# SECTION 7 ELECTRICAL SYSTEM


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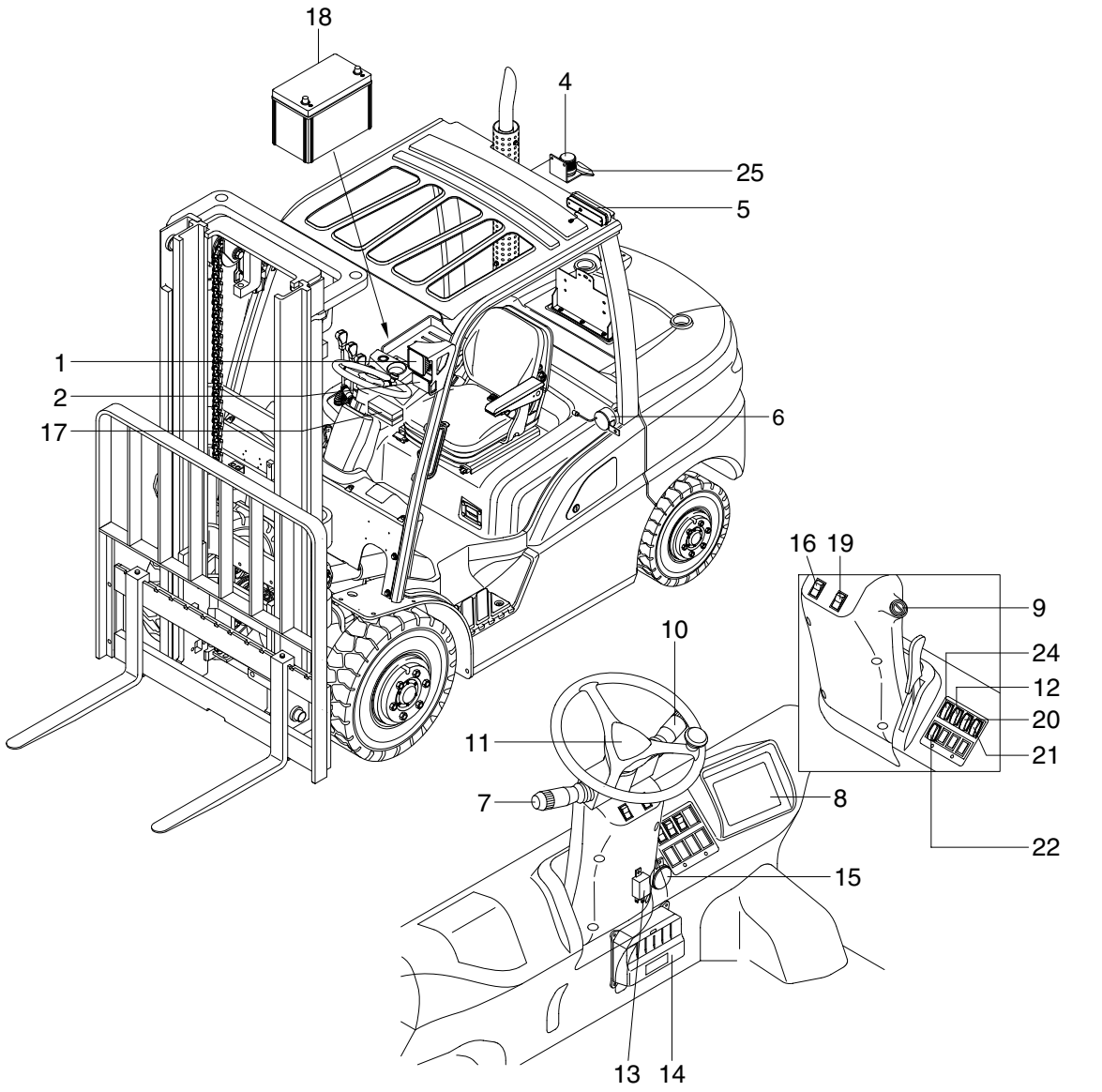
Group 2 Electrical circuit ····· 7-2
Group 3 Component specification ····· 7-19
Group 4 Connector destination ····· 7-20
Group 5 Troubleshooting ····· 7-23

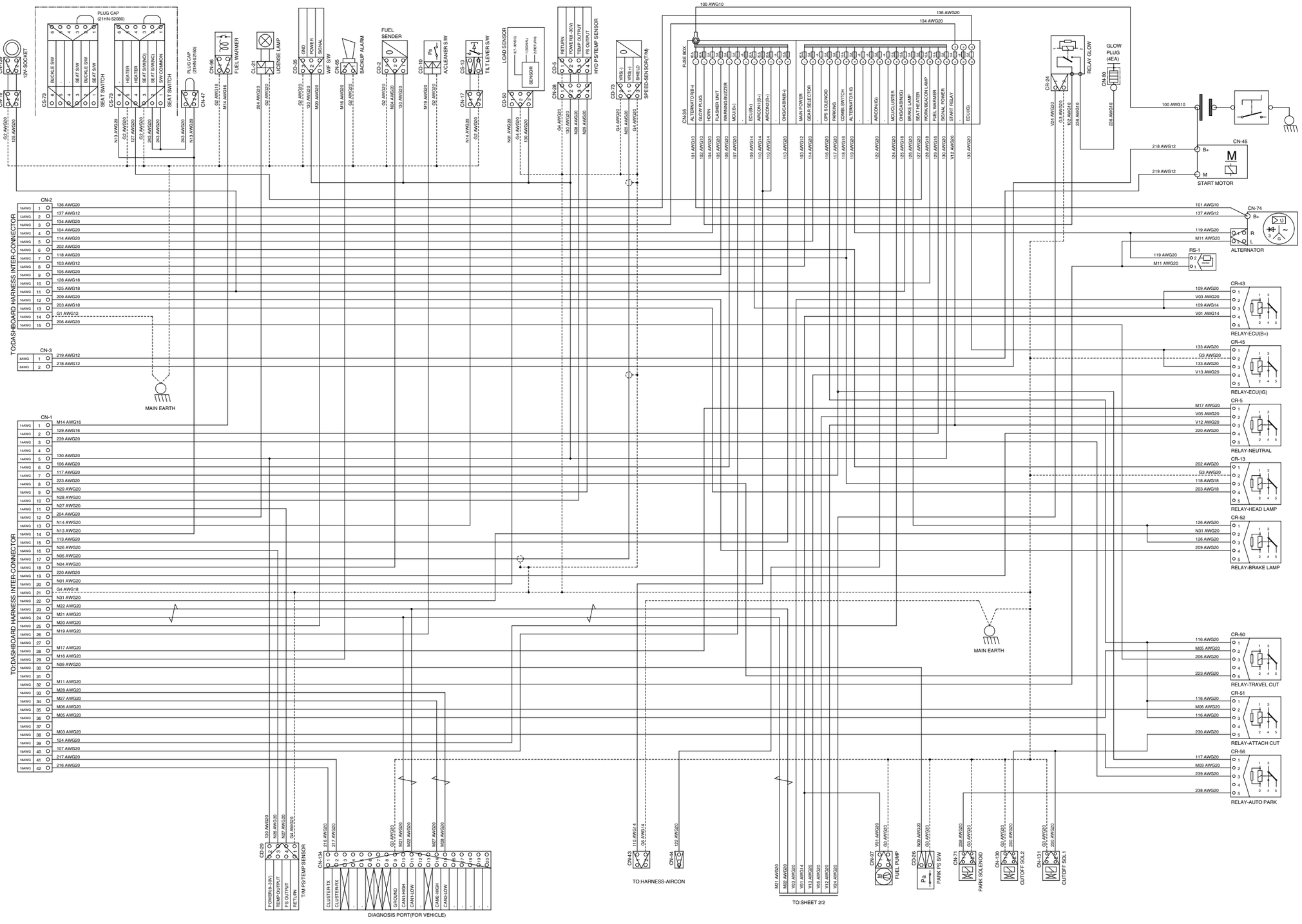
## GROUP 1 COMPONENT LOCATION




22D9EL01

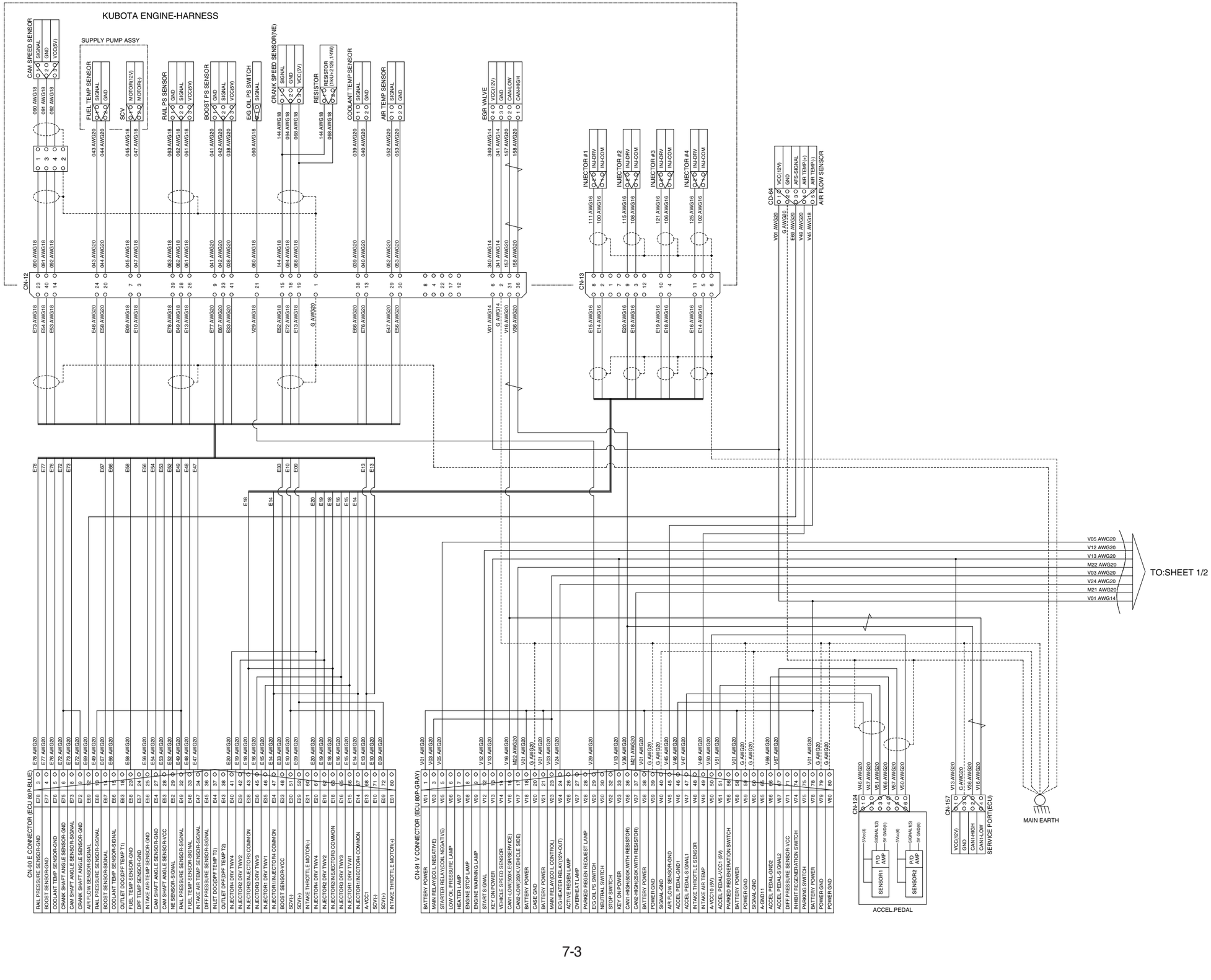
| | | | | | |
|---|---|---|---|---|---|
| 1 | Head lamp | 10 | Head lamp switch | 17 | Fuse box |
| 2 | Turn signal lamp | | Clearance lamp switch | 18 | Battery |
| 3 | Horn assembly | | Turn signal switch | 19 | Parking switch |
| 4 | Beacon lamp (opt) | 11 | Horn button | 20 | Beacon switch (opt) |
| 5 | Combination lamp | 12 | Rear work lamp switch (opt) | 21 | Front wiper/washer switch (opt) |
| 6 | Back buzzer | 13 | Flasher unit | 22 | Heater switch (opt) |
| 7 | Forward-reverse lever | 14 | MCU | 24 | Fuel warmer switch |
| 8 | Cluster | 15 | Buzzer | 25 | Rear camera |
| 9 | Start switch | 16 | Hazard lamp switch (opt) | | |

## · ELECTRICAL CIRCUIT (STD, FRAME 1/2, 22D-9 : -#0056, 25D-9 : -#0770, 30D-9 : -#1524, 33D-9 : -#0396, 35DA-9 : -#0022)




22D9EL02-1

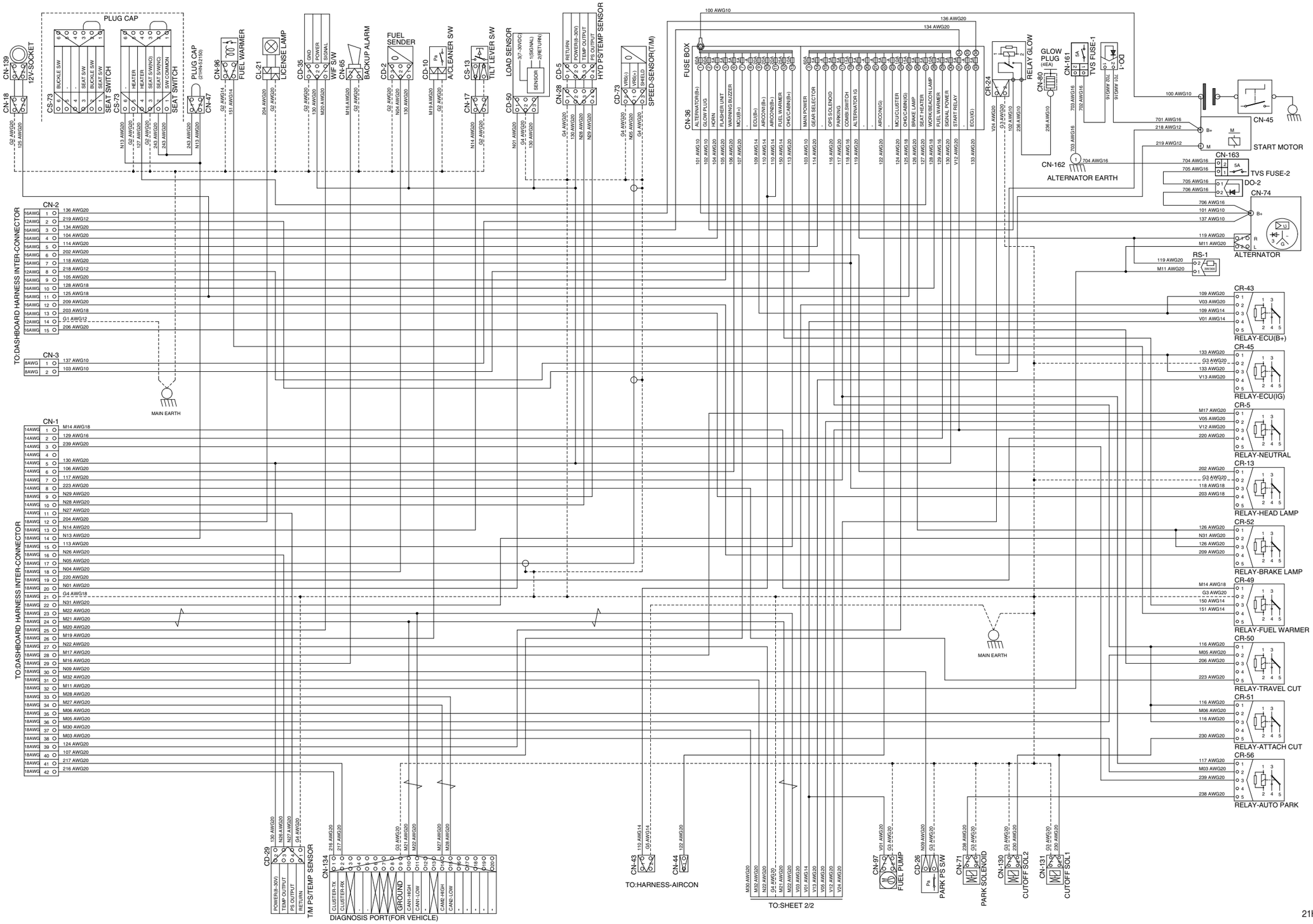
## · ELECTRICAL CIRCUIT (STD, FRAME 2/2, 22D-9 : -#0056, 25D-9 : -#0770, 30D-9 : -#1524, 33D-9 : -#0396, 35DA-9 : -#0022)




| CN-91 E CONNECTOR (ECU 80P-BLUE) | | | |
|---|---|---|---|
| RAIL PRESSURE SENSOR-GND | E76 | 3 | E79 AWG20 |
| BOOST SENSOR-GND | E77 | 4 | E77 AWG20 |
| COOLANT TEMP SENSOR-GND | E76 | 5 | E76 AWG20 |
| CRANK SHAFT ANGLE SENSOR-GND | E75 | 6 | E72 AWG20 |
| CAM SHAFT ANGLE SENSOR-SIGNAL | E73 | 8 | E73 AWG20 |
| CRANK SHAFT ANGLE SENSOR-GND | E72 | 9 | E72 AWG20 |
| AIR FLOW SENSOR-SIGNAL | E69 | 12 | E69 AWG20 |
| RAIL PRESSURE SENSOR-SIGNAL | E68 | 15 | E67 AWG20 |
| BOOST SENSOR-SIGNAL | E67 | 14 | E67 AWG20 |
| COOLANT TEMP SENSOR-SIGNAL | E66 | 13 | E66 AWG20 |
| OUTLET DOC(DPF TEMP T1) | E63 | 18 | |
| FUEL TEMP SENSOR-GND | E58 | 23 | E58 AWG20 |
| DPF TEMP SENSOR-GND | E57 | 24 | |
| INTAKE AIR TEMP SENSOR-GND | E56 | 25 | E56 AWG20 |
| CAM SHAFT ANGLE SENSOR-GND | E54 | 27 | E54 AWG20 |
| CAM SHAFT ANGLE SENSOR-SIGNAL | E53 | 28 | E53 AWG20 |
| CRANK SHAFT ANGLE SENSOR-VCC | E52 | 29 | E52 AWG20 |
| RAIL PRESSURE SENSOR-SIGNAL | E49 | 30 | E49 AWG20 |
| FUEL TEMP SENSOR-SIGNAL | E48 | 33 | E48 AWG20 |
| INTAKE AIR TEMP SENSOR-SIGNAL | E47 | 34 | E47 AWG20 |
| DIFF PRESSURE SENSOR-SIGNAL | E45 | 36 | |
| INLET DOC(DPF TEMP T0) | E44 | 37 | |
| OUTLET DPF(DPF TEMP T2) | E43 | 38 | |
| INJECTOR4 DRV TWV4 | E40 | 41 | E20 AWG20 |
| INJECTOR2 DRV TWV2 | E39 | 42 | E19 AWG20 |
| INJECTOR2&INJECTOR3 COMMON | E38 | 43 | E18 AWG20 |
| INJECTOR3 DRV TWV3 | E38 | 45 | E16 AWG20 |
| INJECTOR1 DRV TWV1 | E35 | 46 | E15 AWG20 |
| INJECTOR1&INJECTOR4 COMMON | E34 | 47 | E14 AWG20 |
| BOOST SENSOR-VCC | E33 | 48 | E33 AWG20 |
| SCV(+) | E30 | 51 | E10 AWG20 |
| SCV(-) | E29 | 52 | E09 AWG20 |
| INTAKE THROTTLE MOTOR(-) | B21 | 60 | |
| INJECTOR4 DRV TWV4 | E20 | 61 | E20 AWG20 |
| INJECTOR2 DRV TWV2 | E19 | 62 | E19 AWG20 |
| INJECTOR2&INJECTOR3 COMMON | E18 | 63 | E18 AWG20 |
| INJECTOR3 DRV TWV3 | E16 | 65 | E16 AWG20 |
| INJECTOR1 DRV TWV1 | E15 | 66 | E15 AWG20 |
| INJECTOR1&INJECTOR4 COMMON | E14 | 67 | E14 AWG20 |
| A-VCC1 | E13 | 68 | E13 AWG20 |
| SCV(-) | E10 | 71 | E10 AWG20 |
| SCV(+) | E09 | 72 | E09 AWG20 |
| INTAKE THROTTLE MOTOR(+) | B01 | 80 | |

| CN-91 V CONNECTOR (ECU 80P-GRAY) | | | |
|---|---|---|---|
| BATTERY POWER | V01 | 1 | V01 AWG20 |
| MAIN RELAY(COIL NEGATIVE) | V03 | 3 | V03 AWG20 |
| STARTER RELAY(COIL NEGATIVE) | V05 | 5 | V05 AWG20 |
| LOW OIL PRESSURE LAMP | V06 | 6 | |
| ENGINE STOP LAMP | V07 | 7 | |
| ENGINE STOP SW | V08 | 8 | |
| ENGINE WARNING LAMP | V09 | 9 | |
| START SIGNAL | V12 | 12 | V12 AWG20 |
| KEY ON POWER | V13 | 13 | V13 AWG20 |
| VEHICLE SPEED SENSOR | V14 | 14 | |
| CAN1-LOW(500K EGR/SERVICE) | V16 | 16 | V16 AWG20 |
| CAN2-LOW(250K VEHICLE SIDE) | V17 | 17 | M22 AWG20 |
| BATTERY POWER | V18 | 18 | V01 AWG20 |
| CASE GND | V20 | 20 | G AWG20 |
| BATTERY POWER | V21 | 21 | V01 AWG20 |
| MAIN RELAY(COIL CONTROL) | V23 | 23 | V03 AWG20 |
| EG HEATER RELAY(12V-OUT) | V24 | 24 | V24 AWG20 |
| ACTIVE REGEN LAMP | V26 | 26 | |
| OVERHEAT LAMP | V27 | 27 | |
| PARKED REGEN REQUEST LAMP | V28 | 28 | V29 AWG20 |
| EG OIL PS SWITCH | V29 | 29 | |
| NEUTRAL SWITCH | V30 | 30 | |
| STOP SWITCH | V32 | 32 | V10 AWG20 |
| KEY ON POWER | V33 | 33 | V39 AWG20 |
| CAN1-HIGH(500K WITH RESISTOR) | V36 | 36 | M36 AWG20 |
| CAN2-HIGH(250K WITH RESISTOR) | V37 | 37 | V01 AWG20 |
| BATTERY POWER | V38 | 38 | G AWG20 |
| POWER GND | V39 | 39 | G AWG20 |
| SIGNAL GND | V40 | 40 | V45 AWG20 |
| AIR FLOW SENSOR-GND | V45 | 45 | V46 AWG20 |
| ACCEL PEDAL-GND1 | V46 | 46 | V47 AWG20 |
| ACCEL PEDAL-SIGNAL1 | V47 | 47 | |
| INTAKE THROTTLE SENSOR | V48 | 48 | V49 AWG20 |
| INTAKE AIR TEMP | V49 | 49 | V50 AWG20 |
| A-VCC10 (5V) | V50 | 50 | V51 AWG20 |
| ACCEL PEDAL-VCC1 (5V) | V51 | 51 | |
| PARKED REGENERATION SWITCH | V56 | 56 | V01 AWG20 |
| BATTERY POWER | V58 | 58 | G AWG20 |
| DIFF PRESSURE GND | V59 | 59 | G AWG20 |
| SIGNAL GND | V60 | 60 | G AWG20 |
| A-GND1 1 | V65 | 65 | |
| ACCEL PEDAL-GND2 | V66 | 66 | V66 AWG20 |
| ACCEL PEDAL-SIGNAL2 | V67 | 67 | V67 AWG20 |
| DIFF PRESSURE SENSOR-VCC | V71 | 71 | |
| INHIBIT REGENERATION SWITCH | V74 | 74 | |
| PARKING SWITCH | V75 | 75 | |
| BATTERY POWER | V76 | 76 | V01 AWG20 |
| POWER GND | V79 | 79 | G AWG20 |
| POWER GND | V80 | 80 | G AWG20 |

## · ELECTRICAL CIRCUIT (STD, FRAME 1/2, 22D-9 : #0057-, 25D-9 : #0771-#1521, 30D-9 : #1525-#3921, 33D-9 : #0397-#0868, 35DA-9 : #0023-#0485)

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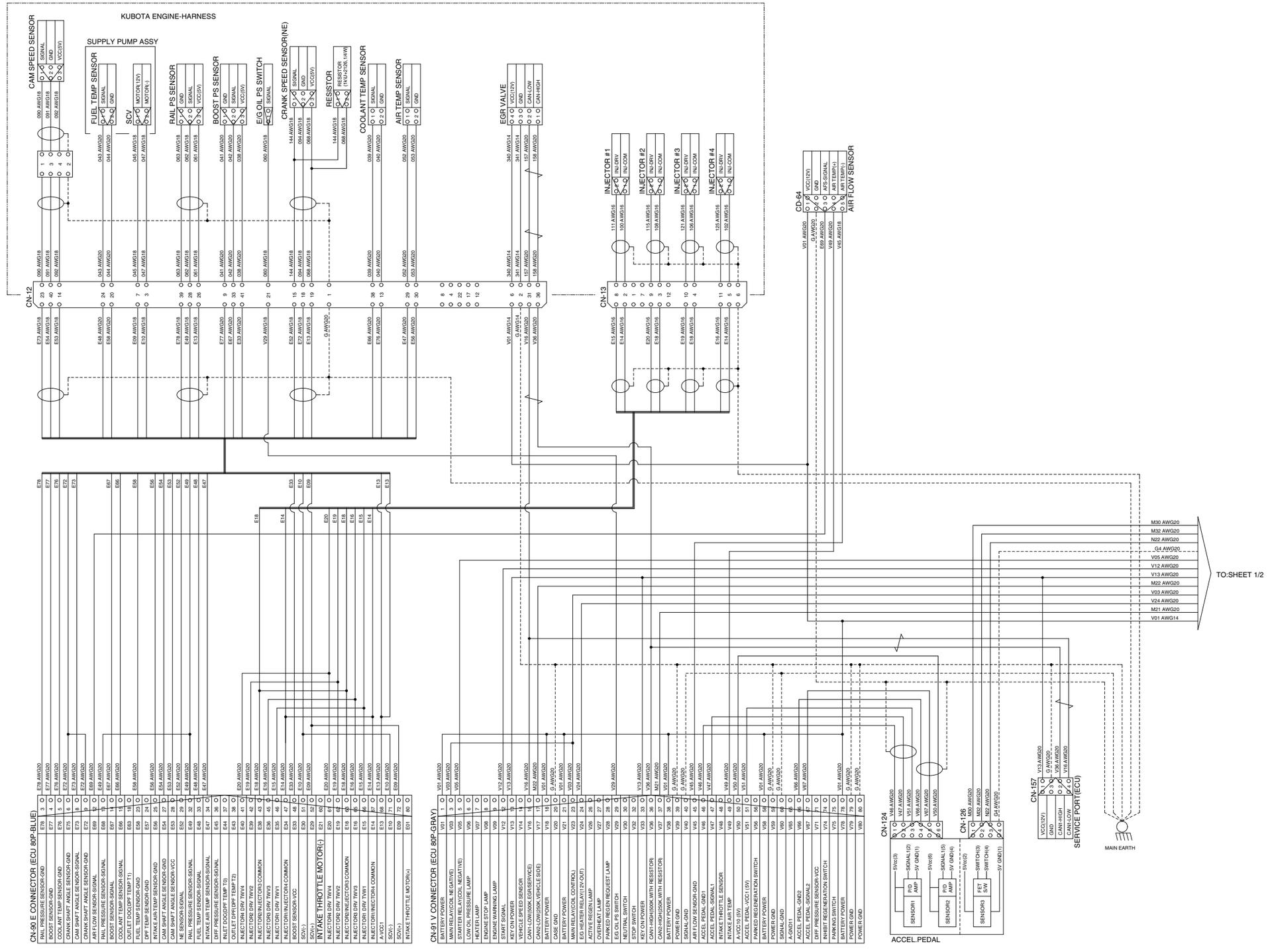
· ELECTRICAL CIRCUIT (STD, FRAME 2/2, 22D-9 : #0057-, 25D-9 : #0771-#1521, 30D-9 : #1525-#3921, 33D-9 : #0397-#0868, 35DA-9 : #0023-#0485)

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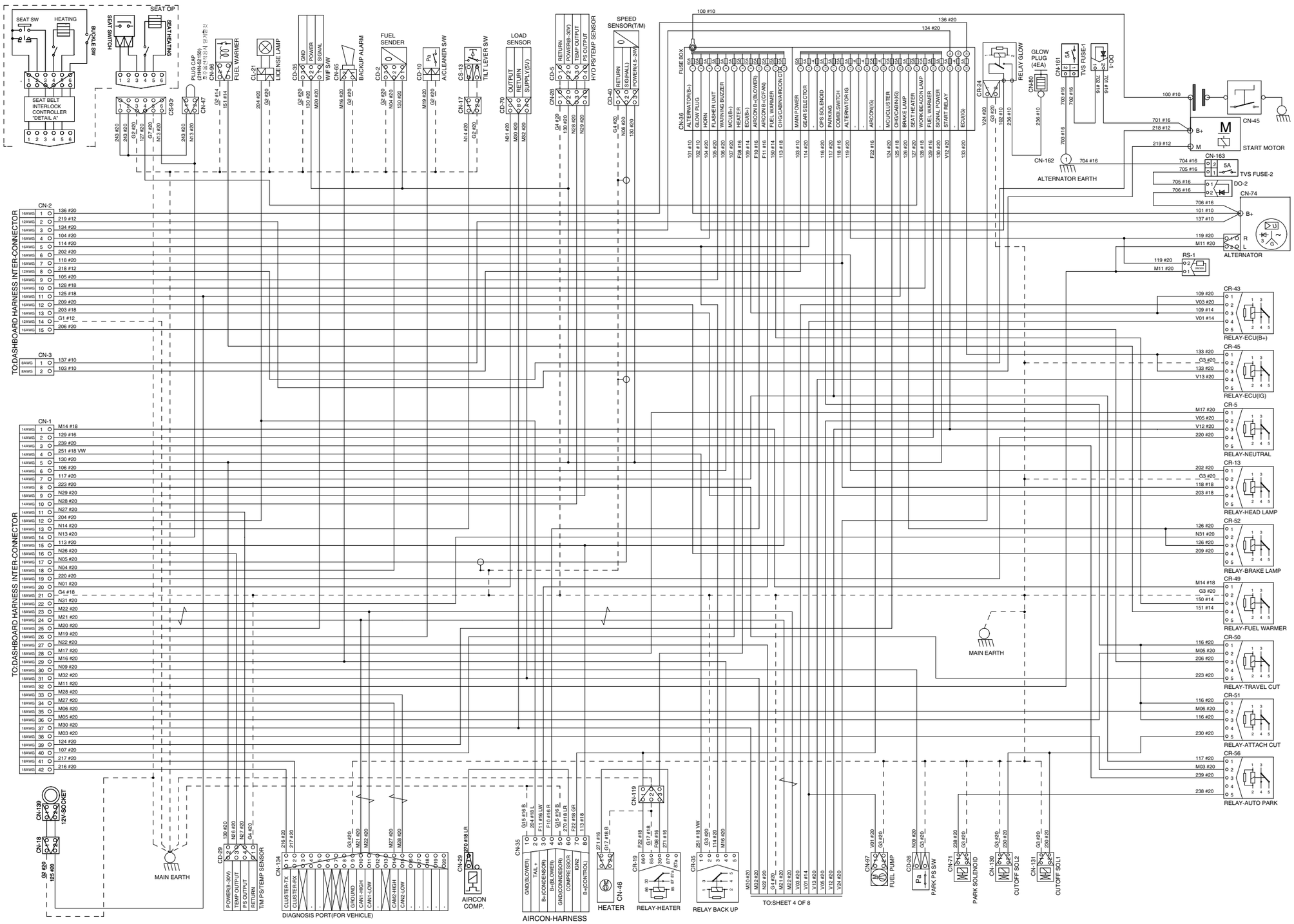
## · ELECTRICAL CIRCUIT (STD, FRAME 1/2, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)

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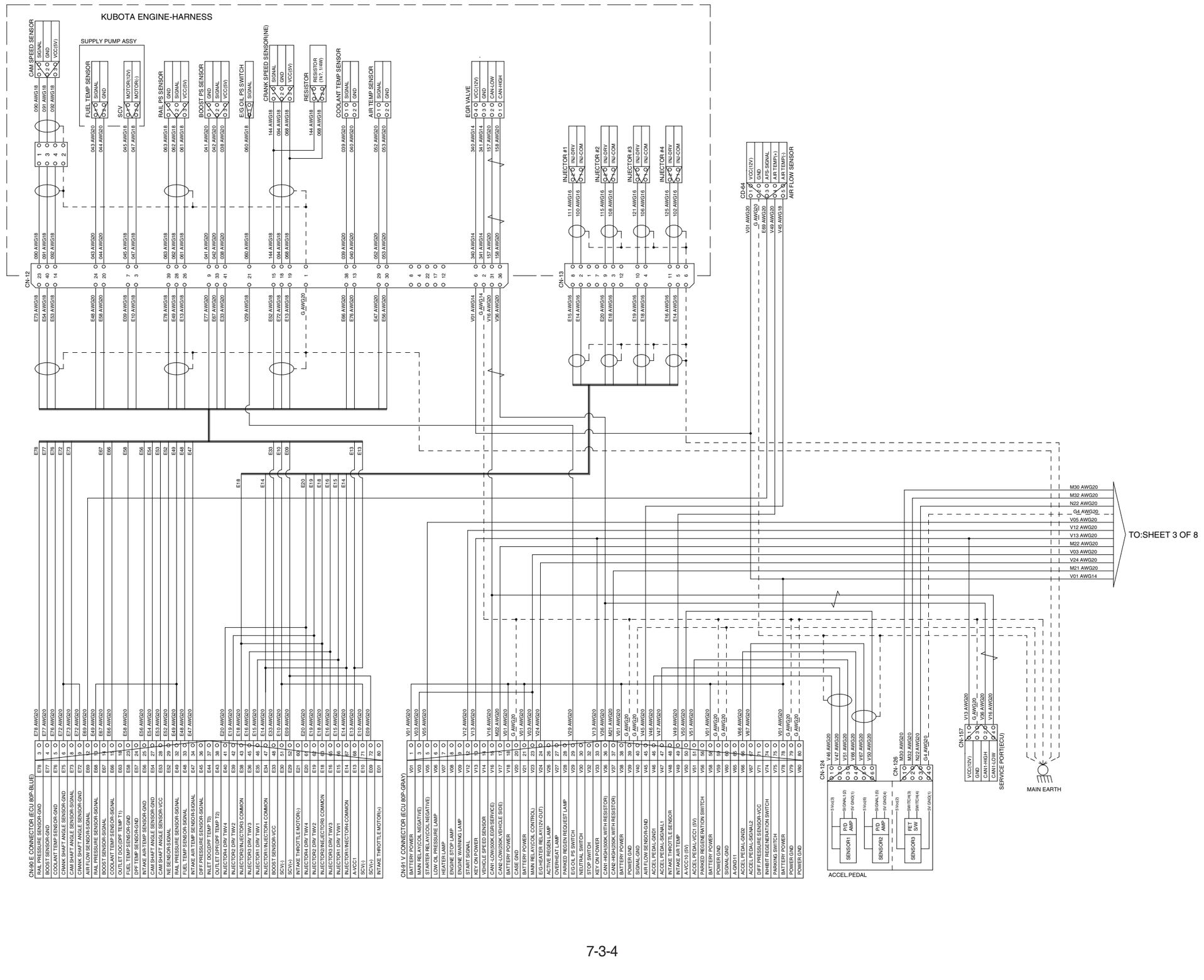
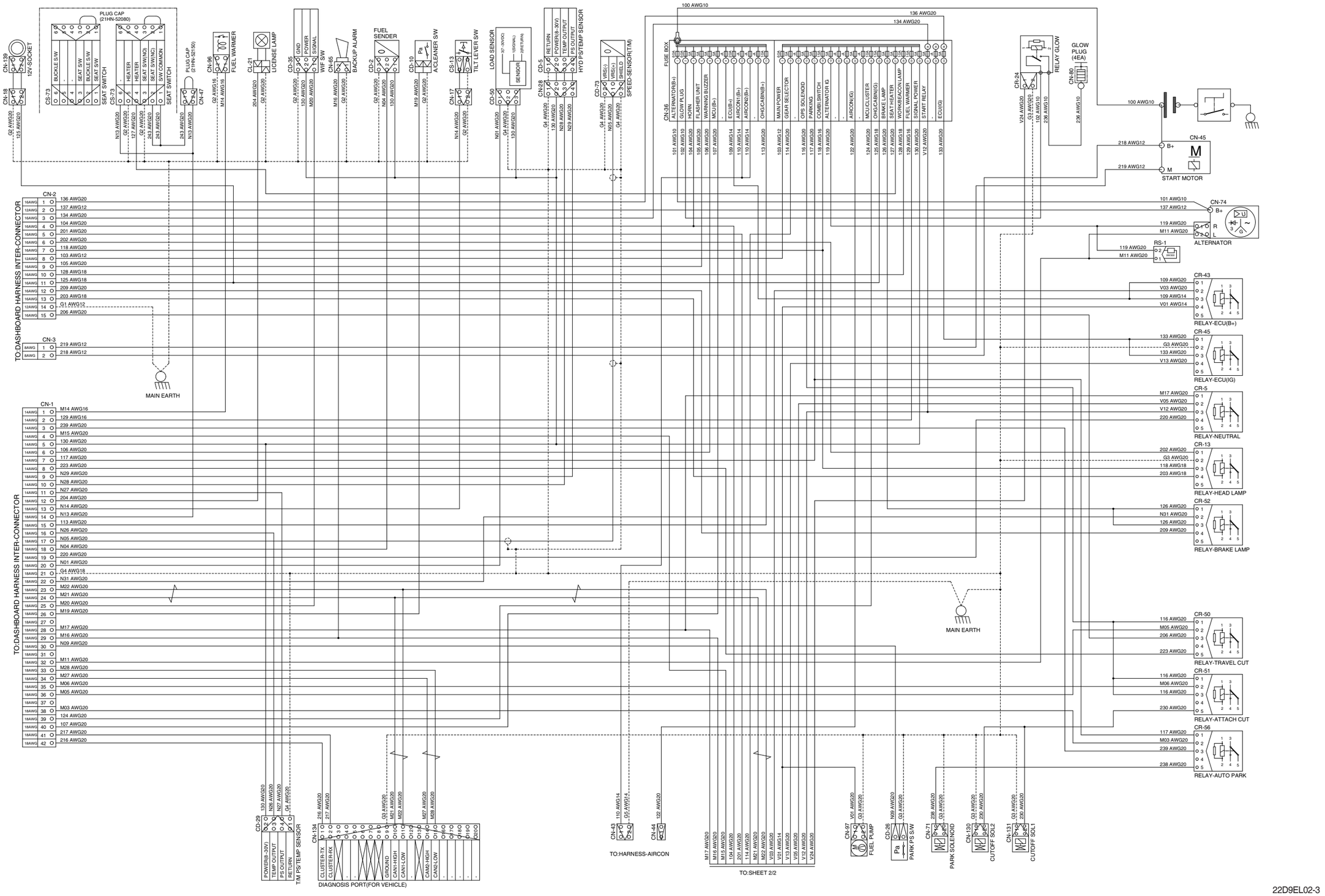
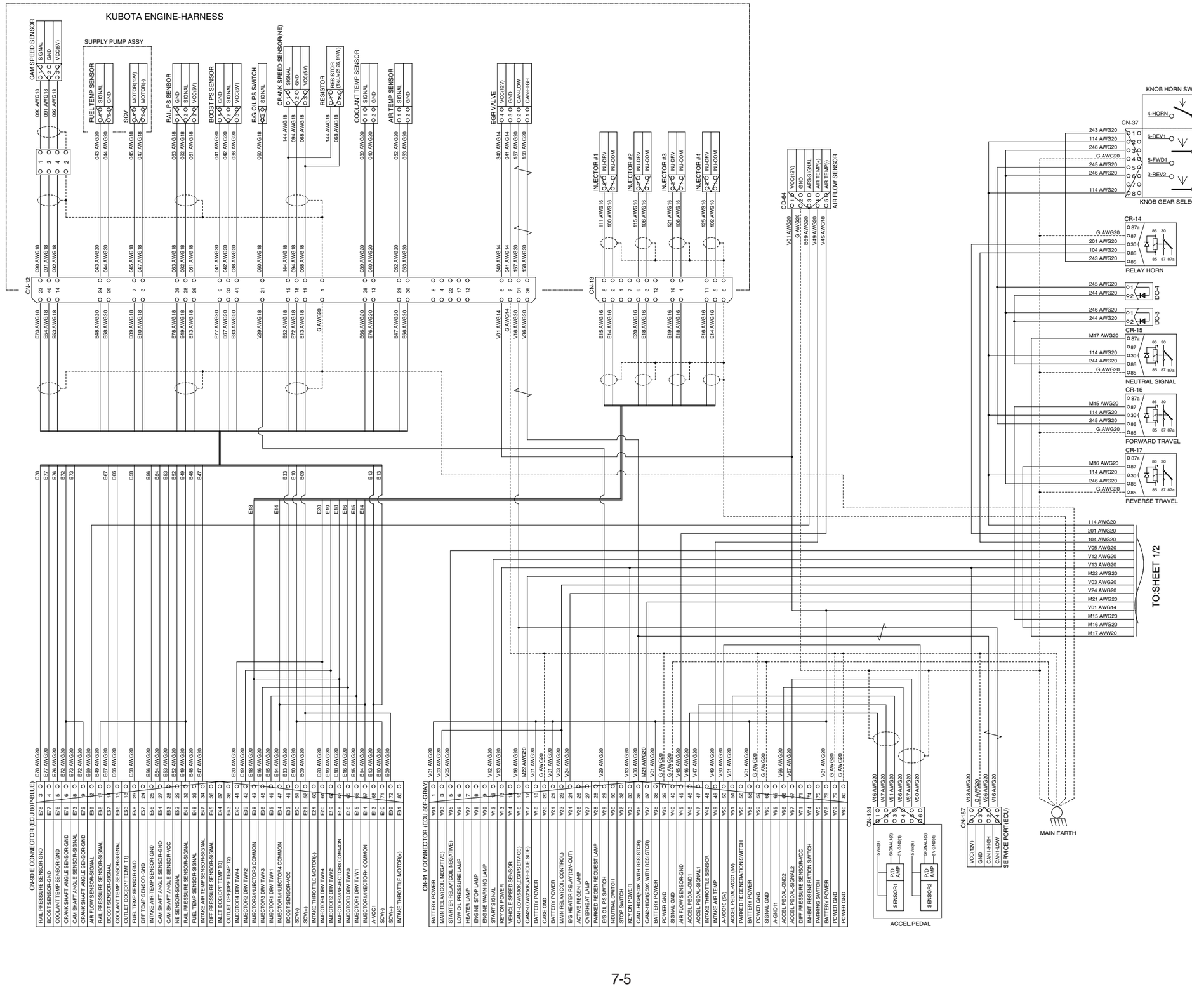
· ELECTRICAL CIRCUIT (STD, FRAME 2/2, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)



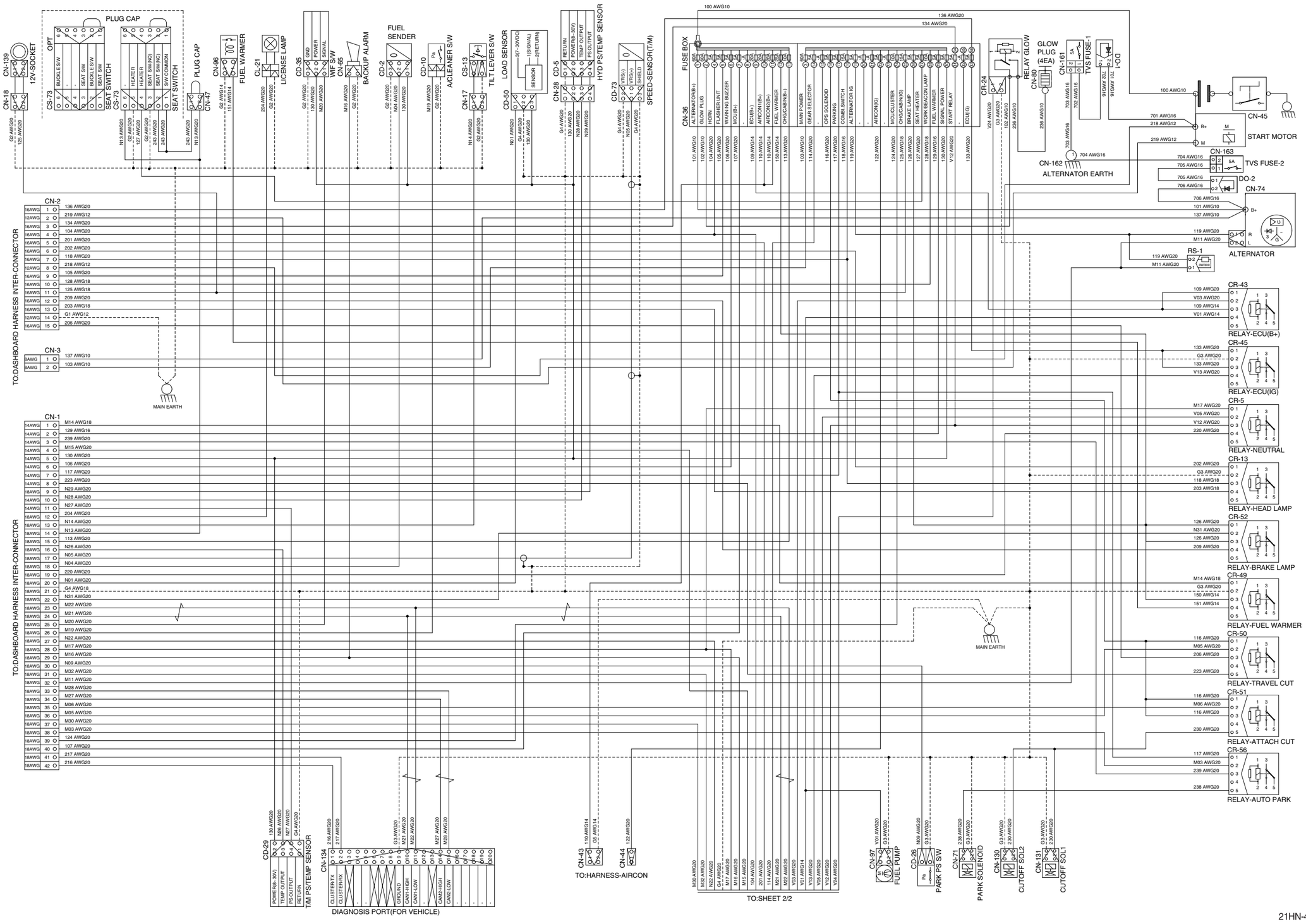
## · ELECTRICAL CIRCUIT (KNOB FNR, FRAME 1/2, 22D-9 : -#0056, 25D-9 : -#0770, 30D-9 : -#1524, 33D-9 : -#0396, 35DA-9 : -#0022)



## · ELECTRICAL CIRCUIT (KNOB FNR, FRAME 2/2, 22D-9 : -#0056, 25D-9 : -#0770, 30D-9 : -#1524, 33D-9 : -#0396, 35DA-9 : -#0022)



## · ELECTRICAL CIRCUIT (KNOB FNR, FRAME 1/2, 22D-9 : #0057-0066, 25D-9 : #0771-0907, 30D-9 : #1525-1870, 33D-9 : #0397-0488, 35DA-9 : #0023-0062)

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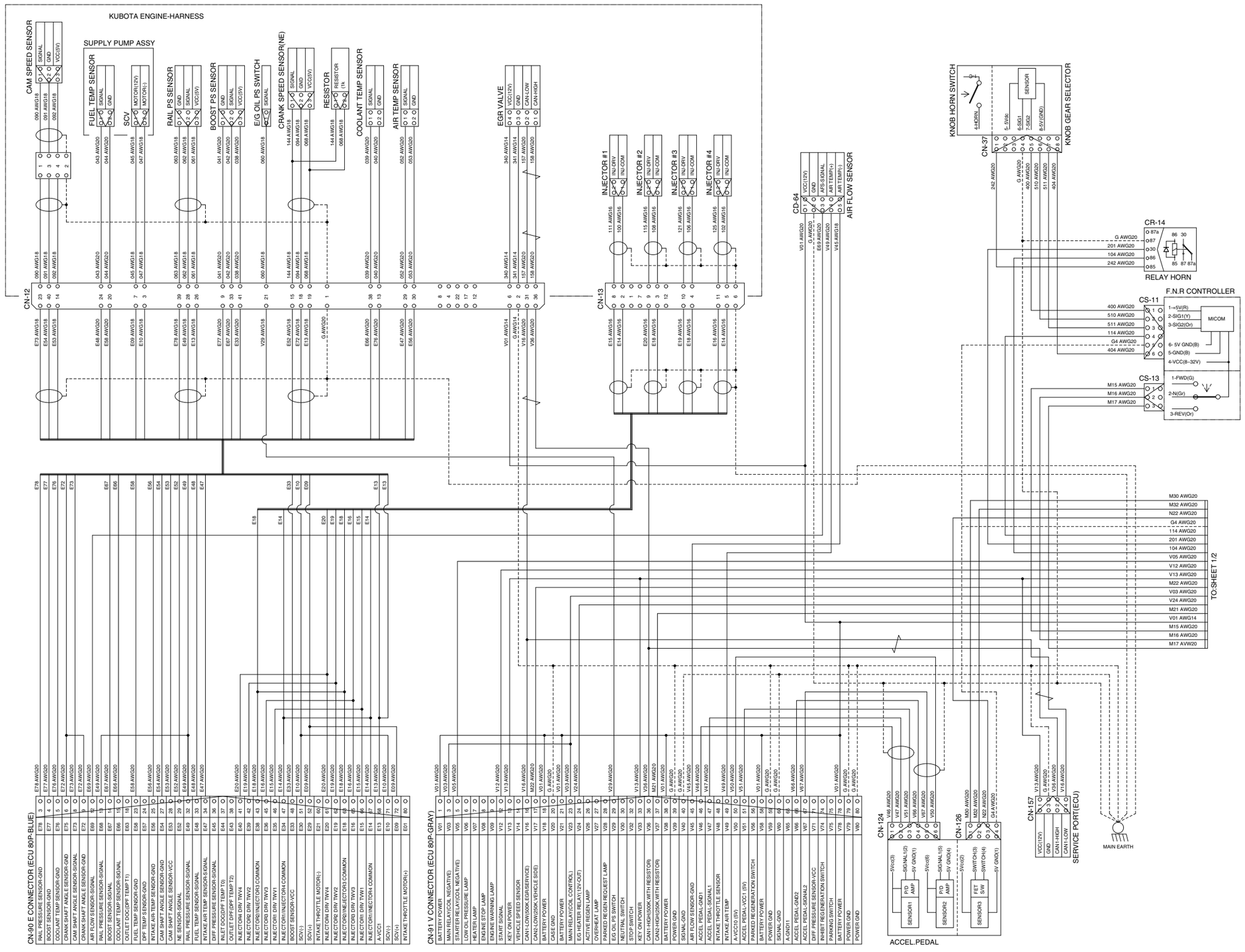
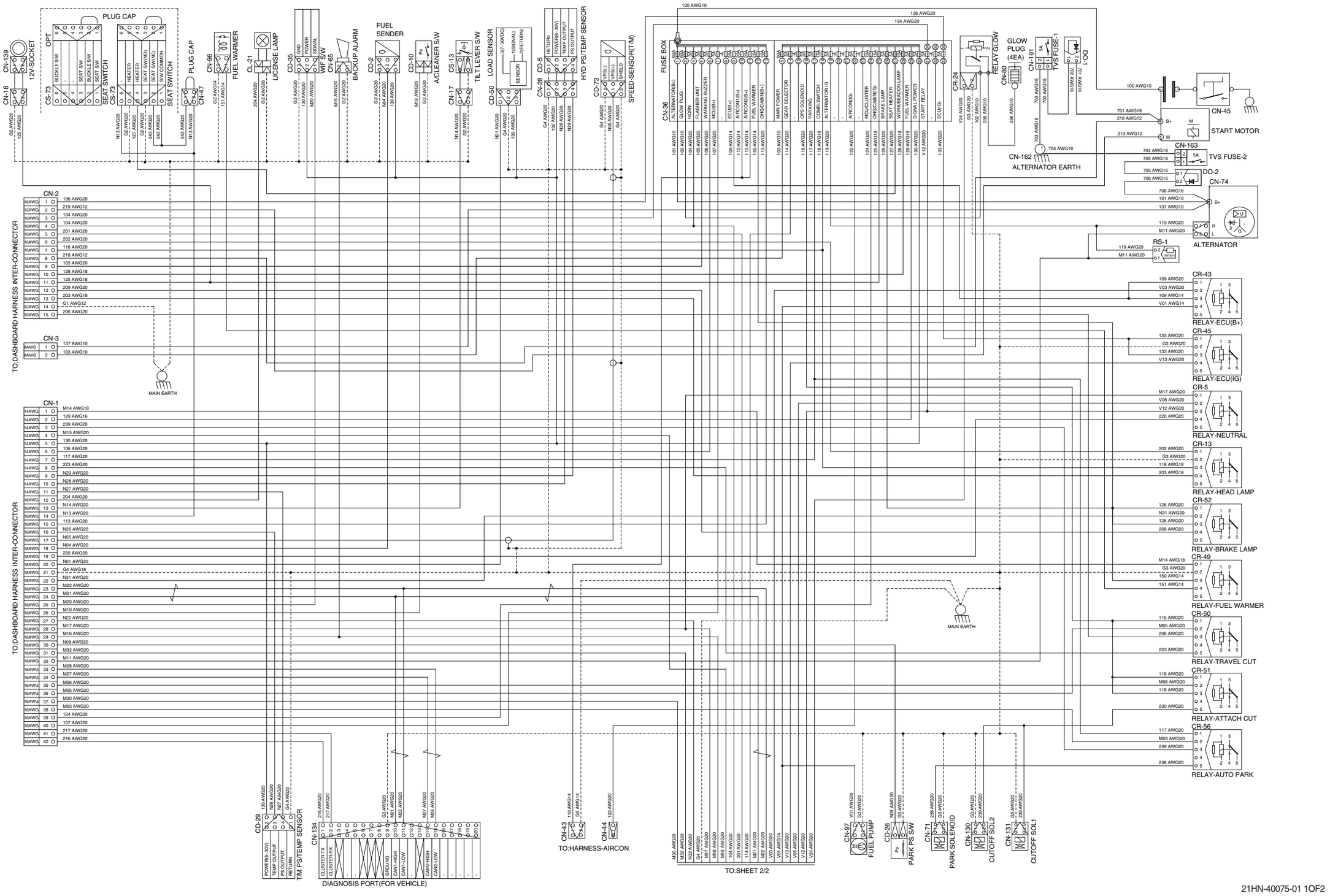
· ELECTRICAL CIRCUIT (KNOB FNR, FRAME 2/2, 22D-9 : #0057-0066, 25D-9 : #0771-0907, 30D-9 : #1525-1870, 33D-9 : #0397-0488, 35DA-9 : #0023-0062)



## · ELECTRICAL CIRCUIT (KNOB FNR, FRAME 1/2, 22D-9 : #0067-, 25D-9 : #0908-#1521, 30D-9 : #1871-#3921, 33D-9 : #0489-#0868, 35DA-9 : #0063-#0485)

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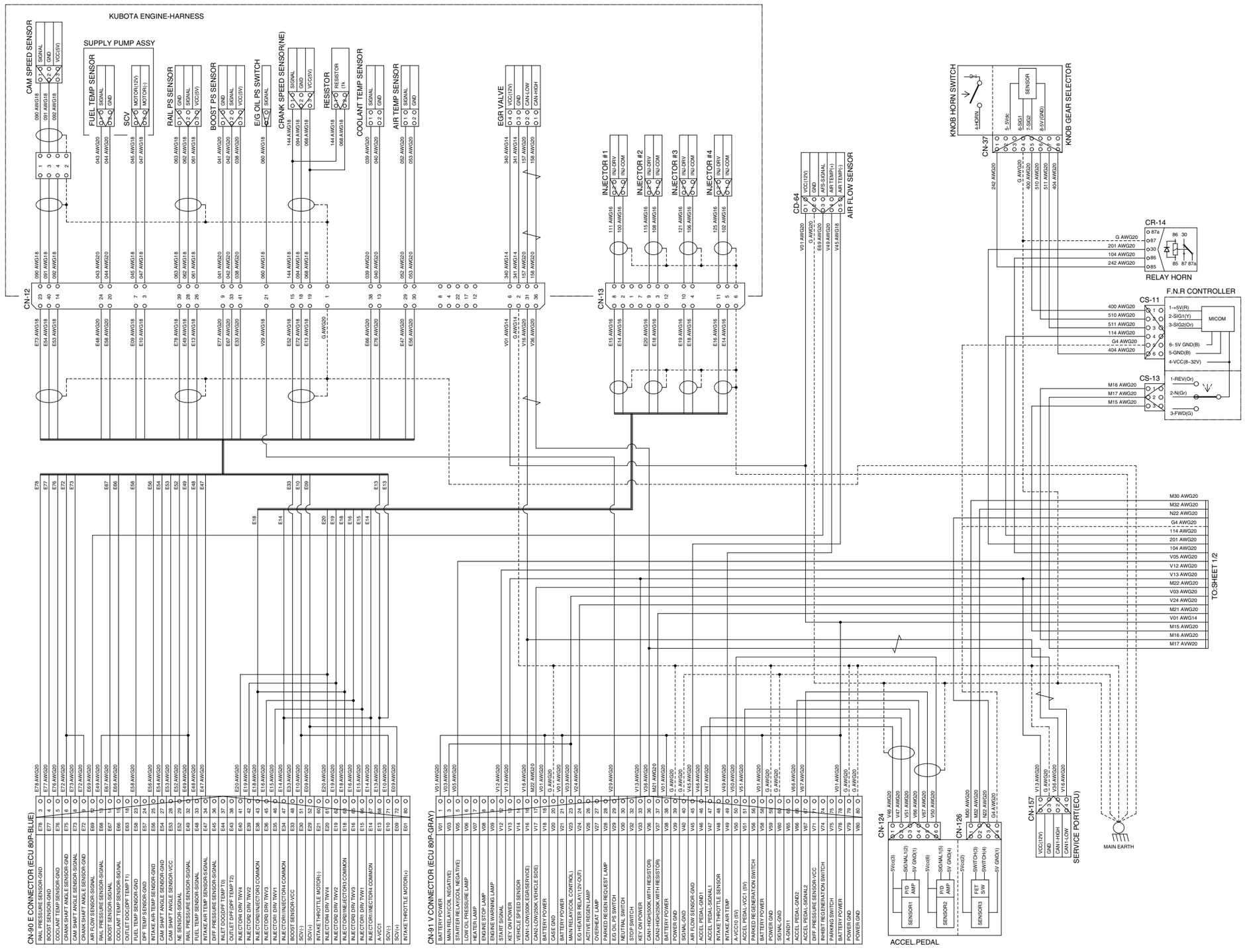
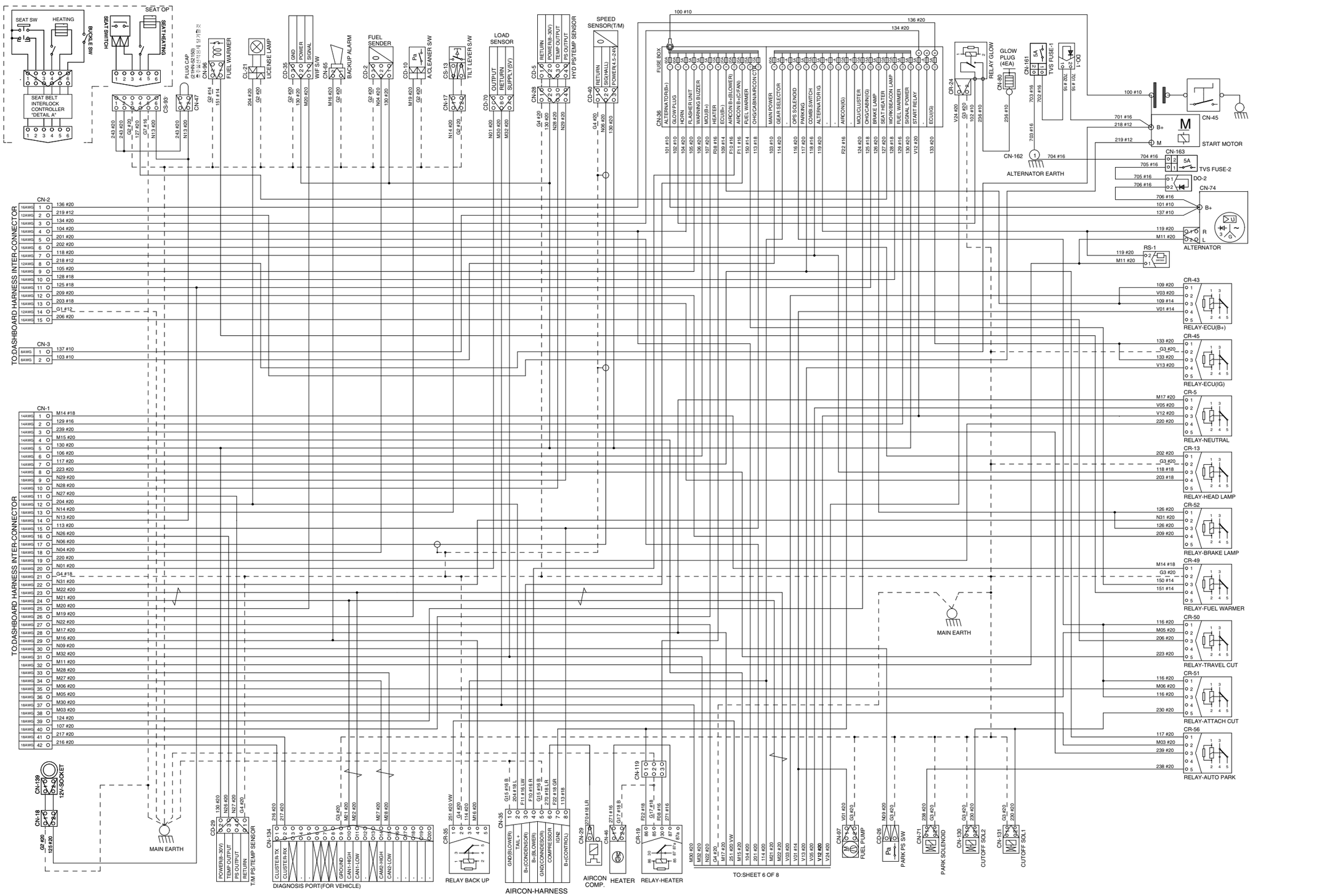
## · ELECTRICAL CIRCUIT (KNOB FNR, FRAME 2/2, 22D-9 : #0067-, 25D-9 : #0908-#1521, 30D-9 : #1871-#3921, 33D-9 : #0489-#0868, 35DA-9 : #0063-#0485)



## · ELECTRICAL CIRCUIT (KNOB FNR, FRAME 1/2, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)

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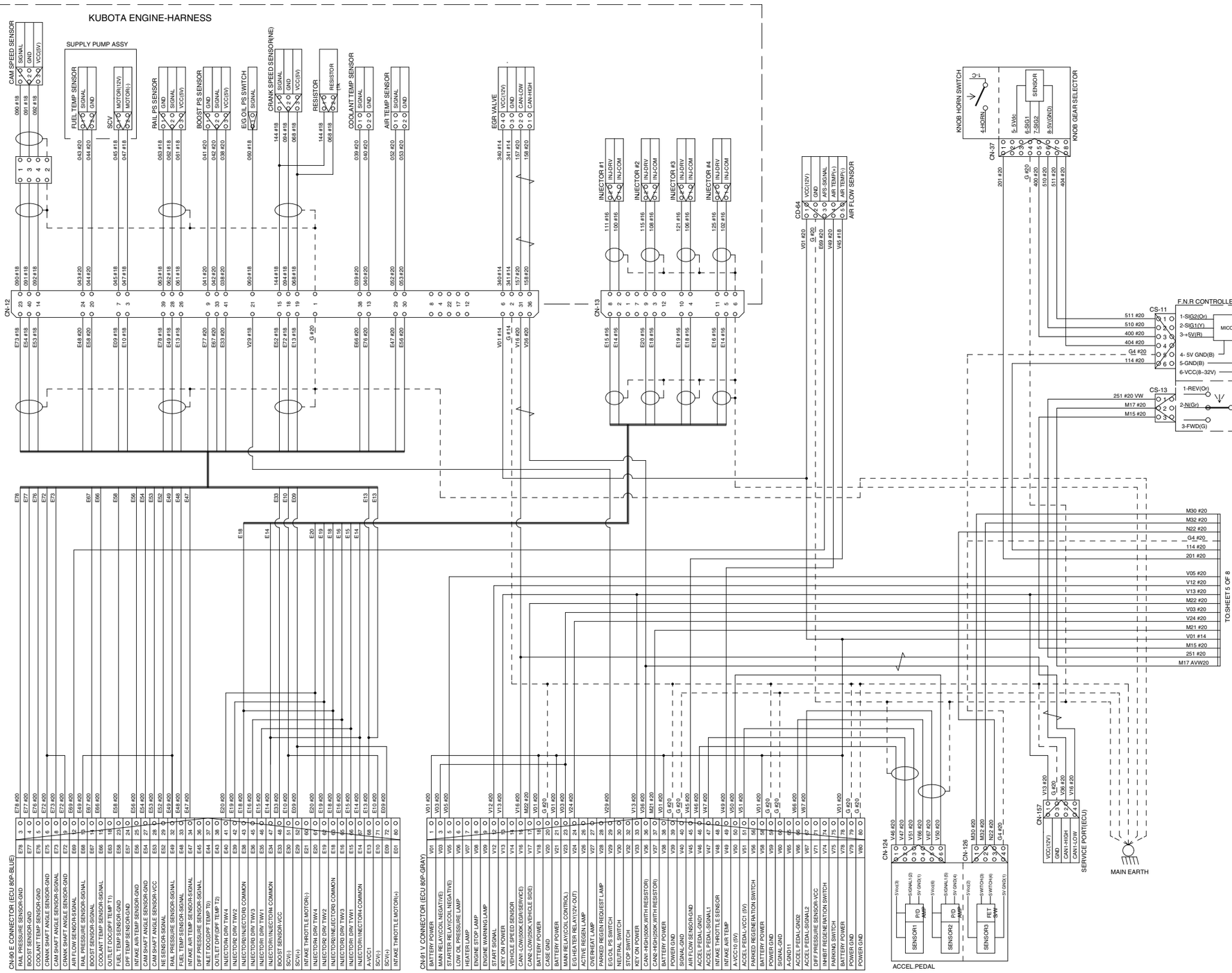
## · ELECTRICAL CIRCUIT (KNOB FNR, FRAME 2/2, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)



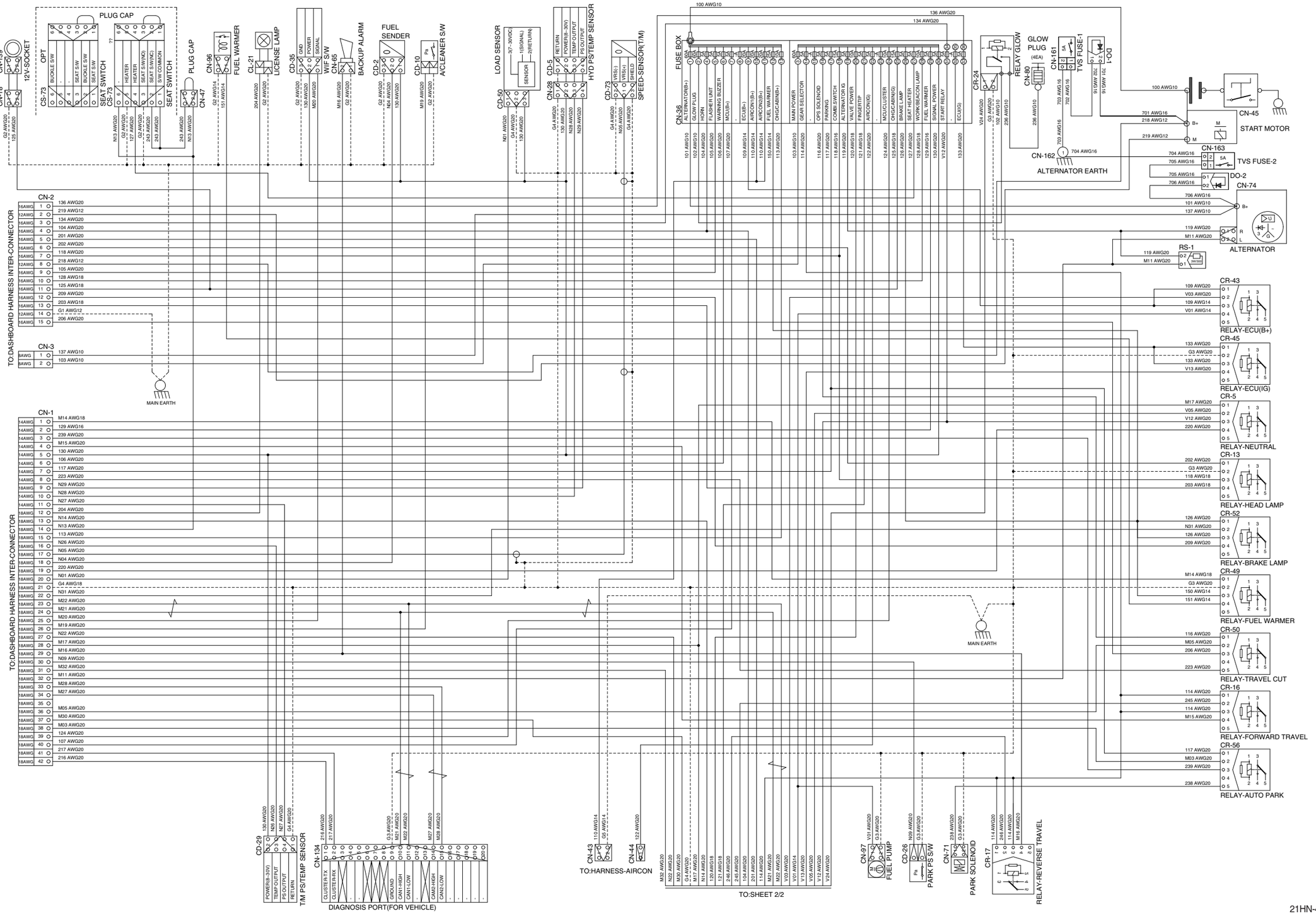

CN-90 E CONNECTOR (ECU 80P-BLUE)

| | | |
|---|---|---|
| RAIL PRESSURE SENSOR-GND | E78 | 3 |
| BOOST SENSOR-GND | E77 | 4 |
| COOLANT TEMP SENSOR-GND | E76 | 5 |
| CRANK SHAFT ANGLE SENSOR-GND | E75 | 6 |
| CAM SHAFT ANGLE SENSOR-SIGNAL | E73 | 9 |
| CRANK SHAFT ANGLE SENSOR-GND | E72 | 10 |
| AIR FLOW SENSOR-SIGNAL | E68 | 12 |
| RAIL PRESSURE SENSOR-SIGNAL | E68 | 13 |
| BOOST SENSOR-SIGNAL | E67 | 14 |
| COOLANT TEMP SENSOR-SIGNAL | E66 | 14 |
| OUTLET DOC(DPF TEMP T1) | E63 | 18 |
| FUEL TEMP SENSOR-GND | E58 | 23 |
| DPF TEMP SENSOR-GND | E57 | 24 |
| INTAKE AIR-TEMP SENSOR-GND | E56 | 25 |
| CAM SHAFT ANGLE SENSOR-GND | E54 | 27 |
| CAM SHAFT ANGLE SENSOR-VCC | E53 | 28 |
| NE SENSOR-SIGNAL | E52 | 29 |
| RAIL TEMP SENSOR-SIGNAL | E49 | 32 |
| FUEL TEMP SENSOR-SIGNAL | E48 | 33 |
| INTAKE AIR TEMP SENSOR-SIGNAL | E47 | 34 |
| DPF PRESSURE SENSOR-SIGNAL | E45 | 36 |
| INLET DOC(DPF TEMP T0) | E44 | 37 |
| OUTLET DPF(DPF TEMP T2) | E43 | 38 |
| INJECTOR4 DRV TWV4 | E40 | 41 |
| INJECTOR2 DRV TWV2 | E39 | 42 |
| INJECTOR3/INJECTOR5 COMMON | E38 | 43 |
| INJECTOR3 DRV TWV3 | E36 | 45 |
| INJECTOR1 DRV TWV1 | E35 | 46 |
| INJECTOR1/INJECTOR4 COMMON | E34 | 47 |
| BOOST SENSOR-VCC | E33 | 48 |
| SCV(+) | E29 | 51 |
| INTAKE THROTTLE MOTOR(-) | E21 | 60 |
| INJECTOR4 DRV TWV4 | E20 | 61 |
| INJECTOR2 DRV TWV2 | E19 | 62 |
| INJECTOR2/INJECTOR5 COMMON | E18 | 63 |
| INJECTOR3 DRV TWV3 | E16 | 65 |
| INJECTOR1 DRV TWV1 | E15 | 66 |
| INJECTOR1/INJECTOR4 COMMON | E14 | 67 |
| A-VCC1 | E13 | 68 |
| SCV(-) | E10 | 71 |
| INTAKE THROTTLE MOTOR(+) | E09 | 72 |
| | E01 | 80 |

CN-91 V CONNECTOR (ECU 80P-GRAY)

| | | |
|---|---|---|
| BATTERY POWER | V01 | 1 |
| MAIN RELAY(COIL NEGATIVE) | V03 | 3 |
| STARTER RELAY(COIL NEGATIVE) | V05 | 5 |
| LOW OIL PRESSURE LAMP | V06 | 6 |
| HEATER LAMP | V07 | 7 |
| ENGINE STOP LAMP | V08 | 8 |
| ENGINE WARNING LAMP | V09 | 9 |
| START SIGNAL | V12 | 12 |
| KEY ON POWER | V13 | 13 |
| CAN1-HIGH(500K EGR/SERVICE) | V16 | 16 |
| CAN1-LOW(500K EGR/SERVICE) | V17 | 17 |
| BATTERY POWER | V18 | 18 |
| CASE GND | V20 | 20 |
| BATTERY POWER | V21 | 21 |
| MAIN RELAY(COIL CONTROL) | V23 | 23 |
| E/G HEATER RELAY(12V-OUT) | V24 | 24 |
| ACTIVE REGEN LAMP | V26 | 26 |
| OVERHEAT LAMP | V27 | 27 |
| PARKED REGEN REQUEST LAMP | V28 | 28 |
| EGR OIL PS SWITCH | V29 | 29 |
| MODE SELECTION | V30 | 30 |
| STOP SWITCH | V32 | 32 |
| KEY ON POWER | V33 | 33 |
| CAN2-HIGH(500K WITH RESISTOR) | V36 | 36 |
| CAN2-HIGH(500K WITH RESISTOR) | V37 | 37 |
| BATTERY POWER | V38 | 38 |
| POWER GND | V39 | 39 |
| SIGNAL-GND | V40 | 40 |
| AIR FLOW SENSOR-GND | V45 | 45 |
| ACCEL PEDAL-GND1 | V46 | 46 |
| ACCEL PEDAL-SIGNAL1 | V47 | 47 |
| INTAKE THROTTLE SENSOR | V48 | 48 |
| INTAKE AIR1 TEMP | V49 | 49 |
| A-VCC1 (5V) | V50 | 50 |
| ACCEL PEDAL-VCC1 (5V) | V51 | 51 |
| PARKED REGENERATION SWITCH | V56 | 56 |
| BATTERY POWER | V57 | 57 |
| POWER GND | V59 | 59 |
| SIGNAL-GND | V60 | 60 |
| A-GND11 | V65 | 65 |
| ACCEL PEDAL-GND2 | V66 | 66 |
| ACCEL PEDAL-SIGNAL2 | V67 | 67 |
| DPF PRESSURE SENSOR-VCC | V71 | 71 |
| INHIBIT REGENERATION SWITCH | V74 | 74 |
| PARKING SWITCH | V75 | 75 |
| POWER SUPPLY | V78 | 78 |
| POWER GND | V79 | 79 |
| POWER GND | V80 | 80 |

## · ELECTRICAL CIRCUIT (FINGERTIP, FRAME 1/2, 22D-9 : #0067-, 25D-9 : #0908-#1521, 30D-9 : #1871-#3921, 33D-9 : #0489-#0868, 35DA-9 : #0063-#0485)

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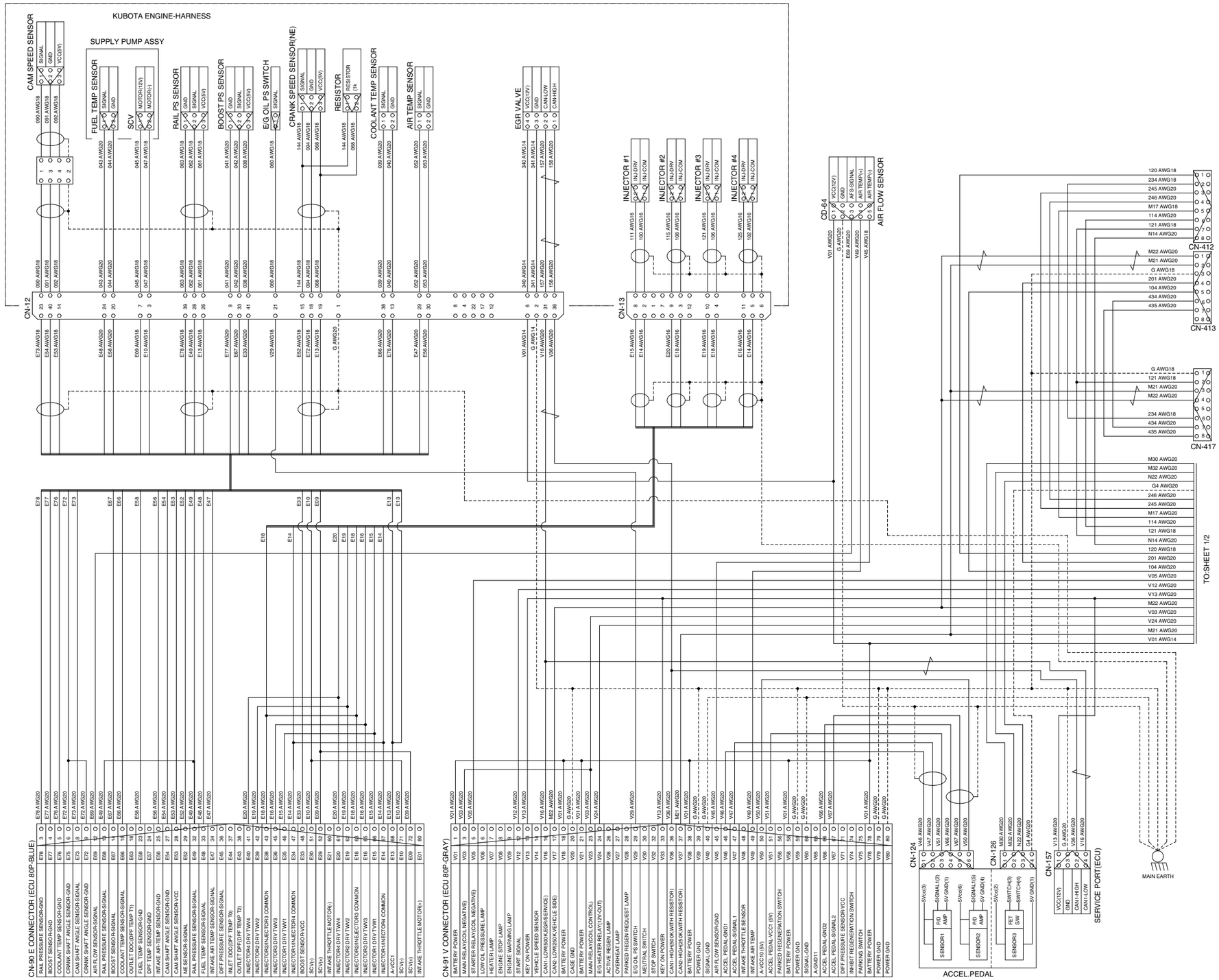
· ELECTRICAL CIRCUIT (FINGERTIP, FRAME 2/2, 22D-9 : #0067-, 25D-9 : #0908-#1521, 30D-9 : #1871-#3921, 33D-9 : #0489-#0868, 35DA-9 : #0063-#0485)

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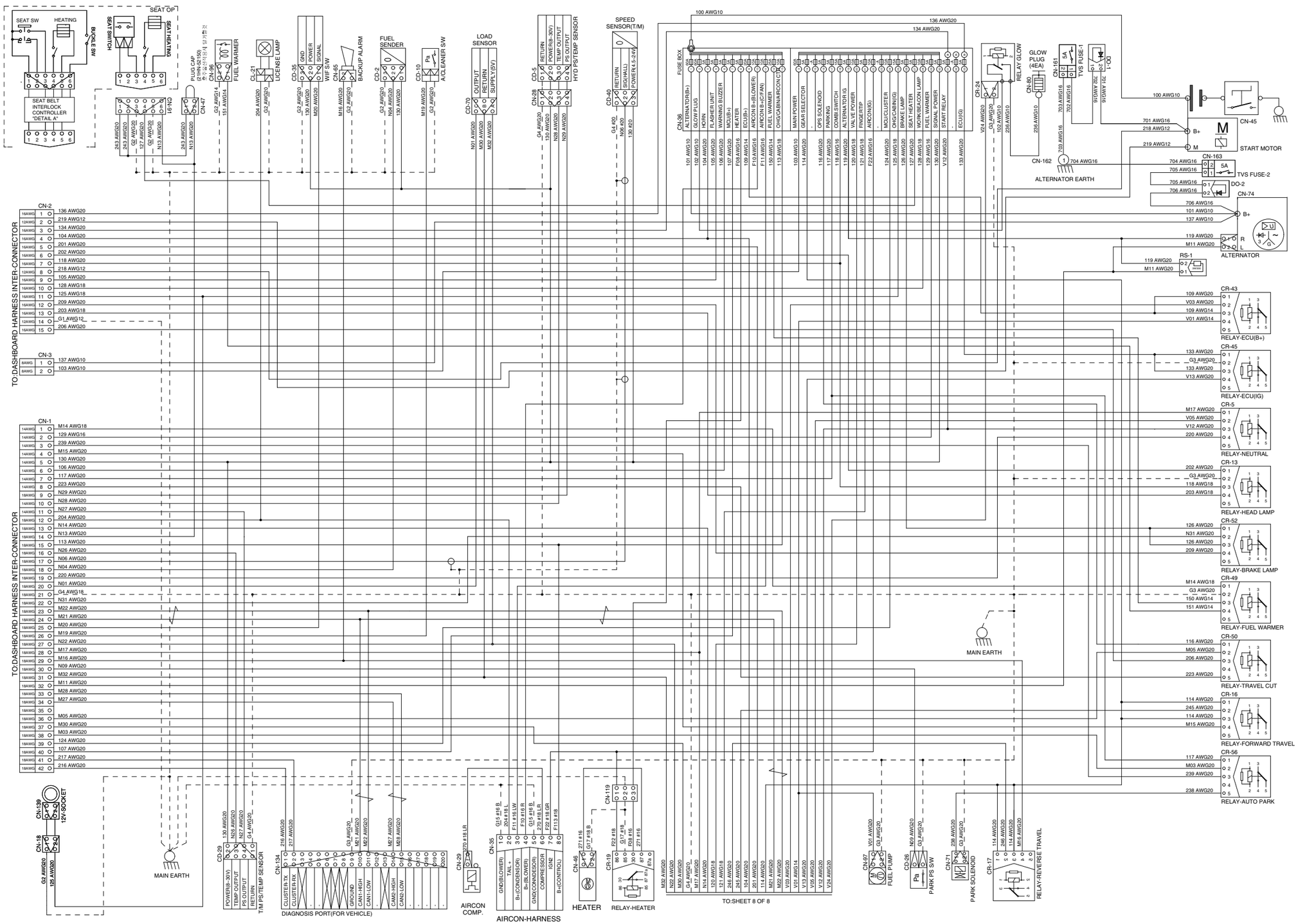
## · ELECTRICAL CIRCUIT (FINGERTIP, FRAME 1/2, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)

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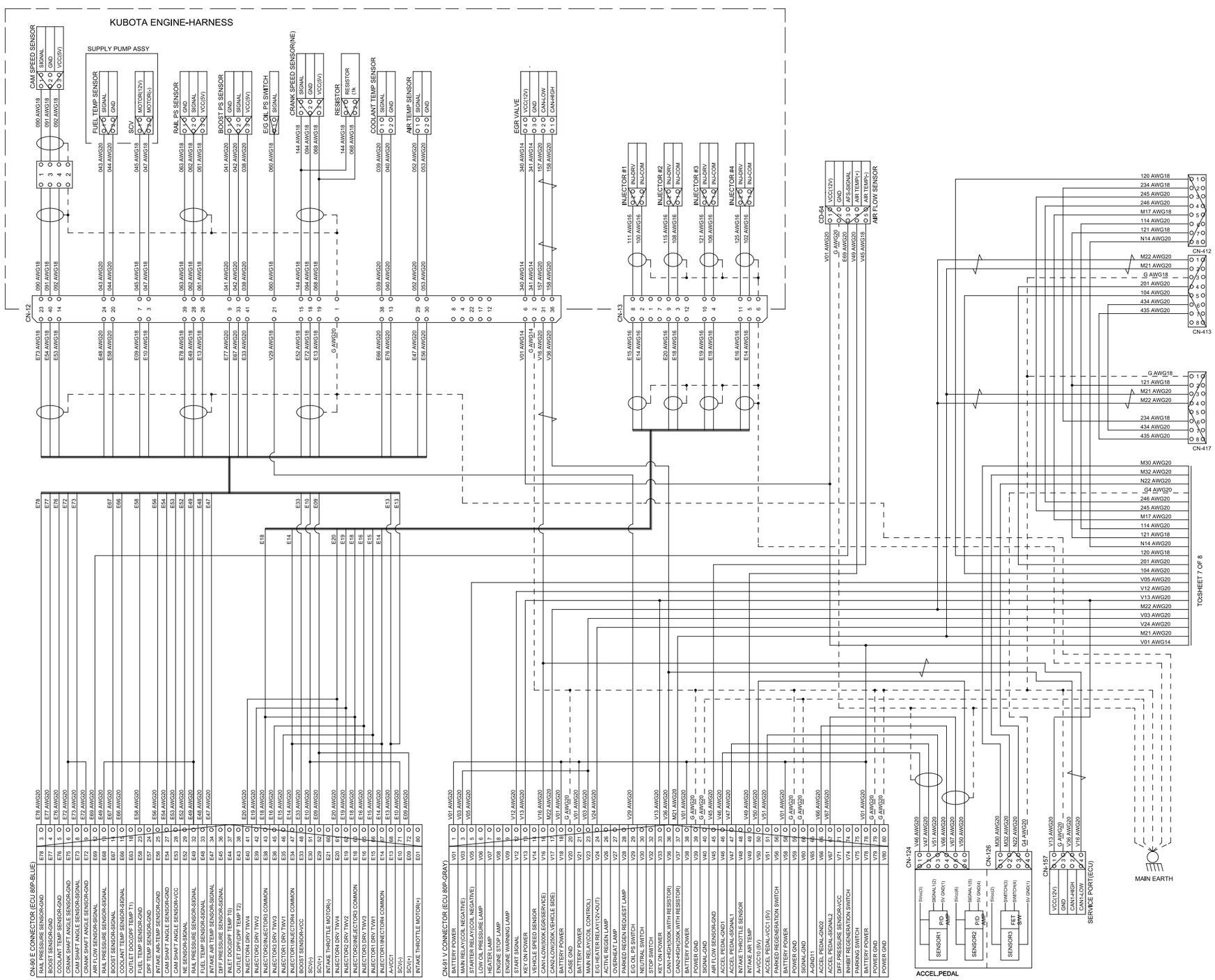
## · ELECTRICAL CIRCUIT (FINGERTIP, FRAME 2/2, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)



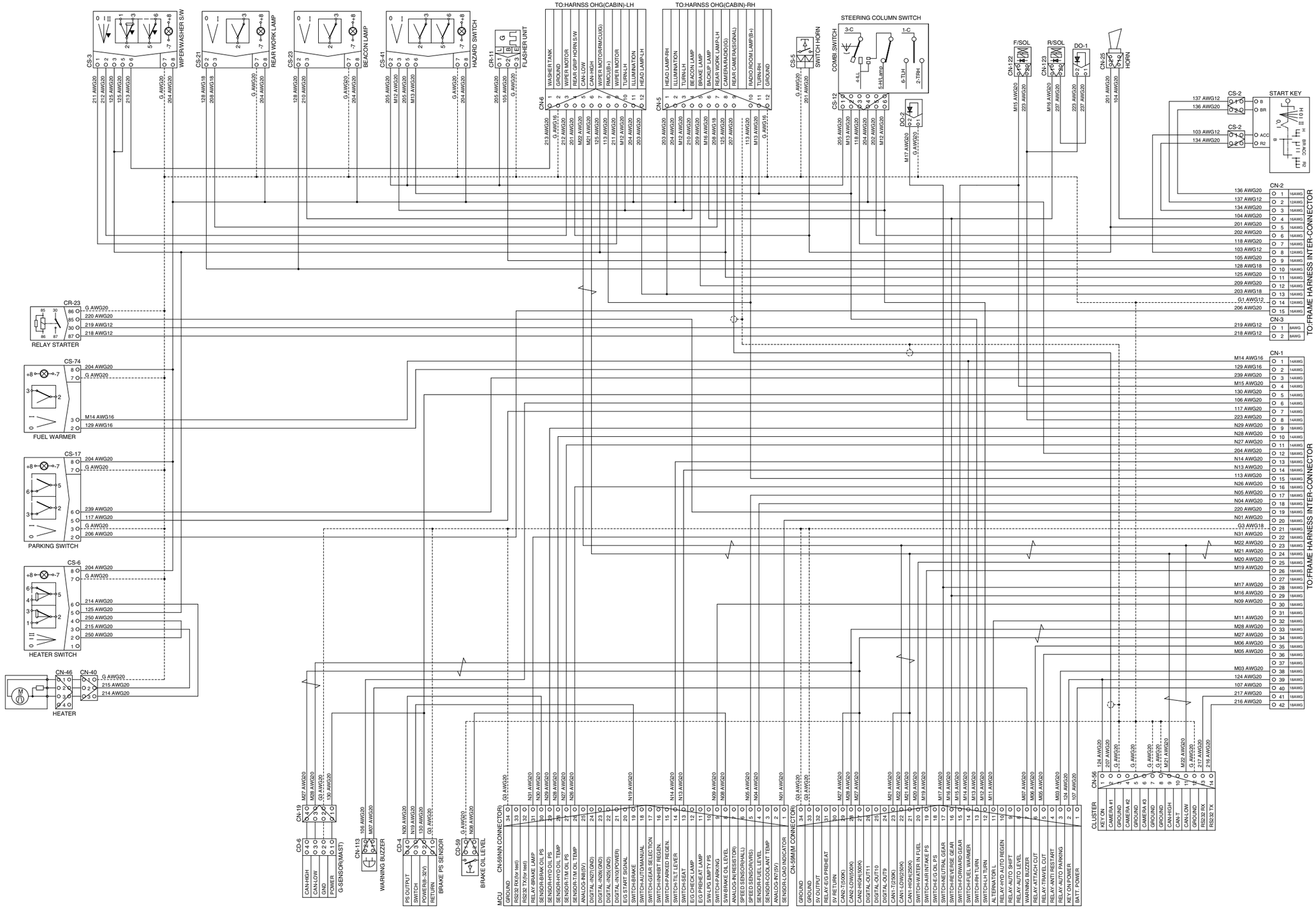

CN-90 E CONNECTOR (ECU 80P-BLUE)

| | | | |
|---|---|---|---|
| RAIL PRESSURE SENSOR-GND | E78 | 3 | E78 AWG20 |
| BOOST SENSOR-GND | E77 | 4 | E77 AWG20 |
| COOLANT TEMP SENSOR-GND | E76 | 5 | E76 AWG20 |
| CRANK SHAFT ANGLE SENSOR-GND | E75 | 6 | E72 AWG20 |
| CAM SHAFT ANGLE SENSOR-SIGNAL | E73 | 8 | E73 AWG20 |
| CRANK SHAFT ANGLE SENSOR-GND | E72 | 9 | E72 AWG20 |
| AIR FLOW SENSOR-SIGNAL | E69 | 12 | E69 AWG20 |
| RAIL PRESSURE SENSOR-SIGNAL | E68 | 10 | E67 AWG20 |
| BOOST SENSOR-SIGNAL | E67 | 11 | E67 AWG20 |
| COOLANT TEMP SENSOR-SIGNAL | E66 | 14 | E66 AWG20 |
| OUTLET DOC(DPF TEMP T1) | E63 | 18 | |
| DPF TEMP SENSOR-GND | E62 | 19 | E58 AWG20 |
| DPF TEMP SENSOR-SIGNAL | E57 | 24 | |
| INTAKE AIR-TEMP SENSOR-GND | E56 | 25 | E56 AWG20 |
| CAM SHAFT ANGLE SENSOR-GND | E54 | 27 | E54 AWG20 |
| CAM SHAFT ANGLE SENSOR-VCC | E53 | 28 | E53 AWG20 |
| NE SENSOR-SIGNAL | E52 | 29 | E52 AWG20 |
| RAIL PRESSURE SENSOR-SIGNAL | E49 | 32 | E48 AWG20 |
| FUEL TEMP SENSOR-SIGNAL | E48 | 33 | E48 AWG20 |
| INTAKE AIR TEMP SENSOR-SIGNAL | E47 | 34 | E47 AWG20 |
| DIFF.PRESSURE SENSOR-SIGNAL | E45 | 36 | |
| INLET DOC(DPF TEMP T2) | E44 | 37 | |
| OUTLET DPF(DPF TEMP T2) | E43 | 38 | |
| INJECTOR3 DRV TWV4 | E40 | 41 | E20 AWG20 |
| INJECTOR3 DRV TWV3 | E39 | 42 | E19 AWG20 |
| INJECTOR3/INJECTOR5 COMMON | E38 | 43 | E18 AWG20 |
| INJECTOR5 DRV TWV3 | E36 | 45 | E16 AWG20 |
| INJECTOR1 DRV TWV1 | E35 | 46 | E15 AWG20 |
| INJECTOR1/INJECTOR4 COMMON | E34 | 47 | E14 AWG20 |
| BOOST SENSOR+VCC | E33 | 48 | E33 AWG20 |
| SCV(+) | E30 | 51 | E10 AWG20 |
| SCV(+) | E29 | 52 | E09 AWG20 |
| INTAKE THROTTLE MOTOR(-) | E21 | 69 | E20 AWG20 |
| INJECTOR4 DRV TWV4 | E20 | 61 | E19 AWG20 |
| INJECTOR2 DRV TWV2 | E19 | 62 | E18 AWG20 |
| INJECTOR2/INJECTOR4 COMMON | E18 | 63 | E16 AWG20 |
| INJECTOR2 DRV TWV2 | E16 | 65 | E15 AWG20 |
| INJECTOR1 DRV TWV1 | E15 | 66 | E14 AWG20 |
| INJECTOR1/INJECTOR4 COMMON | E14 | 67 | E14 AWG20 |
| A+VCC1 | E13 | 68 | E13 AWG20 |
| SCV(-) | E10 | 71 | E10 AWG20 |
| SCV(+) | E09 | 72 | E09 AWG20 |
| INTAKE THROTTLE MOTOR(+) | E01 | 80 | |

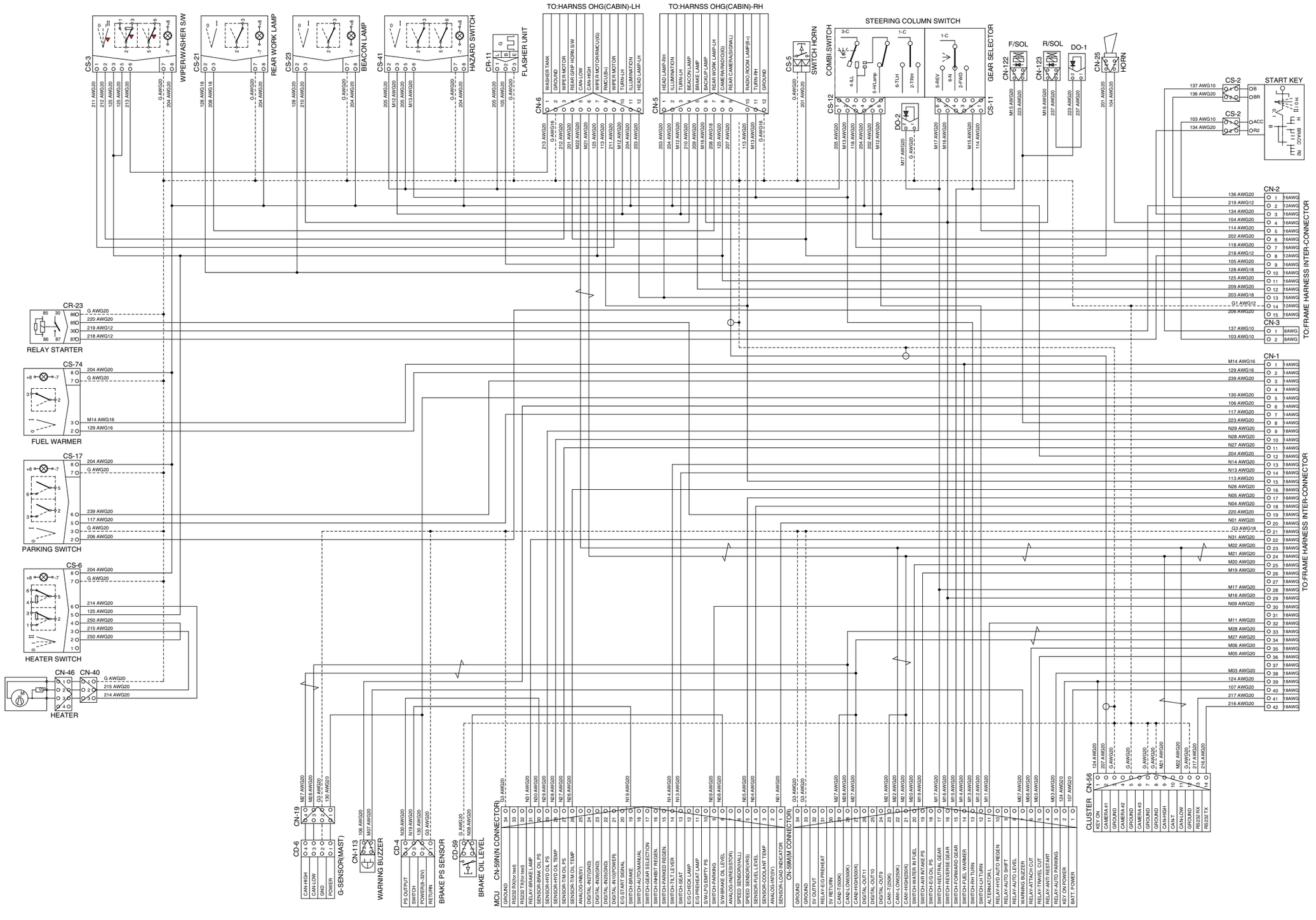
CN-91 V CONNECTOR (ECU 80P-GRAY)

| | | | |
|---|---|---|---|
| BATTERY POWER | V01 | 1 | V01 AWG20 |
| MAIN RELAY(IGN, NEGATIVE) | V03 | 3 | V03 AWG20 |
| STARTER RELAY(IGN, NEGATIVE) | V05 | 5 | V05 AWG20 |
| LOW OIL PRESSURE LAMP | V06 | 6 | |
| HEATER LAMP | V07 | 7 | |
| ENGINE STOP LAMP | V08 | 8 | |
| ENGINE WARNING LAMP | V09 | 9 | |
| START SIGNAL | V12 | 12 | V12 AWG20 |
| KEY ON POWER | V13 | 13 | V13 AWG20 |
| VEHICLE SPEED SENSOR | V14 | 14 | |
| CAN1-LOW(500K,EGR&SERVICE) | V16 | 16 | V16 AWG20 |
| CAN2-LOW(250K,VEHICLE SIDE) | V17 | 17 | M22 AWG20 |
| BATTERY POWER | V18 | 18 | V01 AWG20 |
| CASE GND | V20 | 20 | G AWG20 |
| BATTERY POWER | V21 | 21 | V01 AWG20 |
| MAIN RELAY(IGN, CONTROL) | V23 | 23 | V03 AWG20 |
| EG HEATER RELAY(12V-OUT) | V24 | 24 | V24 AWG20 |
| ACTIVE REGEN LAMP | V26 | 26 | |
| OVERHEAT LAMP | V27 | 27 | |
| PARKED REGEN REQUEST LAMP | V28 | 28 | V28 AWG20 |
| E/G OIL PS SWITCH | V29 | 29 | V29 AWG20 |
| NEUTRAL SWITCH | V30 | 30 | |
| STOP SWITCH | V32 | 32 | V13 AWG20 |
| KEY ON POWER | V33 | 33 | V36 AWG20 |
| CAN1-HIGH(500K WITH RESISTOR) | V36 | 36 | M21 AWG20 |
| CAN2-HIGH(250K WITH RESISTOR) | V37 | 37 | V01 AWG20 |
| BATTERY POWER | V38 | 38 | G AWG20 |
| SIGNAL GND | V39 | 39 | G AWG20 |
| SIGNAL GND | V40 | 40 | G AWG20 |
| AIR FLOW SENSOR+GND | V45 | 45 | V45 AWG20 |
| ACCEL PEDAL-GND1 | V46 | 46 | V46 AWG20 |
| ACCEL PEDAL-SIGNAL1 | V47 | 47 | V47 AWG20 |
| INTAKE THROTTLE SENSOR | V48 | 48 | V48 AWG20 |
| INTAKE AIR-TEMP | V49 | 49 | V49 AWG20 |
| A-VCC10 (5V) | V50 | 50 | V50 AWG20 |
| ACCEL PEDAL-VCC1 (5V) | V51 | 51 | V51 AWG20 |
| PARKED REGENERATION SWITCH | V56 | 56 | V01 AWG20 |
| BATTERY POWER | V58 | 58 | G AWG20 |
| POWER GND | V59 | 59 | G AWG20 |
| SIGNAL GND | V60 | 60 | |
| A-VCC2 | V65 | 65 | V65 AWG20 |
| ACCEL PEDAL-GND2 | V66 | 66 | V66 AWG20 |
| ACCEL PEDAL-SIGNAL2 | V67 | 67 | V67 AWG20 |
| DIFF.PRESSURE SENSOR-VCC | V71 | 71 | |
| INHIBIT REGENERATION SWITCH | V74 | 74 | |
| PARKING SWITCH | V75 | 75 | |
| BATTERY POWER | V78 | 78 | V01 AWG20 |
| POWER GND | V79 | 79 | G AWG20 |
| POWER GND | V80 | 80 | G AWG20 |

## · ELECTRICAL CIRCUIT (STD, DASHBOARD, 22D-9 : -#0022, 25D-9 : -#0328, 30D-9 : -#0550, 33D-9 : -#0171)

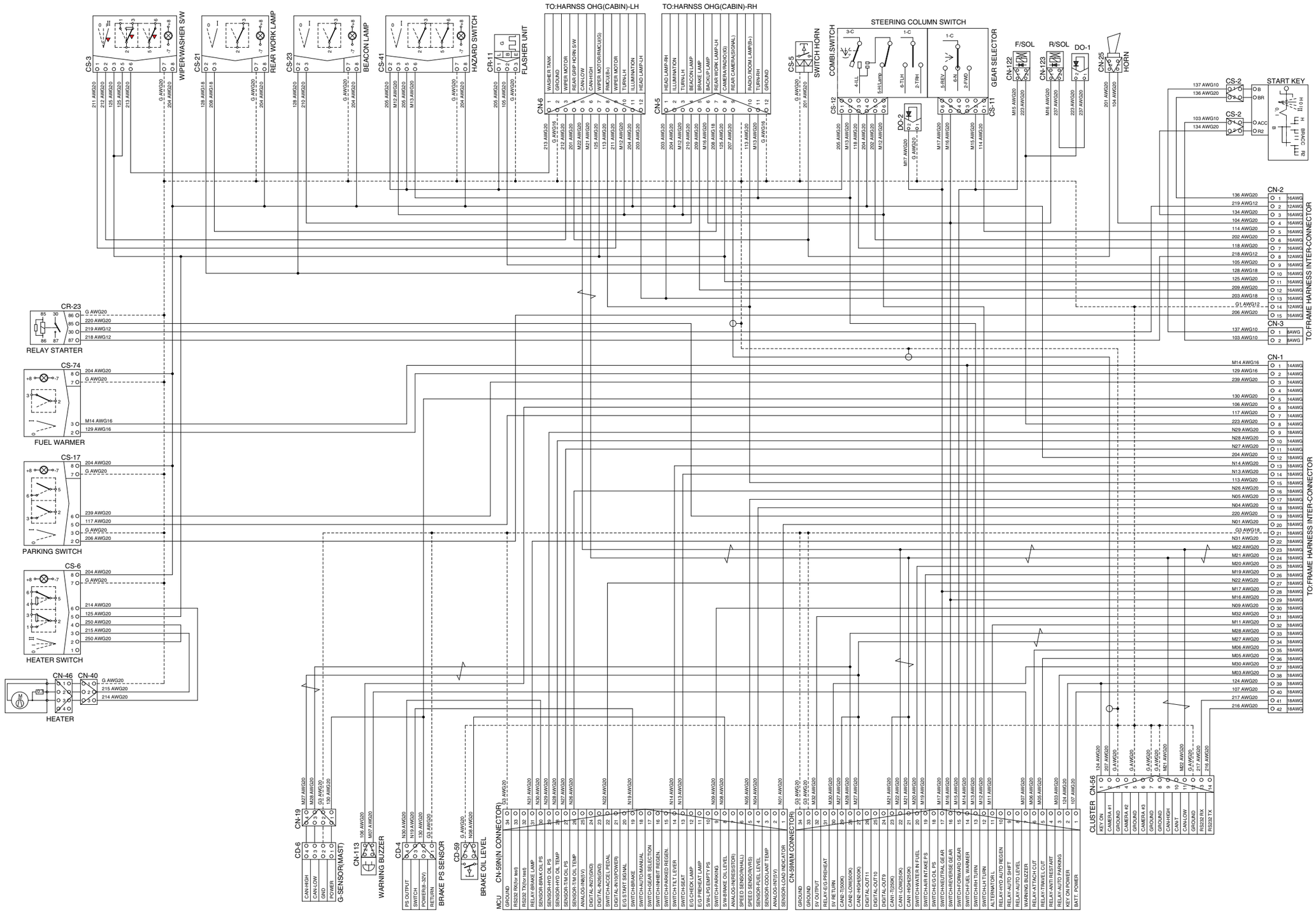


## · ELECTRICAL CIRCUIT (STD, DASHBOARD, 22D-9 : #0023-#0026, 25D-9 : #0329-#0383, 30D-9 : #0551-#0724, 33D-9 : #0172-#0213, 35DA-9 : -#0001)

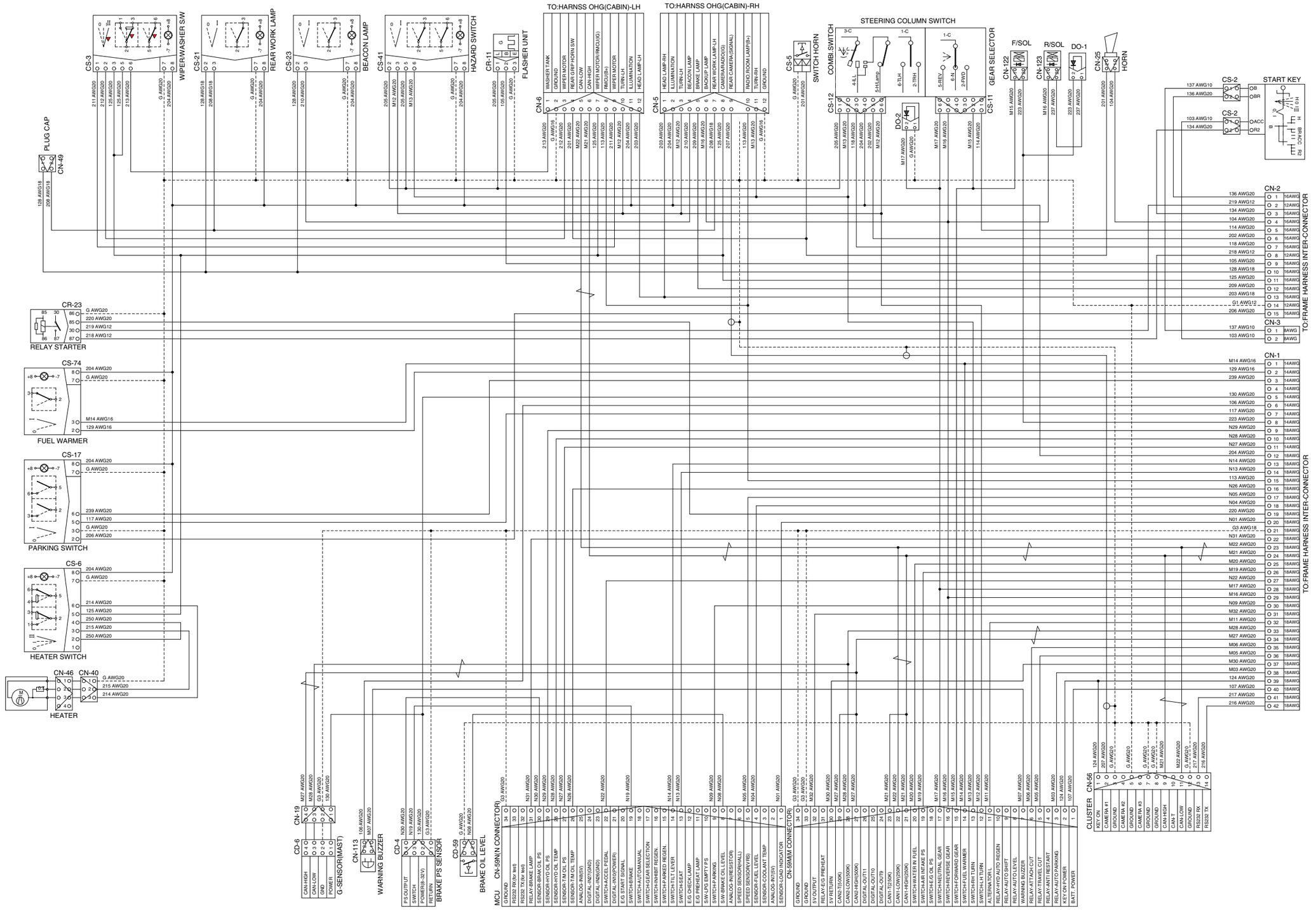



21HN-40014

## · ELECTRICAL CIRCUIT (STD, DASHBOARD, 22D-9 : #0027-#0034, 25D-9 : #0384-#0590, 30D-9 : #0725-#1021, 33D-9 : #0214-#0299, 35DA-9 : #0002-0008)

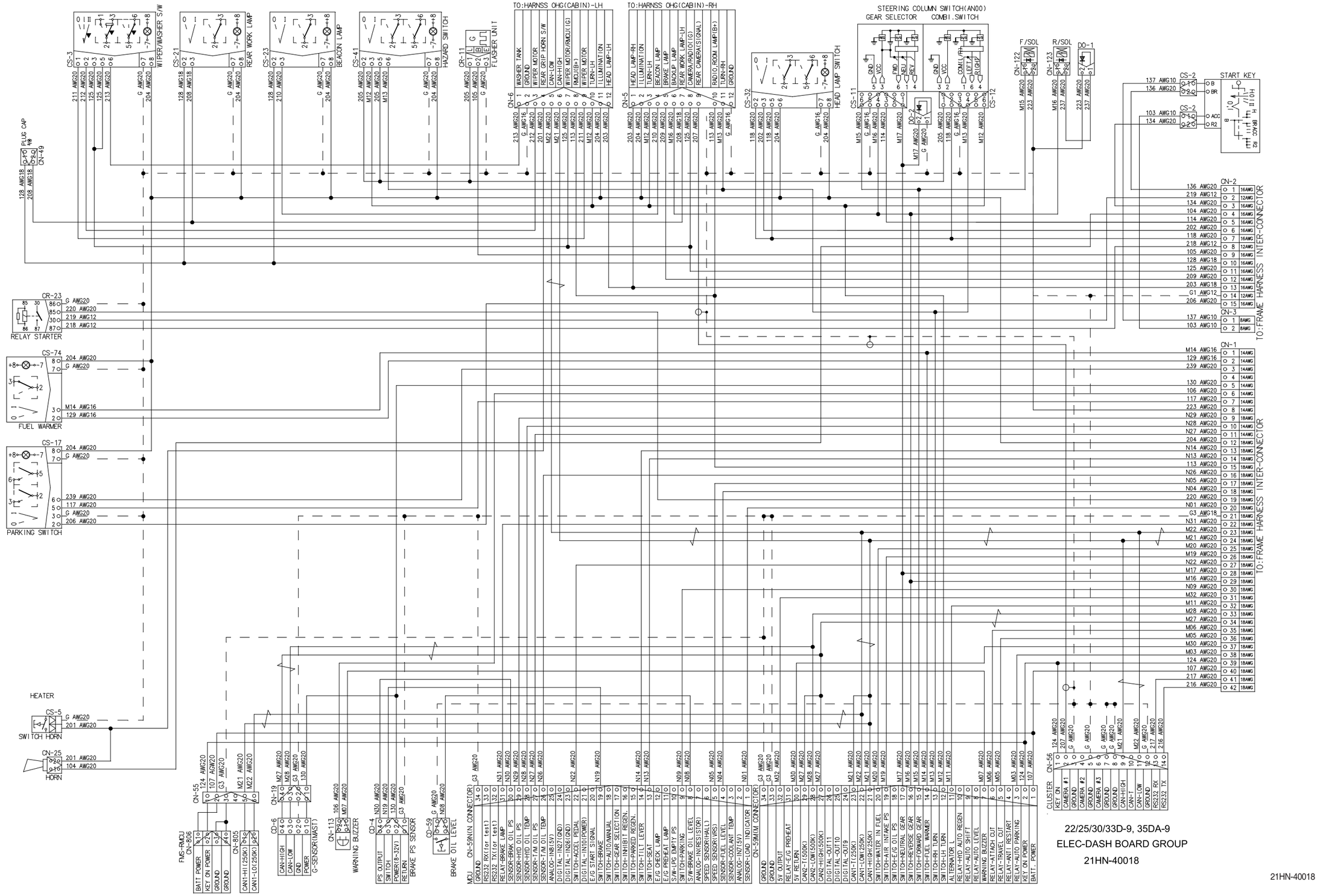


## · ELECTRICAL CIRCUIT (STD, DASHBOARD, 22D-9 : #0035-, 25D-9 : #0591-#1319, 30D-9 : #1022-#3292, 33D-9 : #0300-#0739, 35DA-9 : #0009-#0341)



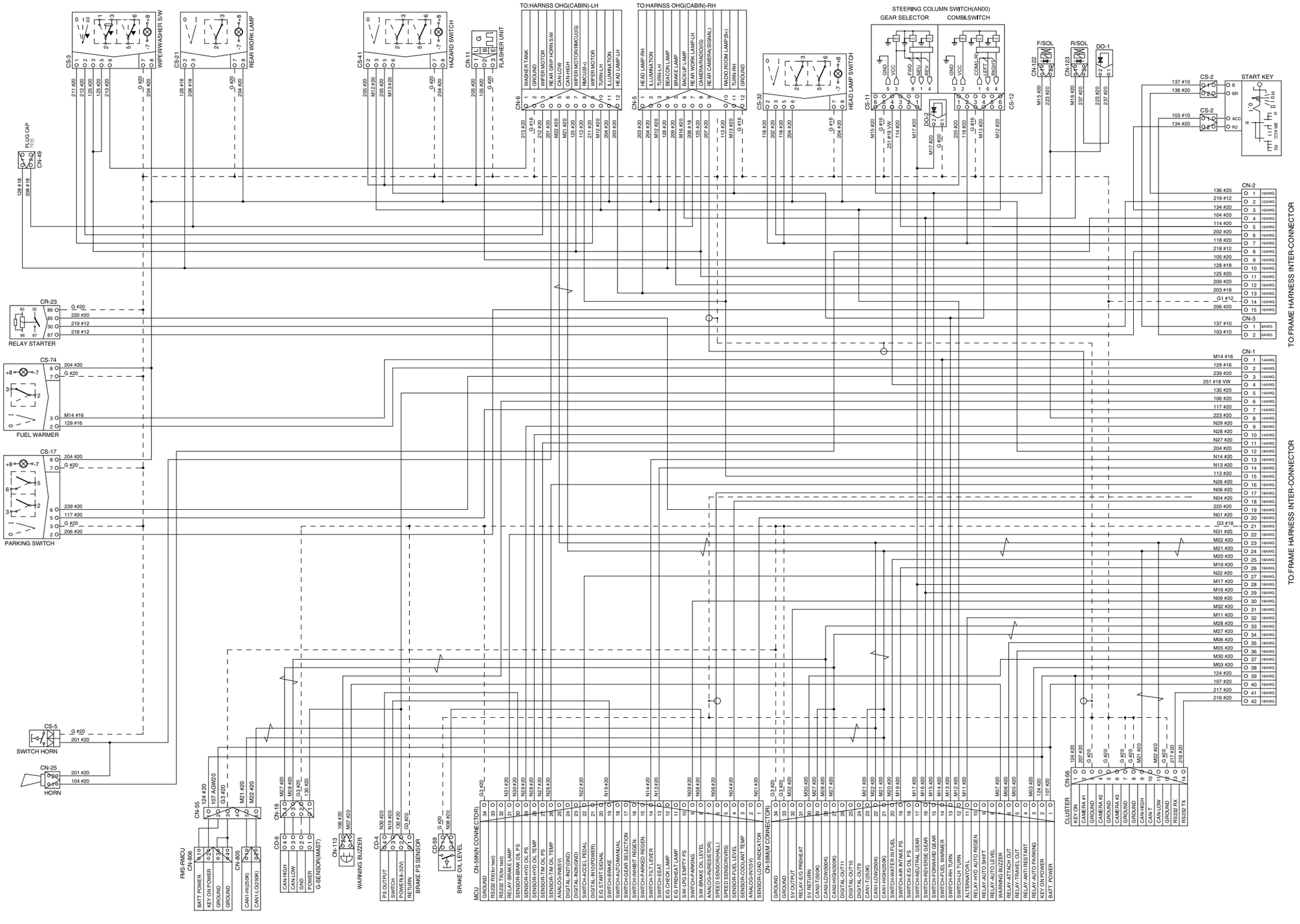

21HN-40016

## · ELECTRICAL CIRCUIT (STD, DASHBOARD, 25D-9 : #1320-#1521, 30D-9 : #3293-#3921, 33D-9 : #0740-#0868, 35DA-9 : #0342-#0485)



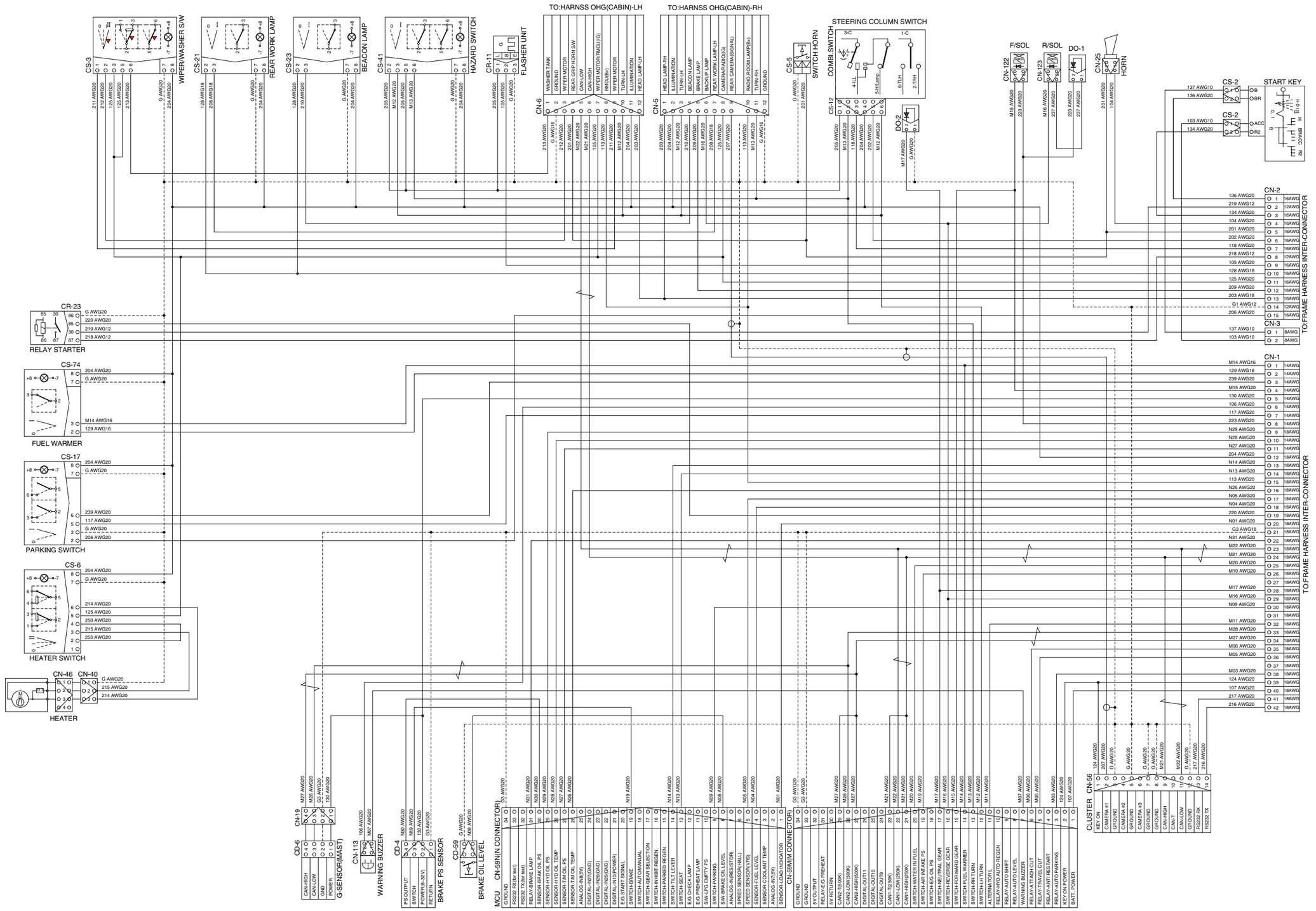

21HN-40018

## · ELECTRICAL CIRCUIT (STD, DASHBOARD, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)



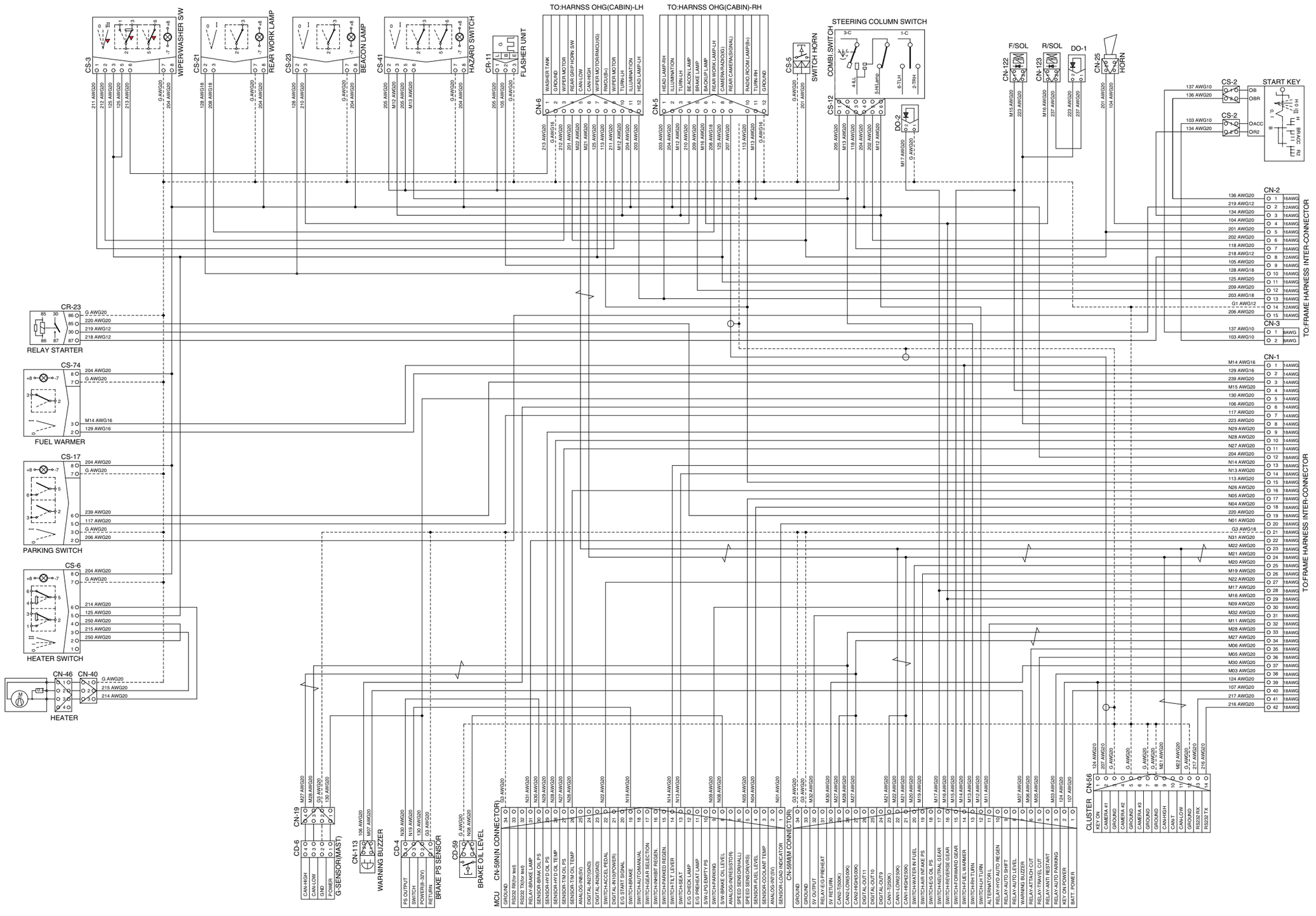

21HN-04001-00 1OF8

## · ELECTRICAL CIRCUIT (KNOB FNR, DASHBOARD, 22D-9 : -#0026, 25D-9 : -#0383, 30D-9 : -#0724, 33D-9 : -#0212, 35DA-9 : -#0001)

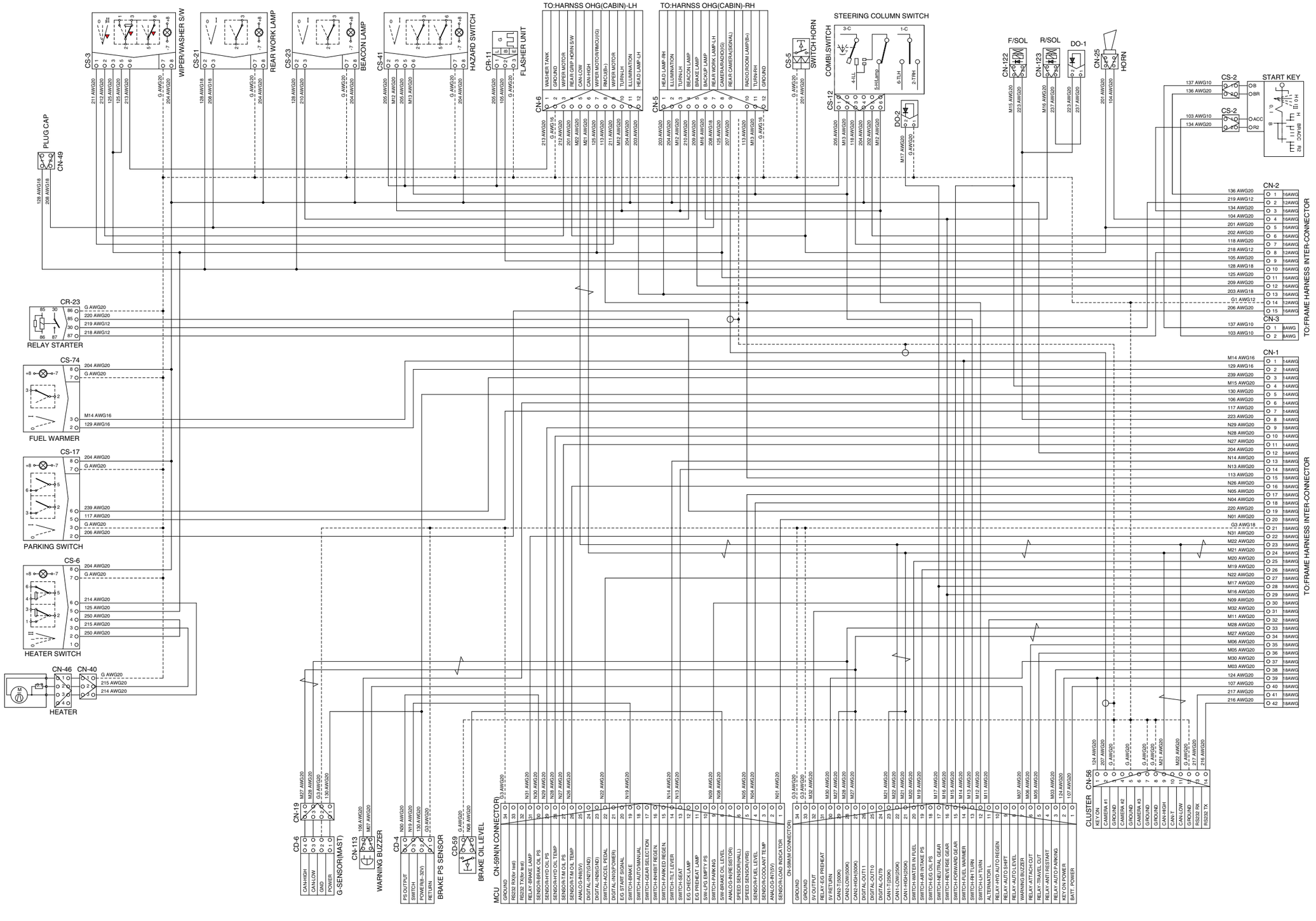



21HN-40061

## · ELECTRICAL CIRCUIT (KNOB FNR, DASHBOARD, 22D-9 : #0027-#0034, 25D-9 : #0384-#0590, 30D-9 : #0725-#1021, 33D-9 : #0213-#0299, 35DA-9 : #0002-#0008)

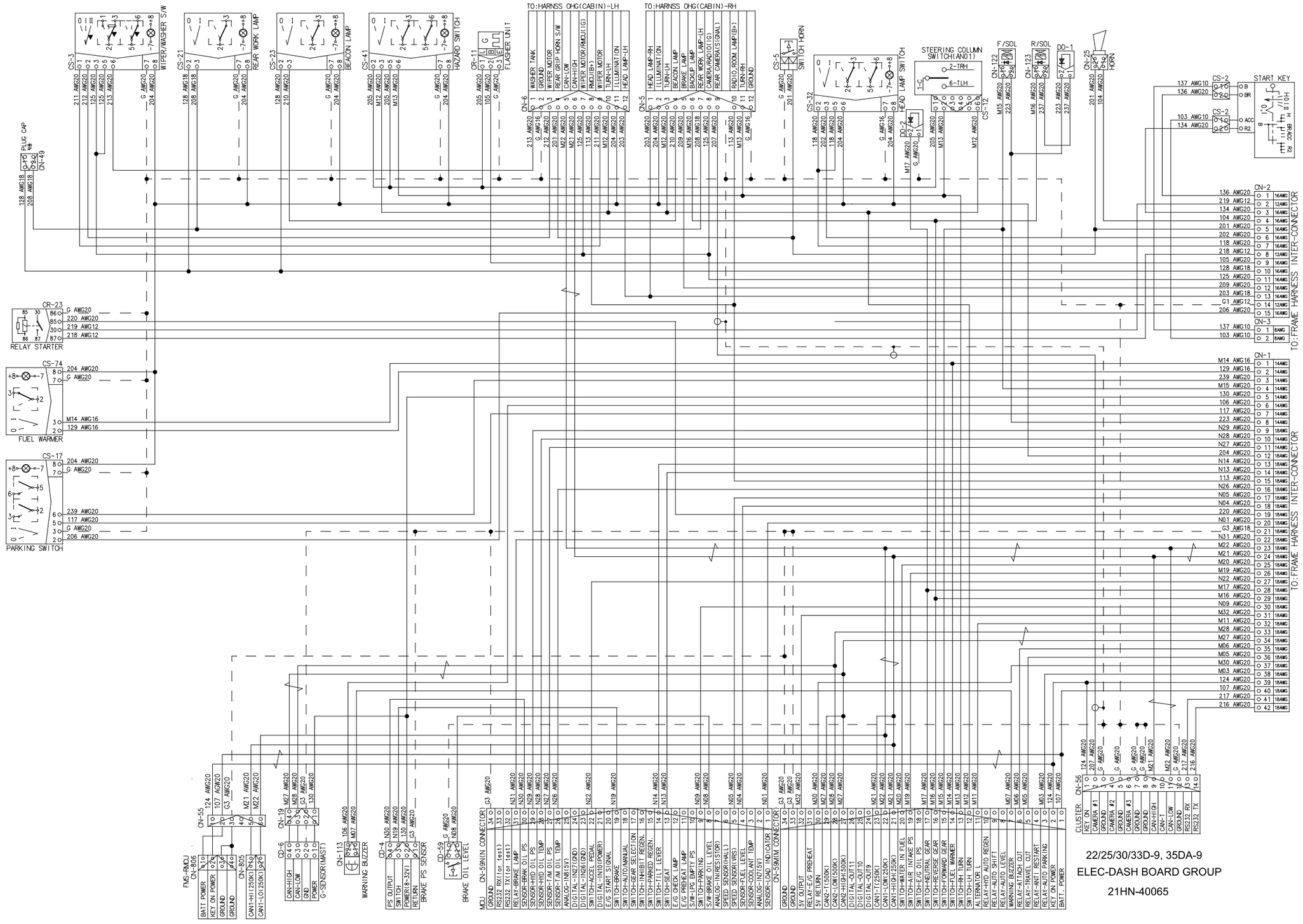


## · ELECTRICAL CIRCUIT (KNOB FNR, DASHBOARD, 22D-9 : #0035-, 25D-9 : #0591-#1319, 30D-9 : #1022-#3292, 33D-9 : #0300-#0739, 35DA-9 : #0009-#0341)

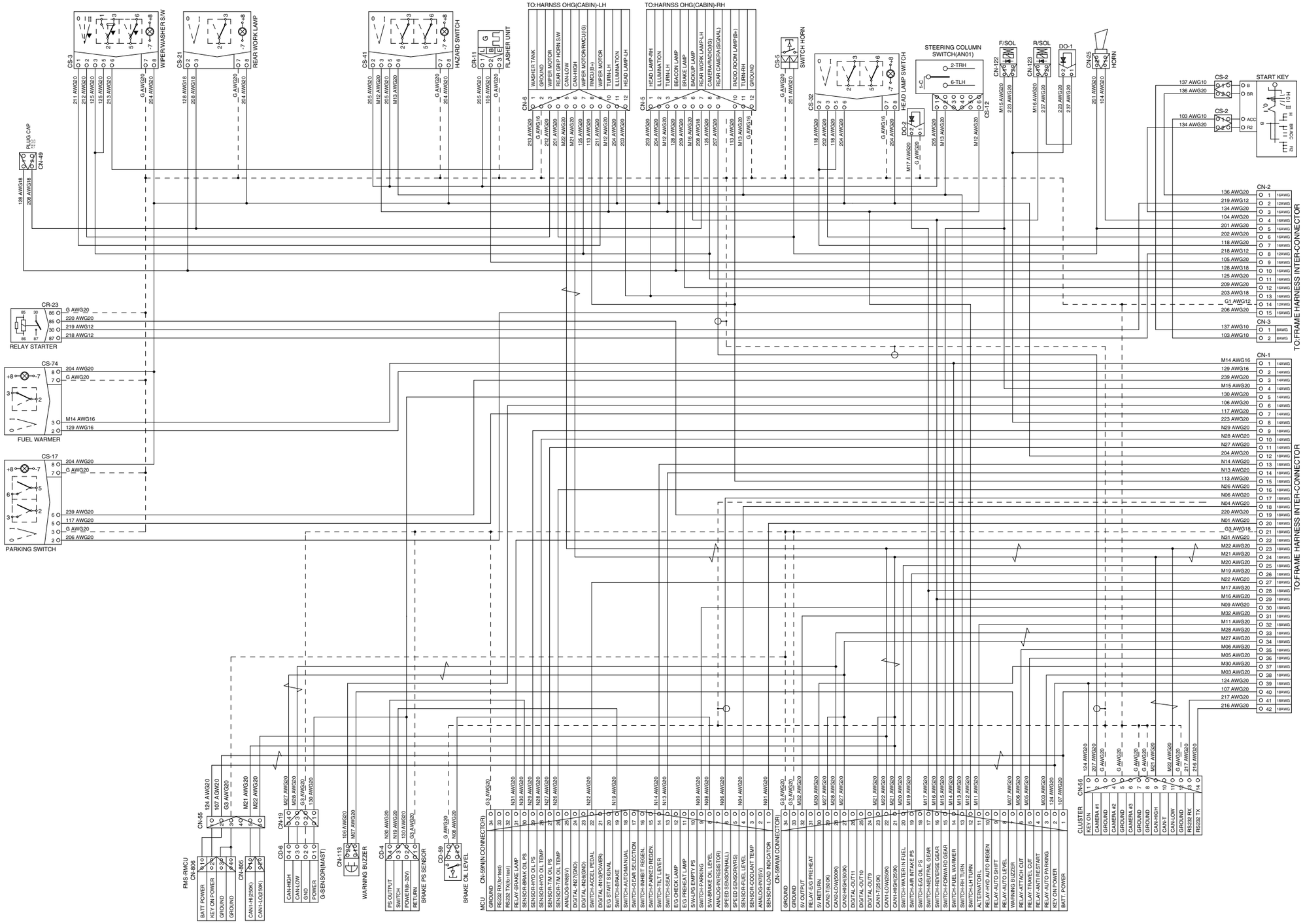



21HN-40063

## · ELECTRICAL CIRCUIT (KNOB FNR, DASHBOARD, 25D-9 : #1320-#1521, 30D-9 : #3293-#3921, 33D-9 : #0740-#0868, 35DA-9 : #0342-#0485)



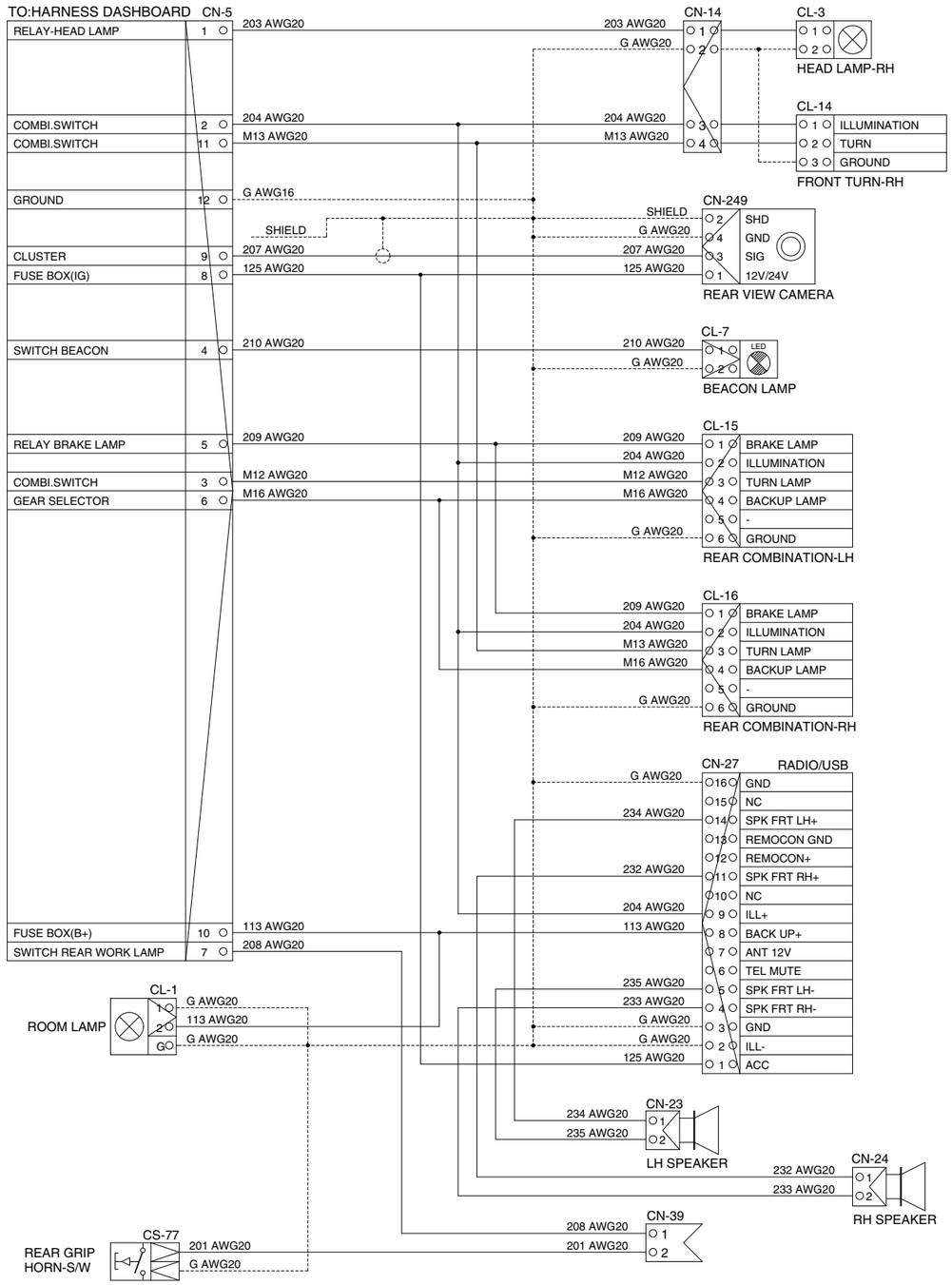
## · ELECTRICAL CIRCUIT (KNOB FNR, DASHBOARD, 25D-9 : #1522-, 30D-9 : #3922-, 33D-9 : #0869-, 35DA-9 : #0486-)



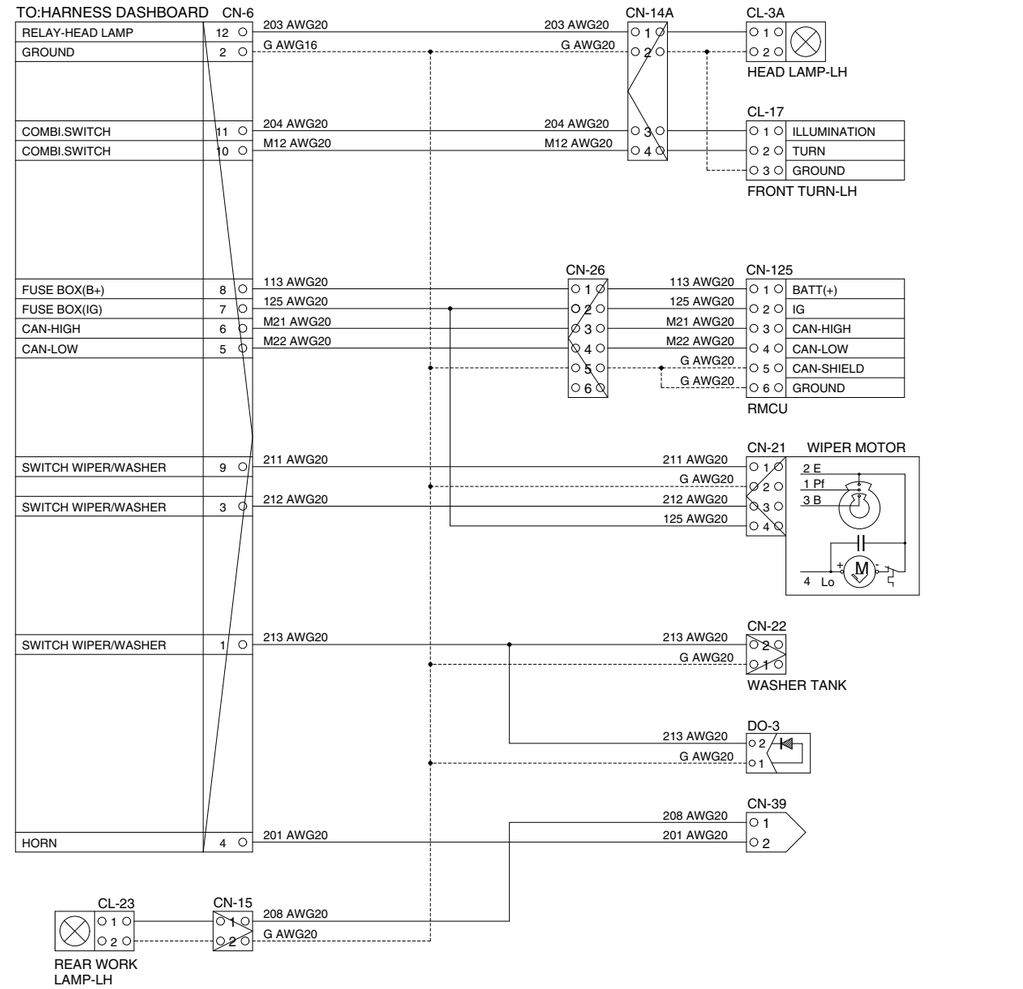

21HN-04001-00 2OF8

## · ELECTRICAL CIRCUIT (CABIN W/KB AIR CONDITIONER 1/2)

### *ELEC.DIAGRAM OF HARNESS CABIN-RH



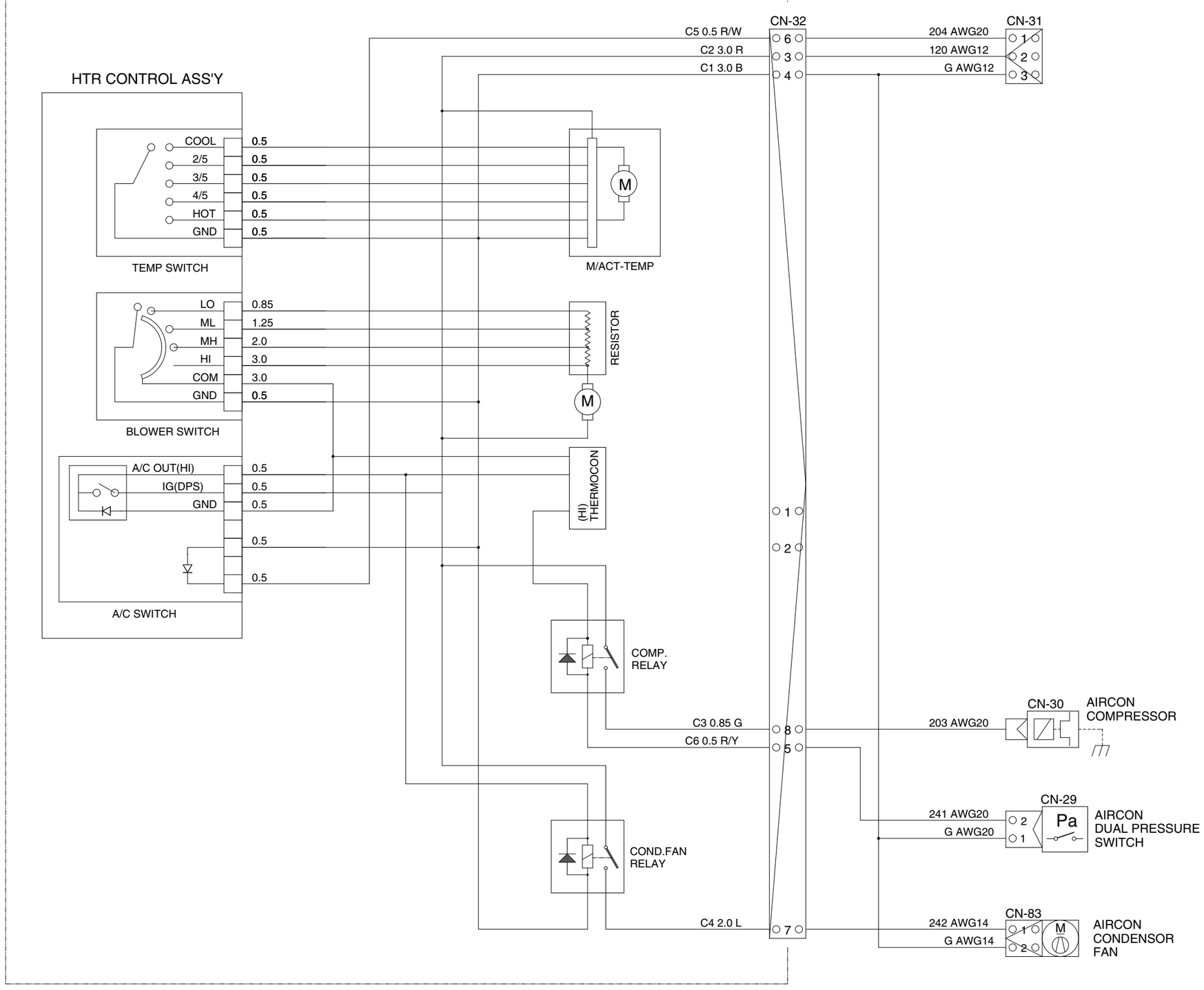

### *ELEC.DIAGRAM OF HARNESS CABIN-LH




22D9EL04-1

## · ELECTRICAL CIRCUIT (CABIN W/KB AIR CONDITIONER 2/2)

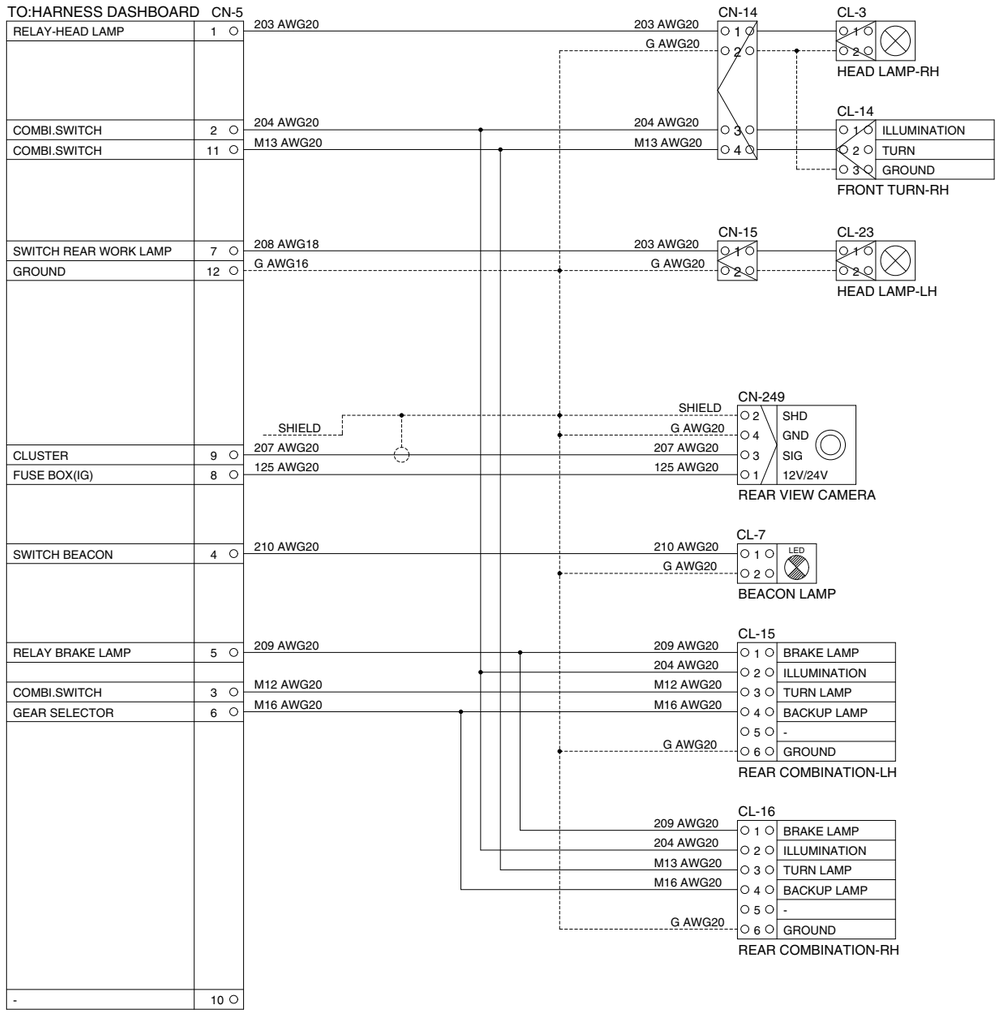
*ELEC. DIAGRAM OF KB AIRCON



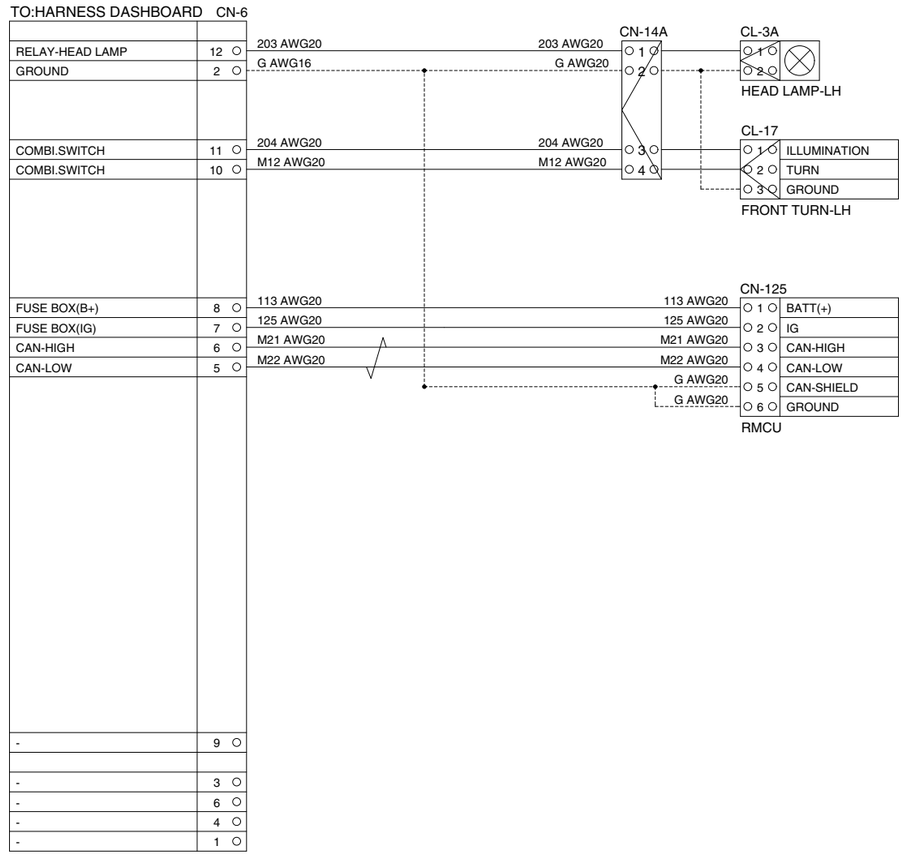

21HN-50052

· ELECTRICAL CIRCUIT (OVERHEAD GUARD, 22D-9 : -#0016, 25D-9 : -#0266, 30D-9 : -#0389, 33D-9 : -#0124)

## *ELEC.DIAGRAM OF HARNESS CABIN-RH



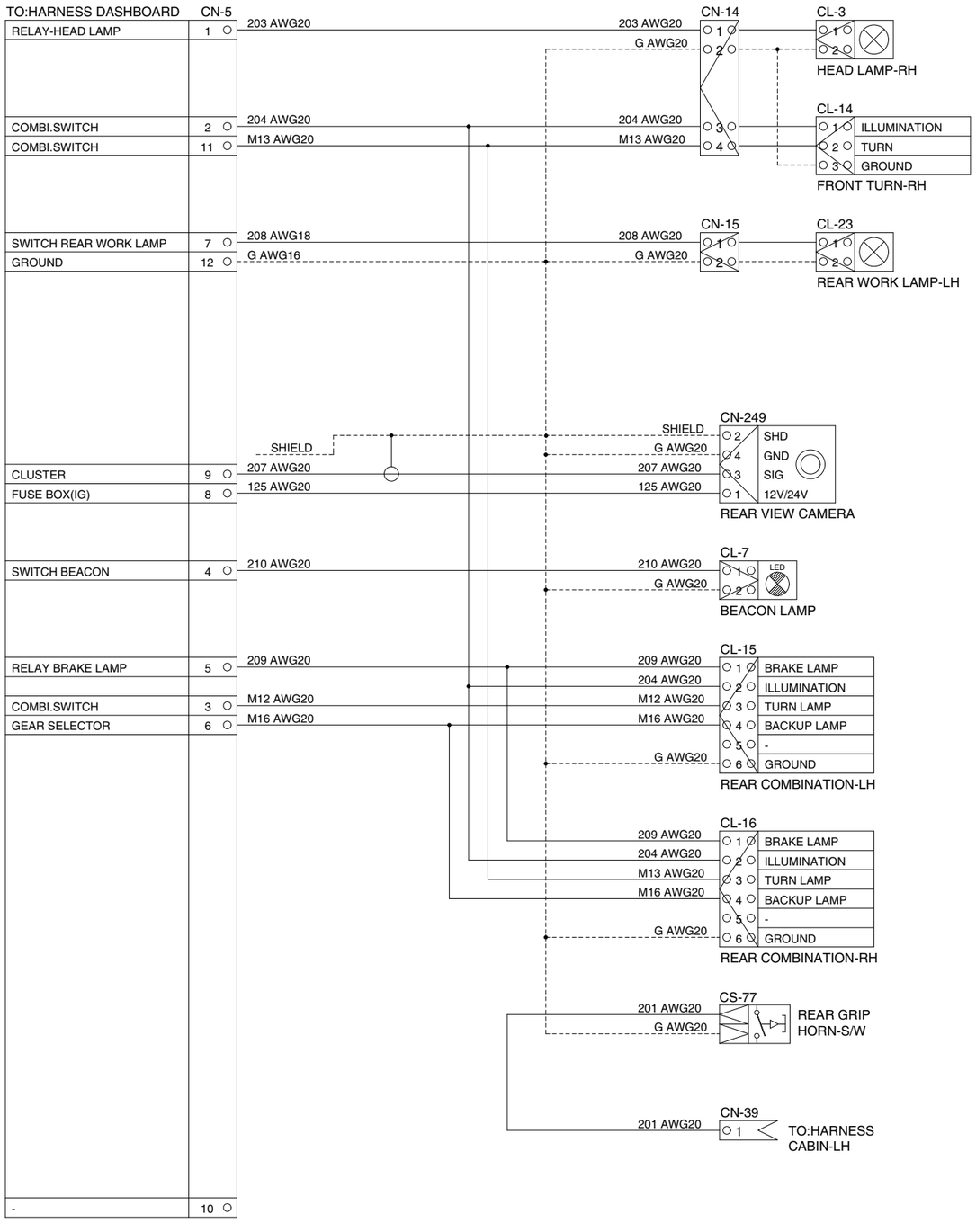

## *ELEC.DIAGRAM OF HARNESS CABIN-LH



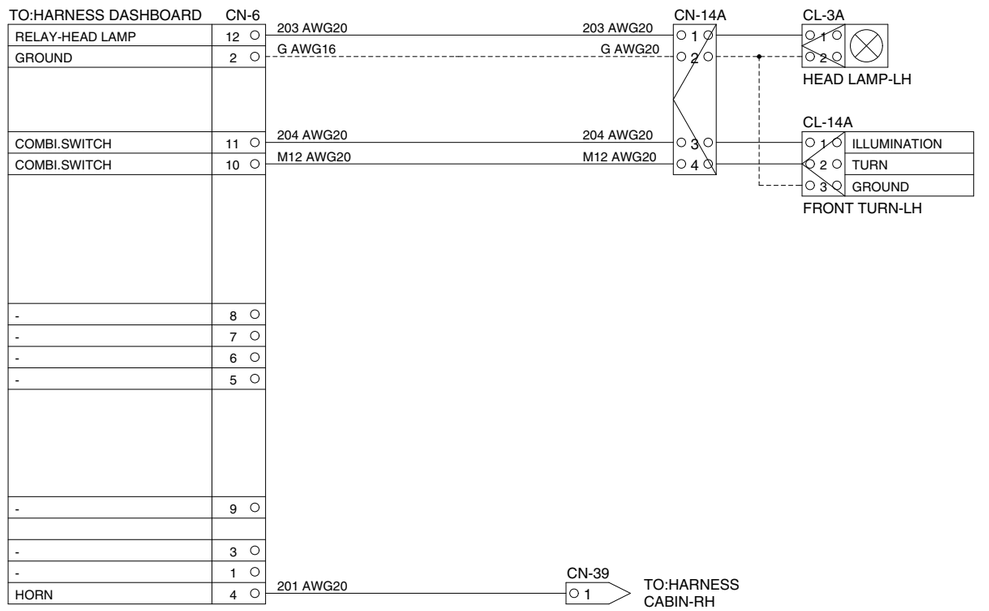

22D9EL04-2

## · ELECTRICAL CIRCUIT (OVERHEAD GUARD, 22D-9 : #0017-, 25D-9 : #0267-, 30D-9 : #0390-, 33D-9 : #0125-, 35DA-9 : #0001-)

### *ELEC.DIAGRAM OF HARNESS OHG-RH

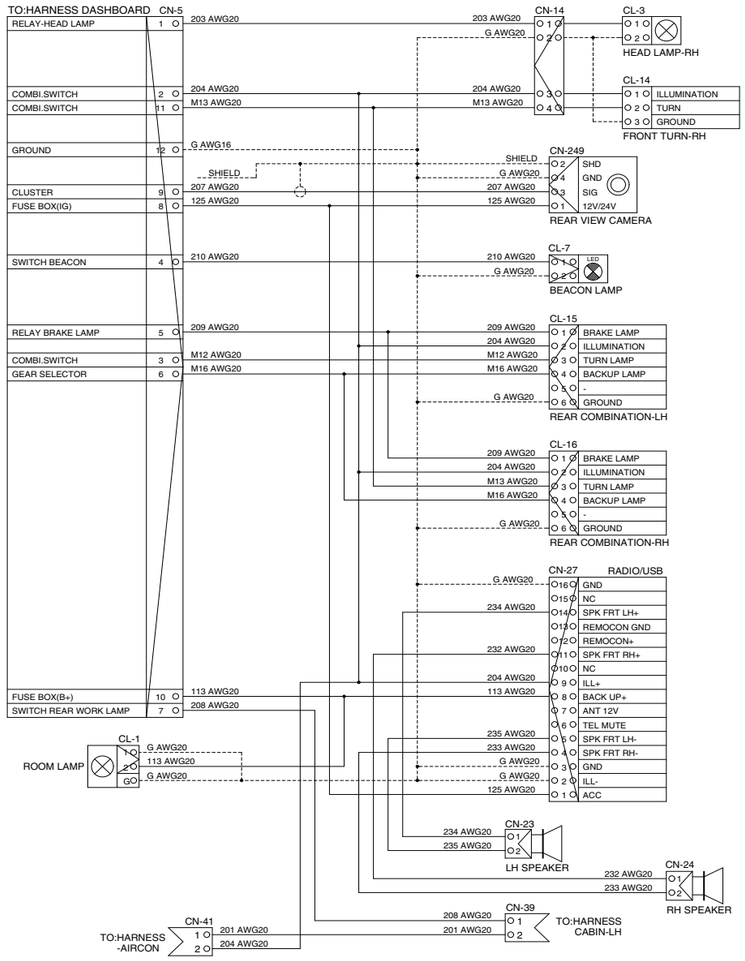



### *ELEC.DIAGRAM OF HARNESS OHG-LH

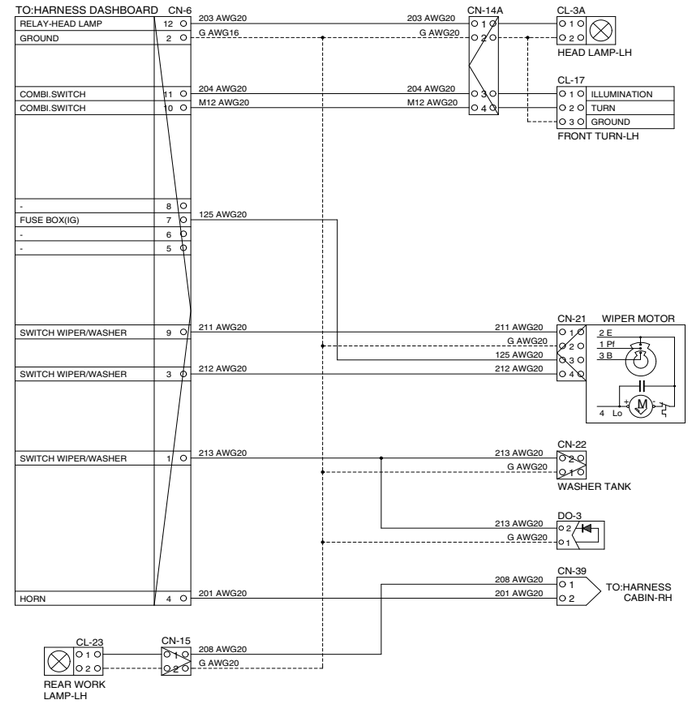


## · ELECTRICAL CIRCUIT (CABIN, W/AC, 22D-9 : #0017-, 25D-9 : #0267-, 30D-9 : #0390-, 33D-9 : #0125-, 35DA-9 : #0001-)

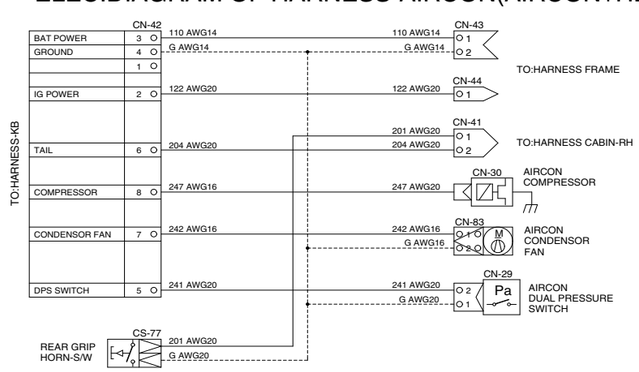
### *ELEC.DIAGRAM OF HARNESS CABIN-RH



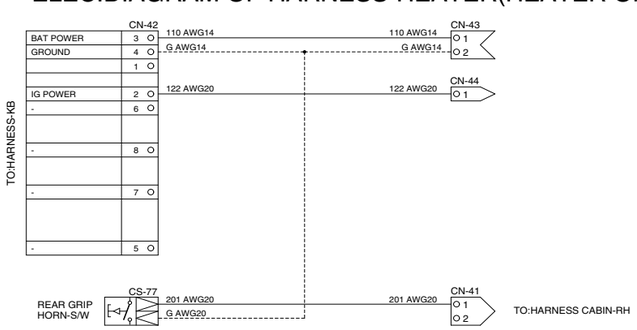

### *ELEC.DIAGRAM OF HARNESS CABIN-LH




### *ELEC.DIAGRAM OF HARNESS-AIRCON(AIRCON+HEATER)

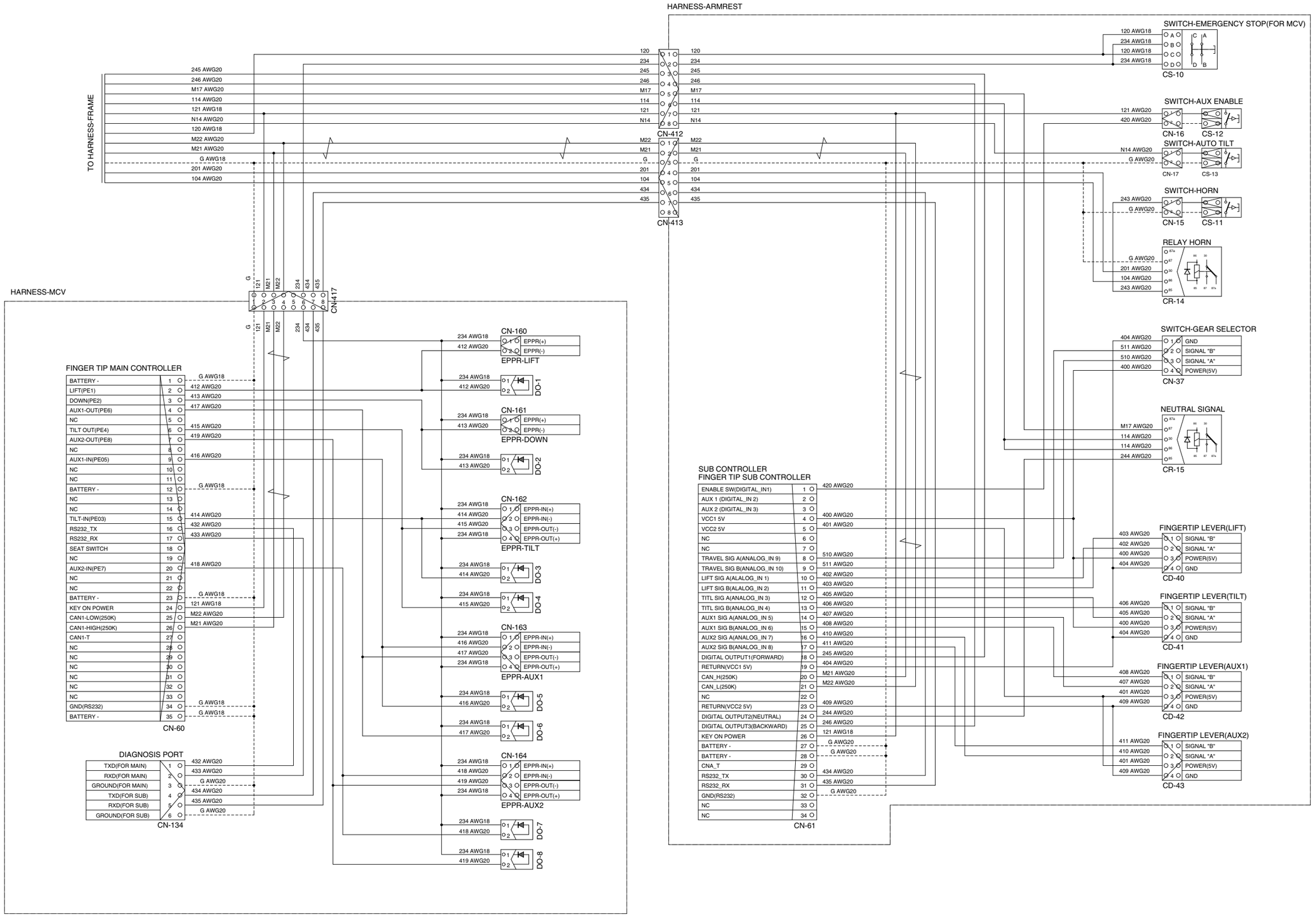



### *ELEC.DIAGRAM OF HARNESS-HEATER(HEATER ONLY)

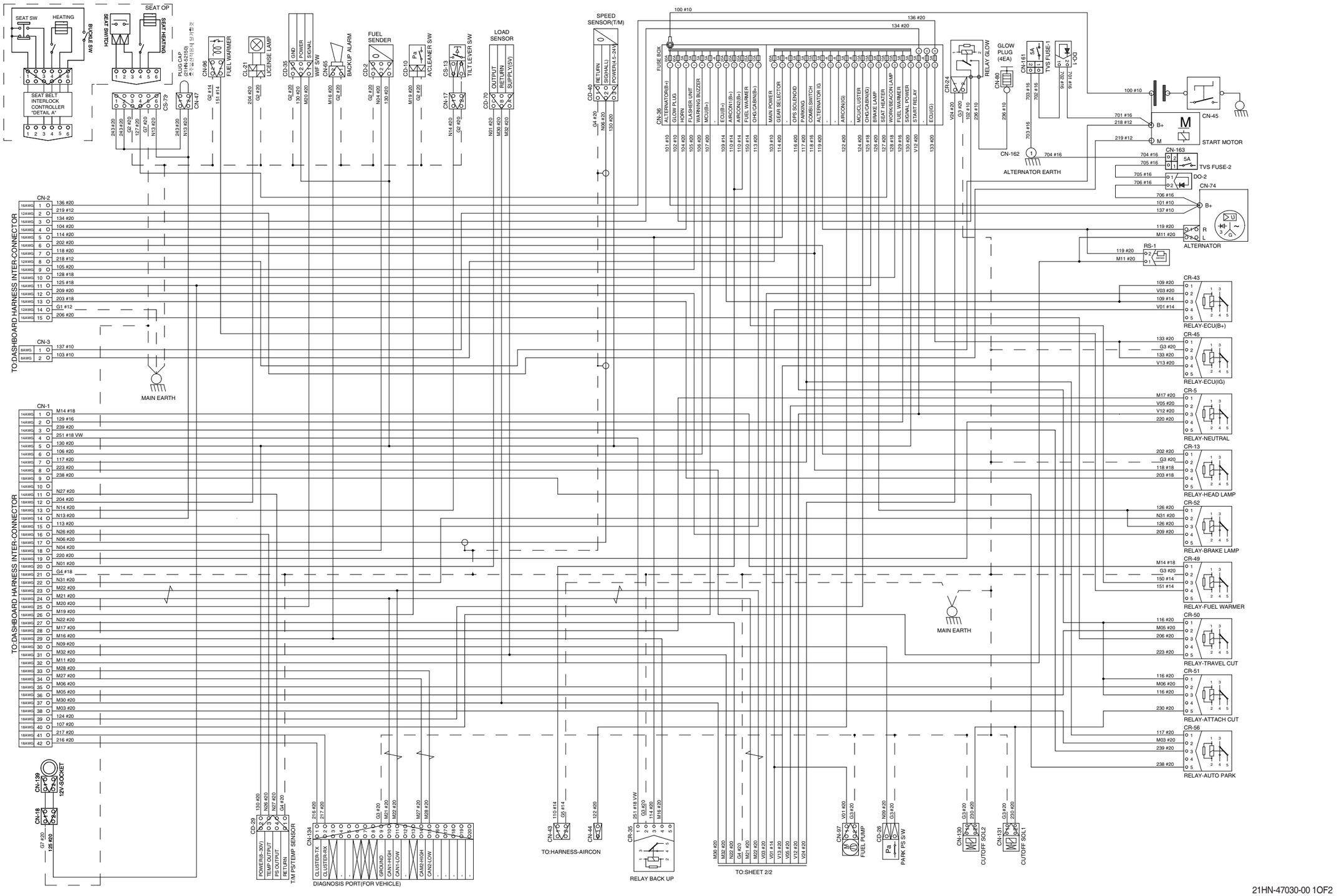



22D9EL04-3

## · ELECTRICAL CIRCUIT (FINGERTIP, 22D-9 : #0028-, 25D-9 : #0408-, 30D-9 : #0790-, 33D-9 : #0230-, 35DA-9 : #0001-)

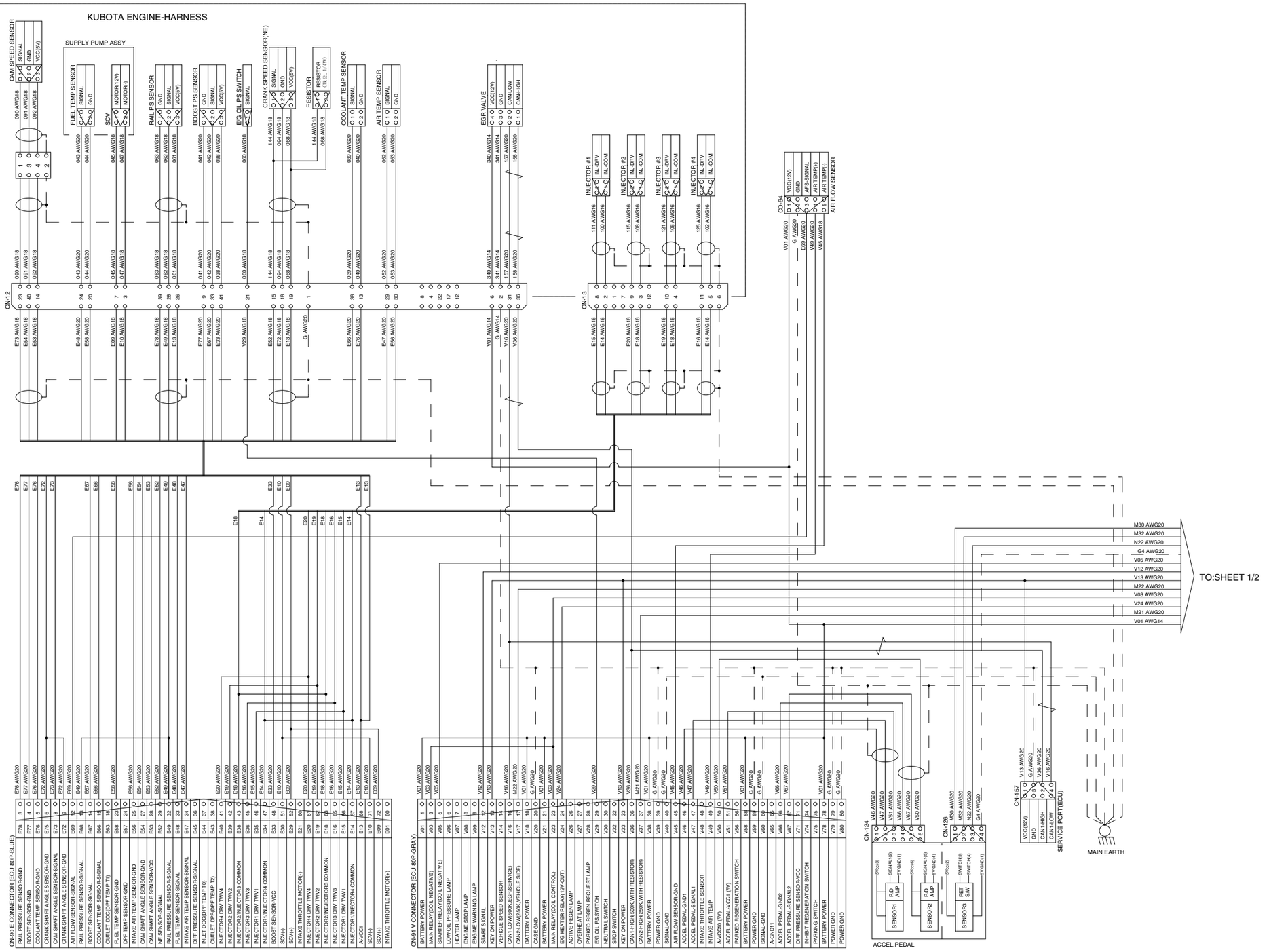


## · ELECTRICAL CIRCUIT (1/8, FRAME 1OF2)

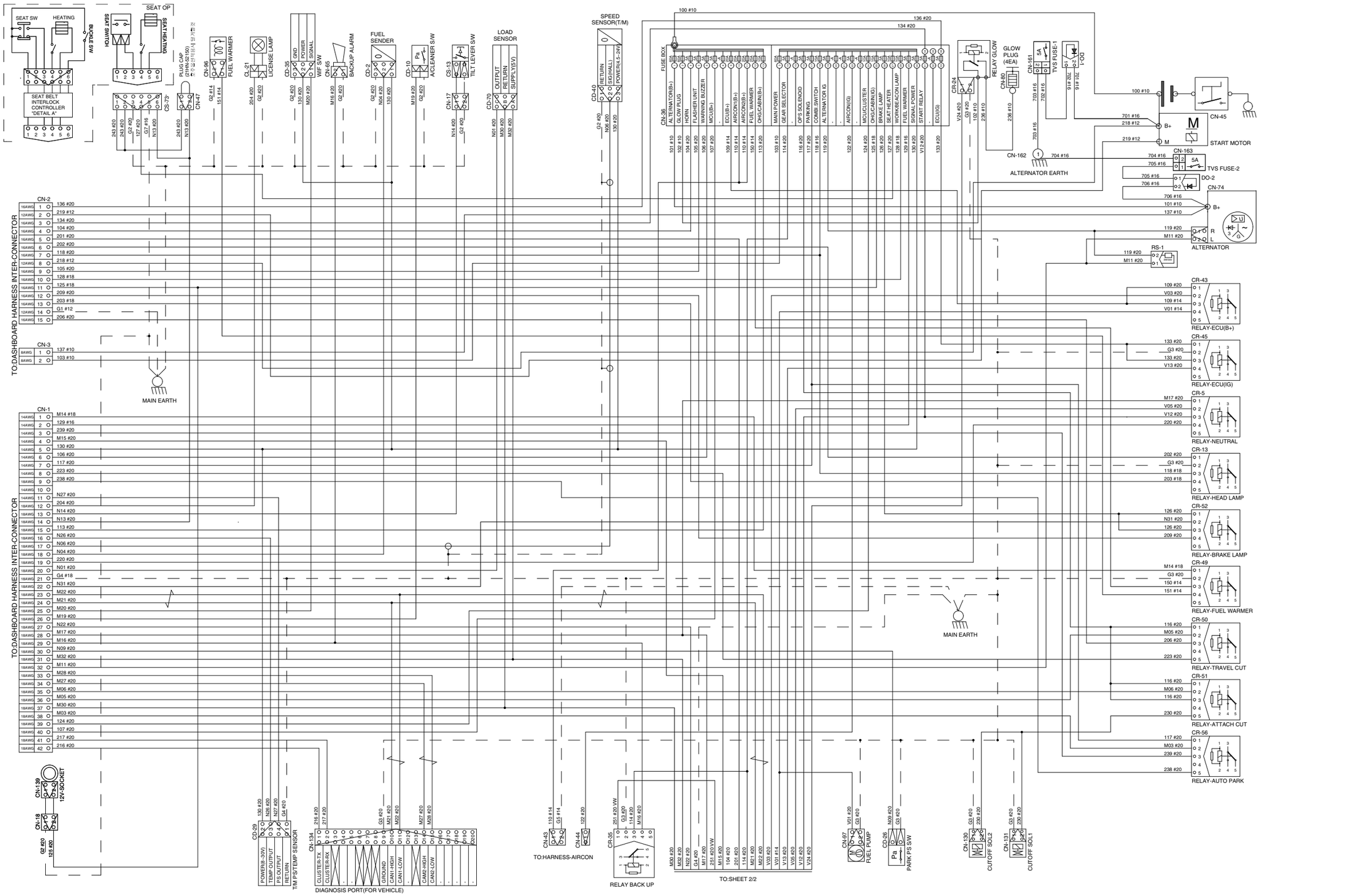



21HN-47030-00 1OF2

## · ELECTRICAL CIRCUIT (2/8, FRAME 1OF2)

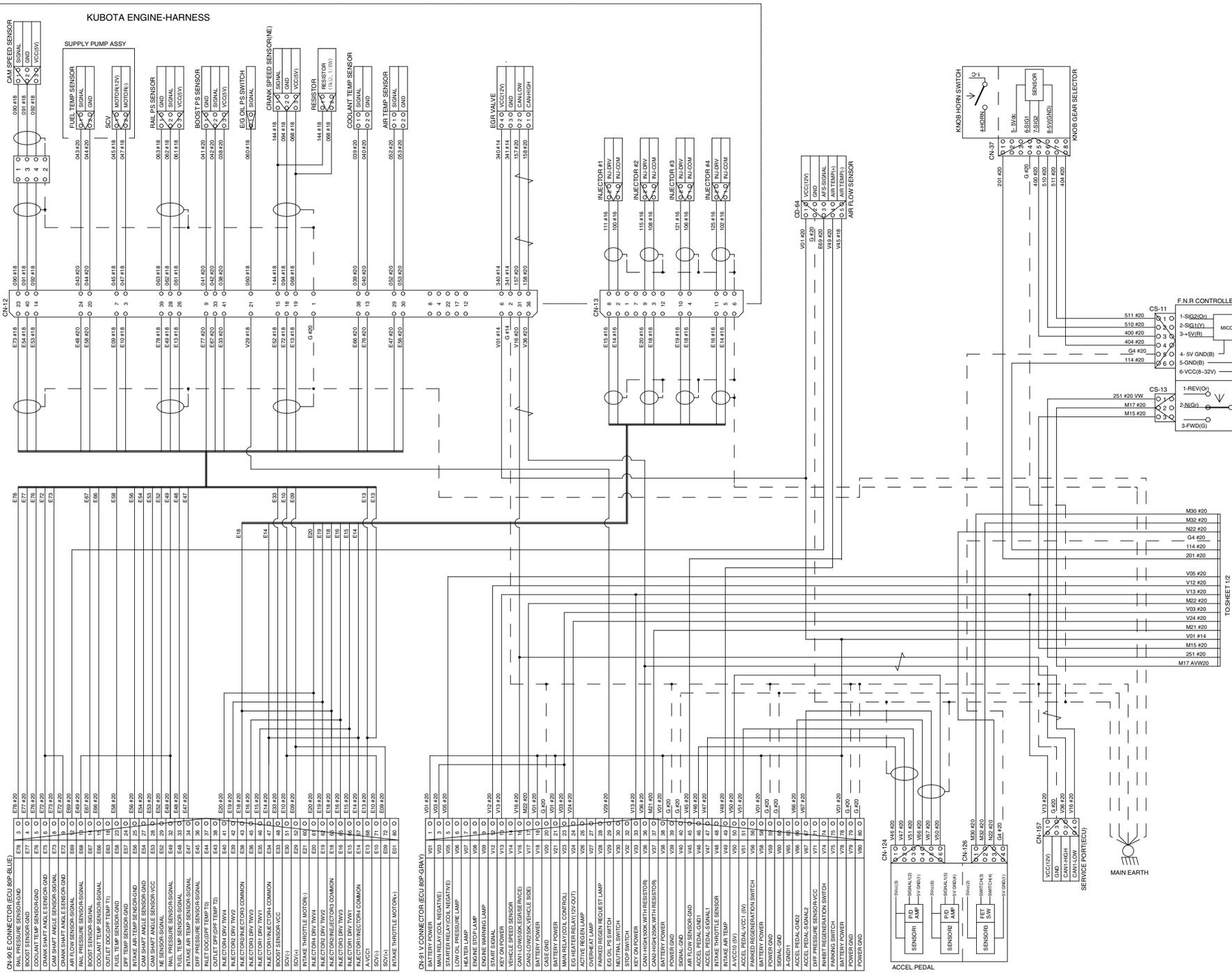


## · ELECTRICAL CIRCUIT (3/8, FRAME-KNOB 1OF2)




21HN-47070-00 1OF2

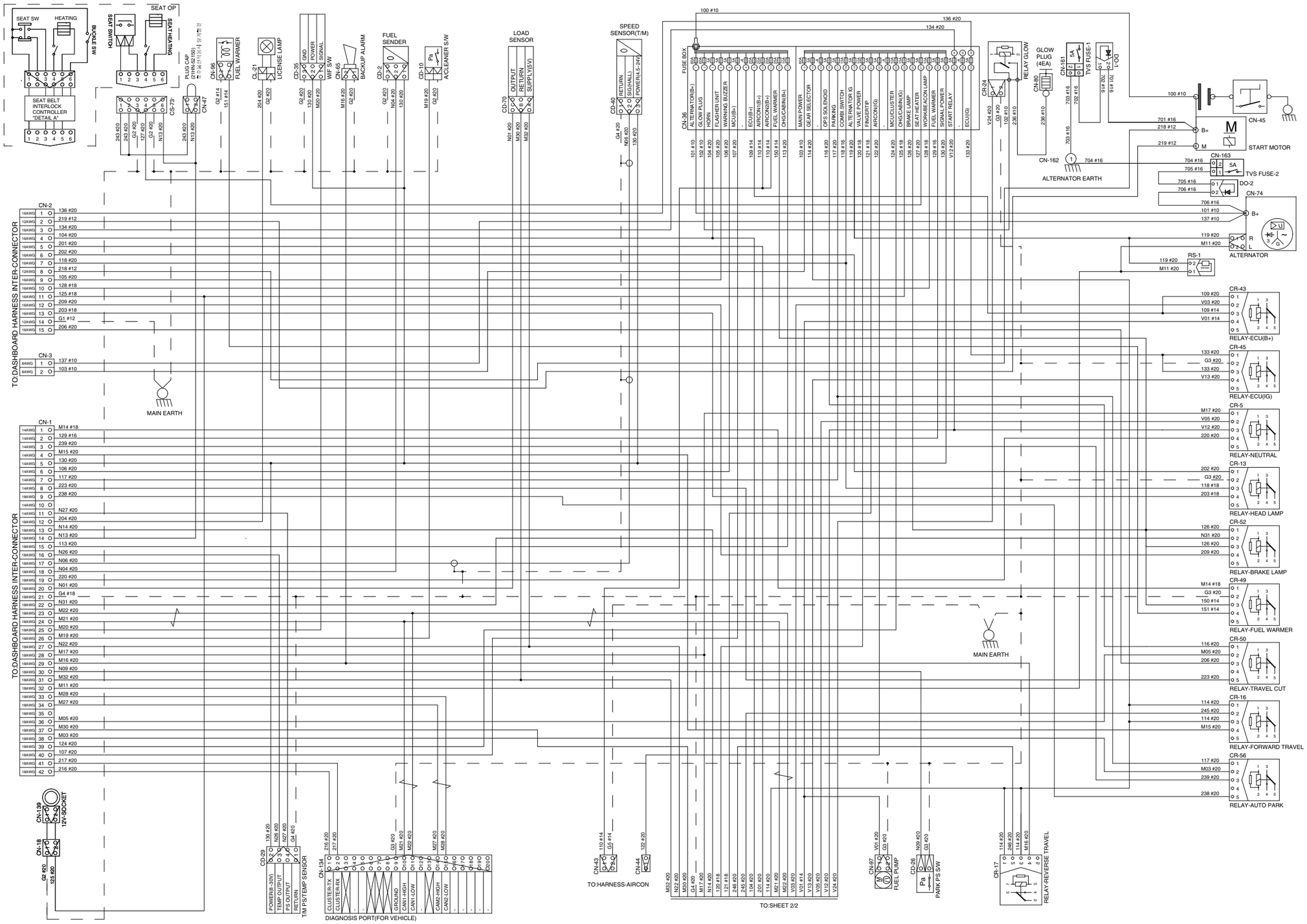
## · ELECTRICAL CIRCUIT (4/8, FRAME-KNOB 2OF2)




| CN-90 E CONNECTOR (ECU 80P-BLUE) | | |
|---|---|---|
| RAIL PRESSURE SENSOR+GND | E78 | 3 |
| BOOST SENSOR-GND | E77 | 4 |
| COOLANT TEMP SENSOR-GND | E76 | 5 |
| CHANK SHAFT ANGLE SENSOR-GND | E75 | 6 |
| CAM SHAFT ANGLE SENSOR-SIGNAL | E73 | 8 |
| FUEL TEMP SENSOR+GND | E72 | 9 |
| AIR FLOW SENSOR-SIGNAL | E69 | 10 |
| RAIL PRESSURE SENSOR-SIGNAL | E68 | 11 |
| BOOST SENSOR-SIGNAL | E67 | 14 |
| COOLANT TEMP SENSOR-SIGNAL | E66 | 15 |
| OUTLET DOC(DPF TEMP T1) | E63 | 18 |
| FUEL TEMP SENSOR-GND | E58 | 23 |
| DPF TEMP SENSOR-GND | E57 | 24 |
| INTAKE AIR-TEMP SENSOR-GND | E56 | 25 |
| CAM SHAFT ANGLE SENSOR-GND | E54 | 27 |
| CAM SHAFT ANGLE SENSOR-VCC | E53 | 28 |
| NE SENSOR-SIGNAL | E52 | 29 |
| AIR FLOW SENSOR-SIGNAL | E49 | 32 |
| FUEL TEMP SENSOR-SIGNAL | E48 | 33 |
| INTAKE AIR TEMP. SENSOR-SIGNAL | E47 | 34 |
| DPF PRESSURE SENSOR-SIGNAL | E45 | 36 |
| INLET DOC(DPF TEMP T0) | E44 | 37 |
| OUTLET DPF(DPF TEMP T2) | E43 | 38 |
| INJECTOR4 DRV TWV4 | E40 | 41 |
| INJECTOR2 DRV TWV2 | E39 | 42 |
| INJECTOR2/INJECTOR3 COMMON | E38 | 43 |
| INJECTOR3 DRV TWV3 | E36 | 45 |
| INJECTOR1 DRV TWV1 | E35 | 46 |
| INJECTOR1/INJECTOR4 COMMON | E34 | 47 |
| BOOST SENSOR-VCC | E33 | 48 |
| SCV(-) | E32 | 49 |
| INTAKE THROTTLE MOTOR(-) | E21 | 60 |
| INJECTOR4 DRV TWV4 | E20 | 61 |
| INJECTOR2 DRV TWV2 | E19 | 62 |
| INJECTOR2/INJECTOR3 COMMON | E18 | 63 |
| INJECTOR3 DRV TWV3 | E16 | 65 |
| INJECTOR1 DRV TWV1 | E15 | 66 |
| INJECTOR1/INJECTOR4 COMMON | E14 | 67 |
| A-VCC1 | E13 | 68 |
| SCV(-) | E10 | 71 |
| SCV(+) | E09 | 72 |
| INTAKE THROTTLE MOTOR(+) | E01 | 80 |

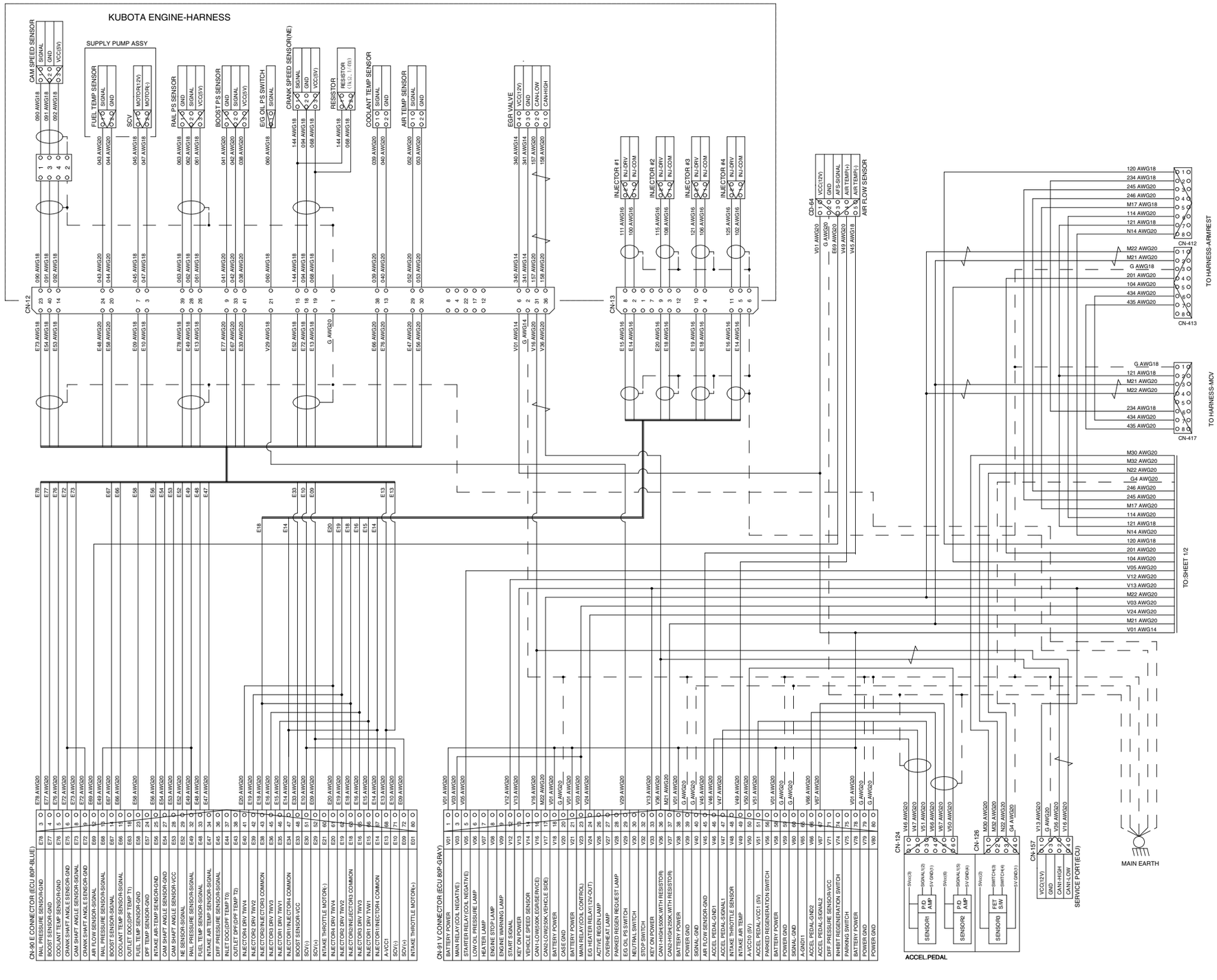
| CN-91 V CONNECTOR (ECU 80P-GRAY) | | |
|---|---|---|
| BATTERY POWER | V01 | 1 |
| MAIN RELAY(COIL NEGATIVE) | V03 | 3 |
| STARTER-RELAY(COIL NEGATIVE) | V05 | 5 |
| LOW OIL PRESSURE LAMP | V06 | 6 |
| HEATER LAMP | V07 | 7 |
| ENGINE STOP LAMP | V08 | 8 |
| ENGINE WARNING LAMP | V09 | 9 |
| START SIGNAL | V12 | 12 |
| KEY ON POWER | V13 | 13 |
| CAN1-LOW(500K,EGR-SERVICE) | V15 | 15 |
| CAN1-LOW(250K,VEHICLE SIDE) | V16 | 16 |
| BATTERY POWER | V17 | 17 |
| CASE GND | V18 | 18 |
| BATTERY POWER | V21 | 21 |
| MAIN RELAY(COIL CONTROL) | V23 | 23 |
| EG HEATER RELAY(12V-OUT) | V24 | 24 |
| ACTIVE REGEN LAMP | V25 | 26 |
| OVERHEAT LAMP | V27 | 27 |
| PARKED REGEN REQUEST LAMP | V28 | 28 |
| EG OIL PS SWITCH | V29 | 29 |
| KEY ON SWITCH | V30 | 30 |
| STOP SWITCH | V32 | 32 |
| KEY ON POWER | V33 | 33 |
| CAN1-HIGH(500K,WITH RESISTOR | V36 | 36 |
| CAN2-HIGH(250K,WITH RESISTOR | V37 | 37 |
| BATTERY POWER | V38 | 38 |
| POWER GND | V39 | 39 |
| SIGNAL GND | V40 | 40 |
| AIR FLOW SENSOR-GND | V45 | 45 |
| ACCEL PEDAL-GND1 | V46 | 46 |
| ACCEL PEDAL-SIGNAL1 | V47 | 47 |
| INTAKE THROTTLE SENSOR | V48 | 48 |
| INTAKE AIR TEMP | V49 | 49 |
| A-VCC(5V) | V50 | 50 |
| ACCEL PEDAL-VCC1 (5V) | V51 | 51 |
| PARKED REGENERATION SWITCH | V56 | 56 |
| BATTERY POWER | V58 | 58 |
| POWER GND | V59 | 59 |
| SIGNAL GND | V60 | 60 |
| A-GND11 | V65 | 65 |
| ACCEL PEDAL-GND2 | V66 | 66 |
| ACCEL PEDAL-SIGNAL2 | V67 | 67 |
| DPF PRESSURE SENSOR+VCC | V71 | 71 |
| INHIBIT REGENERATION SWITCH | V74 | 74 |
| PARKING SWITCH | V75 | 75 |
| BATTERY POWER | V78 | 78 |
| POWER GND | V79 | 79 |
| POWER GND | V80 | 80 |

## · ELECTRICAL CIRCUIT (5/8, FRAME-FINGERTIP 1OF2)



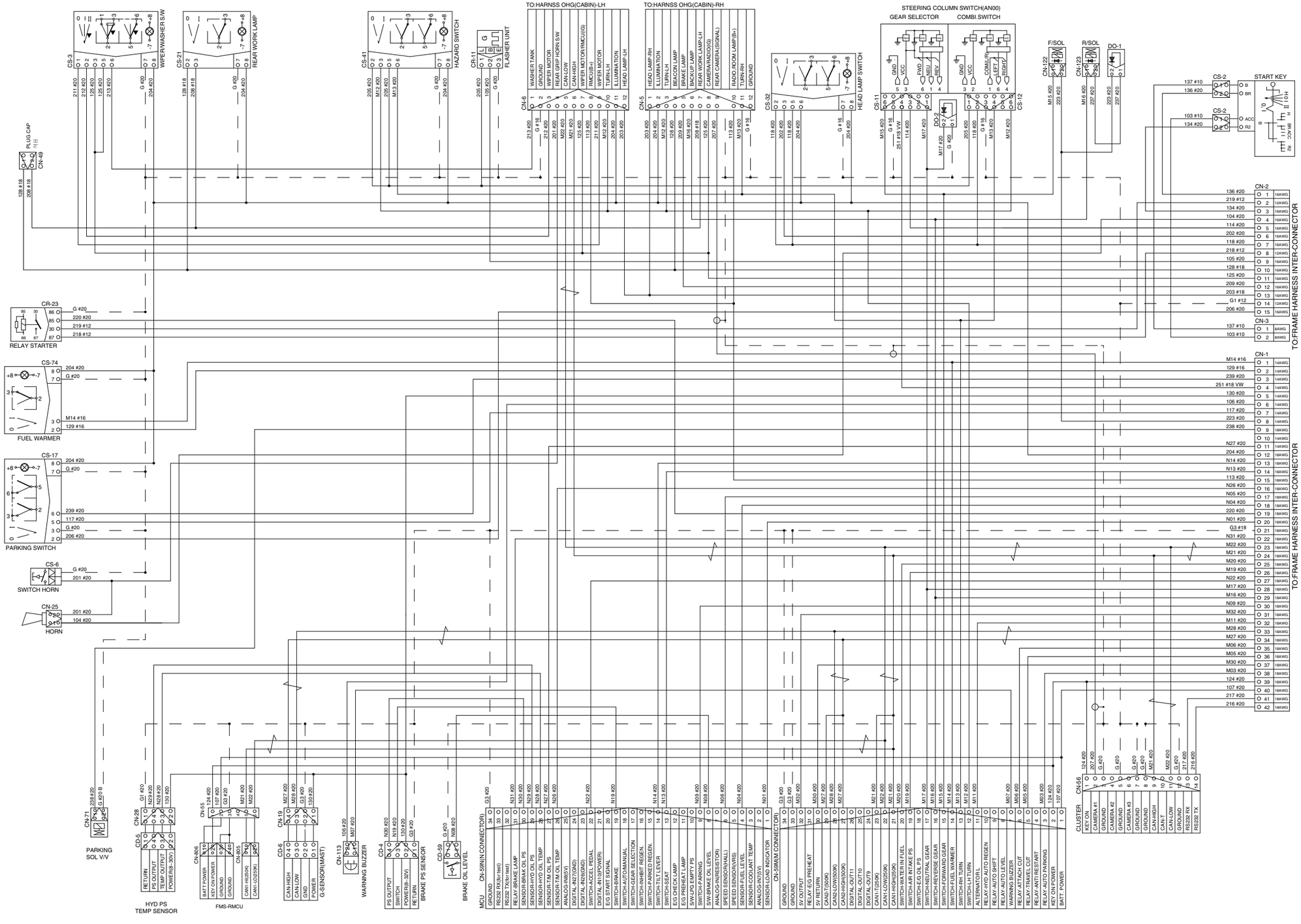

21HN-47090-00 1OF2

## · ELECTRICAL CIRCUIT (6/8, FRAME-FINGERTIP 2OF2)



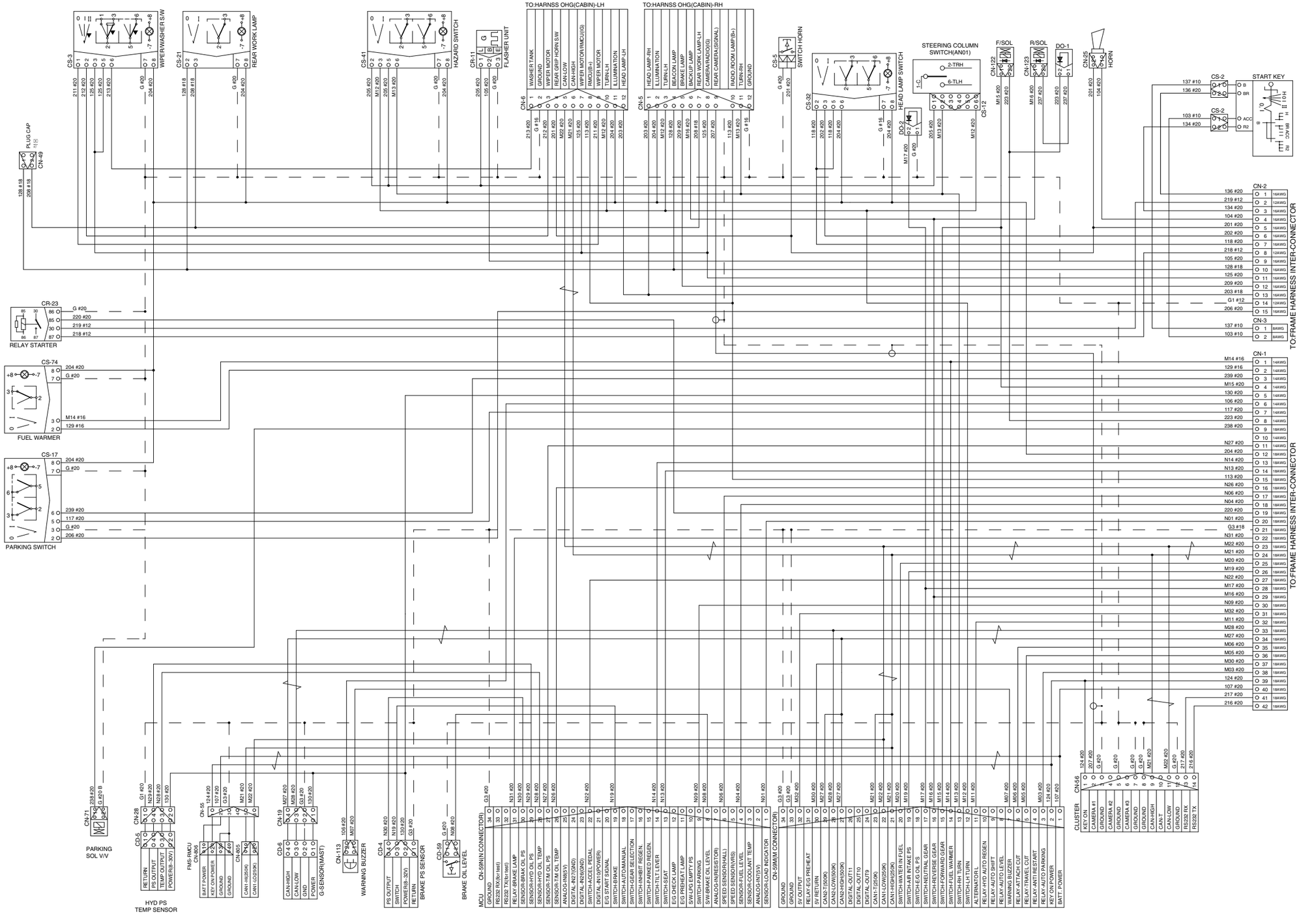

21HN-47090-00 2OF2

## · ELECTRICAL CIRCUIT (7/8, DASHBOARD)




21HN-47020-00

## · ELECTRICAL CIRCUIT (8/8, DASHBOARD-KNOB, FINGERTIP)



## 1. POWER CIRCUIT

The negative terminal of the battery is grounded to the machine 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+)] → I/conn [CN-3 (2)] → Start relay [CR-23 (87)]
Battery (+) → Fuse box [CN-36]
- → Fuse box [No.1] → Alternator [CN-74 (B+)] → I/conn [CN-2 (2)] → Start switch [CS-2 (1)]
- → Fuse box [No.2] → Glow relay [CR-24]
- → Fuse box [No.4] → I/conn [CN-2 (4) → Horn [CN-25]
- → Fuse box [No.5] → I/conn [CN-2 (9)] → Flasher unit [CR-11 (2)]
- → Fuse box [No.6] → I/conn [CN-1 (6)] → Warning buzzer [CN-113 (2)]
- → Fuse box [No.7] → I/conn [CN-1 (40)] → MCU [CN-59M (1)]
- → Fuse box [No.9] → ECU (B+) relay [CR-43 (1, 3)]
- → Fuse box [No.13] → I/conn [CN-1 (15)]
  - → I/conn [CN-5 (10)] → Room lamp [CL-1 (2)]
  - → I/conn [CN-5 (10)] → Radio/USB [CN-27 (8)]
  - → I/conn [CN-6 (8)] → I/conn [CN-26 (1)] → RMCU [CN-125 (1)]

※ I/conn : Intermediate connector

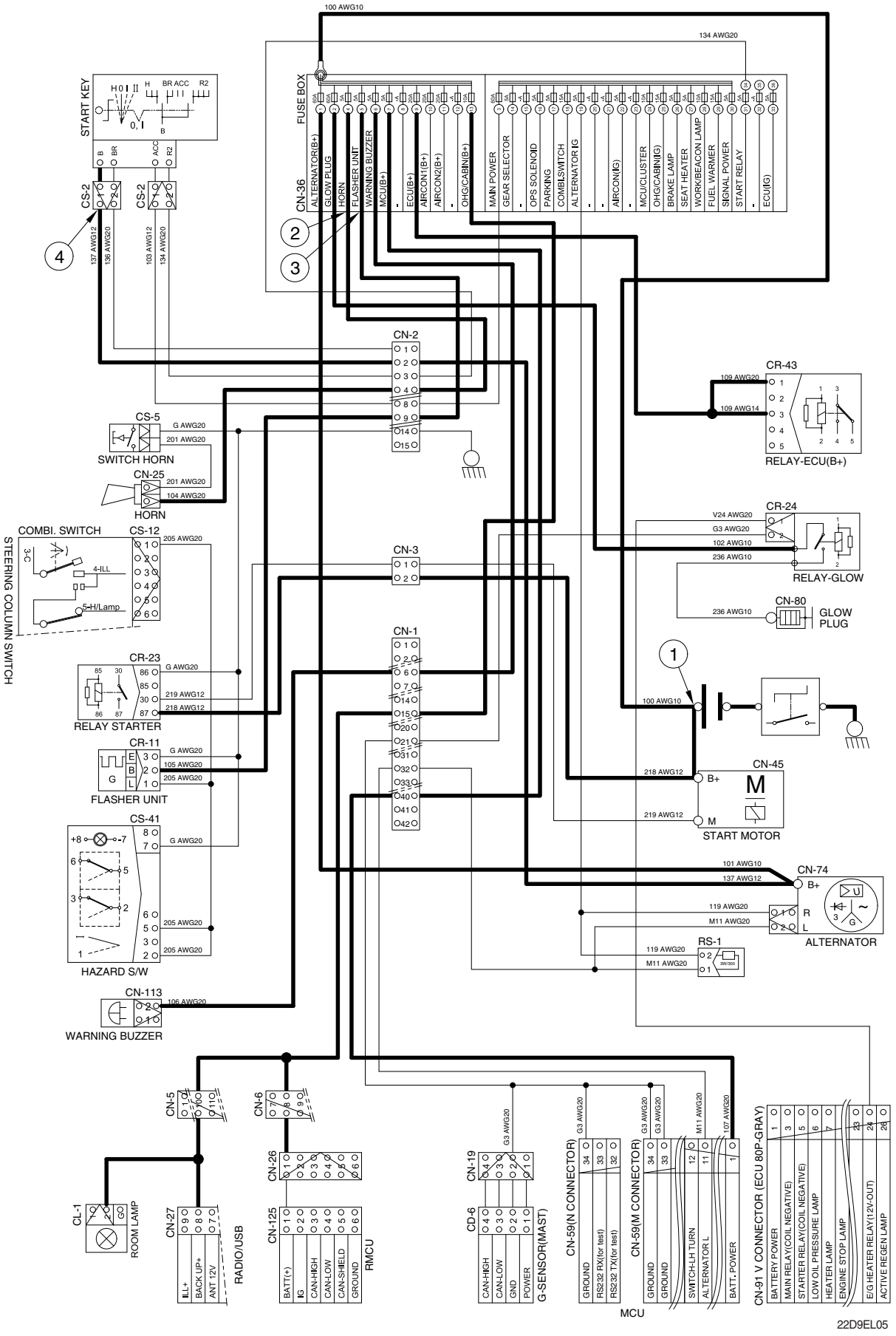
### 2) CHECK POINT

| Engine | Key switch | Check point | Voltage |
|---|---|---|---|
| OFF | OFF | ① - GND (Battery(+))<br>② - GND (Fuse No.3)<br>③ - GND (Fuse No.4)<br>④ - GND (Start key) | 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 relay [CR-23]
Battery (+) terminal → Start motor [CN-45 (B+)]
→ Fuse box [CN-36 (1)] → Alternator [CN-74 (B+)] → I/conn [CN-2 (2)] → Start switch [CS-2 (1)]

**※ The engine can be started only when the gearshift is in neutral position.**

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

Start switch ON [CS-2 (1)] → I/conn[CN-2 (8)] → Fuse box [No.3] → Main power

**(2) When start key switch is START position**

Start switch START [CS-2 (2)] → I/conn [CN-2 (3)] → Fuse box [No. 34 →31]
→ Neutral relay [CR-5(3) → (4)] → I/conn [CN-1 (19)] → Start relay [CR-23 (85)]
→ ECU [CN-91V (12)]

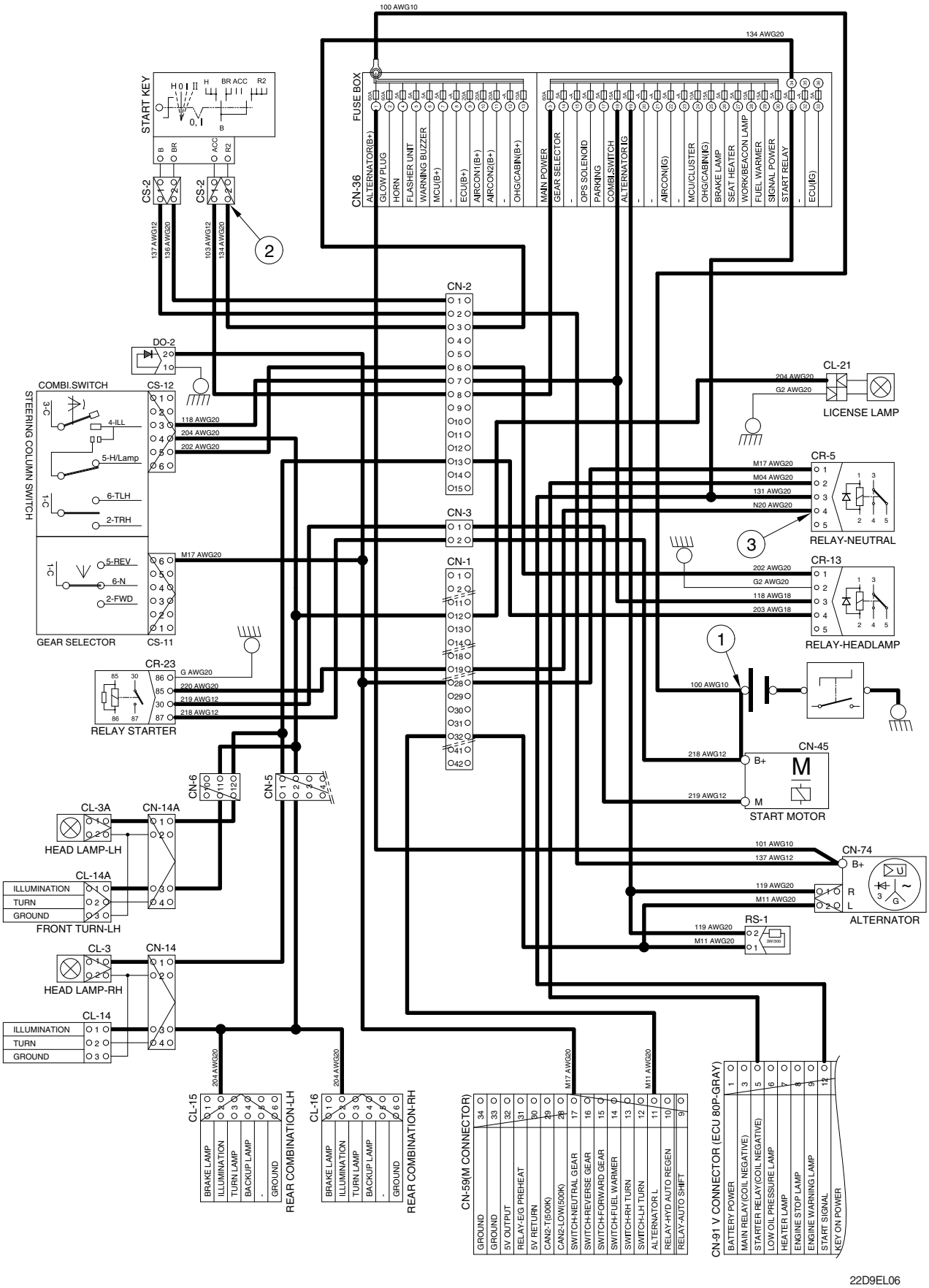
### 2) CHECK POINT

| Engine | Key switch | Check point | Voltage |
|---|---|---|---|
| Running | ON | ① - GND (Battery B+)<br>② - GND (Start key)<br>③ - GND (Neutral 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
Alternator [CN-74 (L)] → I/conn [CN-1 (32)] → MCU [CN-59M (11)]

(2) Charging flow
Alternator [CN-74 (B+)] → Fuse box [CN-36 (1)] → Battery (+) terminal → Charging

### 2) CHECK POINT

| Engine | Key switch | Check point | Voltage |
|---|---|---|---|
| ON | ON | ① - GND (Alternator B+)<br>② - GND (Start switch)<br>③ - GND (Cluster) | 12V |

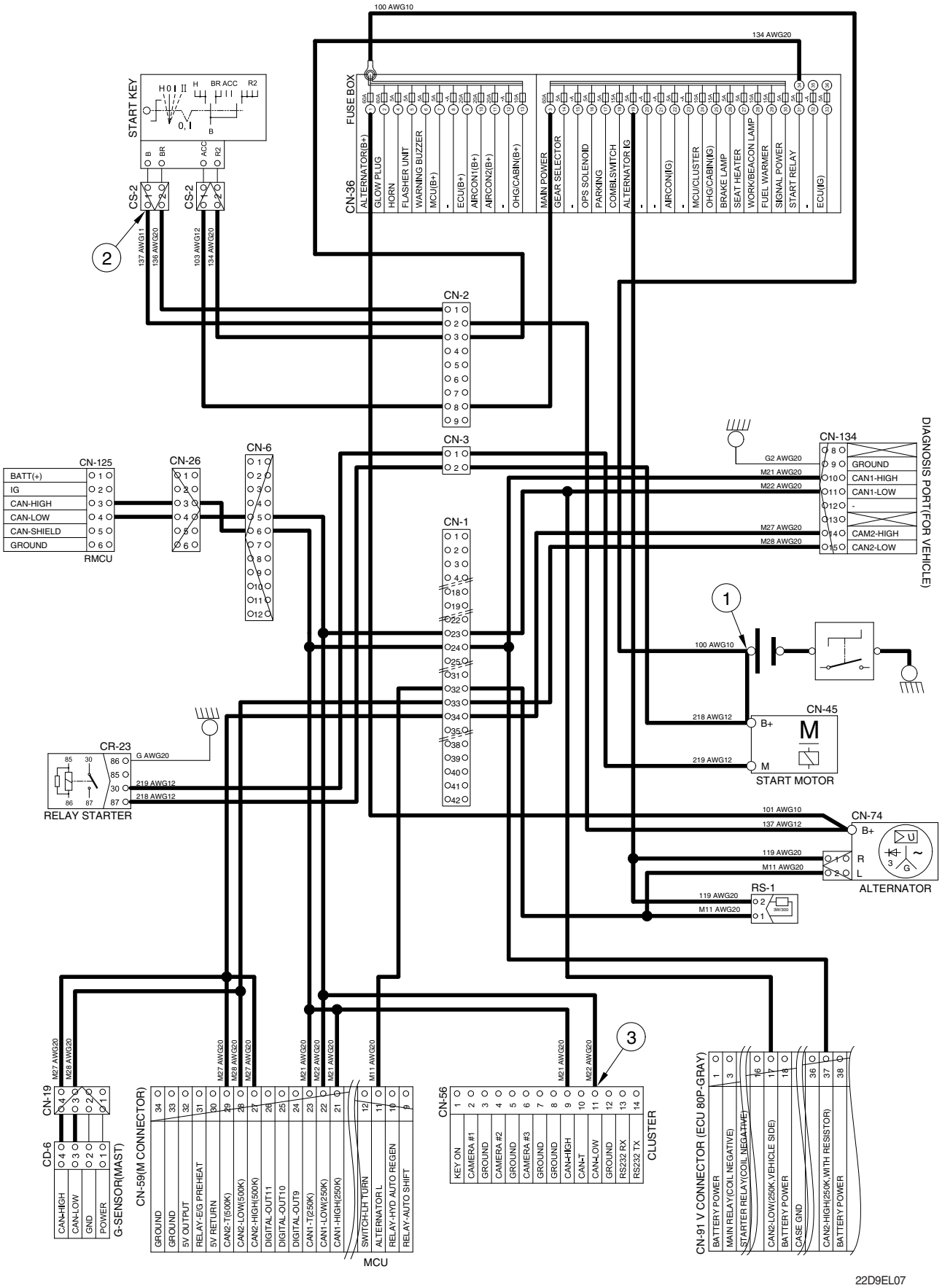
※ GND : Ground

### ※ 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




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

## 4. PREHEATING CIRCUIT

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

### 1) OPERATING FLOW

Battery (+) terminal → Fuse box [CN-36 (1)] → Alternator [CN-74 (B+)] → I/conn [CN-2 (2)]
→ I/conn [CS-2(1)] → Start switch
→ Fuse box [CN-36 (2)] → Glow relay [CR-24]

※ When you turn the start switch to the ON position, the glow relay makes the glow plugs operated and the glow lamp of the cluster turned ON.

Start switch ON [CS-2 (1)] → I/conn [CN-2 (8)] → Fuse box [CN-36 (3)] → I/conn [CN-1 (39)]
→ Cluster [CN-56 (1)] → Key ON
→ MCU [CN-59 (2)] → Key ON power → Glow relay ON [CR-24] → Glow plug operating

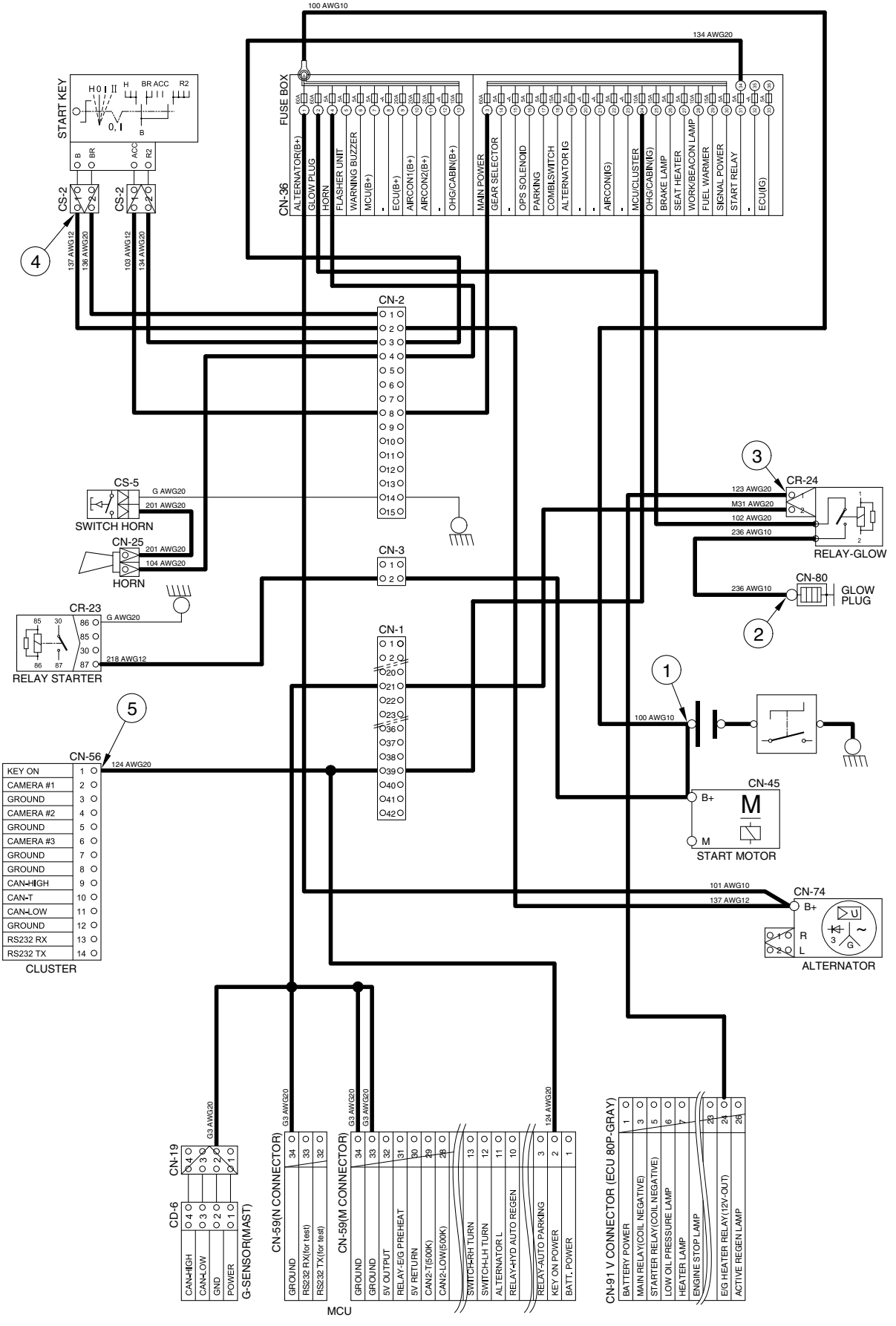
### 2) CHECK POINT

| Engine | Key switch | Check point | Voltage |
|---|---|---|---|
| Stop | HEAT | ① - GND (Battery B+)<br>② - GND (Glow plug)<br>③ - GND (Glow relay)<br>④ - GND (Start switch)<br>⑤ - GND (Cluster) | 12V |

※ GND : Ground

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

## PREHEATING CIRCUIT




22D9EL08

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

# GROUP 3 COMPONENT SPECIFICATION

| No | Part name | Qty | Specification | Remark |
|---|---|---|---|---|
| 1 | Battery | 1 | 12V-CMF100<br>RC : 190 min<br>CCA : 850A | |
| 2 | Working lamp | 1 | 12V, 55W | |
| 3 | License lamp | 1 | 12V, 10W | |
| 4 | Rear combination lamp (LED) | 2 | 12V, 1.6W (T/S) 12V, 1.1W (Back)<br>12V, 0.2W (Tail)<br>12V, 1.1W (Stop) | |
| 5 | Head lamp | 2 | 12V, 55W | |
| 6 | Flasher lamp | 2 | 12V (Posi : 0.5W, T/Signal : 2.2W) | |
| 7 | Beacon lamp (opt) | 1 | 12V, Max. 1.210A | |
| 8 | Beacon lamp - LED (opt) | 1 | 12V, Max. 0.800A | |
| 9 | Camera (opt) | | 12V, Max. 1.32W | |
| 10 | Flasher unit | 1 | 12V, 85±10C/M, (23W+23W)×2+3W×2 | |
| 11 | Backup alarm | 1 | 12V, 90±5dB, 60±10C/M | |
| 12 | Horn | 1 | 12V, MAX 3.5A, 105~120dB | |
| 13 | Fuel level sender | 1 | Reed switch - Magnet type<br>Float indicate: E / 4/8 / F<br>Resistance [Ω]: 700 / 350 / 50<br>Allowance [Ω]: $^{0}_{+5}$% / ±5% / $^{0}_{-5}$% | |
| 14 | Cluster | 1 | 12V, 15W | |
| 15 | 12V scoket | 1 | 12V, 120W | |
| 16 | G-sensor | 1 | 12V, 5W | |
| 17 | Master switch | | 180A | |
| 18 | Gear selector switch | 1 | 12V, (Resistive load max 12V/3.5A) | |
| 19 | Combination switch | 1 | 12V, Direction : Resistive load max 12V/3.5A<br>Multi switch : Resistive load max 12V/2A | |
| 20 | Parking brake switch | 1 | 12V, 20A | |
| 21 | Hazard switch | 1 | 12V, 20A | |
| 22 | Start switch | 1 | DC 12V | |
| 23 | Rear work lamp switch (opt) | 1 | 12V, 20A | |
| 24 | Beacon lamp switch (opt) | 1 | 12V, 20A | |
| 25 | Front wiper/washer switch (opt) | 1 | 12V, 20A | |
| 26 | Relay (4P) | 2 | 12V, 20A | |
| 27 | Relay (5P) | 2 | 12V, 20A | |

## GROUP 4 CONNECTOR DESTINATION

| Connector number | Type | No. of pin | Destination | Connector part No. | |
|---|---|---|---|---|---|
| | | | | Female | Male |
| CN-1 | AMP | 42 | I/conn (Dashboard harness-frame harness) | 936421 | 936429 |
| CN-2 | AMP | 15 | I/conn (Dashboard harness-frame harness) | 2-85262-1 | 368301-1 |
| CN-3 | KET | 2 | I/conn (Dashboard harness-frame harness) | MG642928-5 | MG652934-2 |
| CN-5 | KET | 12 | I/conn (Dashboard harness-OHG harness-RH) | MG610346 | MG640348 |
| CN-6 | KET | 12 | I/conn (OHG harness-LH-Dashboard harness) | MG610346 | MG640348 |
| CN-12 | MOLEX | 42 | Engine harness | 936421 | - |
| CN-13 | MOLEX | 12 | Engine harness | 33472-1206 | - |
| CN-14 | DAEDONG | 4 | Head/Turn lamp-RH | 110-4PR | - |
| CN-14A | DAEDONG | 4 | Head/Turn lamp-LH | 110-4PR | - |
| CN-15 | DAEDONG | 2 | Rear work lamp-RH | 110-2PR | - |
| CN-17 | KET | 2 | Tilt lever switch | MG610320 | - |
| CN-18 | AMP | 2 | 12V socket | 174352-2 | 174354-2 |
| CN-19 | AMP | 4 | G-sensor (mast) | 174257-2 | 174259-2 |
| CN-21 | AMP | 4 | Wiper motor | 180900 | - |
| CN-22 | AMP | 2 | Washer tank | 172130-1 | - |
| CN-24 | KET | 2 | Speaker | MG610070 | - |
| CN-25 | MOLEX | 2 | Horn | 35825-0211 | - |
| CN-26 | KET | 6 | RMCU (Remote control unit) | MG610335 | MG642554 |
| CN-27 | - | 16 | USB/Radio | PK145-16017 | - |
| CN-28 | KET | 4 | Hydraulic oil PS/temp sensor | MG610331 | - |
| CN-37 | KET | 8 | Knob gear selector | - | MG640341 |
| CN-39 | KET | 2 | I/conn (Cabin harness, LH-RH) | MG610320 | MG640322 |
| CN-40 | KET | 3 | Heater harness | - | MG640329 |
| CN-43 | KET | 2 | Air conditioner harness | - | MG652934-5 |
| CN-44 | KET | 1 | Air conditioner harness | - | MG640280 |
| CN-45 | AMP | 1 | Start motor M | 171809-2 | - |
| CN-56 | AMP | 14 | Cluster | 776273-2 | - |
| CN-59M | AMP | 34 | Machine control unit | 4-1437290-0 | - |
| CN-59N | AMP | 34 | Machine control unit | 4-1437290-1 | - |
| CN-65 | KET | 2 | Back buzzer | - | MG640322 |
| CN-71 | DEUTSCH | 2 | Parking solenoid | DT06-2S | - |
| CN-74 | KET | 2 | Alternator | MG610043 | - |
| CN-80 | RING TERM | - | Glow plug | S820-304000 | |
| CN-90E | MOLEX | 80 | Engine ECU | 34566-1903 | - |
| CN-91V | MOLEX | 80 | Engine ECU | 34566-0803 | - |
| CN-96 | RING TERM | 2 | Fuel warmer | 6195-0060 | - |

| Connector number | Type | No. of pin | Destination | Connector part No. | |
|---|---|---|---|---|---|
| | | | | Female | Male |
| CN-97 | KET | 2 | Fuel feed pump | MG610043 | - |
| CN-113 | KET | 2 | OPSS buzzer | MG610320 | - |
| CN-122 | DEUTSCH | 2 | Forward solenoid | DT06-2S | - |
| CN-123 | DEUTSCH | 2 | Reverse solenoid | DT06-2S | - |
| CN-124 | AMP | 6 | Accel pedal | 174262-2 | - |
| CN-130 | PACKARD | 2 | Cut off solenoid 2 (Tilt, lift) | 12015792 | - |
| CN-131 | PACKARD | 2 | Cut off solenoid 1 (Lift down) | 12015792 | - |
| CN-134 | KET | 20 | Diagnosis port (Vehicle) | MG652863 | - |
| CN-139 | KET | 2 | 12V socket | MG610043 | - |
| CN-140 | KET | 3 | MCU update | MG610327 | - |
| CN-157 | AMP | 4 | Service port | 174257-2 | 174259-2 |
| CN-249 | AMP | 4 | Camera rear view | 174257-2 | 174259-2 |
| **Switch** | | | | | |
| CS-2 | KET | 2 | Start switch | MG610281 | MG630418 |
| CS-3 | CARLING | 10 | Wiper/washer switch | 21HN-56300 | - |
| CS-5 | KET | - | Horn switch | S820-105000 | - |
| CS-6 | CARLING | 10 | Heater switch | 21HN-56300 | - |
| CS-11 | DEUTSCH | 6 | Gear selector | DT06-6S | - |
| CS-12 | DEUTSCH | 6 | Combination switch | DT06-6S-P012 | - |
| CS-13 | KET | 1 | Tilt lever switch | ST730018-3 | ST750036-3 |
| CS-17 | CARLING | 10 | Parking switch | 21HN-56300 | - |
| CS-21 | CARLING | 10 | Work lamp switch (rear) | 21HN-56300 | - |
| CS-23 | CARLING | 10 | Beacon lamp switch | 21HN-56300 | - |
| CS-41 | CARLING | 10 | Hazard switch | 21HN-56300 | - |
| CS-73 | DEUTSCH | 6 | Seat switch | DT06-6S | - |
| CS-74 | CARLING | 10 | Fuel warmer switch | 21HN-56300 | - |
| CS-77 | KET | 1 | Horn switch | ST730018-3 | ST750036-3 |
| **Lamp** | | | | | |
| CL-1 | KET | 2 | Room lamp | MG610392 | - |
| CL-3 | KET | 2 | Head lamp-RH | ST730018-3 | ST750036-3 |
| CL-3A | KET | 2 | Head lamp-LH | ST730018-3 | ST750036-3 |
| CL-7 | DEUTSCH | 2 | Beacon lamp | DT06-2S | DT04-2P |
| CL-14 | AMP | 3 | Front turn lamp-RH | 936187-3 | - |
| CL-14A | AMP | 3 | Front turn lamp-LH | 936187-3 | - |
| CL-15 | DAEDONG | 6 | Combination lamp-LH | 110-6PR | - |
| CL-16 | DAEDONG | 6 | Combination lamp-RH | 110-6PR | - |
| CL-21 | KET | 2 | License lamp | ST730018-3 | ST750036-3 |
| CL-23 | DAEDONG | 2 | Working lamp | 110-2PR | - |

| Connector number | Type | No. of pin | Destination | Connector part No. | |
|---|---|---|---|---|---|
| | | | | Female | Male |
| **Relay** | | | | | |
| CR-5 | OMRON | 5 | Neutral relay | 21HN-55510 | - |
| CR-11 | - | 3 | Flasher unit relay | 312_GIHUNG 3P | - |
| CR-13 | OMRON | 5 | Head lamp relay | 21HN-55510 | - |
| CR-14 | KET | 5 | Horn relay (opt) | MG640927 | - |
| CR-15 | KET | 5 | Neutral signal relay (opt) | MG640927 | - |
| CR-23 | KET | 4 | Starter relay | MG612017-5 | - |
| CR-24 | KET | 2 | Glow relay | MG610043 | - |
| CR-43 | OMRON | 5 | ECU (B+) relay | MG640927 | - |
| CR-45 | OMRON | 5 | ECU (IG) relay | 21HN-55510 | - |
| CR-50 | OMRON | 5 | Travel cut relay | 21HN-55510 | - |
| CR-51 | OMRON | 5 | Attach cut relay | 21HN-55510 | - |
| CR-52 | OMRON | 5 | Brake lamp relay | 21HN-55510 | - |
| CR-56 | OMRON | 5 | Auto park relay | 21HN-55510 | - |
| **Sensor and pressure switch** | | | | | |
| CD-2 | KET | 3 | Fuel level sender | MG610327 | - |
| CD-4 | DEUTSCH | 4 | Brake oil pressure sensor | DT06-4S | - |
| CD-6 | DEUTSCH | 4 | G-sensor (Mast agnle) | DT06-4S | - |
| CD-10 | KET | 1 | Air cleaner switch | ST730057-2 | - |
| CD-26 | AMP | 1 | Parking pressure switch | 171809-2 | - |
| CD-29 | DEUTSCH | 4 | T/M oil PS/temp sensor | DT06-4S | - |
| CD-35 | AMP | 3 | Wif switch | 85205-1 | - |
| CD-50 or | DEUTSCH | 3 | Load sensor | DTM06-3S | - |
| CD-70 | DEUTSCH | 3 | Load sensor | DT06-3S | - |
| CD-59 | KET | 2 | Brake oil level | MG610320 | - |
| CD-64 | SUMITOMO | 5 | Air flow sensor | 6189-1046 | - |
| CD-73 | AMP | 3 | Speed sensor (TM) | 85205-1 | - |
| **Diode** | | | | | |
| DO-01 | QPL | - | Diode | 21EA-50550 | - |
| DO-02 | QPL | - | Diode | 21EA-50550 | - |
| DO-03 | QPL | - | Diode | 21EA-50570 | - |

| 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.<br>· Faulty wiring. | · Replace.<br>· Check and repair. |
| Alternator makes abnormal sounds. | · Alternator defective. | · Replace |
| Starting motor fails to run. | · Faulty wiring.<br>· Insufficient battery voltage. | · Check and repair.<br>· Recharge battery. |
| Starting motor pinion repeats going in and out. | · Insufficient battery voltage. | · Recharge battery. |
| Excessively low starting motor speed. | · Insufficient battery voltage.<br>· Starting motor defective. | · Recharge battery.<br>· Replace |
| Starting motor comes to a stop before engine starts up. | · Faulty wiring.<br>· Insufficient battery voltage. | · Check and repair.<br>· Recharge battery. |
| Heater signal does not become red. | · Faulty wiring.<br>· Glow plug damaged. | · Check and repair.<br>· Replace |
| Engine oil pressure caution lamp does not light when engine is stopped (with starting switch left in"ON" position). | · Caution lamp defective.<br>· Caution lamp switch defective. | · Replace<br>· Replace |