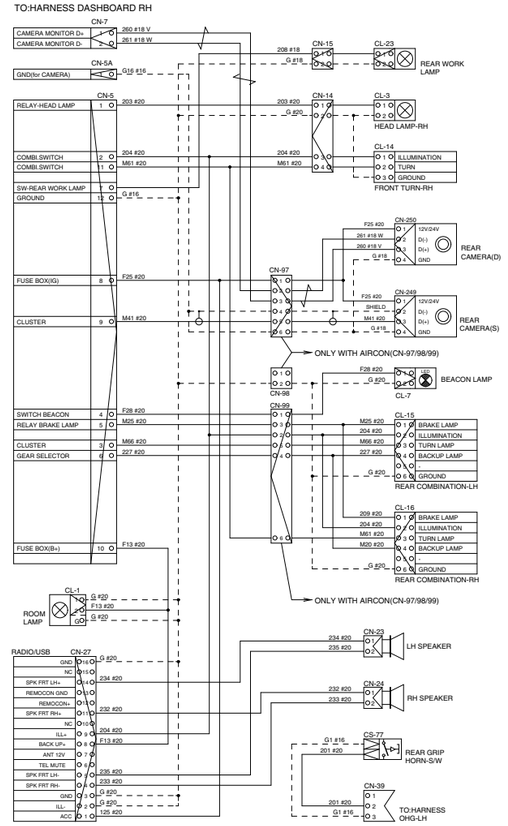
2YFH-10106-00 2OF4

· ELECTRICAL CIRCUIT (CABIN, OHG, AIRCON, HEATER)

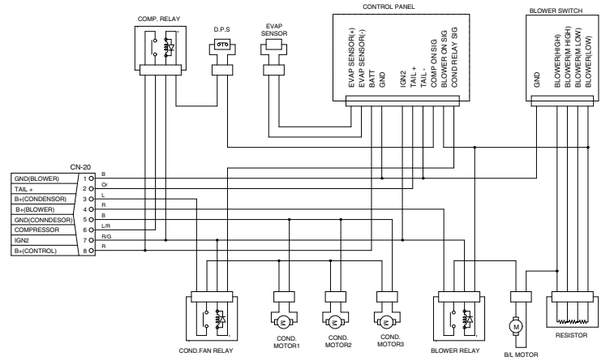
*ELEC.DIAGRAM OF HARNESS OHG-RH(PATIAL CABN-RH)



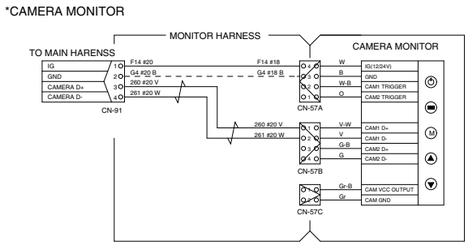
*ELEC.DIAGRAM OF HARNESS CABIN-RH



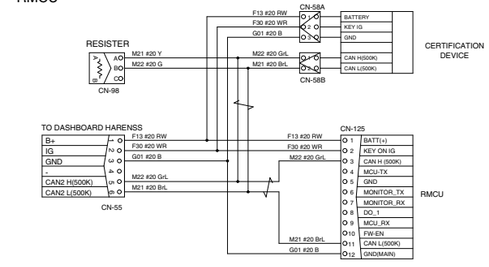
*AIR-CON



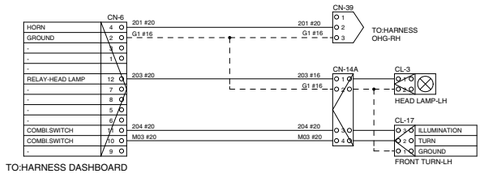
*CAMERA MONITOR



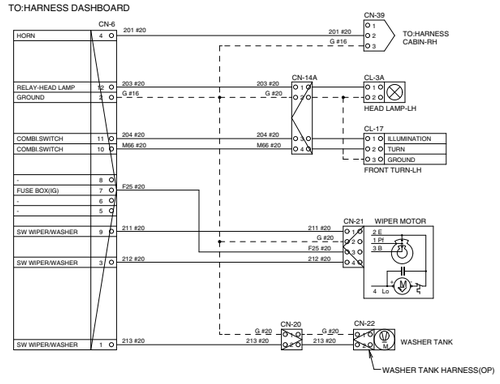
* RMCU



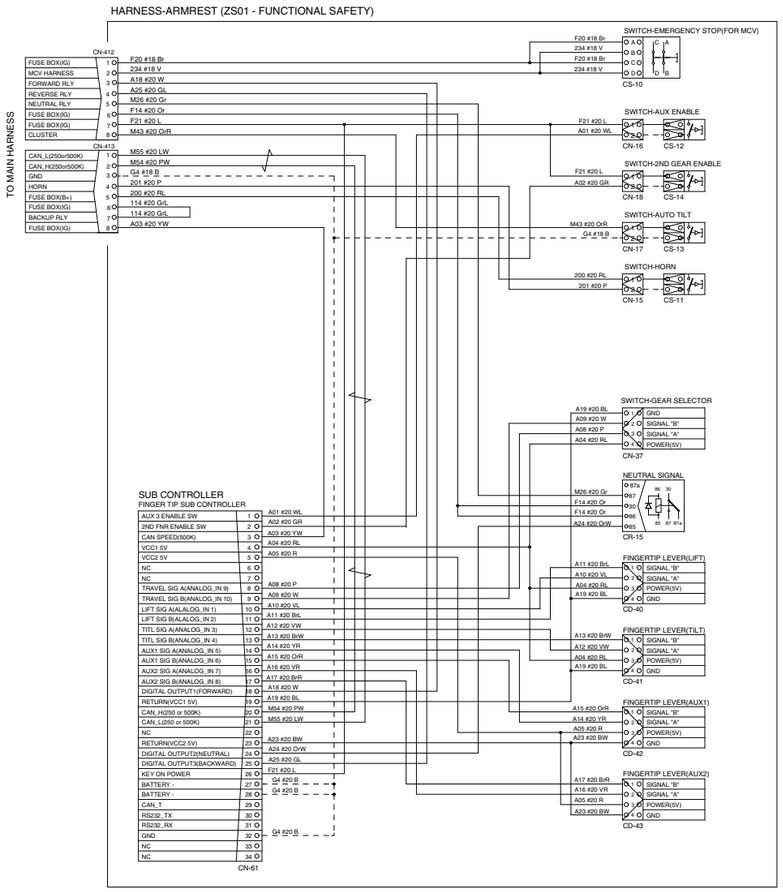
*ELEC.DIAGRAM OF HARNESS OHG-LH

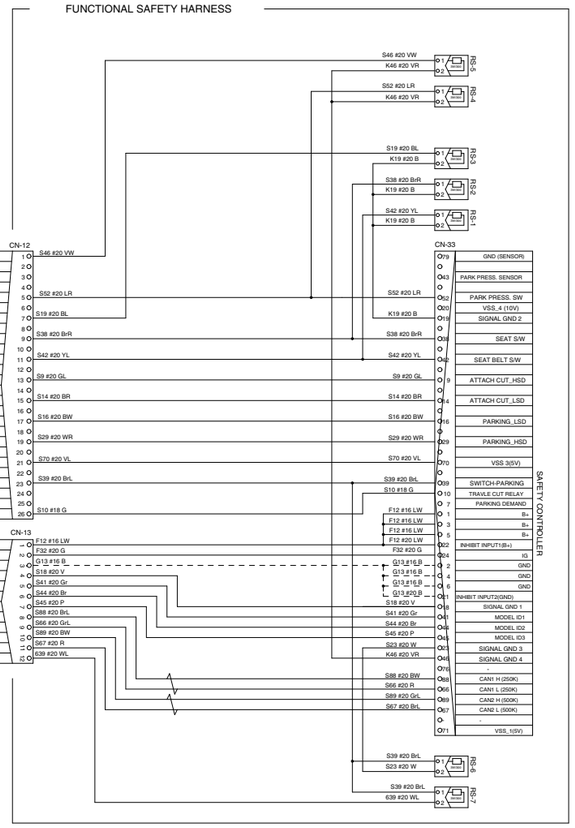


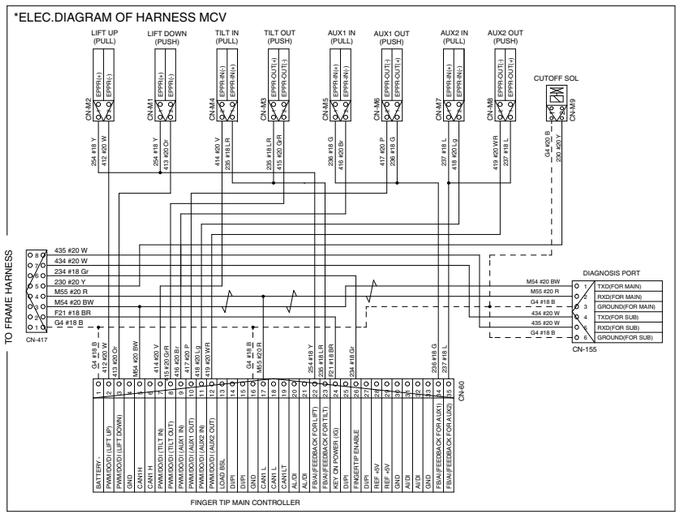
*ELEC.DIAGRAM OF HARNESS CABIN-LH(PATIAL CABIN-LH)



· ELECTRICAL CIRCUIT (ARMREST, MCV)







1. POWER CIRCUIT

The negative terminal of the battery is grounded to the truck chassis.
When the start switch is in the off position, the current flows from the positive battery terminal.

1) OPERATING FLOW

Battery (+) → Start motor [CN-45 (B+)] → Fusible link [CN-95] → Alternator [CN-74 (B+)]
→ Fuse box [CN-36]
→ Fuse box [No.1] → I/conn [CN-3 (1)] → Key S/W [CS-46 (1)]
→ Fuse box [No.2] → Starter motor [CN-VIC3 (1,2)]
→ Fuse box [No.7] → I/conn [CN-1 (12)] → Cluster CI (B+) [CN-56 (20)]
→ Fuse box [No.8] → I/conn [CN-1 (4)] → Flaher unit [CR-11 (1)]
→ Fuse box [No.9] → I/conn [CN-1 (21)] → Horn [CN-25 (1)]
→ Fuse box [No.10] → To air conditioner harness [CN-43 (1)]
→ Fuse box [No.11] → To air conditioner harness [CN-43 (1)]
→ Fuse box [No.13] → I/conn [CN-1 (16)] → I/conn [CN-5 (10)] → Room lamp [CL-1 (2)]
→ Radio/USB [CN-27 (8)]

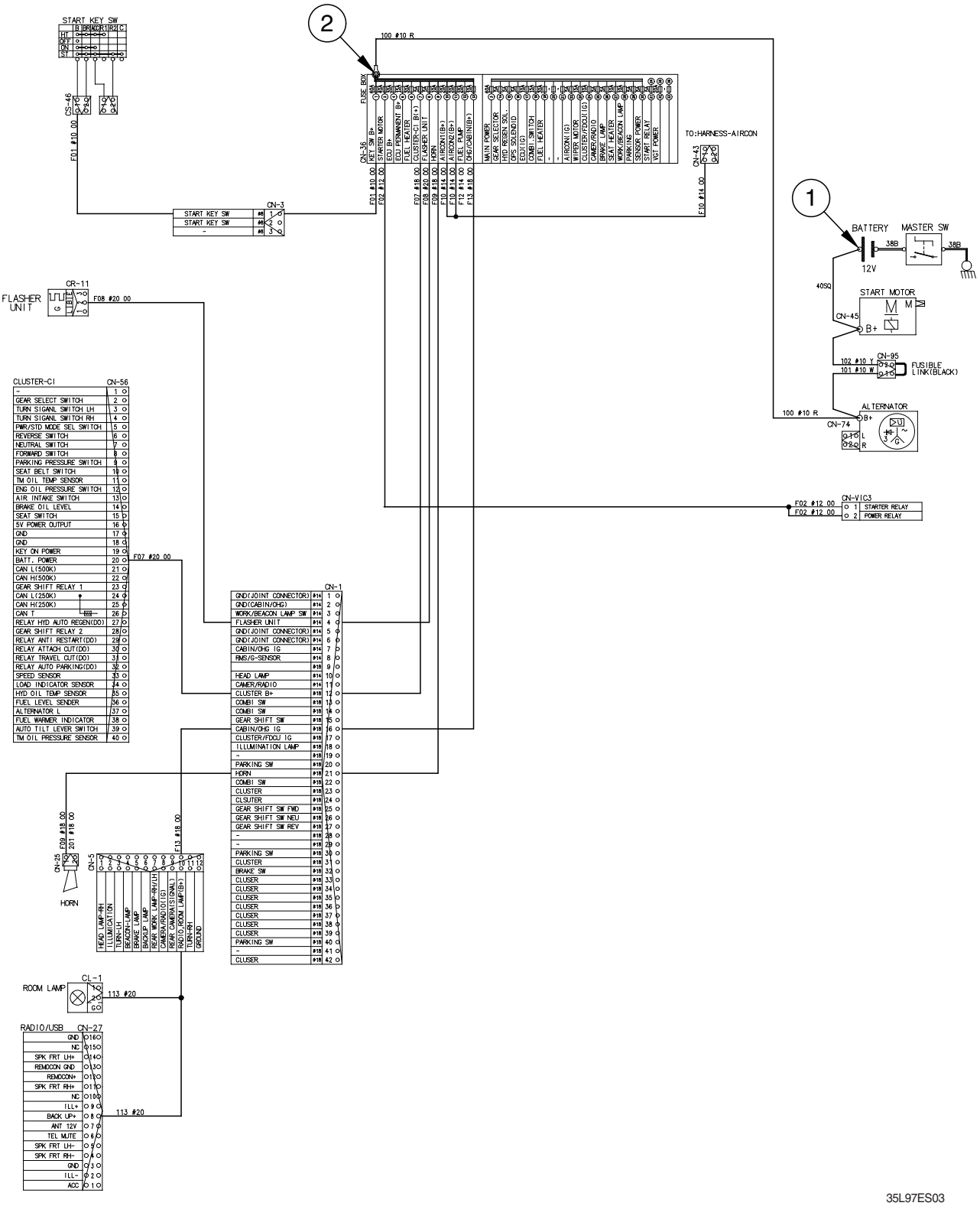
2) CHECK POINT

Engine	Start switch	Check point	Voltage
STOP	OFF	① - GND (Battery (+)) ② - GND (Fuse B+)	12V

※ GND : Ground

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

POWER CIRCUIT



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

2. STARTING CIRCUIT

1) OPERATING FLOW

Battery (+) terminal → Start motor [CN-45 (B+)] → Fusible link [CN-95] → Alternator [CN-74 (B+)] → Fuse box (No.1) → I/conn [CN-3 (1)] → Key S/W [CS-46 (1)]

※ The engine can be started only when the gear selector lever is in neutral position.

(1) When start switch is in ON position

Start switch ON [CS-46 (2)] → I/conn [CN-3 (2)] → Fuse box [CN-36 (No.3)] → Power is supply with the electric components.

(2) When start switch is START position

Start switch START [CS-46 (2)] → I/conn [CN-2 (1)] → Fuse box [CN-36 (No.34 → 31)] → Secret relay [CR-5 (3 → 4)] → Engine harness [CN-VIC1 (F)] → Start motor operating

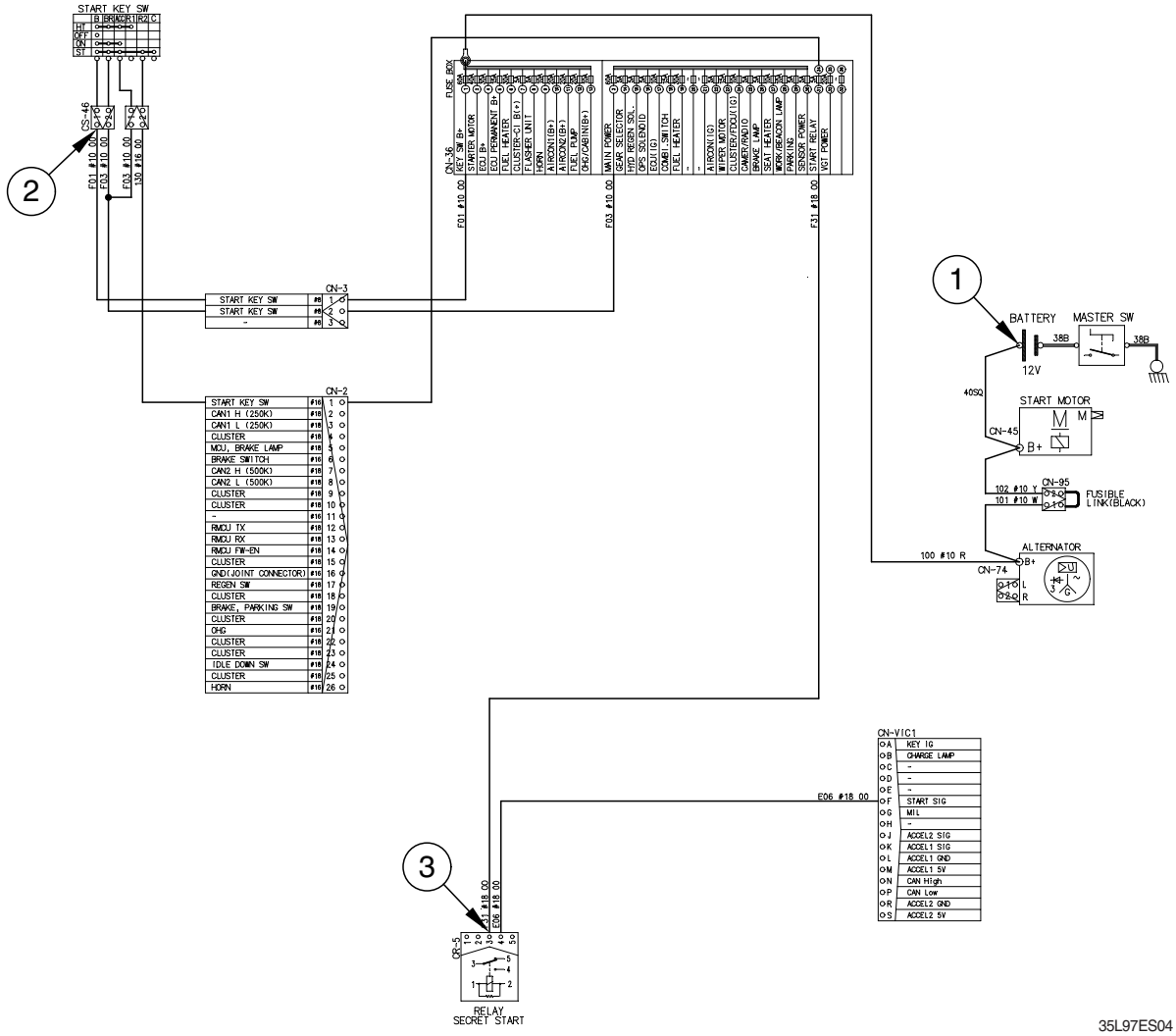
2) CHECK POINT

Engine	Start switch	Check point	Voltage
Running	ON	① - GND (Battery B+) ② - GND (Start key switch) ③ - GND (Secret start relay)	12V

※ GND : Ground

※ 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.

3. CHARGING CIRCUIT

When the starter is activated and the engine is started, the operator release the start 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 through the fuse box.

1) OPERATING FLOW

(1) Warning flow
Cluster charging warning lamp (via CAN interface)

(2) Charging flow
Alternator (B+) → Start motor [CN-45 (B+)] → Fusible link [CN-95] → Battery (+) terminal → Charging

2) CHECK POINT

Engine	Start switch	Check point	Voltage
Running	ON	① - GND (Alternator B+) ② - GND (Battery voltage)	12V

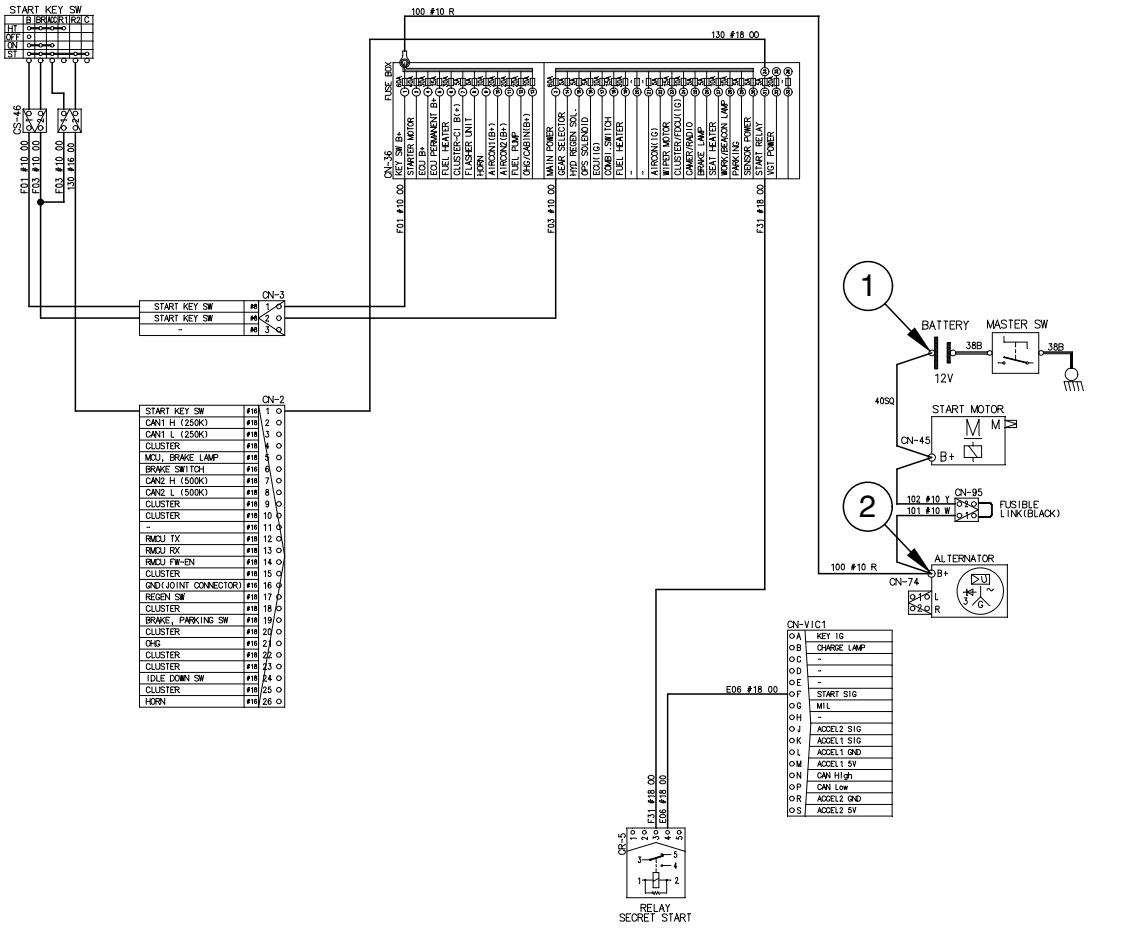
※ GND : Ground

※ Cautions

1. When using an arc welder, always disconnect the ground lead from the battery to prevent alternator or battery damage.
2. Attach the welding ground clamp as close to the weld area as possible to prevent welding current from damaging the bearings of the alternator.
3. Do not disconnect the battery when the engine is running. The voltage surge can damage the diode and resistors in the electrical system.
4. Do not disconnect an electric wire before the engine is stopped and the switches are OFF.

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

CHARGING CIRCUIT



35L97ES05

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

4. HEAD LIGHT AND REAR WORK LIGHT CIRCUIT

1) OPERATING FLOW

(1) Head light

Fuse box [CS-36, No.18] → I/conn [CN-1 (3)] → Multi function switch [CS-12 (5)]
→ Multi function switch ON [CS-12 (7)] → I/conn [CN-1 (14)] → Head lamp relay [CR-13 (1→4)]
→ I/conn [CN-1 (10)] → I/conn [CN-6 (12)] → LH Head lamp ON [CN-14A (1)]
→ I/conn [CN-5 (1)] → RH Head lamp ON [CN-14 (1)]
→ Multi function switch ON [CS-12 (6)] → I/conn [CN-1 (13)] → Tail lamp relay [CR-40 (1→4)]
→ Switch pilot lamp ON
→ License lamp ON

(2) Rear work light

Fuse box [CN-36, No.28)] → I/conn [CN-1 (3)] → Rear work light switch [CS-21 (2)]
→ Switch ON [CS-21 (3)] → I/conn [CN-5 (7)] → LH rear work light ON [CN-15 (1)]
→ RH rear work light ON [CN-15A (1)]

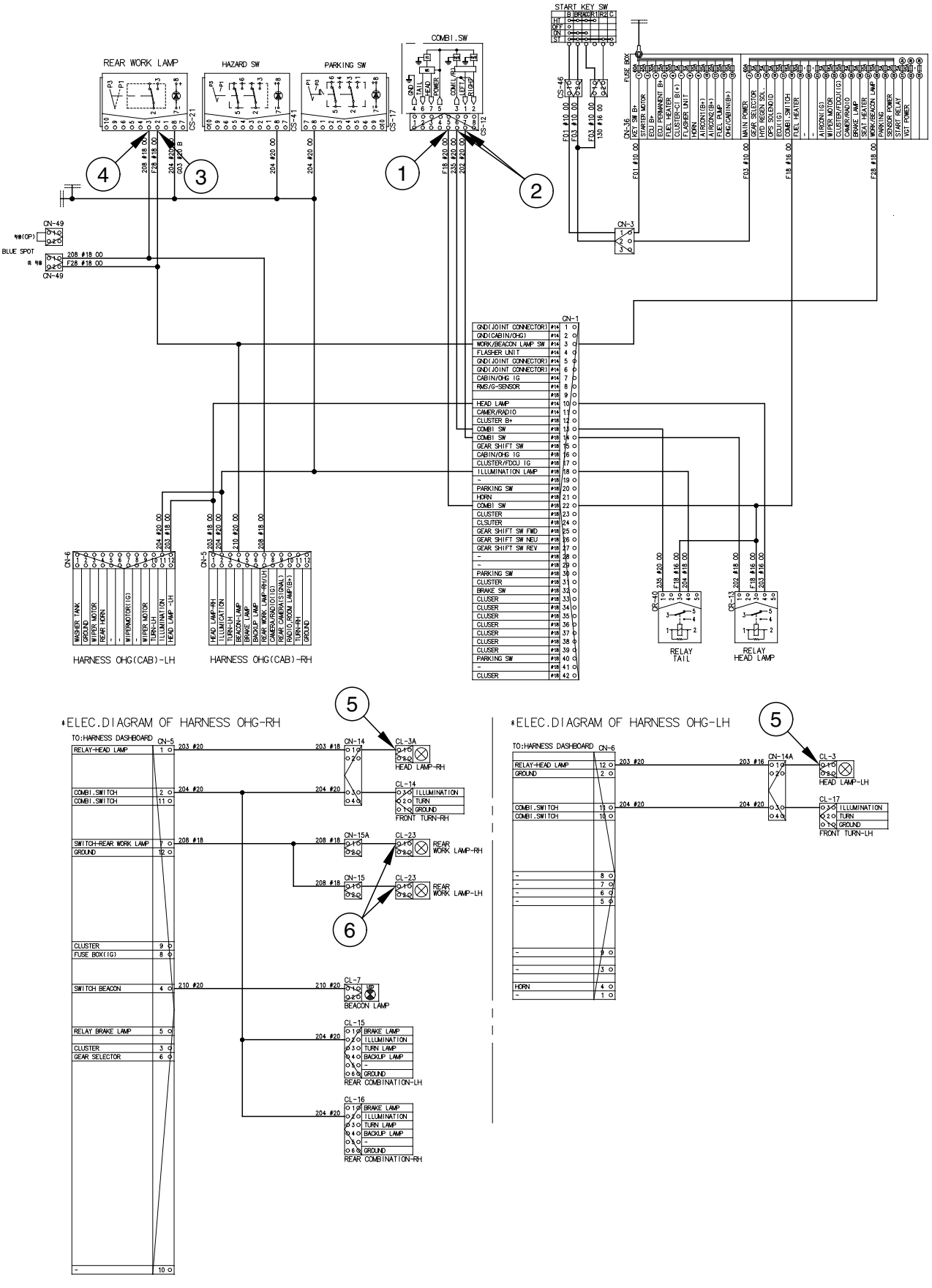
2) CHECK POINT

Engine	Start switch	Check point	Voltage
OFF	ON	① - GND (Multifunction switch input) ② - GND (Multifunction switch output) ③ - GND (Rear work light switch input) ④ - GND (Rear work light switch output) ⑤ - GND (High light) ⑥ - GND (Rear work light)	10~12.5V

※ GND : Ground

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

HEAD LIGHT AND REAR WORK LIGHT CIRCUIT



35D9VB7ES06

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

5. FRONT WIPER AND WASHER CIRCUIT

1) OPERATING FLOW

Fuse box [CN-36 (No.23)] → I/conn [CN-1 (7)] ┬→ Front wiper & washer switch [CS-3 (3, 5)]
└→ I/conn [CN-6 (7)] → Wiper motor [CN-21 (3)]

(1) Front wiper & washer switch ON (1st step)

Front wiper & washer switch [CS-3 (2)] → I/conn [CN-6 (3)] → Front wiper motor [CN-21 (4)]
→ Front wiper motor operating

(2) Front wiper & washer switch ON (2nd step)

Front wiper & washer switch ON [CS-3 (2)] → I/conn [CN-6 (3)] → Front wiper motor [CN-21 (3)]
→ Front wiper motor operating
Front wiper & washer switch [CS-3 (6)] → I/conn [CN-6 (1)] → Front washer tank [CN-22 (2)]
→ Front washer pump operating

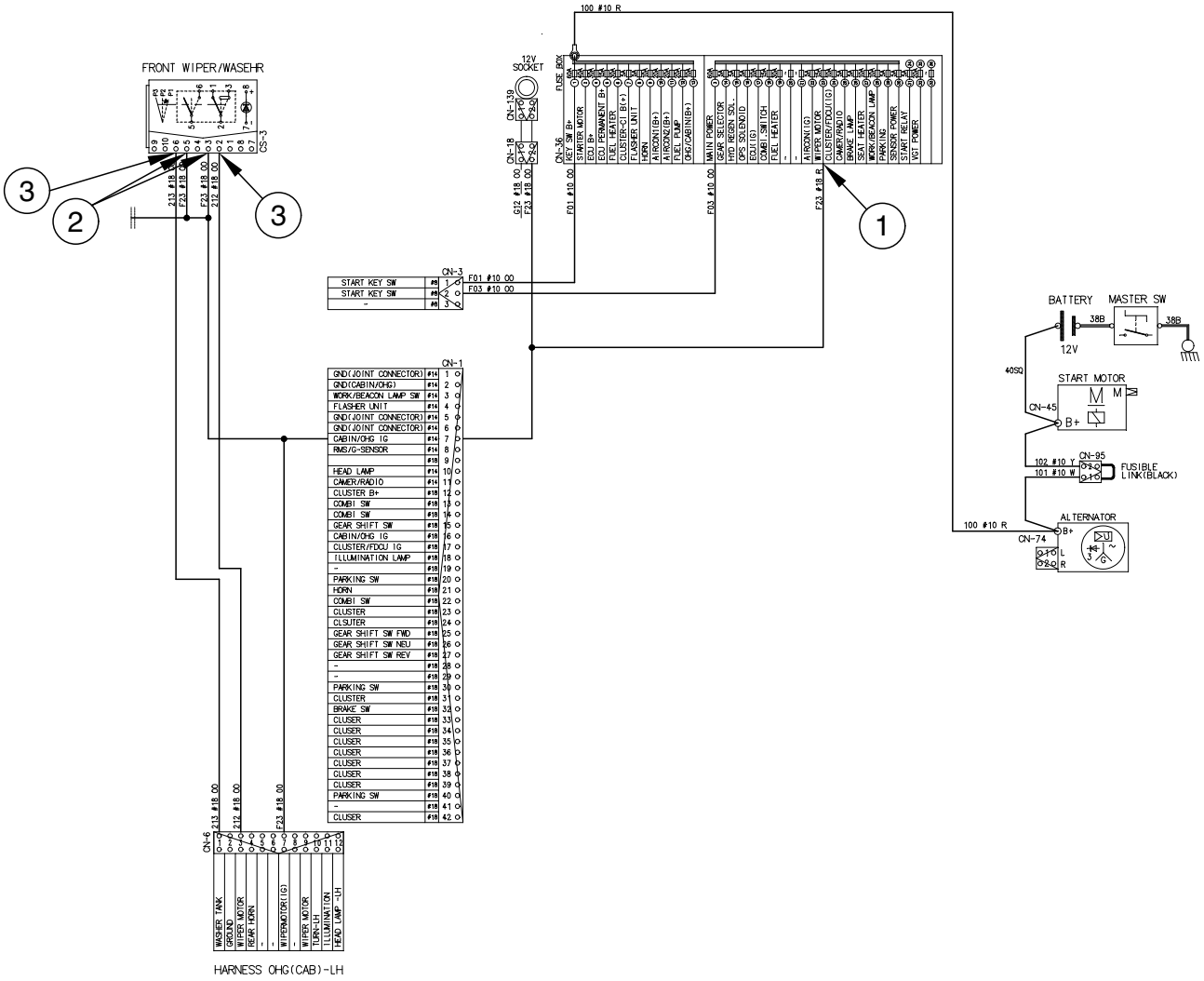
2) CHECK POINT

Engine	Start switch	Check point	Voltage
Stop	ON	① - GND (Fuse box No. 25) ② - GND (Front wiper & washer switch power input) ③ - GND (Front wiper & washer switch output) ④ - GND (Front wiper motor power input) ⑤ - GND (Front washer pump power input)	10~12.5V

※ GND : Ground

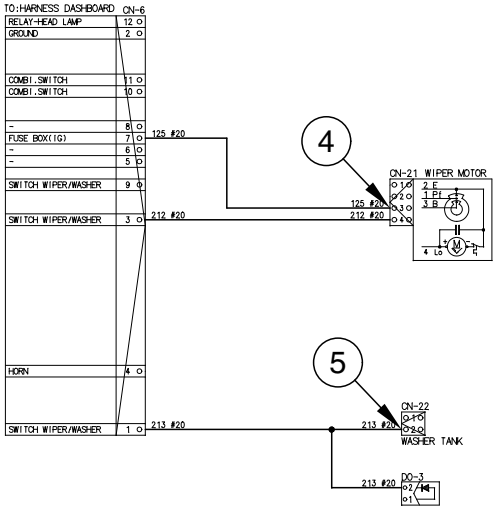
※ The circuit diagram may differ from the equipment, so please check before a repair.

FRONT WIPER AND WASHER CIRCUIT



HARNESS OHG(CAB)-LH

*ELEC.DIAGRAM OF HARNESS CABIN-LH



35D9VB7ES06

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

GROUP 3 COMPONENT SPECIFICATION

No	Part name	Qty	Specification
1	Battery	1	12V×800 AH RC : 130 min CCA : 640 A
2	Work lamp	1	12V, 55W
3	Work lamp (LED, opt)	1	12V, 22W
4	License lamp (opt)	1	12V, 5W
5	Rear combination lamp (LED)	2	12V, 2.6/0.2W (Stop/Tail) 12V, 2.3W (Turn) 12V, 2.1W (Back Up)
6	Flasher lamp	2	12V, 0.5/2.2W (posit/turn signal)
7	Beacon lamp (LED, opt)	1	12V, max. 0.960A
8	Camera (opt)	1	12V, 1.32W
9	Relay (5P)	10	12V, 20A
10	Flasher Unit	1	12V, 85±10 CM, (23W + 23W)×2 + 3W×2
11	Back buzzer	1	12V, 90±5 dB, 60±10 C/M
12	Horn	1	12V, MAX 3.5A, 100 ~ 115 dB
13	Cluster-CI	1	12V, 4W
14	G-sensor (Mast angle) (opt)	1	12V, 5W
15	Master switch (opt)	1	12V, 180A
16	Gear selector switch	1	12V, 5A
17	Combination switch	1	Direction : 12V, 5A Multi-function switch : 12V, 5A
18	Rear worklamp switch (opt)	1	12V, 20A
19	Hazard switch (opt)	1	12V, 20A
20	Wiper/washer switch (opt)	1	12V, 20A
21	Accelerator pedal	1	12V, input voltage 5Vdc, current 16~20mA
22	Parking switch	1	12V, 20A
23	Socket assy (opt)	1	12V, 10A
24	Blue spot (LED, opt)	1	12V, 7.7W

GROUP 4 CONNECTOR DESTINATION

1. FRAME HARNESS

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-1	AMP	42	HARNESS DASHBOARD	-	0-936429-2
CN-2	AMP	26	HARNESS DASHBOARD	1897009-2	-
CN-18	AMP	2	SOCKET(12V)	174352-2	174354-2
CN-19	DEUTSCH	4	G SENSOR	DT06-4S	-
CN-36	QPL		FUSE BOX	-	-
CN-36	KET	3	HARNESS DASHBOARD	-	MG652290-5
CN-43	KET	2	HARNESS-AIRCON	MG642928-5	MG652934-5
CN-44	KET	1	HARNESS-AIRCON	MG610278	MG640280
CN-65	KET	2	BACKUP ALARM	-	MG640322
CN-71	DEUTSCH	2	PARKING VALVE	DT06-2S	
CN-74	KET	20	ALTERNATOR	MG655633	-
CN-87	AMP	2	CUTOFF SOL	963040-3	-
CN-91	DEUTSCH	6	SEAT SWITCH	DT06-6S	-
CN-122	DEUTSCH	2	FWD SOL2	DT06-2S	-
CN-123	DEUTSCH	2	REV SOL	DT06-2S	-
CN-124	DEUTSCH	2	FWD SOL1	DT06-2S	-
CN-134	KET	20	MACHINE DIAGNOSIS	MG652863	-
CN-144	AMP	6	ACCEL PEDAL	174262-2	-
CN-417	KET	8	MCV HARNESS	MG610339	-
CN-990	AMP	2	TEMP SENDER	963040-3	-
CN-J1	KET	20	JOINT CONNECTOR #1	MG655633	MG645695-5
CN-VIC1	DELPHI	16	ENGINE HARNESS	-	15326868
CN-VIC3	MOLEX	2	ENGINE HARNESS	19432-0013	-
· Switch					
CS-11	AMP	6	FNR CONTROLLER A	174262-2	174264-2
CS-13	AMP	3	FNR CONTROLLER B	174357-2	174359-2
CS-53	KET	2	TILT LEVER SWITCH	MG610320	MG642552
· Diode					
DO-01	AMP	2	DIODE	174352-2	-
· Sensor, sender					
CD-9	HCE	-	FUEL EMPTY SWITCH	-	-
CD-10	KET	1	AIR CLEANER SWITCH	ST730057-2	-
CD-29	DEUTSCH	3	TM PRESSUR SENSOR	DT06-3S	-
CD-40	AMP	2	TM SPEED SENSOR	963040-3	-
CD-70	DEUTSCH	3	LOAD SENSOR	DT06-3S	DT04-3P

2. DASHBOARD HARNESS

Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-1	AMP	42	HARNESS-FRAME	0-936421-2	-
CN-2	AMP	26	HARNESS-FRAME	-	1897013-2
CN-3	KET	3	HARNESS-FRAME	MG642292-5	-
CN-5	KET	12	HARNESS OHG(CABIN)-RH	-	MG640348
CN-5A	AMP	1	HARNESS OHG(CABIN)-RH	174877-2	-
CN-6	KET	12	HARNESS OHG(CABIN)-LH	-	MG640348
CN-19	AMP	4	HARNESS G-SENSOR	174257-2	174259-2
CN-25	MOLEX	2	HORN	35825-0211	-
CN-49	AMP	2	BLUE SPOT	174352-2	174354-2
CN-55	DEUTSCH	6	HARNESS-FMS	DT06-6S	-
CN-56	KET	73	CLUSTER CI	MG655708	-
CN-113	KET	2	WARNING BUZZER	MG610320	-
CN-890	KET	8	MONITOR	MG610339	MG640341
· Relay					
CR-11	DAEDONG	3	FLASHER UNIT	312 GIHUNG	-
· Switch					
CS-3	CALRING	10	WIPER SWITCH	-	-
CS-5	HCE	-	HORN SWITCH	-	-
CS-11	AMP	8	GEAR SELECTOR	174984-2	-
CS-12	AMP	8	COMBI SWITCH	-	174894-2
CS-17	CALRING	10	PARKING SWITCH	-	-
CS-21	CALRING	10	REAR WORK LAMP SWITCH	-	-
CS-23	CALRING	10	BEACON LAMP SWITCH	-	-
CS-41	CALRING	10	HARZARD SWITCH	-	-
CS-46	KET	2	START KEY	MG610281	MG620282
CS-990	CALRING	10	CLAMP INTERLOCK	-	-
· Sensor, sender					
CD-26	AMP	1	PARKING PS SWITCH	171809-2	-
CD-59	KET	2	BRAKE OIL LEVEL	MG610320	-
CD-70	AMP	3	BRAKE SWITCH	174357-2	-

GROUP 5 TROUBLESHOOTING

Trouble symptom	Probable cause	Remedy
Lamps dimming even at maximum engine speed.	· Faulty wiring.	· Check for loose terminal and disconnected wire.
Lamps flicker during engine operation.	· Improper belt tension.	· Adjust belt tension.
Charge lamp does not light during normal engine operation.	· Charge lamp defective. · Faulty wiring.	· Replace. · Check and repair.
Alternator makes abnormal sounds.	· Alternator defective.	· Replace.
Starting motor fails to run.	· Faulty wiring. · Insufficient battery voltage.	· Check and repair. · Recharge battery.
Starting motor pinion repeats going in and out.	· Insufficient battery voltage.	· Recharge battery.
Excessively low starting motor speed.	· Insufficient battery voltage. · Starting motor defective.	· Recharge battery. · Replace
Starting motor comes to a stop before engine starts up.	· Faulty wiring. · Insufficient battery voltage.	· Check and repair. · Recharge battery.
Heater signal does not become red.	· Faulty wiring. · Glow plug damaged.	· Check and repair. · Replace