

GROUP 3

WELDED PANEL REPLACEMENT

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ULTRA HIGH STRENGTH STEEL PLATE

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ADVANTAGES OF ULTRA HIGH STRENGTH STEEL PLATE

The ultra high strength steel plate has the following advantages as compared with conventional high strength steel plate.

- It has tensile strength approximately 1.7 times higher than the conventional high strength steel sheet.
- It has a higher yielding point and yielding ratio (yielding point/tensile strength).

These advantages allow thinner and lighter plates and better fuel efficiency than the high strength steel plate.

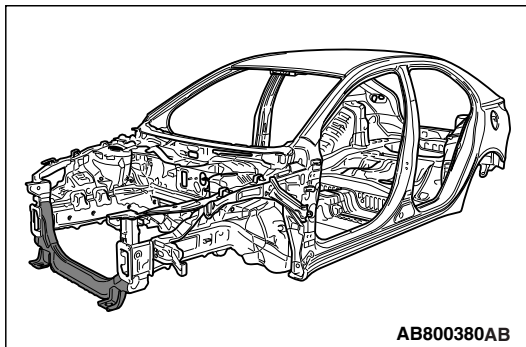
PRECAUTION UPON MAINTENANCE OF ULTRA HIGH STRENGTH STEEL PLATE

- Use a spot cutter for ultra high strength steel plate to ensure that the spot-welded area is cut off. The following tools are recommended.

- Drill bit, spot weld cutter (8) (Tool number: MB992621)
- For the part in which the ultra high strength steel plate is used, do not repair it by cutting and bonding to avoid the reduction in strength by heat. Instead, replace the whole assembly including the part.
- Be careful with rough extending work, because the ultra high strength steel plate has higher tensile strength and a higher yielding point than high strength steel plate and general steel plate. Careless work will cause symptom such as over-pulling and springback. Do not extend it completely at a time. Do it gradually while removing the distortion by sheet metal processing with a hammer.
- Plug welding of $\phi 8$ mm (0.3 inch) diameter plug for repair ensures the strength equivalent to spot welding for 2 steel sheets. For 3 sheets, weld 2 sheets each time from both sides instead of welding from one side to give sufficient welding strength.

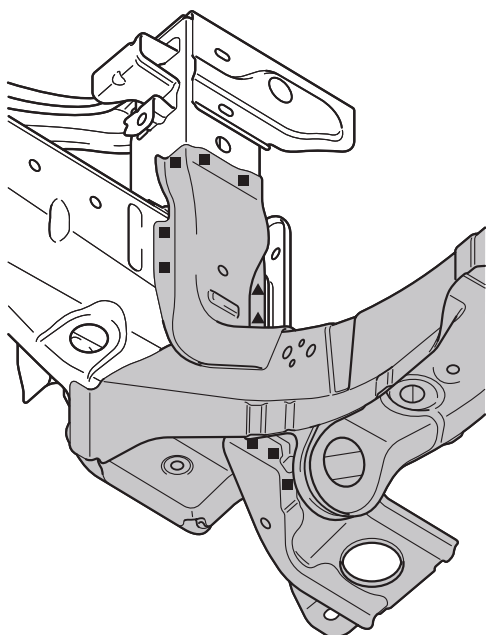
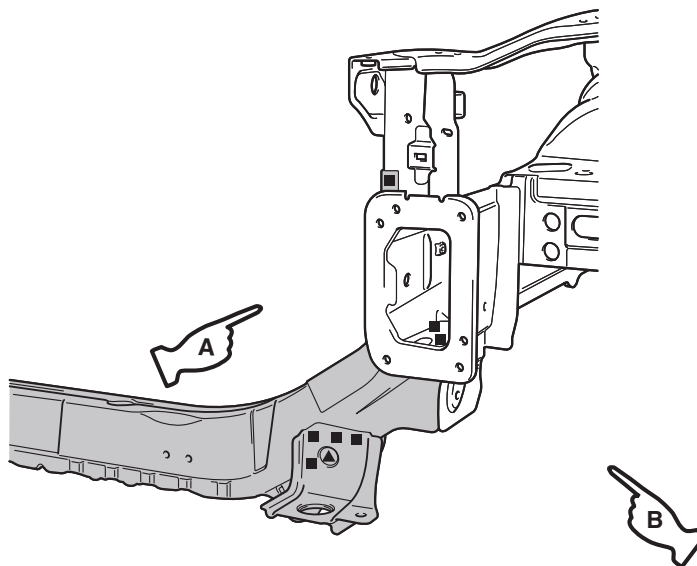
FRONT END CROSSMEMBER

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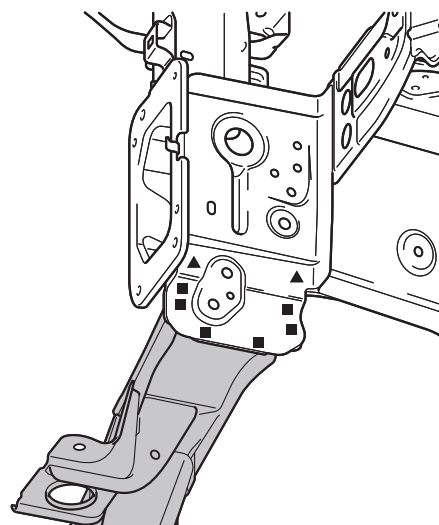


Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



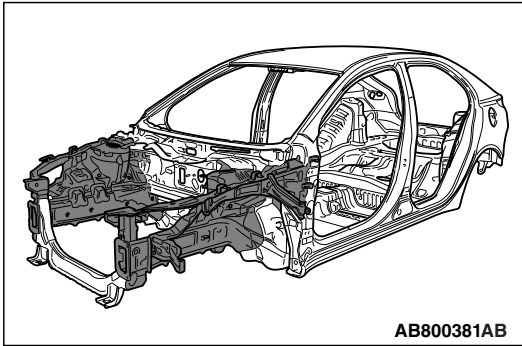
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B

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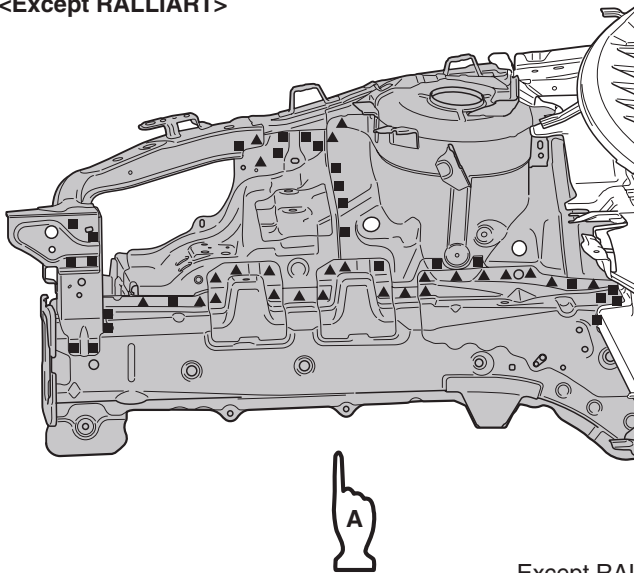
FENDER SHIELD



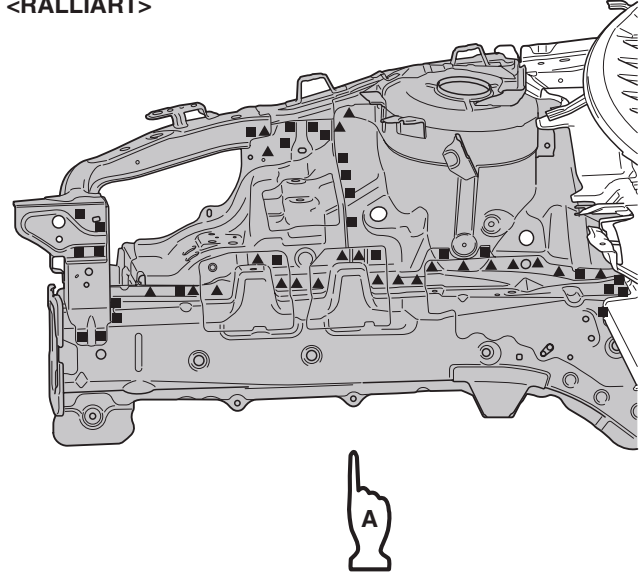
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	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS

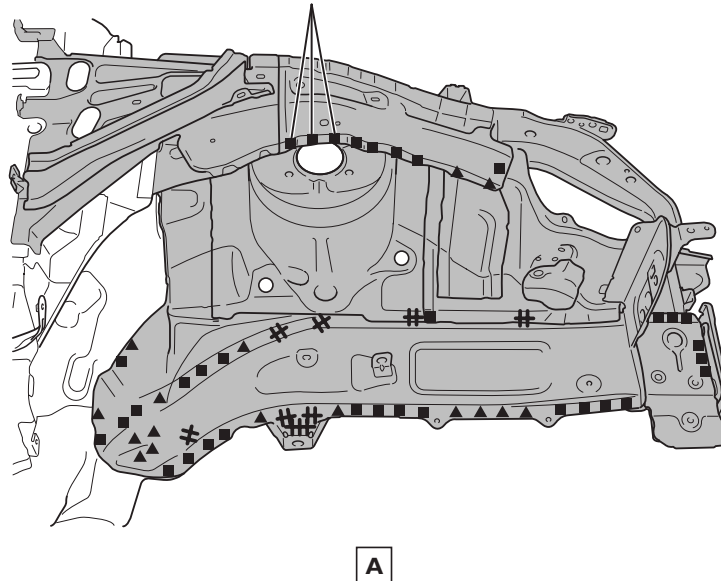
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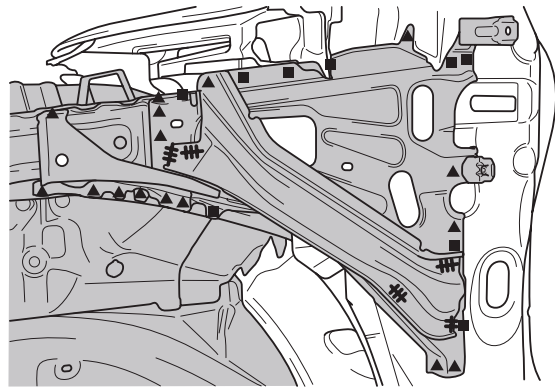
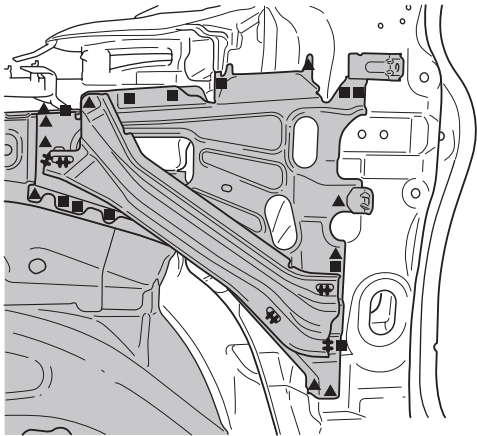
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NOTE: Refer to the Front End Crossmember section on P.3-3 for the welding point with headlight support panel lower.

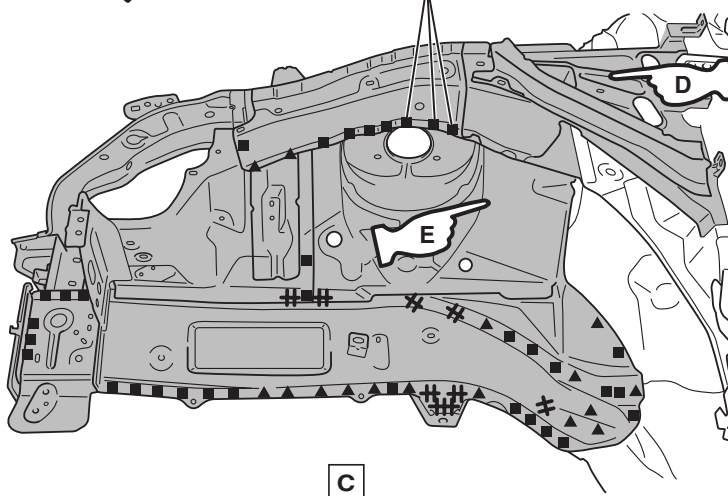
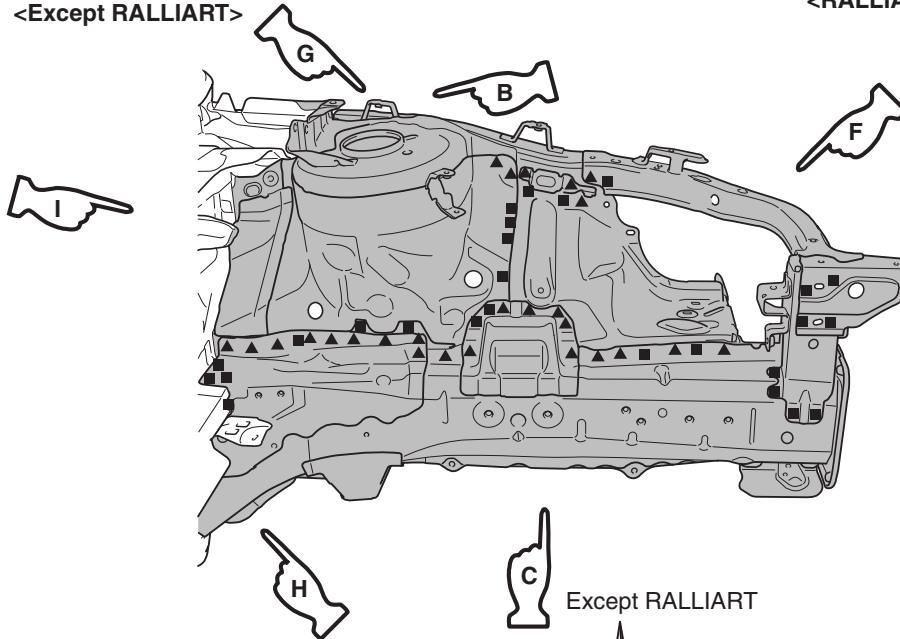


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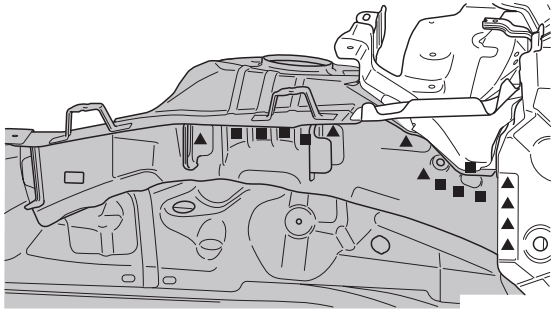
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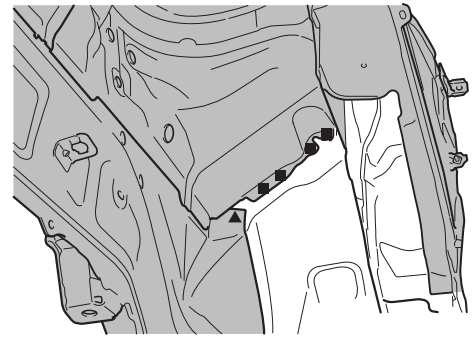
C

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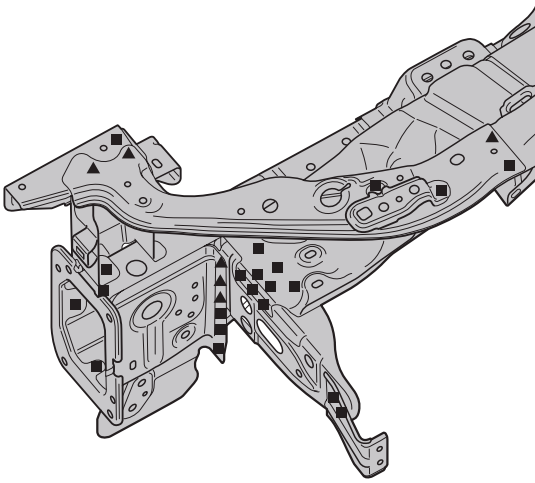


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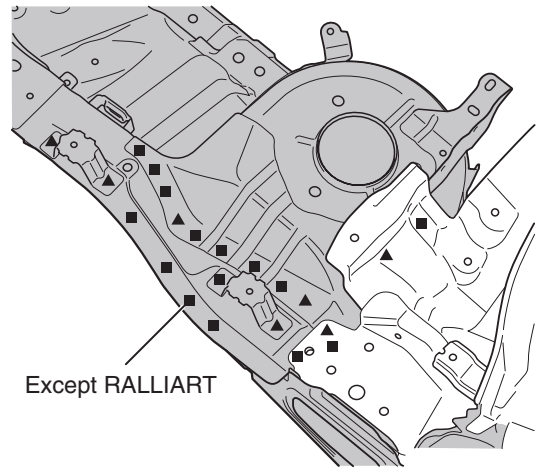
(With the front deck frame upper outer
and fender shield frame upper outer removed)



E

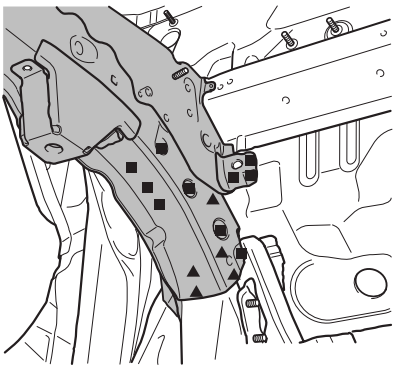


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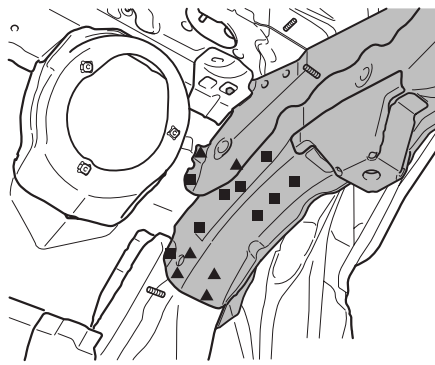
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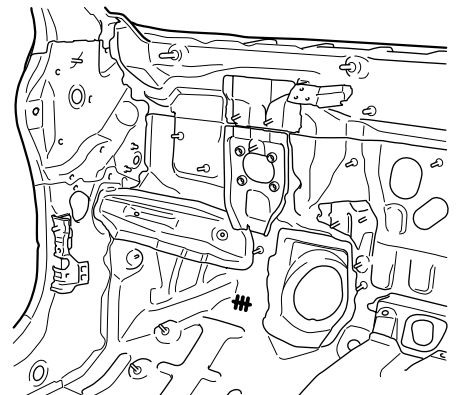
H

(Right side)



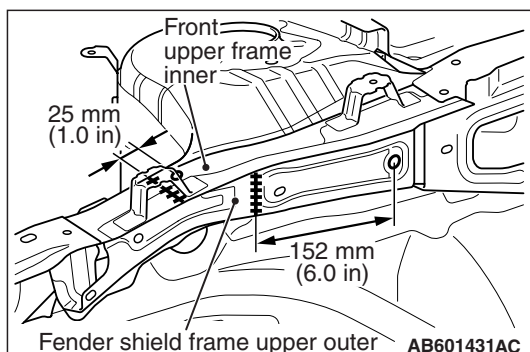
H

(Left side)



I

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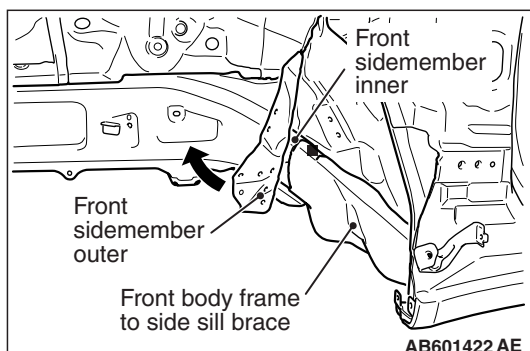


NOTE: Partial replacement of the fender shield frame upper outer is possible depending on the range of damage. When performing partial replacement, cut the fender shield frame upper outer 152 mm (6.0 inches) forward of the positioning hole center, and cut the front upper frame inner 25 mm (1.0 inches) forward of the positioning hole center.

NOTE ON REPAIR WORK

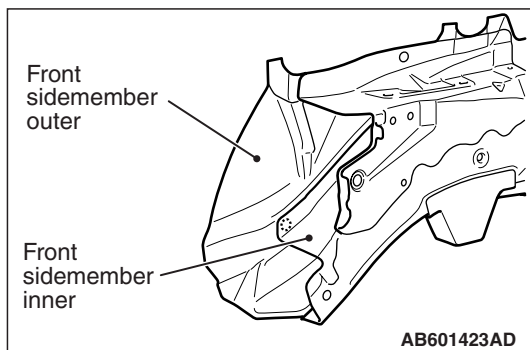
REMOVAL

Turn up the front sidemember outer as shown to cut off the welded point between the front sidemember inner and the front body frame to side sill brace.



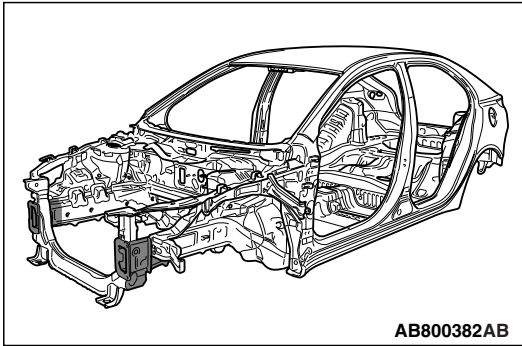
INSTALLATION


When installing the new front sidemember parts, align the hole of the front body frame to side sill brace with the front sidemember to make a hole because the front sidemember outer prevents the front sidemember inner and front body frame to side sill brace from being welded. Then, weld the front sidemember outer, front sidemember inner, and front body frame to side sill brace.



FRONT SIDEMEMBER (PARTIAL REPLACEMENT)

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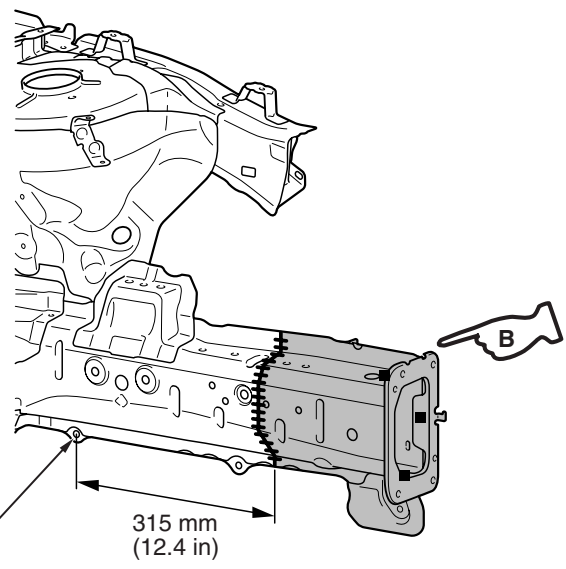
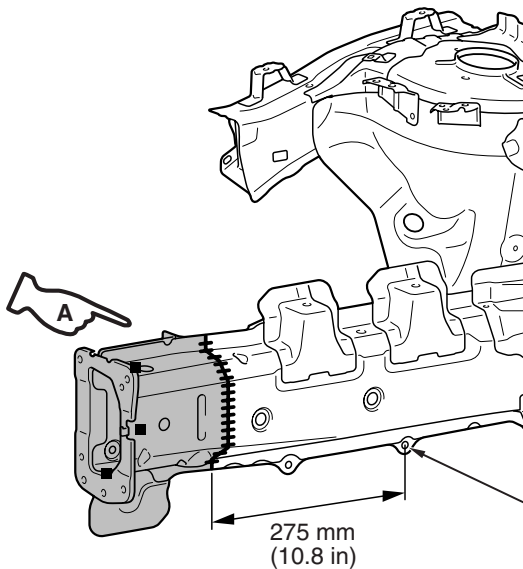


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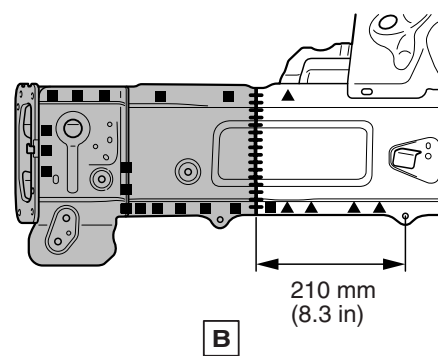
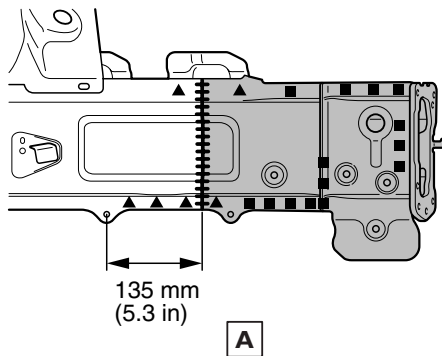
REPAIR WELDS

(Right side)

(Left side)



Engine room side cover mounting hole



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NOTE:

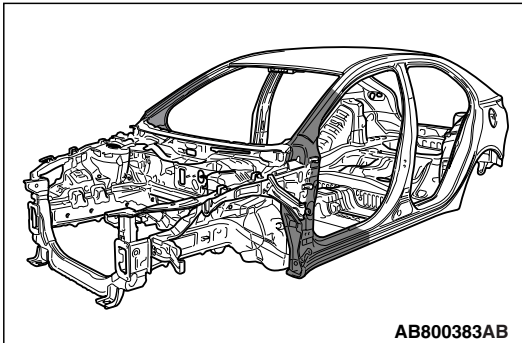
- Refer to the Front End Crossmember section on P.3-3 for the welding point with the headlight support panel lower.
- Refer to the Fender Shield section on P.3-4 for the welding points with the headlight support panel, front fender gusset and front fender shield.

FRONT PILLAR

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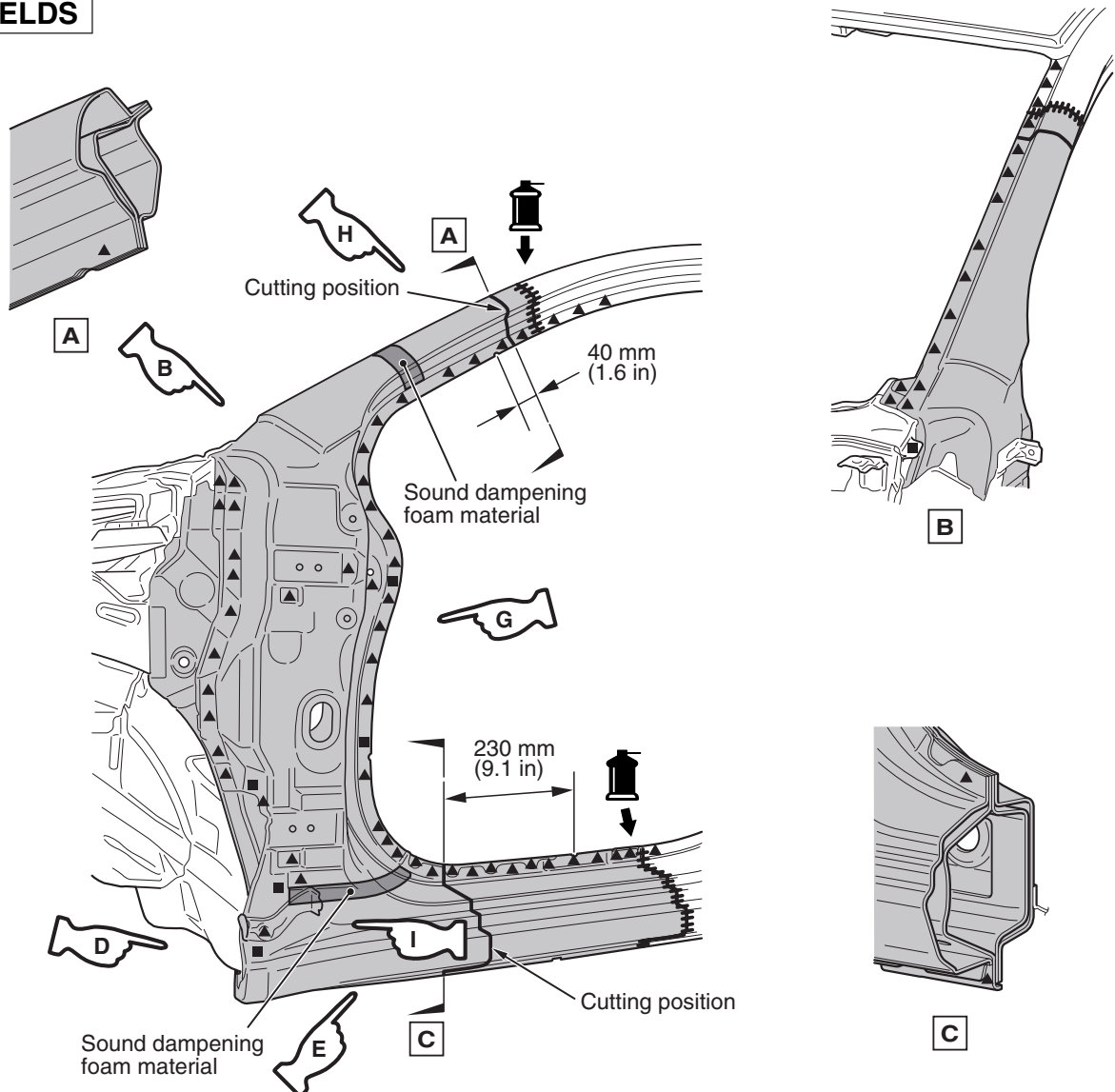
CAUTION

When repairing the area using sound dampening foam material do not use firing tools since the sound dampening foam material may burn.



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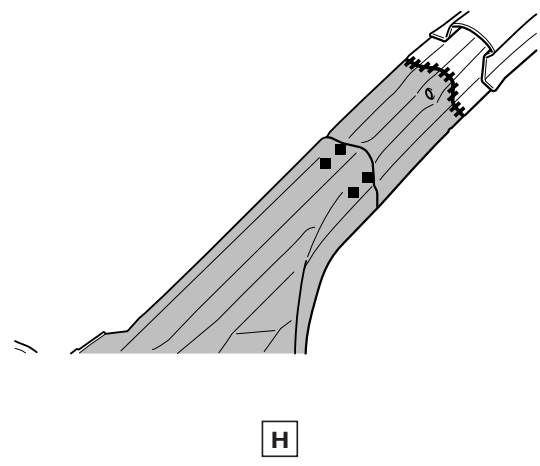
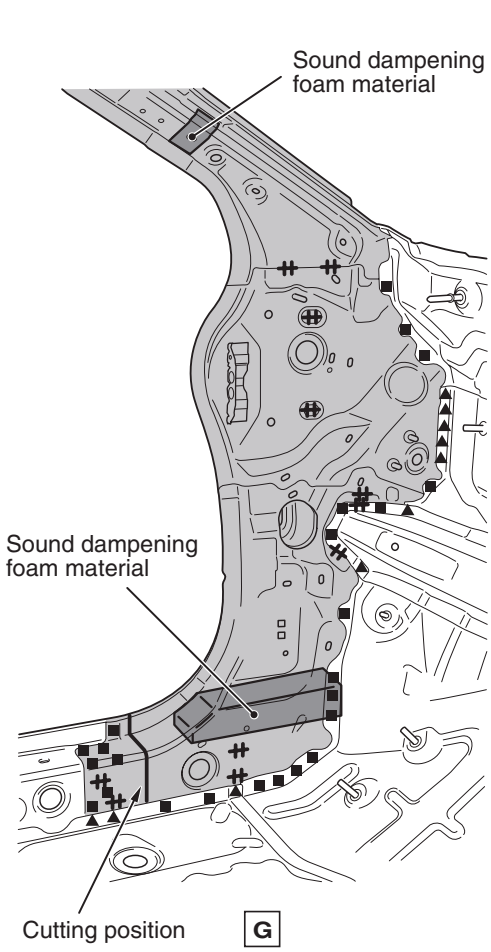
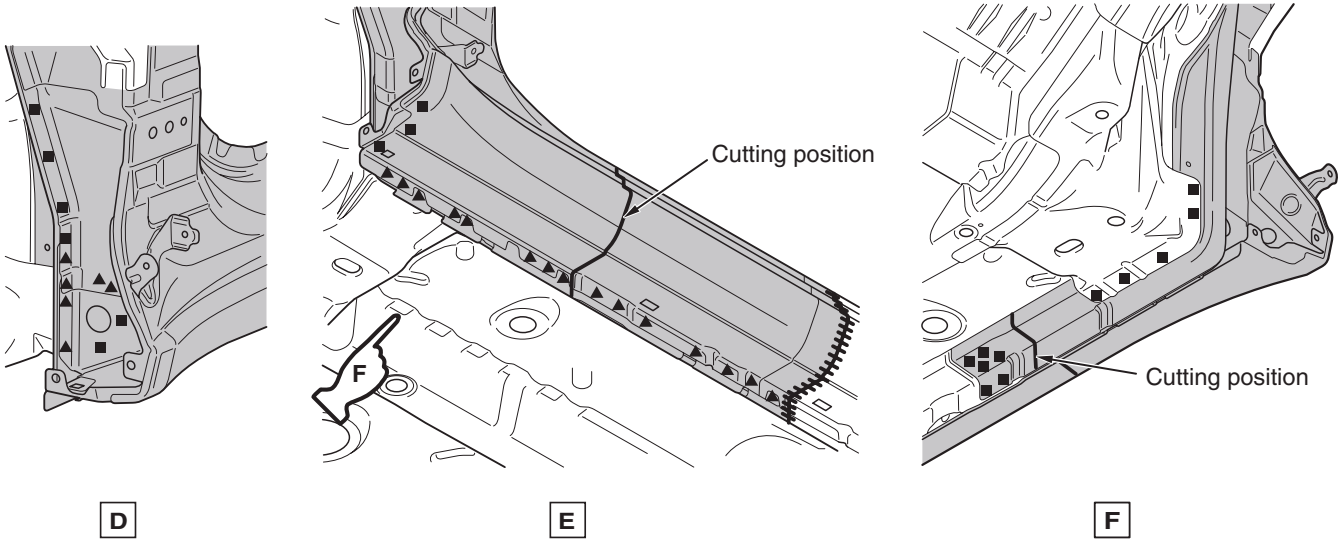
REPAIR WELDS



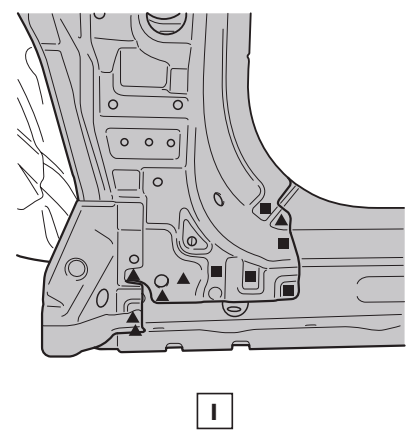
(With the upper frame to front pillar brace and front deck frame upper outer removed)

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NOTE: Refer to the Fender Shield section on P.3-4 for the welding points with the upper frame to front pillar brace and front deck frame upper outer.



(With the side outer panel removed)



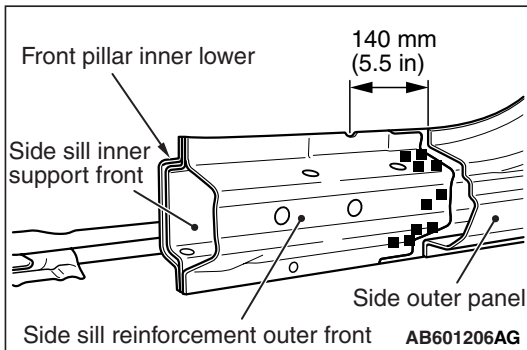
(With the side outer panel removed)

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NOTE ON REPAIR WORK

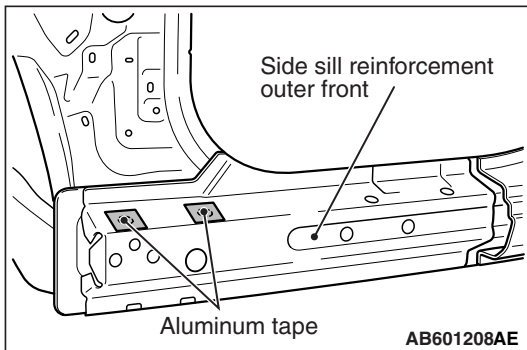
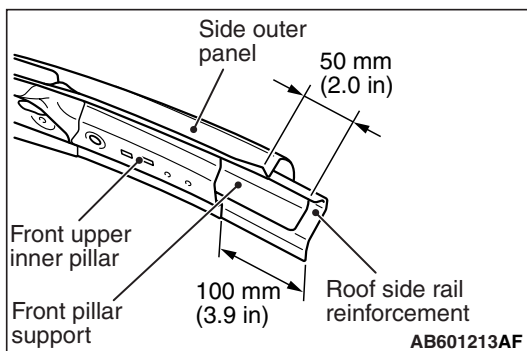
REMOVAL

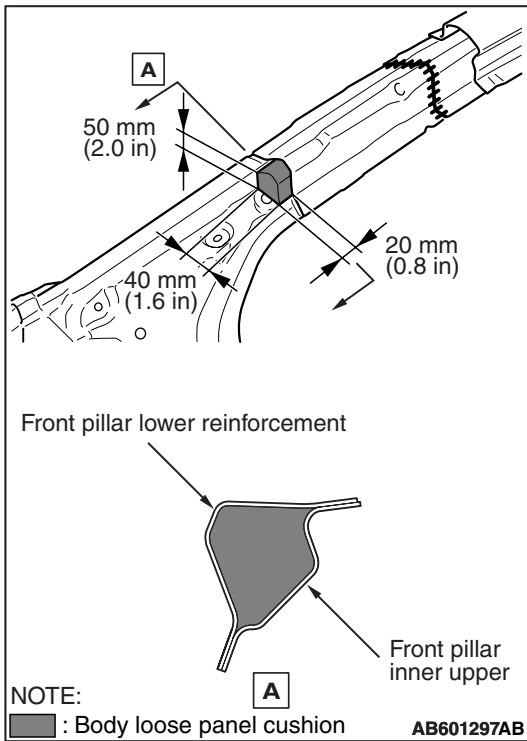
After removing the front pillar, cut the side outer panel 140 mm (5.5 inches) behind the positioning notch to remove the side sill reinforcement outer front, side sill inner support front, and front pillar inner lower remaining on the body side.



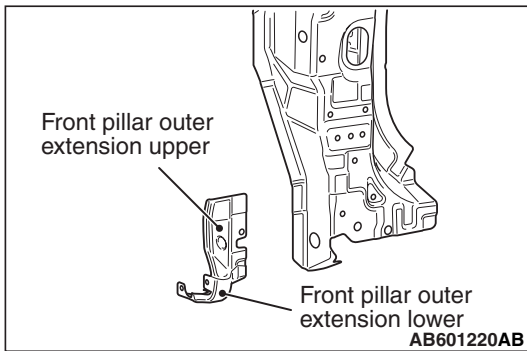
INSTALLATION

1. To reinforce the strength in the front pillar cut area, cut the side outer panel 50 mm (2.0 inches) above the cut area and cut the front upper inner pillar 100 mm (3.9 inches) above the cut area.
2. Assemble the new front lower inner pillar parts.
3. Assemble the new front upper inner pillar part.
4. Assemble the new side sill reinforcement outer front parts. After that, cover the hole with aluminum tape to prevent the sound dampening foam material from dropping when the material is filled into the front pillar in the next process.

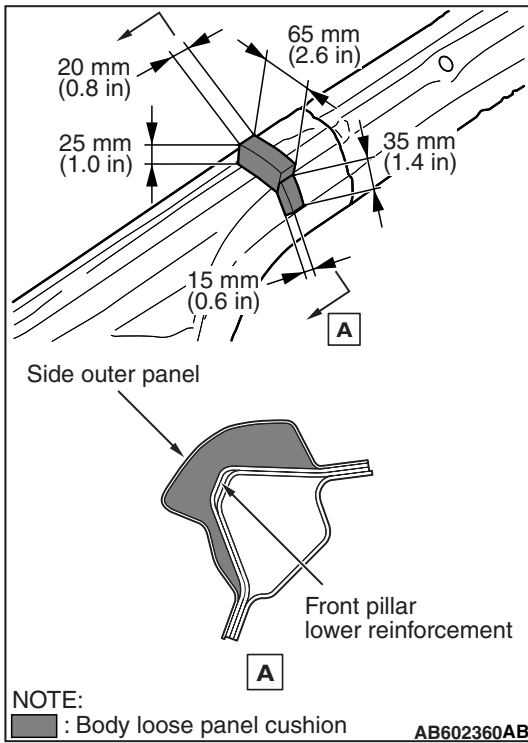




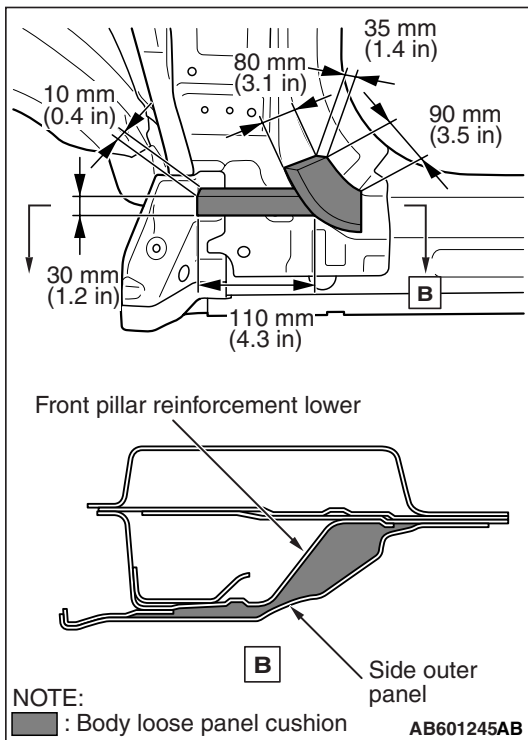
- Align the new roof side rail reinforcement parts to the body side to cut and install. After that, machine the body loose panel cushion (MR535301 or MR435765) as shown and apply it to the body side to prevent the sound dampening foam material from dropping when the material is filled into the front pillar in the next process.



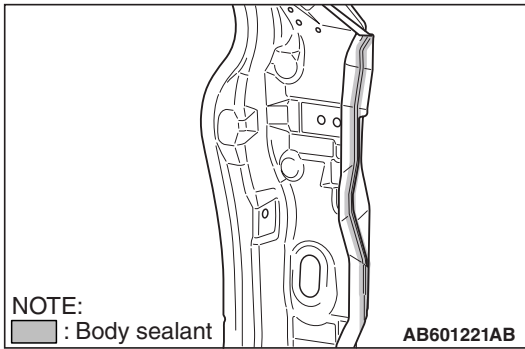
- When installing the new front pillar reinforcement lower inner is installed, remove the front pillar outer extension lower and front pillar outer extension upper in advance, and install the front pillar lower reinforcement because there are some points which cannot be welded on the body side. After that, install the front pillar outer extension lower and front pillar outer extension upper.
- When installing the new front outer pillar parts, perform the following procedures.



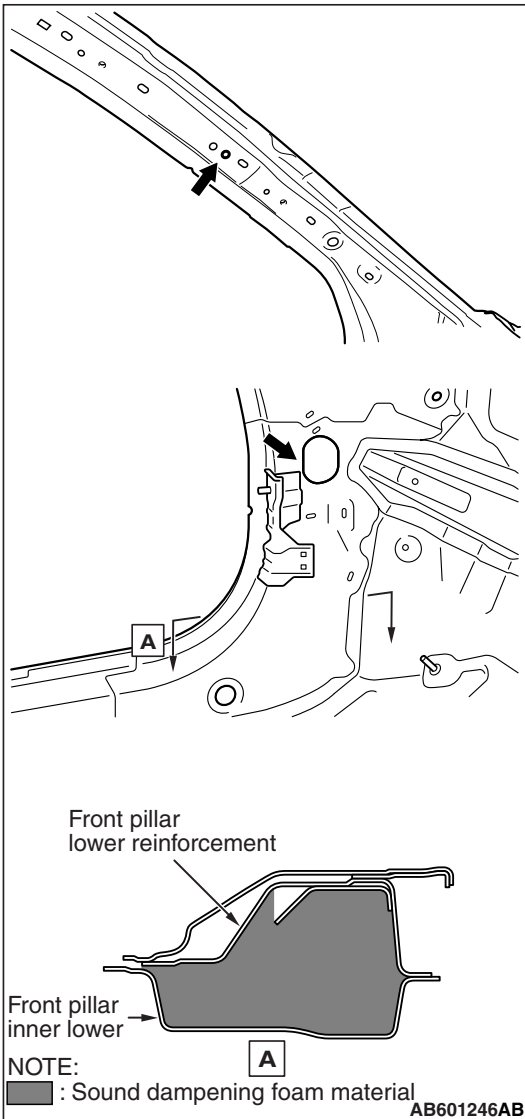
- (1) Machine the body loose panel cushion (MR535301 or MR435765) as shown and apply it to the body side to prevent the sound dampening foam material from dropping when the material is filled into the front pillar upper in the next process (for front pillar upper).



- (2) Machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the front pillar (for front pillar lower).

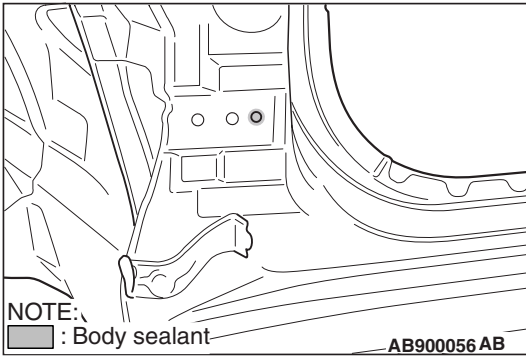


- (3) Apply the body sealant to the areas as shown in advance.
- 8. After installing the front pillar outer, perform the following procedures.

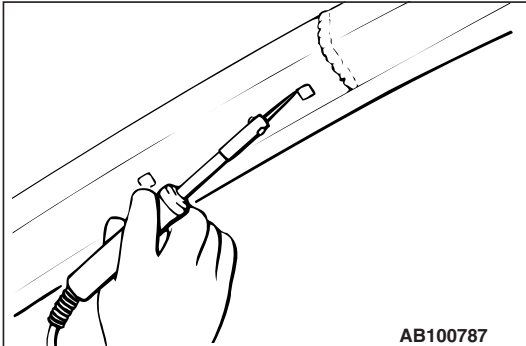


- (1) Seal the hole and flange with bolts and aluminum tape, then fill the hole with sound dampening foam material as shown in the figure of the instructions.

Sound dampening foam material: 3M™ AAD Part No.08463



(2) Apply the body sealant to close the hole of the side outer panel shown in the figure.



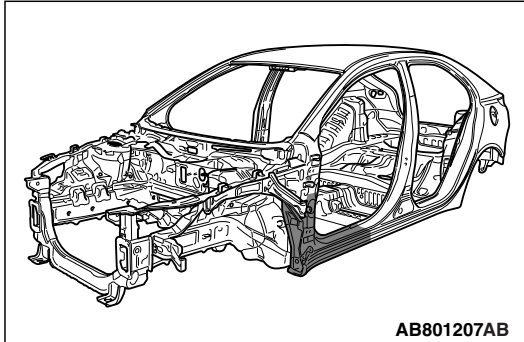
9. Wait 2 hours after filling the sound dampening foam material to remove the bolt and aluminum tape, then melt the sound dampening foam material with a soldering gun so a clip, etc. can thoroughly be inserted in the hole filled with sound dampening foam material.

FRONT PILLAR (PARTIAL REPLACEMENT)

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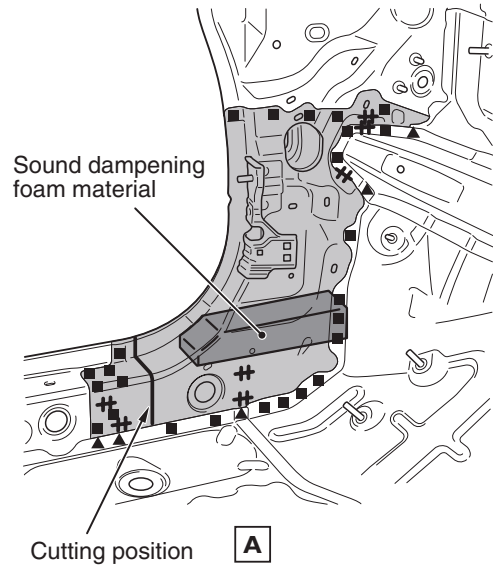
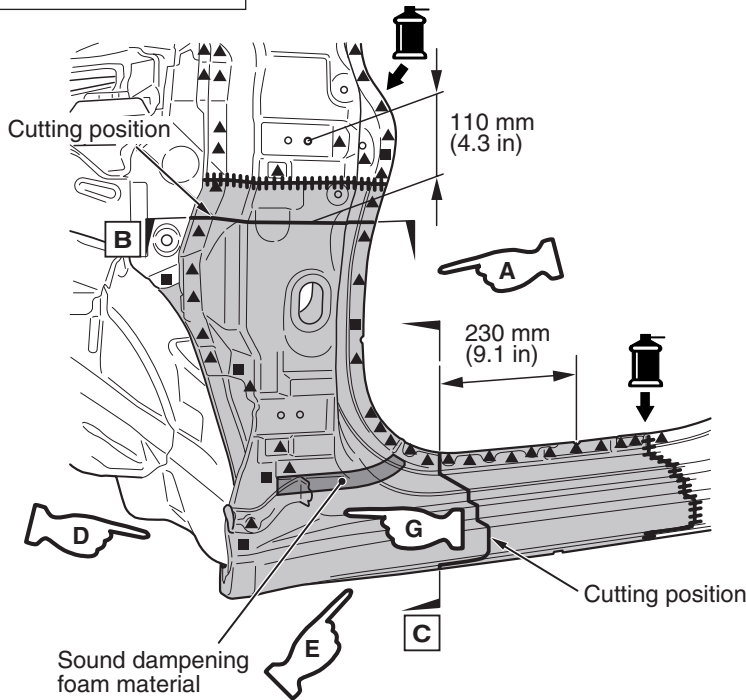
CAUTION

When repairing the area using sound dampening foam material do not use firing tools since the sound dampening foam material may burn.

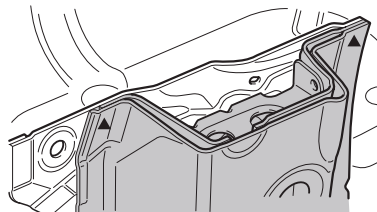


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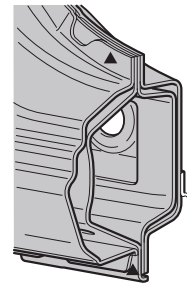
REPAIR WELDS



(With the upper frame to front pillar brace and front deck frame upper outer removed)



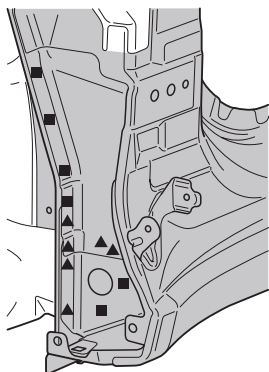
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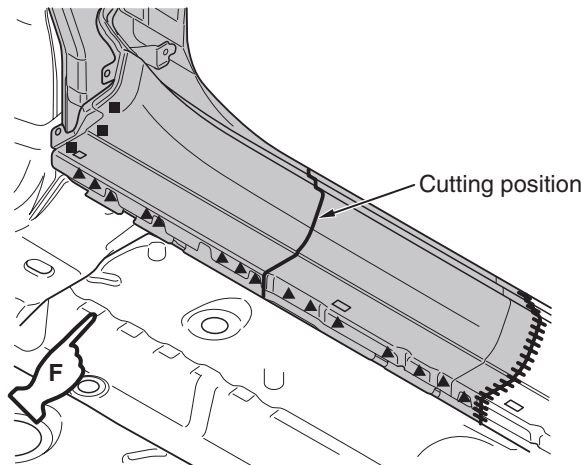
C

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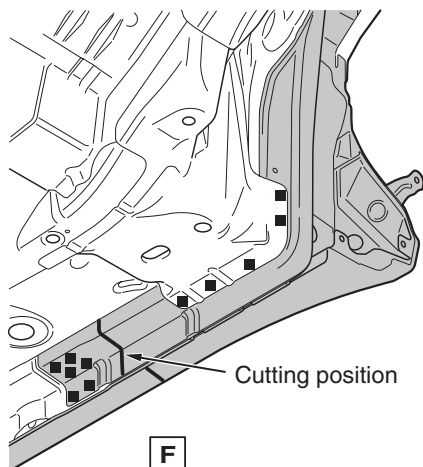
NOTE: Refer to the Fender Shield section on P.3-4 for the welding points with the upper frame to front pillar brace and front deck frame upper outer.



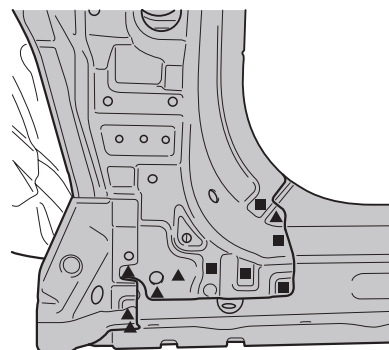
D



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G

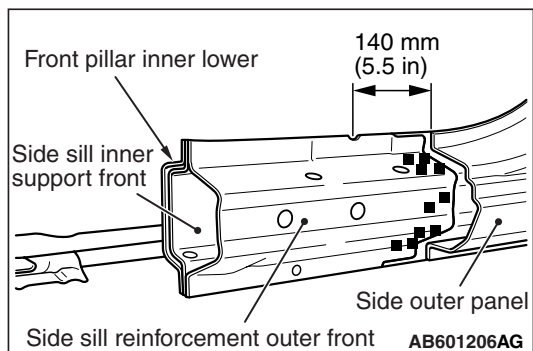
(With the side outer panel removed)

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NOTE ON REPAIR WORK

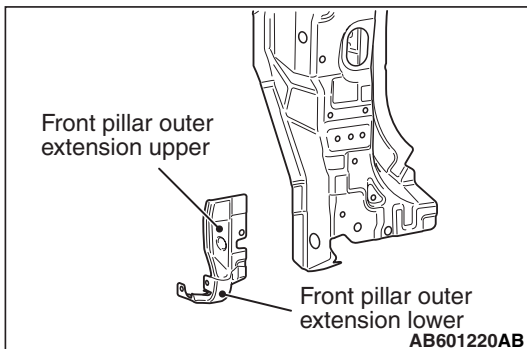
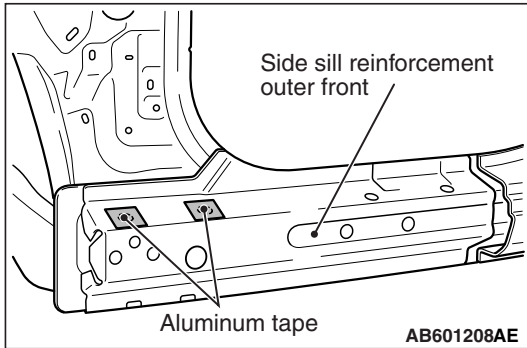
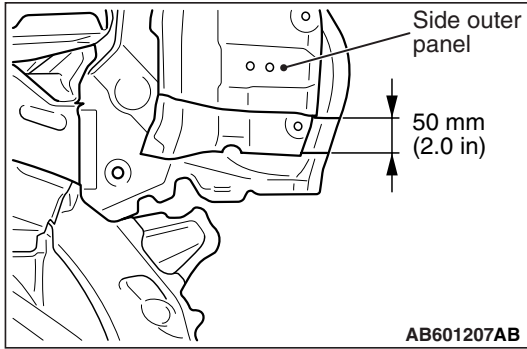
REMOVAL

After removing the front pillar, cut the side outer panel 140 mm (5.5 inches) behind the positioning notch to remove the side sill reinforcement outer front, side sill inner support front, and front pillar inner lower remaining on the body side.

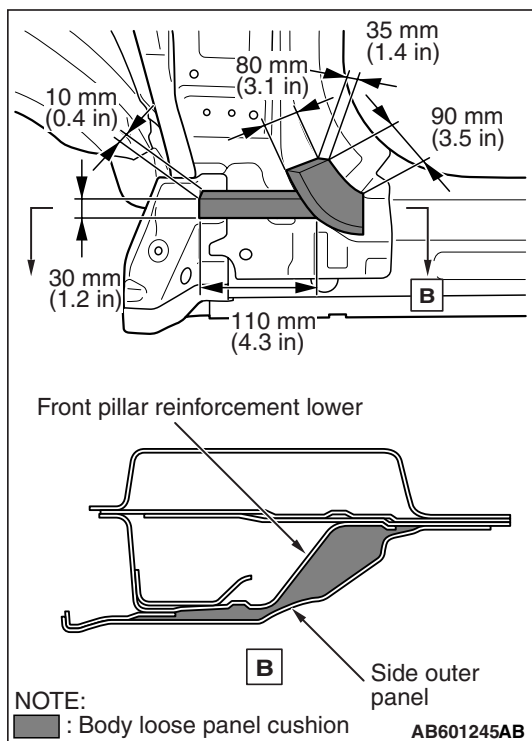


INSTALLATION

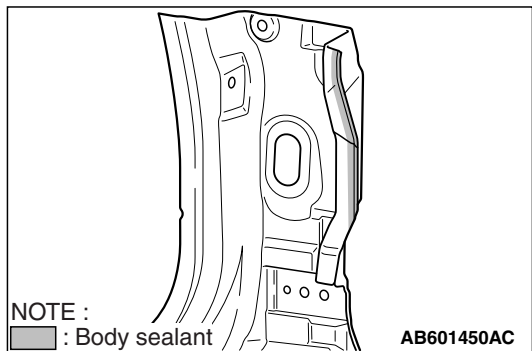
1. To reinforce the strength in the front pillar cut area, cut the side outer panel 50 mm (2.0 inches) above the cut area.
2. Assemble the new front inner lower pillar parts.



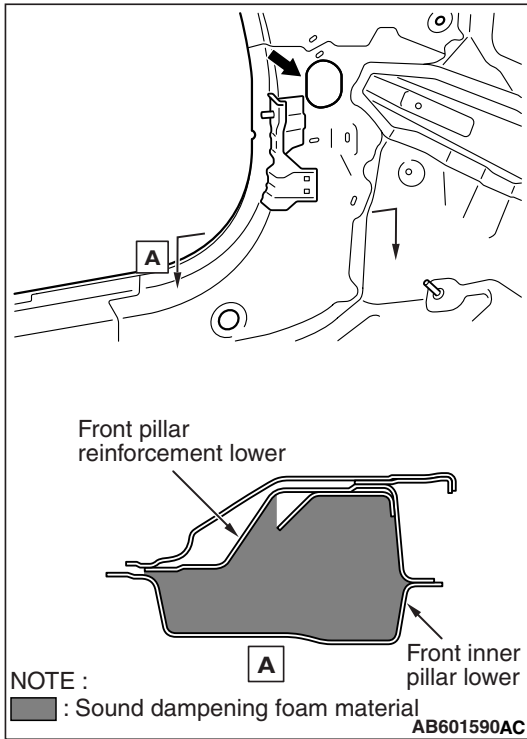
3. Assemble the new side sill reinforcement outer front parts. After that, cover the hole with aluminum tape to prevent the sound dampening foam material from dropping when the material is filled into the front pillar in the next process.
4. When installing the new front pillar reinforcement lower inner is installed, remove the front pillar outer extension lower and front pillar outer extension upper in advance, and install the front pillar lower reinforcement because there are some points which cannot be welded on the body side. After that, install the front pillar outer extension lower and front pillar outer extension upper.
5. When installing the new front outer pillar parts, perform the following procedures.



- (1) Machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the front pillar.

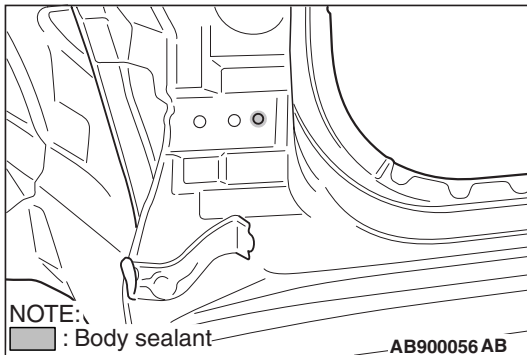


- (2) Apply the body sealant to the areas as shown in advance.
6. After installing the front outer pillar, perform the following procedures.

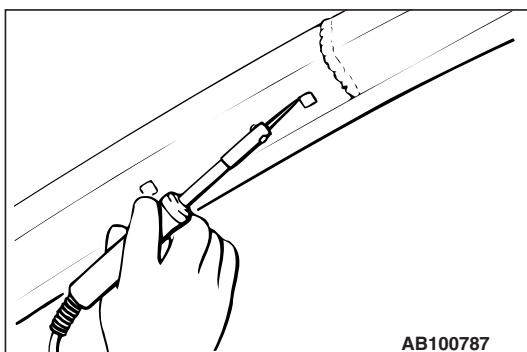


- (1) Seal the hole and flange with bolts and aluminum tape, then fill the hole with sound dampening foam material as shown in the figure of the instructions.

Sound dampening foam material: 3M™ AAD Part No.08463



- (2) Apply the body sealant to close the hole of the side outer panel shown in the figure.



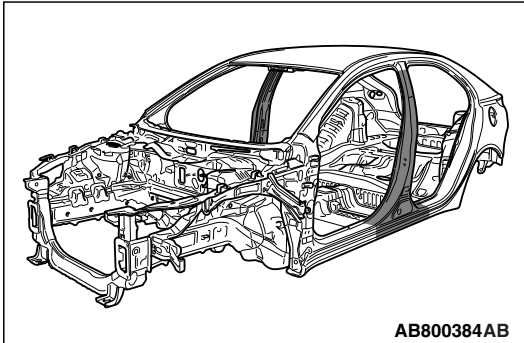
7. Wait 2 hours after filling the sound dampening foam material to remove the bolt and aluminum tape, then melt the sound dampening foam material with a soldering gun so a clip, etc. can thoroughly be inserted in the hole filled with sound dampening foam material.

M4030006001191

CENTER PILLAR

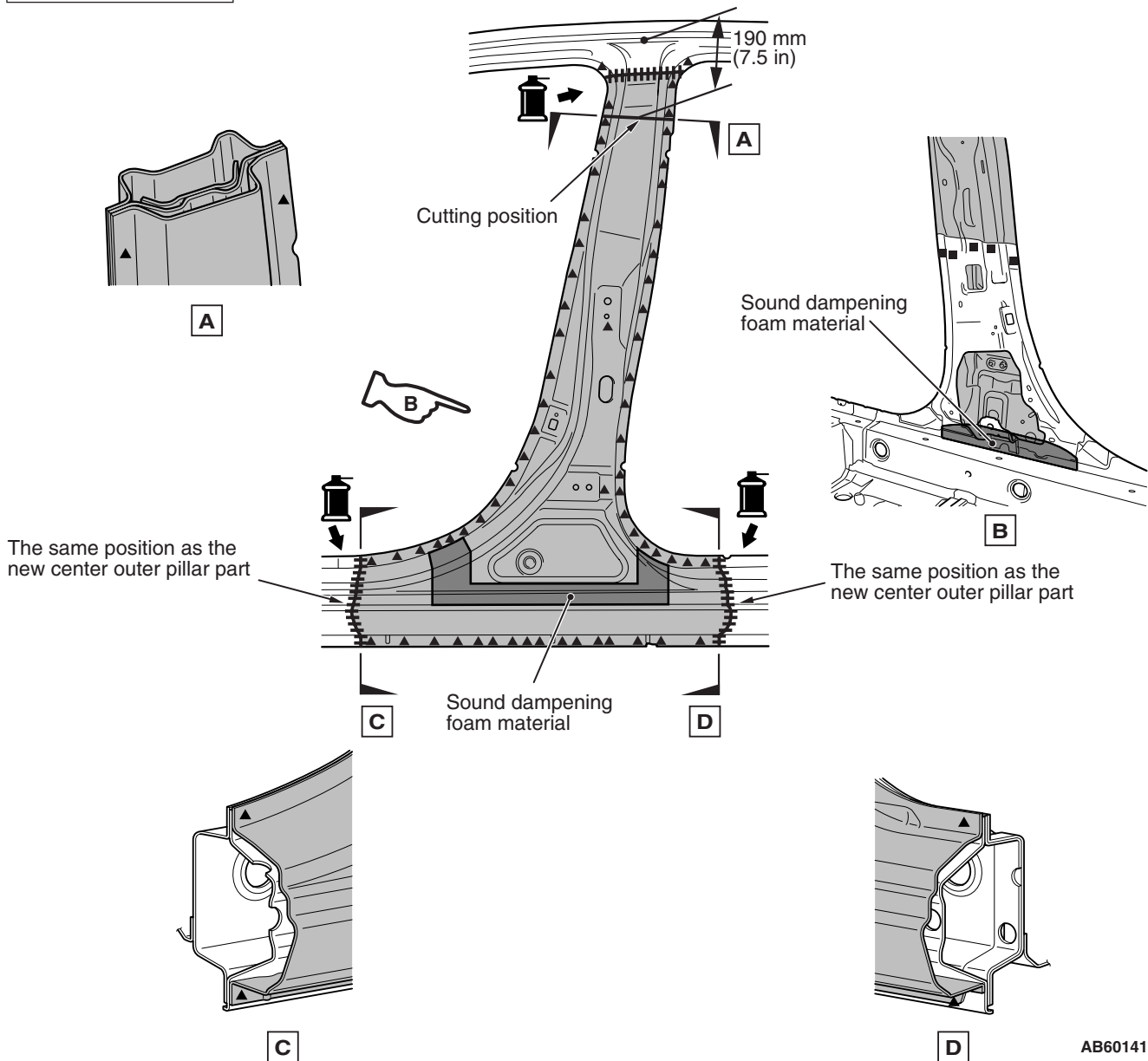
CAUTION

When repairing the area using sound dampening foam material do not use firing tools since the sound dampening foam material may burn.



Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
++++	MIG spot welding
	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS

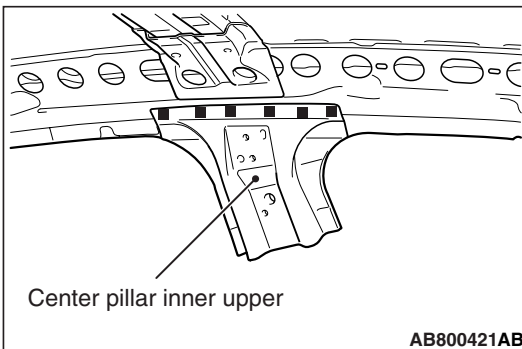
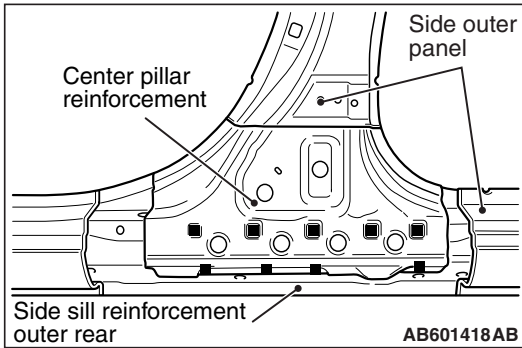


AB601417 AD

NOTE ON REPAIR WORK

REMOVAL

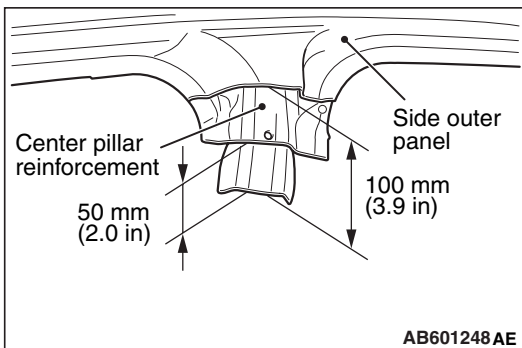
1. To cut the welding points between the center pillar reinforcement and side sill reinforcement outer rear, cut the side outer panel as shown.



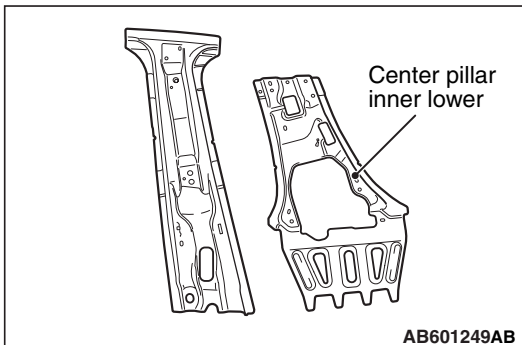
2. After removing the center pillar, remove the center pillar inner upper left on the body side.

INSTALLATION

1. To reinforce the strength in the center pillar cut area, cut the side outer panel 100 mm (3.9 inches) above the cut area and cut the center pillar reinforcement 50 mm (2.0 inches) above the cut area.



2. Remove the center pillar inner lower from the new center inner pillar parts, and install the center inner pillar to the body.



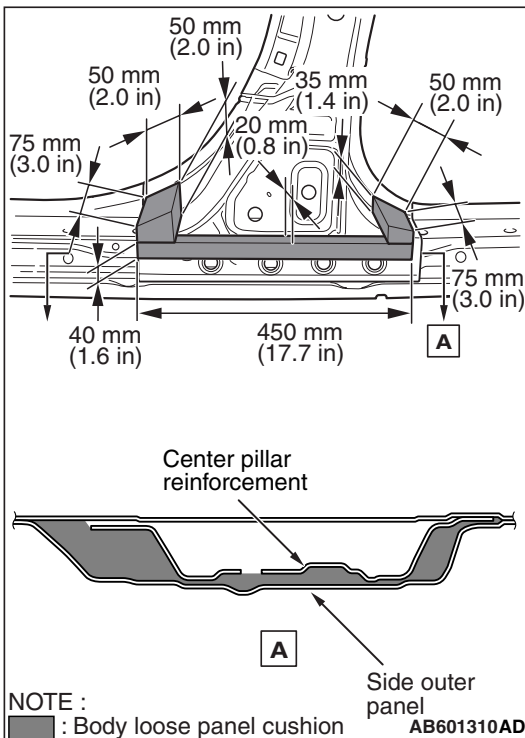
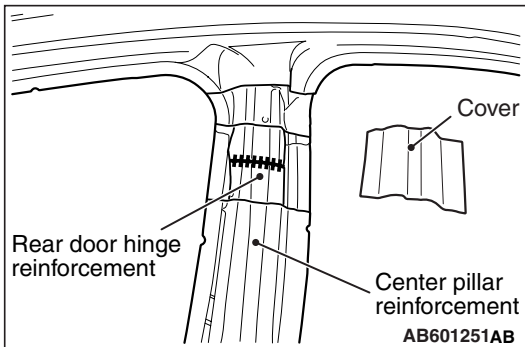
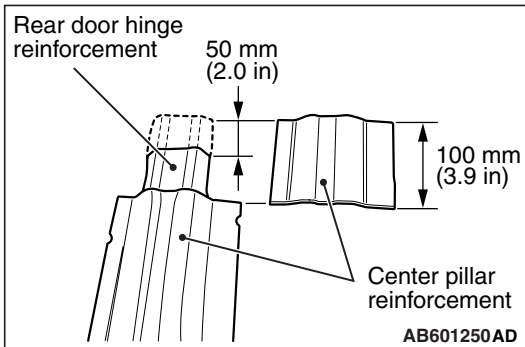
⚠ CAUTION

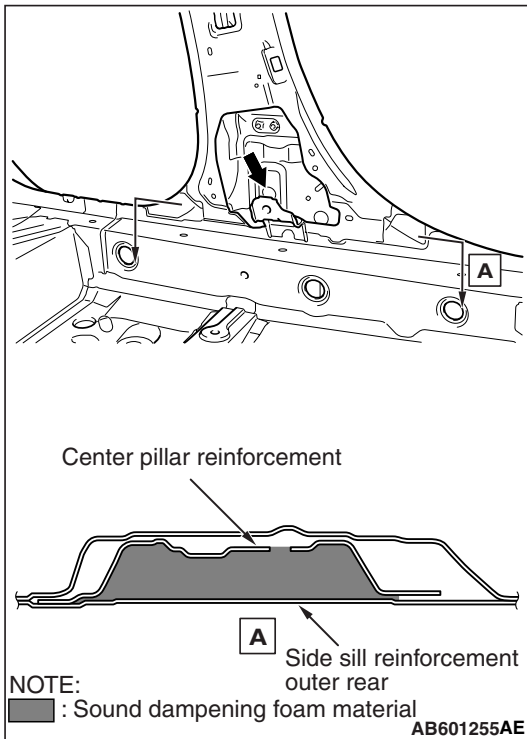
Weld and repair if the rear door hinge reinforcement is damaged.

3. Cut the new center pillar reinforcement parts by aligning them with the cut area of center pillar reinforcement in the body-side. Then, cut only the center pillar reinforcement 100 mm (3.9 inches) below from the cut area to create a cover, and then cut the rear door hinge reinforcement 50 mm (2.0 inches) below from the cut area.

4. Weld the rear door hinge reinforcement then weld the cover of the center pillar reinforcement.

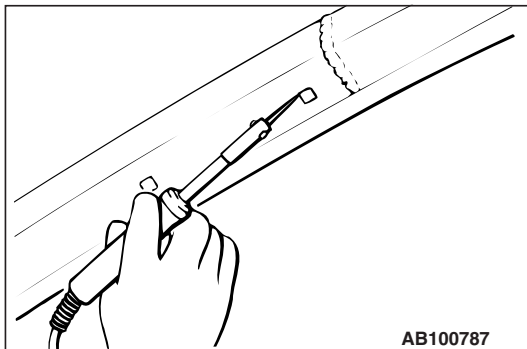
5. When installing the new center outer pillar part, machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the center pillar.





6. After installing the center outer pillar, seal the hole and flange with bolts and aluminum tape, then fill the hole with sound dampening foam material as shown in the figure of the instructions.

Sound dampening foam material: 3M™ AAD Part No.08463



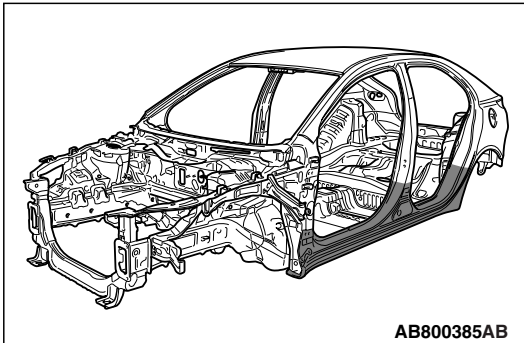
7. Wait 2 hours after filling the sound dampening foam material to remove the bolt and aluminum tape, then melt the sound dampening foam material with a soldering gun so a clip, etc. can thoroughly be inserted in the hole filled with sound dampening foam material.

SIDE SILL

M4030007001581

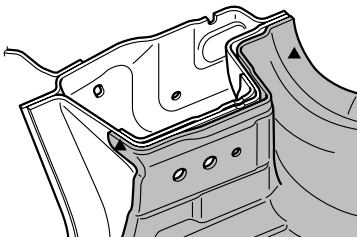
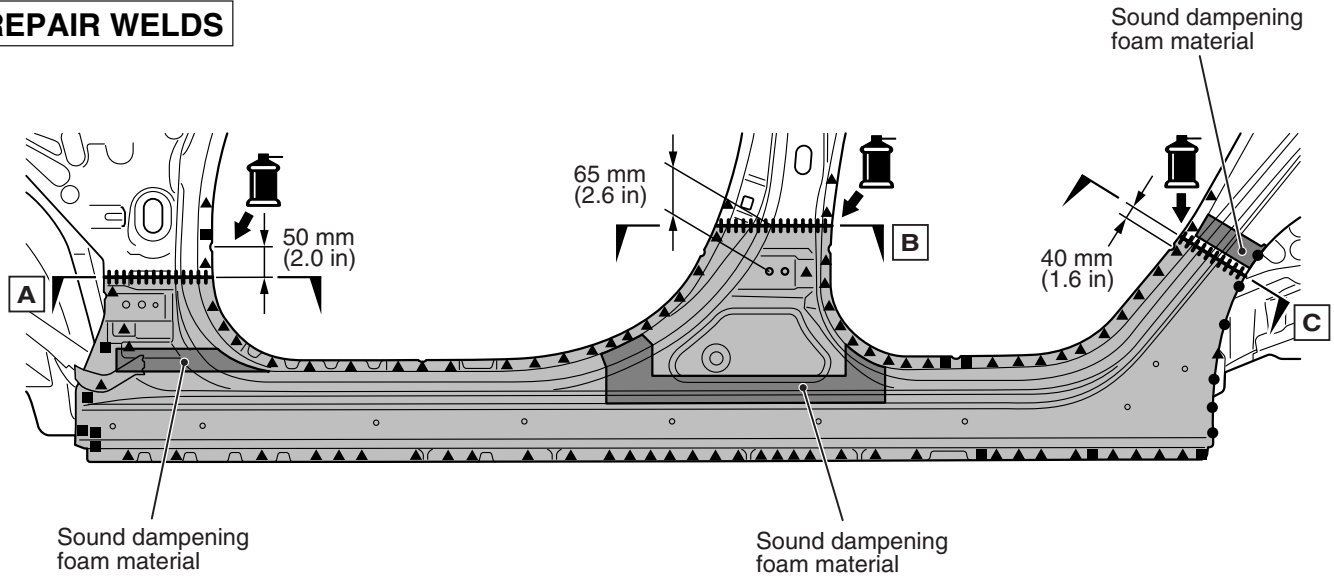
CAUTION

When repairing the area using sound dampening foam material do not use firing tools since the sound dampening foam material may burn.

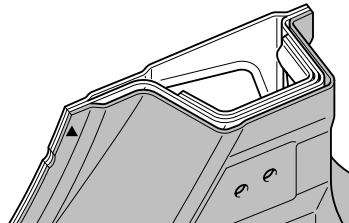


Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

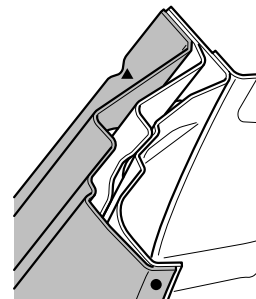
REPAIR WELDS



A

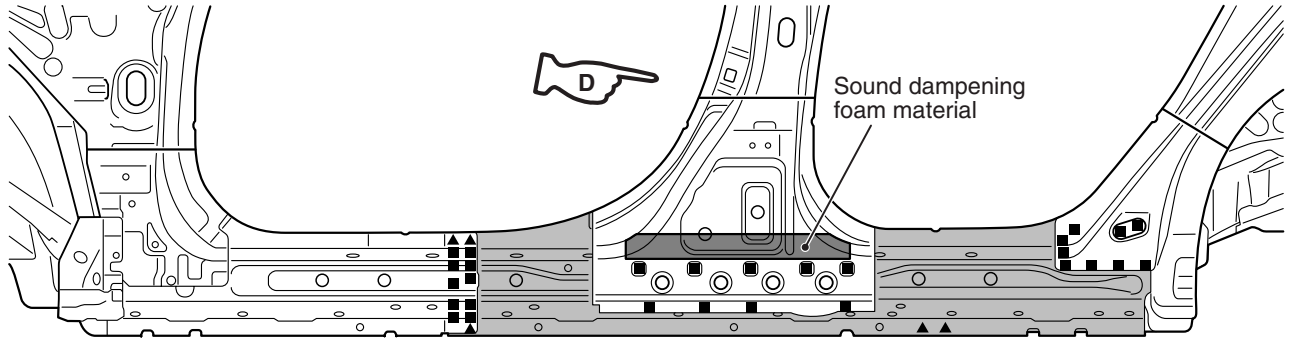


B

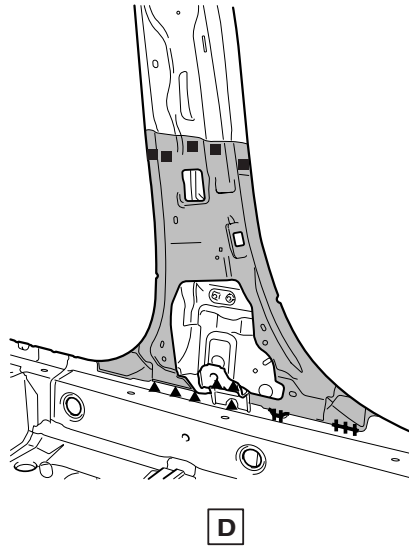


C

AB601516AD



(With the side outer panel removed)

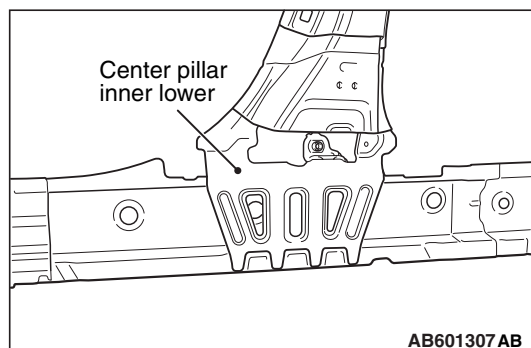
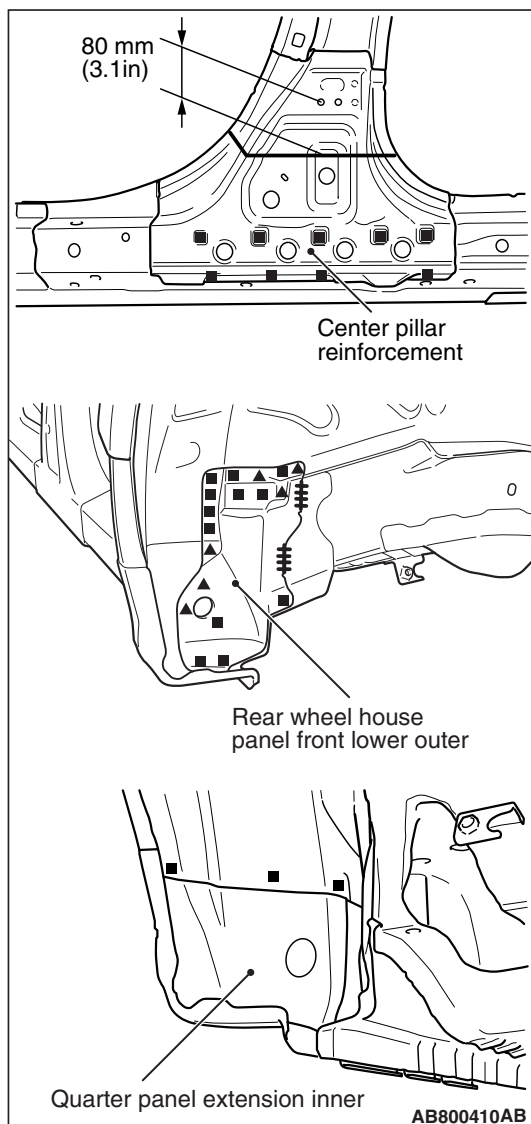


AB601517AB

NOTE ON REPAIR WORK

REMOVAL

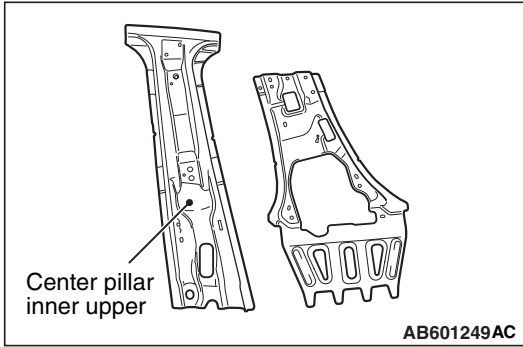
1. When installing the side sill reinforcement outer rear, cut the center pillar reinforcement 80 mm (3.1 inches) downward from the installation hole of the rear door hinge because the center pillar reinforcement interferes with it. For the rear wheel house, remove the rear wheel house front lower outer and quarter panel extension inner because the quarter panel extension inner interferes with the rear wheel house front lower outer.



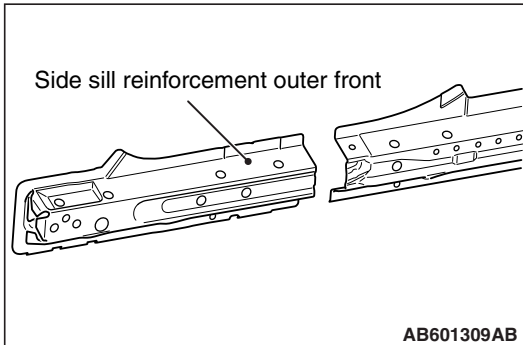
2. After removing the side sill reinforcement outer rear, remove the center pillar inner lower.

INSTALLATION

1. Remove the center pillar inner upper from the new center inner pillar parts, and install the center inner pillar to the body.

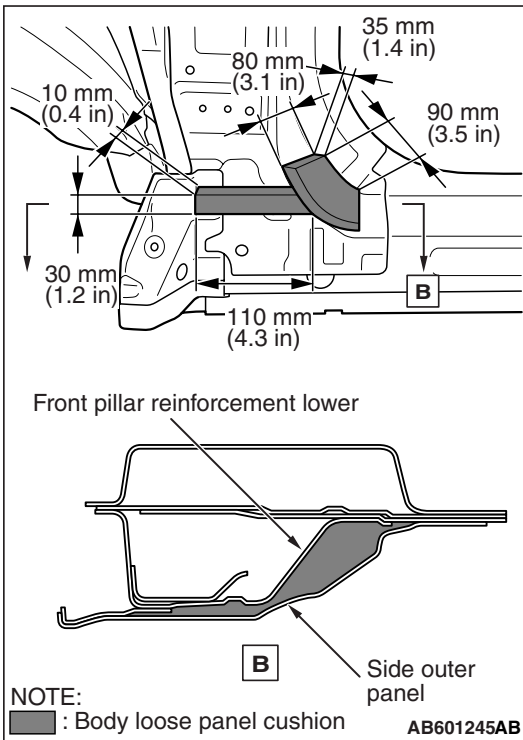


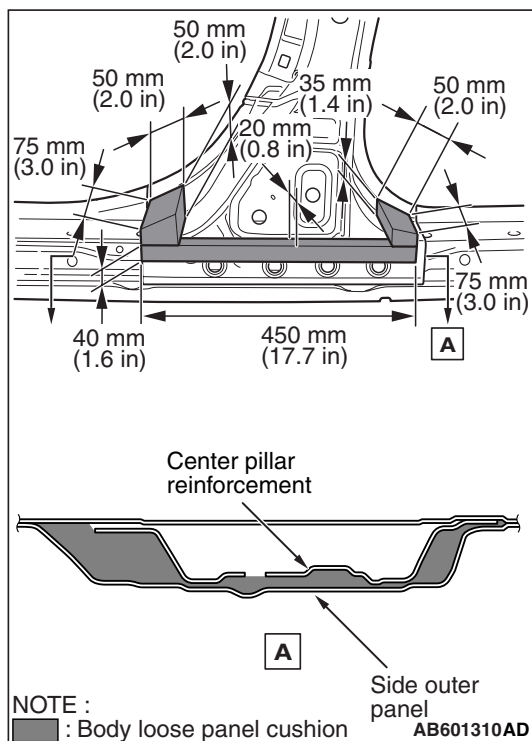
2. Remove the side sill reinforcement outer front from the new side sill reinforcement, and install the side sill reinforcement to the body.



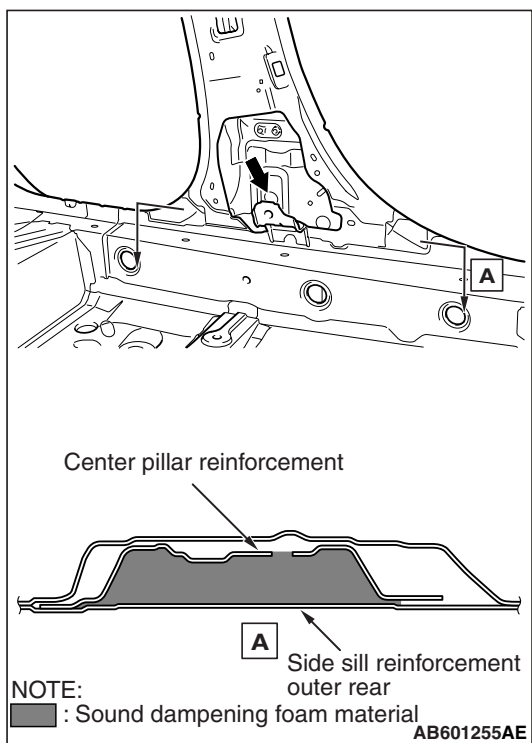
3. When installing the new front floor side sill outer parts, perform the following procedures.

(1) Machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the front pillar.



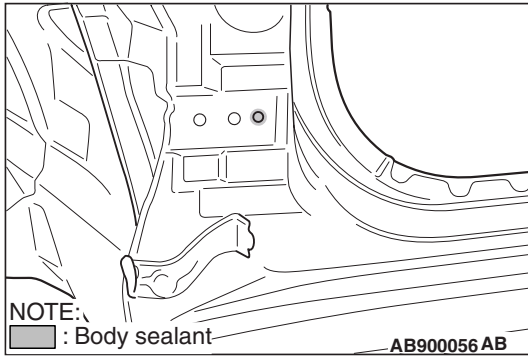


- (2) Machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the center pillar.
4. After installing the front floor side sill outer, perform the following procedures.

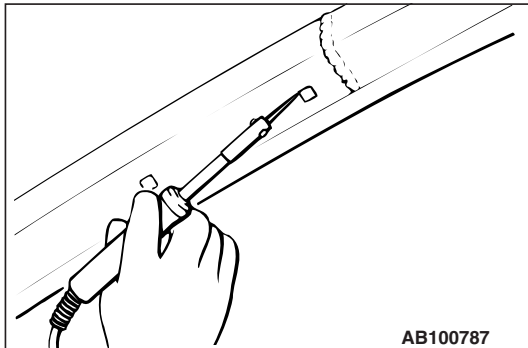


- (1) Seal the hole and flange with bolts and aluminum tape, then fill the hole with sound dampening foam material as shown in the figure of the instructions.

Sound dampening foam material: 3M™ AAD Part No.08463



(2) Apply the body sealant to close the hole of the side outer panel shown in the figure.



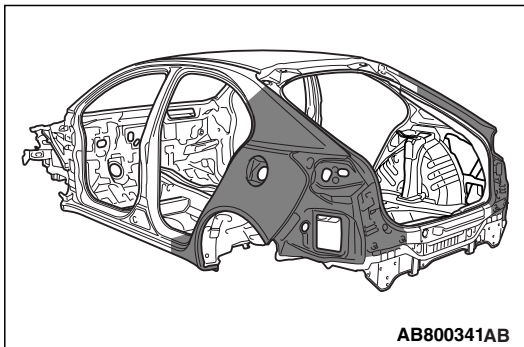
5. Wait 2 hours after filling the sound dampening foam material to remove the bolt and aluminum tape, then melt the sound dampening foam material with a soldering gun so a clip, etc. can thoroughly be inserted in the hole filled with sound dampening foam material.

QUARTER OUTER

M4030008001197

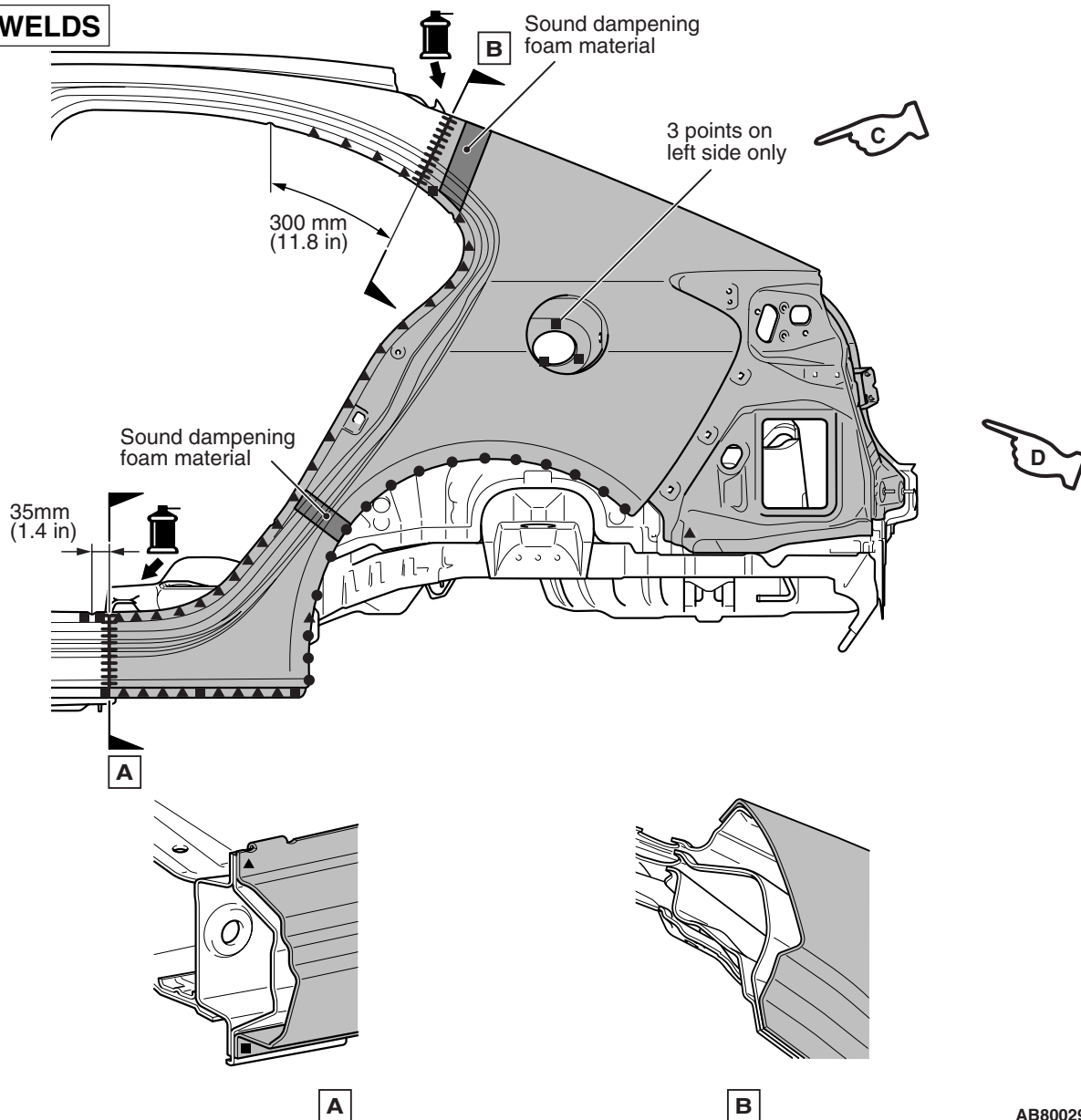
CAUTION

When repairing the area using sound dampening foam material do not use firing tools since the sound dampening foam material may burn.

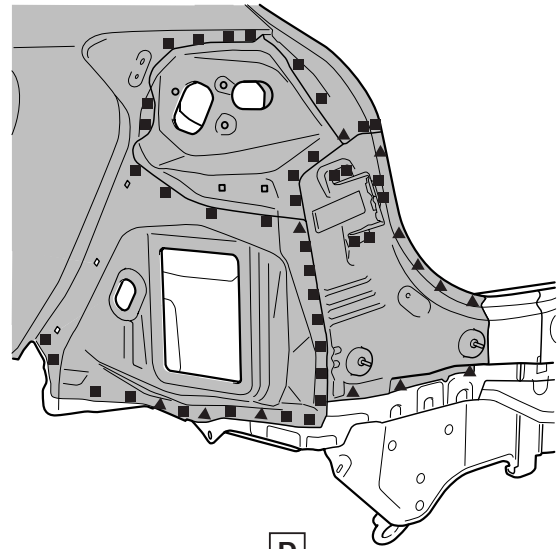
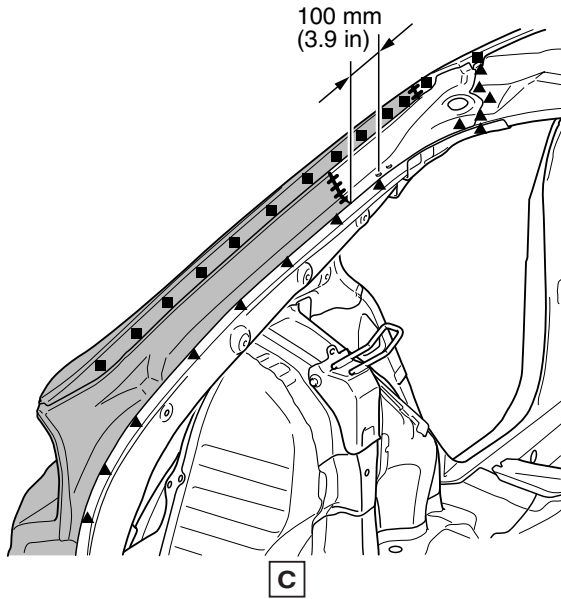


Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
+ + + +	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

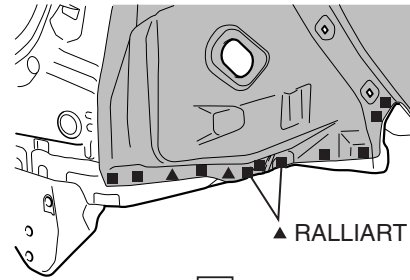
REPAIR WELDS



AB800294AB

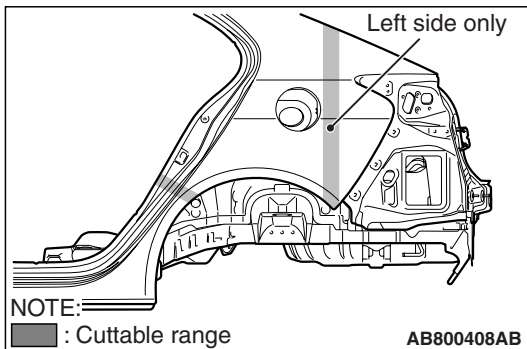


(Left side)



(Right side)

AB800296AB

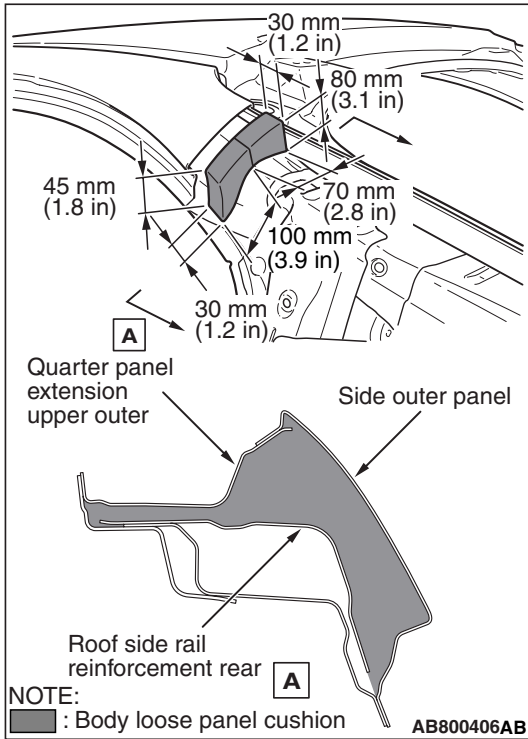


NOTE: Partial replacement is possible depending on the range of damage.

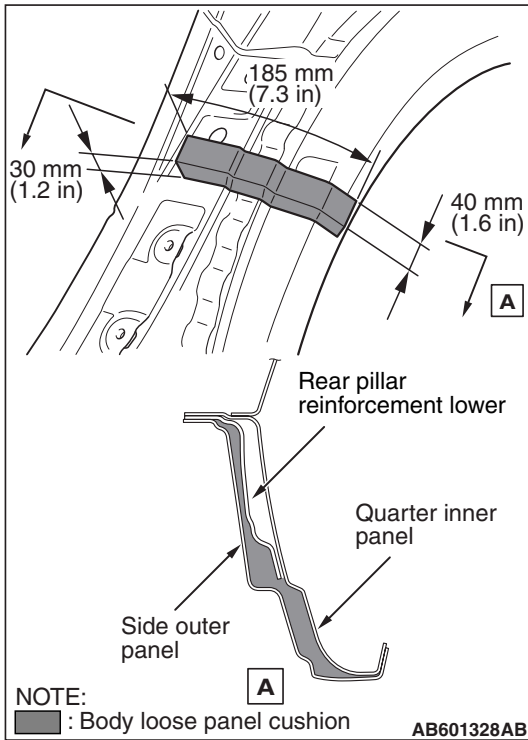
NOTE ON REPAIR WORK

INSTALLATION

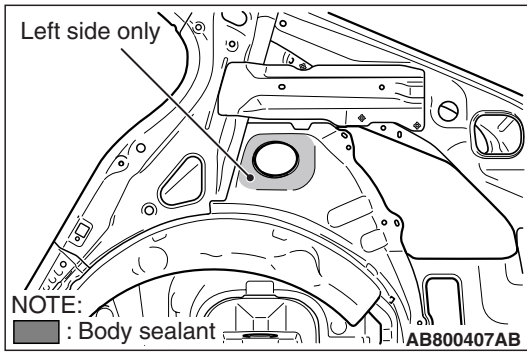
When installing the new quarter panel outer parts, perform the following procedures.



1. Machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the gate pillar.



2. Machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the wheel arch.



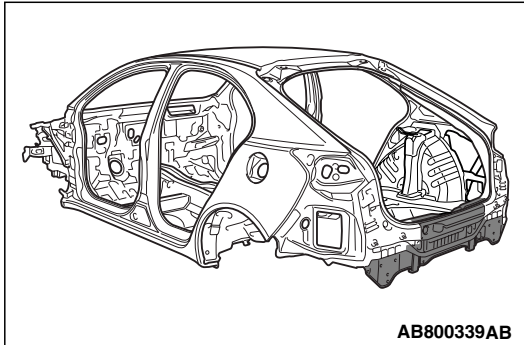
3. Apply the body sealant in advance to the areas as shown.


REAR END CROSSMEMBER

M4030015000680

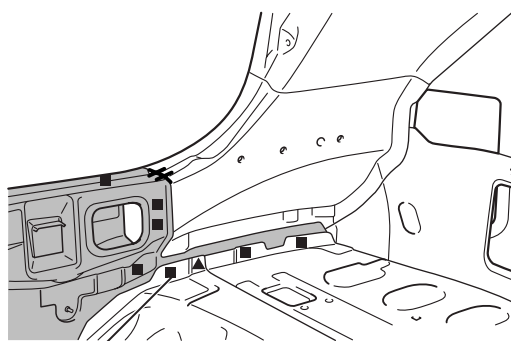
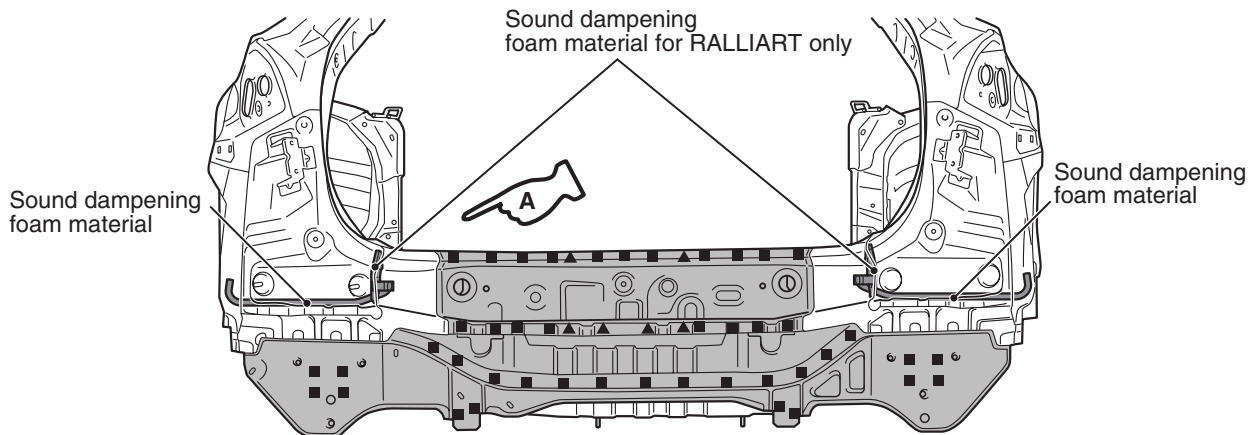
CAUTION

When repairing the area using sound dampening foam material do not use firing tools since the sound dampening foam material may burn.



Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■ : indicates two panels to be welded ▲ : indicates three panels to be welded)
++++	MIG spot welding
	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



AB801204AB

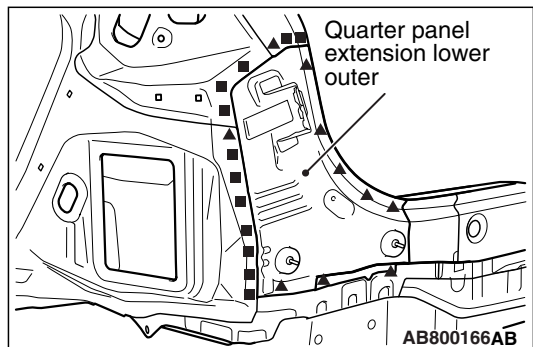
NOTE ON REPAIR WORK

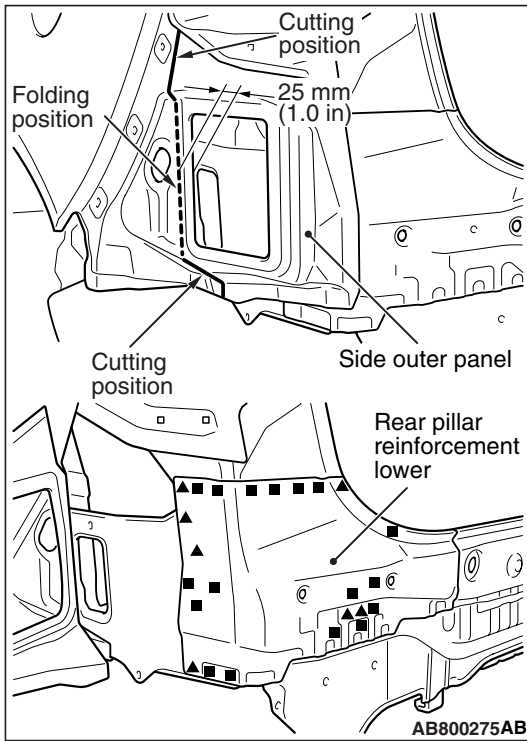
REMOVAL

When removing the rear end panel, remove the following parts because they interfere with the rear end panel.

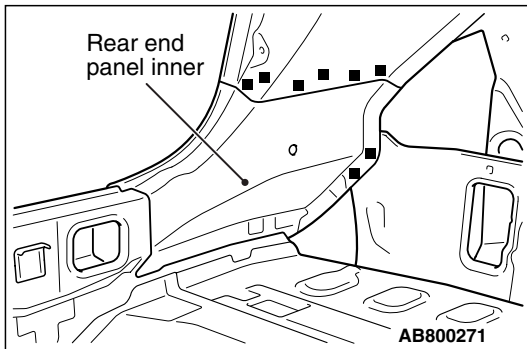
- Quarter panel extension lower outer
- Rear pillar reinforcement lower
- Rear end panel inner

1. Remove the quarter panel extension lower outer.

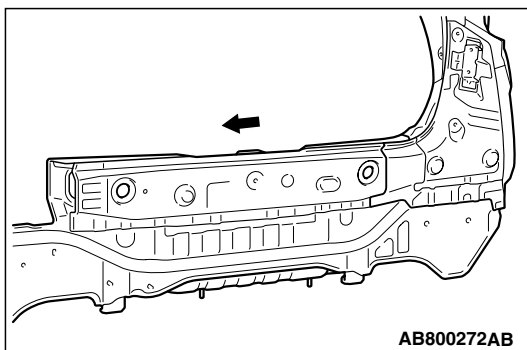




2. When removing the rear pillar reinforcement lower, cut the side outer panel as shown in the figure because the welding points with the gate pillar reinforcement upper are hidden by the side outer panel. Then, fold and turn up the side outer panel 25 mm (1.0 inches) forward from the rear ventilation duct mounting hole.



3. Remove the rear end panel inner.

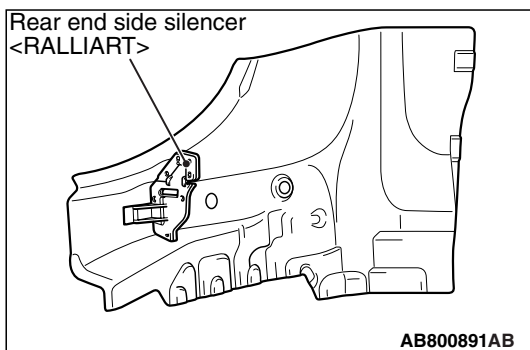


4. Pull out the rear end panel to the left.

NOTE ON REPAIR WORK

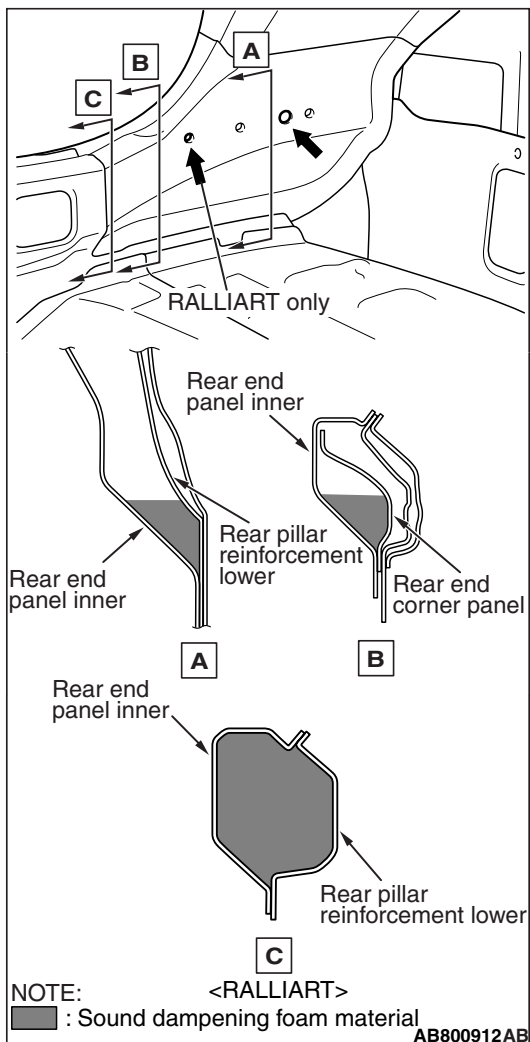
INSTALLATION

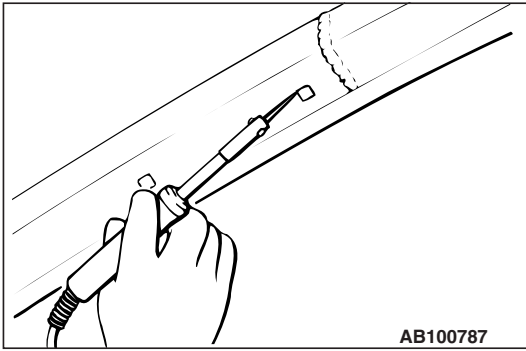
1. When installing the new rear pillar reinforcement lower, in order to prevent the dripping of sound dampening foam material to be filled into the rear end panel inner in the next process, install the rear end side silencer to the rear pillar reinforcement lower, and then apply the butyl-tape to close the hole and gap of rear end side silencer.<RALLIART>



2. After installing the quarter panel extension lower outer, seal the hole and flange with bolts and aluminum tape, then fill the hole with sound dampening foam material as shown in the figure of the instructions.

Sound dampening foam material: 3M™ AAD Part No.08463

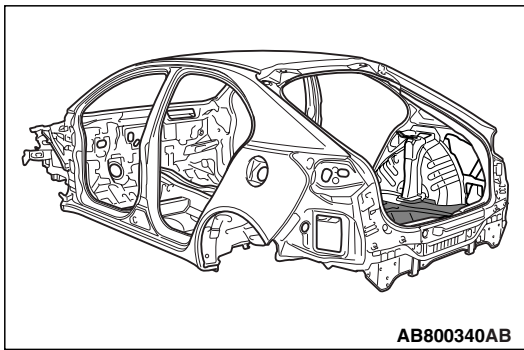




- Wait 2 hours after filling the sound dampening foam material to remove the bolt and aluminum tape, then melt the sound dampening foam material with a soldering gun so a clip, etc. can thoroughly be inserted in the hole filled with sound dampening foam material.

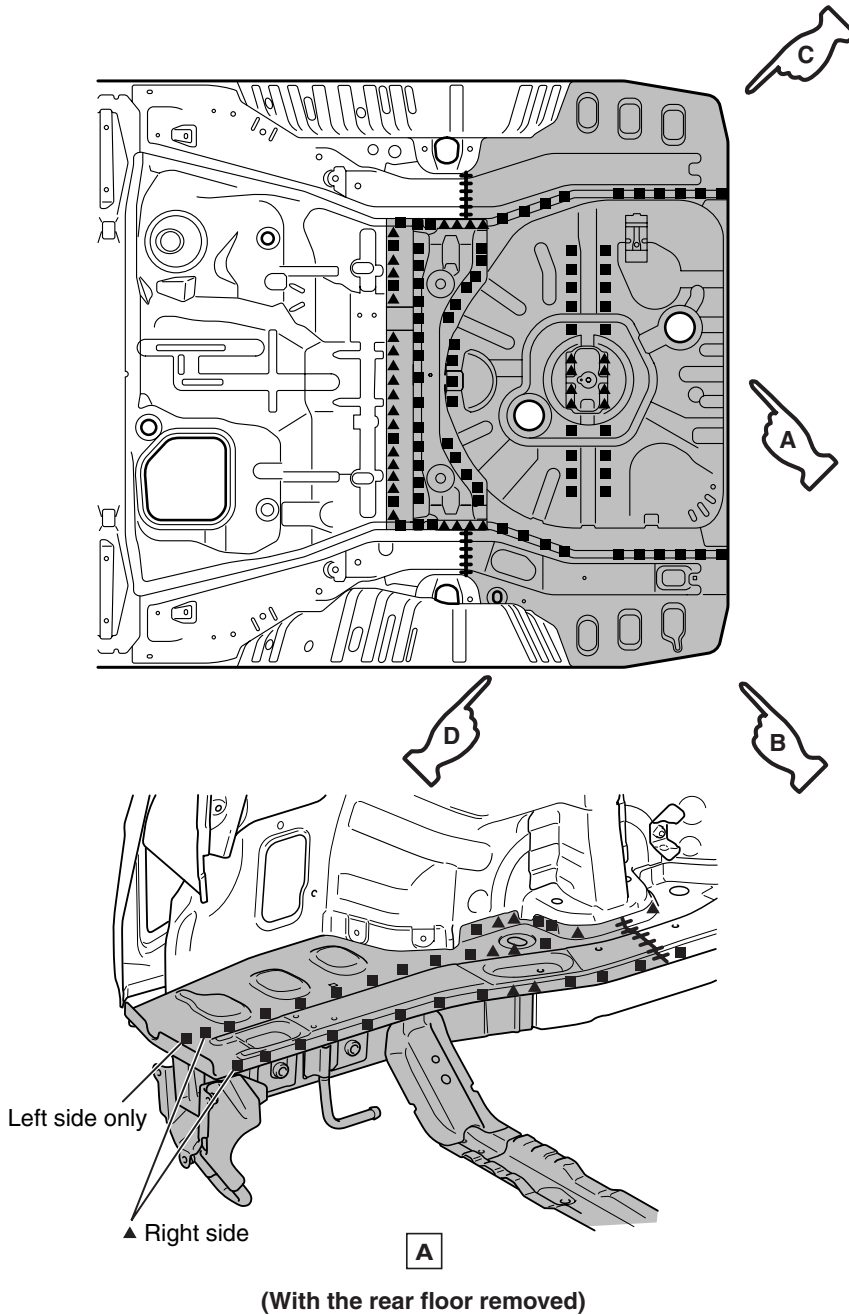
REAR FLOOR

M4030010001105



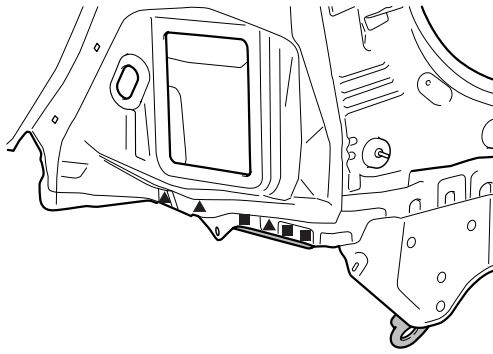
Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■ : indicates two panels to be welded) ▲ : indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
oooooo	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS

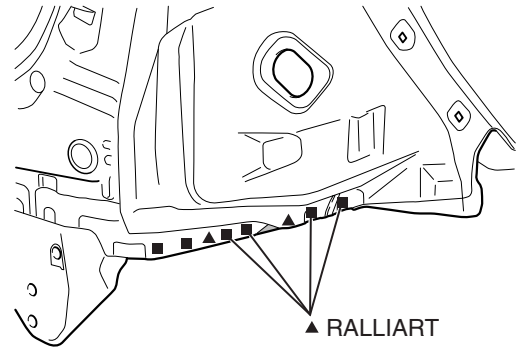


AB800243AB

NOTE: Refer to the Rear End Crossmember section on P.3-34 for the welding points with the Rear end crossmember.

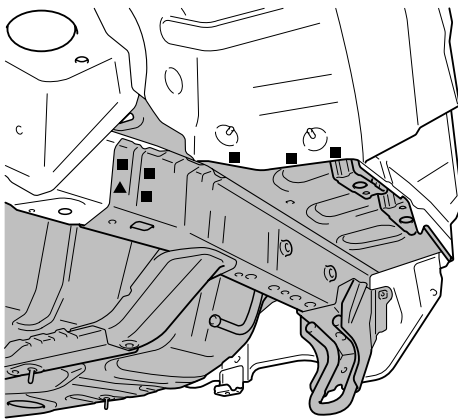


B

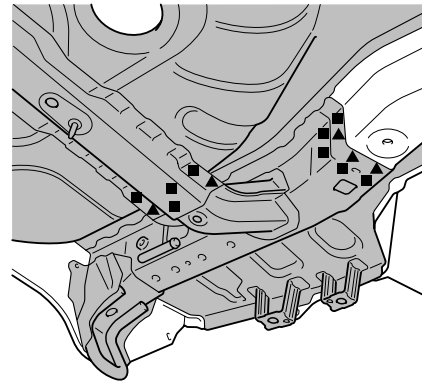


▲ RALLIART

C



D



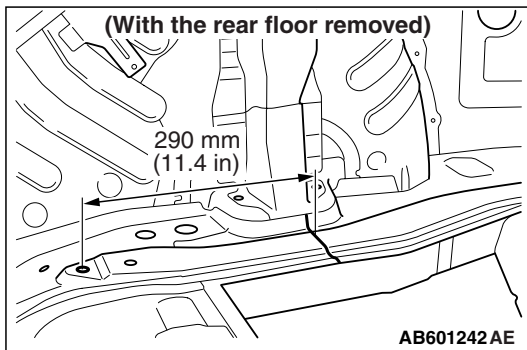
E

AB801228 AB

NOTE ON REPAIR WORK

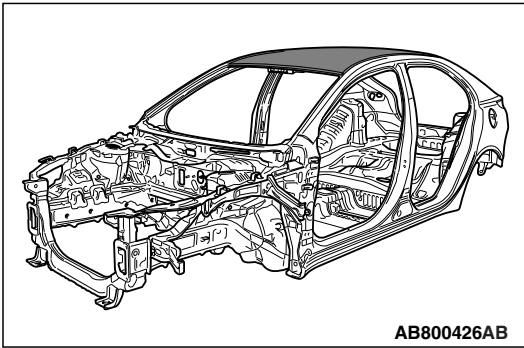
REMOVAL

1. When removing the rear floor side panel, cut it 290 mm (11.4 inches) behind the installation hole of the child restraint bracket.




ROOF

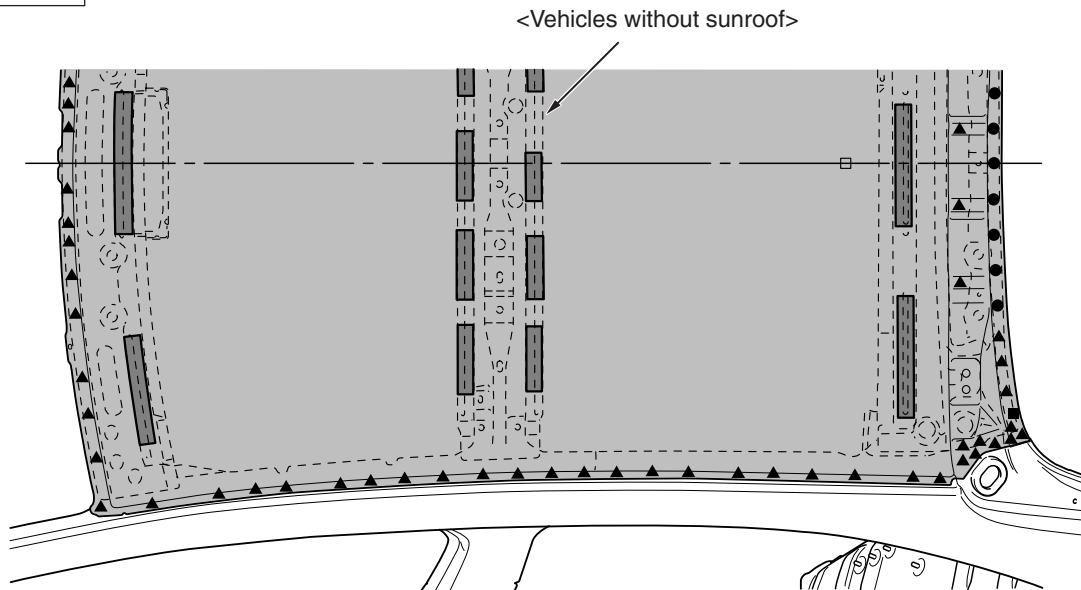
M4030011001313




AB800426AB

Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



NOTE :
 : Adhesive

AB801200AB

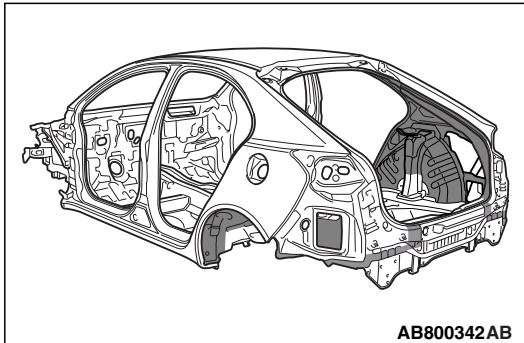
Adhesive: Urethane body sealer

Brand: 3M™ AAD Part No.08360 or equivalent

QUARTER INNER

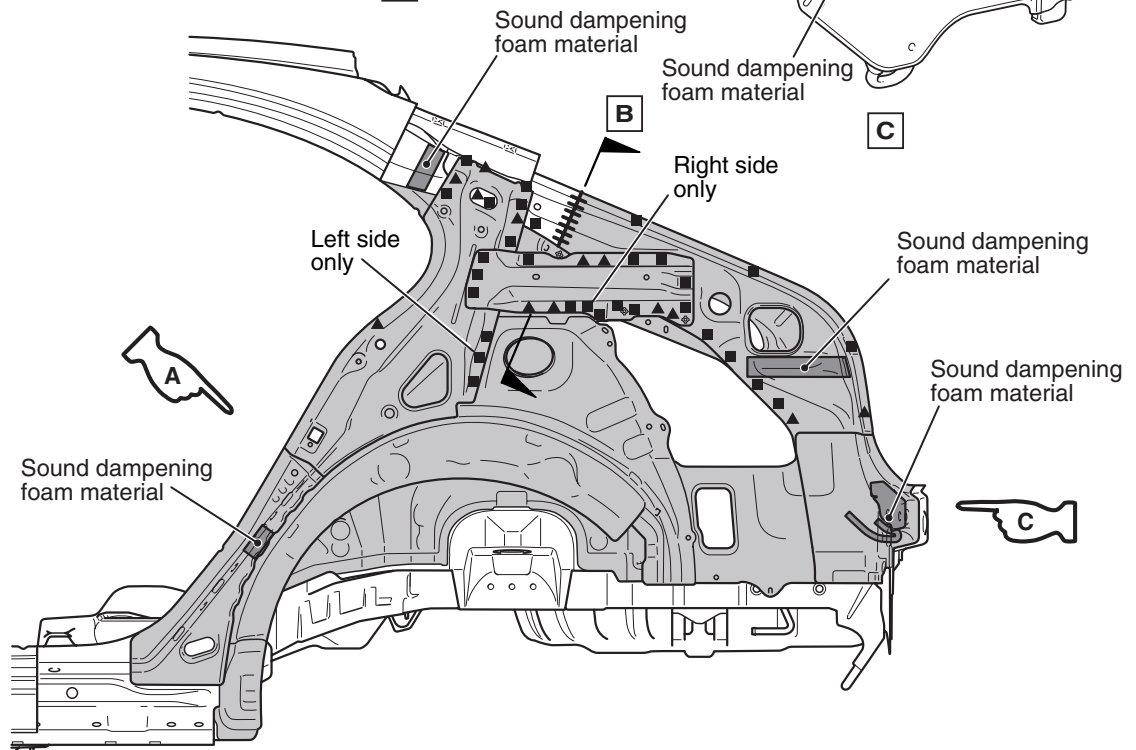
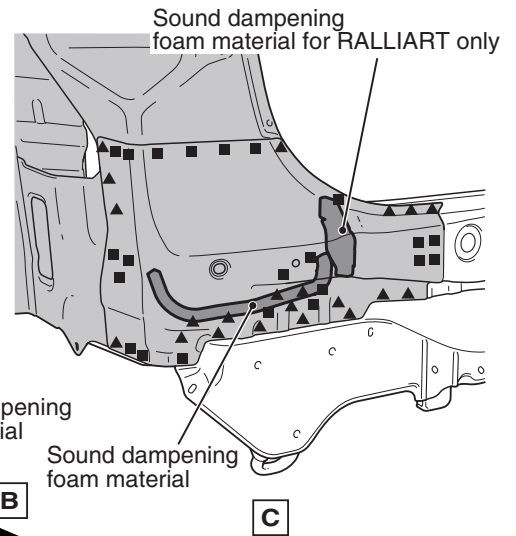
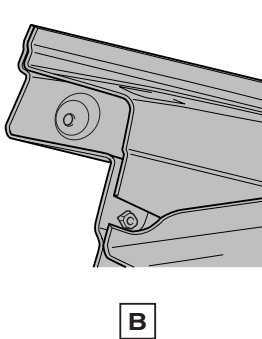
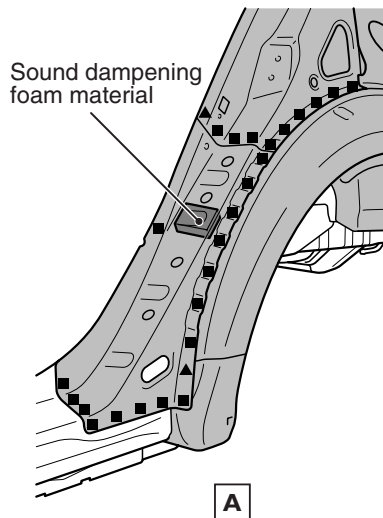
CAUTION

When repairing the area using sound dampening foam material do not use firing tools since the sound dampening foam material may burn.



Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

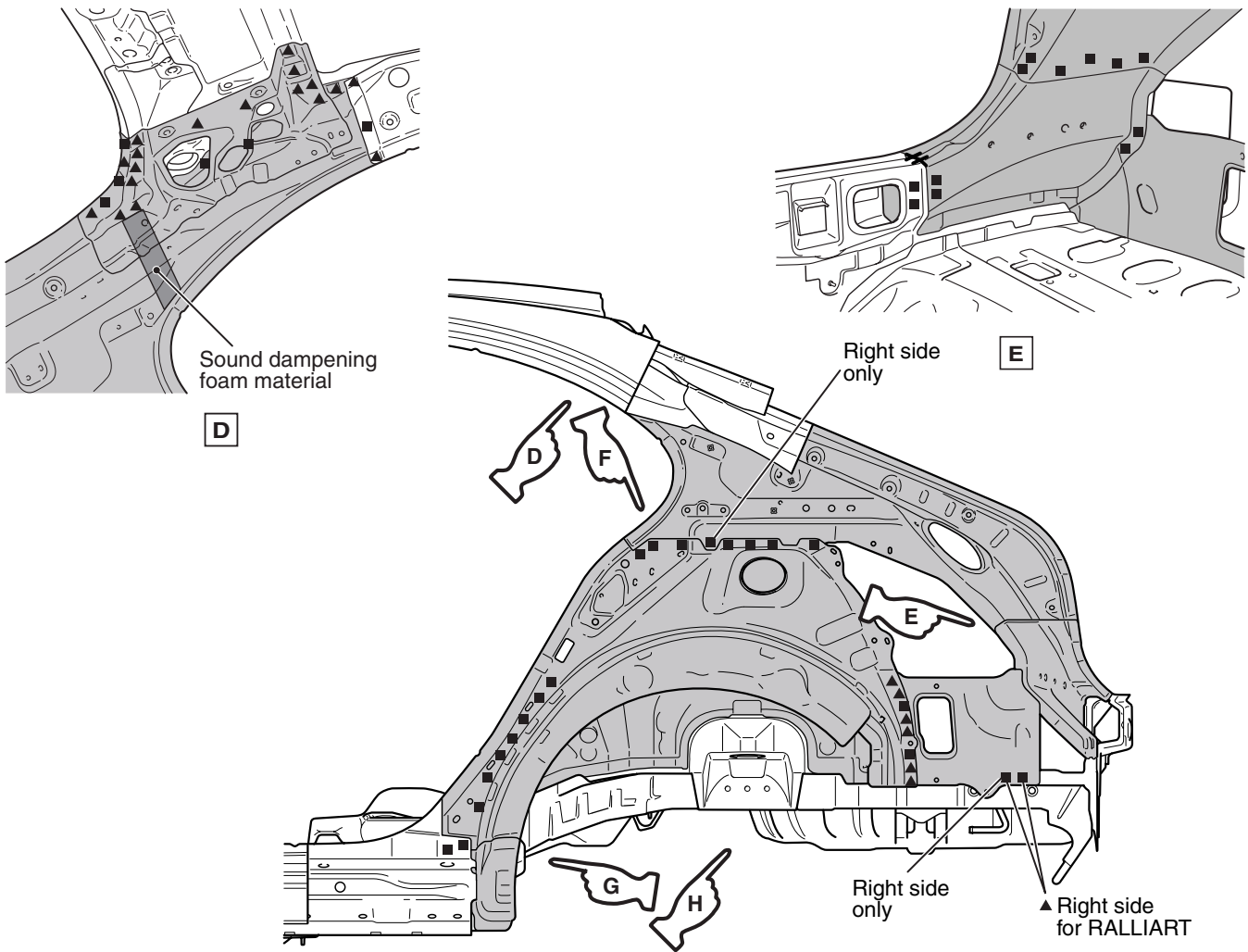
REPAIR WELDS



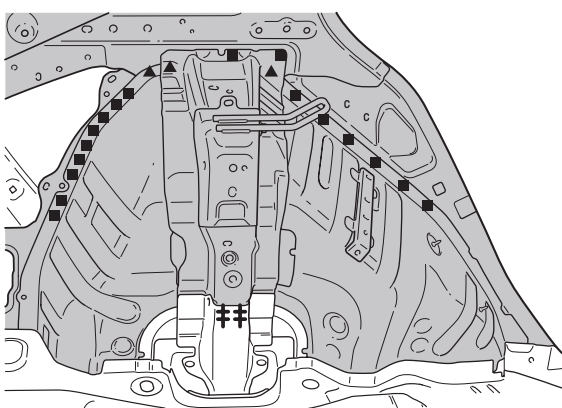
(With the quarter outer removed)

AB801003AB

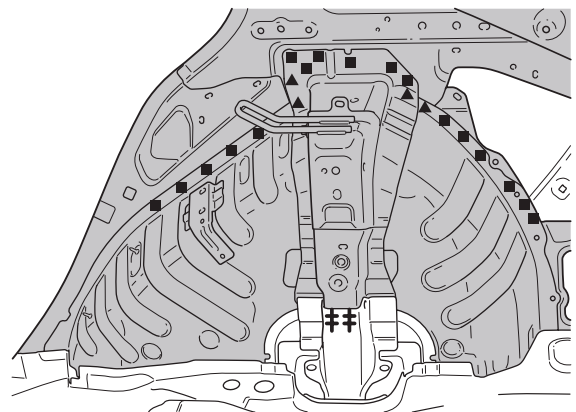
NOTE: Refer to the Quarter Outer section on P.3-30 for the welding points with the quarter outer.



(With the gate pillar reinforcement and the rear pillar reinforcement lower removed)

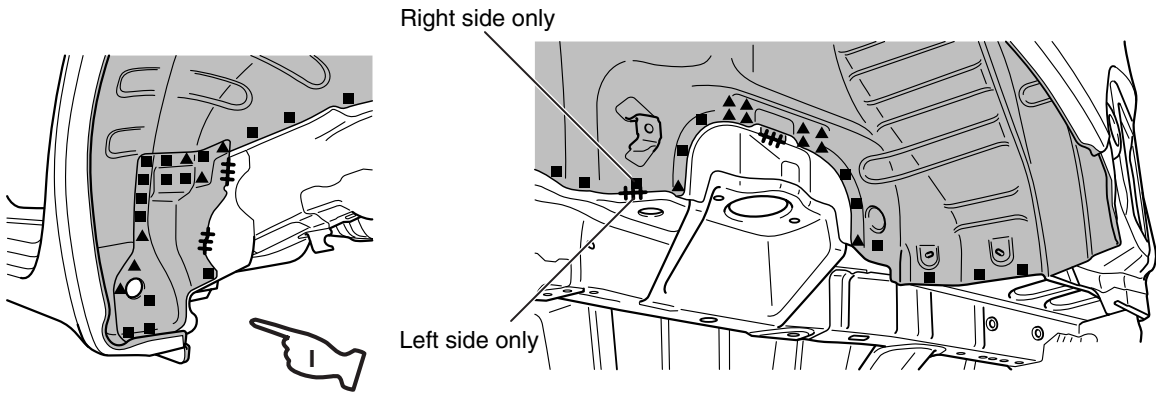


F
(Left side)



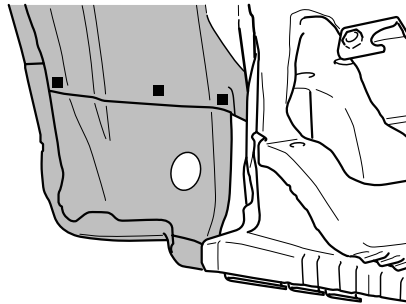
F
(Right side)

AB800402AB



G

H



I

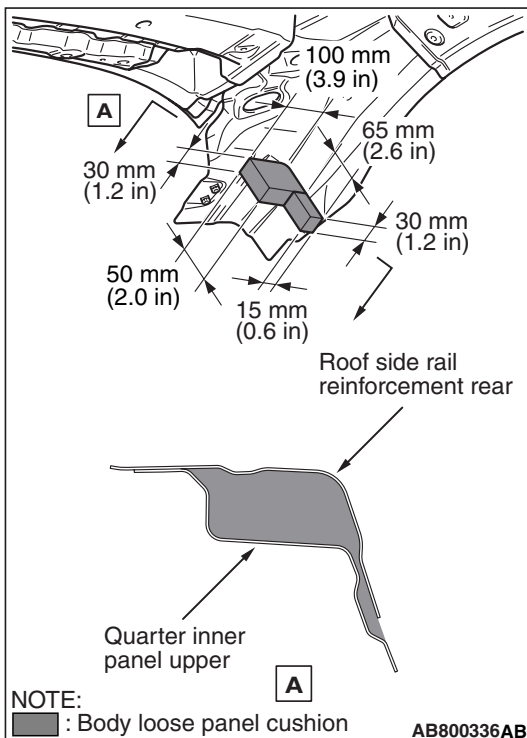
(With the rear wheel house panel front lower outer removed)

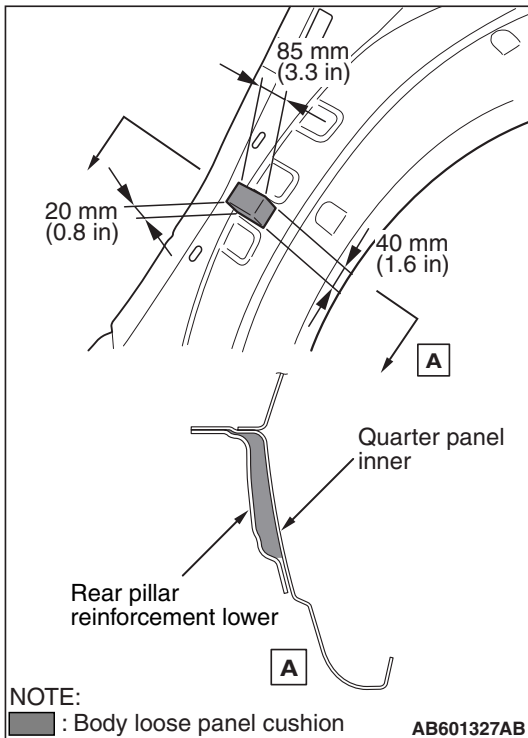
AB800351AB

NOTE ON REPAIR WORK

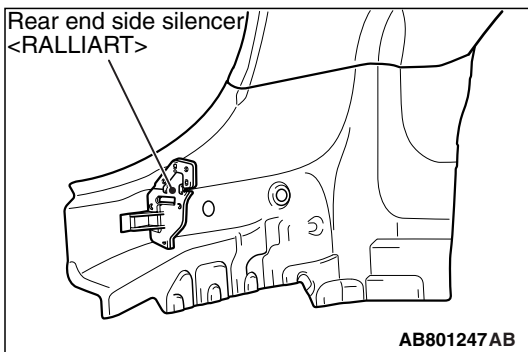
INSTALLATION

1. When installing the new quarter inner panel upper parts, machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the gate pillar.

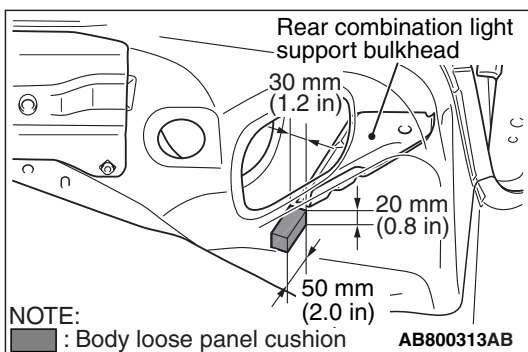




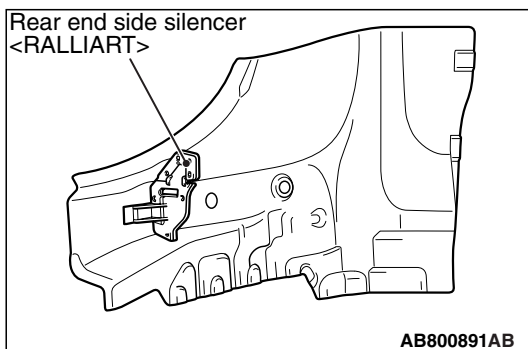
- When installing the new rear pillar reinforcement lower part, machine the body loose panel cushion (MR535301 or MR435765) for replacement as shown and apply it to the body side because the sound dampening foam material cannot be filled into the rear pillar reinforcement lower.



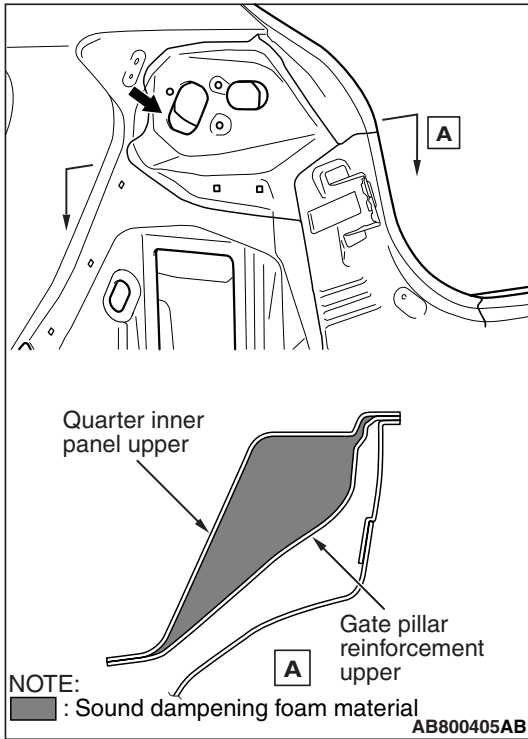
- When installing the new gate pillar reinforcement parts, in order to prevent the dripping of sound dampening foam material to be filled into the rear end panel inner in the next process, install the rear end side silencer to the rear pillar reinforcement lower, and then apply the butyl-tape to close the hole and gap of rear end side silencer.<RALLIART>



- After installing the gate pillar reinforcement, in order to fill the sound dampening foam material into the gate pillar in the next process, machine the body loose panel cushion (MR535301 or MR435765) as shown in the figure, and fill the gap of the rear combination light support bulkhead.

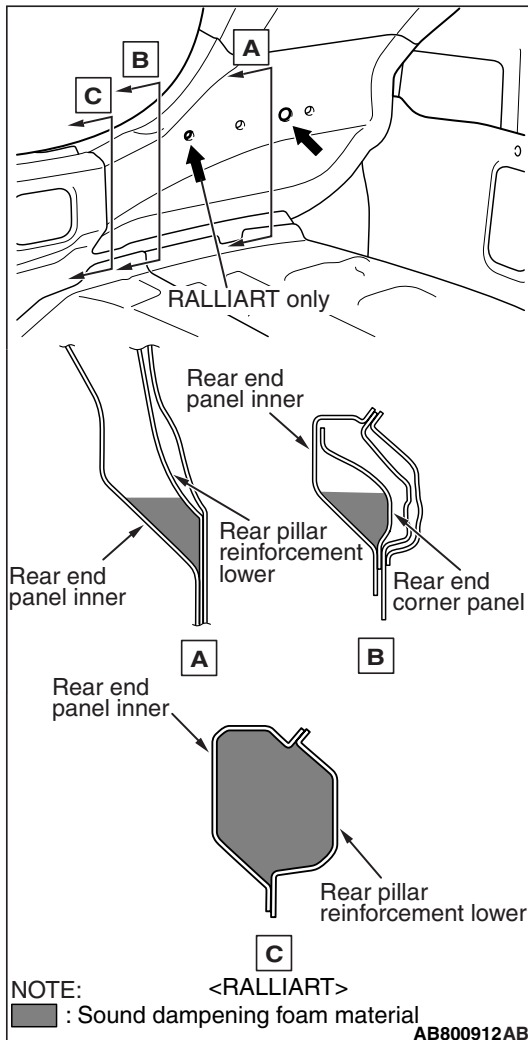


- When installing the new rear pillar reinforcement lower, in order to prevent the dripping of sound dampening foam material to be filled into the rear end panel inner in the next process, install the rear end side silencer to the rear pillar reinforcement lower, and then apply the butyl-tape to close the hole and gap of rear end side silencer.<RALLIART>
- After installing the quarter panel outer, perform the following procedures.



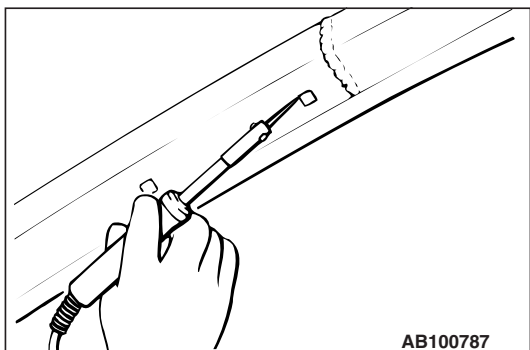
- (1) Seal the hole and flange with bolts and aluminum tape, then fill the hole with sound dampening foam material as shown in the figure of the instructions.

Sound dampening foam material: 3M™ AAD Part No.08463



- (2) Seal the hole and flange with bolts and aluminum tape, then fill the hole with sound dampening foam material as shown in the figure of the instructions.

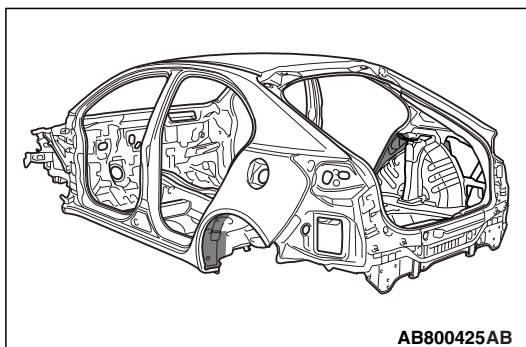
Sound dampening foam material: 3M™ AAD Part No.08463




7. Wait 2 hours after filling the sound dampening foam material to remove the bolt and aluminum tape, then melt the sound dampening foam material with a soldering gun so a clip, etc. can thoroughly be inserted in the hole filled with sound dampening foam material.

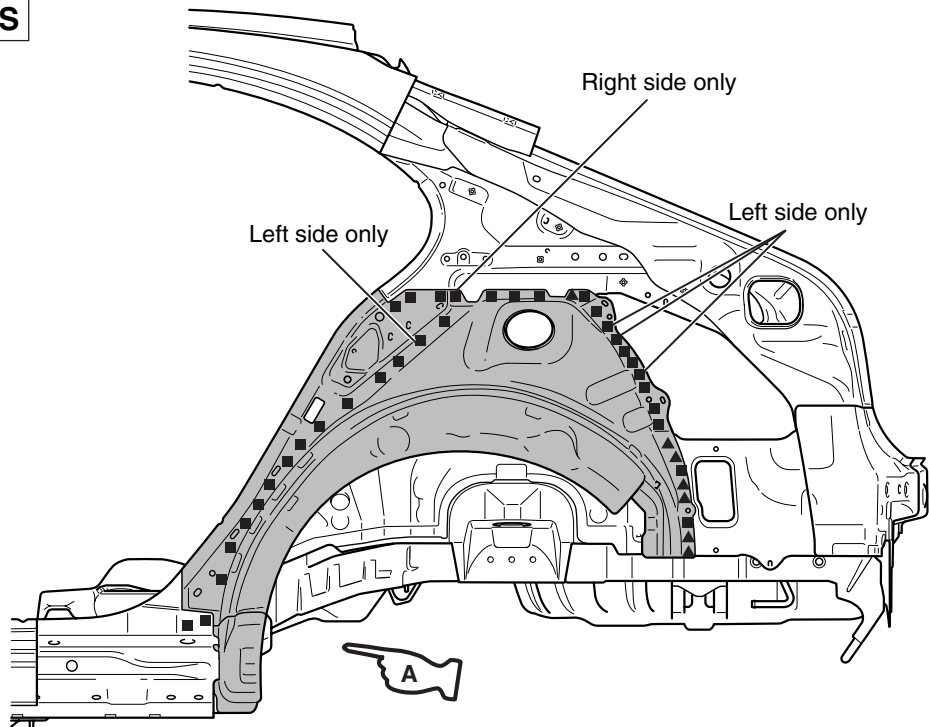
QUARTER INNER LOWER

M4030001100264

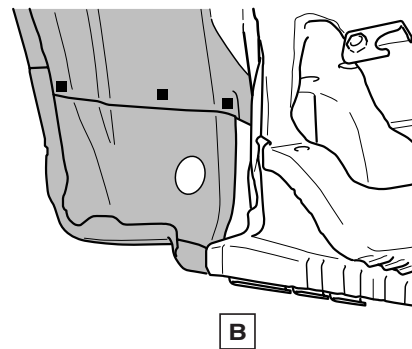
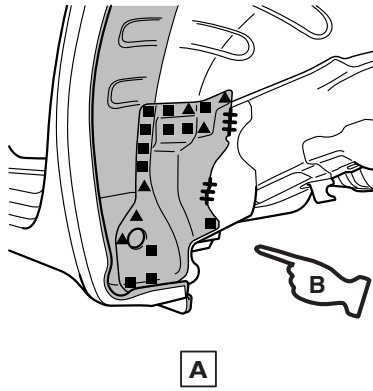


Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded) (▲: indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
oooooo	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



(With the gate pillar reinforcement and the rear pillar reinforcement lower removed)



(With the rear wheel house panel front lower outer removed)

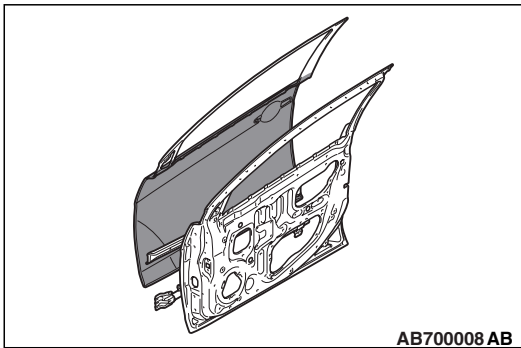
AB800424AB

NOTE:

- Refer to the Quarter Outer section on [P.3-30](#) for the welding points with the quarter outer.
- Refer to the Quarter Inner section on [P.3-42](#) for the welding points with the gate pillar reinforcement and the rear pillar reinforcement lower.

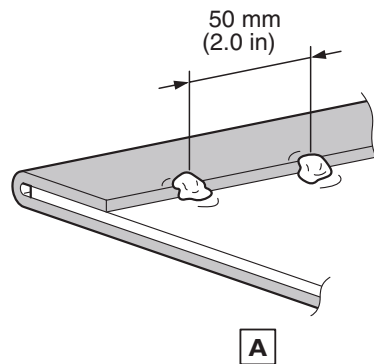
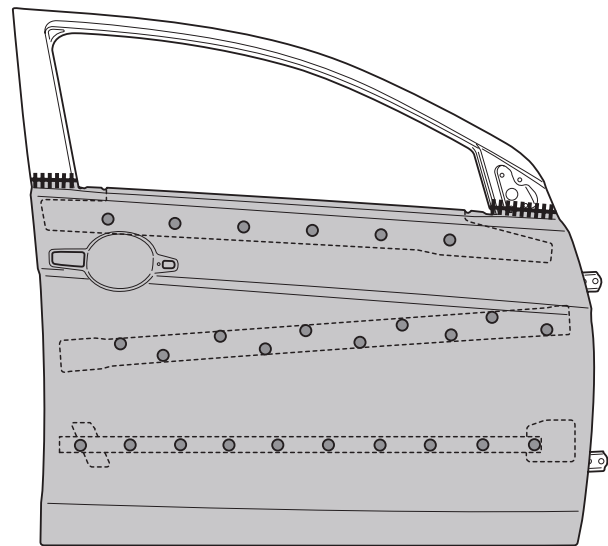
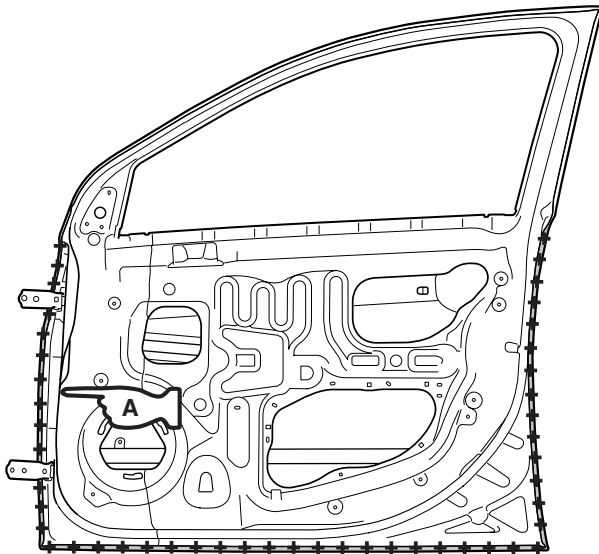
FRONT DOOR OUTER PANEL (WELDED TYPE)

M4030001500455



Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



NOTE :
■ : Adhesive

Adhesive: Urethane body sealer

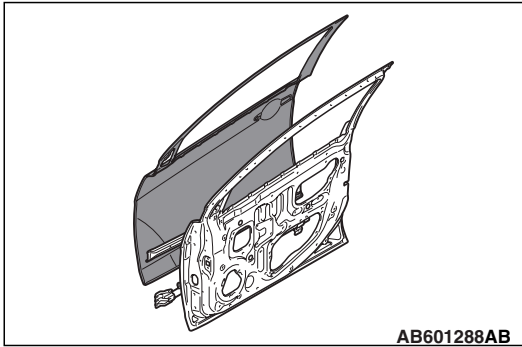
AB601280AB


Brand: 3M™ AAD Part No.08360 or equivalent

NOTE: After hemming the front door outer panel, MIG spot weld the flange overlap section at a pitch of 50 mm (2.0 inches).

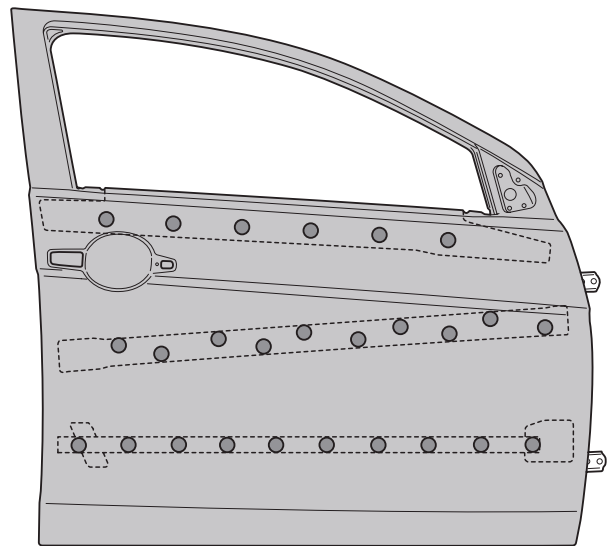
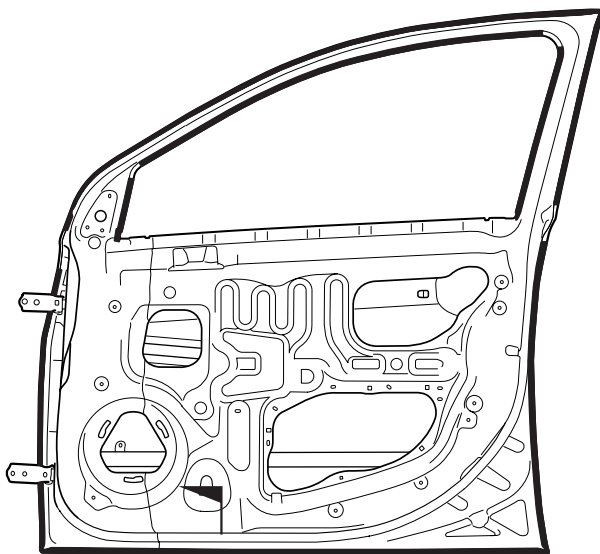
FRONT DOOR OUTER PANEL (ADHESION TYPE)



M4030001700459



SYMBOL	OPERATION DESCRIPTION
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
+++++	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



NOTE :
 : Adhesive 1
 : Adhesive 2

- **Adhesive 1: Urethane body sealer**
Brand: 3M™ AAD Part No.08360 or equivalent
- **Adhesive 2: Epoxyayresin adhesive**
Brand: 3M™ AAD Part No.8115 or equivalent

AB602376AB

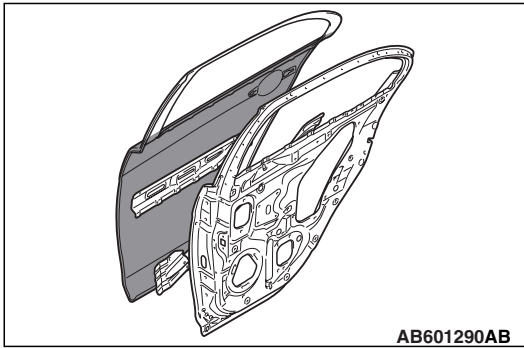
NOTE ON REPAIR WORK


INSTALLATION

1. When installing the new front door panel outer part, grind the bonding surface and remove the paint to improve adhesion. Then, degrease the front door panel outer.
2. Install the front door panel outer and hem it. Then, wipe off the adhesive that squeezed out.

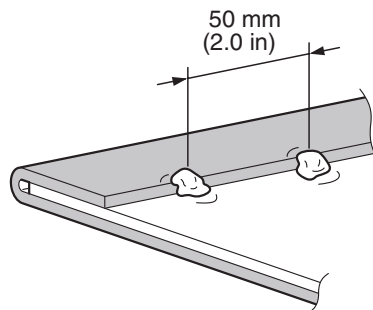
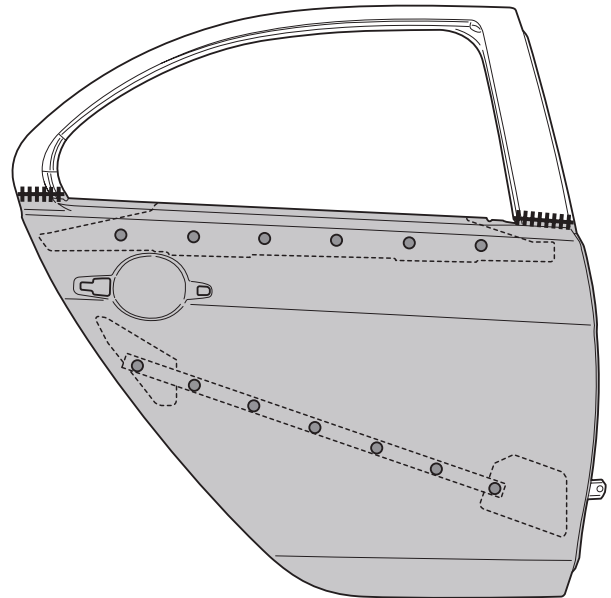
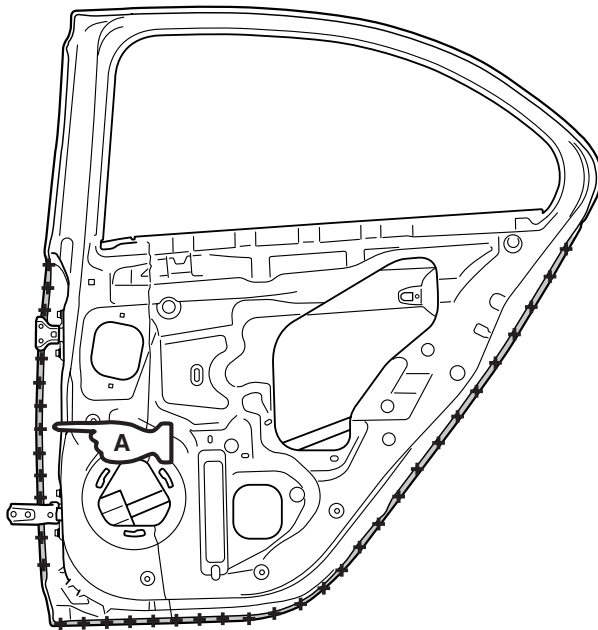
REAR DOOR OUTER PANEL (WELDED TYPE)

M4030001600377



SYMBOL	OPERATION DESCRIPTION
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded ▲: indicates three panels to be welded)
++++	MIG spot welding
#####	MIG arc welding (continuous)
○○○○○○	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



NOTE:

 : Adhesive

Adhesive: Urethane body sealer

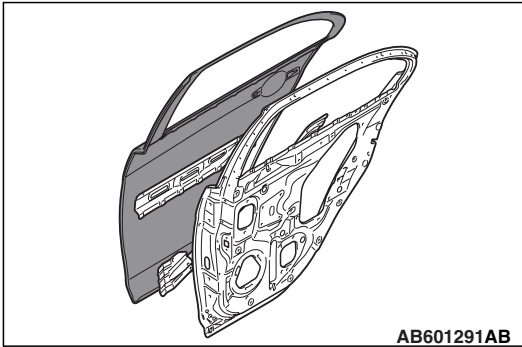
Brand: 3M™ AAD Part No.08360 or equivalent


AB601282AB

NOTE: After hemming the rear door outer panel, MIG spot weld the flange overlap section at a pitch of 50 mm (2.0 inches).

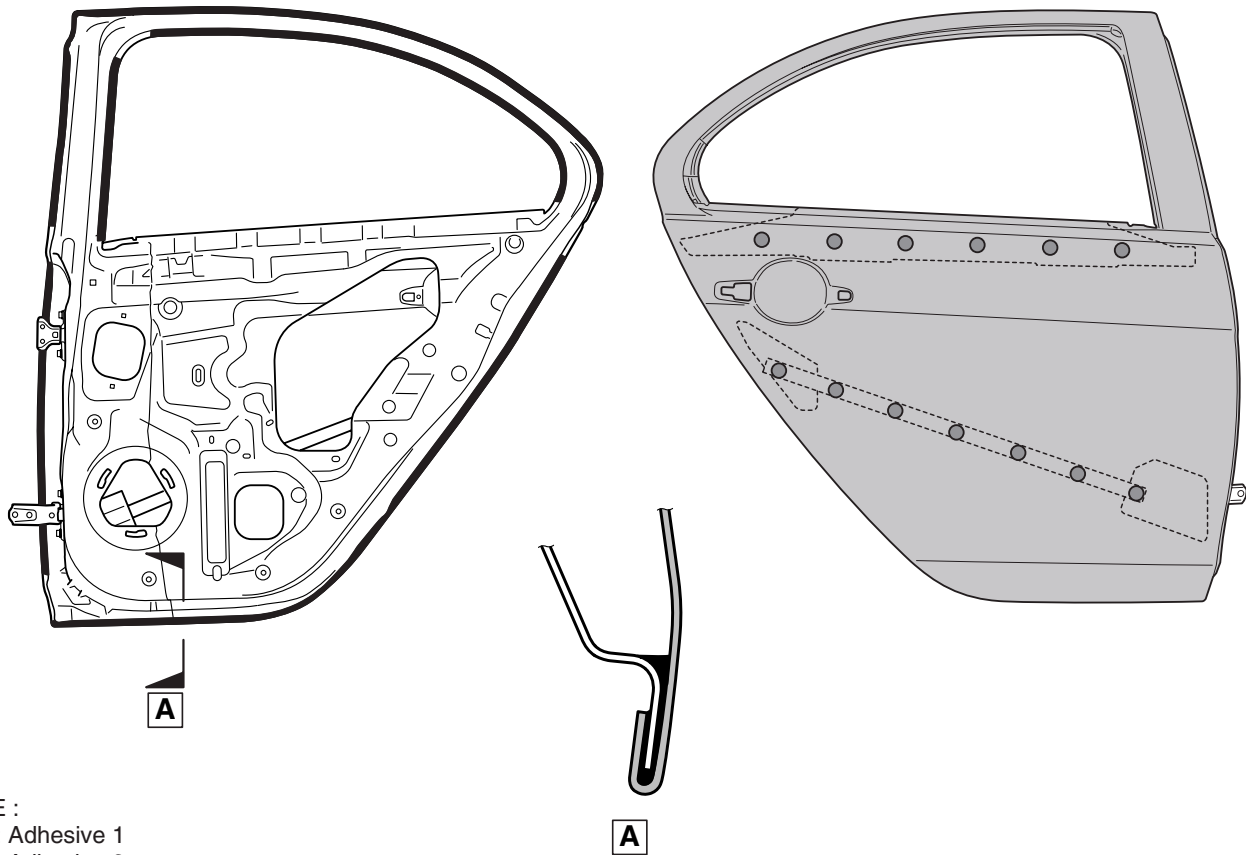
REAR DOOR OUTER PANEL (ADHESION TYPE)

M4030001800360





SYMBOL	OPERATION DESCRIPTION
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■: indicates two panels to be welded) (▲: indicates three panels to be welded)
+++++	MIG spot welding
#####	MIG arc welding (continuous)
oooooo	Braze welding
	Anti-corrosion agent application locations (Use access holes to apply liberally to butt-welded joints.)

REPAIR WELDS



NOTE :

-  : Adhesive 1
-  : Adhesive 2

- Adhesive 1: Urethane body sealer
Brand: 3M™ AAD Part No.08360 or equivalent
- Adhesive 2: Epoxyayresin adhesive

Brand: 3M™ AAD Part No.8115 or equivalent

AB602378 AB

NOTE ON REPAIR WORK

INSTALLATION

1. When installing the new rear door panel outer part, grind the bonding surface and remove the paint to improve adhesion. Then, degrease the rear door panel outer.
2. Install the rear door panel outer and hem it. Then, wipe off the adhesive that squeezed out.

ALUMINUM PANEL <RALLIART>

ALUMINUM PANEL CHARACTERISTICS

M4030000500173

Description of aluminum panel

A new aluminum panel with higher strength and better workability has been developed by adding a small amount of metallic elements, including magnesium (Mg), copper (Cu) and silicon (Si), to aluminum. This type of aluminum material has equivalent strength to cold rolled steel sheets.

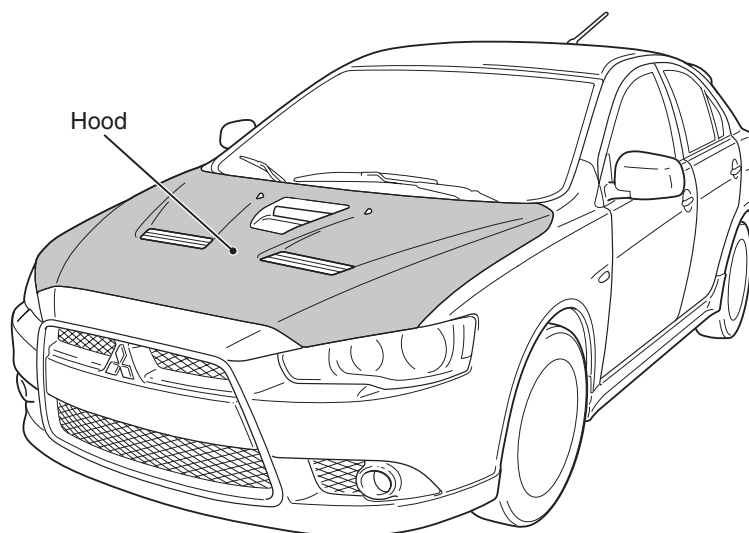
Advantage of aluminum panel

1. Lighter: The specific gravity of aluminum is 2.7, which is only one third of general steel panel (7.9). However, it requires 1.4 times in thickness to obtain the same rigidity as the steel panel, resulting in one half in weight.

2. More durable: Aluminum has the property of creating oxide coating on its surface when it contacts with the air. This coating prevents it from being corroded.
3. More heat-conductive: The heat conductivity of aluminum is twice as high as that of iron. This means that aluminum absorbs and disperses heat more quickly, which results in prompt change of its temperature.
4. More electric-conductive
5. Non-magnetic substance

ALUMINUM PANEL LOCATIONS

M4030000600330



AB801233AB

Application	Thickness
Hood panel outer	0.9 mm (0.04 inch)
Hood panel inner	0.8mm (0.03 inch)

ALUMINUM PANEL REPAIR

M4030000700285

Precautions upon sheet metal processing

1. Major difference in processing between sheet metal and steel sheet (On the basis of general body shop)

Work description	Aluminum alloy panel	Steel sheet
Hammering	Mallet or plastic hammer	Sheet metal hammer
Washer welding	Not possible	Possible
Gas welding	Not good workability but possible	Possible
Spot welding	Not possible	Possible
MIG welding	Possible by a welding machine for aluminum and argon gas	Possible by a general welding machine and CO ₂ gas

2. If strong impact is given under low temperature, its strength becomes low and cracking occurs.
3. The springback (returning force to the original condition) is large due to high elastic modules.
4. The thermal effect is large due to high heat conductivity.
5. When excessively heated, its strength will be deteriorated. When heated additionally, it will be melted without discoloration. [The heating temperature is approximately 250° C (482° F)].

Material	Melting point
Aluminum	475 to 660 ° C (887 to 1220 ° F) <varying with the alloy content>
Steel sheet	1500 to 2500 ° C (2732 to 4532 ° F)

6. Because the material is soft, choose an abrasive carefully. Wear a dustproof mask and safety glasses, because ground particle is light and tends to float in the air.
7. If a disk sander is strongly pressed against the aluminum plate, friction heat is generated, resulting in exfoliation of the aluminum alloy and clogging of the disk sander with the exfoliated particles.
8. Because the clogged disk sander will damage the aluminum alloy panel, replace it with a new one as soon as possible.

9. General tools and sanding tools shall not be shared for both aluminum alloy and steel panels. (Iron powder remaining on the surface may cause electric corrosion with a different type of metal).
10. During MIG welding, protect the vicinity because the spatters are hard to see and spread farther than expected.

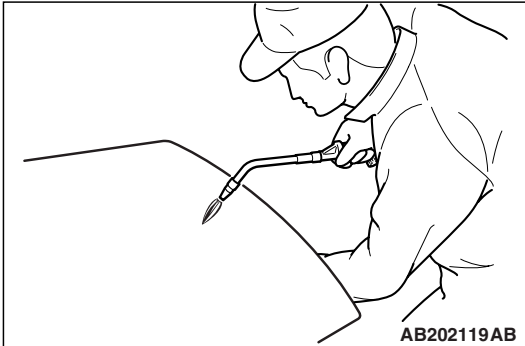
Correction of uneven surface

Basically, the same as the steel panel. However, give a consideration to the aluminum alloy characteristics.

1. Repair of sheet metal
 - (1) Heat with a burner.

⚠ CAUTION

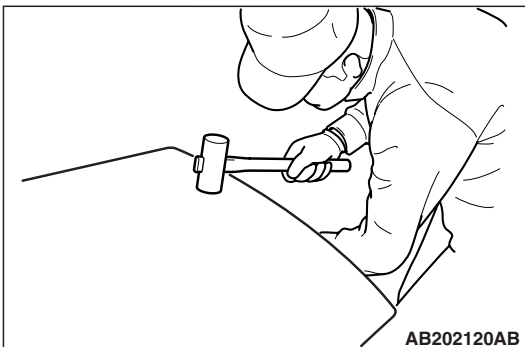
- Heat-up the panel until you feel heat with a keplar work glove on the reverse side of the panel.
- Keep moving the burner evenly to prevent heat from concentrating in one point.



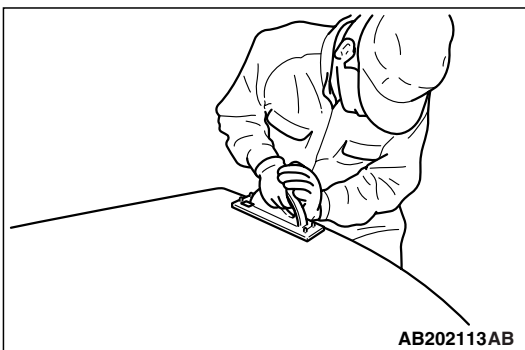
- (2) Because hammering may stretch the panel, use a mallet or plastic hammer.

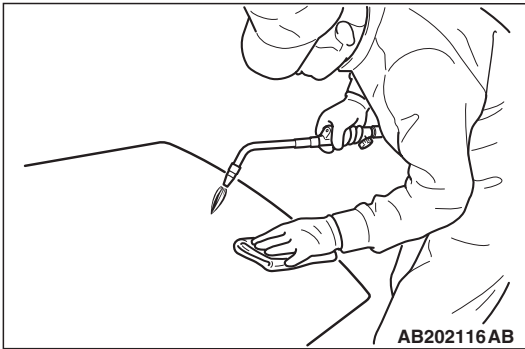
⚠ CAUTION

Minimize the stretch and hardening, and give no hammer dent.



2. Distortion check: Grind the surface with #80 to #120-grit sandpaper and then check for distortion.

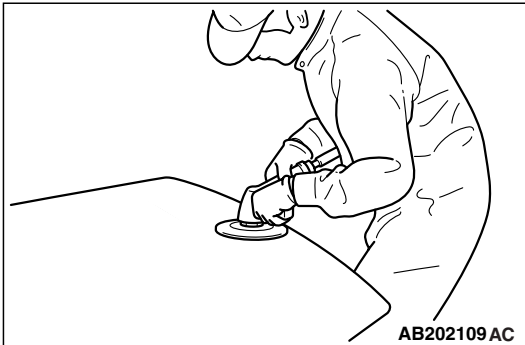




3. Straightening: Remove distortion by the draw correction procedure with a flattening hammer and a burner.

⚠ CAUTION

- The heating temperature should be approximately 250° C (482° F).
- Pay particular attention to heating, because it is melted without discoloration by heat.
- Cover the vicinity of the area to be heated with a wet rag or the like to prevent temperature rise and influence of heat (distortion).
- Do not use a draw hammer for steel sheets because it may cause the panel crack.

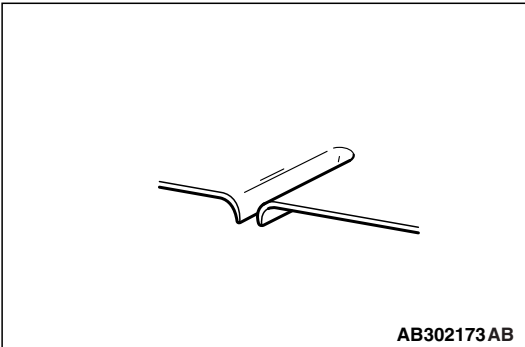


4. Sanding: Grind the surface with a disk sander or a double-action sander.

- Disk sander: #100 to #120
- Double-action sander: #150 to #180

⚠ CAUTION

Aluminum plates are softer than steel sheets, therefore select an appropriate abrasive to prevent the surface from deeply scratched. The heating temperature should be approximately 250° C (482° F).



Correction of cuts and cracks

If cuts, cracks, or holes occur in a steel sheet panel, MIG welding with CO₂ is used for repair. However, for an aluminum panel, use MIG or TIG welding with argon gas (inert gas) as shielding gas for repair.

DEGREE OF DISTORTION CAUSED BY WELDING

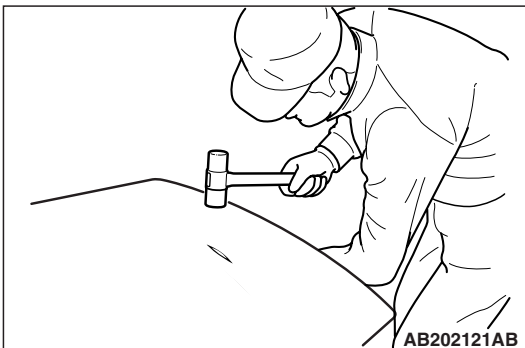
Gas welding (a large amount of distortion) TIG welding MIG welding (a small amount of welding). This manual explains the operation procedure of MIG welding which causes a small amount of distortion by welding heat.

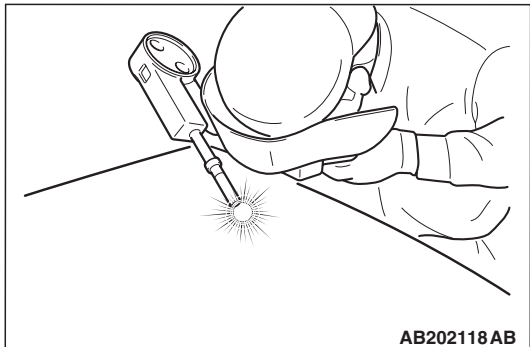
Operation procedure of MIG welding

⚠ CAUTION

- Be careful to avoid excessive stretch of or damage to the panel.
- Minimize the gap of the butt joint.

1. Correct the damaged area by hammering lightly while heating it. If any area is stretched by hammering, grind it off with a pneumatic saw.





⚠ CAUTION

To minimize distortion and meltdown, divide a welding area into several short segments, and weld one segment at a time.

2. Welding: Use an aluminum dedicated welding machine or a shared welding machine for aluminum and steel sheet for the operation.

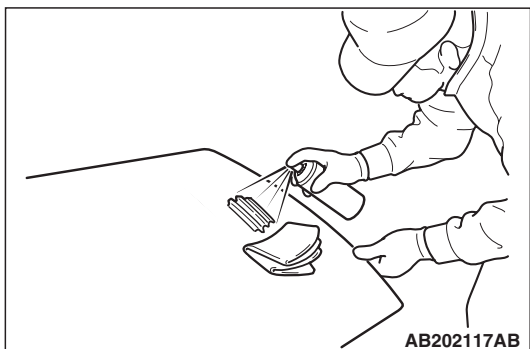
Wire diameter: 0.8 or 1.0 mm (0.03 or 0.04 inch)

- (1) Degrease the welding area by white gasoline or the like.
- (2) Remove the oxide coat from the welding area, including its back, with a stainless steel wire brush just before welding. Welding shall be started as soon as the oxide coat is removed.

⚠ CAUTION

Do not over-grind the base of the panel.

3. Refinish the welding area by a #100-grit disk sander, and then check for any faulty welding by the visible dye penetrate testing.

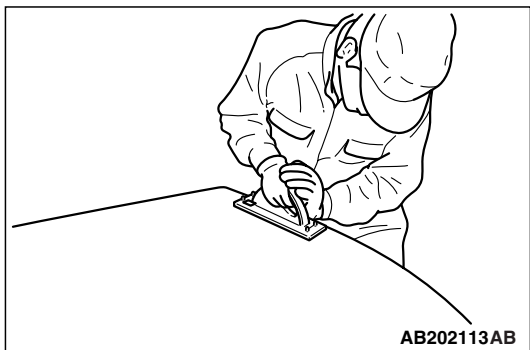


4. Check for distortion: Grind the surface with #80 to #120-grit sandpaper and then check for distortion.

⚠ CAUTION

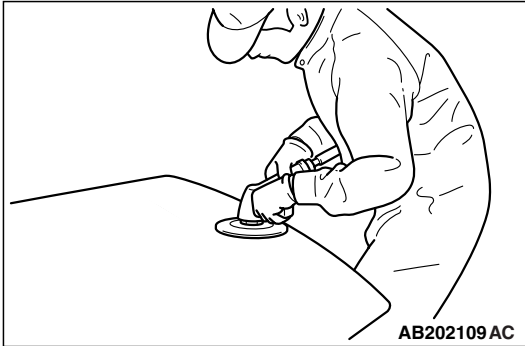
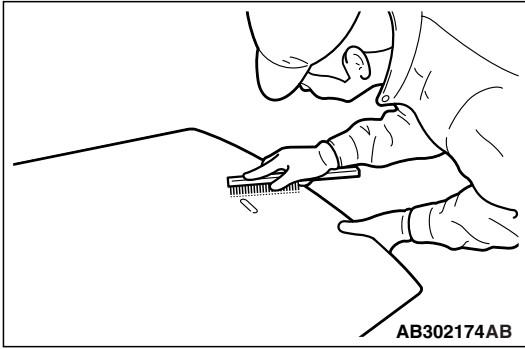
- The heating temperature should be approximately 250° C (482° F).
- Pay particular attention to heating, because it is melted without discoloration by heat.
- Cover the vicinity of the area to be heated with a wet rag or the like to prevent temperature rise and influence of heat (distortion).
- Do not use a draw hammer for steel sheets because it may cause the panel crack.

5. Remove distortion by the draw correction procedure with a flattening hammer and a burner.



⚠ CAUTION

Remove any spark spot or carbon residue on the surface by a stainless steel wire brush, because they will cause improper painting in the following process.



6. Finishing: Finish it with a #100 to #120-grit disk sander.

Other welding

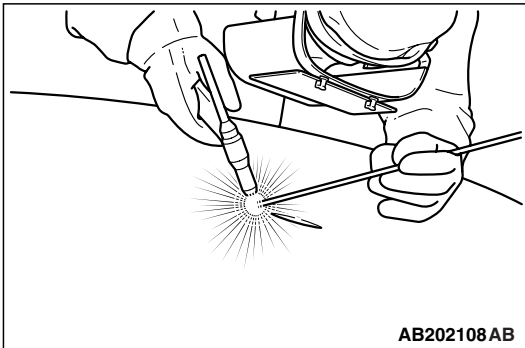
TIG WELDING

1. This welding is conducted by the same arc welding method as for MIG welding, however, it uses a welding rod instead of electrode wire.

Wire diameter: 1.6 mm (0.06 inch).

⚠ CAUTION

- Be careful to avoid excessive stretch of or damage to the panel.
- Minimize the gap of the butt joint.

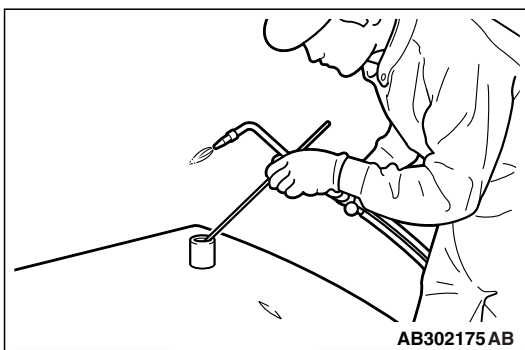


GAS WELDING (OXIDE - ACETYLENE)

If gas welding is allowed, the welding can be conducted using a welding rod and flux (oxide coat remover). However, before the welding work, do sufficient practice to avoid distortion by welding heat or poor welding.

Wire diameter: 1.6 mm (0.06 inch).

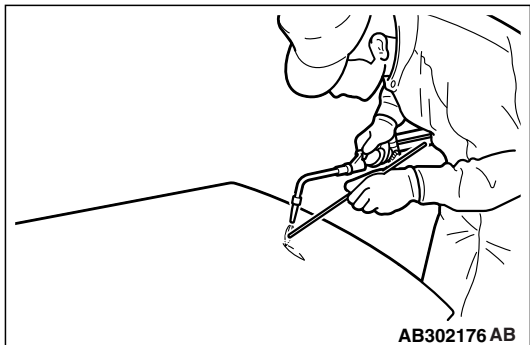
1. Heat the welding rod and bond the flux to it.



⚠ CAUTION

Keep the welding surface as horizontal as possible, because the melted welding rod flows readily.

2. While melting the flux with the burner to remove the oxide coat, conduct the welding.
3. Remove the flux residue from the panel with a stainless steel wire brush.



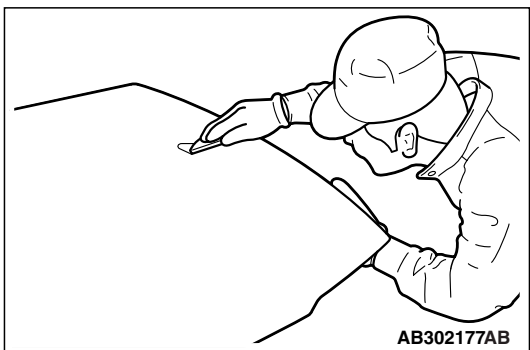
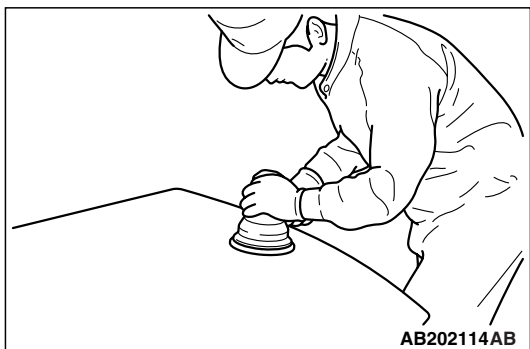
Finish with putty

1. Grind the putty-applied area with a #150 to #180-grit double-action sander.
2. Degrease and clean the putty-applied area.
3. Apply 2-liquid type epoxy primer or a pretreatment agent for aluminum.
4. Grind with a #180-grit double-action sander for cutting action.
5. Degrease and clean the putty-applied area.
6. Apply putty for metal sheets, and dry it naturally.

⚠ CAUTION

Do not dry it forcibly at 60° C (140° F) or higher.

7. Grind with a #180-grit sander.



ALUMINUM PANEL PAINT

M4030000800163

Painting in production line

Same as painting for normal steel sheets.

Precautions upon sheet metal processing**⚠ CAUTION**

- **Avoid hasty grinding and minimize grinding heat.**
- **Do not dry it forcibly at higher than 60° C (140° F).**

1. Peel-off of paint film
2. Cleaning and degreasing

⚠ CAUTION

Apply 2-liquid type epoxy primer or a pretreatment agent for aluminum to the aluminum base surface.

3. Application of wash primer
4. Drying <60° C (140° F) or lower>
5. Application of primer surfacer
6. Drying <60° C (140° F) or lower>
7. Grinding
8. Cleaning and degreasing
9. Finish coating
10. Drying <60° C (140° F) or lower>

NOTE:

- *Refer to paint manufacturers' paint specifications for details.*
- *The procedure is almost the same as the repair painting procedure of anti-corrosion steel panel.*