12 Body, Sheet Metal and Painting

12.1 Warnings and Notices

12.1.1 Warnings and Notices

Collision Sectioning Warning

Warning!

Warning: Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle and cause personal injury if the vehicle is in a collision.

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.

Glass and Sheet Metal Handling Warning

Warning!

Warning: When working with any type of glass or sheet metal with exposed or rough edges, wear approved safety glasses and gloves in order to reduce the chance of personal injury.

Safety Glasses and Compressed Air Warning

Warning!

Warning: Wear safety glasses when using compressed air in order to prevent eye injury.

Exterior Trim Emblem Removal Notice

Note

Notice: Use a plastic, flat-bladed tool to prevent paint damage when removing an emblem/name plate.

Machined Surface Damage Notice

Note

Notice: Do not nick, scratch or damage the sealing surface. The sealing surface is a machined surface. Damage to the machined surface can cause leakage.

Sealant Notice

Note

Notice: Do not allow the RTV sealant to enter any blind threaded hole. RTV sealant that is allowed to enter a blind threaded hole can cause hydraulic lock of the fastener when the fastener is tightened. Hydraulic lock of a fastener can lead to damage to the fastener and/or the components. Hydraulic lock of a fastener can also prevent the proper clamping loads to be obtained when the fastener is tightened. Improper clamping loads can prevent proper sealing of the components allowing leakage to occur. Preventing proper fastener tightening can allow the components to loosen or separate leading to extensive engine damage.

Window Edge Damage Notice

Note

Avoid damage to the window from impacting objects due to an exposed edge. The window must be 1 mm (0.025 in) below the surface of the sheet metal to avoid window damage.

12.2 Body Front End

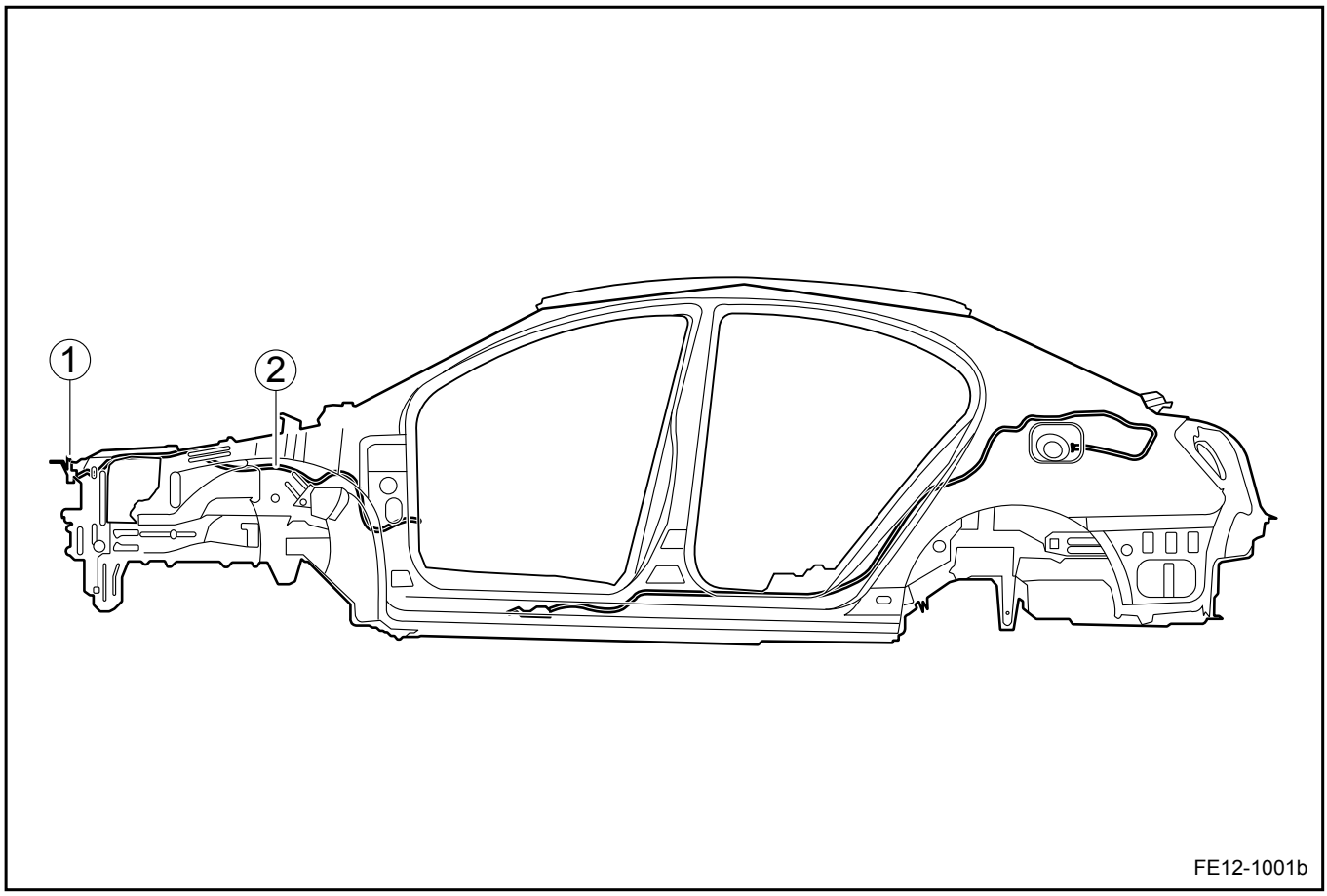
12.2.1 Specifications

12.2.1.1 Fastener Tightening Specifications

Application	Model	Specification	
		Metric (Nm)	US English (lb-ft)
Hood Hinge to Cowl Panel Brace Retaining Bolts	M8	23-26	17-19.2
Hood Hinge to Hood Retaining Bolts	M8 × 20	23-26	17-19.2
Hood Latch Retaining Bolts	M6 × 12	9-13	6.7-9.6

12.2.2 Component Locator

12.2.2.1 Component Views



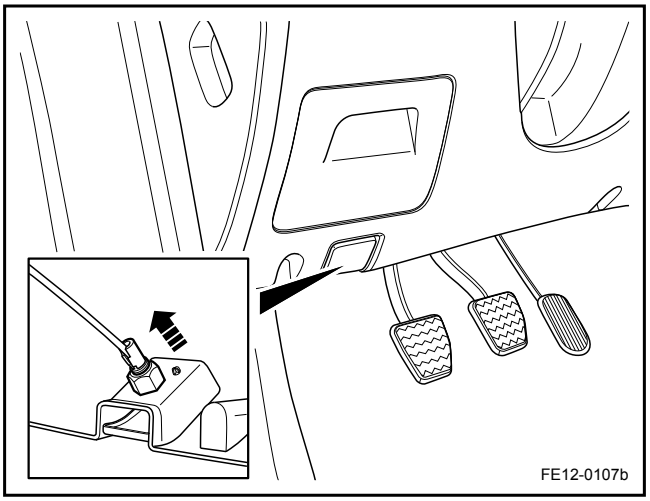
Legend

1. Hood Latch
2. Hood Latch Release Cable

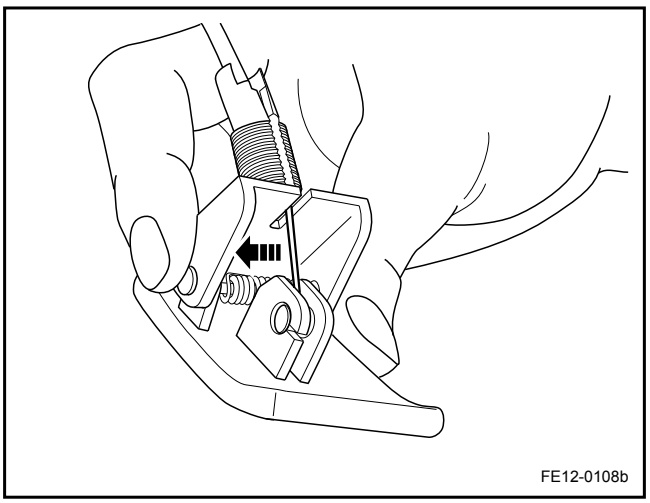
12.2.3 Removal and Installation

12.2.3.1 Hood Latch Release Cable Replacement

Removal Procedure:

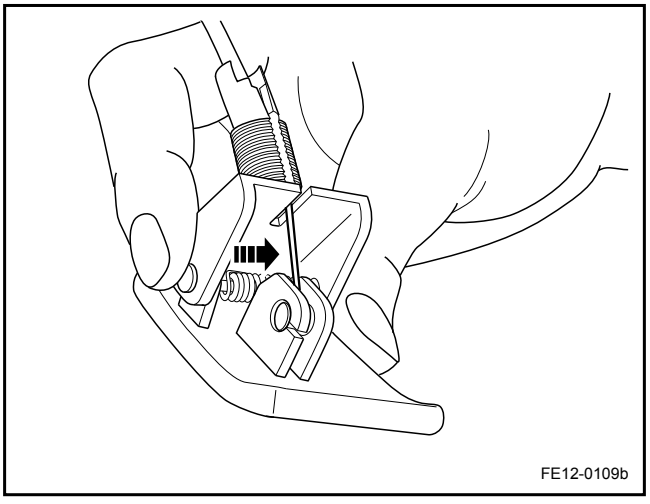


1. Remove the hood release handle retaining nut.

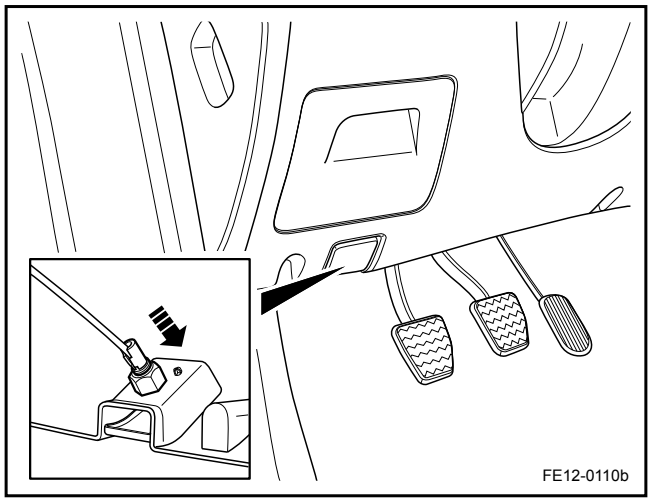


2. Disconnect the hood release cable from the hood release handle.
3. Remove the hood latch. Refer to 12.2.3.2 Hood Latch Replacement.
4. Remove the left front fender in order to remove the hood latch release cable. Refer to 12.10.1.8 Front Wheelhouse Liner Replacement.
5. Detach the hood latch release cable barrel from the hood release handle.

Installation Procedure:



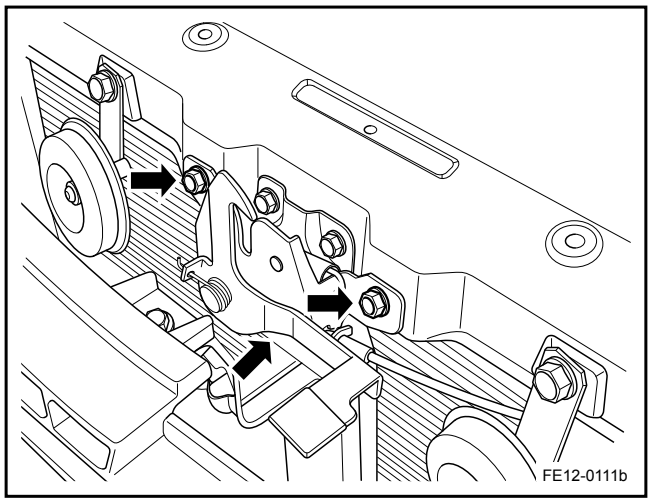
1. Route the string and the hood release cable into the passenger compartment.
2. Install the hood latch.
3. Attach the hood release cable barrel to the hood release handle.



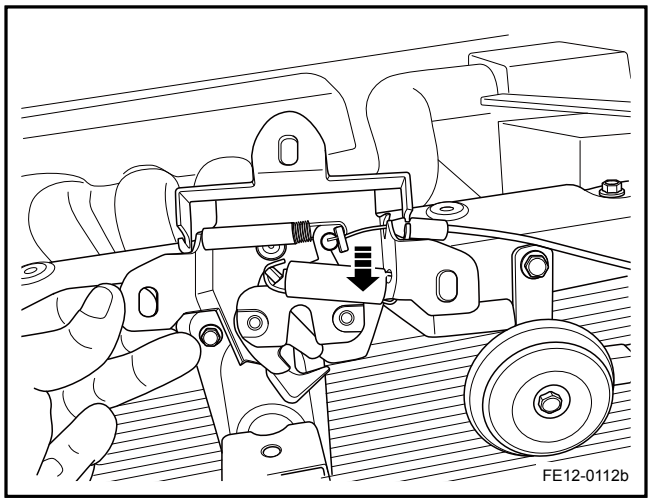
4. Install the hood release handle and tighten the retaining nut.
5. Install the left front fender.

12.2.3.2 Hood Latch Replacement

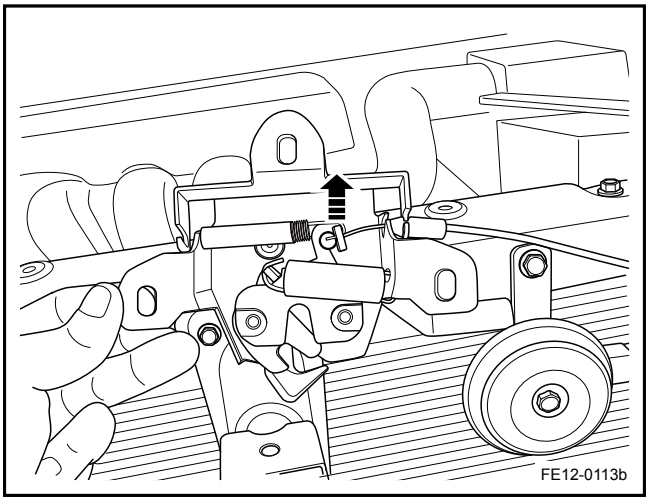
Removal Procedure:

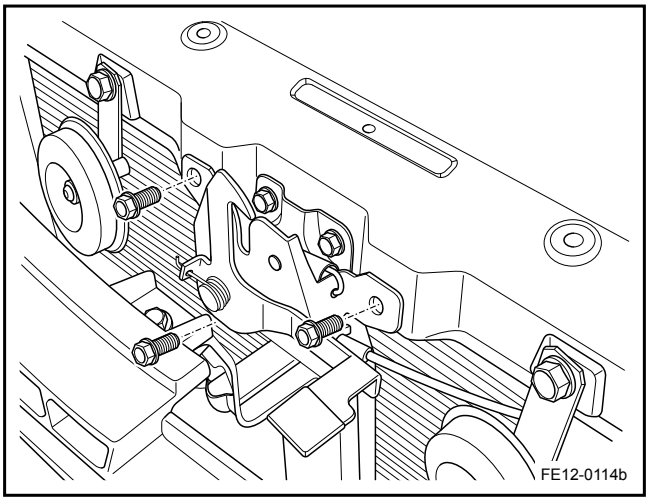


1. Open the hood and install a suitable hood brace to the vehicle.
2. Remove the radiator grille.
3. Remove the hood latch to front end module retaining bolts and washers.



4. Detach the hood latch from the front end module and disconnect the hood release cable from the hood latch.





Installation Procedure:

1. Connect the hood release cable to the hood cable latch.
2. Install and tighten the hood latch to front end module retaining bolts.

   Note

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

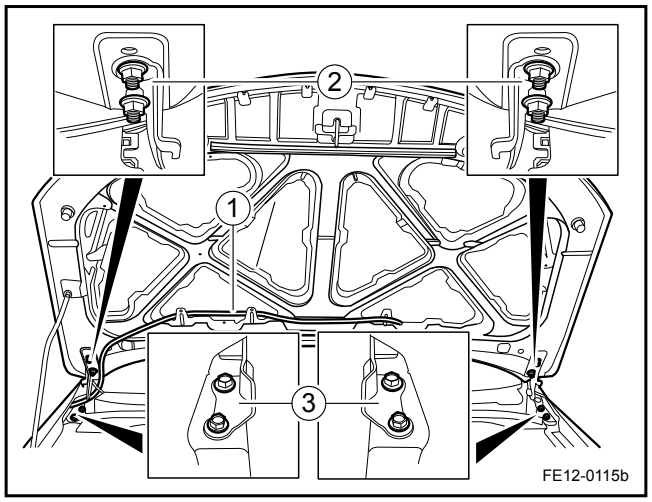
   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)
3. Install the radiator grille.
4. Remove the hood brace and close the hood.

12.2.3.3 Hood and Hinge Replacement

Removal Procedure:

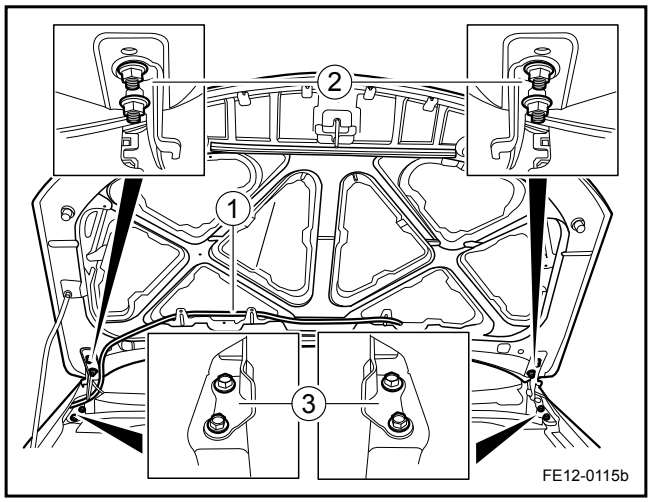
Note

Install protective covers on the front fender and the windshield to avoid damage to the paint, glass and panels.



1. Lift and support the hood.
2. Mark the location of the hinge on the hood assembly to assist installation.
3. Remove the hood insulator. Refer to 12.10.1.2 Hood Sound Insulation Pad Replacement.
4. Disconnect washer hose (1).
5. With the aid of an assistant, remove the hood to the hood hinge retaining bolts (2), repeat this procedure for the opposite side.
6. With the aid of an assistant, remove the hood.
7. Remove the hood hinge to dash and cowl panel brace retaining nuts (3).
8. Remove hood hinges.

Installation Procedure:



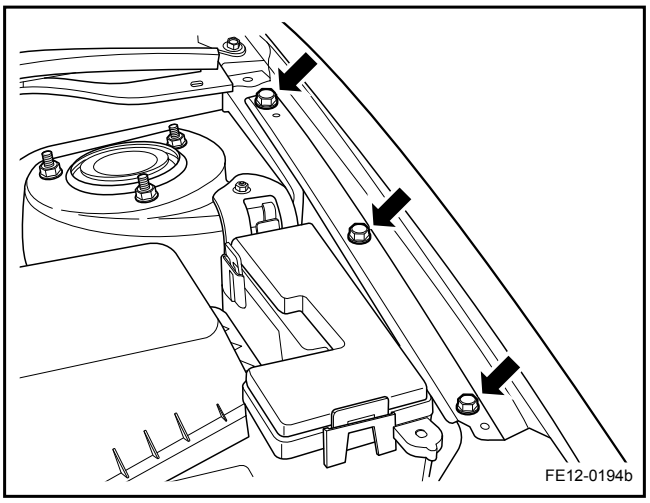
1. Install hood hinges and tighten the retaining nuts (3).

   Torque: 25 Nm (Metric) 18.5 lb-ft (US English)
2. With the aid of an assistant, position the hood to the marks on the hood, repeat this procedure for the opposite side.
3. Install the hood hinges and tighten the retaining bolts (2).

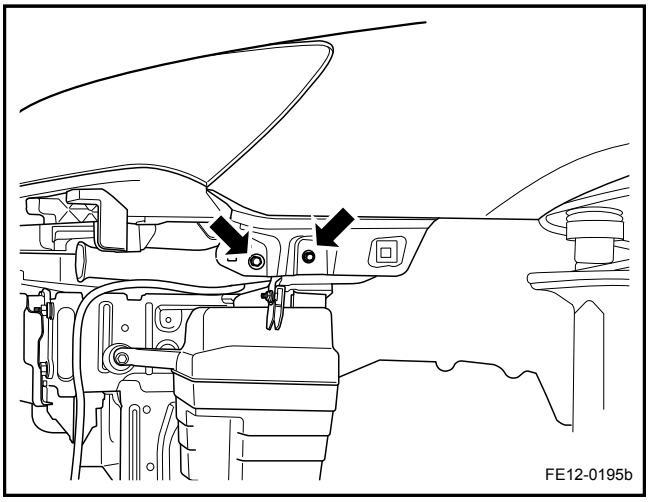
   Torque: 25 Nm (Metric) 18.5lbf-ft (US English)
4. Connect the windshield washer hose.
5. Install the hood insulator.
6. Check the hood is installed correctly.

12.2.3.4 Front Fender Replacement

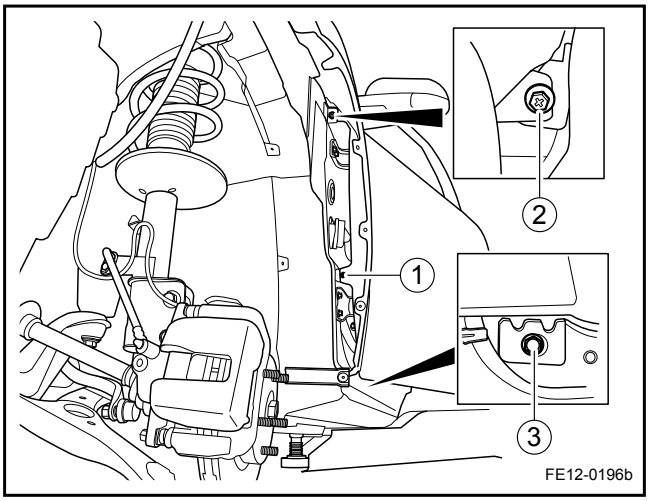
Removal Procedure:



1. Remove the front bumper fascia and front bumper fascia bracket. Refer to 12.4.3.1 Front Bumper Replacement.
2. Lift the vehicle. Refer to 1.3.1.1 Lifting and Jacking the Vehicle.
3. Remove the left front wheel. Refer to 4.4.5.1 Wheel Replacement.
4. Remove the front fender. Refer to 12.10.1.8 Front Wheelhouse Liner Replacement.
5. Remove the rocker panel molding. Refer to 12.10.1.9 Rocker Panel Molding Replacement.
6. Remove the front fender to front end module retaining bolts.

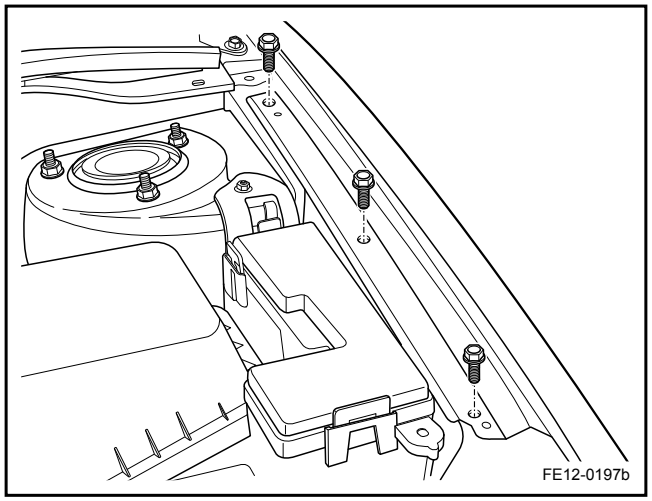


7. Remove the front fender to bumper side retaining bolts.



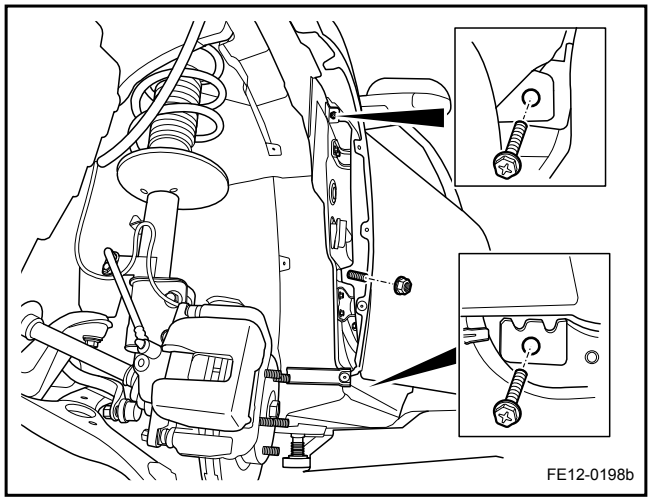
8. Remove the front fender to door pillar retaining bolts (2) and nuts (1).
9. Remove the front fender to inner wheelhouse retaining bolts (3).
10. Remove the front fender.

Installation Procedure:



1. Install the front fender and tighten the front fender to front end module retaining bolts.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

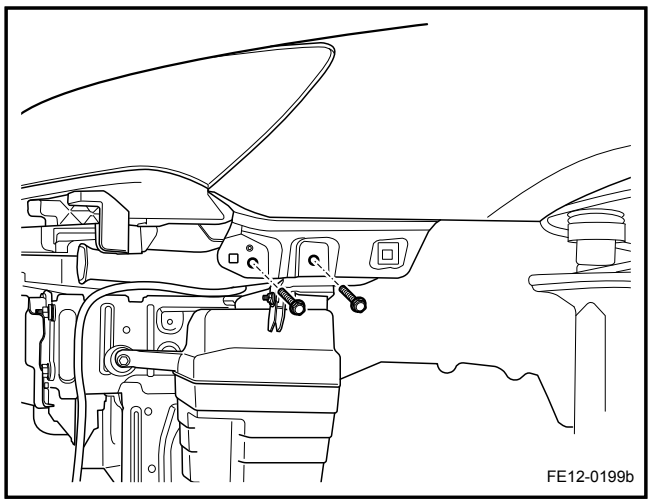


2. Install the front fender to inner wheelhouse retaining bolts and tighten the bolts.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

3. Install and tighten the front fender to door pillar retaining bolts (2) and nuts (1).

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)



4. Install and tighten the front fender to bumper side retaining bolts.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

5. Install the rocker panel molding.
6. Install the left front fender.
7. Install the left front wheel.
8. Install the front bumper fascia and front bumper fascia brackets.
9. Lower the vehicle.

12.3 Body Rear End

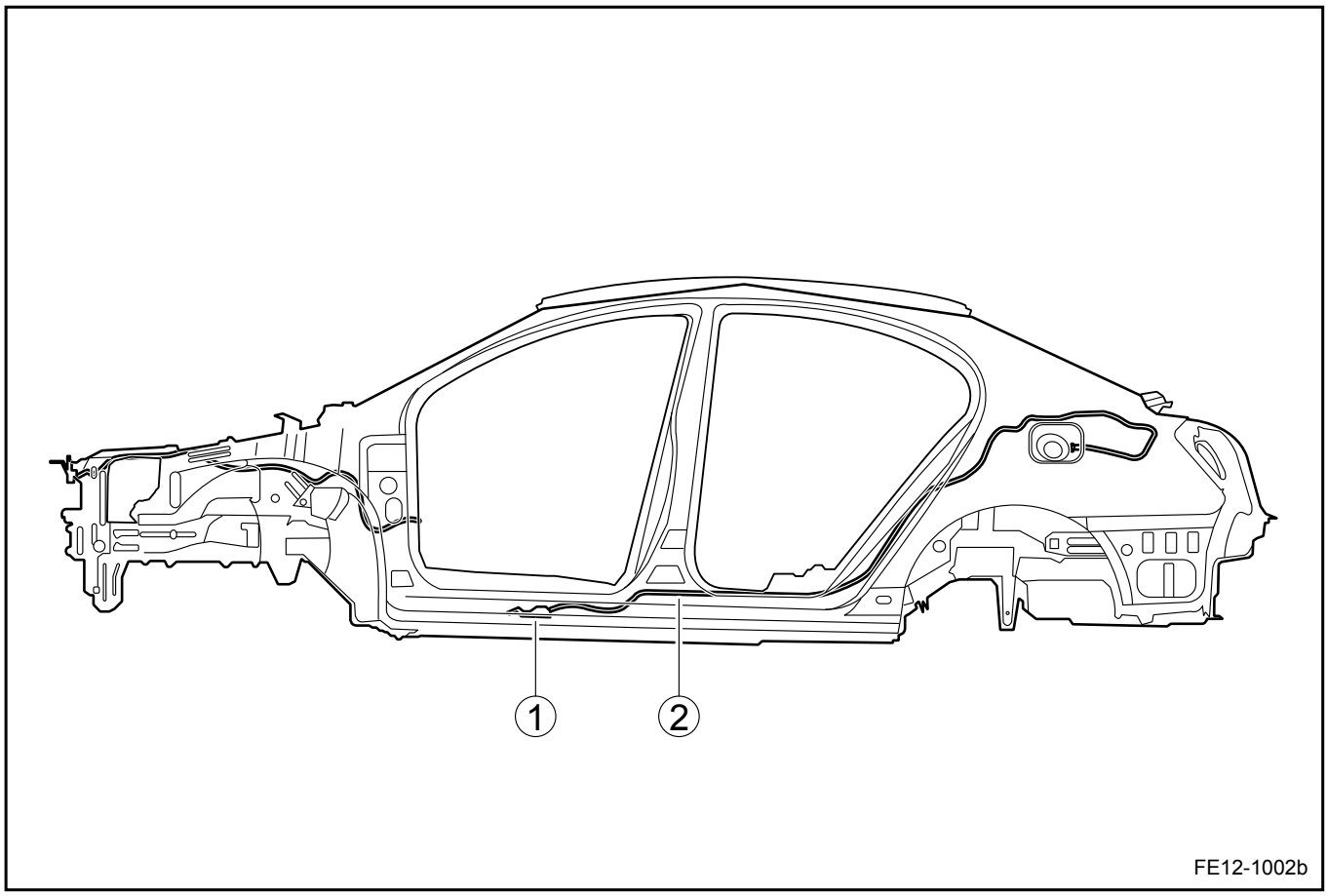
12.3.1 Specifications

12.3.1.1 Fastener Tightening Specifications

Application	Model	Specification	
		Metric (Nm)	US English (lb-ft)
Rear Compartment Lid Lock Actuator Retaining Bolts	M6 × 10	9-13	6.7-9.6
Rear Compartment Lid Hinge Retaining Bolts	M8 × 35	9-13	6.7-9.6
Rear Compartment Lid Latch Striker Retaining Bolts	M6 × 12	9-13	6.7-9.6
Fuel Filler Door Release Actuator Retaining Screws	M6 × 20	9-13	6.7-9.6
Hatchback Open Handle Retaining Nut	M6	9-13	6.7-9.6
Hatchback Latch Retaining Bolts	M8 × 22	23-30	17-22.2
Hatchback Latch Striker Nuts	M6	9-13	6.7-9.6
Hatchback to Hinge Retaining Bolts	M8 × 35	23-30	17-22.2
Hinge to Body Retaining Nuts	M8	23-30	17-22.2

12.3.2 Component Locator

12.3.2.1 Component Views



Legend

1. Fuel Filler Door Release Handle
2. Fuel Filler Door Release Cable

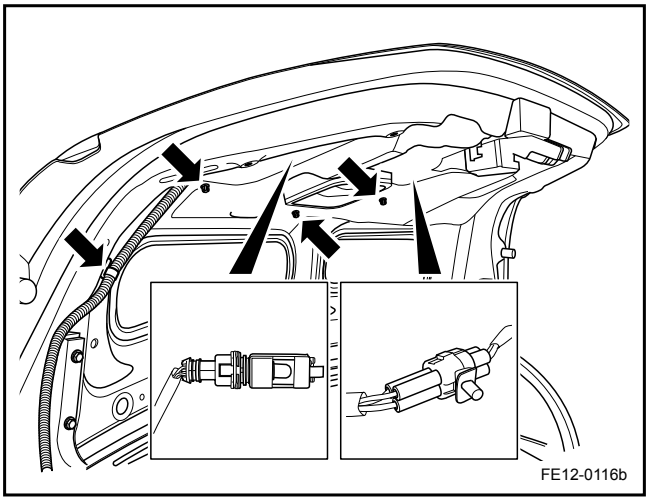
12.3.3 Removal and Installation

12.3.3.1 Rear Compartment Lid Replacement (Sedan)

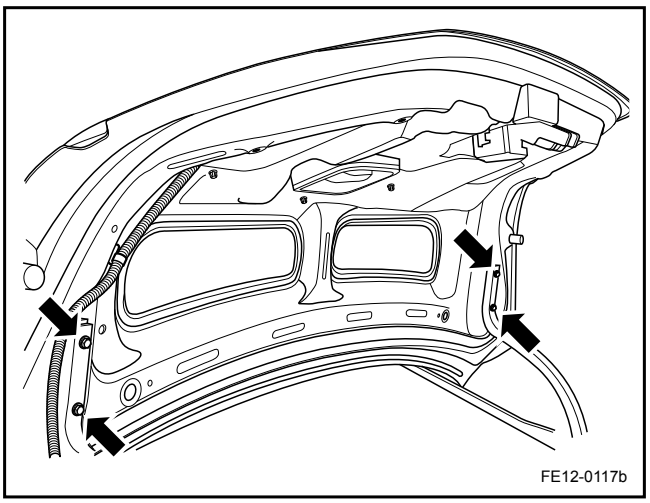
Removal Procedure:

Warning!

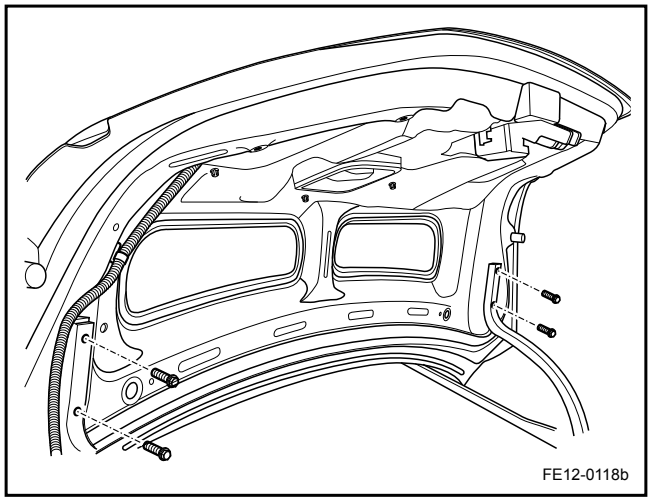
Refer to "Battery Disconnect Warning" in "Warnings and Notices".


FE12-0116b

1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Open and Support the rear compartment lid with a suitable brace.
3. Remove the rear compartment lid inner panel trim. Refer to 12.9.1.9 Rear Compartment Trim Panel Replacement.
4. Remove all the rear compartment lid wiring harness retaining clips, rear compartment latch connectors and two license plate lamp harness connectors.


FE12-0117b

5. Remove rear compartment lid hinges retaining bolts and hinges assembly.
6. With the aid of an assistant, remove the rear compartment lid.



Installation Procedure:

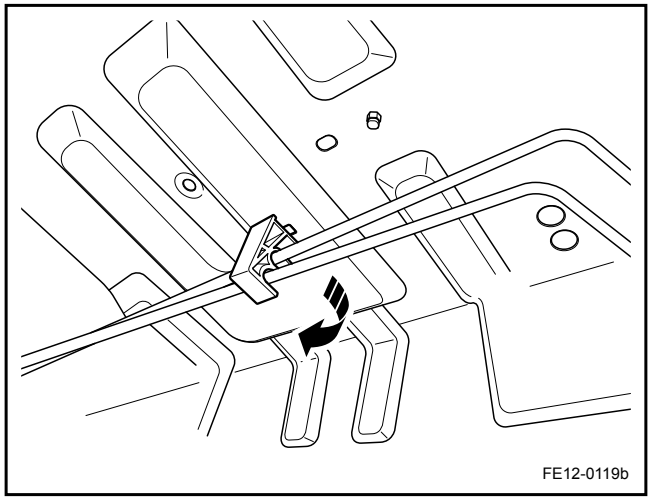
1. Install the rear compartment lid to hinges and tighten the retaining bolts.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

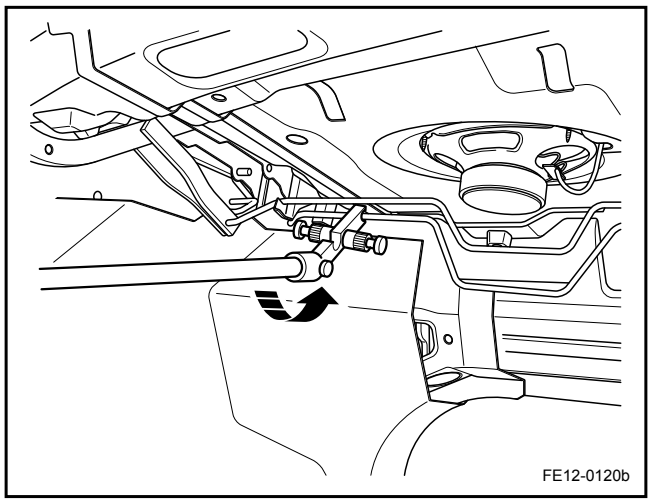
2. Install the wiring harness clips onto the rear compartment lid.
3. Connected the rear compartment lid latch and two license plate lamp harness connectors.
4. Install the rear compartment lid inner panel trim.
5. Close the rear compartment lid.
6. Connect the battery negative cable.

12.3.3.2 Rear Compartment Lid Torsion Spring Replacement (Sedan)

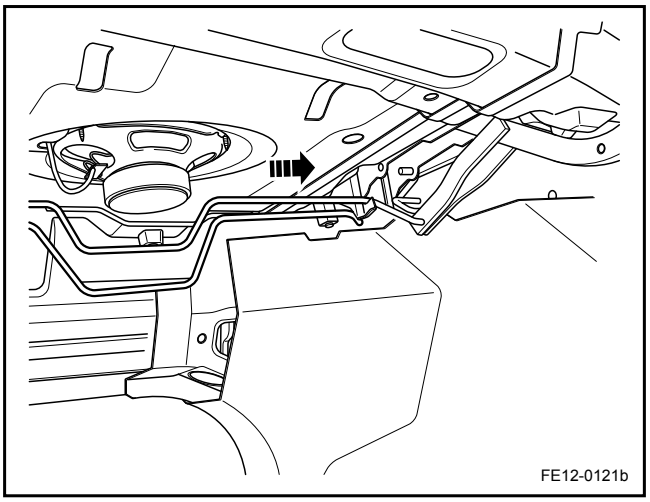
Removal Procedure:



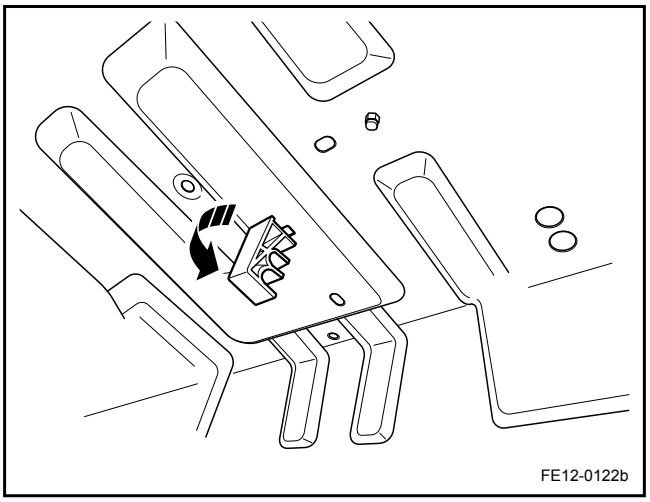
1. Detach the rear compartment lid torsion spring form the rear compartment lid torsion spring bracket (Left).



2. Detach the rear compartment lid torsion spring from the rear compartment lid hinge (Left).



3. Pull the rear compartment lid torsion spring (Left) to the right side to remove it.

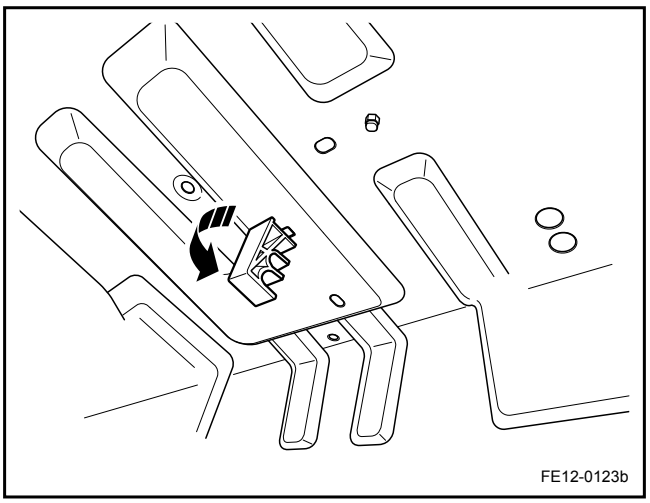


4. Remove the rear compartment lid torsion spring (Right), similar to the rear compartment lid torsion spring (Left).
5. Remove the rear compartment lid torsion spring bracket.

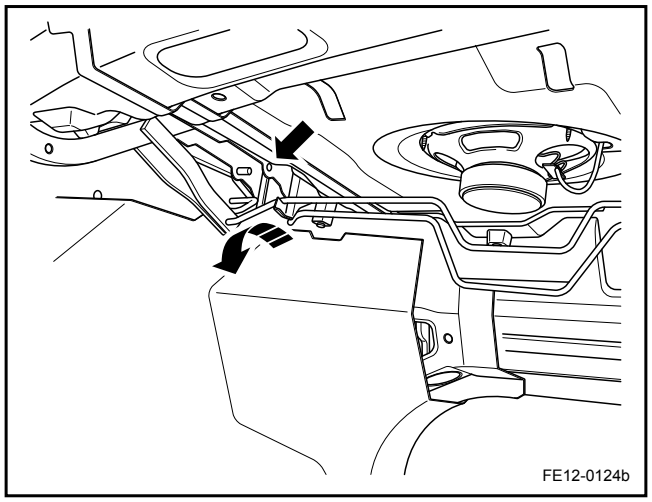
Installation Procedure:

Note

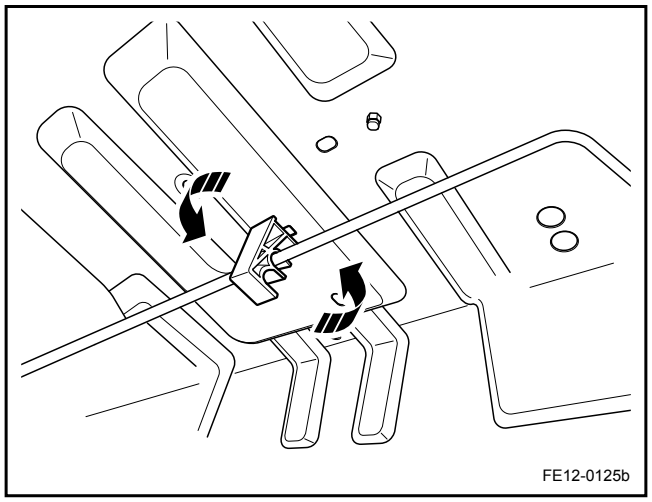
Install the rear compartment lid torsion spring (Right) first, and then install the left side spring.



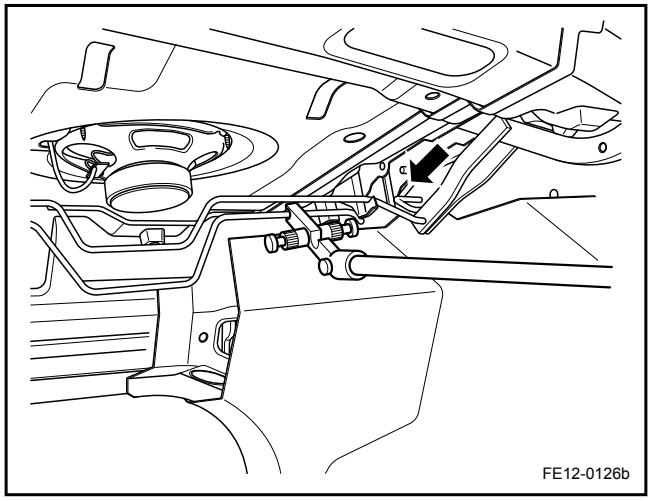
1. Install the rear compartment lid torsion spring bracket.



2. Install the top left end of the rear compartment lid torsion spring (Right) into the mounting hole.



3. Attach the rear compartment lid torsion spring (Right) to the rear compartment lid torsion spring bracket.



4. Install the top right end of the rear compartment lid torsion spring (Right) into the mounting hole first, then install the rear compartment lid torsion spring (Right) to the hinge and the body.

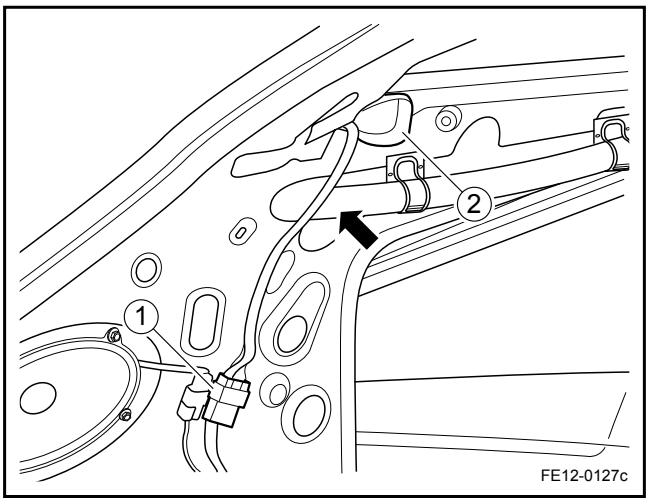
5. Install the rear compartment lid torsion spring (Left), similar to the rear compartment lid torsion spring (Right).

12.3.3.3 Hatchback and Hatchback Hinge Replacement (Hatchback)

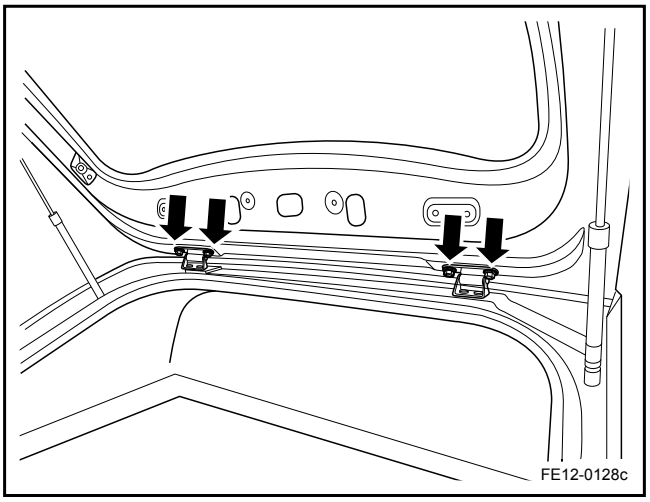
Removal Procedure:

Warning!

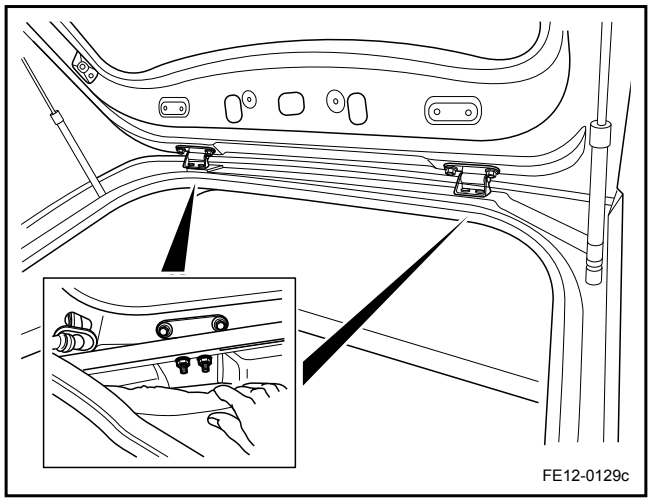
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



1. Open and use a suitable brace to support the hatchback.
2. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
3. Remove the body lock pillar upper trim panel. Refer to 12.9.1.6 Rear Quarter Upper Trim Panel Replacement (Hatchback).
4. Remove wiring harness connector 1 and rear window washer hose 2.
5. Remove the hatchback trim panel. Refer to 12.9.1.9 Rear Compartment Trim Panel Replacement.
6. Remove the hatchback strut. Refer to 12.3.3.4 Hatchback Strut Replacement (Hatchback).

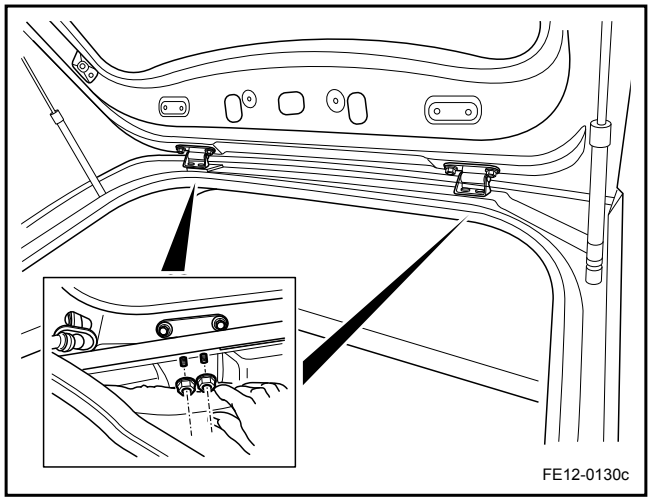


7. Remove the left and right hatchback to the hinges retaining bolts.
8. With the aid of an assistant, remove the hatchback.



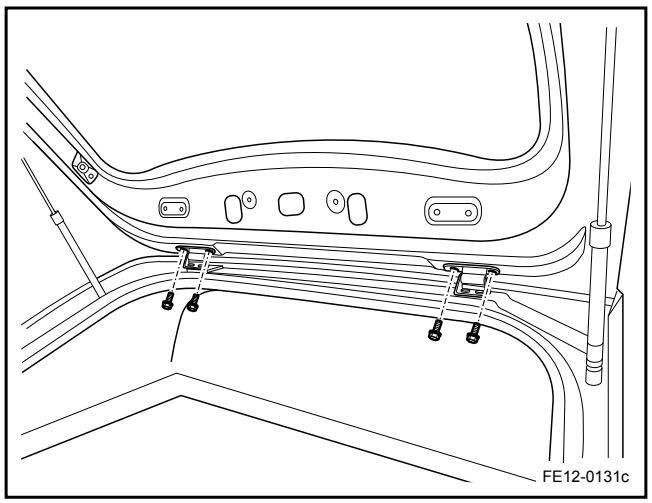
9. Remove the hatchback hinge retaining nuts, two on each side.
10. Remove the hatchback hinges.

Installation Procedure:



1. Install the hatchback hinge retaining nuts and tighten.

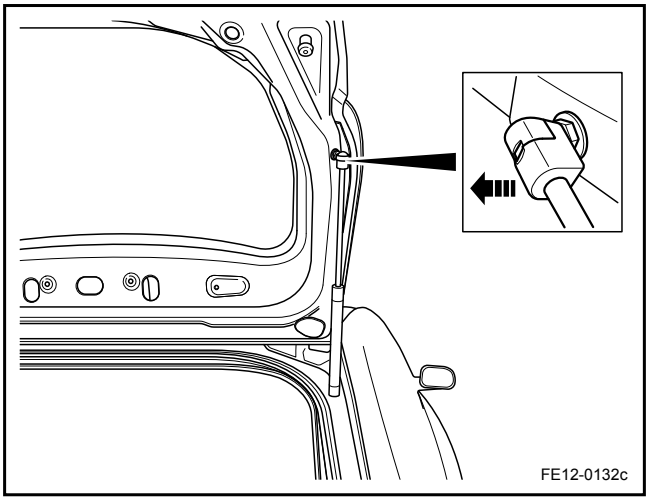
   Torque: 25 Nm (Metric) 18.5 lb-ft (US English)



2. Install the hatchback to the hinges and tighten the retaining bolts.

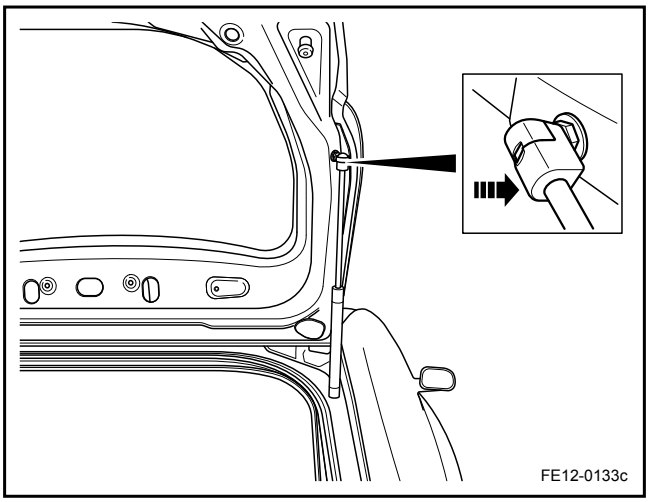
   Torque: 25 Nm (Metric) 18.5 lb-ft (US English)
3. Route the hatchback wiring harness to rear compartment and connect wiring harness connectors and rear window washer hoses.
4. Install the body lock pillar upper trim panel.
5. Install the hatchback trim panel.

12.3.3.4 Hatchback Strut Replacement (Hatchback)



Removal Procedure:

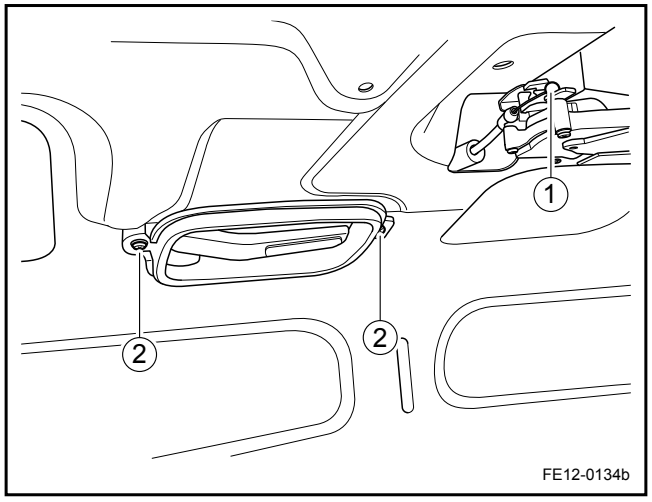
1. Open and use a suitable brace to support the hatchback.
2. Using a flat blade screwdriver, release the hatchback strut to upper strut stud retaining clip and detach the hatchback strut from the upper strut stud. Remove the hatchback strut from the lower strut stud in the same way.
3. Remove the hatchback strut from the vehicle.



Installation Procedure:

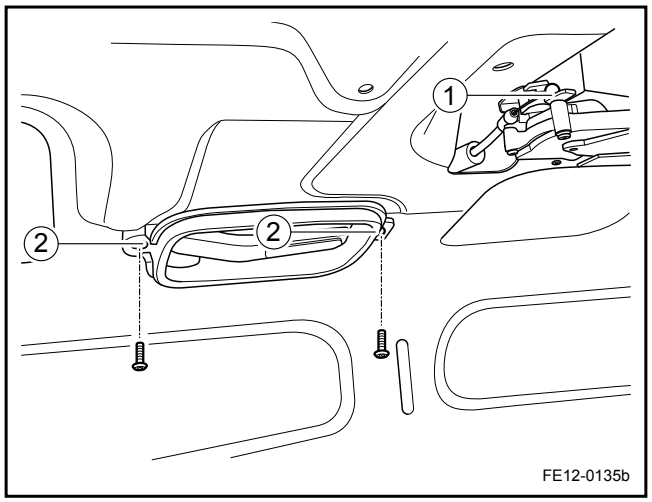
1. Press the end of the hatchback strut into the strut studs. Please note that the strut rod is on the hatchback.
2. Close the hatchback.

12.3.3.5 Emergency Exit Open Handle Assembly Replacement (Sedan)



Removal Procedure:

1. Remove the rear compartment lid inner panel trim. Refer to 12.9.1.14 Rear Compartment Lid Inner Trim Panel Replacement.
2. Disconnect the emergency exit open handle release cable (1) from the rear compartment lid latch.
3. Remove the emergency exit open handle retaining screws (2).
4. Remove the emergency exit open handle assembly.

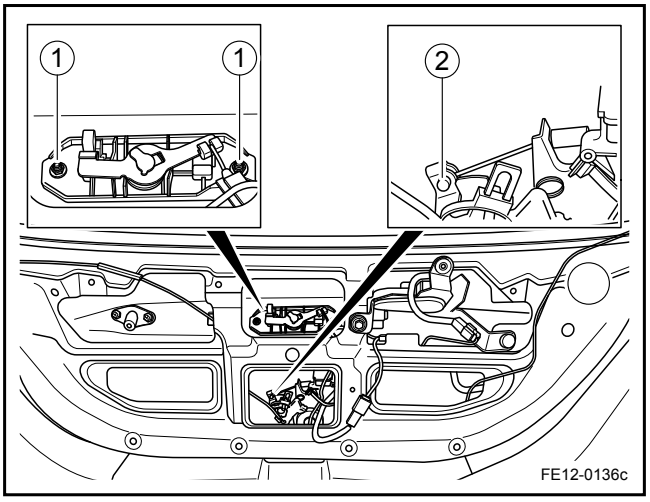


Installation Procedure:

1. Install the emergency exit open handle and tighten the retaining screws (2).

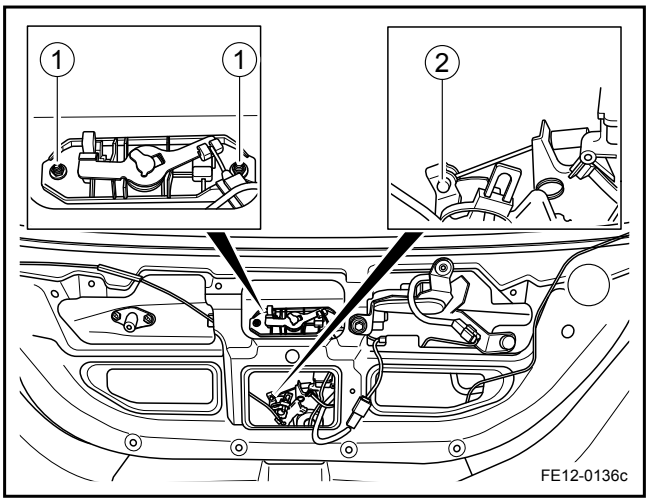
   Torque: 4 Nm (Metric) 2.96 lb-ft (US English)
2. Connect the emergency exit open handle release cable (1) to the rear compartment lid latch.
3. Install the rear compartment lid inner panel trim.

12.3.3.6 Hatchback Release Handle Replacement (Hatchback)



Removal Procedure:

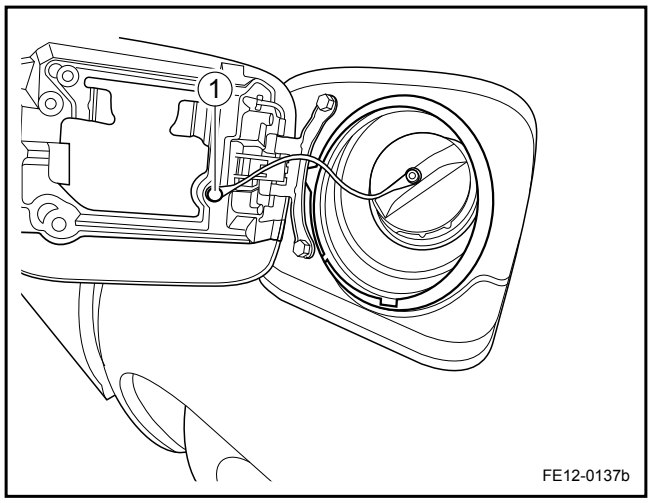
1. Remove hatchback inner trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
2. Remove hatchback release handle retaining nuts (1).
3. Disconnect the hatchback release cable (2) from the hatchback latch.
4. Remove the hatchback release handle.



Installation Procedure:

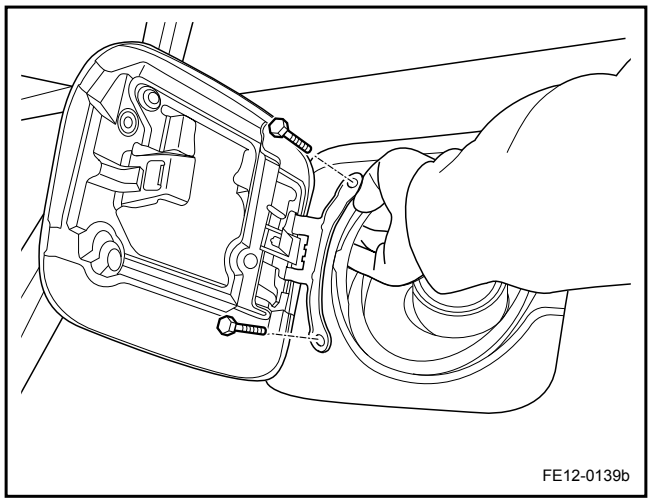
1. Install the hatchback release handle and tighten the retaining nuts (1).
2. Connect the hatchback release cable (2) to the hatchback latch.
3. Install hatchback inner trim panel.

12.3.3.7 Fuel Tank Filler Door Replacement



Removal Procedure:

1. Open the fuel filler cap.
2. Remove the fixed fuel filler gasket.
3. Disconnect the fuel filler cap release cable.



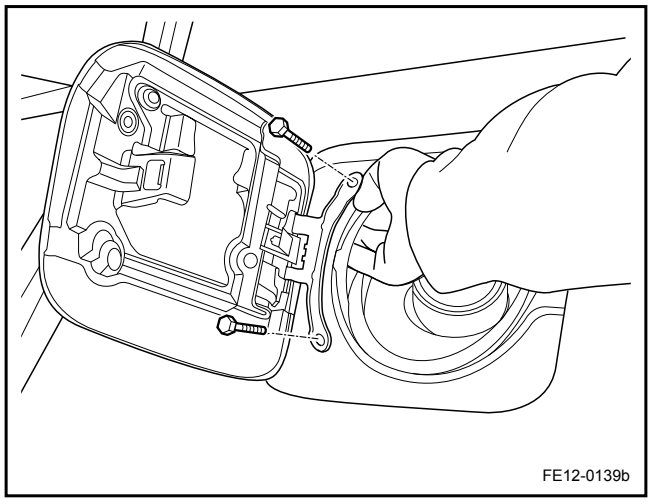
4. Remove the fuel tank filler door to rear quarter panel retaining torx screws.

   Note

   Hold the nuts from the back to remove the torx screws, otherwise the nuts may fall.

5. Remove the fuel filler cap.

Installation Procedure:

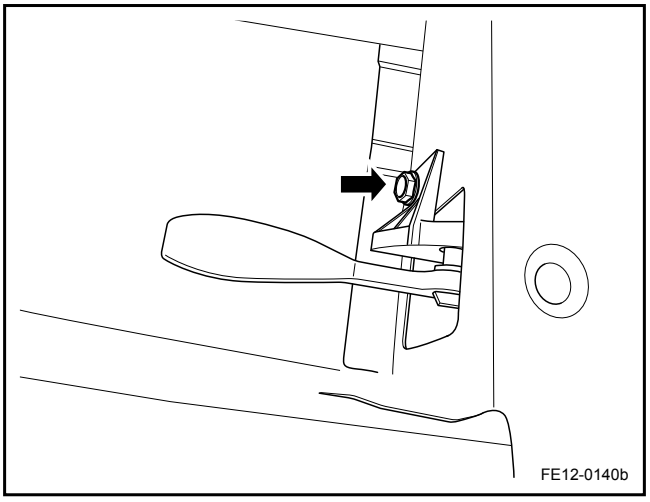


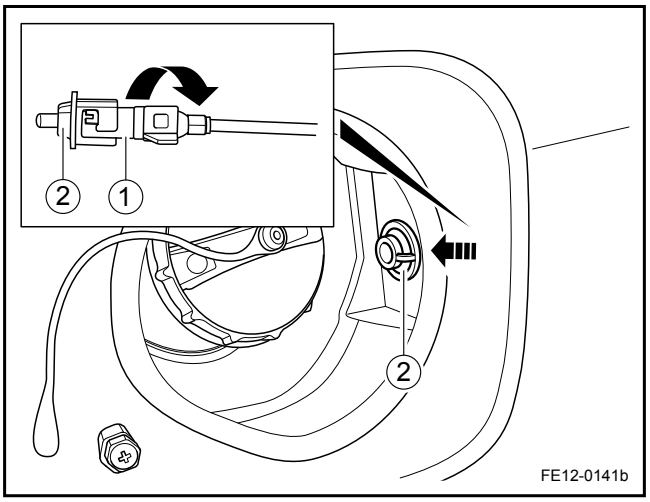
1. Install the fuel filler cap and tighten the retaining torx screws.

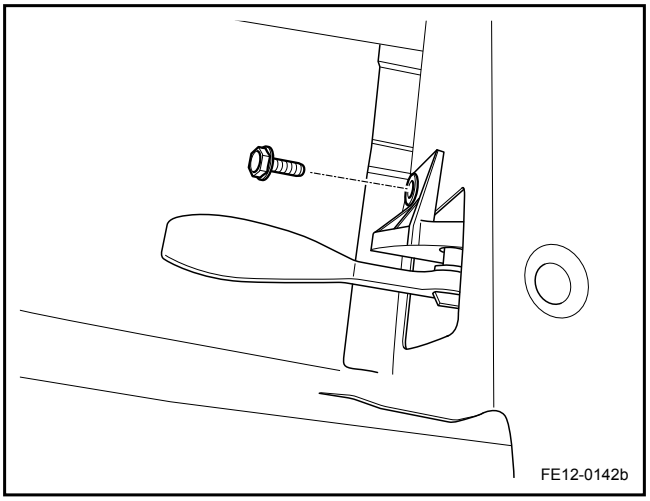
   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

2. Connect the fuel filler cap release cable.
3. Install the fixed fuel filler gasket.
4. Close the fuel filler cap.

12.3.3.8 Fuel Filler Cap Release Handle Replacement







Removal Procedure:

1. Remove the driver electric seat. Refer to 11.11.8.1 Front Electric Seat Replacement.
2. Remove the driver door and the left rear door sill nameplate. Refer to 12.9.1.2 Left and Right Door Sill Nameplate Replacement.
3. Remove center pillar lower trim panel. Refer to 12.9.1.4 Center Pillar Trim Panel Replacement.
4. Remove the rear seat back bolster. Refer to 12.7.3.6 Rear Seat Armrest Assembly Replacement.
5. Lift the car carpet and remove the fuel filler cap release handle retaining bolts.
6. Remove the rear compartment trim panel. Refer to 12.9.1.9 Rear Compartment Trim Panel Replacement.
7. Disconnect the fuel filler cap release cable (1) from inside the vehicle.

   Note

   Rotate the fuel filler door lock actuator counter clockwise to loose the cable (1), and then pull the cable out of the fuel filler door lock actuator (2).
8. Remove the fuel filler door lock actuator (2).
9. From the driver side, pull the fuel filler cap release cable with the handle out of the vehicle.

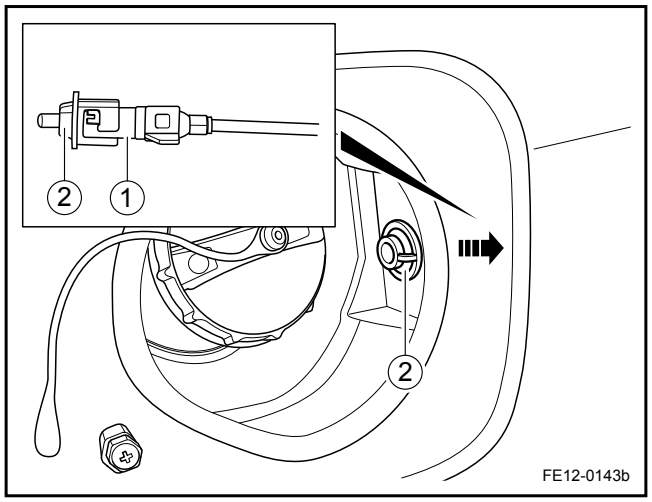
Installation Procedure:

1. Install and tighten the fuel filler cap release handle retaining bolts.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)
2. Route the release cable.

   Note

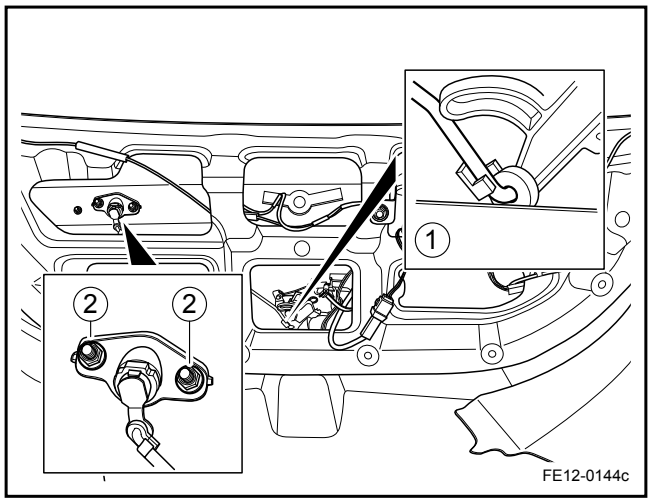
   Route the release cable the same as before removal.



3. Install the fuel filler door lock actuator (2) to the fuel filler neck.
4. Connect the fuel filler cap release cable (1) to the fuel filler door lock actuator (2).
5. Install the rear compartment trim panel.
6. Install the rear seat back bolster.
7. Install the center pillar lower trim panel.
8. Install the driver door and the left rear door sill nameplate.
9. Install the driver electric seat.

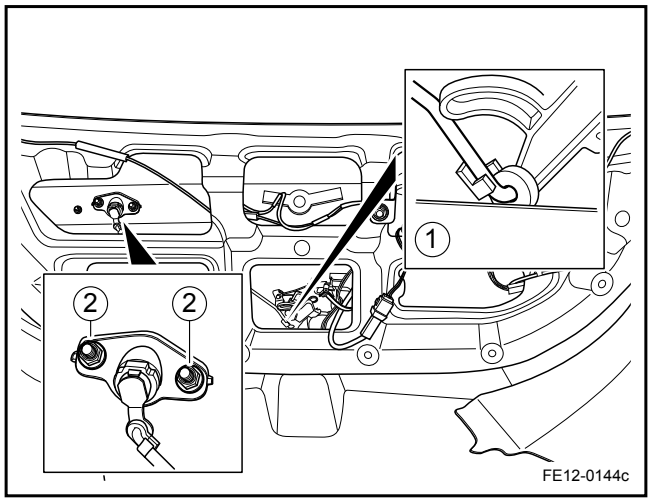
12.3.3.9 Hatchback Latch Replacement

Removal Procedure:



1. Remove the hatchback inner trim panel. Refer to 12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback).
2. Disconnect the latch release cable from the hatchback latch.
3. Remove the hatchback latch retaining nut (2).
4. Remove the hatchback latch.

Installation Procedure:



1. Install and tighten the hatchback latch retaining nut.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)
2. Connect the latch release cable to the hatchback latch.
3. Install the hatchback inner trim panel.

12.4 Bumpers

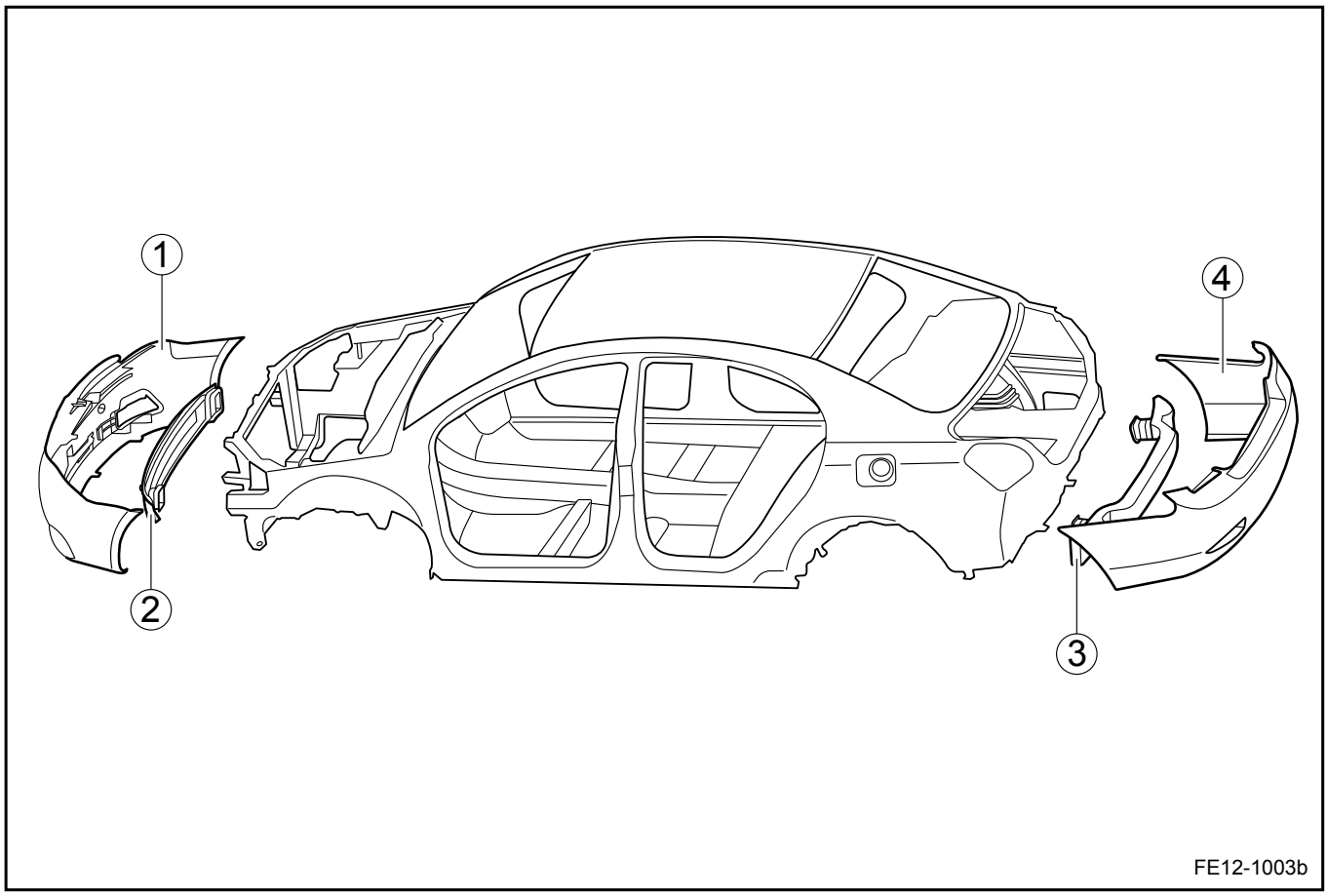
12.4.1 Specifications

12.4.1.1 Fastener Tightening Specifications

Application	Model	Specification	
		Metric (Nm)	US English (lb-ft)
Front Bumper Retaining Bolts	M6 × 16	9-13	6.7-9.6
Rear Bumper Retaining Bolts	M6 × 16	9-13	6.7-9.6
Rear Bumper Retaining Bolts	M6 × 12	9-13	6.7-9.6
Front/Rear Impact Bar Retaining Nuts	M10	70	51.80

12.4.2 Component Locator

12.4.2.1 Component Views



Legend

1. Front Bumper Assembly
2. Front Impact Bar
3. Rear Impact Bar
4. Rear Bumper Assembly

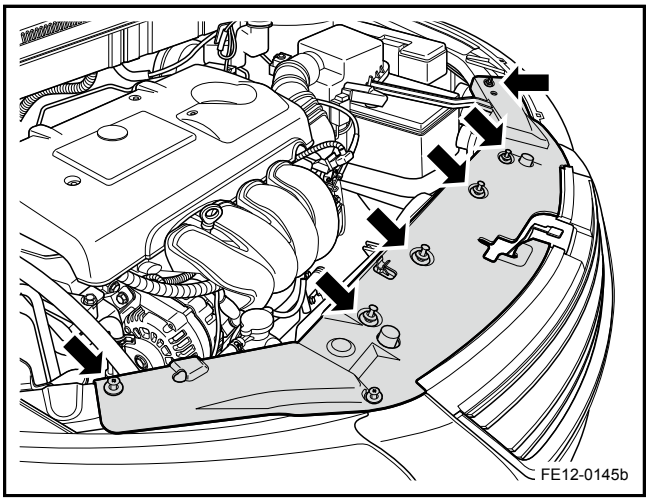
12.4.3 Removal and Installation

12.4.3.1 Front Bumper Replacement

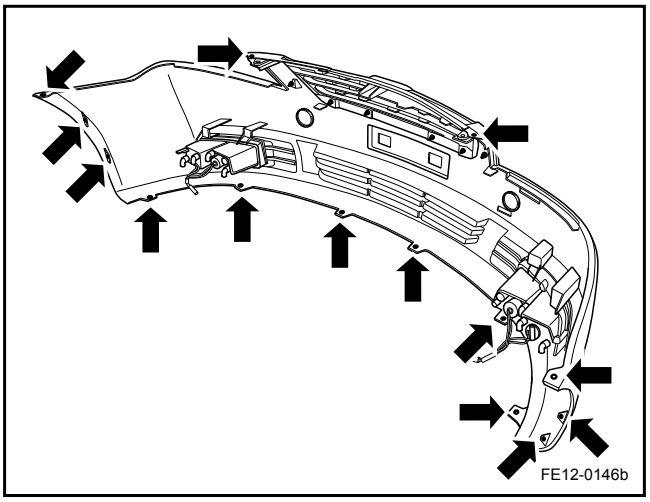
Removal Procedure:

Warning!

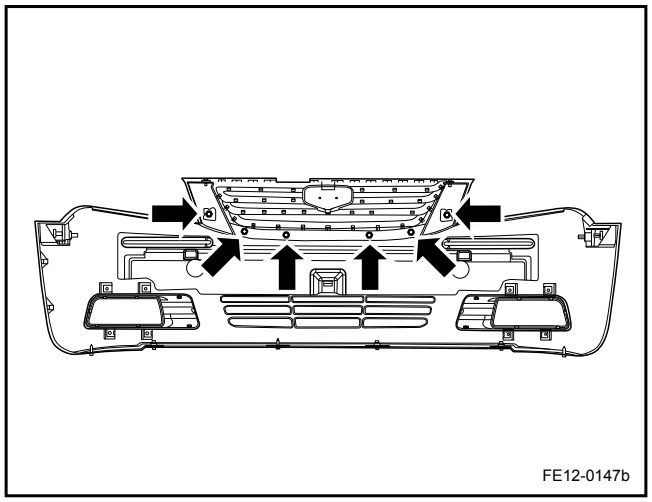
Refer to "Battery Disconnect Warning" in "Warnings and Notices"



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the radiator grille panel from the front end module.



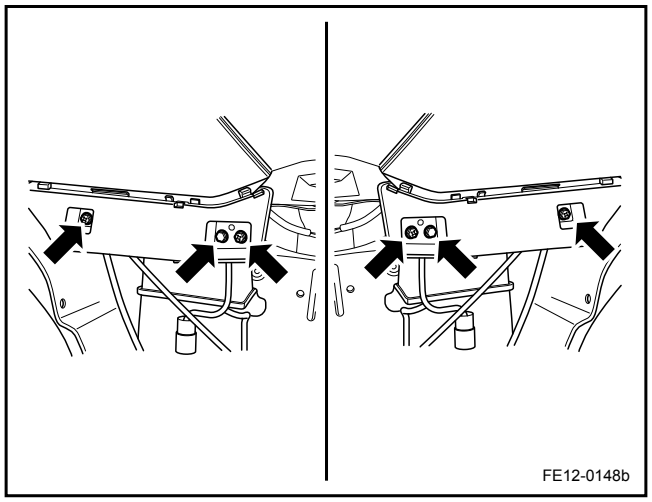
3. Remove the front bumper retaining screws from the sides and the bottom.
4. Remove the front bumper.
5. Disconnect the front fog lamp harness connectors.
6. prior to remove
   Remove the front fog lamps. Refer to 11.4.8.7 Front Fog Lamp Replacement.
7. Remove the front fog lamp covers before removal.



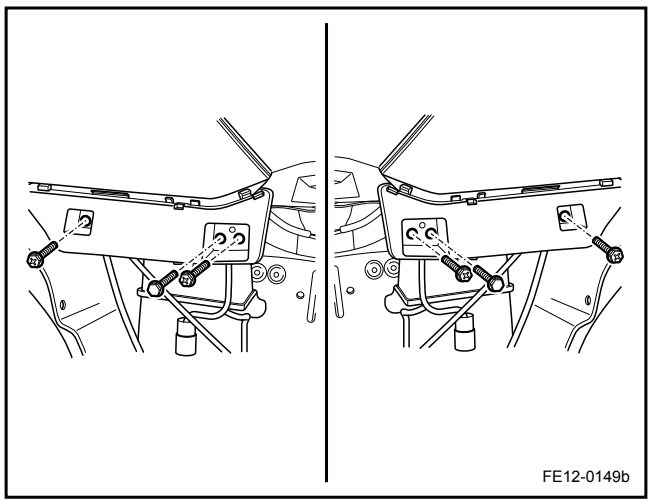
8. Remove the six radiator grille panel to the front bumper retaining screws and remove the radiator grille panel.

   Note

   Hatchback radiator grille has two retaining screws.



9. Remove the front bumper fascia reinforcements from both sides.



Installation Procedure:

1. Install the front bumper fascia reinforcements.

   Torque :9-13 Nm (Metric) 6.7-9.6 lb-ft (US English)

2. Install the front fog lamp covers.
3. Install the radiator grille panel to the front bumper.
4. Install the front fog lamps.
5. Connect the front fog lamp harness connectors.
6. Install the front bumper.
7. Install the front bumper side and bottom retaining screws.
8. Install the radiator grille panel to the front end module.

   Note

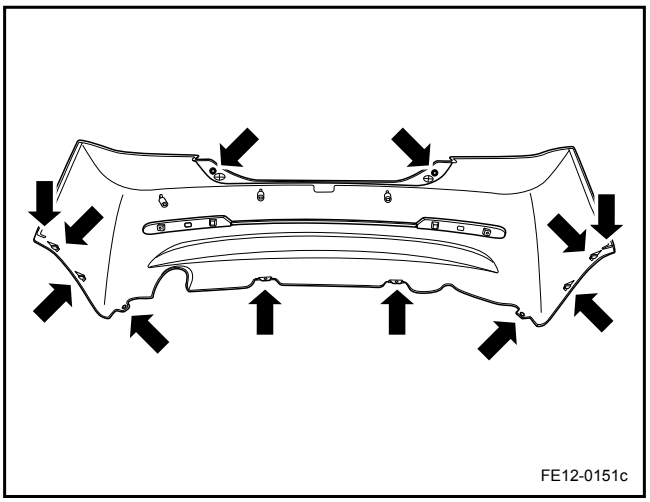
   The replacement procedure for Hatchback is similar to that of sedan.

12.4.3.2 Rear Bumper Replacement (Hatchback)

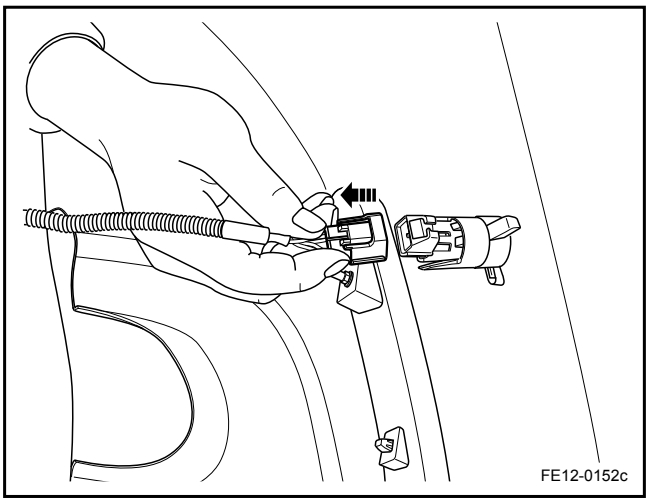
Removal Procedure:

Warning!

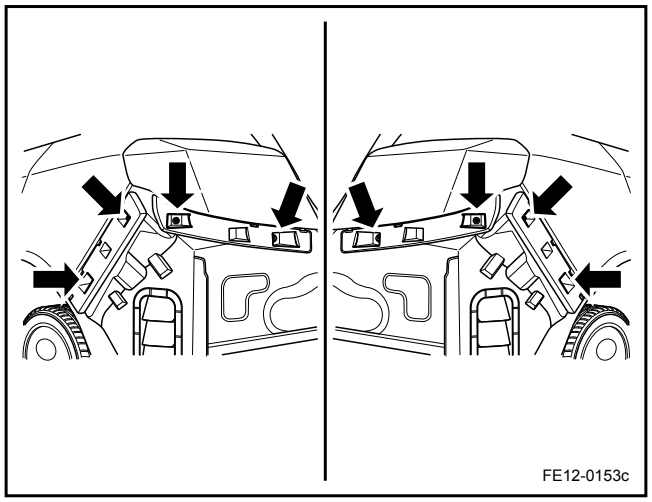
Refer to "Battery Disconnect Warning" in "Warnings and Notices".


FE12-0151c

1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the two rear bumper upper retaining screws, six rear bumper to rear wheelhouse liner retaining bolts and four rear bumper to spare wheel carrier retaining bolts. Pull the rear bumper from sides to loosen the rear bumper.

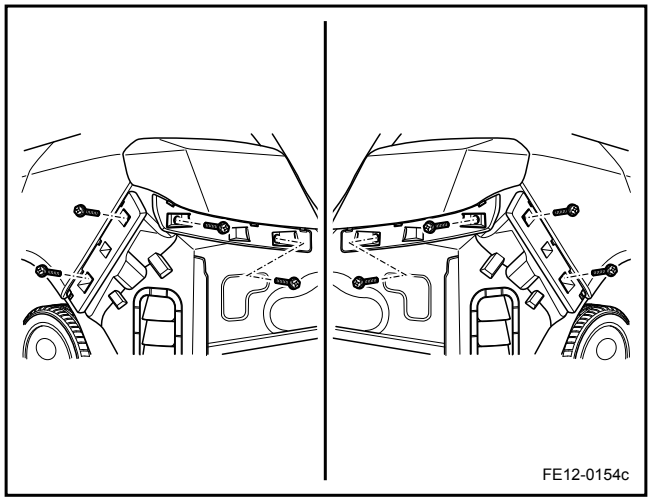

FE12-0152c

3. Disconnect four rear park assist sensor harness connectors and remove the rear bumper.
4. Remove four rear park assist sensors. Refer to 11.14.7.2 Reverse Radar Sensor Replacement.



5. Remove the rear bumper brackets.

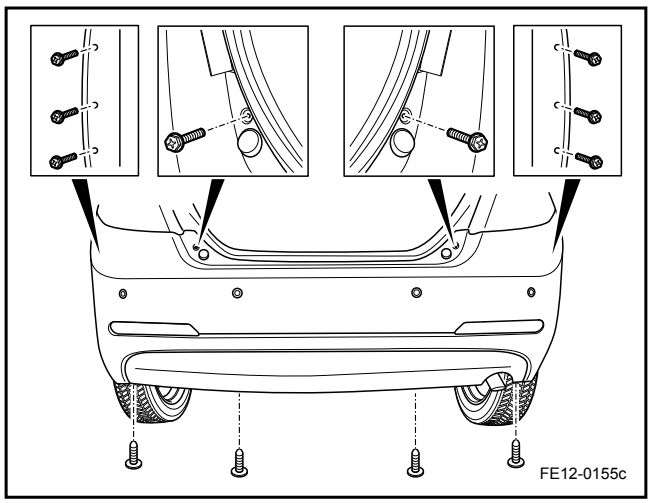
Installation Procedure:



1. Install the rear bumper brackets..

   Torque: 11 Nm (Metric) 8.1 lb-ft (US English)

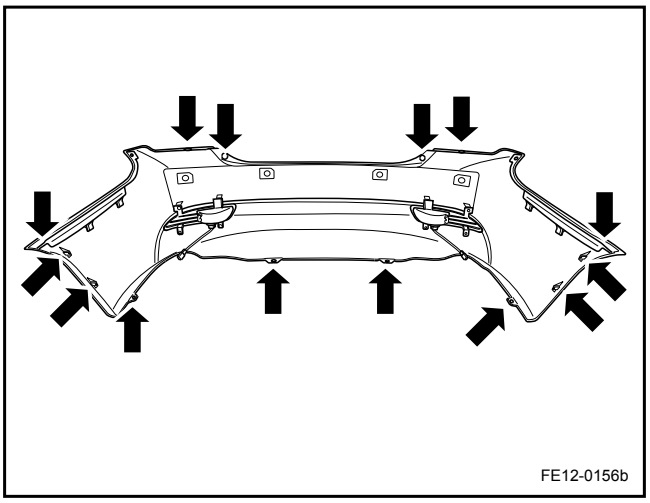
2. Install four rear park assist sensors.
3. Connect four rear park assist sensor harness connectors.



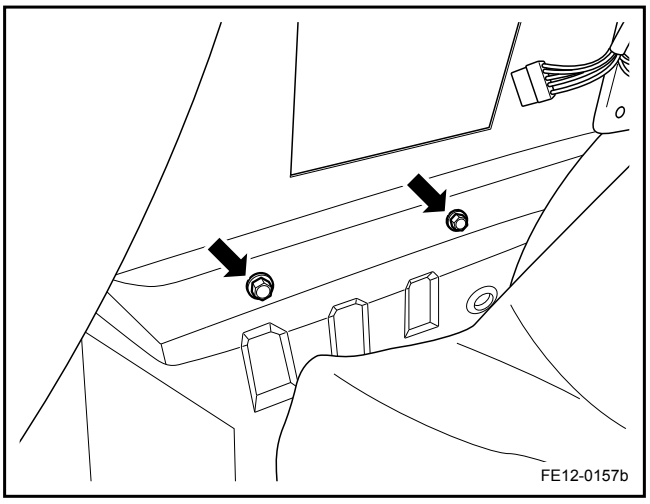
4. Install the two rear bumper upper retaining screws, six rear bumper to rear wheelhouse liner retaining bolts and four rear bumper to spare wheel carrier retaining bolts.
5. Connect the battery negative cable.

12.4.3.3 Rear Bumper Replacement (Sedan)

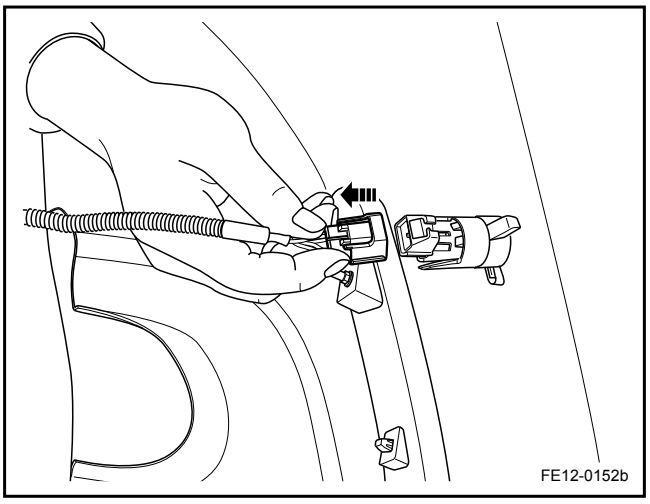
Removal Procedure:



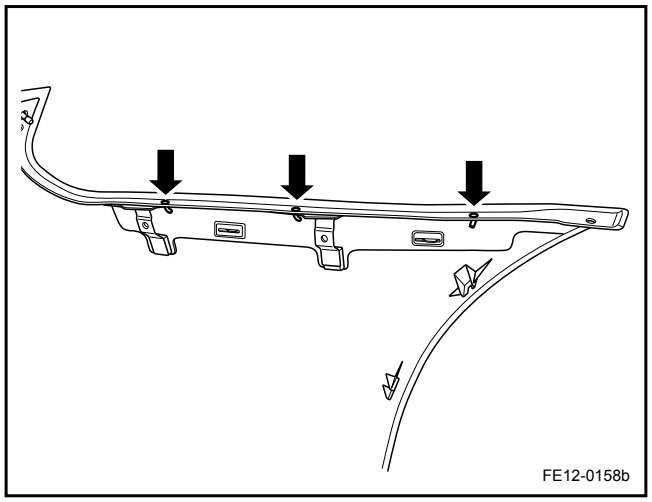
1. Remove the two rear bumper upper retaining screws, two clips, six rear bumper to rear wheelhouse liner retaining bolts and four rear bumper to spare wheel carrier retaining bolts.



2. Remove the rear compartment trim panel. Refer to 12.9.1.9 Rear Compartment Trim Panel Replacement.
3. Remove the rear bumper left and right retaining bolts.

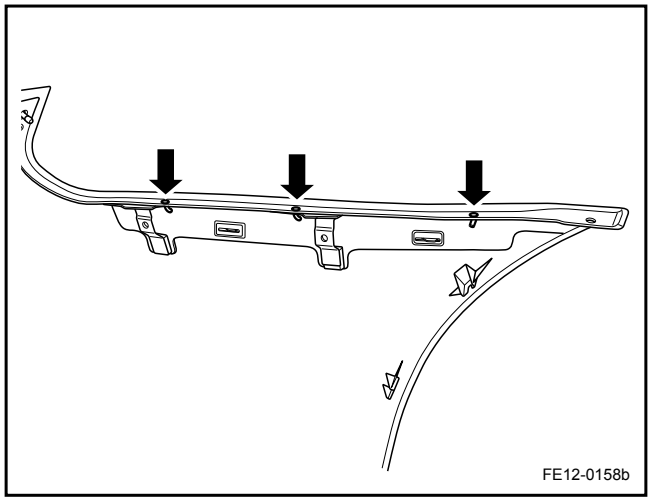


4. Remove four rear park assist sensor harness connectors.
5. Remove four rear park assist sensors. Refer to 11.14.7.2 Reverse Radar Sensor Replacement.

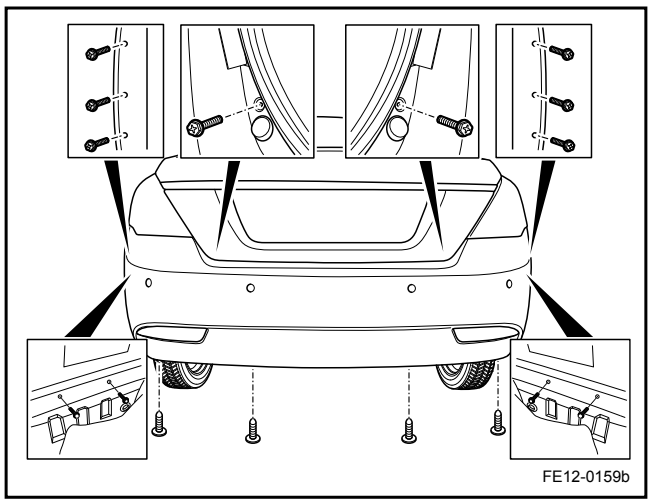


6. Remove the rivets from the rear bumper mounting brackets and remove the rear bumper mounting brackets.

Installation Procedure:



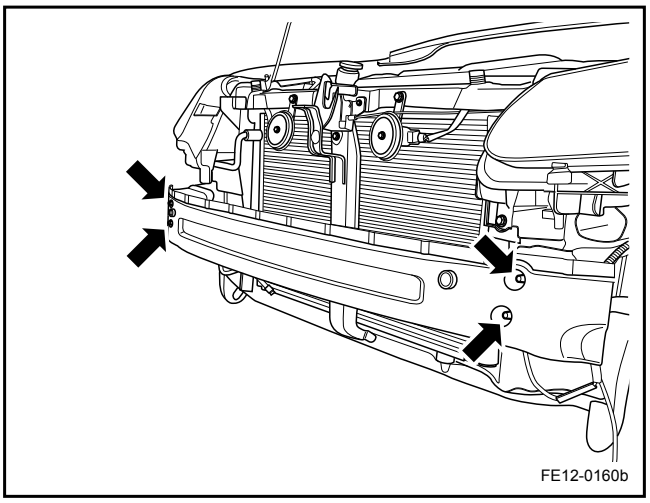
1. Install the rear bumper mounting brackets to the rear bumper.
2. Install four rear park assist sensors.
3. Connect four rear park assist sensor harness connectors.



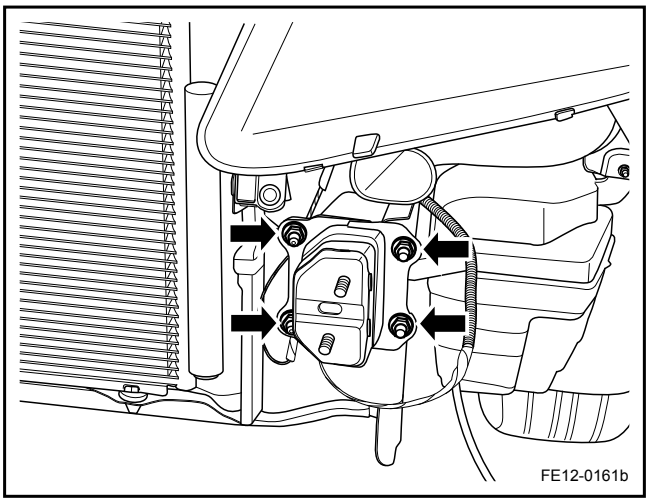
4. Install the rear bumper left and right retaining bolts.
5. Install the two rear bumper upper retaining screws, two clips, six rear bumper to rear wheelhouse liner retaining bolts and four rear bumper to spare wheel carrier retaining bolts.
6. Install the rear compartment trim panel.

12.4.3.4 Front Impact Bar Replacement

Removal Procedure:

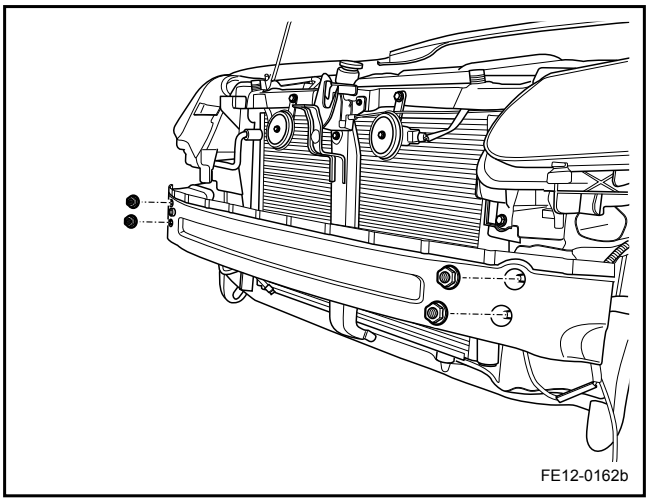


1. Remove the front bumper. Refer to 12.4.3.1 Front Bumper Replacement.
2. Remove the front impact bar retaining nuts.



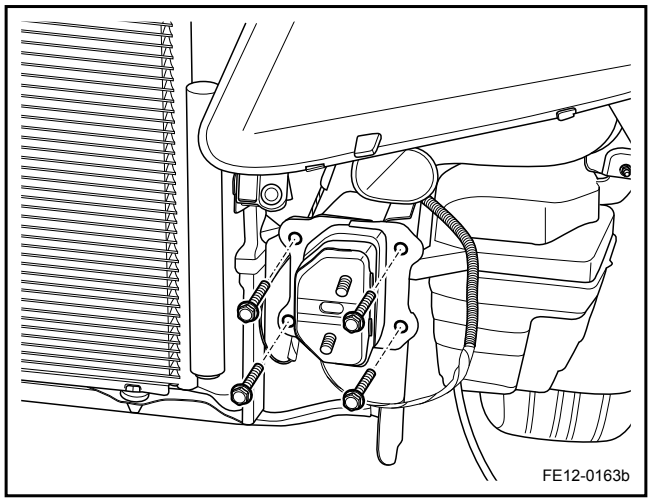
3. Remove four retaining nuts from each side of the front bumper energy absorber.

Installation Procedure:



1. Install four retaining nuts on each side of the front bumper energy absorber.

   Torque: 70 Nm (Metric) 51.8 lb-ft (US English)



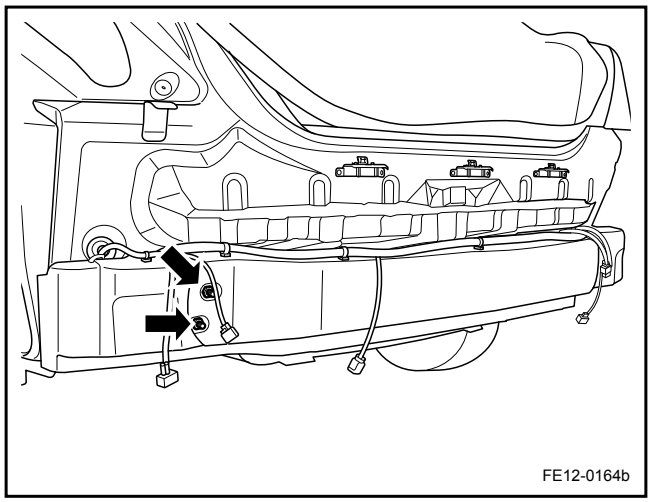
2. Install four front impact bar retaining nuts.

   Torque: 70 Nm (Metric) 51.8 lb-ft (US English)

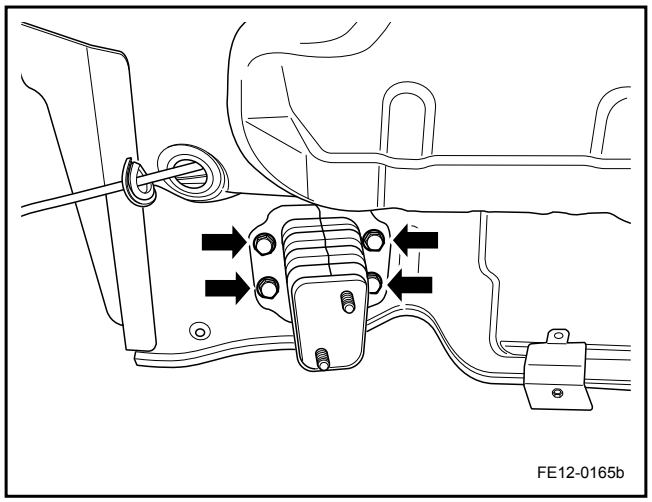
3. Install the front bumper.

12.4.3.5 Rear Impact Bar Replacement

Removal Procedure:

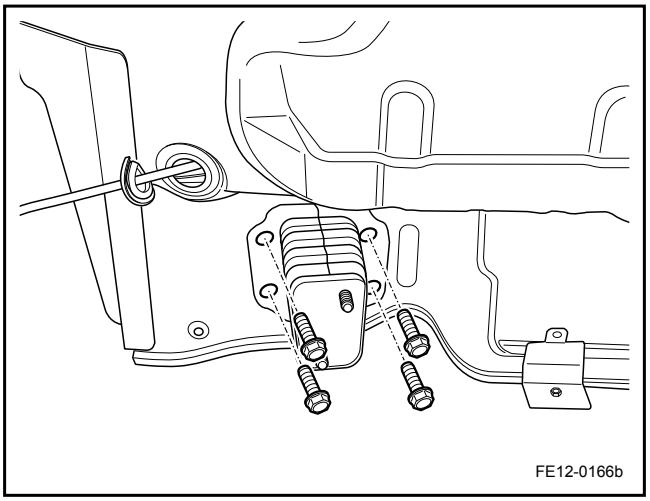


1. Remove the rear bumper. Refer to 12.4.3.3 Rear Bumper Replacement (Sedan).
2. Unclip the wiring harness clips.
3. Remove four retaining nuts from the rear impact bar .



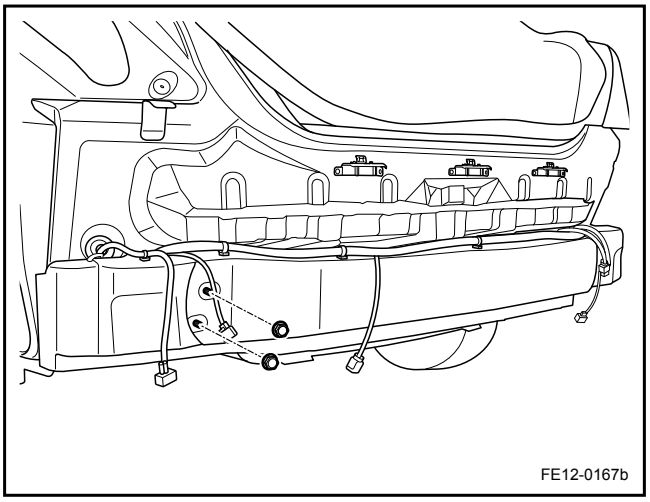
4. Remove four retaining bolts from each side of the rear bumper energy absorber.

Installation Procedure:



1. Install four retaining bolts on each side of the rear bumper energy absorber.

   Torque: 70 Nm (Metric) 51.8 lb-ft (US English)



2. Install four rear impact bar retaining nuts.

   Torque: 70 Nm (Metric) 51.8 lb-ft (US English)

3. Clip the wiring harness clips.

4. Install the rear bumper.

12.5 Doors

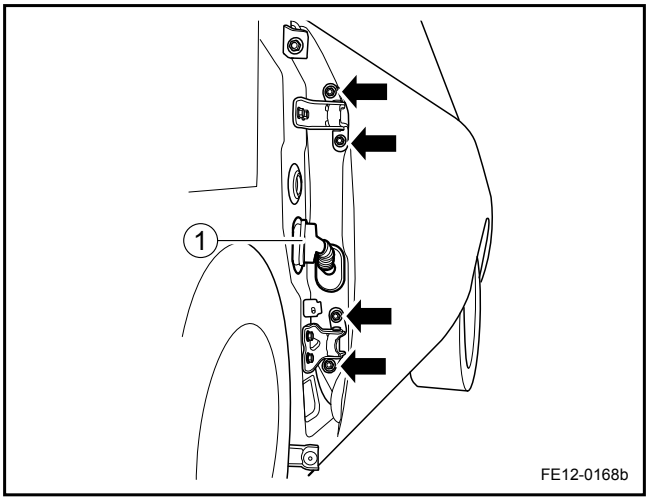
12.5.1 Specifications

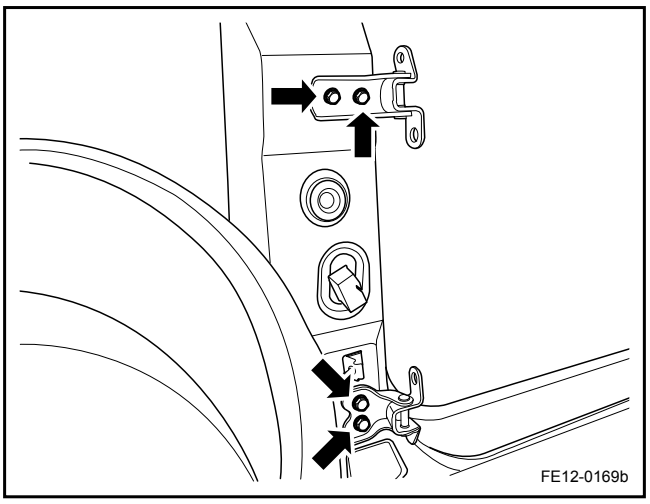
12.5.1.1 Fastener Tightening Specifications

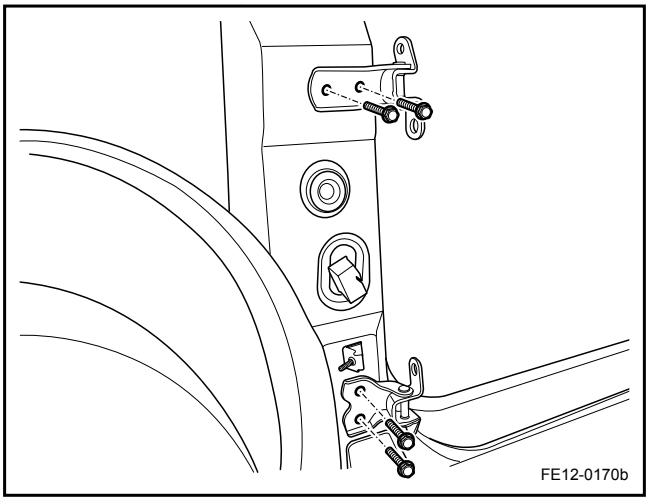
Application	Model	Specification	
		Metric (Nm)	US English (lb-ft)
Left Front Door Assembly Retaining Bolts	M8 × 23	30-38	22.1-28.0
Right Front Door Assembly Retaining Bolts	M8 × 23	30-38	22.1-28.0
Left Rear Door Assembly Retaining Bolts	M8 × 23	30-38	22.1-28.0
Right Rear Door Assembly Retaining Bolts	M8 × 23	30-38	22.1-28.0
Car Lock Retaining Bolts	M6 × 12	9-13	6.7-9.6
Door Check Link Retaining Bolts	M6 × 16	23-26	17.0-19.2

12.5.2 Removal and Installation

12.5.2.1 Front Door Hinge Replacement







Removal Procedure:

1. Remove the front fender. Refer to 12.2.3.4 Front Fender Replacement.
2. Remove the front door wiring harness dust cover and disconnect harness connector (1).
3. Remove the front door check link. Refer to 12.5.2.2 Front Door Check Link Replacement.
4. Use a cleaning cloth to clean the door hinge surface and use an oil pen or other marking tools to mark the door hinge position on the front door surface.
5. Remove the front door hinge to the front door retaining bolts.
6. Remove the front door.
7. Use a cleaning cloth to clean the door hinge surface and use an oil pen or other marking tools to mark the door hinge position on the body surface.
8. Remove the front door hinge to the body retaining bolts.
9. Remove the front door hinges.

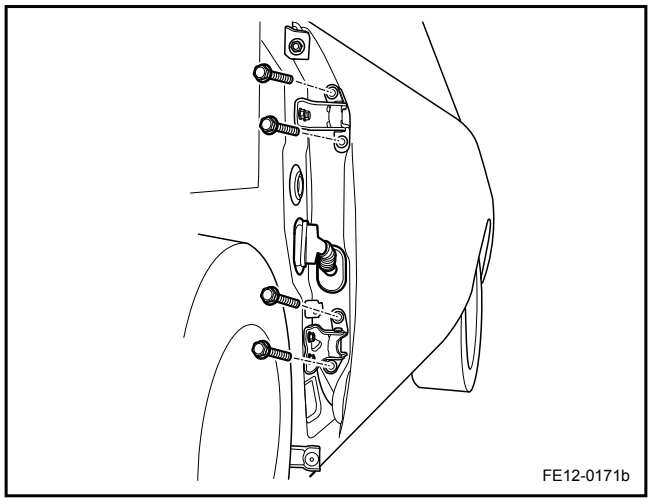
Installation Procedure:

1. Install the front door hinge to the front door retaining bolts and tighten to the specified torque after tuning.

   Torque: 25 Nm (Metric) 18.5 lb-ft (US English)

   Note

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

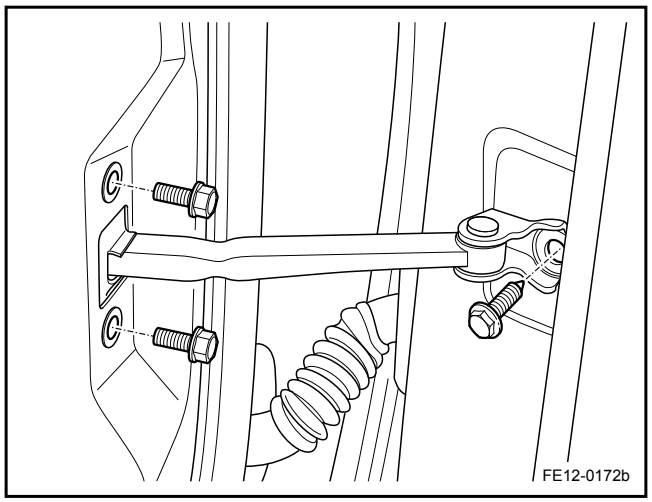


2. Install the front door.
3. Connect the front door wiring harness connector and the dust cover.
4. Install the front door check link.
5. Close the front door and inspect the door Clearance, adjust if necessary.
6. Install the front door hinge to the front door retaining bolts.

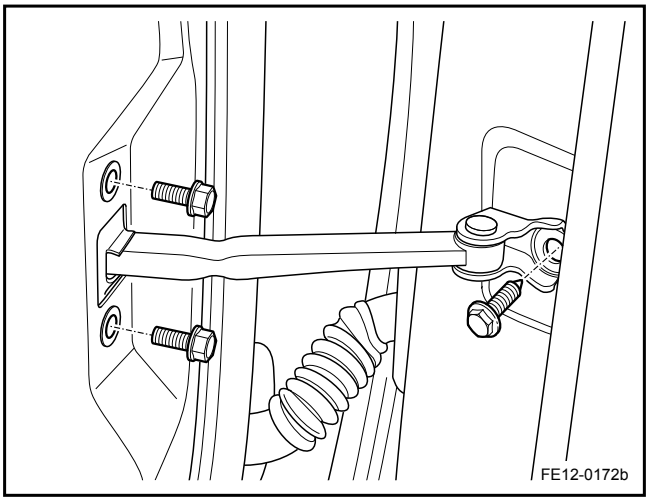
   Torque: 25 Nm (Metric) 18.5 lb-ft (US English)
7. Install the front fender.
8. Install the front fender liner.
9. Install the front wheel.
10. Lower the vehicle.

12.5.2.2 Front Door Check Link Replacement

Removal Procedure:



1. Remove the front door trim panel. Refer to 12.9.1.12 Front Side Door Trim Panel Replacement.
2. Remove the front door check link retaining blots (2 M6, 1 M8).
3. Remove the front door check link from inside of the front door.



Installation Procedure:

1. Install and tighten the front check link retaining bolts (M6).

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

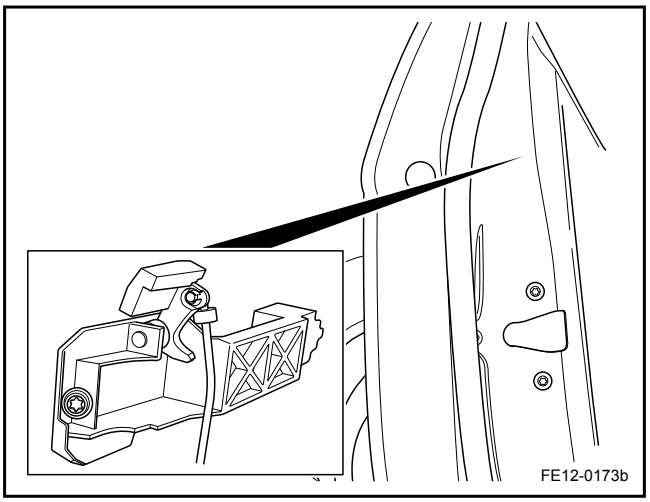
2. Tighten the retaining bolt (M8).

   Torque: 25 Nm (Metric) 18.5 lb-ft (US English)

3. Install the front door trim panel.

12.5.2.3 Front Door Outside Handle Replacement

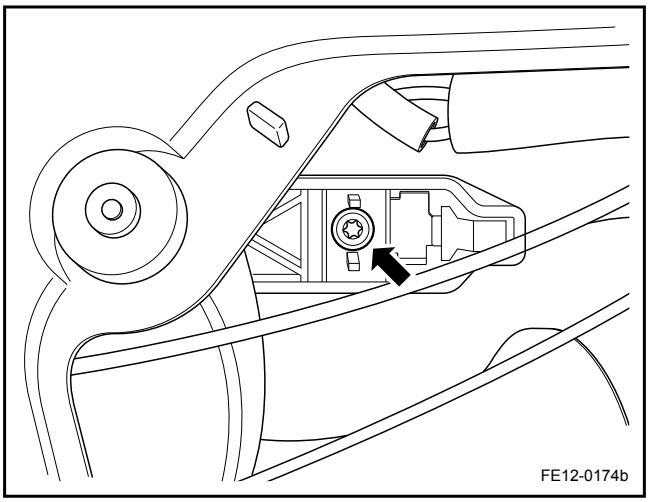
Removal Procedure:



1. Remove the front door trim panel. Refer to 12.9.1.12 Front Side Door Trim Panel Replacement.
2. Remove the front door lock cylinder. Refer to 12.5.2.5 Front Door Lock Cylinder Replacement.
3. Disconnect the front door outside handle rod.
4. Remove the front door outside handle.

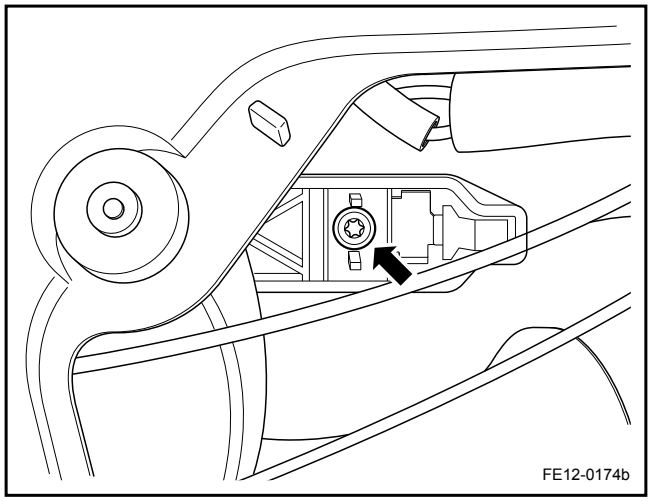
   Note

   Do not discard the seal gasket.



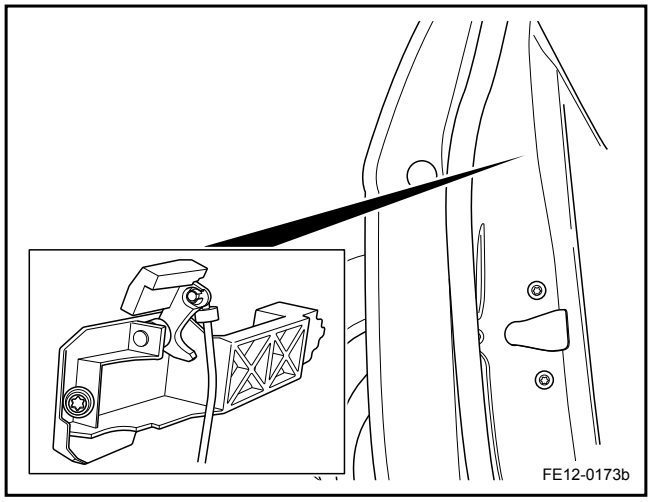
5. Loosen the front door outside handle retaining blot.
6. Remove the inner part of the front door outside handle.

Installation Procedure:



1. Install the inner part of the front door outside handle and tighten the retaining screws.

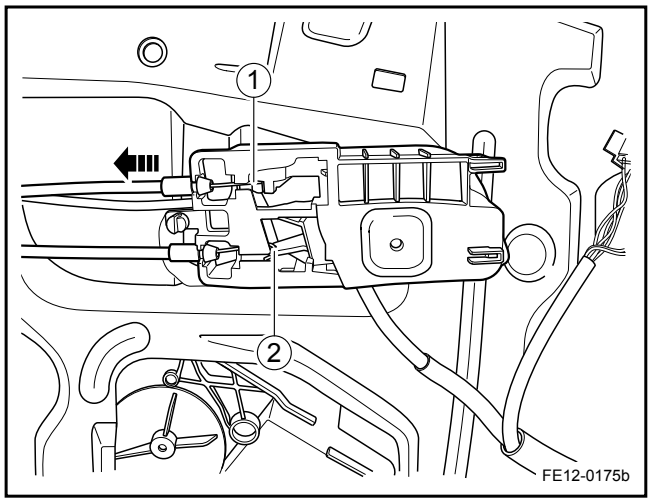
   Torque: 8 Nm (Metric) 5.9 lb-ft (US English)



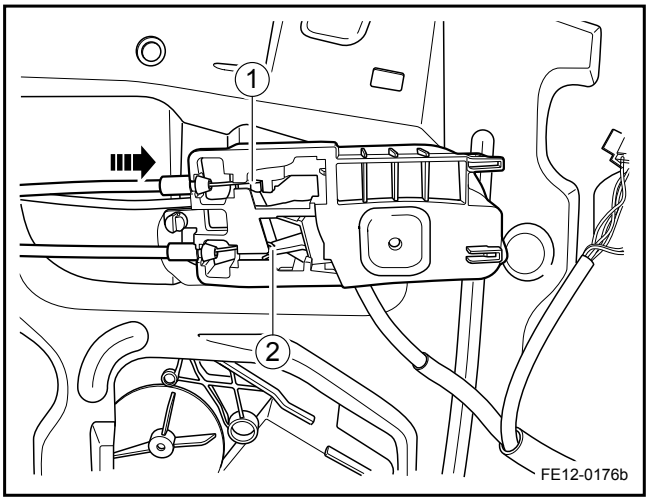
2. Install the front door outside handle and the seal gasket.
3. Connect the front door outside handle rod.
4. Install the front door lock cylinder.
5. Install the front door trim panel.

12.5.2.4 Front Door Inside Handle Replacement

Removal Procedure:



1. Remove the front door trim panel. Refer to 12.9.1.12 Front Side Door Trim Panel Replacement.
2. Remove the front door inside handle.
3. Disconnect the inside door lock cable (1) and the inside door handle cable (2).

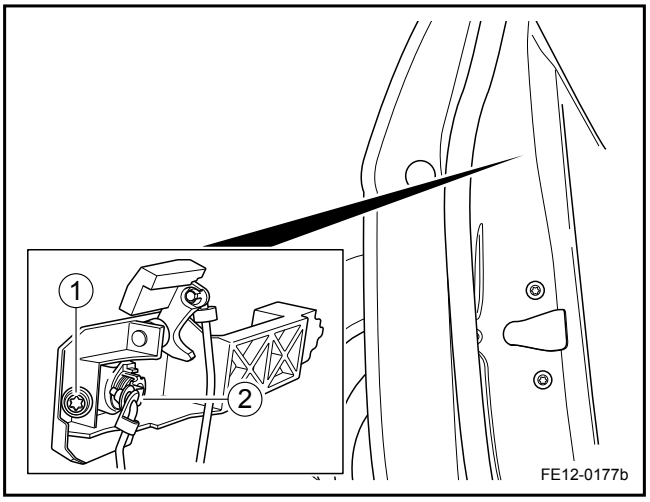


Installation Procedure:

1. Connect the inside door lock cable (1) and the inside door handle cable (2).
2. Install the front door inside handle.
3. Install the front door trim panel.

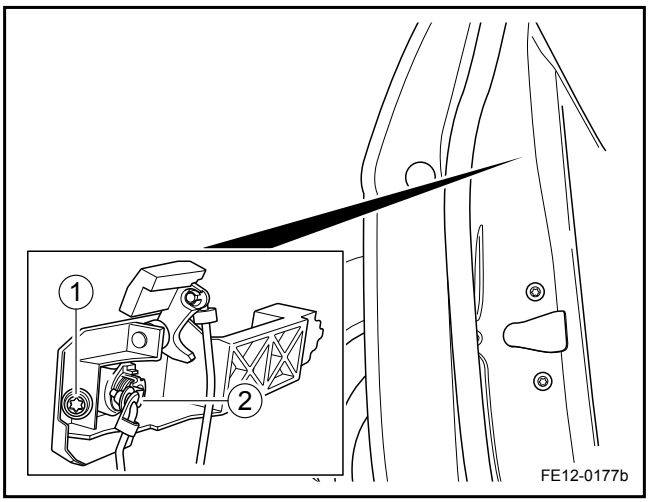
12.5.2.5 Front Door Lock Cylinder Replacement

Removal Procedure:



1. Remove the front door trim panel. Refer to 12.9.1.12 Front Side Door Trim Panel Replacement.
2. Remove the lock actuating rod (2).
3. Remove the door lock cylinder retaining bolt (1).
4. Remove the door lock cylinder and the cover.
5. Separate the door lock cylinder and the cover.

Installation Procedure:



1. Install the front door lock cylinder.
2. Install the lock actuating rod (2).
3. Install and tighten the door lock cylinder retaining bolt (1).

   Torque: 8 Nm (Metric) 5.9 lb-ft (US English)
4. Install the front door lock cylinder cover.
5. Install the front door trim panel.

12.6 Frame and Underbody

12.6.1 Specifications

12.6.1.1 Fastener Tightening Specifications

Application	Model	Specification	
		Metric (Nm)	US English (lb-ft)
Cross Member to Subframe Retaining Bolts	M10 × 18	65-85	47.9-62.7
Front Subframe to Body Retaining Bolts	M14 × 55	160-200	118.4-148
Front Subframe to Body Retaining Bolts	M14 × 95	160-200	118.4-148

12.6.2 Description and Operation

12.6.2.1 Frame and Underbody

The subframe is isolated from the vehicle body by the rubber bushings. It provides support to the powertrain, the front suspension lower control arms and the power steering gear assembly. Any misalignment will lead the front wheels misalignment. The subframe is bolted to the vehicle body by the rubber bushings. The vehicle underbody must be properly positioned in order to ensure proper suspension and wheels alignment. The individual underbody components contribute directly to the overall strength of unibody. Use proper metal bonding techniques during service repair operations to the unibody. The components must be corrosion protected whenever body repair operations damage or destroy the original sealing surfaces. Refer to the "Anti-Corrosion Treatment and Repair" in Collision Repair Description and Operation.12.12.2.4 Anti-Corrosion Treatment.

12.6.3 Diagnostic Information and Procedures

12.6.3.1 Diagnostic Information and Procedures

Inspect the Vehicle Underbody

If the vehicle underbody dimensions do not meet the standard, use the body frame correction tool to ensure correct body components dimensions. Refer to "12.12.1 Specifications.

Inspect the Frame and the Vehicle Body Positioning

If the frame can not be correctly installed to the vehicle body, the frame and body positioning is incorrect. Confirm the correct positioning before carry out the body frame replacement.

12.6.4 Removal and Installation

12.6.4.1 Frame Repair

Check for the possible damage to the frame by the following.

- Check if the frame can be correctly installed to the vehicle body.
- Check if the steering arms have the right geometric relationship.
- Check the wheels alignment.

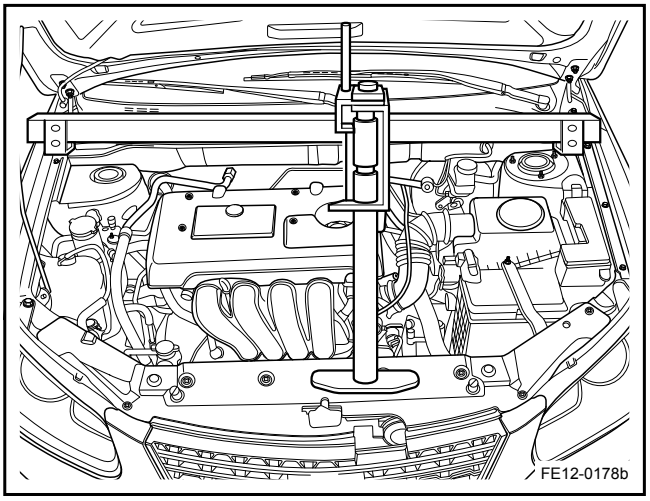
If there is any form of damage to the frame, replace the frame. Do not attempt to repair the frame.

12.6.4.2 Subframe Replacement

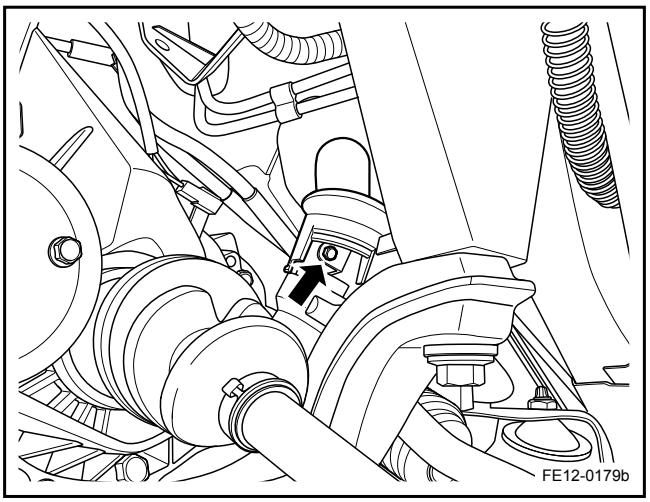
Removal Procedure:

Warning!

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



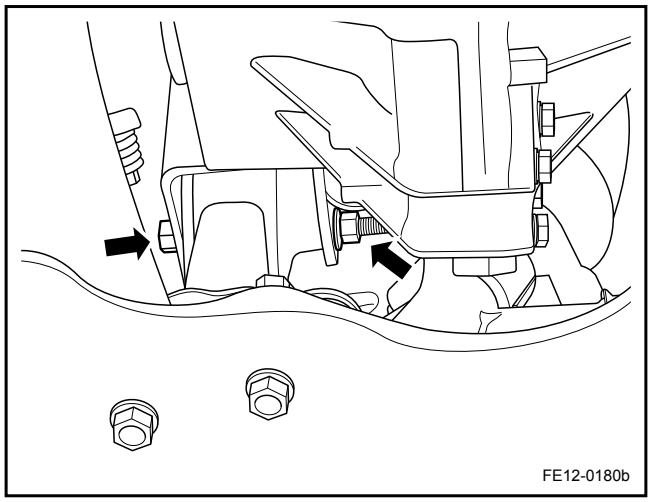
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front wheels. Refer to 4.4.5.1 Wheel Replacement.
3. Use a suitable tool to raise and support the engine.



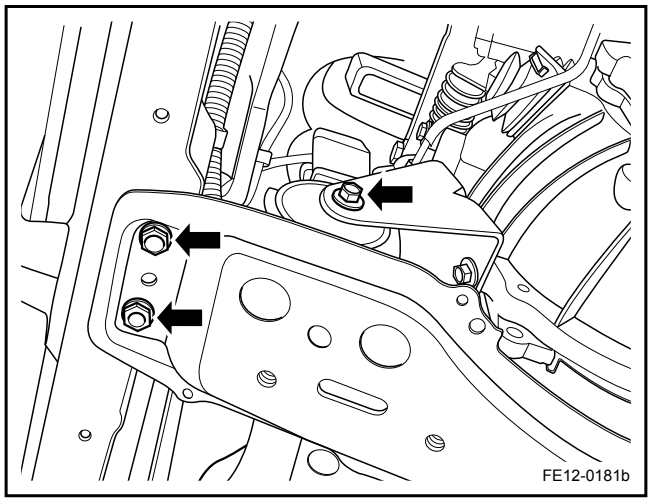
4. Raise and support the vehicle. Refer to 1.3.1.1 Lifting and Jacking the Vehicle.
5. Remove the steering column. Refer to 7.3.6.4 Mechanical Steering Column Assembly Replacement.

   Note

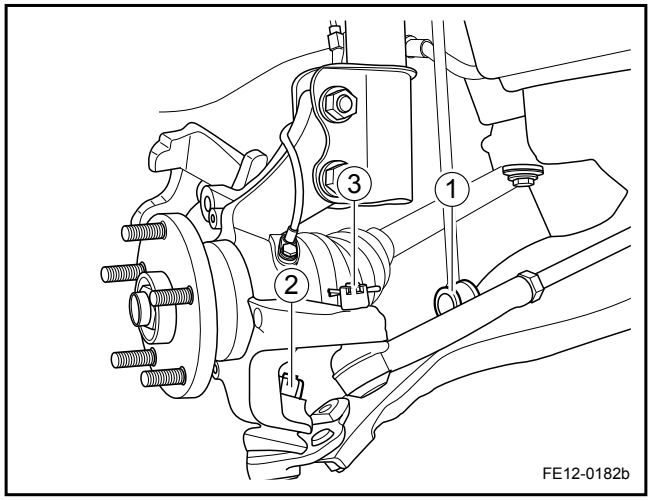
   Before removing the steering column universal joints, make sure straighten and lock the steering wheel.



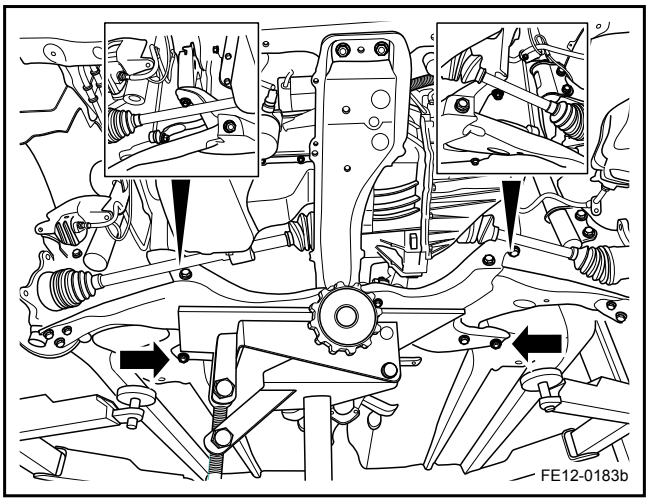
6. Disconnect the power steering gear inlet pipe/outlet pipe. Refer to 7.2.8.6 Power Steering Outlet Pipe Replacement.
7. Remove the cross member retaining bolts.



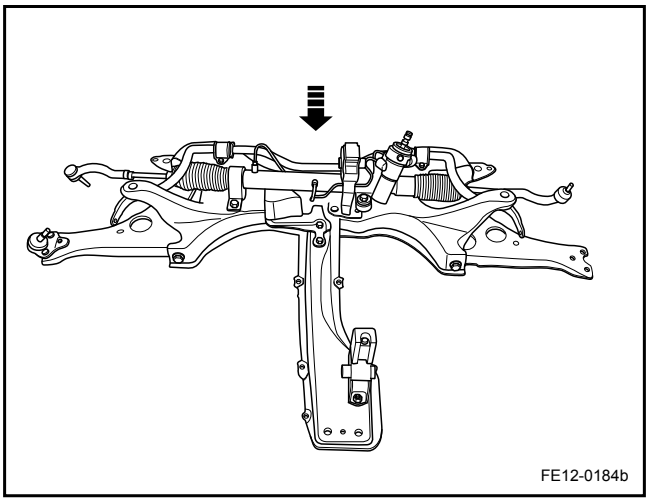
8. Remove the engine rear support retaining bolt and cross member retaining bolts.



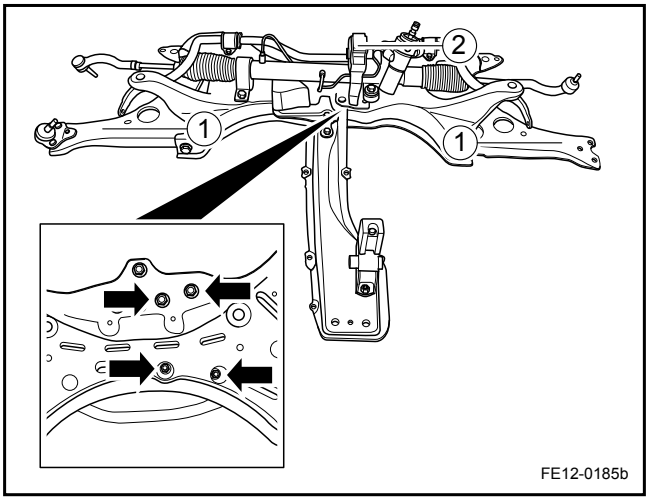
9. Remover the stabilizer shaft link to stabilizer bar retaining nut (1). Refer to 4.2.7.6 Stabilizer Bar Link Replacement.
10. Remove the lower control arm to steering knuckle retaining bolt (2). Refer to 4.2.7.7 Lower Control Arm Ball Joint Replacement.
11. Remove the steering linkage outer tie rod end to steering knuckle retaining nut (4). Refer to 7.2.8.11 Steering Bar and Ball Joint Replacement.



12. Jack and support the vehicle subframe.
13. Remove the subframe retaining bolts.

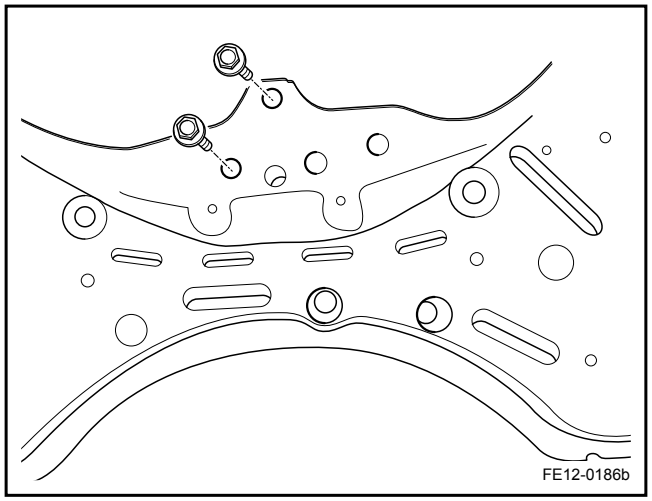


14. Remove the subframe together with the steering assembly, the stabilizer bar, the front lower control arms, the engine rear insulator pad and the engine rear insulator.

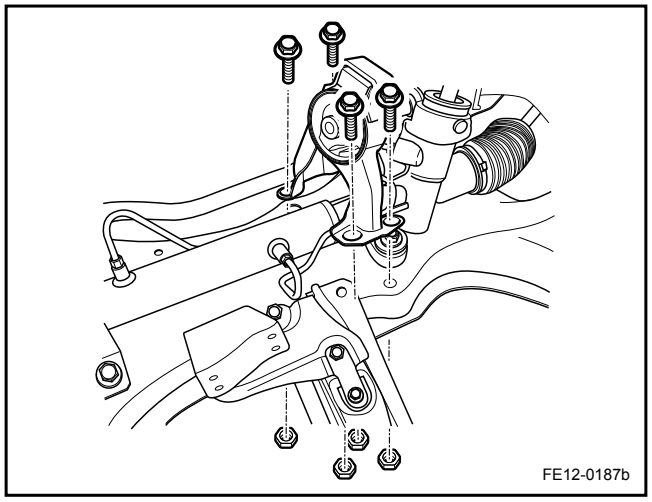


15. Remove the front lower control arms (1).
16. Remove the rear engine insulator (2).
17. Remove the steering assembly. Refer to 7.2.8.13 Power Steering Gear Assembly Replacement.
18. Remove the stabilizer bar. Refer to 4.2.7.5 Stabilizer Bar Replacement.
19. Remove the cross member. Refer to 12.6.4.3 Cross Member Replacement.

Installation Procedure:

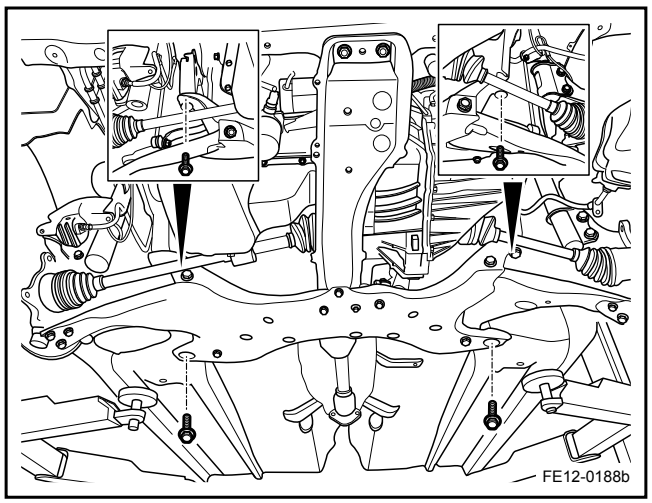


1. Install the cross member to the subframe. Do not tighten the engine rear insulator bolts at this stage.



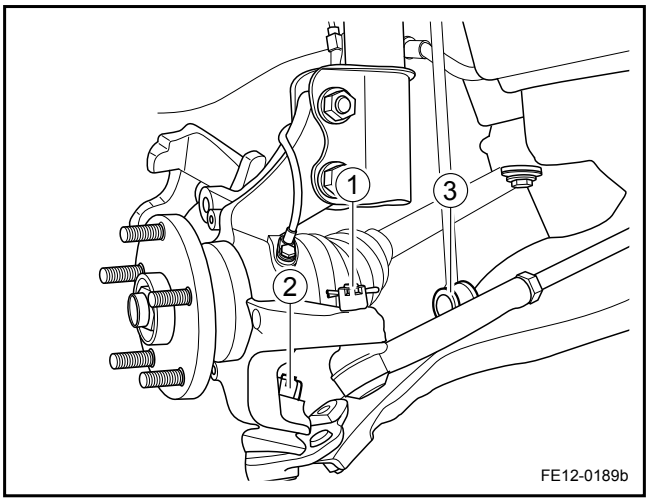
2. Install the stabilizer bar.
3. Install the steering assembly.
4. Install the engine rear isolator bracket and tighten the retaining nuts and bolts. Tighten the engine rear insulator retaining bolts.

   Torque: 75 Nm (Metric) 55.5lbf-ft (US English)
5. Install the front lower control arms.

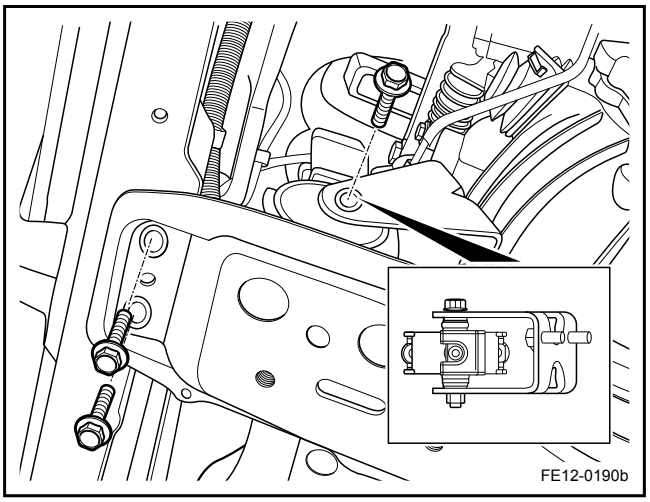


6. Using a jack, raise and support the subframe together with the steering assembly, the stabilizer bar, the front lower control arms, the engine rear insulator bracket and the engine rear insulator.
7. Install the subframe retaining bolts.

   Torque: 180 Nm (Metric) 133.2 lb-ft (US English)
8. Remove the jack.



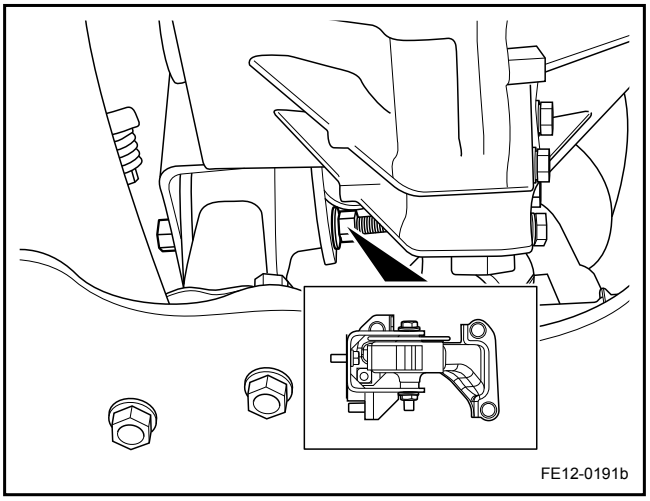
9. Install the steering linkage outer tie rod end to steering knuckle retaining nut (1).
10. Install the lower control arm to steering knuckle retaining bolt (2).
11. Install the stabilizer shaft link to stabilizer bar retaining nut (3).



12. Install the engine front insulator bracket retaining blots and cross member front retaining bolts.

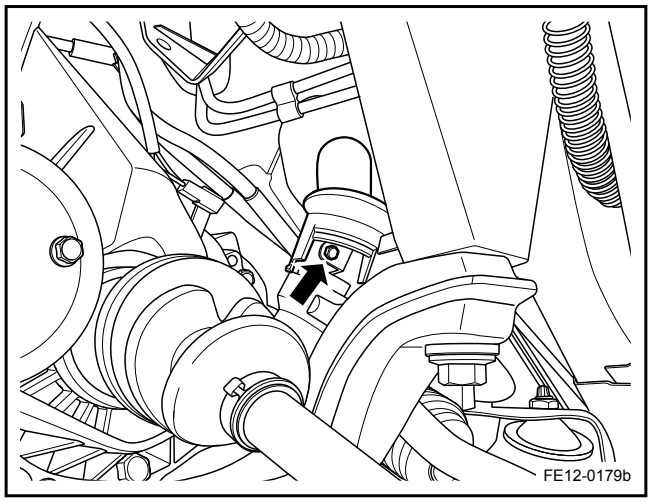
    The engine front insulator bracket blots Torque:61 Nm (Metric) 45.1 lb-ft (US English)

    The cross member front retaining bolts Torque:75 Nm (Metric) 55.5 lb-ft (US English)



13. Install the engine rear insulator bracket retaining blots

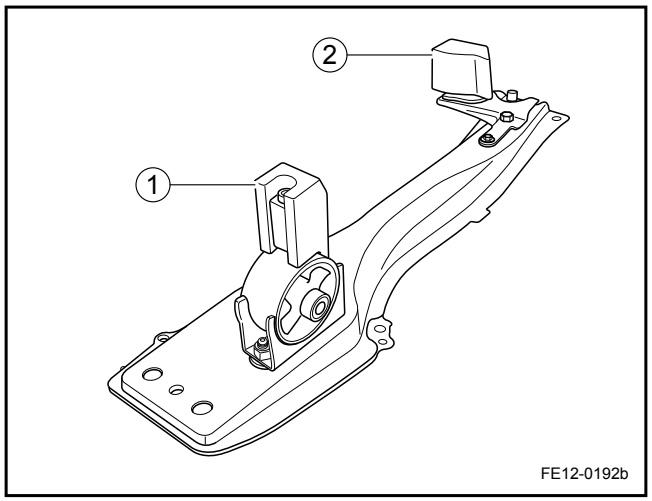
    Torque: 84 Nm (Metric) 62.2 lb-ft (US English)



14. Connect the power steering gear inlet pipe/outlet pipe.
15. Install the steering column universal joints
16. Lower the vehicle.
17. Remove the special tool.
18. Install the front wheels.

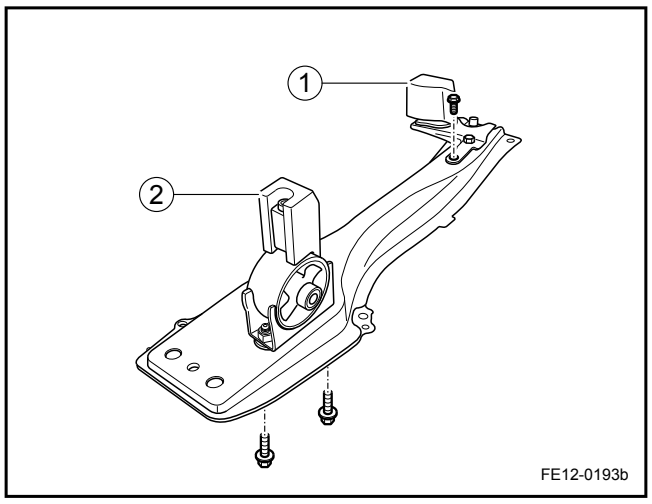
12.6.4.3 Cross Member Replacement

Removal Procedure:



1. Remove the subframe. Refer to 12.6.4.2 Subframe Replacement.
2. Remove the cross member from the subframe.
3. Remove the engine front insulator (1) from the cross member.
4. Remove the engine rear insulator (2) from the cross member.

Installation Procedure:



1. Install the engine rear insulator (2) to the cross member.
2. Install the engine front insulator (1) to the cross member.
3. Install the cross member the subframe.
4. Install the subframe.

12.7 Seats

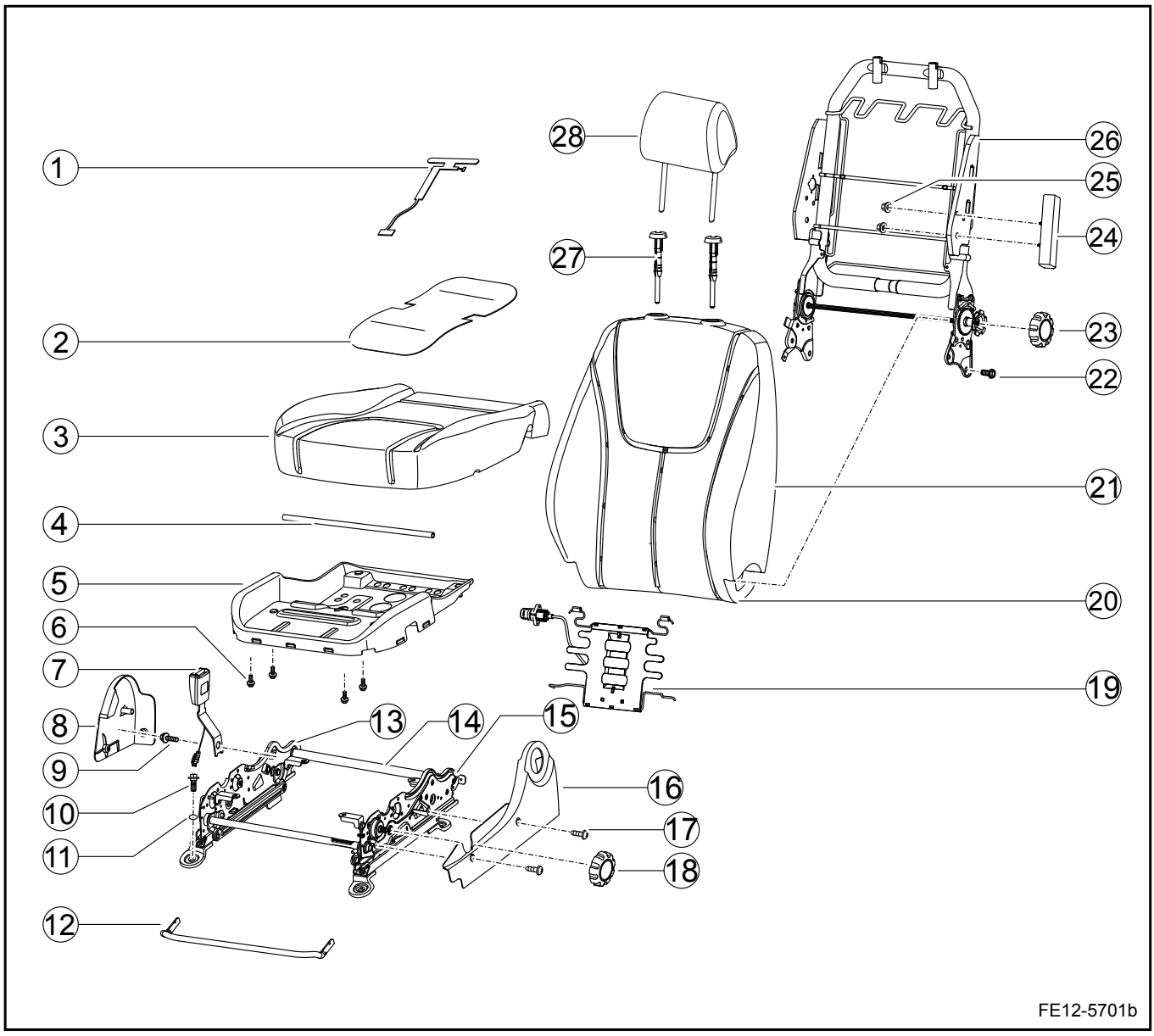
12.7.1 Specifications

12.7.1.1 Fastener Tightening Specifications

Application	Model	Specification	
		Metric (Nm)	US English (lb-ft)
Rear Seat Back to Body Retaining Bolts	M8 × 20	20-25	14.8-18.4
Rear Seat Back to Seat Bases Retaining Bolts	M10 × 22	25-35	18.4-25.8
Rear Seat Armrest Retaining Bolts	M6 × 14	9-13	6.7-9.6

12.7.2 Disassemble View

12.7.2.1 Disassemble View



Legend

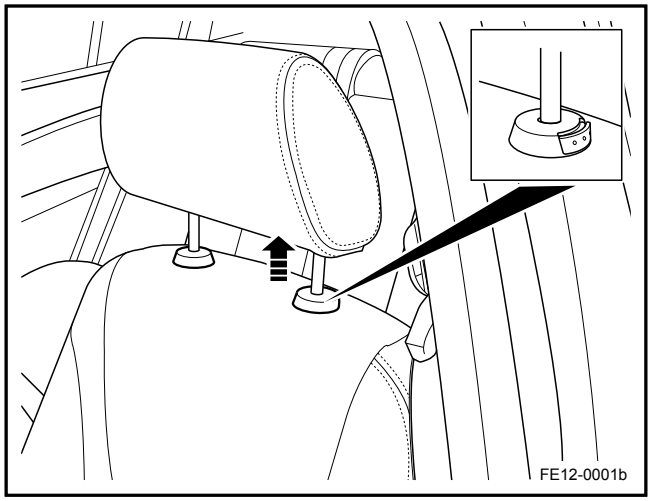
1. Passenger Recognition Sensor
2. Heater
3. Front Seat Cushion Pad
4. Front Seat Adjuster Rod
5. Front Seat Cushion Pad Frame
6. Front Seat Cushion Pad Frame Retaining Bolts
7. Seat Belt Buckle and Pretensioner
8. Front Seat Cushion Inner Trim Panel
9. Seat Belt Buckle and Pretensioner Retaining Bolt
10. Bolt
11. Washer
12. Front Seat Adjuster Rod
13. Front Seat Inner Rail
14. Four-way Manual Adjuster
15. Front Seat Outer Rail
16. Front Seat Cushion Outer Trim Panel
17. Front Seat Cushion Outer Trim Panel Retaining Screw
18. Recliner Adjusting Knob
19. Heater
20. Seat Back Cushion Assembly
21. Seat Back Cushion Assembly
22. Seat Back to Body Retaining Bolt

23. Lumbar Support Knob
24. Side Airbag
25. Side Airbag Retaining Nut
26. Seat Back and Adjuster Assembly
27. Head Restraint Guide
28. Head Restraint

12.7.3 Removal and Installation

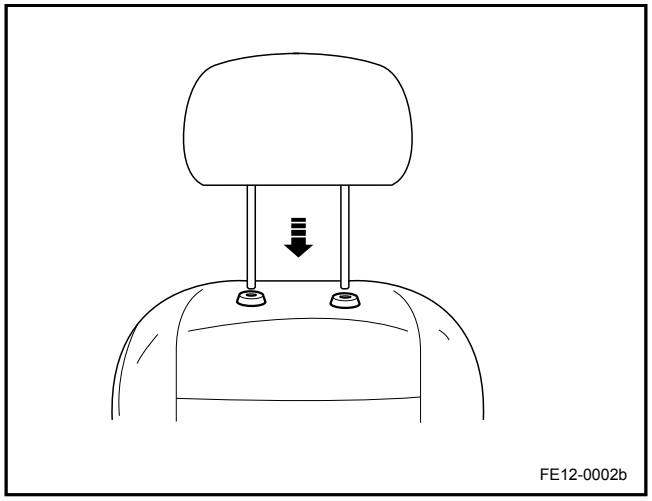
12.7.3.1 Front Seat Head Restraint Replacement

Removal Procedure:



1. Depress the head restraint height adjuster button and remove the head restraint.

Installation Procedure:



1. Install the head restraint by pushing it into the head restraint guides

12.7.3.2 Front Seat Replacement

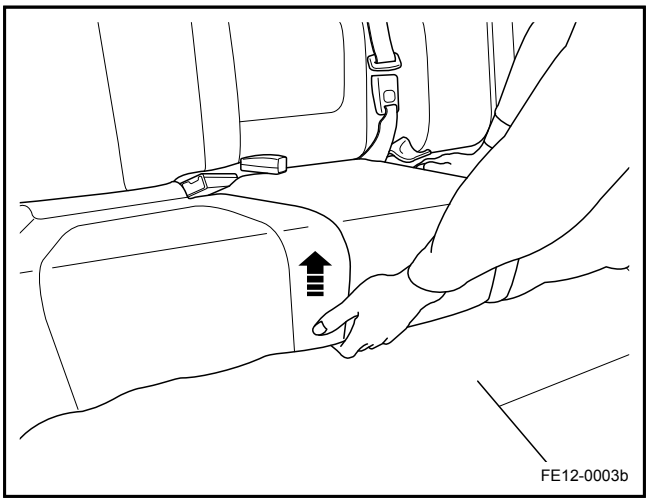
Refer to 11.11.8.1 Front Electric Seat Replacement.

12.7.3.3 Rear Seat Head Restraint Replacement

The rear head restraint replacement is similar to that of the front seat. Refer to 12.7.3.1 Front Seat Head Restraint Replacement.

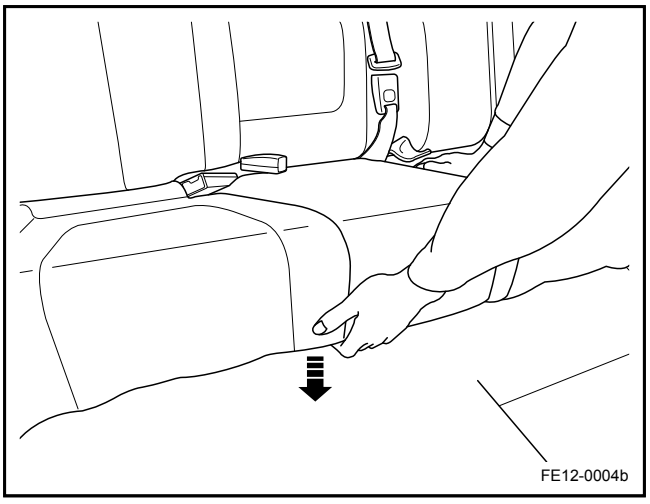
12.7.3.4 Rear Seat Cushion Replacement

Removal Procedure:



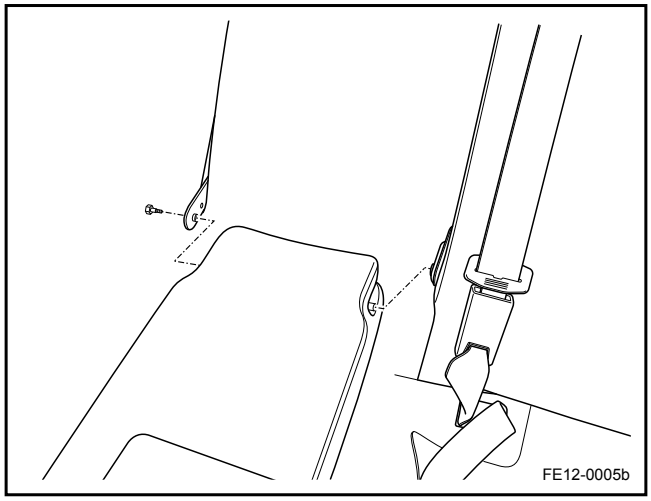
1. Lift the rear seat cushion by grasping the base in the area of the rear seat cushion to body retainers and remove the rear seat cushion from the floor.

Installation Procedure:



1. Install the rear seat cushion to the floor.

12.7.3.5 Rear Seat center Armrest Replacement



Removal Procedure:

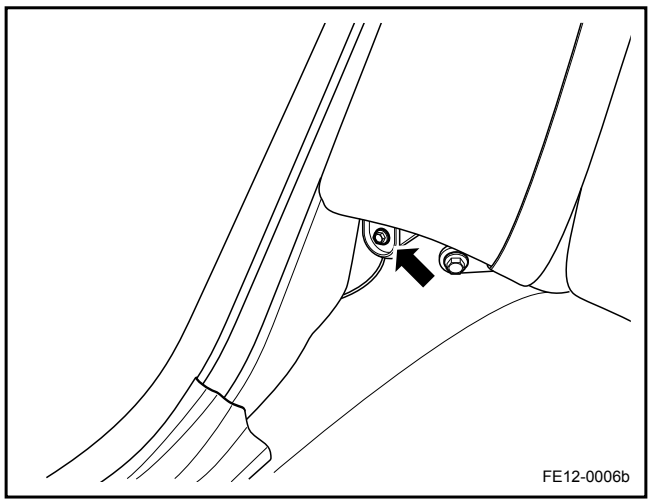
1. Pull down the rear seat back.
2. Remove the rear seat center armrest retaining bolts and remove the rear seat center armrest.

Installation Procedure:

1. Install and tighten the rear seat center armrest retaining bolts

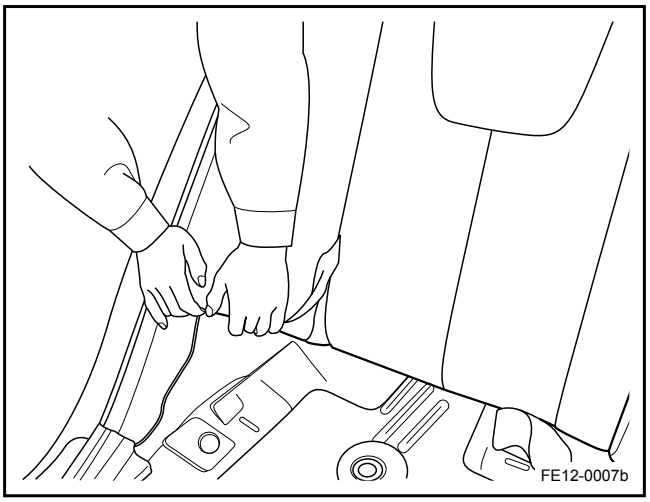
   Torque: 15 Nm (Metric) 11 lb-ft (US English)
2. Pull the rear seat back to the upright position.

12.7.3.6 Rear Seat Armrest Assembly Replacement



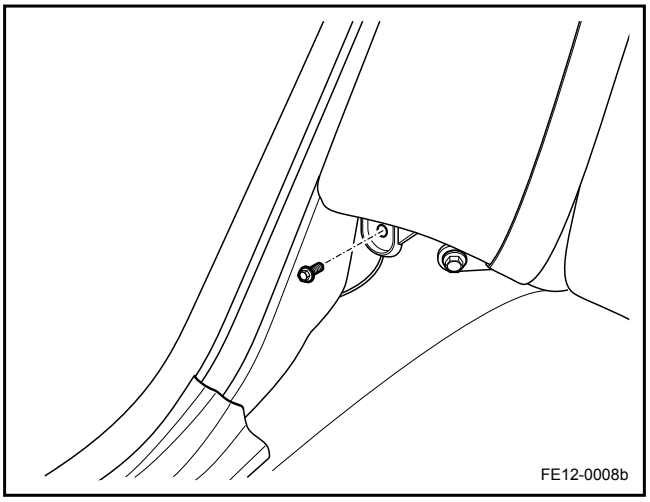
Removal Procedure:

1. Remove the rear seat cushion. Refer to 12.7.3.4 Rear Seat Cushion Replacement.
2. Remove the rear seat right side armrest retaining bolts.



3. Lift the right side armrest and remove the armrest.

Installation Procedure:



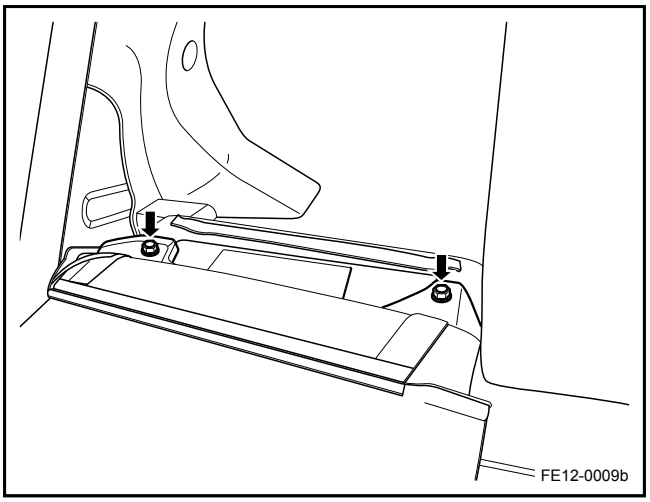
1. Install the rear seat right side armrest retaining bolts.

   Torque: 13 Nm (Metric) 9.6 lb-ft (US English)

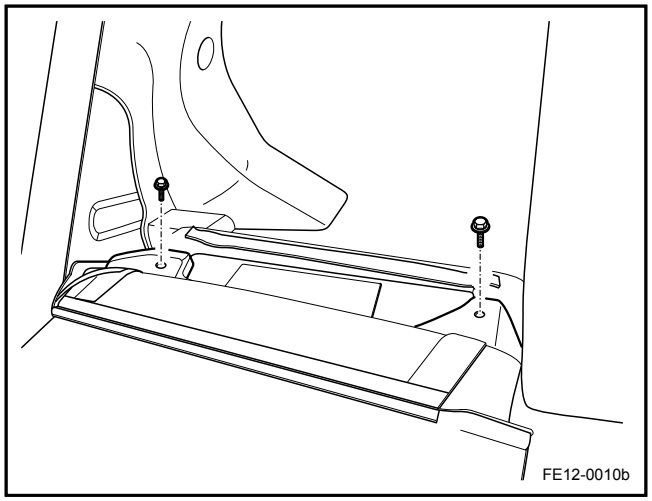
2. Install the rear seat cushion.

12.7.3.7 Rear Seat Back Replacement

Removal Procedure:



1. Fold down the right side rear seat back.
2. Remove the right side rear seat back retaining bolts.



Installation Procedure:

1. Install and tighten the right side rear seat back retaining bolts.

   Torque: 27 Nm (Metric) 19.9 lb-ft (US English)

2. Pull the right side rear seat back to the upright position.

   Note

   For the left side rear seat back replacement, please refer to the above procedure.

12.8 Instrument Panel, Gages and Console

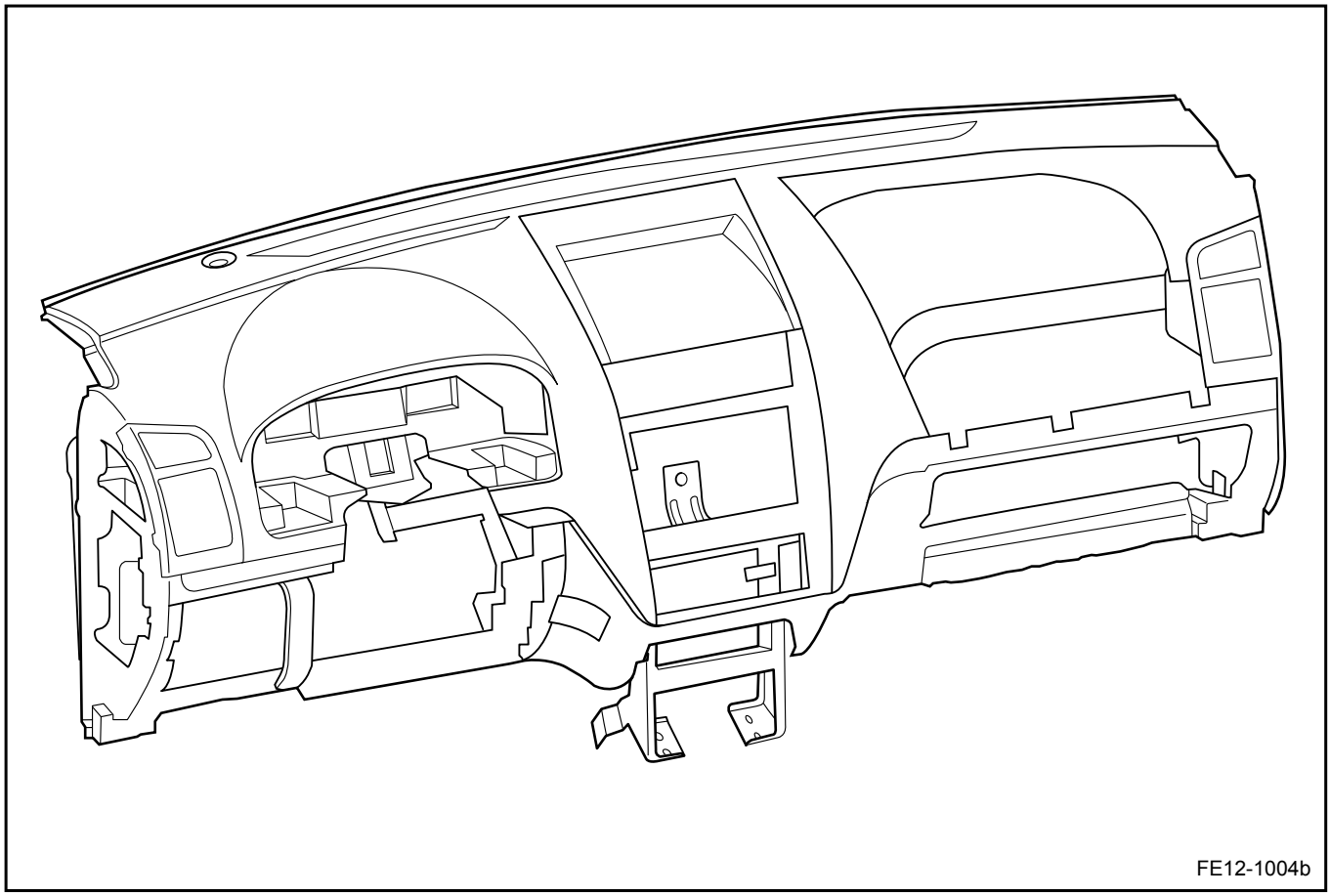
12.8.1 Specifications

12.8.1.1 Fastener Tightening Specifications

Application	Model	Specification	
		Metric (Nm)	US English (lb-ft)
Instrument Panel Left Mounting Bracket Retaining Bolts	M8 × 30	23-30	17.0-22.2
Instrument Panel Right Mounting Bracket Retaining Bolts	M8 × 30	23-30	17.0-22.2
Instrument Panel Lower Right Mounting Bracket Retaining Bolts	M6 × 20	9-13	6.7-9.6
I/P Retainer Bolt	M8 × 16	21	15.5
I/P Retainer Nut	M8	21	15.5

12.8.2 Component Locator

12.8.2.1 Component Views



12.8.3 Removal and Installation

12.8.3.1 Instrument Panel Replacement

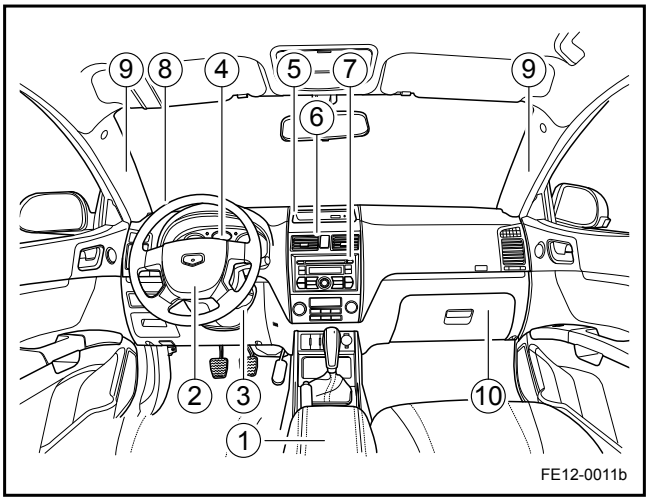
Removal Procedure:

Warning!

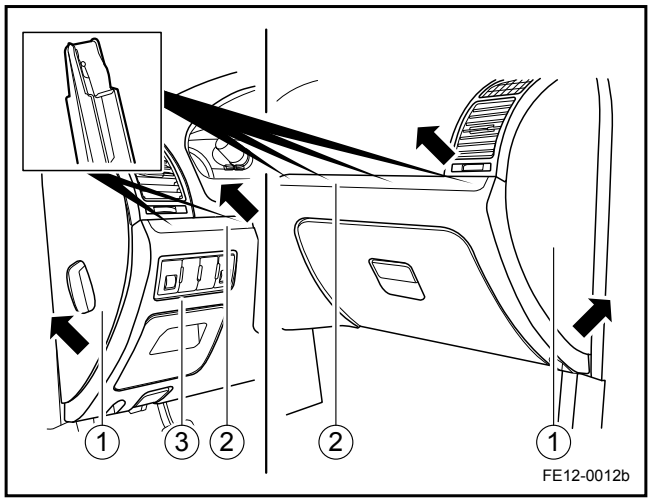
Refer to "Battery Disconnect Warning" in "Warnings and Notices".

Note

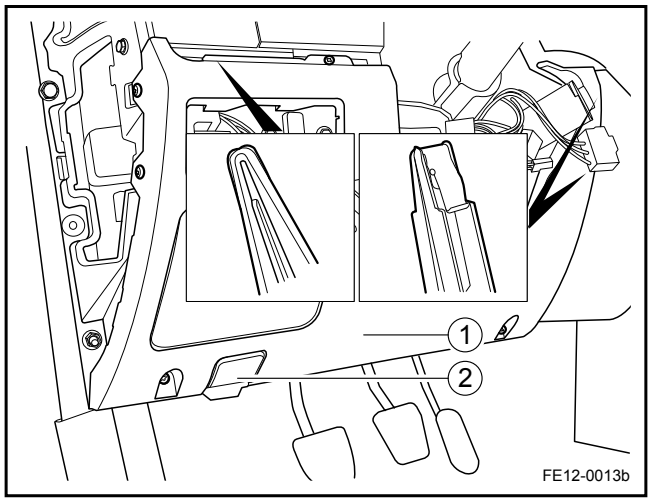
Please use special tools to remove interior panels, otherwise panels will be easily scratched.



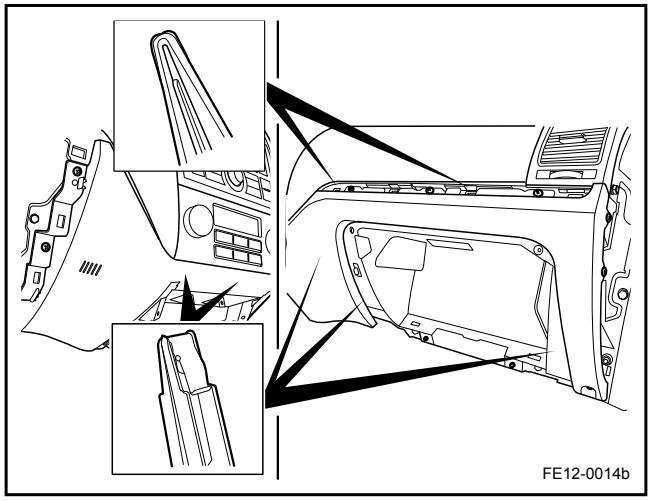
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the center console cup holder (1). Refer to 3.3.8.9 Shift Lever Replacement.
3. Remove the steering wheel (2). Refer to 7.3.6.3 Steering Wheel Replacement.
4. Remove the headlamp switch cover (3). Refer to 11.4.8.1 Headlamp Switch Replacement.
5. Remove the instrument cluster trim panel (4). Refer to 11.7.7.1 Instrument Cluster Replacement.
6. Remove the multi-function clock (5). Refer to 11.15.8.1 Instrument Cluster Replacement.
7. Remove the instrument panel center air outlet deflector (6). Refer to 8.2.8.11 Instrument Panel Air Duct Replacement.
8. Remove the radio control assembly (7). Refer to 11.2.7.5 Radio Control Replacement.
9. Remove the ambient light sensor (8). Refer to 11.4.8.20 Ambient and Sun Light Sensor Replacement.
10. Remove the windshield garnish molding (9). Refer to 12.9.1.3 Windshield Garnish Molding Replacement.
11. Remove the glove box (10). Refer to 12.8.3.2 Glove Box Replacement.



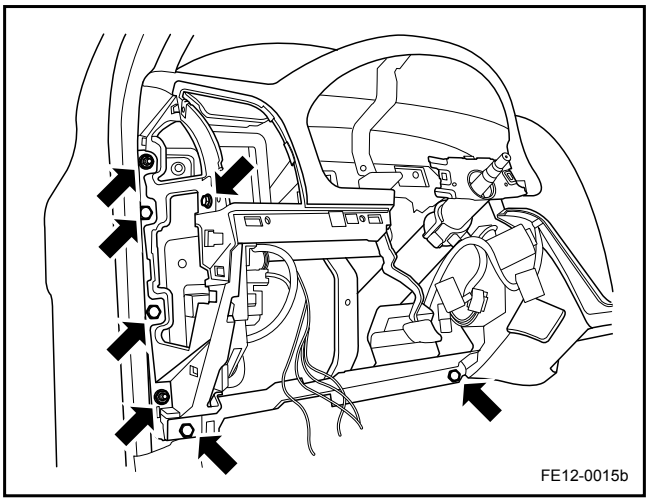
12. Remove the instrument panel outer trim covers (1) and the instrument panel trim panels (2).



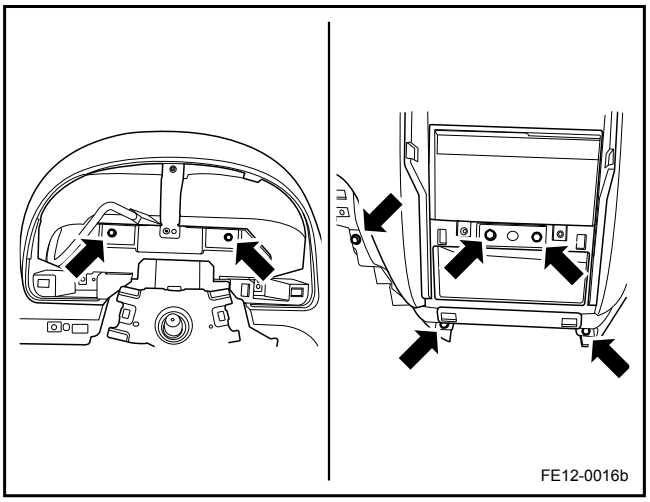
13. Remove the instrument panel lower left trim retaining screws and pull out the instrument panel lower left trim (1) (with clips). Disconnect the headlamp height adjust switch harness connector. Remove the hood release handle (2).



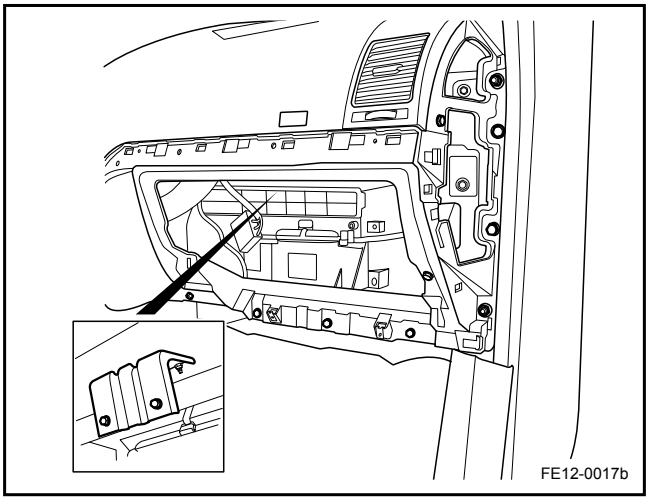
14. Remove the instrument panel lower right trim retaining screws, pull out the instrument panel lower right trim (with clips) and disconnect the harness connector on the back.



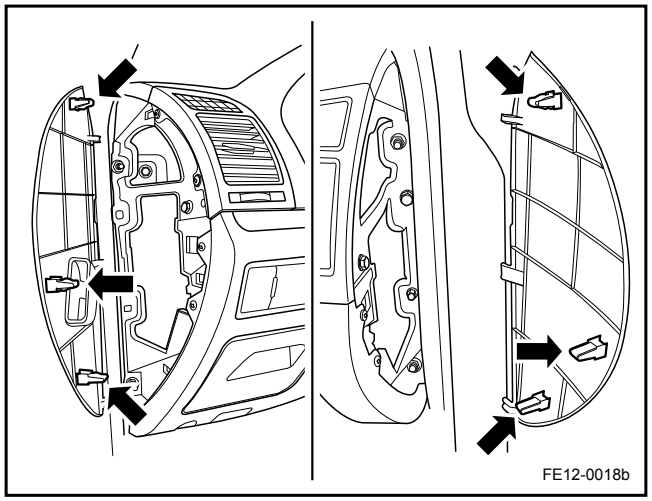
15. Remove the instrument panel left side retaining bolts.



16. Remove the instrument panel center retaining bolts.



17. Remove the instrument panel right side retaining bolts.
18. Disconnect the passenger airbag harness connector from the back of the instrument panel. Remove the passenger airbag. Refer to 9.2.7.4 Passenger Front Airbag Replacement.
19. Remove the instrument panel.
20. Remove the instrument panel outer air outlet upper duct. Refer to 8.2.8.12 Air-conditioning Ventilation Pipe Replacement.



Installation Procedure:

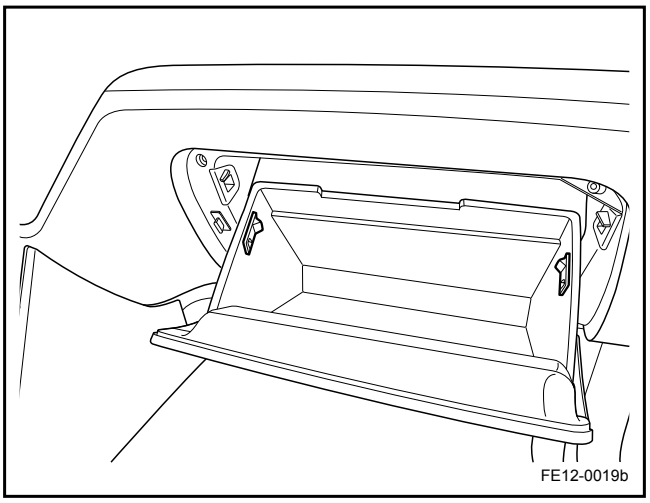
1. Install the instrument panel outer air outlet upper duct and the passenger airbag to the instrument panel.
2. Install the instrument panel.
3. Connect the passenger airbag harness connector.
4. Install the instrument panel right, center and left retaining bolts.

   Torque: 7 Nm (Metric) 5.1 lb-ft (US English)
5. Connect the instrument panel lower right trim harness connector on the back, install and tighten the instrument panel lower right trim retaining screws.

   Torque: 4 Nm (Metric) 2.9 lb-ft (US English)
   Torque: 6 Nm (Metric) 4.4 lb-ft (US English)
6. Install the hood release handle. Install and tighten the instrument panel lower left trim retaining screws. Connect the headlamp height adjust switch harness connector and install the headlamp height adjust switch cover.

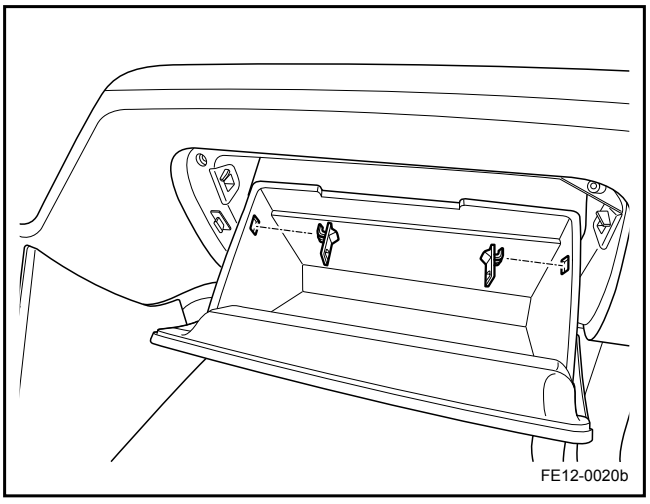
   Torque: 4 Nm (Metric) 2.9 lb-ft (US English)
7. Install the instrument panel trim panels.
8. Install the glove box.
9. Install the instrument panel outer trim covers.
10. Install the ambient light sensor.
11. Install the radio control assembly.
12. Install the instrument panel center air outlet deflector.
13. Install the multi-function clock.
14. Install the instrument cluster trim panel.
15. Install the headlamp switch cover.
16. Install the steering wheel.
17. Install the center console cup holder.

12.8.3.2 Glove Box Replacement



Removal Procedure:

1. Remove the glove box clips on both sides.
2. Remove the glove box.



Installation Procedure:

1. Install the glove box.
2. Install the glove box clips on both sides.

12.8.3.3 Instrument Panel Carrier Replacement

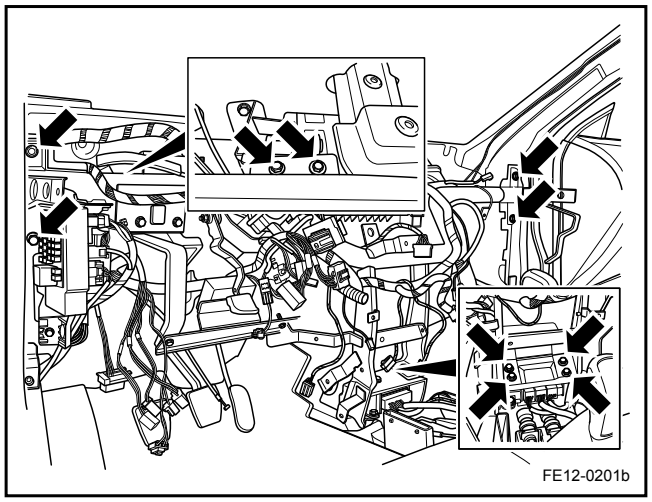
Removal Procedure:

Warning!

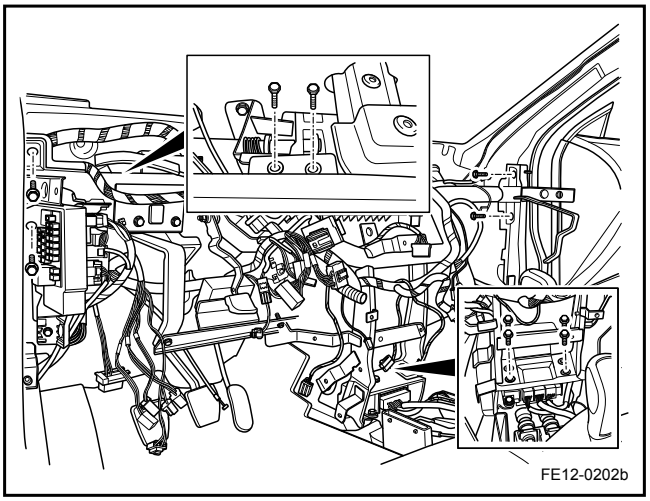
Refer to "Battery Disconnect Warning" in "Warnings and Notices".

Note

Please use special tools to remove interior panels, otherwise panels will be easily scratched.



1. Disconnect the negative battery cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the center console cup holder. Refer to 3.3.8.9 Shift Lever Replacement.
3. Remove the steering wheel. Refer to 7.3.6.3 Steering Wheel Replacement.
4. Remove the headlamp switch covers. Refer to 11.4.8.1 Headlamp Switch Replacement.
5. Remove the instrument cluster trim panel. Refer to 11.7.7.1 Instrument Cluster Replacement.
6. Remove the multi-function clock. Refer to 11.15.8.1 Instrument Cluster Replacement.
7. Remove the instrument panel center air outlet deflector. Refer to 8.2.8.11 Instrument Panel Air Duct Replacement.
8. Remove the radio control assembly. Refer to 11.2.7.5 Radio Control Replacement.
9. Remove the ambient light sensor. Refer to 11.4.8.20 Ambient and Sun Light Sensor Replacement.
10. Remove the instrument panel outer trim covers. Refer to 12.9.1.3 Windshield Garnish Molding Replacement.
11. Remove the glove box. Refer to 12.8.3.2 Glove Box Replacement.
12. Remove the instrument panel. Refer to 12.8.3.1 Instrument Panel Replacement.
13. Remove the steering wheel column. Refer to 7.3.6.4 Mechanical Steering Column Assembly Replacement.
14. Remove the instrument panel wiring harness retaining bolts and clips.
15. Remove the instrument panel carrier retaining bolts.
16. Remove the instrument panel carrier.



Installation Procedure:

1. Install the instrument panel carrier.
2. Install and tighten the instrument panel carrier retaining bolts.

   Torque: 21 Nm (Metric) 15.5 lb-ft (US English)
3. Install the instrument panel wiring harness.
4. Install the steering wheel column.
5. Install the instrument panel.
6. Install the glove box.
7. Install the instrument panel outer trim covers.
8. Install the ambient light sensor.
9. Install the radio control assembly.
10. Install the instrument panel center air outlet deflector.
11. Install the multi-function clock.
12. Install the instrument cluster trim panel.
13. Install the headlamp switch covers.
14. Install the steering wheel.
15. Install the center console cup holder.

12.9 Interior Trim

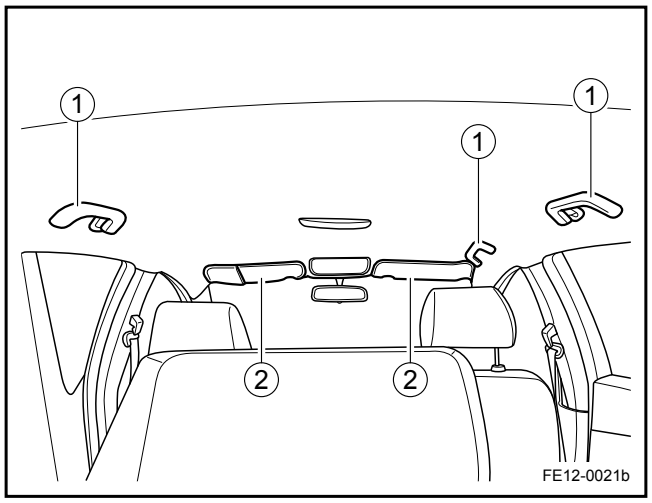
12.9.1 Removal and Installation

12.9.1.1 Headliner Replacement

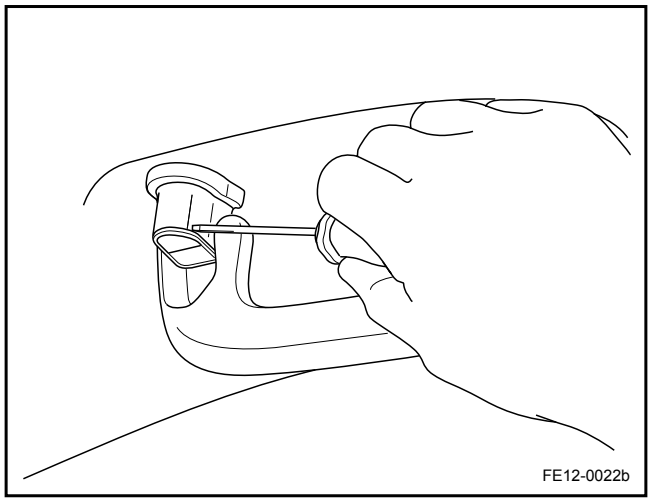
Removal Procedure:

Warning!

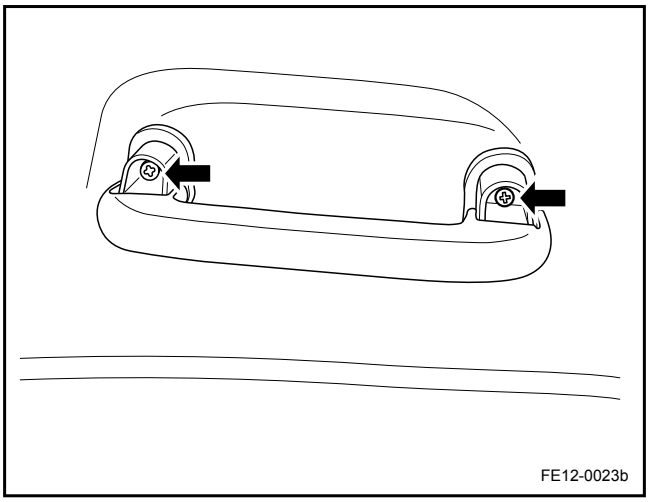
Refer to "Battery Disconnect Warning" in "Warnings and Notices".



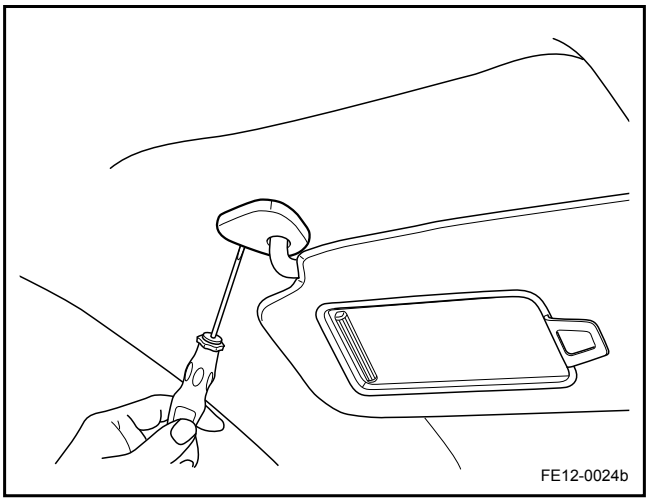
1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the front and rear door sill trim plate. Refer to 12.9.1.2 Left and Right Door Sill Nameplate Replacement.
3. Remove the windshield garnish molding. Refer to 12.9.1.3 Windshield Garnish Molding Replacement. Remove the center pillar upper trim panel. Refer to 12.9.1.3 Windshield Garnish Molding Replacement. Remove the quarter upper trim panel. Refer to 12.9.1.3 Windshield Garnish Molding Replacement.
4. Remove the dome lamp. Refer to 11.4.8.4 Dome Lamp and Reading Lamp Replacement.
5. Remove the door seal strips. Refer to 12.9.1.16 Vehicle Inner Side Seal Replacement.
6. Remove the assist handles and sunshades.



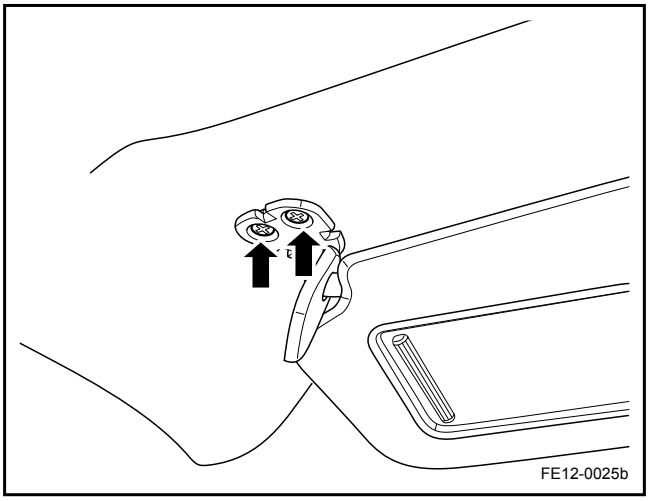
7. Prise open the right front assist handle retaining screw covers.



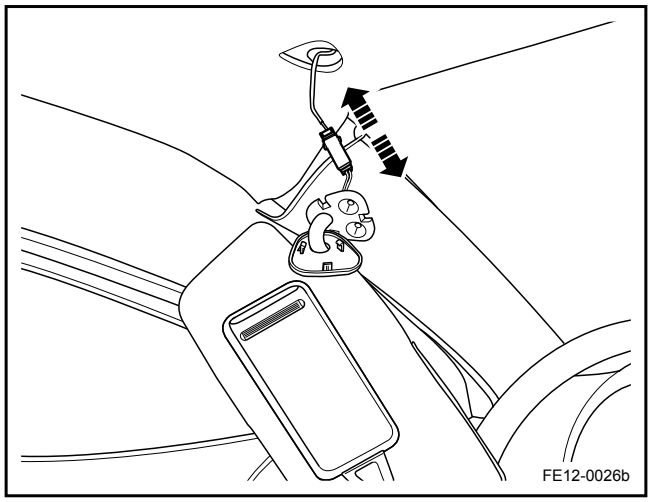
8. Remove the right front assist handle retaining screws. The removal for the left rear and right rear assist handles is the same.



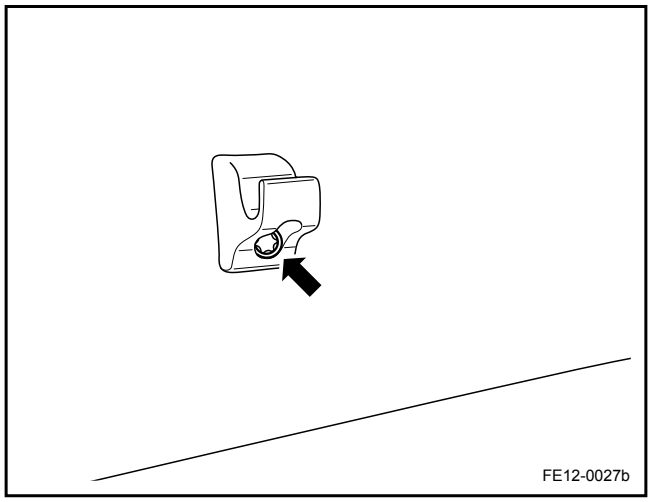
9. Prise open the sunshade retaining screw covers.



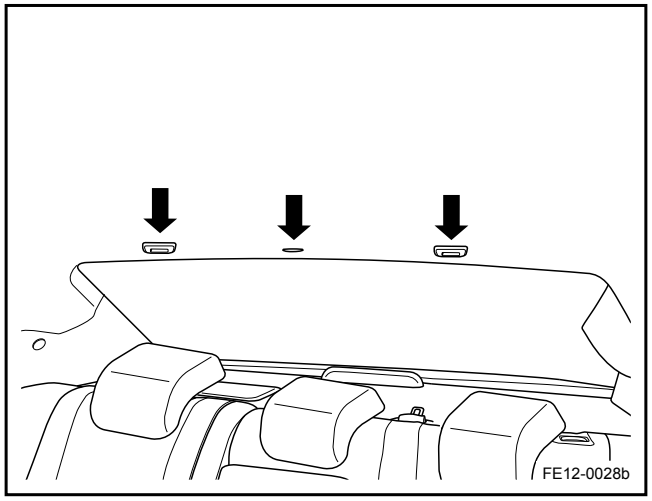
10. Remove the sunshade retaining screws, rotate the sunshade clockwise 90 ° and then remove the sunshade.



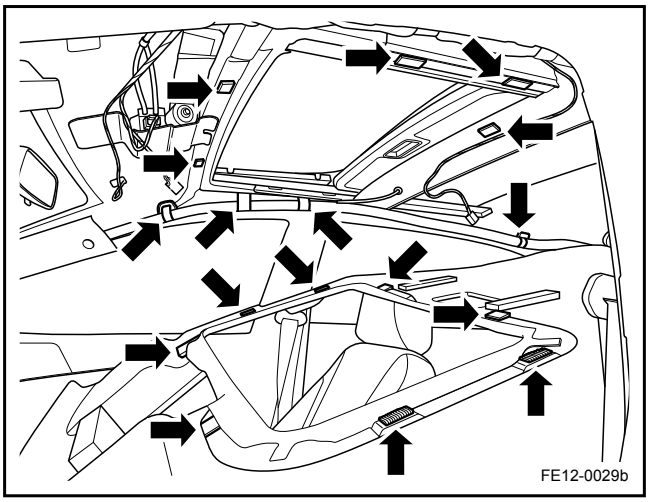
11. Disconnect the left sunshade harness connector.



12. Remove the left sunshade retaining bolt and remove the sunshade hook. The removal of the right sunshade is the same.



13. Remove the headliner rear retaining clips.

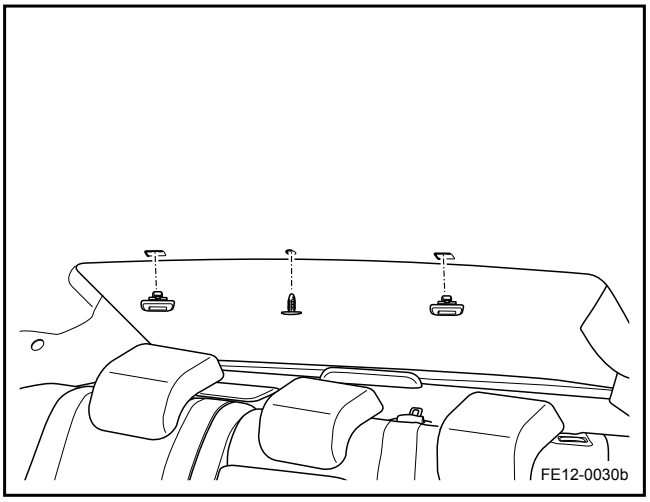


14. Fold down the rear seat and remove the headliner via the trunk.

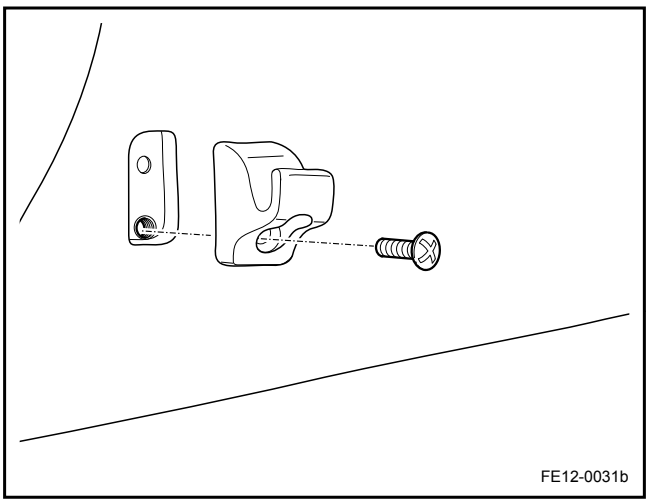
    Note

    Due to the seal between the headliner and the roof, pull the headliner out at an angle. Do not squeeze or dissemble the headliner. The headliner removal is the same for vehicles with or without sunroof.

Installation Procedure:

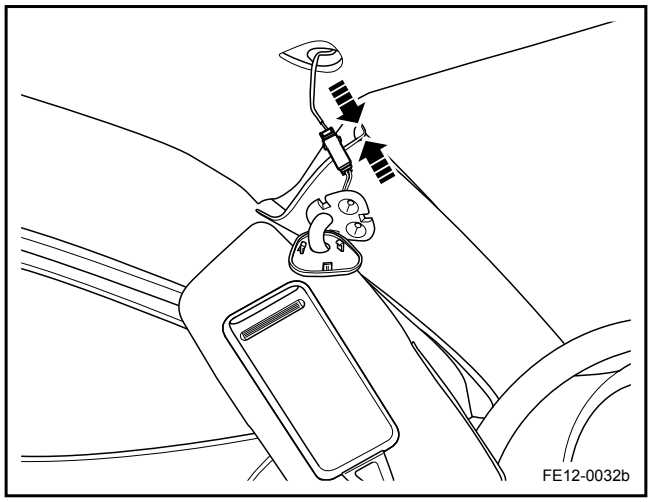


1. Pull the rear seat to the upright position. Place the headliner back into the vehicle via the trunk as per removal.
2. Place the headliner to the roof. Engage the headliner rear retaining clips.

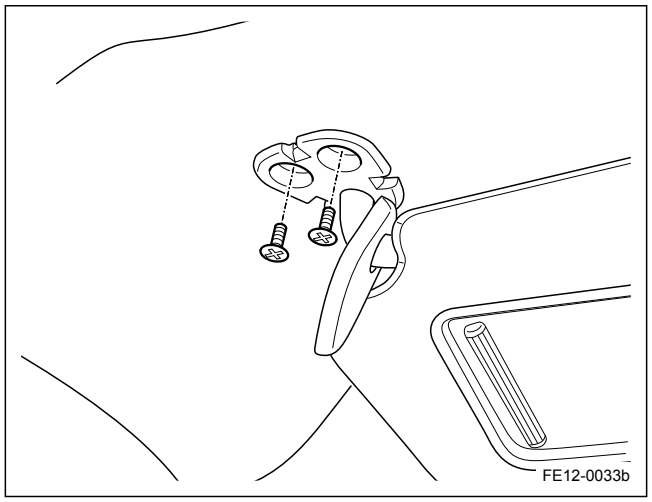


3. Install the sunshade hook.

   Torque: 5 Nm (Metric) 3.7 lb-ft (US English)

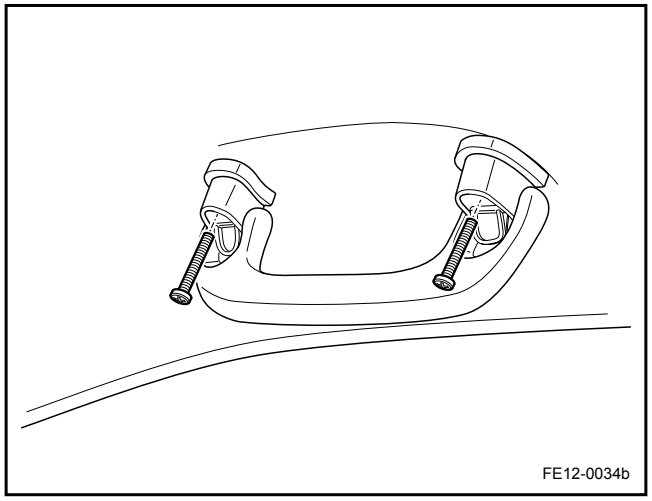


4. Connect the left sunshade harness connector and run the harness through the sunshade hook.



5. Install and tighten the left sunshade retaining bolt. The right sunshade installation is the same.

   Torque: 5 Nm (Metric) 3.7 lb-ft (US English)



6. Install the right front assist handle retaining screws. The left rear and right rear assist handle installations are the same.

   Torque: 5 Nm (Metric) 3.7 lb-ft (US English)

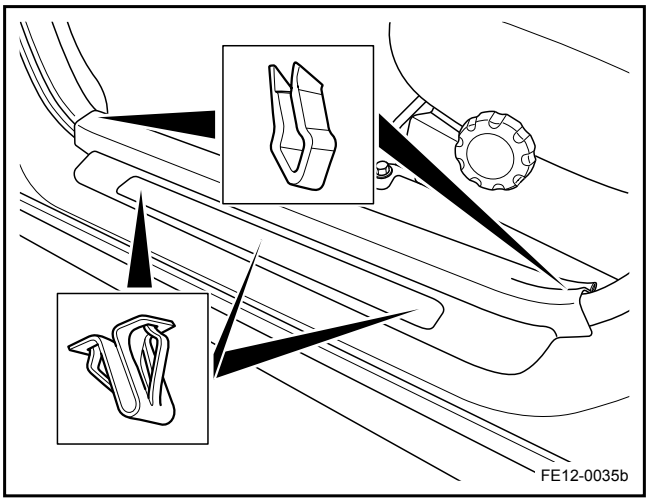
7. Install the door seal strips.
8. Install the dome lamp.
9. Install the windshield garnish molding, install the center pillar upper trim panel and install the quarter upper trim panel.
10. Install the front and rear door sill trim plate.

12.9.1.2 Left and Right Door Sill Nameplate Replacement

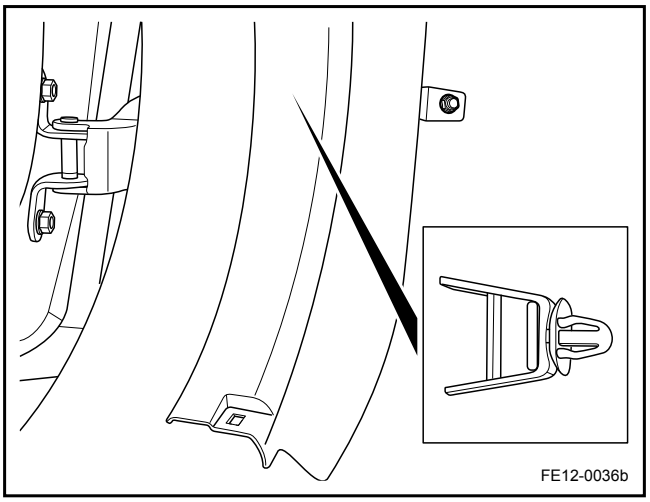
Removal Procedure:

Note

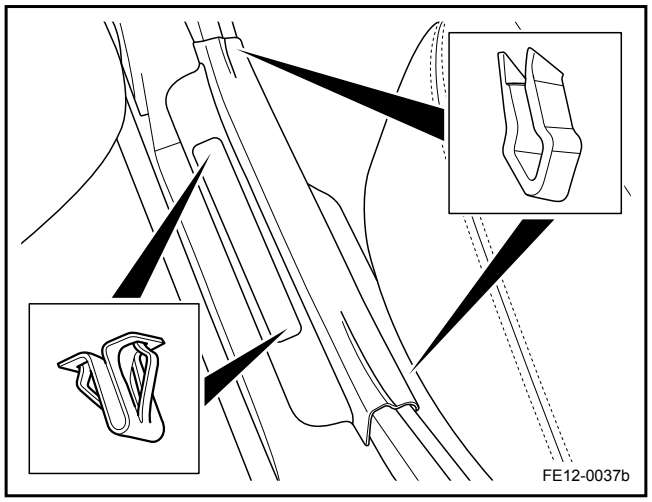
To remove left/right door sill nameplate, please use interior trim panel removal tools. Otherwise, it is easy to scratch door sill nameplate.



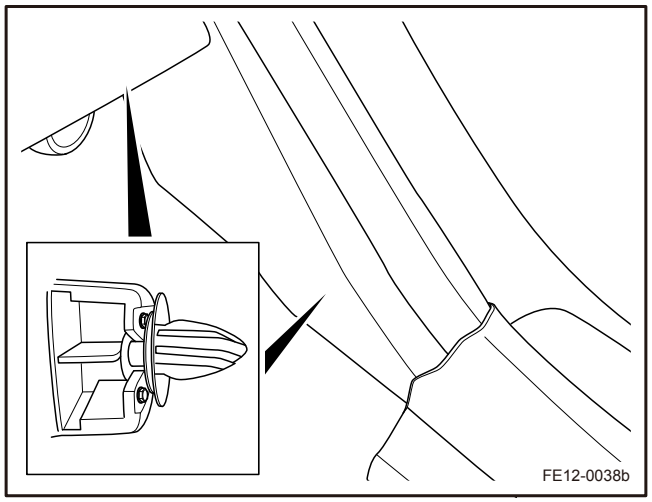
1. Disengage the front door sill trim plate retaining clips and loose the front door sill trim plate.



2. Remove the body hinge pillar trim retaining nut and clip and remove the door sill nameplate.

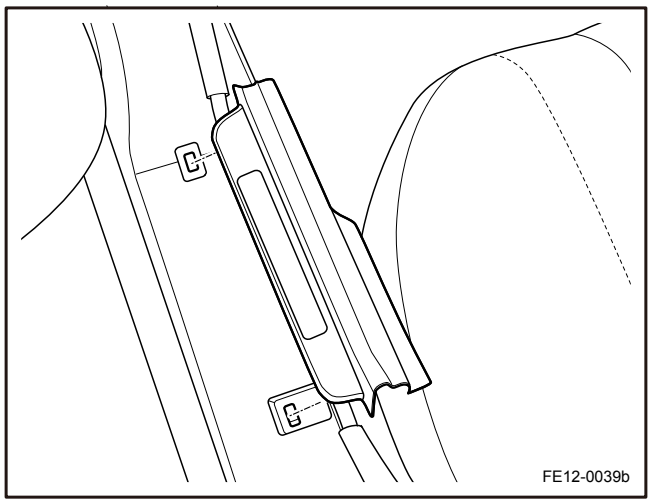


3. Disengage the rear door sill nameplate retaining clips and loose the rear door sill nameplate.

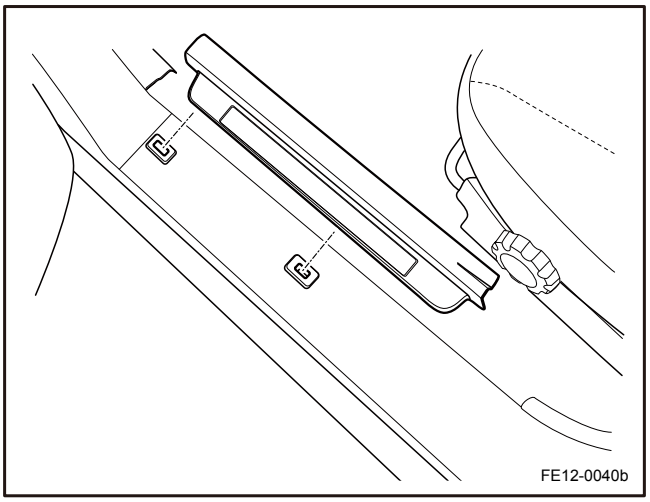


4. Lift the rear seat cushion, disengage the body lock pillar trim retaining clips and remove the rear door sill trim plate.

Installation Procedure:



1. Install the body lock pillar trim and install the rear seat cushion.
2. Press the rear door sill nameplate into position.



3. Install the front door sill nameplate and tighten the retaining nut..

   Torque: 4 Nm (Metric) 3.0 lb-ft (US English)

4. Press the front door sill nameplate into position.

   Note

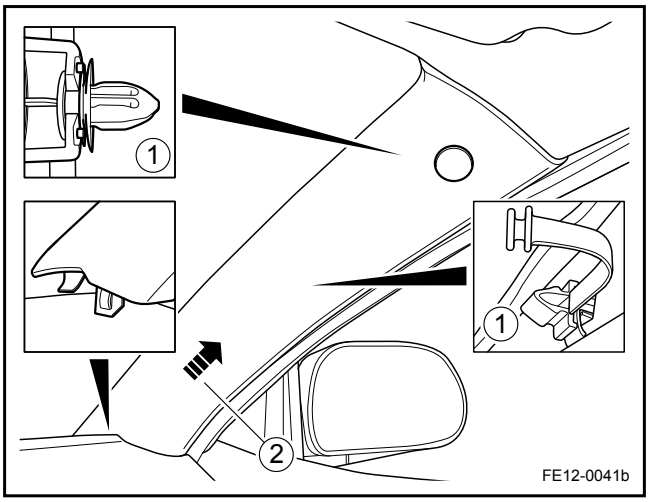
   Left and right door sill nameplate replacements are the same.

12.9.1.3 Windshield Garnish Molding Replacement

Removal Procedure:

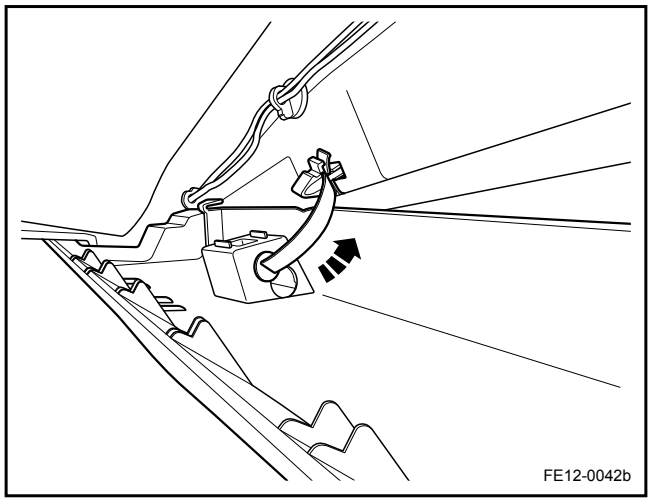
Note

To remove windshield garnish molding, please use interior trim panel removal tools. Otherwise, the windshield garnish molding will easily be scratched.



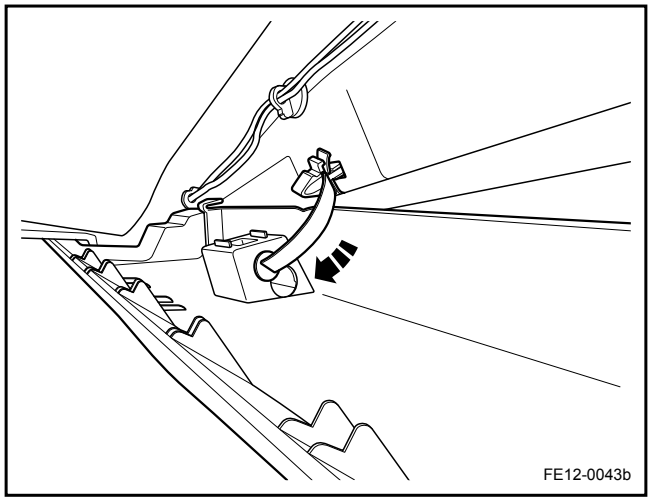
1. Unclip the retaining clip (1) and a D-shape clip from the windshield garnish molding.

2. Pull upward to disengage the windshield garnish molding (2) from the A pillar body panel.

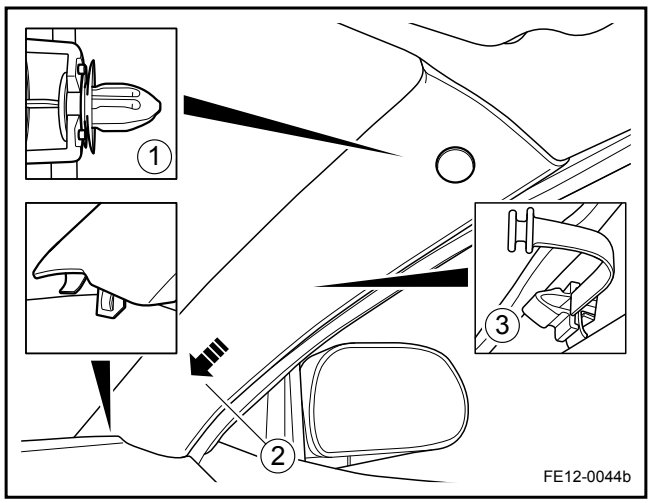


3. Disengage the clip from the windshield garnish molding and remove the windshield garnish molding from the vehicle.

Installation Procedure:



1. Engage the clip to the windshield garnish molding.



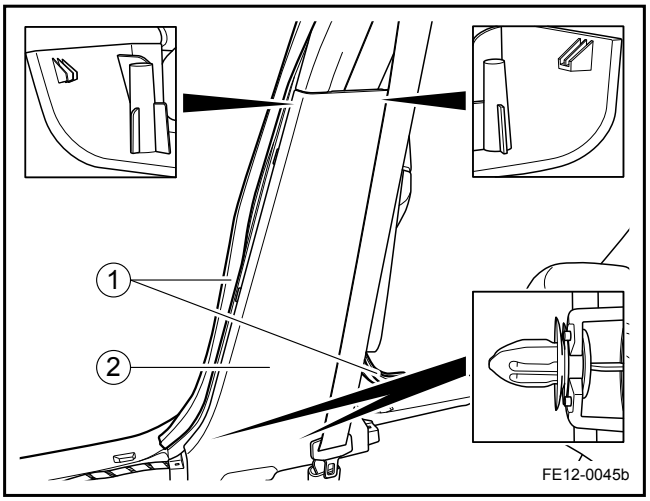
2. Insert the windshield garnish molding (2) lower end into the instrument panel.
3. Press the the windshield garnish molding to secure the D-shape clip (1) and the retaining clips (2), (3).

12.9.1.4 Center Pillar Trim Panel Replacement

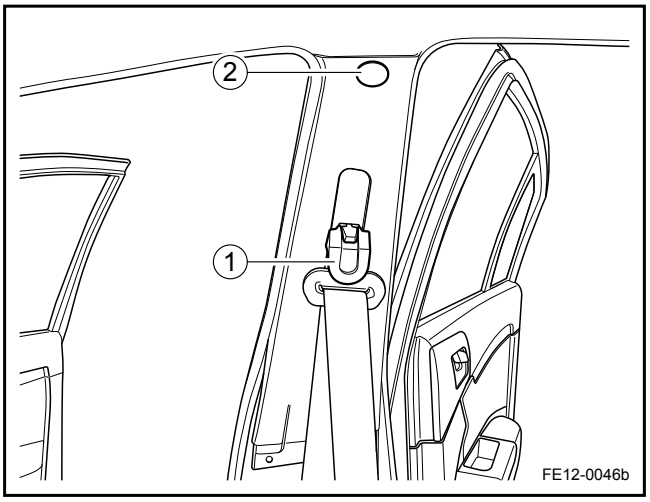
Removal Procedure:

Note

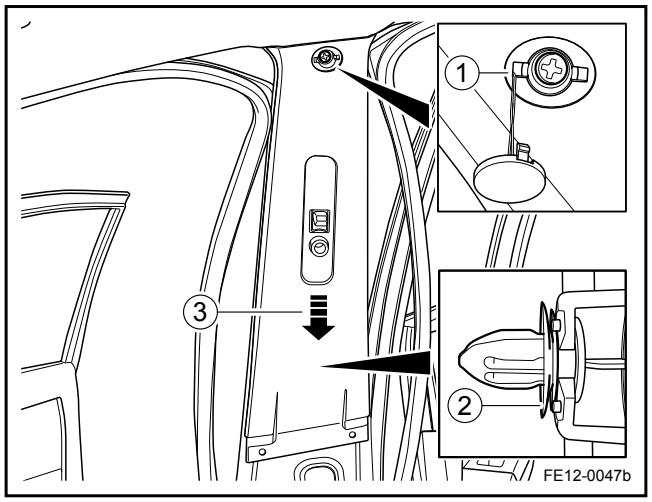
To remove the center pillar trim panel, please use interior trim panel removal tools. Otherwise, the center pillar trim panel will easily be scratched.



1. Remove the left and right door sill nameplate. Refer to 12.9.1.2 Left and Right Door Sill Nameplate Replacement.
2. Remove the door seal (1).
3. Detach the D-shape retaining clips from the center pillar lower trim panel, detach the retaining tangs from the upper part of the center pillar lower trim panel, and remove the center pillar lower trim panel (2).

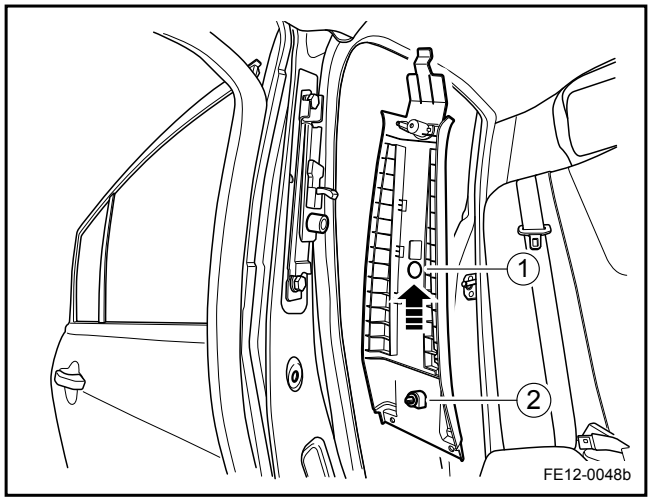


4. Remove the front seat belt height adjuster bolt and remove the seat belt (1). Refer to 9.3.7.5 Front Seat Belt Height Adjuster Replacement.
5. Remove the center pillar upper trim panel retaining screw cover (2).

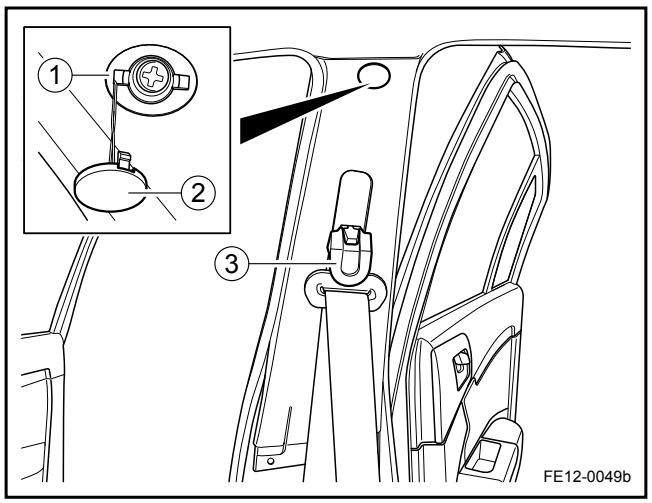


6. Remove the center pillar upper trim panel retaining screw and washer assembly (1).
7. Detach the center pillar upper trim panel clip (2) from the lower part of the panel.
8. Remove the center pillar upper trim panel (3) from the center pillar.

Installation Procedure:

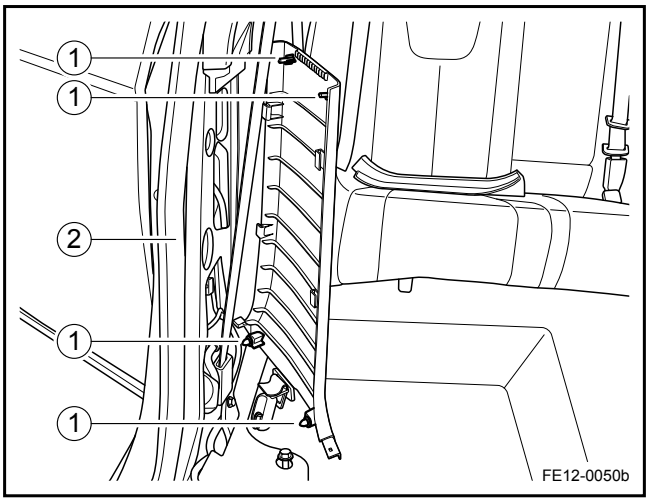


1. Install the center pillar upper trim panel to the mounting hole (1).
2. Press the lower part of the center pillar lower trim panel to secure the retaining clip (2).



3. Install the center pillar upper trim panel retaining screw and washer assembly (1).

   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)
4. Install the center pillar upper trim panel retaining screw cover (2).
5. Install the seat belts (3).



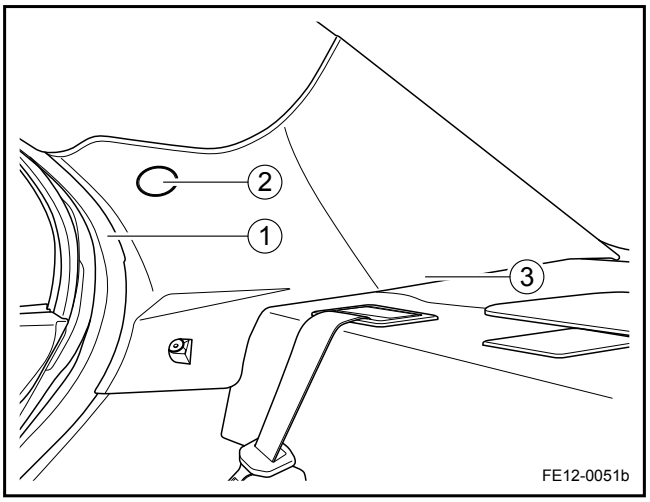
6. Press the lower part of the center pillar upper trim panel to secure the clips and the retaining tang (1).
7. Install the door seal (2).
8. Install the left and right door sill nameplate.

12.9.1.5 Rear Quarter Upper Trim Panel Replacement (Sedan)

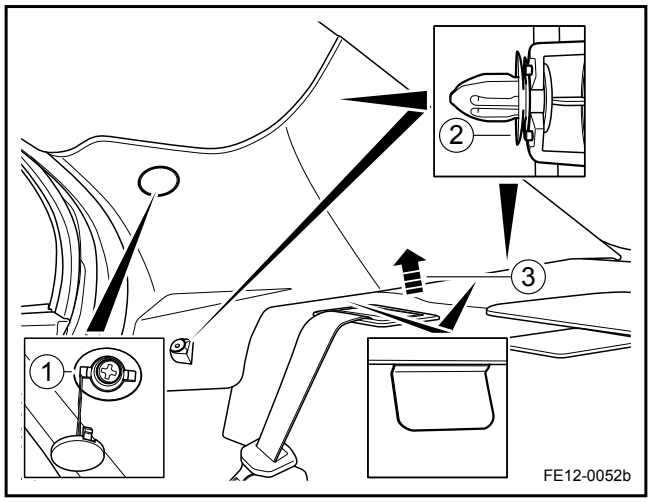
Removal Procedure:

Note

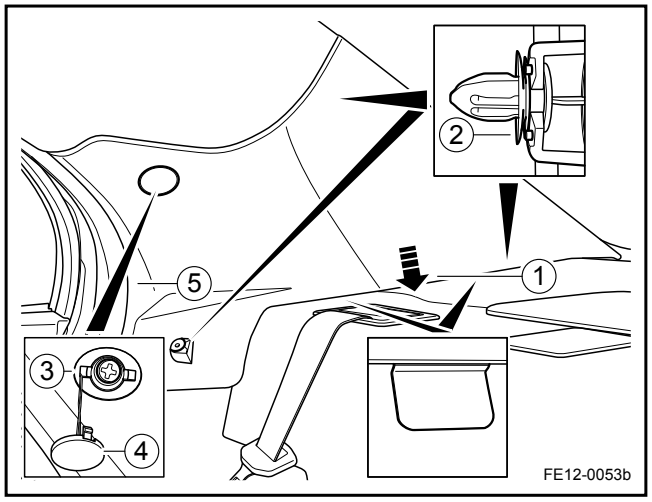
To remove the rear quarter upper trim panel, please use interior trim panel removal tools. Otherwise, the rear quarter upper trim panel will easily be scratched.



1. Fold down the rear seat back and remove the rear seat armrest. Refer to 12.7.3.6 Rear Seat Armrest Assembly Replacement.
2. Remove the rear door seal and the rear compartment lid seal (1).
3. Remove the rear quarter upper trim panel retaining screw cover (2).



4. Remove the rear quarter upper trim panel retaining screw and washer assembly (1).
5. Remove the rear quarter upper trim panel retaining clips (2).
6. Pull upward to remove the rear quarter upper trim panel.



Installation Procedure:

1. Install the rear quarter upper trim panel to the rear parcel shelf mounting hole (1).
2. Press the rear quarter upper trim panel to secure the retaining clip (2).
3. Install the rear quarter upper trim panel retaining screw and washer assembly (3)

   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)
4. Install the rear quarter upper trim panel retaining screw cover (4).
5. Install the door seal (5).
6. Install the rear seat armrest and pull the rear seat back to the upright position.

   Note

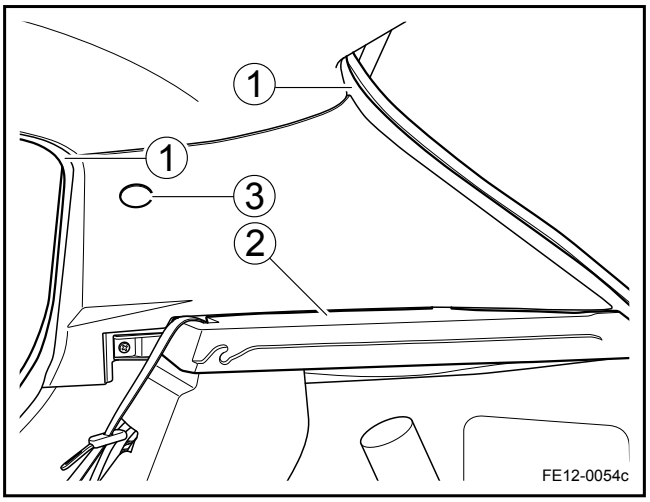
   The rear quarter upper trim panel replacement is the same for both sides.

12.9.1.6 Rear Quarter Upper Trim Panel Replacement (Hatchback)

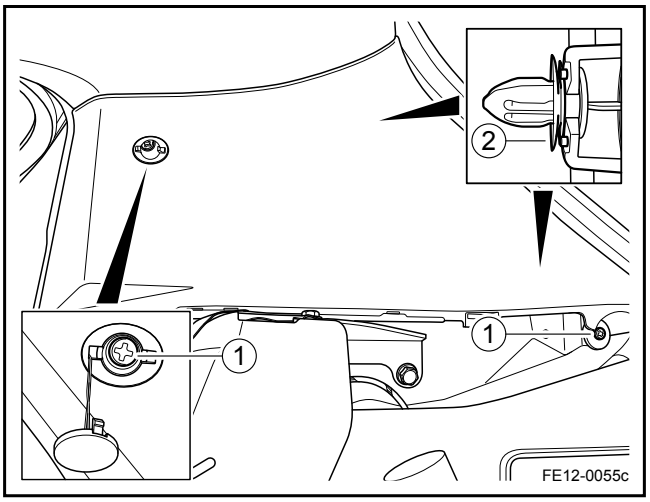
Removal Procedure:

Note

To remove the rear quarter upper trim panel, please use interior trim panel removal tools. Otherwise, the rear quarter upper trim panel will easily be scratched.

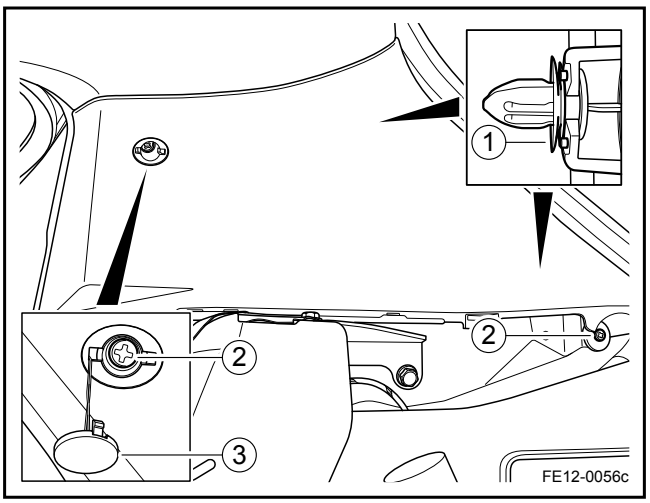


1. Fold down the rear seat back and remove the rear seat armrest. Refer to 12.7.3.6 Rear Seat Armrest Assembly Replacement.
2. Remove the rear door seal and the hatchback seal (1).
3. Remove the rear parcel shelf mounting bracket (2). Refer to 12.9.1.8 Rear Parcel Shelf Replacement (Hatchback).
4. Remove the rear quarter upper trim panel retaining screw cover (3).



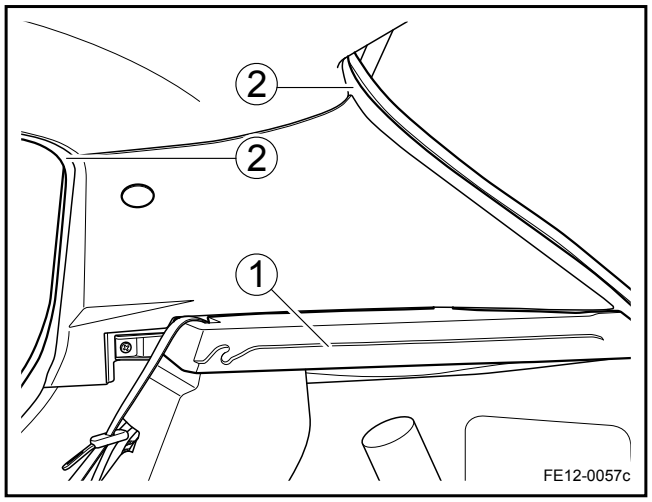
5. Remove the rear quarter upper trim panel retaining screw and washer assembly (1).
6. Remove the rear quarter upper trim panel retaining clips (2) and remove the Remove the rear quarter upper trim panel.

Installation Procedure:



1. Press the rear quarter upper trim panel to secure the retaining clip (1).
2. Install the rear quarter upper trim panel retaining screw and washer assembly (2).

   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)
3. Install the rear quarter upper trim panel retaining screw cover (3).



4. Install the rear parcel shelf (1).
5. Install the rear door seal and the hatchback seal (2).
6. Install the rear seat armrest and lift the rear seat back to the upright position.

Note

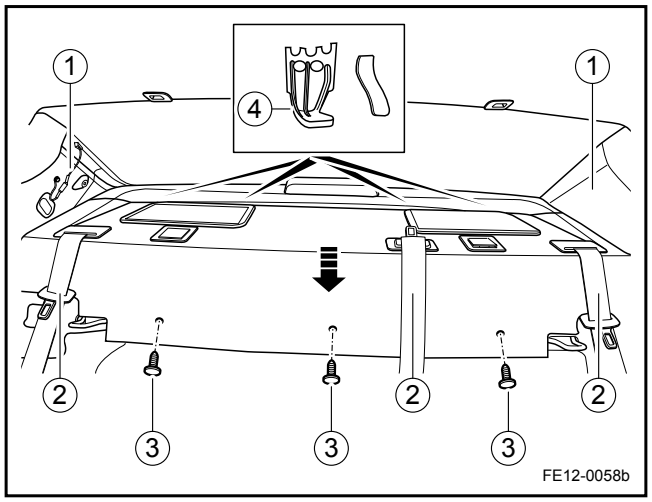
The rear quarter upper trim panel replacement is the same for both sides.

12.9.1.7 Rear Parcel Shelf Replacement (Sedan)

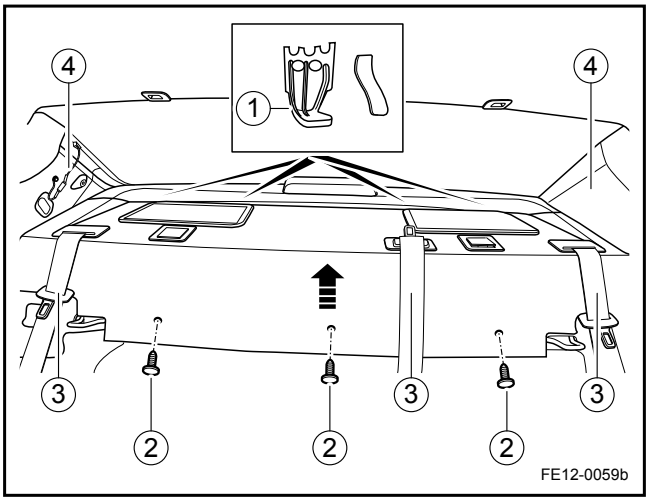
Removal Procedure:

Note

To remove the rear parcel shelf, please use interior trim panel removal tools. Otherwise, the rear parcel shelf panel will easily be scratched.



1. Fold down the rear seat back and remove the rear seat armrest. Refer to 12.7.3.6 Rear Seat Armrest Assembly Replacement.
2. Remove the rear quarter upper trim panel. Refer to 12.9.1.5 Rear Quarter Upper Trim Panel Replacement (Sedan).
3. Remove the rear seat belt buckle retaining bolt (2). Refer to 9.3.7.4 Rear Seat Belt Retractor Replacement.
4. Remove the rear parcel shelf retaining clips (3).
5. Lift the rear parcel shelf to detach the D-shape retaining tangs from the vehicle body.
6. Lift the rear parcel shelf to detach the D-shape retaining tangs from the vehicle body mounting hole (4) and pull the rear parcel shelf forward.
7. Disconnect the center high mounted brake lamp harness connector, slide the center seat belt through the center seat belt slot and remove the rear parcel shelf trim panel.



Installation Procedure:

1. Slide the center seat belt through the center seat belt slot, connect the center high mounted brake lamp harness connector and install the rear parcel shelf trim panel.
2. Push back the rear parcel shelf trim panel to engage the retaining tangs to the slots on the vehicle body.
3. Push back the rear parcel shelf trim panel to engage the D-shape retaining clips and press the rear parcel shelf trim panel to secure the D-shape retaining clips.
4. Install the rear parcel shelf retaining clips (2).
5. Install the rear seat belt buckle retaining bolt (3).
6. Install the rear quarter upper trim panels (4).
7. Install the rear seat armrest and pull the rear seat back to the upright position.

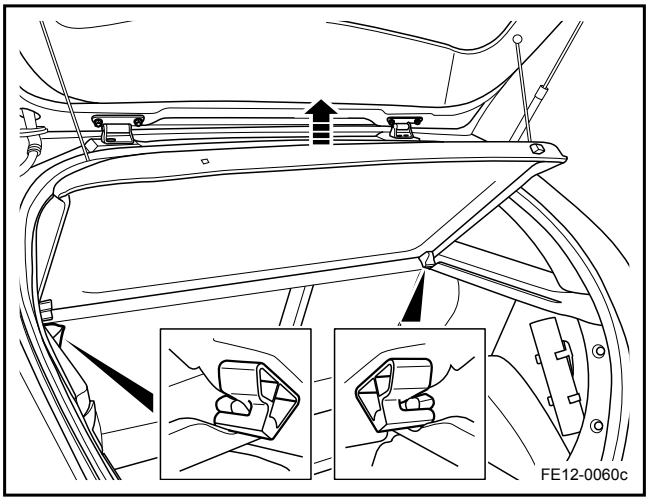
Note

12.9.1.8 Rear Parcel Shelf Replacement (Hatchback)

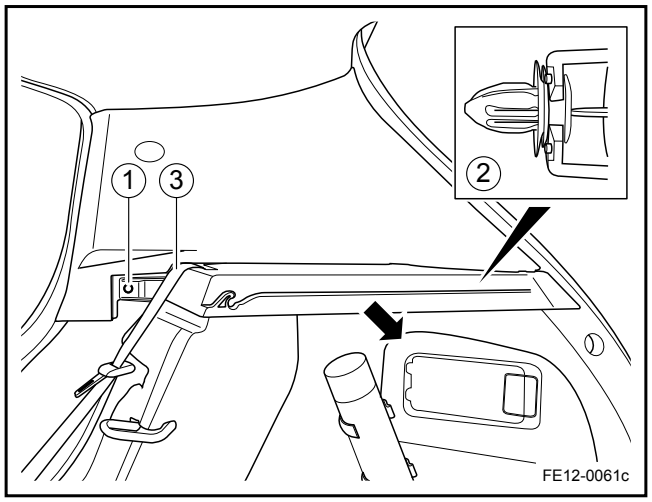
Removal Procedure:

Note

To remove the rear parcel shelf, please use interior trim panel removal tools. Otherwise, the rear parcel shelf panel will easily be scratched.

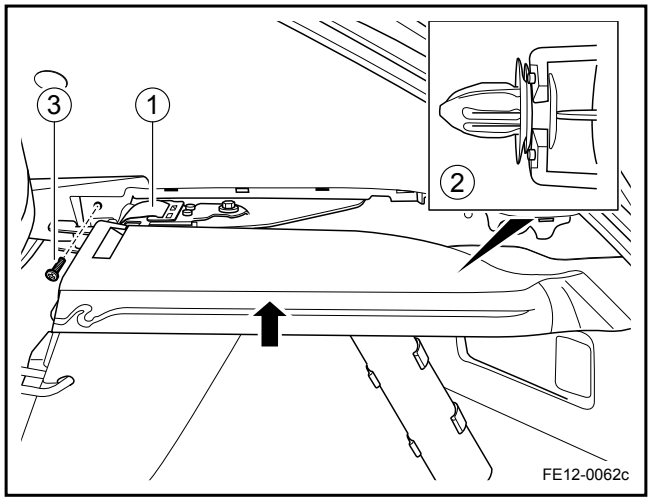


1. Lift the rear parcel shelf and tilt upward at about 45 °, pull rearward to detach the rear parcel shelf from the mounting bracket.



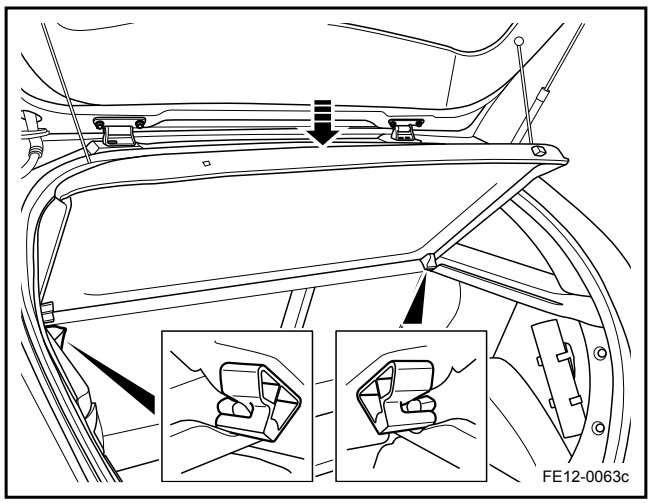
2. Fold down the rear seat back and remove the rear seat armrest. Refer to 12.7.3.6 Rear Seat Armrest Assembly Replacement.
3. Remove the rear parcel shelf mounting bracket retaining bolt (1).
4. Disengage the rear parcel shelf front retaining tangs (2).
5. Slide the rear seat belt through the rear seat belt slot (3).

Installation Procedure:



1. Slide the rear seat belt through the rear seat belt slot (1).
2. Attach the rear parcel shelf mounting bracket retaining clip (2).
3. Install the rear parcel shelf mounting bracket retaining bolt (3).

   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)
4. Install the rear seat armrest and pull the rear seat back to the upright position.



5. Install the rear parcel shelf to the mounting bracket with the rear parcel shelf tilting approximately 45 ° and push down the rear parcel shelf into the rack.

   Note

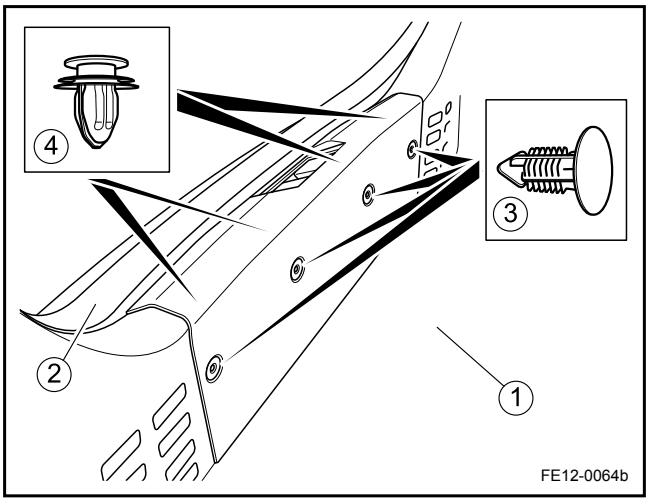
   The rear parcel shelf replacement is the same for both sides.

12.9.1.9 Rear Compartment Trim Panel Replacement

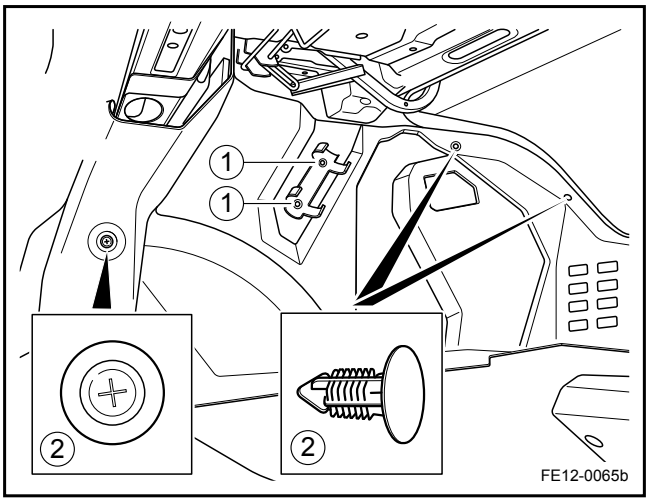
Removal Procedure:

Note

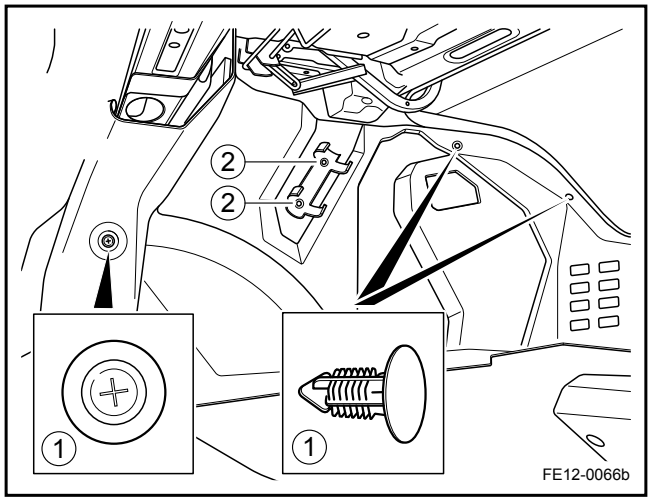
To remove the rear compartment trim panel, please use interior trim panel removal tools. Otherwise, the rear compartment trim panel will easily be scratched.



1. Remove the rear compartment floor carpet.
2. Remove the rear compartment lid seal (2). Refer to 12.9.1.16 Vehicle Inner Side Seal Replacement.
3. Remove the end panel side clips (3).
4. Remove the end panel upper clips (4).



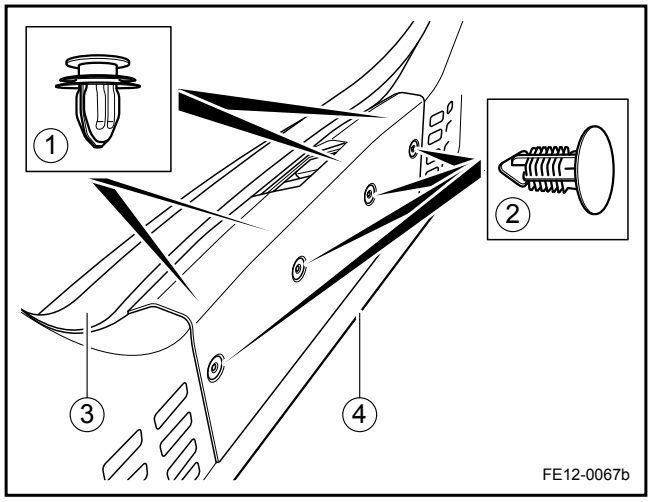
5. Remove the fire extinguisher mounting bracket retaining bolt (1).
6. Remove the retaining clips from the rear of the rear compartment trim panel and remove the retaining clip (2) from the front of the rear compartment trim panel.



Installation Procedure:

1. Install the retaining clips to the rear of the rear compartment trim panel and install the retaining clip (2) to the front of the rear compartment trim panel.
2. Install and tighten the fire extinguisher mounting bracket retaining bolt (2).

   Torque: 13 Nm (Metric) 9.6 lb-ft (US English)



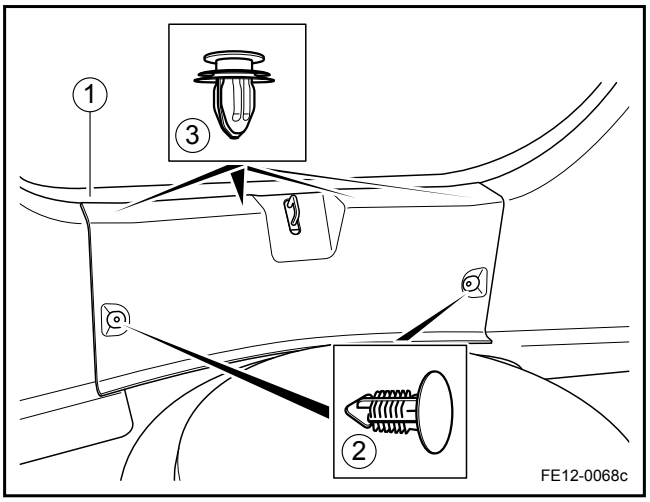
3. Install the end panel upper clips (1).
4. Install the end panel side clips (2).
5. Install the rear compartment lid seal (3).
6. Install the rear compartment floor carpet (4).

12.9.1.10 Rear Compartment Trim Panel Replacement (Hatchback)

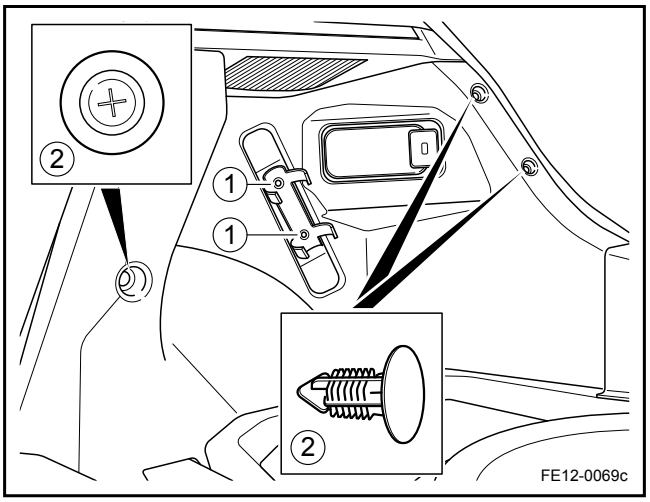
Removal Procedure:

Note

To remove the rear compartment trim panel, please use interior trim panel removal tools. Otherwise, the rear compartment trim panel will easily be scratched.

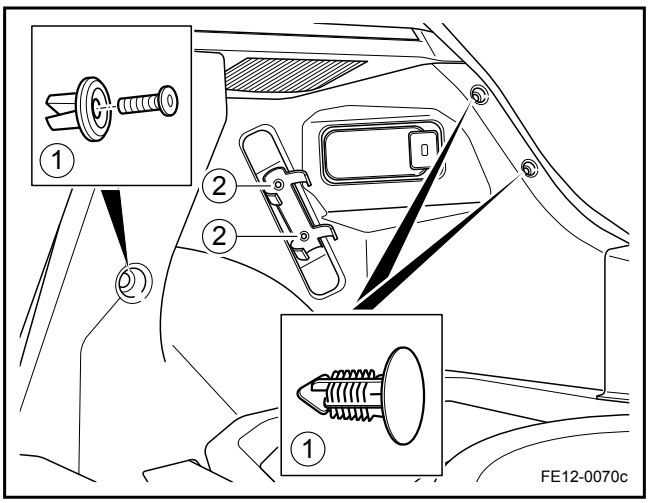


1. Remove the rear compartment floor carpet.
2. Remove the hatchback seal (1). Refer to 12.9.1.16 Vehicle Inner Side Seal Replacement.
3. Remove the end panel side clips (2).
4. Remove the end panel upper clips (3).

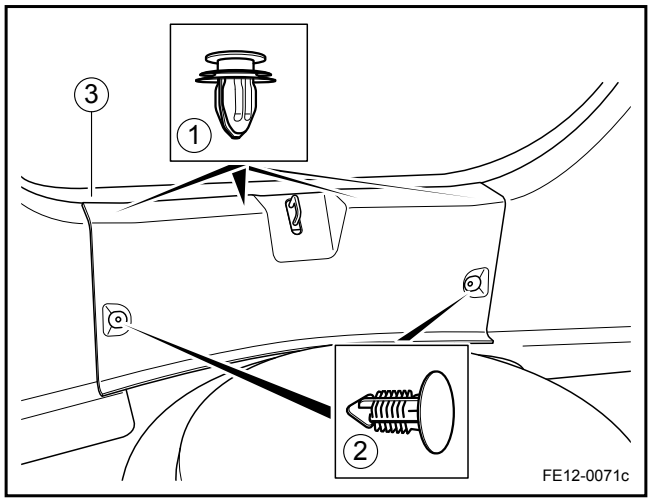


5. Remove the fire extinguisher mounting bracket retaining bolt (1).
6. Remove the retaining clips (2) from the side of the rear compartment trim panel.
7. Remove the parcel shelf mounting bracket and the rear compartment trim panel. Refer to 12.9.1.8 Rear Parcel Shelf Replacement (Hatchback).

Installation Procedure:



1. Install the parcel shelf mounting bracket and the rear compartment trim panel.
2. Install the retaining clips (1) from the side of the rear compartment trim panel.
3. Install the fire extinguisher mounting bracket retaining bolt (2).



4. Press the end panel to secure the upper retaining clips (1).
5. Attach the end panel side clips (2).
6. Install the hatchback seal (3).
7. Install the rear compartment floor carpet.

Note

The removal and installation methods are similar for both sides of rear compartment trim panel.

12.9.1.11 Passenger Compartment Floor Carpet Replacement

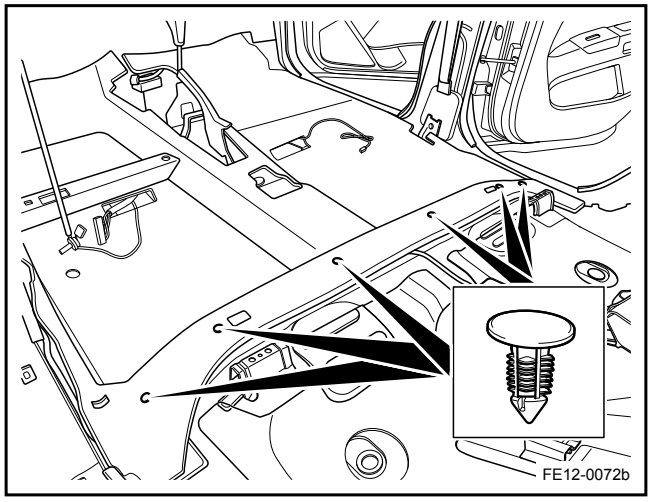
Removal Procedure:

Warning!

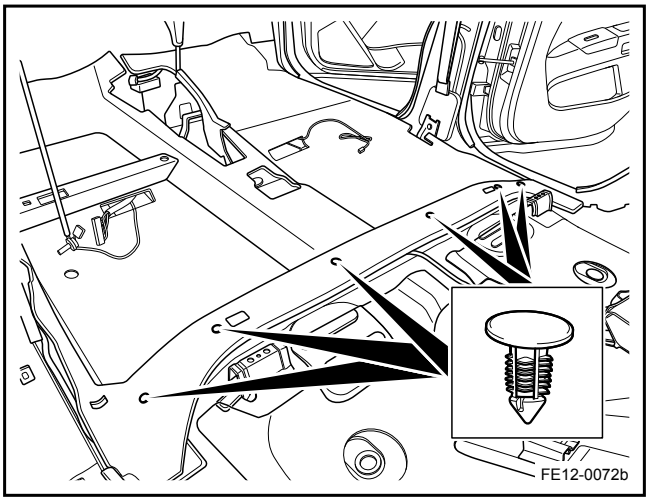
Refer to "Battery Disconnect Warning" in "Warnings and Notices".

Note

To remove the passenger compartment floor carpet, please use interior trim panel removal tools. Otherwise, the passenger compartment floor carpet will easily be scratched.



1. Disconnect the battery negative cable. Refer to 2.11.8.1 Battery Disconnection.
2. Remove the rear seat cushion. Refer to 12.7.3.4 Rear Seat Cushion Replacement.
3. Remove the left and right door sill nameplate. Refer to 12.9.1.2 Left and Right Door Sill Nameplate Replacement.
4. Remove the front seat belts retaining bolts from the left and right center pillar lower trim panels.
5. Remove the left and right center pillar lower trim panels. Refer to 12.9.1.4 Center Pillar Trim Panel Replacement.
6. Remove the left and right front seats. Refer to 11.11.8.1 Front Electric Seat Replacement.
7. Remove the center console. Refer to 3.3.8.9 Shift Lever Replacement.
8. Remove the passenger compartment floor carpet.



Installation Procedure:

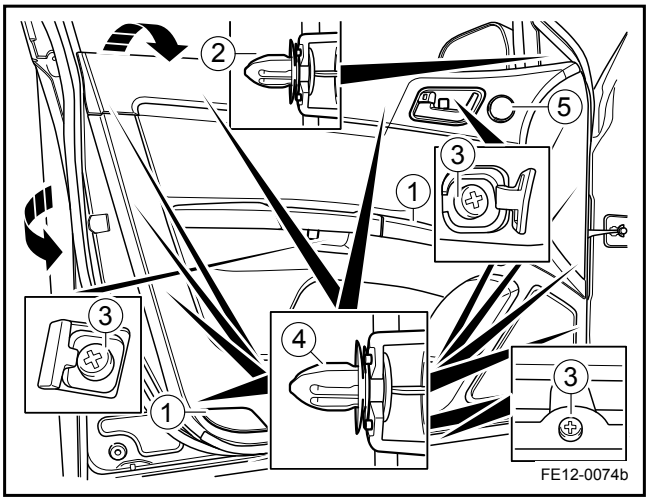
1. Install the passenger compartment floor carpet.
2. Install the center console.
3. Install the left and right front seats.
4. Install the left and right center pillar lower trim panels.
5. Install the left and right front door sill nameplate.
6. Install the front seat belts retaining bolts to the left and right center pillar lower trim panels.
7. Install the left and right rear door sill nameplate.
8. Install the rear seat cushion.
9. Connect the battery negative cable.

12.9.1.12 Front Side Door Trim Panel Replacement

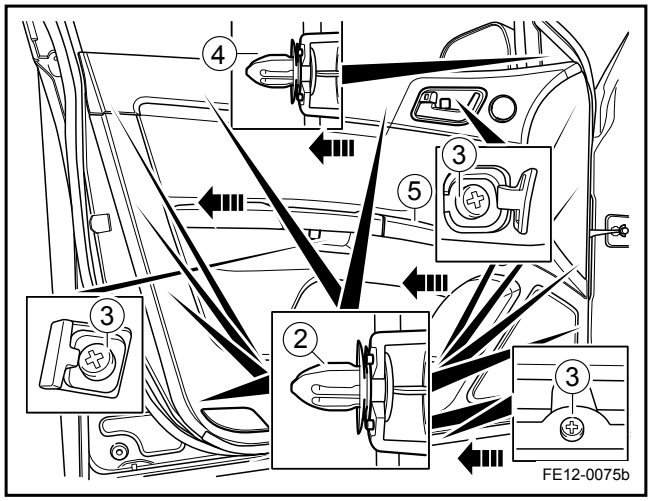
Removal Procedure:

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 side door trim panel corner ornament retaining clip (2) and remove the corner ornament.
3. Remove the front side door trim panel retaining screws (3).
4. Detach the front side door trim panel retaining clips (4).
5. Disconnect the front side door trim panel lamp connector, the front door window switch connector and the tweeter connector and remove the front side door trim panel (5).



Installation Procedure:

1. Connect the front side door trim panel lamp connector, the front door window switch connector and the tweeter connector.
2. Press the front side door trim panel to secure the retaining clips (2).
3. Install the front side door trim panel retaining screws (3).

   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)
4. Press the front side door trim panel corner ornament to secure the corner ornament retaining clip (4).

   Note

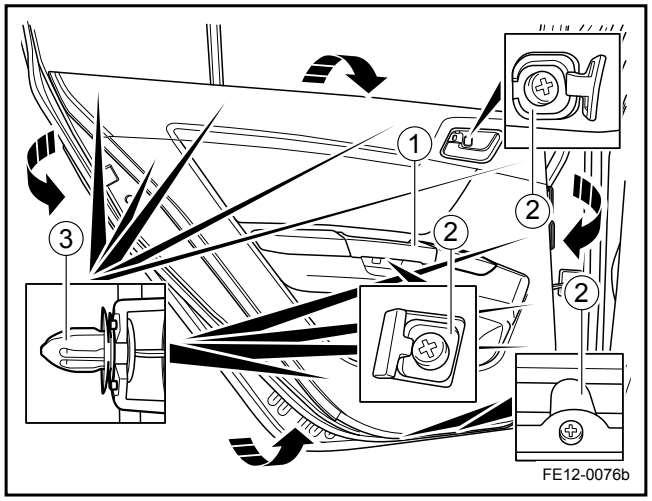
   The replacement of the left and right front door trim panels are similar.

12.9.1.13 Rear Side Door Trim Panel Replacement

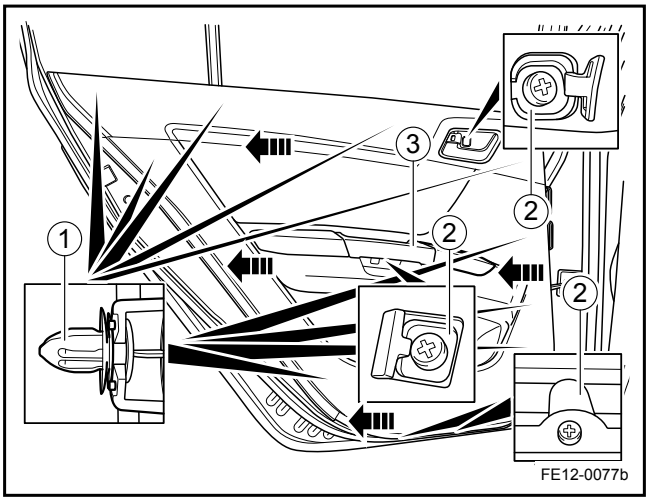
Removal Procedure:

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 side door trim panel retaining screws (2).
3. Detach the rear side door trim panel retaining clips (3), disconnect the wiring harness connectors and remove the rear side door trim panel.



Installation Procedure:

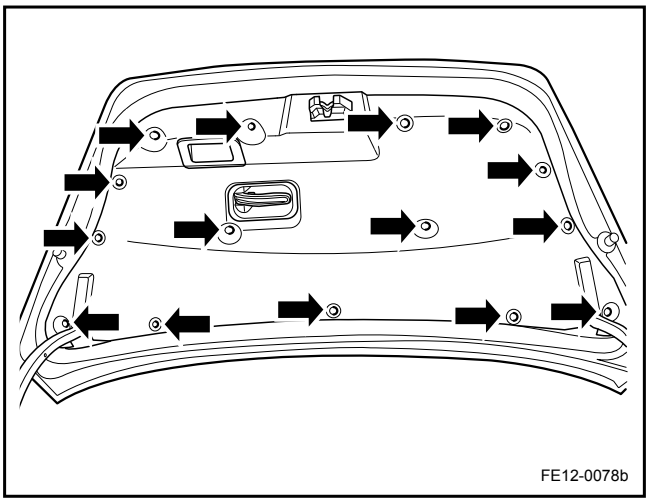
1. Connect the wiring harness connectors on the rear side door trim panel.
2. Press the rear side door trim panel to secure the retaining clips (1).
3. Install the rear side door trim panel retaining screws (2).

   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)

   Note

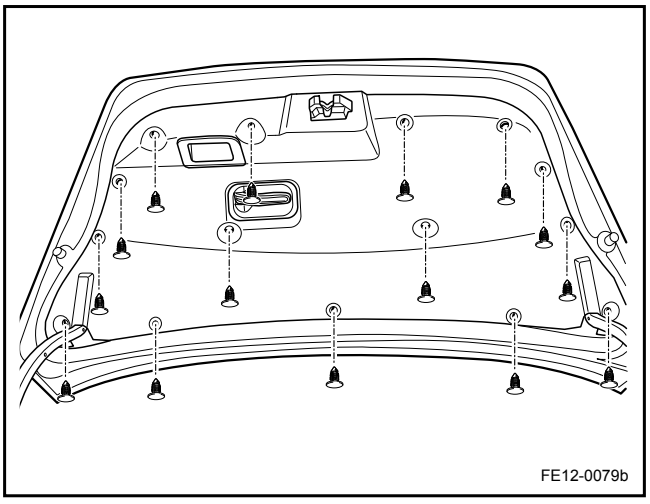
   The replacement of the left and right rear side door trim panels are similar.

12.9.1.14 Rear Compartment Lid Inner Trim Panel Replacement



Removal Procedure:

1. Remove the emergency exit door handle retaining screw and remove the handle.
2. Remove the rear compartment lid inner trim panel retaining clips.
3. Remove the rear compartment lid inner trim panel.

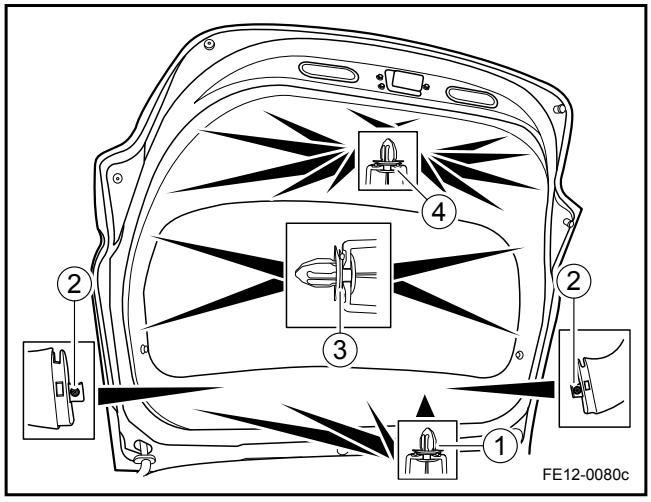


Installation Procedure:

1. Install the rear compartment lid inner trim panel.
2. Install the rear compartment lid inner trim panel retaining clips.
3. Install the emergency exit door handle retaining screw.

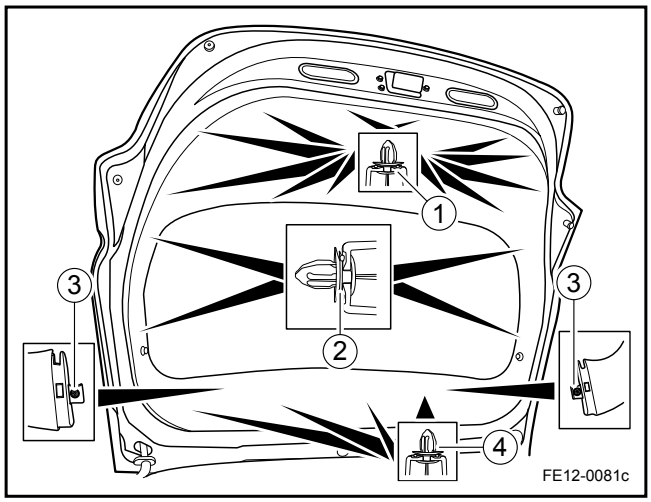
   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)

12.9.1.15 Hatchback Inner Trim Panel Replacement (Hatchback)



Removal Procedure:

1. Detach the retaining clips (1) from the hatchback upper inner trim panel and remove the hatchback upper inner trim panel.
2. Remove the hatchback side inner trim panel retaining screws (2).
3. Detach the retaining clips from the hatchback side inner trim panel and remove the hatchback side inner trim panels (3).
4. Detach the retaining clips (4) from the hatchback lower inner trim panel.



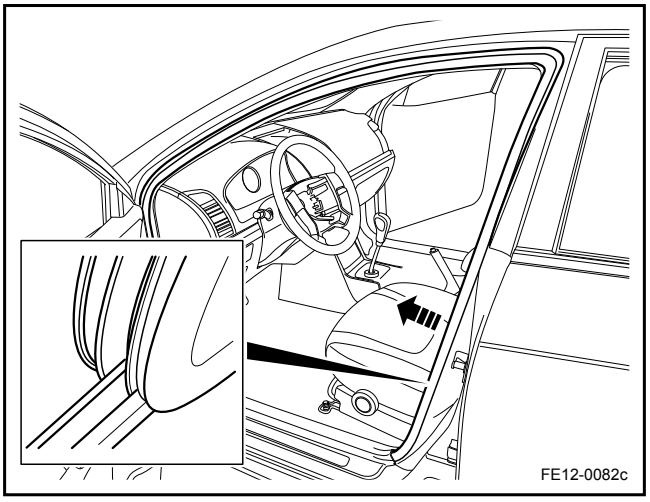
Installation Procedure:

1. Press the hatchback lower inner trim panel to secure the retaining clips (1).
2. Press the hatchback side inner trim panels to secure the retaining clips (2).
3. Install the hatchback side inner trim panel retaining screws (3).

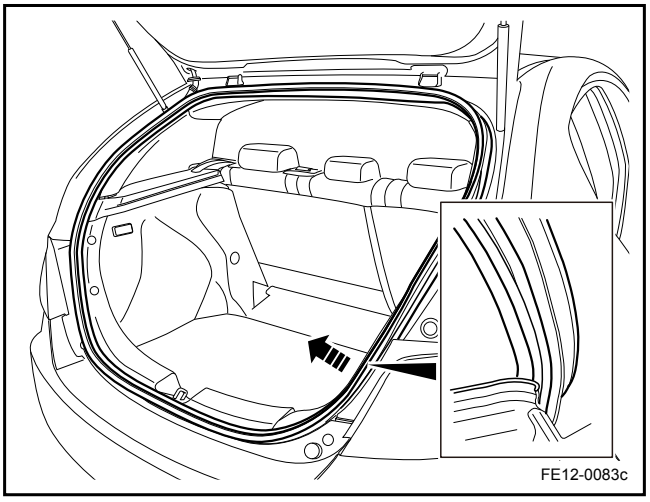
   Torque: 3.5 Nm (Metric) 2.6 lb-ft (US English)
4. Press the hatchback upper inner trim panel to secure the retaining clips (4).

12.9.1.16 Vehicle Inner Side Seal Replacement

Removal Procedure:

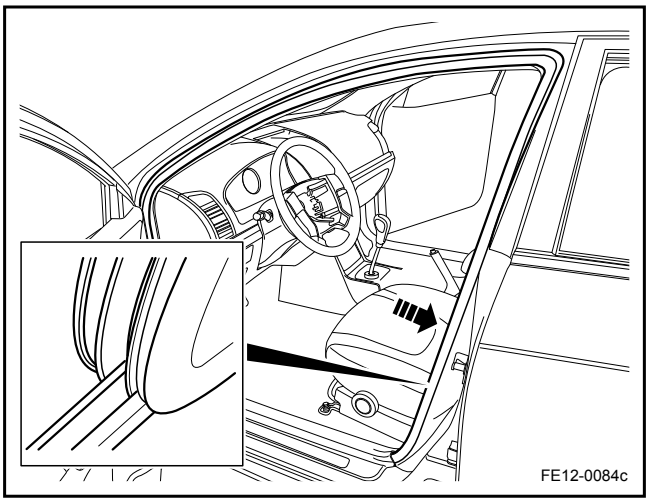


1. Remove the door seals.

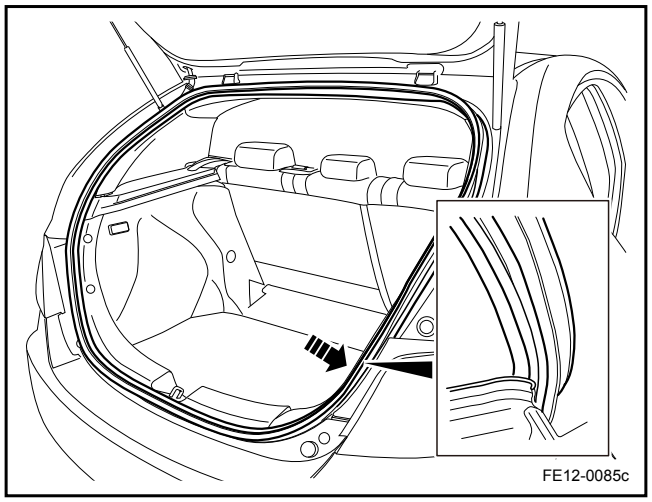


2. Remove the hatchback seal.

Installation Procedure:



1. Install the door seals.



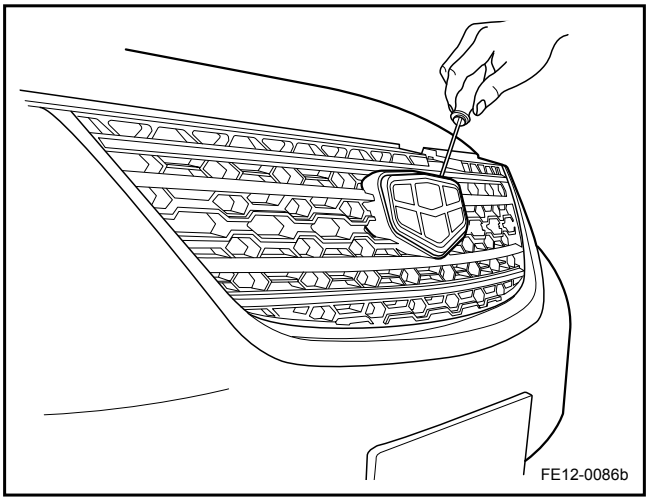
2. Install the hatchback seal.

12.10 Exterior Trim

12.10.1 Removal and Installation

12.10.1.1 Front and Rear Emblem Replacement

Removal Procedure:

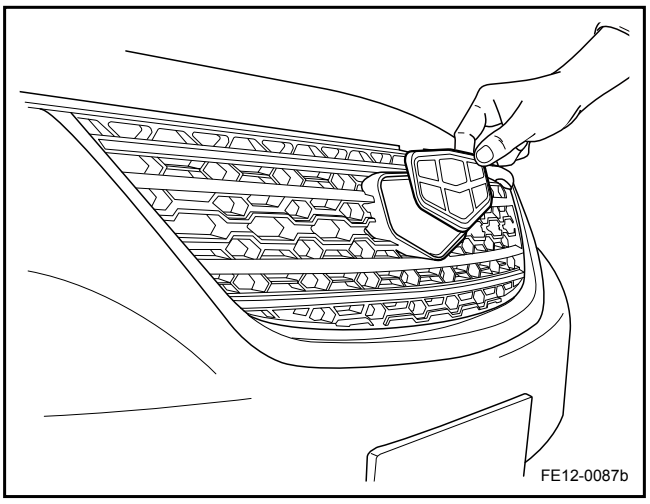


1. Use a flat blade screwdriver to remove the front emblem.

   Note

   Wrap the screwdriver blade with tape to protect components.

Installation Procedure:

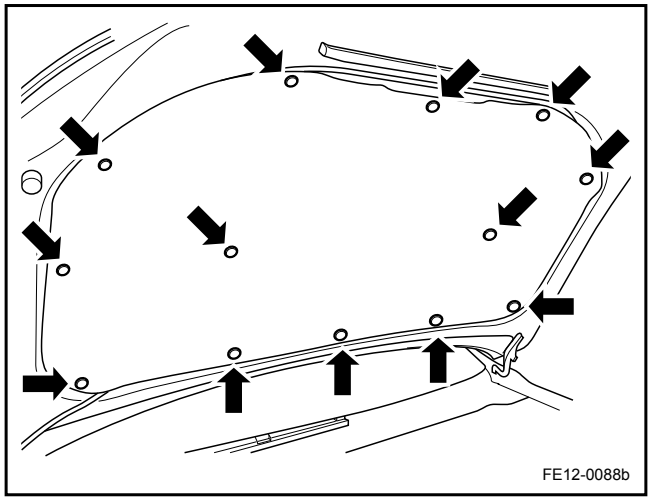


1. Use a suitable cleaning solution to clean the emblem attached surface.
2. Install the front emblem to the specified location.

   Note

   For rear emblem replacement, please refer to the front emblem replacement procedure.

12.10.1.2 Hood Sound Insulation Pad Replacement



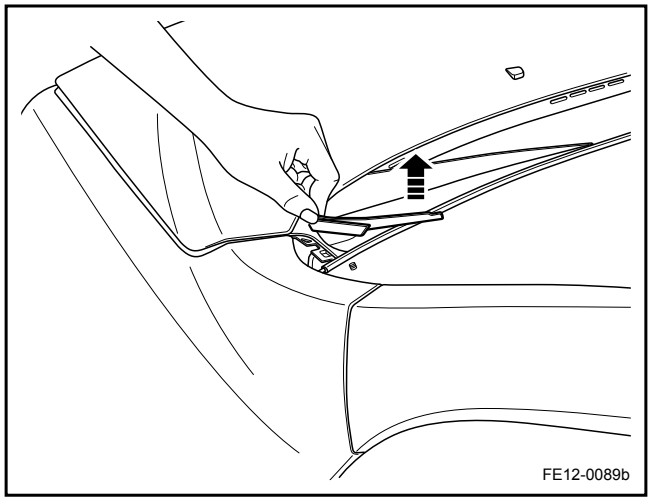
Removal Procedure:

1. Remove the hood inner panel retaining clips and remove the hood sound insulation pad.

Installation Procedure:

1. Install the hood inner panel retaining clips and install the hood sound insulation pad.

12.10.1.3 Air Inlet Grille Panel Replacement

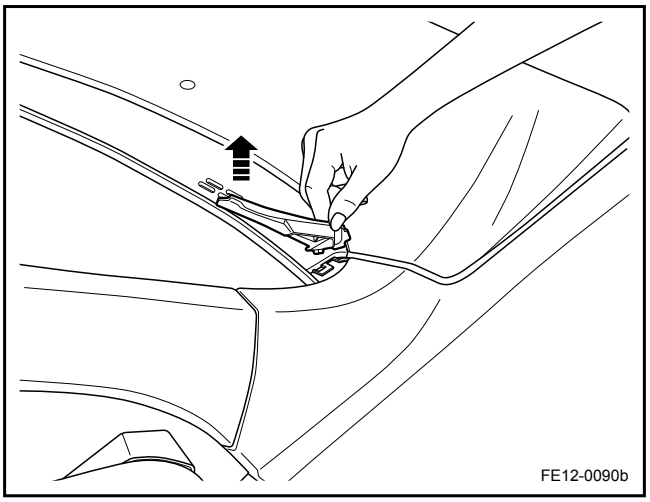


Removal Procedure:

1. Remove the front wipers. Refer to 11.6.8.2 Wiper Arm Replacement.
2. Remove the air inlet grille panel left side ornament panel.

   Note

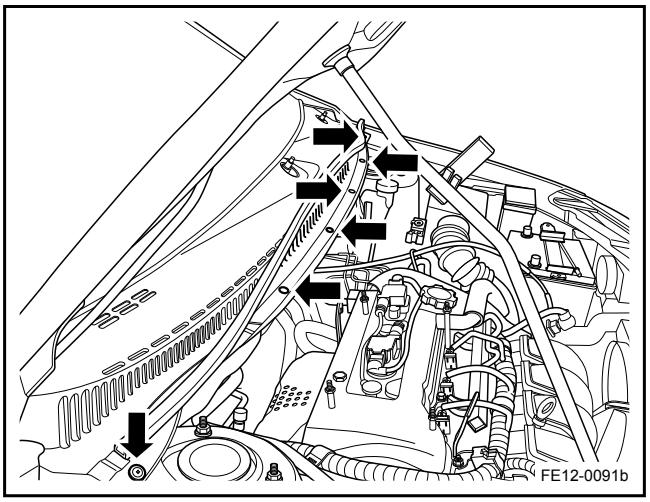
   The air inlet grille panel left side ornament panel back has a double-sided stick tape.



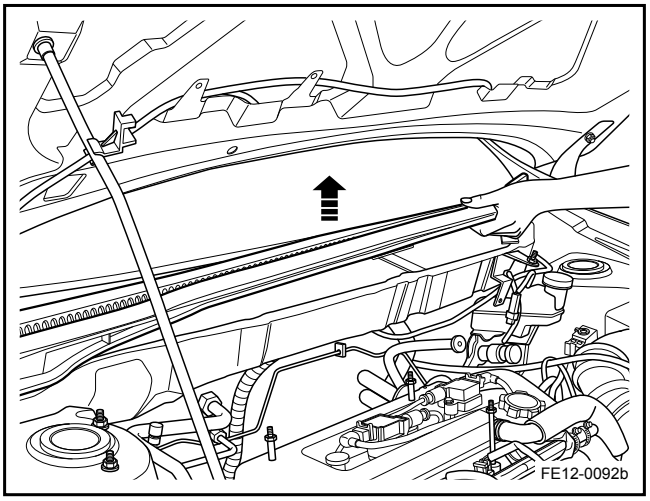
3. Remove the air inlet grille panel right side ornament panel.

Note

The air inlet grille panel right side ornament panel back has a double-sided stick tape.

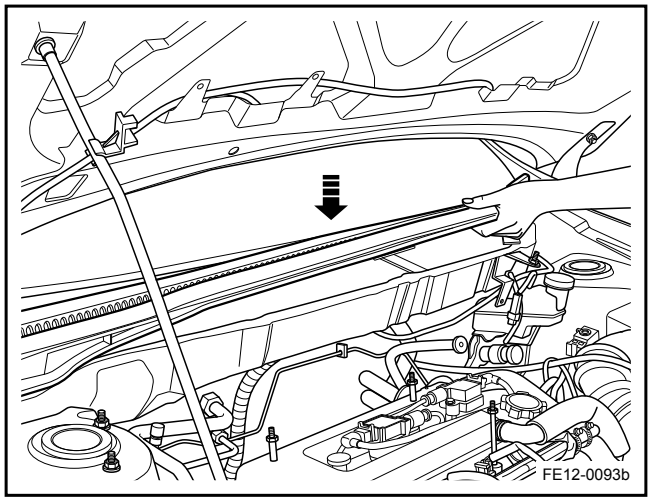


4. Remove the air inlet grille panel retaining clips.

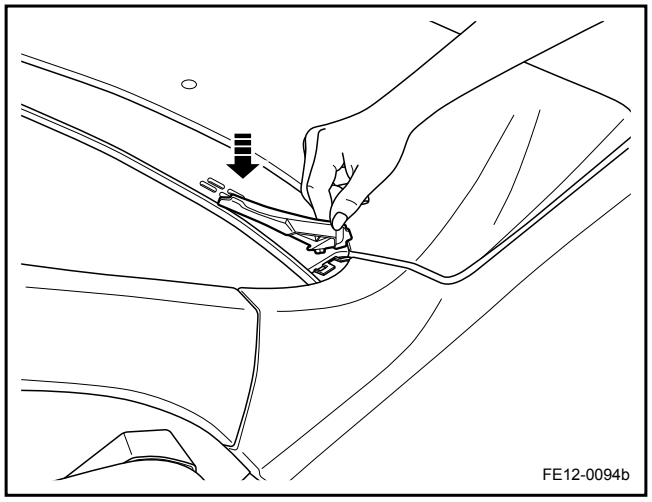


5. Remove the hood seal and the retaining clip.
6. Remove the air inlet grille panel.

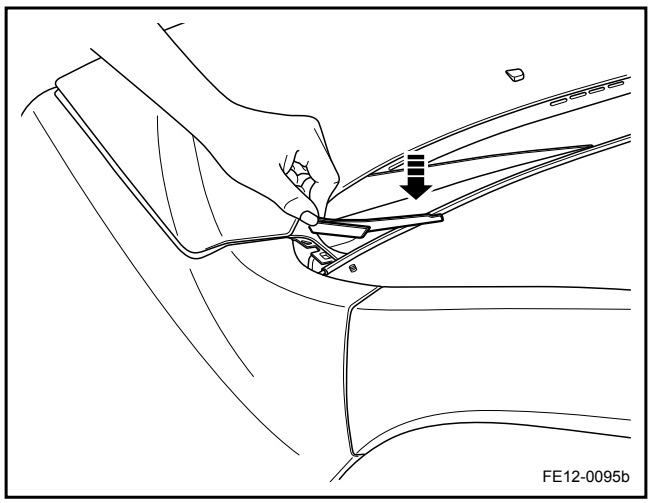
Installation Procedure:



1. Install the air inlet grille panel.
2. Install the air inlet grille panel retaining clips.
3. Install the hood seal and the retaining clip.



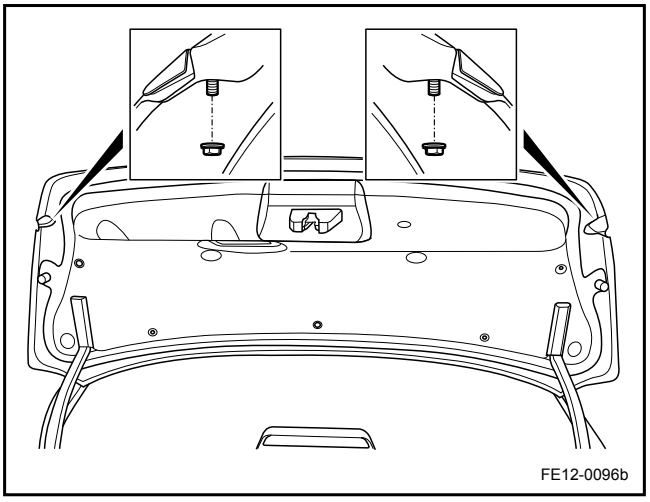
4. Install the air inlet grille panel right side ornament panel.



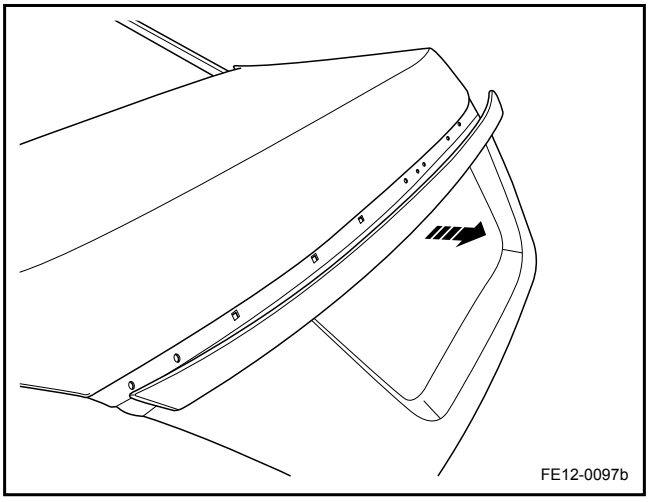
5. Install the air inlet grille panel left side ornament panel.
6. Install the front wipers.

12.10.1.4 Rear Compartment Lid Applique Replacement

Removal Procedure:

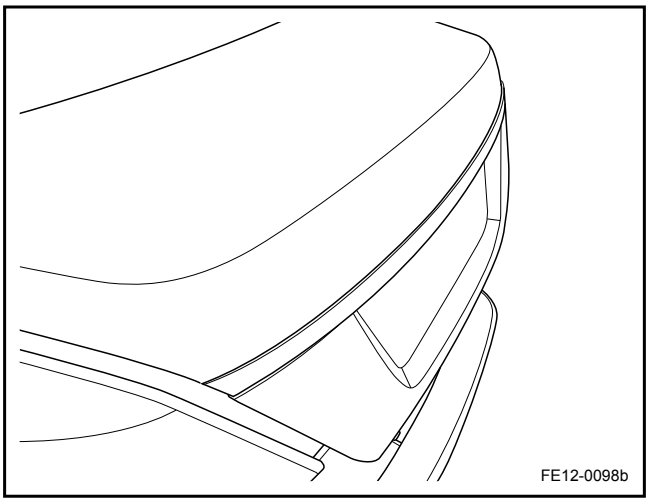

FE12-0096b

1. Open the rear compartment lid and remove the rear compartment lid applique retaining nuts.


FE12-0097b

2. Remove the rear compartment lid.

Installation Procedure:


FE12-0098b

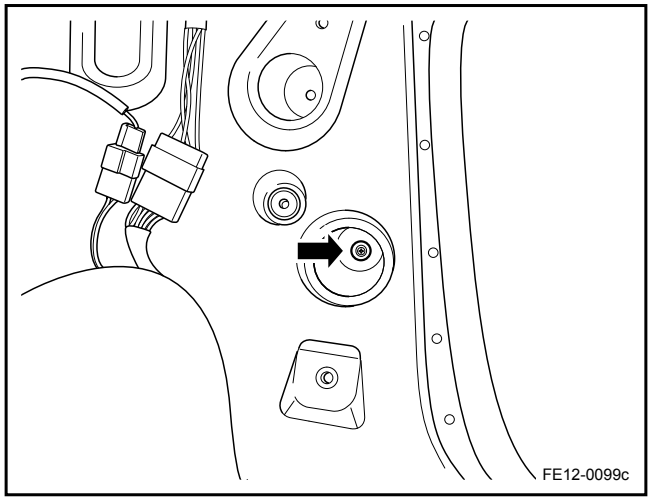
1. Install the rear compartment lid applique retaining nuts.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

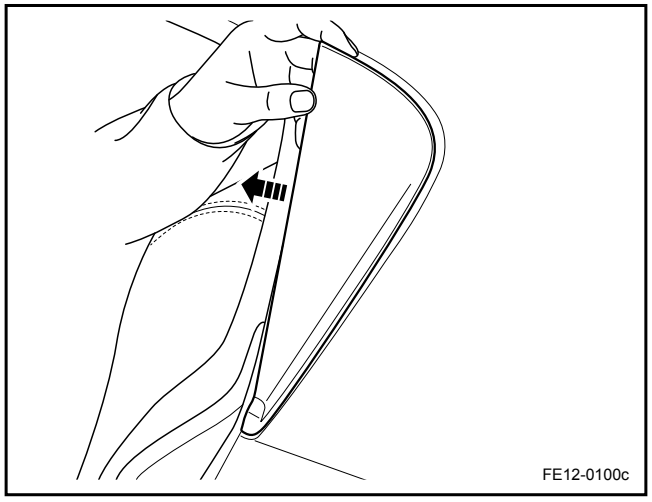
2. Close the rear compartment lid.

12.10.1.5 Hatchback Outside ornament Panel replacement (Hatchback)

Removal Procedure:



1. Remove the rear quarter upper trim panels. Refer to 12.9.1.10 Rear Compartment Trim Panel Replacement (Hatchback).
2. Remove the hatchback outside ornament panel retaining screw.

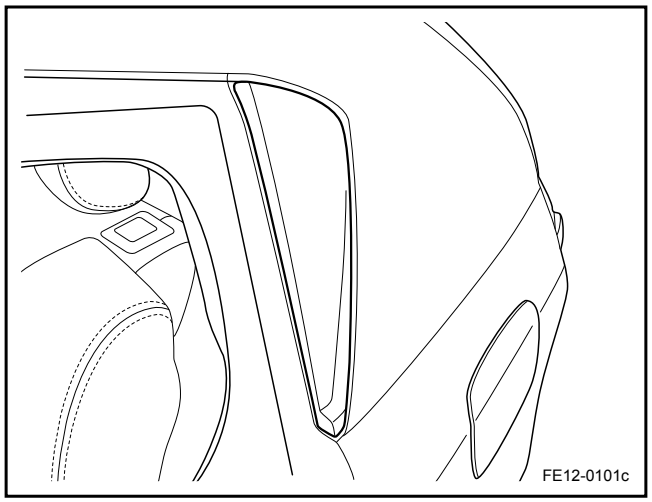


3. Remove the hatchback outside ornament panel.

   Note

   The hatchback outside ornament panel back has a double-sided stick tape.

Installation Procedure:

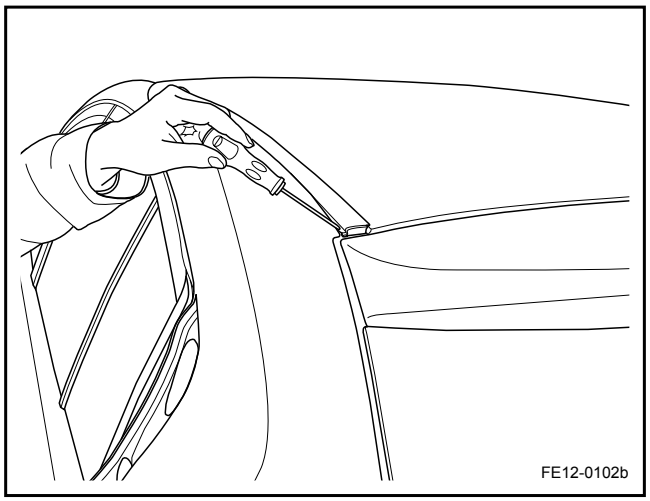


1. Install and tighten the hatchback outside ornament panel retaining screw.

   Torque: 2 Nm (Metric) 1.5 lb-ft (US English)
2. Install the rear quarter upper trim panels.

12.10.1.6 Roof Ornament Panel Replacement

Removal Procedure:

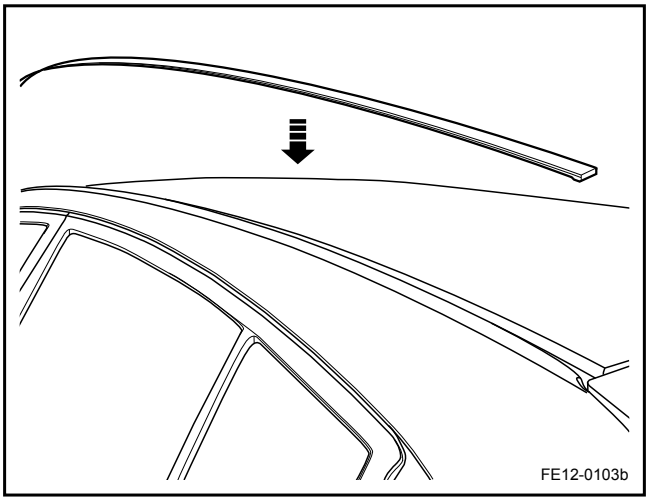


1. Use a flat blade screwdriver to remove the roof ornament panel.

   Note

   Wrap the screwdriver blade with a tape to protect components.

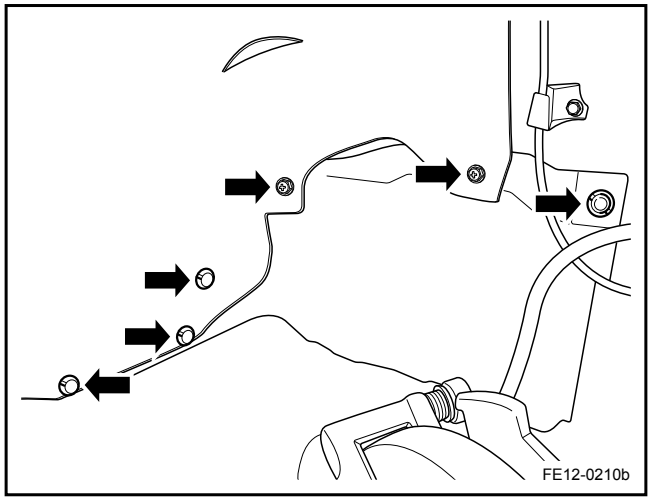
Installation Procedure:



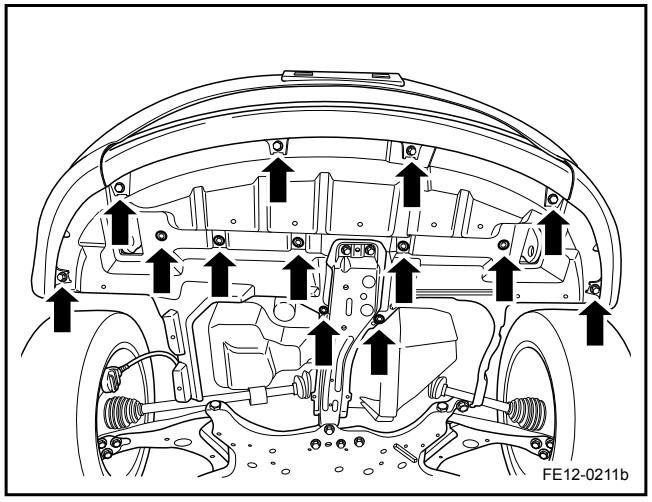
1. Install the roof ornament panel to the roof weld joint.

12.10.1.7 Left and Right Engine Bottom Shield Replacement

Removal Procedure:

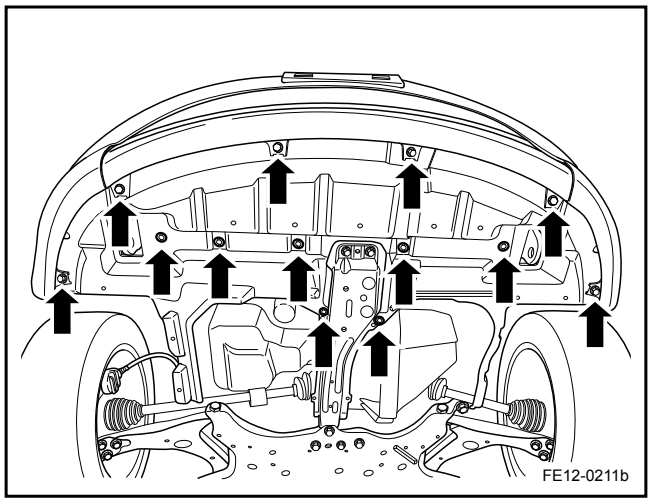


1. Lift and support the vehicle.
2. Remove the left and right engine bottom shield retaining screws and clips on both sides.

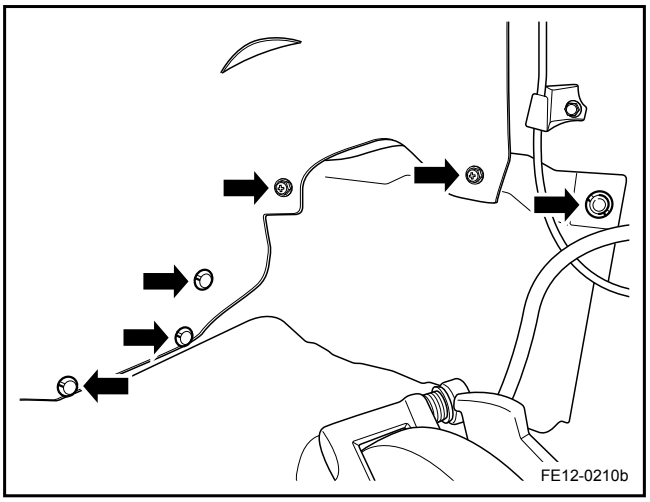


3. Remove all the engine bottom shield retaining screws and clips except one retaining clip to stabilize the engine bottom shield.
4. Use a hand to support the engine bottom shield and remove the last retaining clip.

Installation Procedure:



1. Install the right engine bottom shield and the retaining clips.
2. Install the left engine bottom shield and the retaining clips.



3. Install the right engine bottom shield retaining screws.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

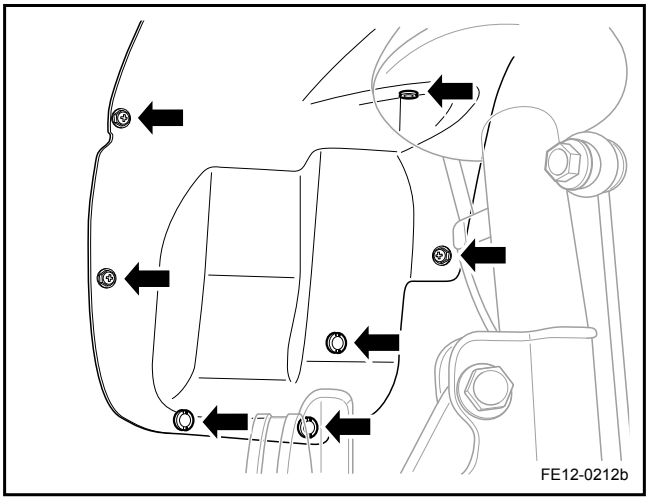
4. Install the left engine bottom shield retaining screws.

   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)

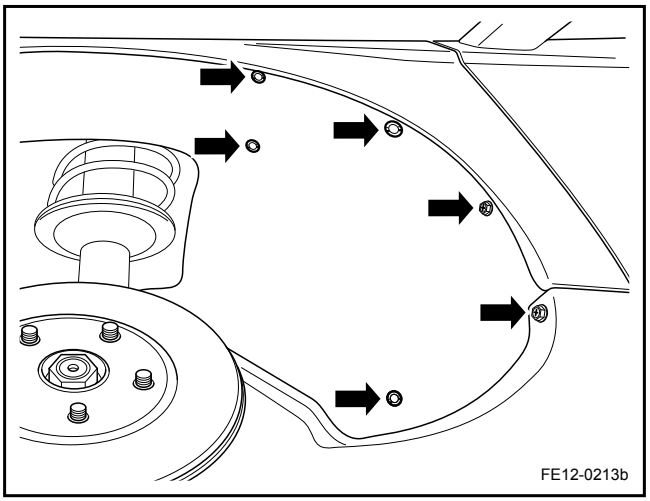
5. Lower the vehicle.

12.10.1.8 Front Wheelhouse Liner Replacement

Removal Procedure:



1. Remove the front wheel. Refer to 4.4.5.1 Wheel Replacement.
2. Remove the front wheelhouse liner front retaining screws and clips.



3. Remove the front wheelhouse liner rear retaining screws and clips and remove the front wheelhouse.

Installation Procedure:

1. Install the front wheelhouse liner front retaining screws and clips.
2. Install the front wheelhouse liner rear retaining screws and clips.
3. Tighten the retaining screws.

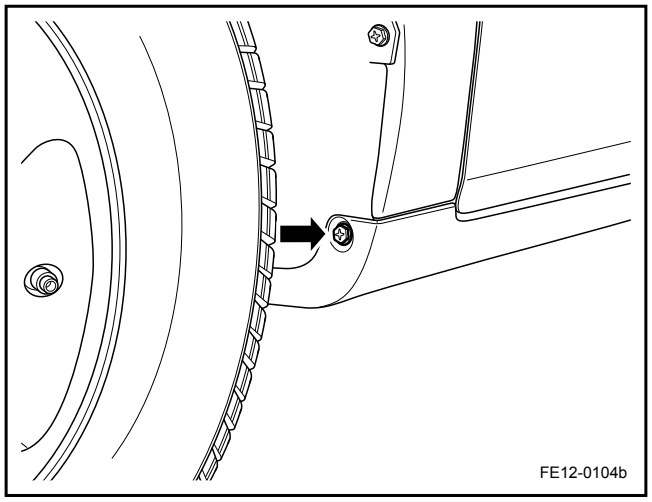
   Torque: 10 Nm (Metric) 7.4 lb-ft (US English)
4. Install the front wheels.

   Note

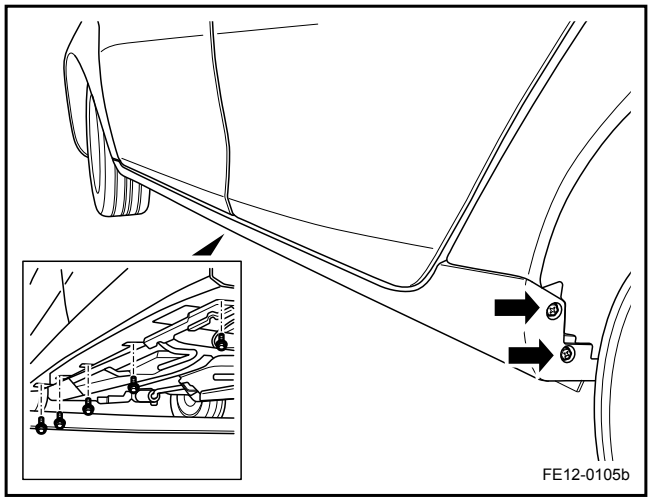
   For rear wheelhouse liner replacement, please refer to the front wheelhouse liner replacement.

12.10.1.9 Rocker Panel Molding Replacement

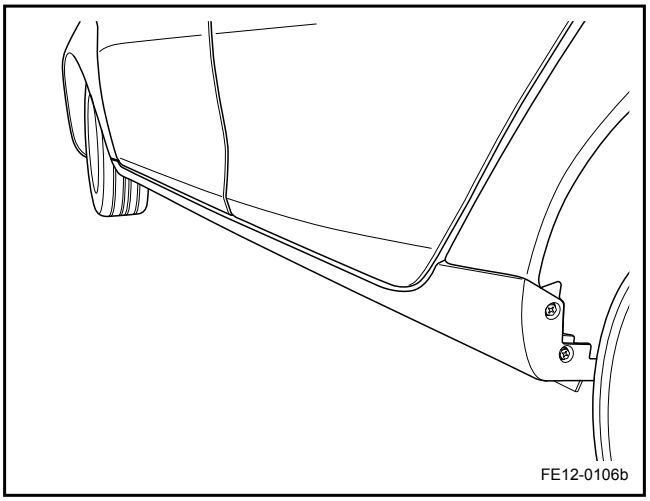
Removal Procedure:



1. lift and support the vehicle.
2. Remove the rocker panel molding front retaining screw.



3. Remove the rocker panel molding middle and rear retaining screws.
4. Detach the rocker panel molding bottom retaining clips and remove the rocker panel molding.



Installation Procedure:

1. Press the rocker panel molding to secure the bottom retaining clips.
2. Tighten the rocker panel molding retaining screws.

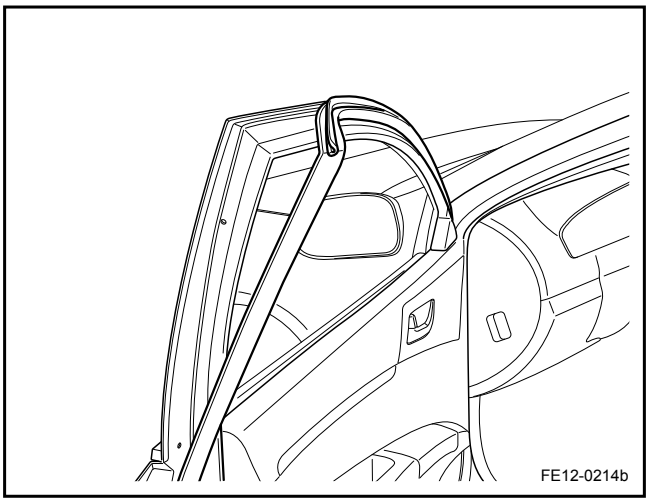
   Torque: 12 Nm (Metric) 8.8 lb-ft (US English)

   Note

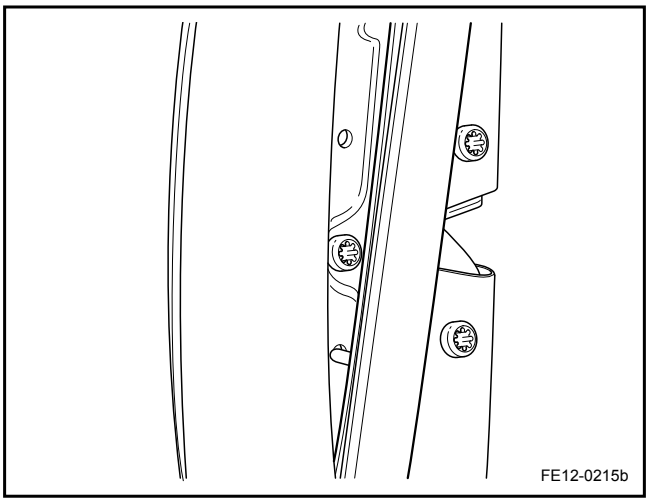
   Two technicians are needed for the rocker panel molding replacement.

12.10.1.10 Vehicle Inner Side Seal Replacement

Removal Procedure:

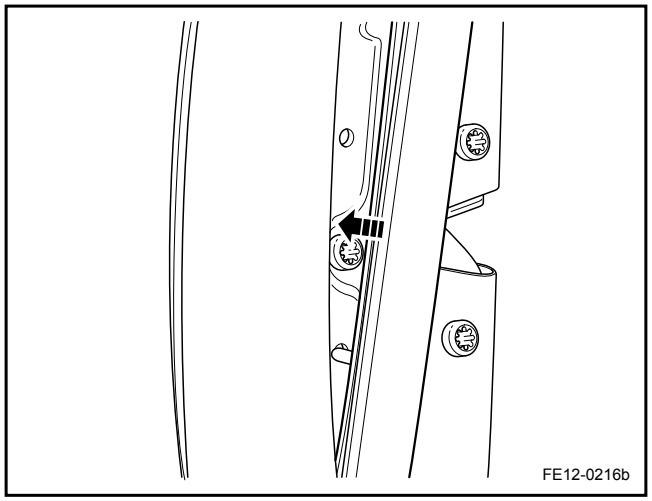


1. Remove the door seals.

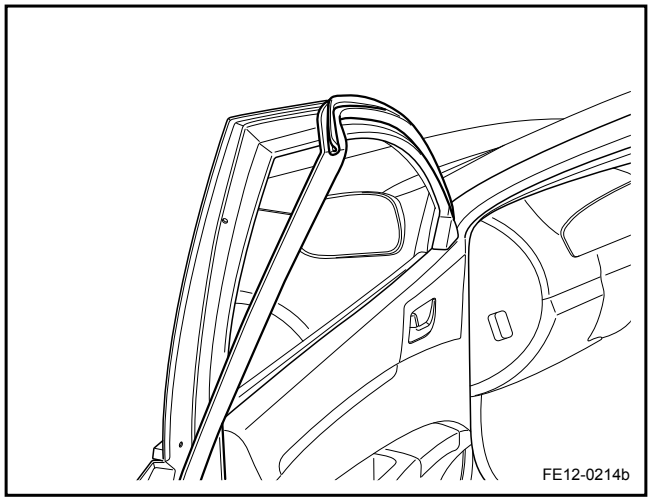


2. Remove the door seal strips side and rear retaining clips and remove the door seal strips.

Installation Procedure:



1. Install the door seal strips side and rear retaining clips.



2. Install the door seals to door seal strip slots.

12.11 Plastic Panel Information and Repair

12.11.1 Description and Operation

12.11.1.1 Description and Operation

The current interior and exterior cover part materials are mainly modified PP, ABS, PC + ABS, PVC (artificial leather material), all of which are thermoplastic materials or modified thermoplastic materials. Some interior and exterior non-cover part materials are POM, PA type and HDPE type materials. Thermosetting plastics are rarely used in interior and exterior parts. Only the ashtray is made from thermosetting plastics. Thermosetting plastics are mainly used in electrical and electronic structural components. ideally the thermoplastic components are repaired with a hot iron welding, but usually the thermoplastic components are replaced. Thermosetting plastics can be repaired with epoxy resin, or other more rigid two-component repair materials. This chapter is only a brief introduction to its repair practices and repair is not recommended.

Plastic Types:

Thermosetting plastic is defined as a type of plastic that can be cured or have insoluble (melt) properties when heated, such as phenolic, epoxy plastics. Thermoplastic is defined as a type of plastic that can be repeatedly hardened after heated and soften after cooled within a specific temperature, such as polyethylene, PTFE and etc. Thermoplastics and thermosetting plastics can be either hard plastics or soft plastics.

12.11.2 Removal and Installation

12.11.2.1 Plastic Repair Notices

1. Apply protective cream to any exposed skin to avoid skin irritation.
2. Wear rubber gloves.
3. When use compressed air or sanding, wear protective goggles.
4. Remove any mixture that comes into contact with skin immediately, as the mixture will become solid very quickly.
5. When grinding or sanding, wear a dust mask and protective goggles.
6. Wash the skin with cold water to minimize irritation caused by resin dust.
7. Avoid dropping repair materials onto clothes.
8. Use repair materials in a well ventilated environment, as the dust produced during repairs is toxic.
9. After use, close all the repair material containers. Dust or moisture will contaminate the repair materials and weaken the repair quality.

12.11.2.2 Thermosetting Plastic Dent Repair

1. Clean the area to be repaired.
2. Heat the dent part with a blower until the appropriate tools can be used to press flat the dent.
3. Grind the dent area with sandpaper/emery paper.
4. Clean the dent area with cleaning agent and leave it dry 5 min.
5. Apply a thin layer of adhesive and leave it dry 10 min.
6. Fill the uneven surface with adhesive and smooth out with putty knife.
7. Use an infrared light to accelerate the curing process and raise the temperature to 60-70°C (140-158 ºF), heat 15 min.
8. Polish the dent area with sanding paper.
9. Remove dust debris.
10. Apply a thin layer of adhesive and leave it dry 10 min.
11. Restore the plastic surface according to the plastic surface repair process.

12.11.2.3 Thermosetting Plastic Scratch Repair

1. Clean the area to be repaired.

2. Use sanding paper to remove protruding material.
3. Clean the area with cleaning agent and leave it dry 5 min.
4. Apply a thin layer of adhesive and leave it dry 10 min.
5. Fill the uneven surface with adhesive and smooth out with putty knife.
6. Use an infrared light to accelerate the curing process and raise the temperature to 60-70°C (140-158 ºF), heat 15 min.
7. Polish the dent area with sanding paper.
8. Remove dust debris.
9. Apply a thin layer of adhesive and leave it dry 10 min.
10. Restore the plastic surface according to the plastic surface repair process.

12.11.2.4 Thermosetting Plastic Crack Repair (length less than 100 mm)

1. Clean the area to be repaired.
2. Pry open the crack tip 5 mm (0.19 in) long, and polish it into a V-shape crack to eliminate stress and protruding materials.
3. Clean the area with cleaning agent and leave it dry 5 min.
4. Apply a thin layer of adhesive and leave it dry 10 min.
5. Apply the adhesive to the back of the repair part,overlapping the damaged part at least 20 mm (0.79 in).
6. Use an infrared light to accelerate the curing process and raise the temperature to 60-70°C (140-158 ºF), heat 15 min.
7. Fill the crack area with adhesive and smooth out with putty knife.
8. Use an infrared light to accelerate the crack tip curing process.
9. Polish the dent area with sanding paper.
10. Apply a thin layer of adhesive and leave it dry 10 min.
11. Remove dust debris.
12. Apply a thin layer of adhesive and leave it dry 10 min.
13. Restore the plastic surface according to the plastic surface repair process.

12.12 Collision Repair

12.12.1 Specifications

12.12.1.1 Collision Repair Materials

Vehicle body collisions will lead to structural deformation, metal penal cracking and solder joints seal off. Collisions will also cause damage to the engine, chassis and other components.

To carry out body collision repair, materials such as adhesives, sealants, anti-loose agent, surface protection materials, anti-corrosion materials and other chemical materials may be used. Please strictly follow the product instructions, scope of use and the standard operation instructions. During the body repair process, choose repair materials that suit the application. The following table lists the repair materials that maybe used in the body repairs for reference.

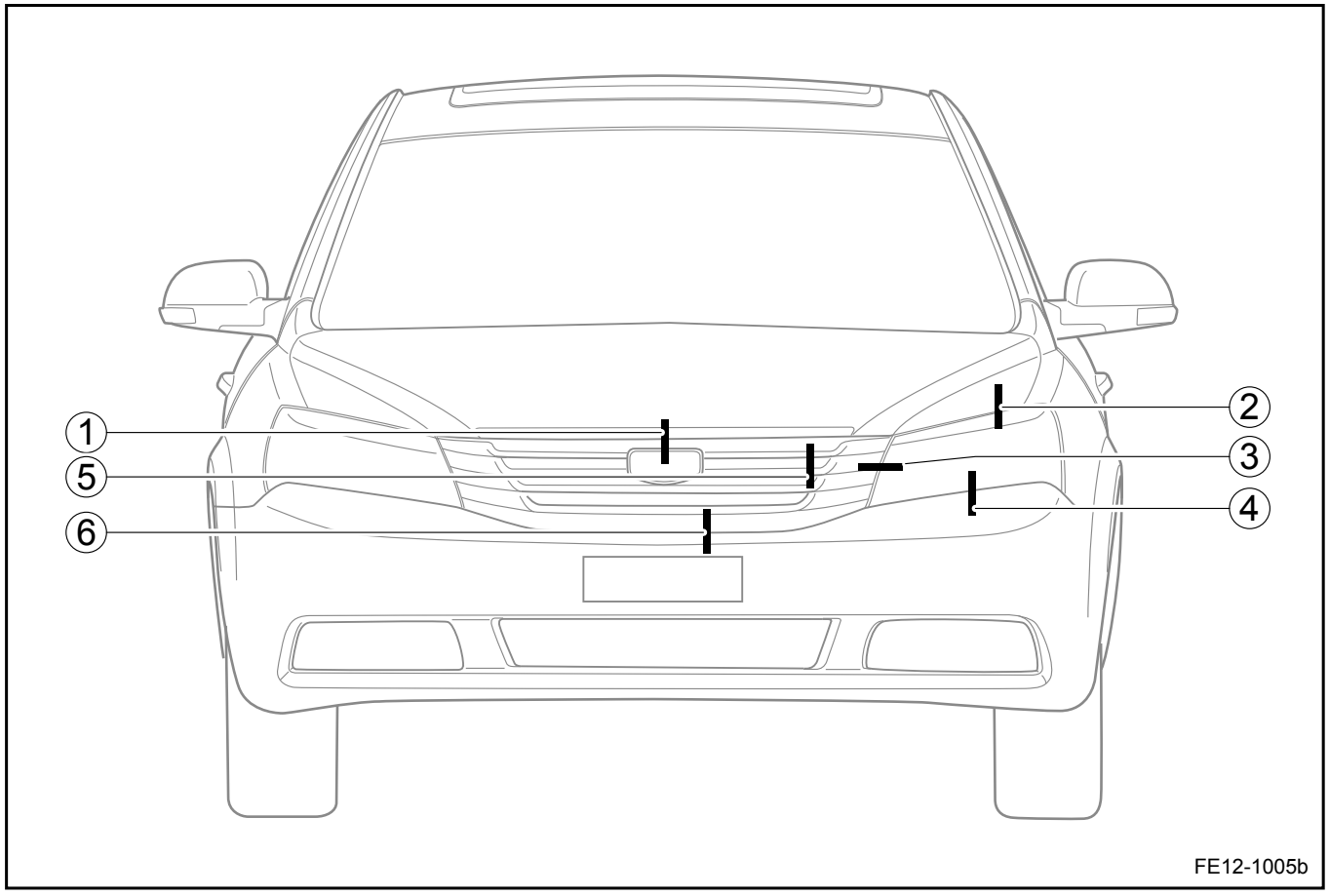
Products	Type	Application	Recommended Model
Body Sealant	Single Unit Polyurethane	Body skin, interior and exterior trim panels, body structure and other components bonding. This seal has a strong cohesive force. It also has good adhesion with metal and a variety of lacquer and so on have a good adhesion.	Tianshan Kesaisi New: 1922,1923
Seam Sealant	Single Unit Polyurethane Based	1. Room temperature curing adhesive used for sealing the body welds. 2. Room temperature curing adhesive used for doors, hood and trunk (hatchback) hem.	China's Auto Parts and Accessory Corp: C8802
Anti-Collision Primer	Rubber and Resin	Cured at room temperature, form a layer of anti-collision coating under the vehicle body. Around the wheelhouse form a layer of permanently elastic anti-aging, anti-corrosion protection coating, crack free at low temperature. These products can replace PVC coating with excellent anti-rust, noise, anti-stoning, anti-oxidation, protective coating and other functions.	China's Auto Parts and Accessory Corp: C312DW
Windshield Sealant	Single Unit Polyurethane	Room temperature curing polyurethane adhesives for the automotive window direct bonding, sealing. The adhesive has excellent adhesion properties, and it reacts with moisture in the air to become solid and has high strength, anti-aging, anti-vibration fatigue, low temperature resistant and non-corrosive characteristics.	China's Auto Parts and Accessory Corp: C8802 Tianshan Kesaisi New: 1956,1924
Primer	-	The primer is applied before applying glue on the windshield and the body and, so that the windshield glass and the body are firmly bonded.	-
Cleaner	-	Clean all floor coatings and surfaces contacting adhesives.	-
Pressure Sensitive Tape	Acrylic Acid Tape	Used as the anti-scratch panels, nameplates, shield, fenders, door protection, a variety of decorative body adhesive strips. This tape has excellent weathering resistance and durability.	3M 4229P, 4215,4221 L

Heat-Sensitive Adhesive Tape	Acrylic Acid Tape	Mainly used in automotive rubber seal system. This material has a strong binding force and strong sealing performance, to avoid the bonding clearance changes and corrosions.	3M 4237P
Tape Glue	-	According to different bonding surfaces, choose different glue. Bonded surfaces should be clean, dry thoroughly. Brush the glue to the mating surface evenly. When the glue is dry, it has a strong adhesion.	3M C-100, K-500/520, N-200

12.12.1.2 Body Surface Clearance and Tolerance (Sedan)

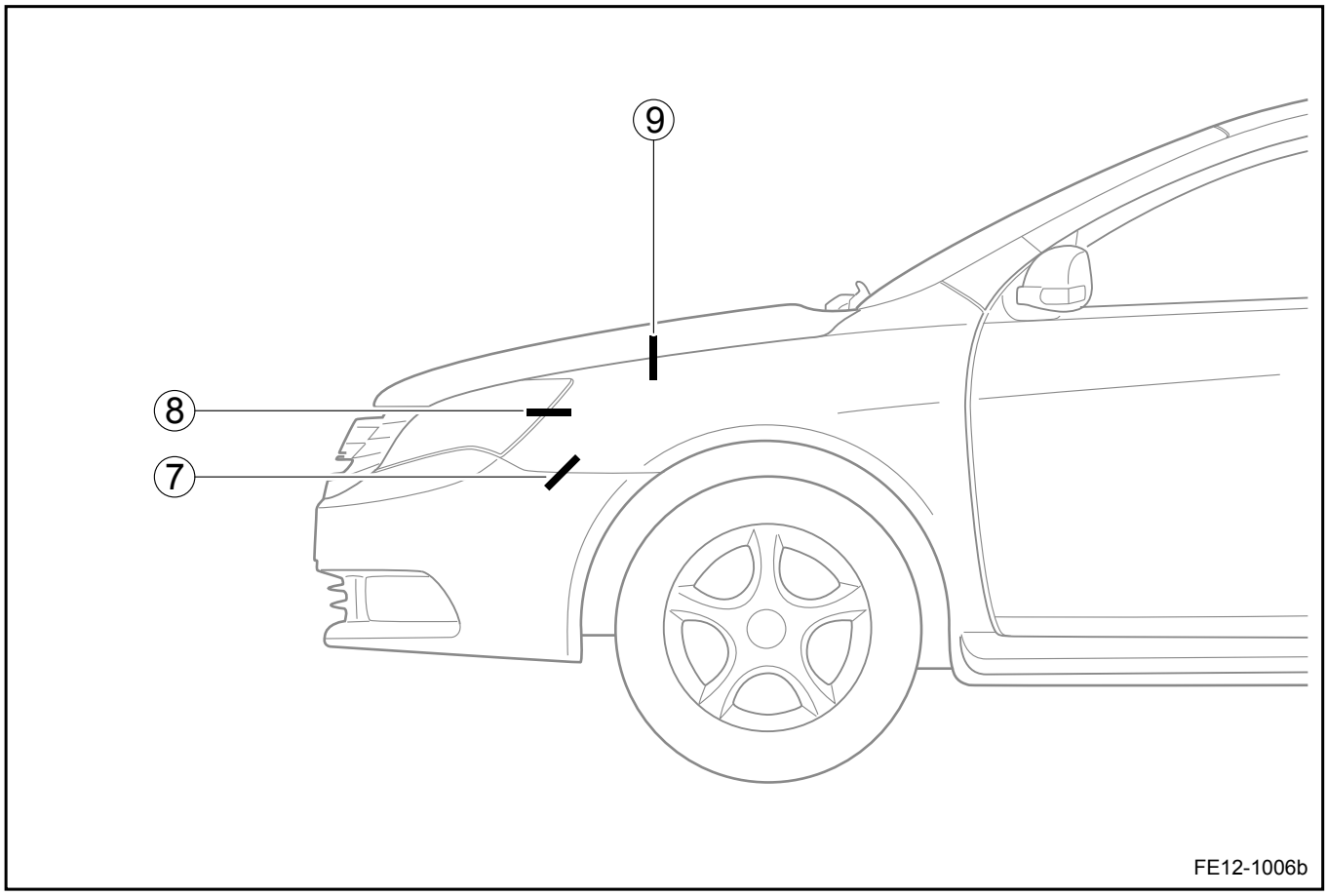
- To adjust or check the clearance, you should use a plastic clearance adjustment ruler.
- Clearance is always measured with the mm/inch unit.

Engine Assembly and Surrounding Surfaces Clearance and Tolerance



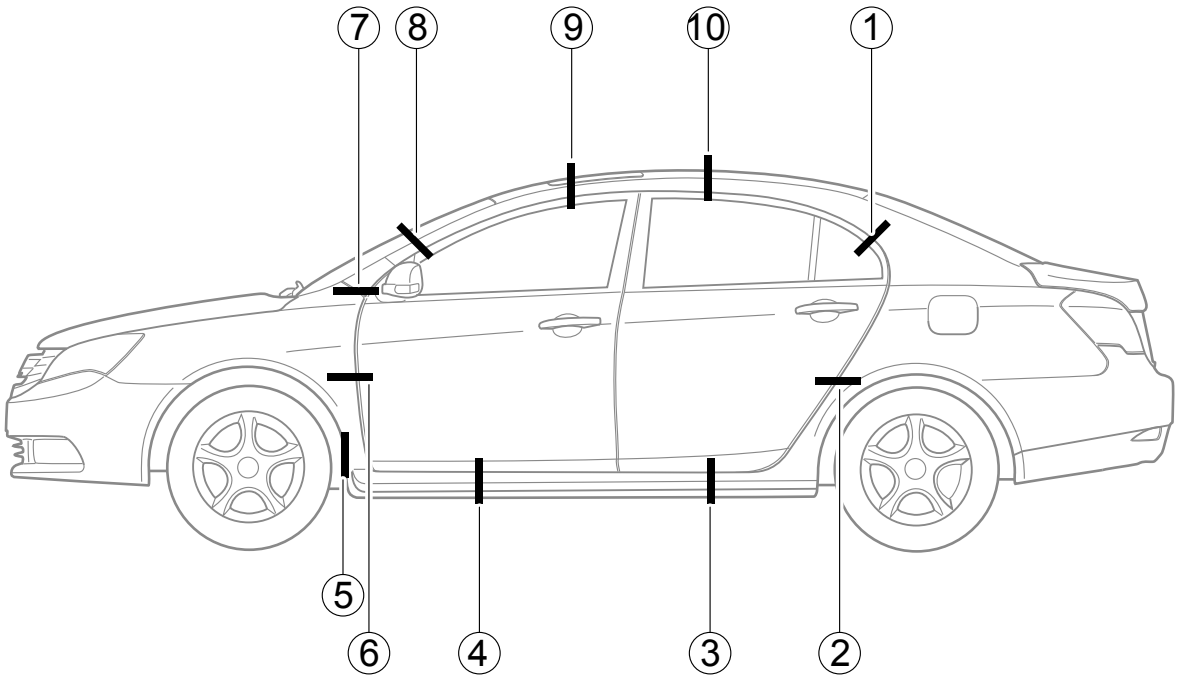
Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance	Tolerance
1	Hood Outer Panel	Hood Ornament	-0.25 ± 0.25/-0.01 ± 0.01	-0.25 ± 0.25/-0.01 ± 0.01
2	Hood Outer Panel	Headlamp	5.0 ± 1.0/0.2 ± 0.04	-1.5 ± 1.0/-0.06 ± 0.04

3	Radiator Grille	Headlamp	3.0 ± 1.5/0.12 ± 0.06	-2.0 ± 2.0/-0.08 ± 0.08
4	Headlamp	Front Bumper	2.5 ± 1.8/0.1 ± 0.07	-1.0 ± 1.0/-0.04 ± 0.04
5	Hood Ornament	Radiator Grille	5.0 ± 1.0/0.2 ± 0.04	-1.5 ± 1.5/-0.06 ± 0.06
6	Front Bumper	Radiator Grille	1.0 ± 1.0/0.04 ± 0.04	-1.0 ± 1.0/-0.04 ± 0.04



Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance	Tolerance
7	Front Fender	Front Bumper	0.5 ± 0.5/0.02 ± 0.02	0 ± 1.5 / 0 ± 0.06
8	Front Fender	Headlamp	1.5 ± 1.0/0.06 ± 0.04	0 ± 0.7 / 0 ± 0.03
9	Front Fender	Hood	3.5 ± 1.0/0.14 ± 0.04	0.75 ± 0.75/0.03 ± 0.03

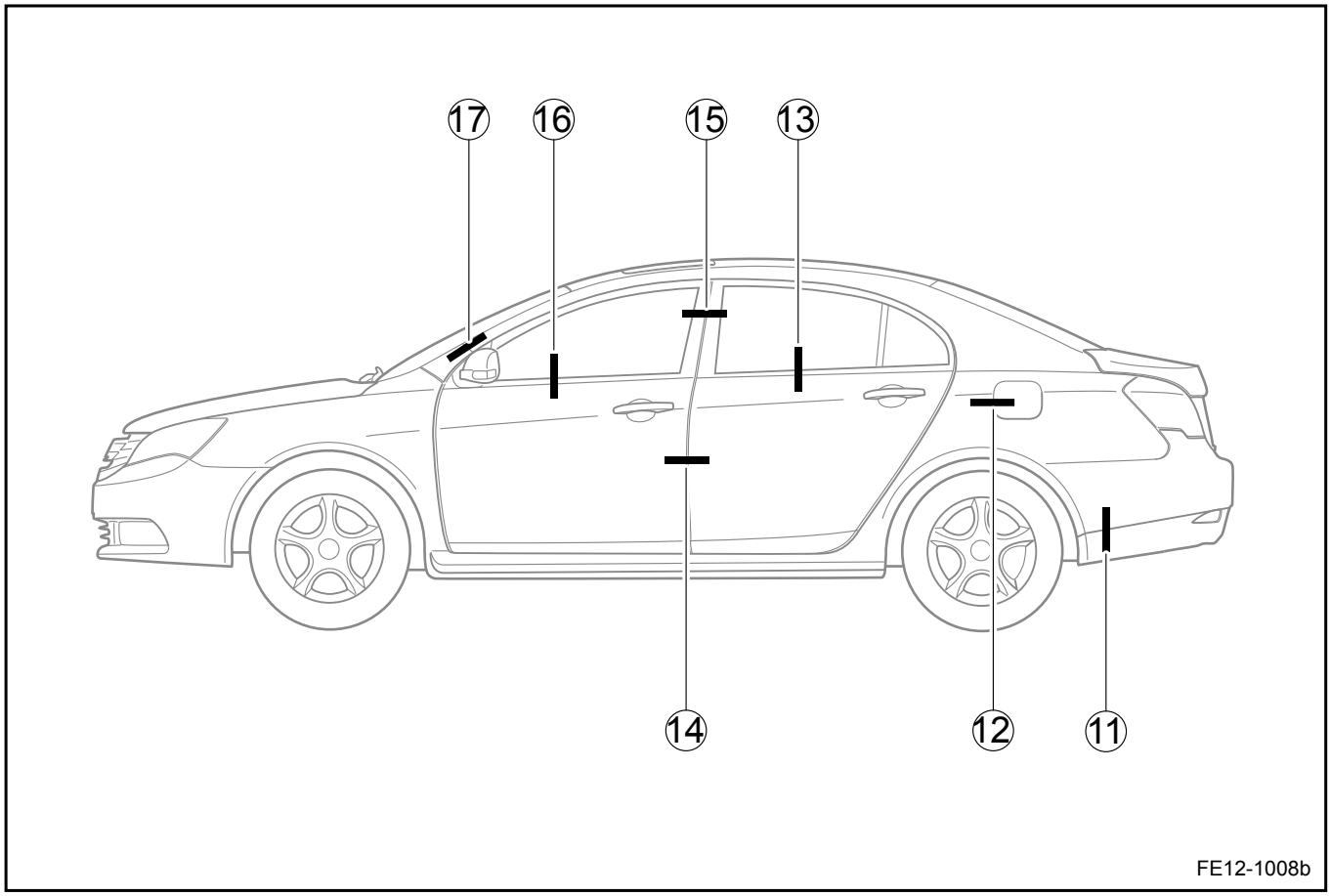
Front and Rear Doors and Surrounding Surfaces Clearance and Tolerance



FE12-1007b

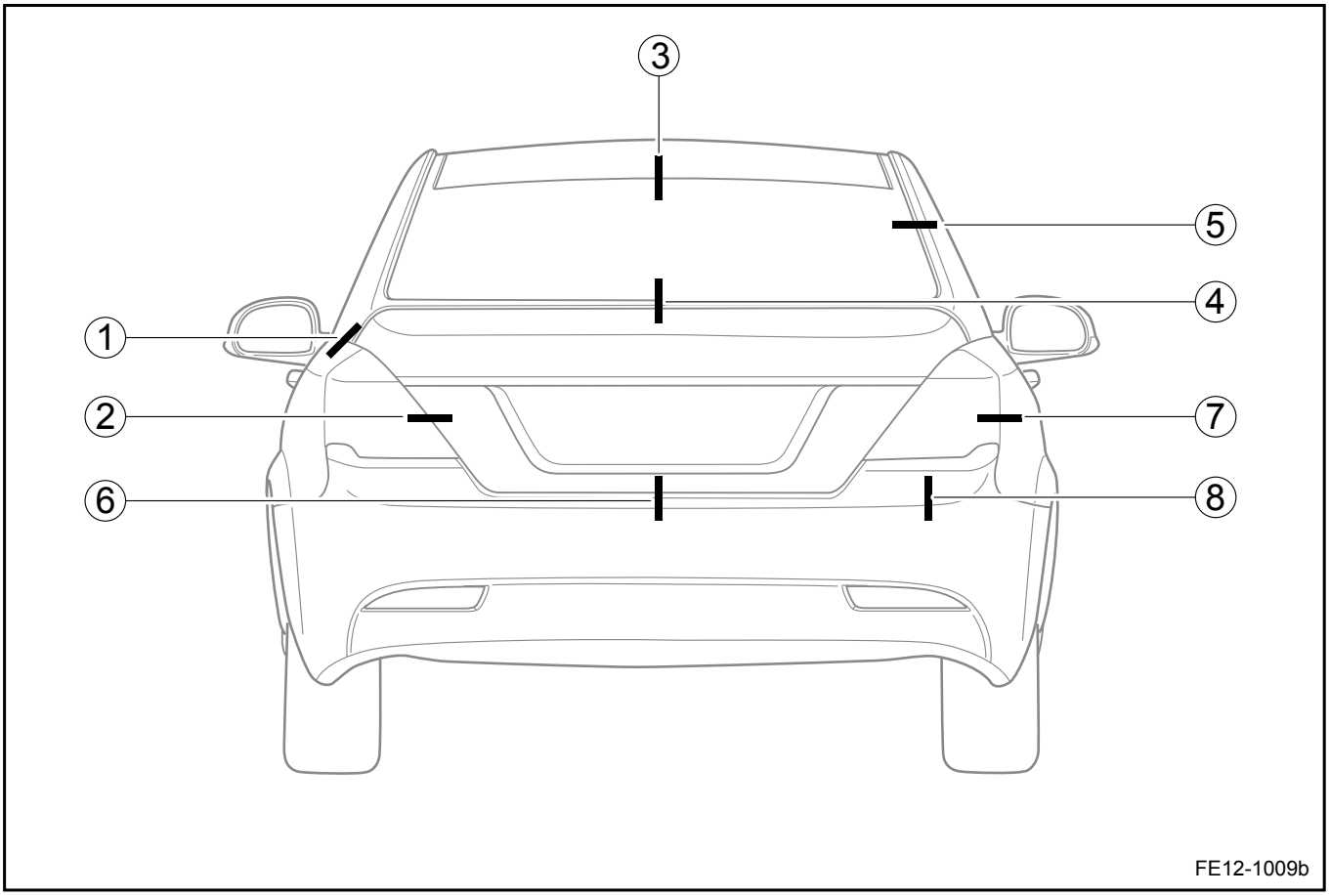
Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance	Tolerance
1	Rear Door Frame Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	3.0 ± 1.0/0.12 ± 0.04
2	Rear Door Outer Panel	Side Outer Panel	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
3	Rear Door Outer Panel	Rocker Panel Molding	5.0 ± 1.5/0.2 ± 0.06	3.5 ± 1.5/0.14 ± 0.06
4	Front Door Outer Panel	Rocker Panel Molding	5.0 ± 1.5/0.2 ± 0.06	3.5 ± 1.5/0.14 ± 0.06
5	Front Fender	Side Outer Panel	0.75 ± 0.75/0.03 ± 0.03	-0.5 ± 1.0/0.02 ± 0.04
6	Front Door Outer Panel	Front Fender	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
7	Front Fender	Outside Rearview Mirror Mounting Panel	5.0 ± 1.0/0.2 ± 0.04	0 ± 1.5 / 0 ± 0.06
8	Front Door Frame Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	3.0 ± 1.0/0.12 ± 0.04

9	Front Door Frame Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	3.0 ± 1.0/0.12 ± 0.04
10	Rear Door Frame Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	3.0 ± 1.0/0.12 ± 0.04



Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance	Tolerance
11	Side Outer Panel	Rear Bumper	0.5 ± 0.5/0.02 ± 0.02	0 ± 1.5 / 0 ± 0.06
12	Side Outer Panel	Fuel Filler Lid Outer Panel	3.5 ± 1.0/0.14 ± 0.04	-0.25 ± 1.25/-0.01 ± 0.05
13	Rear Door Outer Panel	Rear Window Seal Strip	-0.25 ± 0.25/-0.01 ± 0.01	-
14	Front Door Outer Panel	Rear Door Outer Panel	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
15	Front Door Frame	Front Door Frame	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
16	Front Door Outer Panel	Front Window Seal Strip	-0.25 ± 0.25/-0.01 ± 0.01	-
17	Front Door Outer Panel	Front Fender	1.5 ± 1.0/0.06 ± 0.04	-0.25 ± 1.25/-0.01 ± 0.05

Rear Compartment Assembly and Surrounding Surfaces Clearance and Tolerance

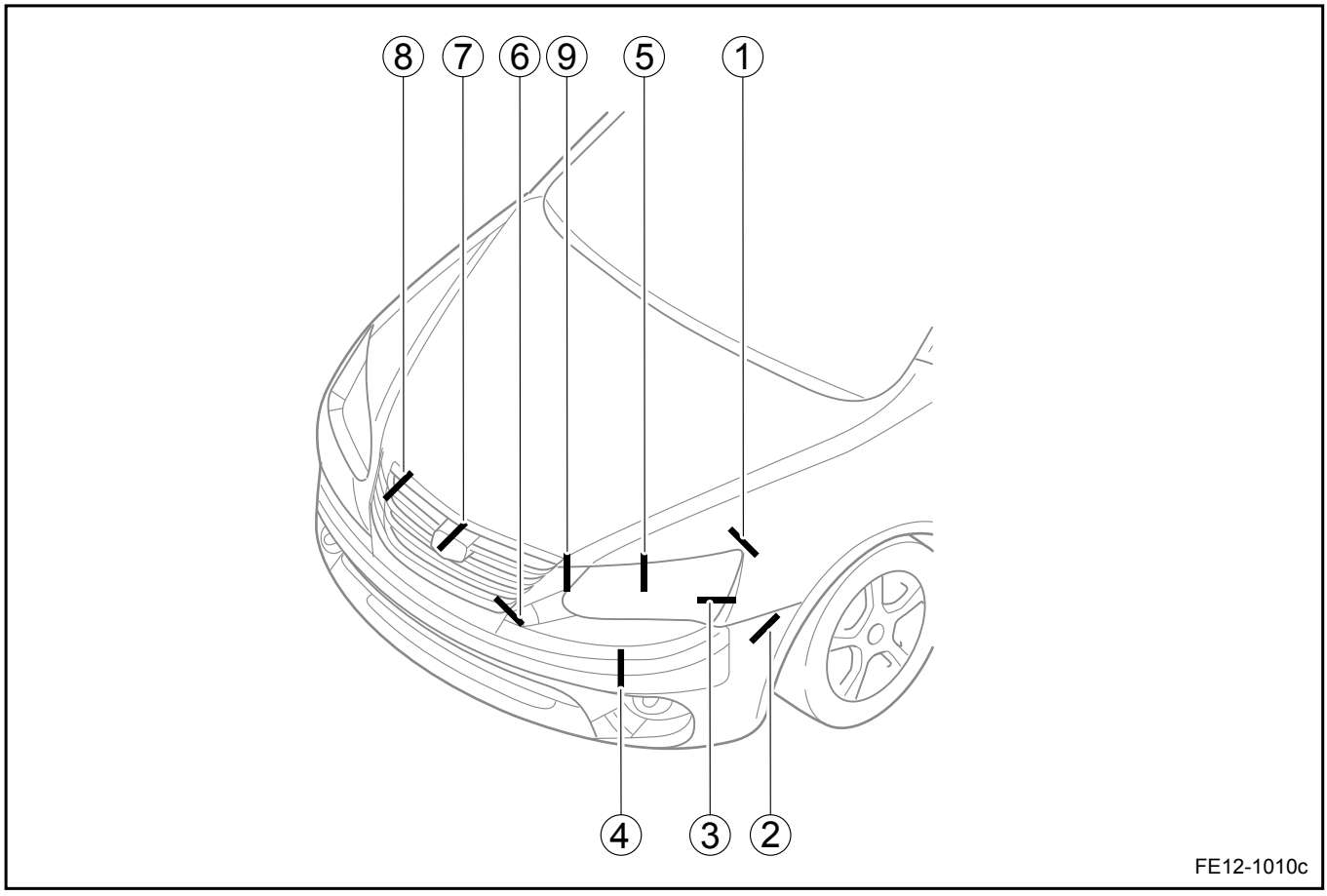


Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance	Tolerance
1	Rear Compartment Lid Outer Panel	Side Outer Panel	4.0 ± 1.0/0.2 ± 0.04	0.75 ± 0.75/0.03 ± 0.03
2	Rear Compartment Lid Outer Panel	Tail Lamp	4.0 ± 1.0/0.16 ± 0.04	1.0 ± 1.0/0.04 ± 0.04
3	Roof Outer Panel	Rear Window	5.0 ± 1.5/0.2 ± 0.06	-2.5 ± 1.5/-0.1 ± 0.06
4	Rear Compartment Lid Outer Panel	Rear Window	11.0 ± 1.2/0.43 ± 0.05	-
5	Side Outer Panel	Rear Window	5.0 ± 1.5/0.2 ± 0.06	-
6	Rear Compartment Lid Outer Panel	Rear Bumper	6.0 ± 1.5/0.24 ± 0.06	-
7	Side Outer Panel	Tail Lamp	2.0 ± 1.0/0.08 ± 0.04	1.5 ± 1.0/0.06 ± 0.04
8	Tail Lamp	Rear Bumper	2.0 ± 1.0/0.08 ± 0.04	0 ± 1.0/0 ± 0.04

12.12.1.3 Body Surface Clearance and Tolerance (Hatchback)

- To adjust or check the clearance, you should use a plastic clearance adjustment ruler.
- Clearance is always measured with the mm/inch unit.

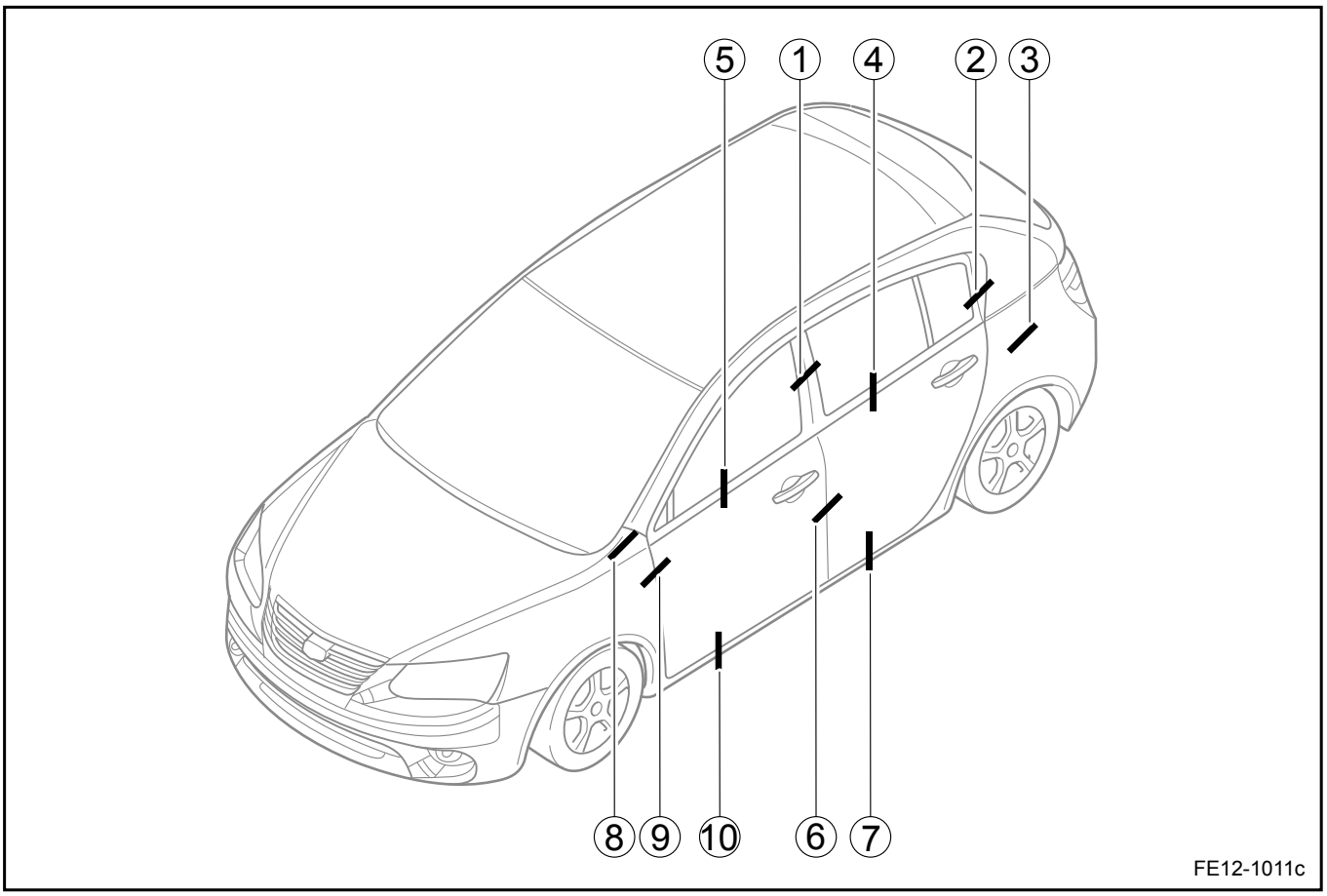
Engine Compartment Assembly and Surrounding Surfaces Clearance and Tolerance



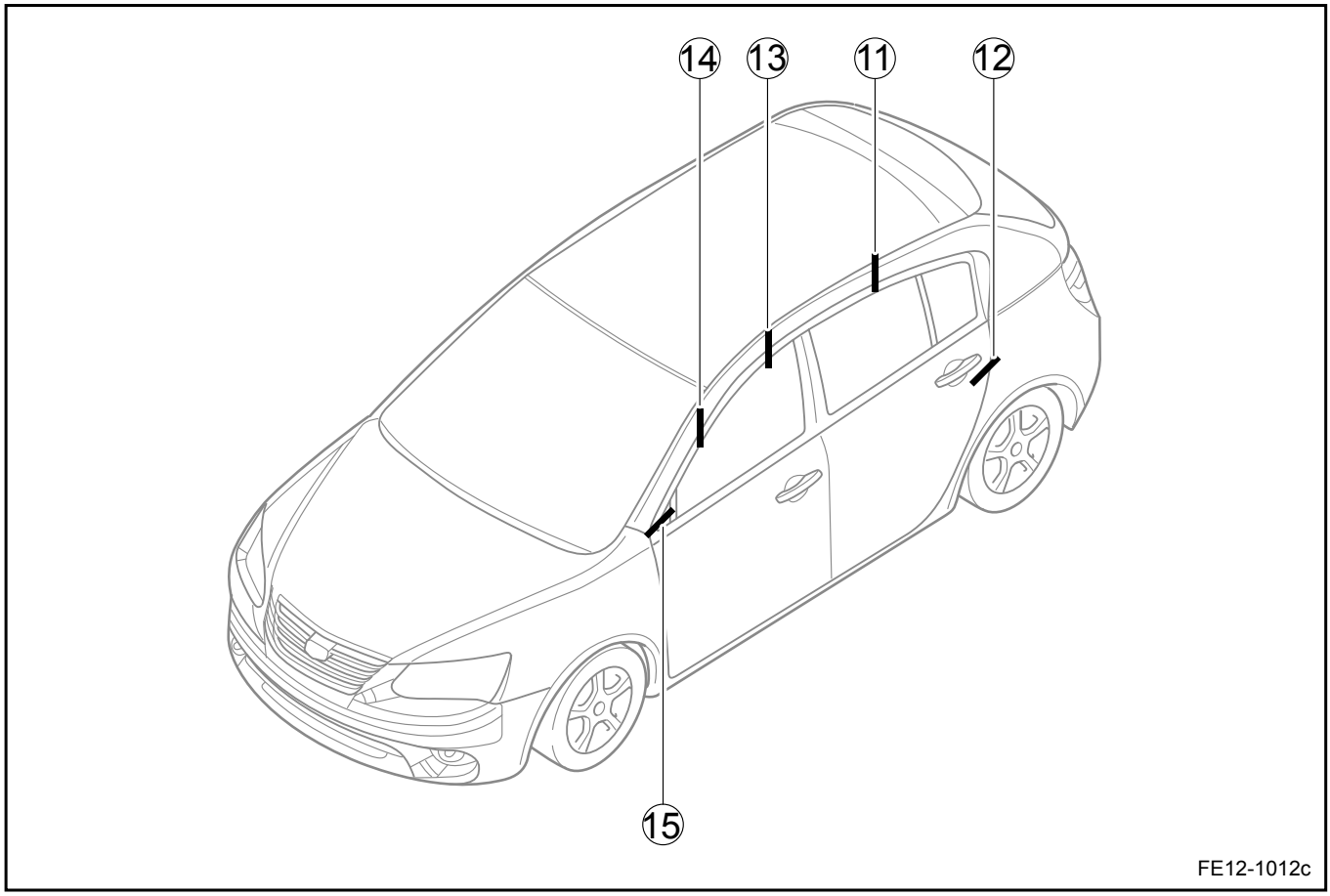
Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance (mm/in)	Tolerance (mm/in)
1	Front Fender	Hood Outer Panel	3.5 ± 1.0/0.14 ± 0.04	0.75 ± 0.75/0.03 ± 0.03
2	Front Fender	Front Bumper	0.5 ± 0.5/0.02 ± 0.02	0 ± 1.5/0 ± 0.06
3	Front Fender	Headlamp	1.5 ± 1.0/0.06 ± 0.04	-0.85 ± 0.85/-0.03 ± 0.03
4	Headlamp	Front Bumper	2.5 ± 1.8/0.1 ± 0.07	-1.2 ± 1.2/-0.05 ± 0.05
5	Hood Outer Panel	Headlamp	5.0 ± 1.0/0.2 ± 0.04	-1.5 ± 1.0/-0.06 ± 0.04
6	Radiator Grille	Front Bumper	3.0 ± 1.5/0.12 ± 0.06	2.0 ± 1.0/0.1 ± 0.04
7	Hood Ornament	Radiator Grille	3.0 ± 1.5/0.12 ± 0.06	2.5 ± 1.5/0.1 ± 0.06
8	Hood Outer Panel	Hood Ornament	-0.25 ± 0.25/-0.01 ± 0.01	-0.25 ± 0.25/-0.01 ± 0.01

9	Front Bumper	Hood Outer Panel	7.5 ± 1.0/0.3 ± 0.04	4.0 ± 1.0/0.16 ± 0.04

Front and Rear Doors and Surrounding Surfaces Clearance and Tolerance

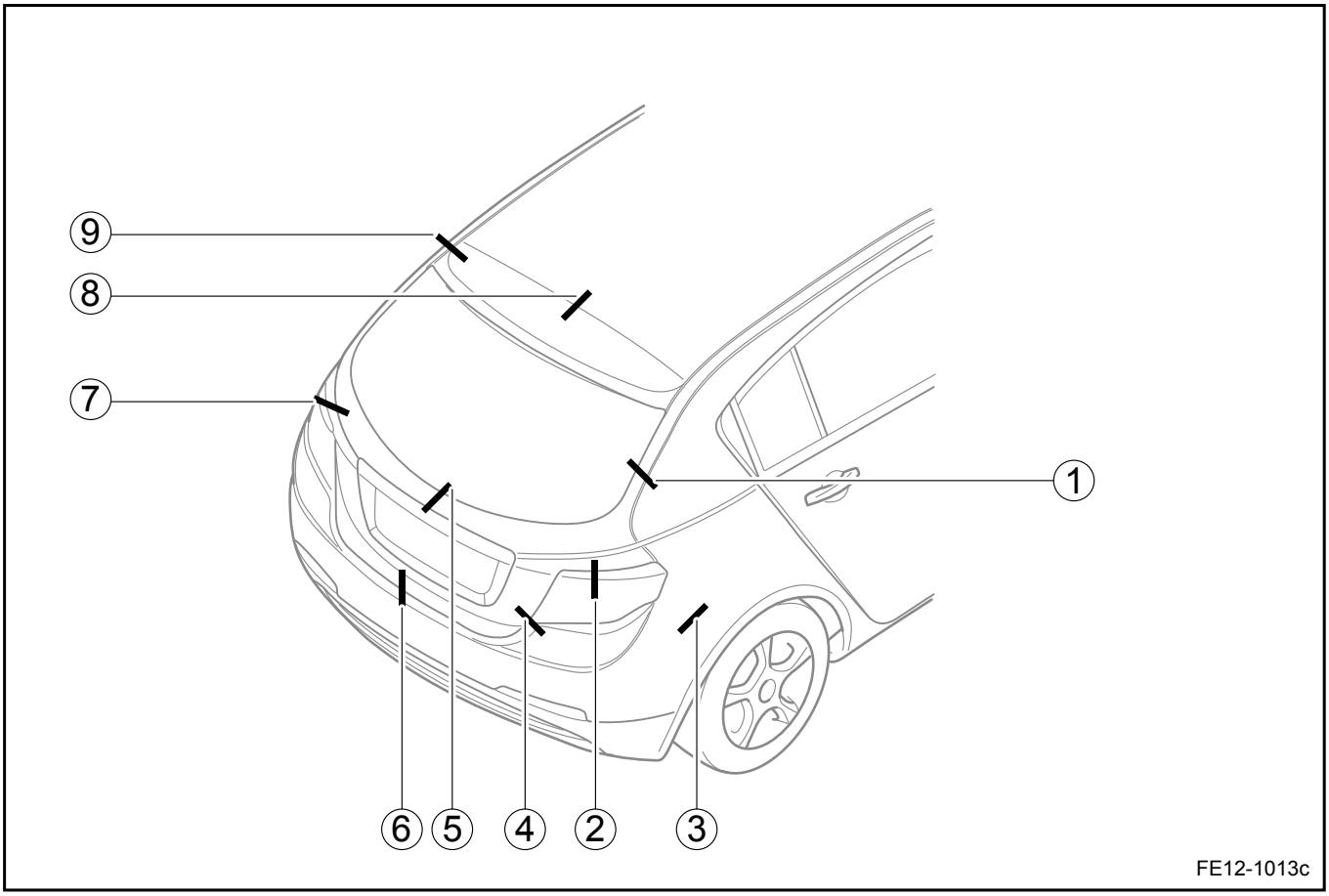


Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance (mm/in)	Tolerance (mm/in)
1	Front Door Frame	Rear Door Frame	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
2	Rear Door Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	3.0 ± 1.0/0.12 ± 0.04
3	Side Outer Panel	Fuel Filler Lid Outer Panel	3.5 ± 1.0/0.14 ± 0.04	-0.75 ± 1.25/-0.03 ± 0.05
4	Rear Door Outer Panel	Rear Window Seal Strip	2.5 ± 1.8/0.1 ± 0.07	-
5	Front Door Outer Panel	Front Window Seal Strip	5.0 ± 1.0/0.2 ± 0.04	-
6	Front Door Outer Panel	Rear Door Outer Panel	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
7	Rear Door Outer Panel	Rocker Panel Molding	5.0 ± 1.5/0.2 ± 0.06	3.5 ± 1.5/0.14 ± 0.06
8	Side Outer Panel	Front Fender	1.5 ± 1.0/0.06 ± 0.04	-0.5 ± 1.0/-0.02 ± 0.04
9	Front Door Outer Panel	Front Fender	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
10	Front Door Outer Panel	Rocker Panel Molding	5.0 ± 1.5/0.2 ± 0.06	3.5 ± 1.5/0.14 ± 0.06



Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance (mm/in)	Tolerance (mm/in)
11	Rear Door Frame Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	5.0 ± 1.0/0.2 ± 0.04
12	Rear Door Outer Panel	Side Outer Panel	4.0 ± 1.0/0.16 ± 0.04	0.25 ± 0.75/0.01 ± 0.03
13	Front Door Frame Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	3.0 ± 1.0/0.12 ± 0.04
14	Front Door Frame Outer Panel	Side Outer Panel	5.0 ± 1.0/0.2 ± 0.04	3.0 ± 1.0/0.12 ± 0.04
15	Front Fender	Outside Rearview Mirror Mounting Panel	5.0 ± 1.0/0.2 ± 0.04	-0.5 ± 1.0/-0.02 ± 0.04

Hatchback Assembly and Surrounding Surfaces Clearance and Tolerance

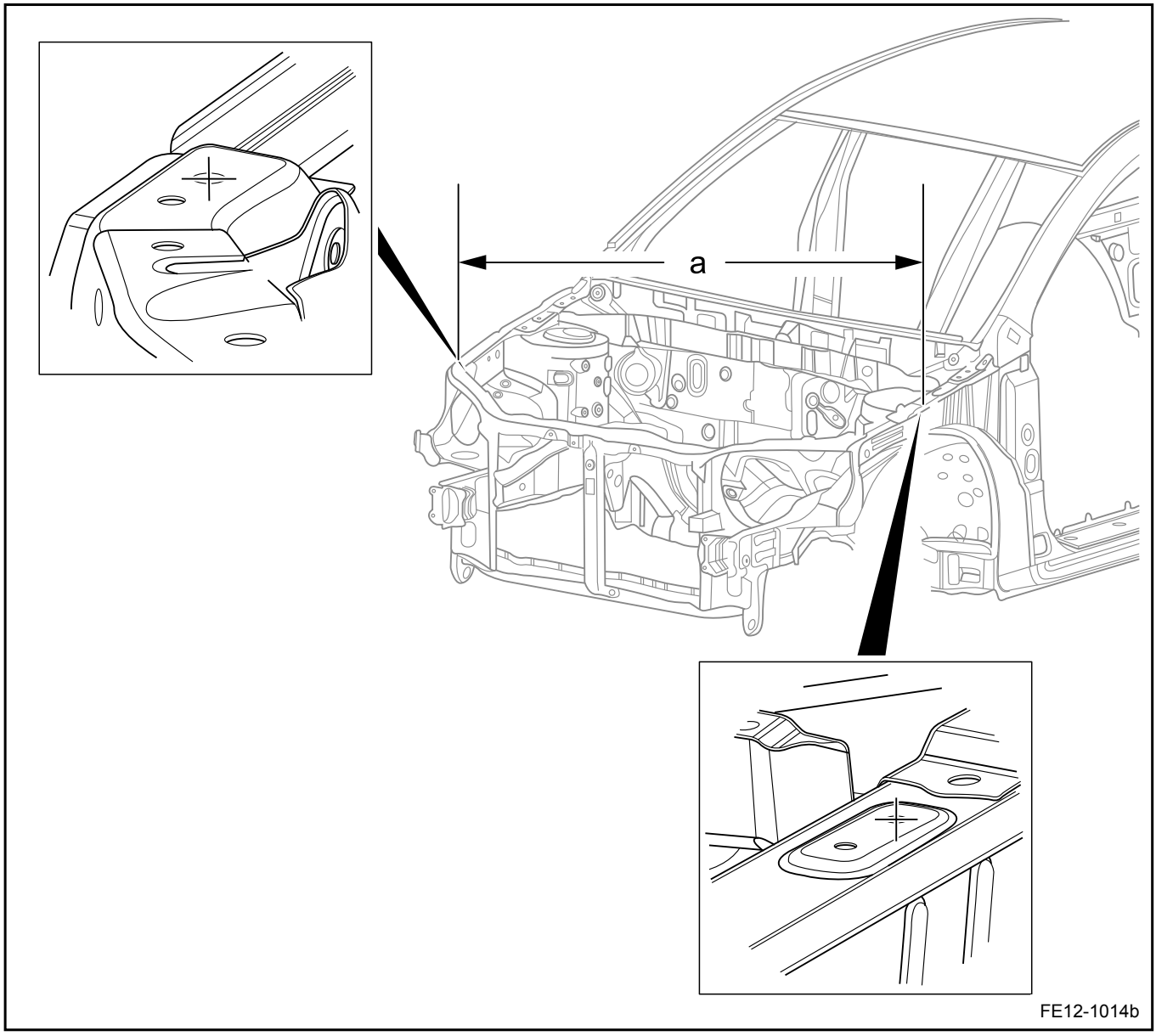


Serial Number	Panel	Adjacent Panel	Specifications	
			Clearance (mm/in)	Tolerance (mm/in)
1	Side Outer Panel	Rear Window	4.0 ± 1.0/0.16 ± 0.04	-1.0 ± 1.0/-0.04 ± 0.04
2	Side Outer Panel	Tail Lamp	2.0 ± 1.0/0.08 ± 0.04	1.5 ± 1.0/0.06 ± 0.04
3	Side Outer Panel	Rear Bumper	0.5 ± 0.5/0.02 ± 0.02	0.25 ± 1.25/0.01 ± 0.05
4	Hatchback Outer Panel	Tail Lamp	4.0 ± 1.0/0.16 ± 0.04	-
5	Rear Window	Hatchback Outer Panel	2.0 ± 1.0/0.08 ± 0.04	-
6	Hatchback Outer Panel	Rear Bumper	6.0 ± 1.5/0.24 ± 0.06	-
7	Hatchback Outer Panel	Side Outer Panel	4.0 ± 1.0/0.2 ± 0.04	0.75 ± 0.75/0.03 ± 0.03
8	Hatchback Outer Panel	Roof Outer Panel	7.5 ± 0.5/0.3 ± 0.02	2.25 ± 0.25/0.1 ± 0.01
9	Hatchback Outer Panel (Spoiler)	Side Outer Panel	4.0 ± 1.0/0.2 ± 0.04	0.75 ± 0.75/0.03 ± 0.03

12.12.1.4 Body Dimensions

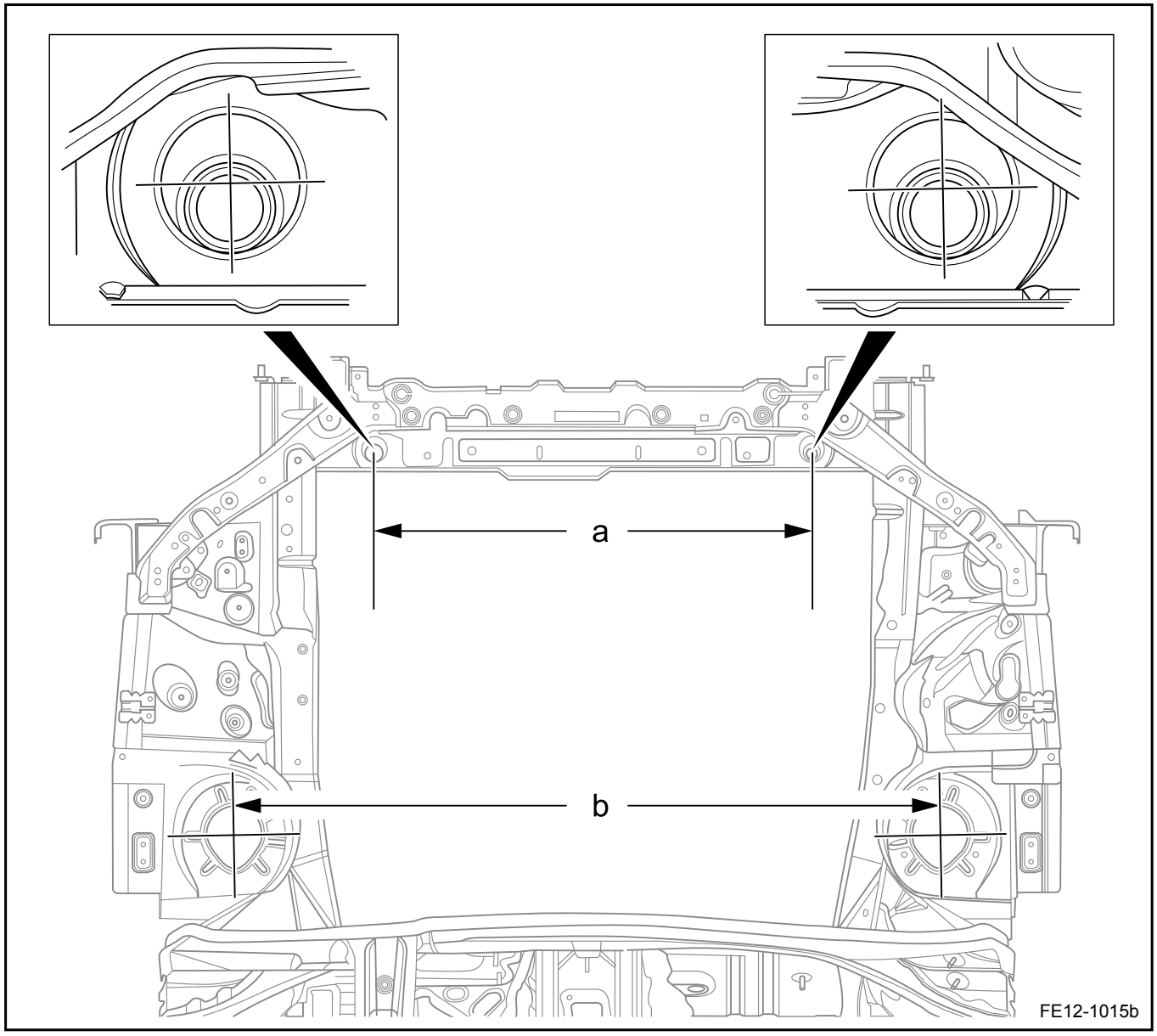
- Body dimensions are used for the body inspection.
- Please use an extension ruler to measure body dimensions.

Body Front



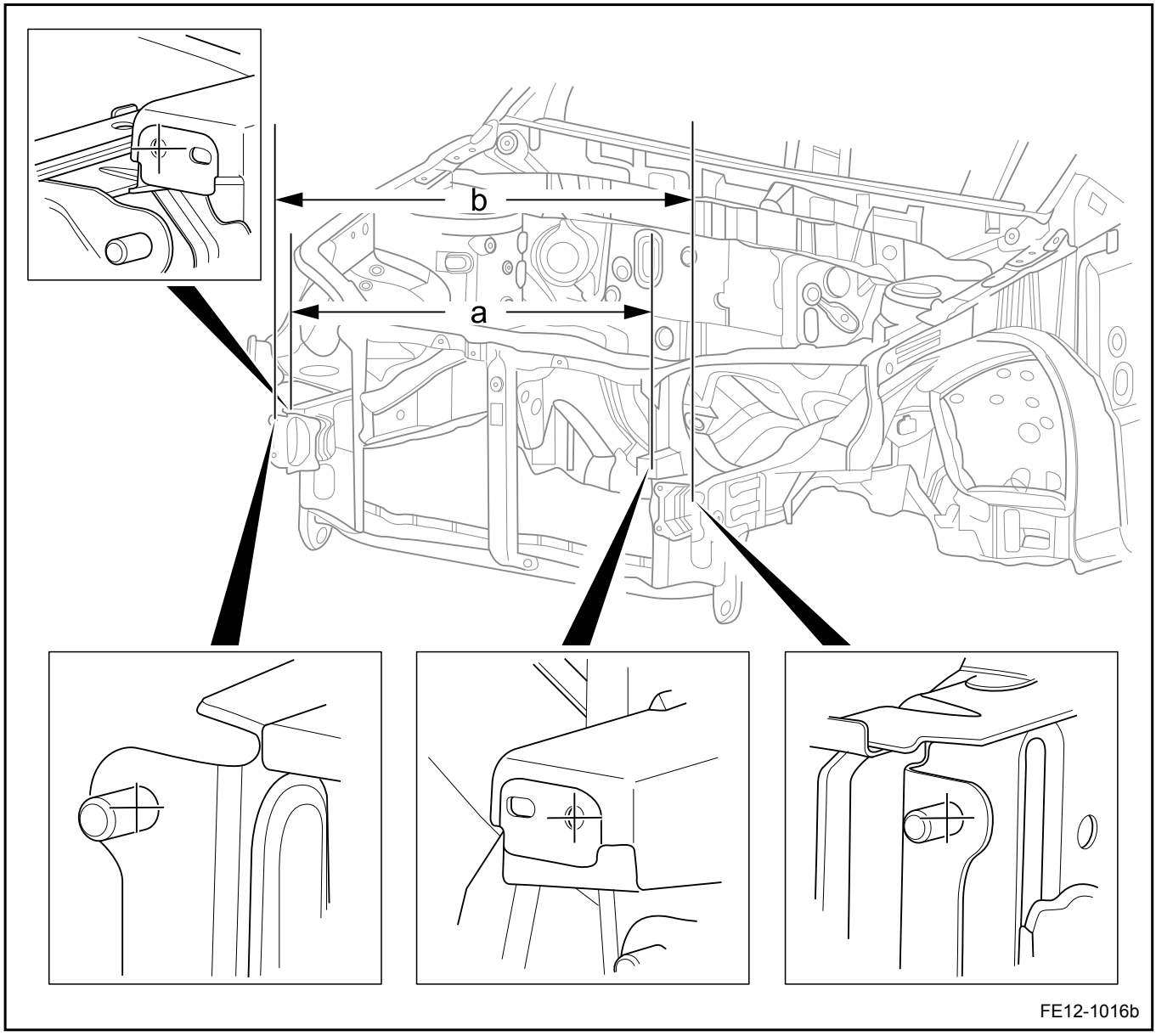
Front Fender Mounting Hole (Front) to Front Fender Mounting Hole (Rear) Diagonal Dimension

Dimension a=1,478 mm (58.2 in)



Radiator Mounting Hole to Radiator Mounting Hole Dimension
Dimension a=705 mm (27.8 in)

Front Shock Absorber Center Hole to Front Shock Absorber Center Hole Dimension
Dimension b=1,136 mm (44.7 in)

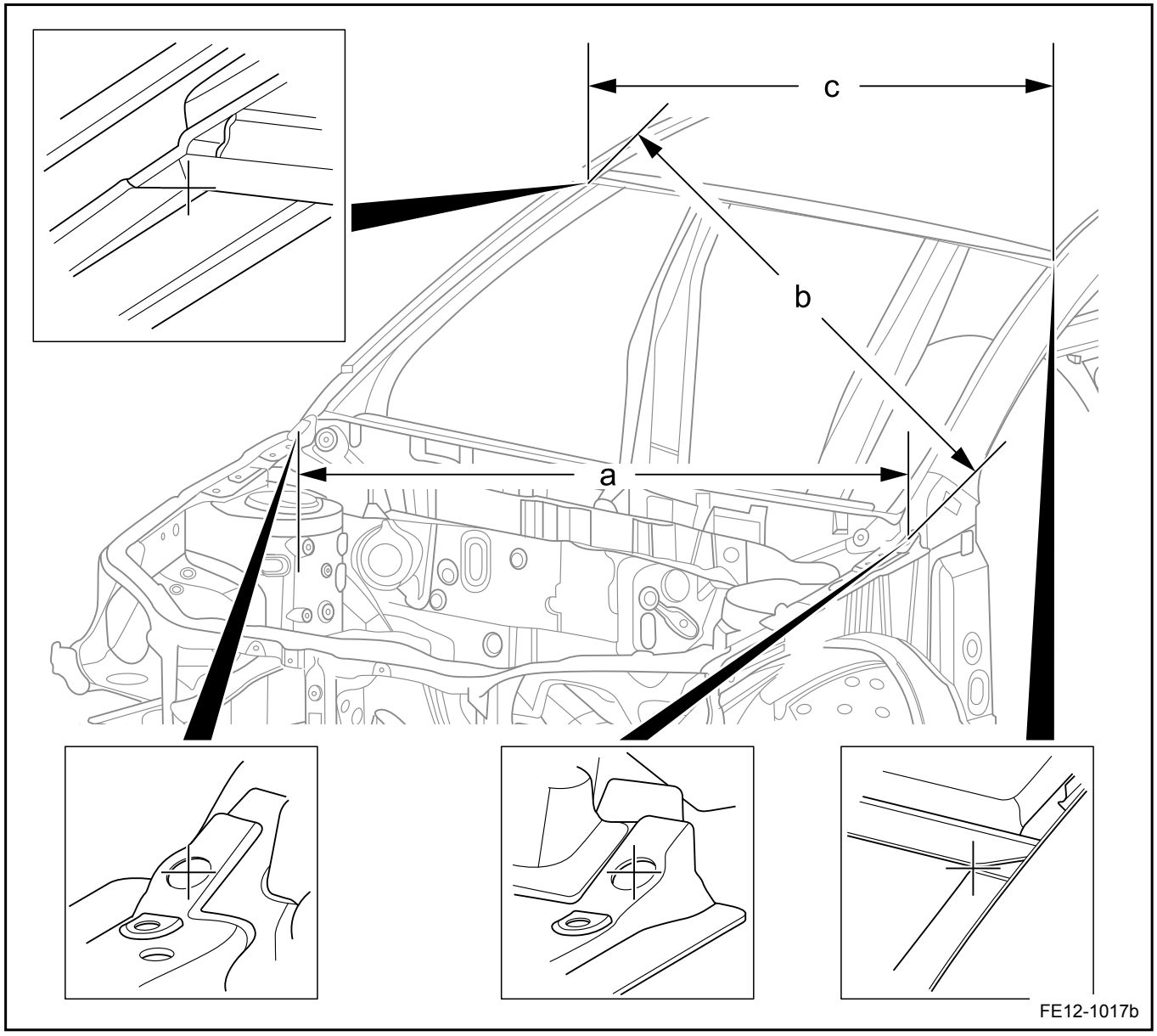


Headlamp Mounting Hole to Headlamp Mounting Hole Dimension

Dimension a=834 mm (32.8 in)

Dimension b=1,071 mm (42.2 in)

Front Side Rail Mounting Hole to Front Side Rail Mounting Hole Dimension

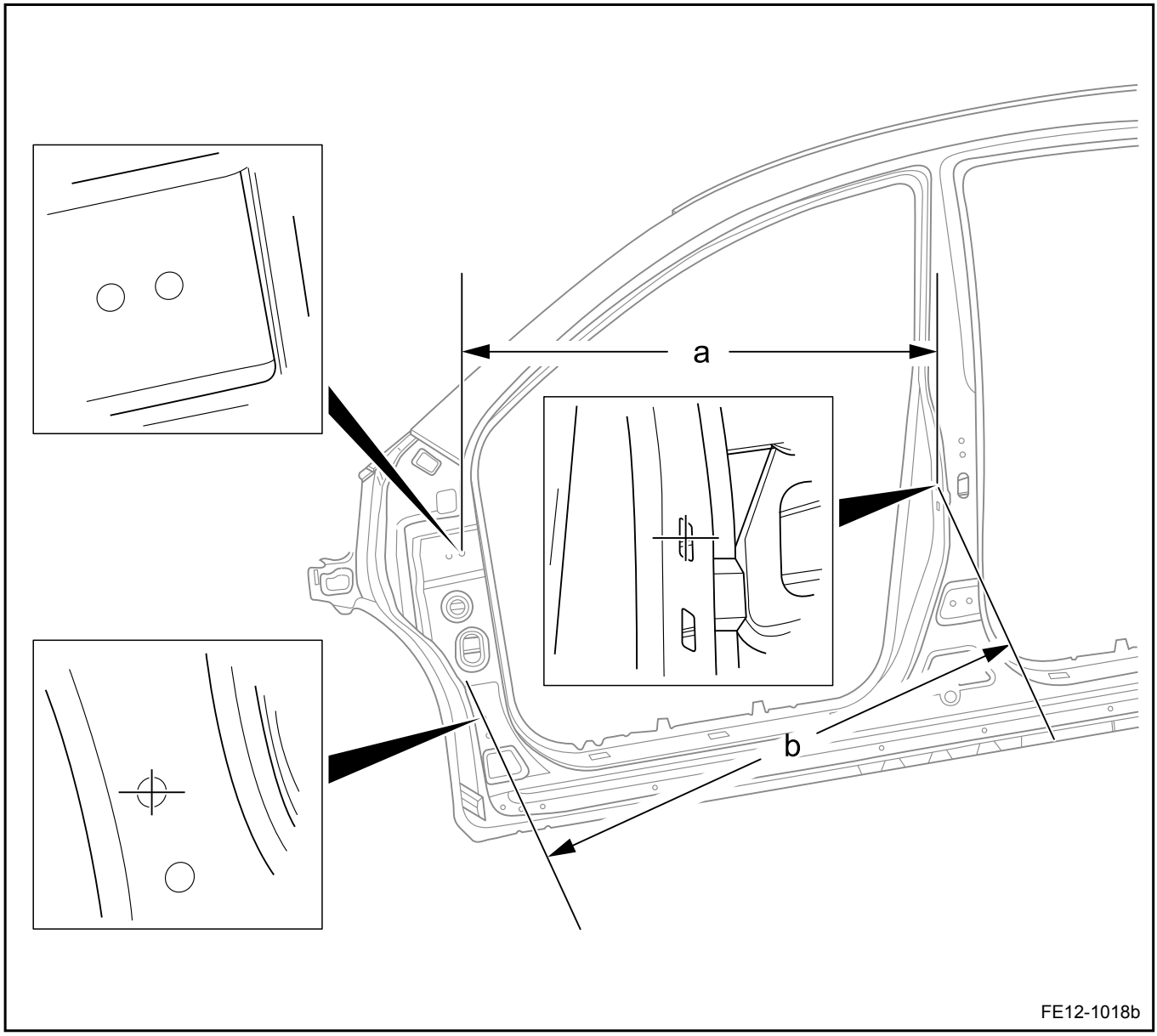


Body Side and Body Front Joint to Body Side and Body Front Joint Dimension
dimensions a=1,459 mm (57.4 in)

Body Side and Body Front Joint to Body Side and Roof Joint Dimension
Dimension b=1,514 mm (59.6 in)

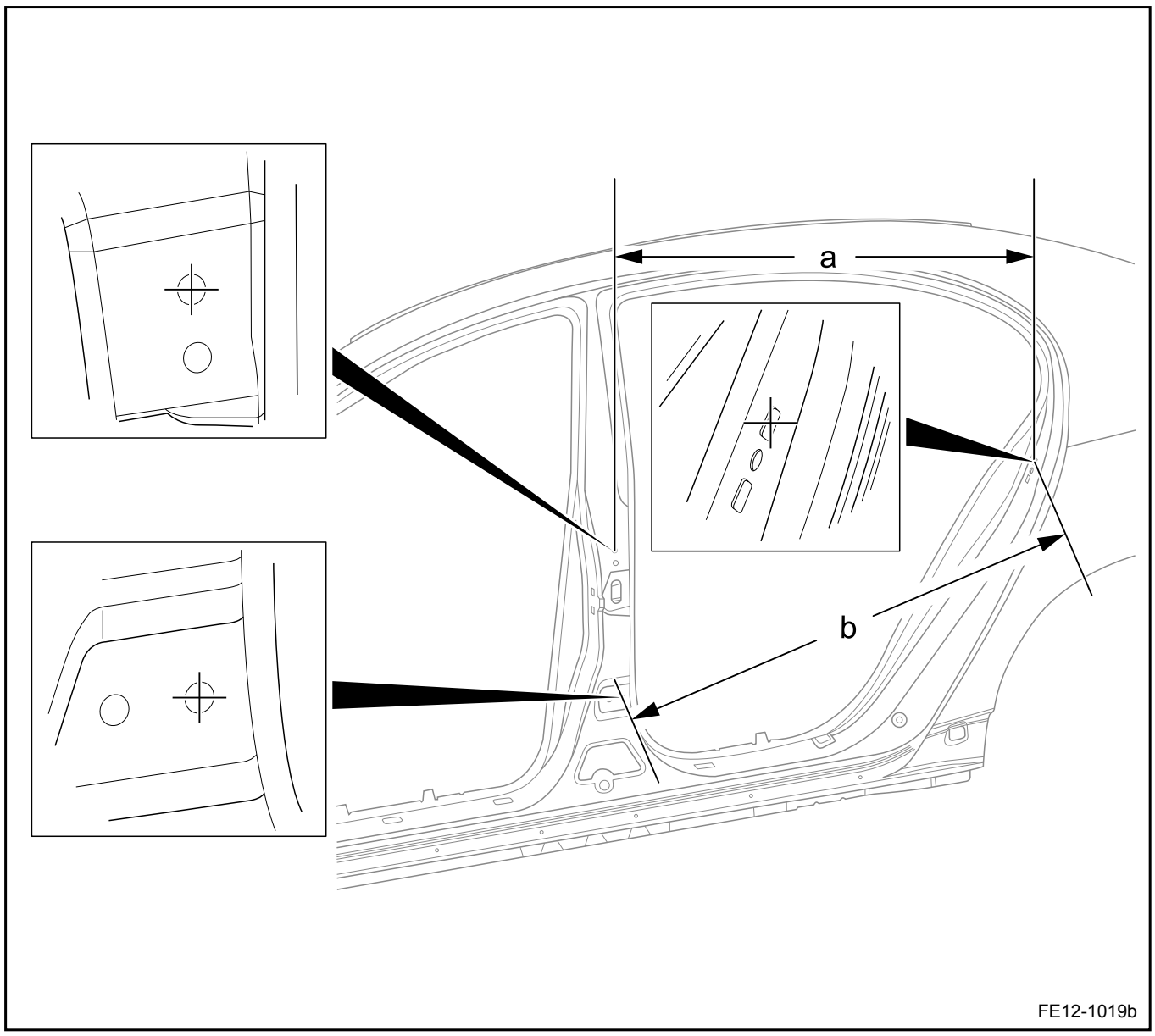
Body Side and Roof Joint to Body Side and Roof Joint Dimension
Dimension c=1,073 mm (42.2 in)

Body Middle



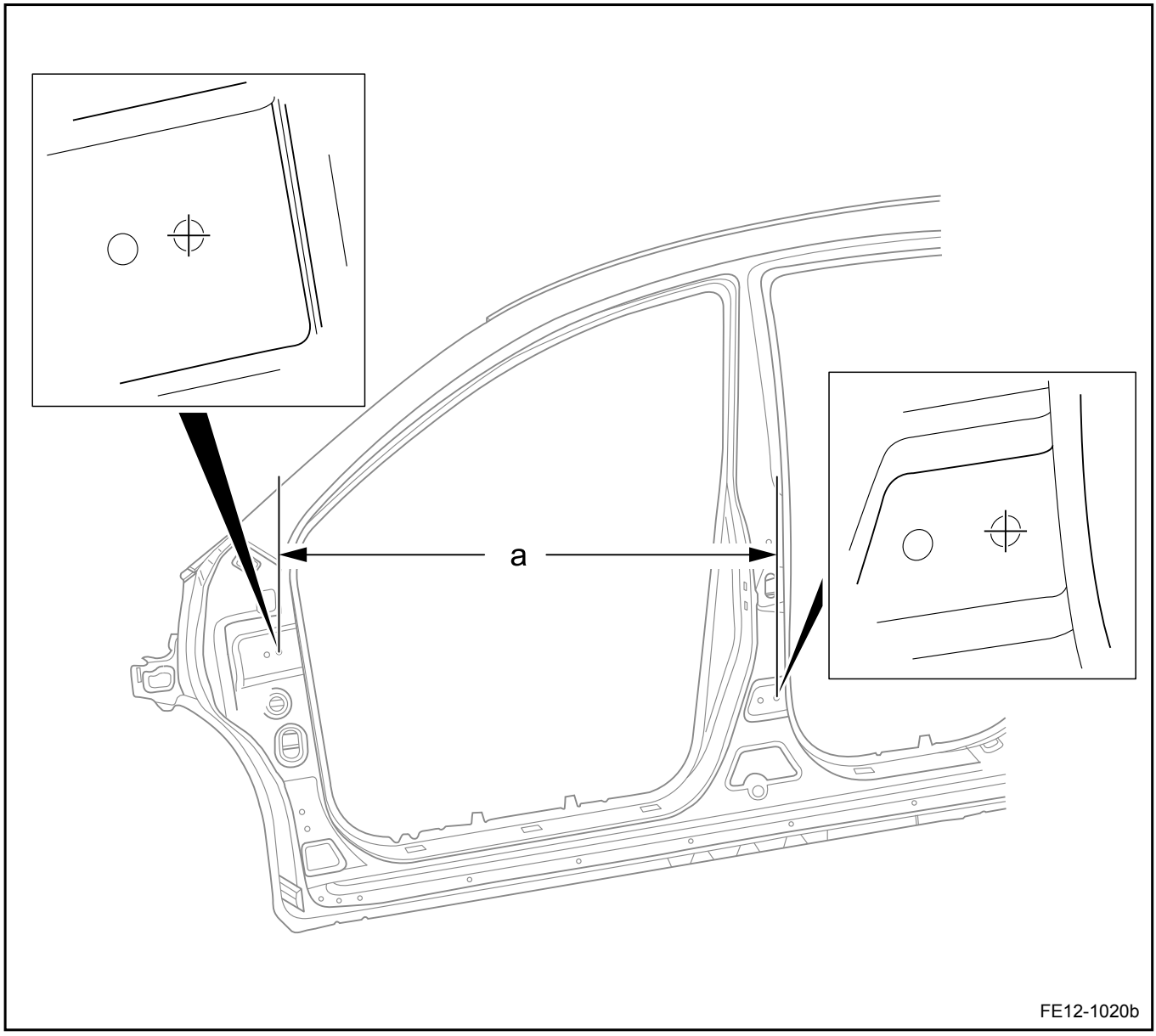
Front Door Upper Hinge Mounting Hole to Front Door Lock Mounting Hole Dimension
Sedan: Dimension a=1,009 mm (39.7 in)
Hatchback: Dimension a=1,005 mm (39.6 in)

Front Door Lower Hinge Mounting Hole to Front Door Lock Mounting Hole Dimension
Sedan: Dimension b=1,047 mm (41.2 in)
Hatchback: Dimension b=1,043 mm (41.1 in)



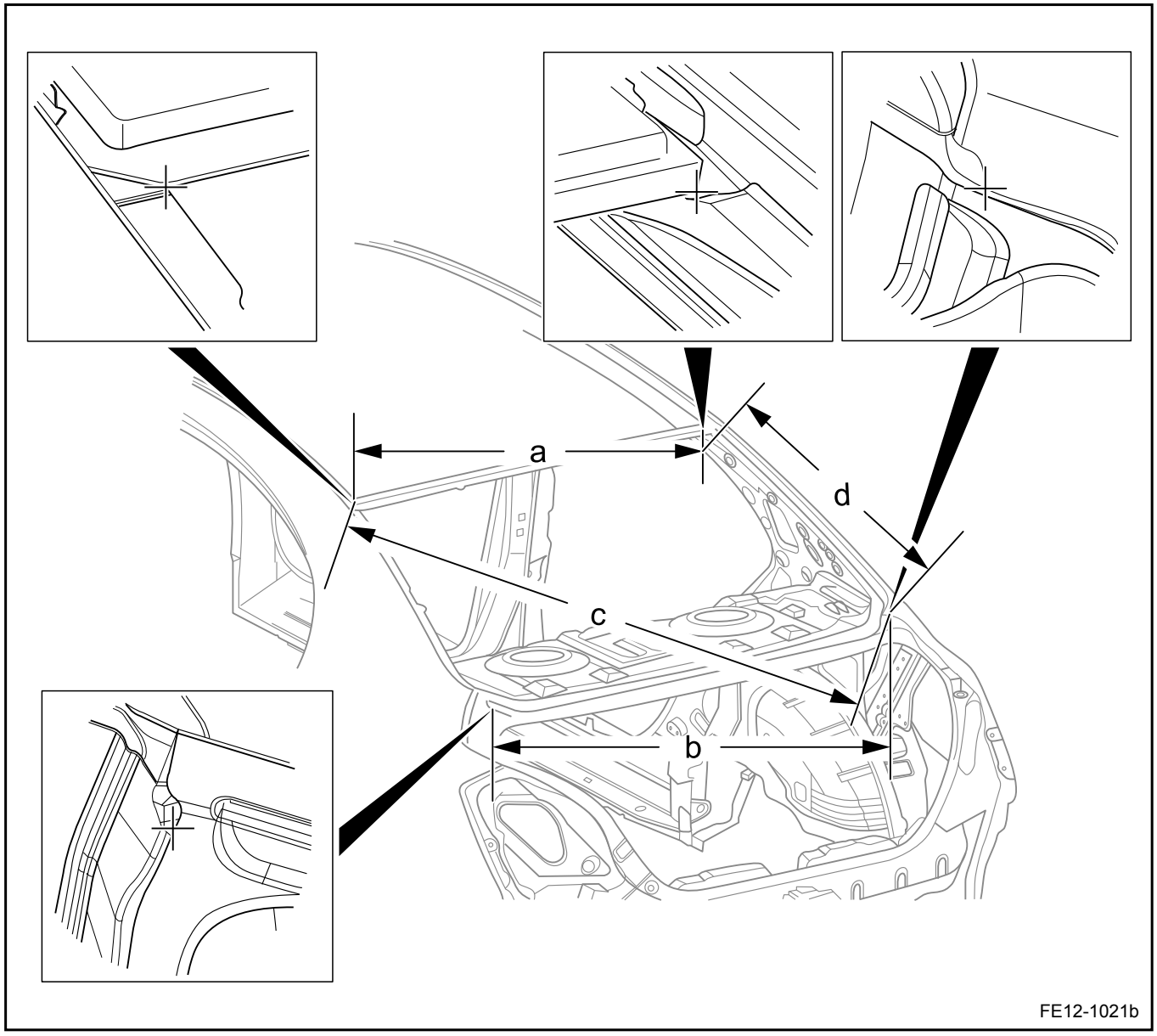
Rear Door Upper Hinge Mounting Hole to Rear Door Lock Mounting Hole Dimension
Sedan: Dimension a=979 mm (38.5 in)
Hatchback: Dimension a=977 mm (38.4 in)

Rear Door Lower Hinge Mounting Hole to Rear Door Lock Mounting Hole Dimension
Sedan: Dimension b=1,057 mm (41.6 in)
Hatchback: Dimension b=1,056 mm (41.6 in)



Front Door Upper Hinge Mounting Hole to Rear Door Lower Hinge Mounting Hole Dimension

Dimension a=1,071 mm (42.2 in)

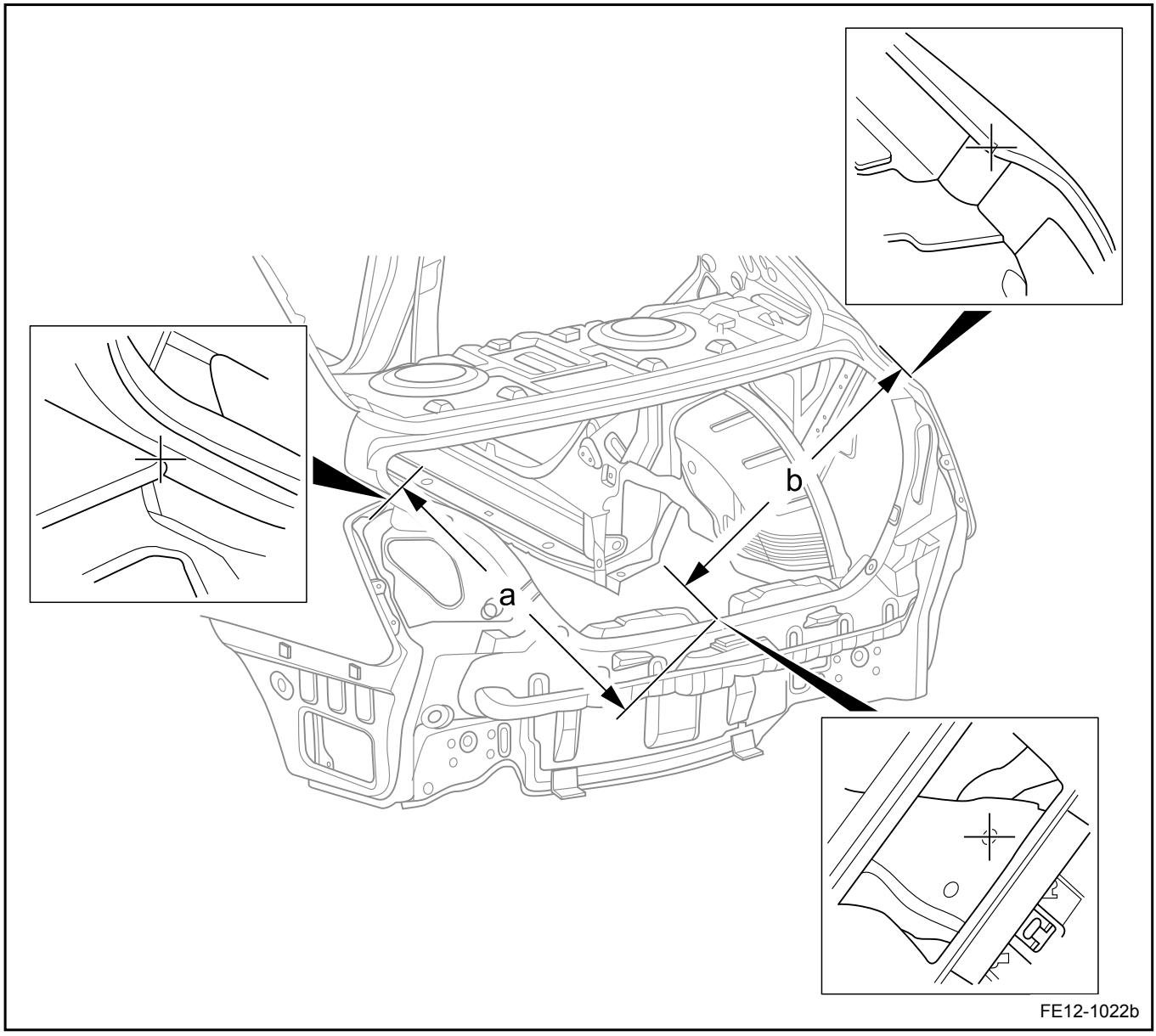


Rear Side Outer Panel and Roof Joint to Rear Side Outer Panel and Roof Joint Dimension
Dimension a=1,043 mm (41.1 in)

Rear Side Outer Panel and Rear Parcel Shelf Panel Joint to Rear Side Outer Panel and Rear Parcel Shelf Panel Joint Dimension
Dimension b=1,210 mm (47.6 in)

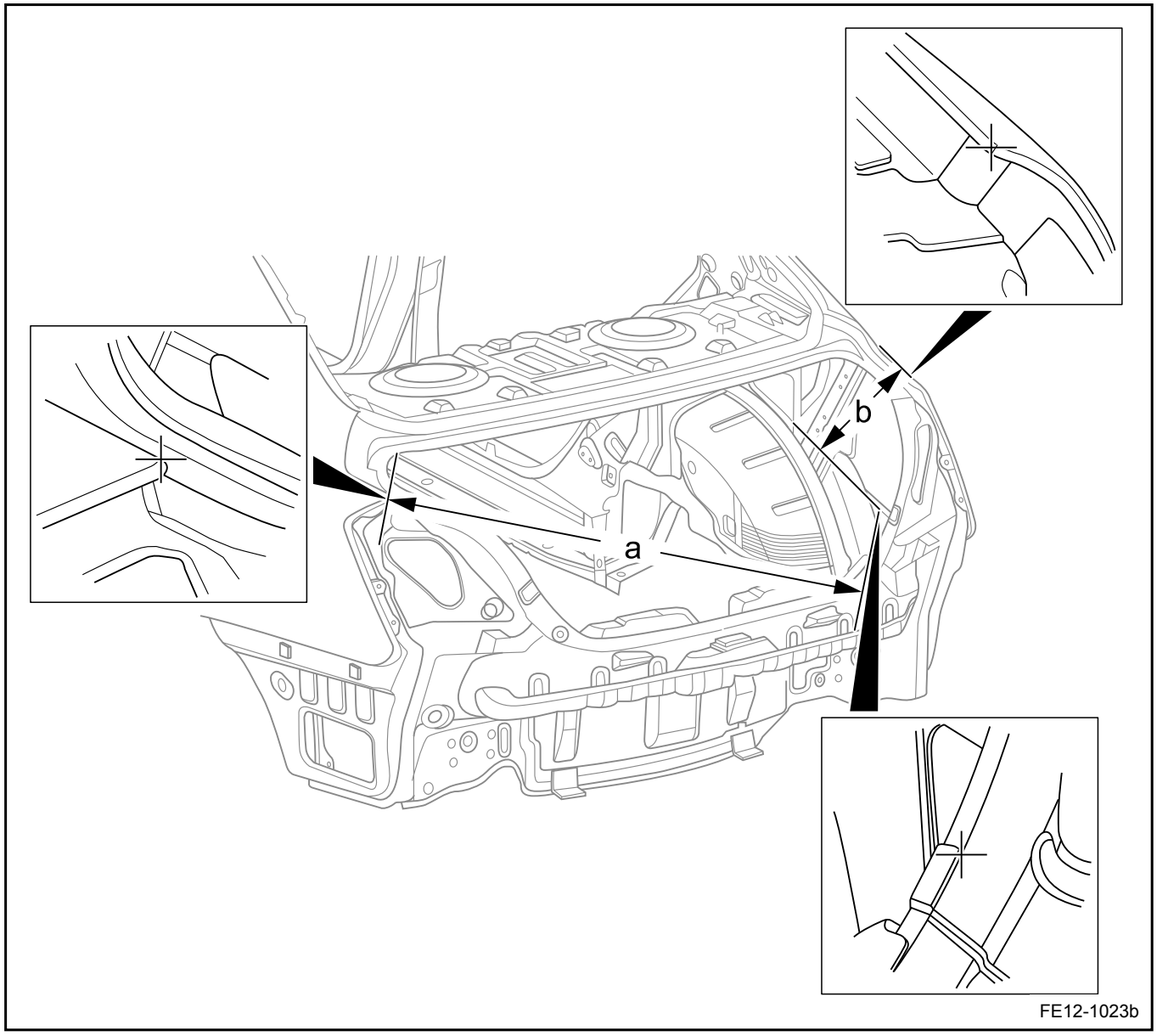
Rear Side Outer Panel and Roof Joint to Rear Side Outer Panel and Rear Parcel Shelf Panel Joint Diagonal Dimension
Dimension c=1,318 mm (51.9 in)

Rear Side Outer Panel and Roof Joint to Rear Side Outer Panel and Rear Parcel Shelf Panel Joint Longitudinal Dimension
Dimension d=688 mm (27.1 in)



Rear Side Outer Panel and Tail Lamp Filler Panel Joint to Rear Compartment Lid Lock Mounting Hole Dimension
Dimension a=809 mm (31.9 in)

Dimension b=777 mm (30.6 in)

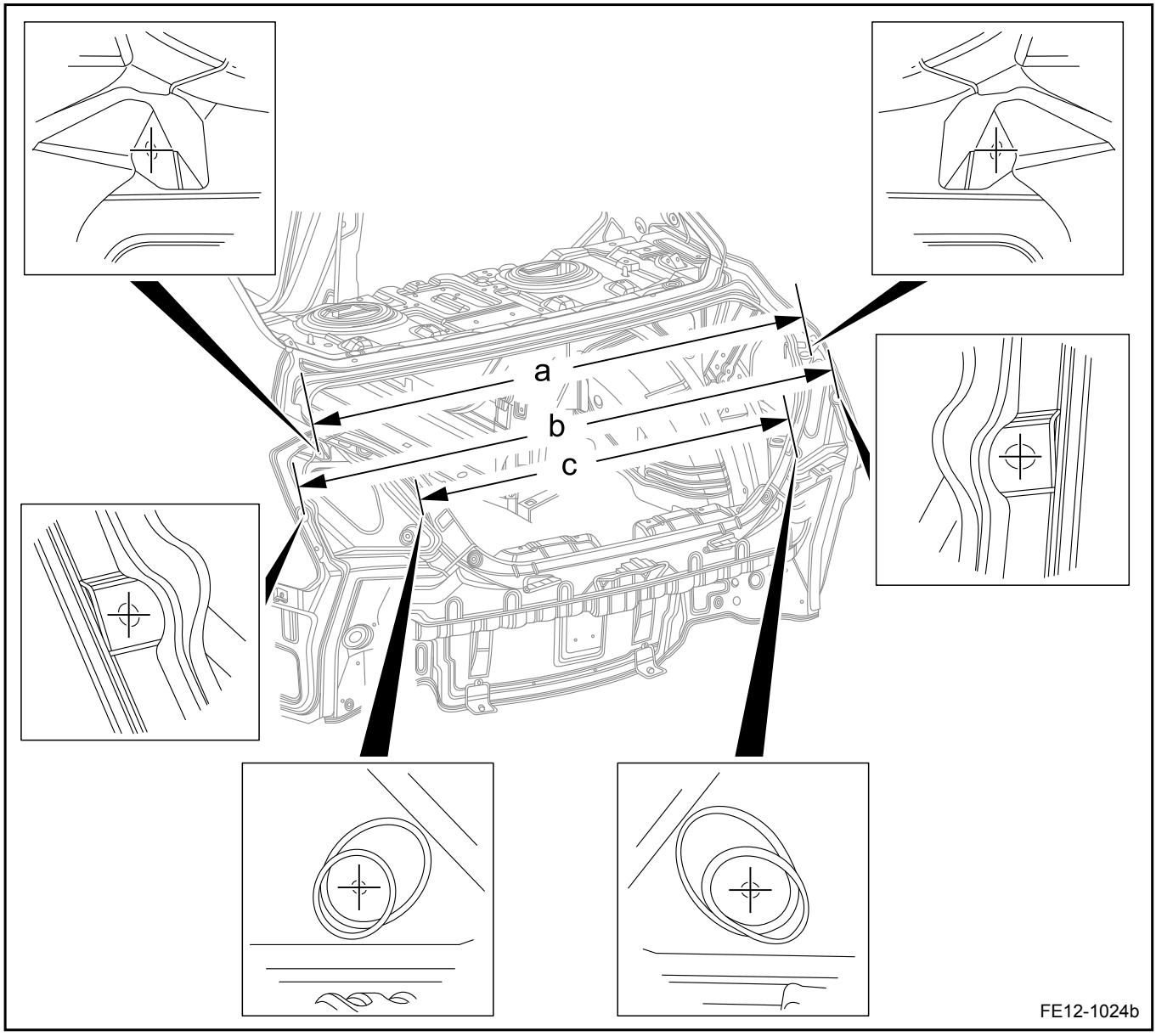


Rear Side Outer Panel and Tail Lamp Filler Panel Joint to Ail Lamp Filler Panel and Rear End Panel Joint Diagonal Dimension

Dimension a=1,153 mm (45.4 in)

Rear Side Outer Panel and Tail Lamp Filler Panel Joint to Ail Lamp Filler Panel and Rear End Panel Joint Longitudinal Dimension

Dimension b=423 mm (16.7 in)



Tail Lamp Upper Mounting Hole to Tail Lamp Upper Mounting Hole Dimension

Dimension a=1,369 mm (53.9 in)

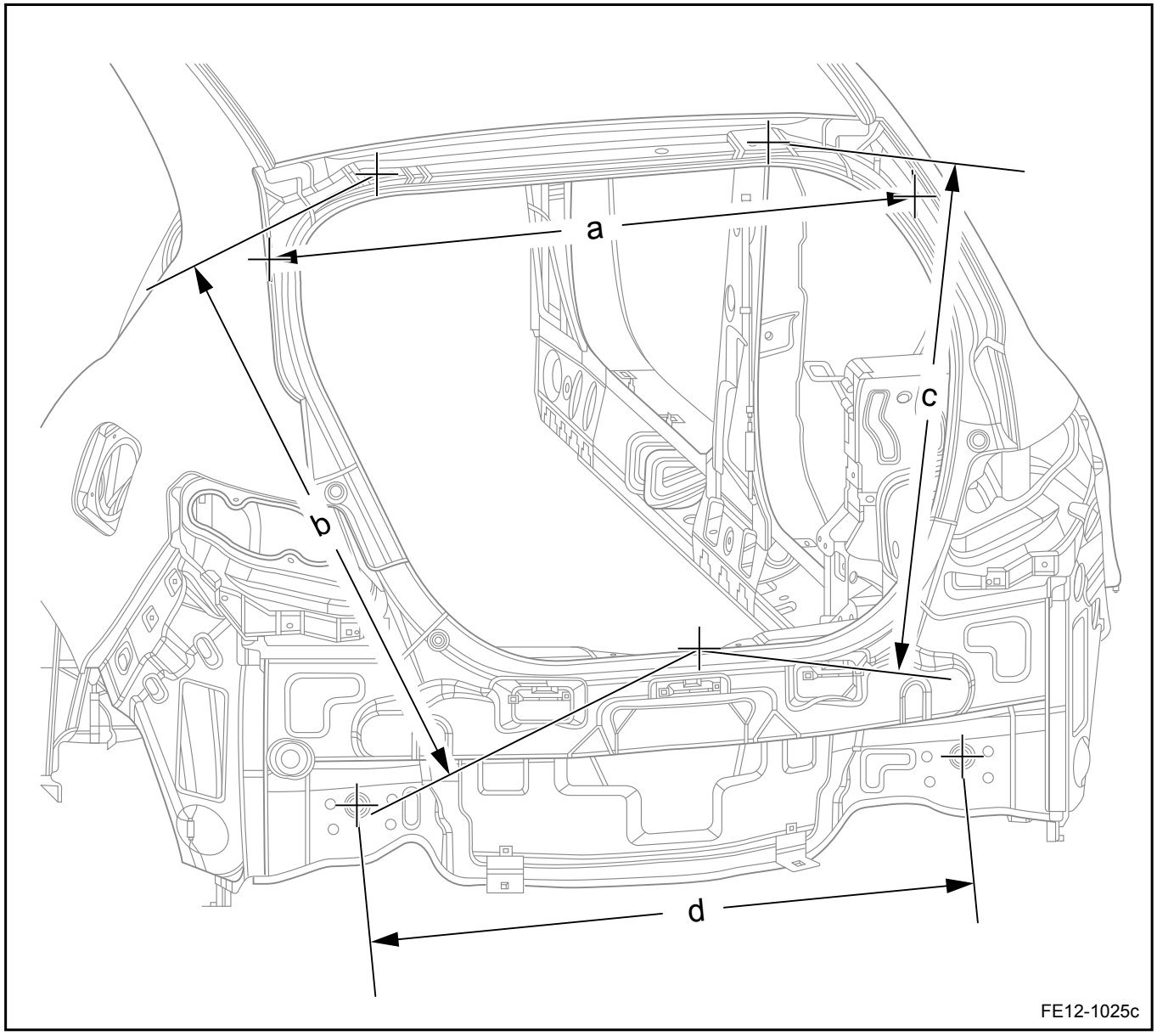
Tail Lamp Middle Mounting Hole to Tail Lamp Middle Mounting Hole Dimension

Dimension b=1,491 mm (58.7 in)

Tail Lamp Lower Mounting Hole to Tail Lamp Lower Mounting Hole Dimension

Dimension c=1,078 mm (42.4 in)

Body Rear (Hatchback)



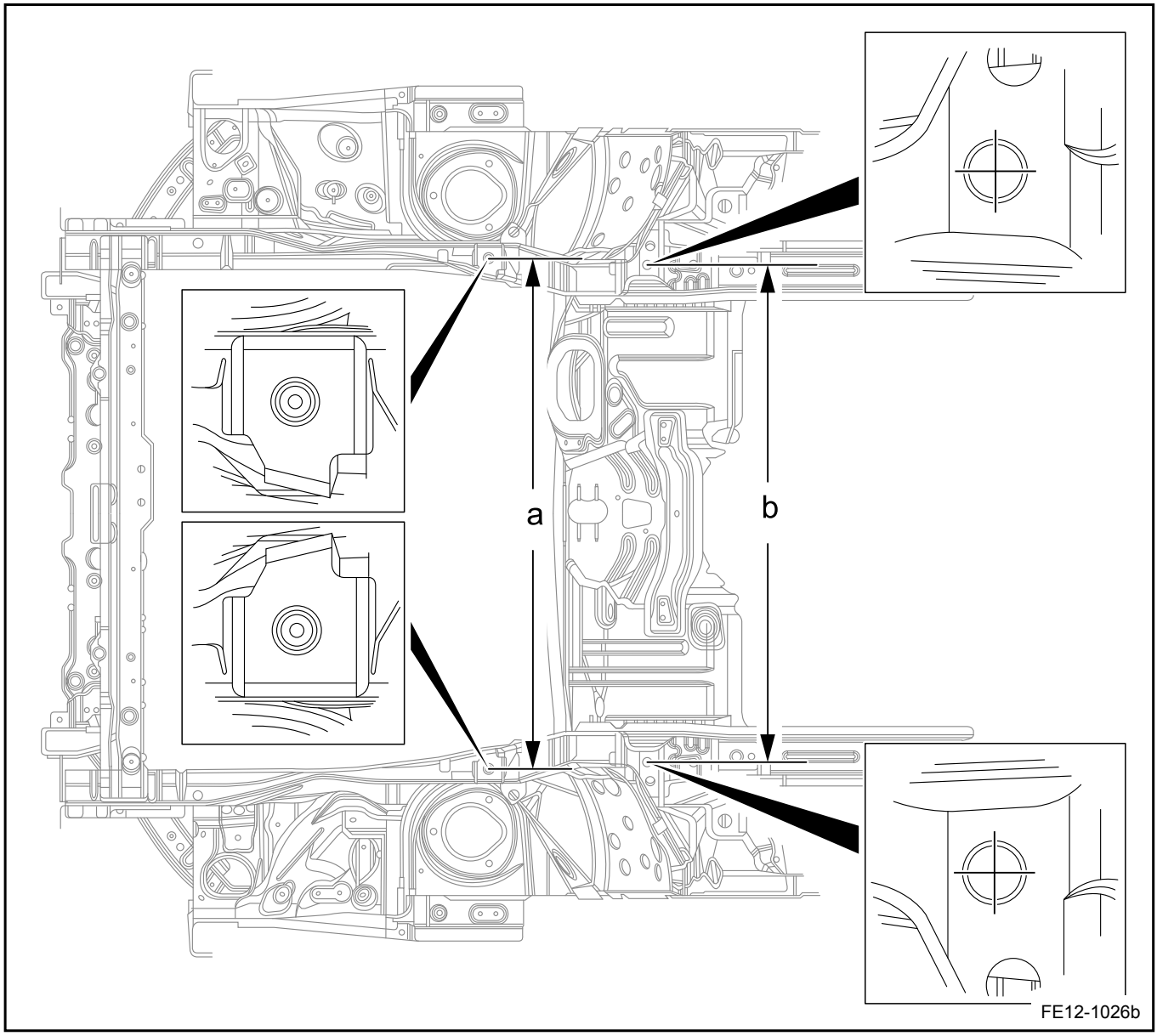
Hatchback Strut Mounting Hole to Hatchback Strut Mounting Hole Dimension
Dimension a=1,084 mm (42.7 in)

Hatchback Left Hinge Mounting Hole and Hatchback Lock Right Mounting Hole Dimension
Dimension b=970 mm (38.2 in)

Hatchback Right Hinge Mounting Hole and Hatchback Lock Right Mounting Hole Dimension
Dimension c=956 mm (37.6 in)

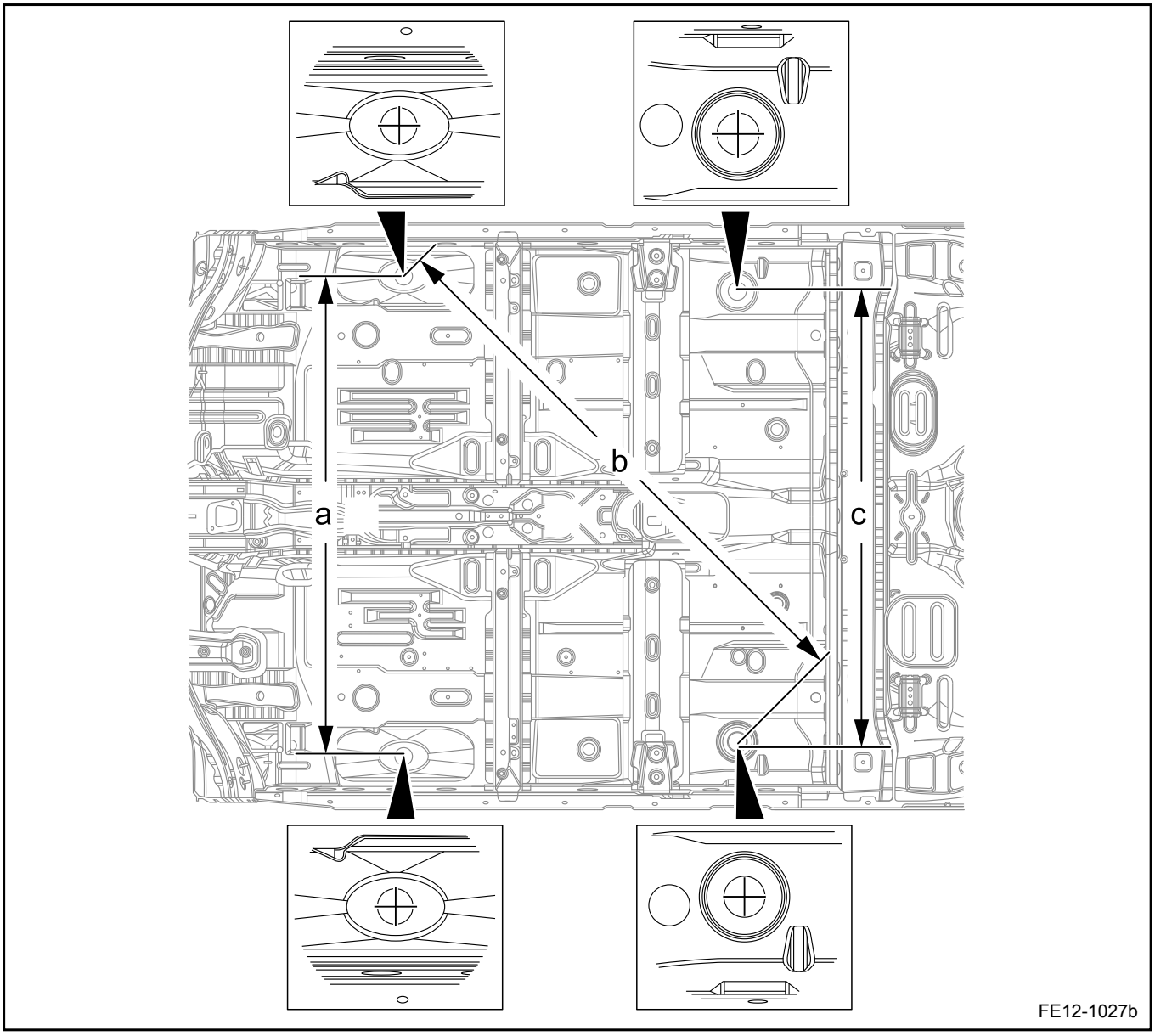
Rear End Panel Mounting Hole to Rear End Panel Mounting Hole Dimension
Dimension d=1,027 mm (40.4 in)

Underbody



Front Suspension Front Mounting Hole to Front Suspension Front Mounting Hole Dimension
Dimension a=911 mm (35.9 in)

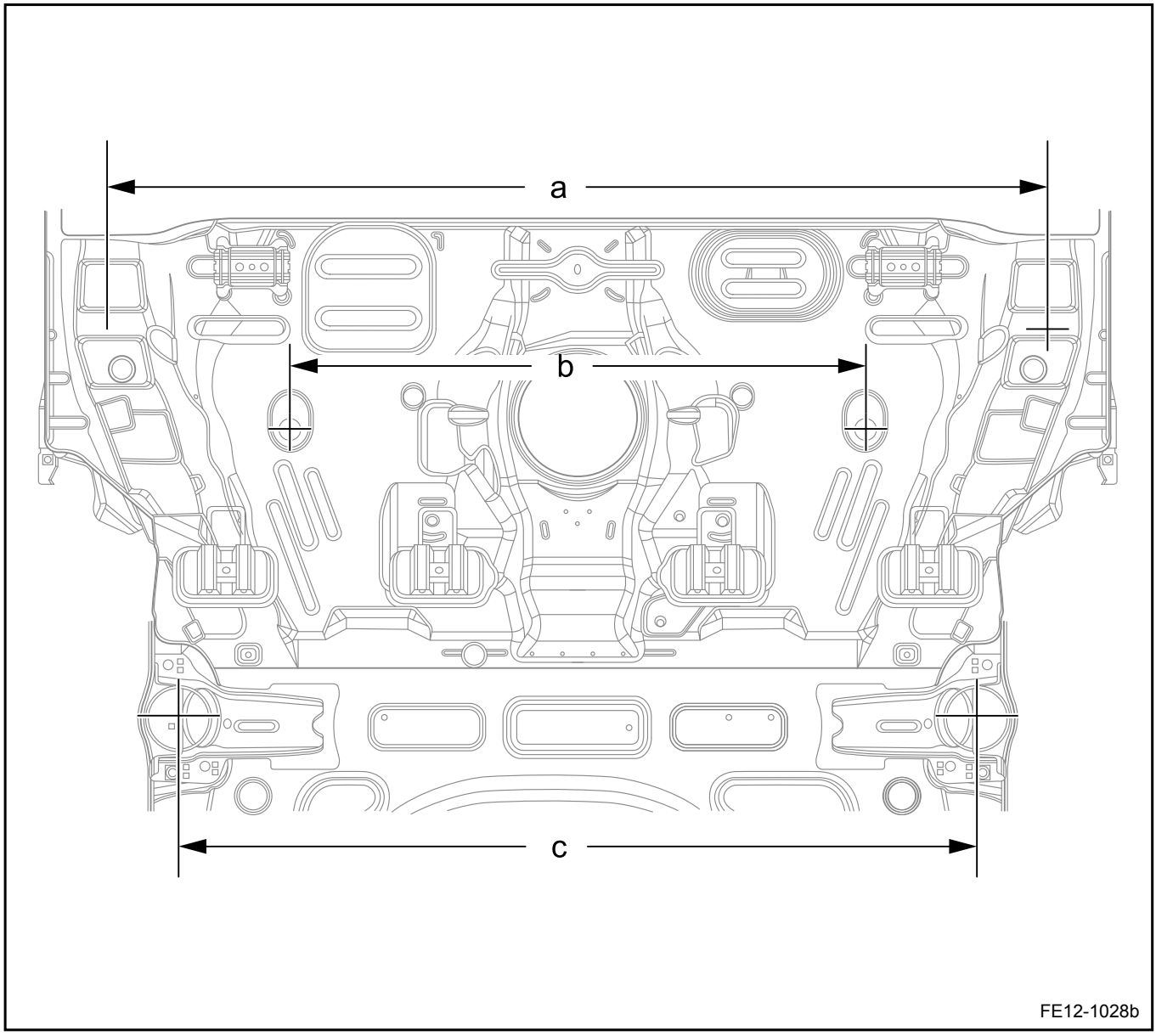
Front Suspension Rear Mounting Hole to Front Suspension Rear Mounting Hole Dimension
Dimension b=890 mm (35.0 in)



Front Floor Front Mounting Hole to Front Floor Front Mounting Hole Dimension
Dimension a=1,157 mm (45.6 in)

Front Floor Front Mounting Hole to Front Floor Rear Mounting Hole Diagonal Dimension
Dimension b=1,380 mm (54.3 in)

Front Floor Rear Mounting Hole to Front Floor Rear Mounting Hole Dimension
Dimension c=1,085 mm (42.7 in)



Rear End Panel Mounting Hole to Rear End Panel Mounting Hole Dimension
Dimension a=1,228 mm (48.3 in)

Middle Floor Panel Mounting Hole to Middle Floor Panel Mounting Hole Dimension
Dimension b=759 mm (29.9 in)

Rear Shock Absorber Datum Hole to Rear Shock Absorber Datum Hole
Dimension c=1,052 mm (41.4 in)

12.12.2 Description and Operation

12.12.2.1 Safety Instructions

When carry out body sheet metal repairs, you must strictly follow the safety instructions as below:

1. When carry out body sheet metal welding, cutting, grinding operation, you must wear protective clothing, protective goggles, gloves and working shoes.
2. The welding area must be well ventilated.
3. Before carry out welding, you must disconnect the battery negative cable and cover the battery negative terminal.
4. If a spark may be produced when carry out welding near a battery, you must remove the battery.
5. Before remove vehicle components, you must lift and support the vehicle on a hoist to avoid the vehicle gravity center changing affecting operational safety.
6. When connect the welding equipment ground cable directly to the parts to be welded, you must ensure that no conductive parts between ground and the welding spot.
7. The ground cable and the welding electrodes must not come into contact with the electronic control unit or the wires.
8. An unprotected vehicle must not be parked in the welding repair area, as the welding sparks could trigger a fire, damage to the vehicle body paint or the windows.
9. When grinding or welding near a fuel tank or other fuel containers, you must be extra careful and remove any suspicious components that may affect the safety.
10. You must not weld, braze or solder any components of refrigerant air conditioning systems, or weld components that may cause air-conditioning system temperatures rise, as this may lead to air-conditioning system explosion. If the refrigerant hose must be near the welding area, you must recycle refrigerant, as welding generated ultraviolet is not visible and will penetrate the refrigerant hose causing refrigerant decay.
11. When carry out airbag system calibration, you must disconnect battery negative cable. The airbag components ambient temperature must not exceed 100°C (212 ºF).

12.12.2.2 The State of Parts

Before deliver the repaired vehicle or components to the paint shop for painting, all the surface must be even, all the seals must be filled and the surface must be polished with sand paper. The preparation process must be completed by the sheet metal repair technician. Body and floor components are mainly formed by steel pressing, so the damaged components must be restored with the same approach. If a damaged component can not be restored, its adjacent components should be adjusted. Remove the damaged component. Replace components to protect the integral structure. Do not cut a single component, as cutting and welding will affect the vehicle body stiffness, driving safety and maintenance convenience.

12.12.2.3 Welding Types Description

Commonly used welding types are spot welding, gas shielded welding and brazing. During spot welding, you must not reduce the number of solder joints. If the spot welding can not be used, drill and use gas-shielded welding. When using spot welding, if it is to connect three-layer panels, only replace the outer panel, then weld on the original solder joints. When using spot welding, you can weld single seam, double seams, double biased seams. When using gas-shielded arc welding, you can carry out overlap welding, continuous welding and intermittent welding. Brazing is commonly used in welding and repair low tensile strength components, or areas with small thickness.

12.12.2.4 Anti-Corrosion Treatment

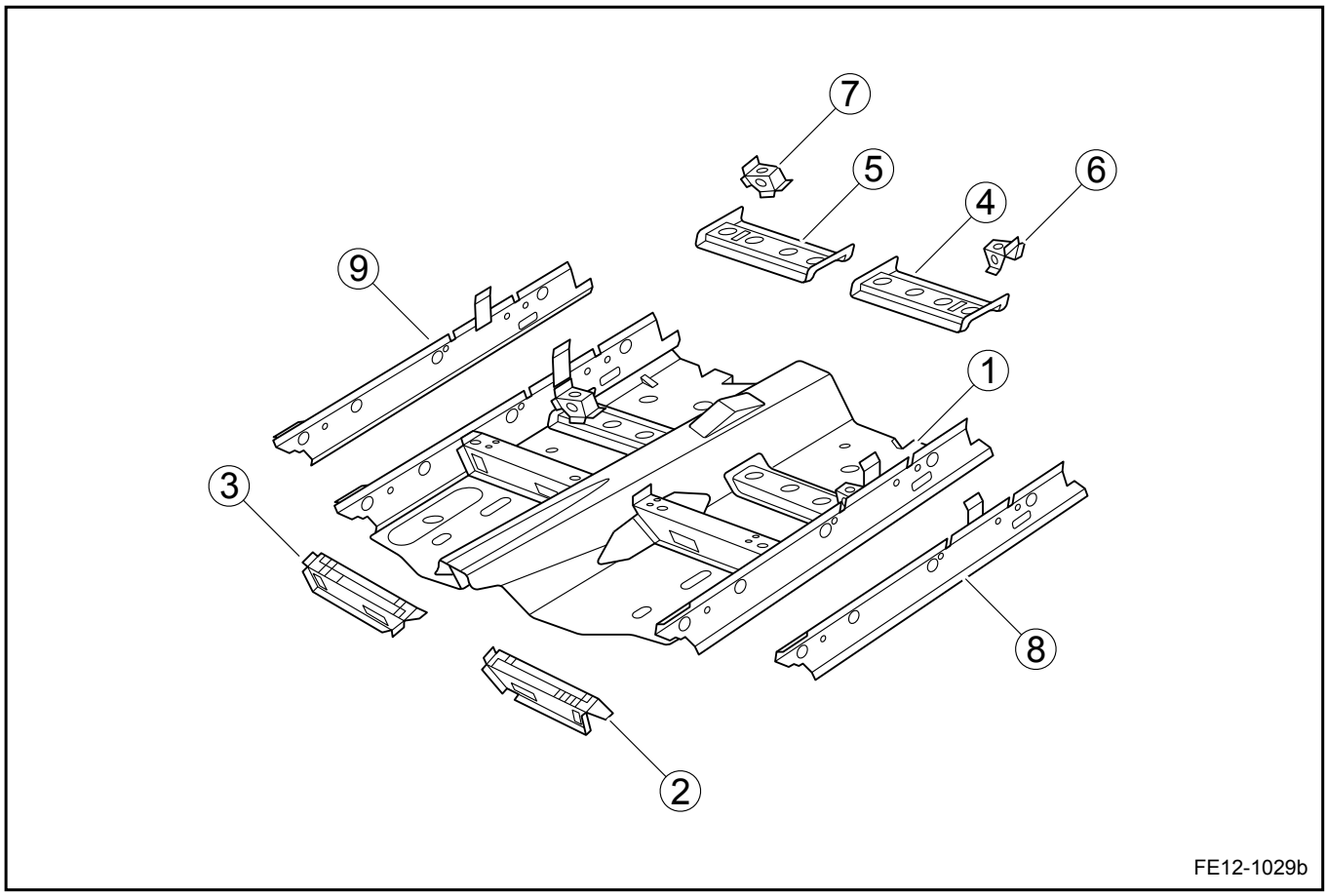
1. After repair, you must use approved materials to restore the anti-corrosion coating .
2. Before apply the sealant, all welding seams must be coated with primer inside and outside.
3. Primer coated metal sheet panels must be applied with sealant.
4. Overlapping pieces of sheet metal, metal edge, welding joints and weld seams must be applied with sealant.
5. The vehicle underbody must be applied with long lasting coating agent.
6. After spray painting, you must use cavity protection materials to treat cavities in the area.
7. After the cavity protective material is dry, clean the water ducts.

12.12.2.5 Scrapped Components Environmentally Friendly Disposal Approach

1. After maintenance or repair, collect different type of waste materials separately.
2. Separate the waste materials and check whether the materials can be reused.

12.12.3 Disassemble View

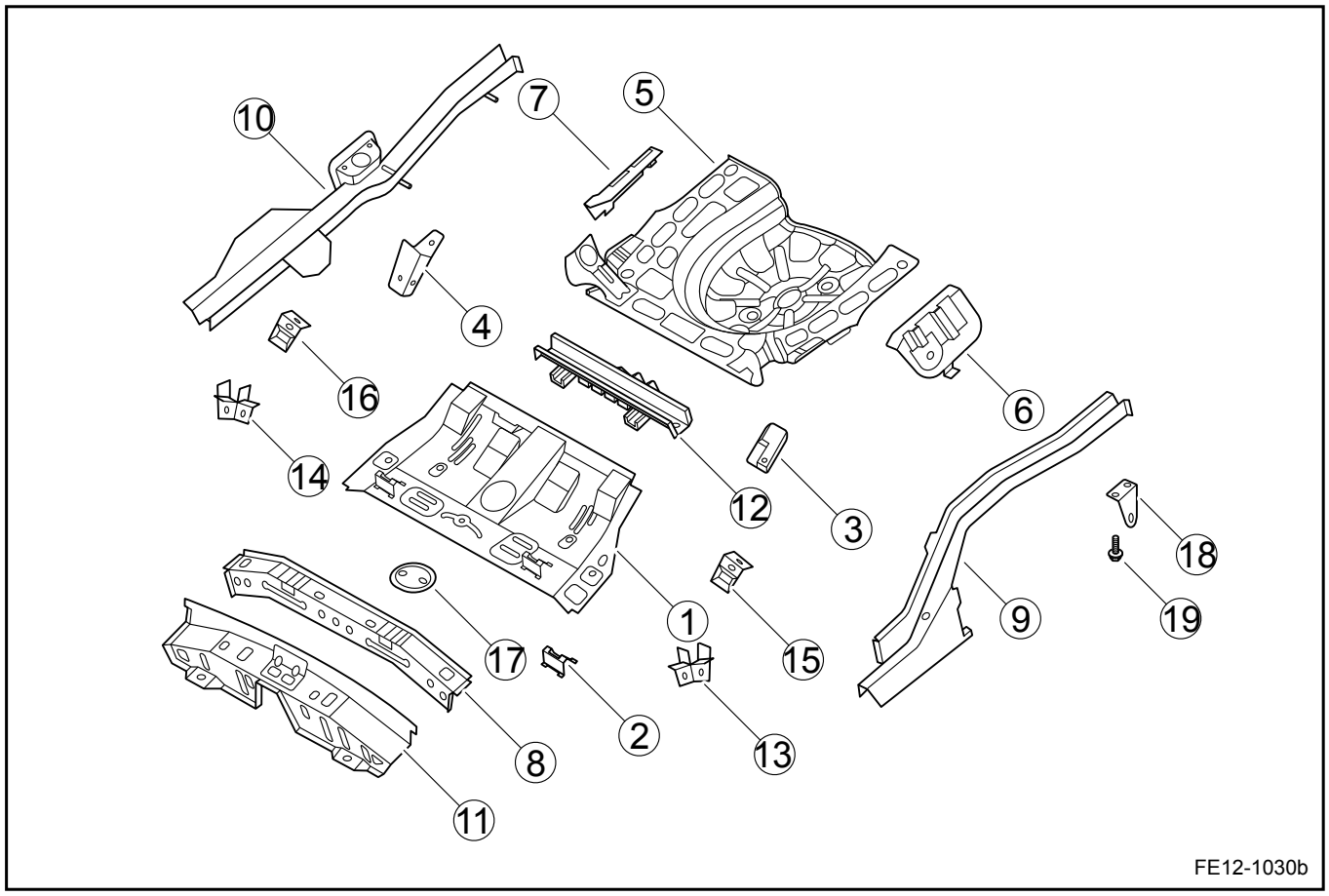
12.12.3.1 Front Floor



Legend

1. Front Floor Assembly
2. Left Upper Panel Assembly I
3. Right Upper Panel Assembly I
4. Left Upper Panel II
5. Right Upper Panel II
6. Left Front Seat Bracket Assembly
7. Right Front Seat Bracket Assembly
8. Left Body Side Outer Panel Assembly
9. Right Body Side Outer Panel Assembly

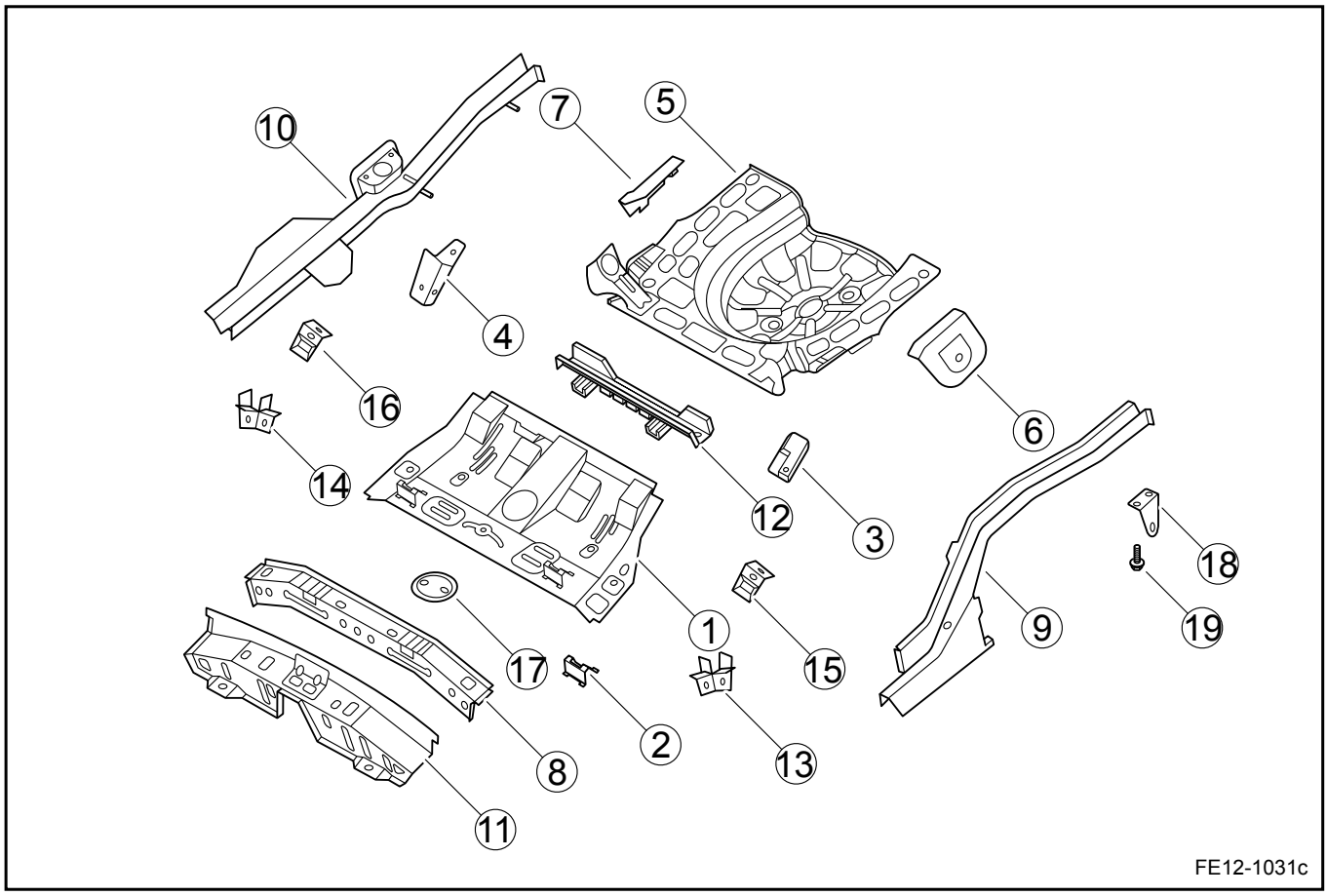
12.12.3.2 Body Rear Floor (Sedan)



Legend

1. Middle Floor Assembly
2. Rear Seat Bracket
3. Middle Floor Seat Left Support
4. Middle Floor Seat Right Support
5. Rear Compartment Floor Assembly
6. Rear Compartment Left Side Panel Assembly
7. Rear Compartment Right Side Panel Assembly
8. Middle Floor Rear Seat Cross Panel Assembly
9. Middle Floor Left Side Panel Assembly
10. Middle Floor Right Side Panel Assembly
11. Middle Floor Front Cross Panel Assembly
12. Middle Floor Cross Panel Assembly
13. Left Rear Suspension Bracket Assembly
14. Right Rear Suspension Bracket Assembly
15. Left Rear Suspension Reinforcement Bracket Assembly
16. Right Rear Suspension Reinforcement Bracket Assembly
17. Middle Floor Fuel Tank Inspection Cap
18. Rear Towing Bracket
19. Hex Head Bolt and Flat Pad Assembly (Domestic)
    Hex Head Bolt and Washer Assembly M12 × 1.25 × 30 (Export)

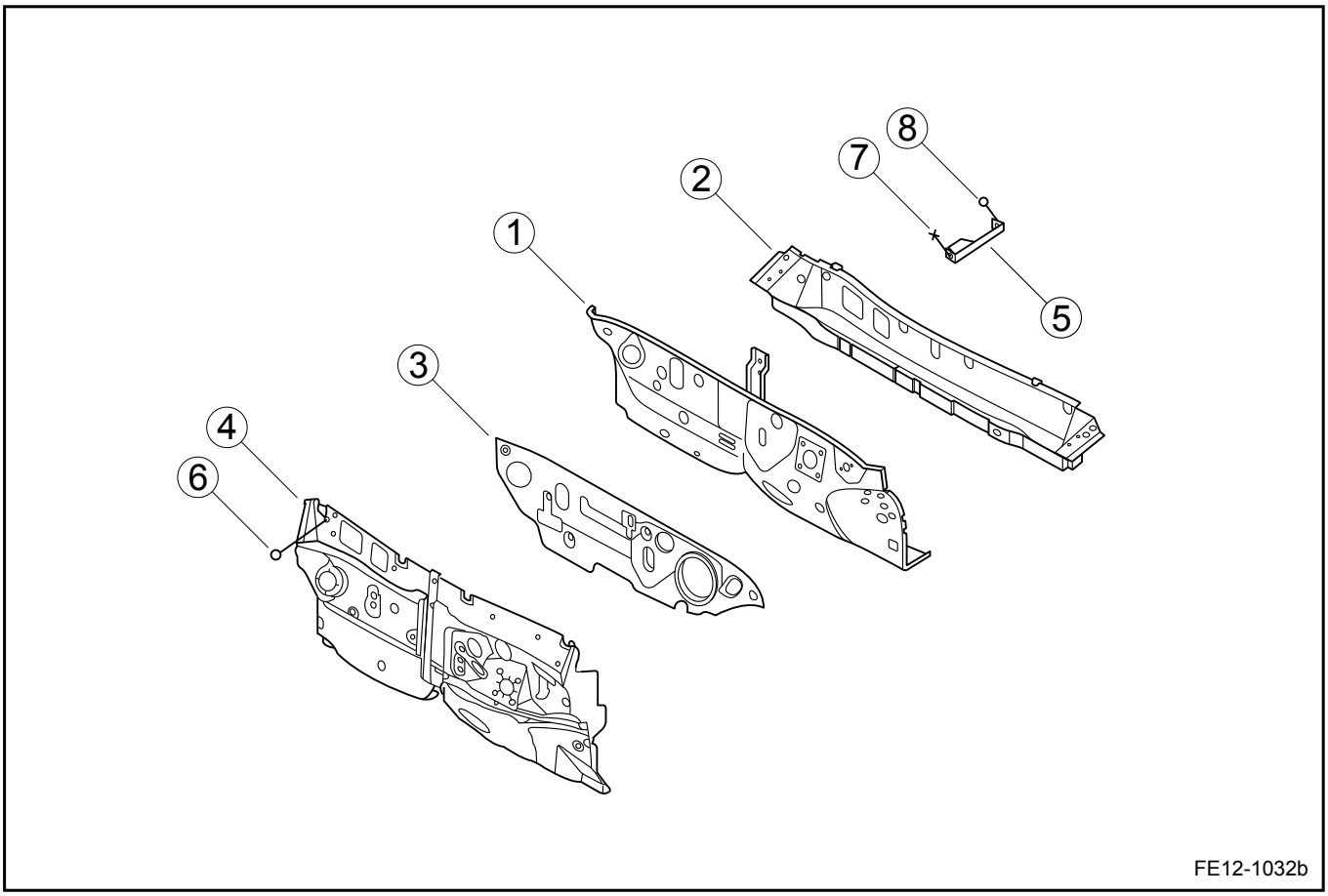
12.12.3.3 Body Rear Floor (Hatchback)



Legend

1. Middle Floor Assembly
2. Rear Seat Bracket
3. Middle Floor Seat Left Support
4. Middle Floor Seat Right Support
5. Rear Compartment Floor Assembly
6. Rear Compartment Left Side Panel Assembly
7. Rear Compartment Right Side Panel Assembly
8. Middle Floor Rear Seat Cross Panel Assembly
9. Middle Floor Left Side Panel Assembly
10. Middle Floor Right Side Panel Assembly
11. Middle Floor Front Cross Panel Assembly
12. Middle Floor Cross Panel Assembly
13. Left Rear Suspension Bracket Assembly
14. Right Rear Suspension Bracket Assembly
15. Left Rear Suspension Reinforcement Bracket Assembly
16. Right Rear Suspension Reinforcement Bracket Assembly
17. Middle Floor Fuel Tank Inspection Cap
18. Rear Towing Bracket
19. Hex Head Bolt and Flat Pad Assembly (Domestic)
    Hex Head Bolt and Washer Assembly M12 × 1.25 × 30 (Export)

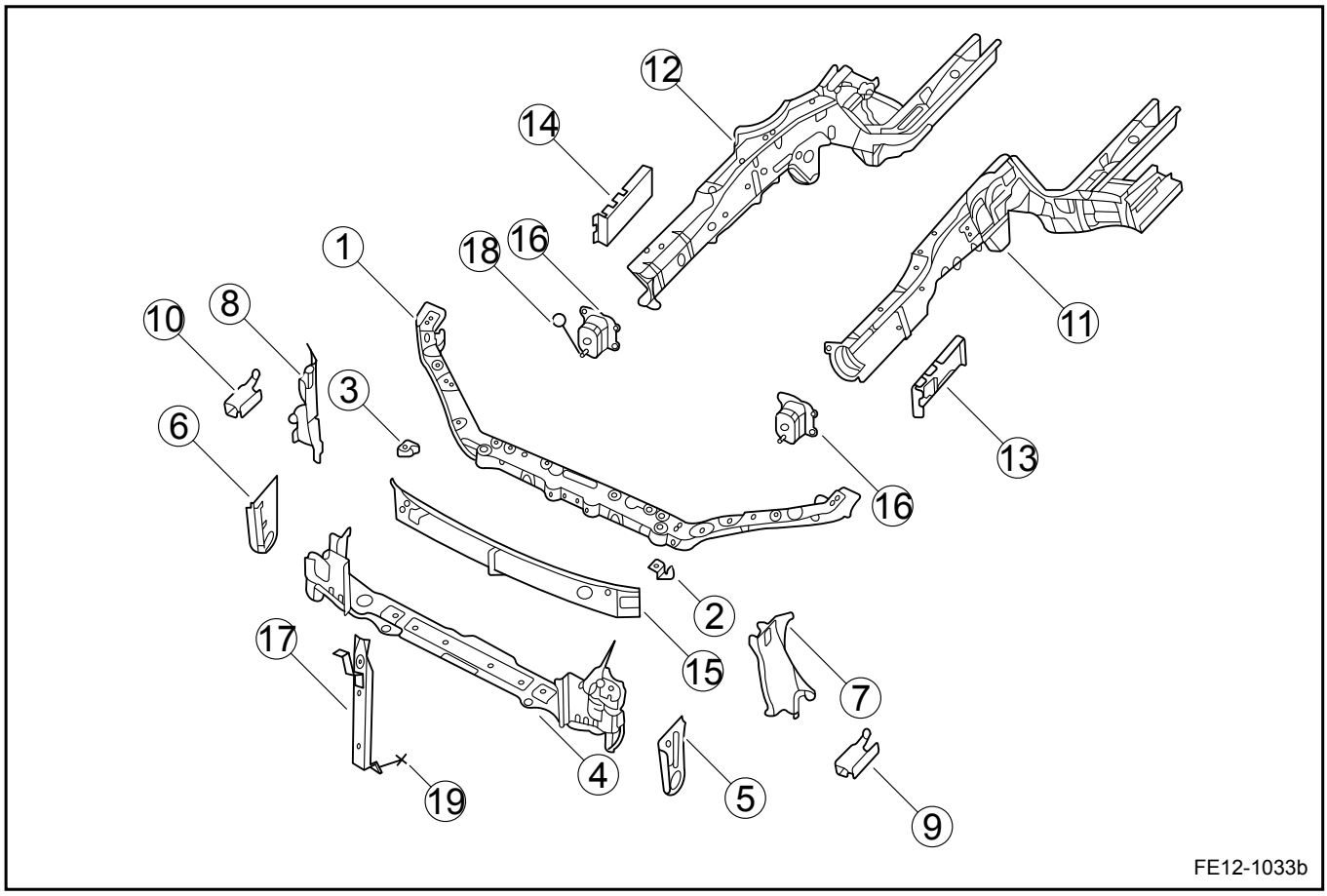
12.12.3.4 Firewall



Legend

1. Passenger Compartment Lower Front Panel Assembly
2. Passenger Compartment Upper Front Panel Assembly
3. Passenger Compartment Front Panel Outer Heat Insulator
4. Passenger Compartment Front Panel Outer Sound Insulator
5. GPS Mounting Panel Assembly
6. Clip
7. Hex Head Bolt and Washer Assembly (Domestic)
8. Hex Head Bolt and Washer Assembly (Export)
9. Hex Flange Nut (Domestic)
10. Hex Flange Nut (Export)

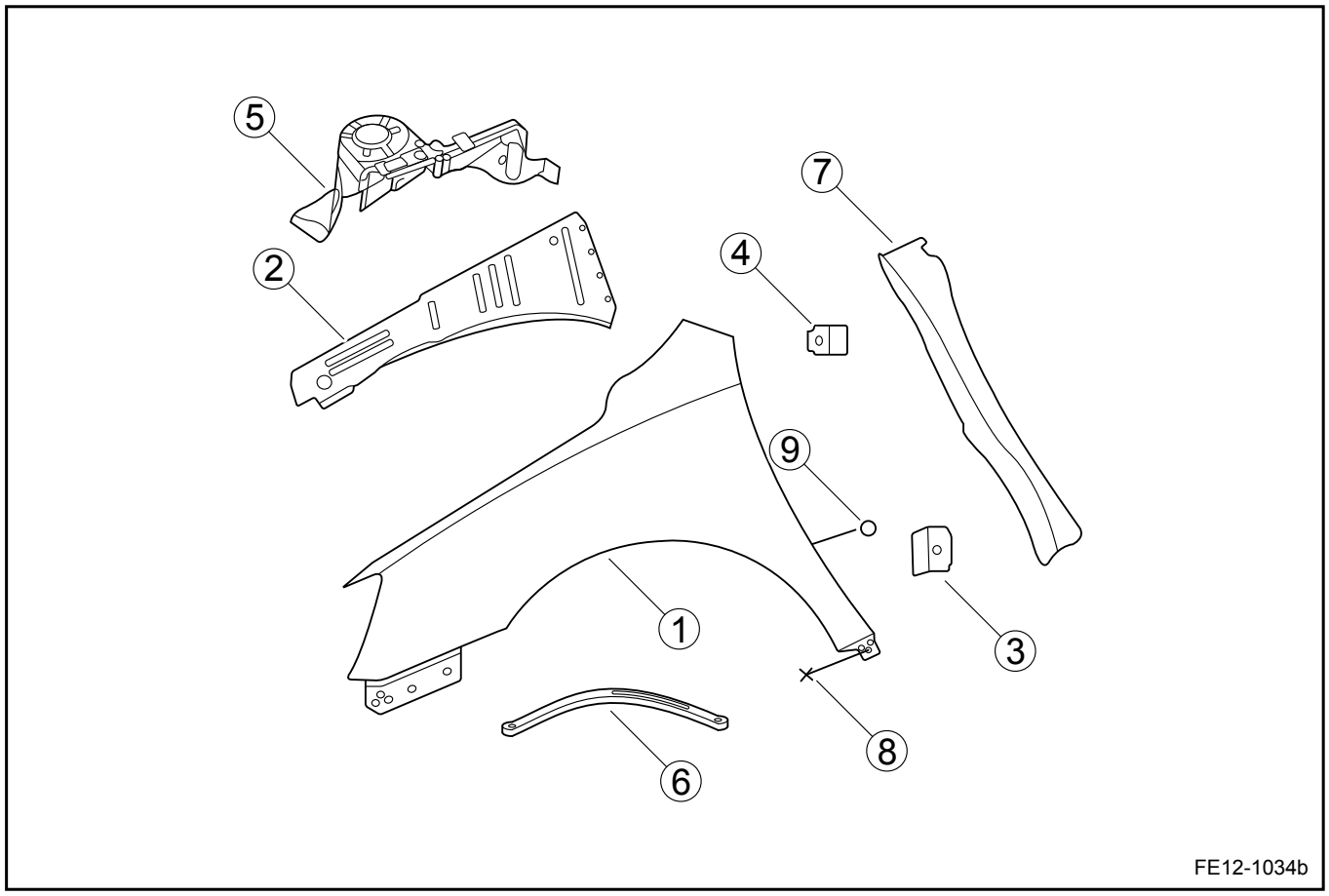
12.12.3.5 Engine Compartment



Legend

1. Radiator Upper Panel Assembly
2. Radiator Upper Panel Left Bracket Assembly
3. Radiator Upper Panel Right Bracket Assembly
4. Radiator Lower Panel Assembly
5. Left Front Towing Hook Panel
6. Right Front Towing Hook Panel
7. Radiator Cross Panel Left Support
8. Radiator Cross Panel Right Support
9. Left Front Headlamp Mount Panel
10. Right Front Headlamp Mount Panel
11. Left Front Side Rail Assembly
12. Right Front Side Rail Assembly
13. Left Front Side Rail Front Side Panel
14. Right Front Side Rail Front Side Panel
15. Front Cross Panel Assembly
16. Front Cross Panel Energy Absorbing Panel
17. Radiator Center Support
18. Hexagon Flange Nut
    Hex Flange Nut (Export)
19. Hexagon Head Bolt, Washer and Spring Washer Assembly (Domestic)
    Hexagon Head Bolt, Washer and Spring Washer Assembly (Export)

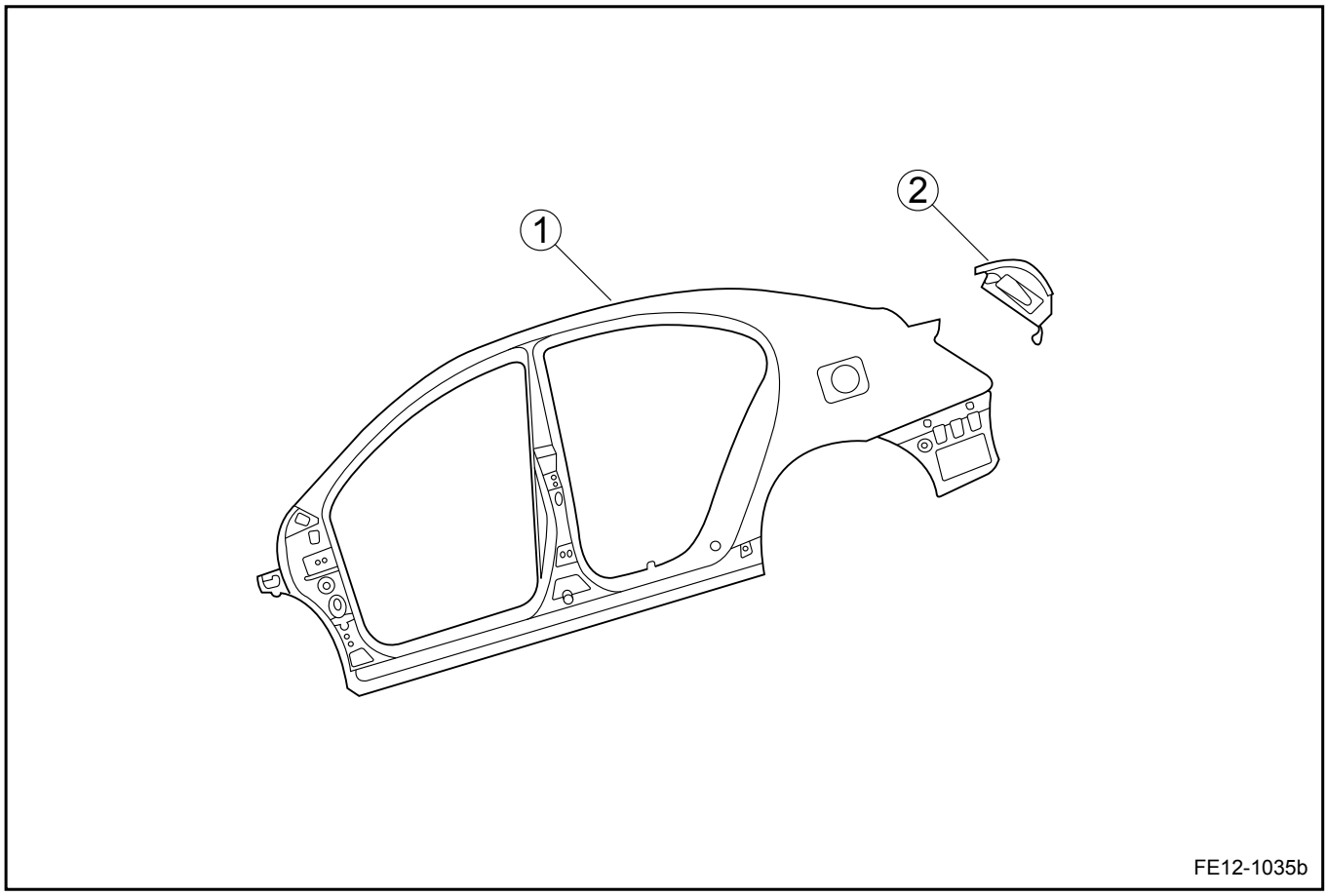
12.12.3.6 Front Fender



Legend

1. Left Front Fender
2. Left Front Fender Cover Panel
3. Left Front Fender Lower Mounting Support
4. Left Front Fender Upper Mounting Support
5. Left Front Shock Absorber Mounting Support
6. Left Front Fender Lower Inner Panel
7. Hexagon Flange Bolt (Domestic)
   Hexagon Flange Bolt - Increased Series (Export)
8. Hex Flange Nut (Domestic)
   Hex Flange Nut (Export)

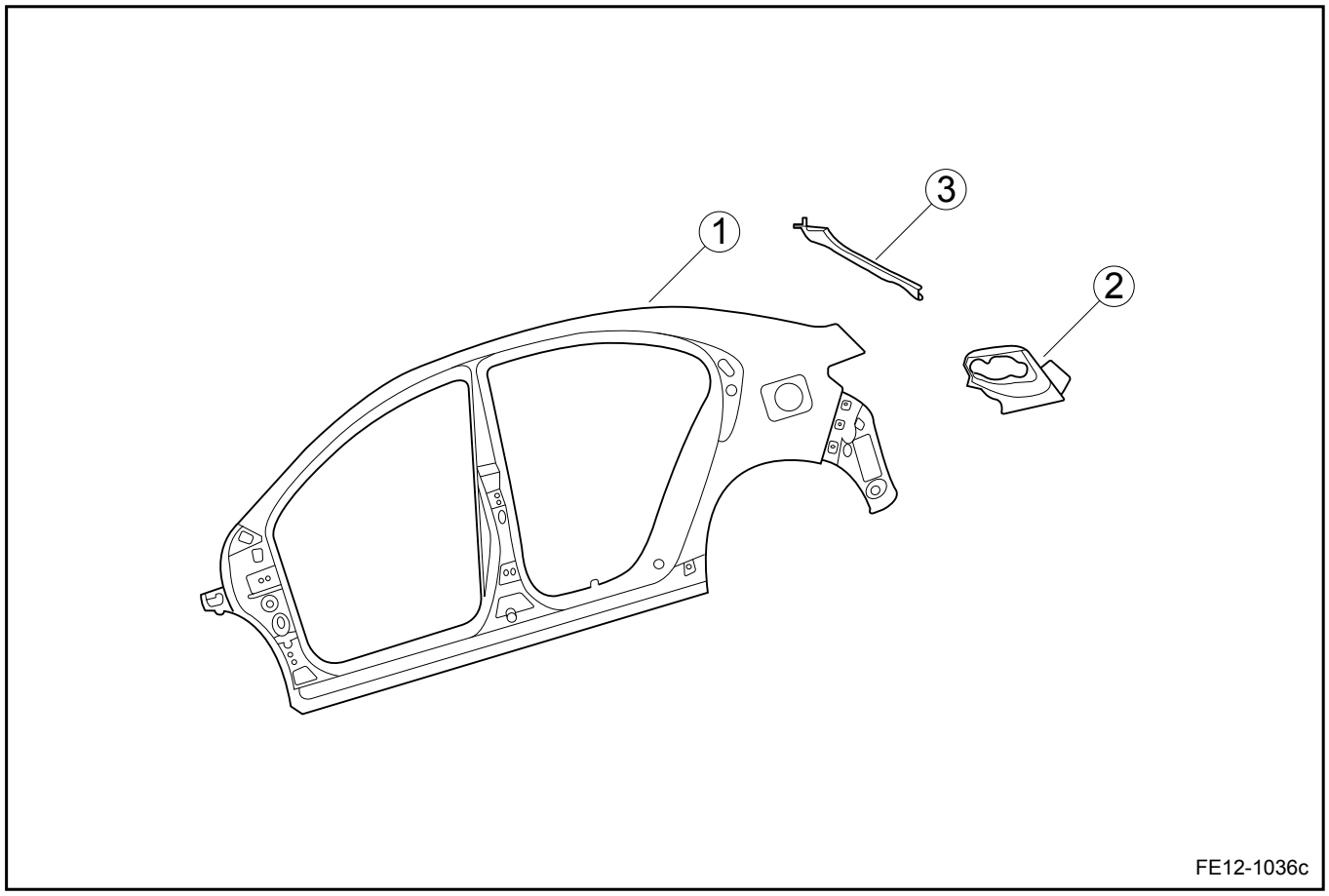
12.12.3.7 Body Side Outer Panel (Sedan)



Legend

1. Left Body Side Outer Panel
2. Left Tail Lamp Mounting Panel

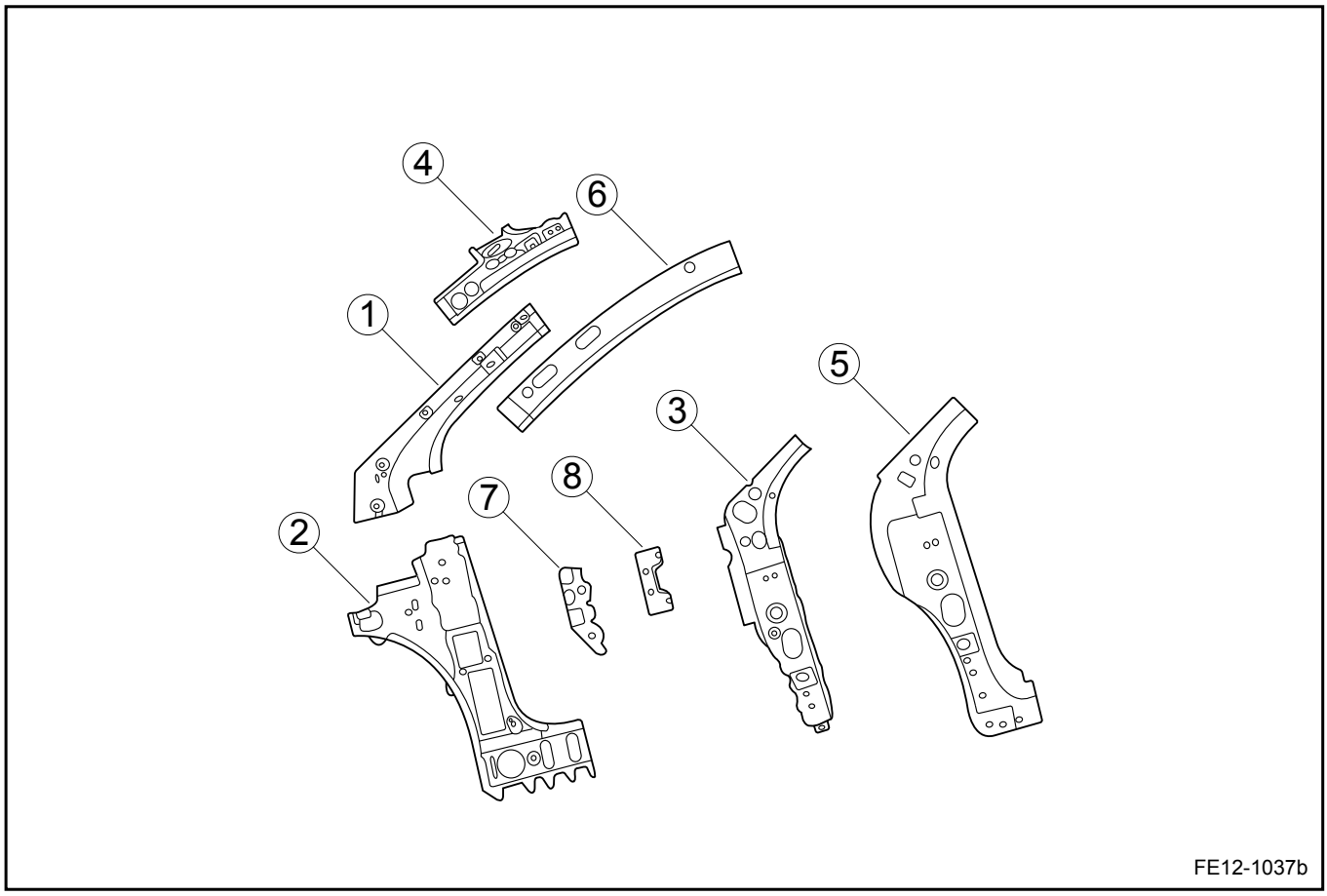
12.12.3.8 Body Side Outer Panel (Hatchback)



Legend

1. Left Body Side Outer Panel
2. Left Tail Lamp Mounting Panel
3. Left Tail Lamp Upper Corner Mounting Panel

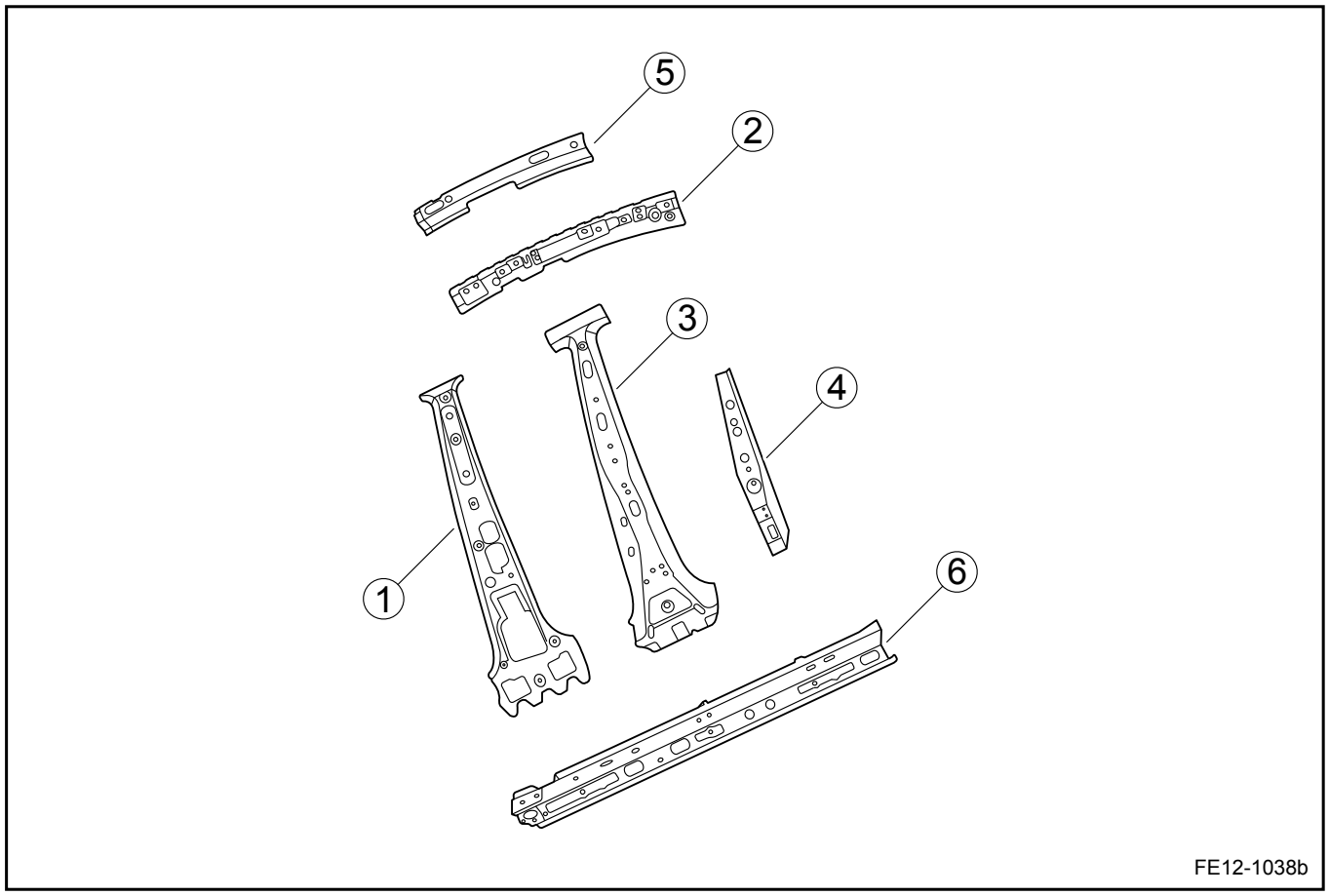
12.12.3.9 Body Front Pillars



Legend

1. Left A-Pillar Inner Upper Panel
2. Left A-Pillar Inner Lower Panel
3. Left A-Pillar Lower Hinge Mounting Panel
4. Left Front Cross Panel Assembly
5. Left A-Pillar Lower Reinforcement Panel
6. Left A-Pillar Upper Reinforcement Panel
7. Left I/P Mounting Panel Reinforcement Panel
8. Left I/P Mounting Panel

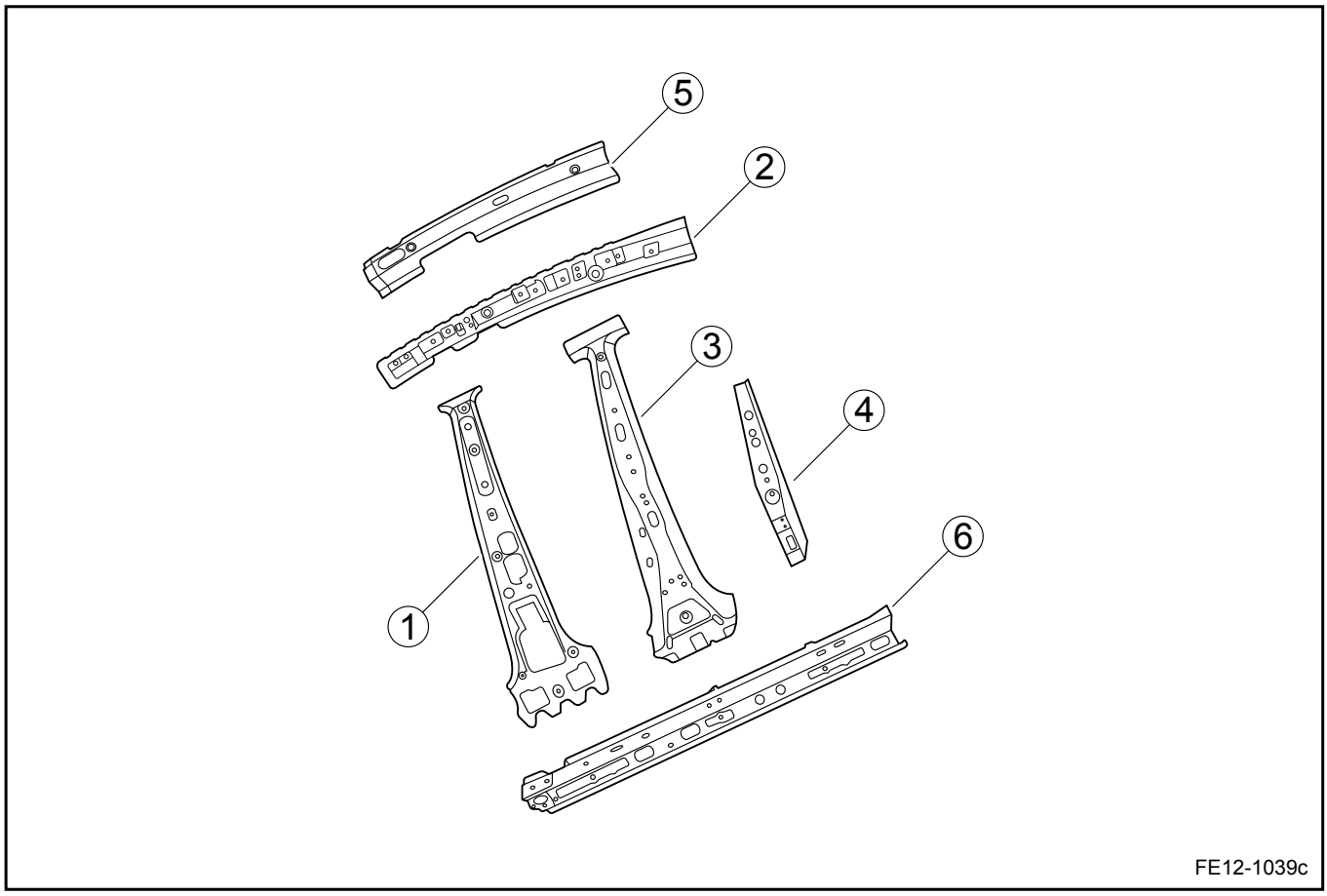
12.12.3.10 Body Middle Pillars (Sedan)



Legend

1. Left Center Pillar Inner Panel Assembly
2. Left Upper Side Panel Assembly
3. Left Center Pillar Outer Reinforcement Panel
4. Left Center Pillar Lower Reinforcement Panel
5. Left Upper Side Panel Reinforcement Panel
6. Left Rocker Panel Reinforcement Panel

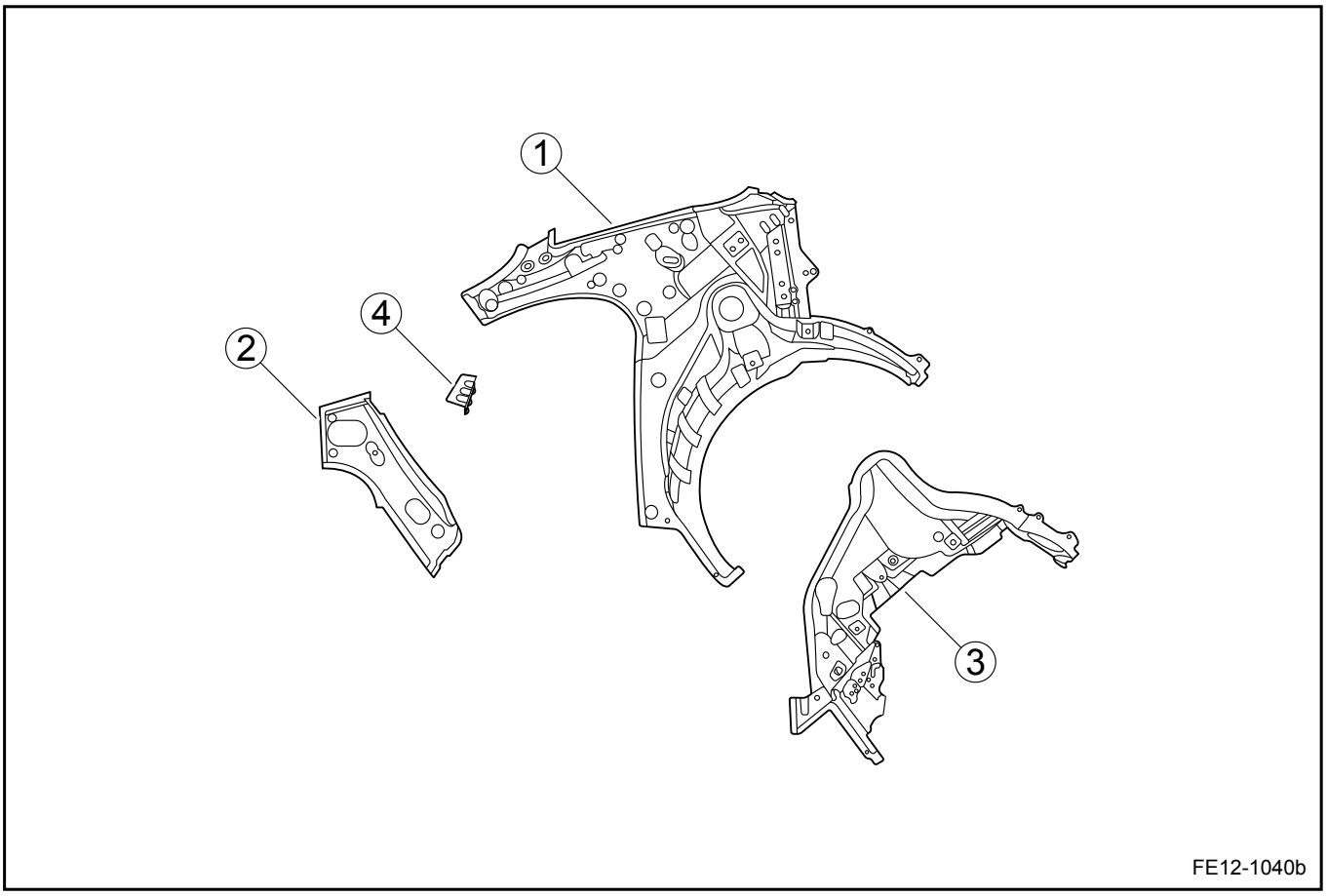
12.12.3.11 Body Middle Pillars (Sedan)



Legend

1. Left Center Pillar Inner Panel Assembly
2. Left Upper Side Panel Assembly
3. Left Center Pillar Outer Reinforcement Panel
4. Left Center Pillar Lower Reinforcement Panel
5. Left Upper Side Panel Reinforcement Panel
6. Left Rocker Panel Reinforcement Panel

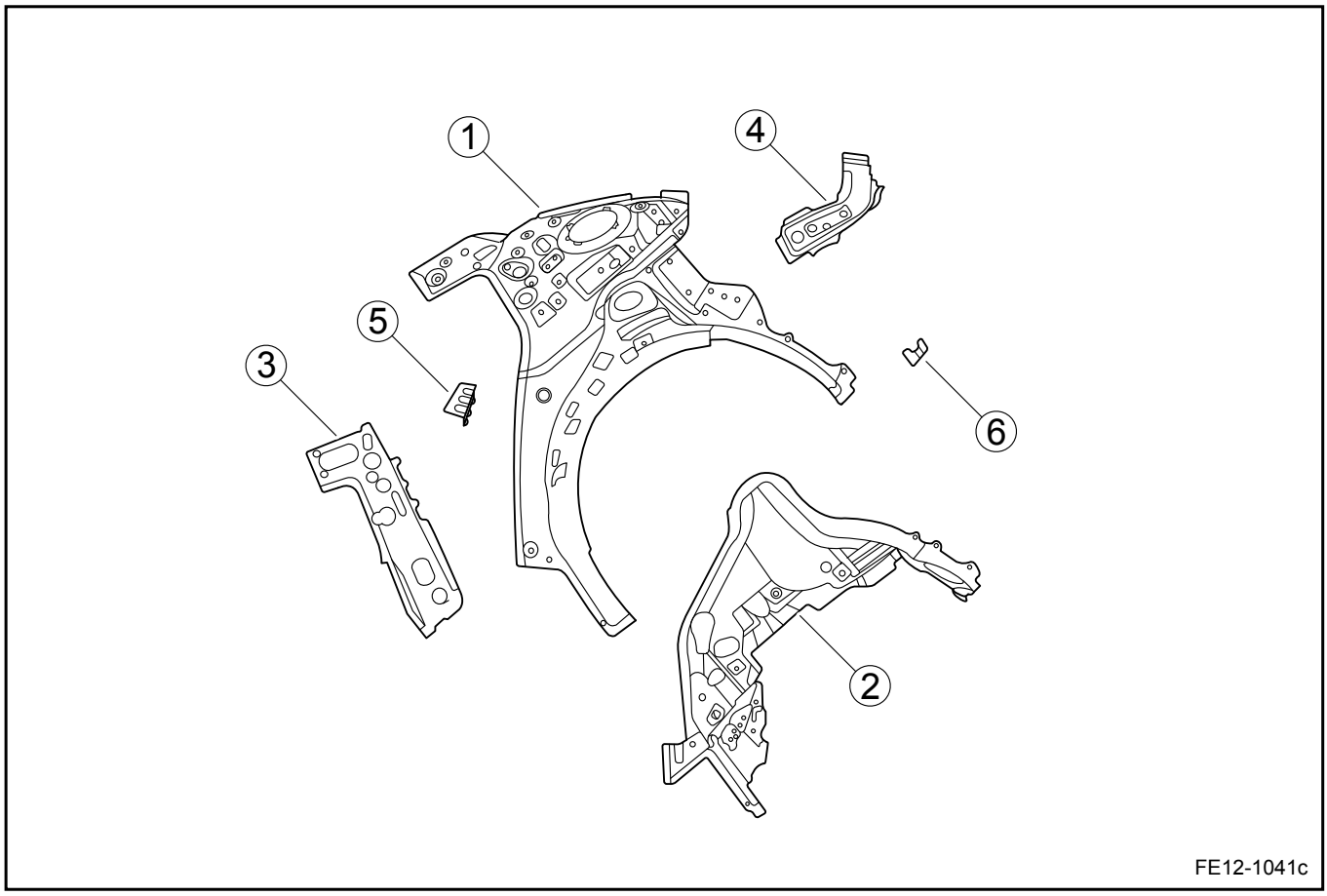
12.12.3.12 Body Rear Pillars (Sedan)



Legend

1. Left Rear Pillar Inner Panel Assembly
2. Left Rear Pillar Reinforcement Panel
3. Left Rear Wheelhouse Panel
4. Left Rear Door Lock Mounting Panel

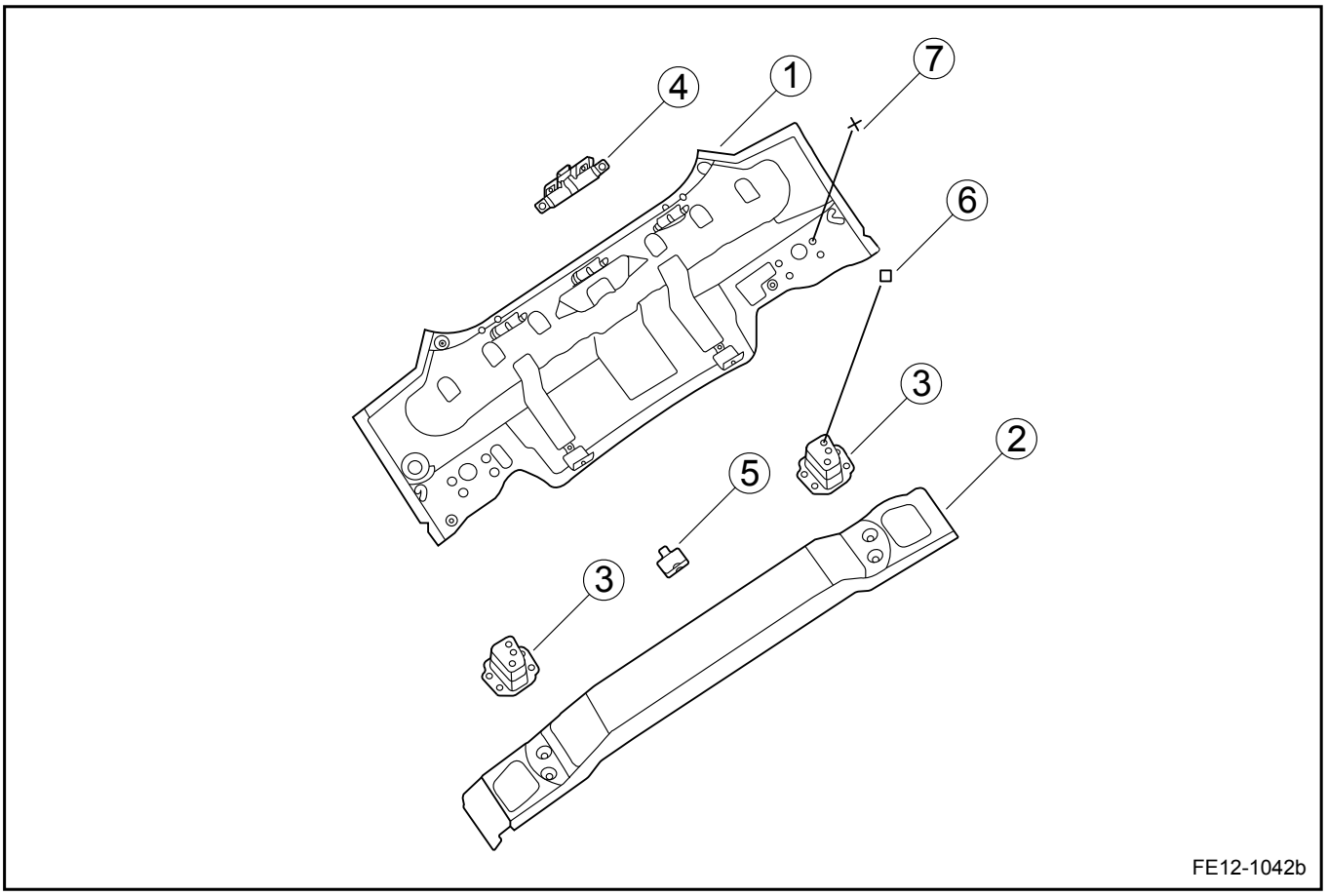
12.12.3.13 Body Rear Pillars (Hatchback)



Legend

1. Left Rear Pillar Inner Panel Assembly
2. Left Rear Wheelhouse Panel
3. Left Rear Pillar 1st Reinforcement Panel
4. Left Rear Pillar 2nd Reinforcement Panel
5. Left Rear Door Lock Mounting Panel
6. Left Rear Bumper Mounting Panel

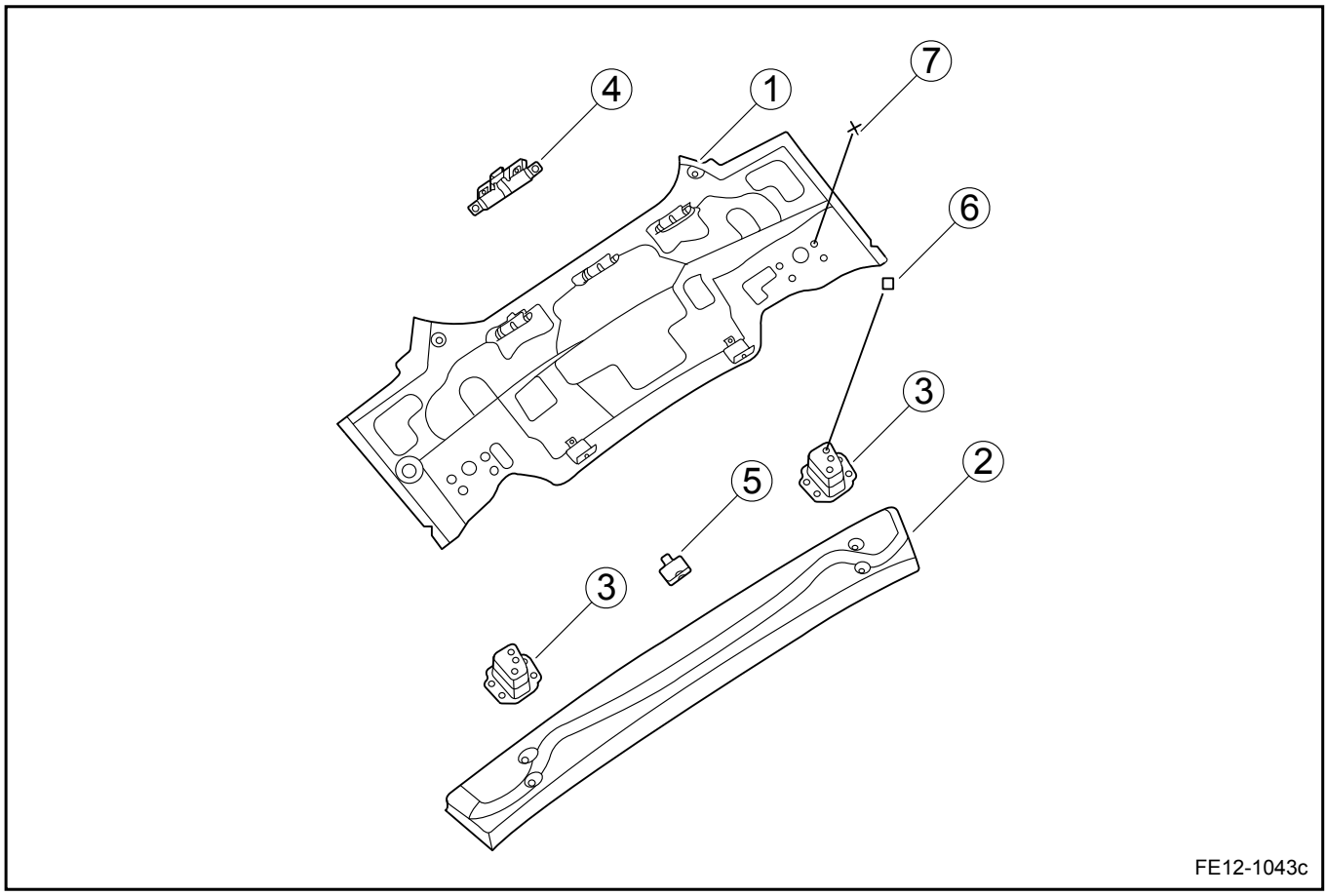
12.12.3.14 Body Rear End (Sedan)



Legend

1. Rear End Panel Assembly
2. Rear Cross Panel Assembly
3. Rear Cross Panel Energy Absorbing Assembly
4. Rear Bumper Mounting Panel
5. Rear Bumper Lower Mounting Panel
6. Hexagon Flange Nut
7. Hex Head Bolt, Spring Washer and Washer Assembly (Domestic)
   Hex Head Bolt, Spring Washer and Washer Assembly (Export)

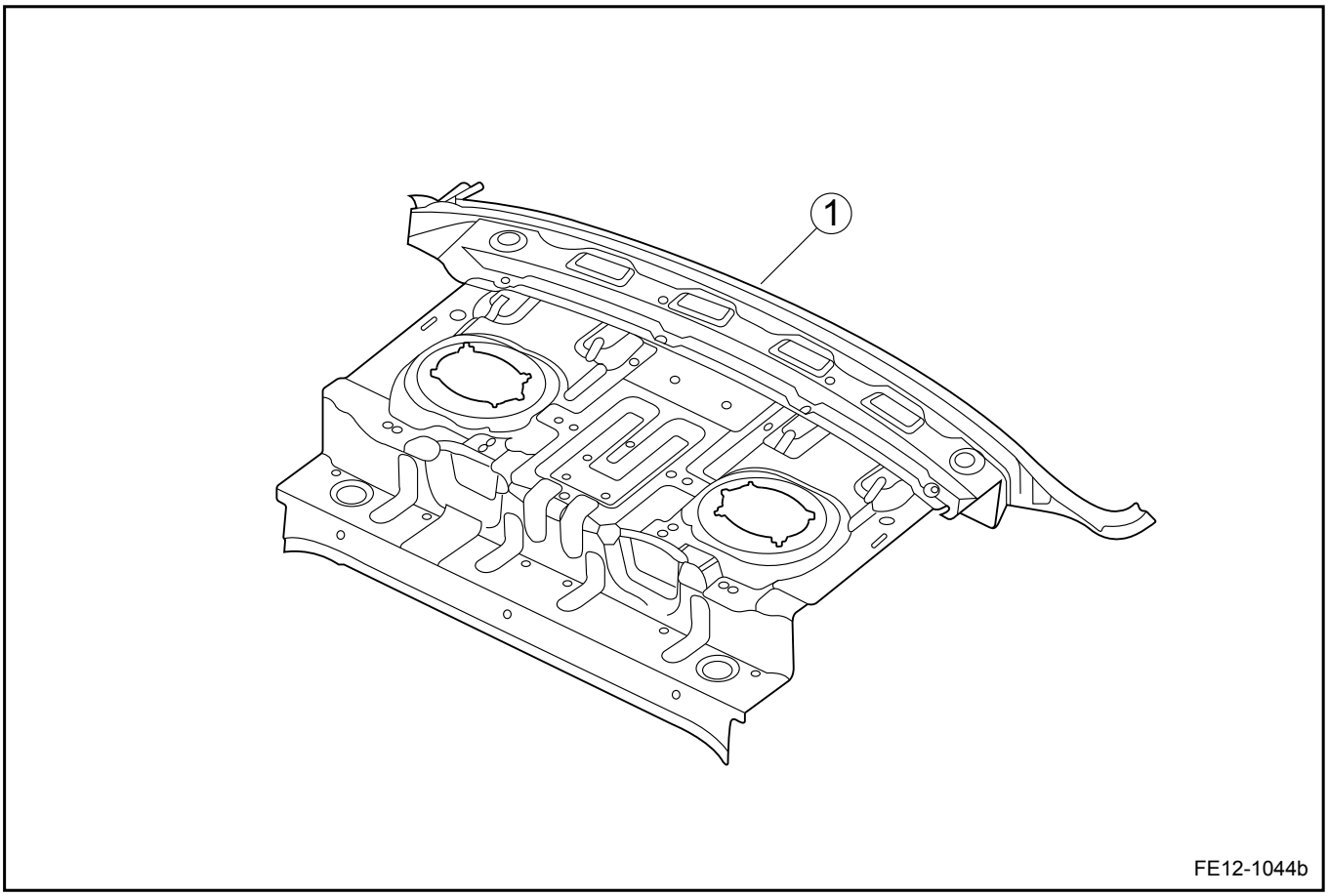
12.12.3.15 Body Rear End (Hatchback)



Legend

1. Rear End Panel Assembly
2. Rear Cross Panel Assembly
3. Rear Cross Panel Energy Absorbing Assembly
4. Rear Bumper Mounting Panel
5. Rear Bumper Lower Mounting Panel
6. Hexagon Flange Nut
7. Hex Head Bolt, Spring Washer and Washer Assembly

12.12.3.16 Rear Parcel Shelf Panel (Sedan)



Legend

1. Rear Parcel Shelf Panel Assembly

12.12.4 Diagnostic Information and Procedures

12.12.4.1 Diagnostic Information and Procedures

Vehicle Diagnostics

In the body repair process, professional technician will use panel calibrator, electronic measurement systems, sheet metal repair machines, welding machines and a variety of cutting tools such as grinding. The repair will ensure that the vehicle will be restored to the original conditions such as geometric dimensions and performance. However, some drive system faults or installation errors that may lead to serious consequences may not be identified in the repair process. Therefore, in addition to make the necessary body geometry inspection, you must pay particular attention to the following components:

- Check to ensure that the steering mechanism and the steering rod can be correctly operated within the wheel turning range. Visual inspect whether there are bent or cracked pieces.
- Check all the running gear components (such as the fork tubes, vertical arm, sliding suspension arm, steering knuckle, stabilizer bar, body frame and the overhang), whether there are bending, distortion and cracking.
- Check whether the wheel and tire are damaged, rotating concentrically and unbalanced. Check tire tread and the sidewalls incisions and tire pressure.
- Check for damages in engine, gearbox and exhaust system mountings.
- Road test to make sure the vehicle's driving performance, and then deliver the vehicle to the customer.

12.12.5 Removal and Installation

12.12.5.1 Removal and Installation

Note

Before remove any key components from the vehicle body, you must use a universal-type body frame correction calibration to correct body, and then determine the damaged components that need to be replaced. Before welding, the parts must be accurately positioned, and then you must measure to ensure that components meet the body dimension requirements. In the welding process, you must measure related dimensions frequently to ensure proper assembly.
Before removal, you must understand the body sheet metal parts correlations. Please refer to the "Body Sheet Metal Parts Map" below. It is not recommended to cut a single part, as cutting and welding will affect the vehicle stiffness, driving safety and maintenance convenience.

Removal Procedure:

1. Remove all the parts relevant to the component that needs to be replaced.
2. Apply sealant and anti-corrosion material when necessary.
3. Locate, mark and drill all the factory solder joints on the component that needs to be replaced.
4. Remove the damaged component that needs to be replaced.
5. Remove material residue.

Installation Procedure:

1. Treat the mating surface when necessary.
2. According to the original welding type, you must choose the correct welding techniques. Use shielded welding at areas that are not convenient for welding. If you choose to plug welding, please drill holes in the new components for plug welding seam. Determine the diameter and spacing according to the original plug weld hole solder joints.
3. Temporarily put the new component on the vehicle.
4. Install the new component with the correct mountings and tighten (correct position the repair board).

5. Frequently measure the location of the new component to ensure that the assembly dimensions are correct.
6. Weld.
7. Clear all welded surfaces.
8. Spray primer.
9. If necessary, spray sealant and anti-corrosion material.
10. Install all the relevant sheet metals and components.

12.13 Paint/Coatings

12.13.1 Specifications

12.13.1.1 Specifications

Refer to the material supplier's technical specifications.

12.13.2 Description and Operation

12.13.2.1 Paint Coating Description

Paint is a liquid mixture. It can be used in a variety of substrates. After the paint is dry, it will form a solid film to protect the substrate and make the exterior more appealing. Vehicles from the factory will already have the following spraying paint, so the vehicle body skins will be corrosion resistant and shining.

1. Electrophoresis Primer
2. Middle Paint
3. Color Paint
4. Lacquer (Transparent Outer Coating)

Electrophoresis Primer Main Functions:

1. Rust-Proof
2. Enhancing Adhesion
3. Providing Filling

Middle Paint Main Functions:

1. Filling
2. Isolation/Tightness
3. Foil Color Paint

Color Paint Main Functions:

1. Adding color
2. Giving Luster

Lacquer Main Functions:

Clear lacquer finish is located in the outermost layer and has the following main functions:

1. Containing anti-UV materials and resistant to the sun's ultraviolet rays.
2. Resistant to environmental dust (acid rain) on the finished surfaces.
3. Resistant to friction.
4. Proving better gloss lacquer.

The requirement for spray paint is to restore the repaired parts to the original conditions. In the repair process, you must strictly follow manufacturer's instructions. Please refer to the12.13.4.4 Rigid Surface Spray Paint Process.

12.13.2.2 Routine Vehicle Paint Maintenance

For routine vehicle paint maintenance, please follow the principles listed below:

1. Do not touch the body paint with a greasy hand or wipe the body paint with a greasy cloth. Do not place a greasy tool on the vehicle body. Do not place a cloth soaked with organic solvent on the vehicle body to avoid chemical reaction.
2. Do not spray paint if the paint surface has no significant scratches, in order to prevent paint mismatching.
3. A long-term parked vehicle should be parked in the garage or a well-ventilated place. Cover the vehicle body with a specialized cover in winter. Choose a cool place for temporary parking.
4. Avoid strong impact, knocking and scratches on the body paint. If paint damage, dent or peeling is found, repair the paint work immediately ideally at a Geely authorized service station.
5. Clean the body decorative parts with a good quality detergent. Do not apply excessive wax, to avoid penetrating paint and reveal the paintwork. For some special highly corrosive traces (such as asphalt, bird droppings, insects, etc.), remove immediately. In this regard, clean the surface with special cleaning agents. Do not scrap with a blade or use gasoline, to avoid damage to the paint.
6. Before and after use the vehicle, remove the dust on the body to minimize the static electricity dust attached to the vehicle body.
7. After the rain, rinse the vehicle body. After the rain, the rain drops on the vehicle body will gradually reduce, so the concentration of acid will increase gradually. If you do not rinse with water, over time the water stains will damage the paintwork.
8. Wash the vehicle after the engine cools down. Do not wash the vehicle in the hot sun or high temperatures, to avoid leaving behind traces of dried cleaning agent. Wash the vehicle with special washing agent. Do not use strong alkaline detergent or soap water to prevent washing off oil paint or speeding up the paint aging. If washing the vehicle in a car washing place, prevent car wash workers using de-waxing detergent, to avoid damage to the paint. If driving in coastal or polluted areas, wash the vehicle once a day.
9. Use clean soft cloth or sponges to wipe the vehicle to prevent the mixing of metal debris and sand. Do not use dry cloth, dry towel or dry sponge cleaning in order to avoid scratches. Wipe the vehicle body along the direction of flow gently from top to bottom. Do not wipe in circles and in horizontal direction.

10. Apply wax to protect the paint from time to time on a regular basis (quarterly) at a Geely authorized service station, to restore the body gloss finish. In addition, paint protection film can be used. 3M paint protection film (Rhino skin) is a colorless transparent paint protection film, with super toughness. It can be used to protect the vehicle bumper, hood, front and rear doors, mirrors and other paint surfaces to protect the car from a minor collision or paint scratch.

12.13.2.3 Warnings and Notices in the Paint Mixing and Spray Paint Operations

Warning!

In the paint mixing and spray paint process, the solvent vapor can cause severe respiratory diseases. The paint, equipment and safety devices manufacturers operation instructions must be strictly followed. To carry out the operation, the technician should wear special labor protection supplies, such as gas masks, anti-static clothing, protective goggles and gloves, to prevent injury.

Note

Do not use different manufacturers' paint and replacement products together. Mixing incompatible products will cause the following:

1. Primer layer peeling
2. Poor bonding between different layers of coating
3. Cure insufficiently
4. Reduced gloss
5. Poor color accuracy
6. Coating damage (pits, bubbles, orange peel-like tarnish).

12.13.2.4 Clear coats Maintenance and Repair Notices

Note

1. Avoid washing the vehicle in direct sunlight.
2. Avoid using strong soaps and chemical detergents.
3. Use brush-less automatic car wash equipment.
4. Avoid using acid and alkali products.
5. Do not use a brush or a broom to clear snow or ice.
6. After thoroughly cleaning, immediately wipe clean water stains. Do not leave the water stains dry on the surface. Recommend using soft chamois leather to wipe the surface dry.
7. When the defects on the surface can be eliminated by polishing, polish the vehicle body.
8. If the surface conditions are not serious, the repair area should be kept as small as possible.
9. Avoid applying excessive clear lacquer, as it may lead to paint premature damage.
10. Strictly follow the polishing equipment manufacturer's recommendations when using an electric polishing equipment. Do not use wax or silicone products to cover a swirl mark (it will soon be revealed and lead to customer's complaint).

12.13.2.5 Anti-Corrosion Treatment Notices

Note

1. When spraying sound insulation or anti-corrosion material, you must take preventive measures to avoid spraying into the open components (such as door locks, window channel, window regulator and the seat belt retractor), any moving parts, rotating parts, especially the parking brake pull cable. After spraying, ensure open all the body discharge holes.
2. When repair body with a naked flame, you must remove the foam insulation materials. Re-install sound insulation material to avoid inhaling harmful dust.
3. When carrying out this operation, you should wear special protective goggles and gloves to prevent injury.
4. Before the vehicle leaving the factory, the electro-coating paint were carried out on the body sheet metal. After repair and/or replacement, all exposed metal surfaces must be treated with anti-rust primer.
5. If during the welding or heating operation, the original coatings or anti-corrosion materials are burnt, the surfaces must be cleaned and treated with anti-corrosion materials.
6. Collision repair will expose metal panels, so these metal surfaces must be applied with special anti-corrosion materials.

7. The sealant can prevent water and dust entering the vehicle, and it also has anti-corrosion function. The original sealed joints are apparent. If they are damaged, they should be corrected by re-sealing. The new joints should be re-sealed. The sealant must maintain flexibility after curing and painting. Openings joints should be filled with high viscosity filler. Follow the selected materials instructions.
8. Insulation materials can control the general noise level inside the vehicle. When the insulator is damaged during repair, replace it with the same material.

12.13.3 Diagnostic Information and Procedures

12.13.3.1 Common Paint Defects and Treatment

Note

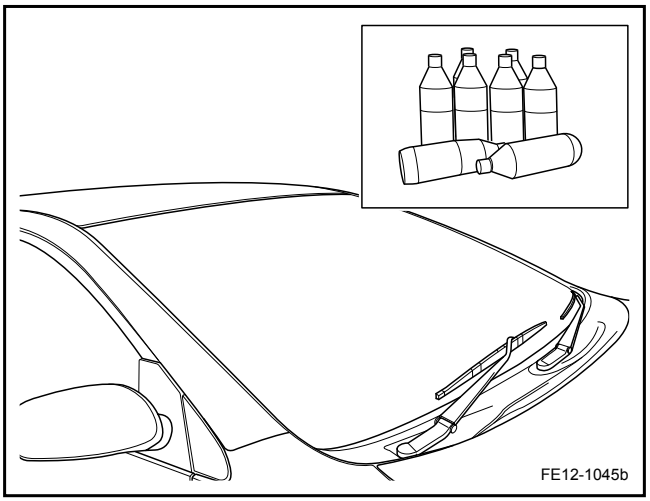
Adding black box in the table indicates the treatment.

Defects	Causes	Treatment
Powder	1. Film subject to strong erosions, such as the strong ultraviolet radiation. 2. Incorrect ratio in the paint mixture. 3. Coating low resistance to sun and bad weather. 4. Vehicle is not cleaned regularly or thoroughly. 5. Incorrect choice of car cleaning agents or polishing wax too coarse.	1. Polishing 2. Conventional grinding and polishing 3. Deep grinding and finesse polishing 4. Local paint repair
Plastic Paint Peeling	1. Poor adhesion between the coating and the substrate or outer coating too hard 2. Coating too thick or erosion caused by water vapor, acid and alkali in the air 3. Under coating treated incorrectly; pinholes and defects in the outer paint layer	1. Polishing 2. Conventional grinding and polishing 3. Deep grinding and finesse polishing 4. Local paint repair
Cracking	1. Primer inadequately stirred 2. Spray paint too thick 3. Middle coating too thick	1. Polishing 2. Conventional grinding and polishing 3. Deep grinding and finesse polishing 4. Local paint repair
Bird Droppings Erosion	1. Bird droppings erosion	1. Polishing (mild erosion) 2. Conventional grinding and polishing (medium erosion) 3. Deep grinding and finesse polishing 4. Local paint repair (severe erosion)
Scratch	1. Film with low hardness 2. Hard objects scratch	1. Polishing (minor scratches) 2. Conventional grinding and polishing (thick scarring) 3. Deep grinding and finesse polishing 4. Local paint repair (scratched)

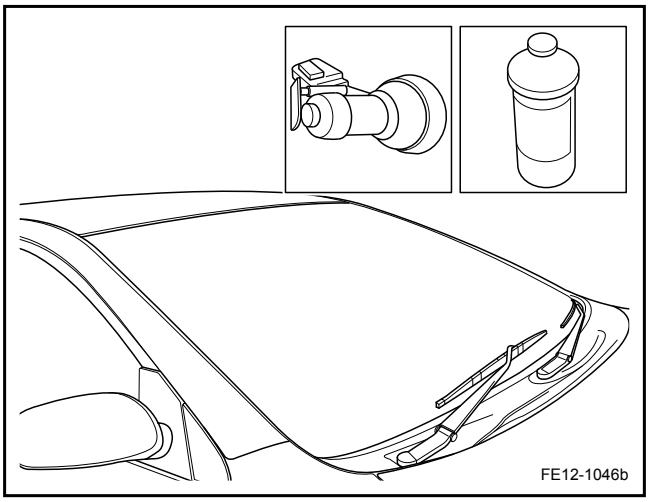
Defects	Causes	Treatment
Corrosion	1. Thin film edges 2. Corrosion at minor collided areas 3. Acid and alkali erosion	1. Polishing 2. Conventional grinding and polishing 3. Deep grinding and finesse polishing 4. Local paint repair (serious rusted metals need to be repaired before painting)
Paint Peeling	1. Poor adhesion between the coating and the substrate or outer coating too hard 2. Coating too thick or erosion caused by water vapor, acid and alkali in the air 3. Under coating treated incorrectly 4. Pinholes and defects in the outer paint layer	1. Polishing 2. Conventional grinding and polishing 3. Deep grinding and finesse polishing 4. Local paint repair (serious rusted metals need to be repaired before painting)
Acid Rain Erosion	1. Acid rain erosion	1. Polishing (mild erosion) 2. Conventional grinding and polishing (medium erosion) 3. Deep grinding and finesse polishing 4. Local paint repair (severe erosion)
Gloss	1. Film eroded by the acid, alkali, electric arc, sea water and other strong corrosive salty spray 2. Incorrect maintenance methods in harsh conditions 3. Poor paint durability 4. Incorrect paint mixture ratio, paint durability deterioration	1. Polishing (mild loss of light) 2. Conventional grinding and polishing (moderate loss of light) 3. Deep grinding and finesse polishing 4. Local paint repair (severe loss of light)
Bubbling	1. Film exposed to a humid environment for a long; water vapor infiltration into paint film; water and gas bubbling when temperature rises 2. Corrosion caused by infiltrated materials 3. Fuel, acid, alkali and other erosion	1. Polishing 2. Conventional grinding and polishing 3. Deep grinding and finesse polishing 4. Local paint repair (serious rusted metals need to be repaired before painting)

12.13.4 Removal and Installation

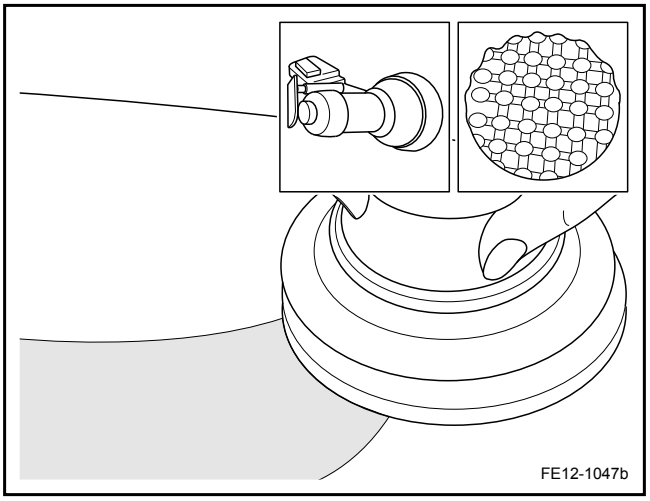
12.13.4.1 Common Coating Film Defect Treatment Example



1. Before polishing, clean the surface with de-greasing materials.



2. Firstly fully soak a sponge and squeeze excessive water.
3. Apply a small amount of polishing wax to the surface and adjust the polishing machine speed.



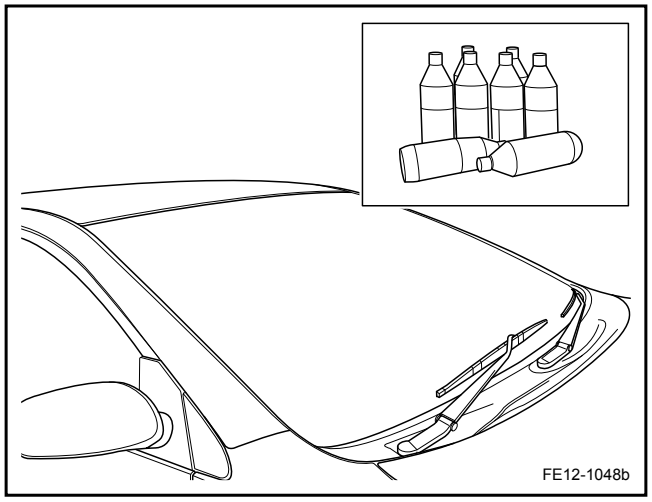
4. Put the sponge onto the surface, turn on the machine with a speed at 2,500-3,000 r/min. Gently press the sponge to polish for 3-5 s.

   Note

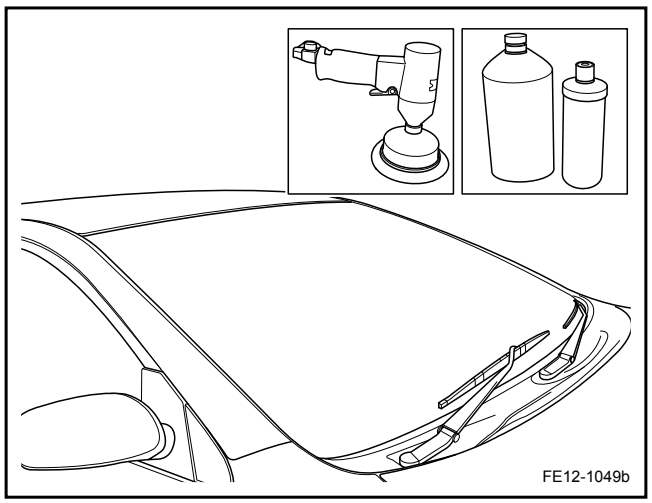
   During operation, keep the machine stable and move gently. Do not work too long to avoid overheating, as the paint will be damaged by the heat.

5. Use a cleaning cloth to wipe the excessive wax.

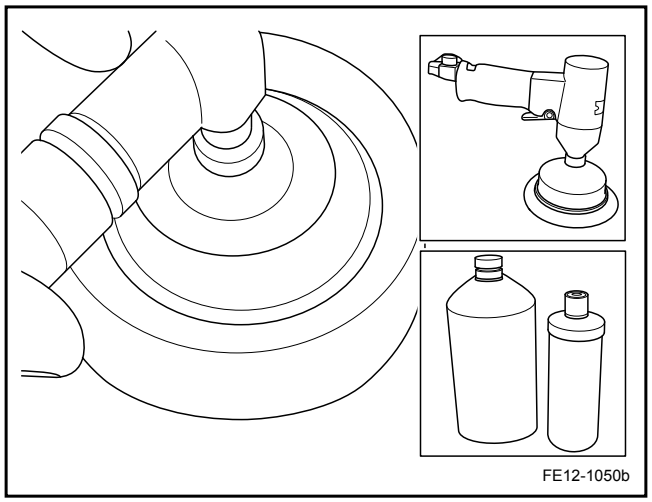
12.13.4.2 Conventional Grind and Polishing Treatment Example



1. Before polishing, clean the surface with de greasing materials.



2. Apply a small amount of polishing wax to the surface and adjust the polishing machine speed.



3. Put the wool ball onto the surface, turn on the machine with a speed at 2,500-3,000 r/ min.

   Note

   During operation, keep the machine stable and move gently. Do not polish too long. Keep the polishing time as short as possible, the polishing area as small as possible.

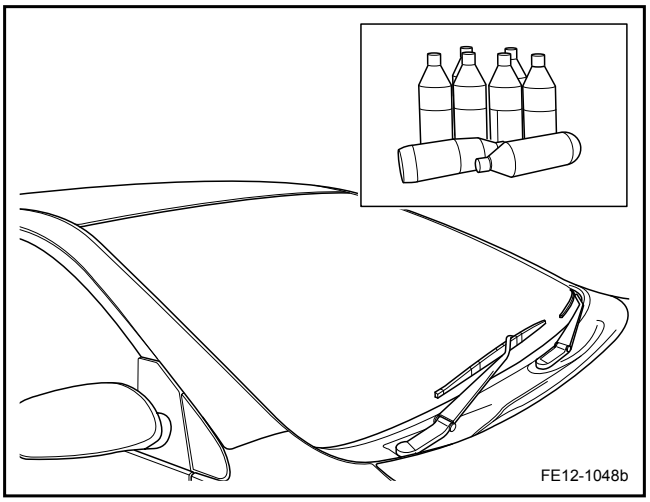
4. Firstly fully soak a sponge and squeeze excessive water. Apply a small amount of polishing wax to the surface. Put the sponge onto the surface, turn on the machine with a speed at 2,500-3,000 r/min. Gently press the sponge to polish for 3-5 s.

   Note

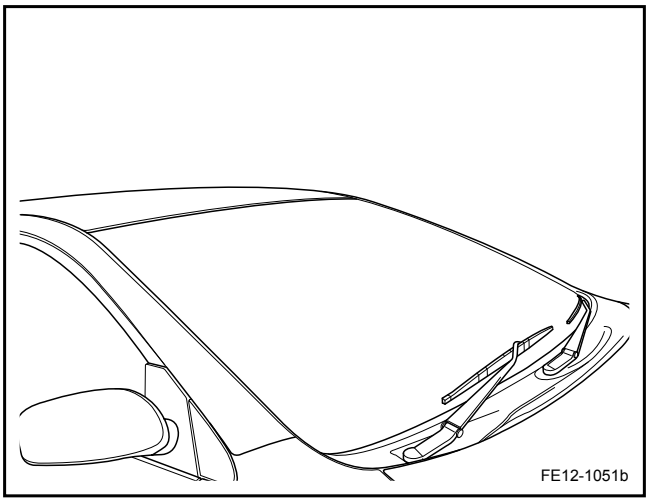
   During operation, keep the machine stable and move gently. Do not work too long to avoid

overheating, as the paint will be damaged by the heat.

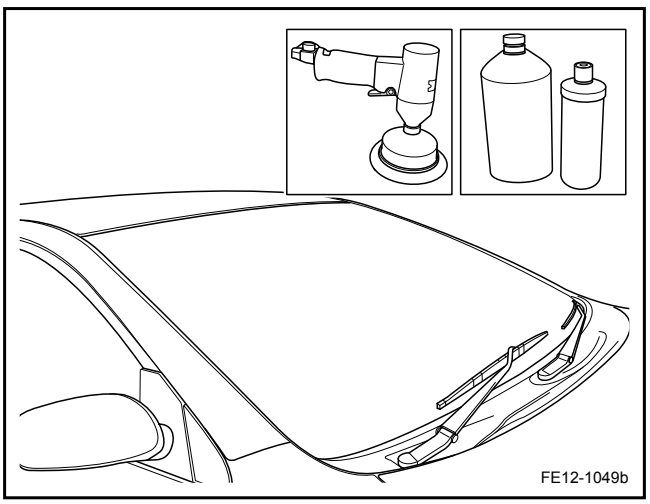
12.13.4.3 Deep Polishing Treatment Example



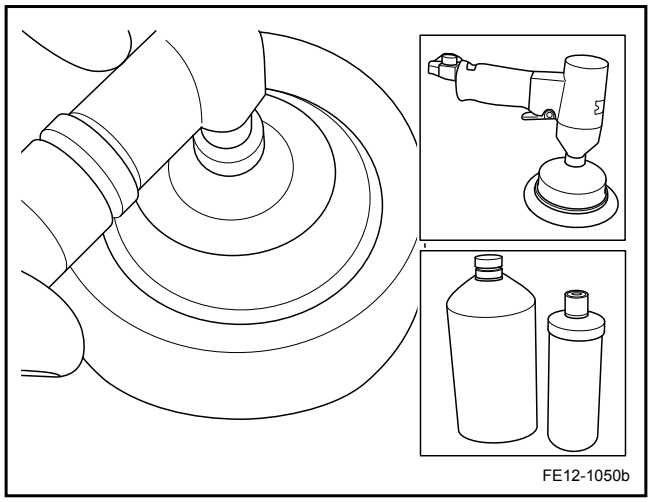
1. Sand the surface with a piece of 2000# sanding paper. Press the sand paper very close to the surface and sand in circles.



2. Remove the polishing power from the surface.



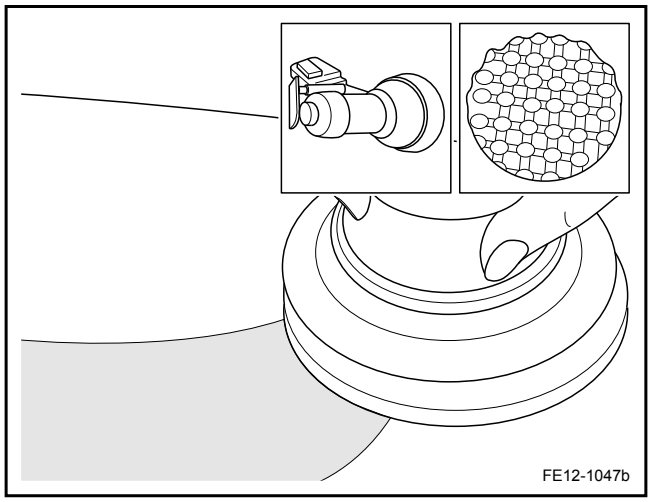
3. Apply an appropriate amount of polishing paste to the surface and adjust the speed polishing machine.



4. Put the wool ball onto the surface, turn on the machine with a speed at 2,500-3,000 r/ min.

   Note

   During operation, keep the machine stable and move gently. Do not polish too deep. Do not polish too long. Keep the polishing time as short as possible, the polishing area as small as possible.



5. Firstly fully soak a sponge and squeeze excessive water. Apply a small amount of polishing wax to the surface. Put the sponge onto the surface, turn on the machine with a speed at 2,500-3,000 r/min. Gently press the sponge to polish for 3-5 s.

   Note

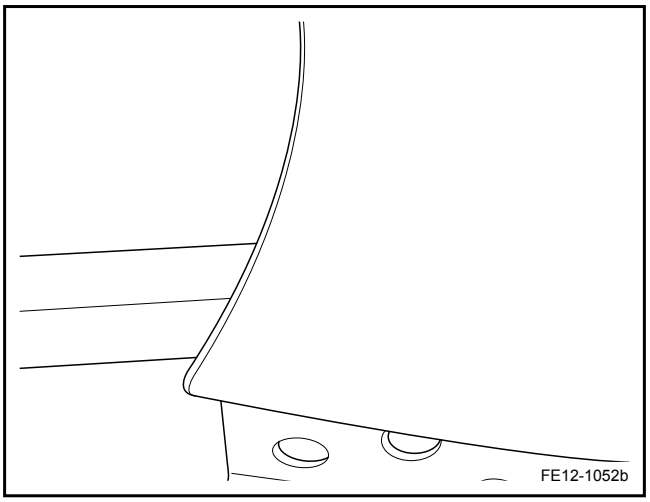
   During operation, keep the machine stable and move gently. Do not work too long to avoid overheating, as the paint will be damaged by the heat.

12.13.4.4 Rigid Surface Spray Paint Process

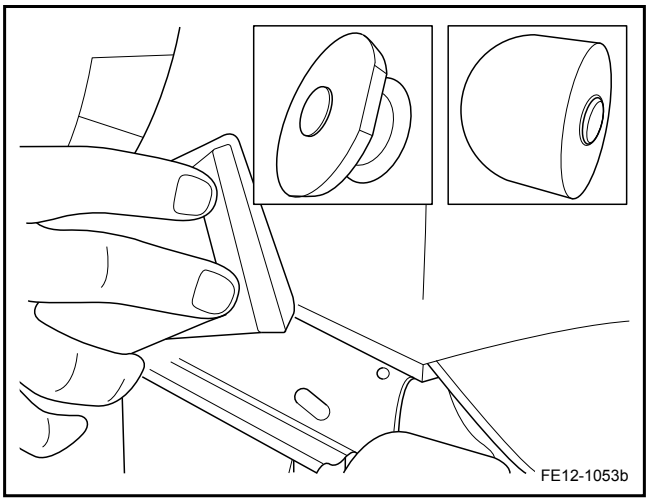
Use the front fender as an example to explain the local paint spray process.

Note

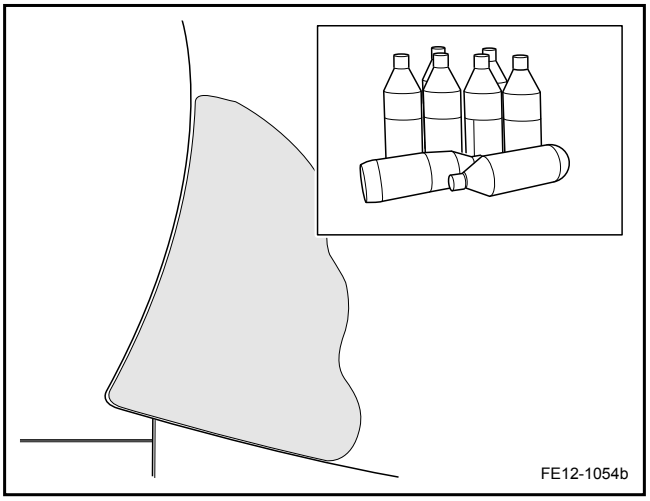
All rigid surface paint repairs must comply with Geely standards. Confirm the repair area and choose the repair techniques, such as local repair, block repair and the whole vehicle repair. If it is a collision repair, according to the sheet metal damage carry out sheet metal repair or replacement the parts and then carry out painting.



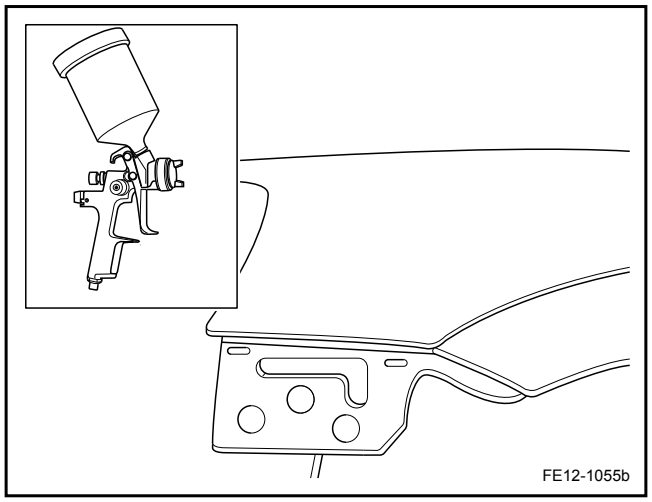
1. For serious fender scratches, use the local paint spray process.



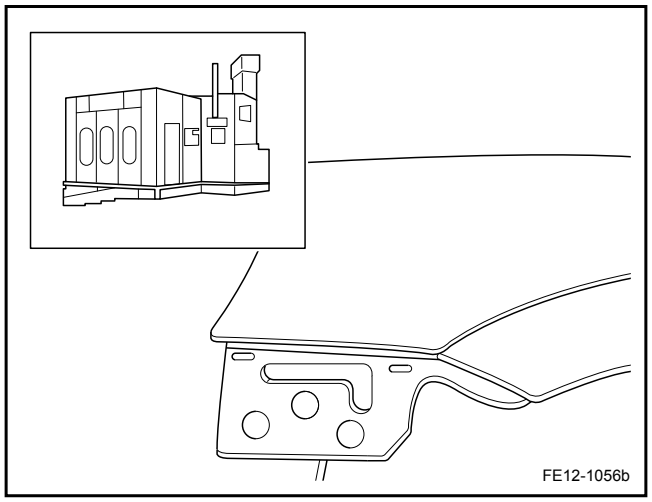
2. Sand the damaged surface with a piece of P500# wet sanding paper in circles.



3. Clean the surface with the de-greasing agents.

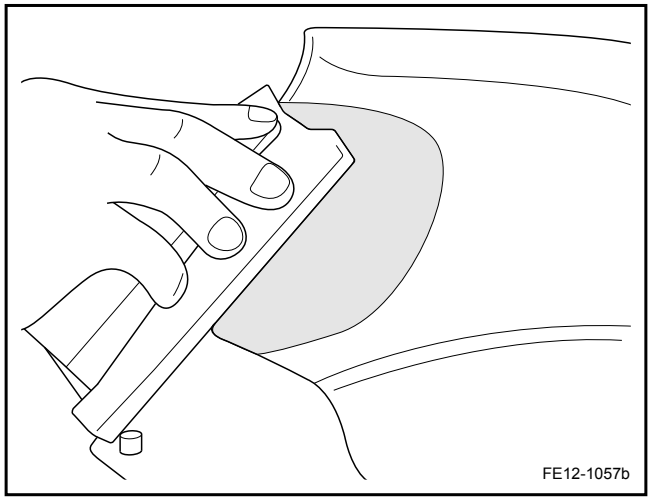


4. For primer painting, control the painting area. Gradually paint the edges. Do not overlap the the paint.

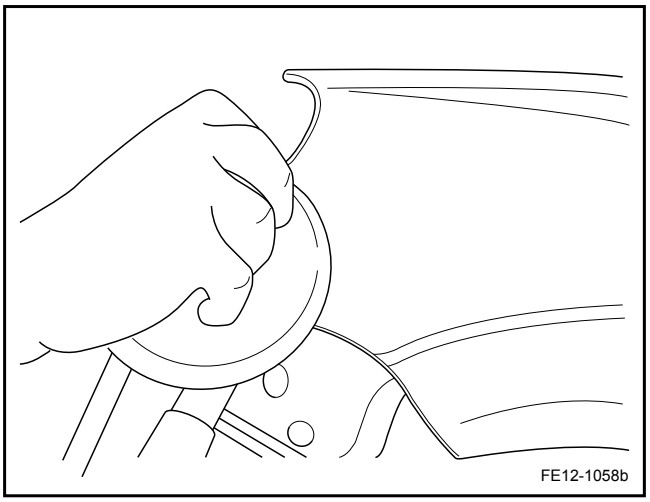


5. Leave the surface dry 4-5 min and then heat to dry 20-30 min.

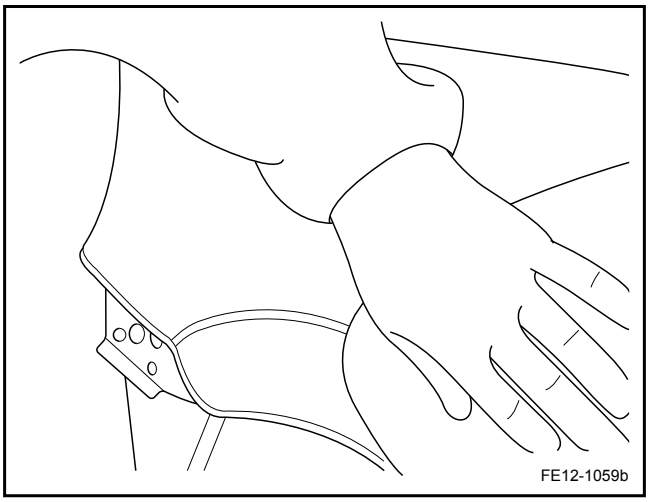
   Paint room temperature at 70-80°C (158-176 ºF)



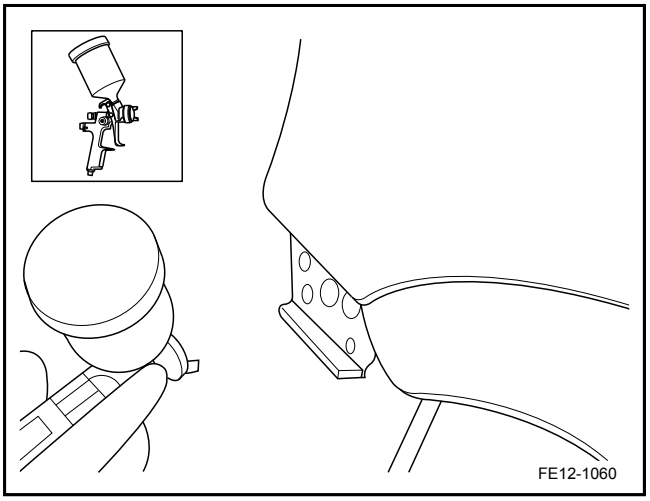
6. After drying, sand the surface with a piece of P800-1,000# sanding paper.



7. Sand the surface with a piece of 2000# fine sanding paper and expand the polishing area.



8. After finish polishing, remove the dust with a cloth to prepare for painting work.

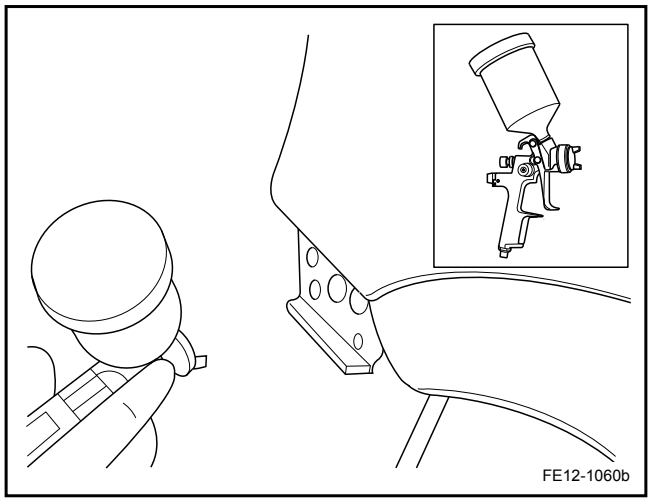


9. Spray the background color paint.

   Air pressure 150-200 kPa (21.8-29.0 psi)
   Spray distance 20-30 cm (7.87-11.81 in)

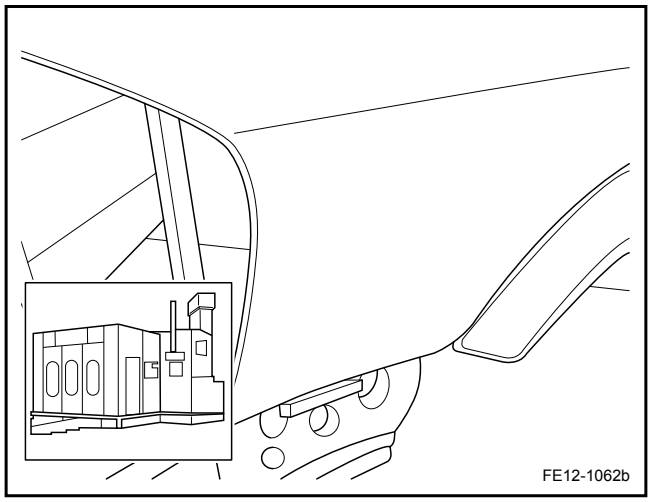
   Note

   Spray a layer slightly wider than the previous layer in order to make the transition.



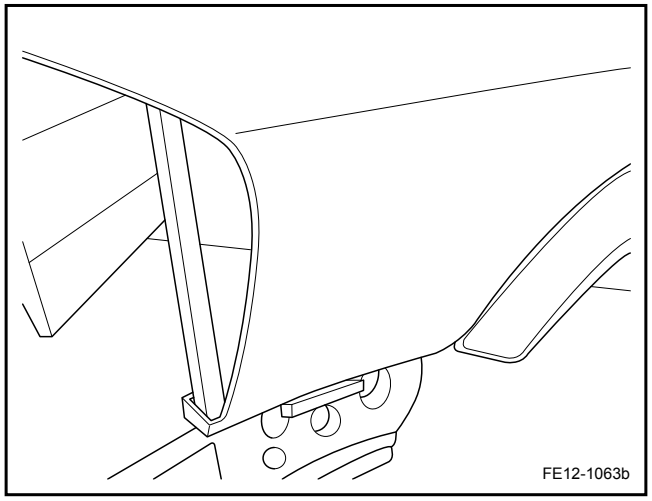
10. Leave the surface dry 2-3 min before spray the second layer of background paint until the layer joints become insignificant.

    Air Pressure 150-200 kPa (21.8-29.0 psi)
    Spray Distance 20-30 cm (7.87-11.81 in)

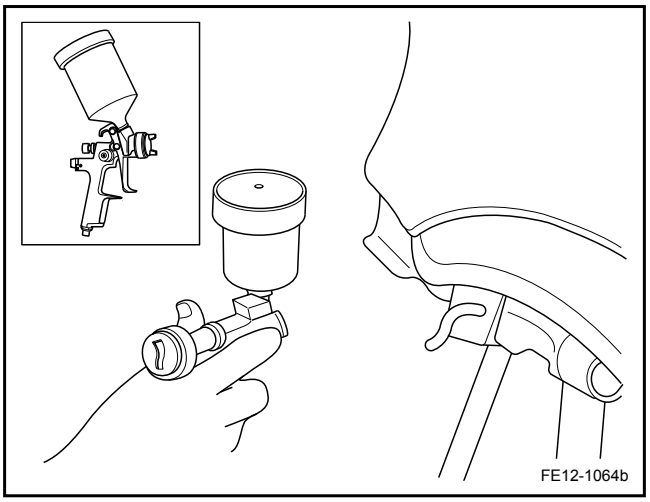


11. Leave the surface dry 4-5 min and then heat to dry 20-30 min.

    Paint room temperature 70-80 at 70-80°C (158-176 ºF)

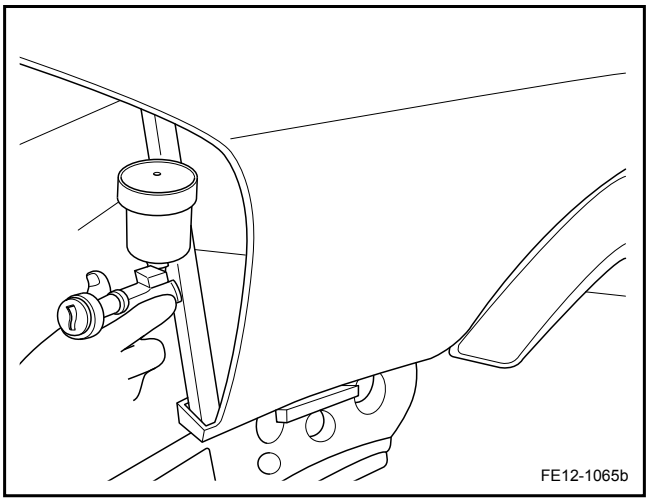


12. After drying, remove the dust with a cloth to prepare for painting work.



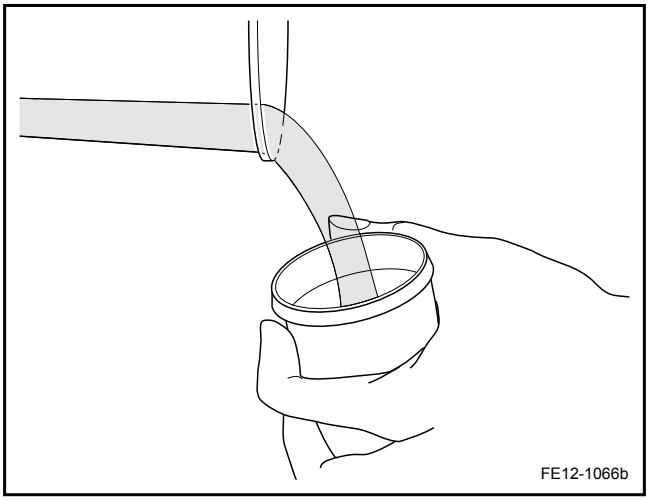
13. Spray clear lacquer to cover the whole background painting area.

    Air Pressure 150-200 kPa (21.8-29.0 psi)
    Spray Distance 20-30 cm (7.87-11.81 in)

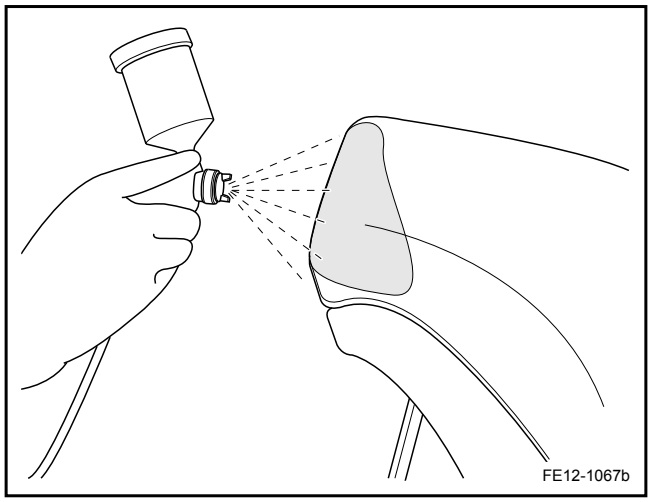


14. Leave the surface dry 2-3min and then spray paint the second layer of clear lacquer to cover the area of the first layer of clear lacquer.

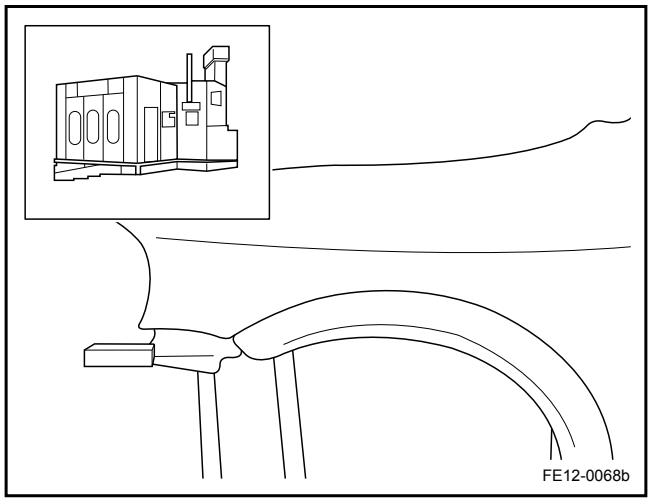
    Air Pressure 150-200 kPa (21.8-29.0 psi)
    Spray Distance 20-30 cm (7.87-11.81 in)



15. After spraying the clear lacquer, add blending thinner or other additives to the original clear lacquer.



16. Spray the paint interface 2-3 times with the blending thinner or the diluted clear lacquer.



17. Dry the paint in the paint room 20-30 min.

    Paint room temperature 70-80°C (158-176 ºF)

12.13.4.5 Spray Paint on the Repaired Rigid Sheet Metal Surface Procedure

Spray paint on the repaired rigid sheet metal surface process is similar to spray paint on the sheet metal surface. There are only a few additional steps between grinding and spray paint background as following:

1. Apply Putty.
2. Putty grinding.
3. Removing dust, de-greasing, cleaning.
4. Filling Scratch gray eyes filled.
5. Sanding the old paint surface.
6. Cleaning, de-greasing and covering adjacent areas.

For the painting process, please refer to12.13.4.4 Rigid Surface Spray Paint Process.

12.13.4.6 Plastic Surface Paint Repair Process

There are three basic requirements for the plastic surface paint repair:

1. Paint and the plastics have a certain adhesion, without loss of mechanical properties.
2. Paint film should have sufficient flexibility and allow the plastic deformation without rupture.
3. Plastic pieces can reflect some of the original particles and rough surface texture.

Plastic surface paint repair process:

Refer to the above mentioned local paint repair procedure for plastic primer paint repair. Please note that use low temperature baking.
Baking conditions 70-80°C (158-176 ºF),20-30 min.