11 Body Electric

11.1 Warnings and Notices

11.1.1 Warnings and Notices

Vehicle Lifting Warning

Warning!

Warning: To avoid any vehicle damage, serious personal injury or death when major components are removed from the vehicle and the vehicle is supported by a hoist, support the vehicle with jack stands at the opposite end from which the components are being removed and strap the vehicle to the hoist.

Battery Disconnect Warning

Warning!

Warning: Unless directed otherwise, the ignition and start switch must be in the OFF or LOCK position, and all electrical loads must be OFF before servicing any electrical component. Disconnect the negative battery cable to prevent an electrical spark should a tool or equipment come in contact with an exposed electrical terminal. Failure to follow these precautions may result in personal injury and/or damage to the vehicle or its components.

Cracked Window Warning

Warning!

Warning: If a window is cracked but still intact, crisscross the window with masking tape in order to reduce the risk of damage or personal injury.

Express Window Down Warning

Warning!

Warning: Disconnect the power window switch when working inside the driver door. When operated, the Express Up/Down Feature allows the door window to move very quickly, without stopping, which could cause personal injury.

Halogen Bulb Warning

Warning!

Warning: Halogen bulbs contain gas under pressure. Handling a bulb improperly could cause it to shatter into flying glass fragments. To help avoid personal injury: Turn off the lamp switch and allow the bulb to cool before changing the bulb. Leave the lamp switch OFF until the bulb change is complete. Always wear eye protection when changing a halogen bulb. Handle the bulb only by its base. Avoid touching the glass. Keep dirt and moisture off the bulb. Properly dispose of the used bulb. Keep halogen bulbs out of the reach of children.

11.2 Audio Entertainment System

11.2.1 Specifications

11.2.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Radio Control Bolt	M6 × 20	8-11	6-8
Rear Speaker Self-Tapping Screws	ST4.8 × 9.5	3-4	2-3
Front Door Tweeters Self-Tapping Screws	ST4.2 × 9.5	3-4	2-3
Radio Antenna Bolts (Sedan)	M6 × 16	8-11	6-8

11.2.2 Description and Operation

11.2.2.1 Description and Operation

Audio System Settings

Whenever the sound system circuit and the battery is disconnected, the sound system all customers personalized settings will be initialized.

Roof Antenna

Hatchback roof antenna is located in the rear. antenna mast can be rotated (to facilitate washing and to avoid damage to the antenna), but can not be removed. Sedan antenna is located in the upper part of rear window defroster grille.

Front Speaker

All audio systems use six speakers: two front doors have front speakers and two tweeters. For sedan, the two rear speakers are installed on the rear parcel shelf. For hatchback, the rear speakers are installed in the C pillar trim panel.

CD maintenance

Carefully carry the CD-ROM. CD-ROM disc should be stored in boxes, and avoid sunlight, heat and dust. If the surface contamination, using a clean soft cloth soaked in neutral cleaning agent, wipe clean the disc.

11.2.3 System Working Principle

11.2.3.1 System Working Principle

Radio:

Turn the radio control switch to "AM" and "FM", the antenna module receives the radio signal and transmits to the radio control through dedicated circuit. Radio control receives radio signals through the internal filter circuit, transfers out to the channel. Audio signal is amplified through the amplifier and eventually through the IP32 terminal output terminals 2-6,1-5,3-7,4-8 to each speaker.

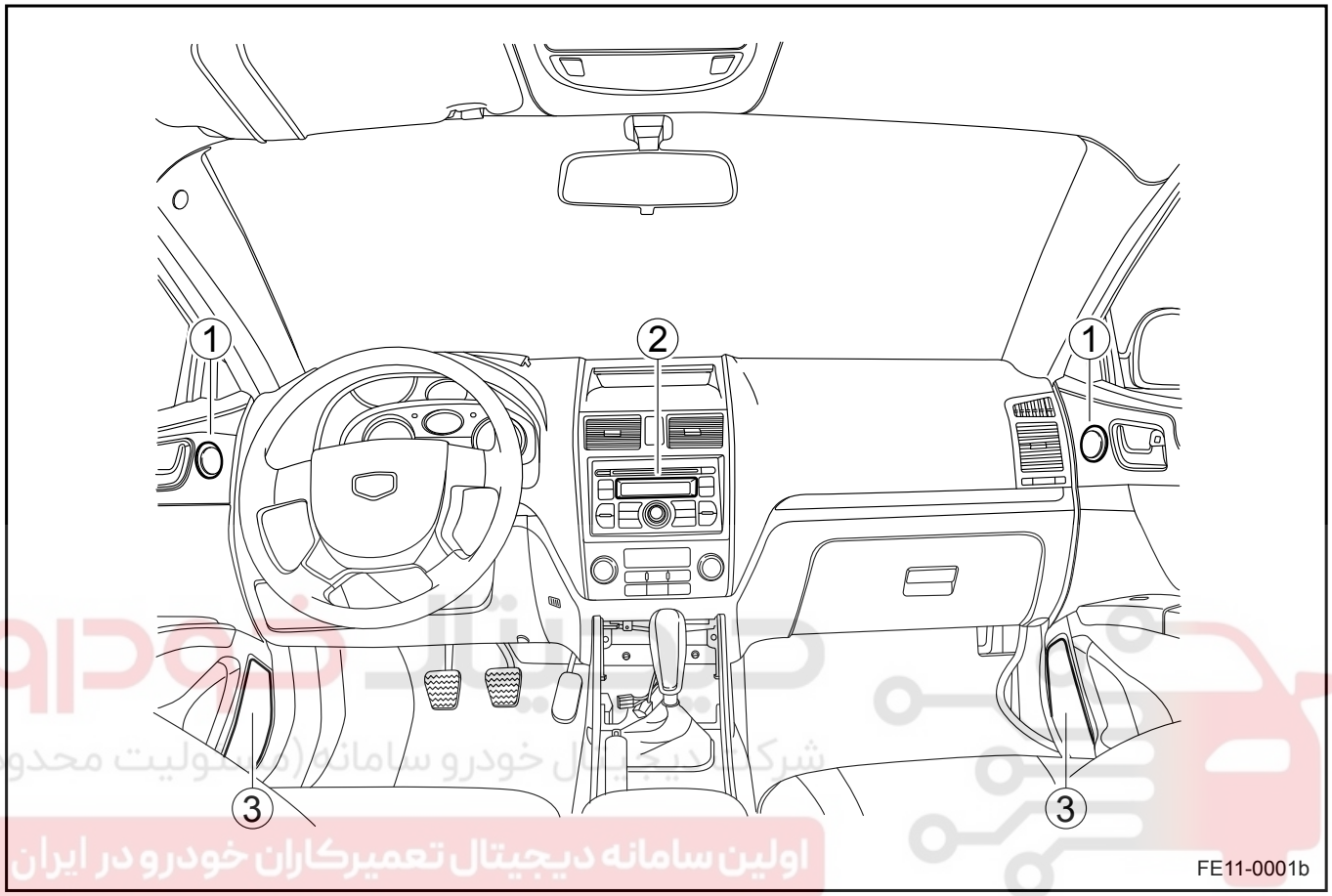
CD player:

Turn the radio control switch to CD mode, the radio control assembly controls the CD movement. CD system mainly consists of the laser and turntable system, servo system, signal processing system, information storage system and control system, etc.. CD player laser is a key component, which consists of semiconductor lasers, optical system and electrical detector component. It is a low-power laser diodes. Laser beam is sent through the optical lens system onto the LP information surface. The disc has a number of pits, when the beam hit the pit, because of the reflected light is weak, photoelectric detector picks up weak signals; when the beam hit the smooth aluminum surface, there will be a strong reflected light. The detector's high or low electrical pulse output signal corresponds to the presence or absence of the pits. Through the RF amplifier and the internal comparator, "1" and "0" serial digital signals are obtained, and added to the digital signal and processing circuit to carry out demodulation, frame sync detection, error correction. The processed data will be added to the digital-analog conversion (D / A) and converted into analog sound output to the amplifier. The amplified audio signals will be sent to each speaker through the radio control wiring harness connector IP32 terminals 2-6,1-5,3-7,4-8.

11.2.4 Component Locator

11.2.4.1 Component Locator

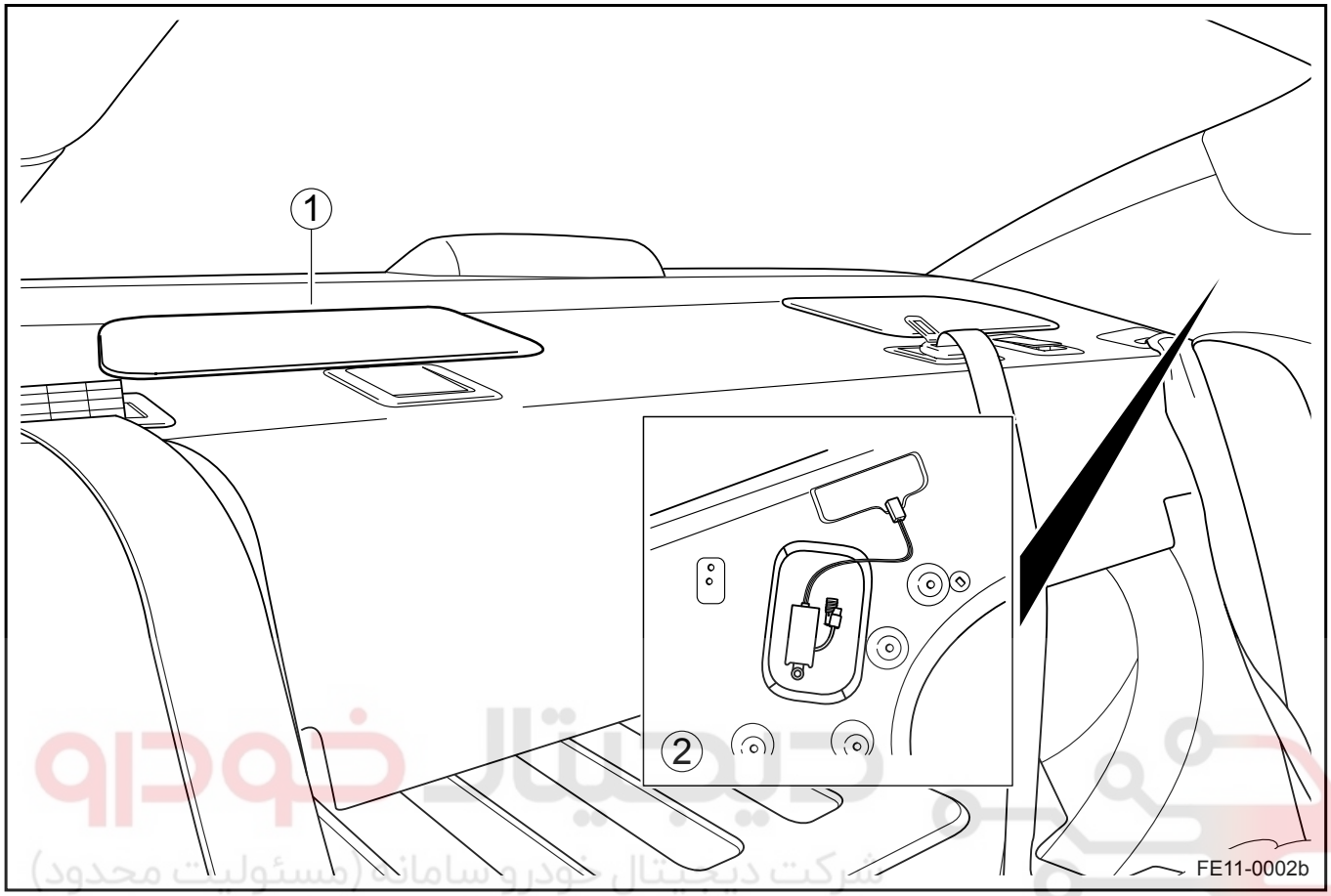
Radio Control and The Front Door Speakers



Legend

1. Front Door Tweeters
2. Radio Control
3. Front Door Speakers

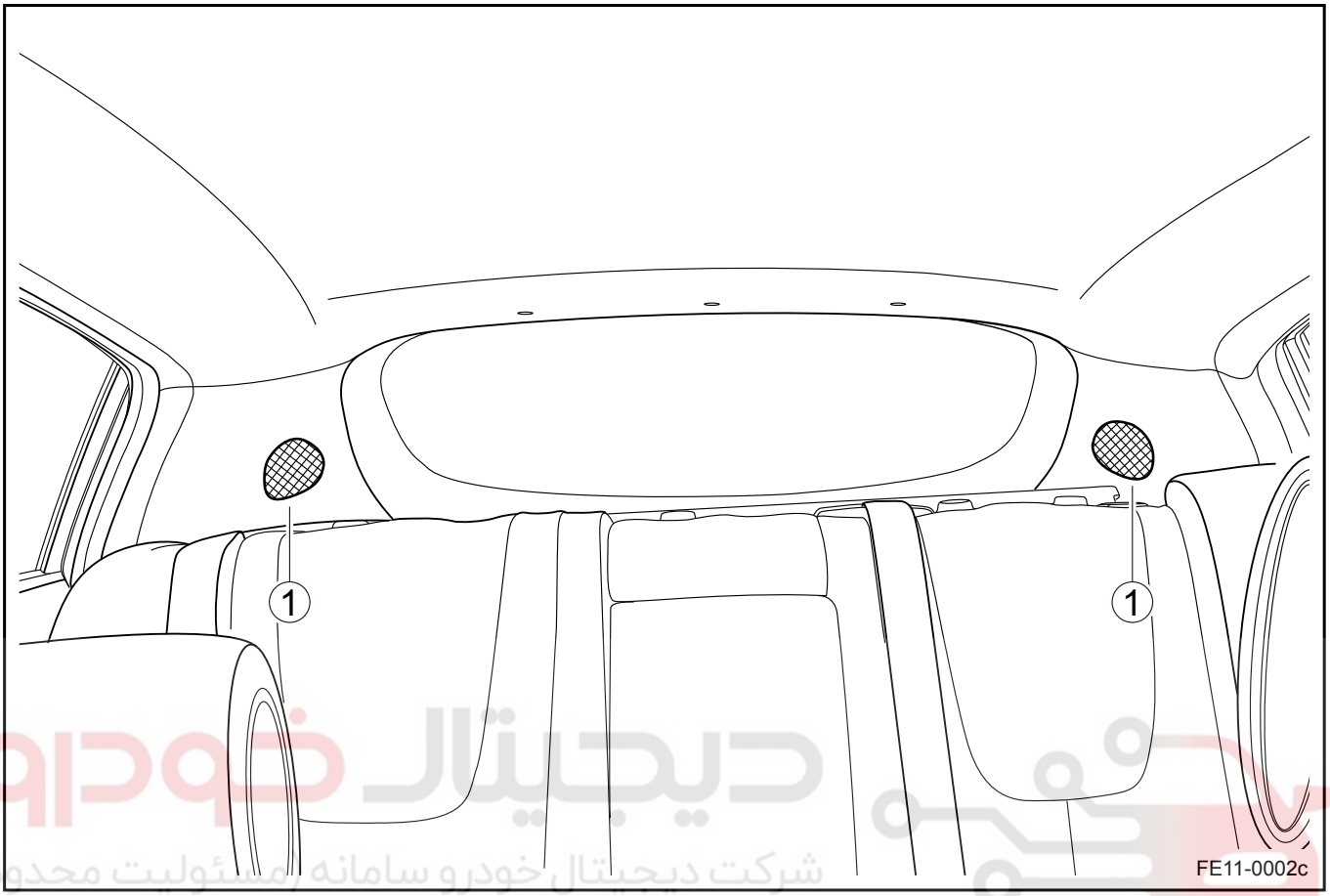
Rear Speakers (Sedan)



Legend

1. Rear Speaker
2. Radio Antenna Amplifier

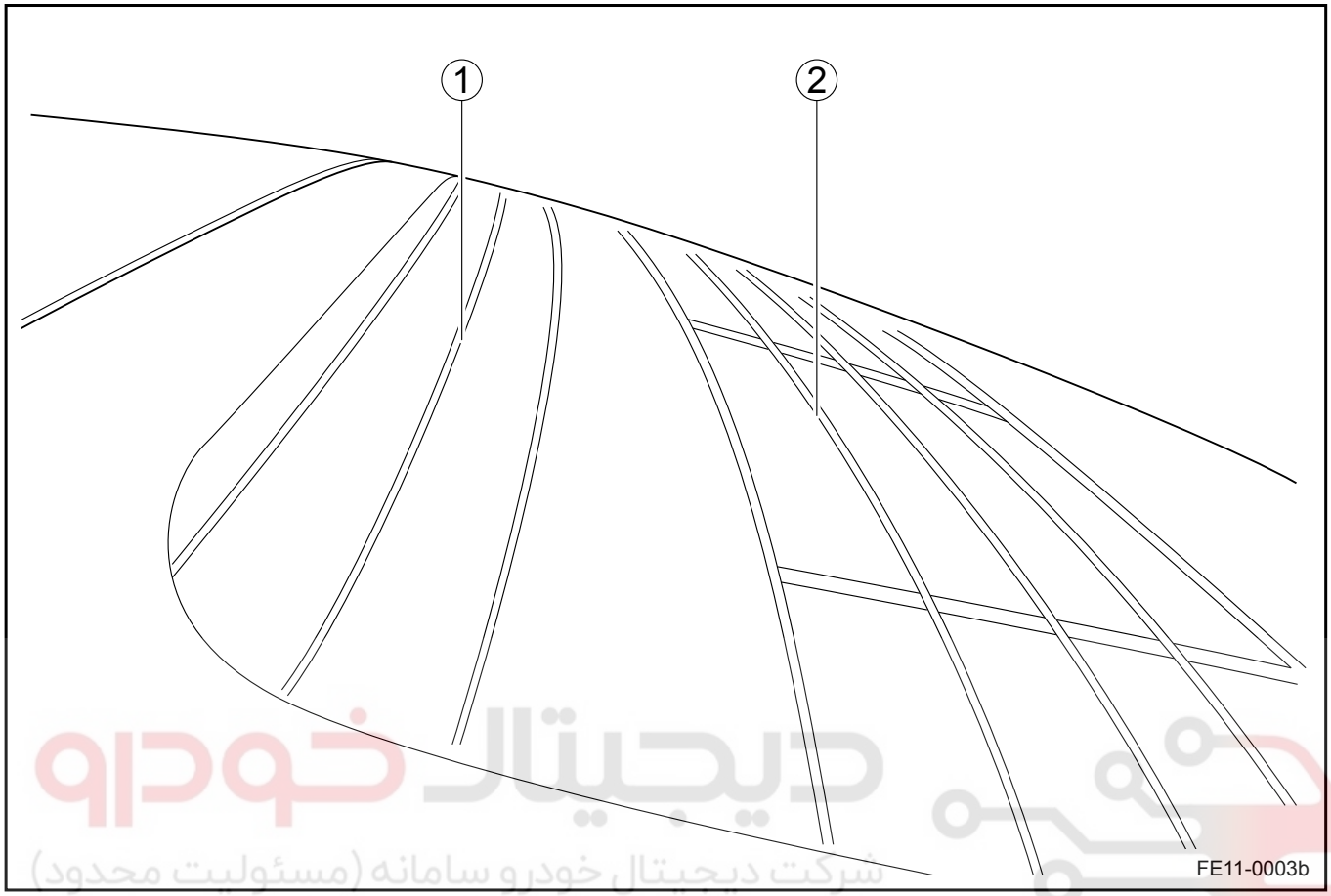
Rear Speakers (Hatchback)



Legend

1. Rear Speakers (Hatchback)

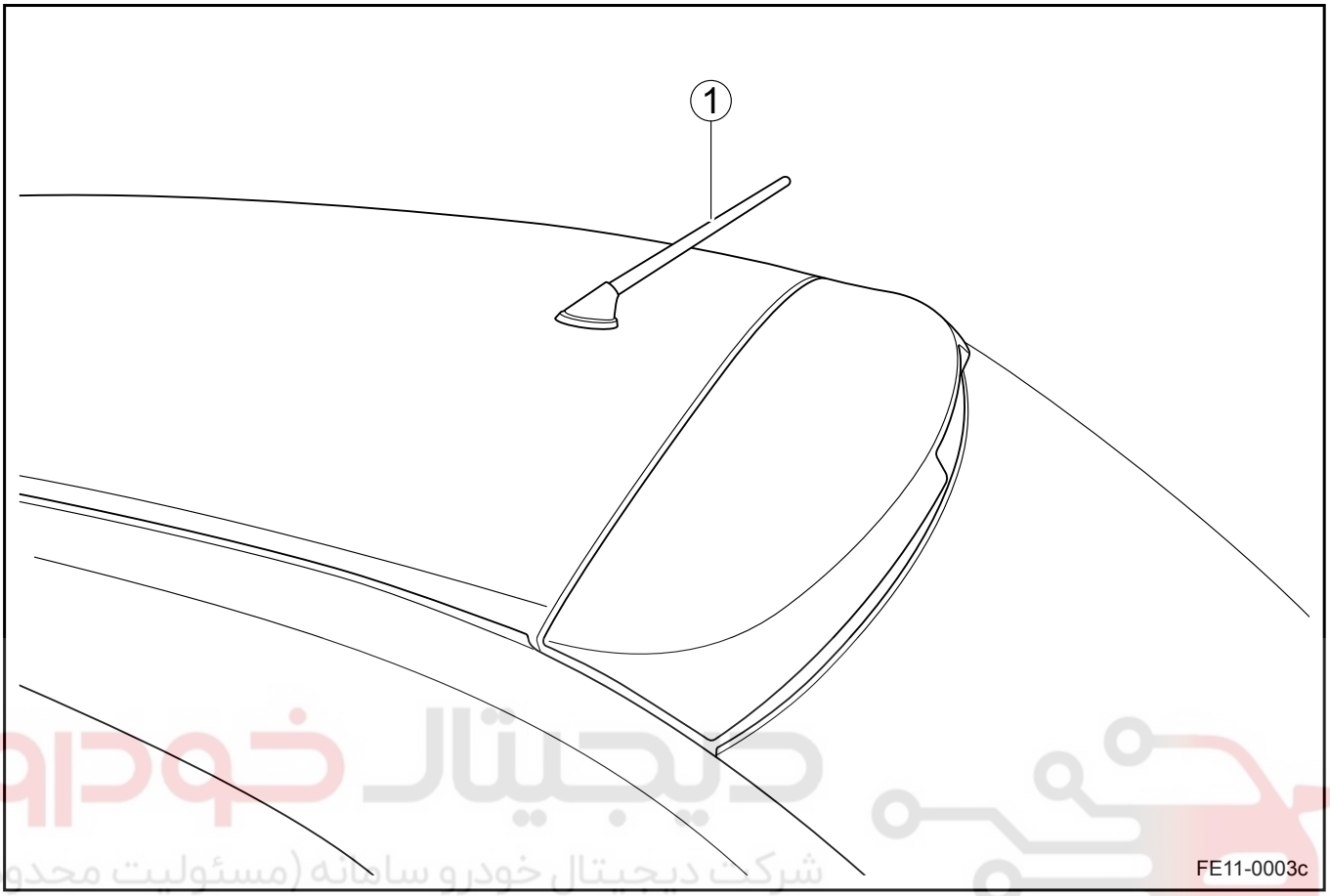
Radio Antenna (Sedan)



Legend

1. Radio Antenna Grid
2. Rear Window Defroster Grid

Radio Antenna (Hatchback)

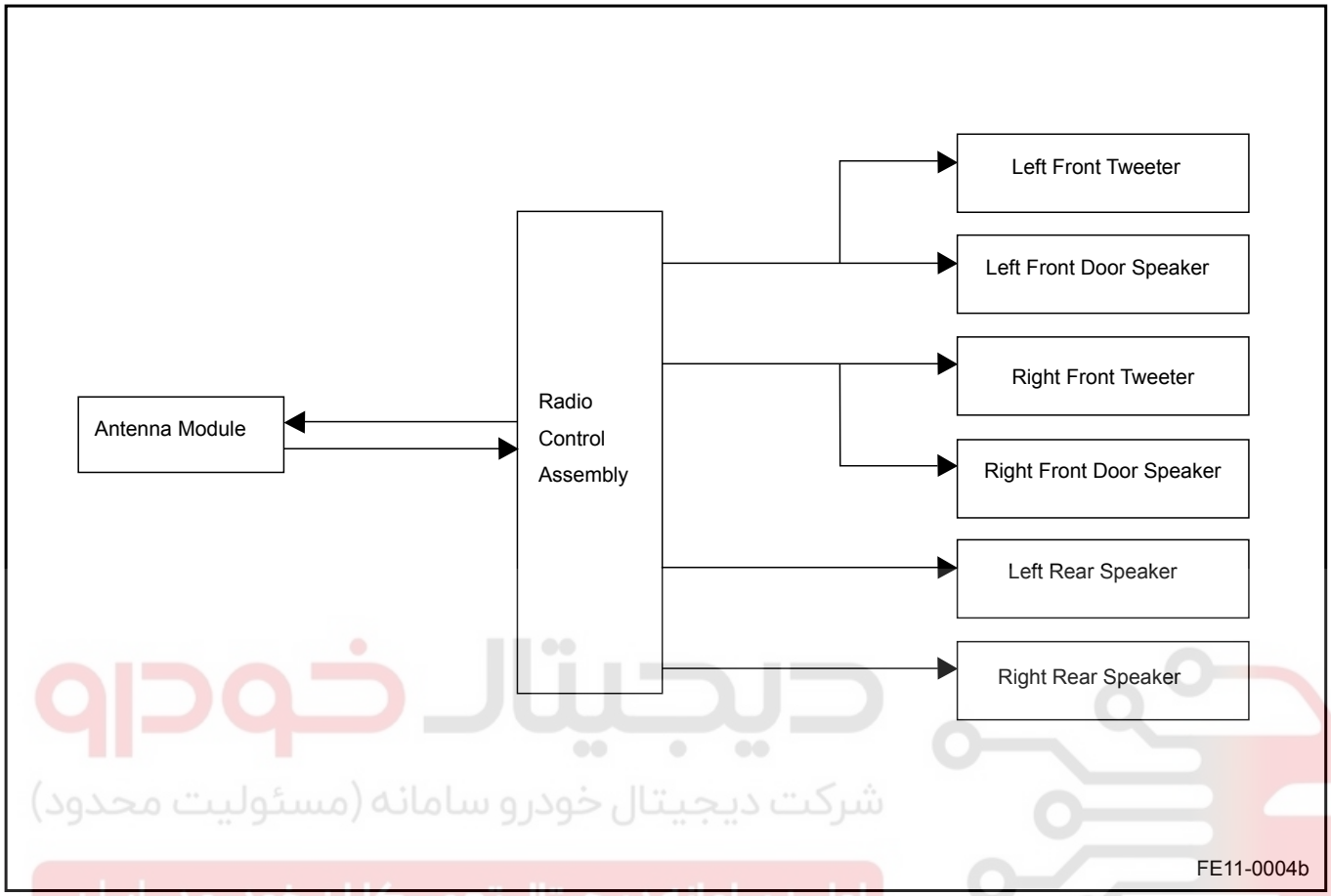


Legend

1. Radio Antenna

11.2.5 Schematic

11.2.5.1 Schematic



11.2.6 Diagnostic Information and Procedures

11.2.6.1 Diagnosis Description

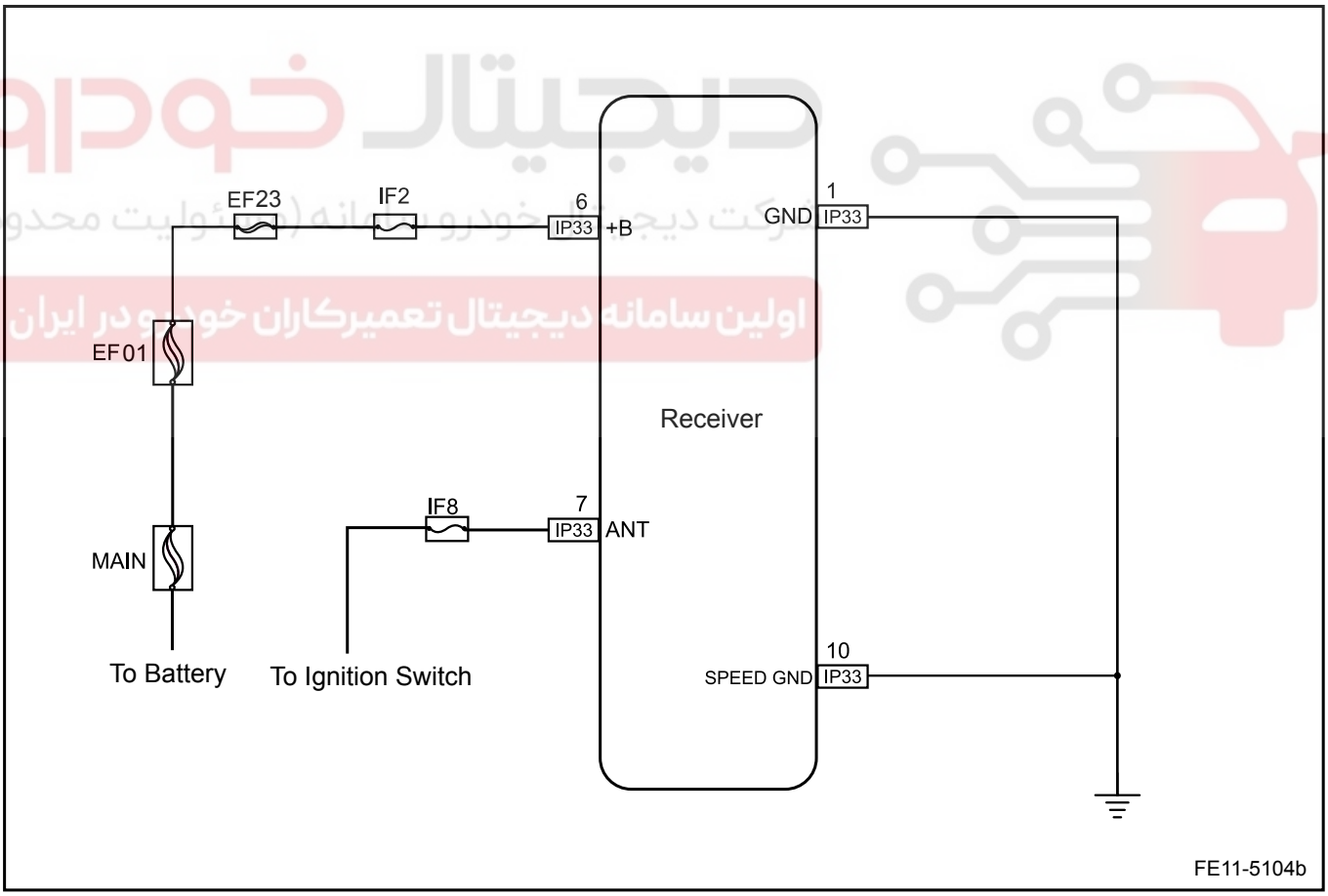
Refer to 11.2.2.1 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.2.6.2 Visual Inspection

- Check installed after market equipment that may affect the operation of the audio system.
- Check the easy to access system components to identify whether there is a significant damage or possible malfunction.
- In the event of all speakers inoperative, focus on circuits that are easy to short to ground, such as the rear compartment speaker wiring harness connector, as it will help with diagnostic.
- If a single speaker is inoperative, it may be the audio channel is shielded, causing a single channel inoperative. It is not a sound system malfunction. Refer to the sound system instructions in the owner handbook.

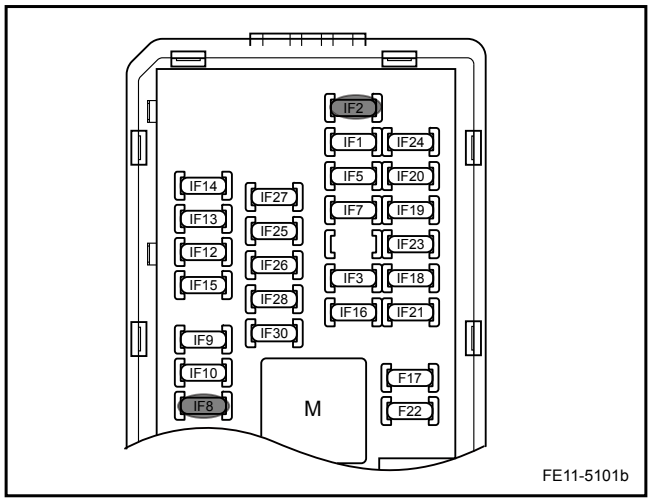
11.2.6.3 Radio Control Can Not Be Turned On

Schematic:



Diagnostic Steps:

Step 1	Check fuses, IF2 and IF8.



(a) Are fuses IF2 and IF8 blown?
Fuse Rating: IF2 15A, and IF8 10 A respectively.
Confirm whether the fuses IF2 and IF8 are blown.

No → Go to step 3

Yes

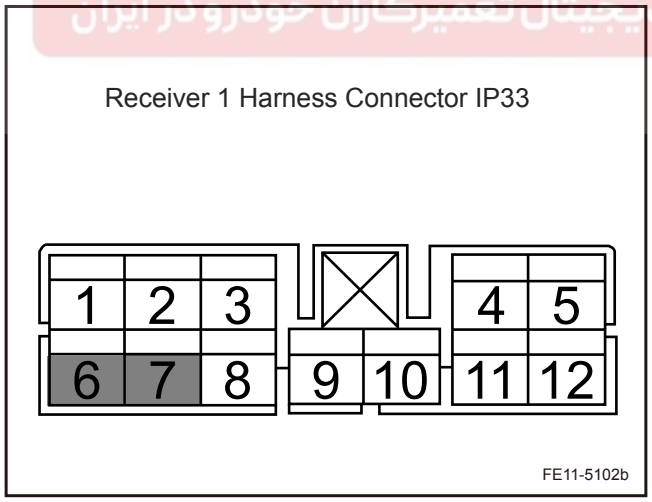
Step 2	Check the fuses, IF2 and IF8 circuits.

(a) Check whether the fuses IF2 and IF8 circuits are short circuits.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.
Confirm whether the radio is working correctly.

Yes → System normal

No

Step 3	Check the radio control power supply.



(a) Remove the radio control.
(b) Measure radio control harness connector IP33 terminals No. 6,7 voltage.

Standard Voltage

Test Terminal	Test Conditions	Standard Voltage
IP33 (6) and Body Ground	Always	11-14 V
IP33 (7) and Body Ground	Ignition Switch ACC	11-14 V

Confirm whether the power supply is normal.

Yes → Go to step 5

No

Step 4	Repair the open circuit between the radio control harness connector IP33 and fuse IF2.

(a) Confirm the open circuit between radio control wiring harness connector IP33 terminal No.6 and fuse IF2 repair is completed.

(b) Confirm the open circuit between radio control wiring harness connector IP33 terminal No.7 and fuse IF8 repair is completed.

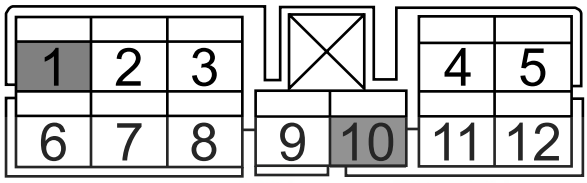
Confirm whether the radio control is working correctly.

Yes → System normal

No

Step 5	Check the radio control ground.

Receiver 1 Harness Connector IP33



FE11-5103b

(a) Measure resistance between radio control wiring harness connector IP33 terminals No.1,10 and the ground.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 7

No

Step 6	Repair the open circuit between radio control harness connector IP33 and the ground.

(a) Confirm the open circuit between the radio control wiring harness connector IP33 terminals No.1,10 respectively and the body repair is completed.

Confirm whether the radio is working correctly.

Yes → System normal

No

Step 7	Replace the radio control.

(a) Refer to 11.2.7.5 Radio Control Replacement.

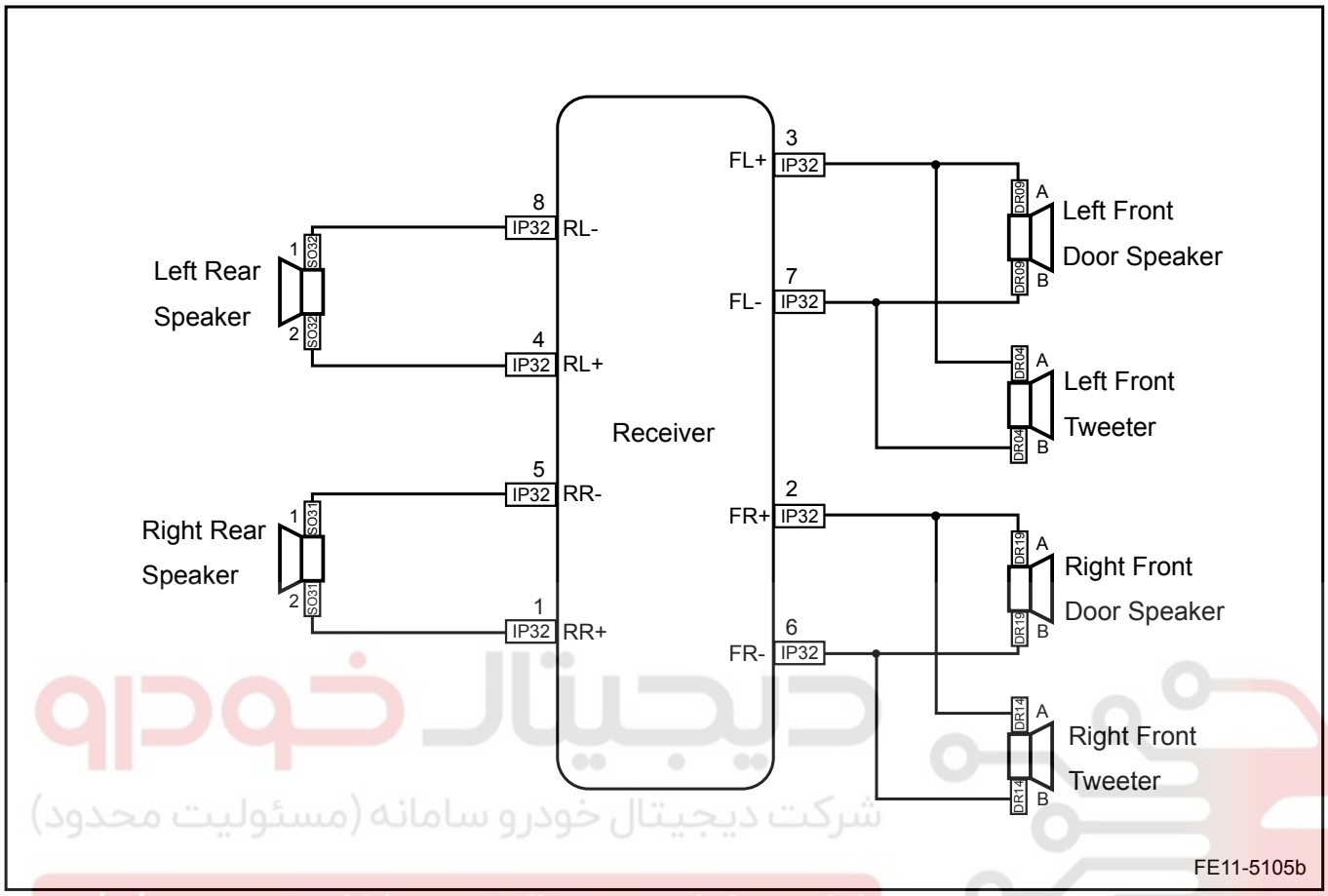
Confirm whether the radio is working correctly.

Next

Step 8	System normal.

11.2.6.4 Radio Control Can Be Turned On But The Speakers Are Inoperative

Schematic:



Diagnostic Steps:

Step 1	Turn on the radio control.

(a) Operate the radio control master control panel, adjust the channel, so that front and rear and left and right channels are in the middle.

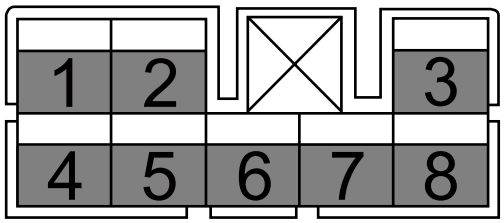
Confirm whether all the speakers are inoperative.

No → Go to step 4

Yes

Step 2	Measure the resistance between radio control harness connector IP32 audio output and ground.

Receiver 2 Harness Connector IP32



FE11-5106b

(a) Remove the radio control.
(b) Disconnect the radio control harness connector IP32.
(c) Measure resistance between radio control wiring harness connector IP32 all audio output terminals and the ground with a multimeter.
Standard Resistance: 10 kΩ or higher

Is the resistance specified value?

Yes	Go to step 8

No

Step 3	Repair the short circuit between radio control harness connector IP32 all audio terminals and body ground.

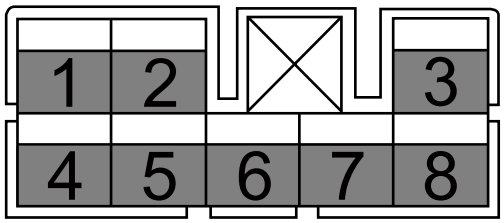
(a) Confirm the short circuit between radio control harness connector IP32 all audio terminals and body ground repair is completed.

Confirm whether the radio is working correctly.

Yes	System normal
No	Go to step 8

Step 4	Check the inoperative speaker circuit.

Receiver 2 Harness Connector IP32



FE11-5106b

(a) Disconnect the radio control harness connector IP32.
(b) Measure the speaker resistance through the wiring harness connector IP32 with a multimeter.

Standard Resistance

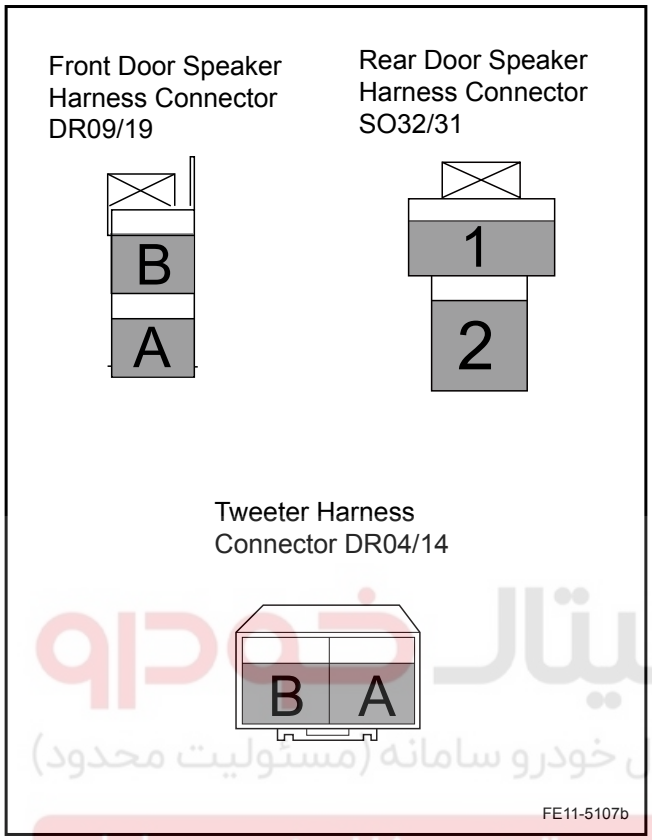
Test Speakers	Test Terminal	Standard Resistance
Left Rear Speaker		3.5-4.5 Ω
Right Rear Speaker		3.5-4.5 Ω
Left Front Door Tweeter		3.5-4.5 Ω
Driver Door Speaker		3.5-4.5 Ω
Left Front Door Tweeter		3.5-4.5 Ω
Passenger Door Speaker		3.5-4.5 Ω

Confirm the resistances are normal.

Yes → Go to step 7

No

Step 5	Check for speaker open circuit.



(a) Disconnect radio control harness connector IP32.
(b) Disconnect the inoperative speaker connector.
(c) Listed in the following table, measure inoperative speaker connector terminal with a multimeter.

Location	Multimeter Connection	Specified Conditions
Left Rear Speaker		Less than 1 Ω
Right Rear Speaker		Less than 1 Ω
Left Front Door Tweeter	Door wiring harness connector DR04 terminals B, A and the instrument harness connector IP32 terminals No.7,3.	Less than 1 Ω
Right Front Door Tweeter	Door wiring harness connector DR14 terminals B, A and the instrument harness connector IP32 terminals No.6,2.	Less than 1 Ω
Driver Door Speaker	Door wiring harness connector DR09 terminals B, A and the instrument harness connector IP32 terminals No.7,3.	Less than 1 Ω
Passenger Door Speaker	Floor wiring harness connector DR19 terminals B, A and the instrument harness connector IP32 terminals No.6,2.	Less than 1 Ω

(d) Confirm the open circuit repair is completed.

Confirm the radio is working properly.

Yes → System normal

No

Step 6	Check the speaker.

(a) Measure speaker terminals.
Standard Resistance: 3.5-4.5 Ω

Confirm whether the resistance are normal.

Yes → Go to step 8

No

Step 7	Replace the speaker.

Confirm speakers are working correctly.

Yes → System normal

No

Step 8	Replace the radio control.

(a) Refer to 11.2.7.5 Radio Control Replacement.
Confirm the repair completed.

Next

Step 9	System normal.

11.2.7 Removal and Installation

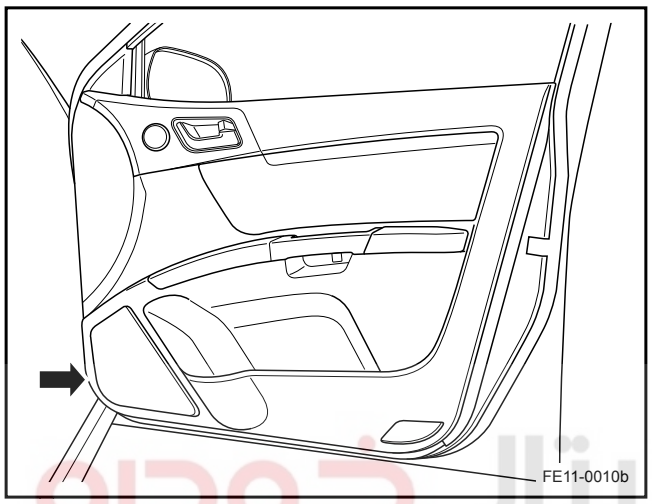
11.2.7.1 Front Door Speaker Replacement

Woofer Replacement

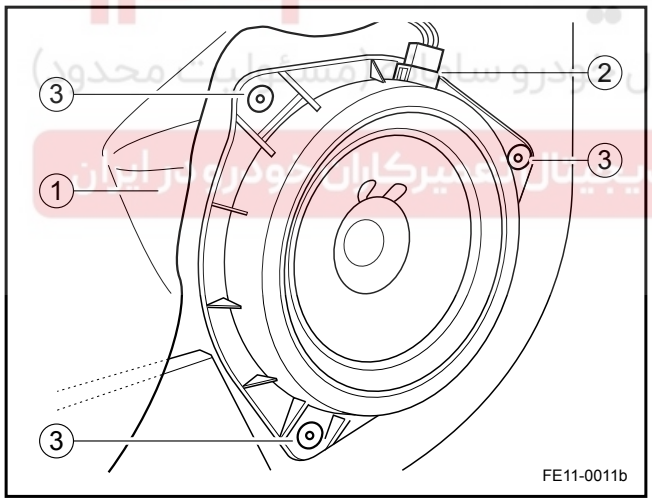
Removal Procedure

Warning!

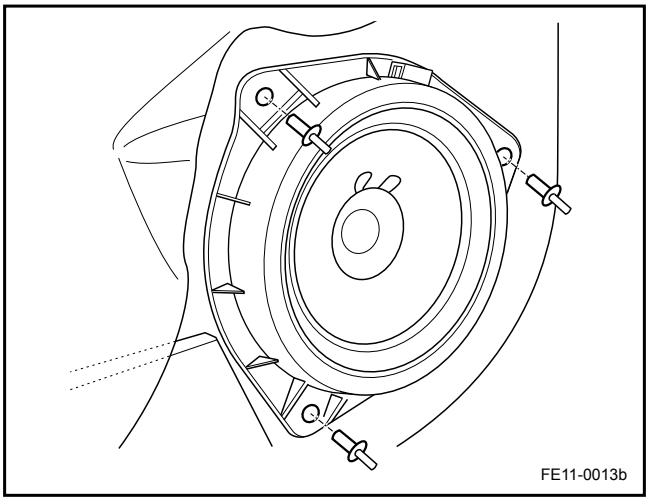
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front door trim panel. Refer to 12.9.1.12 Front Side Door Trim Panel Replacement.



3. Peel the film (1).
4. Disconnect the speaker connector (2).
5. Remove the front door speaker retaining screws (3).

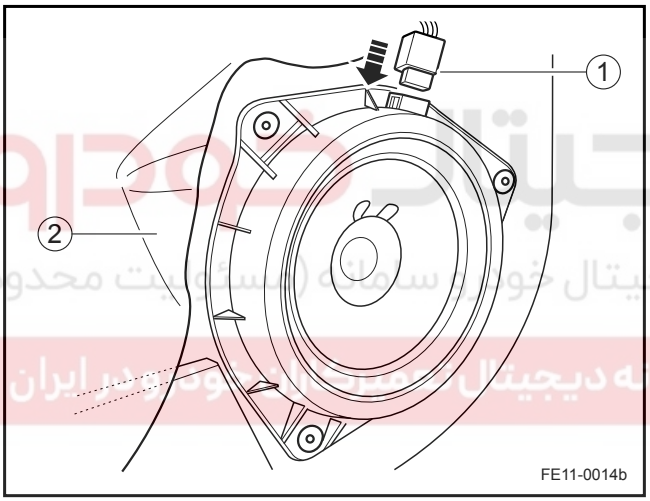


Installation Procedure:

1. Install the speaker and tighten the retaining rivets.

Note

Refer to "Fastener Notice" in "Warnings and Notices".



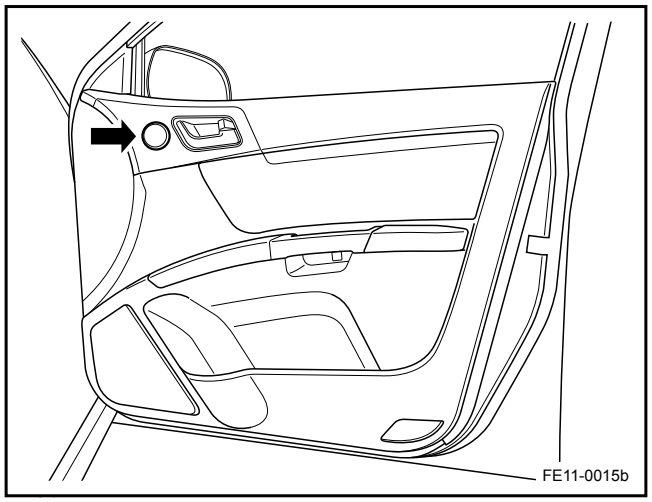
2. Connect the speaker harness connector (1).
3. Paste the film (2).
4. Install the front door trim.
5. Connect the battery negative cable.

Tweeter Replacement

Removal Procedure

Warning!

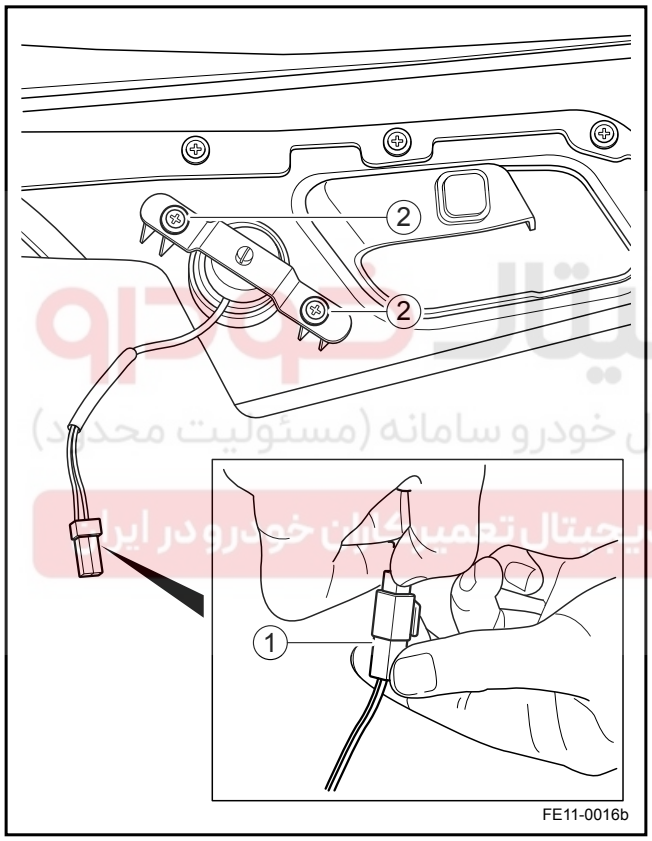
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



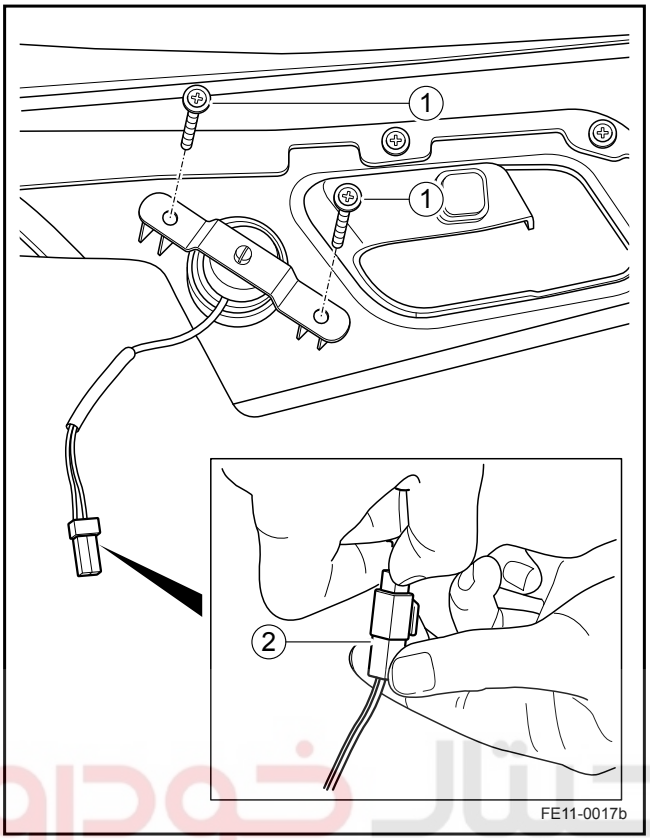
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front door trim panels. Refer to 12.9.1.12 Front Side Door Trim Panel Replacement.

   Note

   The tweeters are symmetrically located on left and right doors.



3. Disconnect the tweeter wiring harness connector (1).
4. Remove the tweeter retaining screw (2).



Installation Procedure:

1. Install the tweeter retaining screw (1).

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)

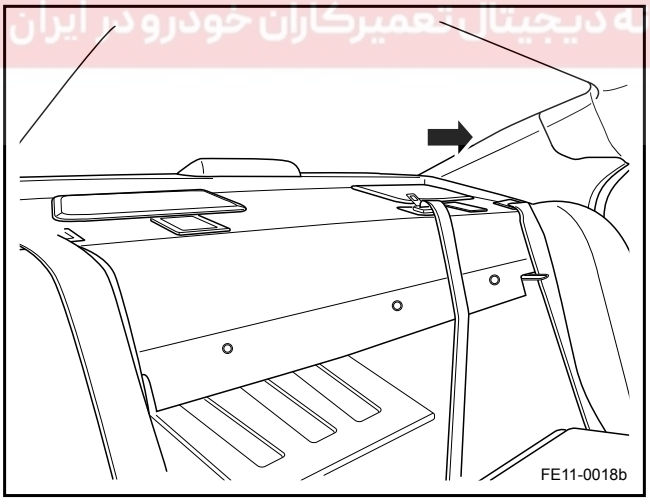
   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

2. Connect the tweeter harness connector (2).
3. Install the front door trim panel.
4. Connect the battery negative cable.

11.2.7.2 Radio Antenna Module Replacement

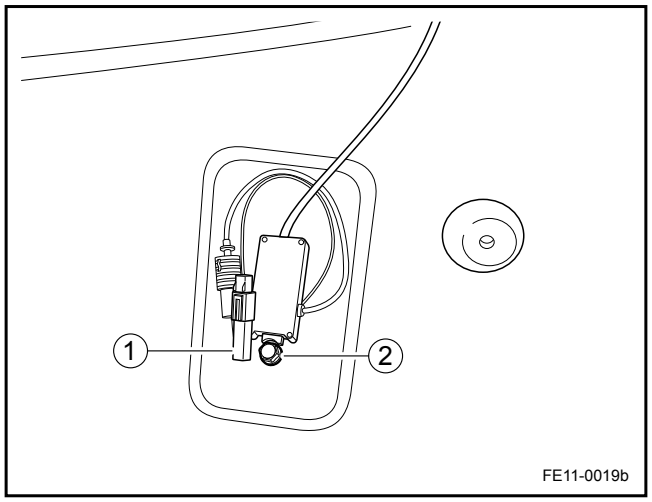
Removal Procedure



1. Remove the left rear C pillar trim panel. Refer to 12.9.1.1 Headliner Replacement.

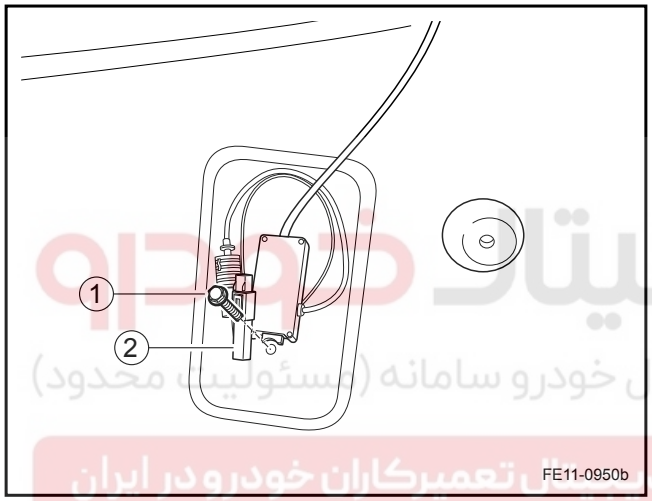
   Note

   To remove interior trim panels, please use the trim panel removal special tools, otherwise the trims are easily to be scratched.



2. Disconnect the antenna module harness connector (1).
3. Remove the antenna module retaining bolt (2).

Installation Procedure:



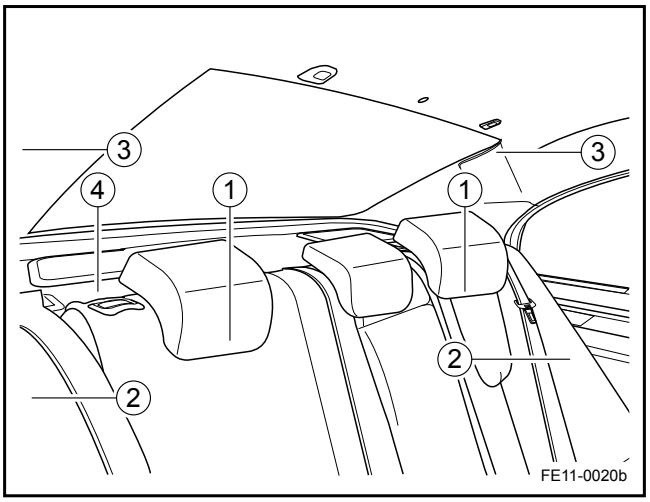
1. Install the antenna module retaining screw (1).
2. Connect the antenna module harness connectors (2).
3. Install the left rear C pillar trim panel.

11.2.7.3 Rear Speaker Replacement

Removal Procedure

Warning!

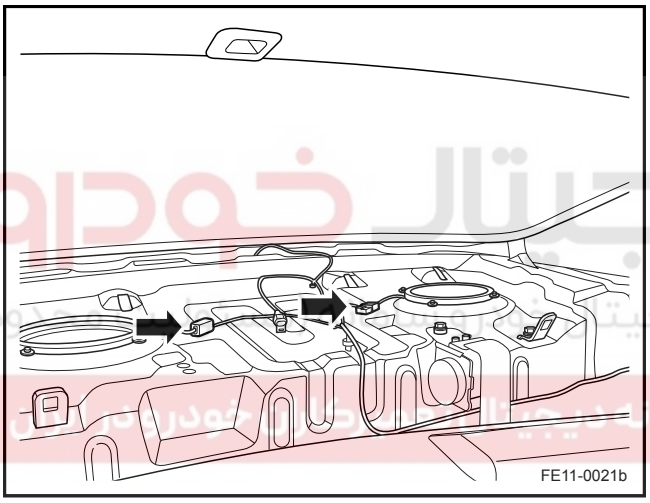
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



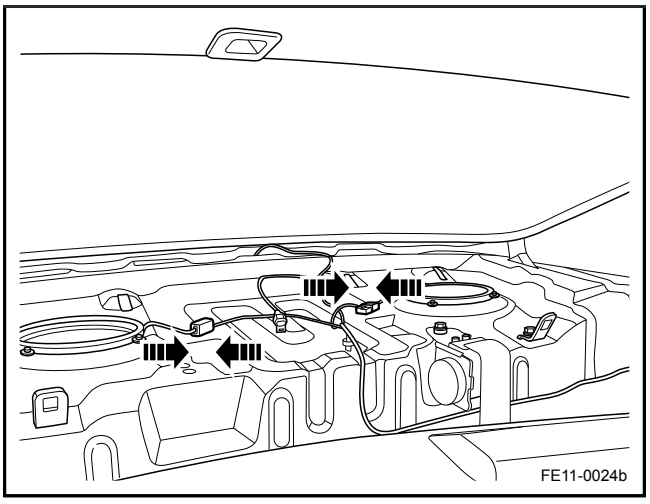
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Fold down the rear seat back (1).
3. Remove the left and right rear seat back (2). Refer to 12.7.3.7 Rear Seat Back Replacement.
4. Remove the left rear and right rear C pillar trim panel (3). Refer to 12.9.1.1 Headliner Replacement.

   Note

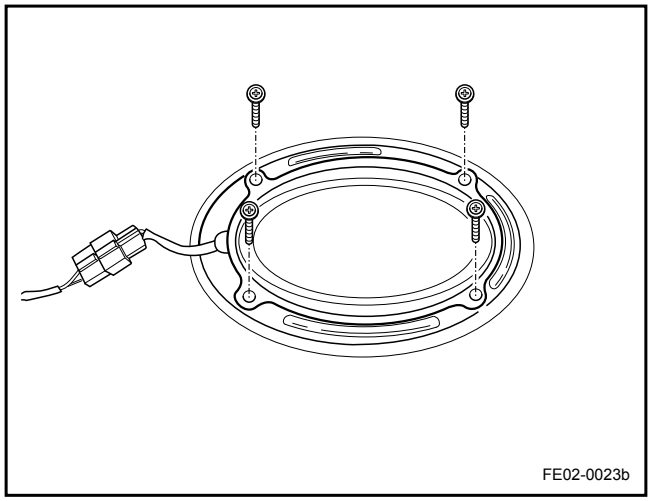
   To remove interior trim panels, please use the trim panel removal special tools, otherwise the trims are easily to be scratched.
5. Remove the rear parcel shelf (4). Refer to 12.9.1.7 Rear Parcel Shelf Replacement (Sedan).



6. Disconnect the rear speaker wiring harness connector.



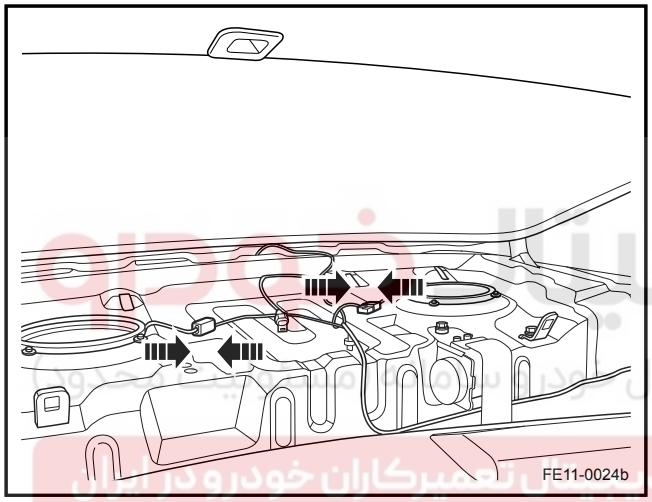
7. Remove the rear speaker retaining screw.



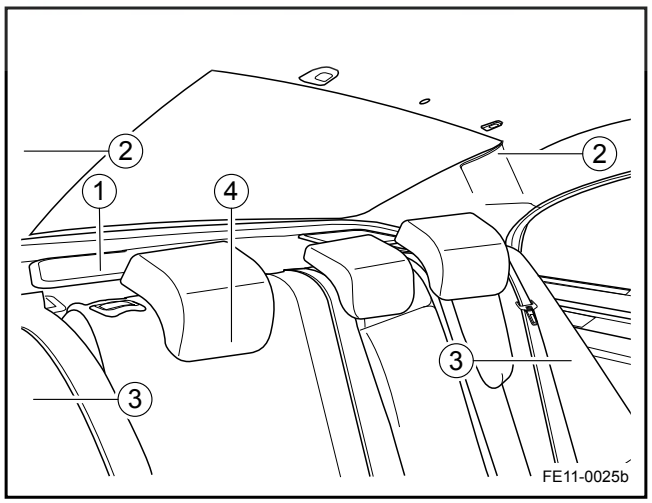
Installation Procedure:

1. Install the rear speaker and the tighten the retaining screw.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)



2. Connect the rear speaker wiring harness connector.



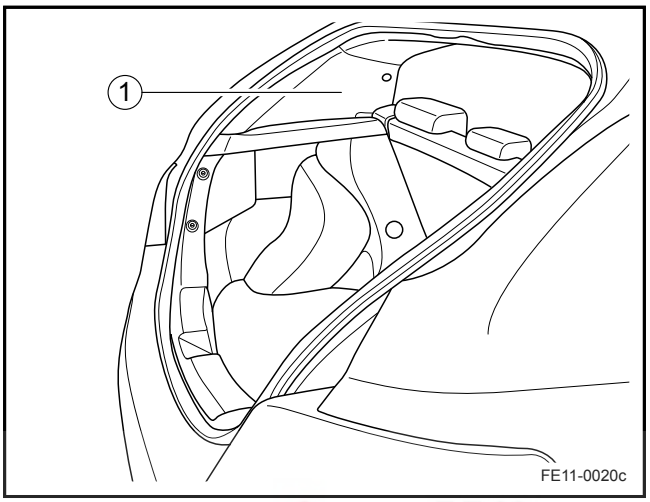
3. Install the rear parcel shelf.
4. Install the left rear and right rear C pillar trim panels.
5. Install the left and right rear seat back.
6. Lift the rear passenger seat backrest.
7. Connect the battery negative cable.

11.2.7.4 Rear Speaker Replacement (Hatchback)

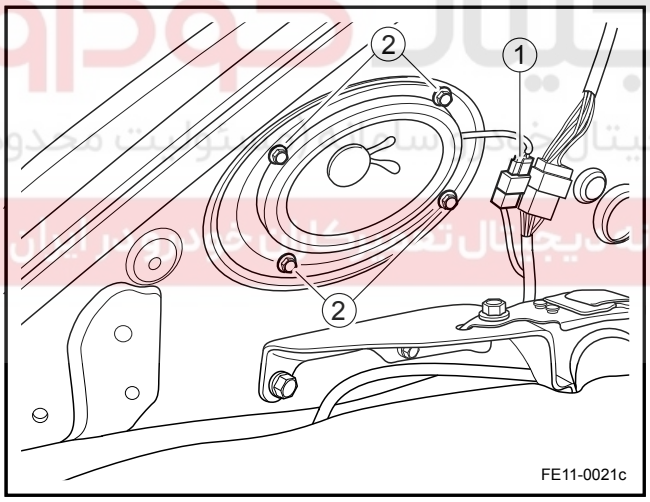
Removal Procedure

Warning!

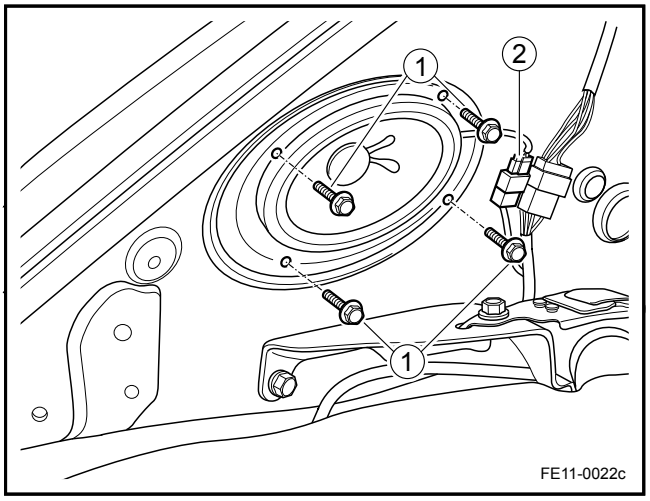
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the hatchback left interior panel (1). Refer to 12.9.1.1 Headliner Replacement.



3. Disconnect the rear speaker wiring harness connector (1).
4. Remove the rear speaker retaining screw (2) and remove the rear speaker.



Installation Procedure:

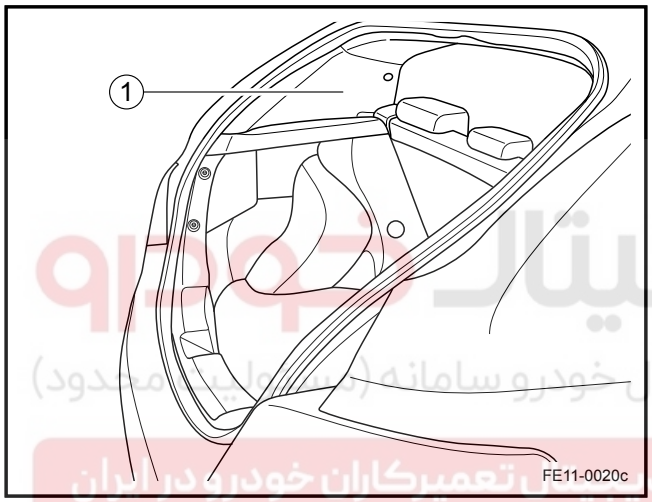
1. Install the rear speaker and tighten the retaining bolts.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)

   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

2. Connect the rear speaker harness connector 2.



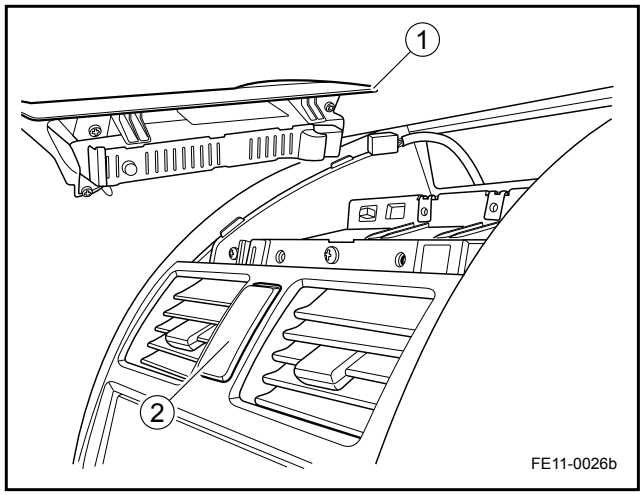
3. Install the hatchback left interior panel, the right interior panel is similar.
4. Connect the battery negative cable.

11.2.7.5 Radio Control Replacement

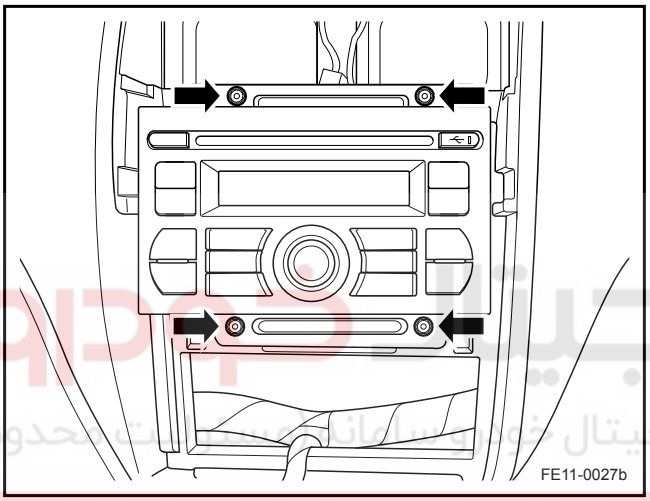
Removal Procedure

Warning!

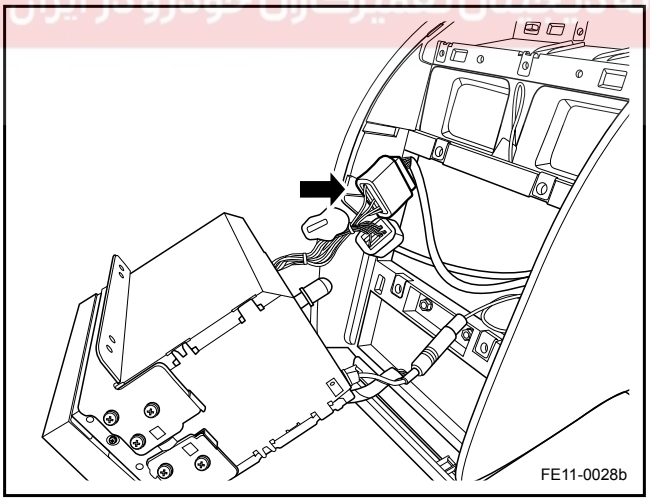
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable.Refer to 2.11.8.1 Battery Disconnection.
2. Remove the instrument cluster. Refer to 11.15.8.1 Instrument Cluster Replacement.
3. Remove the instrument panel center air duct panel (2). Refer to 8.2.8.11 Instrument Panel Air Duct Replacement.
4. Remove the air-conditioning panel. Refer to 8.2.8.1 Air-conditioning Control Panel Replacement.

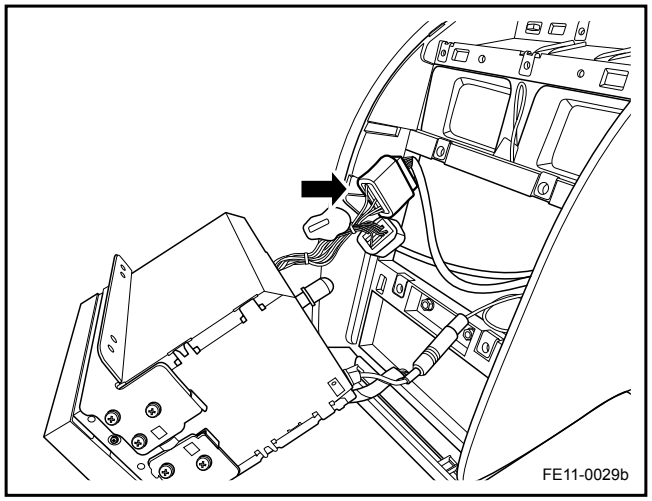


5. Remove the radio control retaining bolts.

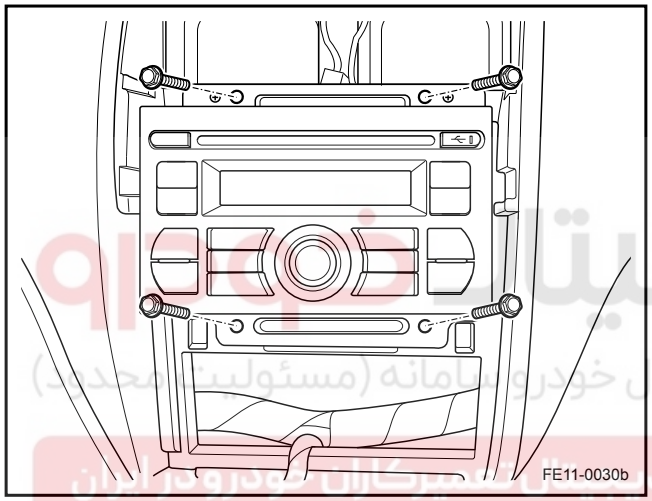


6. Disconnect the radio control wiring harness connector.

Installation Procedure:



1. Connect the radio control wiring harness connector.



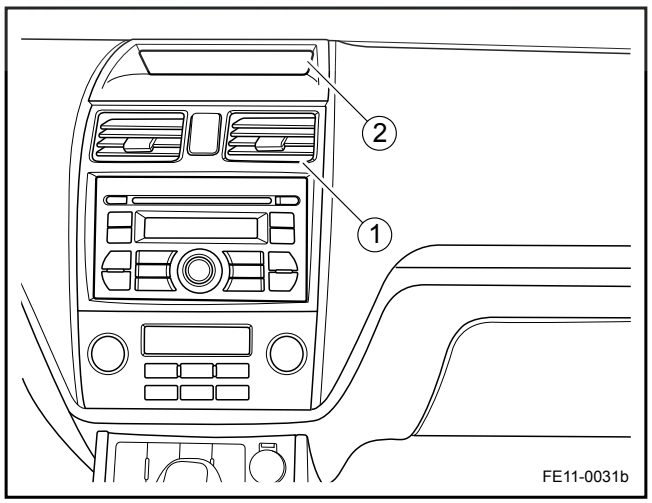
2. Install the radio control and tighten the retaining bolts.

   Torque: 9 Nm (Metric) 6.6 lb-ft (US English)

   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

3. Install the air-conditioning control panel.



4. Install the Instrument panel center air duct panel.
5. Install the Instrument Cluster.
6. Connect the battery negative cable.

11.3 Navigation

11.3.1 Specifications

11.3.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric(Nm)	US English(lb-ft)
Navigation Control Retaining Bolts	M6 × 20	8-11	6-8
GPS Antenna Self-Tapping Screws	ST4.2 × 16	3-4	2-3
Rear Speaker Self-Tapping Screws	ST4.8 × 9.5	3-4	2-3
Front Door Tweeters Self-Tapping Screws	ST4.2 × 9.5	3-4	2-3
Radio Antenna System Bolts (Sedan)	M6 × 16	8-11	6-8

11.3.2 Description and Operation

11.3.2.1 Overview

Vehicle navigation system consists of a GPS receiver, self-navigation device, speed sensors, gyro sensors, LCD monitor etc.. GPS is "Global Positioning System" acronym, the Global Positioning System, which is the U.S. research and development for military purposes. Its means using navigation satellites to measure time and distance, and form a global navigation system.

This vehicle navigation system uses current advanced design approach: navigation display screen, navigation ECU, radio, DVD are integrated in one. Map database uses SD card storage technology, previously using CD-ROM map to store database. Using SD cards as map data storage is faster than using CD-ROM. Without the CD-ROM player, its structure is simpler, so the failure chances are greatly reduced. When a new navigation map database needs to be updated, simply use the computer to update the SD card data. To update the traditional map data stored on CD-ROM, the only way is to replace the CD-ROM.

Vehicle navigation have the following main functions:

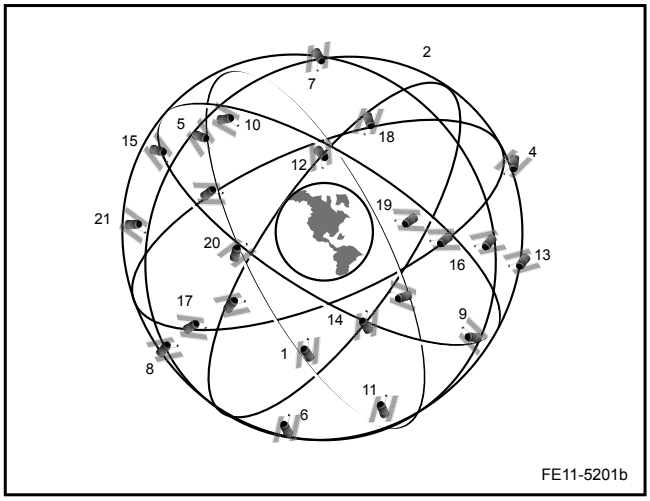
- Be able to retrieve the best route to the destination;
- With instantaneous re-search function;
- Provide an abundance set menu and records to facilitate the search;
- Provide real-time voice prompts at appropriate times;
- Function expansions.

11.3.2.2 GPS System Introduction

GPS consists of the space segment, ground control segment, the user device.

Space Segment:

It includes 21 satellites and three spare satellites, like a constellation, placed in the air 20,000 km away from the Earth. Evenly distributed in the orbit angle 55 ° in six orbital planes, different orbital planes form a 60 ° angle, four satellites are distributed on each orbit. The distribution structure ensures that at any location in the world, one can refer to at least four satellites.



Ground Control Segment:

For navigation and positioning, firstly the satellite location must be known. The satellite position is derived from calculations based on the satellite movement and its orbital parameters. Ground monitoring station continuously monitors each satellite for many years. According to the satellite observed parameters adjust the satellite orbit to amend the satellite positioning. When one satellite fails, a spare satellite can replace the failed satellite.

User Receiver System:

User receiver system includes a power supply, antenna, receiver, microprocessor, control display devices such as hardware and software, data processing software package and so on.

11.3.2.3 Function Expansion Introduction

1. Radio Functions

Same as an ordinary radio, this system radio has radio receiving capabilities, and it can store 30 radio stations. When disconnecting the battery negative cable, the stored list of all the radio stations with all information will be cleared.

2. CD/MP3 Functions

Note

If an already inserted disc does not pop up, inserting the second disc may damage the CD / DVD drive. Insert adisc after the disc ejected from the CD/DVD drive.

This system supports regular music CD, MP3 CD. When the CD/MP3 is inserted, it will automatically start playing, the display shows CD/MP3 status, including "track number", "progress bar," and other information. (When you insert a MP3 disc, the machine will detect the MP3 disc, the screen will switch to the MP3 screen display. When playing MP3 disc, the track name and artist information will also be displayed on the screen).

3. SD Functions

Note

This system supports dedicated cards: If MP3/WMA format file is copied on the SD card with map files, the system does not recognize the corresponding audio files, only when the MP3/WMA format files are copied on other non-loaded SD card, the system will play the music.

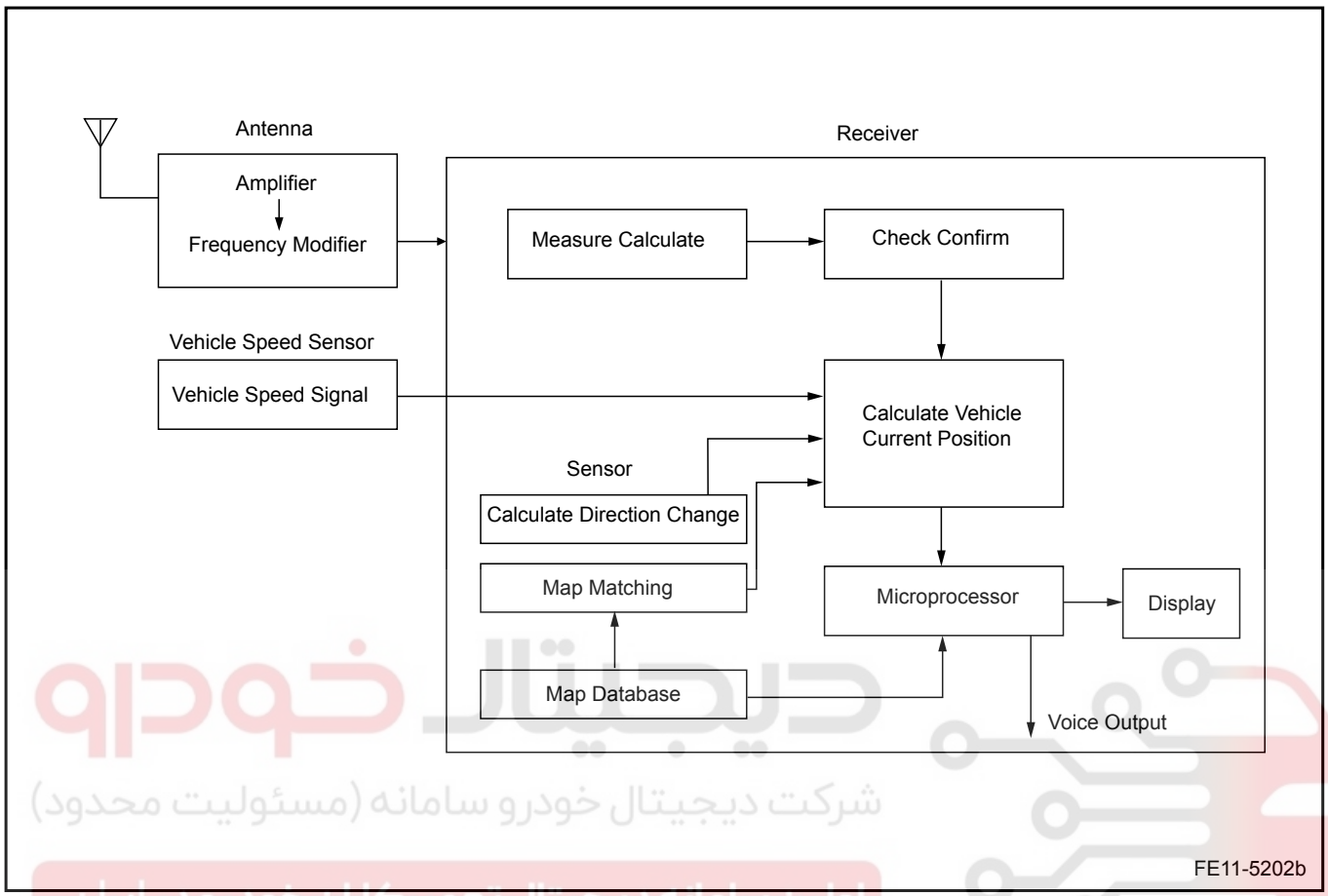
The system supports MP3/WMA format audio file playback. When a SD card with MP3/WMA files is inserted, press [SD] key, the system starts playing the audio files on the SD card, the display shows SD status, including "track name", "Artist Information", "progress bar", etc.

4. DVD Functions

When the DVD disc is inserted, the system will play DVD after reading the menu.

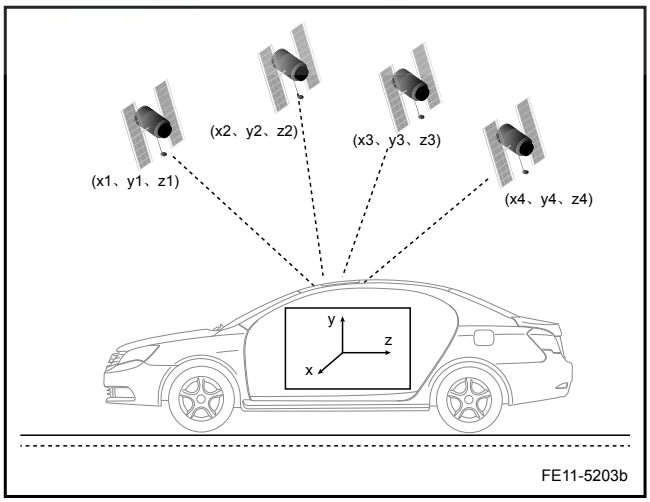
11.3.3 System Working Principle

11.3.3.1 Navigation System Principle Diagram



11.3.3.2 GPS System Positioning Principle

GPS system is used to determine the user's exact location on Earth. each satellite rotate around the Earth two laps every day, so at any location on Earth, four or more satellites signals can be received at the same time. the computer can calculate the user current location in Earth coordinates (longitude, latitude). After the receiver receives these signals, it calculates the current three-dimensional position, three-dimensional direction and velocity and time information. GPS receivers are usually used for pseudo-range measurements, carrier phase measurements, satellite radio interferometry, Doppler measurements and other measurements.

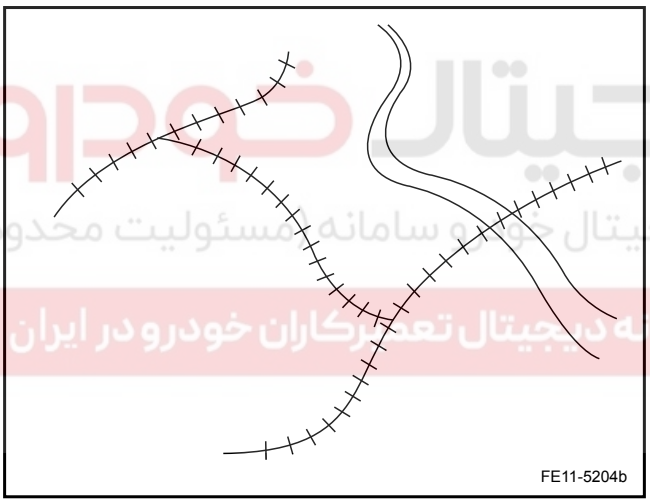


11.3.3.3 Self-Navigation

When the vehicle is traveling to an underground tunnel, between high-rise buildings, under highway bridges, it may not receive GPS satellite signals, the system can automatically enter the self-navigation mode. At this point the vehicle speed sensor detects the vehicle, the vehicle microprocessor calculates the distance. Gyro sensor directly detects the direction change and moving forward status. For example, when the vehicle is traveling in the ditch like Hill Road, round shape bridge, skidding on snow, all these curves cause positioning errors. Only the gyro sensor and microprocessor calculations can get the correct vehicle location. However, the positioning accuracy is far below the GPS positioning accuracy.

11.3.3.4 Map Matching Techniques

Microprocessor electronic map is identified by the node-based data.

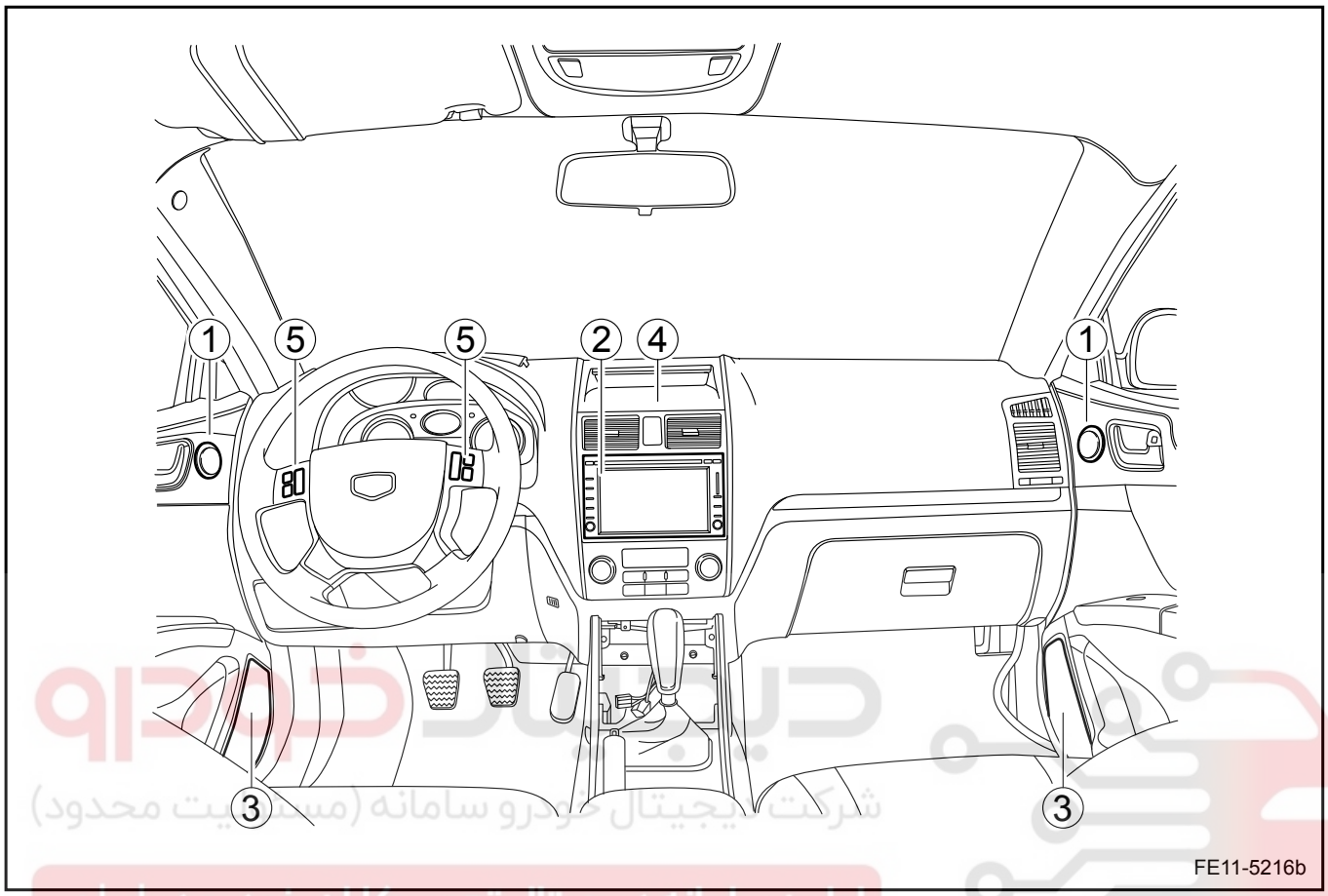


There are discrepancies between the GPS satellite navigation and self-navigation devices detected vehicle location and direction and the actual driving route. To correct these errors, the map-matching techniques are used. The microprocessor correct the errors electronic map errors and automatically adjust.

Map database stores roads, road maps and urban transport map. Before driving, input the city, streets, place names, etc. through the input interface. Through satellite signals systems, the processor determines the direction and the best route according to vehicle speed sensors, gyro sensors measured data. During driving, driver can observe the screen to get the current location. Display can also show the distance remaining to reach the destination. At the same time prompts the related information through audio voice output to the driver.

11.3.4 Component Locator

11.3.4.1 Component Locator



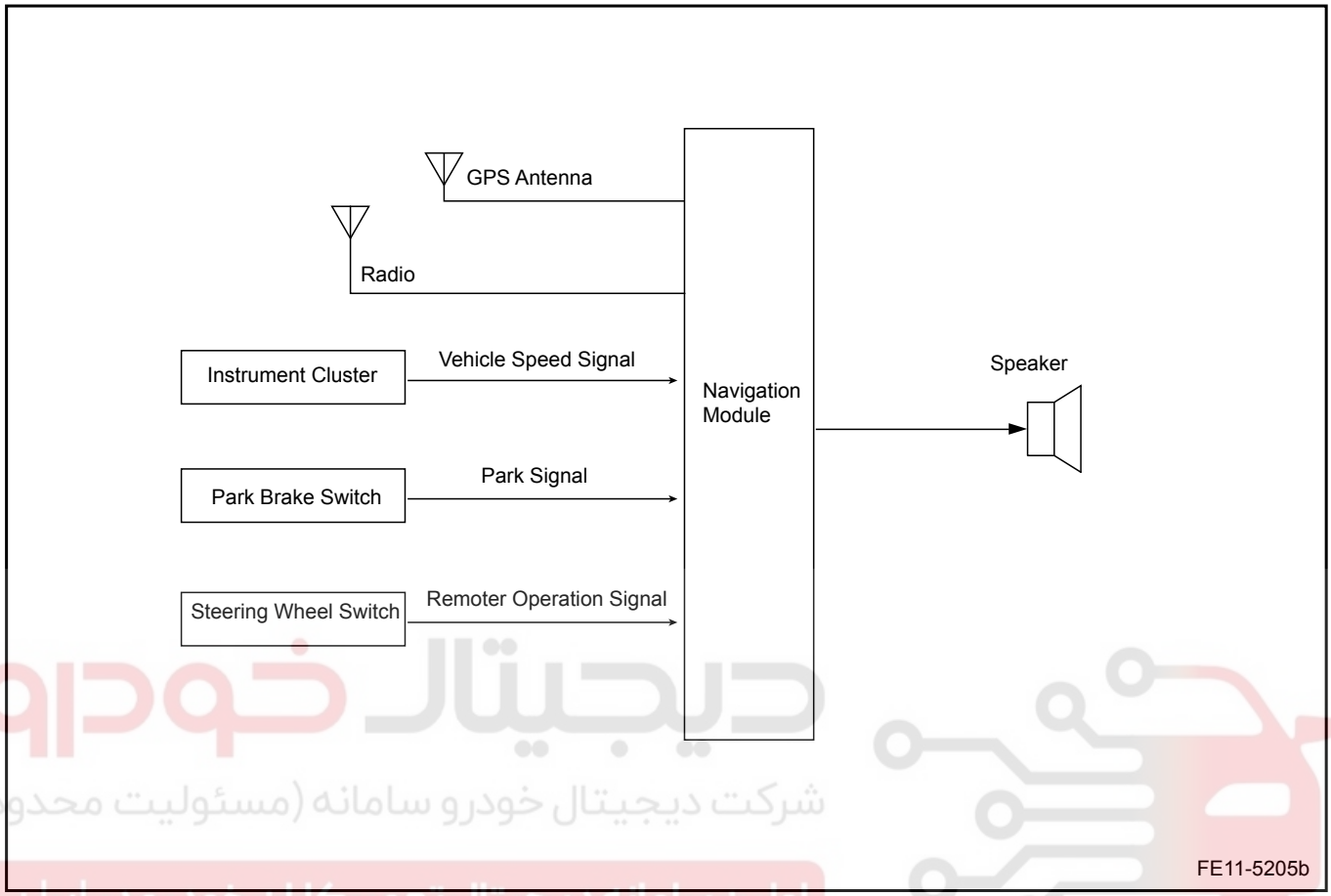
FE11-5216b

Legend

1. Front Door Tweeters
2. Navigation Unit
3. Front Door Speakers
4. GPS Antenna
5. Steering Wheel Switch

11.3.5 Schematic

11.3.5.1 Schematic



11.3.6 Diagnostic Information and Procedures

11.3.6.1 Visual Inspection

- Check installed the after market equipment that may affect audio system operation.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- For all speakers inoperative malfunction, focus on easy to short to ground circuits, such as the rear compartment speaker wiring harness connector, as it will help with quick diagnostic.
- For one speaker inoperative malfunction, it may be because user accidentally shield one channel, making a single channel inoperative. this is not a sound system failure. Refer to the user manual for sound system instructions.
- For unable to enter the navigation interface malfunction, it may be because the SD card with map is not installed or the SD card is not a dedicated card. Check the SD card performance first, whether the internal data is normal.

11.3.6.2 System Diagnostics Description

1. When driving, driver can not watch DVD or operate the navigation system, to avoid distraction affecting driving safety.
2. This vehicle entertainment navigation system can play CD-DA, CD-ROM, CD-R, CD-RW, VCD, DVD-ROM, DVD Recordable disc.
3. The machine can only play the normal 12CM diameter disc. Do not use other disc, otherwise the disc may not eject or it cause no damage to the player.
4. Do not use any solvents, such as the commercially available cleaners, anti-static spray cleaning disc.
5. Keep the vehicle and the disk clean, avoid the dust adhering to the laser head, resulting in a reduced playing disc ability, and ultimately reduce the laser head life.
6. On the rough road, the sharp jolt could cause the sound jump.
7. The entertainment navigation system GPS positioning will be affected by the weather and the location (tower / tunnel / underpass / tree). Most GPS can not be used indoor and in the basement location. GPS the signal can not penetrate the high-rise buildings and metal-containing components of automotive insulation film or similar products.
8. Vehicle entertainment navigation system GPS positioning result is only for driver reference only. If abnormal, please drive according to the actual road conditions.
9. Vehicle entertainment navigation system navigation electronic map data only provides general access information. it can not provide high-precision positioning and the path planning. Voice prompts and the intersection information are based on the digital map database the best path calculation results, and are for reference purposes only, the driver must abide by the rules of the road.
10. Keep the volume at an appropriate level in order to be able to feel the situation of roads and vehicles to ensure road safety.
11. Avoid excessive moisture and dust. Do not let the navigation unit contact water, which will lead to electric shock, fire or other damage.
12. When the vehicle inside temperature is low, do not use entertainment navigation system immediately after turning on the heater. The entertainment navigation system disc or the player may be condensed with water. If there is condensation on the optical components, stop using the entertainment navigation system disc playback function for about 1h. The condensation will disappear naturally, and then it can be normally operated.
13. Very high or very low temperatures can interfere with normal function. If the engine is shut down, and the vehicle is parked under the direct sun or at a cold place under for too long, the vehicle inside may become very hot or very cold. In this environment entertainment navigation system may work properly. Once the temperature inside the vehicle is back to the normal range, the normal function can resume . If it does not, please contact the authorized service center for repair.

14. If the entertainment navigation system fails (power block-up, no picture, no voice) or any abnormal status (foreign matter inside the system, water entering the system, smoke, or smell), do not open the machine shell without permission. after removing the body, lubricate the rotating parts. The power supply should be immediately cut off and contact authorized service center for repair.

11.3.6.3 Navigation Notice

1. Because there are individual differences in each vehicle in the navigation system's initial use, it needs the calibration time for more accurate positioning of the vehicle. In driving, the system automatically and dynamically calibrate.
2. After shut down the engine for a long time, when restart the navigation system receiving GPS signals and re-positioning time will be longer. in general, the vehicle can be successfully positioned within 3min .
3. If the GPS signals are shielding such as: high-rise buildings on either side of the road, roadside trees, under overpasses, underground car parks, tunnels. at this time the GPS signals can not be received, and the positioning is also possibly biased.
4. It may sometimes not be able to identify the vehicles on the elevated road or on the ground. Over time, the vehicle will be re-positioned correctly.
5. To avoid excessive invalid voice order, at some turns there are no voice prompts: If there is no bifurcation of the turning point of intersection or the difference between the level of the road is too great.
6. If one was transferred to the road next to the other parallel road, then the voice will prompt"Turn at x to y" in order to help choose the right turn. Side roads will be counted as an intersection.
7. In the routes calculation, the address input, switching languages, day and night mode switching points of interest search, disc insert and eject operations require more system resources and need to wait for a period of time to complete. it is recommended that when doing these operations, do not turn the ignition or switch interface or plug SD card, otherwise it will affect the system stability. Under serious situation, system may restart.
8. To avoid navigation system not turned off and hot plug SD card, causing the SD card file system damage, lost, resulting in the normal navigation system can not read the map files for navigation, it is prohibit to hot plug the SD card.

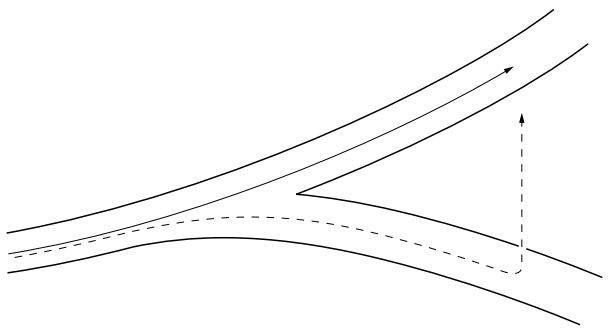
11.3.6.4 Navigation Non-Fault Status, The Positioning Amendment

Note

The following list is not the navigation malfunction. If it occurs, after test the vehicle and verify the problem, explain to customers.

Step 1	Y-shaped Road

Y-shape Divided Roads



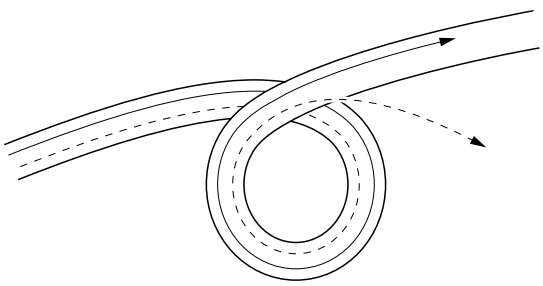
FE11-5206b

On the Y-shaped road or similar roads, the sensor driving direction accumulated error may lead to the current location marker appears in the wrong path.

Correction	Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

Step 2	Spiral-shaped Road

Spiral Road



FE11-5207b

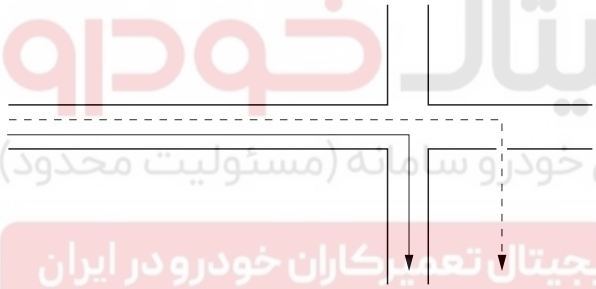
When traveling on a large, continuous spiral road (for example, ring overpasses, etc.), there will be turning point accumulated errors, the location marker may deviate from the current location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

Step 3	Turning A Corner After The Straight Road

Straight Road



FE11-5208b

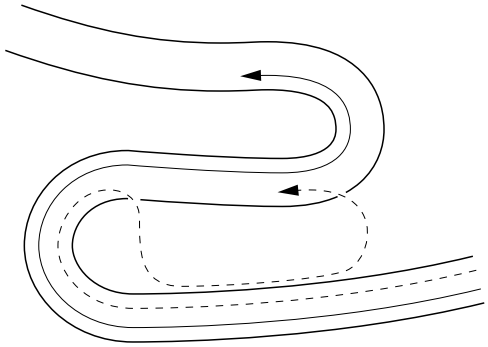
When traveling on a long, straight road, the map matching can not be effective enough to work and may thus accumulate error in distance. Therefore, when the vehicle turning a corner, the location marker may deviate from the current location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly. When turning, maintain a low constant speed to avoid such problems.

Step 4	Zigzag Round-Trip Route

Zigzag Road



FE11-5209b

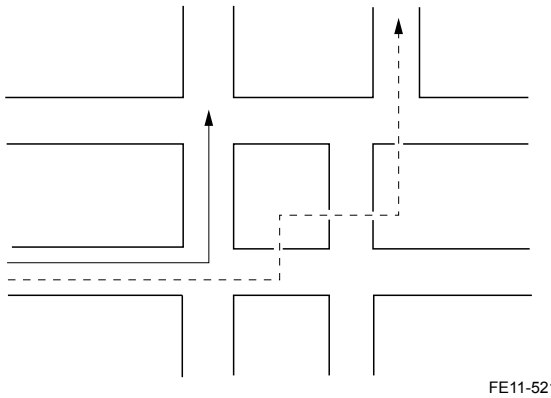
When traveling on a zig-zag road, at each turn the map may be matched to other nearby roads in the same direction, then the location marker may deviate from the current location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

Step 5	Square-shaped Road

Square Blocks



FE11-5210b

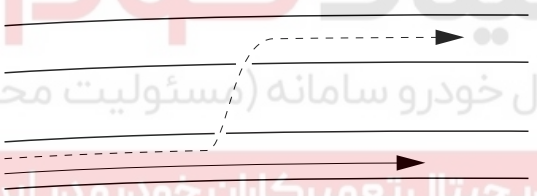
When traveling on a square-shaped road, there are many roads in the vicinity to the same direction, the map may be matched to other roads, then the location marker may deviate from the current location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

Step 6	Parallel Roads

Parallel Roads



FE11-5211b

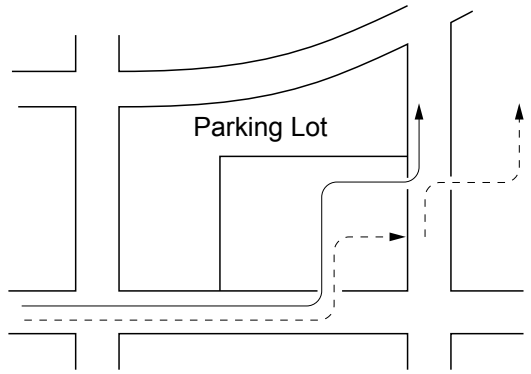
When the two roads are parallel(for example, there is a side road next to the highway.), map may be incorrectly matched to other roads, then the location marker may deviate from the current location.

rection method

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

Step 7	In The Parking Lot

Inside Parking Lot



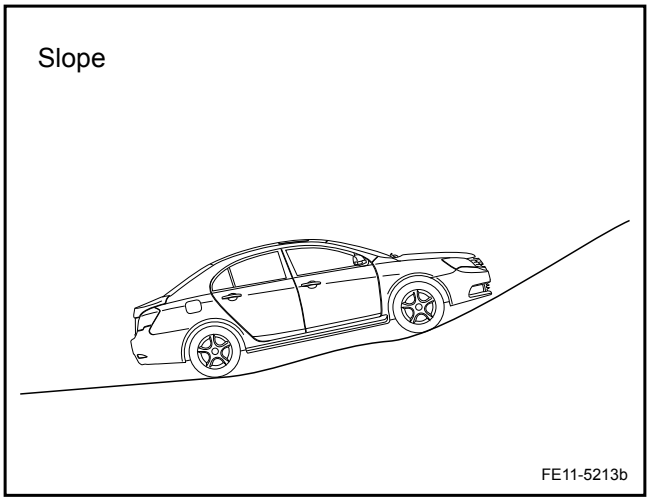
FE11-5212b

When the vehicle is in a parking lot or on an unnamed road, the current location marked as a nearby road. When the vehicle is back on the road, the location marker may deviate from the correct location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

Step 8	Steep Hills, Slopes



When parking on slopes or on a steep hill, the turning point will have error and the location marker may deviate from the correct location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

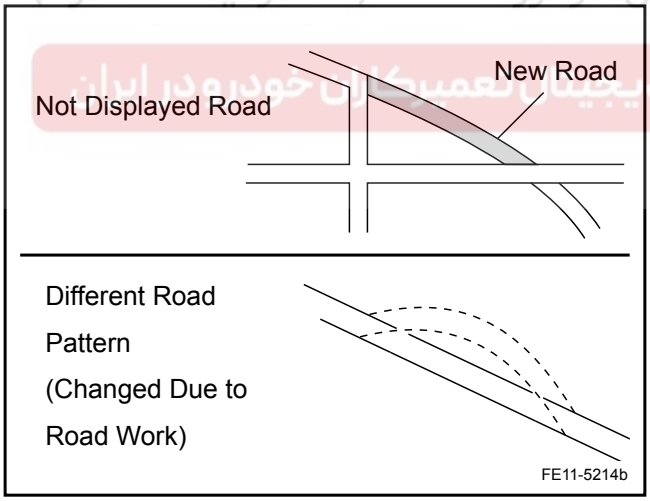
Step 9	Erratic Driving Route

When the vehicle changes lane frequently, the location marker may deviate from the correct location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

Step 10	Map Data Related



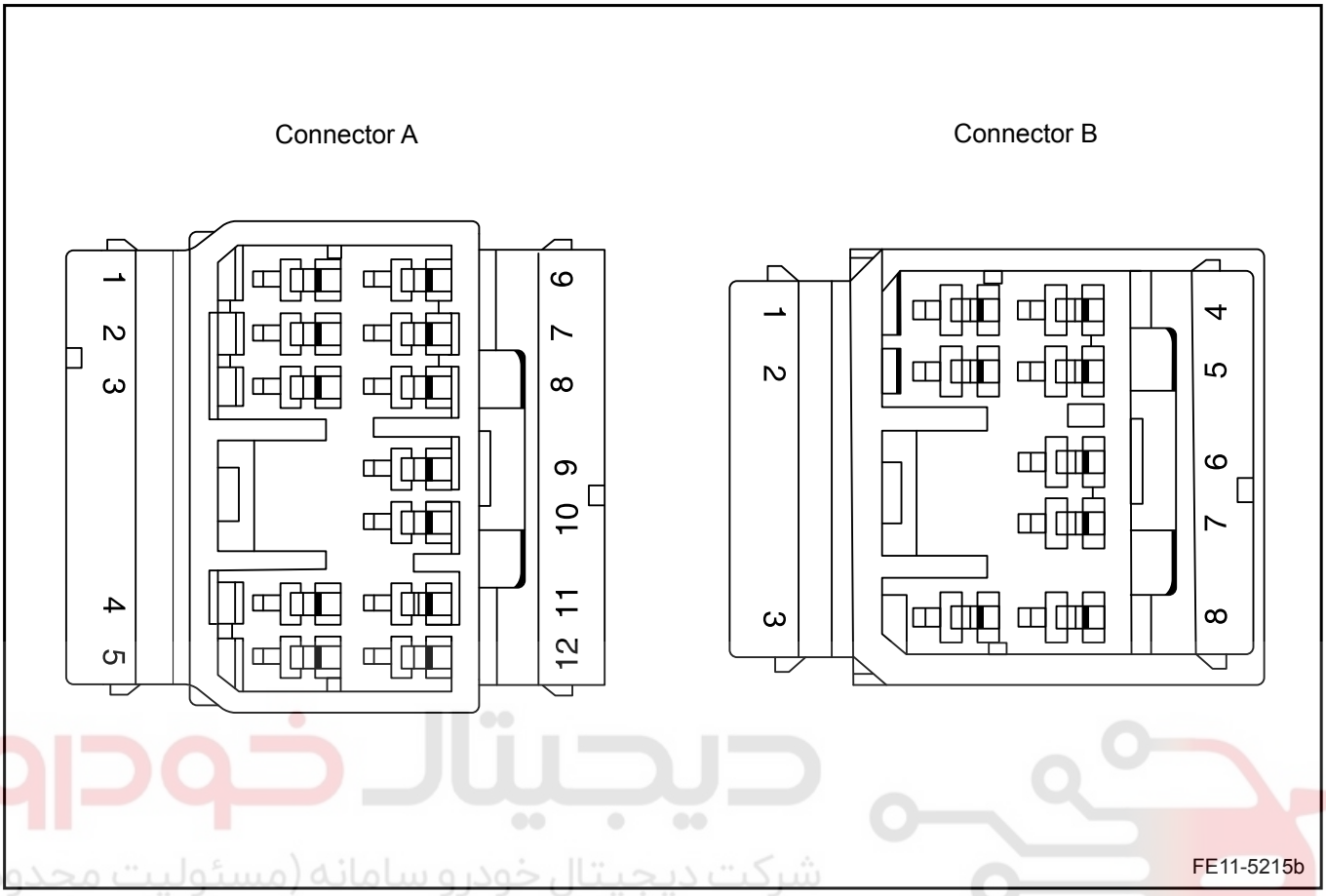
(a) When traveling on a new road, or the the road that does not show on the screen, map matching can not be functioning properly, thus matching the other roads nearby, the marker point may be deviated from the correct location.

(b) B. If the data stored in the road map is different from the actual road shape, normal map-matching does not work, thus matching other roads nearby, the location marker may be deviate from the correct location.

Correction

Continuously driving for some time, after divergent roads, the vehicle will be re-positioned correctly.

11.3.6.5 Navigation Host Terminal List



Connector A:

Terminal ID	Terminal Definition	Wire Color	Specified Conditions
1	Power Ground	0.85 B	Resistance between the terminal and the ground is Less than 1 Ω.
2	Steering Wheel Wire Signal	0.3 W	Volume Increase Button: 0.33 V Volume Decrease Button: 0.94 V Mute Button: 1.5 V Add: 1.98 V Minus: 2.5 V Mode Button: 3 V
3	--	--	--
4	--	--	--
5	Antenna Control	0.5 V	12 V Power Supply
6	Working Power Supply and Memory Power Supply	0.85 G/W	Battery Power Supply
7	Trigger Power Supply	0.5 R	Ignition Switch At ACC，Battery Power Supply
8	--	--	--

Terminal ID	Terminal Definition	Wire Color	Specified Conditions
9	Backlight Control Signals	0.3 O	Dimmer Output, PWM Power Supply
10	Speed Signal Ground	0.5 B	Parallel with speed signal circuit connected to the host, wiring harness should be as short as possible to reduce the wiring harness impedance.
11	Speed Signal	0.3 G	Vehicle Driving: Pulse
12	-	-	-

Connector B:

Terminal ID	Terminal Definition	Wire Color	Specified Conditions
1	Right Rear Speaker Positive	0.5 Gr/R	Sound System At Work: AC Voltage 10 mV ~ 12 V
2	Right Front Speaker Positive	0.5 W/B	Sound System At Work: AC Voltage 10 mV ~ 12 V
3	Left Front Speaker Positive	0.5 Br/W	Sound System At Work: AC Voltage 10 mV ~ 12 V
4	Left Rear Speaker Positive	0.5 G/B	Sound System At Work: AC Voltage 10 mV ~ 12 V
5	Right Rear Speaker Negative	0.5 Gr	Sound System At Work: AC Voltage 10 mV ~ 12 V
6	Right Front Speaker Negative	0.5 W	Sound System At Work: AC Voltage 10 mV ~ 12 V
7	Left Front Speaker Negative	0.5 Br	Sound System At Work: AC Voltage 10 mV ~ 12 V
8	Left Rear Speaker Negative	0.5 G	Sound System At Work: AC Voltage 10 mV ~ 12 V

11.3.6.6 Navigation Common Fault Symptom Table

Failure Symptoms	Reason	Approach
It can not successfully activate the map.	1. When activating, entered the wrong serial number for the navigation unit.	Update the navigation map data.
	2. CD-ROM map has more than two versions, CD-ROM with the wrong map, guide system activation maps generated version and the SD card map version is inconsistent, resulting in map version does not match, can not activate.	

	3. Continuous operation on multiple vehicles, the old U disk activation code is not deleted. directly downloaded the new activation code to the SD card, resulting in an error file name, resulting in maps can not be activated.	
Navigation is able to receive GPS signals, but the GPS does not synchronize with vehicle moving	There are other built-in gyroscope devices. GPS requires a certain driving distance for map data matching.	Driving a vehicle at 60 km/h or more for some time, and then test it.
It can not find the destination on the map.	1. The input address is not accurate.	Refer to the navigation manual, operate correctly.
	2. Input is the old name, the map has the old name, but the place has been renamed, or has changed address.	
	3. Map information related to national security is not shown on the map, such as embassies, water plants, and military units.	

11.3.6.7 Navigation Unit Can Not Be Turned On

For diagnostic steps. Refer to 11.2.6.3 Radio Control Can Not Be Turned On.

11.3.6.8 Navigation Host Can Boot But Can Not Enter The Navigation Interface

Step 1	Check the SD card.

(a) Check SD card is inserted correctly.

No → Re-install SD card

Yes

Step 2	Check whether the SD card is the dedicated navigation card.

(a) Turn off the navigation.
(b) Remove the navigation SD card.
(c) With the PC, check the SD card whether there is any other data in addition to map data, .

SD card data normal?

No → Re-write SD card map data.

Yes

Step 3	Replace the SD card.

(a) Turn off the navigation. Navigation normal?
(b) Remove the SD card.
(c) Re-install the known good SD card.

Yes → System normal

No

Step 4	Check the navigation unit power supply circuit.

(a) For diagnostic steps. Refer to 11.2.6.3 Radio Control Can Not Be Turned On.

Is power supply circuit normal?

No → Deal with the power circuit failure.

Yes

Step 5	Replace the navigation unit.

(a) Refer to 11.2.7.5 Radio Control Replacement.

Next

Step 6	System normal.

11.3.6.9 Navigation Interface Can Be Accessed, But The Navigation Satellite Signals Can Not Be Retrieved.

Fault Definition: at any location (including the open land), the vehicle GPS can not retrieve any satellite signals.

Step 1	Check whether the windshield is covered.

Covered?

Yes → Clear the covering material.

No

Step 2	Check the GPS antenna connector.

(a) Remove the navigation unit. Refer to 11.2.7.5 Radio Control Replacement.

(b) Check whether the GPS antenna connections are normal.

No → Reconnect the GPS antenna

Yes

Step 3	Replace the GPS antenna.

(a) Remove the GPS antenna. Refer to 11.3.7.1 GPS Antenna Replacement.

System normal?

Yes → System normal

No

Step 4	Replace the navigation unit.

(a) Refer to 11.2.7.5 Radio Control Replacement.

Next

Step 5	System normal.

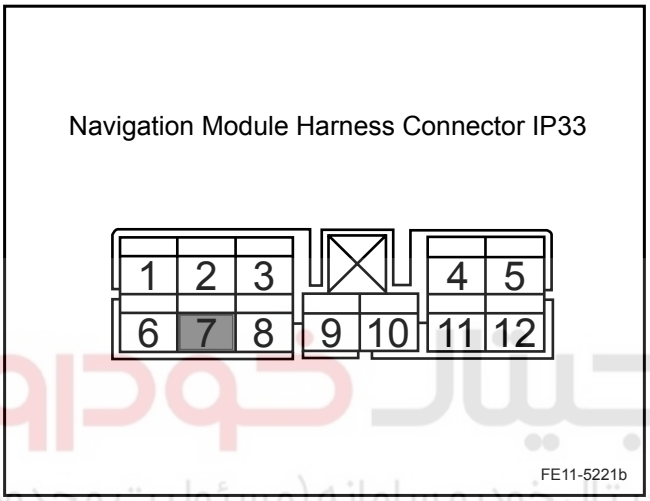
11.3.6.10 Navigation Unit Can Not Be Turned Off

Schematic:

Refer to 11.2.6.3 Radio Control Can Not Be Turned Onschematic.

Diagnostic Steps:

Step 1	Check the navigation unit trigger working power supply.



(a) Remove the navigation unit. Refer to 11.3.7.4 Navigation Unit Replacement.
(b) Turn the ignition switch to "OFF" position.
(c) Disconnect navigation unit harness connector IP33.
(d) Measure voltage between the navigation unit harness connector IP33 terminal No.7 and a reliable ground.
Standard Voltage: 0 V

Is the voltage Standard Value?

No

Navigation unit power circuit failure. Refer to the11.2.6.3 Radio Control Can Not Be Turned On.

Yes

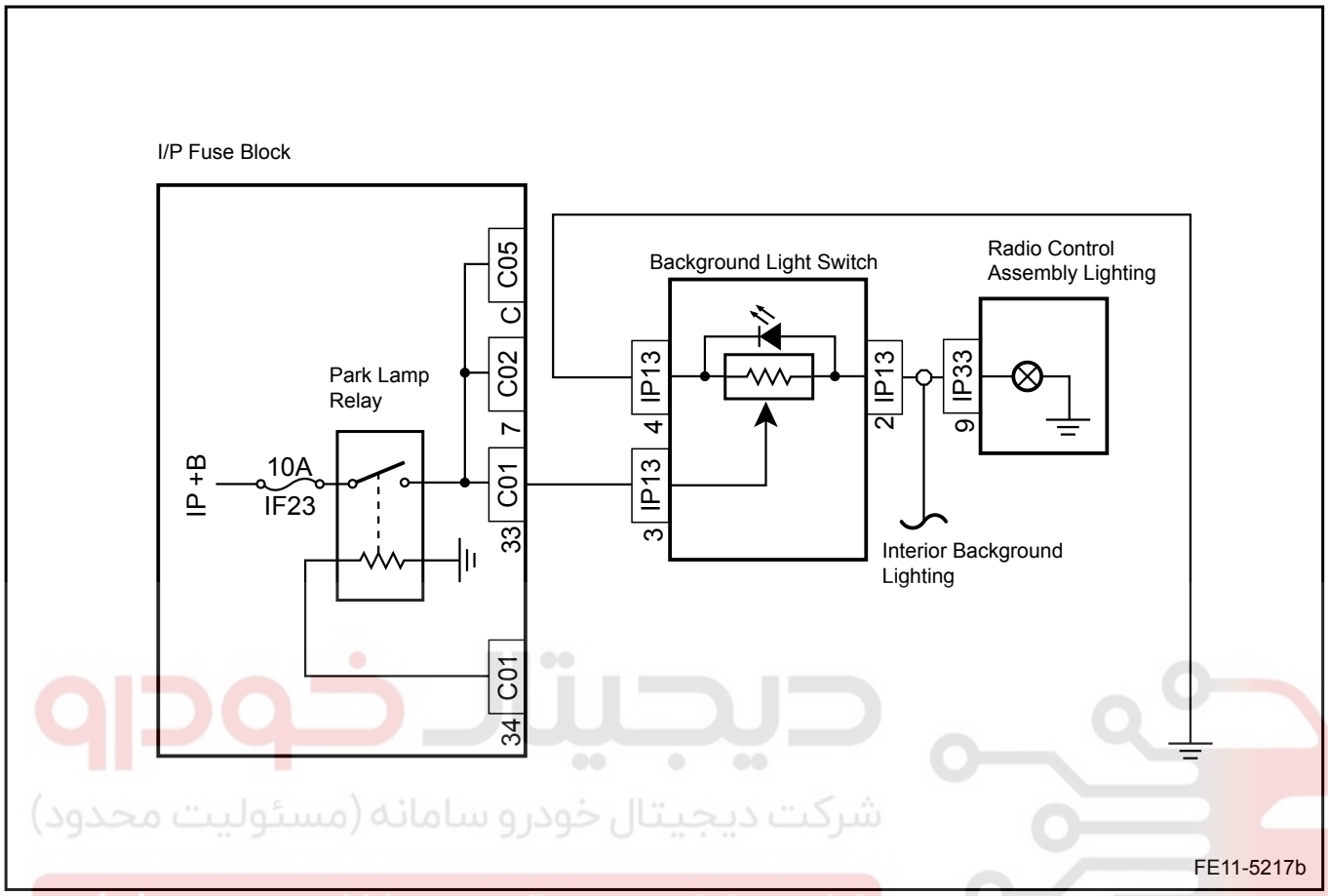
Step 2	Replace the navigation unit. Refer to 11.3.7.4 Navigation Unit Replacement.

11.3.6.11 Navigation Normal Boot But The Speakers Inoperative

Refer to 11.2.6.4 Radio Control Can Be Turned On But The Speakers Are Inoperative.

11.3.6.12 Navigation Panel Background Light Is Not On When The Park Lamps Are On.

Schematic:



Diagnostic Steps:

Note

Before this diagnostic procedures, verify the vehicle park lamps working status. if the park lamps are inoperative, please rule out the park lamp failures (Refer to 11.4.7.5 Park Lamp Inoperative) before the implementation of this diagnostic procedures.

Step 1	Check the air-conditioning control panel, electric windows and the background light switch.

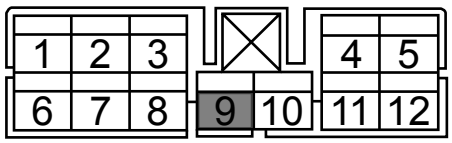
Is the background light normal?

No → Go to step 4

Yes

Step 2	Check the navigation unit background light input voltage.

Navigation Module Harness Connector IP33



FE11-5218b

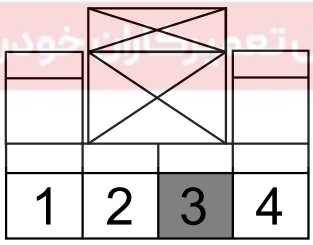
(a) Turn the ignition switch to "OFF" position.
(b) Remove the navigation unit. Refer to 11.3.7.4 Navigation Unit Replacement.
(c) Disconnect the navigation harness connector IP33.
(d) Turn the ignition switch to "ON" position.
(e) Turn on the park lamp.
(f) Adjust the background light adjustment switch to the brightest locations.
(g) Measure navigation unit harness connector IP33 terminal 9 voltage.
Standard Voltage: 11-14 V
(h) Connect the navigation harness connector IP33.
Is the voltage Standard Value:?

No → The circuit between the IP33 terminal No. 9 and the regulation background light switch IP13 No.2 terminal is open.

Yes

Step 3	Replace the navigation unit. Refer to 11.3.7.4 Navigation Unit Replacement.
Step 4	Check the background light adjustment switch voltage.

Background Light Switch Harness Connector IP13



FE11-5219b

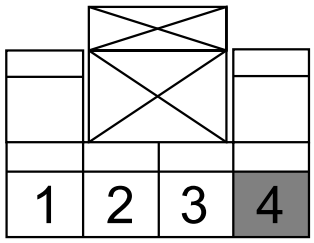
(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the background light adjustment switch wiring harness connector IP13.
(c) Turn the ignition switch to "ON" position.
(d) Turn on the park lamp.
(e) Measure the background light adjustment switch harness connector IP13 terminal 3 voltage.
Standard Voltage: 11-14 V
(f) Connect the regulator switch harness connector IP13.
Is the voltage Standard Value:?

No → The circuit between the IP33 terminal No.3 and the I/P fuse block terminal No.33 is open.

Yes

Step 5	Check regulator switch ground circuit resistance.

Background Light Switch Harness Connector IP13



FE11-5220b

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the background light adjustment switch wiring harness connector IP13.
(c) Measure the resistance between background light adjustment switch IP13 terminal No. 4 and a reliable ground.
Standard Resistance: Less than 1 Ω
(d) Connect the regulator switch harness connector IP13.

Is the resistance normal?

No → The circuit between the IP13 terminal No. 4 and a reliable ground is open.

Yes

Step 6	Replace the background light adjustment switch. Refer to the 11.4.8.19 Instrument Background Light Adjustment Switch and Headlamp Height Adjustment Switch Replacement.

11.3.6.13 The Screen Is Not Dimmed When The Park Lamps Are On

Schematic:

Refer to 11.3.6.12 Navigation Panel Background Light Is Not On When The Park Lamps Are On. Schematic.

Diagnostic Steps:

Step 1	Navigation panel switch background light normal?

No → Refer to 11.3.6.12 Navigation Panel Background Light Is Not On When The Park Lamps Are On. diagnostic step.

Yes

Step 2	Check the navigation unit internal settings.

(a) Enter into the navigation interface display settings.
(b) Check the display settings whether the automatic mode is set to "on"

No → Set the display settings automatic mode to "on".

Yes

Step 3	Check the navigation unit power circuit and ground circuit.

(a) Refer to 11.2.6.3 Radio Control Can Not Be Turned On.

Power circuit and ground circuit normal?

No → After diagnostic, go to Step 1.

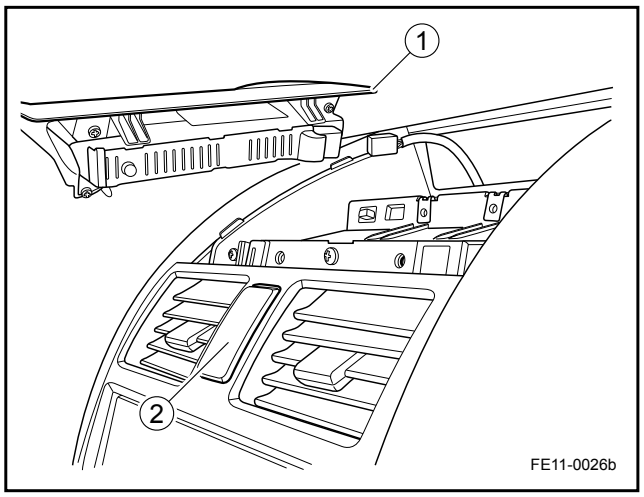
Yes

Step 4	Replace the navigation unit. Refer to 11.3.7.4 Navigation Unit Replacement.

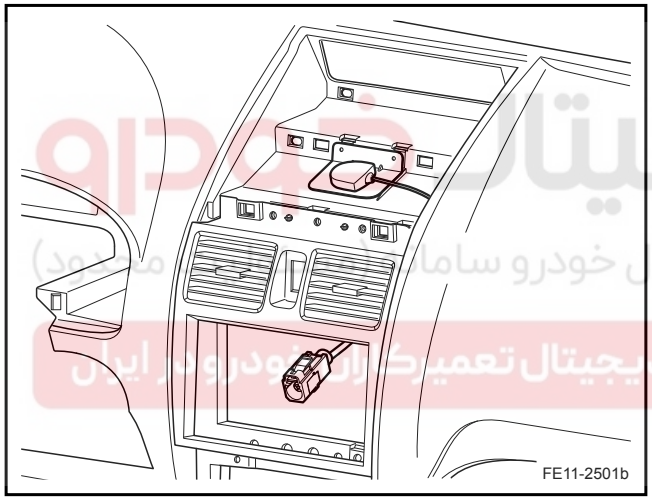
11.3.7 Removal and Installation

11.3.7.1 GPS Antenna Replacement

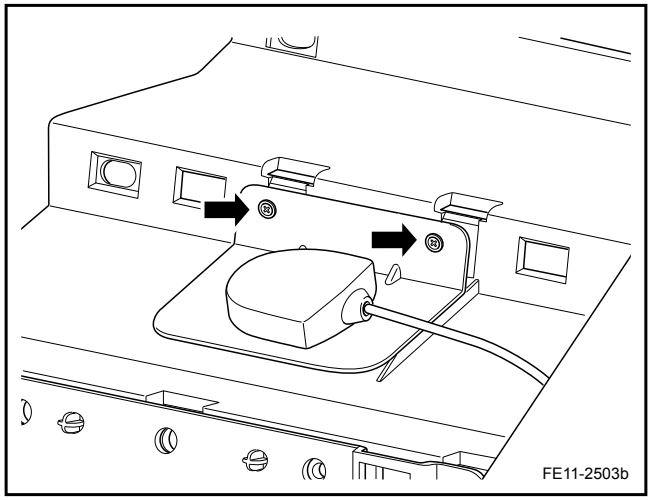
Removal Procedure



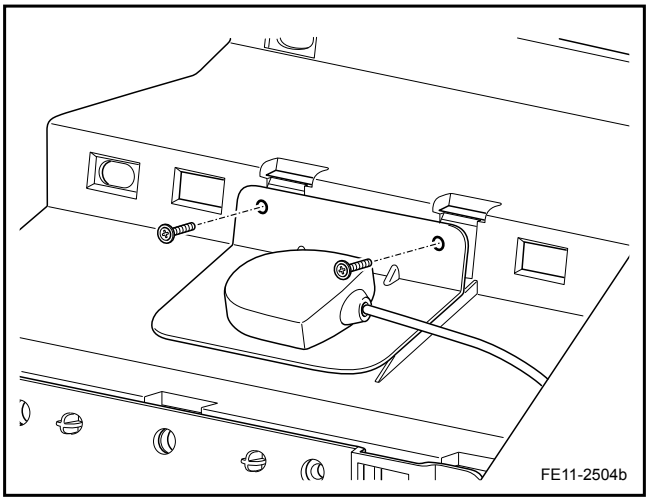
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the instrument cluster (1). Refer to 11.15.8.1 Instrument Cluster Replacement.
3. Remove the center air duct panel (2). Refer to 8.2.8.11 Instrument Panel Air Duct Replacement.



4. Remove the navigation unit. Refer to 11.2.7.5 Radio Control Replacement.
5. Disconnect the GPS antenna wiring harness connector.



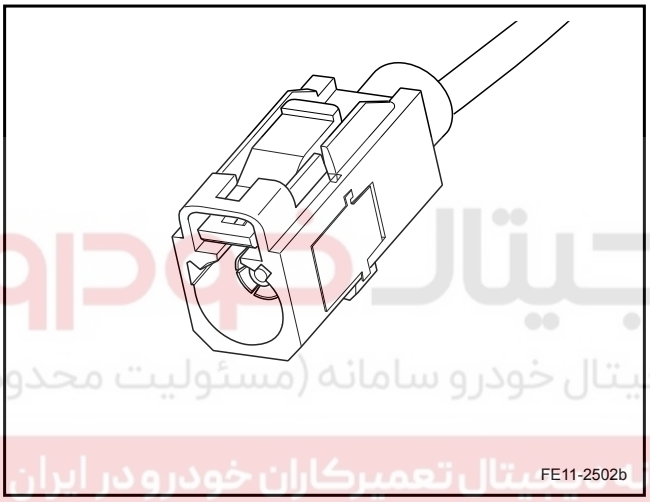
6. Remove the GPS antenna screw.



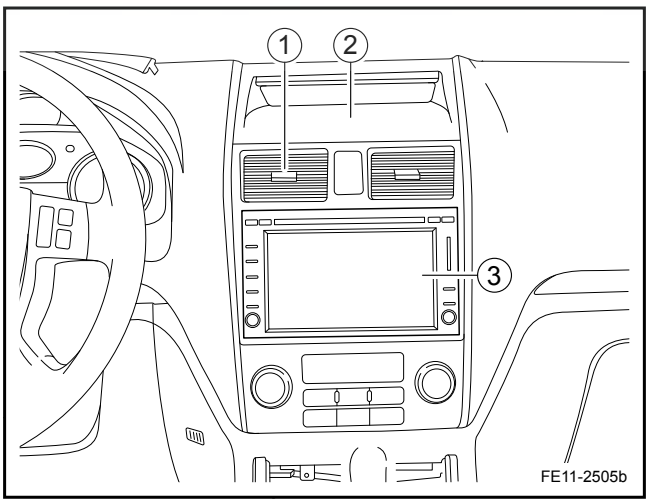
Installation Procedure:

1. Install the GPS antenna screws.

   Torque: 3.5 Nm (Metric) 2.5 lb-ft (US English)



2. Connect the GPS antenna connector.



3. Install the navigation unit (3).
4. Install the center air duct panel (1).
5. Install the instrument cluster (2).
6. Connect the battery negative cable.

11.3.7.2 Speaker Replacement

Refer to 11.2.7.1 Front Door Speaker Replacement.

Refer to 11.2.7.3 Rear Speaker Replacement.

Refer to 11.2.7.4 Rear Speaker Replacement (Hatchback).

11.3.7.3 Radio Antenna Module and Antenna Replacement

Refer to 11.2.7.2 Radio Antenna Module Replacement.

11.3.7.4 Navigation Unit Replacement

Refer to 11.2.7.5 Radio Control Replacement.

11.4 Lighting System

11.4.1 Specifications

11.4.1.1 Lamp Specifications (Sedan)

Component Name	Bulb Name	Bulb Type	Power
Headlamp Assembly	High Beam	H7	12 V 55 W
	Low Beam	H1	12 V 55 W
	Front Turn Lamp	PY21W	13.5 V 25 W
	Front Park Lamp	W5W	13.5 V 5 W
Tail Lamp Assembly	Brake Lamp	LED	-
	Rear Park Lamp	LED	-
	Rear Turn Lamp	PY21W	13.5 V 25 W
	Reverse Lamp	P21W	13.5 V 25 W
Front Fog Lamp Assembly	Front Fog Lamp	H3	12 V 55 W
	Daytime Running Lamp	P21W LL	13.5 V 25 W
Rear Fog Lamp Assembly	Rear Fog Lamp	P21W	13.5 V 25 W
High Mounted Brake Lamp Assembly	High Mounted Brake Lamp	LED	-
License Plate Lamp Assembly	License Plate Lamp	W5W	13.5 V 5 W
Dome Lamp Assembly	Left Reading Lamp	W5W	13.5 V 5 W
	Right Reading Lamp	W5W	13.5 V 5 W
Rear Dome Lamp Assembly	Left Reading Lamp	W5W	13.5 V 5 W
	Right Reading Lamp	W5W	13.5 V 5 W
	Door Lamp	C5W	13.5 V 5 W
Glove Box Lamp Assembly	Glove Box Lamp	C5W	13.5 V 5 W
Rear Compartment Lamp Assembly	Rear Compartment Lamp	W5W	13.5 V 5 W
Door Lamp Holder	Door Lamp	W3W	13.5 V 3 W

11.4.1.2 Lamp Specifications (Hatchback)

Component Name	Bulb Name	Bulb Type	Power
Left / Right Headlamp Assembly	High Beam	H1	12 V 55 W
	Low Beam	H7	12 V 55 W
	Front Turn Lamp	PY21W	13.5 V 25 W
	Front Park Lamp	W5W	13.5 V 5 W
Left / Right Tail Lamp Assembly	Brake Lamp	W16W	13.5 V 16 W

Component Name	Bulb Name	Bulb Type	Power
Left / Right Tail Lamp Assembly	Rear Park Lamp	R5W	13.5 V 5 W
Left / Right Tail Lamp Assembly	Rear Turn Lamp	PY21W	13.5 V 25 W
	Rear Fog Lamp (Left)	PR21W	13.5 V 25 W
	Reverse Lamp (Right)	P21W	13.5 V 25 W
Front Fog Lamp Assembly	Front Fog Lamp	H11	12 V 55 W
High Mounted Brake Lamp Assembly	High Mounted Brake Lamp	W5W	13.5 V 5 W
License Plate Lamp Assembly	License Plate Lamp	W5W	13.5 V 5 W
Front Dome Lamp Assembly	Left Reading Lamp	W5W	13.5 V 5 W
	Right Reading Lamp	W5W	13.5 V 5 W
Front Dome Lamp With Sunroof Switch Assembly	Left Reading Lamp	W5W	13.5 V 5 W
	Right Reading Lamp	W5W	13.5 V 5 W
Rear Dome Lamp Assembly	Left Reading Lamp	W5W	13.5 V 5 W
	Right Reading Lamp	W5W	13.5 V 5 W
	Door Lamp	C5W	13.5 V 5 W
Glove Box Lamp Assembly	Glove Box Lamp	C5W	13.5 V 5 W
Rear Compartment Lamp Assembly	Rear Compartment Lamp	W5W	13.5 V 5 W
Door Lamp Holder	Door Lamp	W3W	13.5 V 3 W

11.4.1.3 Fastener Tightening Specifications (Sedan)

Applications	Model	Specifications	
		Metric(Nm)	US English(lb-ft)
Left / Right Headlamp Assembly Bolts	M6 × 20	3-5	2-4
Left / Right Tail Lamp Assembly Retaining Nut	M5	3-5	2-4
Left / Right Front Fog Lamp Assembly Screws	M6 × 16	3-5	2-4
Left / Right Rear Fog Lamp Assembly Self-Tapping Screws	ST4.2 × 19	3-4	2-3
Dome Lamp Mounting Bracket Bolts	M6 × 16	4-5	3-4
Dome Lamp (With Sunroof Switch) Mounting Brackets Bolt	M6 × 16	4-5	3-4
Dome Lamp Assembly Screws	M5 × 8	3-5	2-4
Dome Lamp (With Sunroof Switch) Assembly Screws	M5 × 8	3-5	2-4
Rear Dome Lamp Assembly Screws	M5 × 12	3-5	2-4

Applications	Model	Specifications	
		Metric(Nm)	US English(lb-ft)
High Mounted Brake Lamp Assembly Self-Tapping Screws	ST4.2 × 13	3-4	2-3

11.4.1.4 Fastener Tightening Specifications (Hatchback)

Applications	Model	Specifications	
		Metric(Nm)	US English(lb-ft)
Left / Right Headlamp Assembly Bolts	M6 × 20	3-5	2-4
Left / Right Tail Lamp Assembly Nut	M5	3-5	2-4
Front Fog Lamp Assembly Self-Tapping Screws	ST4.2 × 16	3-4	2-3
Dome Lamp Mounting Bracket Bolts	M6 × 16	4-5	3-4
Dome Lamp (With Sunroof Switch) Mounting Bracket Bolt	M6 × 16	4-5	3-4
Dome Lamp Assembly Screws	M5 × 8	4-5	3-4
Dome Lamp (With Sunroof Switch) Assembly Screws	M5 × 8	4-5	3-4
Rear Dome Lamp Assembly Screws	M5 × 12	4-5	3-4
High Mounted Brake Lamp Assembly Nut	M5	4-5	3-4
Left / Right Rear Retro-Reflector Assembly Screws	M5 × 6	4-5	3-4

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11.4.2 Description and Operation

11.4.2.1 Exterior Lighting Description and Operation

Headlamp

When the headlamp is turned on, push the lever away from the driver, an audible click will be heard, the light changes from low beam to high beam. When the headlamp high beam is switched on, the indicator light on the instrument cluster assembly will be on. Pull the lever toward the driver, the headlamp changes from high beam to low beam. Continuously pull the lever to the driver direction, the headlamp changes from high beam to low beam again.

Headlamp must be light in order to achieve the correct road lighting. When installing a new headlamp assembly or maintenance, the headlamp light should be checked.

Headlamp Reminder Buzzer

When the headlamp switch is at the headlamp lamp turned on position or park lamp turned on position, and the ignition switch is not at "ON" position, "ACC (Accessories)" position or "START (to start) "position, the body control module monitors driver door status. If the left front door open, body control module will enable buzzer sound. If the headlamp is turned off, the body control module will not detect the headlamp switch, and buzzer will not sound.

Park Lamps and Turn Signals

Turn the headlamp switch to the first position, park lamps will be turned on. Turn the ignition switch to "OFF (off)" position to turn off park lamps. When the turn signals are enabled, the front and rear turn signal lamps and side turn signals flash, indicating vehicle turning. Turn signals only work when the ignition switch is turned on. Turn signals are controlled by the steering column left side light switch. Move the lever up or down (beyond the retaining-point) will turn on front, rear and side turn signals. After vehicle turning, return the lever to the horizontal position, steering signals will stop flashing.

Changing lane or turning at a small corner, the steering wheel angle may not be great enough to cancel turn signal, so the lever will stop and maintain at a position. When the lever is released, the lever will return to the horizontal position, turn signal will be canceled.

When the remote control anti-theft system is working, BCM controls the shift indicator light flashes indicating the remote anti-theft system working condition.

Fog Lamps

Front fog lamps switch is located on the left side of the steering column multi-function lever, while the rear fog lamp switch is located in the central dashboard, below the air-conditioning control panel. When the headlamp switch is turned on, rotate the multi-function lever front fog lamp switch to switch on the front fog lamps. Fog lamps will be lit. To use the rear fog lamps, turn on headlamps (or park lamps) first, with the front fog lamps turned on, press the rear fog lamps switch. The rear fog lamp indicator will be on, indicating the rear fog lamps are turned on. Press the switch again to turn off rear fog lamps. The indicator will be off. Headlamps (or park lamps) and rear fog lamps will also be off.

Fog lamp must be adjusted to achieve the correct lighting. After installing a new lamp or the front-end repair that may have affected the installation of front fog lamps, check the fog light.

Tail Lamp

Hatchback rear park lamps, brake lamps, rear fog lamps, turn signals and reverse lamps are an assembly. Sedan rear fog lamps are a separate assembly. When the headlamps or park lamps are turned on, rear park lamps will be turned on. When press the brakes, the rear park lamps will increase the brightness and will be used for brake lamps.

Sedan high mounted brake lamp is located in the rear window, the hatchback brake lamp is located at the top of the hatchback. Press the brake pedal, the high mounted brake lamp will be turned on.

Reverse Lamp

Sedan has two reverse lamps. Hatchback reverse lamp is located inside the right tail lamp. When the transmission is in reverse, the reverse lamps will be turned on. The reverse lamps are controlled by a reverse switch connected with the transmission.

License Plate Lamp

License plate lamp will be turned on when headlamps or park lamps are on. The license plate lamps are installed on top of the license plate.

Lamp Control Module

Automatic headlamp function will shut down headlamps,park lamps, tail lights, license plate lights and dashboard lights within a few seconds after the driver door is closed. If the headlamp switch is placed at the first or second position, and the key is pulled out, this feature will be enabled.

11.4.2.2 Interior Lighting Description and Operation

Door Controlled Lamp

Door controlled lamps are in the dome lamps. The switch is at the left. When the switch is pressed, the door opens, the door controlled lamps will be on. Close the door, the door controlled lamps will be off after a few seconds delay. When the switch is lifted, with the door open, the door controlled lamps will not be on. Reading lamps are at both sides of the dome lamp. The switch is located at the right side. Press the switch, both sides lamps will be on at the same time. Release the switch, both lamps will be off at the same time.

Rear Compartment Lamp

For sedan vehicles, the rear compartment lamp is located beneath the rear compartment lid. For hatchback vehicles, the rear compartment lamp is located on the left side of the wheel cover panel. As long as the rear compartment (hatchback) is open, the lamp will be on.

11.4.2.3 Comfortable Lighting Control

Following Lighting

If the headlamp switch is turned from "OFF" to "ON" (park lamp, headlamp or auto headlamp) and then to "OFF" again within 10 min the ignition key is pulled out, the following lighting function will be activated. The headlamps will be lit after 30 s delay. When the following lighting function is activated, if one door is opened="Headlamps will be lit after 180 s delay. The 180 s delay is the timing for any door (including rear compartment)opening. After all doors are closed, it will re-time 30 s.

Automatic Headlamp

When the ignition switch is at "ON", headlamp switch is at "AUTO", the park lamp relay and headlamp relay will automatically pull-in or disconnect (requires ambient and sun light sensor signal input) according to the surrounding environment brightness.

Lamp Detection

During turning, if one of the turn signal lamps is (21W) damaged, the other turn signal lamp will flash at about double normal frequency.

Fade Lighting Features

- BCM controls dome lamp fade in light in about 0.7s, fade out in about 1.7s.
- When unlocking, the dome lamp will fade in light, if there is no door open action, 15 s after the dome lamp will fade out.
- When lock (locking device operated), the dome lamp will fade out in about 1.7s.
- With all doors closed and the ignition switch is turned off, dome lamp will fade out in 15 s; doors all shut, the ignition switch is open, dome lamp fade out immediately extinguished.
- With all doors closed and the ignition switch is turned on, dome lamp will immediately extinguish.
- Opening any door, dome lamp will fade in light and keep lit, until the door is closed then fade out in 1.7s, or turned off because of energy saving feature (with the ignition switch is at OFF, the energy saving feature will be activated in 20 min).

Emergency Braking Warning Lamp

If the vehicle speed (BCM receives signal through CAN Bus) rapidly decreases due to emergency braking, all turn signal lamps will be activated and flashing; if the vehicle speed stops decrease, the alarm flash will be deactivated. (Speed decrease more than 0.55g is regarded as an emergency braking). This feature is enabled when all following conditions are met:

1. The current speed is greater than or equal to 45 km/h (if less than 45 km/h, even if an emergency brake is detected, HOD will not be triggered).
2. The brake pedal is pressed and held.
3. Hazard warning lamp (Hazard) have not been manually switched on by driver.
4. Emergency braking has been detected, namely: in 1,000ms sampling time, deceleration value is greater than or equal to the following pre-defined HOD activation deceleration threshold.
5. the pre-defined HOD activation deceleration threshold is stored in the EEPROM vehicle configuration part. It is the factory default value. If a user needs to change, it can be re-configured through scan tool commands.

When the following conditions are met, this feature will be deactivated:

1. After emergency braking warning lamp (HOD) is triggered, the running time is no less than 1,000 ms (either manually or automatically turn off).
2. Driver manually switched off hazard warning lamp.
3. Brake pedal has been released.
4. The vehicle starts accelerating again, that is, in 2000ms speed sampling time, the vehicle acceleration value is greater than or equal to pre-defined stop HOD flashing acceleration threshold.
5. The pre-defined stop HOD flashing acceleration threshold value is also stored in the EEPROM vehicle configuration part. It is selected as the factory default value. If a user needs to change, it can be re-configured through scan tool commands.
6. If the HOD is triggered and the vehicle is stopped, the HOD continues to run until the vehicle acceleration is detected again, and the acceleration value satisfies the above conditions.

11.4.3 System Working Principle

11.4.3.1 System Working Principle

Headlamp Working Principle

When the headlamp switch is at "headlamp" position, the working voltage is provided by terminal 8 to pull-in headlamp relay and light up headlamps. Headlamp supply voltage is sent to the headlamp adjustment switch and the left and right headlamp adjustment motors. Moving up and down the switch can change the adjustment adjustment motor signal voltage, to achieve the headlamp height adjustment.

Note

Moving this button too frequently may cause motor inoperative or damage.

When BCM (the center controller) detects the headlamp switch terminal 12 voltage, it means the switch is at "AUTO" (automatic transmission), at this time BCM will monitor the ambient light sensors signal. If the ambient light is not strong, BCM sends power from IP29 terminal 31 to drive the headlamp relay, the headlamps will be automatically lit. When the ambient light is increased, BCM will cut off the power supply output, headlamps will be automatically off.

When the lighting switch is at high beam position, the working voltage is from the switch terminal 7 to drive high beam relay, at the same time the high beam power supply voltage is transmitted to the instrument panel to light high beam indicator.

Note

High beam relay working voltage is from the headlamp power supply circuit.

Park Lamp Working Principle

When the headlamp switch is at "headlamp" position, the working voltage is sent from terminal 14 to drive the park lamp relay and illuminate all park lamps, instrument lights, as well as left and right license plate lamps; at the same time this voltage is sent to the backlight adjustment switch, this switch can be used to adjust the backlight brightness.

Note

The BCM connector IP29 terminal 16 can also be used to drive park lamp relay, for example, when the vehicle is unlocked with the remote control, BCM light park lamps through this circuit.

Front Fog Lamp Working Principle

Front fog lamps relay coil drive power supply is from the park lamp power supply circuit. When the front fog lamp switch is turned on, the switch ground circuit will drive the front fog lamp relay. The working voltage through the relay will light front fog lamps. At the same time this voltage is sent to the instrument panel front fog lamp indicator.

Note

Note that front fog lamps working voltage will be sent to rear fog lamps at the same time.

Rear Fog Lamp Working Principle

When the rear fog lamp switch is turned on, the power supply from the front fog lamps will drive the rear fog lamps relay and light rear fog lamps, while the voltage is also sent to the instrument panel front fog lamp indicator.

Note

Note: The sedan has a separate rear fog lamp assembly; hatchback has only one rear fog lamp, located inside the left tail assembly.

Turn Signal Working Principle

The multi-function lever controls light switch terminals 1 and 3 ground circuits. This ground signal is sent to BCM. BCM lights the left and right turn signals through IP28 terminals No.4,13 respectively.

Note

When the hazard warning lamp button is pressed, BCM will send output voltage to these two circuits at the same time to light all turn signal lamps.

Brake Lamp Working Principle

The brake lamps are controlled by the brake lamp switch on the brake pedal. When the brake pedal is pressed. the working voltage is directly sent to the brake lamp bulb.

Note

Sedan high mounted brake lamp is located on the rear parcel shelf inside the rear window. Hatchback high mounted brake lamp is located at the top of the hatchback.

Reverse Lamp Working Principle

Reverse lamps are controlled by the reverse lamp switch. When the vehicle is at reversing, the working voltage is directly sent to the brake lamp bulb.

Note

Hatchback has only one reverse lamp, located inside the right tail lamp assembly.

Courtesy Lamp and Rear Compartment (Hatchback) Lamp Working Principle

Courtesy lamp and rear compartment lamp (Hatchback) power is from fuse IF19.

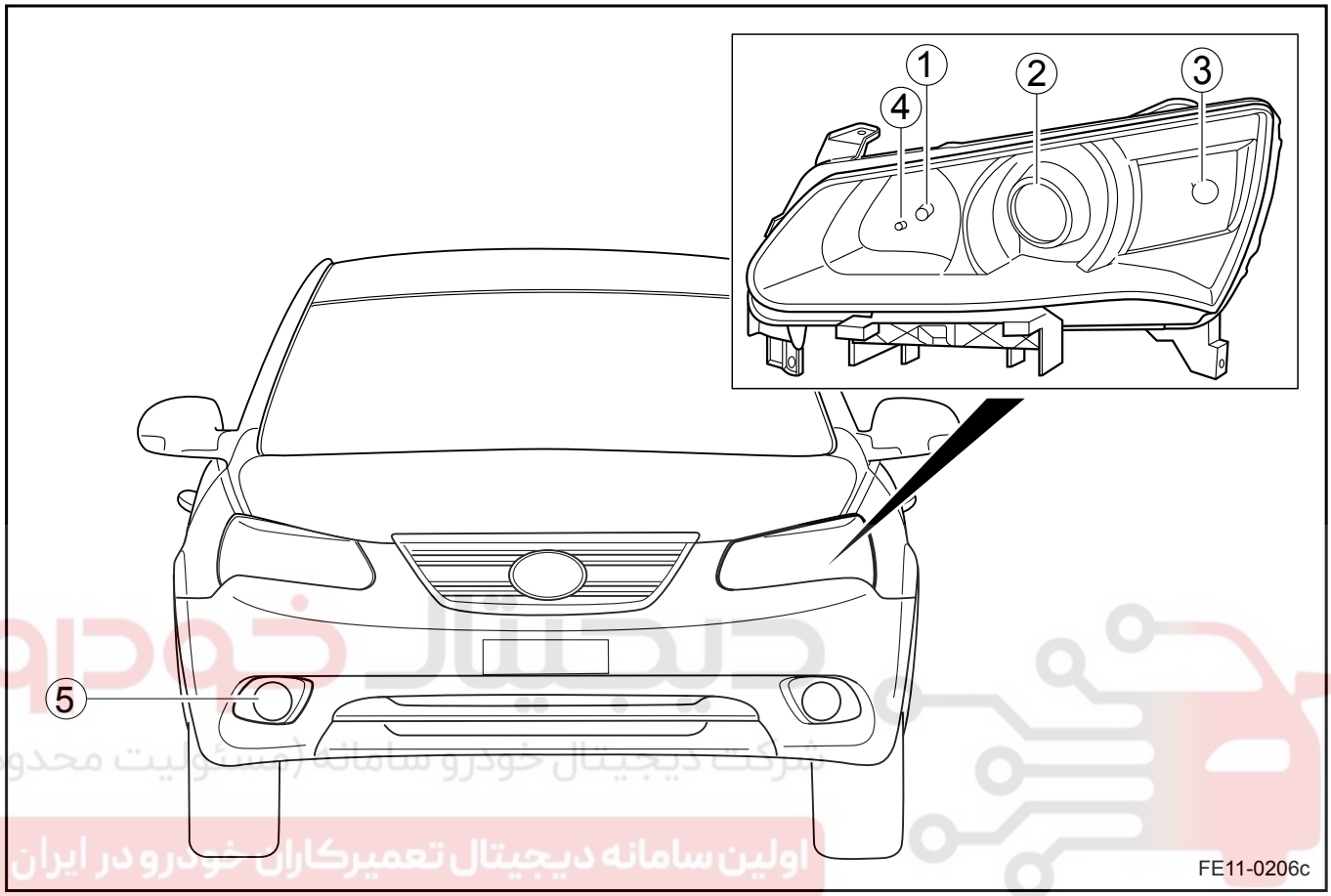
When the door is opened, the door lock will connect the door courtesy lamp circuit to ground so that the door courtesy lamp will be lit.

When the rear compartment (Hatchback) is opened, the rear compartment (Hatchback) lock connects the rear compartment lamp (Hatchback) ground circuit and light rear compartment lamp (Hatchback).

11.4.4 Component Locator

11.4.4.1 Component Locator

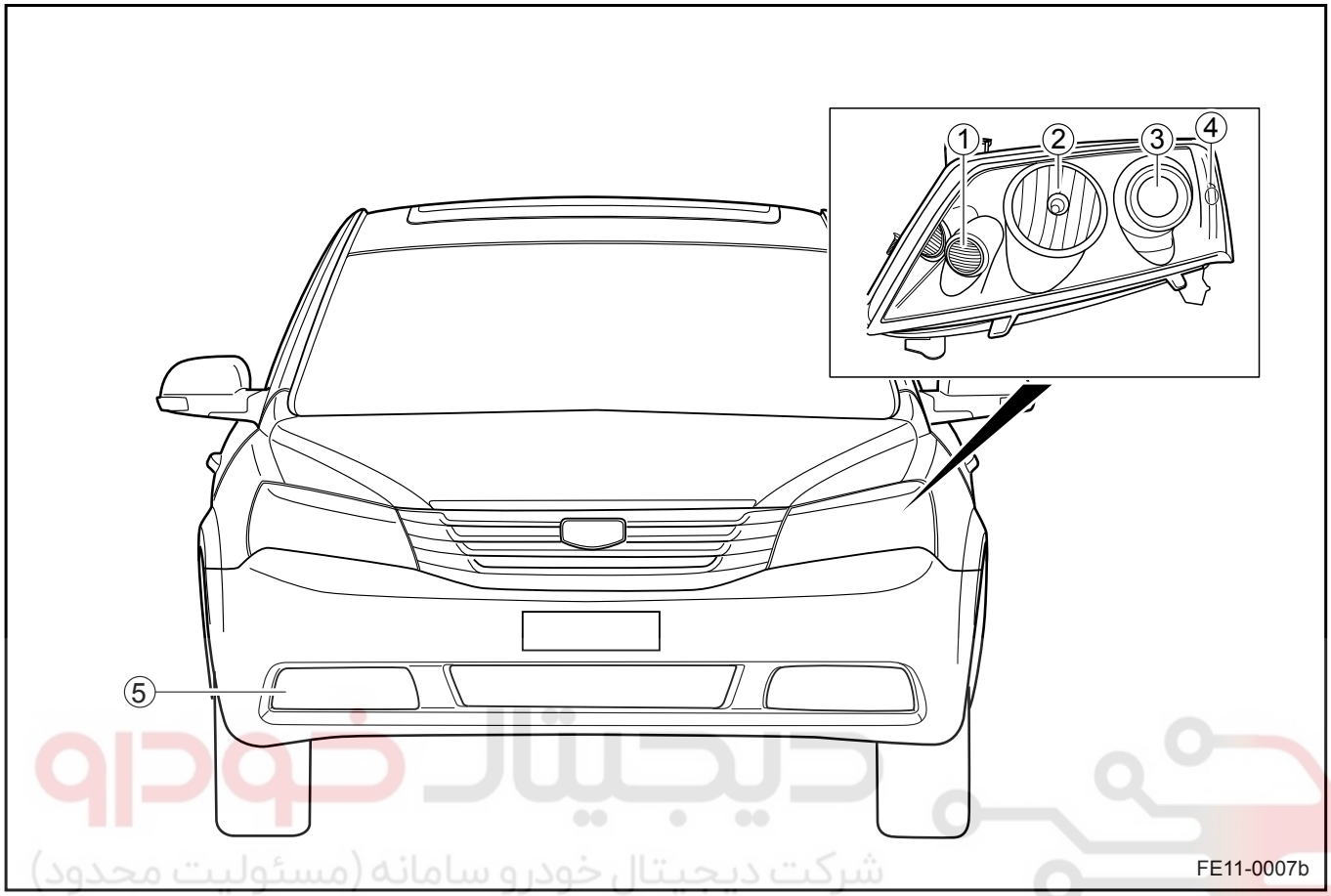
Body Front (Hatchback)



Legend

1. High Beam
2. Low Beam
3. Turn Signal Lamp
4. Park Lamp
5. Front Fog Lamp

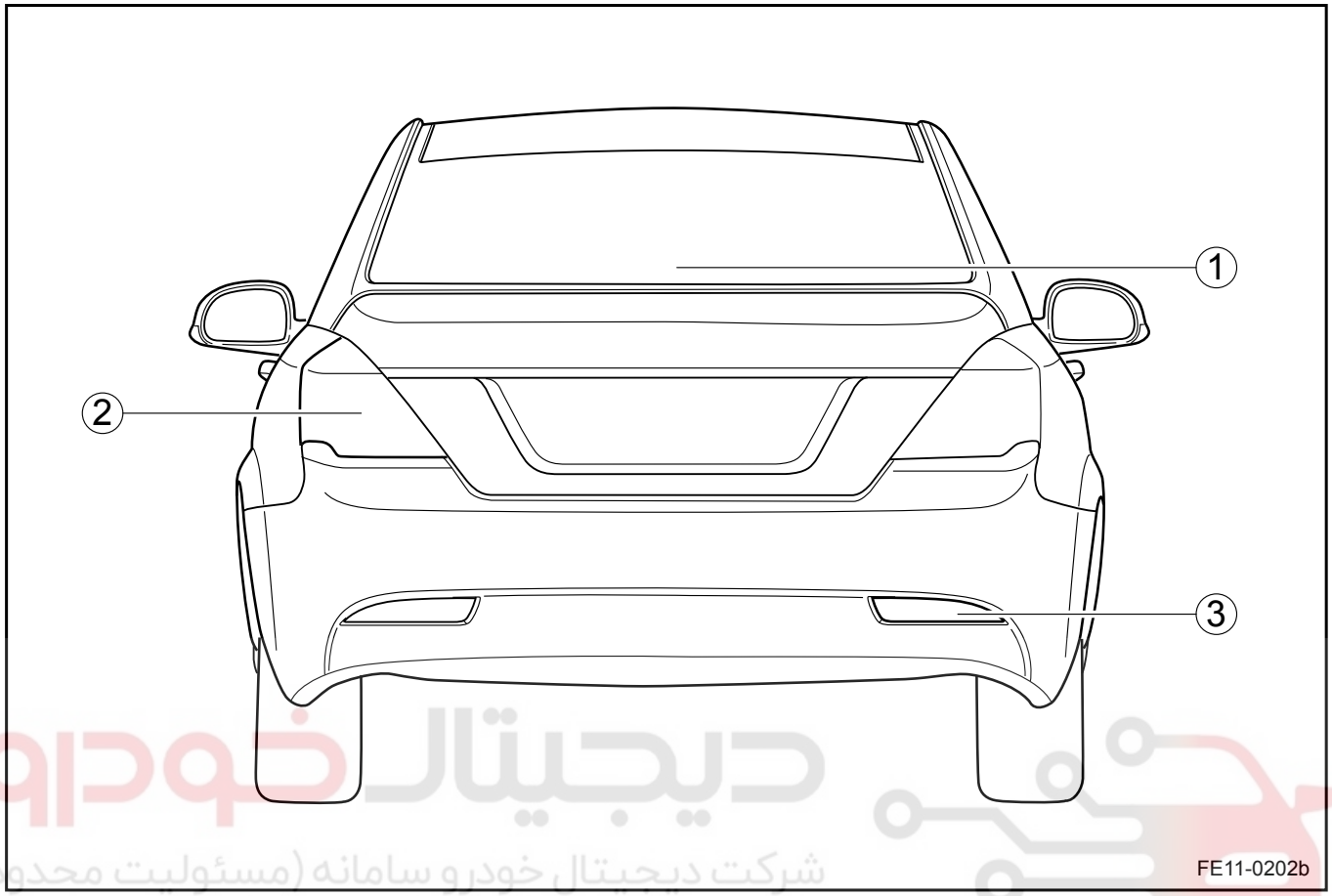
Body Front (Sedan)



Legend

1. Park Lamp
2. High Beam
3. Low Beam
4. Turn Signal Lamp
5. Front Fog Lamp

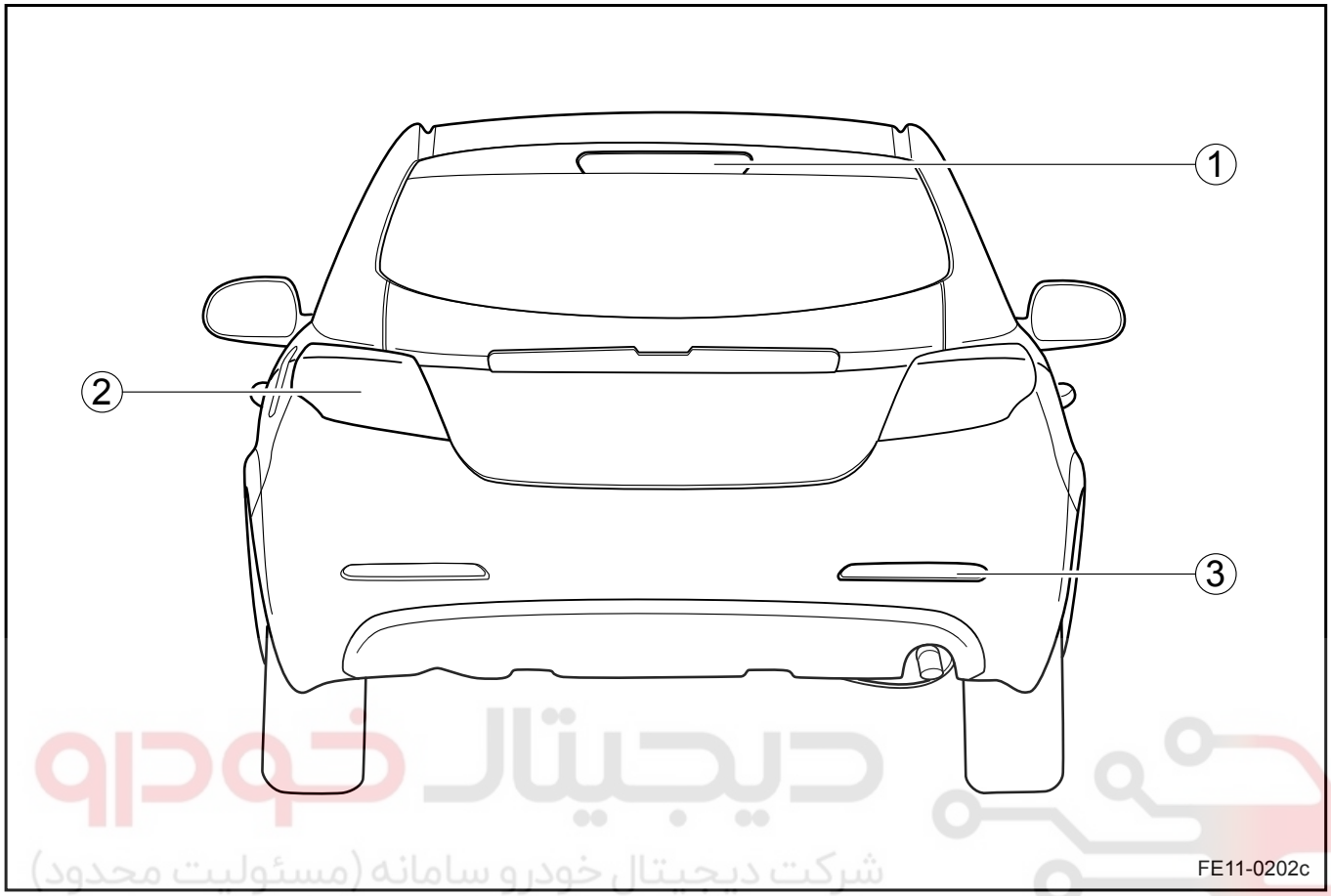
Body Rear (Sedan)



Legend

1. High Mounted Brake Lamp
2. Tail Lamp Assembly
3. Rear Fog Lamp (Plus Rear-Retro-Reflector)

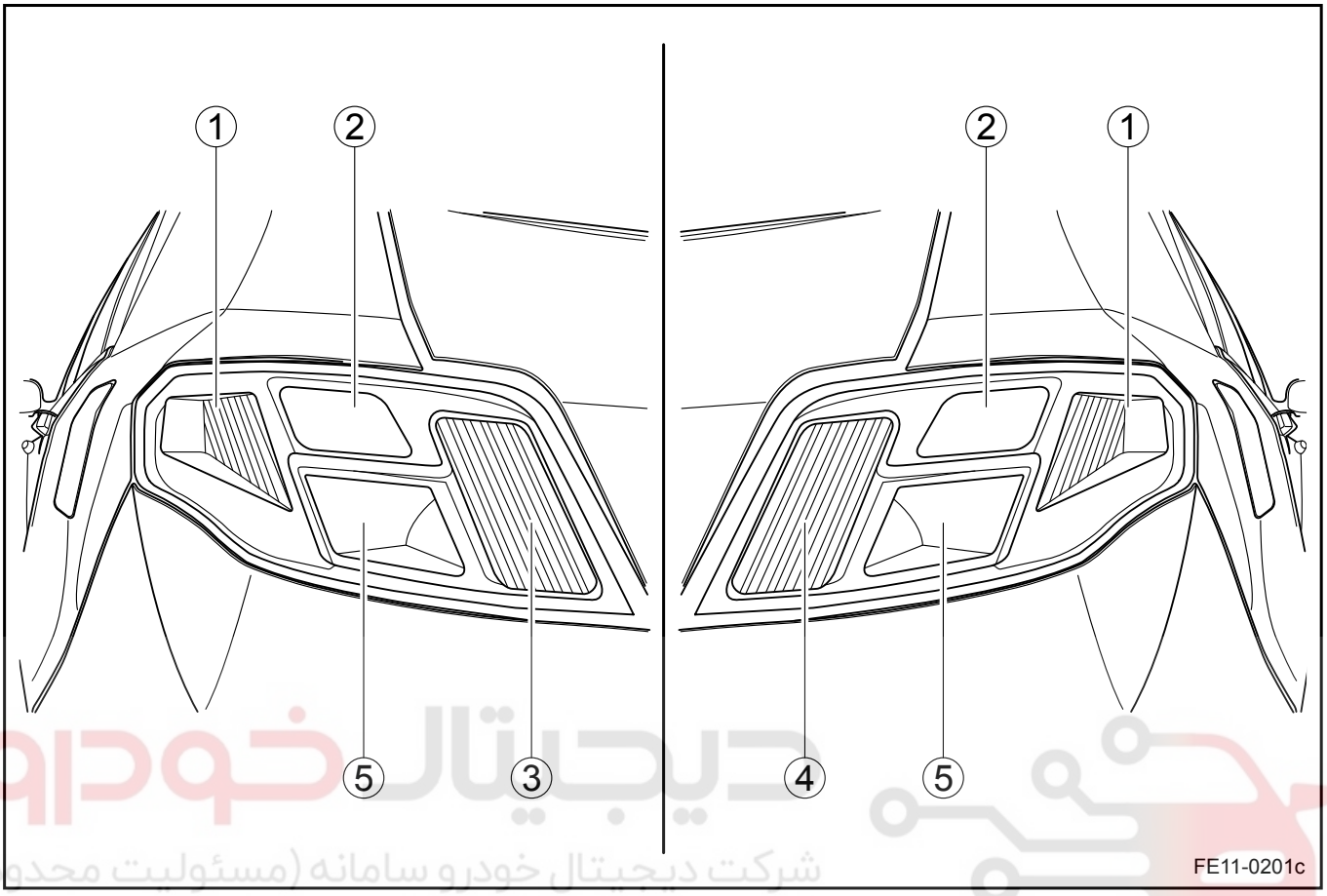
Body Rear (Hatchback)



Legend

1. High Mounted Brake Lamp
2. Tail Lamp Assembly
3. Rear-Retro-Reflector

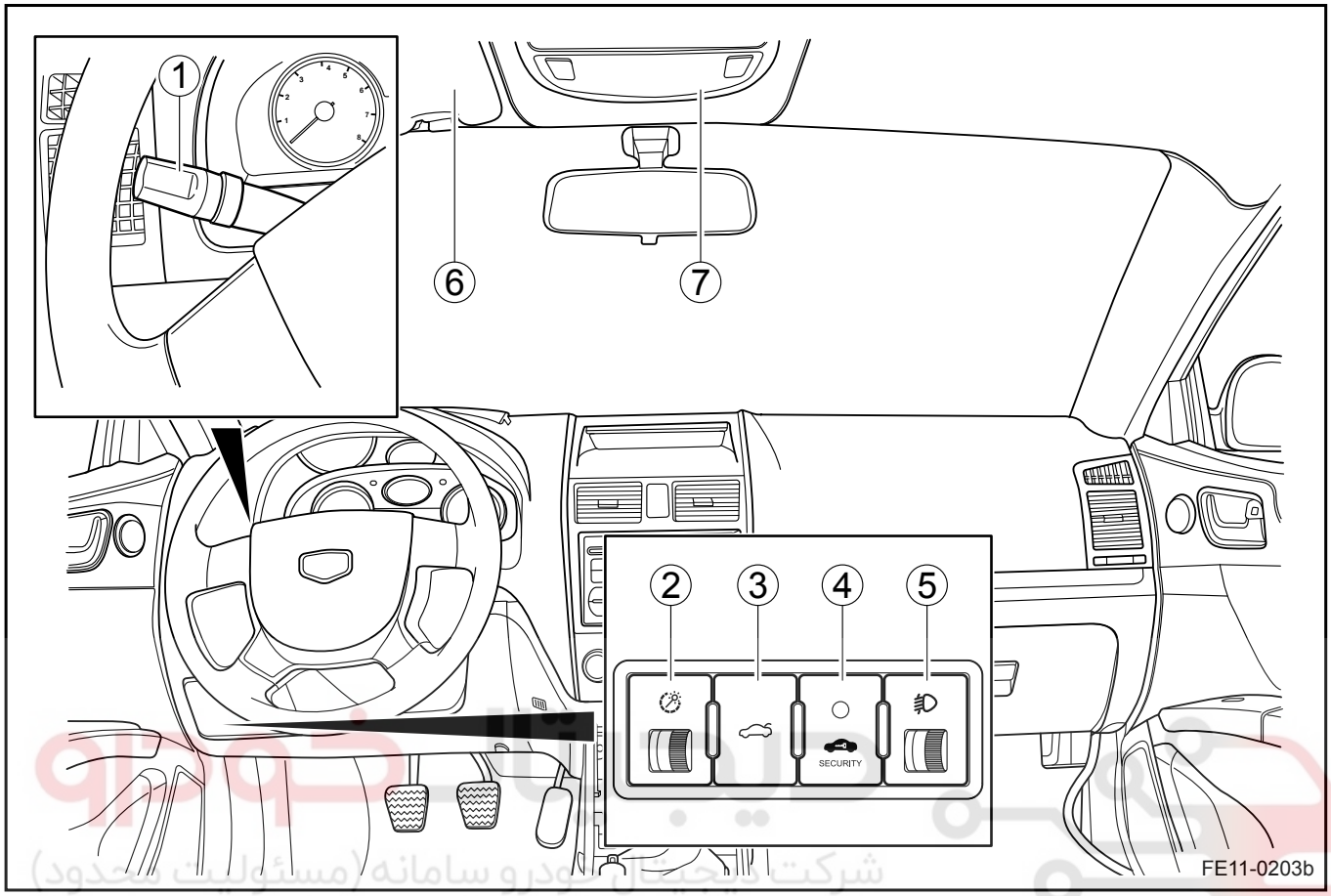
Rear Lamp Assembly (Hatchback)



Legend

1. Brake Lamp
2. Park Lamp
3. Rear Fog Lamp
4. Reverse Lamp
5. Turn Signal Lamp

Interior Lamp and Switch



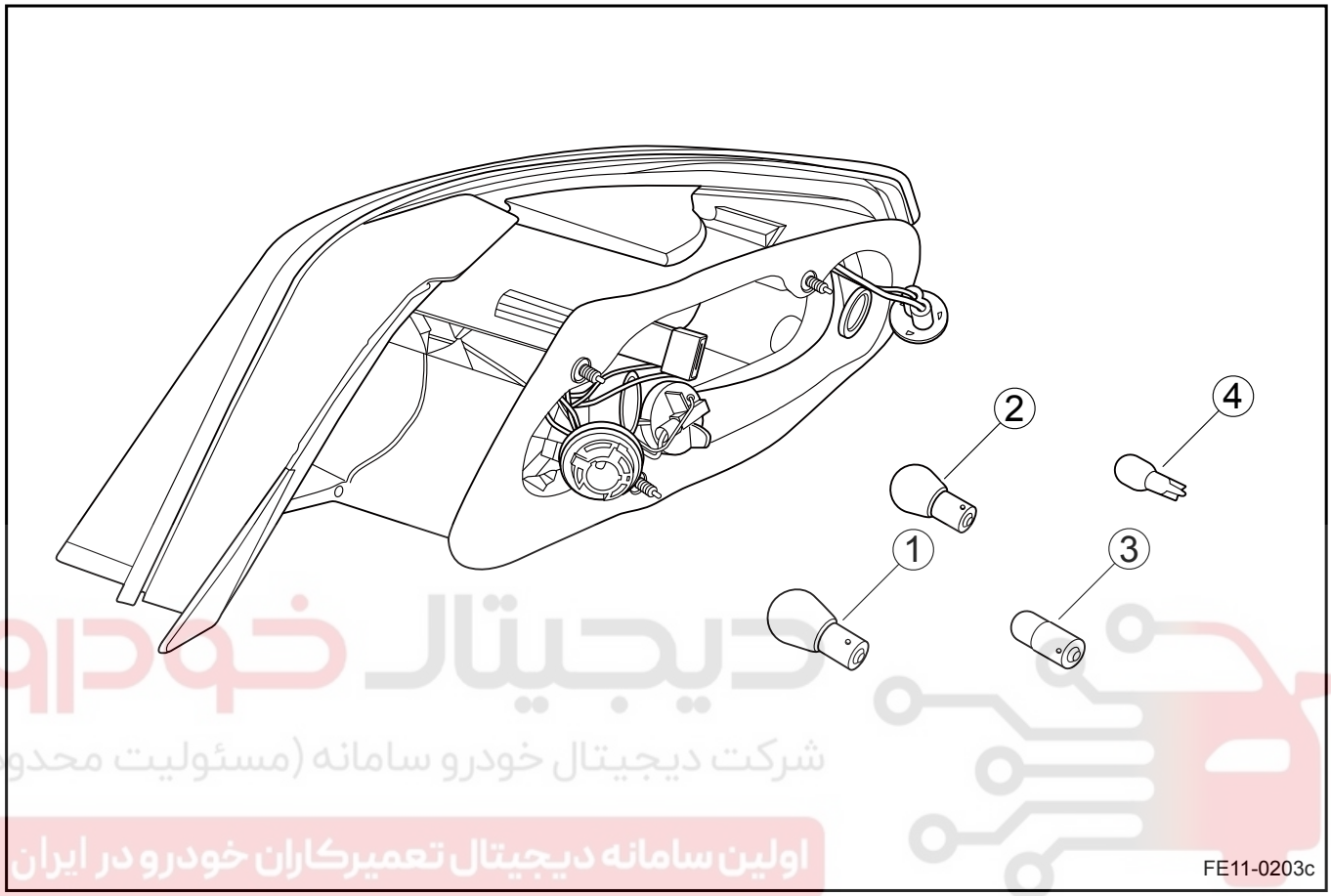
Legend

1. Multifunction Lever
2. Background Light Brightness Adjustment Switch
3. Rear Compartment Release Switch
4. Anti-theft Indicator
5. Headlamp Height Adjustment Switch
6. Visor / Mirror Lamp
7. Reading Lamp

11.4.5 Disassemble View

11.4.5.1 Disassemble View

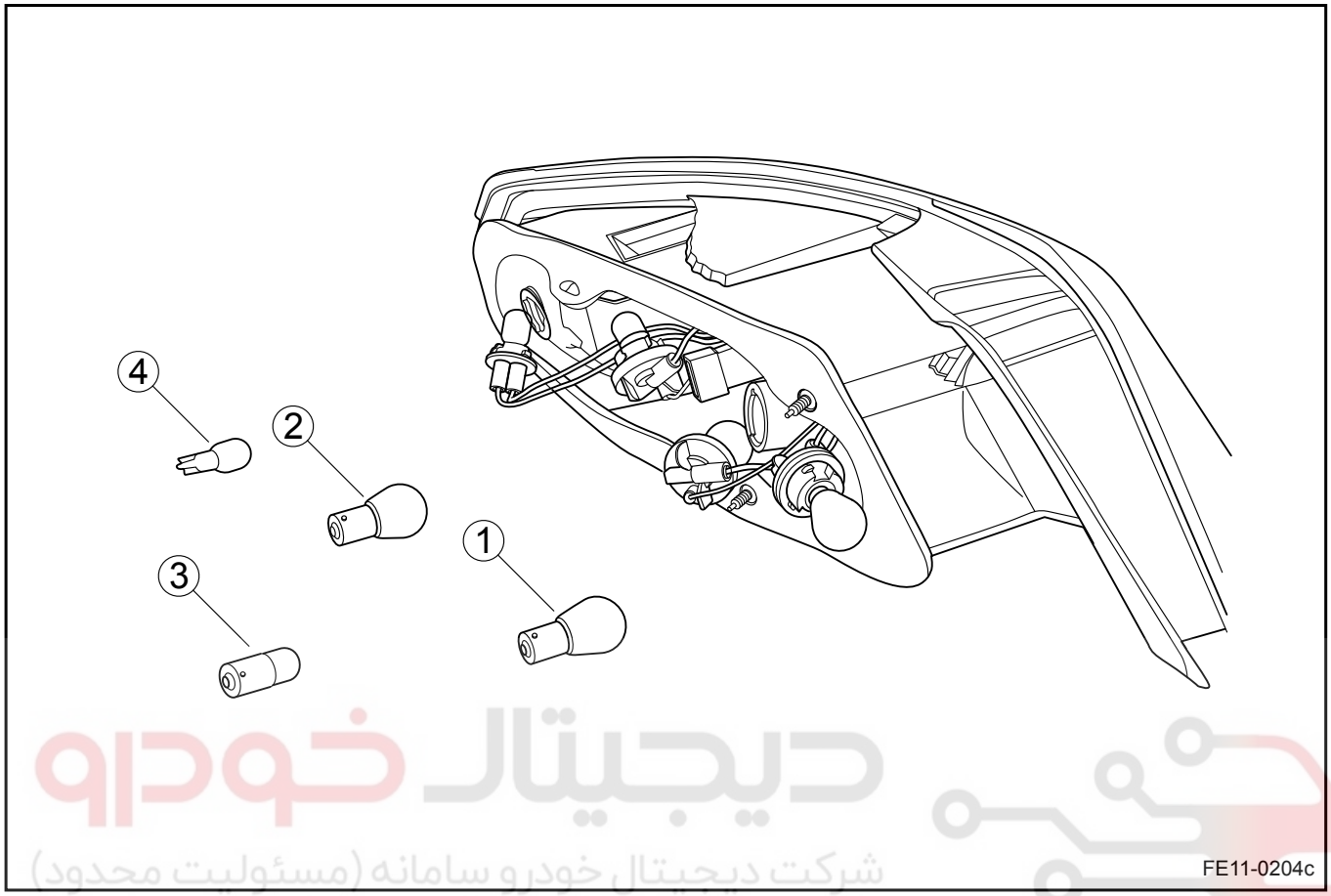
Left Tail Lamp Assembly (Hatchback)



Legend

1. Rear Fog Lamp Bulb
2. Turn Signal Lamp Bulb
3. Park Lamp Bulb
4. Brake Lamp Bulb

Right Tail Lamp Assembly (Hatchback)

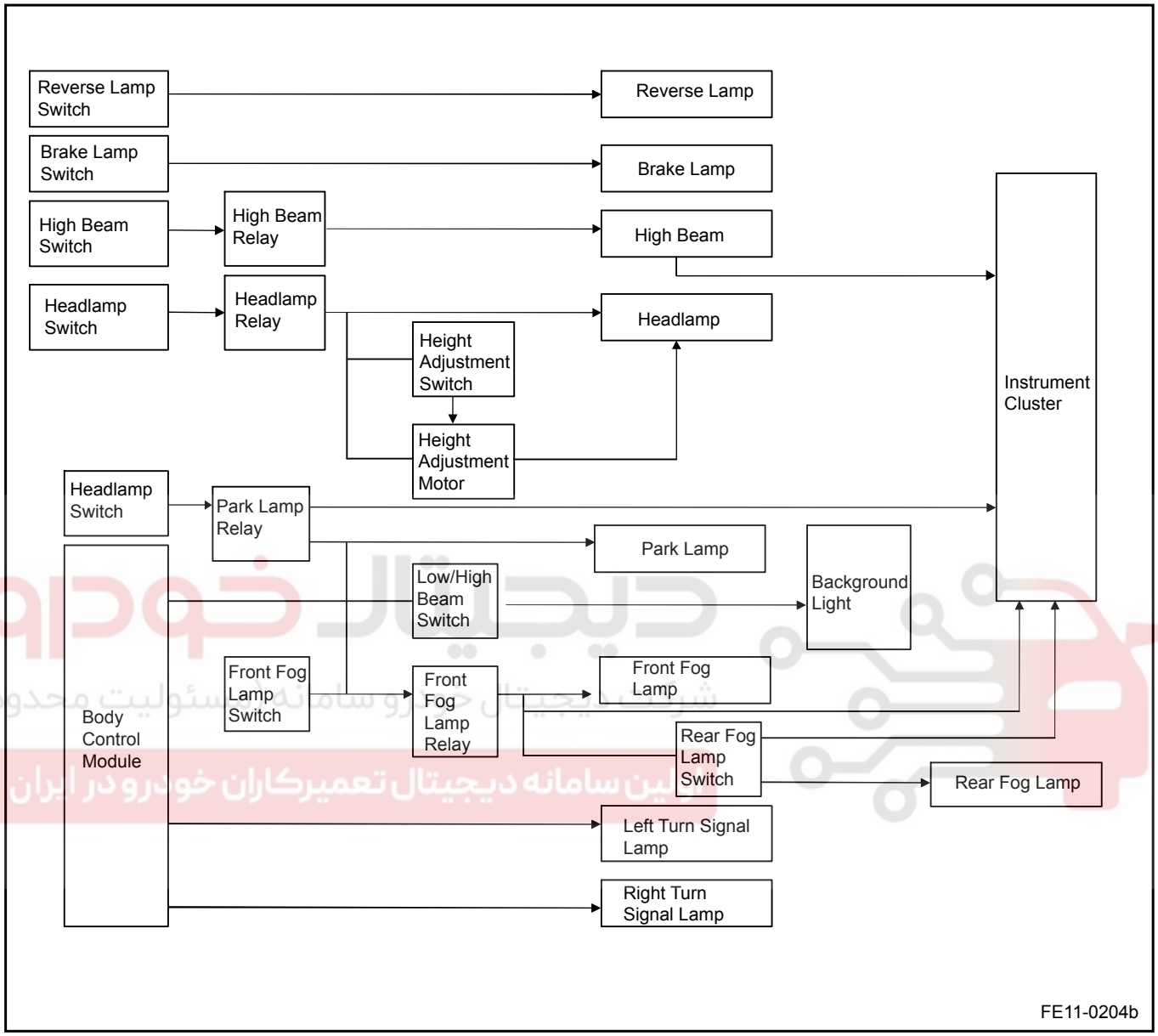


Legend

1. Reverse Lamp Bulb
2. Turn Signal Lamp Bulb
3. Park Lamp Bulb
4. Brake Lamp Bulb

11.4.6 Schematic

11.4.6.1 Schematic



11.4.7 Diagnostic Information and Procedures

11.4.7.1 Diagnosis Description

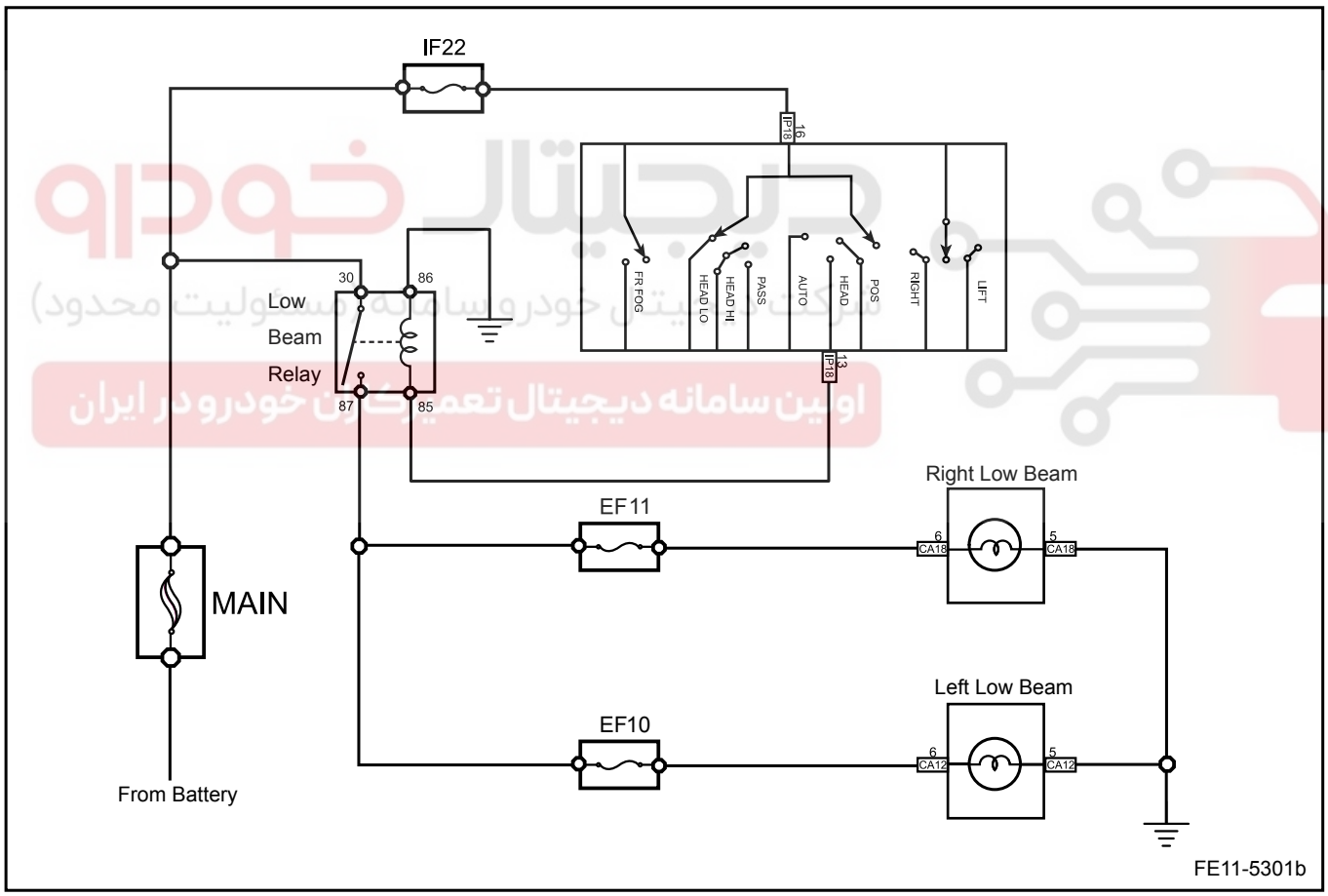
Refer to11.4.2 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.4.7.2 Visual Inspection

- Check installed after market equipment that may affect windshield wiper/washer system operations.
- Check the easy to access system components to identify whether there is a significant damage or potential malfunction.
- If there is only one lamp inoperative, before replace the bulb, check and repair poor connections to power supply or ground or poor circuits.

11.4.7.3 Headlamp Inoperative

Schematic:



Diagnostic Steps:

Step 1	With a scan tool, carry out headlamp active to check the headlamp working status. (a) Select as the following sequence: Body Control Module / active test / external lamp control output / light headlamps. Are headlamps lit?

Yes → Go to step 14

No

Step 2	Check the left front or right front headlamp bulb.

(a) Remove the left front or right front headlamp bulb.

Is the the bulb filament blown?

No → Go to step 4

Yes

Step 3	Replace the faulty headlamp bulb.

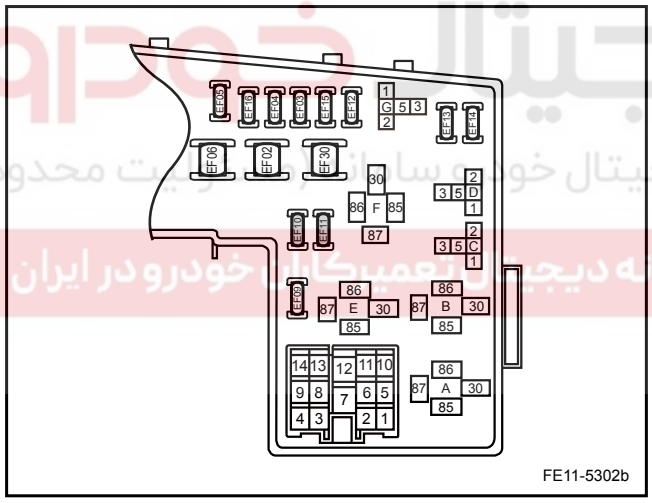
(a) Replace the faulty headlamp bulb.

Is the headlamp working properly?

Yes → System normal

No

Step 4	Check fuse EF10 or EF11.



(a) Check whether the fuse EF10 or EF11 is blown.

Fuse Rating: 10 A

No → Go to step 6

Yes

Step 5	Repair fuse EF10 or EF11 circuit.

(a) Check for fuse EF10 or EF11 short circuit.

(b) Repair the circuits. Confirm that there are no short circuits.

(c) Replace with fuses with rated current.

Confirm the headlamp is working correctly.

Yes → System normal

No

Step 6	Check fuse EF10 or EF11 voltage.

(a) Turn on headlamps, measure fuse EF10 or EF11 voltage with a multimeter.
Standard Voltage: 11-14 V

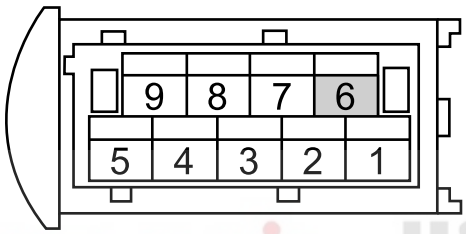
Is the voltage specified value?

No → Go to step 10

Yes

Step 7	Check headlamp harness connector CA12/CA18 terminal terminal No.6 voltage.

Front Headlamp Harness Connector CA12/18



(a) Turn on headlamps, measure wiring harness connector CA12/CA18 terminal No.6 voltage with a multimeter .
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 12

No

Step 8	Check circuit between headlamp fuse EF10/EF11 and the headlamp harness connector CA12/CA18 terminal No.6.

(a) Measure resistance between headlamp fuse EF10/EF11 and headlamp harness connector CA12/CA18 terminal No.6 with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 10

No

Step 9	Repair open circuit between headlamp fuse EF10/EF11 and the headlamp harness connector CA12/CA18 terminal No.6.

(a) Confirm open circuit between headlamp fuse EF10/EF11 and the headlamp harness connector CA12/CA18 terminal No.6 repair is completed.

Are headlamps working correctly?

Yes → System normal

No

Step 10	Replace the headlamp relay with the high beam relay.

(a) Is the headlamp working properly after the relay replacement?

No → Go to step 12

Yes

Step 11	Install a new headlamp relay.

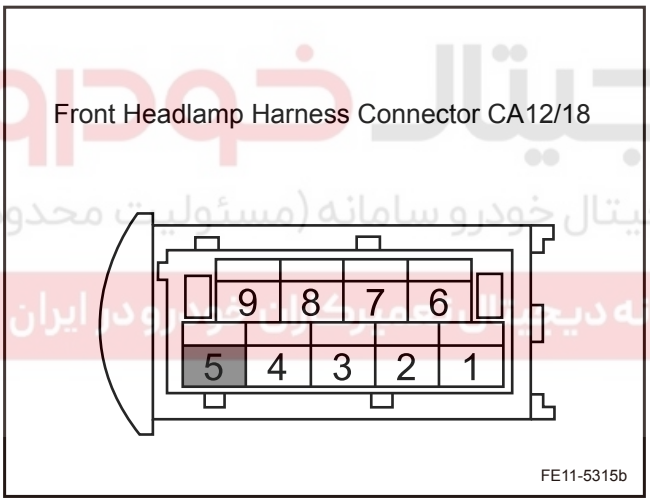
(a) Return the headlamp relay to its original position and install a new high beam relay.

Is the headlamp working properly?

Yes → System normal

No

Step 12	Measure resistance between headlamp harness connector CA12/CA18 terminals No.5 and the body ground.



(a) Disconnect the headlamp wiring harness connector CA12/CA18.

(b) Measure resistance between headlamp harness connector CA12/CA18 terminals No.5 and the body ground.

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 14

No

Step 13	Repair the open circuit between headlamp harness connector CA12/CA18 and the body ground.

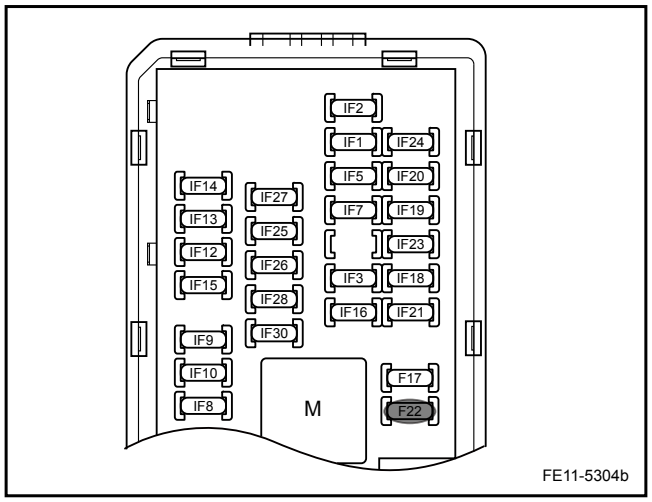
(a) Confirm the open circuit between headlamp harness connector CA12/CA18 and the body ground repair is completed.

Is the headlamp working properly?

Yes → System normal

No

Step 14	Check the fuse IF22.



(a) Check the fuse IF22.
Fuse Rating: 10 A

Is the fuse IF22 blown?

No → Go to step 17

Yes

Step 15	Check fuse IF22 circuit.

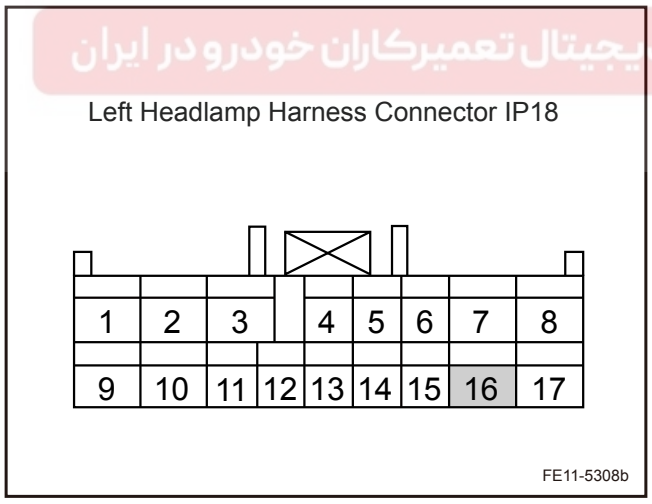
(a) Check fuse IF22 for short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Is the headlamp working properly?

Yes → System normal

No

Step 16	Measure headlamp switch wiring harness connector IP18 terminal No.16 voltage.



(a) Measure headlamp switch wiring harness connector IP18 terminal 16 voltage.
Standard Voltage: 11-14 V

Is the Is the voltage normal?

Yes → Go to step 18

No

Step 17	Repair open circuit between fuse IF22 and headlamp switch wiring harness connector IP18 terminal No.16.

(a) Confirm open circuit between fuse IF22 and headlamp switch wiring harness connector IP18 terminal No.16 repair is completed.

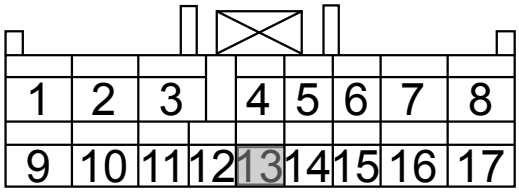
Is the headlamp working properly?

Yes → System normal

No

Step 18	Check headlamp switch wiring harness connector IP18 terminal No.13 voltage.

Left Headlamp Harness Connector IP18



FE11-5305b

(a) Turn on headlamps, measure headlamp switch harness connector IP18 terminal No.13 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 20

No

Step 19	Replace the headlamp switch.

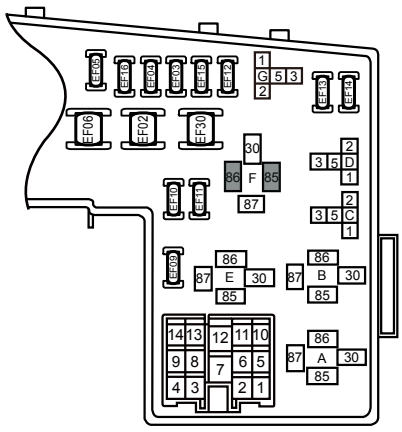
(a) Refer to 11.4.8.1 Headlamp Switch Replacement.

Are headlamps working properly?

Yes → System normal

No

Step 20	Check circuit between headlamp relay F terminal No.85 and headlamp switch connector IP18 terminal No. 13.



FE11-5306b

(a) Confirm headlamp relay terminal No.86 ground is intact.
(b) Check and repair headlamp relay terminal No.85 and the headlamp switch connector IP18 terminal No.13 circuit malfunction.

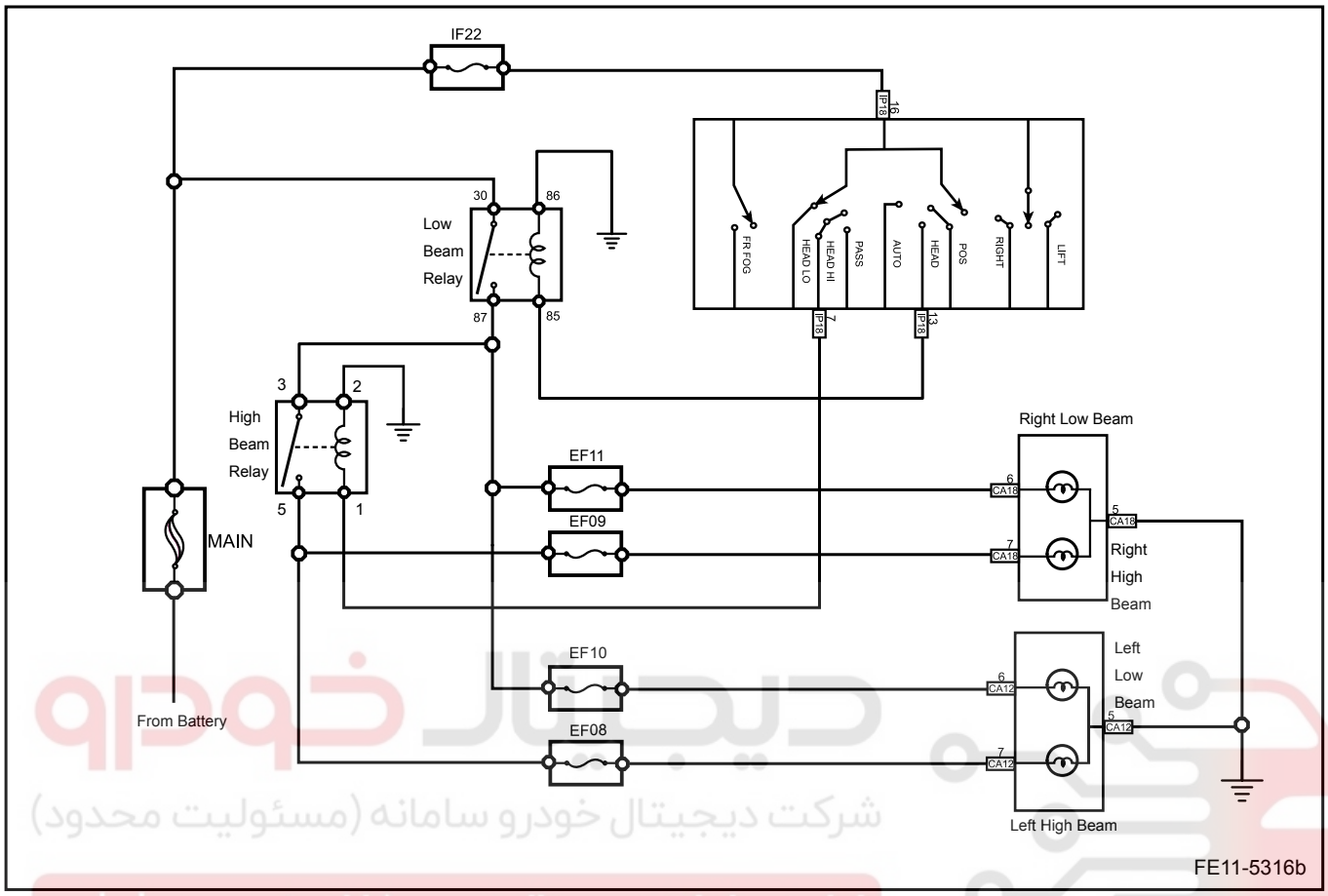
Confirm the repair completed.

Next

Step 21	System normal.

11.4.7.4 High Beam Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the left front or right front high beam bulb.

(a) Remove the left front or right front high beam bulb.
Is the the bulb filament blown?

No → Go to step 3

Yes

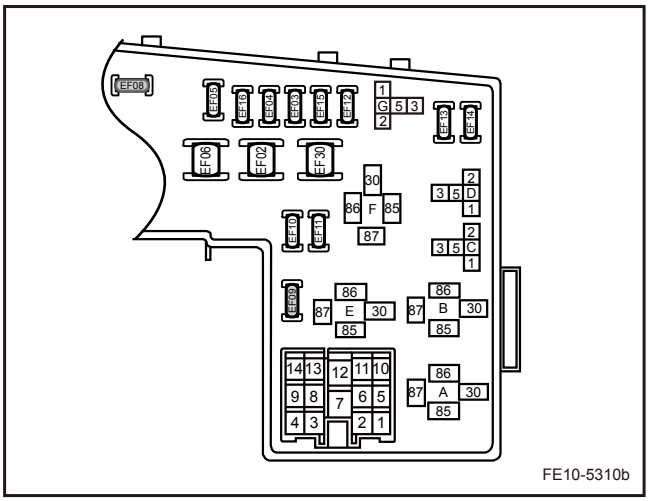
Step 2	Replace the faulty bulb.

(a) Replace the faulty bulb.
Are high beam lamps working properly?

Yes → System normal

No

Step 3	Check fuses EF08 and EF09.



(a) Check fuses EF08 or EF09.
Is the fuse blown?
Fuse Rating: 10 A

No → Go to step 5

Yes

Step 4	Check the fuses EF08 and EF09 circuits.

(a) Check for the fuse EF10 or EF11 short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.
Are high beam lamps working properly?

Yes → System normal

No

Step 5	Confirm headlamp harness connector CA12/CA18 terminal No.5 and body ground connection is intact.

(a) Confirm headlamp harness connector CA12/CA18 terminal No.5 and body ground connection is intact. Refer to11.4.7.3 Headlamp Inoperative.

Next

Step 6	Check the fuse EF08 or EF09 voltage.

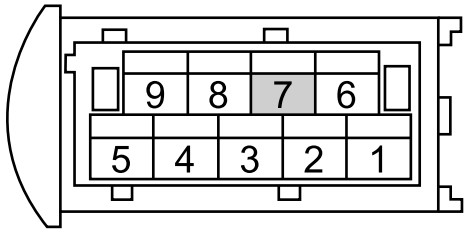
(a) Turn on high beams. measure the fuse EF08 or EF09 voltage with a multimeter.
Standard Voltage: 11-14 V
Is the voltage specified value?

No → Go to step 8

Yes

Step 7	Repair the open circuit between headlamp fuse EF08 or EF09 and CA12/CA18 terminal No.7.

Headlamp Harness Connector CA12/18



FE11-5311b

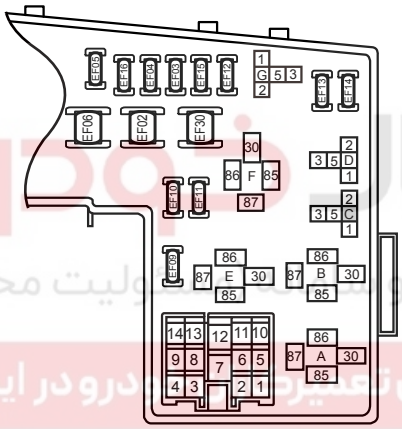
(a) Confirm the open circuit between headlamp fuse EF08 or EF09 and CA12/CA18 terminal No.7 repair is completed.

Is high beam working correctly?

Yes → System normal

No

Step 8	Replace the high beam relay C (M).



FE11-5312b

(a) Replace the high beam relay.

Is high beam working correctly?

Yes → System normal

No

Step 9	Measure the high beam relay C (M) terminal No.3 voltage.

(a) Turn the headlamp switch to the high beam position.

(b) Measure the high beam relay C (M) terminal No.3 voltage with a multimeter.

Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 11

No

Step 10	Check the circuit between the high beam relay C (M) terminal No.3 and the headlamp relay connector F terminal No.87.

(a) Confirm headlamps are working properly.

(b) Check and repair the circuit open between the high beam relay C (M) terminal No.3 and the headlamp relay connector F terminal No.87.

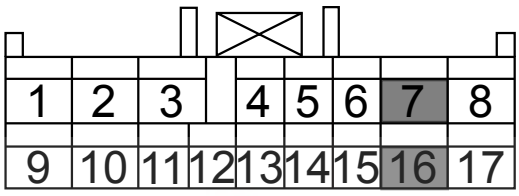
Confirm headlamps are working properly.

Yes → System normal

No

Step 11	Measure voltage between the headlamp switch wiring harness connector IP18 terminals No.7 and No.16.

Left Headlamp Switch Harness Connector IP18



FE11-5313b

(a) Turn on high beam to determine the voltage between the headlamp switch wiring harness connector IP18 terminals No.7 and No.16.
Standard Voltage: 11-14 V

(b) Is the voltage specified value?

No → Replace the headlamp switch. Refer to the11.4.8.1 Headlamp Switch Replacement

Yes

Step 12	Check headlamp switch wiring harness connector terminal No. 7 terminal IP18 and the high beam of the relay C (M) between terminal No. 1 line.

(a) Check and repair circuit between the headlamp switch wiring harness connector IP18 terminal No.7 and the high beam relay C (M) terminal No.1.

(b) Repair the high beam relay C (M) terminal No.2 ground circuit.

Confirm the high beam is working correctly.

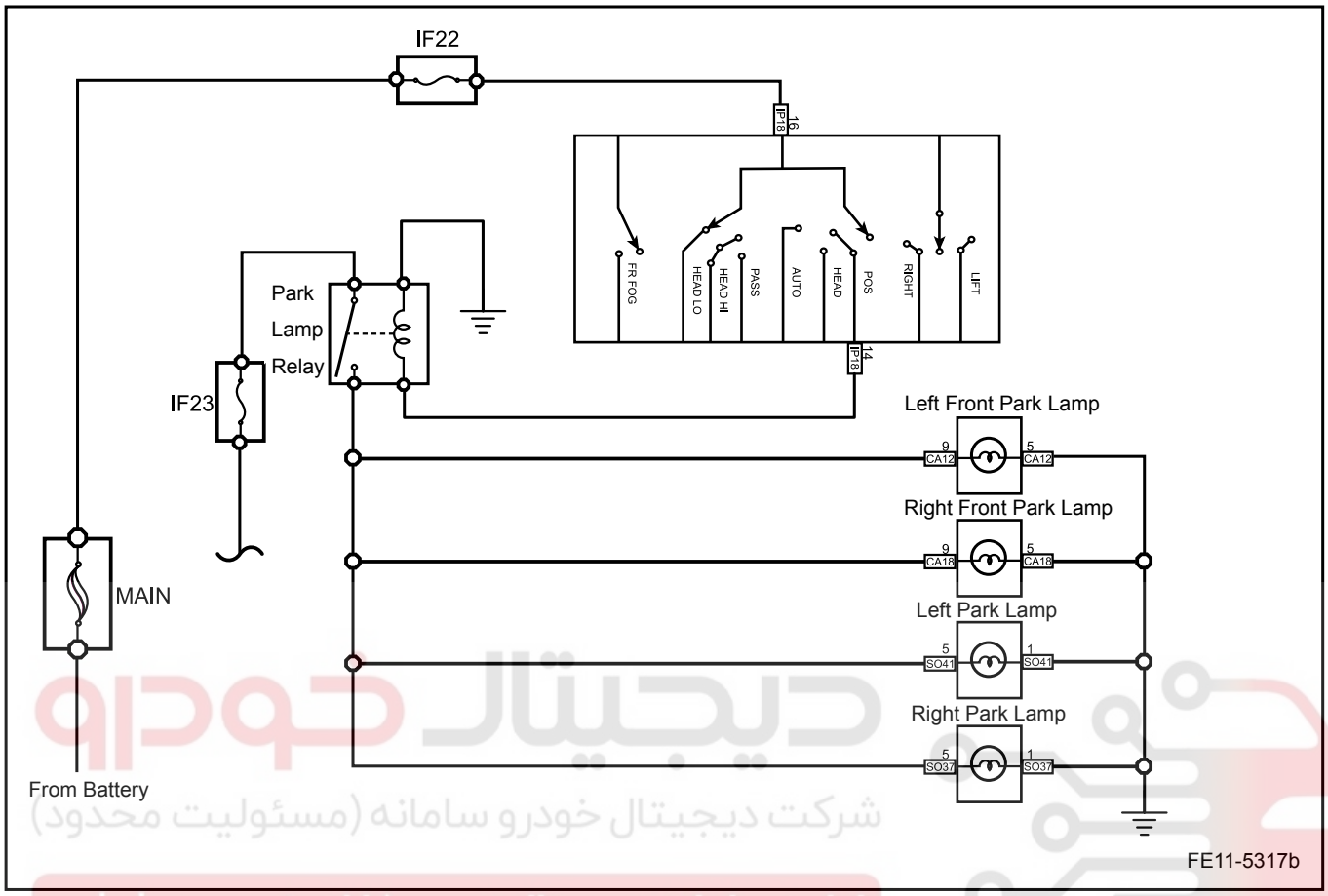
Confirm the repair completed.

Next

Step 13	System normal.

11.4.7.5 Park Lamp Inoperative

Schematic:



Diagnostic Steps:

Step 1	Use scan tool active test function to check the park lamp working status.

(a) Select as the following sequence: Body Control Module / active test / external lamp control output / light the park lamp.

Is the park lamp (small lamp) lit?

Yes → Go to step 11

No

Step 2	Check the left front or right front park lamp bulb.

(a) Remove the left front or right front park lamp bulb.

Is the the bulb filament blown?

No → Go to step 4

Yes

Step 3	Replace the faulty left front or right front park lamp bulb.

(a) Replace the faulty left front or right front park lamp bulb.

Confirm the park lamps are working properly.

Yes → System normal

No

Step 4	Check the fuse IF23.

(a) Check whether the fuse IF23 is blown.
Fuse Rating: 10 A

Is the fuse blown?

No → Go to step 6

Yes

Step 5	Check fuse IF23 circuit.

(a) Check the fuse IF23 circuit fault.
(b) Repair the circuit. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Confirm the park lamp is working correctly.

Yes → System normal

No

Step 6	Check the left front park lamp harness connector CA12 terminal No.9 voltage.

(a) Turn on park lamps, measure the left front park lamp harness connector CA12 terminal No. 9 voltage.
Standard Voltage: 11-14 V

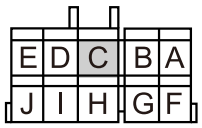
Is the voltage specified value?

Yes → Go to step 8

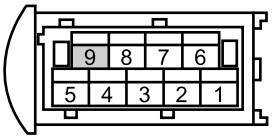
No

Step 7	Check continuity between S011 terminal C and the left front park lamp harness connector CA12 terminal No.9.

I/P Fuse Block Harness Connector SO11



Left Headlamp Harness Connector CA12



FE11-5318b

(a) Check and repair the open circuit between S011 terminal C and the left front park lamp harness connector CA12 terminal No.9.

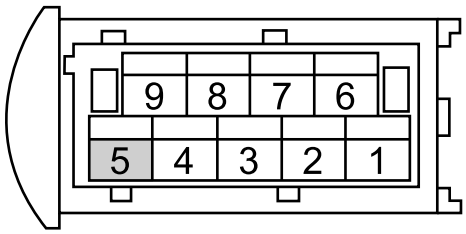
Confirm the park lamp is working correctly.

Yes → System normal

No

Step 8	Check continuity between the left front park lamp harness connector CA12 terminal No.5 and the body ground.

Left Headlamp Harness Connector CA12



FE11-5319b

(a) Check and repair the open circuit between the left front park lamp harness connector CA12 terminal No.5 and the body ground.

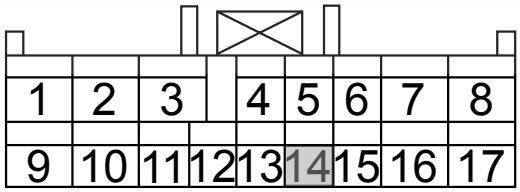
Confirm the park lamp is working correctly.

Yes → System normal

No

Step 9	Measure headlamp switch wiring harness connector IP18 terminal No.14 voltage.

Left Combination Switch Harness Connector IP18



FE11-5320b

(a) Refer to 11.4.7.3 Headlamp Inoperative diagnostic steps to confirm IP18 terminal No.16 voltage.

(b) Turn on park lamps, measure headlamp switch harness connector IP18 terminal No.14 voltage with a multimeter.

Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 11

No

Step 10	Replace the headlamp switch.

(a) Refer to 11.4.8.1 Headlamp Switch Replacement.

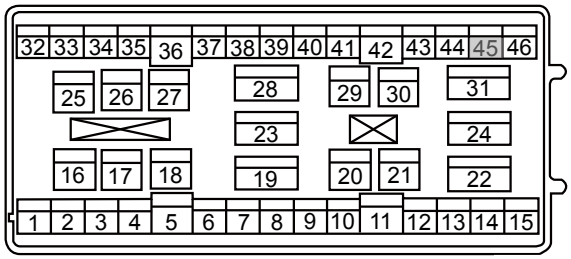
Confirm the park lamps are working properly.

Yes → System normal

No

Step 11	Check I/P fuse block harness connector IP05 terminal No.45 voltage.

To I/P Fuse Block Harness Connector IP05



FE11-5321b

(a) Remove the I/P fuse block and measure the wiring harness connector terminal No.45 voltage.
Standard Voltage: 11-14 V

Is the Is the voltage normal?

Yes → Go to step 13

No

Step 12	Repair the open circuit between IP05 terminal No.45 and IP18 terminal No.14.

(a) Confirm the open circuit between IP05 terminal No.45 and IP18 terminal No.14 repair is completed.

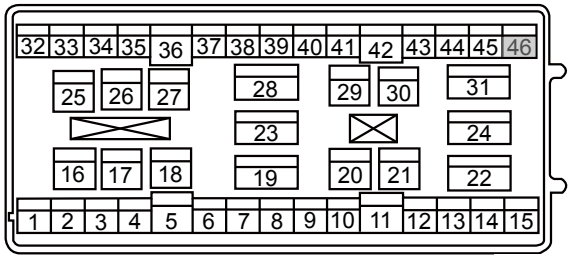
Confirm the park lamps are working properly.

Yes → Go to step 14

No

Step 13	Test continuity between I/P fuse block harness connector IP05 terminal No.46 and the body ground.

To I/P Fuse Block Harness Connector IP05



FE11-5322b

(a) Check to confirm the continuity between I/P fuse block harness connector IP05 terminal No.46 and the body ground.

Confirm the park lamp is working correctly.

Yes → System normal

No

Step 14	Replace the I/P fuse block.

(a) Replace the I/P fuse block.

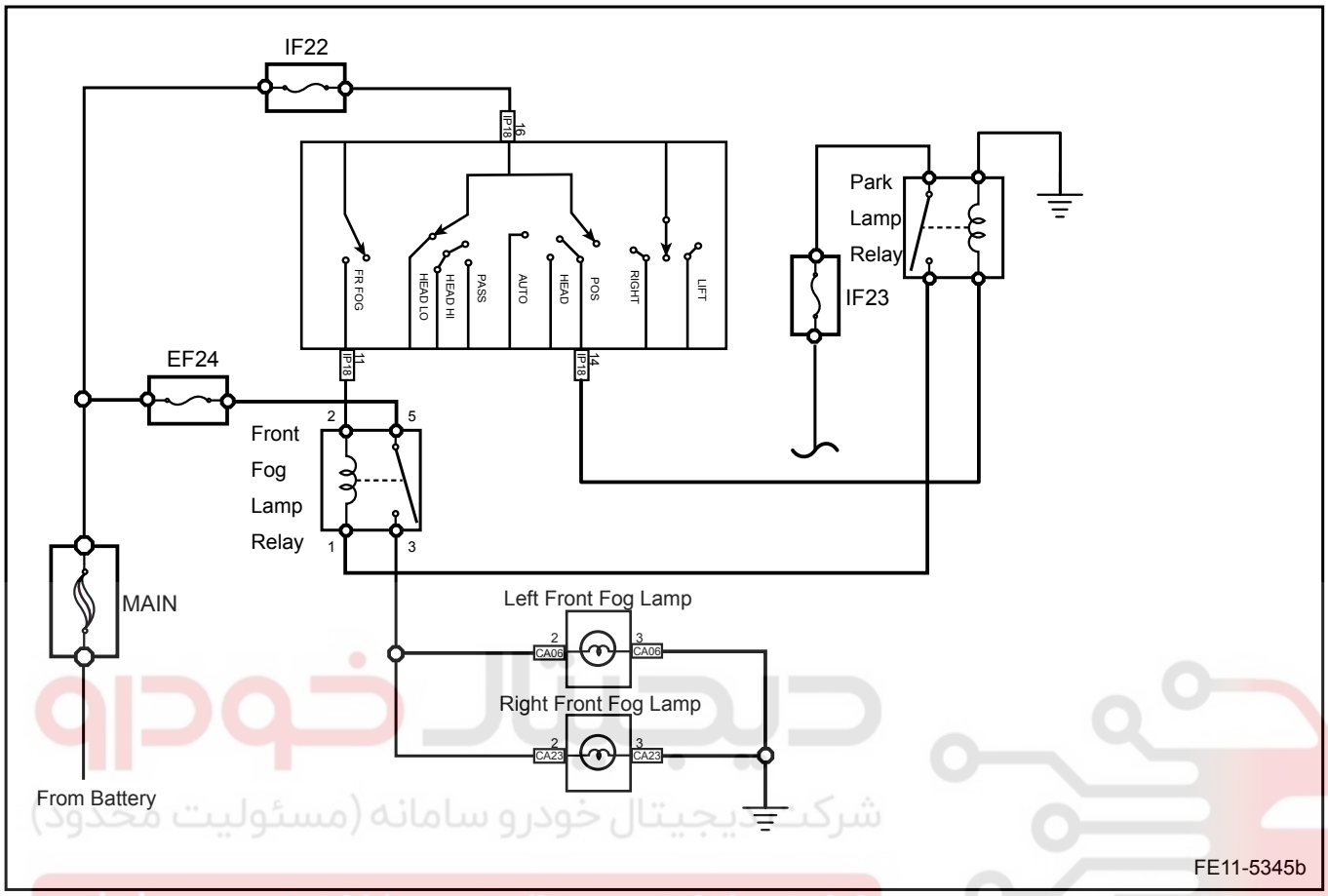
Confirm the repair completed.

Next

Step 15	System normal.

11.4.7.6 Front Fog Lamp Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the left front or right front fog lamp bulb.

(a) Remove the left front or right front fog lamp bulb.
Is the the bulb filament blown?

No → Go to step 3

Yes

Step 2	Replace the faulty left front or right front fog lamps bulb.

(a) Replace the faulty left front or right front fog lamps bulb.
Confirm front fog lamps are working properly.

Yes → System normal

No

Step 3	Replace with a new front fog lamp relay.

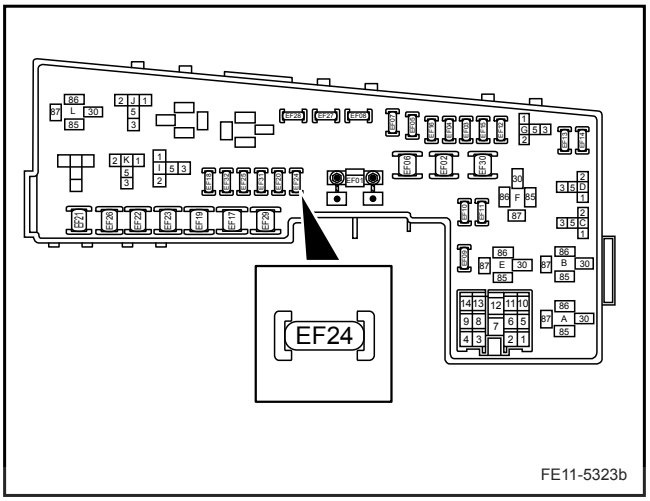
(a) Replace with a new front fog lamp relay.

Confirm front fog lamps are working correctly.

Yes → System normal

No

Step 4	Check the front fog lamp fuse EF24.



(a) Check whether the fuse EF24 is blown.
Fuse Rating: 15 A

Is the fuse blown?

No → Go to step 6

Yes

Step 5	Check the fuse EF24 circuit.

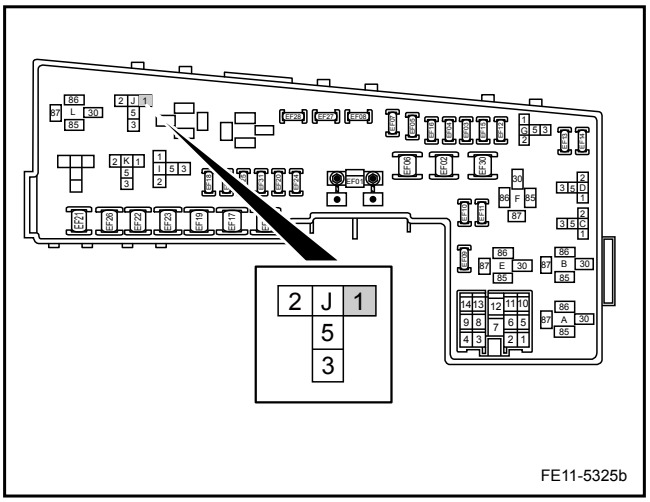
(a) Check for the fuse EF24 short circuit.
(b) Repair the circuit. Confirm that there are no short circuits.
(c) Replace with a fuse with rated current.

Is the headlamp working properly?

Yes → Working properly

No

Step 6	Measure the front fog lamps relay J (M) terminal No.1 voltage.



(a) Remove the fog lamp relay.
(b) Turn on park lamps and measure the front fog lamp relay terminal No.1 voltage.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 8

No

Step 7	Repair the open circuit between the underhood fuse block wiring harness connector CA10 and I/P fuse block harness connector SO11.

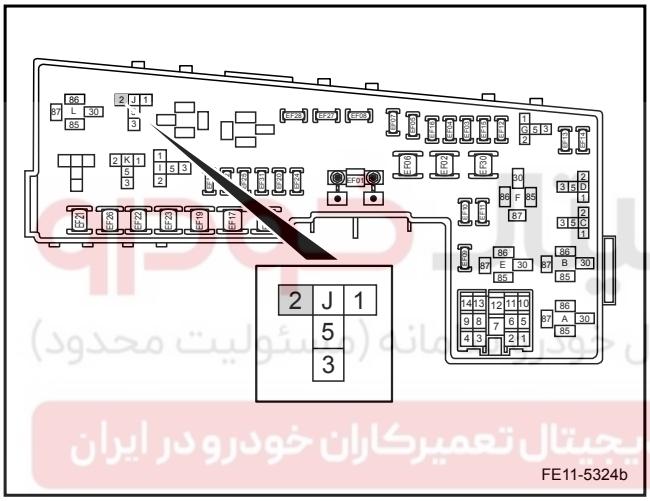
(a) Confirm the open circuit between the underhood fuse block wiring harness connector CA10 terminal No.7 and I/P fuse block harness connector SO11 terminal C repair is completed.

Confirm front fog lamps are working correctly.

Yes → System normal

No

Step 8	Test continuity between the underhood fuse block J (M) terminal No.2 and headlamp switch wiring harness connector IP18 terminal No.11.



(a) Remove the headlamp switch wiring harness connector IP18, and front fog lamp relay J (M). measure resistance between the underhood fuse block front fog lamp relay J (M) terminal No.2 and headlamp switch harness connector IP18 terminal No.11 with a multimeter .

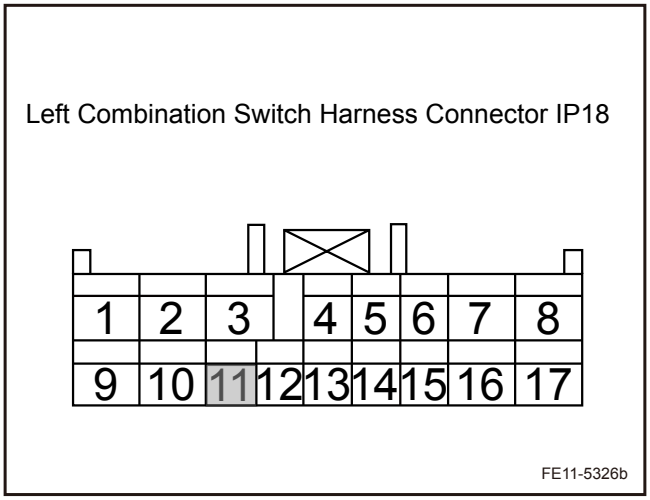
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 10

No

Step 9	Repair open circuit between the underhood fuse block front fog lamp relay J (M) terminal No.2 and headlamp switch wiring harness connector IP18 terminal No.11.



(a) Confirm the open circuit between the underhood fuse block front fog lamp relay J (M) terminal No.2 and headlamp switch wiring harness connector IP18 terminal No.11 repair is completed.

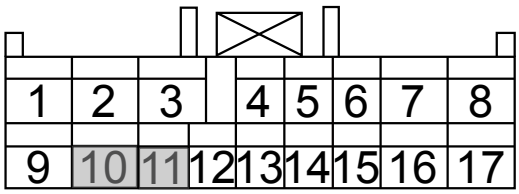
Confirm front fog lamps are working properly.

Yes → System normal

No

Step 10	Check the headlamp switch.

Left Combination Switch Harness Connector IP18



FE11-5327b

(a) Disconnect the headlamp switch wiring harness connector IP18, turn on the front fog lamps switch. Test continuity between terminals No.10 and No.11 with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 12

No

Step 11	Replace the headlamp switch.

(a) Replace the headlamp switch.

Confirm front fog lamps are working properly.

Yes → System normal

No

Step 12	Test continuity between the headlamp switch wiring harness connector IP18 terminal No.10 and the body ground.

(a) Test continuity between the headlamp switch wiring harness connector IP18 terminal No.10 and the body ground.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 14

No

Step 13	Repair the open circuit between the headlamp switch wiring harness connector IP18 terminal terminal No. 10 and the body ground.

(a) Confirm the open circuit between the headlamp switch wiring harness connector IP18 terminal terminal No.10 and the body ground repair is completed.

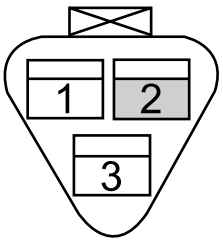
Confirm front fog lamps are working properly.

Yes → System normal

No

Step 14	Test continuity between the underhood fuse block relay J (M) terminal No.3 and front fog lamp wiring harness connector CA06/23 terminal No.2.

Left/Right Front Fog Lamp Harness Connector



FE11-5328b

(a) Check and repair the open circuit between the underhood fuse block relay box J (M) Terminal No.3 and front fog lamp wiring harness connector CA06/23 terminal No.2.

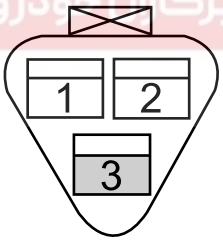
Confirm front fog lamps are working properly.

Yes → System normal

No

Step 15	Repair the open circuit between the front fog lamp wiring harness connector CA06/23 terminal No.3 and the body ground.

Left/Right Front Fog Lamp Harness Connector



FE11-5329b

(a) Confirm the open circuit between the front fog lamp wiring harness connector CA06/23 terminal No.3 and the body ground repair is completed.

Confirm the repair completed.

Next

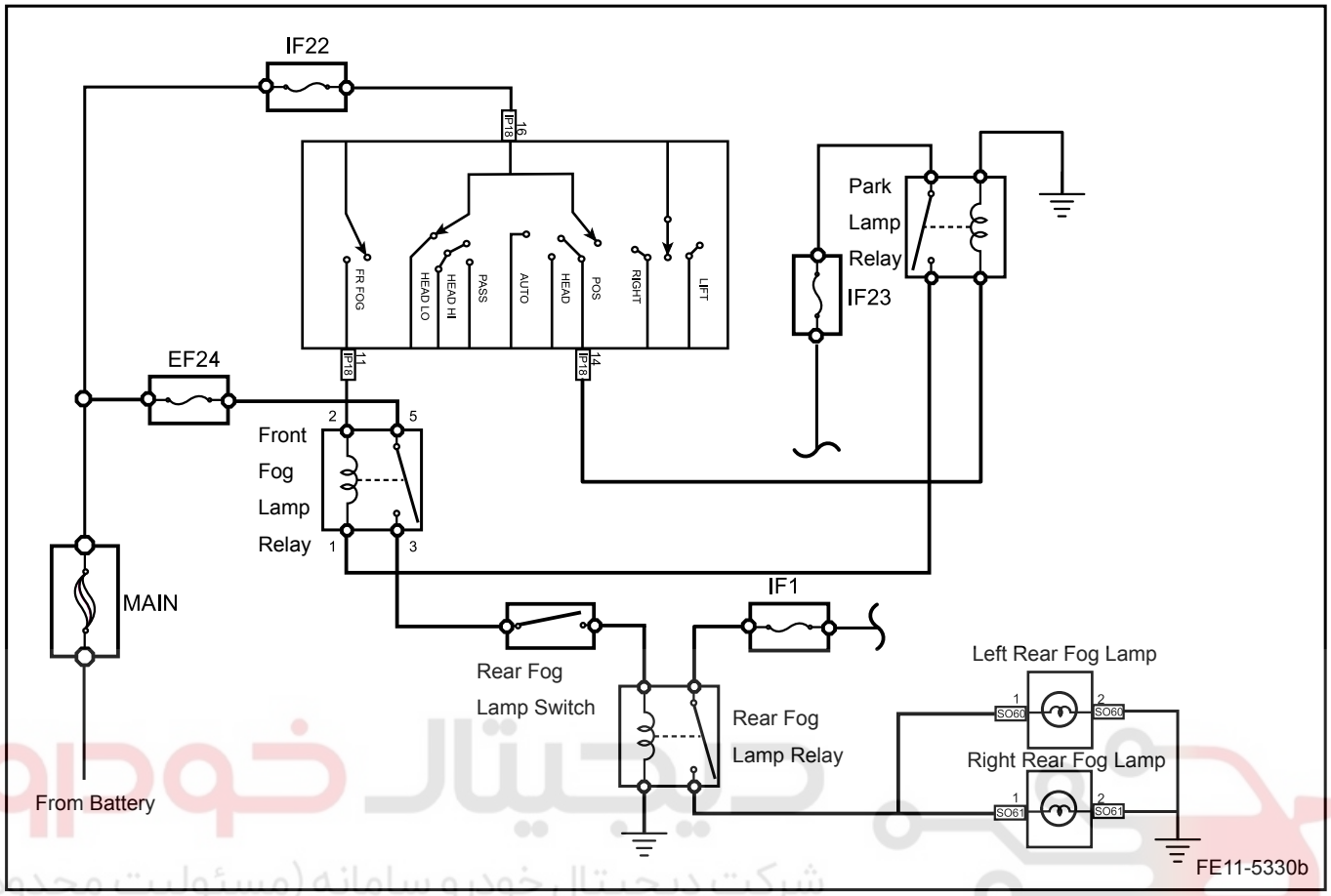
Step 16	System normal.

11.4.7.7 Rear Fog Lamp Inoperative

Note

Sedan uses a separate rear fog lamp assembly. There is a bulb for either side of the rear fog lamps. Hatchback has only one rear fog lamp, located inside the left rear tail lamp assembly.

Schematic:



Diagnostic Steps:

Step 1	Check the rear fog lamp switch indicator.

(a) Turn on fog lamps. Observe whether the rear fog lamp switch indicator is lit.

Yes → Go to step 3

No

Step 2	Replace the fog lamp switch.

(a) Replace the fog lamp switch. Refer to 11.4.8.2 Fog Lamp Switch Replacement.

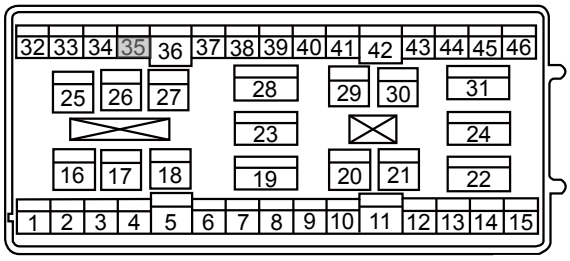
Confirm rear fog lamps are working properly.

Yes → System normal

No

Step 3	Test continuity between I/P fuse block wiring harness connector IP05 terminal No.35 and the underhood fuse block relay J (M) terminal No.3 .

To I/P Fuse Block Harness Connector IP05



FE11-5331b

(a) Test and repair continuity between I/P fuse block wiring harness connector IP05 terminal No.35 and the underhood fuse block relay J (M) terminal No.3.

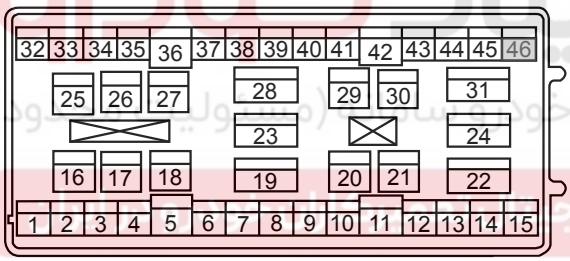
Confirm rear fog lamps are working properly.

Yes → System normal

No

Step 4	Test and repair continuity between wiring harness connector IP05 terminal No.46 and the body ground.

To I/P Fuse Block Harness Connector IP05



FE11-5333b

(a) Test and repair continuity between wiring harness connector IP05 terminal No.46 and the body ground.

Confirm rear fog lamps are working properly.

Yes → System normal

No

Step 5	Check the rear fog lamp bulb.

(a) Remove the left rear or right rear fog lamp bulb.

Is the the bulb filament blown?

No → Go to step 7

Yes

Step 6	Replace the rear fog lamp failure.

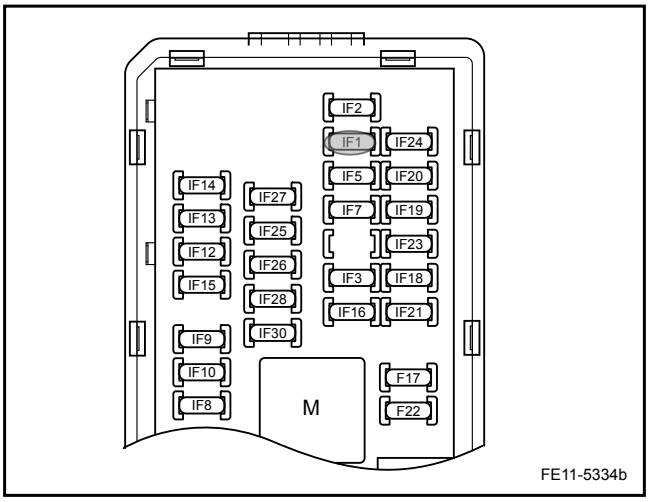
(a) Replace the faulty rear fog lamp bulb.

Confirm rear fog lamps are working properly.

Yes → System normal

No

Step 7	Check rear fog lamp fuse IF1.



(a) Check whether the rear fog lamp fuse IF1 is blown.
Fuse Rating: 10 A

Is the fuse blown?

No → Go to step 9

Yes

Step 8	Check the rear fog lamp fuse IF1 circuit.

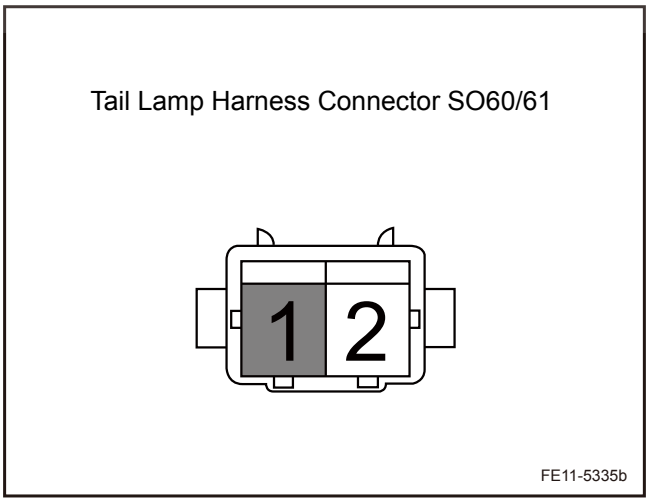
(a) Check the fuse IF1 circuit.
(b) Repair the circuit. Confirm that there are no short circuits.
(c) Replace with the fuse with rated current.

Confirm rear fog lamps are working correctly.

Yes → System normal

No

Step 9	Check SO60/61 terminal No.1 voltage.



(a) Disconnect the rear fog lamp connector SO60/61.
(b) Turn on fog lamps and measure SO60/61 terminal No.1 voltage.
Standard Voltage: 11-14 V

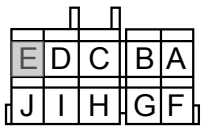
Is the voltage specified value?

Yes → Go to step 11

No

Step 10	Check the circuit between SO60/61 terminal No.1 and SO11 terminal E.

To I/P Fuse Block Harness Connector SO11



Tail Lamp Harness Connector SO60/61

FE11-5336b

(a) Disconnect the I/P fuse block wiring harness connector SO60/SO61.
(b) Check and repair the open circuit between SO60/61 terminal No.1 and SO11 terminal E.

Confirm rear fog lamps are working properly.

Yes → System normal

No

Step 11	Test continuity between SO60/61 terminal No.2 and the body ground .

Tail Lamp Harness Connector SO60/61

FE11-5337b

(a) Check and repair the open circuit between SO60/61 Terminal No.2 and the body ground.

Confirm rear fog lamps are working properly.

Yes → System normal

No

Step 12	Replace the I/P fuse block.

(a) Replace the I/P fuse block.

Confirm the repair completed.

Next

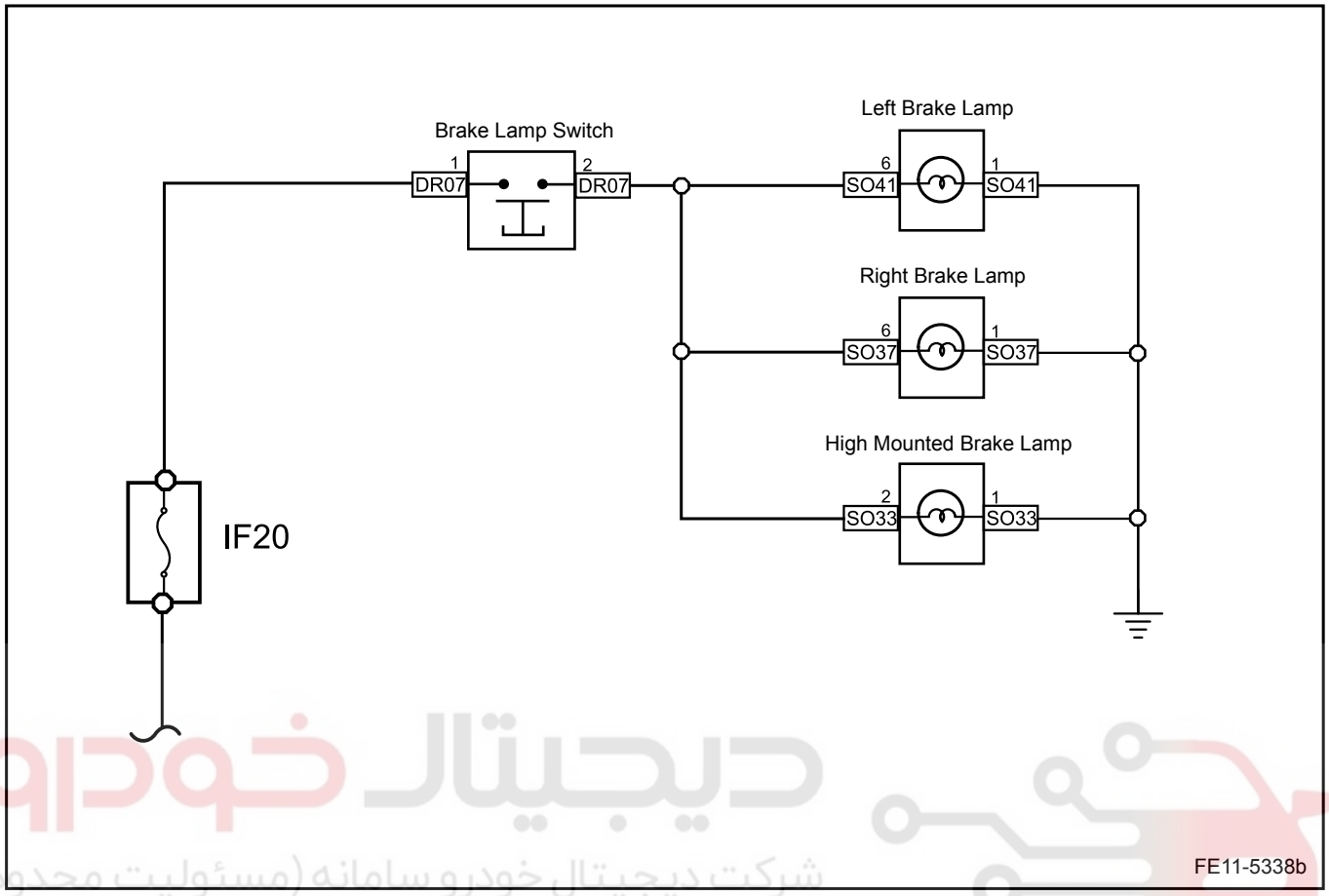
Step 13	System normal.

11.4.7.8 Brake Lamp Inoperative

Note

Sedan brake lamps and high mounted brake lamp have adopted light-emitting diodes. For hatchback , only high mounted brake lamp has light-emitting diodes

Schematic:



Diagnostic Steps:

Step 1	Check brake lamp bulb.

(a) Remove the brake lamp bulb.

Is the the bulb filament blown?

No → Go to step 3

Yes

Step 2	Replace the brake lamp bulb.

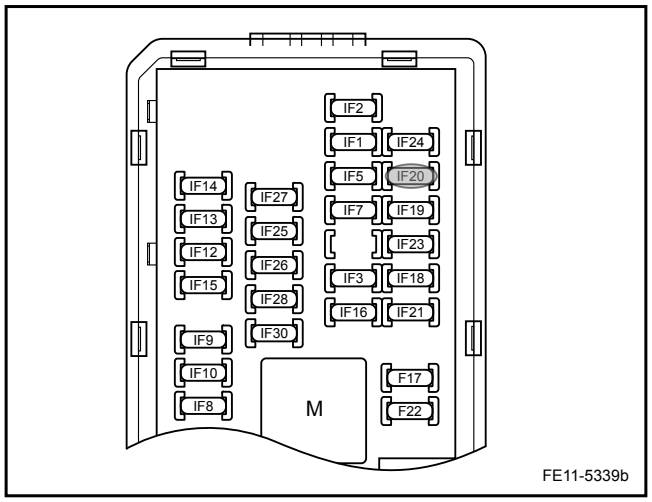
(a) Replace the faulty brake lamp bulb.

Confirm brake lamps are working properly.

Yes → System normal

No

Step 3	Check the fuse IF20.



(a) Check whether the fuse IF20 is blown.
Fuse Rating: 10 A

Is the fuse blown?

No → Go to step 5

Yes

Step 4	Check the fuse IF20 circuit.

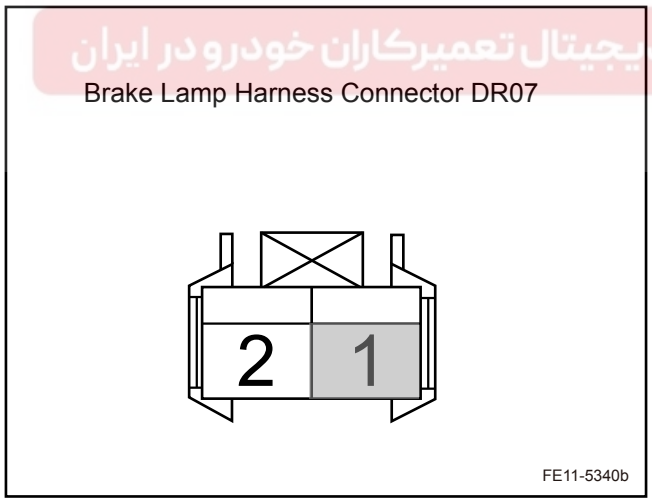
(a) Check the fuse IF20 circuit malfunction.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Confirm brake lamps are working correctly.

Yes → System normal

No

Step 5	Check the brake lamp switch wiring harness connector DR07 terminal No.1 voltage.



(a) Measure brake lamp switch harness connector DR07 terminal No.1 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Repair the open circuit between the brake lamp switch wiring harness connector DR07 terminal No.1 and the fuse IF20.

(a) Confirm the open circuit between the brake lamp switch wiring harness connector DR07 terminal No.1 and the fuse IF20 repair is completed.

Confirm brake lamps are working correctly.

Yes → System normal

No

Step 7	Check the brake switch.

(a) Disconnect the brake lamp switch wiring harness connector, press the brake pedal. Measure resistance between the brake switch connector terminals No.1 and No.2 with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes →

No

Step 8	Replace the brake lamp switch.

(a) Replace the brake lamp switch. Refer to 11.4.8.17 Brake Lamp Switch Replacement.

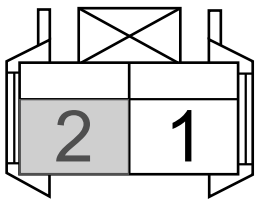
Confirm brake lamps are working correctly.

Yes → System normal

No

Step 9	Test continuity between the brake lamp switch wiring harness connector DR07 and tail lamp harness connector SO41 (SO33).

Brake Lamp Harness Connector DR07



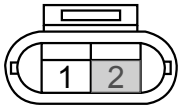
FE11-5341b

(a) Confirm continuity between the brake lamp switch wiring harness connector DR07 terminal No.2 and tail lamp harness connector SO41/37 Terminal No.6 (SO33 terminal No.2).

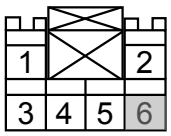
Confirm brake lamps are work properly.

Yes → System normal

High Mounted Brake Lamp Harness Connector SO33



Tail Lamp Harness Connector SO41/SO37

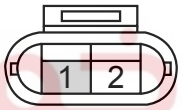


FE11-5342b

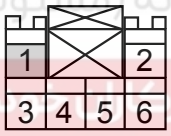
No

Step 10	Repair the open circuit between the tail lamp wiring harness connector SO41 (SO33) and the body ground.

High Mounted Brake Lamp Harness Connector SO33



Tail Lamp Harness Connector SO41/SO37



FE11-5343b

(a) Confirm the open circuit between the tail lamp wiring harness connector SO41 (SO33) and the body ground repair is completed.

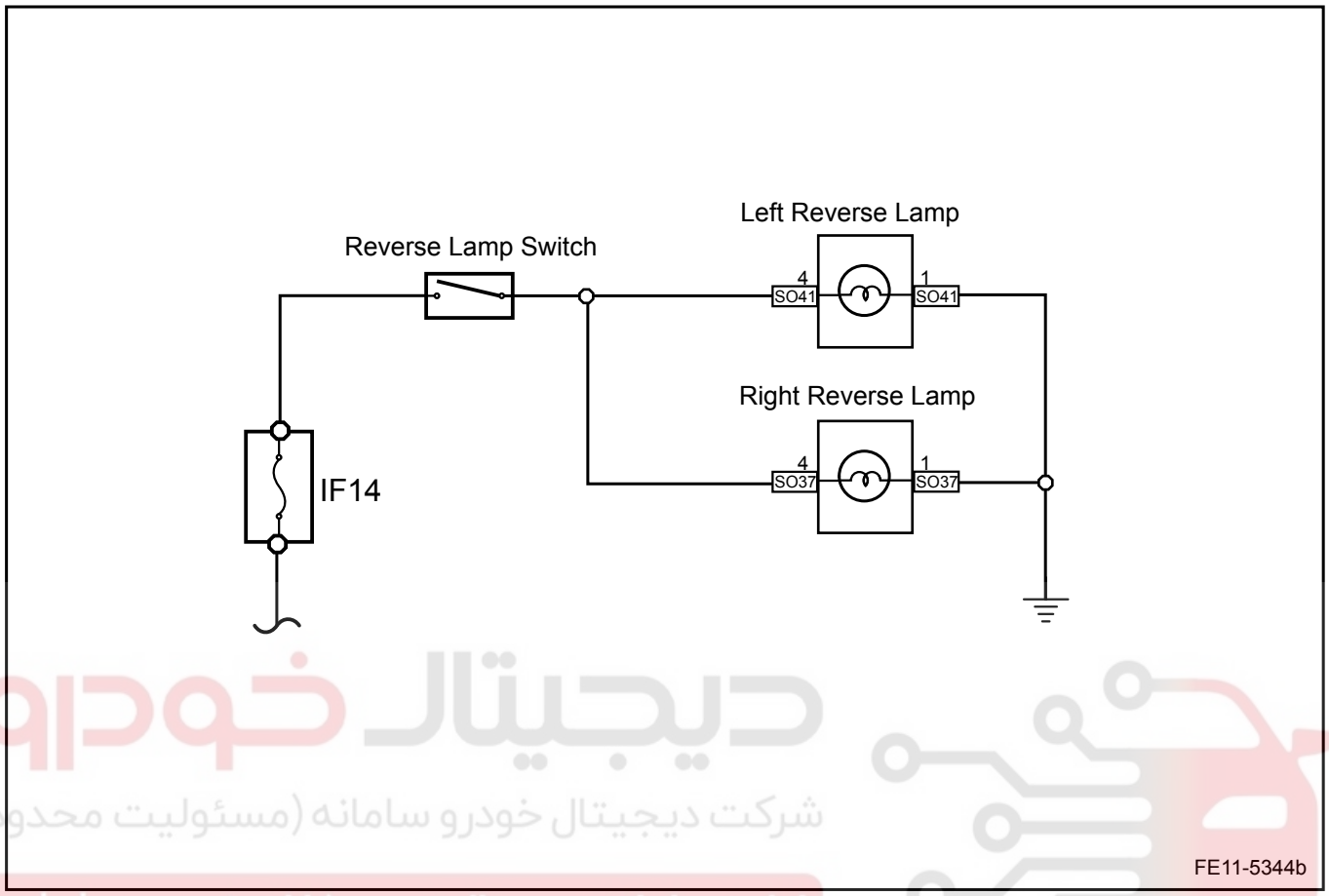
Confirm the repair completed.

Next

Step 11	System normal.

11.4.7.9 Reverse Lamp Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check reverse lamp bulbs.

(a) Remove the brake lamp bulbs.
Is the the bulb filament blown?

No → Go to step 3

Yes

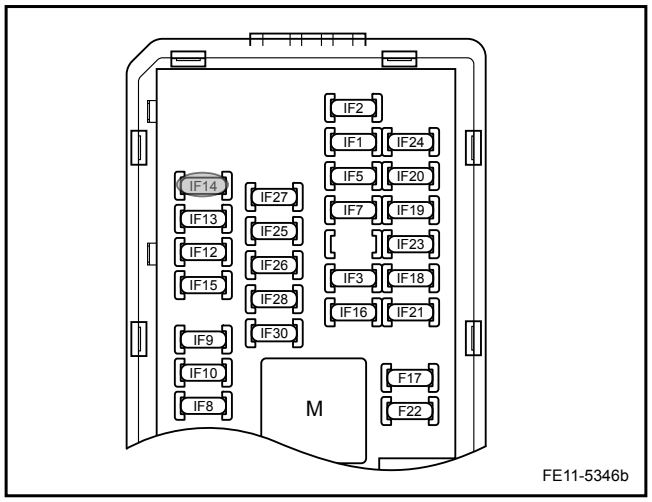
Step 2	Replace the reverse lamp bulbs.

(a) Replace the faulty reverse lamp bulb.
Confirm brake lamps are working properly.

Yes → System normal

No

Step 3	Check the fuse IF14 circuit.



(a) Check whether the fuse IF14 is blown.
Fuse Rating: 10 A

Is the fuse blown?

Yes → Go to step 5

No

Step 4	Repair the fuse IF14 circuit.

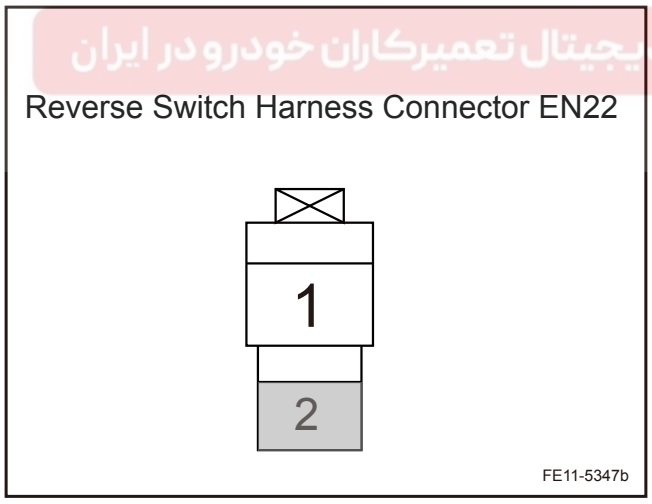
(a) Check the fuse IF14 short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Confirm whether the reverse lamps are working properly.

Yes → System normal

No

Step 5	Measure the reverse lamp switch wiring harness connector EN22 terminal No.2 voltage.



(a) Measure the reverse lamp switch wiring harness connector EN22 terminal No.2 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Repair the open circuit between the reverse lamp switch wiring harness connector terminal and the fuse IF14.

(a) Confirm the open circuit between the reverse lamp switch wiring harness connector terminal and the fuse IF14 repair is completed.

Confirm whether the reverse lamps are working properly.

Yes → System normal

No

Step 7	Check the reverse lamp switch.

(a) Turn the ignition switch. Do not start the engine. Engage reverse gear, disconnect the reverse switch wiring harness connector.

(b) Measure resistance between the brake switch terminal No.1 and No.2 with a multimeter .

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 9

No

Step 8	Replace the reverse switch.

(a) Replace the reverse switch. Refer to 11.4.8.16 Reverse Switch Replacement.

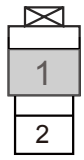
Confirm whether the reverse lamps are working properly.

Yes → System normal

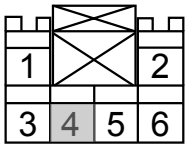
No

Step 9	Test continuity between the reverse lamp switch harness connector SO41/37 and reverse lamp switch harness connector EN22 terminal No.1.

Reverse Switch Harness Connector EN22



Tail Lamp Harness Connector SO37/SO41



FE11-5348b

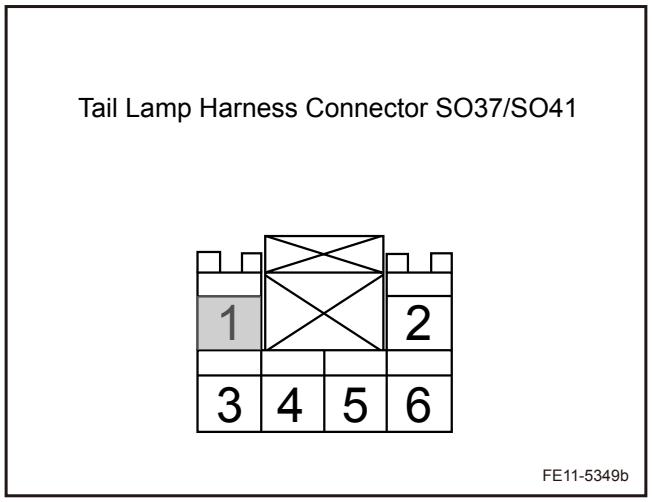
(a) Confirm continuity between the reverse lamp switch harness connector SO41/37 and reverse lamp switch harness connector EN22 terminal No.1.

Confirm whether the reverse lamps are working properly.

Yes → System normal

No

Step 10	Repair the open circuit between reverse lamp wiring harness connector SO41/37 terminal No.1 and the body ground.



(a) Confirm the open circuit between reverse lamp wiring harness connector SO41/37 terminal No.1 and the body ground repair is completed.

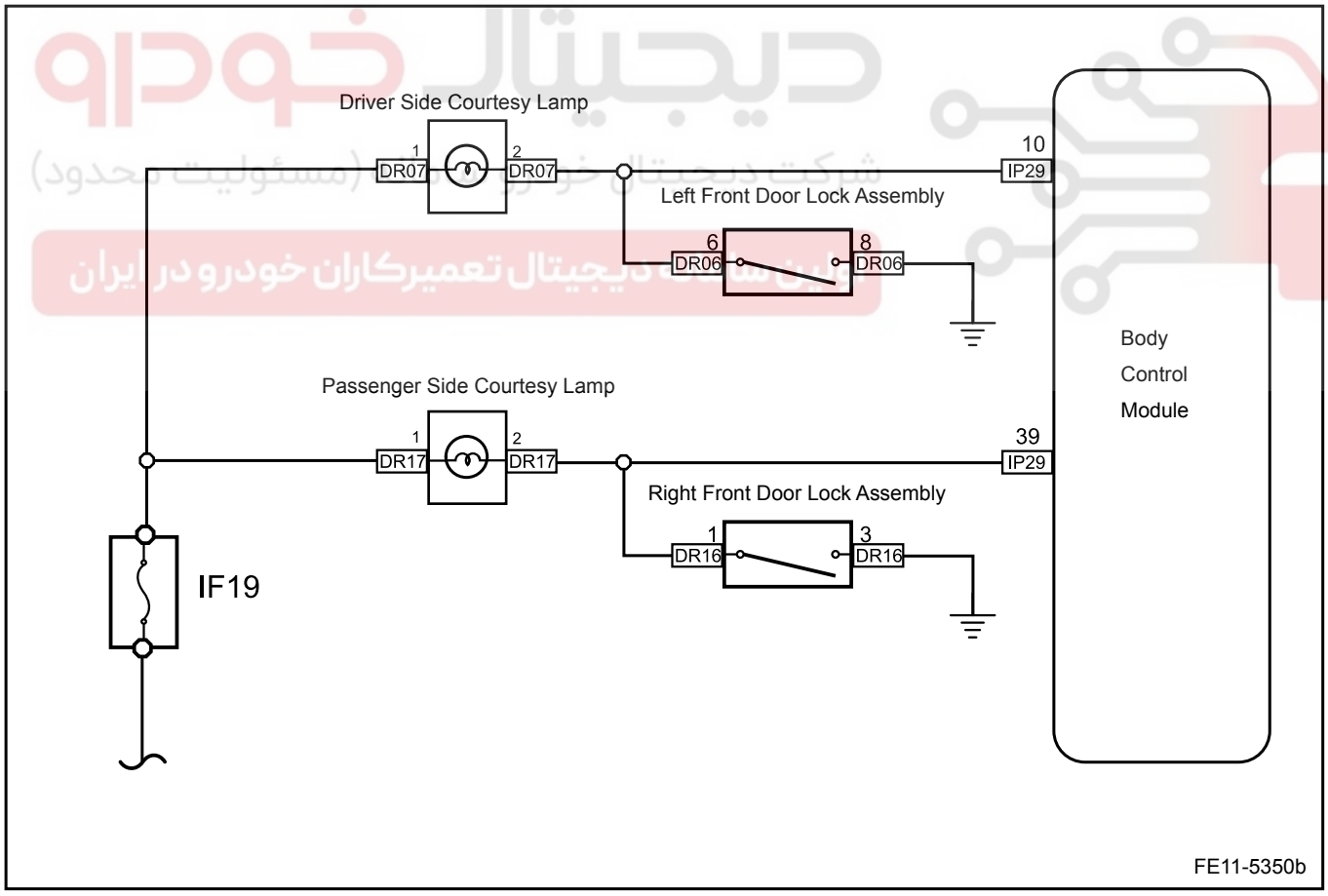
Confirm the repair completed.

Next

Step 11	System normal.

11.4.7.10 Courtesy Lamp Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the courtesy lamp bulb.

(a) Remove the courtesy lamp bulb.

Is the the bulb filament blown?

No → Go to step 3

Yes

Step 2	Replace the courtesy lamp bulb.

(a) Replace the faulty courtesy lamp bulb.

Confirm courtesy lamps are working properly.

Yes → System normal

No

Step 3	Check the fuse IF19 circuit.

(a) Check whether the fuse IF19 is blown.
Fuse Rating: 15 A

Is the fuse IF19 blown?

No → Go to step 5

Yes

Step 4	Repair the fuse IF19 circuit.

(a) Check for fuse IF19 short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

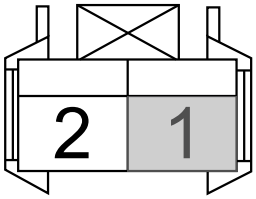
Confirm courtesy lamps are working correctly.

Yes → System normal

No

Step 5	Measure courtesy lamp switch wiring harness connector DR07/DR17 terminal No.1 voltage.

Left/Right Courtesy Lamp Harness Connector DR07/DR17



FE11-5351b

(a) Measure courtesy lamp switch wiring harness connector DR07/DR17 terminal No.1 voltage.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Repair the open circuit between courtesy lamp switch wiring harness connector DR07/17 terminal No.1 and fuse IF19.

(a) Confirm the open circuit between courtesy lamp switch wiring harness connector DR07/17 terminal No.1 and fuse IF19 repair is completed.

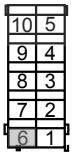
Confirm courtesy lamps are working correctly.

Yes → System normal

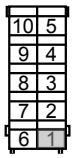
No

Step 7	Measure lock assembly harness connector DR06 terminal No.6 (DR16 terminal No.1) voltage.

Left Front Door Lock Harness Connector DR06



Right Front Door Lock Harness Connector DR16



FE11-5355b

(a) Measure lock assembly harness connector DR06 terminal No.6 (DR16 terminal No.1) voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 9

No

Step 8	Test continuity between the door lock assembly harness connector DR06 terminal No.6 (DR16 terminal No. 1) and door lock assembly harness connector DR07 terminal No.2 (DR17 terminal No.2).

(a) Confirm continuity between the door lock assembly harness connector DR06 terminal No.6 (DR16 terminal No.1) and

door lock assembly harness connector DR07 terminal No.2 (DR17 terminal No.2).

Confirm courtesy lamps are working correctly.

Yes → System normal

No

Step 9	Check the door lock assembly.

(a) Remove the left / right door lock assembly harness connector. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

(b) press the door lock switch, measure resistance between the door lock assembly DR06 terminal No.6 and No.8 (DR16 terminals No.1 and No.3).

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 11

No

Step 10	Replace the lock assembly.

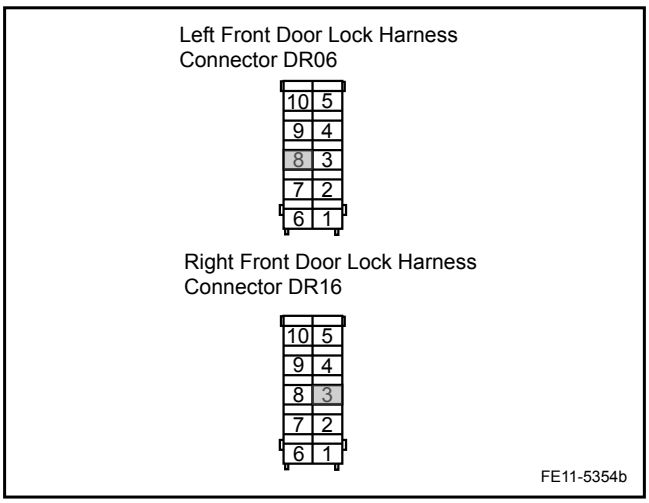
(a) Replace the lock assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

Confirm courtesy lamps are working correctly.

Yes → System normal

No

Step 11	Repair the open circuit between the door lock assembly harness connector DR06 terminal No.8 (DR16 terminal No.3) and the body ground.



(a) Confirm the open circuit between the door lock assembly harness connector DR06 terminal No.8 (DR16 terminal No. 3) and the body ground repair is completed.

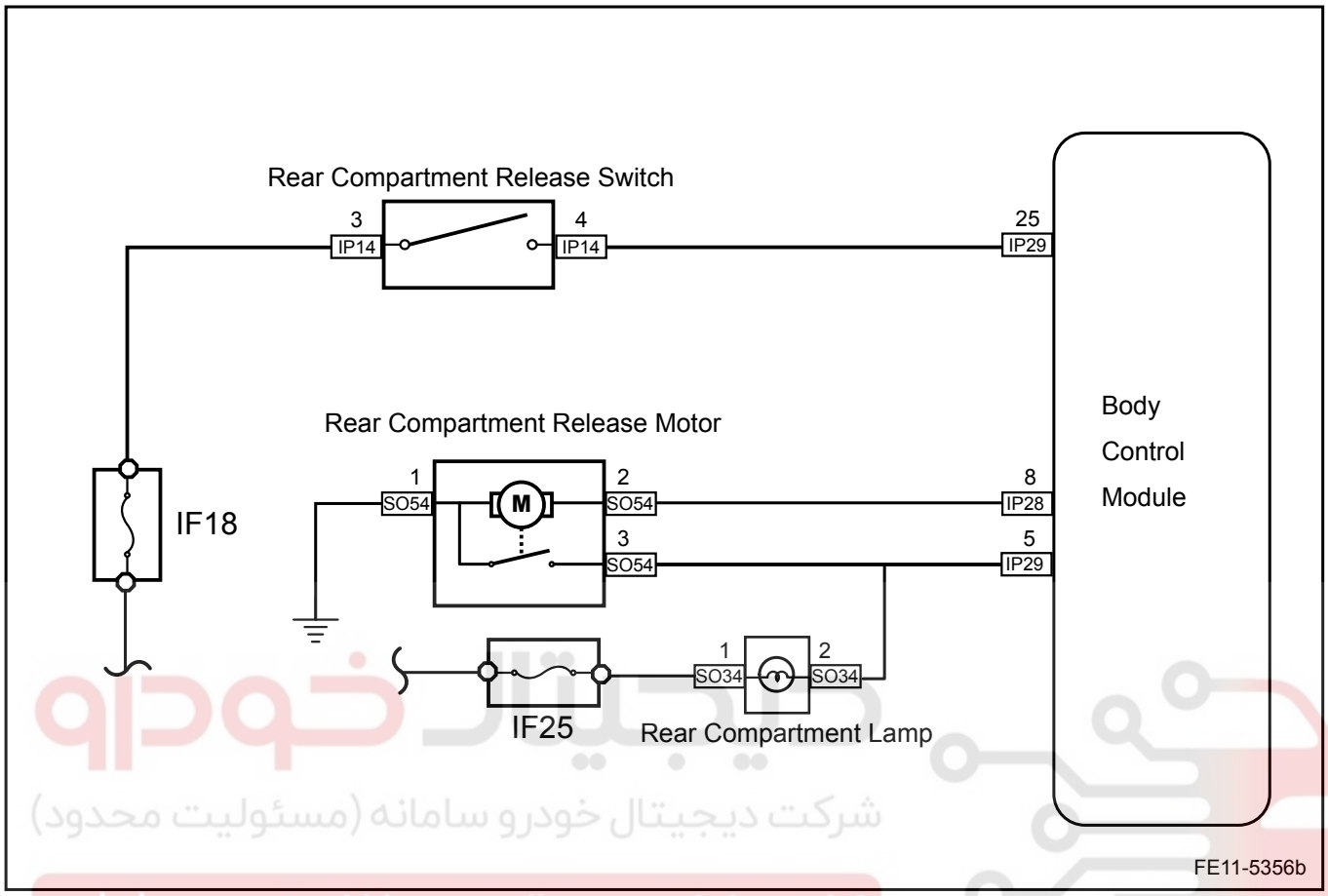
Confirm the repair completed.

Next

Step 12	System normal.

11.4.7.11 Rear Compartment Lamp Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check whether the rear compartment lid opens.

(a) Check whether the rear compartment lid opens.

No → Refer to 11.9.7.7 Rear Compartment Lid Can Not Be Opened (Sedan).

Yes

Step 2	Check the rear compartment lamp bulb.

(a) Remove the rear compartment lamp bulb.

Is the the bulb filament blown?

No → Go to step 4

Yes

Step 3	Replace the rear compartment lamp bulb.

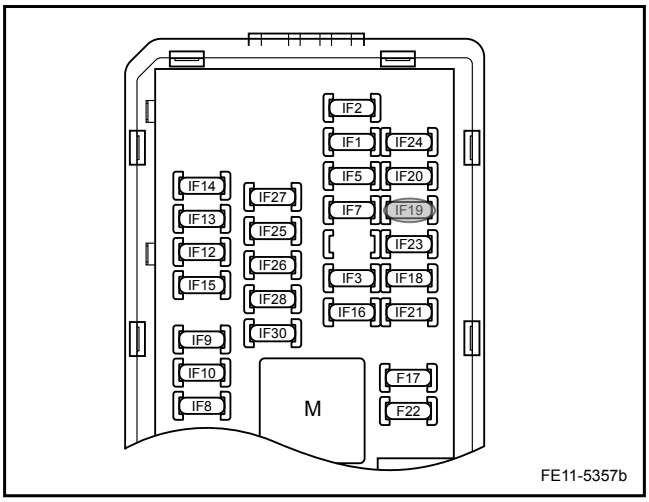
(a) Replace the faulty rear compartment lamp bulb.

Confirm the rear compartment lamp is working properly.

Yes → System normal

No

Step 4	Check the fuse IF19 circuit.



(a) Check whether the fuse IF19 is blown.
Fuse Rating: 15A

Is the fuse blown?

No → Go to step 6

Yes

Step 5	Repair the fuse IF19 circuit.

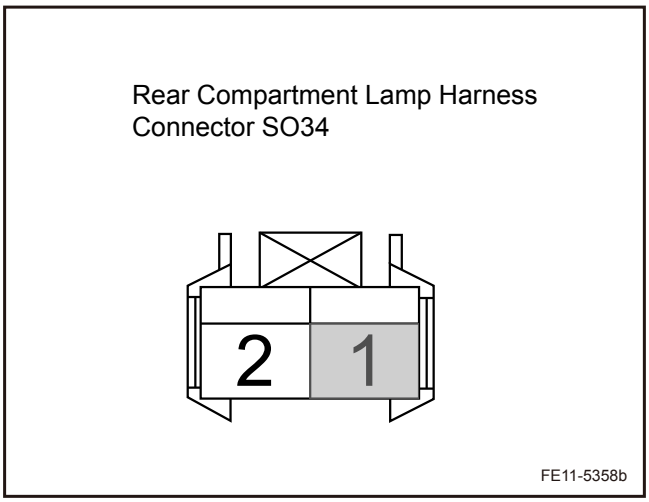
(a) Check the fuse IF19 for short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Confirm the rear compartment lamp is working correctly.

Yes → System normal

No

Step 6	Measure rear compartment light switch wiring harness connector SO34 terminal No.1 voltage.



(a) Measure the rear compartment lamp switch wiring harness connector SO34 terminal No.1 voltage.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 8

No

Step 7	Repair the open circuit between the rear compartment light switch wiring harness connector SO34 terminal No.1 and fuse IF19.

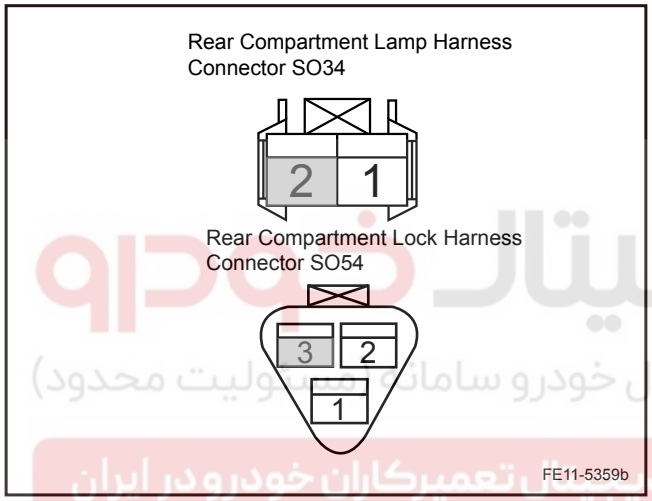
(a) Confirm the open circuit between the rear compartment light switch wiring harness connector SO34 terminal No.1 and fuse IF19 repair is completed.

Confirm the rear compartment lamp is working correctly.

Yes → System normal

No

Step 8	Test continuity between the rear compartment lamp switch wiring harness connector SO34 terminal No.2 and the rear compartment electrical wiring harness connector SO54 terminal No.3.



(a) Remove the rear compartment lamp switch wiring harness connector and the rear compartment electrical wiring harness connector.

(b) Measure resistance between the rear compartment lamp switch wiring harness connector SO34 terminal No.2 and the rear compartment electrical wiring harness connector SO54 terminal No.3 with a multimeter.

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 10

No

Step 9	Repair the open circuit between the wiring harness connector SO34 and connector SO54.

(a) Confirm the open circuit between the wiring harness connector SO34 terminal No.2 and connector SO54 terminal No.3 repair is completed.

Confirm the rear compartment lamp is working correctly.

Yes → System normal

No

Step 10	Replace the rear compartment motor.

(a) Replace the rear compartment motor. Refer to 11.9.8.4 Rear Compartment Lock Assembly Replacement (Sedan), "

Confirm the repair completed.

Next

Step 11	System normal.

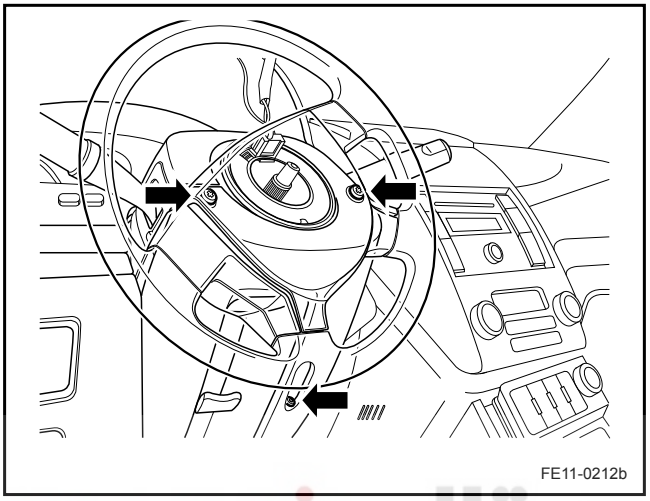
11.4.8 Removal and Installation

11.4.8.1 Headlamp Switch Replacement

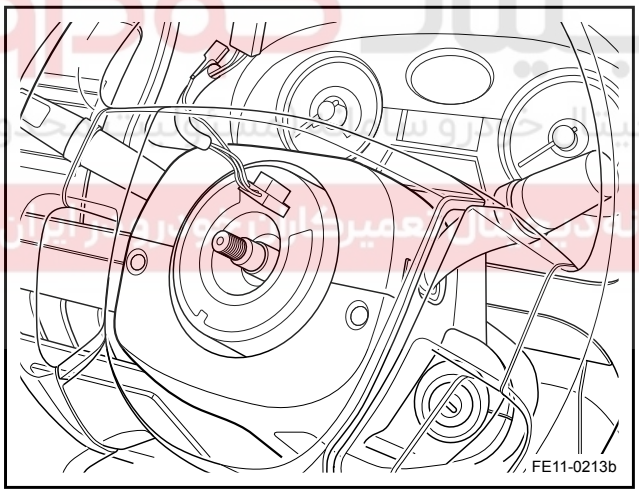
Removal Procedure

Warning!

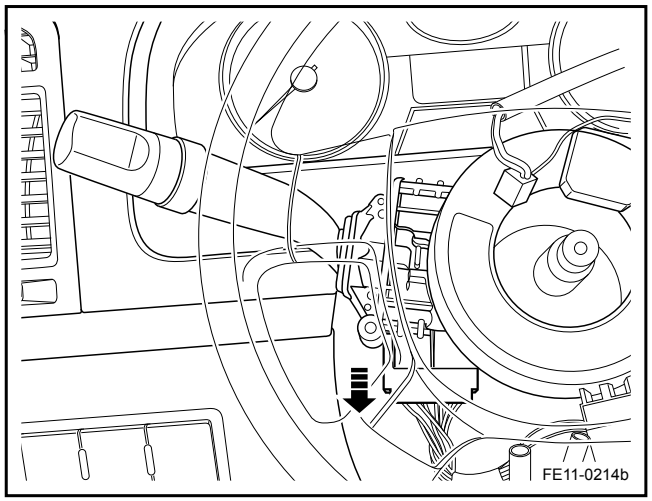
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



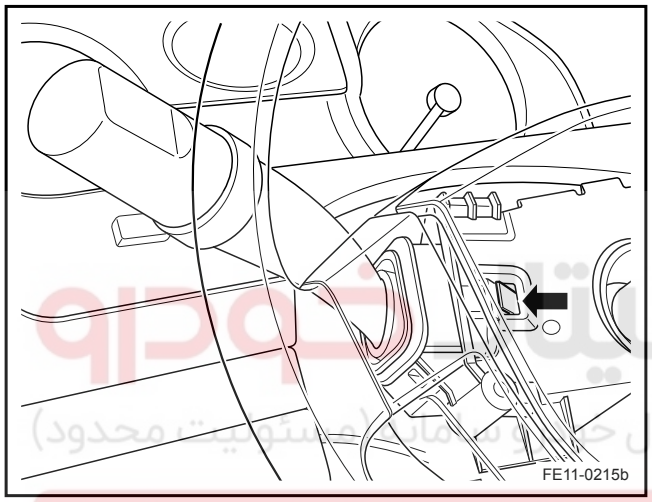
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Turn the steering wheel and remove the upper and lower steering column shield panel retaining screws.



3. Remove the upper and lower steering column shield panels.

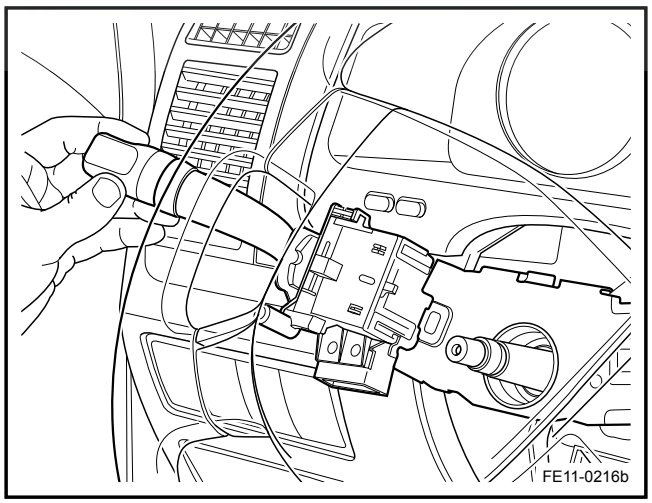


4. Disconnect the headlamp switch wiring harness connector.

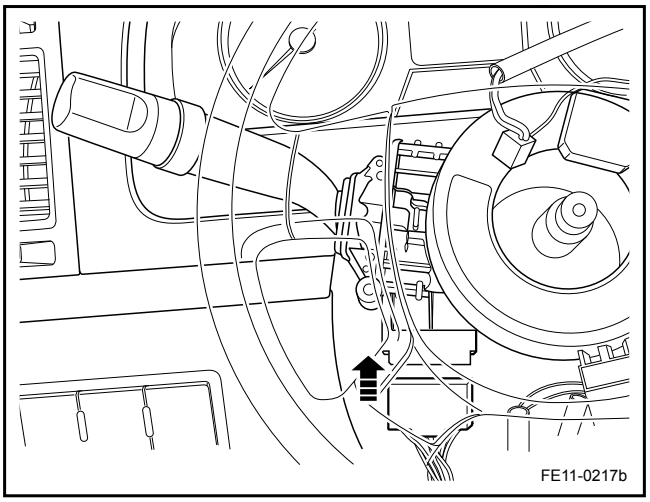


5. Press the switch outside tongue to remove the headlamp switch.

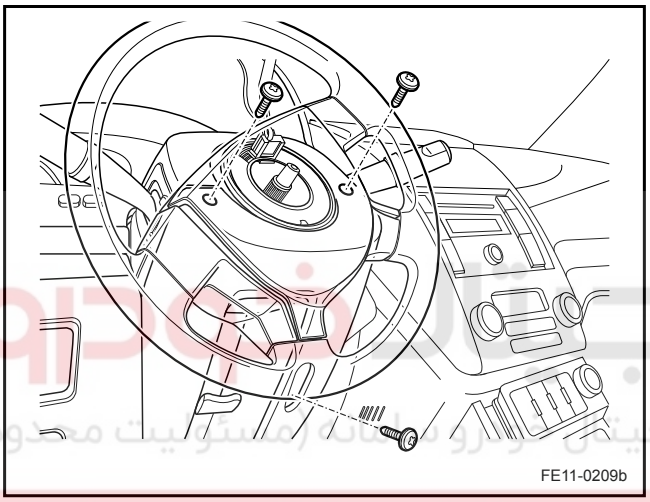
Installation Procedure:



1. Insert the headlamp switch into the switch seating.



2. Connect the headlamp switch wiring harness connector



3. Install and tighten the upper and lower steering column shield panel retaining screws.

   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

   Torque: 8.8 Nm (Metric) 6.5 lb-ft (US English)

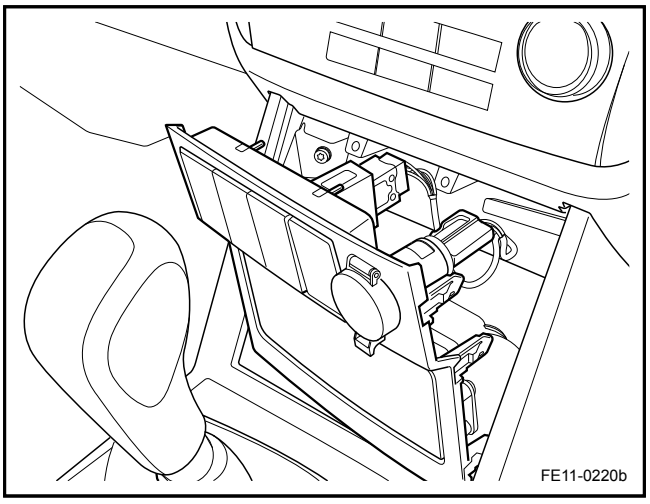
4. Connect the battery negative cable.

11.4.8.2 Fog Lamp Switch Replacement

Removal Procedure

Warning!

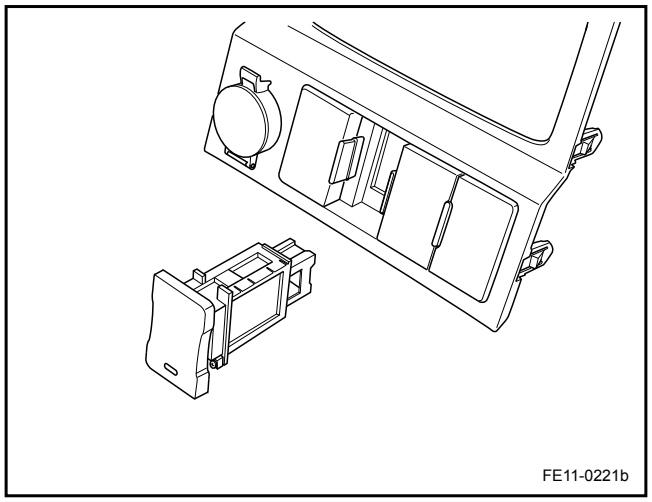
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable.2.11.8.1 Battery Disconnection.
2. Remove cigarette lighter panel. Refer to 11.16.6.1 Cigarette Lighter Replacement.
3. Disconnect the fog lamp, cigarette lighter and AUX wiring harness connectors.

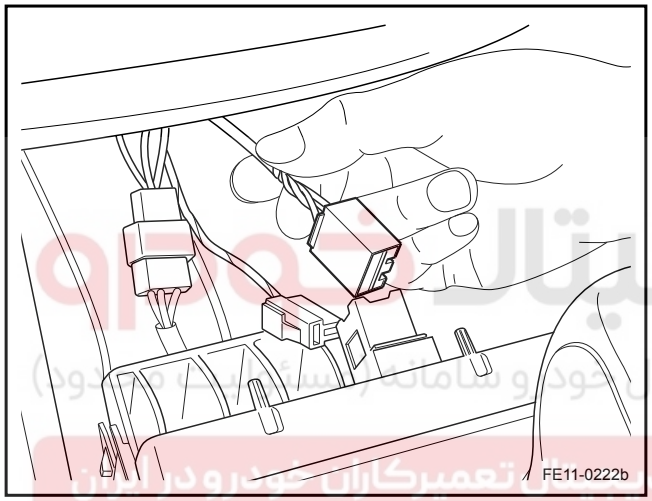
   Note

   To remove interior panels, please use interior trim removal special tools, otherwise the interior trims will be easily scratched.



4. Remove the rear fog lamp switch from back of the cigarette lighter panel.

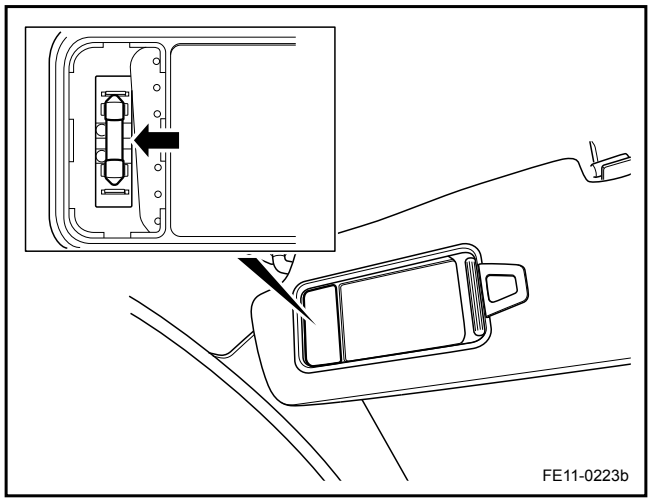
Installation Procedure:



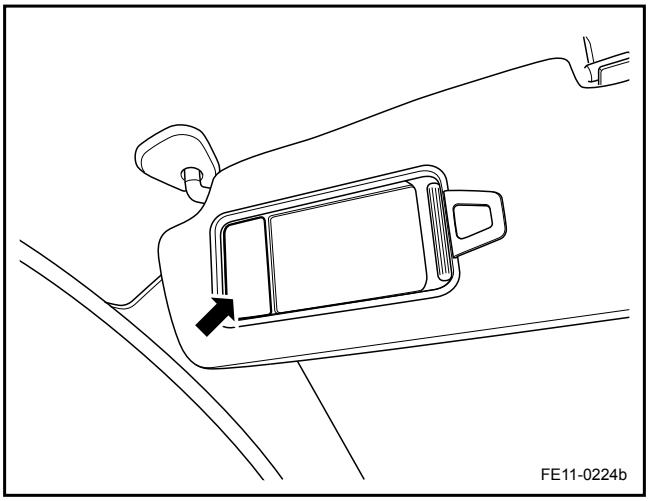
1. Install the rear fog lamp switch.
2. Connect the fog lamp, cigarette lighter and AUX wiring harness connectors.
3. Install the cigarette lighter panel.
4. Connect the battery negative cable.

11.4.8.3 Vanity Mirror Lamp Replacement

Removal Procedure



1. Remove the vanity mirror lamp cover.
2. Remove the vanity mirror lamp bulb.



Installation Procedure:

1. Install the vanity mirror lamp bulb.
2. Press the vanity mirror lamp cover into place.

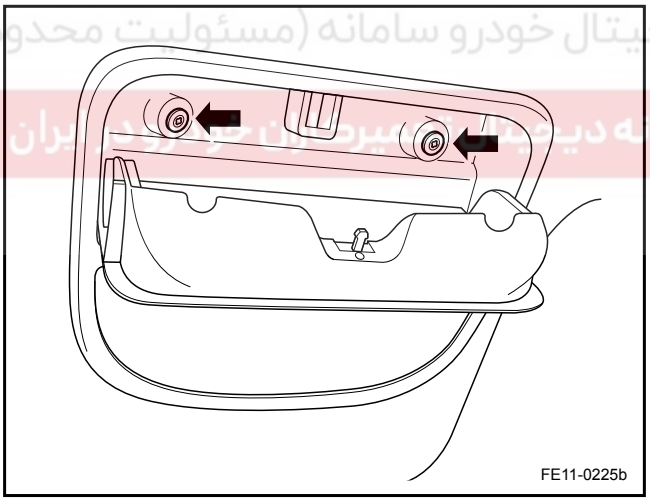
11.4.8.4 Dome Lamp and Reading Lamp Replacement

Front Dome Lamp Replacement

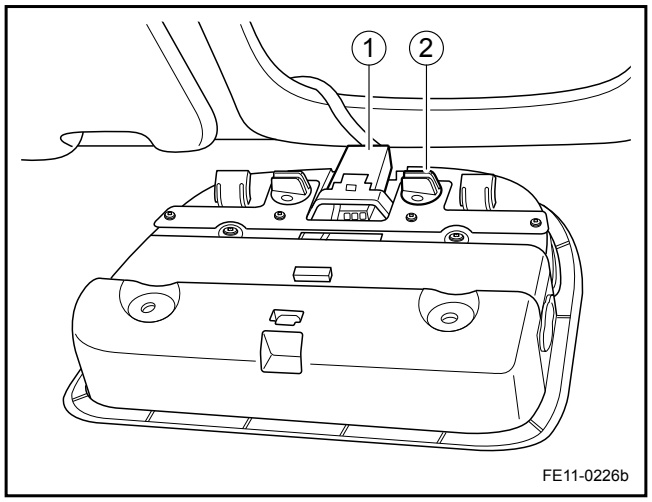
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

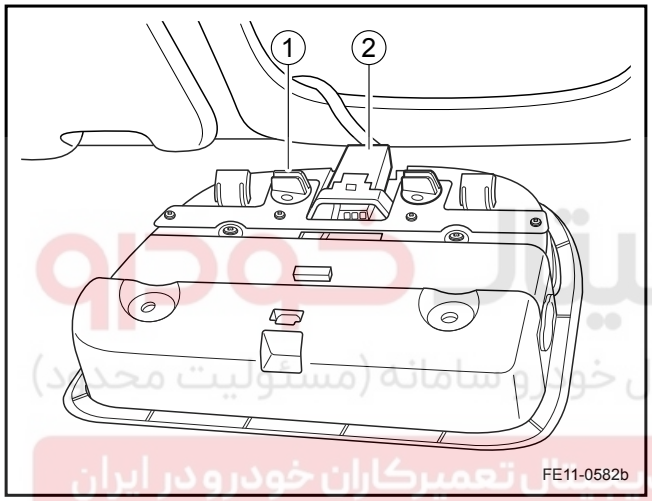


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Open the glasses case and remove the screw.

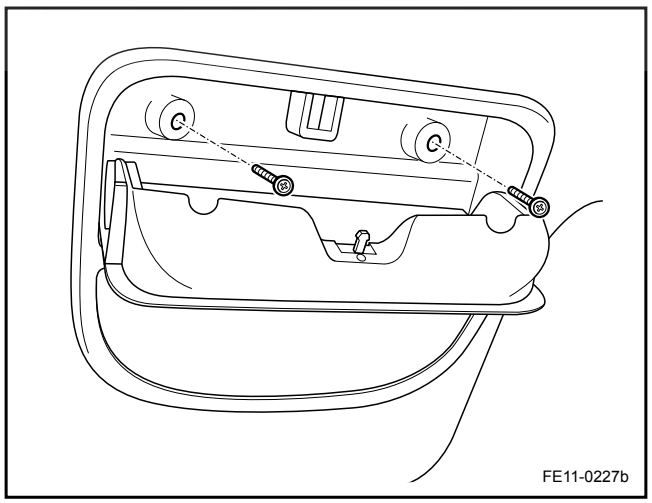


3. Remove the dome lamp, disconnect the wiring harness connector (1).
4. Remove the lamp bulb (2).

Installation Procedure:



1. Install the lamp bulb (1).
2. Connect the electrical wiring harness connector (2).



3. Install the dome lamp and tighten the retaining screws.

   Note

   "Fastener Notice" in "Warnings and Notices".

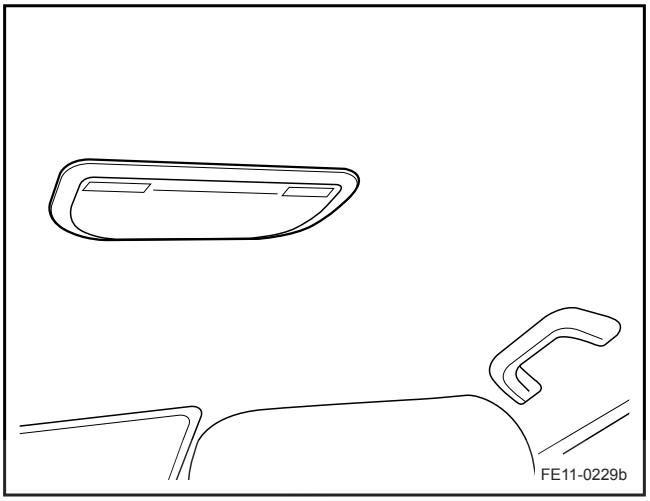
   Torque: 3 Nm (Metric) 2.2 lb-ft (US English)
4. Connect the battery negative cable.

Rear Dome Lamp and Reading Lamp Replacement

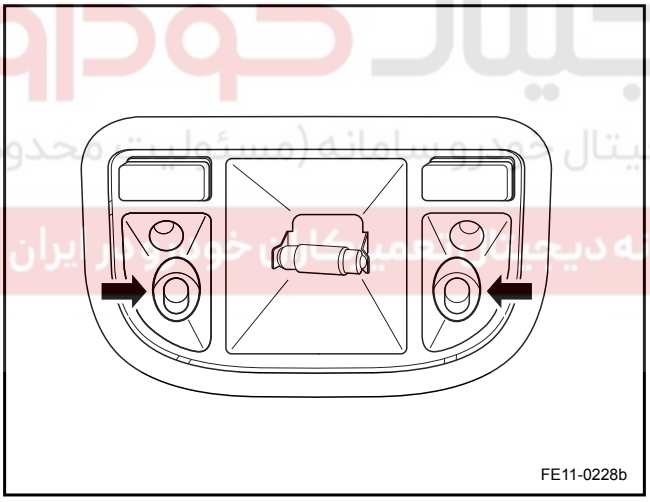
Removal Procedure

Warning!

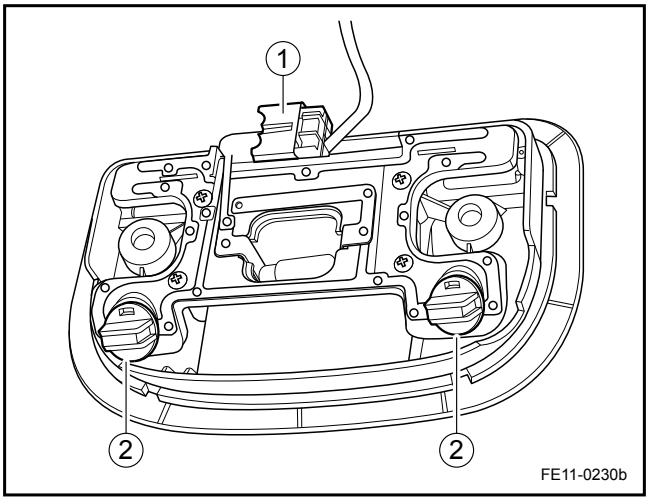
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Insert a special tool to the dome lamp cover edge to remove the cover.



3. Remove the screws and the door controlled lamp cover.



4. Disconnect the rear dome lamp wiring harness connector (1).

5. Remove the lamp bulb (2).

Installation Procedure:

1. Install the lamp bulb (1).
2. Connect the electrical wiring harness connector (2).
3. Install the rear dome lamp.

   Note

   "Fastener Notice" in "Warnings and Notices".

   Torque: 4 Nm (Metric) 3 lb-ft (US English)
4. Press the door controlled lamp cover into place.
5. Connect the battery negative cable.

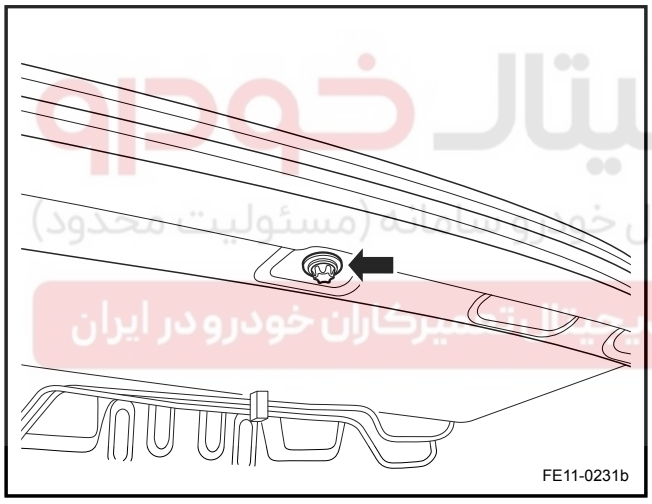
11.4.8.5 Rear Compartment Lamp (Hatchback Lamp) Replacement

Removal Procedure

1. Remove the rear compartment lamp cover.

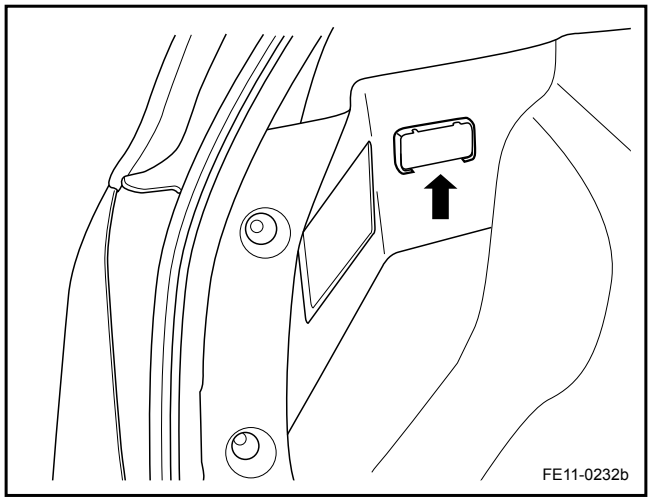
   Note

   Hatchback lamp cover for hatchback.
2. Remove the rear compartment lamp (Hatchback Lamp) bulb.



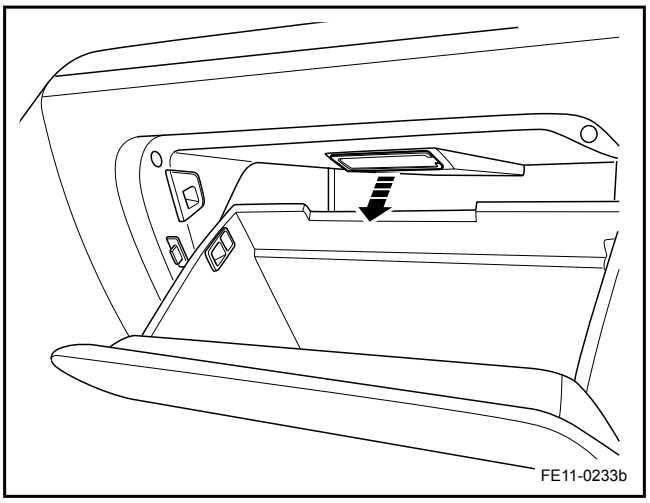
Installation Procedure:

1. Install the rear compartment lamp (Hatchback Lamp) bulb.
2. Install the rear compartment lamp cover (hatchback lamp cover).



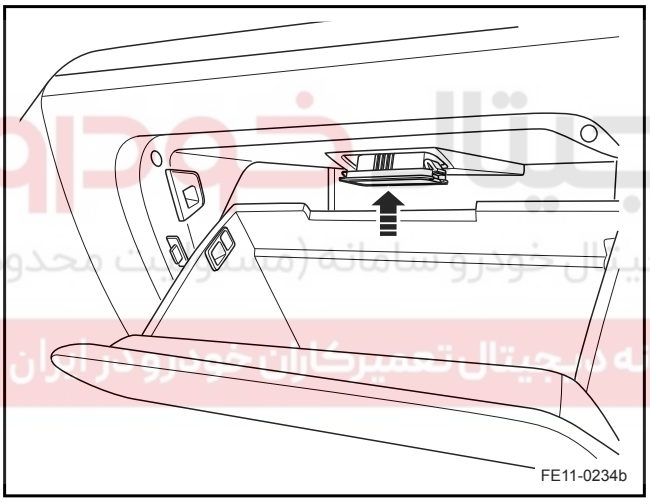
11.4.8.6 Glove Box Lamp Replacement

Removal Procedure



1. Remove the glove box lamp cover.
2. Disconnect the wiring harness connector.
3. Remove the glove box lamp bulb.

Installation Procedure:



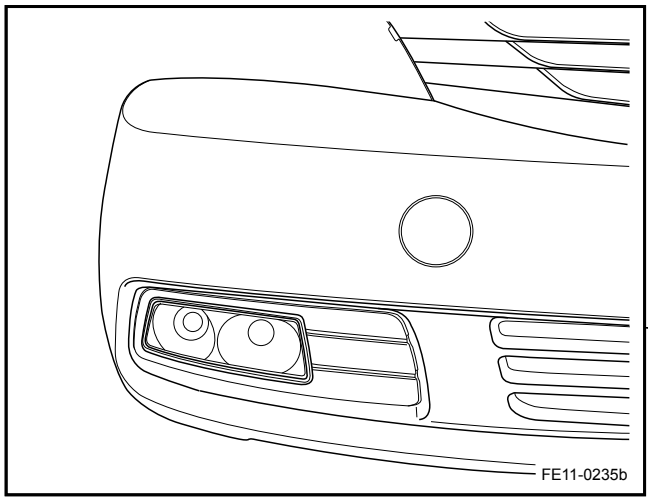
1. Install the glove box lamp bulb.
2. Connect the wiring harness connector.
3. Press the glove box lamp cover into place.

11.4.8.7 Front Fog Lamp Replacement

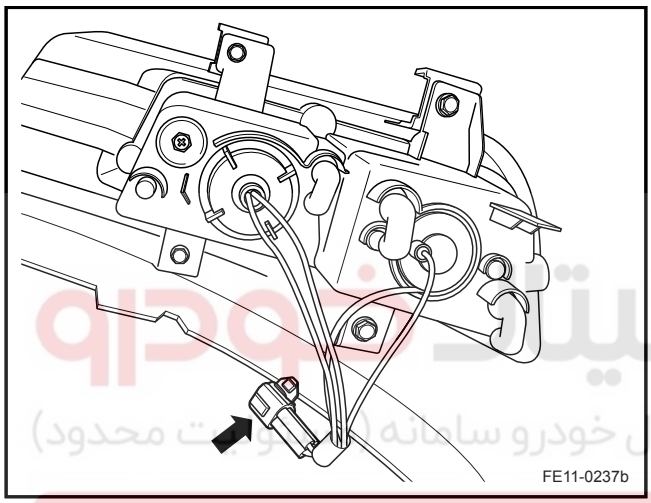
Removal Procedure

Warning!

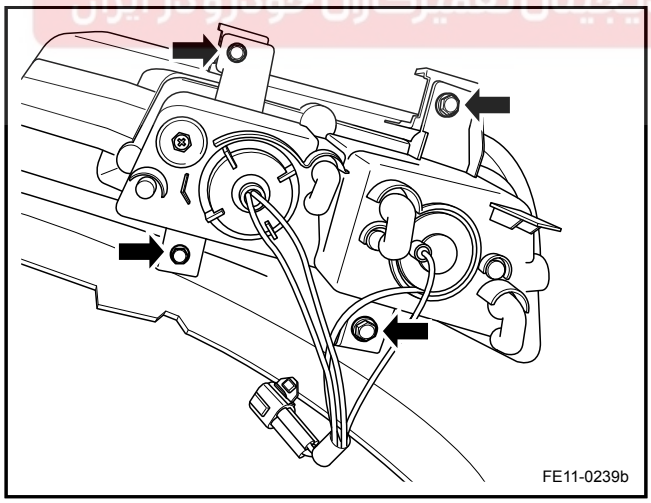
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



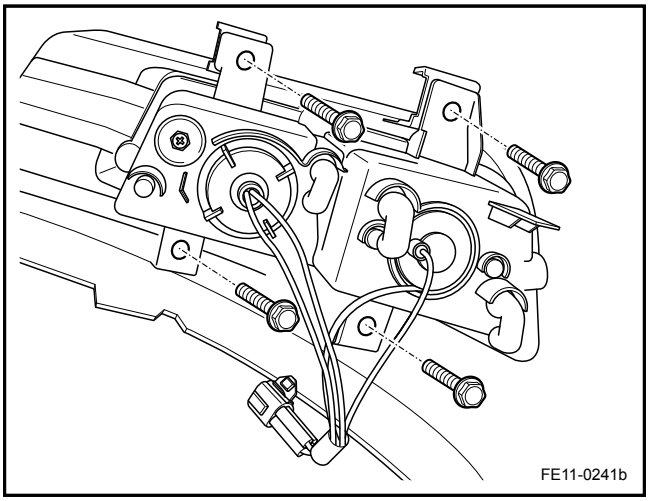
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the engine bottom shield. Refer to 12.10.1.7 Left and Right Engine Bottom Shield Replacement.



3. Disconnect the fog lamp assembly wiring harness connector.



4. Remove the fog lamp retaining bolts.
5. Remove the fog lamp assembly.
6. Loose the fog lamp assembly screws and remove the bulb.



Installation Procedure:

1. Insert and tighten the new fog lamp bulb to the fog lamp assembly.

   Note

   Avoid touching the bulb or letting the bulb to come into contact with any moist. When the lamp is turned on, the grease or moisture on the bulb may cause the bulb explode. If the bulb contacts with grease or moisture, clean the bulb with alcohol or an appropriate cleaning agent and dry the bulb.

2. Tighten the fog lamp retaining bolts.

   Torque: 5.5 Nm (Metric) 4 lb-ft (US English)

3. Connect the fog lamp wiring harness connector.
4. Install the engine bottom shield.
5. Connect the battery negative cable.

   Note

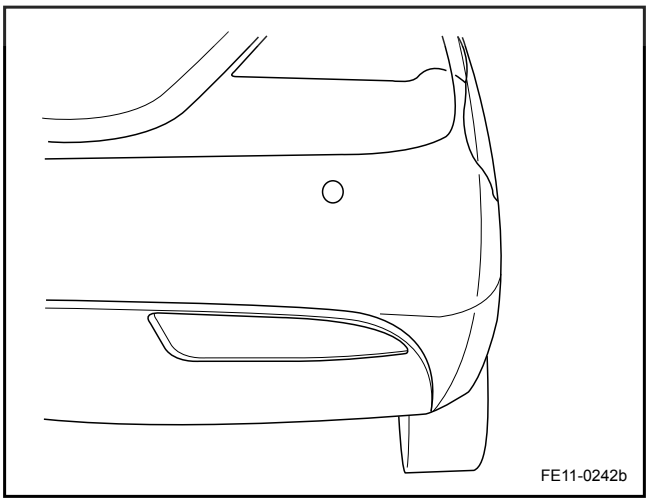
   Hatchback front fog lamp replacement is the same as sedan.

11.4.8.8 Rear Fog Lamp Replacement (Sedan)

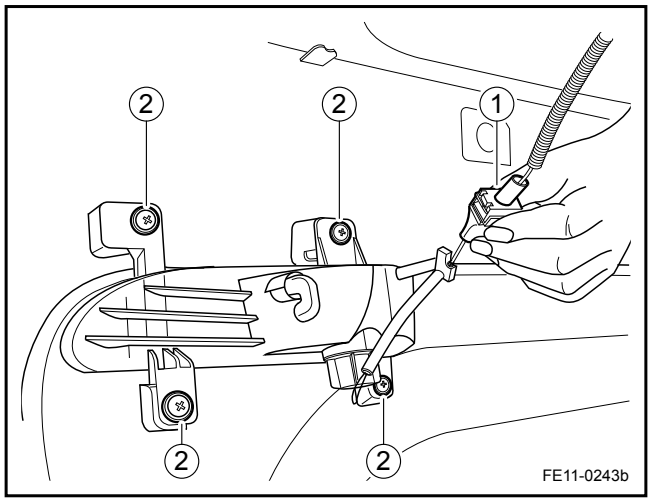
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

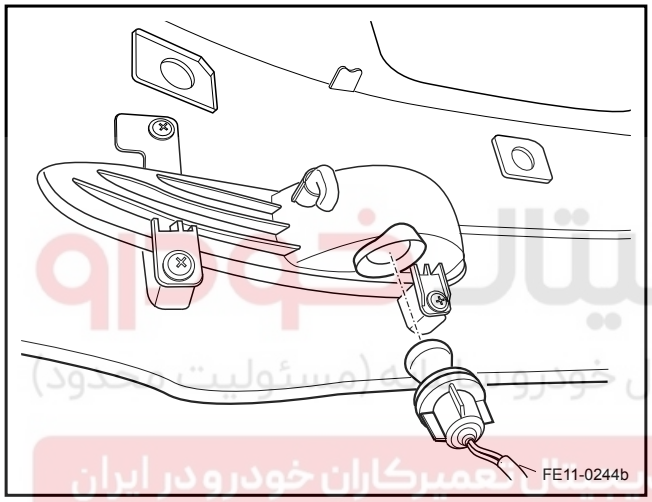


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear bumper. Refer to 12.4.3.3 Rear Bumper Replacement (Sedan).



3. Disconnect the wiring harness connector (1).
4. Remove the rear fog lamp retaining bolts.
5. Remove the rear fog lamp bulb.

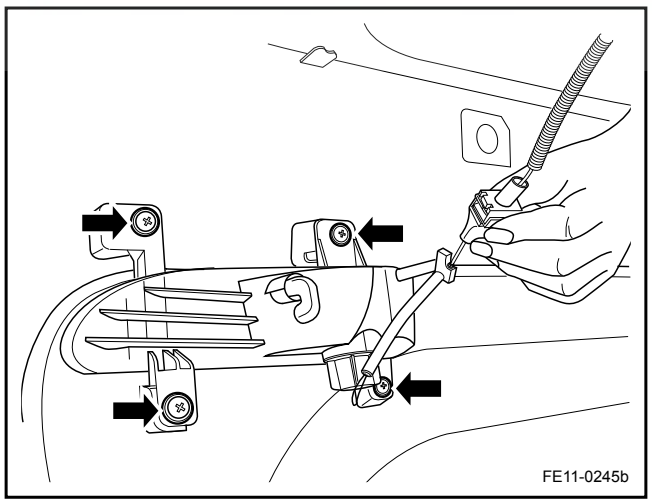
Installation Procedure:



1. Insert and tighten the fog lamp bulb to the rear fog lamp assembly.

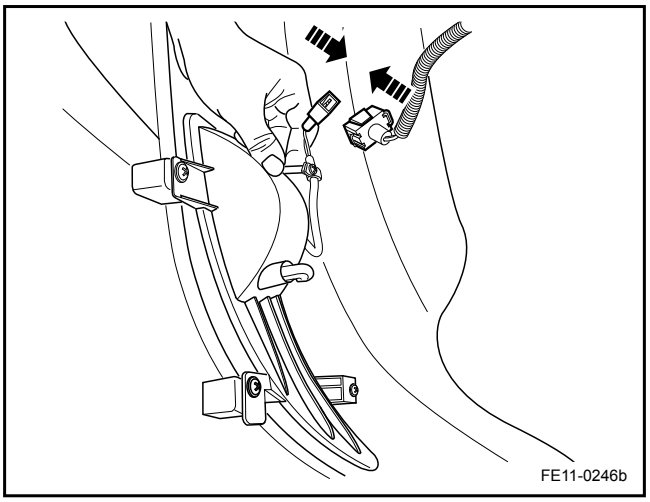
   Note

   Avoid touching the bulb or letting the bulb to come into contact with any moist. When the lamp is turned on, the grease or moisture on the bulb may cause the bulb explode. If the bulb contacts with grease or moisture, clean the bulb with alcohol or an appropriate cleaning agent and dry the bulb.



2. Install the rear fog lamp assembly.

   Torque: 5.5 Nm (Metric) 4 lb-ft (US English)



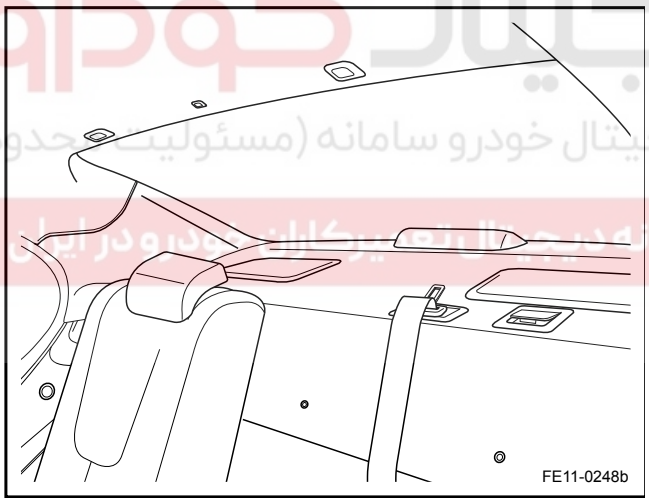
3. Connect the tail lamp assembly electrical wiring harness connector.
4. Install the rear bumper.
5. Connect the negative battery connector.

11.4.8.9 High Mounted Brake Lamp Replacement (Sedan)

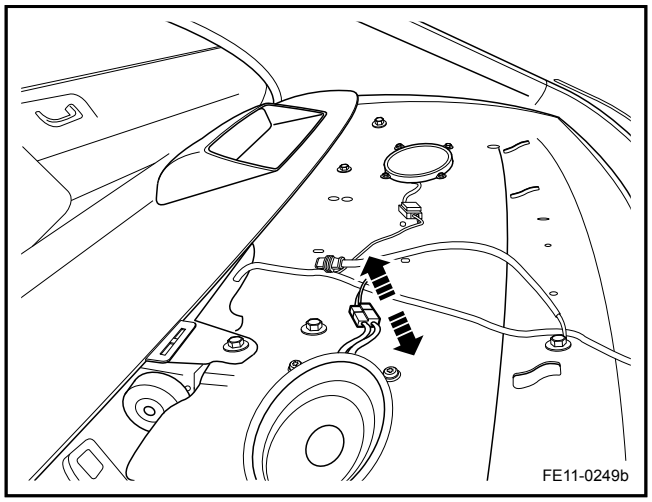
Removal Procedure

Warning!

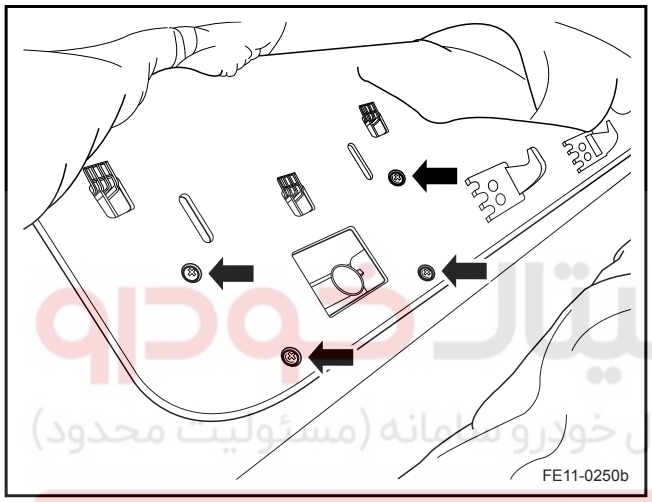
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear parcel shelf. Refer to 12.9.1.7 Rear Parcel Shelf Replacement (Sedan).

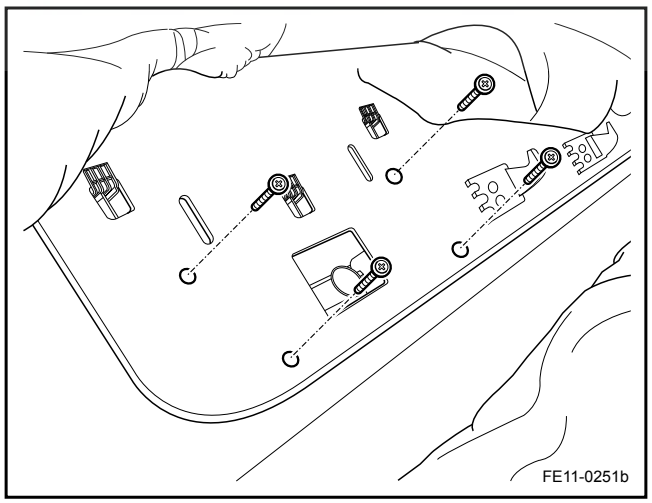


3. Disconnect the high mounted brake lamp wiring harness connector.



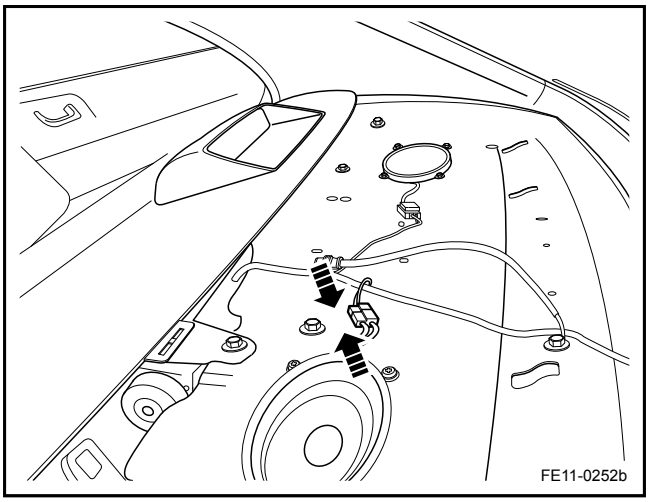
4. Remove the high mounted brake lamp retaining screws.
5. Remove the high mounted brake lamp.

Installation Procedure:



1. Install the high mounted brake lamp and tighten the retaining screws.

   Torque: 3.5 Nm (Metric) 2.5 lb-ft (US English)



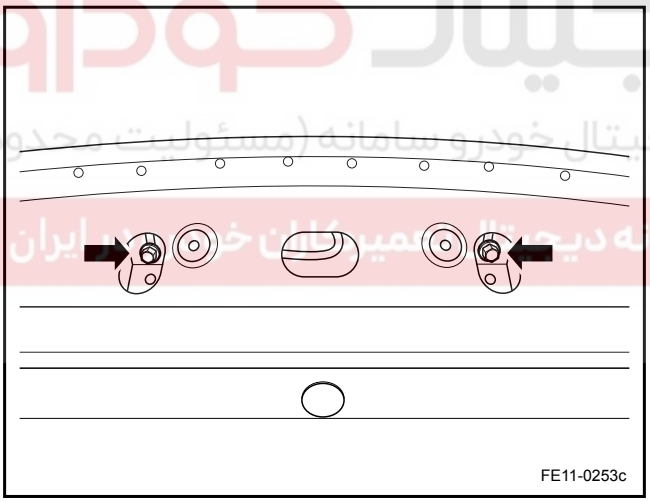
2. Connect the high mounted brake lamp wiring harness connector.
3. Install the rear parcel shelf.
4. Connect the battery negative cable.

11.4.8.10 High Mounted Brake Lamp Replacement (Hatchback)

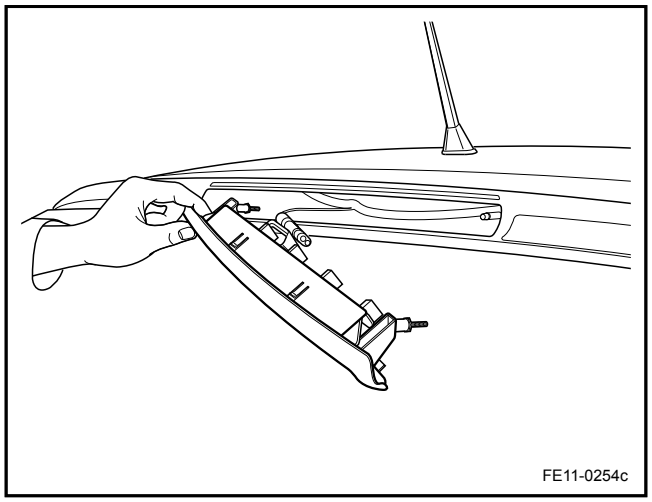
Removal Procedure:

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

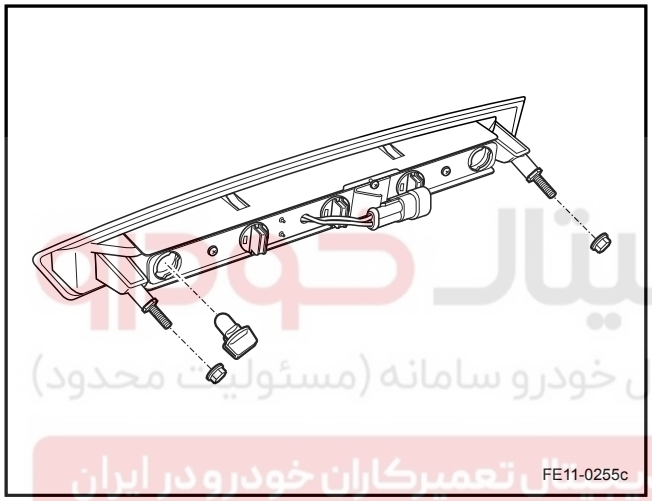


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the hatchback trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
3. Remove the high mounted brake lamp retaining nut.

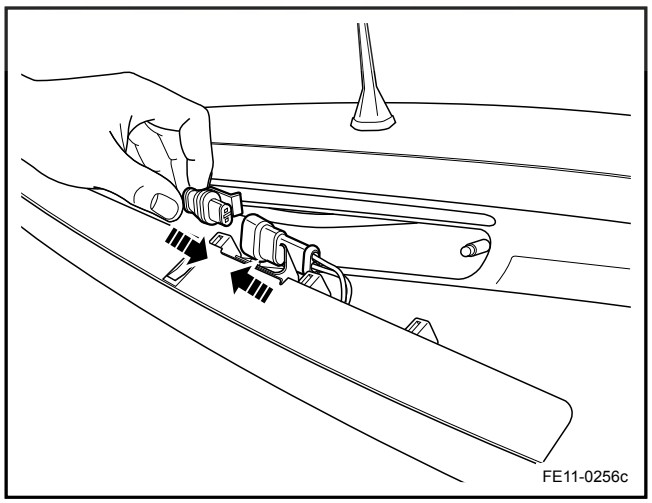


4. Remove the high mounted brake lamp.
5. Disconnect the high mounted brake lamp wiring harness connector and remove the wiper nozzle.
6. Remove the high mounted brake lamp.

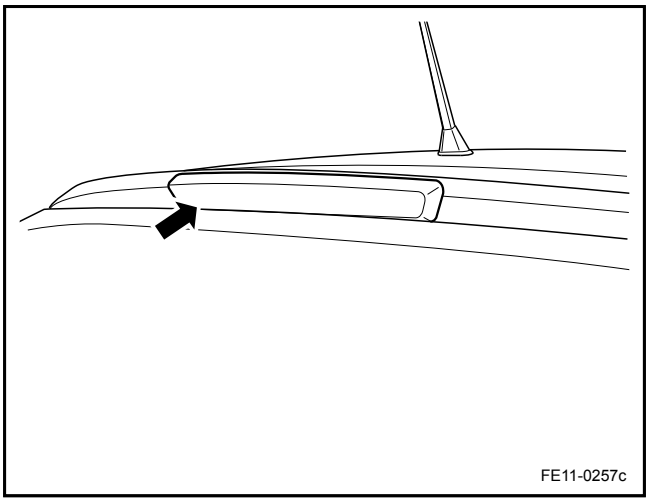
Installation Procedure:



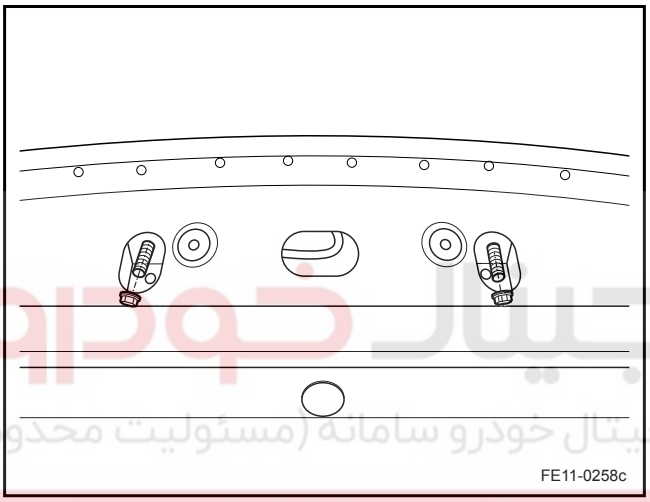
1. Clean the high mounted brake lamp and mounting holes and surroundings.



2. Install wiper nozzle into the high mounted brake lamp.
3. Connect the high mounted brake lamp wiring harness connector.


FE11-0257c

4. Install the high mounted brake lamp.


FE11-0258c

5. Tighten the high mounted brake lamp retaining nut.

   Torque: 3 Nm (Metric) 2.2 lb-ft (US English)

6. Install the hatchback trim panel.

7. Connect the battery negative cable.

11.4.8.11 Headlamp Replacement

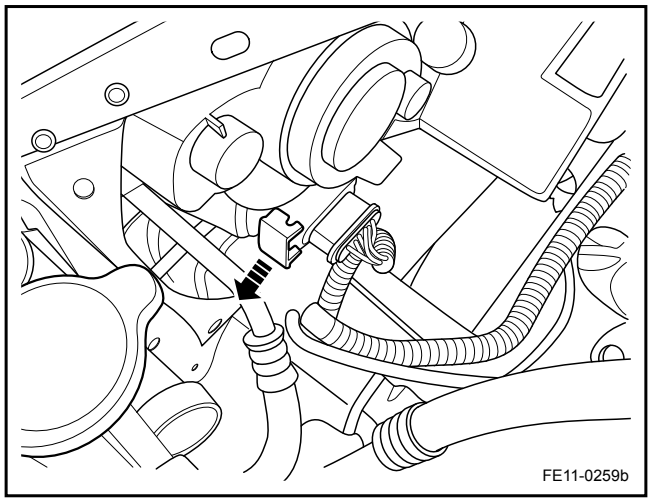
Removal Procedure

Note

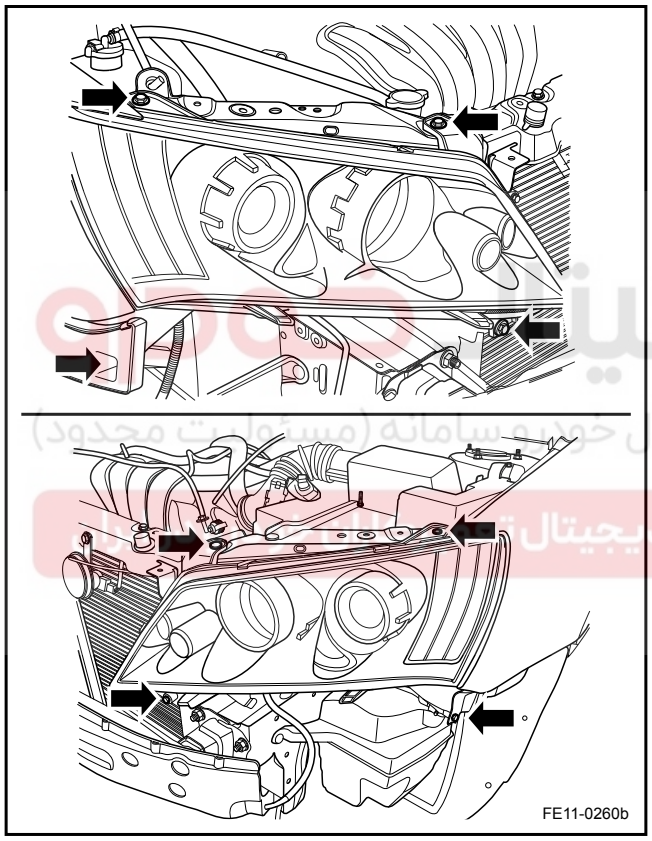
Headlamp height adjustment motor.

Warning!

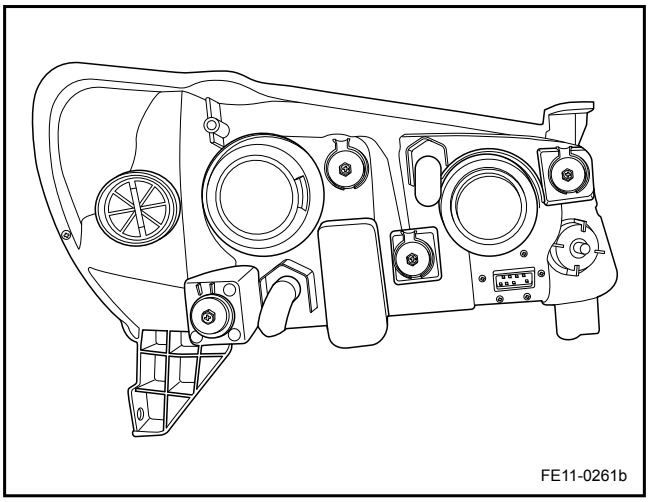
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front bumper. Refer to 12.4.3.1 Front Bumper Replacement.
3. Disconnect the headlamp assembly harness connector.



4. Remove the bolts and the headlamp assembly.

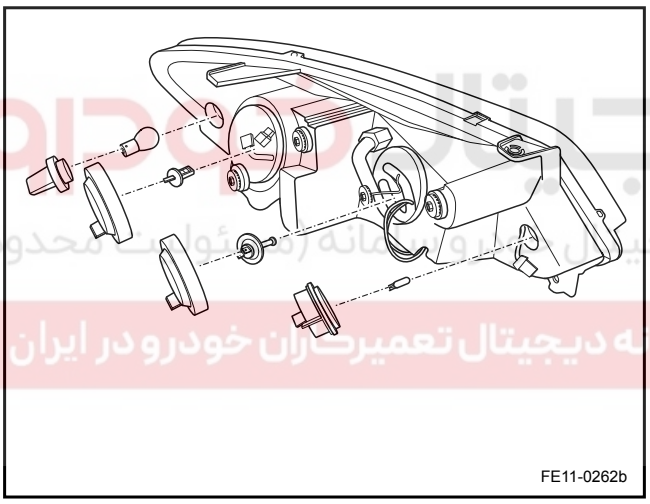

FE11-0261b

5. Remove the Headlamp bulb cover.
6. Disconnect the headlamp bulb connector.
7. Remove the Headlamp bulb.

Installation Procedure:

Warning!

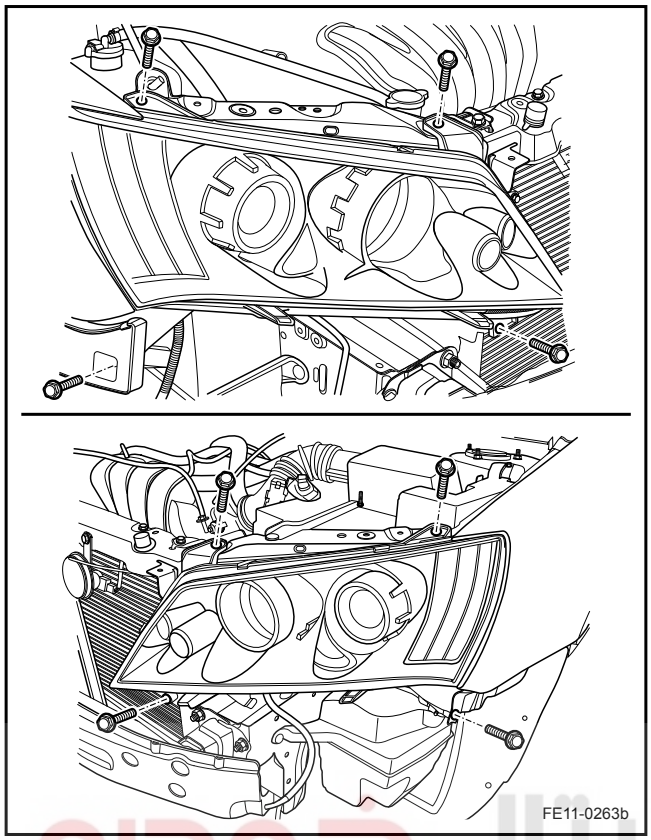
Refer to "Halogen Bulb Warning" in "Warnings and Notices".


FE11-0262b

1. Install headlamp bulb.

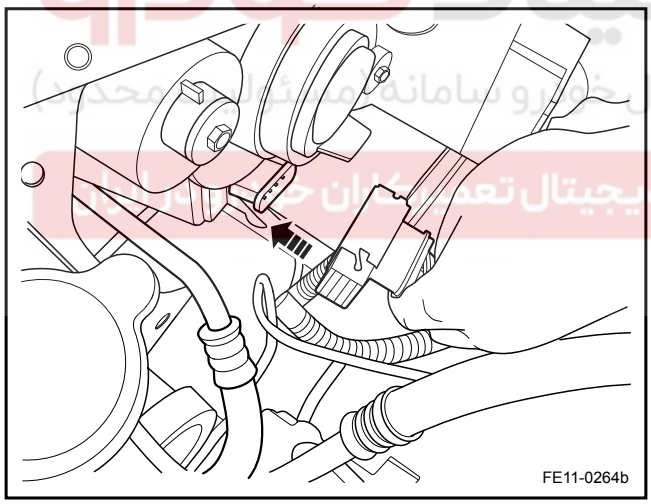
   Note

   Avoid touching the bulb or letting the bulb to come into contact with any moist. When the lamp is turned on, the grease or moisture on the bulb may cause the bulb explode. If the bulb contacts with grease or moisture, clean the bulb with alcohol or an appropriate cleaning agent and dry the bulb.
2. Connect the Headlamp bulb connector.
3. Install the headlamp bulb cover.

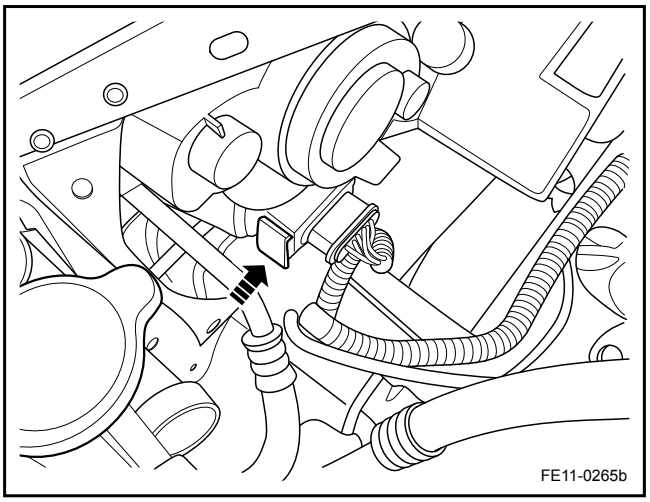


4. Install the headlamp and tighten the retaining bolts.

   Torque: 8.8 Nm (Metric) 6.5 lb-ft (US English)



5. Connect the headlamp wiring harness connector.



6. Connect the connector.
7. Install the front bumper.
8. Connect the battery negative cable.

Note

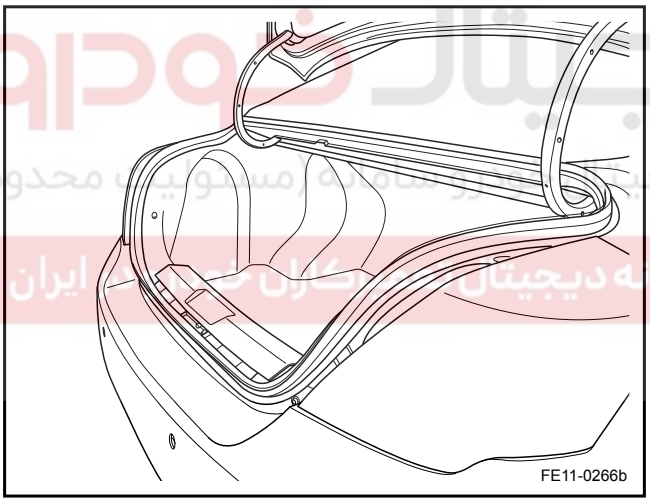
After installing the headlamp, adjust the light beam. The front park lamps, front turn signal lamps replacements are the same as the headlamp.

11.4.8.12 Tail Lamp Replacement (Sedan)

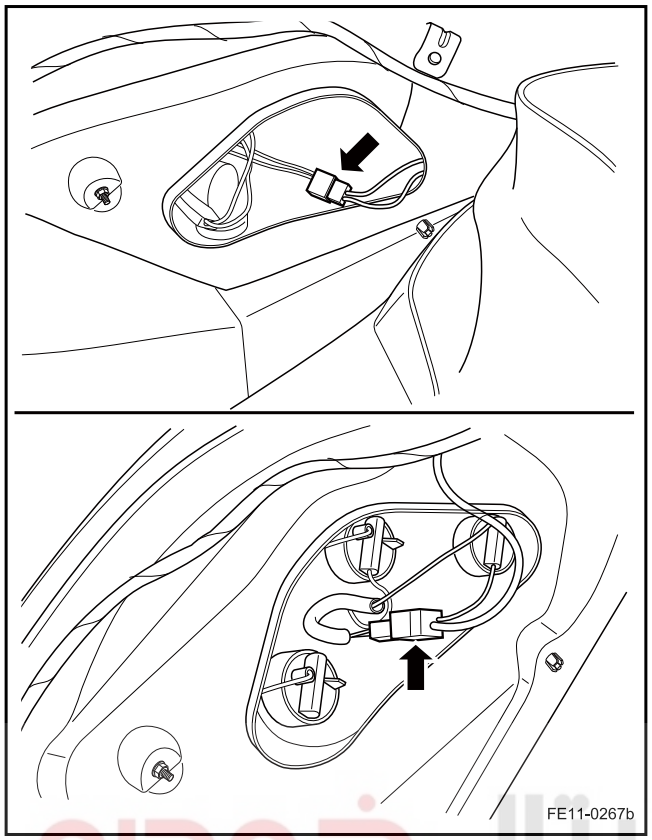
Removal Procedure

Warning!

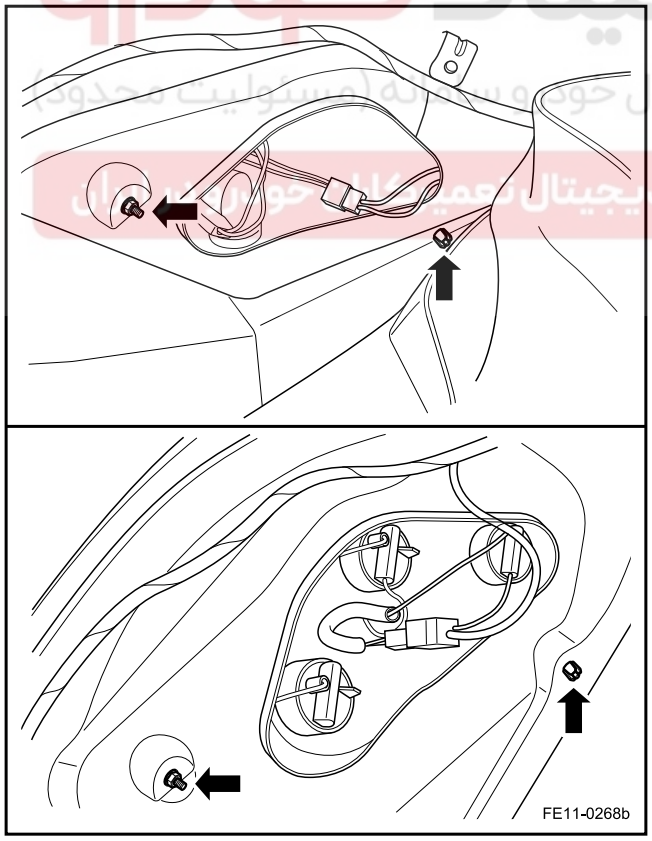
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



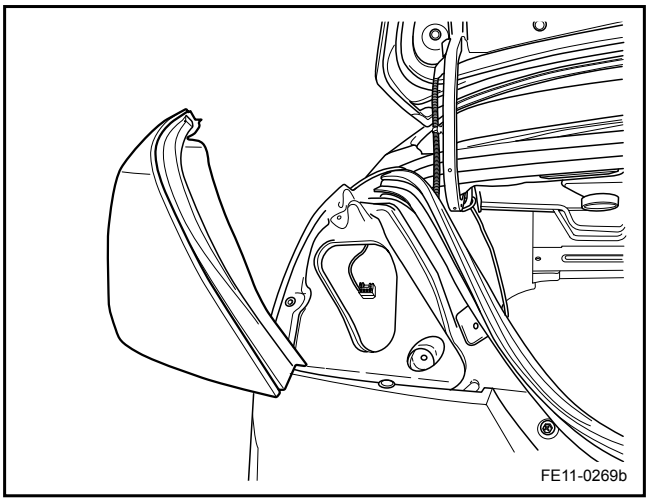
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear compartment side trim. Refer to 12.9.1.9 Rear Compartment Trim Panel Replacement.



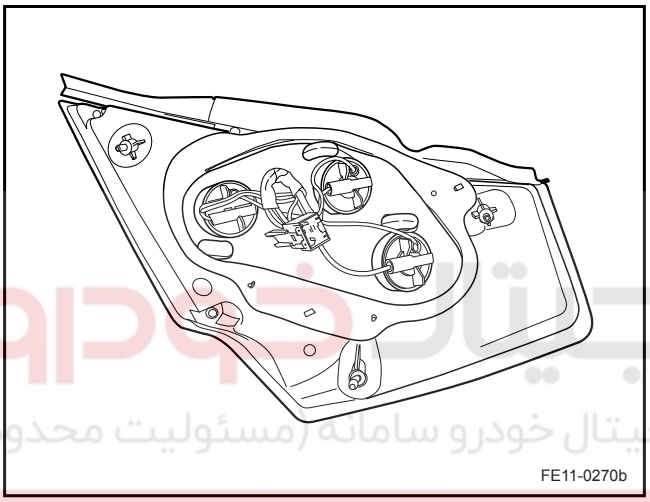
3. Disconnect the tail lamp harness connector.



4. Remove the tail lamp retaining bolts.



5. Remove the tail lamp.

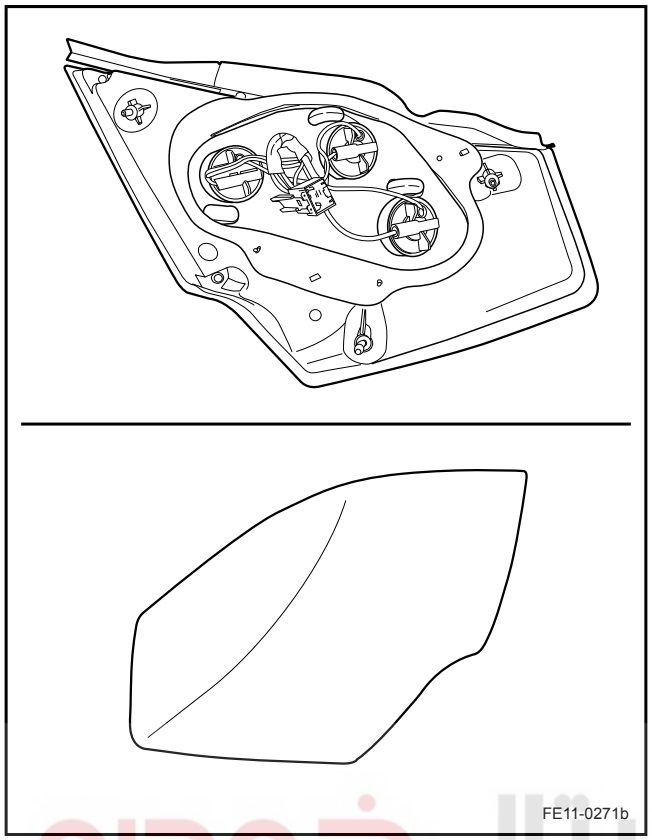


6. Remove the tail lamp cover and remove the tail lamp bulb.

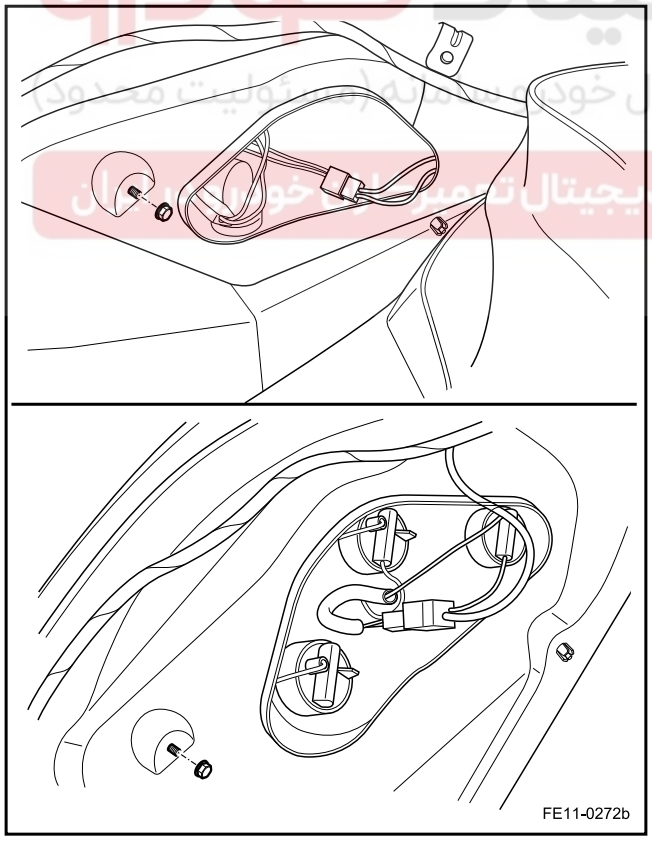
Installation Procedure:

Note

Avoid touching the bulb or letting the bulb to come into contact with any moist. When the lamp is turned on, the grease or moisture on the bulb may cause the bulb explode. If the bulb contacts with grease or moisture, clean the bulb with alcohol or an appropriate cleaning agent and dry the bulb.

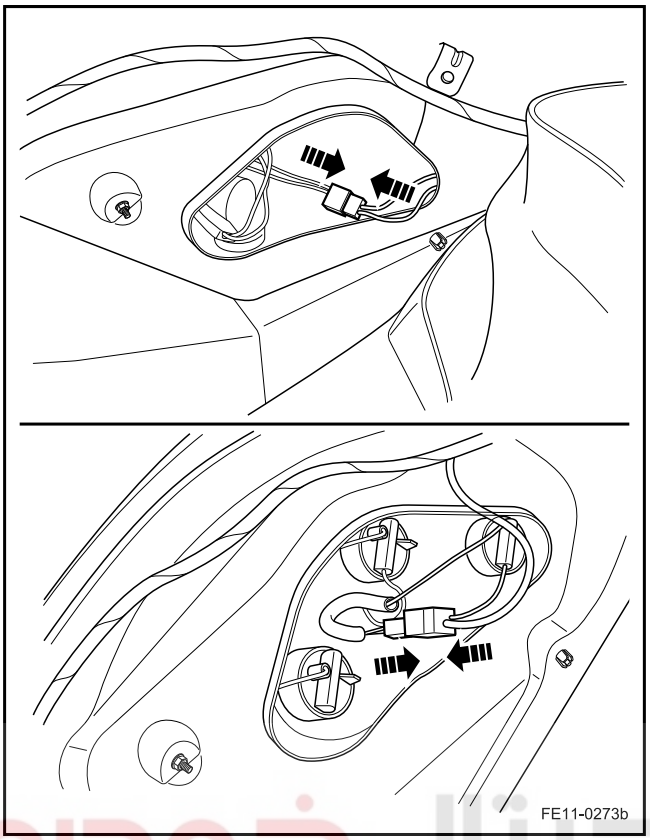


1. Install the tail lamp into the tail lamp assembly and install the tail lamp cover.



2. Install the tail lamp assembly.

   Torque: 3 Nm (Metric) 2.2 lb-ft (US English)



3. Connect the tail lamp wiring harness connector.
4. Install the rear compartment side trim panel.
5. Connect the battery negative cable.

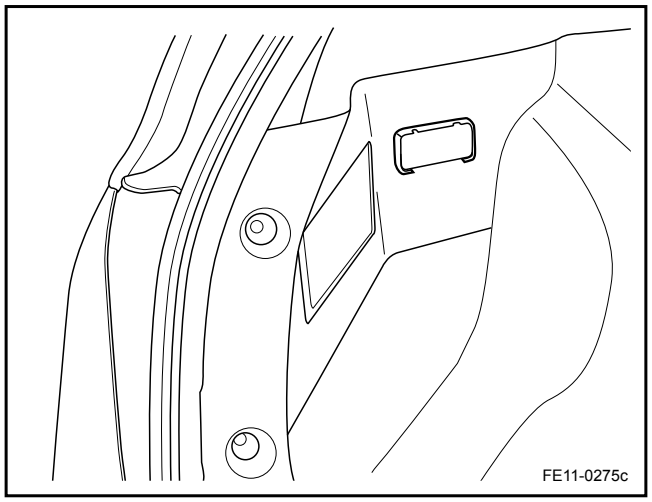
6. To replace the tail lamp bulb, open the tail lamp cover.

11.4.8.13 Tail Lamp Replacement (Hatchback)

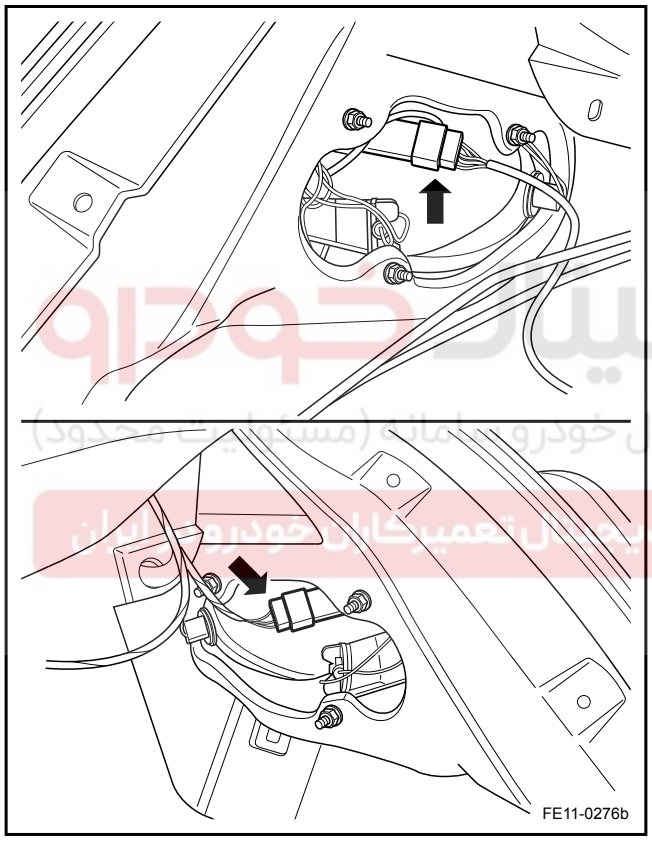
Removal Procedure

Warning!

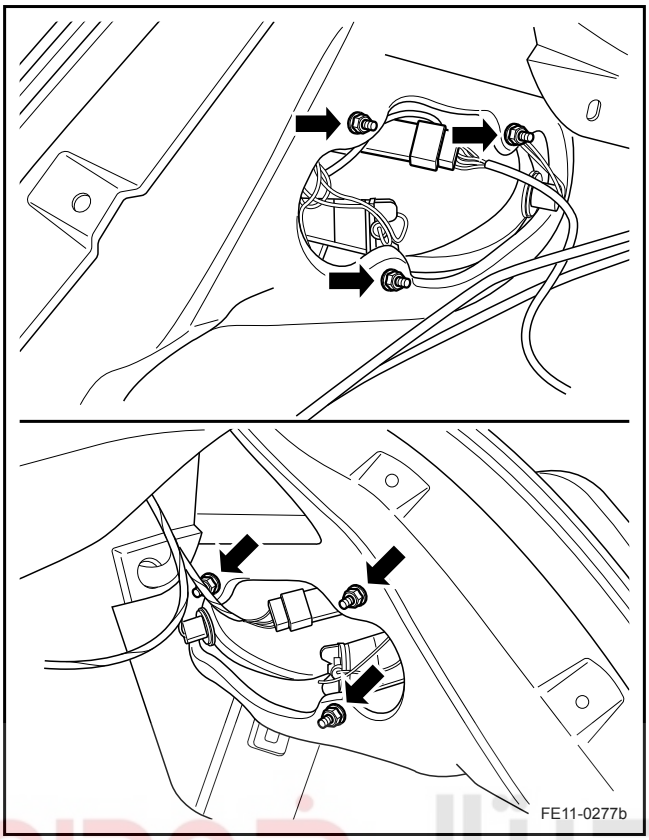
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



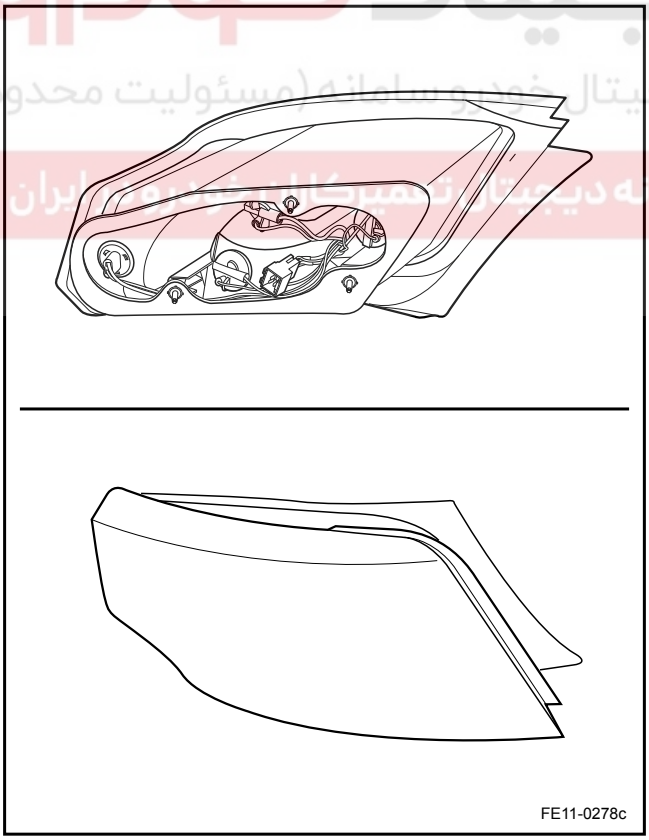
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the hatchback trim panel. Refer to 12.9.1.10 Rear Compartment Trim Panel Replacement (Hatchback).



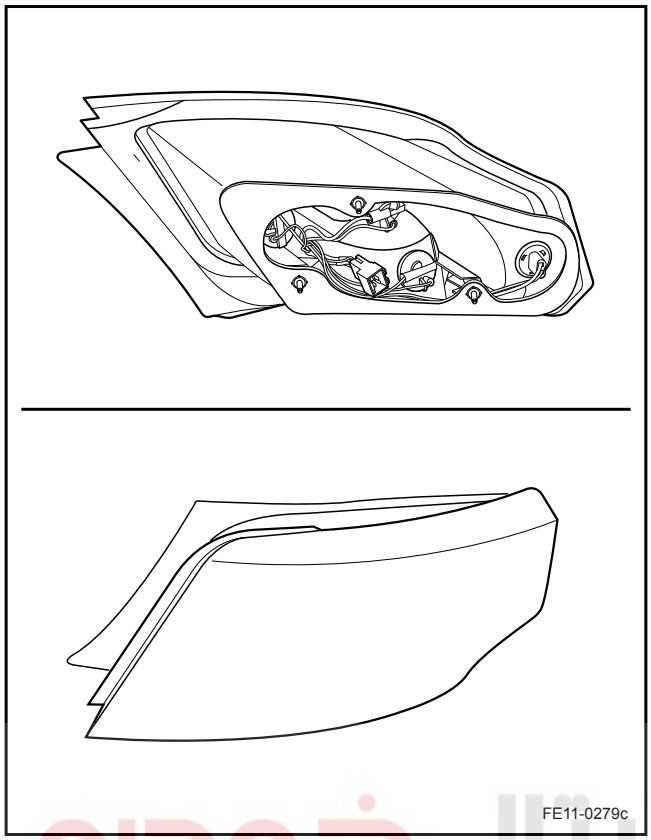
3. Disconnect the tail lamp harness connector.



4. Remove the tail lamp retaining bolts and pull out the tail lamp.



5. Remove the left tail lamp and remove the bulbs.



FE11-0279c

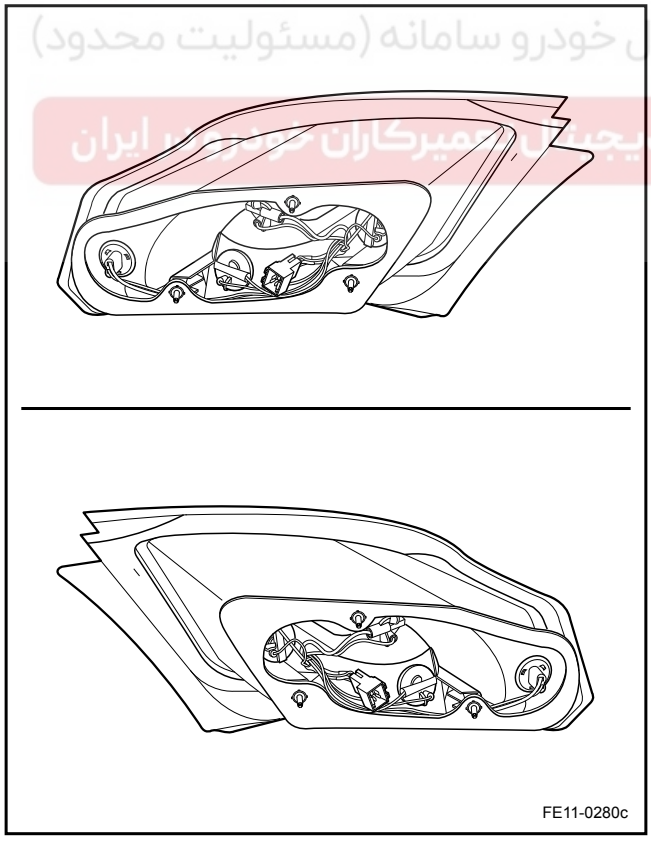
6. Remove the left tail lamp and remove the bulbs.

Installation Procedure:

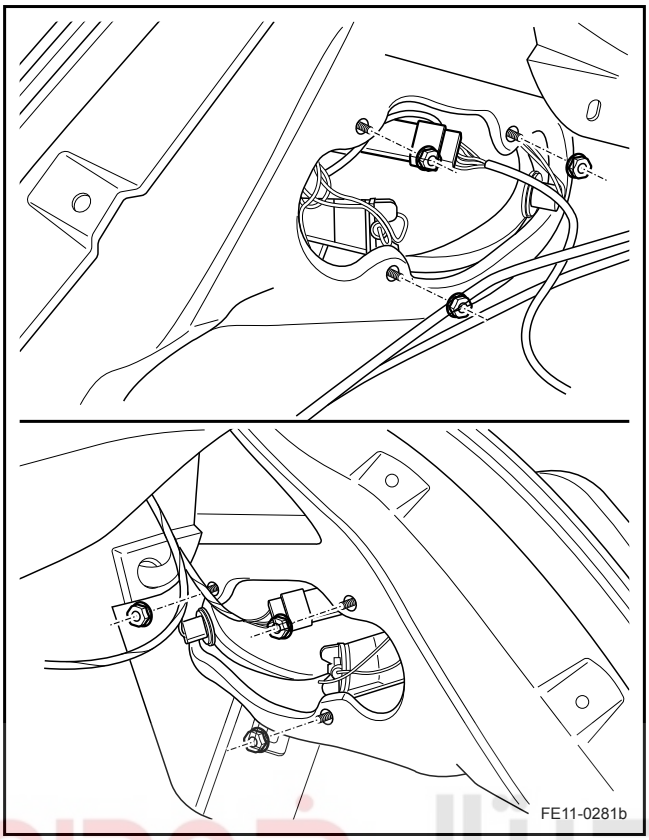
1. Insert the bulbs into the tail lamp assembly.

Note

Avoid touching the bulb or letting the bulb to come into contact with any moist. When the lamp is turned on, the grease or moisture on the bulb may cause the bulb explode. If the bulb contacts with grease or moisture, clean the bulb with alcohol or an appropriate cleaning agent and dry the bulb.

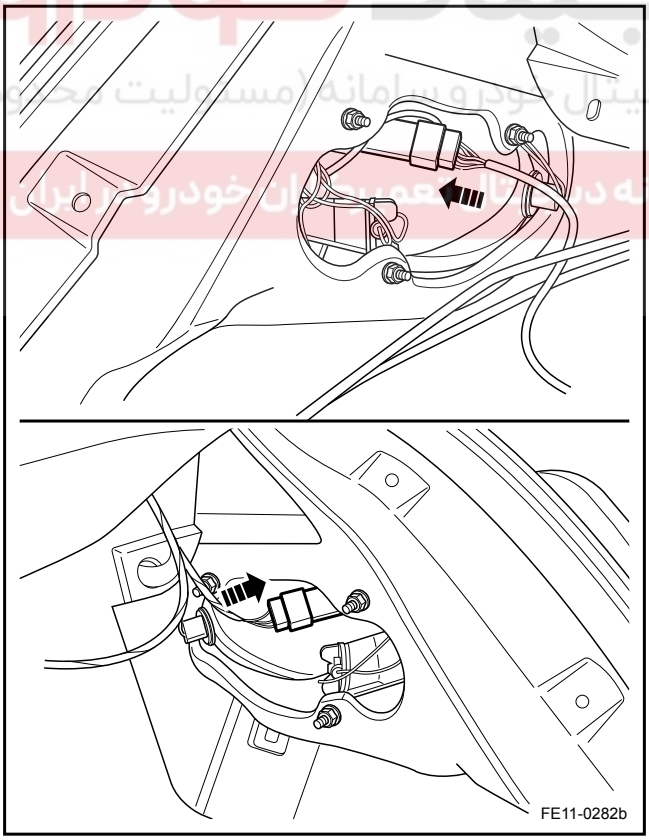


FE11-0280c

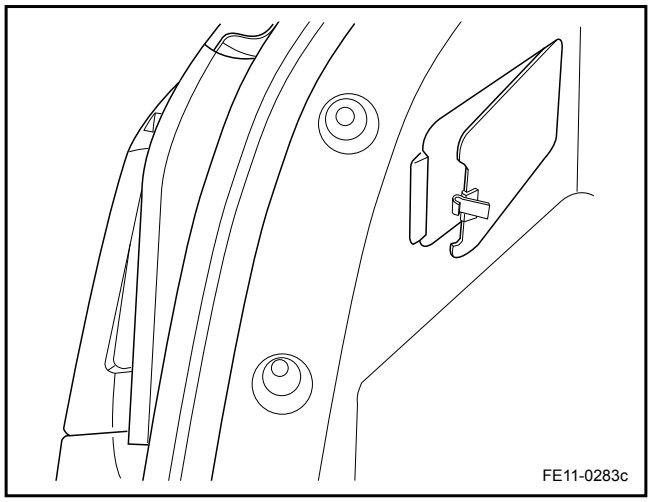


2. Install the tail lamp assembly.

   Torque: 3 Nm (Metric) 2.2 lb-ft (US English)



3. Connect the tail lamp assembly wiring harness connector.
4. Install the hatchback trim panel.
5. Connect the battery negative cable.



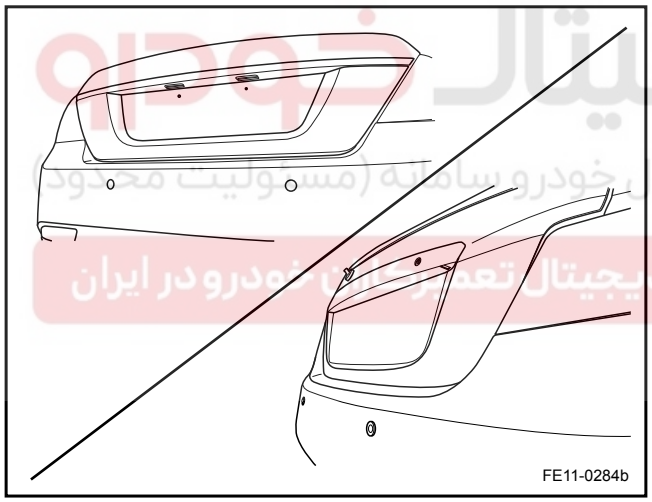
6. To replace the tail lamp bulb, open the tail lamp cover.

11.4.8.14 License Plate Lamp Replacement

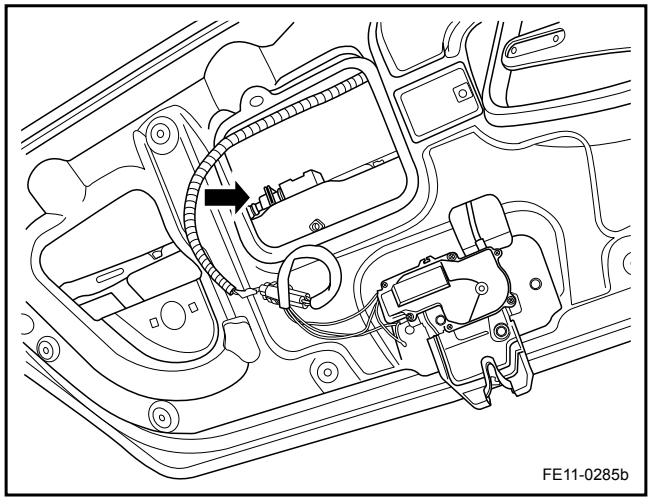
Removal Procedure

Warning!

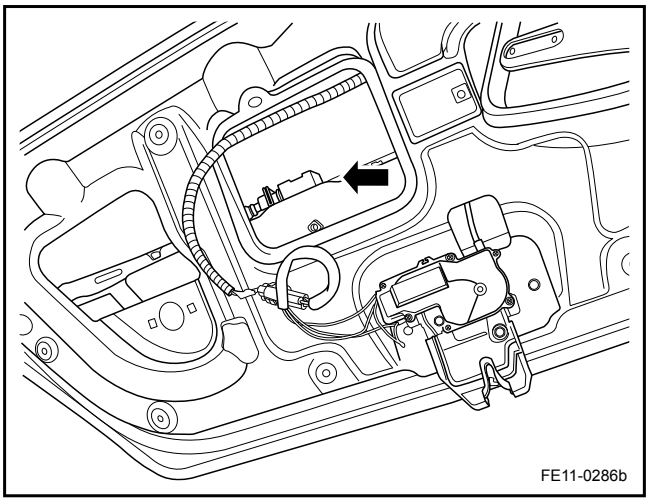
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear compartment lid trim panel. Refer to 12.9.1.14 Rear Compartment Lid Inner Trim Panel Replacement.

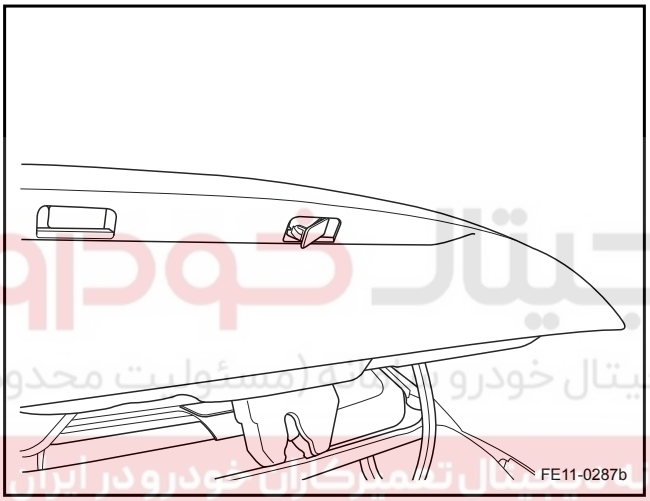


3. Disconnect the License Plate Lamp wiring harness to connect devices.
4. Remove the rear compartment lid applique. Refer to 12.10.1.4 Rear Compartment Lid Applique Replacement.



5. Hold down the license plate tongue and remove the license plate lamp.
6. Remove the license plate lamp bulb.

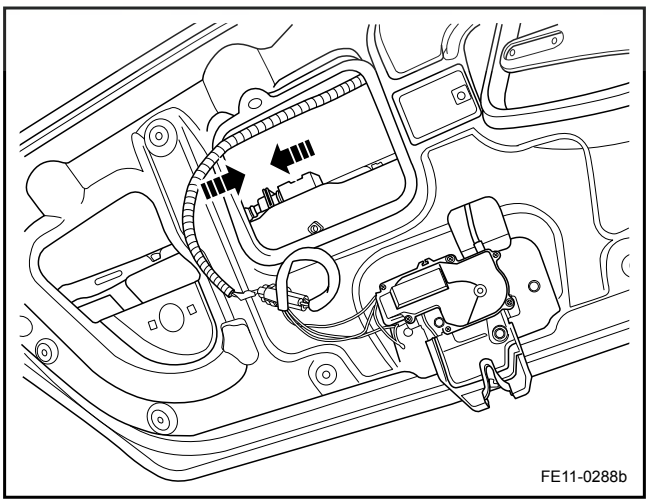
Installation Procedure:



1. Install the license plate lamp bulb.

   Note

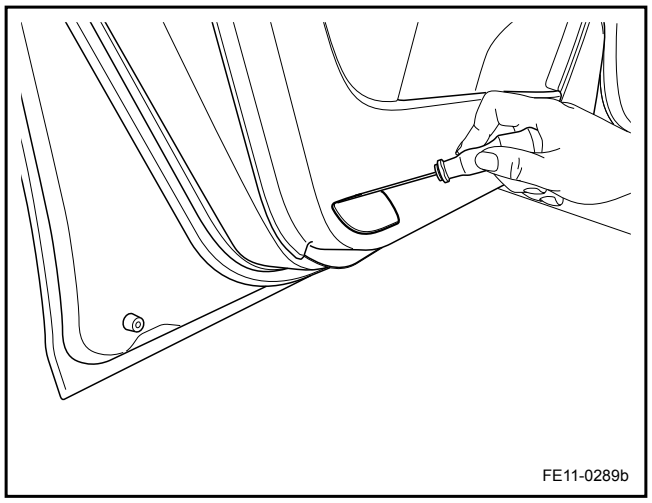
   Avoid touching the bulb or letting the bulb to come into contact with any moist. When the lamp is turned on, the grease or moisture on the bulb may cause the bulb explode. If the bulb contacts with grease or moisture, clean the bulb with alcohol or an appropriate cleaning agent and dry the bulb.
2. Press the license plate lamp into the mounting hole on the rear compartment lid.
3. Install the rear compartment lid applique.



4. Connect the license plate lamp harness connector.
5. Install the rear compartment lid trim panel.
6. Connect the battery negative cable.

11.4.8.15 Door Lamp Replacement

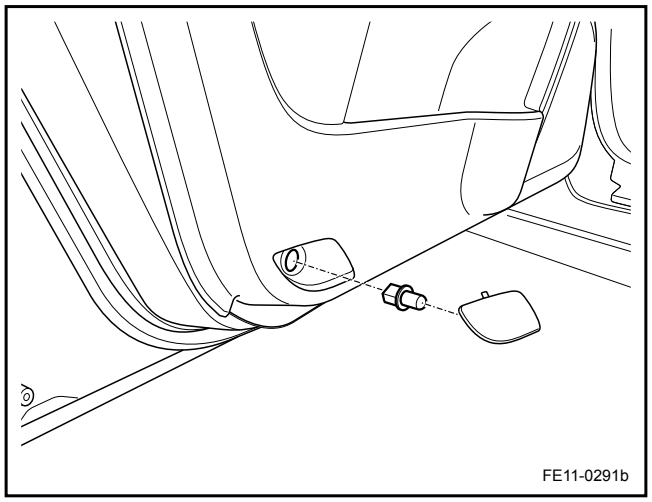
Removal Procedure



1. Remove the door lamp cover.

2. Remove the door lamp bulb.

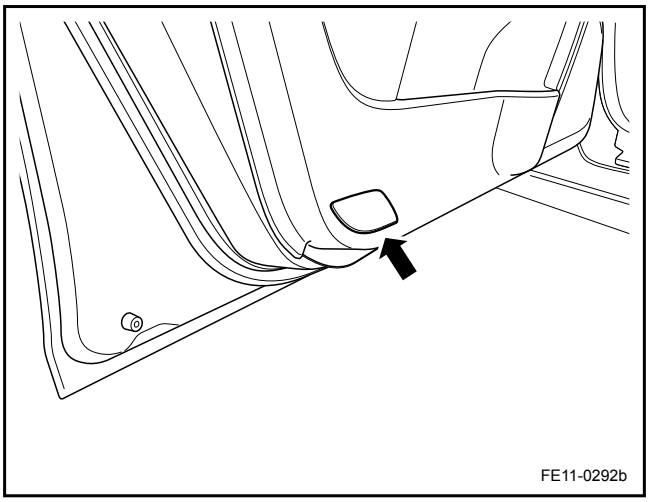
Installation Procedure:



1. Install the door lamp bulb.

   Note

   Avoid touching the bulb or letting the bulb to come into contact with any moist. When the lamp is turned on, the grease or moisture on the bulb may cause the bulb explode. If the bulb contacts with grease or moisture, clean the bulb with alcohol or an appropriate cleaning agent and dry the bulb.



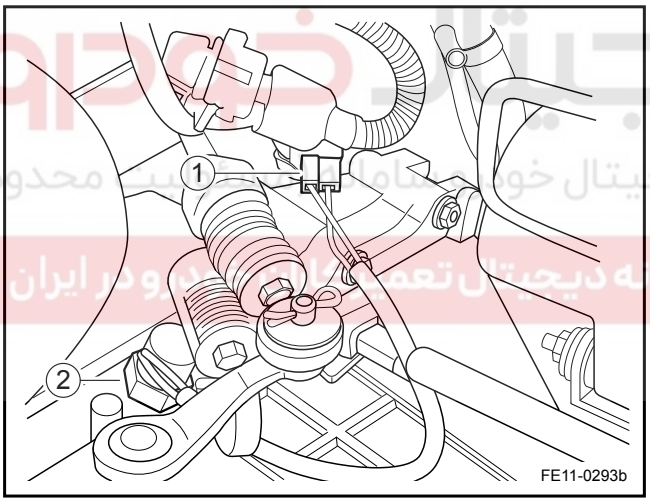
2. Install the door lamp cover.

11.4.8.16 Reverse Switch Replacement

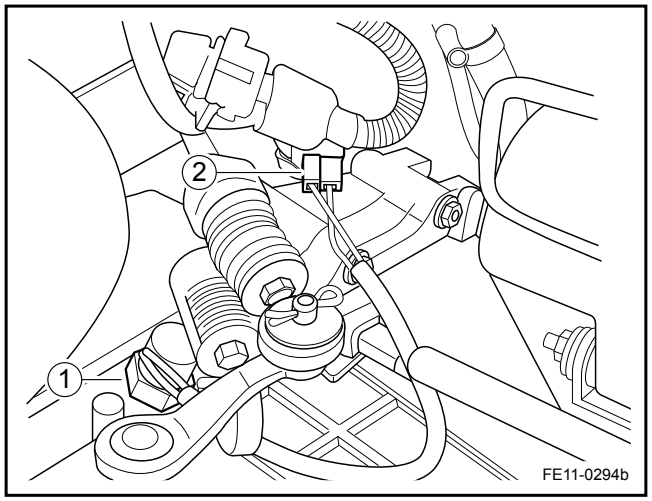
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Disconnect the reverse switch wiring harness connector (1).
3. Remove the the reverse switch from the gearbox (2).



Installation Procedure:

1. Install and tighten the reverse switch (1).

   Torque: 40 Nm (Metric) 30 lb-ft (US English)

2. Connect the reverse switch harness connector 2.

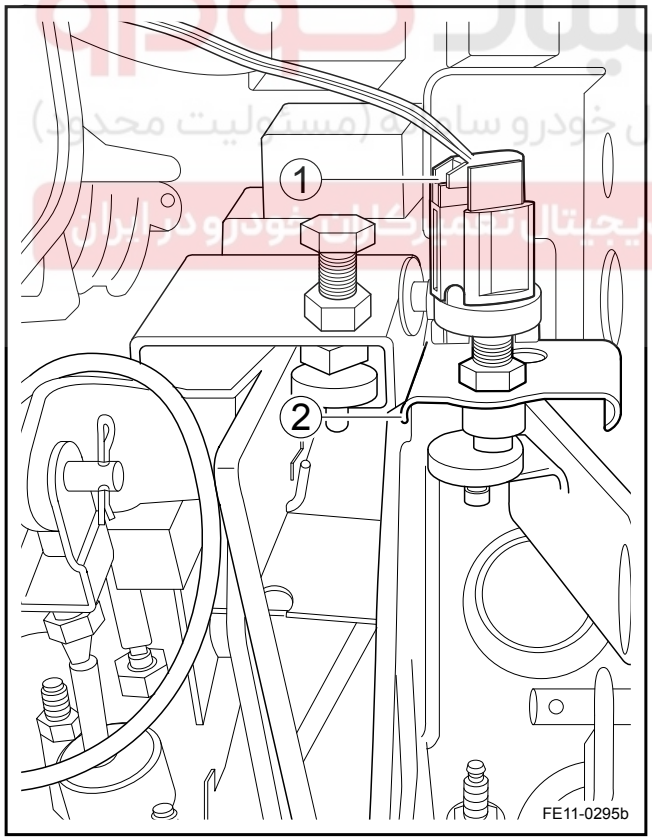
3. Connect the battery negative cable.

11.4.8.17 Brake Lamp Switch Replacement

Removal Procedure

Warning!

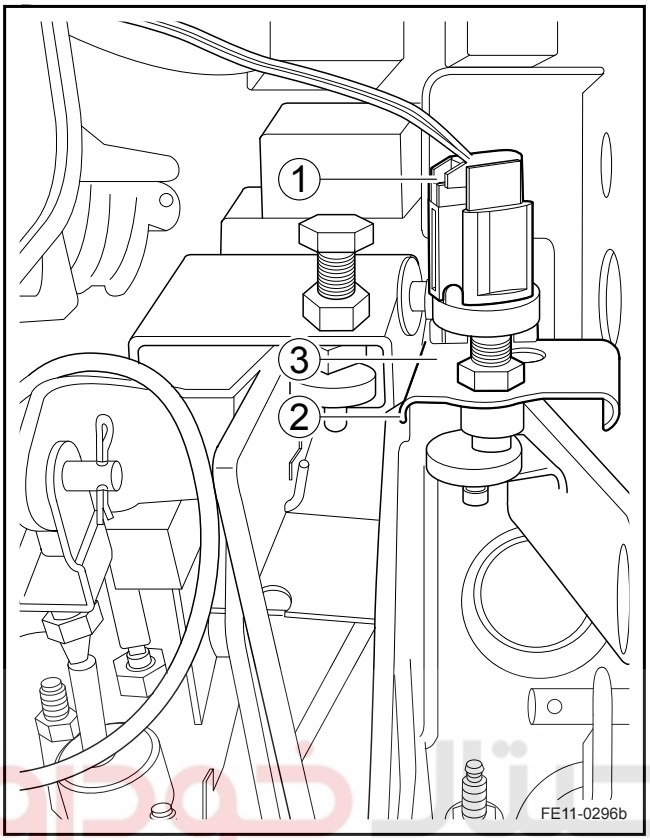
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.

2. Disconnect the brake lamp switch wiring harness connector (1).

3. Release the locking nut, loose and remove the switch from the brake pedal bracket (2).



Installation Procedure:

1. Rotate the brake lamp switch locking nut to the top position.
2. Press the brake pedal to the end.
3. Install the brake lamp switch into the mounting hole (2).

   Note

   Do not fully tighten the screw.
4. Slowly release the brake pedal until the brake lamp switch contacts fully pressed in because of brake pedal reaction.
5. Tighten the locking nut (3).

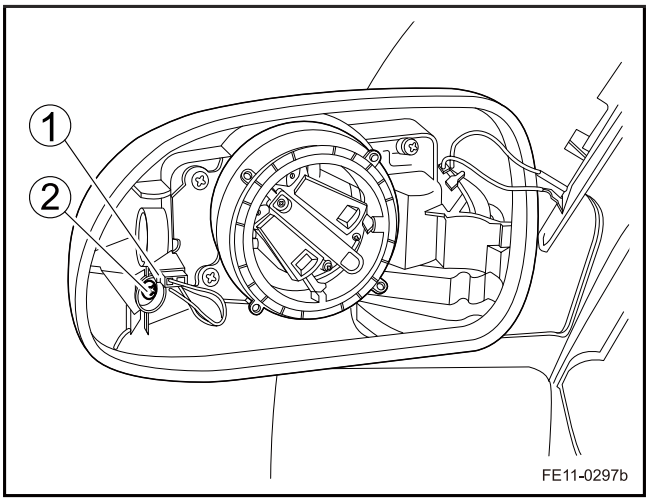
   Torque: 10 Nm (Metric) 7 lb-ft (US English)
6. Connect the brake lamp switch harness connector (1).
7. Connect the battery negative cable.

11.4.8.18 Turn Signal Lamp Replacement

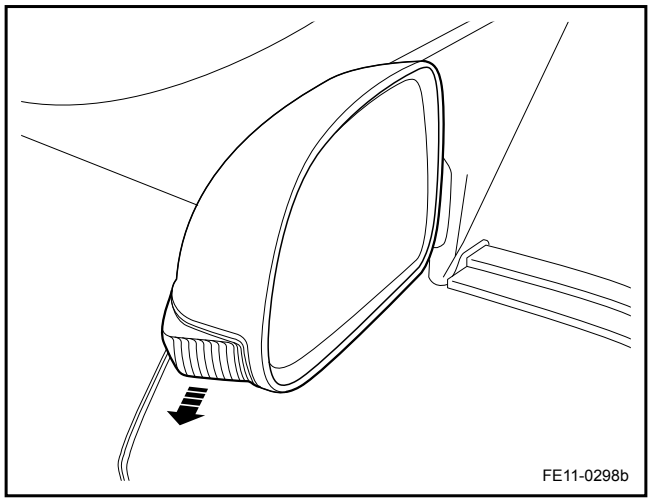
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

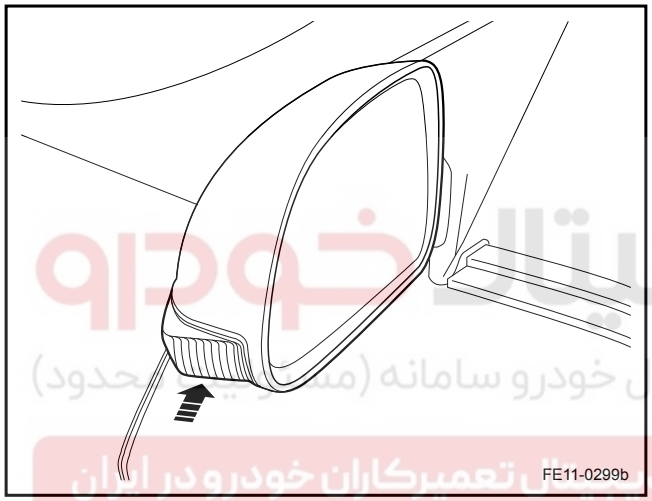


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the outside rearview mirror glass. Refer to 11.5.8.1 Outside Rearview Mirror Replacement.
3. Disconnect the turn signal lamp wiring harness connector (1).
4. Remove the retaining screw (2).

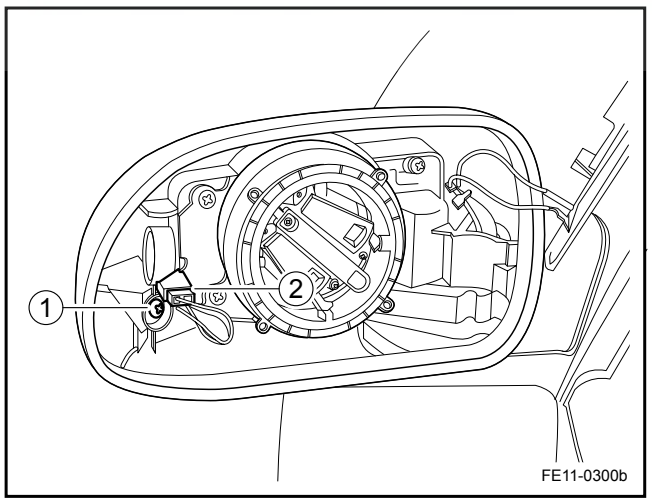


5. Remove the turn signal lamp.

Installation Procedure:



1. Install the turn signal lamp.



2. Install the turn signal lamp retaining screw (1).

   Torque: 1.5 Nm (Metric) 1.1 lb-ft (US English)

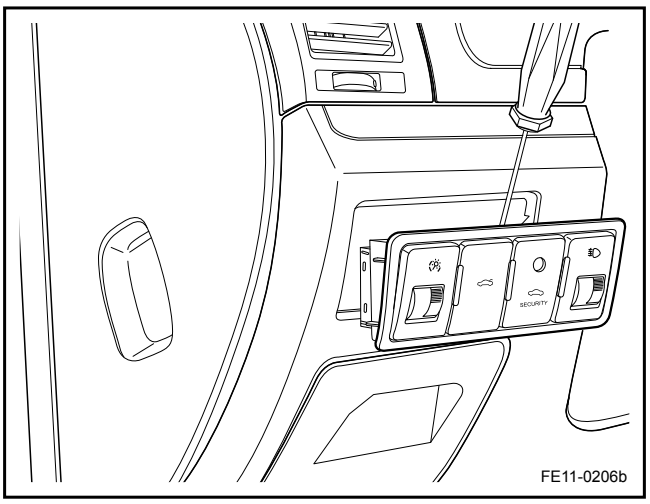
3. Connect the turn signal lamp wiring harness connector (2).

4. Install the outside rearview mirror glass.

5. Connect the battery negative cable.

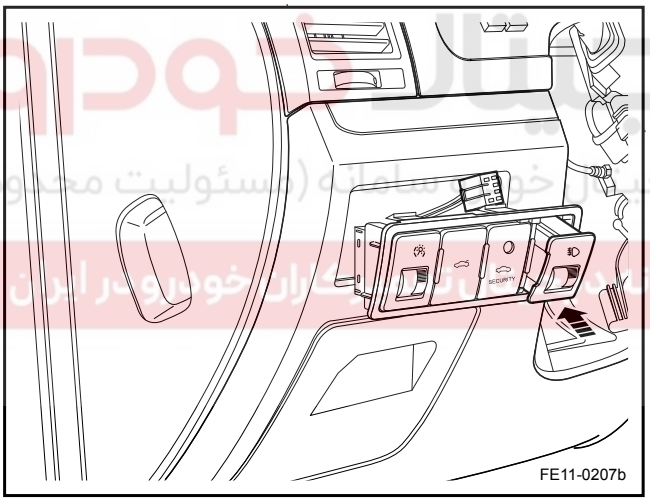
11.4.8.19 Instrument Background Light Adjustment Switch and Headlamp Height Adjustment Switch Replacement

Removal Procedure



1. Remove the instrument background light switch.
2. Disconnect the dimmer switch wiring harness connector.
3. Remove the switch.

Installation Procedure:



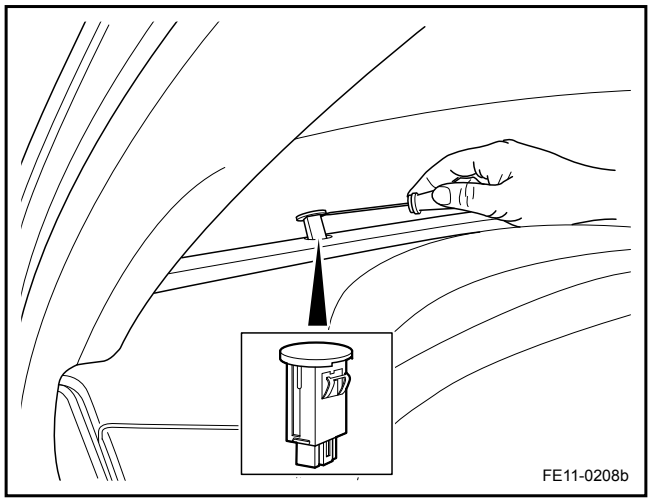
1. Install the switch.
2. Connect the switch wiring harness connector.
3. Install the switch panel to the instrument panel.

11.4.8.20 Ambient and Sun Light Sensor Replacement

Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the ambient and sun light sensor from the instrument panel.
3. Disconnect the ambient and sun light sensor harness connector.

Installation Procedure:

1. Connect the ambient and sun light sensor harness connector.
2. Install the ambient and sun light sensor to the instrument panel.
3. Connect the battery negative cable.

11.5 Glasses / Windows / Mirrors

11.5.1 Specifications

11.5.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Window Glass Regulator Assembly Nuts	M6	7-9	5-7
Window Glass Regulator Assembly Bolts	M6 × 10	7-9	5-7
Window Sealing Strip Self-Tapping Screws	4.2 × 9	3-4	2-3
Window Express Down Module Retaining Bolts	M6 × 16	7-9	5-7

11.5.2 Description and Operation

11.5.2.1 Description and Operation

Window Regulator Description and Operation

Anti-trap function has the following four kinds of operating modes: manual-up, manual-down, automatic-up, automatic-down. Window regulator without anti-trap function has two kinds of operating modes: manual-up, manual-down. Please review the configuration instructions before use and confirm whether the anti-trap function is available.

- Manual - Up

  Gently pull the left front door window switch (pull up and the holding time is less than 500 ms), the left front window rises; the rest windows operation is the same.

- Manual - Down

  Gently press the left front door window switch (press and the holding time is less than 500 ms), left front window goes down; the rest windows operation is the same.

- Automatic - Up

  Completely pull the left front door window switch (pull up and the holding time is greater than 500 ms), left front window rises to the upper limit until the switch is pressed or pulled up again; the rest windows operation is the same.

- Automatic - Down

  Completely press the left front door window switch (press and the holding time is greater than 500 ms), left front windows goes down to the lower limit until the switch is pressed or pulled up again; the rest windows operation is the same.

  Note

  During the window rising and doing down period, if the window switch is pulled or pressed and held for more than 500 ms, the window will change its moving direction; If pressing the left front door window switch no more than 500 ms, the window will stop moving.

- Delay Function

  With the ignition switch is turned on, the window is allowed to move. After 90 s the ignition switch is turned off, the controller the power will be cut off to disable the operation of the window.

- Anti-Trap Function (If Equipped)

  The window regulator control module is equipped with an integrated obstacle detection / anti-trap system.

  The anti-trap system works in the window seal all exposed edges and 4-200 mm within the window seals. Window anti-trap function requirements: the window has been initialized in the automatic-up process, any obstacle within 4mm from the top should activate the anti-trap function and the window movement should be reversed.

  Note

  - If a certain window has not been initialized or has lost its initialization, there is no automatic-up function, at this time the anti-trap function will not be activated.
  - The anti-trap function is only available during window automatic-up process.

  The anti-trap system meets the 2000/4/EC specification. The anti-trap system window anti-trap force shall not exceed 100 N.

- Comfort Closing Function (If Equipped) (If Equipped With Anti-Trap Function)

  Comfort closing is through a LIN communication to automatically close the window. Once the comfort closing instruction is received, all the windows will move upward, until the windows reach the trip destination (the windows fully closed position). The activation sequence and delay requirement is controlled by software. During comfort closing period, the signal from the window switch will be ignored, and the anti-trap function is active.

- Motor Protection (If Equipped With Anti-Trap Function)

  If the motor runs continuously for longer than 20 s, the control module shuts down and loses initialization.

- Adaptive Learn (If Equipped With Anti-Trap Function)

  The system has the ability to adapt to the vehicle characteristics and environmental conditions throughout the vehicle lifetime, such as seals wear.

- Overheating Protection (If Equipped With Anti-Trap Function)

  Control module provides protection against overheating through a thermal protection algorithms and activates overheating protection during anti-trap period. The system will complete the window reverse movement, but will ignore any new window upward command until the motor is completely cooled down.

  When the overheating protection is enabled, windows can still open, but the windows can not be closed.

  When the overheating protection is enabled, the control module can not switch to the sleep mode, until the system exits the overheating protection, and the control module can move the window.

Outside Rearview Mirror Description and Operation

Exterior rearview mirror is controlled by the driver door switch. Rearview mirror has 3 switches. The left and right selector switch selects the desired rearview mirror, the direction buttons are used to adjust the rearview mirror position.

Exterior rearview mirrors have heating elements inside. When the rear window demister switch is pressed, the exterior mirror heating element will also be working. For defrost function operation. Refer to the "Rear Window Defrost" and11.12.2 Description and Operation.

11.5.3 System Working Principle

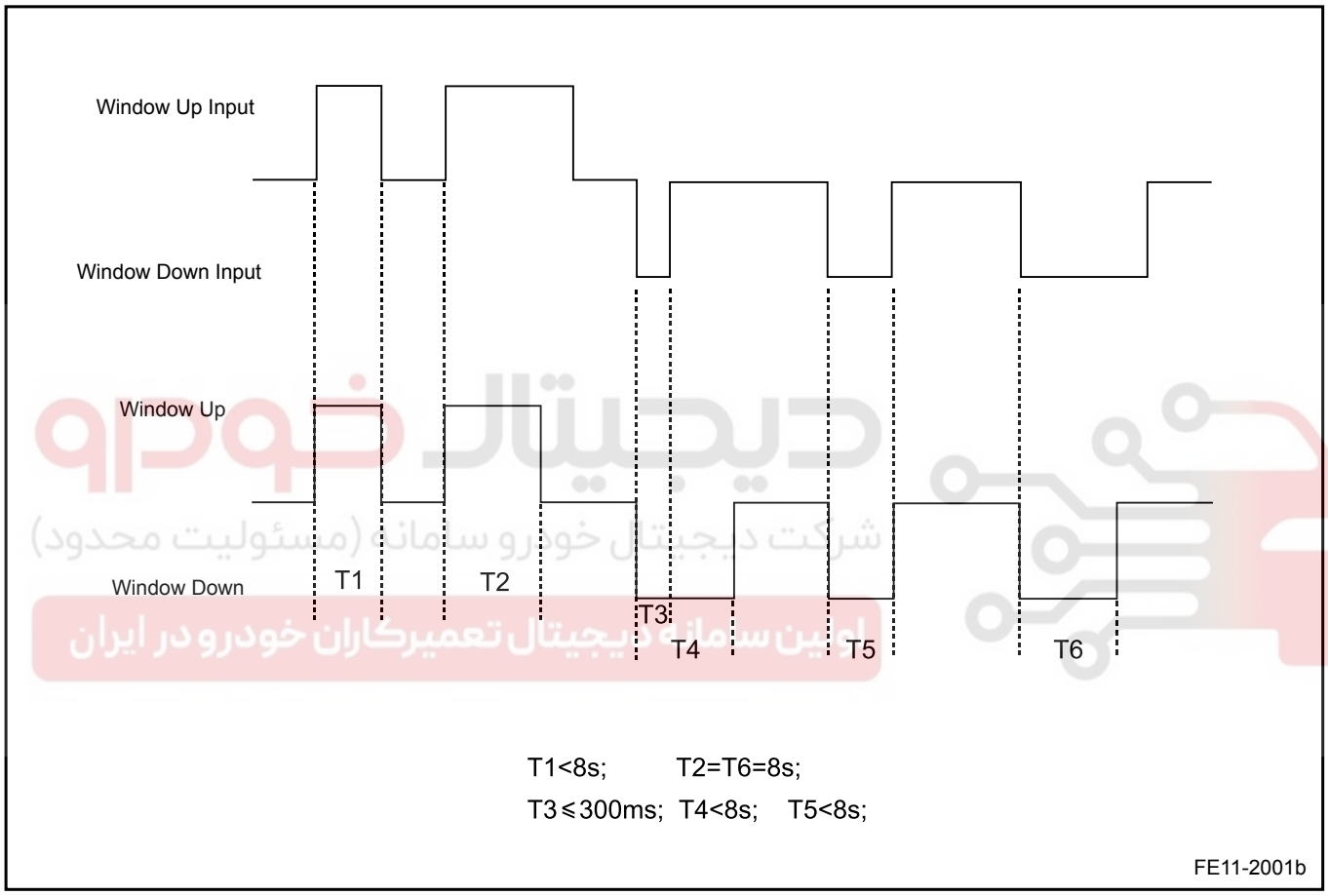
11.5.3.1 Power Management

- Window regulator control module has a power supply (15 A).
- The left front door window regulator and the left rear door window share a power supply (30 A).
- The right front door window regulator and the right rear door window share a power supply (30 A).

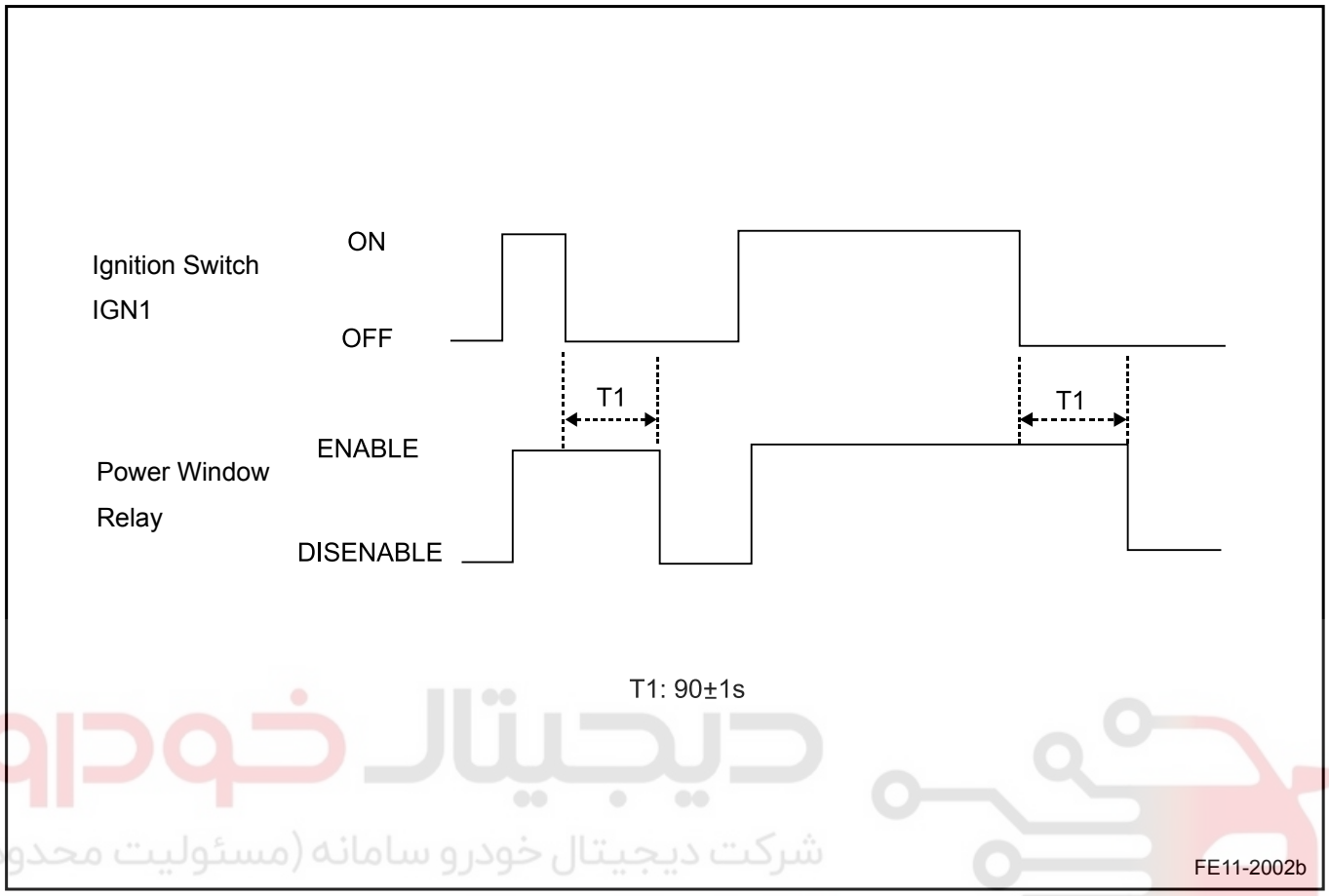
Note

Four window regulator switches low current controls high current, and have current protection function; four window regulator motors all have continuous output 8 s protection function.

11.5.3.2 Functional Timing Diagram



11.5.3.3 Power Window Relay Time Control



11.5.3.4 Mode

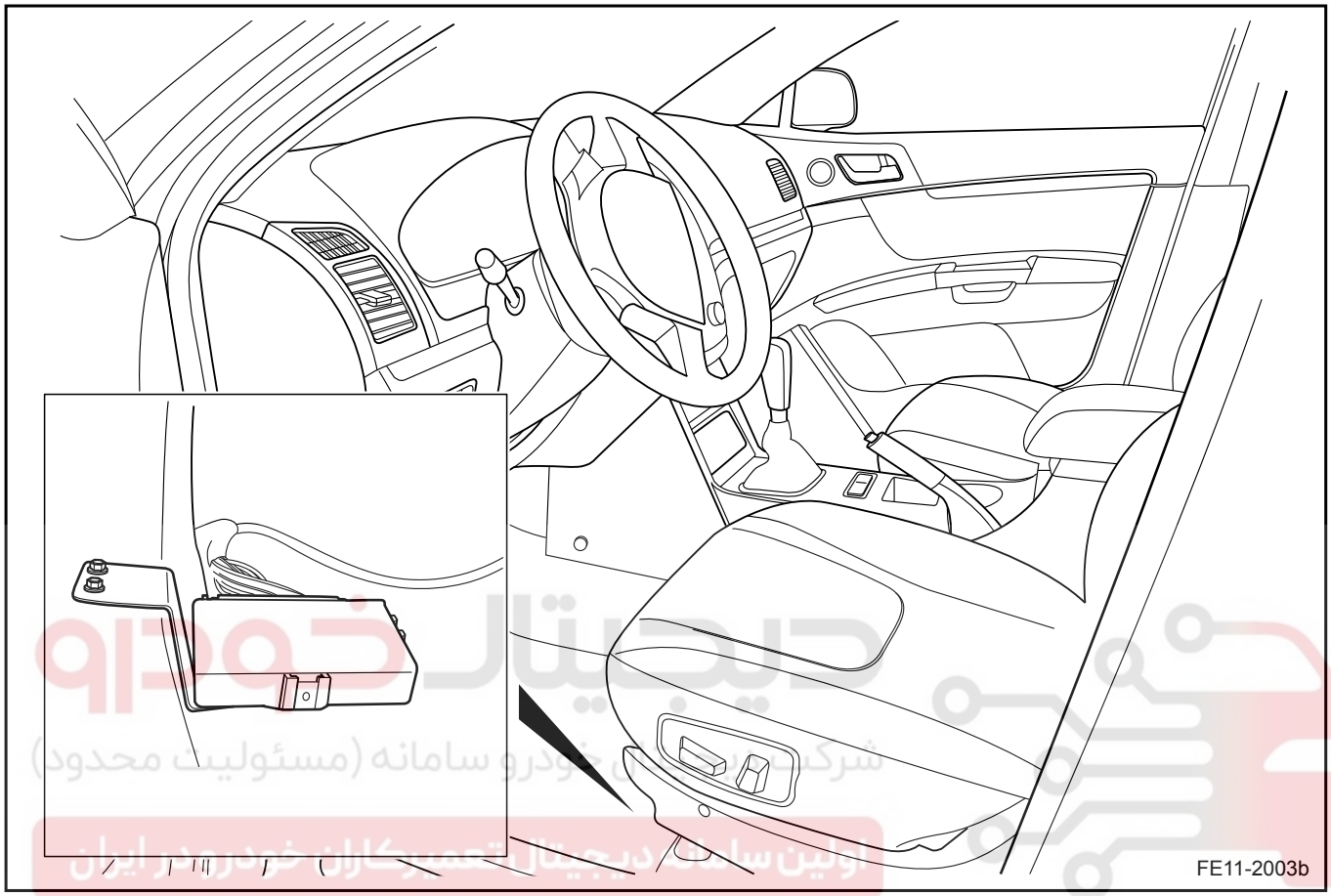
- Working Mode: All functions are available, normal operating current is obtained from the power supply + B.
- Sleep Mode: The supply current is reduced sleep mode current. The following two ways activate the system sleep mode.
  - LIN Master Node Sleep Mode Request
  - LIN Signal Interruption

If LIN signal is received from LIN master again, the system will exit sleep mode.

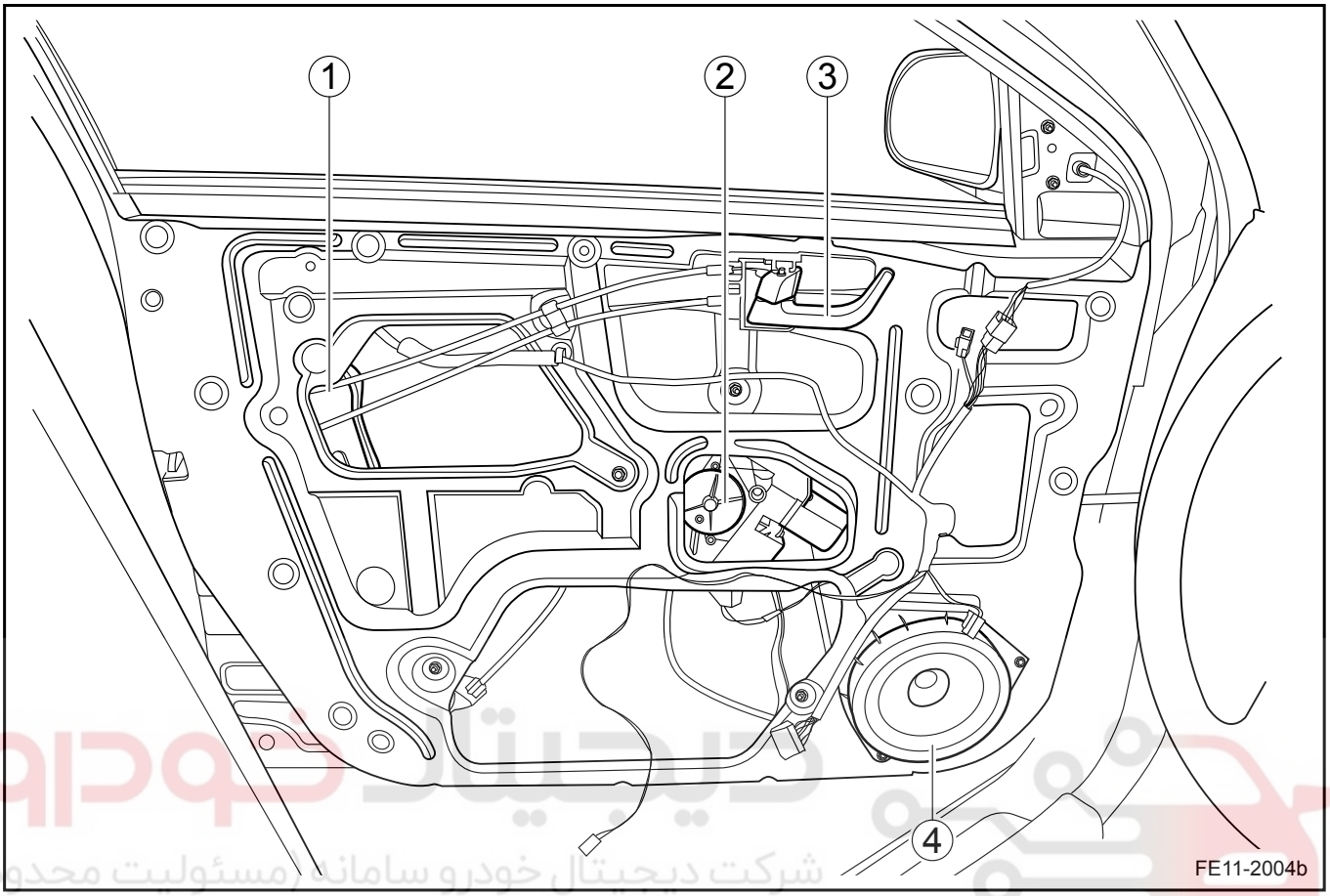
11.5.4 Component Locator

11.5.4.1 Component Locator

Electric Window Control Module (Without Express Down Function)



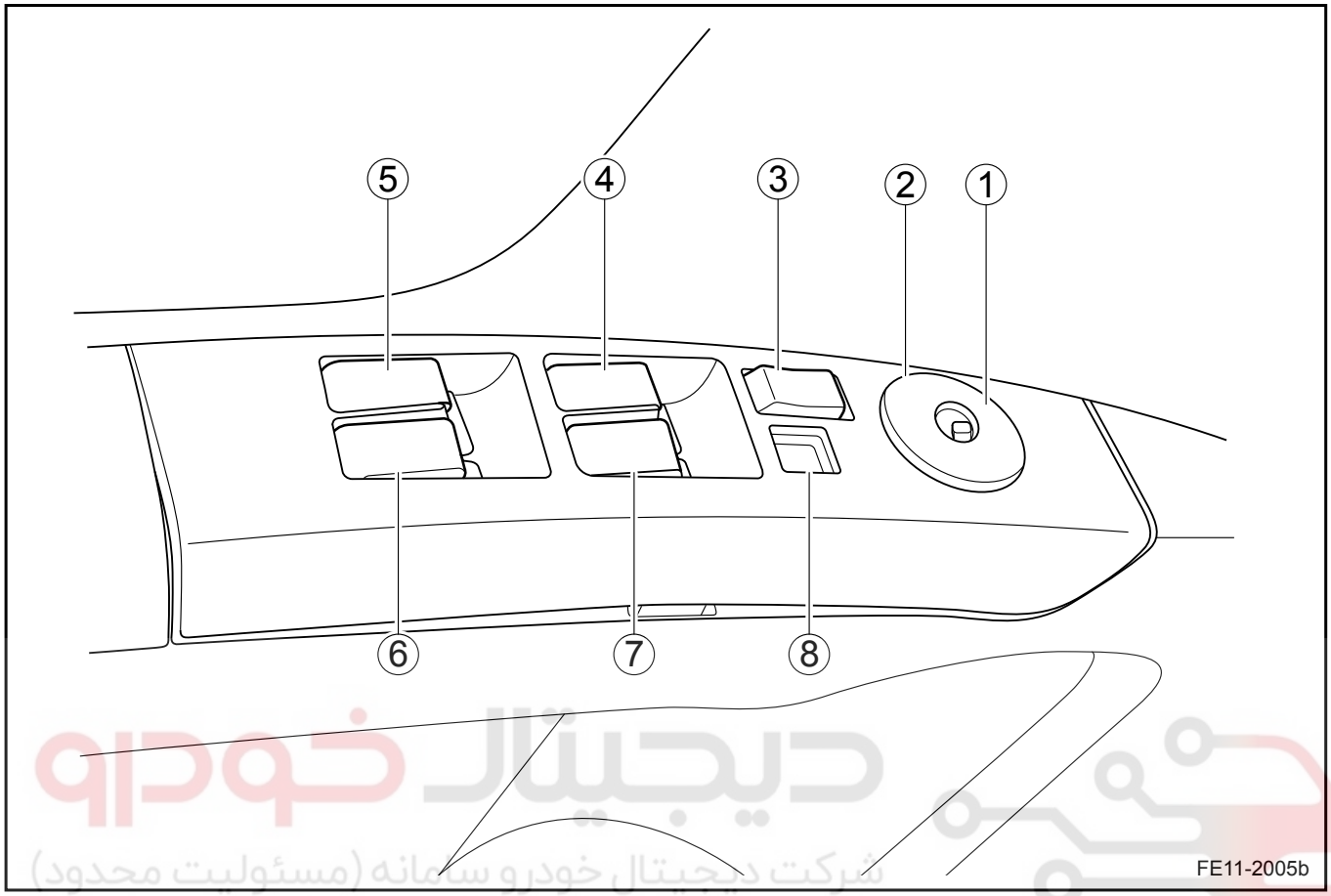
Glass Regulator, Mirror



Legend

1. Door Motor
2. Glass Motor
3. Inside Door Handle
4. Front Door Speaker

Left Front Door Combination Switch



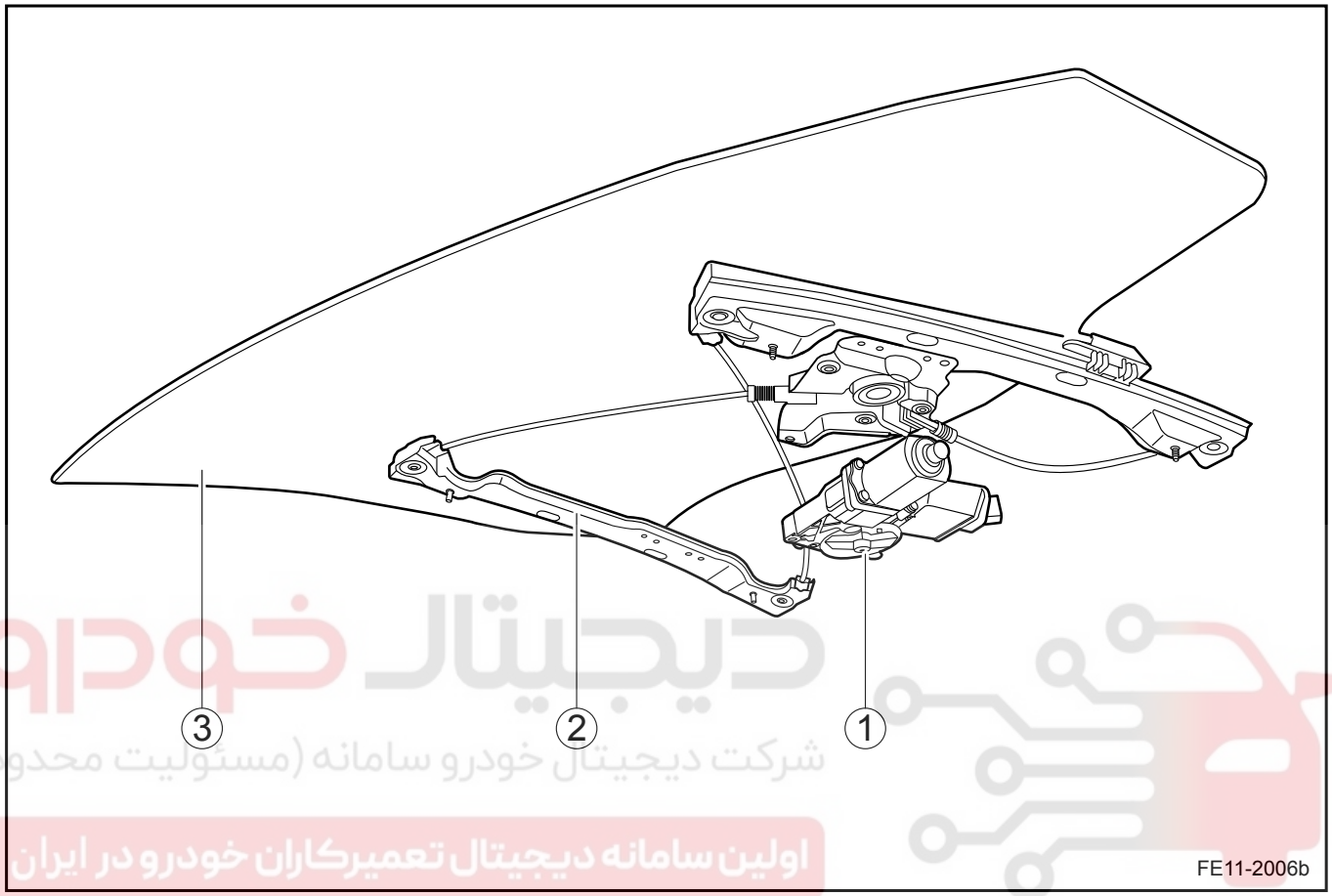
Legend

1. Left/Right Outside Rearview Mirror Select Button
2. Left/Right Outside Rearview Mirror Adjust Button
3. Central Locking Button
4. Left Front Window Switch
5. Left Rear Window Switch
6. Right Front Window Switch
7. Right Rear Window Switch
8. Window Locking Switch

11.5.5 Disassemble View

11.5.5.1 Disassemble View

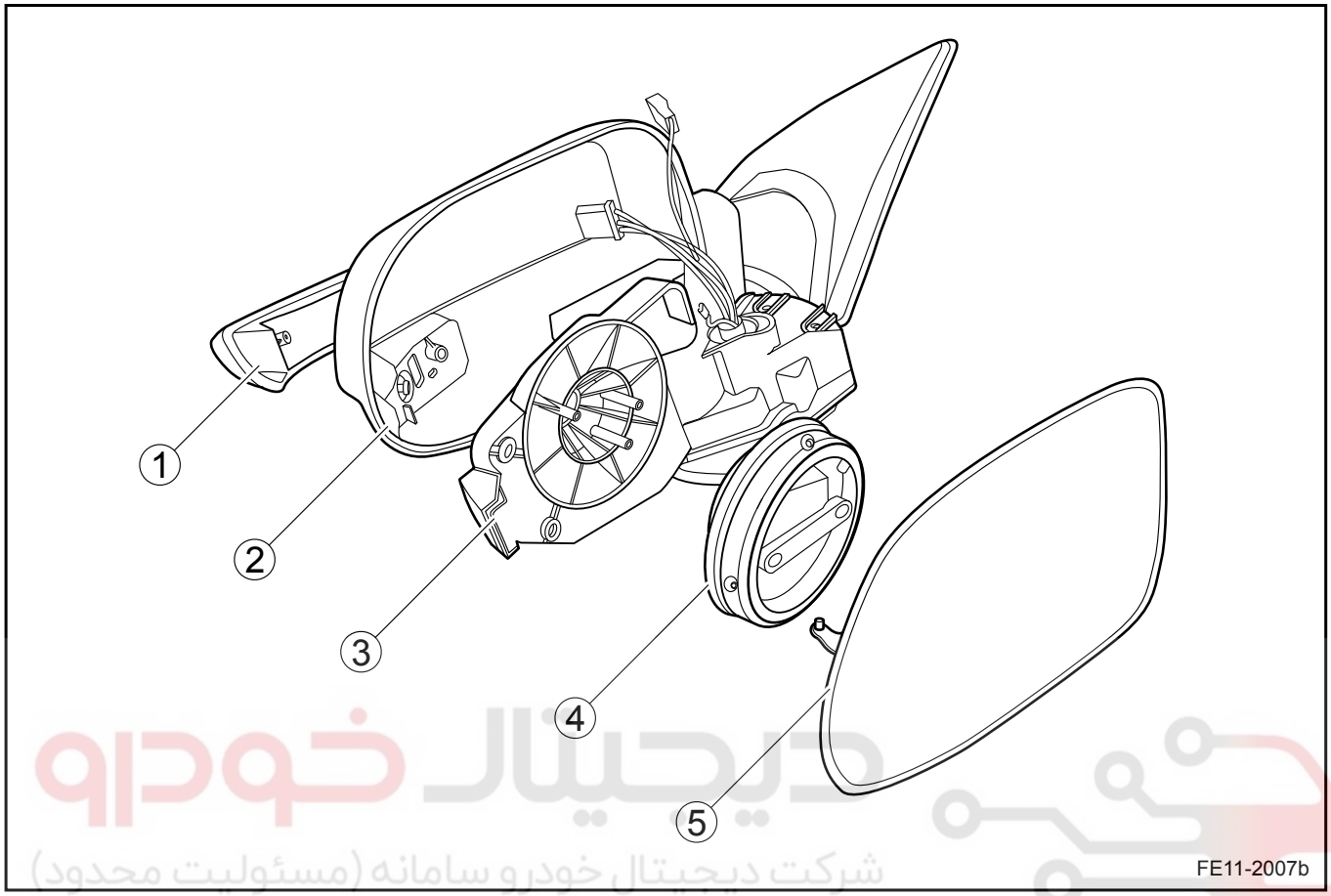
Window Regulator Assembly



Legend

1. Window Motor
2. Window Regulator Rail
3. Electric Window

Outside Rearview Mirror Assembly



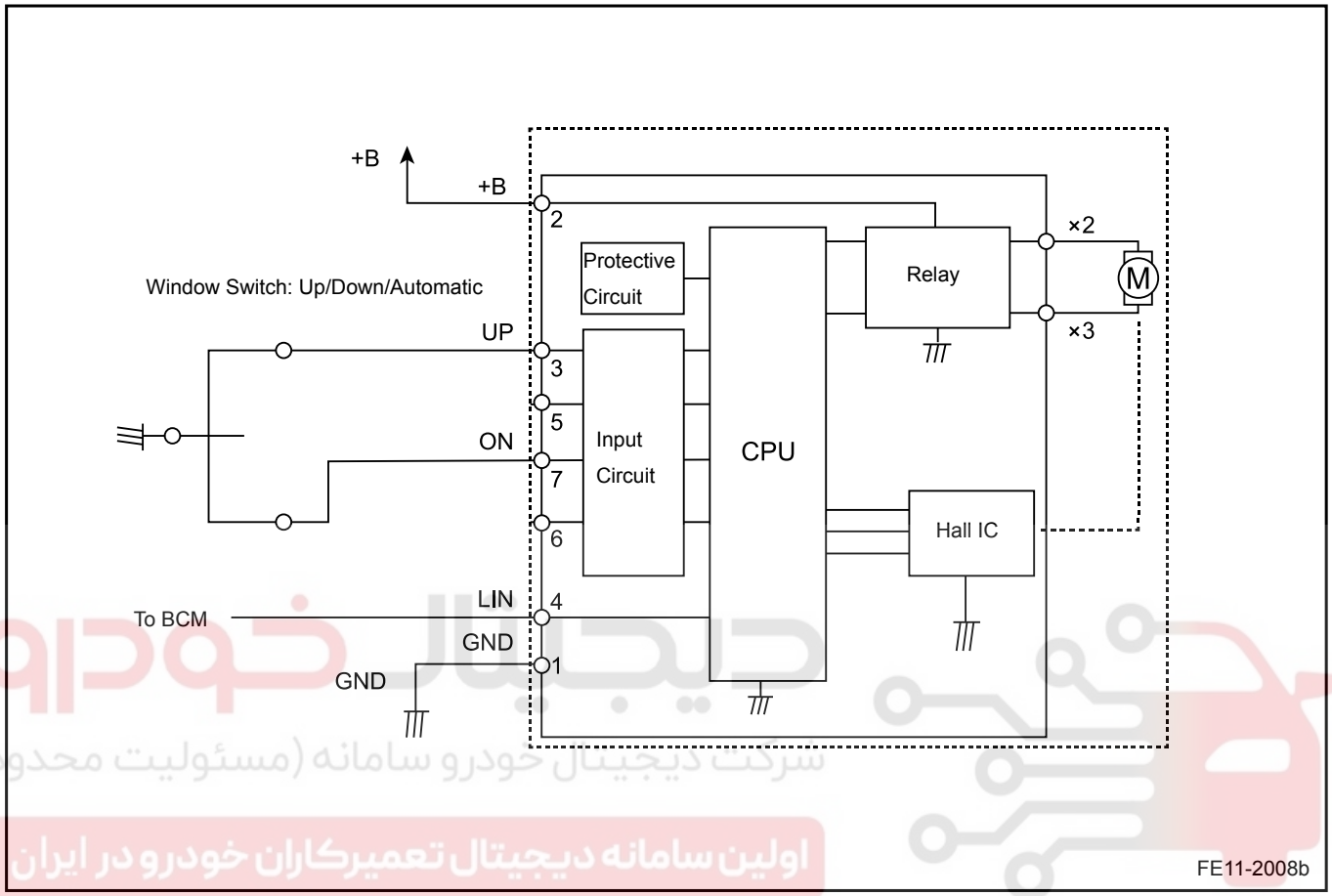
Legend

1. Electric Outside Rearview Mirror Turn Signal Lamp
2. Outside Rearview Mirror Cover
3. Outside Rearview Mirror Adjust Motor Bracket
4. Outside Rearview Mirror Adjust Motor
5. Outside Rearview Mirror Adjust Motor Glass (With Heating Wire)

11.5.6 Schematic

11.5.6.1 Schematic

Schematic With Express Down (If Equipped)



11.5.7 Diagnostic Information and Procedures

11.5.7.1 Diagnosis Description

Refer to11.5.2 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.5.7.2 Visual Inspection

- Check installed aftermarket equipments that may affect the power windows and power mirrors operations.
- Check the easy to access system components to identify whether there is a significant damage or potential malfunction.
- Check whether the window initialization failed.

11.5.7.3 Control Module Diagnostic Information

Power window control module reports the following failures through the LIN bus:

- Motor / Relay Malfunction
- Hall Sensor Malfunction
- Thermal Protection Triggered
- Up Button Is Pressed
- Down Button Is Pressed

11.5.7.4 Glass Regulator Initialization (If Window Express Down Feature Is Available)

- To initialize the system, the glass must be up all the way to the top, and the switch is pressed to lift the window glass until the control module stops the glass motor (within 1s after the glass reaches the top). Each time the system lost initialization, repeat these steps to restore the window express down function.
- Initialization, all system functions must be operational.
- Initialization, the control module voltage should not drop to below 9 V.
- When the control module supply voltage drops momentarily, but the voltage is still higher than 6V, the initialization is effective.
- Every time the glass is lift to the top till stop using automatic mode (at the top position); system will obtain the latest top position and overwrite the previous value to calculate the top position.

Note

- Only when the new value is in the calibrated value range, it overwrites the original value, otherwise the control module will ignore the new value.
- If the initialization process has not been implemented or have been lost, system does not provide automatic up, express down and comfort closing function. Manual up, down and auto-down feature can be operated.

In the following circumstances, the initialization will be lost (If window express down is available is equipped)

- Power supply is cut off.
- When the glass is moving up, the power supply voltage drops below 6 V.
- Control module can not detect logical Hall sensor signals.
- Window glass moves to a location outside the operating range.

11.5.7.5 Window Regulator Control Module Terminal List (Without The Express Down)

Terminal ID	Wiring Color	Terminal Instructions	Status	Specified Conditions
1	L/W	Right Front Window Regulator Down Input	Right Front Window Down	GND
2	L / Y	Right Rear Window Regulator Down Input	Right Rear Window Down	GND
3	L	Left Front Window Regulator Down Input	Left Front Window Down	GND
4	--	--	--	--
5	--	--	--	--
6	R/W	Right Front Window Regulator Up Input	Right Front Window Up	GND
7	--	--	--	--
8	V	Left Front Window Regulator Up Input	Left Front Window Up	GND
9	B	Control Module Ground	Always	GND
10	B	Control Module Ground	Always	GND
11	-	-	-	-
12	R/B	Right Rear Window Regulator Up Input	Right Rear Window Up	GND
13	--	--	--	--
14	--	--	--	--
15	--	--	--	--
16	--	--	--	--
17	--	--	--	--
18	--	--	--	--
19	R	Ignition Power Supply	Ignition Switch On	+12 V
20	V / L	Right Rear Window Regulator Down Output	Right Rear Window Down	+12 V
21	L/W	Right Rear Window Regulator Up Output	Right Rear Window Up	+12 V
22	R/W	Right Side Window Regulator Motor Power Supply	Always	+12 V
23	G/W	Control Module Power Supply	Always	+12 V
24	V	Left Rear Window Regulator Down Output	Left Rear Window Down	+12 V
25	L	Left Rear Window Regulator Up Output	Left Rear Window Up	+12 V
26	W/G	Right Front Window Regulator Down Output	Right Front Window Down	+12 V
27	B	Signal Ground	Always	GND

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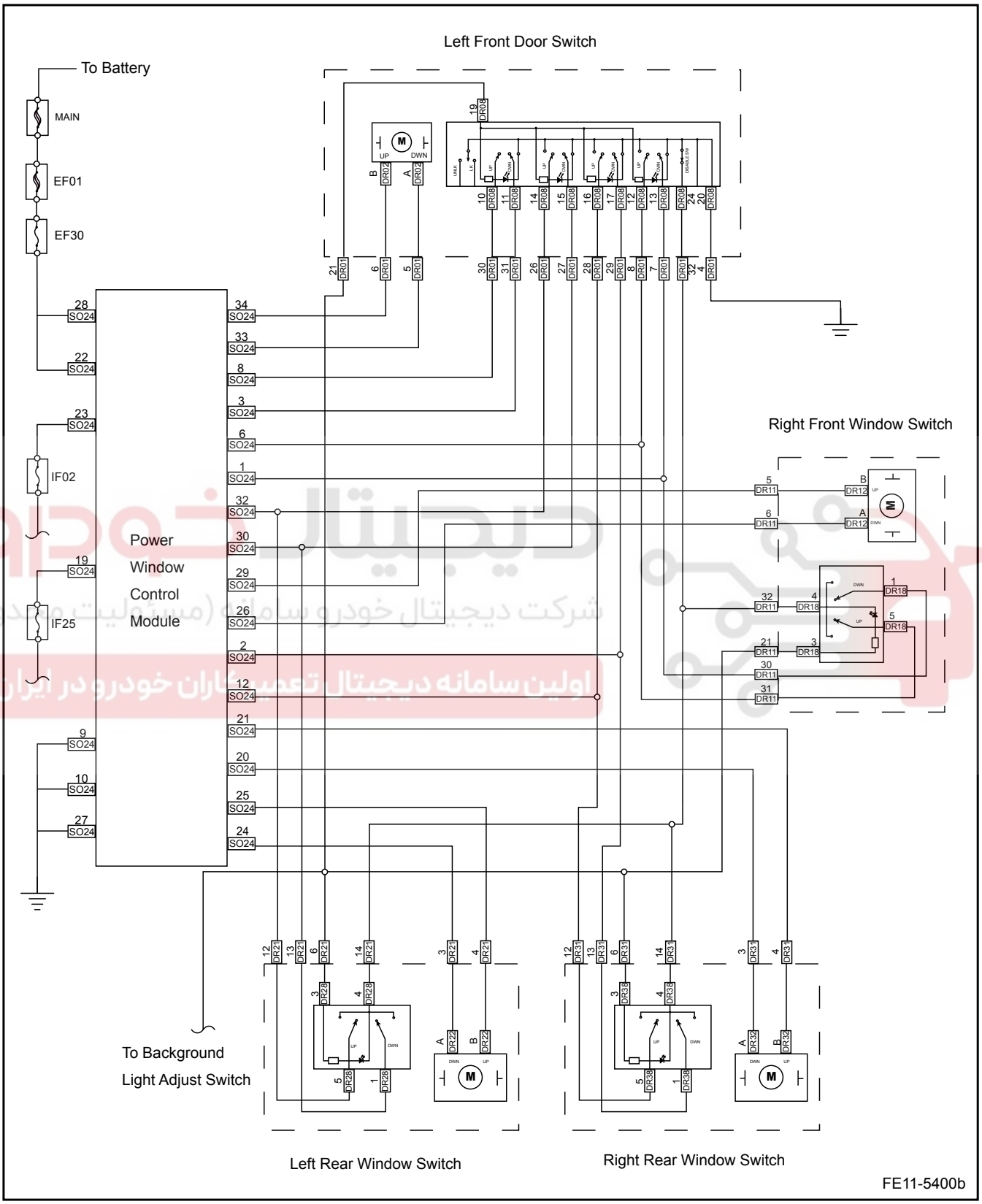
Terminal ID	Wiring Color	Terminal Instructions	Status	Specified Conditions
28	R/W	Left Side Window Regulator Motor Power Supply	Always	+12 V
29	Y/B	Right Front Window Regulator Up Output	Right Front Window Up	+12 V
30	L/B	Left Rear Window Regulator Down Input	Left Rear Window Down	GND
31	--	--	--	--
32	L/R	Left Rear Window Regulator Up Input	Left Rear Window Up	GND
33	G/B	Left Front Window Regulator Down Output	Left Front Window Down	+12 V
34	R/B	Left Front Window Regulator Up Output	Left front window up	+12 V
35	--	--	--	--

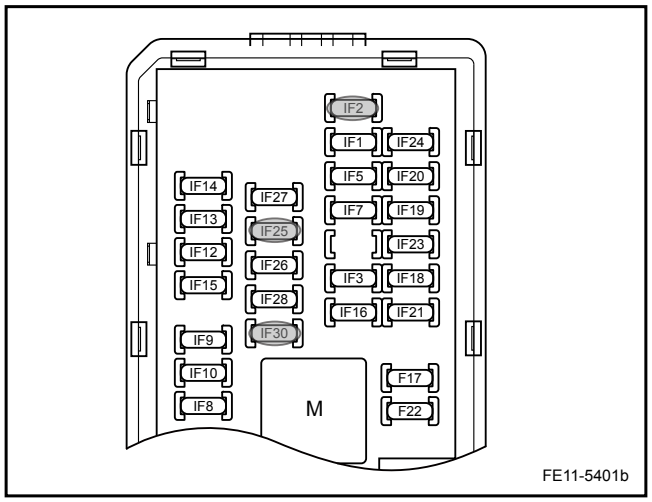
11.5.7.6 All Electric Windows Inoperative (Without Window Express Down Function)

Schematic:



Diagnostic Steps:

Step 1	Check the fuses IF2, IF25 and EF30.



(a) Check whether fuses IF2, IF25 and EF30 are blown.

(b) Fuse Rating:

IF2	15 A
IF25	10 A
EF30	30 A

Are fuses normal?

No → Go to step 3

Yes

Step 2	Check fuses IF2, IF25 and EF30 circuits.

(a) Check whether there is a short circuit.

(b) Repair the circuits. Confirm that there are no short circuits.

(c) Replace with fuses with rated current.

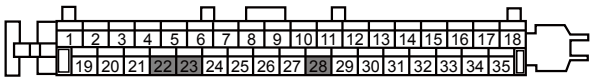
Is the window regulator working properly?

Yes → System normal

No

Step 3	Check the regulator control module power supply circuits.

Power Window Control Module (Without Express Down) Harness Connector SO24



(a) Measure regulator control module harness connector SO24 terminals No.22,23,28 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 5

No

Step 4	Repair the window regulator control module power supply open circuits.

(a) Repair the open circuit between the window regulator control module harness connector SO24 terminal No.23 and fuse

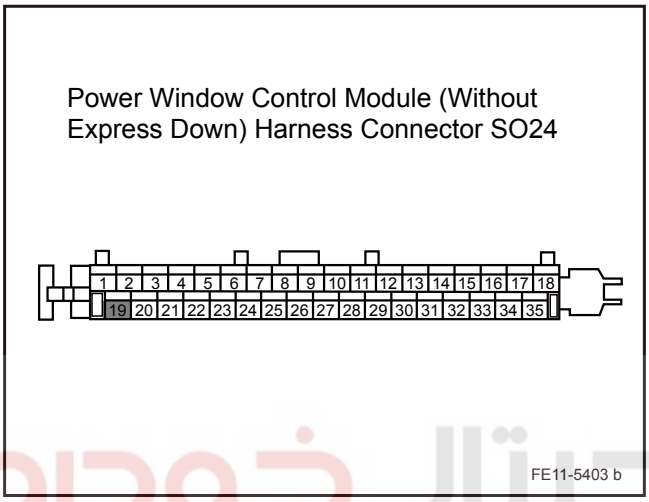
IF2; Repair the open circuit between the window regulator control module harness connector SO24 terminal No.22,28 and fuse EF30.

Is the window regulator working properly?

Yes → System normal

No

Step 5	Check the window regulator control module ignition power supply circuit.



(a) Turn on the ignition switch.

(b) Check the window regulator control module harness connector SO24 terminal No.19 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Repair the window regulator control module ignition power supply open circuit.

(a) Repair the open circuit between the window regulator control module harness connector SO24 terminal No.19 and fuse IF25.

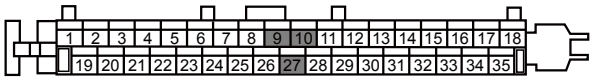
Is the window regulator working properly?

Yes → System normal

No

Step 7	Check the window regulator control module ground circuit.

Power Window Control Module (Without Express Down) Harness Connector SO24



FE11-5404 b

(a) Disconnect the window regulator control module harness connector.
(b) Test continuity between the window regulator control module harness connector SO24 terminals No.9,10,27 and ground with a multimeter.

Test Terminal	Continuity
SO249-Body Ground	Less than 1 Ω
SO2410-Body Ground	Less than 1 Ω
SO2427-Body Ground	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 9

No

Step 8	Repair the window regulator control module and the ground open circuit.

(a) Repair the open circuit between the window regulator control module harness connector SO24 terminals No.9,10,27 and ground.

Is the window regulator working properly?

Yes → System normal

No

Step 9	Replace the window regulator control module.

(a) Replace the window regulator control module. Refer to 11.5.8.8 Window Regulator Module Replacement (If equipped).
(b) Confirm the repair completed.

Next

Step 10	System normal.

11.5.7.7 Left Front Window Regulator Inoperative (Without Window Express Down Function)

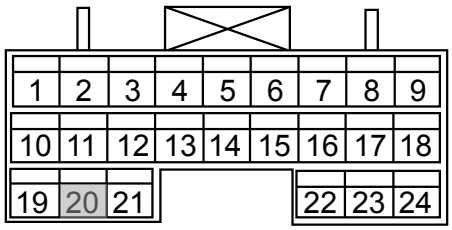
Schematic:

Refer to 11.5.7.6 All Electric Windows Inoperative (Without Window Express Down Function).

Diagnostic Steps:

Step 1	Check the left front window lift switch ground circuit.

Left Front Window Switch Harness Connector DR08



FE11-5405b

(a) Disconnect the left front window switch wiring harness connector.
(b) Check the resistance between the left front window switch wiring harness connector DR08 terminal No.20 and the ground.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 3

No

Step 2	Repair the left front window switch ground circuit open.

(a) Repair the left front window switch ground circuit open.

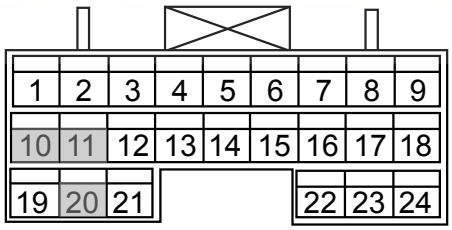
Is the left front window regulator working correctly?

Yes → System normal

No

Step 3	Check the left front window switch.

Left Front Window Switch Harness Connector DR08



FE11-5406b

(a) Connect the left front window switch wiring harness connector.
(b) Operate the left front window switch button.
(c) Test continuity between the left the front door switch wiring harness connector DR08 terminal No.20 and terminal No. 10,11 with a multimeter.

Test Terminal	Test Conditions	Continuity
DR08 (20)-DR01 (10)	Down	10 kΩ or higher
DR08 (20)-DR01 (10)	Up	Less than 1 Ω
DR08 (20)-DR01 (11)	Down	Less than 1 Ω
DR08 (20)-DR01 (11)	Up	10 kΩ or higher

Is the resistance between terminals specified value?

Yes → Go to step 5

No

Step 4	Replace the left front window switch.

(a) Replace the left front window switch. Refer to 11.5.8.4 Left Front Window Switch Replacement.

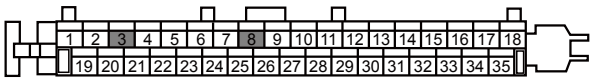
Is the window regulator working properly?

Yes → System normal

No

Step 5	Check the window regulator control module left front signal circuit.

Power Window Control Module (Without Express Down) Harness Connector SO24



FE11-5407b

(a) Operate the left front window switch button.
(b) Test continuity between the window regulator control module harness connector SO24 terminals 3,8 and the ground with a multimeter.

Test Terminal	Test Conditions	Continuity
SO2 (48) - Body Ground	Press	10 kΩ or higher
SO2 (48) - Body Ground	Filed	Less than 1 Ω
SO2 (43) - Body Ground	Press	Less than 1 Ω
SO2 (43) - Body Ground	Filed	10 kΩ or higher

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Repair the window regulator control module left front signal circuit open circuit.

(a) Repair the open circuit between the window regulator control module harness connector SO24 terminal No.3,8 and the left front door wiring harness connector DR08 terminal No.11,10 respectively.

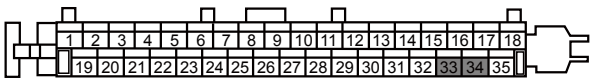
Is the left front window regulator working properly?

Yes → System normal

No

Step 7	Check the window regulator left front control module control circuit.

Power Window Control Module (Without Express Down) Harness Connector SO24



FE11-5408b

(a) Operate the left front window switch button.
(b) Measure the left front window regulator motor wiring harness connector SO24 terminals No.33,34 voltage with a multimeter.

Test Terminal	Test Conditions	Standard Value
SO24 (33)-SO24 (34)	Down	11-14 V
SO24 (33)-SO24 (34)	Up	11-14 V

Is the voltage specified value?

Yes → Go to step 9

No

Step 8	Replace the window regulator control module.

(a) Replace the window regulator control module. Refer to 11.5.8.8 Window Regulator Module Replacement (If equipped).

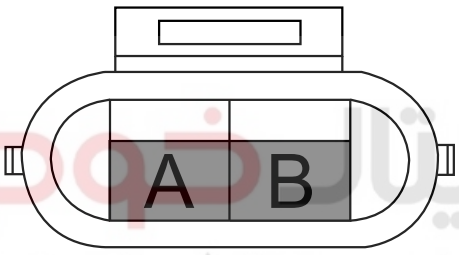
IS the left front window regulator working properly?

Yes → System normal

No

Step 9	Check the left front window regulator control motor circuit.

Driver Door Window Motor Harness Connector DR02



FE11-5409b

(a) Operate the left front window switch button.

(b) Test continuity between the left front window regulator motor harness connector DR02 terminals A, B and the ground with a multimeter.

Test Terminal	Test Conditions	Standard Value
DR02 (A)-DR02 (B)	Down	11-14 V
DR02 (A)-DR02 (B)	Up	11-14 V

Is the resistance specified value?

Yes → Go to step 11

No

Step 10	Repair the left front window regulator motor control circuit open.

(a) Repair the open circuit between the window regulator motor harness connector DR02 terminals A,B and the left front window regulator control module wiring harness connector SO24 terminals No.33,34 respectively.

Is the left front window regulator working correctly?

Yes → System normal

No

Step 11	Replace the left front window regulator motor.

(a) Replace the left front window regulator motor. Refer to 11.5.8.3 Left Front Window Regulator Motor Replacement.

Confirm the repair completed.

Next

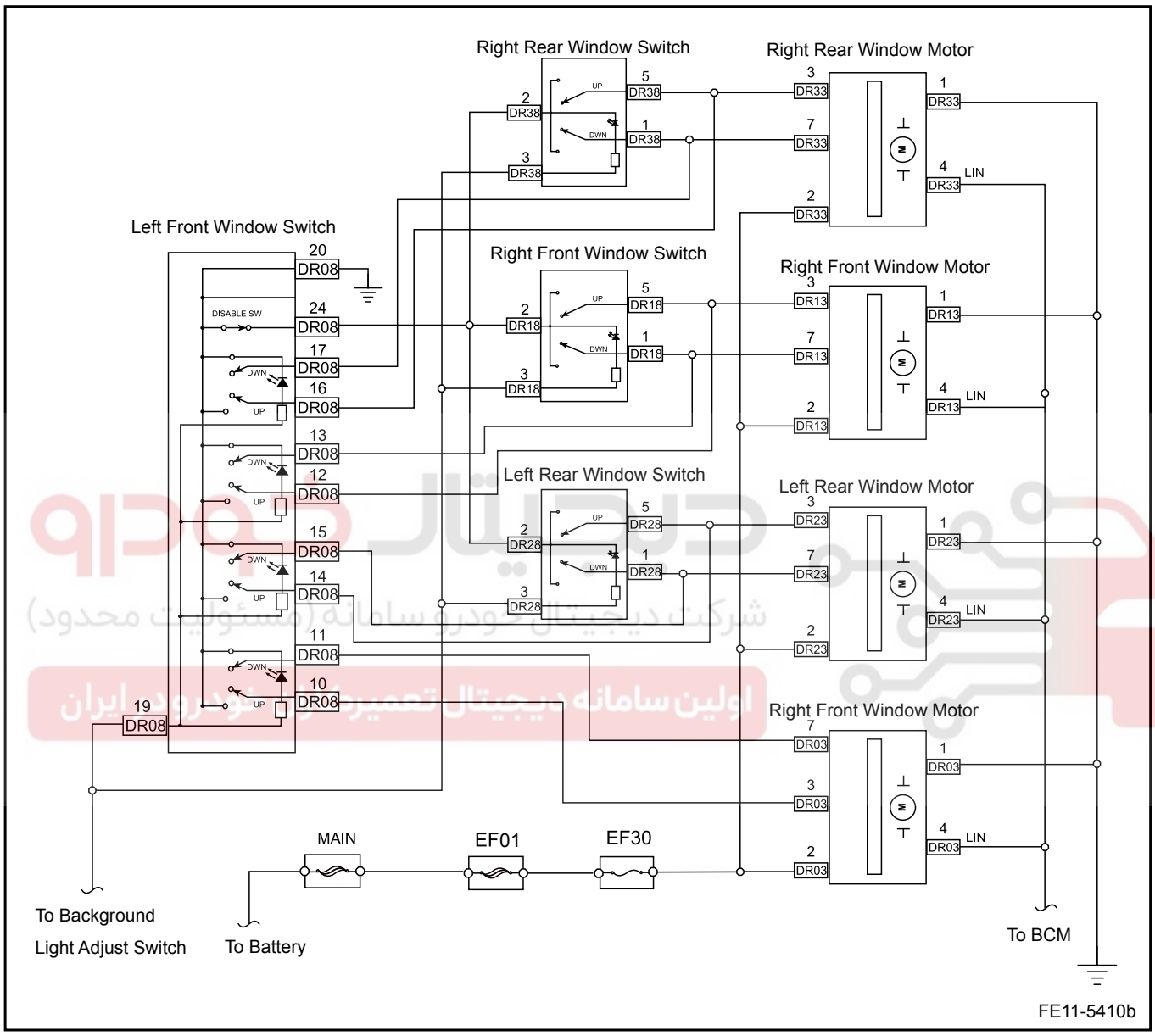
Step 12	System normal.

Note

Other single window regulator inoperative diagnostic is similar.

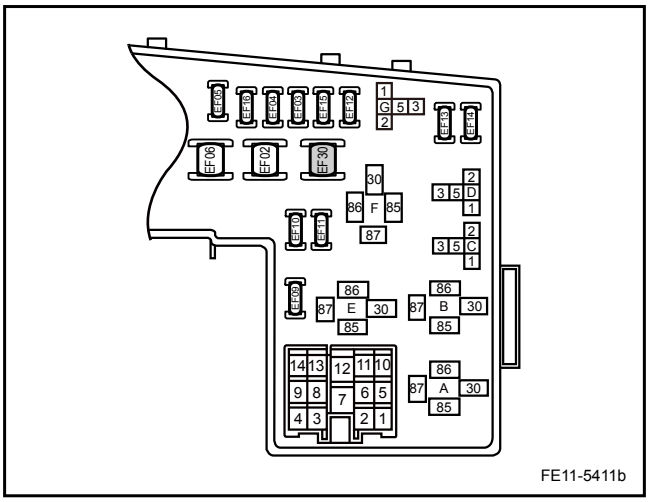
11.5.7.8 Window Regulator Inoperative (With Window Express Down Function)

Schematic:



Diagnostic Steps:

Step 1	Check the fuse EF30.



(a) Check whether the fuse EF30 is blown.
Fuse Rated Current: 30 A

Is the fuse blown?

No → Go to step 3

Yes

Step 2	Check the fuse EF30 circuit.

(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

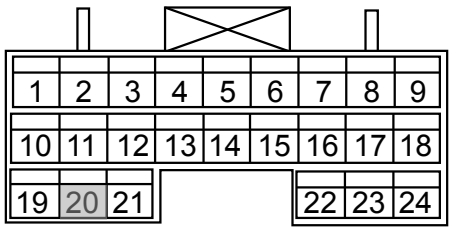
Is the window regulator working properly?

Yes → System normal

No

Step 3	Check the left front door combination switch ground circuit.

Left Front Window Switch Harness Connector DR08



(a) Disconnect the left front window switch wiring harness connector.
(b) Measure resistance between the left front window switch wiring harness connector DR08 terminal No.20 and the ground.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 5

No

Step 4	Repair the left front door combination switch ground circuit open.

(a) Repair the left front door combination switch ground circuit open.

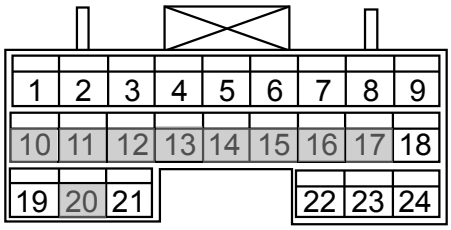
Is the window regulator working properly?

Yes → System normal

No

Step 5	Check the left front window switch.

Left Front Window Switch Harness Connector DR08



FE11-5412b

(a) Connect the left front window regulator switch wiring harness connector.
(b) Operate the window switch.
(c) Test continuity between the left front window switch wiring harness connector DR08 corresponding terminals with a multimeter.

Test Terminal	Test Conditions	Continuity
DR08 (20)-DR08 (11)	Down	Less than 1 Ω
DR08 (20)-DR08 (15)	Down	Less than 1 Ω
DR08 (20)-DR08 (17)	Down	Less than 1 Ω
DR08 (20)-DR08 (13)	Down	Less than 1 Ω
DR08 (20)-DR08 (10)	Up	Less than 1 Ω
DR08 (20)-DR08 (14)	Up	Less than 1 Ω
DR08 (20)-DR08 (16)	Up	Less than 1 Ω
DR08 (20)-DR08 (12)	Up	Less than 1 Ω

Is the resistance specified value?

Yes — Go to step 7

No

Step 6	Replace the left front window switch.

(a) Replace the left front window switch. Refer to 11.5.8.4 Left Front Window Switch Replacement.

Is the window regulator working properly?

Yes — System normal

No

Step 7	Check the faulty window regulator motor control signal circuit.

(a) Operate the faulty window switch.
(b) Test continuity between the window regulator motor corresponding wiring harness connector terminals No.3,7 and the ground with a multimeter.

Test Terminal	Test Location	Test Condition	Continuity
DR03 (7)-DR08 (11)	Left Front Window	Down	Less than 1 Ω

Test Terminal	Test Location	Test Condition	Continuity
DR03 (3)-DR08 (10)	Left Front Window	Up	Less than 1 Ω
DR23 (7)-DR08 (15)	Left Rear Window	Down	Less than 1 Ω
DR23 (3)-DR08 (14)	Left Rear Window	Up	Less than 1 Ω
DR13 (7)-DR08 (13)	Right Front Window	Down	Less than 1 Ω
DR13 (3)-DR08 (12)	Right Front Window	Up	Less than 1 Ω
DR33 (7)-DR08 (17)	Right Rear Window	Down	Less than 1 Ω
DR33 (3)-DR08 (16)	Right Rear Window	Up	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 9

No

Step 8	Repair the faulty window regulator motor control signal circuit open.

(a) Repair the faulty window regulator motor control signal circuit open.
(b) Replace the faulty window switch.

Is the window regulator working properly?

Yes → System normal

No

Step 9	Replace the faulty window regulator motor.

(a) Replace the faulty window regulator motor. Refer to 11.5.8.3 Left Front Window Regulator Motor Replacement.

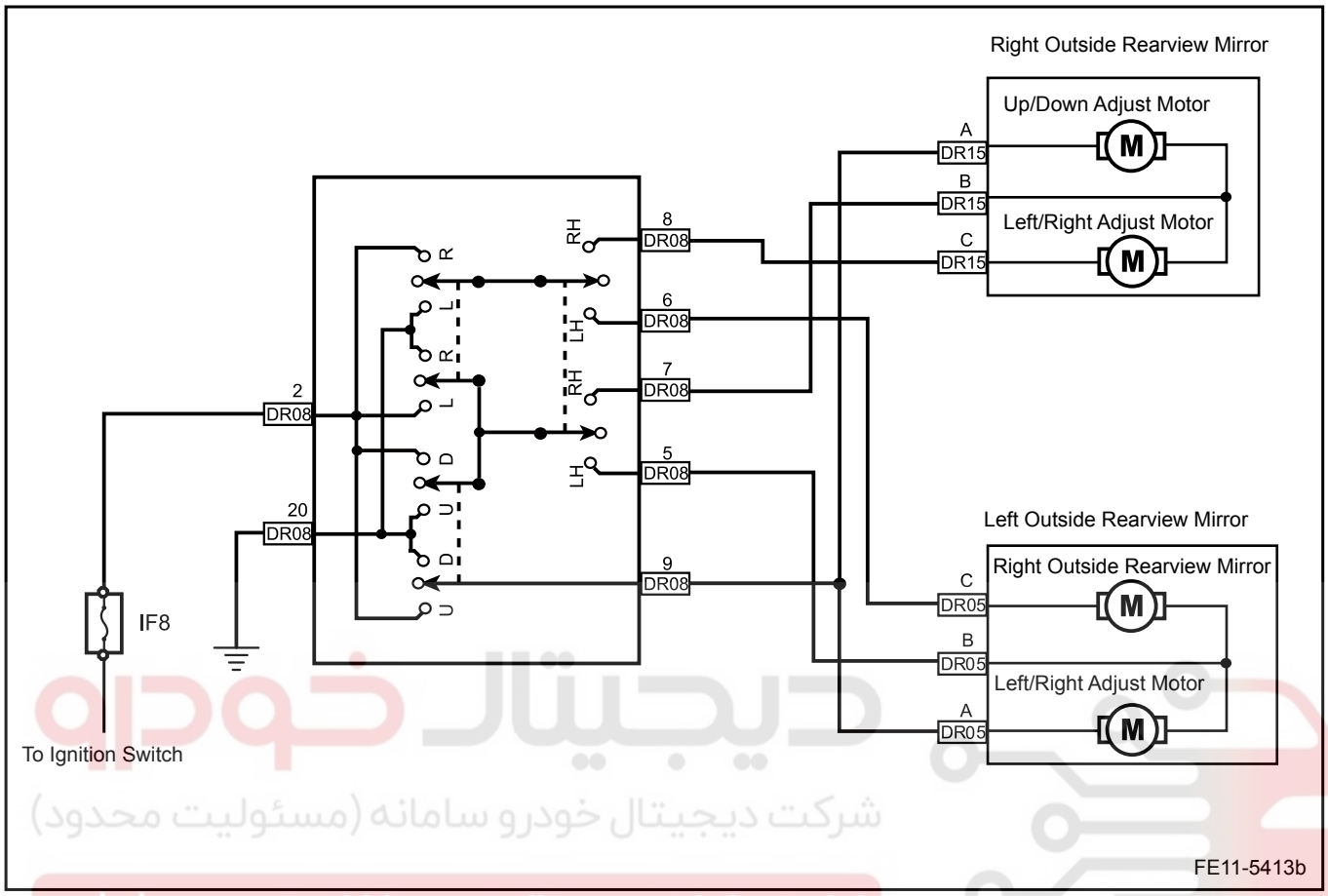
Confirm the repair completed.

Next

Step 10	System normal.

11.5.7.9 Electric Rearview Mirror Can Not Be Adjusted

Schematic:



Diagnostic Steps:

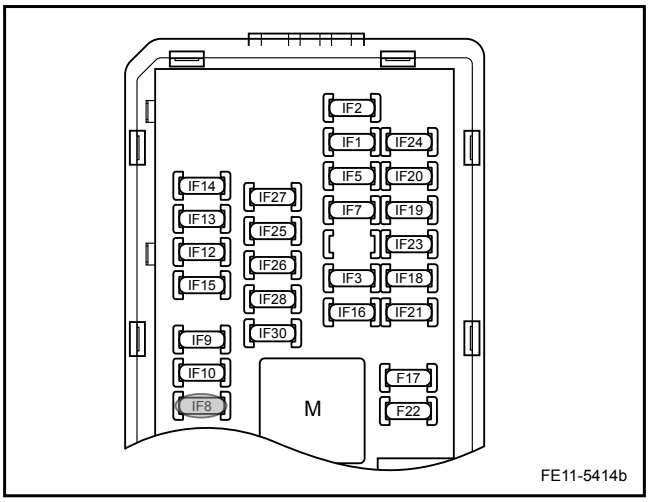
Step 1	Check the left and right outside electric rearview mirror working status.

(a) Adjust the outside electric rearview mirror on both sides.
Both sides outside rearview mirrors can not work.

No → Go to step 10

Yes

Step 2	Check the fuse IF8.



(a) Is the fuse IF8 blown?
Fuse Rated Current: 10 A

Is the fuse blown?

No → Go to step 3

Yes

Step 3	Check the fuse IF8 circuit.

(a) Check whether there is a short circuit.
(b) Repair circuits, Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

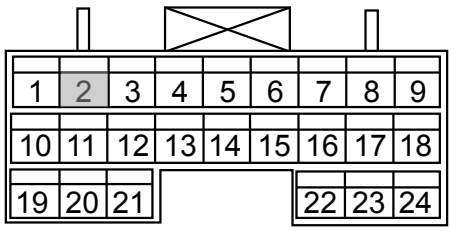
Confirm the electric rearview mirror is working correctly.

Yes → System normal

No

Step 4	Check the left front window switch power supply circuit.

Left Font Window Switch Harness Connector DR08



(a) Disconnect the left front window switch wiring harness connector.
(b) Check the left front window switch wiring harness connector DR08 terminal No.2 voltage.
Voltage Standard Value: 11-14 V

Is the Is the voltage normal?

Yes → Go to step 6

No

Step 5	Repair the left front window switch power supply circuit open.

(a) Repair the left front window switch power supply circuit open.

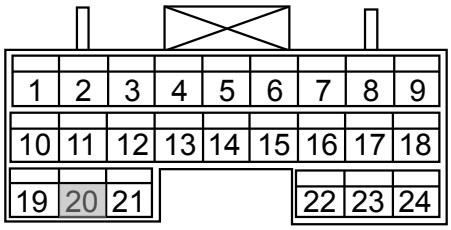
Confirm electric rearview mirror is working correctly.

Yes → System normal

No

Step 6	Check the left front window switch ground circuit.

Left Front Window Switch Harness Connector DR08



FE11-5405b

(a) Disconnect the left front window switch wiring harness connector.

(b) Check resistance between the left front window switch wiring harness connector DR08 terminal No.20 and the ground.
Standard Resistance: Less than 1 Ω

Yes → Go to step 8

No

Step 7	Repair the left front window switch ground circuit open.

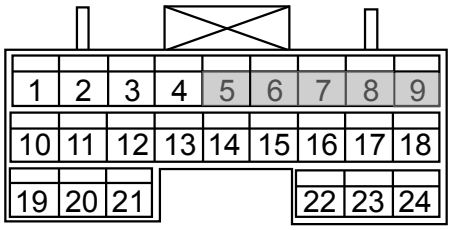
(a) Repair the left front window switch ground circuit open.
Confirm electric rearview mirror is working correctly.

Yes → System normal

No

Step 8	Check the left front window regulator switch.

Left Font Window Switch Harness Connector DR08



FE11-5416b

(a) Connect left front window switch wiring harness connector.

(b) Operate the electric mirror adjust button.

(c) Measure the left front door combination switch wiring harness connector DR08 corresponding terminals voltage with a multimeter.

Test Terminal	Test Conditions	Standard Value
DR08 (9)-DR08 (5)	Left, Upward	11-14 V
DR08 (9)-DR08 (5)	Left, Downward	- (11-14) V
DR08 (6)-DR08 (5)	Left, Right	11-14 V
DR08 (6)-DR08 (5)	Left, Left	- (11-14) V
DR08 (9)-DR08 (7)	Right, Upward	11-14 V
DR08 (9)-DR08 (7)	Right, Downward	- (11-14) V
DR08 (8)-DR08 (7)	Right, Right	11-14 V

Test Terminal	Test Conditions	Standard Value
DR08 (8)-DR08 (7)	Right, Left	- (11-14) V

Is the voltage specified value?

Yes → Go to step 10

No

Step 9	Replace the left front window switch.

(a) Replace the left front window switch. Refer to 11.5.8.4 Left Front Window Switch Replacement.

Confirm the electric rearview mirror is working correctly.

Yes → System normal

No

Step 10	Check the fault electric mirror working status.

(a) Select the faulty mirror.
(b) Adjust upward, downward, left, right.

Confirm the electric rearview mirror can be adjusted upward or downward.

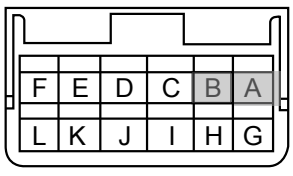
Yes → Go to step 14

No

Step 11	Check the faulty mirror upward and downward control signal circuits.

Driver Side Outside Rearview Mirror Harness Connector DR05

Passenger Side Outside Rearview Mirror Harness Connector DR15



FE11-5417b

(a) Operate the electric rearview mirror upward and downward.
(b) Measure voltage between the faulty electric mirror harness connector DR05 (left) or DR15 (right) terminal A and B with a multimeter.

Test Terminal	Test Conditions	Continuity
DR05 (A)-DR05 (B)	Up	11-14 V
DR05 (A)-DR05 (B)	Down	- (11-14) V
DR15 (A)-DR15 (B)	Up	11-14 V
DR15 (A)-DR15 (B)	Down	- (11-14) V

Is the voltage specified value?

Yes → Go to step 13

No

Step 12	Repair the faulty electric mirror upward and downward control signals open circuit.

(a) Repair the faulty electric mirror upward and downward control signals open circuit.

Confirm the electric rearview mirror is working correctly.

Yes → System normal

Step 13	Replace the faulty electrical outside rearview mirror motor.

(a) Replace the faulty electrical outside rearview mirror motor. Refer to 11.5.8.5 Electric Outside Rearview Mirror Adjust Motor Replacement.

Confirm whether the electric rearview mirror can be adjusted to left and right.

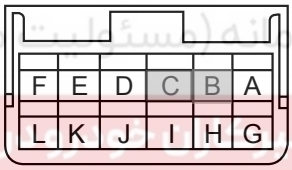
Yes → System normal

No

Step 14	Check the faulty electric mirror left and right control signal circuit.

Driver Side Outside Rearview Mirror Harness Connector DR05

Passenger Side Outside Rearview Mirror Harness Connector DR15



FE11-5418b

(a) Operate the electric mirror left and right adjust buttons.

(b) Measure voltage between the faulty electric mirror harness connector DR05 (left) or DR15 (right) terminal C and B with a multimeter.

Test Terminal	Test Conditions	Continuity
DR05 (C)-DR05 (B)	Right	11-14 V
DR05 (C)-DR05 (B)	Left	- (11-14) V
DR15 (C)-DR15 (B)	Right	11-14 V
DR15 (C)-DR15 (B)	Left	- (11-14) V

Is the voltage specified value?

Yes → Go to step 16

No

Step 15	Repair the faulty electric mirror control signal circuit open.

(a) Repair the faulty electric mirror control signal circuit open.

Confirm the electric rearview mirror is working correctly.

Yes → System normal

No

Step 16	Replace the faulty electric rearview mirror motor assembly.

(a) Replace the faulty electric rearview mirror motor assembly. Refer to 11.5.8.5 Electric Outside Rearview Mirror Adjust Motor Replacement.

Confirm the repair completed.

Next

Step 17	System normal.

11.5.7.10 Electric Rearview Mirror Can Not Be Heated

Refer to 11.12.6.4 Electric Rearview Mirror Defroster Inoperative.

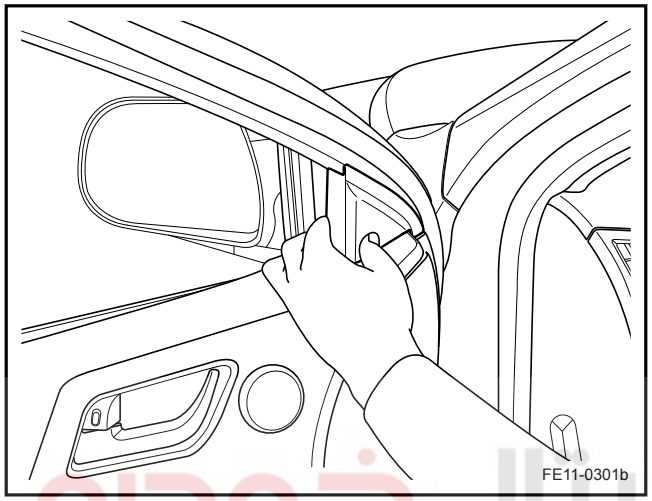
11.5.8 Removal and Installation

11.5.8.1 Outside Rearview Mirror Replacement

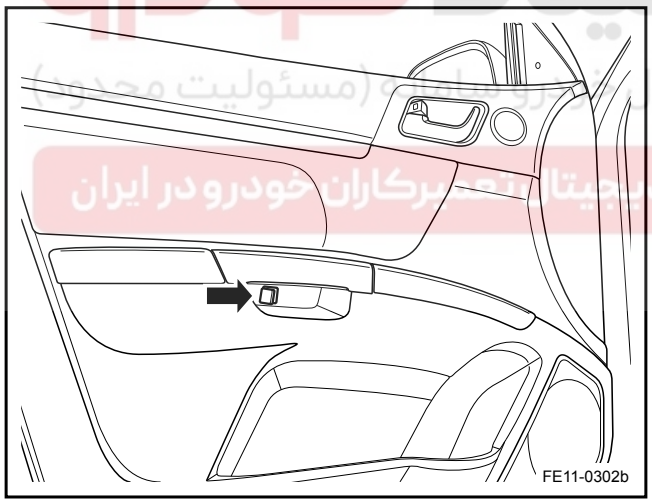
Removal Procedure

Warning!

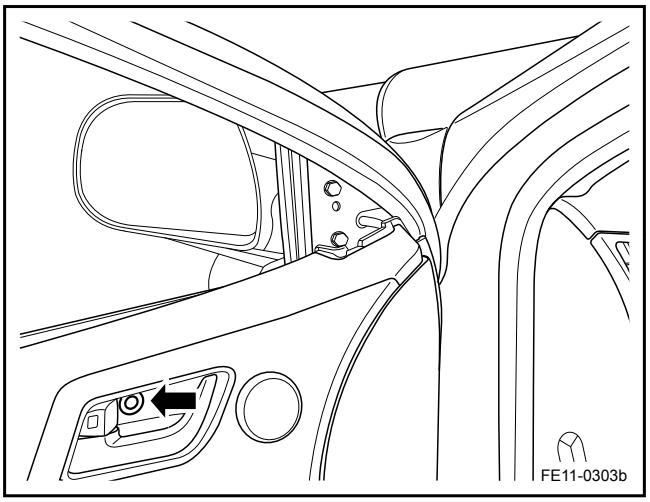
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



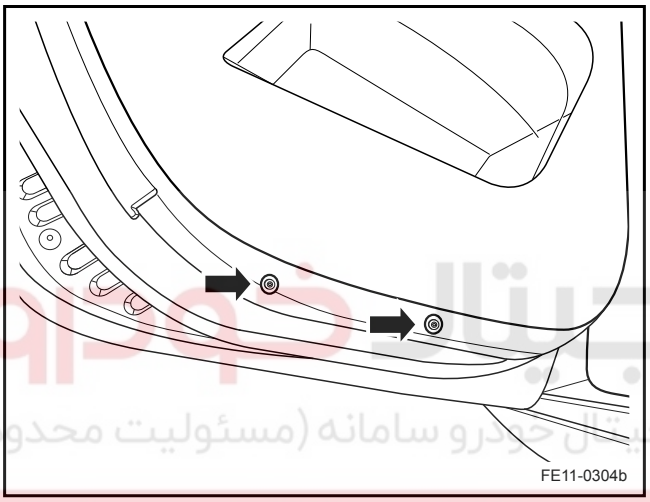
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front door triangle trim panel.



3. Remove the front door armrest retaining screw cover.



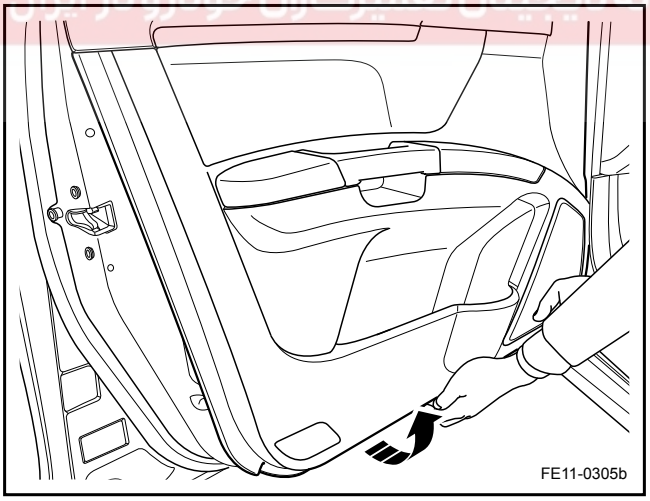
4. Remove the front door inside handle retaining screw cover.



5. Remove the front door trim panel retaining screw.

Note

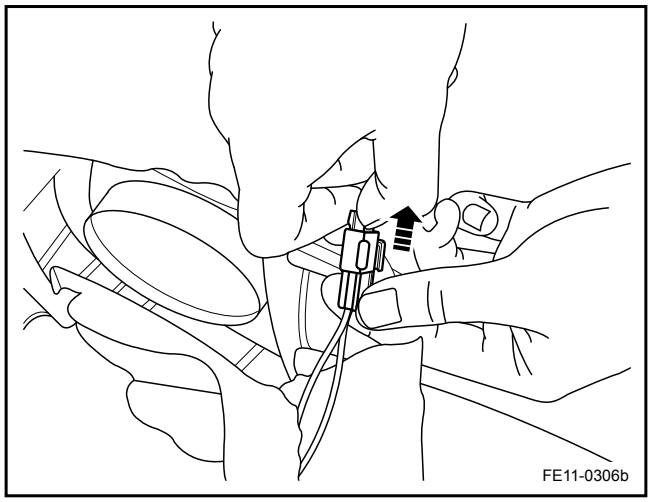
There are two retaining screws at the lower side of the front door trim panel.



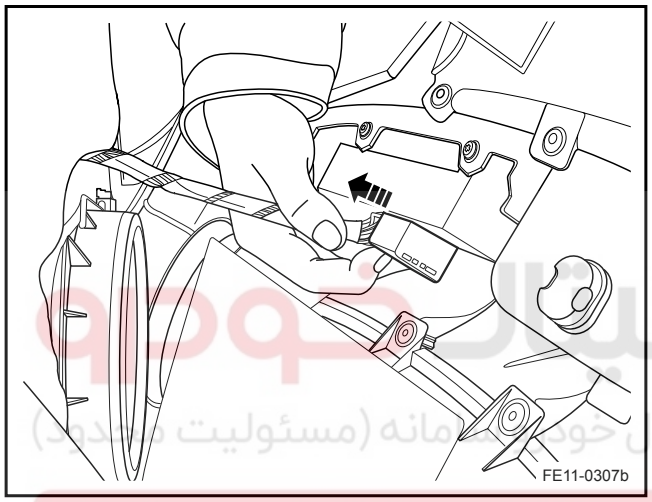
6. Remove the front door trim panel.

Note

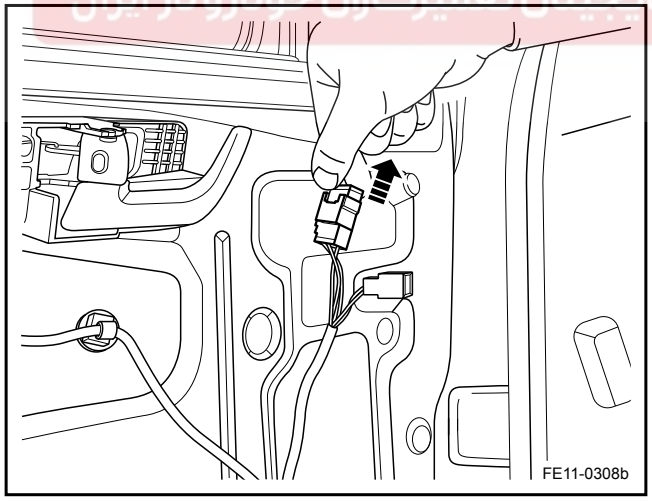
Do not to damage the the wiring harness connectors inside the front door trim panel.



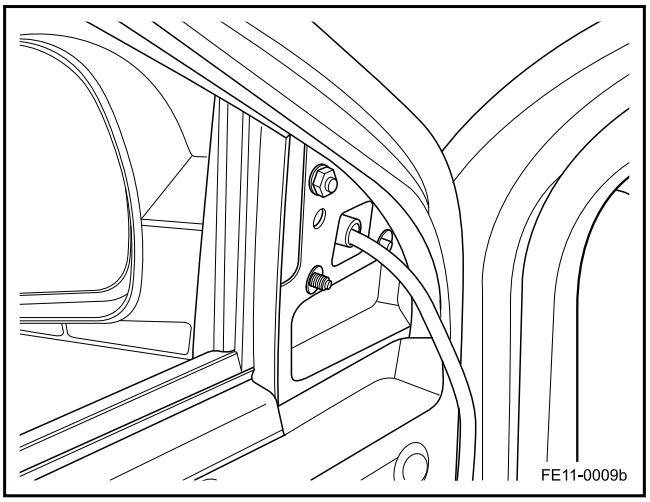
7. Disconnect the front tweeter harness connector.



8. Disconnect the front window switch harness connector and remove the front door trim panel.

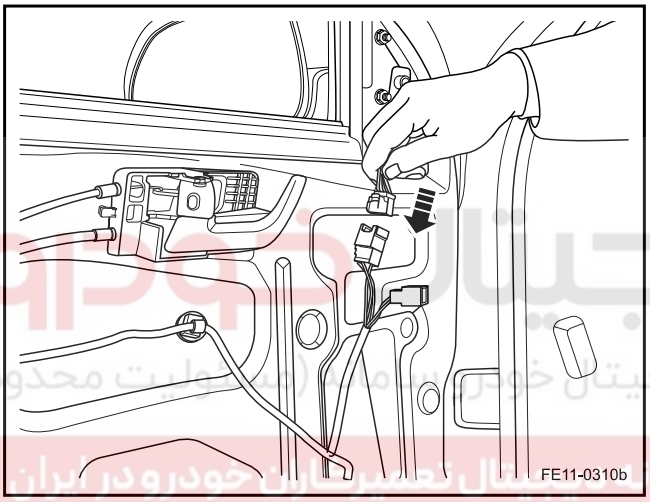


9. Disconnect outside rearview mirror harness connector, loose the outside rearview mirror bracket nut.
10. Leave the nut on the top and remove the other two rearview mirror bracket nuts.
11. Hold the outside rearview mirror and remove the remaining nut.



12. Remove the outside rearview mirror assembly.

Installation Procedure:



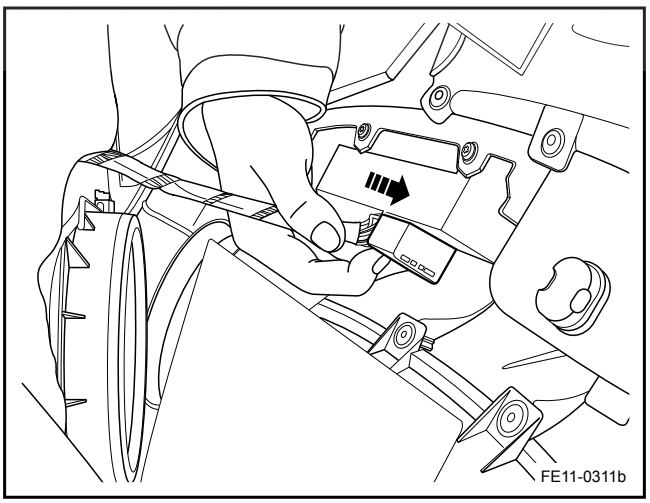
1. Install the outside rearview mirror assembly and tighten the retaining nuts.

   Torque: 6 Nm (Metric) 4.4 lb-ft (US English)

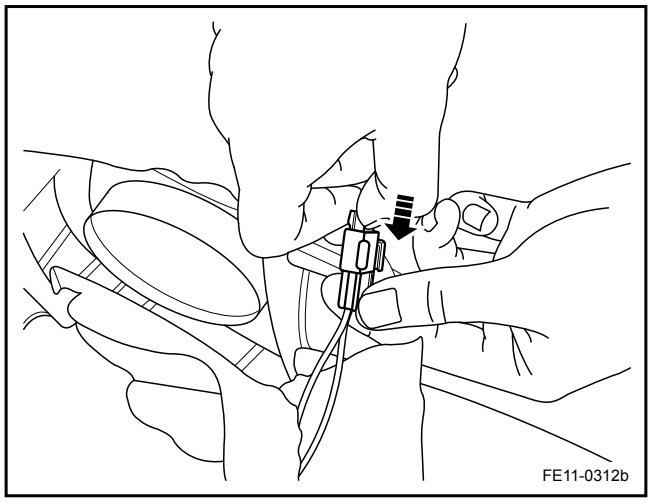
   Note

   "Fastener Notice" in "Warnings and Notices"

2. Connect the outside rearview mirror harness connector.



3. Connect the front window switch wiring harness connector.



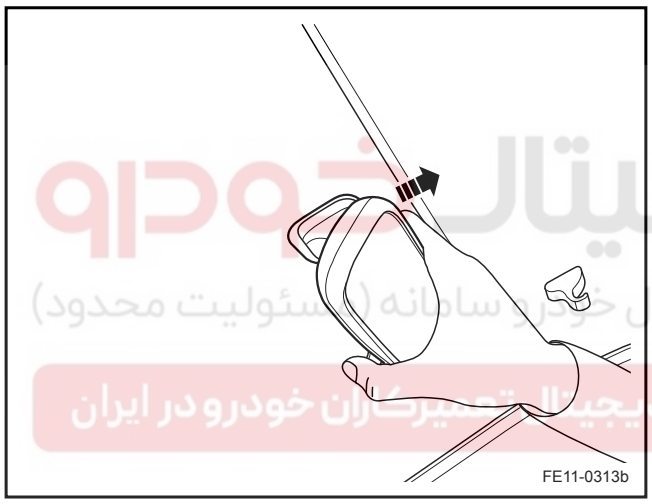
4. Connect the front tweeter harness connector.
5. Install the new clips to the front door trim panel.
6. Install the front door trim panel.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)
7. Install the front door armrest retaining screw cover.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)
8. Install the front door handle retaining screw cover.
9. Install the front door triangular panel.
10. Connect the battery negative cable.

11.5.8.2 Inside Rearview Mirror Replacement

Removal Procedure

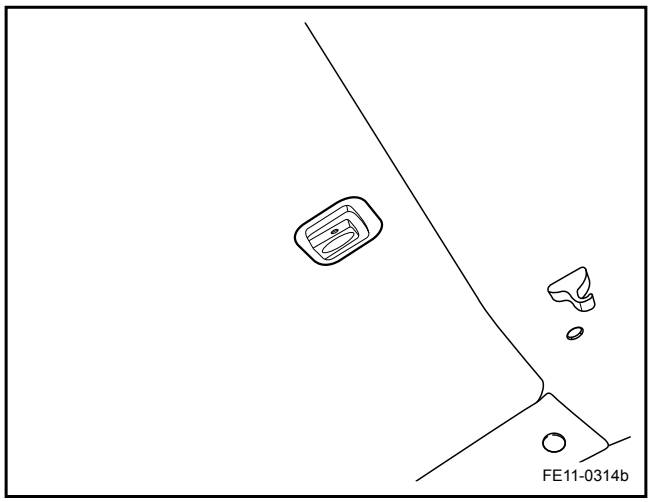


1. Remove the inside rearview mirror from the retaining bracket.
2. Remove the inside rearview mirror bracket.

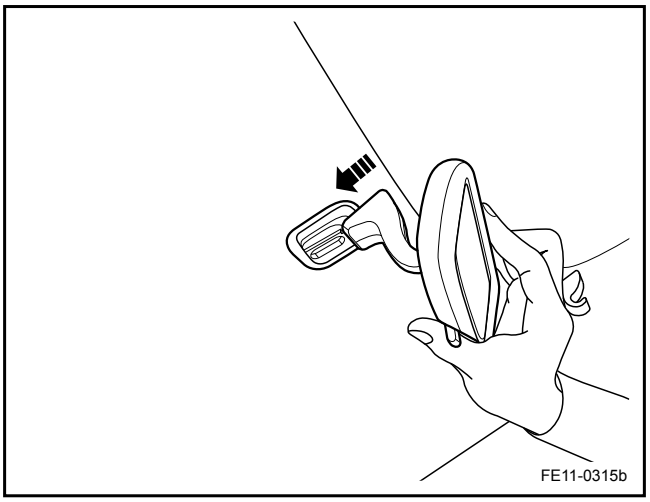
   Note

   The inside rearview mirror is bonded to the windshield using a special adhesive.

Installation Procedure:



1. Use dedicated cleaning agent to clean the inside rearview mirror bracket installation surface.
2. Apply the adhesive according to the adhesive requirements.
3. Position the inside rearview mirror bracket to the marked position, with the constant pressure to press the bracket on the glass for 1-2 min.
4. Use dedicated cleaning agent to remove excess adhesive after 5 min.



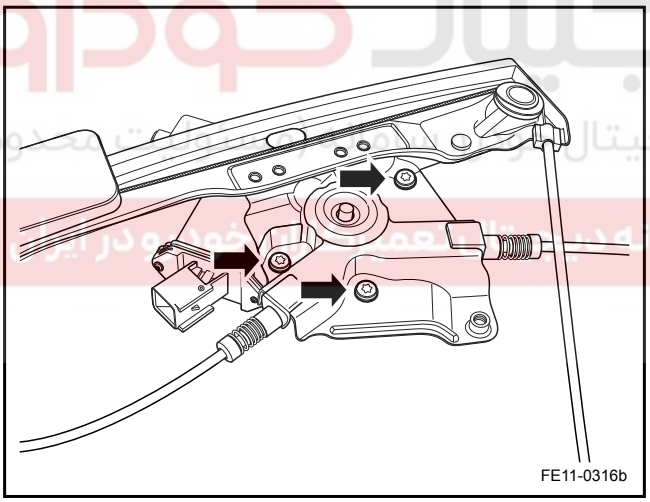
5. Install the inside rearview mirror.

11.5.8.3 Left Front Window Regulator Motor Replacement

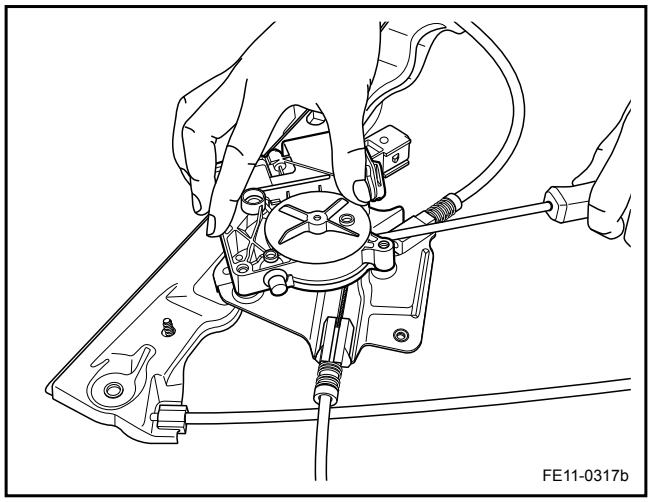
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the left front window regulator. Refer to 11.5.8.6 Front Door Window Regulator Replacement.
3. Remove the left front window regulator motor retaining screws.

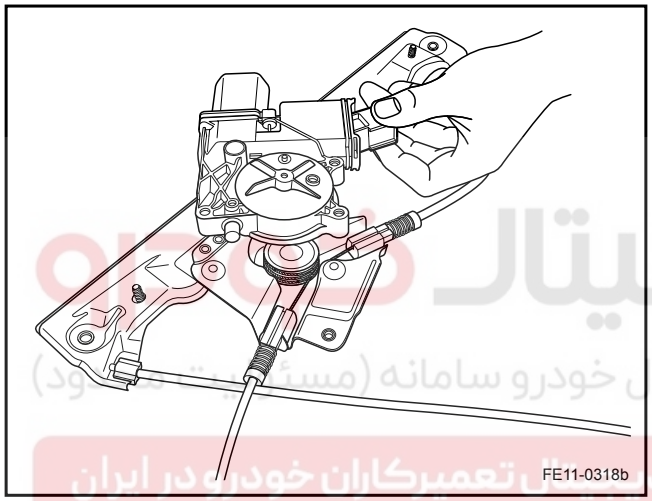


4. Remove the left front window regulator motor from the regulator.

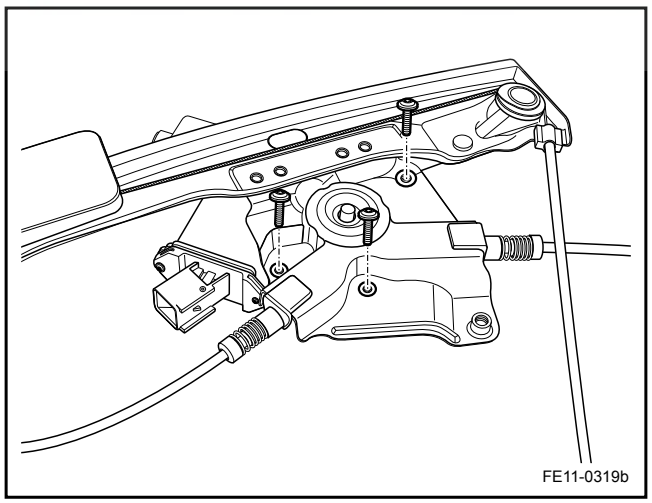
Note

To avoid the cable pop-up, use a flat blade screwdriver.

Installation Procedure:



1. Install the left front window regulator motor to the regulator.



2. Install the left front window regulator motor retaining screws.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)

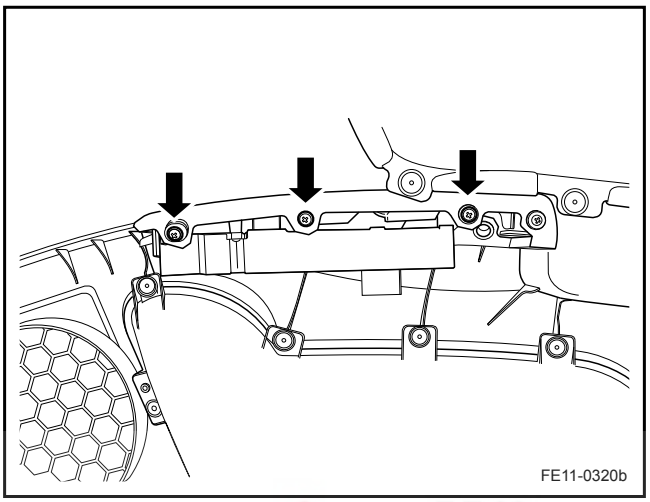
3. Install the left front window regulator assembly.
4. Connect the battery negative cable.

11.5.8.4 Left Front Window Switch Replacement

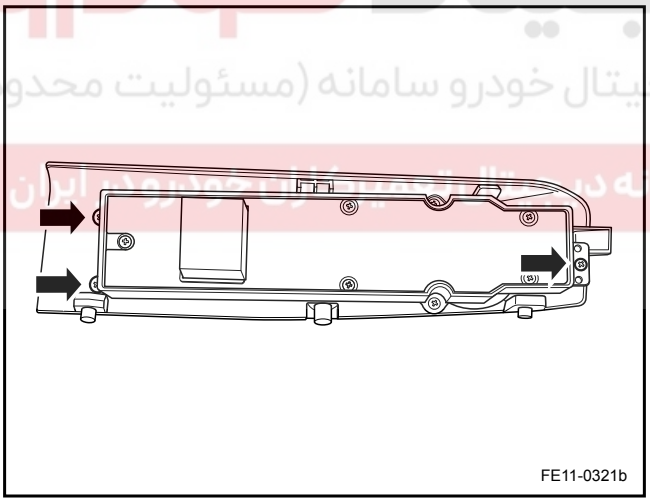
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices"



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the left front door trim panel. Refer to 11.5.8.1 Outside Rearview Mirror Replacement.
3. Remove the left front window switch panel to the door trim panel retaining screws and remove the switch panel.
4. Remove the left front window switch retaining screws.
5. Remove the left front window switch from the switch panel.



Installation Procedure:

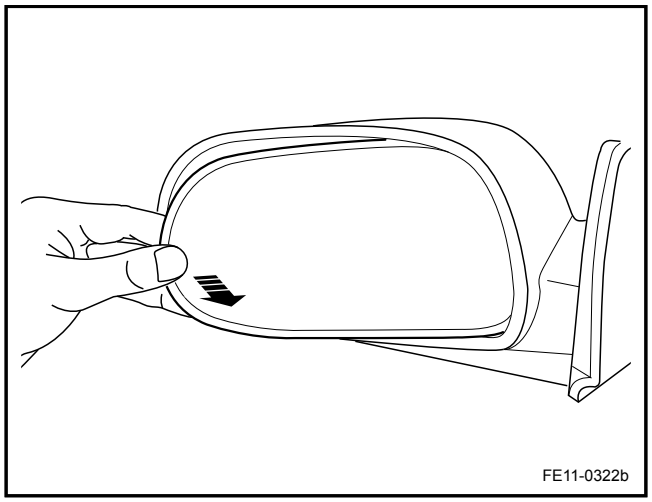
1. Install the left front window switch to the switch panel.
   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)
2. Install the left front window switch panel to the door trim panel retaining screws.
   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)
3. Install the left front door trim panel.
4. Connect the battery negative cable.

11.5.8.5 Electric Outside Rearview Mirror Adjust Motor Replacement

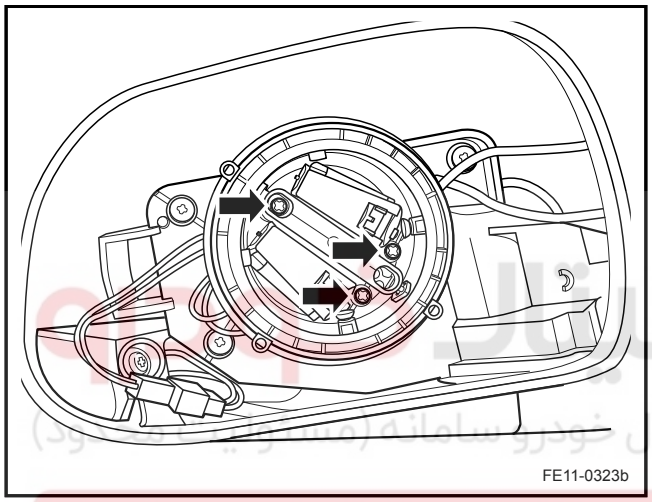
Removal Procedure

Warning!

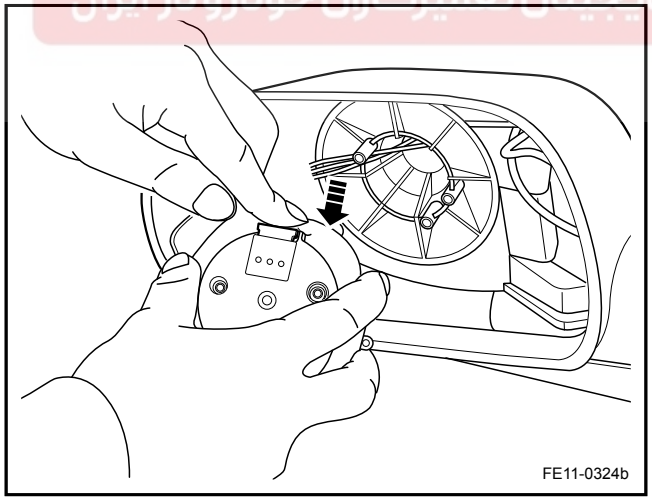
Refer to "Battery Disconnect Warning" in "Warnings and Notices"



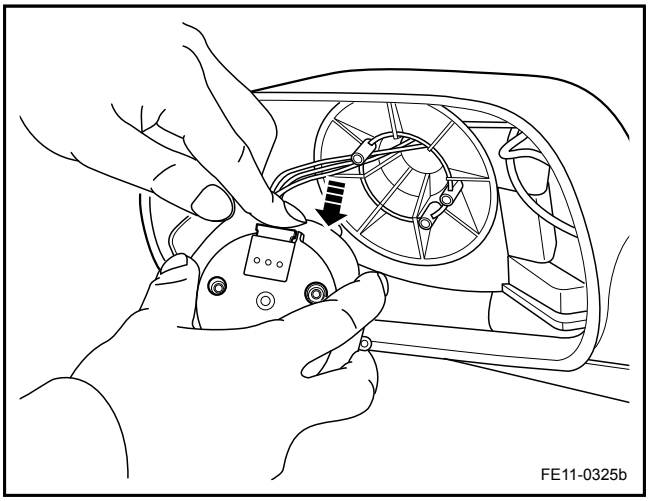
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the electric outside rearview mirror glass.



3. Disconnect the electric outside rearview mirror defroster wiring harness connector.
4. Remove the electric rearview mirror adjust motor retaining screws.



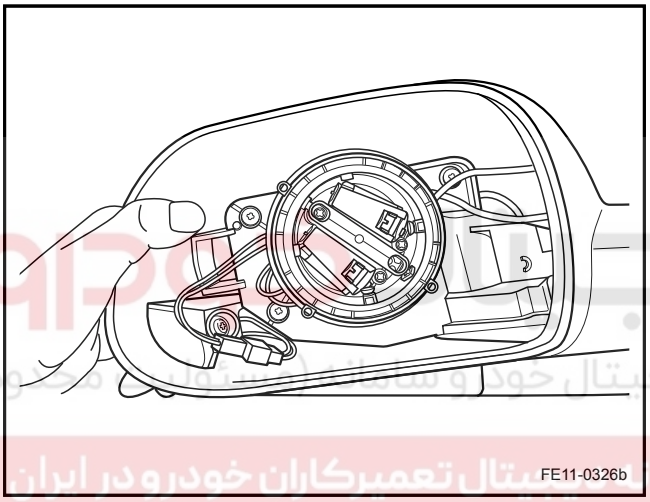
5. Remove the electric rearview mirror adjust motor from the electric rearview mirror bracket.
6. Disconnect the electric rearview mirror adjust motor wiring harness connector.



Installation Procedure:

1. Connect the electric rearview mirror adjust motor wiring harness connector.
2. Install the electric rearview mirror adjust motor to the electric rearview mirror motor bracket.
3. Install the electric rearview mirror adjust motor retaining screws.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)



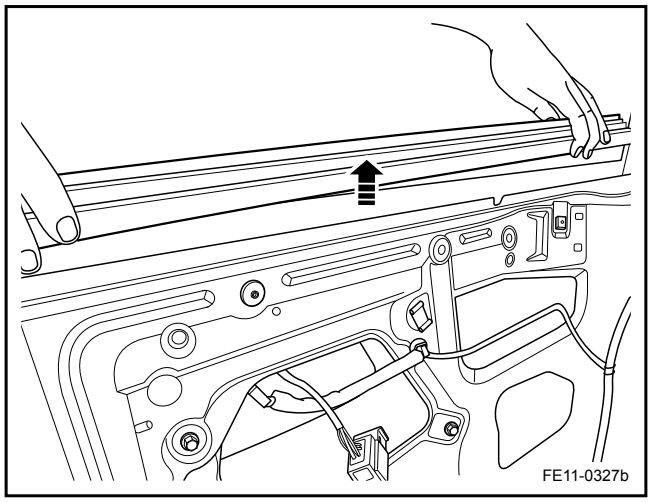
4. Connect the outside rearview mirror defroster wiring harness connector.
5. Install the outside rearview mirror glass.
6. Connect the battery negative cable.

11.5.8.6 Front Door Window Regulator Replacement

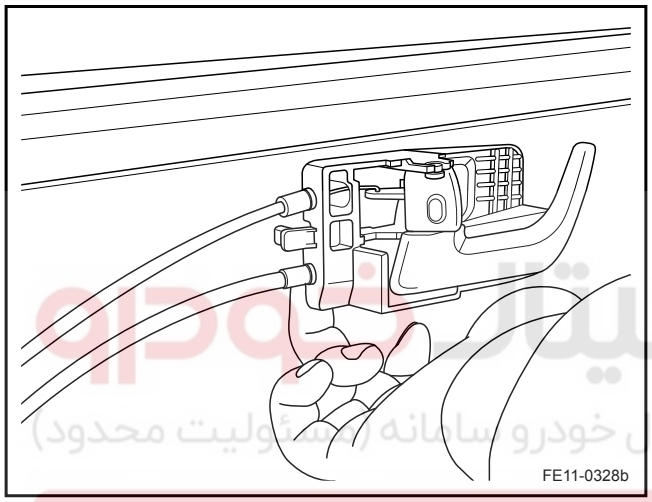
Removal Procedure

Warning!

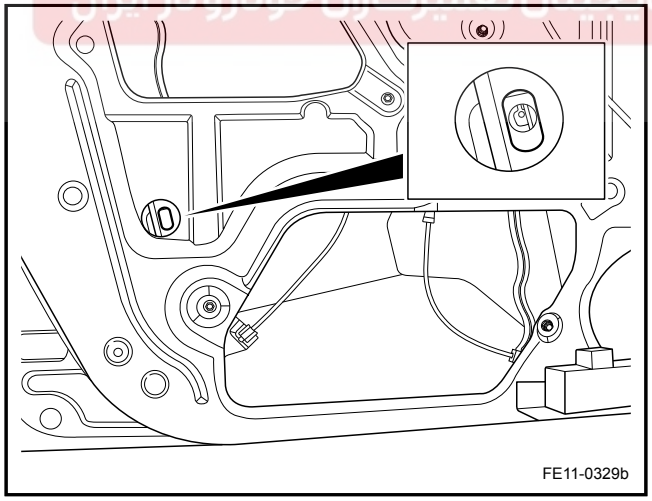
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



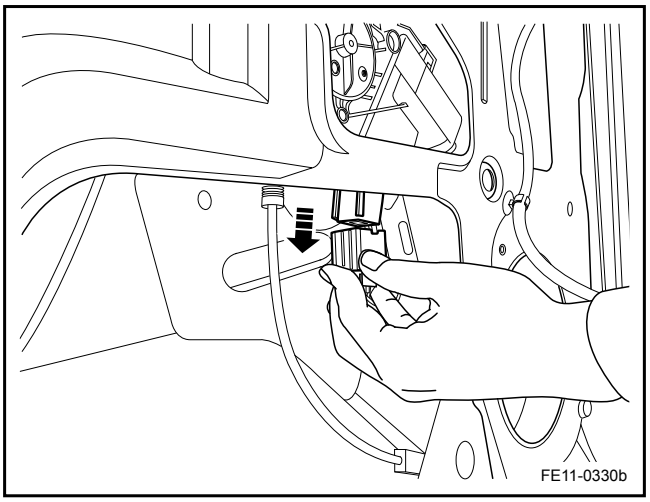
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front door trim panel. Refer to 11.5.8.1 Outside Rearview Mirror Replacement.
3. Remove the front door window inner seal strip.



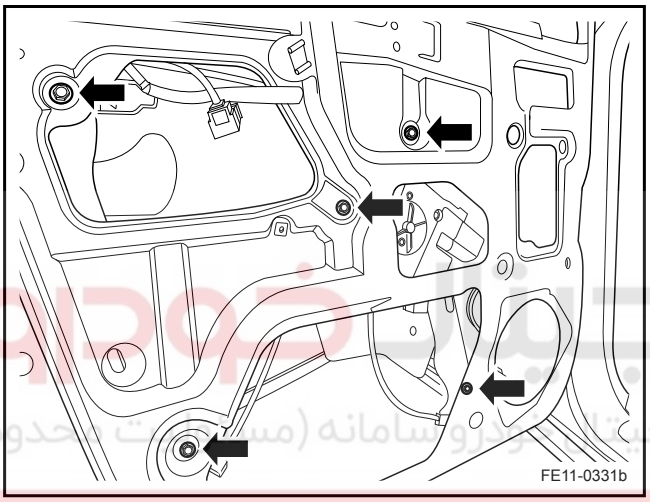
4. Remove the front door inside handle from the slot.



5. Remove the front door water deflector.
6. Hold the window regulator with a thin steel bar to release the window glass, otherwise the glass can not be removed.
7. Remove the front door window glass from the front door.

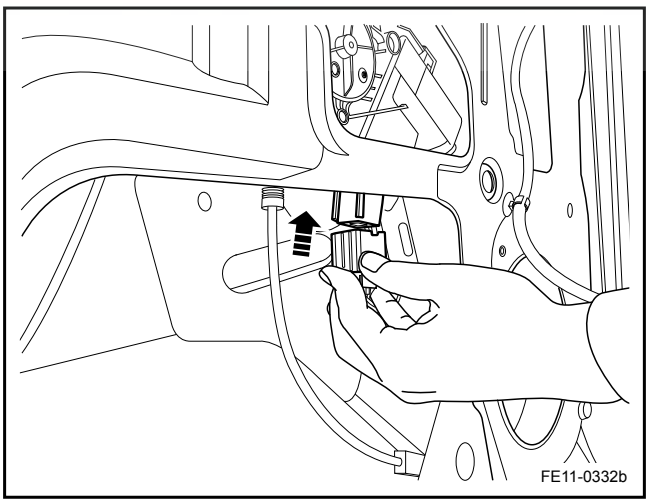


8. Disconnect the front door window regulator wiring harness connector.



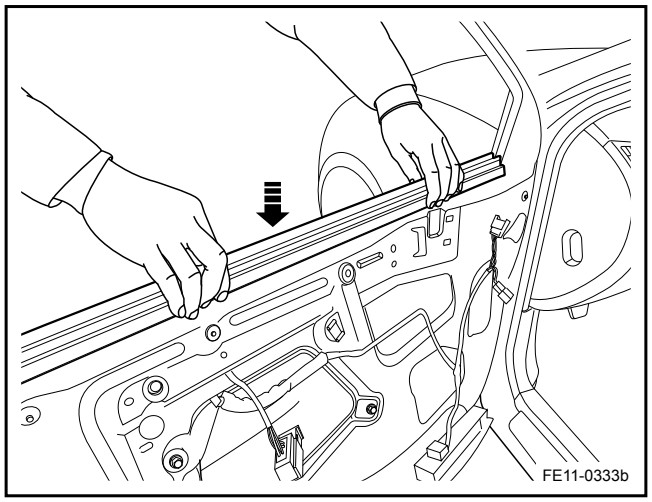
9. Remove the front door window regulator retaining nuts and bolts.
10. Remove the front door window regulator from the front door.

Installation Procedure:



1. Install and tighten the front door window regulator retaining nuts and bolts.

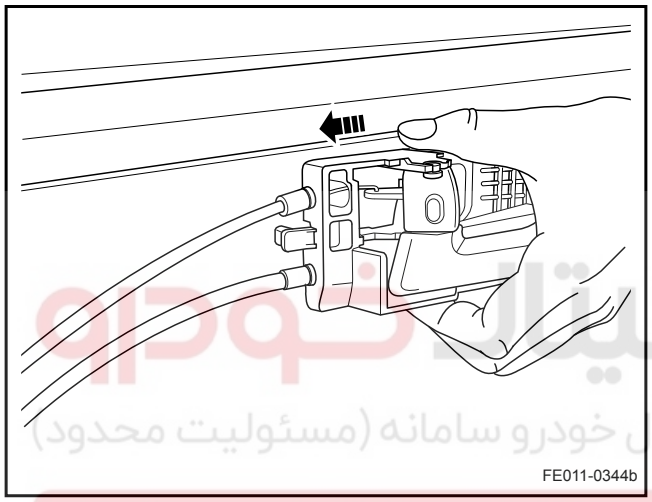
   Torque: 8 Nm (Metric) 6 lb-ft (US English)
2. Connect the front door window regulator wiring harness connector.



3. Install the front door water deflector.
4. Install the front door window glass into the front door and adjust the glass position in relation to the window regulator.

   Note

   The glass can not be properly installed caused by incorrect position.
5. Install the front door window inner seal strip.



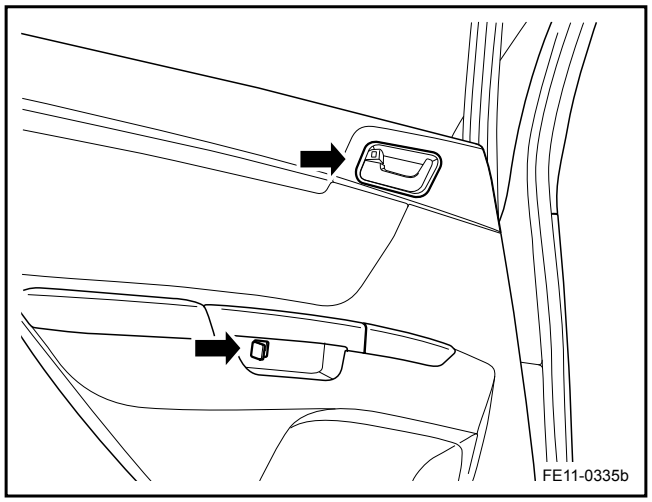
6. Install the front door inside door handle to the slot.
7. Install the front door trim panel.
8. Connect the battery negative cable.

11.5.8.7 Rear Window Regulator Replacement

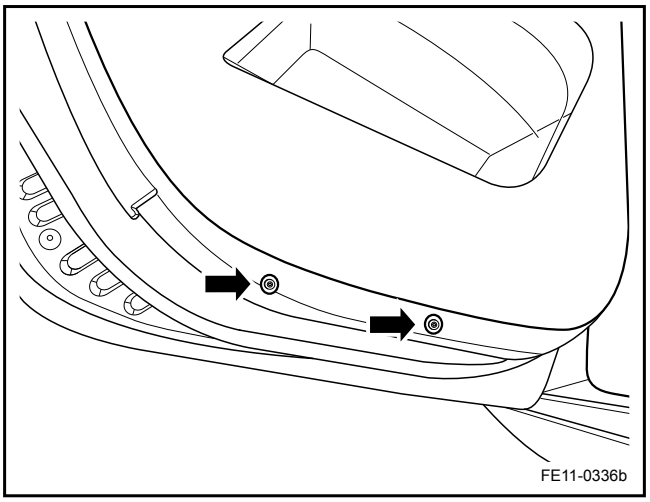
Removal Procedure

Warning!

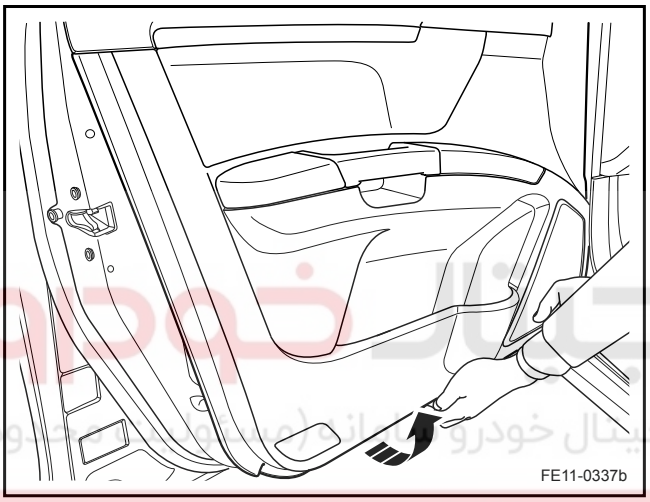
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear door armrest and inside door handle covers and remove the retaining screws.



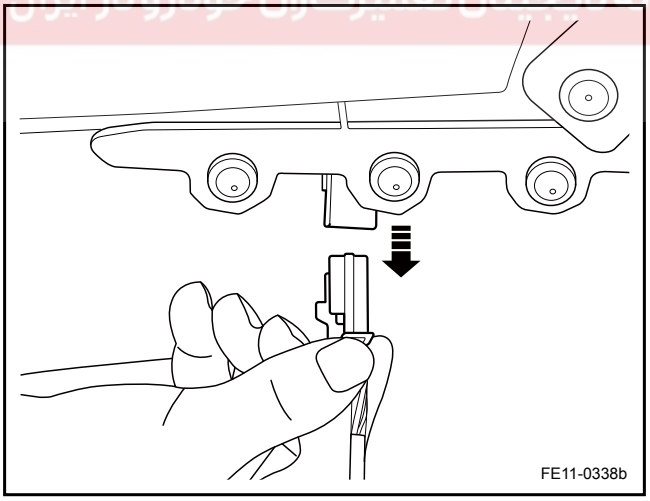
3. Remove the rear door trim panel lower retaining screws.



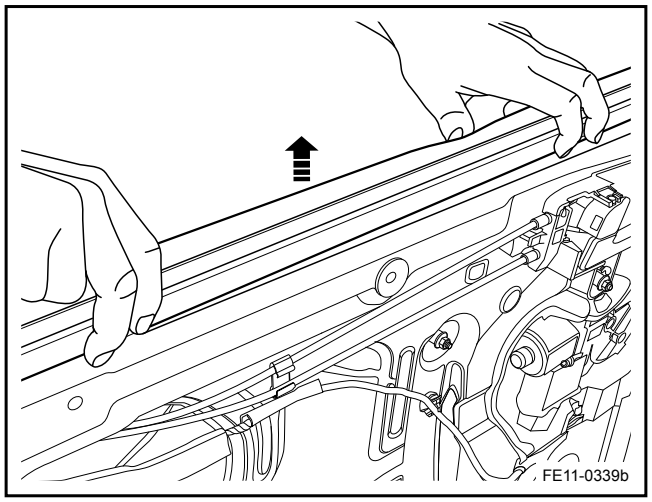
4. Remove the rear door trim panel.

Note

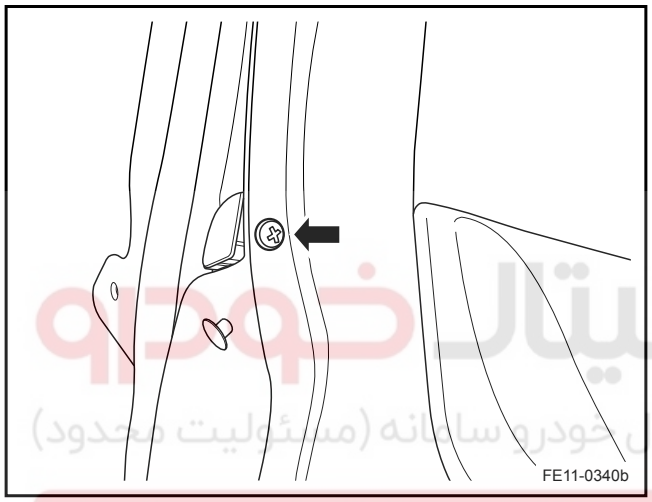
Do not damage the wiring harness connectors inside the rear door trim panel.



5. Disconnect the rear door window switch wiring harness connector and remove the rear door trim panel.



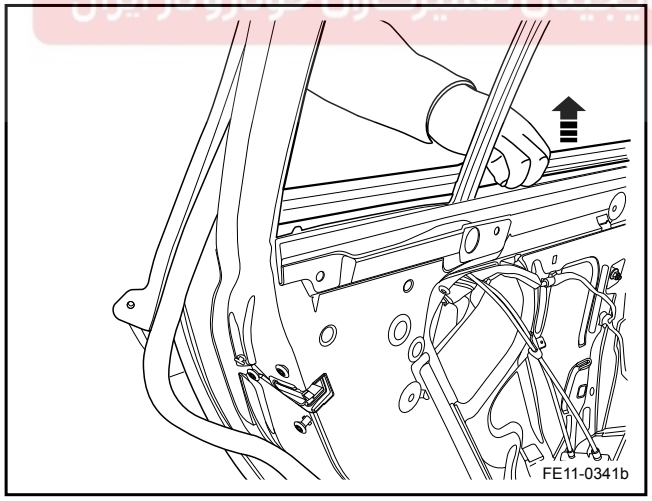
6. Remove the rear door window inner seal strip.



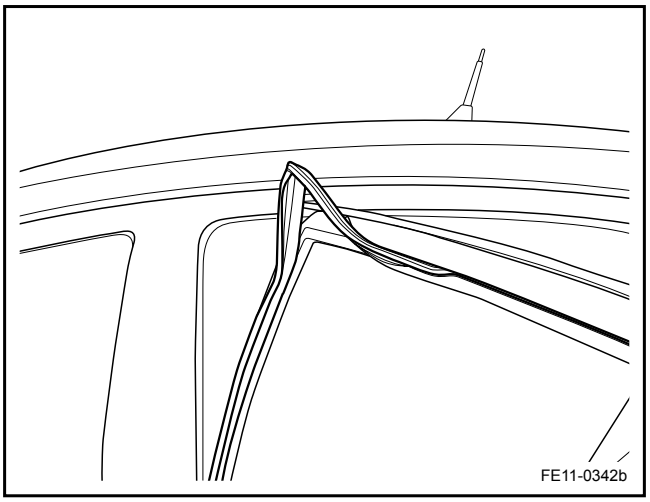
7. Remove the rear door window outer seal strip retaining screws from both sides.

Note

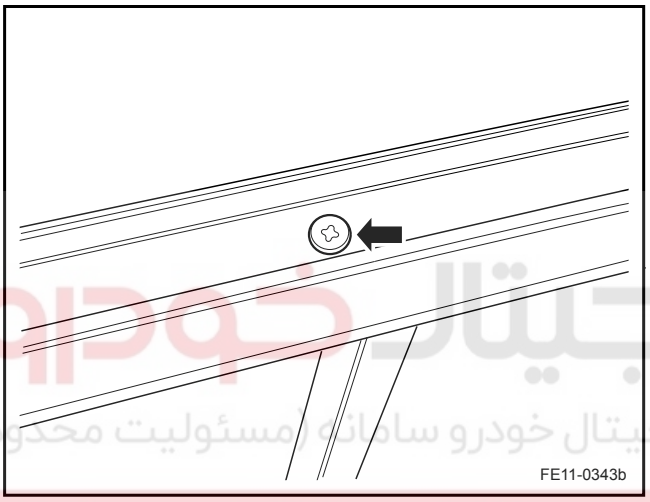
Forgetting to remove the retaining screws may damage the the rear door window outer seal strip.



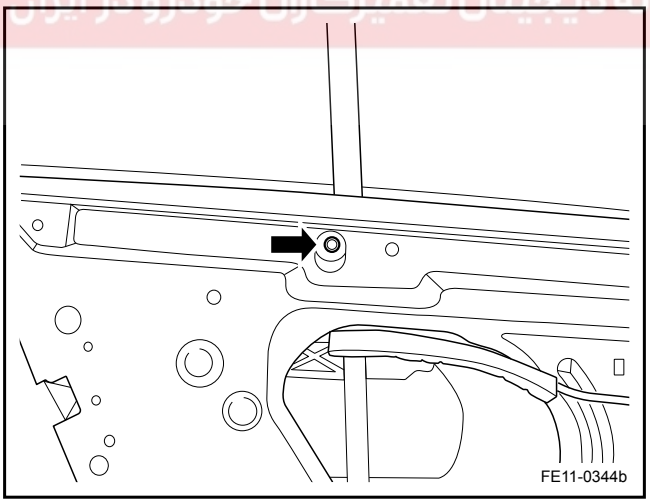
8. Remove the rear door window outer seal strip.



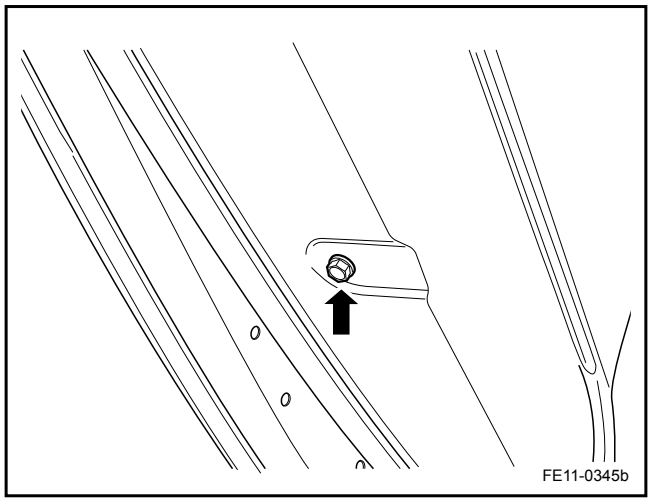
9. Remove the rear door window glass guide rail.



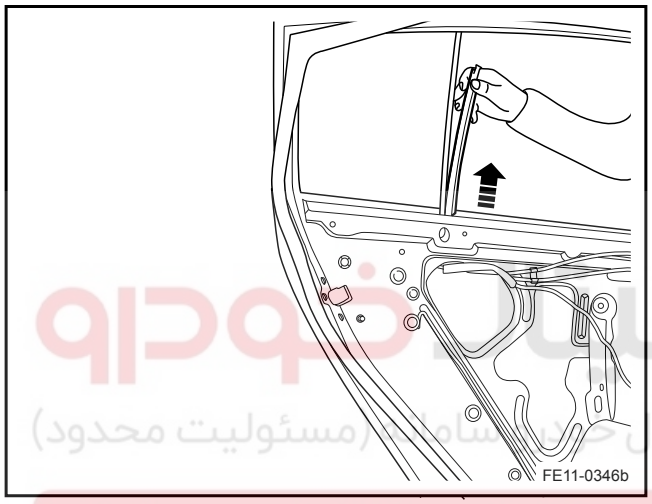
10. Remove the rear door window channel upper retaining bolt.



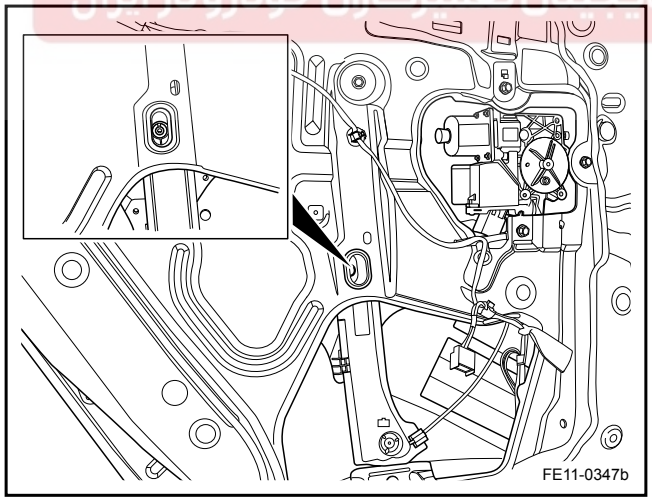
11. Remove the rear door window channel middle retaining bolt.



12. Remove the rear door window channel lower retaining bolt.

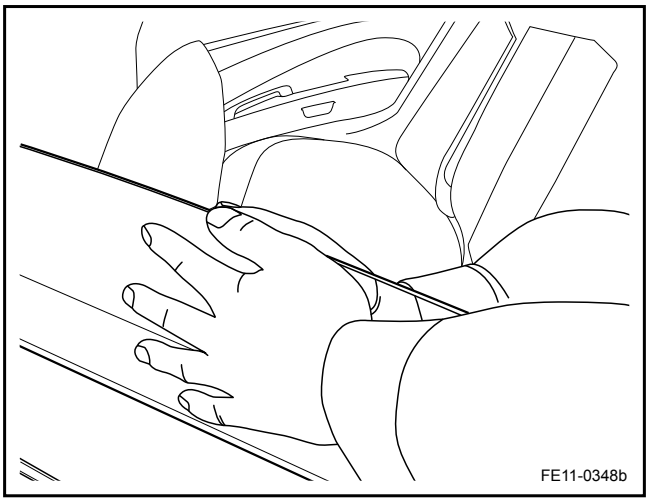


13. Remove the rear door window channel.

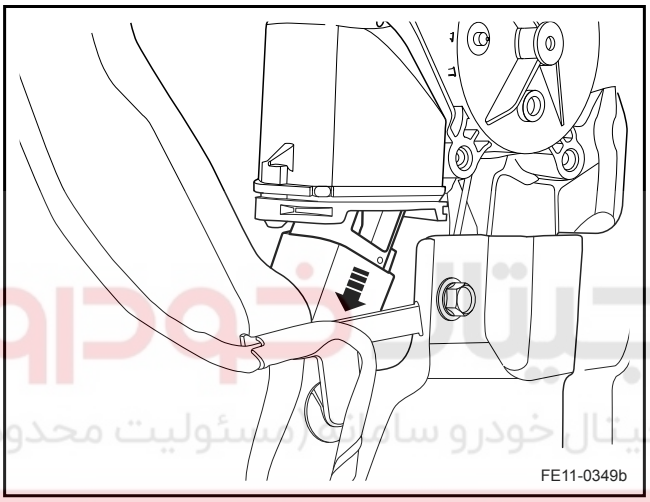


14. Remove the rear door water deflector.

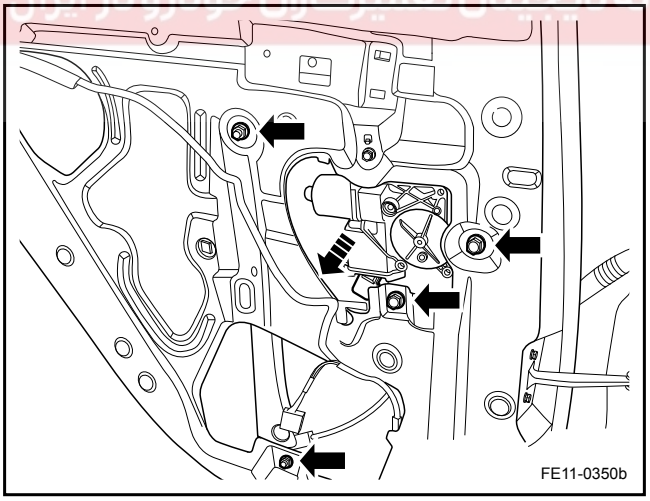
15. Remove the rear door window retaining pin with a screwdriver, otherwise the glass can not be removed.



16. Carefully lift the rear door window glass upward to remove the glass.

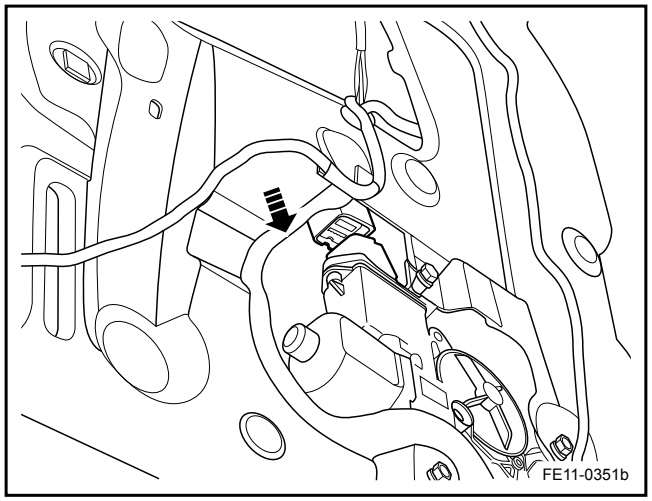


17. Disconnect the rear door window glass wiring harness connector.



18. Remove the rear door window regulator retaining nuts and window retaining bolts.

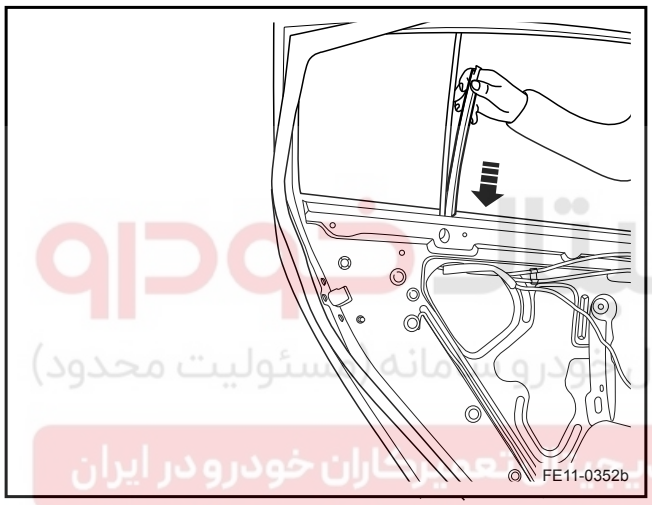
19. Remove the rear door window regulator.



Installation Procedure:

1. Install the rear window regulator.
2. Install the rear window regulator retaining bolts.

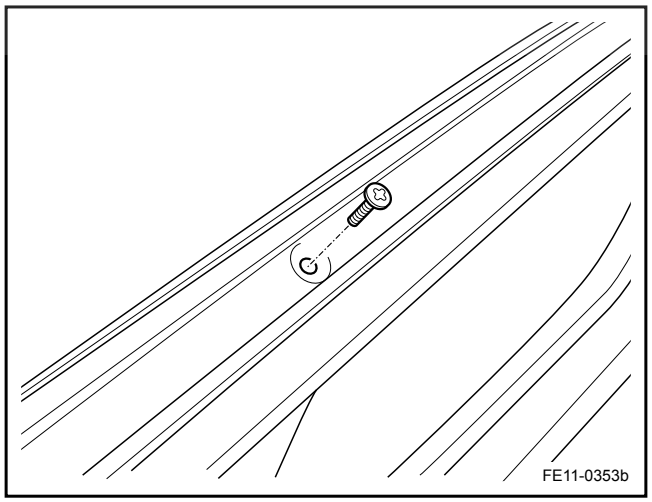
   Torque: 8 Nm (Metric) 6 lb-ft (US English)
3. Connect the rear door window regulator wiring harness connector.
4. Install the rear door window glass into the rear door and adjust the glass position.
5. Install the rear door window glass locating pin to the regulator bracket to retain the glass.
6. Install the rear door water deflector.



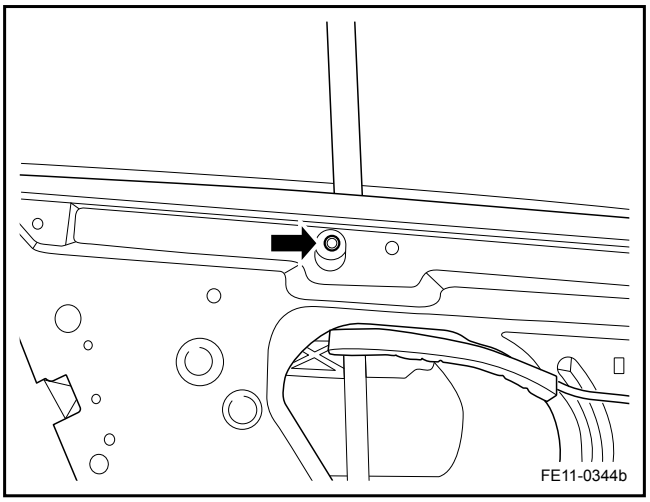
7. Install the rear door window channel.

   Note

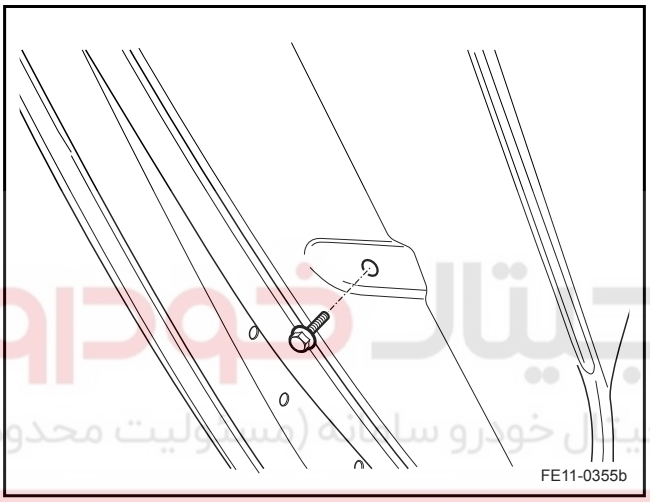
   Revolving the rear door window channel to fit the glass into the channel.



8. Install the rear door window channel upper retaining bolt.

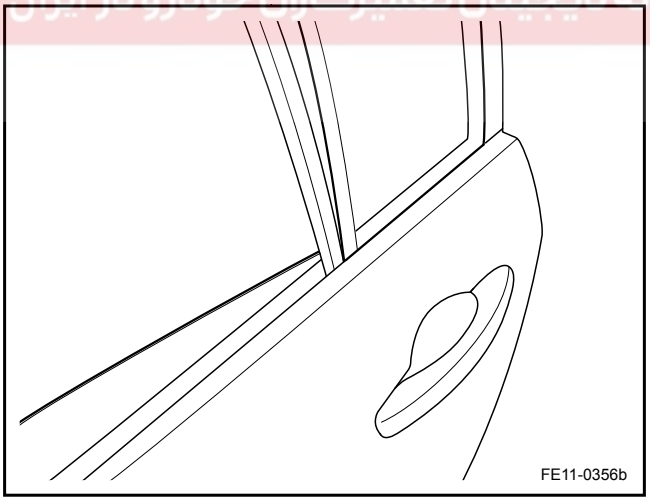


9. Install the rear door window channel middle retaining bolt.

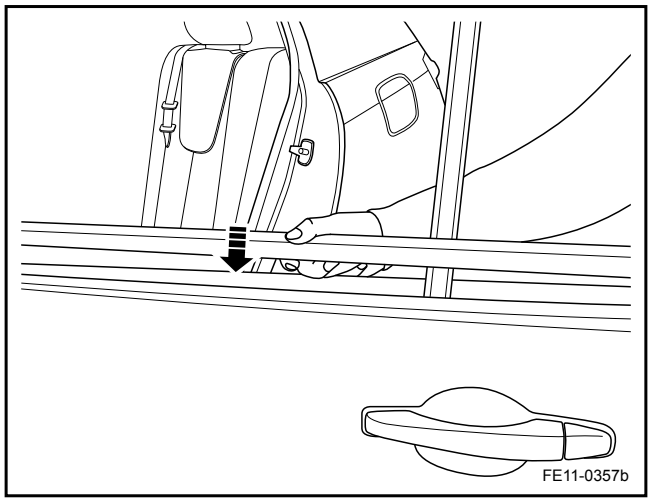


10. Install the rear door window channel lower retaining bolt.

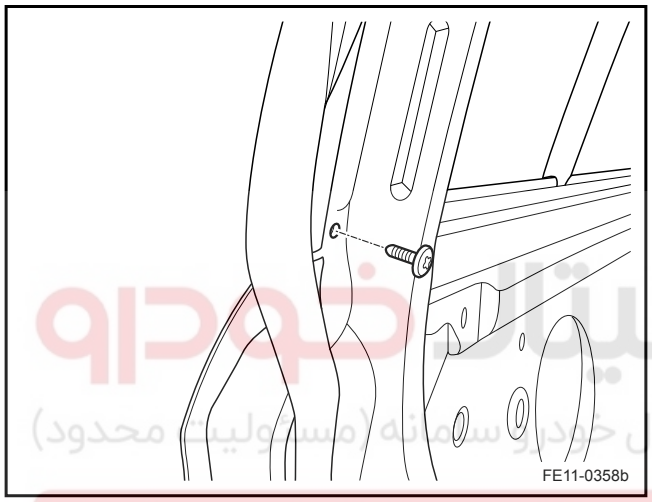
    Torque: 8 Nm (Metric) 6 lb-ft (US English)



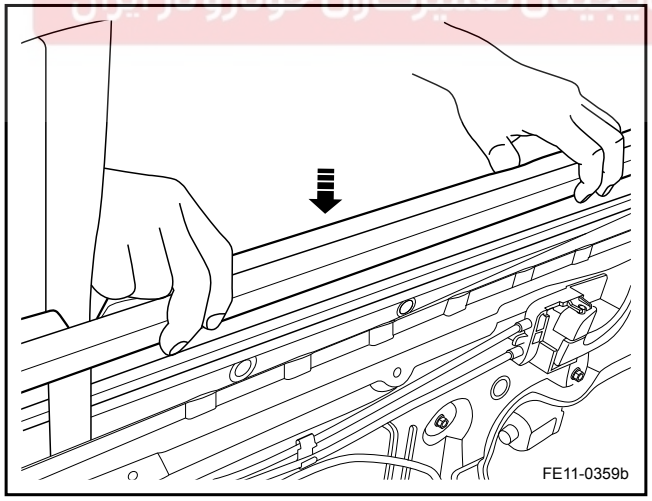
11. Lift the rear window glass to the position as shown in the graphic and install the rear door window guide rail.



12. Install the rear door window outer seal strip.

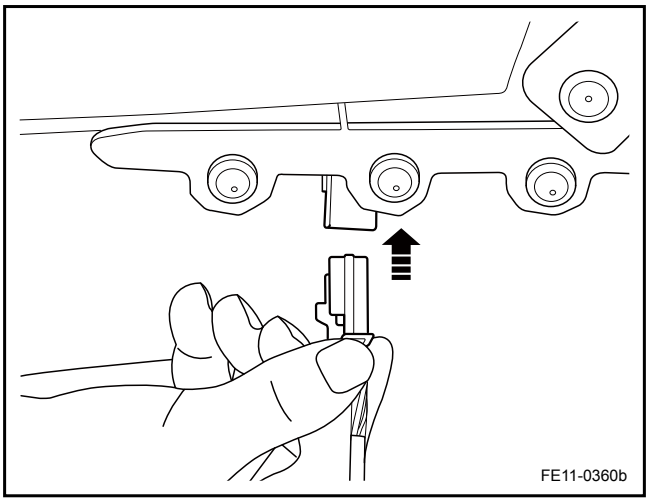


13. Tighten the rear door window outer seal strip retaining screw.



14. Install the rear door window inner seal strip.

15. Install the rear door inside door handle to the slot.


FE11-0360b

16. Connect the rear door window switch wiring harness connector.
17. Install the rear door trim panel clips.
18. Install the rear door trim panel.
19. Tighten the rear door trim panel retaining screw.

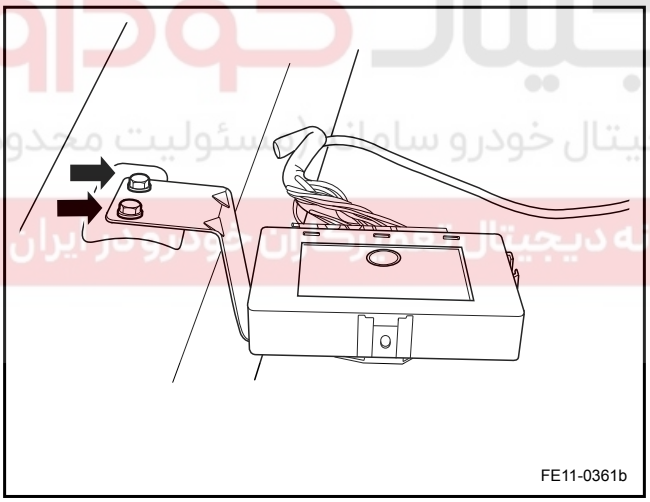
    Torque: 2 Nm (Metric) 1.5 lb-ft (US English)
20. Install the rear door armrest retaining screw cover.
21. Install the rear door handle retaining screw cover.

11.5.8.8 Window Regulator Module Replacement (If equipped)

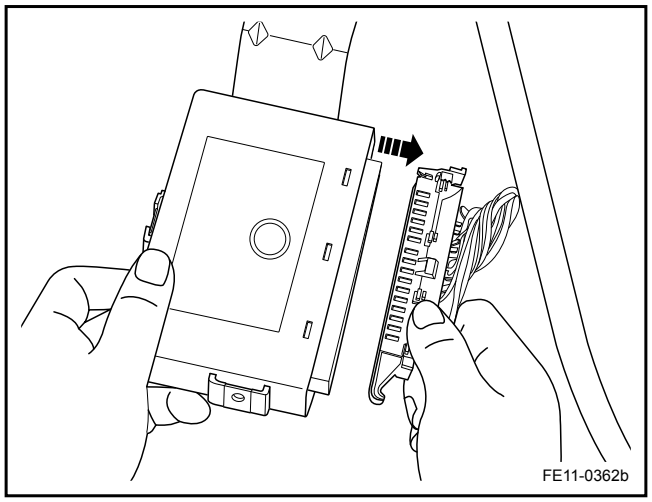
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

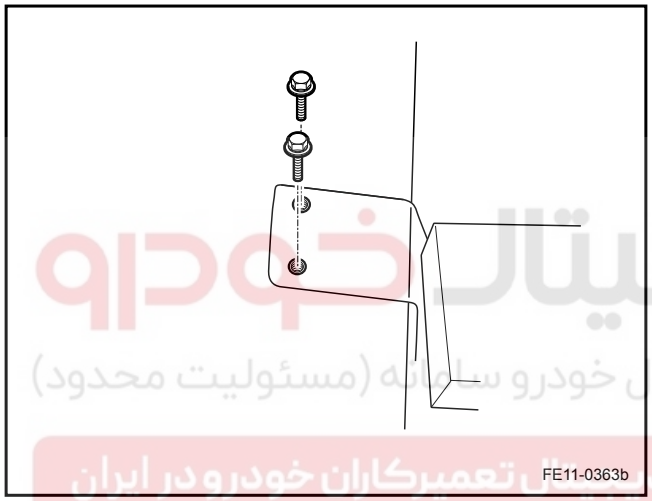

FE11-0361b

1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the left front seat. Refer to 11.11.8.1 Front Electric Seat Replacement.



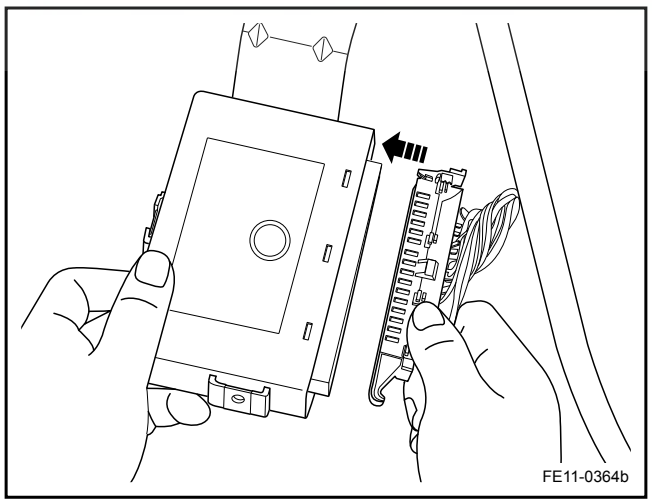
3. Disconnect the power window module harness connector.

Installation Procedure:



1. Install the window regulator module retaining bolts.

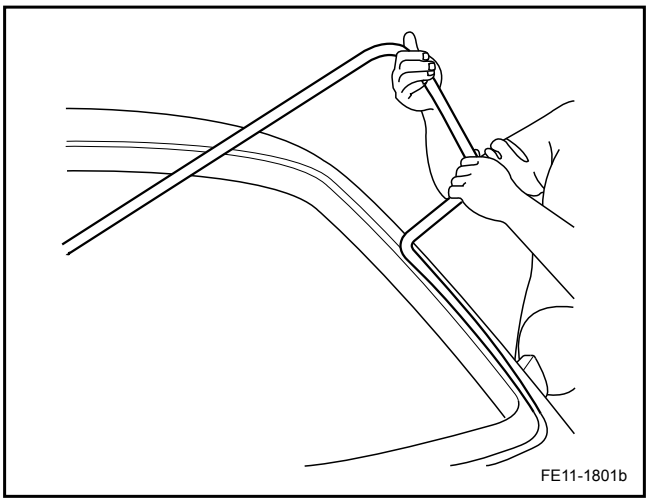
   Torque: 15 Nm (Metric) 11 lb-ft (US English)



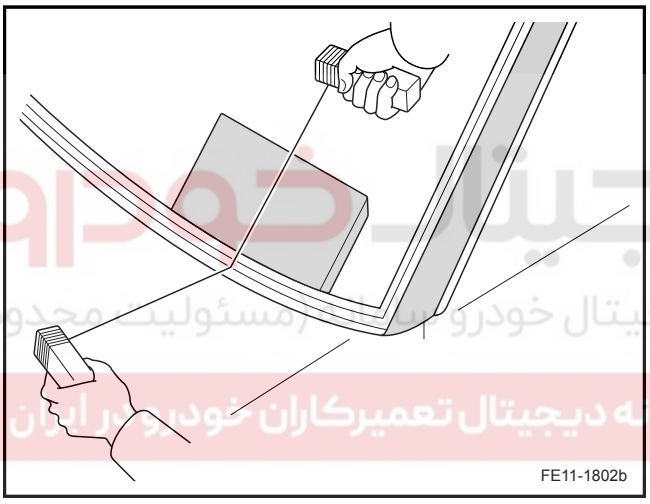
2. Connect the window regulator module harness connector.
3. Install the left front seat.
4. Connect the battery negative cable.

11.5.8.9 Windshield Replacement

Removal Procedure


FE11-1801b

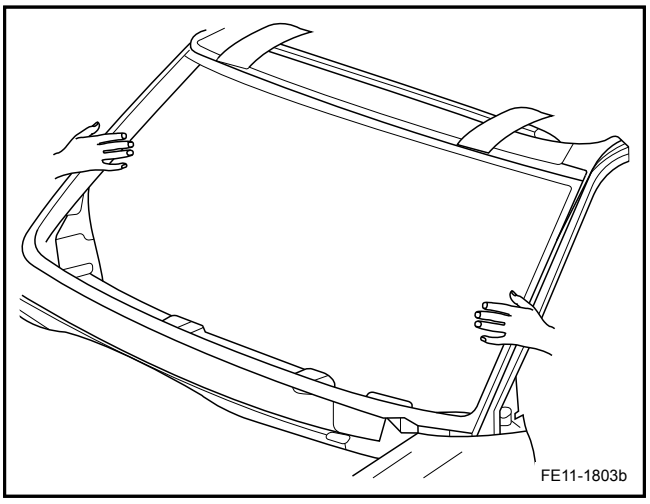
1. Remove the wiper arms. Refer to 11.6.8.2 Wiper Arm Replacement.
2. Remove the air inlet duct.12.10.1.3 Air Inlet Grille Panel Replacement.
3. Remove the left / right front A pillar garnish moldings. Refer to 12.9.1.3 Windshield Garnish Molding Replacement.
4. Remove the inside rearview mirror. Refer to 11.5.8.2 Inside Rearview Mirror Replacement.
5. Remove the seal around the windshield.


FE11-1802b

6. Cut the windshield glass adhesive with a thin steel wire.

   Note

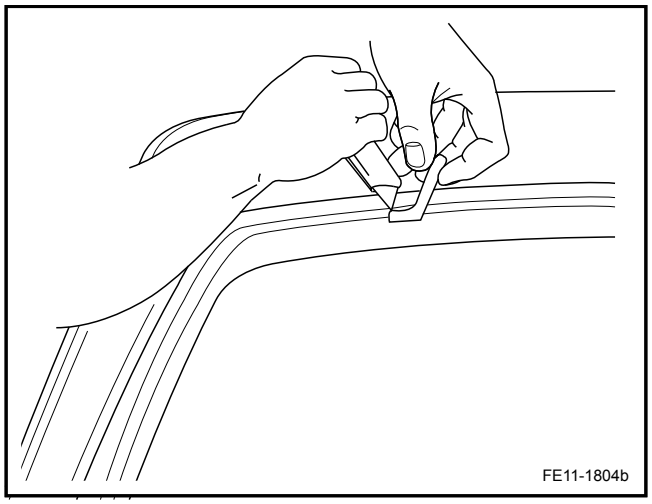
   Wrap both end of the fine steel wire around a wood handle, operate by with two people to facilitate the removal. Place a piece of plastic on the instrument panel to protect the instrument panel.


FE11-1803b

7. Remove windshield from the frame.

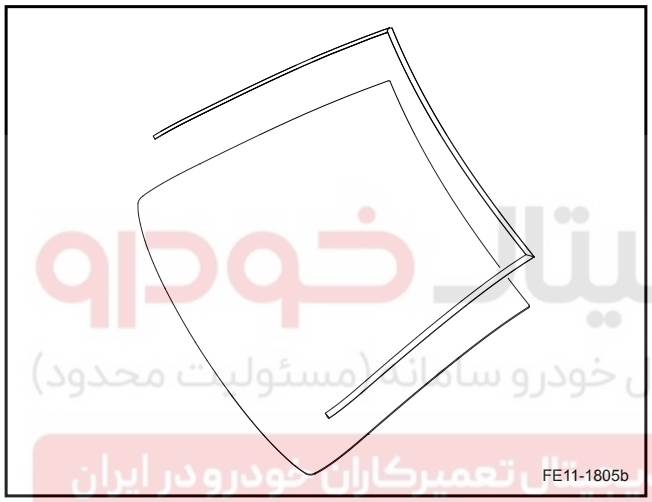
   Note

   It takes two people to complete this step.

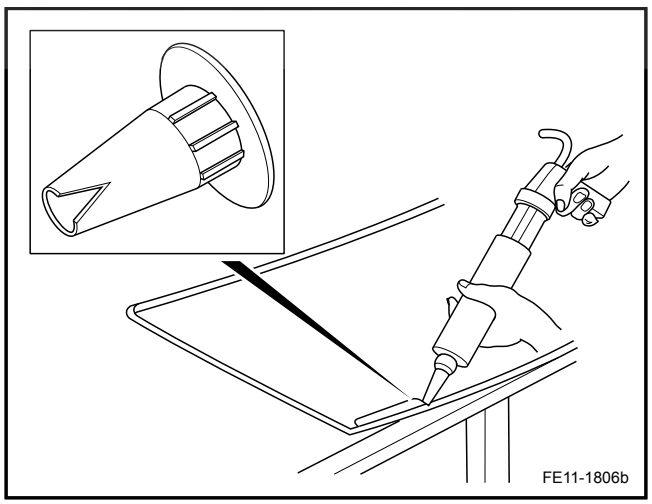


8. Remove the glue residue on the windshield with a blade.
9. Remove the glue residue on the windshield frame with a blade.
10. Clean the windshield inner surface with a cloth stained soaked with industrial ethanol and water mixture with 50/50 volume ratio.

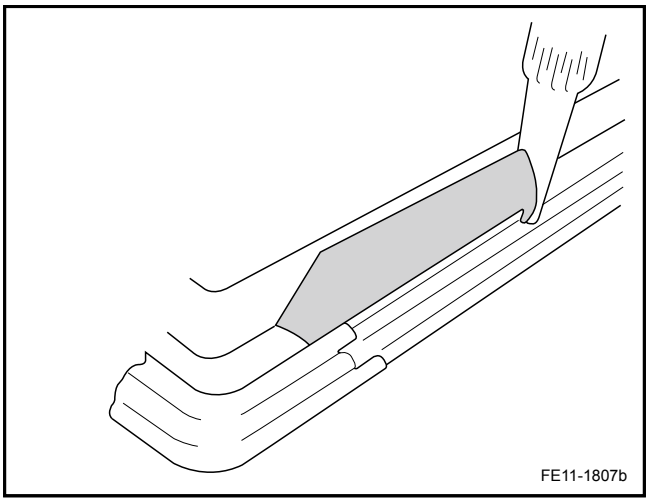
Installation Procedure:



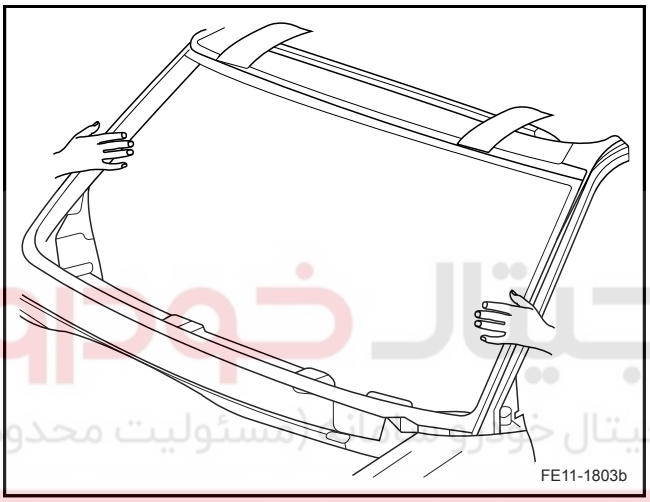
1. Apply the new glass seal strip to the windshield.



2. Spray the dedicated Geely glass sealant, with 8 mm (0.3 in) Width 8 mm (0.3 in) height.



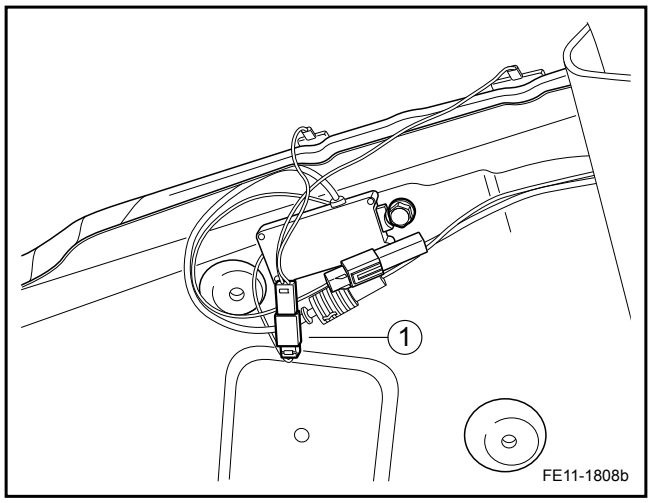
3. With a double-pipe gun evenly apply glass sealant to the window glass edge to make sure that the sealant width is even.



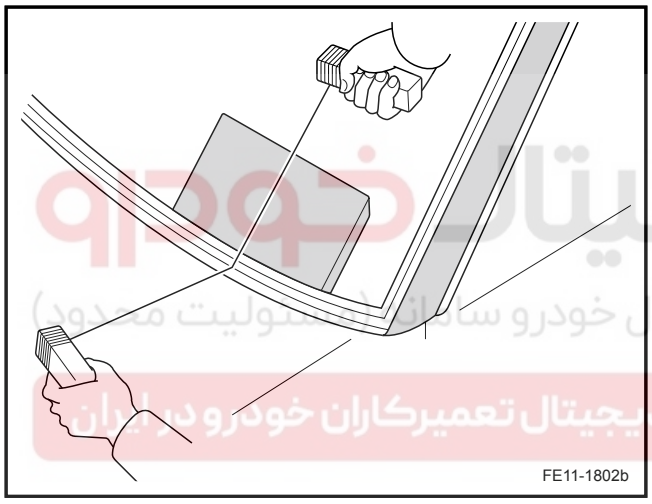
4. With the help of an assistant, install the windshield glass to the windshield frame.
5. Press the windshield glass to bond the adhesive to the seal strip, the windshield and the windshield frame to retain the windshield.
6. Let adhesive dry 24 h.
7. spray water onto the windshield to check for water leaks. If it leaks, dry the windshield and apply adhesives to the leaking location. If it still leaks, remove the windshield and repeat the entire repair procedure.
8. Install the inside rearview mirror.
9. Install the left / right A pillar garnish moldings.
10. Install the air inlet duct.
11. Install the wiper arms.

11.5.8.10 Rear Window Replacement (Sedan)

Removal Procedure



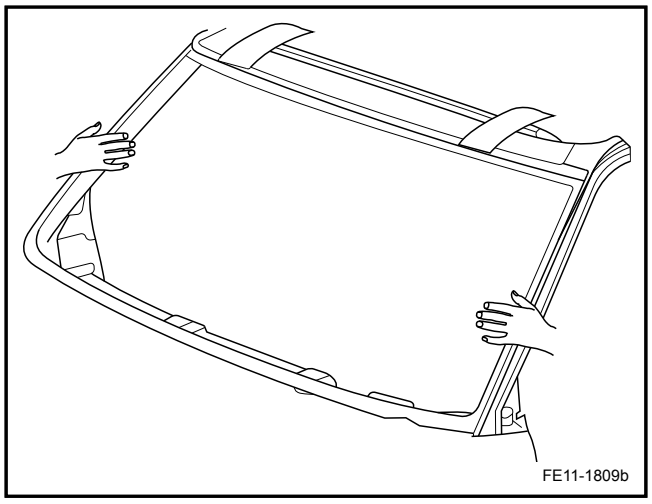
1. Remove the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the left / right rear upper quarter panel. Refer to 12.9.1.5 Rear Quarter Upper Trim Panel Replacement (Sedan).
3. Remove the rear parcel shelf. Refer to 12.9.1.7 Rear Parcel Shelf Replacement (Sedan).
4. Disconnect the rear window defroster electrical connector (1).



5. Cut the rear window glass adhesive with a thin steel wire.

   Note

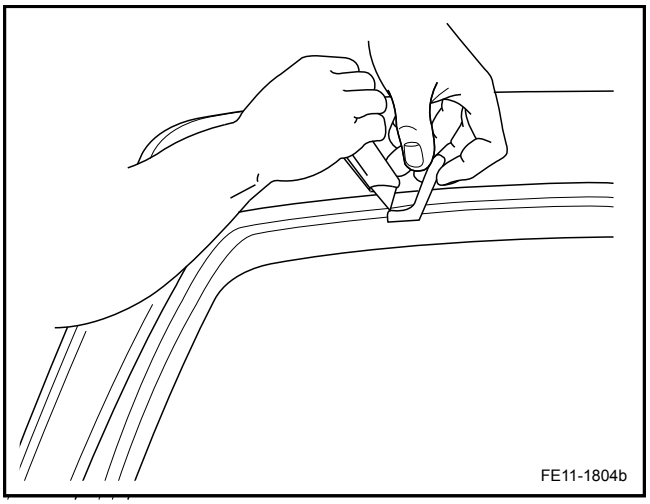
   Wrap both end of the fine steel wire around a wood handle, operate by with two people to facilitate the removal.



6. Remove the rear window glass from the rear window frame.

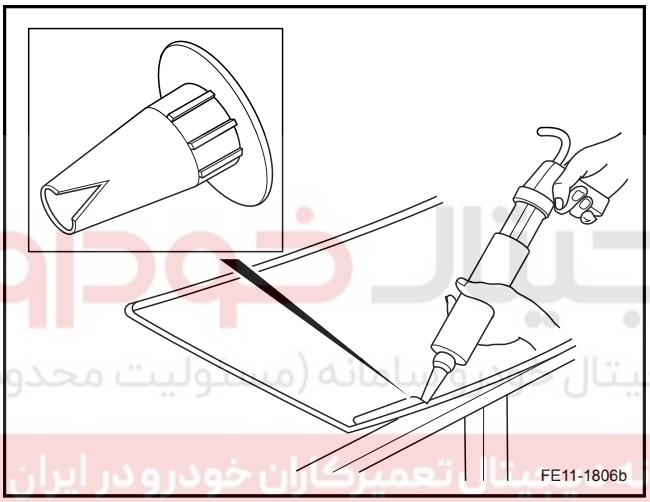
   Note

   It takes two people to complete this step.

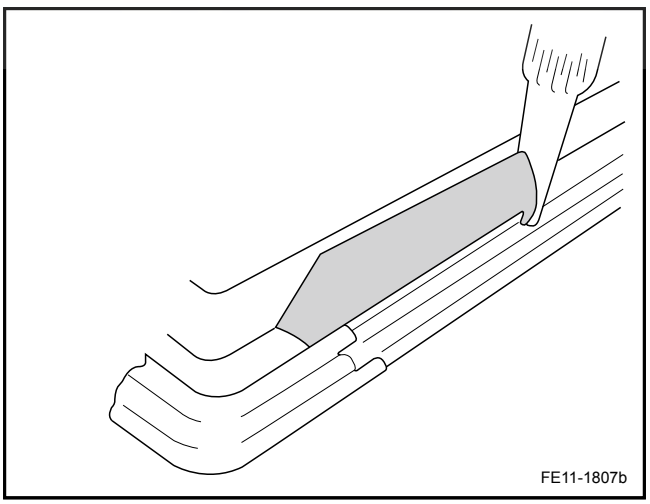


7. Removed the adhesive on the rear window glass with a blade.
8. Removed the adhesive on the rear window frame with a blade.
9. Clean the windshield inner surface with a cloth stained soaked with industrial ethanol and water mixture with 50/50 volume ratio.

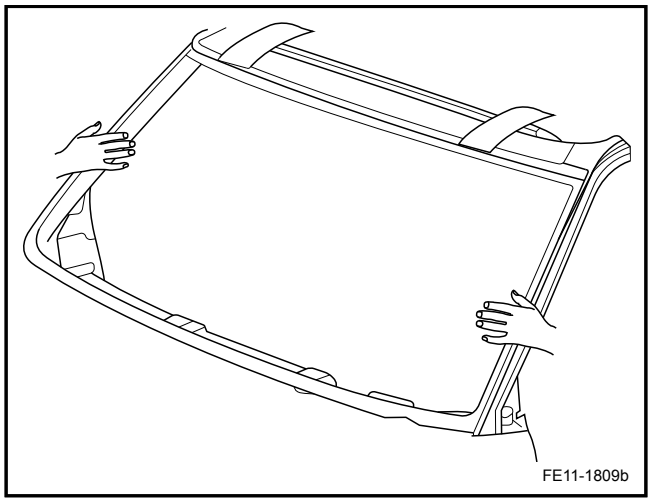
Installation Procedure:



1. Spray the dedicated Geely glass sealant, with 8 mm (0.3 in) width 8 mm (0.3 in) height.



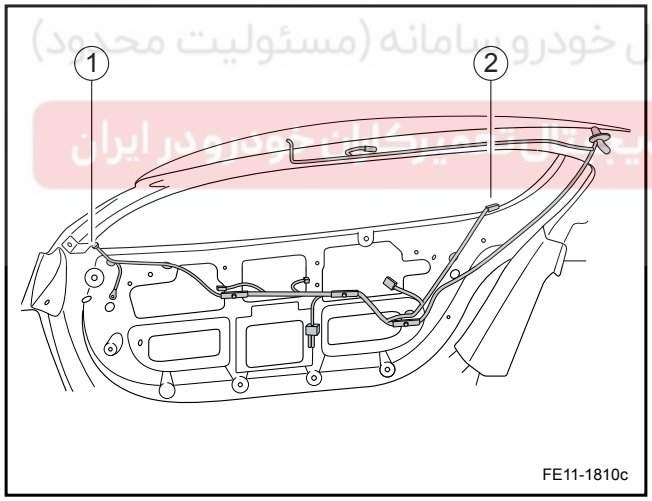
2. With a double-pipe gun evenly apply glass sealant to the window glass edge to make sure that the sealant width is even.


FE11-1809b

3. With the help of an assistant, install the rear window glass to the rear window frame.
4. Press the rear window glass to bond the adhesive to the seal strip, the rear window glass and the rear window frame to retain the rear window.
5. Let adhesive dry 24 h.
6. Spray water onto the rear window to check for water leaks. If it leaks, dry the rear window and apply adhesives to the leaking location. If it still leaks, remove the rear window and repeat the entire repair procedure.
7. Connect the rear window defroster wiring harness connector.
8. Install the rear parcel shelf.
9. Install left / right rear upper quarter panel.
10. Connect the battery negative cable.

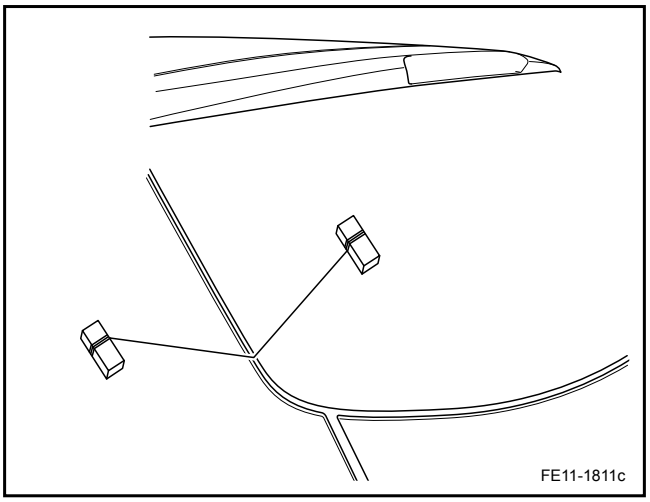
11.5.8.11 Rear Window Replacement (Hatchback)

Removal Procedure



FE11-1810c

1. Remove the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the wiper arm. Refer to 11.6.8.3 Rear Wiper Arm Replacement (Hatchback).
3. Remove the hatchback trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
4. Remove the high mounted brake lamp. Refer to the11.4.8.10 High Mounted Brake Lamp Replacement (Hatchback).
5. Disconnect Defroster harness connectors (1) and (2).



6. Cut the rear window glass adhesive with a thin steel wire.

   Note

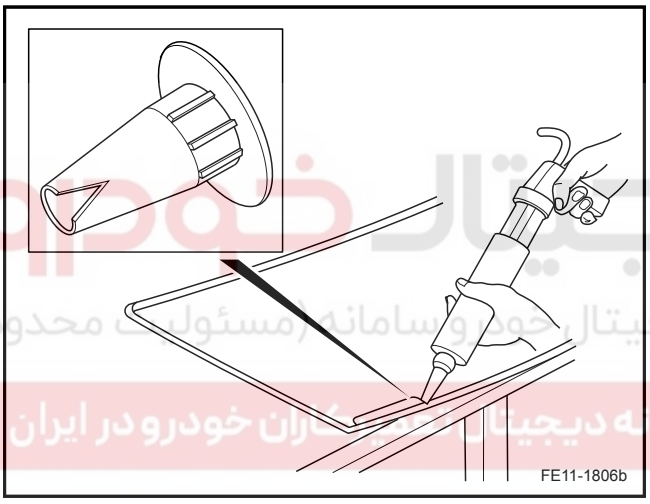
   Wrap both end of the fine steel wire around a wood handle, operate by with two people to facilitate the removal.

7. Removed the adhesive on the rear window glass with a blade.

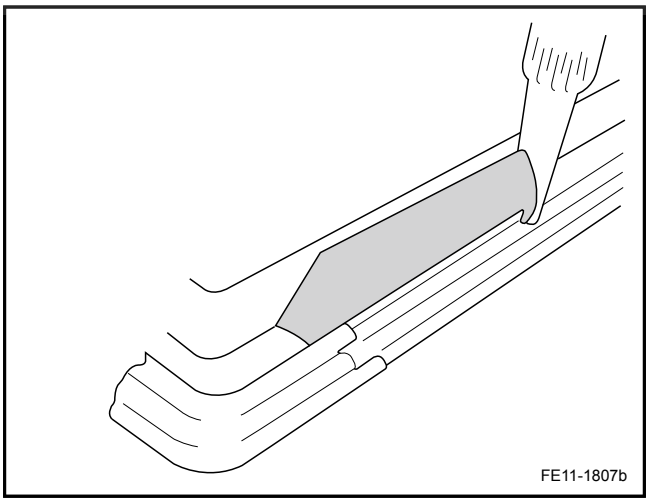
8. Removed the adhesive on the rear window frame with a blade.

9. Clean the windshield inner surface with a cloth stained soaked with industrial ethanol and water mixture with 50/50 volume ratio.

Installation Procedure:



1. Spray the dedicated Geely glass sealant, with 8 mm (0.3 in) width 8 mm (0.3 in) height.



2. With a double-pipe gun evenly apply glass sealant to the window glass edge to make sure that the sealant width is even.

3. With the help of an assistant, install the rear window glass to the rear window frame.

4. Press the rear window glass to bond the adhesive to the seal strip, the rear window glass and the rear window frame to retain the rear window.

5. Let adhesive dry 24 h.

6. Spray water onto the rear window to check for water leaks. If it leaks, dry the rear window and apply adhesives to the leaking location. If it still leaks, remove the rear window and repeat the entire repair procedure.

7. Connect the rear window defroster wiring harness connector.
8. Install the wiper arms.
9. Install the hatchback trim panel.
10. Install the high mounted brake lamp.
11. Connect the battery negative cable.

11.6 Wipers / Washers System

11.6.1 Specifications

11.6.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Front Fender Liner Screws	ST4.8	6-8	4.4-6
Washer Fluid Tank Retaining Bolts	M6 × 20	8-11	6-8
Wiper Retaining Bracket	M6 × 20	8-11	6-8
Wiper Motor Bolts	M6 × 20	8-11	6-8
Wiper Arm Connecting Rod Nut	M8	8-9	6-7
Wiper Arm Nut	M8	14-16	10-12
Rear Wiper Motor Bolt	M6 × 20	8-11	6-8
Rear Wiper Arm Nut	M6	8-11	6-8

11.6.2 Description and Operation

11.6.2.1 Description and Operation

Wipers / washers system consists of the following components:

- Central Controller
- Wipers / Washers Switch
- Washer Fluid Tank
- Washer Pump
- Wiper Motor
- Wiper Arm and Connecting Rod Installation
- IF27 20A Wiper / Washer Switch Fuse
- Rear Washer Pump (Hatchback)
- Rear Wiper Motor (Hatchback)
- Rear Wiper Arm (Hatchback)
- IF28 10 A Rear Wiper Fuse (Hatchback)
- Rear Wiper Relay (Hatchback)

Wiper / washer system can achieve high-speed, low speed, intermittent three kinds of wiper speed, and can wiper switch off automatically after the reset function.

Front Wiper / Washer System

Front wiper system consists of a wiper motor, linkage, wiper arm, wiper blades as well as the wiper / washer switch. Front wiper circuit has a self-cut-off device, which consists of a worm gear and a cam plate. The device aims at temporarily maintain the circuit integrity when the wiper / washer switch is off until the wiper arm is back to the original position. Wiper system consists of a permanent magnet motor. The front wiper motor is installed on the front fender and directly connected with the front wiper rod. The front wiper motor speed has two stages (high-speed and low speed), and it can operate intermittently. Wiper switch is a wiper / washer system component. Front wiper switch is installed on the steering column right side lever.

Windshield Washer System

Windshield washer system consists of a washer fluid tank, washer pump, hoses, nozzles and wiper / washer switch. Windshield washer fluid tank is installed below the right front headlamp assembly, in the front of the right front fender. Washer pump is retained on the washer fluid tank, which sends washing liquid through the hose to the two nozzles installed on the engine hood. Wiper switch is also a washing / washer switch component.

Rear Wiper / Washer System (Hatchback)

Windshield wiper system consists of a rear wiper motor, wiper arm and wiper blades. Rear wiper motor is located in the hatchback, and directly connected to the rear window wiper arms and equipped with a separate washer pump, hoses and nozzles. Rear washer system shares the same washer tank and the same washer pump with the windshield washer system. Washer pump sends washing fluid through the hose to the rear nozzle installed on the hatchback. Rear window washer nozzle passes through the high mounted brake lamp cover and retained inside this cover.

11.6.3 System Working Principle

11.6.3.1 System Working Principle

Front wiper system is directly controlled by the wiper / washer switch. Front wiper motor wiring harness connector terminal No.4 is the high-speed wiper input, terminal No.1 is the low-speed wiper input. Different signals from the IF27 20A wiper / wash switch power supply through wiper / washer switch to the wiper motor input achieve different wiper speed.

The wiper / washer switch has a built-in integrated circuit, which monitors the wiper motor return switch signal. Once the wiper switch is off, the power from the IF27 20A wiper / wash switch fuse is cut off. This IC can send output voltage through the wiper / washer switch contact circuit to the front wiper motor low-speed input terminal No.1, until the wiper arms are back to the original position. Reset switch signals change and cut off the voltage output, so the wiper arm reset is achieved.

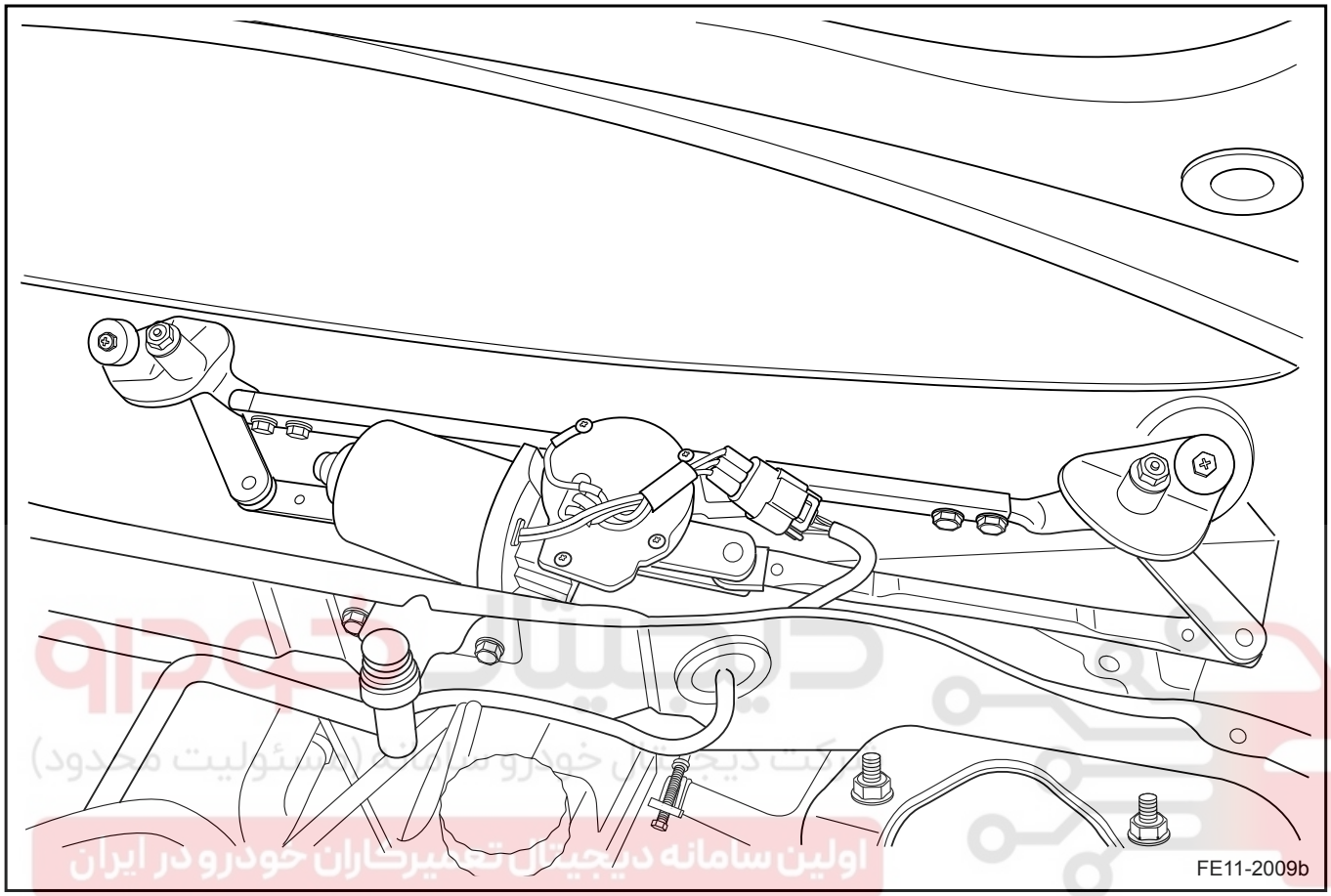
The rear wiper system is controlled by the central controller. The integrated rear wiper switch sends continuous and intermittent wiper requests to the central controller. The central controller controls the rear wiper relay pull-in to achieve rear wiper control.

Front and rear washer pump is driven directly by the wash switch. The switch built-in integrated circuit can monitor the front washer pump signal, and after 2s continued washing the rear wipers will be automatically enabled. The rear wiper system is controlled by the central controller.

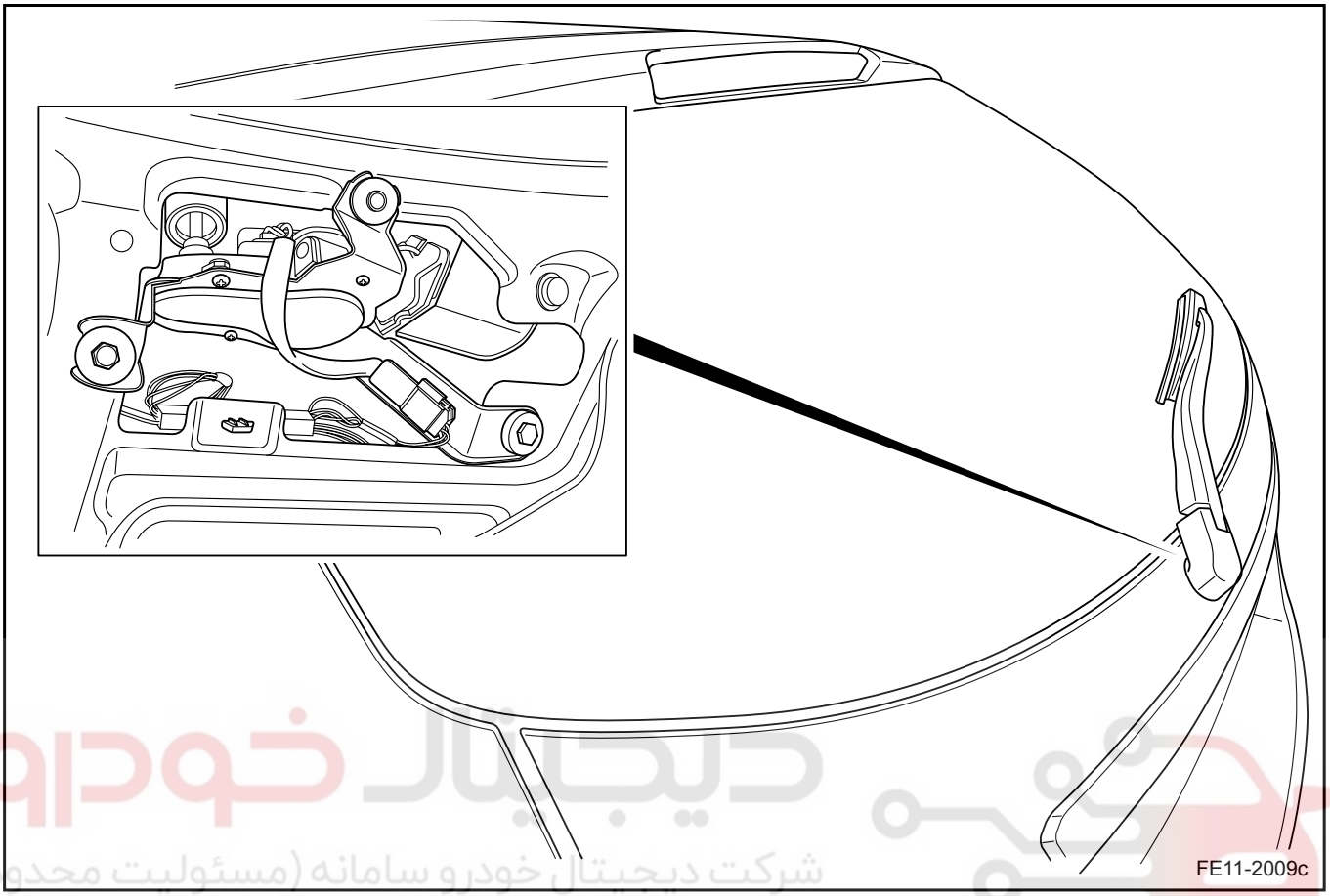
11.6.4 Component Locator

11.6.4.1 Component Locator

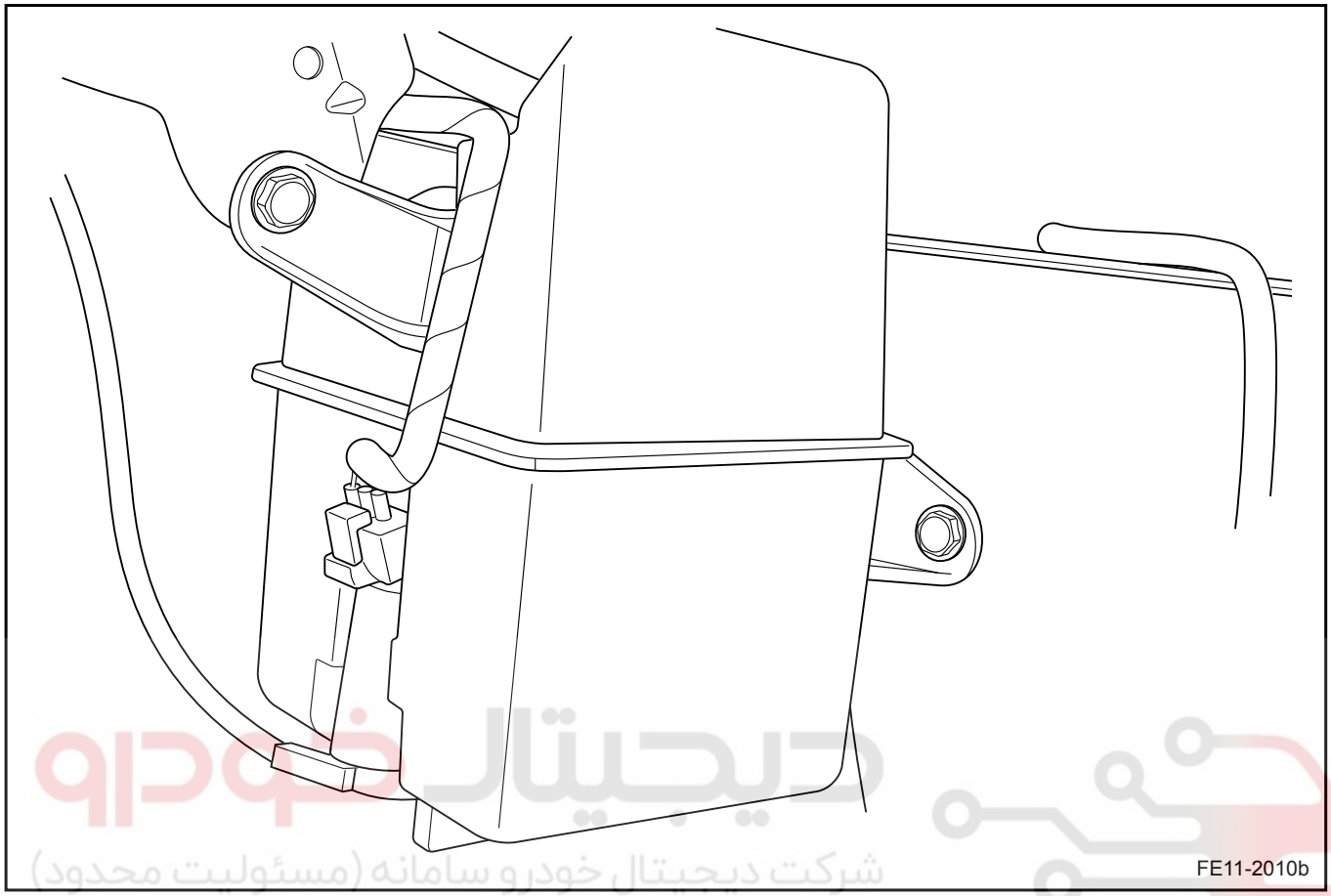
Front Wiper Motor



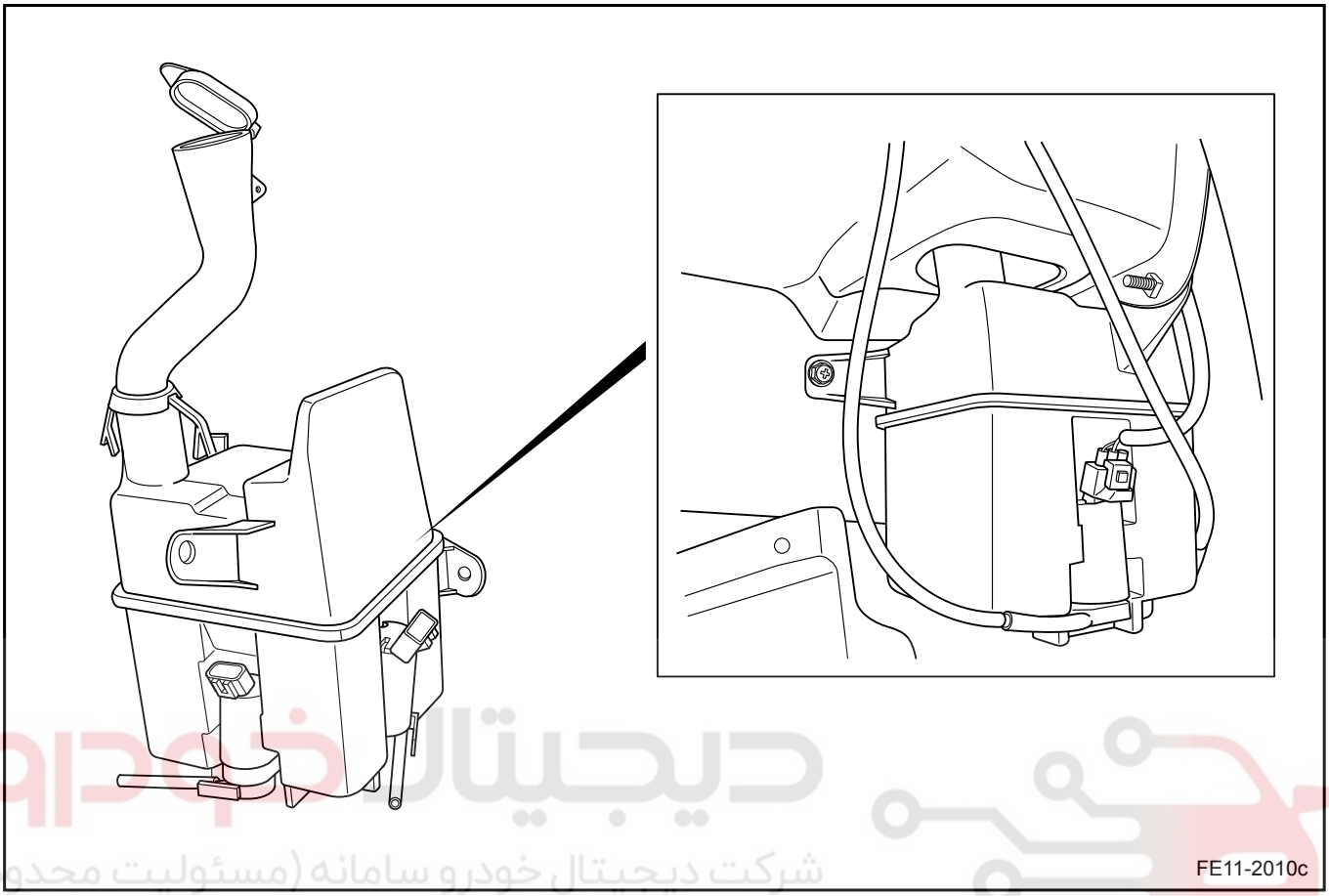
Rear Wiper Motor (Hatchback)



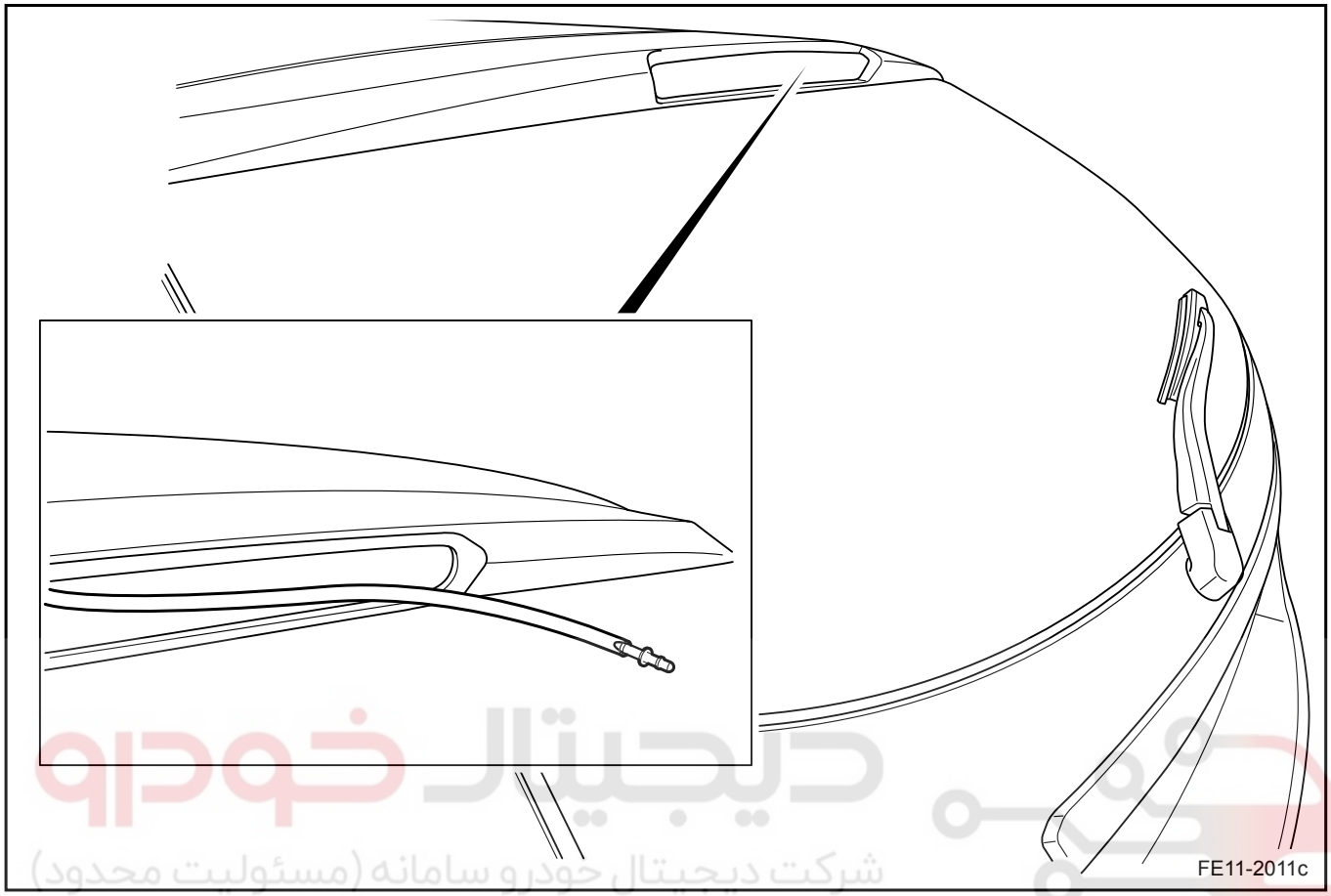
Washer Fluid Tank (Sedan)



Washer Fluid Tank (Hatchback)



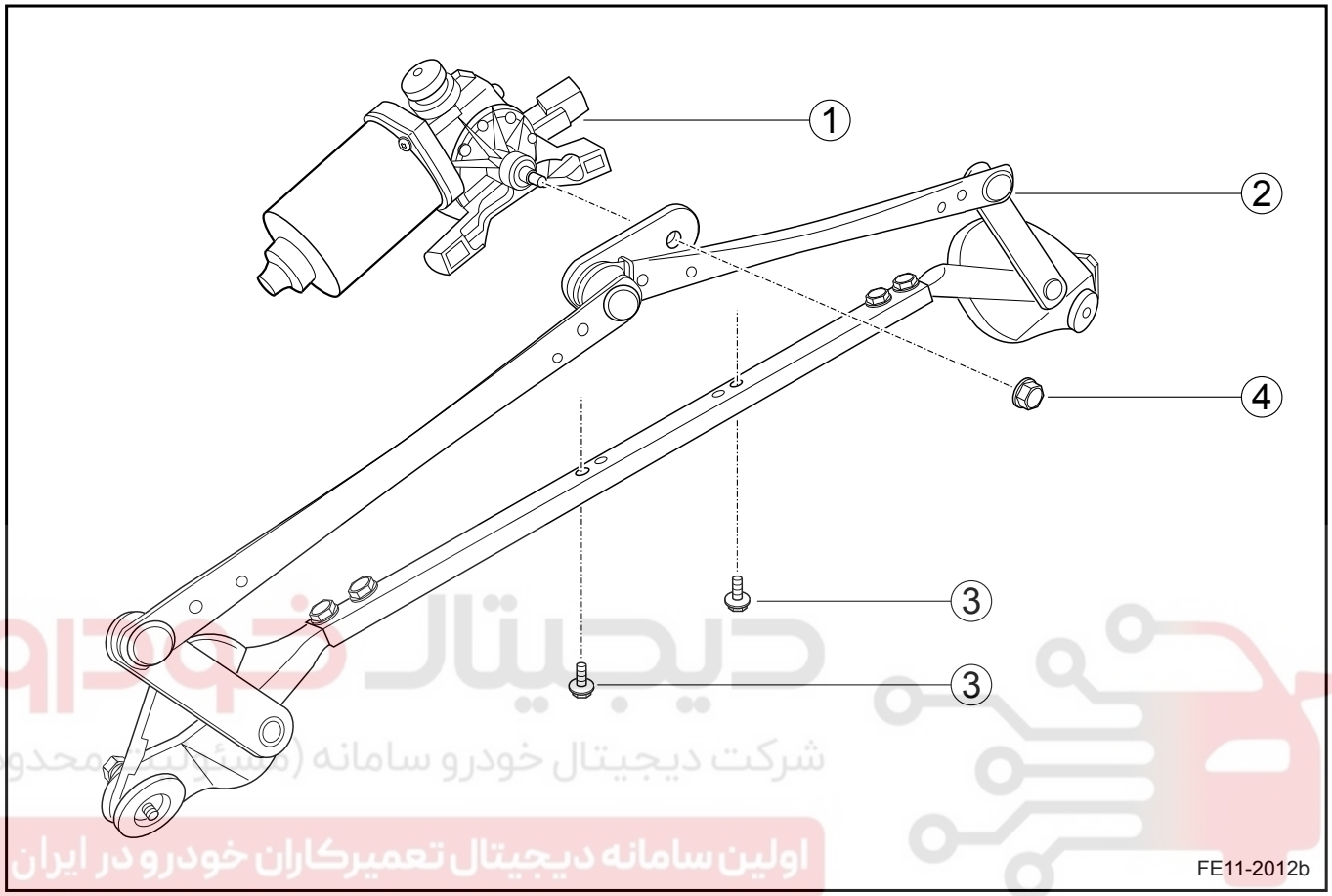
Rear Washer Nozzle (Hatchback)



11.6.5 Disassemble View

11.6.5.1 Disassemble View

Wiper Assembly

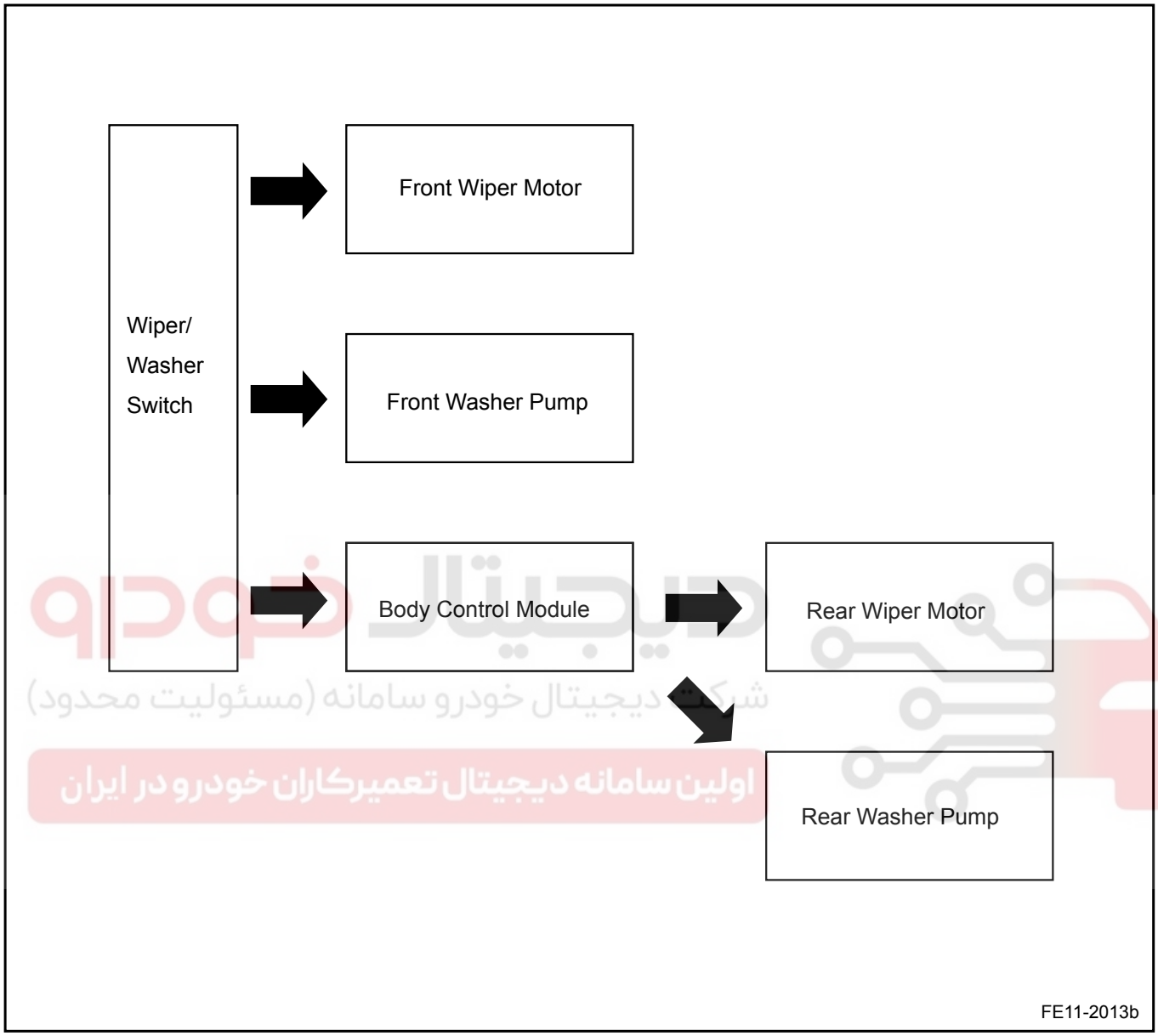


Legend

1. Wiper Motor
2. Wiper Rod
3. Wiper Motor Retaining Bolts
4. Wiper Rod Retaining Nut

11.6.6 Schematic

11.6.6.1 Schematic



11.6.7 Diagnostic Information and Procedures

11.6.7.1 Diagnosis Description

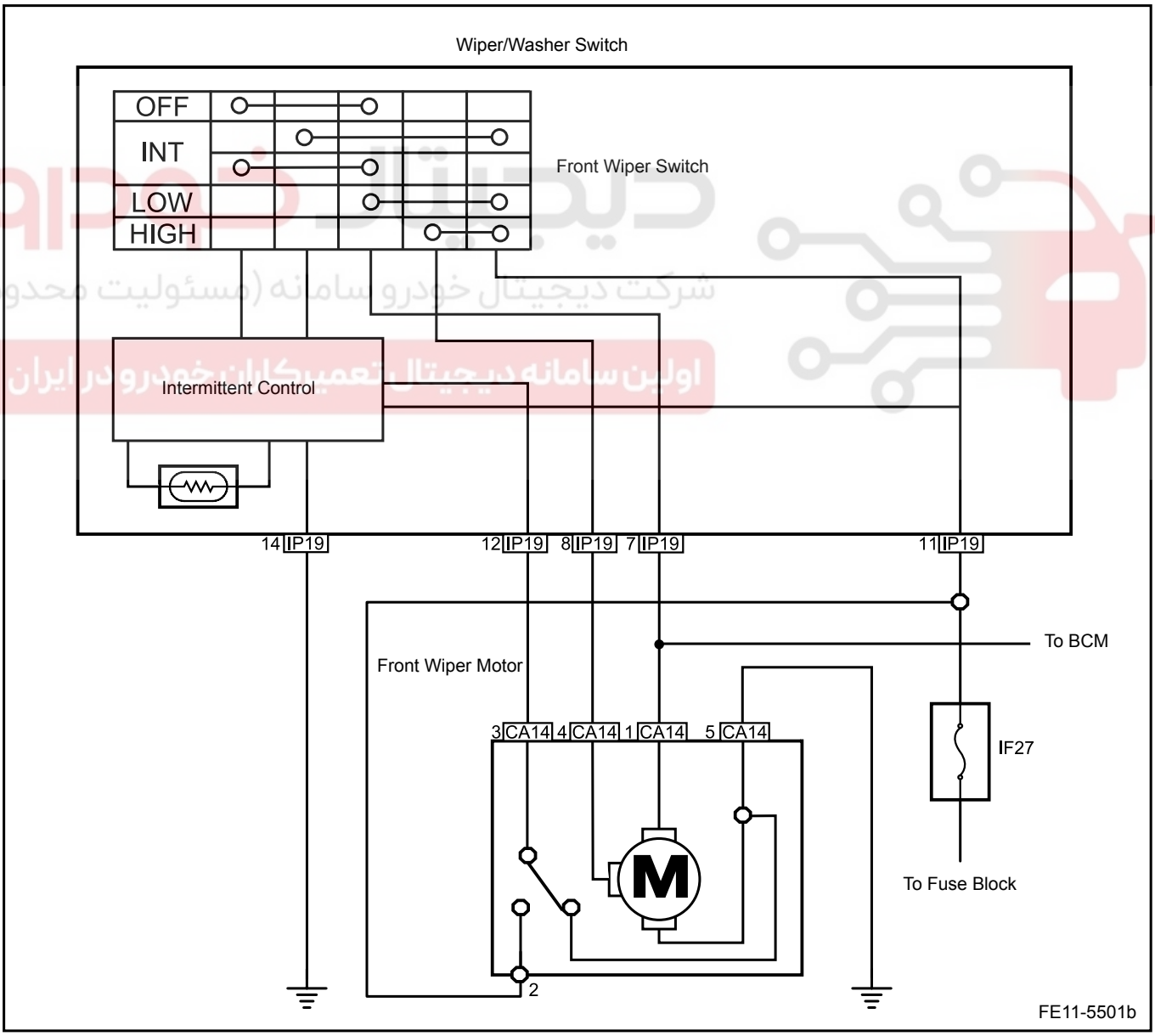
Refer to11.6.2 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.6.7.2 Visual Inspection

- Check installed after market equipment that may affect windshield wiper system operation.
- Check the easy to access system components to identify whether there is a significant damage or potential malfunction.
- Check whether the washer fluid level is correct.

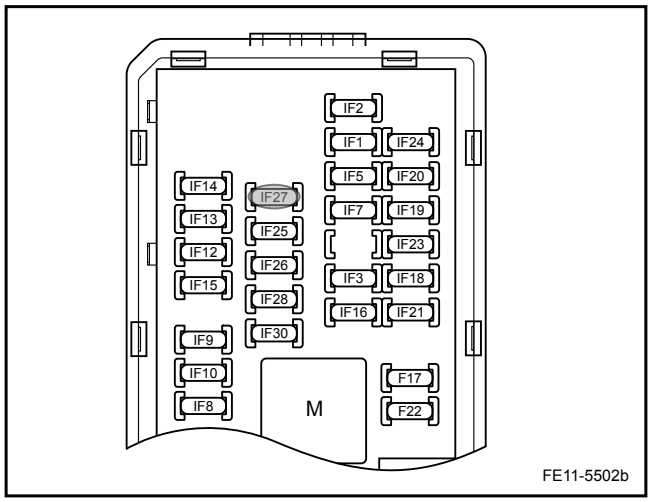
11.6.7.3 Wiper Inoperative At All Speed

Schematic:



Diagnostic Steps:

Step 1	Check the fuse IF27.



(a) Is the fuse IF27 blown?
Fuse Rating: 20 A
Is the fuse blown?

No → Go to step 3

Yes

Step 2	Repair the fuse IF27 circuit.

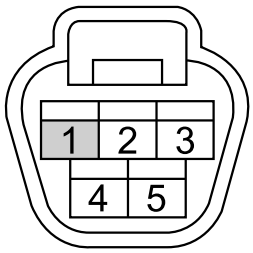
(a) Check whether the IF27 circuit is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.
Are the wipers working properly?

Yes → System normal

No

Step 3	Check the wiper motor harness connector terminal No.1 voltage.

Front Wiper Motor Harness Connector CA14



(a) Turn on the ignition switch.
(b) Turn the wiper switch to "LOW" position.
(c) Measure the wiper motor harness connector terminal No.1 voltage with a multimeter.
Standard Voltage: 11-14 V
Is the voltage specified value?

No → Go to step 5

Yes

Step 4	Replace the wiper motor.

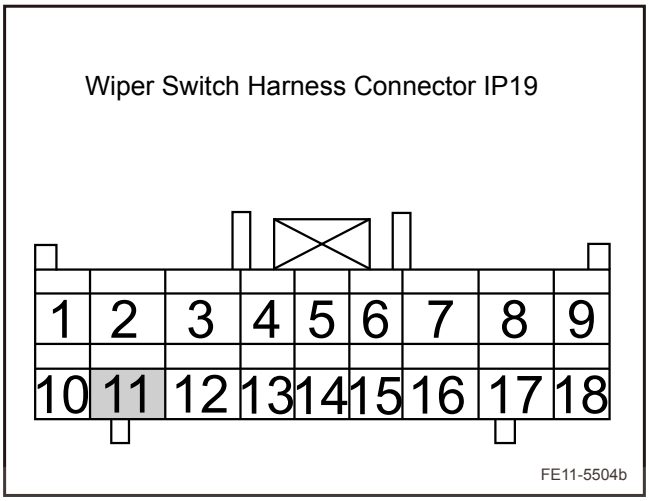
(a) Replace the wiper motor. Refer to 11.6.8.9 Wiper Motor Replacement.

Are the wipers working properly?

Yes → System normal

No

Step 5	Check the wiper switch wiring harness connector terminal No.11 voltage.



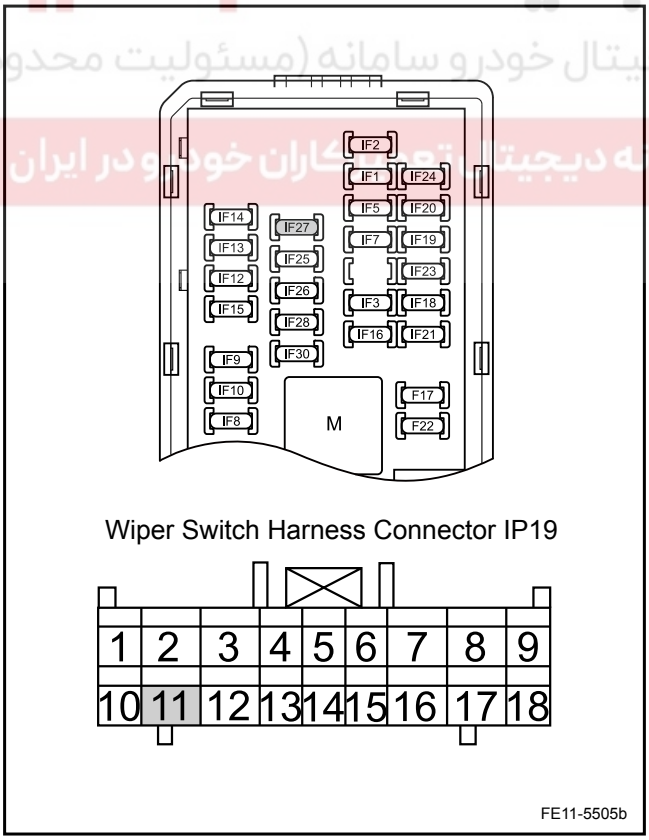
(a) Disconnect the wiper switch wiring harness connector.
(b) Turn on the ignition switch.
(c) Measure terminal No.11 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Repair the wiper switch wiring harness connector circuit.



(a) Check and repair the open circuit between the wiper switch wiring harness connector terminal No.11 and the fuse IF27.

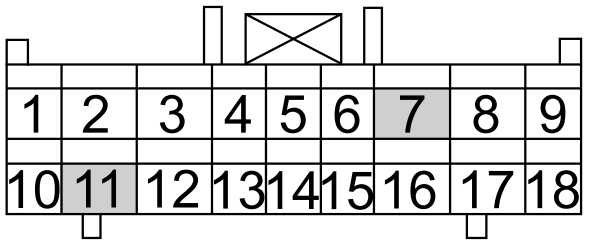
Are the wipers working properly?

Yes → System normal

No

Step 7	Check the wiper switch continuity.

Wiper Switch Harness Connector IP19



FE55-5506b

(a) Turn the wiper switch to "LOW" position.
(b) Measure resistance between the wiper switch terminal No.11 and 7 with a multimeter.
Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 9

No

Step 8	Replace the wiper switch.

(a) Replace the wiper switch. Refer to 11.6.8.8 Wiper and Washer Switch Replacement.

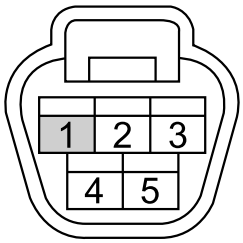
Is the wiper switch working correctly?

Yes → System normal

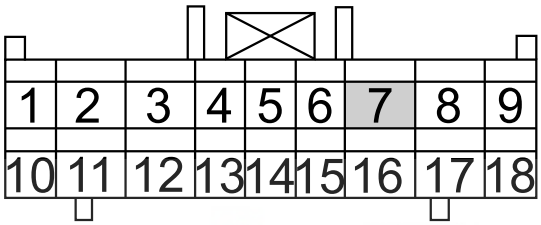
No

Step 9	Check wiper switch and wiper motor circuit.

Front Wiper Motor Harness Connector CA14



Wiper Switch Harness Connector IP19



FE11-5507b

(a) Check and repair the open circuit between the windshield wiper switch and wiper motor.
(b) Confirm the circuit between the windshield wiper switch and wiper motor is working properly.

Confirm the repair completed.

Next

Step 10	System normal.

11.6.7.4 Wiper Inoperative At High Speed

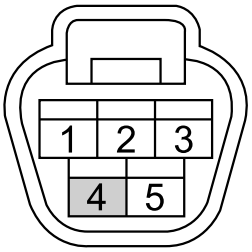
Schematic:

Refer to 11.6.7.3 Wiper Inoperative At All Speed.

Diagnostic Steps:

Step 1	Check the wiper motor harness connector terminal No.4 voltage.

Front Wiper Motor Harness Connector CA14



FE11-5508b

(a) Turn on the ignition switch.
(b) Turn the wiper switch to "HI" (high speed) position.
(c) Measure the wiper motor wiring harness connector terminal No.4 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

No	Go to step 3

Yes

Step 2	Replace the wiper motor.

(a) Replace the wiper motor repair. Refer to 11.6.8.9Wiper Motor Replacement.

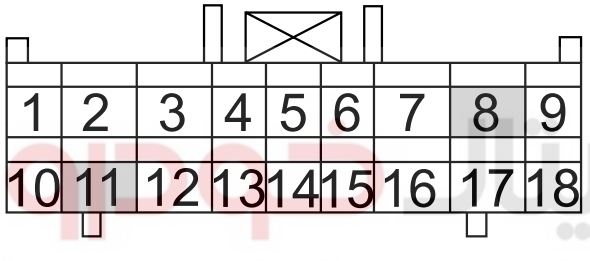
Is the wiper motor working correctly?

Yes → System normal

No

Step 3	the wiper switch continuity.

Wiper Switch Harness Connector IP19



(a) Turn the wiper switch to "HI" (high speed) position.

(b) Measure resistance between the wiper switch terminals No. 11 and 8 and check the wiper switch continuity with a multimeter.

Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 5

No

Step 4	Replace the wiper switch.

(a) Replace the wiper switch. Refer to 11.6.8.8Wiper and Washer Switch Replacement

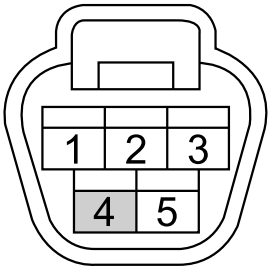
Are the wipers working properly?

Yes → System normal

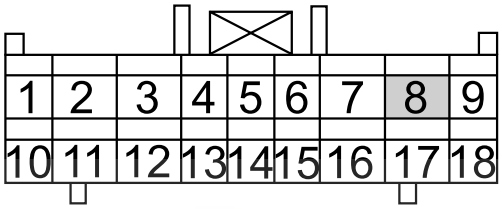
No

Step 5	Check the circuit between the wiper switch wiring harness connector terminal No.8 and the wiper motor wiring harness connector terminal No.4.

Front Wiper Motor Harness Connector CA14



Wiper Switch Harness Connector IP19



FE11-5510b

(a) Check the circuit between the wiper switch wiring harness connector terminal No.8 and the wiper motor wiring harness connector terminal No.4.
(b) Repair the open circuit between the wiper switch wiring harness connector terminal No.8 and the wiper motor wiring harness connector terminal No.4.

Confirm the repair completed.

Next

Step 6	System normal.

11.6.7.5 Wiper Inoperative At Low Speed

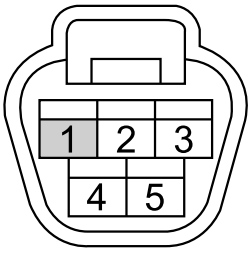
Schematic:

Refer to 11.6.7.3 Wiper Inoperative At All Speed.

Diagnostic Steps:

Step 1	Measure the wiper motor harness connector terminal No.1 voltage.

Front Wiper Motor Harness Connector CA14



FE11-5503b

(a) Turn on the ignition switch.
(b) Turn the wiper switch to "LOW" (low speed) position.
(c) Measure the wiper motor harness connector terminal No.1 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

No	Go to step 3

Yes

Step 2	Replace the wiper motor.

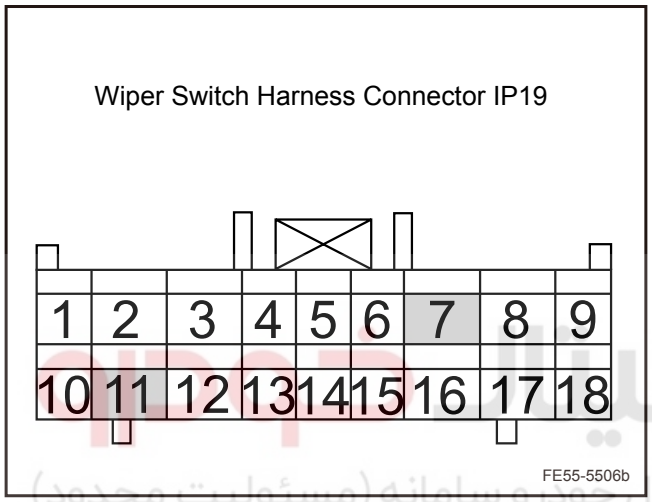
(a) Replace the wiper motor repair. Refer to 11.6.8.9Wiper Motor Replacement.

Is the wiper motor working correctly?

Yes → System normal

No

Step 3	Check the wiper switch.



(a) Turn the wiper switch to "LOW" (low speed) position.

(b) Measure resistance between wiper switch terminals No.11 and 7 and check the wiper switch Continuity with a multimeter.

Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 5

No

Step 4	Replace the wiper switch.

(a) Replace the wiper switch. Refer to 11.6.8.8Wiper and Washer Switch Replacement.

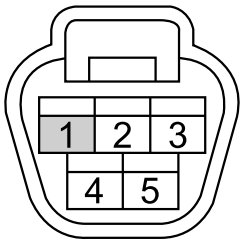
Are the wipers working properly?

Yes → System normal

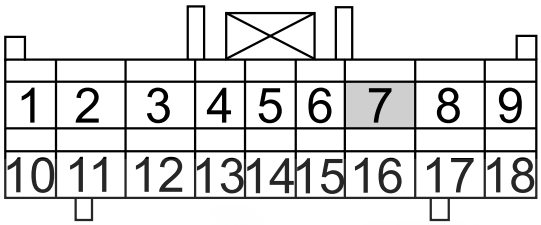
No

Step 5	Check the circuit between the wiper switch wiring harness connector terminal No.7 and the wiper motor wiring harness connector terminal No.1.

Front Wiper Motor Harness Connector CA14



Wiper Switch Harness Connector IP19



FE11-5507b

(a) Check the circuit between the wiper switch wiring harness connector terminal No.7 and the wiper motor wiring harness connector terminal No.1.
(b) Repair the open circuit between the wiper switch wiring harness connector terminal No.7 and the wiper motor wiring harness connector terminal No.1.

Confirm the repair completed.

Next

Step 6	System normal.

11.6.7.6 Wiper Inoperative At Intermittent

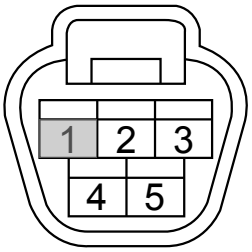
Schematic:

Refer to 11.6.7.3 Wiper Inoperative At All Speed.

Diagnostic Steps:

Step 1	Measure the wiper motor harness connector terminal No.1 voltage.

Front Wiper Motor Harness Connector CA14



FE11-5503b

(a) Turn on the ignition switch.
(b) Turn the wiper switch to "INT" (intermittent) position, measure the wiper motor harness connector terminal No.1 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

No	Go to step 3

Yes

Step 2	Replace the wiper motor.

(a) Replace the wiper motor repair. Refer to 11.6.8.9 Wiper Motor Replacement.

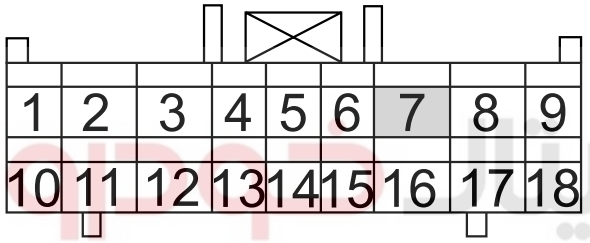
Is the wiper motor working correctly?

Yes → System normal

No

Step 3	Measure the wiper switch wiring harness connector terminal No.7 voltage.

Wiper Switch Harness Connector IP19



FE55-5511b

(a) Turn on the ignition switch.
(b) Turn the wiper switch to "INT" (intermittent) position.
(c) Measure the wiper motor wiring harness connector terminal No.7 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 5

No

Step 4	Replace the wiper switch.

(a) Refer to 11.6.8.8 Wiper and Washer Switch Replacement.

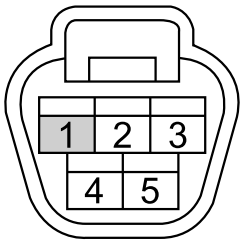
Are the wipers working properly?

Yes → System normal

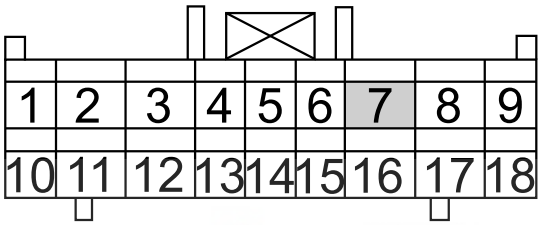
No

Step 5	Check the circuit between the wiper switch wiring harness connector terminal No.7 and the wiper motor connector terminal No.1.

Front Wiper Motor Harness Connector CA14



Wiper Switch Harness Connector IP19



FE11-5507b

(a) Check the circuit between the wiper switch wiring harness connector terminal No.7 and the wiper motor connector terminal No.1.

(b) Repair the open circuit between the wiper switch wiring harness connector terminal No.7 and the wiper motor connector terminal No.1.

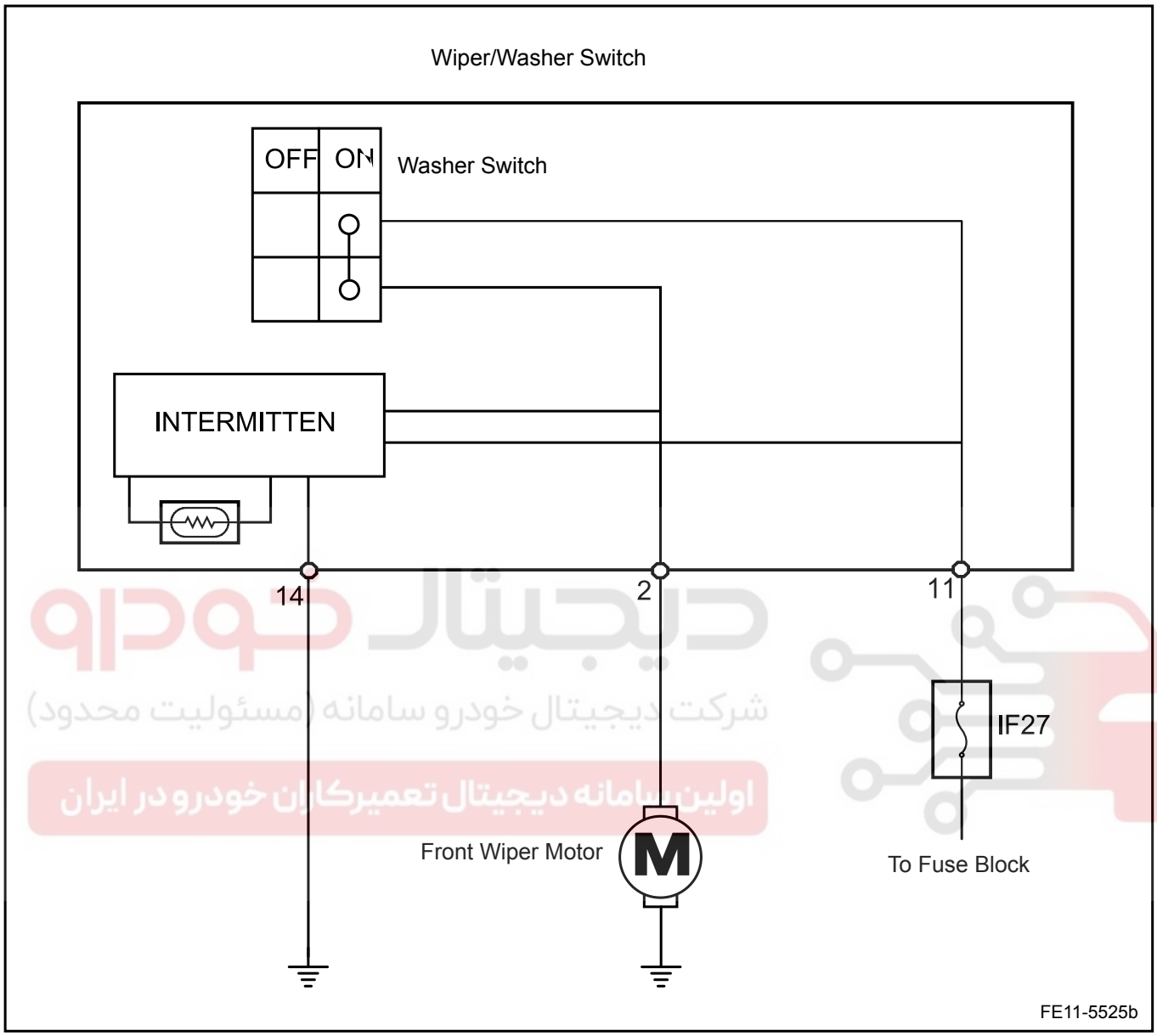
Confirm the repair completed.

Next

Step 6	System normal.

11.6.7.7 Front Washer Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the windshield wipers working status.

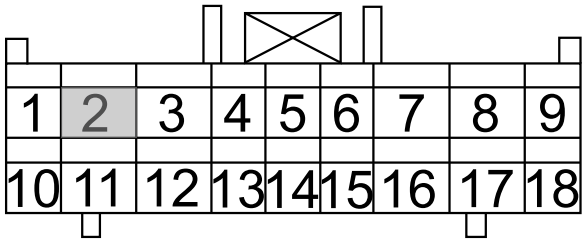
(a) Turn on the ignition switch.
(b) Turn the wiper switch to "LOW" (low speed) position.
Confirm that the windshield wipers work after the switch is turned on.

Yes → Go to step 3

No

Step 2	Measure the wiper switch wiring harness connector terminal No.2 voltage.

Wiper Switch Harness Connector IP19



(a) Turn on the ignition switch.
(b) Turn on the washer switch.
(c) Measure the wiper / washer switch terminal No.2 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 8

No

Step 3	Replace the wiper switch.

(a) Replace the wiper switch. Refer to 11.6.8.8 Wiper and Washer Switch Replacement.

Is the wiper switch working correctly?

Yes → System normal

No

Step 4	Check whether the washer fluid is sufficient.

(a) Add washer fluid.

Yes → Go to step 6

No

Step 5	Add windshield washer fluid.

(a) Add windshield washer fluid.

Confirm that the windshield washer is working correctly.

No

Step 6	Check the windshield washer hose and nozzle.

(a) Check the windshield washer hose and nozzle for blockage or damage.

No → Go to step 8

Yes

Step 7	Repair or replace the damaged windshield washer hose and nozzle.

(a) Repair or replace the damaged windshield washer hose and nozzle.

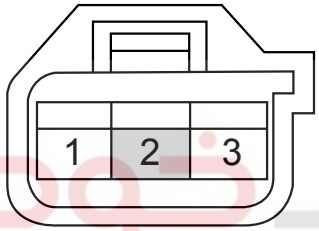
Is the windshield washer working correctly?

Yes → System normal

No

Step 8	Check the windshield washer motor power supply.

Washer Motor Harness Connector CA24



FE11-5513b

(a) Turn on the ignition switch.
(b) Turn on the windshield washer switch.
(c) Measure the Windshield Washer Pump harness connector pin 2 voltage with a multimeter.
Standard Voltage: 11-14 V

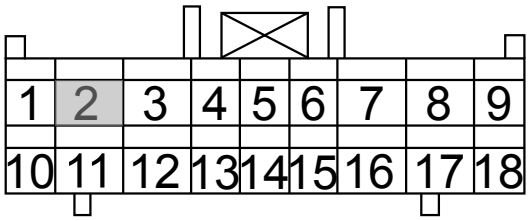
Is the voltage specified value?

Yes → Go to step 10

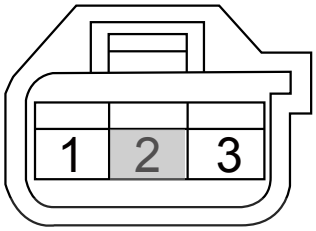
No

Step 9	Check the circuit between the windshield washer motor and the windshield washer switch.

Wiper Switch Harness Connector IP19



Washer Motor Harness Connector CA24



FE11-5514b

(a) Check and repair the open circuit between the windshield washer motor and the windshield washer switch.

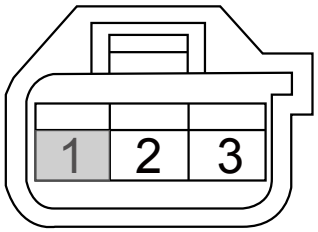
Is the windshield washer working correctly?

Yes → System normal

No

Step 10	Check the windshield washer motor ground circuit.

Washer Motor Harness Connector CA24



FE11-5515b

(a) Test continuity between the windshield washer electrical ground circuit (pin 1) and the body ground with a multimeter.
Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 12

No

Step 11	Repair the Windshield Washer motor ground circuit.

(a) Repair the Windshield Washer motor ground circuit.

Confirm whether the Windshield washer ground circuit is normal.

Yes → System normal

No

Step 12	Replace the windshield washer motor.

(a) Replace the windshield washer motor. Refer to 11.6.8.6 Washer Motor and Hose Replacement.

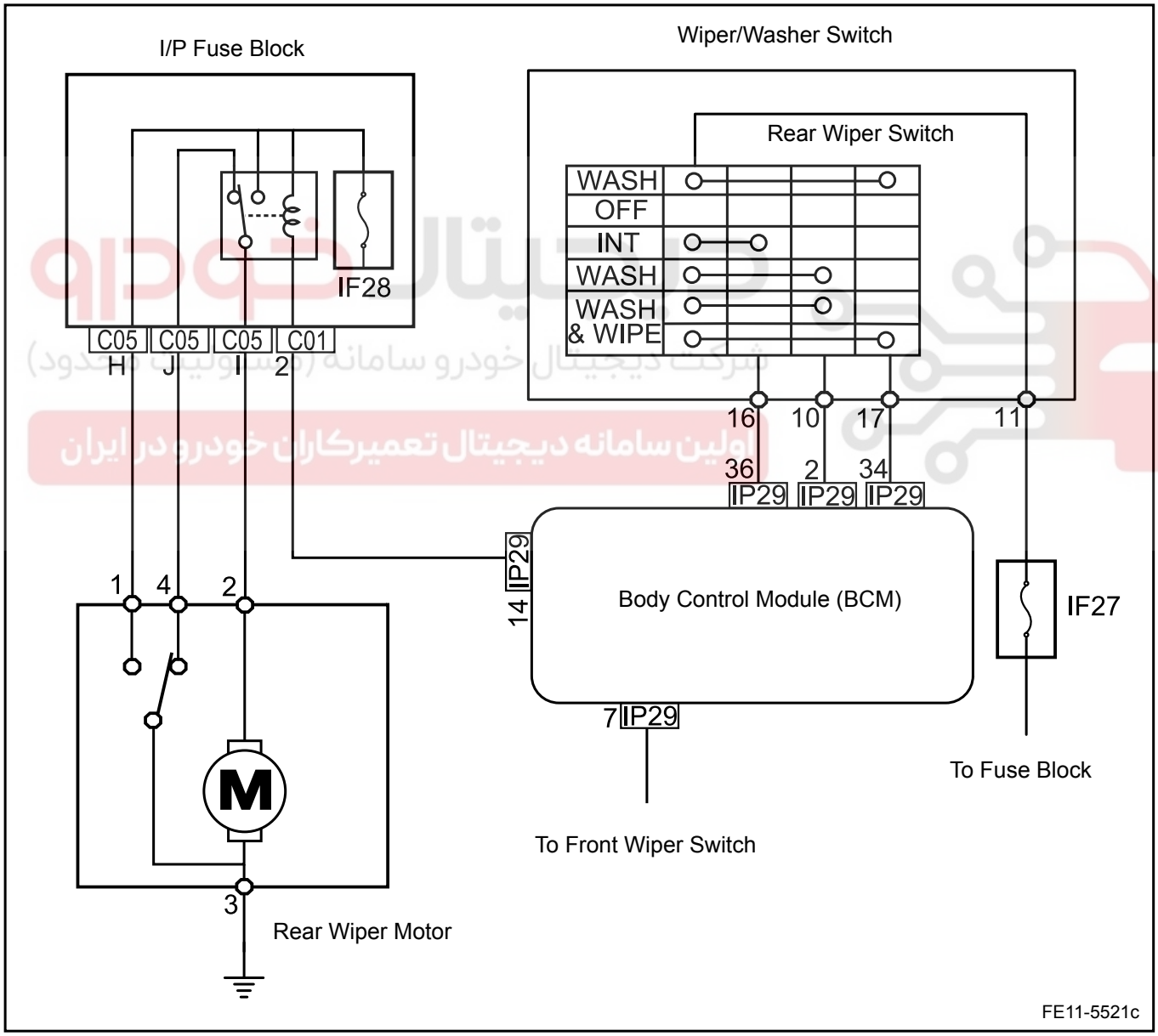
Confirm the repair is completed.

Next

Step 13	System normal.

11.6.7.8 Rear Window Wipers Inoperative (Hatchback)

Schematic:



Diagnostic Steps:

Note

Before carry out this diagnostic procedure, make sure that the rear wiper motor ground circuit is not faulty.

Step 1	Use scan tool active test function and check the rear wipers working status.

(a) Select as the following sequence: body control module / active test / rear wipers output control.

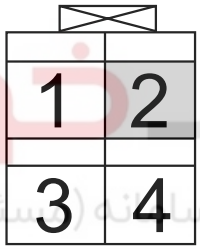
Are the rear wipers working properly?

Yes → Go to step 6

No

Step 2	Measure the rear wiper motor wiring harness connector terminal No.2 voltage.

Rear Wiper Motor Harness Connector SO47



FE11-5522c

(a) Disconnect the wiper motor wiring harness connector.

(b) Turn on the ignition switch.

(c) Activate the wiper switch, measure the wiper motor harness connector terminal No.2 voltage with a multimeter.

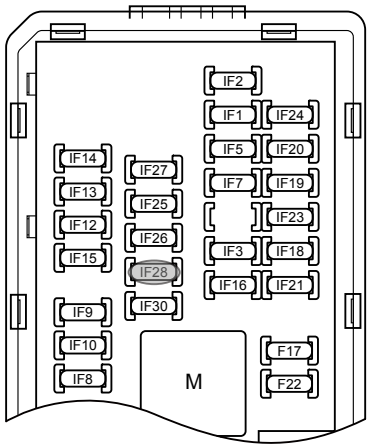
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Replace the wiper motor. Refer to 11.6.8.11 Rear Wiper Motor Replacement (Hatchback)

No

Step 3	Check the fuse IF28.



FE11-5529c

(a) Check the fuse IF28.

Fuse Rating: 10 A

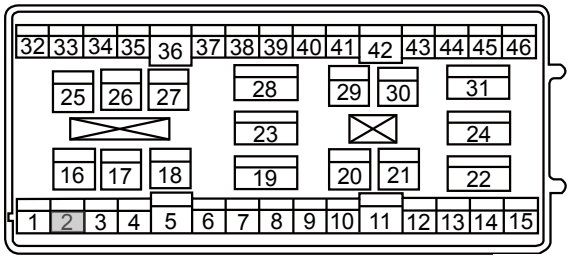
Is the fuse normal?

No → Check the circuits and replace the fuse, confirm the fault has been fixed.

Yes

Step 4	Check the rear wiper relay control circuit.

I/P Fuse Block Harness Connector IP05



FE11-5530c

(a) Find the wiring harness connector IP05 terminal No.2.

Note

Do not disconnect the wiring harness connector IP05.

(b) Connect the wiring harness connector IP05 terminal No.2 to the ground.

(c) Turn the ignition switch to the ON position.

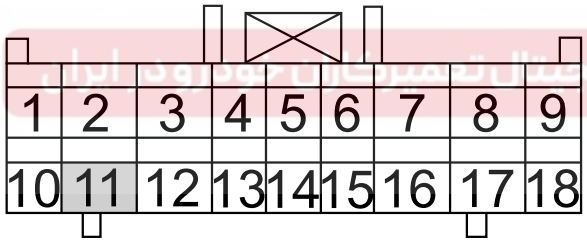
Confirm that wipers are working properly.

No → Go to step 10

Yes

Step 5	Measure the wiper switch wiring harness connector terminal No.11 voltage.

Wiper Harness Connector IP19



FE11-5531c

(a) Turn the ignition switch to the ON position.

(b) Measure the wiper switch harness connector IP19 terminal No.11 voltage with a multimeter.

Standard Voltage: 11-14 V

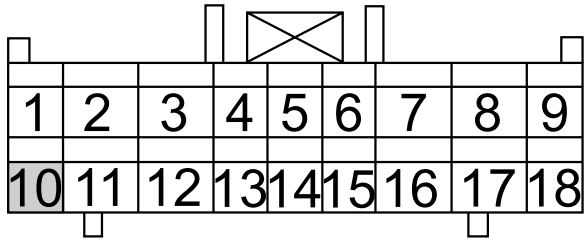
Is the voltage specified value?

No → Check the wiper switch power supply circuit open.

Yes

Step 6	Check the wiper switch wiring harness connector terminal No.10 voltage.

Wiper Harness Connector IP19



FE11-5523c

(a) Turn the ignition switch to the ON position.
(b) Operate the rear wiper switch to normal position.
(c) Measure the wiper switch harness connector IP19 terminal No.10 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 8

No

Step 7	Replace the wiper switch.

(a) Replace the wiper switch. Refer to 11.6.8.8 Wiper and Washer Switch Replacement.

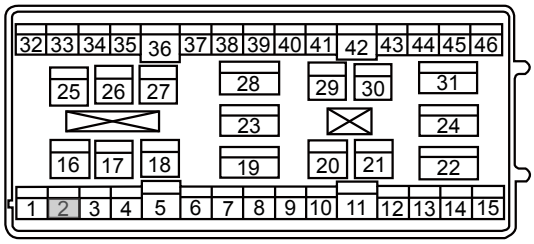
Confirm that wipers are working correctly.

Yes → System normal

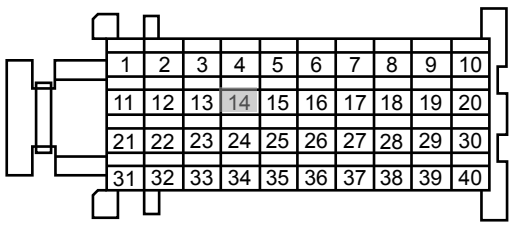
No

Step 8	Test continuity between the body control module (BCM) IP29 terminal No.14 and I/P fuse block wiring harness connector IP05 terminal No.2.

I/P Fuse Block Harness Connector IP05



Body Control Module 1 Harness Connector IP29



FE11-5526c

(a) Disconnect the I/P fuse block wiring harness connector IP02.
(b) Disconnect the I/P fuse block wiring harness connector IP29.
(c) Measure resistance between IP02 terminal No.2 and IP29 terminal No.14.
Standard Resistance values: Less than 1 Ω

Is the resistance specified value?

No → Check the open circuit between IP02 terminal No.2 and IP29 terminal No.14.

Yes

Step 9	Replace the body control module (BCM).

(a) Replace the body control module (BCM). Refer to 11.10.8.1 BCM Replacement.

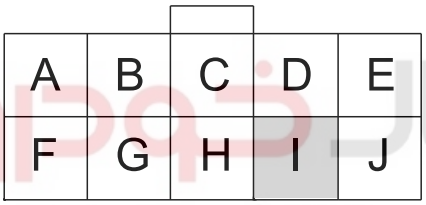
Confirm the wipers are working correctly.

Yes → System normal

No

Step 10	Measure the I/P fuse block fuse C05 terminal I voltage.

I/P Fuse Harness Connector C05



FE11-5527c

(a) Turn the ignition switch to the ON position.

(b) Operate the rear wiper switch to normal position.

(c) Measure the I/P fuse block fuse C05 terminal I voltage with a multimeter.

Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 12

No

Step 11	Replace the I/P fuse block.

(a) Replace the I/P fuse block.

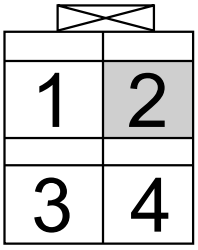
Confirm the wipers are working correctly.

Yes → System normal

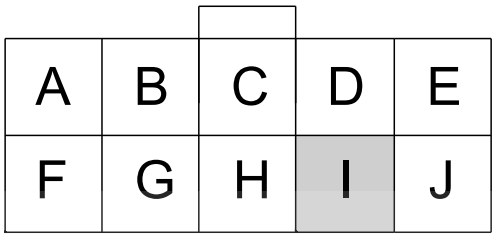
No

Step 12	Repair the circuit between the I/P block C05 terminal I and the rear wiper motor wiring harness connector terminal No.2.

Rear Wiper Motor Harness Connector SO47



I/P Fuse Harness Connector C05



FE11-5528c

(a) Repair the circuit between the I/P block C05 terminal I and the rear wiper motor wiring harness connector terminal No.2.

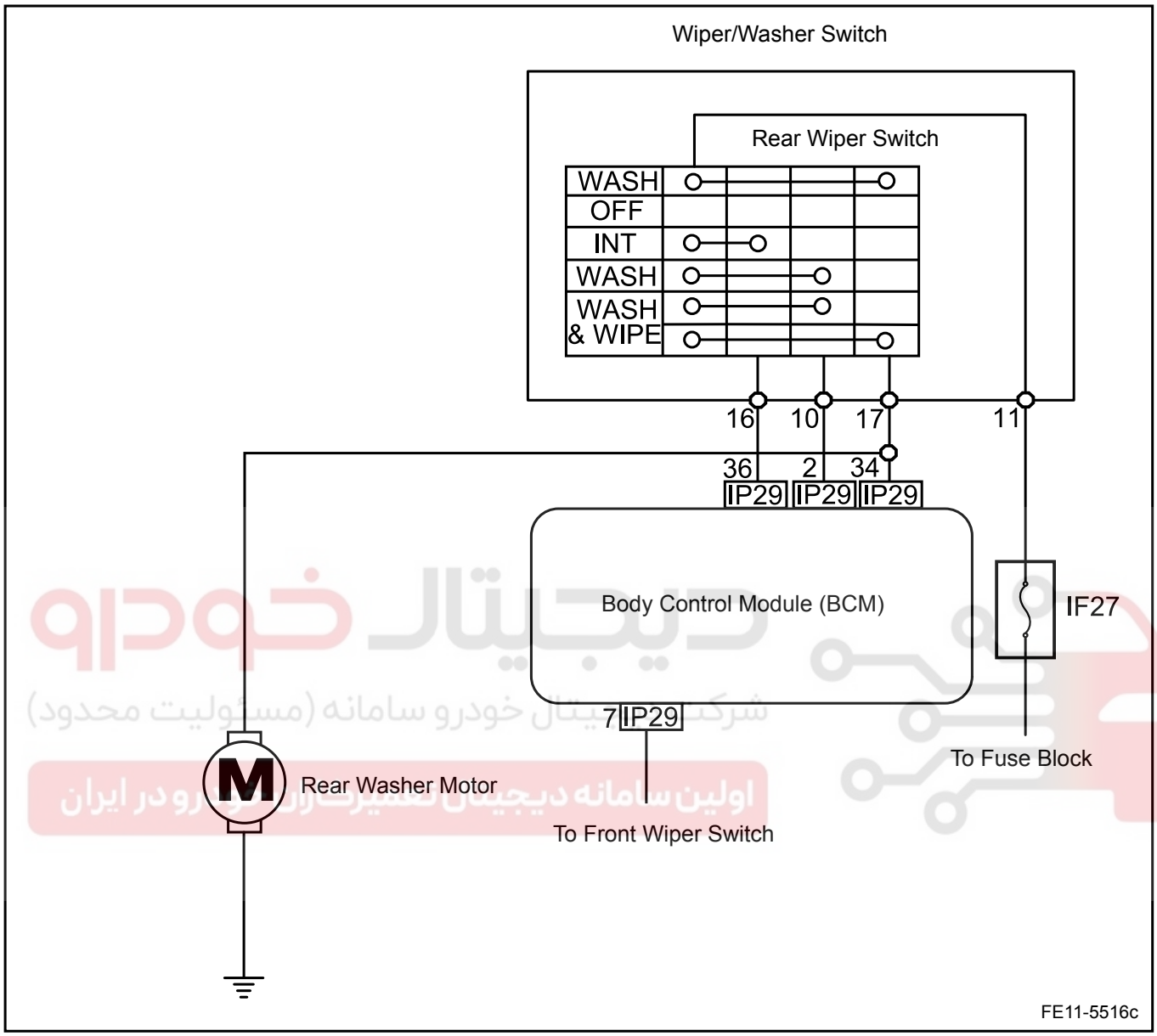
Confirm the repair completed.

Next

Step 13	System normal.

11.6.7.9 Rear Washer Inoperative (Hatchback)

Schematic:



Diagnostic Steps:

Step 1	Check the washer fluid level.

(a) Check whether the washer fluid is sufficient.

Yes → Go to step 3

No

Step 2	Add the washer fluid.

(a) Add the washer fluid.

Confirm the rear washer is working correctly.

Yes → System normal

No

Step 3	Check the rear washer hose and nozzle.

(a) Check the windshield washer hose and nozzle for blockage / damage / leaking.

No → Go to step 5

Yes

Step 4	Repair hoses and nozzles.

(a) Repair or replace the blocked / damaged / leaking hose and nozzle scrubbers. Refer to 11.6.8.7 Washer Fluid Tank Replacement.

Confirm the washer is working properly.

Yes → System normal

No

Step 5	Operating the wipers, check the wiper working status.

(a) If the rear wipers are inoperative, the rear wipers circuit is faulty. First repair the wipers inoperative. For detailed procedures. Refer to 11.6.7.8 Rear Window Wipers Inoperative (Hatchback), and then to the "A" wiper

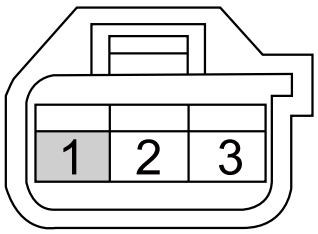
(b) If the rear wipers work, the wiper switch power supply circuit is normal, to "B"

A → Go to step 10

B

Step 6	Check the rear washer motor ground circuit.

Rear Washer Motor Harness Connector



FE11-5517c

(a) Disconnect the rear washer motor wiring harness connector.

(b) Check the continuity between the rear washer motor terminal No.1 and the ground with a multimeter.

Resistance Standard Value: Less than 1 Ω

Yes → Go to step 8

No

Step 7	Repair the rear washer motor ground circuit.

(a) Repair the rear washer motor ground circuit resistance too high or open circuit.

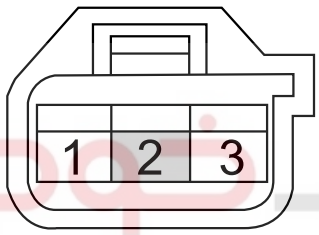
Is the ground circuit normal?

Yes → System normal

No

Step 8	Measure the rear washer motor terminal No.2 voltage.

Rear Washer Motor Harness Connector



FE11-5518c

(a) Turn on the ignition switch.
(b) Turn on the rear washer.
(c) Measure rear washer motor connector terminal No.2 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

No → Go to step 10

Yes

Step 9	Replace the rear washer motor.

(a) Replace the rear washer motor. Refer to 11.6.8.10 Rear Washer Pump and Hose Replacement (Hatchback).

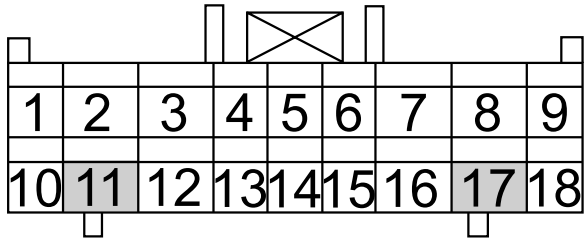
Confirm the rear wipers are working correctly.

Yes → System normal

No

Step 10	Check the circuit between the rear wiper switch wiring harness connector terminals No.11 and 17.

Wiper Switch Harness Connector IP19



FE11-5519c

(a) Disconnect the rear wiper switch.
(b) Turn on the rear washer switch.
(c) Connect a multimeter between the rear wiper switch terminals 11 and 17.
Resistance Standard Value: Less than 1 Ω

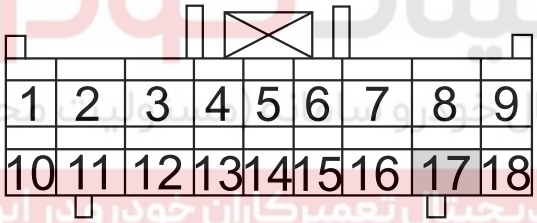
Is the resistance specified value?

No → Go to step 12

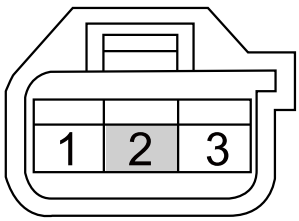
Yes

Step 11	Check the circuit between the rear wiper switch wiring harness connector terminal No.17 and the rear washer pump connector terminal No.2.

Wiper Switch Harness Connector IP19



Rear Washer Motor Harness Connector CA25



FE11-5520c

(a) Check the circuit between the rear wiper switch wiring harness connector terminal No.17 and the rear washer pump connector terminal No.2.
(b) Repair the open circuit between the rear wiper switch wiring harness connector terminal No.17 and the rear washer pump connector terminal No.2.

Confirm whether the wipers are work properly.

Yes → System normal

No

Step 12	Replace the wiper switch.

(a) Replace the wiper switch. Refer to 11.6.8.8 Wiper and Washer Switch Replacement.

Confirm the repair completed.

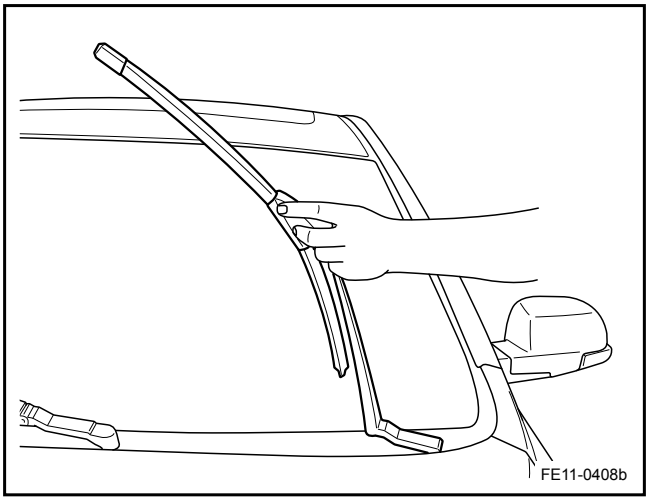
Next

Step 13	System normal.

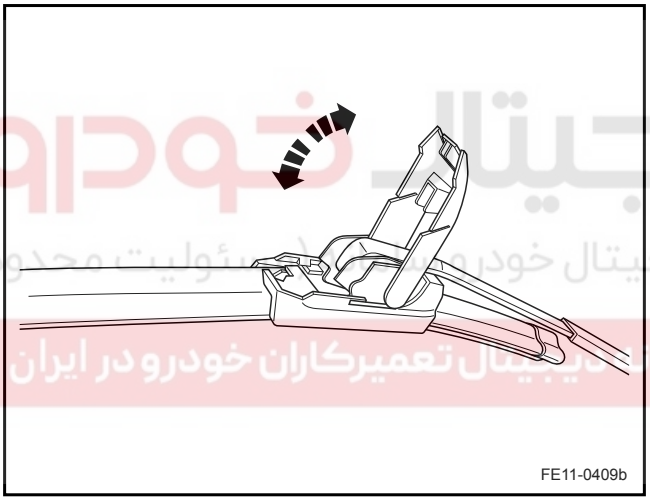
11.6.8 Removal and Installation

11.6.8.1 Wiper Blade Replacement

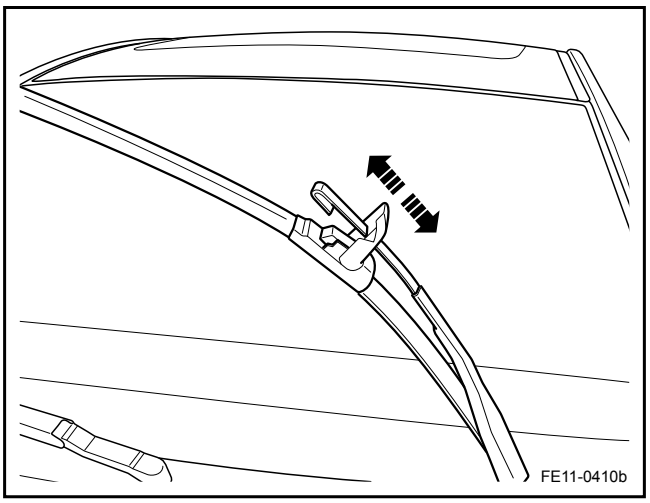
Removal Procedure



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Lift the wiper arm.



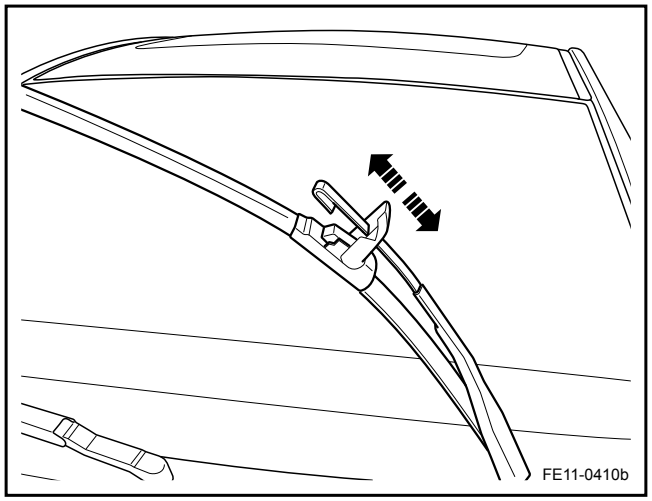
3. Move the retaining clip upward.



4. Hold the wiper arm, move the wiper blade downward to remove the wiper blade.

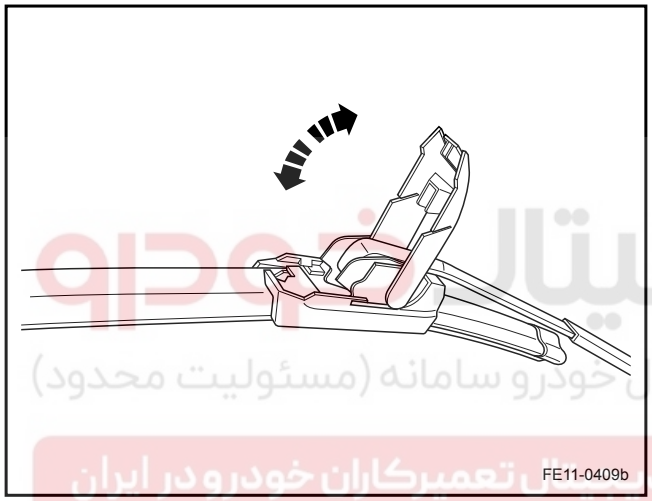
   Note

   If new parts are not immediately replaced, put down the wiper arm gently to prevent the damage to the windshield.



Installation Procedure:

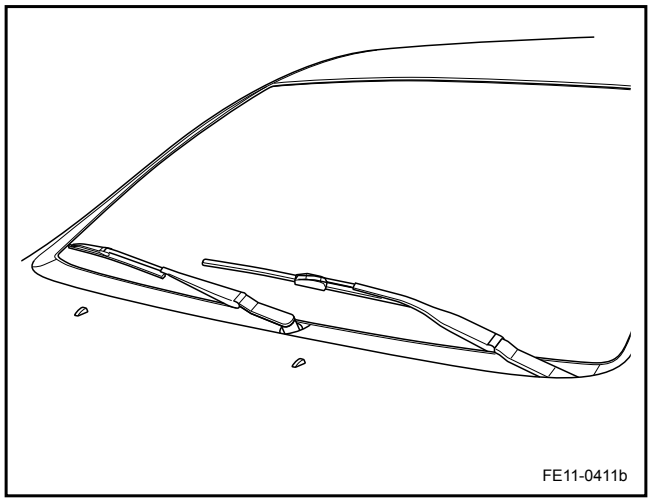
1. Install the wiper blade, until the wiper blade arm is tightened with the wipers.



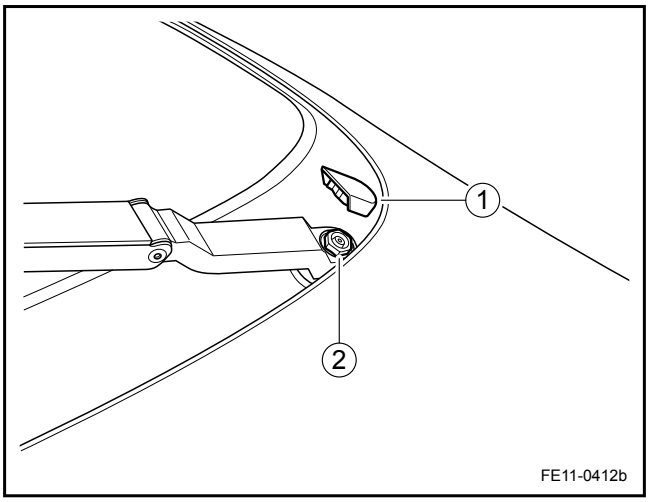
2. Move the wiper blade retaining clip, until the clip is back to its original position.
3. Lower the wiper arm gently.
4. Connect the battery negative cable.

11.6.8.2 Wiper Arm Replacement

Removal Procedure

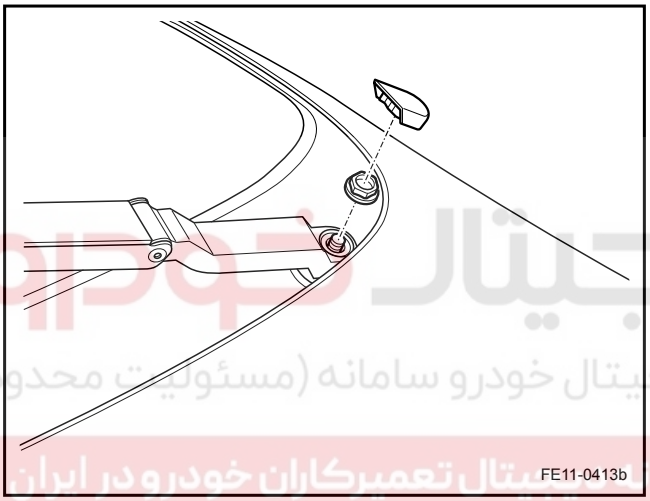


1. Before removal place the wiper arm at its initial position.



2. Remove the wiper arm nut cover (1).
3. Remove the wiper arm nut (2).

Installation Procedure:



1. Install the wiper arm.
2. Tighten the wiper arm nut.

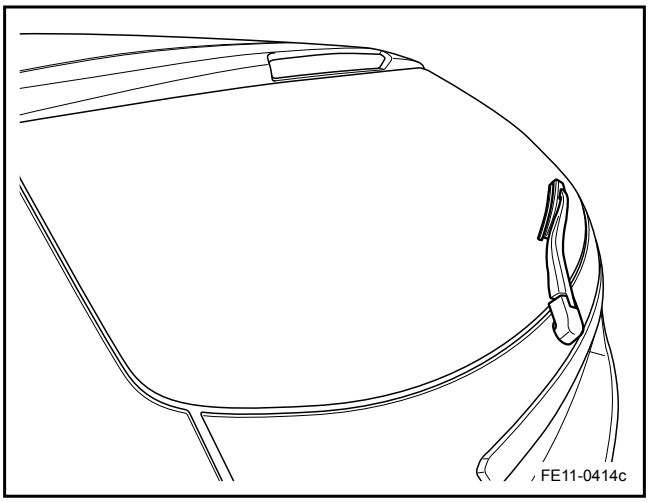
Note

Refer to "Fastener Notice" in "Warnings and Notices".

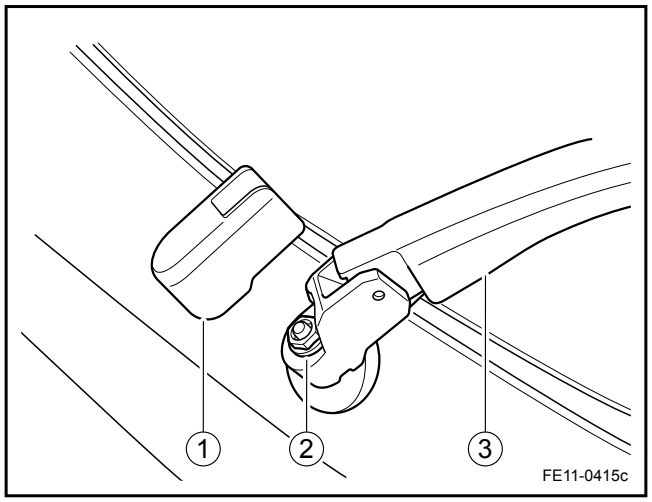
Torque: 60 Nm (Metric) 44 lb-ft (US English)

11.6.8.3 Rear Wiper Arm Replacement (Hatchback)

Removal Procedure

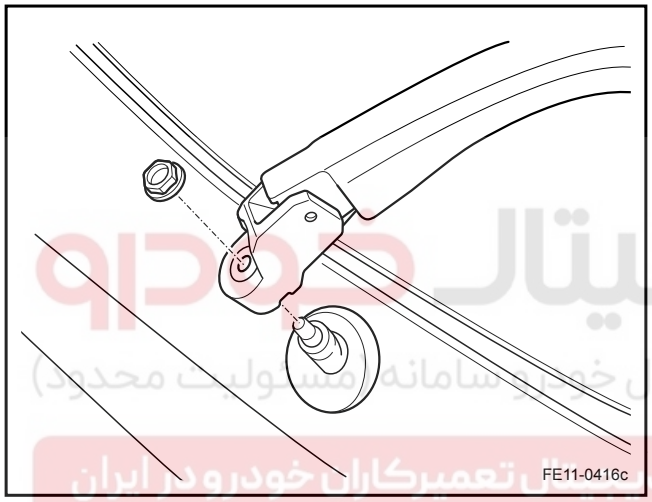


1. Before removal place the wiper arm at its initial position.



2. Remove the wiper arm nut cover (1).
3. Remove the wiper arm nut (2).
4. Remove the wiper arm (3).

Installation Procedure:



1. Install the wiper arm.
2. Tighten the wiper arm nut.

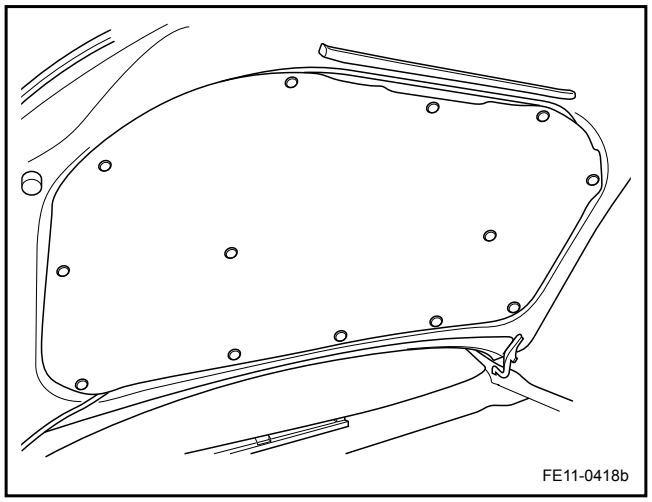
   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

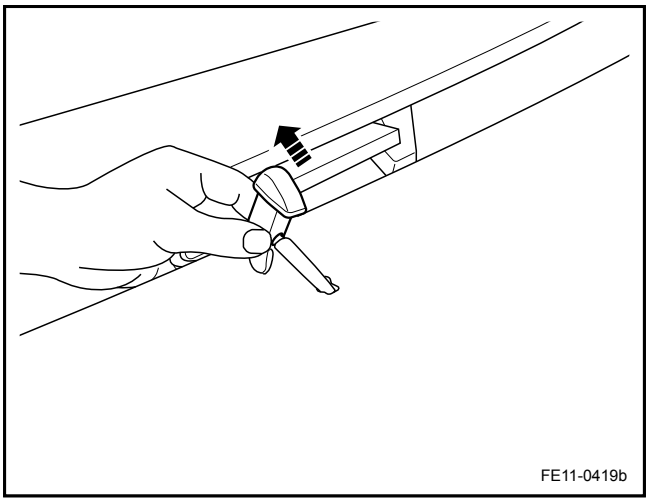
   Torque: 45 Nm (Metric) 33 lb-ft (US English)

11.6.8.4 Wiper Nozzle Replacement

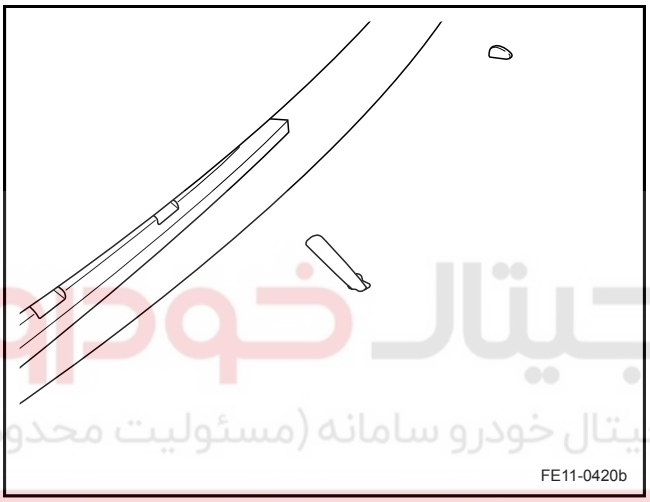
Removal Procedure



1. Open the hood.
2. Remove the hood insulation pad. Refer to 12.10.1.2 Hood Sound Insulation Pad Replacement.



3. Disconnect the nozzle pipe.

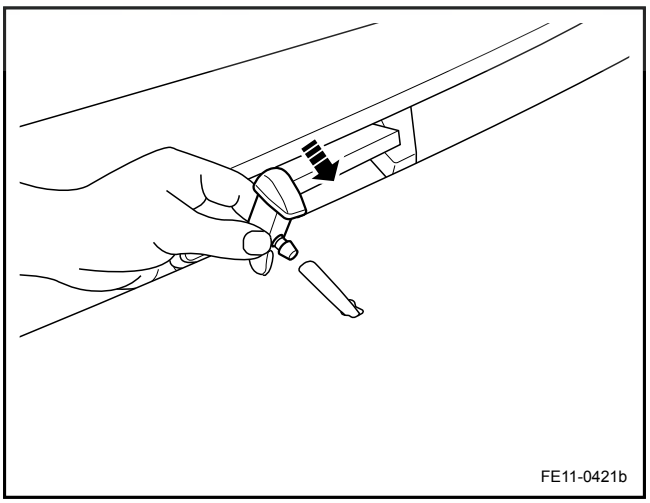


4. Remove the nozzle from the engine hood.

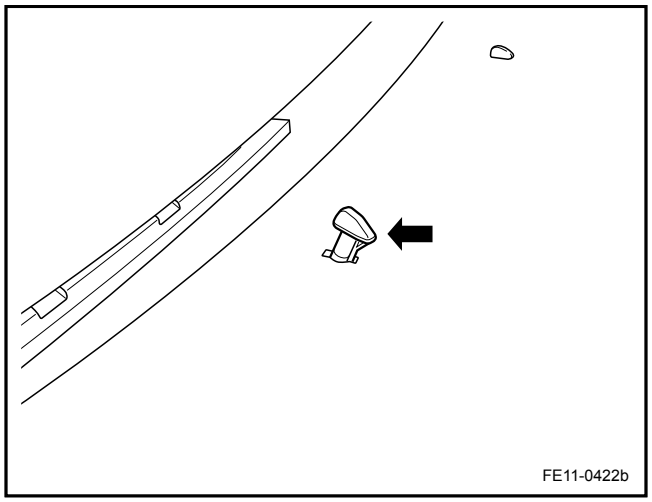
Note

Prevent the hose falling into the engine compartment.

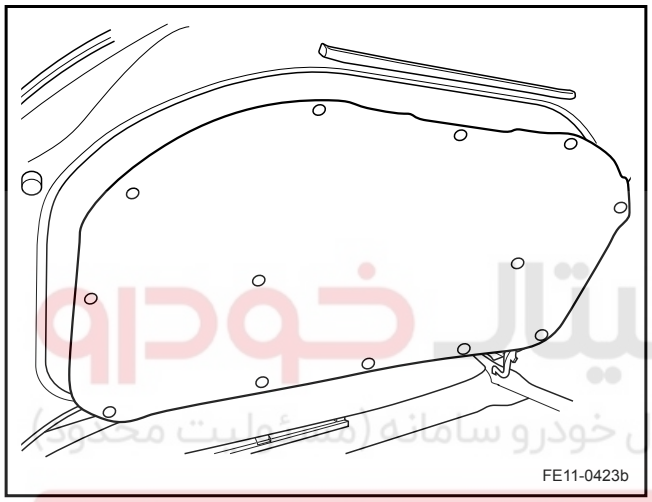
Installation Procedure:



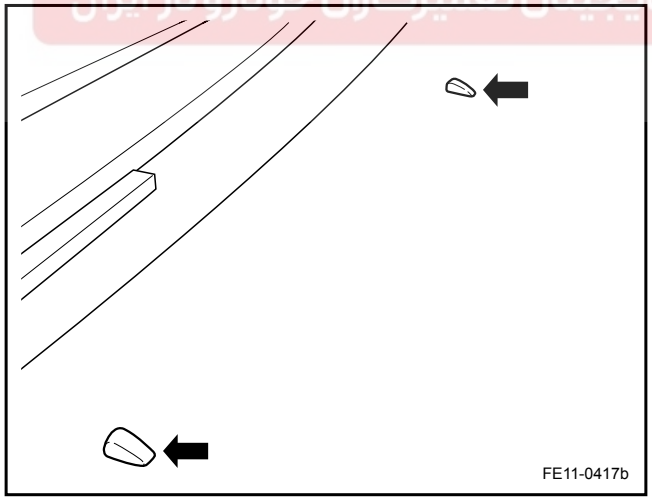
1. Install the nozzle to the engine hood.



2. Install the the spray nozzle to the hose, and press the nozzle into the engine hood.



3. Install the engine hood insulation pad.



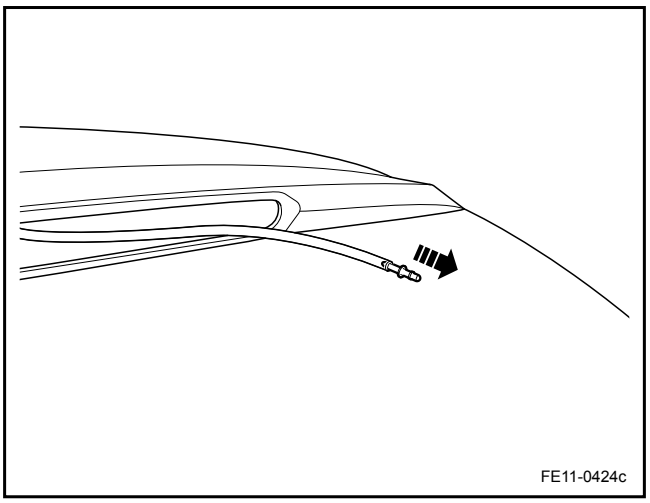
4. Close the engine hood.

Note

Adjust the spray angle to the right position after installation.

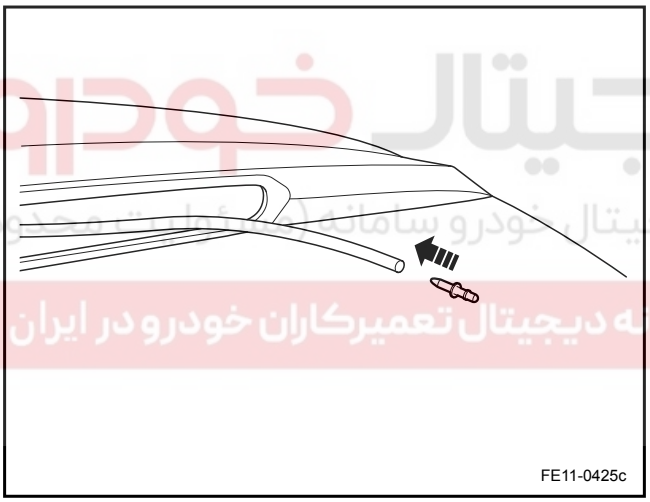
11.6.8.5 Rear Wiper Nozzle Replacement (Hatchback)

Removal Procedure



1. Remove the hatchback trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
2. Remove the high mounted brake lamp. Refer to the11.4.8.10 High Mounted Brake Lamp Replacement (Hatchback).
3. pull out the nozzle.

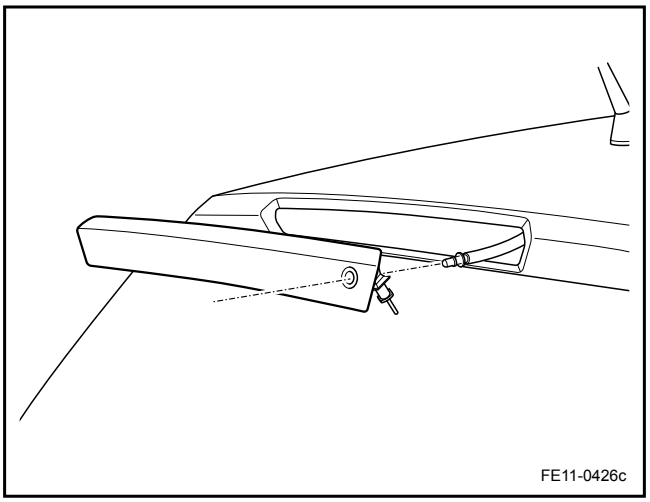
Installation Procedure:



1. Connect the spray nozzle and the hose.

   Note

   Hose can not be squeezed or folded.



2. Run the nozzle through the high mounted brake lamp.
3. Install the high mounted brake lamp.
4. Install the hatchback trim panel.

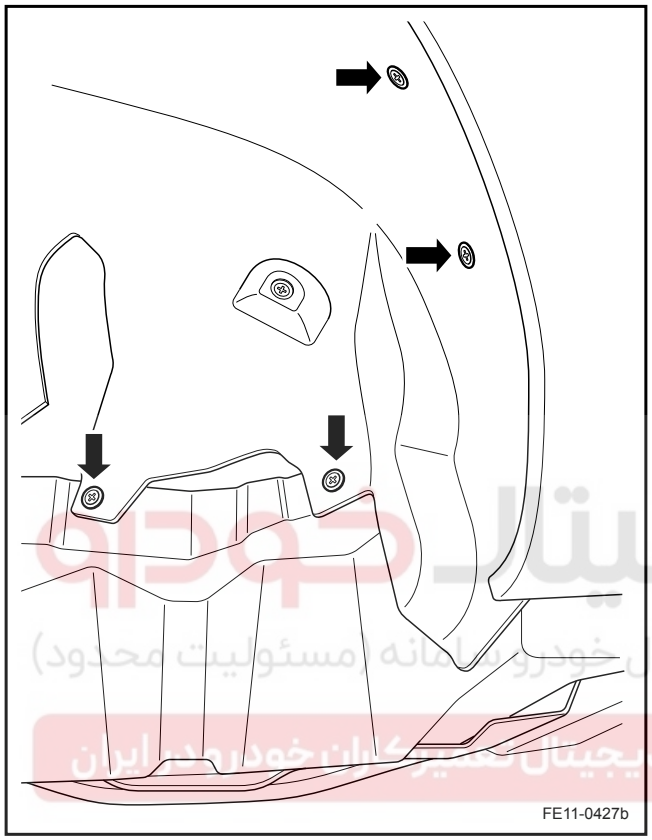
11.6.8.6 Washer Motor and Hose Replacement

Wash Motor Replacement

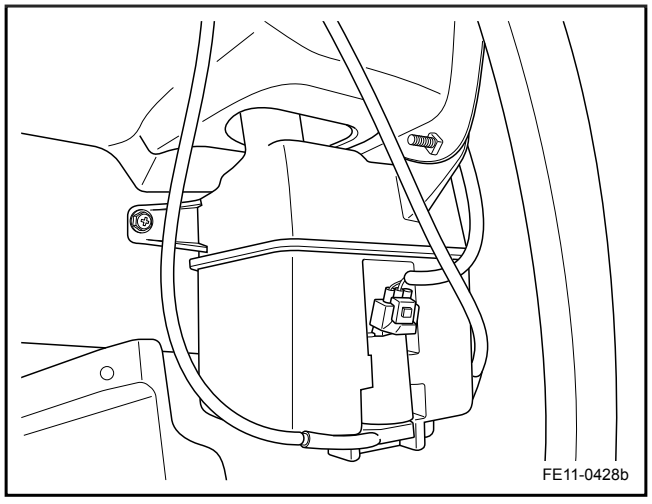
Removal Procedure

Warning!

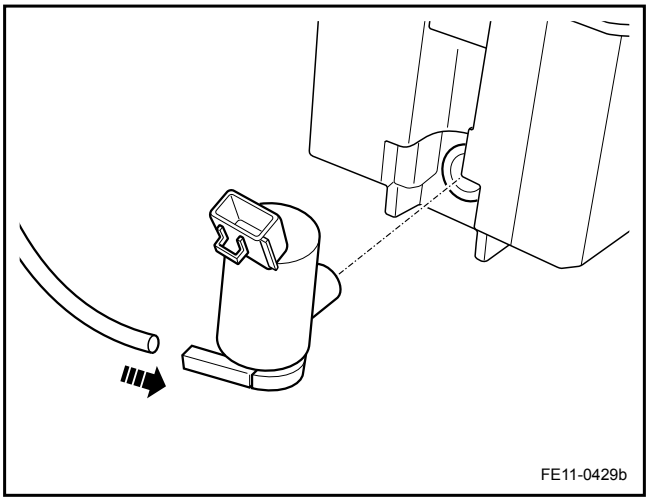
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Turn the front wheels to the right end for access.
2. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
3. Remove the right front fender. Refer to 12.10.1.8 Front Wheelhouse Liner Replacement.

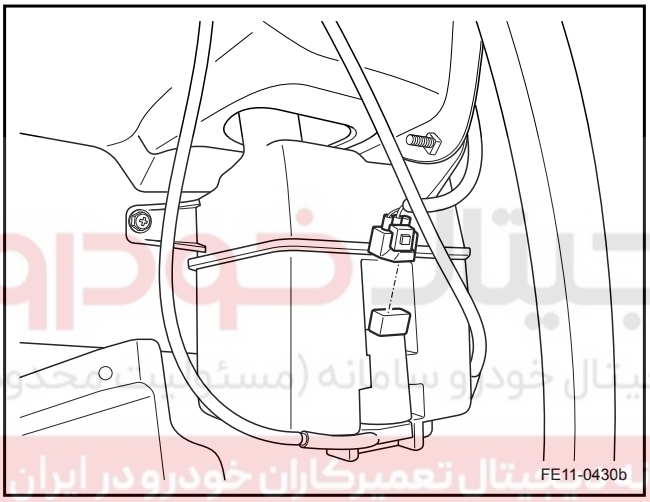


4. Disconnect the washer motor wiring harness connector.
5. Disconnect the washer hose from the washer motor.
6. Pull out the washer motor.



Installation Procedure:

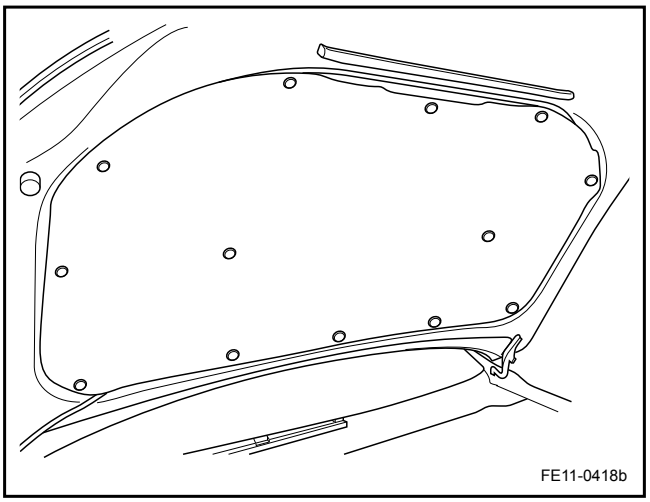
1. Install the washer motor.
2. Connect the washer hose.



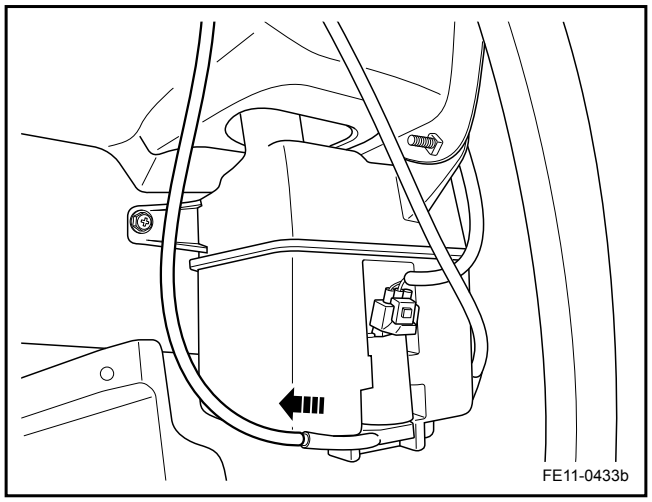
3. Connect the washer motor wiring harness connector.
4. Install the right front fender.
5. Connect the battery negative cable.
6. Turn the front wheels back to straight.

Hose Replacement

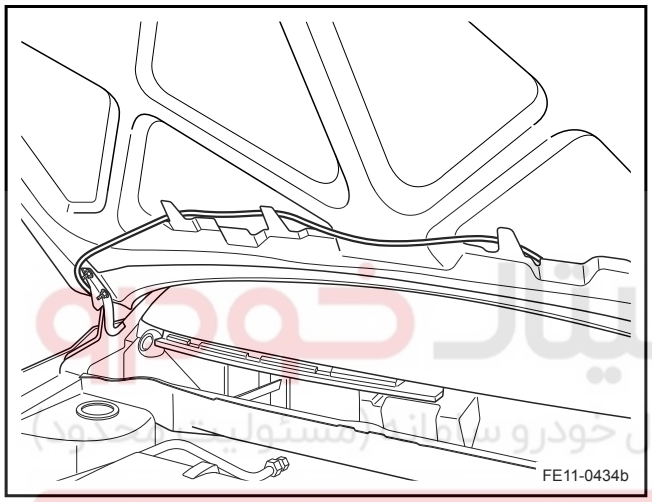
Removal Procedure



1. Turn the front wheels to the right end for access.
2. Remove the engine hood insulation pad. Refer to 12.10.1.2 Hood Sound Insulation Pad Replacement.
3. Disconnect the washer hose and the nozzle. Refer to 11.6.8.4 Wiper Nozzle Replacement.

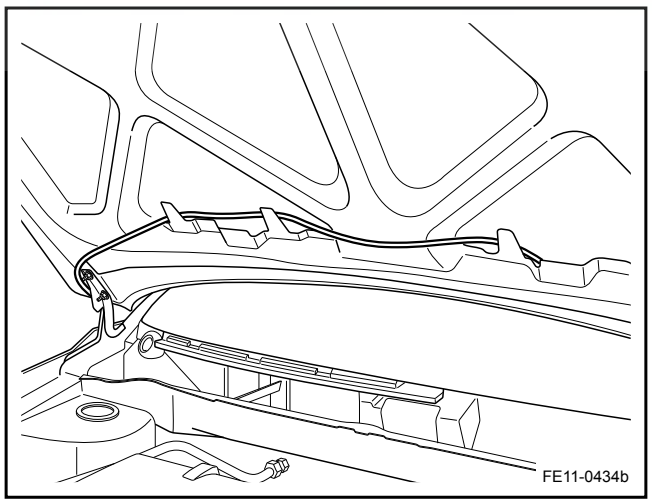


4. Remove the front fender. Refer to 12.10.1.8 Front Wheelhouse Liner Replacement.
5. Disconnect the washer hose from the motor.

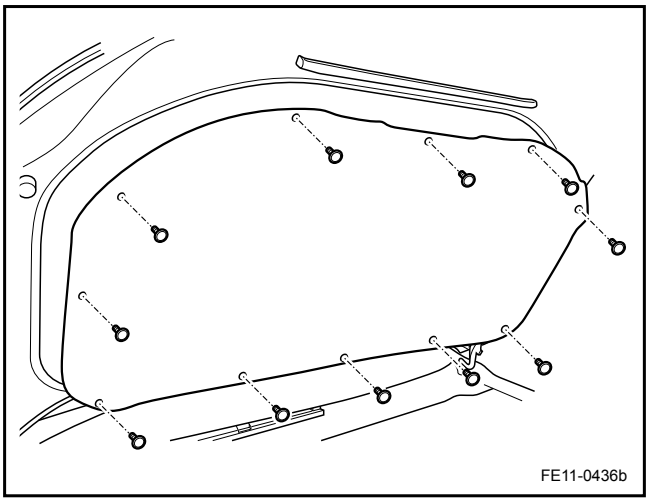


6. Remove the washer hose.

Installation Procedure:



1. Install the washer hose to the washer pump.
2. Run through and install the hose.
3. Install the front fender.
4. Connect the washer hose to the nozzle.



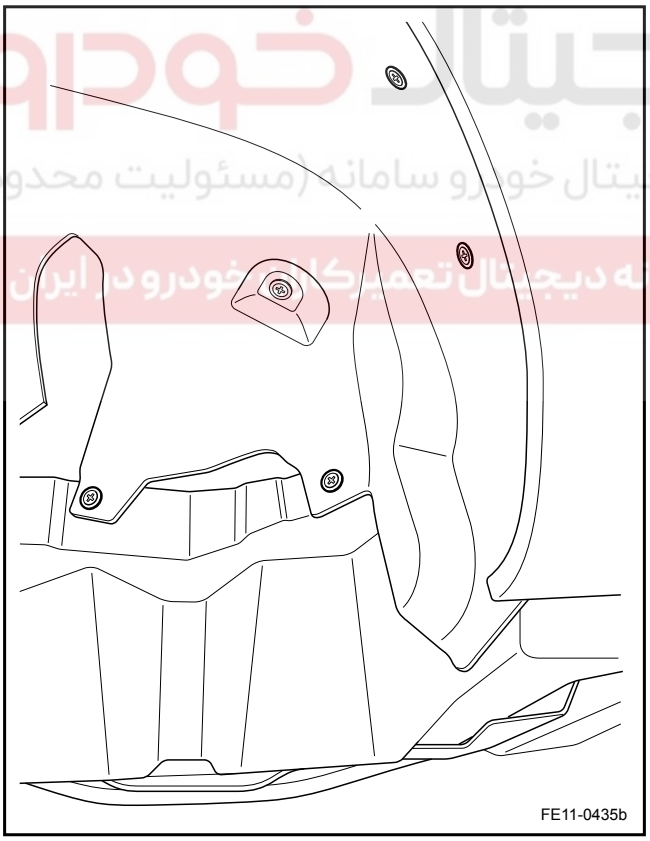
5. Install the engine hood insulation pad.

11.6.8.7 Washer Fluid Tank Replacement

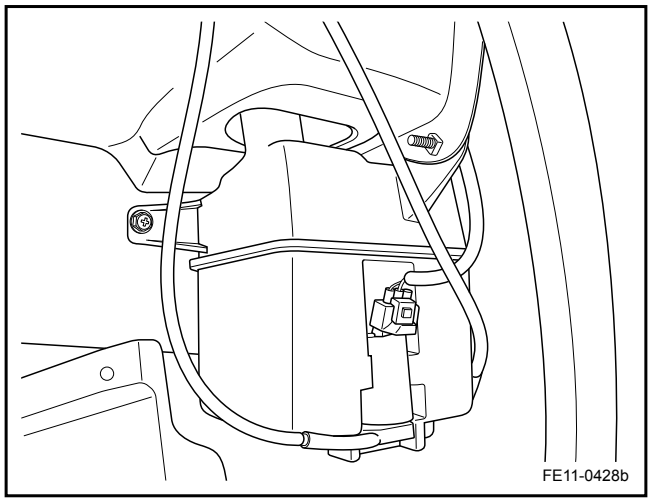
Removal Procedure

Warning!

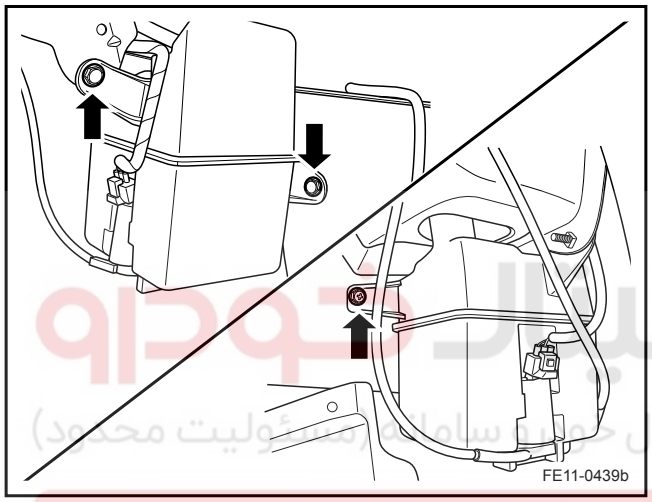
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



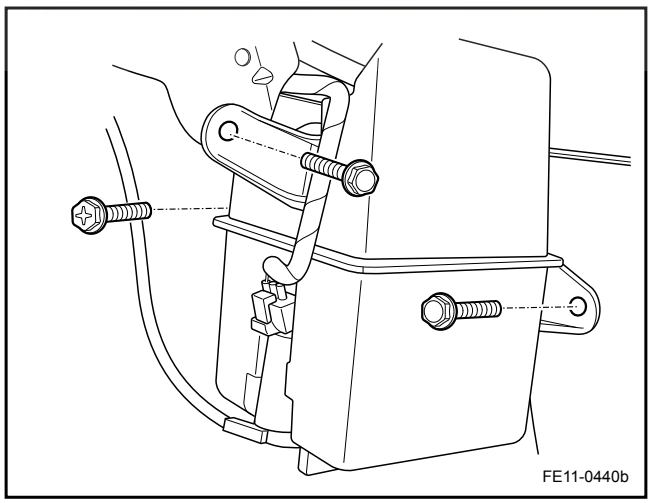
1. Turn the front wheels to the right end for access.
2. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
3. Remove the right front fender. Refer to 12.10.1.8 Front Wheelhouse Liner Replacement.



4. Disconnect the washer pump harness connector.
5. Disconnect the washer pump hose.



6. Remove the washer tank bolts.
7. Remove the washer tank.



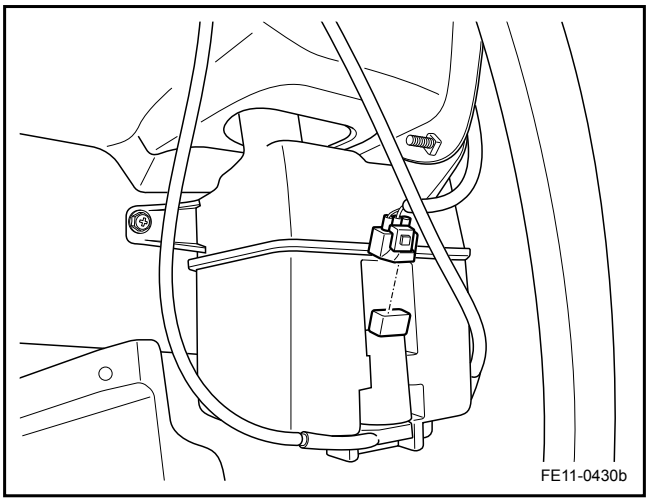
Installation Procedure:

1. Install the washer fluid tank and tighten the retaining bolts.

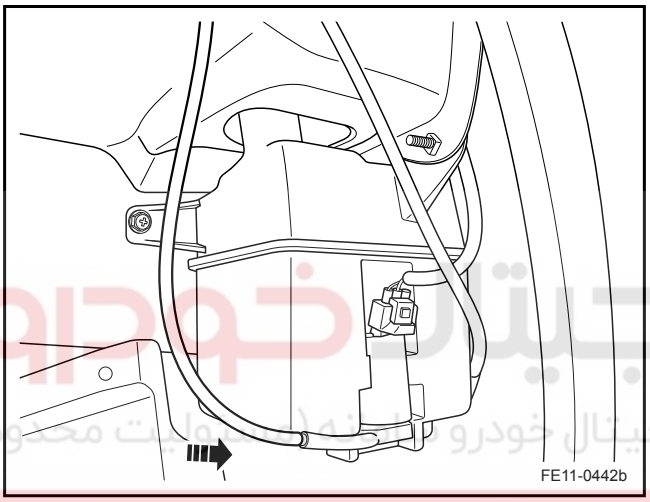
   Note

   "Fastener Notice" in "Warnings and Notices"

   Torque: 10 Nm (Metric) 8 lb-ft (US English)



2. Connect the washer pump harness connector.



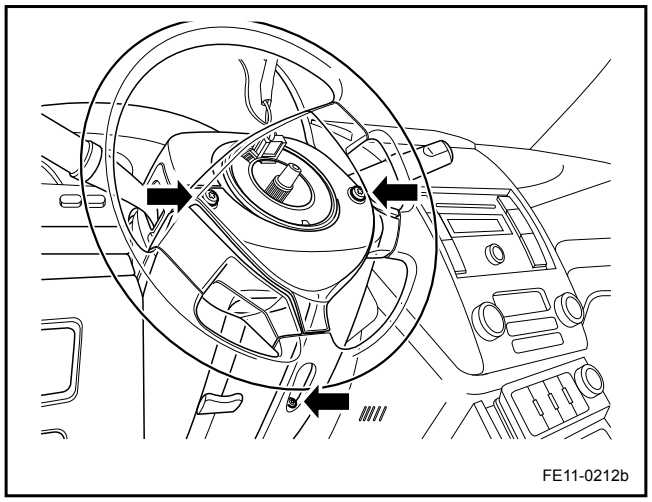
3. Connect the washer hose to the washer pump.
4. Install the right front fender.
5. Connect the battery negative cable.

11.6.8.8 Wiper and Washer Switch Replacement

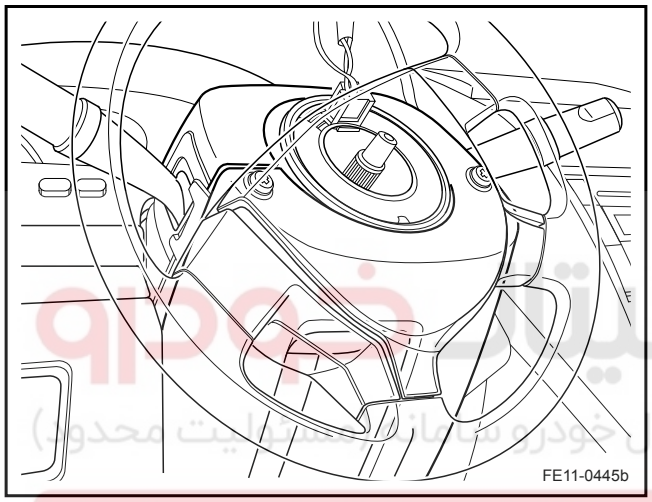
Removal Procedure

Warning!

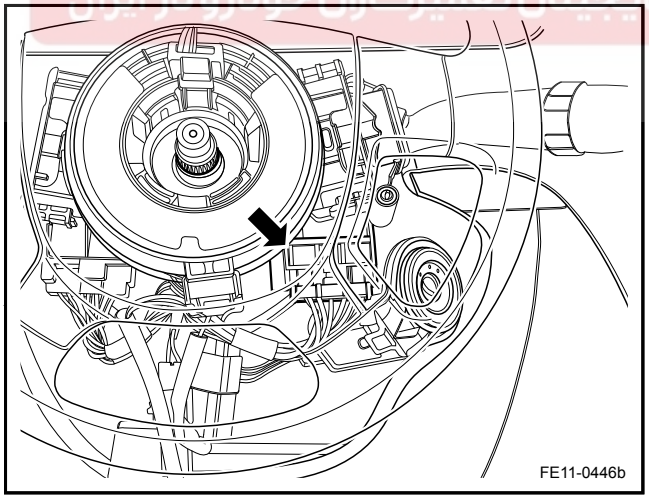
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



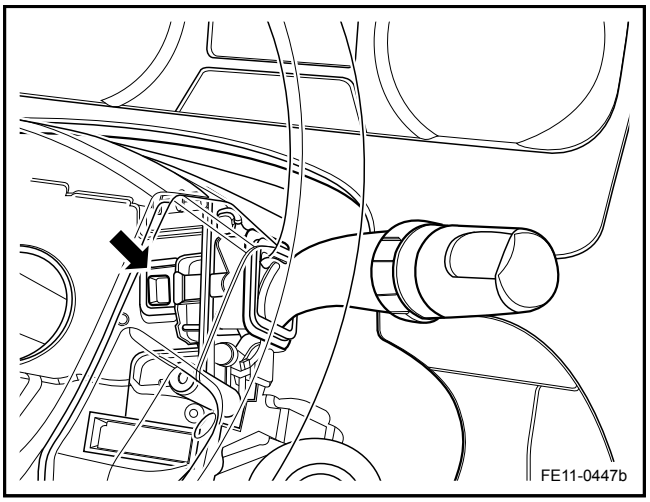
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Turn Left and right to loosen the steering wheel, Remove the steering column upper and lower retaining screws.



3. Remove the steering column upper and lower shield panels.

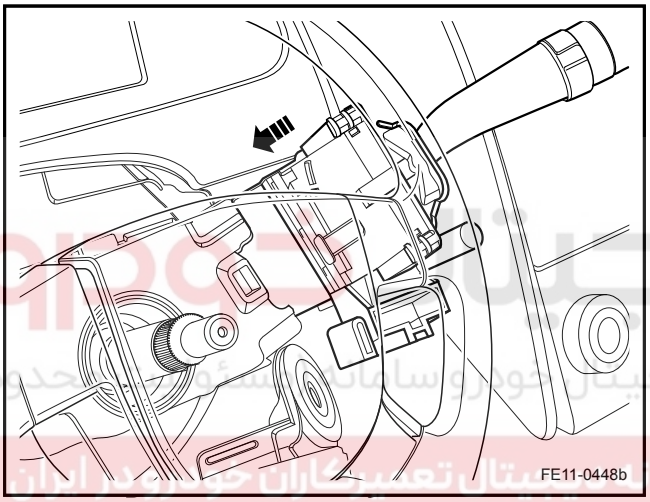


4. Disconnect the wiper switch wiring harness connector.

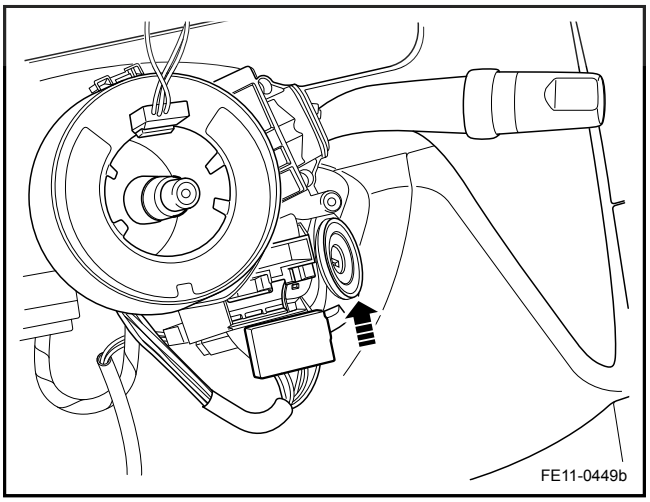


5. Press the switch tongue at the top to remove the wiper switch.
6. Remove the wiper switch.

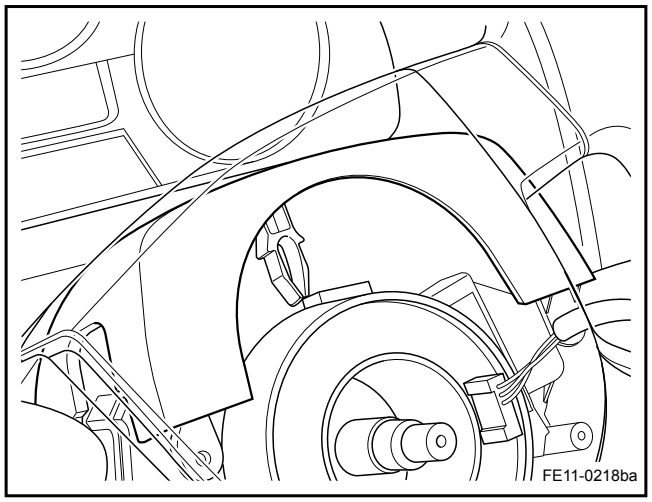
Installation Procedure:



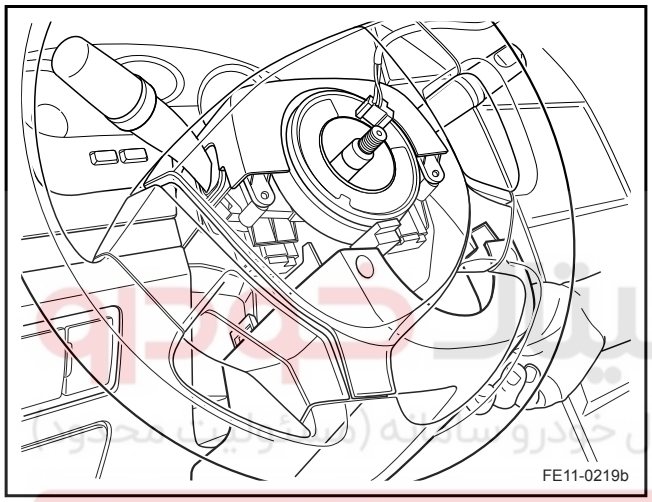
1. Install the wiper switch into the switch housing.



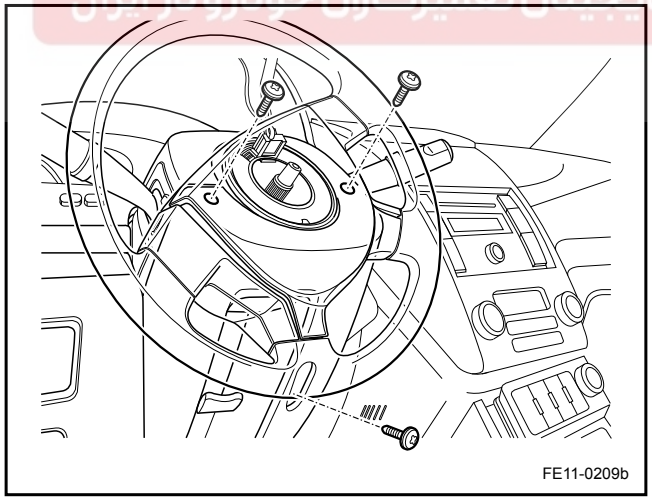
2. Connect the wiper switch harness connector.



3. Install the steering column upper shield panel.



4. Install the steering column lower shield panel.



5. Install the steering column upper and lower shield panel screws.

   Note

   Refer to "Fastener Notice" in the "Warnings and Notices".

   Torque: 8.8 Nm (Metric) 6.5 lb-ft (US English)

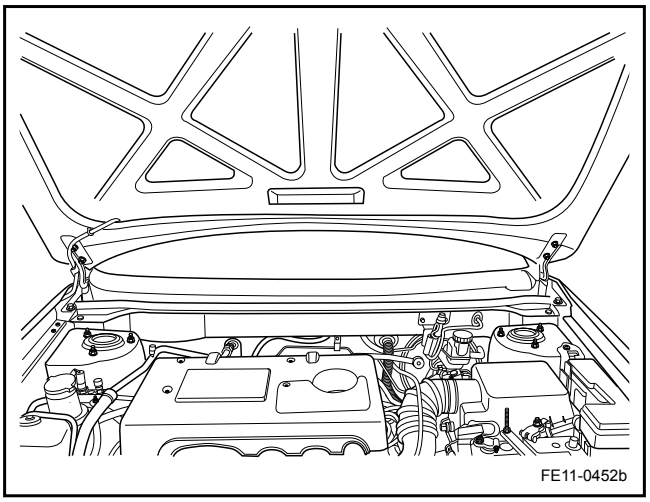
6. Connect the battery negative cable.

11.6.8.9 Wiper Motor Replacement

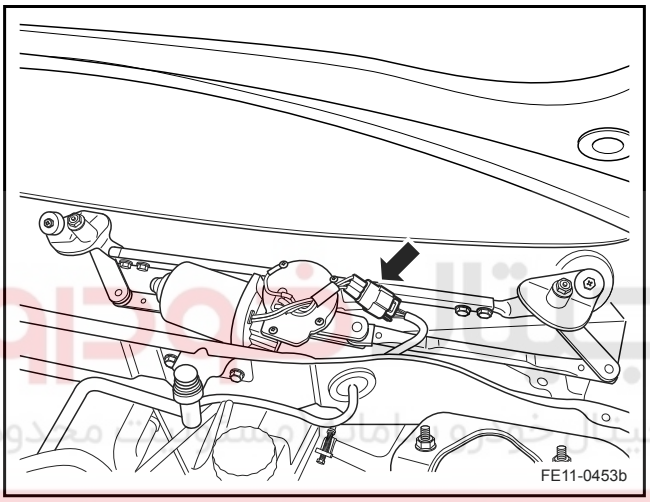
Removal Procedure

Warning!

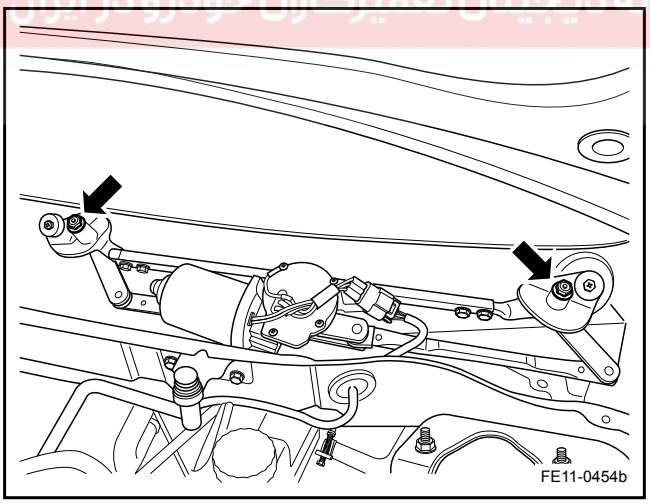
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



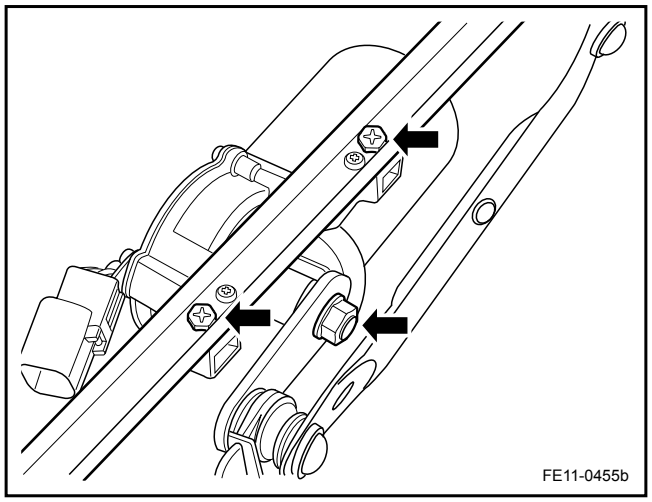
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the wiper blade. Refer to 11.6.8.1 Wiper Blade Replacement.
3. Remove the wiper arm. Refer to 11.6.8.2 Wiper Arm Replacement.
4. Remove the Air Inlet Duct. Refer to 12.10.1.3 Air Inlet Grille Panel Replacement.



5. Disconnect the wiper motor wiring harness connector.

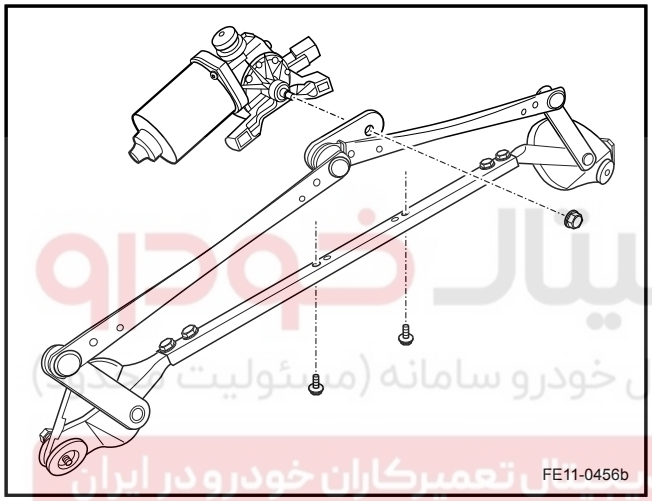


6. Remove the wiper rod retaining nut, remove the wipers and the wiper motor rod.



7. Remove the wiper motor bolts and nuts.

Installation Procedure:

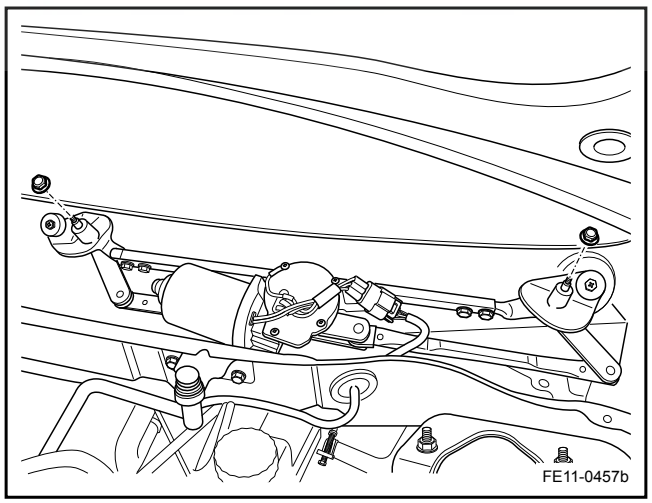


1. Install the wiper motor retaining bolts and nuts.

   Note

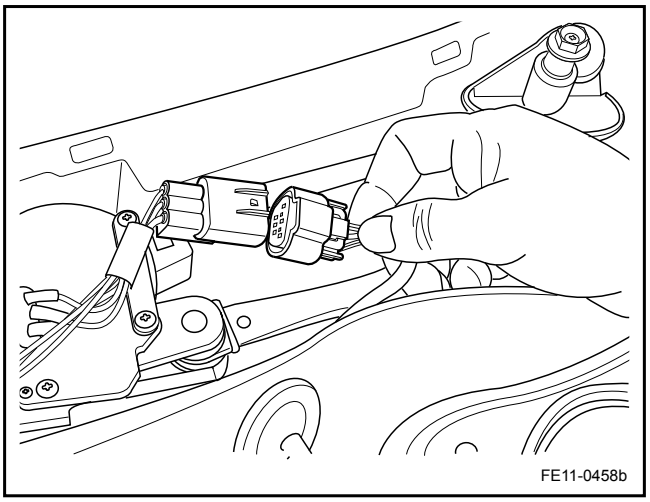
   Refer to "Fastener Notice" in "Warnings and Notices".

   Torque: 8 Nm (Metric) 6 lb-ft (US English)



2. Install the wiper arm connecting rod retaining bolts.

   Torque: 20.5 Nm (Metric) 15 lb-ft (US English)



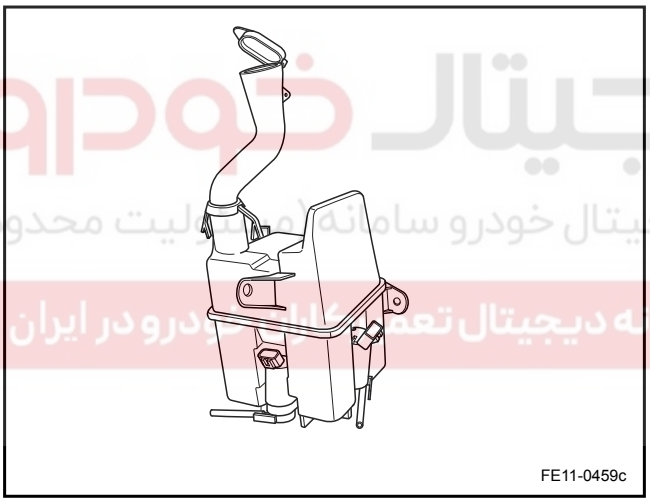
3. Connect the wiper motor wiring harness connector.
4. Install the air inlet duct.
5. Install the wiper arm.
6. Install the wiper blade.
7. Connect the battery negative cable.

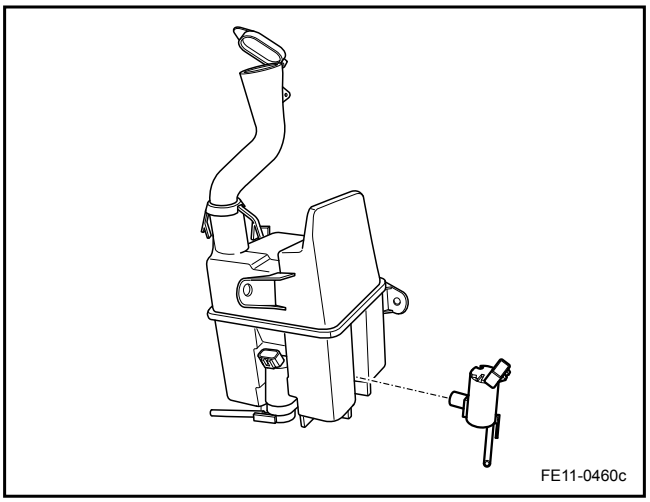
11.6.8.10 Rear Washer Pump and Hose Replacement (Hatchback)

Replace the rear washer pump.

Removal Procedure

1. Remove the washer fluid tank. Refer to 11.6.8.7 Washer Fluid Tank Replacement.





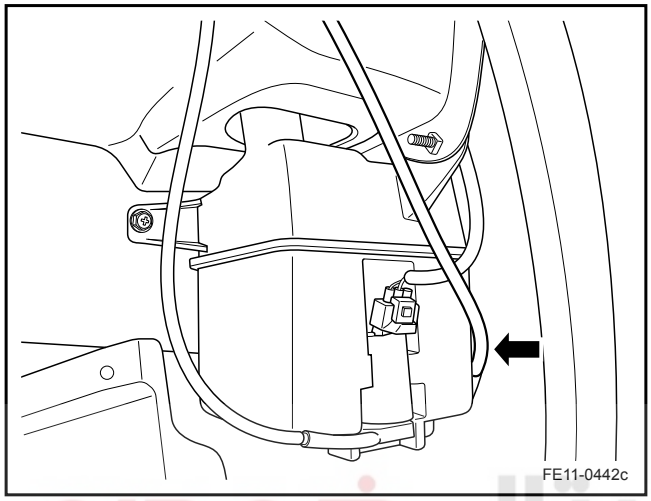
2. Remove the washer pump. pull the pump from the washer fluid tank.

Installation Procedure:

1. Install the washer pump. Press the washer pump into the tank.
2. Install the washer fluid tank.

Hose Replacement

Removal Procedure



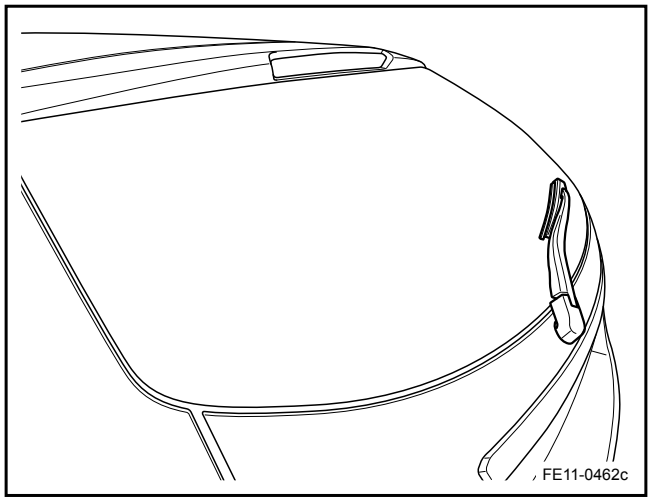
1. Turn the front wheel to the right end to gain access.
2. Disconnect the hose from nozzle.
3. Disconnect the hose from the pump.
4. Remove the rear washer hose.

Installation Procedure:

1. Install the hose to the rear washer pump.
2. Install the hose.
3. Install the right front fender.
4. Install the other end of the hose to the nozzle.

11.6.8.11 Rear Wiper Motor Replacement (Hatchback)

Removal Procedure

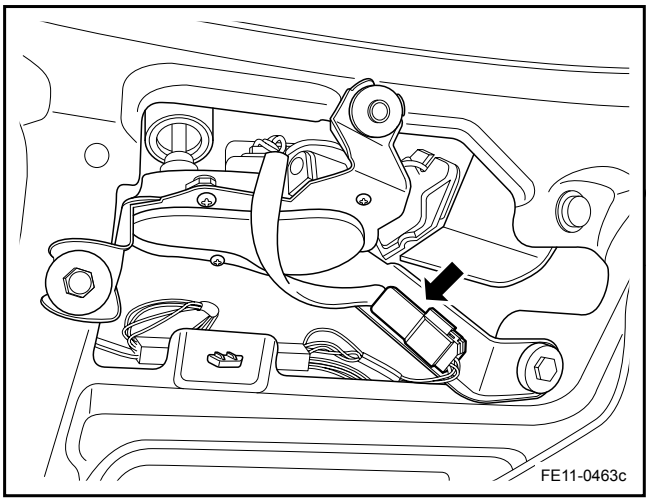


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.

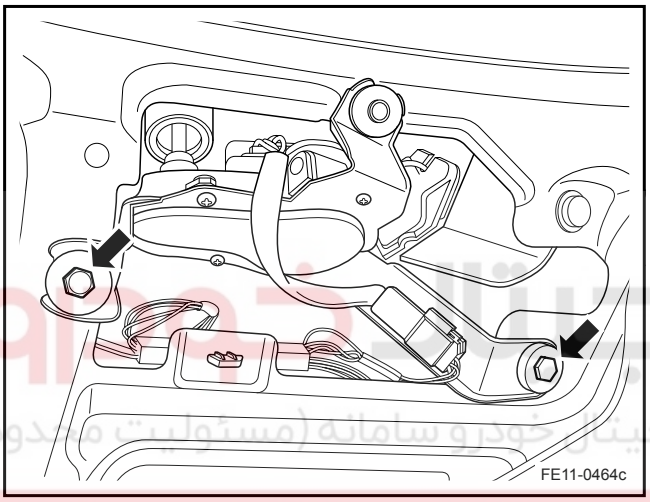
   Warning!

   Refer to "Battery Disconnect Warning" in "Warnings and Notices".

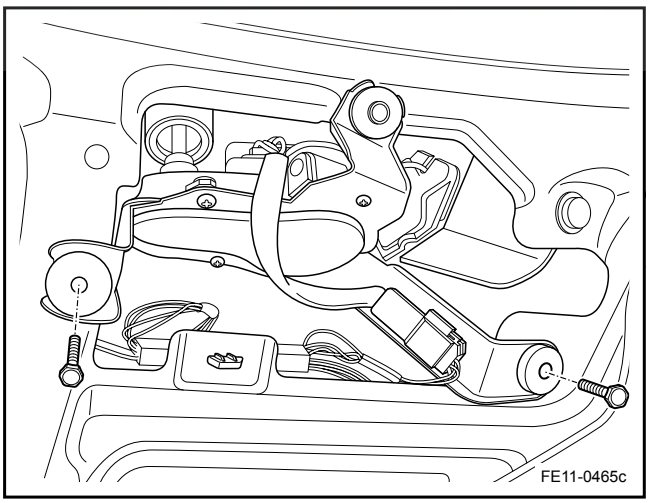
2. Remove the rear wiper blade. Refer to 11.6.8.1 Wiper Blade Replacement.
3. Remove the rear wiper arm. Refer to 11.6.8.3 Rear Wiper Arm Replacement (Hatchback).



4. Remove the hatchback trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback)
5. Disconnect the rear wiper motor wiring harness connector.



6. Remove the wiper motor retaining bolts.
7. Remove the wiper motor.



Installation Procedure:

1. Install and tighten the rear wiper motor retaining bolts.

   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

   Torque: 20 Nm (Metric) 15 lb-ft (US English)
2. Connect the rear wiper motor wiring harness connector.
3. Install the rear door trim panel.
4. Install the rear wiper arm.
5. Install the rear wiper blade.

11.7 Instrument / Driver Information System

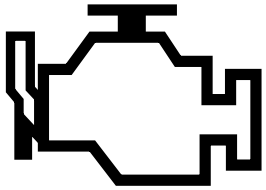
11.7.1 Specifications

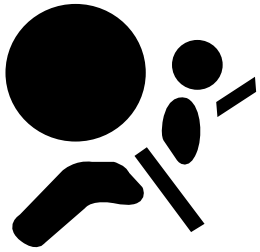
11.7.1.1 Fastener Tightening Specifications

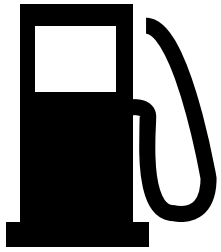
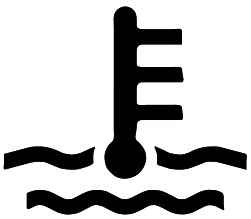
Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Instrument Cluster Self-Tapping Screws	ST4.8 × 13	3-4	2-3

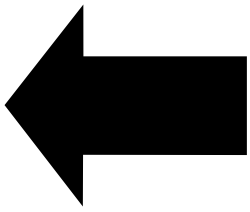
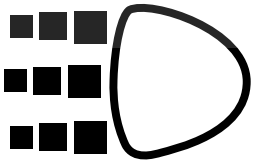
11.7.1.2 Indicator Descriptions

Instrument cluster has 18 warning lamps to provide a warning or reminder.

Symbols	Indicator	Color
	Engine Oil Pressure Warning Lamp	Red
	Battery Charging Indicator	Red
	Engine Emission Fault Warning Lamp	Yellow

Symbols	Indicator	Color
	Driver Seat Belt Warning Lamp	Red
	Airbag Fault Warning Lamp	Red
	Tire Pressure Warning Lamp	Yellow
TPMS	Tire Pressure Management System Indicator	Yellow
	Headlamp High Beam Indicator	Blue

Symbols	Indicator	Color
	Fuel Level Too Low Warning Lamp	Yellow
	Engine Overheating Warning Lamp	Red
	ABS Failure Warning Lamp	Yellow
EBD	EBD Fault Warning Lamp	Yellow
	Park Brake Indicator	Red

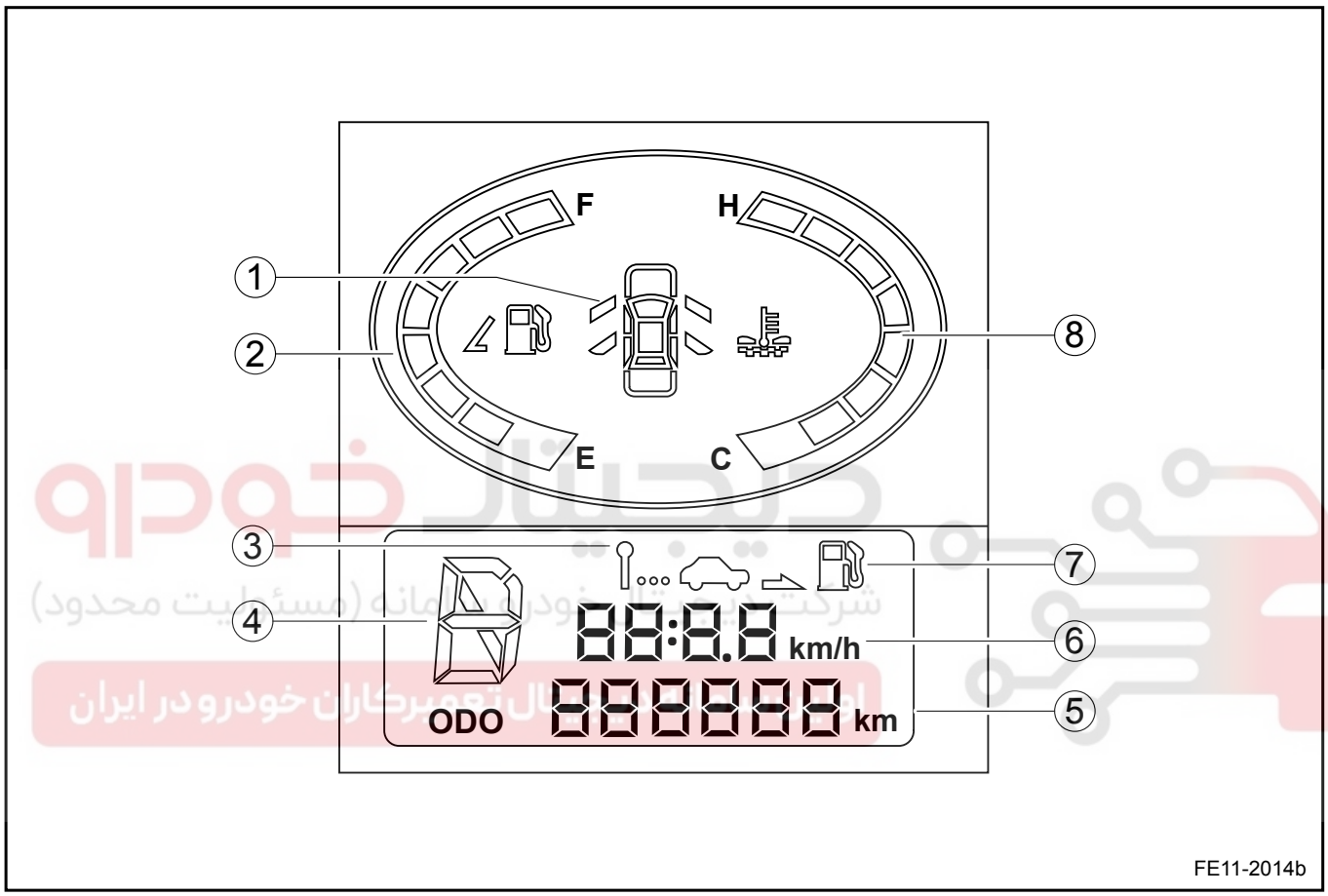
Symbols	Indicator	Color
	Brake Failure / Brake Fluid Low Warning Lamp	Red
	Left Turn Indicator	Green
	Right Turn Indicator	Green
	Daylight Running Light (If Equipped)	Grass Green

11.7.2 Description and Operation

11.7.2.1 Display

There are 2 LCD screens (primary, secondary) on the instrument panel, installed on the primary and secondary instrument panels.

The primary LCD is divided into two parts. Upper half shows the fuel, engine temperature, and four doors conditions; lower half shows odometer, reverse radar, transmission gear, trip meter, driving time, average speed and remaining mileage. LCD can also be divided into left and right half. Left half shows transmission gear and ODO symbols. The right half is divided into upper, middle and lower three rows. Upper row shows reverse radar and remaining mileage; the middle row shows trip meter, driving time, average speed, remaining mileage; the lower row shows odometer. Refer to the following diagram:



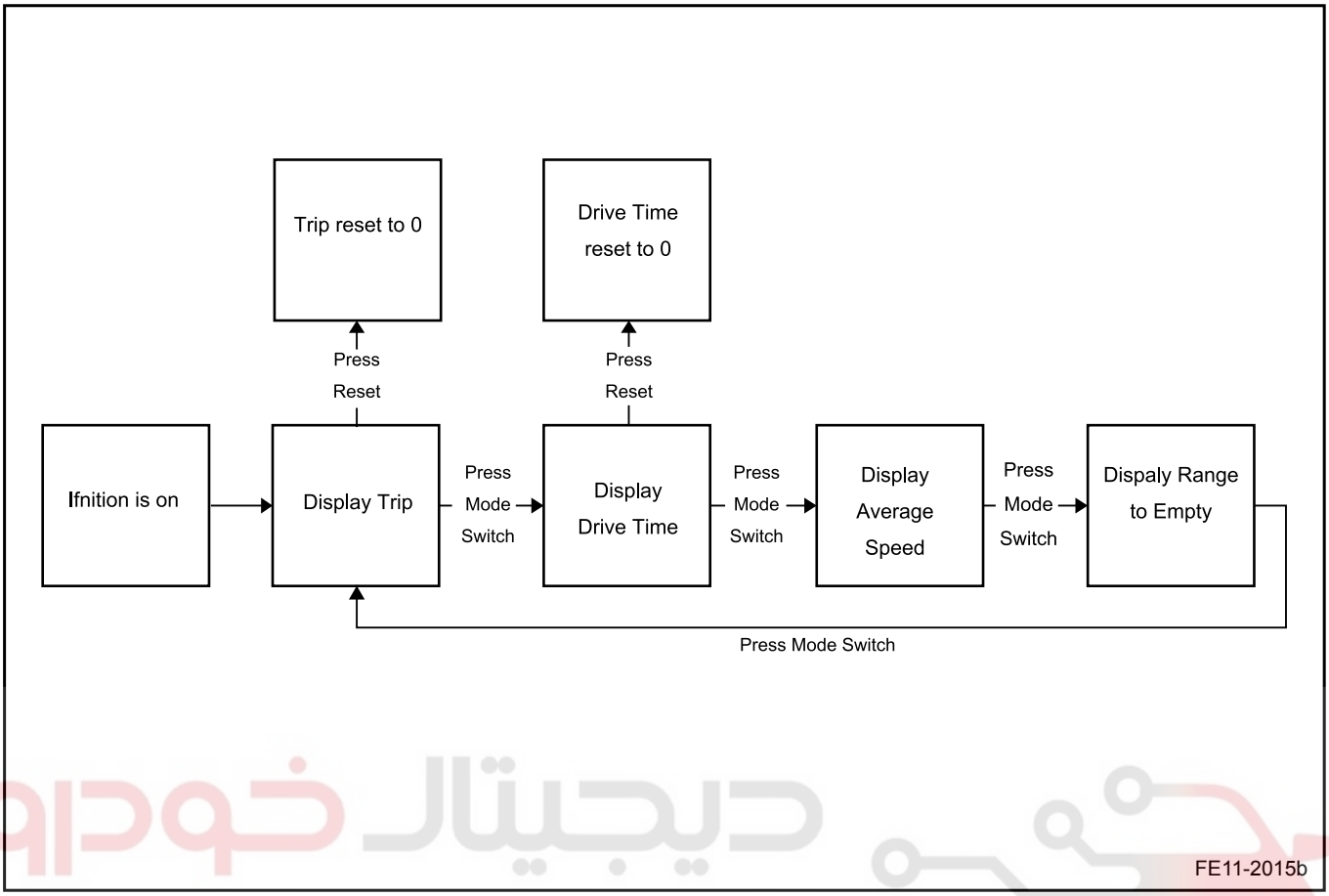
Legend

1. Doors Open Information
2. Fuel Information
3. Reverse Radar Symbol
4. Gear Information (Automatic Transmission Models)
5. Odometer
6. Mode Switching Display: Trip Meter, Driving Time, Average Speed, Remaining Mileage
7. Remaining Mileage
8. Engine Coolant Temperature Information

11.7.2.2 Odometer Display Mode Switch

LCD lower half right side middle row shows four different types of values, including the trip meter, driving time, average speed and remaining mileage, press the Mode button to switch (Refer to 11.7.4.1 Component Locator). Only when the engine is running, mode button and the Clear button can be used.

Mode switching logic is shown below:



When the engine is turned off, the primary LCD shows trip meter by default, and the model can not be switched. When the ignition is turned on again, the primary LCD display is in the previous mode.

11.7.3 System Working Principle

11.7.3.1 System Working Principle

Wake up and Sleep

When the engine is turned off, if the sleeping conditions are met (engine shut down, no warning lamp alarm, no buzzer alarm, main control Sleep CAN message four conditions are simultaneously satisfied), instrument panel will enter a power saving sleep mode, all the instrument functions and CAN bus communication stops running. If the wake-up conditions are met (CAN network communication, ignition switch signal, reverse lamp switch one of the signals), the entire CAN bus will return to normal operating mode.

Lighting

General Lighting Rules:

- Instrument panel has white translucent lighting, LCD has white backlight.
- Lighting level is adjusted by an external PWM input signal, after engine shut down lights brightness can still be adjusted.

Lighting logic:

Ignition Signal	Parking Signal Light	LCD Lighting	Instrument Panel Lighting
Off	VCC	On, Brightness Adjustable	On, Brightness Adjustable
Off	GND	On, Brightness Is Not Adjustable	Off
On	VCC	On, Brightness Adjustable	On, Brightness Is Not Adjustable
On	GND	On, Brightness Is Not Adjustable	Off

Note

When the instrument cluster enters into the sleep mode, backlight will be off. If the parking lights are turned on, instrument cluster will be awakened, LCD and instrument cluster lighting will be enabled. In this case, when the CAN network is in the sleep mode, the meter only shows trip meter, odometer, ODO icon, fuel icons, the water temperature icons, mode can not be switched, non CAN based messages on the LED and sound alarm; When the CAN network is awake, the instrument cluster will start all defined functions.

Warning Lamps Control

- Two warning lamps in the instrument cluster are powered by battery, they are:
  - Headlamp High Beam Indicator
  - Daytime Running Light (If equipped)

  Note

  Other warning lamps in the instrument cluster are powered by the ignition power supply.
- The following warning lamps are directly controlled by the hardware:
  - Headlamp High Beam Indicator
  - Daytime Running Light (If equipped)
  - Battery Charging Indicator
  - Tire Pressure Warning Lamp
  - Brake Malfunction / Low Brake Fluid Warning Lamp
  - Park Brake Indicator
  - Tire Pressure Management System Indicator
  - Engine Oil Pressure Warning Lamp

  Note

  The rest warning lamps are controlled by signals from the CAN bus.

Buzzer

Buzzer Function

In the following five cases, the buzzer will sound, prompt the driver the corresponding warning message. Buzzer tones frequency parameter is stored in EEPROM.

Function	Trigger conditions	Frequency	Time and Interval
Keys are not pulled warning	When the ignition is off, the key is not pulled out, the driver door open.	651.0 Hz	Buzzer sound 2 min, until the driver door is closed or the key being pulled out. 500 ms off, 500 ms open.

Function	Trigger conditions	Frequency	Time and Interval
Seat Belt Not Tightened Warning	1. When the ignition is turned on, the drive seat belt is not tightened, buzzer will sound for 4 s. 2. After the ignition is turned on, if the drive seat belt is not tightened, when the vehicle speed reaches 25 km/h. The acoustic signal is activated for 30 s. 3. If the seat belt is fastened within 30 s, the visual signal and the acoustic signal will be off. 4. If the speed is less than 25 km/h, acoustic signals will be activated until the seat belt is fastened or 30 s elapsed. 5. The next time the speed exceeds 25 km/h, whether or not the driver seat belt is fastened, the acoustic signals will not be activated.	578.7 Hz	Buzzer sounds 4 s, 500 ms off, 500 ms on.

Function	Trigger conditions	Frequency	Time and Interval
Door Not Open Warning	when the speed is greater than 10 km/h, if a door opens. Refer to11.7.3.1 Door Status Display.	868.0 Hz	Buzzer sounds, 500 ms off, 500 ms on.
Reverse Radar Warning	when the vehicle is reversing.	578.7 Hz	Buzzer on and off is determined by the reverse radar input signal. If the signal is low, the buzzer sound. Otherwise the buzzer will be off.
Light Not Turned Off Warning	If the following four conditions are met: 1. Ignition Off 2. Driver Door Open 3. Key Pulled Out 4. Park lamp or low beam lamps are not turned off	651.0Hz	Buzzer will sound 2 min, 500 ms off, 500 ms on. If any one of four conditions is no longer valid, the buzzer will be off.

Self-Test

When the ignition switch is turned on, there are seven LED warning lamps under the control of the software. These alarm lamps are:

- Engine Overheating Warning Lamp
- Fuel Level Too Low Warning Lamp
- ABS Failure Warning Lamp
- Engine Emissions Failure Warning Lamp
- Engine System Failure Warning Lamp
- Airbag Fault Warning Lamp
- EBD Fault Warning Lamp

When the engine speed is greater than 300 rpm, self-test is interrupted.

Gages

After the engine is shut down, all gages return to zero.

Speedometer

There are two kinds speed signals used to calculate the speed. One is obtained from the EMS module CAN message signal, the other is the vehicle speed sensor frequency signal. When the ignition system is turned on, the instrument cluster system determines calculate the speed with which speed signal. Priority is as following: CAN bus through the acquisition from the EMS speed signal is greater than the speed sensor.

Specific speed signal switching in the following strategies:

- If the ICU can not receive messages in continuous five cycles, or EMS received CAN speed message is not valid, the system switched to using the frequency sent from the speed sensor signal to calculate speed within 50 ms.
- If the CAN speed message is back to normal, and maintains continuous five cycles, the system switches back to using the CAN speed signal to calculate speed within 50 ms.

Engine Tachometer

Engine speed data is from the CAN bus, sent by EMS. Instrument micro-controller accepts the signal, calculates the engine speed, and then drives a stepper motor to point to the appropriate location (rpm/min).

The behavioral characteristics of the engine tachometer is as following:

- When the engine is turned off, if the battery has been connected, the engine tachometer pointer is back to the "0" position.
- If the battery is disconnected, the engine tachometer pointer does not return to the "0" position; When the battery is connected again, the engine tachometer pointer is back to the "0" location
- If the engine speed signal from the CAN is invalid or missing for 5 s, the engine tachometer pointer will return to "0" position.

Fuel Gage

Fuel gage input signal is from the fuel level sensor, one end of the fuel gage is connected to fuel sensor terminal.

Fuel sensor resistance parameters are as following:

Fuel	Resistance
Full	40 (± 2 Ω)
3/4	60(± 2 Ω)
1/2	90(± 2 Ω)
1/4	140(± 2 Ω)
Threshold	190 (± 2 Ω)
Empty	300 (± 2 Ω)

According to the total fuel tank capacity (55 L), LCD display is divided into eight equal interval value (slightly different in the low fuel alarm mode). When the fuel amount decreases, if the current fuel level falls into the appropriate range, the corresponding LCD segment will be lit.

Fuel Tank Capacity (L/pt)	LCD Segment Display
5-10/8.8-17.6	Empty (The First Segment)
10-13.5/17.6-23.8	First and Second Segment Light
13.6-20.25/23.9-35.6	First To The Third Segment Light
20.26-27.0/35.7-47.5	First To The Fourth Segment Light
27.1-33.75/47.7-59.4	First To The Fifth Segment Light
33.76-40.5/59.4-71.3	First To The Sixth Segment Light
40.6-47.25/71.4-83.1	First To The Seventh Segment Light
47.26-55.0/83.2-96.8	Full (All Light)

When the fuel level is lower than the threshold, low fuel level warning lamp light.

Engine Coolant Temperature Gage

Engine coolant temperature information is from the CAN bus. Micro-controller calculates the engine coolant temperature, and then displays on LCD according to the message sent from the EMS.

If the CAN message from the EMS is lost continuously for one minute, or the temperature value is invalid for one minute, LCD thermometer will show the minimum, and the temperature warning lamp will be on.

Temperature is displayed in eight segments on LCD. The temperature corresponding relationships may be adjusted in the programming and stored in EEPROM. The default comparison is shown below.

Temperature°C (ºF)	LCD Segment Display
T ≤ 50 (T ≤ 122)	Low Temperature Sign (All Off)
50 < T ≤ 70 (122 < T ≤ 158)	First Segment Light
70 < T ≤ 80 (158 < T ≤ 176)	First and Second Segment Light
80 < T ≤ 90 (176 < T ≤ 194)	First To The Third Segment Light
90 < T ≤ 100 (194 < T ≤ 212)	First To The Fourth Segment Light
100 < T ≤ 110 (212 < T ≤ 230)	First To The Fifth Segment Light
110 < T ≤ 120 (230 < T ≤ 248)	First To The Sixth Segment Light
120 < T ≤ 124 (248 < T ≤ 255)	First To The Seventh Segment Light
124 < T ≤ 130 (255 < T ≤ 266)	High Temperature Sign (All Light)

When the engine temperature reaches 124°C (255 ºF), the engine overheating warning lamps will be flashing at 1Hz frequency. For detailed alarm policy, please refer to the table:

Previous Alarm Status	Temperature T °C (ºF)	Next Status
No Overheating Alarm	T ≥ 124 (T ≥ 255)	An Overheating Alarm
Overheating Alarm	T<121 (T<250)	Overheating Lifted

Door Status Display

Four doors information is from the CAN bus, sent by the BCM module. Instrument cluster shows each door information on LCD display. When the vehicle speed is greater than 10 km/h, if a door opens, the corresponding LCD segment will be blinking, body icon shows on LCD, buzzer will ring until all doors are closed; when the speed is less than or equal to 10 km/h, if a door opens, the corresponding LCD segment will be lit (not blinking), body icon shows on LCD, but the buzzer does not ring.

When the engine is shut down, if a door opens and there is no other alarm, the LCD will show the door open status for 4 s. The instrument panel goes into sleep mode, while there is no LCD information display, no backlight.

When the engine is shut down, if the engine hood opens or the rear compartment lid opens and there is no other alarm, then the LCD backlight illuminates. LED shows corresponding status, also shows the status of each door. After 4 s, the instrument panel goes to sleep. At the same time there is no LCD information display, no backlight.

If the key is not pulled out or park lamps are not turned off, although the engine is shut down, the LCD will be backlight on. LCD shows the status of each door until the alarm expires or the alarm is deactivated. After the alarm, instrument panel goes to sleep. At the same time there is no LCD information display, no backlight.

When the engine is shut down, if the hazard warning lamp is enabled, then the LCD backlight will be on, the right and left turn signal lamps start flashing. LCD shows the status of each door until the hazard warning lamp is turned off. If there is no other alarm, the instrument panel goes to sleep. At the same time there is no LCD information display, no backlight.

Odometer

Display Range: 6 digits, maximum 999,999 km
Accuracy: 1 km

Odometer shows the total vehicle mileage. When the total mileage reaches the maximum reading (999,999 km), the display remains unchanged. In order to prevent a total mileage value loss, micro-controller updates the value stored in EEPROM once every 2 km. When battery power supply is off, the total mileage maximum error is 1 km. If reading from the EEPROM fails, the corresponding display position shows "Err".

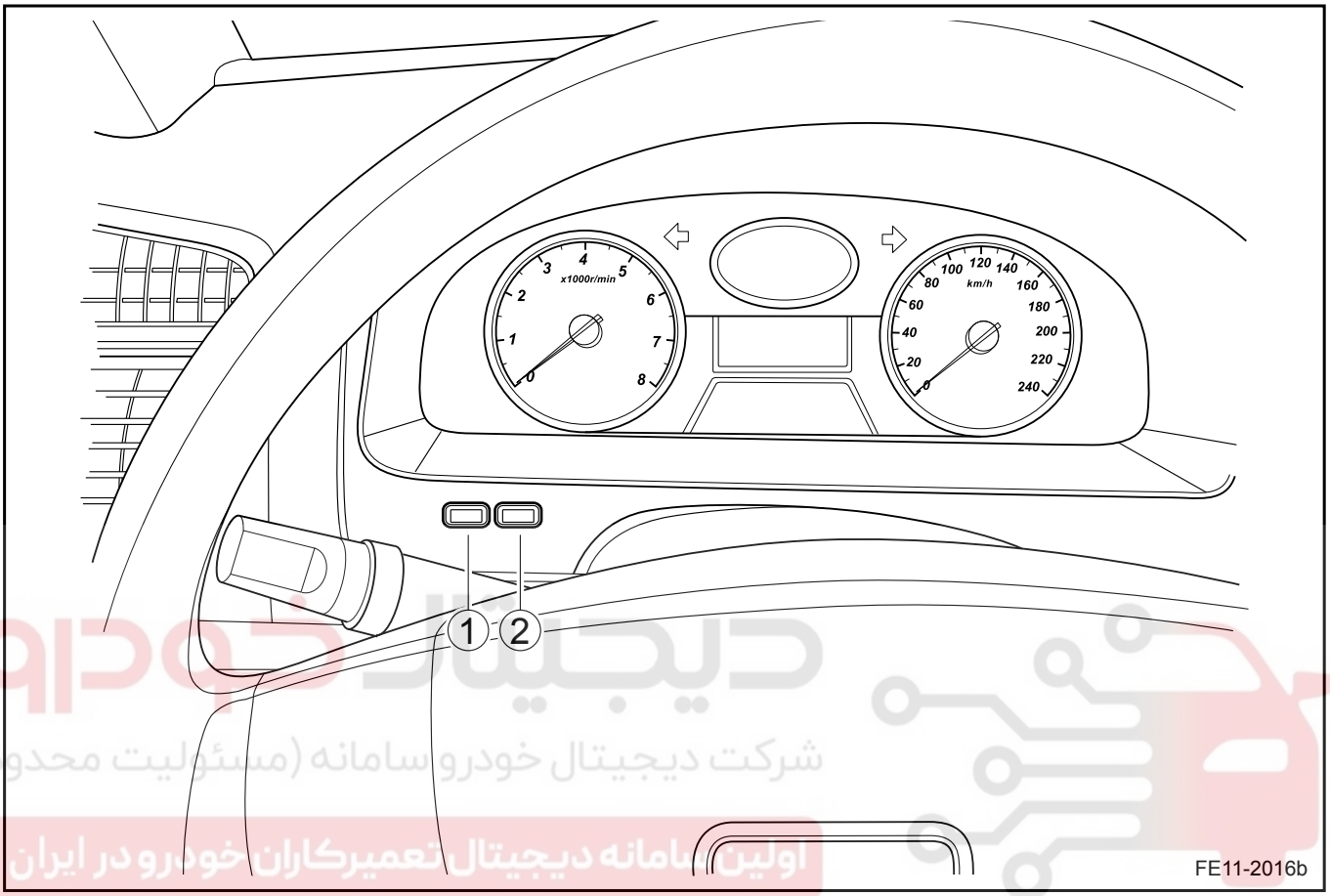
After the ignition is turned on, the micro-controller checks the RAM for the total mileage value. If the RAM value is missing or invalid, a total mileage reading from the EEPROM will be displayed on the LCD. The value of the total mileage is stored in RAM, and its accuracy is 1 km.

In the event of the battery power-down, the engine will be shut down. Press the mode switch button, ignition on, and maintain for 20 s. The odometer value is cleared (only when the reading is less than 256 km). This operation can only be operated once.

11.7.4 Component Locator

11.7.4.1 Component Locator

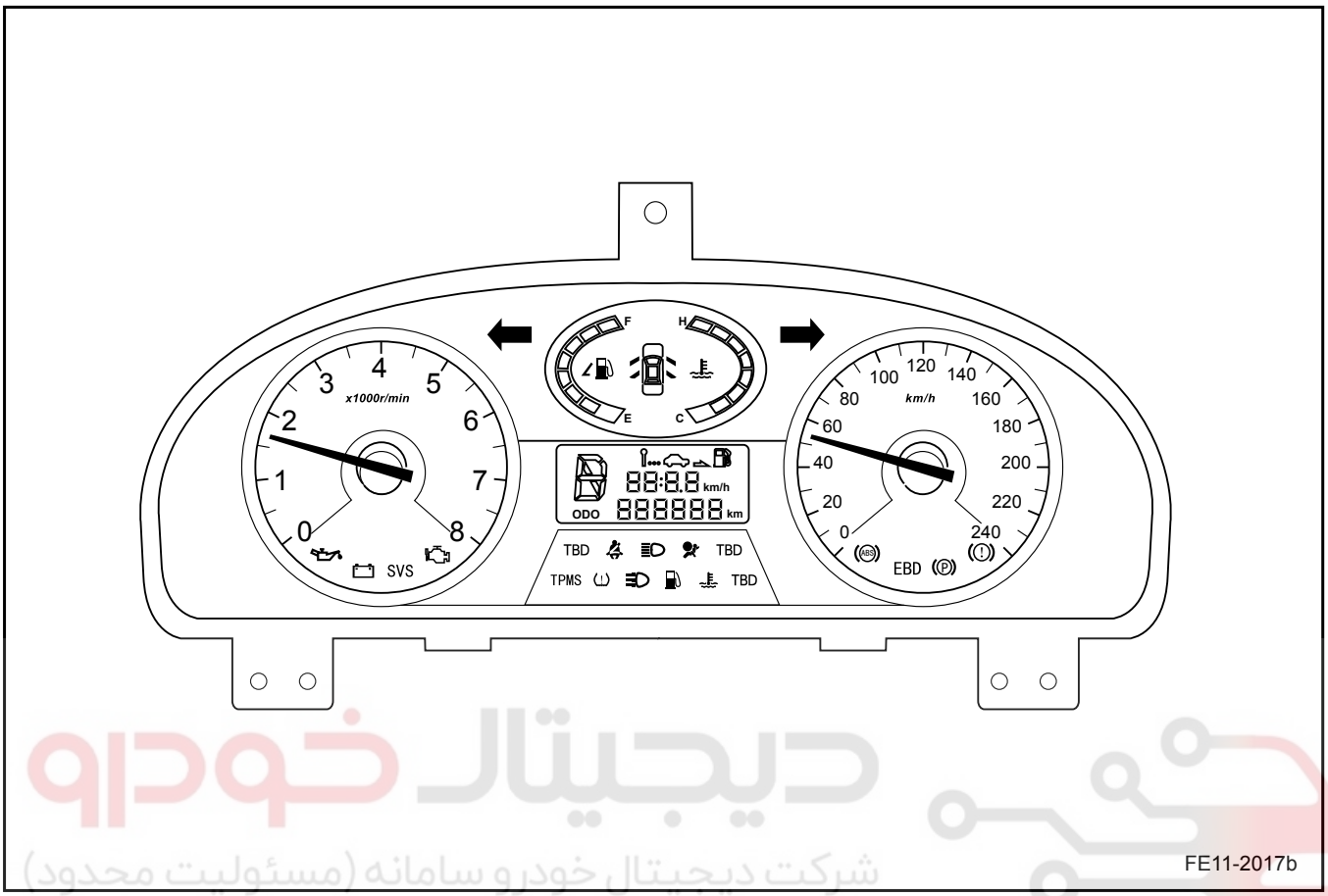
Instrument Cluster Front End



Legend

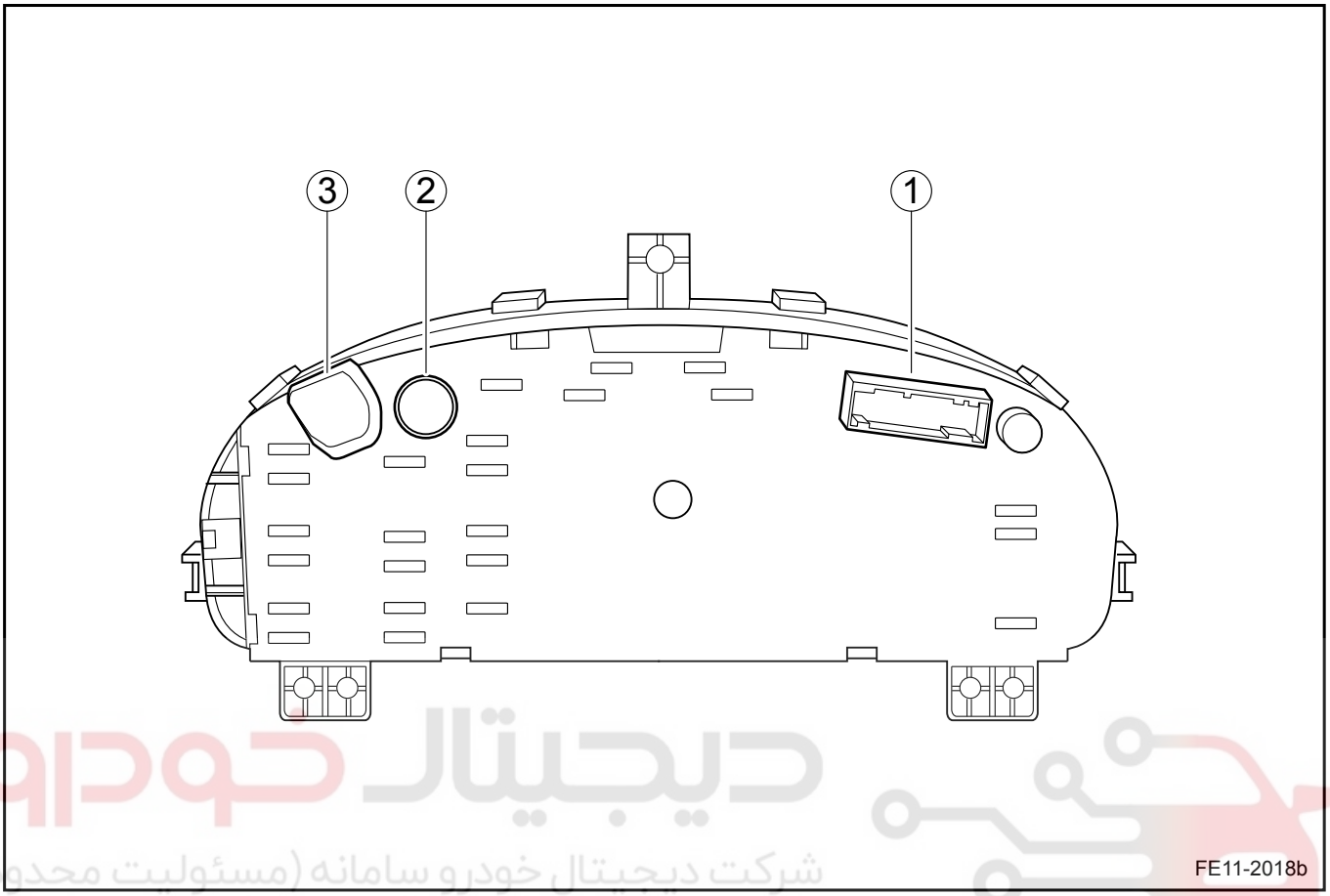
1. Mode Switch Button
2. Reset Button

Warning Lamps, Gage



FE11-2017b

Instrument Cluster Rear End

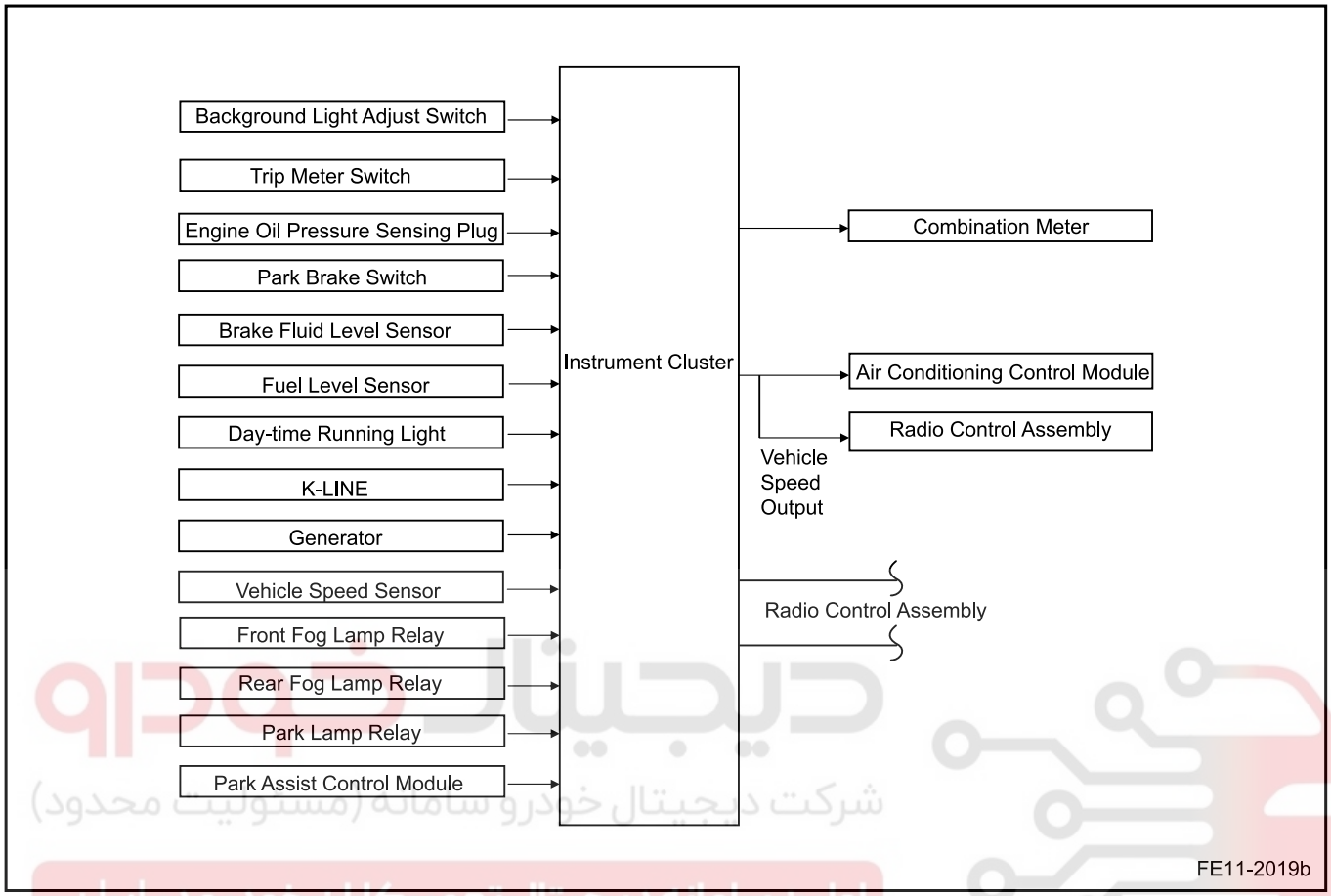


Legend

1. Instrument Cluster Wiring Harness Connector (32-Pin Blue)
2. Buzzer
3. Multi-Meter Wiring Harness Connector (12-Pin White)

11.7.5 Schematic

11.7.5.1 Schematic



11.7.6 Diagnostic Information and Procedures

11.7.6.1 Diagnosis Description

The instrument supports CAN-based bus OBD and standard KWP2000 protocol.

OBD can be K-wire serial communications and CAN communications.

Refer to11.7.2 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.7.6.2 Visual Inspection

- Check installed after market equipment that may affect system operation.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- Check whether all sensors are normal.

11.7.6.3 Fault Diagnostic Code (DTC) List

DTC code	Description
U1303	Fuel sensor input signal circuit high-voltage, or the wiring harness connector is disconnected
U1304	Fuel sensor input signal circuit is short to ground.
U129C	Meter voltage is higher than normal.
U129D	Meter voltage is lower than normal.
U150F	EEPROM Checksum Error
U1400	ABS Message Time Out, ABS Communication Lost
U1410	airbag control module Message Time Out, airbag control module Communication Lost
U1420	BCM Message Time Out, BCM Communication Lost
U1430	EMS Message Time Out, EMS Communication Lost
U1501	CAN Network System Integrity Test Failure
U1601	CAN Bus Off

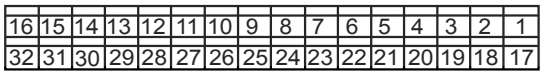
11.7.6.4 Instrument Active Test List

Test Parts	Test Items
Buzzer Test	Door Buzzer
	Seat Belt Beep
	Reverse Radar Buzzer
	Key Does Not Pull Buzzer
	Lights Are Not Off Beep
LCD Test	Vertical Section, Horizontal Section
	Special Section, Symbols

Test Parts	Test Items
LCD Test	Remove All
Digital Output	Driver Seat Belt Warning
	Passenger Seat Belt Warning
	ABS Warning
	Low Fuel Warning
	Coolant Temperature Warning
	Left Turn Signal
	Right Turn Signal
	Hood Open Warning
	Trunk Open Warning
	EBD Alarm
	Airbag Alarm
	MIL Alarm

11.7.6.5 Meter Terminal List

Instrument Cluster Harness Connector IP03



FE11-5601b

Terminal ID	Terminal Definition	Diameter / Color	Specified Conditions (Voltage, Current, Waveform, etc.)
1	Front Fog Lamp On Signal	0.85 R/O	20 mA
2	Rear Fog Lamp On Signal	0.5 R/W	20 mA
3	Tire Pressure Management System Malfunction Lamp	0.3W	20 mA
4	Reserved	Reserved	-
5	Low Tire Pressure Warning	0.3 L	20 mA

Terminal ID	Terminal Definition	Diameter / Color	Specified Conditions (Voltage, Current, Waveform, etc.)
6	Daytime Running Light On Signal	0.85 O/L	20 mA
7	High Beam Light Signal	0.85 O/W	20 mA
8	Reserved	Reserved	-
9	Reserved	Reserved	-
10	Park Brake Switch Signal	0.5 B/R	20 mA
11	Brake Fluid Level Sensor Signal	0.5 B/Y	20 mA
12	--	--	--
13	Charging Indicator	0.5 Y	200 mA
14	Engine Oil Pressure Switch Signal	0.5 B/R	20 mA
15	Sensor Ground	0.5 B	Ground / 1 A
16	Chassis Ground	0.5 B	Ground / 1 A
17	Reset	0.3 W/R	1 mA
18	Subtotal Button	0.3W	1 mA
19	Reverse Radar Buzzer	0.5 L	1 mA
20	Park Lamp On	0.5 R/G	1 mA
21	Diagnosis	0.5 Gr/P	1 mA
22	Vehicle Speed Input	0.3 Y	PWM Waveform / 1 mA
23	Vehicle Speed Output	0.3 G	PWM Waveform / 1 mA
24	Ignition	0.5 R/O	Ignition Voltage / 1 A
25	--	--	--
26	Backlight Adjustment Switch	0.3 O/Y	1 mA
27	--	--	--
28	--	--	--
29	Fuel Sensor Signal	0.5 R	-
30	CAN_H	0.5 L/W	PWM Waveform / 100 mA
31	CAN Low	0.5 Gr/V	PWM Waveform / 100 mA
32	Battery Power Supply	0.85 R	Battery Voltage / 1 A

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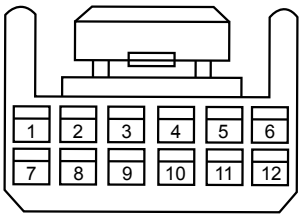
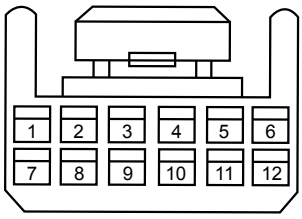
Combination Meter to Instrument Cluster Harness Connector IP02



FE11-5602b

Terminal ID	Terminal Definition	Diameter / Color	Specified Conditions (Voltage, Current, Waveform, Etc.)
1	Seat Belt	0.3 Gr	5 V/20 mA
2	Ground	0.5 B	GND, Current 1 A
3	5 V Power Supply	0.5 R	5 V / 1 A
4	Lighting Adjustment	0.3 O/Y	5 V / 160 mA
5	Power Supply	0.5 Y	Battery Power Supply / 1 A
6	Clock Switch	0.3 G	5 V / 1 mA
7	Trunk	0.3 W	5 V / 20 mA
8	Hood	0.3 W/R	5 V / 20 mA
9	Rear Fog Lamps	0.5 R/W	14 V / 20 mA
10	Front Fog Lamps	0.5 R/O	14 V / 20 mA
11	Communication Clock	0.3 B/Y	5 V / 2 mA
12	Data Communications	0.3 O/L	5 V / 2 mA

Instrument Cluster Harness Connector IP01



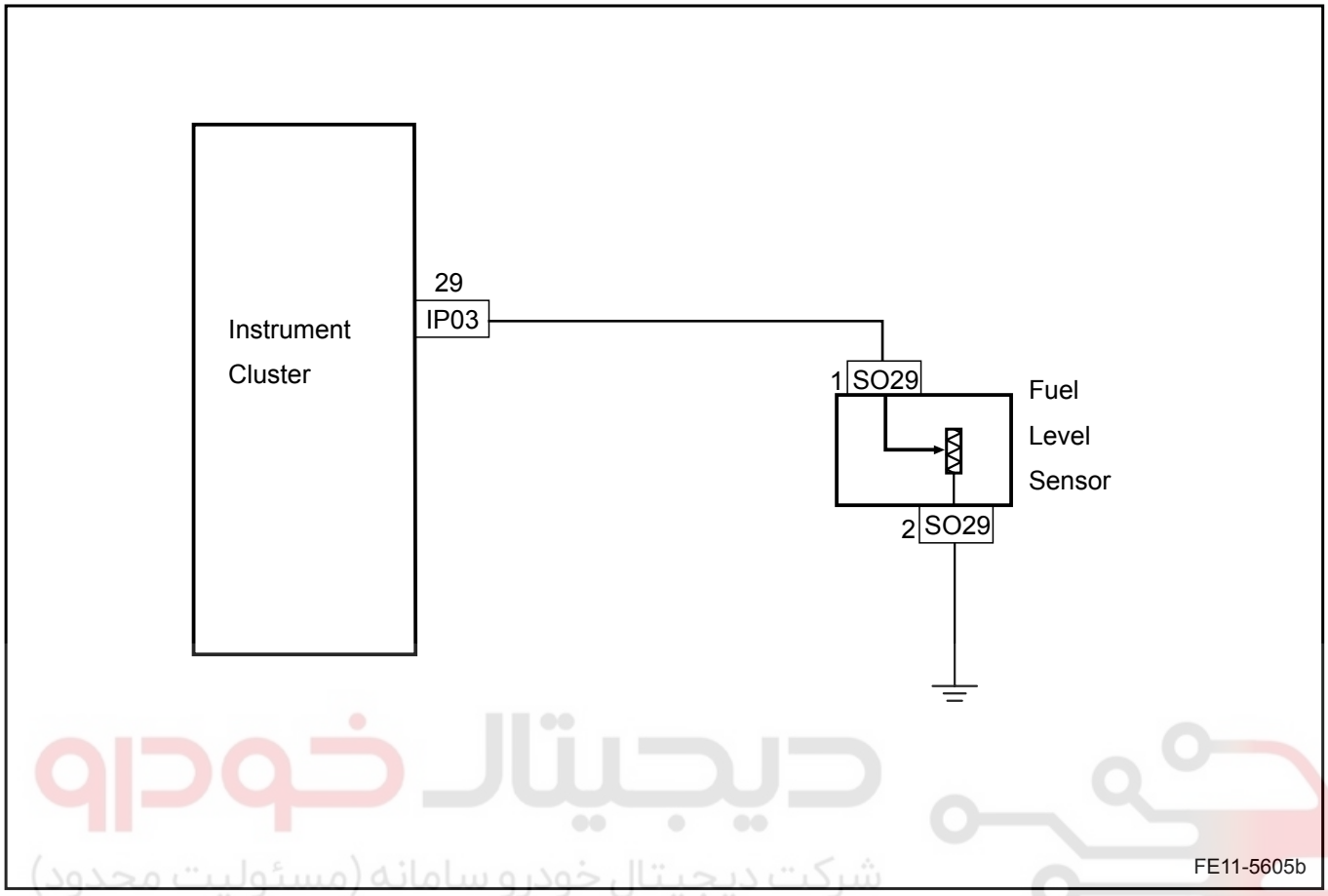
FE11-5603b

Terminal ID	Terminal Definition	Diameter / Color	Specified Conditions (Voltage, Current, Waveform, Etc.)
1	Clock Switch	0.3 Gr	5 V / 1 mA
2	Power Supply	0.5 Y	Battery Power Supply / 1A
3	Lighting Adjustment	0.3 O/Y	5 V / 160 mA
4	5 V Power Supply	0.5 R	5 V / 1 A
5	Ground	0.5 B	GND, Current 1 A
6	Seat Belt	0.3 Gr	5 V / 20 mA
7	Communication Data	0.3 O/L	5 V / 2 mA
8	Communication Clock	0.3 B/Y	5 V / 2 mA
9	Front Fog Lamps	0.5 R/O	14 V / 20 mA
10	Rear Fog Lamps	0.5 R/W	14 V / 20 mA
11	Hood	0.3 W/R	5 V / 20 mA
12	Trunk	0.3 O/L	5 V / 20 mA

11.7.6.6 DTC U1303 U1304

DTC	U1303	Fuel level sensor input signal circuit high-voltage, or wiring harness connector is disconnected.
DTC	U1304	Fuel level sensor input signal circuit is short to ground.

Schematic:



Diagnostic Steps:

Step 1	Check whether there is any DTC Code other than U1303 U1304.

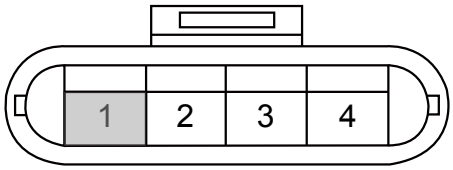
Is there any DTC Code other than U1303 U1304?

Yes → to 11.7.6.3 Fault Diagnostic Code (DTC) List, according to repair DTC Code

No

Step 2	Check the sensor circuit.

Fuel Pump Harness Connector SO29



FE11-5606b

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect instrument cluster harness connector IP03.
(c) Disconnect the fuel level sensor wiring harness connector SO29.
(d) Measure resistance between the fuel level sensor wiring harness connector SO29 terminal No.1 and a reliable ground.
(e) Measure voltage between the fuel level sensor wiring harness connector SO29 terminal No.1 and a reliable ground.

Standard Value:

Connector Terminal	Standard Value:
Resistance Between SO29 (1) and A Reliable Ground	10 kΩ or higher
Voltage Between SO29 (1) and A Reliable Ground	0 V

Is the value specified value?

No → Repair open circuit or short circuit between the SO29 terminal No.1 and IP03 terminal No. 29.

Yes

Step 3	Check the fuel sensor resistance.

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the fuel level sensor wiring harness connector SO29.
(c) Remove the fuel pump. Refer to 2.3.8.3 Fuel Pump Assembly Replacement.
(d) Measure the fuel level sensor resistance according to the following table.

Fuel	Resistance
Full	40(± 2 Ω)
3/4	60(± 2 Ω)
1/2	90(± 2 Ω)
1/4	140(± 2 Ω)
Threshold	190 (± 2 Ω)
Empty	300 (± 2 Ω)

Is the value specified value?

No → Replace the fuel level sensor. Refer to 2.3.8.4 Fuel Level Sensor Replacement

Yes

Step 4	Check whether the engine tachometer, speedometer are working as per normal?

No → Replace the fuel level sensor. Refer to 2.3.8.4 Fuel Level Sensor Replacement

Yes

Step 5	Replace the instrument cluster. Refer to 11.7.7.1 Instrument Cluster Replacement.

Next

Step 6	Use scan tool to confirm whether the DTC Code is stored again.

(a) Connect scan tool to the datalink connector.
(b) Turn the ignition switch to "ON" position.
(c) Clear the DTC code.
(d) Read the DTC Code again, confirm the system has no DTC code.

Is the value specified value?

No → Go to step 1

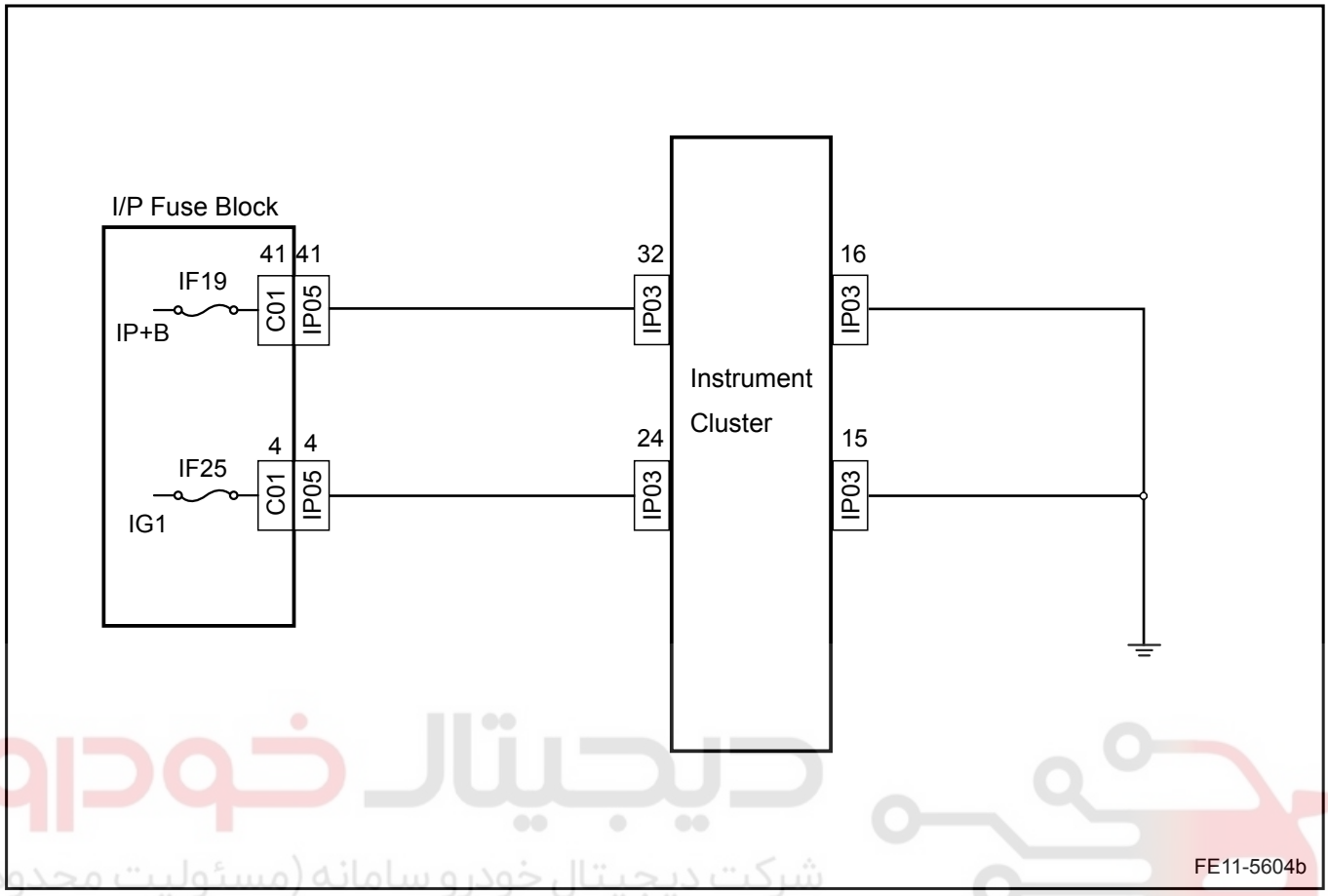
Yes

Step 7	Diagnostic Completed.

11.7.6.7 DTC U129C U129D

DTC	U129C	Meter voltage Higher Than Normal.
DTC	U129D	Meter voltage Lower Than Normal.

Schematic:



Diagnostic Steps:

Step 1	Check I/P fuse block fuses IF19 and IF25.

(a) Turn the ignition switch to "OFF" position.
(b) Remove I/P fuse block fuses IF19 and IF25.
(c) Test these two fuses continuity with a multimeter.

Conducted?

Yes → Check whether there is a short. replace the fuse.

No

Step 2	Check the meter power supply voltage.

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the meter harness connector IP03.
(c) Turn the ignition switch to "ON" position.
(d) Measure voltage between the meter harness connector IP03 terminal No.24 and a reliable ground.
(e) Measure voltage between ECM harness connector IP03 terminal No.32 and a reliable ground.

Standard Value: :11-14 V

Is the voltage normal?

No → Repair the open circuit between fuse IF19 and IP03 terminal No.32 . repair the open circuit between fuse IF25 and IP03 terminal No.24.

Yes

Step 3	Check the instrument ground circuit.

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the meter harness connector IP03.
(c) Turn the ignition switch to "ON" position.
(d) Measure resistance between the gage wiring harness connector IP03 terminal No.24 and a reliable ground.
(e) Measure resistance between ECM harness connector EN01 terminal No.32 and a reliable ground.

Standard Value: Less than 1 Ω

Is the resistance normal?

No → ECM ground circuit is faulty. Repair the faulty part.

Yes

Step 4	Check the charging system.

(a) Check the battery voltage.
Standard Value: 11-14 V
(b) Check the generator charging voltage.
Standard Value: 11.5-14.5 V

Normal?

No → Repair the faulty part.

Yes

Step 5	Replace the instrument cluster. Refer to 11.7.7.1 Instrument Cluster Replacement.

Next

Step 6	Use scan tool to confirm whether the DTC Code is stored again.

(a) Connect scan tool to the datalink connector.
(b) Turn the ignition switch to "ON" position.
(c) Clear the DTC codes.
(d) Start and run the engine at idle speed to warm up the engine for at least 5 min.
(e) Read control system DTC code again.

DTC codes still exist?

Yes → Go to step 1

No

Step 7	Diagnostic completed.

11.7.6.8 DTC U150F

DTC	U150F	EEPROM Checksum Error

Diagnostic Steps:

Step 1	Check whether the meter power supply circuit and ground circuit are normal.

Refer to 11.7.6.7 DTC U129C U129D.

Yes → Fault site

No

Step 2	Replace the instrument cluster. Refer to 11.7.7.1 Instrument Cluster Replacement.

Next

Step 3	Use scan tool to confirm whether the DTC Code is stored again.

(a) Connect scan tool to the datalink connector.
(b) Turn the ignition switch to "ON" position.
(c) Clear DTC codes.
(d) Start and run the engine at idle speed to warm up the engine for at least 5 min.
(e) Read the control system DTC Code again.

DTC codes still exist?

Yes → Go to step 1

No

Step 4	Diagnostic completed.

11.7.6.9 DTC U1400 U1410 U1420 U1430 U1501 U1601

DTC	U1400	ABS Message Time Out, ABS Communication Lost
DTC	U1410	airbag control module Message Time Out, airbag control module Communication Lost
DTC	U1420	BCM Message Time Out, BCM Communication Lost
DTC	U1430	EMS Message Time Out, EMS Communication Lost
DTC	U1501	CAN Network System Integrity Test Failure
DTC	U1601	CAN Bus Off

Diagnostic Steps:

Refer to "Data Communications System" in the11.17.7 Diagnostic Information and Procedures.

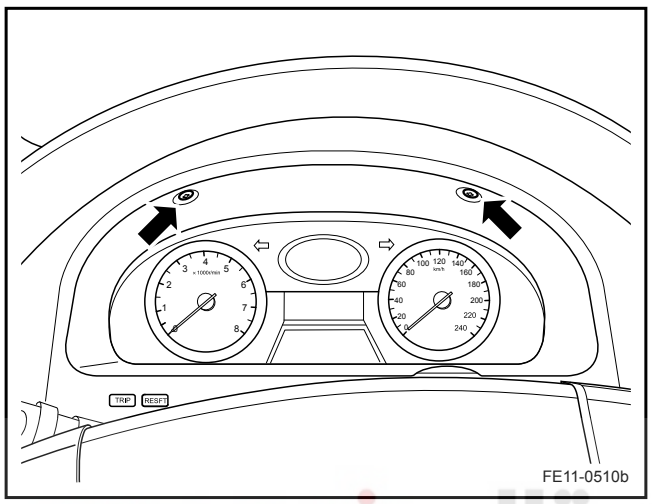
11.7.7 Removal and Installation

11.7.7.1 Instrument Cluster Replacement

Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".



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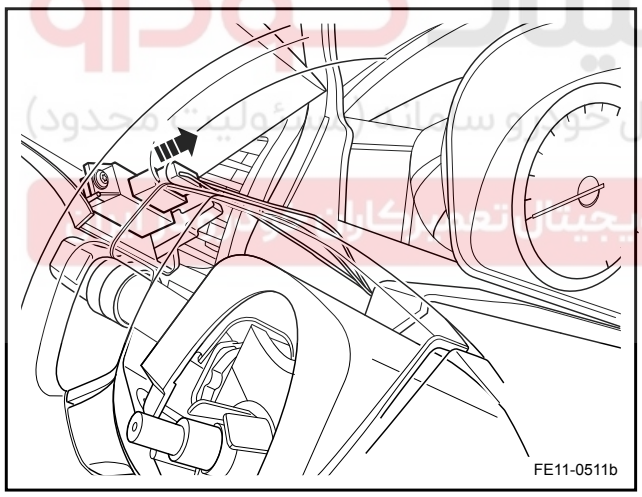
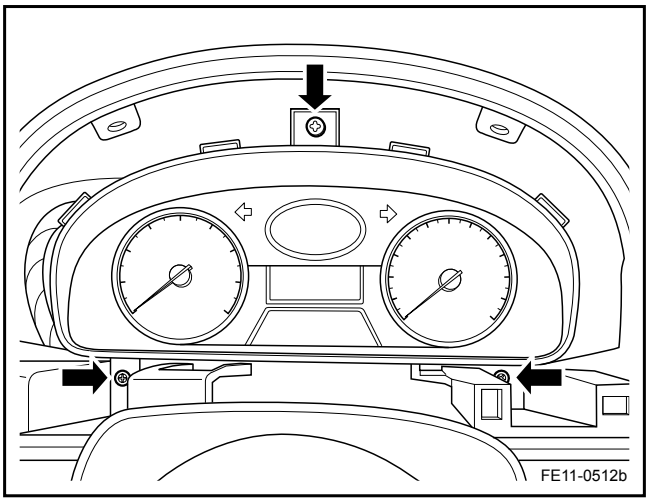
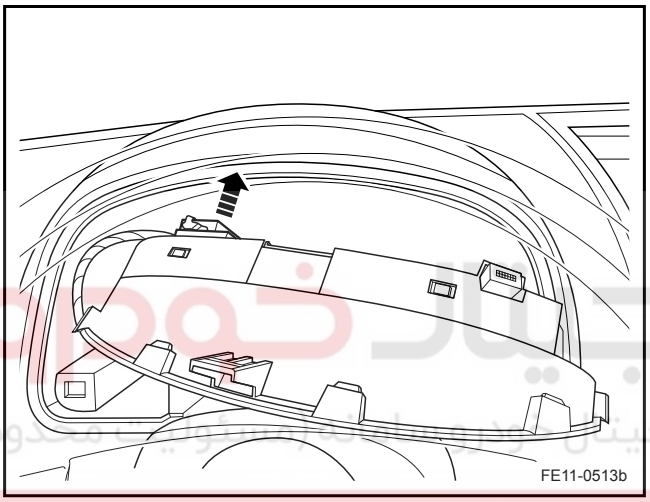
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Adjust the steering wheel to the lowest position, remove the instrument cluster panel screws.


FE11-0511b

3. Disconnect the odometer reset switch connector, remove the instrument cluster panel.

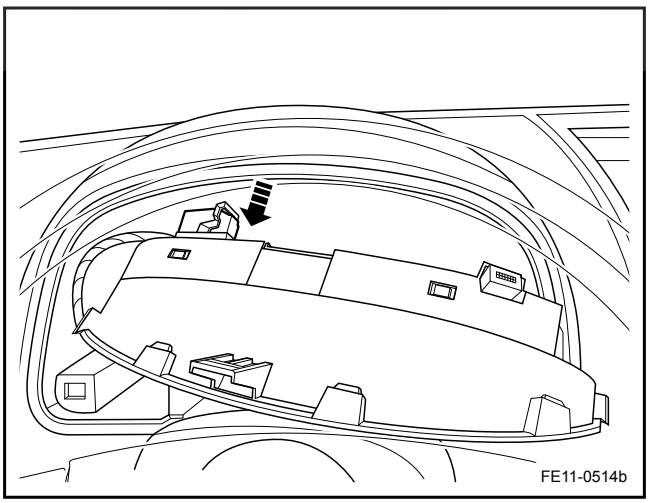


4. Remove the instrument cluster retaining screw, remove the instrument cluster.

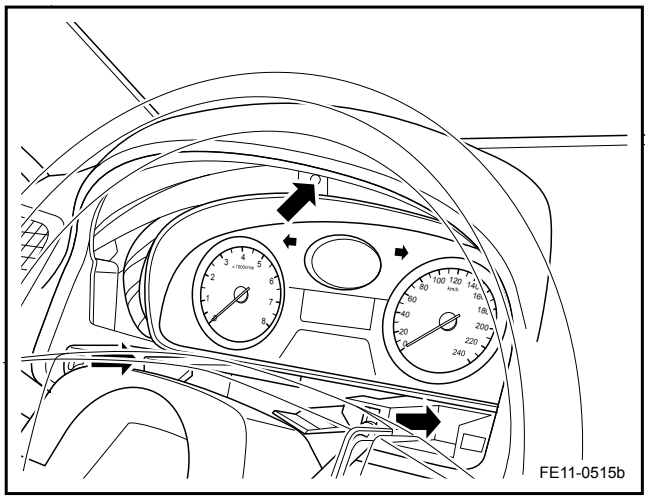


5. Disconnect the instrument cluster harness connector.

Installation Procedure:



1. Connect the instrument cluster harness connector.

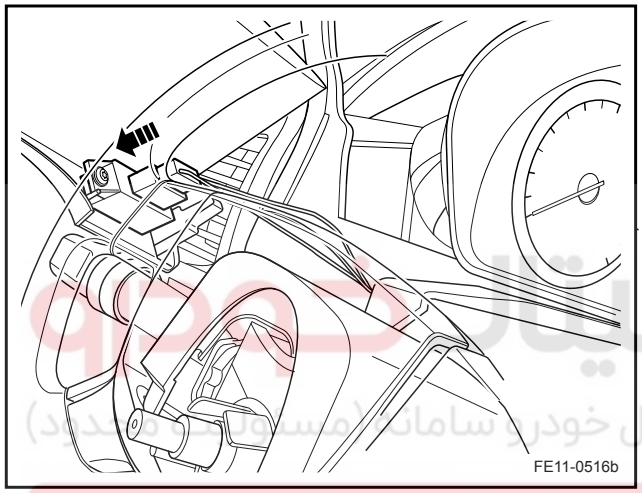


2. Install the instrument cluster and tighten the retaining screws.

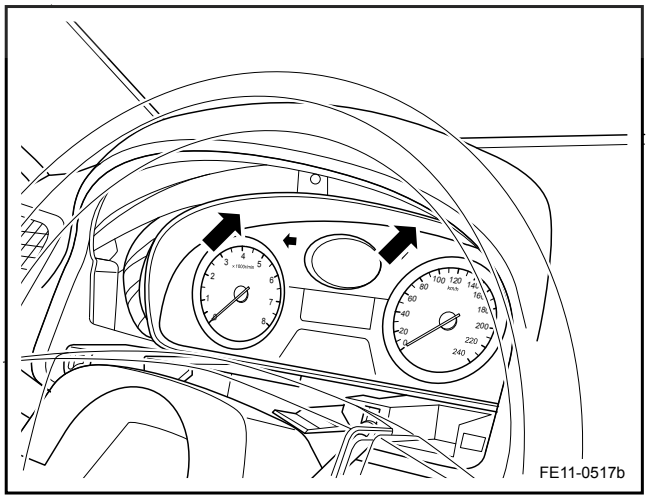
   Torque: 9.8 Nm (Metric) 7.3 lb-ft (US English)

   Note

   Refer to "Fastener Notice" in "Warnings and Notices".



3. Connect the odometer reset switch connector.



4. Install the instrument cluster panel.

   Torque: 3 Nm (Metric) 2.2 lb-ft (US English)

   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

5. Connect the battery negative cable.

11.8 Sunroof

11.8.1 Specifications

11.8.1.1 Fastener Tightening Specifications

Applications	Specifications	Specifications	
		Metric (Nm)	US English (lb-ft)
Doom Lamp With Sunroof Switch Assembly Screw	M5 × 8	3-4	2-3
Doom Lamp With Sunroof Switch Mounting Bracket Assembly Retaining Bolts	M6 × 16	4-5	3-4
Sunroof Assembly Bolts	M6 × 12	7-9	5-7

11.8.1.2 Sunroof Motor Specification

Parameters	Rating
Working Voltage Range	9-16 V
Normal Working Voltage	125-135 V
Maximum Locked-Rotor Current	25 A
Waiting Current	20 mA
Sleep Current	1 mA

11.8.2 Description and Operation

11.8.2.1 Description and Operation

System Components

- Sunroof Control Module
- Sunroof Switch
- Sunroof Motor With Pressure Sensor and Limit Sensor
- Sunroof
- Sunroof Visor

Manual Operation

Electric sunroof is operated by sunroof switch located in the dome lamp area. When the sunroof switch is pressed to move the sunroof to a certain location, it will send a message to the sunroof control module. The module will control the motor direction to perform the corresponding operation to move the sunroof glass to the requested location. Hold the button 40-500ms, the sunroof glass will continue to move until the button is released.

Fast Operation

Fast operating mode allows sunroof automatically open or close without the need to hold the switch. this function is activated when the switch signal is more than 500ms, and can be achieved when sliding and tilting.

Over-Flap

- This function is only activated in the tilt mode
- When the sunroof glass is tilted to the fully closed position, the control module controls the motor to stop at the Over-Flap, and then move back to full closed position.

Soft Stop

- When the sunroof glass is sliding to open, it will stop at a default location before the fully open position. This default location is used to reduce wind-induced vibration.
- When the glass stopped at this location, the user can continue to manipulate through the sunroof switch to the fully open position of sunroof.

Express Down Function

When the sunroof closing is hindered, it will return to 200 mm (7.87 in) before the normal closed position. This feature is only activated in the fast-sliding closing and tilt mode.

Sleep Mode

- After the sunroof motor stops rotating 30 s and there is no open or close operation, the sunroof will enter sleep mode to reduce power consumption.
- When opening or closing operation is executed, sunroof will automatically be awakened.

11.8.3 System Working Principle

11.8.3.1 System Working Principle

Sunroof motor and control module are integrated with a total of 8-pin wiring harness connector. Terminals are defined as following:

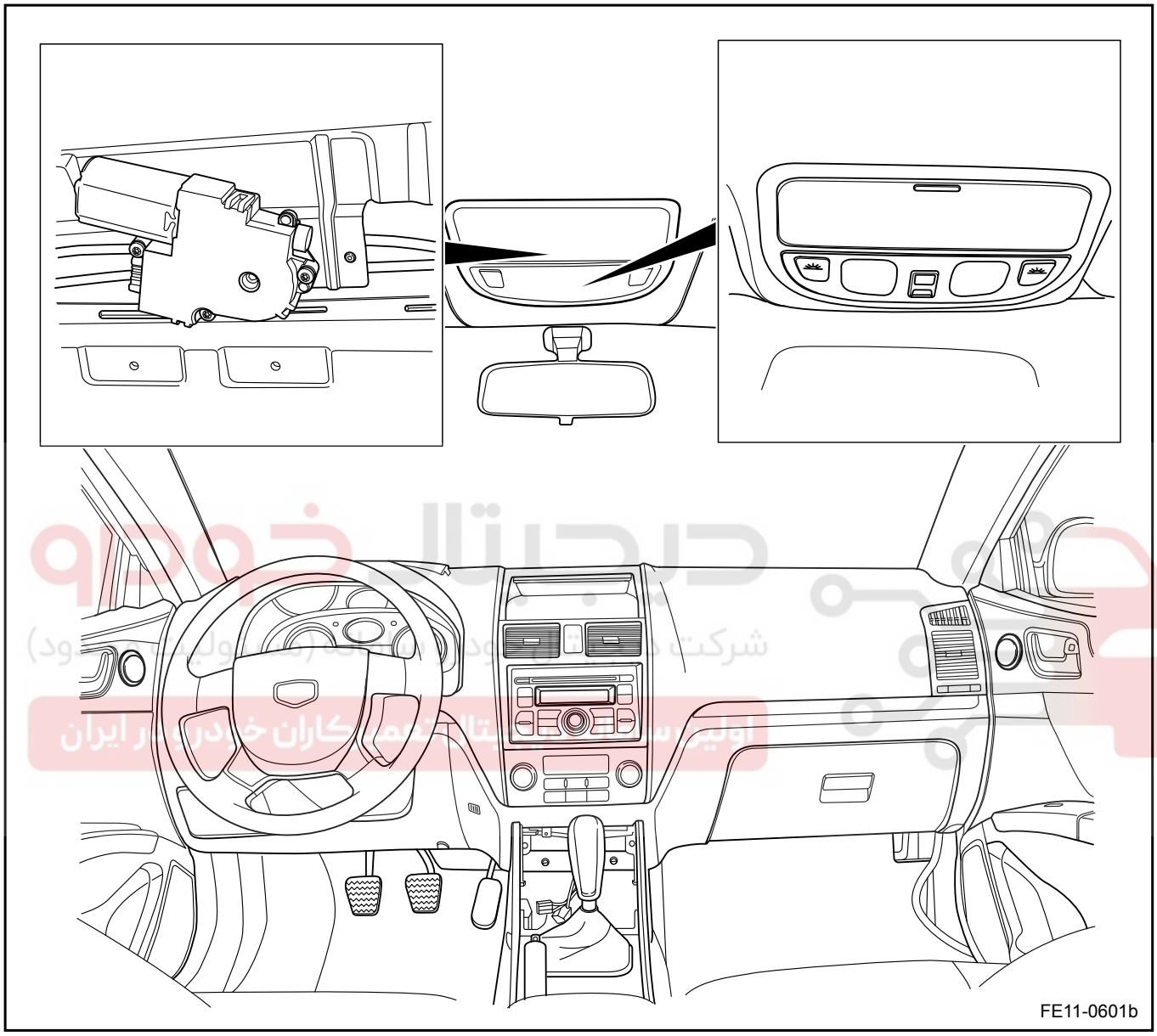
Terminal ID	Terminal Definition	Wire Color	Terminal Status	Description
1	+ B	2.0 W/L	Power Supply	Battery Power Supply
2	Ground	2.0 B	Power Supply	Ground
3	IG1	0.5 R/L	Power Supply	Ignition Power Supply
4	Tilt Switch	0.3 W	Output	Tilt Signal Output
5	Slide Switch	0.3 L	Output	Slide Signal Output
6	ACC	0.5 R/G	Power Supply	Accessory Power Supply
7	Alarm	0.3 L/R	Output	Alarm Signal Output
8	Spare	-	-	Empty

Tilt switch and slide switch are ground signals, when the switch is pressed, the signal circuit will have a low voltage.

11.8.4 Component Locator

11.8.4.1 Component Locator

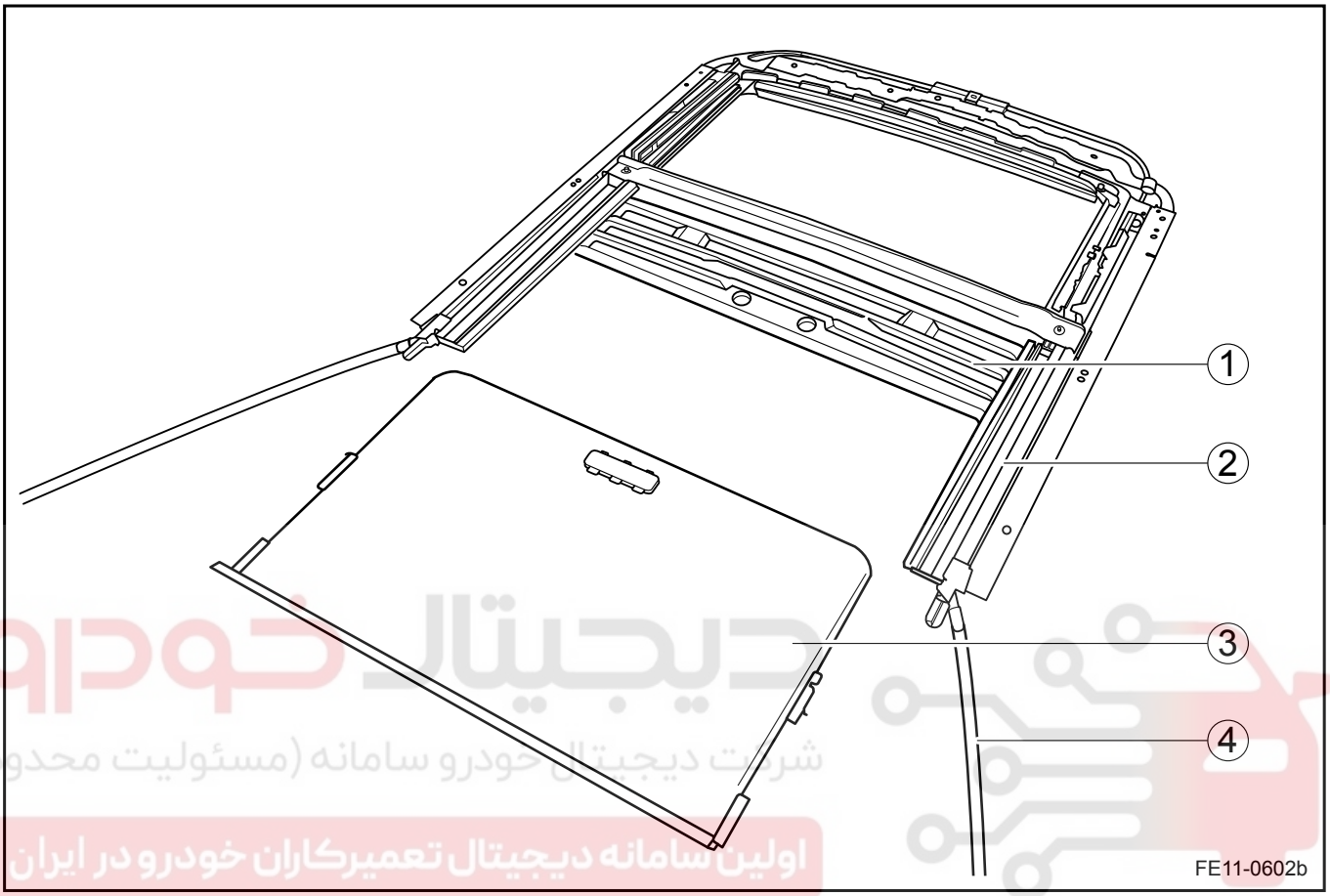
Sunroof Switch Assembly



11.8.5 Disassemble View

11.8.5.1 Disassemble View

Sunroof Disassemble View

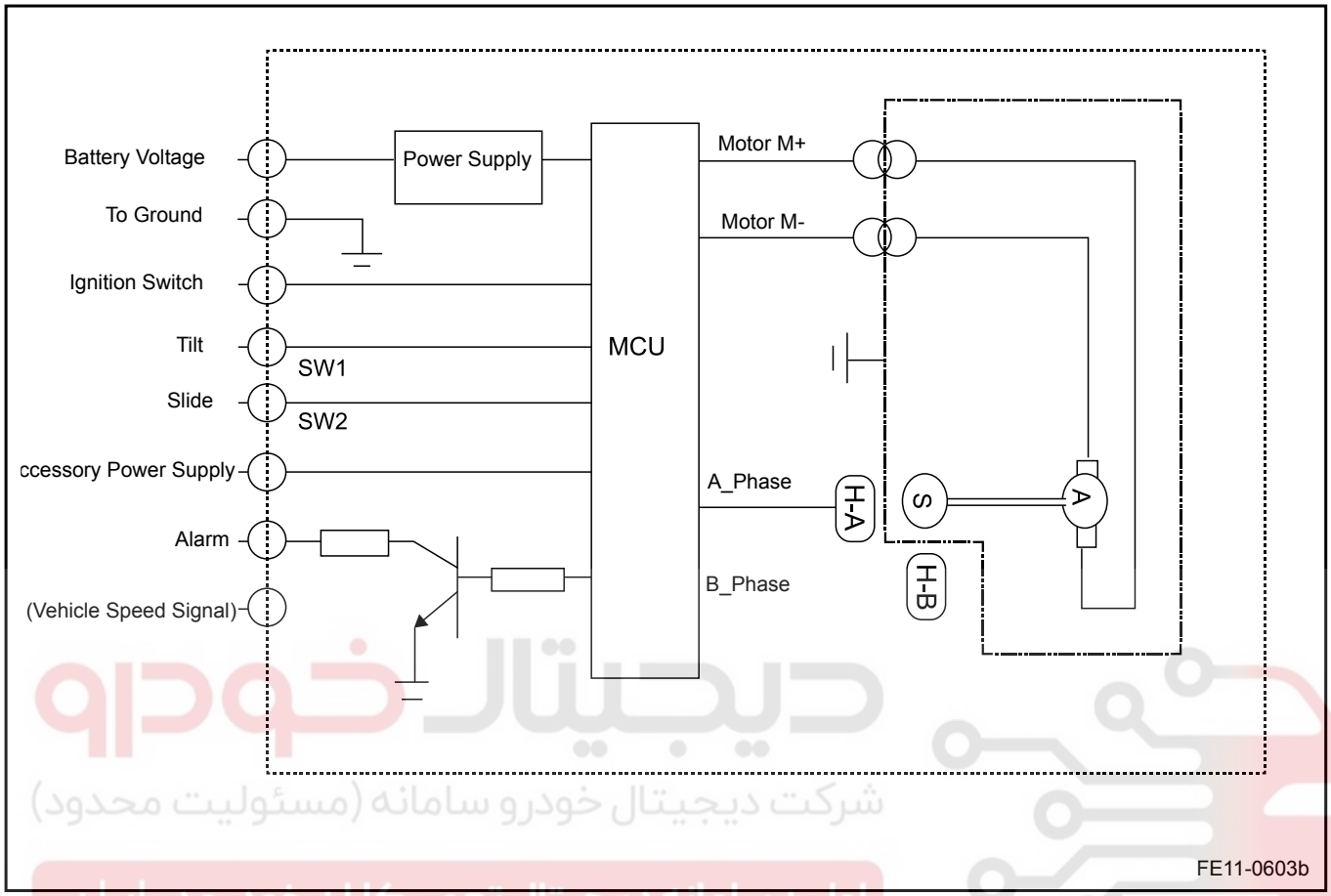


Legend

1. Roof Stiffener
2. Sunroof Frame
3. Sunroof Visor
4. Sunroof Aqueduct

11.8.6 Schematic

11.8.6.1 Schematic



11.8.7 Diagnostic Information and Procedures

11.8.7.1 Diagnosis Description

Refer to11.8.2 Description and Operationget familiar with the contents of system functions and operation of a later start system diagnostics, so that will help in the event of failure determine the correct troubleshooting steps, more importantly, so would also help to determine whether the customer describe the situation of normal operation.

11.8.7.2 Visual Inspection

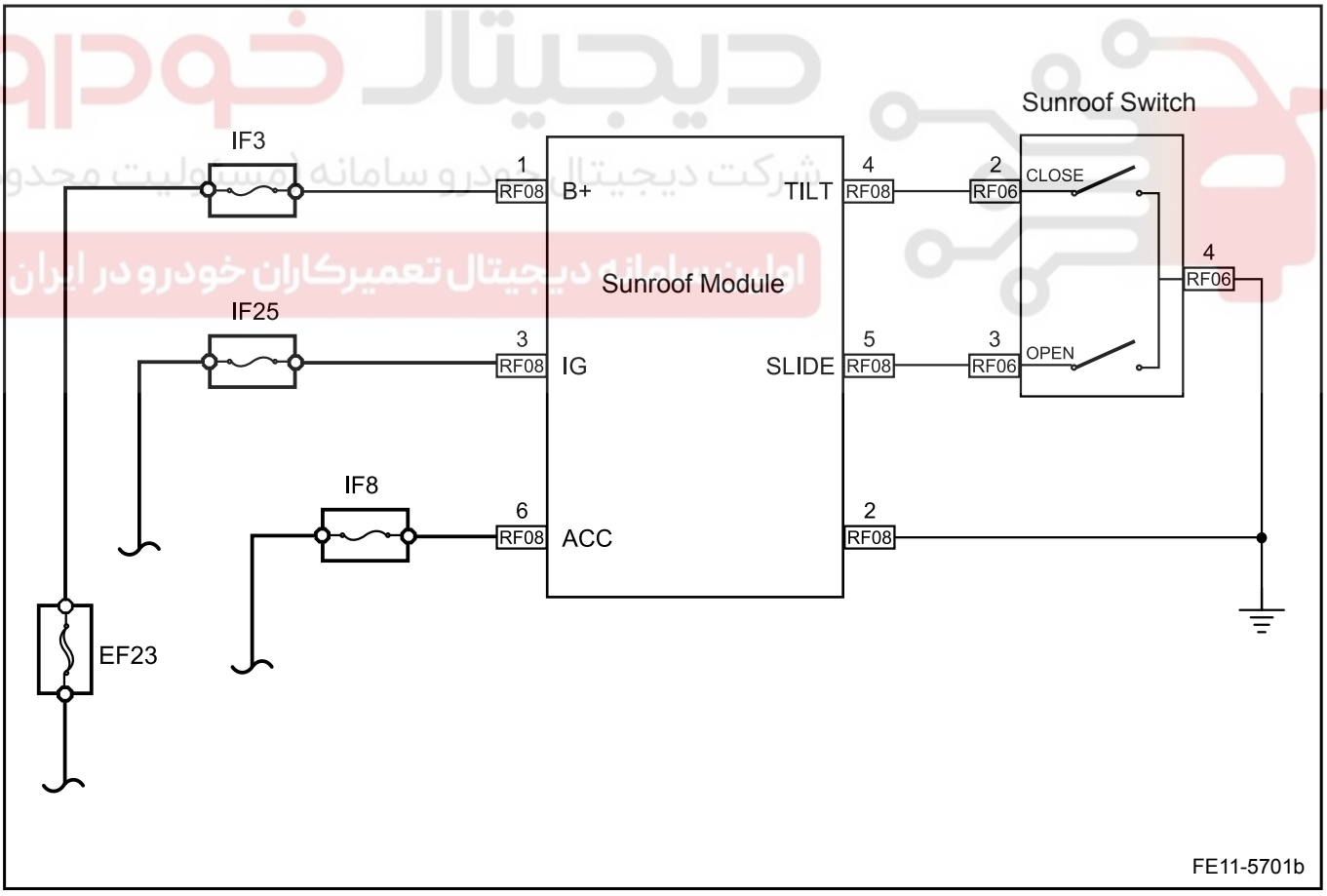
- Check installed after market equipment that may affect system normal operations.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- Check whether the sunroof initialization is no longer valid.

11.8.7.3 Sunroof Initialization

When the initial position is lost, perform this procedure:
At the completely tilt position, press the tilt button for more than 5s, sunroof will perform the initialization.

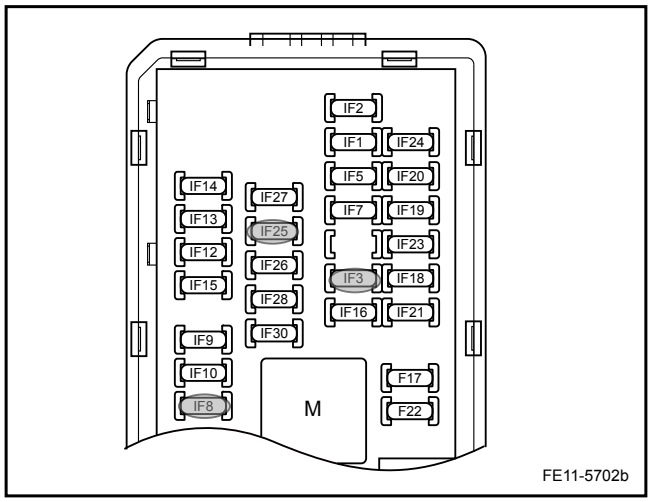
11.8.7.4 Sunroof Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the fuses, IF3, IF25, IF8.



(a) Check whether the fuses, IF3, IF25 and IF8 are blown.
Fuse Rating: Respectively 30 A, 10 A, 10 A

No → Go to step 3

Yes

Step 2	Check the fuses, IF3, IF25, IF8 circuits.

(a) Check the fuses IF3, IF25 and IF8 for short circuits.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.
Is the sunroof working correctly?

Yes → System normal

No

Step 3	Carry out the sunroof initialization.

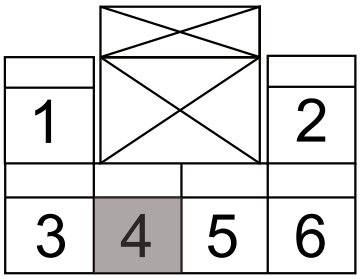
(a) Carry out the sunroof initialization. Refer to 11.8.7.3 Sunroof Initialization.
Is the sunroof working properly?

Yes → System normal

No

Step 4	Check the sunroof switch harness connector RF06 ground circuit.

Interior Light + Sunroof Switch Harness Connector RF06



FE11-5703b

(a) Remove the sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

(b) Measure resistance between the sunroof switch harness connector RF06 and body ground with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 6

No

Step 5	Repair the open circuit between the sunroof switch harness connector RF06 and body ground.

(a) Confirm the open circuit between the sunroof switch harness connector RF06 and body ground repair is completed.

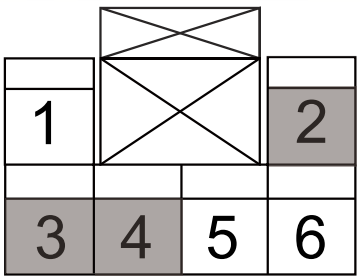
Is the sunroof working properly?

Yes → System normal

No

Step 6	Check the sunroof switch assembly.

Interior Light + Sunroof Switch Harness Connector RF06



FE11-5704b

(a) Press the sunroof switch, while measure resistance between the switch RF06 terminals 2,3 and 4 with a multimeter.

(b) Measure resistance between sunroof switch harness connector RF06 terminals 4 and body ground with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 8

No

Step 7	Replace the sunroof switch.

(a) Install a new sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

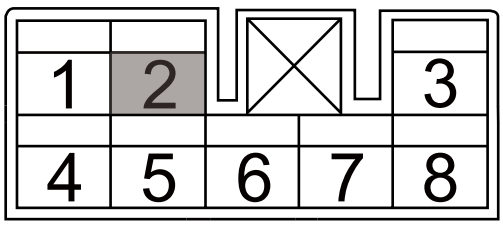
Is the sunroof working properly?

Yes → System normal

No

Step 8	Check the sunroof assembly harness connector RF08 terminal No.2 and the body ground circuit.

Sunroof Module Harness Connector RF08



FE11-5705b

(a) Disconnect the roof harness connector. Refer to 11.8.8.2 Sunroof Motor Replacement.

(b) Measure resistance between the sunroof switch harness connector RF08 terminal No.2 and the body ground with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 10

No

Step 9	Repair the open circuit between the sunroof assembly harness connector RF08 and body ground.

(a) Confirm the open circuit between the sunroof assembly harness connector RF08 and body ground repair is completed.

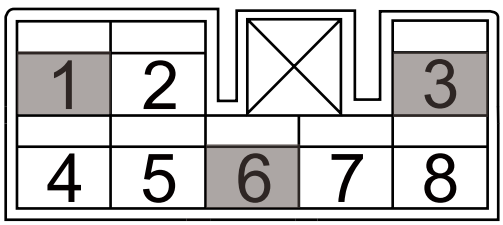
Is the sunroof working properly?

Yes → System normal

No

Step 10	Check the sunroof module assembly connector RF08 terminals No.1,3,6 voltage.

Sunroof Module Harness Connector RF08



FE11-5706b

(a) Turn the ignition switch to the ON position, measure the sunroof module assembly connector RF08 terminals No. 1,3,6 voltage with a multimeter.
Standard Voltage: 11-14 V

Yes → Go to step 12

No

Step 11	Check the circuits between the sunroof assembly connector RF08 terminal No.1,3,6 and fuses IF-3, IF-25, IP-8 respectively.

(a) Disconnect the roof assembly connector RF08.
(b) Measure resistance between the sunroof assembly connector RF08 terminals No.1,3,6, fuse IF-3.IF-25.IP-24 respectively, with a multimeter.
Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 13

No

Step 12	Repair the open circuits between the sunroof assembly connector RF08 terminals and fuses IF-3, IF-25, IP-8.

(a) Confirm the open circuits between the sunroof assembly connector RF08 terminals and fuses IF-3, IF-25, IP-8 repair is completed.

Is the sunroof working properly?

Yes → System normal

No

Step 13	Replace the sunroof motor assembly.

(a) Replace the sunroof motor assembly. Refer to 11.8.8.2 Sunroof Motor Replacement.

Confirm the repair completed.

Next

Step 14	System normal.

11.8.7.5 Sunroof Can Not Open

Schematic:

Refer to 11.8.7.4 Sunroof Inoperative.

Diagnostic Steps:

Step 1	Send a ground signal to the sunroof module.

(a) Remove the sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.
(b) Connect the roof antenna switch harness connector RF06 terminal No.3 and body ground with a suitable antenna.

Is the sunroof motor working properly?

Yes → Go to step 5

No

Step 2	Check resistance between the sunroof switch and the sunroof module.

(a) Disconnect the sunroof module harness connector.

(b) Measure resistance between the sunroof module harness connector terminal No.5 and sunroof switch wiring harness connector RF08 terminal No.3 with a multimeter.
Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 4

No

Step 3	Repair the wiring harness between the sunroof switch and the sunroof module assembly.

Is the sunroof working properly?

Yes → System normal

No

Step 4	Replace the sunroof motor.

(a) Replace the sunroof motor. Refer to 11.8.8.2 Sunroof Motor Replacement.

Confirm the repair completed.

Yes → System normal

No

Step 5	Check the circuit between the sunroof switch harness connector RF06 and body ground.

(a) Remove the sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

(b) Measure resistance between the sunroof switch harness connector RF06 terminal No.4 and body ground with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 7

No

Step 6	Repair the circuit between the sunroof switch harness connector RF06 and body ground.

Confirm the repair completed.

Yes → System normal

No

Step 7	Replace the sunroof switch assembly.

(a) Install a new sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

Confirm the repair completed.

Next

Step 8	System normal.

11.8.7.6 Sunroof Can Not Close

Schematic:

Refer to 11.8.7.4 Sunroof Inoperative.

Diagnostic Steps:

Step 1	Send a ground signal to the sunroof module.

(a) Remove the sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.
(b) Connect the sunroof antenna switch harness connector RF06 terminal No.2 and body ground with a suitable antenna.

Confirm the sunroof motor is working.

Yes → Go to step 5

No

Step 2	Check resistance between the sunroof switch and the sunroof module.

(a) Disconnect the sunroof module assembly harness connector.
(b) Measure resistance between the sunroof module harness connector RF08 terminal No.4 and the sunroof switch wiring harness connector RF06 terminal No.2 with a multimeter.
Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 4

No

Step 3	Repair the wiring harness between the sunroof switch and the sunroof module

Is the sunroof working properly?

Yes → System normal

No

Step 4	Replace the sunroof motor.

(a) Replace the sunroof motor. Refer to 11.8.8.2 Sunroof Motor Replacement.

Confirm the repair completed.

Yes → System normal

No

Step 5	Check the circuit between the sunroof switch harness connector RF06 and body ground.

(a) Remove the sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

(b) Measure resistance between the sunroof switch harness connector RF06 terminal No.4 and body ground with a multimeter.

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 7

No

Step 6	Repair the circuit between the sunroof switch harness connector RF06 and body ground.

Confirm the repair completed.

Yes → System normal

No

Step 7	Replace the sunroof switch.

(a) Install a new sunroof switch.. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

Confirm the repair completed.

Next

Step 8	System normal.

11.8.7.7 Sunroof Anti-trap Function Inoperative

Schematic:

Refer to 11.8.7.4 Sunroof Inoperative.

Diagnostic Steps:

Step 1	Carry out the sunroof initialization.

Is the sunroof working properly?

Yes → System normal

No

Step 2	Replace the sunroof switch assembly.

(a) Install a new sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

Is the sunroof working properly?

Next

Step 3	System normal.

11.8.7.8 Sunroof Can Not Operate Intermittently

Schematic:

Refer to 11.8.7.4 Sunroof Inoperative.

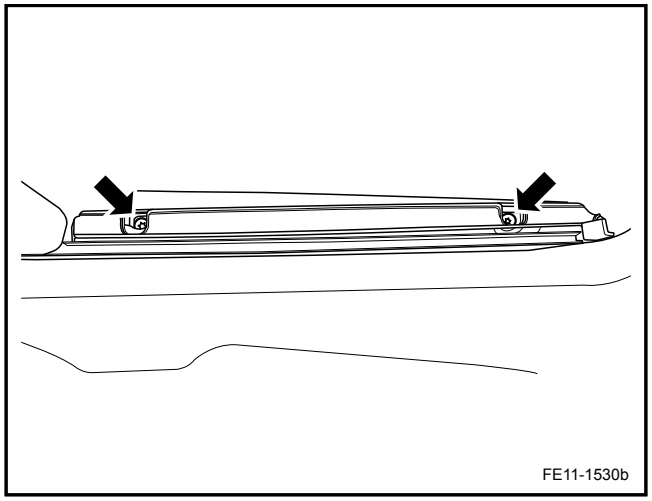
Fault Symptom Table:

Symptoms	Suspected Faulty Part	Repair Procedure
Insulation Inner Layer Wire Poor Connection	Sunroof Module and The Sunroof Switch Slide Switch	Refer to 11.8.7.5 Sunroof Can Not Open.
Harness Connector Male and Female Terminals Poor Connection	1. Sunroof Switch 2. Sunroof Motor Wire Harness Connector 3. Sunroof Switch Harness Connector 4. Sunroof Motor	1. Clean connector male and female terminals. 2. Replace the sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement. 3. Replace the wiring harness. 4. Replace the sunroof motor. Refer to 11.8.8.2 Sunroof Motor Replacement.
Ground Poor Connection	G7A Ground	1. Ground Fasteners. 2. Clean the ground connection.
Sunroof Switch Poor Connection	1. Slide Switch 2. Tilt Switch	Replace the sunroof switch. Refer to 11.8.8.3 Sunroof Switch Assembly Replacement.

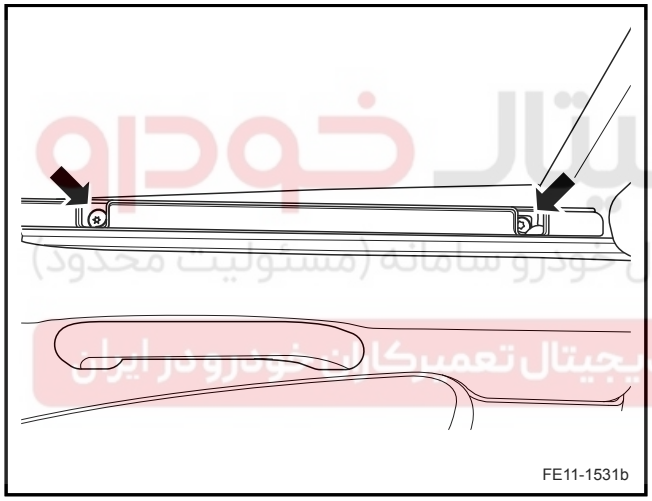
11.8.8 Removal and Installation

11.8.8.1 Sunroof Glass Replacement

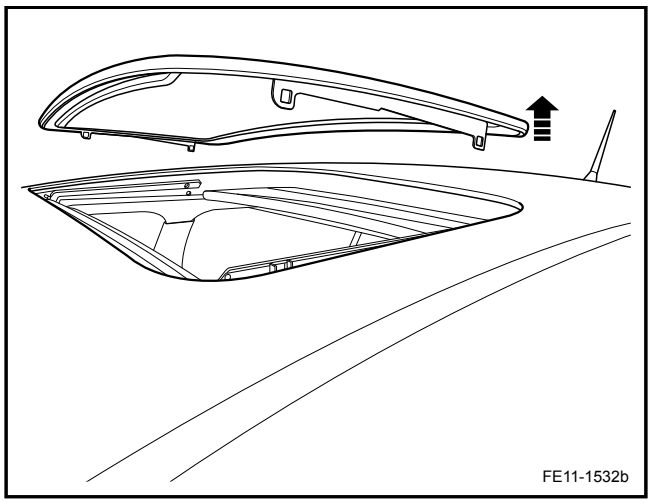
Removal Procedure



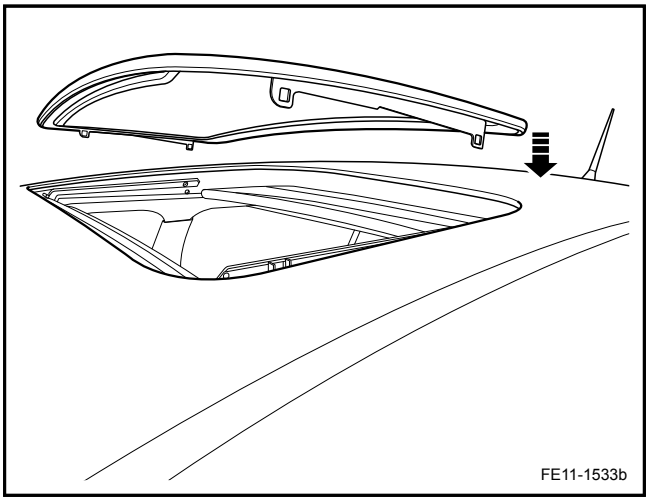
1. Tilt the sunroof for access to remove the sunroof retaining bolts and remove the left side sunroof retaining bolts.



2. Remove the right side sunroof retaining bolts.



3. Pull the sunroof window upward to remove the sunroof window glass.

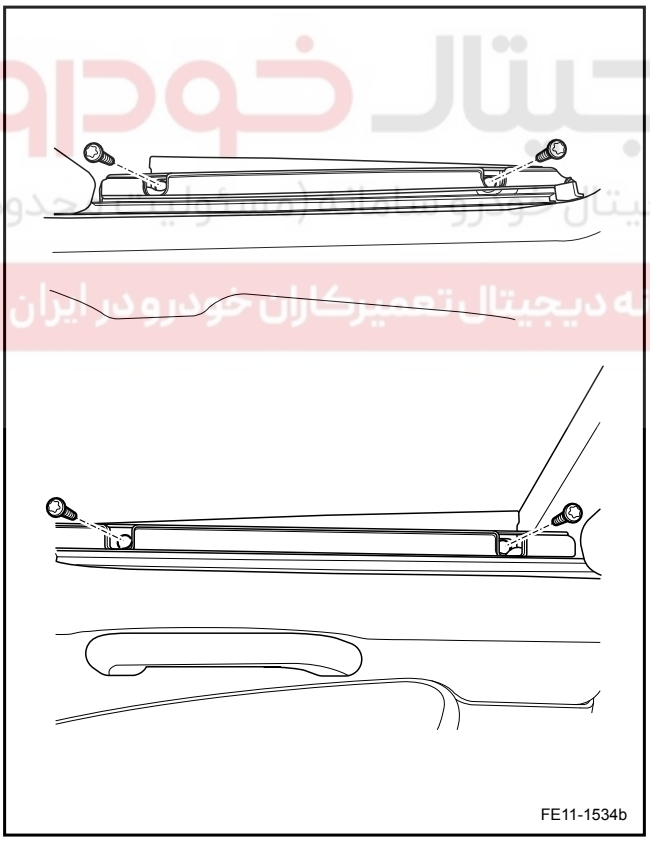


Installation Procedure:

1. Install the sunroof window glass, do not tighten the retaining bolts at this stage.

Note

Note: After installation, carry out water leaking test. check whether there is water leaking to confirm the correct installation.



2. Adjust the sunroof window to make it even with the roof and make sure the surrounding gaps are consistent and tighten the retaining bolts.

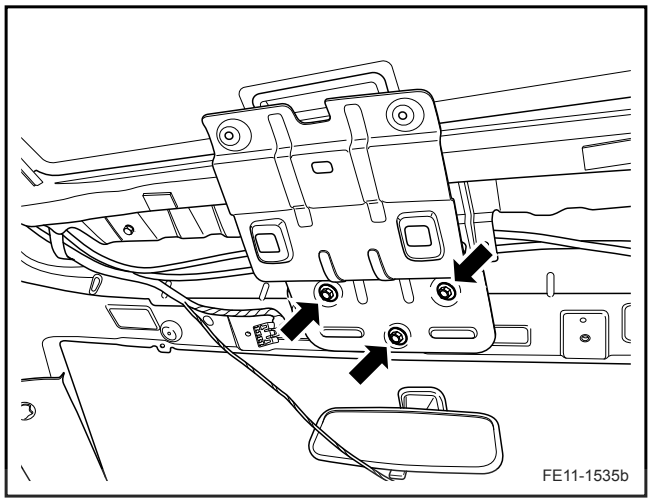
   Torque: 4 Nm (Metric) 3 lb-ft (US English)

11.8.8.2 Sunroof Motor Replacement

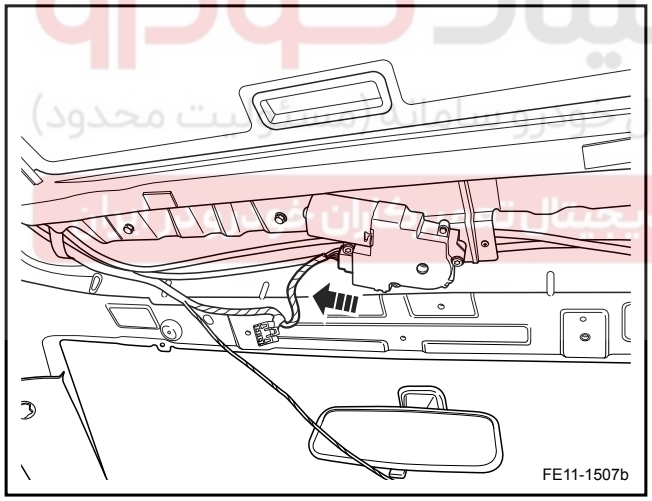
Removal Procedure

Warning!

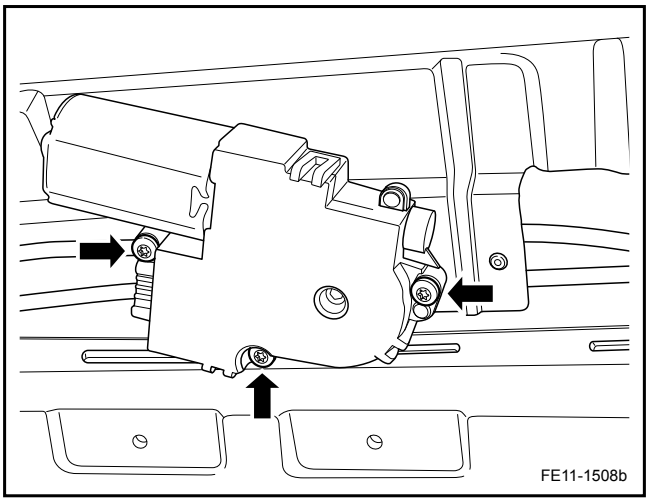
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



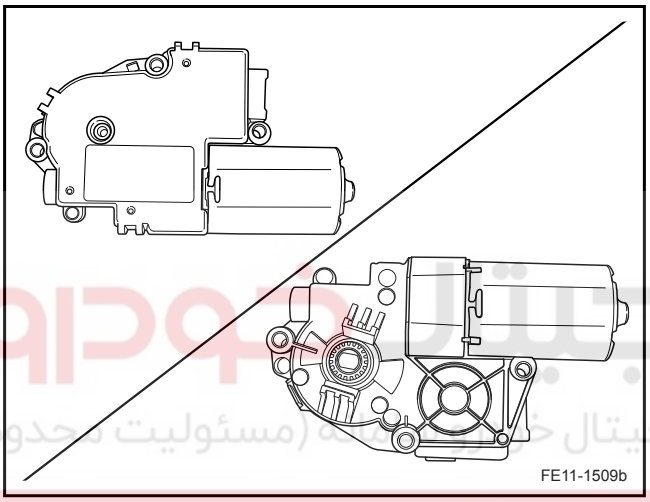
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the headliner. Refer to 12.9.1.1 Headliner Replacement.



3. Remove the sunroof switch bottom retaining bolts.
4. Disconnect the sunroof motor wiring harness connector.



5. Remove the sunroof motor retaining bolts.

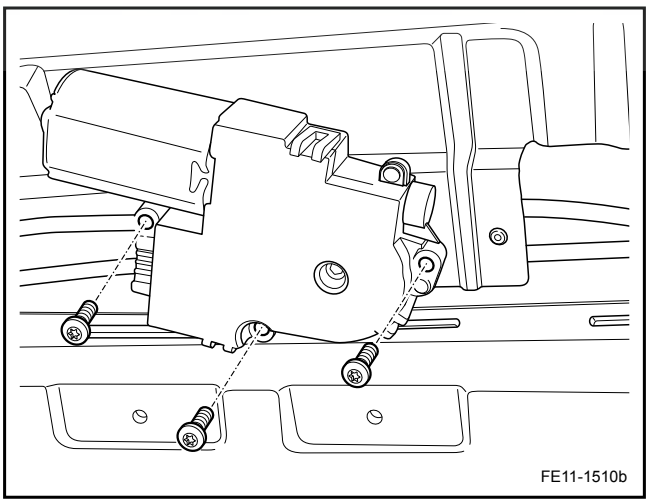


6. Pull downward to remove the sunroof motor.

Note

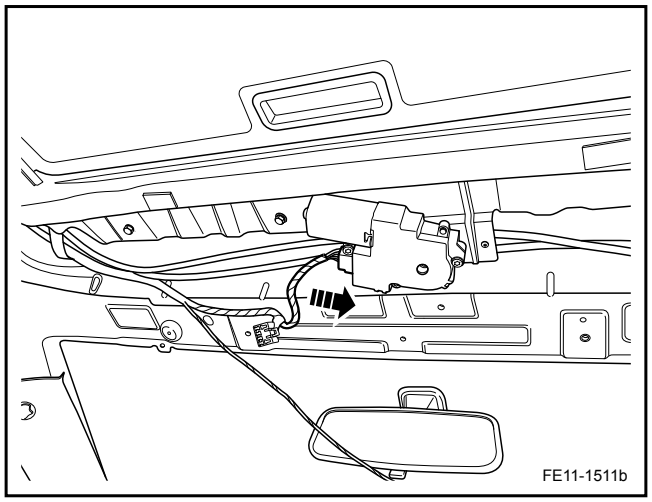
Prevent the motor rack and pinion gears misalignment.

Installation Procedure:

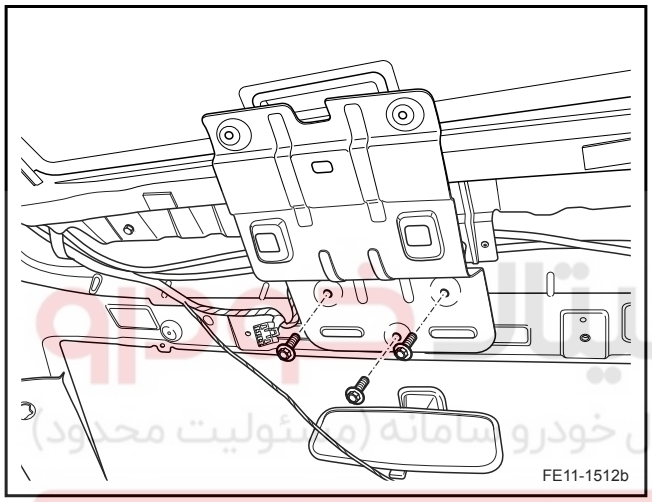


1. Install the sunroof motor and tighten the retaining bolts.

Torque: 5 Nm (Metric) 3.7 lb-ft (US English)



2. Connect the electrical wiring harness connector.



3. Install the sunroof switch bottom panel.

   Torque: 7 Nm (Metric) 5.2 lb-ft (US English)

4. Install the headliner.

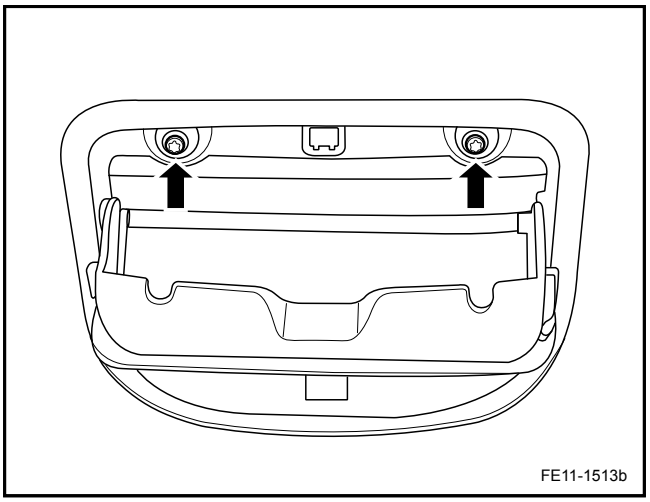
5. Connect the battery negative cable.

11.8.8.3 Sunroof Switch Assembly Replacement

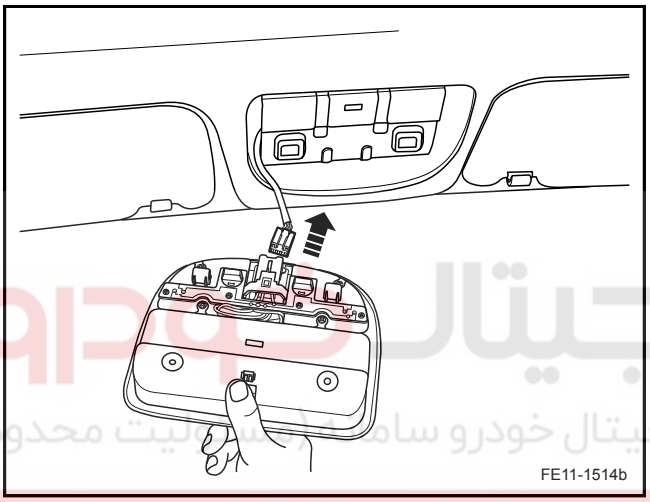
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

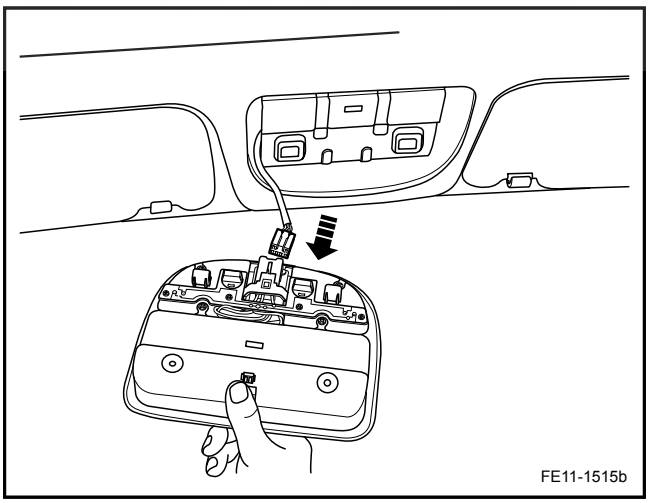


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the sunroof switch assembly retaining screws, remove the sunroof switch assembly.

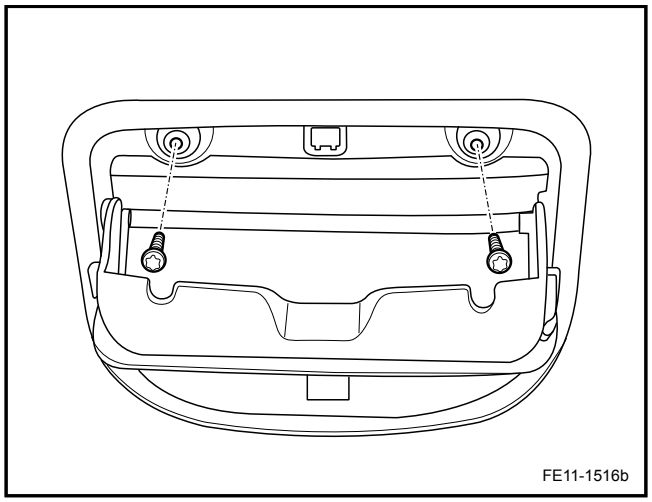


3. Disconnect the sunroof switch assembly wiring harness connector.

Installation Procedure:



1. Connect the sunroof switch assembly wiring harness connector.



2. Install the sunroof switch assembly and tighten the retaining screws.

   Torque: 4 Nm (Metric) 3 lb-ft (US English)

   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

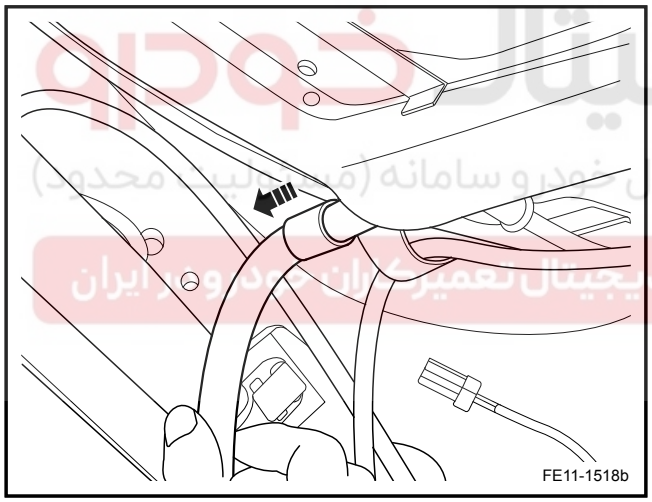
3. Connect the battery negative cable.

11.8.8.4 Sunroof Frame Replacement

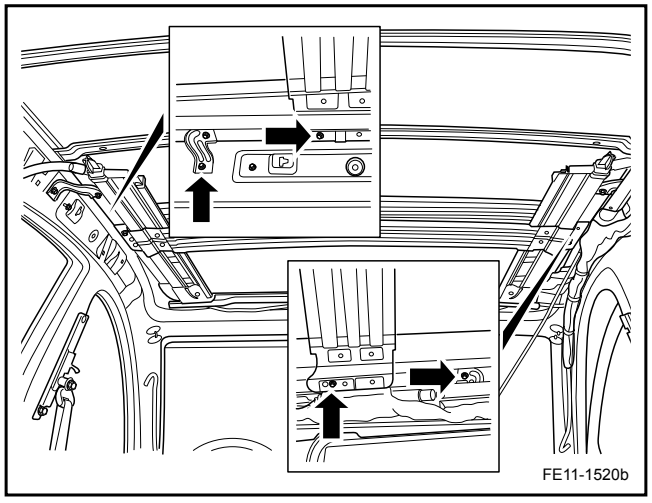
Removal Procedure

Warning!

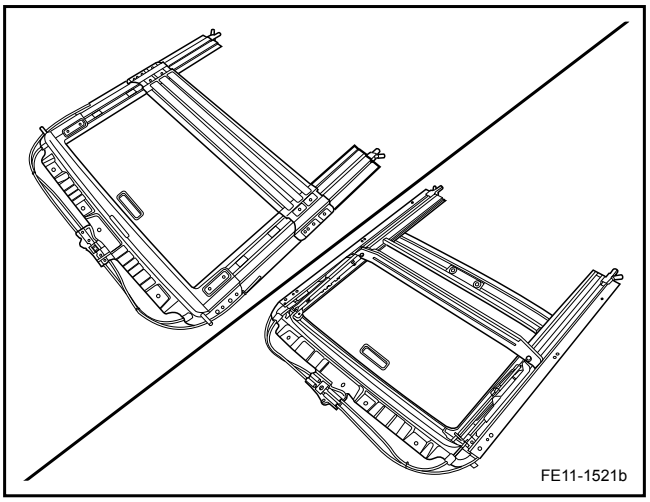
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the sunroof window. Refer to 11.8.8.1 Sunroof Glass Replacement.
3. Remove the headliner. Refer to 12.9.1.1 Headliner Replacement.
4. Remove the sunroof motor. Refer to 11.8.8.2 Sunroof Motor Replacement.
5. Remove the sunroof frame front retaining bolts.

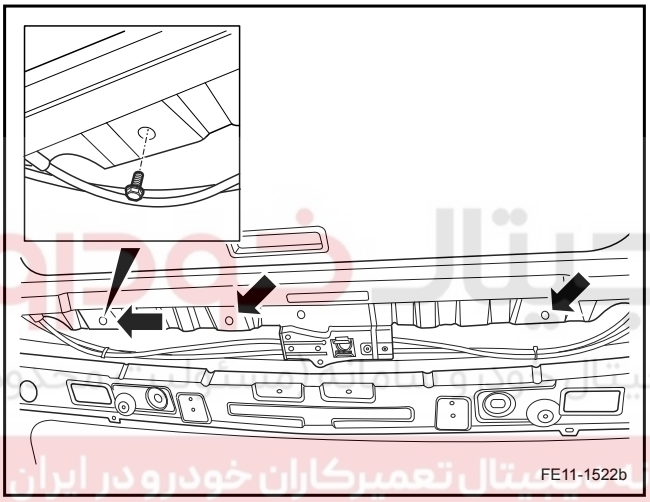


6. Remove the sunroof frame rear side retaining bolts.



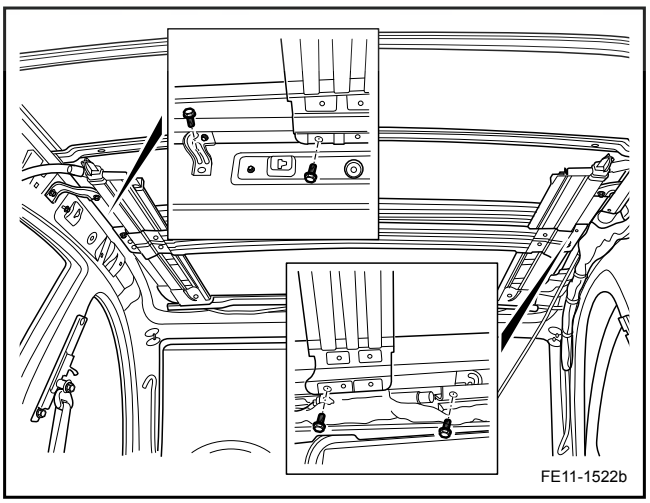
7. Remove the sunroof frame.

Installation Procedure:



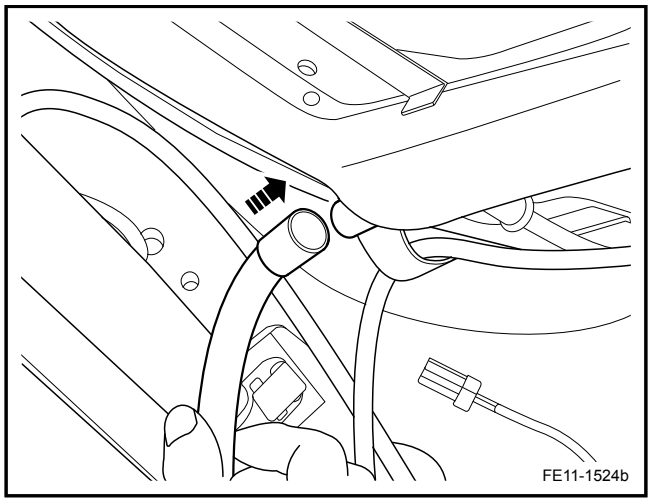
1. Install the sunroof frame, tighten the sunroof frame front retaining bolts.

   Torque: 10 Nm (Metric) 7 lb-ft (US English)



2. Tighten the sunroof frame rear side retaining bolts.

   Torque: 10 Nm (Metric) 7 lb-ft (US English)



3. Install the sunroof front and rear drain pipes.
4. Install the sunroof motor.
5. Install the headliner.
6. Install the sunroof window.
7. Connect the battery negative cable.

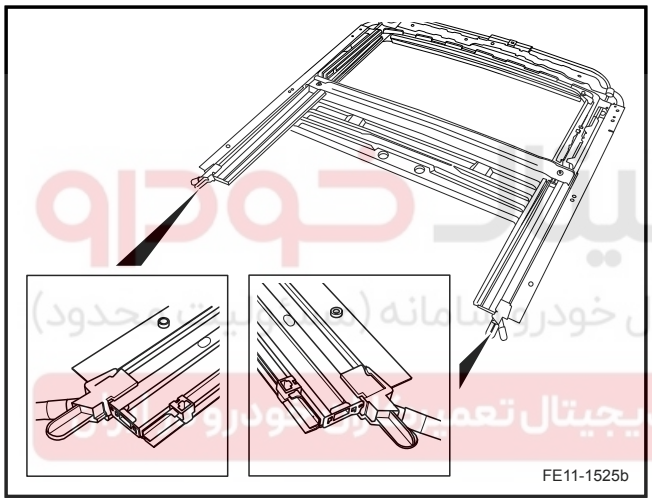
Note

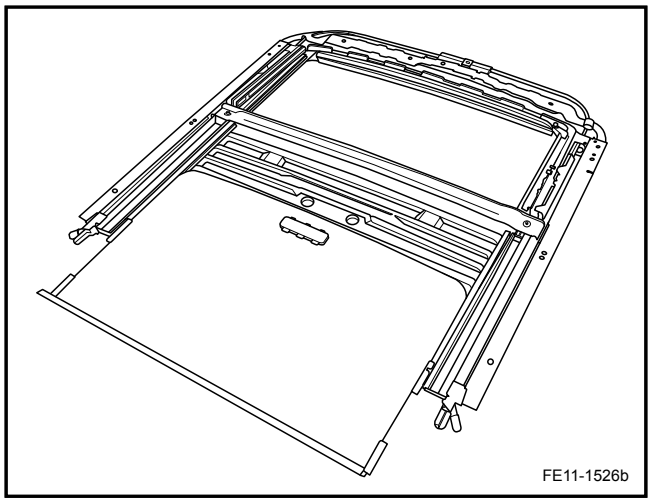
During the installation, do not to be squeeze the drain pipes.

11.8.8.5 Sunroof Visor Replacement

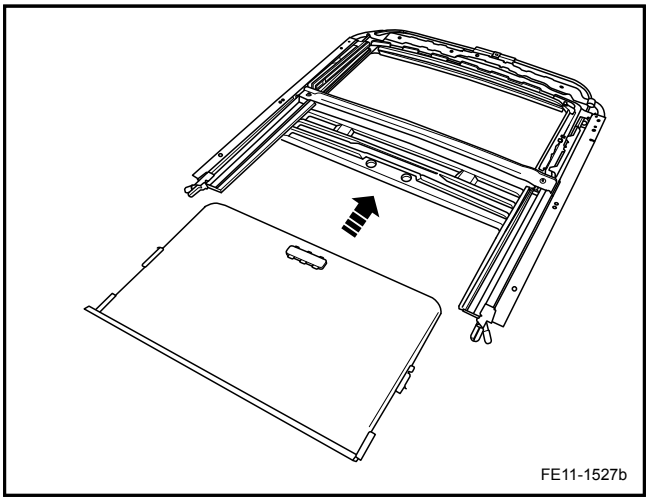
Removal Procedure

1. Remove the sunroof frame. Refer to 11.8.8.4 Sunroof Frame Replacement.
2. Remove the sunroof visor limit tangs.



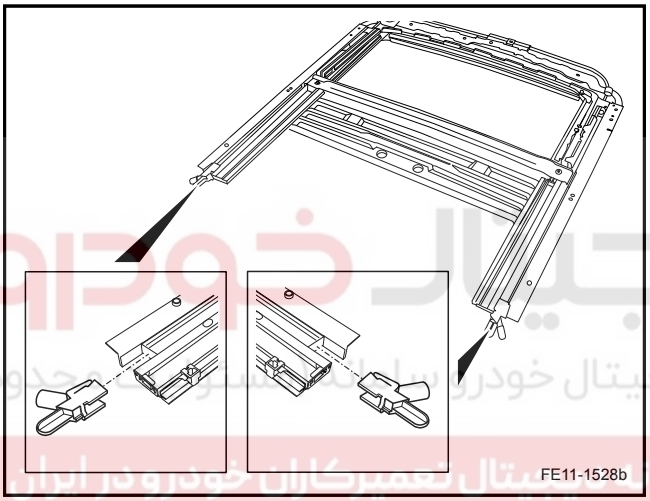


3. Remove the sunroof visor.



Installation Procedure:

1. Insert the sunroof visor.



2. Install the sunroof visor limit tangs.
3. Install the sunroof frame.

11.9 Central Locking

11.9.1 Specifications

11.9.1.1 Fasteners Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Left Front Door Lock Retaining Bolts	M6 × 10	4-5	3-4
Left Rear Door Lock Retaining Bolts	M6 × 10	4-5	3-4
Left Front Door Lock Seat Retaining Bolts	M6 × 16	20-26	14.8-19.2
Left Rear Door Lock Seat Retaining Bolts	M6 × 16	20-26	14.8-19.2
Rear Compartment Lock Seat Retaining Bolts	M6 × 12	13-17	9.6-12.6
Rear Compartment Lid Lock Assembly Bolts	M6 × 12	13-17	9.6-12.6

11.9.2 Description and Operation

11.9.2.1 Description and Operation

Electric door locks use a solenoid valve within each door lock. Door locks can only be controlled by combination switch on the left front inside door handle the driver door switch (remote control key operation). When using the actuator or cylinder lock to unlock the driver door, all door locks will be unlocked.

Lock and Unlock

- Turn the key on the driver door lock to unlocking position, all four locks are unlocked.
- Turn the key on the driver door lock to locking position, all four locks are locked.
- Inside unlocking / lock switch (driver door): unlock four doors; lock four doors.
- The rear compartment lid can be opened by the remote control or the unlock switch (sedan); Hatchback can be unlocked by the remote control or unlock switch (hatchback). At speeds up to 5kph the rear compartment / hatchback unlocking function is prohibited.

Auto Locking

- Turn the ignition switch to the "ON" position. When the speed is above 20 km/h, all four doors will automatically lock. If the speed is more than 20 km/h again, auto-lock will not react. Only when the ignition switch is turned off or then any door is unlocked and locked, the automatic locking feature will be activated.
- After pressing the remote unlock button 15 s, if none of all four doors, engine hood, rear compartment lid is opened, all doors will automatically lock. If the unlock button is pressed inside the 15 s, it will start 15 s timer again.

Key In Lock Reminder

If the key is inserted in the ignition "OFF"(ACC position will not be detected) position, the door can not be locked; if the driver door is open, BCM will send a CAN periodic alarm signal to the instrument to warn that the key is not removed.

Auto Unlocking

- When the doors are locked, after pulling out the ignition key, all four doors automatically unlock. When door are not locked, after pulling out the ignition key, all four door locks will not respond.
- After receiving the airbag deployed signal from the CAN (3 or more collision signals are received), four doors will automatically unlock. This function is not guaranteed in the following circumstances, such as battery voltage low or the wiring harness damaged by the collision causing the lack of door locks motor control power supply.

Super Locking (If Equipped)

Achieve super-Lock function in one the following two ways:

- Press the by remote control "locking" key twice in 300ms.
- In 3s turn the key in the lock from the "Lock" to "Unlock" position twice. Flash once to confirm the above two ways.

  Note

  At this point the door can only be unlocked by the valid key or remote control.

Super Unlocking (If Equipped)

Dual lock unlocking will change the lock motor from dual locking to central locking status. Under the dual locking status, there are ways to unlock the dual locking:

- Driver door metal key unlock dual locking

  Turn the driver door metal keys to the unlocked position, dual locking status will be disabled, the lock motor will be in central locking status.
- Remote Control Dual Locking Unlock

  Use the remote control to unlock, the dual locking status disabled. The lock motor will be in central locking status. Flash twice to confirm.

11.9.3 System Working Principle

11.9.3.1 System Working Principle

Door Lock Switch

- System has two lock switches, one is located in the left front door combination switch and the other is in the left front door key cylinder. Other key cylinders can only be used to unlock a single door and can not activate the central locking function.
- The two lock switch locking signals input to the BCM share a common input terminal, but the unlocking signal is input individually.

Locking Operation

When the BCM receives locking input signal or the automatic locking requirements are met, the BCM locking output terminal will send power supply to control the door motor to lock four doors. For hatchback model, the locking command is also sent to the hatchback lock motor.

Unlocking Operation

When the BCM receives unlocking input signal or the automatic unlocking requirements are met, the BCM unlocking output terminal will send power supply to control the door motor to unlock four doors. For hatchback model, the unlocking command is also sent to the hatchback lock motor. (rear compartment (hatchback) unlocks separately).

Super Locking (If Equipped)

On the vehicle with the super locking feature, in addition to door lock there is also a super locking motor. If BCM receives the super locking input signal, it will immediately send power from the super locking output terminal to control the super locking motor to activate super locking.

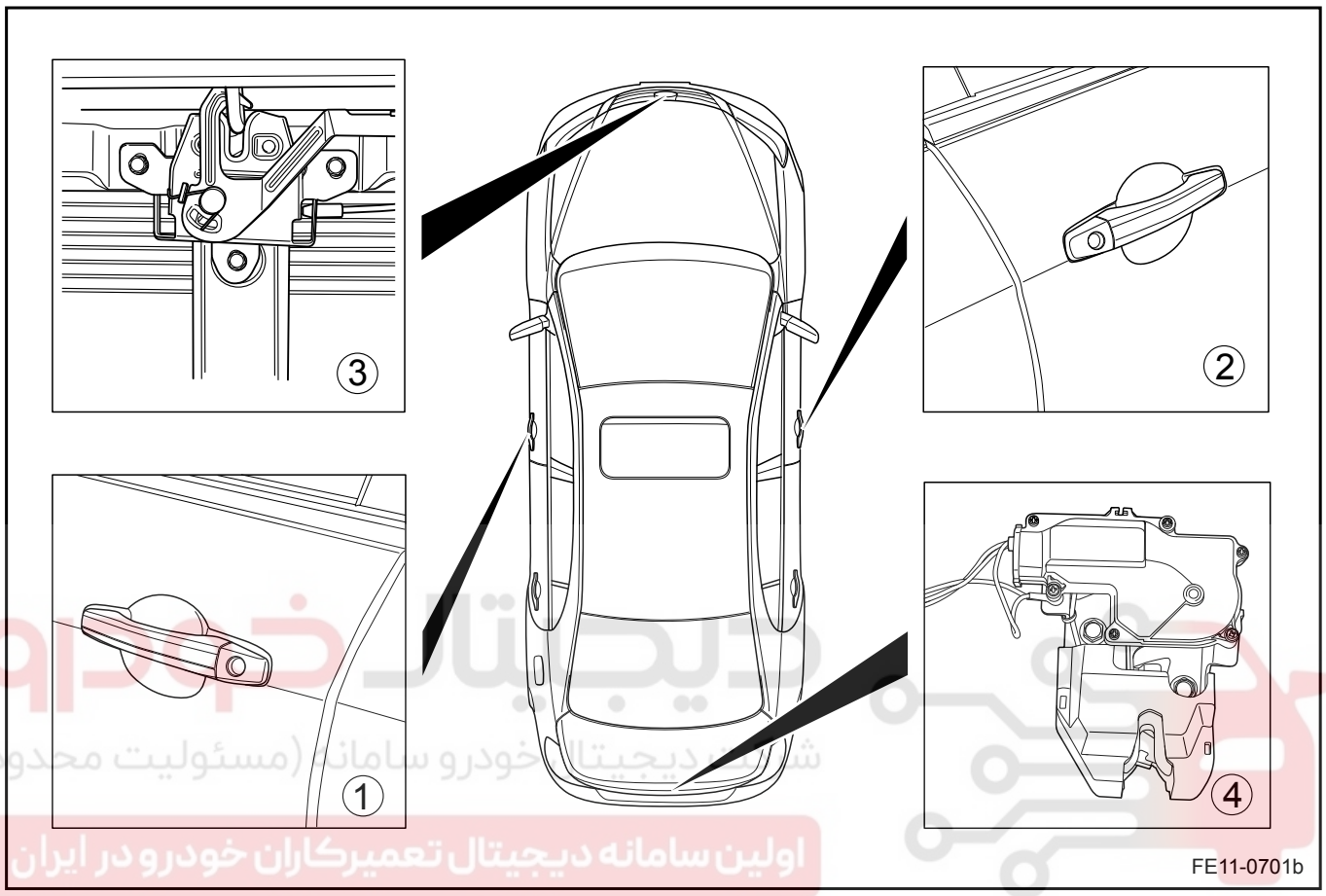
Note

Even on the vehicle with the super locking feature, the rear compartment (hatchback) lock does not have the super locking feature.

11.9.4 Component Locator

11.9.4.1 Component Locator

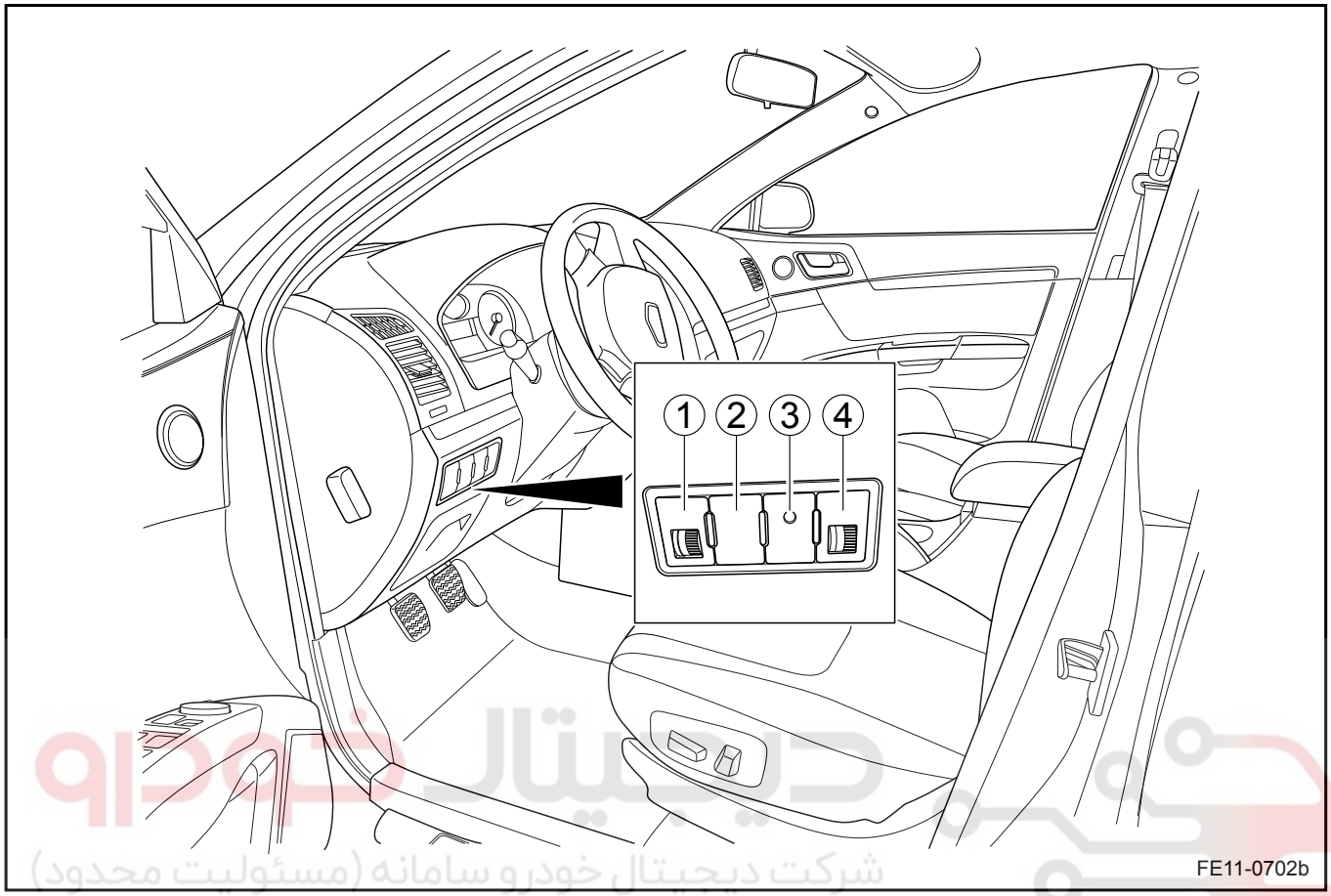
Entire Vehicle Mechanical Cylinder



Legend

1. Driver Door Cylinder
2. Passenger Door Cylinder
3. Hood Ajar Switch
4. Rear Compartment Lid Lock Assembly

Rear Compartment Lid Release Button



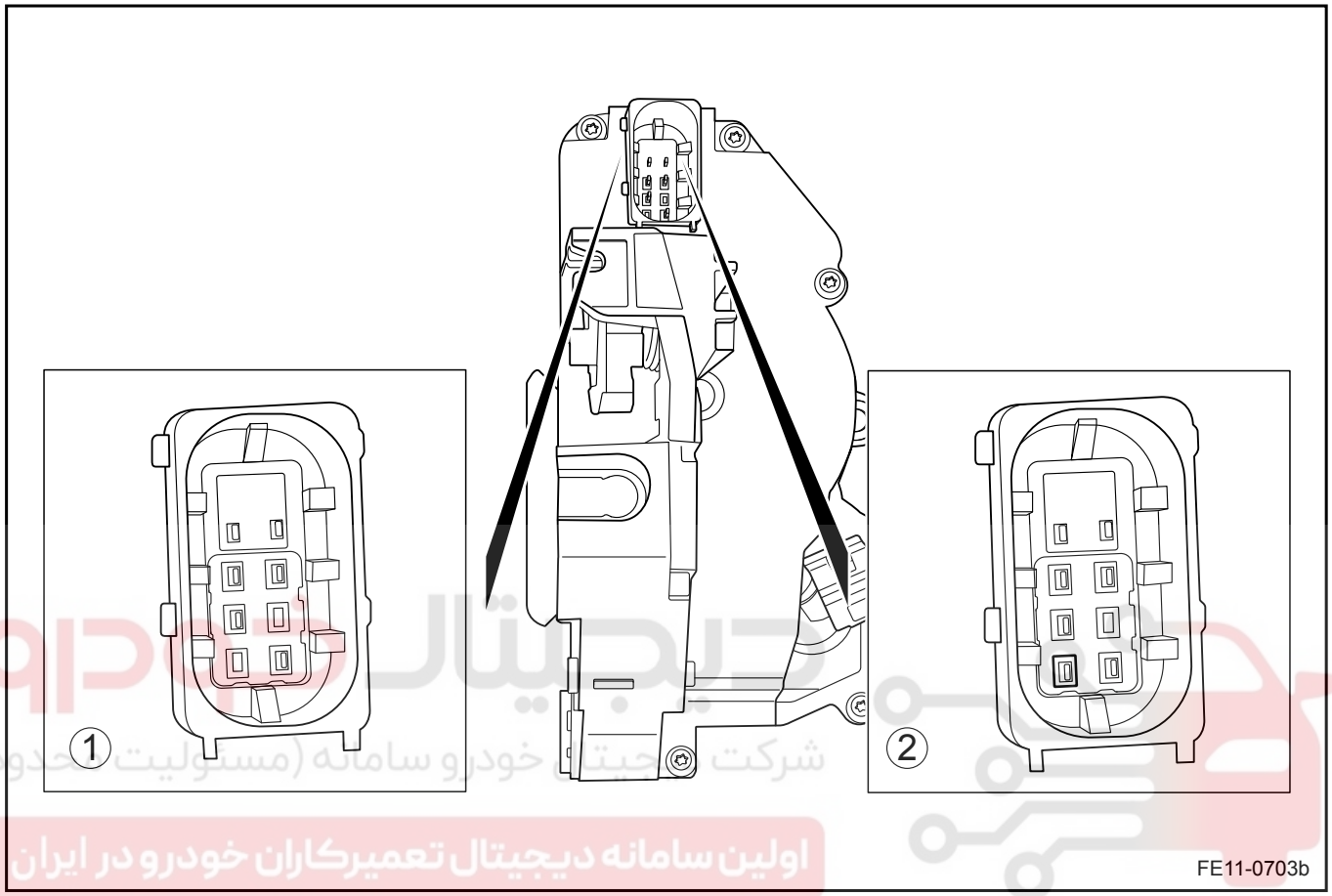
Legend

1. Dimmer Switch
2. Rear Compartment Lid Release Button
3. Remote Anti-theft Indicator
4. Headlamp Height Adjustment Switch

11.9.5 Disassemble View

11.9.5.1 Disassemble View

Left Front Door Lock Assembly With or Without Super Locking Function

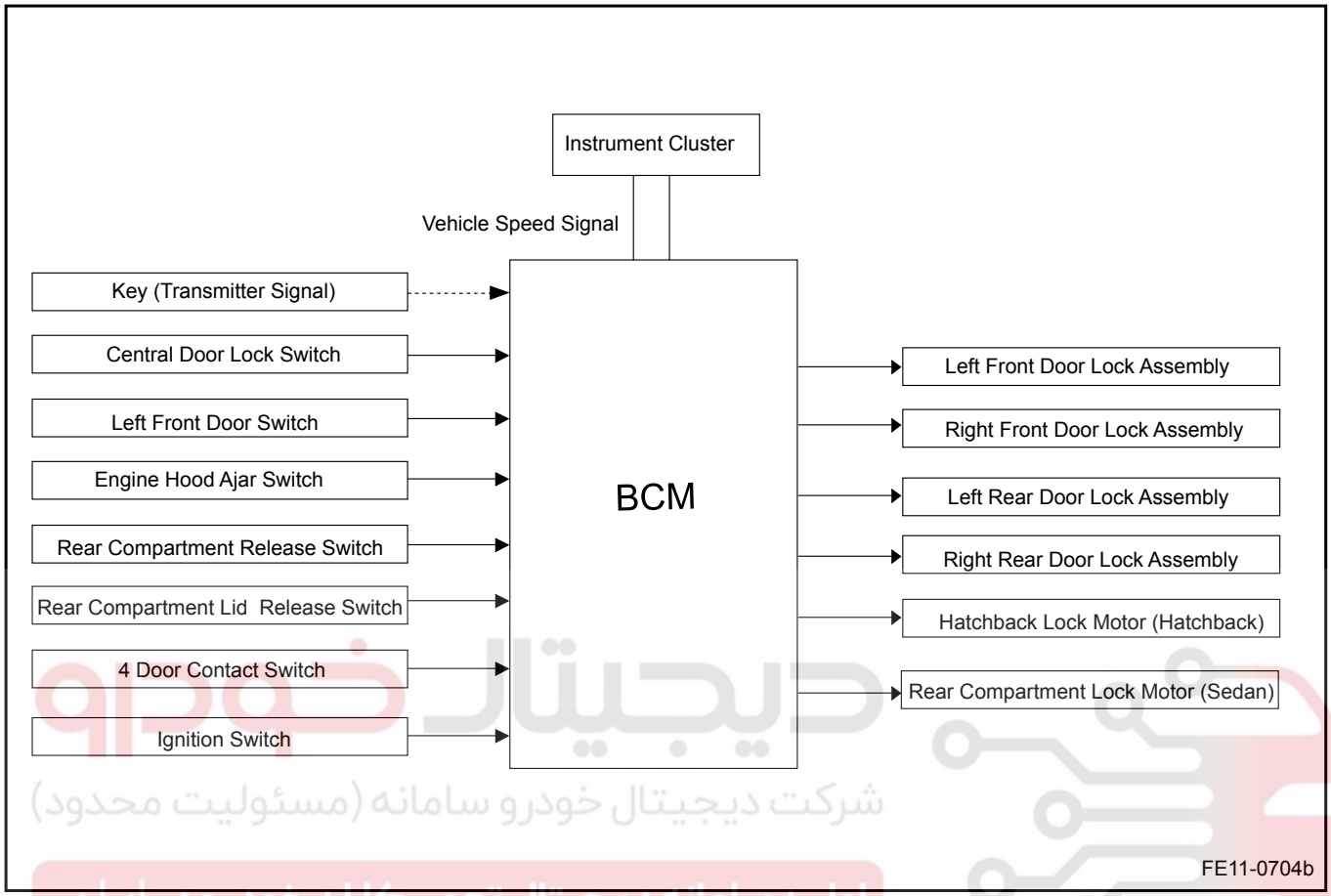


Legend

1. Door Lock Motor Terminal Without The Express Down Function
2. Door Lock Motor Terminal With Express Down Function

11.9.6 Schematic

11.9.6.1 Schematic



11.9.7 Diagnostic Information and Procedures

11.9.7.1 Diagnosis Description

Refer to11.9.2 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.9.7.2 Visual Inspection

- Check installed after market equipment that may affect Central Locking operation.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- If all door locks are inoperative, check the power supply circuit and the ground circuit for poor connection or open circuit before replacing bulbs.

11.9.7.3 Symptom List

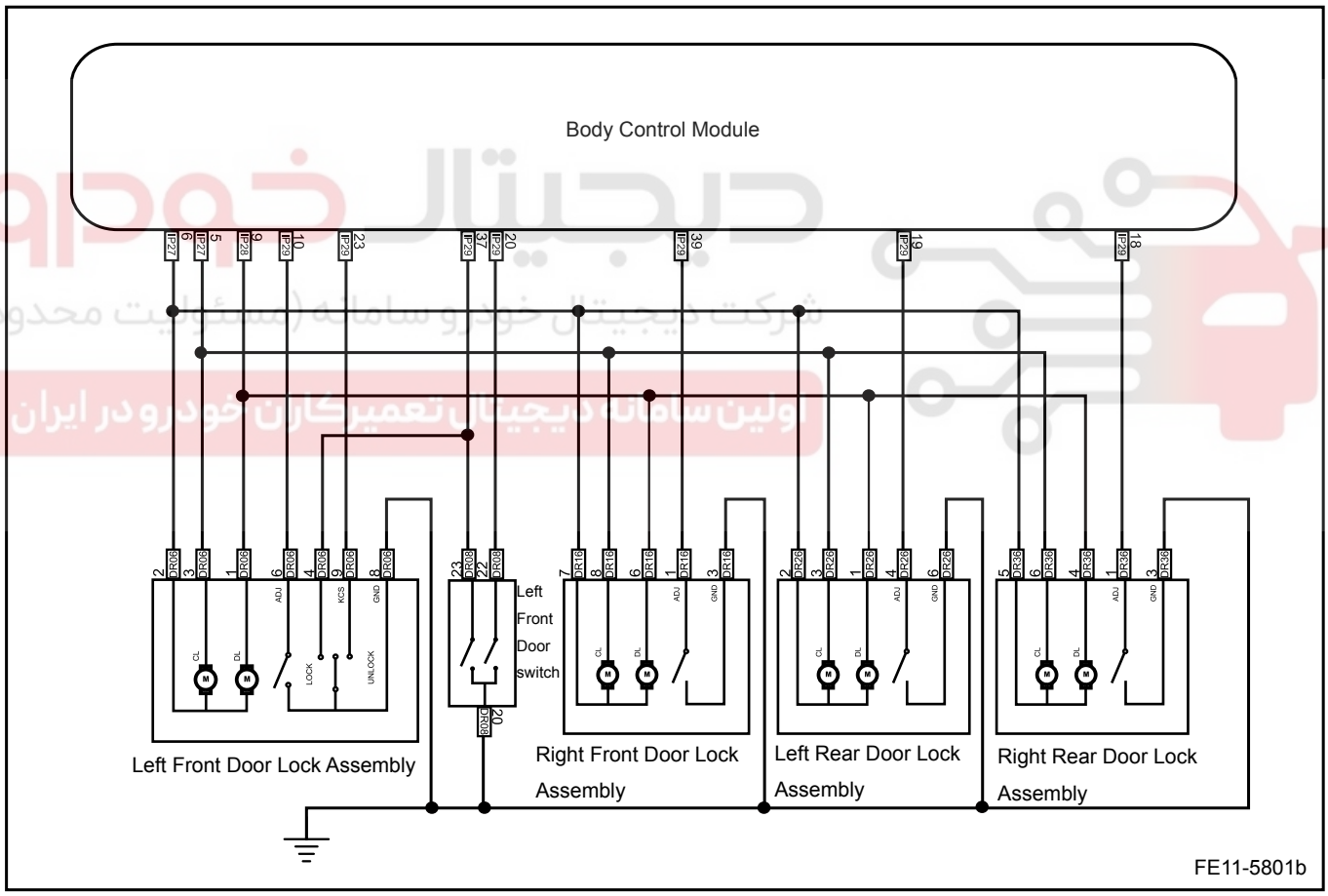
Symptoms	Suspected Faulty Parts	Repair Procedure
Mechanical key can not lock / unlock the door	1. Central Locking Power Supply Malfunction 2. Left Front Door Unlock / Lock Switch Poor Connection 3. Wiring Harness Connector Poor Connection 4. Ground Poor Connection 5. Harness Malfunction 6. Central Locking Motor Malfunction 7. BCM Malfunction	1. Check the power supply circuit. 2. Check wiring harnesses and connectors. 3. Check ground malfunction 4. Replace the door lock motor. 5. Check the BCM, if necessary, replace the BCM.
Central locking switch can not lock / unlock doors	1. Central Locking Power Supply Malfunction 2. Left Front Door Combination Switch Central Locking Switch Malfunction 3. Wiring Harness Connector Poor Connection 4. Ground Poor Connection 5. Harness Malfunction 6. Central Locking Motor Malfunction 7. BCM Malfunction	1. Check the power supply circuit. 2. Check wiring harnesses and connectors. 3. Check ground malfunction 4. Check the left front door window switch. 5. Replace the lock motor. 6. Check the BCM, if necessary, replace the BCM.

Symptoms	Suspected Faulty Parts	Repair Procedure
Only the left front door can not be locked / unlocked	1. Central Locking Power Supply Malfunction 2. Left Front Door Lock Harness Connector Poor Connection 3. Left Front Door Lock Ground Poor Connection 4. Harness Malfunction 5. Left The Front Door Central Locking Motor Poor Connection 6. BCM Poor Connection	1. Check the power supply circuit. 2. Check wiring harnesses and connectors. 3. Check ground malfunction 4. Replace the lock motor. 5. Check the BCM, if necessary, replace the BCM.
Remote control does not lock / unlock doors	1. Electromagnetic Interference 2. Remote Malfunction 3. Central Locking Power Supply Malfunction 4. Wiring Harness Connector Poor Connection 5. Ground Poor Connection 6. Harness Malfunction 7. Central Locking Motor Malfunction 8. BCM Malfunction	1. Move to a non-interference environment. 2. Check the remote control battery, if necessary, replace the remote control. 3. Check the power supply circuit. 4. Check the wiring harnesses and connectors. 5. Check the ground. 6. Replace the door lock motor. 7. Check the BCM, if necessary, replace the BCM.
Auto locking is not activated in central locking anti-theft mode.	1. Insufficient Power Supply Voltage 2. Wiring Harness Connectors Poor Connection 3. Ground Poor Connection 4. Harness Malfunction 5. Central Locking Motor Contact Switch Malfunction 6. BCM Malfunction	1. Check the power supply circuit. 2. Check the wiring harnesses and connectors. 3. Check the ground. 4. Replace the lock motor. 5. Check the BCM, if necessary, replace the BCM.

Symptoms	Suspected Faulty Parts	Repair Procedure
Door lock operated during driving	1. Mechanical Lock Mechanism Malfunction 2. Wiring Harness Connectors Poor Connection 3. Ground Poor Connection 4. Harness Malfunction 5. Central Locking Motor Contact Switch Malfunction 6. BCM Malfunction	1. Adjust mechanical lock mechanism , if necessary, replace the lock body. 2. Check the wiring harnesses and connectors. 3. Check the ground. 4. Replace the lock motor. 5. Check the BCM, if necessary, replace the BCM.

11.9.7.4 Mechanical Key / Central Locking Switch Can Not Lock All Doors

Schematic:



Diagnostic Steps:

Note

When there is not a remote control, use the scan tool special setting function to drive door locks. Select as the following sequence: body control module / BCM special setting function / locking, unlocking dual-locking (all doors) / locking all the doors.

Step 1	Check the remote locking.

Is the remote locking working?

Yes → Go to step 3

No

Step 2	Check remote anti-theft system for possible malfunction.

(a) Check and repair the remote anti-theft system for possible malfunction

Is the remote locking working?

Yes → System normal

No

Step 3	Check the mechanical key or the control button locking.

Body Control Module 1 Harness Connector IP29

FE11-5802b

(a) Use the mechanical key or the left front combination switch to repeatedly lock and unlock, at the same time measure the BCM harness connector IP29 terminal No.37 voltage with a multimeter.

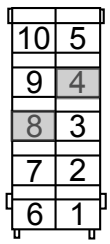
Is the voltage between 0 V and 10 V?

Yes → Go to step 10

No

Step 4	Check the left front door lock assembly.

Left Front Door Lock Motor Harness Connector DR06



FE11-5803b

(a) Remove the left front door lock assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

(b) Simulate the mechanical key locking action, measure resistance between the left front door lock assembly DR06 terminals No.4 and 8 with a multimeter.

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 6

No

Step 5	Replace the left front door lock motor assembly.

(a) Replace the left front door lock motor assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

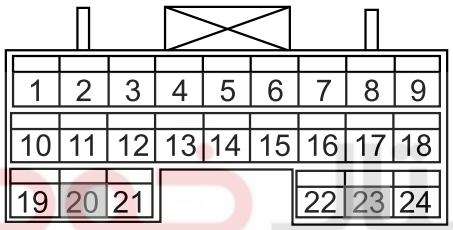
Use a key to lock the door, confirm whether the door can be locked.

Yes → System normal

No

Step 6	Check the left front combination switch control locking button.

Left Front Window Switch Harness Connector DR08



FE11-5804b

(a) Remove the left front combination switch.

(b) Press the central locking button to lock, while test continuity between the left front combination switch assembly DR08 terminal No.23 and 20 with a multimeter.

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 8

No

Step 7	Replace the left front window switch.

(a) Replace the left front window switch. Refer to 11.5.8.4 Left Front Window Switch Replacement.

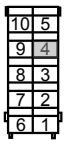
Use the Central Locking button to lock doors. Confirm whether it is working.

Yes → System normal

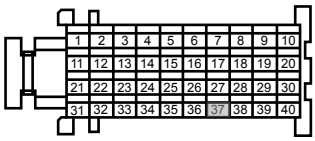
No

Step 8	Check the circuit between the BCM harness connector IP29 and the left front door motor harness connector DR06.

Left Front Door Lock Motor Harness Connector DR06



Body Control Module 1 Harness Connector IP29



FE11-5805b

(a) Disconnect the BCM harness connector. Refer to 11.10.8.1 BCM Replacement.

(b) Disconnect the left front door motor wire harness connector. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

(c) Measure resistance between the BCM harness connector IP29 terminal No.37 and the left front door motor wire harness connector DR06 terminal No.4 with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes	Go to step 10
No	

Step 9	Repair the open circuit between the BCM harness connector IP29 and the left front motor wire harness connector DR06.

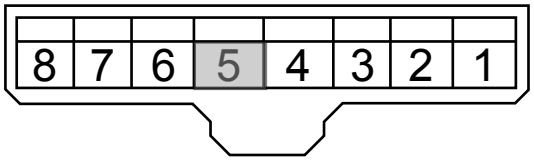
(a) Confirm the open circuit between the BCM harness connector IP29 and the left front motor wire harness connector DR06 repair is completed.

Is the electric door lock working?

Yes	System normal
No	

Step 10	Measure the BCM harness connector IP27 terminals No.5 voltage.

Body Control Module 3 Harness Connector IP27



FE11-5813b

(a) Use a mechanical key or the central locking control button to lock doors while measure the BCM harness connector IP27 terminal No.5 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

No	Go to step 12
Yes	

Step 11	Measure the BCM harness connector IP27 terminal No.6 voltage.

(a) Use a mechanical key or the central locking control button to repeatedly lock and unlock several times, while measure the BCM harness connector IP27 terminal No.6 voltage with a multimeter.

Is the power supply voltage between 0 V and the power supply voltage?

Yes → Go to step 13

No

Step 12	Replace the BCM.

(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.

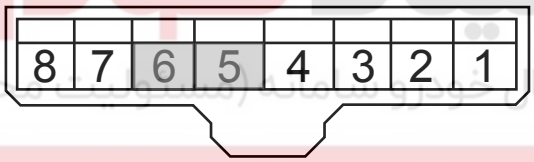
Is the electric door lock working?

Yes → System normal

No

Step 13	Repair the open circuit between the BCM harness connector IP27 and the electric door lock harness connector.

Body Control Module 3 Harness Connector IP27



FE11-5807b

(a) Confirm the open circuit between the BCM harness connector IP27 terminals No.6 and 5 and the electric door lock assembly harness connector corresponding terminals repair is completed.

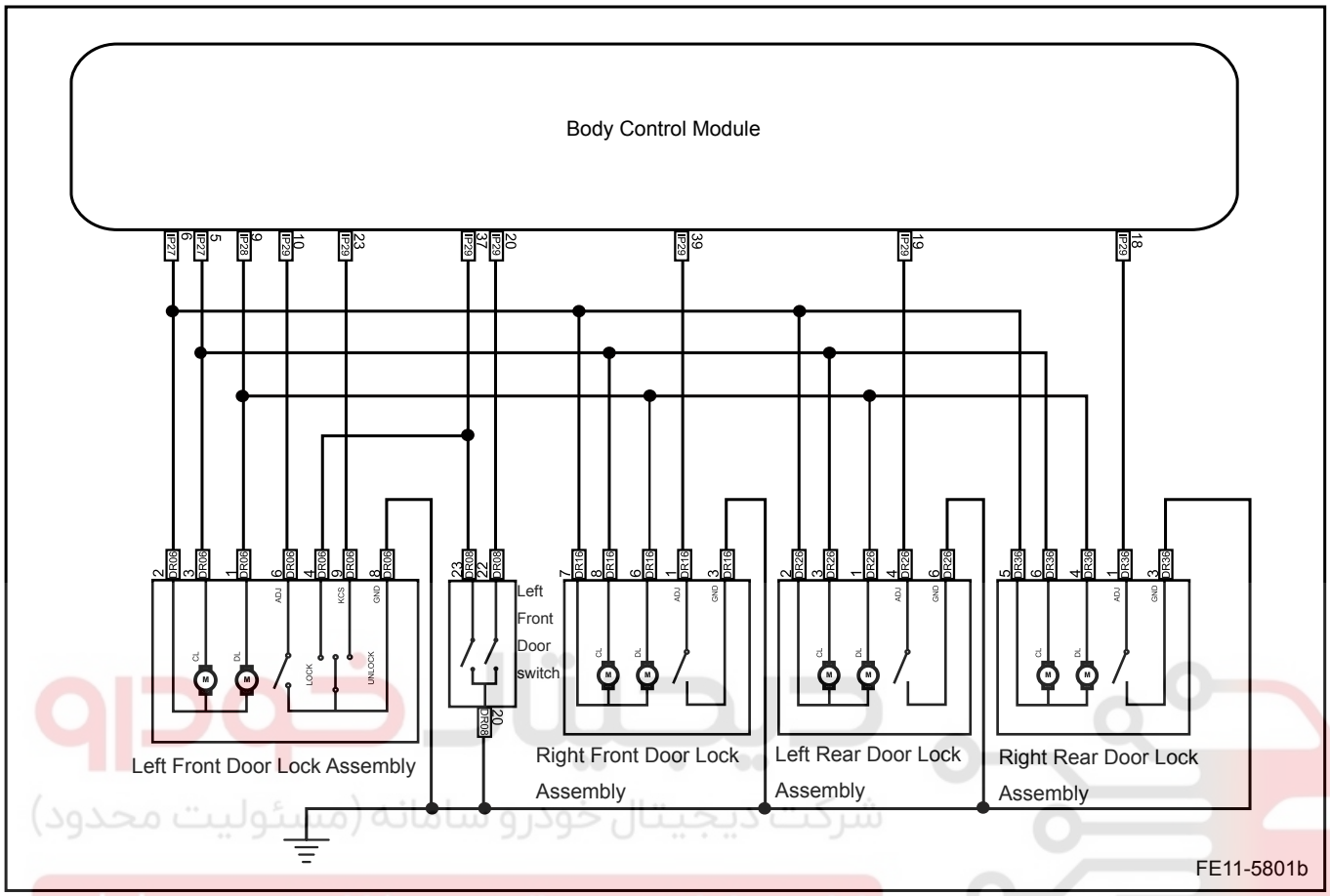
Confirm the repair completed.

Next

Step 14	System normal.

11.9.7.5 Mechanical key / Central Locking Switch Can Not Unlock All Doors

Schematic:



Diagnostic Steps:

Note

When there is not a remote control key, use the scan tool special setting function to drive the door locks. Select as the following sequence: body control module / BCM Special Set Function / lock / unlock dual locks (all doors) / unlock all doors.

Step 1	Use the remote control to lock.

Is the remote control locking working?

Yes → Go to step 3

No

Step 2	Check the remote anti-theft system for potential malfunction.

(a) Check and repair the remote anti-theft system for potential malfunction.

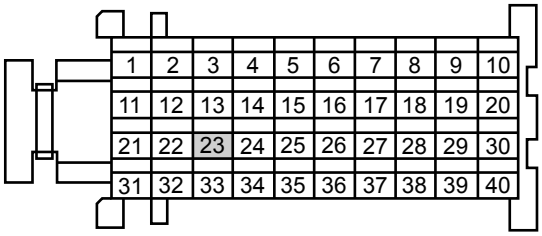
Is the electric door locking working?

Yes → System normal

No

Step 3	Use a mechanical key to unlock.

Body Control Module 1 Harness Connector IP29



FE11-5808b

(a) Use the mechanical key to repeatedly lock and unlock, at the same time measure BCM harness connector IP29 terminal No.23 voltage with a multimeter.

Is the voltage between 0 V and 10 V?

Yes → Go to step 5

No

Step 4	Check the left front door lock assembly.

Left Front Door Lock Motor Harness Connector DR06

FE11-5809b

(a) Remove the left front door lock assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

(b) Simulate mechanical key locking action, measure resistance between the left front door lock assembly DR06 terminals No. 4 and 8 with a multimeter.

Standard Resistance: Less than 1 Ω

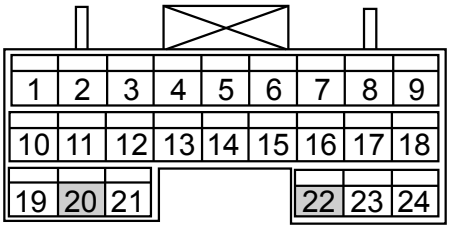
Is the resistance specified value?

No → Replace the left front door lock assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement to confirm completion of the repairs

Yes

Step 5	Use the Central Locking button to unlock.

Left Front Window Switch Harness Connector DR08



FE11-5810b

(a) Use the Central Locking button to repeatedly lock and unlock, while measure BCM harness connector IP29 terminal No.20 voltage with a multimeter.

Is the voltage between 0 V and 10 V?

Yes	Go to step 7

No

Step 6	Check the Central Locking button assembly.

(a) Remove the left front door window switch assembly.

(b) Press the central locking unlock button, measure resistor between the left front door lock assembly DR06 terminals No. 9 and 8 with a multimeter.

Standard Resistance: Less than 1 Ω

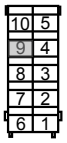
Is the resistance specified value?

Yes	Replace the left front door window switch assembly. Refer to 11.5.8.4 Left Front Window Switch Replacement to confirm completion of the repairs

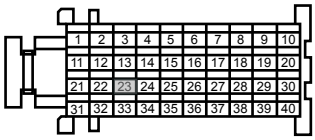
No

Step 7	Check the circuit between the BCM harness connector IP29 and the left front motor assembly harness connector DR06.

Left Front Door Lock Motor Harness Connector DR06



Body Control Module 1 Harness Connector IP29



FE11-5811b

(a) Disconnect BCM harness connector.

(b) Disconnect the left front door lock motor assembly wire harness connector. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

(c) Measure resistance between BCM harness connector IP29 terminal No.23 and the left front motor wire harness connector assembly DR06 terminal No.9 with a multimeter.

Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes	Go to step 9

No

Step 8	Repair the open circuit between the BCM harness connector IP29 and the left front motor wire harness connector assembly DR09.

(a) Confirm the open circuit between the BCM harness connector IP29 and the left front motor wire harness connector assembly DR09 repair is completed.

Is normal electric door locking working?

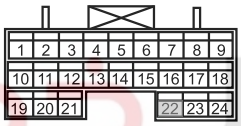
Is the resistance specified value?

Yes → System normal

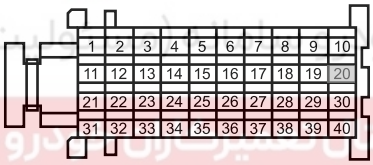
No

Step 9	Check the circuit between the BCM harness connector IP29 and the left front window switch assembly wiring harness connector DR08.

Left Front Window Switch Harness Connector DR08



Body Control Module 1 Harness Connector IP29



FE11-5812b

(a) Disconnect BCM harness connector.

(b) Disconnect the left front door lock motor assembly wire harness connector. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

(c) Disconnect the left front door combination switch wiring harness connector. Measure resistance between the BCM harness connector IP29 terminal No.20 and the left front window switch wiring harness connector DR08 terminal No. 22 with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 11

No

Step 10	Repair the open circuit between the BCM harness connector IP29 and the left front window switch wiring harness connector DR08.

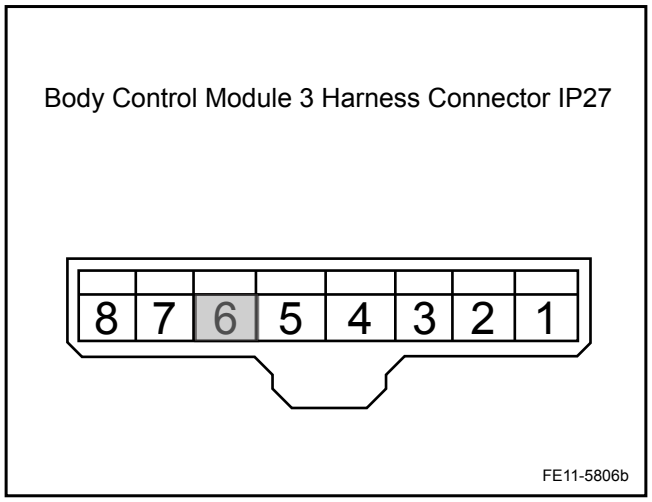
(a) Confirm the open circuit between the BCM harness connector IP29 and the left front window switch wiring harness connector DR08 repair is completed.

Is the electric door locking working?

Yes → System normal

No

Step 11	Measure the BCM harness connector IP27 terminals No.6 voltage.



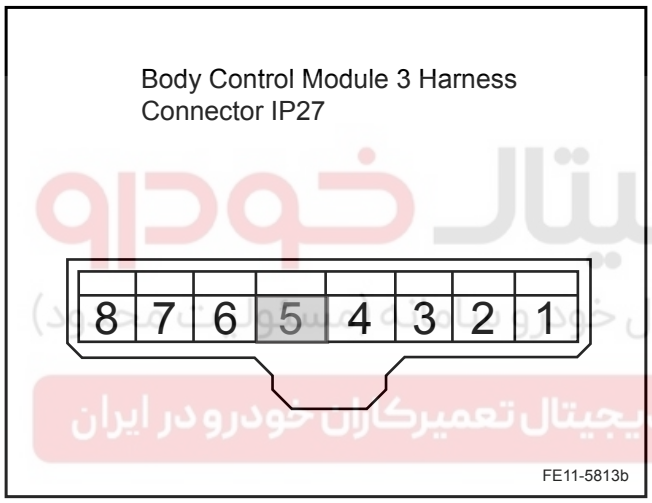
(a) Use a mechanical key or the central locking control button to repeatedly lock, while measure the BCM harness connector IP27 terminal No.6 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

No → Go to step 13

Yes

Step 12	Measure the BCM harness connector IP27 terminal No.5 voltage.



(a) Use a mechanical key or the central locking control button to repeatedly lock and unlock several times, while measure the BCM harness connector IP27 terminal No.5 voltage with a multimeter.

(b) Is the voltage between 0 V and the power supply voltage?

Yes → Go to step 14

No

Step 13	Replace the BCM.

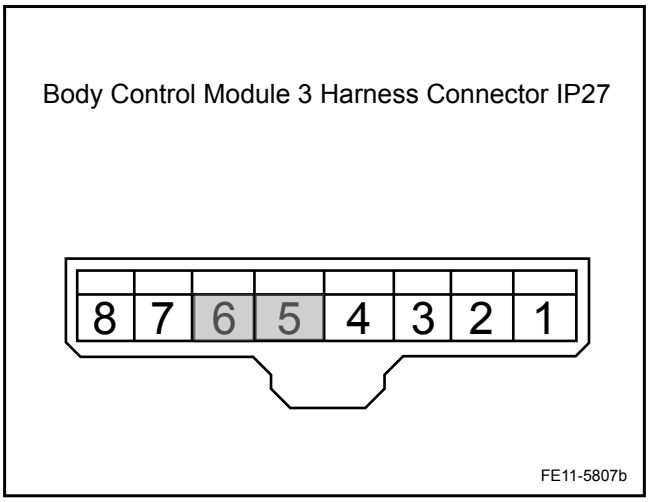
(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.

Is the electric door locking working?

Yes → System normal

No

Step 14	Repair the open circuit between the BCM harness connector IP27 and the electric door lock assembly harness connector.



(a) Confirm the open circuit between the BCM harness connector IP27 and the electric door lock assembly harness connector repair is completed.

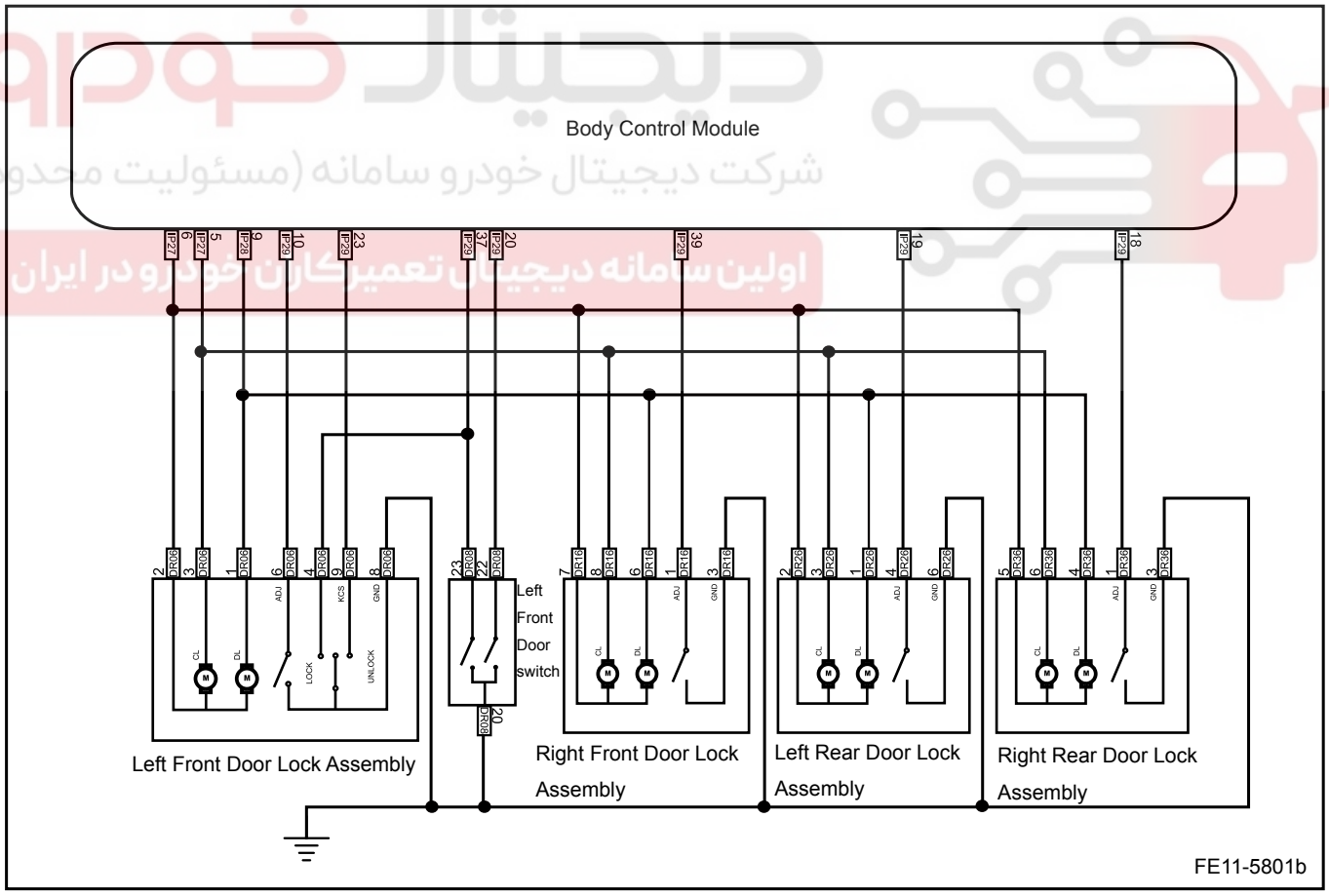
Confirm the repair completed.

Next

Step 15	System normal.

11.9.7.6 Super Locking Inoperative

Schematic:



Diagnostic Steps:

Step 1	Use the remote key to perform the super locking.

Is the remote control super locking working?

Yes → Go to step 3

No

Step 2	Check for remote anti-theft system potential malfunction.

(a) Check and repair the remote anti-theft system potential malfunction.

Is the super-locking working?

Yes → System normal

No

Step 3	Use a mechanical keys to lock and unlock.

Is the mechanical key working?

Yes → Go to step 5

No

Step 4	Repair the locking and unlocking malfunction.

(a) Repair the locking and unlocking malfunction. Refer to 11.9.7.4 Mechanical Key / Central Locking Switch Can Not Lock All Doors, 11.9.7.5 Mechanical key / Central Locking Switch Can Not Unlock All Doors.

Confirm the lock and unlocking are working properly.

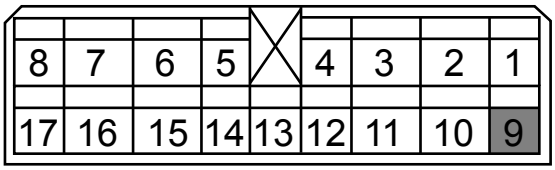
Confirm the Super Lock function is normal.

Yes → System normal

No

Step 5	Measure the BCM harness connector IP28 terminal No.9 voltage.

Body Control Module 2 Harness Connector IP28



FE11-5814b

(a) Perform the super locking, while measure the BCM harness connector IP28 terminal No.9 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Replace the BCM.

(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.

Confirm the Super Locking function is normal.

Yes → System normal

No

Step 7	Check the circuit between the BCM harness connector IP28 and the electric door lock assembly harness connector.

(a) Disconnect the BCM harness connector IP28 and the electric door lock assembly harness connector.

(b) Measure resistance between the BCM harness connector IP28 and the electric door lock assembly super-locking harness connector with a multimeter
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 9

No

Step 8	Check the open circuit between the BCM harness connector IP28 and the electric door lock harness connector.

(a) Repair the circuit between the BCM harness connector IP28 and the electric door lock assembly super-locking harness connector.

Confirm Super Locking function is normal.

Yes → System normal

No

Step 9	Replace the lock motor.

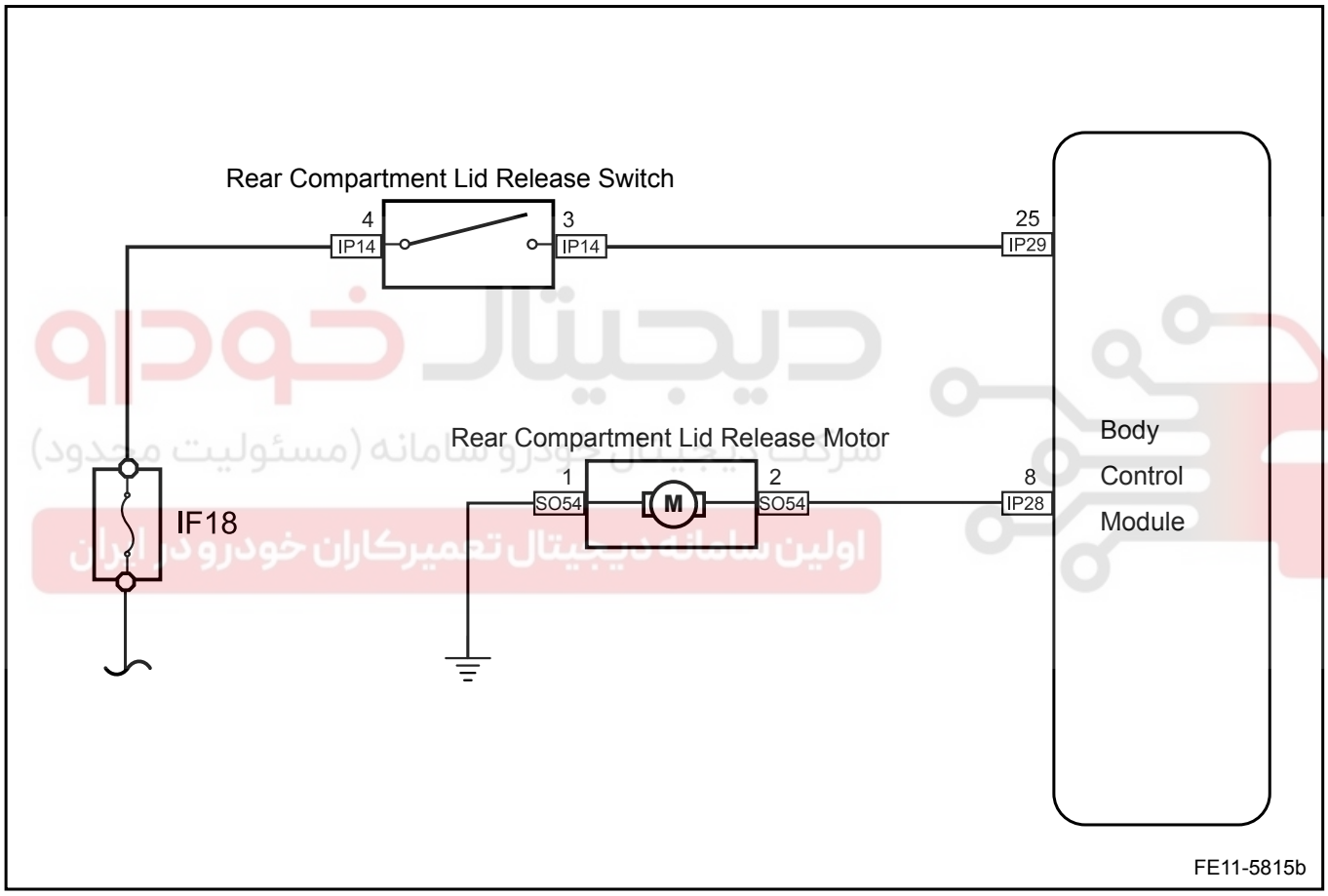
(a) Replace the lock motor.
Confirm the repair is completed.

Next

Step 10	System normal.

11.9.7.7 Rear Compartment Lid Can Not Be Opened (Sedan)

Schematic:



Diagnostic Steps:

Note

When there is not a remote control key, use the scan tool special setting function to drive the door locks. Select as the following sequence: body control module / BCM special set features / rear compartment Lid (rear compartment) open control.

Step 1	Use the remote key to open the rear compartment lid.

Is the remote key working?

Yes → Go to step 3

No

Step 2	Check the remote anti-theft system for potential malfunction.

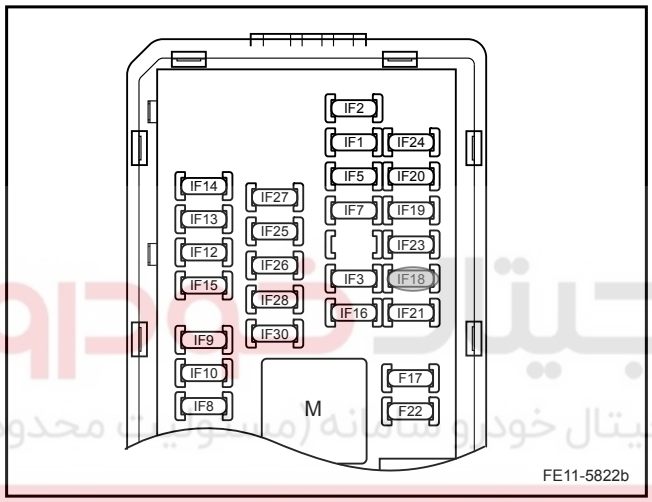
(a) Check and repair the remote anti-theft system for potential malfunction.

Is the rear compartment lid working correctly?

Yes → System normal

No

Step 3	Check the fuse IF18.



(a) Is the fuse IF18 blown?

Fuse Rating: 20 A

Yes → Go to step 5

No

Step 4	Check fuse IF18 circuit.

(a) Check whether the fuse IF18 circuit is short.

(b) Repair the circuits. Confirm that there are no short circuits.

(c) Replace with fuses with rated current.

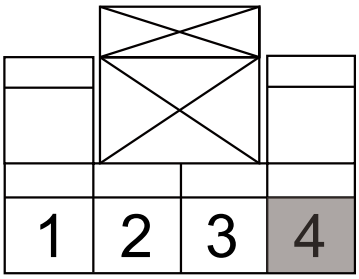
Confirm rear compartment lid is working correctly.

Yes → System normal

No

Step 5	Measure the wiring harness connector IP14 terminal No.4 voltage.

Rear Compartment Lid Release Switch Harness Connector IP14



FE11-5816b

(a) Disconnect the rear compartment wiring harness connector IP14.
(b) Measure harness connector IP14 terminal No. 4 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Check the open circuit between the wiring harness connector IP14 and the fuse IF18.

(a) Check and repair the open circuit between the wiring harness connector IP14 and the fuse IF18.

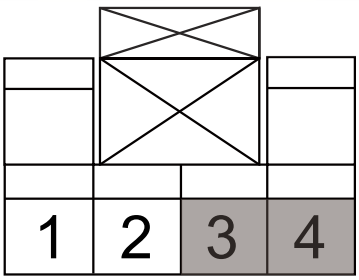
Confirm rear compartment lid is working correctly.

Yes → System normal

No

Step 7	Check the rear compartment lid release switch.

Rear Compartment Lid Release Switch Harness Connector IP14



FE11-5817b

(a) Press the rear compartment lid release switch, measure resistance between the rear compartment lid release switch terminals No.3 and 4.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 9

No

Step 8	Replace the rear compartment lid release switch.

(a) Replace the rear compartment lid release switch. Refer to 11.9.8.4 Rear Compartment Lock Assembly Replacement (Sedan).

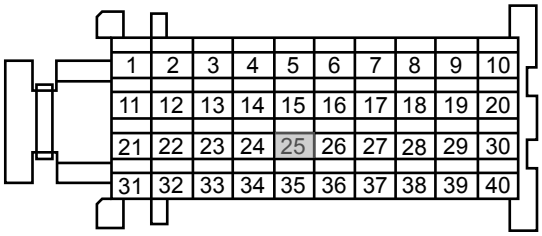
Confirm the rear compartment lid is working correctly.

Yes → System normal

No

Step 9	Measure BCM harness connector IP29 terminal No.25 voltage.

Body Control Module 1 Harness Connector IP29



FE11-5818b

(a) Press the rear compartment lid release switch, measure the BCM harness connector IP29 terminal No.25 voltage.
Standard Voltage: 11-14 V

Yes → Go to step 11

No

Step 10	Repair the open circuit between the rear compartment lid release switch wiring harness connector IP14 and the BCM harness connector IP29.

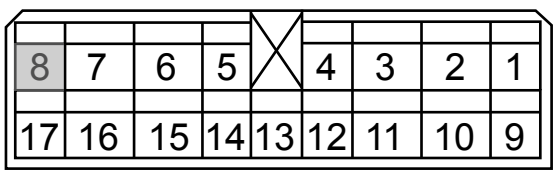
(a) Confirm the open circuit between the rear compartment lid release switch wiring harness connector IP14 terminal No.3 and the BCM harness connector IP29 terminal No.25 repair is completed.
Confirm the rear compartment lid is working correctly.

Yes → System normal

No

Step 11	Measure the BCM harness connector IP28 terminal No.8 output voltage.

Body Control Module 2 Harness Connector IP28



FE11-5819b

(a) Press the rear compartment lid release switch, measure the BCM harness connector IP28 terminal No.8 voltage.
Standard Voltage: 11-14 V
Is the voltage specified value?

Yes → Go to step 13

No

Step 12	Replace the BCM.

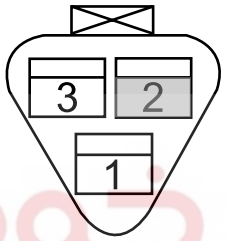
(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.
Confirm the rear compartment lid is working correctly.

Yes → System normal

No

Step 13	Measure rear compartment lock assembly harness connector SO54 terminal No.2 voltage.

Rear Compartment Lock Harness Connector SO54



FE11-5820b

(a) Press the rear compartment lid release switch, at the same time measure the rear compartment lock assembly harness connector terminal No.2 voltage with a multimeter.
Standard Voltage: 11-14 V
Is the voltage specified value?

Yes → Go to step 15

No

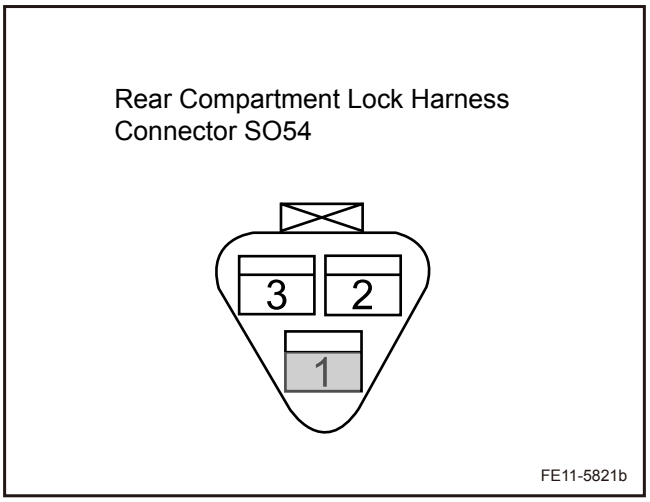
Step 14	Repair the open circuit between the BCM harness connector IP28 and the rear compartment door lock assembly harness connector SO54.

(a) Confirm the open circuit between the BCM harness connector IP28 and the rear compartment door lock assembly harness connector SO54 repair is completed.
Confirm the rear compartment lid is working correctly.

Yes → System normal

No

Step 15	Check the circuit between the rear compartment lock assembly harness connector SO54 and body ground.



(a) Measure resistance between the rear compartment lock assembly harness connector SO54 and body ground with a multimeter.
Resistance Standard Value: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 17

No

Step 16	Repair the open circuit between the rear compartment lock harness connector SO54 and the body ground.

(a) Confirm the open circuit between the rear compartment lock harness connector SO54 and the body ground repair is completed.

Confirm the rear compartment lid is working correctly.

Yes → System normal

No

Step 17	Replace the rear compartment lock assembly.

(a) Replace the rear compartment lock assembly. Refer to 11.9.8.4 Rear Compartment Lock Assembly Replacement (Sedan).

Confirm the repair completed.

Next

Step 18	System normal.

11.9.7.8 Doors Automatically Lock (20 km/h) Inoperative

Diagnostic Steps:

Step 1	Check DTC.

(a) Connect scan tool.
(b) Read the DTC.

Confirm DTC.

No → Go to step 3

Yes

Step 2	Clear DTC.

(a) Use scan tool to clear DTC.

Is the system working correctly?

Yes → System normal

No

Step 3	Carry out the Central Lock active test.

(a) Use scan tool to carry out the Central Locking active locking function.

Is the Central Locking working?

No → Refer to 11.9.7.4 Mechanical Key / Central Locking Switch Can Not Lock All Doors

Yes

Step 4	Confirm the vehicle speed signal.

(a) Connect scan tool to the ABS system, read data when the actual vehicle speed reaches 20 km/h or above.

Is the speed signal data more than 20 km/h?

No → Check the data communications network. check the ABS system, the vehicle speed sensor and the ECM circuit.

Yes

Step 5	Check the BCM circuit.

(a) Check the BCM power supply, ground and data communication circuits.

(b) Repair the BCM-related circuits.

Is the system working properly?

Yes → System normal

No

Step 6	Replace the BCM.

(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.

Confirm the repair completed.

Next

Step 7	System normal.

11.9.7.9 Vehicle Door Lock Operated During Driving

Schematic:

Refer to 11.9.7.4 Mechanical Key / Central Locking Switch Can Not Lock All Doors.

Diagnostic Steps:

Step 1	Carry out the Central Locking active test.

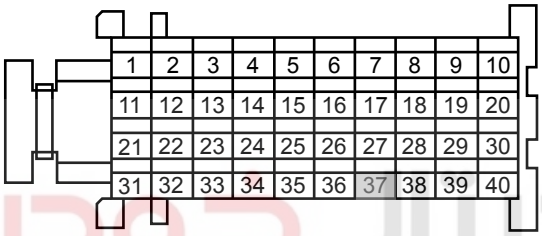
(a) Use scan tool to test the Central Lock active locking function.
Is the Central Locking working properly?

No → Refer to 11.9.7.4 Mechanical Key / Central Locking Switch Can Not Lock All Doors

Yes

Step 2	Use a mechanical key to lock.

Body Control Module 1 Harness Connector IP29



FE11-5802b

(a) Use the mechanical key to lock, unlock repeatedly, at the same time measured the BCM harness connector IP29 terminal No.37 voltage with a multimeter.
Is the voltage between 0 V and 10 V?

No → Go to step 5

Yes

Step 3	Use a mechanical key to unlock.

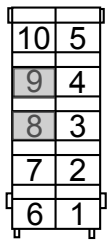
(a) Use the mechanical key to lock, unlock repeatedly, at the same time measure the BCM harness connector IP29 terminal No.23 voltage with a multimeter.
Is the voltage between 0 V and 10 V?

No → Go to step 5

Yes

Step 4	Check the left front door lock assembly.

Left Front Door Lock Motor Harness Connector DR06



FE11-5809b

(a) Remove the left front motor assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

(b) Use a mechanical key to simulate the unlock action, Measure resistance between the left front door lock assembly DR06 terminals No.9 and 8 with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 6

No

Step 5	Replace the left front motor assembly.

(a) Replace the left front door lock motor assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

Use the key to lock, confirm the electrical door locks are working properly.

Yes → System normal

No

Step 6	Replace the BCM.

(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.

Confirm the repair completed.

Next

Step 7	System normal.

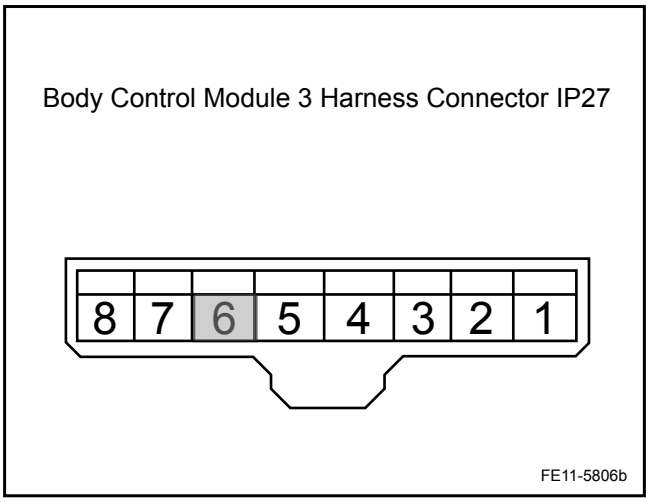
11.9.7.10 Left Front Door Lock Inoperative

Schematic:

Refer to 11.9.7.4 Mechanical Key / Central Locking Switch Can Not Lock All Doors.

Diagnostic Steps:

Step 1	Measure the BCM harness connector IP27 terminal No.6 voltage.



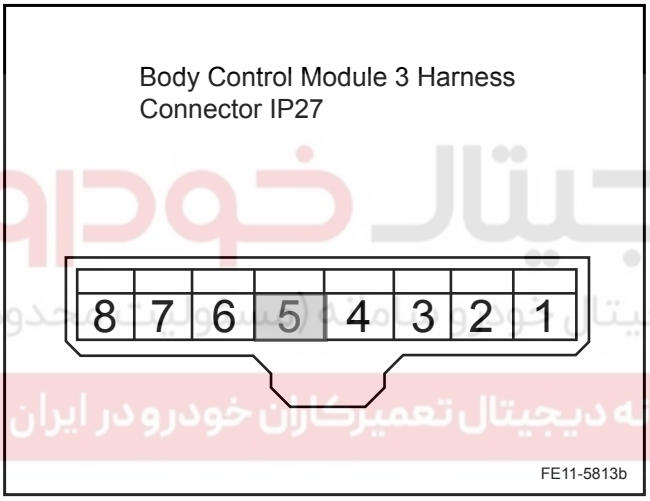
(a) Turn on the ignition switch.
(b) Use a mechanical key or the central locking control button to repeatedly lock and unlock several times, at the same time measure the BCM harness connector IP27 terminal No.6 voltage with a multimeter.

Is the voltage between 0 V and power supply voltage?

No	Go to step 3

Yes

Step 2	Measure the BCM harness connector IP27 terminal No.5 voltage.



(a) Turn on the ignition switch.
(b) Use a mechanical key or the central locking control button to repeatedly lock and unlock several times, at the same time measure the BCM harness connector IP27 terminal No.5 voltage with a multimeter.

Is the voltage between 0 V and power supply voltage?

Yes	Go to step 4

No

Step 3	Replace the BCM.

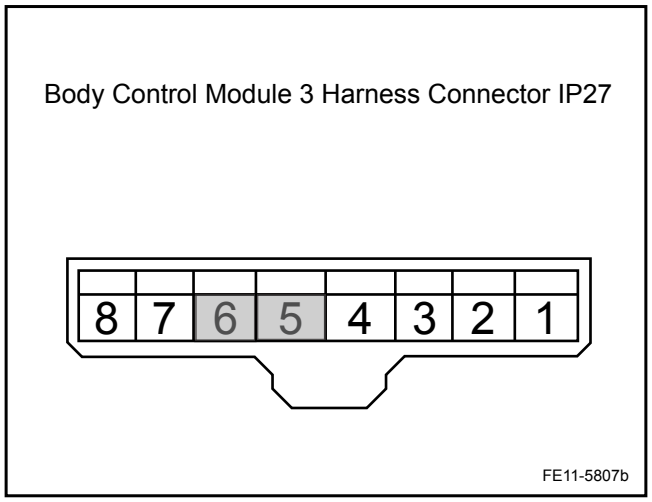
(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.

Is the left front door electric door lock working properly?

Yes	System normal

No

Step 4	Repair the open circuit between the BCM harness connector IP27 and the electric door lock harness connector.



(a) Repair the open circuit between the BCM harness connector IP27 terminals No.6 and 5 and the electric door lock assembly harness connector corresponding terminals respectively.

Is the left front door electric door lock working properly?

Yes → System normal

No

Step 5	Replace the left front door lock assembly.

(a) Replace th e left front door lock motor assembly. Refer to 11.9.8.1 Left Front Door Lock Assembly Replacement.

Confirm the repair completed.

Next

Step 6	System normal.

11.9.7.11 Right Front Door Lock Inoperative, Left Rear Door Lock Inoperative, Right Rear Door Lock Inoperative

Repair Procedures are similar to the left front door lock inoperative.

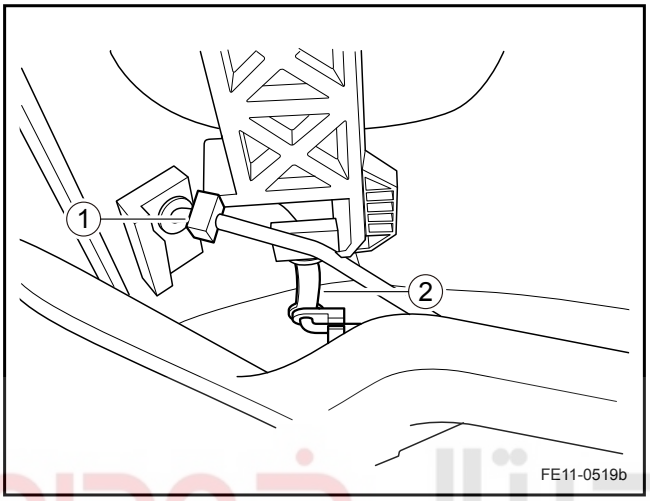
11.9.8 Removal and Installation

11.9.8.1 Left Front Door Lock Assembly Replacement

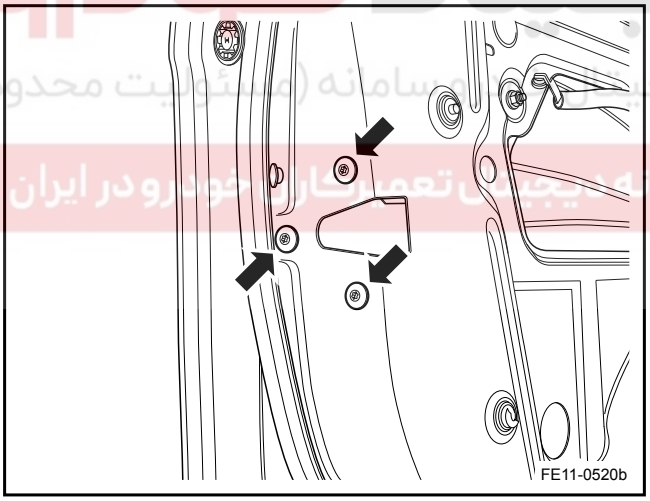
Removal Procedure

Warning!

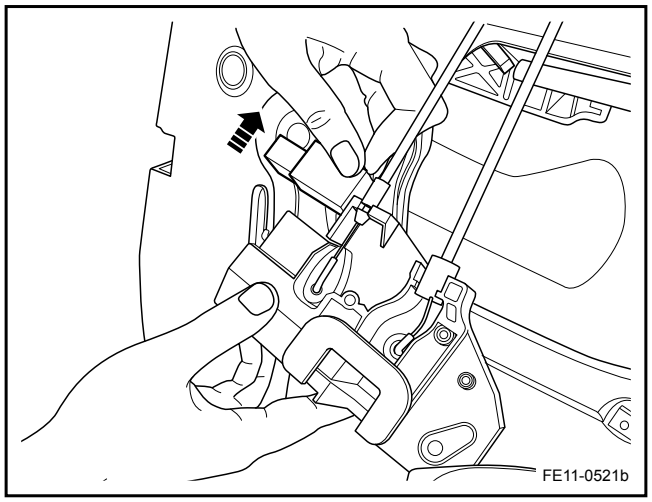
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



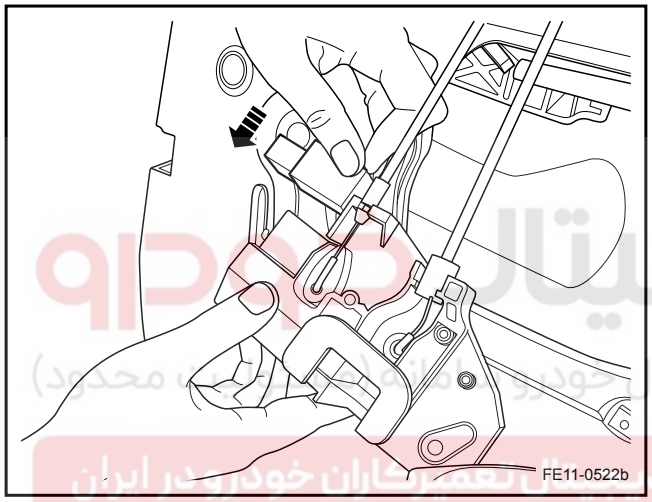
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the left front door triangle panel. Refer to 11.5.8.1 Outside Rearview Mirror Replacement.
3. Remove the left front door trim panel. Refer to 11.5.8.1 Outside Rearview Mirror Replacement.
4. Remove the left front door outside open handle (1).
5. Remove the left front door lock rod (2).



6. Remove the left front door lock assembly retaining bolts.



7. Disconnect the left front door lock assembly harness connector.
8. Remove the left front door lock assembly.



Installation Procedure:

1. Connect the left front door lock assembly connector.
2. Install the left front door lock assembly.
3. Install the left front door lock assembly retaining bolts.

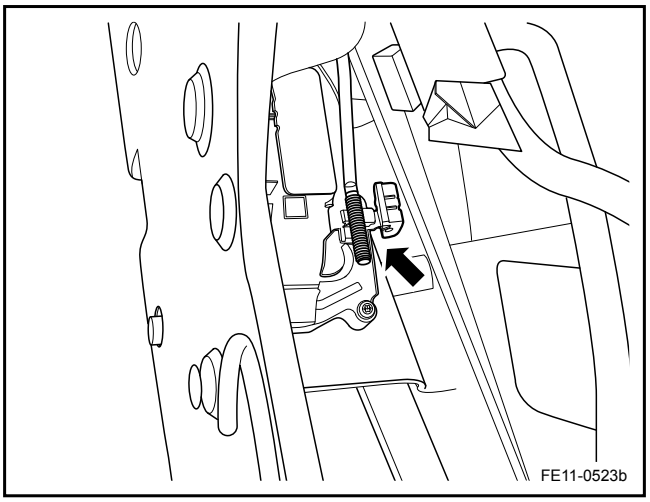
   Torque: 15 Nm (Metric) 11 lb-ft (US English)
4. Install the left front door inside handle cable.
5. Install the left front door outside handle cable and the cylinder rod.
6. Install the left front door trim panel.
7. Install the left front door triangle panel.
8. Connect the battery negative cable.

11.9.8.2 Rear Door Lock Block Replacement

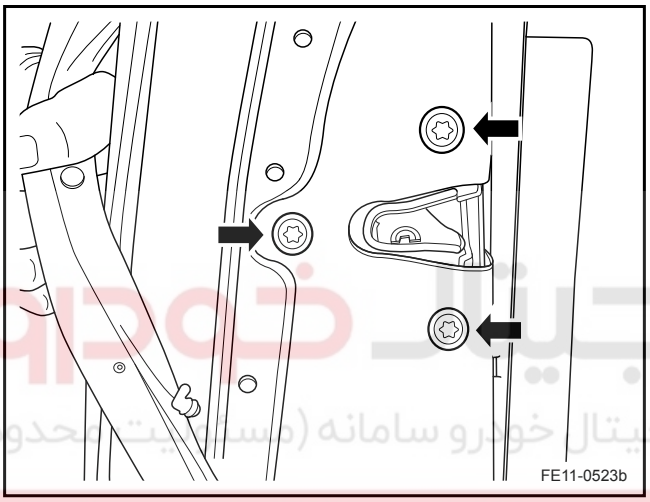
Installation Procedure:

Warning!

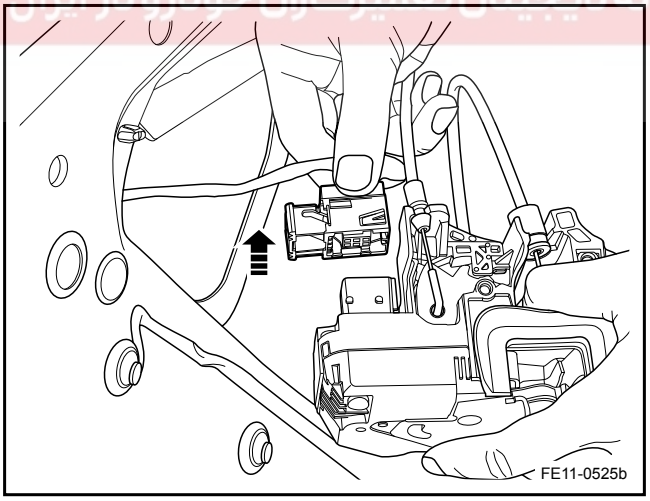
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear door window guide rail. Refer to 11.5.8.7 Rear Window Regulator Replacement.
3. Disconnect the door lock rod retaining tang.

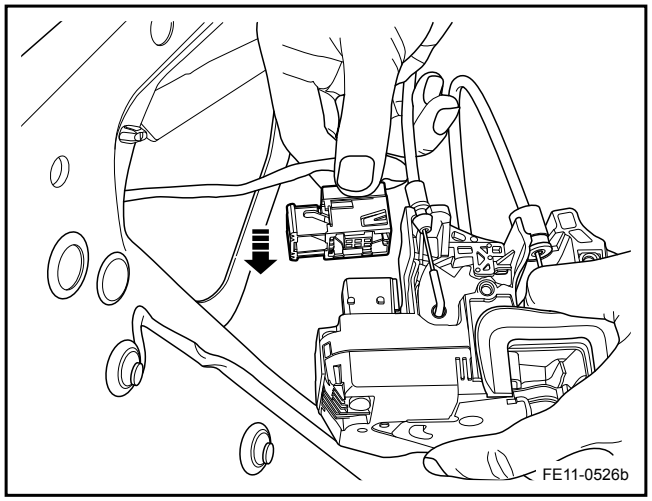


4. Remove the rear door lock retaining screws.

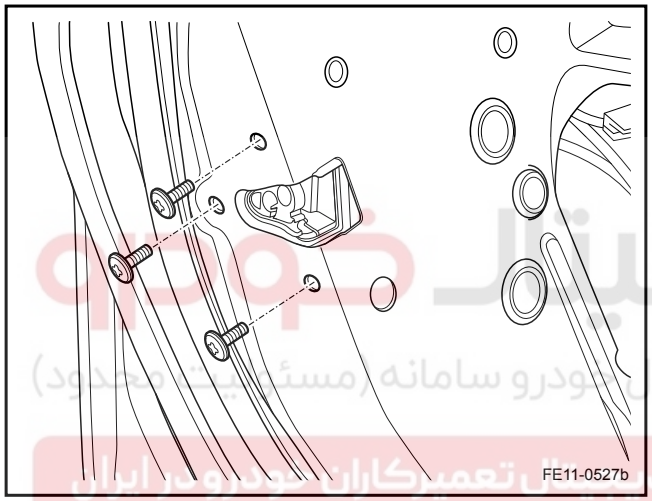


5. Disconnect the rear door lock harness connector and remove the rear door lock assembly.

Installation Procedure:

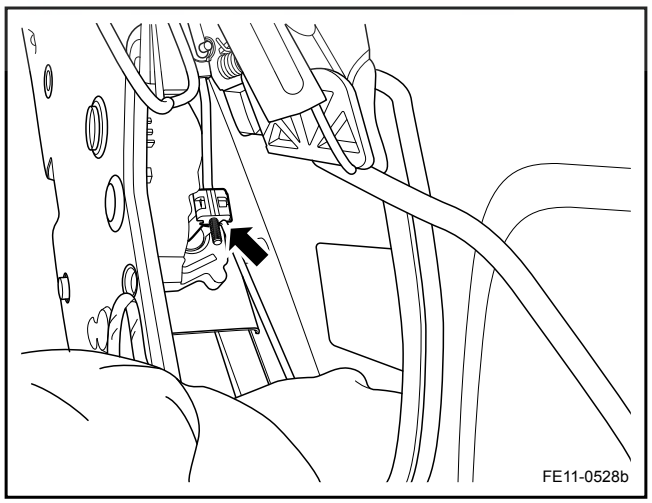


1. Connect the rear door lock assembly harness connector.



2. Install the rear door lock assembly.
3. Install the rear door lock assembly retaining screws.

   Torque: 15 Nm (Metric) 11 lb-ft (US English)



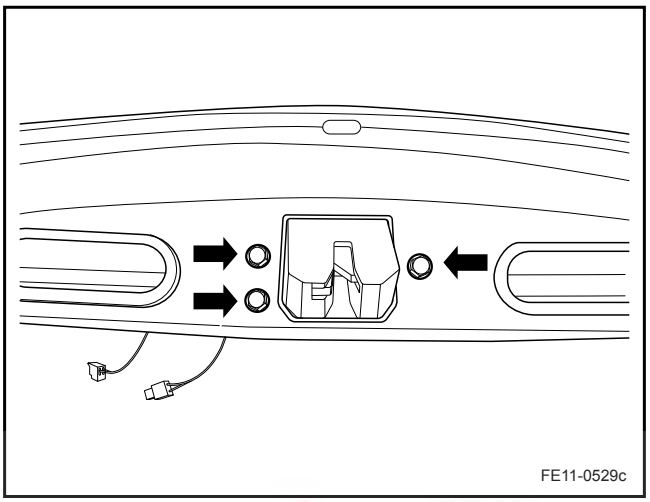
4. Connect the rear door lock rod.
5. Install the rear door window guide rail.
6. Install the rear door trim panel.
7. Connect the battery negative cable.

11.9.8.3 Hatchback Lock Assembly Replacement (Hatchback)

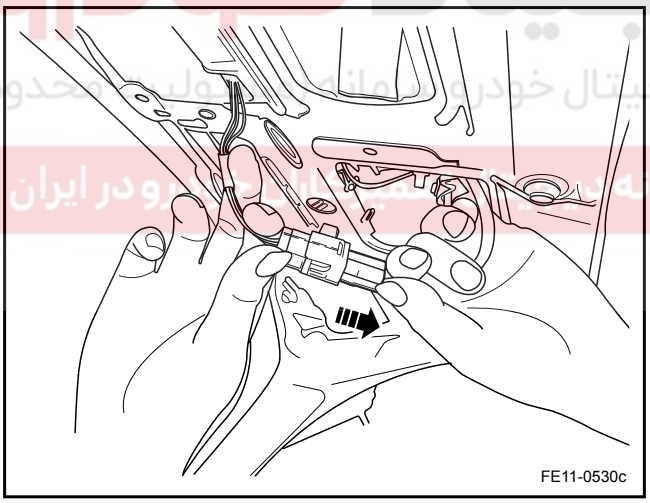
Removal Procedure

Warning!

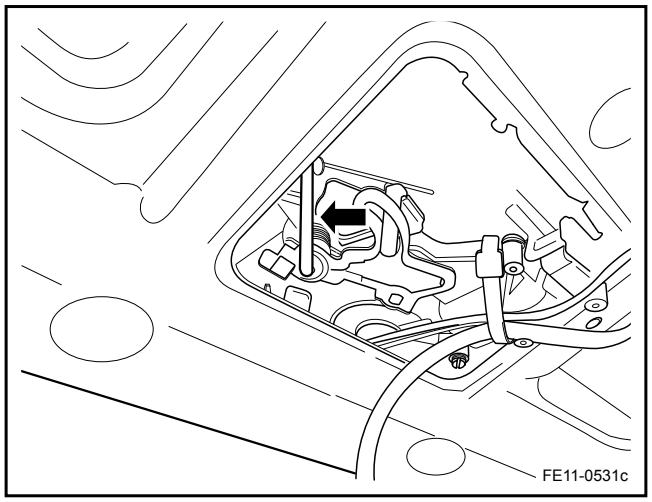
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



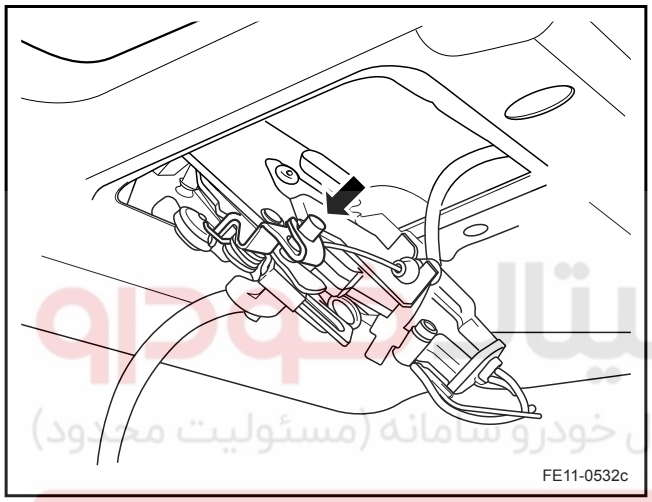
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the hatchback trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
3. Remove the hatchback side trim panels. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
4. Remove the hatchback lower trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
5. Remove the hatchback retaining bolts.



6. Disconnect the hatchback assembly harness connector.

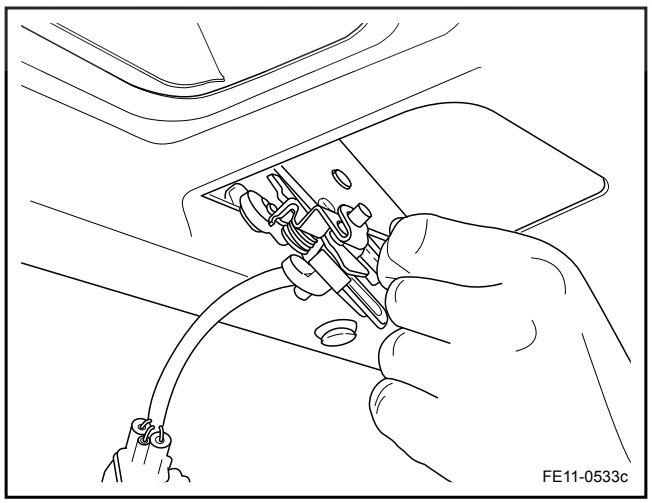


7. Disconnect the hatchback rod.

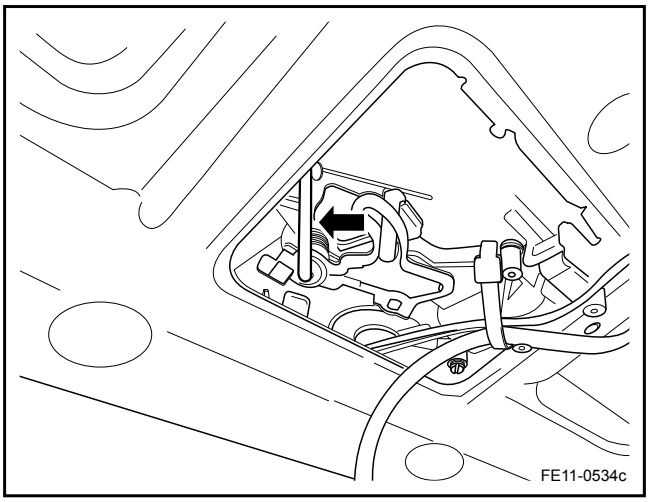


8. Disconnect the hatchback lock cable.
9. Remove the hatchback lock assembly.

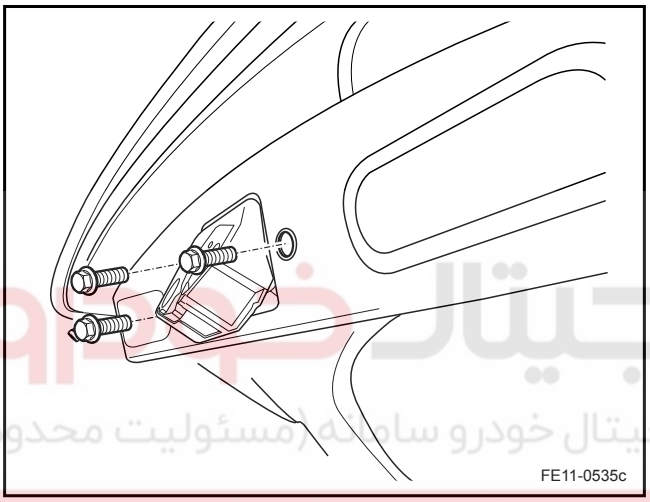
Installation Procedure:



1. Connect the hatchback lock cable.

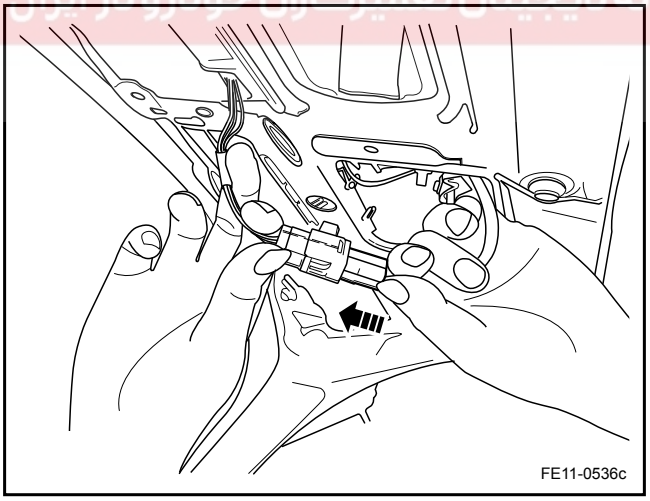


2. Connect the hatchback rod.



3. Install the hatchback retaining bolts.

   Torque: 15 Nm (Metric) 11 lb-ft (US English)



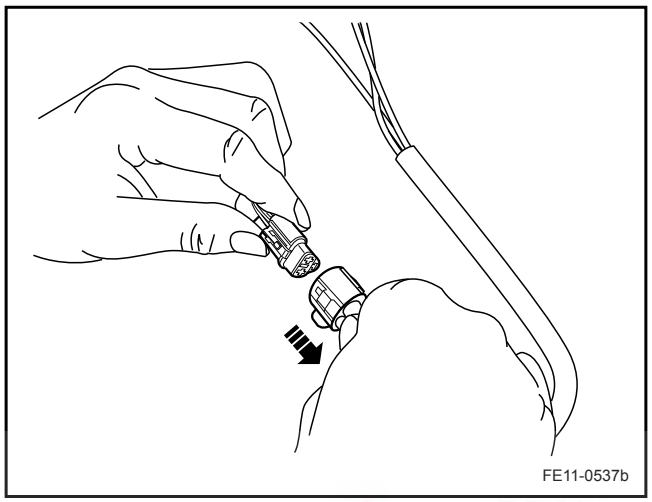
4. Connect the hatchback harness connector.
5. Install the hatchback lower trim panel.
6. Install the hatchback side trim panels.
7. Install the hatchback upper trim panel.
8. Connect the battery negative cable.

11.9.8.4 Rear Compartment Lock Assembly Replacement (Sedan)

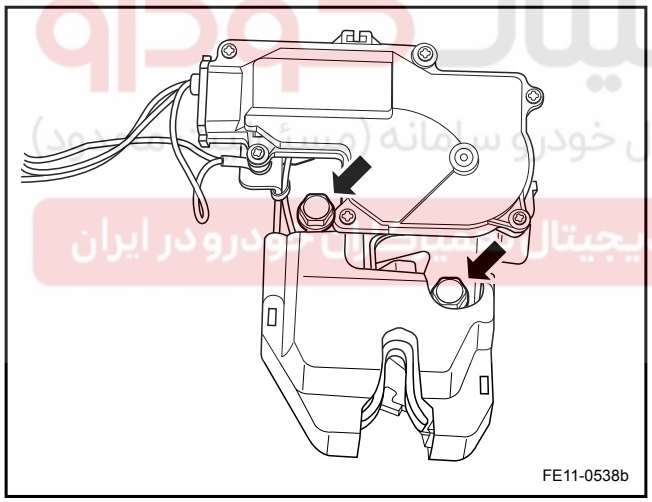
Removal Procedure

Warning!

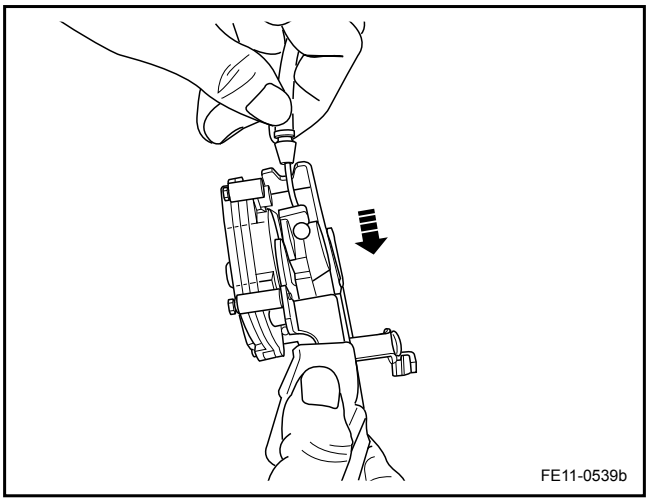
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear compartment trim panel. Refer to 12.9.1.9 Rear Compartment Trim Panel Replacement.
3. Disconnect the rear compartment lock harness connector.

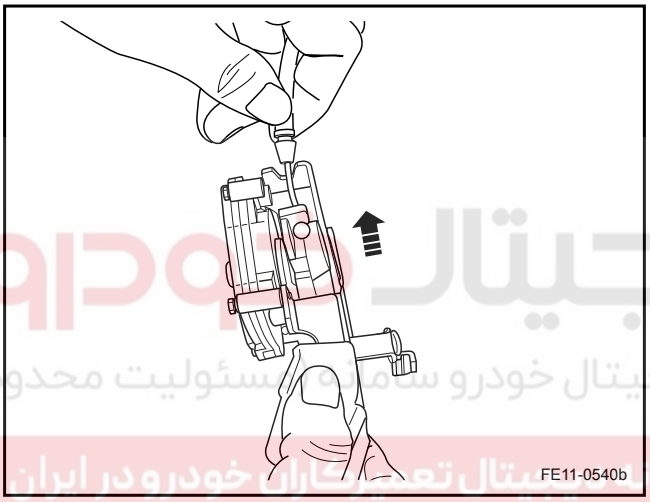


4. Remove the rear compartment lock retaining bolts.

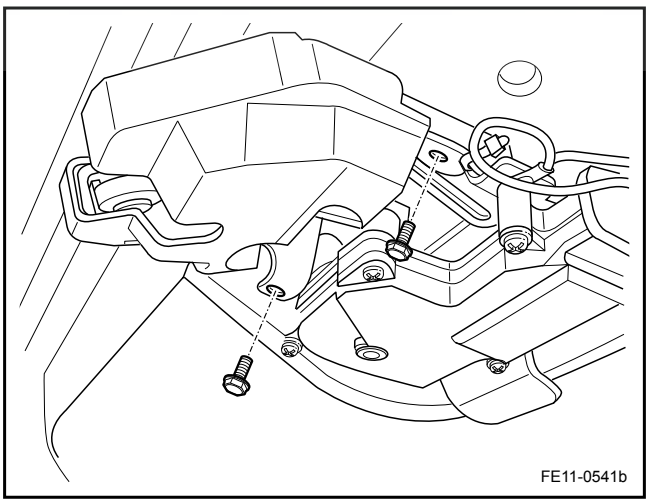

FE11-0539b

5. Disconnect the rear compartment lock cable.
6. Disconnect the rear compartment lock cylinder cable.
7. Remove the rear compartment lock assembly.

Installation Procedure:

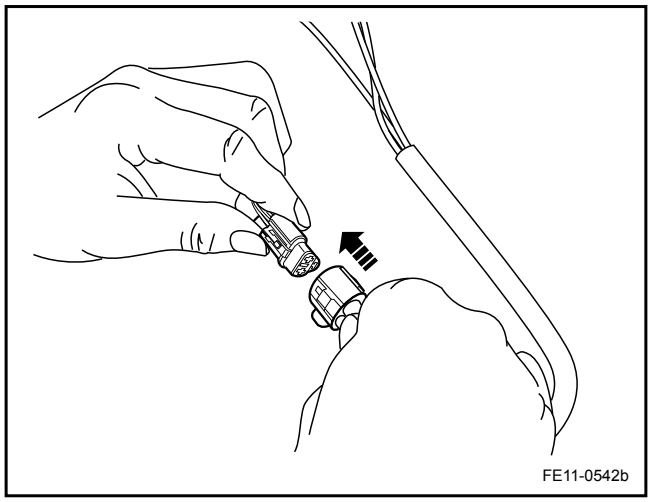

FE11-0540b

1. Connect the rear compartment lock cable.
2. Connect the rear compartment lock cylinder cable.


FE11-0541b

3. Install the rear compartment lock retaining bolts.

   Torque: 15 Nm (Metric) 11 lb-ft (US English)



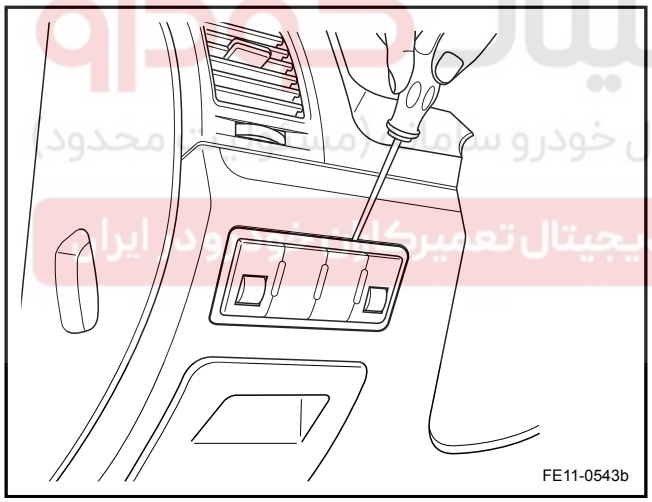
4. Connect the rear compartment lock assembly harness connector.
5. Install the rear compartment trim panel.
6. Connect the battery negative cable.

11.9.8.5 Rear Compartment Lid Release Switch Replacement

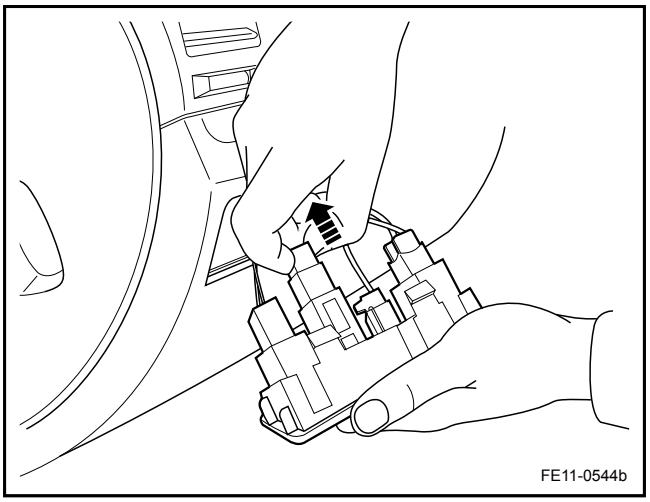
Removal Procedure

Warning!

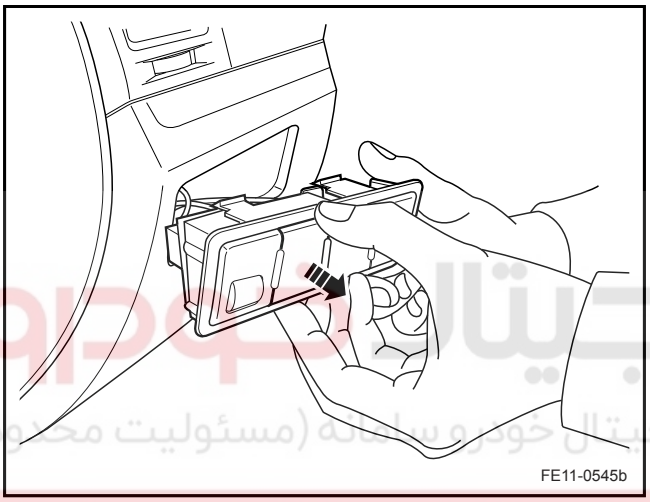
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the dimmer switch.

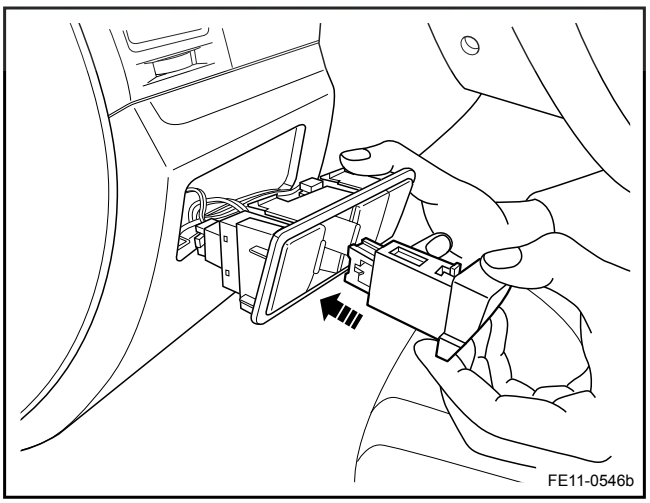


3. Disconnect the rear compartment lid release switch wiring harness connector.

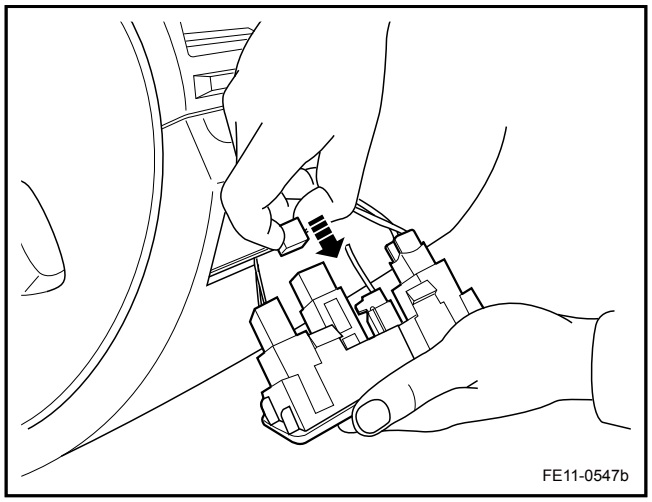


4. Release the rear compartment lid release switch clip and remove the rear compartment lid release switch.

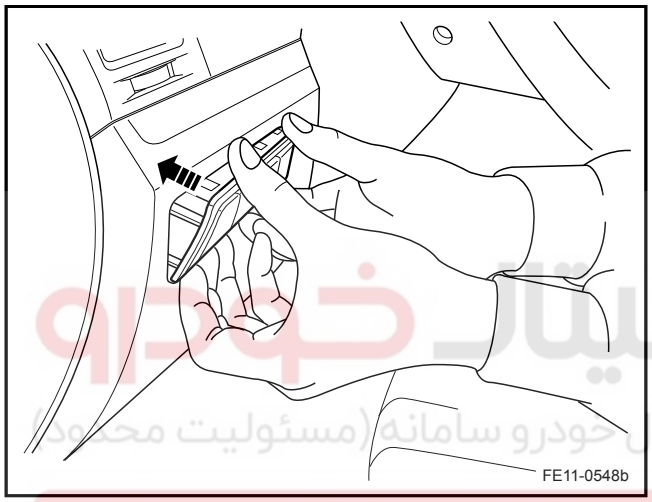
Installation Procedure:



1. Install the rear compartment lid release switch in to the dimmer switch panel.



2. Connect the rear compartment lid release switch wiring harness connector.



3. Install the dimmer switch.
4. Connect the battery negative cable.

11.10 Remote Anti-theft System

11.10.1 Specifications

11.10.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
BCM Retaining Bolts	M8 × 16	8-11	6-8

11.10.2 Description and Operation

11.10.2.1 Description and Operation

Remote anti-theft system is an auxiliary vehicle alarm device. The alarm system is triggered when there is a forcible intrusion. The system is used in conjunction with the central locking system. Radio frequency interference or run out of battery power can make the system inoperative. Remote anti-theft system allows the operation of the following components.

- Door Lock
- Anti-theft Horn
- Turn Signal

Remote anti-theft system consists of the following main components:

- Transmitter (Remote Control Key)
- RF Receiver (BCM)
- Door Contact Switch
- Hood Ajar Switch
- Rear Compartment Lid (Hatchback) Contact Switch

When the button on the transmitter is pressed, the transmitter sends a signal to BCM. Then, BCM implements the corresponding functions.

Remote Anti-theft

Remote anti-theft system operates independently from the engine anti-theft system. Remote anti-theft system is designed to sound the alarm when a door, the rear compartment lid or the engine hood is forced open. In the alarm system, the alarm horn will sound intermittently, while turn signal lamps will flash. After 30 s, the horn will stop working, only turn signal lamps flash 5 min. When all doors are closed, the alarm will continue to sound for 30 s. After 30 s, the horn and the lamps will stop and the doors are locked, the system returns enabled. Remote anti-theft system will not affect the engine to start or work properly.

Rolling Code

Remote anti-theft system uses rolling code technology. The technology prevents any person recording the message sent from the transmitter and use the information to get into the vehicle. The term "Rolling Code" indicates the way the remote anti-theft system sending and receiving signals. Transmitter transmits signals in different order each time. Transmitter and RF receiver synchronize according to the corresponding order. If a programmed transmitter sending a signal that is not consistent with the RF expected signal, the synchronization will fail. This usually occurs when the vehicle remote control transmitter button is pressed outside the 255 times range.

Remote Control Door Lock

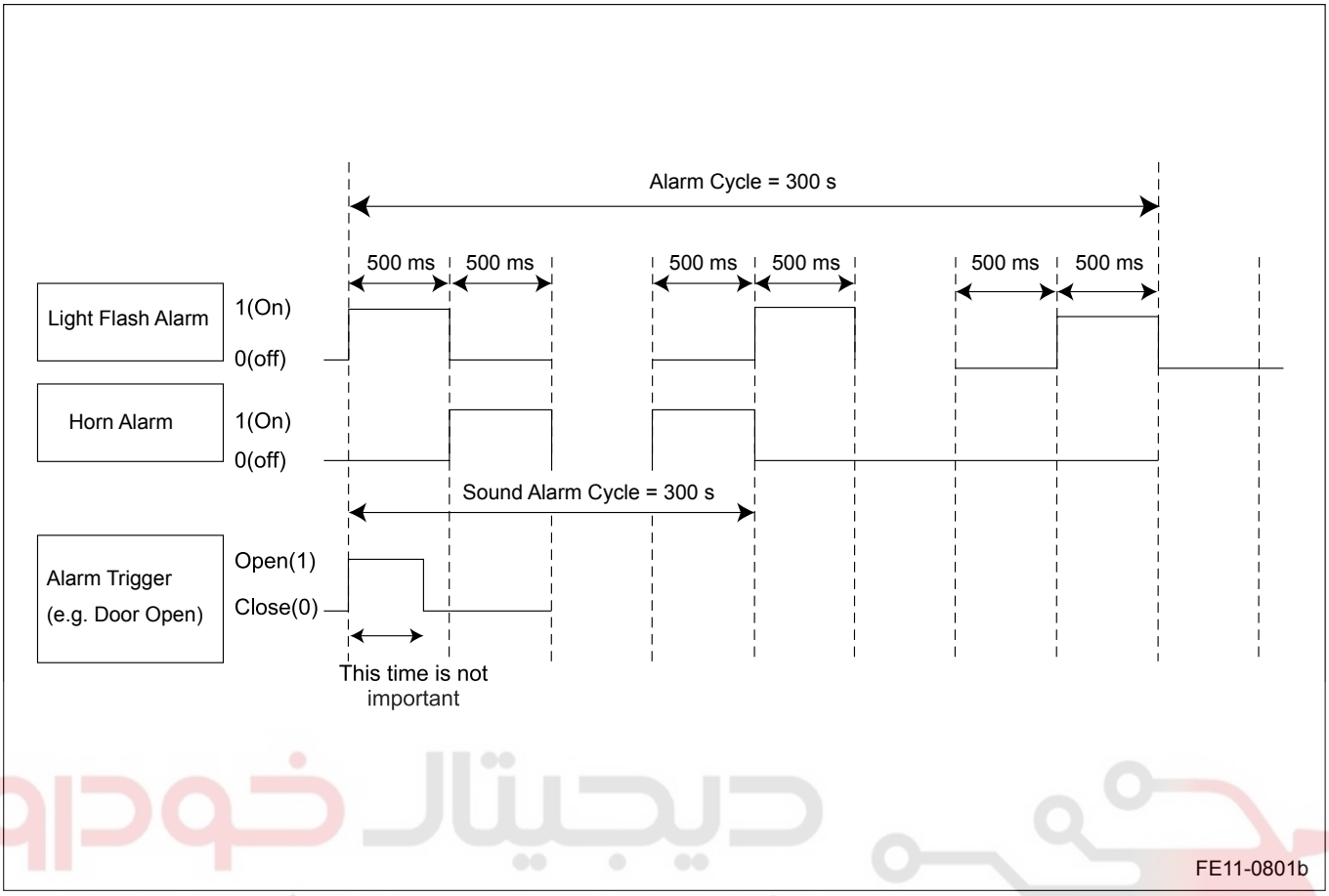
- When the ignition key is not inserted, press the unlock button on the remote control, four doors unlock, turn signal lamps flash.
- When the ignition key is not inserted, press the lock button on the remote control, four doors lock, turn signal lamps flash.

Anti-theft Activated

- When the ignition key is pulled out, close all doors / rear compartment lid / engine hood with remote control door lock (press lock button once), turn signal lamps flash once. The anti-theft mode will be activated in 3 s.
- Automatic locking, the anti-theft mode will be activated automatically.

Anti-theft Activation Failure

Using the remote control lock button to lock the doors, but if any door / rear compartment lid / engine hood is not closed properly, turn signal lamps will flash 3 times, the anti-theft horn will sound twice, 2 s each time, in 10 s, the anti-theft alarm will be activated (alarm loop is as following: left and right turn signal lamps flash, anti-theft alarm horn sound, after 30 s the horn will stop working, only the left and right turn signal lamps flash 5 min). If in 10 s, the lock button is pressed, the anti-theft alarm will not be activated, but the system will still be in anti-theft mode (If no other trigger conditions, horns will not sound and turn signal lamps will not flash). In the anti-theft alarm mode, if the remote control unlock key is pressed, it will stop the alarm loop, and the anti-theft status will be lifted. If the lock button is pressed again, the system will resume its original status. As shown below:



Note

In the anti-theft or alarm mode, BCM will prohibit the starter relay coil to work.

Lift Anti-theft

Using the remote control or by releasing CAN signals received from the EMS to lift anti-theft or alarm mode (turn signal lamps flash / horn sound). When the radio remote control is not powered, in the anti-theft mode, insert the key into the ignition switch, start the engine and lift the anti-theft or alarm at the same time.

Mute Mode

- In the anti-theft mode, press the remote control "lock" "unlock" button at the same time for more than two 2 s, turn signal lamps flash twice, the mode mode is activated. In mute mode, the alarm horns do not sound.
- Press the remote control "lock" "unlock" button at the same time for more than two 2 s, turn signal lamps flash twice, the mode mode is deactivated.

Locating Vehicle Feature

In the anti-theft mode, press the lock button twice within 500ms, horns sound three times, turn signal lamps flash three times (in the absence of dual lock).

Remote Control Learn

In the anti-theft lifted status, open the driver door, turn the key from "OFF" to "ON " 6 times within 10 s, and stops at the "OFF" position, at this time, anti-theft indicator light indicating the system is in learn mode. Hold any key on the remote control, if the anti-theft lights flash once, it indicates a successful learn. Four keys can be learned. After 10 s or after the completion of four keys learn, or at least the completion of one key learn, turn the ignition lock to "ON" to exit.

11.10.3 System Working Principle

11.10.3.1 System Working Principle

Hood Ajar Switch

There is a contact switch under the engine hood. When the engine hood is closed, the switch is opened; once the engine hood is opened, this switch is closed and sends a ground signal to the BCM. Based on this signal, BCM sends "Engine hood is not closed warning lamp" message through CAN bus to the instrument panel.

Rear Compartment (Hatchback) Contact Switch

In the rear compartment (rear door), Office of settings are a touch switch, when the rear compartment (back gate) is closed for this switch off; Once the rear compartment (back gate) is opened, this switch is closed, and BCM transmit signals to the ground, BCM based on this signal sent through the CAN bus to the instrument light "rear compartment (rear door) is not closed warning lamp" information.

Door Contact Switch

In each door lock assembly, there is a contact switch. When a door is closed, the switch is opened; once a door is opened, the door contact switch is closed and sends a ground signal to BCM. Based on this signal, BCM sends a "Door open" message through the CAN bus to the instrument.

Anti-theft Indicator

Anti-theft indicator is a light-emitting diode, its power supply is supplied through the circuit. When the system enters anti-theft mode, BCM provides ground circuit to control their flashing.

Anti-theft Horn

Anti-theft horns are located in the rear compartment (rear of the body on a Hatchback) left side interior panel, and have ground circuits. When the system enters the anti-theft alarm trigger mode, BCM provides ground power, controls the horn sound.

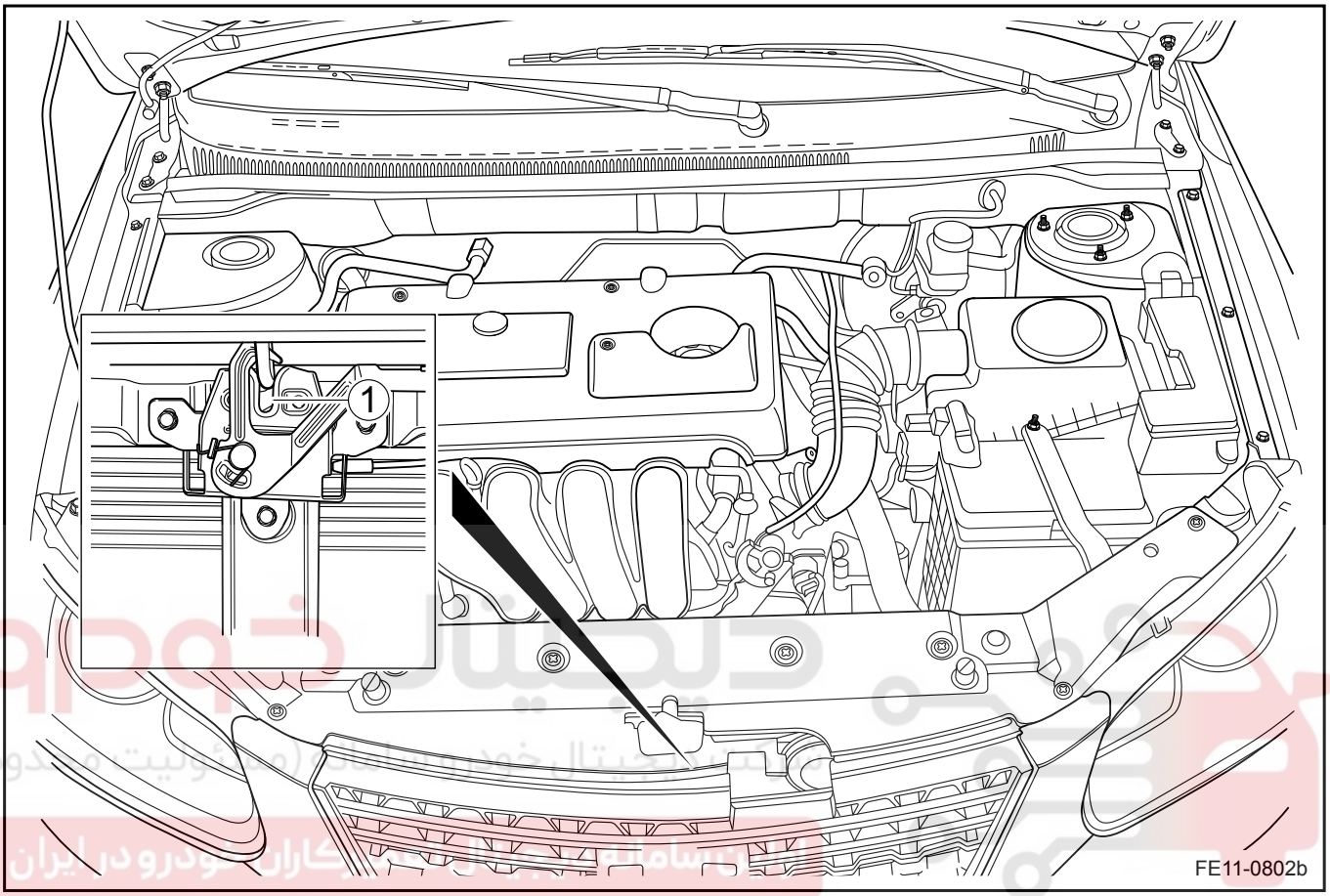
Turn Signal

Refer to 11.4.2.1 Exterior Lighting Description and Operation

11.10.4 Component Locator

11.10.4.1 Component Locator

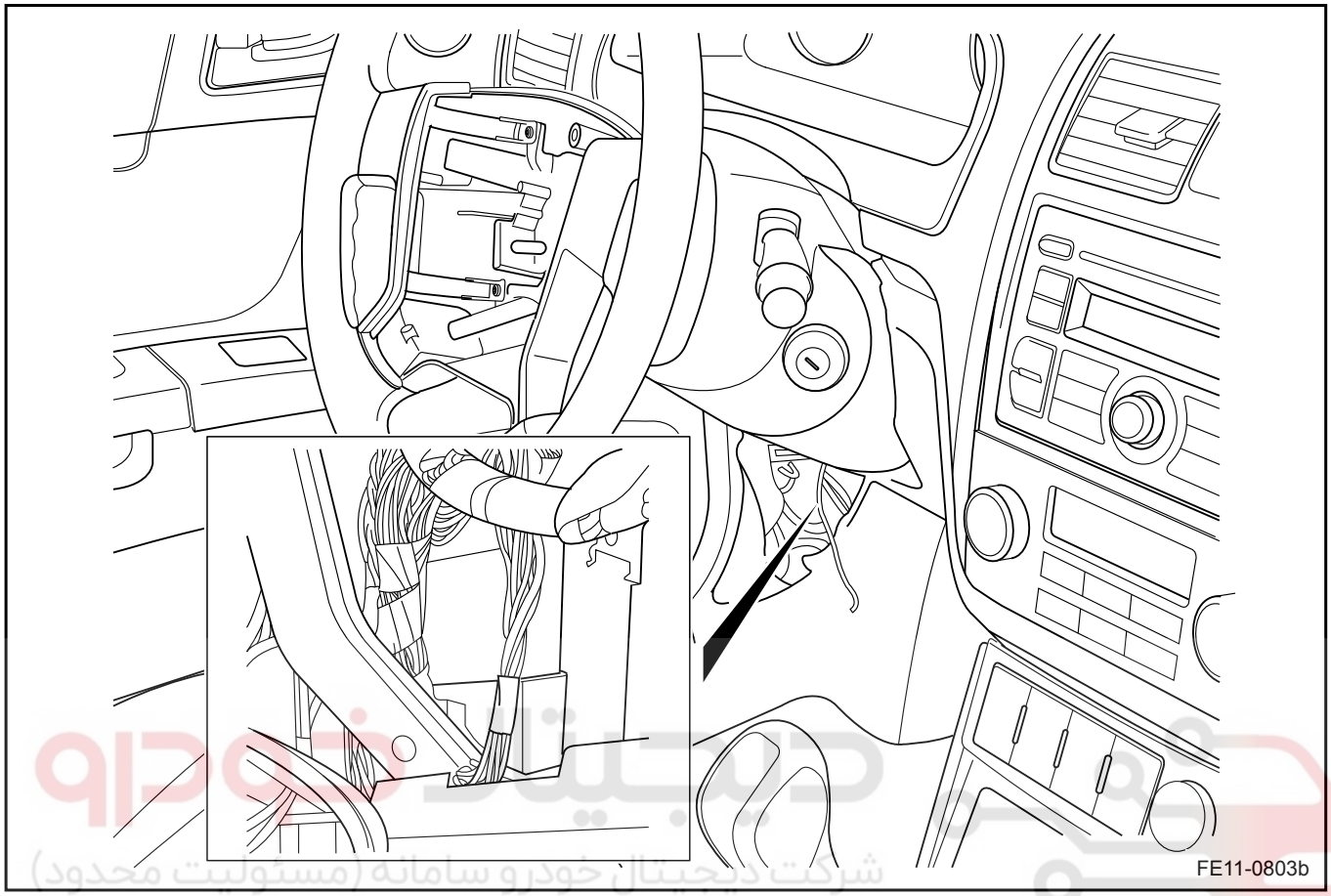
Hood Ajar Switch

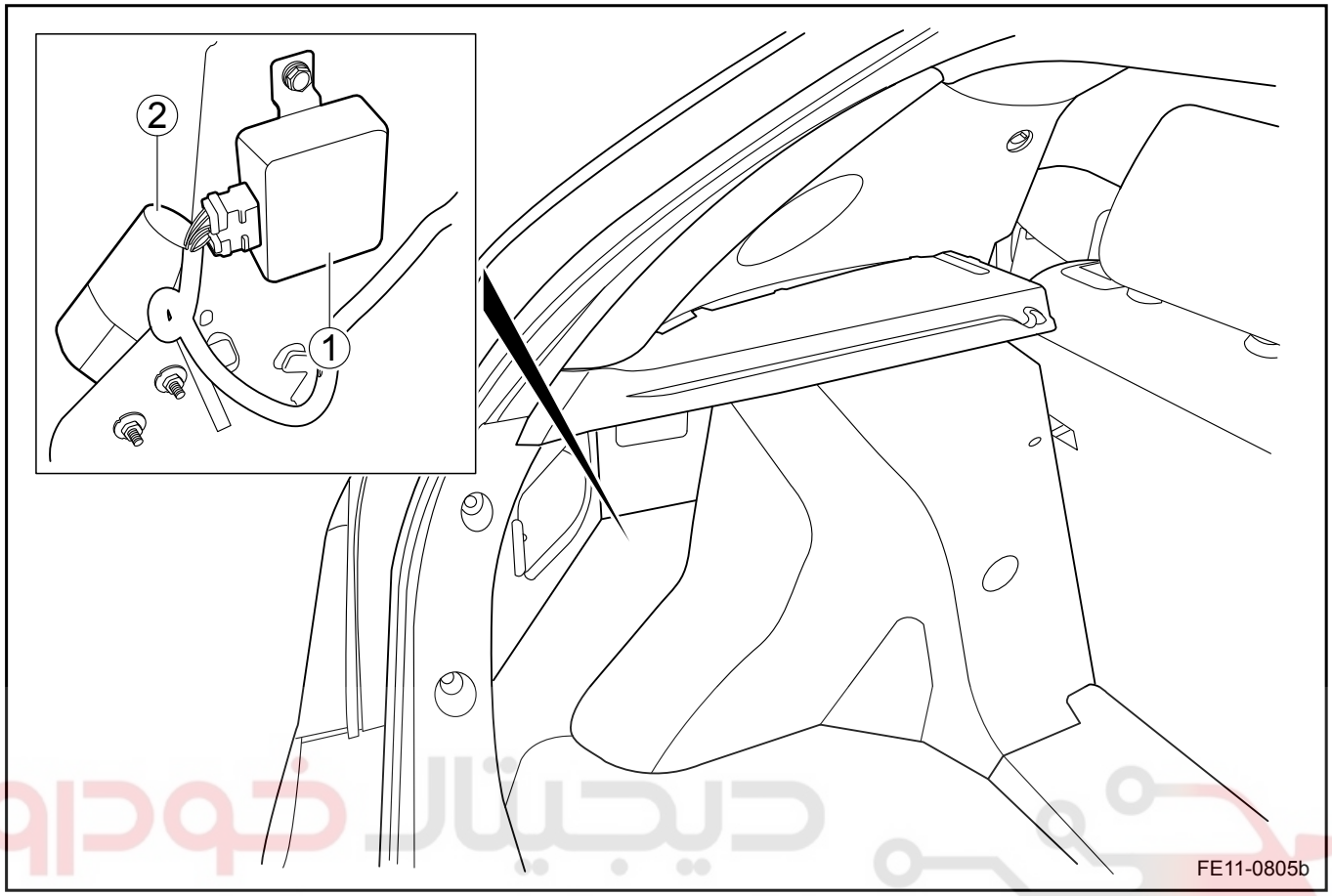


Legend

1. Hood Ajar Switch

BCM



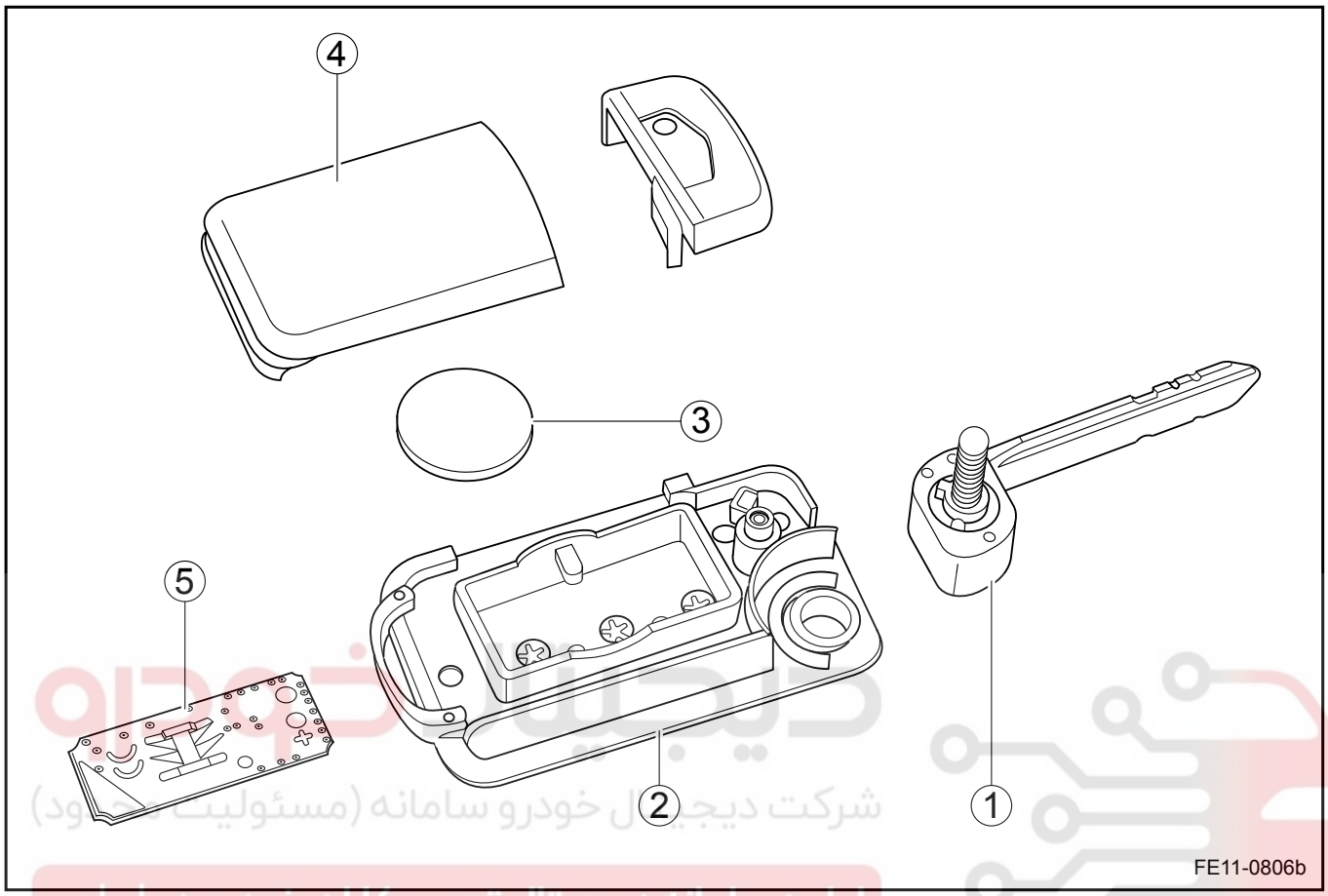


Legend

1. Reverse Radar Module
2. Alarm Horn

11.10.5 Disassemble View

11.10.5.1 Remote Key

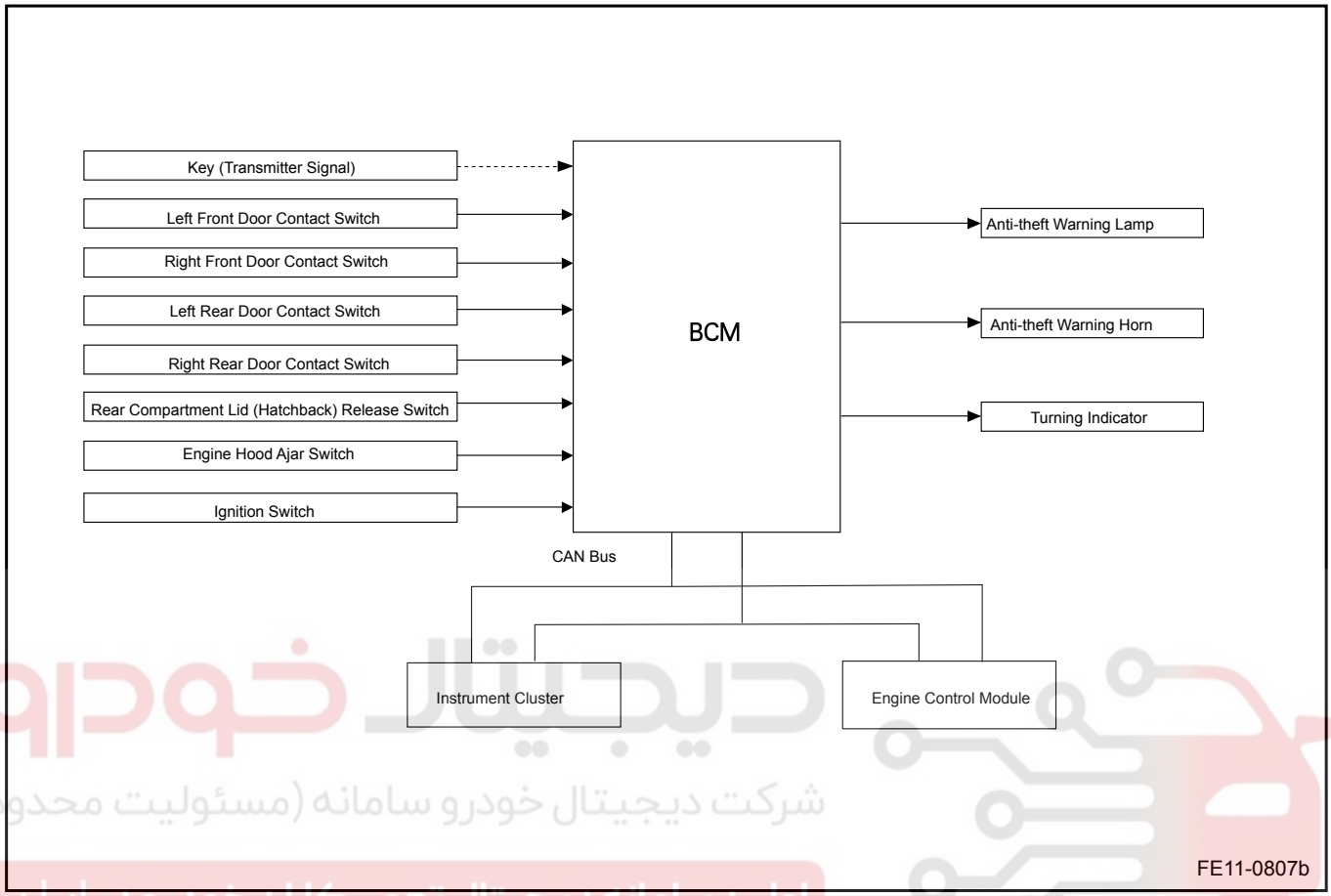


Legend

1. Mechanical Key
2. Remote Keyless Entry Block
3. Battery
4. Remote Key Cover
5. Remote Keyless Transmitter

11.10.6 Schematic

11.10.6.1 Schematic



11.10.7 Diagnostic Information and Procedures

11.10.7.1 Diagnosis Description

Refer to 11.9.2.1 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it also help to determine whether the customer described situation is normal.

11.10.7.2 Visual Inspection

- Check installed after market equipment that may affect the remote anti-theft system operations.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- If the remote control is inoperative, confirm the remote control battery has power before check the system.

11.10.7.3 Remote Control Inoperative

- Confirm the remote control battery has power.
- Deactivate the anti-theft function, unlock the driver door. Turn the key to ON and OFF 6 times in 10 s and leave the key at the OFF position. At this time, the anti-theft indicator is on indicating the key learn mode. Press and hold key key on the remote control, if the anti-theft light flash once, then the key learn is successful. Four keys can be learned. The key learn process will end after 10 s or after four keys learn, or the ignition key is turned to "ON" after at least one key learn.

Note

After the first key learn, the previous id will be cleared.

11.10.7.4 Symptom Table

Suggestion:

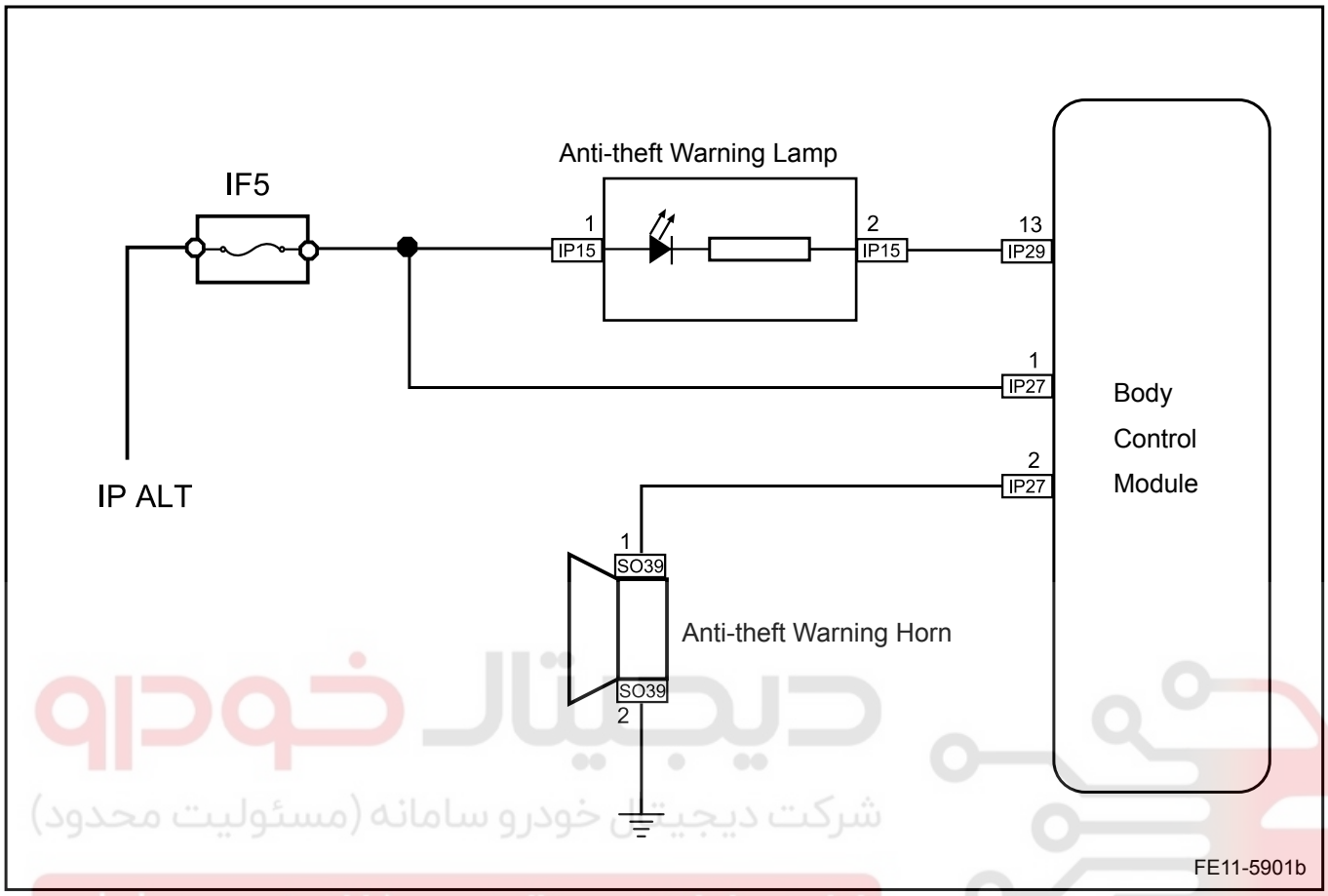
- Before the anti-theft system diagnostic: Make sure door lock control system and the remote control door lock control system are working correctly.
- Diagnostic steps are in the following table.
- Check the fuses and relays before check suspected parts.

Symptoms	Suspected Parts	Measures / Refer to
Remote Control Can Not Lock Doors	1. Alarm Indicator Circuit	Refer to 11.10.7.5 Anti-theft Indicator Inoperative.
	2. The Door Key Lock / Unlock Switch Circuit	Refer to 11.9.6.1 Schematic.
	3. Door Controlled Lamp Switch Circuit	Refer to 11.4.7.10 Courtesy Lamp Inoperative.
	4. Rear Compartment Controlled Lamp Switch Circuit	Refer to 11.4.7.11 Rear Compartment Lamp Inoperative.
	5. Hood Controlled Lamp Switch Circuit	Refer to 11.4.7.11 Rear Compartment Lamp Inoperativeinspection methods, check the hood controlled lamp switch control circuit.

Symptoms	Suspected Parts	Measures / Refer to
	6. If the above circuits are normal but the symptoms still occur, replace the BCM	Refer to 11.10.8.1 BCM Replacement.
Set up the anti-theft system, the security indicator does not blink	1. Alarm Indicator Circuit	Refer to 11.10.7.5 Anti-theft Indicator Inoperative.
	2. If the anti-theft indicator light circuit is normal, replace the BCM	Refer to 11.10.8.1 BCM Replacement.
When the remote control has no power, in the alarm mode with the ignition switch is at ON position, the alarm sound can not be canceled.	1. Ignition Switch Circuit	Refer to 2.10.7.3 Check Ignition Switch.
	2. CAN-Bus Circuit	Refer to11.17 Data Communication System.
	3. Replace the remote control battery. If the remote control system is working properly, replace the BCM	Refer to 11.10.8.1 BCM Replacement.
Even if the door is open, the alarm system can still be set.	1. Door Controlled Lamp Switch Circuit	Refer to 11.4.7.10 Courtesy Lamp Inoperative.
	2. If the door controlled lamp switch circuit is normal, but the symptoms still occur, replace the BCM	Refer to 11.10.8.1 BCM Replacement.
When the anti-theft alarm system is in working condition, the vehicle anti-theft horn is inoperative.	1. Horn Circuit	Refer to 11.10.7.6 Anti-theft Horn Inoperative.
	2. If the horn circuit is normal, replace the BCM	Refer to 11.10.8.1 BCM Replacement.
When the anti-theft alarm system is in working condition, the hazard warning lamps do not blink.	1. Hazard Warning Lamps Circuit	Operate the turn signal (hazard warning lamps), if all the turning lights do not work, check the turn signal circuit.
	2. If all the turn signal lamps do not work, replace the BCM	If all turn signal lamps do not work, replace the BCM. Refer to 11.10.8.1 BCM Replacement.

11.10.7.5 Anti-theft Indicator Inoperative

Schematic:

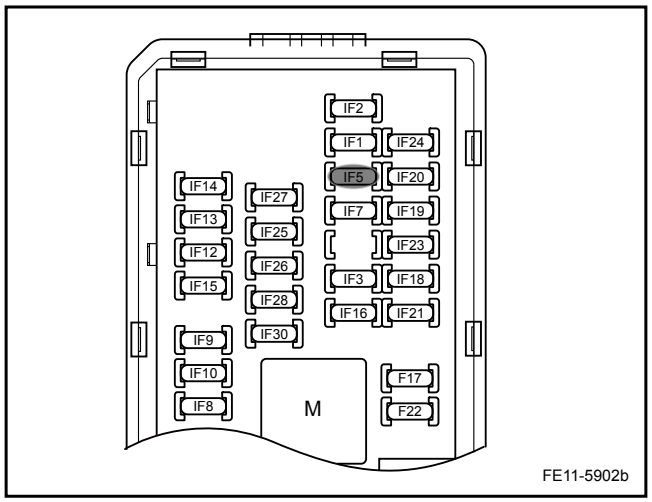


Diagnostic Steps:

Note

Before carry out this diagnostic procedure, Select on the scan tool as the following sequence: Body Control / BCM special set function / anti-theft indicator. Use scan tool to drive the anti-theft indicator, which helps with quick diagnostic.

Step 1	Check the fuse IF5.



(a) Check whether the fuse IF5 is blown.
Fuse Rating: 10 A

No → Go to step 3

Yes

Step 2	Check the fuse IF5 circuit.

(a) Check whether the fuse IF5 circuit is short.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

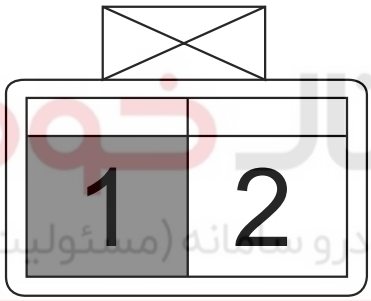
Is the anti-theft indicator working correctly?

Yes → System normal

No

Step 3	Measure the alarm indicator harness connector IP15 terminal No.1 voltage.

Anti-theft Warning Lamp Harness Connector IP15



(a) Measure IP15-1 voltage with a multimeter.
Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 5

No

Step 4	Repair the open circuit between the anti-theft indicator wiring harness connector IP15 and the fuse IF5.

(a) Confirm the open circuit between the anti-theft indicator wiring harness connector IP15 and the fuse IF5 repair is completed.

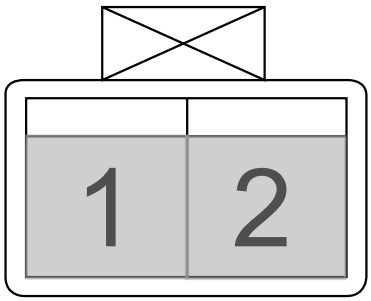
Is the anti-theft indicator working correctly?

Yes → System normal

No

Step 5	Check the alarm indicator.

Anti-theft Warning Lamp Harness Connector IP15



FE11-5904b

(a) Disconnect the anti-theft indicator wiring harness connector. Refer to 11.10.8.2 Anti-theft Indicator Lamp Replacement.
(b) Test continuity between the anti-theft light IP15 terminal No. 1 and 2 is consistent with a multimeter.

Yes → Go to step 7

No

Step 6	Replace the anti-theft indicator.

(a) Replace the anti-theft indicator. Refer to 11.10.8.2 Anti-theft Indicator Lamp Replacement.

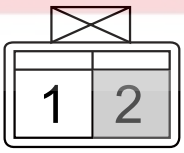
Is the anti-theft indicator working correctly?

Yes → System normal

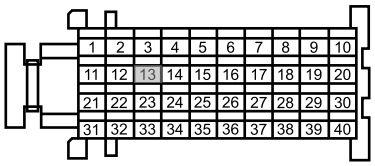
No

Step 7	Check the circuit between the BCM harness connector IP29 and the anti-theft indicator harness connector IP15.

Anti-theft Warning Lamp Harness Connector IP15



Body Control Module 1 Harness Connector IP29



FE11-5910b

(a) Disconnect the anti-theft indicator wiring harness connector IP15 and the BCM harness connector IP29.
(b) Measure resistance between the BCM harness connector IP29 terminal No.13 and the anti-theft indicator wiring harness connector IP15 terminal No.2 with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 9

No

Step 8	Repair the open circuit between the BCM harness connector IP29 and the anti-theft indicator harness connector IP15.

(a) Confirm the open circuit between the BCM harness connector IP29 and the anti-theft indicator harness connector IP15 repair is completed.

Is the anti-theft indicator working correctly?

Yes	System normal

No

Step 9	Replace the BCM

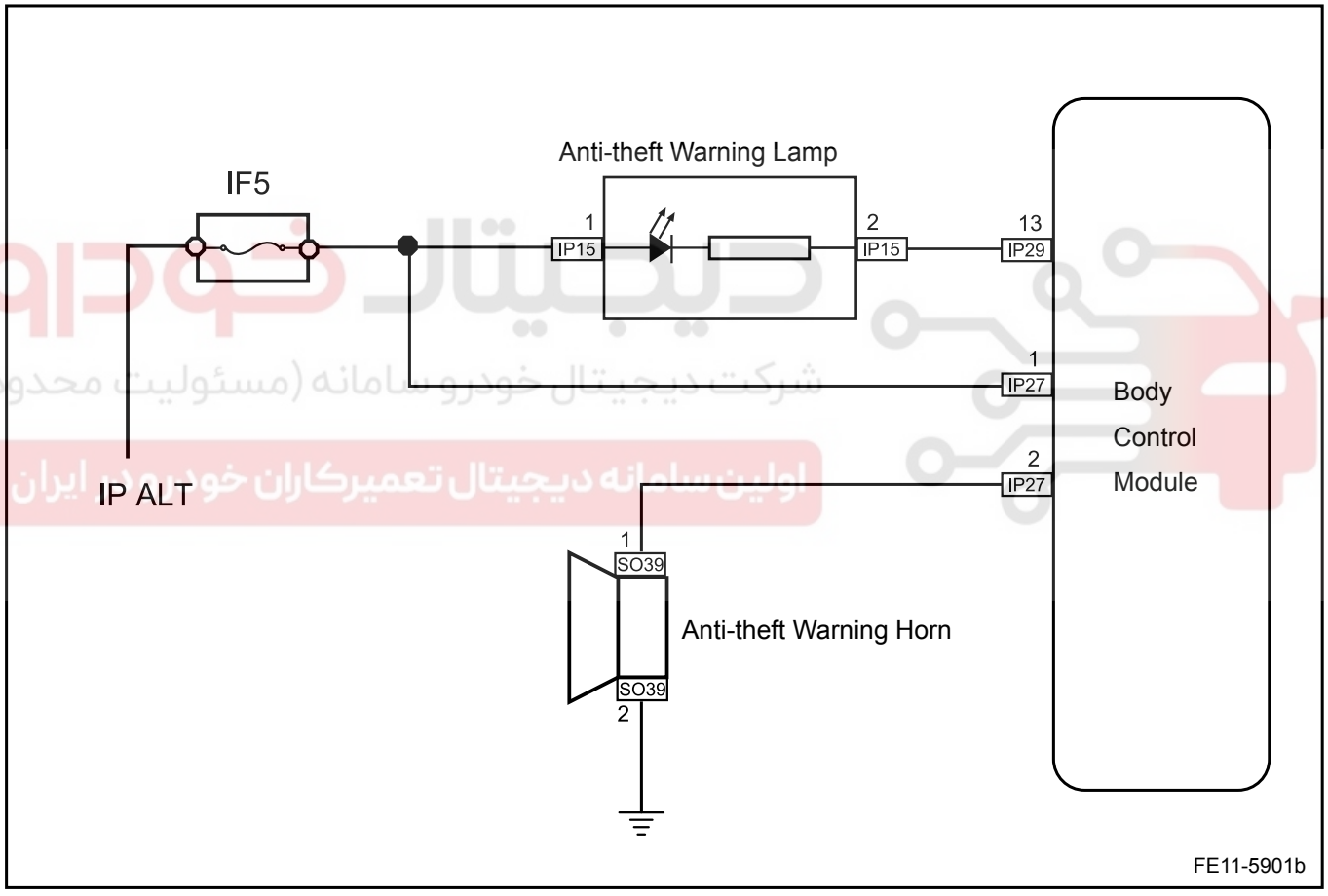
(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.
Confirm the repair completed.

Next

Step 10	System normal.

11.10.7.6 Anti-theft Horn Inoperative

Schematic:



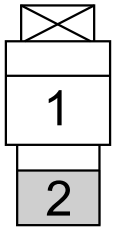
Diagnostic Steps:

Note

Before carry out this diagnostic procedure, Use scan tool to select as the following sequence: Body Control System / Active Test / Alarm Horn output control. Drive the anti-theft alarm horn, so it will facilitate quick diagnostic.

Step 1	Check the circuit between the alarm horn wiring harness connector SO39 and the body ground.

Anti-theft Horn Harness Connector S039



FE11-5906b

(a) Disconnect the anti-theft horn wiring harness connector SO39. Refer to 11.10.8.3 Anti-theft Horn Replacement.
(b) Measure resistance between anti-theft horn harness connector SO39 terminal No.2 and the body ground with a multimeter.
Standard Resistance: Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 3

No

Step 2	Repair the open circuit between the anti-theft horn harness connector SO39 terminal No.2 and the body ground.

(a) Confirm the open circuit between the anti-theft horn harness connector SO39 terminal No.2 and the body ground. repair is completed.

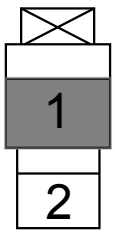
Is the anti-theft indicator working correctly?

Yes → System normal

No

Step 3	Measure the alarm horn harness SO39 terminal No.1 voltage.

Anti-theft Horn Harness Connector S039



FE11-5907b

(a) Connect the anti-theft horn wiring harness connector, enter the anti-theft alarm system and trigger the anti-theft system.
(b) Measure anti-theft horn harness connector SO39 terminal No.1 voltage.
Standard Voltage: 11-14 V

Is the voltage specified value?

No → Go to step 5

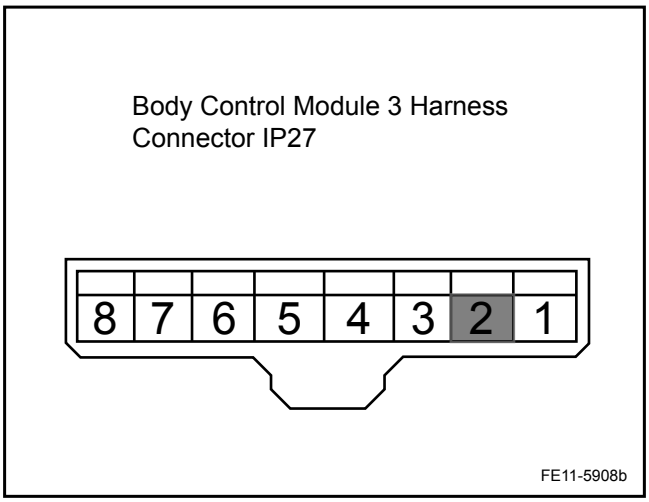
Yes

Step 4	Replace the anti-theft horn.

(a) Replace the anti-theft horn. Refer to 11.10.8.3 Anti-theft Horn Replacement.

Is the horn working properly?

Step 5	Measure the BCM harness connector IP27 terminal No.2 voltage.



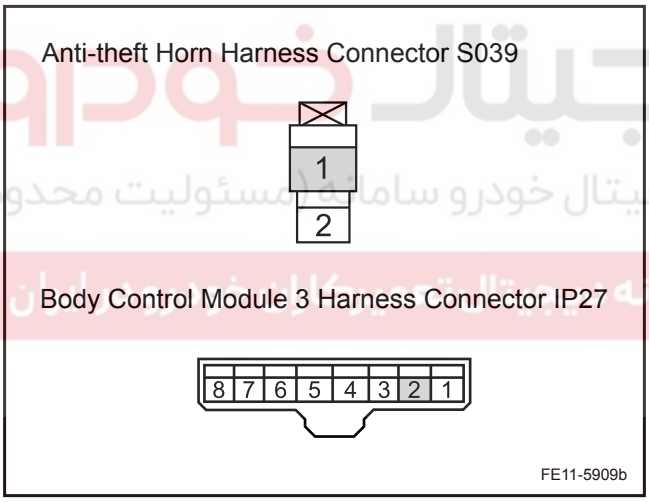
(a) Connect the anti-theft horn wiring harness connector, enter the anti-theft alarm system and trigger the anti-theft system.
Standard Voltage: 11-14 V

Is the voltage specified value?

No → Go to step 7

Yes

Step 6	Repair the open circuit between the BCM harness connector IP27 and the anti-theft horn wiring harness connector SO39.



(a) Confirm the open circuit between the BCM harness connector IP27 and the anti-theft horn wiring harness connector SO39 repair is completed.

Is the horn working properly?

Yes → System normal

No

Step 7	Replace the BCM.

(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.
Confirm the repair completed.

Next

Step 8	System normal.

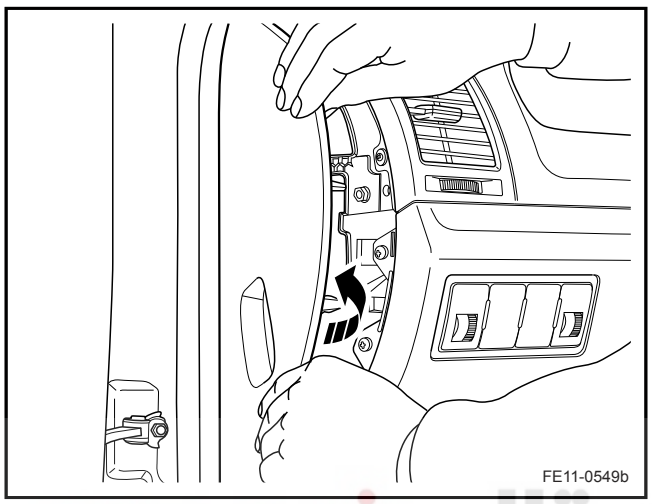
11.10.8 Removal and Installation

11.10.8.1 BCM Replacement

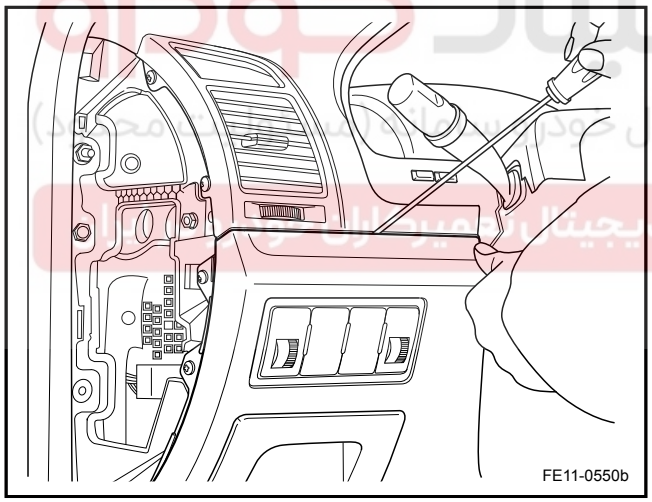
Removal Procedure

Warning!

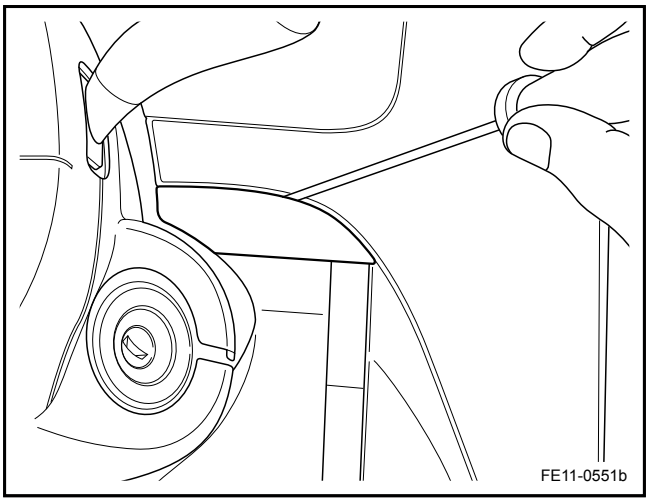
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



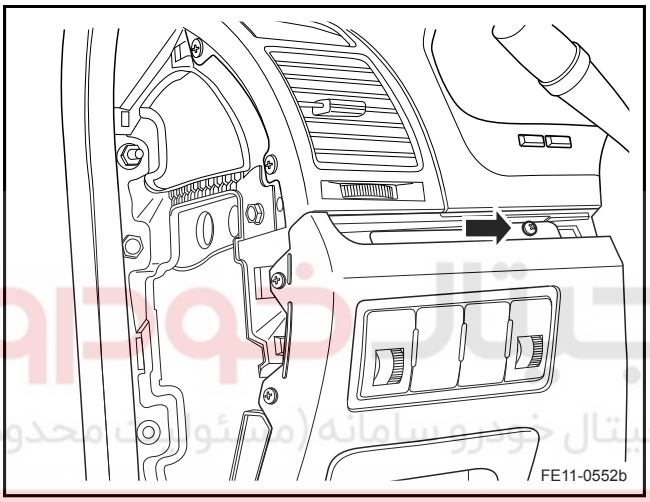
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the instrument panel left outer panel.



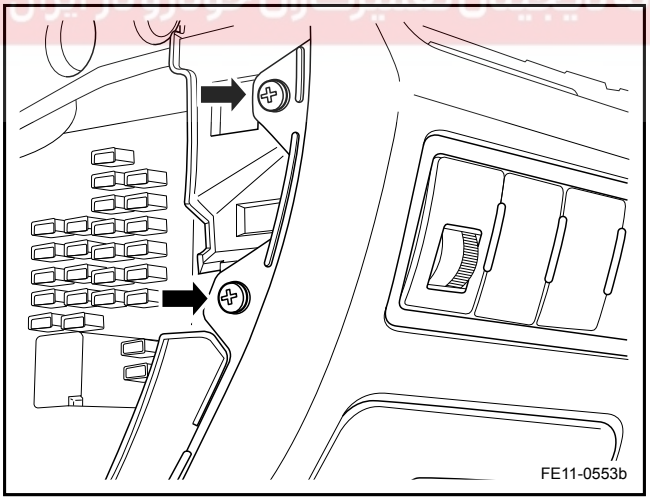
3. Remove the instrument panel steering wheel left side panel.



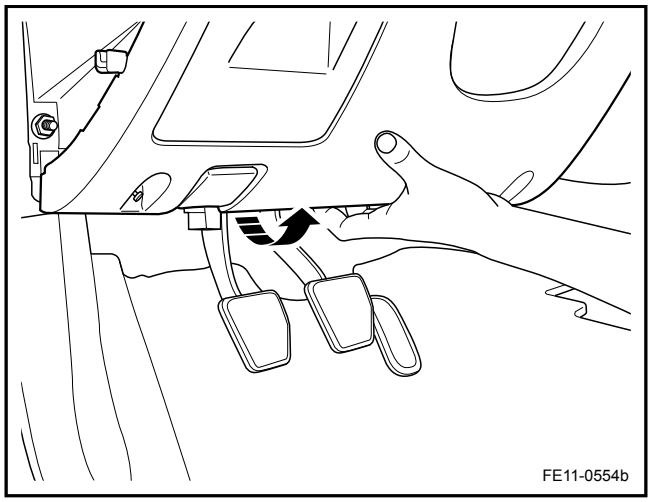
4. Remove the instrument panel steering wheel right side panel.



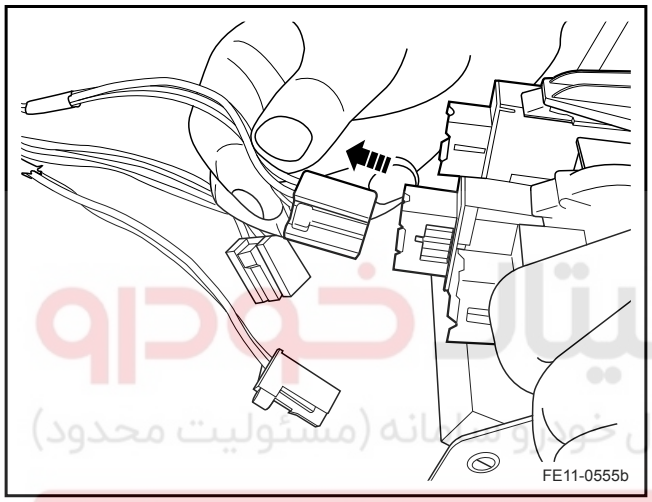
5. Remove the instrument panel trim driver side lower panel front retaining screws.



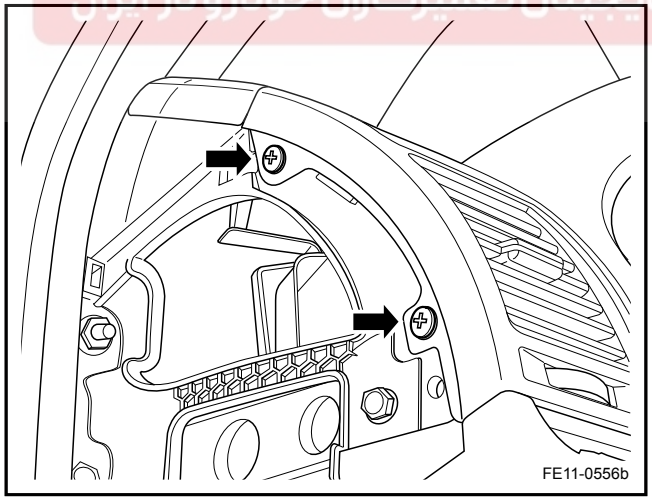
6. Remove the instrument panel trim driver side lower panel side retaining screws.



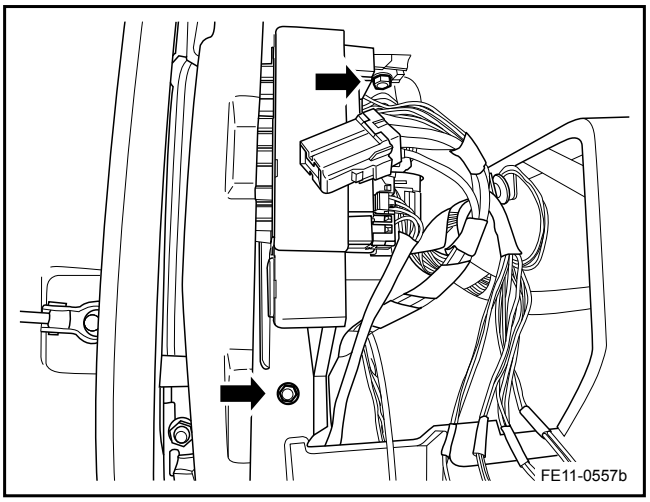
7. Remove the instrument panel trim driver side lower panel.



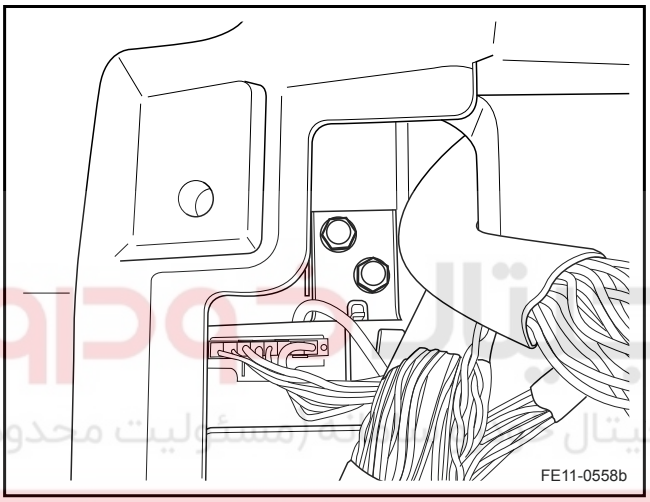
8. Disconnect headlamp switch wiring harness connectors.



9. Remove the instrument panel left side air duct panel retaining screws.

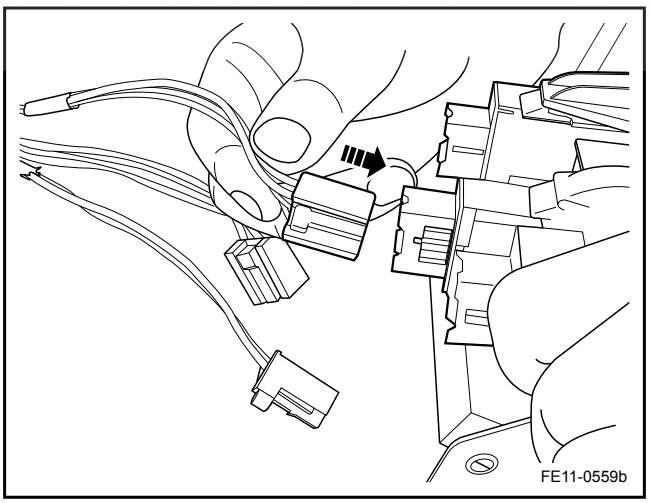


10. Remove the instrument panel left side air duct panel.
11. Remove the I/P fuse block bracket retaining bolts.

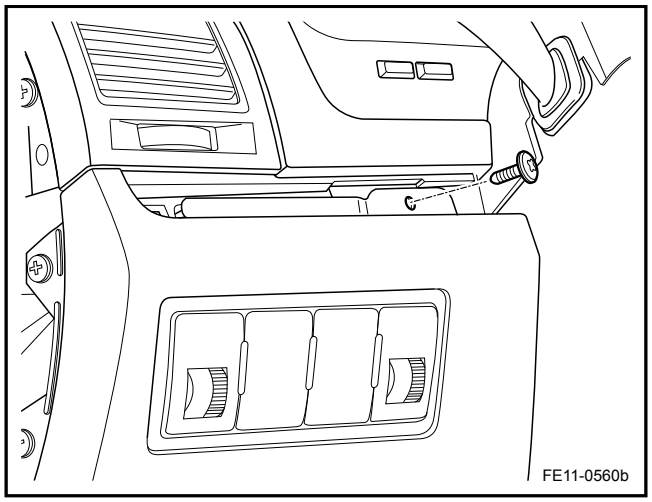


12. Remove the BCM bracket retaining bolts.
13. Disconnect the BCM harness connector and remove the BCM.

Installation Procedure:

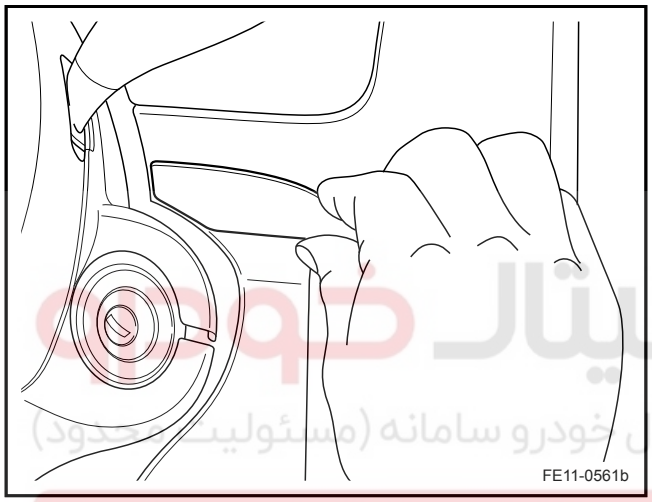


1. Connect the BCM harness connector.
2. Install the BCM bracket retaining bolts.
   Torque: 15 Nm (Metric) 11 lb-ft (US English)
3. Install the I/P fuse block bracket retaining bolts.
   Torque: 10 Nm (Metric) 7 lb-ft (US English)
4. Install the instrument panel left side air duct panel.
   Torque: 8 Nm (Metric) 6 lb-ft (US English).
5. Connect all headlamp switch harness connectors.

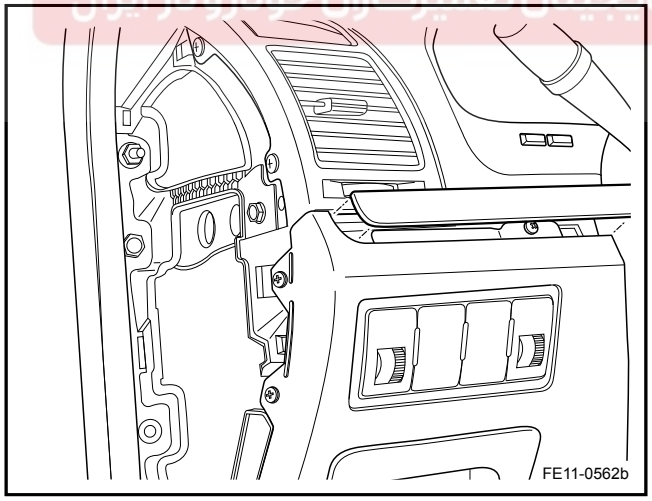


6. Install the Instrument panel driver side lower panel.

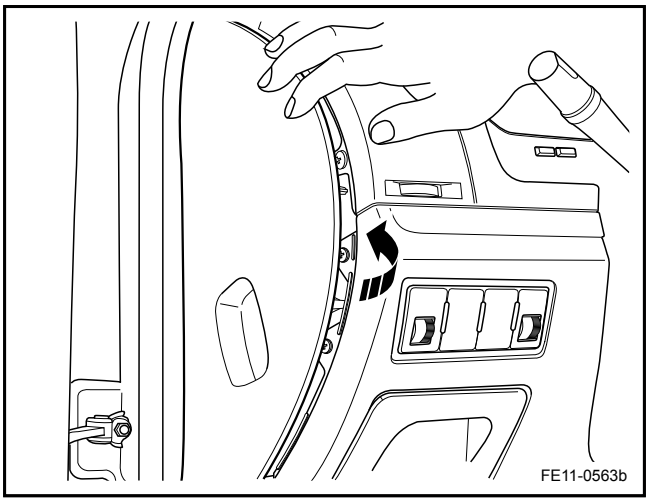
   Torque: 10 Nm (Metric) 7 lb-ft (US English)



7. Install the instrument panel steering wheel right side panel.



8. Install the instrument panel steering wheel left side panel.



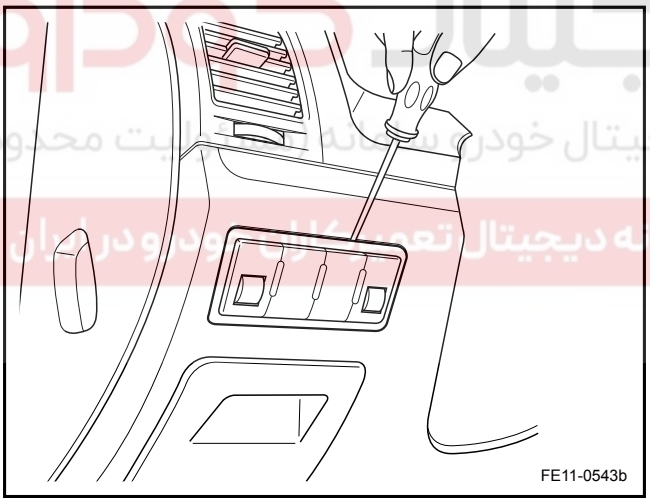
9. Install the Instrument panel left outer panel.
10. Connect the battery negative cable.

11.10.8.2 Anti-theft Indicator Lamp Replacement

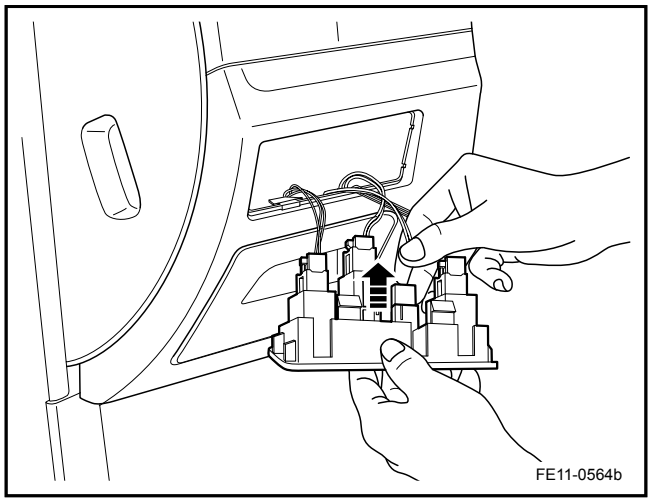
Removal Procedure

Warning!

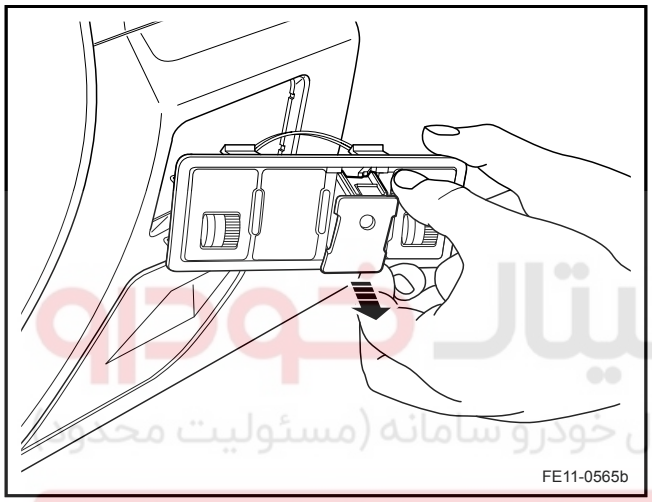
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the dimmer switch.

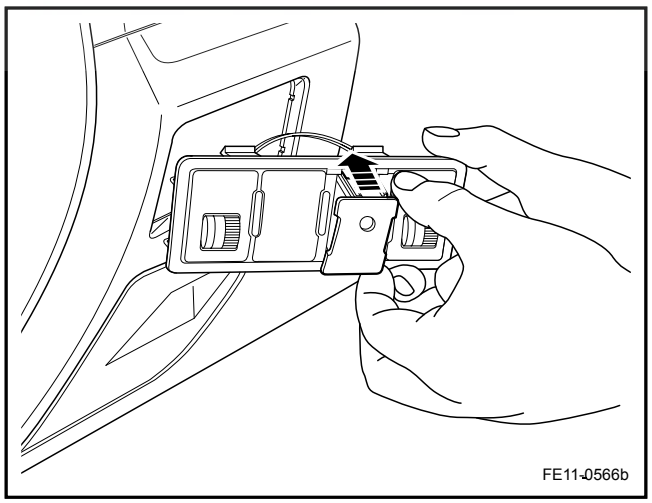


3. Disconnect the anti-theft indicator lamp wiring harness connector.

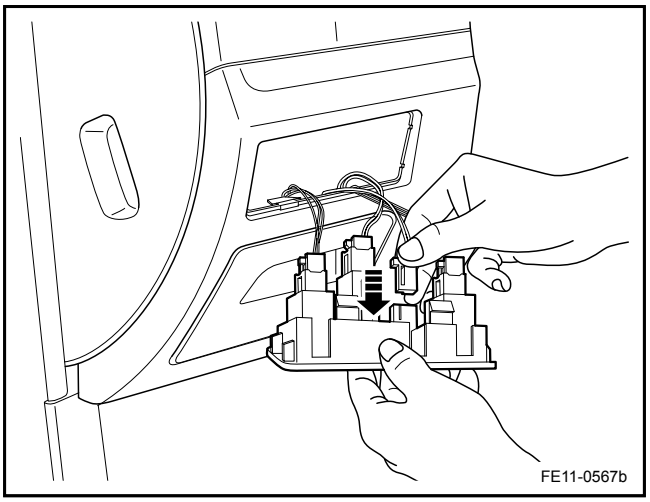


4. Release the clip and remove the anti-theft alarm lamp.

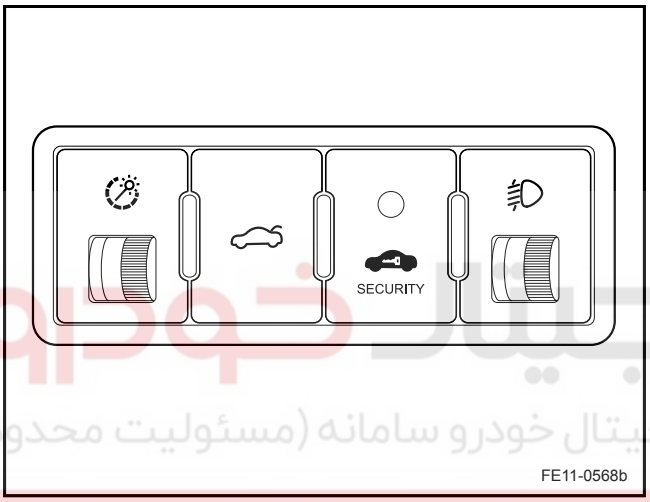
Installation Procedure:



1. Install the anti-theft lamp to the dimmer switch bracket.



2. Connect the anti-theft indicator lamp wiring harness connector.



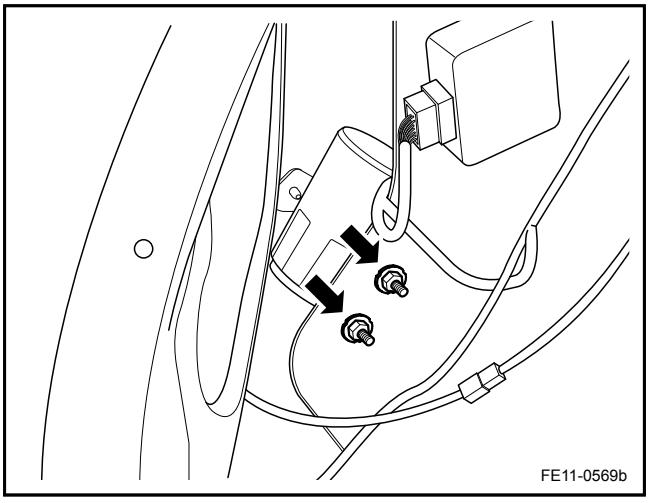
3. Install the dimmer switch to the instrument panel.
4. Connect the battery negative cable.

11.10.8.3 Anti-theft Horn Replacement

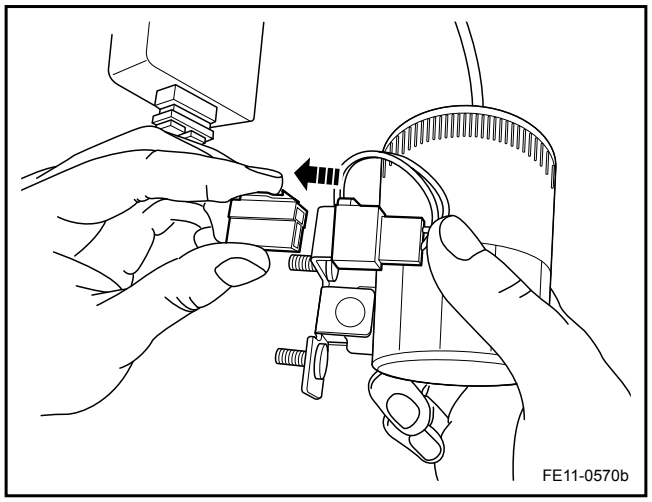
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

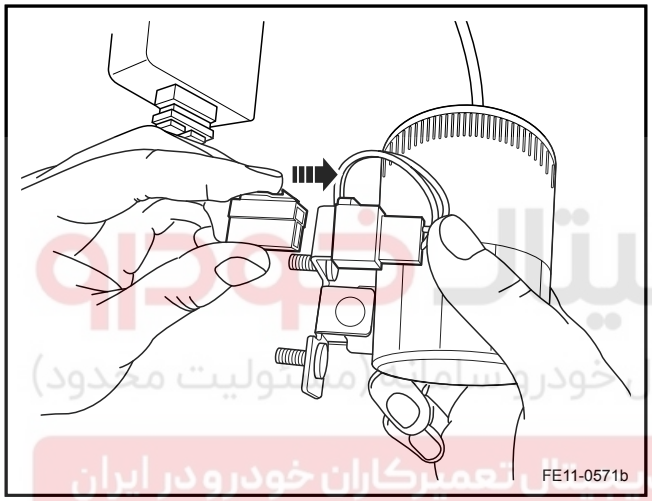


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the left rear compartment trim panel. Refer to 12.9.1.9 Rear Compartment Trim Panel Replacement.
3. Remove the anti-theft horn retaining bolts.

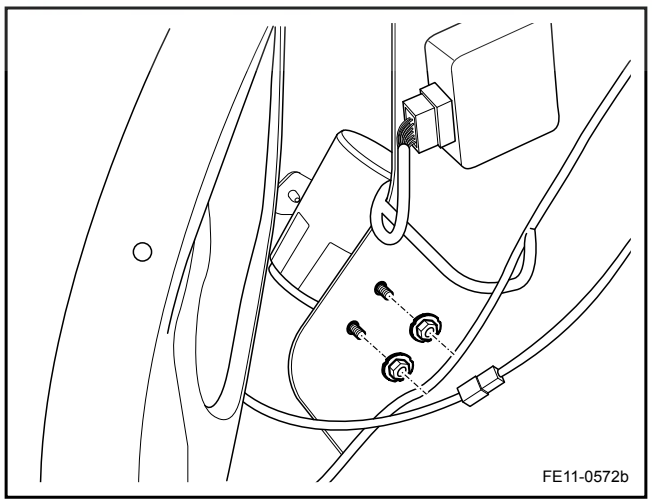


4. Disconnect the anti-theft horn wiring harness connector.
5. Remove the anti-theft horn.

Installation Procedure:



1. Connect the anti-theft horn wiring harness connector.

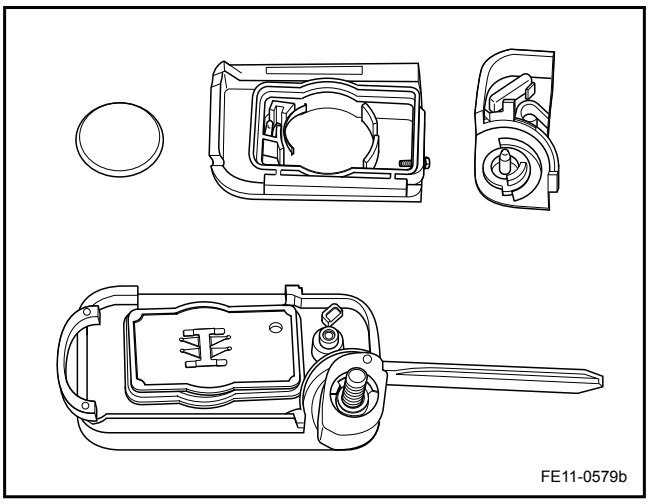


2. Install the anti-theft horn retaining bolts.

   Torque: 10 Nm (Metric) 7 lb-ft (US English)
3. Install the left rear compartment trim panel.
4. Connect the battery negative cable.

11.10.8.4 Hood Ajar Switch Replacement

For removal and installation procedures. Refer to 12.2.3.2 Hood Latch Replacement.



11.10.8.5 Remote Control Emitter Battery Replacement

Removal Procedure

1. Remove the remote transmitter cover screw.
2. Remove the transmitter cover.
3. Remove the remote control transmitter battery.

Installation Procedure:

1. Install the remote control transmitter battery.
2. Install the transmitter cover.
3. Tighten the remote transmitter cover screw.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)

11.11 Electric Seats

11.11.1 Specifications

11.11.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Electric Seat Assembly Retaining Bolts	M10 × 36	39-53	28.9-39.2
Electric Seat Side Trim Retaining Screws	ST4.8 × 16	3-4	2-3
Electric Seat Back Retaining Bolts	M10 × 20	25-35	18.5-25.9
Electric Seat Cushion Bracket Retaining Nut	M8	20-25	14.8-18.5
Electric Seat Back Adjustment Motor Retaining Bolts	M8 × 10	8.5-11.5	6.3-8.5

11.11.2 Description and Operation

11.11.2.1 Description and Operation

Driver and passenger power seat system, each includes the following components:

- Electric Seat Adjustment Switch
- Electric Seat Heating Switch (If Equipped)
- Electric Seat Heaters (Such As Equipment)
- Seat Front and Back Adjust Motor
- Seat Height Adjust Motor
- Seat Back Adjust Motor
- Seat Circuit Breaker

Through the seat adjustment switches, the seats can be adjusted to the front and back, seat cushion upward and downward, seat back forward and rearward.

A high-spec vehicle front seat is equipped with heaters. The electric seat heating can be turned on or off through the seat heating switch.

11.11.3 System Working Principle

11.11.3.1 System Working Principle

Seat Adjuster Switch

seat adjuster switch motor to provides the power and ground circuit for the selected seat, drives motor to adjust the seat.

Motor

All seats motors work independently. The motor includes an electronic circuit breaker (PTC). The circuit breaker disconnects the circuit in overload situation and only resets when the circuit voltage is cut off. There are three seat adjustment motors. They are forward and backward adjustment motor, height adjustment motor, and seat back adjustment motor. forward and backward adjustment motor moves the whole seat forward and backward. Height adjustment motor moves the seat cushion upward or downward. Seat back adjustment motor moves the seat back forward or backward.

Forward and Backward Adjustment

When operating the seat adjustment switch to move whole seat forward, the battery positive voltage passes through the switch contacts and the motor forward control circuit to the motor. The ground circuit is through the backward switch contacts and the motor backward control circuit. Motor runs in order to drive the entire seat forward until the switch is released. Move the seat backward is similar. The difference is that the positive battery voltage and ground circuit is through the opposite circuits, to reverse the motor operation.

Height Adjustment

When the operating the seat adjustment switch to move the seat cushion upward, the battery positive voltage passes through the switch contacts and the motor upward control circuit to the motor. The ground circuit is through the downward switch contacts and the motor downward control circuit. Motor runs in order to drive the seat cushion upward until the switch is released. Move the seat downward is similar. The difference is that the positive battery voltage and ground circuit is through the opposite circuits, to reverse the motor operation.

Seat Back Adjustment

When operating the seat adjustment switch to move the seat back forward, the battery positive voltage passes through the switch contacts and the motor forward control circuit to the motor. The ground circuit is through the backward switch contacts and the motor backward control circuit. Motor runs in order to drive the seat back forward until the switch is released. Move the seat backward is similar. The difference is that the positive battery voltage and ground circuit is through the opposite circuits, to reverse the motor operation.

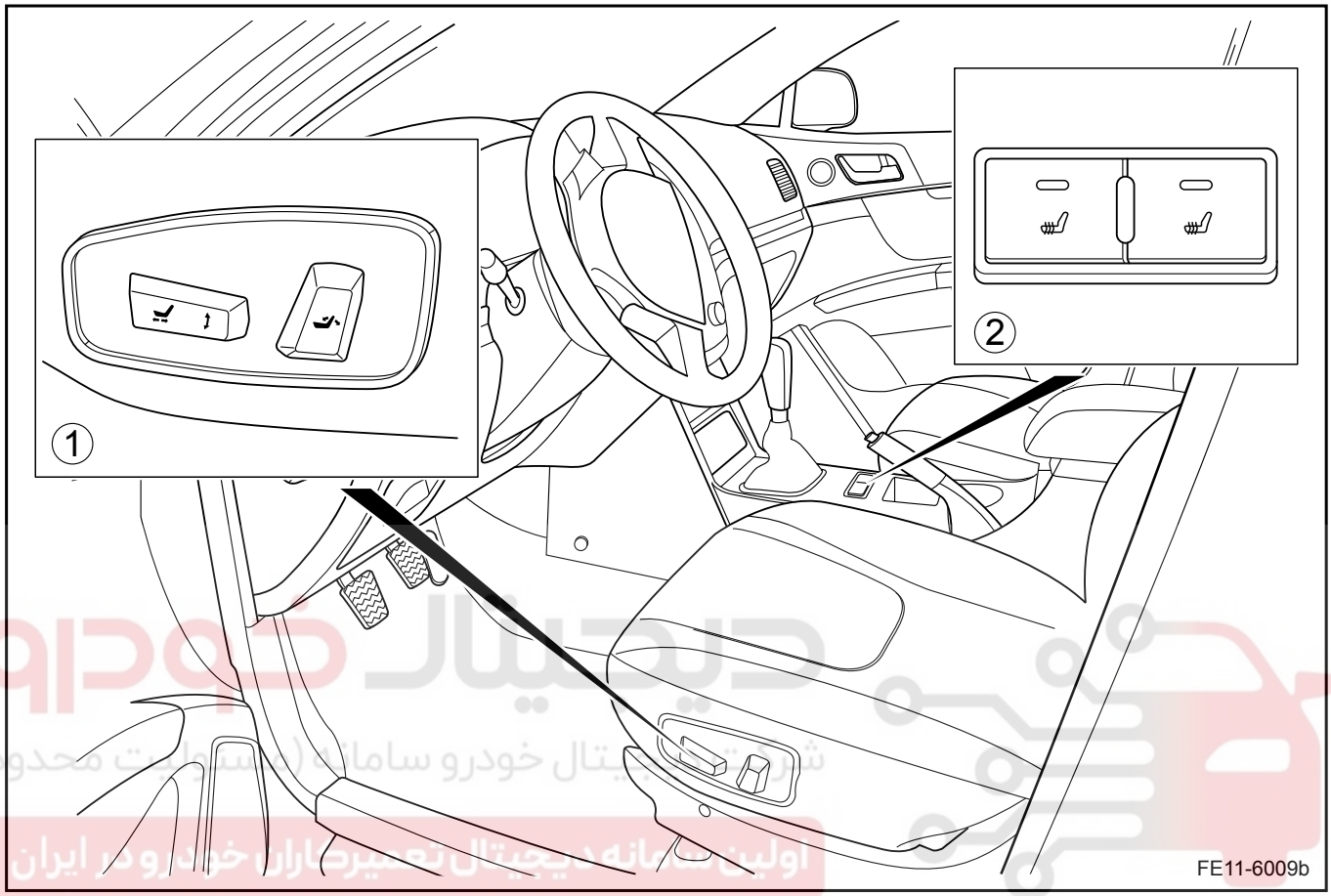
Seat Heating (If Equipped)

BCM receives the voltage signal from CAN bus. when the battery voltage is greater than 10.7 V, and the ignition lock switch is at the "ON" position, the seat heater enable relay is activated, seat heating is able to work. at this time if the seat heating switch is pressed, the seat heating starts. When the battery voltage is less than 10.3 V, BCM will disconnect the heated seats relay, seat heaters are not allowed work.

11.11.4 Component Locator

11.11.4.1 Component Locator

Electric Seat Heating Switch, Electric Seat Adjustment Switch

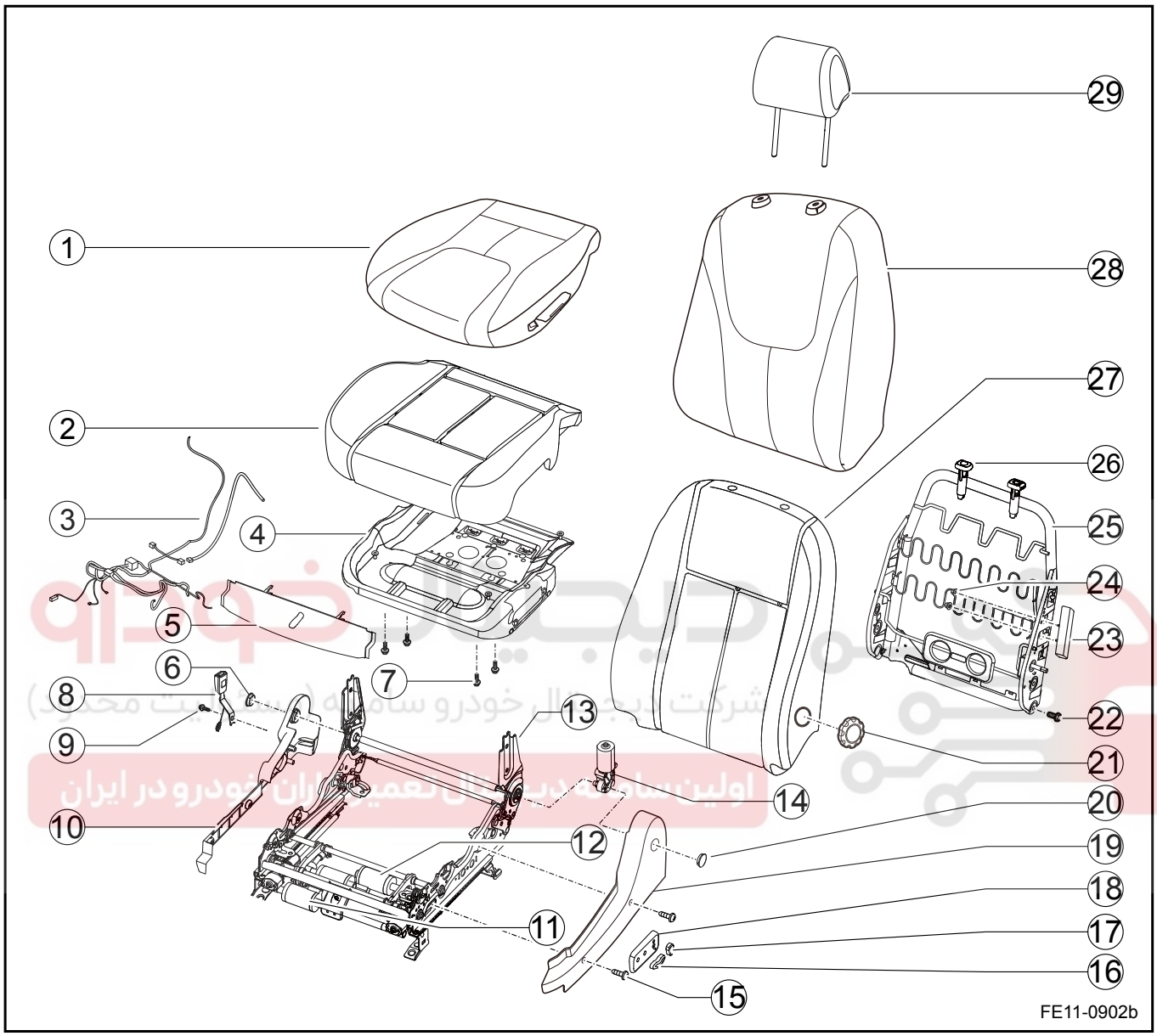


Legend

1. Electric Seat Adjustment Switches
2. Electric Seat Heating Switches

11.11.5 Disassemble View

11.11.5.1 Disassemble View



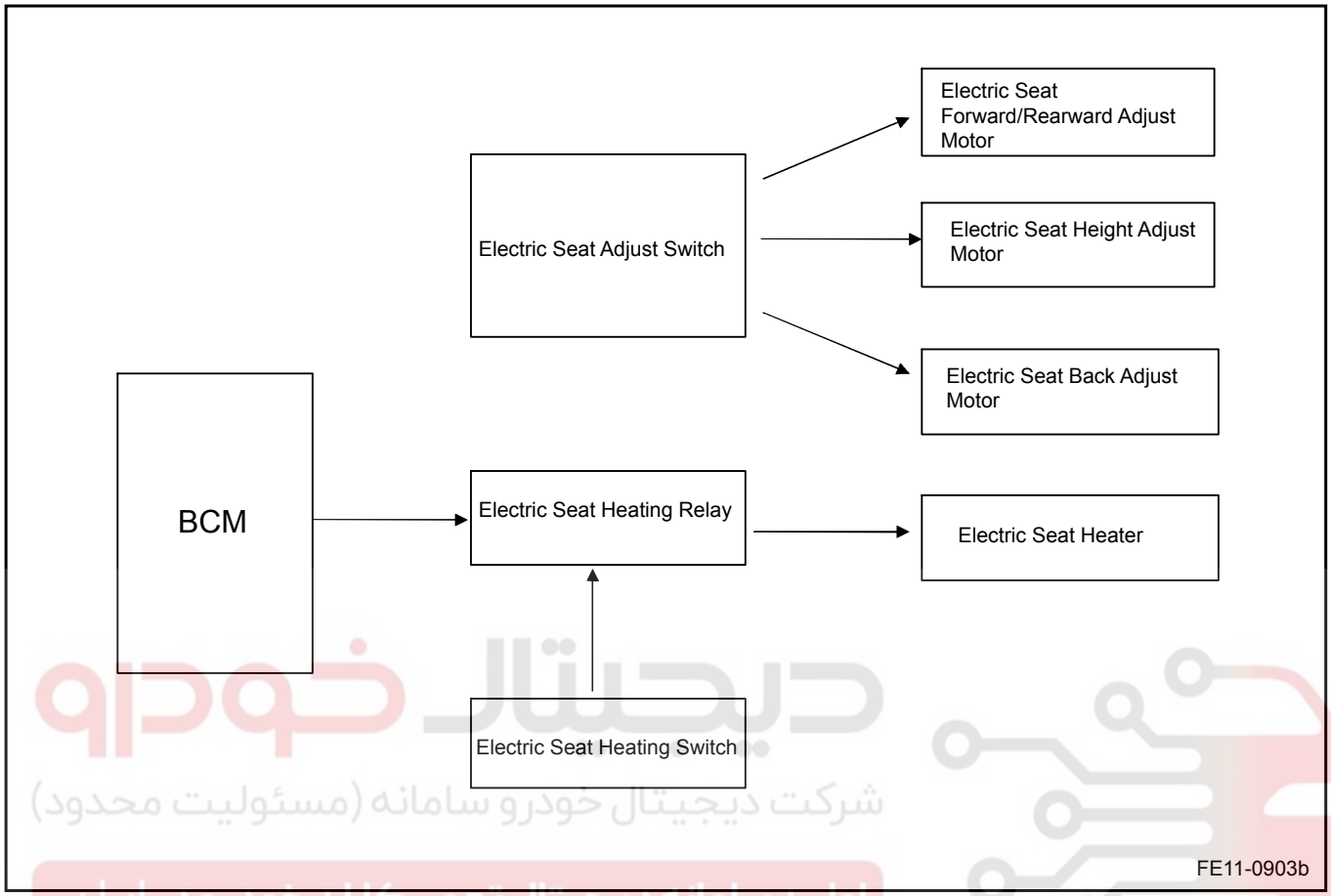
Legend

1. Seat Cover
2. Seat Foam
3. Harness
4. Seat Frame
5. Left Front Seat Front Cover
6. Plug
7. Seat Frame Retaining Bolt
8. Seat Belt Buckle
9. Seat Belt Buckle Retaining Bolt
10. Seat Adjuster Outer Trim Panel
11. Electric Motor
12. Seat Recliner Motor
13. Left Front Seat Slide Rail Assembly
14. Left Front Seat Slide Rail Assembly
15. Regulator Left Outer Cover Retaining Screw
16. Four-Way Adjustable Switch
17. Seat Back Adjustment Handle
18. Adjustment Switch Base
19. Regulator Left Outer Trim Panel
20. Plug
21. Seat Back Lumbar Adjustment Handle
22. Seat Back Frame Retaining Bolts

23. Side Airbag
24. Side Airbag Retaining Nut
25. Seat Back Frame
26. Headrest Guide Sleeve (With Control) / Headrest Guide Sleeve (Without Control)
27. Seat Back Foam
28. Seat Back Cover
29. Headrest

11.11.6 Schematic

11.11.6.1 Schematic



11.11.7 Diagnostic Information and Procedures

11.11.7.1 Diagnosis Description

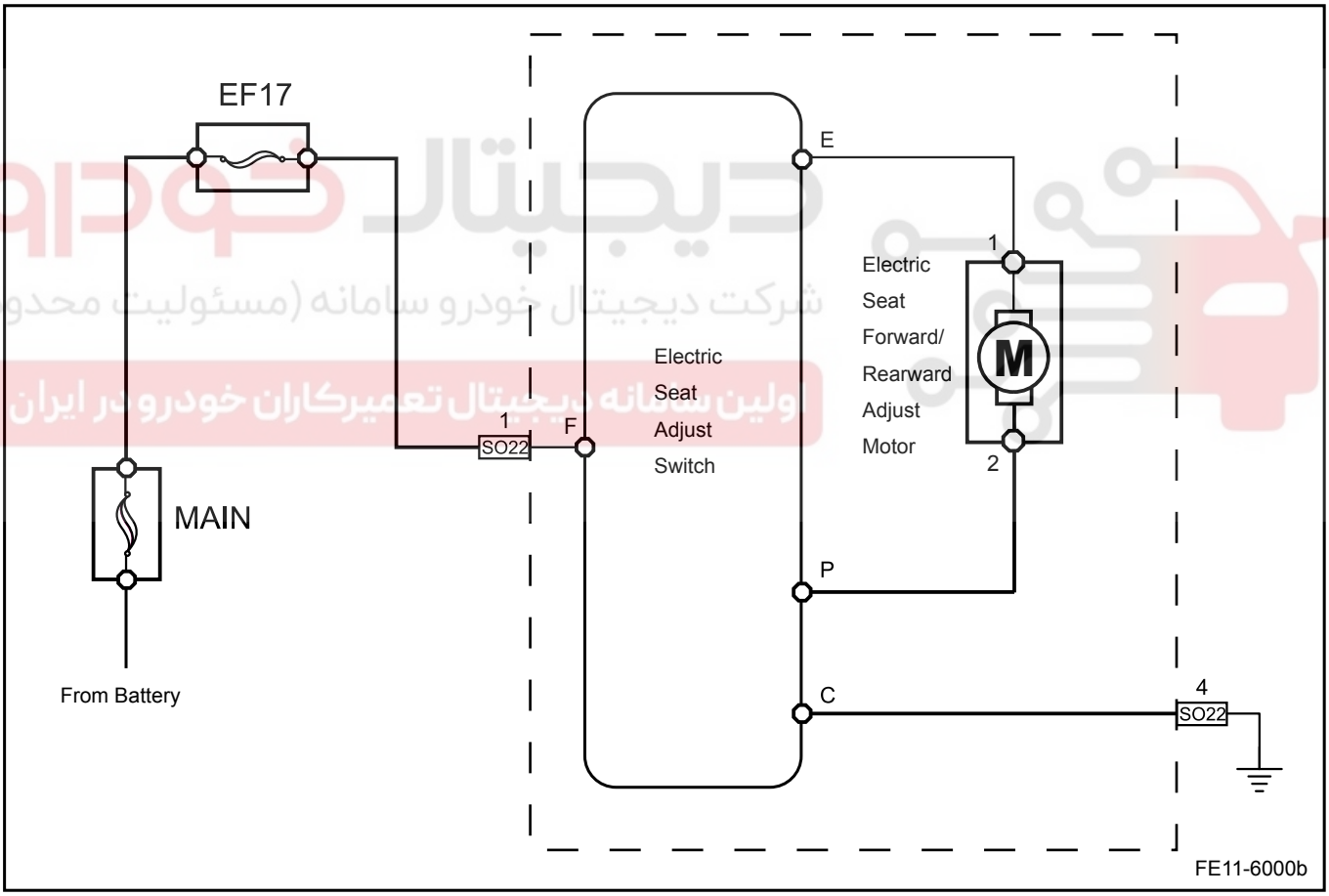
Refer to 11.11.2.1 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.11.7.2 Visual Inspection

- Check the installed after market equipment that may affect the seats operations.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- If electric seats are inoperative, check and repair the power supply or ground circuit poor connection, or open circuit before carry out the diagnostics.

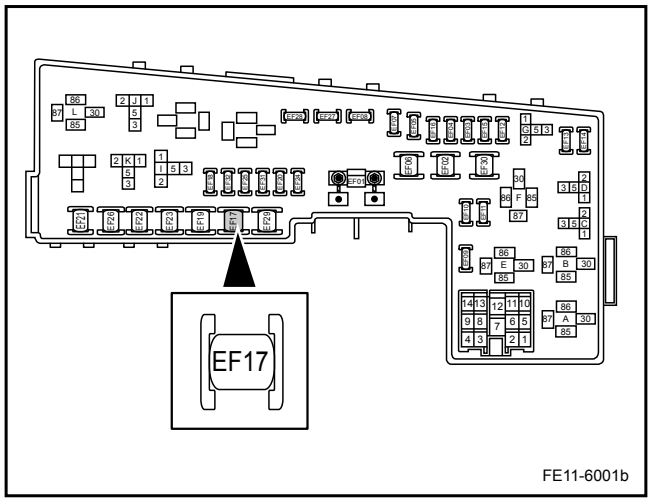
11.11.7.3 Electric Seat Can Not Be Adjusted Forward and Rearward

Schematic:



Diagnostic Steps:

Step 1	Check the fuse EF17.



(a) Whether the fuse EF17 is blown.

Fuse Rating: 30 A

No → Go to step 3

Yes

Step 2	Check the fuse EF17 circuit.

(a) Check whether there is a short circuit.

(b) Repair the circuits. Confirm that there are no short circuits.

(c) Replace with fuses with rated current.

Is the electric seat working correctly?

Yes → System normal

No

Step 3	Check the electric seat forward and rearward adjustment switch.

(a) Operate the electric seat forward and rearward adjustment switch.

(b) At the same time, measure voltage between the electric seat adjustment switch socket P and E with a multimeter.

Test Terminal	Test Conditions	Standard Voltage
P-E	Forward	11-14 V
P-E	Rearward	11-14 V

Is the voltage specified value?

Yes → Go to step 5

No

Step 4	Replace the electric seat adjustment switches.

(a) Replace the electric seat adjustment switches. Refer to 11.11.8.9 Electric Seat Adjustment Switch Replacement.

Is the electric seat working correctly?

Yes → System normal

No

Step 5	Check the electric seat forward and rearward adjustment motor.

(a) Operate the electric seat forward and rearward adjustment switch.

Note

Do not disconnect the electric seat forward and rearward adjustment motor wiring harness connector.

(b) At the same time, measure the electric seat forward and rearward adjustment motor wiring harness connector terminal No.1 and 2 voltage with a multimeter.

Test Terminal	Test Conditions	Standard Voltage
1-2	Forward	11-14 V
1-2	Rearward	11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Replace the electric seat forward and rearward adjustment motor.

(a) Replace the electric seat forward and rearward adjustment motor. Refer to 11.11.8.8 Electric Seat Frame Assembly Replacement.

Is the electric seat working correctly?

Yes → System normal

No

Step 7	Repair the open circuit between the electric seat adjustment switch and the electric seat forward and rearward motor.

(a) Check the circuit between the electric seat adjustment switch and the electric seat forward and rearward motor.

(b) Repair the open circuit.

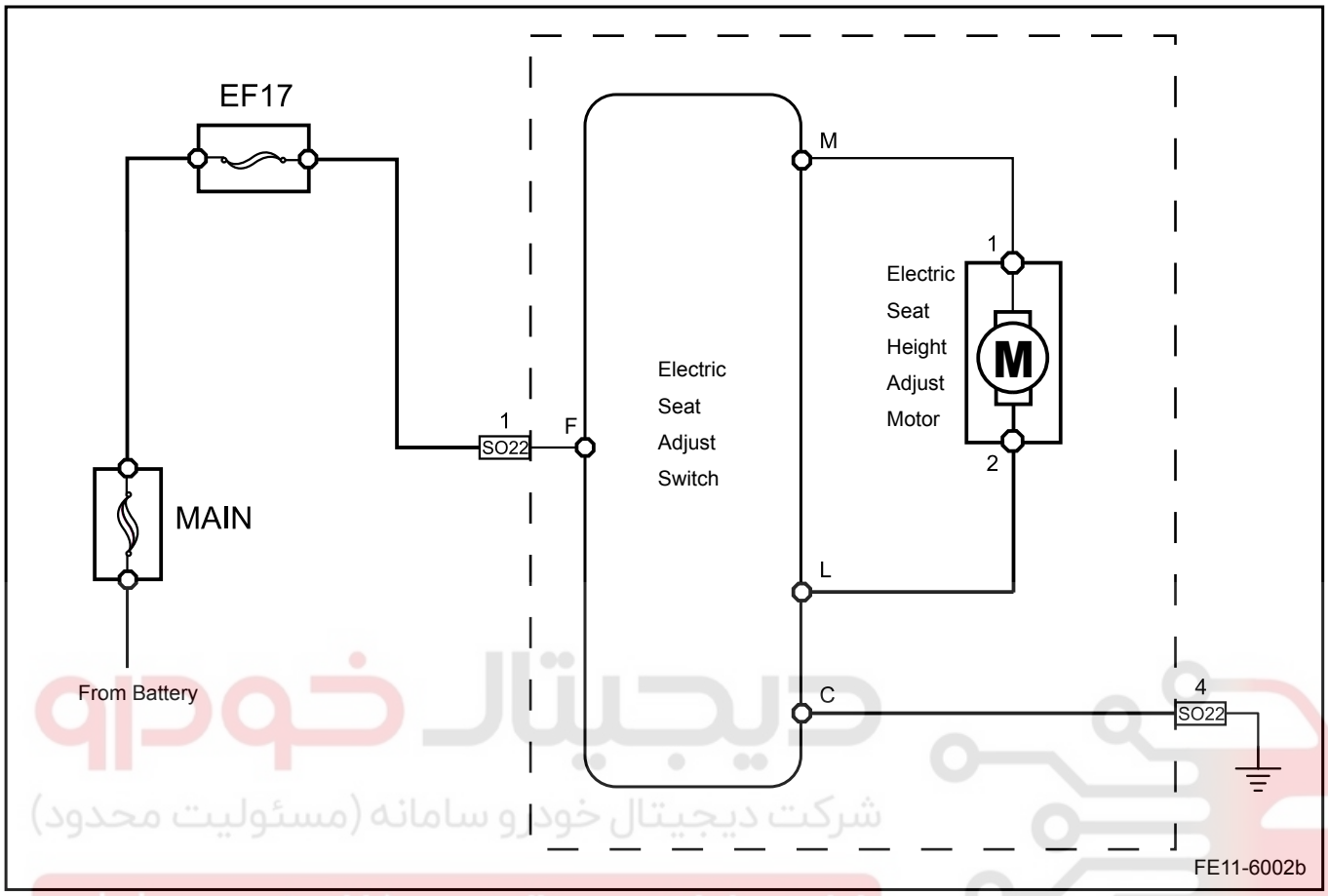
Confirm the repair completed.

Next

Step 8	System normal.

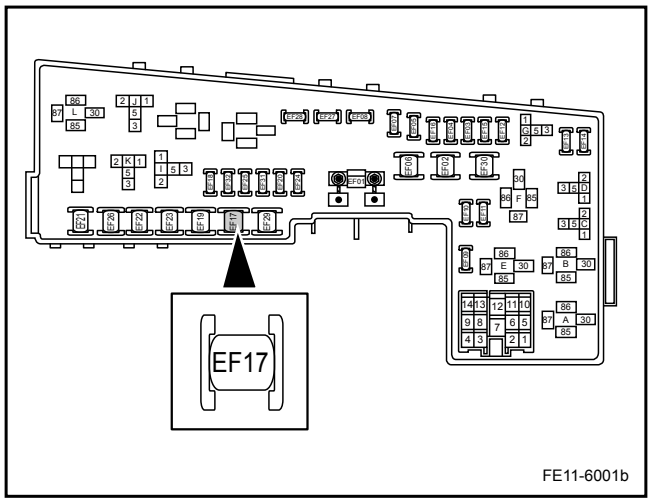
11.11.7.4 Electric Seat Height Can Not Be Adjusted

Schematic:



Diagnostic Steps:

Step 1	Check the EF17 fuse.



(a) Whether the fuse EF17 is blown.
Check the Fuse Rated Current: 30 A

No	Go to step 3

Yes

Step 2	Check the fuse EF17 circuit.

(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Is the electric seat working correctly?

Yes → System normal

No

Step 3	Check the electrical seat height adjustment switch.

(a) Operate the electric seat height adjustment switch.
(b) At the same time, measure voltage between the electric seat adjustment switch socket M and L with a multimeter.

Test Terminal	Test Conditions	Standard Voltage
M-L	Up	11-14 V
M-L	Down	11-14 V

Is the voltage specified value?

Yes → Go to step 5

No

Step 4	Replace the electric seat adjustment switch.

(a) Replace the electric seat adjustment switch. Refer to 11.11.8.9 Electric Seat Adjustment Switch Replacement.

Is the electric seat working correctly?

Yes → System normal

No

Step 5	Check the electric seat height adjustment motor.

(a) Operate the electric seat forward and rearward adjustment switch.

Note

Do not disconnect the height adjustment motor harness connector.

(b) At the same time, measure voltage between the electric seat height adjustment motor wiring harness connector terminals No.1 and 2 with a multimeter.

Test Terminal	Test Conditions	Standard Voltage
1-2	Up	11-14 V

1-2	Down	11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Replace the electric seat height adjustment motor.

(a) Replace the electric seat height adjustment motor. Refer to 11.11.8.8 Electric Seat Frame Assembly Replacement.

Is the electric seat working correctly?

Yes → System normal

No

Step 7	Repair the open circuit between the electric seat adjustment switch and the electric seat height adjustment motor.

(a) Check the circuit between the electric seat adjustment switch and height adjustment motor.

(b) Repair the open circuit.

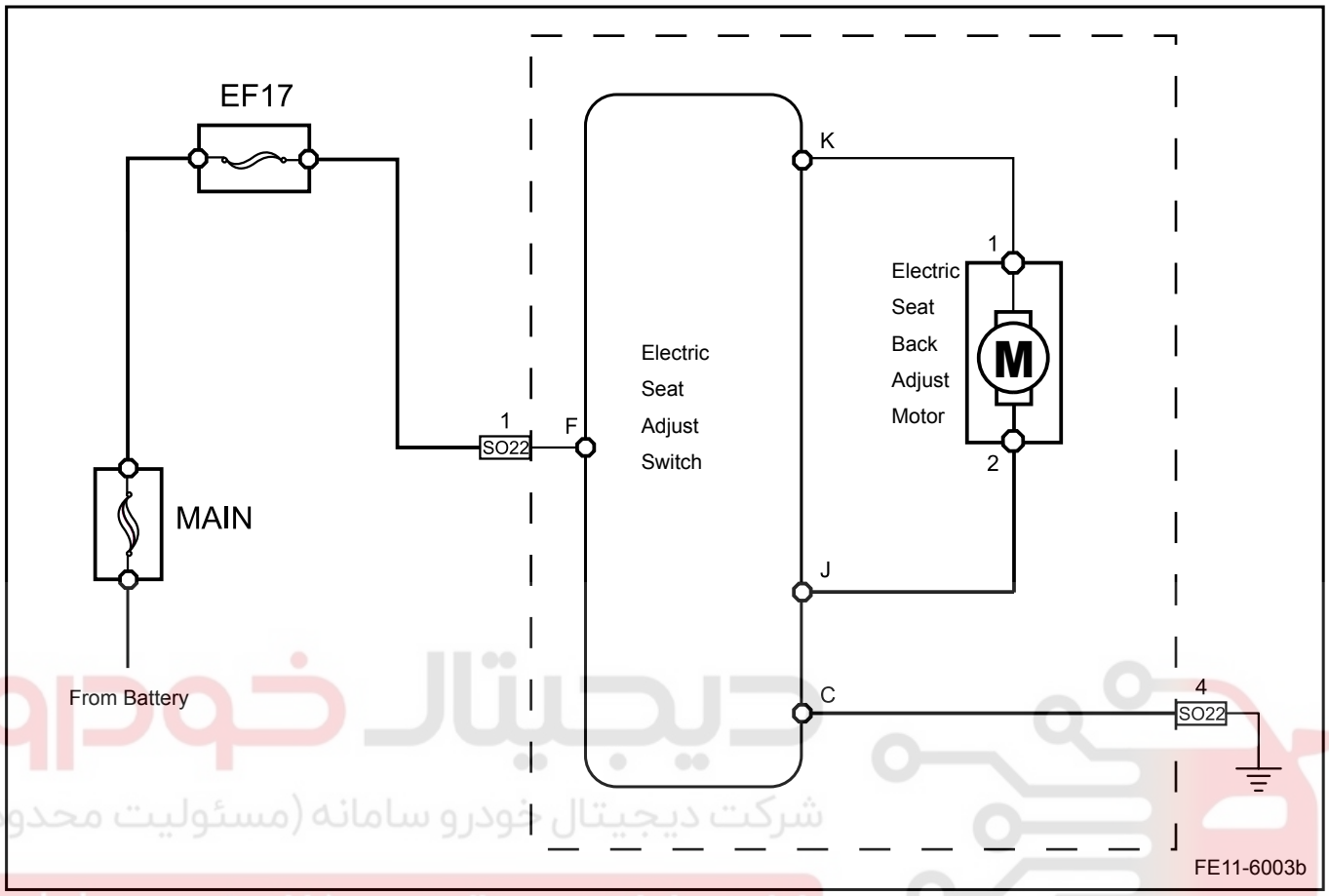
Confirm the repair completed.

Next

Step 8	System normal.

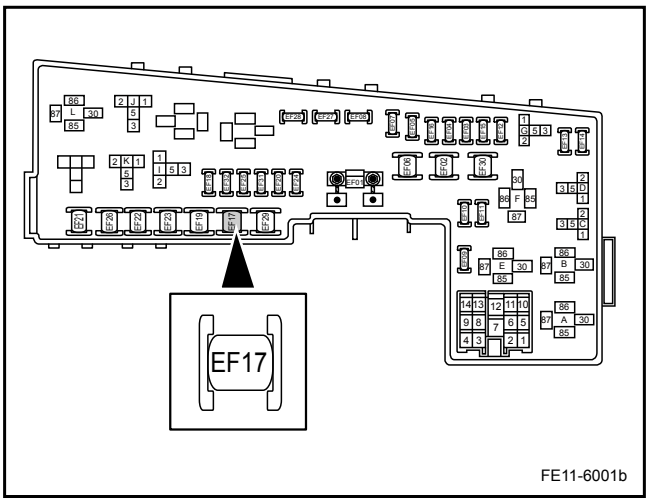
11.11.7.5 Electric Seat Back Can Not Be Adjusted

Schematic:



Diagnostic Steps:

Step 1	Check the EF17 fuse.



(a) Check whether the fuse EF17 is blown.

Fuse Rated Current: 30 A

No → Go to step 3

Yes

Step 2	Check the fuse EF17 circuit.

(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Is the electric seat working correctly?

Yes → System normal

No

Step 3	Check the electric seat back adjustment switch.

(a) Operate the electric seat back adjustment switch.
(b) At the same time, measure voltage between electric seat adjustment switch sockets K and J with a multimeter.

Test Terminal	Test Conditions	Standard Voltage
K-J	Forward	11-14 V
K-J	Rearward	11-14 V

Is the voltage specified value?

Yes → Go to step 5

No

Step 4	Replace the electric seat adjustment switches.

(a) Replace the electric seat adjustment switches. Refer to 11.11.8.9 Electric Seat Adjustment Switch Replacement.

Is the electric seat working correctly?

Yes → System normal

No

Step 5	Check the seat back adjustment motor.

(a) Operate the electric seat forward and rearward adjustment switch.
(b) At the same time, measure voltage between the electric seat back adjustment motor harness connector terminals No.1 and 2 with a multimeter.

Test Terminal	Test Conditions	Standard Voltage
1-2	Forward	11-14 V
1-2	Rearward	11-14 V

Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Replace the power seat back adjustment motor.

(a) Replace the power seat back adjustment motor. Refer to 11.11.8.3 Electric Seat Back Adjustment Motor Replacement.

Is the electric seat working correctly?

Yes — System normal

No

Step 7	Repair the open circuit between the electric seat adjustment switch and the electric seat back adjustment motor.

(a) Check the circuit between the electric seat adjustment switch and the electric seat back adjustment motor.

(b) Repair the open circuit.

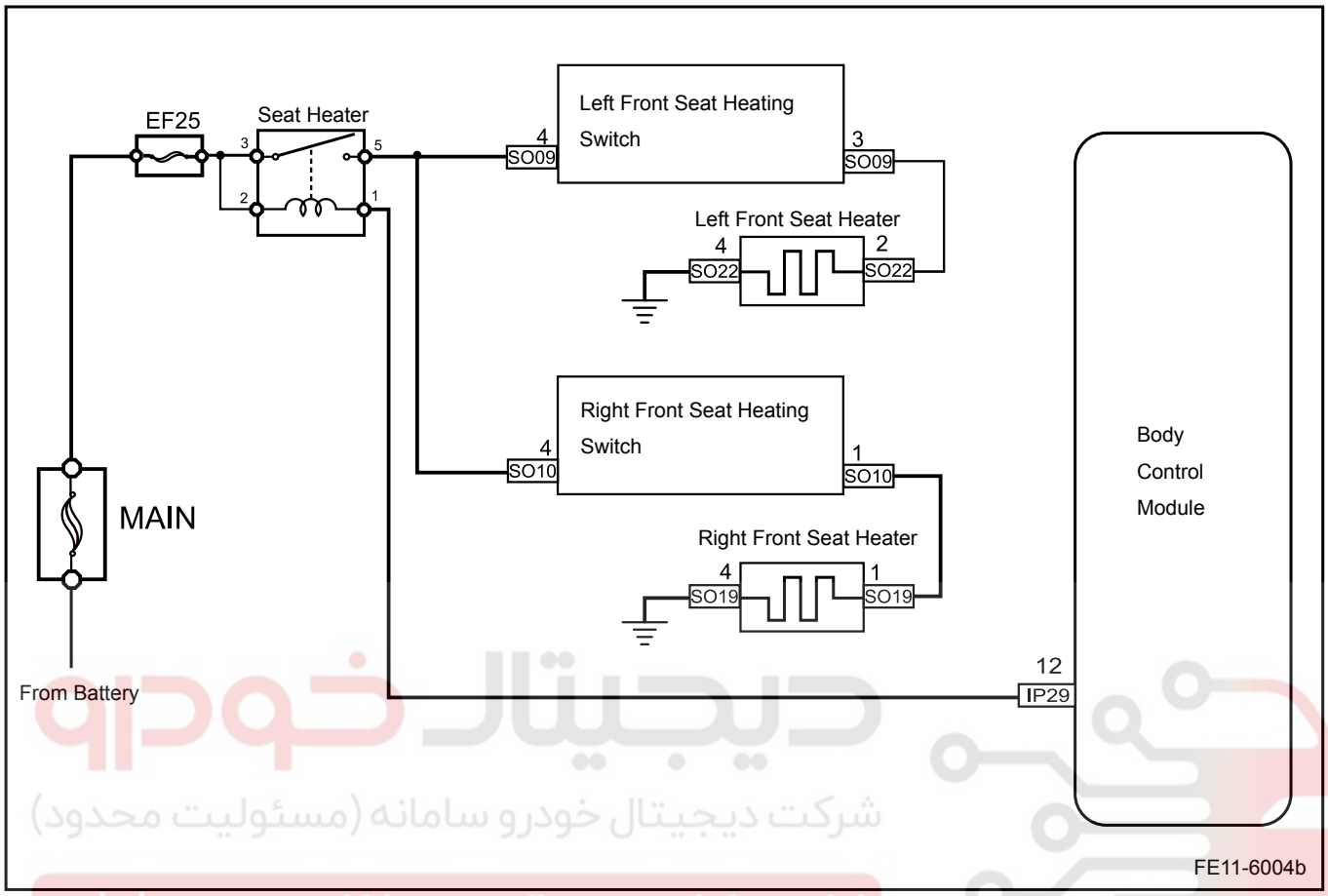
Confirm the repair completed.

Next

Step 8	System normal.

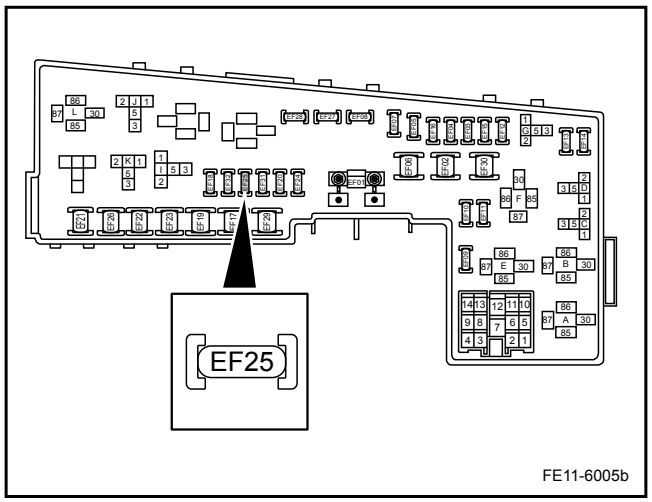
11.11.7.6 Left Front Electric Seat Can Not Be Heated

Schematic:



Diagnostic Steps:

Step 1	Check the fuse EF25.



(a) Check whether the fuse EF25 is blown.

Fuse Rated Current: 15 A

No → Go to step 3

Yes

Step 2	Check the fuse EF25 circuit.

(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

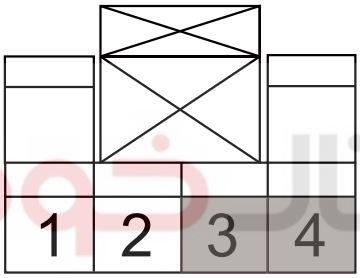
Is the heating function working correctly.

Yes → System normal

No

Step 3	Check the left front seat heating switch.

Left Front Seat Heating Switch Harness Connector SO09



FE11-6006b

(a) Press the left front seat heating switch.
(b) At the same time, test continuity between the left front seat heating switch wiring harness connector SO09 terminals No. 3 and 4 with a multimeter.

Test Terminal	Test Conditions	Continuity
3-4	Release	10 kΩ or higher
3-4	Press	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 5

No

Step 4	Replace the left front seat heating switch.

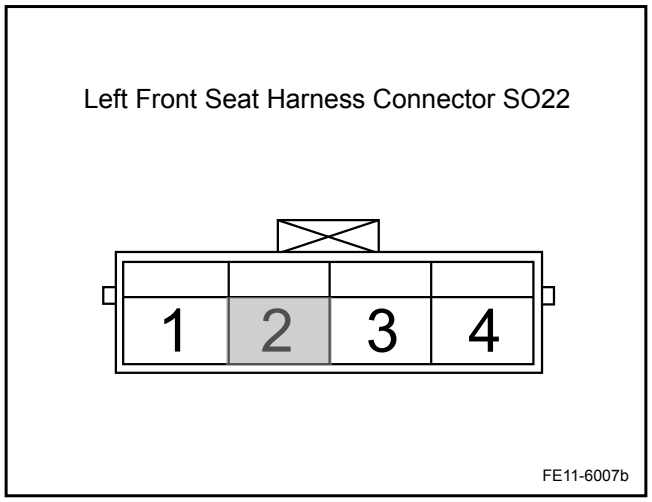
(a) Replace the left front seat heating switch. Refer to 11.11.8.7 Seat Heating Switch Replacement.

Is the heating function working correctly.

Yes → System normal

No

Step 5	Check the left front seat heater.

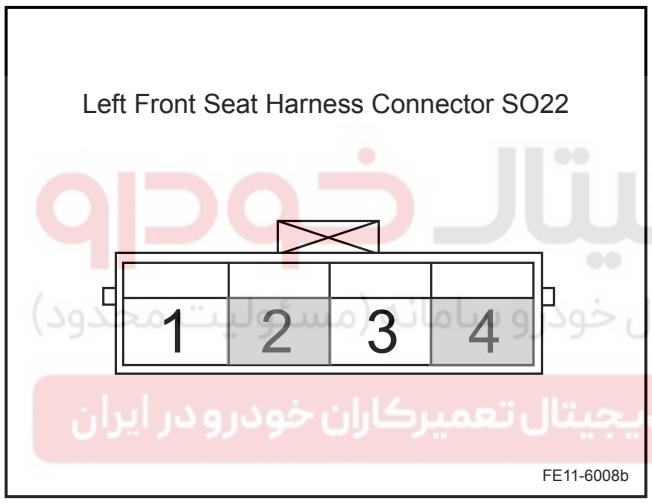


(a) Press the left front seat heating switch.
(b) At the same time, measure the left front seat harness connector SO22 terminals No.2 voltage with a multimeter.
Standard Voltage: 11-14 V
Is the voltage specified value?

Yes → Go to step 7

No

Step 6	Check the left front seat heater circuit.



(a) Disconnect the left front seat harness connector SO22.
(b) Check terminals No.2 and 4 continuity with a multimeter.

Test Terminal	Continuity
SO09 3-SO22 2	Less than 1 Ω
Body Ground-SO22 4	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 8

No

Step 7	Repair the left front seat heater open circuit.

(a) Repair the open circuit.
Is the heating function working correctly?

Yes → System normal

No

Step 8	Replace the left front seat heater.

(a) Replace the left front seat heater. Refer to 11.11.8.6 Electric Seat Cushion Replacement.
Confirm the repair completed.

Next

Step 9	System normal.

Note

Right front seat can not be heated diagnostic steps are similar.

11.11.8 Removal and Installation

11.11.8.1 Front Electric Seat Replacement

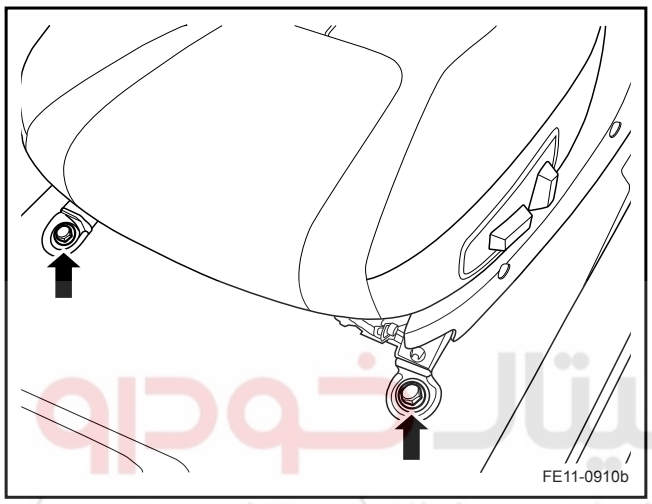
Removal Procedure

Warning!

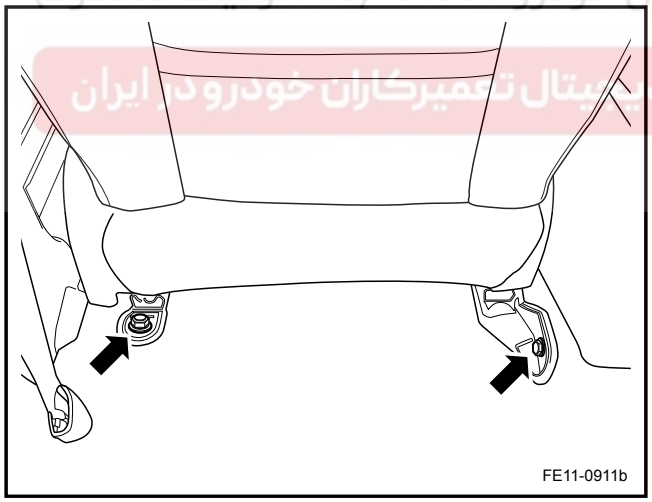
Refer to "Battery Disconnect Warning" in "Warnings and Notices".

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front seat front retaining bolts.



3. Remove the front seat rear retaining bolts.

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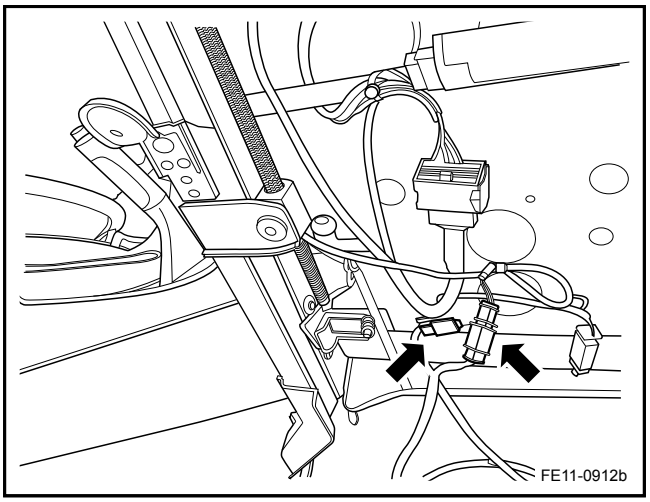
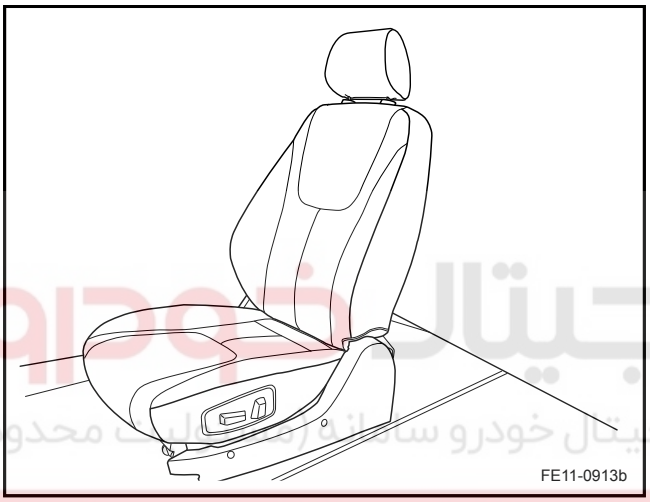
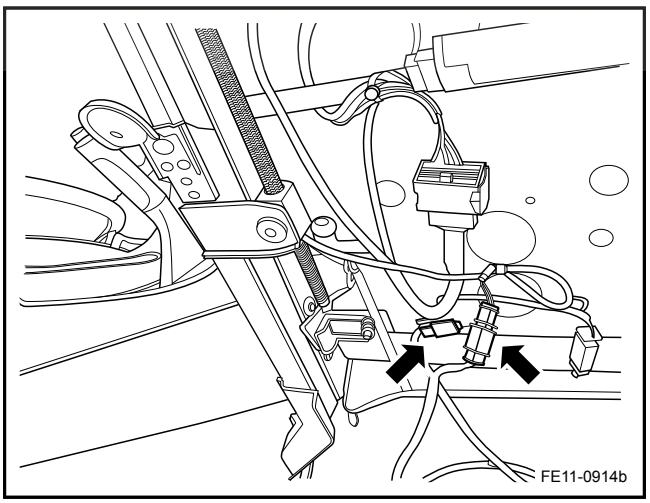


4. Disconnect the front seat bottom harness connector.

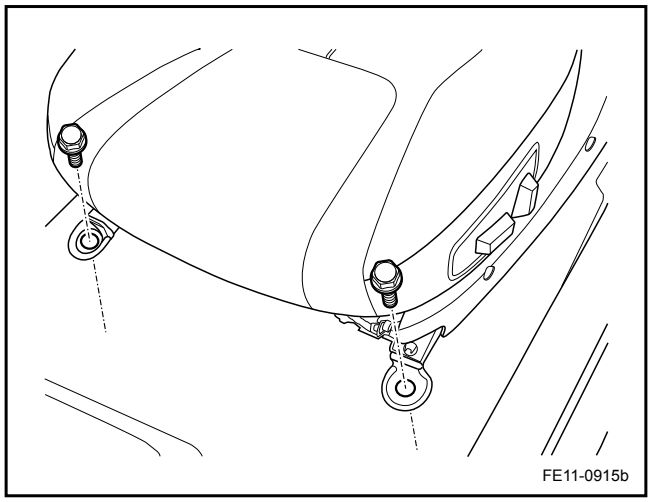


5. Remove the front seat.

Installation Procedure:

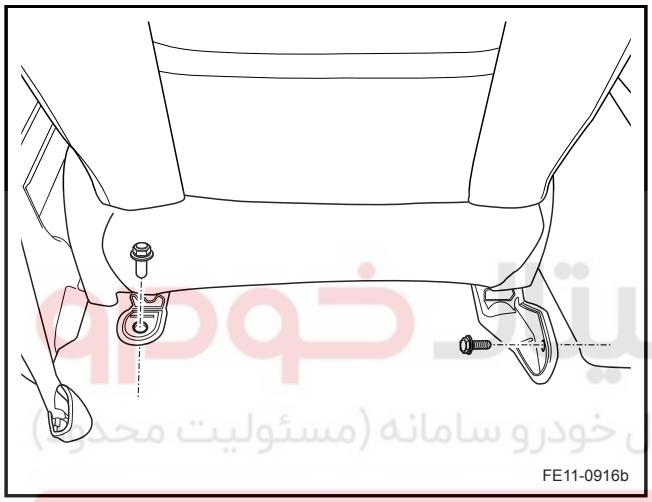


1. Install the front seat.
2. Connect the front seat bottom harness connector.



3. Install the front seat front retaining bolts.

   Torque: 47 Nm (Metric) 35 lb-ft (US English)



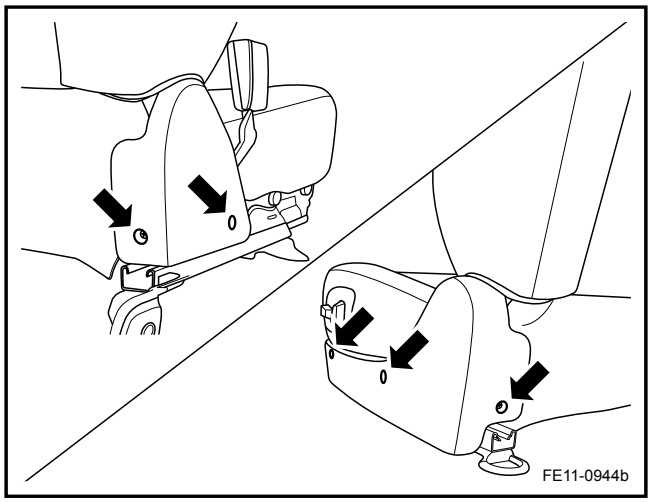
4. Install the front seat rear retaining bolts.

   Torque: 47 Nm (Metric) 35 lb-ft (US English)

5. Connect the battery negative cable.

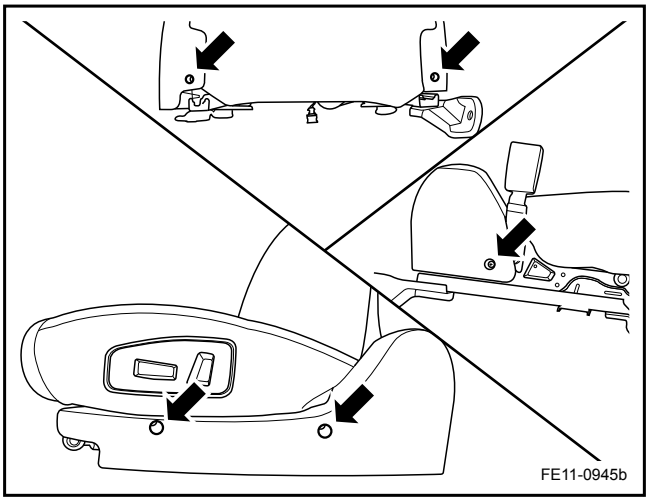
11.11.8.2 Seat Side Trim Panel Replacement

Removal Procedure



1. Remove the electric seat. Refer to 11.11.8.1 Front Electric Seat Replacement.

2. Remove the seat side trim panel screws.



Installation Procedure:

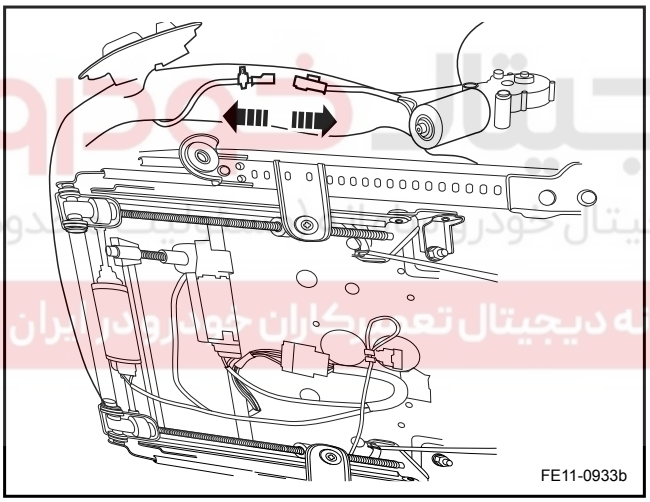
1. Install the seat side trim panel and tighten the retaining screws.

   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)

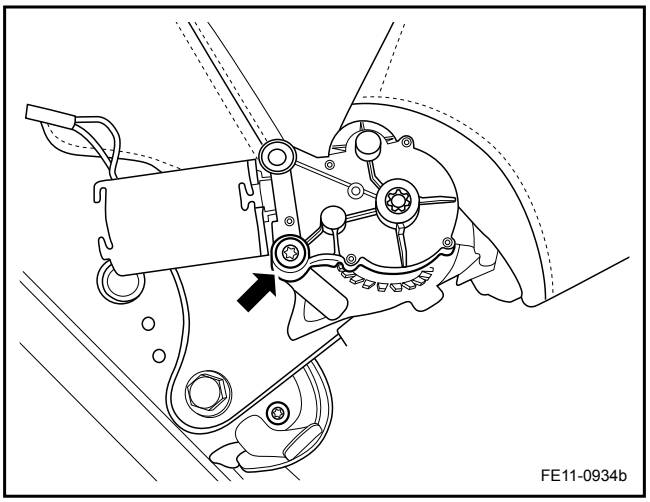
2. Install the electric seat.

11.11.8.3 Electric Seat Back Adjustment Motor Replacement

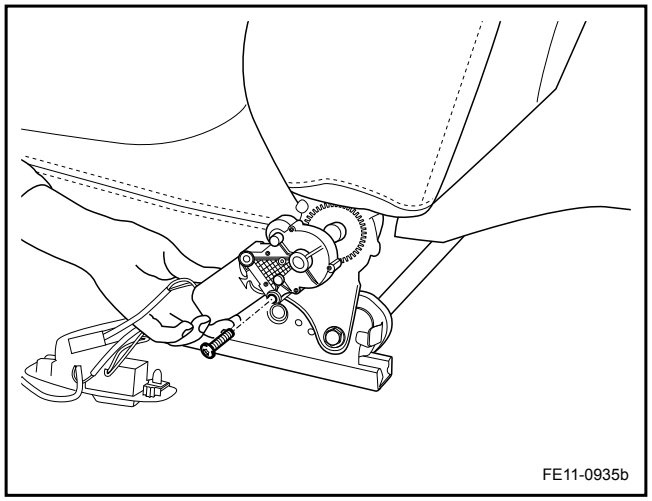
Removal Procedure



1. Remove the electric seat. Refer to 11.11.8.1 Front Electric Seat Replacement.
2. Remove the seat side trim panel. Refer to 11.11.8.2 Seat Side Trim Panel Replacement.
3. Disconnect the seat back adjustment motor wiring harness connector.



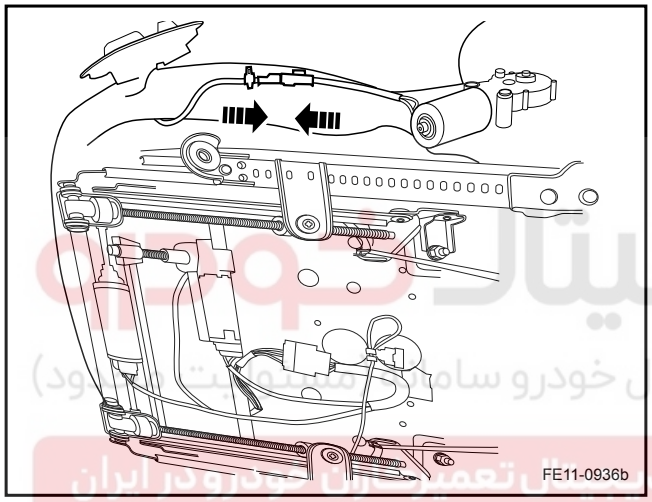
4. Remove the seat back adjustment motor retaining bolts and remove the adjustment motor.



Installation Procedure:

1. Insert the motor and tighten the adjustment motor retaining bolts.

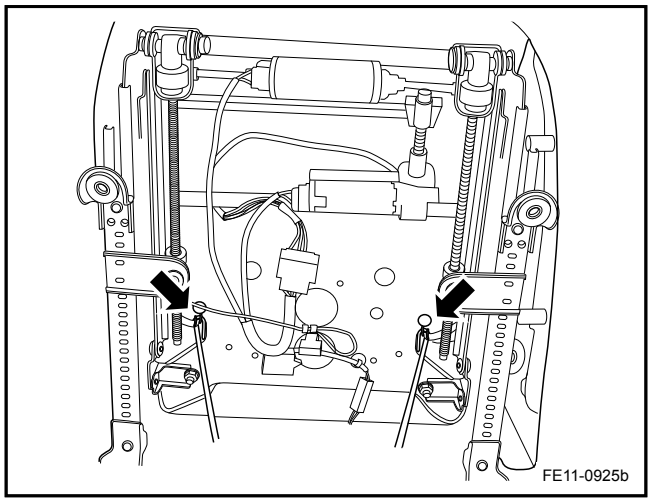
   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)



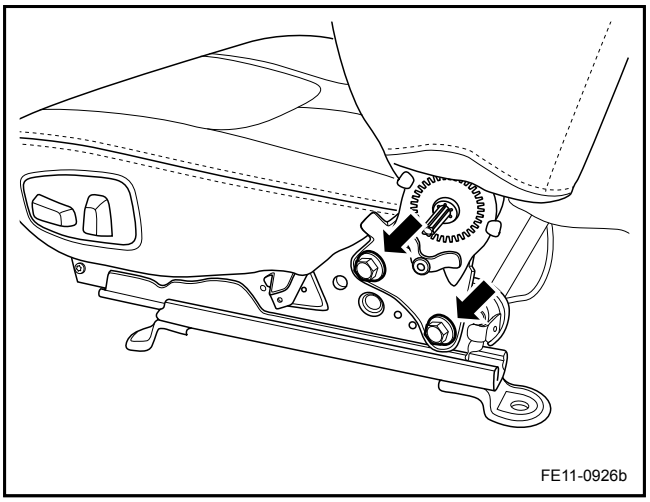
2. Connect the seat back adjustment motor wiring harness connector.
3. Install the seat side trim panel.
4. Install the electric seat.

11.11.8.4 Electric Seat Back Replacement

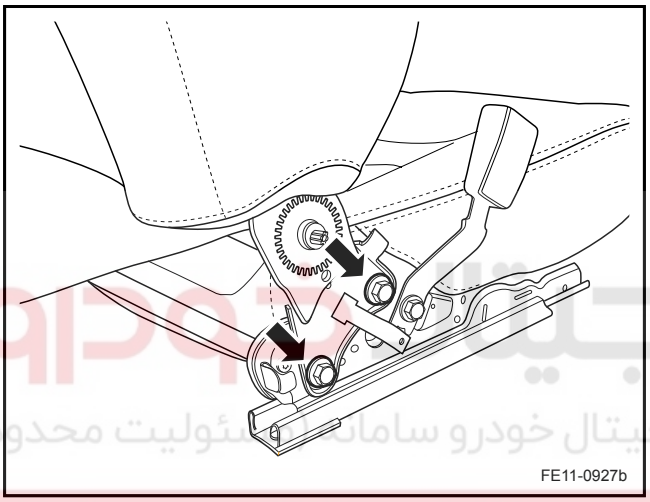
Removal Procedure



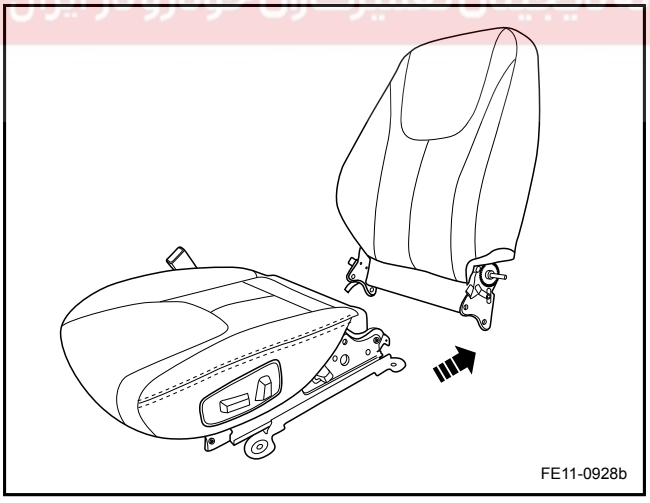
1. Remove the electric seat. Refer to 11.11.8.1 Front Electric Seat Replacement.
2. Remove the seat side trim panel. Refer to 11.11.8.2 Seat Side Trim Panel Replacement.
3. Remove the electric seat back adjustment motor. Refer to 11.11.8.3 Electric Seat Back Adjustment Motor Replacement.
4. Remove the seat back cover clips.



5. Remove the seat back left side retaining bolts.

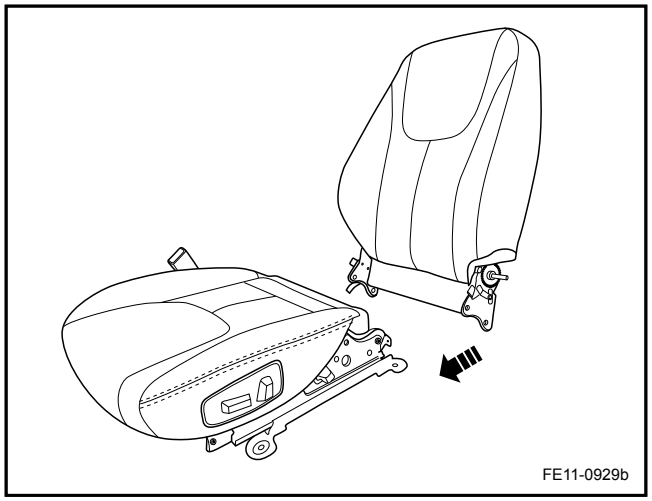


6. Remove the seat back right side retaining bolts.

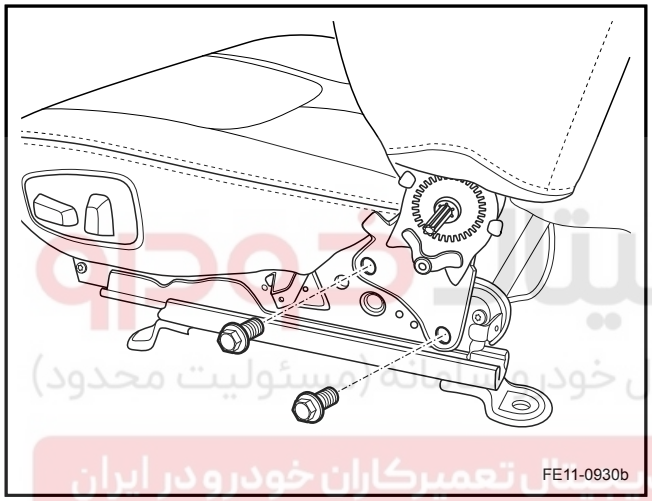


7. Remove the seat back.

Installation Procedure:

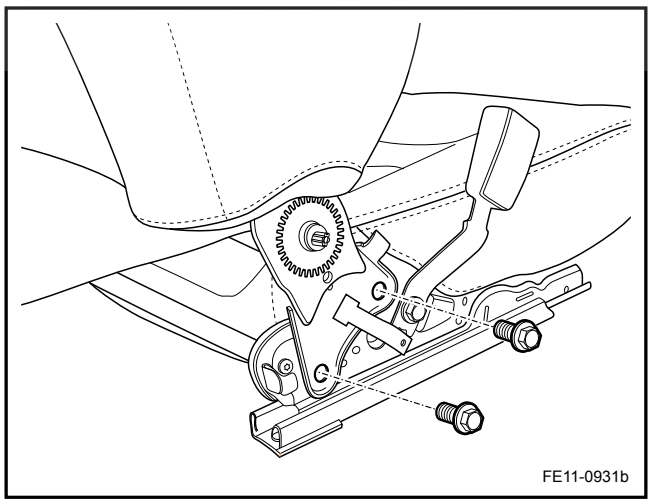


1. Install seat back.



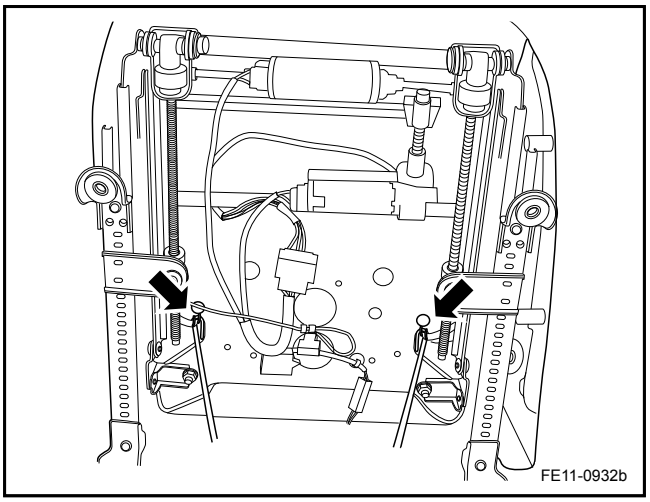
2. Install the seat back left side retaining bolts.

   Torque: 30 Nm (Metric) 22 lb-ft (US English)



3. Install the seat back right side retaining bolts.

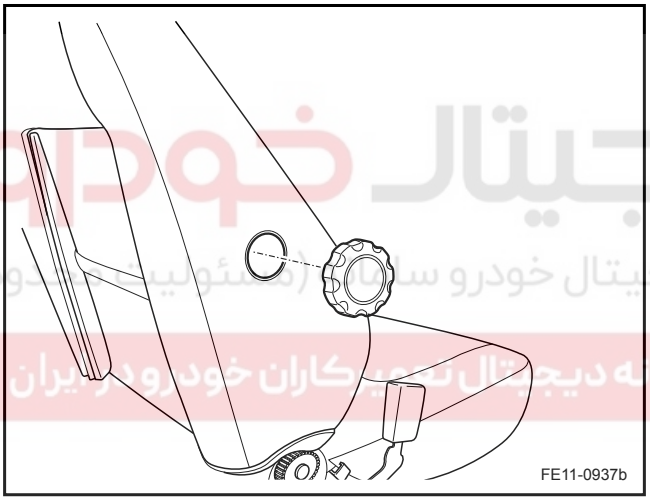
   Torque: 30 Nm (Metric) 22 lb-ft (US English)



4. Install the seat back cover and clips.
5. Install the electric seat back adjustment motor.
6. Install the seat side trim panel.
7. Install the electric seat.

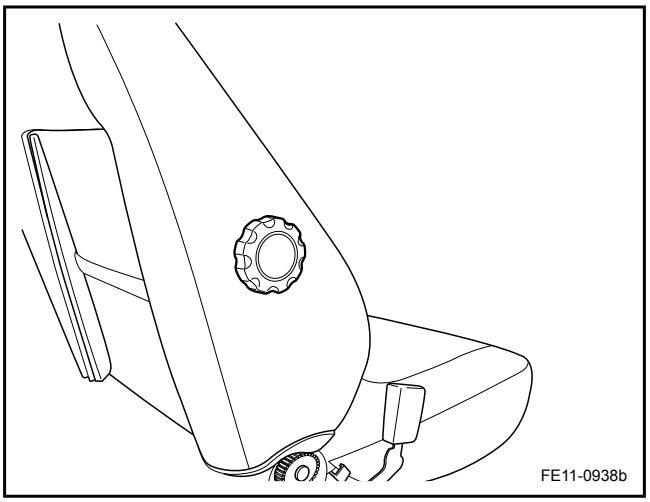
11.11.8.5 Front Seat Lumbar Support Knob Replacement

Removal Procedure



1. Pull the lumbar support knob.

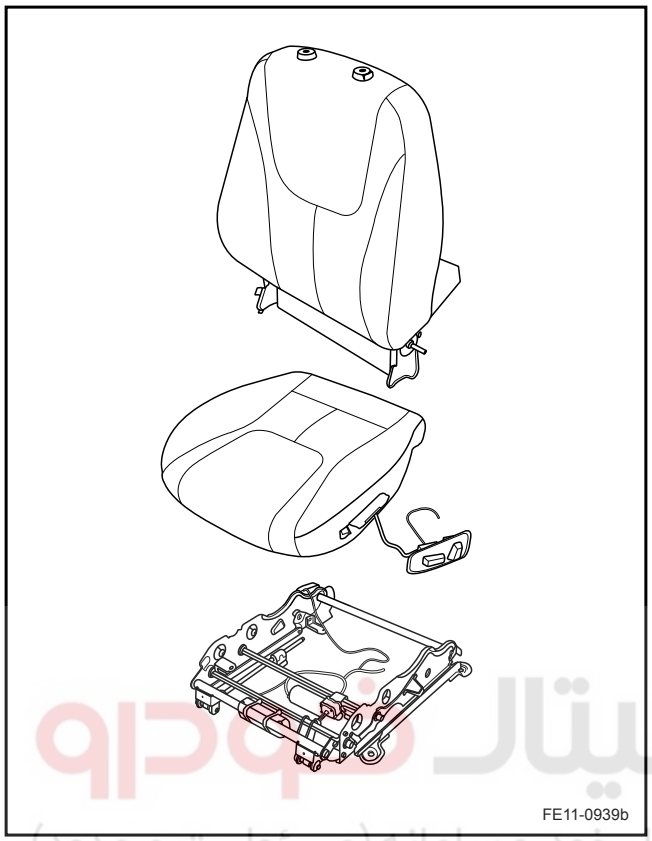
Installation Procedure:



1. Press the lumbar support knob into position.

11.11.8.6 Electric Seat Cushion Replacement

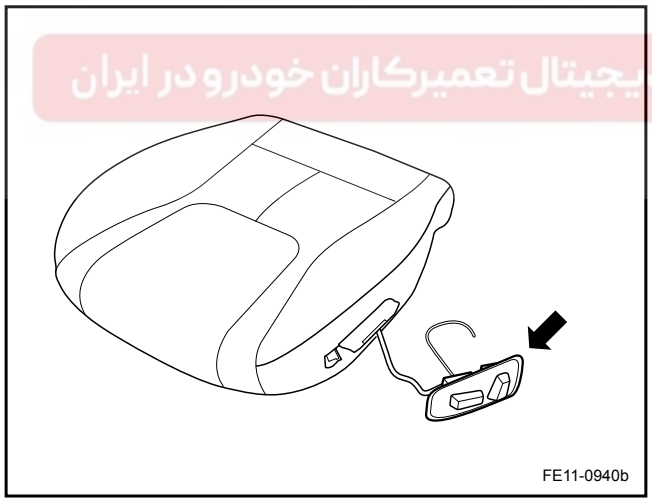
Removal Procedure


FE11-0939b

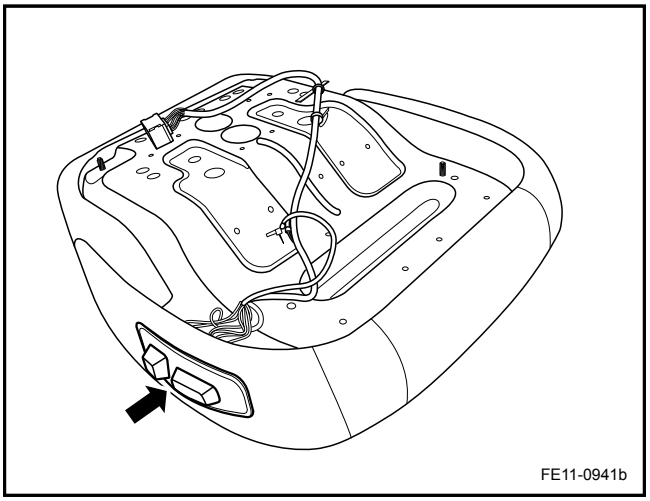
1. Remove the electric seat adjustment assembly. Refer to 11.11.8.8 Electric Seat Frame Assembly Replacement.

   Note

   Heaters and cushions are integrated.


FE11-0940b

2. Remove the seat adjustment switch panel, pull out seat adjustment switch wiring harness.



Installation Procedure:

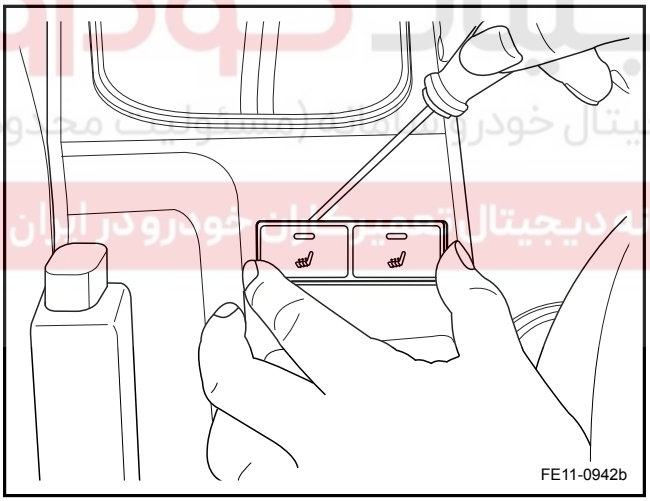
1. Run through the seat adjustment switch wiring harness and install the seat adjustment switch panel.
2. Install the electric seat adjustment switch assembly.

11.11.8.7 Seat Heating Switch Replacement

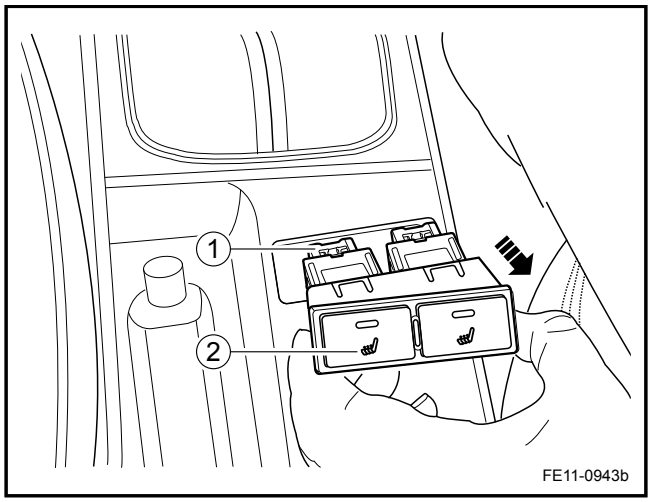
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the seat heating switch panel.



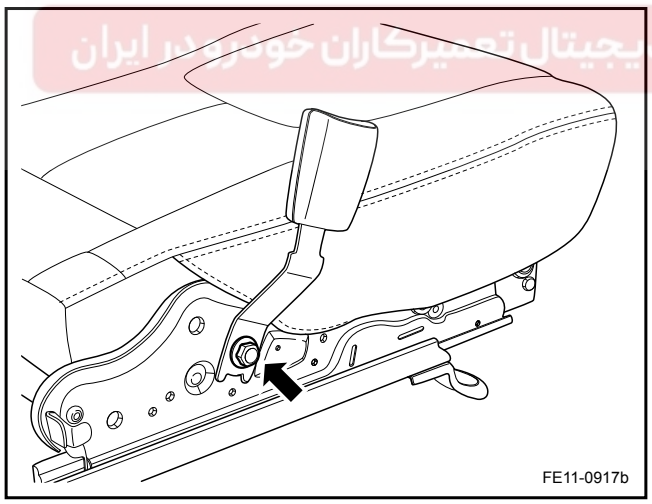
3. Disconnect the seat heating switch wiring harness connector (1).
4. Remove the seat heating switch (2).

Installation Procedure:

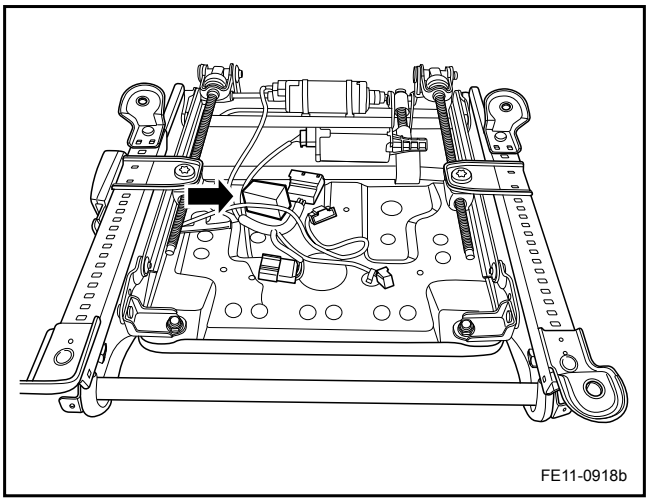
1. Press the seat heating switch into position.
2. Connect the seat heating switch wiring harness connector.
3. Install the seat heating switch panel.
4. Connect the battery negative cable.

11.11.8.8 Electric Seat Frame Assembly Replacement

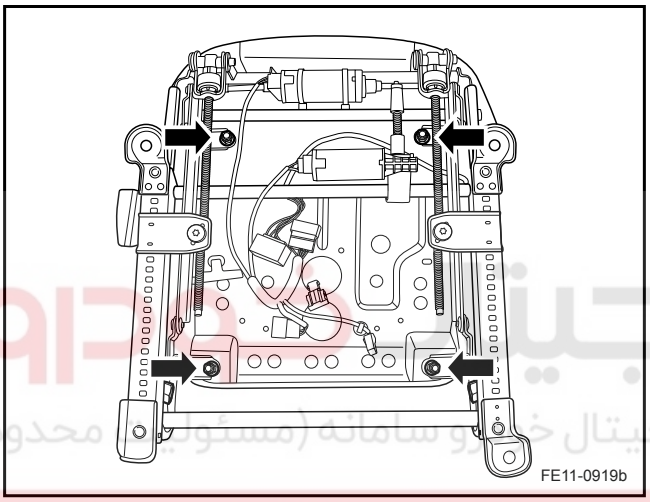
Removal Procedure



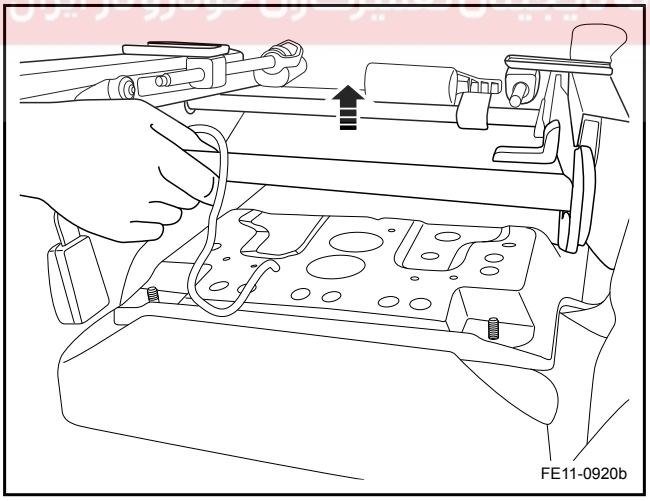
1. Remove the electric seat. Refer to 11.11.8.1 Front Electric Seat Replacement.
2. Remove the seat side trim panel. Refer to 11.11.8.2 Seat Side Trim Panel Replacement.
3. Remove the electric seat back adjustment motor. Refer to 11.11.8.3 Electric Seat Back Adjustment Motor Replacement.
4. Remove the electric seat back. Refer to 11.11.8.4 Electric Seat Back Replacement.
5. Remove the seat belt buckle, remove the seat belt warning switch harness.



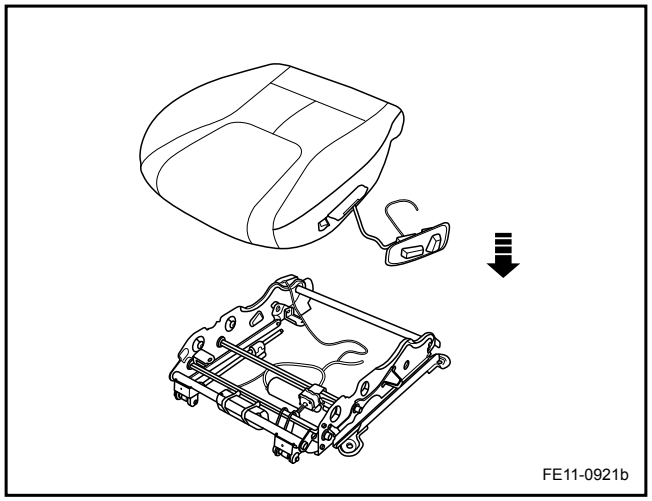
6. Remove the harness retaining clip, disconnect the wiring harness connector between the seat adjustment switch and the seat adjustment motor.



7. Remove the seat cushion to seat frame retaining nut.

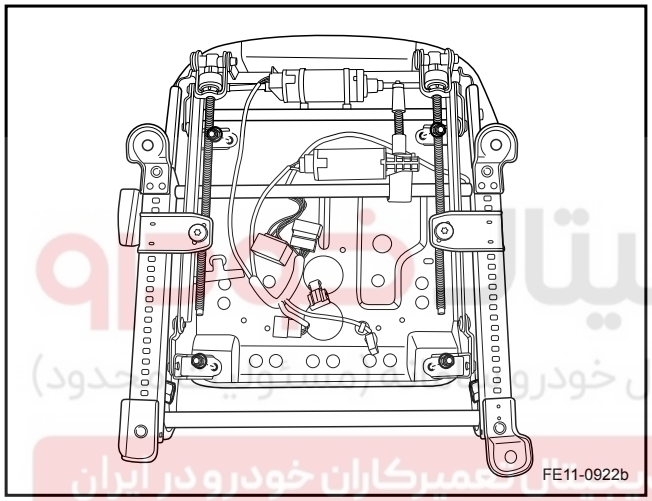


8. Separate the seat cushion and seat frame.



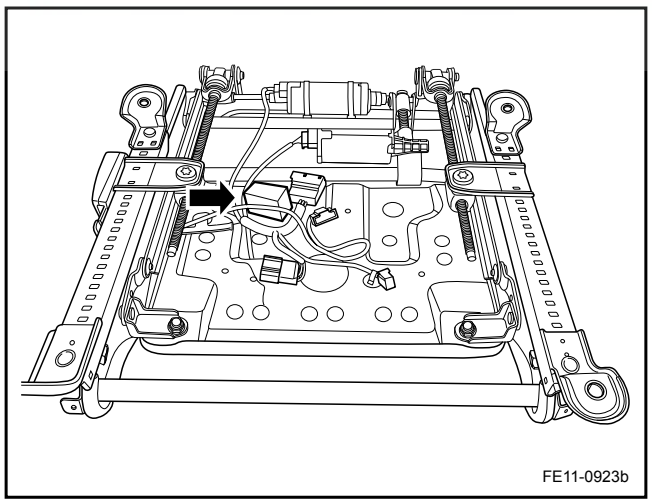
Installation Procedure:

1. Assemble the seat cushion and the seat frame.

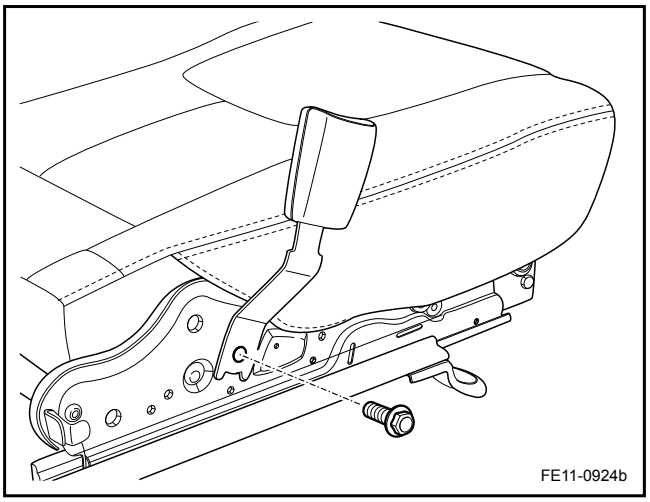


2. Install the seat cushion and seat frame assembly.

   Torque: 20 Nm (Metric) 15 lb-ft (US English)



3. Connect the wiring harness connector between the seat adjustment switch and the seat adjustment motor.



4. Install the seat belts buckle, run through the seat belt warning switch harness, retain the seat bottom wiring harness.
5. Install the electric seat back.
6. Install the electric seat back adjustment motor.
7. Install the seat side trim panel.
8. Install the electric seat.

11.11.8.9 Electric Seat Adjustment Switch Replacement

1. Refer to 11.11.8.6 Electric Seat Cushion Replacement.

11.12 Defrosting

11.12.1 Specifications

11.12.1.1 Defroster Working Condition Requirements

Ignition Switch Status	Battery Voltage (V)	Defrost Working Condition
OFF	-	OFF
ON	>10.7	Normal
ACC / ON / START	<10.3	Stop Working

11.12.2 Description and Operation

11.12.2.1 Description and Operation

Defroster system main components include following:

- Defrost Button (Air-Conditioning Panel)
- Air-Conditioning Control Module
- Left and Right Outside Rearview Mirror Heater
- Rear Window Heater

Defrost button is located on the air-conditioning control panel. The rear window heater is located on the rear window. The left and right rearview mirrors are integrated with heaters.

11.12.3 System Working Principle

11.12.3.1 Working Principle

The defrost button located on the air-conditioning control panel sends defrosting request signals to the air-conditioning control module. air-conditioning control module receives the defrosting signal and then send it to the BCM. BCM controls the rear window defroster grille and the left and right rearview mirror heaters.

BCM monitor the voltage signal. When the battery voltage is greater than 10.7 V, and the ignition lock switch is at "ON", it allows the rear defroster / heated mirrors to work. When the battery voltage is less than 10.3 V, BCM does not allow the rear defroster / heated mirrors to work.

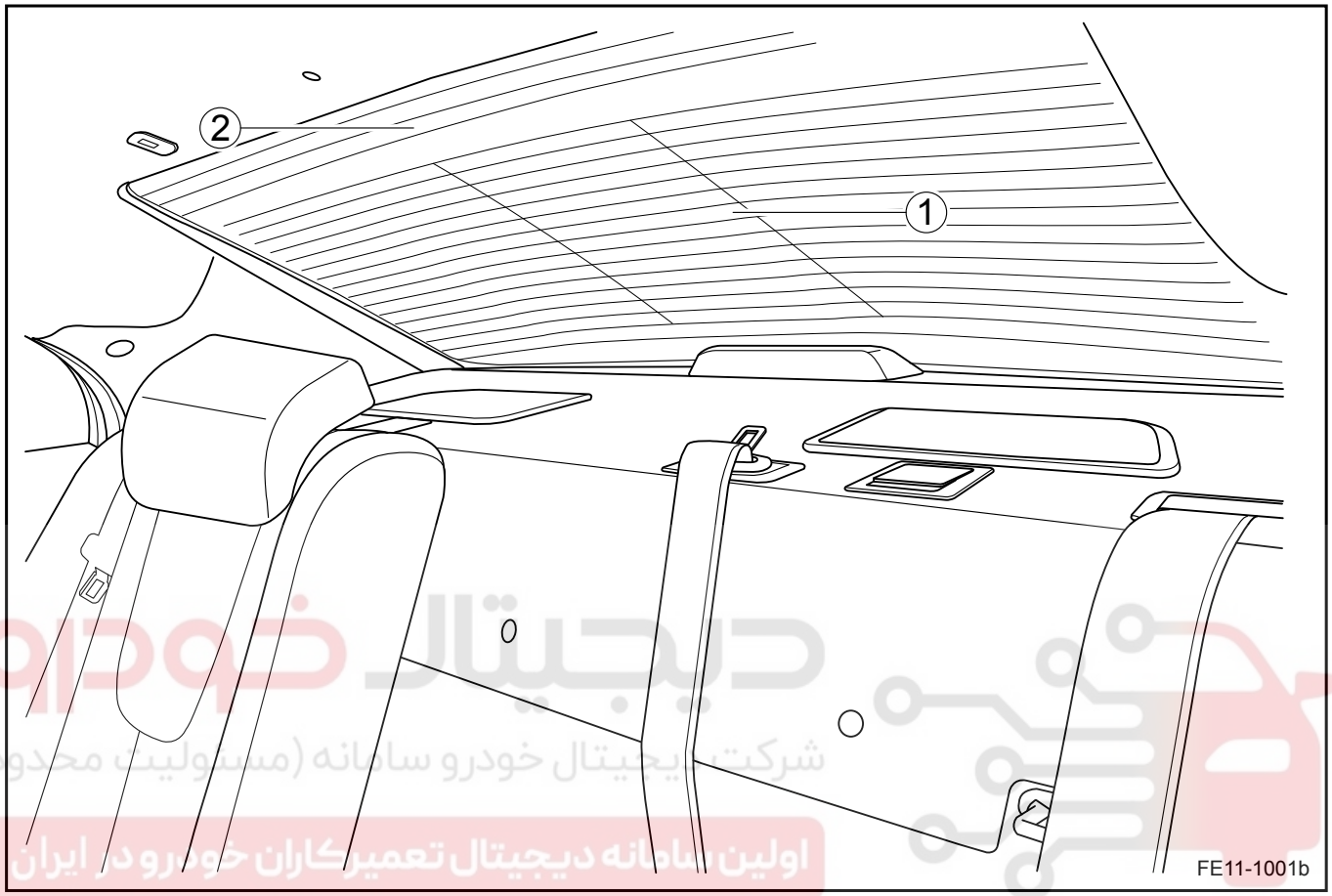
The rear defroster / rearview mirror heating switch is a push button switch. After pressing the defrost / mirror heating switch, the rear defroster / heated mirrors work for 12 min; if the heating switch is pressed again during heating, the heating stops. Press the rear defrost / mirror heating switch again, the rear defroster / heated rearview mirror work 12 min (accumulative run 12 min) stops. The reset time parameter is 36 min. Before the 36 min, the heating time is not accumulative.

In the low voltage status, the rear defroster / heated rearview mirror do not work. but previous timer (12 min) will not be interrupted and will still be included in the next cycle. The rear defroster / heated mirror working signal is sent to the ECM through a dedicated circuit. ECM increase the engine speed according to the demand.

11.12.4 Component Locator

11.12.4.1 Component Locator

Rear Window Defroster Grille (Sedan)

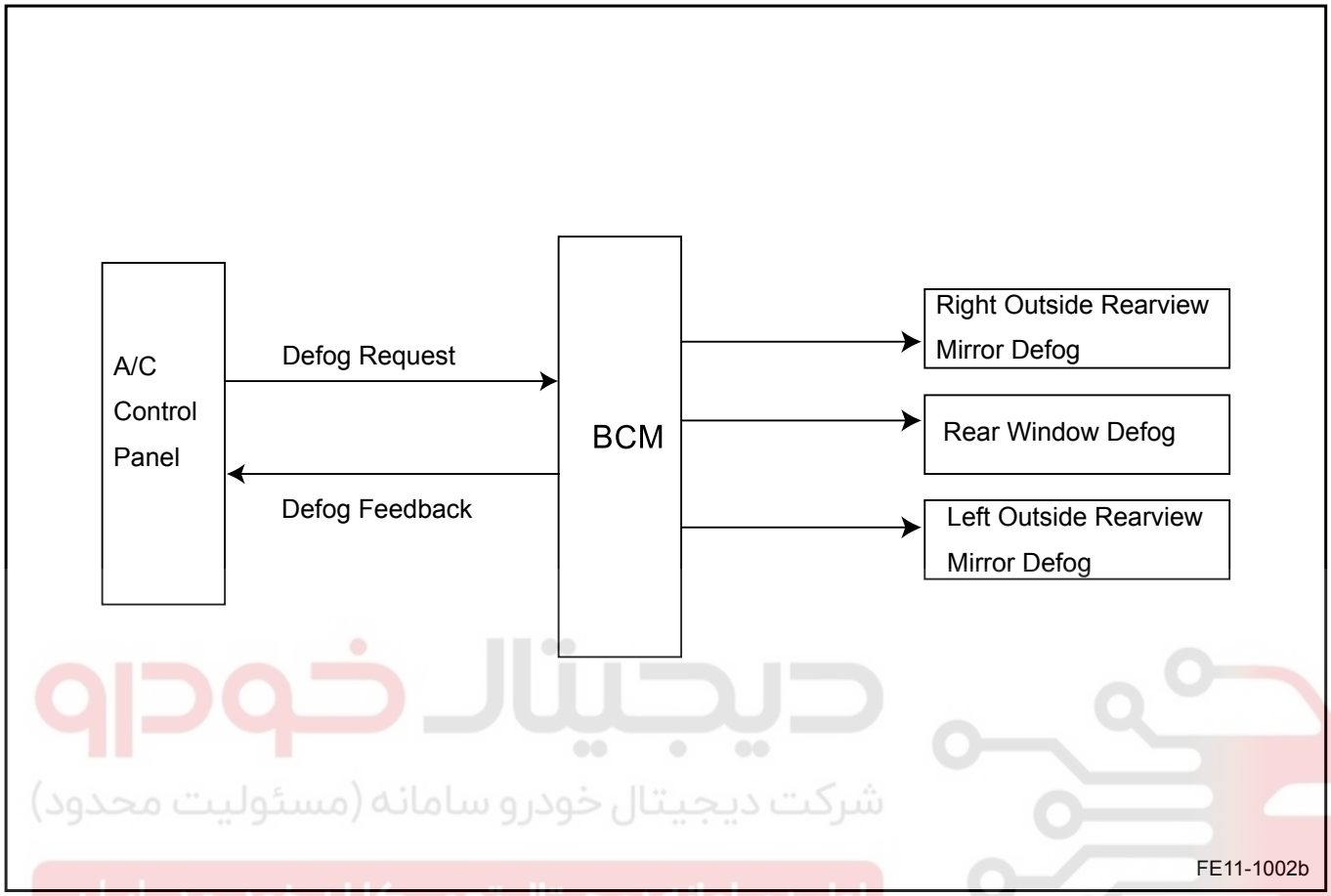


Legend

1. Rear Window Defroster Grille
2. Radio Antenna

11.12.5 Schematic

11.12.5.1 Schematic



11.12.6 Diagnostic Information and Procedures

11.12.6.1 Diagnosis Description

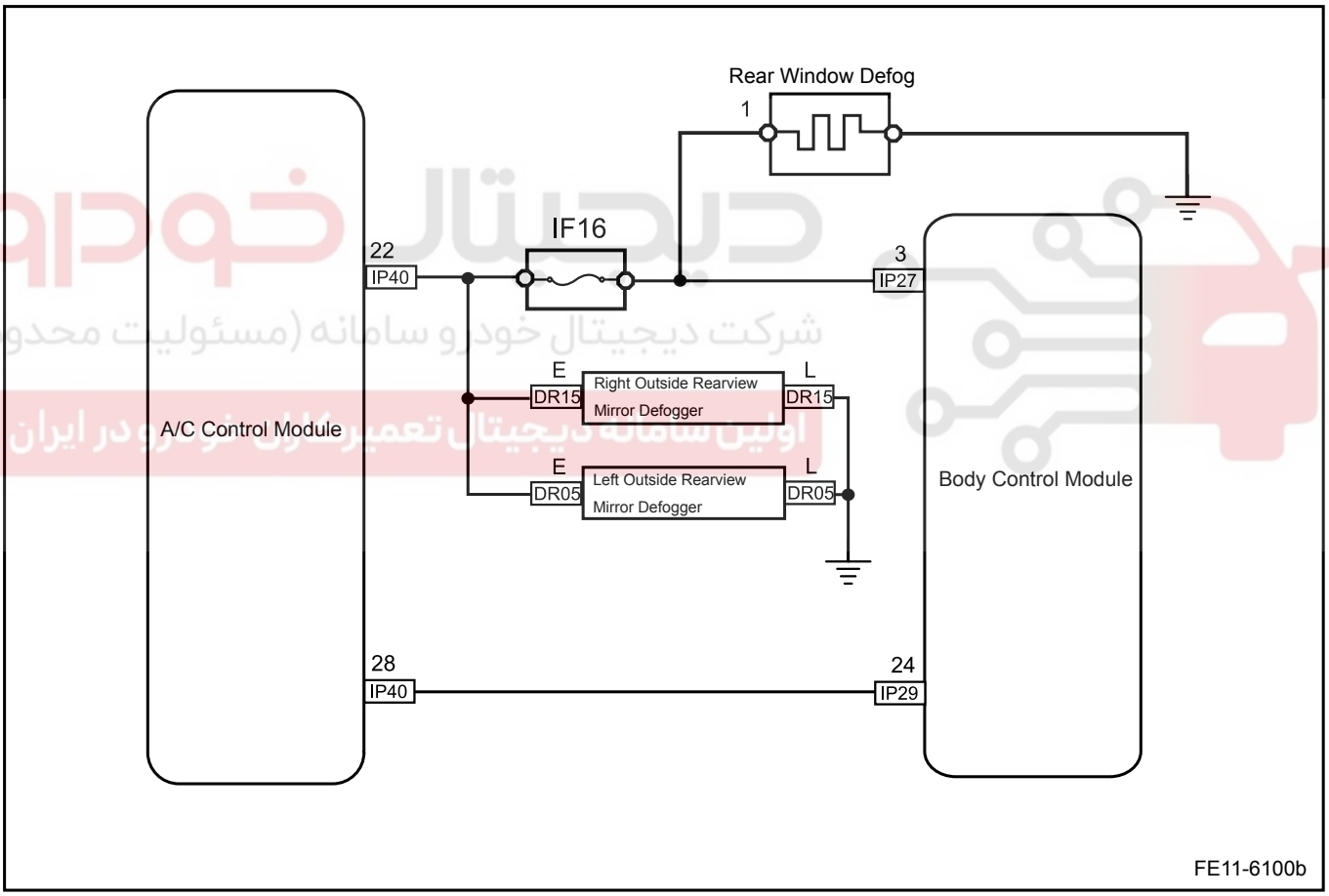
Refer to 11.12.2.1 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.12.6.2 Visual Inspection

- Check installed aftermarket equipment that may affect the defrosting operation.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- If all the defroster are inoperative, check and repair the power supply or ground circuit poor connection, or open circuit.

11.12.6.3 Rear Window Defroster Inoperative

Schematic:



Diagnostic Steps:

Step 1	Use scan tool active test function to check the defroster working status.

(a) Select as the following sequence: Body Control Module / active test / rear defroster output control.

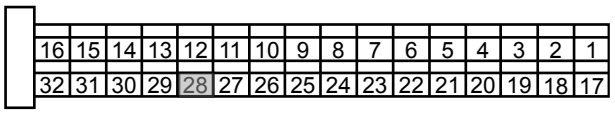
Is the rear defroster working properly?

No → Go to step 6

Yes

Step 2	Check the defrost button.

A/C Control Panel Harness Connector IP40



FE11-6105b

(a) Press the defrost button.
(b) At the same time,test continuity between the air-conditioning control module harness connector IP40 terminal No.28 and the body ground with a multimeter.

Test Terminal	Test Conditions	Continuity
IP40 28 - Body Ground	Release	10 kΩ or higher
IP40 28 - Body Ground	Press	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 4

No

Step 3	Replace the air-conditioning control panel.

(a) Replace the air-conditioning control panel. Refer to 8.2.8.1 Air-conditioning Control Panel Replacement.

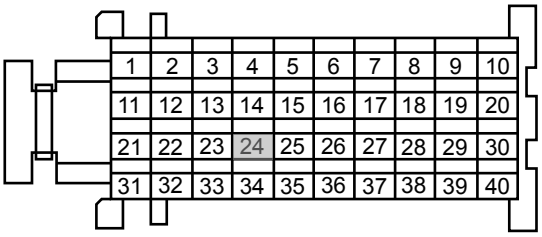
Is the rear window defrosting function working correctly?

Yes → System normal

No

Step 4	Check the defrost request signal.

Body Control Module 1 Harness Connector IP29



FE11-6102b

(a) Press the defrost button.
(b) At the same time, test continuity between the BCM harness connector IP29 terminal No.24 and the ground with a multimeter.

Test Terminal	Test Conditions	Continuity
IP29 24 - Body Ground	Release	10 kΩ or higher
IP29 24 - Body Ground	Press	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 6

No

Step 5	Repair the defrost request signal open circuit.

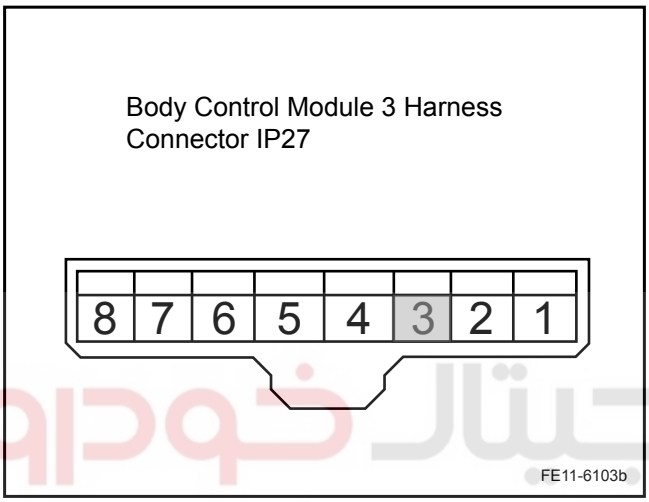
(a) Repair the open circuit.

Is the rear window defrosting function working correctly?

Yes → System normal

No

Step 6	Check the BCM defrost power output.



(a) Press the defrost button.

(b) At the same time, measure the BCM harness connector IP27 terminal No.3 voltage with a multimeter.

Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 8

No

Step 7	Replace the BCM.

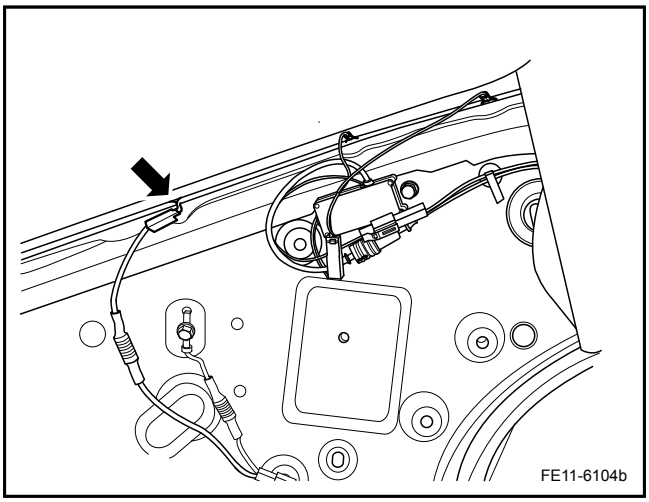
(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.

Is the rear window defrosting function working correctly?

Yes → System normal

No

Step 8	Measure the rear Window defroster grid supply voltage.



(a) Press the defrost button.

(b) At the same time, measure the rear window defrost grille harness connector terminal No.1 voltage with a multimeter.

Test Terminal	Test Conditions	Standard Voltage
Terminal 1	Release	0 V
Terminal 1	Press	11-14 V

Is the voltage specified value?

Yes → Go to step 10

No

Step 9	Repair the rear window defrosting grid power supply circuit.

(a) Repair the open circuit between the BCM harness connector IP27 terminal No.3 and the rear window defroster grille harness connector terminal No.1.

Is the rear window defrosting function working correctly?

Yes → System normal

No

Step 10	Check the rear window defroster grille grounded circuit.

(a) Disconnect the rear window defroster grille wiring harness connector.

(b) Measure resistance between the rear window defroster grille harness connector terminal No.1 and the ground with a multimeter.

Resistance Standard Value: Less than 1 Ω

Yes → Go to step 12

No

Step 11	Repair the rear window defroster grille ground circuit.

(a) Repair the open circuit.

Is the rear window defrosting function working correctly?

Yes → System normal

No

Step 12	Replace the rear window defroster grille.

(a) Replace the rear window defroster grille. Refer to 11.5.8.10 Rear Window Replacement (Sedan).

Confirm the repair completed.

Next

Step 13	System normal.

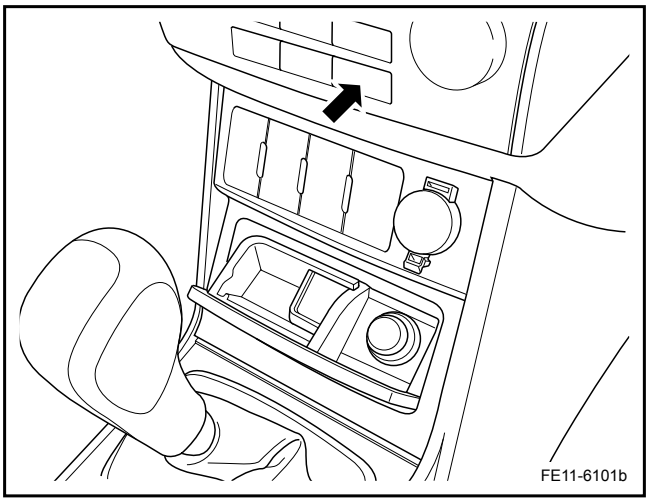
11.12.6.4 Electric Rearview Mirror Defroster Inoperative

Schematic:

Refer to 11.12.6.3 Rear Window Defroster Inoperative.

Diagnostic Steps:

Step 1	Check the defrost button.



(a) Press the defrost button.
(b) At the same time, test continuity between the air-conditioning control module harness connector IP40 terminals No.28 and the body ground with a multimeter.

Test Terminal	Test Conditions	Continuity
IP40 28 - Body Ground	Release	10 kΩ or higher
IP40 28 - Body Ground	Press	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 3

No

Step 2	Replace the air-conditioning control panel.

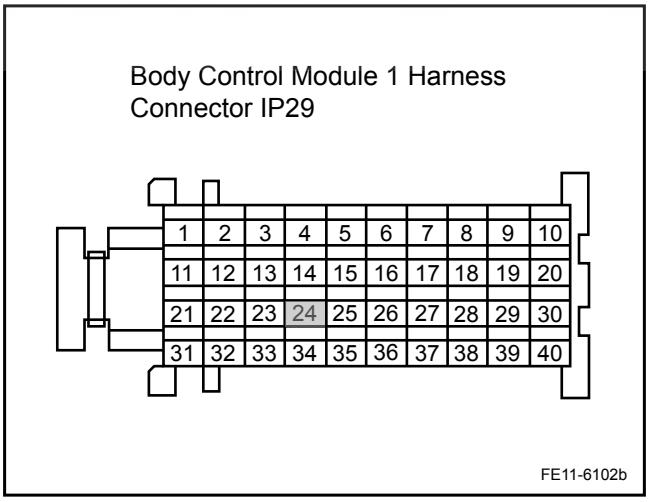
(a) Replace the air-conditioning control panel. Refer to 8.2.8.1 Air-conditioning Control Panel Replacement.

Is the rearview mirror defrost function working correctly?

Yes → System normal

No

Step 3	Check the defrost request signal.



(a) Press the defrost button.
(b) At the same time, test continuity between the BCM harness connector IP29 terminal No.24 and the body ground with a multimeter.

Test Terminal	Test Conditions	Continuity
IP29 24 - Body Ground	Release	10 kΩ or higher
IP29 24 - Body Ground	Press	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 5

No

Step 4	Repair the defrost request signal open circuit.

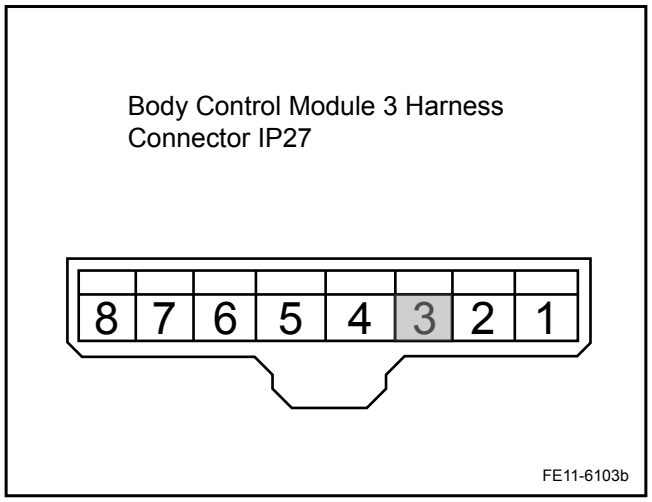
(a) Repair the open circuit.

Is the rearview mirror defrost function working correctly?

Yes → System normal

No

Step 5	Check the BCM defrost power output.



(a) Press the defrost button.
(b) At the same time, measure the BCM harness connector IP27 terminal No.3 voltage with a multimeter.
Standard Voltage: 11-14 V
Is the rearview mirror defrost function working correctly?

Yes → Go to step 7

No

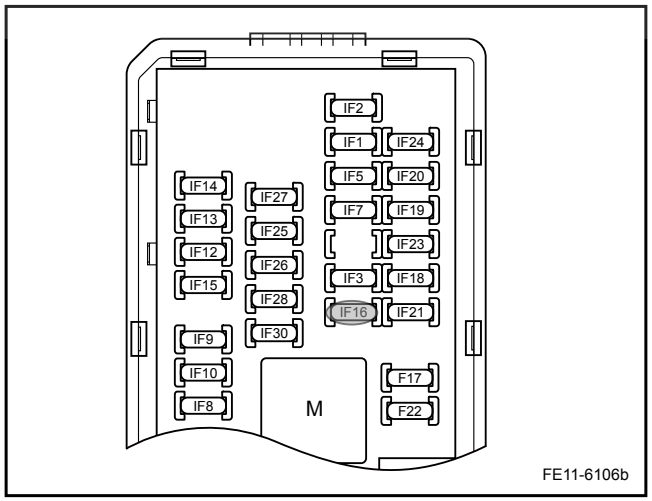
Step 6	Replace the BCM.

(a) Replace the BCM. Refer to 11.10.8.1 BCM Replacement.
Is the rearview mirror defrost function working correctly?

Yes → System normal

No

Step 7	Check the fuse IF16.



(a) Check whether the fuse IF16 is blown.
Fuse Rated Current: 10 A

No → Go to step 9

Yes

Step 8	Check the fuse IF16 circuit.

(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.

(c) Replace with fuses with rated current.

Is the rearview mirror defrost function working correctly?

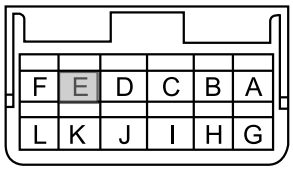
Yes → System normal

No

Step 9	Check the rearview mirror defrost supply voltage.

Left Outside Rearview Mirror Harness Connector DR05

Right Outside Rearview Mirror Harness Connector DR15



FE11-6107b

(a) Press the defrost button.

(b) Measure the electric rearview mirror harness connector DR05 (left) or DR15 (right) terminal E voltage with a multimeter.

Standard Voltage: 11-14 V

Yes → Go to step 11

No

Step 10	Repair rearview mirror defrost power supply open circuit.

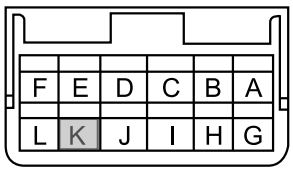
(a) Repair the open circuit between the rearview mirror defroster harness connector DR05 (left) or DR15 (right) terminal E and the BCM harness connector IP27 terminal No.3.

Is the rearview mirror defrost function working correctly?

Step 11	Check the rearview mirror defrost ground circuit.

Left Outside Rearview Mirror Harness Connector DR05

Right Outside Rearview Mirror Harness Connector DR15



FE11-6108b

(a) Disconnect the rearview mirror harness connector.

(b) Measure resistance between the mirror harness connector DR05 (left) or DR15 (right) terminal K and the ground with a multimeter.

Resistance Standard Value: Less than 1 Ω

Yes → Go to step 13

No

Step 12	Repair the rearview mirror defrost ground circuit open.

(a) Repair the open circuit.

Is the rearview mirror defrost function working correctly?

Yes → System normal

No

Step 13	Replace the rearview mirror glass.

(a) Replace the rearview mirror glass. Refer to 11.5.8.1 Outside Rearview Mirror Replacement.

Confirm the repair completed.

Next

Step 14	System normal.

11.12.7 Removal and Installation

11.12.7.1 Rear Window Defrost Grille Replacement

Refer to 11.5.8.10 Rear Window Replacement (Sedan).

11.12.7.2 Electric Rearview Mirror Heater Replacement

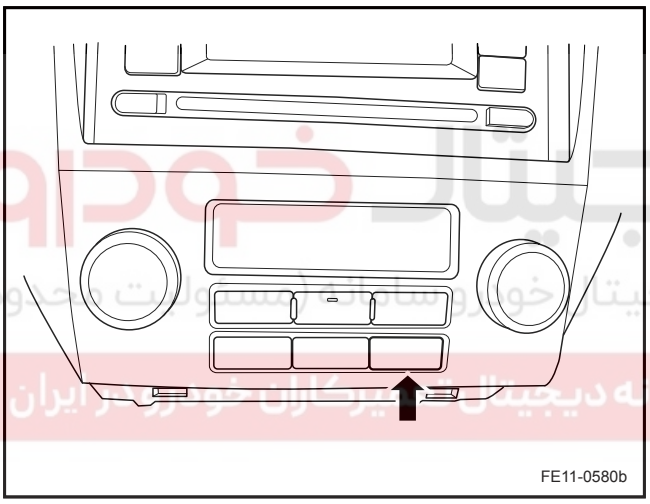
Refer to 11.5.8.1 Outside Rearview Mirror Replacement.

11.12.7.3 Rear Window Defrost Switch Replacement

Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the air-conditioning control panel.. Refer to 8.2.8.1 Air-conditioning Control Panel Replacement.

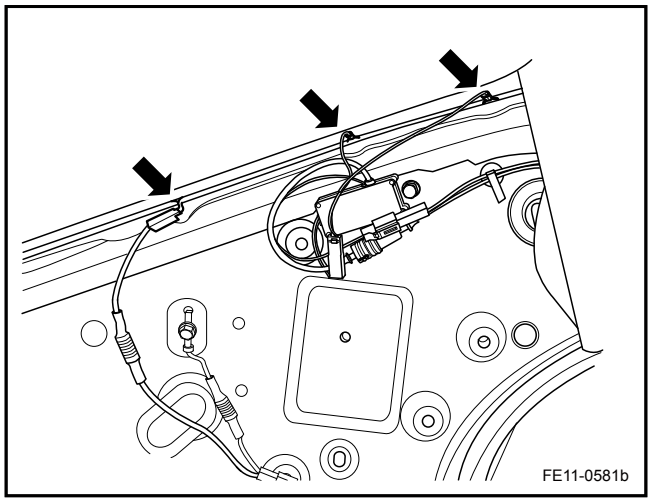
Installation Procedure:

1. Install the air-conditioning control panel.
2. Connect the battery negative cable.

11.12.7.4 Rear Window Defroster Lead Repair

Note

By re-soldering the rear window defroster lead or terminal can be re-connected. 3% silver and rosin welding electrodes.



1. Before welding, polish parts with fine steel.
2. Using a brush, apply a small amount of rosin in the lead wires and repair parts.
3. Dipping the tip of the solder to make sure adequate welding material.
4. Use only enough melting heat, do not overheat the wire.

11.13 Horn

11.13.1 Specifications

11.13.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Horn Assembly Retaining Bolts	M8 × 14	8-11	6-8
Horn Bracket Retaining Nuts	M12	8-11	6-8

11.13.1.2 Speaker Specifications

Sound Level	105-118 dB	
Audio	Treble	290-330
	Bass	370-410

11.13.2 Description and Operation

11.13.2.1 Description and Operation

Horns are located in the engine compartment, retaining to the vehicle on both sides in front of the radiator. The right side horn is a tweeter, the left one is a woofer, controlled by the steering wheel horn switch. When the steering wheel horn button is pressed, the horn circuit is supplied with power, so the horns sound.

11.13.3 System Working Principle

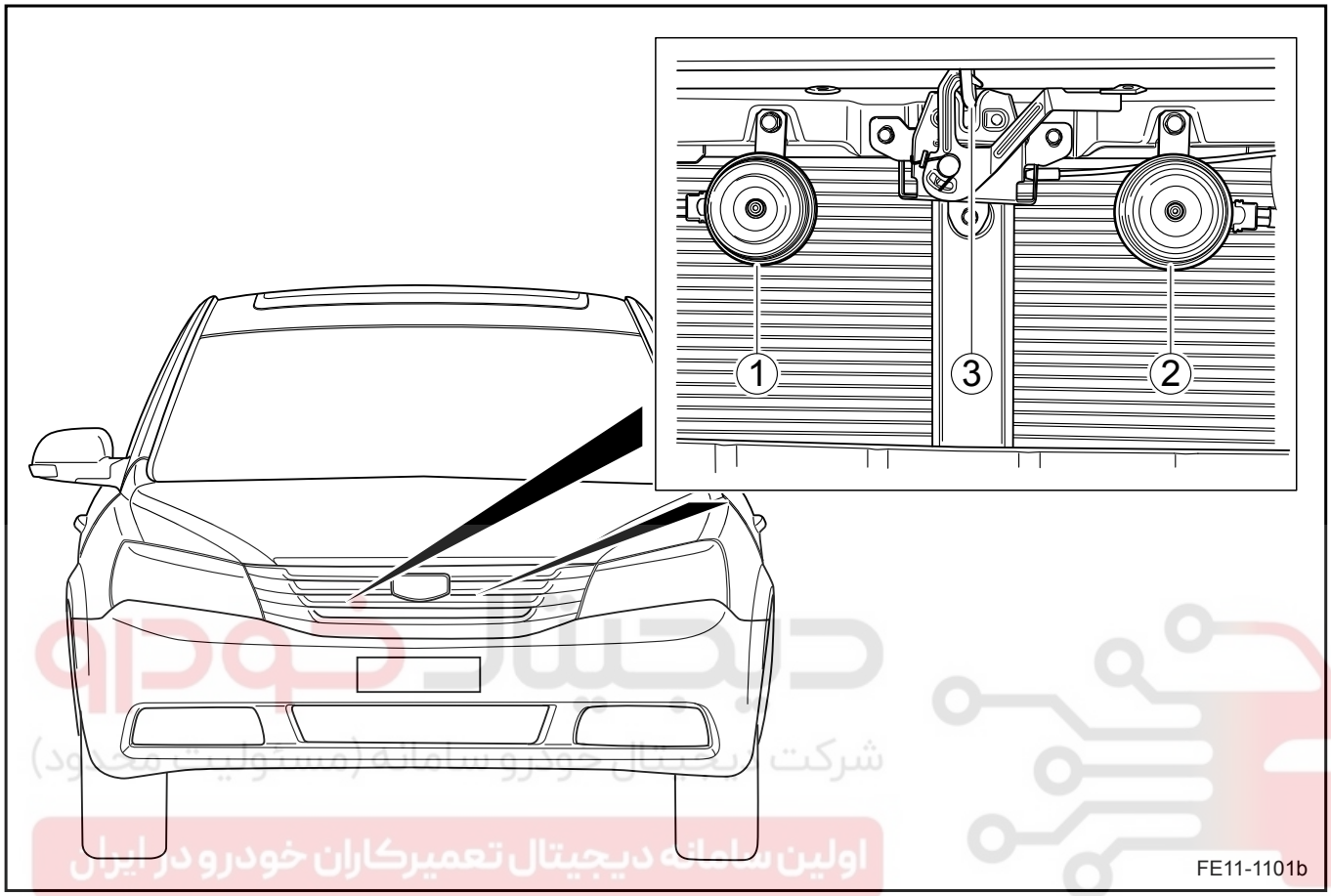
11.13.3.1 System Working Principle

Horn control mode is the power supply, namely, horn switch controls the horn relay pull-in. The power is supplied from the relay to the horn. Horns are often grounded.

11.13.4 Component Locator

11.13.4.1 Component Locator

Horn



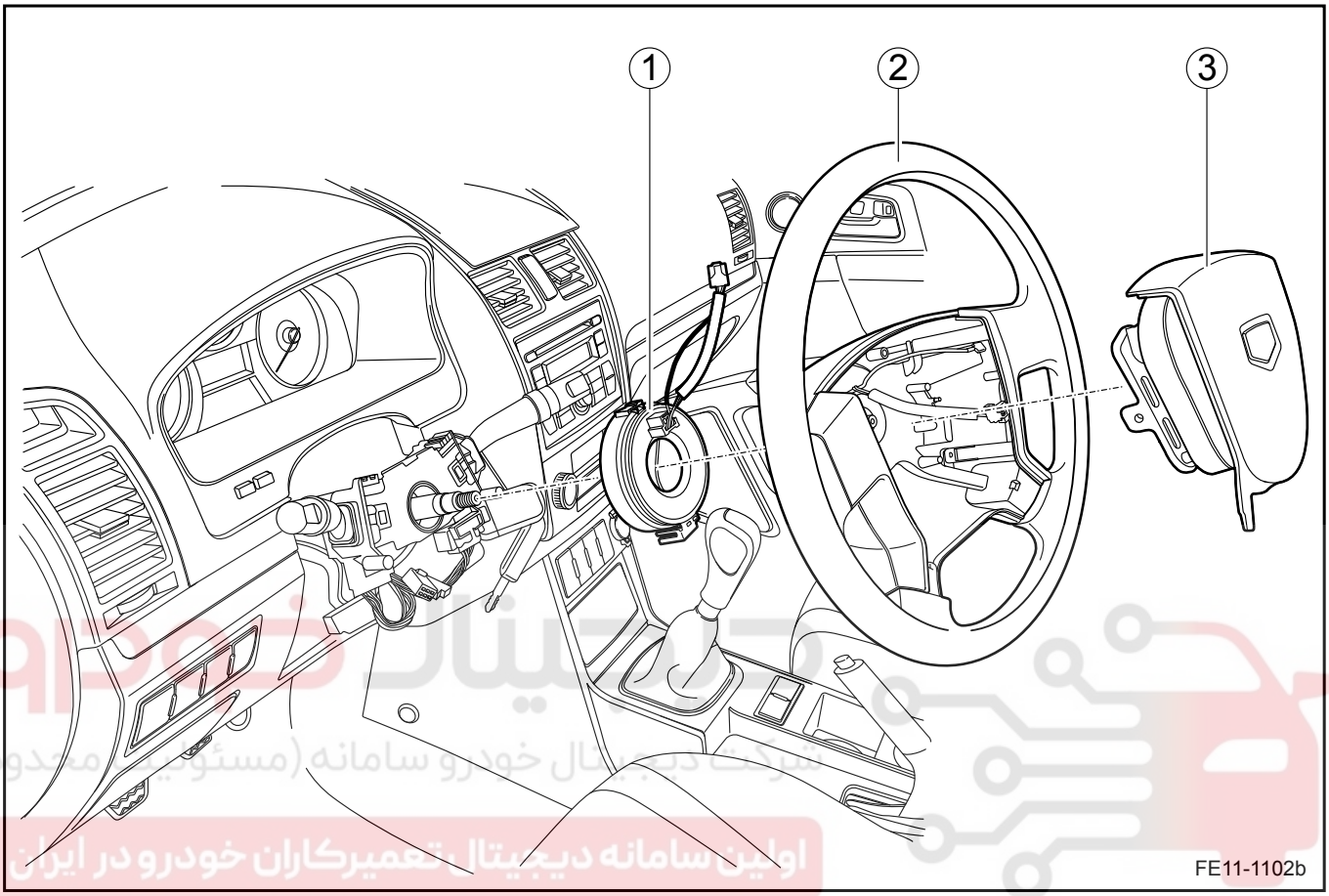
Legend

1. Tweeter
2. Subwoofer
3. Hood Latch

11.13.5 Disassemble View

11.13.5.1 Disassemble View

Horn Switch

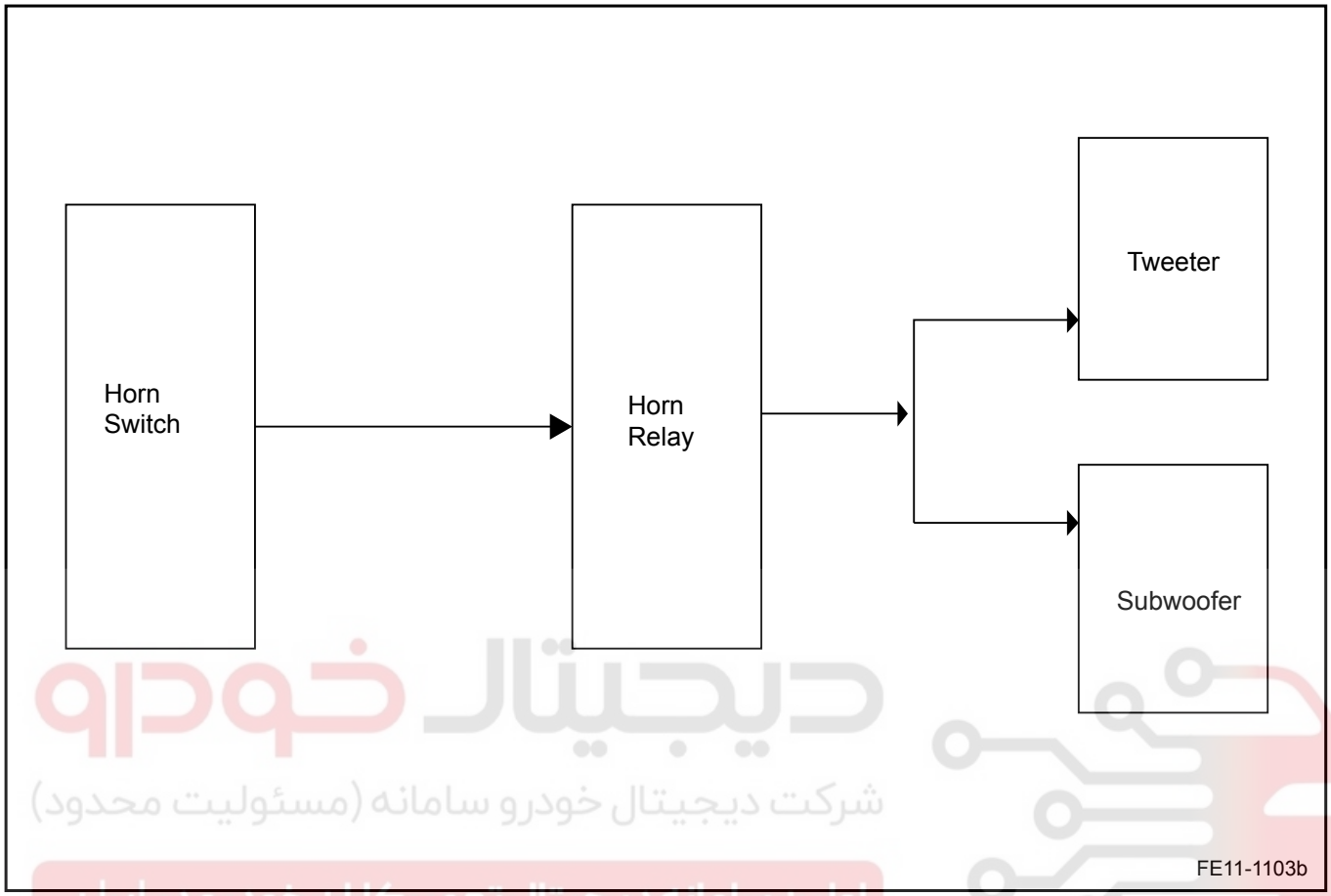


Legend

1. Clock Spring
2. Steering Wheel
3. Driver Front Airbag (Horn Switch)

11.13.6 Schematic

11.13.6.1 Schematic



11.13.7 Diagnostic Information and Procedures

11.13.7.1 Diagnosis Description

Refer to 11.13.2.1 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.13.7.2 Visual Inspection

- Check installed aftermarket equipment that may affect the horn operation.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- If the two speakers are inoperative, check and repair the power supply or switch ground circuit poor connection or open circuit before replace the horn.

Warning!

For horn and the clock spring removal and inspection, please strictly abide by the airbag system safety operation. Refer to "SIR Warning."

11.13.7.3 Horn Switch Contact Adjustment

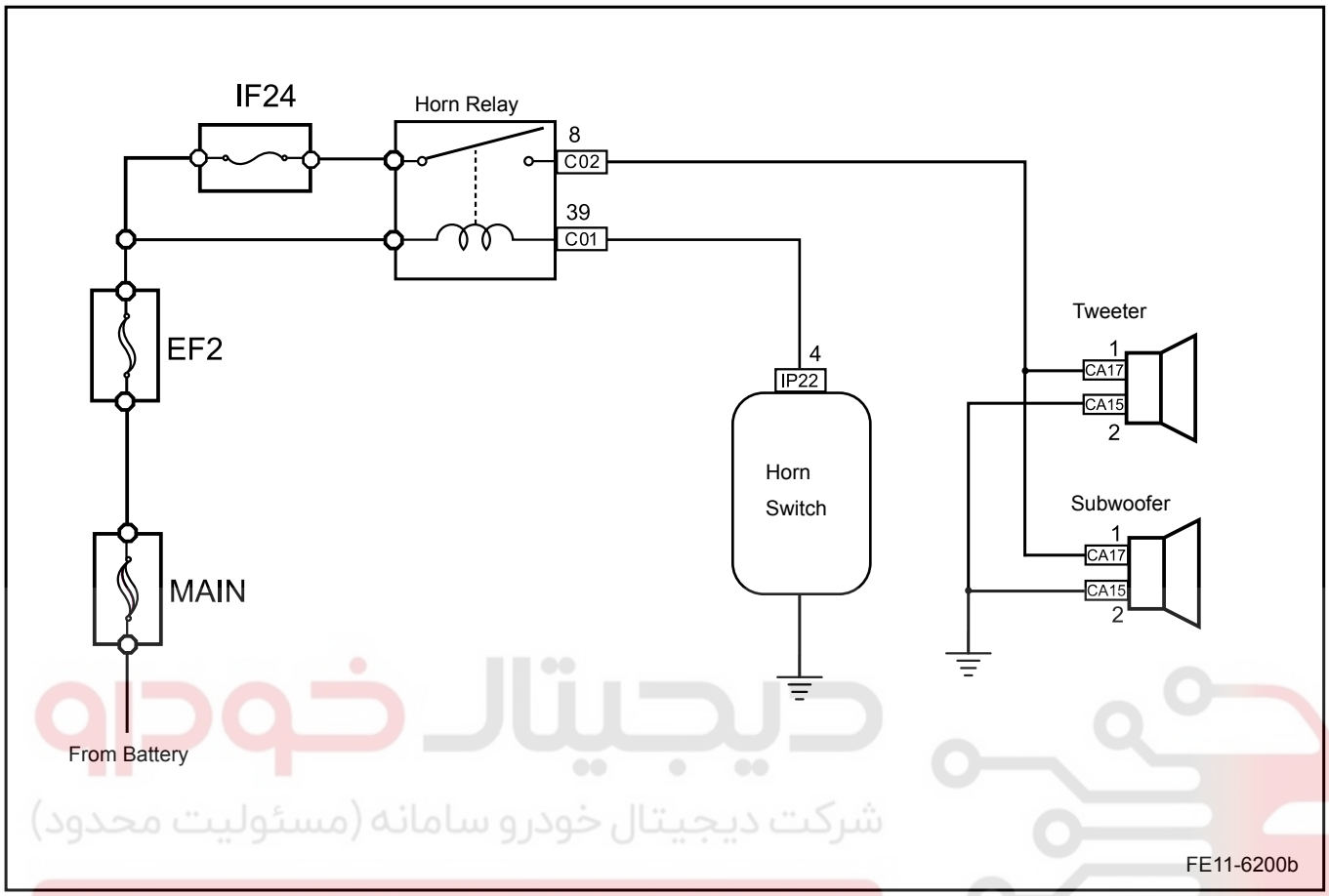
When horns are intermittent inoperative, or one side of the steering wheel horn push switch is inoperative, it is likely that the horn contact switch has poor connection. At this time, adjust the driver front airbag horn switch contact.

Warning!

For airbag module removal, please strictly abide by the airbag system safety operation. Refer to "SIR Warning."

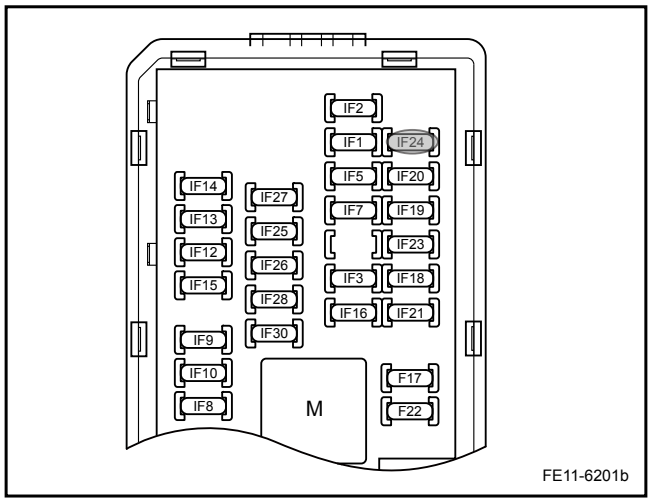
11.13.7.4 Horn Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the fuse IF24.



(a) Check whether the fuse IF24 is blown.

Fuse Rated Current: 10 A

No	Go to step 3

Yes

Step 2	Check fuse IF24 circuit.

(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.

Is horn working properly?

Yes → System normal

No

Step 3	Check the horn switch.

(a) Press the horn switch.
(b) At the same time, test continuity between the horn switch harness connector terminal No.1 and the ground with a multimeter.

Test Terminal	Test Conditions	Continuity
Terminal No.1 - Body Ground	Release	10 kΩ or higher
Terminal No.1 - Body Ground	Press	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 5

No

Step 4	Adjust the horn switch contacts.

(a) Adjust the horn switch contacts. Refer to 11.13.7.3 Horn Switch Contact Adjustment.

Is horn working properly?

Yes → System normal

No

Step 5	Check the clock spring.

(a) Press the horn switch.
(b) At the same time, test continuity between the clock spring harness connector IP22 terminal No.4 and the ground with a multimeter.

Test Terminal	Test Conditions	Continuity
Terminal 4 - Body Ground	Release	10 kΩ or higher

Terminal 4 - Body Ground	Press	Less than 1 Ω

Is the resistance specified value?

Yes → Go to step 7

No

Step 6	Repair clock spring open circuit.

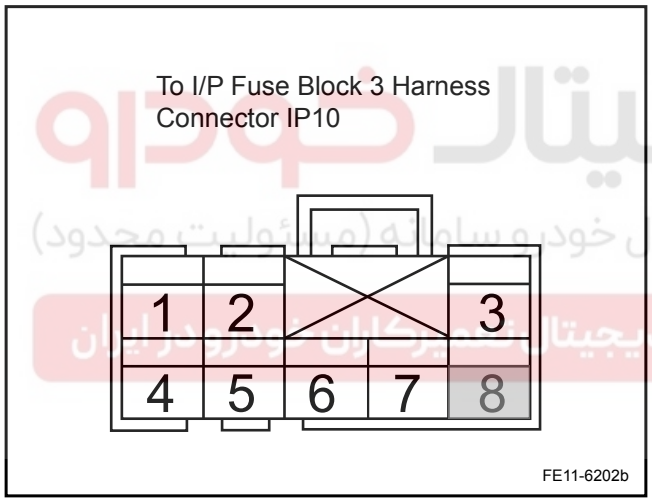
(a) Repair the open circuit between the clock spring harness connector IP22 terminal No.4 and the horn switch harness connector terminal No.1.
(b) If necessary, replace the clock spring.

Is horn working properly?

Yes → System normal

No

Step 7	Check the horn relay.



(a) Press the horn switch.
(b) Measure the I/P fuse block wiring harness connector IP10 terminal No.8 voltage with a multimeter.
Standard Voltage: 11-14 V

Yes → Go to step 9

No

Step 8	Replace the I/P fuse block.

(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace the I/P fuse block.

Is horn working properly?

Yes → System normal

No

Step 9	Check the horn power supply circuit.

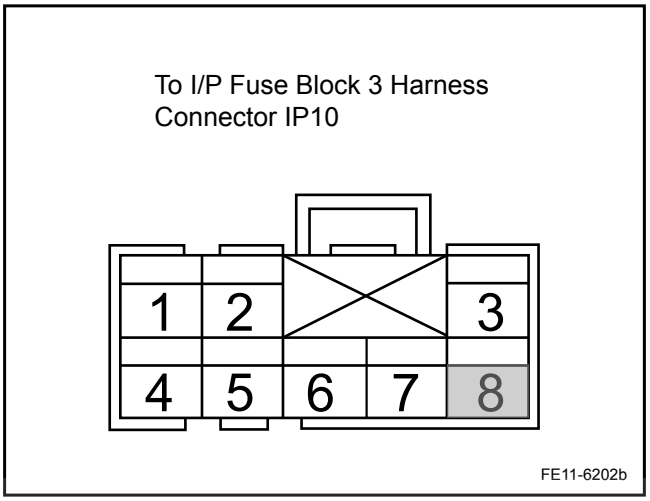
(a) Press the horn button.
(b) Measure the horn harness connector terminal No.1 voltage with a multimeter.

Standard Voltage: 11-14 V

Yes → Go to step 11

No

Step 10	Repair the horn power supply circuit open.



(a) Repair the open circuit between the horn harness connector terminal No.1 and the I/P fuse block wiring harness connector IP10 terminal No.8.

Is horn working properly?

Yes → System normal

No

Step 11	Check the horn ground circuit.

(a) Disconnect the horn wiring harness connector.

(b) Measure resistance between the harness connector terminal No.2 and ground with a multimeter.

Resistance Standard Value: Less than 1 Ω

Yes → Go to step 13

No

Step 12	Repair the horn ground circuit open.

(a) Repair the open circuit.

Is horn working properly?

Yes → System normal

No

Step 13	Replace the horn.

(a) Replace the horn. Refer to 11.13.8.1 Horn Replacement.

Confirm the repair completed.

Next

Step 14	System normal.

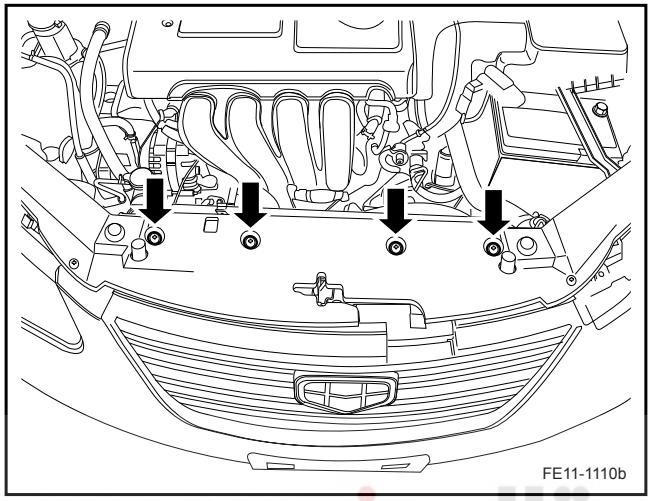
11.13.8 Removal and Installation

11.13.8.1 Horn Replacement

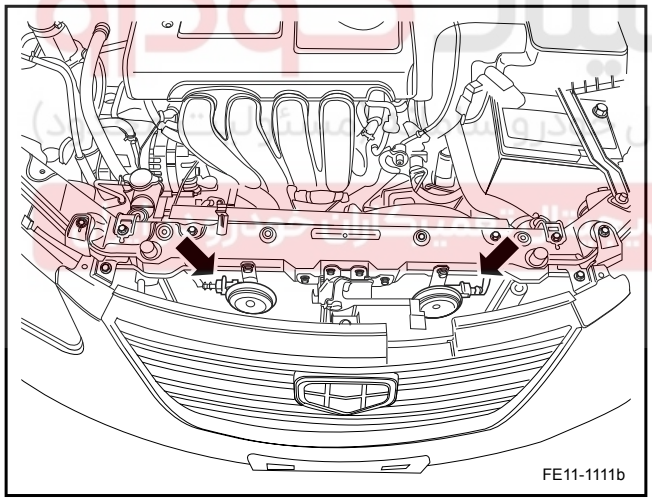
Removal Procedure

Warning!

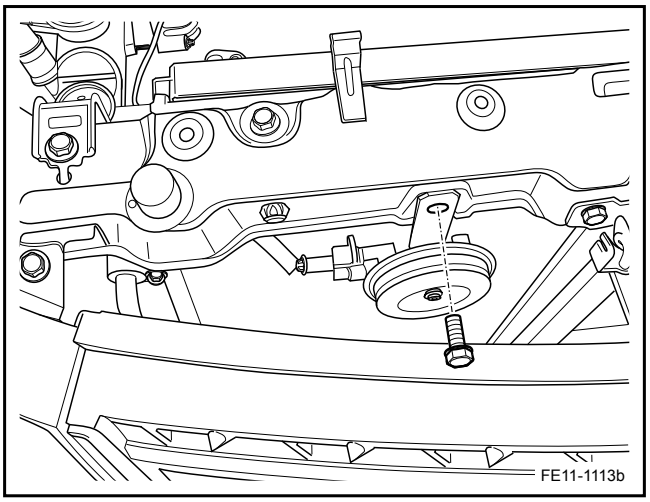
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the radiator upper grille retaining clips.

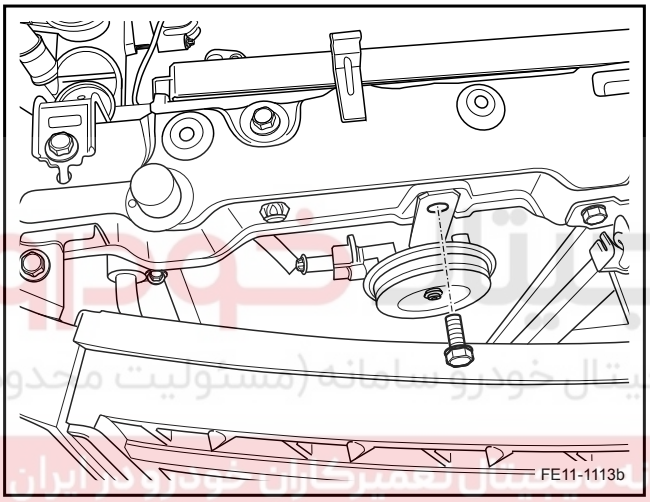


3. Disconnect the horn wiring harness connector.



4. Remove the horn retaining bolts.

Installation Procedure:

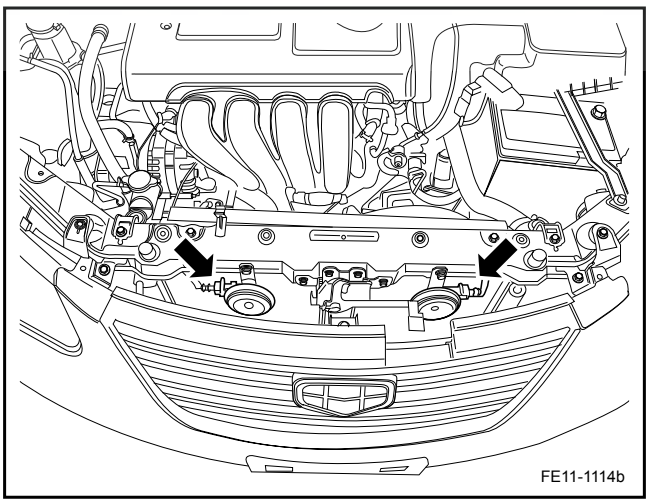


1. Tighten the horn retaining bolts.

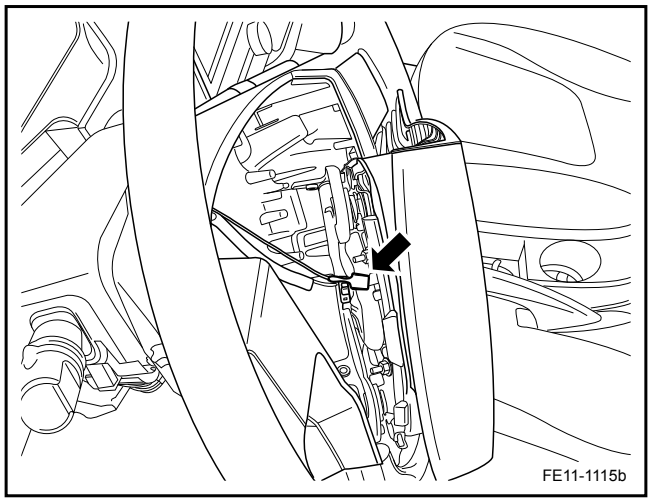
   Note

   Refer to "Fastener Notice" in "Warnings and Notices".

   Torque: 8-11 Nm (Metric) 6-8 lb-ft (US English)



2. Connect the horn wiring harness connector.
3. Install the radiator upper grille.
4. Connect the battery negative cable.



5. When removing the horn button, please note that the driver front airbag and the horn button is an integrated part.

   Warning!

   For horn and the clock spring removal and inspection, please strictly abide by the airbag system safety operation. Refer to "SIR Warning."

11.14 Reverse Radar

11.14.1 Specifications

11.14.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Reverse Radar Module Retaining Bolts	M6 × 16	8-11	6-8

11.14.2 Description and Operation

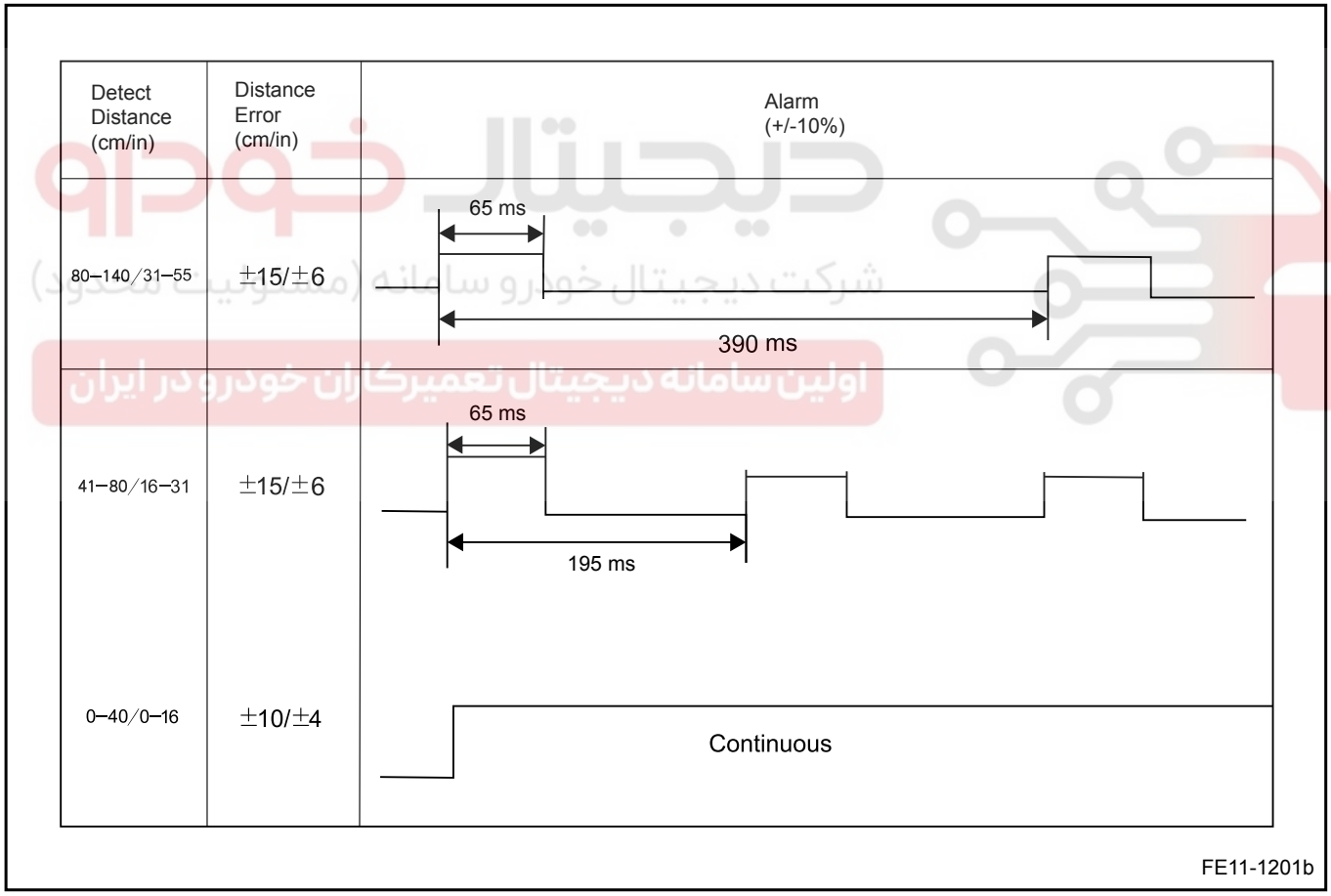
11.14.2.1 Description and Operation

1. When reversing (speed less than 5 km/h), reverse radar system detects the distance between obstacles and the vehicle and sends out corresponding alarm signals to ensure the parking safety. However, the obstacles within 30 cm to rear bumper (11.8 in) are not guaranteed to be detected.
2. Reverse sensor control unit converts the signal traveling time from the sensor to the obstacle, and then from the obstacle to the sensor signal to determine the obstacle distance.
3. Reverse radar system consists of sensors on the rear bumper, a control unit and a built-in buzzer in the instrument cluster.

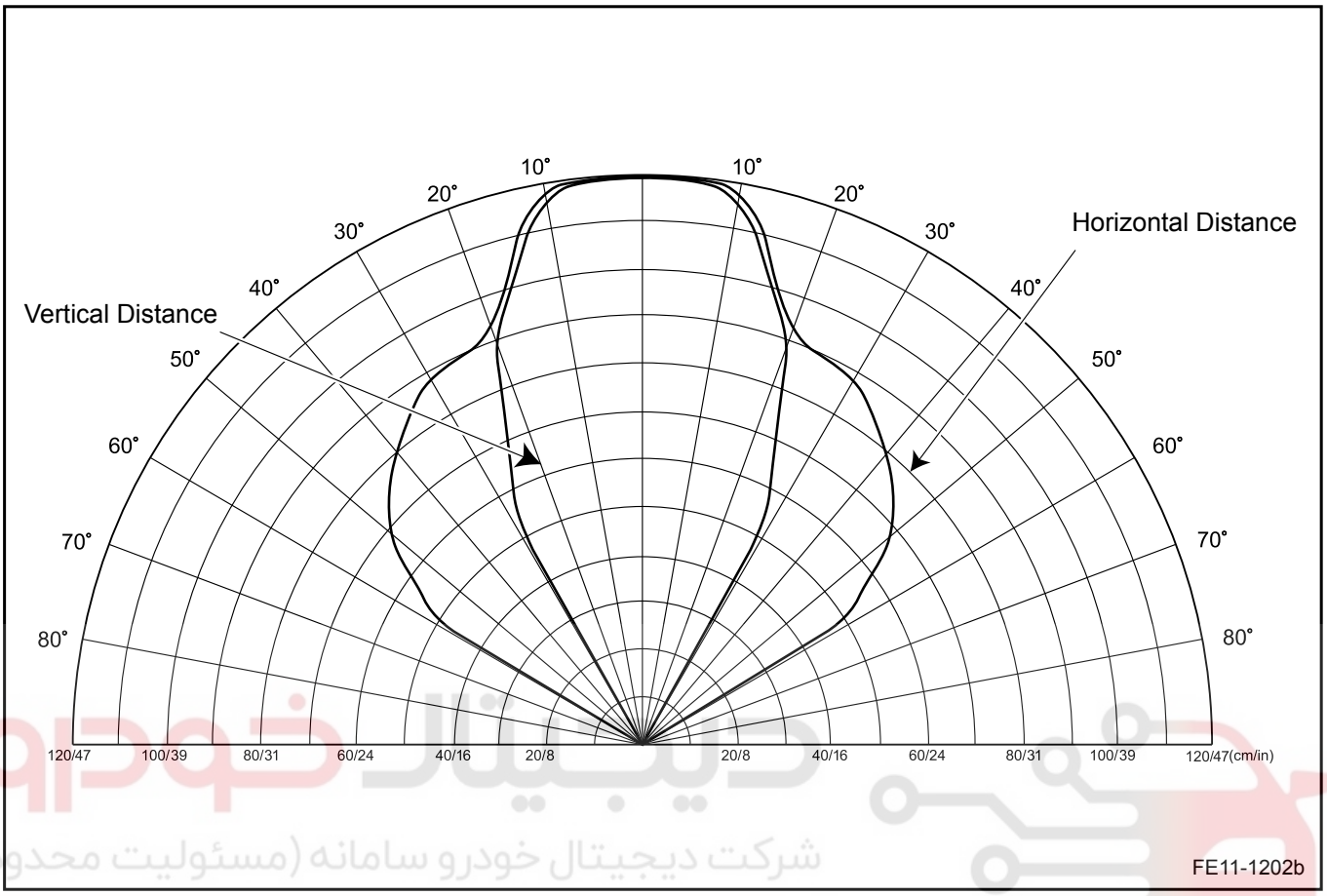
Note

1. According to the distance to obstacles, the system can give the driver the corresponding alarm signal (buzzer) and thus provide confidence for the driver safe parking, but this process does not mean that careless parking, or the driver can avoid parking failures.
2. This system's ability to detect distance and obstacles is limited, the driver must be careful when th obstacle is not detected. In particular, when driving across the obstacles, the driver can not solely rely on the system.

11.14.2.2 Alert Tone Level



11.14.2.3 Detection Area



For the reversing radar system, when the reversing speed is less than 5 km/h, the detection area is a straight line from the rear bumper 140 cm (55 in), the corner distance is 60 cm (24 in).

11.14.3 System Working Principle

11.14.3.1 Reverse Radar Control Unit Functions

- Produce TX Signal To Drive The Sensor Work
- Receive The RX Signal From The Obstacle
- Compare The RX Signal With The Reference Level
- Send Alarm According To The Detected Obstacles Distance
- Sensor Fault Diagnosis
- Drive Buzzer Alarm
- Provide Sensor Drive Voltage

11.14.3.2 Sensor-Driven Sequence

Five-Step Cycle:

Left Corner Sensor=Left Corner Sensor;

Left Middle Sensor=Left Middle Sensor;

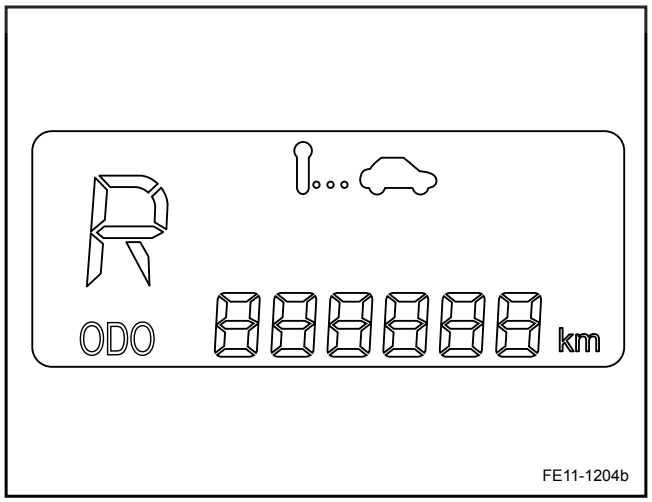
Right Middle Sensor=Right Middle Sensor;

Right Corner Sensor=Right Corner Sensor;

Right Middle Sensor=Right Middle Sensor.

11.14.3.3 Reverse Radar Display

Reverse radar indicator in the instrument cluster is on the LCD lower half right side. When reversing, the reverse radar indicator blinks with 1Hz frequency on the LCD.



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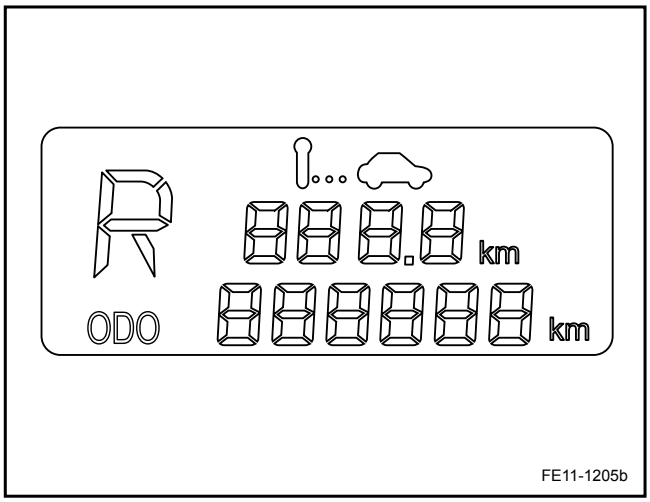
Reverse radar sign and odometer sign share a car icon on the LCD. Displaying the reverse radar and the odometer have conflict. When reverse radar is displayed, the odometer display will be temporarily unavailable, as shown above. This principle also applies to travel time and reverse radar conflict.



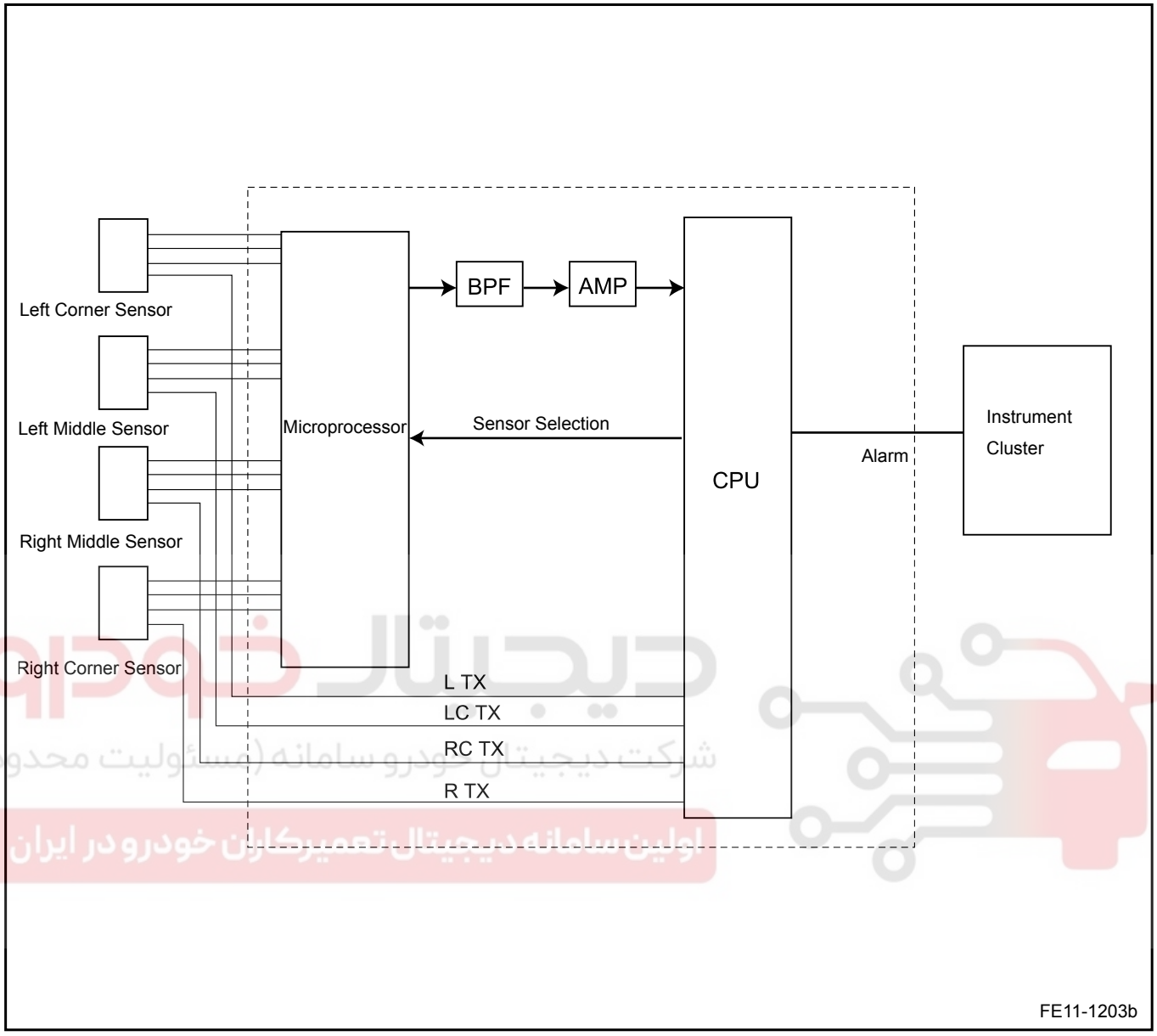
FE11-1205b

When reversing, if the the middle row does not display the time or odometer, then there is no conflict, the middle row displays the normal value, as shown above.

11.14.3.4 Buzzer Driver

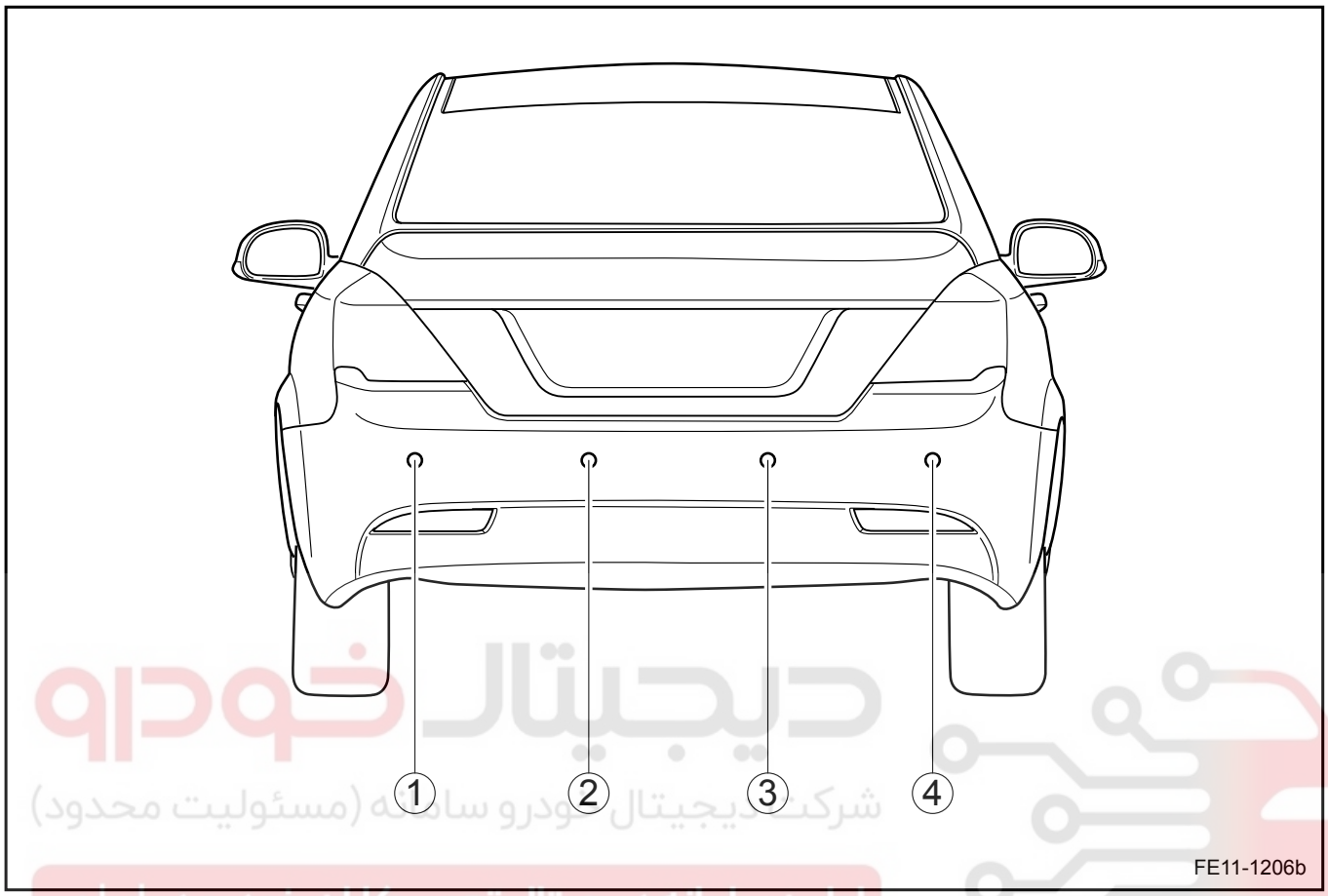
Buzzer is integrated within the instrument cluster, and connected to the reverse radar control module through cable.

Buzzer Driver Diagram



11.14.4 Component Locator

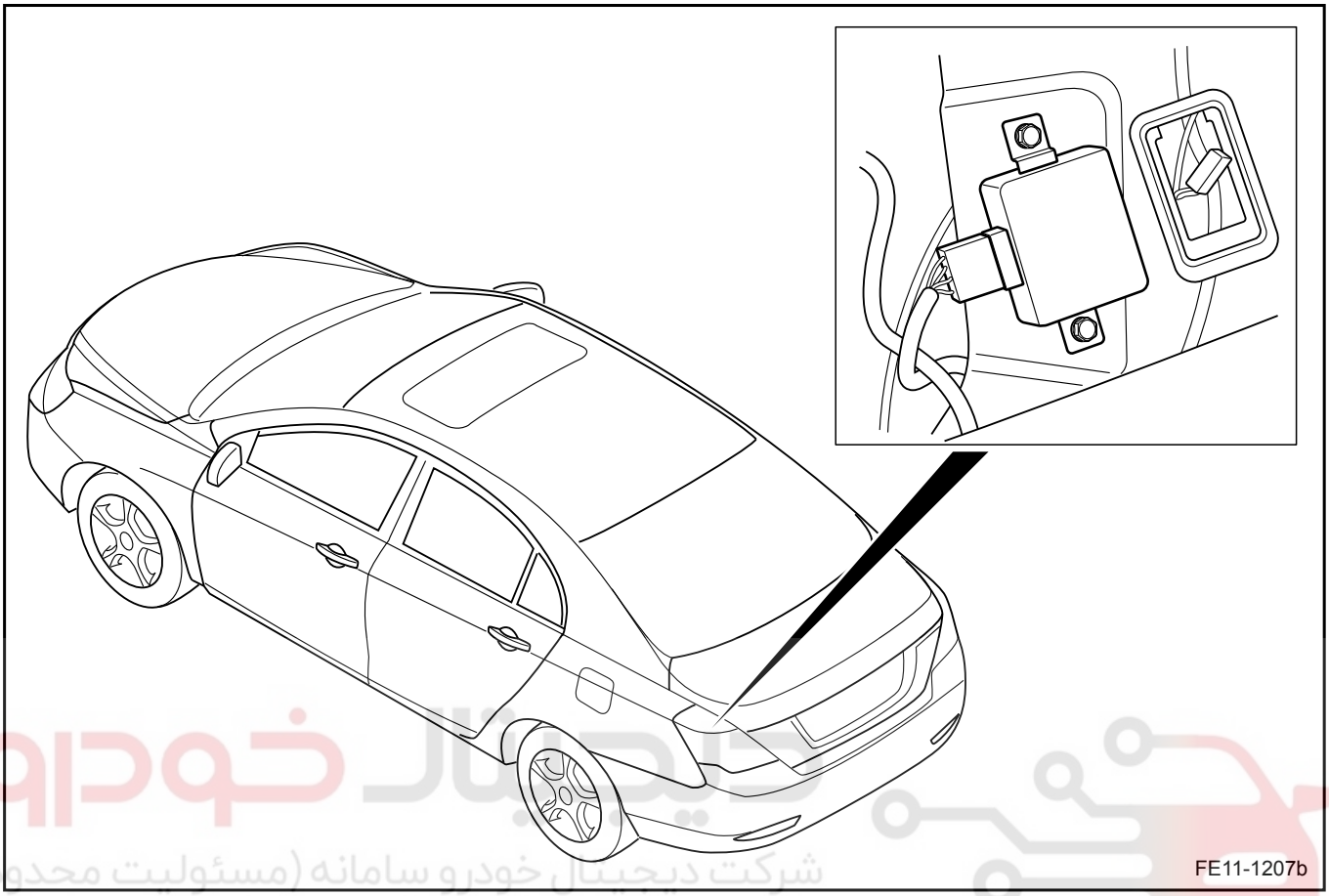
11.14.4.1 Component Locator



Legend

1. Left Corner Sensor
2. Left Middle Sensor
3. Right Middle Sensor
4. Right Corner Sensor

Reverse Radar Control Module



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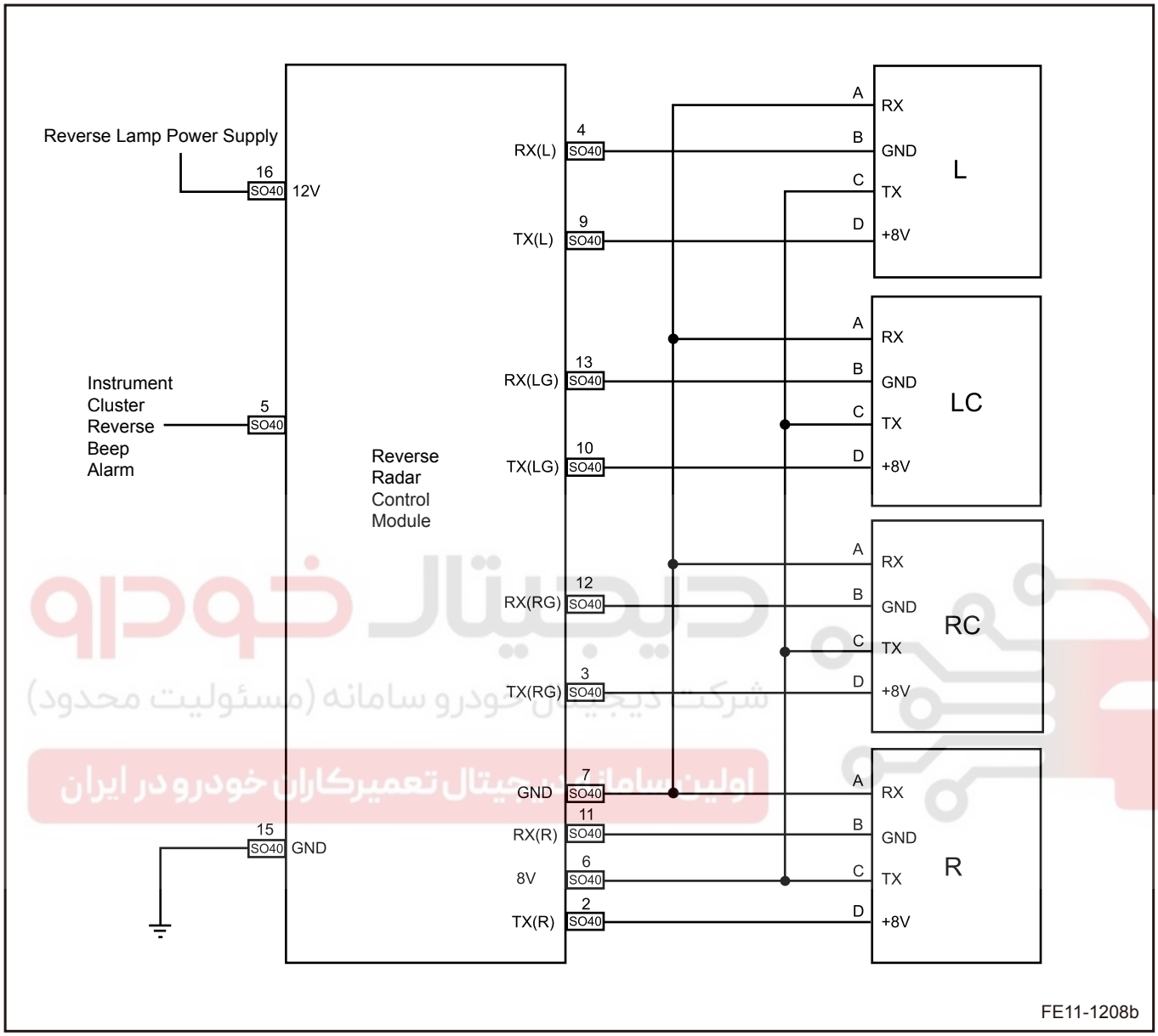
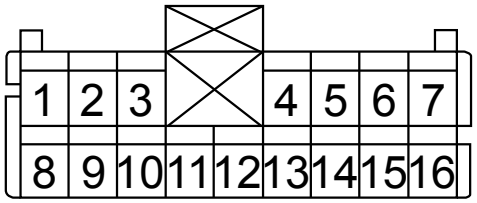
11.14.5 Schematic

11.14.5.1 Schematic



11.14.5.2 Reverse Radar Control Module Terminal List

Reverse Radar Control Module Harness Connector SO40



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Terminal ID	Wiring Color	Terminal Descriptions	Status	Specified Conditions
1	- -	Empty	- -	- -
2	R/W	The Right Corner Sensor Data Output	Gear In Reverse	0-5 V 40 KHz, 50% PWM
3	L/G	Right Middle Sensor Data Output	Gear In Reverse	0-5 V 40 KHz, 50% PWM
4	Br/R	Left Corner Sensor Data Input	Gear In Reverse	0-3.5 V
5	L	Buzzer Drive Signal	Trigger Alarm	Data Signals
6	P	Sensor Power Supply	Gear In Reverse	8 V
7	O	Sensor Ground	Always	GND
8	- -	Empty	- -	- -
9	L / Y	Left Corner Sensor Data Output	Gear In Reverse	0-5V 40 KHz, 50% PWM
10	Gr	Left Middle Sensor Data Output	Gear In Reverse	0-5V 40 KHz, 50% PWM
11	Y	Right Corner Sensor Data Input	Gear In Reverse	0-3.5 V
12	W	Right Middle Sensor Data Input	Gear In Reverse	0-3.5 V
13	R	Left Middle Sensor Data Input	Gear In Reverse	0-3.5 V
14	- -	Empty	- -	- -
15	B	Control Module Ground	Always	GND

16	R	Control Module Power Supply	Gear In Reverse	12 V

11.14.6 Diagnostic Information and Procedures

11.14.6.1 Diagnosis Description

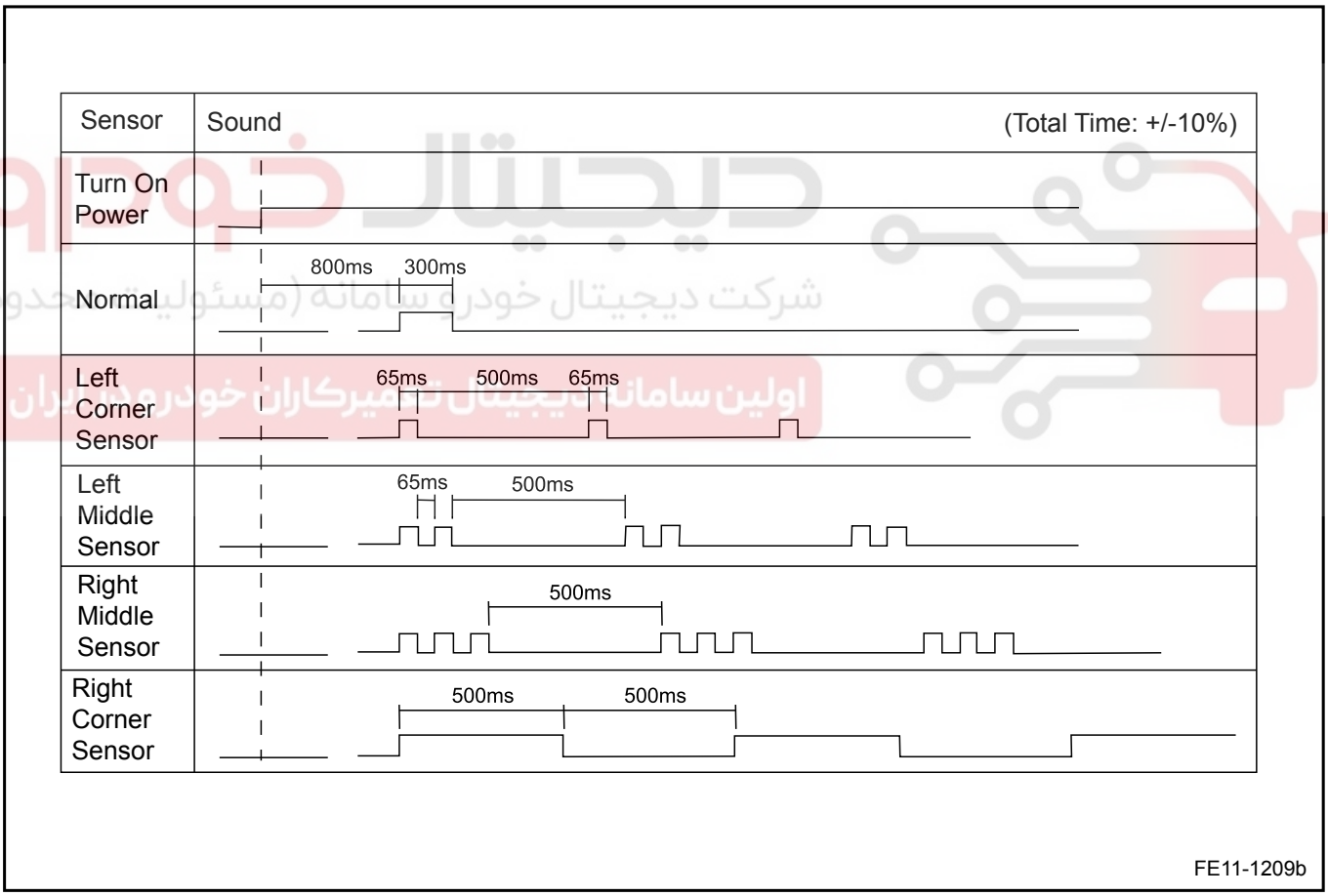
Refer to 11.14.2.1 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.14.6.2 Visual Inspection

- Check the installed after market equipment that may affect the reverse radar system operation.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- Check whether the the reverse radar control module and the wiring harness connectors are installed correctly.

11.14.6.3 Sensor Malfunction Diagnostic

After each ignition cycle, if there is a sensor malfunction, the system will send out corresponding alarm sound, the waveform is shown as below:



11.14.6.4 The System May Not Work Properly Because

1. The sensor external assembly is frozen.
2. Sensor surface has snow or water droplets.

11.14.6.5 The Sensor Detecting Ability May Drop Because

1. The snow or water falls on the sensor probe.
2. Very hot or cold days.
3. There is an obstacle, and its diameter is less than 14 cm (5.5 in) and its length is less than 1 m (39 in).

11.14.6.6 The False Alarm May Be Triggered Because

1. On an uneven road, cobblestone pavement and lawn.
2. The system is close to other ultrasonic sources such as vehicles horn, motorcycle engine noise, commercial vehicle air brake etc.
3. Heavy rain and water splashing.
4. Close to a radio equipment such as a Walkman and so on.
5. The sensor is covered by snow etc.

11.14.6.7 The System Can Not Detect The Following Objects

1. Objects with sharp corners and ropes.
2. Objects that can absorb ultrasonic, such as cotton, snow and sponges.

11.14.6.8 Possible Scenarios

1. According to vehicle speed and the obstacles shape, alarm levels may not be continuous.
2. When the sensor height and rear bumper changes, or the vehicle towed objects are in the detecting area, the system may send a false alarm.
3. The system may not detect objects within 30 cm (11.8 in).
4. When the sensor error is detected, check whether the sensor surface is covered by dust, snow, water, etc.. If it is the case, remove the dust, snow, water, etc from the sensor surface.
5. Avoid sensor surface being squeezed, impacted and scratched and so on.
6. If a vehicle is loaned to others to use, please notify the user of these Notices.

11.14.6.9 Fault Symptom List

Symptoms	Suspected Parts	Refer to Page
System is unable to self-test (buzzer does not ring)	1. Reverse Radar Control Module Power Supply Circuit	Refer to 11.14.6.10 System Unable to Self-test (Buzzer Did Not Ring).
	2. Harness and Connectors	
	3. Instrument Cluster	
Gear at R, buzzer rings	1. Harness and Connectors	Refer to 11.14.6.11 Buzzer Continuously Ring with Gear at R.
	2. Reverse Radar Control Module	
	3. Harness and Connectors	
	4. Reverse Radar Control Module	
Self Test Right Corner Sensor Malfunction	1. Sensor	Refer to 11.14.6.12 Self-test Right Corner Sensor Malfunction.
	2. Harness and Connectors	

Symptoms	Suspected Parts	Refer to Page
	3. Reverse Radar Control Module	
Self Test Right Middle Sensor Malfunction	1. Sensor	Refer to 11.14.6.13 Self-test Right Middle Sensor Malfunction.
	2. Harness and Connectors	
	3. Reverse Radar Control Module	
Self Test Left Middle Sensor Malfunction	1. Sensor	Refer to 11.14.6.14 Self-test Left Middle Sensor Malfunction.
	2. Harness and Connectors	
	3. Reverse Radar Control Module	
Self Test Left Corner Sensor Malfunction	1. Sensor	Refer to 11.14.6.15 Self-test Left Corner Sensor Malfunction.
	2. Harness and Connectors	
	3. Reverse Radar Control Module	

11.14.6.10 System Unable to Self-test (Buzzer Did Not Ring)

Diagnostic Steps:

Note

It is prohibited to start the vehicle during this diagnostic procedure, otherwise it will result in vehicle damage and personal injury.

Step 1	Check whether reverse lamps are working.

(a) Turn the ignition switch to "ON" position.
(b) Put gear at "R" position.
(c) Observe whether reverse lamps are lit.
Are reverse lamps on?

No → Check the reverse lamp circuit. Refer to 11.4.7.9 Reverse Lamp Inoperative

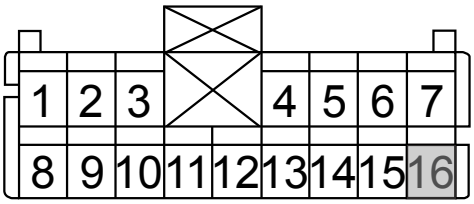
Yes

Note

It is prohibited to start the vehicle during this diagnostic procedure, otherwise it will result in vehicle damage and personal injury.

Step 2	Check whether the reverse sensor control module power supply is normal.

Reverse Radar Control Module Harness Connector SO40



FE11-6302b

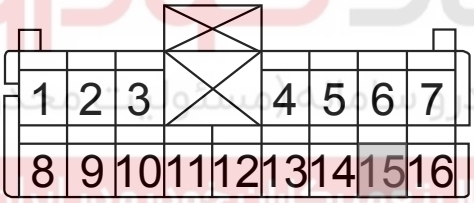
(a) Turn the ignition to the "OFF" position.
(b) Disconnect the reverse radar control module harness connector SO40.
(c) Turn the ignition switch to "ON" position.
(d) Put gear at "R".
(e) Measure voltage between reverse radar harness connector SO40 terminal No.16 and a reliable ground.
Standard Value: 11.5-12.5 V
Is the voltage normal?

No → The circuit between SO40 terminal No.16 and SO02 terminal No.13 is open.

Yes

Step 3	Check whether the reverse sensor control module ground circuit is normal.

Reverse Radar Control Module Harness Connector SO40



FE11-6303b

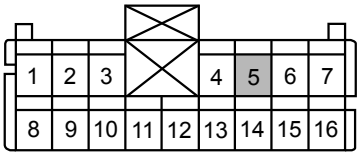
(a) Turn the ignition to "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Measure resistance between the reverse radar harness connector SO40 terminal No.15 and a reliable ground.
Standard Value: Less than 1 Ω
Is the resistance specified value?

No → The circuit between SO40 terminal No.15 and ground is open.

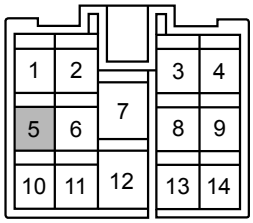
Yes

Step 4	Check whether the reverse sensor control module buzzer drive circuit is normal.

Reverse Radar Control Module Harness Connector SO40



To Instrument Cluster Harness Connector SO03



FE11-6304b

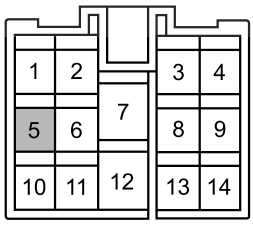
(a) Turn the ignition to the "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Disconnect the floor harness connector SO03 and instrument wiring harness connector IP10.
(d) Measure resistance between the reverse radar harness connector SO40 terminal No.5 and the floor wiring harness connector SO03 terminal No.5.
Standard Value: Less than 1 Ω
Is the resistance specified value?

No → Circuit between SO40 terminal 5 and SO03 terminal 5 is open.

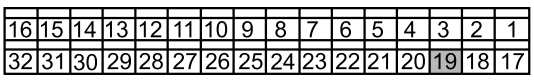
Yes

Step 5	Check whether the reverse sensor control module buzzer drive circuit is normal.

To Instrument Cluster Harness Connector SO03



Instrument Cluster Harness Connector IP03



FE11-6305b

(a) Turn the ignition to the "OFF" position.
(b) Disconnect the meter harness connector IP03.
(c) Disconnect the floor harness connector SO03 and instrument cluster wiring harness connector IP10.
(d) Measure resistance between the floor wiring harness connector SO40 terminal No.5 and the instrument wiring harness connector IP03 terminal No.19.
Standard Value: Less than 1 Ω
Is the resistance specified value?

No → The circuit between the SO40 terminal No.5 and SO03 terminal No.5 is open.

Yes

Step 6	Check whether other instrument cluster warning sounds are normal.

No → Replace the instrument cluster. Refer to 11.7.7.1 Instrument Cluster Replacement

Yes

Step 7	Replace the reverse radar control module. Refer to 11.14.7.1 Reverse Radar Module Replacement.

Next

Step 8	Verify the repair result.

Next

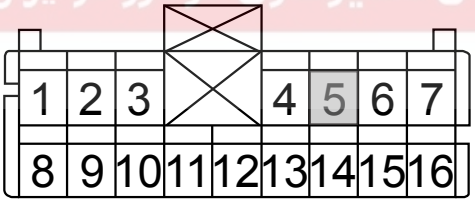
Step 9	Diagnostic completed.

11.14.6.11 Buzzer Continuously Ring with Gear at R

Diagnostic Steps:

Step 1	Check the reverse radar module buzzer drive circuit.

Reverse Radar Module Harness Connector SO40



FE11-6306b

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Disconnect the instrument cluster harness connector IP03.
(d) Measure resistance between the reverse radar harness connector SO40 terminal No.5 and a reliable ground.
(e) Turn the ignition switch to "ON" position.
(f) Measure voltage between the reverse radar harness connector SO40 terminal No.5 and a reliable ground.

Standard Value:

Test Items	Specified Conditions
Resistance Between SO40 (5) and A Reliable Ground	10 kΩ or higher
Voltage Between SO40 (5) and A Reliable Ground	0 V

Is the value specified value?

No → Go to step 3

Yes

Step 2	Check whether the reverse radar control module power supply circuit is normal.

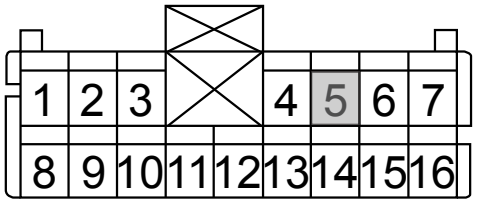
Refer to 11.14.6.10 System Unable to Self-test (Buzzer Did Not Ring).

No → Repair the faulty part.

Yes → Go to step 5

Step 3	Check and repair the buzzer drive circuit floor wiring harness.

Reverse Radar Module Harness Connector SO40



FE11-6306b

(a) Turn the ignition to the "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Disconnect floor harness connector SO03.
(d) Measure resistance between the reverse radar harness connector SO40 terminal No.5 and a reliable ground.
(e) Turn the ignition switch to "ON" position.
(f) Measure voltage between the reverse radar harness connector SO40 terminal No.5 and a reliable ground.
Standard Value:

Test Items	Specified Conditions
SO40 (5) and A Reliable Ground	10 kΩ or higher
Resistance Between SO40 (5) and A Reliable Ground	0 V

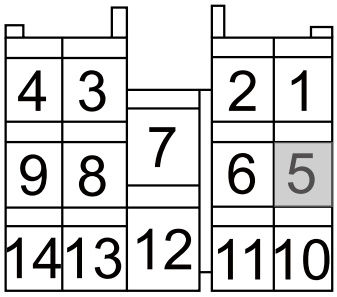
Is the value specified value?

No → Repair the circuit between the SO40 terminal No.5 and the SO03 terminal No.5.

Yes

Step 4	Check and repair the buzzer drive circuit instrument panel wiring harness.

To Floor Harness Connector IP10



FE11-6307b

(a) Turn the ignition to the "OFF" position.
(b) Disconnect the floor harness connector SO03 and the instrument cluster wiring harness connector IP10.
(c) Disconnect the instrument cluster harness connector IP03.
(d) Measure resistance between the wiring harness connector IP10 terminal No.5 and a reliable ground.
(e) Turn the ignition switch to "ON" position.
(f) Measure voltage between harness connector IP10 terminal No.5 and a reliable ground.
Standard Value:

Test Items	Specified Conditions
Resistance Between SO40 (5) and A Reliable Ground	10 kΩ or higher

Resistance Between SO40 (5) and A Reliable Ground	0 V

Is the value specified value?

No → The circuit between the SO40 terminal No.5 and SO03 terminal No.5 is faulty.

Yes

Step 5	Replace the reverse radar control module. Refer to 11.14.7.1 Reverse Radar Module Replacement.

Next

Step 6	Verify the repair result.

Next

Step 7	Diagnostic completed.

11.14.6.12 Self-test Right Corner Sensor Malfunction

Diagnostic Steps:

Step 1	Carry out the initial inspection.

(a) Check whether the sensor surface is covered by impurities.
(b) Check whether the sensor surface is damaged or abnormal.
(c) Incorrectly spray the rear bumper will cause excessive paint covering the sensor surface. check whether this situation exists.

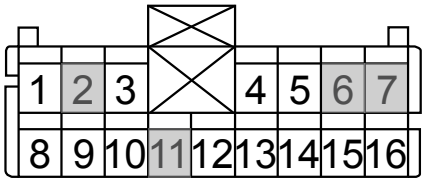
Is the sensor surface normal?

No → Clean the sensor surface, if necessary, replace the sensor.

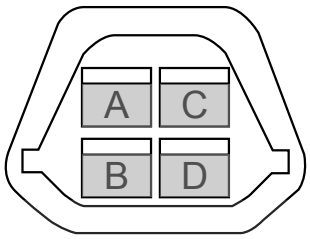
Yes

Step 2	Check the wiring harness and connectors.

Reverse Radar Module Harness Connector SO40



Reverse Radar Module Harness Connector SO45



FE11-6308b

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Disconnect the right corner sensor SO45.
(d) Test the terminals continuity according to the following table.

Test Items	Specified Value
SO45 (D)-SO40 (2) Resistance Value	Less than 1 Ω
SO45 (C)-SO40 (6) Resistance Value	
SO45 (B)-SO40 (11) Resistance Value	
SO45 (A)-SO40 (7) Resistance Value	
Resistance Between SO45 (D) and A Reliable Ground	10 kΩ or higher
Resistance Between SO45 (C) and A Reliable Ground	
Resistance Between SO45 (B) and A Reliable Ground	
Resistance Between SO45 (A) and A Reliable Ground	
Resistance Between SO45 (D) and A Reliable Ground	0 V
Resistance Between SO45 (C) and A Reliable Ground	
Resistance Between SO45 (B) and A Reliable Ground	
Resistance Between SO45 (A) and A Reliable Ground	
Resistance Between Any Two Of SO45 Terminals (A, B, C, D)	10 kΩ or higher

Are the test results normal?

No → Repair the faulty circuits.

Yes

Step 3	Check whether reverse radar control module power supply circuits are normal.

Refer to 11.14.6.10 System Unable to Self-test (Buzzer Did Not Ring).

No → Repair the faulty circuit.

Yes

Step 4	Replace the right corner sensor. Refer to 11.14.7.2 Reverse Radar Sensor Replacement.

Next

Step 5	Check the reverse radar self-test function to confirm the fault has been fixed.

11.14.6.13 Self-test Right Middle Sensor Malfunction

Diagnostic Steps:

Step 1	Carry out the following initial inspection.

(a) Check whether the sensor surface is covered by impurities.
(b) Check whether the sensor surface is damaged or abnormal.
(c) Incorrectly spray the rear bumper will cause excessive paint covering the sensor surface. check whether this situation exists.

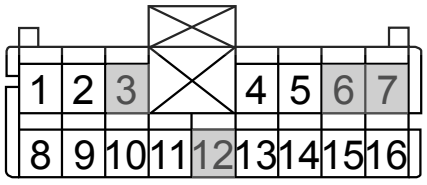
Is the sensor surface normal?

No → Clean the sensor surface, if necessary, replace the sensor.

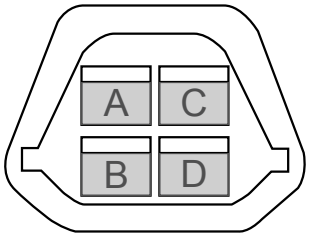
Yes

Step 2	Check the wiring harness and connectors.

Reverse Radar Module Harness Connector SO40



Reverse Radar Module Harness Connector SO44



FE11-6309b

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Disconnect the right middle sensor SO44.
(d) Test the terminals continuity according to the following table.

Test Items	Specified Value
SO44 (D)-SO40 (3) Resistance Value	Less than 1 Ω
SO44 (C)-SO40 (6) Resistance Value	
SO44 (B)-SO40 (12) Resistance Value	
SO44 (A)-SO40 (7) Resistance Value	
Resistance Between SO44 (D) and A Reliable Ground	10 kΩ or higher
Resistance Between SO44 (C) and A Reliable Ground	
Resistance Between SO44 (B) and A Reliable Ground	
Resistance Between SO44 (A) and A Reliable Ground	

Resistance Between SO44 (D) and A Reliable Ground	0 V
Resistance Between SO44 (C) and A Reliable Ground	
Resistance Between SO44 (B) and A Reliable Ground	
Resistance Between SO44 (A) and A Reliable Ground	
Resistance Between Any Two Of SO44 Terminals (A, B, C, D)	10 kΩ or higher

Are the test results correct?

No → Repair the faulty part.

Yes

Step 3	Check whether the reverse sensor control module power supply circuits are normal.

Refer to 11.14.6.10 System Unable to Self-test (Buzzer Did Not Ring).

No → Repair the faulty circuit.

Yes

Step 4	Replace the right middle sensor. Refer to 11.14.7.2 Reverse Radar Sensor Replacement.

Next

Step 5	Check the reverse radar self-test function to confirm the fault has been fixed.

11.14.6.14 Self-test Left Middle Sensor Malfunction

Diagnostic Steps:

Step 1	Carry out the following initial inspection.

(a) Check whether the sensor surface is covered by impurities.
(b) Check whether the sensor surface is damaged or abnormal.
(c) Incorrectly spray the rear bumper will cause excessive paint covering the sensor surface. check whether this situation exists.

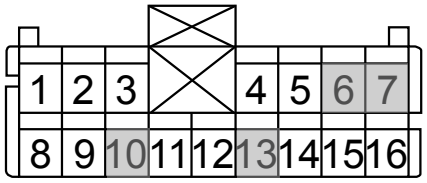
Is the sensor surface normal?

No → Clean the sensor surface, if necessary, replace the sensor.

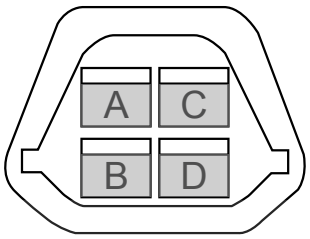
Yes

Step 2	Check the wiring harness and connectors.

Reverse Radar Module Harness Connector SO40



Reverse Radar Module Harness Connector SO43



FE11-6310b

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Disconnect the left middle sensor SO43.
(d) Test the terminals continuity according to the following table.

Test Items	Specified Value
SO43 (D)-SO40 (10) Resistance Value	Less than 1 Ω
SO43 (C)-SO40 (6) Resistance Value	
SO43 (B)-SO40 (13) Resistance Value	
SO43 (A)-SO40 (7) Resistance Value	
Resistance Between SO43 (D) and A Reliable Ground	10 kΩ or higher
Resistance Between SO43 (C) and A Reliable Ground	
Resistance Between SO43 (B) and A Reliable Ground	
Resistance Between SO43 (A) and A Reliable Ground	
Resistance Between SO43 (D) and A Reliable Ground	0 V
Resistance Between SO43 (C) and A Reliable Ground	
Resistance Between SO43 (B) and A Reliable Ground	
Resistance Between SO43 (A) and A Reliable Ground	
Resistance Between Any Two Of SO43 Terminals (A, B, C, D)	10 kΩ or higher

Are the test results correct?

No → Repair the faulty circuit.

Yes

Step 3	Check whether the reverse sensor control module power supply circuits are normal.

Refer to 11.14.6.10 System Unable to Self-test (Buzzer Did Not Ring).

No → Repair the faulty circuit.

Yes

Step 4	Replace the left middle sensor. Refer to 11.14.7.2 Reverse Radar Sensor Replacement.

Next

Step 5	Check the reverse radar self-test function to confirm the fault has been fixed.

11.14.6.15 Self-test Left Corner Sensor Malfunction

Diagnostic Steps:

Step 1	Carry out the following initial inspection.

(a) Check whether the sensor surface is covered by impurities.
(b) Check whether the sensor surface is damaged or abnormal.
(c) Incorrectly spray the rear bumper will cause excessive paint covering the sensor surface. check whether this situation exists.

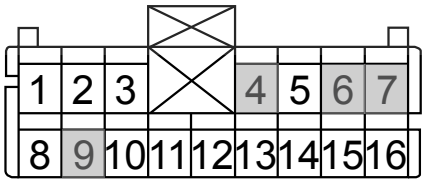
Is the sensor surface checks normal?

No → Clean the sensor surface, if necessary, replace the sensor.

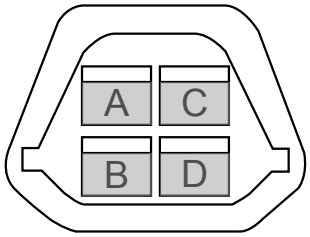
Yes

Step 2	Check the wiring harness and connectors.

Reverse Radar Control Module Harness Connector SO40



Reverse Radar Control Module Harness Connector SO42



FE11-6311b

(a) Turn the ignition switch to "OFF" position.
(b) Disconnect the radar control module harness connector SO40.
(c) Disconnect right middle sensor SO42.
(d) Test the terminals continuity according to the following table.

Test Items	Specified Value
SO42 (D)-SO40 (9) Resistance Value	Less than 1 Ω
SO42 (C)-SO40 (6) Resistance Value	
SO42 (B)-SO40 (4) Resistance Value	
SO42 (A)-SO40 (7) Resistance Value	
Resistance Between SO42 (D) and A Reliable Ground	10 kΩ or higher
Resistance Between SO42 (C) and A Reliable Ground	
Resistance Between SO42 (B) and A Reliable Ground	

Resistance Between SO42 (A) and A Reliable Ground	
Resistance Between SO42 (D) and A Reliable Ground	0 V
Resistance Between SO42 (C) and A Reliable Ground	
Resistance Between SO42 (B) and A Reliable Ground	
Resistance Between SO42 (A) and A Reliable Ground	
Resistance Between Any Two Of SO42 Terminals (A, B, C, D)	10 kΩ or higher

Are the test results correct?

No → Repair the faulty circuit.

Yes

Step 3	Check whether the reverse sensor control module power supply circuits are normal.

Refer to 11.14.6.10 System Unable to Self-test (Buzzer Did Not Ring).

No → Repair the faulty circuit.

Yes

Step 4	Replace the left corner sensor. Refer to 11.14.7.2 Reverse Radar Sensor Replacement.

Next

Step 5	Check the reverse radar self-test function to confirm fault has been fixed.

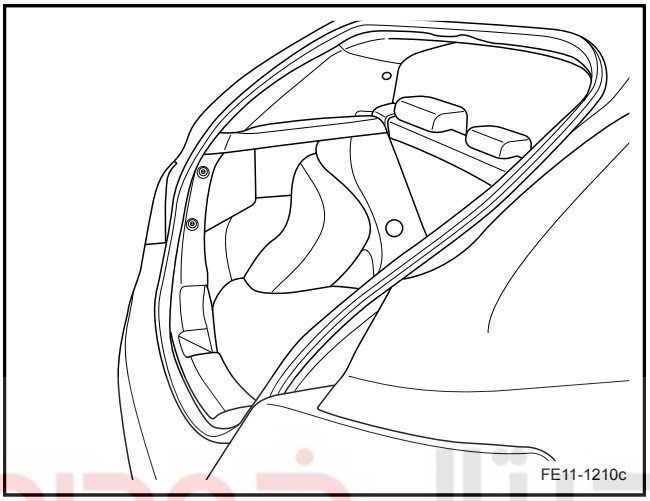
11.14.7 Removal and Installation

11.14.7.1 Reverse Radar Module Replacement

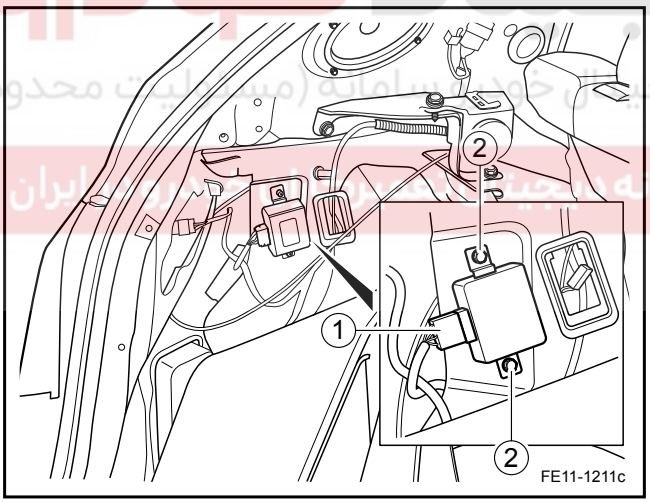
Removal Procedure

Warning!

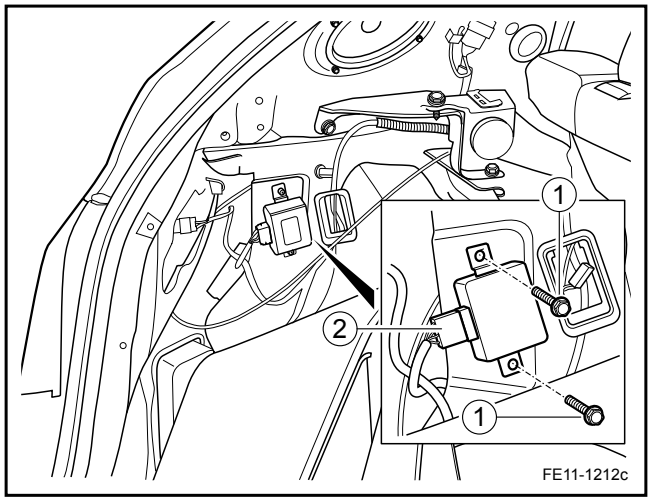
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the hatchback left panel. Refer to 12.9.1.8 Rear Parcel Shelf Replacement (Hatchback).



3. Disconnect the radar module harness connector (1).
4. Remove the reverse radar module retaining bolt (2).



Installation Procedure:

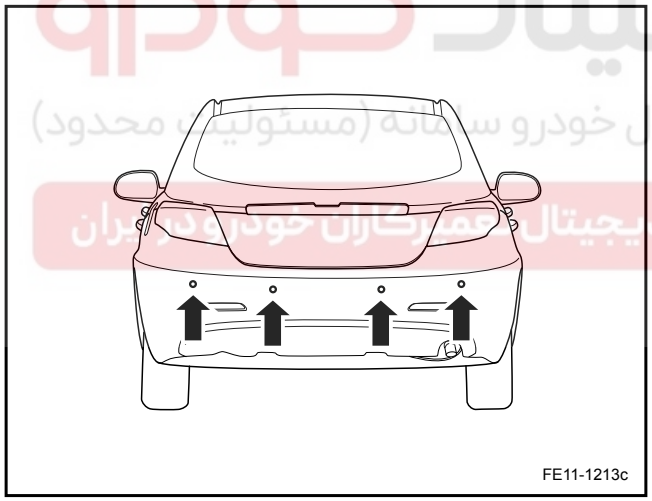
1. Tighten the reverse radar module retaining bolts (1).
   Torque: 8-11 Nm (Metric) 6-8 lb-ft (US English)
2. Connect the reverse radar module harness connector (2).
3. Install the hatchback left panel.
4. Connect the battery negative cable.

11.14.7.2 Reverse Radar Sensor Replacement

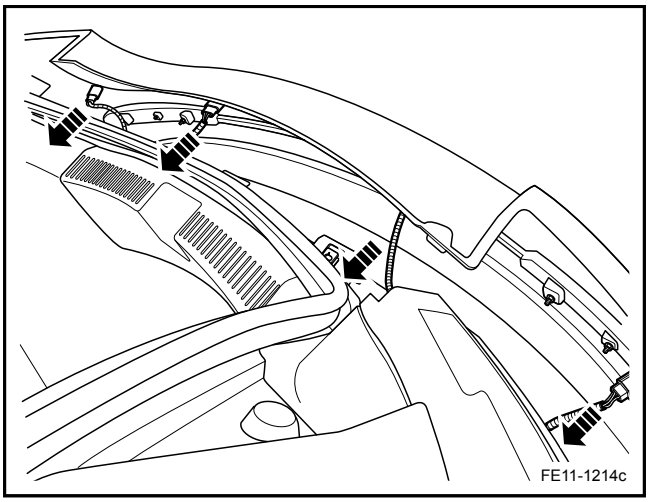
Removal Procedure

Warning!

Refer to "Battery Disconnect Warning" in "Warnings and Notices".

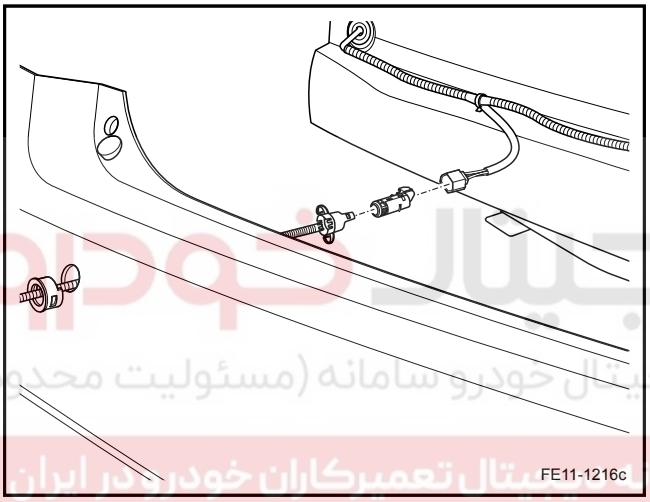


1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear bumper. Refer to 12.4.3.3 Rear Bumper Replacement (Sedan).

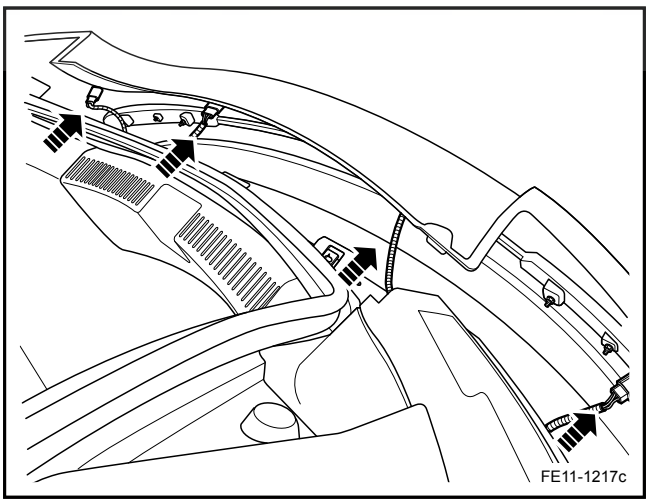


3. Disconnect the reverse radar sensor harness connectors.
4. Remove the reverse radar sensors.

Installation Procedure:



1. Install the reverse radar sensors to the rear bumper.
2. Connect the reverse radar sensor harness connectors.



3. Install rear bumper.
4. Connect the battery negative cable.

11.15 Instrument Cluster

11.15.1 Specifications

11.15.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Instrument Cluster Self-Tapping Screws	ST4.2 × 9.5	3-4	2-3

11.15.1.2 Indicator Descriptions

The instrument cluster has a total of five warning lamps to provide a warning or a reminder.

Symbols	Indicator	Color
	Passenger Seat Belts Are Not Tighten Warning Lamps	Red
	Front Fog Lamps On	Green
	Rear Fog Lamps On	Yellow

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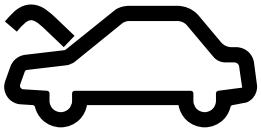
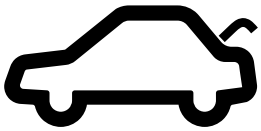
Symbols	Indicator	Color
	Hood Is Not Closed Warning Lamp	Red
	Rear Compartment Lid (Hatchback) Is Not Closed Warning Lamp	Red
	Clock	Blue Background With White Text

11.15.2 Description and Operation

11.15.2.1 Description and Operation

The time is displayed as a 24-hour clock on the LCD screen. Even if the engine is shut down, the time is still displayed. set the time Through the time adjustment button (Refer to 11.15.4.1 Component Locator).

Clock error is less than ±10 s per month.

Trigger Clock Settings

Pressing and holding (greater than 2 s) the time adjustment button, it will enter the clock setting mode. The number of hours and a colon blink at 1Hz frequency. This mode is hours configuration mode. When the hour is set, the number will no longer blink.

Set Up Hours

In the hours setting mode, the number of hours will increase with a short rod press (more than 300 ms and less than 2 s). If press and hold the adjustment rod more than 2 s, the number of hours will increase at 5 h/s rate.

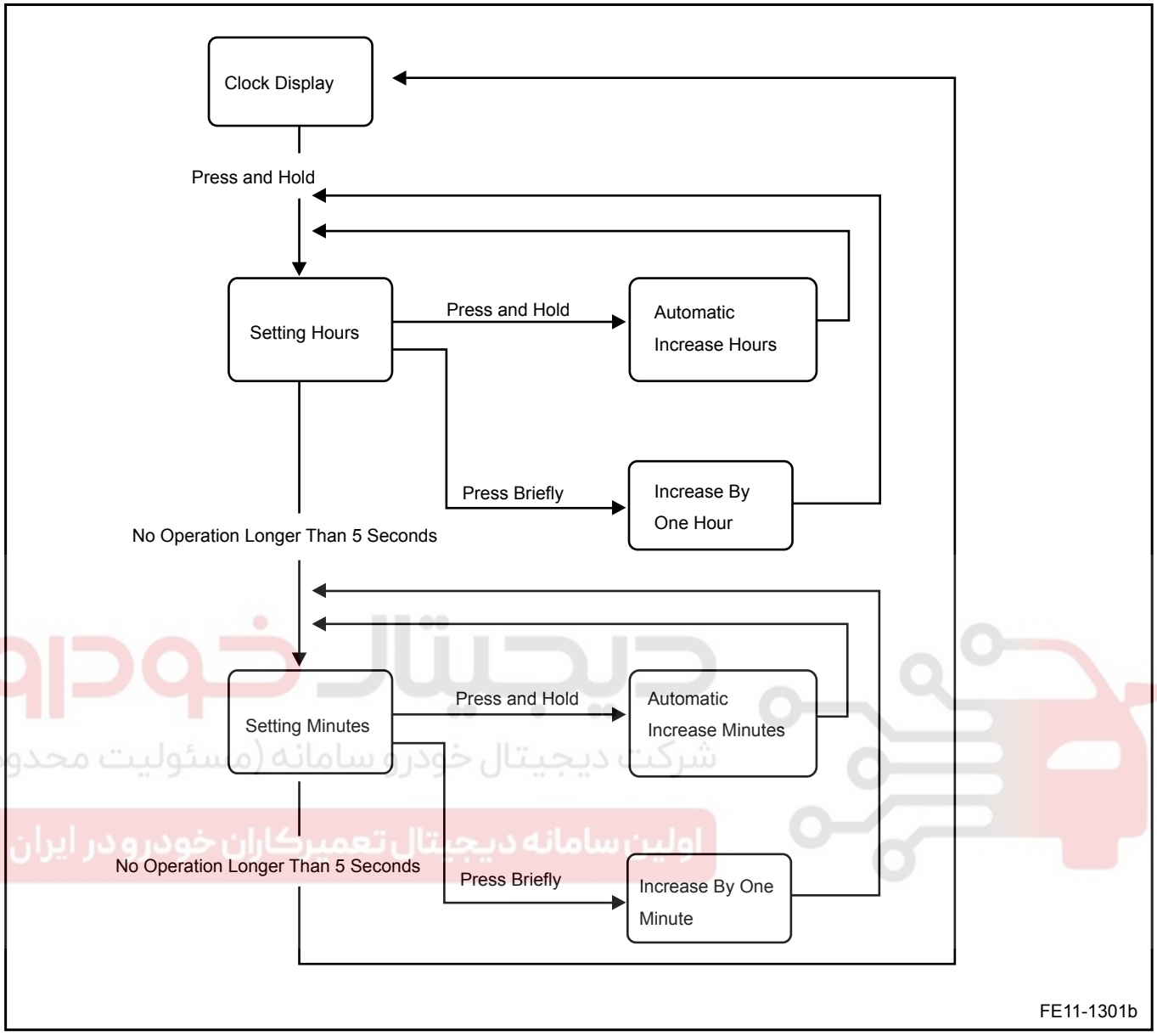
If the rod is not pressed in 5 s, it will enter the minutes setting mode. The number of minutes and a colon blink at 1 Hz frequency, as described above.

Set Up Minutes

In the minutes setting mode, the number of minutes will increase with a short rod press (more than 300ms and less than 2 s). If press and hold the adjustment rod more than 2 s, the number of minutes will increase at 5 h/s rate.

If the rod is not pressed in 5 s, the setting mode will end, the clock will not blink.

Clock Settings Flowchart



11.15.3 System Working Principle

11.15.3.1 Warning Lamps Control

The instrument cluster has two warning lamps and their power is supplied by the battery (the battery is inside the instrument cluster). they are:

- Front Fog Lamp Indicator
- Rear Fog Lamp Indicator
- Hood Not Closed Warning Lamp
- Rear Compartment Lid (Hatchback) Not Closed Warning Lamp

The following instrument cluster warning lamps are directly controlled by the hardware:

- Front Fog Lamp Indicator
- Rear Fog Lamp Indicator

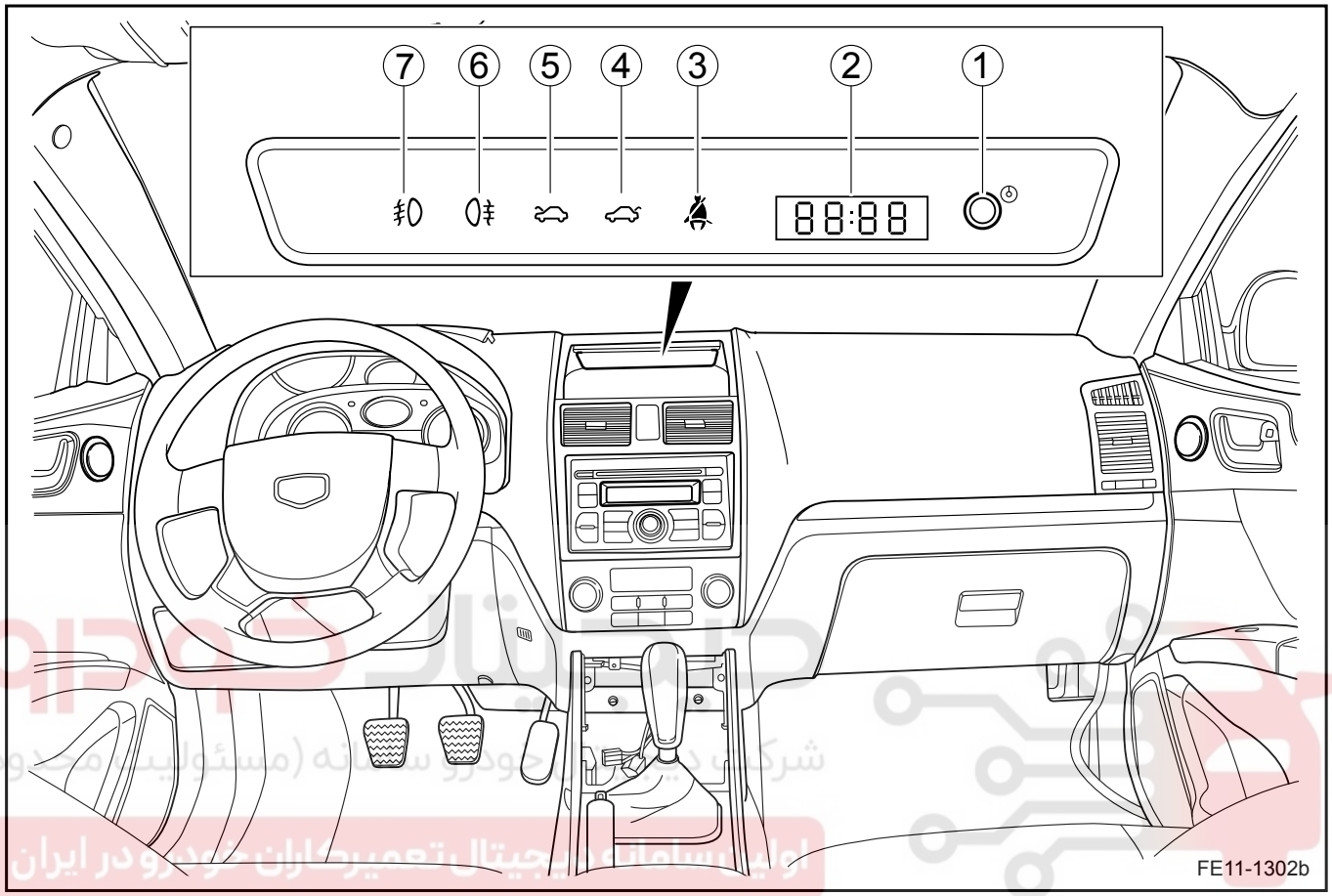
Note

Other warning lamps are controlled by the CAN bus signal.

11.15.4 Component Locator

11.15.4.1 Component Locator

Instrument Cluster

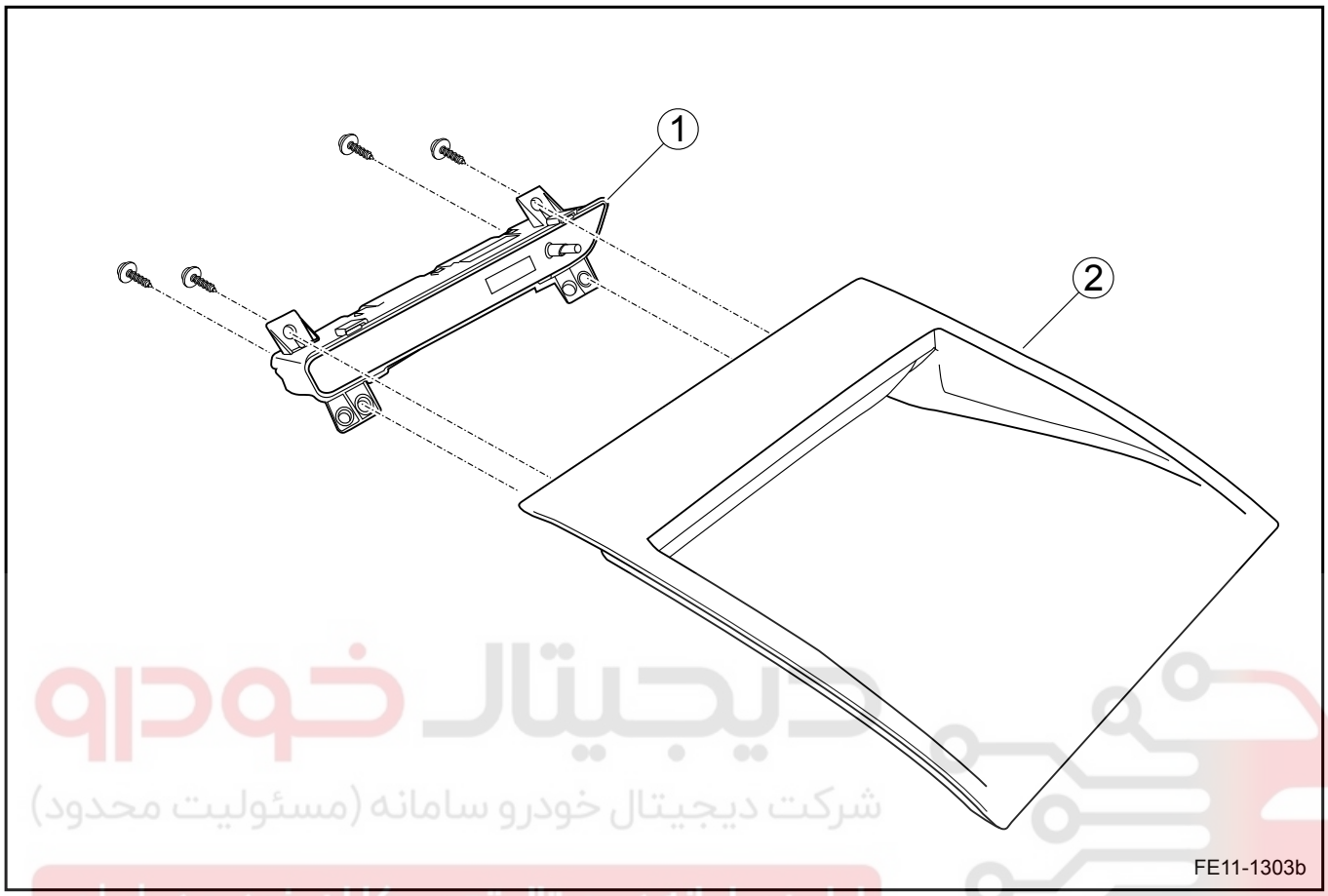


Legend

1. Time Adjustment Button
2. Clock Display
3. Passenger Seat Belts Not Tightened Warning Lamps
4. Rear Compartment Lid (Hatchback) Not Closed Warning Lamp
5. Hood Not Closed Warning Lamp
6. Rear Fog Lamp Indicator
7. Front Fog Lamp Indicator

11.15.5 Disassemble View

11.15.5.1 Disassemble View

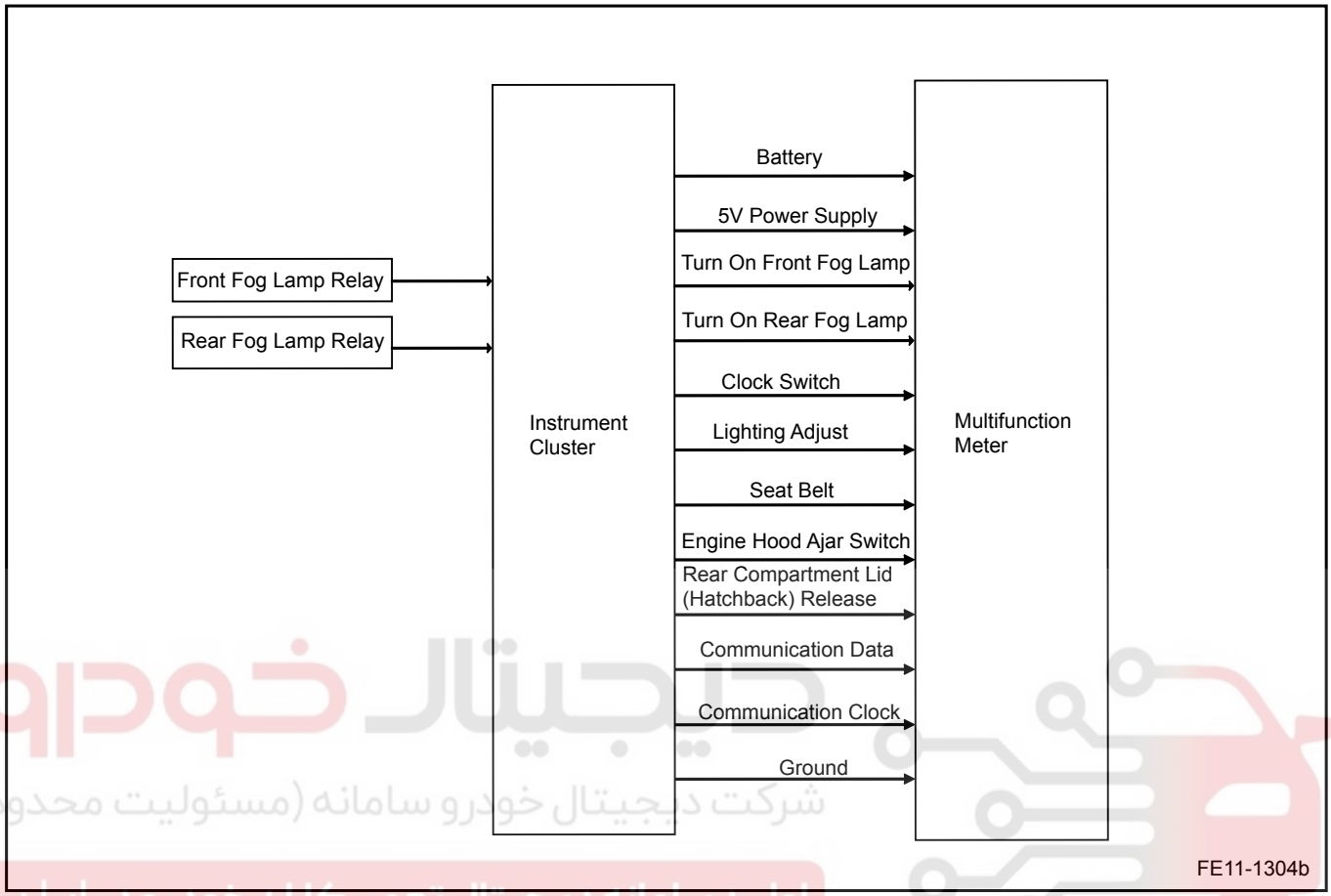


Legend

1. Instrument Cluster
2. Instrument Cluster Shroud

11.15.6 Schematic

11.15.6.1 Schematic



11.15.7 Diagnostic Information and Procedures

11.15.7.1 Diagnostic Information and Procedures

Refer to 11.7.6.1 Diagnosis Description.

11.15.8 Removal and Installation

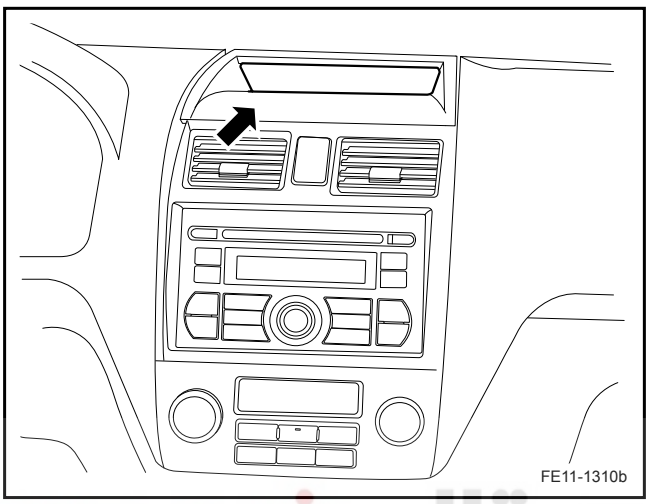
11.15.8.1 Instrument Cluster Replacement

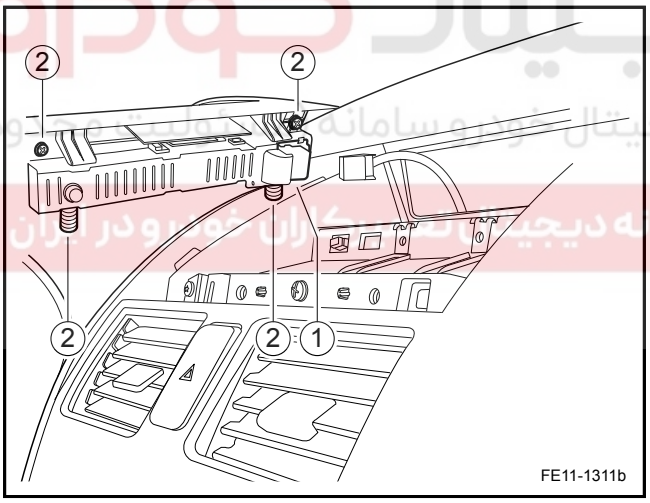
Removal Procedure

Warning!

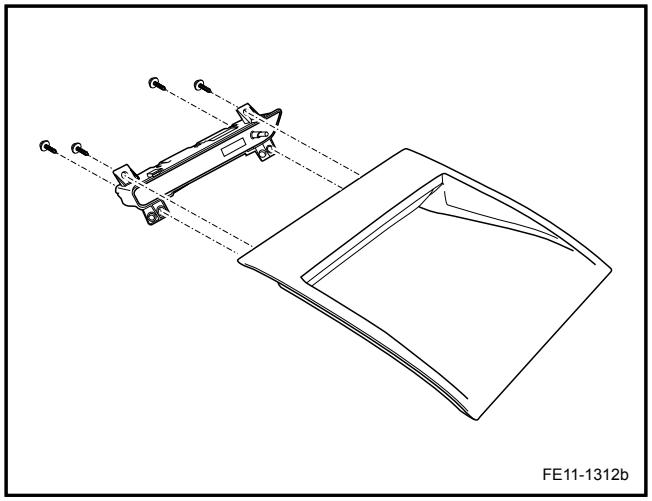
Refer to "Battery Disconnect Warning" in "Warnings and Notices".

1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the instrument panel panel.





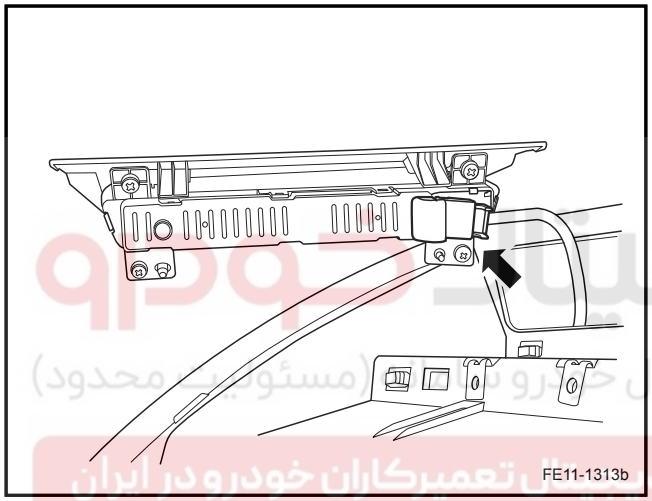
3. Disconnect the display harness connector (1).
4. Remove the screws and the display (2).



Installation Procedure:

1. Install the display.

   Torque: 3 Nm (Metric) 2 lb-ft (US English)



2. Connect the display harness connector.
3. Install the instrument cluster panel.
4. Connect the battery negative cable.

11.16 Cigarette Lighter

11.16.1 Specifications

11.16.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Center Console Panel Retaining Bolts	M6 × 20	8-11	6-8
Center Console Panel Retaining Screws	ST4.2 × 16	3-4	2-3

11.16.2 Description and Operation

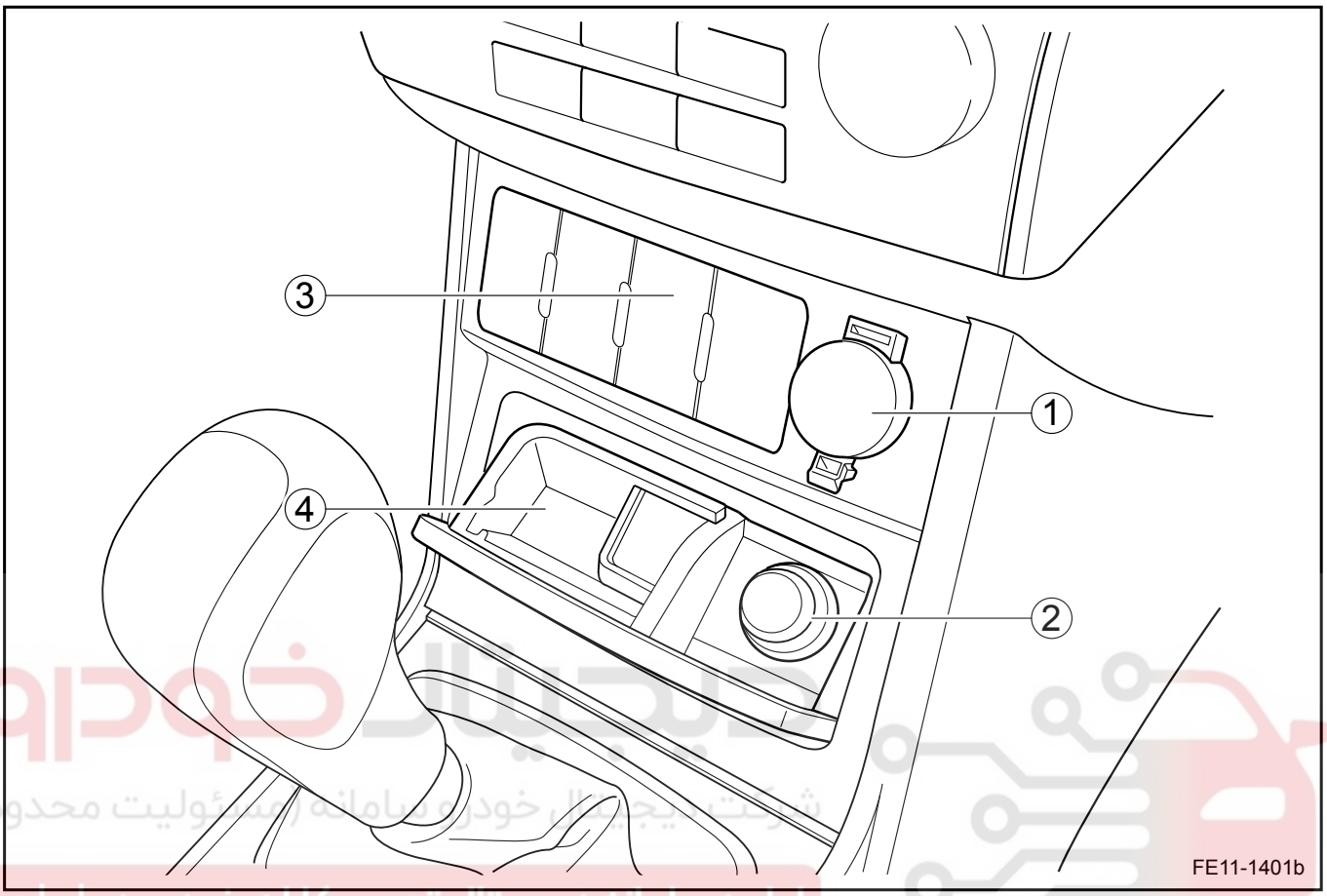
11.16.2.1 Description and Operation

In addition to a cigarette lighter, this vehicle is equipped with a spare power outlet installed at right side of the rear fog lamp switch.

The cigarette lighter and the spare power outlet power is all from the ACC. On the cigar-lighter panel there is also a lamp to facilitate the use in the evening.

11.16.3 Component Locator

11.16.3.1 Component Locator



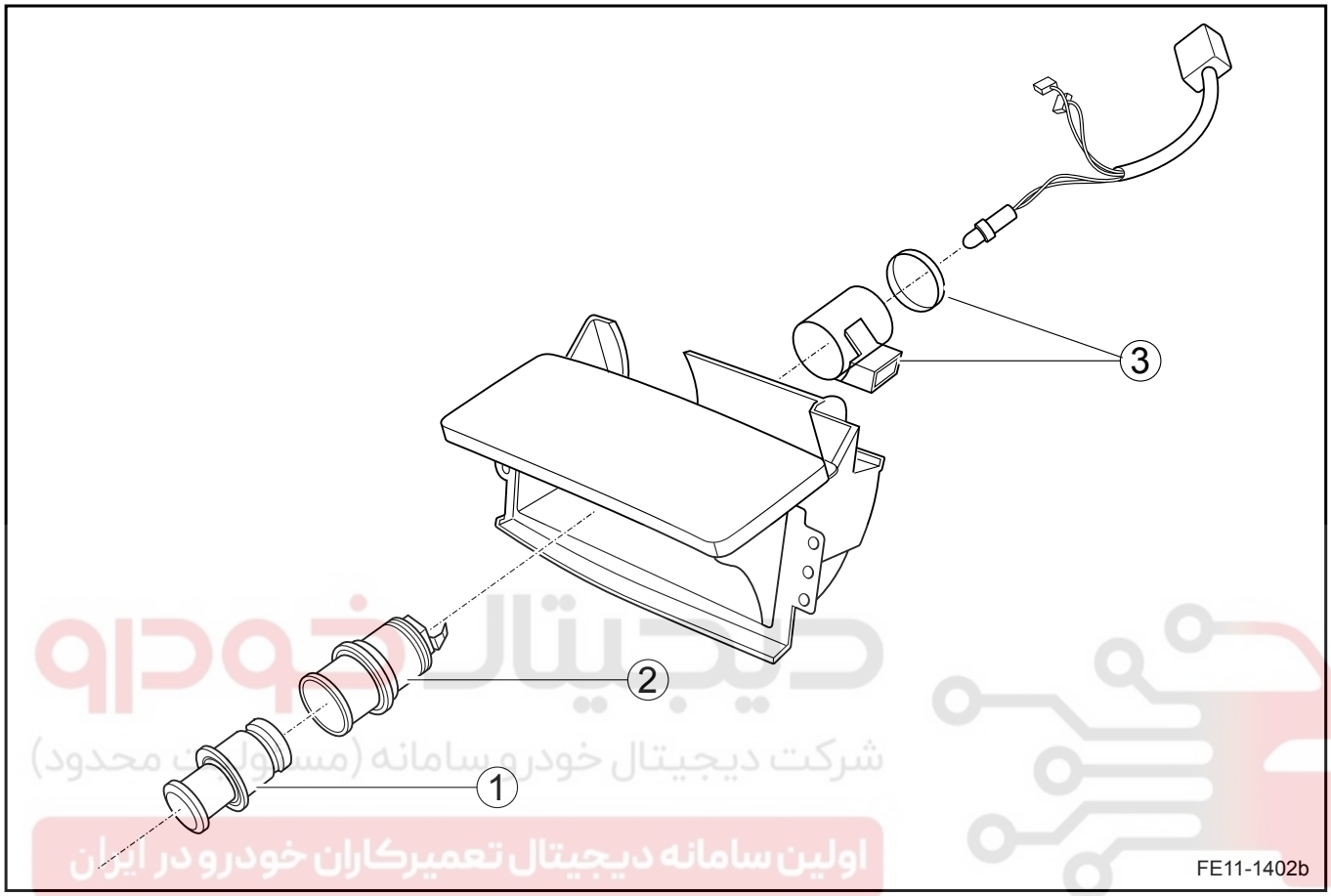
Legend

1. Spare Power Outlet
2. Cigarette Lighter
3. Rear Fog Lamp Switch
4. Ashtray

11.16.4 Disassemble View

11.16.4.1 Disassemble View

Cigarette Lighter



Legend

1. Cigarette Lighter
2. Cigarette Lighter Socket
3. Cigarette Lighter Retaining Bracket

11.16.5 Diagnostic Information and Procedures

11.16.5.1 Diagnosis Description

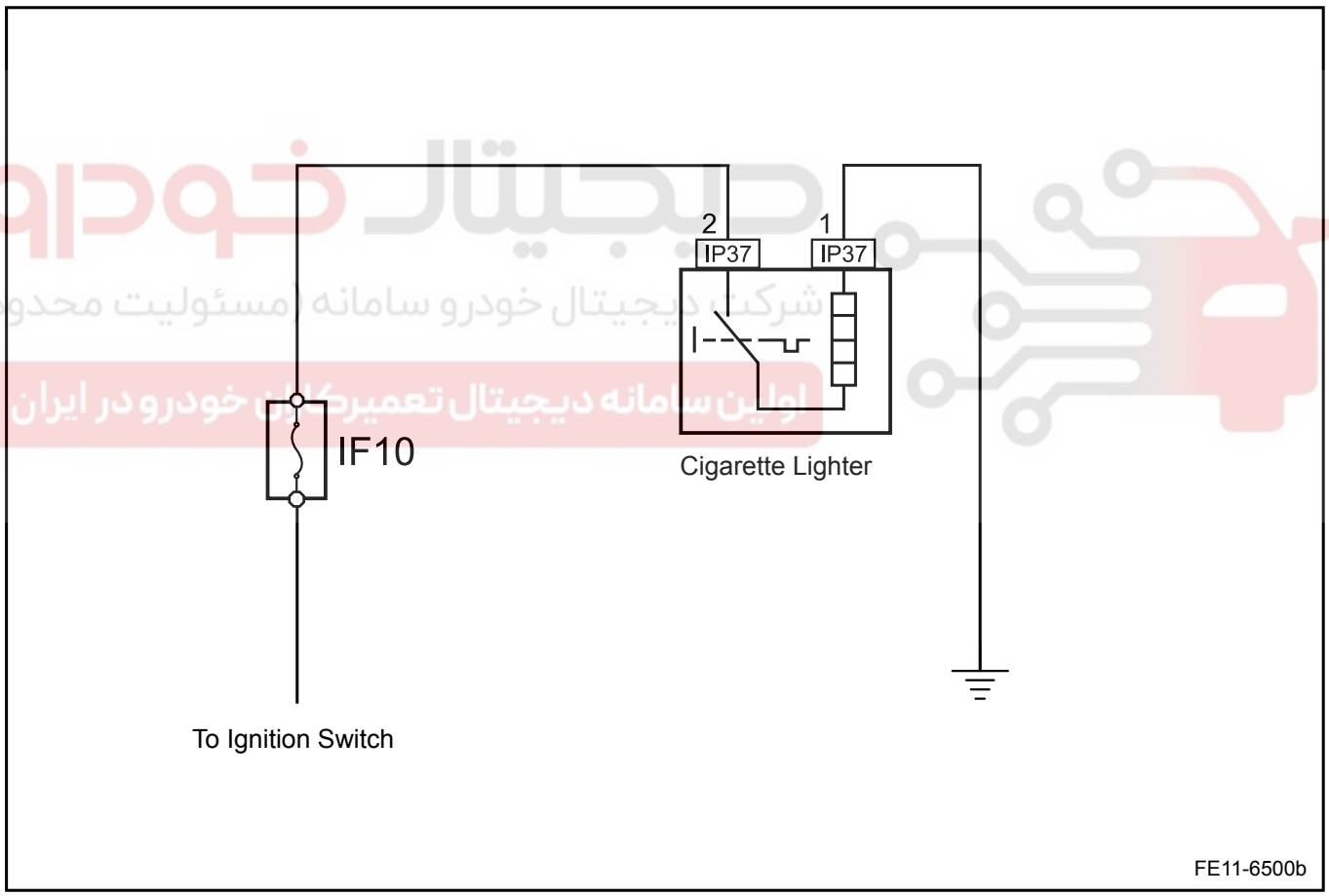
Refer to 11.16.2.1 Description and Operationget familiar with the system functions and operation before start system diagnostics, so that it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.16.5.2 Visual Inspection

- Check installed after market equipment that may affect the cigarette lighter, spare power outlet operation.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- If the cigarette lighter and the backup power outlet are inoperative, check and repair the ACC power supply or ground poor connection or open circuit before carry out the diagnostic.

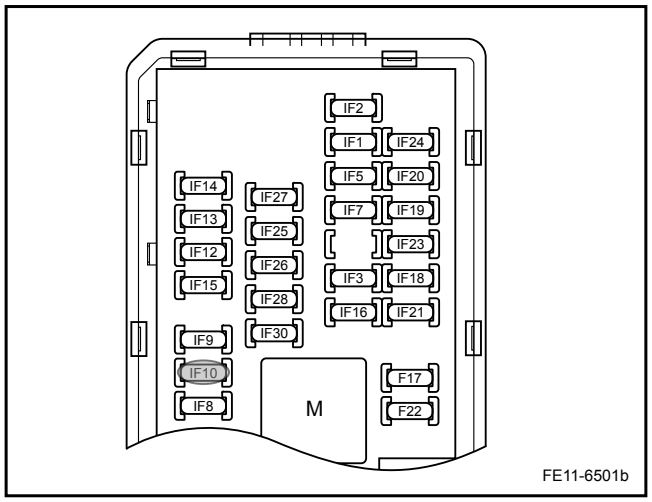
11.16.5.3 Cigarette Lighter Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the fuse IF10.



(a) Check whether the fuse IF10 is blown.

Fuse Rated Current: 15 A

No → Go to step 3

Yes

Step 2	Check the fuse IF10 circuit.

(a) Check whether there is a short circuit.

(b) Repair the circuits. Confirm that there are no short circuits.

(c) Replace with fuses with rated current.

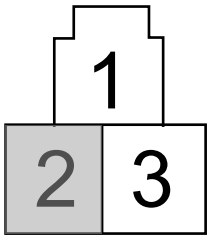
Confirm the cigarette lighter is working properly.

Yes → System normal

No

Step 3	Check the cigarette lighter power supply circuit.

Cigarette Lighter + Lighting Harness Connector IP37



(a) Turn the ignition switch to the ACC position.

(b) At the same time, measure the cigarette lighter wiring harness connector IP37 terminal No.2 voltage with a multimeter.

Standard Voltage: 11-14 V

Is the voltage specified value?

Yes → Go to step 5

No

Step 4	Repair the cigarette lighter power supply circuit open.

(a) Repair the circuit between the cigarette lighter wiring harness connector IP37 terminal No.2 and the fuse IF10.

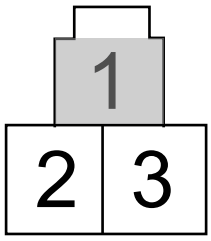
Confirm the cigarette lighter is working properly.

Yes → System normal

No

Step 5	Check the cigarette lighter ground circuit.

Cigarette Lighter + Lighting Harness Connector IP37



FE11-6503b

(a) Disconnect the cigarette lighter wiring harness connector.
(b) At the same time, measure resistance between the cigarette lighter wiring harness connector IP37 terminal No.1 and the ground with a multimeter.
Resistance Standard Value: Less than 1 Ω
Is the resistance specified value?

Yes → Go to step 7

No

Step 6	Repair the cigarette lighter ground circuit open.

(a) Repair the open circuit between the cigarette lighter wiring harness connector IP37 terminal No.1 and ground.
Confirm the cigarette lighter is working properly.

Yes → System normal

No

Step 7	Replace the cigarette lighter.

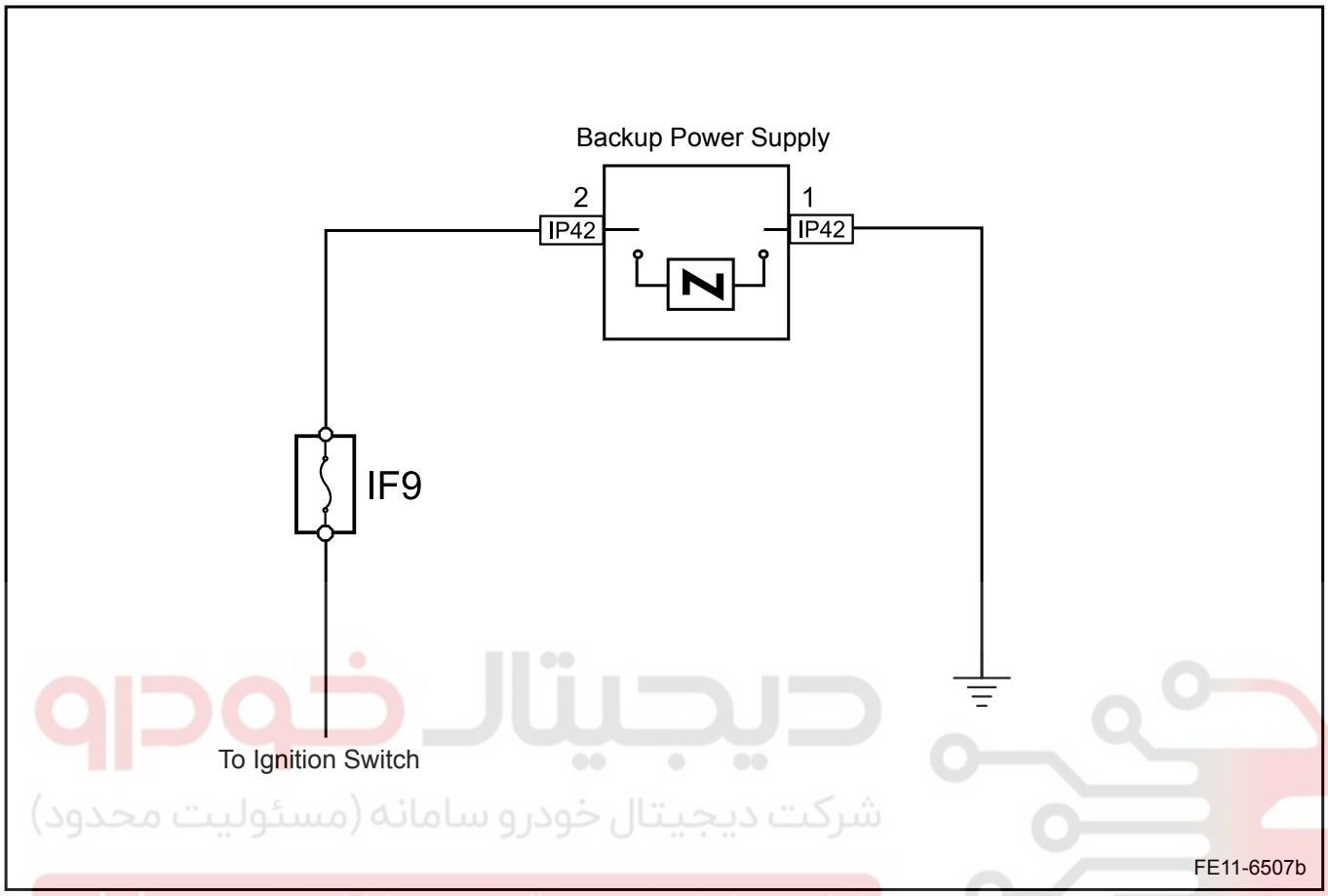
(a) Replace the cigarette lighter. Refer to 11.16.6.1 Cigarette Lighter Replacement.
Confirm the repair completed.

Next

Step 8	System normal.

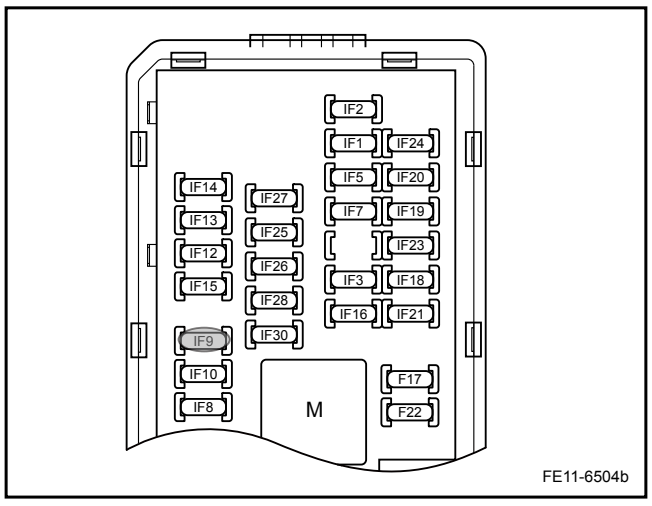
11.16.5.4 Spare Power Outlet Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check the fuse IF9.



(a) Check whether the fuse IF9 is blown.

Fuse Rated Current: 15 A

No	Go to step 3

Yes

Step 2	Check fuse IF9 circuit.

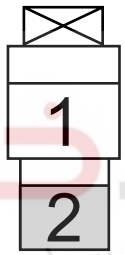
(a) Check whether there is a short circuit.
(b) Repair the circuits. Confirm that there are no short circuits.
(c) Replace with fuses with rated current.
Is the spare power outlet working correctly?

Yes → System normal

No

Step 3	Check the spare power outlet power supply circuit.

Backup Power Supply Harness Connector IP42



FE11-6505b

(a) Turn the ignition switch to the ACC file.
(b) At the same time, measure the spare power outlet wiring harness connector IP42 terminal No.2 voltage with a multimeter.
Standard Voltage: 11-14 V
Is the voltage specified value?

Yes → Go to step 5

No

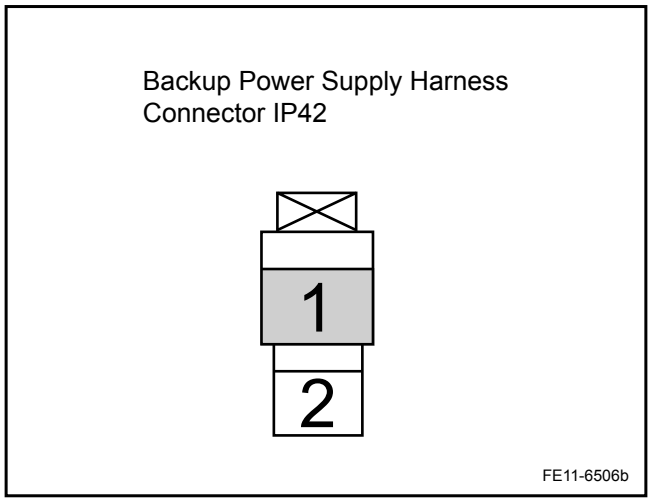
Step 4	Repair the spare power outlet power supply circuit open.

Repair
(a) Repair the open circuit between the spare power outlet harness connector IP42 terminal No.2 and the fuse IF9.
Confirm the spare power outlet is working properly.

Yes → System normal

No

Step 5	Check the spare power outlet ground circuit.



(a) Disconnect the spare power outlet wiring harness connector.
(b) At the same time, measure resistance between the the spare power outlet wiring harness connector IP42 terminal No.1 and the ground with a multimeter.
Resistance Standard Value: Less than 1 Ω
Is the resistance specified value?

Yes → Go to step 7

No

Step 6	Repair the spare power outlet ground circuit open.

Repair
(a) Repair the open circuit between the spare power outlet harness connector IP42 terminal No.1 and the ground.
Confirm the spare power outlet is working properly.

Yes → System normal

No

Step 7	Replace the spare power outlet.

(a) Replace the standby power outlet. Refer to 11.16.6.2 Spare Power Outlet Replacement.
Confirm the repair completed.

Next

Step 8	System normal.

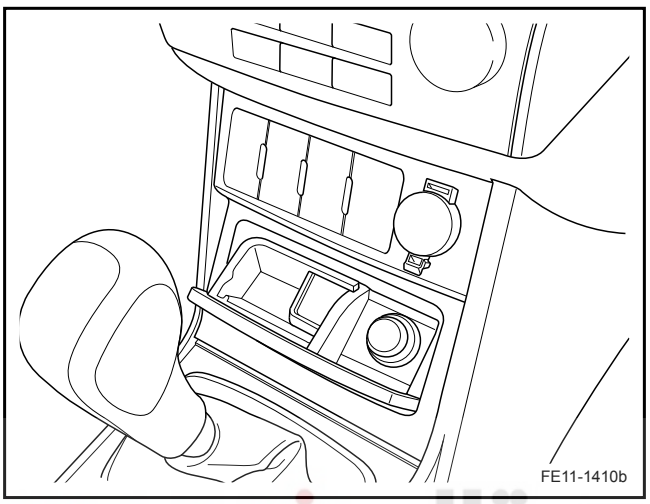
11.16.6 Removal and Installation

11.16.6.1 Cigarette Lighter Replacement

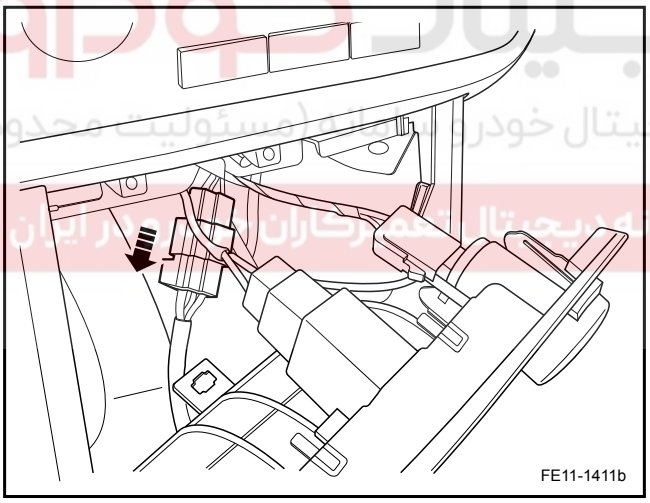
Removal Procedure

Warning!

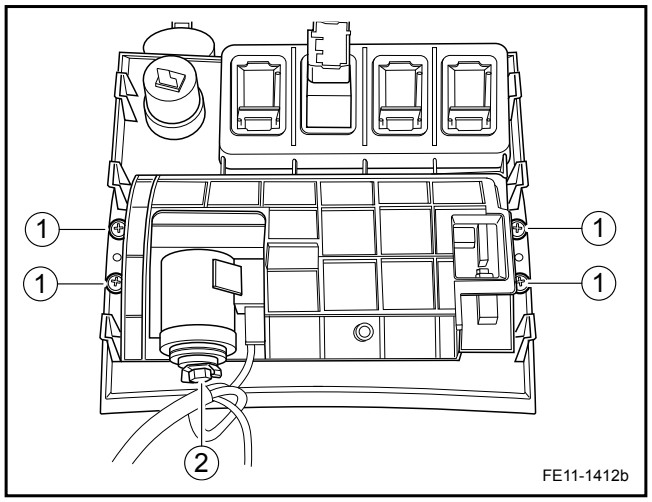
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



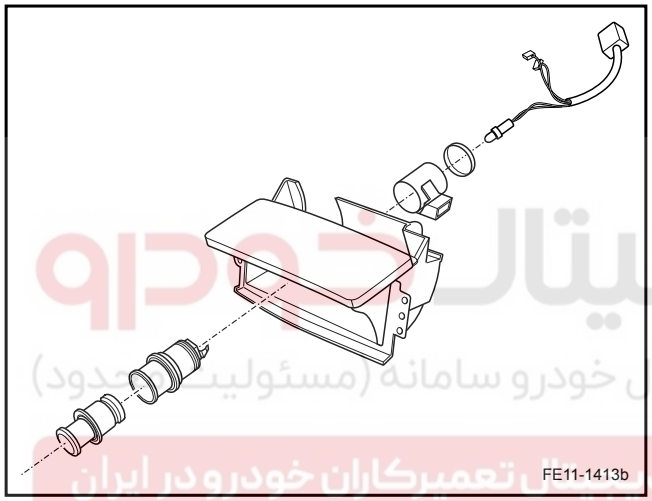
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Pry out the cigarette lighter panel.



3. Disconnect the wiring harness connector from the back of the panel.

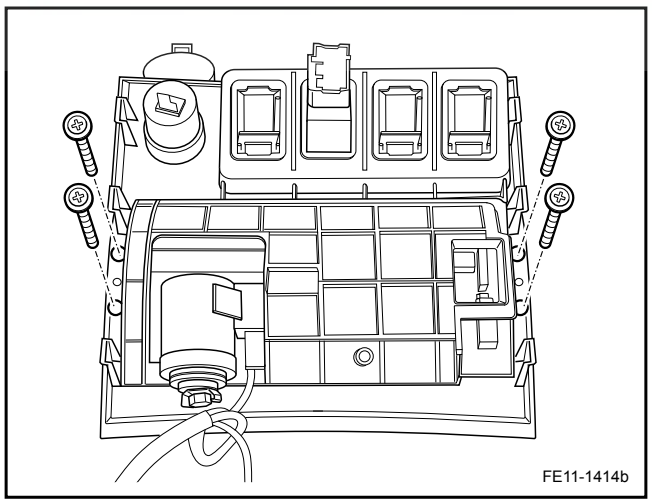


4. Remove the ashtray screws (1).
5. Remove the cigarette lighter retaining nut (2).

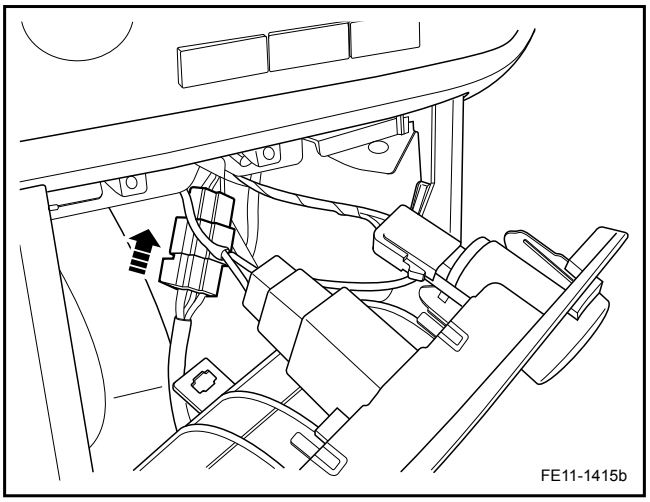


Installation Procedure:

1. Install the cigarette lighter.
2. Tighten the cigarette lighter locking nut.



3. Install the ashtray to the cigarette lighter panel.
4. Tighten the retaining screws.



5. Connect the harness connector from the back of the panel.
6. Install the cigarette lighter panel.
7. Connect the battery negative cable.

11.16.6.2 Spare Power Outlet Replacement

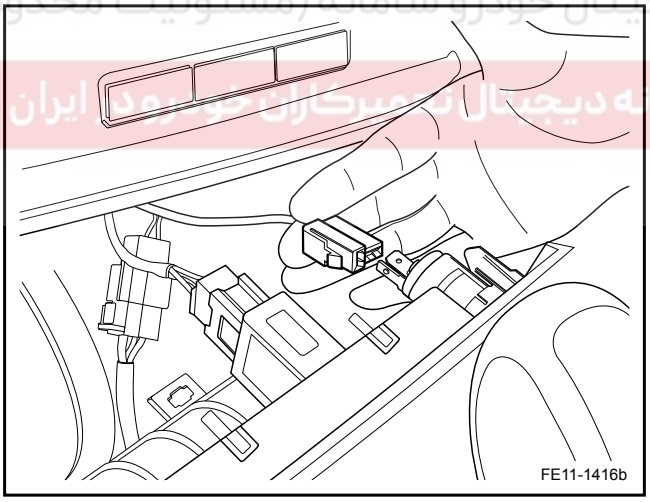
Removal Procedure

Warning!

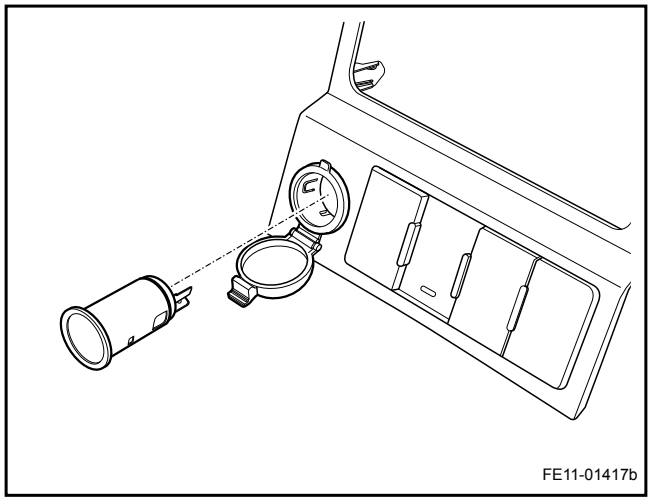
Refer to "Battery Disconnect Warning" in "Warnings and Notices".

Note

To remove the interior trim panels, please use the trim panel removal special tools, otherwise the trim panels will be easily scratched.



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the cigarette lighter panel. Refer to 11.16.6.1 Cigarette Lighter Replacement.
3. Disconnect the wiring harness connector from the back of the panel.
4. Remove the spare power outlet.



Installation Procedure:

1. Install the spare power outlet.
2. Connect the spare power outlet harness connector.
3. Install the cigarette lighter panel.
4. Connect the battery negative cable.

11.17 Data Communication System

11.17.1 Specifications

11.17.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
ECM Retaining Bolts	M6 × 18	8-10	6-7
ECM Bracket Retaining Bolts	M6 × 16	8-10	6-7
ABS Retaining Bolts	M8 × 20	35	26
airbag control module Bracket Retaining Nuts	M6	8-10	6-7
BCM Bracket Retaining Nuts	M8	8-10	6-7
Instrument Cluster Self-Tapping Screws	ST4.8 × 13	3-4	2-3
Air-Conditioning Self-Tapping Screws	ST6.3 × 19	5-7	4-5
Air-Conditioning Retaining Nuts	M6	5-7	4-5
IMMO Bracket Retaining Nuts	M6	8-10	6-7
TPMS Retaining Bolts	M6 × 16	8-10	6-7

11.17.2 Description and Operation

11.17.2.1 System Working Principle

Overview

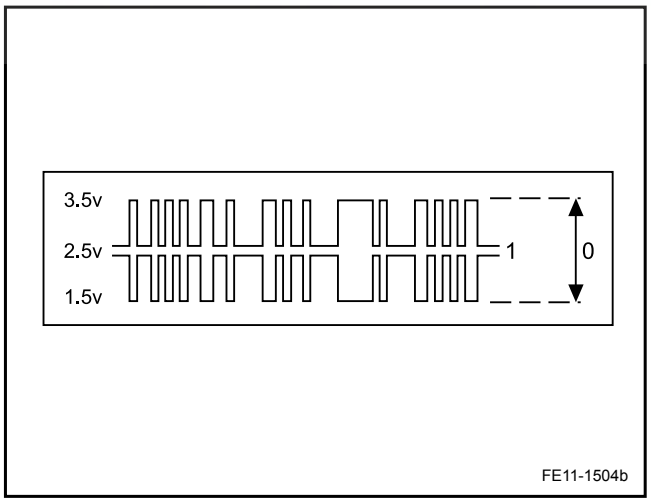
This vehicle uses three types data communication:

- CAN Bus
- K Bus
- LIN Bus

CAN Bus Description

- CAN is the Controller Area Network acronym, stands for Controller Area Network bus, the control devices connected to each other and exchange data .

  CAN bus communication medium is a twisted-pair, in which high-speed CAN bus communication speed is 500 kbps. Twisted-pair terminals are two 120 Ω resistors, one end is in the engine control module (ECM), the other side is in the body control module (BCM). High-speed CAN bus is a differential bus. High-speed CAN bus serial data bus (H) and high-speed CAN bus serial data bus (L) from a stationary or idle-level drive to the opposite limit. About 2.5 V idle level is considered to transmit data and interpreted as a hidden logic 1. The extreme limit of line-driven, high-speed CAN bus serial data bus (H) would increase the 1V and the high-speed CAN bus serial data bus (L) will reduce 1 V. Limit voltage difference 2 V is considered dominant transmission of data and explain the logic 0 (as shown).



- If the communication signal is lost, the program will target the control module losing communication to set DTC codes. The fault diagnosis codes can be read by scan tool.

  Note

  Serial data loss does not mean that the module is faulty.

- The advantages of CAN bus:
  1. Reduce the number of sensors and signal wires.
  2. Reduce the number of wires in wiring harness.
  3. Greatly reduces the weight of the wire harness.
  4. Reduce the number of control devices pins.
  5. Improve the reliability and durability.
- In this vehicle, high-speed CAN bus allows BCM, ECM, ABS, airbag control module, IP Cluster communication.

LIN Bus Description

- LIN is used for automotive distributed electronic control system and is a new type of low-cost serial communication system, mainly for smart sensors and actuators serial communication.
- LIN bus features:

  Based on UART data format
  Single-master multi-structural
  Single transmission :0-12 V
  Communication speed: 19.2 kbps

K Bus Description

- K bus is for communication between the vehicle ECM and the external test equipment. Transfer rate is 10.47 kbps. Voltage is between 0 V and 12 V: 12 V, logic "1"; 0 V, logic "0".

Data Link Connector Description

Datalink connector (DLC) is the result of consultation between automotive manufacturers and regulations. scan tool must be used to communicate with the vehicle and for vehicle communication system programming.

The connector must meet the following conditions:

- Connect all scan tools 16-pin connector.
- Always use No.16-pin to provide power to scan tool.
- Always use No.4-pin as the scan tool ground.

- The rest pins are for vehicle serial data communications. The vehicle is controlled by a microprocessor, which communicates to scan tool through the serial data circuit.

11.17.3 System Working Principle

11.17.3.1 System Working Principle

Data Communication System Components

Use scan tool to access the following control module data circuits:

- ECM
- ABS
- TPMS
- IP Cluster
- IMMO
- ACU
- BCM
- HVAC

LIN Bus Applications

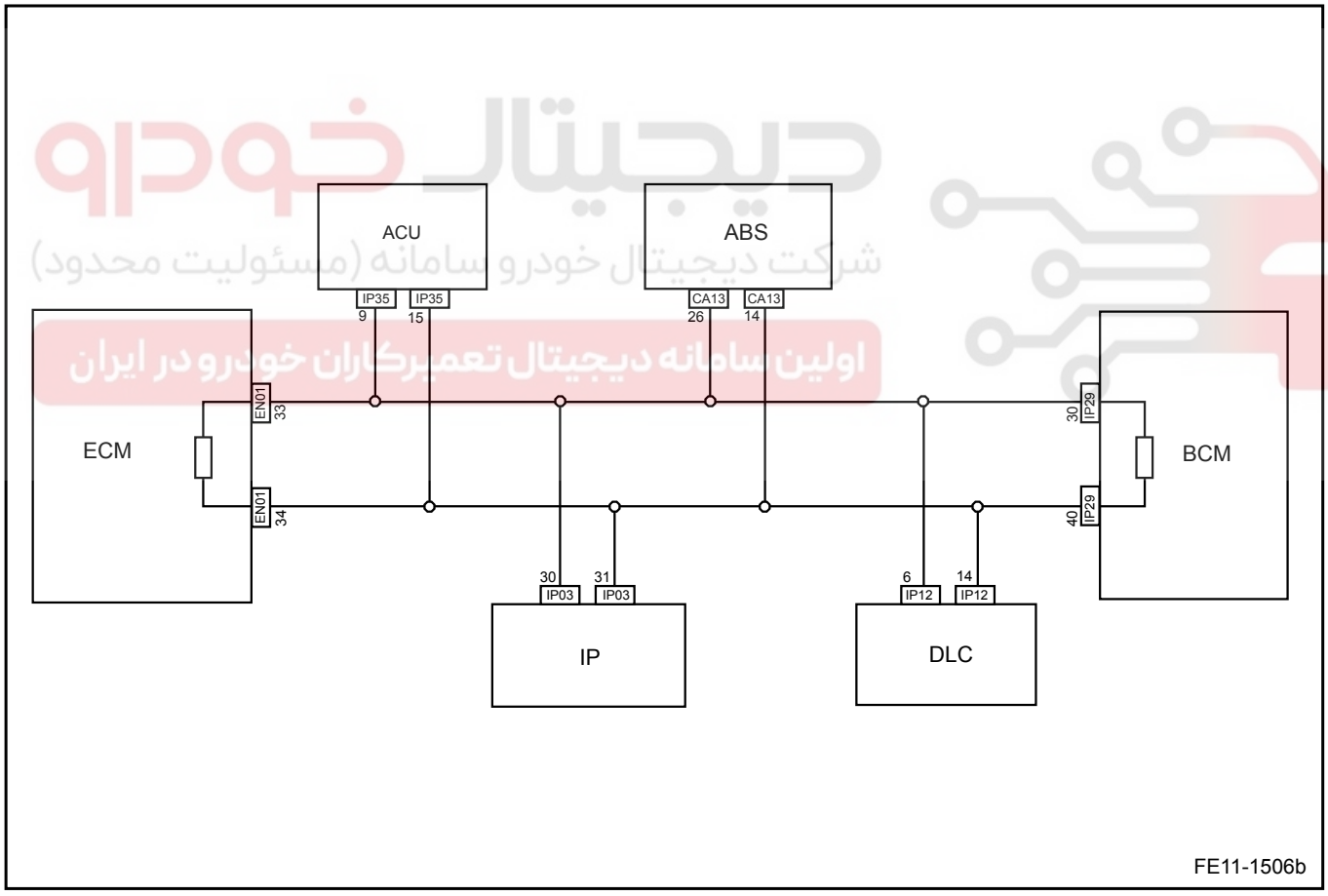
The vehicle with express window down function is equipped with a LIN bus, connecting BCM and windows regulators, to achieve power windows remote control and express window down function. Refer to 11.5.2.1 Description and Operation.

K Bus Applications

This vehicle uses the K-bus to achieve the ECM, ABS, TPMS, IMMO, and HVAC fault diagnosis.

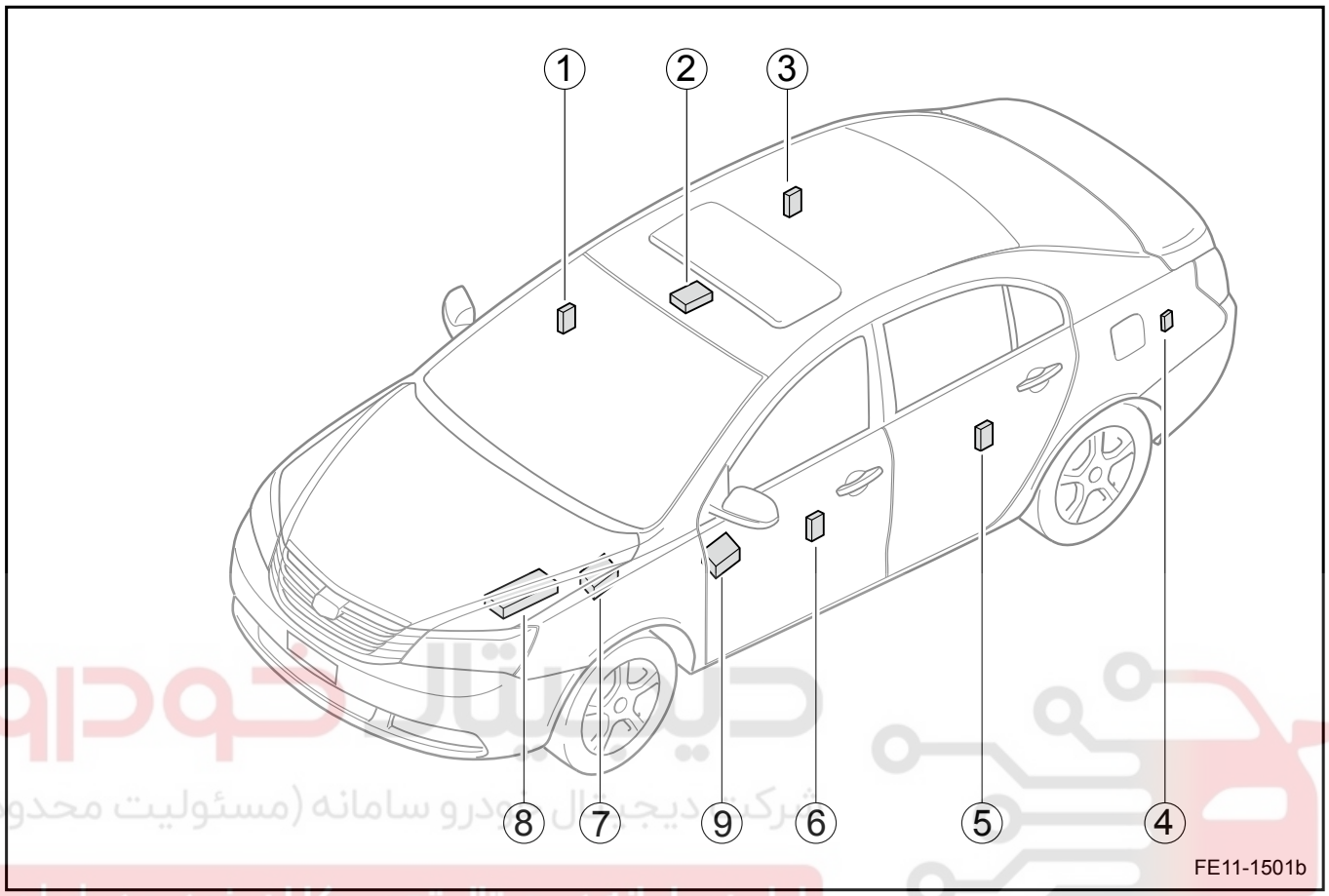
CAN Bus Applications

In this vehicle, ABS, airbag control module, BCM, ECM, and IP Cluster five modules are parallel connected to the CAN bus to form a CAN bus network architecture, terminal resistors are set within the BCM and ECM. Refer to figure below:



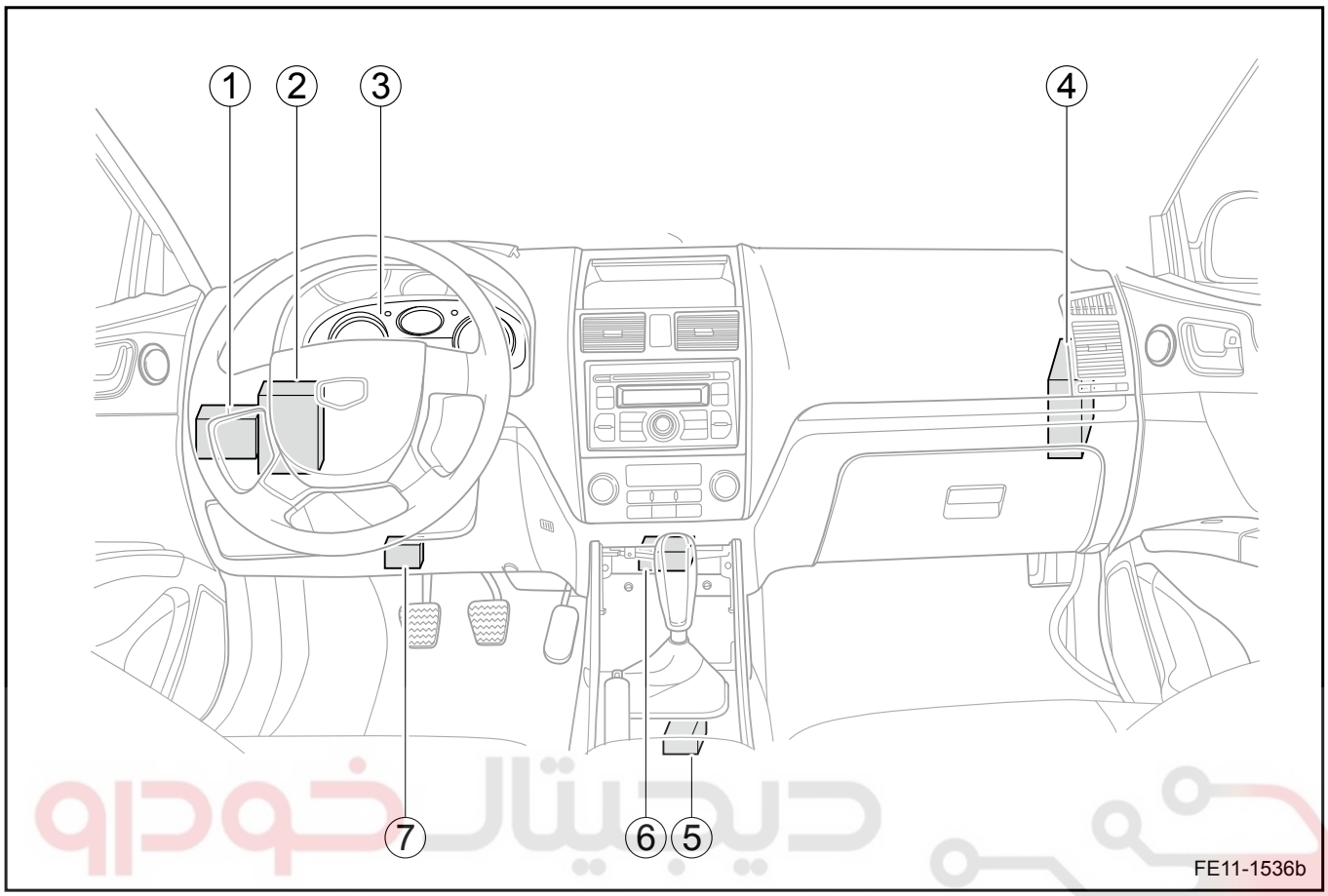
11.17.4 Component Locator

11.17.4.1 Module Position



Legend

1. Right Front Window Regulator Motor With Module Assembly (Express Down Function)
2. Sunroof Motor With Module Assembly
3. Right Rear Window Regulator Motor With Module Assembly (Express Down Function)
4. Reverse Radar Control Module
5. Left Rear Window Regulator Motor With Module Assembly (Express Down Function)
6. Left Front Window Regulator Motor With Module Assembly (Express Down Function)
7. ABS Control Module
8. Underhood Fuse Block
9. Window Regulator Control Module (Without The Express Down Function)

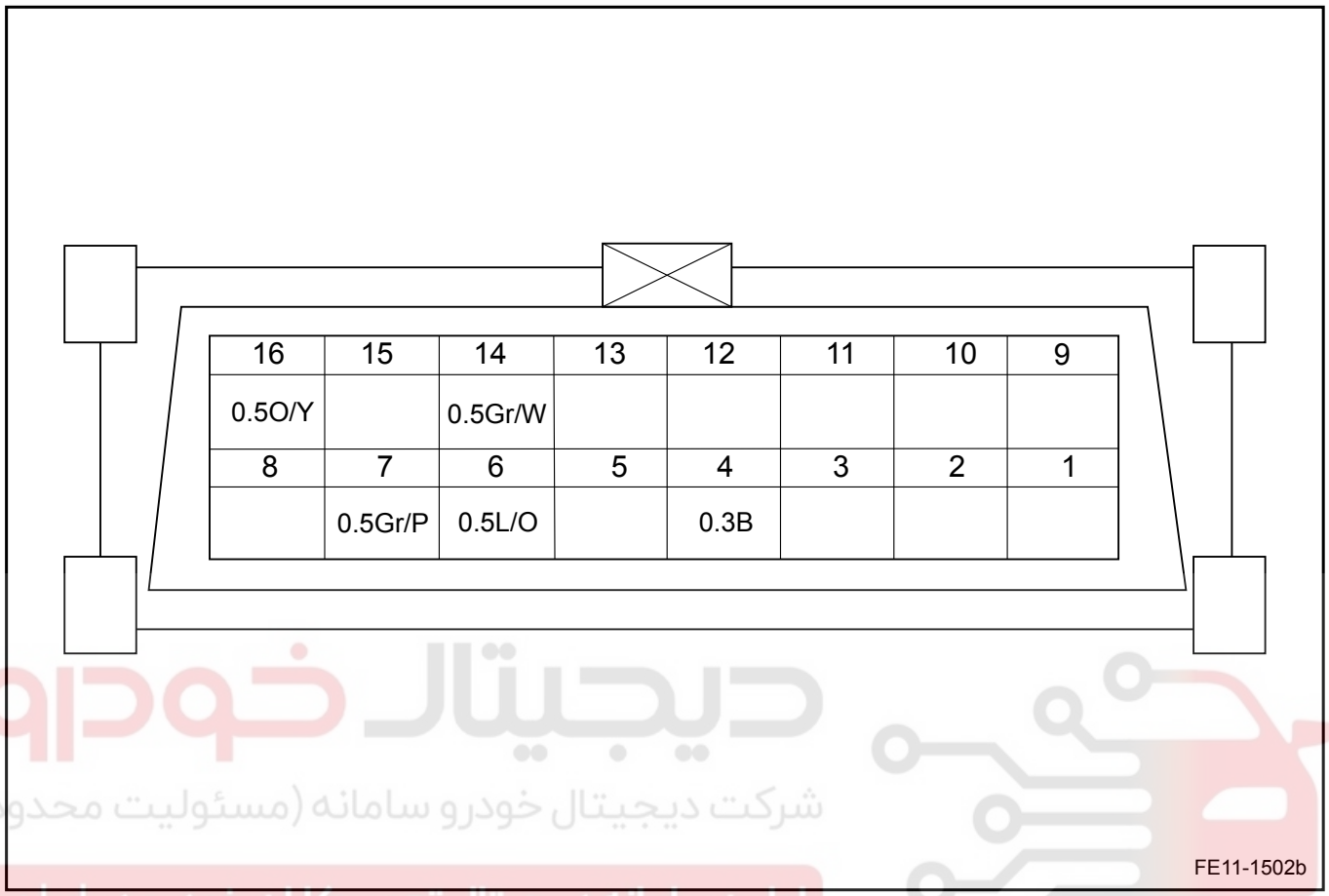


Legend

1. I/P Fuse Block
2. Body Control Module
3. Instrument Cluster
4. Engine Control Module
5. Tire Pressure Monitoring Control Module
6. Airbag Control Module
7. Engine Anti-theft Control Module

11.17.5 Disassemble View

11.17.5.1 Data Link Connector

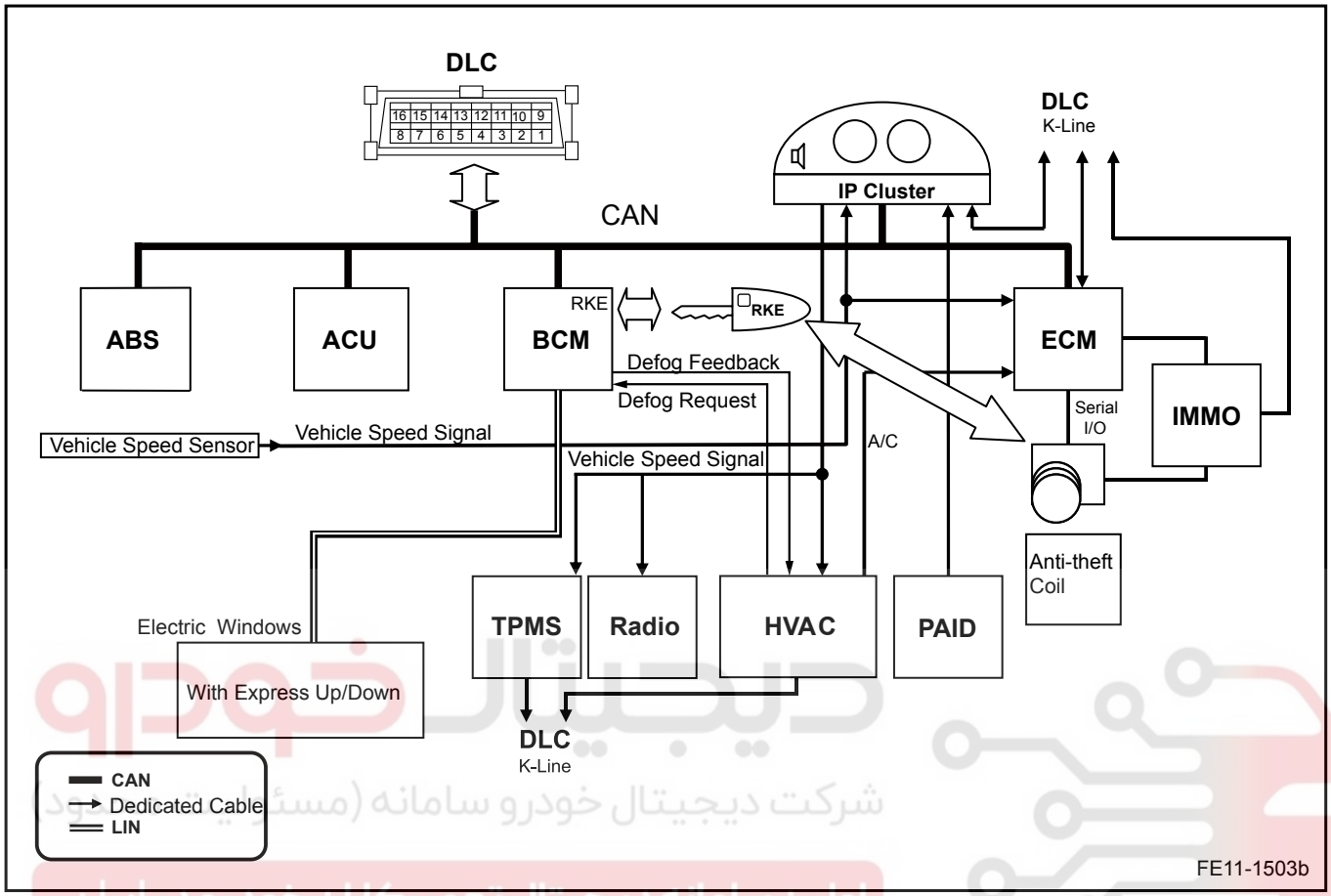


Legend

1. PIN 4 - Ground
2. PIN 6 - CAN_H
3. PIN 7 - K Bus
4. PIN 14 - CAN_L
5. PIN 16 - Power Supply

11.17.6 Schematic

11.17.6.1 Data Communication Schematic



11.17.7 Diagnostic Information and Procedures

11.17.7.1 Diagnosis Description

Refer to 11.17.2.1 System Working Principleget familiar with the system functions and operation before start system diagnostics, so that in the event of failure it will help to determine the correct diagnostic steps, more importantly, it will also help to determine whether the customer described situation is normal.

11.17.7.2 Visual Inspection

- Check the installed after market equipment that may affect data communication system.
- Check the easy to access system components to identify whether there is a significant damage or a potential malfunction.
- If the data communication system has a fault, before repair check whether all data communication system control module harness connectors have been correctly connected.

11.17.7.3 CAN Bus Fault Prevention

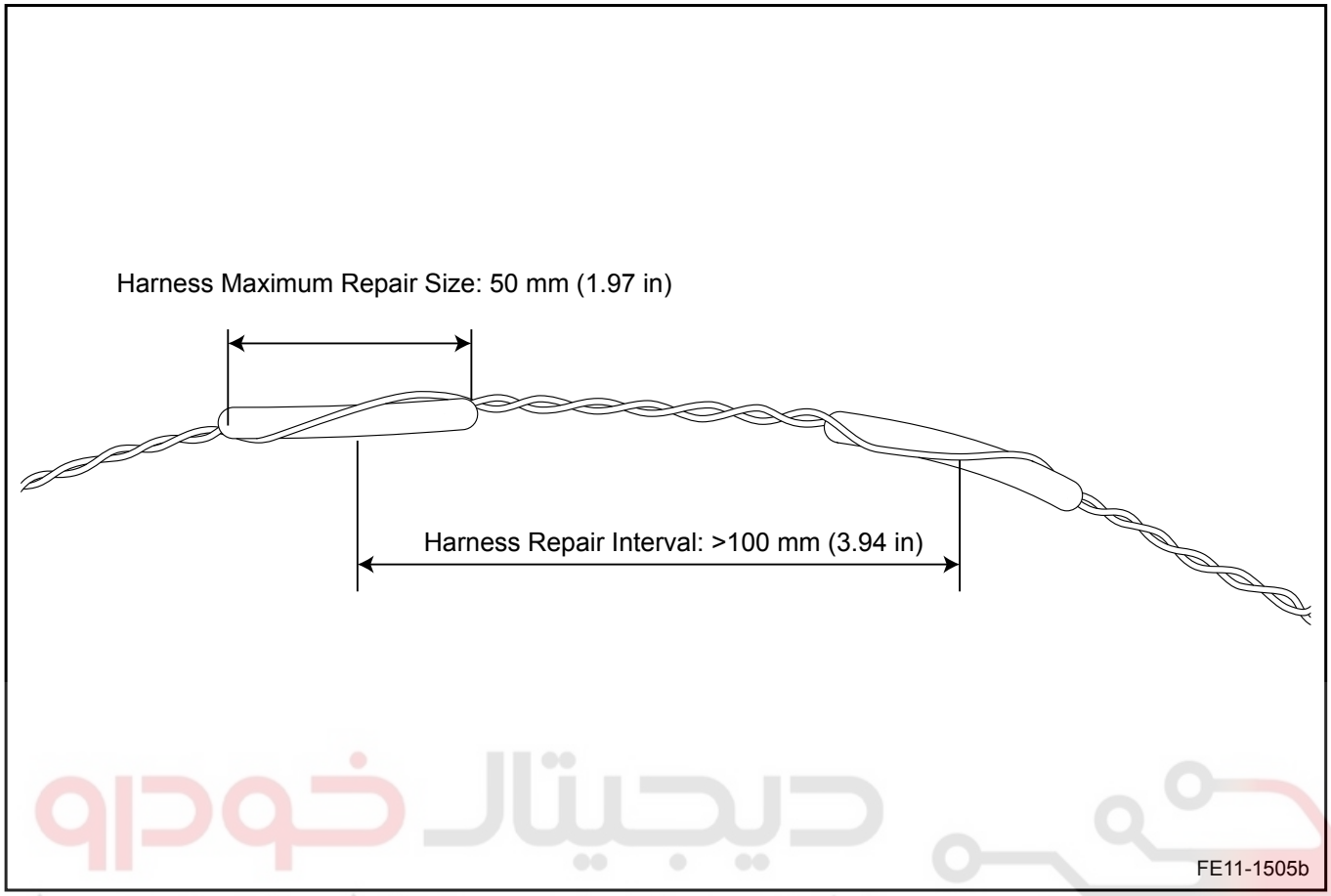
- Do not stretch CAN bus wiring harness.
- Do not open the CAN bus wiring harness more than 4 cm (1.6 in).
- Do not connect CAN bus wiring harness with other wiring harness.
- Use manufacturers recommended scan tool.

11.17.7.4 CAN Bus Integrity Diagnosis

To check whether CAN bus is normal, perform the CAN bus integrity diagnosis to confirm whether the fault is due to the physical CAN bus circuit open. For specific operations. Refer to 11.17.8.1 CAN Bus Network Integrity Checking.

11.17.7.5 CAN Bus Wiring Harness Repair Specification

- CAN_H and CAN_L two lines must be articulated way.
- When CAN bus circuit fault occurs, the length of wire joints should not exceed L1: 50 mm (1.97 in).
- If the circuit is open at two or more places. The distance between the two places must be more than L2: 100 mm (3.94 in), then it is allowed to repair. Otherwise replace the CAN bus wiring harness.



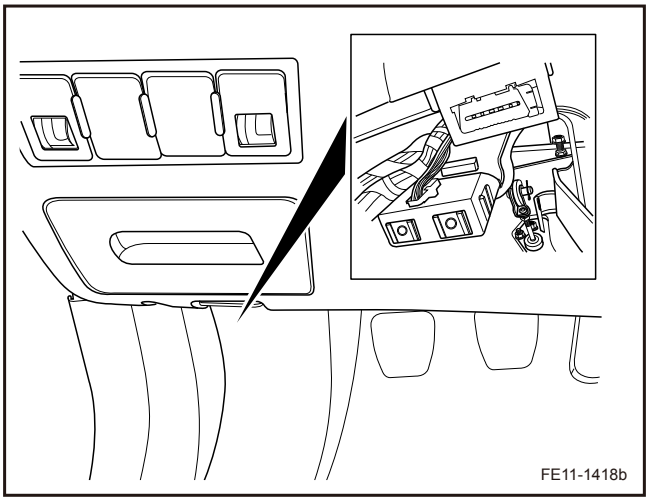
11.17.7.6 CAN Bus Signal Diagnostic

Use the oscilloscope dual-channel input to monitor the signal on the CAN bus, the signal should have the following features:

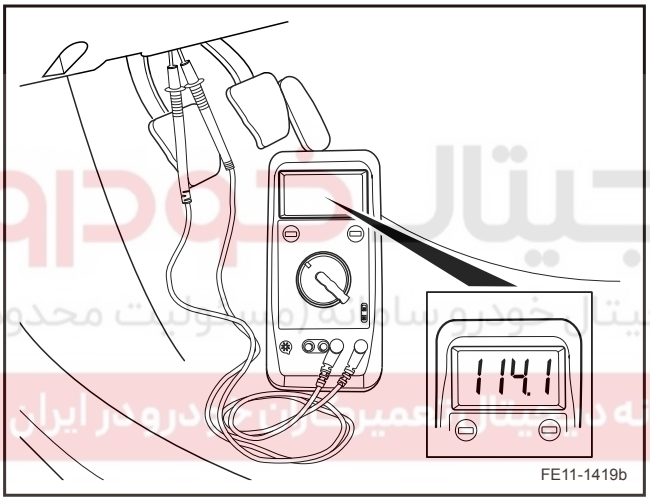
1. CAN_H bus voltage signal is 2.5-3.5 V, CAN_L bus voltage signal is 1.5-2.5 V.
2. Two signals mirror each other.
3. Signals start to transfer with the ignition switch is turned to on, but stops 2 s after the ignition is switched off.

11.17.8 Removal and Installation

11.17.8.1 CAN Bus Network Integrity Checking



1. Turn off the ignition switch, use a multimeter to measure the datalink connector terminals PIN6 and PIN14 resistance.

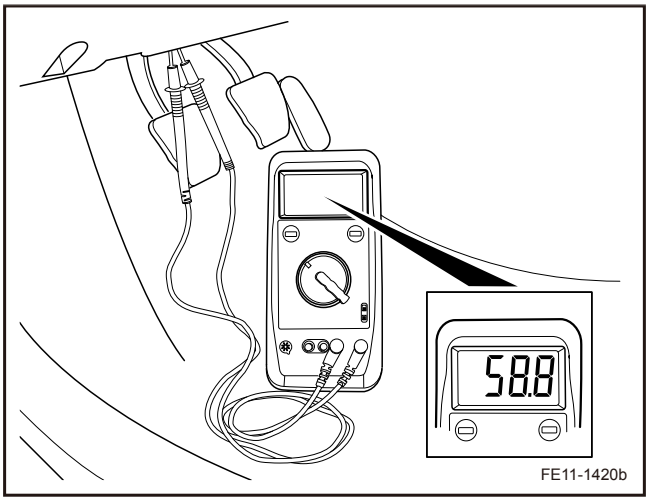


2. If the multimeter shows about 110-125 Ω resistance or non-conduction, the CAN bus is incomplete.

3. Check the ECM and the BCM harness connectors, confirm the CAN bus connection is normal. If there are undesirable situations such as open circuit or connection, carry out repairs.

Note

CAN bus repairs must follow the repair specification. Refer to 11.17.7.5 CAN Bus Wiring Harness Repair Specification.



4. If the multimeter shows that the resistance is about 55-63 Ω, it means the from the BCM to ECM the CAN bus is complete.

11.17.8.2 Scan Tool Can Not Be Turned On

For diagnostic steps. Refer to 2.2.7.2 Control System Check.