DTC	U0100-87	Lost Communication With EMS
DTC	U0101-87	Lost Communication With TCU
DTC	U0245-87	Lost Communication With RRM
DTC	U0129-87	Lost Communication With Brake System Control Module -Missing Message
DTC	U0131-87	Lost Communication With Electronic Power Steering Module -Missing Message
DTC	U0151-87	Lost Communication With Air Bag Module - Missing Message
DTC	U0140-87	Lost Communication With Body Control Module - Missing Message
DTC	U0214-87	Lost Communication With Passive Entry Passive Start Unit -Missing Message
DTC	U0164-87	Lost Communication With Climate Module - Missing Message
DTC	U0141-87	Lost Communication With RADAR-Missing Message
DTC	U0142-87	Lost Communication With AVM-Missing Message
DTC	U1157-87	Lost Communication With Air Bag Module - Missing Message
DTC	U0230-87	Lost Communication With PLG-Missing Message
DTC	U1162-87	Lost Communication With FCM-Missing Message
DTC	U1163-87	Lost Communication With FRM-Missing Message
DTC	U1193-87	Lost Communication With EGS-Missing Message
DTC	U1190-87	Lost Communication with ESCL
DTC	U1189-87	Lost Communication With MFS-Missing Message

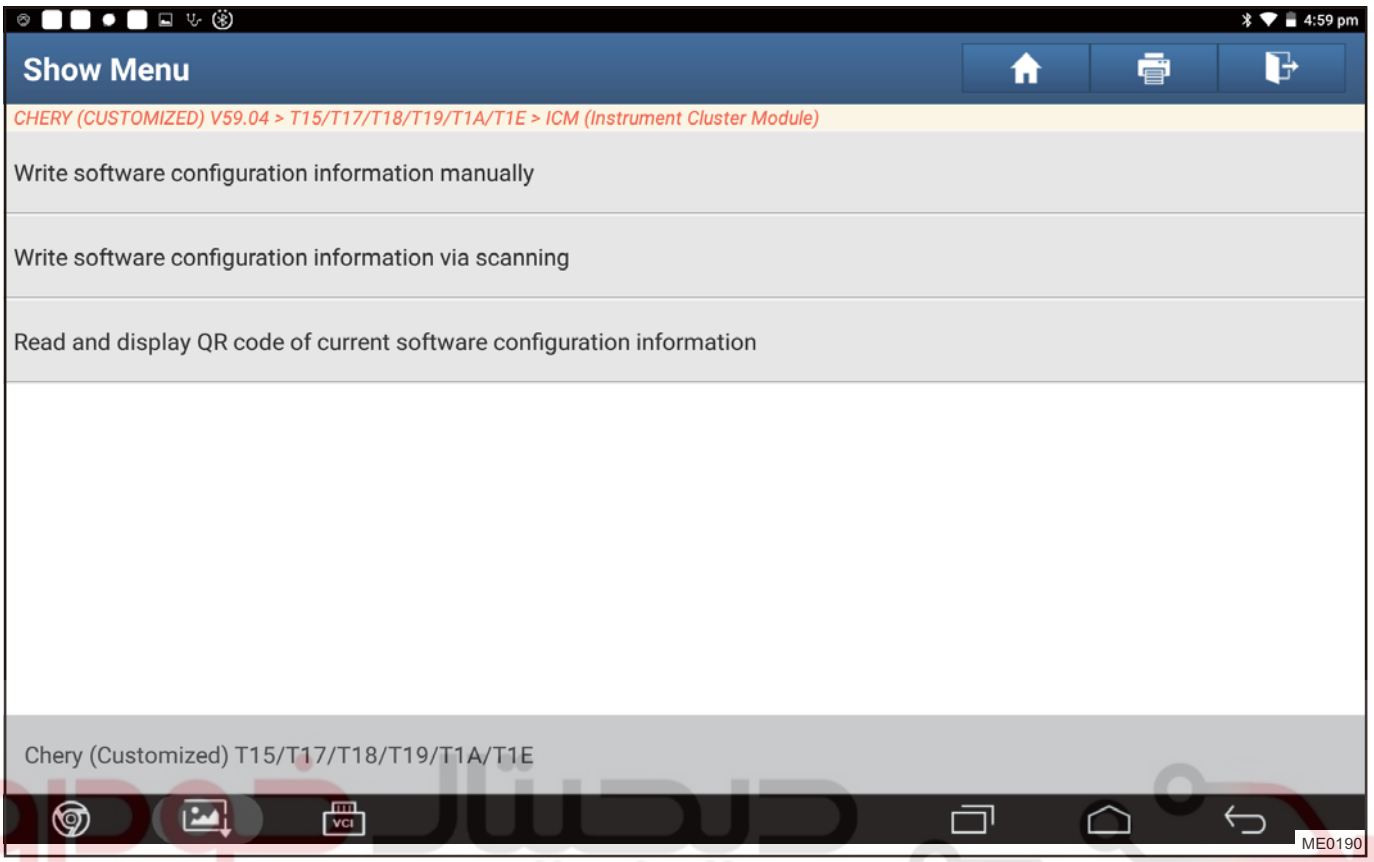
DTC	U1300-55	Software Configuration Error-Not Configured

Refer to CAN communication system

Matching learning

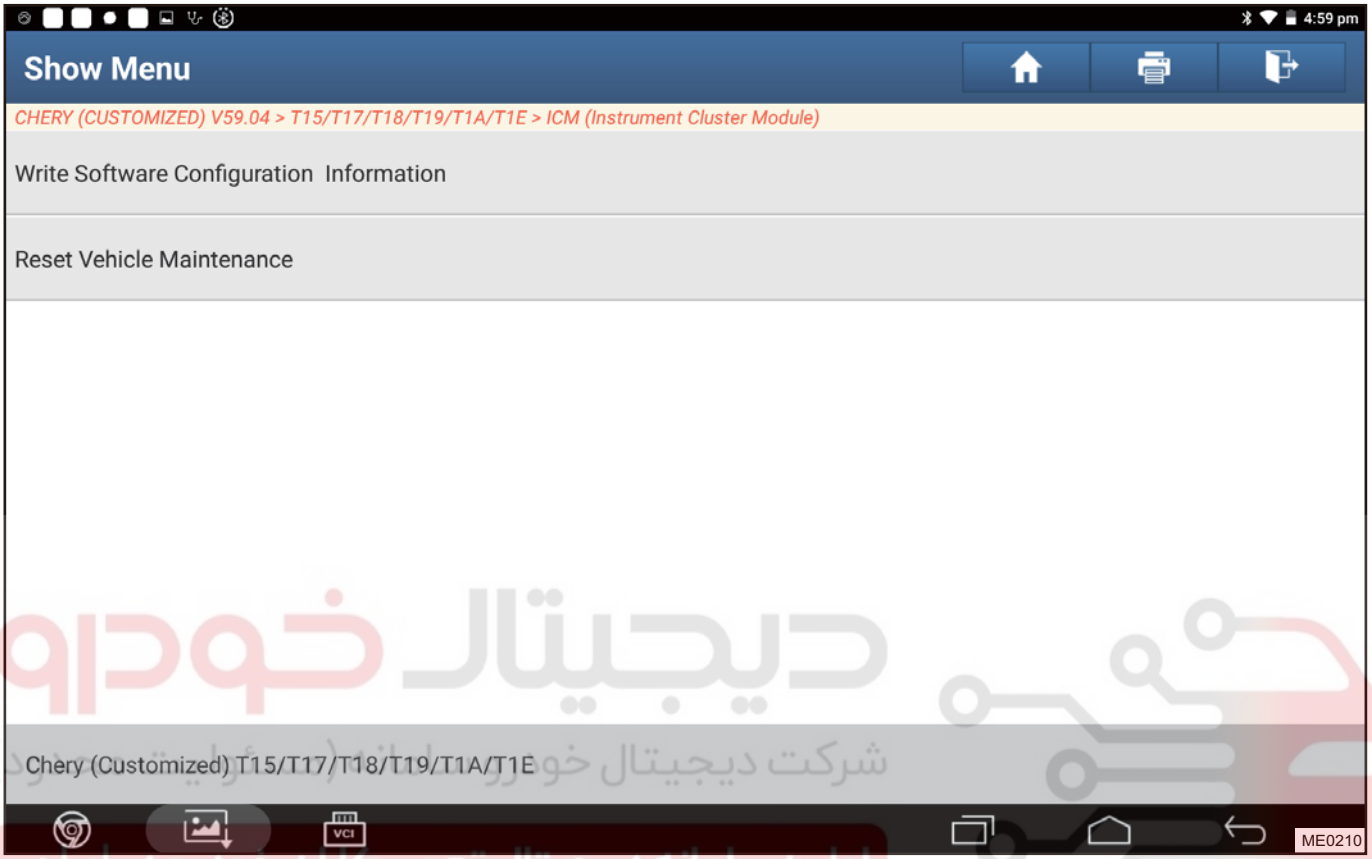
Write software configuration information

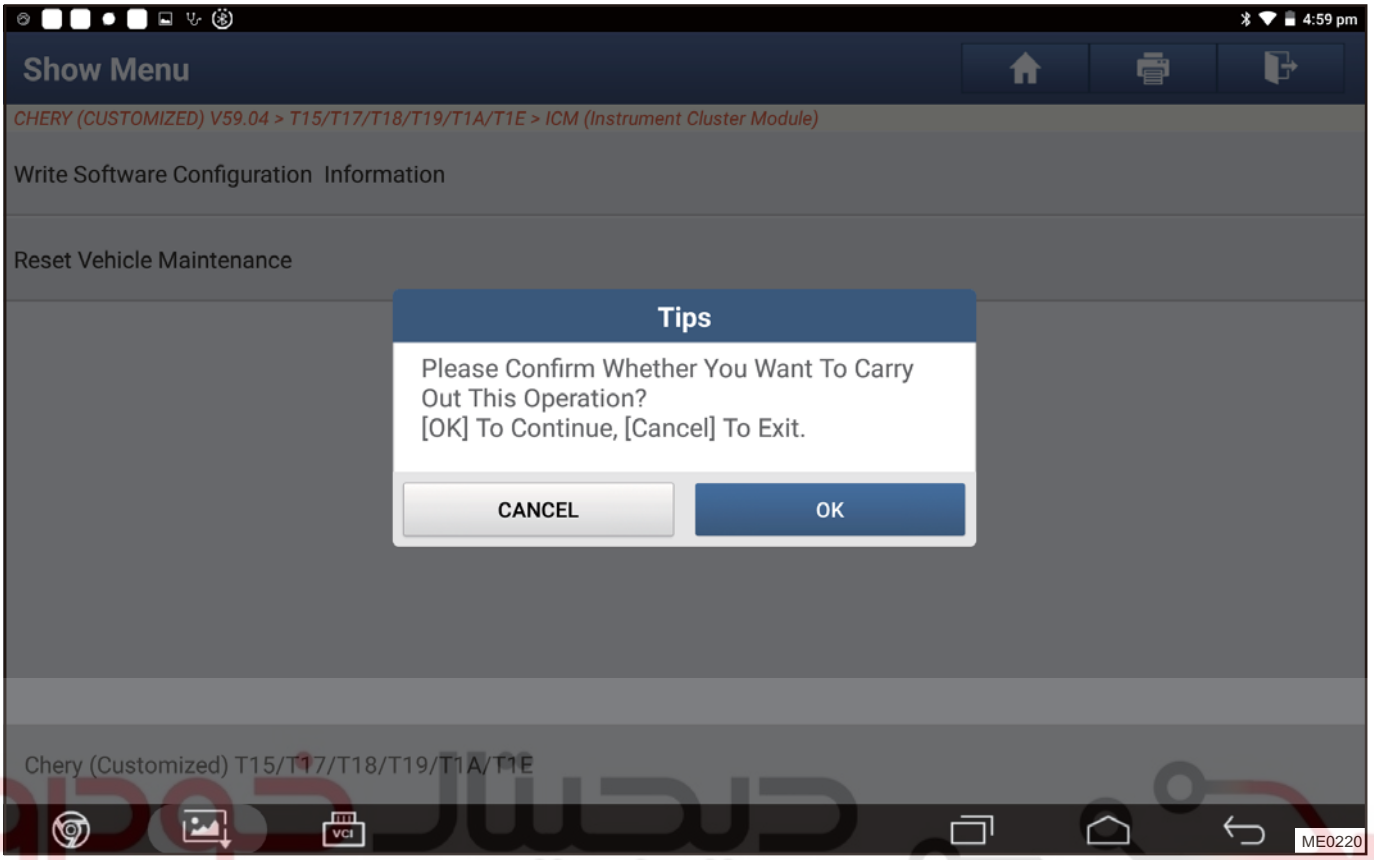
1. Click "ICM (Instrument Cluster Module)"
2. Click "Special Function".
3. Click "Write Software Configuration Information".

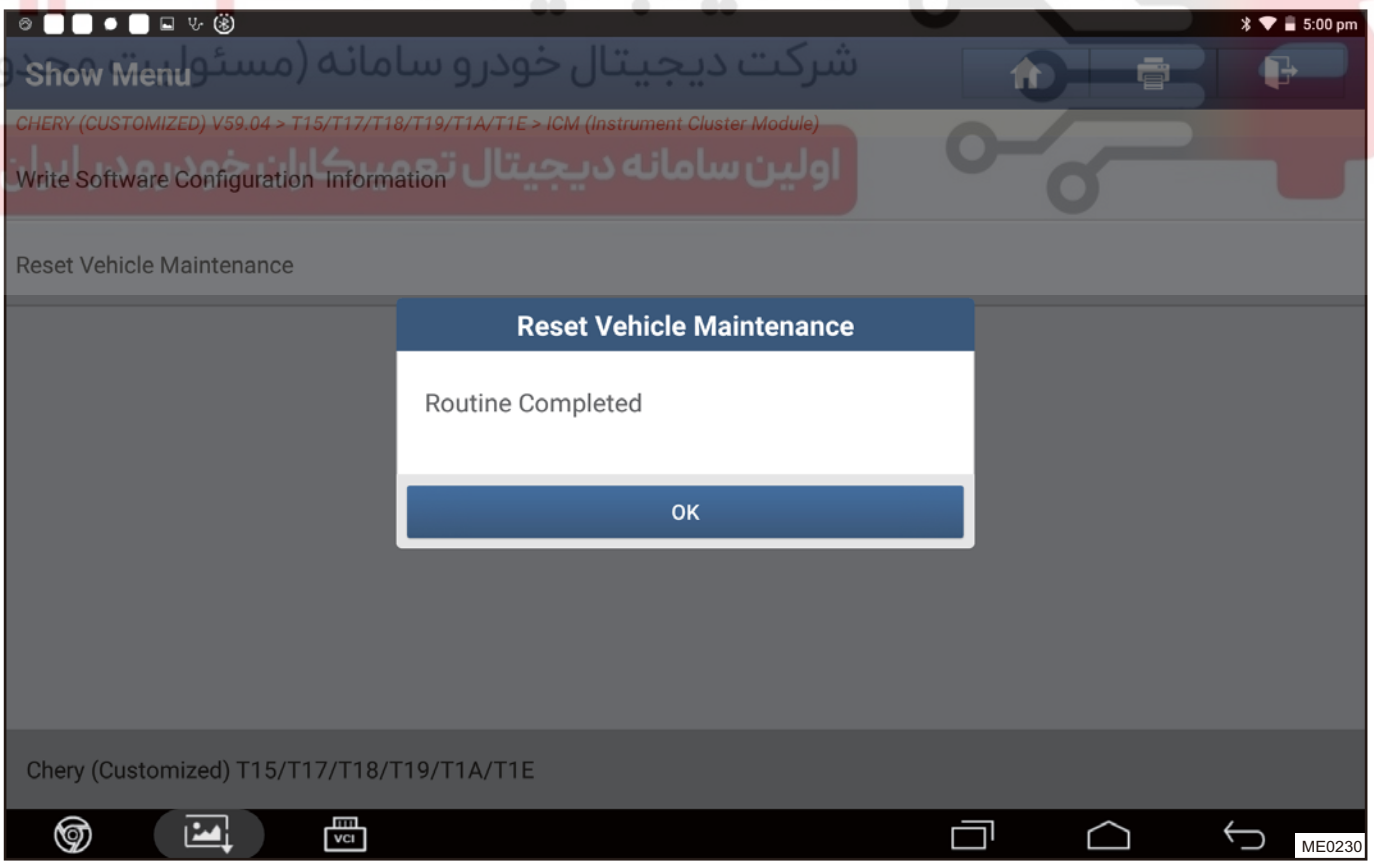


Write software configuration information

1. Click "ICM (Instrument Cluster Module)".
2. Click "Special Function".
3. Click "Vehicle Maintenance Function Reset".







Removal & Installation

Instrument Cluster (3.5 inch/7 inch color/7 inch combined) (If equipped)

Removal

Warning:

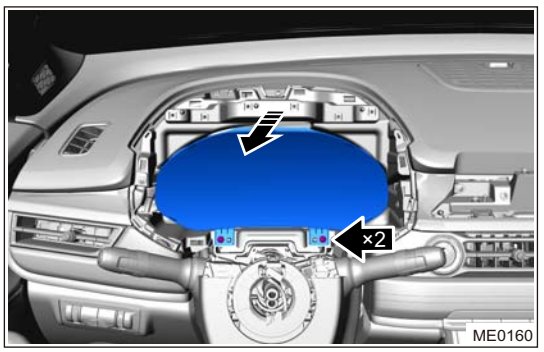
- Be sure to wear necessary safety equipment to prevent accidents, when removing instrument cluster.
- Appropriate force should be applied, when removing combination cluster. Be careful not to operate roughly.
- When removing the instrument cluster, handle it with care, so as to avoid bump caused by meter needle and dial looseness or deviation to initial position.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Adjust steering column to lowest position.
4. Gently shake the front cover of instrument and pull it out in the direction of front cover of instrument cluster.

5. Remove 4 fixing screws from instrument cluster trim frame.

6. Shake instrument cluster trim frame gently to pull it in a direction perpendicular to the surface of display.

7. Remove 2 fixing screws from instrument cluster. Pull out instrument cluster in perpendicular direction until clips return to stopper groove.
   Torque: 1.5 ± 0.5 N·m



8. Disconnect the combination cluster connector and remove combination cluster.

Installation

Installation is in the reverse order of removal.

Instrument Cluster (12.3 inch)

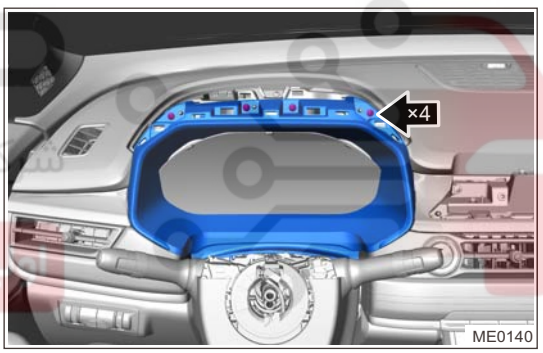
Removal

Warning:

- Be sure to wear necessary safety equipment to prevent accidents, when removing instrument cluster.
- Appropriate force should be applied, when removing combination cluster. Be careful not to operate roughly.
- When removing the instrument cluster, handle it with care, so as to avoid bump caused by meter needle and dial looseness or deviation to initial position.

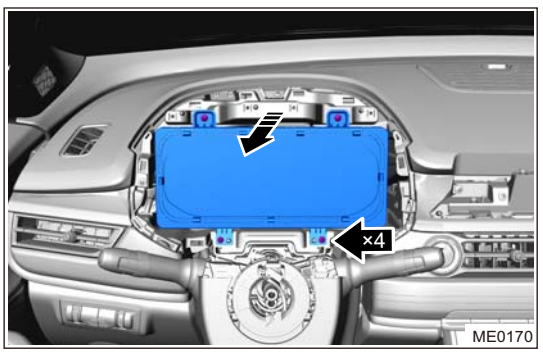
1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Adjust steering column to lowest position.
4. Gently shake the front cover of instrument and pull it out in the direction of front cover of instrument cluster.

5. Remove 4 fixing screws from instrument cluster trim frame.



6. Shake instrument cluster trim frame gently to pull it in a direction perpendicular to the surface of display.

7. Remove 4 fixing screws from instrument cluster and pull out it with force in the vertical direction until the clip moves out of stopper groove.
   Torque: 1.5 ± 0.5 N·m



8. Disconnect the combination cluster connector and remove combination cluster.

Installation

Installation is in the reverse order of removal.

- MEMO -

AUDIO AND ENTERTAINMENT SYSTEM

GENERAL INFORMATION

Overview

Description

1 - Multi-function Button Assembly	2 - Audio Head Unit Display
3 - Multi-function Interface	4 - Backup Power Supply
5 - Front Left Woofer Assembly	6 - Rear Left Woofer Assembly
7 - Left Tweeter Assembly	8 - Rear Right Woofer Assembly

9 - Front Right Woofer Assembly	10 - Front Right Tweeter Assembly

Audio system mainly consists of no disc DVD/audio head unit (if equipped), speakers and antenna.
No disc DVD mainly consists of no disc DVD head unit, center control panel, multi-function interface.

Inspection

Hint:
If some functions of system are found failure before repairing, please read the instruction carefully, and then check the table below, which will help you to clear DTC.

Current Status	Symptom	Possible Cause and Solution
General condition	Head unit operates, but has no sound or sound is very low.	Turn up the volume. Check setting of front and rear, left and right balance for horn.
	Navigation volume can not be adjusted	Stop vehicle, and adjust volume on navigation screen or volume setting screen.
	Head unit screen can not be operated	In some states, operations of screen are not available. End current state, long press the Power button for 10S to restart the system and try to operate the screen again. Or click the [SET] button to restore factory setting in the system setting.
	Some functions in air conditioning and setting are not available.	Some functions related to the vehicle are available only when ENGINE START STOP switch is in ON.
Radio playback	Poor reception	Check if antenna is fully deployed, connection is correct (whether negative is grounded). The required radio signal is too weak, please use manual search.
	Automatic search can not search a available station	When there are several available stations in current range and favorite station is 0, only 40 stations with the strongest signal can be searched. If you have other favorite ones, please manually search and store them.
USB file playback	There are unplayable files	The system can not support all formats files. There are many audio and video formats nowadays. Even file formats supported by audio video descriptions may not be supported due to the different encoding formats. Please refer to audio video descriptions, download supported formats and try.
	Volume fluctuates up and down during playback	Because there is no uniform standard, the volume can not be handled uniformly, please adjust the volume knob by yourself.
	Knocking / noise	It may be caused when the original file is being recorded or caused by noise. Please confirm if it is a native problem with other players.
	USB audio, video, pictures can not be played normally and no prompt is given	Due to large number of USB manufacturers, the file system, supported protocols, etc. are very different, the system can not support all of them. Please try another USB. USB device types supported by the system are defined in [music] section, please use it as a reference.
Music playback	Bluetooth music name is showed as unknown	The model shows name in accordance with Bluetooth standard, if phone does not comply with the standard, it will be shown as unknown. Please change your phone and try again.
Speech recognition	Inaccurate speech recognition	Say out voice command words provided by voice recognition system as much as possible and use Mandarin; Try to keep the vehicle quiet, and use voice recognition function in low noise surroundings; Microphone is in dome light position, so if noise is unavoidable, say command out as close to the microphone as possible.

Hint:
When checking general malfunctions of audio system, perform inspection at spacious area without obstacle nearby.

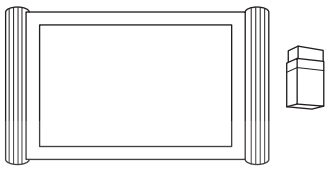
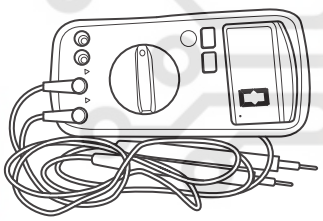
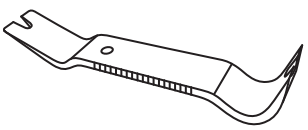
Specifications

Torque Specifications

Description	Torque (N·m)
No Disc DVD/Audio Head Unit Fixing Screw	5 ± 1
Audio Head Unit Display Fixing Screw	1.5 ± 0.5
Front Speaker Fixing Screw	2 ± 0.5
Rear Speaker Fixing Screw	2 ± 0.5
Front Speaker Fixing Screw	2 ± 0.5
Combined Antenna Fixing Nut	5 ± 1

Tools

General Tools

Diagnostic Tester	 RCH000106
Digital Multimeter	 RCH0002006
Interior Crow Plate	 RCH002506

DIAGNOSIS & TESTING

Diagnostic Content

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Suspected Area
Noise occurs	Noise source (interference)
	Tweeter assembly
	Instrument cluster
No disc DVD/audio head unit assembly does not operate	Center control panel (malfunction)
	No disc DVD/audio head unit fuse (blown)
	No disc DVD/audio head unit (malfunction)
	Wire harness and connector (malfunction)
No sound can be heard from speakers	System setting (incorrect)
	Speaker assembly
	Center control panel
	Wire harness and connector
Radio broadcast signal cannot be received(poor reception)	Center control panel (malfunction)
	No disc DVD/audio head unit (malfunction)
	Options (interference)
	Combined antenna (malfunction)
	Wire harness and connector

Hint:

When checking general malfunctions of audio system, perform inspection at spacious area without obstacle nearby.

Diagnosis Tools

Diagnostic Tester

When connecting the diagnostic tester:

- Connect diagnostic tester (the latest software) to diagnostic interface for communication with vehicle.
- Diagnostic interface is located on instrument panel lower left protector.
- Diagnostic interface uses a trapezoidal design which can hold 16 terminals.

Digital Multimeter

When using digital multimeter:

- Troubleshoot electrical malfunctions and wire harness system.
- Look for basic malfunction.
- Measure voltage, current and resistance.

Diagnostic Help

When using digital multimeter:

1. Connect diagnostic tester (the latest software) to diagnostic interface, and make it communicate with vehicle electronic module through data network.
2. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
3. If Diagnostic Trouble Code (DTC) cannot be cleared, it indicates that there is a current malfunction.
4. Only use a digital multimeter to measure voltage of electronic system.
5. Refer to any Technical Bulletin that may apply to this malfunction.
6. Visually check related wire harness and connector.
7. Check and clean all audio entertainment system grounds related to the latest DTC.

8. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

Intermittent DTC Troubleshooting

Intermittent DTC Troubleshooting

- If malfunction is intermittent, perform the followings:
- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate the conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Look for broken, bent, protruded or corroded terminals.
- Inspect the mounting areas of audio system, wire harness or wire harness connector and so on for damage, foreign matter, etc. that will cause incorrect signals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- Remove the no disc DVD/audio head unit from the malfunctioning vehicle and install it to a new vehicle and perform a test. If this DTC cannot be cleared, no disc DVD/audio head unit is malfunctioning. If DTC can be cleared, reinstall no disc DVD/audio head unit to original vehicle.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

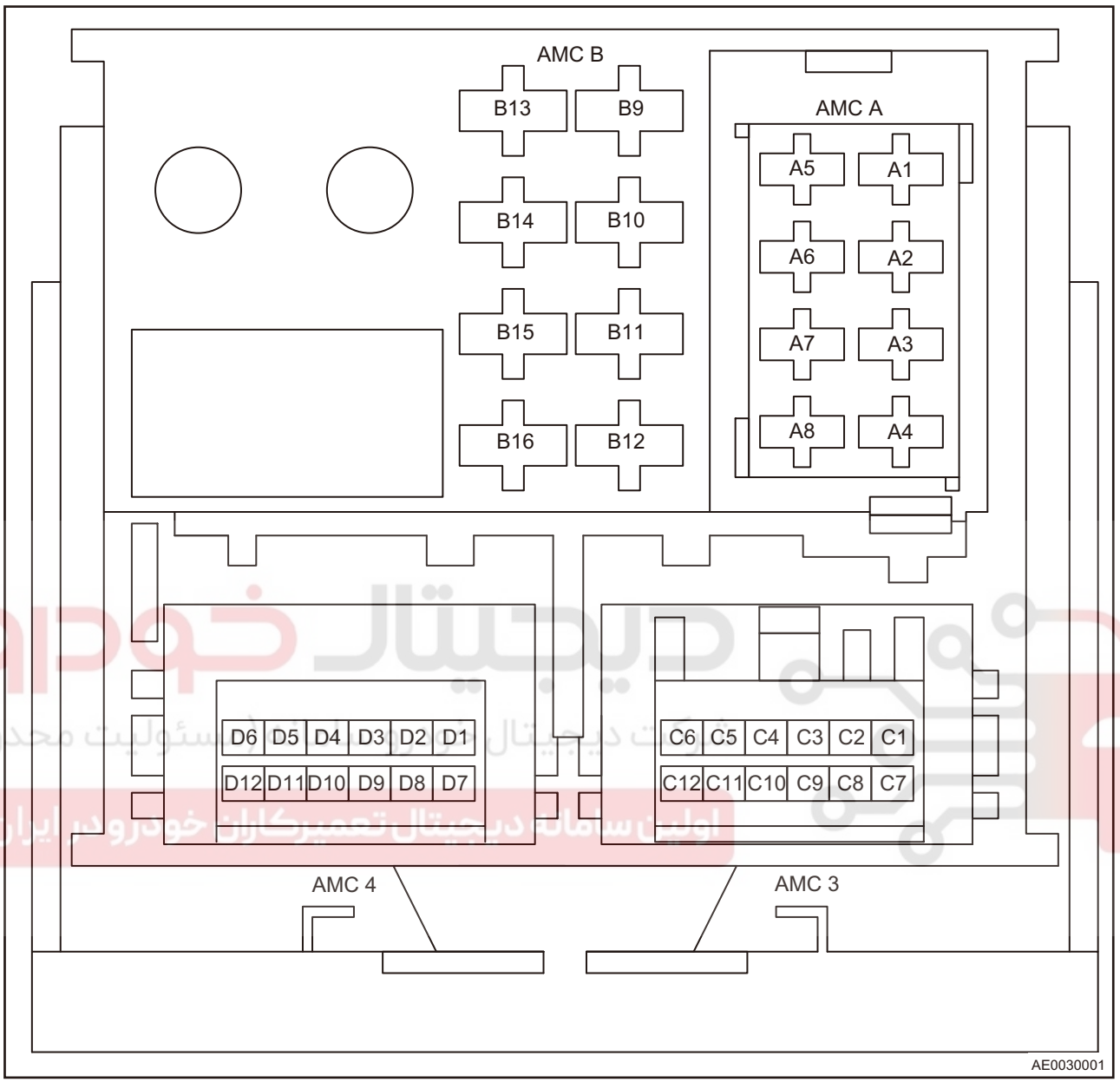
Ground Inspection

Groundings are very important to entire circuit system, which are normal or not can seriously affect the entire circuit system. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) and oxidation may increase load resistance. This case will seriously affect normal operation of circuit. Check the ground points as follows:

1. Remove ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that contact is in good condition.
4. Reinstall ground bolt or nut securely.
5. Check if add-on accessories interfere with ground circuit.
6. If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure that all wire harnesses are clean and securely fastened while providing a good ground path.

Audio and Entertainment System Controller Terminal List

Instrument Panel Wire Harness Connector Terminal List



Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
A1	Rear Right Woofer +	C5	Camera Power Supply Ground
A2	Front Right Woofer +	C6	Video Signal -
A3	Front Left Woofer +	C7	CAN Low Signal
A4	Rear Left Woofer +	C8	Power Supply Switch (With Reset)
A5	Rear Right Woofer -	C9	MIC+ Signal
A6	Front Right Woofer -	C10	Control Panel Signal Ground
A7	Front Left Woofer -	C11	Camera Power Supply
A8	Rear Left Woofer -	C12	Video Signal +
B9	Steering Wheel Button Signal 1	D1	Audio Signal Output Positive
B10	Steering Wheel Button Ground	D2	Audio Signal Output Negative
B11	Steering Wheel Button Signal 2	D3	Mute
B12	Power Supply Ground	D4	-

Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
B13	Trigger Power Supply Signal	D5	-
B14	-	D6	Volume -
B15	Operation/Memory Power Supply	D7	-
B16	Night Light Power Supply	D8	MIC+
C1	CAN High Signal	D9	MIC-
C2	Starting Signal	D10	-
C3	MIC Signal	D11	-
C4	Control Panel Signal	D12	Volume +

Diagnosis Procedure

HINT

Use following procedures to troubleshoot the audio system.

1	Vehicle brought to workshop

Result

Go to
NEXT

NEXT

2	Check battery voltage

Check if battery voltage is normal.

OK

Standard voltage: Not less than 12 V.

Result

Go to
OK
NG

NG → **Replace battery**

OK

3	Customer problem analysis

Result

Go to
NEXT

NEXT

4	Read DTCs

Result

Go to
DTC output
No DTC is output

No DTC is output → **Repair according to Problem Symptoms Table**

DTC output

5	Read DTCs (current DTC and history DTC)

Result

Go to
Current DTC
History DTC

History DTC → **Troubleshooting according to intermittent DTC troubleshooting flow**

Current DTC

6	Repair according to Diagnostic Trouble Code (DTC) Chart

Result

Go to
NEXT

NEXT

7	Adjust, repair or replace

Result

Go to
NEXT

NEXT

8	Conduct test and confirm malfunction has been repaired

Result

Go to
NEXT

NEXT → End

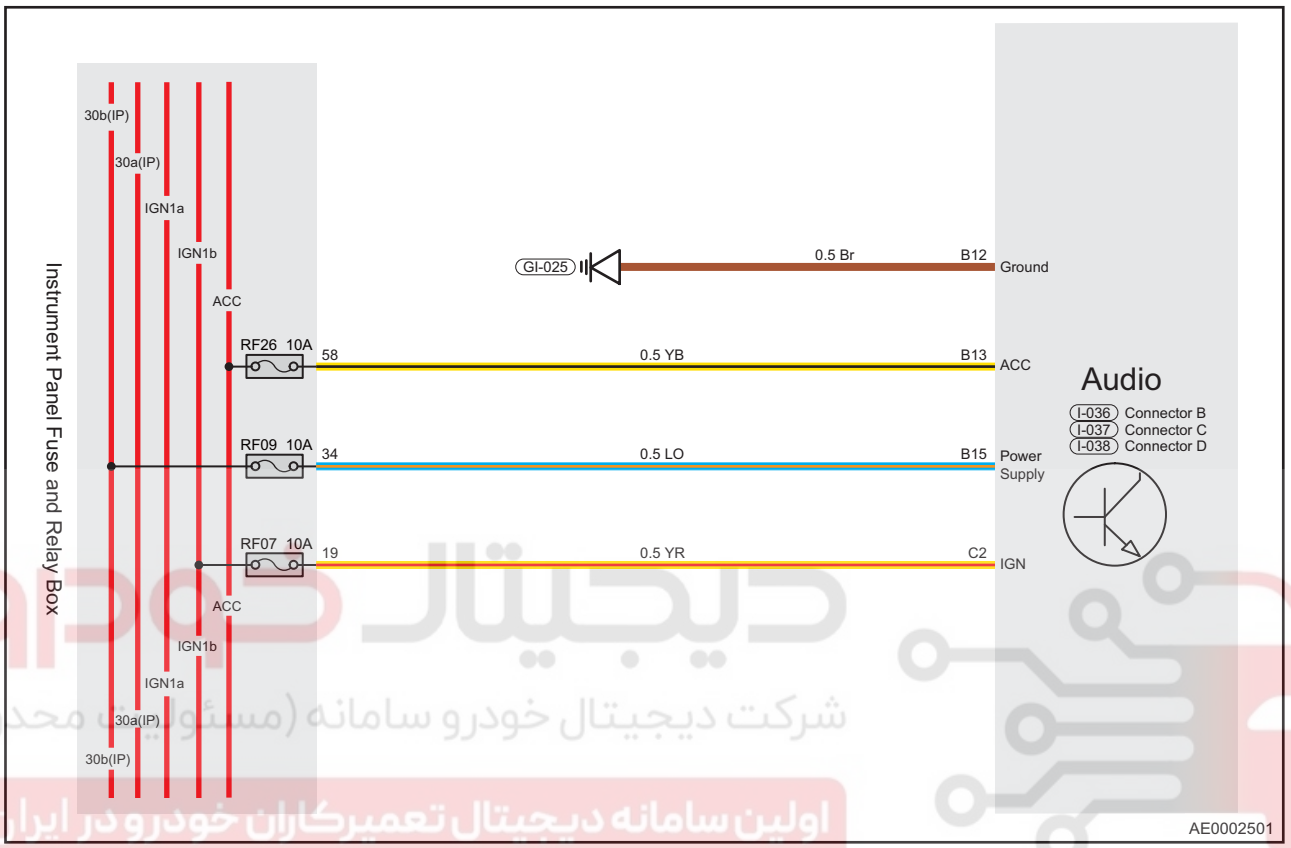
Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition
B1800-16	Power Supply Voltage Below Threshold
B1800-17	Power Supply Voltage Above Threshold
B1810-00	Front Switch Error
B1811-00	Steering Switch Error
B1812-00	Speed Signal Abnormal
B1813-00	Speakers Connected Amplifier Failure
B1814-00	Tuner Antenna Abnormal
B1830-04	Amplifier Failure
B1832-04	Tuner IC R/W Failure
B1834-04	Voice Recognition IC R/W Failure
B1846-04	DSP IC R/W Failure
B1835-04	Communication Failure Between MCU and Main Processor
B1840-4B	MMI Over Temperature
B1841-19	USB1 Current Above Threshold
B1842-19	USB2 Current Above Threshold
B1844-04	SOC Communication Error With DESerializer
B1845-04	SOC Communication Error With TFTMCU

DTC	B1800-16	Power Supply Voltage Below Threshold

DTC	B1800-17	Power Supply Voltage Above Threshold

Circuit Diagram



Description

DTC is stored when stopping high voltage DC output is detected.

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1800-16	Power Supply Voltage Below Threshold	ENGINE START STOP switch is in ON and engine is running	Charging system Poor connection of no disc DVD/audio head unit ground wire Fuse malfunctions No disc DVD/audio head unit assembly damaged
B1800-17	Power Supply Voltage Above Threshold		

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software) to diagnostic interface.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in DVD system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON, select "Read DTC".
- If DTC is detected, malfunction indicated by DTC is current. Go to diagnosis procedure - Step 1.
- If DTC is not detected, malfunction indicated by DTC is intermittent.

CAUTION

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnosis Procedure

1	Check the battery

(a) Check if battery voltage is normal.

Result

Go to
OK
NG

NG → **Recharge or replace battery**

OK

2	Check battery terminal

(a) Check if battery terminals are loose or corroded.

Result

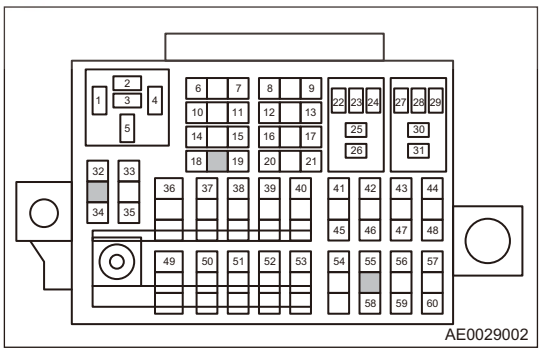
Go to
OK
NG

NG → **Tighten or replace battery terminal.**

OK

3	Check fuse

(a) Unplug the fuses RF09 (10A), RF26 (10A) and RF07 (10A) from instrument panel fuse and relay box.



(b) Inspect resistance of fuses RF09 (10A), RF26 (10A) and RF07 (10A).

Result

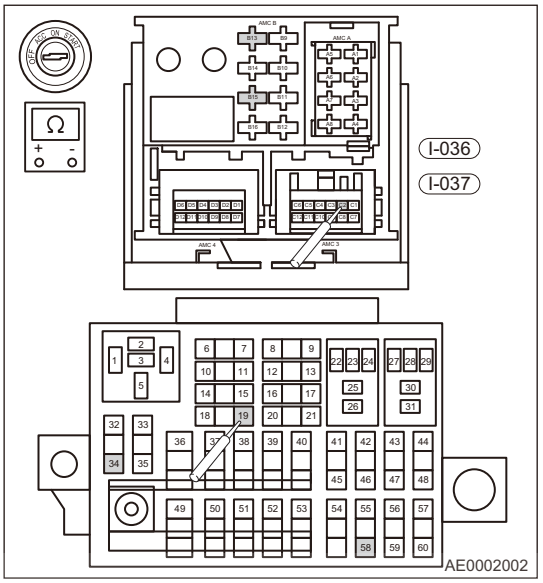
Go to
OK
NG

NG → **Replace fuse**

OK

4	Check instrument panel wire harness

(a) Turn ENGINE START STOP switch to OFF.



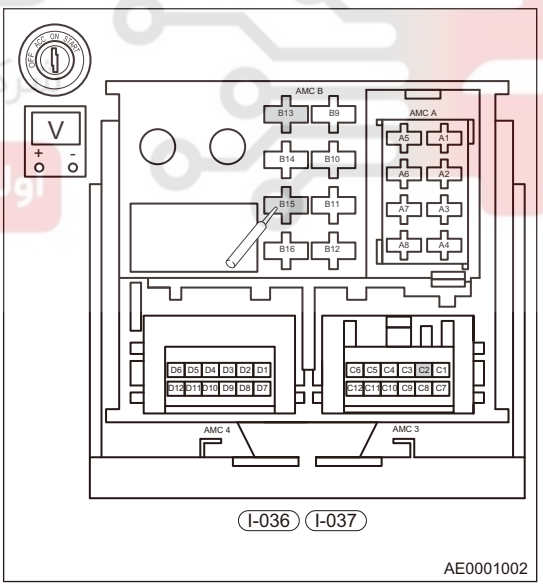
(b) Disconnect the negative battery cable.
(c) Disconnect the connector I-052 from the no disc DVD.
(d) Connect the negative battery cable.
(e) Turn ENGINE START STOP switch to ON.
(f) Using a digital multimeter, measure voltage between no disc DVD connector I-036, I-037 and body, and detect it with a 21 W test lamp according to table below.

OK

Multimeter Connection	Condition	Specified Condition
I-036 (B15) - Ground	Always	Not less than 12 V
I-036 (B13) - Ground	Always	Not less than 12 V
I-037 (C2) - Ground	Always	Not less than 12 V

Result

Go to
OK
NG



(g) Using a digital multimeter, check for continuity between instrument panel fuse and relay box and no disc DVD connectors I-036, I-037 according to the table below.

OK

Multimeter Connection	Condition	Specified Condition
I-007 (19) - I-037 (C2)	Always	⩽ 1 Ω
I-007 (34) - I-036 (B15)	Always	⩽ 1 Ω
I-007 (58) - I-036 (B13)	Always	⩽ 1 Ω

NEXT → **Repair or replace body wire harness and connector**

NEXT

5	Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester (the latest software) to record and clear DTCs stored in audio entertainment system.
(e) Turn ENGINE START STOP switch to OFF and wait several seconds.
(f) Turn ENGINE START STOP switch to ON.
(g) Use diagnostic tester (the latest software) to read DTCs stored in audio entertainment system again.

Result

Go to
OK
NG

OK → **System operates normally**

NG → **Replace no disc DVD**

DTC	B1810-00	Front Switch Error

Description

Detect that any front panel button is pressed for more than 30s

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1810-00	Front Switch Error	ENGINE START STOP switch is in ON	Center control panel

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software) to diagnostic interface.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in DVD system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON, select "Read DTC".
- If DTC is detected, malfunction indicated by DTC is current. Go to diagnosis procedure - Step 1.
- If DTC is not detected, malfunction indicated by DTC is intermittent.

CAUTION

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnosis Procedure

1	Check center control panel operation

(a) Remove center control panel from malfunctioning vehicle. then install it to a new vehicle and perform a test.
(b) Connect all connectors.
(c) Connect negative battery cable, and turn ENGINE START STOP switch to ON.
(d) Check center control panel status.

Result

Go to
OK
NG

NG → **Replace center control panel**

OK →

2	Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative cable to negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester (the latest software) to record and clear DTCs stored in audio entertainment system.
(e) Turn ENGINE START STOP switch to OFF and wait several seconds.
(f) Turn ENGINE START STOP switch to ON.
(g) Use diagnostic tester (the latest software) to read DTCs stored in audio entertainment system again.

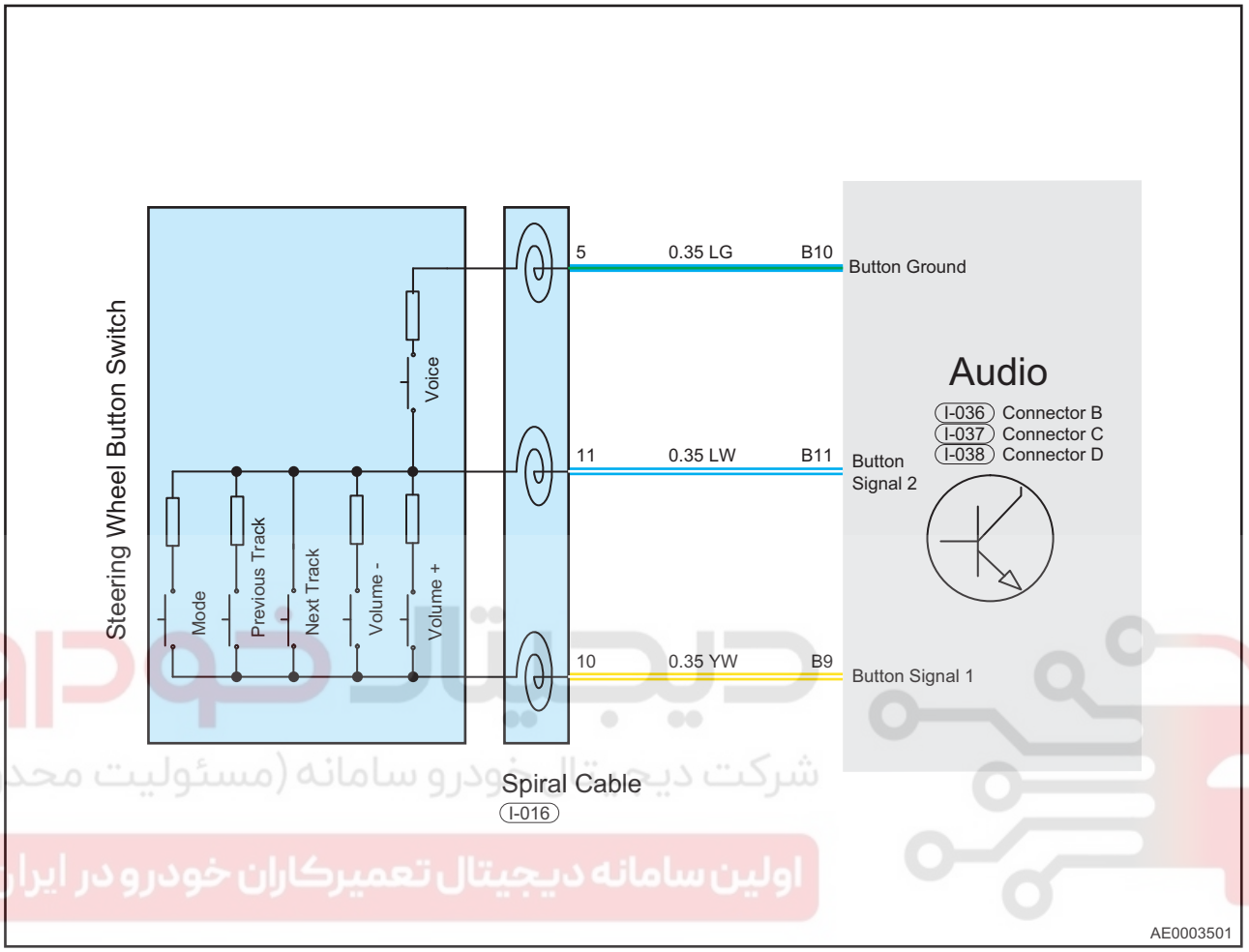
Result

Go to
OK
NG

OK	System operates normally
NG	Replace no disc DVD

DTC	B1811-00	Steering Switch Error

Circuit Diagram



Description

Detect that any steering wheel line control button is pressed for more than 30s

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1811-00	Steering Switch Error	ENGINE START STOP switch is in ON	Steering wheel quick button

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software) to diagnostic interface.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in audio entertainment system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON, select "Read DTC".
- If DTC is detected, malfunction indicated by DTC is current. Go to diagnosis procedure - Step 1.
- If DTC is not detected, malfunction indicated by DTC is intermittent.

Caution

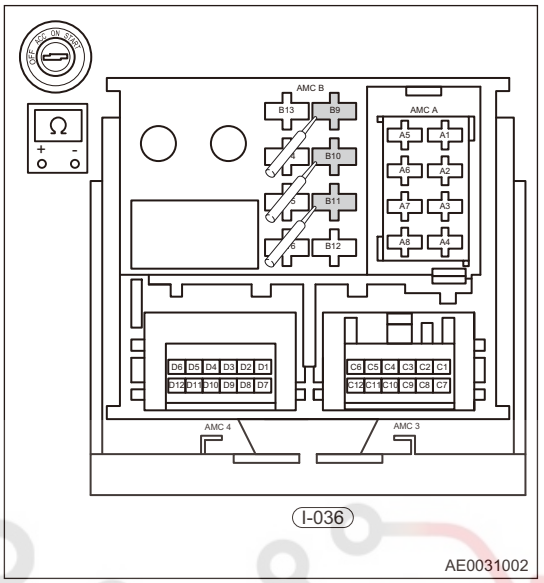
Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnosis Procedure

1	Check connector wire harness between multi-function button assembly and no disc DVD/audio head unit

(a) Turn ENGINE START STOP switch to OFF.
(b) Remove the No Disc DVD/audio head unit.
(c) Check connector wire harness between multi-function button assembly and no disc DVD/audio head unit.
Using a digital multimeter, check for continuity between connector wire harness of multi-function button assembly and no disc DVD/audio head unit according to the table.



Multimeter Connection	Condition	Operation Resistance (Ω)
I-036 (B11) - I-036 (B10)	Press voice	⩽ 1 Ω
I-036 (B10) - I-036 (B9)	Press volume +	1.4 KΩ
I-036 (B10) - I-036 (B9)	Press volume -	3.6 KΩ
I-036 (B10) - I-036 (B9)	Press previous song/ answer	⩽ 1 Ω
I-036 (B10) - I-036 (B9)	Press next song/hang up	470Ω
I-036 (B10) - I-036 (B9)	Press mode	10KΩ

Result

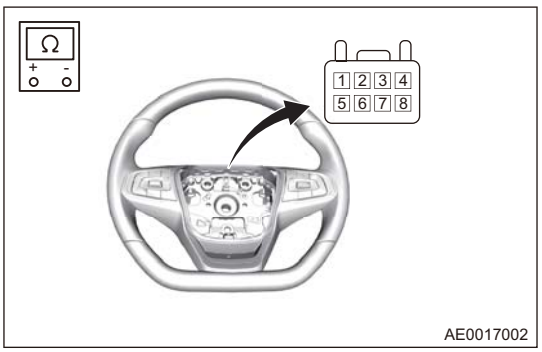
Go to
NG
OK

OK → **Reconfirm DTCs**

NG

2	Check multi-function button assembly

(a) Turn ENGINE START STOP switch to OFF.
(b) Remove the driver airbag.
(c) Check multi-function button assembly.
Using a digital multimeter, check for continuity between multi-function button assembly according to the table.



Multimeter Connection	Condition	Operation Resistance (Ω)
Terminal 3 - Terminal 6	Press voice	⩽ 1 Ω
Terminal 3 - Terminal 5	Press volume +	1.4 KΩ
Terminal 3 - Terminal 5	Press volume -	3.6 KΩ
Terminal 3 - Terminal 5	Press previous song/ answer	⩽ 1 Ω
Terminal 3 - Terminal 5	Press next song/hang up	470Ω
Terminal 3 - Terminal 5	Press mode	10KΩ

Result

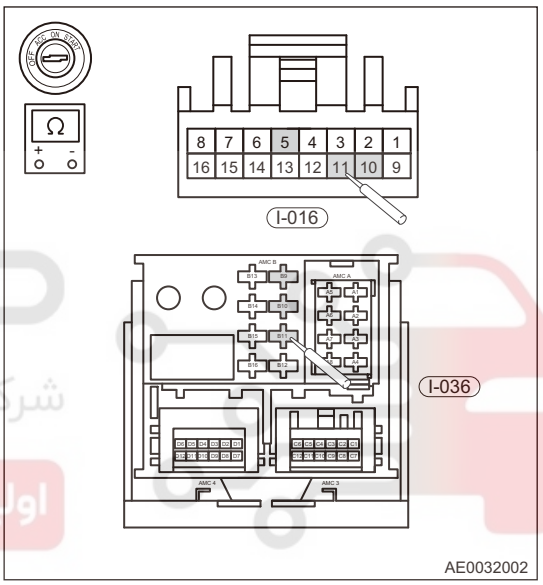
Go to
OK
NG

NG → **Replace multi-function button assembly**

OK

3	Check instrument panel wire harness no disc DVD/audio head unit to clock spring

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect no disc DVD/audio head unit connector I-036 and spiral cable connector I-016.
(d) Using a digital multimeter, measure resistance between no disc DVD/ audio head unit connector I-052 and spiral cable connector I-016 and check for open according to table below.



Standard Condition

Multimeter Connection	Condition	Specified Condition
I-016 (11) - I-036 (B11)	Always	⩽ 1 Ω
I-016 (5) - I-036 (B10)	Always	⩽ 1 Ω
I-016 (10) - I-036 (B9)	Always	⩽ 1 Ω

Result

Go to
OK
NG

Repair or replace instrument panel wire harness and connector

4	Repair the clock spring and reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative cable to negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester (the latest software) to record and clear DTCs stored in audio entertainment system.
(e) Turn ENGINE START STOP switch to OFF and wait several seconds.
(f) Turn ENGINE START STOP switch to ON.
(g) Use diagnostic tester (the latest software) to read DTCs stored in audio entertainment system again.

Result

Go to
OK
NG

System operates normally
Replace no disc DVD/audio head unit

DTC	B1814-00	Tuner Antenna Abnormal

DTC	B1814-00	Tuner Antenna Abnormal

Description

When it detects the tuner antenna is abnormal, current DTC will be stored.

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1814-00	Tuner Antenna Abnormal	ENGINE START STOP switch is in ON	• Antenna assembly (w/ amplifier) • No disc DVD/audio head unit • Wire harness and connector

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester to Data Link Connector (diagnostic interface).
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in audio entertainment system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON, select "Read DTC".
- If DTC is detected, malfunction indicated by DTC is current. Go to diagnosis procedure - Step 1.
- If DTC is not detected, malfunction indicated by DTC is intermittent.

CAUTION

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Diagnosis Procedure

1	Check the battery

(a) Check if battery voltage is normal.

Result

Go to
OK
NG

NG → **Recharge or replace battery**

OK

2	Check battery terminal

(a) Check if battery terminals are loose or corroded.

Result

Go to
OK
NG

NG → **Tighten or replace battery terminal.**

OK

3	Check combined antenna

(a) Remove combined antenna from malfunctioning vehicle, then install it to a new vehicle and perform a test.
(b) Check the radio operation.

Result

Go to
OK
NG

NG → Replace combined antenna

OK

4	Check wire harness and connector of radio and combined antenna

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect no disc DVD/audio head unit connector of instrument panel wire harness.
(d) Disconnect the combined antenna wire harness connector.
(e) Using a digital multimeter, check for continuity of antenna connecting cable.

Result

Go to
OK
NG

Repair or replace faulty circuit

5	Reconfirm DTCs

(a) Connect all connectors.
(b) Connect the negative battery cable.
(c) Turn ENGINE START STOP switch to ON.
(d) Use diagnostic tester (the latest software) to record and clear DTCs stored in audio entertainment system.
(e) Turn ENGINE START STOP switch to OFF and wait several seconds.
(f) Turn ENGINE START STOP switch to ON.
(g) Use diagnostic tester (the latest software) to read DTCs stored in audio entertainment system again.

Result

Go to
OK
NG

System operates normally
Replace no disc DVD/audio head unit

DTC	B1830-04	Amplifier Failure
DTC	B1832-04	Tuner IC R/W Failure
DTC	B1835-04	Communication Failure Between MCU and Main Processor
DTC	B1840-4B	MMI Over Temperature
DTC	B1841-19	USB1 Current Above Threshold
DTC	B1842-19	USB2 Current Above Threshold
DTC	B1844-04	SOC Communication Error With DESerializer
DTC	B1845-04	SOC Communication Error With TFTMCU
DTC	B1845-04	SOC Communication Error With TFTMCU

Description

DTC	DTC Definition	DTC Detection Condition	Possible Cause
B1830-04	Amplifier Failure	ENGINE START STOP switch is in ON	• No disc DVD/audio head unit
B1832-04	Tuner IC R/W Failure		
B1835-04	Communication Failure Between MCU and Main Processor		
B1845-04	SOC Communication Error With TFTMCU		
B1840-4B	MMI Over Temperature		
B1841-19	USB1 Current Above Threshold		
B1842-19	USB2 Current Above Threshold		
B1844-04	SOC Communication Error With DESerializer		

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software) to diagnostic interface.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in audio entertainment system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON, select "Read DTC".
- If DTC is detected, malfunction indicated by DTC is current. Go to diagnosis procedure - Step 1.
- If DTC is not detected, malfunction indicated by DTC is intermittent.

CAUTION

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Diagnosis Procedure

1	Check no disc DVD/audio head unit

(a) Remove no disc DVD/audio head unit from malfunctioning vehicle, then install it to a new vehicle and perform a test.
(b) Connect all connectors.
(c) Turn ENGINE START STOP switch to ON.
(d) Check if no disc DVD/audio head unit operates normally.

Result

Go to
OK
NG

OK	System operates normally
NG	Replace no disc DVD/audio head unit

ON-VEHICLE SERVICE

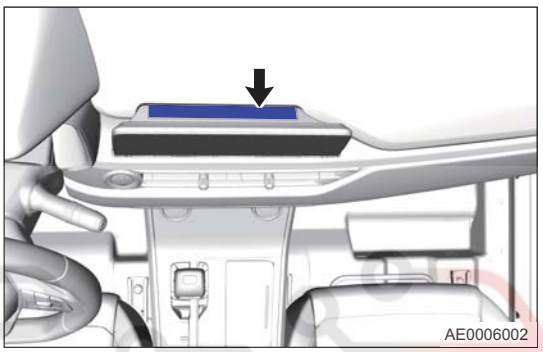
Audio Head Unit Display

Removal

WARNING:

- Be sure to wear necessary safety equipment to prevent accidents, when removing audio head unit display.
- Appropriate force should be applied, when removing audio head unit display. Be careful not to operate roughly.
- Try to prevent interior from being scratched, when removing audio head unit display.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the audio head unit display.
   (a) Using an interior crow plate, pry up the cover (arrow) of audio head unit display.



   (b) Remove 2 fixing screws from audio head unit display and disconnect audio head unit display connector.

   Tightening torque

   1.5 ± 0.5 N·m

Installation

1. Installation is in the reverse order of removal.

   Caution:

   - Operate carefully to prevent other components from being damaged, when installing audio head unit display.
   - Make sure to tighten fixing screws to specified torque, when installing audio head unit display.
   - Install each connector into place when installing audio head unit display.
   - When installing audio head unit display, check no disc DVD for proper operation.

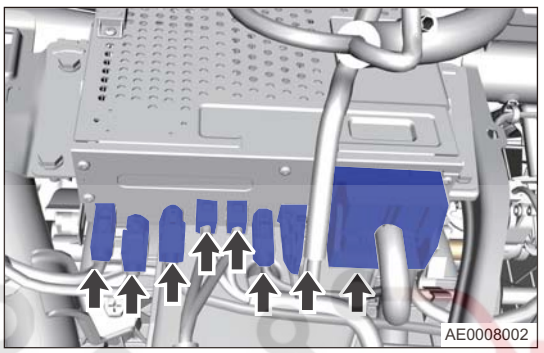
No Disc DVD/Audio Head Unit

Removal

WARNING:

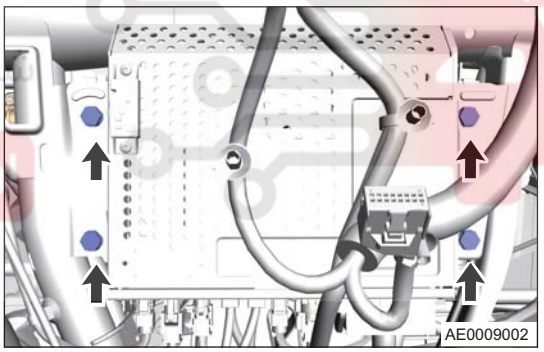
- After replacing No Disc DVD/Audio Head Unit, it is necessary to write software configuration code.
- Be sure to wear safety equipment to prevent accidents, when removing no disc DVD/audio head unit.
- Appropriate force should be applied, when removing no disc DVD/audio head unit. Be careful not to operate roughly.
- DO NOT scratch interior when removing no disc DVD/audio head unit.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the instrument panel assembly.
4. Remove the No Disc DVD/audio head unit.
   (a) Disconnect no disc DVD/audio head unit connector (arrow).



   (b) Remove 4 fixing bolts (arrow) from no disc DVD/audio head unit.

   Tightening torque
   5 ± 1 N·m



Inspection

1. Check if no disc DVD/audio head unit connector and terminal is deformed or damaged. Replace them if necessary.
2. Check if connectors are damaged. Replace them if necessary.
3. Check if no disc DVD/audio head unit housing is deformed or damaged. Replace it if necessary.

Installation

1. Installation is in the reverse order of removal.

   Caution:

   - Operate carefully to prevent other components from being damaged, when installing no disc DVD/audio head unit.
   - Be sure to tighten fixing screws to the specified torque, when installing no disc DVD/audio head unit.
   - Install each connector in place, when installing no disc DVD/audio head unit.
   - When installing no disc DVD/audio head unit, check no disc DVD for proper operation.

Door Speaker

Removal

Hint:

- The 4-door procedure is the same as the left.
- Procedures listed below are for left side.

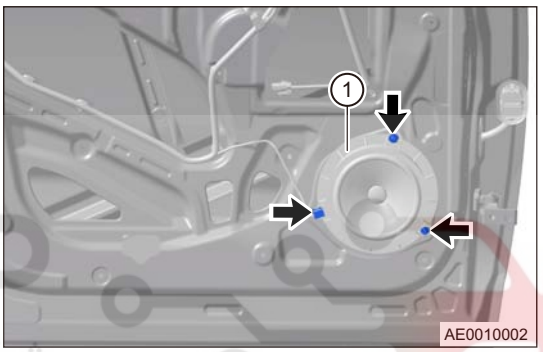
Caution:

Caution:

- Be sure to wear safety equipment to prevent accidents, when removing door speaker.
- Appropriate force should be applied when removing door speaker. Be careful not to operate roughly.
- DO NOT scratch front door inner protector assembly, when removing door speaker.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the front left door protector assembly.
4. Remove front left door woofer.
   (a) Disconnect front left door woofer connector (1), and remove 3 fixing screws (arrow) from front left door.

   Tightening torque
   2 ± 0.5 N·m

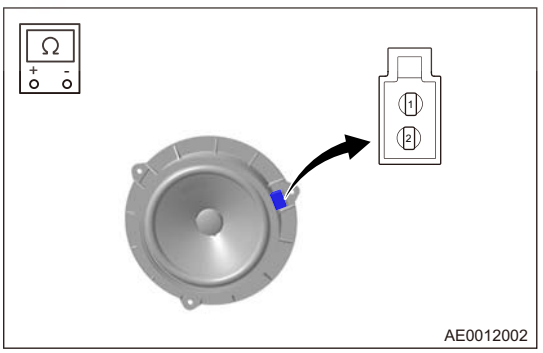


   (b) Remove front left door woofer.

Inspection

1. Check front left door woofer.
   (a) Using a digital multimeter, measure resistance of rear left speaker according to table below.

Multimeter Connection	Condition	Specified Condition
Terminal 1 - Terminal 2	At normal temperature	Approximately 4.5 Ω



   (b) Check cone paper of rear left speaker for damage or deformation. Replace it if necessary.
   (c) Check rear left speaker connector for damage and terminals for bend or poor connection. Replace them if necessary.

Installation

1. Installation is in the reverse order of removal.

Tweeter

Removal

HINT:

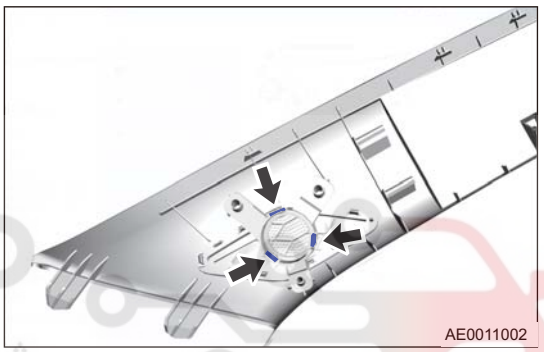
- Use same procedures for right and left sides.
- Procedures listed below are for left side.

Caution:

Caution:

- Be sure to wear safety equipment to prevent accidents, when removing tweeter.
- Appropriate force should be applied when removing tweeter. Be careful not to operate roughly.
- DO NOT scratch A-pillar upper protector assembly, when removing door speaker.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the A-pillar upper protector assembly.
4. Remove the left tweeter.
   (a) Detach 3 fixing clips (arrow) from left tweeter, remove front left door tweeter.



   (b) Remove left tweeter.

Installation

1. Installation is in the reverse order of removal.

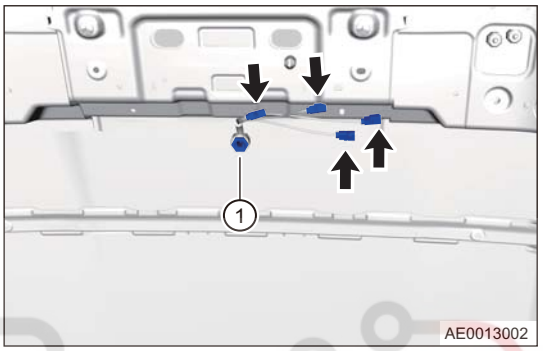
Combined Antenna

Removal

Caution:

- Be sure to wear safety equipment to prevent accidents, when removing combined antenna.
- Appropriate force should be applied when removing combined antenna. Be careful not to operate roughly.
- DO NOT scratch interior removing combined antenna.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the roof.
4. Remove the combined antenna.
   (a) Disconnect the combined antenna connector (arrow).



   (b) Remove the combined antenna fixing nut (1).
   Tightening torque
   5 ± 1N·m
   (c) Remove the combined antenna assembly.
   Caution:
   Hold the antenna by hand when tightening the nut, pay attention to the gap between antenna base and metal plate hole, try to keep the gap even, and ensure that there is no obvious deflection after installation.

Installation

1. Installation is in the reverse order of removal.

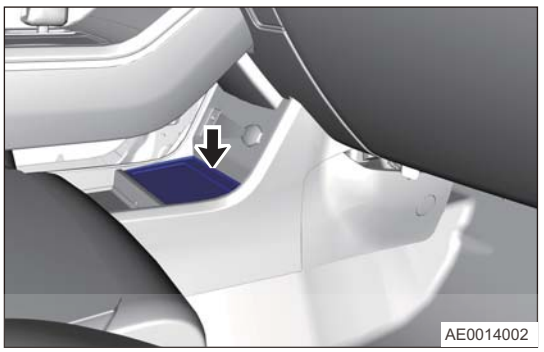
Multi-function Interface

Removal

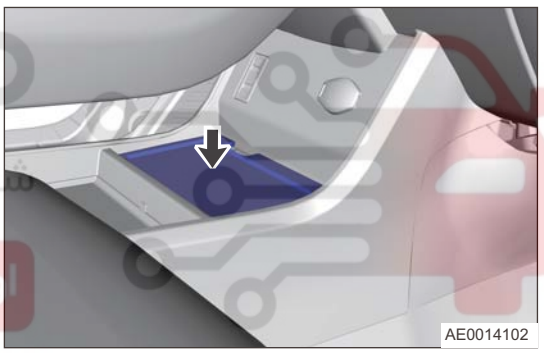
CAUTION:

- Be sure to wear safety equipment to prevent accidents, when removing multi-function interface.
- Appropriate force should be applied when removing multi-function interface. Be careful not to operate roughly.

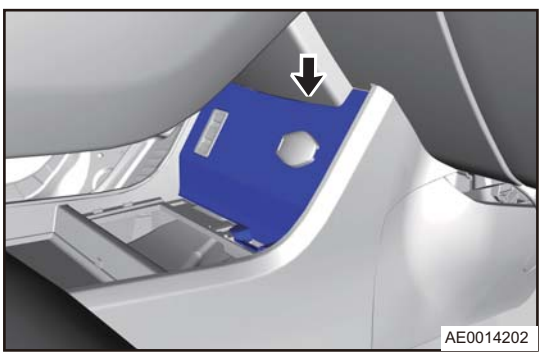
1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the front storage box cover plate.
   (a) Remove the rubber pad (1) from the front storage box of auxiliary fascia console panel.


AE0014002

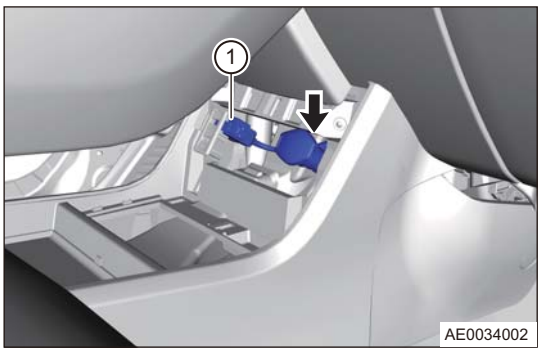
   (b) Pry off the front storage box cover plate assembly (1) with interior crow plate.


AE0014102

4. Remove the multi-function interface.
   (a) Remove USB Panel Assembly.


AE0014202

(b) Disconnect the backup power supply connector (arrow) and 2 USB connectors (1).



Installation

1. Installation is in the reverse order of removal.

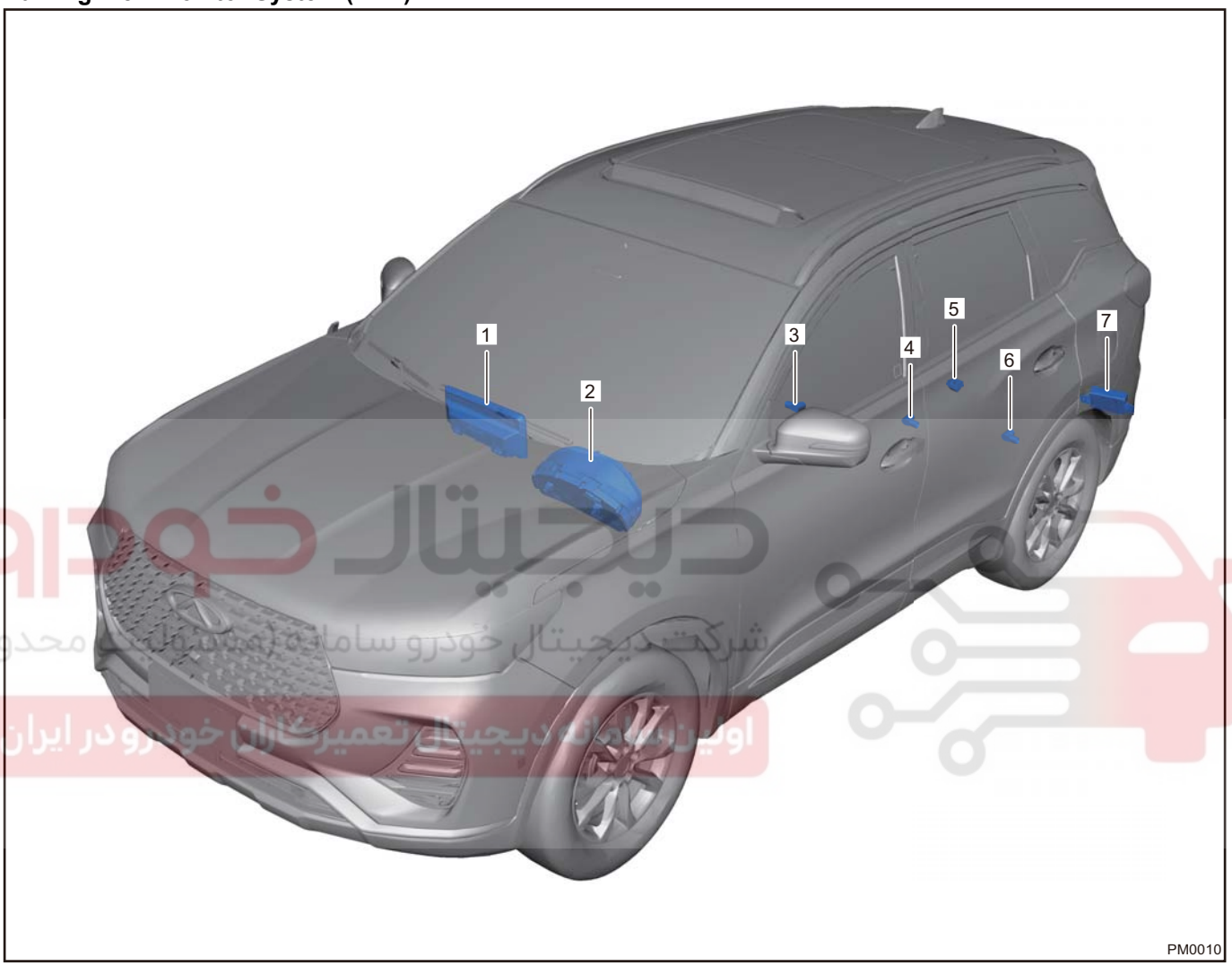
PARKING ASSIST SYSTEM

PARKING ASSIST SYSTEM

System Overview

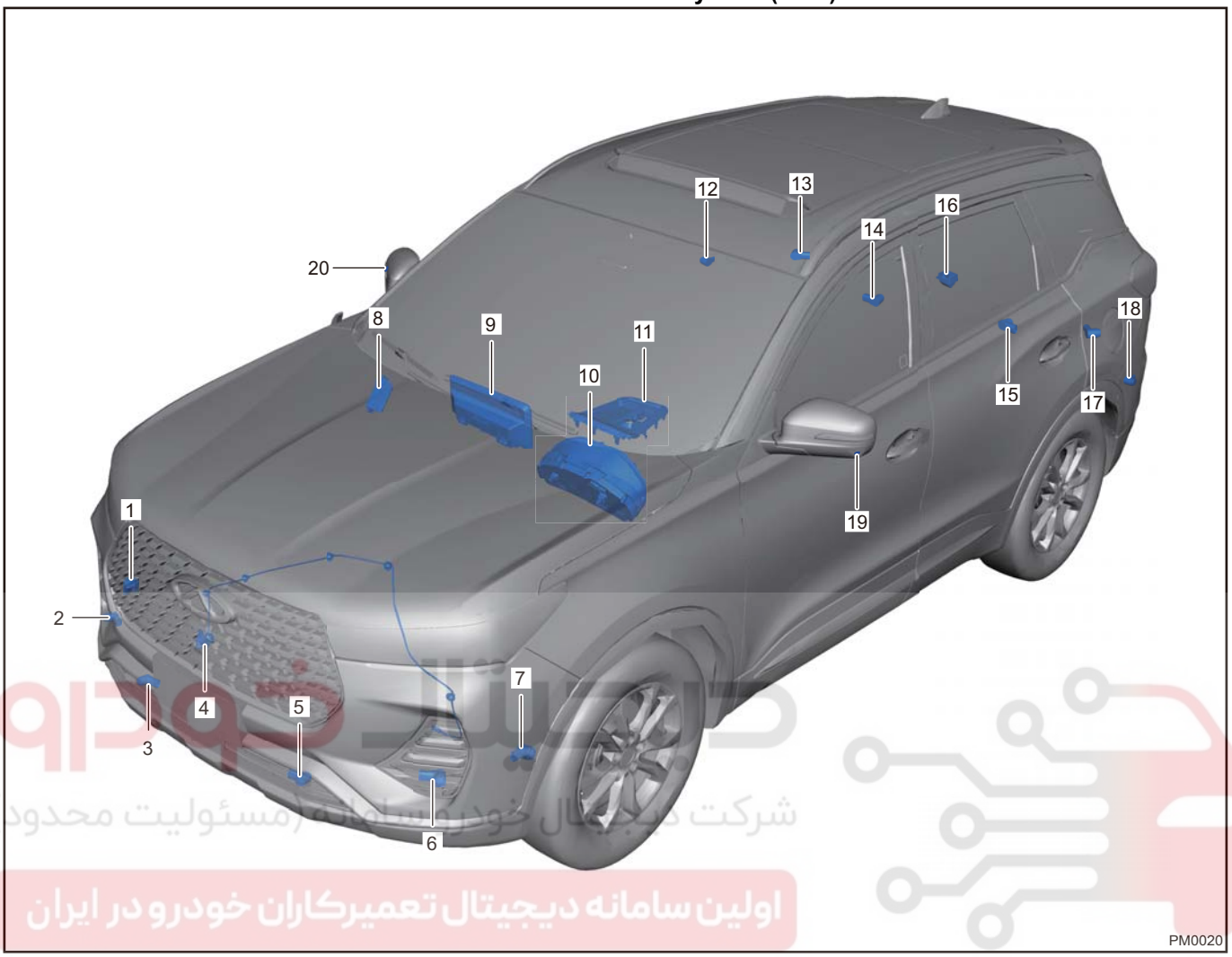
System Components Diagram

Parking View Monitor System (RVC)



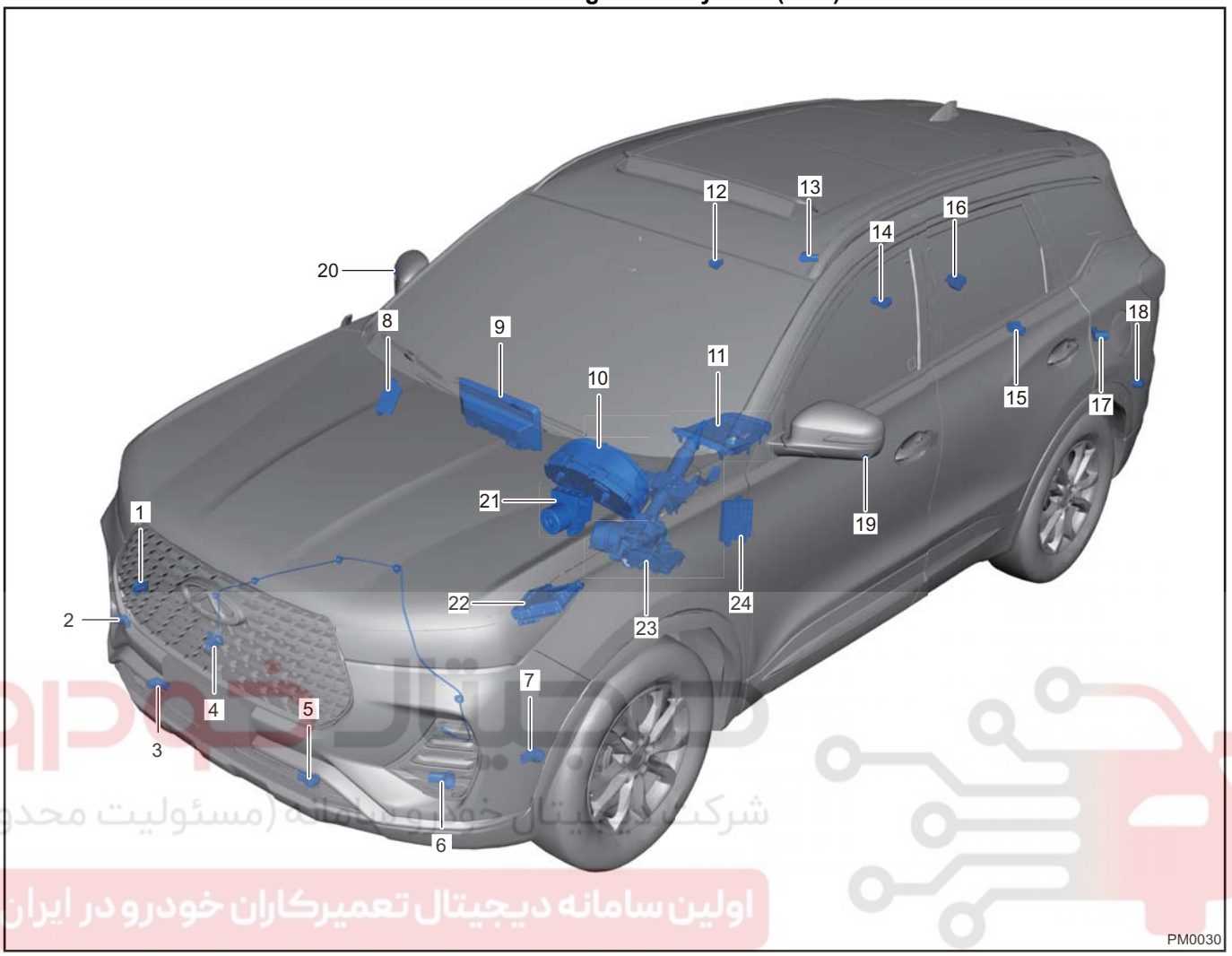
1	Audio Head Unit (IHU)	5	Rear Camera Assembly
2	Instrument Cluster (ICM)	6	Rear Right Radar Sensor
3	Rear Left Radar Sensor	7	Reversing Radar Module (RADAR)
4	Rear Center Radar Sensor		

Panoramic View Monitor System (AVM)



1	Front Right Side Radar Sensor	11	Panoramic View Monitor Button
2	Front Right Radar Sensor	12	Rear Right Side Radar Sensor
3	Front Right Center Radar Sensor	13	Rear Right Radar Sensor
4	Front Camera Assembly	14	Rear Right Center Radar Sensor
5	Front Left Center Radar Sensor	15	Rear Left Center Radar Sensor
6	Front Left Radar Sensor	16	Rear Camera Assembly
7	Front Left Side Radar Sensor	17	Rear Left Radar Sensor
8	Panoramic View Monitor Control Module (AVM)	18	Rear Left Side Radar Sensor
9	Audio Head Unit (IHU)	19	Left Camera
10	Instrument Cluster (ICM)	20	Right Camera

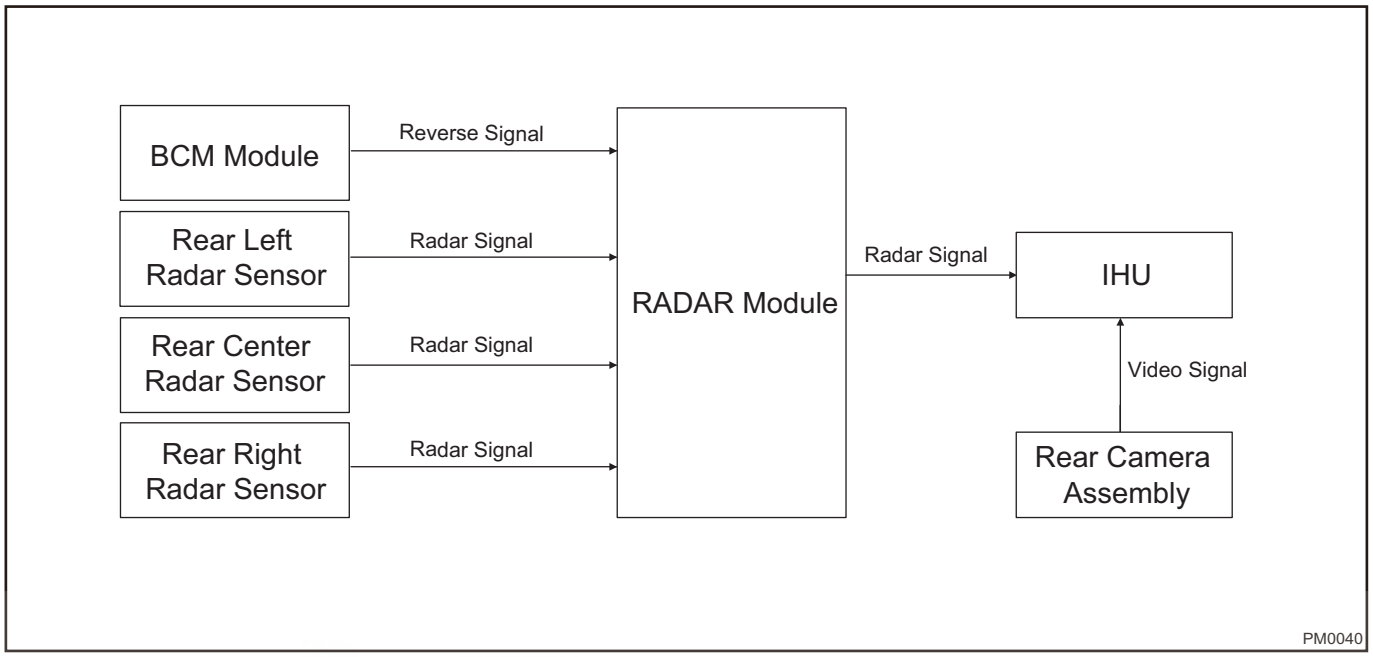
Automatic Parking Assist System (APA)



1	Front Right Side Radar Sensor	13	Rear Right Radar Sensor
2	Front Right Radar Sensor	14	Rear Right Center Radar Sensor
3	Front Right Center Radar Sensor	15	Rear Left Center Radar Sensor
4	Front Camera Assembly	16	Rear Camera Assembly
5	Front Left Center Radar Sensor	17	Rear Left Radar Sensor
6	Front Left Radar Sensor	18	Rear Left Side Radar Sensor
7	Front Left Side Radar Sensor	19	Left Camera
8	Panoramic View Monitor Control Module (AVM)	20	Right Camera
9	Audio Head Unit (IHU)	21	EPB Module
10	Instrument Cluster (ICM)	22	Engine Control Module (EMS)
11	Automatic Parking Button	23	Electric Power Steering (EPS)
12	Rear Right Side Radar Sensor	24	Body Control Module (BCM)

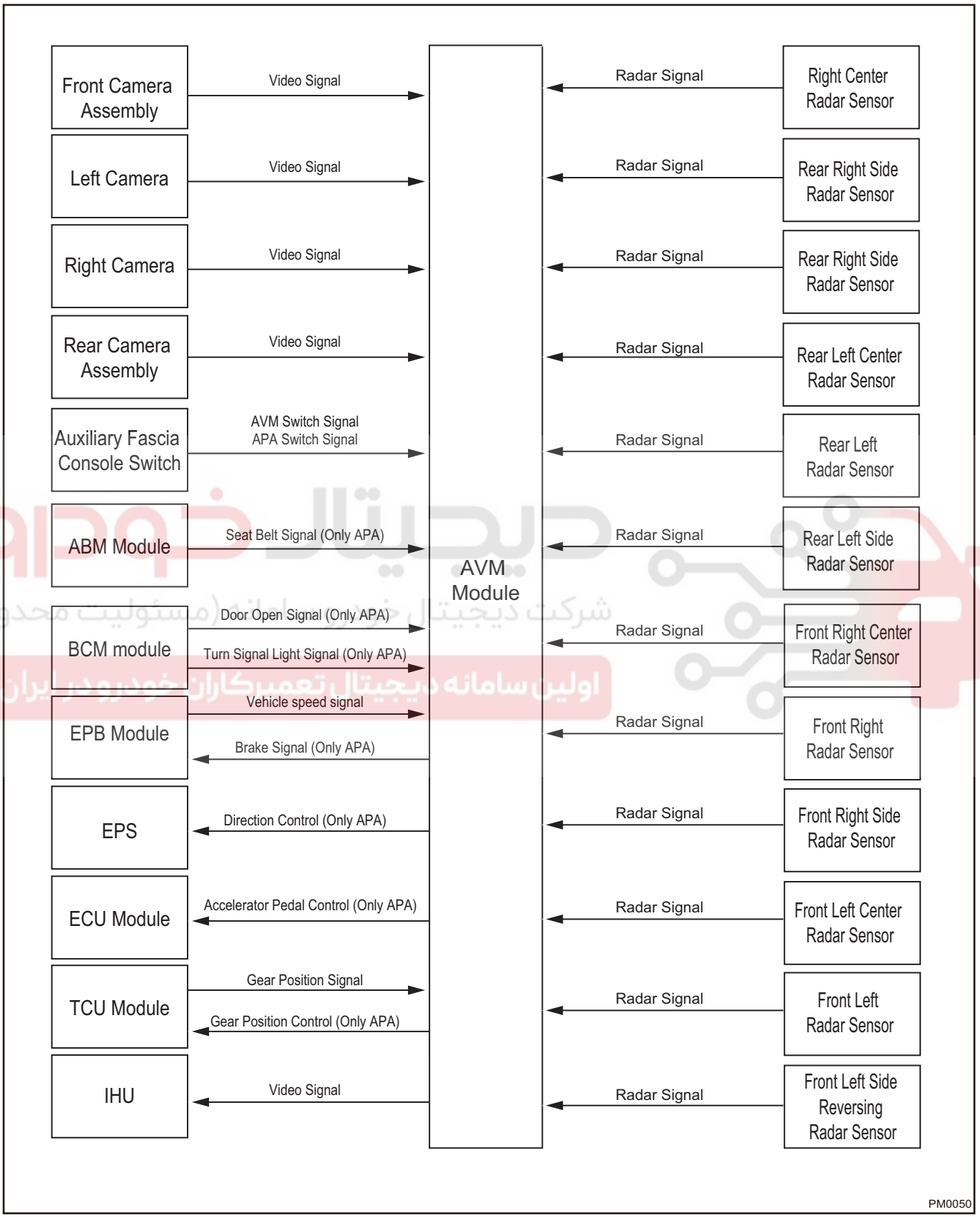
System Principle

Parking View Monitor System (RVC) & Reversing Radar (3-Radar) System



The reversing radar module collects reverse gear signals through CAN line, and collects radar signals through hard-wire connection. The audio head unit displays radar information and image screen through data requirements analysis.

Panoramic View Monitor System (AVM) & Automatic Parking Assist System (APA) & Parking Radar (12-Radar) System



The automatic parking module is integrated in panoramic view monitor control module. The panoramic view monitor control module collects seat belt signals, door open signals, turn signal light signals, vehicle speed signals and gear position signals through CAN line, and collects radar signals and video signals through hard-wire connection. The audio head unit displays radar information and image screen through data requirements analysis. EPB module controls braking and parking (APA models only), electric power steering controls steering (APA models only), and transmission control module controls gear position (APA models only).

System Function

Parking View Monitor System (RVC)

The parking view monitor system uses three ultrasonic sensors to measure the distance from obstacles, and rear camera collects the rear view of vehicle. The audio head unit displays the rear view of vehicle, radar information and vehicle guideline, to remind the driver of the distance between the rear of vehicle and other objects, so as to reduce personal injuries or vehicle damage caused by parking.

Shift the shift lever to R position to enter parking view monitor screen, and display the parking view and vehicle guideline. Vehicle guideline varies depending on steering wheel rotation and it is used for prejudging the wheel's traveling trace during reversing.

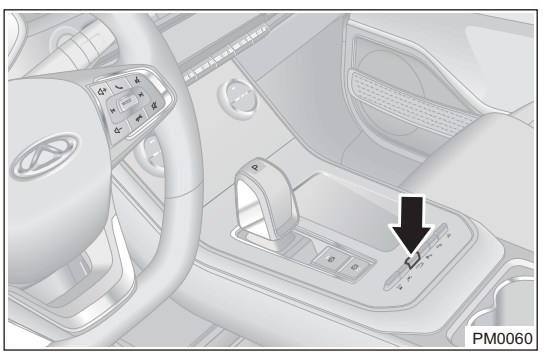
Caution:

- Use the distance as a reference (such as on the hill).
- Vehicle width guideline and predicting line are wider than the actual line.
- Do not scratch the lens when cleaning dirt or snow on the camera surface.
- If tire is replaced with a different size, the displayed predicting line is different from the actual line. Please use the rear view mirror or check and determine the distance to other objects actually.

Warning:

- When reversing, make sure that back door is firmly closed.
- Never distract your attention from surrounding traffic due to images on display.
- Due to the limited monitoring range, parking view monitor system cannot view the bottom and corners of bumper.
- When reversing, always pay extra attention to surrounding children, small animals and objects, because they cannot always be detected by camera.
- Because rear camera uses wide-angle lens, object distance displayed on parking view monitor is different from the actual distance.
- Do not tap the cameras, as they are precision instruments. Failure to do so may cause malfunction or damage, leading to fire or electric shock.
- Do not spray water around the camera when washing vehicle with high pressure water. Otherwise, water drop may enter camera and condense on the lens, causing malfunction, fire or electric shock.
- Rear camera may enlarge and distort the view, so image on display is different from real object or it cannot reflect the real object accurately, and there is also blind spot and a little delay.
- The parking view monitor is convenient, but it is not a substitute for correct reversing operation. When reversing, be sure to look around to check if the surroundings are safe and reverse slowly.

Panoramic View Monitor System (AVM)


PM0060

The panoramic view monitor system uses ultrasonic sensors to measure the distance from obstacles, and four ultra wide angle cameras collect the front, rear, left and right view of vehicle, then splicing them into a birds-eye view of vehicle surroundings through image processing algorithm. The audio head unit (IHU) displays the sounding view of vehicle, radar information and vehicle guideline, to remind the driver of the distance between the rear of vehicle and other objects, so as to reduce personal injuries or vehicle damage caused by parking.

When vehicle power supply is turned to ON mode and vehicle speed is less than 20 km/h: Press the panoramic view monitor switch to enter the panoramic view monitor system, press the panoramic view monitor switch again to exit.

When vehicle power supply is turned to ON mode and vehicle speed is less than 20 km/h: Shift the shift lever to R position to enter the panoramic view monitor system, shift the shift lever out from P to exit panoramic view monitor system after a delay of 15 s.

When vehicle power supply is turned to ON mode and vehicle speed is less than 15 km/h (D position): After receiving the parking radar obstacle distance signals, enter the panoramic view monitor system (APA models only), shift the shift lever to N/P position or when there is no obstacle distance information, it will exit panoramic view monitor system after a delay of 15 s.

Function	Description
Two-dimensional view/three-dimensional view	Click two-dimensional view/three-dimensional view button to switch two-dimensional/three-dimensional view
Front wide view/rear wide view	Click front wide view/rear wide view button to switch front/rear wide view
Panoramic startup animation	When AVM is starting, surround the vehicle all around
Turn signal light activating panoramic	Click turn signal light activating button, it will enter panoramic view monitor system when left/right turn signal light is turned on
Steering angle activating panoramic	Click steering angle activating panoramic button, it will enter panoramic view monitor system during large-angle steering
Auto enlarging view	Click auto enlarging view button to enter enlarged view automatically according to the obstacle distance
Door opening view	Click door opening view button, it will enter front left/front right door opening view when front left/ front right door is opened
Vehicle guideline	Click vehicle guideline display button, it will load static and dynamic vehicle guidelines and wheel track line when entering panoramic view monitor system
License plate number setting	Click license plate number display button to receive the license plate number sent by audio head unit and display it in 3D vehicle icon

Caution:

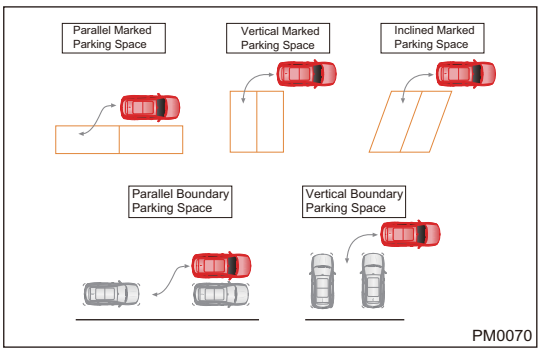
- Do not scratch the lens when cleaning dirt or snow on the camera surface.
- Distance from object seen from panoramic view monitor system is different from the actual distance.
- Make sure that the outside rear view mirrors are unfolded and the back door is firmly closed before using panoramic view monitor system.
- Cameras are installed on front grille, outside rear view mirrors and above the rear license plate. Do not place anything on the camera.
- Panoramic view monitor system has professionally calibrated before leaving factory. Any removal and installation behaviors without permission that cause changes in installation position and angle of camera may affect the function and effect of panoramic view monitor system.
- The panoramic view monitor system provides driving assist, however, object in image does not indicate the actual size and distance from it. There is a slight delay and blind spot in image relative to the actual condition. Therefore, the panoramic view function is not a substitute for driver's operation and judgment. During on, off and use of the function, driver should pay attention to the surroundings to ensure safe driving.

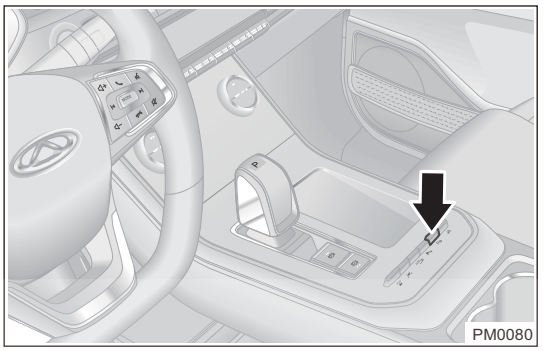
Automatic Parking Assist System (APA)

The automatic parking assist system uses ultrasonic sensors to measure the distance from obstacles, and four ultra wide angle cameras detect the parking spaces on both sides of road. After confirming the target parking space by audio head unit, assist the driver to automatically park the vehicle in or out of the target parking space.

The types of parking spaces supported by automatic parking assist system include parallel marked parking space, vertical marked parking space, inclined marked parking space, parallel boundary parking space and vertical boundary parking space.

Press the automatic parking switch to enter the automatic parking assist system; press the automatic parking switch again to exit the automatic parking assist system.





1. Automatic parking in
   (a) Turn on the automatic parking assist system and drive vehicle to search for parking space.
   Before activating the automatic parking assist system, make sure that the driver's seat belt is fastened and the doors, engine hood and back door are all closed;
   Press the automatic parking switch to turn on the parking screen, when the transmission is in D position, vehicle speed is < 25 km/h, and the lateral distance between driving path and available parking space is about 0.5 m-1.9 m, it begins to search for the parking space;
   The automatic parking assist system searches for the right parking space by default. Turn on the left turn signal light if you need to search for the left parking space.
   (b) The automatic parking assist system finds available parking space, and the driver confirms the target parking space.
   When the automatic parking assist system finds available parking spaces, the parking space information will be displayed on the parking screen. Please stop at this time;
   When there are multiple available parking spaces, the driver can select the desired parking space on the parking screen. If not selected, the nearest parking space will be selected by default.
   (c) Automatic parking in.
   After confirming the target parking space, press the automatic parking switch and operate according to prompts on the parking screen to enter the automatic parking process;
   During automatic parking in, the driver does not need to perform vehicle operations, but needs to pay attention to the surroundings at all times. Be ready to brake vehicle at any time to ensure that the vehicle can be controlled in dangerous situations.
   (d) Complete parking.
   After the vehicle is parked in target parking space, the parking screen prompts that parking is completed. The automatic parking assist system applies electronic parking brake automatically, and shift to P position. At this time, the driver takes over the vehicle operation.
2. Automatic parking space selection
   (a) Turn on automatic parking assist system, and the driver confirms the target parking space.
   Before activating the automatic parking assist system, make sure that the driver's seat belt is fastened and the doors, engine hood and back door are all closed;

Press the automatic parking switch while depressing and holding the brake pedal, to turn on the parking screen. Select the automatic parking space selection to enter the automatic parking space selection screen;

The automatic parking assist system provides vertical parking spaces by default. Double click the vehicle icon to switch between horizontal parking space and inclined parking space. Select the type of required parking space, dragging the vehicle icon to determine the parking position, and control the four-axes of vehicle icon to adjust the angle slightly; The right panoramic view screen will display the target parking position, and the driver should ensure the availability of the position.

(b) Automatic parking in.

After confirming the target parking space, press the automatic parking switch and operate according to prompts on the parking screen to enter the automatic parking process;

During automatic parking in, the driver does not need to perform vehicle operations, but needs to pay attention to the surroundings at all times. Be ready to brake vehicle at any time to ensure that the vehicle can be controlled in dangerous situations.

(c) Complete parking.

After the vehicle is parked in target parking space, the parking screen prompts that parking is completed. The automatic parking assist system applies electronic parking brake automatically, and shift to P position. At this time, the driver takes over the vehicle operation.

3. Automatic moving out

(a) Turn on automatic parking assist system, and the driver selects the direction of moving out.

Before activating the automatic parking assist system, make sure that the driver's seat belt is fastened and the doors, engine hood and back door are all closed;

Start the engine, the transmission is in P position, press the automatic parking switch to turn on the parking screen. Select automatic moving out to enter the automatic moving out screen;

The driver can select the direction of moving out by toggling the combination switch (left/right turn signal light).

(b) Automatic moving out.

The parking spaces supported by automatic moving out are only horizontal parking spaces and there are obstacles ahead;

After selecting the direction of moving out, operate according to prompts on the parking screen to enter the automatic moving out process;

During automatic moving out, the driver does not need to perform vehicle operations, but needs to pay attention to the surroundings at all times. Be ready to brake vehicle at any time to ensure that the vehicle can be controlled in dangerous situations.

(c) Complete parking.

After the vehicle is parked in target parking space, the parking screen prompts that parking is completed. The automatic parking assist system applies electronic parking brake automatically, and shift to P position. At this time, the driver takes over the vehicle operation.

Hint:

- When searching for a parking space, the distance between vehicle and obstacles that make up the parking space should be 0.5 m-1.9 m. The parking space may not be found if exceeds the range.
- When searching for a parking space, try to keep the vehicle passing through the parking space in a straight line, thus to achieve a better parking space detection effect.
- The rattling sound during parking is the normal operating noise of brake system, and it is no need to worry about it.
- When parking on uneven road, fluctuation may occur in parking speed, and the vehicle may bump. Try to avoid using this system on uneven road.
- The automatic parking assist system only supports the moving out function of parallel parking spaces. Appropriate adjustment space is required in front and rear of vehicle body. The moving out function may not be available when there is abnormal change in the parking space.
- During parking, the steering, braking, accelerator pedal and gear position are controlled by the automatic parking assist system. The driver can operate the brake pedal to control vehicle speed or stop the vehicle. The vehicle can continue to park after release the brake pedal.

Caution:

- The automatic parking assist system does not consider the changes in recognized target parking space, which may cause parking failure.
- When using automatic parking assist system, the vehicle may cross or hit the curbs during steering. Therefore, the driver must ensure that the brake intervention can be performed at any time, otherwise it may cause wheel or vehicle damage.
- Target recognition is restricted by the ultrasonic measurement physical laws and camera vision algorithms. The ability to recognize person, animals and various obstacles around the vehicle is limited. In addition, external sound sources or light and shadow may cause interference to the system, resulting in missing recognition or misrecognition of system. Therefore, before confirming the target parking space, the driver is responsible for paying attention to the surroundings of vehicle and confirming the availability of target parking space.

Warning:

- The automatic parking assist system only provides assistance to the driver, and cannot operate normally under all driving conditions, weather conditions, traffic or road conditions.
- When using automatic parking assist system, the driver has responsibility to control the vehicle, monitor the system operation and intervene when necessary to avoid danger.

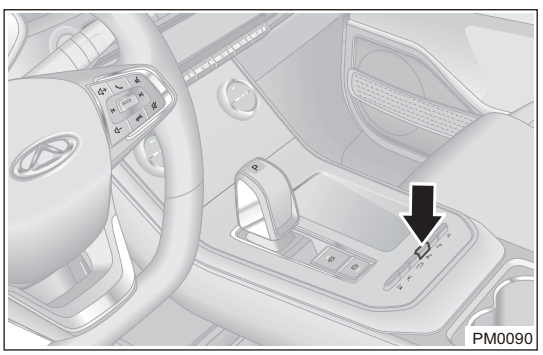
Reversing Radar (3-Radar) System

Turn vehicle power supply to ON mode and shift the shift lever to R position to activate the parking radar system; When the radar sensor detects an obstacle, the audio head unit will display the corresponding distance information, and the buzzer sounds. When the radar sensor is faulty, it will sound for 2 s continuously when parking radar system is turned on.

Distance/cm	Display Method			Note
	Rear Left	Rear Center	Rear Right	
⩽ 35				Continuous sound
40 ⩽ L ⩽ 60				Sound at 4Hz
65 ⩽ L ⩽ 90				Sound at 2Hz
95 ⩽ L ⩽ 150				Sound at 1Hz

Parking Radar (12-Radar) System

Turn vehicle power supply to ON mode and shift the shift lever to R position to activate the parking radar system; When the front/rear radar sensor detects an obstacle, the audio head unit will display the corresponding distance information with sounding; When the side radar sensor detects an obstacle, the audio head unit will display the corresponding distance information without sounding; When the radar sensor is faulty, it will sound for 2 s continuously when parking radar system is turned on (applying parking brake or shifting the transmission gear to P position will block the radar sensor failure alarm sound).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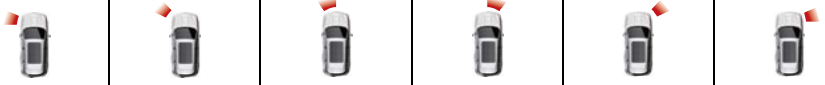
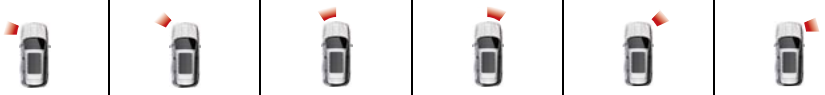
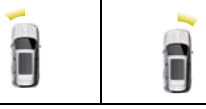
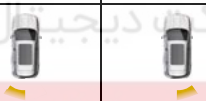
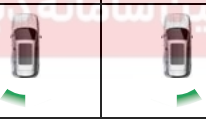
The parking radar system is turned on by default when powered-on for the first time, and the parking radar switch indicator comes on; Press parking radar switch, the parking radar switch indicator goes off and exit the parking radar system; When vehicle speed is > 15 km/h, it will exit parking radar system; When vehicle speed is < 15 km/h, press the parking radar switch to activate the parking radar system again.

Distance/cm	Display Method						Note
	Front Left Side	Front Left	Front Left Center	Front Right Center	Front Right	Front Right Side	
⩽ 35							Continuous sound
40 ⩽ L ⩽ 60							Sound at 4Hz
65 ⩽ L ⩽ 90							Sound at 2Hz

Distance/cm	Display Method						Note
	Rear Left Side	Rear Left	Rear Left Center	Rear Right Center	Rear Right	Rear Right Side	
⩽ 35							Continuous sound
40 ⩽ L ⩽ 60							Sound at 4Hz
65 ⩽ L ⩽ 90							Sound at 2Hz
95 ⩽ L ⩽ 150							Sound at 1Hz

Caution:

The parking radar system may not operate normally in the following conditions:

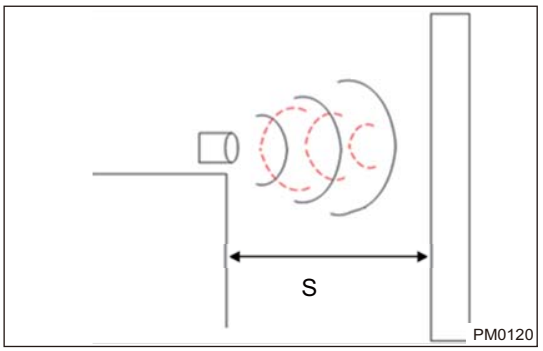
- When the vehicle is on a steep slope.
- When driving in jelly-like snow or in rain.
- Low objects such as rocks, etc. cannot be detected.
- Objects that are higher than bumper may not be detected.
- Thin objects such as wires, fences and ropes, etc. cannot be detected.
- When vehicle is equipped with high frequency radio or antenna is in use.
- When radar sensor surface is frozen, it will not detect any obstacle.
- When radar sensor is covered by dirt, snow or mud, it may not detect obstacles.
- Objects that can easily absorb ultrasonic waves such as soft snow, cotton, sponge, etc. cannot be detected.
- The vicinity of vehicle is noisy (such as vehicle horns, motorcycle engines, air brakes of large vehicles, or other loud noises producing ultrasonic waves).
- If multiple radar sensors have detected an obstacle, audio head unit will display distances between each radar sensor and obstacle simultaneously, and sound alarm will be sound from nearest obstacle.
- For obstacles out of the detection range, radar sensors do not give a warning.
- When vehicle is moving, please note that the reversing radar sensor on the other side may get close to other obstacles.

Components Operation Description

Radar Sensor

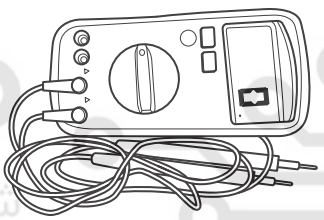
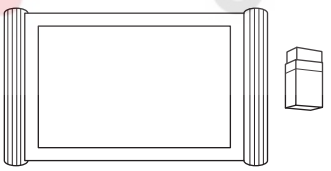
Main Function

After radar sensors send out ultrasonic and receive back wave from obstacle, control module calculates obstacle distance (S=t×340÷2) according to ultrasonic distance measuring principle, and sends data to display terminal to display and alarm.



Special Tools and Equipment

General Tools

Tool Name	Tool Drawing
Digital Multimeter	 RCH0002006
Diagnostic Tester	 RCH0001006

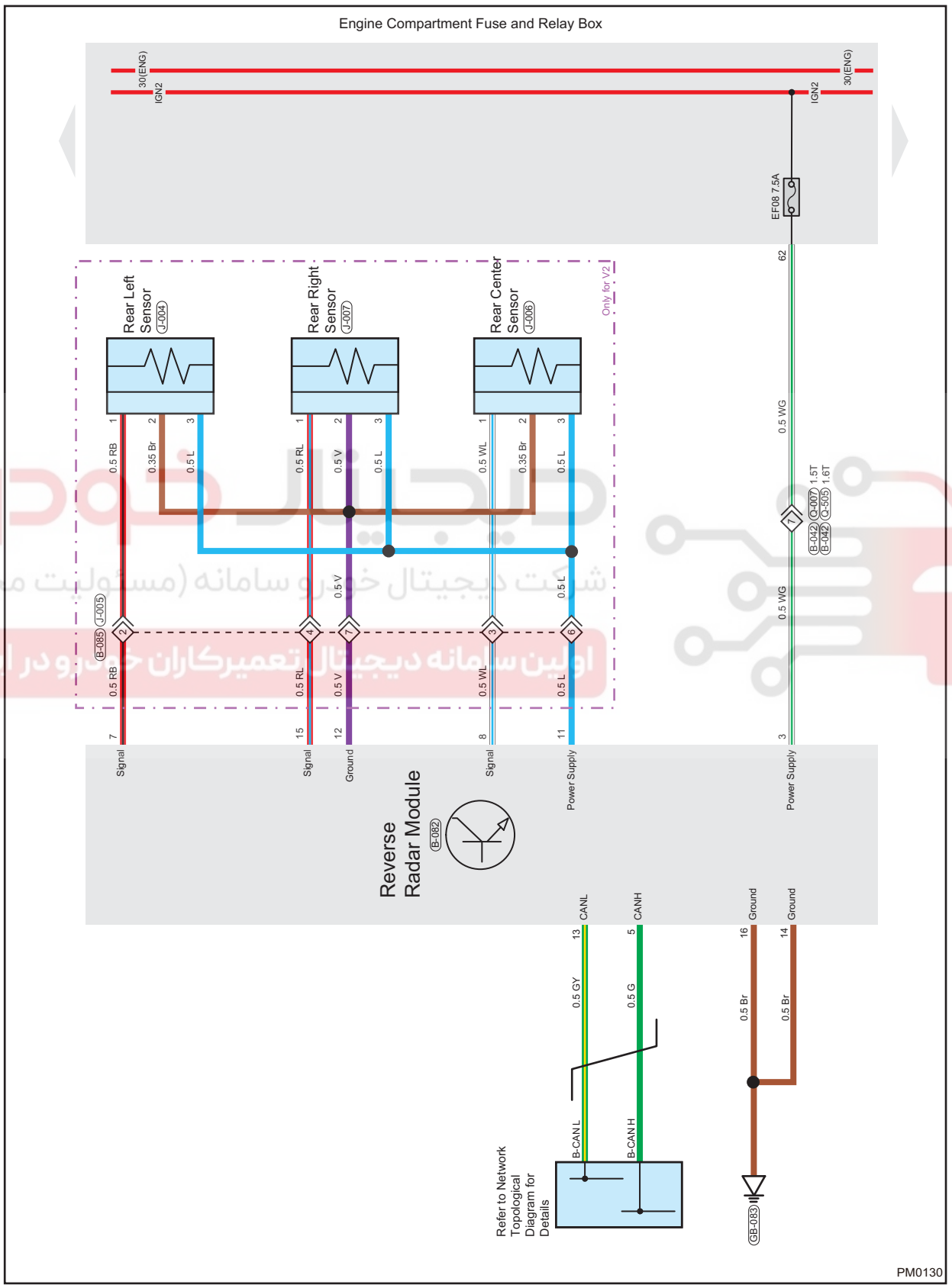
Tightening Torque List

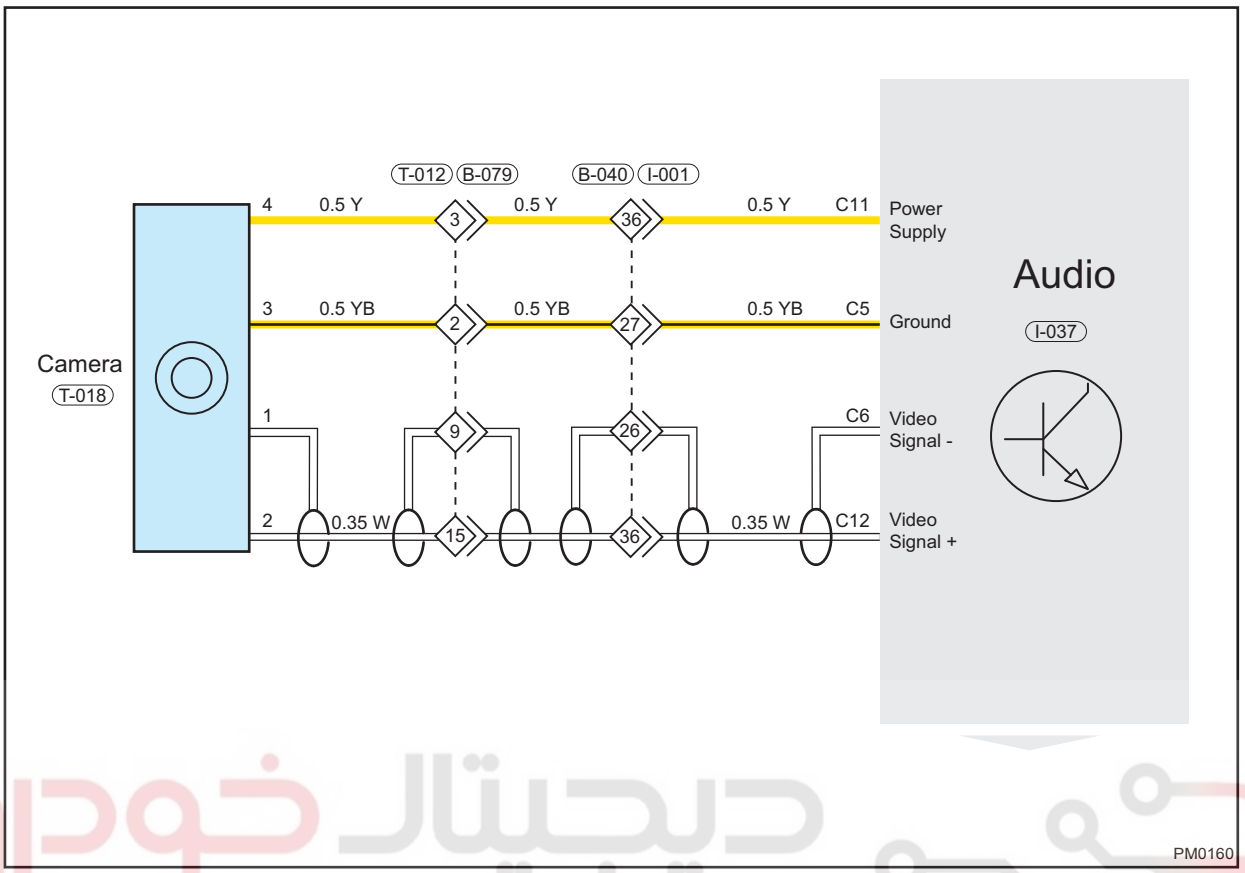
Torque

Description	Tightening Torque
Outside Rear View Mirror Fixing Bolt	7 ± 1 N·m
Reversing Radar Control Module Fixing Bolt	5 ± 1 N·m
Panoramic Control System Module Fixing Bolt	7 ± 1 N·m

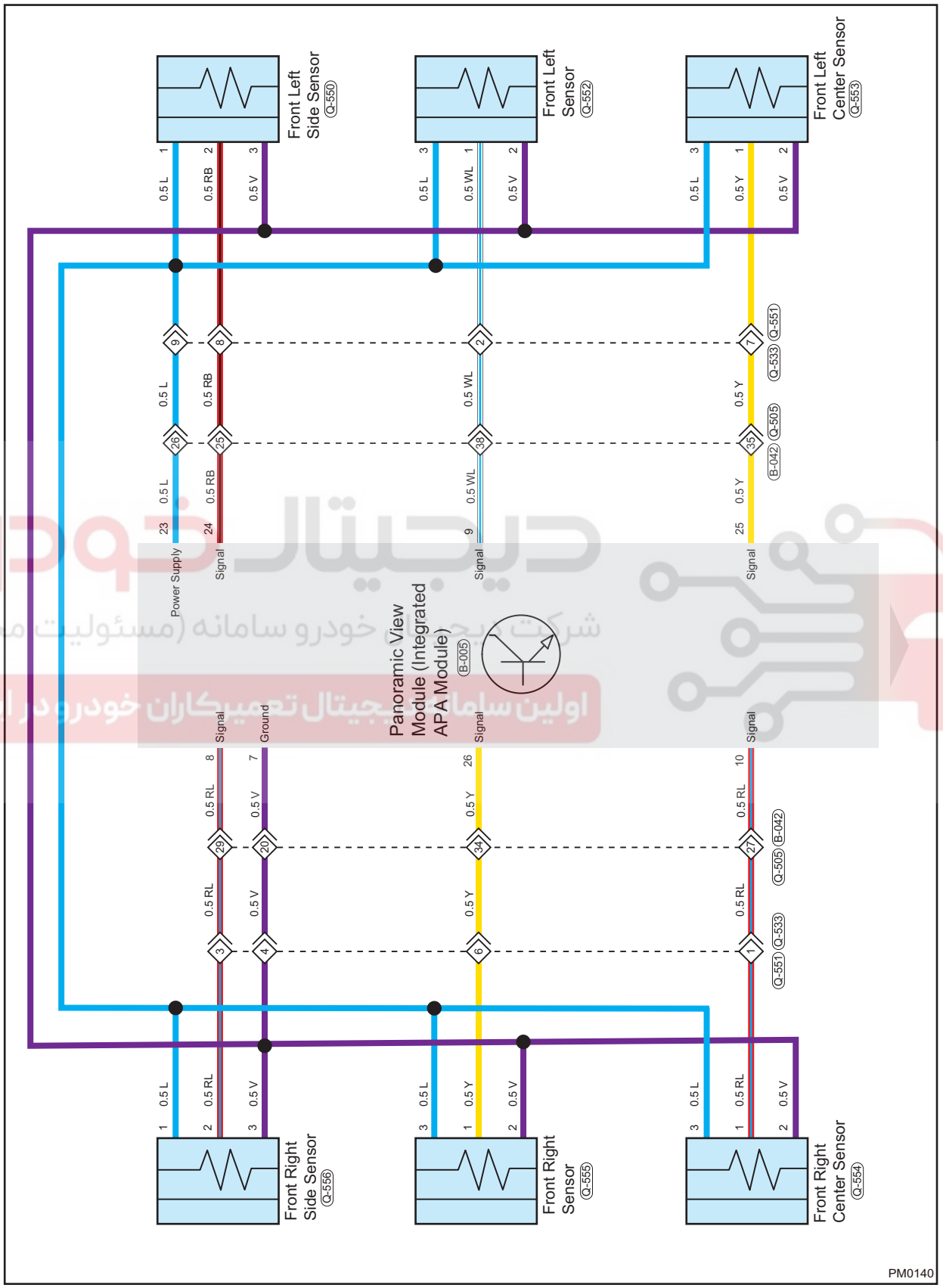
System Circuit Diagram

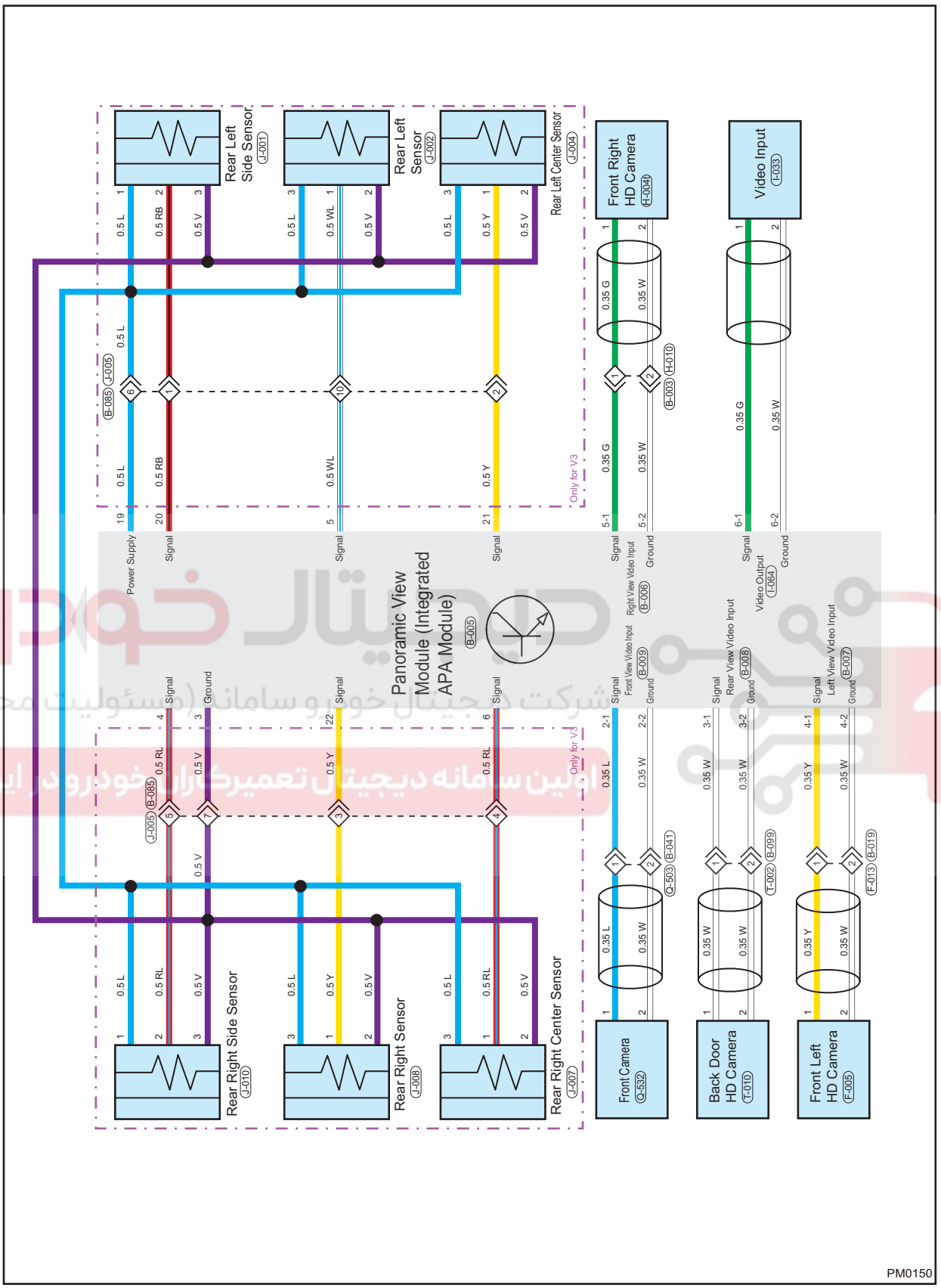
Parking View Monitor System (RVC) & Reversing Radar (3-Radar) System Circuit Diagram

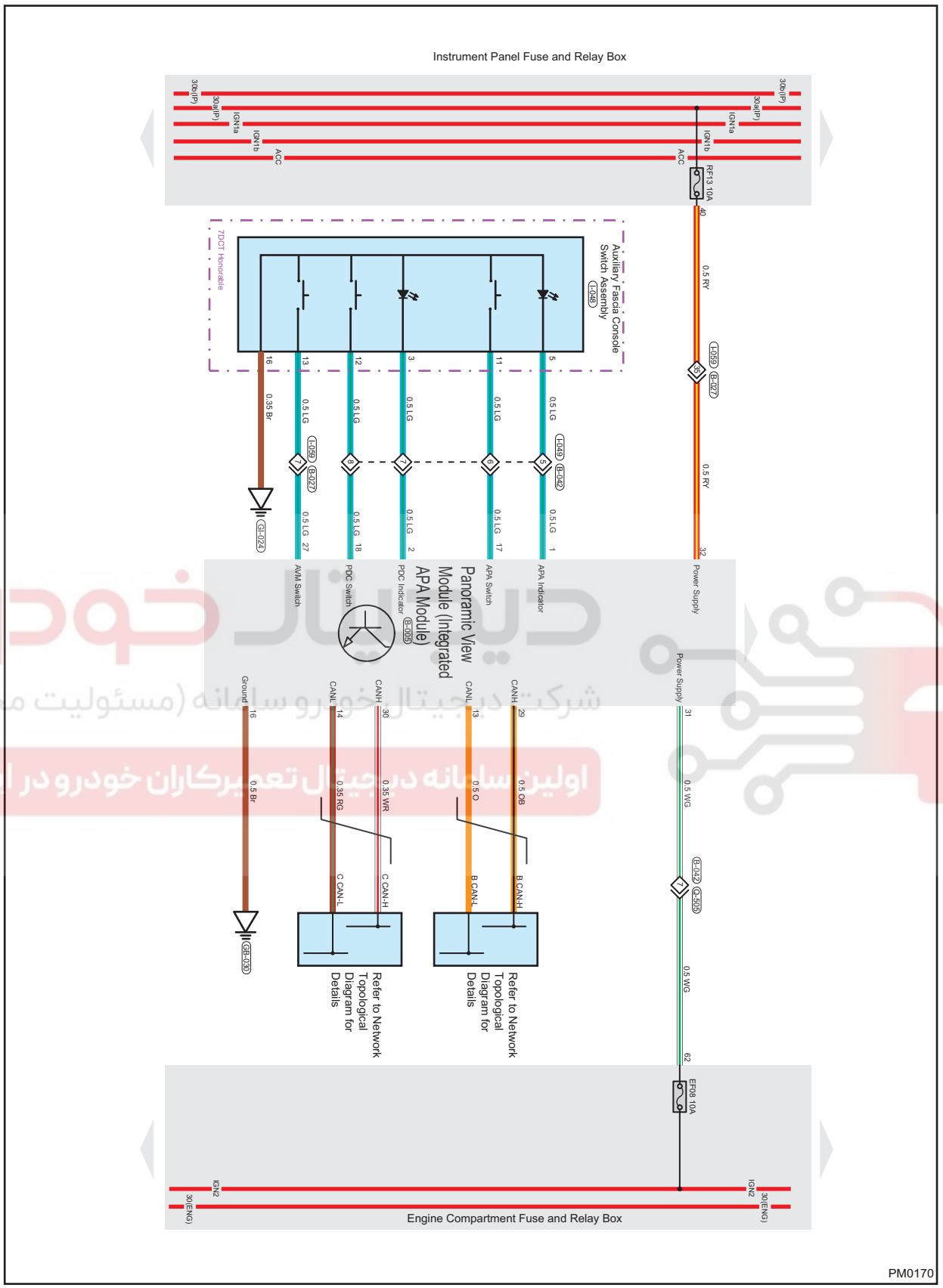




Panoramic View Monitor System (AVM) & Automatic Parking Assist System (APA) & Parking Radar (12-Radar) System Circuit Diagram




Rear Left Side Sensor (J-001)
Rear Left Sensor (J-002)
Rear Left Center Sensor (J-004)
Front Right HD Camera (H-004)
Video Input (I-033)
Panoramic View Module (Integrated APA Module) (B-005)
Power Supply
Signal
Ground
Only for V3
Front View Video Input
Rear View Video Input
Left View Video Input
Right View Video Input
Video Output (I-064)
Rear Right Side Sensor (J-010)
Rear Right Sensor (J-008)
Rear Right Center Sensor (J-007)
Front Camera (Q-532)
Back Door HD Camera (T-010)
Front Left HD Camera (F-005)
PM0150



Diagnosis Information and Procedures

Diagnosis Procedure

Hint:

Use following procedures to troubleshoot the parking assist system.

1	**Vehicle brought to workshop**

NEXT

2	**Check battery voltage**

Check if battery voltage is normal.

OK

Standard voltage: Not less than 12 V.

Result

Result	Go to
OK	A
NG	B

B → **Replace battery**

A

3	**Customer problem analysis**

NEXT

4	**Read DTCs**

Result

Result	Go to
DTC exists	A
No DTC	B

B → **Repair according to Problem Symptoms Table**

A

5	**Read DTCs (current DTC and history DTC)**

Result

Result	Go to
DTC exists	A
No DTC	B

B

	Troubleshoot according to intermittent DTC Troubleshooting

A

6	**Repair according to Diagnostic Trouble Code (DTC) Chart**

NEXT

7	**Adjust, repair or replace**

NEXT

8	**Conduct test and confirm malfunction has been repaired**

NEXT **End**

DTC Confirmation Procedure

Confirm that battery voltage is not less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON and check the DTCs in system again.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

Intermittent DTC Troubleshooting

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Check for broken, bent, protruded or corroded terminals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit works. Circuits are very sensitive to proper grounding. A loose or corroded ground can affect the control circuit. Check the ground points as follows:

- Remove ground bolt or nut.
- Check all contact surfaces for tarnish, dirt and rust, etc.
- Clean as necessary to ensure that contact is in good condition.
- Reinstall ground bolt or nut securely.
- Check if add-on accessories interfere with ground circuit.

- If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure that all wire harnesses are clean and securely fastened while providing a good ground path.

Problem Symptoms Table

Parking View Monitor System (RVC) & Reversing Radar (3-Radar) System Circuit Diagram

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Suspected Area
Parking view monitor system (RVC) operate abnormally	Radar sensor
	Reversing radar module (RADAR)
	Audio head unit
	Wire harness fault
	Fuse
CAN network failure	Fuse
	Wire harness fault
	Central gateway (CGW)
	Reversing radar module (RADAR)

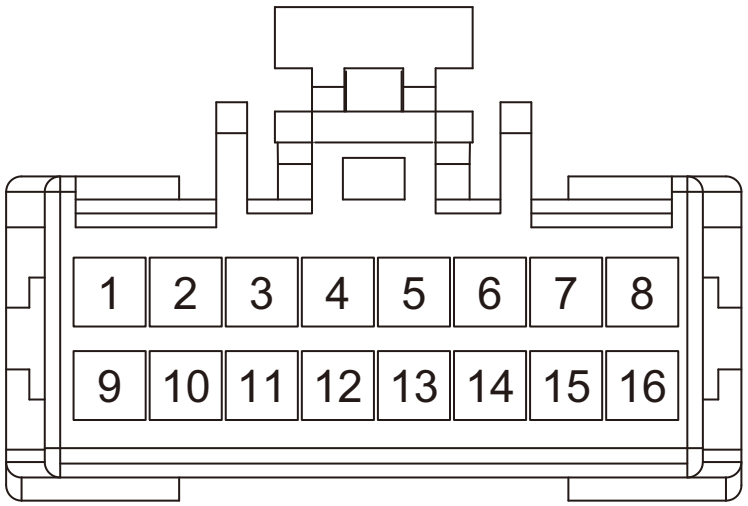
Panoramic View Monitor System (AVM) & Automatic Parking Assist System (APA) & Parking Radar System(12-Radar) Circuit Diagram

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Suspected Area
Panoramic view monitor system (AVM) operate abnormally	Radar sensor
	Panoramic View Monitor Control Module (AVM)
	Audio head unit
	Wire harness fault
	Fuse
	Camera
	Auxiliary fascia console switch
CAN network failure	Fuse
	Wire harness fault
	Central gateway (CGW)
	Panoramic View Monitor Control Module (AVM)

Reversing Radar Module (RADAR) Terminal List



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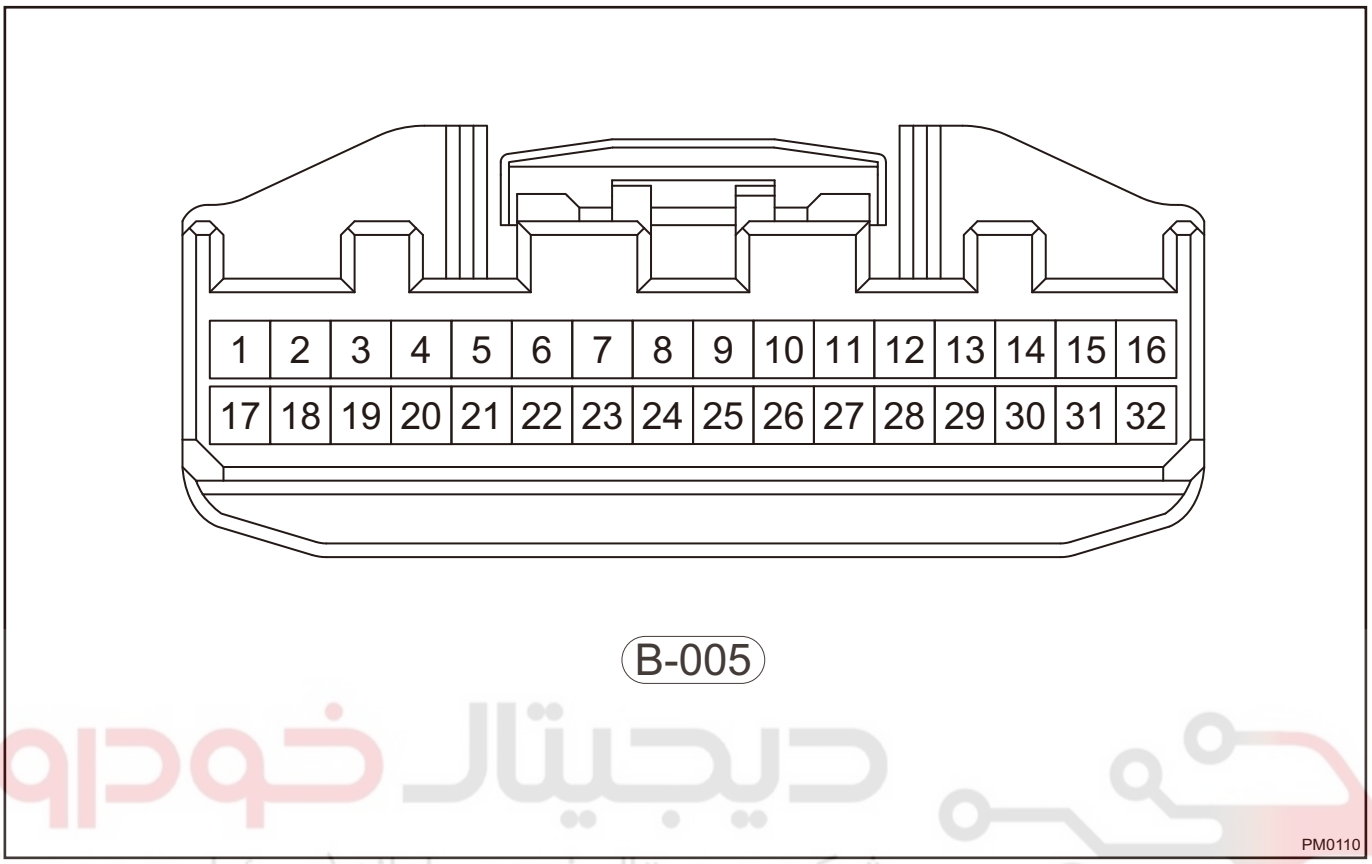
Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
1	\	9	\
2	\	10	\
3	Radar Control Module Power Supply	11	Sensor Power Supply
4	\	12	Sensor Ground
5	CAN2-H	13	CAN2-L
6	\	14	Ground
7	Rear Left Radar Sensor Signal	15	Rear Right Radar Sensor Signal
8	Rear Center Radar Sensor Signal	16	Ground

Panoramic View Monitor Control Module (AVM) Terminal List



Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
1	APA Indicator	17	APA Switch
2	PDC Indicator	18	PDC Switch
3	Rear Sensor Ground	19	Rear Sensor Power Supply
4	Rear Right Side Sensor Signal	20	Rear Left Side Sensor Signal
5	Rear Left Sensor Signal	21	Rear Left Center Sensor Signal
6	Rear Right Center Sensor Signal	22	Rear Right Sensor Signal
7	Front Sensor Ground	23	Front Sensor Power Supply
8	Front Right Side Sensor Signal	24	Front Left Side Sensor Power Supply
9	Front Left Sensor Signal	25	Front Left Center Sensor Signal
10	Front Right Center Sensor Signal	26	Front Right Sensor Signal
11	\	27	AVM Switch
12	\	28	\
13	B CAN-L	29	B CAN-H
14	C CAN-L	30	C CAN-H
15	\	31	IGN
16	Ground	32	Power Supply

Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition
B1A20-13	AVM Left Camera LVDS Cable Open
B1A21-13	AVM Rear Camera LVDS Cable Open
B1A22-13	AVM Left Camera LVDS Cable Open
B1A23-13	AVM Right Camera LVDS Cable Open
B1A20-11	AVM Front Camera Power Short to Ground
B1A20-12	AVM Front Camera Power Short to Battery
B1A21-11	AVM Rear Camera Power Short to Ground
B1A21-12	AVM Rear Camera Power Short to Battery
B1A22-11	AVM Left Camera Power Short to Ground
B1A22-12	AVM Left Camera Power Short to Battery
B1A23-11	AVM Right Camera Power Short to Ground
B1A23-12	AVM Right Camera Power Short to Battery
B1A24-04	AVM ECU Trouble
B1A25-17	Control Module Input Power High
B1A25-16	Control Module Input Power Low
B1A26-54	AVM No Calibration
B1A27-71	AVM On/Off Switch Mechanical Adhesion
B1A28-71	APS On/Off Switch Mechanical Adhesion
B1A28-96	APS Function Indicator Light Circuit Failure
B1A29-71	PDC On/Off Switch Mechanical Adhesion
B1A29-96	PDC Function Indicator Light Circuit Failure
B1A3009	Rear Right Side Long Distance Ultrasonic Sensor Hardware Fault
B1A3109	Rear Right Lateral Ultrasonic Sensor Hardware Fault
B1A3209	Rear Right Ultrasonic Sensor Hardware Fault
B1A3309	Rear Left Ultrasonic Sensor Hardware Fault
B1A3409	Rear Left Lateral Ultrasonic Sensor Hardware Fault
B1A3509	Rear Left Side Long Distance Ultrasonic Sensor Hardware Fault
B1A3609	Front Right Side Long Distance Ultrasonic Sensor Hardware Fault
B1A3709	Front Right Lateral Ultrasonic Sensor Hardware Fault
B1A3809	Front Right Ultrasonic Sensor Hardware Fault
B1A3909	Front Left Ultrasonic Sensor Hardware Fault
B1A3A09	Front Left Lateral Ultrasonic Sensor Hardware Fault
B1A3B09	Front Left Side Long Distance Ultrasonic Sensor Hardware Fault
B1A3096	Rear Right Side Long Distance Ultrasonic Sensor Probe Failure
B1A3196	Rear Right Lateral Ultrasonic Sensor Probe Failure
B1A3296	Rear Right Ultrasonic Sensor Probe Failure
B1A3396	Rear Left Ultrasonic Sensor Probe Failure
B1A3496	Rear Left Lateral Ultrasonic Sensor Probe Failure
B1A3596	Rear Left Side Long Distance Ultrasonic Sensor Probe Failure
B1A3696	Front Right Side Long Distance Ultrasonic Sensor Probe Failure
B1A3796	Front Right Lateral Ultrasonic Sensor Probe Failure
B1A3896	Front Right Ultrasonic Sensor Probe Failure
B1A3996	Front Left Ultrasonic Sensor Probe Failure
B1A3A96	Front Left Lateral Ultrasonic Sensor Probe Failure
B1A3B96	Front Left Side Long Distance Ultrasonic Sensor Probe Failure
U0140-87	Lost Communication With BCM
U015587	Lost Communication With ICM

DTC	DTC Definition
U0126-87	Lost Communication With SAM
U0245-87	Lost Communication With MMI (RRM)
U0101-87	Lost Communication With TCU
U0100-87	Lost Communication With EMS
U0129-87	Lost Communication With ESC
U0131-87	Lost Communication With EPS
U0164-87	Lost Communication With CLM
U007388	Body CAN BusOff Error
U100588	Chassis CAN BusOff Error

DTC	B1A25-17	Control Module Input Power High

DTC	B1A25-16	Control Module Input Power Low

Description

DTC	DTC Definition	Possible Cause
B1A25-17	Control Module Input Power High	Battery Panoramic view monitor control module (AVM) Wire harness fault
B1A25-16	Control Module Input Power Low	

1	Check battery voltage

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Check battery voltage with a digital multimeter (not less than 12 V).

Result

Result	Go to
OK	B
NG	A

A → **Replace battery**

B →

2	Check charging system

(a) Turn ENGINE START STOP switch to OFF.
(b) Check positive and negative battery cables for broken or damage.
(c) Turn ENGINE START STOP switch to ON.
(d) Start the engine.
(e) Check if voltage of positive and negative battery is normal with a digital multimeter (13.5V-14.8V).

Result

Result	Go to
OK	B
NG	A

A → **Repair or replace positive and negative cables and alternator**

B →

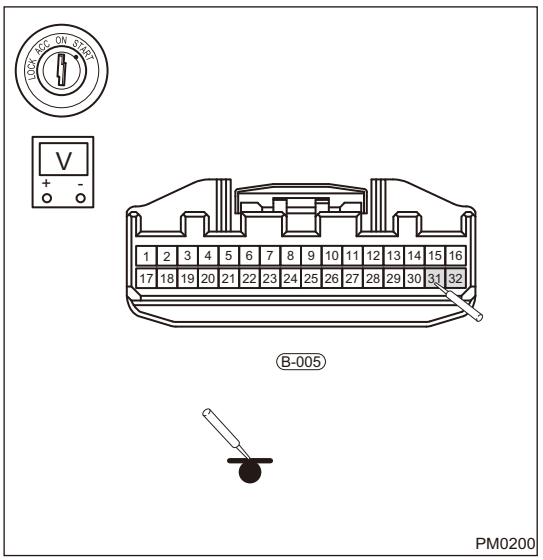
3	Check AVM module power supply wire harness

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the AVM connector B-005.
(c) Turn ENGINE START STOP switch to ON.

(d) Using a digital multimeter, check if the voltage between terminal B-005 (32), (31) and body ground is normal.

Standard Condition

Multimeter Connection	Condition	Specified Condition
B-005 (32) - Body ground	Always	Not less than 12 V
B-005 (31) - Body ground	Always	Not less than 12 V



Result

Result	Go to
OK	B
NG	A

A → **Repair or replace wire harness**

B

4	Check AVM module ground circuit

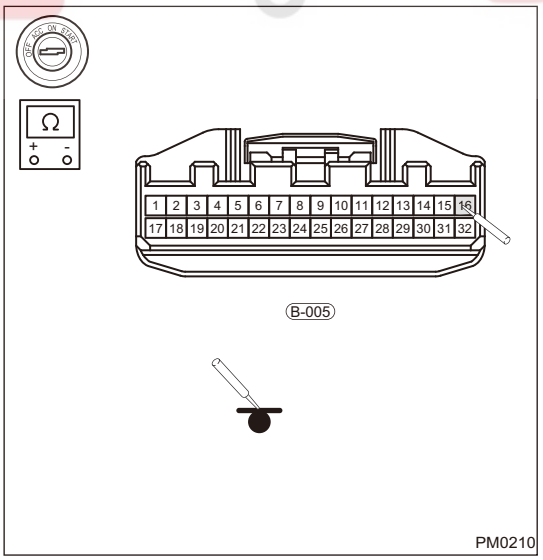
(a) Turn ENGINE START STOP switch to OFF.

(b) Disconnect the AVM connector B-005.

(c) Using a digital multimeter, check for continuity between B-005 (16) and body ground to check ground circuit for open.

Standard Condition

Multimeter Connection	Condition	Specified Condition
B-005 (16) - Body ground	Always	⩽ 1 Ω

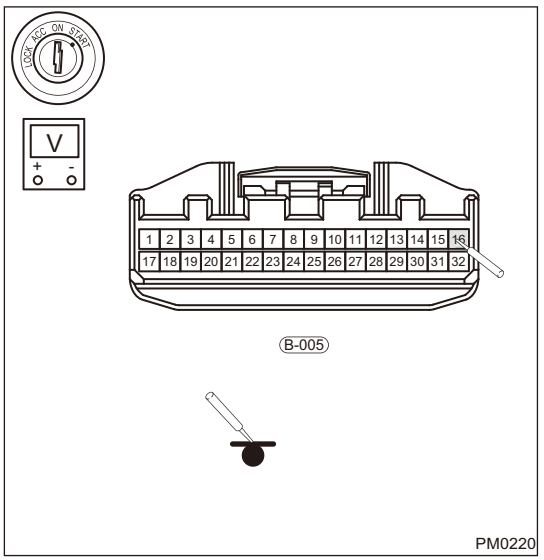


(d) Turn ENGINE START STOP switch to ON.

(e) Using voltage band of digital multimeter, measure voltage between B-005 (16) and body ground to check for short to power supply.

Standard Condition

Multimeter Connection	Condition	Specified Condition
B-005 (16) - Body ground	Always	0V



Result

Result	Go to
OK	B
NG	A

B → **Replace AVM module**

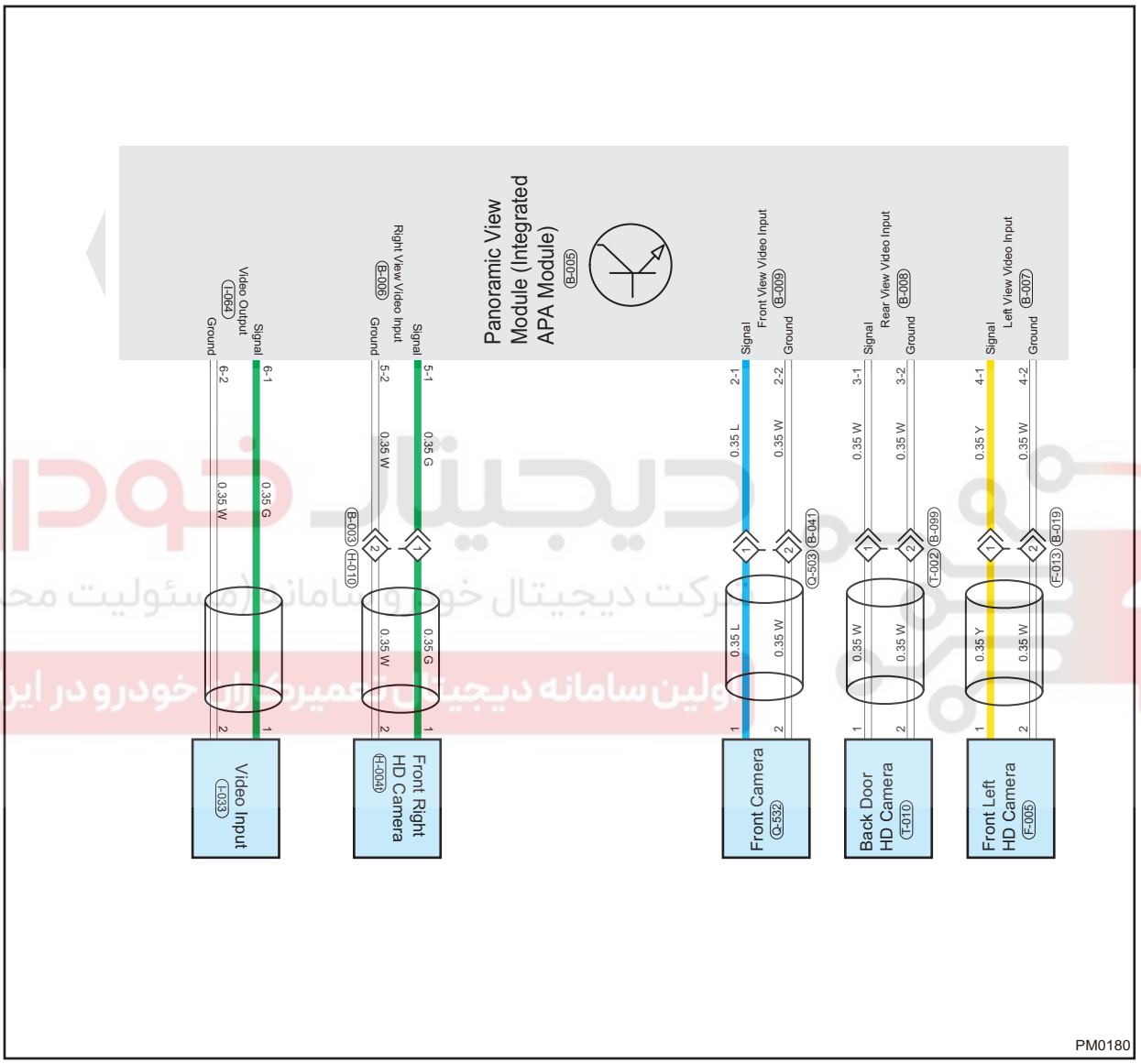
A → **Replace wire harness**

DTC	B1A20-13	AVM Left Camera LVDS Cable Open

DTC	B1A20-11	AVM Front Camera Power Short to Ground

DTC	B1A20-12	AVM Front Camera Power Short to Battery

Circuit Diagram



49

Description

DTC	DTC Definition	Possible Cause
B1A20-13	AVM Left Camera LVDS Cable Open	• Camera • Wire harness
B1A20-11	AVM Front Camera Power Short to Ground	
B1A20-12	AVM Front Camera Power Short to Battery	

1	Replace camera with a new one

(a) Turn ENGINE START STOP switch to OFF.

(b) Replace front camera with a new one, connect negative battery cable, and turn ENGINE START STOP switch to ON. Start panoramic view monitor system and observe if the camera is working properly.

Result

Result	Go to
OK	B
NG	A

B → **Replace front camera**

A

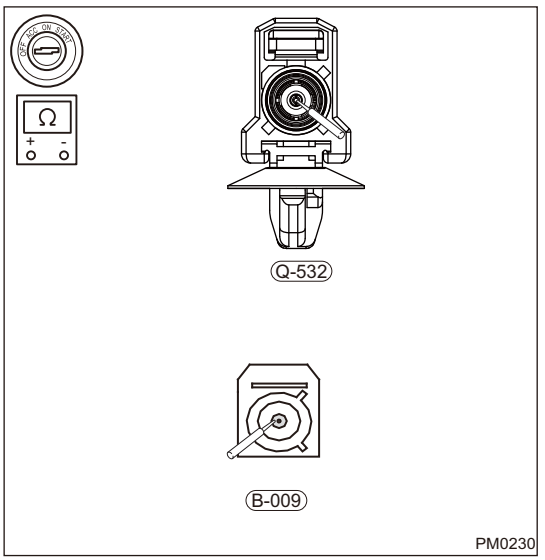
2	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the AVM connector B-009.
(c) Disconnect the front camera connector Q-532.

(d) Using ohm band of multimeter, check for continuity between B-009 (2-1) and Q-532 (1).

Standard Condition

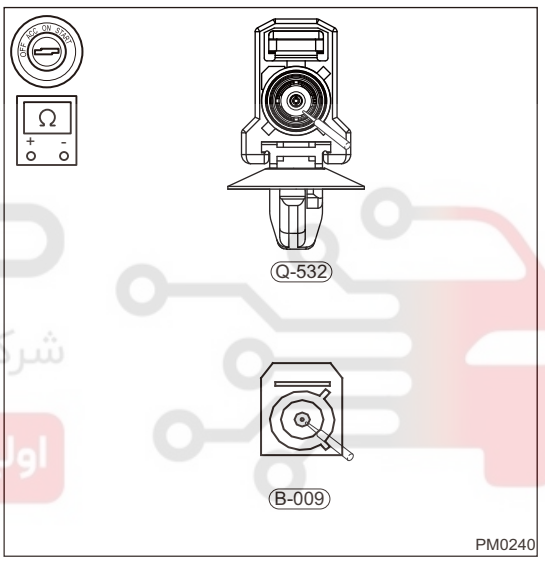
Multimeter Connection	Condition	Specified Condition
B-009 (2-1) - Q-532 (1)	Always	⩽ 1 Ω



(e) Using ohm band of multimeter, check for continuity between B-009 (2-2) and Q-532 (2).

Standard Condition

Multimeter Connection	Condition	Specified Condition
B-009 (2-2) - Q-532 (2)	Always	⩽ 1 Ω



Result

Result	Go to
OK	B
NG	A

A → **Repair or replace wire harness and connector**

B

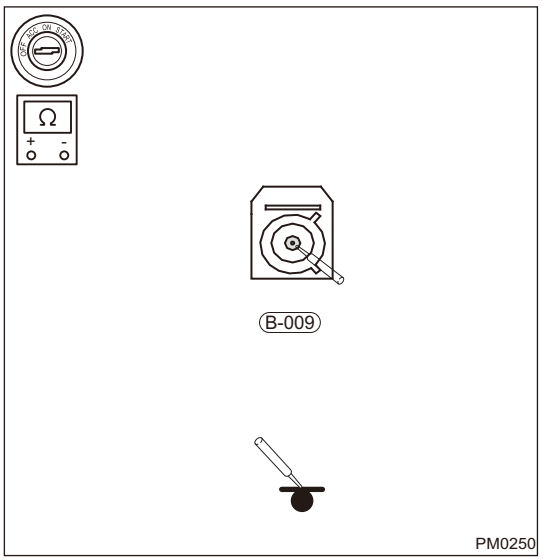
3	Check for short to ground in wire harness or connector

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.
(b) Disconnect the AVM connector B-009.
(c) Disconnect the front camera connector Q-532.

(d) Using ohm band of multimeter, check for continuity between B-009 (2-1) and body ground, B-009 (2-2) and body ground separately.

Standard Condition

Multimeter Connection	Condition	Normal Condition
B-009 (2-1) - Body ground	Always	No continuity
B-009 (2-2) - Body ground	Always	No continuity



Result

Result	Go to
OK	B
NG	A

B → **Replace AVM module**

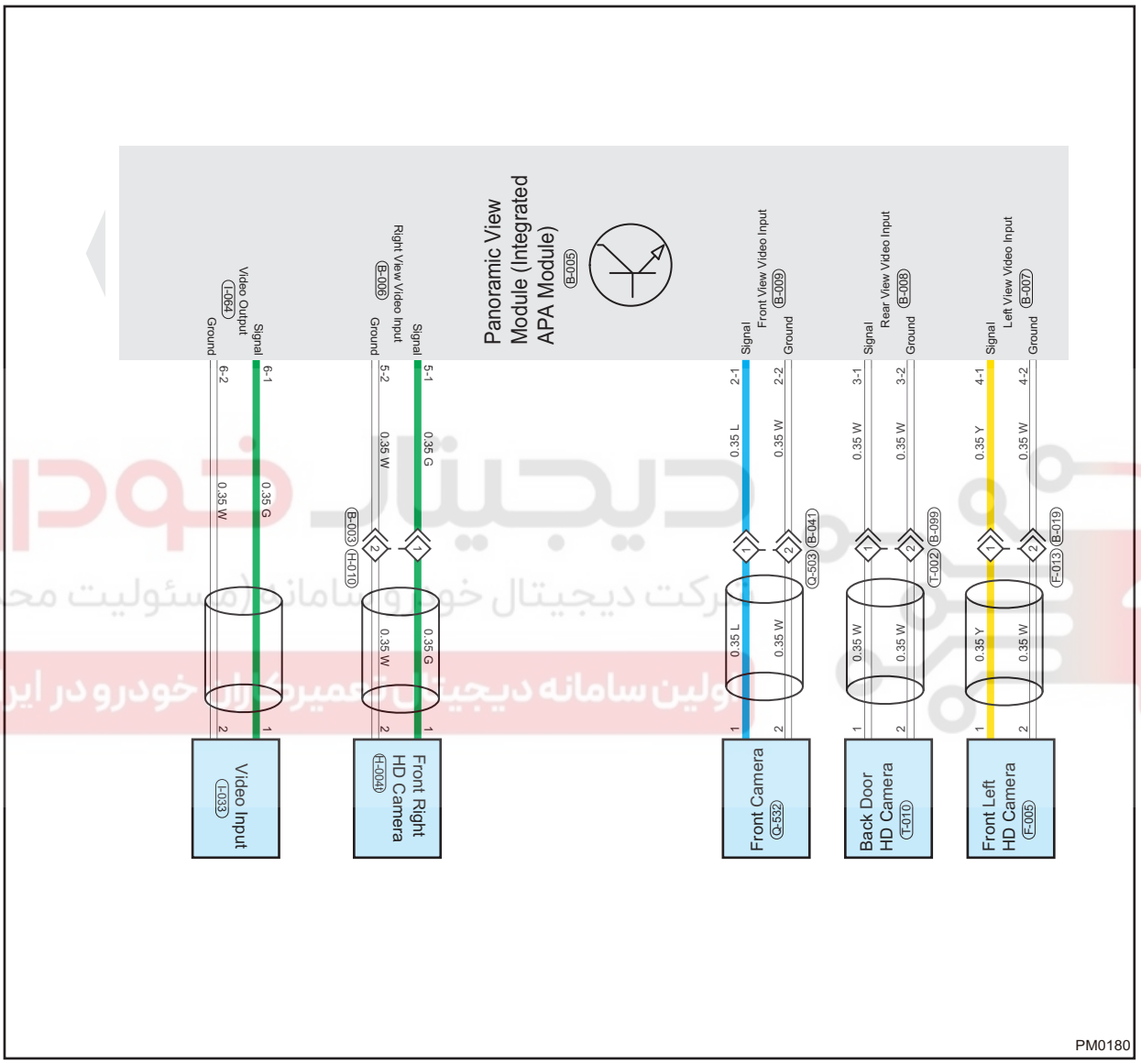
A → **Repair or replace connector or wire harness that is shorted to ground**

DTC	B1A21-13	AVM Rear Camera LVDS Cable Open

DTC	B1A21-11	AVM Rear Camera Power Short to Ground

DTC	B1A21-12	AVM Rear Camera Power Short to Battery

Circuit Diagram



49

Description

DTC	DTC Definition	Possible Cause
B1A21-13	AVM Rear Camera LVDS Cable Open	Camera Wire harness
B1A21-11	AVM Rear Camera Power Short to Ground	
B1A21-12	AVM Rear Camera Power Short to Battery	

1	Check rear camera

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.

(b) Replace rear camera with a new one, connect negative battery cable, and turn ENGINE START STOP switch to ON. Start panoramic view monitor system and observe if the camera is working properly.

Result

Result	Go to
OK	B
NG	A

B → **Replace rear camera**

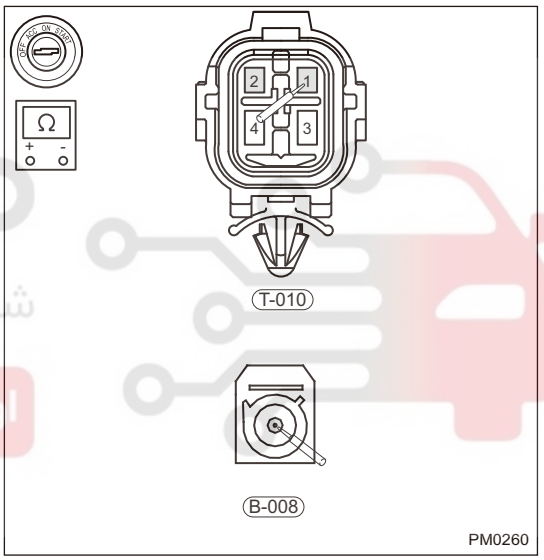
A

2	Check wire harness and connector

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.
(b) Disconnect the AVM connector B-008.
(c) Disconnect the rear camera connector T-010.
(d) Using ohm band of multimeter, check for continuity between B-008 (3-1) and T-010 (1), B-008 (3-2) and T-010 (2) separately.

Standard Condition

Multimeter Connection	Condition	Normal Condition
B-008 (3-1) - T-010 (1)	Always	⩽ 1 Ω
B-008 (3-2) - T-010 (2)	Always	⩽ 1 Ω



Result

Result	Go to
OK	B
NG	A

A → **Repair or replace wire harness and connector**

B

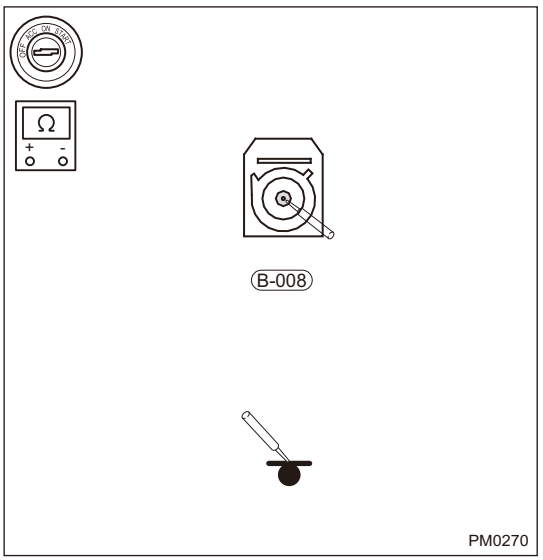
3	Check for short to ground in wire harness and connector

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.
(b) Disconnect the AVM connector B-008.

(c) Using ohm band of multimeter, check for continuity between B-008 (3-1) and body ground, B-008 (3-2) and body ground separately.

Standard Condition

Multimeter Connection	Condition	Normal Condition
B-008 (3-1) - Body ground	Always	∞
B-008 (3-2) - Body ground	Always	∞



Result

Result	Go to
OK	B
NG	A

B → **Replace AVM module**

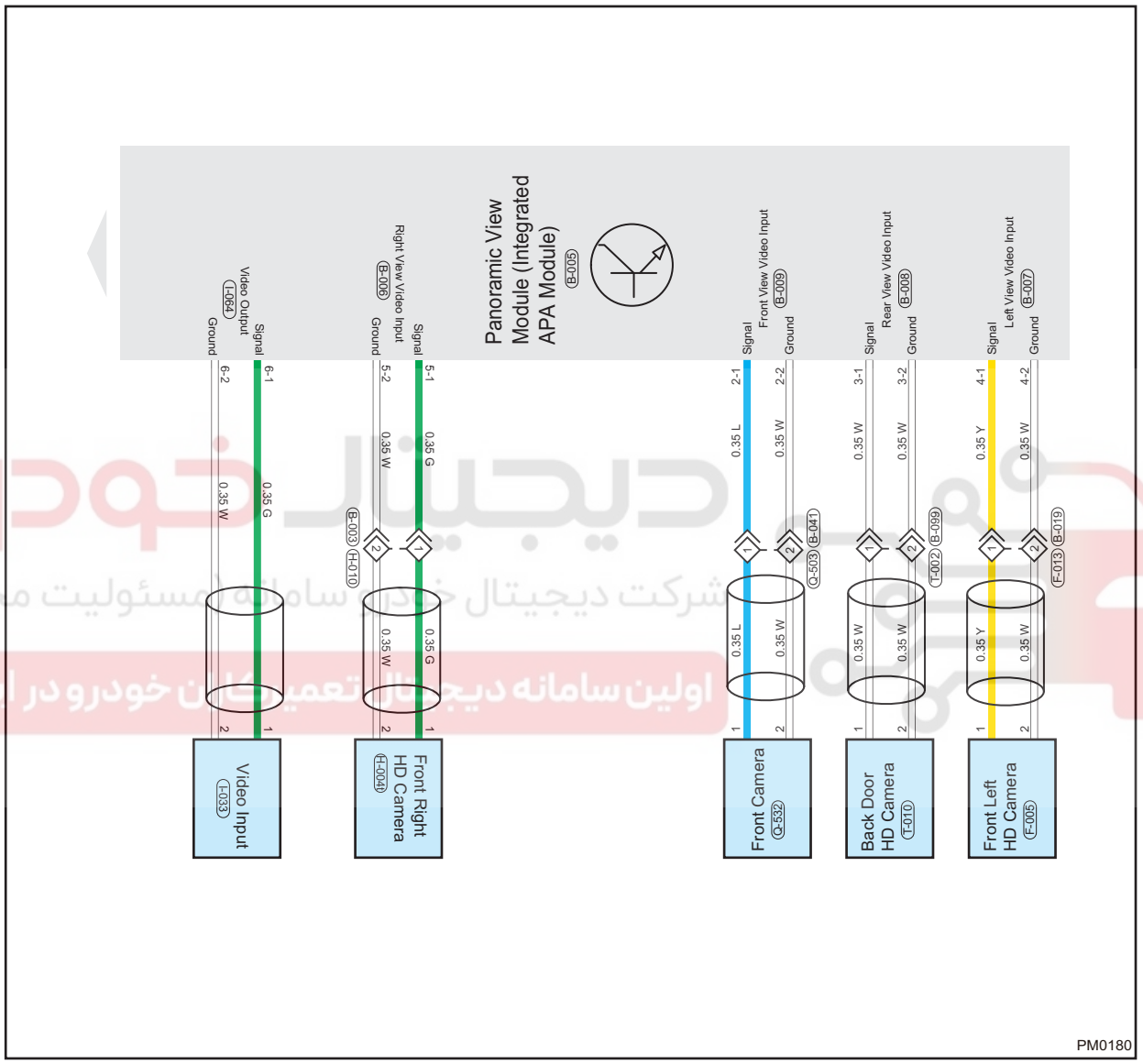
A → **Repair or replace connector or wire harness that is shorted to ground**

DTC	B1A22-13	AVM Left Camera LVDS Cable Open

DTC	B1A22-11	AVM Left Camera Power Short to Ground

DTC	B1A22-12	AVM Left Camera Power Short to Battery

Circuit Diagram



Description

DTC	DTC Definition	Possible Cause
B1A22-13	AVM Left Camera LVDS Cable Open	Wire harness, camera
B1A22-11	AVM Left Camera Power Short to Ground	
B1A22-12	AVM Left Camera Power Short to Battery	

1	Check left camera

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.

(b) Replace left camera with a new one, connect negative battery cable, and turn ENGINE START STOP switch to ON. Start panoramic view monitor system and observe if the camera is working properly.

Result

Result	Go to
OK	B
NG	A

B → **Replace left camera**

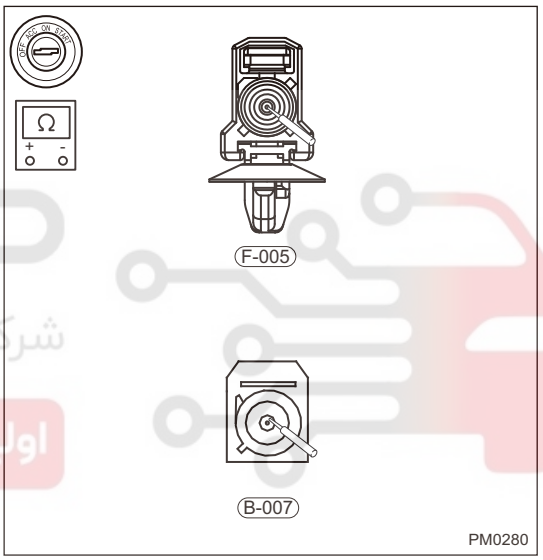
A

2	Check for open in wire harness and connector

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.
(b) Disconnect the AVM connector B-007.
(c) Disconnect the left camera connector F-005.
(d) Using ohm band of multimeter, check for continuity between B-007(4-1) and F-005(1), B-007(4-2) and F-005(2) separately.

Standard Condition

Multimeter Connection	Condition	Normal Condition
B-007 (4-1) - F-005 (1)	Always	⩽ 1 Ω
B-007 (4-2) - F-005 (2)	Always	⩽ 1 Ω



Result

Result	Go to
OK	B
NG	A

A → **Repair or replace wire harness and connector**

B

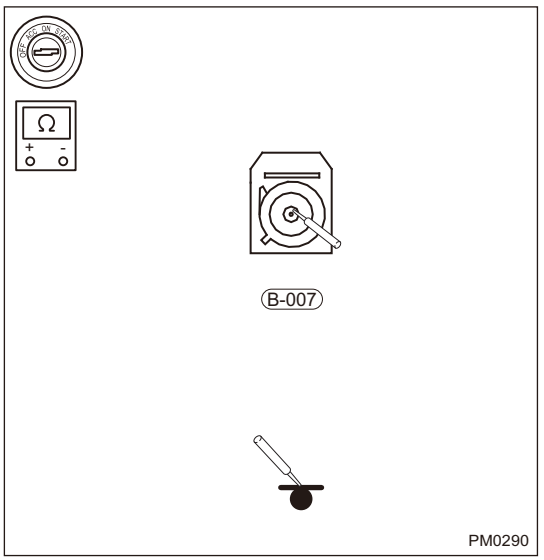
3	Check for short to ground in wire harness or connector

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.
(b) Disconnect the AVM connector B-007.

(c) Using ohm band of multimeter, check for continuity between B-007(4-1) and ground, B-007(4-2) and ground separately.

Standard Condition

Multimeter Connection	Condition	Normal Condition
B-007 (4-1) - Ground	Always	∞
B-007 (4-2) - Ground	Always	∞



Result

Result	Go to
OK	B
NG	A

A → **Repair or replace connector or wire harness that is shorted to ground**

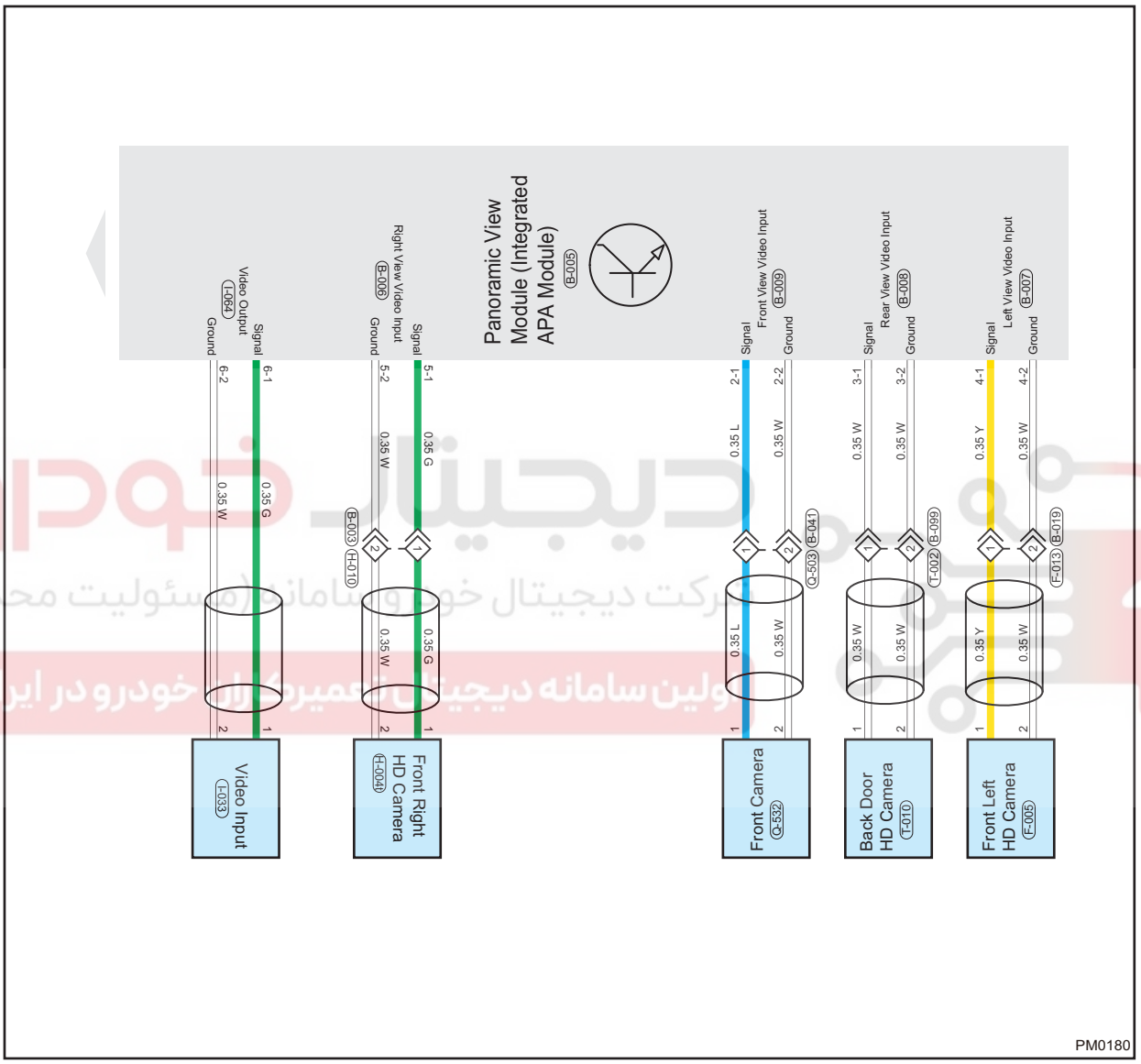
B → **Replace AVM module**

DTC	B1A23-13	AVM Right Camera LVDS Cable Open

DTC	B1A23-11	AVM Right Camera Power Short to Ground

DTC	B1A23-12	AVM Right Camera Power Short to Battery

Circuit Diagram



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Description

DTC	DTC Definition	Possible Cause
B1A23-13	AVM Right Camera LVDS Cable Open	Wire harness, camera
B1A23-11	AVM Right Camera Power Short to Ground	
B1A23-12	AVM Right Camera Power Short to Battery	

1	Check right camera

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.

(b) Replace right camera with a new one, connect negative battery cable, and turn ENGINE START STOP switch to ON. Start panoramic view monitor system and observe if the camera is working properly.

Result

Result	Go to
OK	B
NG	A

B → **Replace right camera**

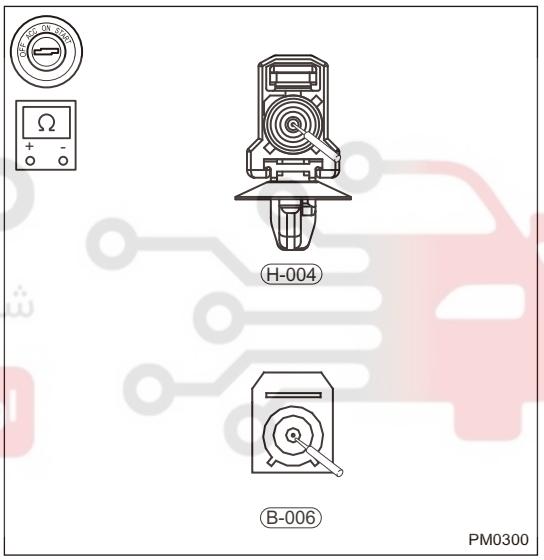
A

2	Check for open in wire harness and connector

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.
(b) Disconnect the AVM connector B-006.
(c) Disconnect the right camera connector H-004.
(d) Using ohm band of multimeter, check for continuity between B-006 (5-1) and H-004 (1), B-006 (5-2) and H-004 (2) separately.

Standard Condition

Multimeter Connection	Condition	Normal Condition
B-006 (5-1) - H-004 (1)	Always	⩽ 1 Ω
B-006 (5-2) - H-004 (2)	Always	⩽ 1 Ω



Result

Result	Go to
OK	B
NG	A

A → **Repair or replace wire harness and connector**

B

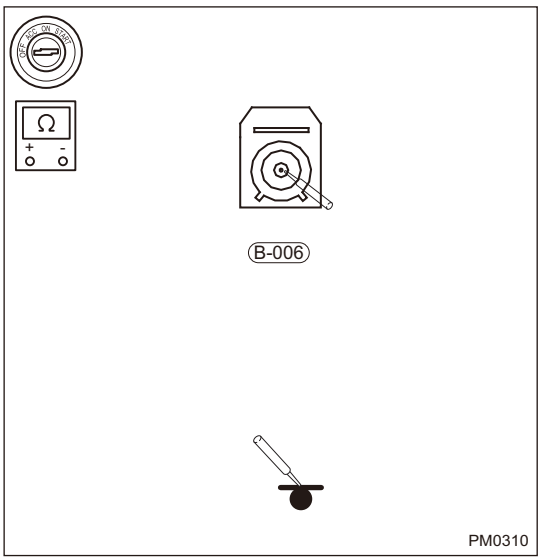
3	Check for short to ground in wire harness or connector

(a) Turn ENGINE START STOP switch to OFF, disconnect the negative battery cable.
(b) Disconnect the AVM connector B-006.

(c) Using ohm band of multimeter, check for continuity between B-006 (5-1) and body ground, B-006 (5-2) and body ground separately.

Standard Condition

Multimeter Connection	Condition	Normal Condition
B-006 (5-1) - Body ground	Always	∞
B-006 (5-2) - Body ground	Always	∞



Result

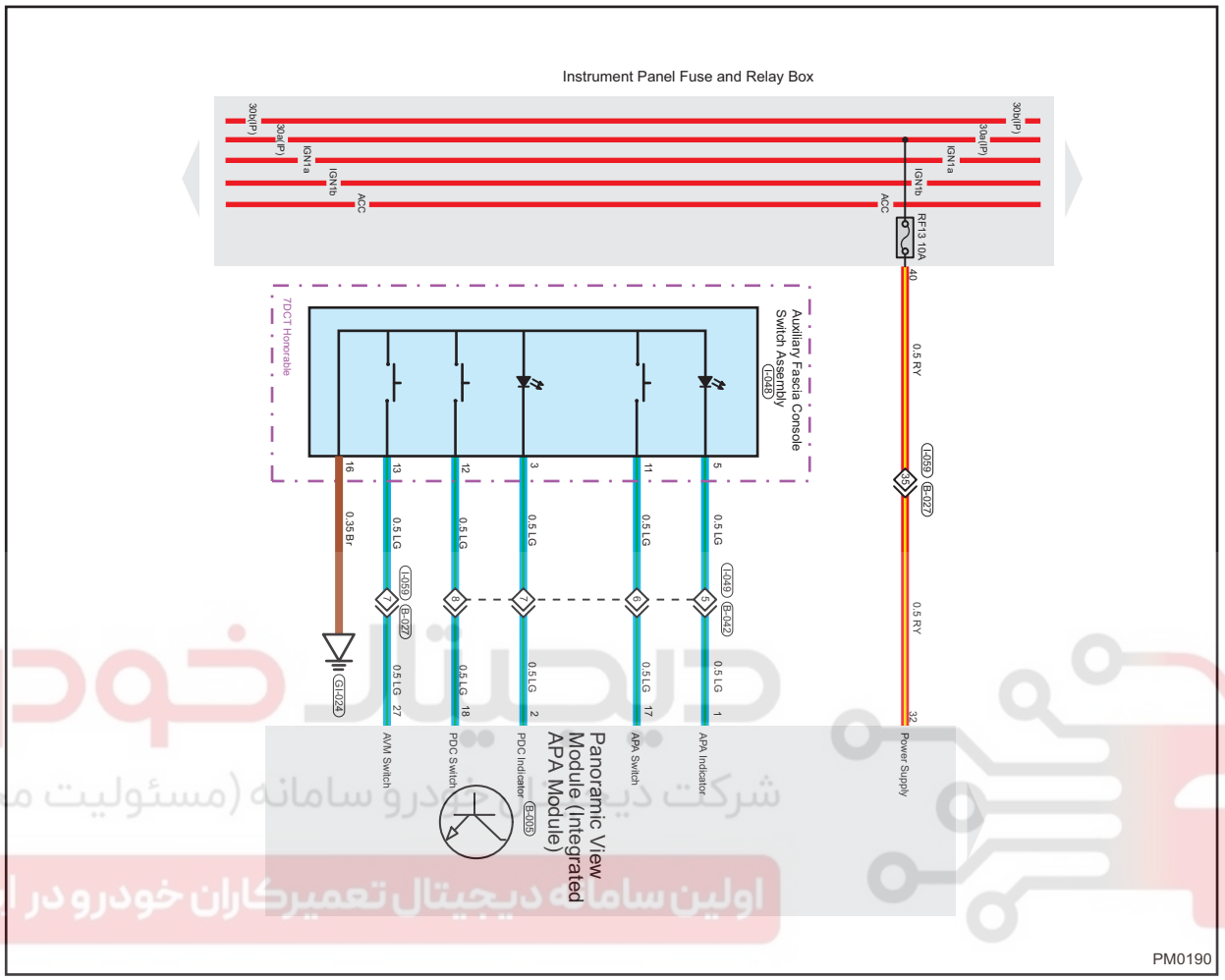
Result	Go to
OK	B
NG	A

A → **Repair or replace connector or wire harness that is shorted to ground**

B → **Replace AVM module**

DTC	B1A27-71	AVM On/Off Switch Mechanical Adhesion

Circuit Diagram



Description

DTC	DTC Definition	Possible Cause
B1A27-71	AVM On/Off Switch Mechanical Adhesion	AVM module Switch

1	Replace AVM switch with a new one

(a) Turn ENGINE START STOP switch to OFF.
(b) Remove the old AVM switch.
(c) Install new switch and perform running test.

Result

Result	Go to
OK	B
NG	A

B → **Replace AVM switch**

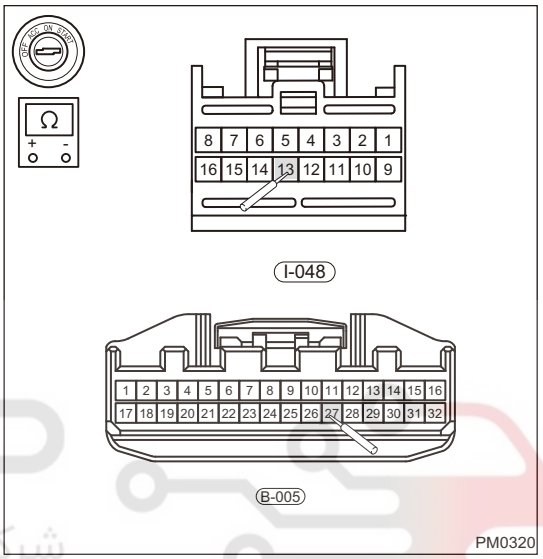
A

2	Check wire harness for open or short

(a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the AVM connector B-005.
(d) Disconnect the auxiliary fascia console switch connector I-048.
(e) Check if wire harnesses are worn, pierced, pinched or partially broken.
(f) Check for broken, bent, protruded or corroded terminals.
(g) Check if related connector pins are in good condition.
(h) Using ohm band of digital multimeter, check for continuity between B-005 (27) and I-048 (13) to check circuit for open.

Standard Condition

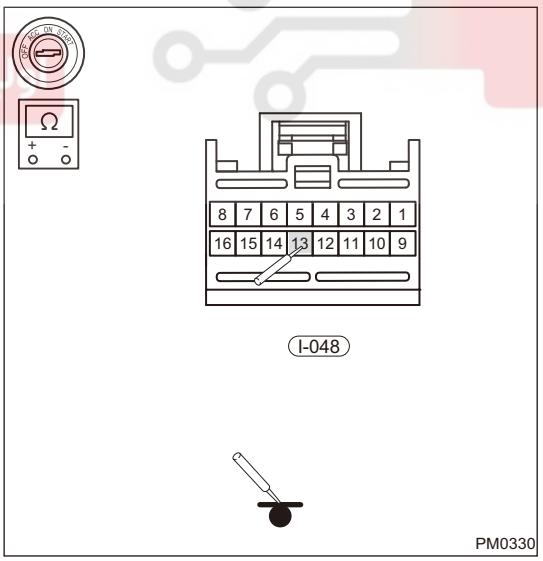
Multimeter Connection	Condition	Specified Condition
B-005 (27) - I-048 (13)	Always	⩽ 1 Ω



(i) Using ohm band of digital multimeter, check for continuity between I-048 (13) and body ground to check instrument panel wire harness for short to ground.

Standard Condition

Multimeter Connection	Condition	Specified Condition
I-048 (13) - Body ground	Always	No continuity



Result

Result	Go to
OK	B
NG	A

B	Replace AVM module
A	Replace wire harness

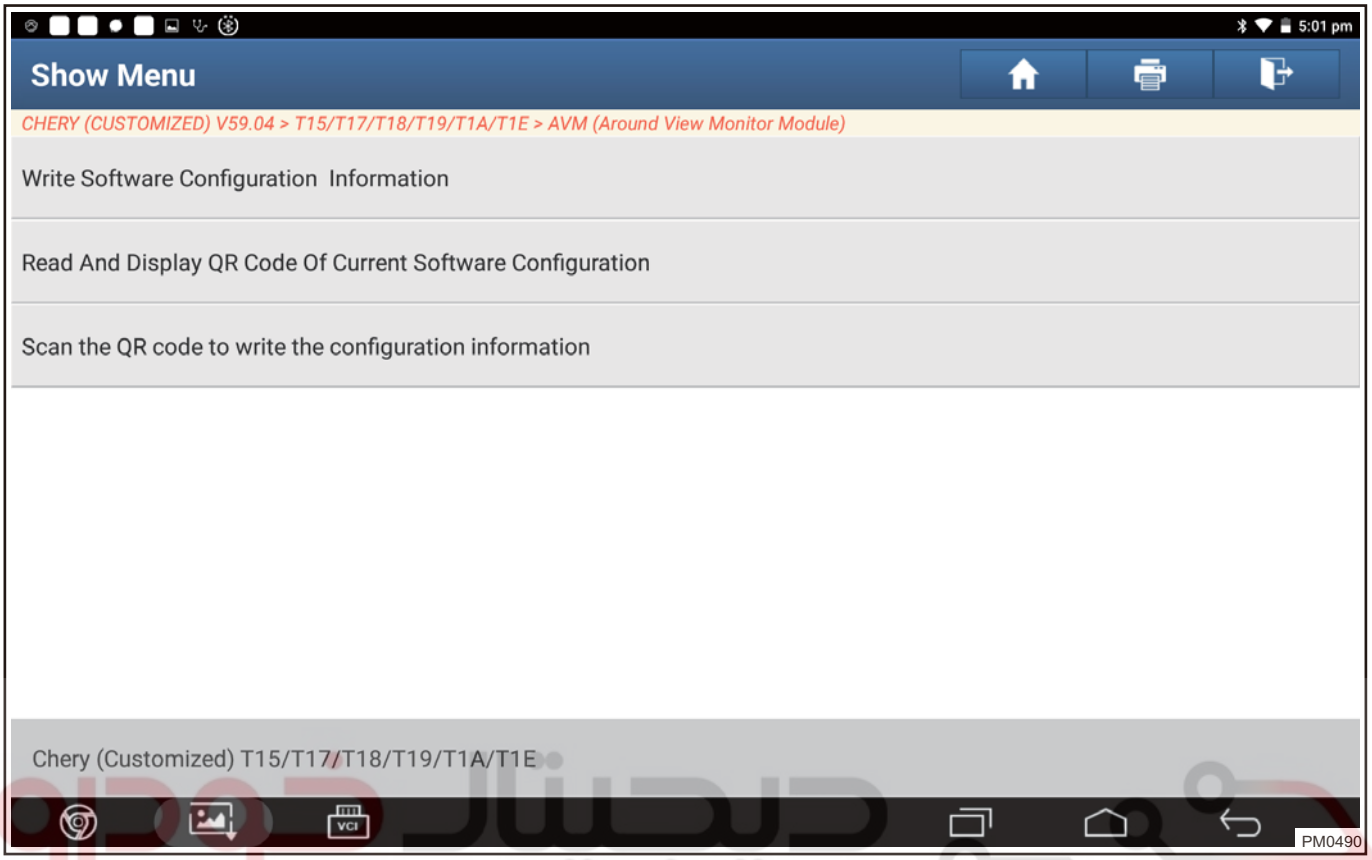
DTC	U0140-87	Lost Communication With BCM
DTC	U015587	Lost Communication With ICM
DTC	U0126-87	Lost Communication With SAM
DTC	U0245-87	Lost Communication With MMI (RRM)
DTC	U0101-87	Lost Communication With TCU
DTC	U0100-87	Lost Communication With EMS
DTC	U0129-87	Lost Communication With ESC
DTC	U0131-87	Lost Communication With EPS
DTC	U0164-87	Lost Communication With CLM
DTC	U007388	Body CAN BusOff Error
DTC	U100588	Chassis CAN BusOff Error

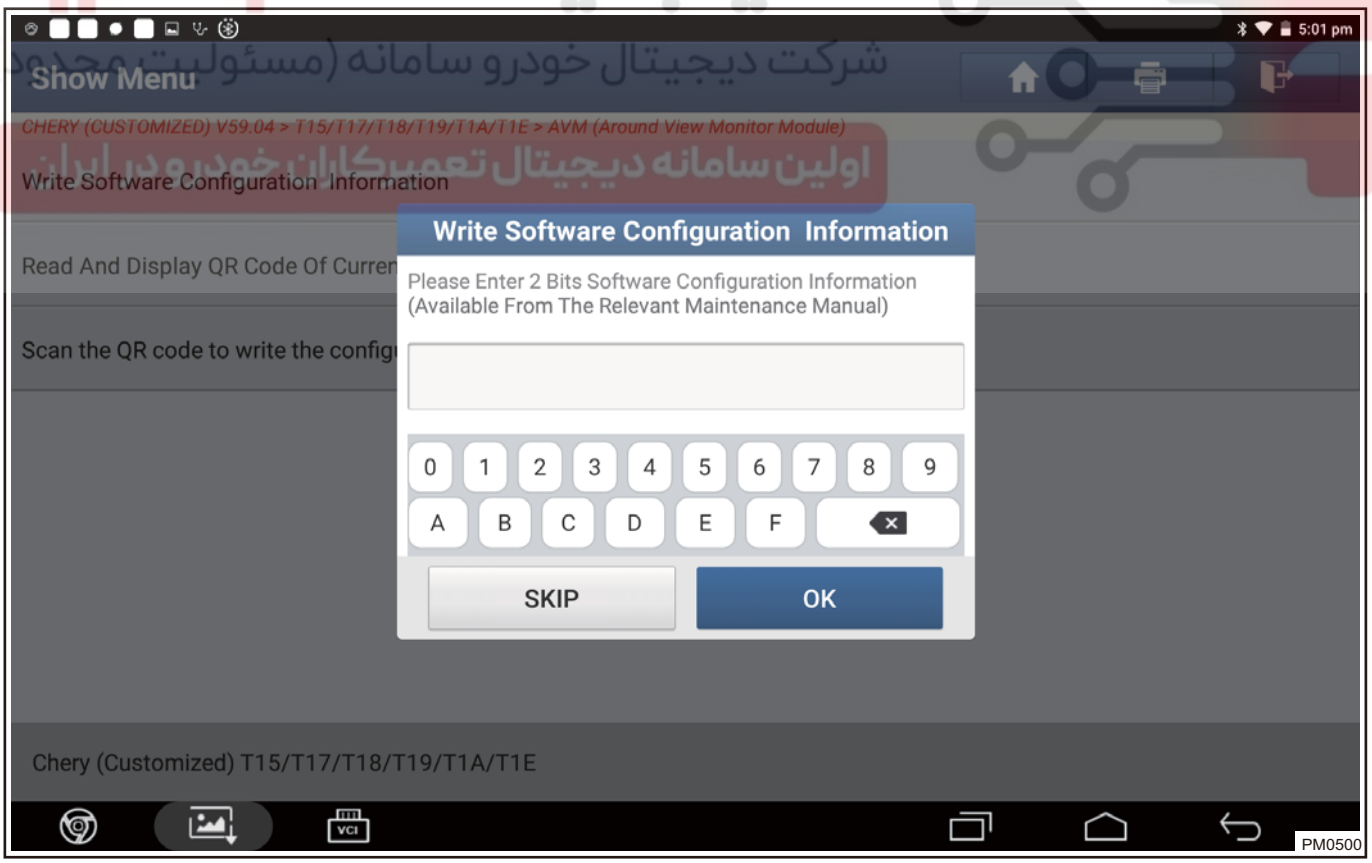
Refer to CAN communication system

Matching Learning

Write Software Configuration Information

1. Click "AVM (Around View Monitor Module)".
2. Click "Special Function".
3. Click "Write Software Configuration Information".


5:01 pm
Show Menu
CHERY (CUSTOMIZED) V59.04 > T15/T17/T18/T19/T1A/T1E > AVM (Around View Monitor Module)
Write Software Configuration Information
Read And Display QR Code Of Current Software Configuration
Scan the QR code to write the configuration information
Chery (Customized) T15/T17/T18/T19/T1A/T1E
VCI
PM0490


5:01 pm
Show Menu
CHERY (CUSTOMIZED) V59.04 > T15/T17/T18/T19/T1A/T1E > AVM (Around View Monitor Module)
Write Software Configuration Information
Read And Display QR Code Of Curren
Scan the QR code to write the config
Write Software Configuration Information
Please Enter 2 Bits Software Configuration Information
(Available From The Relevant Maintenance Manual)
0 1 2 3 4 5 6 7 8 9
A B C D E F
SKIP
OK
Chery (Customized) T15/T17/T18/T19/T1A/T1E
VCI
PM0500

Panoramic Control System Calibration

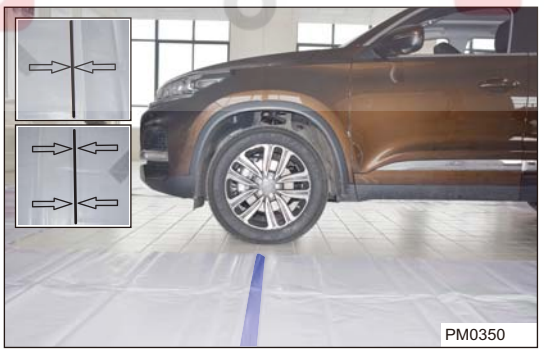
Camera Calibration

1. Situations needs to perform camera calibration:
   - When service station removes or installs camera or rear view mirror with camera.
   - When camera position changes due to vehicle accident.
   - After replacing panoramic view monitor system controller.
   - When removing and installing front and rear bumpers.
2. Calibration method:
   (a) Park vehicle at the fixed location.
   (b) Lay calibration cloth (front and rear sides) at front and rear of vehicle.

   Caution:
   - "Front center" of calibration cloth corresponds to the front side of vehicle.
   - Center line position of calibration cloth should align with the middle position of front and rear of vehicle.


PM0340

   (c) Unfold calibration cloth (left and right sides) and lay it onto both sides of vehicle.
   - Center line corresponds to front left and right wheel positions.
   - Left and right sides and front and rear sides of calibration cloth should be placed in accordance with single and double arrow marks respectively.


PM0350

   (d) Entering calibration mode (calibration function activated).
      (1) With IGN-ON or panoramic view monitor system turned on by pressing AVM switch, press "HOME+NAVI+SET" buttons on the head unit at the same time and then release them, if the operation is valid, audio display will display the screen shown in illustration. "Automatic calibration" is used for production line, and "manual calibration" is used for after-sales calibration.

      Caution:

      The command is valid only when three buttons are pressed at the same time and then released. If the first operation is unsuccessful, repeat the operation several times until above screen prompt appears.
3. Manual calibration process

(a) After entering the manual calibration screen in the previous step, it is necessary to manually calibrate the front, right, rear and left views. Front view calibration operation is taken as an example:

(1) Manually click "front" view (red frame) of panorama view on right side, and 5 square color lumps in the single side view can be seen. The selected color lump is black and unselected color lump is white.

(2) Manually click to select the color lump, and perform adjustment by up, down, left and right buttons (red frame). Adjust the center of color lump to the focus of two triangles, and click " √ " after completing to save.

Caution:

It is necessary to adjust the corresponding red triangle focus for front and rear views, and green triangle focus for left and right views.

(3) According to the previous step, make 5 color lumps correspond to the 5 different triangle focus in illustration respectively, thus the calibration operation of "front" view is completed. Then, perform calibrations for "left", "right" and "rear" views in accordance with the procedures above.

(4) After calibration of 4 directions are completed, it is necessary to observe if panoramic view screen on right side is displayed smoothly without misalignment, which can be determined by lines on calibration cloth. If the line is straight without any misalignment or twist, it is determined that the calibration is OK.

(5) After calibration is confirmed, click "EXIT" button to exit, then select " √ " in the pop-up dialog box to complete the whole calibration operation.

4. Calibration environment requirement

(a) Site requirement

- Calibration site size: About 5.6 m in width and 8.4 m in length, which can accommodate the vehicle driving and calibration cloth laying.

(b) Ground flatness and calibration cloth laying requirement:

- To ensure the calibration effect, calibration site requires the ground as flat as possible, and calibration cloth has no any obvious bumps after laying.
- When laying a calibration cloth, pay attention that it is fully unfolded and laid smoothly, and each piece should be corresponded according to requirement.

(c) Light condition

- There is no special requirement for light environment of calibration site. Make sure each positioning triangle and its focus can be clearly seen during calibration.

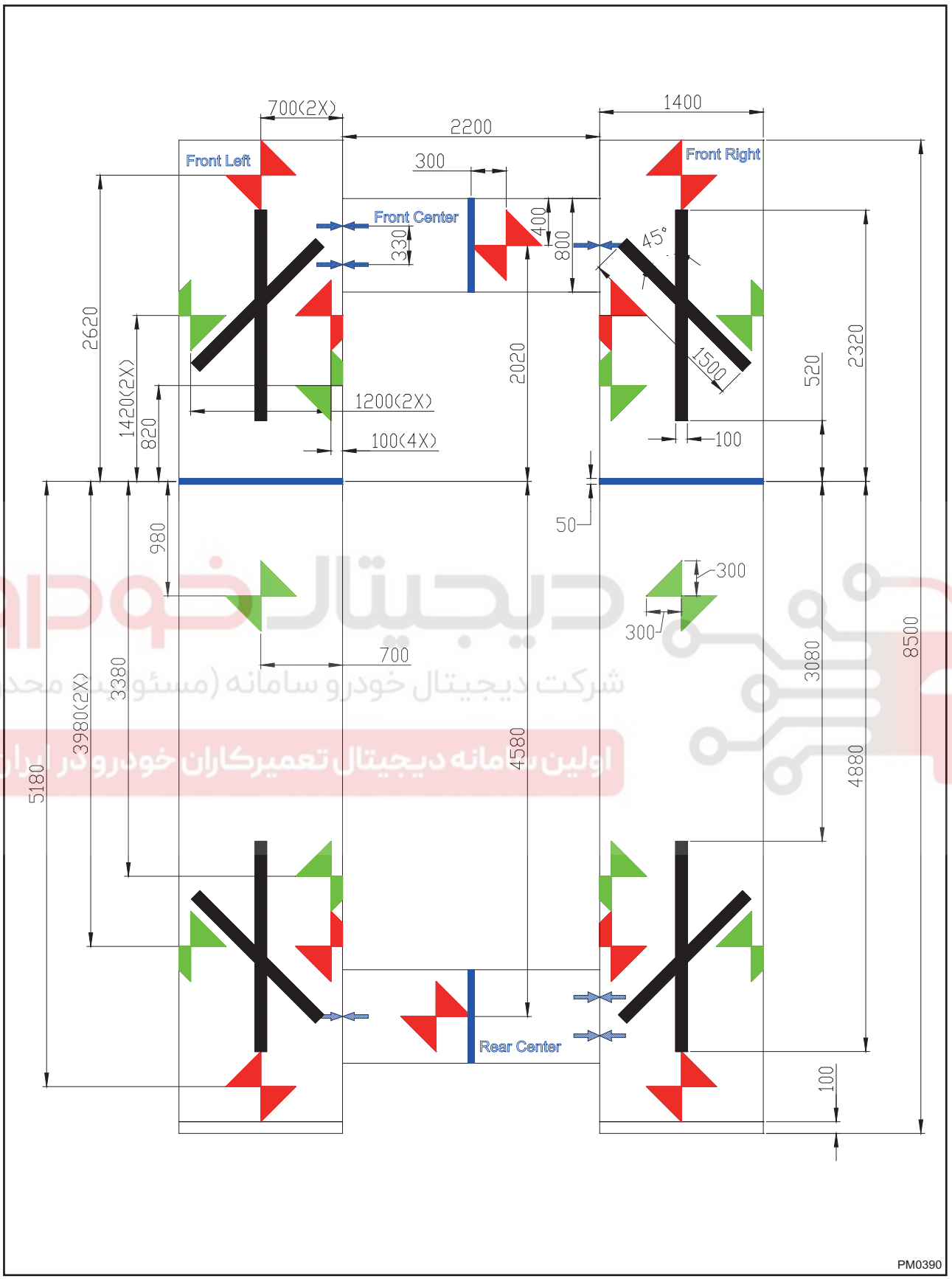
(d) Calibration cloth storage

- Calibration cloth should be rolled up smoothly (with left and right sides separated) after use for safekeeping.

Caution:

If calibration cloth is wet, please dry it and then roll it up. Avoid wrinkles during rolling, so as not to affect the subsequent use.

5. Calibration cloth drawing



Removal & Installation

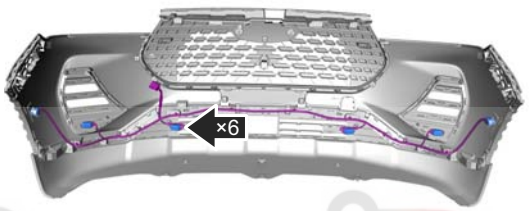
Front Radar Sensor

Removal

Caution:

- Be sure to wear necessary safety equipment to prevent accidents, when removing front radar sensor.
- Operate carefully to avoid damaging front radar sensor, when removing front radar sensor.
- Install connectors in place when installing front radar sensor.
- Check front radar system for proper operation, after installing front radar sensor.
- When installing front radar sensor, align the boss at end of front radar sensor with the slot on front bumper assembly, and then firmly install front radar sensor.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 61-6).
4. Disconnect the front radar sensor connectors.



PM0400

5. Remove the front radar sensor.

Installation

Installation is in the reverse order of removal.

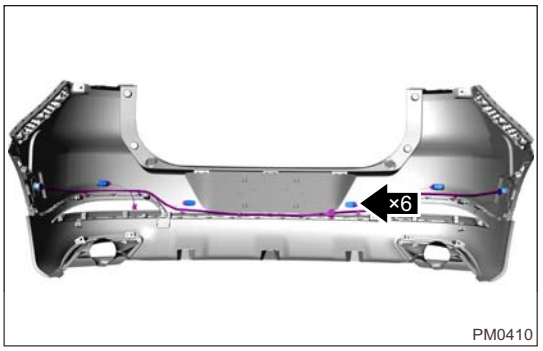
Rear Radar Sensor

Removal

Caution:

- Install connectors in place when installing rear radar sensor.
- Check reversing radar system for proper operation, after installing rear radar sensor.
- Be sure to wear necessary safety equipment to prevent accidents, when removing rear radar sensor.
- Operate carefully to avoid damaging rear radar sensor, when removing rear radar sensor.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the rear bumper assembly (See page 61-6).
4. Disconnect the rear radar sensor connectors.



5. Remove the rear radar sensor.

Installation

Installation is in the reverse order of removal.

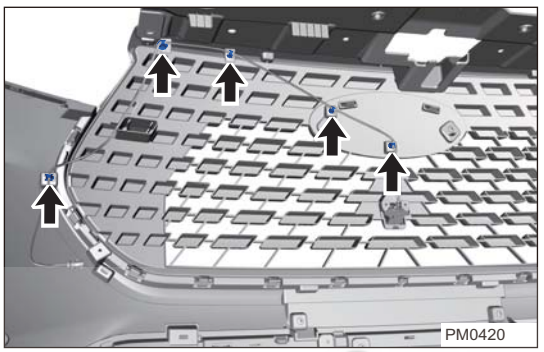
Front Camera Assembly

Removal

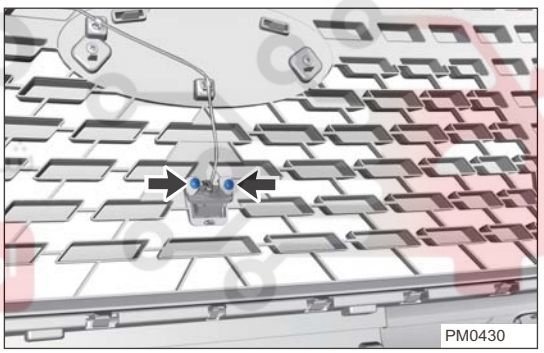
Caution:

- Be sure to wear necessary safety equipment to prevent accidents, when removing front camera assembly.
- Appropriate force should be applied when removing front camera assembly. Be careful not to operate roughly.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper assembly (See page 61-6).
4. Disconnect the front camera connector.
5. Using an interior crow plate, pry off fixing clips from front camera wire harness assembly.



6. Remove 2 fixing screws from front camera.



7. Remove the front camera assembly.

Installation

Installation is in the reverse order of removal.

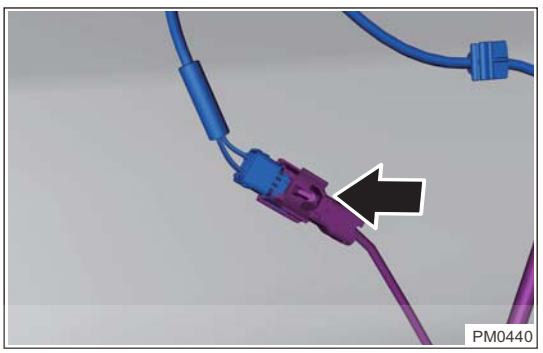
Rear Camera Assembly

Removal

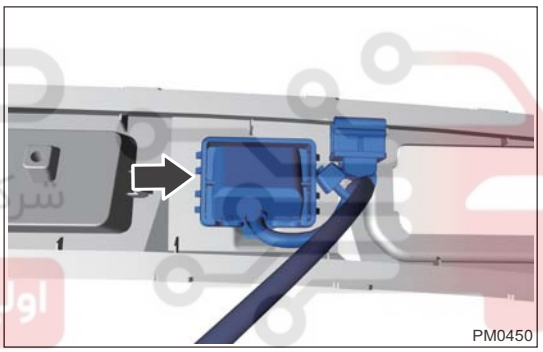
Caution:

- Be sure to wear necessary safety equipment to prevent accidents, when removing rear camera assembly.
- Appropriate force should be applied when removing rear camera assembly. Be careful not to operate roughly.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the back door lower protector assembly.
4. Disconnect the rear camera connector.



5. Reach your hand to the metal plate of back door to take out the camera.



Installation

Installation is in the reverse order of removal.

Left/Right Camera

Removal

Hint:

As left/right camera is installed inside the outside rear view mirror assembly, it must be replaced together with outside rear view mirror assembly when damaged.

Caution:

- Install connector in place and tighten fixing nuts to the specified torque, when installing the outside rear view mirror assembly.
- Make sure the outside rear view mirror assembly can move smoothly, flexibly and reliably after installing.
- After installing outside rear view mirror assembly, it is necessary to perform panoramic image calibration.

1. Remove the outside rear view mirror assembly.

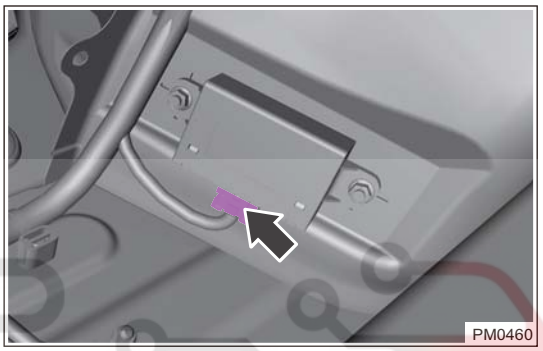
Reversing Radar Module

Removal

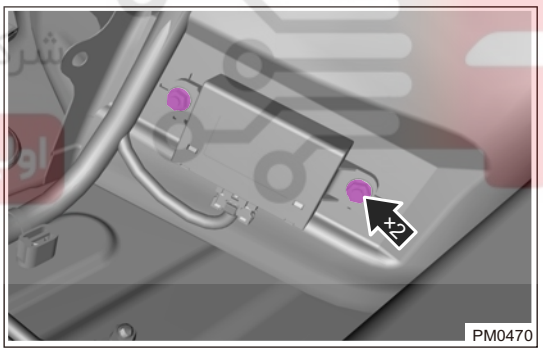
Caution:

- Be sure to wear necessary safety equipment to prevent accidents, when removing reversing radar control module assembly.
- Appropriate force should be applied when removing reversing radar control module assembly. Be careful not to operate roughly.
- Tighten fixing bolts to the specified torque, when installing reversing radar control module assembly.
- Install connector in place when installing reversing radar control module assembly.
- Check reversing radar system for proper operation, after installing reversing radar control module assembly.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the luggage compartment left wheel house assembly.
4. Disconnect the reversing radar module connector.



5. Remove 2 fixing bolts from reversing radar control module assembly.



6. Remove the reversing radar module.

Installation

Installation is in the reverse order of removal.

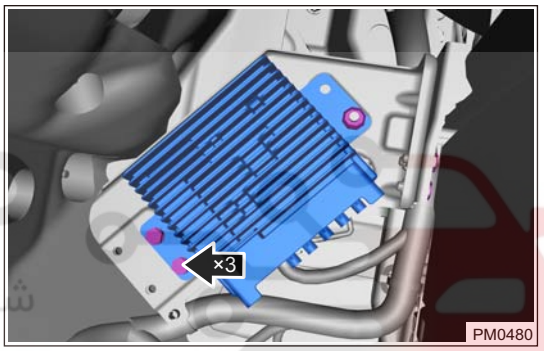
Panoramic Control System Module

Removal

Caution:

- Be sure to wear necessary safety equipment to prevent accidents, when removing panoramic control system module assembly.
- Appropriate force should be applied, when removing panoramic control system module assembly. Be careful not to operate roughly.
- Tighten fixing bolts to the specified torque, when installing panoramic view monitor control module assembly.
- Install connector in place when installing panoramic view monitor control module assembly.
- Check reversing radar system for proper operation, after installing panoramic view monitor control module assembly.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the glove box assembly (See page 58-13).
4. Remove the right soundproof board assembly.
5. Disconnect the panoramic view monitor control module connector.
6. Remove 2 fixing bolts and 1 fixing nut from panoramic view monitor control module.



7. Remove the panoramic view monitor control module.

Installation

Installation is in the reverse order of removal.

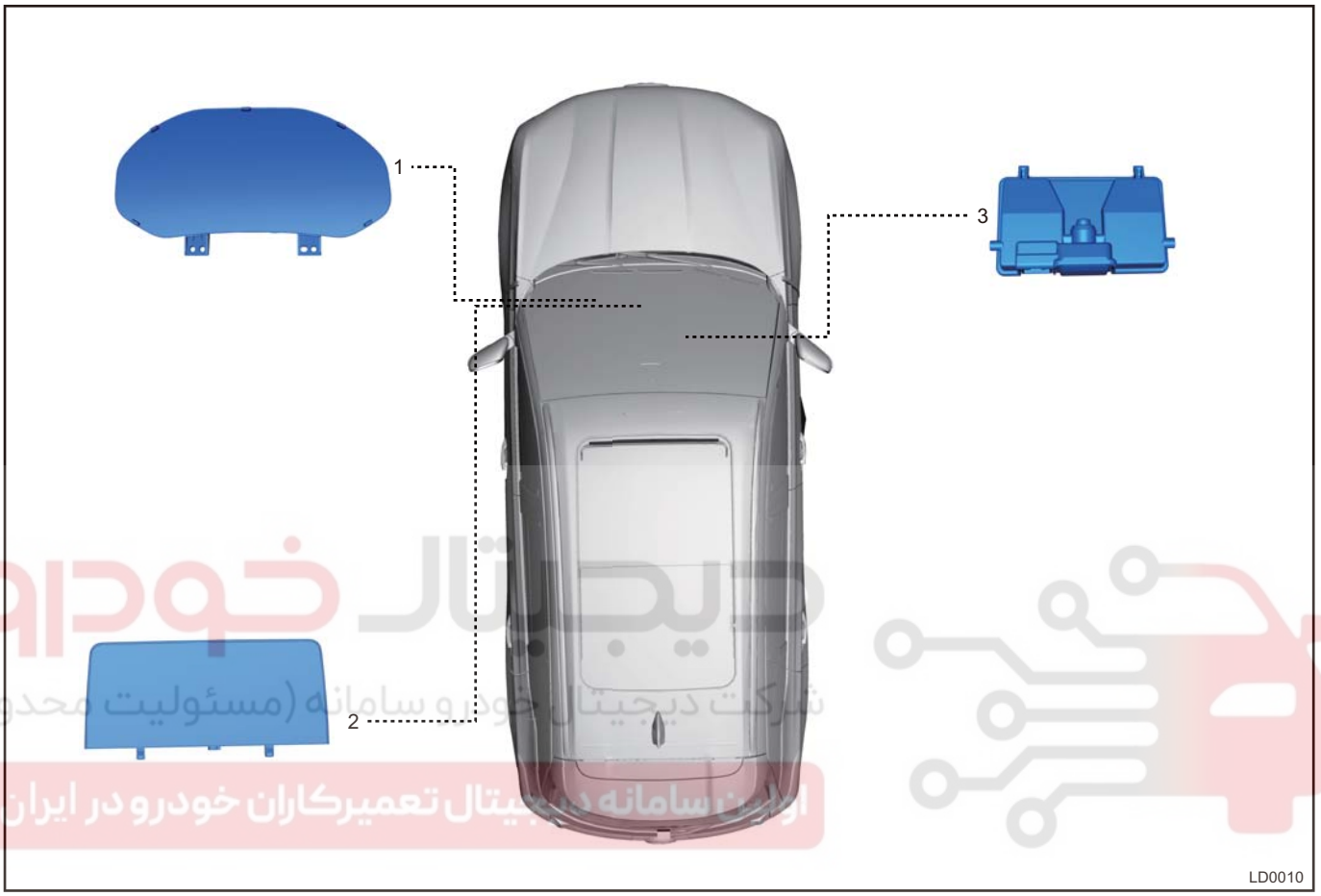
- MEMO -

LANE ASSIST SYSTEM

Lane Assist System

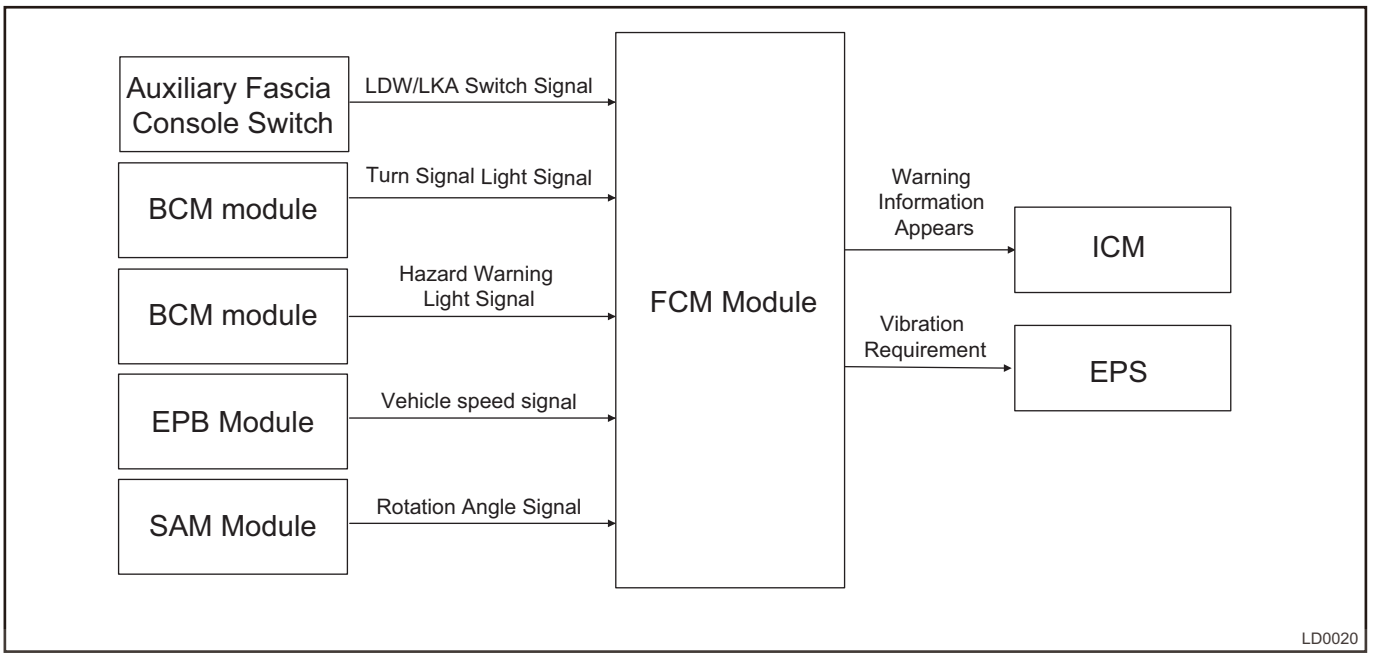
System Overview

System Components Diagram



1	Instrument Cluster (ICM)	2	Audio Head Unit (IHU)
3	Front Multi-function Camera (FCM)		

System Schematic Diagram

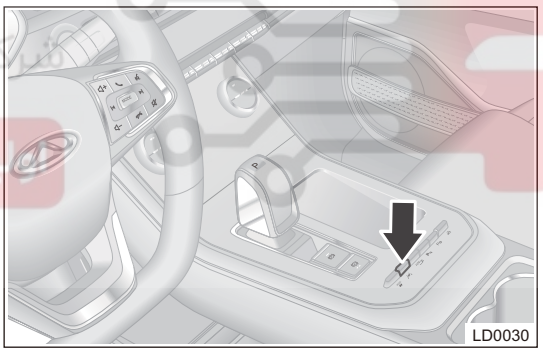


The lane assist system collects LDW/LKA switch signal, turn signal light signal, hazard warning light signal, vehicle speed signal and corner signal through CAN line. Through data demand analysis, steering wheel vibration and instrument cluster displays relevant alarm information.

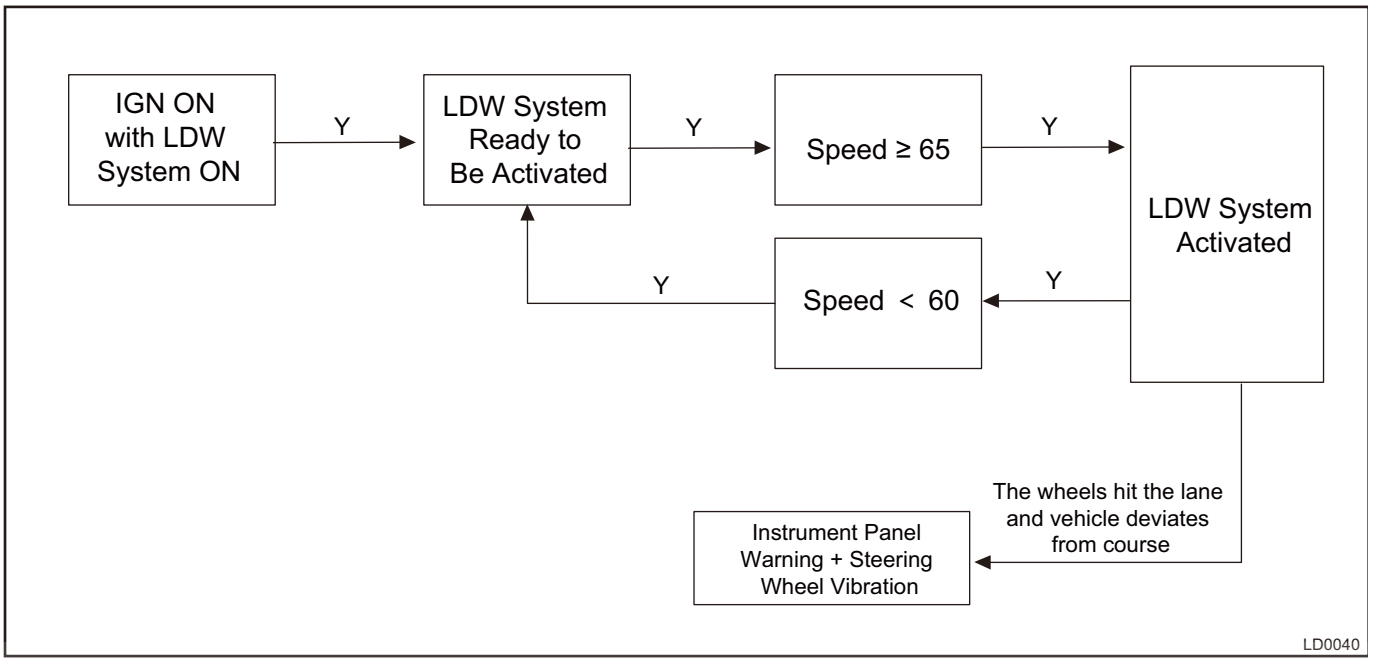
System Function

Lane assist system includes lane departure warning system (LDW) and lane keeping assist system (LKA), which can help drivers reduce traffic accidents caused by lane departure and improve driving safety.

Press the lane assist system switch to cycle between lane departure warning system (LDW) / lane keeping assist system (LKA) / OFF.



lane Departure Warning System (LDW)

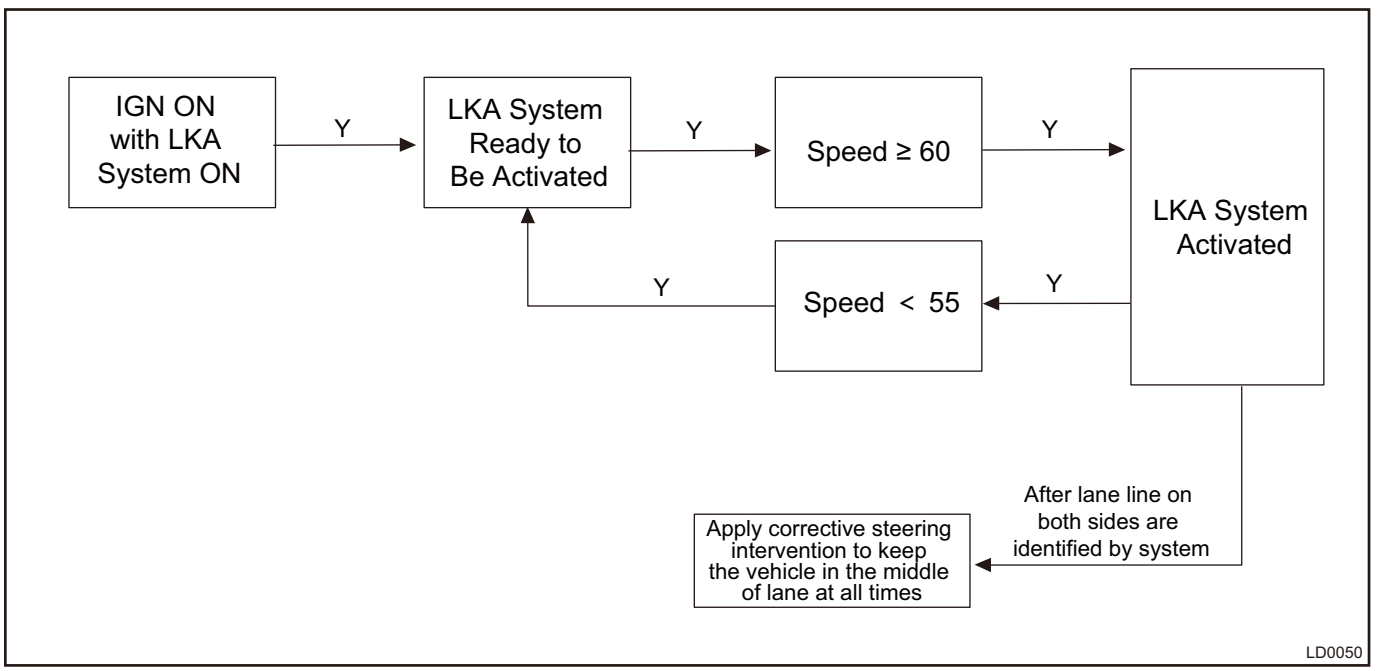


The lane departure warning system (LDW) detects the lane line through the front multi-function camera (FCM). When the wheels roll to the lane line and the vehicle departs from the driving route, the system will send out an alarm and steering wheel will vibration.

The lane departure warning system (LDW) may not operate normally in the following situations:

1. When the vehicle is changing lanes.
2. When the turning speed is too high.
3. When the accelerator pedal is pressed hard.
4. When the brake pedal is pressed hard.
5. When the hazard warning light is turned on.
6. When the departure side turn signal light is turned on.
7. When driving on a curve with a small turning radius.
8. When the lane line is too thin, broken, blurred or there is no lane line on the departure side.

Lane Keeping Assist System (LKA)



The lane keeping assist system (LKA) detects lane line through front multi-function camera (FCM). When the lane lines on the left and right sides are identified by the system, the system applies corrective steering intervention to make the vehicle always drive in the middle of the lane.

The lane keeping assist system (LKA) may not operate normally in the following situations:

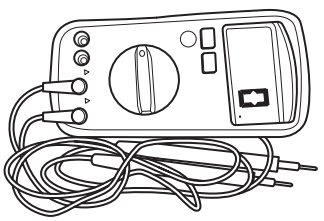
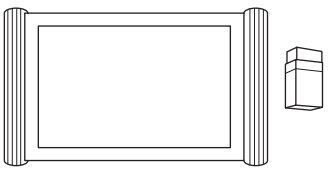
1. When the vehicle is changing lanes.
2. When the turn signal light is turned on.
3. When the braking force is too large.
4. When the turning speed is too high.
5. When the accelerator pedal is pressed hard.
6. When the hazard warning light is turned on.
7. Lane keeping assist system (LKA) recognizes that the driver has not operated the steering wheel for a period of time.
8. The driver controls the steering wheel when lane keeping assist system (LKA) applies corrective steering intervention control.

Identification of Lane Line Types

No.	Road Type	Performance Requirements
1	Applicable road curvature radius	More than 250m (class II highway standard)
2	Effective lane width	2.5 m, 5.2 m
3	Effective lane marker line width	8cm, 60cm
4	Visible range of lane line	Influenced by environmental factors, the farthest visible range of lane line is 60-100m
5	Lane line definition	Visible to the naked eye
6	Judging accuracy of distance between vehicle and lane line	The error is less than 4 cm
7	Lane line types	Double line, solid line, virtual solid line, dotted line
8	Lane line colors	White, yellow, orange, blue
9	Road geometry	Straight, curve
10	Road conditions	Asphalt, cement

Special Tools

General Tools

Tool Name	Tool Drawing
Digital Multimeter	 RCH0002006
Diagnostic Tester	 RCH0001006

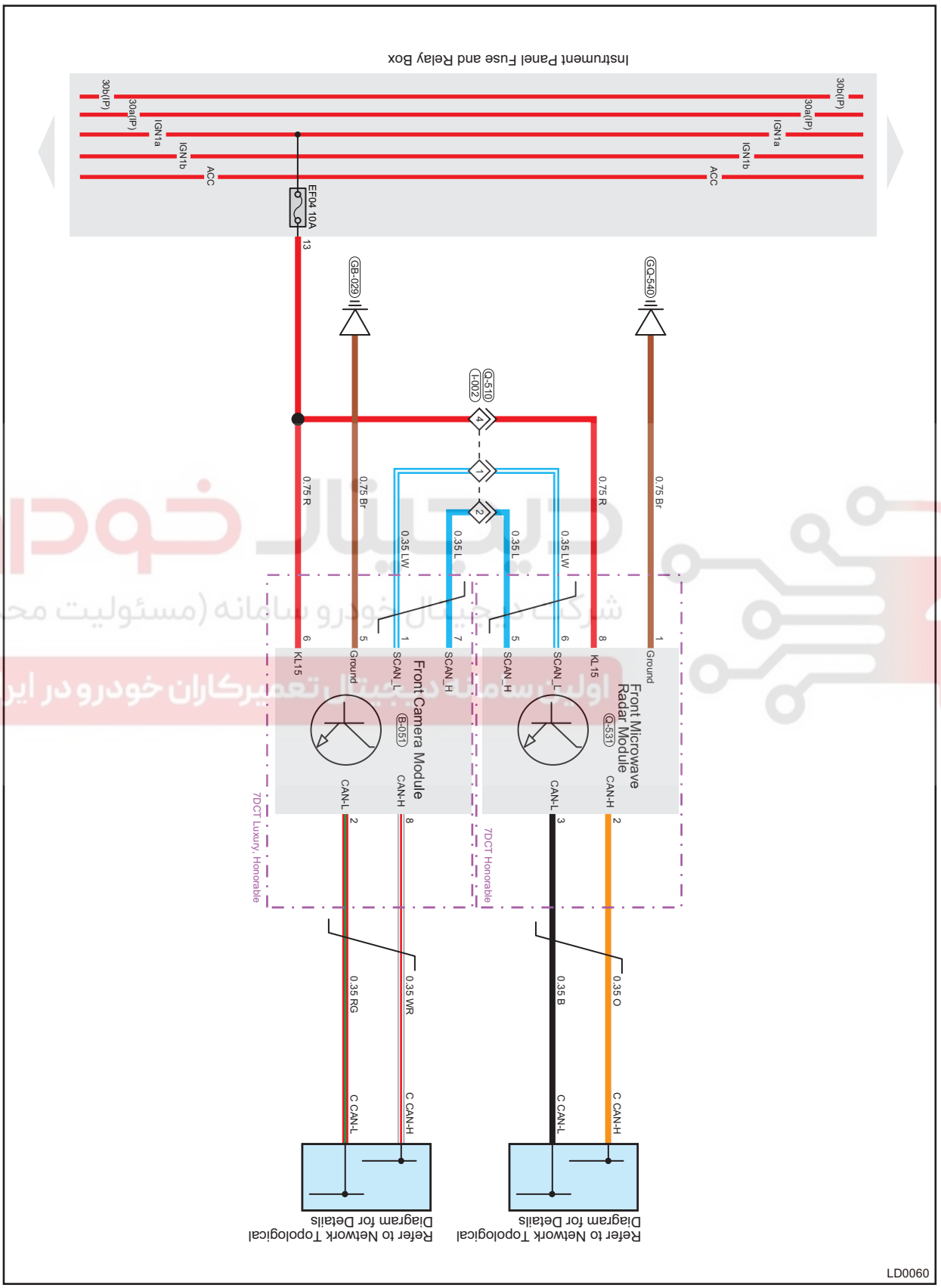
Tightening Torque List

Torque Specifications

Description	Tightening Torque
Panoramic Control System Module Fixing Bolt	7 ± 1 N·m

System Circuit Diagram

Front Camera Module (FCM) Circuit Diagram



Diagnostic Information and Step

Diagnosis Procedure

Hint:

Use following procedures to troubleshoot the lane assist system.

1	**Vehicle brought to workshop**

NEXT

2	**Check battery voltage**

Check if battery voltage is normal.

OK

Standard voltage: Not less than 12 V.

Result

Result	Go to
OK	A
NG	B

B → **Replace battery**

A

3	**Customer problem analysis**

NEXT

4	**Read DTCs**

Result

Result	Go to
DTC	A
No DTC	B

B → **Repair according to Problem Symptoms Table**

A

5	**Read DTCs (current DTC and history DTC)**

Result

Result	Go to
DTC	A
No DTC	B

B → Troubleshoot according to Intermittent DTC Troubleshooting procedure

A

6	Repair according to Diagnostic Trouble Code (DTC) Chart

NEXT

7	Adjust, repair or replace

NEXT

8	Conduct test and confirm malfunction has been repaired

NEXT → End

DTC Confirmation Procedure

Confirm that battery voltage is no less than 12 V before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software).
- Turn ENGINE START STOP switch to ON.
- Use the diagnostic tester to record and clear DTCs stored in the system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON, and check DTCs in the system again.
- If DTC is detected, it indicates current malfunction.
- If no DTC is detected, malfunction indicated by the DTC is intermittent.

Intermittent DTC Troubleshooting

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Check for broken, bent, protruded or corroded terminals.
- Check and clean all wire harness connectors and ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

Ground Inspection

Ground points are very important to the proper operation of circuits. Ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit works. Circuits are very sensitive to proper grounding. A loose or corroded ground can affect the control circuit. Check the ground points as follows:

- Remove ground bolt or nut.
- Check all contact surfaces for tarnish, dirt and rust, etc.
- Clean as necessary to ensure that contact is in good condition.
- Reinstall ground bolt or nut securely.
- Check if add-on accessories interfere with ground circuit.

- If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure that all wire harnesses are clean and securely fastened while providing a good ground path.

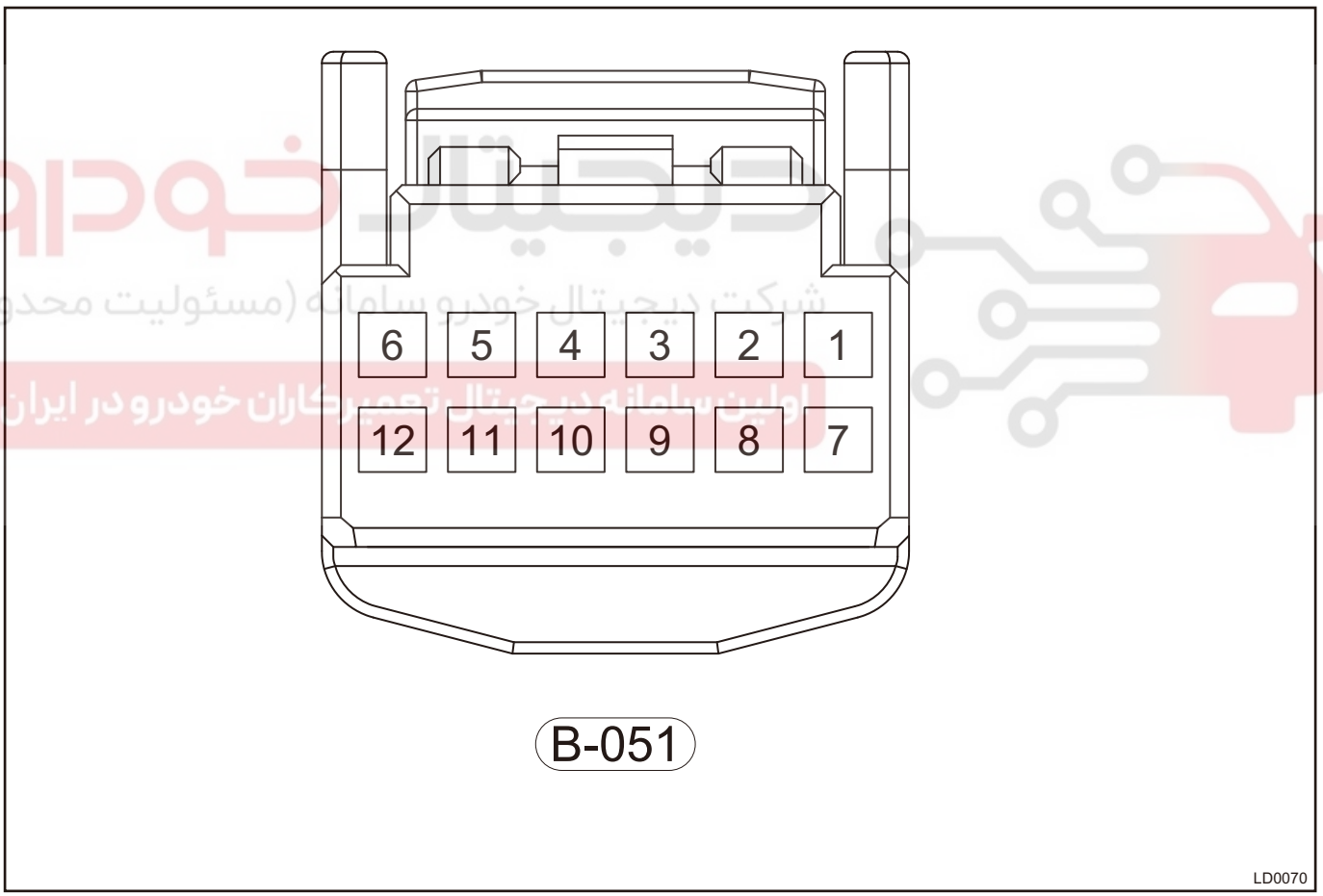
Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Possible Cause
LDW/LKA malfunction indicator ON	Fuse
	Wire harness fault
	Front camera module (FCM)
CAN network failure	Fuse
	Wire harness fault
	Central gateway (CGW)
	Front camera module (FCM)

Front Camera Module (FCM) Terminal List



Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
1	SCAN-L	7	SCAN-H
2	CAN-L	8	CAN-H
3	-	9	-
4	-	10	-
5	Ground	11	-
6	KL15	12	-

Front Camera Module (FCM) DTC Chart

DTC	DTC Definition
C190016	Supply Voltage Error - Low Voltage
C190017	Supply Voltage Error - High Voltage
C190116	Circuit Voltage Error - Below Threshold
C190117	Circuit Voltage Error - Above Threshold
C190244	Parameter Error - Dataset Error
C190354	Parameter Error - Initial Calibration Data Missing
C190346	Parameter Error - Initial Calibration Data Out of Range
C190446	Parameter Error - Online Calibration Data Out of Range
C190594	Process Error - Initial Calibration Timeout
C19064B	Temperature Error - ECU Temperature Out of Range
C190797	Electronic Error - Camera Blindness
C190749	Electronic Error - Internal Electronic Failure Temporary
C190709	Electronic Error - Internal Electronic Failure Permanent
U007388	CAN Communication Error - Vehicle CAN Controller BusOff Error
U12A188	CAN Communication Error - Private CAN Controller BusOff Error
U012987	CAN Communication Error - Lost Communication with BSM
U014087	CAN Communication Error - Lost Communication with BCM
U300051	Control Module-Not Programmed
U010087	CAN Communication Error - Lost Communication with EMS
U013187	CAN Communication Error - Lost Communication with EPS
U015587	CAN Communication Error - Lost Communication with ICM
U024587	CAN Communication Error - Lost Communication with IHU
U012687	CAN Communication Error - Lost Communication with SAM
U012387	CAN Communication Error - Lost Communication with YAS
U12E187	CAN Communication Error - Lost Communication with FRM
U041881	CAN Communication Error - Invalid Data from Brake System Control Module
U042281	CAN Communication Error - Invalid Data from BCM
U044781	CAN Communication Error - Invalid Data Received from Gateway "A"
U040181	CAN Communication Error - Invalid Data from EMS
U042081	CAN Communication Error - Invalid Data from EPS
U042381	CAN Communication Error - Invalid Data from ICM
U0546-81	CAN Communication Error - Invalid Data from IHU
U0428-81	CAN Communication Error - Invalid Data from SAM
U051381	CAN Communication Error - Invalid Data from YAS
U140981	CAN communication error - Invalid Data from Cruise Control Front Distance Range Sensor
U3000-51	Control Module-Not Programmed

DTC	C190244	Parameter Error - Dataset Error

DTC	C190749	Electronic Error - Internal Electronic Failure Temporary

DTC	C190709	Electronic Error - Internal Electronic Failure Permanent

Description

DTC	DTC Definition	Possible Cause
C190244	Parameter Error - Dataset Error	Damaged front camera module
C190749	Electronic Error - Internal Electronic Failure Temporary	
C190709	Electronic Error - Internal Electronic Failure Permanent	

1	Check for DTCs

(a) Using diagnostic tester to clear DTC, and read front camera module DTC again.
(b) Check if DTCs occur again.

Result

Result	Go to
OK	B
NG	A

B → System is normal

A

2	Check if front camera module operates normally

Result

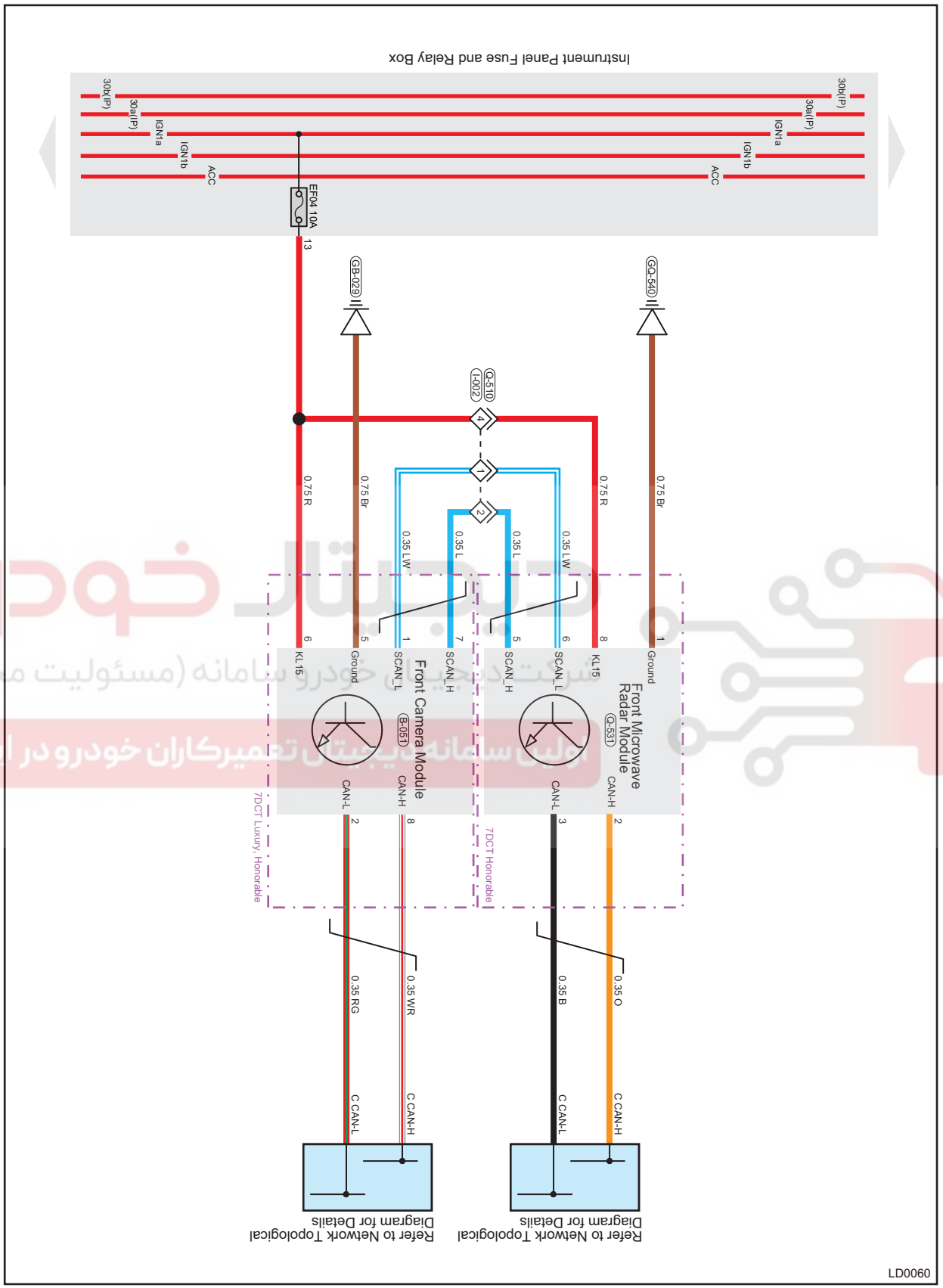
Result	Go to
OK	B
NG	A

B → Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC again

A → Replace front camera module

DTC	C190116	Circuit Voltage Error - Below Threshold
DTC	C190117	Circuit Voltage Error - Above Threshold
DTC	C190016	Supply Voltage Error - Low Voltage
DTC	C190017	Supply Voltage Error - High Voltage

Circuit Diagram



Description

DTC	DTC Definition	Possible Cause
C190116	Circuit Voltage Error - Below Threshold	Damaged front camera module Wire harness
C190117	Circuit Voltage Error - Above Threshold	
C190016	Supply Voltage Error - Low Voltage	
C190017	Supply Voltage Error - High Voltage	

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Confirmation Procedure

Confirm that battery voltage is 9 to 14.5 V under starting before performing following procedures.

1	Check fuse

(a) Check if fuse EF04 10A of engine compartment fuse and relay box is blown.

Result

Result	Go to
OK	B
NG	A

A → Replace fuse

B

2	Check instrument panel fuse box output voltage

(a) Turn ignition switch to ON.

(b) Measure voltage between instrument panel fuse box I-004 (13) and body ground (using a digital multimeter).

Standard Condition

Multimeter Connection	Condition	Specified Condition
I-004 (13) and body ground	ON	9 - 14.5 V

Result

Result	Go to
OK	B
NG	A

A → Replace instrument panel relay box

B

3	Check wire harness for open

(a) Turn ENGINE START STOP switch to OFF.

(b) Disconnect the negative battery cable.

(c) Disconnect the front camera module connector B-051.

(d) Using ohm band of digital multimeter, check resistance between I-004(13) - B-051(6) of instrument panel fuse and relay box for normal, to check wire harness for open.

Standard Condition

Multimeter Connection	Condition	Specified Condition
I-004 (13) - B-051 (6)	ENGINE START STOP switch OFF	⩽ 1 Ω

Result

Result	Go to
OK	B
NG	A

B → **Replace front camera module**

A → **Repair related wire harness**

DTC	C190797	Electronic Error - Camera Blindness

Description

DTC	DTC Definition	Possible Cause
C190797	Electronic Error - Camera Blindness	Damaged front camera module

1	Check for DTCs

(a) Using diagnostic tester to clear DTC, and read front camera module DTC again.
(b) Check if DTCs occur again.

Result

Result	Go to
OK	B
NG	A

B → System is normal

A

2	Check if front camera module is covered by foreign material and clean dirt on the surface of front camera module

Result

Result	Go to
OK	B
NG	A

B → Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC again

A → Replace front camera module assembly

DTC	C19064B	Temperature Error - ECU Temperature Out of Range

Description

DTC	DTC Definition	Possible Cause
C19064B	Temperature Error - ECU Temperature Out of Range	Overheat protection

1	Clear DTC to relieve overheat protection

DTC	C190346	Parameter Error - Initial Calibration Data Out of Range

DTC	C190354	Parameter Error - Initial Calibration Data Missing

DTC	C1905-94	Process Error - Initial Calibration Timeout

DTC	C1904-46	Parameter Error - Online Calibration Data Out of Range

Description

DTC	DTC Definition	Possible Cause
C190346	Parameter Error - Initial Calibration Data Out of Range	Recalibration
C190354	Parameter Error - Initial Calibration Data Missing	
C190594	Process Error - Initial Calibration Timeout	
C190446	Parameter Error - Online Calibration Data Out of Range	

Caution:

Possible cause for malfunction: Front camera module calibration is not performed or does not meet related calibration condition.

1	**Refer to calibration method of front camera module and perform recalibration**

DTC	U130055	Control Module-Not Programmed

Description

DTC	DTC Definition	Possible Cause
U130055	Control Module-Not Programmed	Rewrite configuration data

Caution:
Possible cause for malfunction: Configuration data does not write into module.

1	Rewrite configuration data

(a) Using diagnostic tester to enter the system "Special function" to perform writing configuration data.

Result

Result	Go to
OK	B
NG	A

B → **Perform running test after clearing DTCs**

DTC	U007388	CAN Communication Error - Vehicle CAN Controller BusOff Error
DTC	U12A188	CAN Communication Error - Private CAN Controller BusOff Error
DTC	U012987	CAN Communication Error - Lost Communication with BSM
DTC	U014087	CAN Communication Error - Lost Communication with BCM
DTC	U300051	Control Module-Not Programmed
DTC	U010087	CAN Communication Error - Lost Communication with EMS
DTC	U013187	CAN Communication Error - Lost Communication with EPS
DTC	U015587	CAN Communication Error - Lost Communication with ICM
DTC	U024587	CAN Communication Error - Lost Communication with IHU
DTC	U012687	CAN Communication Error - Lost Communication with SAM
DTC	U012387	CAN Communication Error - Lost Communication with YAS
DTC	U12E187	CAN Communication Error - Lost Communication with FRM
DTC	U041881	CAN Communication Error - Invalid Data from Brake System Control Module
DTC	U042281	CAN Communication Error - Invalid Data from BCM
DTC	U044781	CAN Communication Error - Invalid Data Received from Gateway "A"

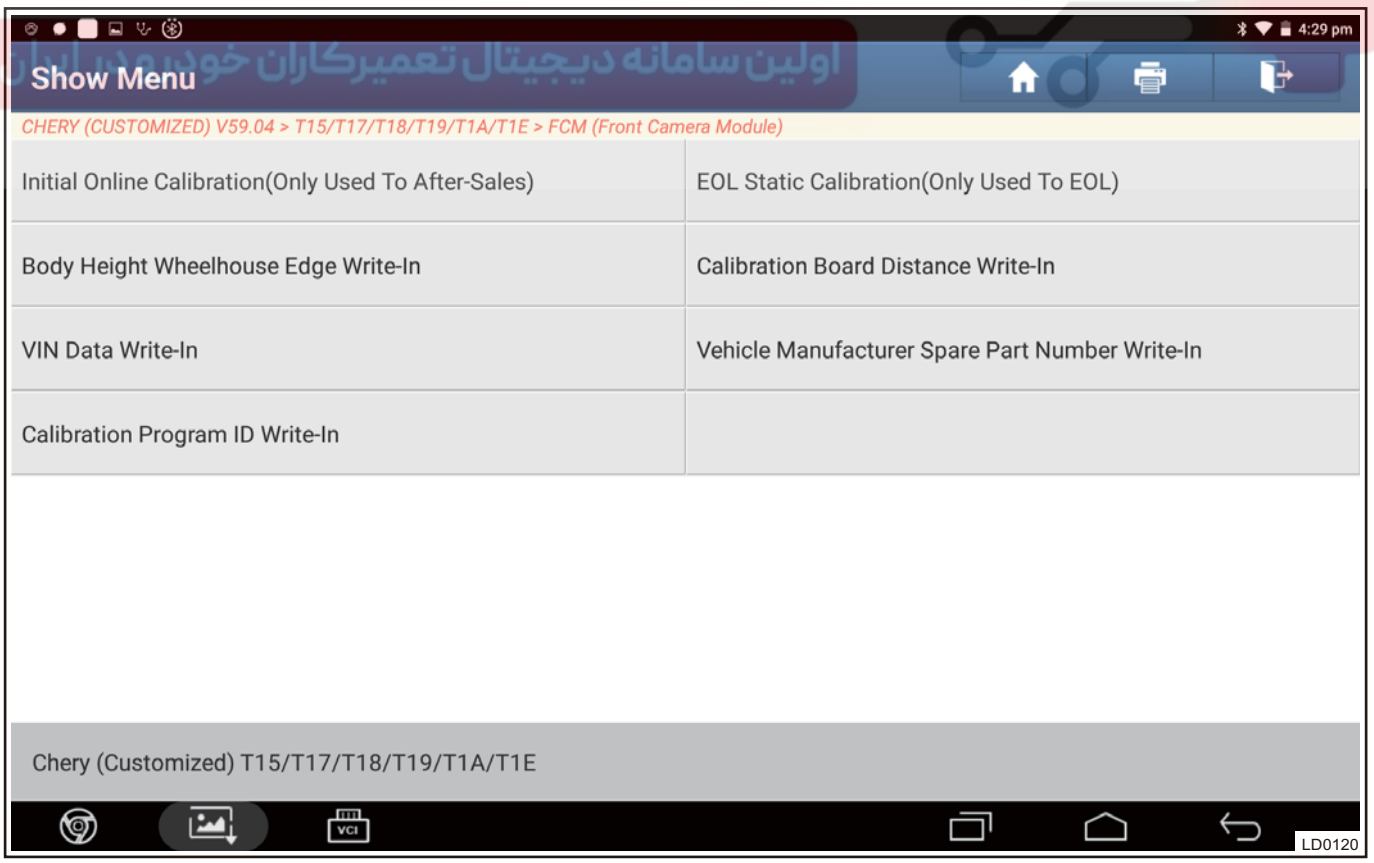
DTC	U040181	CAN Communication Error - Invalid Data from EMS
DTC	U042081	CAN Communication Error - Invalid Data from EPS
DTC	U042381	CAN Communication Error - Invalid Data from ICM
DTC	U0546-81	CAN Communication Error - Invalid Data from IHU
DTC	U0428-81	CAN Communication Error - Invalid Data from SAM
DTC	U051381	CAN Communication Error - Invalid Data from YAS
DTC	U140981	CAN communication error - Invalid Data from Cruise Control Front Distance Range Sensor
DTC	U3000-51	Control Module-Not Programmed

Refer to CAN communication system

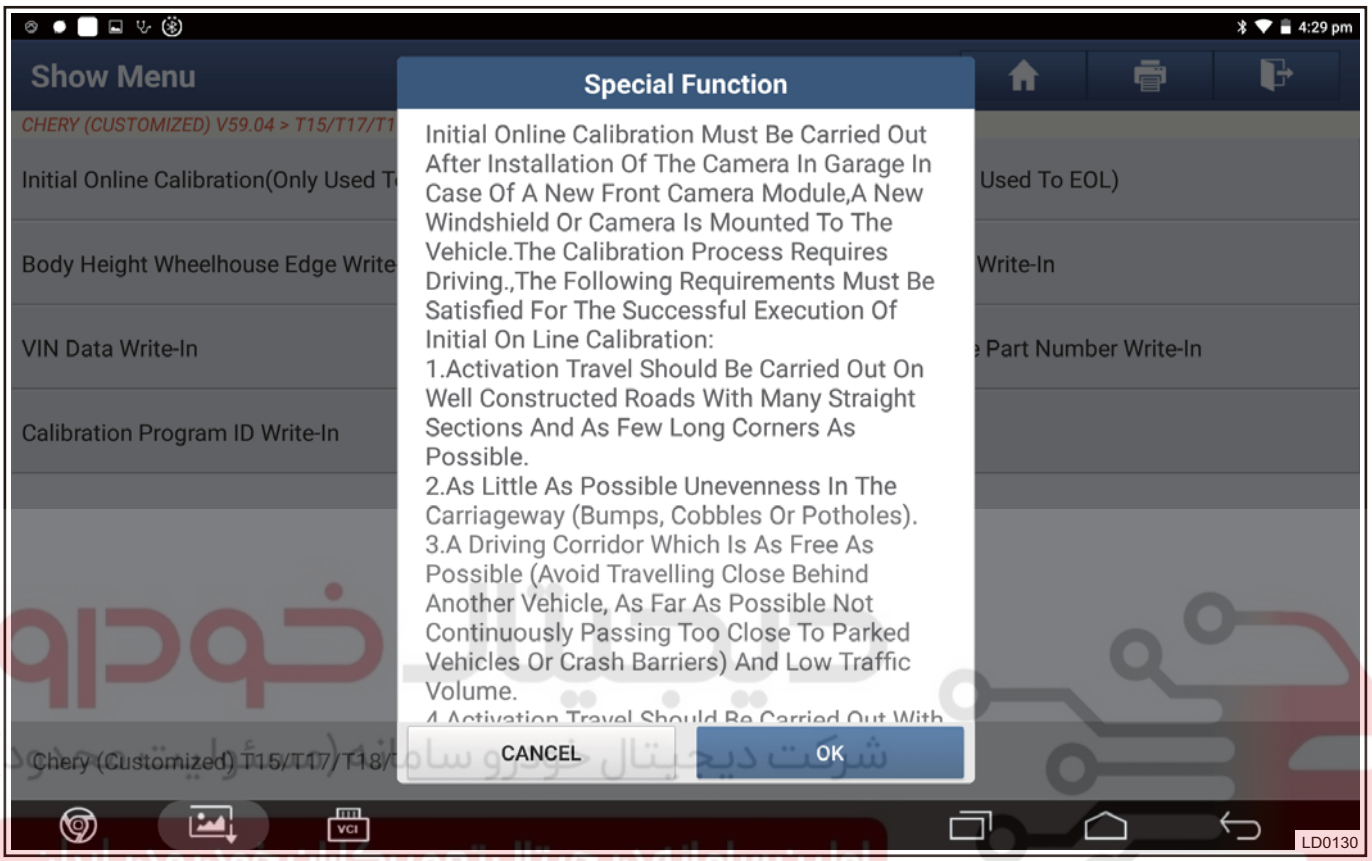
Matching Learning

Front Camera Module (FCM) Calibration

1. Click on "FCM (Front Camera Module)".
2. Click on "Special Function".
3. Click on "Online Initial Calibration (Only for After-Sales)".



4. Read precaution, click "Yes" after the information has been confirmed.
   Calibration description: Initial online calibration is after-sales calibration method, which can calibrate camera when there is no calibration board. Initial online calibration is performed during driving, so it is necessary to measure wheel house height accurately before calibrating, and write camera by diagnostic instruction.



5. Drive for about 6 minutes and display countdown, after countdown is completed, there is a prompt "Calibration Completion - Successful".

Removal and Installation

Front Camera

Removal

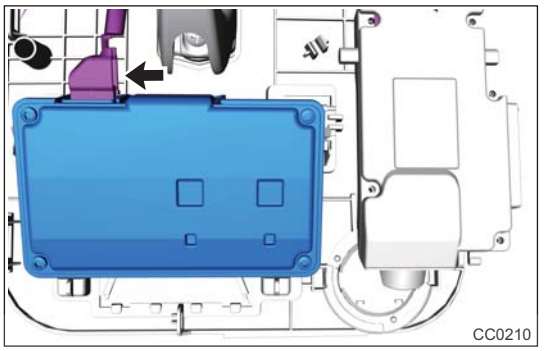
Warning:

- Be sure to wear necessary safety equipment to prevent accidents, when removing front camera.
- Appropriate force should be applied when removing front camera. Be careful not to operate roughly.
- Remove front camera to perform matching calibration.

1. Turn ENGINE START STOP switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the inside rear view mirror left cover.

4. Remove the inside rear view mirror right cover.

5. Disconnect connector from front camera.



6. Push back metal spring on bracket, meanwhile, remove front camera from rear lower area.

Installation

Installation is in the reverse order of removal.

- MEMO -