INDEX



## GENERAL INFORMATION

1. HOW TO READ ELECTRICAL WIRING DIAGRAM..... 3

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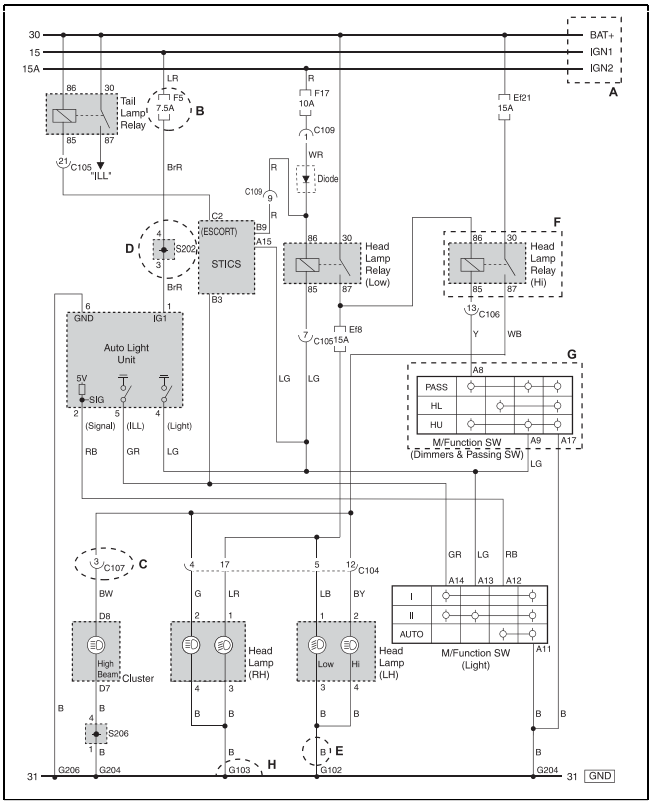
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# GENERAL INFORMATION

## 1. HOW TO READ ELECTRICAL WIRING DIAGRAM

### 1) HOW TO READ ELECTRICAL WIRING DIAGRAM




### 2) CONTENTS OF ELECTRICAL WIRING DIAGRAM (CIRCUIT)

| Position | Explanation |
|---|---|
| A | - Upper horizontal lines : Power supply lines<br>- Power supply lines : 30, 15, 15A, 15C, 58 |
| B | - Ef20 or F2 : Fuse Number<br>·Ef20 : Fuse No #20 in engine room compartment<br>·F2 : Fuse No #2 in passenger room compartment |
| C | - Connector (C101 ~ C903)<br>·Connector No C203 terminal No1<br>·Refer to Major Connector Position (Section 2) |
| D | - S201 : Splice pack (S201 ~ S207)<br>·Refer to Major Splice Pack Position (Section2) |
| E | - Wiring Harness Color<br>·Refer to Wiring Harness Color Abbreviation |
| F | - Internal circuit of component (Relay)<br>(Component Name and Terminal Number) |
| G | - Internal circuit of component (Switch)<br>(Component Name, Terminal Number and Connecting Wiring Circuit) |
| H | - Lower horizontal line : Ground line<br>·Ground position (G101 ~ G402)<br>·B : Body Ground<br>·Refer to Major Ground Position (Section2) |



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### 3) CIRCUIT IDENTIFICATION SYMBOL

| Identification Symbol | Meaning |
|---|---|
| C | Connector |
| D | Diode |
| Ef | Fuse in engine room fuse & relay box |
| F | Fuse in passenger room fuse box |
| G | Ground |
| S | Splice pack (Junction connector) |

### 4) FUNCTION OF POWER SUPPLY LINE (NUMBER)

| Power supply No. | Power supply condition |
|---|---|
| 15 | Battery Voltage (B+) supply in Ignition Switch "ON" and "ST" (IGN 1) |
| 15A | Battery Voltage (B+) supply in Ignition Switch "ON" (IGN 2) |
| 15C | Battery Voltage (B+) supply in Ignition Switch "ON" and "ACC" |
| 30 | Battery Voltage (B+) supply directly regardless of Ignition Switch |
| 31 | Ground connected to battery (-) |
| 58 | Battery Voltage (B+) supply in Head Lamp Switch 1st and 2nd step (Illumination circuit) |

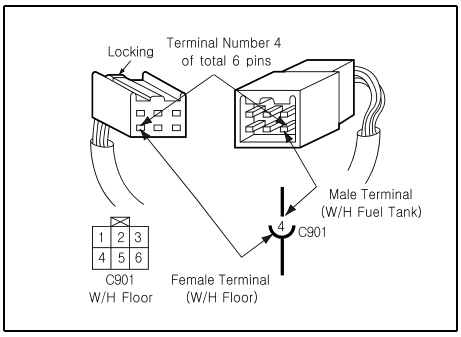
### 5) WIRING HARNESS COLOR IDENTIFICATION

| Abbreviation | Color | Abbreviation | Color |
|---|---|---|---|
| Br | Brown | Sb | Sky Blue |
| G | Green | R | Red |
| V | Violet | L | Blue |
| P | Pink | Y | Yellow |
| W | White | Gr | Gray |
| Or | Orange | B | Black |
| Lg | Light Green | | |

### 6) HOW TO CHECK TERMINAL NUMBER OF CONNECTOR

▶ **Terminal number is given based on Female Terminal Male Connector**

- ex) Terminal Number 4 of C901 connection






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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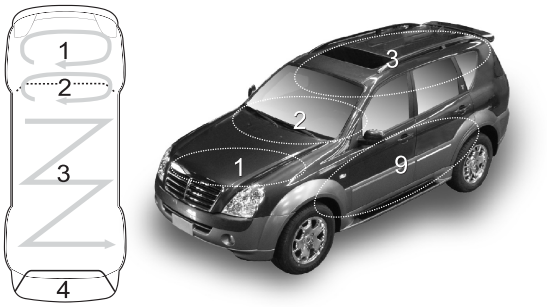
## 7) PART LOCATION ACCORDING TO PART NUMBER

▶ **Ex.) C 1 0 2**

- C : Symbol character for connector

| Symbol Character | Description |
|---|---|
| C | Connector (Connecting part that connects two wiring harness) |
| D | Diode |
| G | Ground |
| S | Splice pack (Joint connector that connects various wiring harness) |

- 1 : Part location number




- Part number according to locating section

| Part Numbe | Location |
|---|---|
| □ 1□□ | Engine compartment |
| □ 2□□ | Instrument panel |
| □ 3□□ | Passenger compartment |
| □ 4□□ | Tailgate |
| □ 9□□ | Underbody |

- In the locating section, the assignment for part number startsfrom left bottom and proceeds clockwise.
- In the fuse and relay box or the instrument panel, the partnumber is assigned from left top to light bottom.

## 8) ELECTRIC SYMBOLS

| Items | Symbols | Items | Symbols |
|---|---|---|---|
| Resistance | | Lamp | |
| Rheostat | | Single Bulb | |
| Coil, Inductance | | Double Bulb | |
| Condenser, Capacitor | | Transistor : PNP type | |
| Ground, Earth | | Transistor : NPN type | |
| Diode | | ~Meter, ~Gauge | |
| Zener Diode | | Voltmeter | V |
| Photo Diode | | Amperemeter | A |
| Light Emitting Diode | | Switch | |
| Battery | | Thermistor | |
| Disconnected Wire | | Junction Point | |
| Fuse | | Fusible Link | |
| Motor | M | Connector | No. |
| Speaker | | Horn | |



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# 8201-00/8210-00/8210-02/8210-03/8210-09/8210-10/8210-06/8210-07/8210-08



## WIRING

8201-00 WIRING HARNESS, COMPONENTS LOCATION..... 3

## CONNECTOR/GROUND

8210-00 W/H ENGINE ROOM..... 24
8210-02 W/H MAIN..... 25
8210-03 W/H FLOOR..... 27
8210-09 W/H ROOF..... 29
8210-06 W/H DRIVER DOOR..... 29
8210-07 W/H PASSENGER DOOR..... 30
8210-08 W/H RR DOOR..... 30
8210-10 W/H TAIL GATE..... 31

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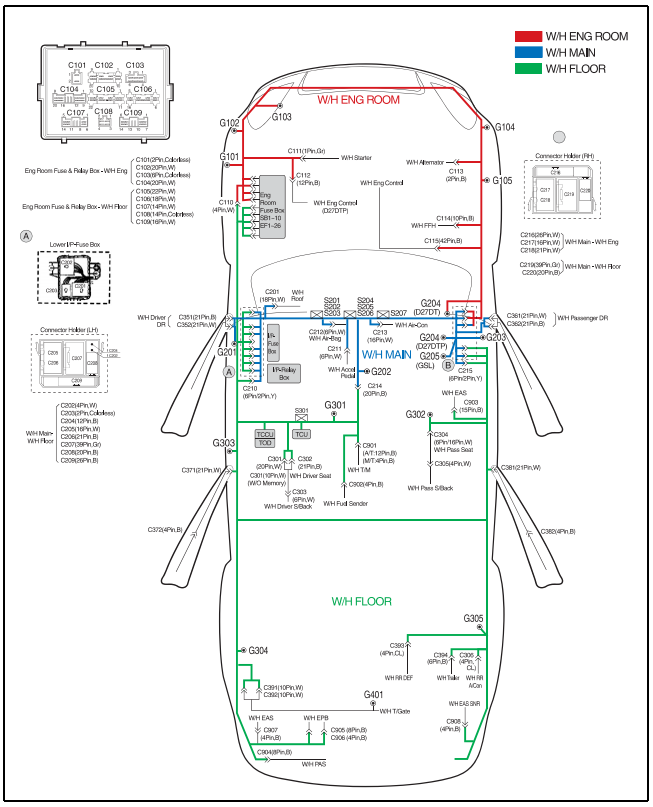
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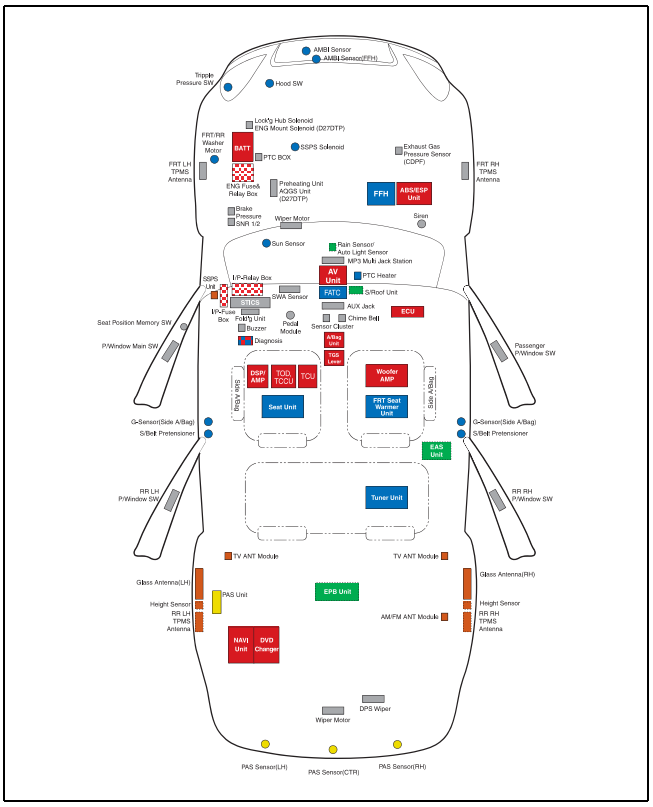
## WIRING HARNESS

### 8201-00 WIRING HARNESS, COMPONENTS LOCATION

#### 1) WIRING HARNESS




#### 2) COMPONENTS LOCATION




| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |



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## 3) CONNECTOR, GROUND & SPLICE PACK INFORMATION

▶ **CONNECTOR**

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C101 (2Pin, Colorless) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C103 (6Pin, Colorless) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C108 (4Pin, Colorless) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C110 (4Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C111 (1Pin, Gray) | W/H Floor - Starter Motor | Under the Preheating Time Relay | Solenoid |
| C112 (12Pin, Black) | W/H Eng - W/H Eng Control | Under the Preheating Time Relay | D27DTP |
| C113 (2Pin, Black) | W/H Eng - W/H Alternator | Under the Coolant Reserve Tank | |
| C114 (16Pin, Black) | W/H Eng - W/H FFH | Backside Coolant Reserve Tank | FFH |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C201 (18Pin, White) | W/H Main - W/H Roof | Under the I/P Fuse Box | |
| C202 (4Pin, White) | W/H Main - W/H Floor | Under the I/P Fuse Box | PTC |
| C203 (2Pin, Colorless) | W/H Main - W/H Floor | Under the I/P Fuse Box | |
| C204 (12Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C208 (20Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C210 (6Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Driver Cowl Side C/Holder | Side A/Bag |
| C210 (2Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Driver Cowl Side C/Holder | |
| C211 (6Pin, White) | W/H Main - W/H Accel Pedal | Inside the Driver Under-Cover | |
| C212 (6Pin, White) | W/H Main - W/H Air Bag | Backside the Cluster(Inside I/P) | |
| C213 (16Pin, White) | W/H Main - W/H A/Con | Backside the A/V Head Unit | |
| C213A (13Pin, White) | W/H A/Con - W/H Blower | Backside the Glove Box | |
| C214 (20Pin, Black) | W/H Main - W/H Floor | Lower the Console Box | |
| C215 (6Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Passenger Cowl Side C/Holder | Side A/Bag |
| C215 (2Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Passenger Cowl Side C/Holder | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C218 (21Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C220 (20Pin, Black) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Seat Warmer |
| C302 (21Pin, Black) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C303 (6Pin, White) | W/H Driver Seat - W/H Seat Back | Under the Driver Seat | Memory/Power |
| C304 (16Pin, White) | W/H Floor - W/H Passenger Seat | Under the Passenger Seat | Power |
| C304 (6Pin, White) | W/H Floor - W/H Passenger Seat | Under the Passenger Seat | Seat Warmer |
| C305 (4Pin, White) | W/H Passenger Seat - W/H Seat Back | Under the Passenger Seat | Power |
| C306 (4Pin, Colorless) | W/H Floor - W/H RR A/Con | Inside the 3RD Seat RH Trim | Duel A/Con |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C361 (21Pin, White) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C372 (4Pin, Black) | W/H RR LH DR - W/H DR EXTN | Inside the RR LH DR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| C382 (4Pin, Black) | W/H RR RH DR - W/H DR EXTN | Inside the RR RH DR | |
| C391 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| C392 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| C393 (4Pin, Colorless) | W/H Floor - W/H Tail Gate | Inside the RR RH Upper QTR Trim | |
| C394 (6Pin, Black) | W/H Floor - W/H Trailer | Under the RR Bumper (RH) | Trailer |
| C901 (12Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | A/T |
| C901 (4Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | M/T |
| C902 (4Pin, Black) | W/H Floor - W/H Fuel Sender | Upper the T/M | |
| C903 (15Pin, Black) | W/H Floor - W/H EAS | Lower the Passenger | |
| C904 (8Pin, Black) | W/H Floor - W/H PAS | Under the RR Bumper (LH) | |
| C905 (8Pin, Black) | W/H Floor - W/H EPB | Under the RR Bumper (LH) | |
| C906 (4Pin, Black) | W/H Floor - W/H EPB | Under the RR Bumper (LH) | |
| C907 (4Pin, Black) | W/H Floor - W/H EAS Sensor | Under the RR Bumper (LH) | |
| C908 (4Pin, Black) | W/H Floor - W/H EAS Sensor | Under the RR Bumper (RH) | |



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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▶ **GROUND**

| Connector Number | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| G101 | W/H Eng | Center the Eng Room Fuse Box | |
| G102 | W/H Eng | Center the Eng BATT | |
| G103 | W/H Eng | Backside LH Head Lamp | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G105 | W/H Eng | Beside Coolant Reserve Tank | ABS/ESP |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G202 | W/H Main | Lower the Console Box | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G204 | W/H Main | Beside Eng ECU (D27DTP) | |
| G205 | W/H Main | Beside Eng ECU (GSL) | |
| G301 | W/H Floor | Under the Driver Seat | |
| G302 | W/H Floor | Under the Passenger Seat | |
| G303 | W/H Floor | Under the LH "B" PLR | |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the LH QTR GLS Lower | |
| G401 | W/H Tail Gate | Center the Tail Gate | |
| G402 | W/H Tail Gate | LH The Tail Gate | |

▶ **SPLICE PACK**

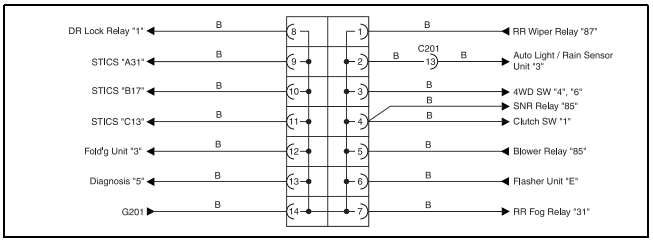
| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |



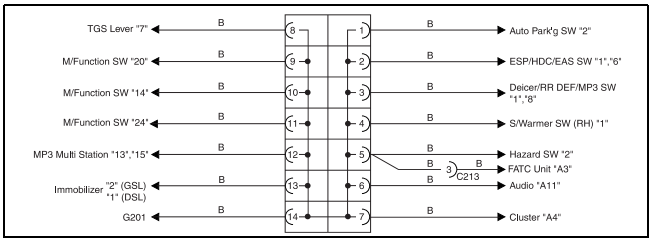
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## 4) SPLICE PACK CIRCUIT

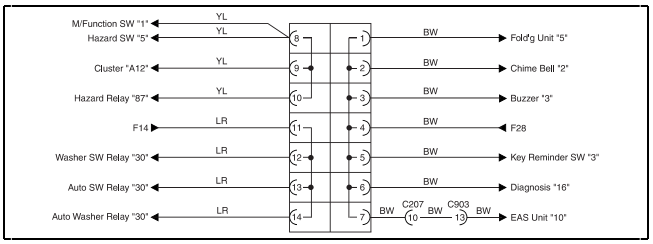
▶ S201 (GND)



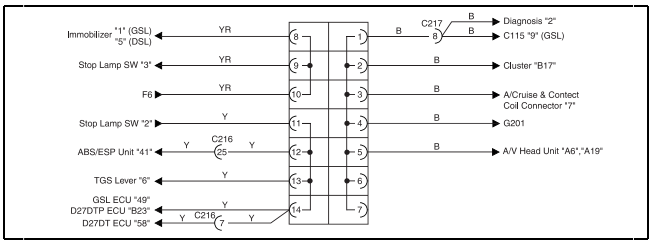

▶ S204 (GND)



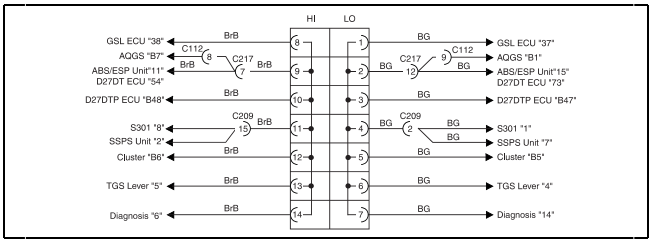

▶ S202



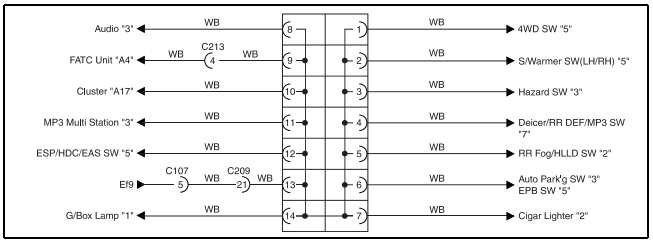

▶ S205




▶ S203 (CAN)




▶ S206 (ILL)

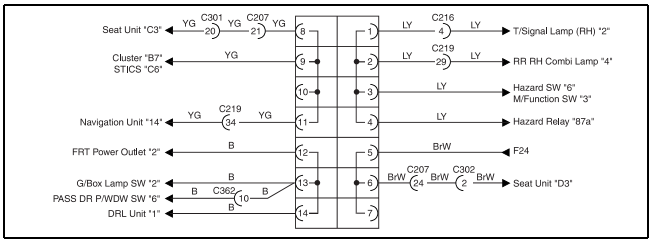




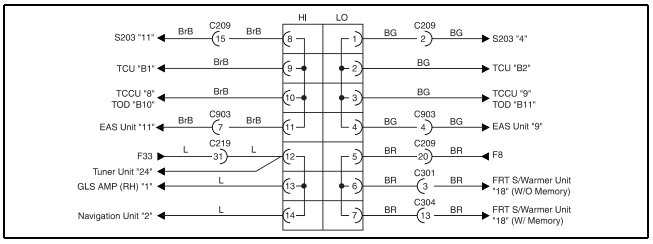

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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▶ **S207**




▶ **S301 (CAN)**



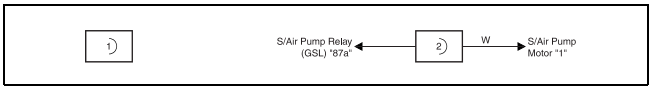

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |



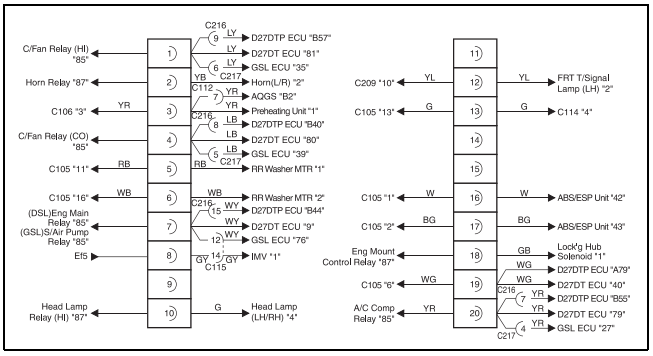
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## 5) CONNECTOR CIRCUIT

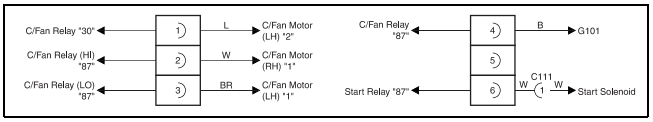
▶ C101



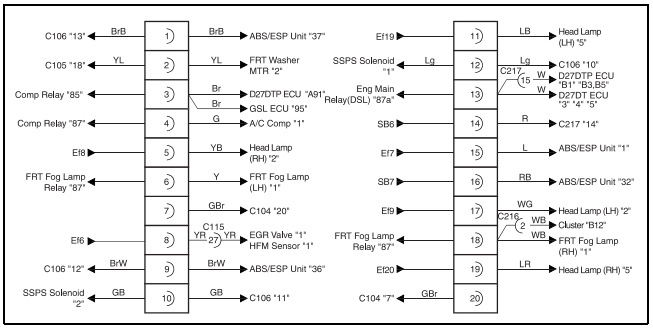

▶ C102



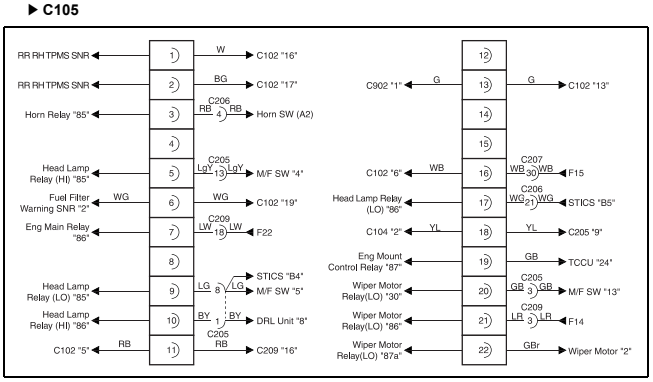

▶ C103



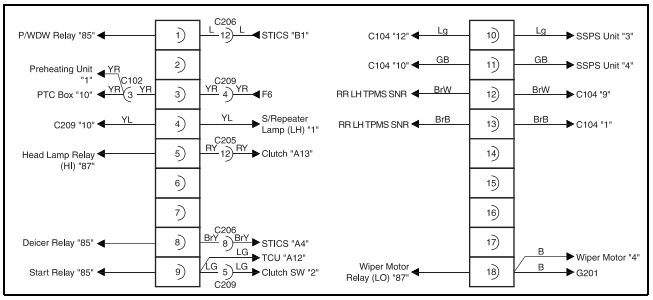

▶ C104




▶ C105




▶ C106

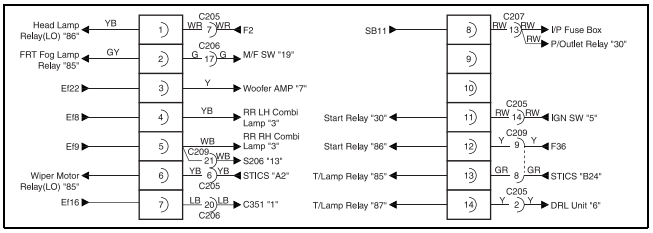





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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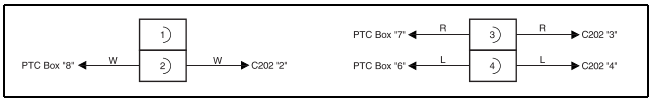
### ▶ C107



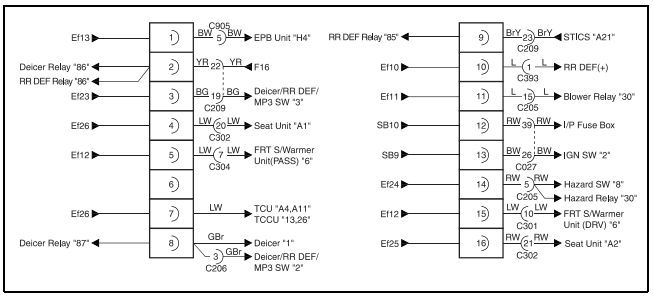

### ▶ C108



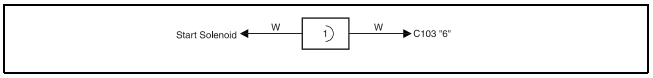

### ▶ C109



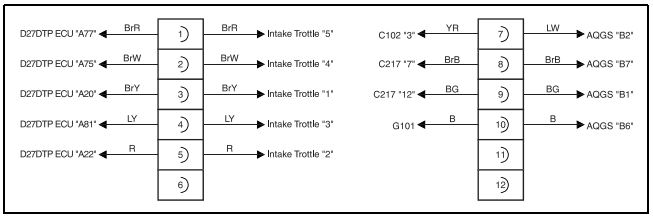

### ▶ C110



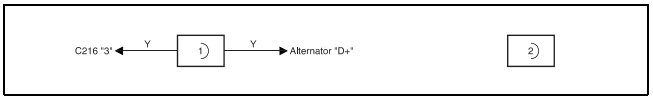

### ▶ C111



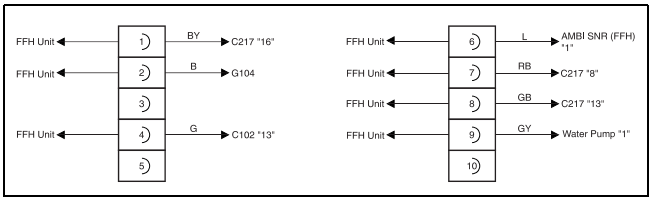

### ▶ C112




### ▶ C113




### ▶ C114



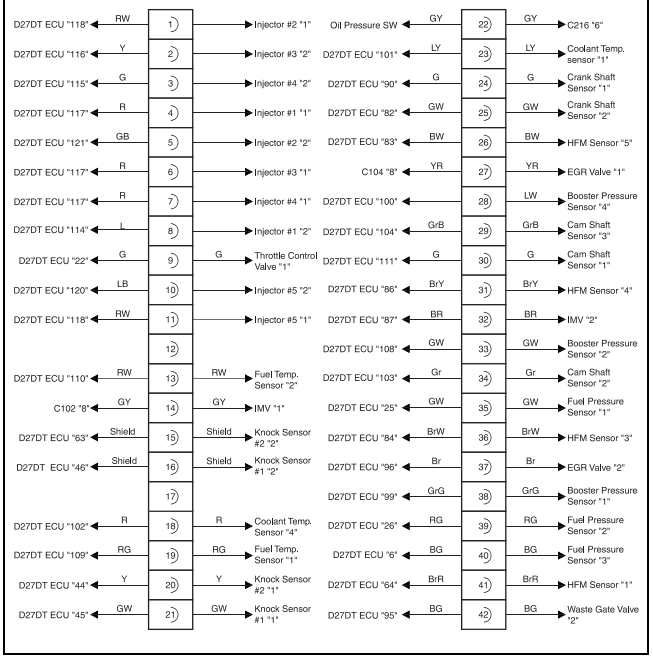

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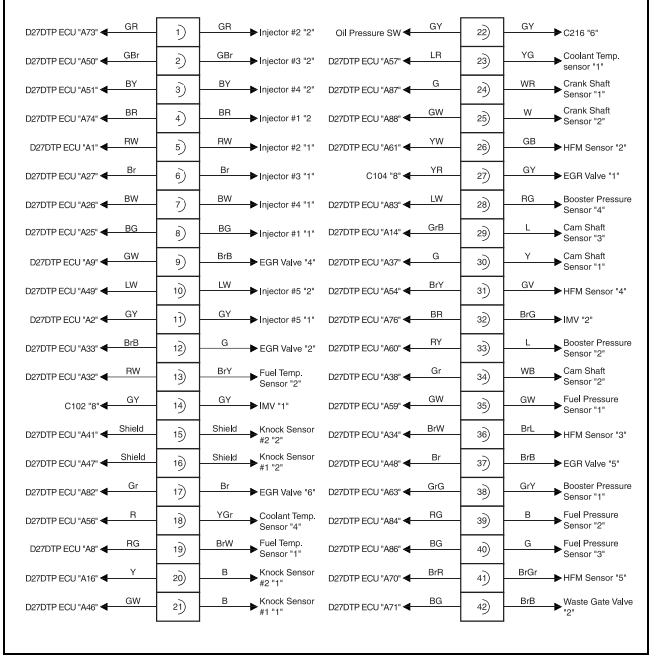
▶ C115

(D27DT)




▶ C115

(D27DTP)

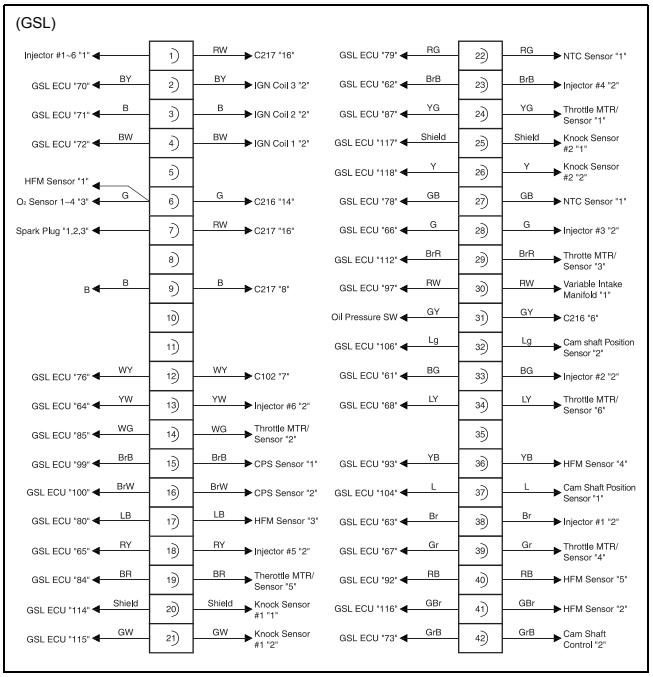




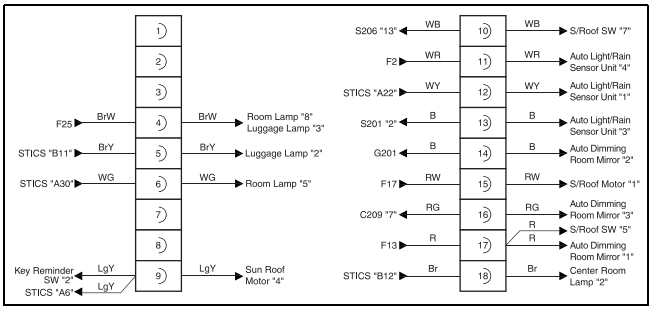

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| Application basis | |
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▶ C115



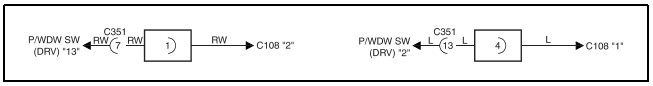

▶ C201



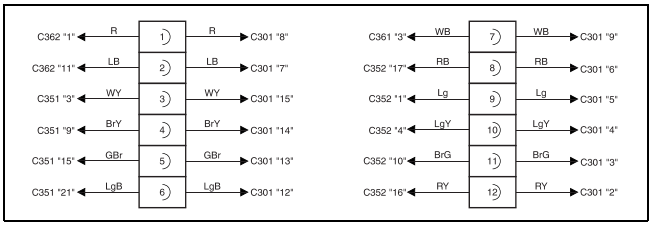

▶ 202




▶ C203




▶ C204

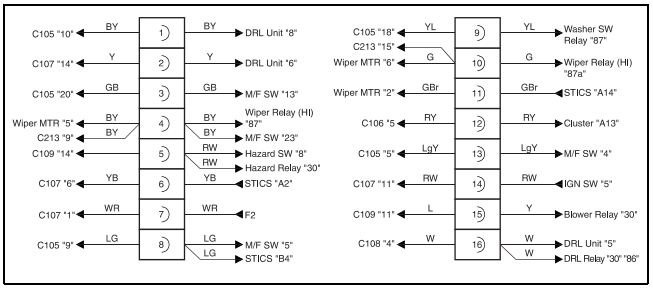



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| Application basis | |
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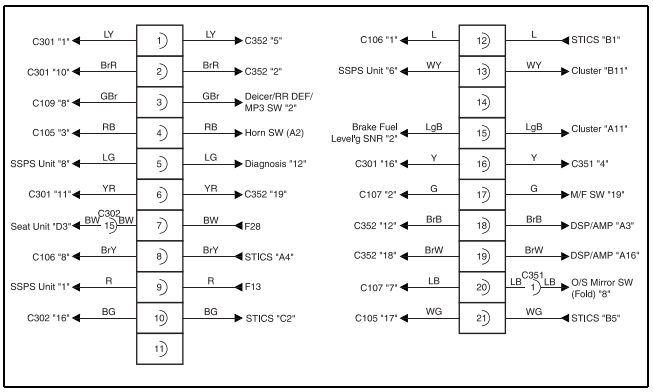


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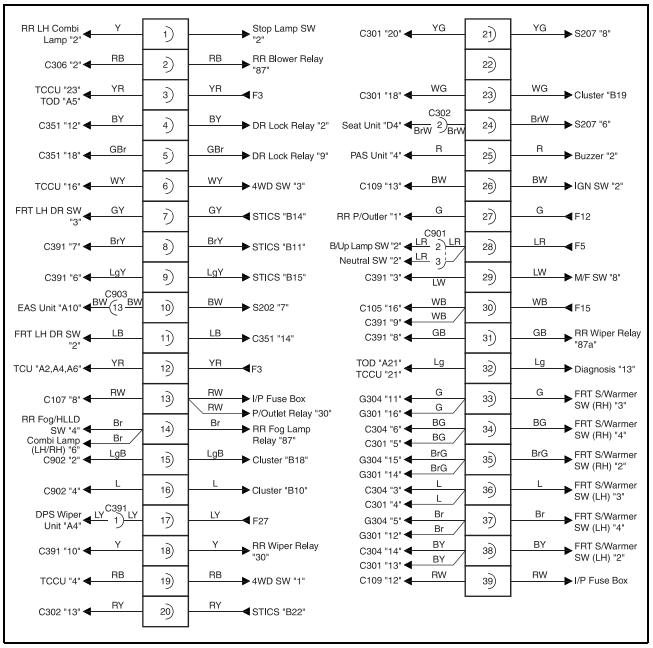
▶ C205




▶ C206




▶ C207

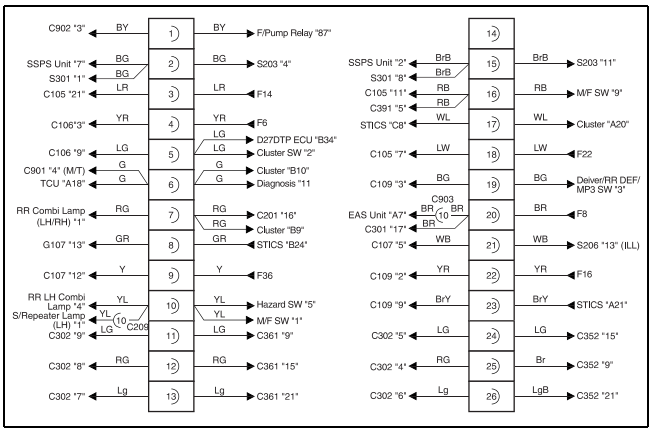




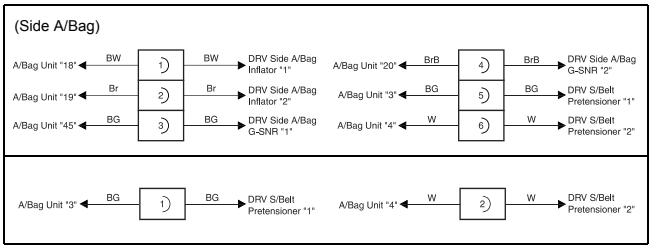

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| Modification basis | |
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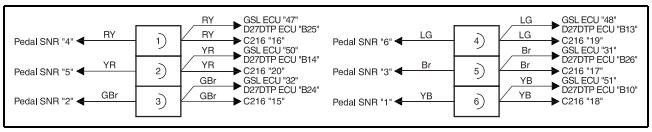
### ▶ C209



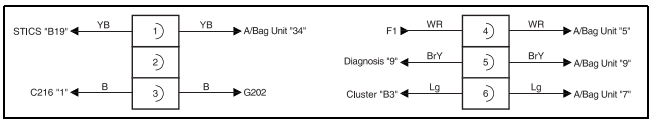

### ▶ C210



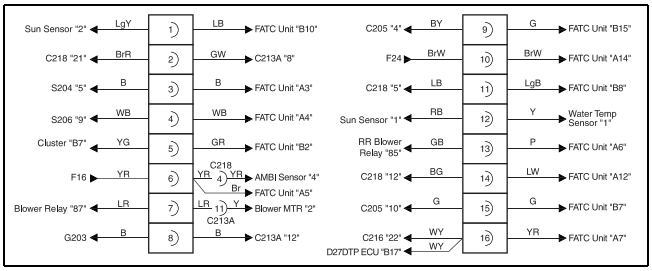

### ▶ C211



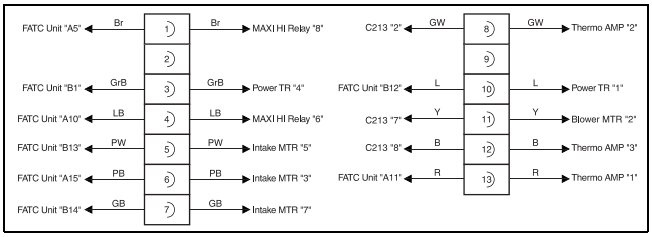

### ▶ C212




### ▶ C213




### ▶ C213A

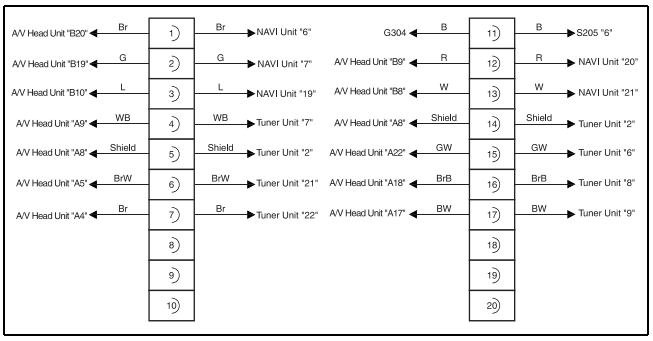



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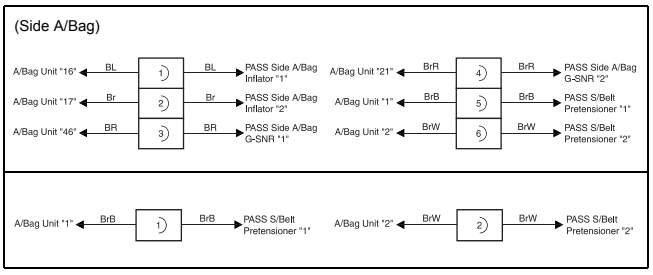


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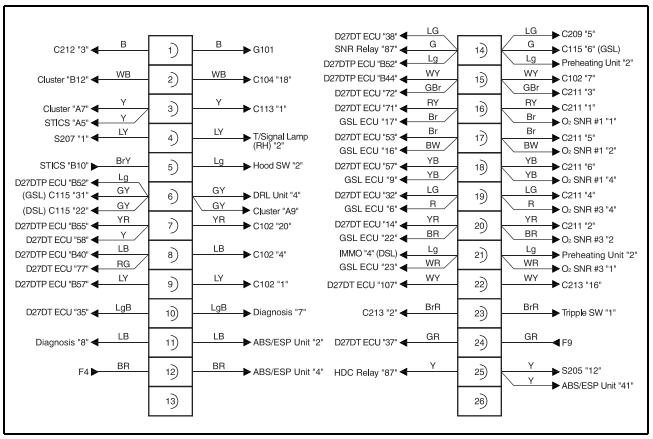
▶ C214



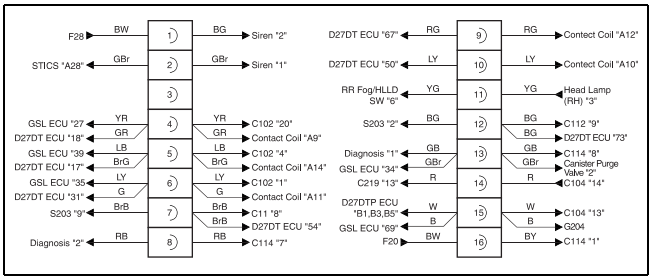

▶ C215




▶ C216




▶ C217

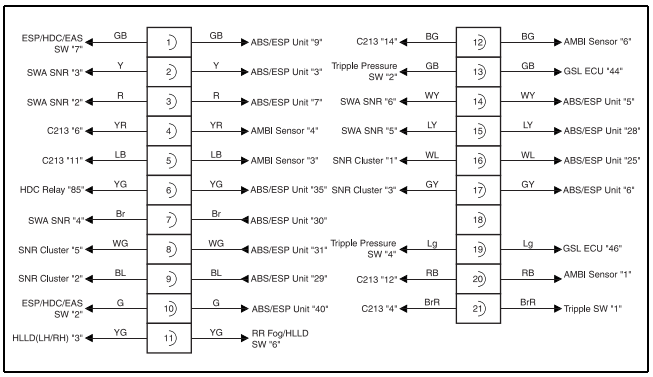




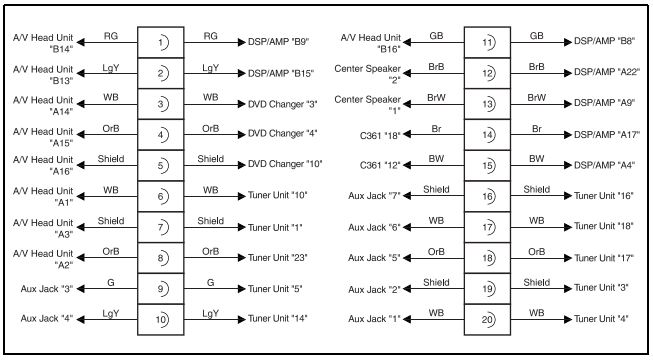

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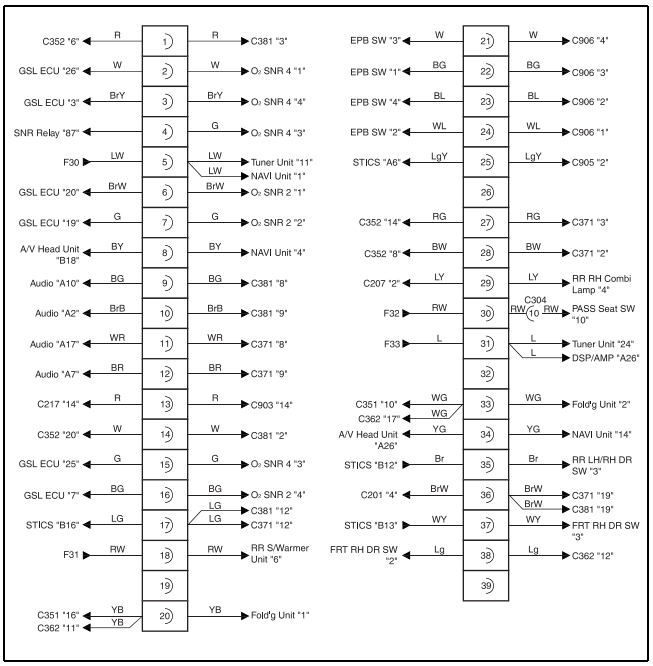
▶ C218




▶ C220




▶ C219



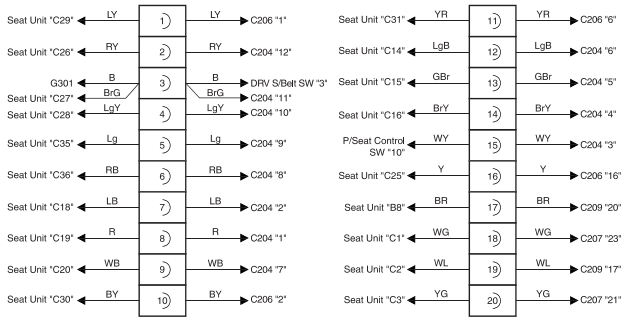

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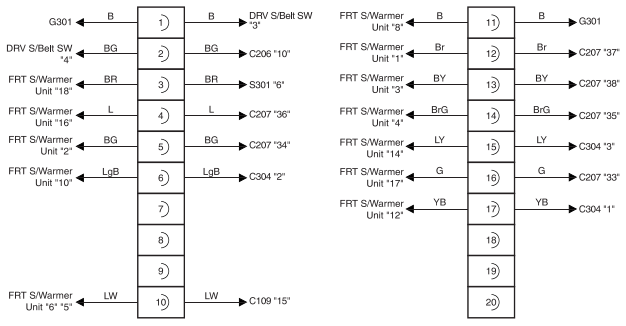
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▶ **C301**

(W/ Memory, Power)

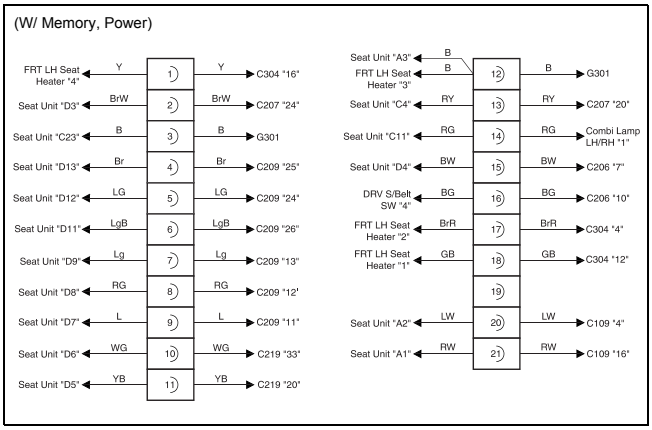



(W/O Memory)

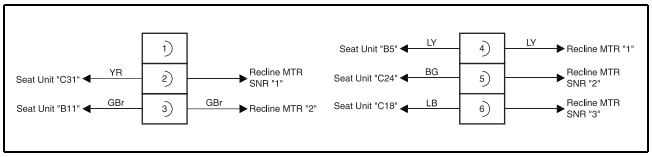



▶ **C302**

(W/ Memory, Power)




▶ **C303**



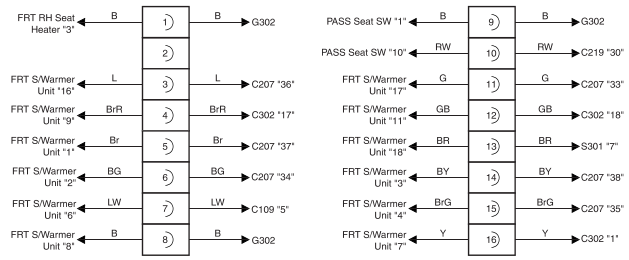



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| Modification basis | |
| Application basis | |
| Affected VIN | |

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## ▶C304

(W/ Memory, Power)

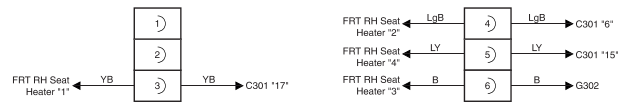



(W/O Memory)

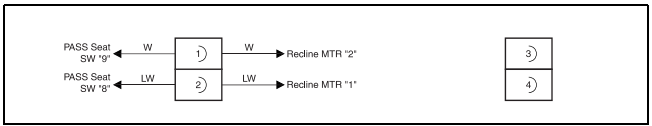



## ▶C305

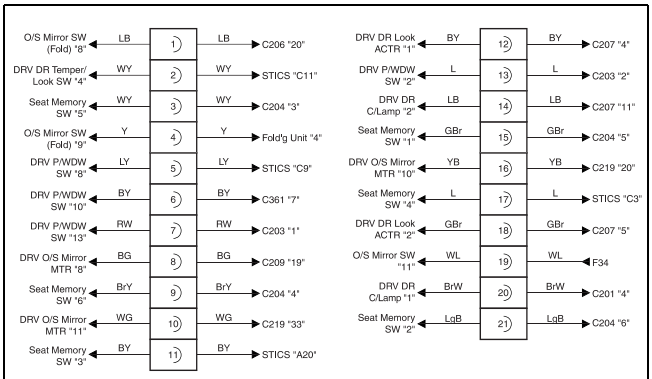
(W/ Memory, Power)



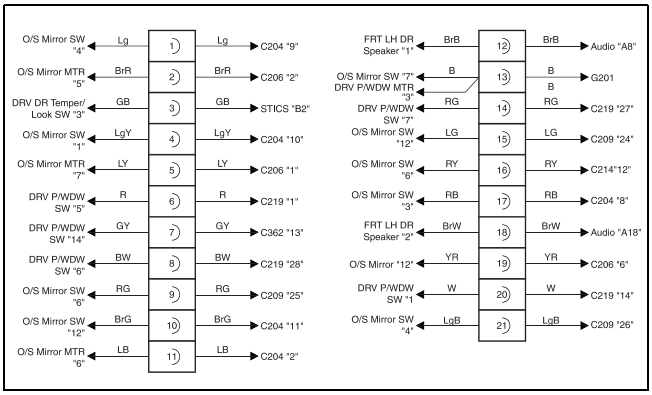

## ▶C306




## ▶C351



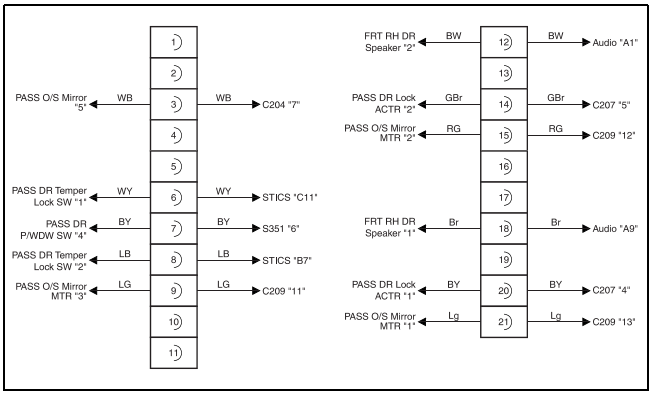

## ▶C352



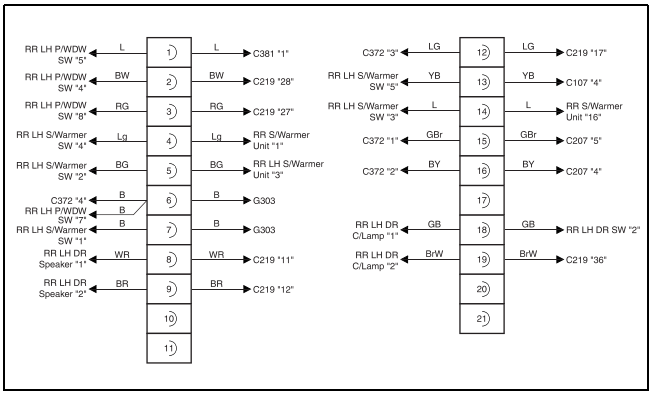



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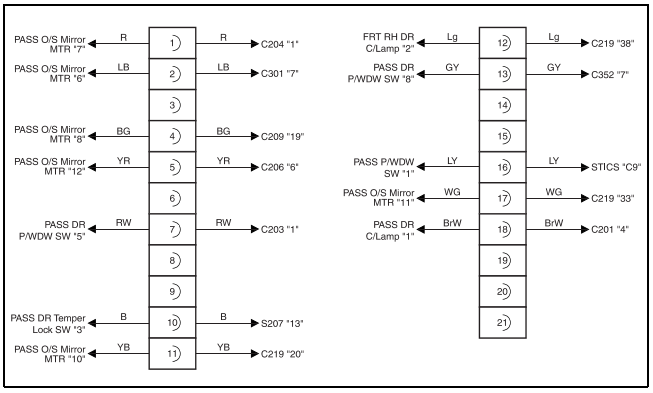
▶C361



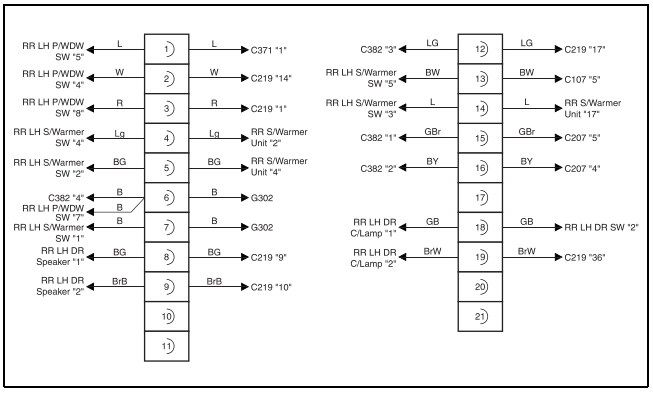

▶C371




▶C362




▶C381

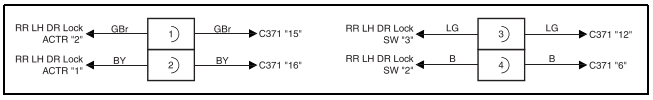




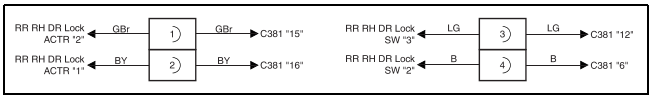

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| Modification basis | |
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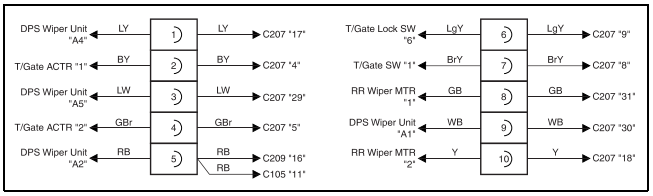
### ▶C372



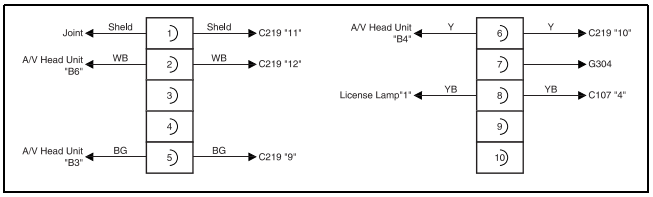

### ▶C382



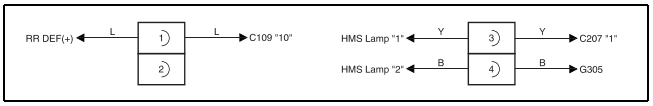

### ▶C391



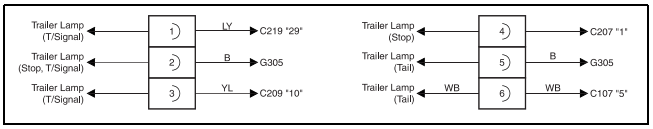

### ▶C392




### ▶C393

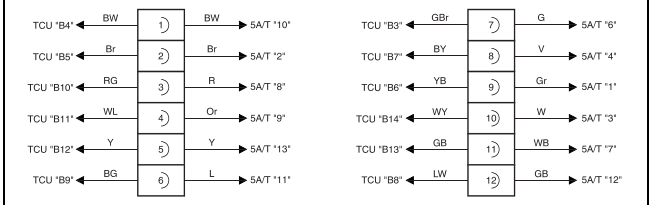



### ▶C394

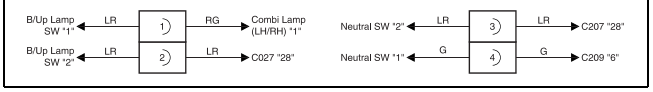



### ▶C901

(A/T)

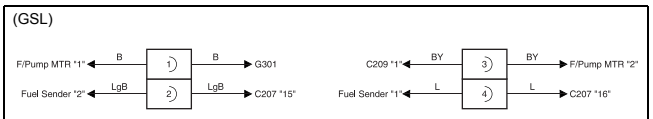



(M/T)

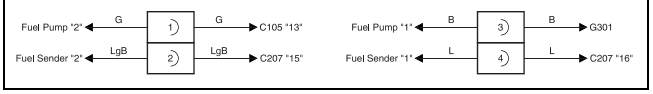



### ▶C902

(GSL)




(DSL)

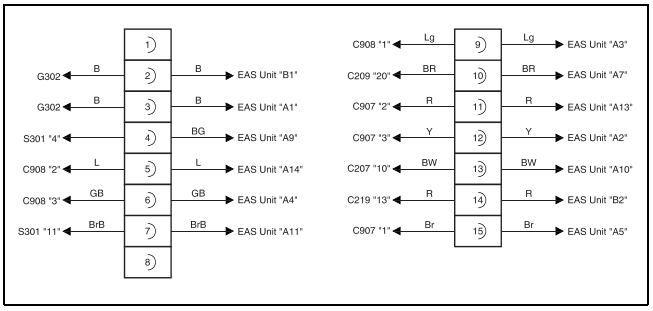



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| Affected VIN | |

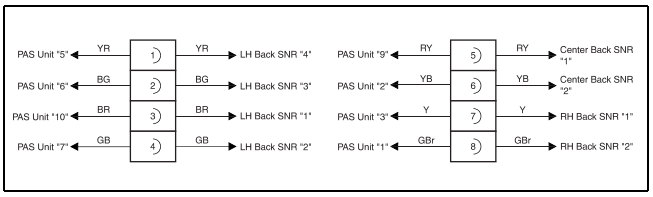


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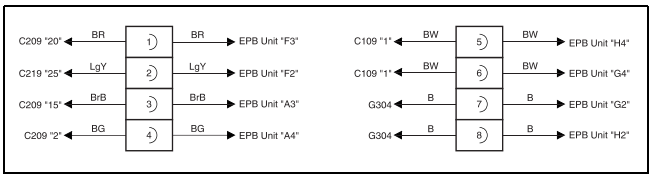
▶C903



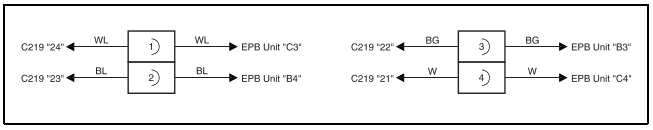

▶C904



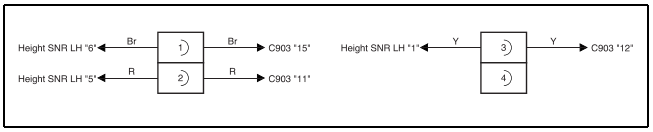

▶C905



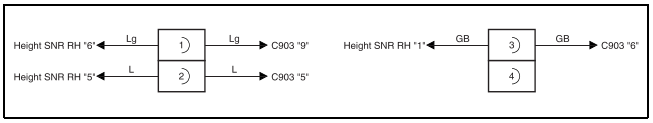

▶C906




▶C907




▶C908

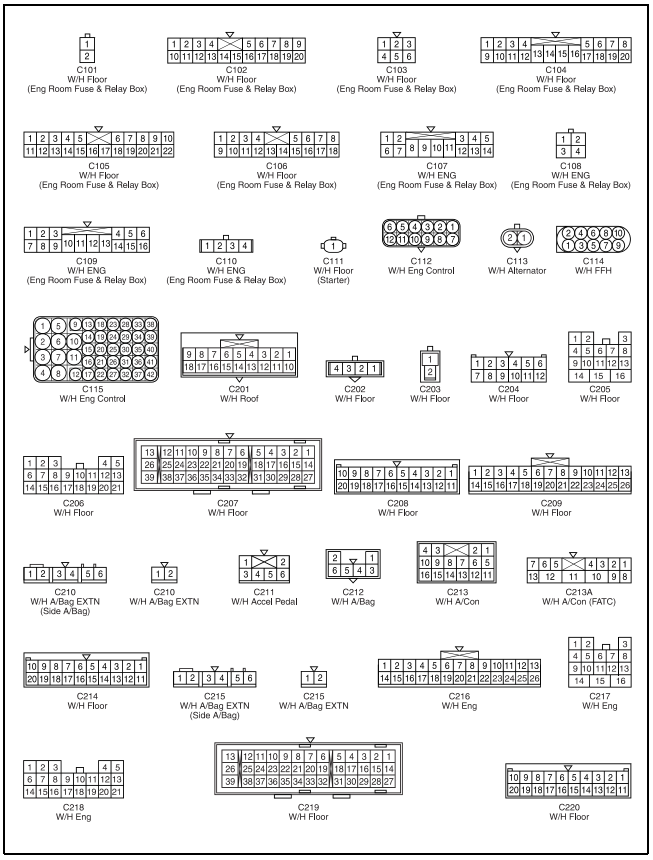


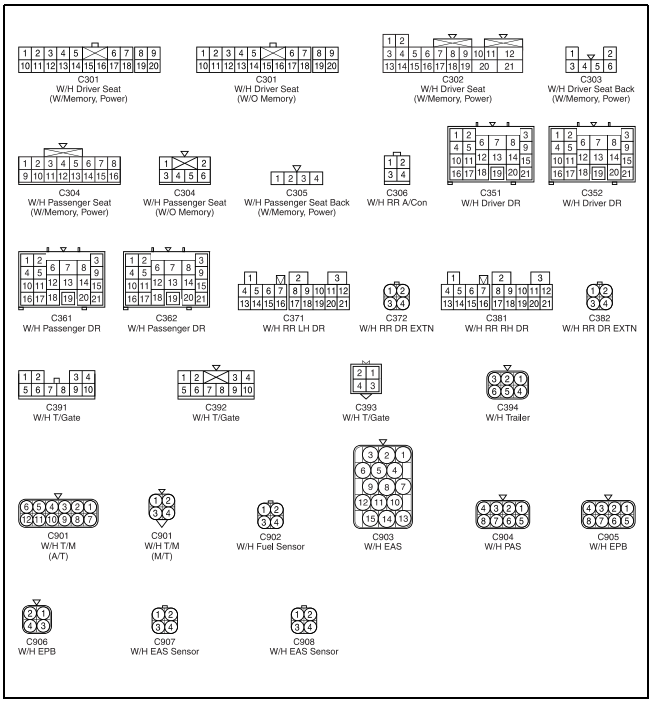



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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## ▶ WIRNING CONNECTOR



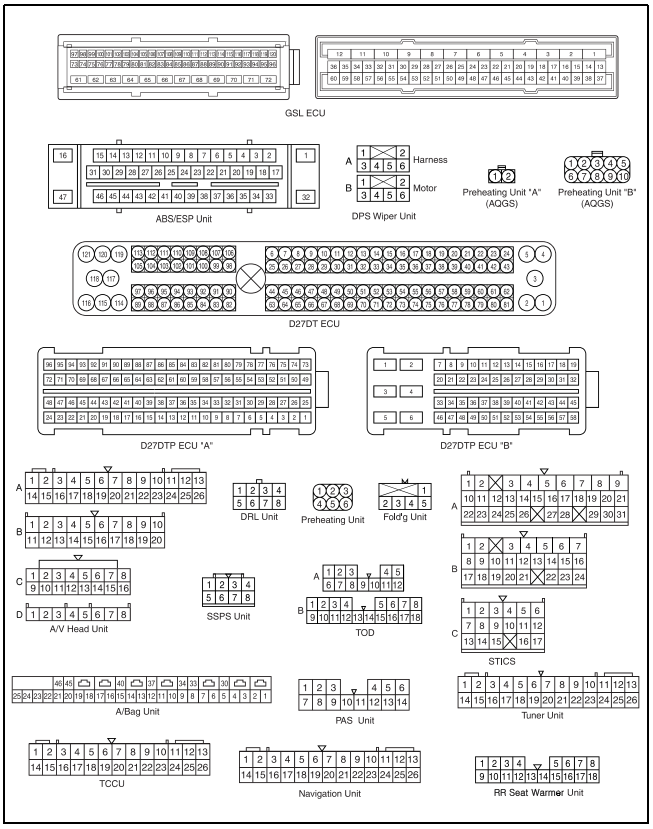



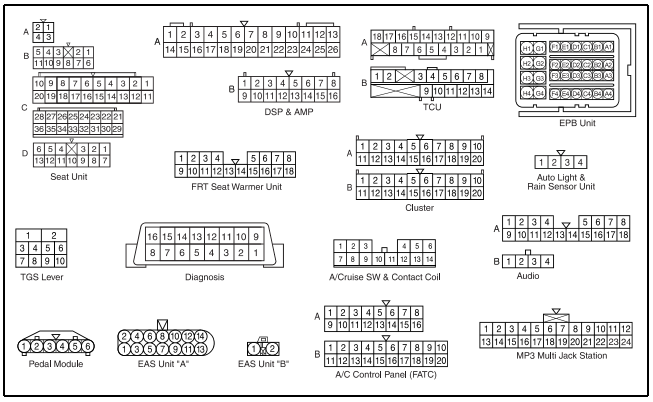

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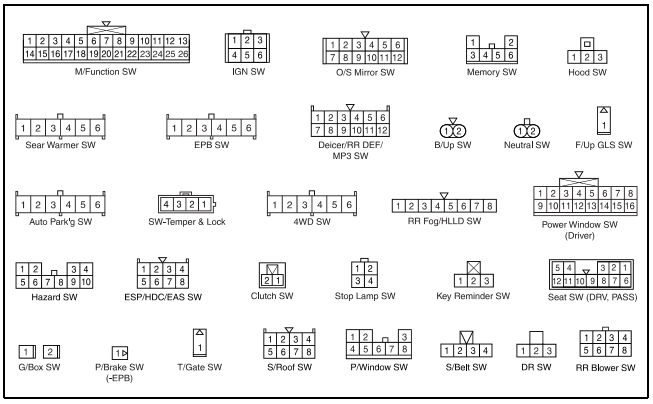
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## ▶UNIT CONNECTOR




## ▶SWITCH CONNECTOR

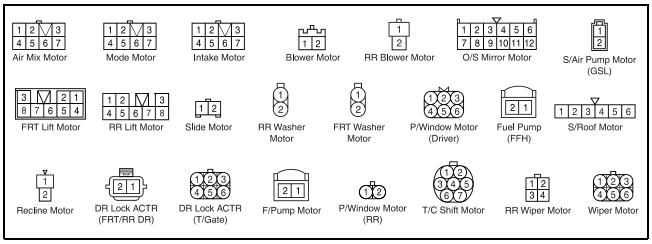




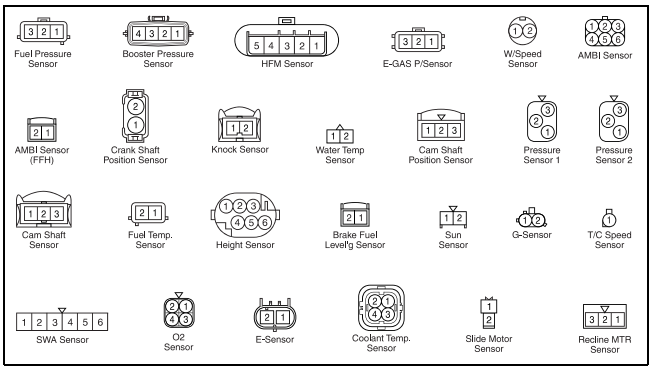

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| Modification basis | |
| Application basis | |
| Affected VIN | |

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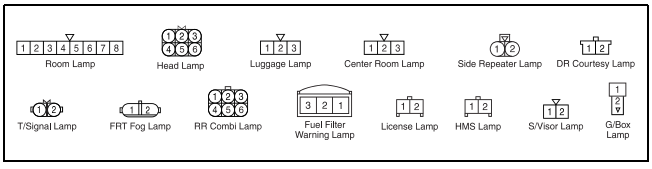
## ▶MODE CONNECTOR



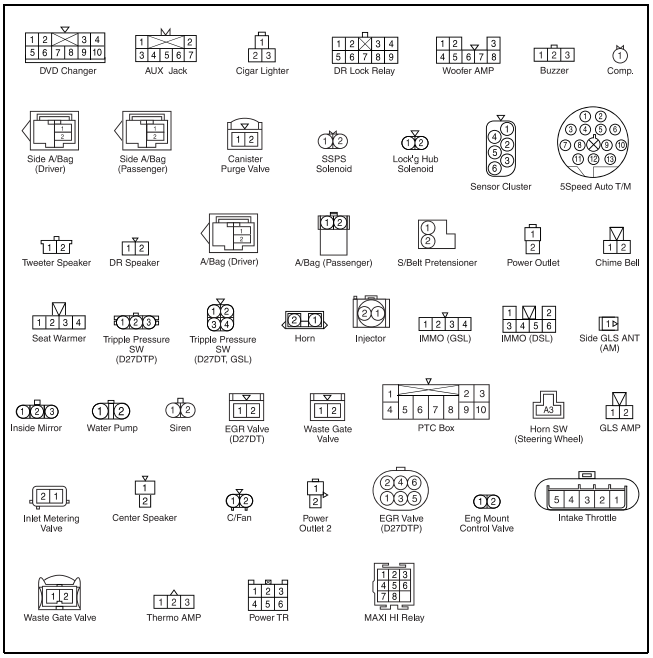

## ▶SENSOR CONNECTOR




## ▶LAMP CONNECTOR




## ▶ETC.



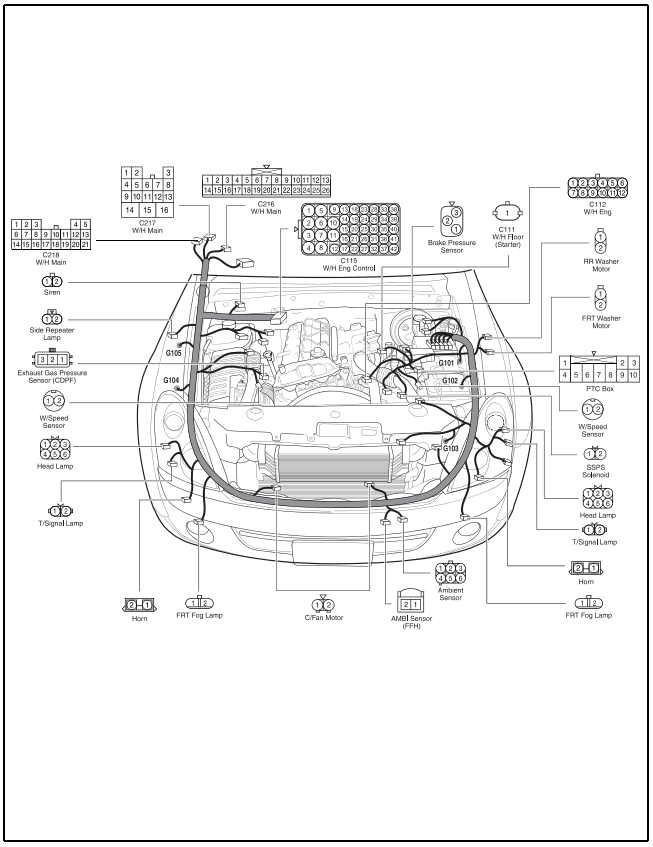

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| Application basis | |
| Affected VIN | |

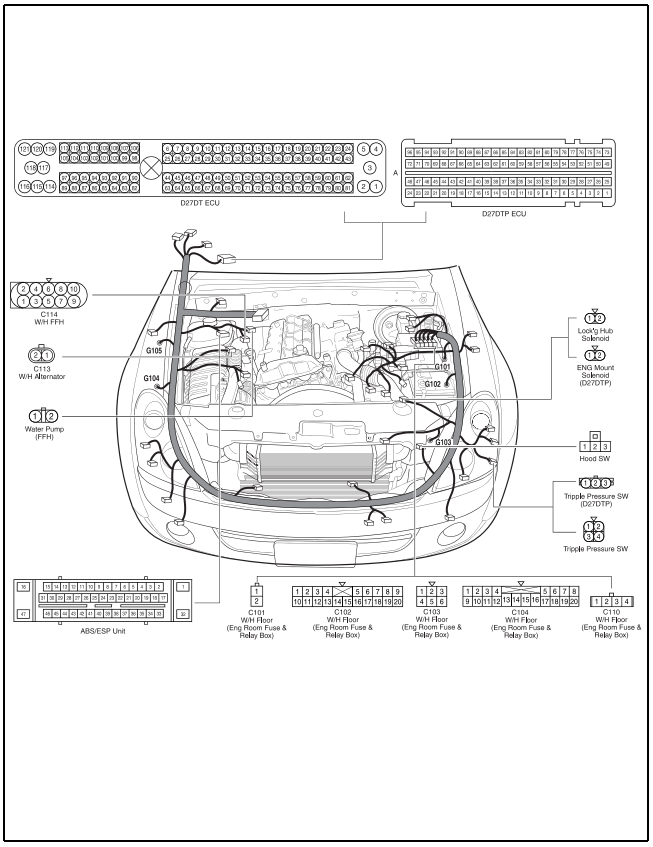


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## CONNECTOR

8210-00 **W/H ENGINE ROOM**



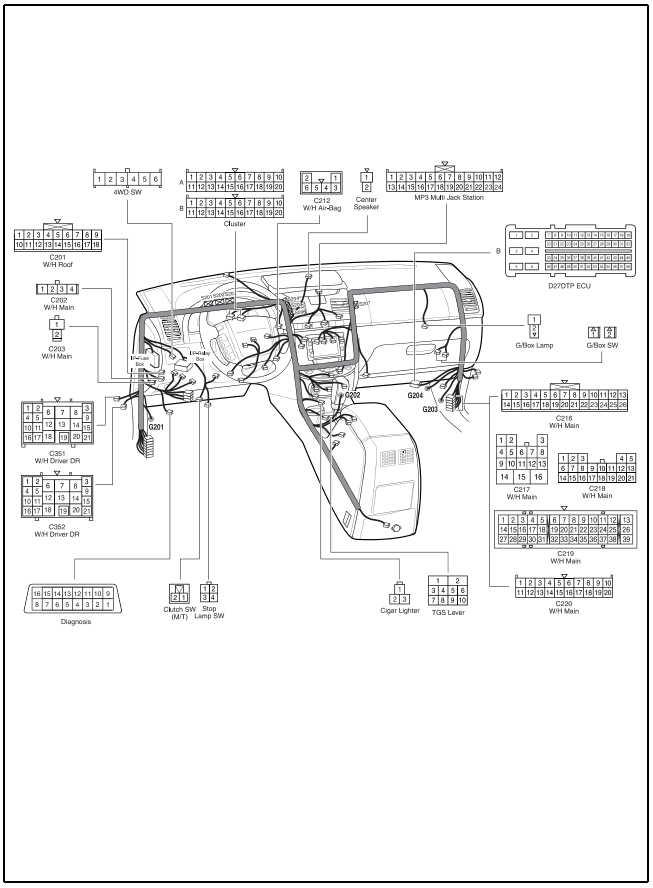



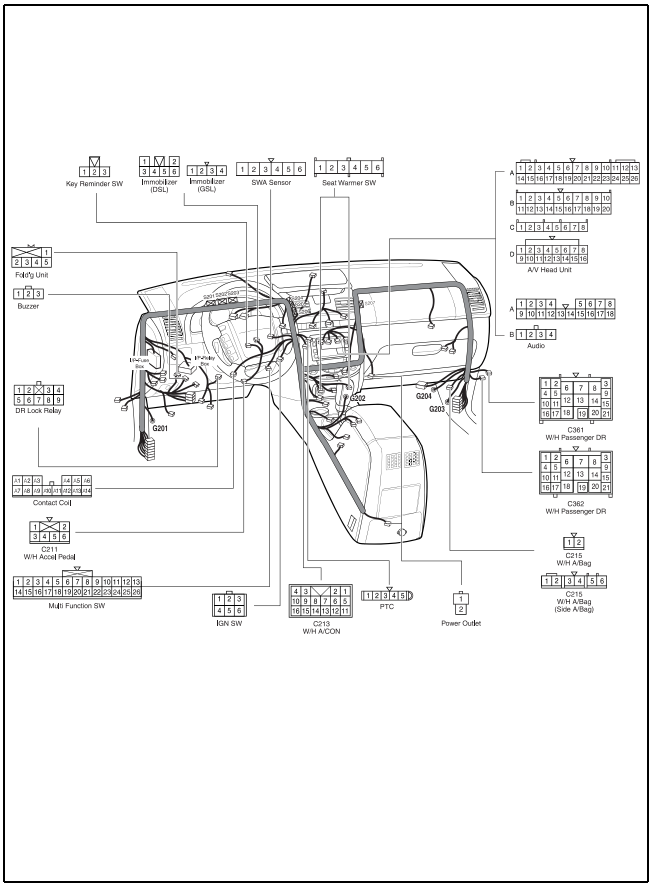



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| Modification basis | |
| Application basis | |
| Affected VIN | |

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## 8210-02 W/H MAIN

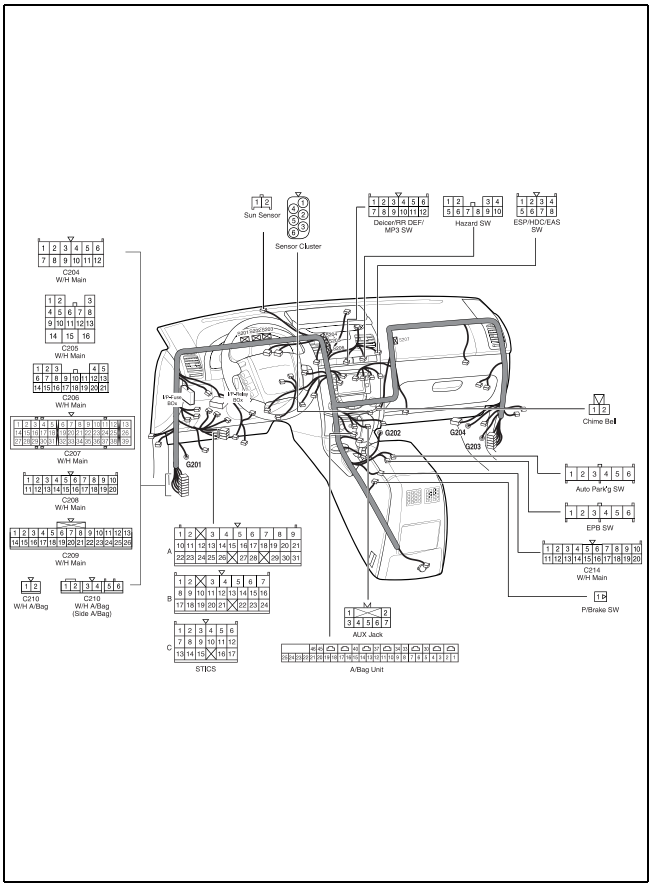



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| Modification basis | |
| Application basis | |
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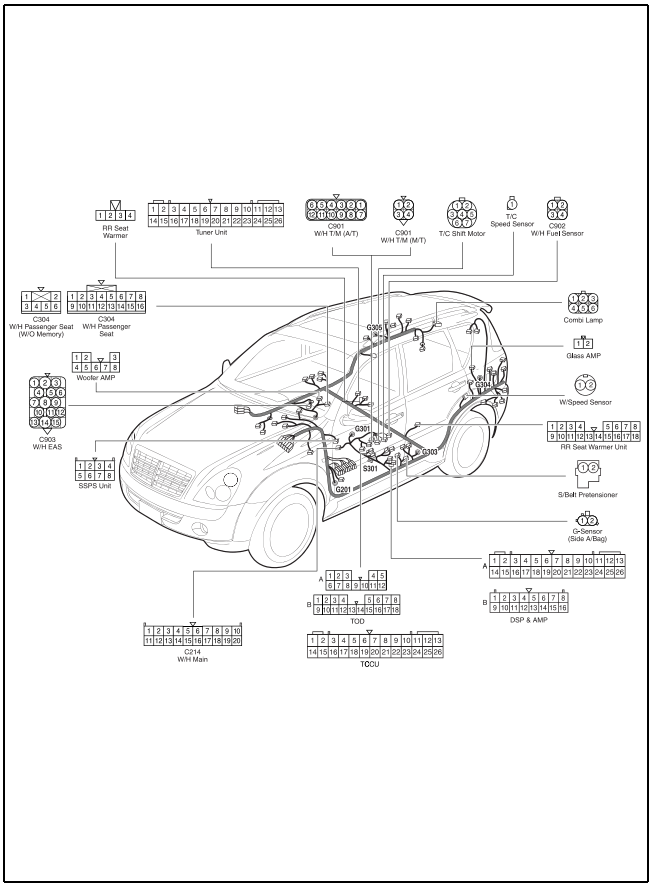


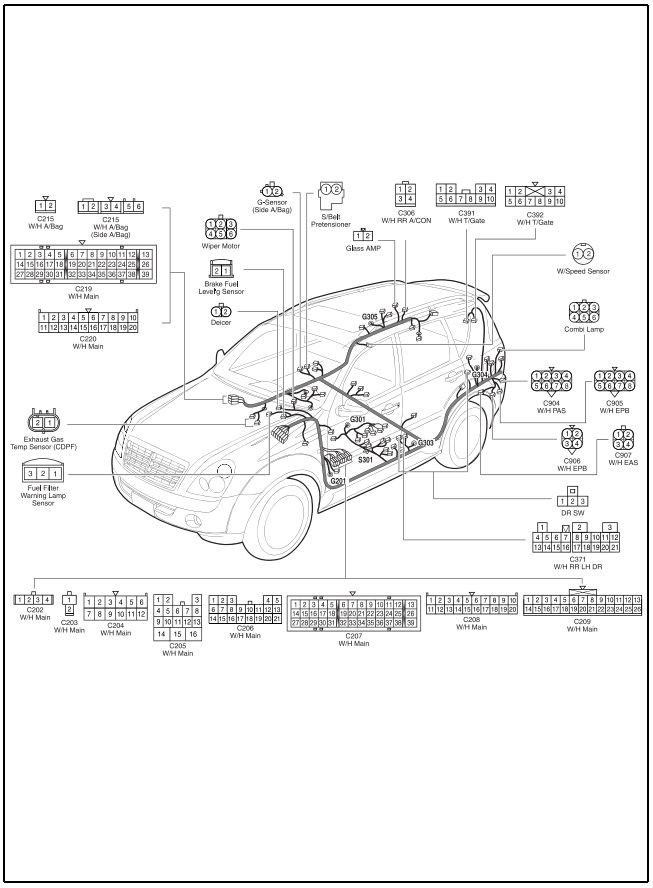



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| Modification basis | |
| Application basis | |
| Affected VIN | |

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## 8210-03 W/H FLOOR

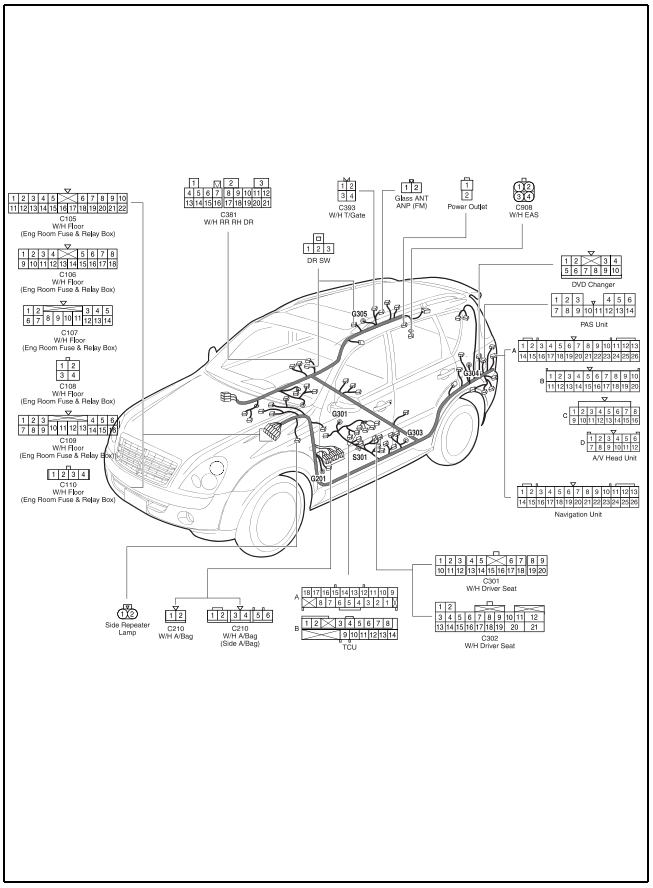



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| Modification basis | |
| Application basis | |
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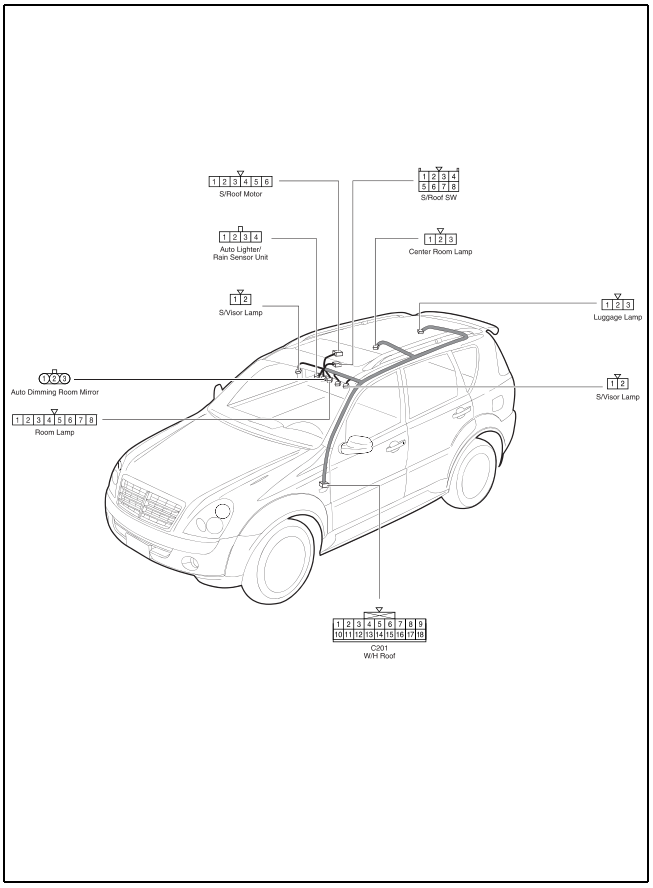




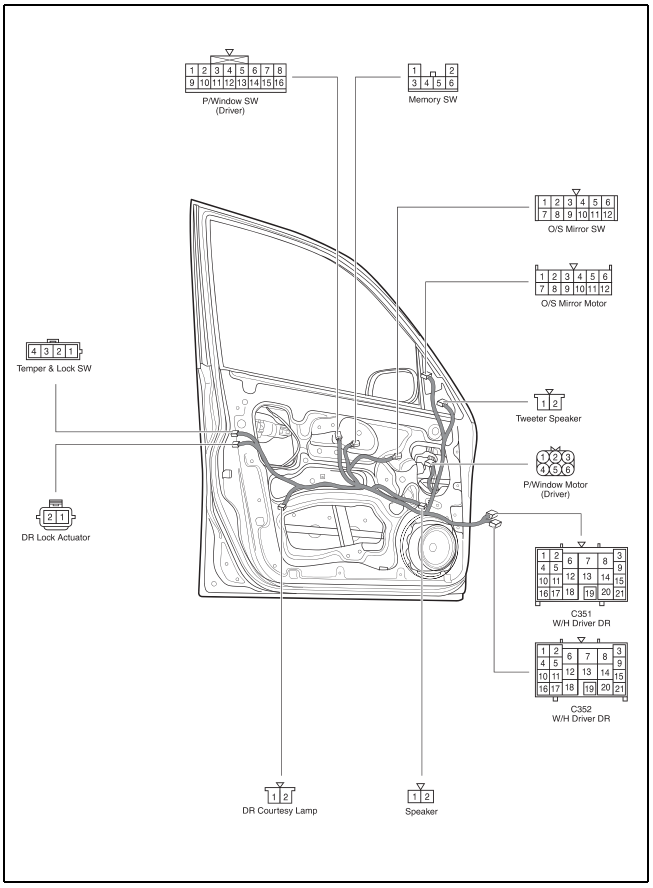

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|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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## 8210-09 W/H ROOF




## 8210-06 W/H DRIVER DOOR

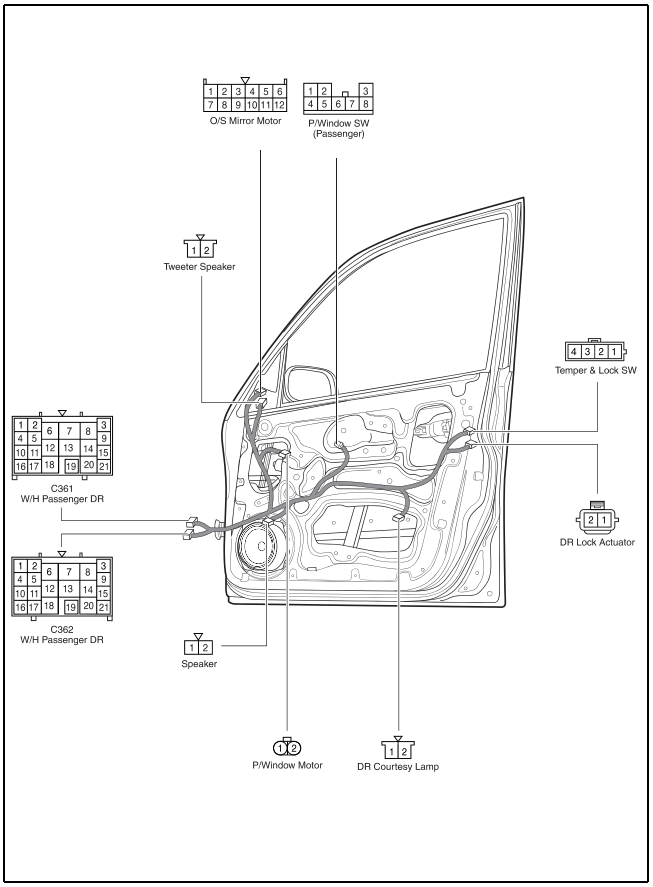



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|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

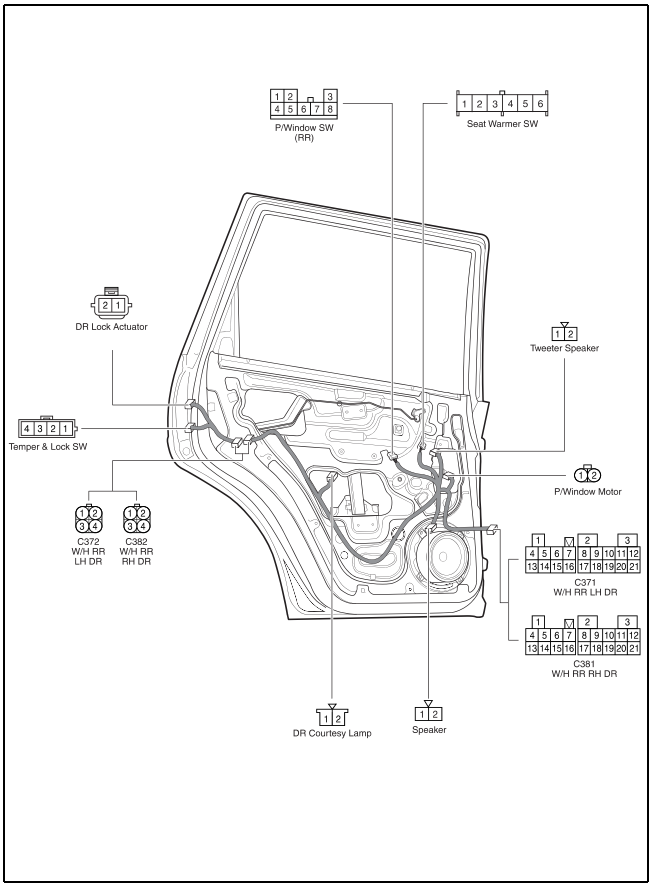


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## S.G.N 8210-07 W/H PASSENGER DOOR




## S.G.N 8210-08 W/H RR DOOR

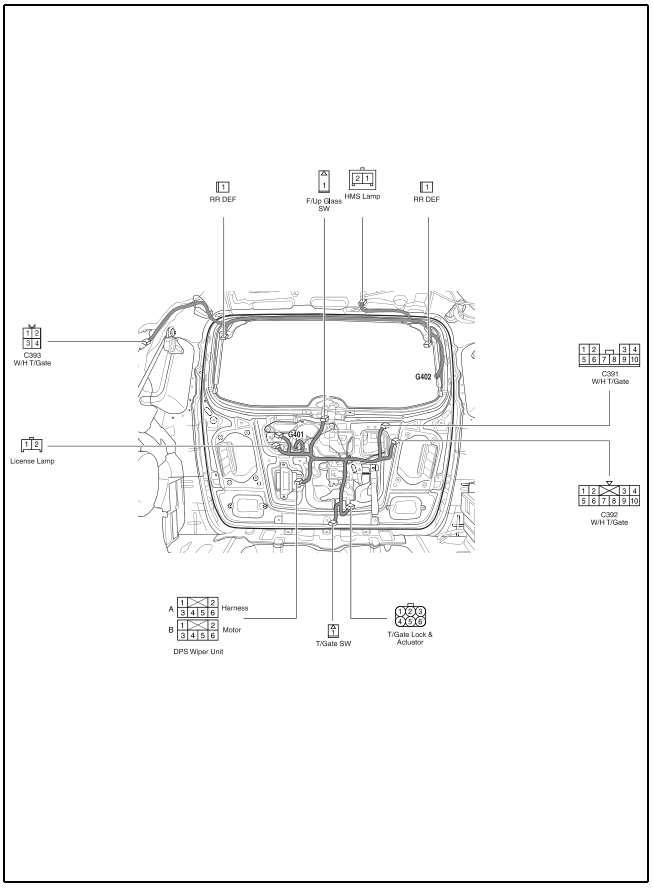





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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## 8210-10 W/H TAIL GATE




| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |



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# POWER DISTRIBUTION

## 8410-02/8410-04/8401-06

INDEX



### FUSE/RELAY

8410-02 ENGINE ROOM FUSE & RELAY BOX..... 3
8410-04 I/P - FUSE BOX..... 5
8401-06 I/P - RELAY BOX..... 6

### ELECTRICITY DIVIDE

8210-02 ENGINE ROOM FUSE & RELAY BOX CIRCUIT..... 7
8410-04 I/P - FUSE BOX CIRCUIT..... 11
8410-06 I/P - RELAY BOX CIRCUIT..... 15

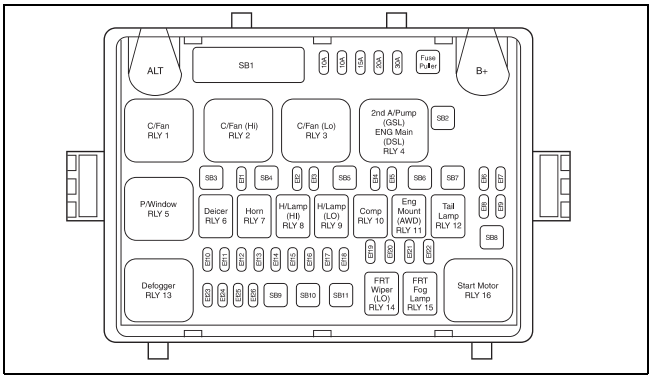
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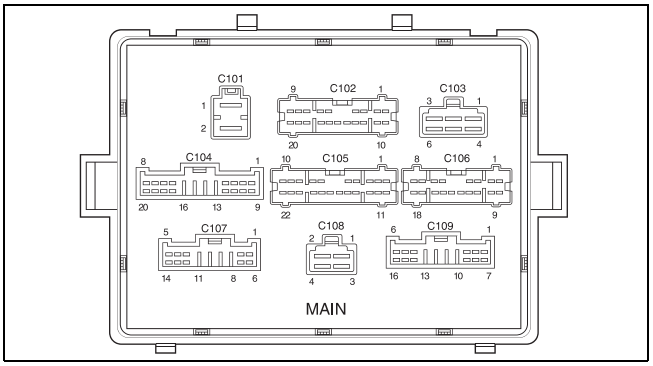
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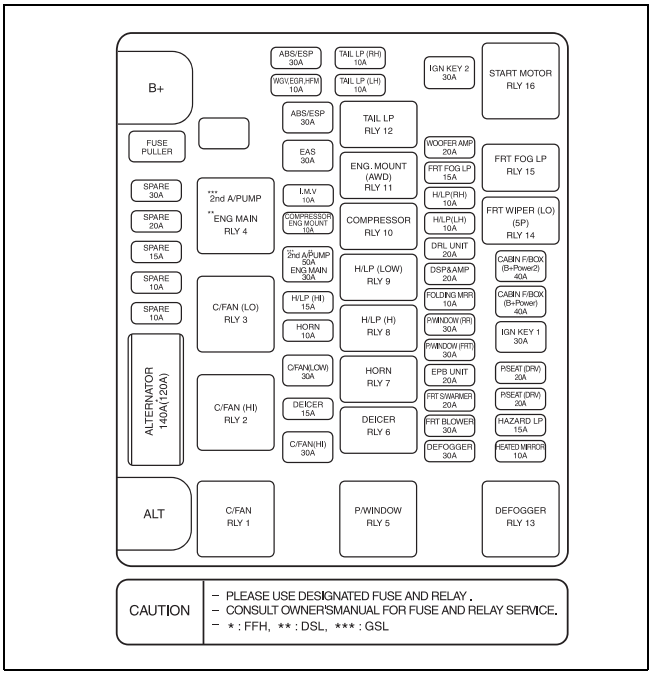
### 1) UPPER




### 2) LOWER




### 3) ENGINE ROOM FUSE & RELAY BOX




| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |



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### 4) USAGE OF FUSE IN ENGINE ROOM FUSE BOX

| Fuse No. | Capacity | Usage | Fuse No. | Capacity | Usage |
|---|---|---|---|---|---|
| SB1 | 140A/120A | Alternator | Ef9 | 10A | Combi Lamp (RH) |
| SB2 | - | - | Ef10 | 30A | RR DEF (B+) |
| SB3 | 30A | Condenssor Fan (HI) | Ef11 | 30A | Blower Relay |
| SB4 | 30A | Condenssor Fan (LO) | Ef12 | 20A | FRT Seat Warmer |
| SB5 | 30A/50A | ENG Main(DSL), S/Air Pump(GSL) | Ef13 | 20A | EPB |
| SB6 | 30A | EAS | Ef14 | 30A | Power Window (LH) |
| SB7 | 30A | ABS/ESP | Ef15 | 30A | Power Window (LH) |
| SB8 | 30A | Key SW, Start Relay | Ef16 | 10A | O/S Mirror SW |
| SB9 | 30A | Key SW (AM1) | Ef17 | 20A | DSP/AMP |
| SB10 | 40A | I/P-Fuse Box (F17~F24, F32) | Ef18 | 20A | DRL |
| SB11 | 40A | I/P-Fuse Box (F25~F31) | Ef19 | 10A | Head Lamp (LH) |
| Ef1 | 10A | Deicer Relay | Ef20 | 10A | Head Lamp (RH) |
| Ef2 | 10A | Horn Relay | Ef21 | 15A | FRT Fog Lamp Relay |
| Ef3 | 15A | Head Lamp Relay (HI) | Ef22 | 15A | Woofer AMP |
| Ef4 | 10A | Compressor Relay | Ef23 | 10A | O/S Mirror DEF |
| Ef5 | 10A | InLet Metering Valve | Ef24 | 15A | Hazard |
| Ef6 | 10A | EGR Valve, HFM Sensor | Ef25 | 20A | Seat Unit |
| Ef7 | 30A | ABS/ESP | Ef26 | 20A | Seat Unit |
| Ef8 | 10A | Combi Lamp (LH) | | | |

### 5) ENGINE ROOM FUSE BOX CONNECTOR NUMBER

| Connector No. | Pin No. | Connector Color |
|---|---|---|
| C101 | 2 | Colorless |
| C102 | 20 | White |
| C103 | 6 | Colorless |
| C104 | 20 | White |
| C105 | 22 | White |
| C106 | 18 | White |
| C107 | 14 | White |
| C108 | 4 | Colorless |
| C109 | 16 | White |

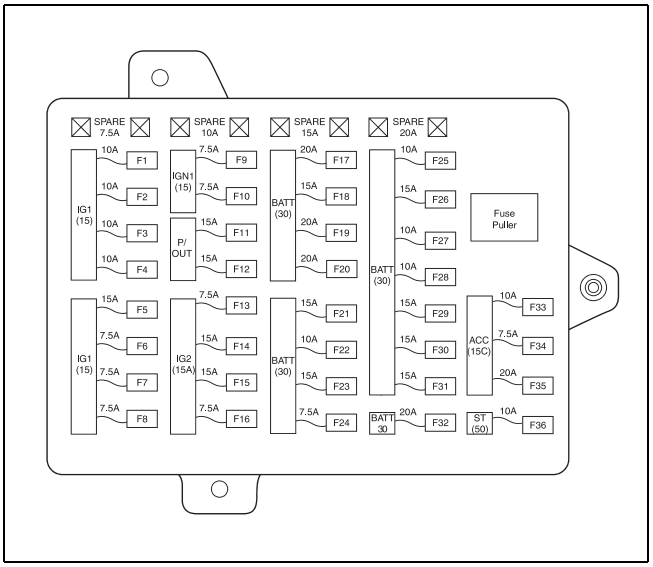


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

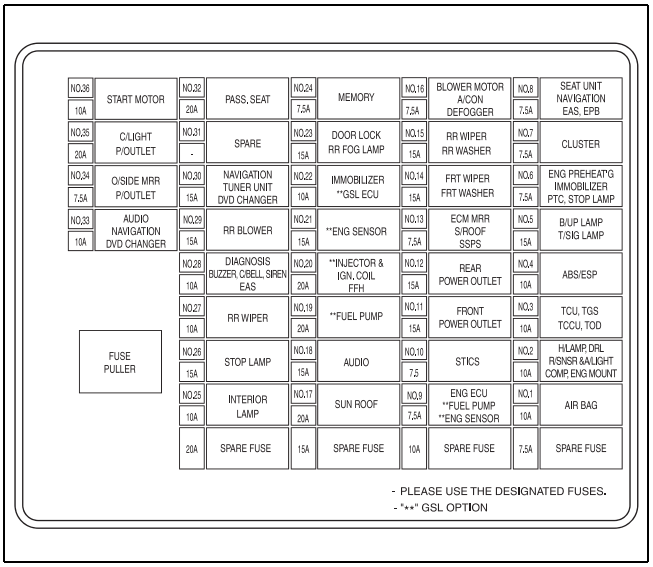
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# 8410-04 I/P - FUSE BOX

## 1) FUSE BOX




## 2) POWER SUPPLY



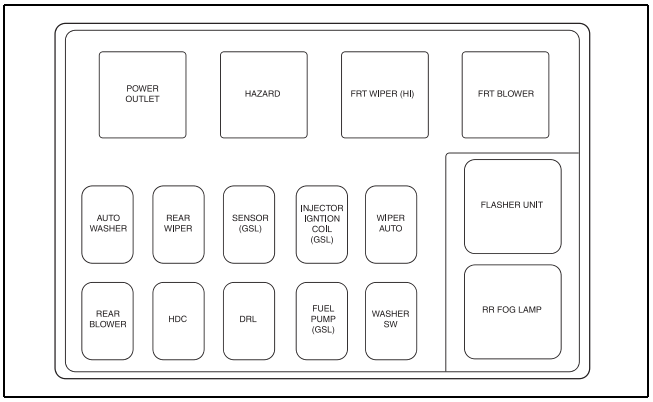

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |



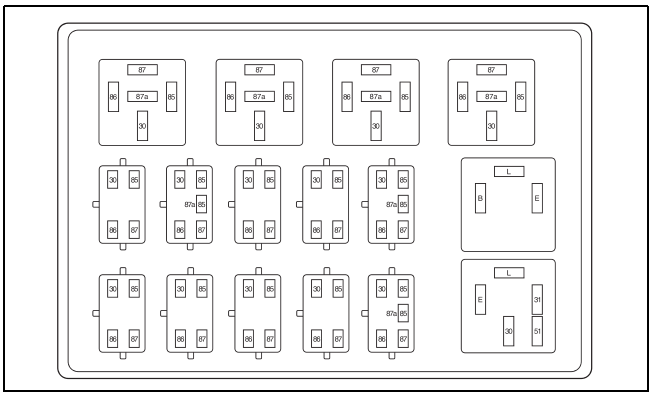
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## 8410-06 I/P - RELAY BOX

### 1) RELAY BOX




### 2) POWER SUPPLY





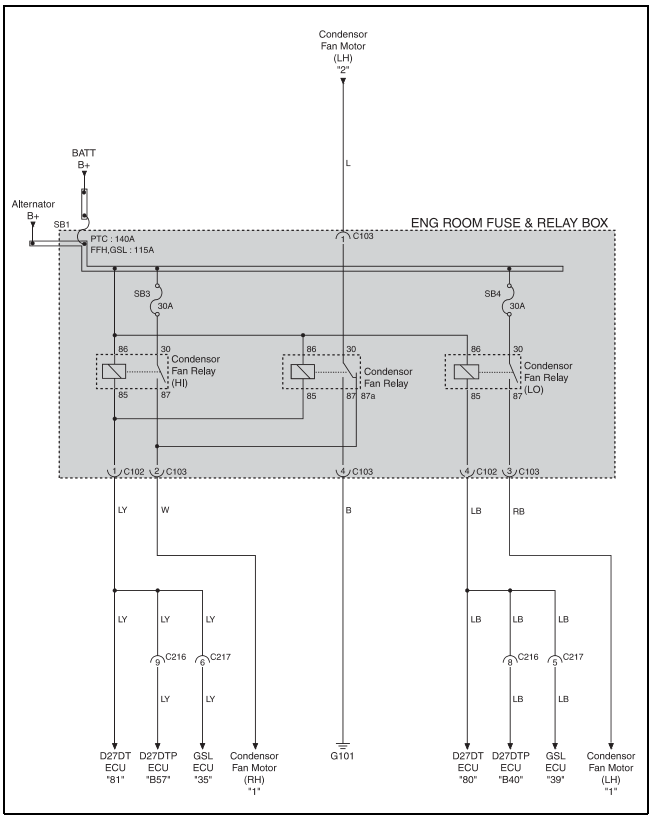

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| Modification basis | |
| Application basis | |
| Affected VIN | |

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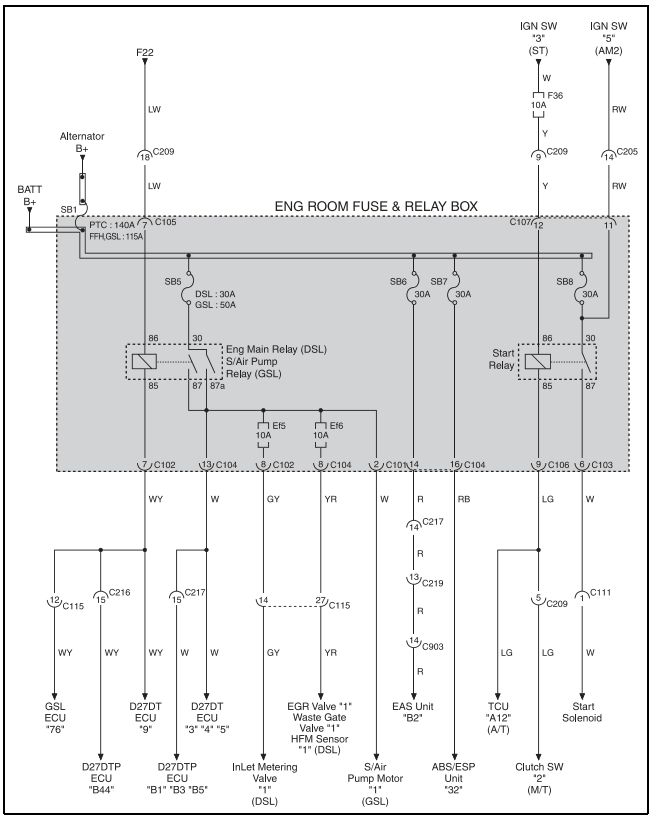
## ELECTRICITY DIVIDE

### 8210-02 ENGINE ROOM FUSE & RELAY BOX CIRCUIT

**(1) SB1, SB3, SB4, CONDENSOR FAN RELAY (HI, LO)**




**(2) SB5 ~ SB8, EF5, EF6, ENG MAIN RELAY, START RELAY**

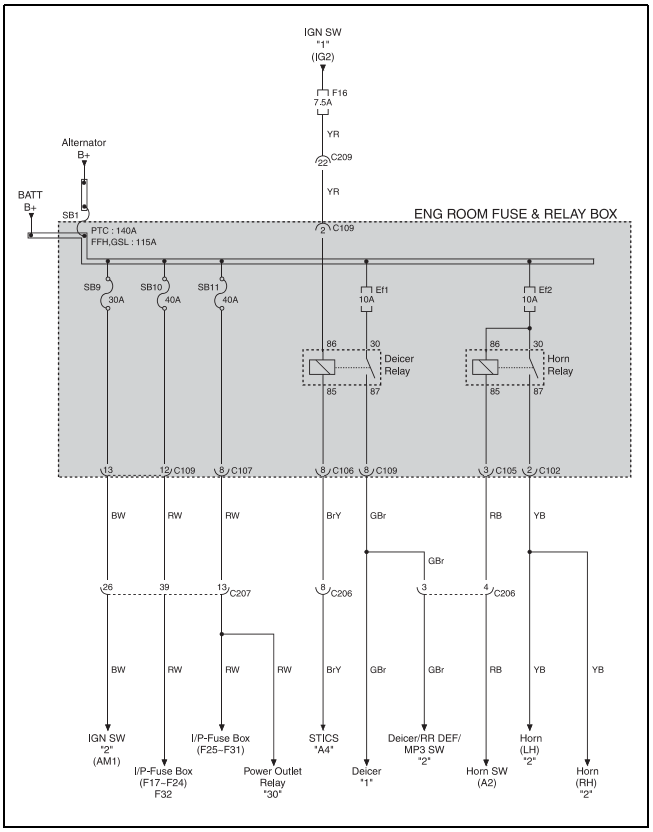



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| Application basis | |
| Affected VIN | |

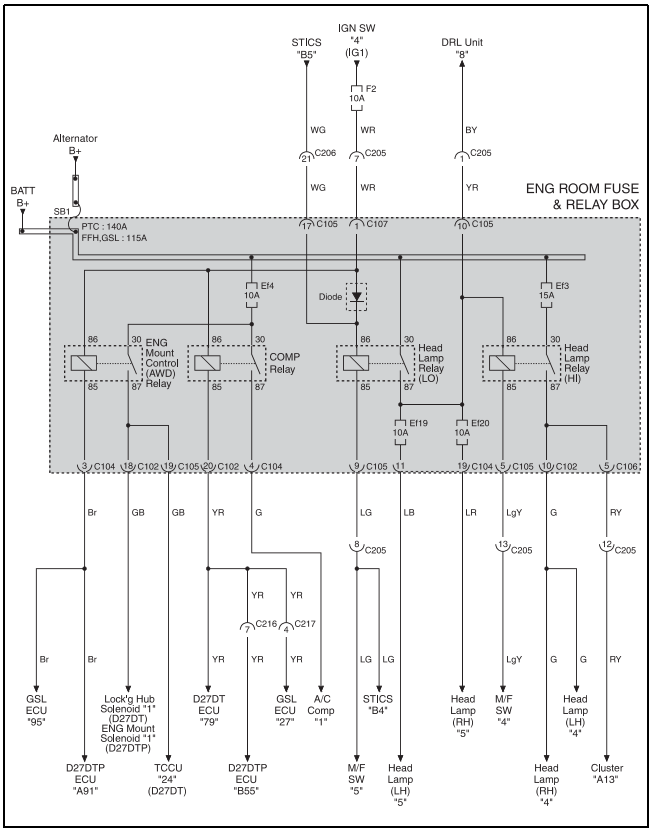


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### (3) SB9 ~ SB11, EF1, EF2, DEICER RELAY, HORN RELAY




### (4) EF3, EF4, EF19, EF20, HEAD LAMP RELAY(HI, LO), COMP RELAY,ENG MOUNT CONTROL RELAY

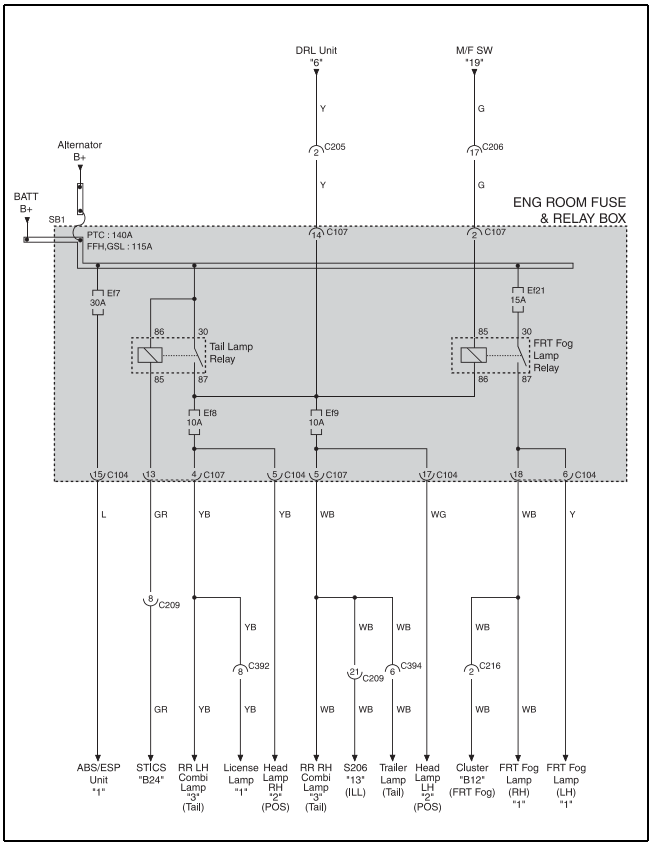




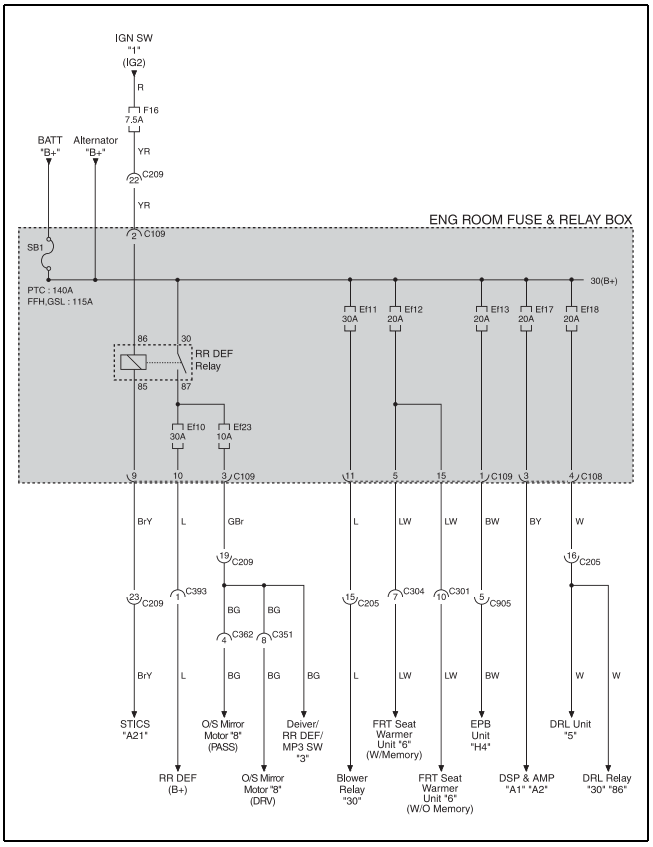

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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### (5) EF7 ~ EF9, EF21, TAIL LAMP RELAY, FRT FOG LAMP RELAY




### (6) EF10 ~ EF13, EF17, EF18, EF23, RR DEF RELAY

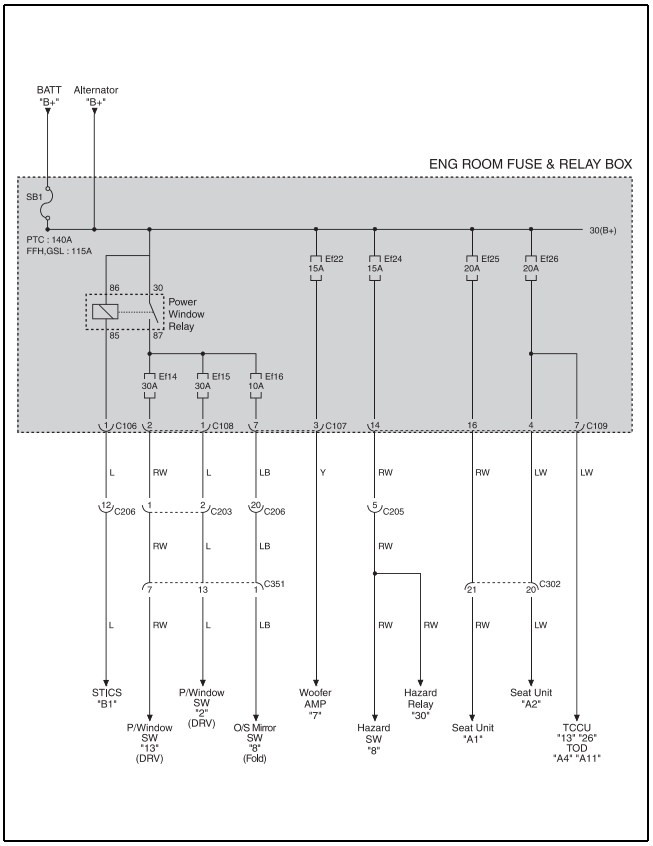



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|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

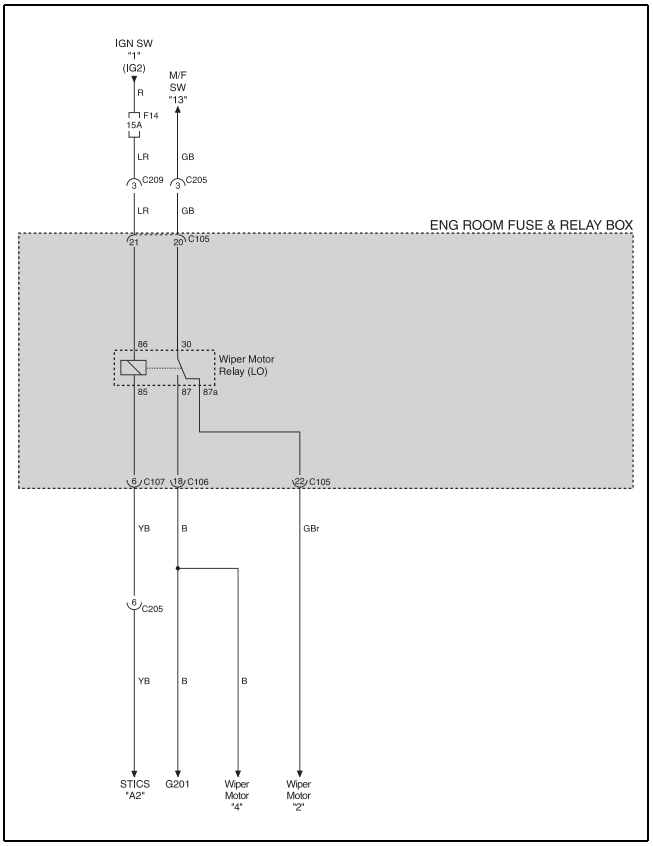


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### (7) EF14 ~ EF16, EF22, EF24 ~ EF26, POWER WINDOW RELAY




### (8) FRT WIPER MOTOR RELAY(LO)



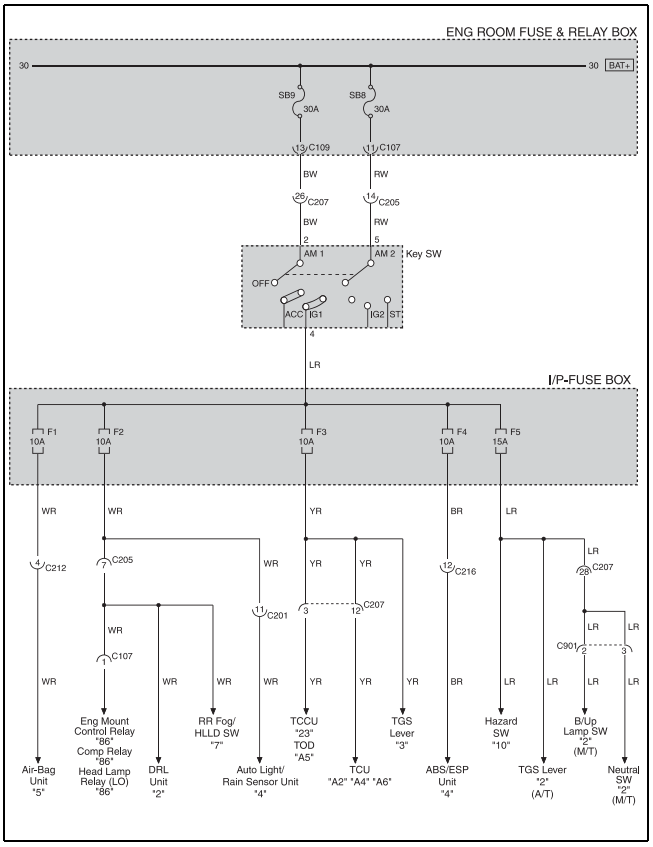



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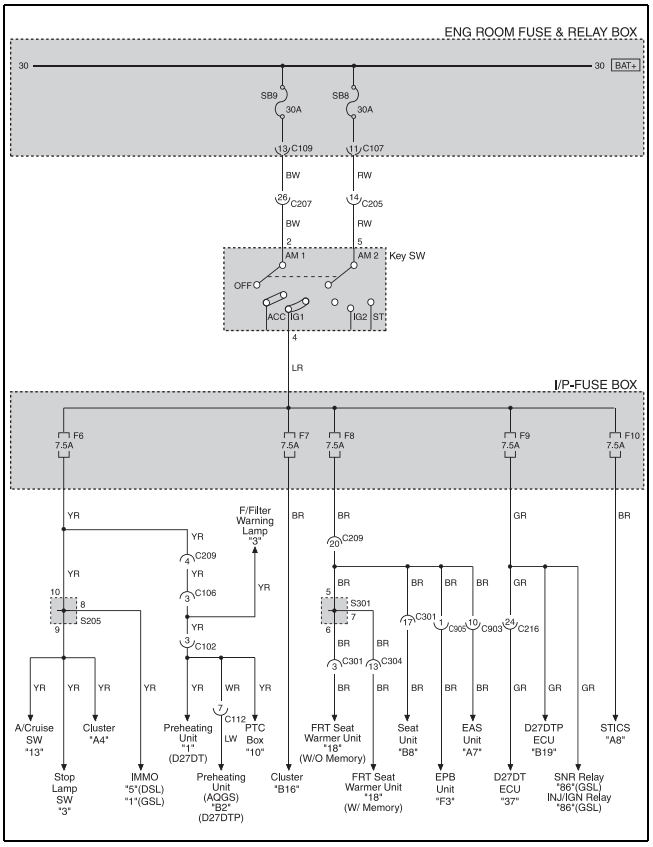
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# 8410-04 I/P - FUSE BOX CIRCUIT

## (1) F1 ~ F5




## (2) F6 ~ F10

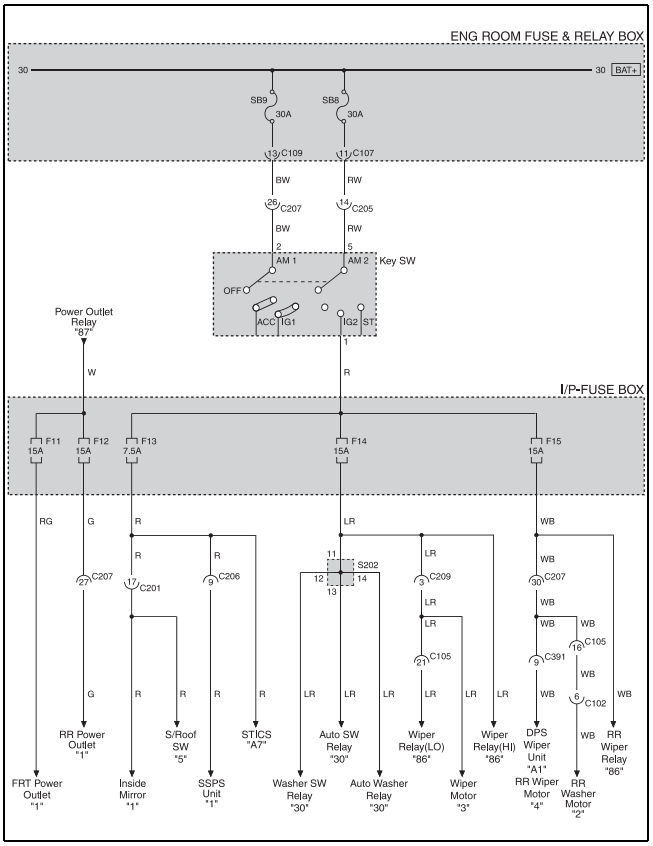



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| Affected VIN | |

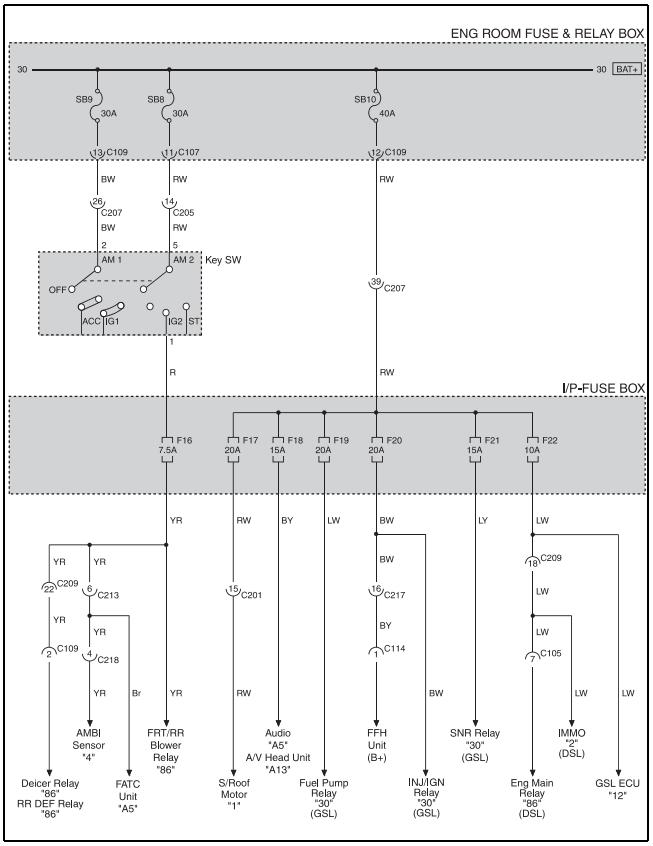


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### (3) F11 ~ F15




### (4) F16 ~ F22

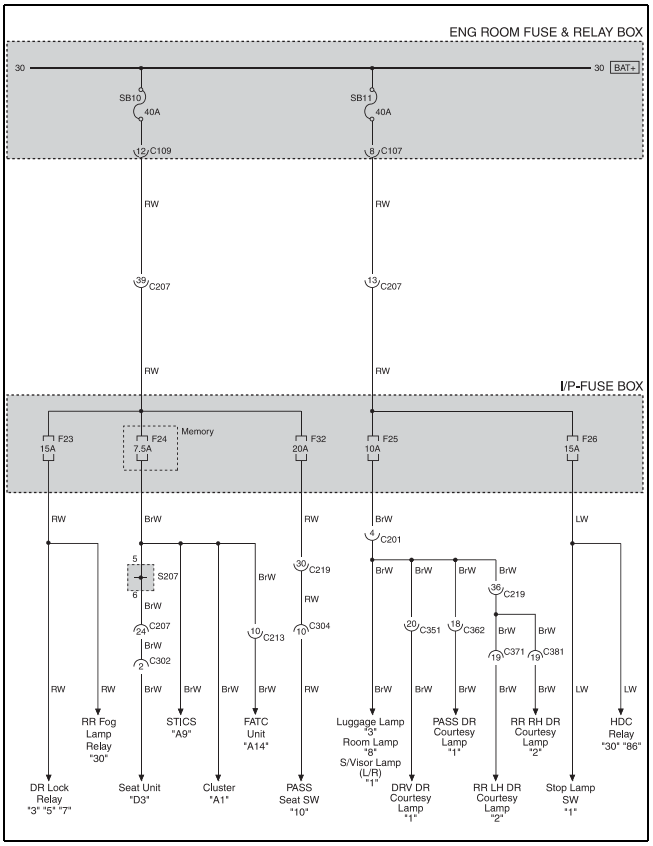




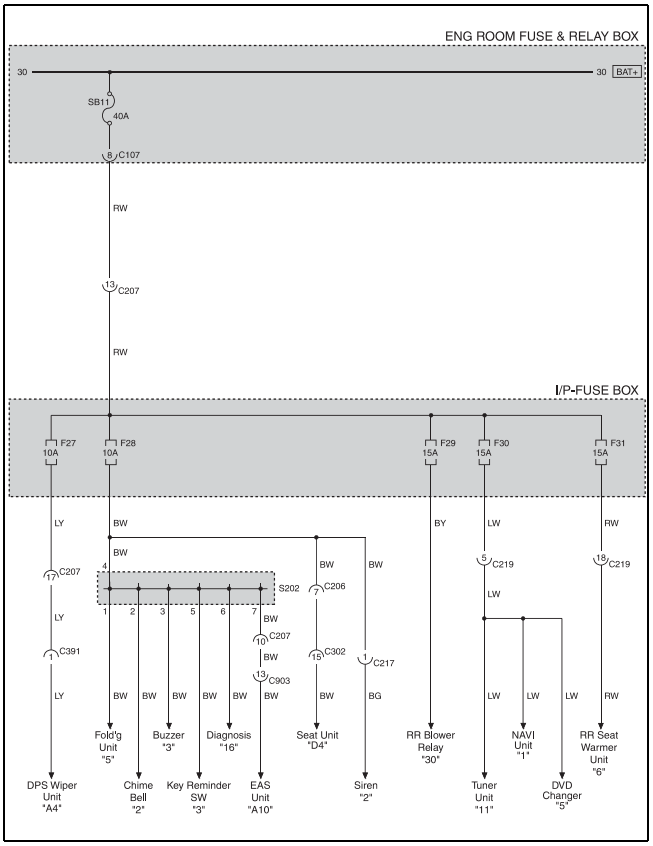

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|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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### (5) F23 ~ F26, F32




### (6) F27 ~ F31

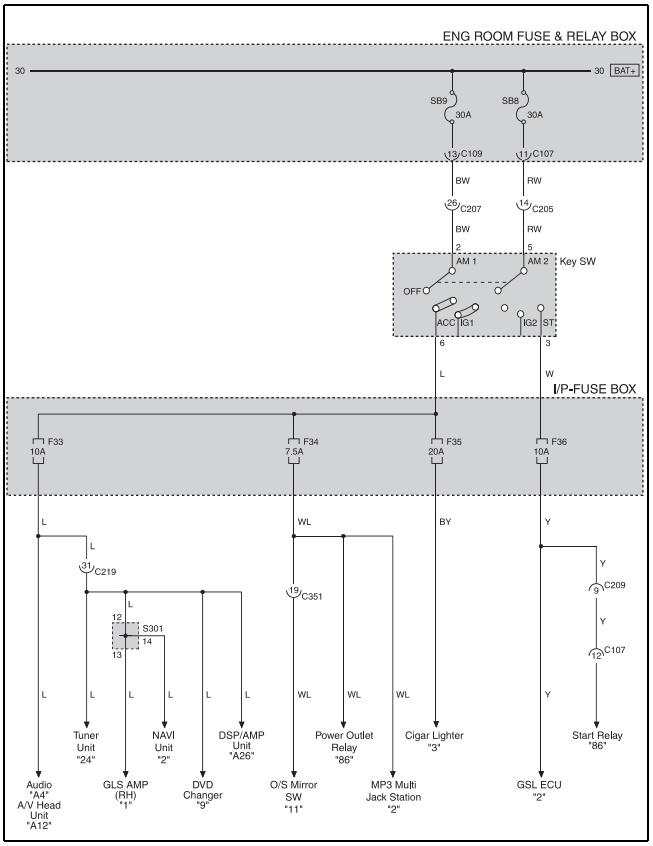



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| Modification basis | |
| Application basis | |
| Affected VIN | |



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**(7) F33 ~ F36**



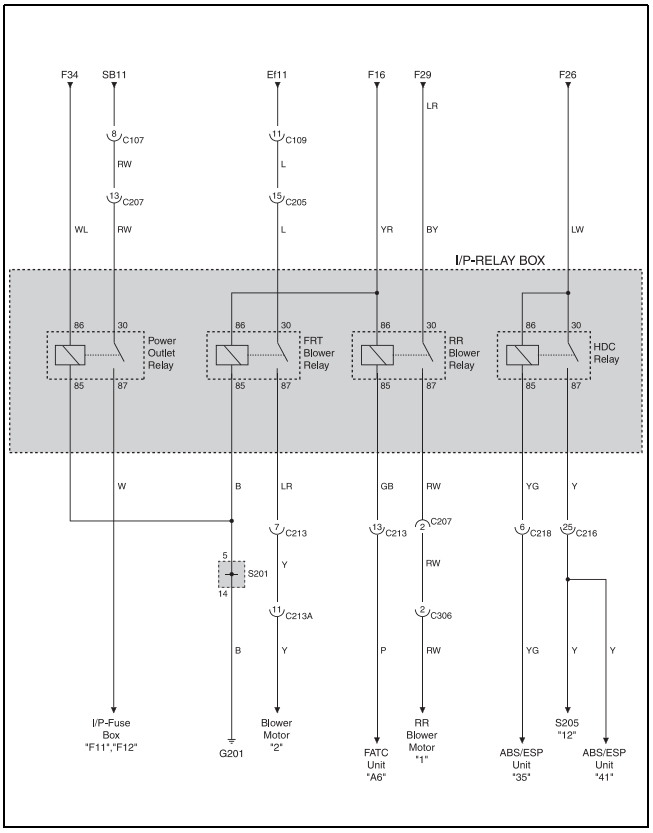



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| Modification basis | |
| Application basis | |
| Affected VIN | |

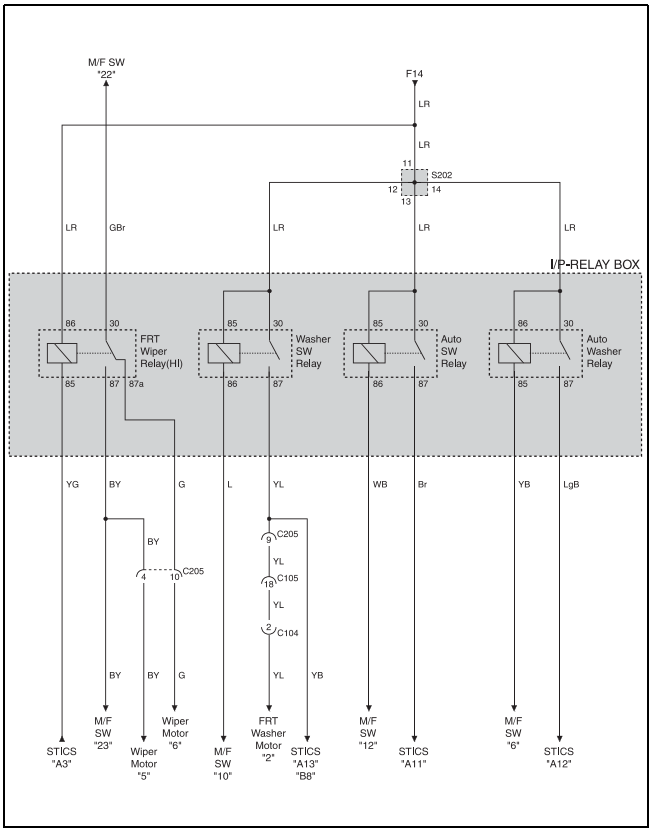
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# 8410-06 I/P - RELAY BOX CIRCUIT

## (1) POWER OUTLET RELAY, BLOWER RELAY(FRT,RR), HDC RELAY




## (2) WIPER RELAY(HI), WASHER SW RELAY, AUTO SW RELAY, AUTO WASHER RELAY

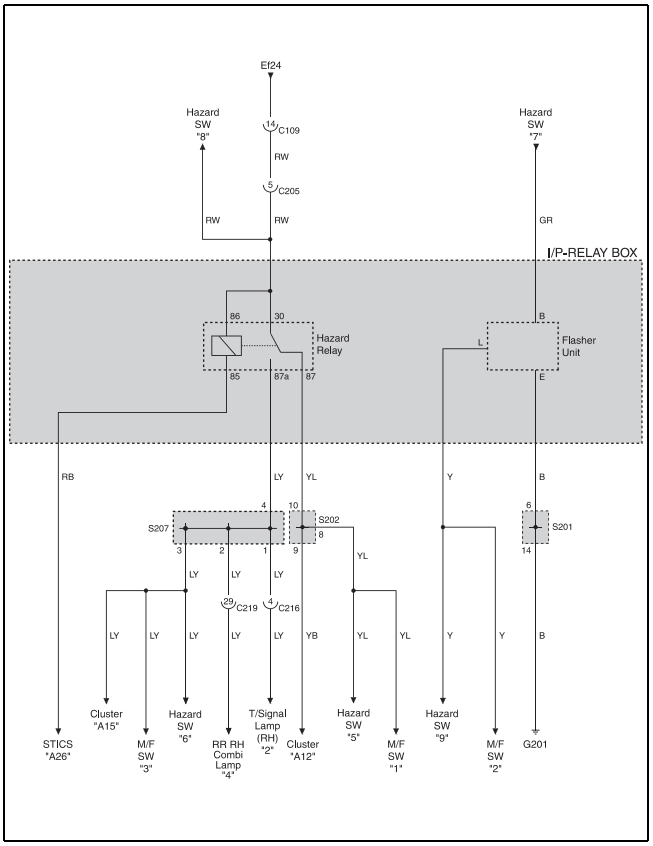



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| Modification basis | |
| Application basis | |
| Affected VIN | |

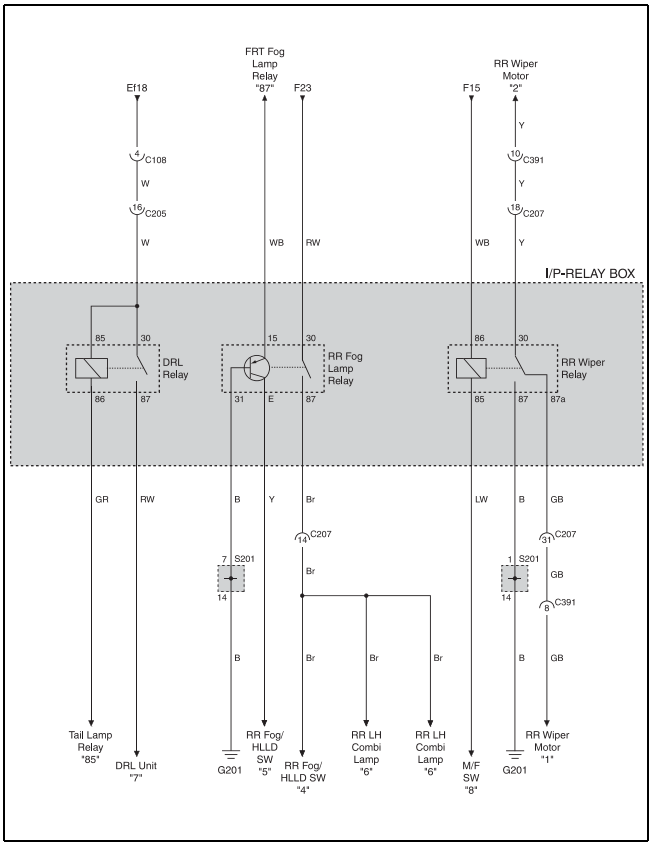


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### (3) HARZARD RELAY, FLASHER UNIT




### (3) DRL RELAY, RR FOG LAMP RELAY, RR WIPER RELAY

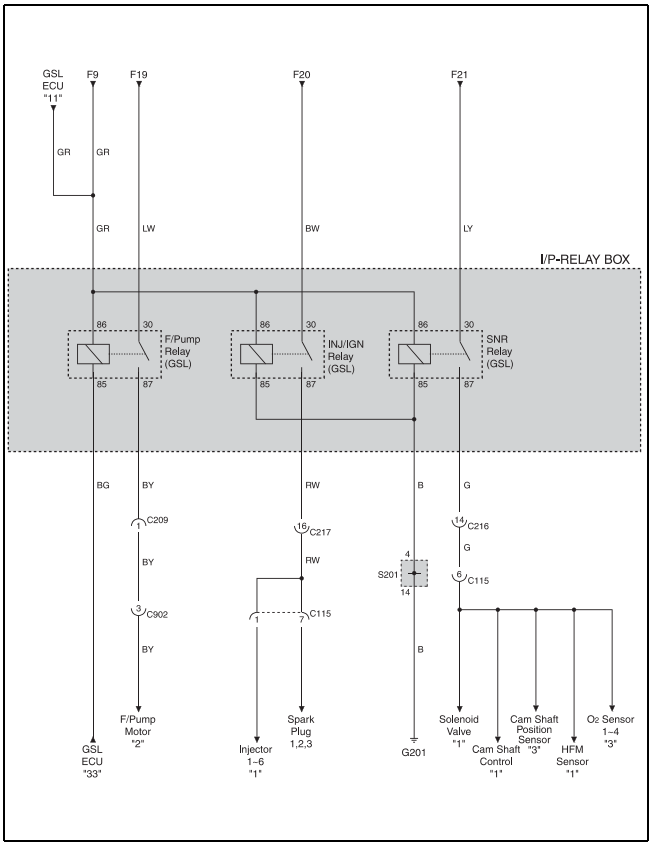





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| Affected VIN | |

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**(5) F/PUMP RELAY, INJ/IGN RELAY, SNR RELAY**




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| Modification basis | |
| Application basis | |
| Affected VIN | |



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Memo

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# 1461-01/2820-01/1491-01/8210-01/3410-01/4480-01/4920-01/4892-01/4620-12/8010-01/7410-13/7410-04/8510-52/8510-48/8710-02/7830-03/8510-05/8610-06/7632-167340-03/8310-01/8510-00/8320-01/8410-01/8210-01/8310-10/4810-01/7770-02/7770-10/8910-01/8930-01/8790-01/6810-15/6910-01/6810-20



## ENGINE


1461-01 STARTING & CHARGING..... 3
2820-01 PREHEATING CIRCUIT I - AQGS(D27DTP)..... 4
2820-01 PREHEATING CIRCUIT II (D27DT)..... 5
1491-01 ECU (ENGINE CONTROL UNIT - D27DTP)..... 6
1491-01 ECU (ENGINE CONTROL UNIT - D27DT)..... 9
1491-01 ECU (ENGINE CONTROL UNIT - GSL G32D)..... 12
8210-01 DIAGNOSIS CIRCUIT..... 15


## CHASSIS


3110-01 TCU (5SPEED - A/T)..... 16
3410-01 TCCU..... 20
3410-01 TOD..... 21
4480-01 EAS..... 22
4920-01 EPB..... 23
4892-01 ABS/ESP..... 24
4620-12 S.S.P.S (SPEED SENSITIVE POWER STEERING)..... 29


## ELECTRIC


8810-01 AIR-BAG (CURTAIN AIR-BAG)..... 31
8010-01 CLUSTER..... 32
7410-13 POWER SEAT - DRIVER (W/ MEMORY)..... 38
7410-04 POWER SEAT - PASSENGER..... 42
8510-52 ELECTRIC OUTSIDE MIRROR & FOLDING (W/O MEMORY)..... 43
8510-48 FRT SEAT WARMER (W/ MEMORY)..... 44
8510-48 FRT SEAT WARMER (W/O MEMORY)..... 45
8510-48 RR SEAT WARMER..... 46
8710-02 STICS..... 48
7830-03 RR WIPER CIRCUIT..... 64
7830-03 RR STANDARD WIPER & WAS... 65
8510-05 POWER WINDOW CIRCUIT..... 66
8610-06 HORN..... 67
7632-16 CIGAR LIGHTER & POWER OUTLET CIRCUIT..... 68
7340-03 SUN ROOF CIRCUIT..... 69
8310-01 HEAD LAMP & DRL (DAY TIME RUNNING LIGHT) UNIT CIRCUIT. 70
8510-00 HLLD (HEAD LAMP LEVEL'G DEVICE) CIRCUIT..... 71
8320-01 TAIL LAMP CIRCUIT..... 72
8410-01 TURN SIGNAL & HAZARD LAMP CIRCUIT..... 73
8210-01 TRAILER LAMP CIRCUIT..... 74
8310-10 FOG LAMP CIRCUIT..... 75
4810-01 STOP & BACK-UP LAMP CIRCUIT..... 76
7770-02 INTERIOR LAMP CIRCUIT..... 77
7770-10 AUTO DIMMING ROOM MIRROR CIRCUIT..... 78
8910-01 AUDIO..... 79
8930-01 A/V SYSTEM..... 80
8790-01 PARKING AID CIRCUIT..... 85
6810-15 PTC HEATER (POSITIVE TEMPERATURE COEFFICIENT).. 87
6910-01 FFH (FUEL FIRED HEATER)..... 89
6810-20 FATC (FULL AUTO TEMP. CONTROL) CIRCUIT..... 93

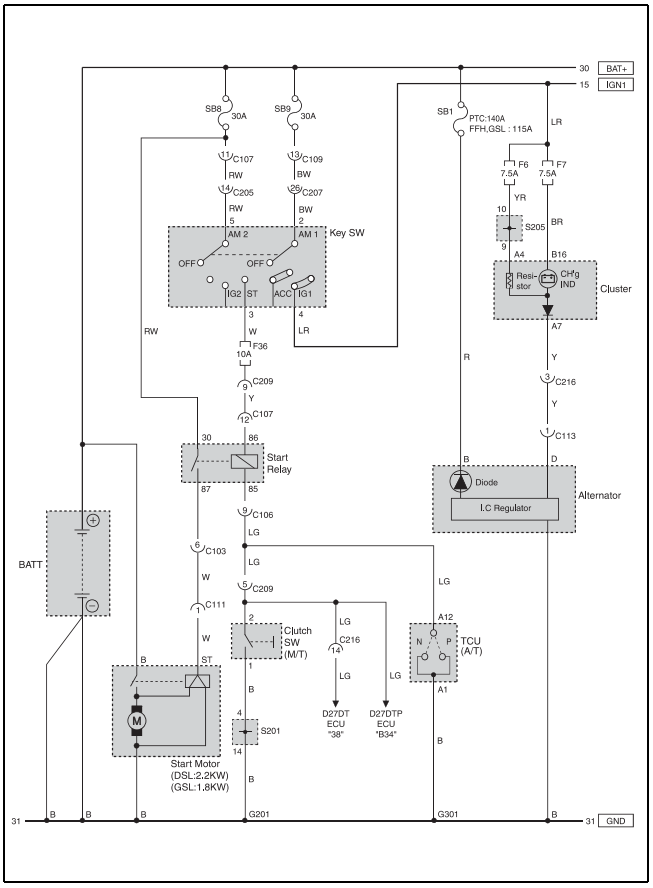

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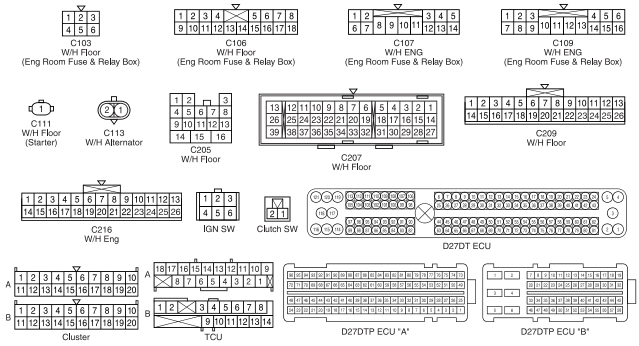
# SGN 1461-01 STARTING & CHARGING




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C103 (6Pin, Colorless) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C111 (1Pin, Gray) | W/H Floor - Starter Motor | Under the Preheating Time Relay | Solenoid |
| C113 (2Pin, Black) | W/H Eng - W/H Alternator | Under the Coolant Reserve Tank | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

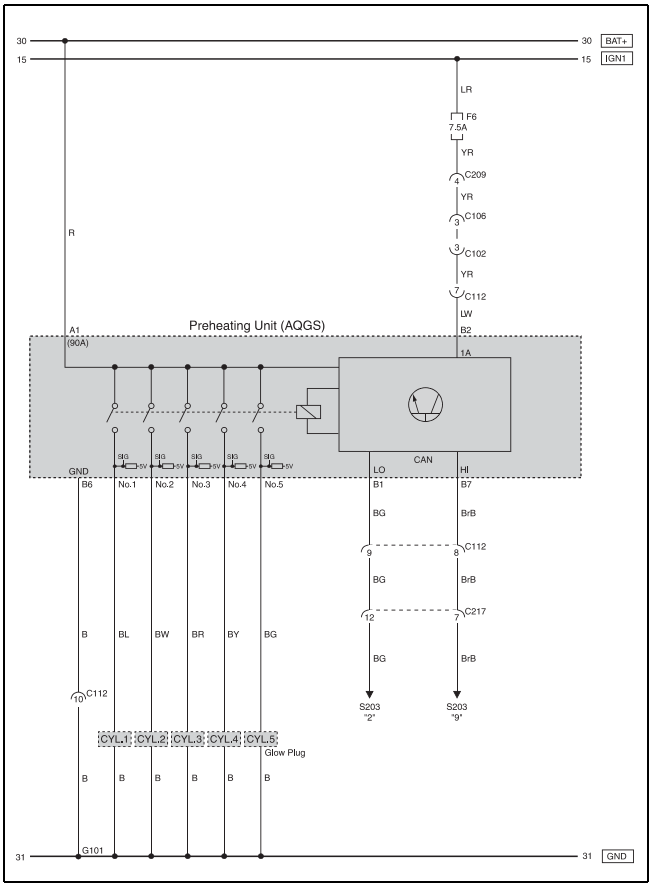



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| Modification basis | |
| Application basis | |
| Affected VIN | |



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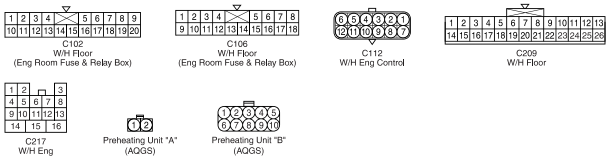
## SGN 2820-01 PREHEATING CIRCUIT I - AQGS(D27DTP)




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C112 (12Pin, Black) | W/H Eng - W/H Eng Control | Under the Preheating Time Relay | D27DTP |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G101 | W/H Eng | Center the Eng Room Fuse Box | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



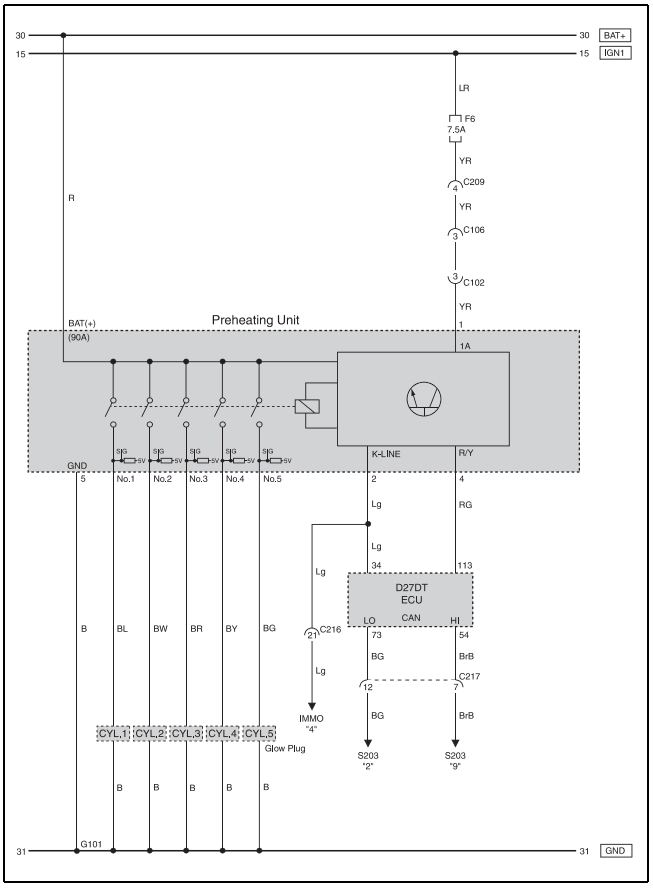



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| Modification basis | |
| Application basis | |
| Affected VIN | |

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SGN 2820

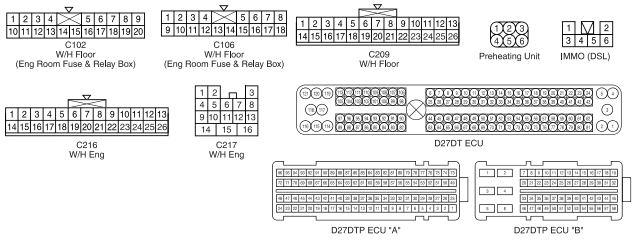
# PREHEATING CIRCUIT II (D27DT)




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G101 | W/H Eng | Center the Eng Room Fuse Box | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




## (3) CIRCUIT DESCRIPTION

Glow plug is installed on the cylinder head (combustion chamber) in the DSL preheating control unit system. Cold starting performance has improved and exhaust gas during cold starting has reduced. ECU receives coolant temperature and engine speed to control; after monitoring the engine preheating/post heating and glow plug diagnosis function, the fault contents will be delivered to ECU.

- Engine preheating/post heating functions
- Preheating relay activation by ECU controls
  - · Senses engine temperature and controls the preheating/post heating time
  - · Preheating warning light
- K-LINE for information exchanges between preheating unit and ECU
  - · Transmits preheating unit self-diagnosis results to ECU
  - · Transmits glow plug diagnosis results and operating status to ECU

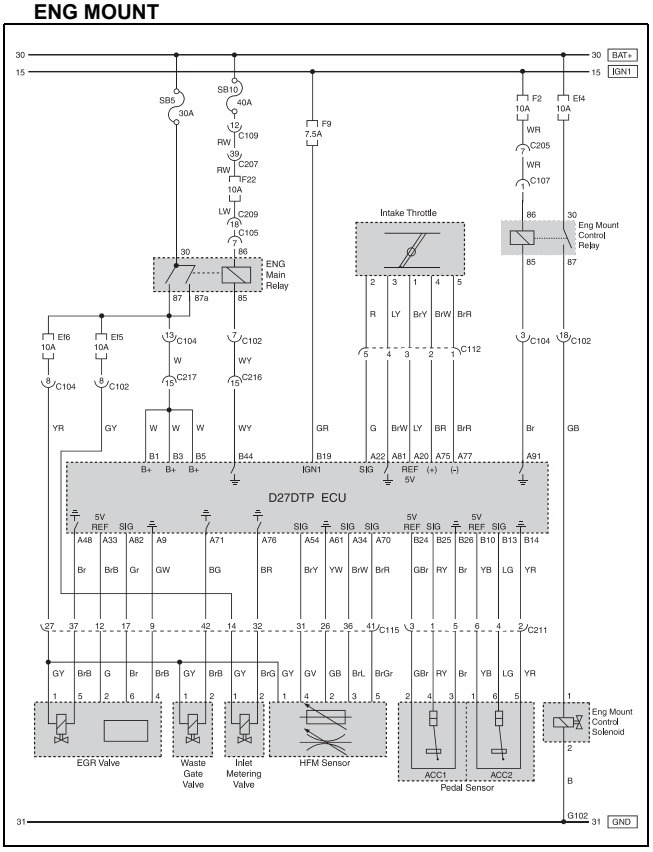
| | |
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| Modification basis | |
| Application basis | |
| Affected VIN | |



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## SGN 1491-01 ECU (ENGINE CONTROL UNIT - D27DTP)

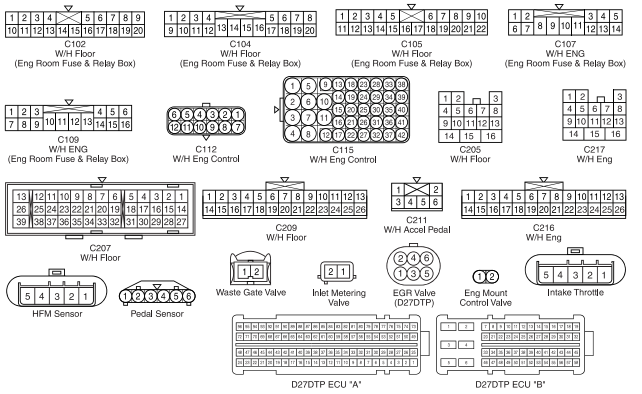
### 1) ENG MAIN RELAY, PEDAL MODULE, HFM SENSOR, VALVE, ENG MOUNT




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C112 (12Pin, Black) | W/H Eng - W/H Eng Control | Under the Preheating Time Relay | D27DTP |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C211 (6Pin, White) | W/H Main - W/H Accel Pedal | Inside the Driver Under-Cover | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

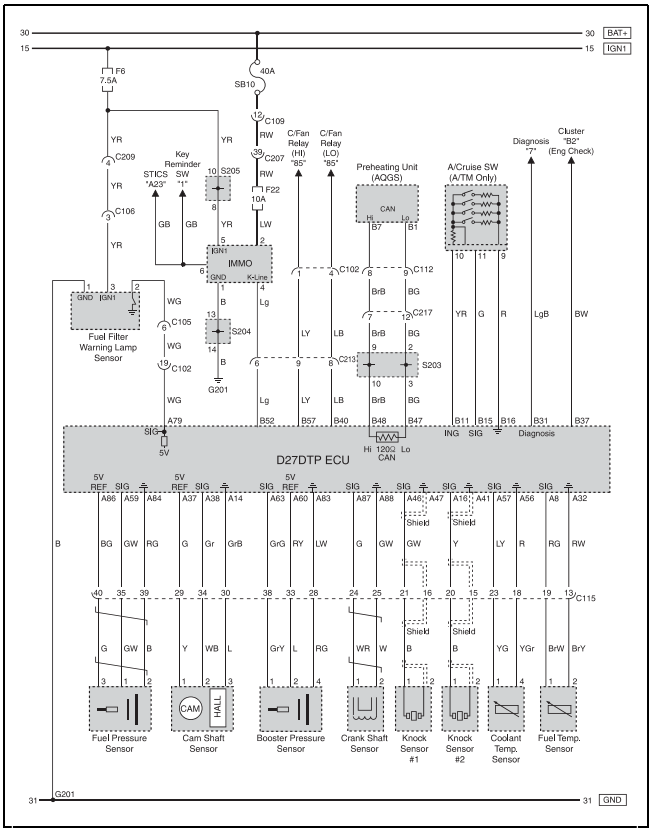





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| Application basis | |
| Affected VIN | |

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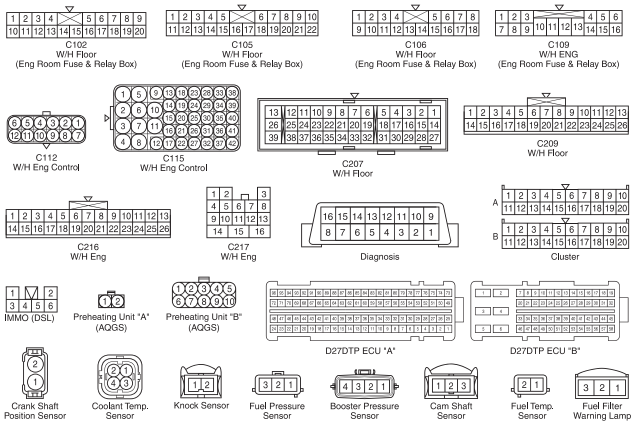
## 2) FUEL FILTER WARNING LAMP, IMMOBILIZER, SENSOR (FUEL PRESSURE, CAMSHAFT, BOOSTER PRESSURE, CRANKSHAFT, COOLANT/FUEL TEMP.) A/CRUISE SW




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C112 (12Pin, Black) | W/H Eng - W/H Eng Control | Under the Preheating Time Relay | D27DTP |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

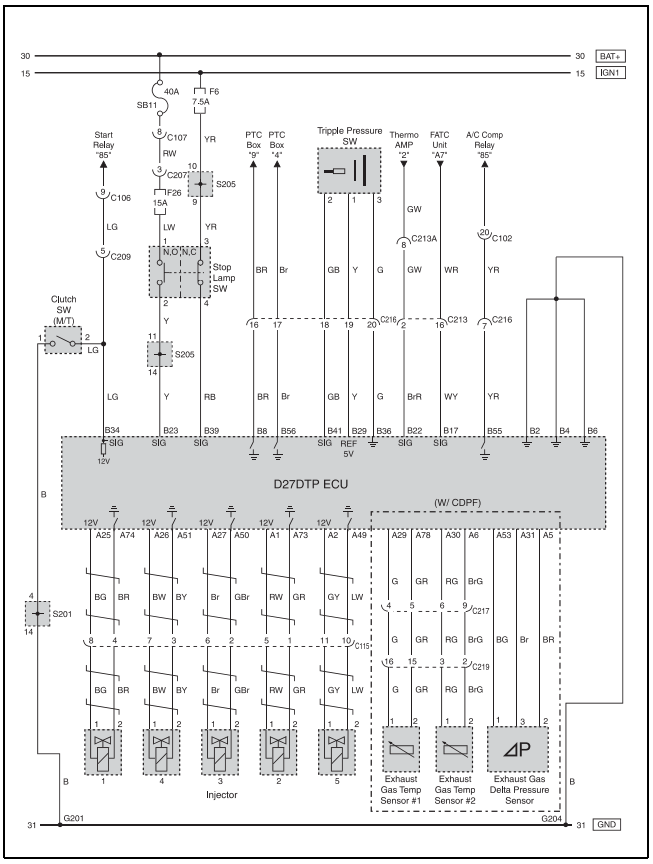



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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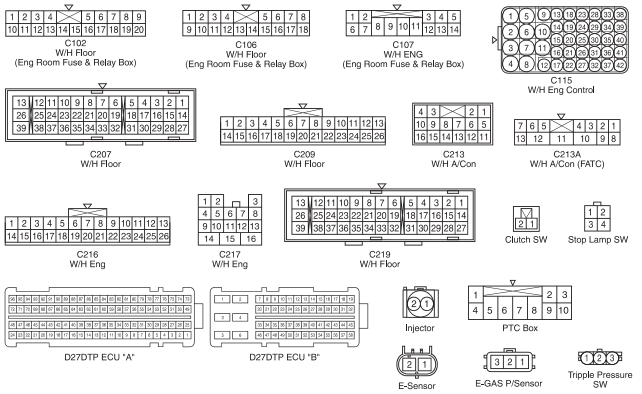
## 3) INJECTOR, STOP LAMP SW, SENSOR(A/CON, E-GAS), CLUTCH SW




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C213 (16Pin, White) | W/H Main - W/H A/Con | Backside the A/V Head Unit | |
| C213A (13Pin, White) | W/H A/Con - W/H Blower | Backside the Glove Box | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G204 | W/H Main | Beside Eng ECU (D27DTP) | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



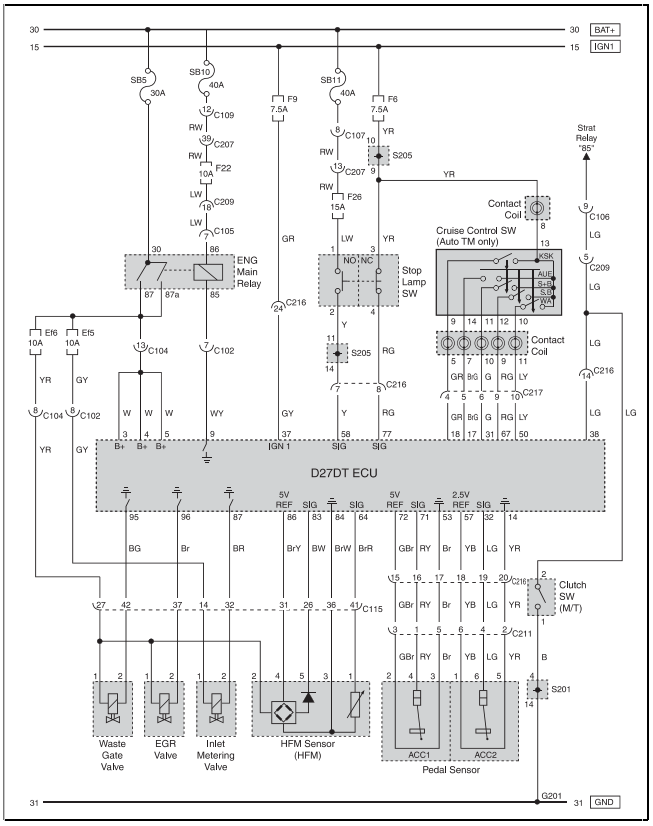



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| Modification basis | |
| Application basis | |
| Affected VIN | |

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# SGN 1491-01 ECU (ENGINE CONTROL UNIT - D27DT)

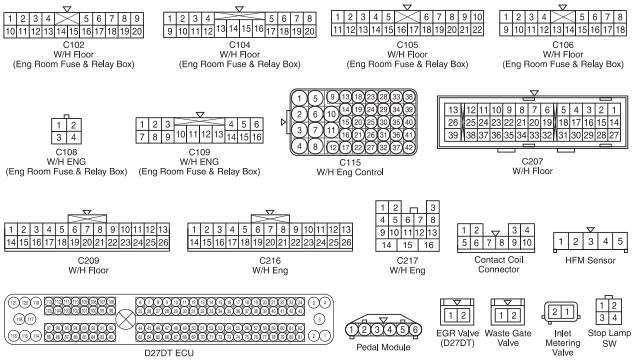
## 1) ENG MAIN RELAY, PEDAL MODULE, HFM SENSOR, VALVE, CRUISE CONTROL SW




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C108 (4Pin, Colorless) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

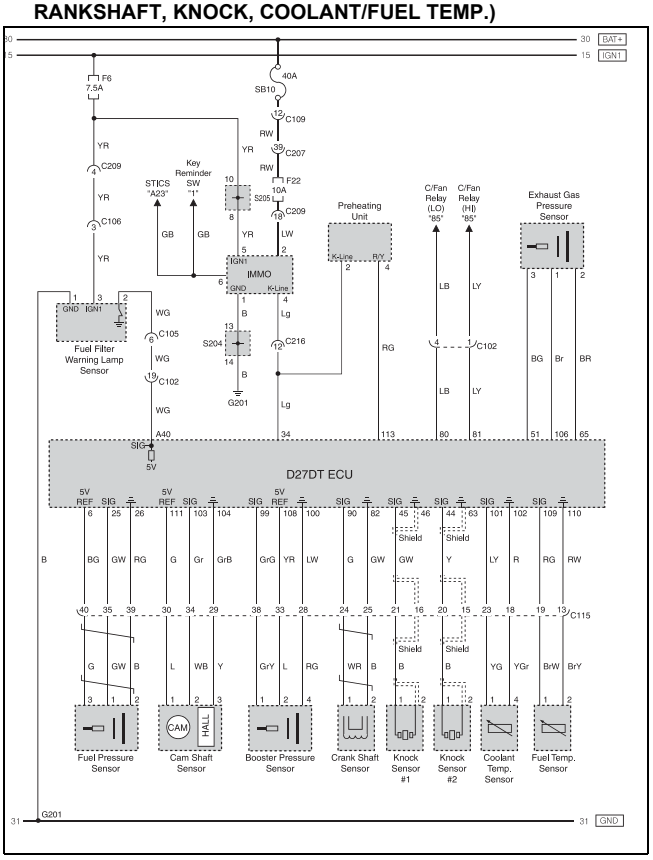



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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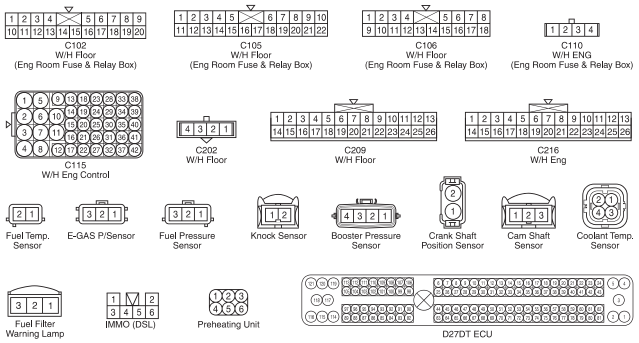
## 2) FUEL FILTER WARNING LAMP, IMMOBILIZER, SENSOR (FUEL PRESSURE, CAMSHAFT,BOOSTER PRESSURE, RANKSHAFT, KNOCK, COOLANT/FUEL TEMP.)




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C110 (4Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C202 (4Pin, White) | W/H Main - W/H Floor | Under the I/P Fuse Box | PTC |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

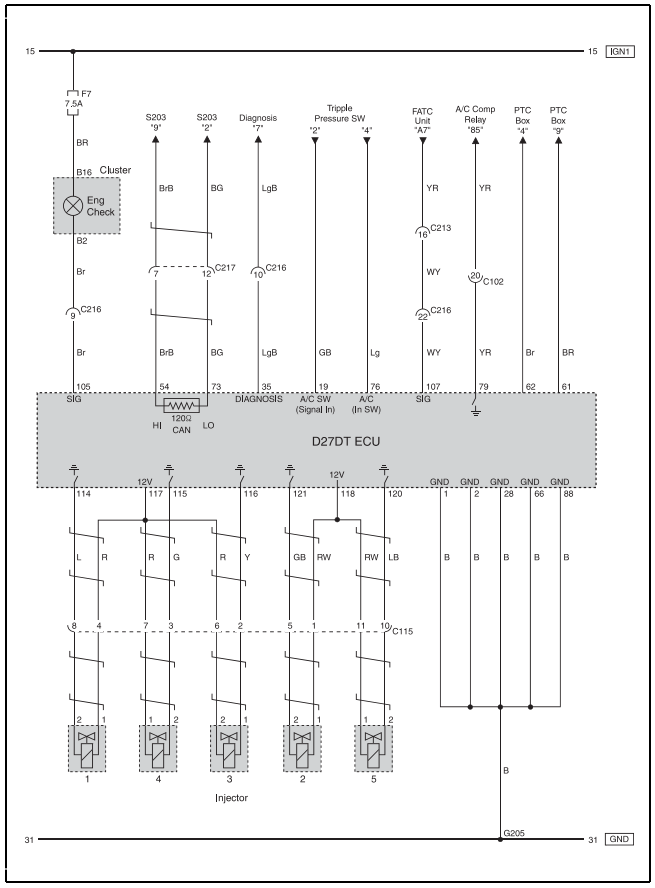





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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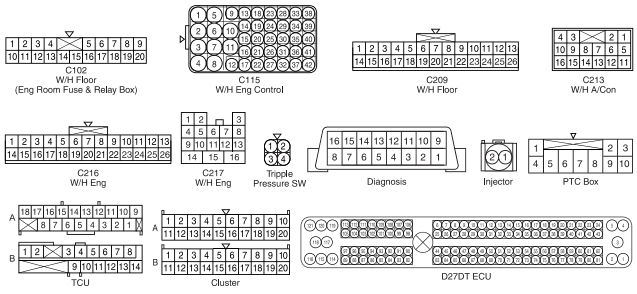
## 3) INJECTOR, CAN LINE




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C213 (16Pin, White) | W/H Main - W/H A/Con | Backside the A/V Head Unit | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G205 | W/H Main | Beside Eng ECU (GSL) | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



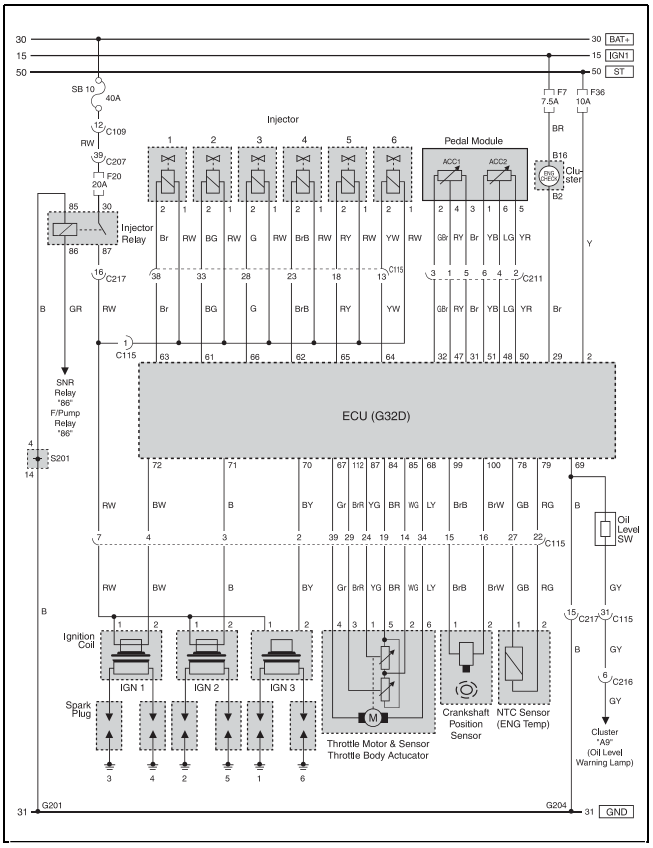

| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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# 1491-01 ECU (ENGINE CONTROL UNIT - GSL G32D)

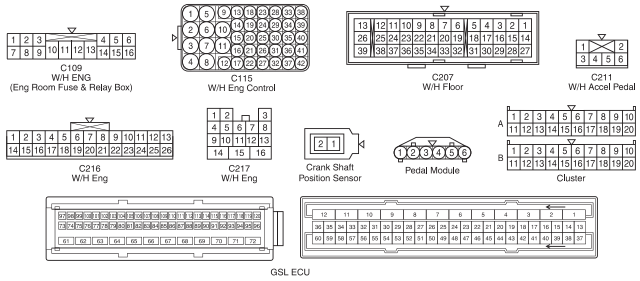
## 1) IGN COIL, INJECTOR, PEDAL MODULE, THROTTLE SENSOR




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C211 (6Pin, White) | W/H Main - W/H Accel Pedal | Inside the Driver Under-Cover | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G204 | W/H Main | Beside Eng ECU (D27DTP) | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

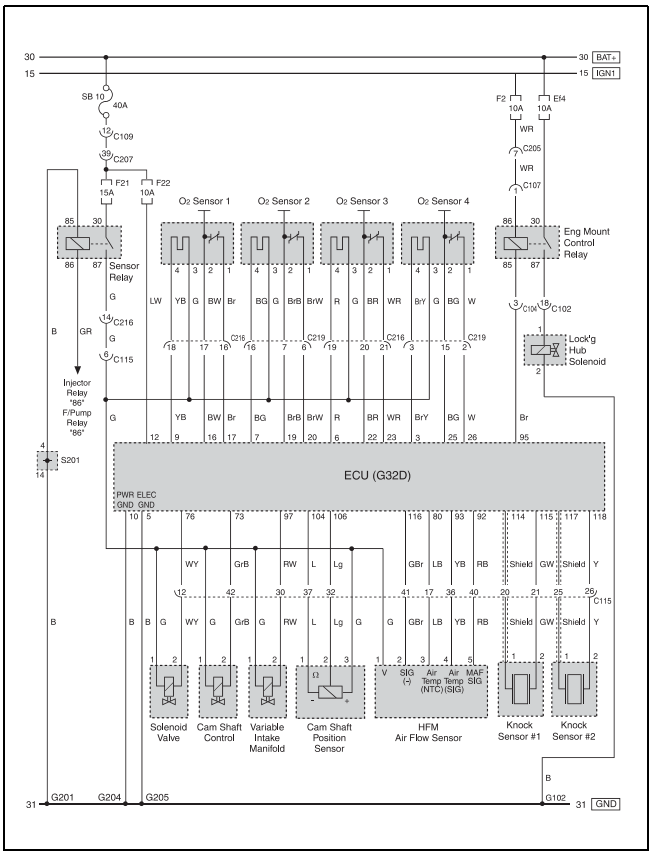





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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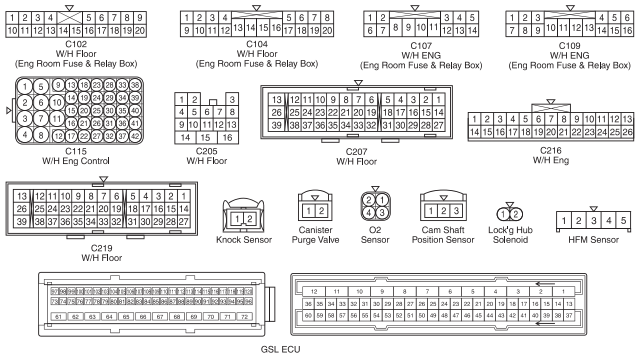
## 2) O2 SENSOR, CPS, KNOCK SENSOR, HFM SENSOR, CANISTER PURGE VALVE




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G204 | W/H Main | Beside Eng ECU (D27DTP) | |
| G205 | W/H Main | Beside Eng ECU (GSL) | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

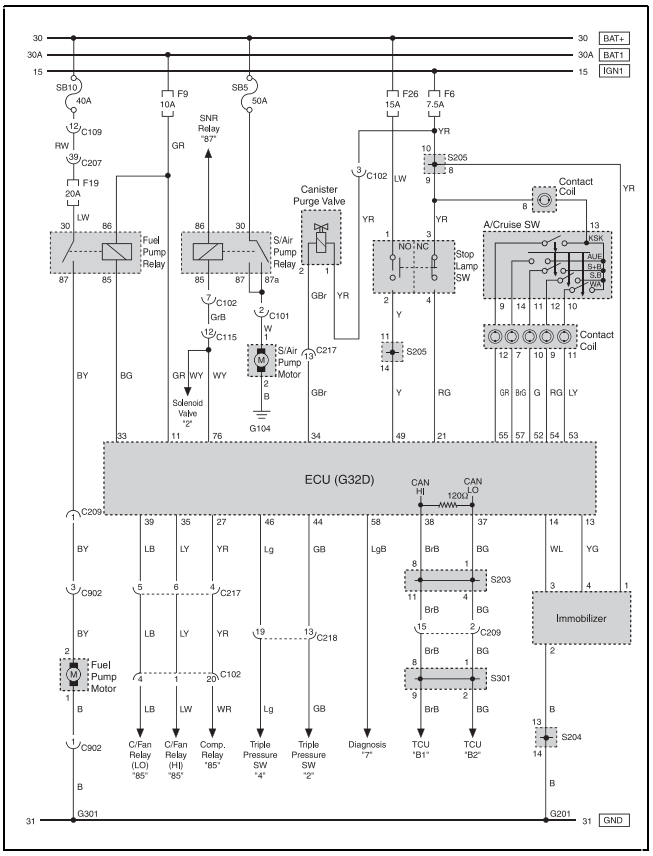



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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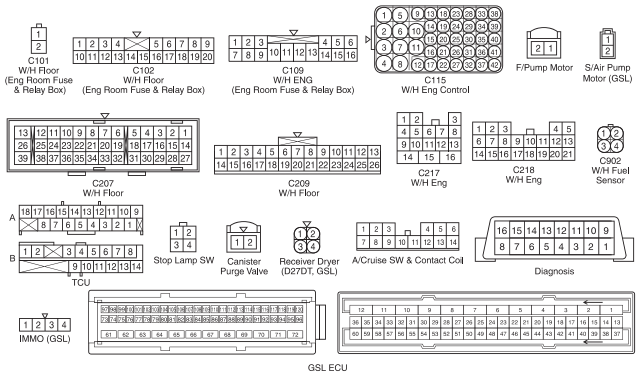
## 3) S/AIR PUMP, STOP LAMP, CRUISE CONTROL SW, FUEL PUMP, IMMOBILIZER




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C101 (2Pin, Colorless) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C218 (21Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C902 (4Pin, Black) | W/H Floor - W/H Fuel Sender | Upper the T/M | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

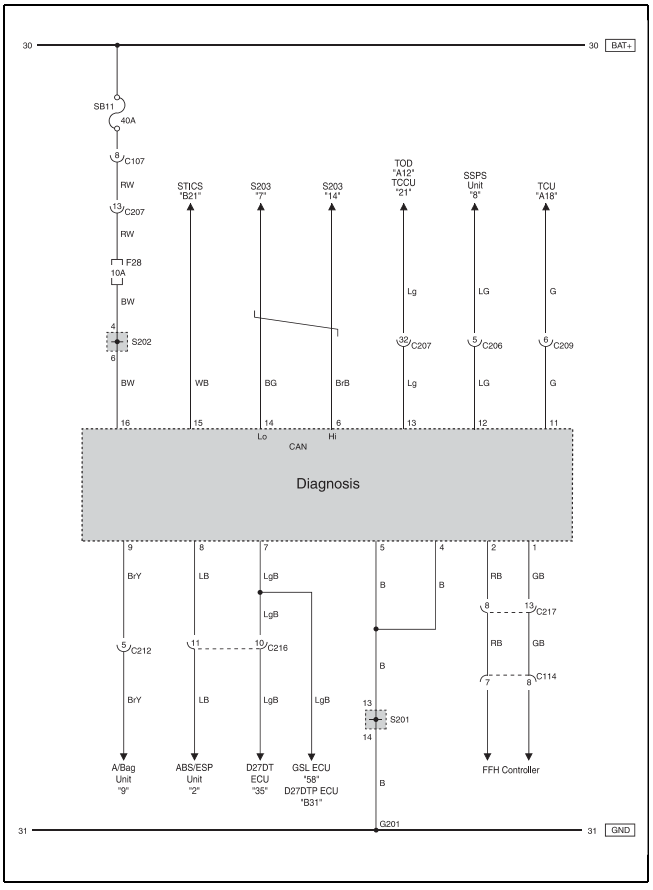





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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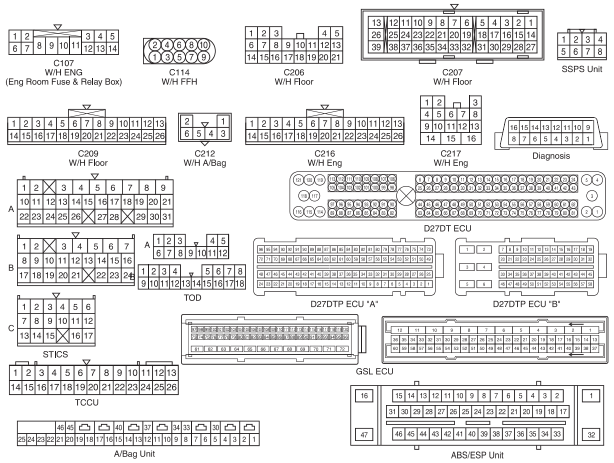
SGN
## 8210-01 DIAGNOSIS CIRCUIT




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C114 (16Pin, Black) | W/H Eng - W/H FFH | Backside Coolant Reserve Tank | FFH |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C212 (6Pin, White) | W/H Main - W/H Air Bag | Backside the Cluster(Inside I/P) | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



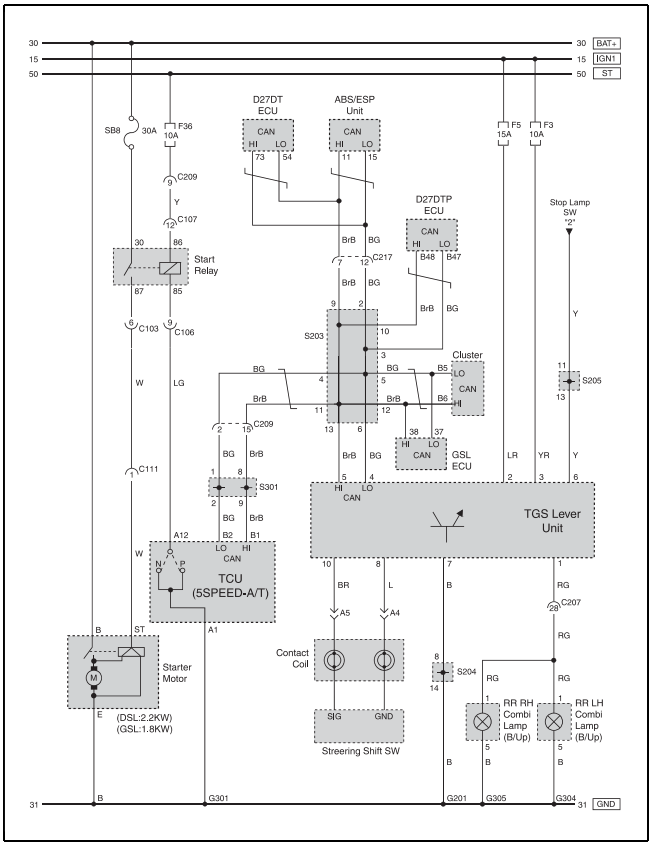

| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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# 3110-01 TCU (5SPEED - A/T)

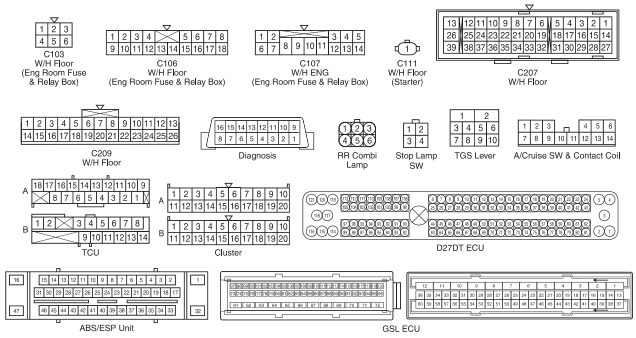
## 1) START MOTOR, TGS LEVER, CAN LINE




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C103 (6Pin, Colorless) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C111 (1Pin, Gray) | W/H Floor - Starter Motor | Under the Preheating Time Relay | Solenoid |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the LH QTR GLS Lower | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

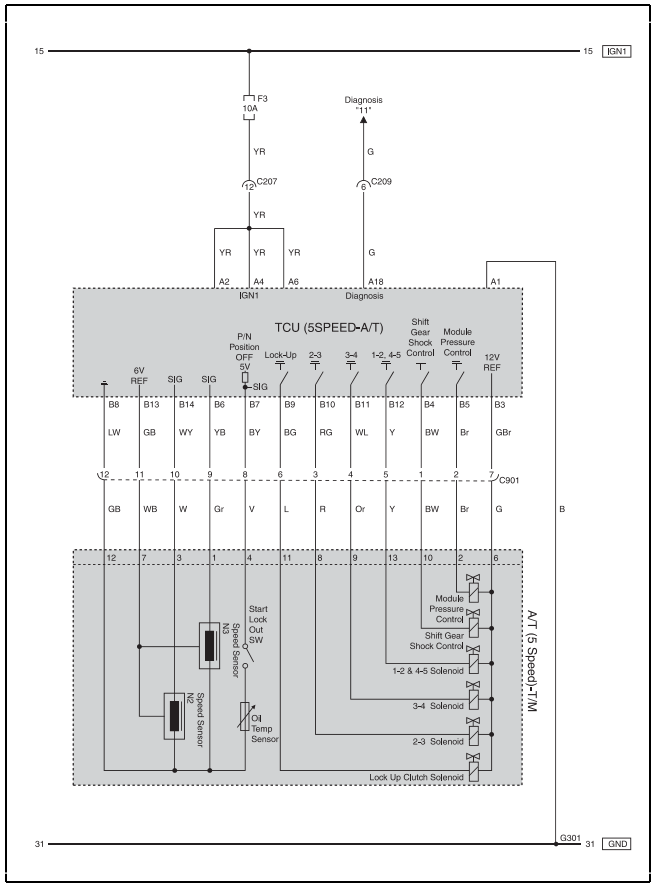





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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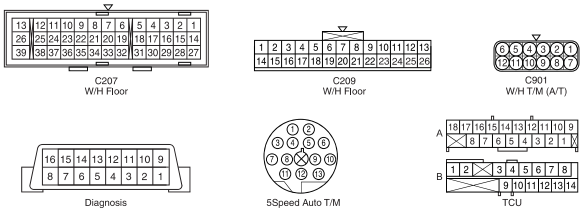
## 2) SOLENOID, OIL TEMP SENSOR, SPEED SENSOR (N2, N3)




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|---|
| C207 (39Pin, Gray) | | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C901 | (12Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | A/T |
| | (4Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | M/T |
| G301 | | W/H Floor | Under the Driver Seat | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## (3) CIRCUIT DESCRIPTION

### A. FUNCTION

TCU controls the gear groups according to the driving conditions. It receives the driving data from many sensors and switches as input signals. It is also connected with ECU, HECU,instrument panel and selector lever control unit.

▶Shifting Method

Basic shift operation includes up-shift and down-shift for all gear groups. The shift control unit determines driving resistance, accelerator pedal position, vehicle speed and some parameters (road surface condition, up hill and down hill gradients, trailer driving conditions, catalytic converter conditions, driving habits and automatic transmission oil temperature) to select a shift gear.

▶Down Shift

When engine speed increases excessively, the down shift does not occur. To get an engine brake effect during downhill driving, the current gear is maintained in speed control mode.

▶Engine RPM Adjustment

During shifting, the engine torque is reduced to optimize the shift operation by delaying the ignition time.

▶Lock-Up Clutch Control

The lockup clutch in torque converter is activated in 3rd, 4th and 5th gear and operates in sequence via PWM solenoid valve.

▶Others

The transmission is automatically controlled to compensate durability and wear.
The shift control values such as shifting point, shifting time, pressure during shifting, and lockup clutch control are permanently saved and the diagnosis is partially available.

### B. MODE SWITCH

▶Function

The mode switch is installed beside the selector lever and it has two modes of "S" mode (Standard Mode) and "W" mode (Winter Mode).

- "S" mode is used in normal driving (starts off with 1st gear). TCU (Transmission Control Unit) provides pleasant driving by changing the shifting pattern according to the driving habits (downhill gripping: approx. 11 ~ 13.5 %)
- When "W" mode is selected, the Winter mode indicator in meter cluster comes on, and the vehicle starts off with 2nd gear to achieve smooth starting on the icy or slippery road.

In winter mode, the up shift becomes faster and the down shift becomes slower for improving fuel consumption. The "W" mode is automatically changed to "S" mode in full throttle or kick-down operation. The vehicle can starts off with 2nd reverse gear (gear ratio: 1.92 ~ 1.93) when the "W" mode is selected. It is very useful on icy and slippery road. However, in this case, the "W" switch should be selected before placing the selector lever to "R" position.

Even though "W" mode is selected, the vehicle starts off with 1st gear in following:
When the system recognizes the mode switch operation, the selector lever control unit sends the control signal TCU via CAN communication.

- When the selector lever is in "1" position.
- When fully depressing the accelerator pedal or when starting off with kick-down condition.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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### C. REVERSE/PARKING (R/P) LOCK SYSTEM

Reverse (R) lock system is a safety system that prevents the selector lever from shifting to "P" or "R" position by activating the solenoid valve when the selector lever unit determines that the vehicle speed exceeds 10 km/h by checking the speed signal from wheel speed sensor via CAN communication. Parking (P) lock system uses the signals from brake switch other than conventional cable system to shift to other positions. The wiring harness for detecting brake switch operation is connected to selector lever control unit.

### D. STARTER LOCK-OUT CONTACT SWITC

The starter lock-out contact is installed beside oil temperature sensor and is actuated by a cam rail, which is located on the latching plate. In the selector lever positions "P" and "N", the permanent magnet is moved away from the reed contact. This opens the reed contact and the transmission control module receives an electrical signal. The transmission control module activates the starter lock-out relay module. This closes the electrical circuit to the starter in selector lever positions "P" and "N" via the starter lock-out relay module. In other words, when the selector lever is in driving positions, the contact is closed and the starter cannot be operated.

### E. OIL TEMPERATURE SENSOR

The oil temperature sensor is installed in hydraulic control unit and is connected in series with the starter lock-out contact. This means that the temperature signal is transferred to TCU when the starter lock-out contact is closed. The oil temperature has a considerable effect on the shifting time and therefore the shift quality. By measuring the oil temperature, shift operations can be optimized in all temperature ranges.

### F. SPEED SENSOR

The speed sensors are fixed to the shell of the hydraulic control unit via the contact tabs. A leaf spring, which rests against the valve body, presses the speed sensors against the transmission housing. This ensures a precise distance between speed sensors and impulse rings. speed sensor (n3) detects the speed of the front sun gear and speed sensor (n2) detects the speed of the front planetary carrier. If the speed sensor is defective, the transmission is operated in emergency driving mode. Below table shows the detection of speed sensor.

| Gear | N2 | N3 |
|---|---|---|
| 1 | ● | - |
| 2 | ● | ● |
| 3 | ● | ● |
| 4 | ● | ● |
| 5 | ● | - |
| R (S mode) | ● | - |
| R (W mode) | ● | ● |

### G. LOCKUP SOLENOID VALVE

This valve activates and releases the lockup clutch by adjusting the current to solenoid valve according to engine throttle opening value and output shaft speed. The lockup clutch operates in 3rd, 4th and 5th gear with steps to reduce shift shocks.

| | |
|---|---|
| Working Current | 1.5 ~ 2.0 A |
| Operating distance | 0.2 mm |
| Resistance | 2.5 ± 0.2 Ω (25°C) |
| Operating range | 3, 4, 5 shift |

### H. MODULATING PRESSURE (MP) AND SHIFT PRESSURE (SP) CONTROL SOLENOID VALVE

These valves control the modulating pressure and the shift pressure by applying appropriate electric current to solenoid valves according to driving condition of engine and transmission.
When the electric current from TCU is high/low, the regulated pressure decreases/increases.

| | |
|---|---|
| Working Curren | 0 ~ 1.0 A |
| Operating distance | 0.6 mm |
| Resistance | 5 ± 0.2 Ω (25°C) |

### I. CHARACTERISTICS OF UP/DOWNSHIFT OLENOID VALVE

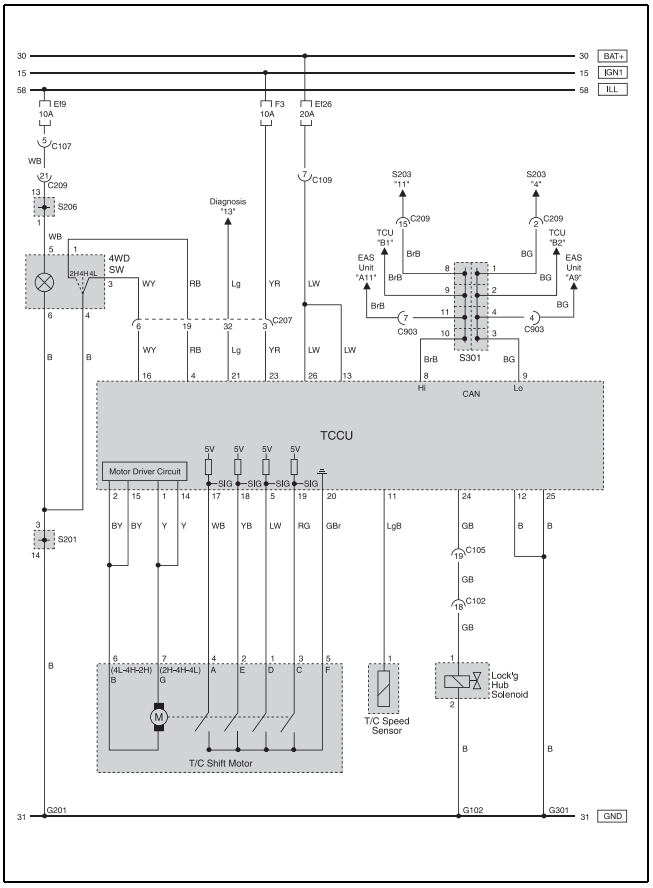
The solenoid valve remains energized and therefore open until the shift process is completed according to the engine and transmission conditions. If a solenoid valve is energized, it opens and transmits shift valve pressure to the corresponding command valve.

| | |
|---|---|
| Working Curren | 1.5 ~ 2.0 A |
| Operating distance | 0.2 mm |
| Resistance | 3.8 ± 0.2 Ω (25°C) |



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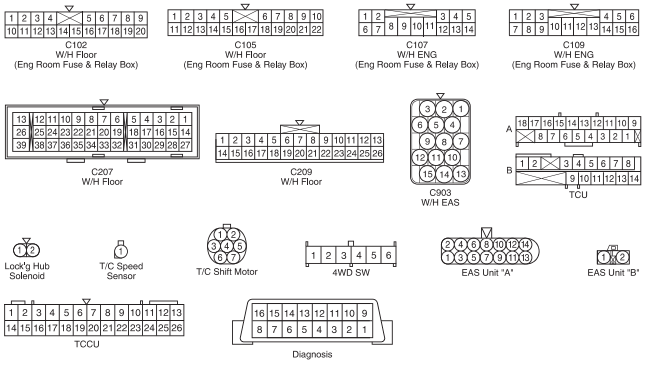
## 3410-01 TCCU




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C903 (15Pin, Black) | W/H Floor - W/H EAS | Lower the Passenger | |
| G102 | W/H Eng | Center the Eng BATT | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

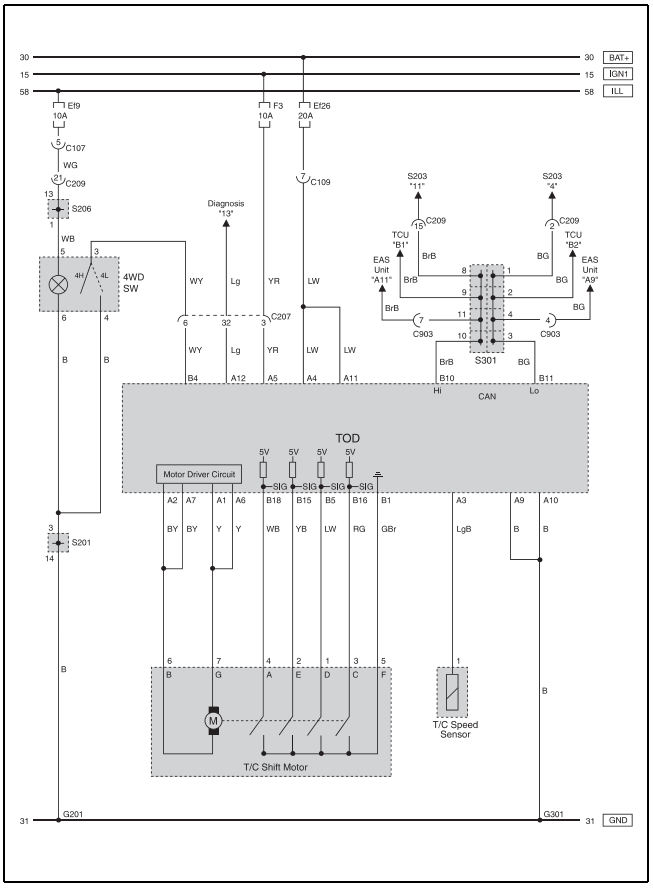





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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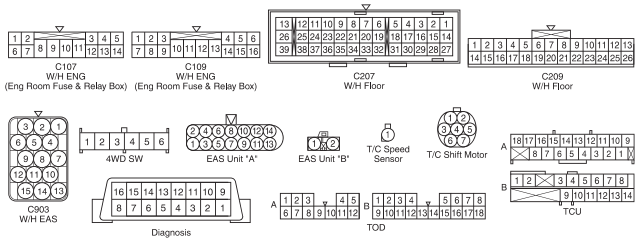
## 3410-01 TOD




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C903 (15Pin, Black) | W/H Floor - W/H EAS | Lower the Passenger | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

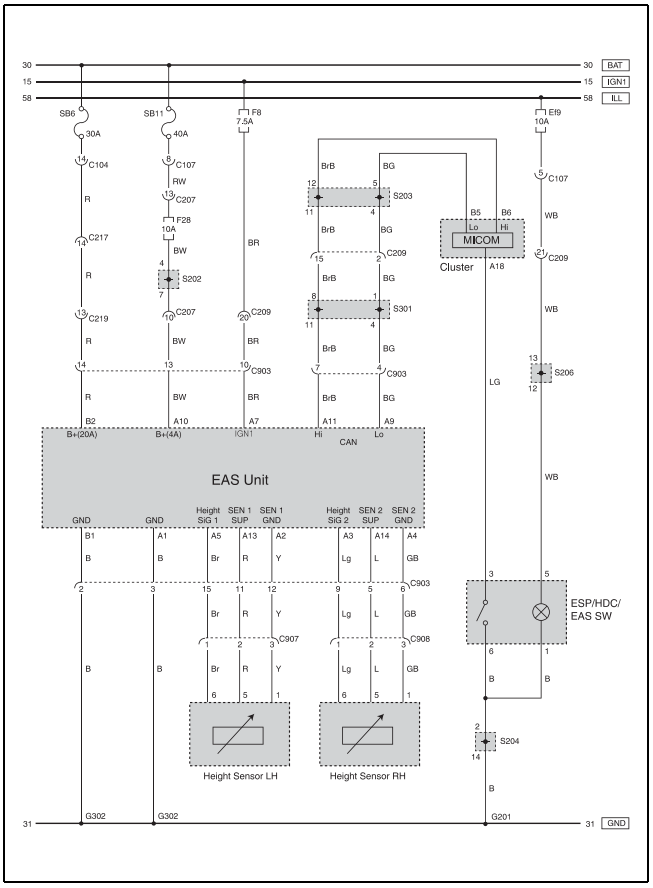



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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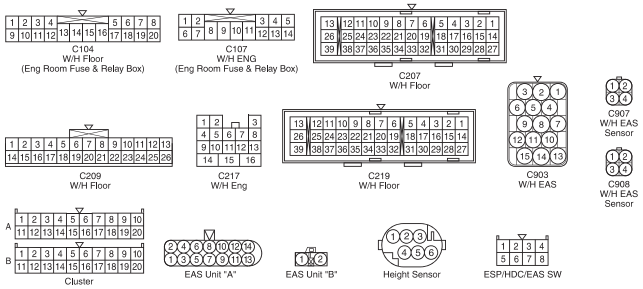
# 4480-01 EAS




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C903 (15Pin, Black) | W/H Floor - W/H EAS | Lower the Passenger | |
| C907 (4Pin, Black) | W/H Floor - W/H EAS Sensor | Under the RR Bumper (LH) | |
| C908 (4Pin, Black) | W/H Floor - W/H EAS Sensor | Under the RR Bumper (RH) | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G302 | W/H Floor | Under the Passenger Seat | |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

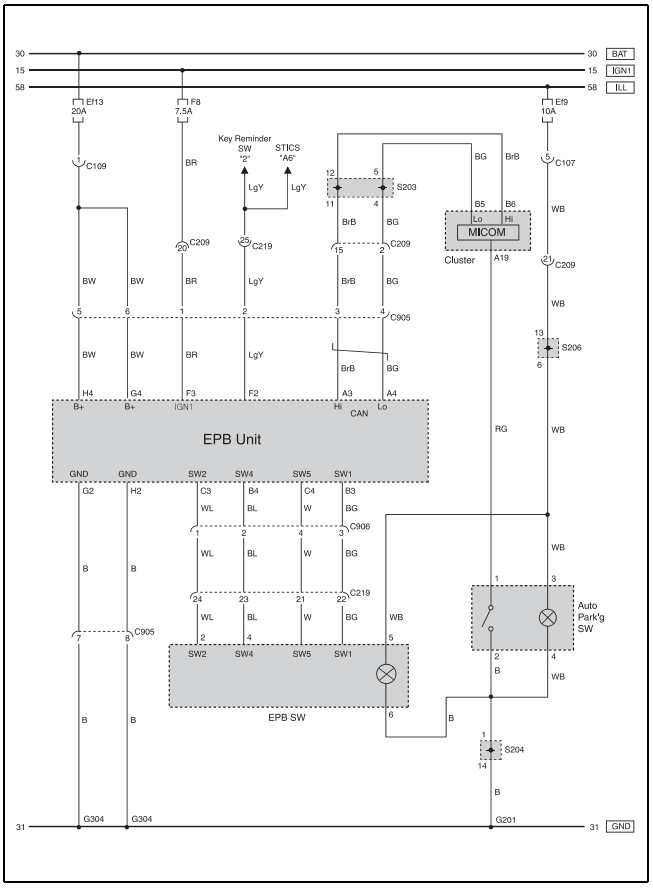





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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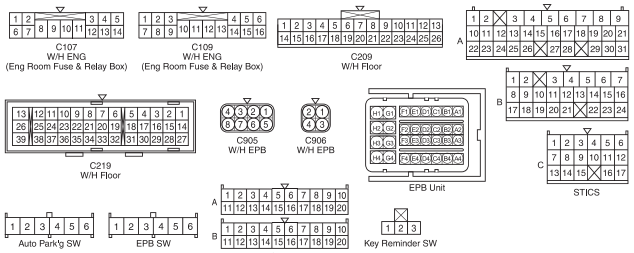
# 4920-01 EPB




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C905 (8Pin, Black) | W/H Floor - W/H EPB | Under the RR Bumper (LH) | |
| C906 (4Pin, Black) | W/H Floor - W/H EPB | Under the RR Bumper (LH) | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



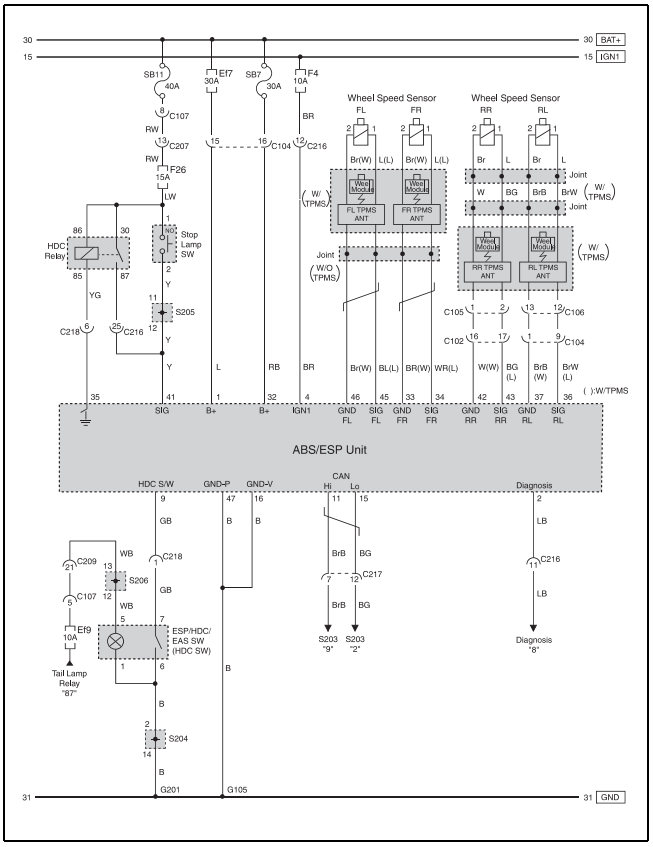

| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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# 4892-01 ABS/ESP

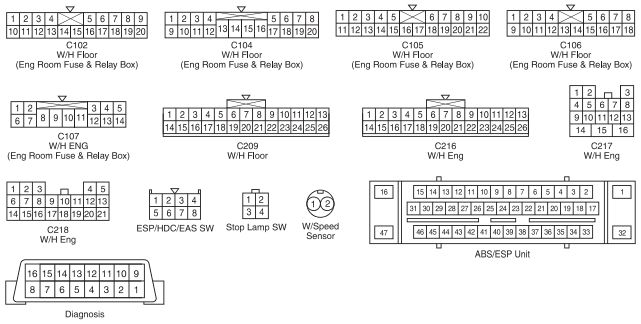
## 1) W/SPEED SENSOR, STOP LAMP SW, DIAGNOSIS, HDC, TPMS




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C218 (21Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G105 | W/H Eng | Beside Coolant Reserve Tank | ABS/ESP |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

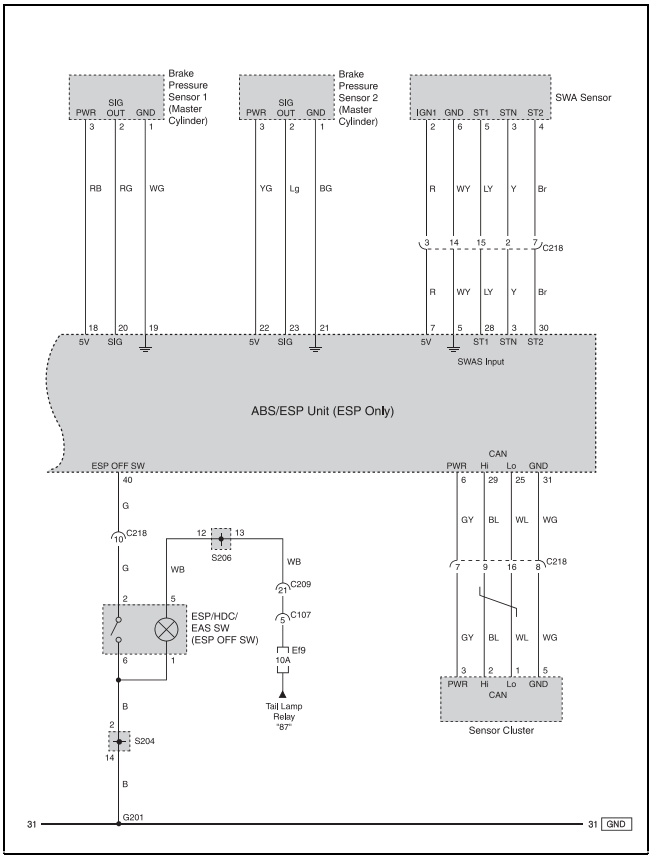





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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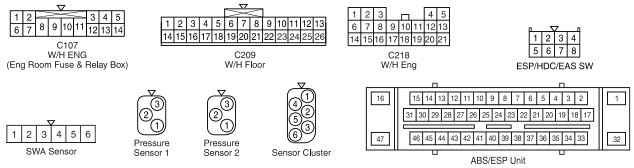
## 2) PRESSURE SENSOR, S.W.A SENSOR, SENSOR CLUSTER, ESP OFF SW




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C218 (21Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## (3) CIRCUIT DESCRIPTION

### A. ABS COMPONENTS

Newly introduced ABS has a different shape of integrated hydraulic modulator and HECU (Hydraulic and Electronic Control Unit) compared to existing ABS. And, the wheel speed sensor uses different method to detect wheel speed. The basic function of the ABS that maintains the vehicle stability by controlling the steerability of the vehicle when braking has not been changed.

### B. ACTIVE WHEEL SPEED SENSOR

The speed sensor used in traditional ABS is made of permanent magnet and transmits the output voltage that changes as the wheel rotor rotates to the HECU system. New wheel speed sensor detects the wheel speed through the current value that depends on the resistance that changes according to the magnetic field by using four resisters and supplying the 12 V power supply to the sensor.

▶ **Specifications**

| Item | Specifications | Reference |
|---|---|---|
| Supplying voltage | DC 12V | |
| Air gap | Front: 0.335 ~ 0.945 mm | Cannot measure the air gap |
| | Rear: 0.309 ~ 0.958 mm | |
| Output current (vehicle speed: at 2.75 km/h) | 7mA (Lo) ~ 14mA (Hi) +20 % / −16 % | |
| Tightening torque | Front: 19 ~ 25 Nm | 7.5 ~ 20 V |
| | Rear: 6 ~ 10 Nm | |

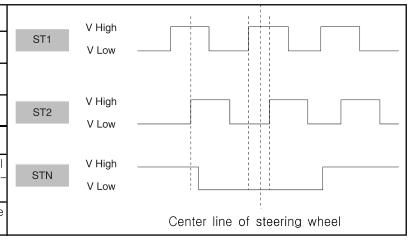
### C. HBA (HYDRAULIC BRAKE ASSIST SYSTEM)

HBA (Hydraulic Brake Assist) system helps in an emergency braking situation when the driver applies the brake fast, but not with sufficient pressure, which leads to dangerously long braking distance. ECU recognizes the attempt at full braking and transmits the signal calling for full brake pressure from the hydraulic booster. An inexperienced, elderly or physically weak driver may suffer from the accident by not fully pressing the brake pedal when hard braking is required under emergency. The HBA System increases the braking force under urgent situations to enhance the inputted braking force from the driver.

### D. SWAS : STEERING WHEEL ANGLE SENSOR

The steering wheel angle sensor is located between clock spring and multifunction switch. This sensor is used for recognition of driver's intends. If the sensor is replaced with new one, it can detect the neutral position after the vehicle is moving over 20 km/h for more than 5 seconds.

| | |
|---|---|
| Working voltage | 9 ~16 V |
| Number of pulse per revolution | 45 Pulses /1rev |
| Duty | Approx. 50 % |
| High – V | 3.0 ~ 4.1 V |
| Low – V | 1.3 ~ 2.0 V |
| ST1 and ST2 | Detects steering wheel angle and angular velocity as an average value |
| STN | Detects the center value of steering wheel |




### E. HDC (Hill Descent Control) SYSTEM

When the slope level exceeds 10%, the HDC operates until the vehicle reaches the speed condition given in step (4).

▶ **When the slope level is between 10% and 20% during the HDC operation**

When depressing the accelerator pedal or brake pedal, HDC system is changed to stand-by mode. When depressing the accelerator pedal again, HDC starts its operation again. Therefore, drivers can control the vehicle speed to a desired level by operating the accelerator pedal.

▶ **When the slope level exceeds 20% during the HDC operation**

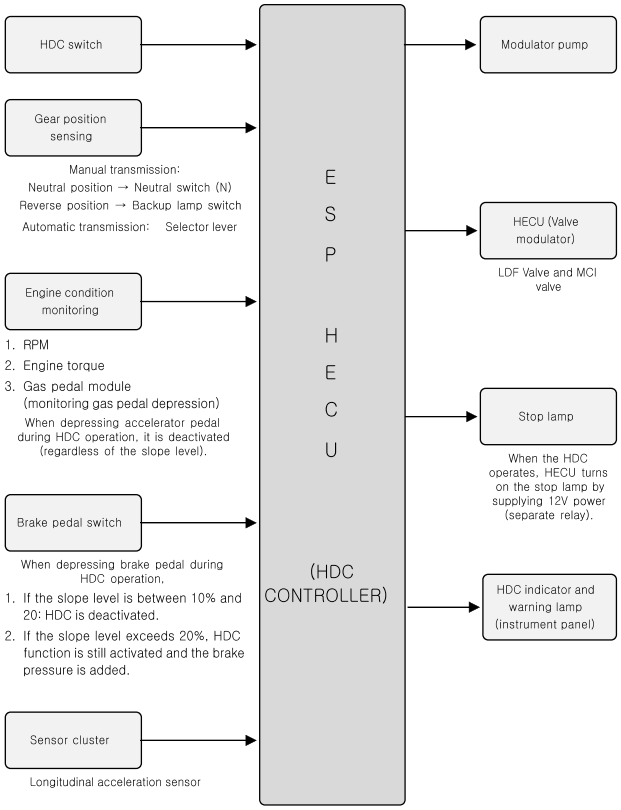
When depressing the accelerator pedal, HDC system is changed to stand-by mode. When depressing the brake pedal, HDC continues its operation and the braking power is increased. In this case, HECU sounds an abnormal noise and brake pedal may be very rigid, but this is a normal condition due to HDC operation.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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### F. INPUT/OUTPUT SIGNALS FOR HDC OPERATION




### G. OPERATION OF HDC INDICATOR CONTROLLER

This table describes the coming-on and blinking mode of HDC indicator according to the HDC switch operation (ON/OFF). The HDC indicator on the instrument panel has two modes; green (function lamp) and red (warning lamp). The HDC switch is a push & self return type switch ? when you press it once, it starts to operate and when you press it again, it stops the operation.

<table>
<tr><td colspan="3" rowspan="3">HDC Operation Mode</td><td>HDC Indicator</td><td>HDC Warning Lamp</td></tr>
<tr><td>Green</td><td>Red</td></tr>
<tr><td>HDC</td><td>HDC</td></tr>
<tr><td colspan="3">Initial ignition ON (From hence, this signifies operation mode after the engine starts. Even when HDC switch is ON, if the ignition is OFF, HDC operation stops automatically.)</td><td>OFF</td><td>ON<br>(goes off after 1.8 seconds)</td></tr>
<tr><td rowspan="2">Not available</td><td colspan="2">HDC switch OFF</td><td>OFF</td><td>OFF</td></tr>
<tr><td colspan="2">HDC system error</td><td>OFF</td><td>ON</td></tr>
<tr><td rowspan="2">Stand-by</td><td colspan="2">HDC switch ON</td><td>ON</td><td>OFF</td></tr>
<tr><td colspan="4">The HDC switch is turned ON, but HDC system is in stand-by mode because the operating requirements are not met.</td></tr>
<tr><td rowspan="2">In operation</td><td colspan="2">HDC system is operating.</td><td>Blinking (0.5 seconds of interval)</td><td>OFF</td></tr>
<tr><td colspan="4">The HDC switch is turned ON, and the operating requirements are met. HDC is operating with operating sound.</td></tr>
<tr><td rowspan="3">System overheat</td><td rowspan="2">High brake system temperature (over 350°C)</td><td>HDC stand-by mode</td><td>OFF</td><td>Blinking</td></tr>
<tr><td>HDC is operating</td><td colspan="2">Alternate blinking of green and red lamp (0.5 seconds of interval)</td></tr>
<tr><td colspan="2">Too high brake system temperature (over 450°C)</td><td>OFF</td><td>ON</td></tr>
<tr><td colspan="4">There is no specific temperature sensor in the system, but a programmed logic inside the HECU predicts the temperature based on the operating numbers and conditions of HDC (HDC cannot be operated).</td></tr>
</table>

### H. ESP (ELECTRONIC STABILITY PROGRAM)

ESP (Electronic Stability Program) recognizes critical driving conditions, such as panic reactions in dangerous situations, and stabilizes the vehicle by wheel-individual braking and engine control intervention with no need for actuating the brake. This system is developed to help the driver avoid the danger of losing the control of the vehicle stability due to under-steering or over-steering during cornering.



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**I. SENSOR CLUSTER (YAW RATE SENSOR + LATERAL ACCELERATION SENSOR + LONGITUDINAL ACCELERATION SENSOR)**

| Descriptions | Specifications |
|---|---|
| Supplying voltage | Approx. 5 V (4.75 ~ 5.25 V) |
| Output voltage when stop | Approx. 2.5 V (Ignition switch "ON") |
| Output range | 0.2 ~ 4.8 V |
| Operation start speed | −75°/s ~ +75°/s |

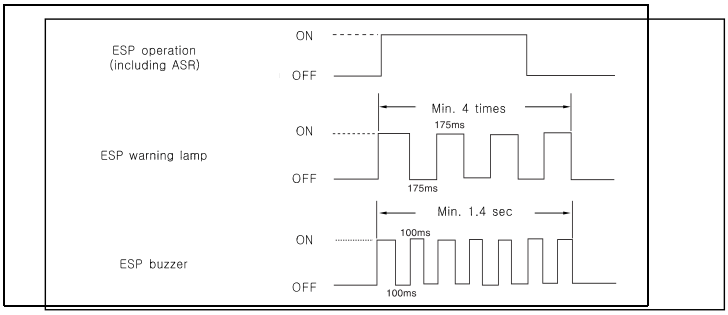
**J. PRESSURE SENSOR**

▶ **Specificatons**

| Descriptions | Specifications |
|---|---|
| Supplying voltage | 4.75 ~ 5.25 V |
| Output range | 0.25 ~ 4.75 V |
| Output voltage when stop | 2.5 V |

**K. ESP WARNING LAMP BLINKING IN CONTROL**

ESP warning lamp blinks when ESP control is activated. If the activation reaches a certain limitation, a beep sounds to warn the driver. The ESP warning lamp goes off when ESP function is deactivated. Even when the ESP is operated for a very short period of time, the ESP warning lamp blinks minimum of 4 times every 175 milliseconds and the buzzer sounds for at least 1.4 seconds with 100 ms interval.




**L. ESP SYSTEM CANCELLATION USING THE ESP OFF SWITCH**

When the ESP switch at the center switch panel is pushed (for over approximately 150 ms), the ESP system will be cancelled and the vehicle will be driven regardless of the output values from the corresponding sensors. Then, the ESP warning lamp on the instrument panel comes on.

**M. RESUMING THE ESP SYSTEM BY USING THE ESP OFF SWITCH**

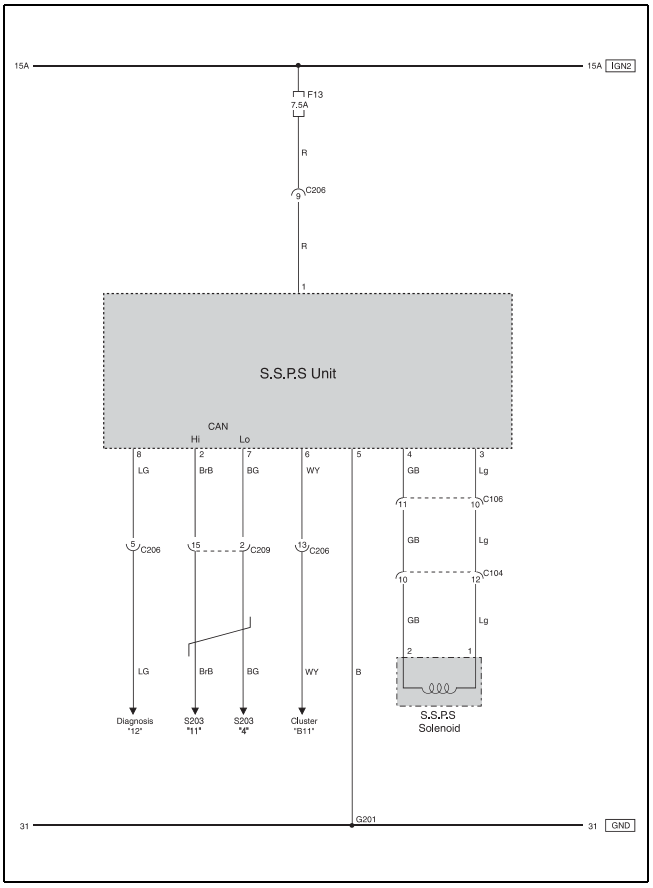
The ESP system will be resumed and the ESP warning lamp at the instrument panel goes off when the ESP switch at the center switch panel is pushed (for over approximately 150 ms) while the ESP system is not operating.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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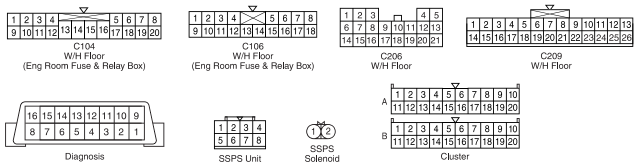
# S.G.N 4620-12 S.S.P.S (SPEED SENSITIVE POWER STEERING




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION





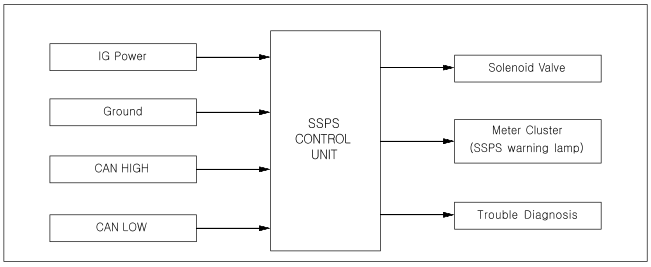

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## 3) CIRCUIT DESCRIPTION

### (1) SSPS (SPEED SENSITIVE POWER STEERING)

In the conventional constant power assist steering system, the steerability gets lighter as vehicle speed rises, and this may cause a dangerous situation. Where as having heavy steerability in high speed driving makes it difficult to manipulate the steering wheel when vehicle is in stop. This steering system solves this problem as the steerability is changed according to the vehicle speed, which is called Speed Sensitive Power Steering (SSPS).
SSPS, by providing appropriate steerability to a driver according to the changes of vehicle speed, gives steering stability. The power steering control unit adjusts the hydraulic pressure to reaction plunger by controlling the pressure solenoid valve located in the gear box to optimize the steerability. In other words, the steering wheel gets lighter by adjusting steerability in stop or low speed and provides steering stability by adjusting steering wheel to become heavier in high speed.

### (2) INPUT/OUTPUT OF SSPS CONTROL UNIT




### (3) SSPS CONFIGURATION

**A. PCV (Pressure Control Valve)**

This valve controls the hydraulic pressure supplied to reaction device by moving the spool valve according to the changes of solenoid valve.

**B. Reaction device**

This device increases the steerability effect by binding the input shaft with supplied hydraulic pressure from PCV.

**C. Solenoid valve**

The SSPS control unit controls the amount of electric current to the solenoid valve according to the vehicle speed. In other words, the solenoid valve controls the hydraulic pressure applied to reaction plunger by changing the valve spool position that is linked with solenoid valve according to the amount of electric current. The changes of hydraulic pressure applied to input shaft according to the pressure changes applied to the reaction plunger provide proper steerability based on the amount of electric current.

▶ **Specifications**

| Description | Specification |
|---|---|
| Voltage Rating | DC 12 V |
| Current Rating | 1.0 A |
| Resistance | 6.7 ± 1Ω |

▶ **Electric Current Check**

· Disconnect the solenoid valve connector (waterproof connector) and install the ammeter between the solenoid valve connector and the wiring harness.

**NOTE**
- Do not ground the solenoid terminal.

- When the vehicle speed is at 0 km/h, check whether the electric current for solenoid is in specified range and check that the current is reduced as the vehicle speed increases.

| | |
|---|---|
| Current | 0.9 ~ 1.1 A (vehicle speed at 0 km/h) |

**D. SSPS Control Unit**

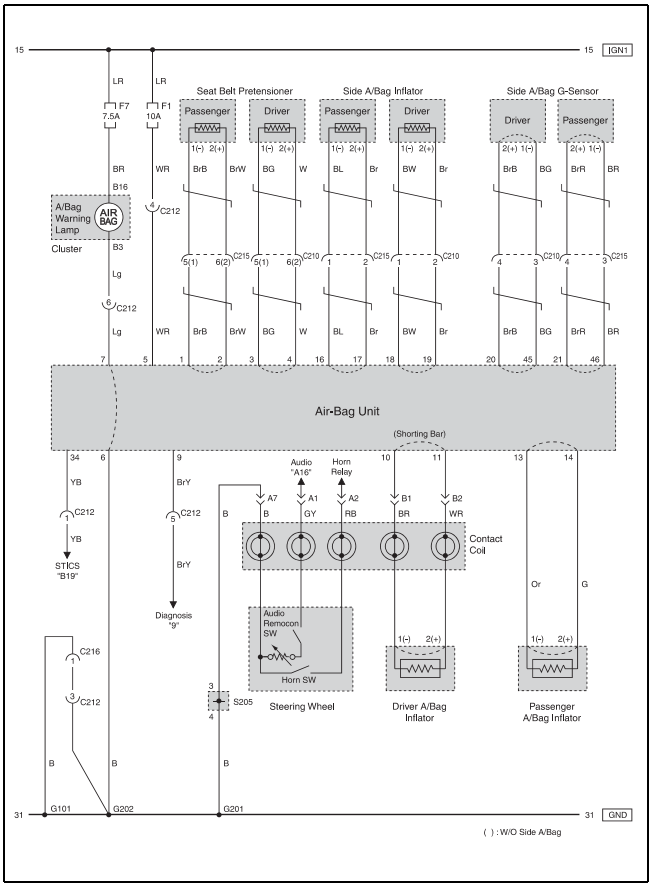
- To provide proper steerability to a driver, the SSPS control unit controls the solenoid valve by receiving the vehicle speed and the throttle position data via CAN
- communication.
  The SSPS control unit controls the working current for the solenoid valve with PWM type duty ratio of 333 Hz frequency and sets the target current to 1A during 1 second after the
- ignition is "ON".
  When a trouble occurs in the system, the SSPS control unit generates a trouble code using fail safe function.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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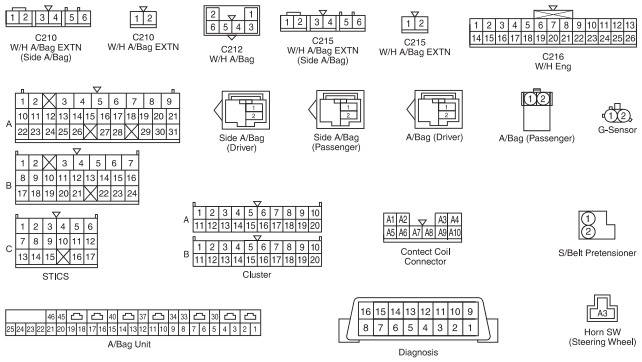
SSN 8810-01 **AIR-BAG (CURTAIN AIR-BAG)**




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C210 (2Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Driver Cowl Side C/Holder | |
| C210 (6Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Driver Cowl Side C/Holder | Side A/Bag |
| C212 (6Pin, White) | W/H Main - W/H Air Bag | Backside the Cluster(Inside I/P) | |
| C215 (2Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Passenger Cowl Side C/Holder | |
| C215 (6Pin, Yellow) | W/H Air Bag - W/H Air Bag EXTN | Passenger Cowl Side C/Holder | Side A/Bag |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G101 | W/H Eng | Center the Eng Room Fuse Box | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G202 | W/H Main | Lower the Console Box | |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



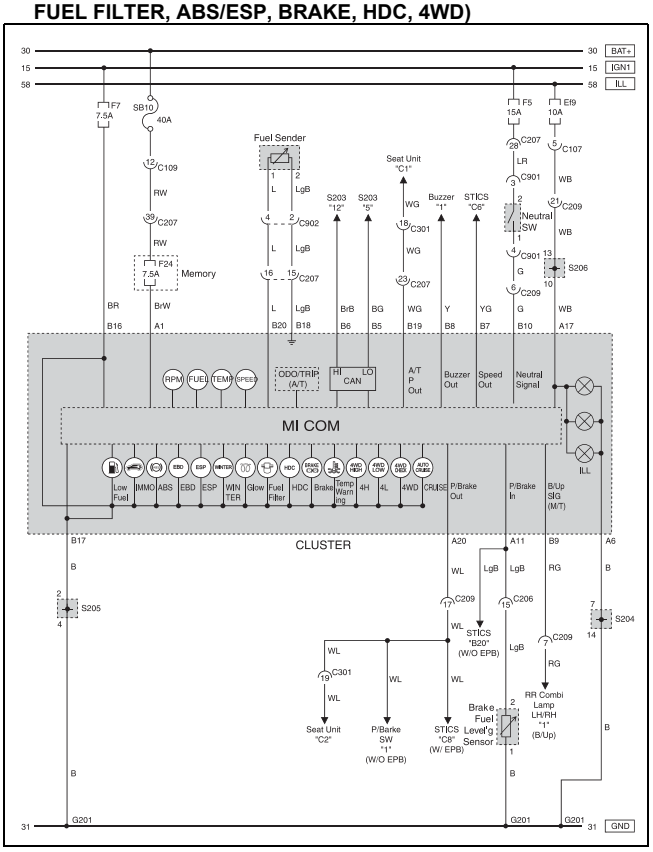

| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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# 8010-01 CLUSTER

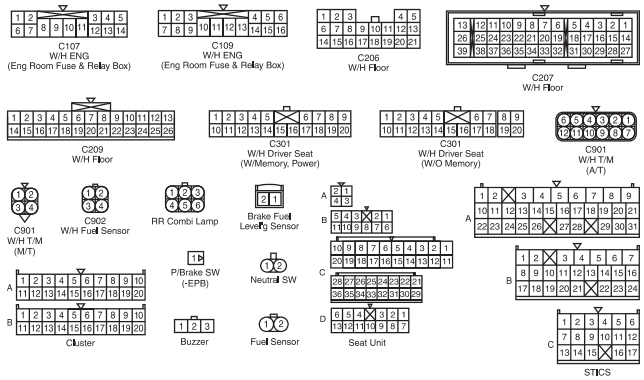
## 1) GAUGE (SPEED, RPM, FUEL, TEMP), WARNING LAMP (FUEL, FUEL FILTER, ABS/ESP, BRAKE, HDC, 4WD)




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Seat Warmer |
| C901 (12Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | A/T |
| C901 (4Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | M/T |
| C902 (4Pin, Black) | W/H Floor - W/H Fuel Sender | Upper the T/M | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S203 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

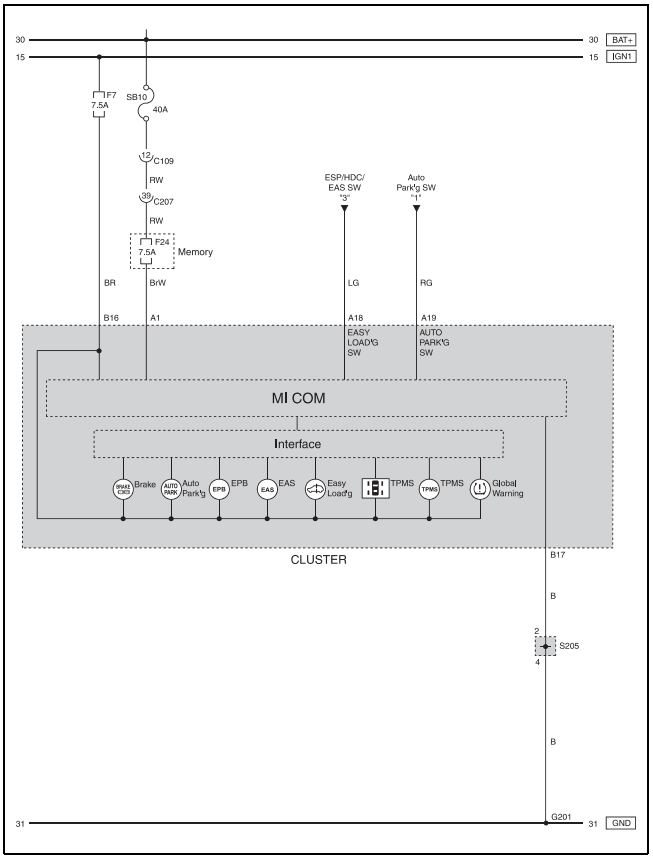





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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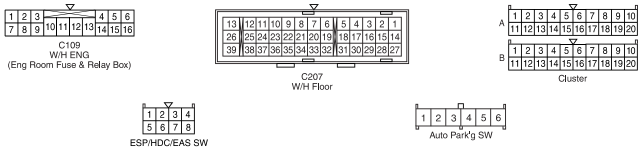
## 2) WARNING LAMP (EAS, EPB, AUTO PARK'G,GLOBAL), EASY LOAD'G, TPMS




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

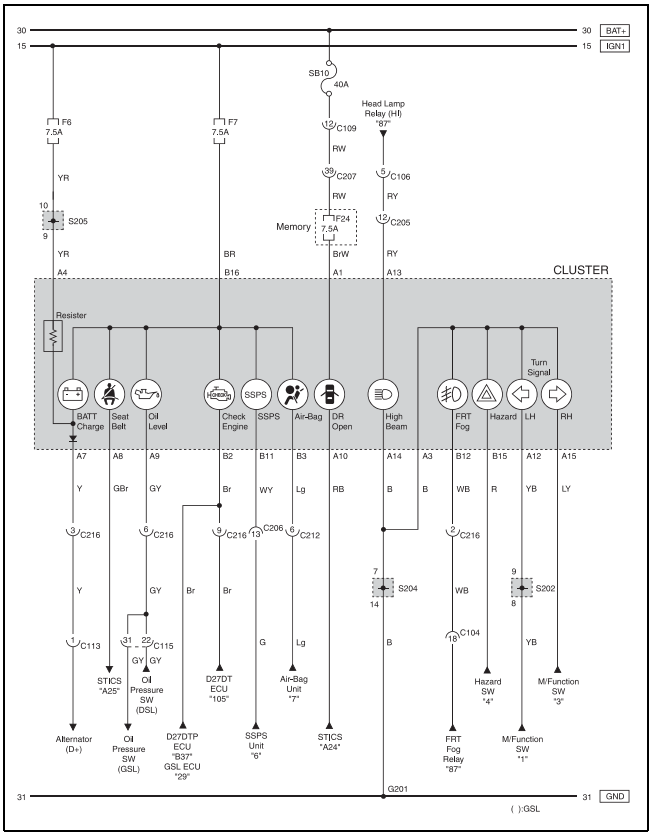
### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION






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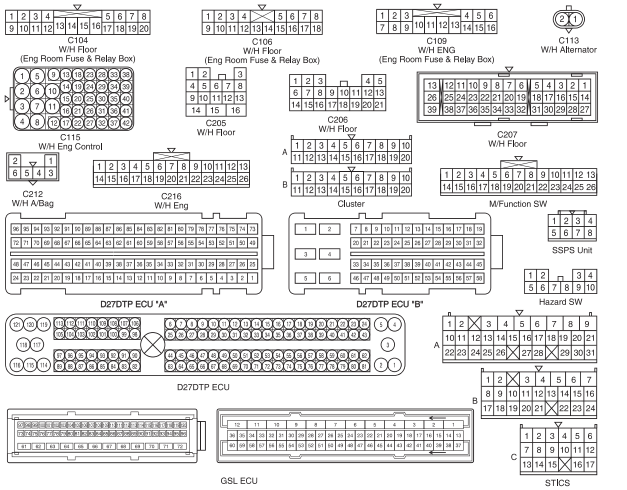
## 3) WARNING LAMP (BATT CHARGE, OIL, SSPS, DOOR, ENG CHECK, AIR BAG, SEAT BELT), TURN SIGNAL, FOG LAMP, HAZARD




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C113 (2Pin, Black) | W/H Eng - W/H Alternator | Under the Coolant Reserve Tank | |
| C115 (42Pin, Black) | W/H Floor - W/H Eng Control | Right Eng Room Dash PNL | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C212 (6Pin, White) | W/H Main - W/H Air Bag | Backside the Cluster(Inside I/P) | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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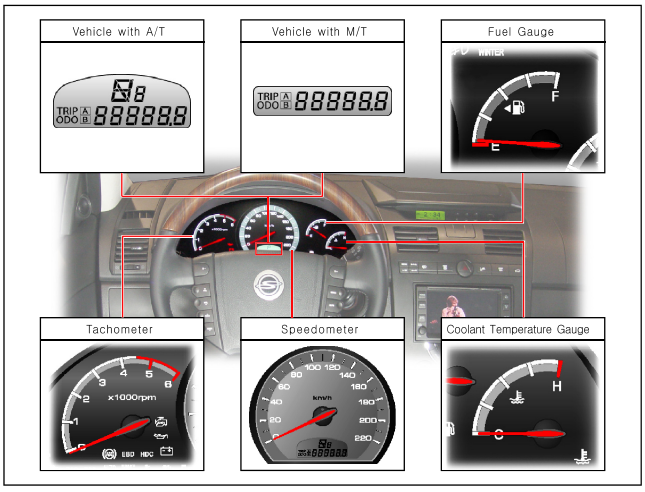
## (3) CIRCUIT DESCRIPTION

### A. INSTRUMENT CLUSTER

The instrument cluster uses the CAN communication.
The HDC warning lights (green & red) are added since the HDC function has been introduced into ESP system.

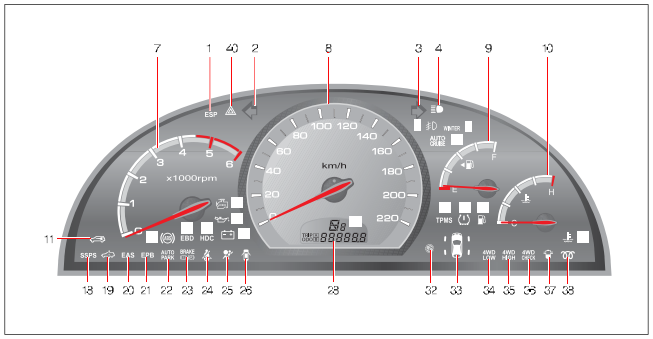
| | |
|---|---|
| Green | Turn signal, 4WD HIGH, WINTER, Parking Brake, HDC, Front fog light |
| Blue | High beam |
| Red | Seat belt, Battery charge, 4WD CHECK, Oil pressure, Door ajar, EBD, Brake, Airbag, Water separator, HDC, Coolant temperature |
| Amber | Engine CHECK, ABS, Global warning, TPMS, Fuel, Pre-glow, ESP, 4WD LOW, SSPS, Immobilizer |

▶Location and Configuration




### B. DESCRIPTIONS OF INDICATOR DISPLAY

▶Deluxe Version

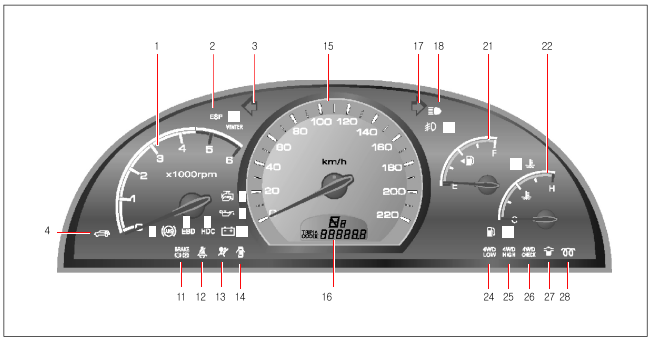


1. ESP warning light
2. Left turn signal indicator
3. Right turn signal indicator
4. High beam indicator
5. Front fog light indicator
6. Winter mode indicator
7. Tachometer
8. Speedometer
9. Fuel gauge
10. Engine coolant temperature gauge
11. Immobilizer indicator
12. ABS warning light
13. EBD warning light
14. HDC indicator
15. Engine check warning light
16. Engine oil pressure warning light
17. Battery charge warning light
18. SSPS warning light
19. EAS level change indicator
20. EAS warning light
21. EPB warning light
22. Automatic parking brake setting indicator
23. Brake warning light
24. Seat belt reminder (driver's seat)
25. Air bag warning light
26. Door ajar warning light
27. Auto shift indicator
28. Odometer/ Trip odometer
29. TPMS warning light
30. Global warning
31. Low fuel level warning light
32. Trip switch
33. Tire inflation pressure indicator
34. 4WD LOW indicator
35. 4WD HIGH indicator
36. 4WD CHECK warning light
37. Water separator warning light
38. Glow indicator
39. Engine overheat warning light
40. Hazard indicator
41. Auto cruise indicator



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▶Standard Version




1. RPM gauge
2. ESP warning light
3. Left turn signal indicator
4. Immobilizer indicator
5. ABS warning light
6. EBD warning light
7. HDC warning light
8. Engine CHECK warning light
9. Engine oil pressure warning light
10. Charge warning light
11. Brake warning light
12. Seat belt reminder
13. Air bag warning light
14. Door open warning light
15. Speedometer
16. Gear display/Odometer
17. Right turn signal indicator
18. High beam indicator
19. Front fog lamp indicator
20. Winter mode indicator
21. Fuel level gauge
22. Coolant temperature gauge
23. Low fuel level warning light
24. 4WD LOW indicator (TOD/Part time)
25. 4WD HIGH indicator (Part time)
26. 4WD CHECK warning light (TOD/Part time)
27. Water separator warning light
28. Glow indicator
29. Over temperature warning light

## C. WARNING LIGHTS AND INDICATORS

### ▶Engine Tachometer

The tachometer indicates engine speed in revolutions per minute. Multiply 1,000 to the current number, then it will be the current number of engine revolutions.
Under the normal engine operating temperature, the proper idling speed is 750 ± 50 rpm for D27DT engine. The red zone (danger rpm range) starts from 4,500 rpm.

1) Connect the tachometer for tune-up test and start the engine.
2) Eliminate the hysteresis by tapping the tachometer.
3) Compare the values on the tester and tachometer and replace the tachometer if the tolerance is excessive.

| Description | Specification (VIN=13 ± 0.1V, Temperature: 25°C) | | | | | | |
|---|---|---|---|---|---|---|---|
| Engine speed (rpm) | 750 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 |
| Tolerance (rpm) | – | +100 | +100 | +100 | +100 | +100 | – |
| | – | −100 | −100 | −100 | −100 | −100 | |

### ▶Speedometer Gauge

The speedometer indicates the vehicle speed by calculating the signals from the rear wheel speed sensors through ABS or ESP unit (speed signal cycle: 21 ms). If the speedometer gauge vibrates, stops at a certain range or makes an abnormal noise, there could be defectives in speedometer. However, these symptoms also could be occured when the tire has uneven wear, different tire inflation pressures or different tire specifications. Perform the speedometer test regarding the tolerance as described. However, it is not similar simple work in field due to lack of measuring conditions such as test equipment and preciseness.

1) Check the allowable tolerance of the speedometer and operations of the trip odometer by using atester.
2) Check if the speedometer gauge is shaking and the abnormal noise sounds.
3) Eliminate the hysteresis by tapping the speedometer.

| Description | (VIN = 13 ± 0.1V, Temperature: 25°C) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Standard speed (Km/h) | 20 | 40 | (60) | 80 | 100 | 120 | 140 | (160) | (180) |
| Tolerance (Km/h) | +4 | +4 | +7 | +9 | +10.5 | +12.5 | +14.5 | +16 | +18 |
| | 0 | 0 | +2.5 | +3.5 | +4 | +6 | +7.5 | +8.5 | +10 |



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |

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### ▶Fuel Level Gauge

The fuel level gauge displays the resistance value of the float on the fuel sender in the fuel tank through a pointer. Note that this vehicle doesn't have a service hole for checking the fuel sender connector in the fuel tank. The fuel sender and its connector can be checked and replaced only when the fuel tank is removed. The power supply and resistance value should be measured at the connector in front of the fuel sender (refer to wiring diagram). When the power supply and output resistance are normal, the float operation by fuel level may be defective; if so, replace the fuel sender.

### ▶Tolerance and resistance value by indicating angle

| | Specification (VIN= 13.5 ± 0.1 V, temperature: 25°C) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Scale | Full | Full (Gauge) | 7/8 | 3/4 | 5/8 | 1/2 | 1/4 | Fuel warning lamp ON | Empty (Gauge) | Empty (center) |
| Indicating angle (°) | 54 | 50 | 37.5 | 25 | 12.5 | 0 | -25 | -47 | -50 | -54 |
| Tolerance (°) | +2, -2 | +2, -2 | - | - | - | ± 5 | - | ± 2 | +2, -2 | +2, -2 |
| Fuel sender resistance (Ω) | 38 | 43 | 55.8 | 67 | 82.5 | 99.5 | 150 | DSL: 266<br>GSL: 266 | 276.3 | 283 |
| Fuel level in tank | 78 liters | 76 liters | 67 liters | 58 liters | 49 liters | 41 liters | 25 liters | DSL: 9.0 liters<br>GSL: 9.5 | 5 liters | - |

This table shows the tolerance and resistance value changes by fuel level in normal conditions. Therefore, the differences that can be occurred by the road conditions and fuel fluctuations are ignored.

### ▶Coolant Temperature Gauge

Using a needle, it displays the coolant temperature obtained from the engine coolant temperature sensor. The PTC resistance value of the coolant temperature sensor is transmitted to the engine ECU and then to the cluster as CAN signal. The angle of guage that can be varied by coolant temperature is as shown below.

| | | Tolerance and resistance value by indicating angle | | |
|---|---|---|---|---|
| Indicating angle (°) | -50 | 0 (center) | | +50 |
| Tolerance | +0°C<br>-5°C | +0°C<br>-5°C | +0°C<br>-5°C | +5°C<br>+0°C |
| Coolant temperature | Less than 40°C | 70 ~ 110°C (diesel) | 80 ~ 110°C (gasoline) | Over 125°C |

### ▶Measurement of coolant temperature sensor resistance

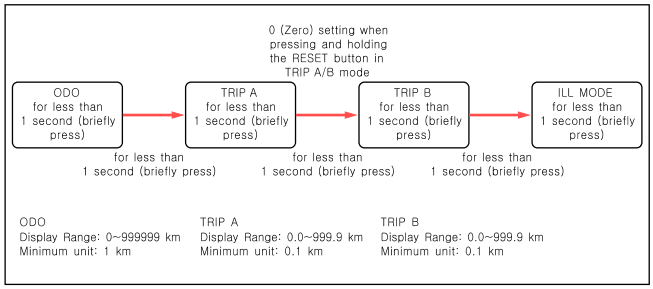
Measure the resistance between the terminal and the ground with an ohmmeter and replace if the resistance is out of specified range.

Resistance value by coolant temperature: 20°C – 2449Ω ± 5 %
50°C – 826Ω ± 5 %
80°C – 321Ω ± 5 %
100°C – 12Ω ± 5 %

- When the resistance value by coolant temperature is within the specified range, check thermostat, water pump, radiator related coolant circuit for normal operation. Also, check the wiring harnesses and connectors for proper connection (D27DT engine ECU: NO.101, 102 / D27DTP (power up) engine ECU: A56, A57).
- The time when the engine coolant temperature reaches the normal temperature (gauge indicating angle: 0°) depends on the ambient temperature and the vehicle's load. Therefore, the coolant temperature gauge should be used only for reading its movement.

### ▶PRESS "RESET BUTTON" TO GO THE EACH MODE

Mode changes

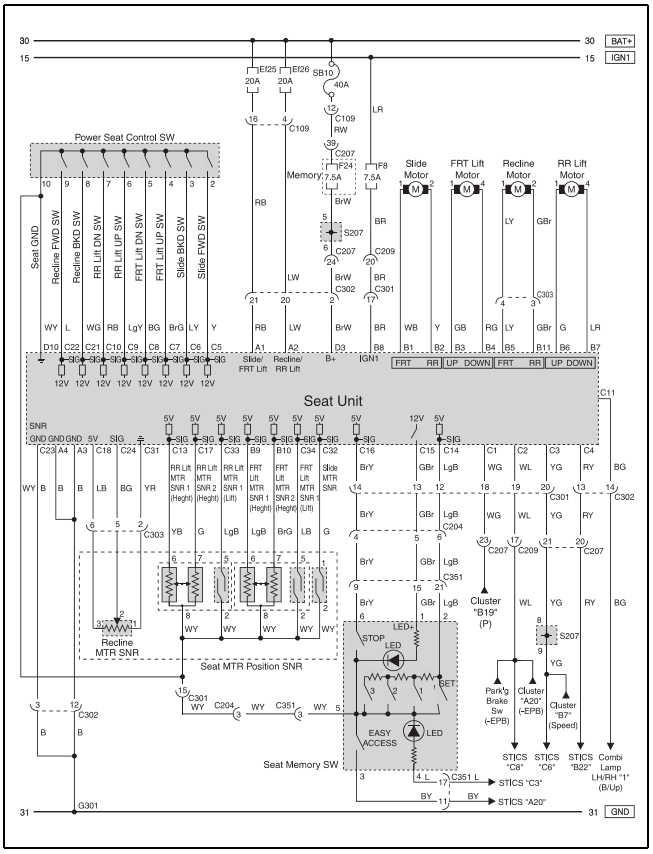





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# 7410-13 POWER SEAT - DRIVER (W/ MEMORY)

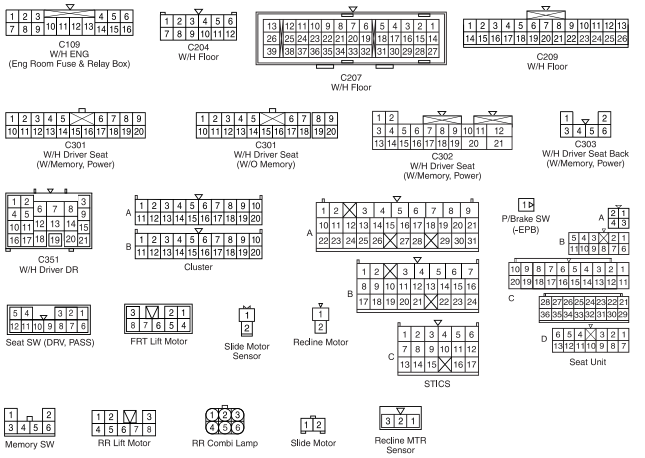
## 1) DRIVER POWER SEAT & SEAT MEMORY




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C204 (12Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Seat Warmer |
| C302 (21Pin, Black) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C303 (6Pin, White) | W/H Driver Seat - W/H Seat Back | Under the Driver Seat | Memory/Power |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

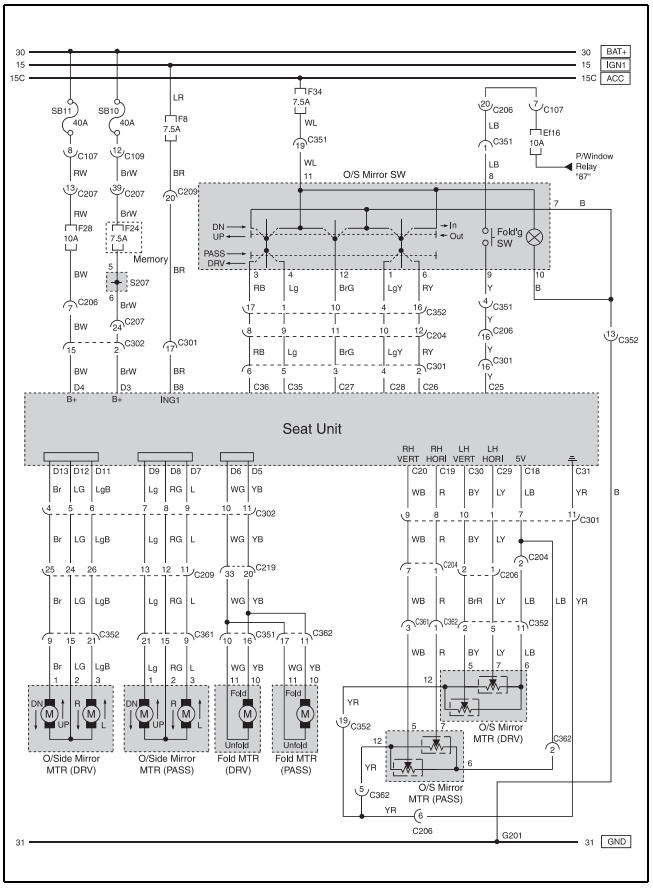





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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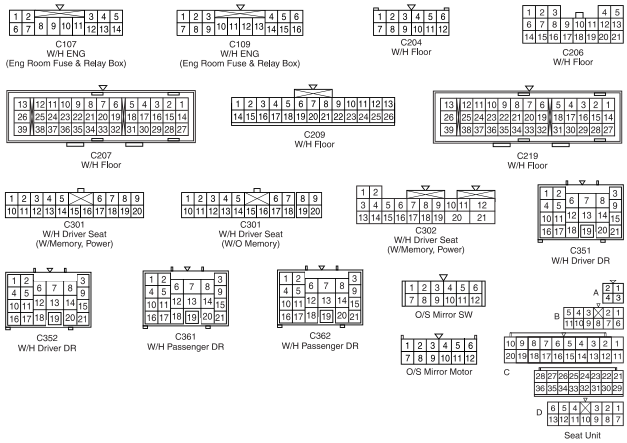
## 2) ELECTRIC OUTSIDE MIRROR & FOLDING




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C204 (12Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Seat Warmer |
| C302 (21Pin, Black) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C361 (21Pin, White) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## (3) CIRCUIT DESCRIPTION

### A. FUNCTION AND DESCRIPTION

Basic function: Adjustment and memorization of driver's seat position, Folding/Unfolding the outside rearview mirrors.
Additional function: Easy access function, Aiming down (3.5°) when reversing Deleted component: Outside rearview mirror folding unit (model with SPWM) However, for the vehicle without SPWM, the outside rearview mirror folding unit is installed in front of STICS.

### B. MAJOR FUNCTIONS OF SPWM UNIT

The control the SPWM unit, the ignition ON/OFF signal is transmitted to SPWM unit from STICS. However, the parking brake signal and transmitted to SRWM unit from the instrument cluster.

- Power Seat Position Control
- Outside Rearview Mirror Control
- Driver's Seat and Outside Rearview Mirror Position Memory
- Easy Access
- Outside Rearview Mirror Auto Down

### C. SPECIFICATIONS

▶ Driver's Power Seat

| Inputs | Specifications | | |
|---|---|---|---|
| Position sensor | Type | | Reed switch type |
| | ON:OFF ratio | | 50 ± 20 % |
| | Contact current | | Max. 0.5 A |
| | Chattering | | Max. 0.2 msec |
| | Stroke | Sliding | 228 mm ± 3 mm |
| | | Reclining | 23° (front) ↔ 0° ↔ 48° (rear) |
| | | Raising (FRT/RR) | 30 ± 3mm |
| | Total number of pulses | Sliding | 1,200 Pulses |
| | | Raising (FRT/RR) | 46.93 Pulses |
| | Operation speed | Sliding | 17.9 mm / Sec |
| | | Reclining | 3.50° / Sec |
| | | Raising (FRT/RR) | 7.0 mm / Sec |
| | Resolution | Sliding | 0.188 / Pulse |
| | | Raising (FRT/RR) | 0.64 / Pulse |
| | Variable resistance | | REC |
| SPWM memory switch | Type | | Selt-return type |
| | Contact current | | Min. 10 mA |
| | Chattering | | Max. 10 msec |
| Manual switch | Type | | Self-return type (Active low) |
| | Contact current | | Max. 7A |
| | Chattering | | Max. 10 msec |

▶Actuator

| Actuator | Specifications | | |
|---|---|---|---|
| For sliding/ reclining/raising front and rear (DC motor) | Rated voltage | | DC 12V |
| | Operation current | Sliding | Max 2A (No-load) |
| | | Reclining (REC) | Max 3.6A (AT 1.5 Nm) |
| | | | Max 8.0A (AT 12 Nm) |
| | | Raising (FRT/RR) | Max 3A |
| | Limited current | Sliding | Max 16A |
| | | Reclining | Max 13A |
| | | Raising | Max 11A |

▶Outside Rearview Mirror

- Manual Mode (Normal): 12V

| Controls \ Inputs | H | C | V |
|---|---|---|---|
| UP | GND | 12V | GND |
| DOWN | 12V | GND | 12V |
| OFF | GND | GND | GND |
| RIGHT | GND | 12V | 12V |
| LEFT | 12V | GND | GND |

- Position Sensor and Folding Switch

| Inputs | Specifications | |
|---|---|---|
| Position sensor | Type | Variable resistance |
| | Rated voltage | DC 5V |
| | Output tolerance | ± 0.1 V (± 2% from max. output) |
| | Supply current | Max 20 mA, 0.25W |
| | Operation range | Vertically and horizontally: ± 8° |
| Folding switch | Type | Self-return type (Active high) |
| | Contact current | Min. 10 mA |
| | Chattering | Max. 10 msec |
| Manual switch | Type | Self-return type (Active low) |
| | Contact current | Max. 7A |
| | Chattering | Max. 10 msec |



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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▶Motor

| Inputs | Specifications | |
|---|---|---|
| Mirror drive motor | Rated voltage | DC 12V |
| | Operation current | Max. 0.2A |
| | Limited current | Max. 1.5A |
| | Operation speed | 2.5° ± 0.5° / sec (at 12V) |
| Folding motor | Rated voltage | DC 12V |
| | Operation current | Max. 3A |
| | Limited current | Max. 3.4A |
| | Turn over torque (by hand) | Manual folding: Min 50 kgf·cm |
| | | Electric folding: Max 100 kgf·cm |

▶Motor Output (normal mode: ground)

| Controls \ Inputs | H | C | V |
|---|---|---|---|
| UP | GND | GND | 12V |
| DOWN | 12V | 12V | GND |
| RIGHT (IN) | GND | 12V | 12V |
| LEFT | 12V | GND | GND |

▶Buzzer

| Output | Specifications | |
|---|---|---|
| Buzzer | Rated volatage | DC 12V |
| | Rated current | Max. 30 mA |
| | Acoustic pressure | Min. 92 dB |
| | Base frequency | 2200 ± 150 Hz |

- Output time: 2Hz, DUTY 20% (ON: 0.1 sec., OFF: 0.4 sec.)
- Buzzer output conditions
  - · When the memory operation is permitted (memory switch ON): once
  - · After completing the memory recall (position switch ON): twice
  - · When starting to recall the memory (position switch ON): once
  - · When pressing the position switch button twice consecutively: three times
  - · When detecting a sensor error while recalling (position switch ON): three times
  - · No buzzer output for the easy access memory/recall operations
  - · No buzzer output for the outside mirror position recall by the auto down operation when reversing

**D. EASY ACCESS FUNCTION**

This system is designed to provide a sufficient space for the driver to access and exit by moving the seat rearwards.

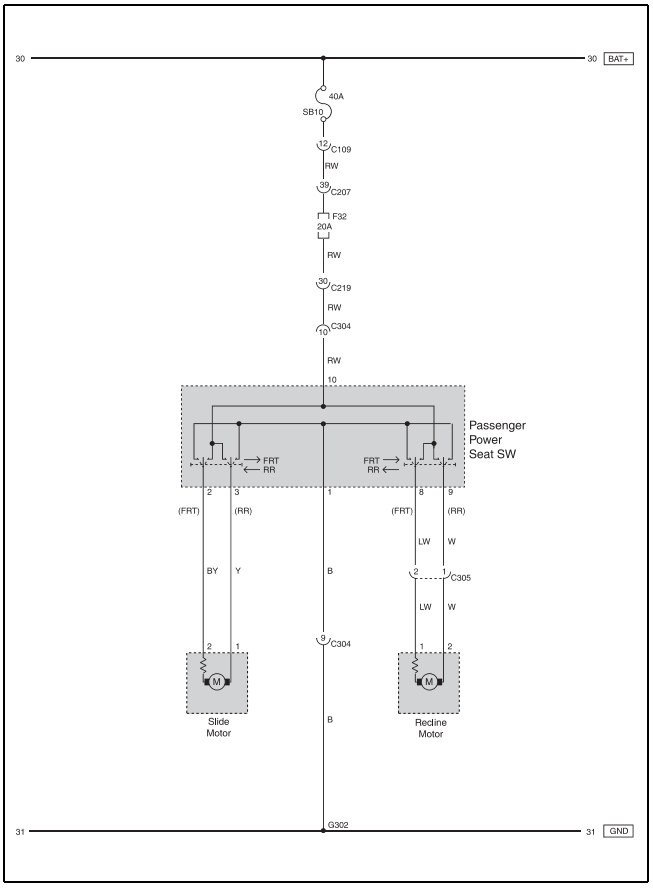
Easy access permissible conditions:

| | M/T | A/T |
|---|---|---|
| When getting off | Parking brake switch is "ON (applied)" when removing the ignition key. | Parking brake switch is "ON (applied)" when removing the ignition key. Or, shift lever is in "P" position before turning off the ignition switch. |
| When getting on | Parking brake switch is "ON (applied)" when turning the ignition switch to "On" position and vehicle is stationary.<br>Not available when the shift lever is in "R" position. | Parking brake switch is "ON (applied)" when turning the ignition switch to "On" position . Or, shift lever is in "P" position and vehicle is stationary.<br>Not available when the shift lever is in "R" position. |
| Easy access permissible conditions | Permissible conditions when getting off:<br>Only the signal between the parking brake switch and the SPWM unit (connected with wire) can be used.<br>The vehicle speed signal is not transferred to the SPWM when the ignition key is removed.<br><br>Permissible conditions when getting on:<br>The vehicle should be stationary. | Permissible conditions when getting off: Same with the M/T's<br>However, shift lever is in "P" position before turning off the ignition switch.<br>* The position signal of shift lever cannot be transferred from instrument cluster when the ignition switch is turned off (IGN OFF → Cluster OFF). |



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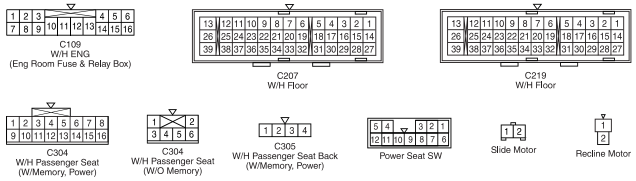
# 7410-04 POWER SEAT - PASSENGER




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C304 (16Pin, White) | W/H Floor - W/H Passenger Seat | Under the Passenger Seat | Power |
| C304 (6Pin, White) | W/H Floor - W/H Passenger Seat | Under the Passenger Seat | Seat Warmer |
| C305 (4Pin, White) | W/H Passenger Seat - W/H Seat Back | Under the Passenger Seat | Power |
| G302 | W/H Floor | Under the Passenger Seat | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

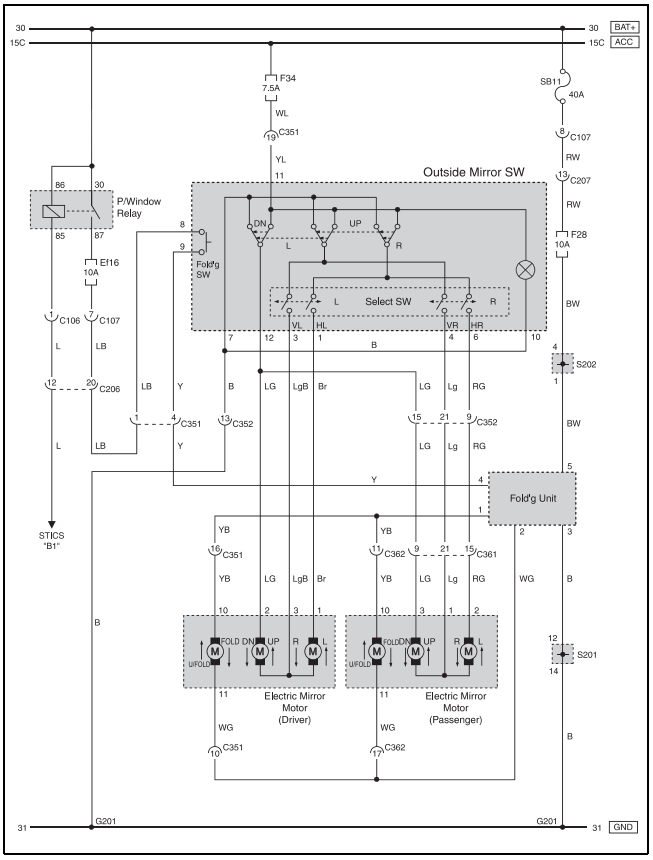





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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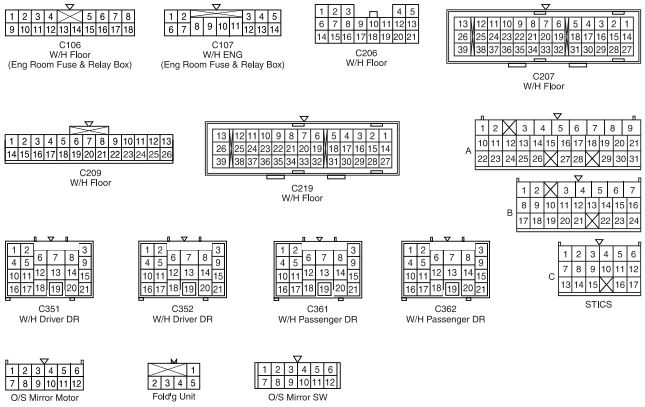
# 8510-52 ELECTRIC OUTSIDE MIRROR & FOLDING (W/O MEMORY)




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C361 (21Pin, White) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

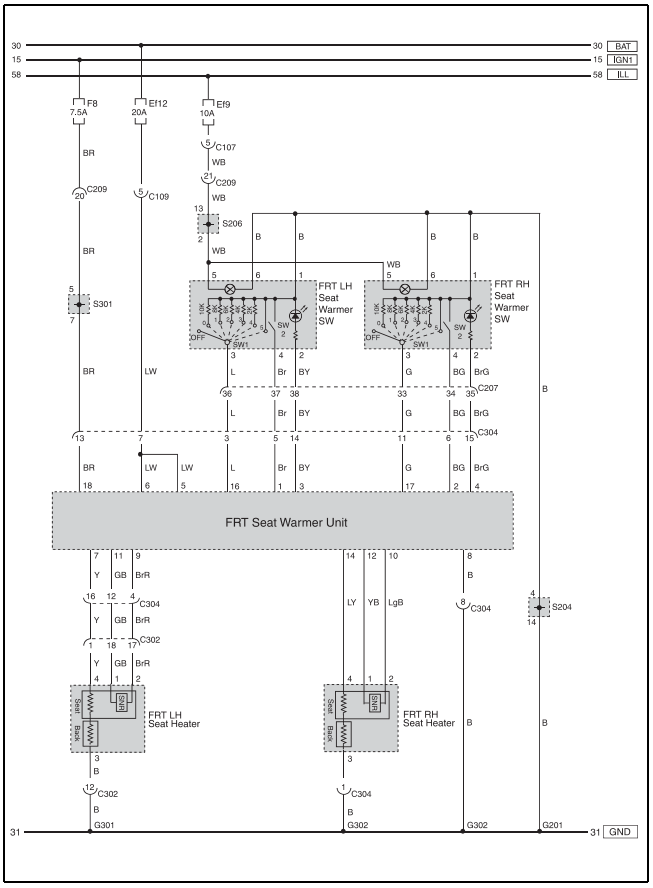



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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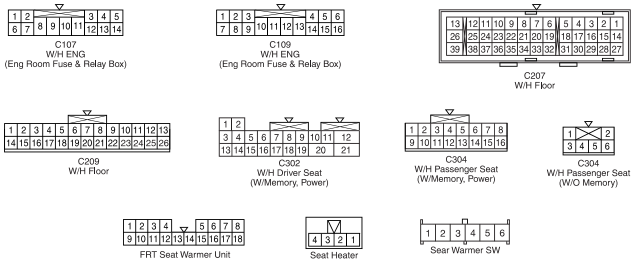
## 8510-48 FRT SEAT WARMER (W/ MEMORY)




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C302 (21Pin, Black) | W/H Floor - W/H Driver Seat | W/H Floor - W/H Driver Seat | Memory/Power |
| C304 (16Pin, White) | W/H Floor - W/H Passenger Seat | W/H Floor - W/H Passenger Seat | Power |
| C304 (6Pin, White) | W/H Floor - W/H Passenger Seat | W/H Floor - W/H Passenger Seat | Seat Warmer |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| G302 | W/H Floor | Under the Passenger Seat | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

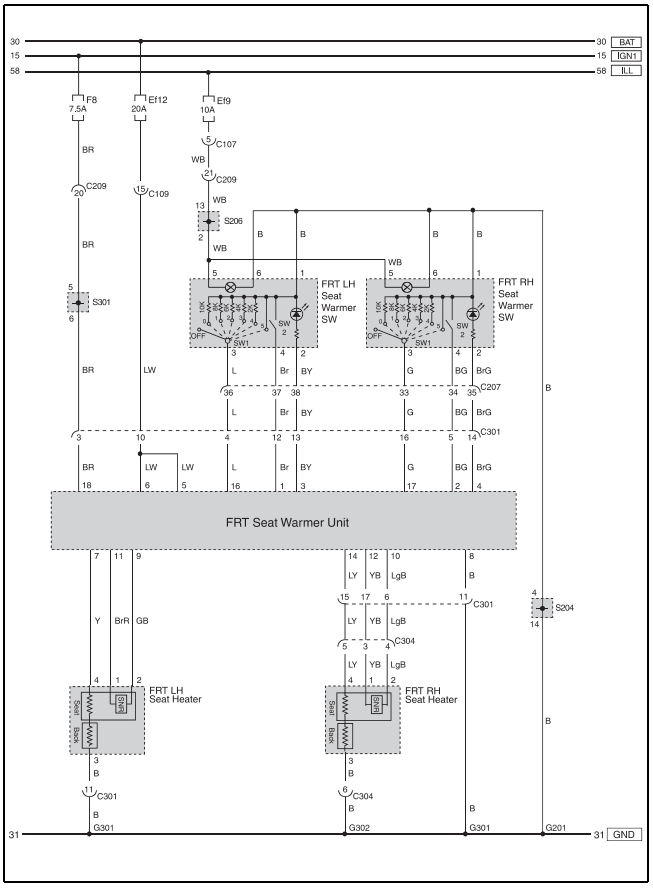





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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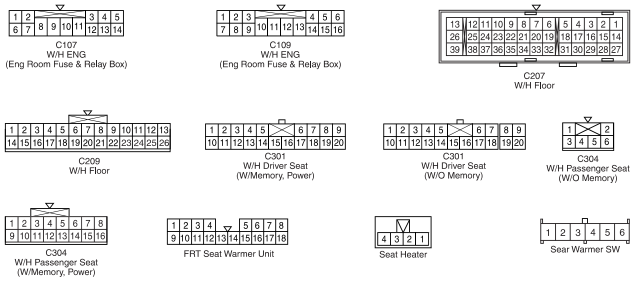
# 8510-48 FRT SEAT WARMER (W/O MEMORY)




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Seat Warmer |
| C304 (16Pin, White) | W/H Floor - W/H Passenger Seat | W/H Floor - W/H Passenger Seat | Power |
| C304 (6Pin, White) | W/H Floor - W/H Passenger Seat | W/H Floor - W/H Passenger Seat | Seat Warmer |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| G302 | W/H Floor | Under the Passenger Seat | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

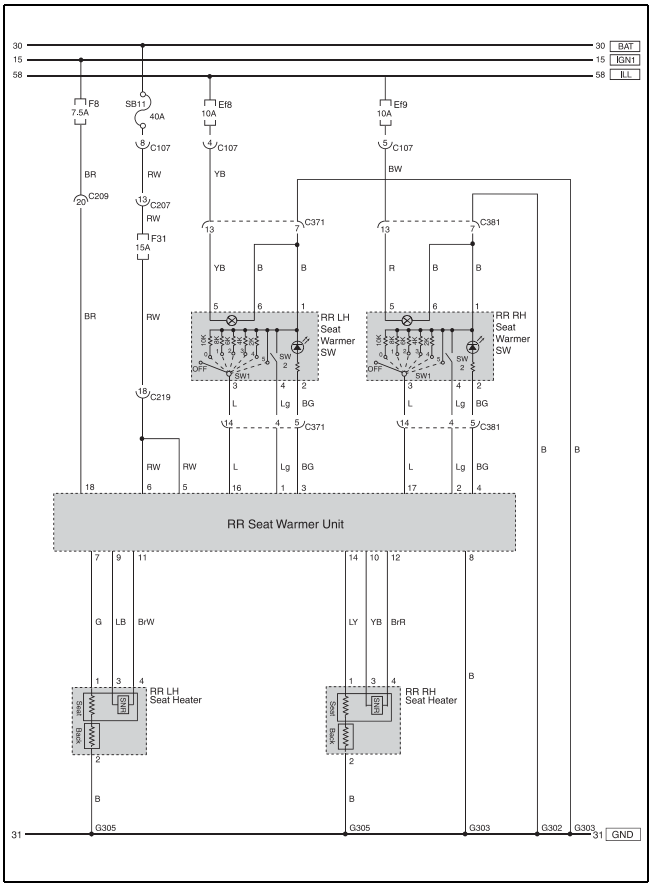



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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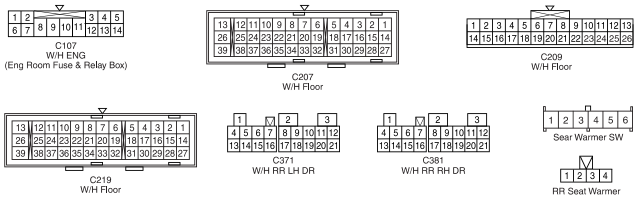
# 8510-48 RR SEAT WARMER




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| G302 | W/H Floor | Under the Passenger Seat | |
| G303 | W/H Floor | Under the LH "B" PLR | |
| G305 | W/H Floor | Inside the LH QTR GLS Lower | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

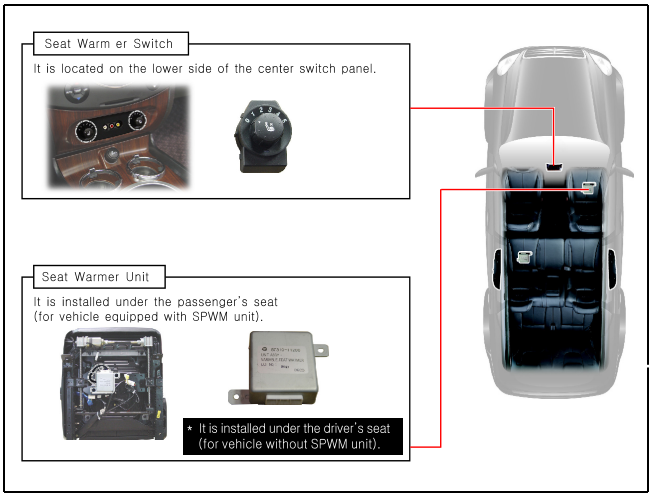
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## 3) CIRCUIT DESCRIPTION

### A. VARIABLE SEAT WARMER SYSTEM

The variable seat warmer system controls the temperature in 5 levels.

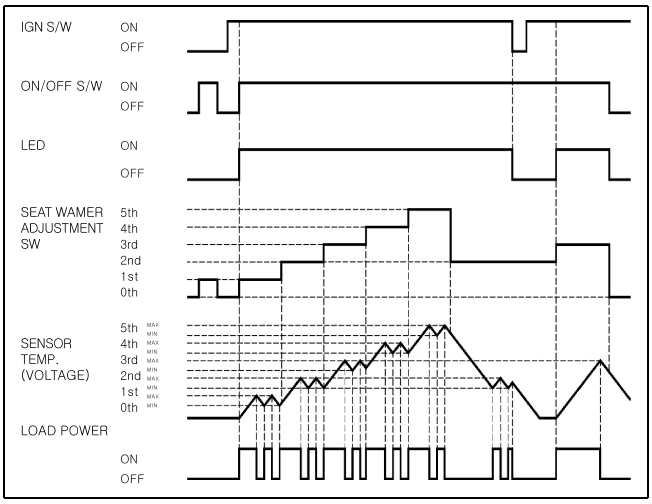
▶Location




### B. OPERATING CHARACTERISTICS

The variable seat warmer system operates when the ignition is ON. The unit heats the seat in each level according to the resistance based on each switch operation.

▶Operation Characteristics




▶Temperature and sensor output value in each switch level

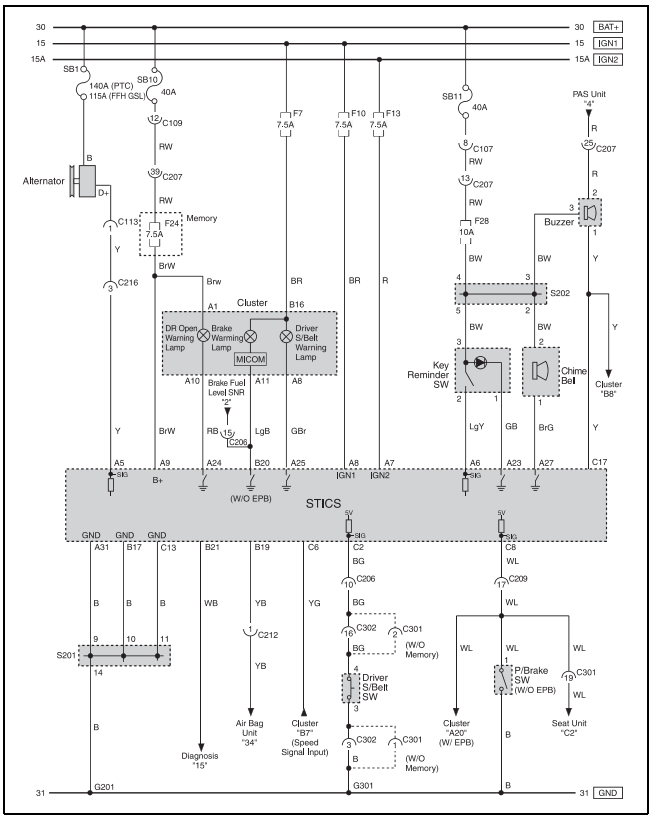
| | Seat warmer temp. (°C) | | Sensor output resistance (W) | | Sensor output value (V) | |
|---|---|---|---|---|---|---|
| | MIN | MAX | MIN | MAX | MIN | MAX |
| 0th | – | – | – | – | – | – |
| 1st | 39 | 41 | 5419 | 4982 | 2.01 | 1.91 |
| 2nd | 46 | 48 | 4050 | 3734 | 1.76 | 1.66 |
| 3rd | 54 | 56 | 2938 | 2717 | 1.53 | 1.44 |
| 4th | 61 | 63 | 2240 | 2077 | 1.32 | 1.24 |
| 5th | 69 | 71 | 1661 | 1544 | 1.14 | 1.07 |



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## 8710-02 STICS

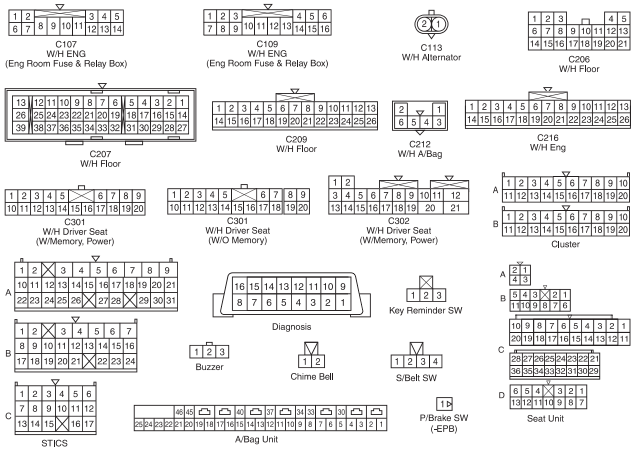
### 1) POWER/GROUND, CHIME BELL, BUZZER WARNING LAMP (BRAKE, S/BELT, DR OPEN)




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C113 (2Pin, Black) | W/H Eng - W/H Alternator | Under the Coolant Reserve Tank | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C212 (6Pin, White) | W/H Main - W/H Air Bag | Backside the Cluster(Inside I/P) | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C301 (20Pin, White) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Seat Warmer |
| C302 (21Pin, Black) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G301 | W/H Floor | Under the Driver Seat | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

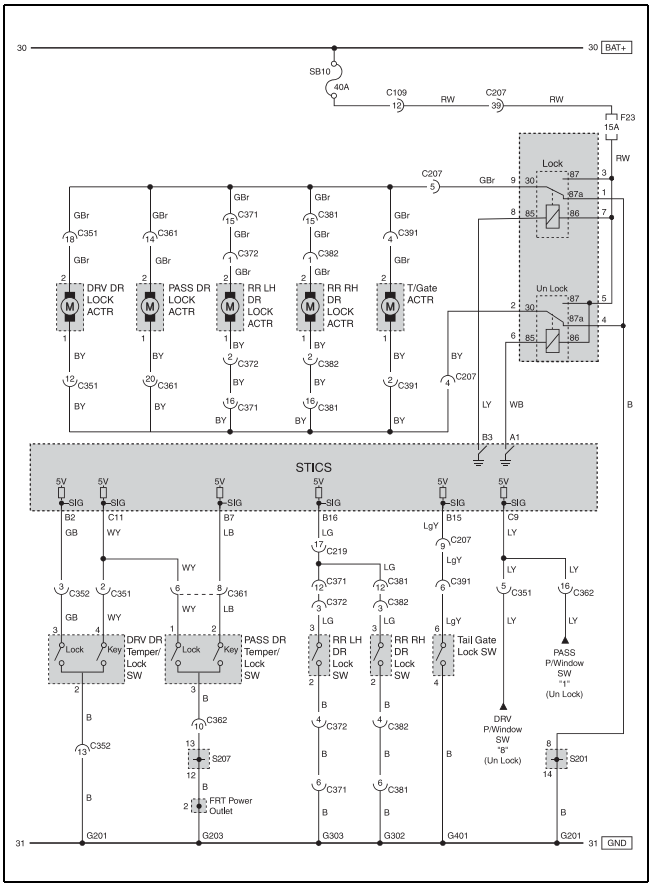





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|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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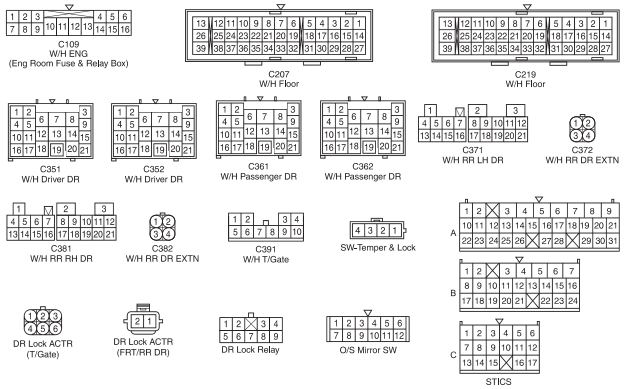
## 2) CENTRAL DOOR LOCK CIRCUIT




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C361 (21Pin, White) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C372 (4Pin, Black) | W/H RR LH DR - W/H DR EXTN | Inside the RR LH DR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| C382 (4Pin, Black) | W/H RR RH DR - W/H DR EXTN | Inside the RR RH DR | |
| C391 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G302 | W/H Floor | Under the Passenger Seat | |
| G303 | W/H Floor | Under the LH "B" PLR | |
| G401 | W/H Tail Gate | Center the Tail Gate | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

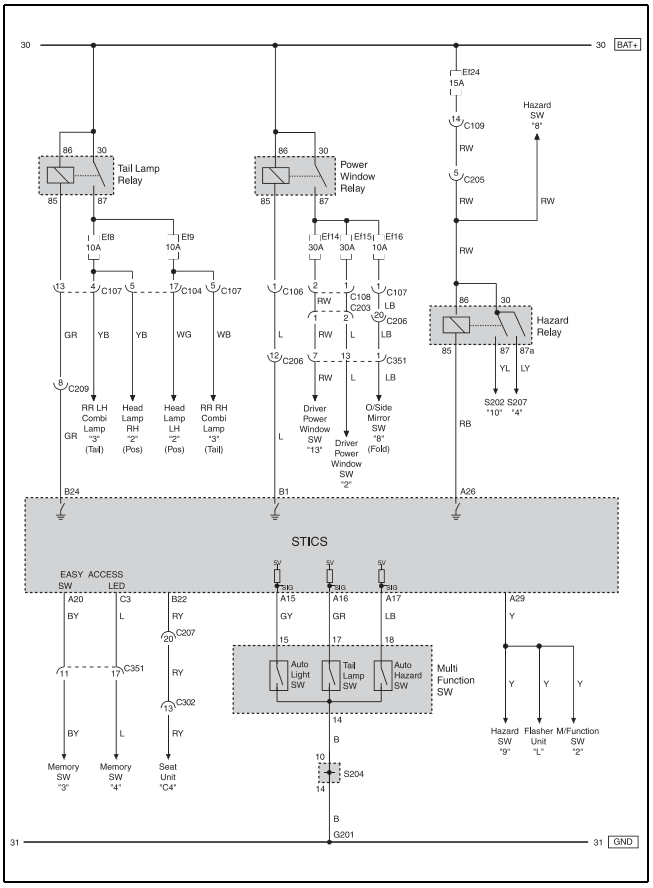



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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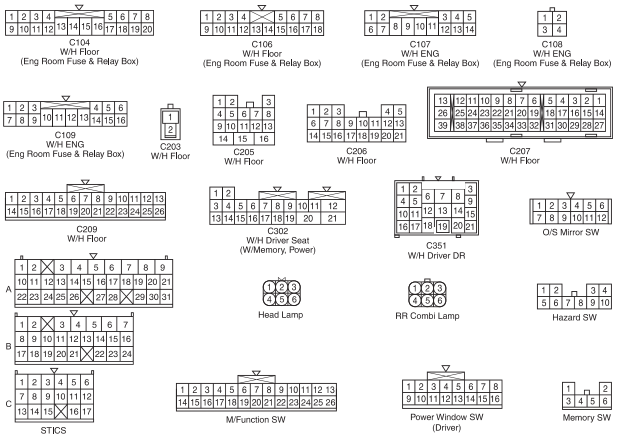
## 3) TAIL LAMP, HAZARD, POWER WINDOW




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C108 (4Pin, Colorless) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C203 (2Pin, Colorless) | W/H Main - W/H Floor | Under the I/P Fuse Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C302 (21Pin, Black) | W/H Floor - W/H Driver Seat | Under the Driver Seat | Memory/Power |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

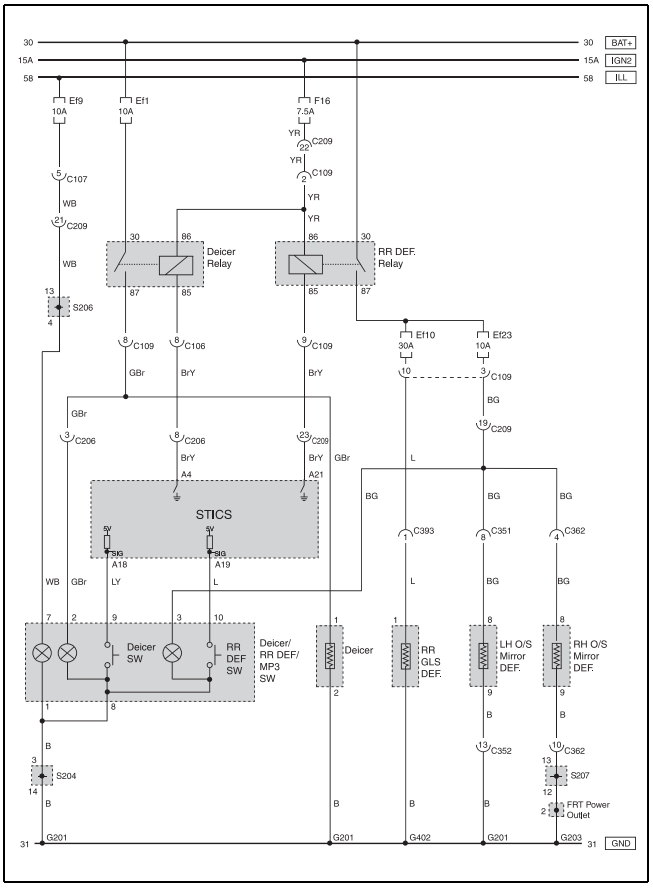





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| Application basis | |
| Affected VIN | |

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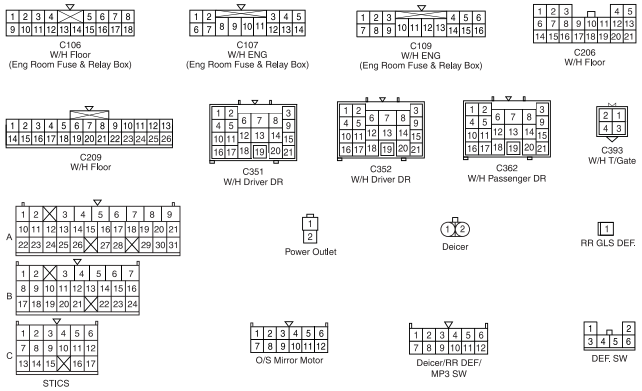
## 4) DEFOGGER




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Driver Cowl Side PNL | |
| C393 (4Pin, Colorless) | W/H Floor - W/H Tail Gate | Inside the RR RH Upper QTR Trim | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G402 | W/H Tail Gate | LH The Tail Gate | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

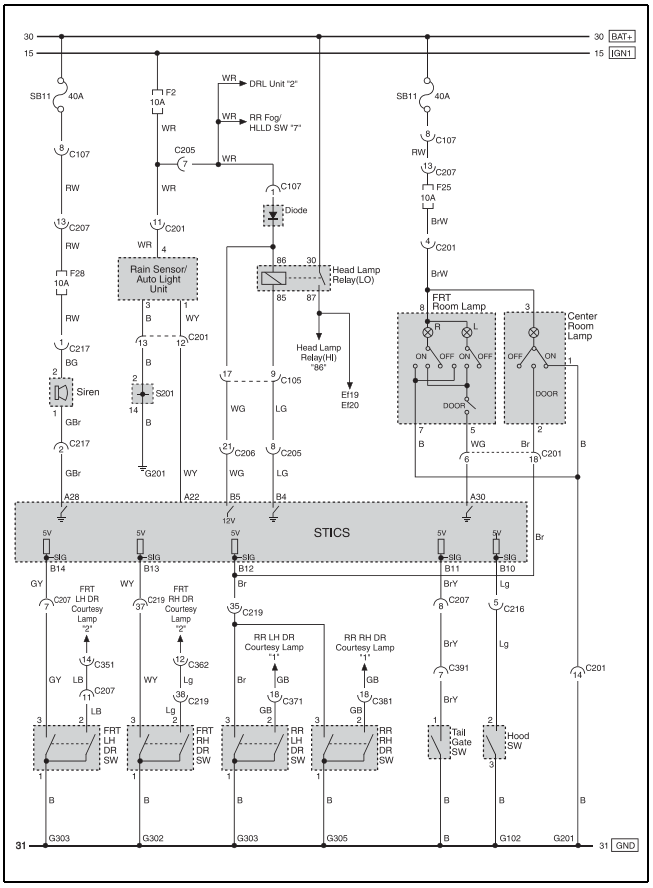



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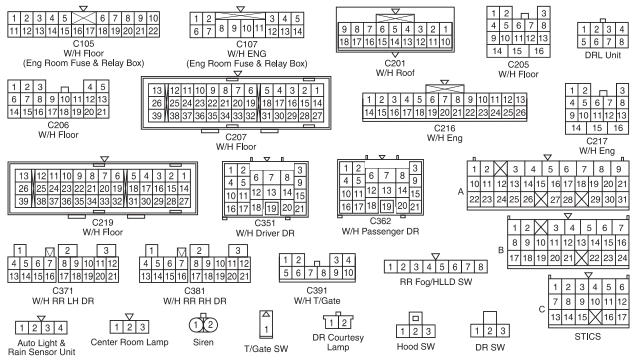
## 5) PANIC, AUTO LIGHT & RAIN SENSING, ROOM LAMP




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C201 (18Pin, White) | W/H Main - W/H Roof | Under the I/P Fuse Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| C391 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| G102 | W/H Eng | Center the Eng BATT | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G302 | W/H Floor | Under the Passenger Seat | |
| G303 | W/H Floor | Under the LH "B" PLR | |
| G305 | W/H Floor | Inside the LH QTR GLS Lower | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

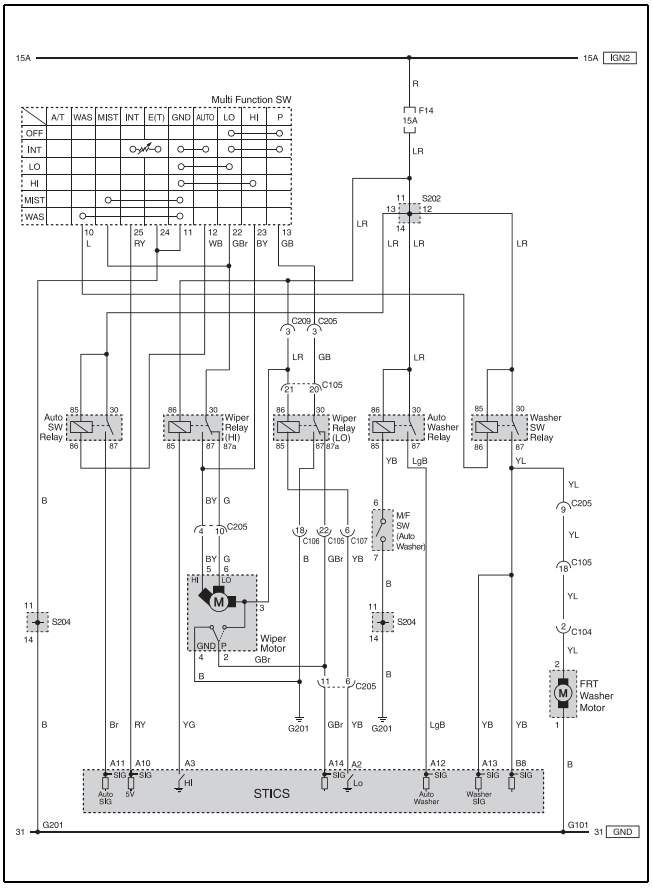





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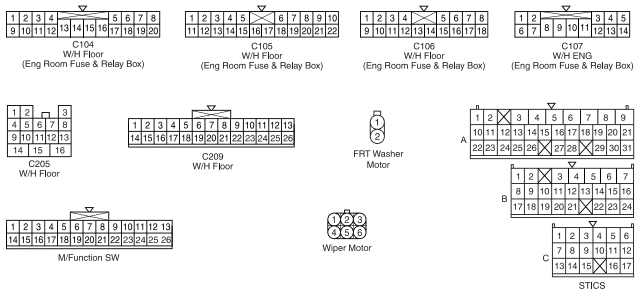
## 6) FRT WIPER/WASHER




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G101 | W/H Eng | Center the Eng Room Fuse Box | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## (3) CIRCUIT DESCRIPTION

### A. OVERVIEW

The RKSTICS (REKES + STICS (Super Time & Integrated Control System)) communicates with the transmitter (remote controller) and other electronic systems to transmit and receive the data. The STICS also includes a diagnosis function that can inspect the error for related devices.

### B. MAJOR CHANGES

▶**Integration of Auto Light Sensor and Rain Sensor**

The auto light sensor integrated rain sensor communicates with STICS.

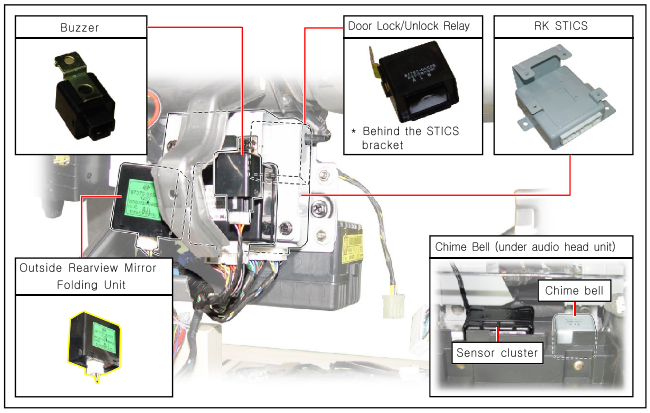
▶**Auto Washer Coupled Wiper**

When pressing the auto washer switch, the washer fluid is sprayed on the windshield and the wiper sweeps off 4 times, and then the washer fluid is sprayed and the wiper sweeps off 3 times again.

▶**Communication with SPWM**

The communication with SPWM is added due to the introduction of easy access function to SPWM.

▶**SPWM Unit**




### C. SPECIFICATIONS

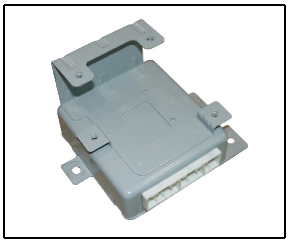
▶**Electrical Performance**

- Electrical Performance

| Item | Requirement | Remark |
|---|---|---|
| Rated voltage | DC 12.0V | |
| Operating voltage | DC 9.0V ~ 16.0V | Should operate normally within this range. (9.5 V ~ 16.0 V only for auto hazard lamp function) |
| Operating temperature | -30°C ~ +80°C | Should operate normally within this range. |
| Reserved temperature | -40°C ~ +85°C | |
| Max. operating humidity | 95% | |
| Resistible voltage | 24V | |
| Insulating resistance | No heat and fire due to the current leaks | Confined with PCB, waterproof and coating that requires the insulation. |
| Dark current | below 7.0 mA | When initiating the sleep mode after removing ignition key and locking the doors |
| Voltage drop | below 1.0V | Pin no. 72 and 2, 7, 8, 9, 10, 11, 19, 24, 27, 28, 29, 30, 31, 32, 33, 36, 56, 57, 58, 59, 60, 61, 70, 71 |
| | below 1.5V | Pin no. 72 and 3, 6, 17, 18, 20, 21, 37, 39, 41, 42, 43, 44, 45, 62, 64, 65, 66, 67, 68, 69 |

- Characteristics of Radio Wave

· Transmitting frequency: 447.800 ± 0.0125 MHz
· Channel width: below 12.5 KHz
· Frequency bandwidth: below 8.5 KHz
· Modulation method: FSK (Frequency Shift Keying)
· Receiving distance: Approx. 10 ~ 15 m (In case there are not obstacles around the system)





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| Modification basis | |
| Application basis | |
| Affected VIN | |

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### D. RATED LOAD

| NO. | Description | Rated Load |
|---|---|---|
| 1 | Chime bell / Buzzer | DC 12V 350 mA / DC 12V 40 mA (Inductive load) |
| 2 | Front room lamp | DC 12V 16W (Lamp load) |
| 3 | Key hole illumination | DC 12V 1.2W (Lamp load) |
| 4 | Seat belt warning lamp | DC 12V 1.2W (Lamp load) |
| 5 | Seat belt warning lamp | DC 12V 1.2W (Lamp load) |
| 6 | Parking brake warning lamp | DC 12V 1.2W (Lamp load) |
| 7 | Door ajar warning lamp | DC 12V 1.2W (Lamp load) |
| 8 | Door lock relay | DC 12V 200 mA (Inductive load) |
| 9 | Door unlock relay | DC 12V 200 mA (Inductive load) |
| 10 | Siren | DC 12V 260 mA (Inductive load) |
| 11 | Tail lamp relay | DC 12V 200 mA (Inductive load) |
| 12 | Hazard warning relay | DC 12V 200 mA (Inductive load) |
| 13 | Power window relay | DC 12V 200 mA (Inductive load) |
| 14 | Rear defogger relay | DC 12V 200 mA (Inductive load) |
| 15 | Wiper LOW relay | DC 12V 250 mA (Inductive load) |
| 16 | Wiper HIGH relay | DC 12V 250 mA (Inductive load) |
| 17 | Front washer motor | DC 12V 1.5A |
| 18 | Rear washer motor relay | DC 12V 500 mA (Inductive load) |
| 19 | Headlamp relay | DC 12V 750 mA (Inductive load) |
| 20 | Front defogger relay | DC 12V 200 mA (Inductive load) |
| 21 | SPWM easy access button illumination | DC 12V 1.2 W (Lamp load) |

### E. INPUT SIGNALS

| NO. | Input Signal Name | Logic Status |
|---|---|---|
| 1 | IGN1 | ON = BAT (IGN "ON" or "START") |
| 2 | IGN2 | ON = BAT (IGN "ON") |
| 3 | ALT_D | ON = BAT (engine running) |
| 4 | Key reminder switch | IN = BAT (Key in) |
| 5 | Driver's door switch | OPEN = GND, CLOSE = OPEN |
| 6 | Passenger's door switch | OPEN = GND, CLOSE = OPEN |
| 7 | Rear door switch | - OPEN (one of rear seat) = GND<br>- CLOSE (all rear seats) = OPEN |
| 8 | Tailgate switch | OPEN = GND, CLOSE = OPEN |
| 9 | Hood switch | OPEN = GND, CLOSE = OPEN |
| 10 | Driver's door lock/unlock switch | LOCK = OPEN, UNLOCK = GND |
| 11 | Passenger's door lock/unlock switch | LOCK = OPEN, UNLOCK = GND |
| 12 | Rear door lock/unlock switch | - UNLOCK (one of rear seat) = GND<br>- LOCK (all rear seats) = OPEN |
| 13 | Tailgate lock/unlock switch | LOCK = OPEN, UNLOCK = GND |
| 14 | Rear defogger switch | ON = GND, OFF = OPEN |
| 15 | Seat belt switch | Unfastened = GND, Fastened = OPEN |
| 16 | Hazard warning flasher selection switch | ON = GND, OFF = OPEN |
| 17 | Parking brake switch | ON = GND, OFF = OPEN |
| 18 | Air bag collision sensor | ON = 200 ms Low signal, OFF = OPEN |
| 19 | Wiper motor (parking) switch | STOP = BAT VOLTAGE, ROTATING = GND |
| 20 | Washer switch | ON = BAT, OFF = OPEN |
| 21 | Auto switch | ON = BAT, OFF = OPEN |
| 22 | Auto washer switch | ON = BAT, OFF = OPEN |
| 23 | Auto resistance | 0W ~ 51KW (for intermittent wiper) |
| 24 | Speed sensor | ON = GND (PWM), OFF = OPEN |
| 25 | IDR (Coding) | ON = BAT, OFF = OPEN |
| 26 | Front defogger switch | ON = GND, OFF = OPEN |
| 27 | Auto hazard switch | ON = GND, OFF = OPEN |
| 28 | Central door lock switch | ON = GND, OFF = OPEN |
| 29 | SPWM easy access button switch | ON = GND, OFF = OPEN |
| 30 | Multifunction auto light switch | ON = GND, OFF = OPEN |
| 31 | Indicator lamp switch | ON = BAT/GND, OFF = OPEN (Approx. 5.1V ~ 9.2V) |
| 32 | SPWM (Seat Position with Memory) | ON = GND (PWM), OFF = OPEN |
| 33 | Rain sensor | ON = GND (DATA), OFF = BAT |
| 34 | Diagnosis (SCAN-100) | ON = GND (DATA), OFF = BAT (KWP2000) |
| 35 | Immobilizer | ON = GND (DATA), OFF = BAT (KWP2000) |
| 37 | Driver/Passenger's door key cylinder switch | ON = GND, OFF = OPEN |



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**F. FUNCTIONS AND SPECIFICATIONS**

**▶ Wiper MIST and Front Washer Coupled Wiper**

- The wiper relay is turned on at 0.3 seconds after from the time when the washer switch is turned on for 0.1 to 0.59 seconds (T2) with the ignition switch "ON", . If the wiper parking terminal gets off, the wiper relay is turned off.
- The wiper relay is turned on at 0.3 seconds (T1) after from the time when the washer switch is turned on for more than 0.6 seconds (T2) with the ignition switch "ON". The wiper relay gets on 3 times immediately after turning off the washer
- switch.
  When the washer switch is turned on for more than 0.6 seconds during the wiper operation by AUTO switch, the wiper operates three times. When it is turned on for a certain period of time (0.1 to 0.59 seconds), the wiper operates once.

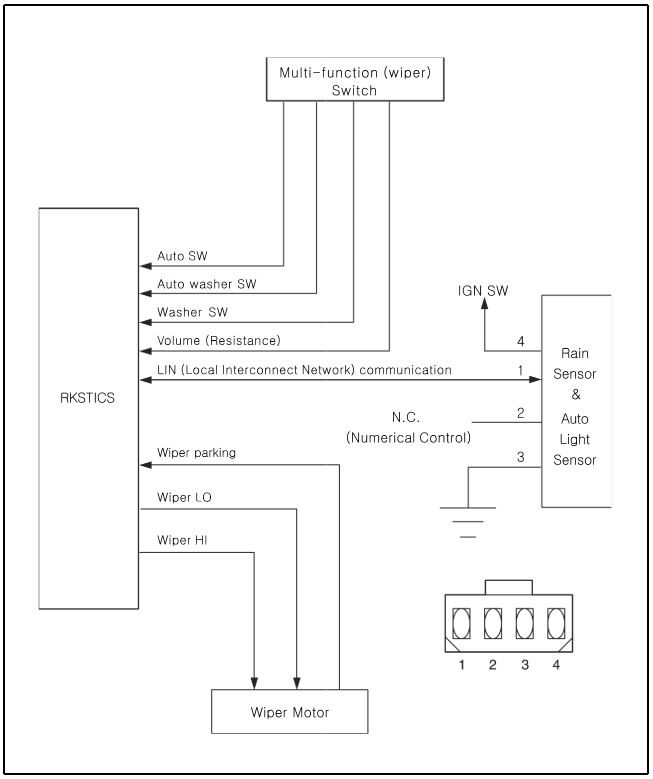
**▶ Auto Washer and Wiper Switch**

- When the auto washer switch is turned on with the ignition switch "ON" and the AUTO switch "OFF", the washer motor output gets ON for 1 second. If the system recognizes the output signal, the wiper relay output gets ON during 4 cycles and the washer motor output gets ON for 1 second. Then, the wiper relay output gets OFF after 3 cycles.
- The auto washer switch output is overridden during the washer coupled wiper operation.
- The auto washer switch input is overridden during the auto washer coupled wiper operation.
- The auto washer switch input is overridden during the rain sensor coupled wiper or vehicle speed sensitive AUTO wiper operation.
- When the AUTO switch input is received during the auto washer operation, the auto washer operation stops and the auto INT operation is activated.

**▶Rain Sensor Coupled Wiper and Auto Light Control**

If equipped with RKSTICS rain sensor, it has following operation system.

- System layout






| | |
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| Modification basis | |
| Application basis | |
| Affected VIN | |

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▶Auto Switch Position Reminder (Power-Up Reminder Wiper)

- When turning off and on the IGN2 switch with the auto switch on, the system drives the wiper motor through LOW relay one cycle regardless of communication with rain sensor.
- The wiper relay (LOW) is turned on and the wiper motor runs one cycle when changing the auto switch from "OFF" to "ON" position regardless of communication with rain sensor(while the ignition key is in the "ON" position). When the auto switch is turned to the "ON" position again from the "OFF" position, the system drives the wiper motor through LOW relay one cycle only when the rain sensor detects the "Rain Detected" signal.

▶Washer Coupled Wiper in Rain Sensing Mode

- The washer coupled wiper is operated when receiving the washer switch input with the ignition switch "ON" and the AUTO switch "ON" in the rain sensing mode. At this moment, the communication with the rain sensor is overridden. However, the washer switch input is overridden during the continuous operation.
- The operation data is sent to the rain sensor even during the washer coupled wiper's operation

▶Rain Sensing Sensitivity Control

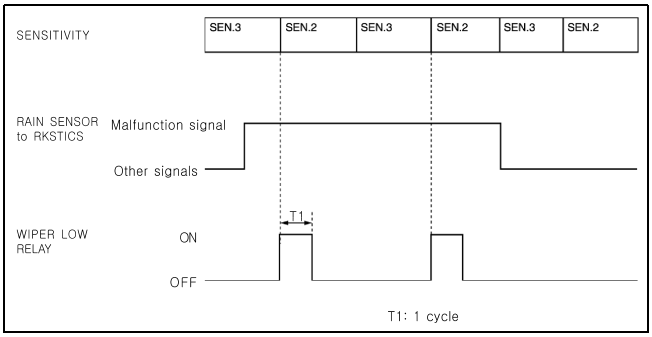
- The wiper LOW relay is turned on and the wiper motor runs one cycle when the volume sensitivity is increased (while the ignition key is in the "ON" position, the AUTO switch is in the "ON" position, and the wiper motor is in "Parked" position). However, the wiper motor can be operated only when the rain sensor detects the "Rain Detected" signal.
  · If the volume sensitivity is changed more than 2 stages within 2 seconds, the wiper motor runs only one cycle.

▶When the Wiper Parking Signal is Abnormal

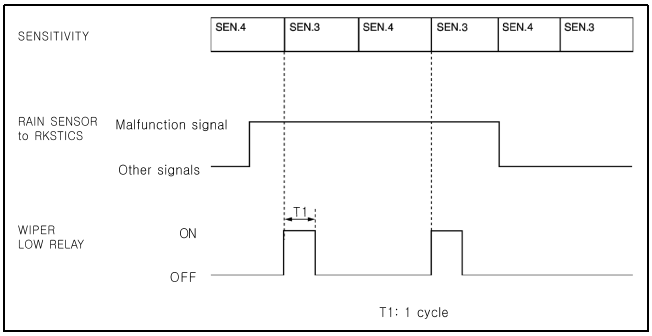
- The wiper system continuously outputs the wiper parking signal when the wiper parking terminal is grounded (while the ignition key is in "ON" position and the AUTO switch is in "ON" position).
  · The wiper motor runs only when the rain sensor requires the wiper operation.
- When the parking terminal is fixed to HIGH with the ignition key and the AUTO switch in "ON" position, the wiper system outputs the wiper operating signal for 2 seconds, then continuously outputs the wiper parking signal.
  · The wiper motor runs only when the rain sensor requires the wiper operation.

▶Defective Rain Sensor

- The wiper relay (LOW) is turned on and the wiper motor runs one cycle when the volume sensitivity is changed to 2 from 3 during receiving the malfunction signal from the rain sensor (while the ignition key is in "ON" position and the AUTO switch is in "ON" position).




- The wiper relay (LOW) is turned on and the wiper motor runs one cycle when the volume sensitivity is changed to 3 from 4 during receiving the malfunction signal from the rain sensor (while the ignition key is in "ON" position and the AUTO switch is in "ON" position).




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| Modification basis | |
| Application basis | |
| Affected VIN | |



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▶Trouble Shooting

**Symptom 1. The wiper does not operate one cycle when turning the multifunction wiper switch to the "AUTO" from the "OFF" position or starting the engine while the wiper switch is in the "AUTO" position.**

- When starting the engine with the multifunction wiper switch in the "AUTO" position, the wiper operates one cycle to remind a driver that the wiper switch is in the "AUTO" position.
- If the above operation does not occur, place the wiper switch to "AUTO" position and perform the following procedures:
  If the wiper operates one cycle when moving the variable resistance knob from 5th stage to 4th stage, replace the rain sensor or check the sensor for contamination and tightness. If the wiper does not operates, replace STICS and check if the wiper operates properly.

**Symptom 2. It rains but the system does not work in "AUTO" position.**

- Check if the wiper operates at high speed when grounding pin 1 and pin 2.Check whether the multifunction wiper switch is in the "AUTO" position.
- Check the power to the sensor. Check the conditions of the pin 3 (Ground) and the pin 4 (IGN).
- Check the wiper relay for defective.

**Symptom 3. The wiper operates 3 or 4 times at high speed abruptly.**

Check whether the variable resistance knob on the multifunction wiper switch is set in "FAST". The "FAST" is the highest stage of the sensitivity and very sensitive to small amount of rain drops. Therefore, change the knob to the low sensitivity.

**Symptom 4. The wiper operates continuously even on the dry glass.**

- Check the wiper blade for wear. If the wiper blade cannot wipe the glass uniformly and clearly, this problem could be occurred. In this case, replace the wiper blade with a new one.
- Check whether the variable resistance knob on the multifunction wiper switch is set in "FAST". The "FAST" is the highest stage of the ensitivity and very sensitive to small amount of rain drops. Therefore, change the knob to the low sensitivity.

**Symptom 5. The wiper responses are too fast or too slow.**

Check whether the variable resistance knob on the wiper switch is set in "FAST" or "SLOW". Notify that the customer can select the sensitivity by selecting the variable resistance value. And, select a proper stage.

▶Auto Light Control

- The tail lamps and headlamps can be controlled by the communication with the rain sensor only when the auto light switch is in "AUTO" position with the ignition switch "ON".
- Rain detected headlamp: If it rains heavy which requires the highest AUTO speed, the headlamps are turned on automatically (while the light switch is in "AUTO" position and the wiper switch is in "AUTO" position).
- Night detected wiping: When the auto light control turns on the headlamps and the rain sensor detects the rain, the wiper sensitivity is automatically increased by one level. (i.e. the AUTO wiper switch is at the 3rd level, but the wiper operates at the 4th level.)

▶Speed Sensitive AUTO Wiper

For RKSTICS without the rain sensor, perform the following operation:

- Controls the wiper intermittent operation by the values from the vehicle speed and the volume.
  · Calculates and converts the Intermittent interval automatically by using the AUTO VOLUME when the ignition switch is in the "ON" position and the AUTO switch is in the "ON" position.
  · The wipers are operated in vehicle speed sensitive mode when turning the AUTO switch to the "ON" position with the engine running or starting the engine with the AUTO switch positioned to "ON".
  · Intermittent interval (at 0 km/h): 3 ± 0.5 ~ 19 ± 2 seconds
- Vehicle speed calculation

  [Input the vehicle speed]
  It is calculated by the numbers of input pulses for one second.

$$1\ [\text{PULSE/SEC}] = \frac{60\ [\text{km/h}] \times 60\ [\text{sec}]}{637 \times 4\ \text{PULSE}} \fallingdotseq 1.41\ [\text{km/h}]$$

- VOLUME calculation
  · The pause time of the vehicle speed sensitive AUTO wiper is calculated by the AUTO volume (input voltage). Each level has the hysteresis.
- Pause time calculation
  · Pause time: the duration that wipers are stopped at parking position
  · Elapsed time: the duration after the wiper motor started to operate from parking position
  · The pause time is calculated by the vehicle speed and the VOLUME.
  ※ If the pause time is below 1.0 second, the wipers operate without pause.
  ※ If the pause time is over 1.5 seconds, the wipers operate intermittently.



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| Modification basis | |
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| Affected VIN | |

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▶ **Ignition Key Reminder Warning (The ignition key reminder warning has priority over the "TAILLAMP ON WARNING".)**

- The chime bell sounds continuously with the interval of 0.3 seconds when opening the driver's door while the ignition key is in ignition switch.
- When removing the ignition key or closing the driver's door during chime buzzer operation, the buzzer stops.
- This function is not available when the ignition switch is in "ON" position.

▶ **Ignition Key Reminder**

- The system outputs "UNLOCK" signal for 5 seconds after the driver's door is opened and the door lock switch is changed to "LOCK" (while the ignition key is in ignition switch).
- The system outputs "UNLOCK" signal for 5 seconds (T2) when the door lock switch is changed to "LOCK" from "UNLOCK" and the driver's door is closed within 0.5 seconds (while the ignition key is in the ignition switch).
- If the "UNLOCK" conditions are met, the system outputs "UNLOCK" signal unconditionally. However, if the ignition key is removed after the door lock switch is changed from "UNLOCK" to "LOCK", the system does not output "UNLOCK" signal.

▶ **All Door Lock Prevention Function when a Door is Open**

- All doors, except the tailgate and hood, output "UNLOCK" signal for 5 seconds when the "LOCK" signal is inputted (while the ignition key is removed and one of any doors is open).
- When the door is closed during the UNLOCK output, the UNLOCK output stops immediately.
- When the ignition key is inserted during the UNLOCK output, the output continues for approx. 5 seconds.
- If the ignition switch is in the "ON" position or the ignition switch is removed, the above steps are performed. If the key is in the key cylinder, the ignition key reminder function is activated.
- This function does not work if the vehicle speed is over 10 km/h.

▶ **Tail Lamp Left On Warning**

- The chime bell sounds with the interval of 0.3 second when opening the driver's door while the tail lamp is turned on and the ignition key is removed.
- The chime bell output stops when turning off the tail lamp and closing the driver's door.
- The system outputs "UNLOCK" signal for 5 seconds when the driver's and passenger's door lock switch is locked (while the tail lamp is turned on and the driver's door is open).
- This function is not available when the ignition key is in the "ON" position.

▶ **Door Ajar Warning**

- The warning light in instrument panel comes on when opening any of doors including tailgate while the vehicle speed is below 10 km/h.
- The warning light goes off when closing the door under step 1.
- The warning light blinks when the vehicle speed is over 10 km/h while the warning light is turned on.
- The warning light blinks when a door is open while the vehicle speed is over 10 km/h.
- The warning light goes off when closing the door under step 3.
- The warning light comes on when the vehicle speed goes below 10 km/h under step 3.

▶ **Seat Belt Warnin**

- The seat belt warning light comes on and the chime bell sounds for 6 seconds when turning the ignition key to "ON" from "OFF". If the seat belt is fastened before turning the ignition key to the the "ON" position, the warning light in the instrument panel blinks, however, the chime bell does not sound.
- The seat belt warning light goes off and the chime bell stops when turning the ignition switch to the "OFF" position.
- The chime bell stops and the seat belt warning light stays on for the specified period of time when fastening the seat belt during the warning operation.
- The seat belt warning light comes on and the chime bell sounds for 6 seconds again when unfastening the seat belt during fastening operation while the ignition key is "ON" position.

▶ **Parking Brake Warning**

- The parking brake warning light comes on for approx. 4 seconds when turning the ignition key from the "OFF" to the "ON" position regardless of the vehicle speed and the parking brake switch position. After this 4 seconds, the warning lamp comes on, goes off or blinks according to the vehicle speed and the parking brake switch position.
- The warning light comes on when the parking brake switch is turned on while the vehicle speed is below 10 km/h.
- The warning light goes off when turning off the parking brake switch under step 2.
- The warning light blinks and the chime bell sounds for 0.6 seconds and stops for 0.3 seconds when the vehicle speed is over 10 km/h for more than 2 seconds while the parking brake switch is turned on.
- The warning light goes off and the chime buzzer stops when turning off the parking brake switch under step 4.
- The warning light comes on and the chime buzzer stops when the vehicle speed goes down below 10 km/h under step 4.
- This function is not available when the ignition key is turned to the "OFF" position.



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▶ **Front/Center Room Lamp Control**

The overhead console lamp (front room lamp) comes on when opening the door(driver's/passenger's) while the door coupled front rooom lamp switch is at the coupled operating position and the key reminder switch is "OFF".

- When the door (Driver's/Passenger's) is opened, the front room lamp comes on.
- The room lamp stays on for 2 seconds and then dims out through 3 seconds when closing the opened door.
- The dimming operation must have greater than 32 steps per one second.
- The room lamp output should stop immediately after turning on the ignition key during the dimming operation.
- The front room lamp comes on for 30 seconds when receiving the unlock signal from the remote control key while the doors are closed.
- The front room lamp and the center room lamp output period is extended by 30 seconds when receiving the unlock signal from the remote control key again during output. (The lamp stays on when unlocked by the remote control key.)
- When a door is opened during its extended period, the lamp stays on. If closed, operates as in step 2.
- The room lamp output stops immediately after receiving the lock signal from driver's/passenger's door lock switches while the driver's and passenger's doors are closed or entering into the anti-theft mode by pushing LOCK button on the remote control key.
- The front room lamp comes on when opening the driver's door or passenger's door and goes off when closing the opened door while the ignition key is in ON position.

▶ **Tail Lamp Auto Cut (Battery Saver)**

- The tail lamp is turned on or off according to the operations of the tail lamp switch.
- The tail lamp relay is turned off (auto cut) when opening and closing the driver's door after removing the ignition key without turning off the tail lamp.
- The tail lamp relay is turned on when inserting the ignition key into the ignition switch.
- The tail lamp relay is not turned off automatically (auto cut) when opening and closing the driver's door while the ignition is removed and the tail lamp is turned on.

▶ **Windshield heated glass (deicer) switch**

- The front defogger output is "ON" when turning "ON" the front defogger (heated glass) switch while the ignition switch is "ON" (with engine running).
- The output stops when turning on the front defogger (heated glass) switch again during its operation.
- The output is "ON" only for 6 minutes when turning "ON" the front defogger (heated glass) switch within 10 minutes after completion of output for 12 minutes. This can be done only once.
- The output is "OFF" when the ignition switch is "OFF".

▶ **Ignition Key Hole Illumination**

- The ignition key hole illumination comes on when opening the driver's door or passenger's door when the ignition key is removed.
- The ignition key hole illumination stays on for 10 seconds when closing the door after step 1.
- The output stops when the ignition key is turned to "ON" position.
- The output stops when receiving the lock signal from the remote control key (under anti-theft mode).

▶ **Rear Defogger Timer**

- The rear defogger output is "ON" when turning "ON" the rear defogger switch while the IGN 2 switch is "ON" (with engine running).
- The output is "OFF" when turning "ON" the rear defogger switch again during
- output.
  The output is "ON" only for 6 minutes when turning "ON" the rear defogger switch within 10 minutes after completion of output for 12 minutes. This can be done
- only once.
  The output is "OFF" when the IGN 2 switch is "OFF".

▶ **Door Lock/Unlock Control by Door Lock Switch**

- The door lock system outputs "LOCK" signal for 0.5 seconds when positioning the driver's or passenger's door lock switch to the lock position.
- The door lock system outputs "UNLOCK" signal for 0.5 seconds when positioning the driver's or passenger's door lock switch to the unlock position.
- The door lock system outputs "LOCK" signal for 0.5 seconds when switching from LOCK to UNLOCK by the driver's or passenger's door key cylinder.
- The door lock system outputs "UNLOCK" signal for 0.5 seconds when switching from UNLOCK to LOCK by the driver's or passenger's door key cylinder.
- The alarm will not be activated when switched to UNLOCK by driver's or passenger's door key cylinder switch in theft deterrent mode.
- It does not occur abnormal operation when reconnecting the battery after disconnecting the battery cable.
- All door lock signals are "UNLOCK" for 0.5 seconds just for once when receiving the "LOCK" signal within 0.5 seconds after closing the driver's or passenger's door while the ignition key is removed.

▶ **Door Lock/Unlock by Central Door Lock Switch**

- The door lock system outputs "LOCK/UNLOCK" signal for 0.5 seconds when operating the central door lock switch. (However, if the door lock switch (front doors) is at LOCK position, the system outputs UNLOCK signal, and vice versa.)
- The "LOCK" or "UNLOCK" inputs from the central door lock switch in anti-theft mode are ignored



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| Application basis | |
| Affected VIN | |

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▶ **The door lock system outputs Door LOCK/UNLOCK by Remote Control Key**

- The door lock relay output is "ON" for 0.5 seconds when receiving the remote control lock signal.
- The door unlock relay output is "ON" for 0.5 seconds when receiving the remote control unlock signal.

▶ **Auto Door Lock**

- The door lock system outputs "LOCK" when the vehicle speed maintains over 50 km/h.
- However, it doesn't output "LOCK" when all doors are locked or failed.
- If any of doors is unlocked after outputting "LOCK" in step 1, outputs "LOCK"
- up to 5 times (except step 1) at the interval of one second.
- If any of doors is unlocked after 5 times of "LOCK" outputs, the door is regarded
- as "FAIL".
- If the door that was regarded as fail changes (UNLOCK to LOCK) to unlock, only one
- "LOCK" output will be done.
- If any door is regarded as FAIL, the auto door lock function does not work (if it is occurred when the vehicle speed is over 50 km/h, the auto door lock output does not occur even if the vehicle speed falls below 50 km/h and accelerates again to over 50
- km/h.). Nonetheless, the central door lock function works properly.
- When the system receives "UNLOCK" signal from a door switch, it outputs "LOCK" signals 5 times. If additional "LOCK" signal from another door switch is detected during the period, the system outputs five "LOCK" signals 5 times for
- the door system outputs five "LOCK" signals 5 times for the door.
- The door lock system outputs "UNLOCK" automatically if the "LOCK" output conditions are established by this function or the key is cycled (IGN1=OFF) (even when there is no "LOCK" output while the vehicle speed maintains over 50 km/h under lock condition). (If the LOCK condition is established with the ignition switch ON, the system outputs UNLOCK signal unconditionally when turning the ignition switch to OFF position.) However, when the ignition key is turned to "OFF"
- position, the lock output conditions will be cancelled.
- The "FAIL" condition of the door will be erased when the ignition key is turned to "OFF" position.

▶ **Description of Burglar Alarm Function**

- Armed mode activation requirements

· The "LOCK" output is "ON" when receiving the "LOCK" signal from transmitter while the ignition key is removed and all doors are closed. The armed mode is activated when the door lock switch is locked (hazard relay output: twice).
· The theft deterrent horn and hazard relay outputs are "ON" when receiving the "LOCK" signal from the remote control key again in armed mode (hazard relay output: twice).
· When receiving "LOCK" signal from the remote control key while any of doors is not closed, only the "LOCK" output can be done and then activates the armed ready mode (without hazard warning flasher). At this moment, if the ignition key is in the ignition switch, the door unlock switch is turned "ON" or the door lock switch is unlocked, it cancels the armed mode and activates the normal mode. However, when closing and locking the opened door, the hazard warning lamps
· flash twice.
When the door is not opened or the ignition key is not inserted into ignition switch for 30 seconds after receiving "UNLOCK" signal, it outputs "LOCK" and then activates armed mode (RELOCK operation). Also, at this moment, the system
· outputs the hazard warning flasher twice.
The armed mode will not be activated except above conditions.
Ex) The armed mode will not be activated when the door is locked by the ignition key.

- Armed mode cancellation requirementsArmed mode cancellation requirements

· Unlocking by remote control key
· Door unlocking by the driver's and passenger's key cylinder switch
· The armed mode is cancelled when turning the ignition key "ON". The siren is deactivated in 27seconds.

- Warning operation requirements

· When opening the door in armed mode
· When unlocking the door lock switch in armed mode
· When closing and then opening the door after completion of warning (27 seconds)

- Warning operation

· The siren and hazard warning flasher output is "ON" for 27 seconds with the interval of 1 second.

- Warning cancellation requirements

· Cancels warning by using any signal from the remote control key (LOCK, UNLOCK, PANIC) during warning operation.
· Cancels warning after 27 seconds (remaining period) while the ignition key is turned to "ON" position.
· If the ignition switch is turned to ON position when the warning is activated in armed mode, the warning is canceled immediately and the warning buzzer stops after 27 seconds (remaining time).
· When unlocking the doors by the driver's/passenger's door key cylinder in armed mode, the armed mode is cancelled.



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- Operation when warning is cancelled
  · The siren and hazard warning flasher outputs are "OFF".
- Operations when removing and installing the battery

| Removed \ Installed | Normal | Armed | Warning | Remark |
|---|---|---|---|---|
| Normal | ○ | | | |
| Armed Ready | ○ | | | |
| Armed | | ○ | | |
| Warning | | | ○ | |
| Warning Completion | ○ | ○ | ○ | |
| RELOCK Ready | ○ | | | |

If the system is in armed mode while installing a battery, the siren sounds and the emergency warning lamp blinks. (Same operations with warning in armed mode).

**NOTE**

RELOCK Operation: It the door is not opened or the ignition key is not inserted into the key cylinder within 30 seconds after unlocking the door with remote control key, the system outputs "LOCK" signal and activates the armed mode.

▶ **Auto Door Unlock (Crash Unlock)**

- The air bag collision signal input cannot be accepted within 7 seconds after turning the ignition key to "ON" position.
- After this period, the door lock system outputs "UNLOCK" for all doors for 5 seconds from 40ms after receiving the air bag collision signal.
- Even though the key is turned to "OFF" position during the output of "UNLOCK", the output continues on for remaining period.
- The function is erased when turning "OFF" the IGN switch.

▶ **Time Lag Power Window Control**

- The power window relay output is "ON" when turning on the ignition switch.
- The power window relay output is "ON" for 30 seconds when turning off the ignition switch. The power window relay output is "OFF" when opening the driver's door or the passenger's door.
- The power window relay is turned "OFF" when receiving the remote control key lock signal (armed mode) during its extended operation period of 30 seconds.

▶ **Specifications of Remote Control Key**

When any of switches on remote control key is pressed, the integrated CPU in remote control key sends the coded control message to the CPU in receiver to control the vehicle.

- Switch Functions on Remote Control Key

**Door Lock Button**

Lock (briefly press)

· If you press this button briefly, all doors and the tailgate are locked and the theft deterrent mode is activated.
· When the theft deterrent mode is activated, the hazard warning flashers blink twice.



**Door Unlock/Panic Button**

1. Unlock (briefly press)

· If you press this button briefly, all doors and the tail gate are unlocked and the theft deterrent mode is deactivated.
· When the deterrent mode is deactivated, hazard warning flashers blink once.

2. Panic function (press and hold)

· If you are in your vehicle and feel threatened while the ignition key is inserted into the key switch, you may activate the alarm to call attention. If you press this button, the warning siren will sound for approx. 27 seconds.
· The panic function will stop when any of the buttons on the remote control key is pressed.

Panic Button
(operative only when the ignition key is inserted)

**CAUTION**

The coding signal is transmitted only if pressing the door unlock button long (approx. 2 seconds) when coding the remote control key.



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| Modification basis | |
| Application basis | |
| Affected VIN | |

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▶ **Receiver**

- Operating requirements
  IGN Key = OUT (removed)
- Code registration requirement
  Codes can be registered only through SCAN-100.
- Transmitter Code Registration
  · Up to five transmitter codes (same for REKES key) can be registered.
  · The received code cannot be output during the registration.
  · The remote control key must be encoded through the SCAN-100.

▶ **Remote Door Lock**

- All doors are locked when briefly pressing the door LOCK switch on remote control key (less than 0.5 seconds).
- The system outputs LOCK signal immediately after receiving the door lock message from the remote control key. The system activates the theft deterrent mode when all doors are locked while they are fully closed (the hazard warning lamps blink twice.).

▶ **Door Unlock**

- The door unlock operates when pressing the door unlock switch on the remote control key for less than 0.5 seconds.
- The door unlock relay is "ON" for 0.5 seconds when receiving the door unlock message from the remote control key.
- The hazard warning lamps blink once only when all the doors unlocked.

▶ **Auto Door Lock in 30 Seconds after Pressing Door Unlock Butt**

- If no door is opened for 30 seconds after inputting remote door unlock, the doors are automatically locked and the armed mode of anti-theft system is activated again.

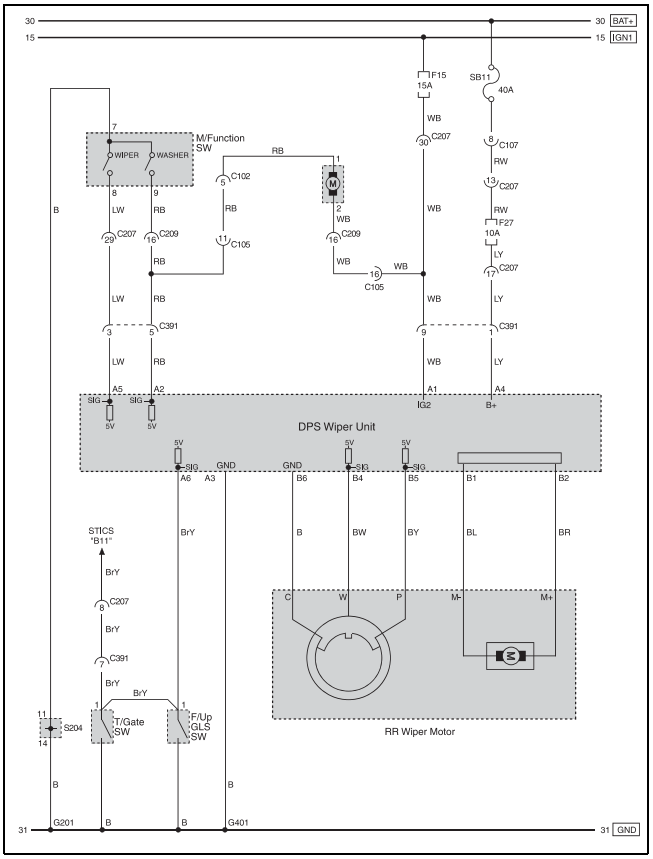
**G. DIAGNOSIS TROUBLE CODE AND HELP TIPS**

| Fault Code | Malfunction | Descriptions |
|---|---|---|
| 01 | Dr Door Lock Knob | Driver's door lock knob is not operated when locking/unlocking doors. |
| 02 | Ps Door Lock Knob | Passenger's door lock knob is not operated when locking/unlocking doors. |
| 03 | Rr Door Lock Knob | Rear door lock knob is not operated when locking/unlocking doors. |
| 04 | T/Gate Lock Knob | Tailgate lock knob is not operated when locking/unlocking doors. |
| 05 | Door Lock Output | All door lock knob are not moved to lock position even when the door lock relay is activated. |
| 06 | Door Unlock Output | All door lock knob are not moved to unlock position even when the door unlock relay is activated. |
| 07 | C/DR Lock Output | Doors are locked by central door lock switch while the engine is running. |
| 08 | DR Lock Output | Doors are locked by driver's door lock switch while the engine is running. |
| 09 | PS Lock Output | Doors are locked by passenger's door lock switch while the engine is running. |
| 10 | Auto Door Lock Output | Door lock knob is not moved to lock position when the system outputs auto door lock signal while the ignition switch is in ON position and the vehicle speed is over 50 km/h. |
| 11 | Auto Door Unlock Output | Door lock knob is not moved to unlock position after receiving the output from collision sensor. |
| 12 | Wiper Output | The WIPER P-POS signal is not detected when the wiper relay is activated. |
| 13 | SPEED SIGNAL | The vehicle speed over 3 km/h is detected at the speed signal area while the ignition switch is in ON position and the alternator signal is "D" LOW. |
| 14 | INT WIPER Volume | The circuit is open (over 4.5 V) when changing the INT volume in the speed sensitive INT wiper (saved as history error). |
| 15 | SPEED SENSOR | The vehicle speed over 200 km/h is detected (saved as history error). |
| 16 | A/BAG COLLISION SENSOR INPUT | A signal is sent to the collision sensor input area while the ignition switch is in OFF position (saved as history error unconditionally). |
| 17 | A/BAG COLLISION SENSOR OUTPUT | The RKSTICS outputs UNLOCK signal after receiving collision sensor input while the ignition switch is in ON position (saved as history error). |
| 18 | A/BAG COLLISION MONITOR | The STICS outputs the Door Unlock signal due to the collision sensor and the feedback value is in proper range (saved as history error). |
| 19 | Door Ajar Warning IND | The door warning indicator blinks when the vehicle speed is over 10 km/h (saved as history error). |
| 20 | PARKING BRAKE IND | The parking brake indicator blinks when the vehicle speed is over 10 km/h (saved as history error). |
| 21 | Auto Washer Out | The auto washer output is not sent to the front washer (saved as history error). |
| 22 | WASHER RELAY | The front washer switch receives the input signal for more than 10 seconds (saved as history error). |



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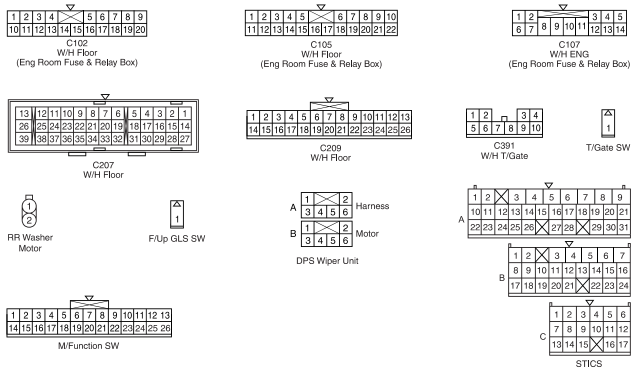
# SGN 7830-03 RR DPS WIPER & WASHER (W/ FLIP UP GLASS)




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C391 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G401 | W/H Tail Gate | Center the Tail Gate | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

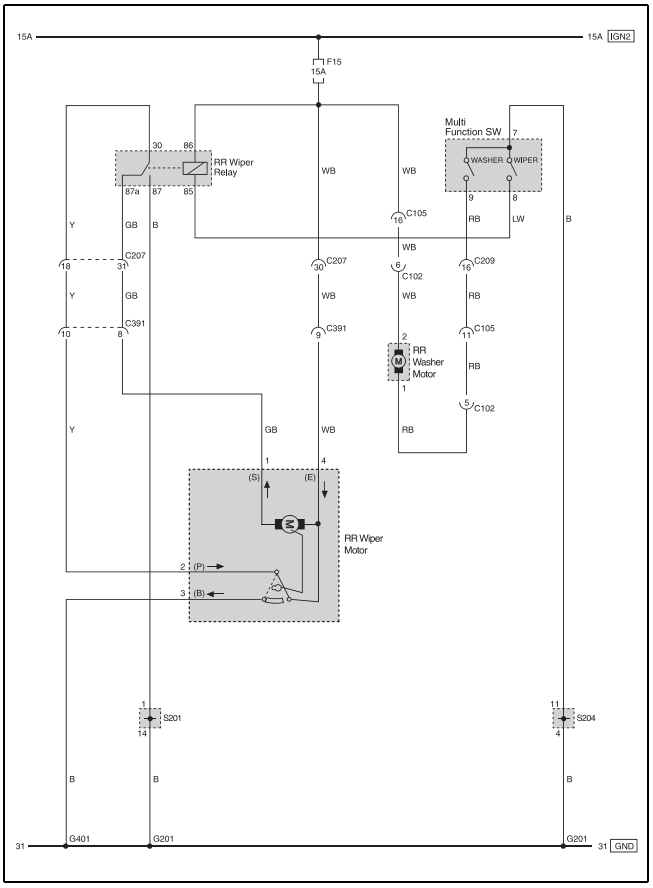





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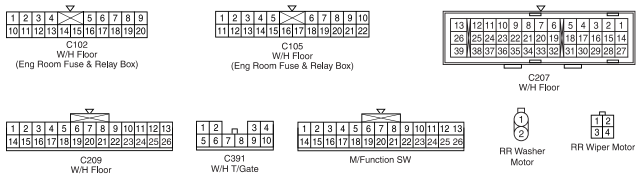
# 7830-03 ??RR STANDARD WIPER & WASHER




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C391 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G401 | W/H Tail Gate | Center the Tail Gate | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

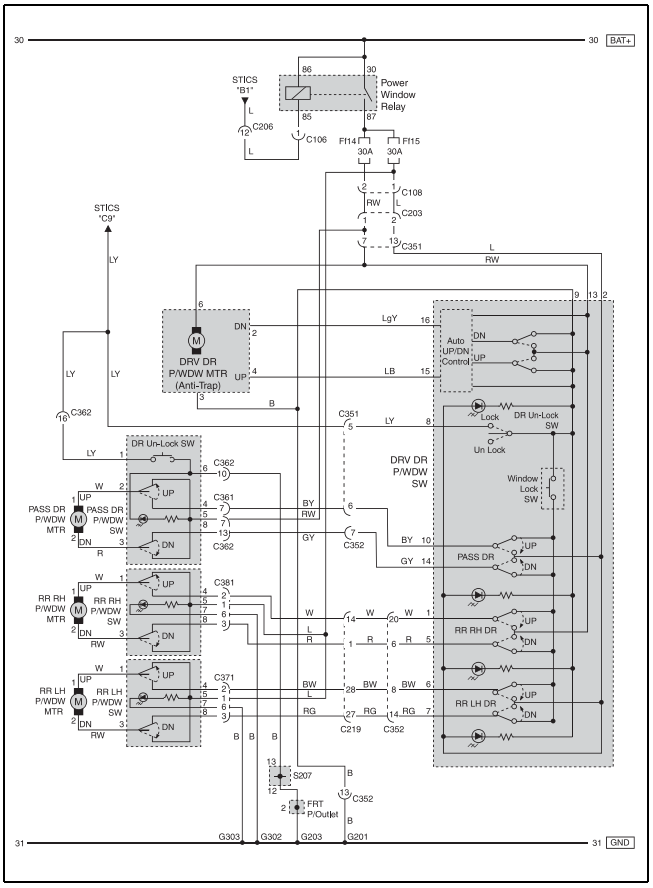



| Modification basis | |
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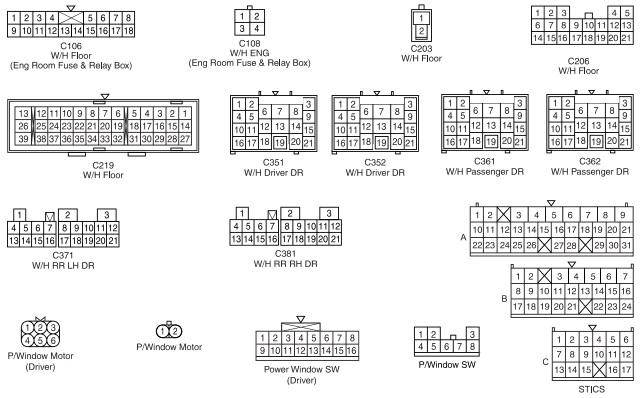
## 8510-05 POWER WINDOW CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C108 (4Pin, Colorless) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C203 (2Pin, Colorless) | W/H Main - W/H Floor | Under the I/P Fuse Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C361 (21Pin, White) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G302 | W/H Floor | Under the Passenger Seat | |
| G303 | W/H Floor | Under the LH "B" PLR | |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

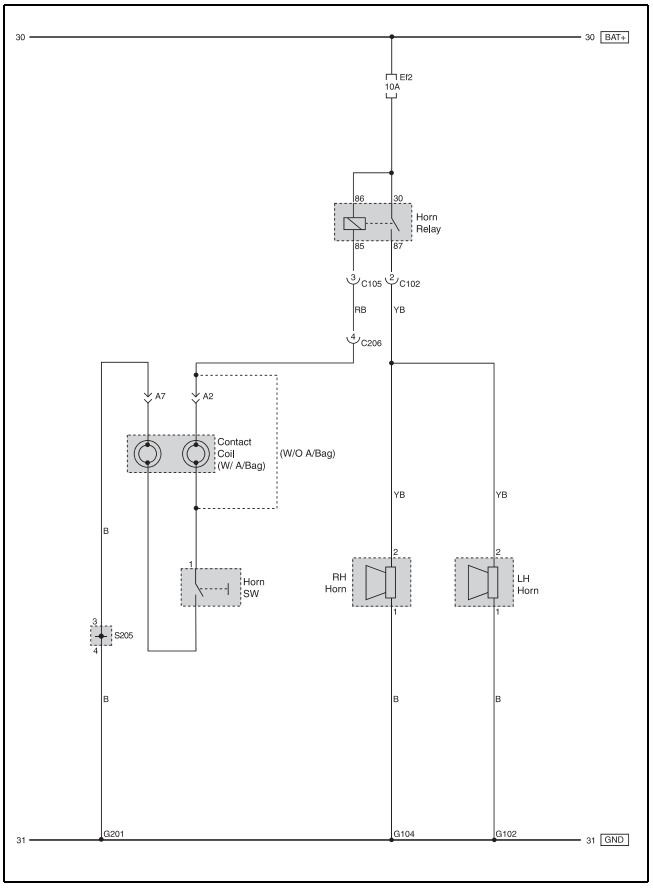





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# 8610-06 HORN

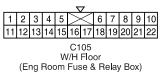



## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

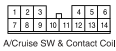

C102
W/H Floor
(Eng Room Fuse & Relay Box)


C105
W/H Floor
(Eng Room Fuse & Relay Box)


C206
W/H Floor



Horn


A/Cruise SW & Contact Coil



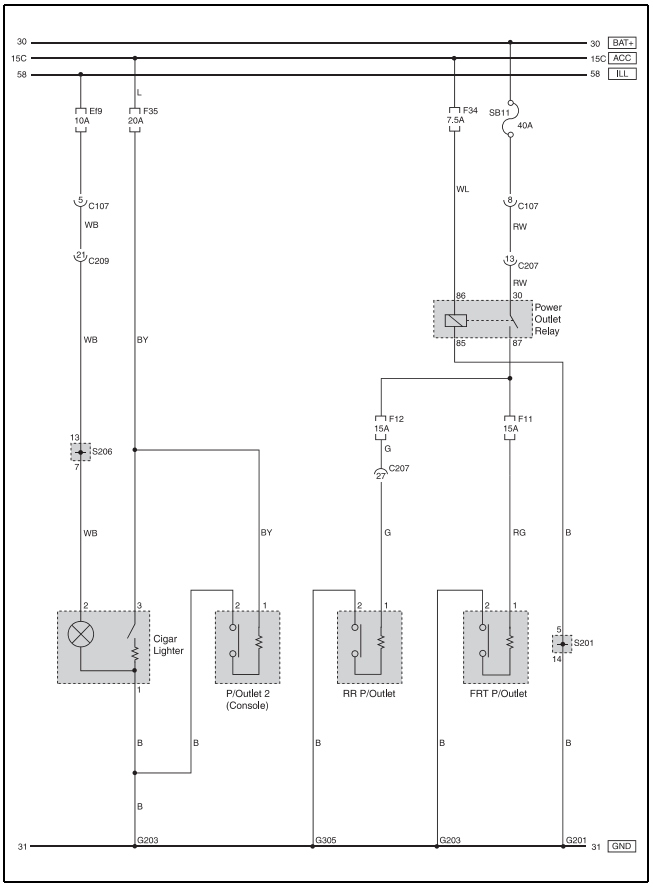
Horn SW
(Steering Wheel)

| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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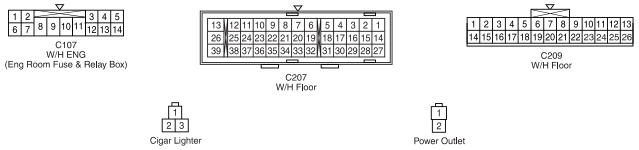
# 7632-16 CIGAR LIGHTER & POWER OUTLET CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G305 | W/H Floor | Inside the LH QTR GLS Lower | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

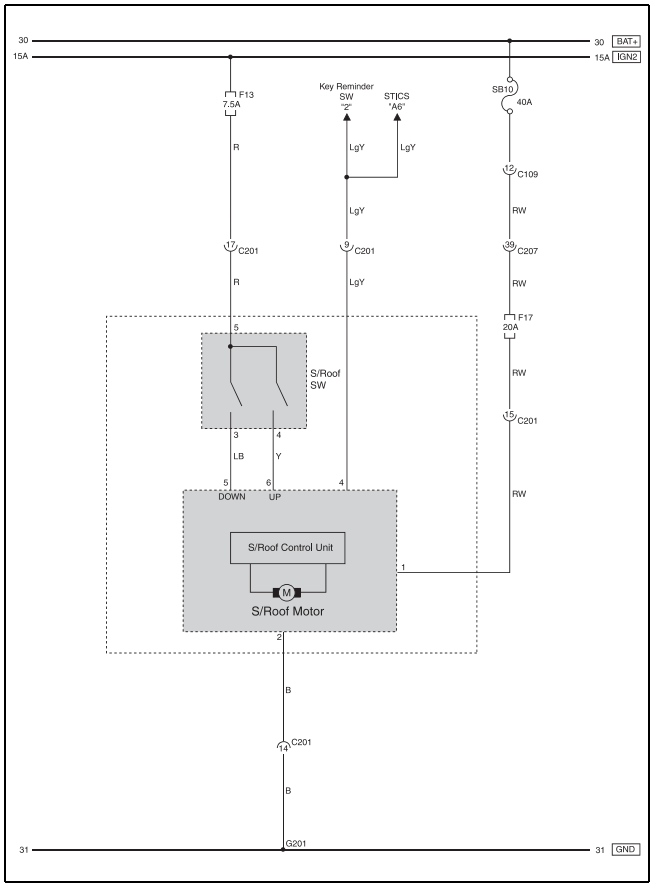





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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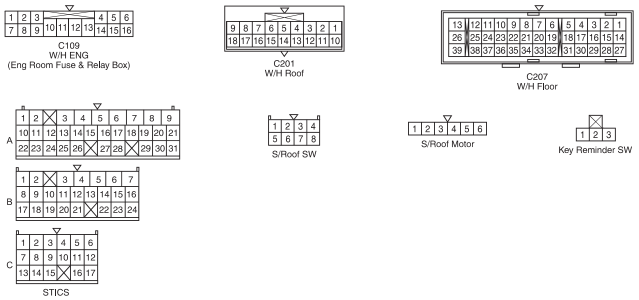
SGN 7340-03 **SUN ROOF CIRCUIT**




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C201 (18Pin, White) | W/H Main - W/H Roof | Under the I/P Fuse Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



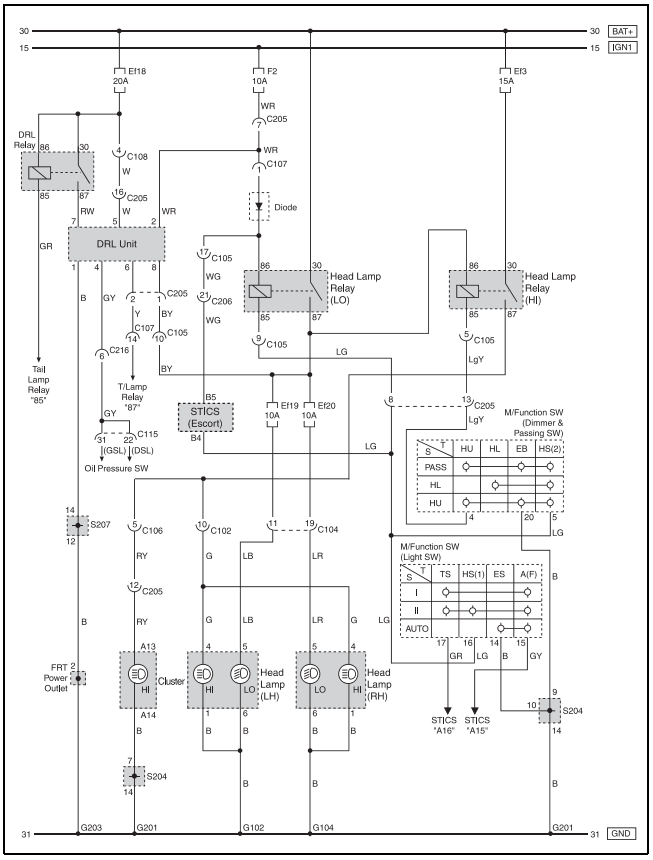

| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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S.G.N. 8310-01

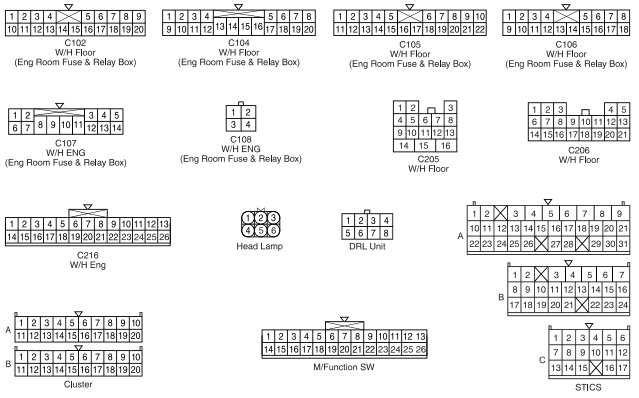
# HEAD LAMP & DRL (DAY TIME RUNNING LIGHT) UNIT CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C108 (4Pin, Colorless) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | GND |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | CAN |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

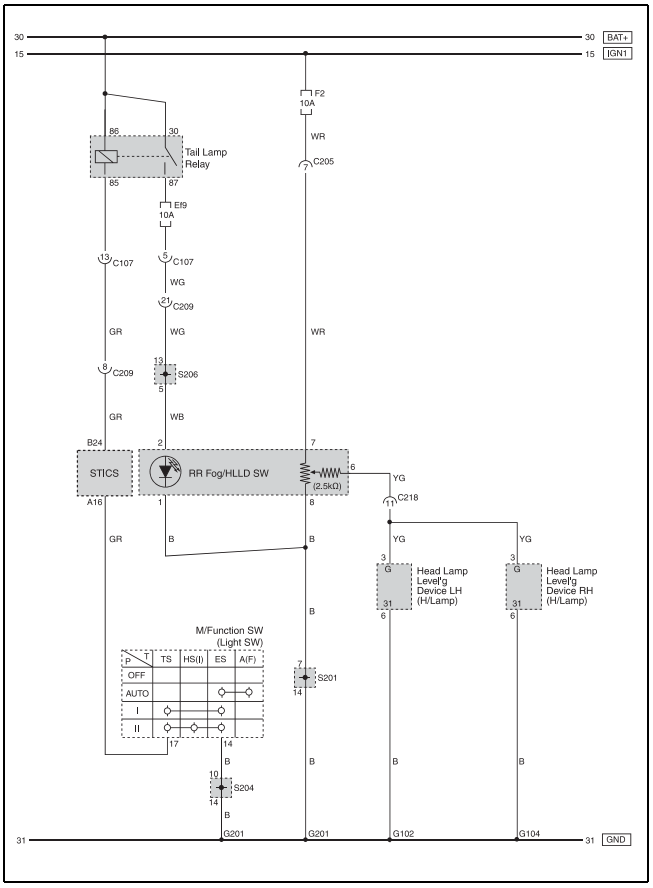





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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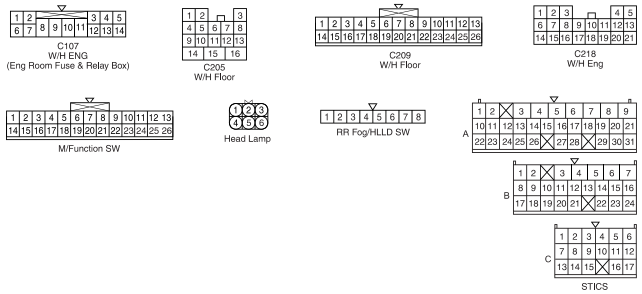
# SSN 8510-00 HLLD (HEAD LAMP LEVEL'G DEVICE) CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C218 (21Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

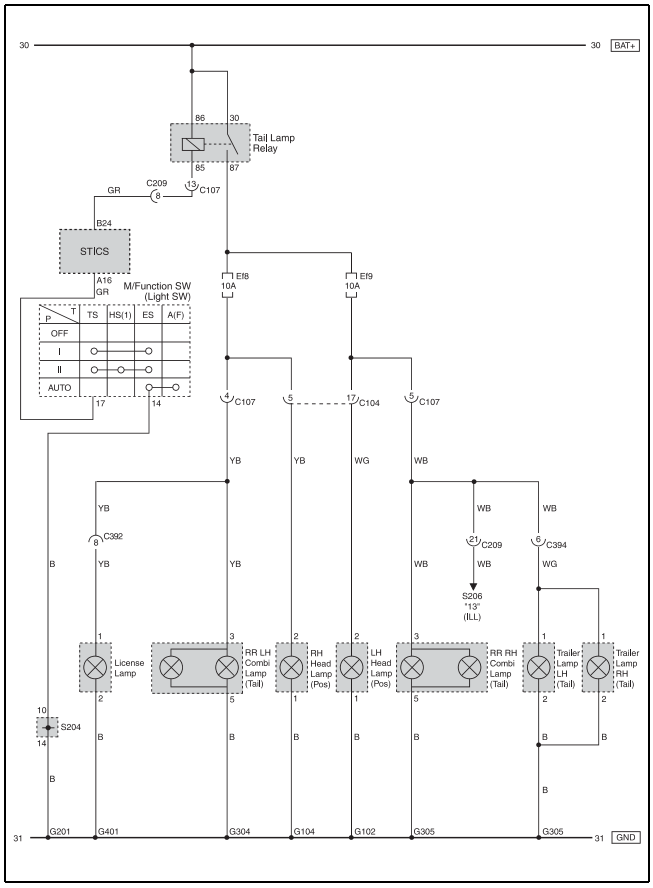



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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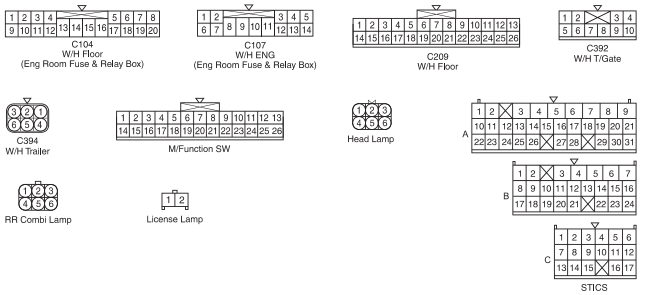
## SGN 8320-01 TAIL LAMP CIRCUIT




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C392 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| C394 (6Pin, Black) | W/H Floor - W/H Trailer | Under the RR Bumper (RH) | Trailer |
| G102 | W/H Eng | Center the Eng BATT | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the RH QTR GLS Lower | |
| G401 | W/H Tail Gate | Center the Tail Gate | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

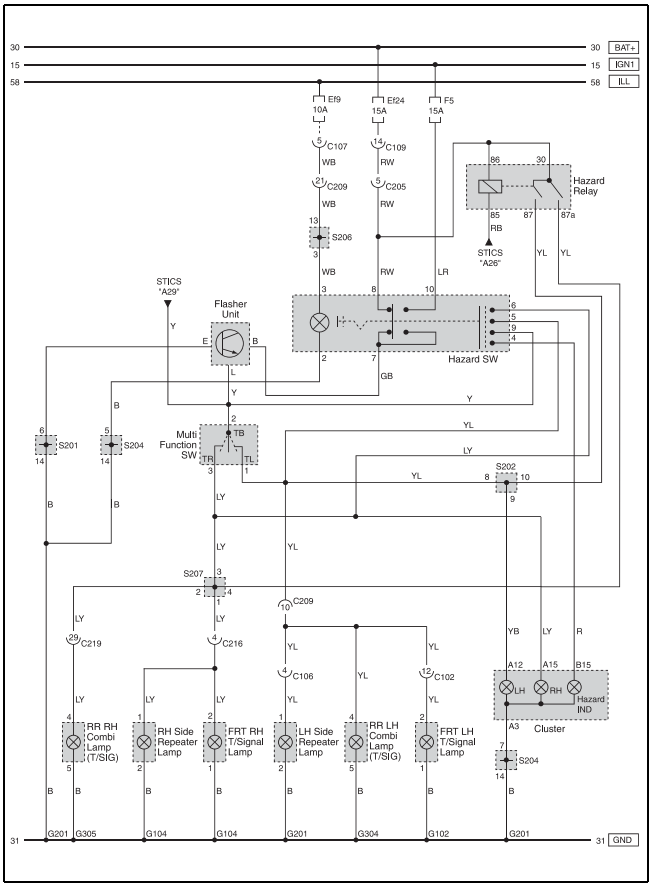





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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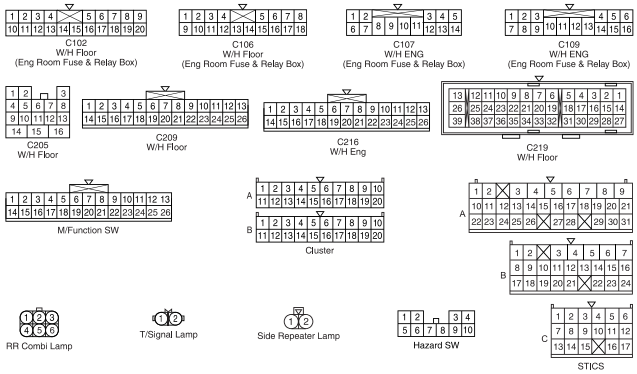
# SGN 8410-01 TURN SIGNAL & HAZARD LAMP CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the RH QTR GLS Lower | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

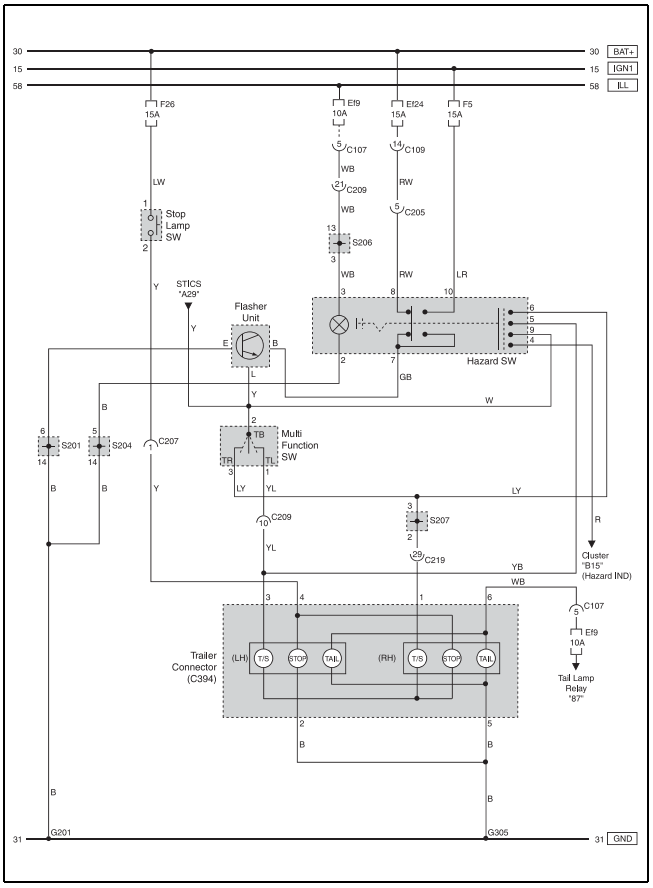



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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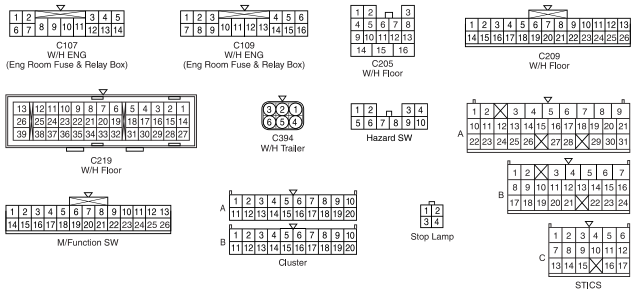
# 8210-01 TRAILER LAMP CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C394 (6Pin, Black) | W/H Floor - W/H Trailer | Under the RR Bumper (RH) | Trailer |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G305 | W/H Floor | Inside the RH QTR GLS Lower | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

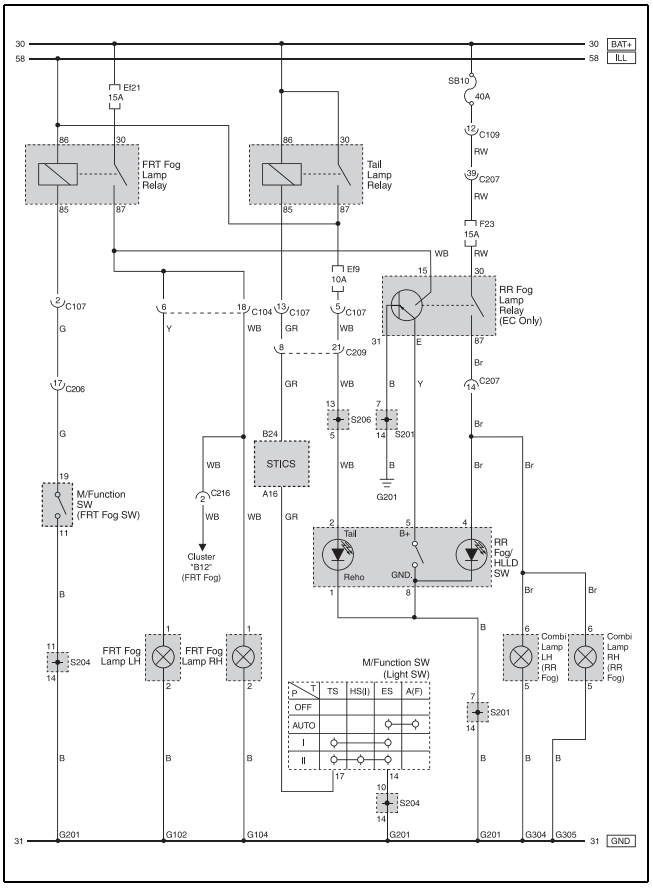





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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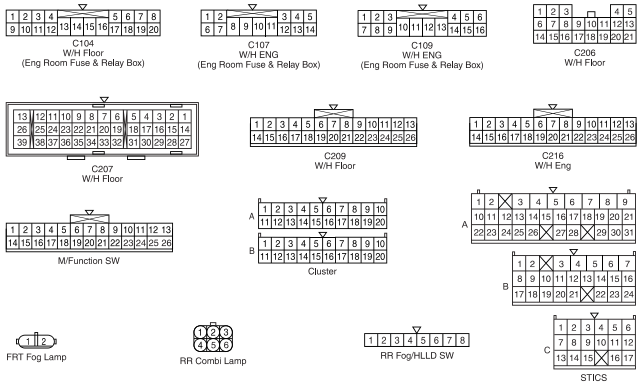
# 8310-10 FOG LAMP CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G304 | W/H Main | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the RH QTR GLS Lower | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

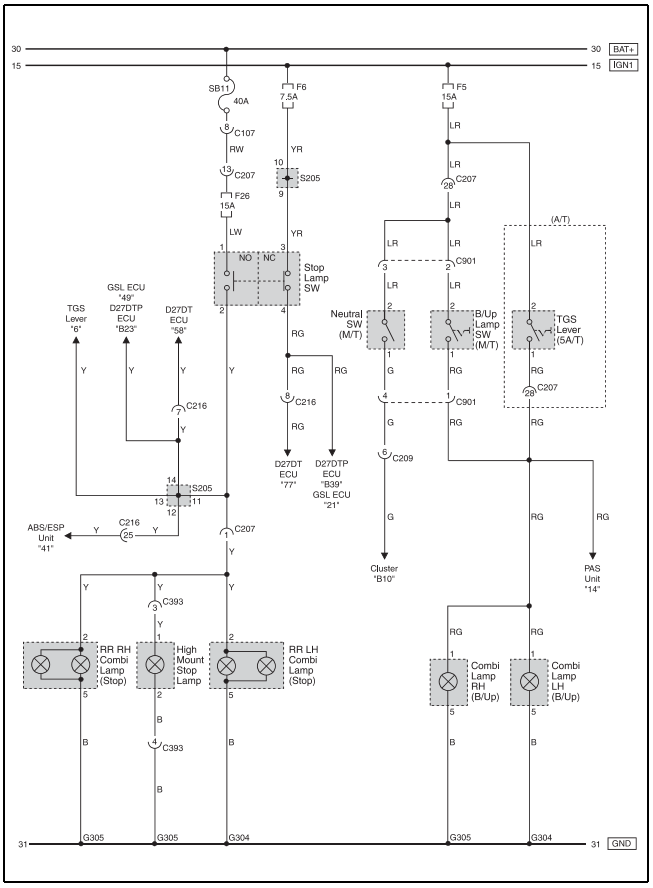



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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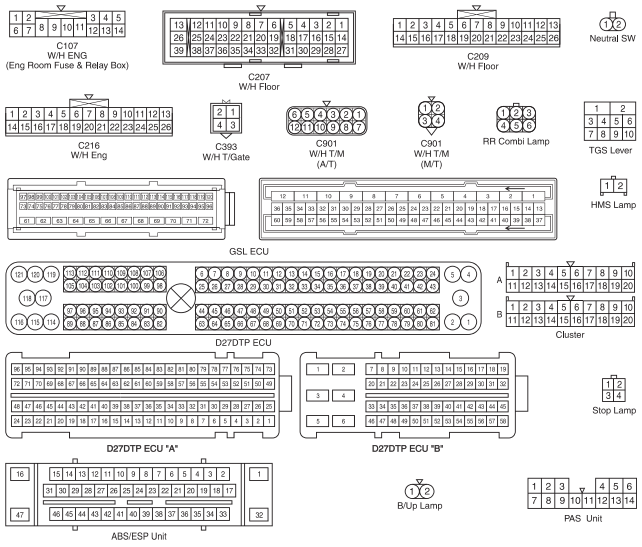
## 4810-01 STOP & BACK-UP LAMP CIRCUIT




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C393 (4Pin, Colorless) | W/H Floor - W/H Tail Gate | Inside the RR RH Upper QTR Trim | |
| C901 (12Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | A/T |
| C901 (4Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | M/T |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the RH QTR GLS Lower | |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

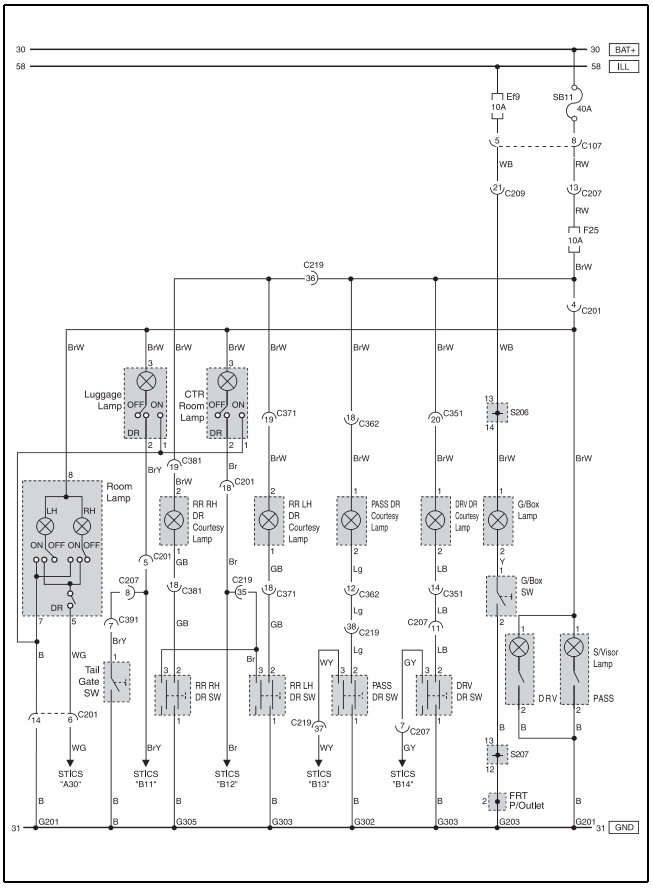





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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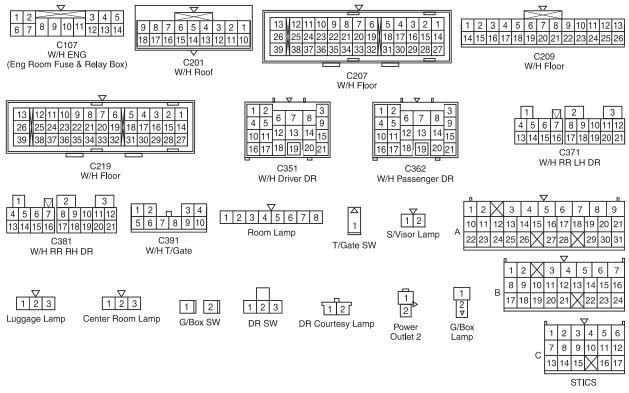
# SGN 7770-02 INTERIOR LAMP CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C201 (18Pin, White) | W/H Main - W/H Roof | Under the I/P Fuse Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C351 (21Pin, Black) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C362 (21Pin, Black) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| C391 (10Pin, White) | W/H Floor - W/H Tail Gate | Inside the Tail Gate | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G302 | W/H Floor | Under the Passenger Seat | |
| G303 | W/H Floor | Under the LH "B" PLR | |
| G305 | W/H Floor | Inside the RH QTR GLS Lower | |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

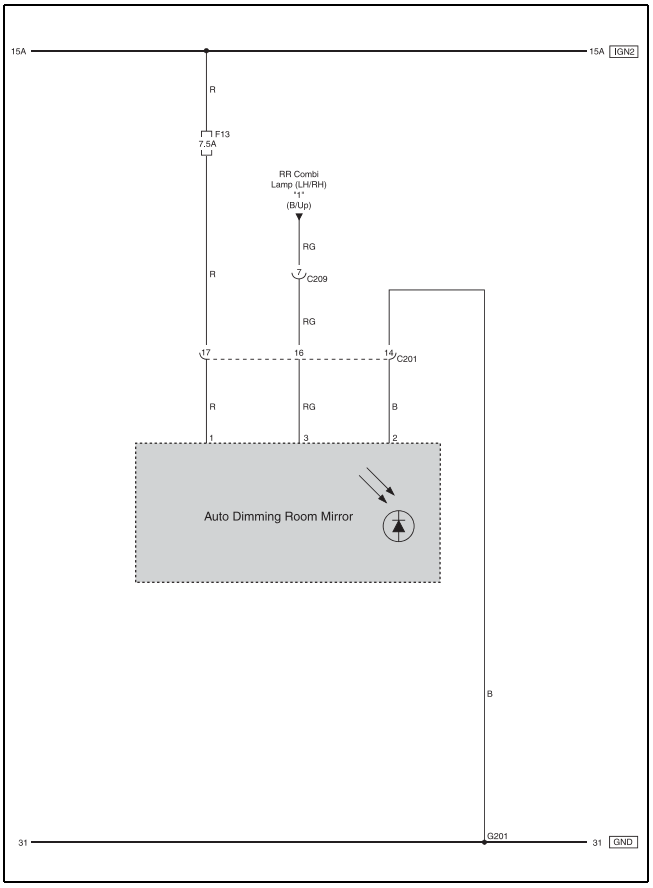



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## 7770-10 AUTO DIMMING ROOM MIRROR CIRCUIT




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C201 (18Pin, White) | W/H Main - W/H Roof | Under the I/P Fuse Box | |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



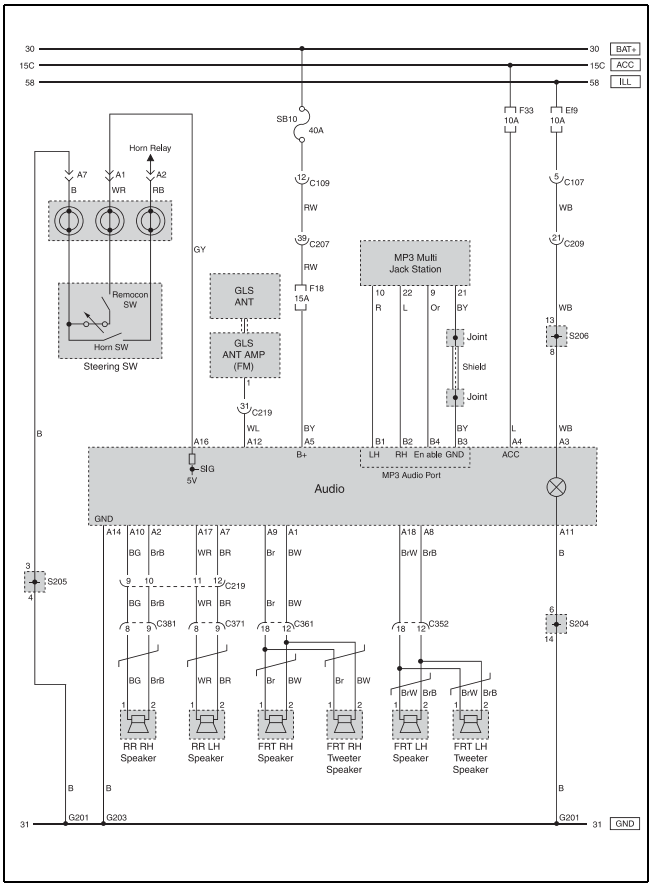



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |

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ENGINE
CHASSIS
ELECTRIC

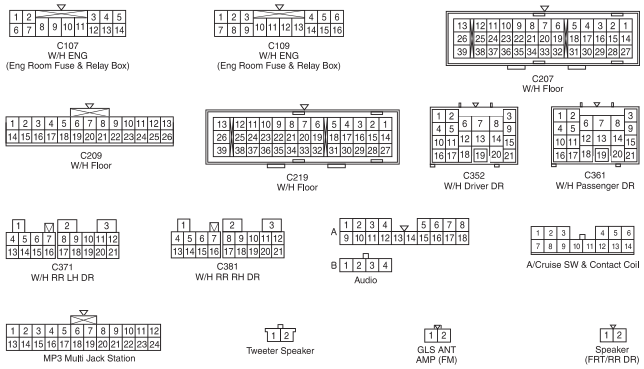
# 8910-01 AUDIO




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C361 (21Pin, White) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION



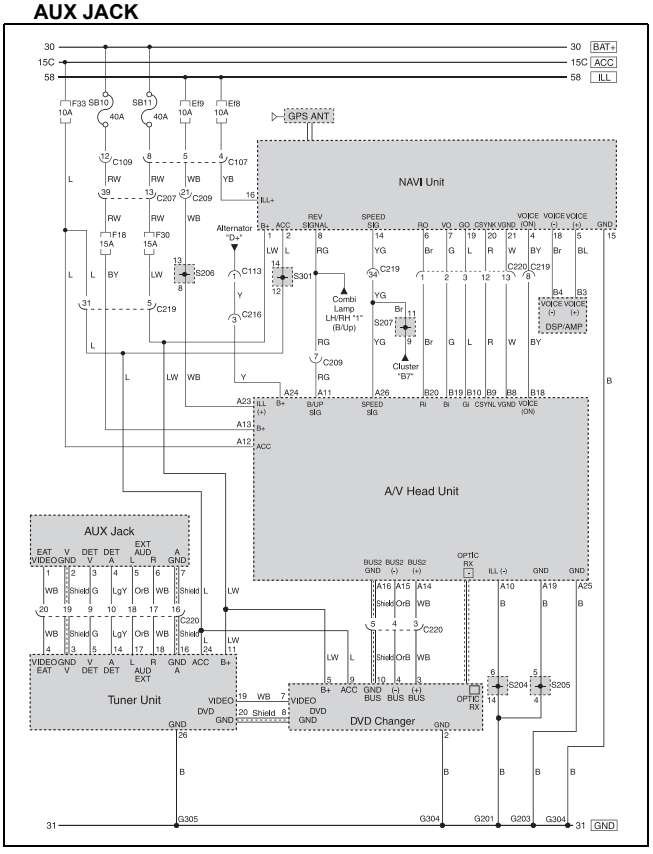

| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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# 8930-01 A/V SYSTEM

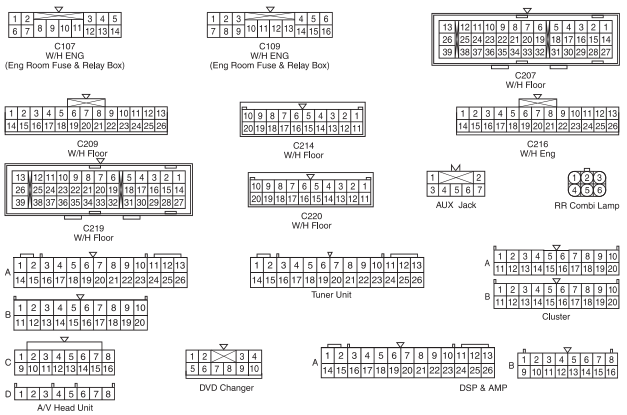
## 1) NAVI UNIT, A/V HEAD UNIT, DVD CHANGER, TUNER UNIT, AUX JACK




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C214 (20Pin, Black) | W/H Main - W/H Floor | Lower the Console Box | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C220 (20Pin, Black) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the RH QTR GLS Lower | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |
| S207 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S301 (14Pin, Black) | W/H Floor | Under the Driver Seat | CAN |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

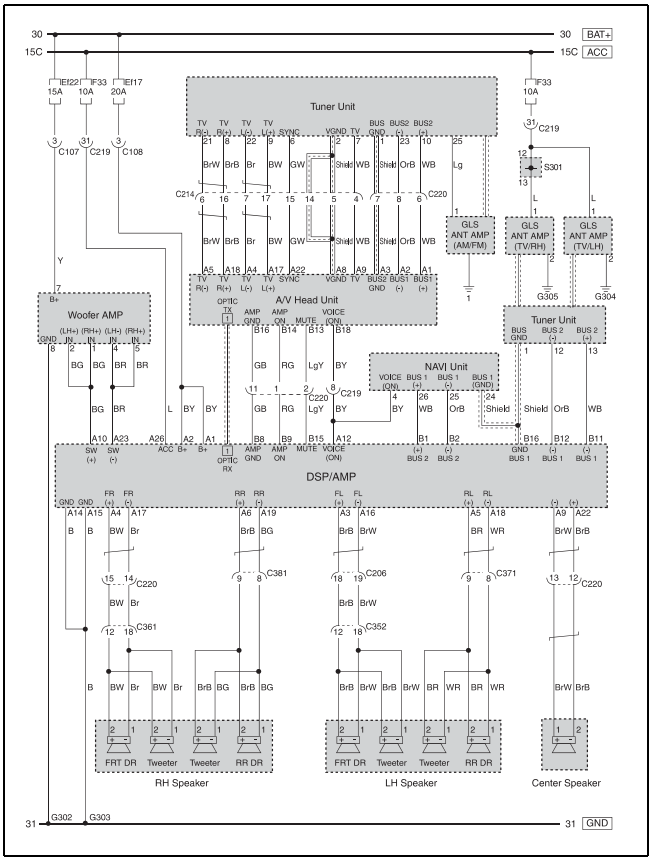





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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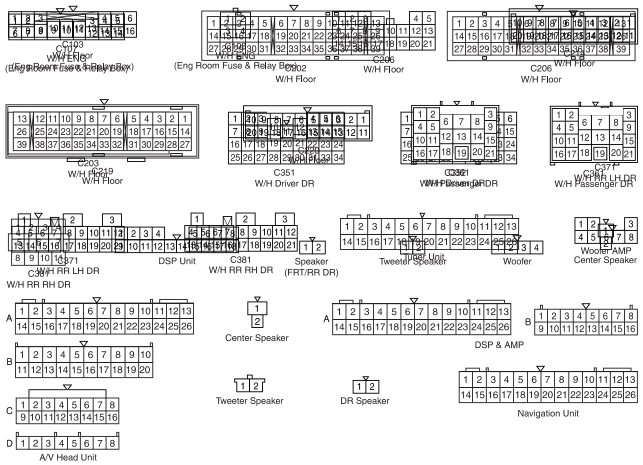
## 2) A/V HEAD UNIT, DSP/AMP, TUNER UNIT, WOOFER AMP, SPEAKER




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C108 (4Pin, Colorless) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C206 (21Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C214 (20Pin, Black) | W/H Main - W/H Floor | Lower the Console Box | |
| C219 (39Pin, Gray) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C220 (20Pin, Black) | W/H Main - W/H Floor | Passenger Cowl Side C/Holder | C/Holder |
| C352 (21Pin, White) | W/H Main - W/H Driver DR | Inside the Driver Cowl Side PNL | |
| C361 (21Pin, White) | W/H Main - W/H Passenger DR | Inside the Passenger Cowl Side PNL | |
| C371 (21Pin, White) | W/H Floor - W/H RR LH DR | Under the Left "B" PLR | |
| C381 (21Pin, White) | W/H Floor - W/H RR RH DR | Under the Right "B" PLR | |
| G302 | W/H Floor | Under the Passenger Seat | |
| G303 | W/H Floor | Under the LH "B" PLR | |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

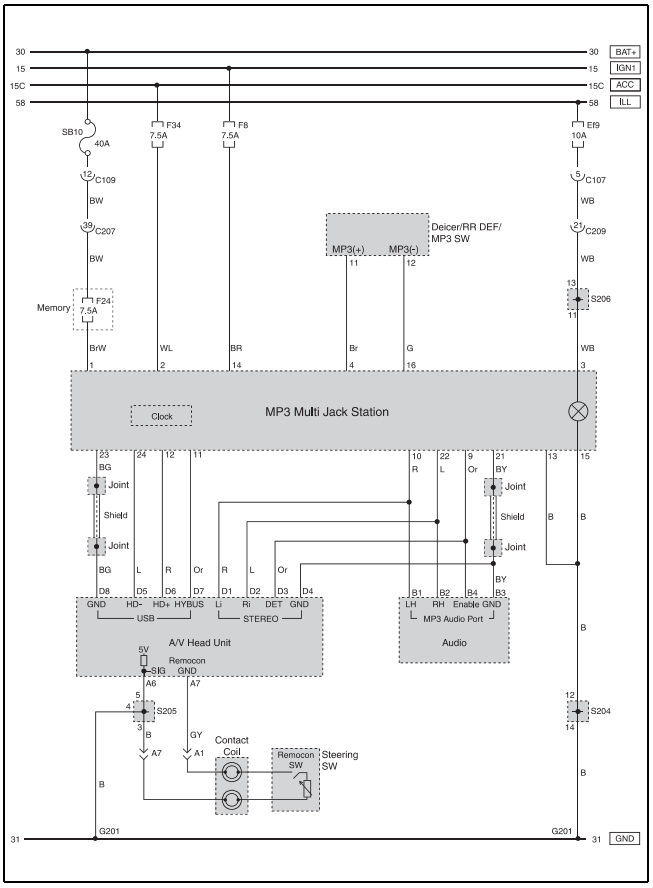



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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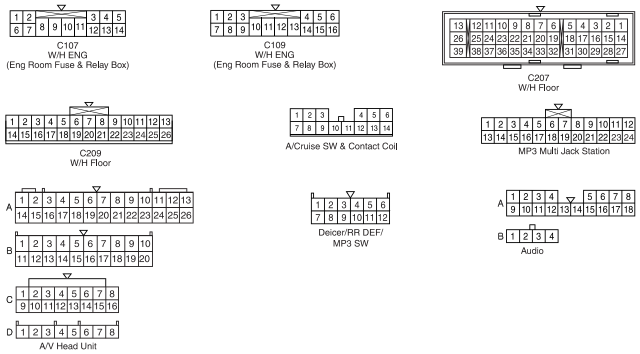
## 3) MP3 MULTI JACK STATION, A/V HEAD UNIT, AUDIO, MP3 SW




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S205 (14Pin, Black) | W/H Main | Backside A/V Head Unit | |
| S206 (16Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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## (3) CIRCUIT DESCRIPTION

### A. OVERVIEW

▶Difference Between Audio System and AV System

- Audio System

Standard Specification: Audio
Option 1: 2-DIN player (Radio and CD player, No cassette deck
Option 2: USB type MP3 jack (for multi jack staion)
The multi jack station includes the clock and stereo jack (MP3 USB jack is optional).
The speaker system consists of 4 speakers (one in each door) and 2 tweeter speakers (above each front door). The radio antenna is attached on the tailgate. The integrated type antenna is not available.

- AV System

Radio, CD/Cassette/MP3, TV and DVD system are available. The USB type MP3 jack is installed as the standard specification. If the navigation is installed, the GPS antenna is attached on the rear section of the roof.

The speaker system consists of 1 center speaker, 4 door speakers (one in each door) and 2 tweeter speakers (one in each door) and 1 woofer under the passenger seat.

1. AV head unit
2. Tuner
3. DSP amplifier (10 speakers including woofer speaker)
4. Navigation unit
5. 8-DVD changer
6. Multi jack station (including MP3 USB)
7. GPS antenna
8. AUX terminal (1 video terminal, 2 audio terminals)

* Some functions may not be included according to the model.

▶AV Head Unit

The AV head unit equipped with the DVD system has two optical input/ouput terminals; one is to receive the sound signal from the 8-DVD changer and the other is to send the sound to the amplifier with builtin DSP. The tuner unit transmits the TV and video signals to the head unit through cable.

▶Tuner

A tuner filters and cuts unnecessary signals among received signals and then precisely adjusts input signals. Connecting terminal of the tuner receives amplified signals from each TV antenna module locating rear quarter glass that receives TV signals from glass antenna. AM/FM radio module on the roof panel rear end receives amplified signals from glass antenna and then transmits to tuner input (1 channel).

- Tuner Specifications

| NO | Characteristic/Function | Remarks |
|---|---|---|
| 1 | AM/FM 1PACK Tuner | |
| 2 | TV Tuner (HITACHI V1) | |
| 3 | External Video/Audio Input (SDMB Input or AUX Jack Input) | |
| 4 | Tuning: Manual, Seek, BSM, AS | |
| 5 | Preset Memory: FM1 (6), FM2 (6), AM (6), TV1 (6), TV2 (6) | |

▶DSP Amplifier

DVD system displays high quality pictures and separates digital audio sources to give digital effects according to speaker arrangement. A chipset that can treat digital audio source signal is installed on the exterior AMP and has following function.

- DSP Amplifier Specifications

| NO | Characteristic/Function | Remarks |
|---|---|---|
| 1 | DSP Function: Stadium, Hall, Church, Club | |
| 2 | EQ Control Function: Defeat, Classic Jazz, Rock | |
| 3 | Bass, Mid, Treble Adjustment: +/- 12dB (1dB Up/Down) | |
| 4 | Fader/Balance Function | |
| 5 | 5.1CH SPDIF optical input function | |

▶DVD Changer

The 8-DVD changer is connected to the AV head unit with optical fiber cable and also connected to the tuner to process the video signals. It is installed on the bracket under the rear left quarter trim with the navigation unit.

- DVD Changer Specifications

| NO | Characteristic/Function | Remarks |
|---|---|---|
| 1 | Playing CD-DA, Video CD, DVD Video amd MP3 files | |
| 2 | Sound Output: L/R Output | |
| 3 | Video Output: NTSC Output | |
| 4 | Storing 8 DVDs | |
| 5 | Track Up/Down, Direct Selection Function | |
| 6 | Disc Up/Down, Direct Selection Function | |
| 7 | FF/FB, Up/Down Function | |
| 8 | Repeat | |
| 9 | PBC (Video CD ver 2.0 compatible) | |
| 10 | Scan Function | |



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▶AUX Termainal (for vehicle with AV system)

The AUX terminal is located between the seat warmer switches on the lower side of the AV head unit and it is installed only for the vehicle with the AV system. It is composed of AUDIO-R/AUDIO-L and VIDEO terminal which can be connected to a digital camera, camcoder and other digital devices to play the video through the AV system.

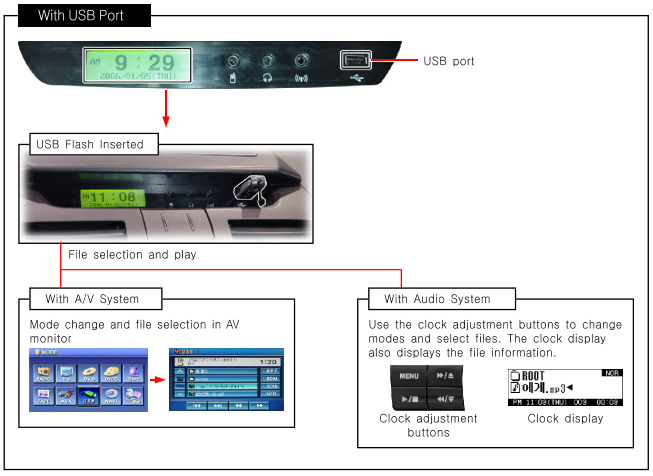
**B. MULTI JACK STATION**

▶Overview

The multi jack station is an integrated unit of digital clock and various audio play devices. It also includes the stereo jack which can be connected to an external audio device and the MP3 USB jack which can be connected to the USB flash drive for playing music through the speakers on vehicle.

▶Functional Specification

- Functions
  - · Clock (including date and year) adjustment
  - · Audio output through the stereo jack
  - · File search and play through the USB flash drive




▶Electrical Performance

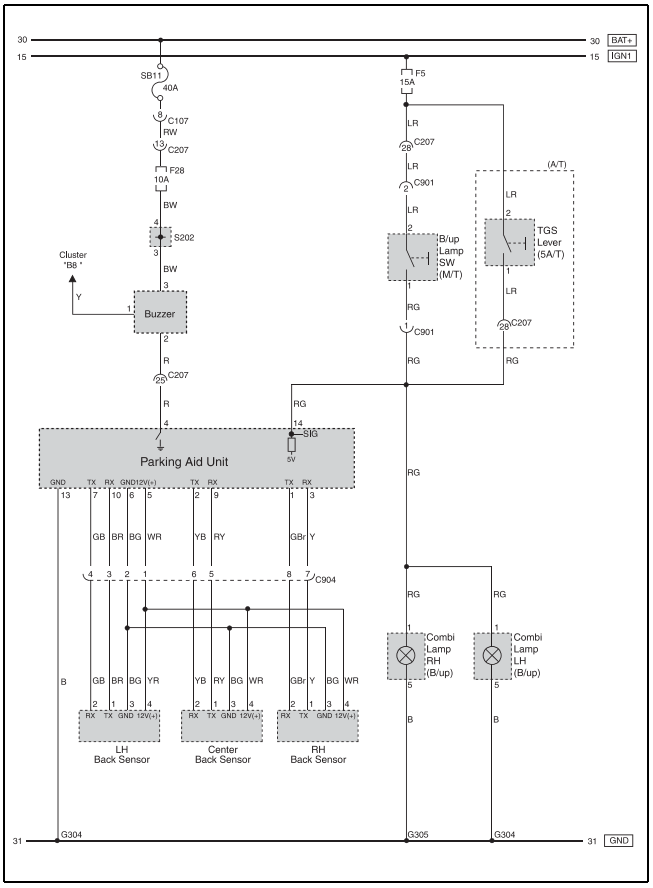
| Items | Requirement | Remarks |
|---|---|---|
| Rated voltage | DC 12.0V | |
| Operating voltage | DC 6V ~ 16V | Should operate normally within this range. |
| Operating temperature | -30°C ~ +80°C | Should operate normally within this range. |
| Reserved temperature | -40°C ~ +90°C | |
| Max. operating humidity | 95% | |
| Max. internal voltage | 24V | |
| Insulating resistance | No heat and fire due to the current leaks. | Specified with the parts which needs insulation such as PCB, waterproof, coating, etc. |
| Dark current | | AT DC 13V |
| Max. permissible current | Less than 5mA | AT DC 13V, current for illumination excluded |
| Number of audio channels | MAX 70 mA | |
| Audio frequency | STEREO (LH, RH, GND) | |
| Audio line output | 20 Hz ~ 20 kHz | |
| CMR (Common Mode Rejection Ratio) | Vpp 4V<br>85dB | |
| Graphic LCD | 160 X 48 BIT FSTN TYPE | |
| Text color | Black | |
| LCD size | 66 X 26.5 mm | Actual display range: 60 X 16 mm |
| DOT pitch | 0.35 X 0.33 mm | |
| Time tolerance | ± 2s/day | |



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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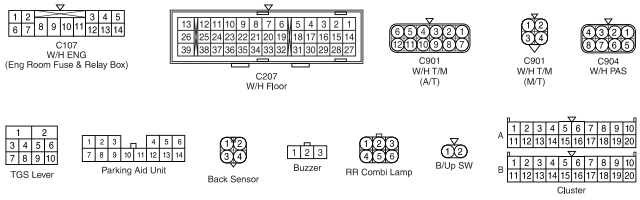
# 8790-01 PARKING AID CIRCUIT




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C901 (12Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | A/T |
| C901 (4Pin, Black) | W/H Floor - W/H T/M | Upper the T/M | M/T |
| C904 (8Pin, Black) | W/H Floor - W/H PAS | Under the RR Bumper (LH) | |
| G304 | W/H Floor | Inside the LH QTR GLS Lower | |
| G305 | W/H Floor | Inside the LH QTR GLS Lower | |
| S202 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## 3) CIRCUIT DESCRIPTION

### (1) COMPONENT SPECIFICATIONS

The parking aid system emits the supersonic wave signals from the sensors on the rear bumper with a specific interval and detects the reflected signals from obstacles while the gear selector lever is in "R" position. The number of displaying bars is decreased and the alarm interval becomes faster as the obstacle approaches. This supplementary system is to secure the safety distance for parking.

| Descriptions | | Value | Descriptions | | Value |
|---|---|---|---|---|---|
| Rated voltage | | DC 12 V | Operating temperature | | -30℃ ~ +80℃ |
| Operating voltage | | DC 9 V ~ 16 V | Storage temperature | | -40℃ ~ +85℃ |
| Current consumption | Unit | Below 100 mA | Relative humidity | | 95%RH max |
| | Sensor | Below 20 mA (each) | Weight | Unit | 160g ± 10g max |
| Sensor insulating resistance | | Over 5 MΩ | | Sensor | 70g ± 10g max |

**A. Parking aid unit**

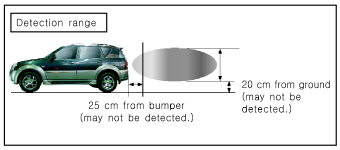
Detecting type: Super sonic wave
Detecting distance: 25 ~ 120 cm (distance between sensor and obstacle)

**B. Parking aid sensor**

- Type: Piezo ceramic element
- Frequency: 40 KHz ± 2 KHz
- Detecting range (13.5 V)
  - · Horizontal: Min. 20° at 110 ± 5 cm  Min. 100° at 50 ± 5 cm
  - · Vertical: Min. 20° at 110 ± 5 cm  Min. 60° at 50 ± 5 cm

### (2) ALARM INTERVAL

Alarm interval and display changes according to the distance as below: While reversing, if obstacles are within stage 1, the warning beep sounds with long intervals. If within stage 2, the warning beep sounds with short intervals and if within stage 3, the warning beep sounds continuously.




| Stage | L, R Sensor | C Sensor | Interval (msec) | Remark |
|---|---|---|---|---|
| 1 | 90 ~ 100 cm | 90 ~ 120 cm | 65, 195 | "Beep -----", "Beep -----" |
| 2 | 60 ~ 90 cm | | 65, 65 | "Beep -, Beep -, Beep -" |
| 3 | 25 ~ 60 cm | | | "Beep -----" |
| Tolerance | ± 5 cm | | ±10% | |

### (3) TROUBLESHOOTING OF SENSOR

When the shift lever is in the "R" position with the ignition switch on, the sensor is diagnosed once (under normal condition, the buzzer sounds once). If found any failure due to open circuit to sensor or communication error, buzzer sounds as below: However, if more than one sensor are malfunctioning, warning buzzer sounds for 3 seconds.

▶When sensor fails self-diagnosis

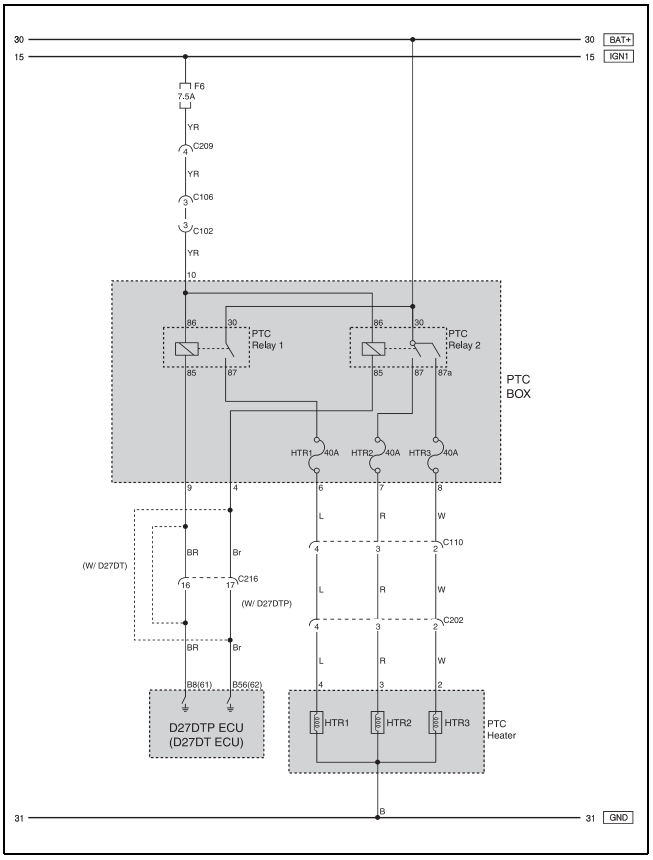
| Malfunction mode | Interval (msec) | Remark |
|---|---|---|
| Left sensor error | 65, 65, 195 | "beep----beep" |
| Center sensor error | 65, 65, 65, 65, 195 | "beep, beep---- beep, beep" |
| Right sensor error | 65, 65, 65, 65, 195 | "beep, beep, beep---- beep, beep, beep" |
| Multiple sensor error | 3 seconds | The buzzer sounds for 3 seconds if there is any defect in more than one sensor. |



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |

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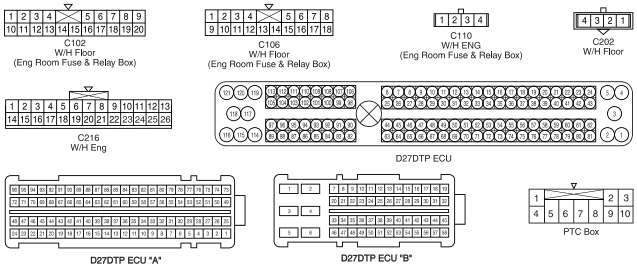
# 6810-15 PTC (POSITIVE TEMPERATURE COEFFICIENT) HEATER




## 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C106 (18Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C110 (4Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C202 (4Pin, White) | W/H Main - W/H Floor | Under the I/P Fuse Box | PTC |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |

## 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## 3) CIRCUIT DESCRIPTION

### (1) PTC (POSITIVE TEMPERATURE COEFFICIENT) SYSTEM

The supplementary electrical heater is installed in DSL engine equipped vehicle as a basic equipment. The PTC system is operated according to two temperature values measured at the coolant temperature sensor and HFM sensor. This device is mounted in the heater air outlet and increase the temperature of air to the passenger room. Because PTC system is heated by electrical power, high capacity alternator is required. (Alternator of 12 V 75 A/90 A has changed to 12 V 140A)

### (2) PTC OPERATING (ON) CONDITION

The operating condition of PTC is controlled by two step. Generally, ECU control the power relay for PTC depending on the coolant temperature and ambient temperature sensor.

▶ **1st step (Initial PTC operating condition**

- When coolant temperature < 15°C, PTC is operating (ON).
- When coolant temperature ≥ 15°C, tow conditions decribed below must be satisfied.

▶ **2nd step (Coolant temperature: 15°C)**

- When coolant temperature 65°C ≤ and ambient temperature ≤ 10°C PTC operates (ON)
- When coolant temperature 65 ~ 60°C and ambient temperature −10°C ~ 0°C PTC operates (ON)
- When coolant temperature ≤ 60°C and ambient temperature ≤ 0°C ~ 5°C, PTC operates (ON)

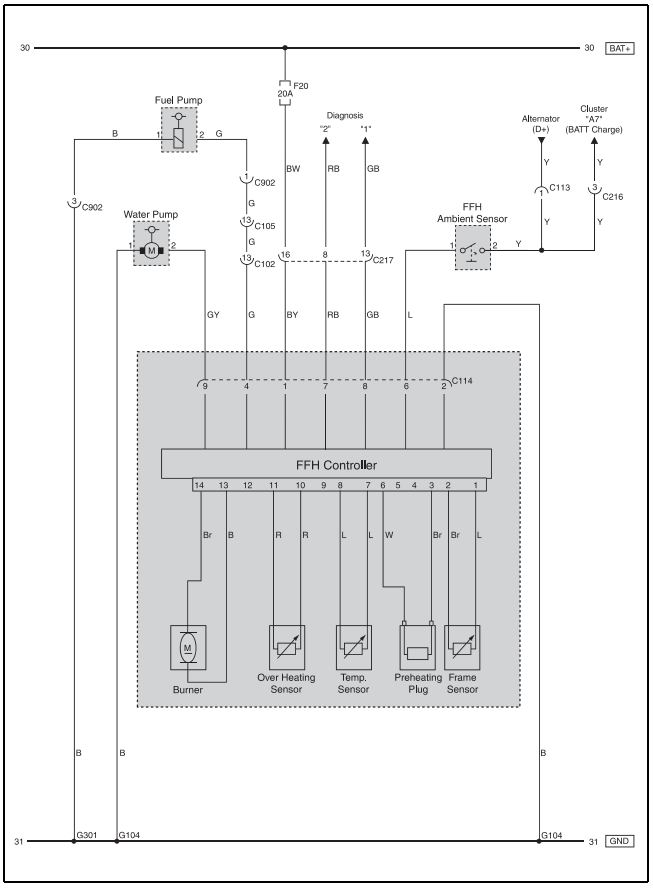
▶ **PTC "OFF" CONDITION**

- Airconditioner blower switch OFF
- Ambient temperature sensor error (wiring short or open)
- When engine craking
- Battery voltage is lower than 11V
- When preheating the engine (Glow indicator "ON")



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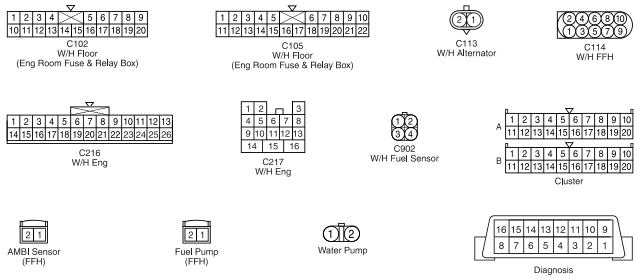
## SSQN 6910-01 FFH (FUEL FIRED HEATER)




### 1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C105 (22Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C113 (2Pin, Black) | W/H Eng - W/H Alternator | Under the Coolant Reserve Tank | |
| C114 (16Pin, Black) | W/H Eng - W/H FFH | Backside Coolant Reserve Tank | FFH |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C902 (4Pin, Black) | W/H Floor - W/H Fuel Sender | Upper the T/M | |
| G104 | W/H Eng | Backside RH Head Lamp | |
| G301 | W/H Eng | Under the Driver Seat | |

### 2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION




| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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## 3) CIRCUIT DESCRIPTION

### (1) FFH (FUEL FIRED HEATER) SYSTEM

The system is to increase the coolant temperature quickly by firing diesel fuel in the burner that is installed in engine cooling system when in winter time the ambient temperature and engine coolant temperature is low.
(Option)
FFH System consists of independent fuel lines, fuel pump, coolant circuit, coolant ciculation pump, electrical glow plug and exhaust system by driver's intention because FFH system is automatically. Operated according to the coolant temperature and the ambient temperature.
FFH system operates up to more than 2 minutes to burn the residual fuel inside the system when driver stop the engine during its operation. Therefore, a certain period of FFH operation after stopping the engine is not a malfunction.

### (2) CONTROL AND SAFETY MODE

▶ **Heater operations and safety mode**

- If the fuel pump

· If the fuel pump fails to ignite within 90 seconds after fuel pumping starts, the start procedure is repeated as described. If after a further 90 seconds fuel pumping the fuel pump still fails to ignite, the heater is switched off in fault mode.
The controller is locked after a certain number of failed starts.
· If the flame does out by itself during operation, firstly a new start is activated. If the fuel pump fails to ignite within 90 seconds after fuel pumping has started again, the heater is switched off.
· If the heater is overheated (lack of water, poorly vented cooling circuit), the overheating sensor triggers, the fuel supply is interrupted and the heater is switched off.
· The heater is switched off if the lower or upper voltage limit is reached.
· The fuel pump does not start when the glow plug is defect or electrical lead to the dosing pump is interrupted.
· The fan motor speed is monitored continuously. If the fan motor does not start up, is blocked or if the speed falls below 40% of the nominal speed, the heater is switched off in fault mode after 60 seconds.
· It is possible to diagnose the system by connecting the diagnostic device to controller. For details, refer to the "Diagnosis Procedures" section.

**NOTE**

**Emergency shutdown**

If an emergency shutdown -EMERGENCY OFF- is necessary during operation, proceed as follows;

- Pull the fuse (Ef6: 20A) out.
- Disconnect the heater from the battery.

### (3) DTC (DIAGNOSIS TROUBLE CODE)

| Trouble Code | Trouble Description | Remedies |
|---|---|---|
| 0 | No faults | • Measure battery voltage (must be < 15.9V) |
| 10 | Shutdown for overvoltage | • Check alternator<br>• Check alternator over voltage |
| 11 | Shutdown for undervoltage | • Measure battery voltage (must be > 10.2V under load)<br>• Check alternator<br>• Check lead |
| 12 | Overheating (software threshold) | Temperature at overheating sensor >125°C<br>• Check cooling system:<br>• Check the temperature sensor and overheating sensor, replace if necessary |
| 14 | Overheating (difference evaluation) | trol overheating sensor is too large. (Prerequisite for this trouble<br>perature at the overheating sensor has reached min. 80°C)<br>• Check cooling system<br>• Check the temperature sensor and overheating sensor, replace if necessary |
| 15 | Overheating (operating block) | The controller is locked.<br>• Delete the fault memory to release the controller<br>• Check cooling system<br>• Check the temperature sensor and overheating sensor, replace if necessary |
| 16 | Difference evaluation 2 | If the surface sensor has a far higher temperature value than the control overheating sensor, then the system proceeds with a fault shutdown. |
| 17 | Overheating (hardware, device) | Temperature at control overheating sensor > 125°C<br>• Check cooling system<br>• Check the temperature sensor and overheating sensor,replace if necessary |
| 20 | Glow plug interruption | • Check cable harness for this component for damage and through current and replace component if necessary<br>• Check plug-in connection, replace component if necessary |
| 21 | Overload, short-circuit or ground contact, glow plug output | • Check cable harness for this component for damage, replace component if necessary |
| 22 | Glow plug output defect | • Check cable harness for this component for damage, replace component if necessary |
| 25 | Comunication line short | • Check the line |



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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| Trouble Code | Trouble Description | Remedies |
|---|---|---|
| 30 | Speed of combustion fan motor outside tolerable range | Fan wheel or combustion air fan motor blocked (frozen, contaminated, stiff, cable harness scrapes on shaft end, …)<br>• Eliminate blockage<br>• Measure speed of combustion air fan motor:<br>– dismantle combustion air fan<br>– check with 8.2 V + 0.2 V, to do so, unclip the cable 0.75 black from chamber 13 of the 14-pin connector and the cable 0.75² brown from chamber 14. Apply marking (white paint) to the fan wheel and measure speed with contactless speed meter.<br>If the measured speed is outside a range of 8,800 rpm to 10,400 rpm, then replace the combustion fan. If the measured speed is within a range of 8800 rpm to 10400 rpm, then replace the controller. |
| 31 | Burner motor interruption | • Check cable harness for this component for damage and through current<br>• Check plug-in connection, replace component if necessary |
| 32 | Overload, short-circuit or ground contact, burner motor | • Fan wheel or combustion air fan motor blocked (contaminated, stiff)<br>• Check cable harness of this component for damage, if necessary replace component |
| 34 | Burner motor output defect | • Check whether the lead to this component has a short-circuit to GND, if not, check component for ground contact, if necessary replace controller |
| 47 | Overload, short-circuit or ground contact, fuel pump | • Check cable harness to the external component for damage and through current and replace external component if necessary |
| 48 | Fuel pump interruption | • Check cable harness to the external component for damage and through current<br>• Check plug-in connection, replace external component if necessary |
| 49 | Fuel pump output defect | • Check whether lead to this component has short-circuit to +Ub, if not, check component for ground contact, replace controller if necessary |
| 50 | Operating block because too many start attempts in vain (10 start attempts, also one start repeat for every start attempt) | Too many start attempts, the controller is locked<br>• Delete the fault memory to release the controller<br>• Check fuel quantity and fuel supply |
| 51 | Time exceeded for cold blowing | • During start (no flame formed yet), the flame sensor reports temperature value too high for too long<br>• Check exhaust and combustion air<br>• Check flame sensor |

| Trouble Code | Trouble Description | Remedies |
|---|---|---|
| 52 | Safety time exceeded | • Check exhaust and combustion air system<br>• Check fuel quantity and fuel supply<br>• Clean or replace sieve used in fitting of fuel pump |
| 53<br>54<br>56 | Flame aborted from "power" stage<br>Flame aborted from "large" stage<br>Flame aborted from "small" stage | Warning<br>*In the case of flame aborted in "power", "large" and "small" stage and with still tolerable start attempts, the heater proceeds with a new start or with subsequent start repeat. If the new start or start repeat is successful, the trouble code display goes off.*<br>Fault(because no more start attempt allowed )<br>• Check exhaust and combustion air system<br>• Check fuel quantity and fuel supply<br>• Check flame sensor – see trouble code 64 and 65 |
| 60 | Control overheating sensor interruption | • Check cable harness to this component for damage and through current<br>• Check plug-in connection<br>• Check sensor resistance value, replace component if necessary |
| 61 | Short circuit or ground contact control overheating sensor | • Check cable harness to this component for damage<br>• Check sensor resistance value, replace external component if necessary |
| 64 | Flame sensor interruption | • Check cable harness to this component for damage and through current<br>• Check plug-in connection<br>• Check sensor resistance value, replace component if necessary |
| 65 | Short circuit flame sensor | • Check cable harness to this component for damage<br>• Check sensor resistance value, replace external component if necessary |
| 71 | Surface sensor interruption | • Check cable harness to this component for damage and through current<br>• Check plug-in connection<br>• Check sensor resistance value, replace component if necessary |
| 72 | Short circuit surface sensor | • Check cable harness to this component for damage<br>• Check sensor resistance value, replace external component if necessary |
| 74 | Overheating hardware defect, operating block | • Replace controller |
| 87 | Internal temperature sensor short-circuit | • Replace controller |
| 88 | Internal temperature sensor interruption | • Replace controller |
| 89 | CAN error | • Check CAN interface |
| 90 | Watch dog reset | • Replace controller |



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| Trouble Code | Trouble Description | Remedies |
|---|---|---|
| 91 | Too many resets | • Replace controller |
| 92 | ROM error | • Replace controller |
| 93 | RAM error | • Replace controller |
| 94 | Transistor fault occurs too frequently – operation block | • Remedy short-circuit of the component to +Ub to GND, replace controller if necessary |
| 95 | Software stack overflow | • Replace controller |
| 96 | No valid process, operation lock | • Replace controller |
| 97 | Resonator/quartz faulty, wrong processor cycle | • Replace controller |
| 98 | Main relay faulty | • Replace controller |
| 99 | EEPROM error | • Replace controller |

### (4) GENERAL TROUBLE CAUSES AND REMEDIES

| Condition | Causes | Remedies |
|---|---|---|
| Low coolant level | Coolant leakage | Change the radiatior |
| | Leakage in coolant auxiliary tank | Change the coolant auxiliary tank |
| | Leakage in heater core | Change heater core |
| | Leakage in joint junction of coolant hose | Check the condition of hose and changing clamp |
| | Leakage in defective coolant hose | Change the hose |
| | Leakage in water pump gasket | Change the gasket |
| | Leakage in water pump sealing | Change the water pump |
| | Leakage in water inlet cap | Change the water inlet cap gasket |
| | Leakagein thermostat housing | Change the thermostat sealing |
| | Insufficient tightening torque of cylinder head bolt | Fasten the bolt to specified torque |
| | Damaged cylinder head gasket | Change the head gasket |
| Abnormally high coolant temperature | The coolant leakage (Check the coolant level) | Add coolant |
| | excessive anti-freezer | Check the density coolant (Anti-freezer) |
| | Bad coolant hose condition | Check the bent area of hose or change if needed |
| | Defective thermostat | Change thermostat |
| | Defective water pump | Change water pump |
| | Defective radiator | Change radiator |
| | Defective coolant auxiliary tank or tank cap | Change coolant auxiliary tank or tank cap |
| | Crack in cylinder head or in cylinder block | Change cylinder head or cylinder block |
| | Clogged water flow in cylinder head or block | Clean the coolant flow line |
| | Clogged water flow in radiator core | Clean the radiator core |
| | Defective cooling fan | Change or check the cooling fan |
| | Defective temp.sensor, wiring, and lamp cluster | Chaange the sensor and related area |
| Abnormally loow coolant temperature | Defective thermostat | Change the thermostat |
| | Defective cooling fan | Change or check the cooling fan |
| | Defective tem.sensor, wiring, and lamp cluster | Change the sensor and related area |

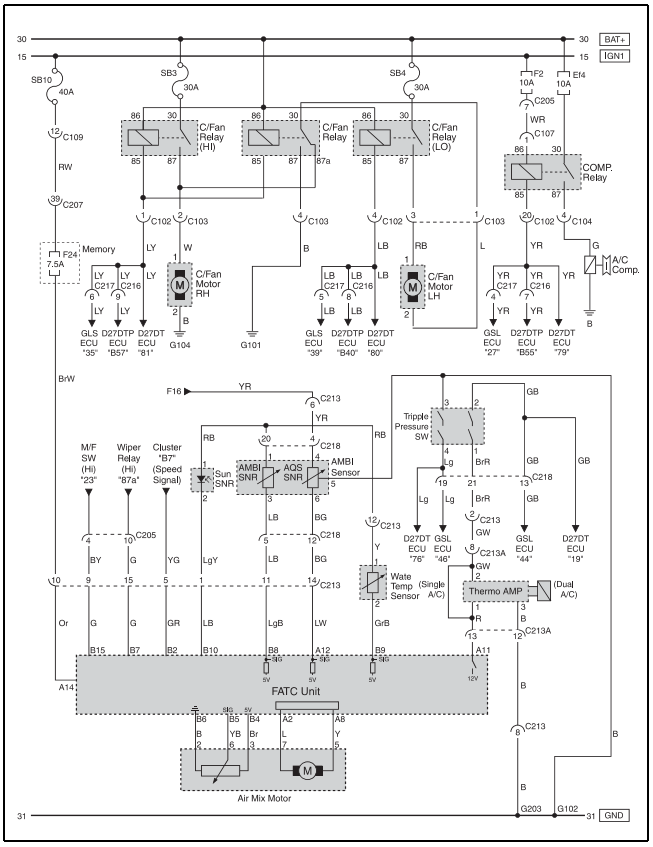


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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# 6810-20 FATC (FULL AUTO TEMP. CONTROL) CIRCUIT

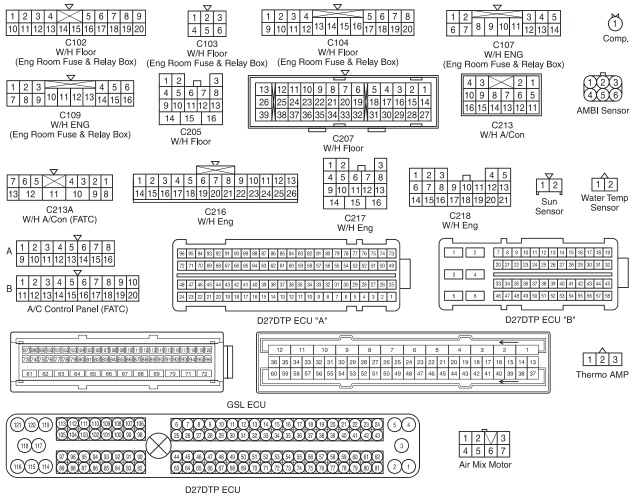
## 1) CONDENSOR FAN, SENSOR (SUN, AMBI, WATER TEMP)




## (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C102 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C103 (6Pin, Colorless) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C104 (20Pin, White) | W/H Floor - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C213 (16Pin, White) | W/H Main - W/H A/Con | Backside the A/V Head Unit | |
| C213A (13Pin, White) | W/H A/Con - W/H Blower | Backside the Glove Box | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C217 (16Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C218 (21Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| G102 | W/H Eng | Center the Eng BATT | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |

## (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION

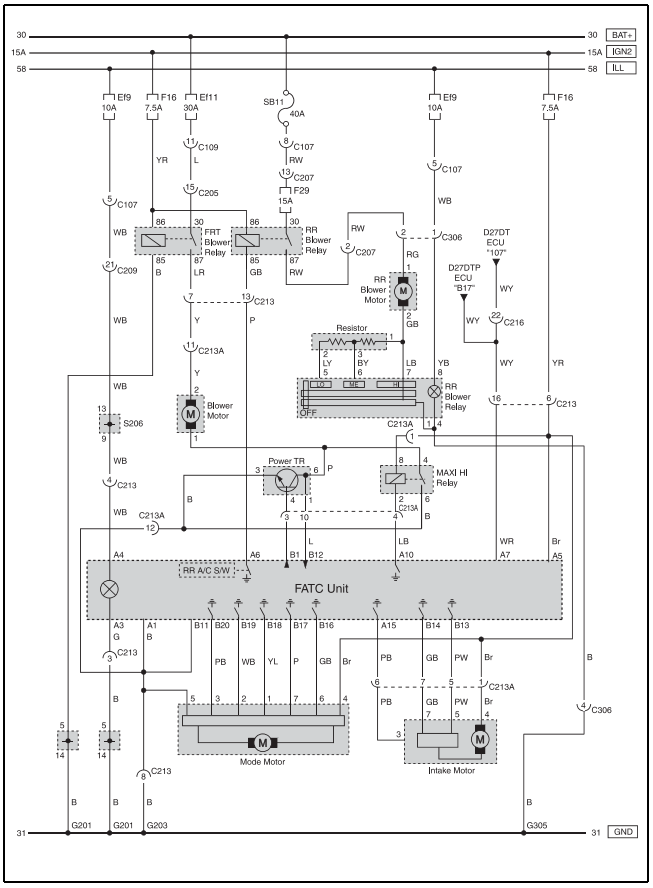



| Modification basis | |
|---|---|
| Application basis | |
| Affected VIN | |



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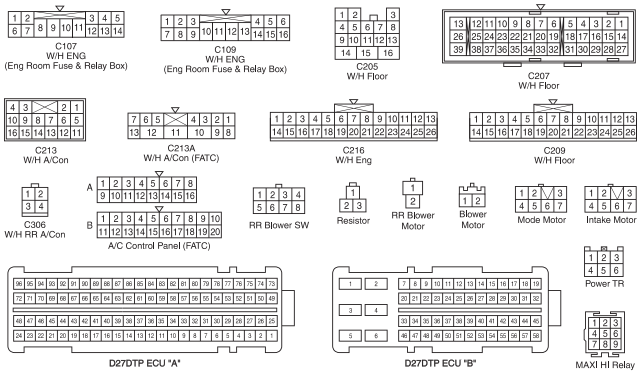
## 2) MOTOR (MODE, INTAKE), BLOWER, POWER TR




### (1) CONNECTOR INFORMATION

| Connector Number (Pin Number, Color) | Connecting Wiring Harness | Connector Position | Remark |
|---|---|---|---|
| C107 (14Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C109 (16Pin, White) | W/H Eng - Eng Room Fuse & Relay Box | Eng Room Fuse & Relay Box | |
| C205 (16Pin, White) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C207 (39Pin, Gray) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C209 (26Pin, Black) | W/H Main - W/H Floor | Driver Cowl Side C/Holder | C/Holder |
| C213 (16Pin, White) | W/H Main - W/H A/Con | Backside the A/V Head Unit | |
| C213A (13Pin, White) | W/H A/Con - W/H Blower | Backside the Glove Box | |
| C216 (26Pin, White) | W/H Main - W/H Eng | Passenger Cowl Side C/Holder | C/Holder |
| C306 (4Pin, Colorless) | W/H Floor - W/H RR A/Con | Inside the 3RD Seat RH Trim | Duel A/Con |
| G201 | W/H Main | Under the Driver Cowl Side PNL | |
| G203 | W/H Main | Inside the Passenger Cowl Side PNL | |
| G305 | W/H Floor | Inside the LH QTR GLS Lower | |
| S201 (14Pin, Black) | W/H Main | Upper the I/P Relay Box | GND |
| S204 (14Pin, Black) | W/H Main | Backside A/V Head Unit | GND |
| S206 (14Pin, Black) | W/H Main | Backside A/V Head Unit | ILL |

### (2) CONNECTOR IDENTIFICATION SYMBOL & PIN NUMBER POSITION






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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## (3) CIRCUIT DESCRIPTION

### A. THE V5 FULL AUTOMATIC TEMPERATURE CONTROL (FATC) SYSTEM

The full automatic temperature control (FATC) uses the integrated control panel as the driver's interface to thesystem. The FATC receives driver's input signal and various input signal from sensors and controls the actuatorsto maintain driver's desired room temperature.

### B. SELF DIAGNOSIS (ONLY FOR FATC AIR CONDITIONER)

**▶Self Diagnosis Code**

The FATC controller has the self diagnosis function. Perform the self diagnosis procedure to find the trouble code before starting the repair job.

- Starting Self Diagnosis
  - · Turn the ignition switch to ON position.
  - · Set the temperature to 26°C with the temperature setting switch.
  - · With "AUTO" switch pressed, press "OFF" switch 3 times within 3 seconds after setting the temperature. The Micom displays the trouble code on the display window after self diagnosis.

- Erasing Conditions of Trouble Code
  - · When restarting the engine
  - · When pressing "OFF" switch after self diagnosis
  - · 39 seconds after starting the self diagnosis procedure

- Fail Safe Function

If the input value from the sensor is wrong, Micom compensates the incorrect value to determine the correct setting temperature.

**▶Self Diagnosis**

- Set the temperature to 26°C with the temperature setting switch. With "AUTO" switch pressed, press "OFF" switch 3 times within 3 seconds after setting the
- temperature.
- Now, the air conditioner controller start the self diagnosis procedure.
  After self diagnosis, Micom integrated in controller displays the trouble codes in turns
- on the display window.
  The system resumes in AUTO mode after displaying the trouble code.

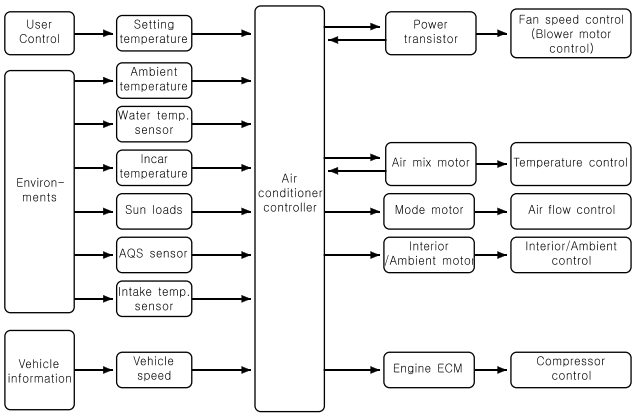
**▶ Specifications**

| Type | | Specifications | |
|---|---|---|---|
| Compressor | Model | V - 5 (single) | KC83 (dual) |
| | Type | Variable displacement type | Fixed type |
| | Disaplcement (cc/rev) | 9.8 ~ 151 | 175.5 |
| | Refrigerant oil | 265 ml (Composite PAG oil) | 220 ml (ZXL 100PG) |
| Condenser | Type | MFC | |
| | Size | 656w X 455h X 16t | |
| Receiver Drier | Capacity | 250cc | |
| | Moisture absorbent | XH - 9 (35g) | |
| | Pressure switch | Triple pressure type, Refrigerant pressure sensor | |
| Front Air conditioner and Heater Unit | Type | Heater + Evaporator & Blower (2 pieces) | |
| | Heating capability | Min. 9040 kcal/hr (340m³/h) | |
| | Cooling capability | Min. 6300 kcal/hr (405m³/h) | |
| | Expansion valve | Block type | |
| | Input power | Max. 22A(at 12V) | |
| Fefrigerant | Specification | R134a | |
| | Capacity | Single: 720 ± 30g / Dual: 1120 ± 30g | |



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### C. SYSTEM DIAGRAM




▶ Air Conditioner Compressor Control by Engine ECU

In case of current vehicle models, the system turns ON/OFF the compressor switch according to refrigerant pressure, ambient temperature and condenser temperature to protect air conditioner circuits. However, for the vehicle equipped with DI engine, the engine ECU turns off air conditioner compressor as below in addition to above conditions.

- Coolant temperature: below −20°C
- Coolant temperature: over 115°C
- For approx. 4 seconds after starting the engine
- When engine speed is below 650 rpm
- When engine speed is over 4,500 rpm
- During abrupt acceleration for the vehicle equipped with manual transmission

### D. ACTIVE INCAR/HUMIDITY SENSOR (AIH SENSOR)

The AIH sensor is installed at the driver side instrument panel undercover. It is a sensor that detects interiortemperature and humidity.

▶Functions

- Interior temperature sensor
  This sensor is a negative temperature coefficient (NTC) thermistor and detects the interior temperaturewith air coming from senor hole and then sends the voltage value according to the changed resistance toFATC controller.
- Humidity sensor
  This sensor detects the interior humidity with humidity cell and then sends the voltage value according tothe changed humidity to FATC controller.

▶Inspection

If the active incar sensor defect code (DTC 1) and the humidity sensor defect code (DTC 10) are set, check as below:

- Active incar sensor
  - · Remove the integrated AIH sensor and measure the resistance between terminal No. 5 and 6 on thesensor connector. (standard: approx. 25°C, 2.2 kW)
  - · If the measured value is out of the specified range, replace the AIH sensor. If the measured values arewithin the specified range, check as below.
  - · Turn the ignition switch to ON position and measure the voltage to active incar sensor from the FATCcontroller connector. (standard: approx. 2 V at 25°C)
  - · If the voltage value cannot be measured, check the circuit for open. If the measured value is within thespecified range, replace the FATC controller.

- Humidity sensor
  - · Apply 5 V to terminal No. 1 and 3 on the humidity sensor connector.
  - · Connect the positive (+) probe of a tester on No. 2 terminal and the negative (-) probe on No. 3 terminal, andmeasure the output voltage while the voltage is applied. (output voltage: approx. 0.8 ~ 3.4 V)
  - · Check whether the output voltage is changed when blowing into the inlet of the sensor. If there is avoltage change, the sensor is in normal condition. However, if the voltage is not changed, replace thehumidity sensor.
  - · In addition, if the output voltage is extremely high or low even in the specified range, replace the humid-ity sensor.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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## E. AIR QUALITY SYSTEM (AQS)

### ▶Components of AQS

Air Quality System (AQS) changes the air source selection to recirculation mode when polluted air is detectedthrough AQS sensor. The air source selection returns back to fresh air intake mode after a specified period orthe polluted air is disappeared.

### ▶AQS and air source selection switch

The AQS switch is integrated with the air source selection switch.

### ▶AUTO Mod

The air source is not changed when pressing the AQS and air source selection switch in "AUTO" mode. However,the indicator on the switch turned ON/OFF. In other words, the air source cannot be changed to recirculationmode in AUTO mode by just pressing the switch.To change the air source to recirculation mode in AUTO mode, get into Manual mode first, then press the airsource selection switch.

### ▶Manual Mode

To change the AQS mode to Manual mode from AUTO mode, use the MODE switch or the fan speed controldial. In Manual mode, the "AUTO" symbol on the display is disappeared. When pressing the AQS and air sourceselection switch, the mode is changed in order of AQS LED ON, AQS LED OFF (fresh air), and air source LEDON (recirculation). The figure shows that the mode has been changed to the recirculation mode from fresh air mode under AQSmode (AQS LED ON) after detecting the polluted outside air.

### ▶AQS operation

To change the AQS mode to Manual mode from AUTO mode, use the MODE switch or the The AQS operates under air conditioner AUTO mode or when the AQS switch is pressed under manual mode.It requires preheating time (for seconds) for operation and the module and sensor are integrated. (However, it operates only when the DEF (defroster) switch on the air conditioner switch panel is not pressed in.)

- Self diagnosis and preheating process during initial operation of A/C controller (AUTO mode)
  - · When the air conditioner controller is operated in AUTO mode during its initial operation, the air sourceis changed to the recirculation mode and AQS LED comes on.(This is the self diagnosis and preheating process for AQS.)
  - · After completing the above process, the AQS LED is turned off and the air source is automaticallychanged to the fresh air mode.

### ▶AQS operation (AQS switch is pressed in): detecting the polluted outside air

- When pressing the AQS switch, the LED on the AQS switch is turned on and the AQS function is activated.
- When the polluted outside air is detected, the AQS operates and converts the air source to recirculationmode automatically. At this moment, the recirculation mode indicator comes on in the display.

### ▶When driving out of polluted area

- If the polluted air is disappeared, the air source is automatically changed to the fresh air mode and AQSLED stays on.
- The air source is not changed when pressing the AQS and air source selection switch in "AUTO" mode. To change the air source to recirculation mode in AUTO mode, get into Manual mode first, then pressthe air source selection switch.

## F. AQS OPERATION CIRCUIT

### ▶AQS sensor

- Measure the voltage value of AQS. (between connector terminal No. 3 and 4.)
- If the measured voltage is out of 0.1 to 4.8 V, replace the AQS.
- If the measured voltage is out of the specified range, replace the AQS. If it is within the specified range, check as below.
- Turn the ignition key to "ON" position.
- Measure the voltage between terminal B9 and B15 on the air conditioner controller.
- If the voltage value cannot be measured, check the circuit for open. If the measured value is within thespecified range, replace the FATC controller.

### ▶Ambient temperature sensor

- Remove the sensor and measure the resistance between terminal No. 5 and 6 on the sensor connector. (standard: approx. 25°C, 2.2 kW)In addition, if the resistance is extremely high or low, replace the sensor.
- If the measured value is out of the specified range, replace the ambient temperature sensor. If themeasured value is within the specified range, check as below.
- Turn the ignition switch to ON position and measure the voltage to ambient temperature sensor from theFATC controller connector. (standard: approx. 2 V at
- 25°C)
  If the voltage value cannot be measured, check the circuit for open. If the measured value is within thespecified range, replace the FATC controller.



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**G. SUN SENSOR**

It is installed on the upper left end of instrument panel. It is using characteristics that the amount of currentchanges according to amount of light on the photosensitive surface. Photo diode, converts the changes in lightintensity into electrical changes, detects the amount of light coming through windshield and changes it intocurrent and then sends the signal to FATC controller.

▶Inspection

- Remove the sun sensor and measure the current between terminals under sunlight.
- Measure the current again under shade. It is in normal conditions if the measured value is less than themeasured value under sunlight.
- Turn the ignition switch to "ON" position.
- Measure the voltage to the sun sensor from FATC connector. (approx. 2.5 V under sunlight and 4.8 Vunder shade.)
- If the voltage value cannot be measured, check the circuit for open. If the measured value is within thespecified range, replace the FATC controller.

**H. WATER TEMPERATURE SENSOR**

The water temperature sensor is installed on the top of heater unit. It detects the inside temperature of waterand transmits the voltage value that is changed according to resistance value (NTC) to FATC controller.

▶Inspection

If the water temperature sensor defect code (DTC 3) is set, check as below.

- Remove the water temperature sensor and measure the resistance between terminals on the sensorconnector. (standard: approx. 25°C, 2.2 kW)In addition, if the resistance is extremely high or, replace the sensor.
- 2. If the measured value is out of the specified range, replace the water temperature sensor. If the measured value is within the specified range, check as below.
- 3. Turn the ignition switch to ON position and measure the voltage to water temperature sensor from theFATC controller connector. (standard: approx. 2 V at 25°C)
- 4. If the voltage value cannot be measured, check the circuit for open. If the measured value is within thespecified range, replace the FATC controller.

**I. POWER TRANSISTOR**

The power transistor controls the fan speed. It controls the blower motor operating speed without stages bychanging the current value to the base of power transistor when receiving the fan control signal from FATC.

**J. POWER TRANSISTOR**

The intake sensor outputs the compressor ON or OFF signal to ECU to prevent evaporator from freezing. Thesensing part of the thermistor is the evaporator fin contact type.

If the air conditioner does not turn on, check as below.

- Remove the intake sensor and measure the voltage between terminal No. 1 and 2 on the connector.
- Check whether the output voltages (ON: approx. 12 V, off: 0 V).
- If the voltage value is out of the specified value, replace the intake sensor. If the circuit is in normalcondition, check as below.
- Turn the ignition switch to ON position and turn on the air conditioner by pressing the A/C button. Andmeasure the voltage between terminal A12 and A11 on the FATC controller connector. (standard: approx.12 V)
- If the voltage value cannot be measured, check the circuit for open. If the measured value is within thespecified range, replace the FATC controller.

**K. VEHICLE SPEED CALIBRATION**

On the Ambient or the 1/3 Ambient and the blower AUTO, the blower decreases the voltage with the vehiclespeed 100 Km/h such as 1.5 V for the Ambient, 1.0 V for the 1/3 Ambient.But it is the exception for the blower max.

**L. WIPER CALIBRATION CONTROL**

It is possible to generate the frost on the windshield in the rainy days. At this time, FATC controller allows themode to change the AUTO defroster mode.

- Operation Condition: When the passenger operates the wiper on AUTO mode, the system controls thewiper on the A/C AUTO mode after sending the wiper signal and controlling the delay for 1 minutes.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

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**L. VEHICLE SPEED CALIBRATION**

On the Ambient or the 1/3 Ambient and the blower AUTO, the blower decreases the voltage with the vehiclespeed 100 Km/h such as 1.5 V for the Ambient, 1.0 V for the 1/3 Ambient.But it is the exception for the blower max.

**M. WIPER CALIBRATION CONTROL**

It is possible to generate the frost on the windshield in the rainy days. At this time, FATC controller allows themode to change the AUTO defroster mode.

- Operation Condition: When the passenger operates the wiper on AUTO mode, the system controls thewiper on the A/C AUTO mode after sending the wiper signal and controlling the delay for 1 minutes.



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