Mazda MX-5 Bodyshop Manual

FOREWORD

This bodyshop manual is intended for use by technicians of Authorized Mazda Dealers to help them service and repair Mazda vehicles. It can also be useful to owners and operators of Mazda vehicles in performing limited repair and maintenance on Mazda vehicles.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing.
As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers. This manual should be kept up-to-date.

Mazda North American Operations reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

Mazda Motor Corporation
HIROSHIMA, JAPAN

CONTENTS

APPLICATION:
This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN), shown on the following page.

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Part No. 9999–95–060F–06

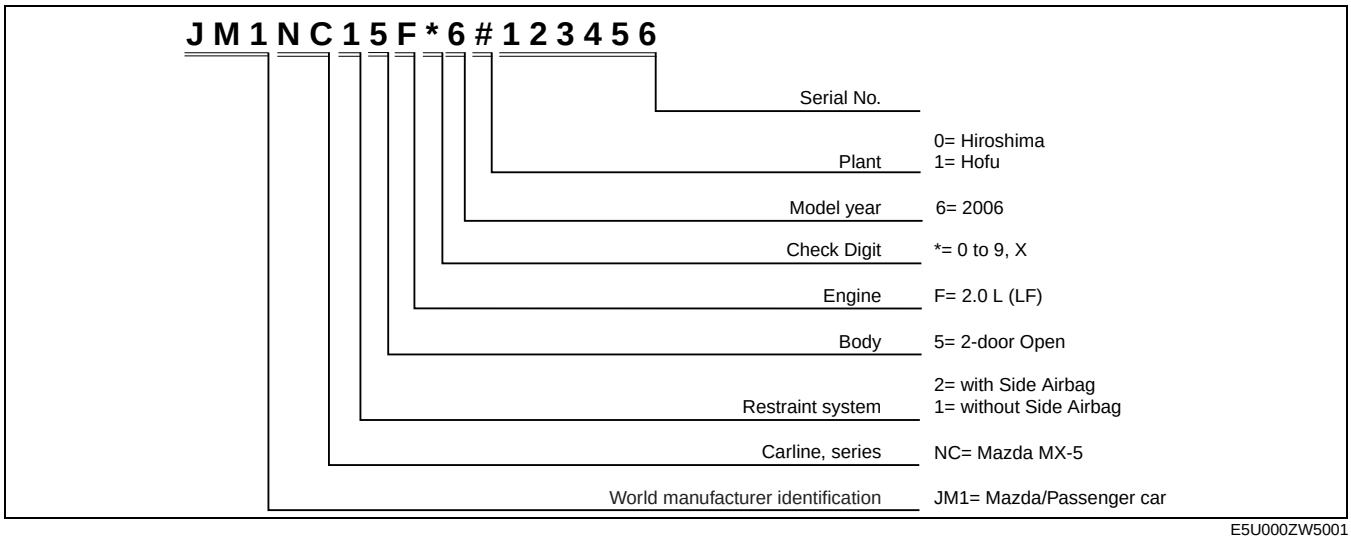
VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1	NC15F⁎6#	100001—
JM1	NC25F⁎6#	100001—

00–00 GENERAL INFORMATION

VEHICLE IDENTIFICATION NUMBER (VIN) CODE

D5U000000000B12



E5U000ZW5001

VEHICLE IDENTIFICATION NUMBERS (VIN)

D5U000000000B13

JM1 NC15F*6# 100001—
JM1 NC25F*6# 100001—

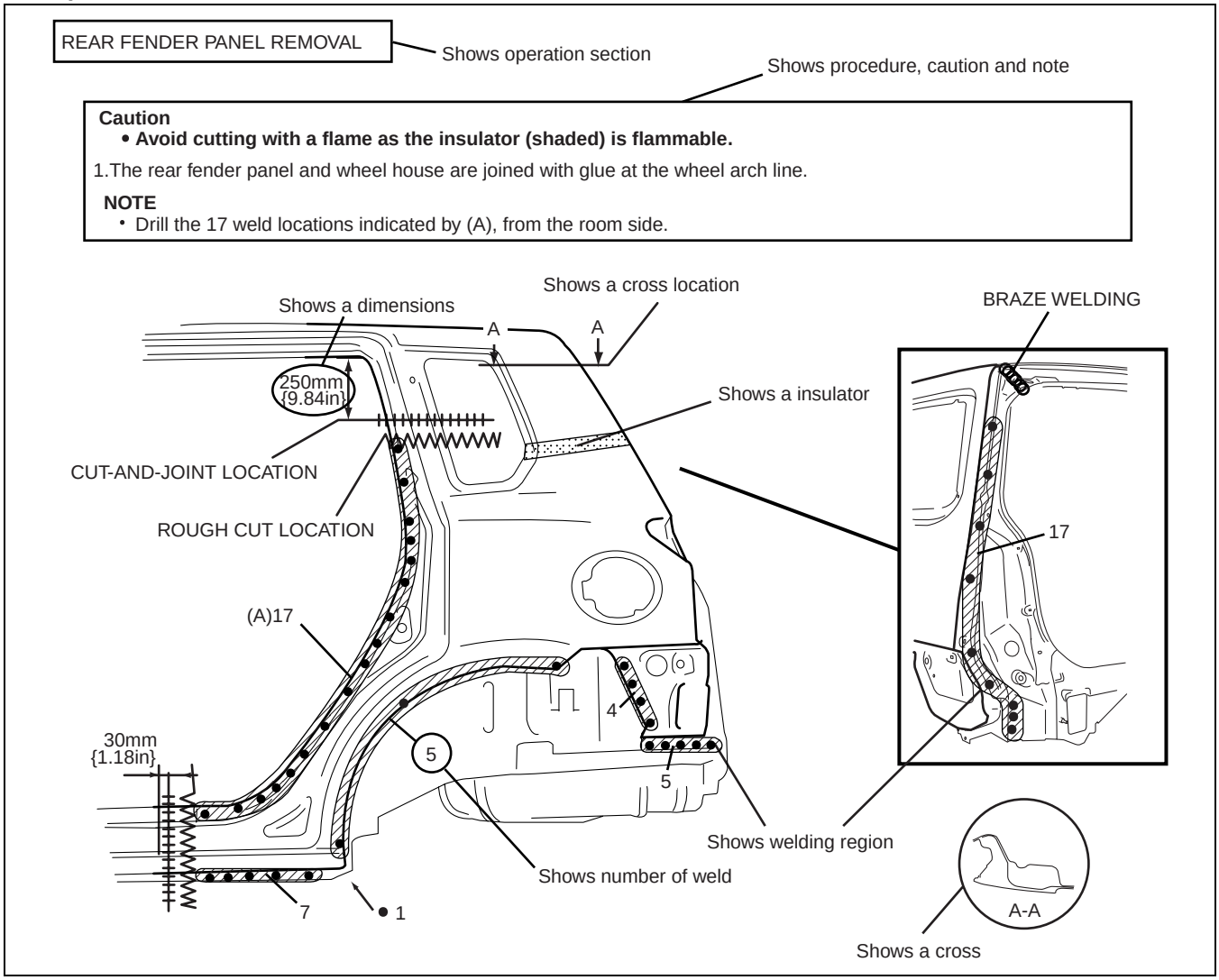
HOW TO USE THIS MANUAL

D5U000000000B03

Efficient Replacement of Body Panels

- This section contains information on the body panels in regard to the welding types, number of spot welds, and cut-and-join locations that are necessary for panel removal and installation.
- The type of weld and position are indicated by symbols.
- Some sections have notes concerning the operation being performed. Thoroughly read and understand the notes before carrying out any procedures.

Example



DPE2010B001

Symbols of Panel Replacement

- The following 6 symbols are used to indicate the type of weld that is used when replacing body panels.

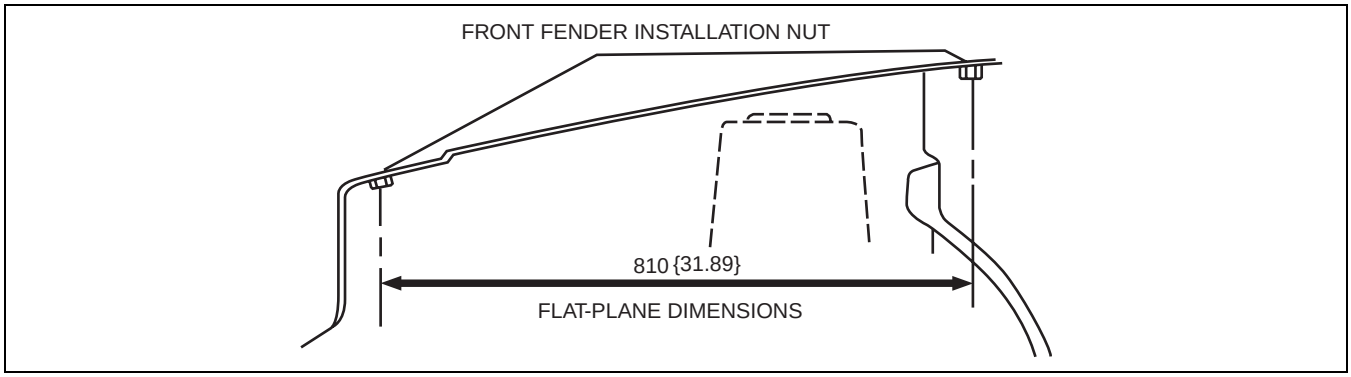
SYMBOL	MEANING
●	Spot welding
■	CO^2 arc welding (plug welding)
+	CO^2 spot welding

SYMBOL	MEANING
|||||	Continuous MIG welding (Cut-and-join location)
○○○	Braze welding
⩘⩘	Rough cut location

MZZ2010B002

Body Dimensions (Flat-plane Dimensions)

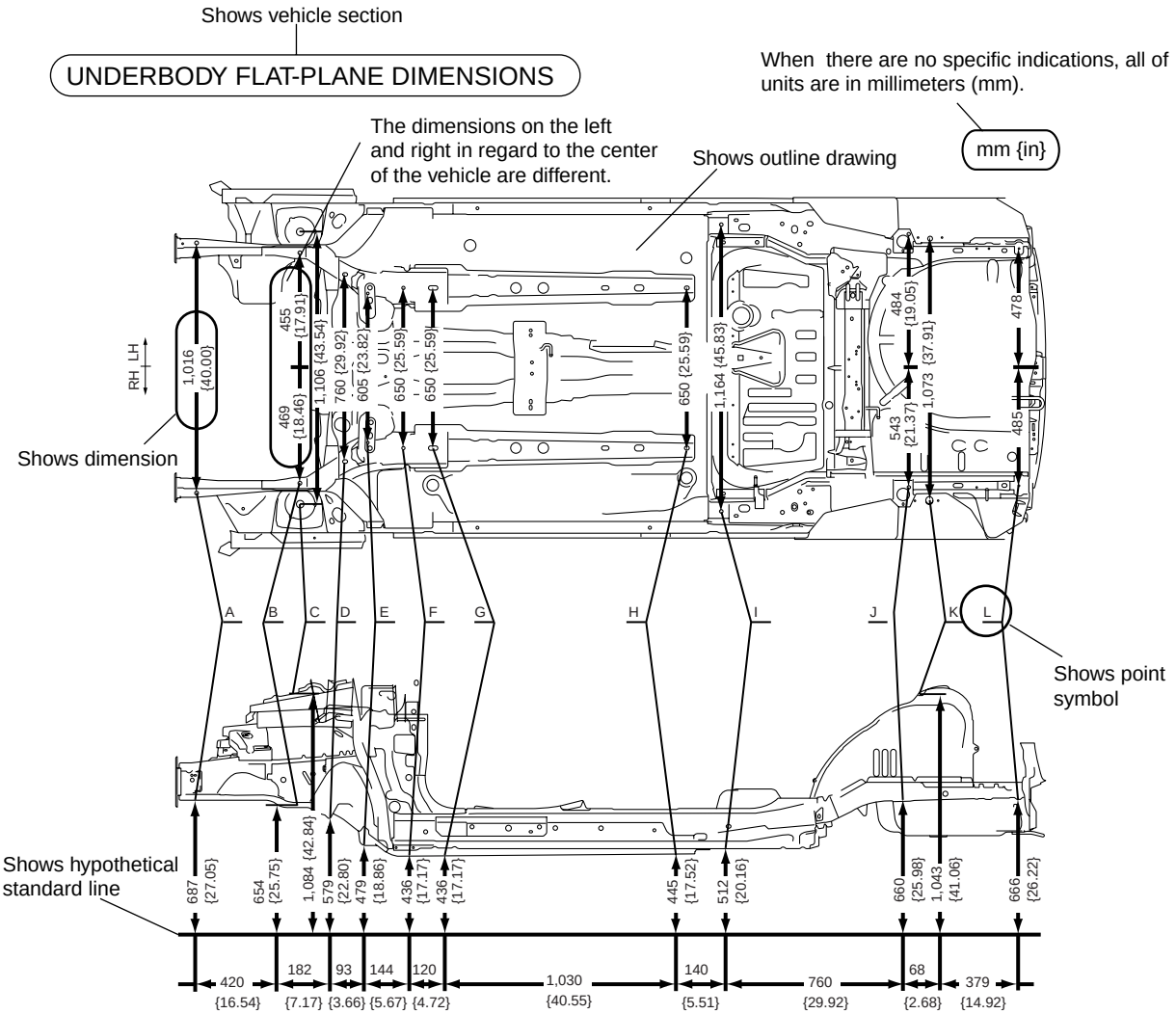
- Flat-plane dimensions are the dimensions measured by projecting certain reference points onto a plane surface.



DPE2010B010

- When there are no specific indications, the standard points and dimensions are symmetrical in regard to the center of the vehicle.
- The hypothetical lines may differ according to the vehicle model.
- The schematic diagram shows the vehicle as it is projected from the underbody.

Example



Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Crossmember No,1 standard hole	ϕ 16 {0.62}
B	Front side frame standard hole	ϕ 16 {0.62}
C	Front suspension mounting block surface hole center	ϕ 80 {3.14}
D	Front suspension mounting bolt	M14 {0.55}
E	Front frame rear standard hole	ϕ 16 {0.62}

Shows bolt size

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
F	Front frame rear standard hole	ϕ 18 {0.62}
G	Rear side frame standard hole	ϕ 16 {0.62}
H	Link bracket	17 × 29.5 {0.66×1.16}
I	Rear suspension housing	ϕ 12 {0.47}
J	Rear side frame standard hole	ϕ 16 {0.62}
K	Rear suspension housing	ϕ 31 {1.22}
L	Rear side frame standard hole	ϕ 12 {0.47}

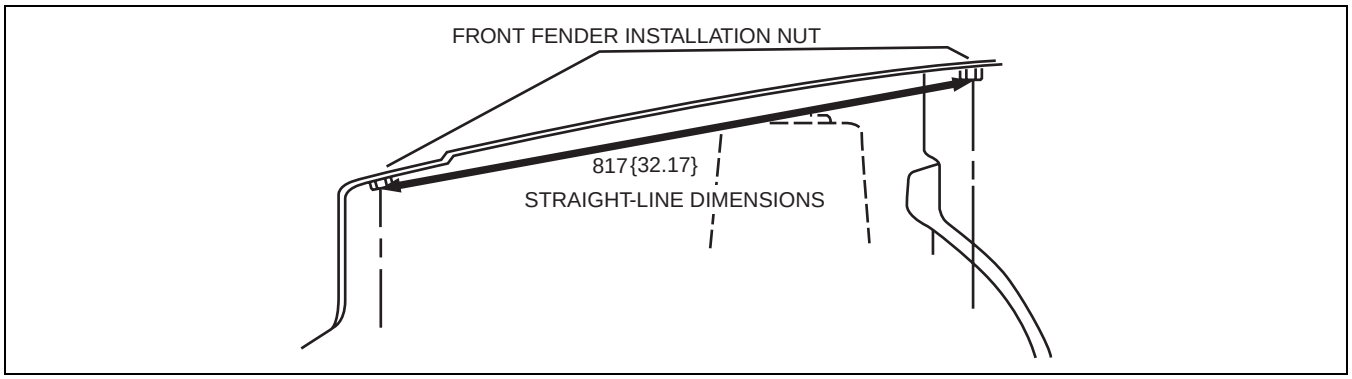
Shows slot

Shows hole diameter

DPE2010B003

Body Dimensions (Straight-line Dimensions)

- Straight-line dimensions are the actual dimensions between two standard points.



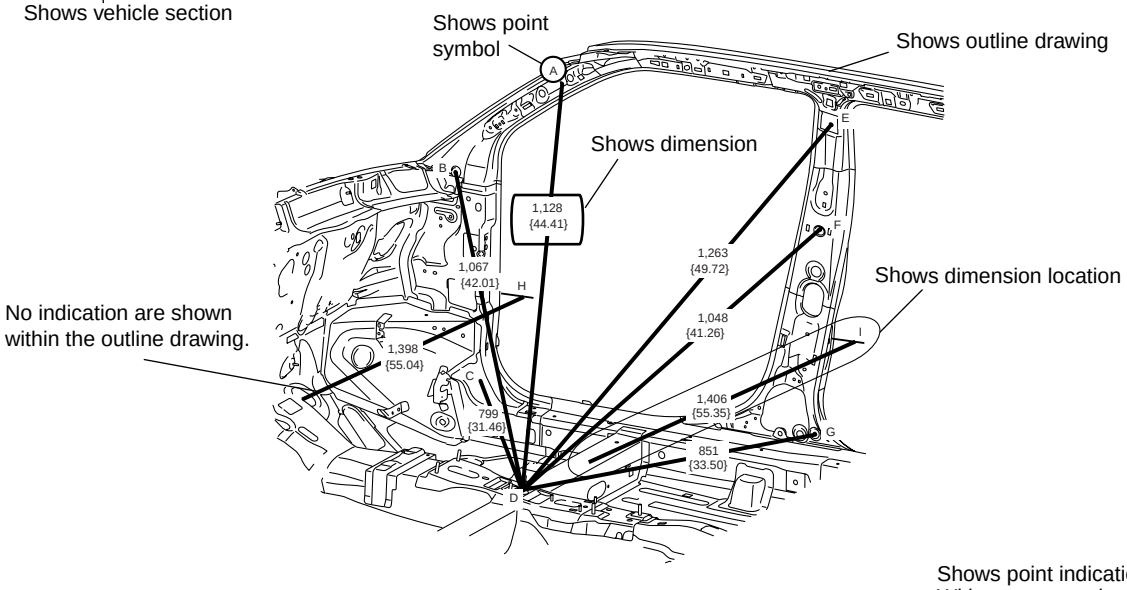
DPE2010B011

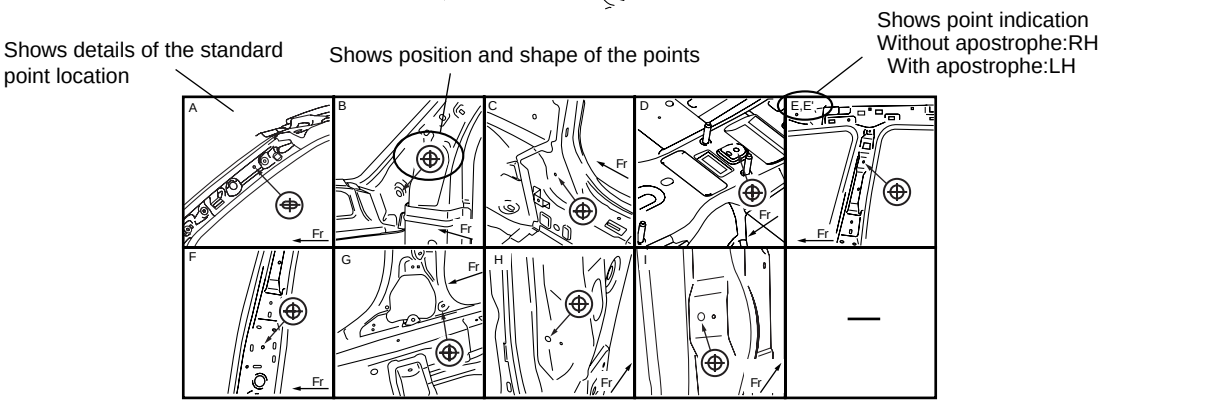
- When there are no specific indications, the standard points and dimensions are symmetrical in regard to the center of the vehicle.

Example

ROOM STRAIGHT-LINE DIMENSIONS (1)

Shows vehicle section





Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front pillar inner designation	f16
B	Front pillar inner designation	f17
C	Harness installation hole	f31
D	Front floor pan designation	M14
E	Adjuster installation hole	f16

Shows bolt size

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
F	Trim installation hole	f18
G	Harness installation hole	f16
H	Chaker bracket installation hole	17 ´ 29.5
I	Chaker bracket installation hole	f12

Shows hole diameter

Shows slot

DPE2010B004

Symbols of Body Dimensions

- The following 8 symbols are used to indicate the standard points.

SYMBOL	MEANING
⊕	Center of circular hole
⊕	Center elliptical hole
⊕	Notch
⊕	Panel seam, bead, etc.

SYMBOL	MEANING
← (arrow only)	Bolt tip
⊞	Center of rectangular-shaped hole
⊡	Edge of rectangular-shaped hole

MZZ2010B016

SERVICE PRECAUTIONS

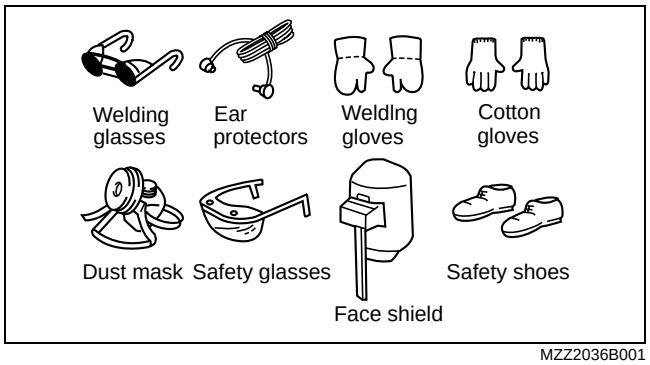
D5U000000000B04

Arrangement of Workshop

- Arrangement of the workshop is important for safe and efficient work.

Safety Precautions

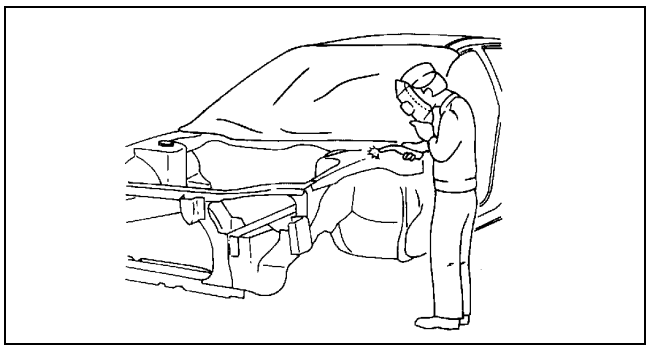
- Protective head covering and safety shoes should always be worn. Depending upon the nature of the work, gloves, safety glasses, ear protectors, face shield, etc., should also be used.



MZZ2036B001

Vehicle Protection

- Use seat covers and floor covers.
- Use heat-resistant protective covers to protect glass areas and seats from heat or sparks during welding.
- Protect items such as moldings, garnishes, and ornaments with tape when welding.



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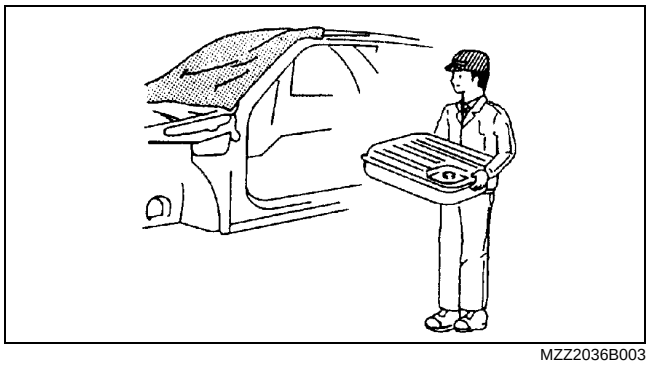
Remove Dangerous Articles

- Remove the fuel tank before using an open flame in that area. Plug connection piping to prevent fuel leakage.



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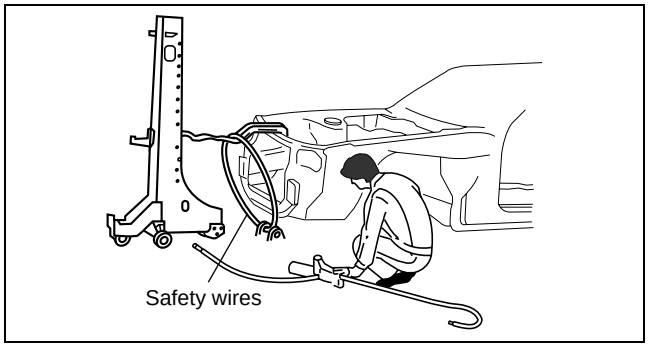
Use of Pulling Equipment

- When using pulling equipment, keep away from the pulling area and use safety wires to prevent accidents.



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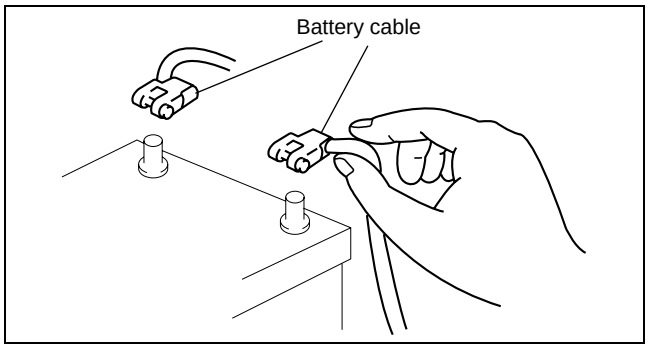
Prevent Short Circuits

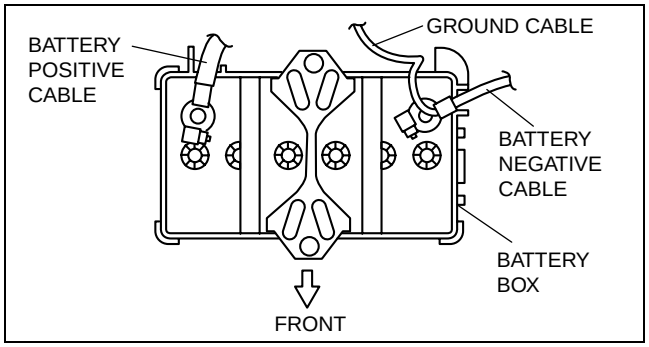
- Turn the ignition switch to the LOCK position.
- Disconnect the battery cables.



MZZ2036B005

Note

- When connecting the negative battery cable to the battery, connect the negative battery cable and the ground cable as shown in the figure.



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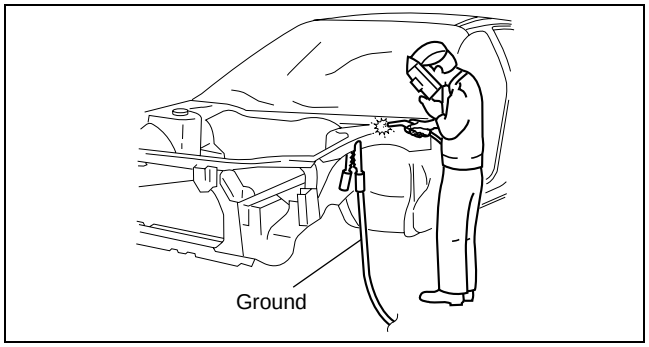
- Securely connect the welding machine ground near the welding area.



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EFFICIENT REMOVAL OF BODY PANELS

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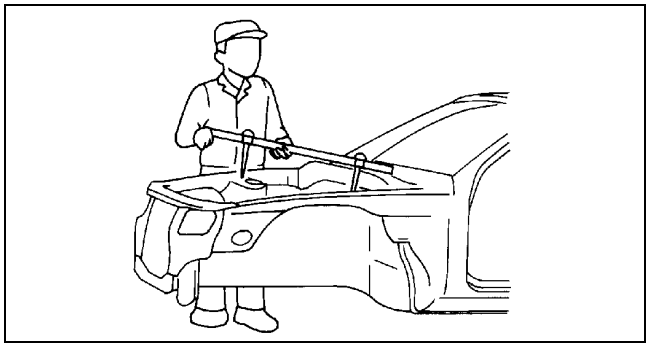
Body Measurements

- Before removal or rough-cutting, first measure the body at and around the damaged area against the standard reference dimension specifications. If there is deformation, use frame repair equipment to make a rough correction.



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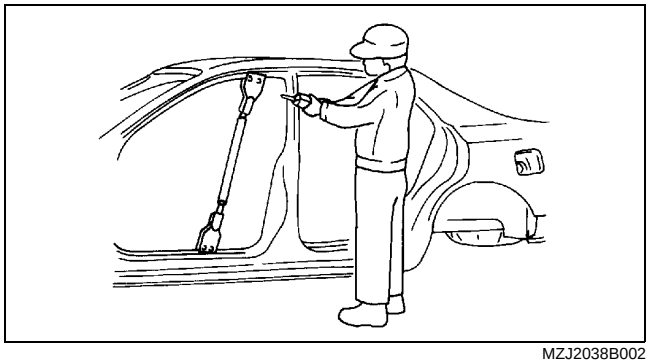
Prevention of Body Deformation

- Use a clamp or a jack for removal and reinforce at and around the rough-cutting location to prevent deforming of the body.



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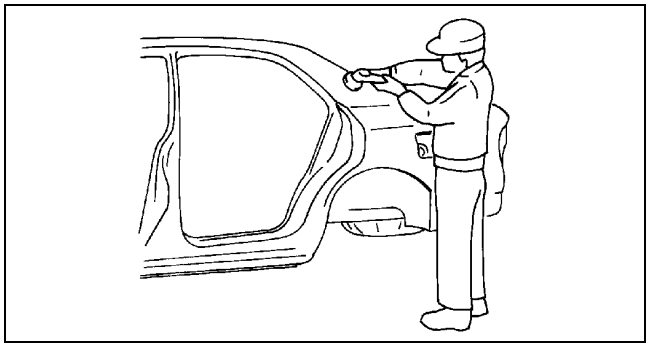
Selection of Cut-and-join Locations

- For parts where complete replacement is not feasible, careful cutting and joining operations should be followed. If the location to be cut is a flat area where there is no reinforcement, the selected cutting location should be where the welding distortion will be minimal.



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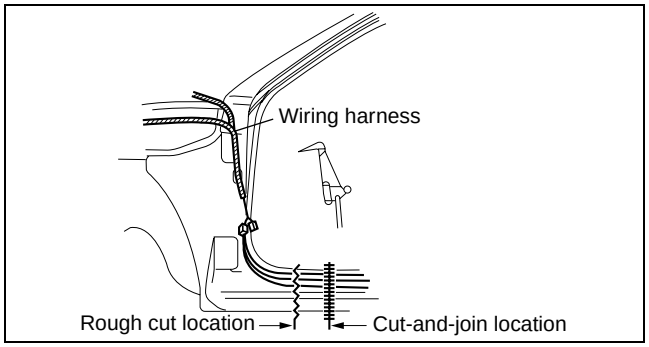
Removal of Associated Parts

- Protect moldings, garnishes, and ornaments with tape when removing associated parts.

Rough Cutting of Damaged Panel

- Verify that there are no parts (such as pipes, hoses, and wiring harness) nearby or on the opposite side of a panel which could be damaged by heat.
- For cut-and-join areas, allow for an overlap of 30—50 mm {1.18—1.97 in} and then rough-cut the damaged panel.



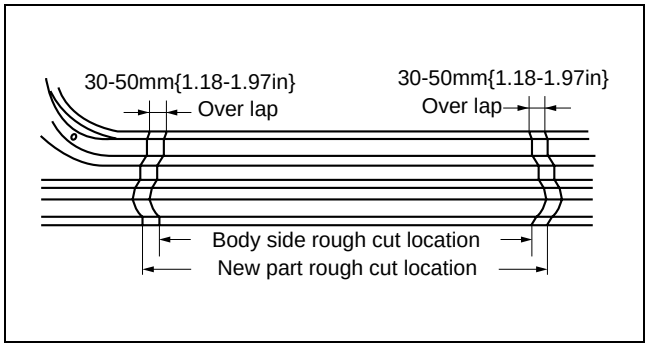
MZZ2038B001

INSTALLATION PREPARATIONS

D5U000000000B06

Rough Cutting of New Parts

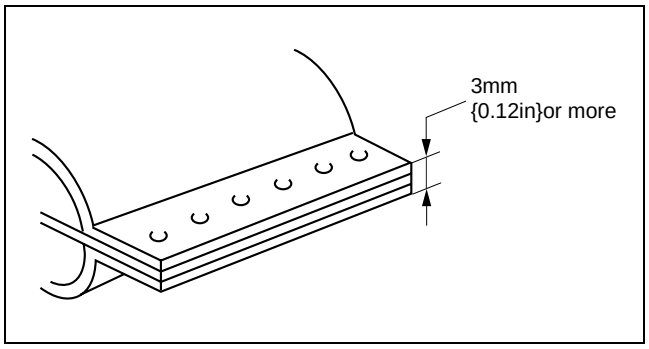
- For cut-and-join areas, allow for an overlap of 30—50 mm {1.18—1.97 in} with the remaining area on the body side and then rough-cut the new parts.



MZZ2038B002

Determination of Welding Method

- If the total thickness at the area to be welded is 3 mm {0.12 in} or more, use a CO_2 gas shielded-arc welder to make the plug welds.



MZZ2038B003

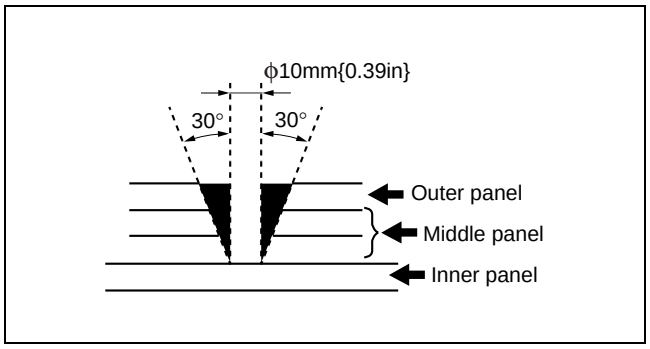
Making Holes for CO_2 Arc Welding

- For places that cannot be spot welded, make a hole for CO_2 arc welding using a punch or drill as follows.

(mm {in})

Panel thickness (ø)	Hole diameter (ø)
0.60—0.90 {0.02—0.03}	5 {0.19}
0.91—1.20 {0.04—0.05}	6 {0.23}
1.21—1.80 {0.051—0.07}	8 {0.31}
1.81—4.50 {0.071—0.17}	10 {0.39}

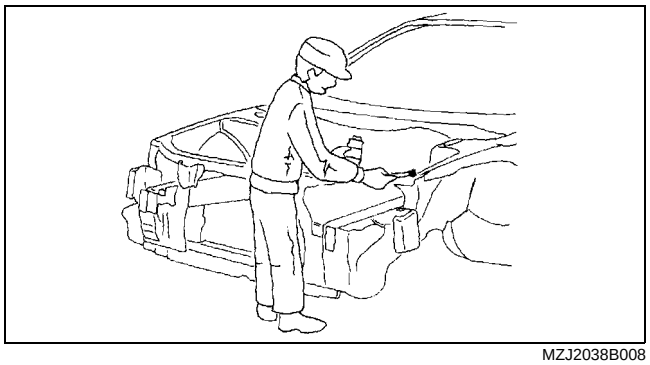
- Grind the shaded section indicated in the diagram below and create a hole in the part where the 3—4 plates are put together. Also, weld the plates together tightly so that gaps do not develop.



MZZ2038B004

Application of Weld-through Primer

- For treatment against corrosion, remove the paint grease, and other material from the portion of new part and body to be welded, and apply weld-through primer.



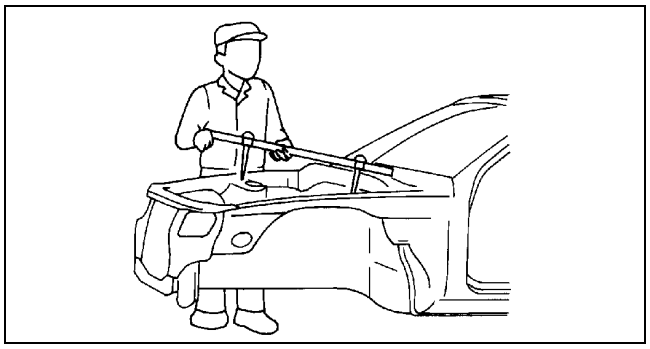
MZJ2038B008

EFFICIENT INSTALLATION OF BODY PANELS

D5U000000000B07

Checking Preweld Measurements And Watching

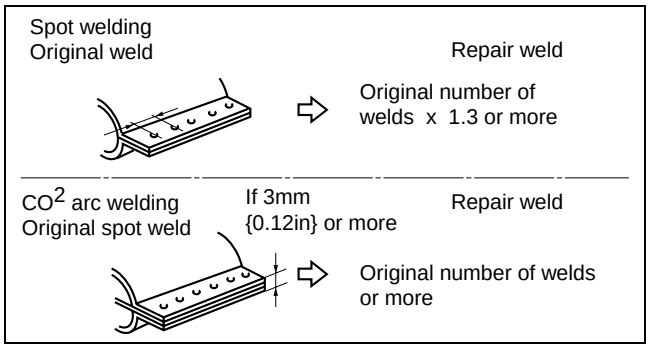
- Align to the standard reference dimensions, based upon the body dimensions illustration, so that new parts are installed in the correct position.



MZJ2038B009

Welding Notes

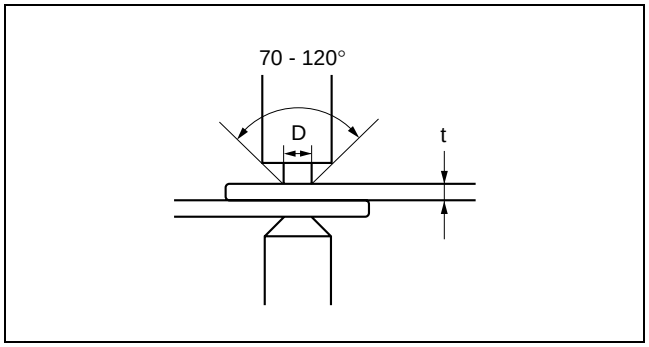
- For the number of weld points, welding should be performed in accordance with the following reference standards.



DPE2038B005

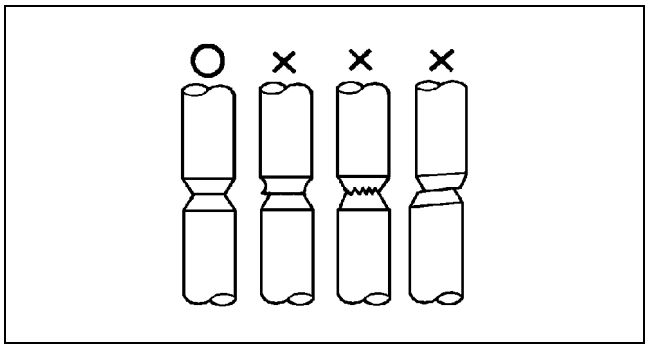
Spot Welding Notes

- The shape of the spot welder tip is D=(2×t)+3. If the upper panel thickness is different from that of the under panel, adjust to the thinner one.



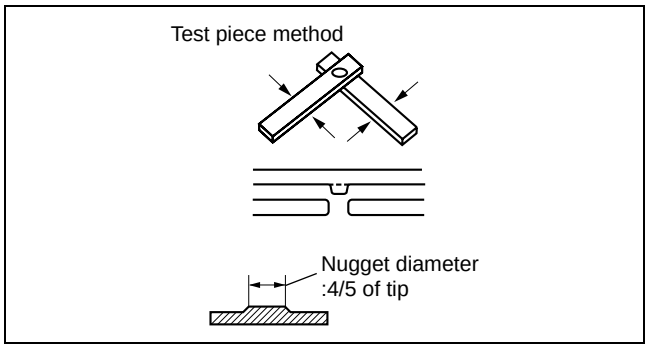
MZZ2038B009

- Because the weld strength is affected by the shape of the spot welder tip, the optimum condition of the tip should always be maintained.
- Spot welds should be made at points other than the originally welded points.



MZJ2038B012

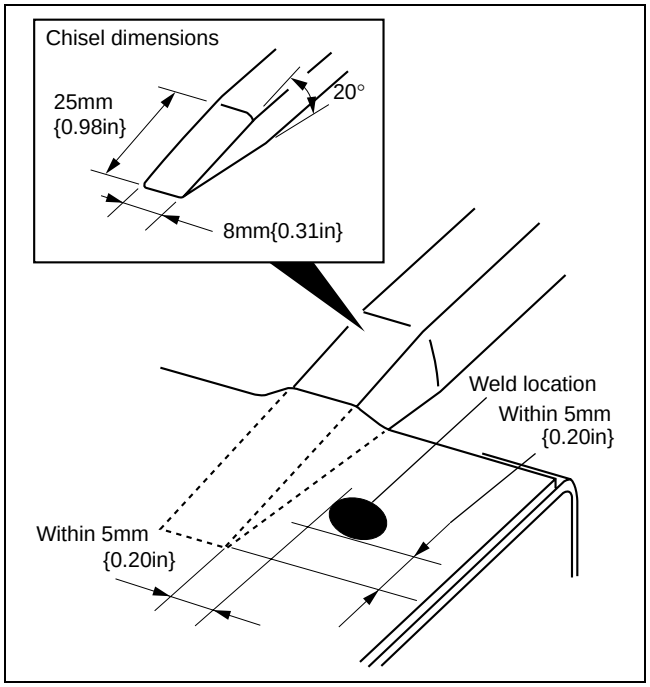
- Before spot welding, make a trial weld using the same material as the body panel to check the weld strength.



MZZ2038B006

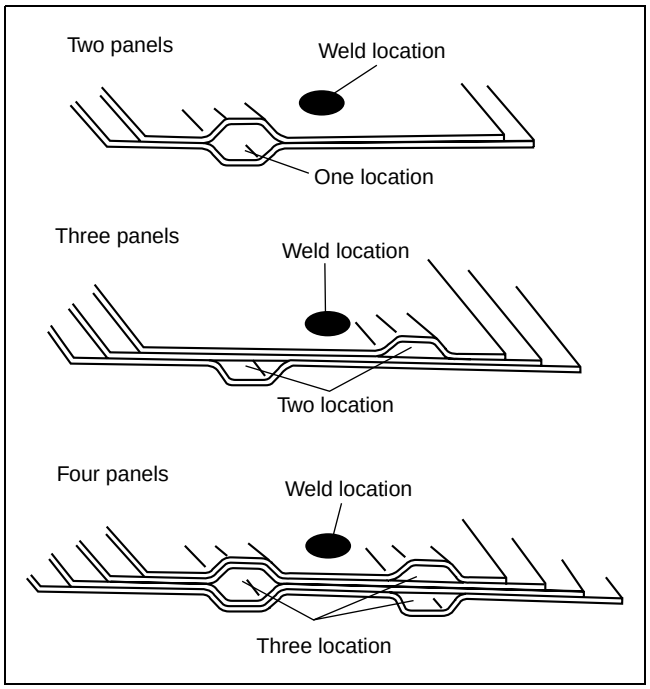
Checking Weld Strength

- Installation locations of the engine, chassis, and seat belts are designated as important safety locations for weld strength. Check weld strength by driving a chisel between the panels at every fourth or fifth weld spot, and every tenth regular weld location.



MZZ2038B007

- Drive the chisel between the panels according to the number of panels as shown below.
- To determine weld strength, drive the chisel between the panel and check whether the panels come apart. If the panels come apart, make another weld near the original weld.
- Restore the shape of the checked area.



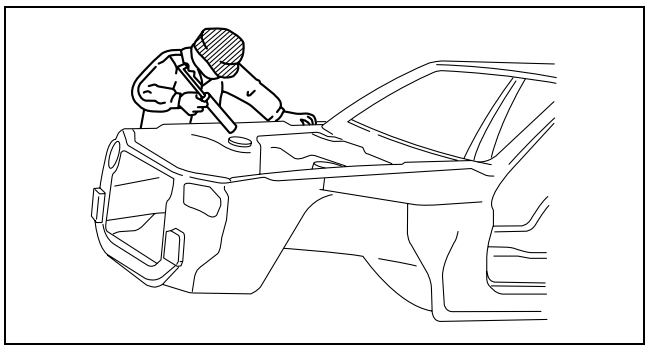
MZZ2038B008

ANTICORROSION, SOUND INSULATION, AND VIBRATION INSULATION

D5U000000000B08

Body Sealing

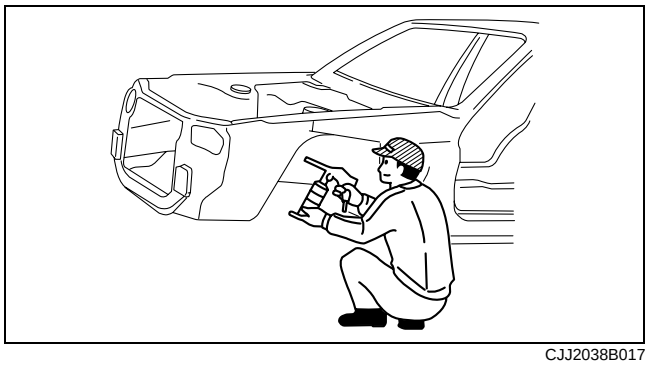
- Apply body sealer where necessary.
- For locations where application of body sealer is difficult after installation, apply it before installation.



CJJ2038B016

Application of Undercoating

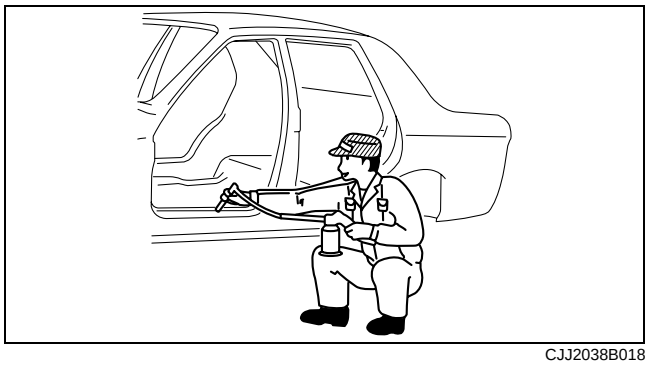
- Apply an undercoat to the required location of the body.



CJJ2038B017

Application of Rust Inhibitor

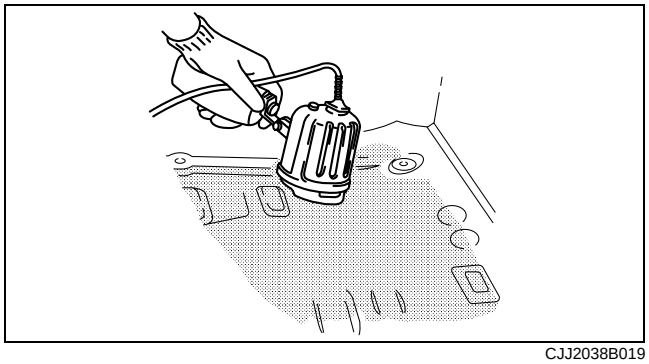
- Apply rust inhibitor (wax, oil, etc.) to the back of the welded areas.



CJJ2038B018

Application of Damping Sheet

- Apply damping sheet by heating with an infrared ray lamp.



CJJ2038B019

ABBREVIATION

D5U000000000B09

CM	Control module
Ctr	Center
DSC	Dynamic stability control
Fr	Front
HU	Hydraulic unit
LH	Left
M	Metallic
MC	Mica
RH	Right
Rr	Rear

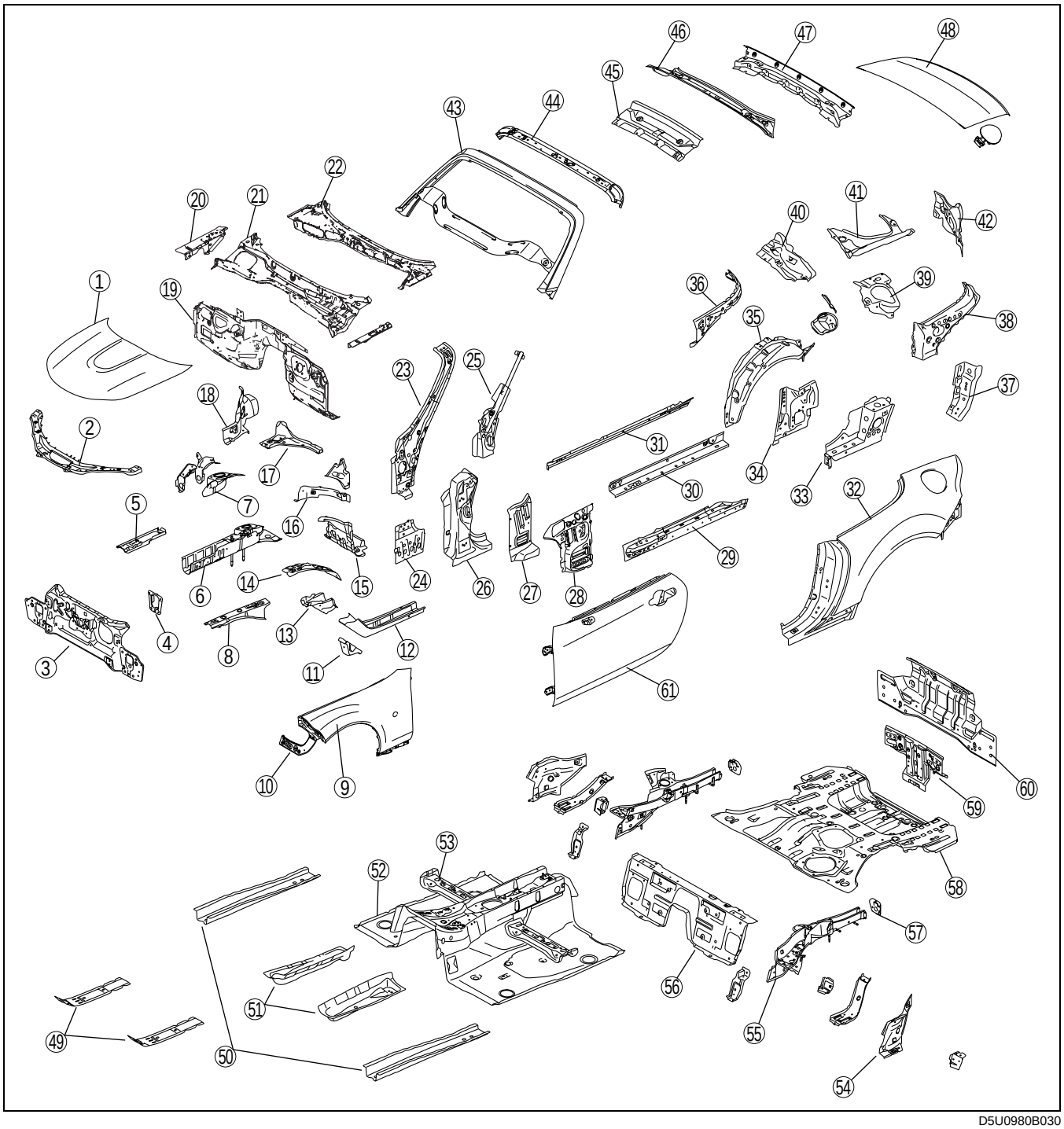
BODY & ACCESSORIES

09
SECTION

09–80A BODY STRUCTURE [CONSTRUCTION]

BODY COMPONENTS CONSTRUCTION

D5U098007000B08



D5U0980B030

x:Applied
-:Not applied

No.	Part Name	Ultra high-tension steel	High-tension steel	Rust proof steel	Thickness (mm) {in}
1	Hood	-	-	-	0.95 {0.037}
2	Shroud upper panel	-	-	x	0.70 {0.028}
3	Shroud lower panel	-	-	x	0.70 {0.028}
4	Front bumper bracket	-	x	-	2.00 {0.079}
5	Front side frame (outer)	x	-	x	1.00 {0.039}
6	Front side frame	x	-	x	1.60 {0.063}

No.	Part Name		Ultra high-tension steel	High-tension steel	Rust proof steel	Thickness (mm) {in}
7	Suspension housing		-	-	x	2.60 {0.102}
8	Apron reinforcement (upper)		-	x	x	0.90 {0.035}
9	Front fender panel		-	-	x	0.75 {0.030}
10	Front fender bracket		-	-	x	1.00 {0.039}
11	Lower arm bracket		-	-	x	2.30 {0.091}
12	Front frame rear		-	x	x	1.40 {0.055}
13	Front frame rear (upper)		-	x	x	1.40 {0.055}
14	Wheel apron panel		-	-	x	0.90 {0.035}
15	Torque box		-	-	x	1.20 {0.047}
16	Front frame reinforcement (outer)		-	x	x	1.40 {0.055}
17	Front frame reinforcement (upper)		x	-	x	1.80 {0.071}
18	Front frame reinforcement (inner)		-	x	x	1.40 {0.055}
19	Dash lower panel		-	-	x	0.75 {0.030}
20	Cowl upper plate		-	x	x	1.00 {0.039}
21	Dash upper panel		-	-	x	0.65 {0.026}
22	Cowl panel		-	-	x	0.65 {0.026}
23	Front pillar (inner)	upper	-	x	-	2.00 {0.079}
		lower	x	-	-	2.00 {0.079}
24	Side sill reinforcement (front)		x	-	x	1.60 {0.063}
25	Front pillar reinforcement		-	x	-	2.00 {0.079}
26	Hinge pillar (outer)		-	x	x	1.40 {0.055}
27	Cowl side panel		-	x	x	1.20 {0.047}
28	Cowl side reinforcement		-	x	x	1.00 {0.039}
29	Side sill reinforcement		-	x	x	1.80 {0.071}
30	Side sill (inner)		x	-	-	2.00 {0.079}
31	Side sill reinforcement (upper)		x	-	x	1.20 {0.047}
32	Rear fender panel		-	-	x	0.80 {0.031}
33	Side sill gusset		-	x	-	1.80 {0.071}
34	Center pillar (inner)		-	-	-	1.20 {0.047}
35	Wheel house (inner)		-	-	x	0.65 {0.026}
36	Side brace		-	-	-	0.70 {0.028}
37	Striker reinforcement		-	-	-	1.40 {0.055}
38	End plate		-	-	-	0.70 {0.028}
39	Rear pillar (inner)		-	-	-	0.65 {0.026}
40	Package gusset		-	-	-	0.80 {0.031}
41	Rear fender rain rail		-	-	x	0.90 {0.035}
42	Corner plate		-	-	x	0.80 {0.031}
43	Front header (upper)		-	-	x	1.00 {0.039}
44	Header reinforcement		-	-	-	1.40 {0.055}
45	Package tray		-	-	-	0.80 {0.031}
46	Rear deck panel		-	-	x	0.80 {0.031}
47	Rear deck		-	-	-	0.70 {0.028}
48	Trunk lid panel		-	-	-	0.95 {0.037}
49	Floor reinforcement		x	-	-	1.00 {0.039}
50	Front B frame		x	-	x	1.60 {0.063}
51	Member bracket		-	x	x	0.80 {0.031}
52	Front floor pan		-	-	x	0.65 {0.026}
53	Crossmember No.2		-	-	-	1.40 {0.055}
54	Rear side frame		-	x	x	1.20 {0.047}
55	Rear side frame		x	-	x	1.40 {0.055}
56	Center floor pan		-	x	x	0.80 {0.031}
57	Rear bumper bracket		-	x	x	1.20 {0.047}

No.	Part Name	Ultra high-tension steel	High-tension steel	Rust proof steel	Thickness (mm) {in}
58	Rear floor pan	-	-	x	0.65 {0.026}
59	Rear end member	-	-	-	0.65 {0.026}
60	Rear end panel	-	-	x	0.60 {0.024}
61	Door panel	-	x	x	0.65 {0.026}

(*) : Material of hood and trunk lid are aluminum.

ADOPTION OF ULTRA HIGH-TENSION STEEL

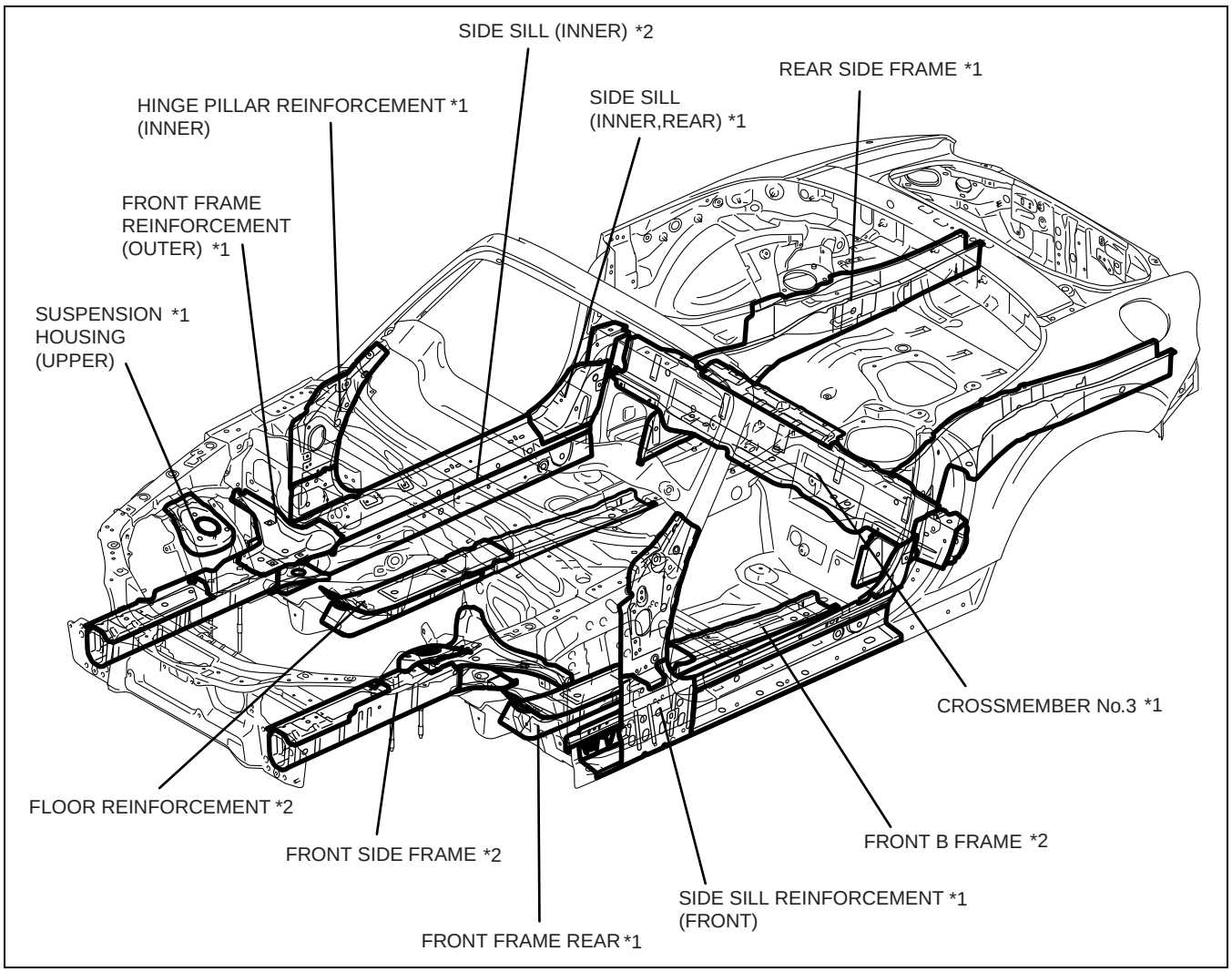
D5U098007000B02

Characteristics of Ultra High-Tensile Steel Plates

- Ultra high-tensile steel plates have enhanced tensile strength compared to previous high-tensile steel plates.
- Because the strength is maintained even though the plates are thin-walled, the ultra high-tensile steel plates are used for the frames and the main frame parts which form the cabin, reducing the weight of the vehicle.
- Enhanced shock absorption has improved the safety.

Range of Use and Cautions for Service

- Because the ultra high-tensile steel is hard and it may be difficult to reform, when extracting the damaged part using a frame repair machine, perform the work verifying that other parts are not affected.
- When drilling welded parts, use a well-ground drill bit.
- After welding, inspect the weld strength. If adhesion is poor, perform CO_2 arc welding (plug welding).



D5U0980B031

*1. Indicates tensile strength of 590 MPa.

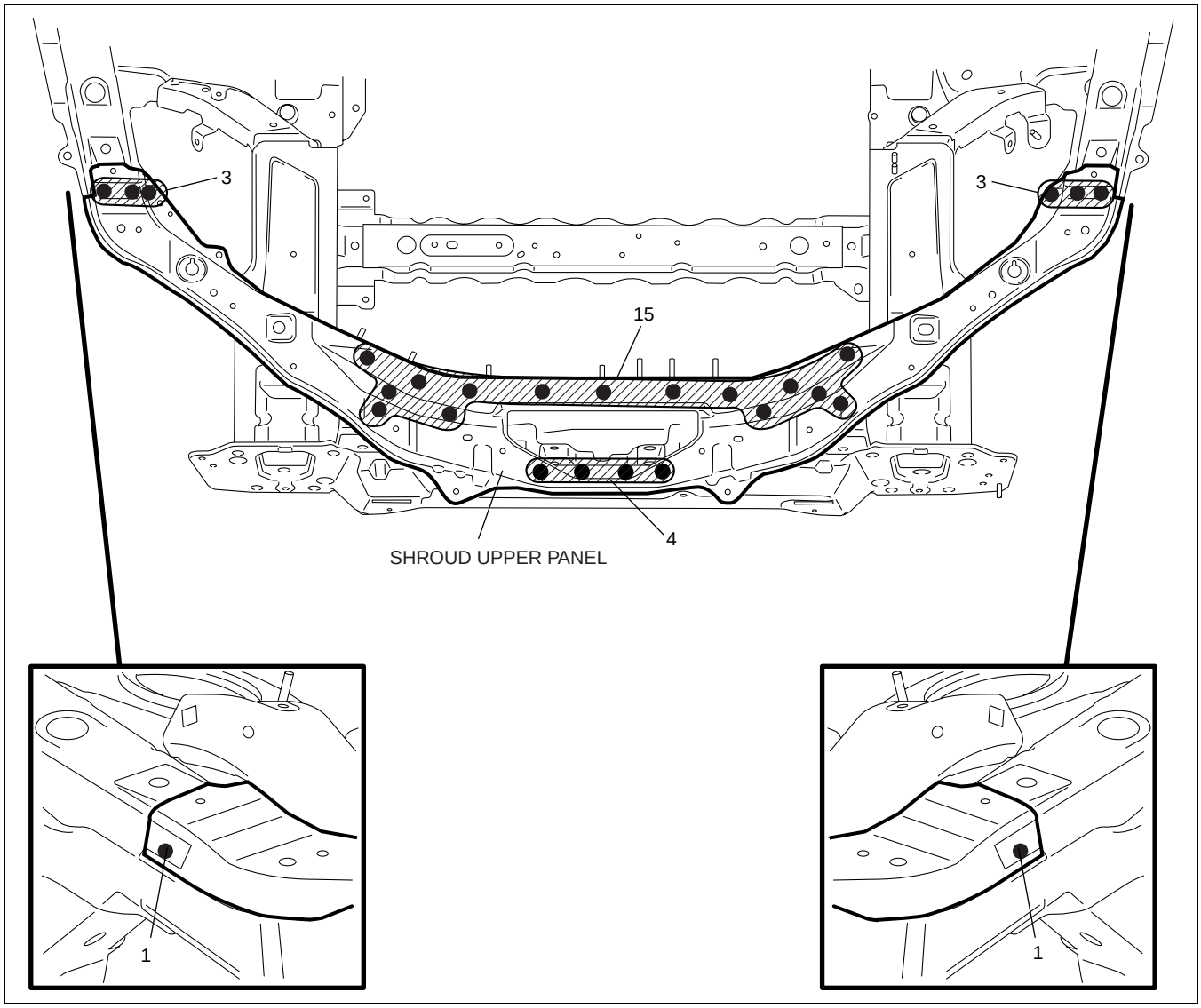
*2. Indicates tensile strength of 780 MPa.

09–80B BODY STRUCTURE [PANEL REPLACEMENT]

SHROUD UPPER PANEL REMOVAL

D5U098053140B01

1. Remove the shroud upper panel.

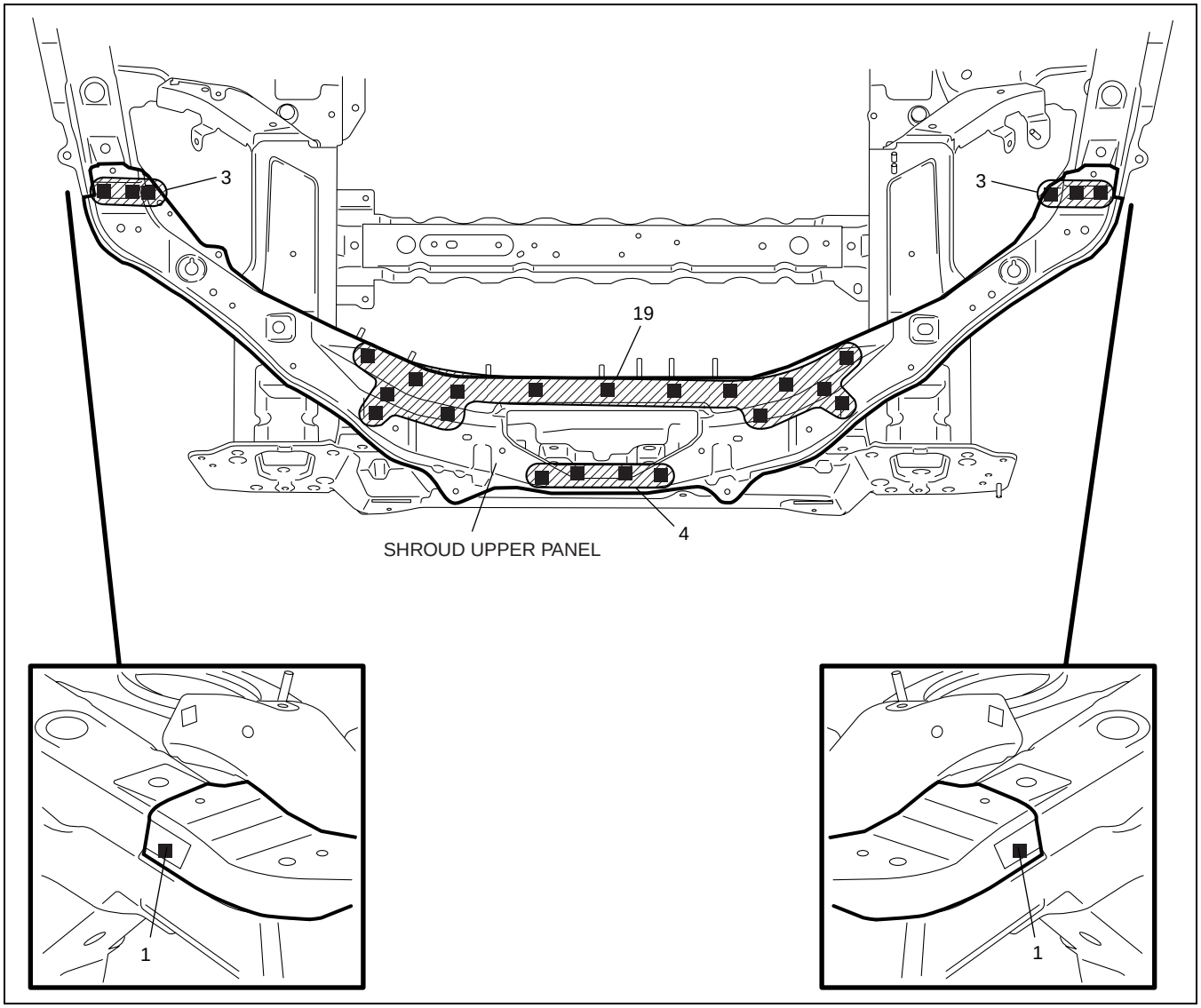


D5U0980B040

SHROUD UPPER PANEL INSTALLTION

D5U098053140B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B041

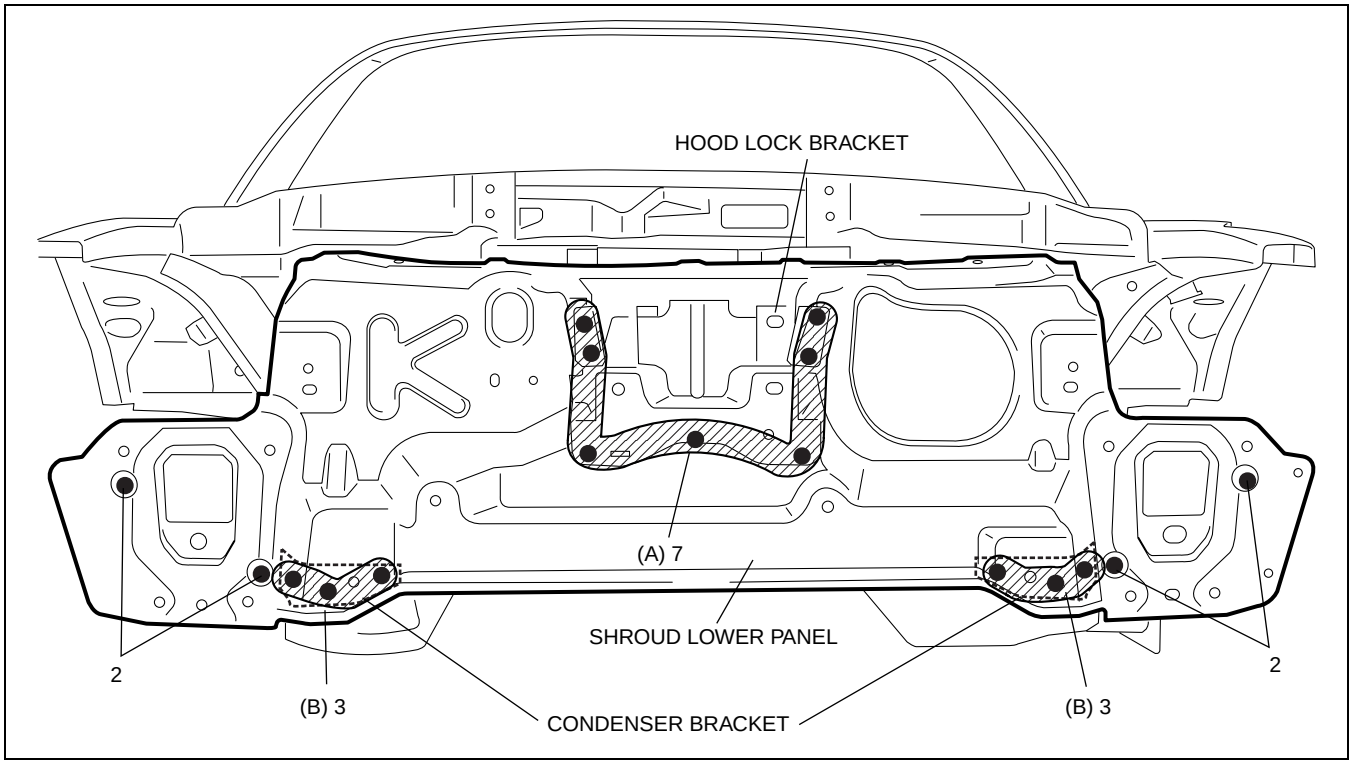
SHROUD LOWER PANEL REMOVAL

D5U098053140B03

1. Remove the shroud lower panel.

Note

- When removing the hood lock bracket and the condenser bracket separately, drill the 7 locations indicated by (A) and the 6 locations indicated by (B).



D5U0980B042

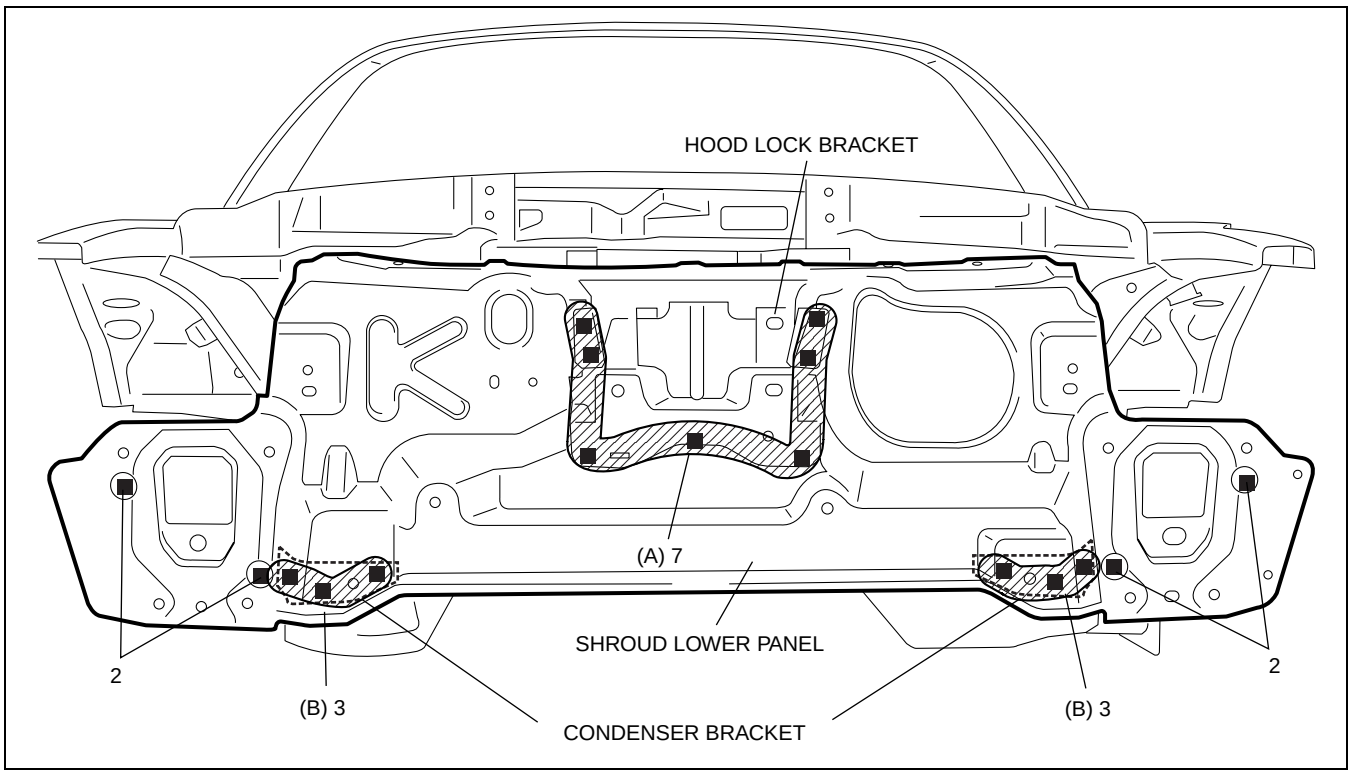
SHROUD LOWER PANEL INSTALLTION

D5U098053140B04

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

Note

- When replacing the hood lock bracket and the condenser bracket separately, weld the 7 locations indicated by (A) and the 6 locations indicated by (B).

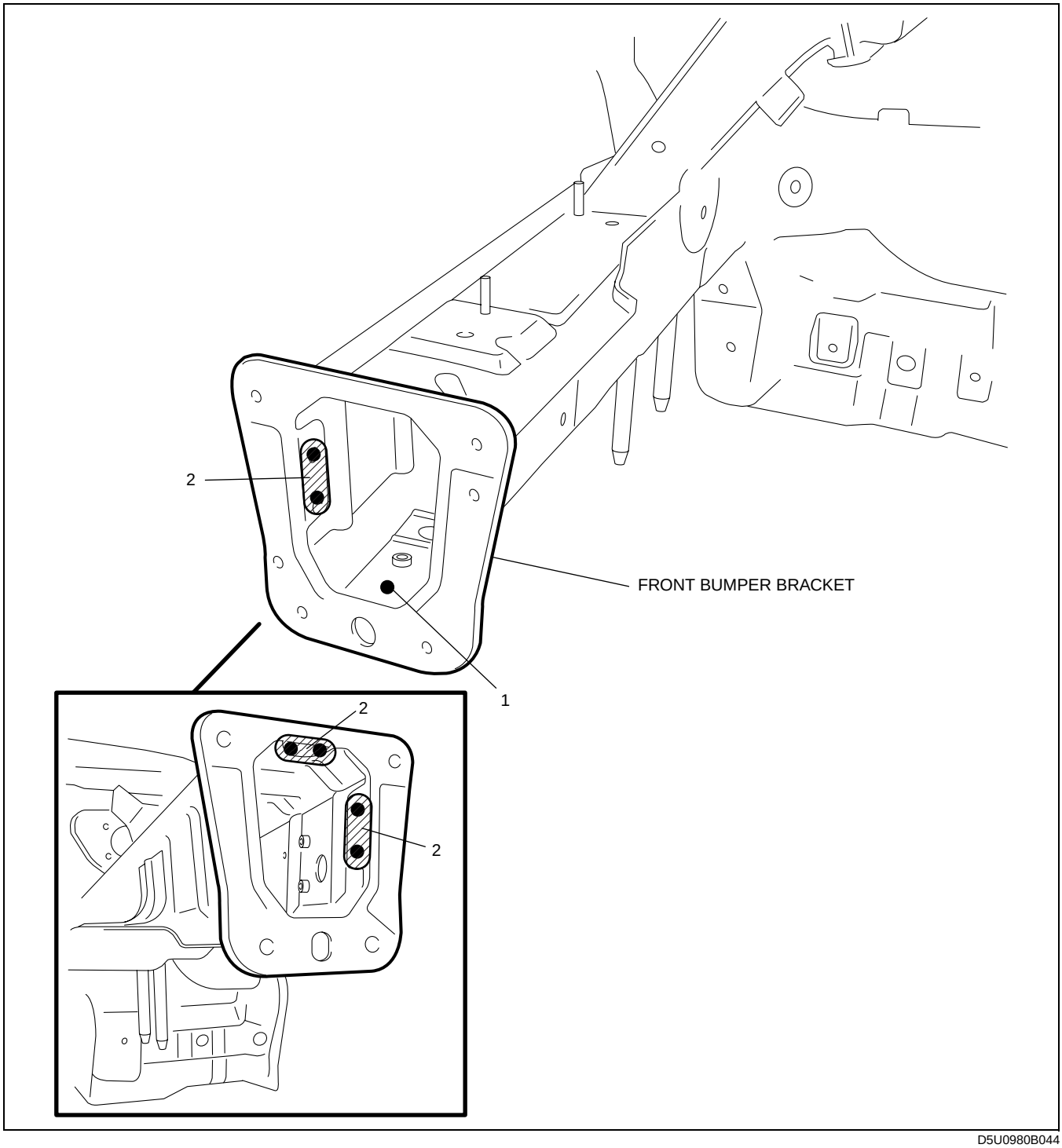


D5U0980B043

FRONT BUMPER BRACKET REMOVAL

D5U098053986B01

1. Remove the front bumper bracket.

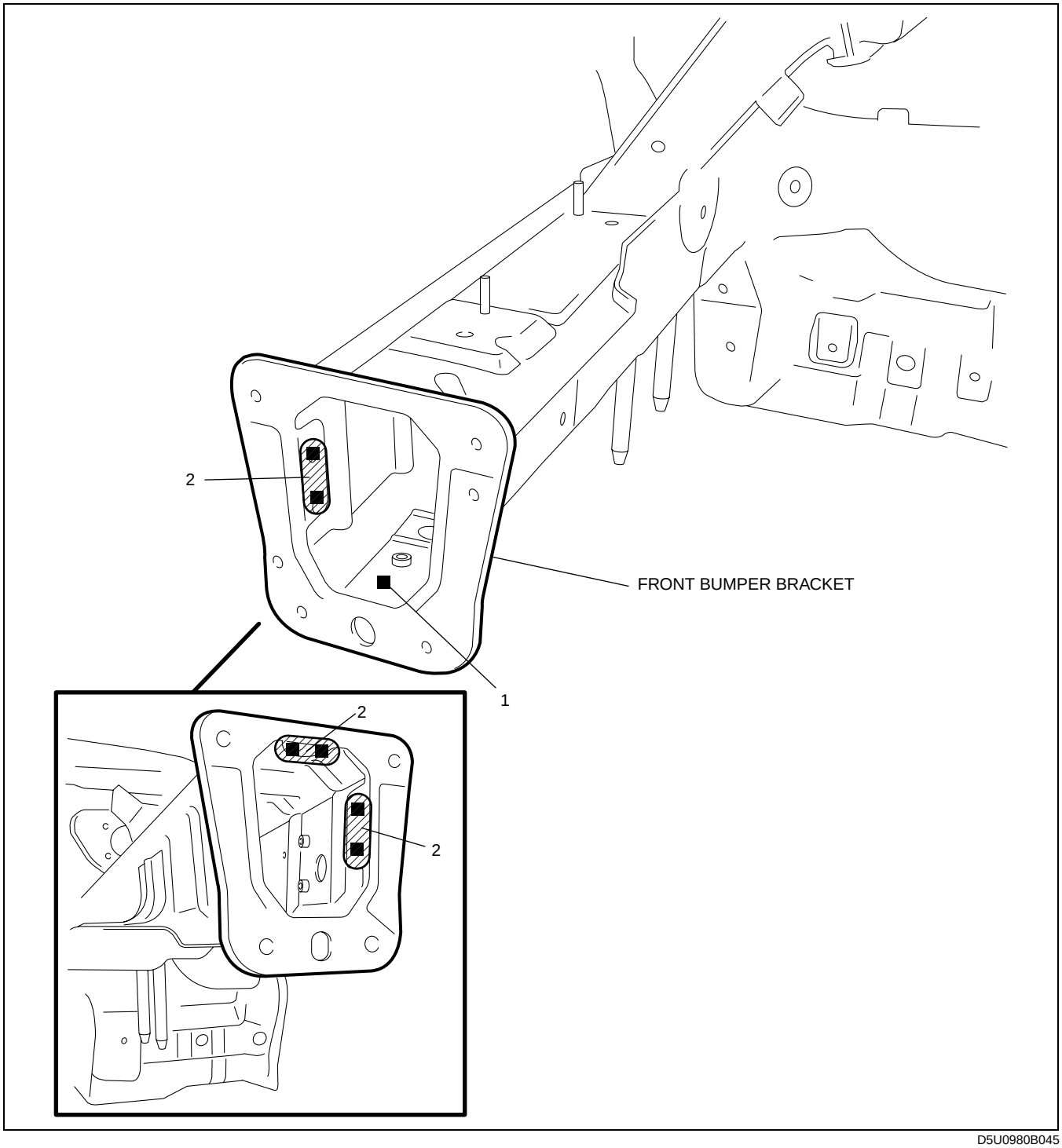


D5U0980B044

FRONT BUMPER BRACKET INSTALLATION

D5U098053986B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

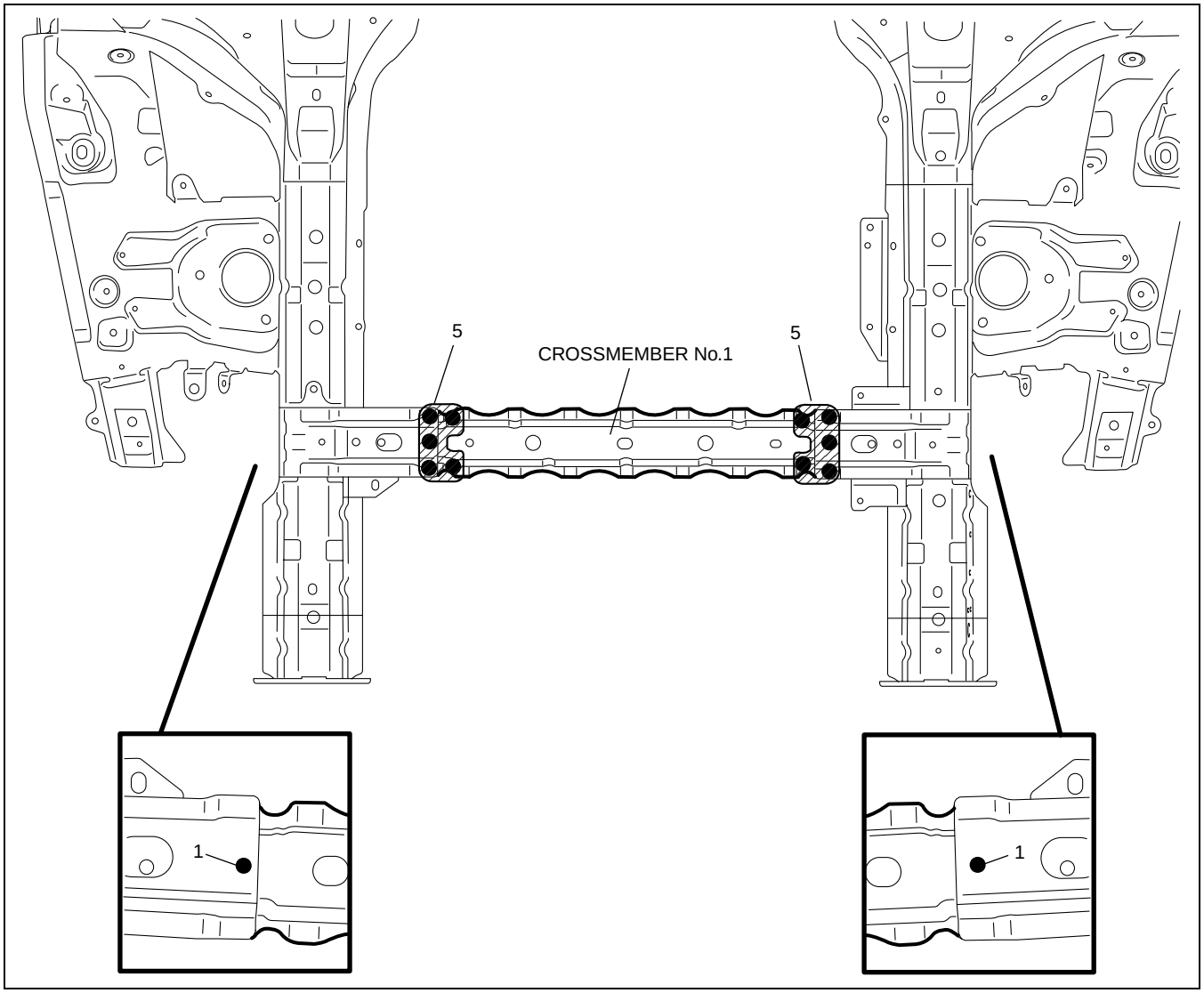


D5U0980B045

CROSSMEMBER NO.1 REMOVAL

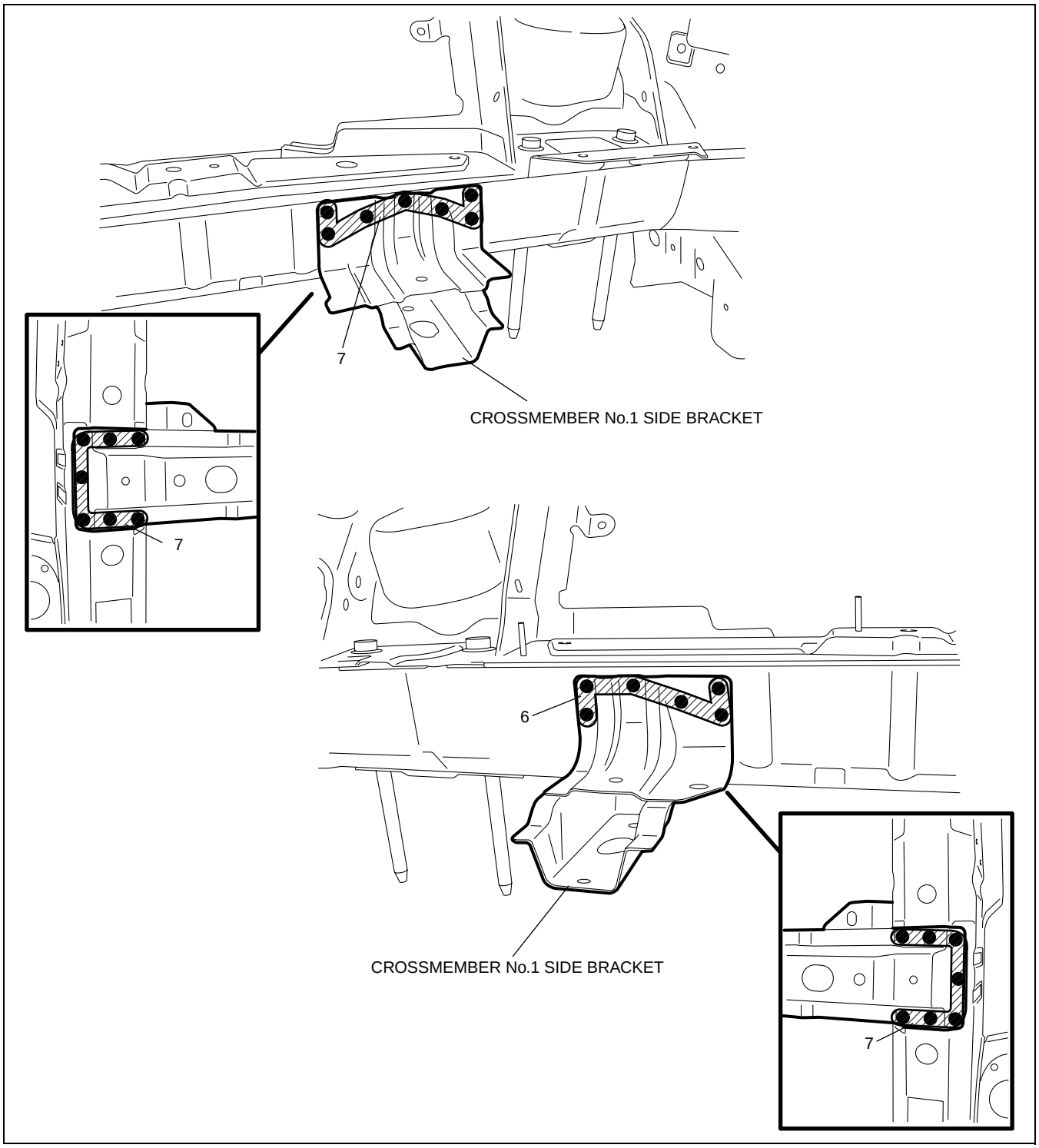
D5U098053160B01

1. Remove the crossmember No.1.



D5U0980B046

2. Remove the crossmember No.1 side bracket.

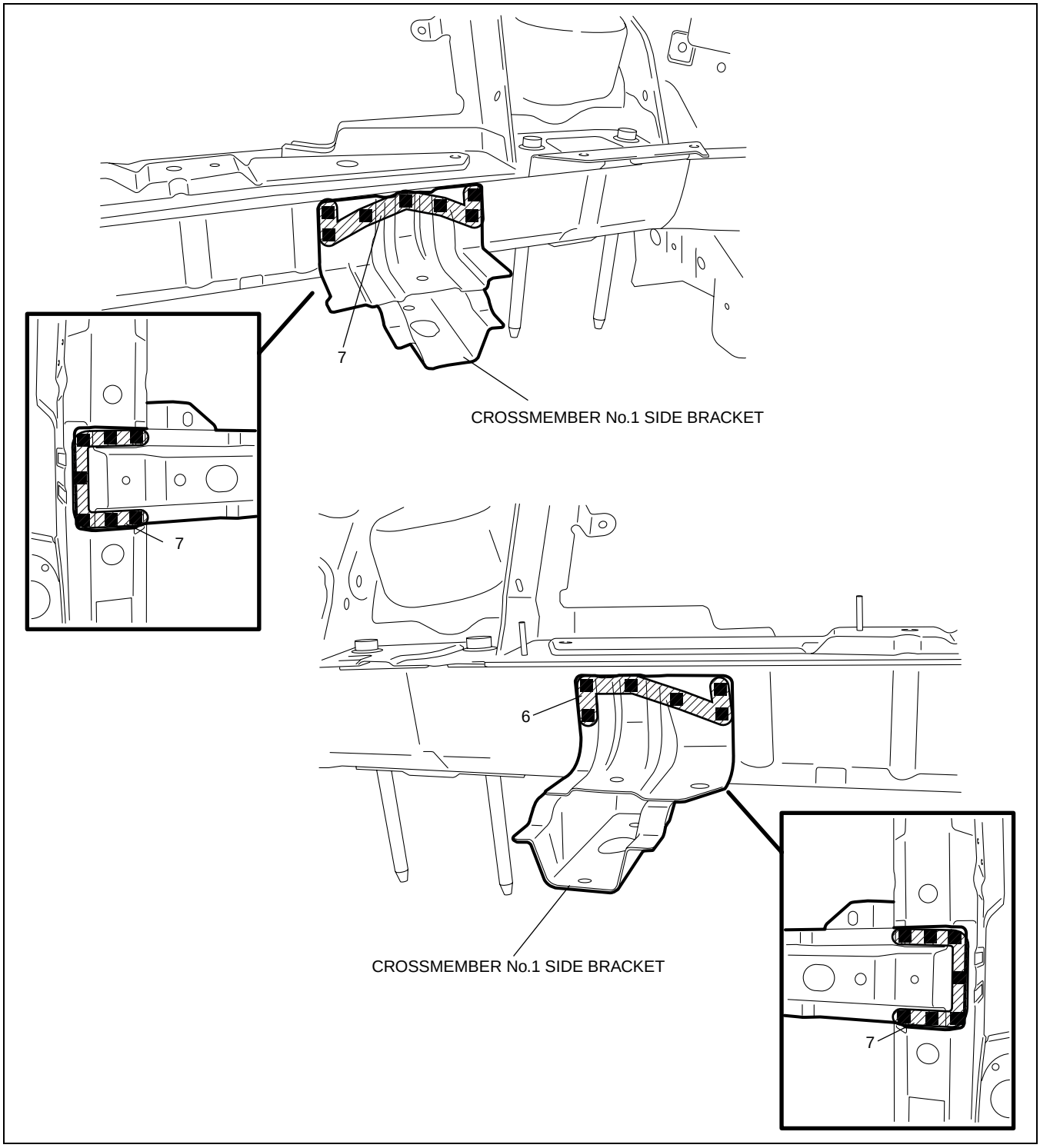


D5U0980B052

CROSSMEMBER NO.1 INSTALLATION

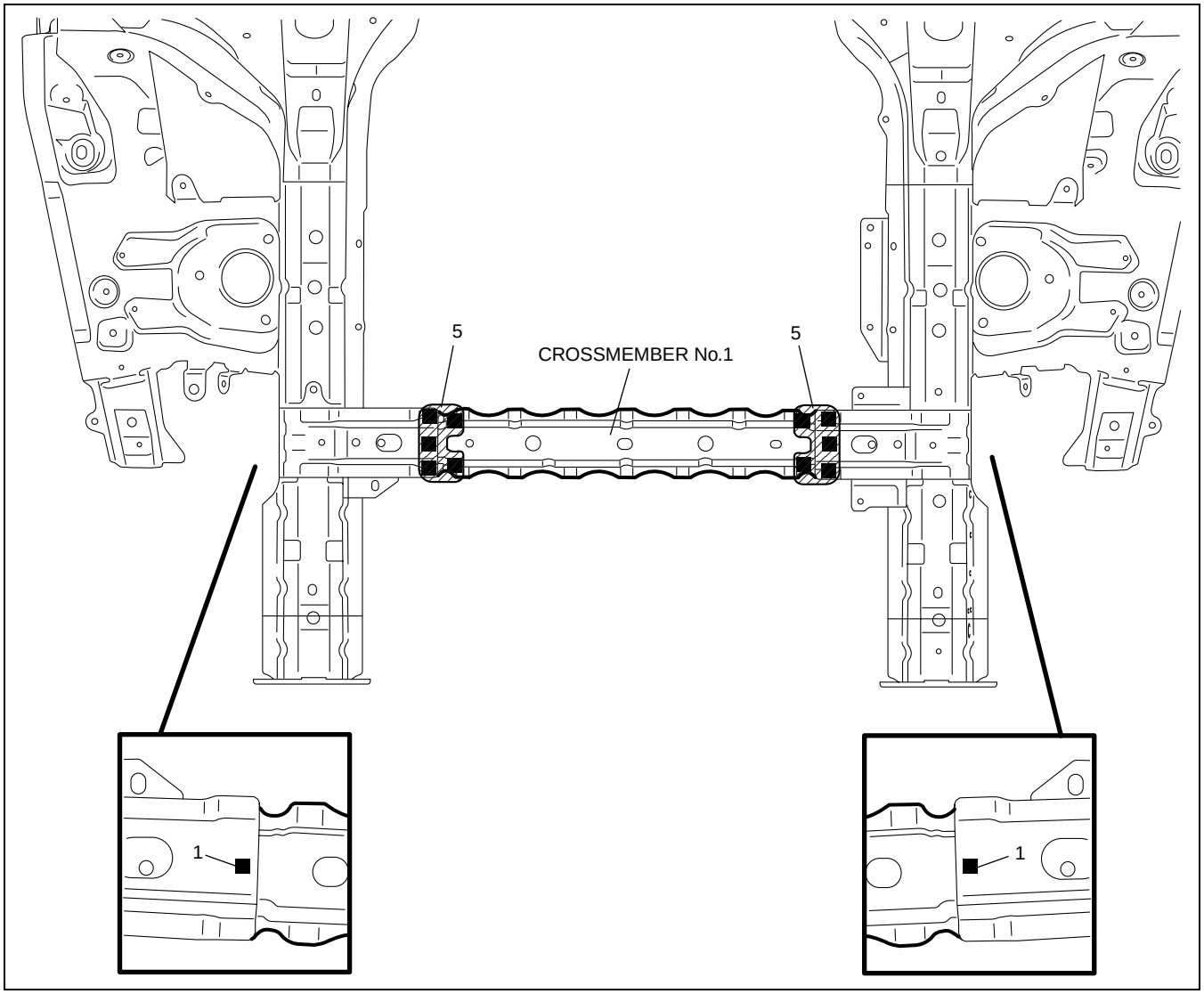
D5U098053160B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.
4. Install the crossmember No.1 side bracket.



D5U0980B053

5. Install the crossmember No.1.



D5U0980B047

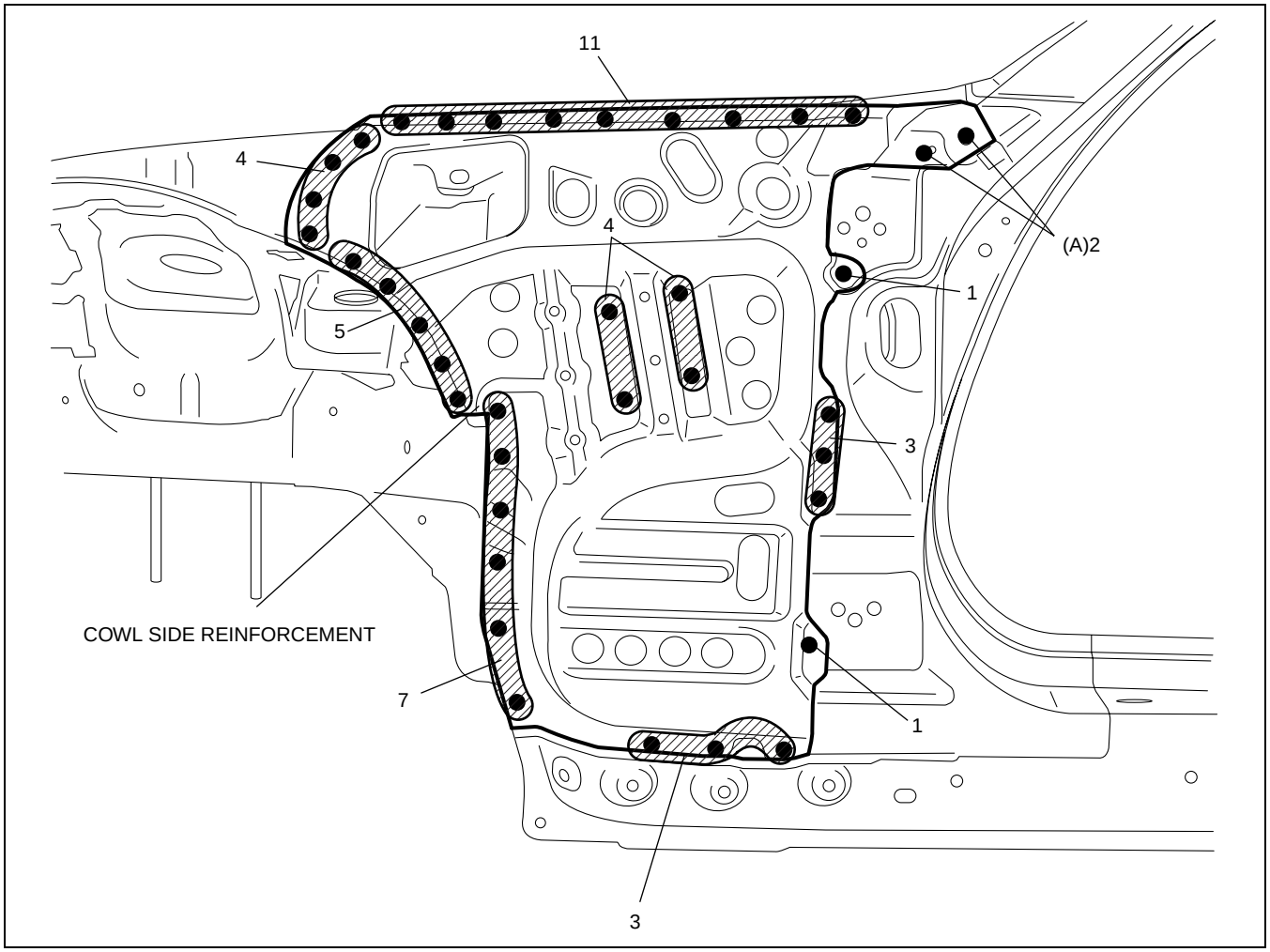
COWL SIDE REINFORCEMENT REMOVAL

D5U098053290B01

1. Remove the cowl side reinforcement.

Caution

- **Be careful not to damage the windshield when drilling the 2 locations indicated by (A).**

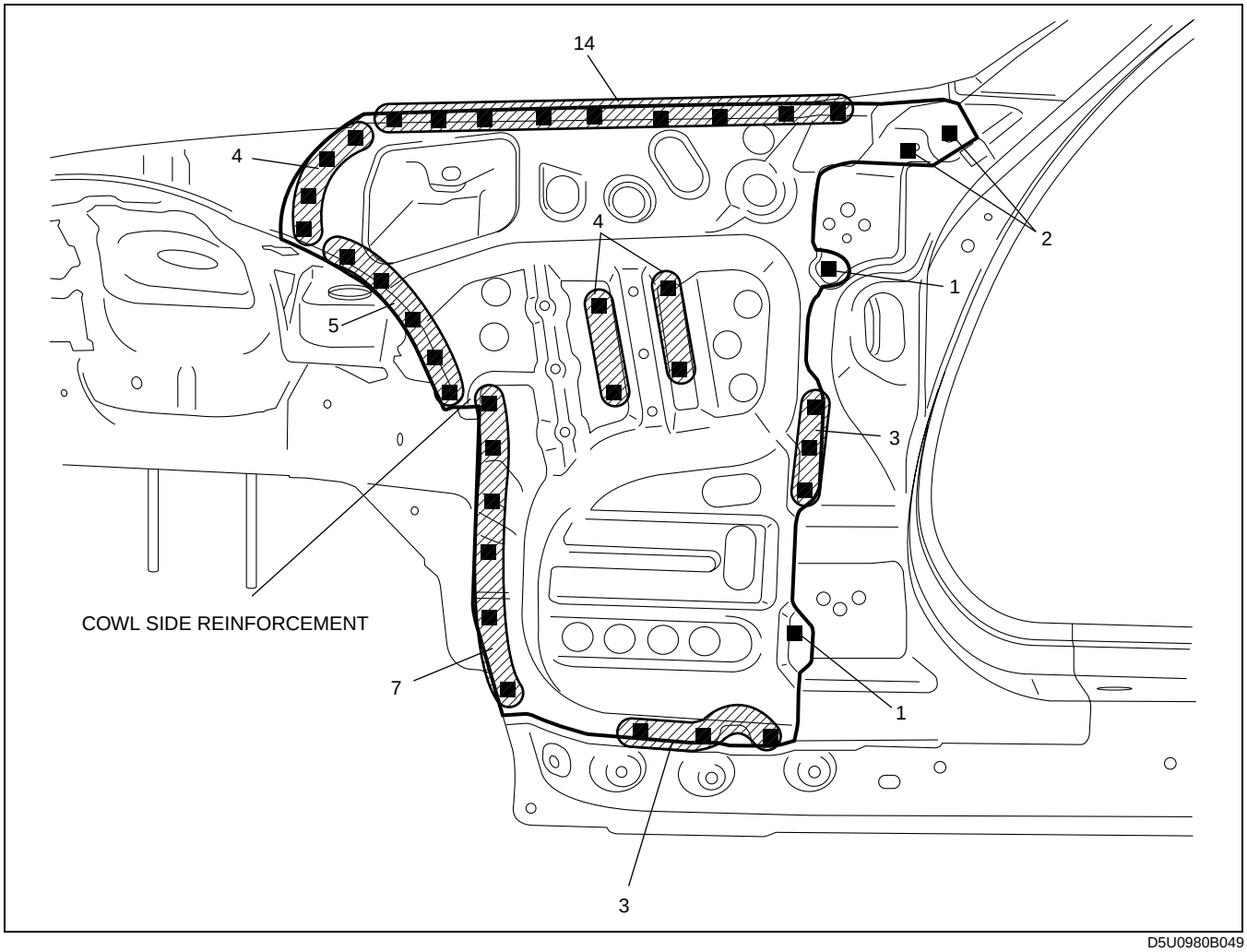


D5U0980B048

COWL SIDE REINFORCEMENT INSTALLATION

D5U098053290B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B049

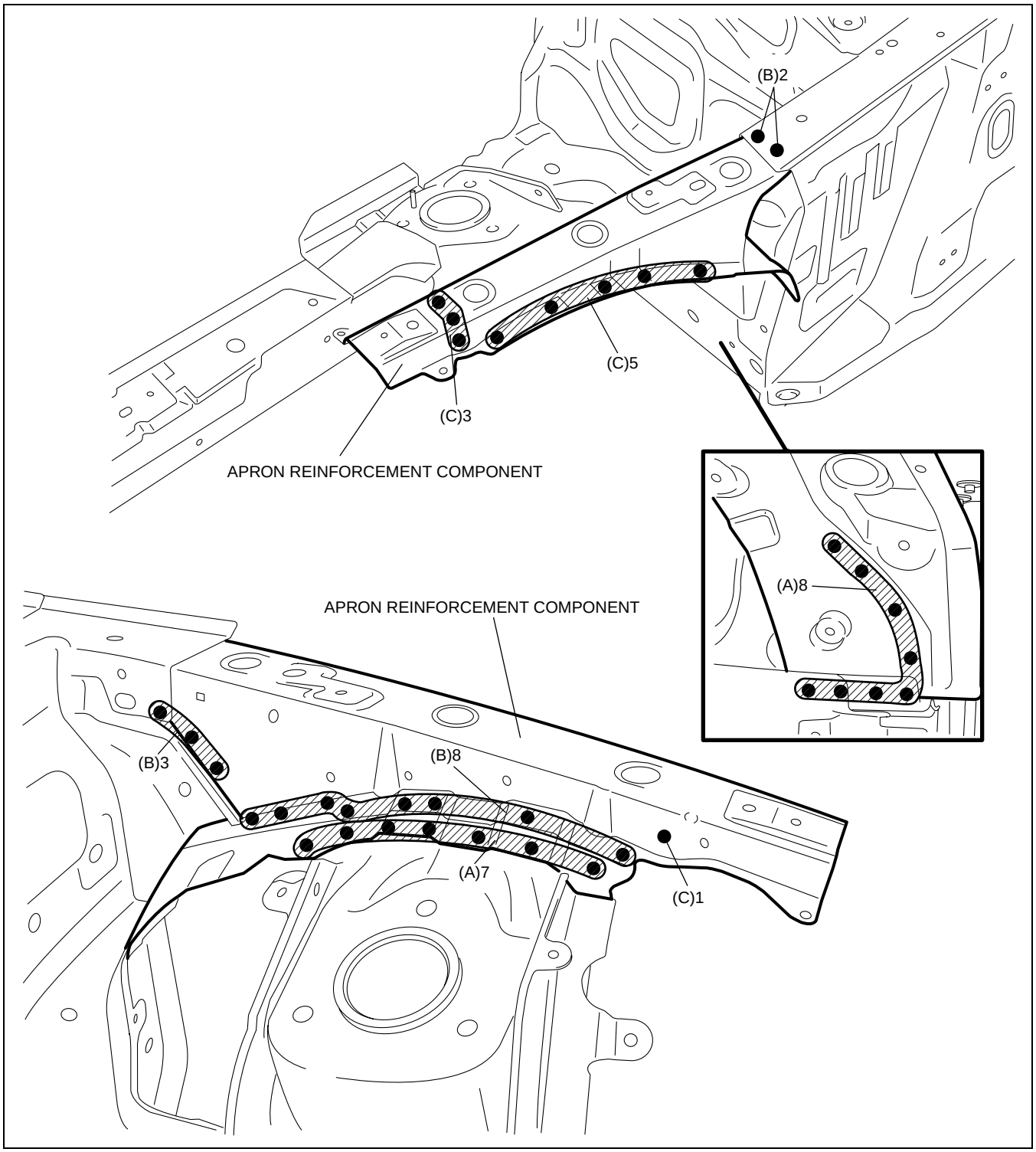
APRON REINFORCEMENT COMPONENT REMOVAL

D5U098053260B01

1. Drill the 15 locations indicated by (A) and 13 locations indicated by (B), then remove the apron reinforcement component.

Note

- When removing the apron reinforcement (upper) separately, drill the 13 locations indicated by (B) and the 9 locations indicated by (C).

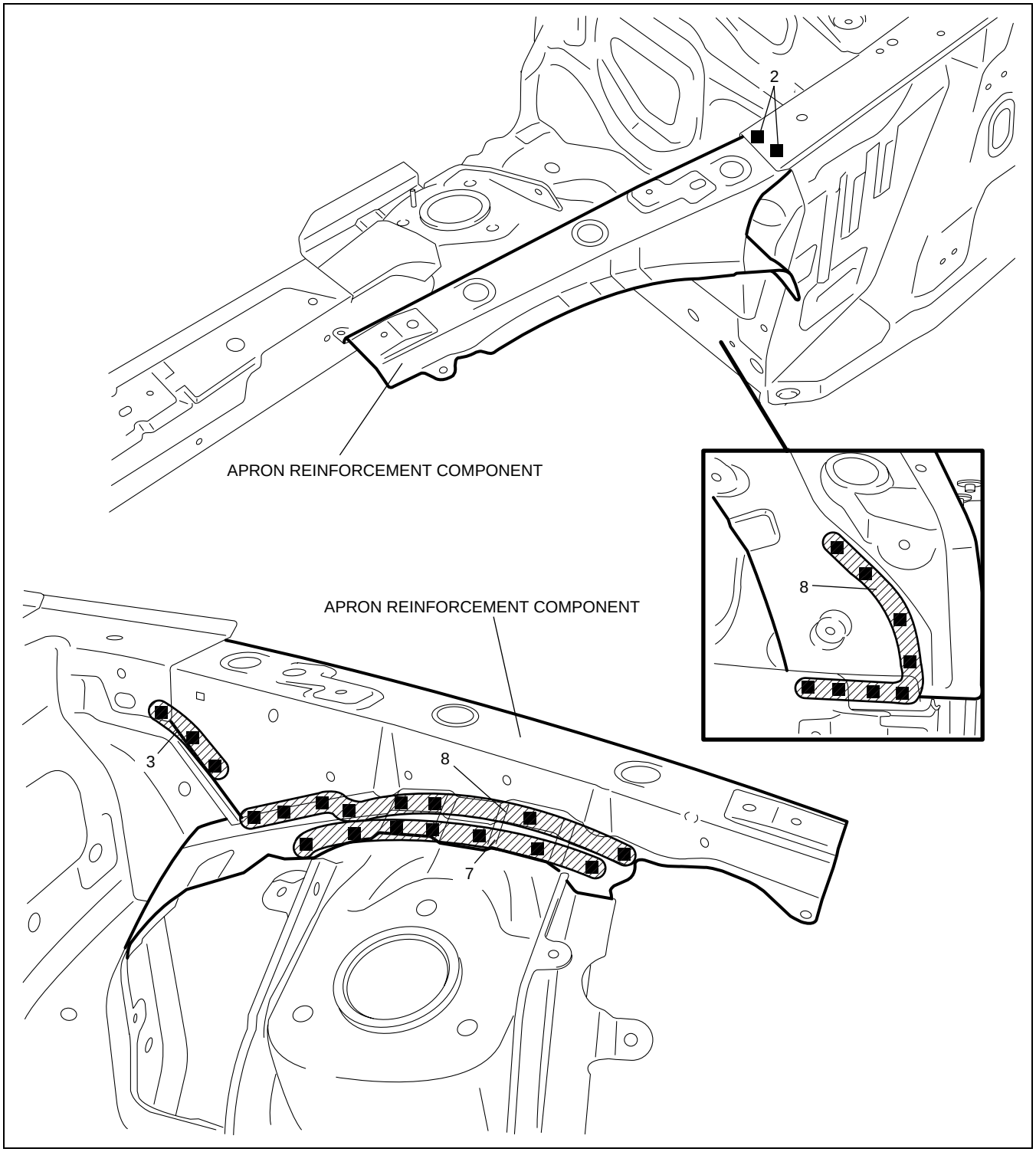


D5U0980B050

APRON REINFORCEMENT COMPONENT INSTALLATION

D5U098053260B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

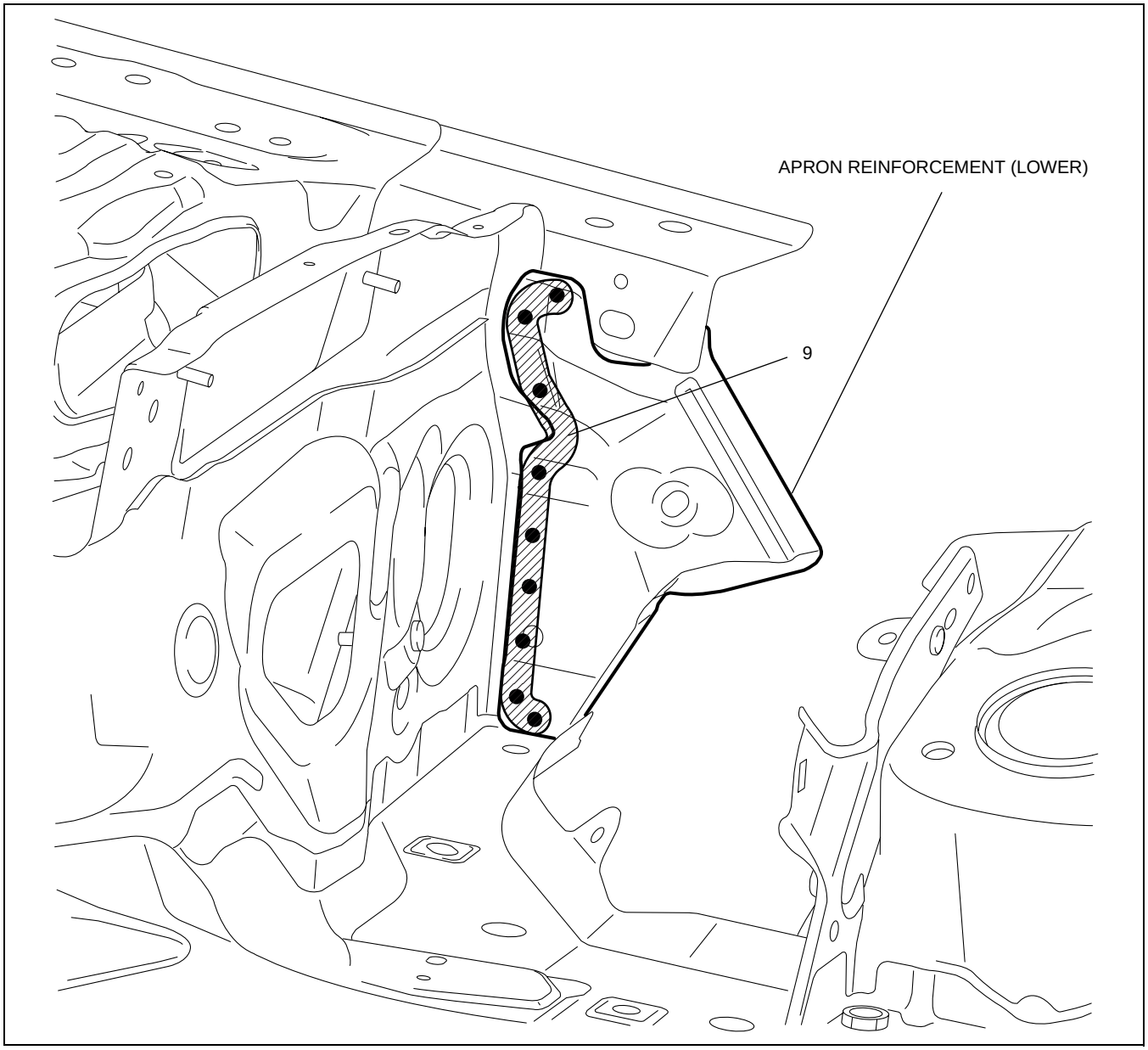


D5U0980B051

APRON REINFORCEMENT (LOWER) REMOVAL

D5U098053260B03

1. Remove the apron reinforcement (lower).

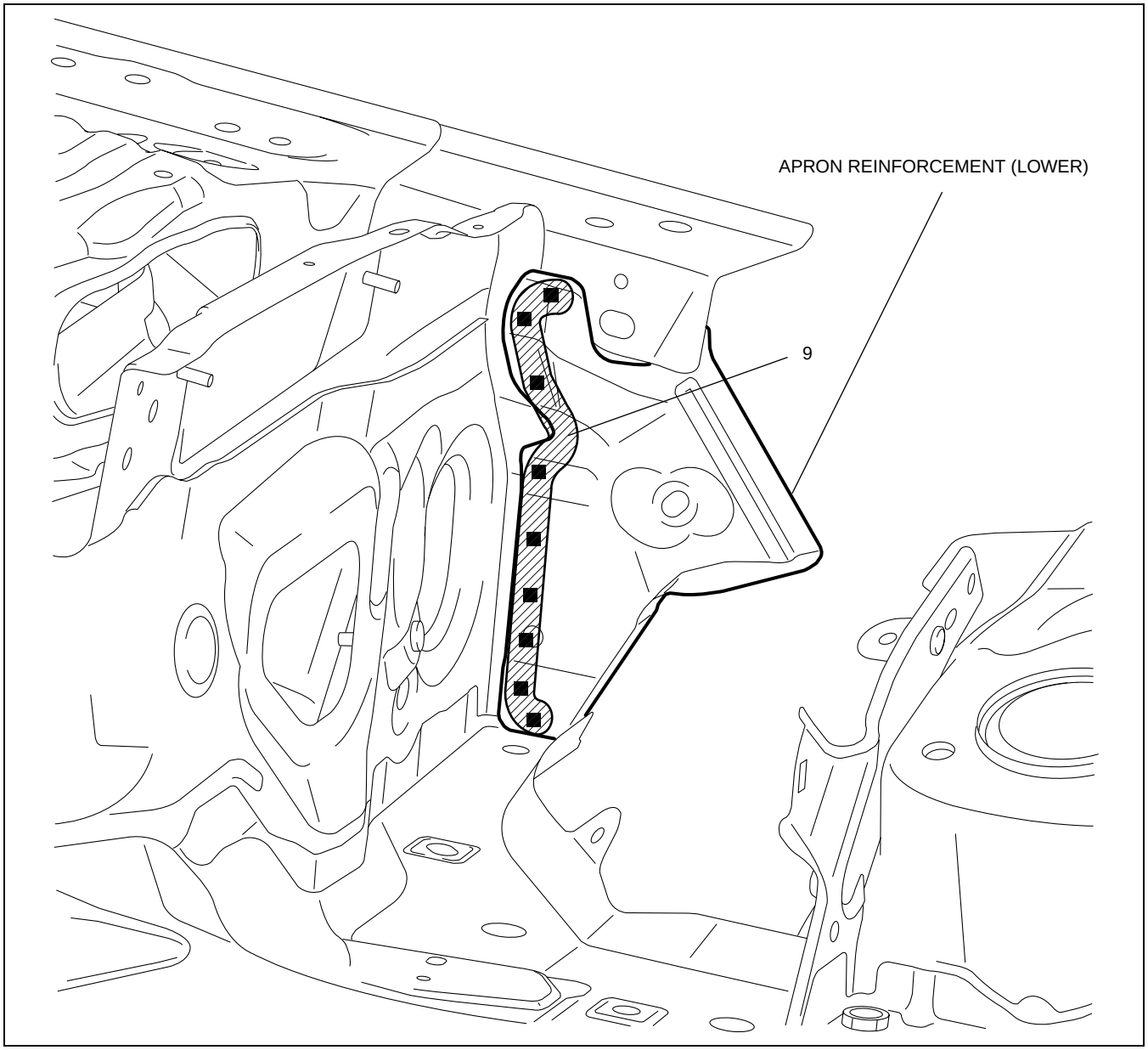


D5U0980B054

APRON REINFORCEMENT (LOWER) INSTALLATION

D5U098053260B04

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B055

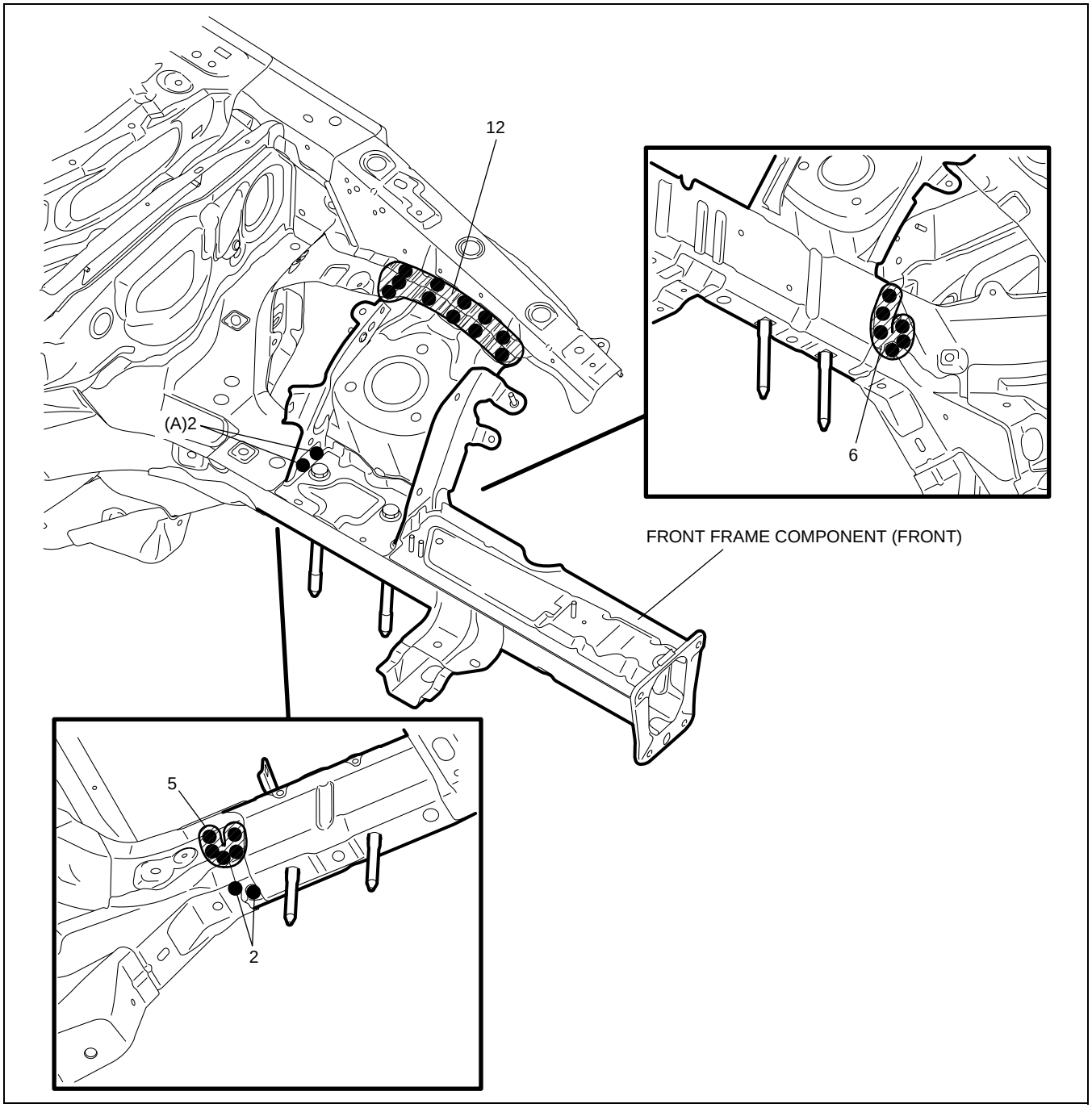
FRONT FRAME COMPONENT (FRONT) REMOVAL

D5U098053300B12

1. Drill the 2 locations indicated by (A).

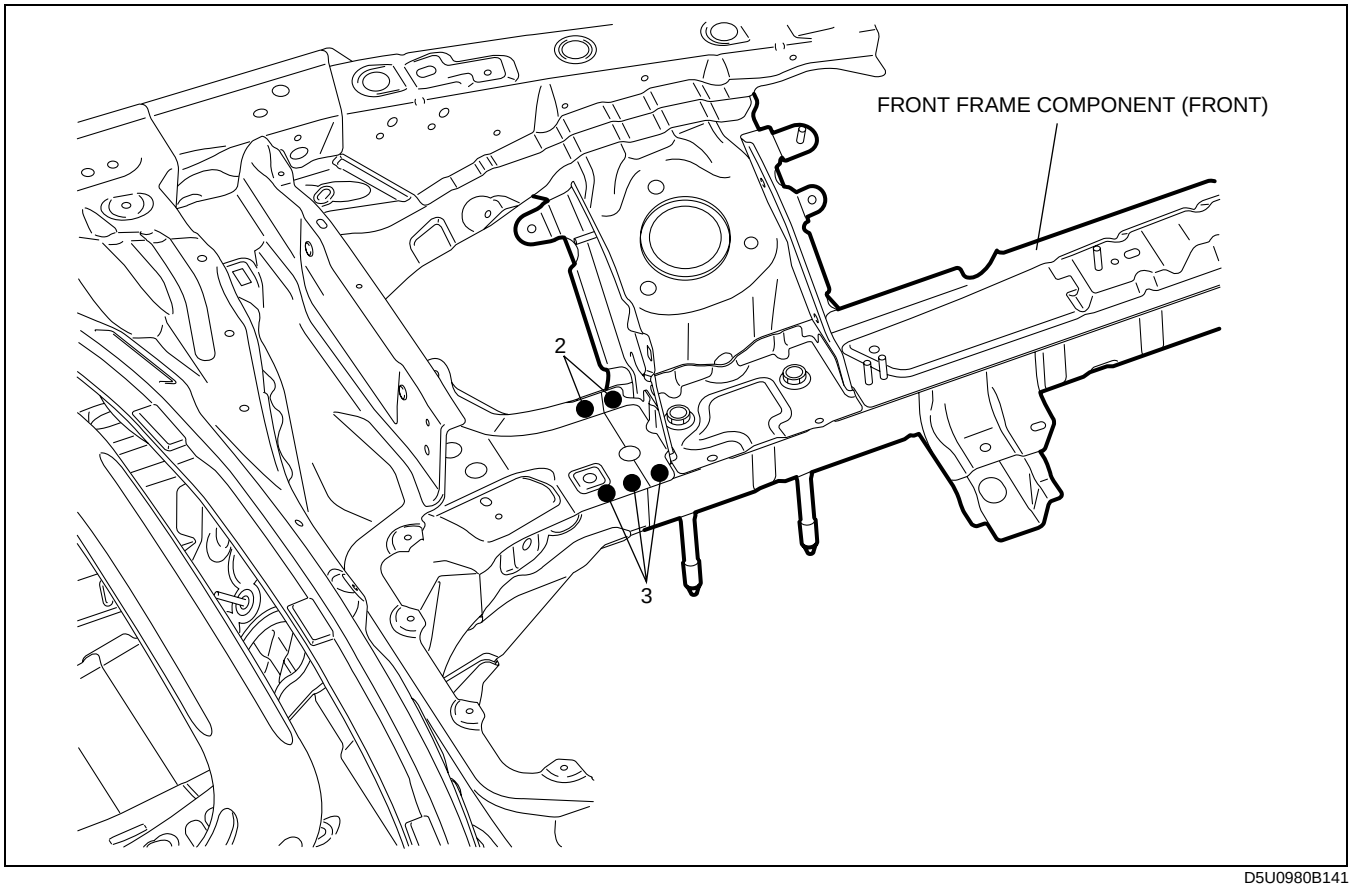
Note
- To prevent damage to the front side frame rear reinforcement, grind it using a belt grinder from the front side.

2. Remove the front frame component (front).



D5U0980B140

BODY STRUCTURE [PANEL REPLACEMENT]



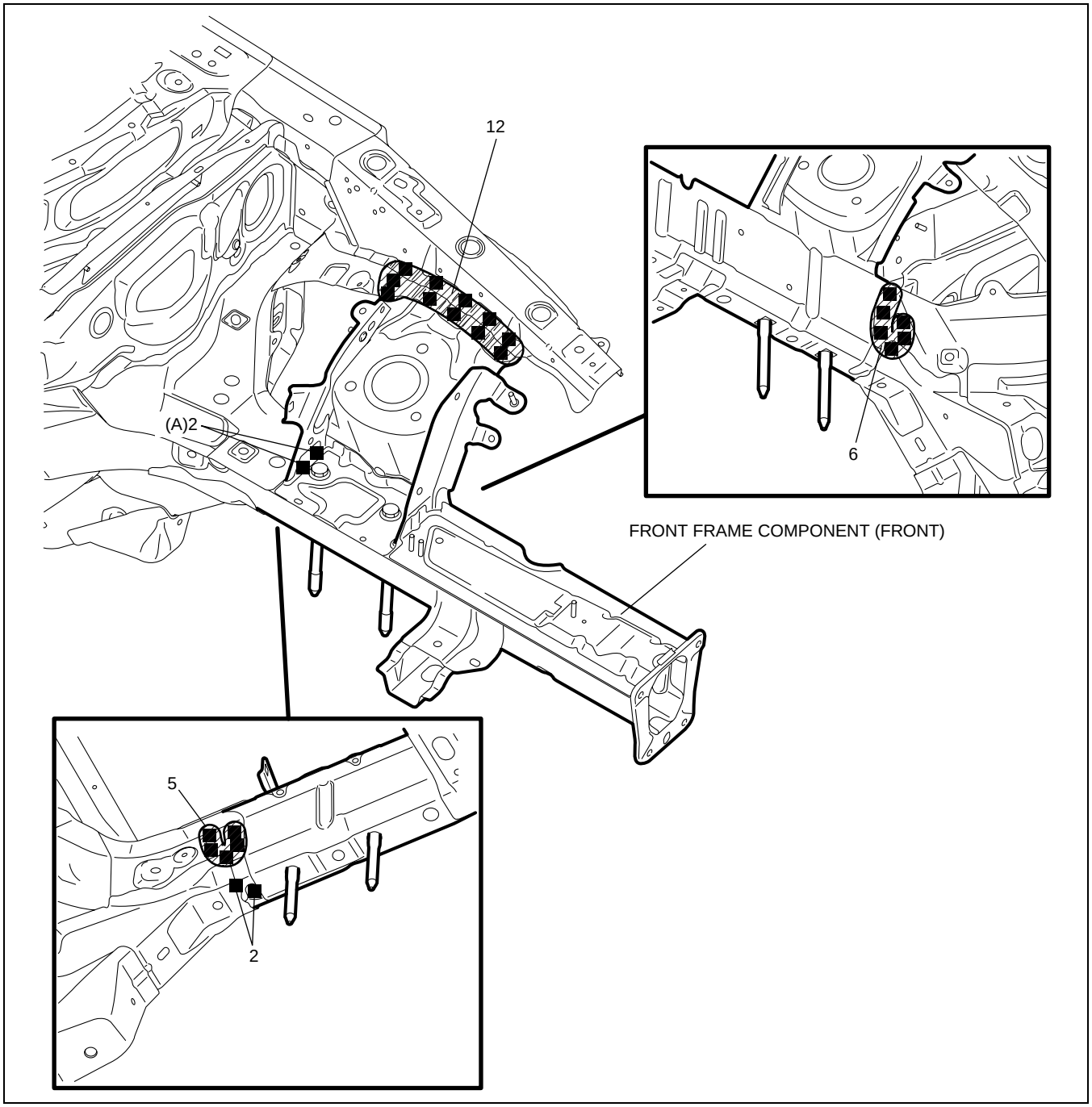
FRONT FRAME COMPONENT (FRONT) INSTALLATION

D5U098053300B13

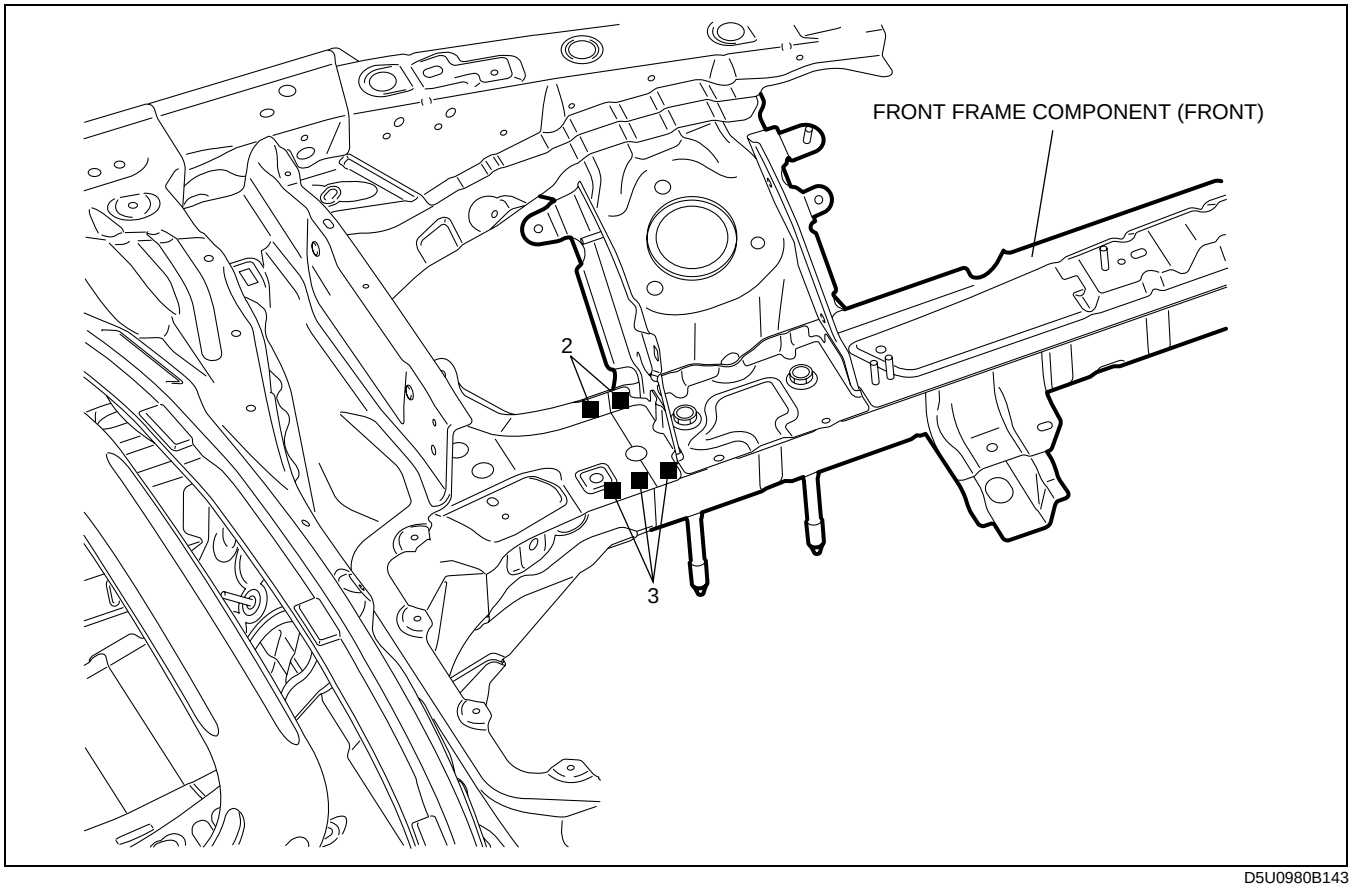
1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

Caution

- **Plug weld the 2 weld locations indicated by (A) together with the front side frame rear reinforcement.**



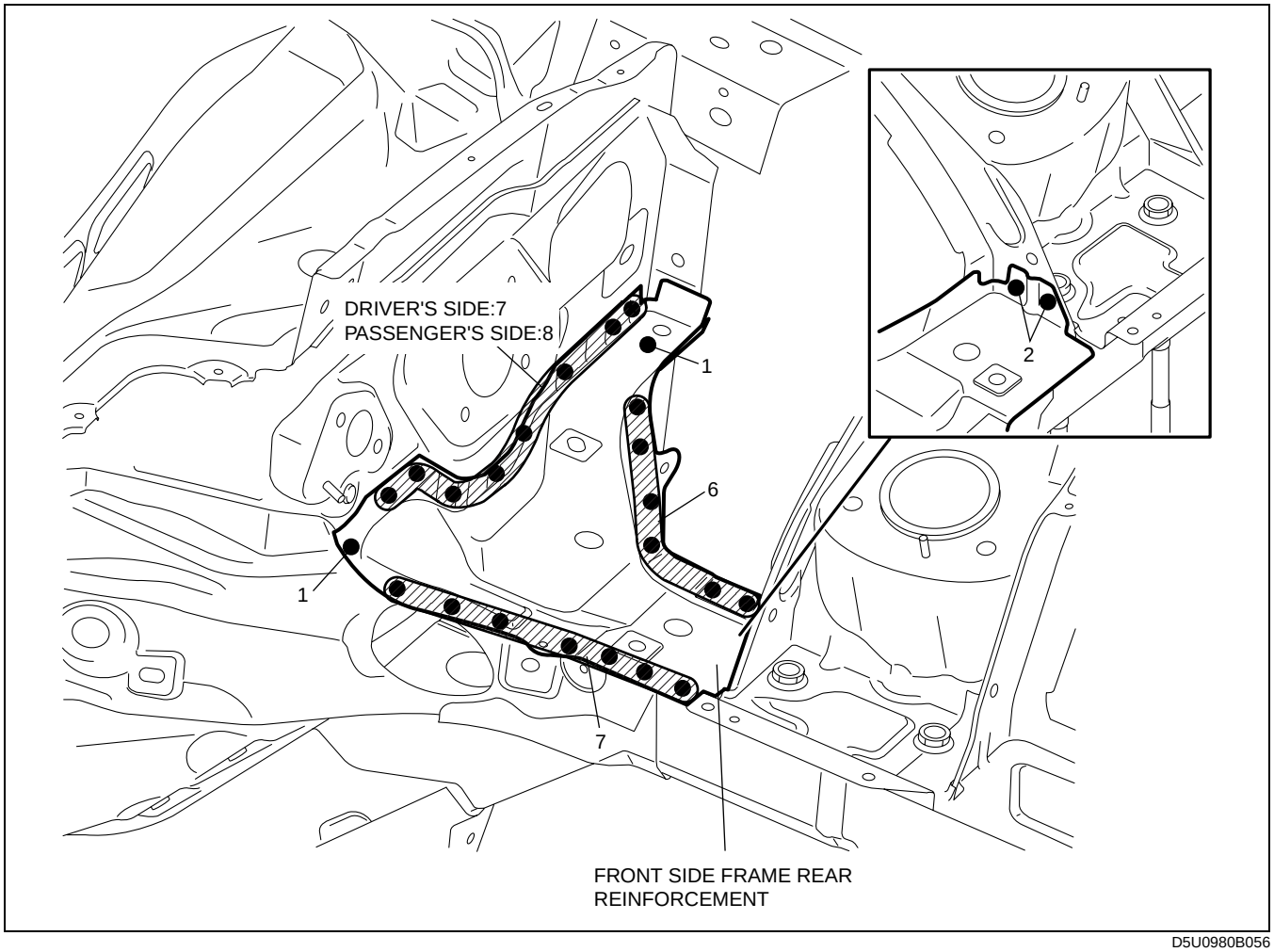
D5U0980B142


FRONT FRAME COMPONENT (FRONT)
2
3
D5U0980B143

FRONT SIDE FRAME REAR REINFORCEMENT REMOVAL

D5U098053300B05

1. Remove the front side frame rear reinforcement.

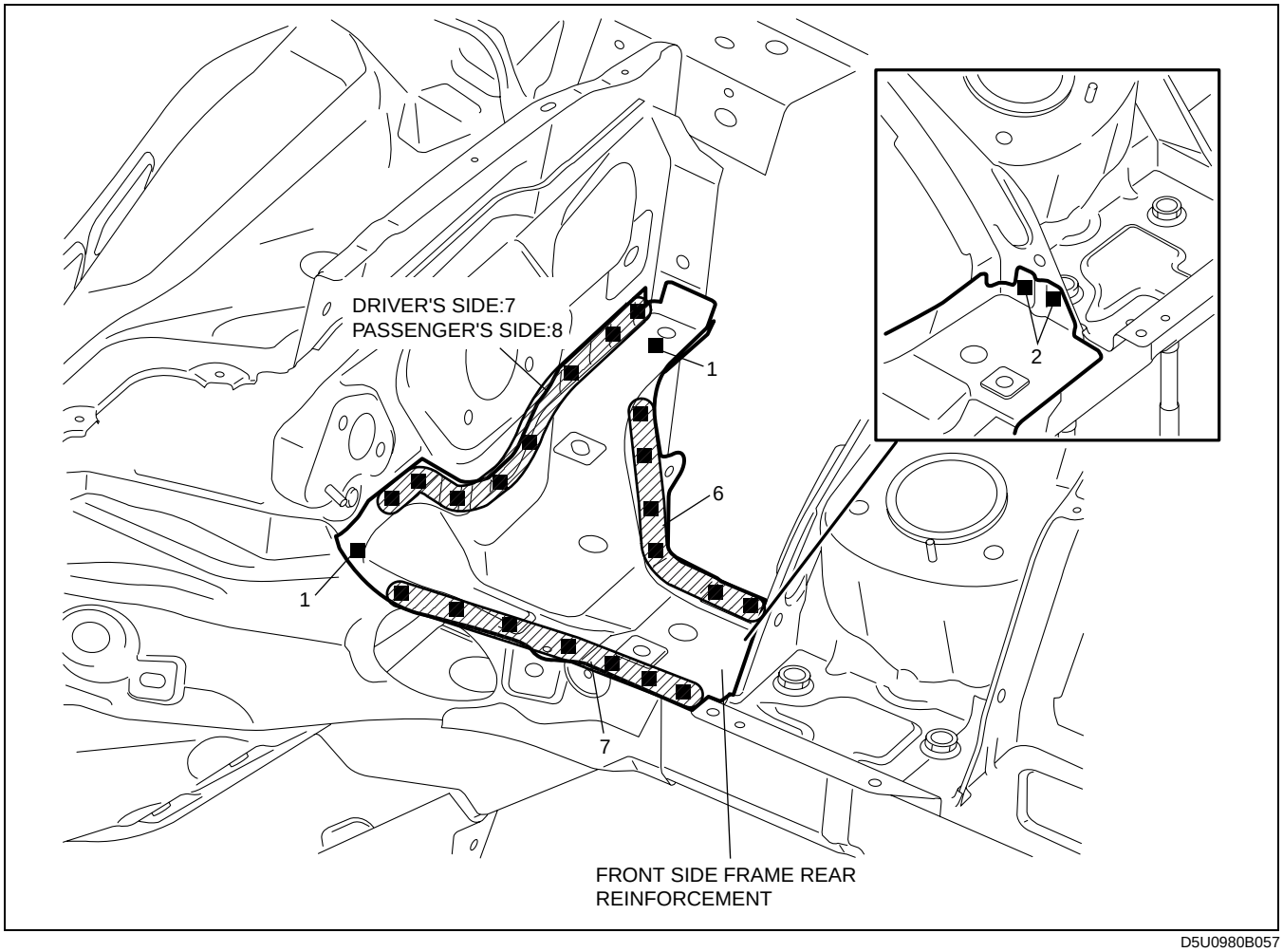


D5U0980B056

FRONT SIDE FRAME REAR REINFORCEMENT INSTALLATION

D5U098053300B06

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

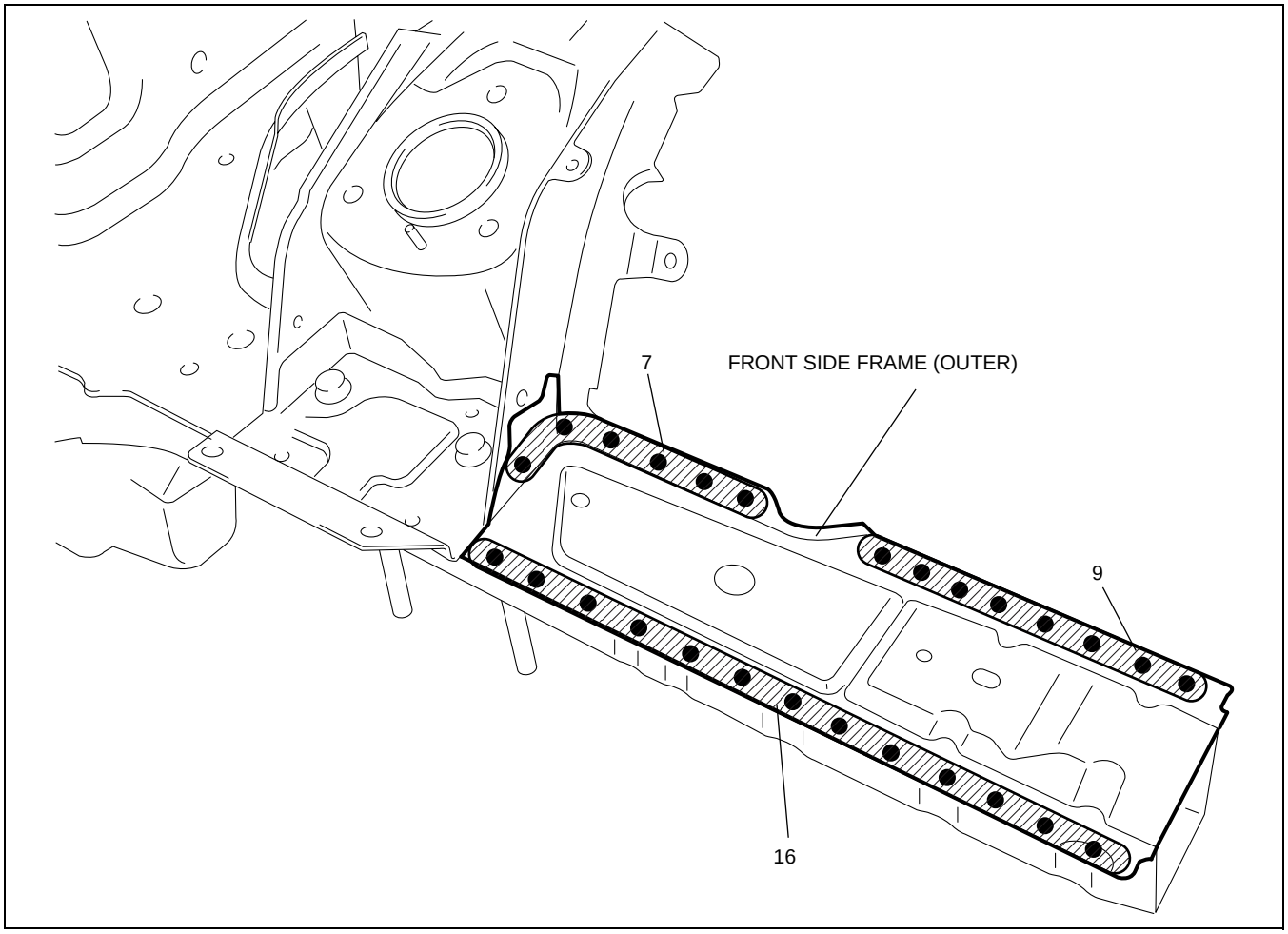


D5U0980B057

FRONT SIDE FRAME (OUTER) REMOVAL

D5U098053300B07

1. Remove the front side frame (outer).

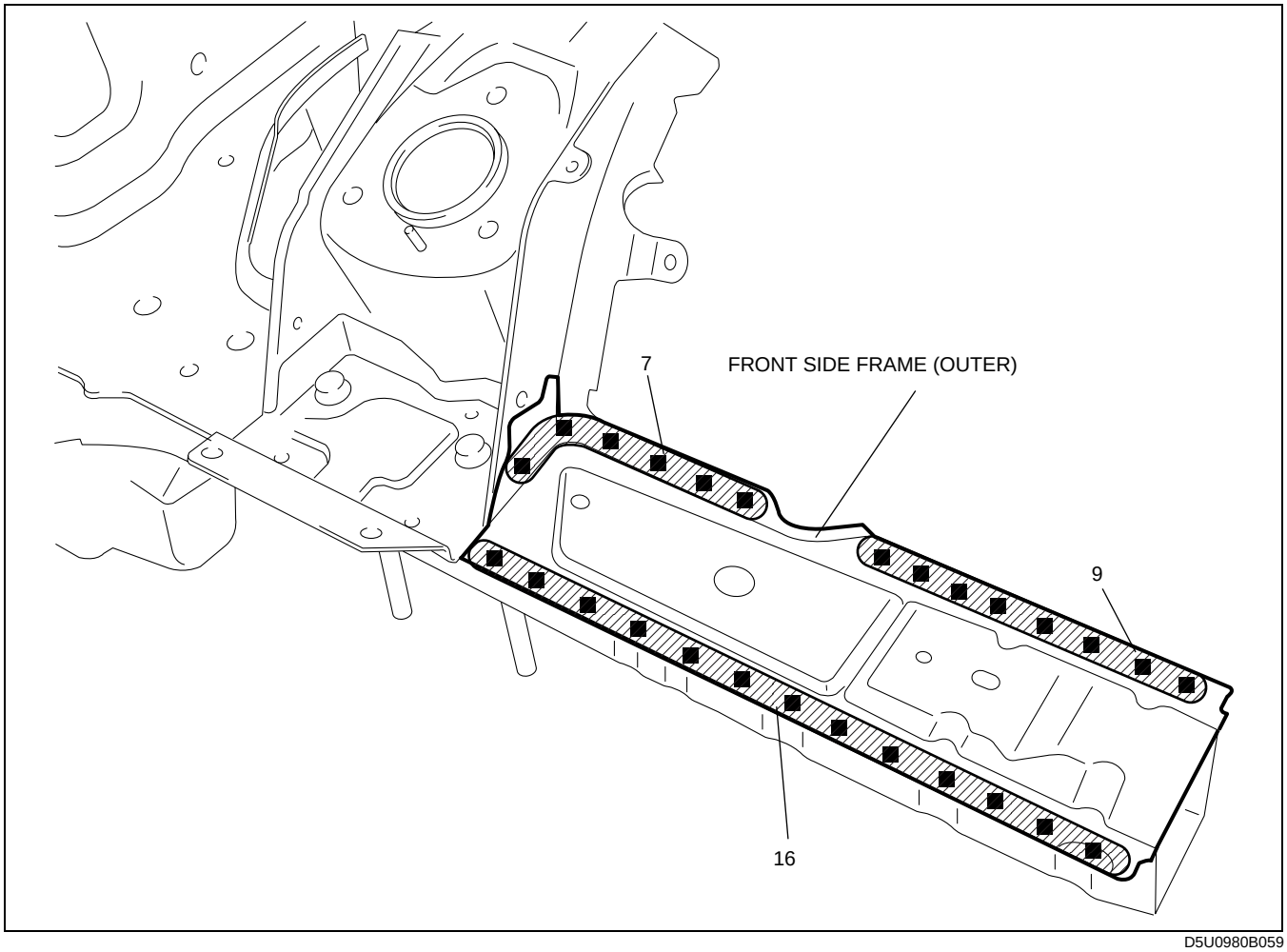


D5U0980B058

FRONT SIDE FRAME (OUTER) INSTALLATION

D5U098053300B08

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

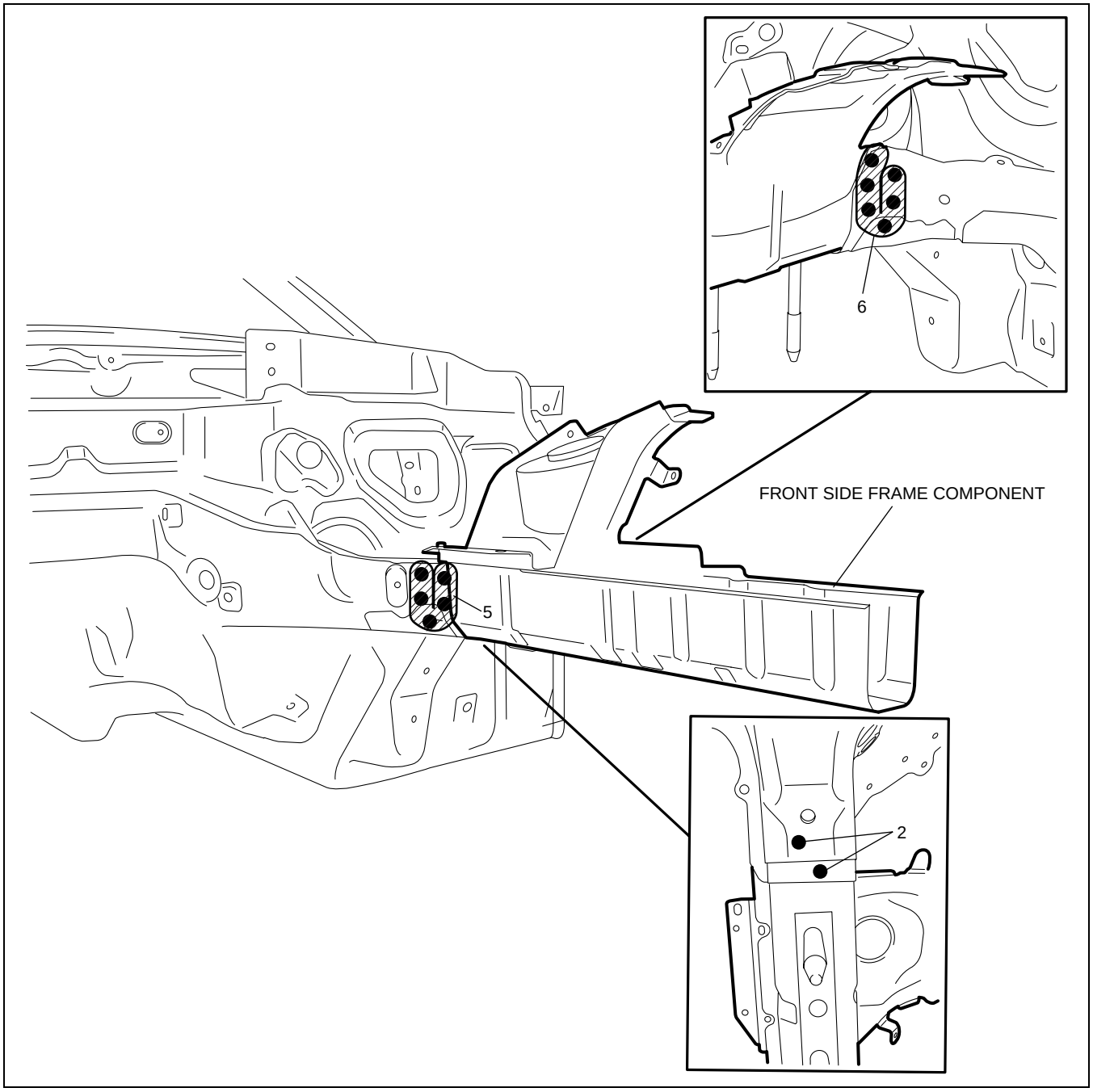


D5U0980B059

FRONT SIDE FRAME COMPONENT REMOVAL

D5U098053300B09

1. Remove the front side frame component.

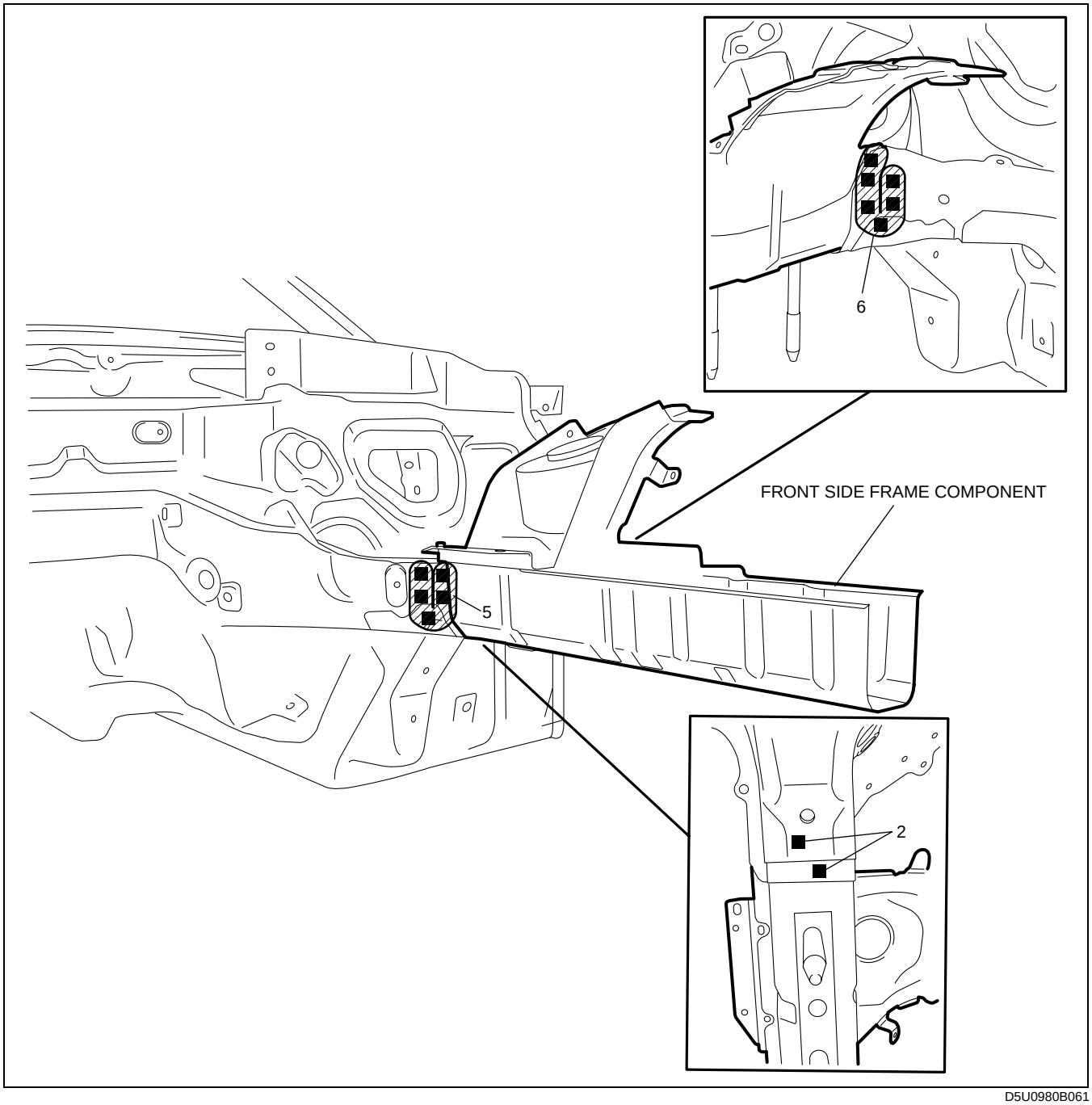


D5U0980B060

FRONT SIDE FRAME COMPONENT INSTALLATION

D5U098053300B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

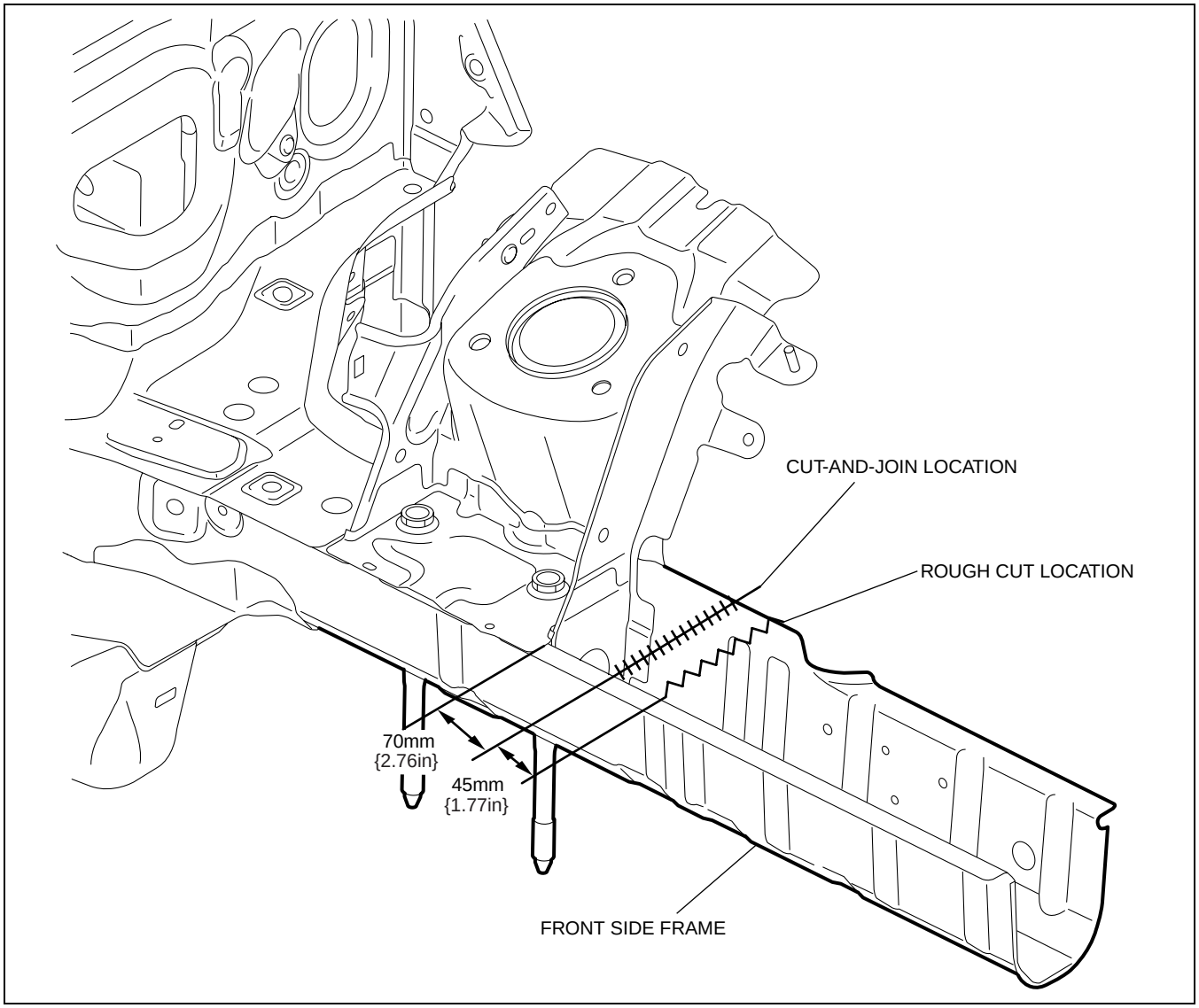


D5U0980B061

FRONT SIDE FRAME (PARTIAL CUTTING) REMOVAL

D5U098053300B03

1. Rough cut and remove the damaged part of the front side frame.



D5U0980B068

FRONT SIDE FRAME (PARTIAL CUTTING) INSTALLATION

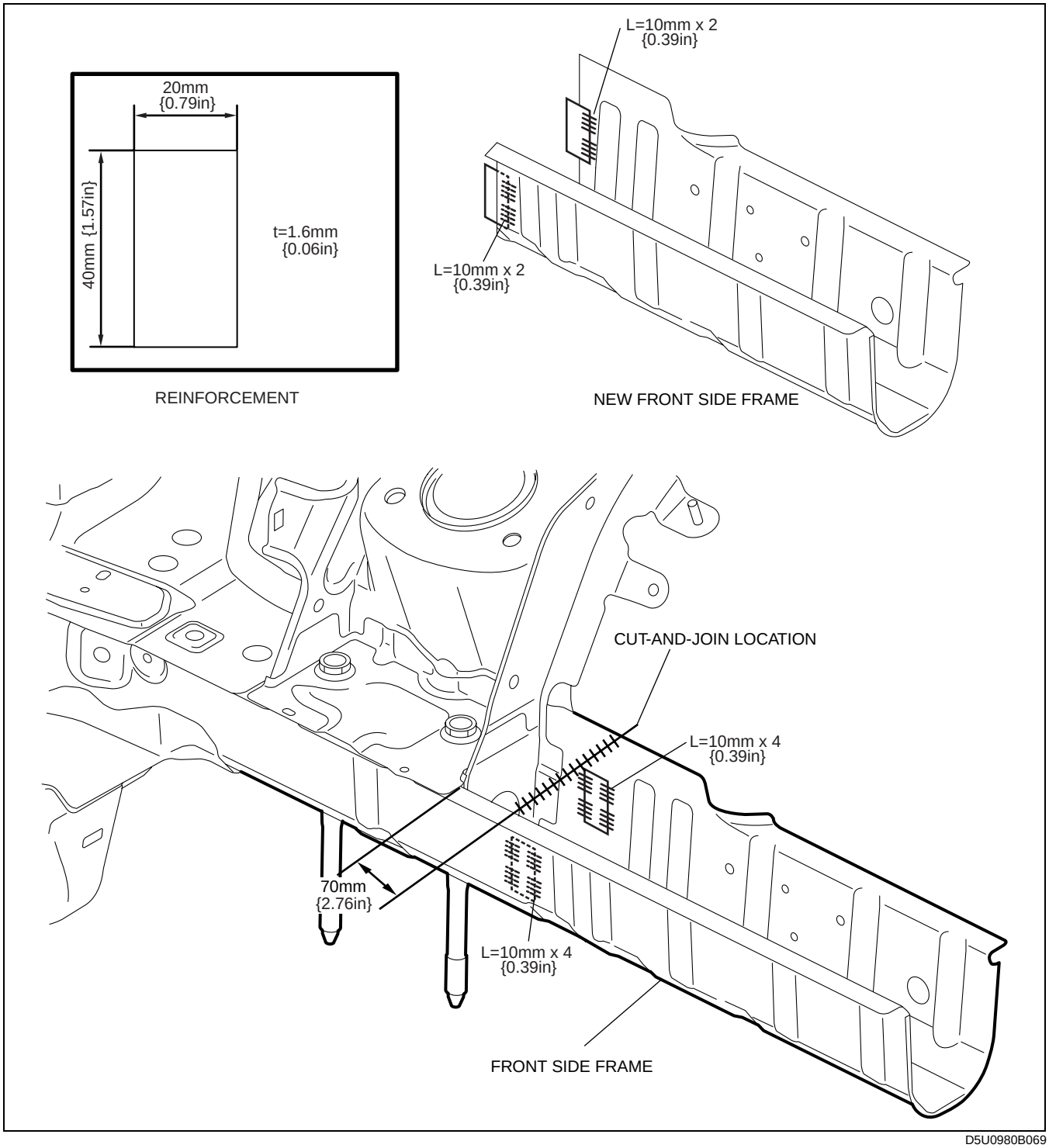
D5U098053300B04

Caution
- **The cut-and-joint area indicates the maximum size range of the installation position.**

1. Make a reinforcement panel using the material from the front side frame.
2. To cut and join the new and existing parts, cut the new part at the specified location shown in the figure, and chamfer the joint surfaces of the new and existing parts.
3. When installing the new parts, trial-fit new and existing parts, and then measure and adjust the body to conform with standard dimensions.
4. After temporarily installing new parts, make sure the related parts fit properly.
5. Trial-fit the new and existing parts, weld the existing parts and the reinforcement, and then butt weld the new and existing parts.

Caution

- **Press fit the reinforcement panel and the body side material, and then plug weld them.**

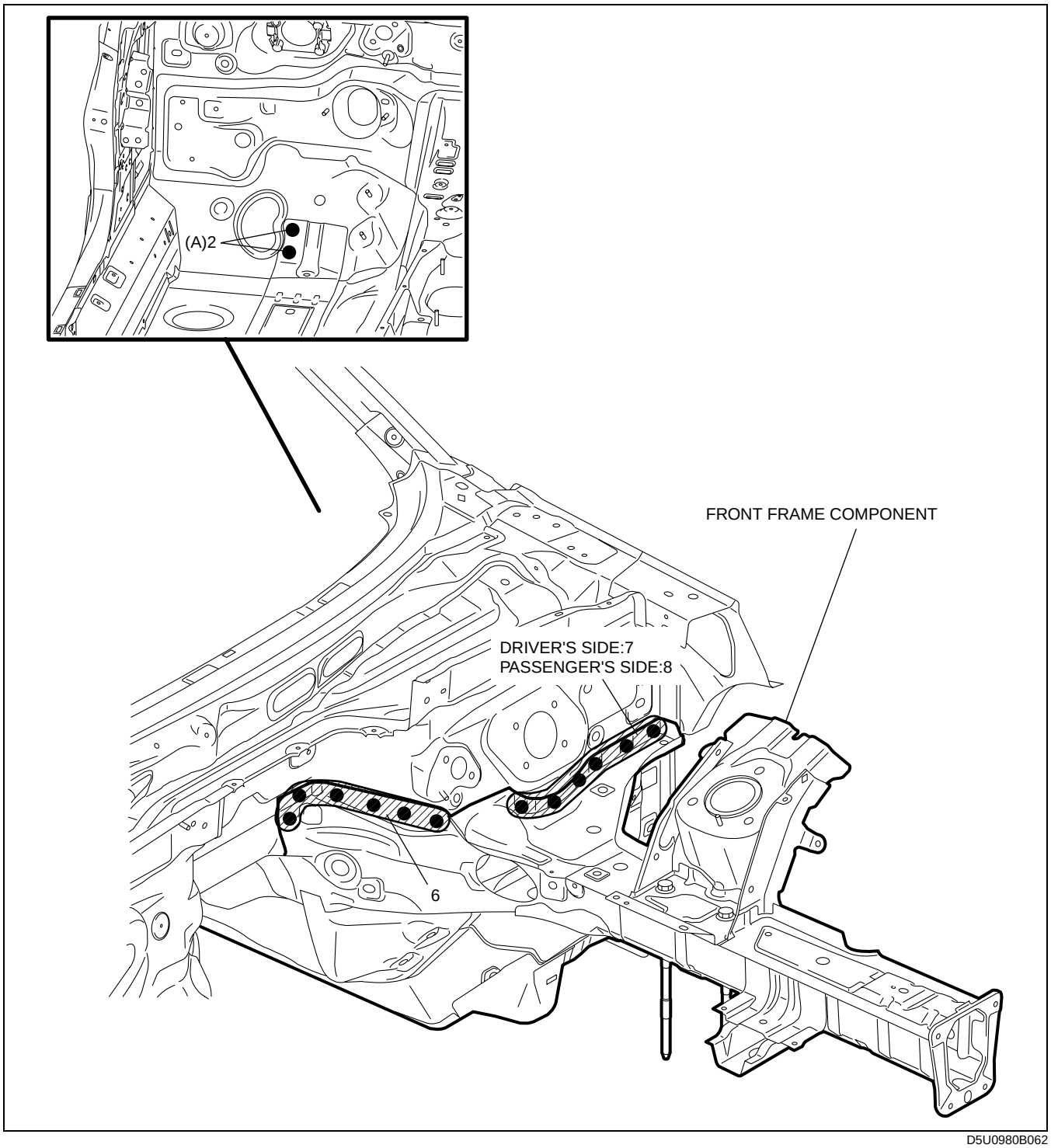


D5U0980B069

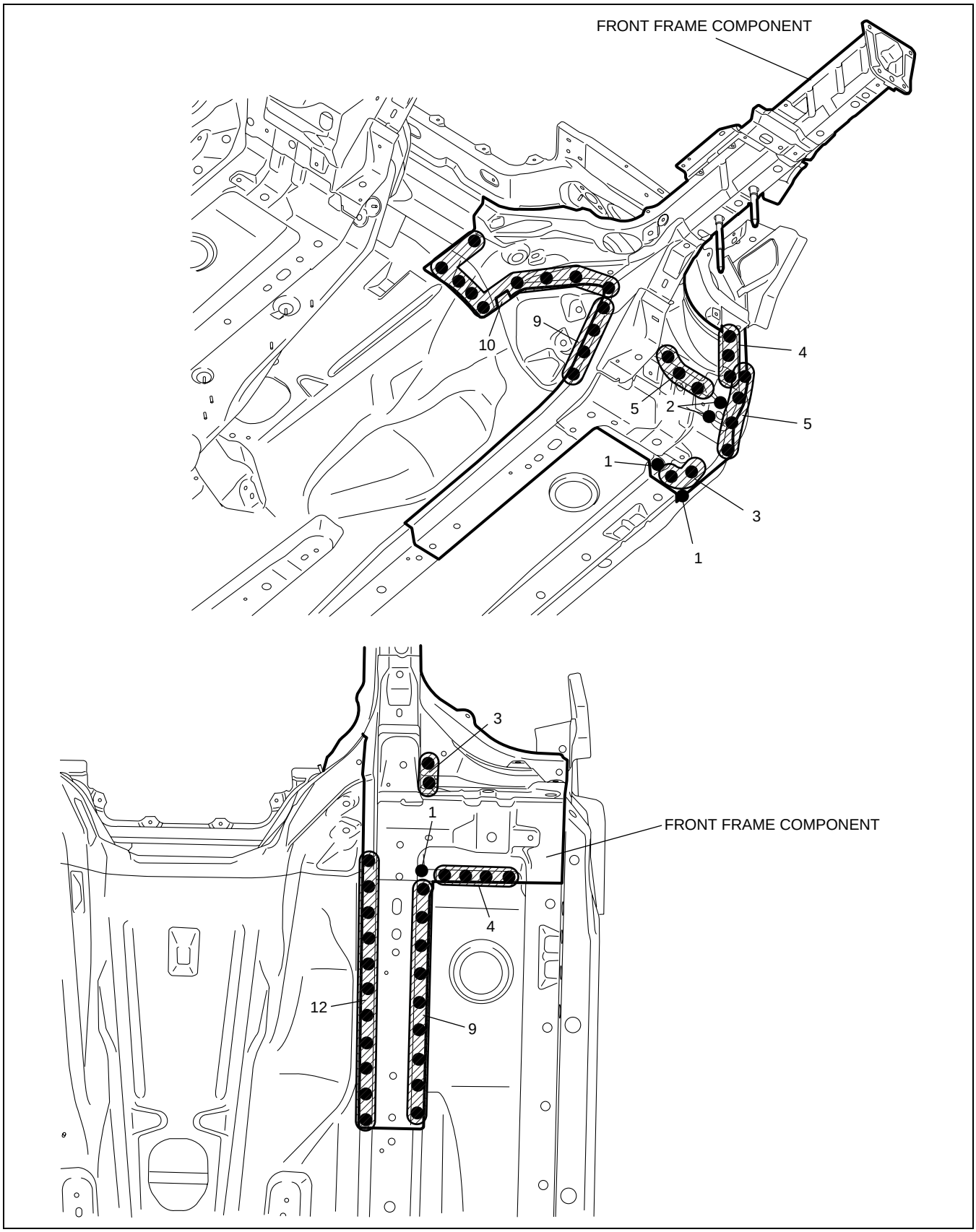
FRONT FRAME COMPONENT REMOVAL

D5U098053300B10

1. Drill the 2 location indicated by (A) from the interior, as they cannot be seen from the outer side.
2. Remove the front frame component.



D5U0980B062

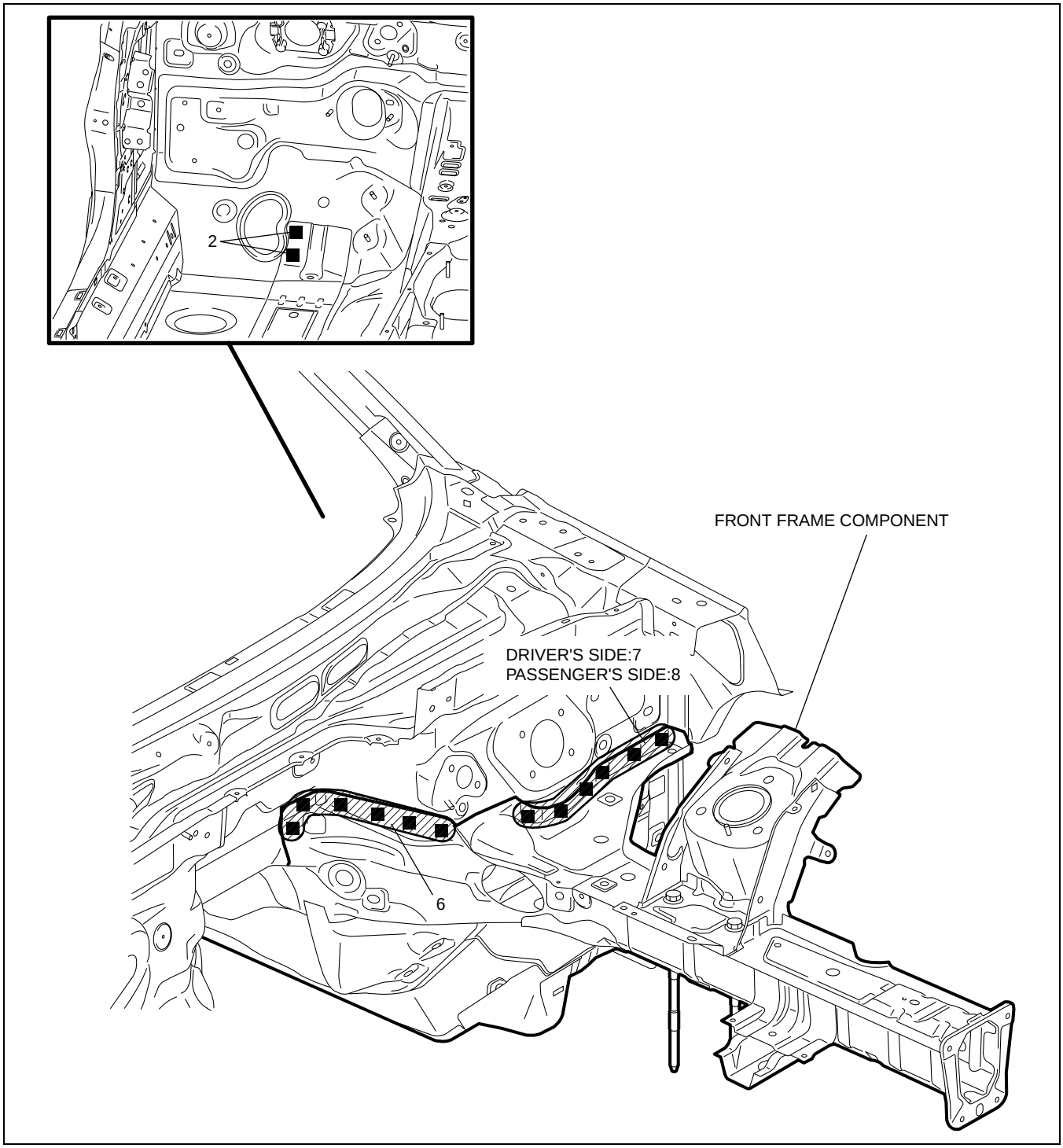


D5U0980B063

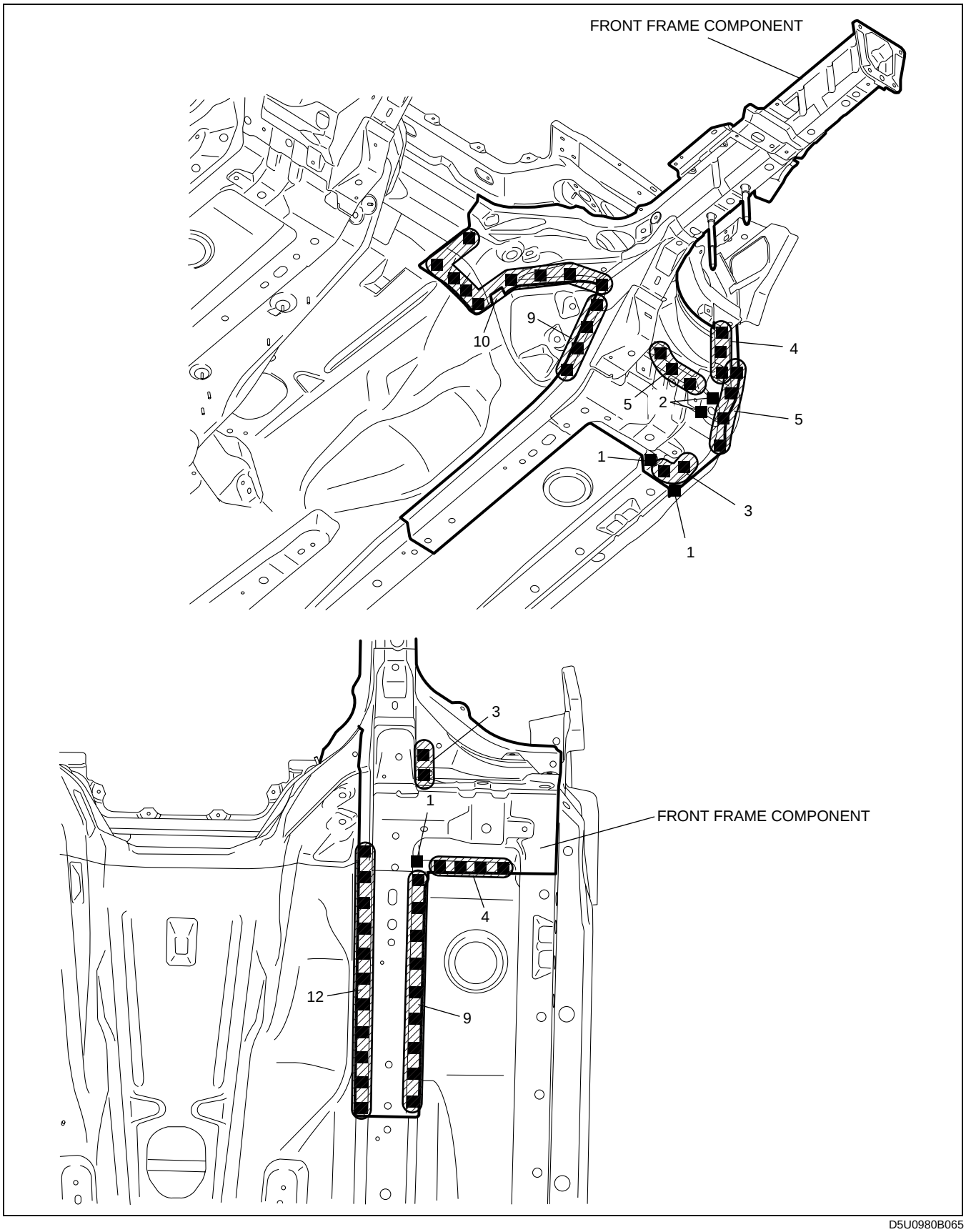
FRONT FRAME COMPONENT INSTALLATION

D5U098053300B11

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B064



D5U0980B065

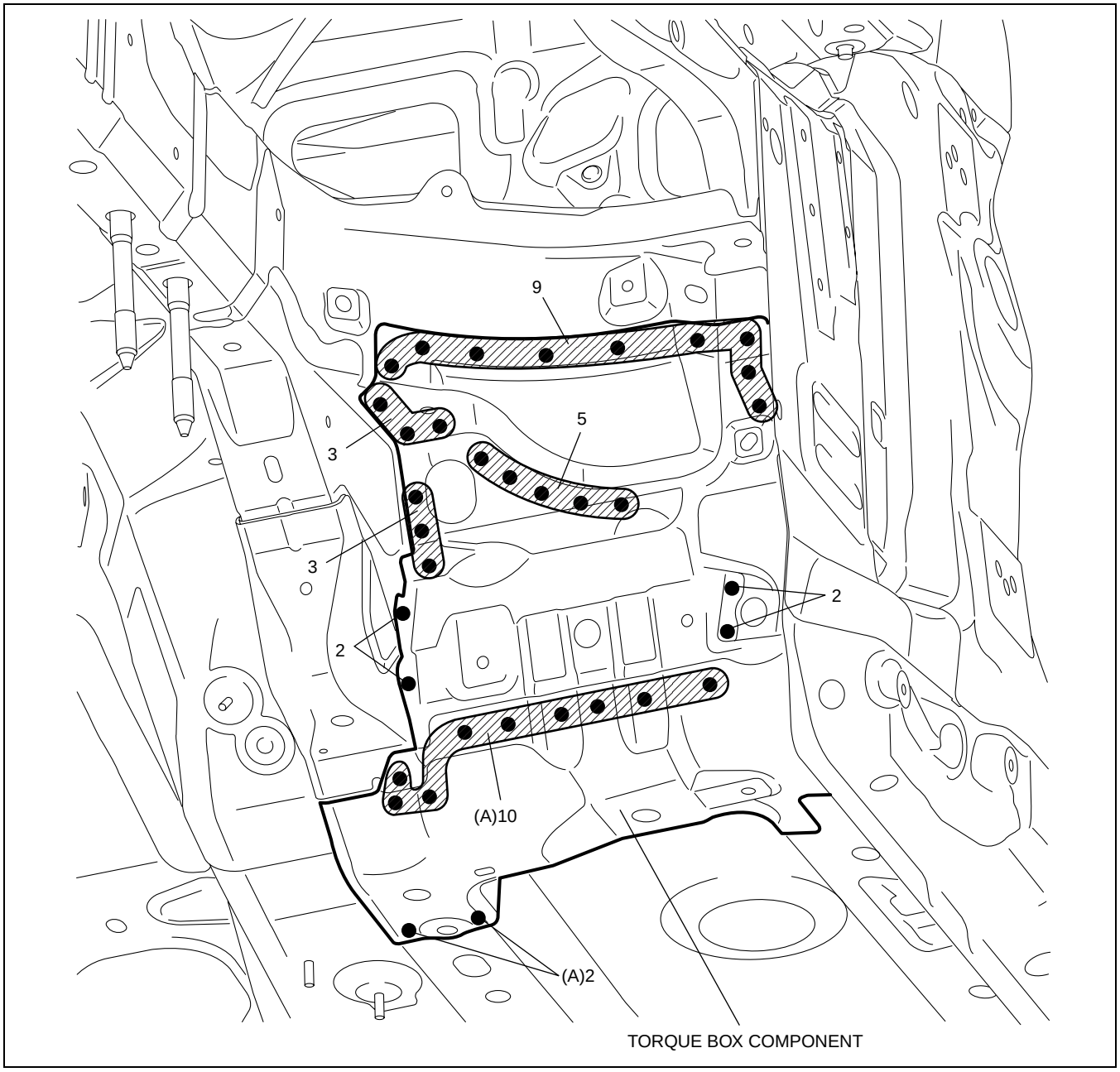
TORQUE BOX COMPONENT REMOVAL

D5U098053381B01

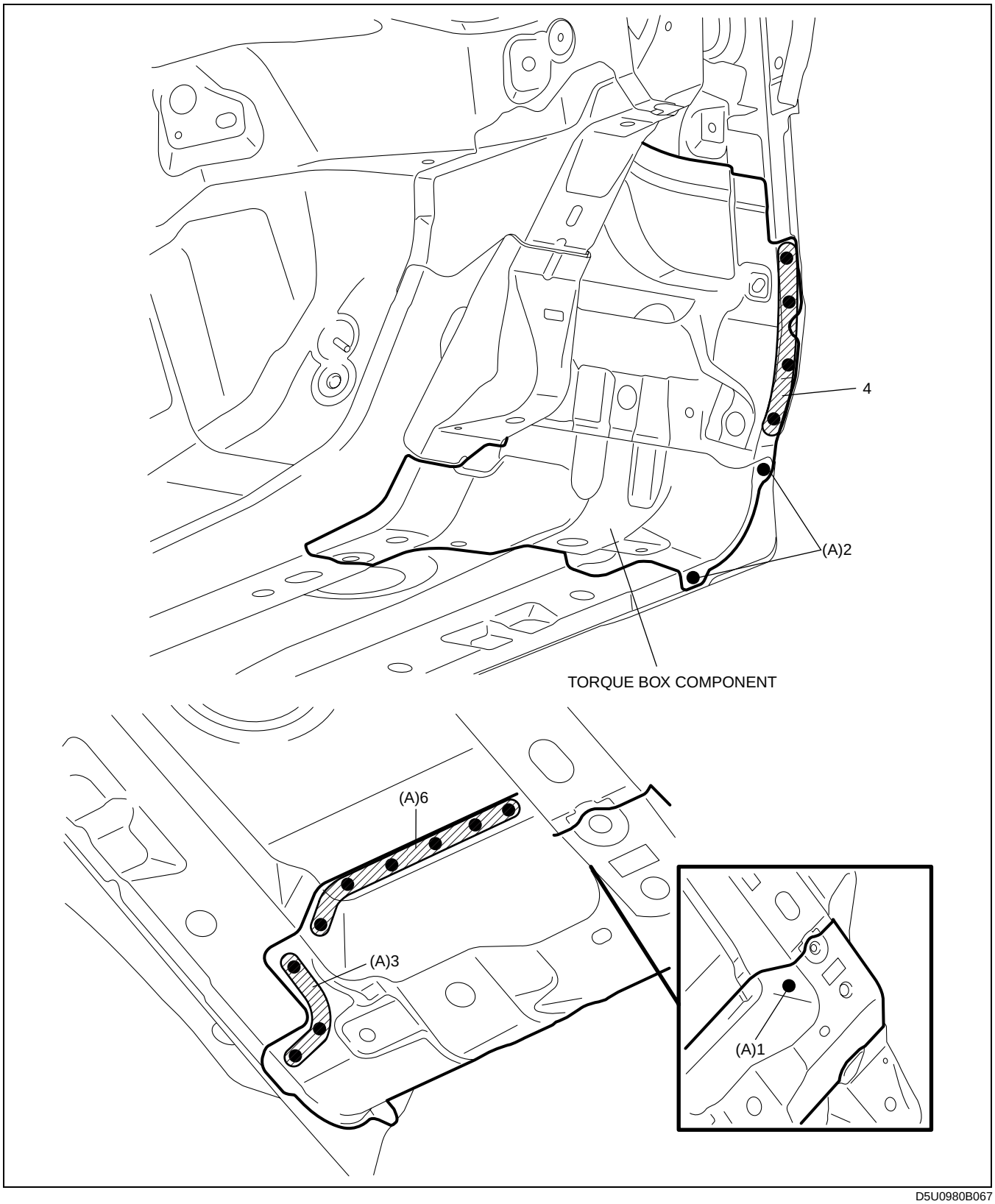
1. Remove the torque box component.

Note

- When removing the torque box separately, drill the 24 locations indicated by (A).



D5U0980B066

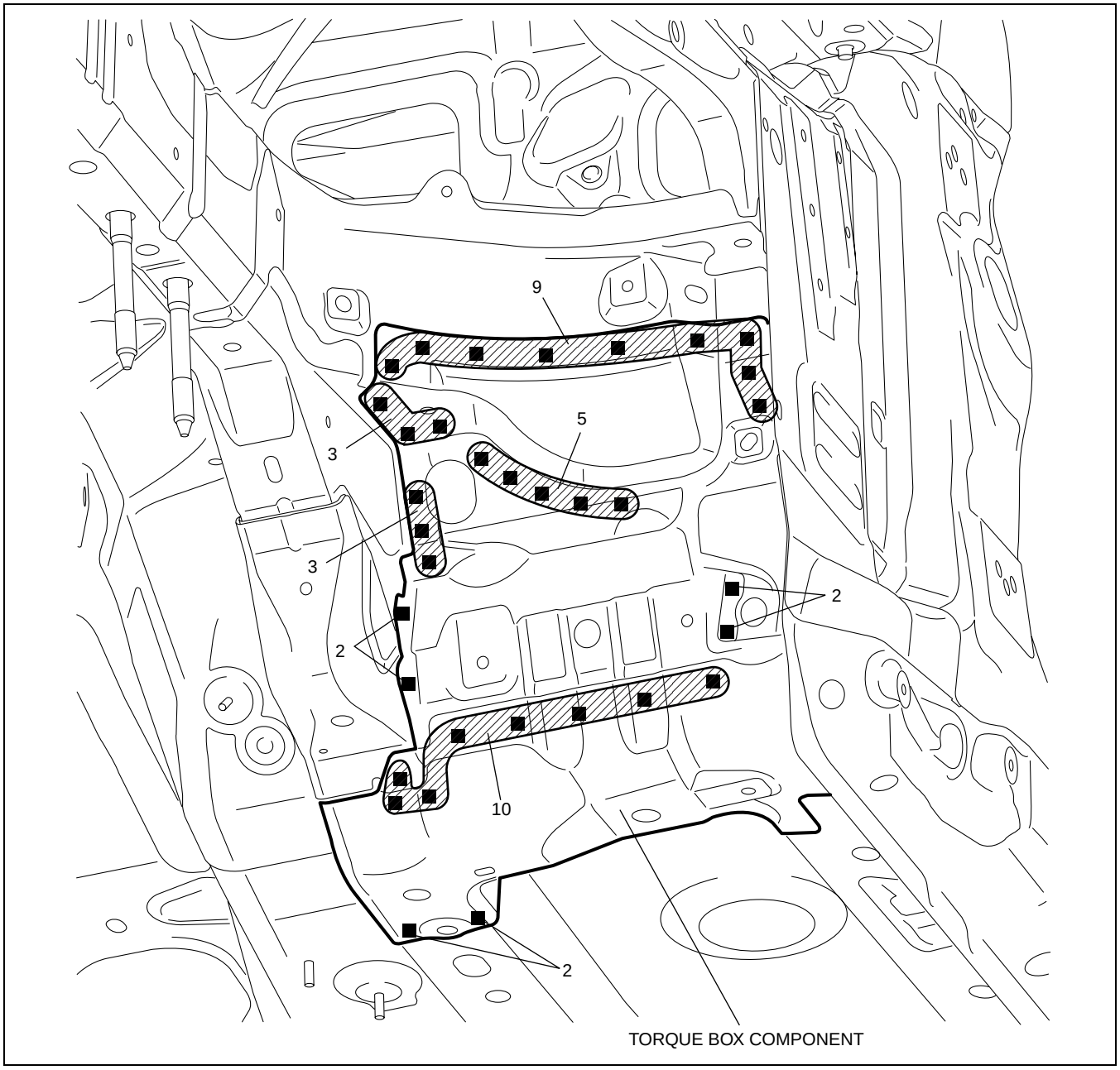


D5U0980B067

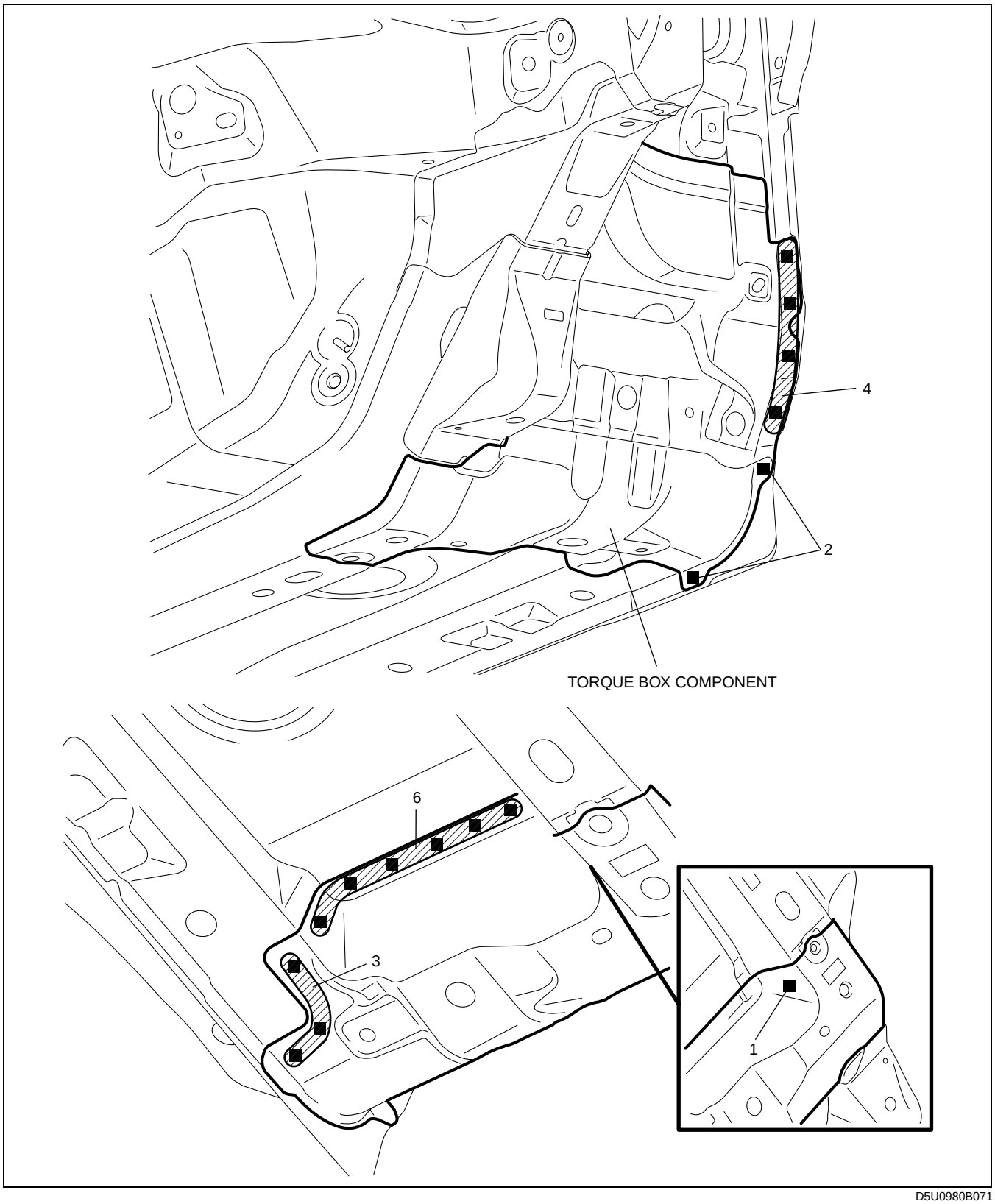
TORQUE BOX COMPONENT INSTALLATION

D5U098053381B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B070



D5U0980B071

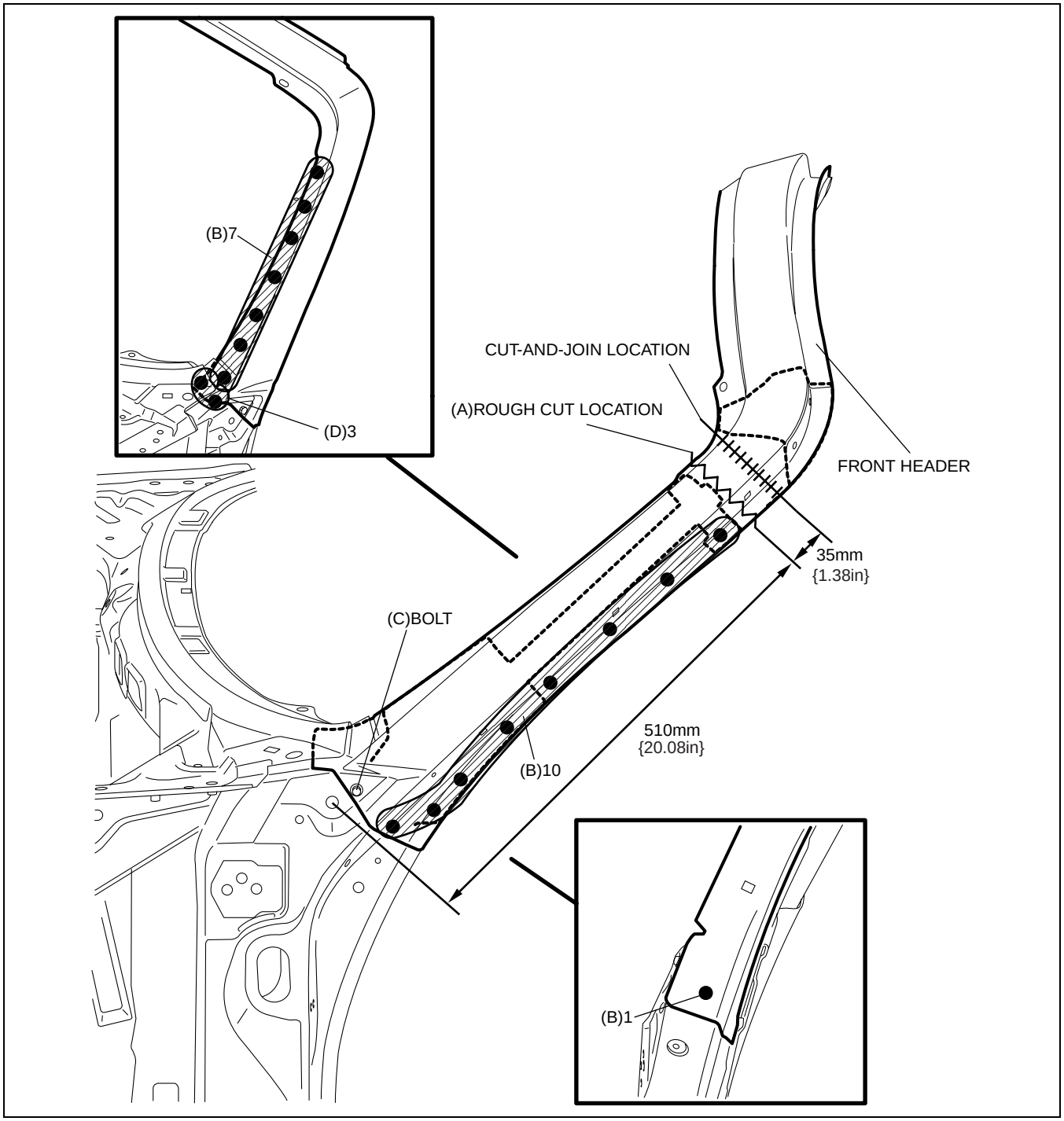
FRONT PILLAR (OUTER) REMOVAL

D5U098074090B01

1. Rough cut area (A), drill the 18 locations indicated by (B).

Caution
- **During rough cutting, be careful not to damage the front pillar reinforcement indicated by dotted lines in the figure.**

2. Remove the bolt locations indicated by (C).
3. To facilitate removal of the front header, drill the 3 locations indicated by (D), then lift the cowl panel upward.
4. Remove the front header.
5. Remove the weld bond using a disc grinder.

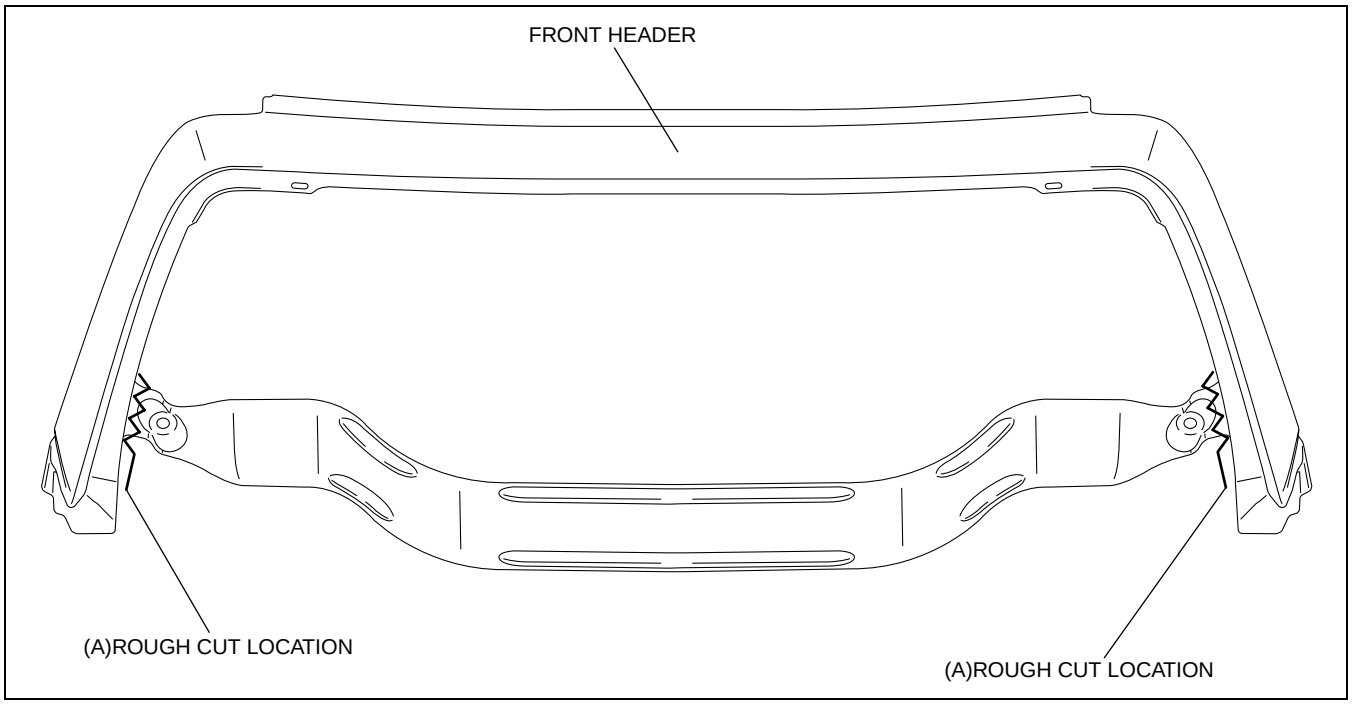


D5U0980B072

FRONT PILLAR (OUTER) INSTALLATION

D5U098074090B02

1. To prepare for installation, cut area (A) on the new front header.
2. Grind the area (A) on the new front header with a disk grinder to finish the surface.

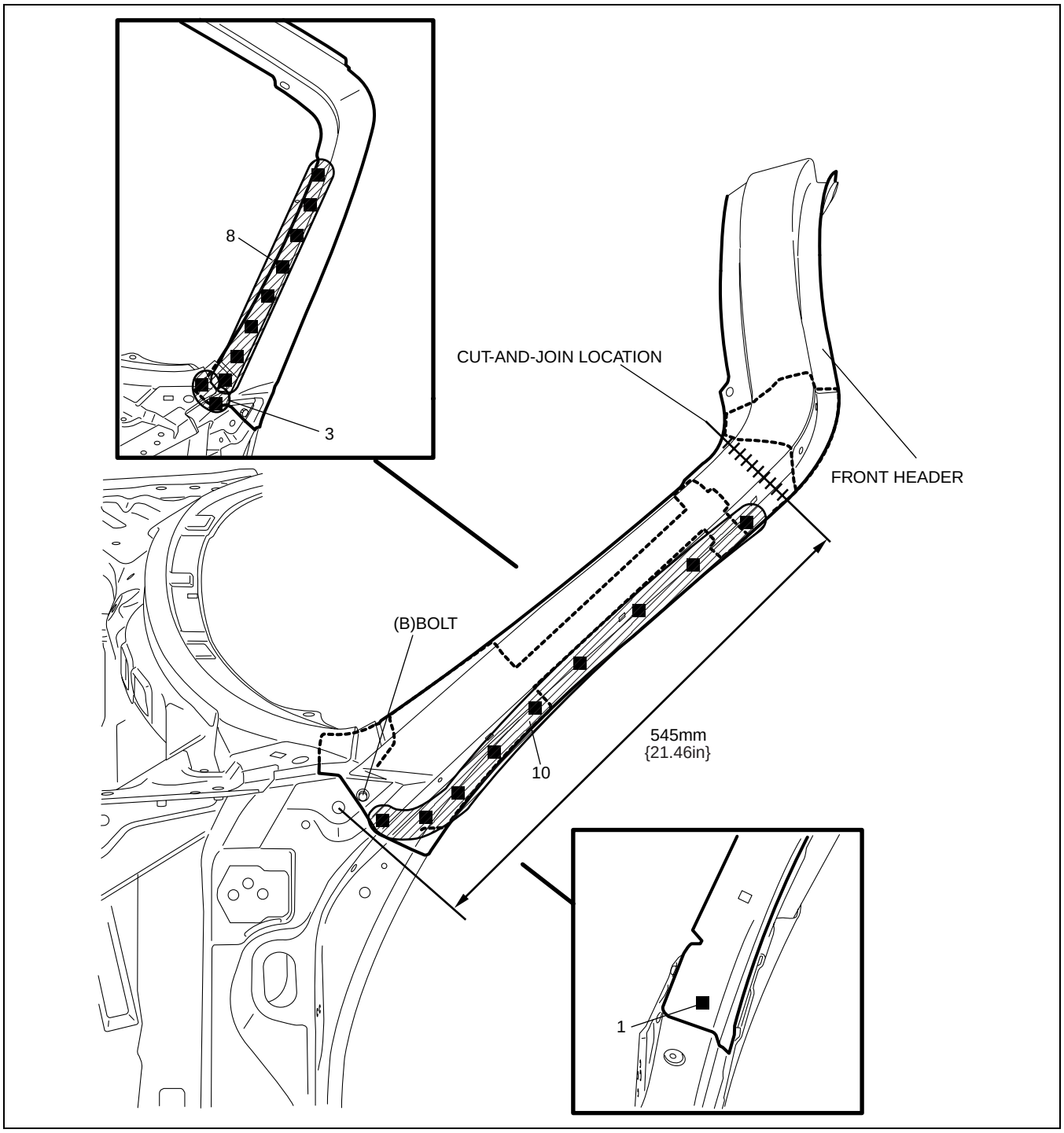


D5U0980B119

3. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
4. Drill holes for plug welds before installing new parts.
5. After temporarily installing new parts, make sure the related parts fit properly.
6. Install the bolt locations indicated by (B).

Tightening torque
6.9—11.8 N·m {71—120 kgf·cm, 62—104 in·lbf}

7. Install the front header.

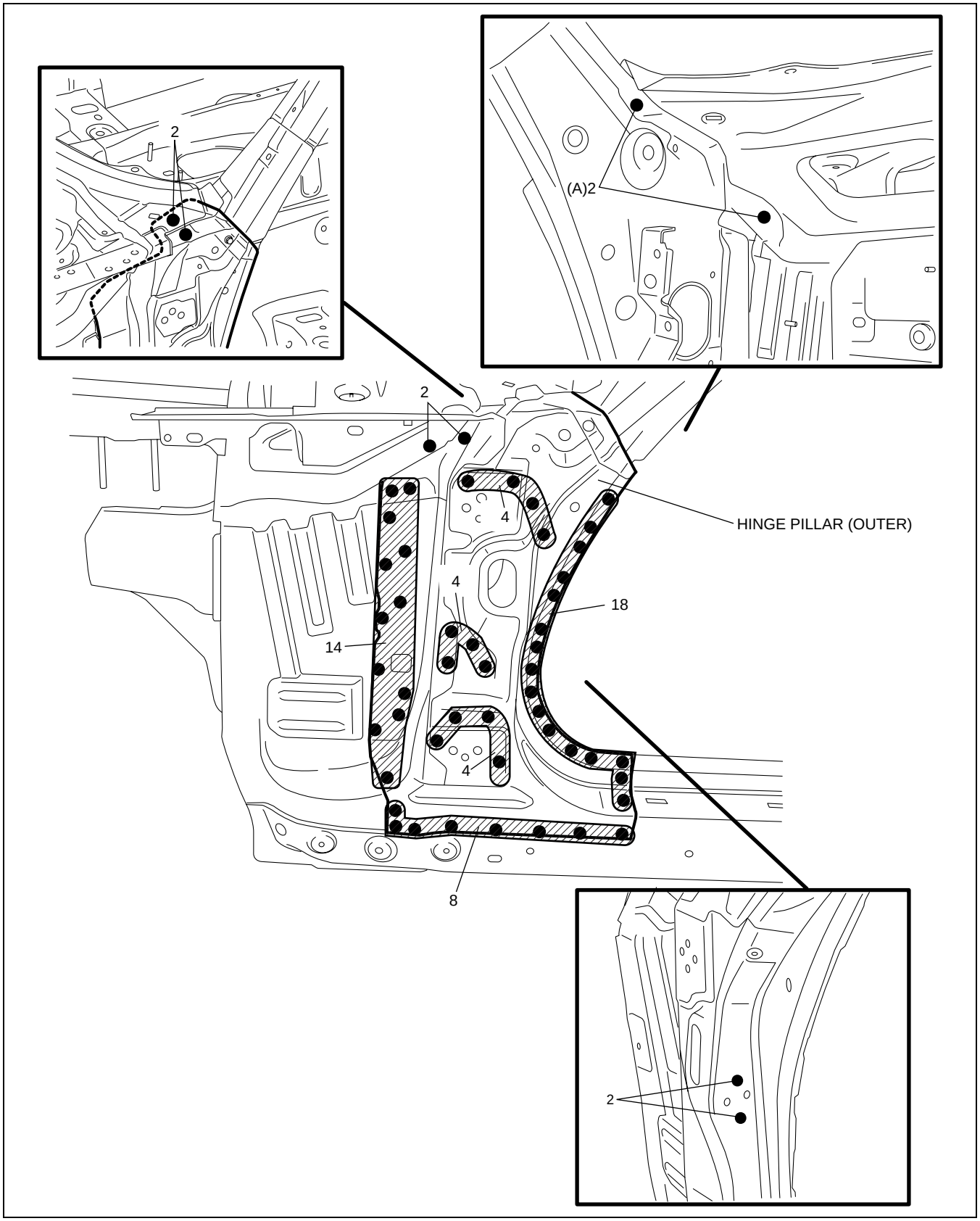


D5U0980B073

HINGE PILLAR (OUTER) REMOVAL

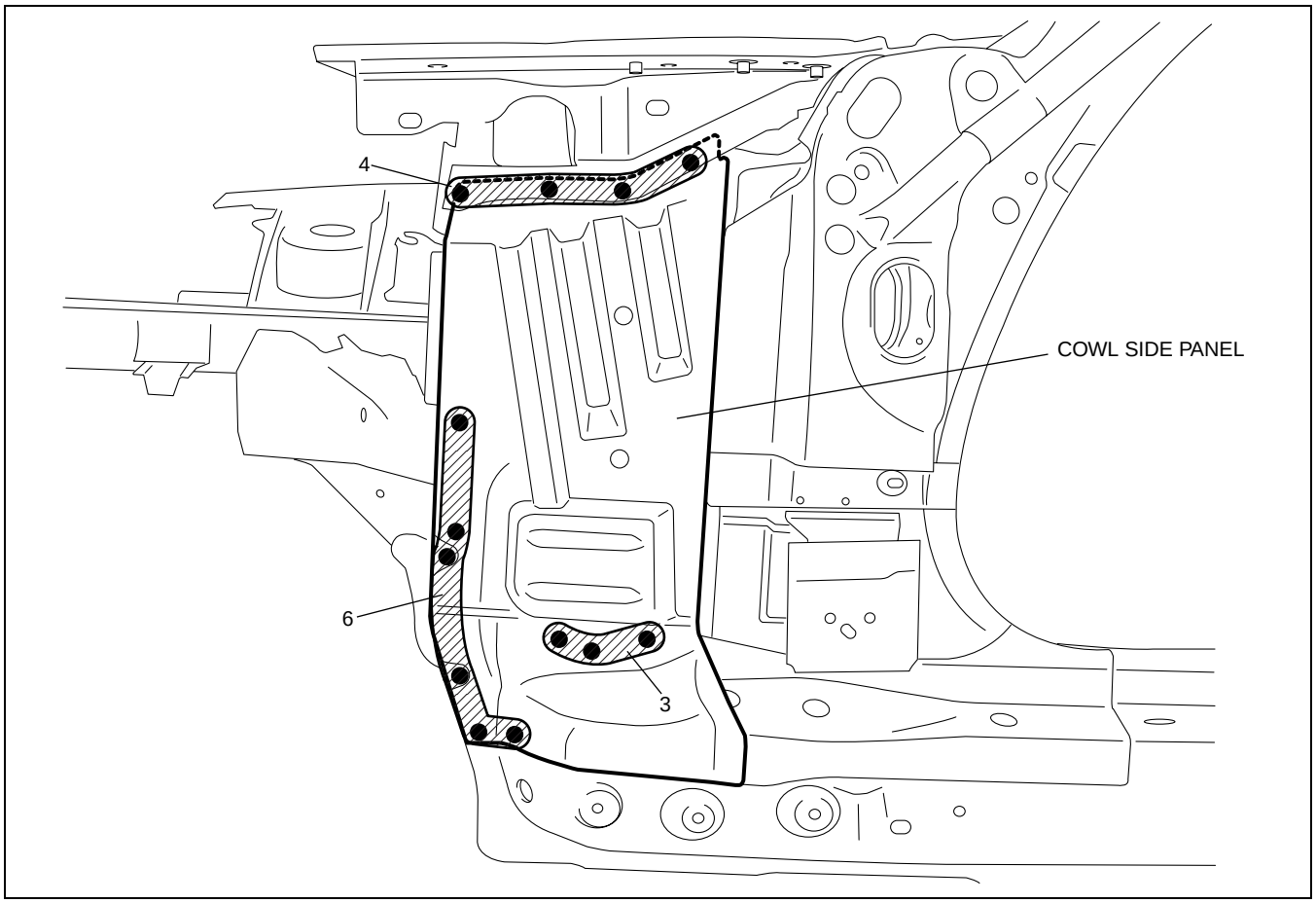
D5U098074090B03

1. Drill the 2 locations indicated by (A) from the interior.
2. Remove the hinge pillar (outer).
3. Remove the spot weld sealer using a disc grinder.



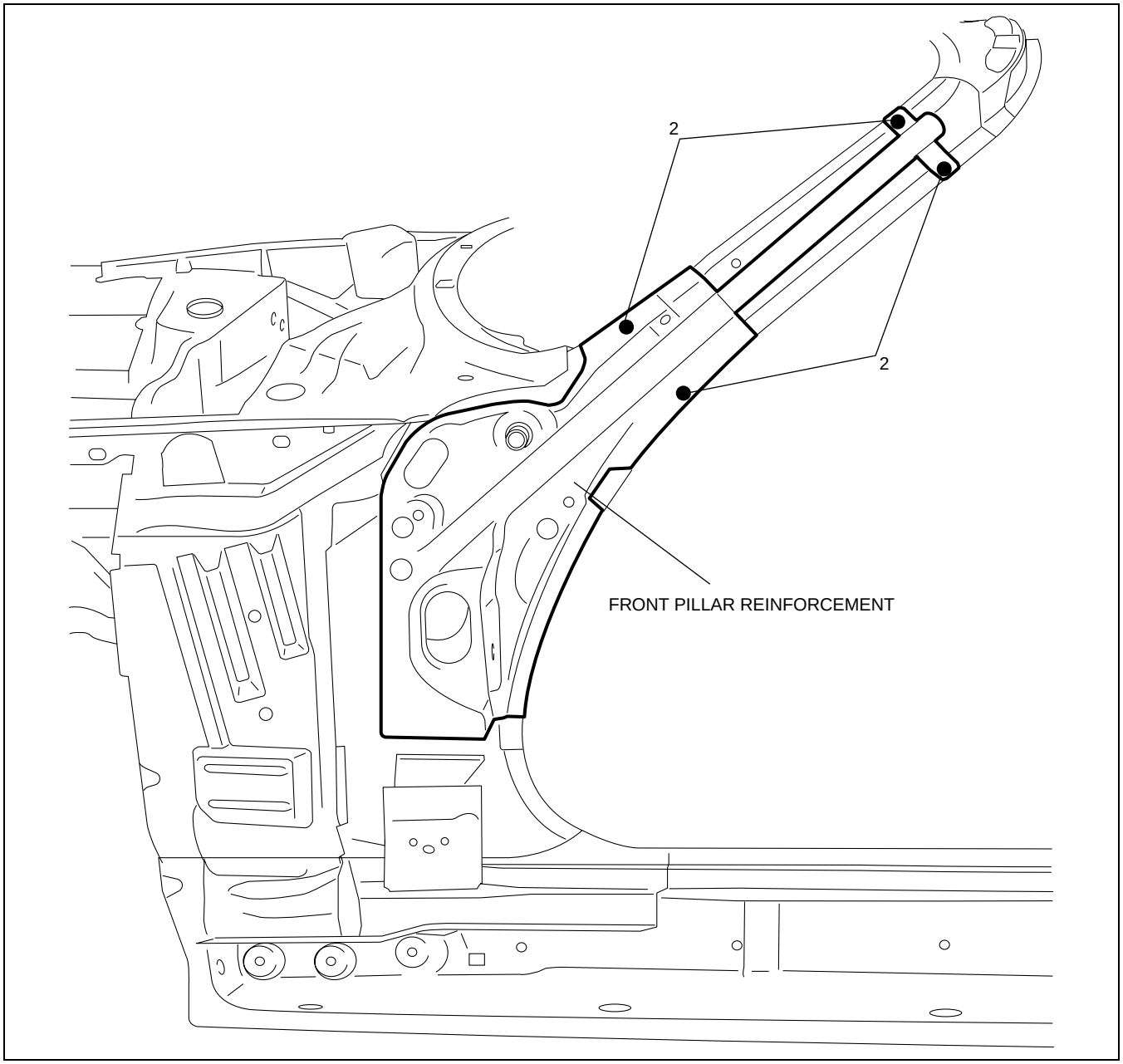
D5U0980B074

4. Remove the cowl side panel.
5. Remove the spot weld sealer using a disc grinder.



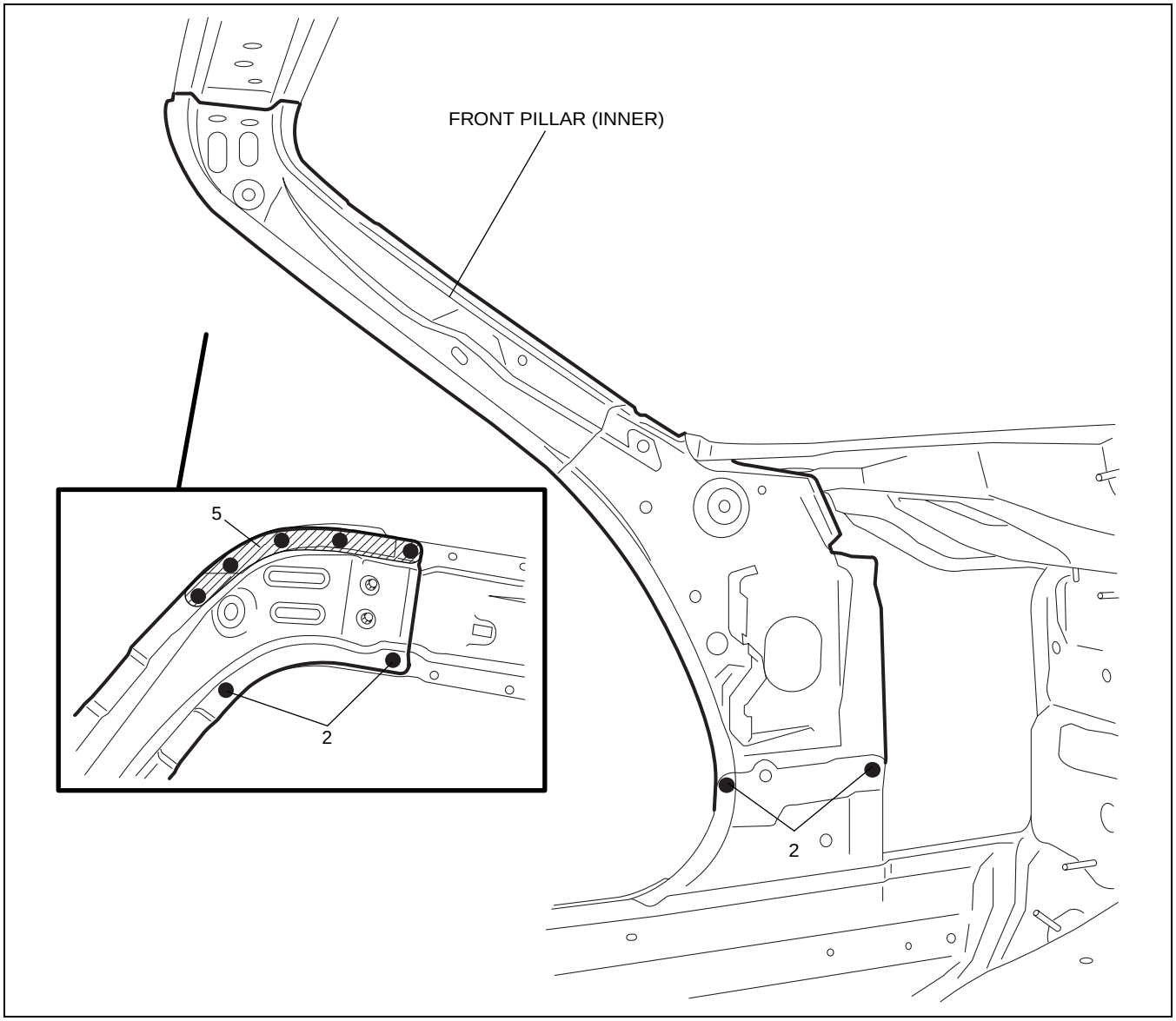
D5U0980B075

6. Remove the front pillar reinforcement.



D5U0980B076

7. Remove the front pillar (inner).

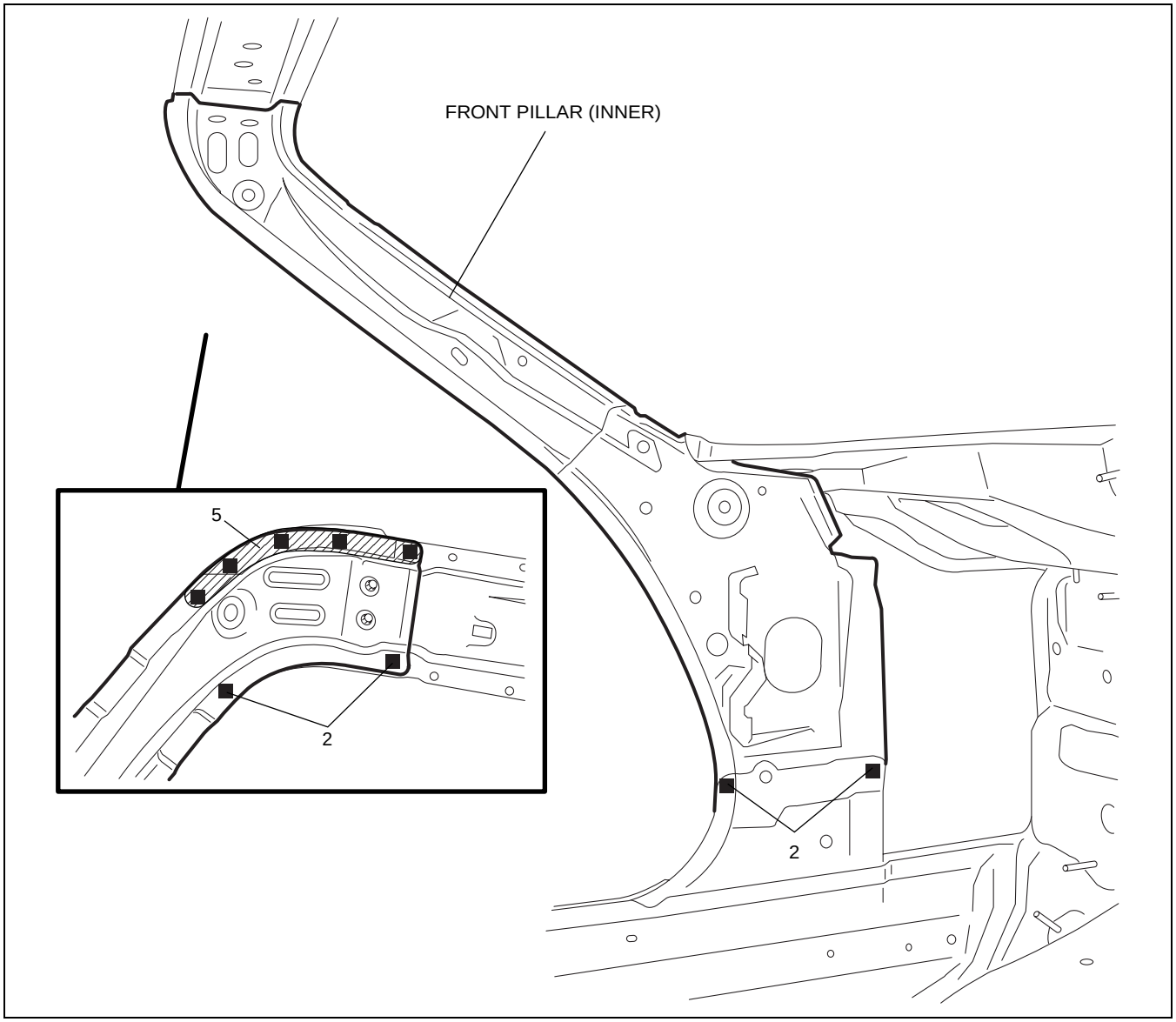


D5U0980B077

HINGE PILLAR (OUTER) INSTALLATION

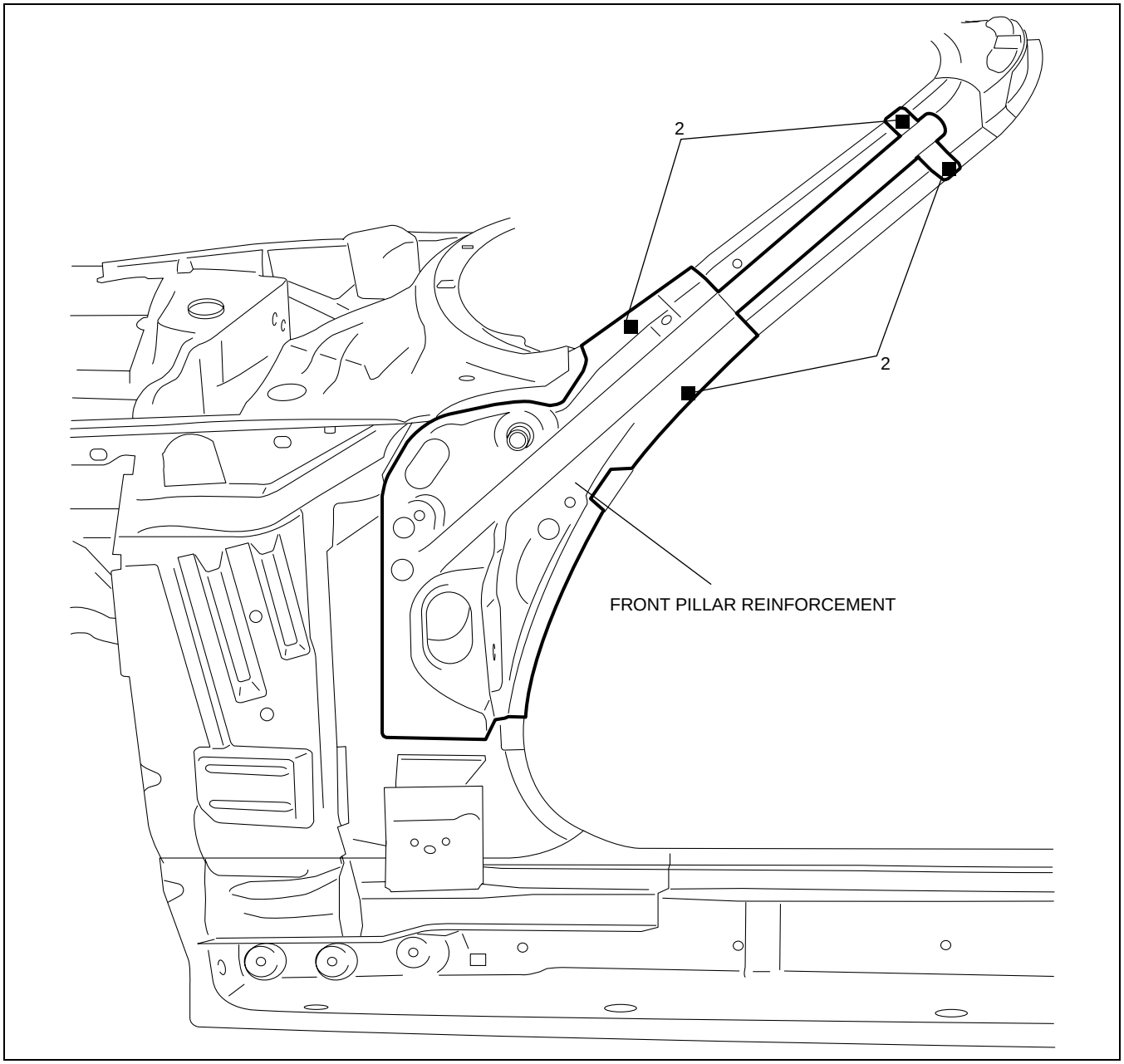
D5U098074090B04

1. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.
4. Install the front pillar (inner).



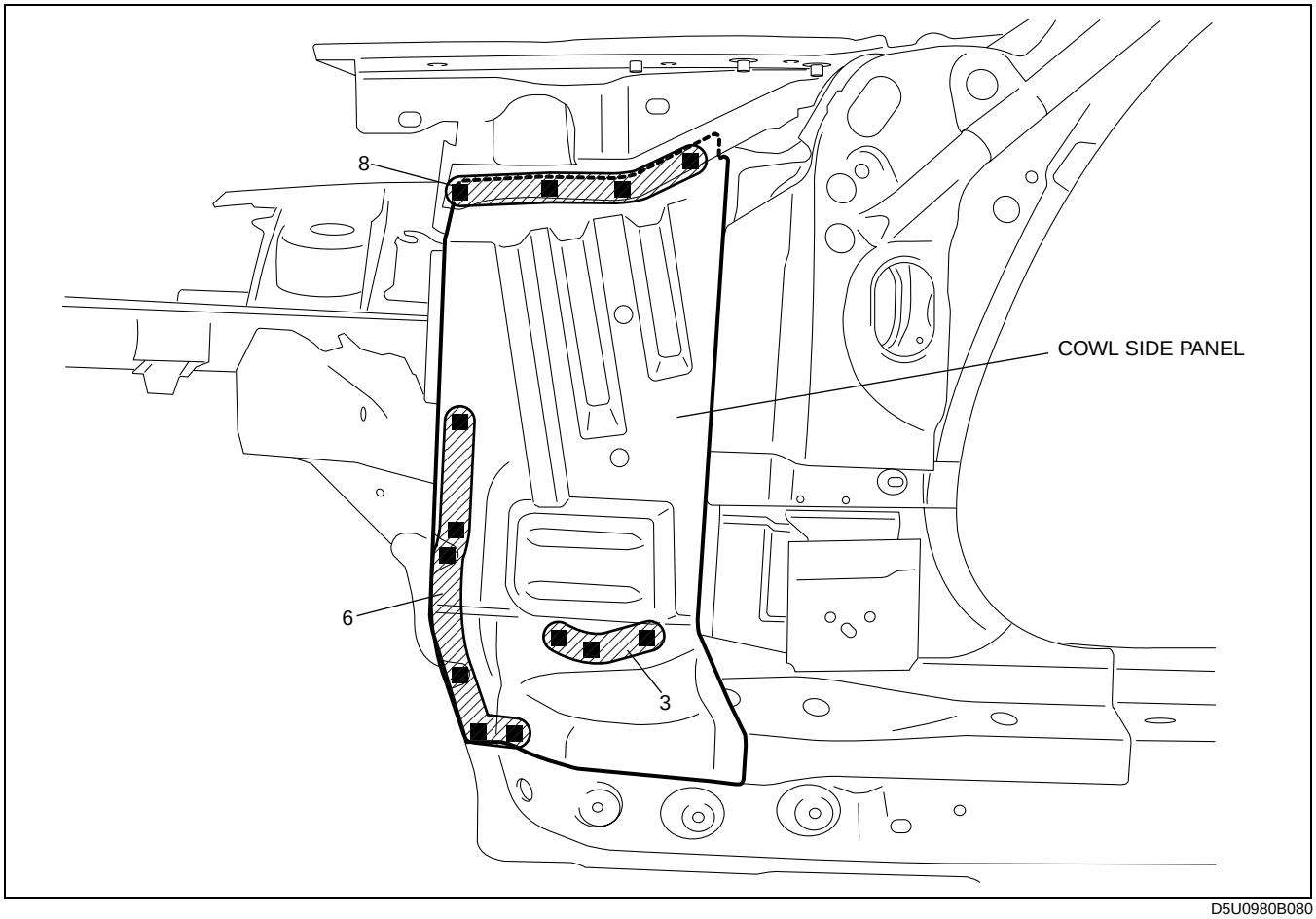
D5U0980B078

5. Install the front pillar reinforcement.



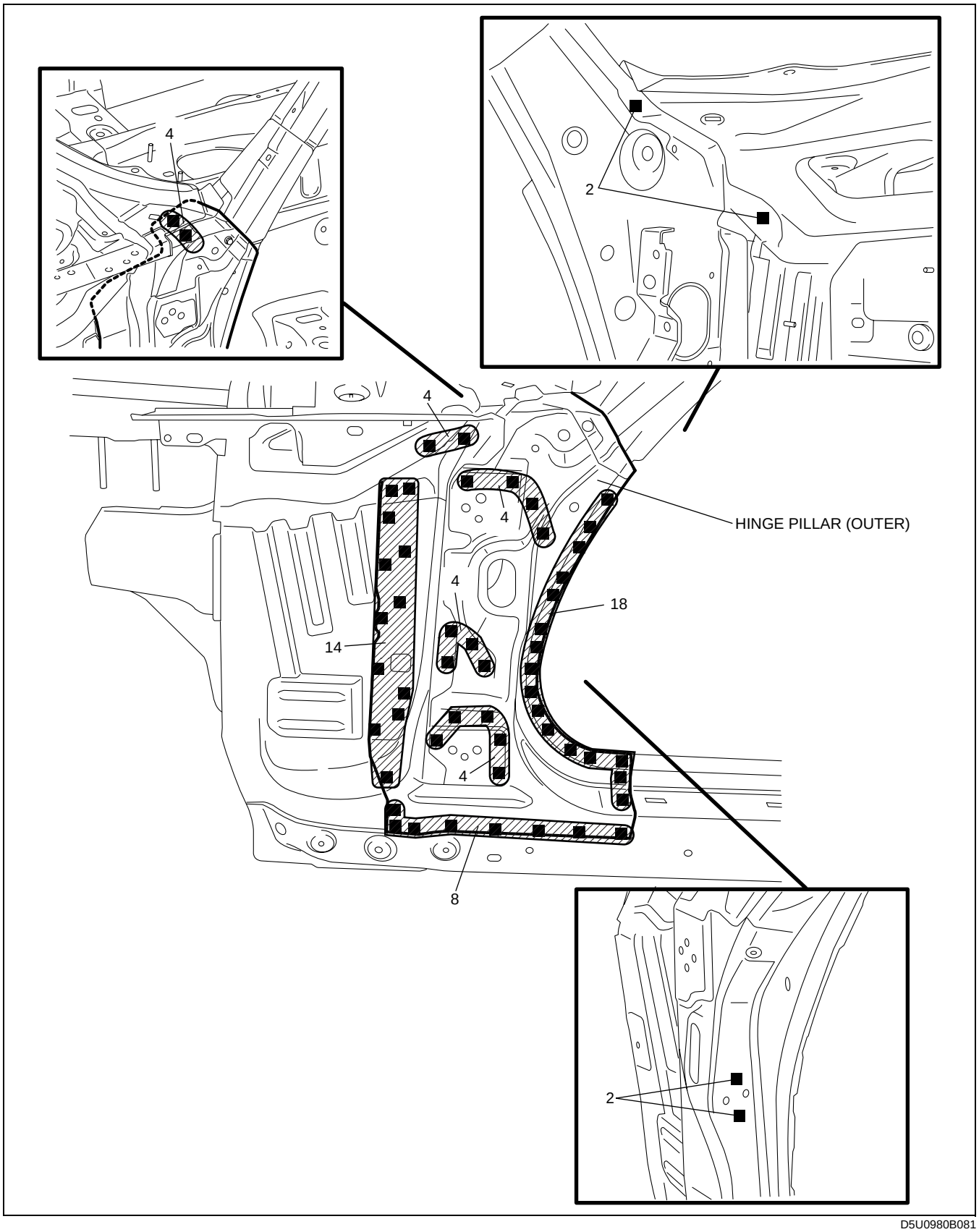
D5U0980B079

6. Install the cowl side panel.



D5U0980B080

7. Install the hinge pillar (outer).

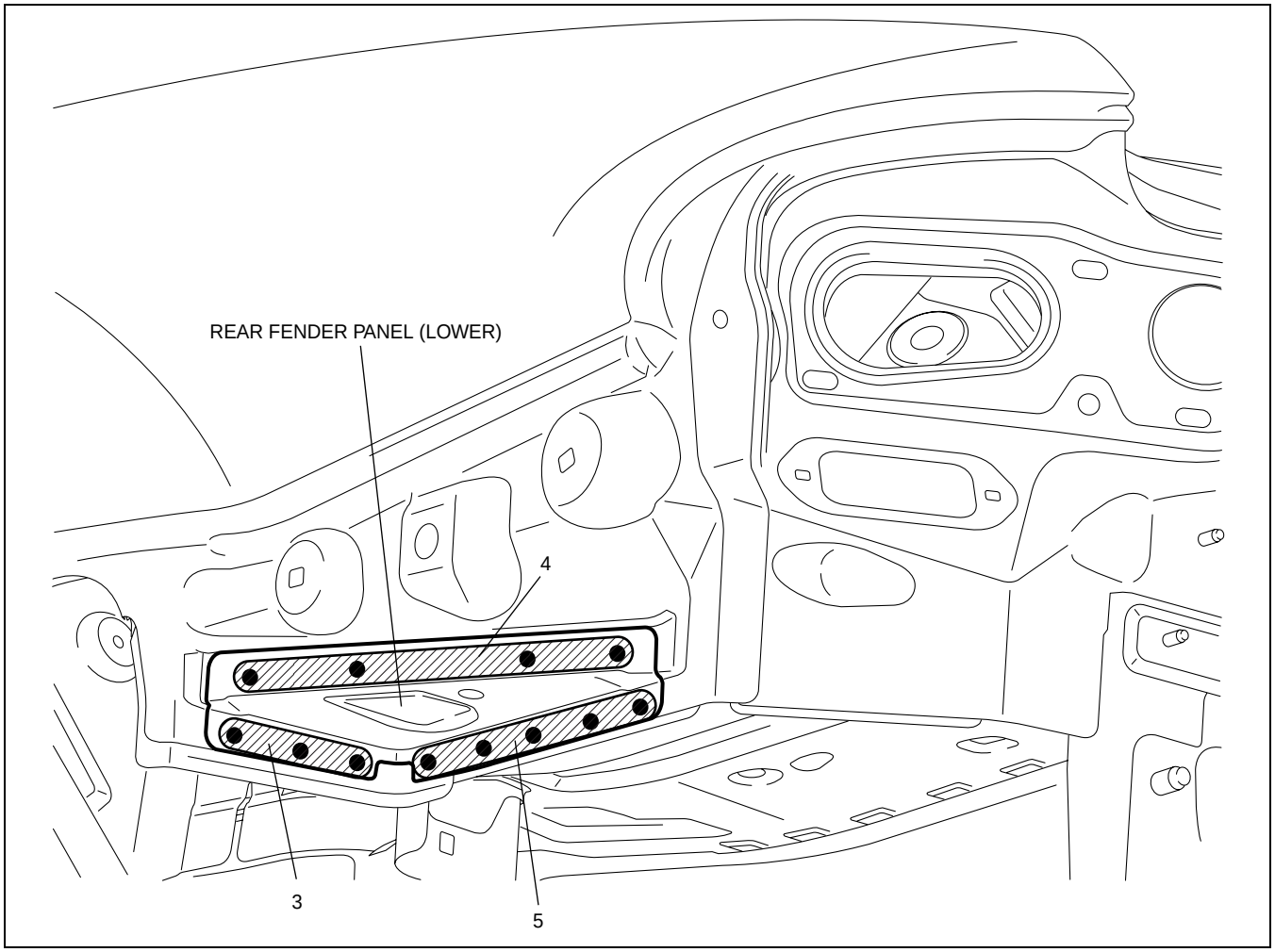


D5U0980B081

REAR FENDER PANEL (LOWER) REMOVAL

D5U098074100B01

1. Remove the rear fender panel (lower).

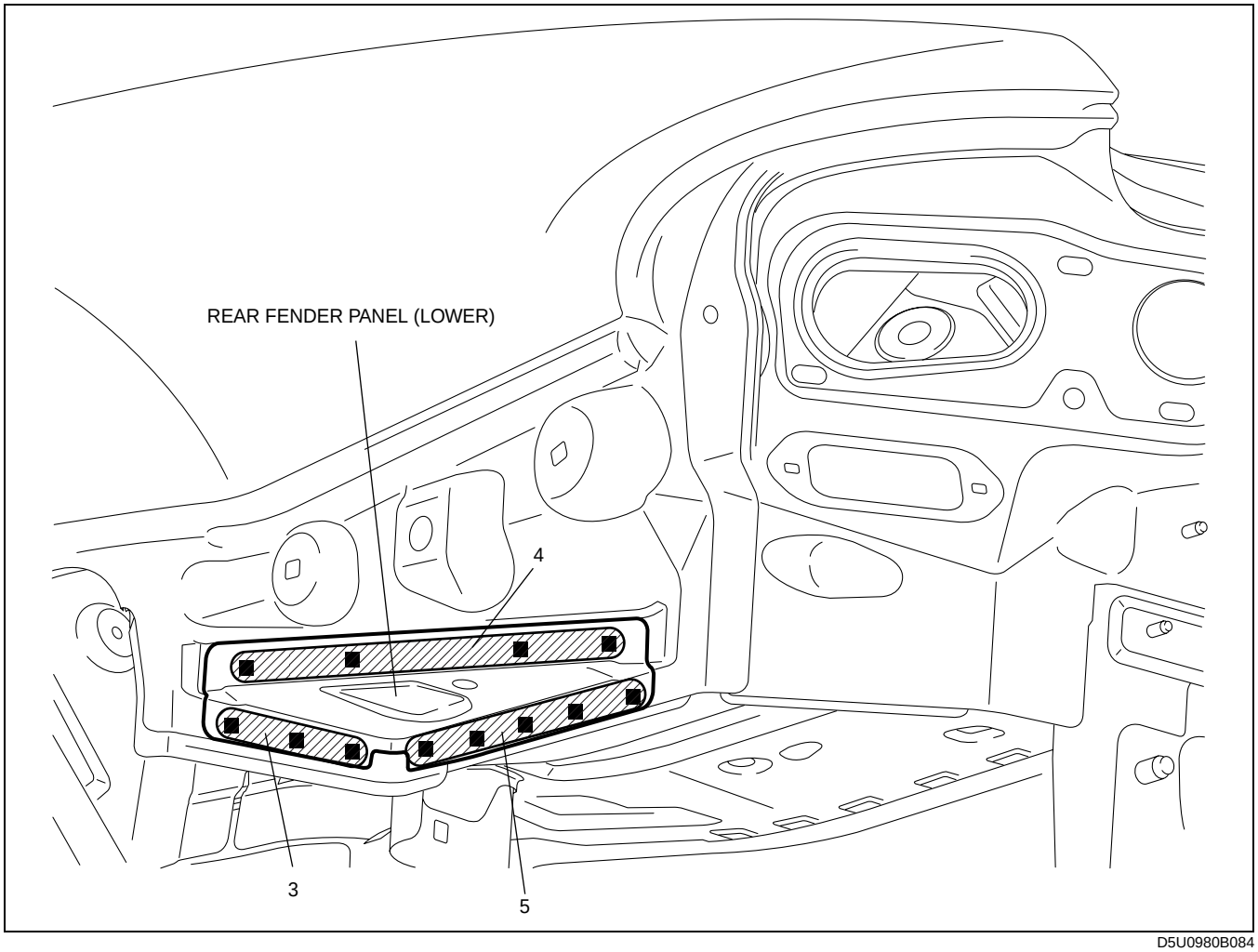


D5U0980B083

REAR FENDER PANEL (LOWER) INSTALLATION

D5U098074100B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B084

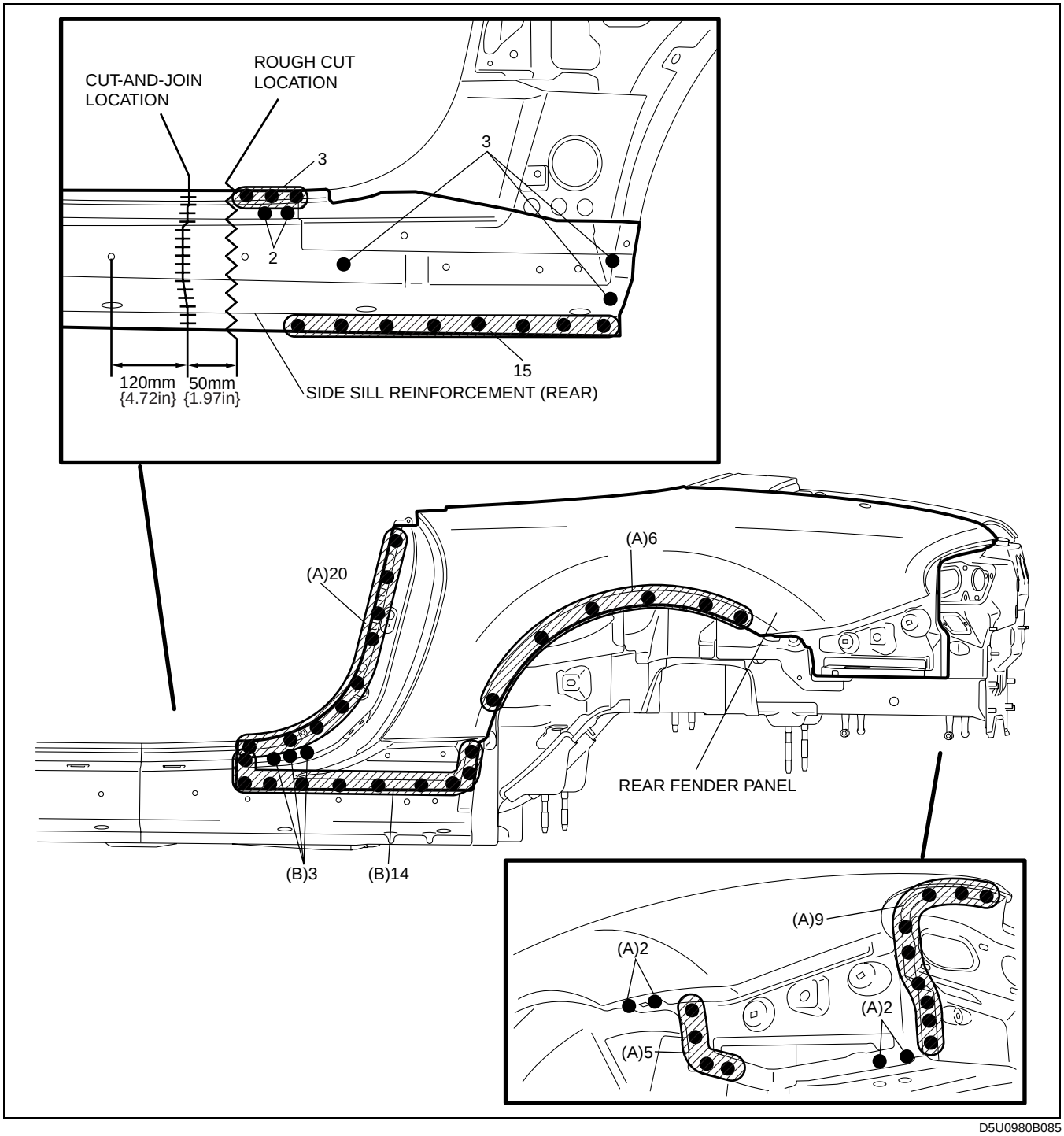
REAR FENDER PANEL REMOVAL

D5U098074100B03

1. Drill the 65 locations indicated by (A) and 17 locations indicated by (B) and 2 locations indicated by (C), then remove the rear fender panel.

Note

- Drilling of the 17 location indicated by (B) is not necessary when removing the rear fender panel and the side sill reinforcement (rear) at the same time.

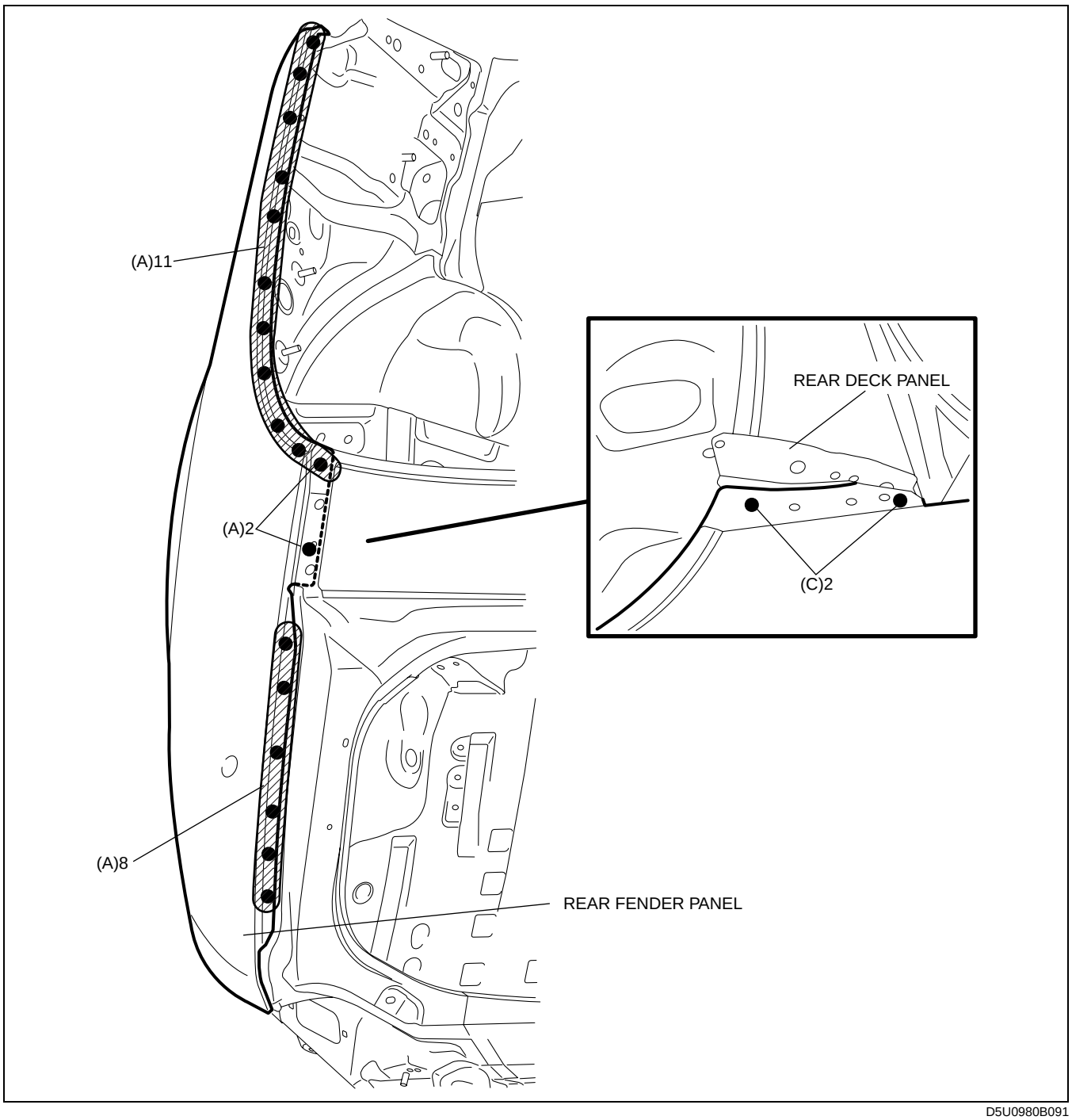


D5U0980B085

2. Remove the rear fender panel.

Note
- For weld the 2 location (C), partially bend back the rear deck panel before drilling.

3. Remove the spot weld sealer using a disc grinder.

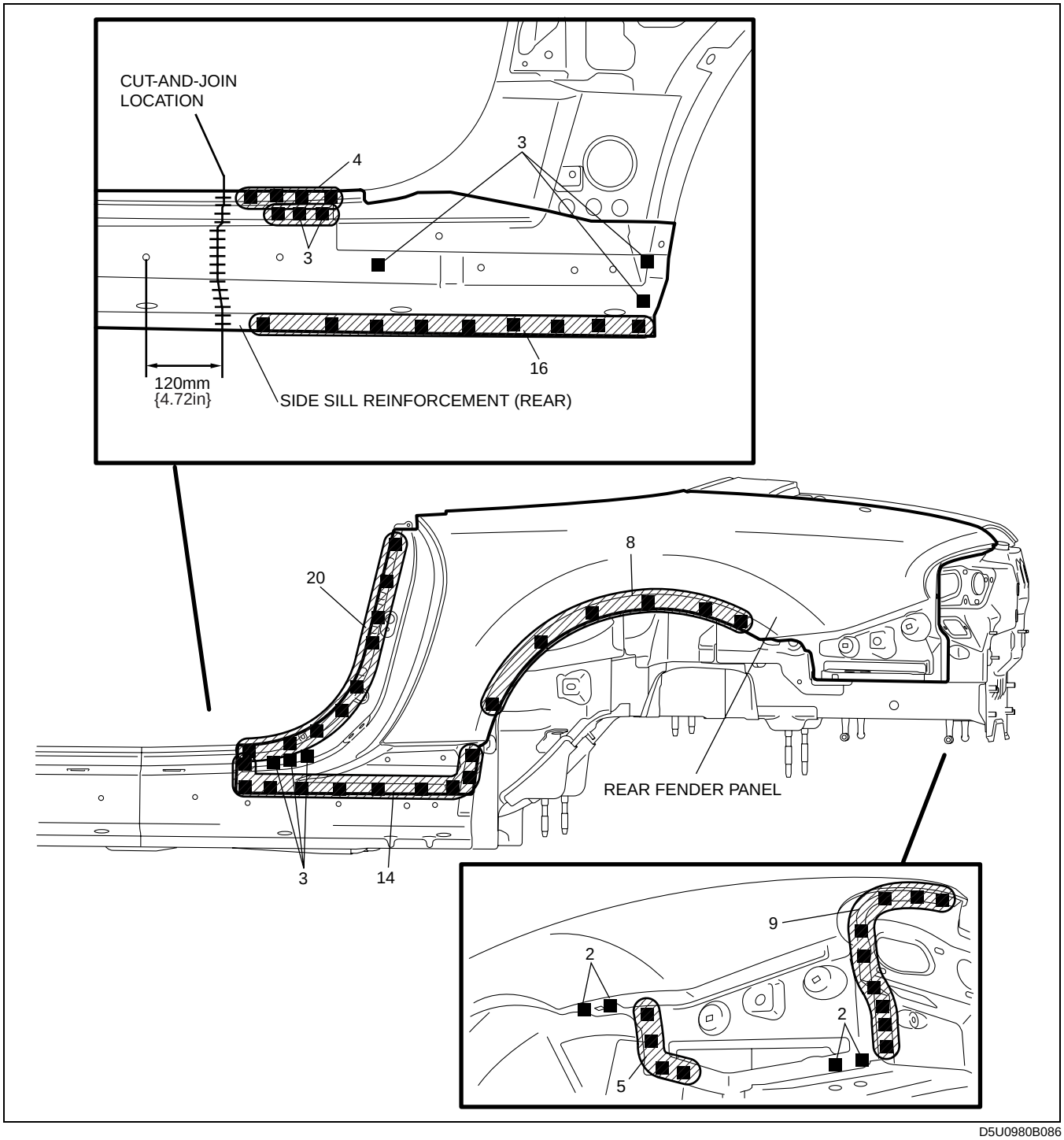


D5U0980B091

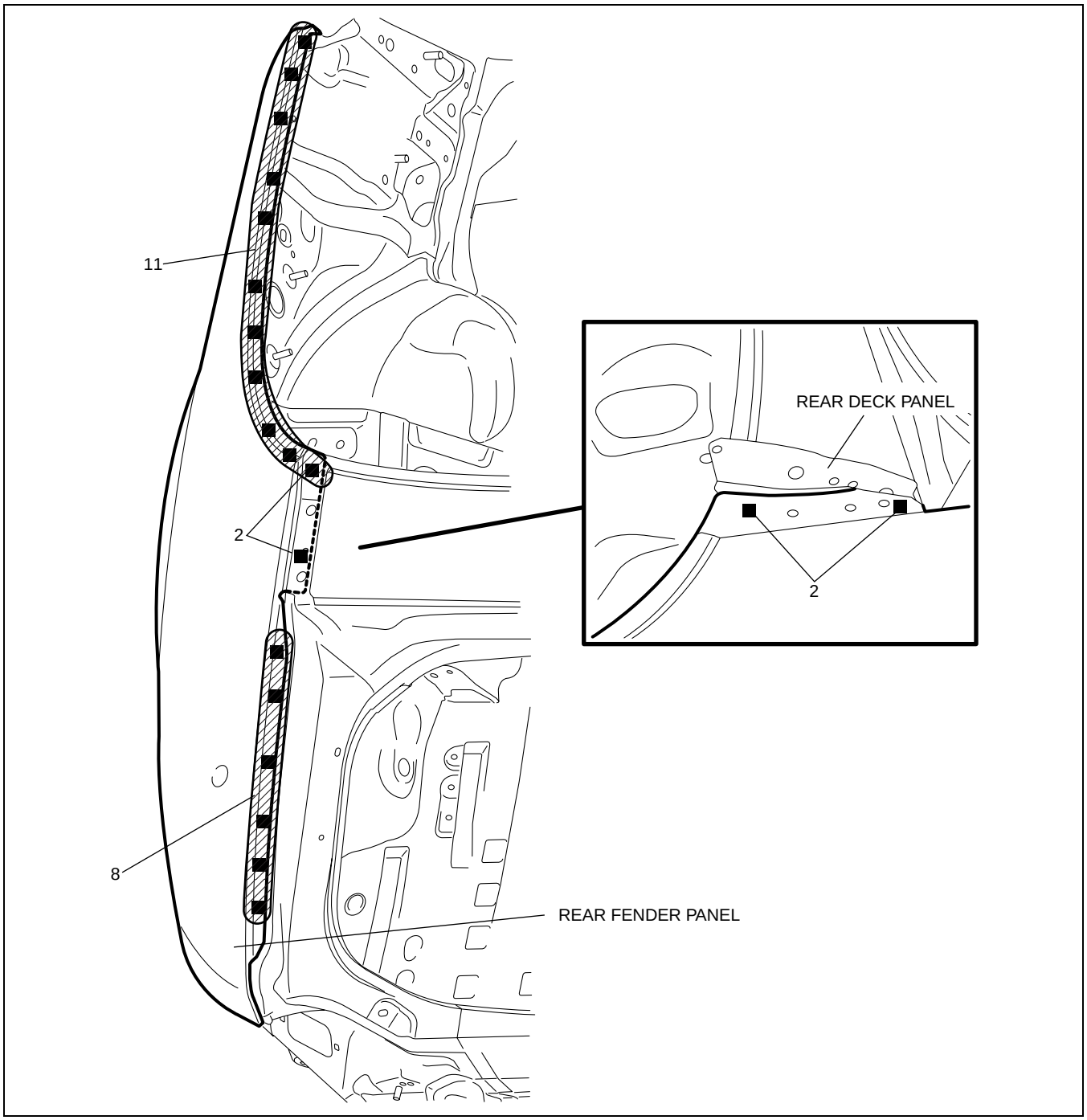
REAR FENDER PANEL INSTALLATION

D5U098074100B04

1. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. Before installing new parts, apply spot weld sealer to the wheel arch line.
4. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B086



D5U0980B092

SIDE SILL REINFORCEMENT (FRONT) REMOVAL

D5U098070270B09

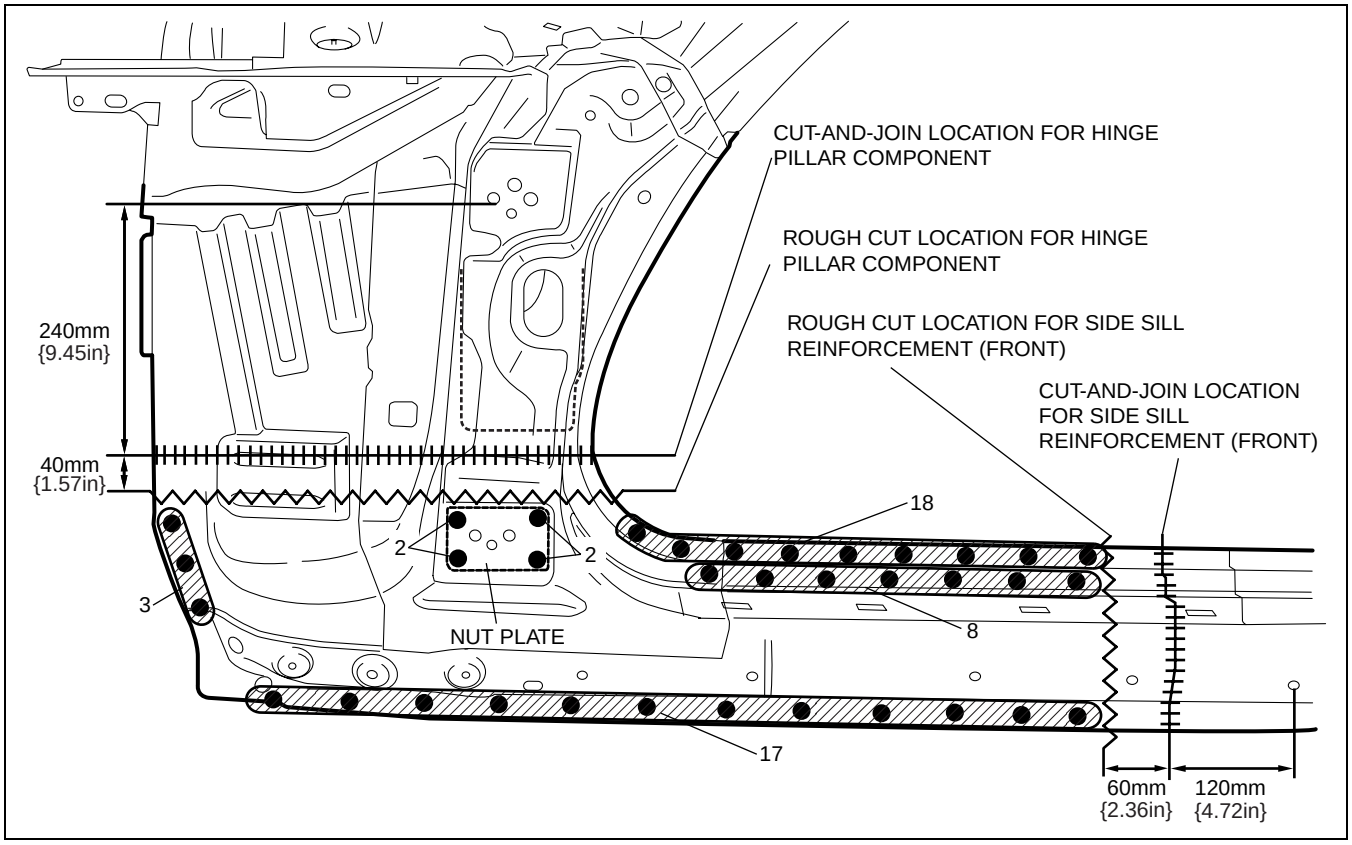
1. Rough cut and remove the damaged part of the side sill reinforcement (front).

Caution

- **During rough cutting, be careful not to damage the front pillar reinforcement indicated by dotted lines in the figure.**

Note

- If the nut plate is not damaged, do not dispose of it, as it can be reinstalled. If it is damaged considerably, replace it with a new one.

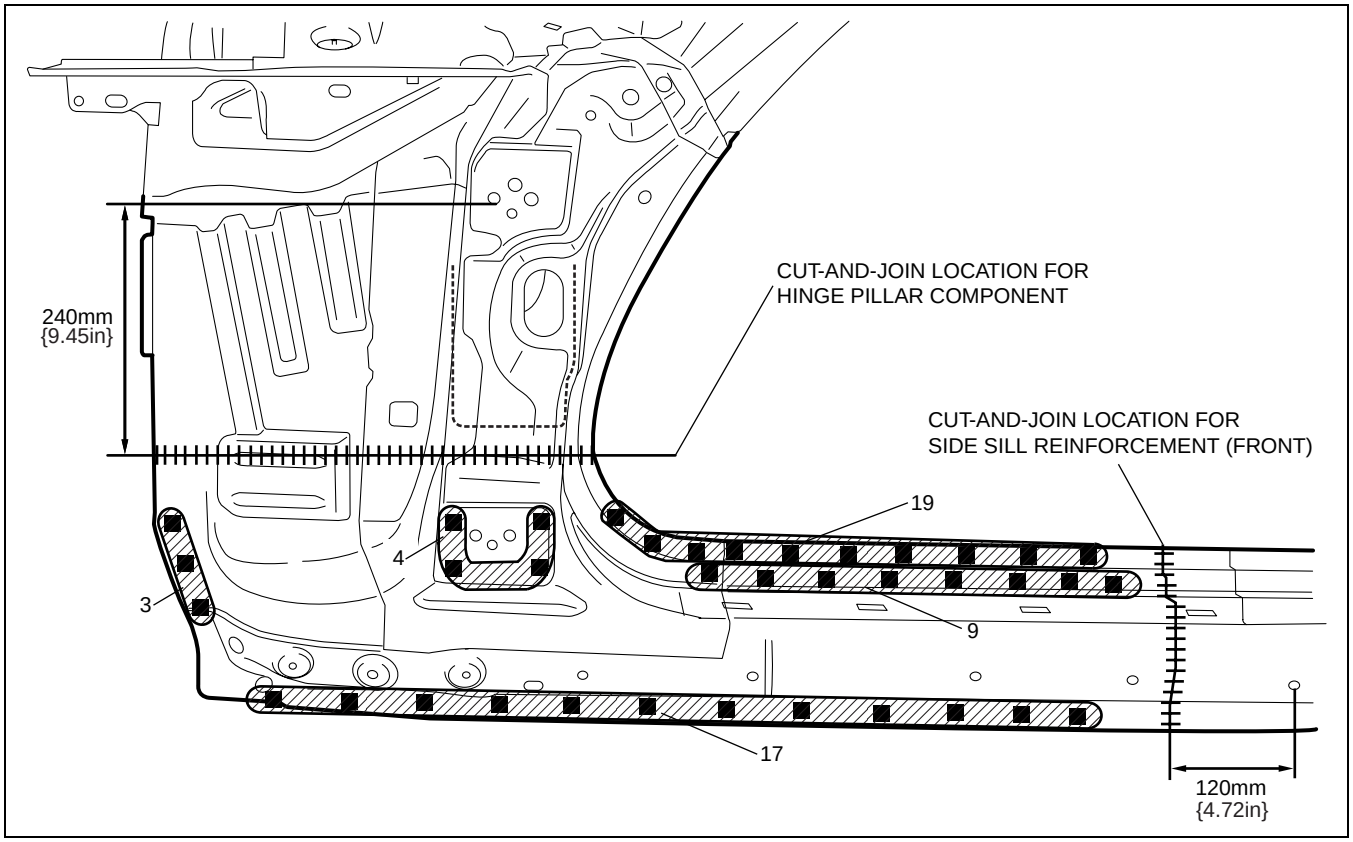


D5U0980B093

SIDE SILL REINFORCEMENT (FRONT) INSTALLATION

D5U098070270B10

1. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

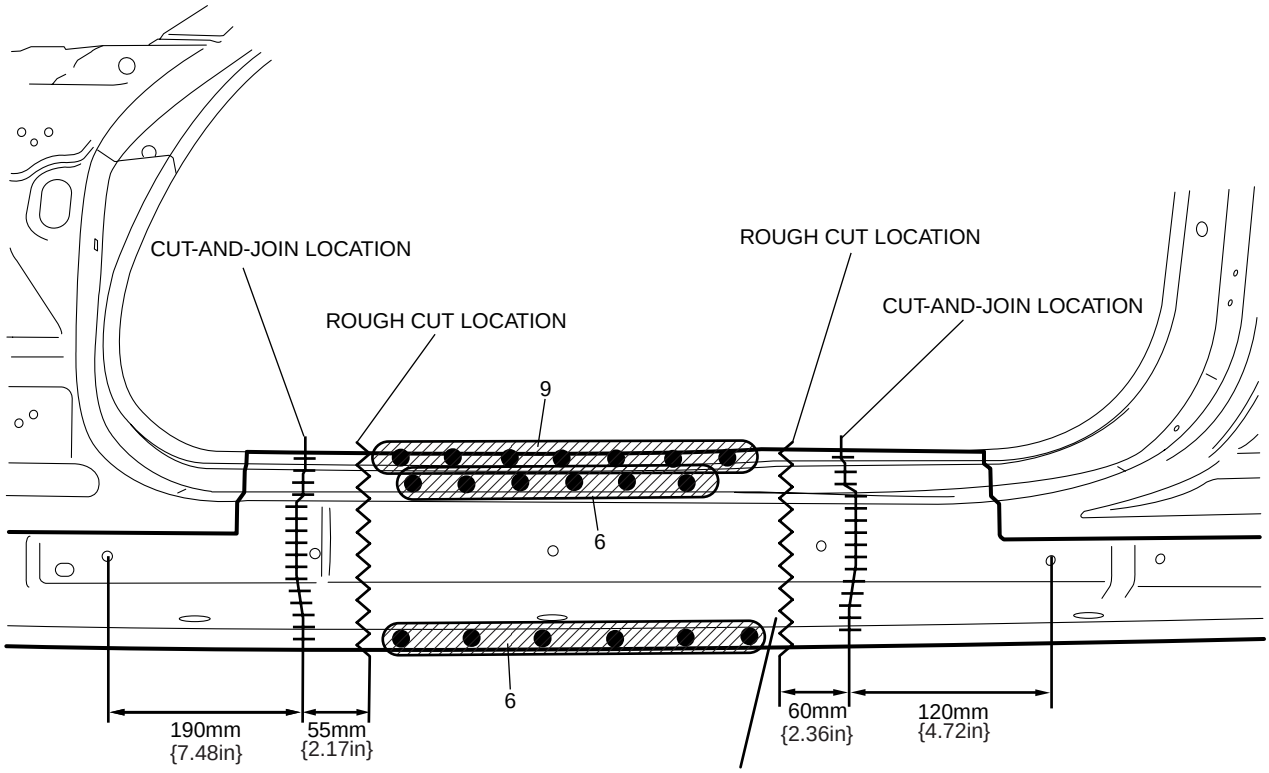


D5U0980B094

SIDE SILL REINFORCEMENT (CENTER) REMOVAL

D5U098070270B05

1. Rough cut at the locations shown in the figure to remove damaged parts.
2. Remove the side sill reinforcement (center).



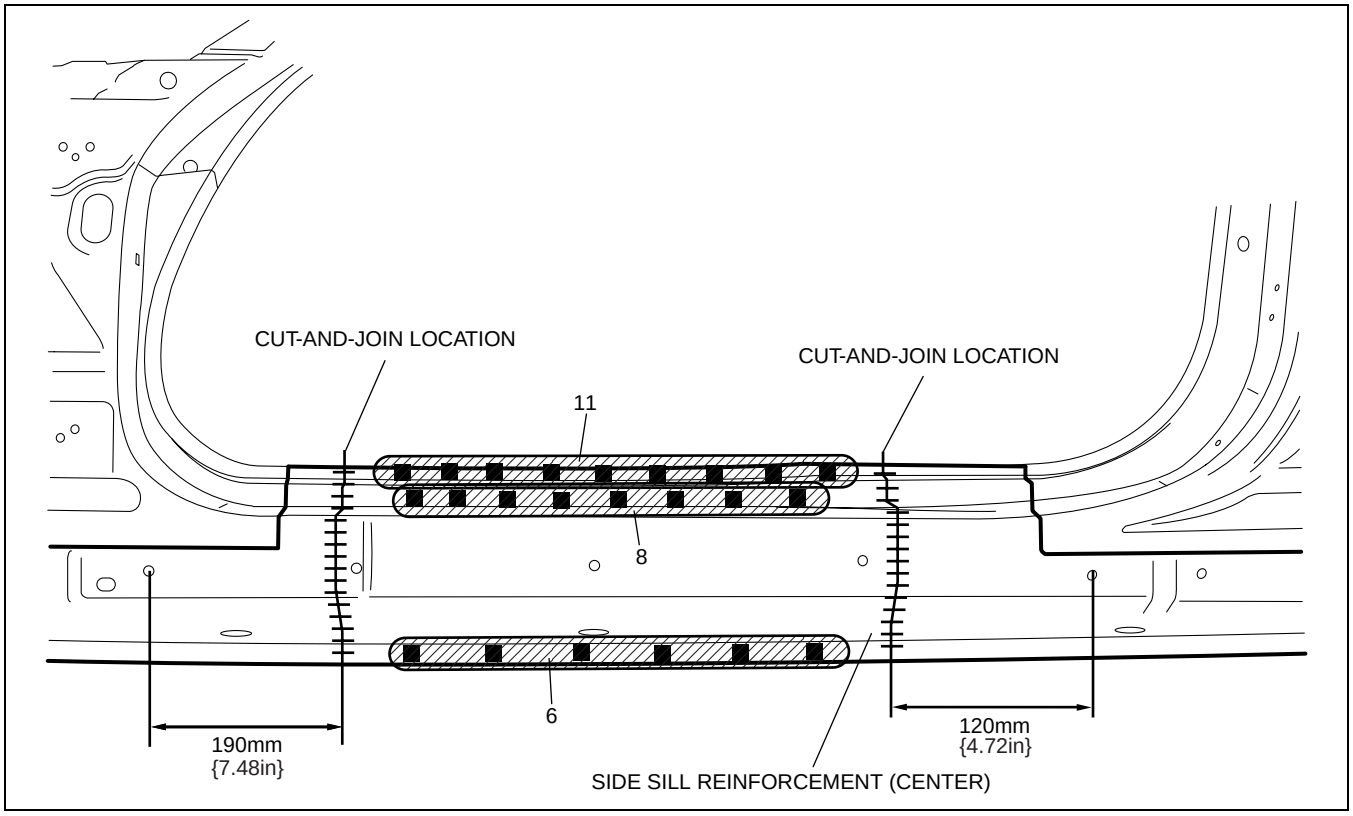
SIDE SILL REINFORCEMENT (CENTER)

D5U0980B087

SIDE SILL REINFORCEMENT (CENTER) INSTALLATION

D5U098070270B06

1. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B088

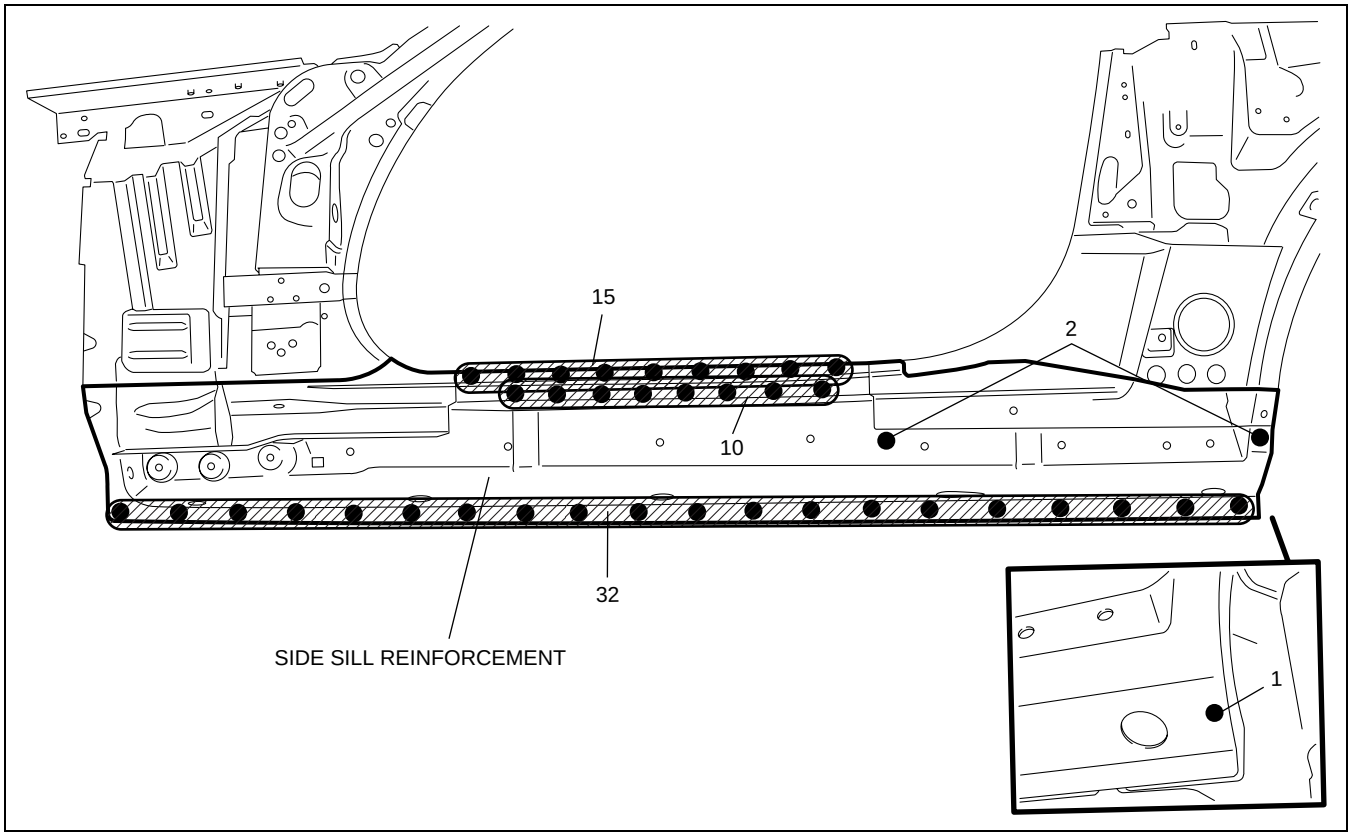
SIDE SILL REINFORCEMENT REMOVAL

D5U098070270B07

Caution

- **The side sill reinforcement removal procedure is based on the condition that the cowl side panel and the hinge pillar (outer) and the rear fender panel have been removed.**

1. Remove the side sill reinforcement.



D5U0980B089

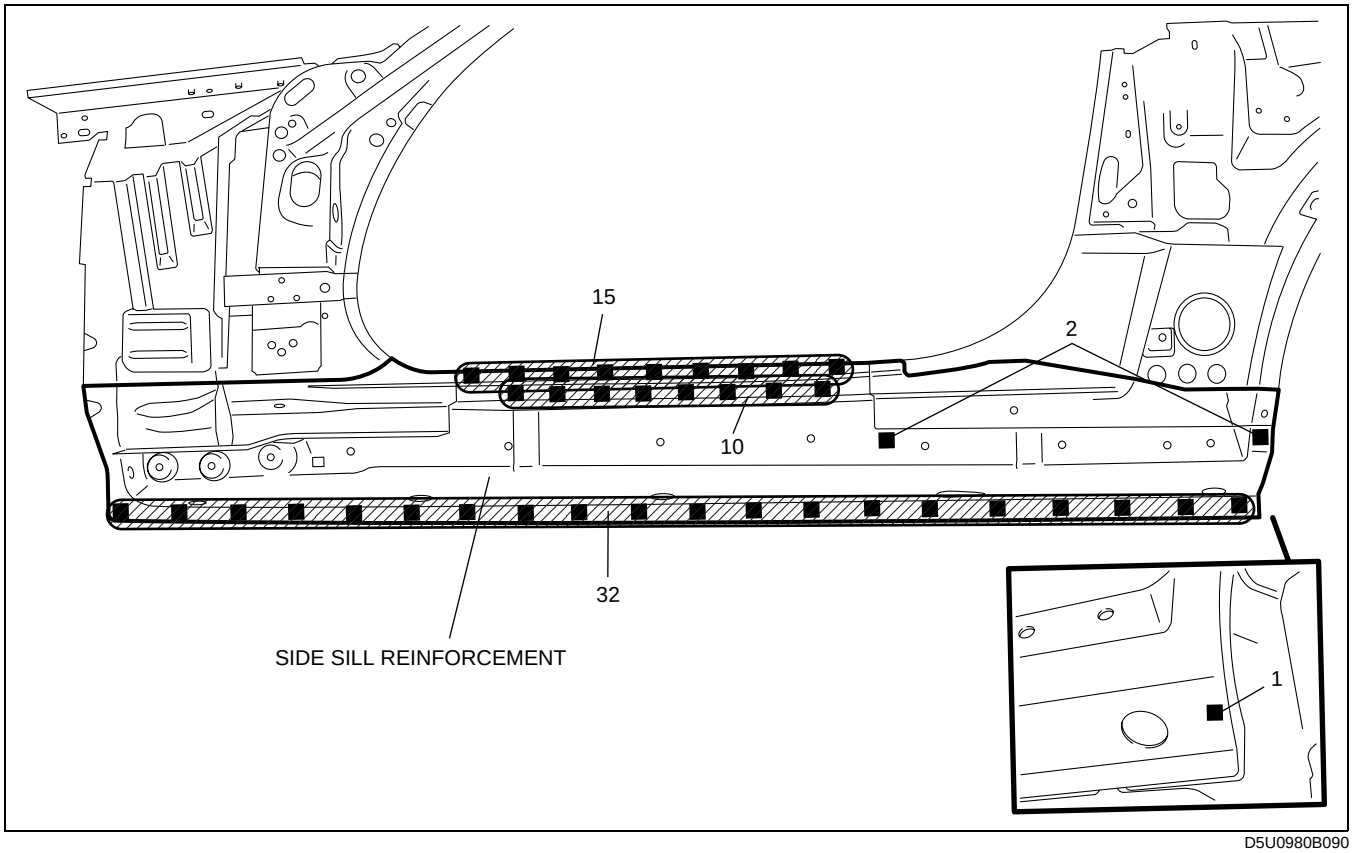
SIDE SILL REINFORCEMENT INSTALLATION

D5U098070270B08

Caution

- **The side sill reinforcement installation procedure is based on the condition that the cowl side panel and the hinge pillar (outer) and the rear fender panel have been removed.**

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

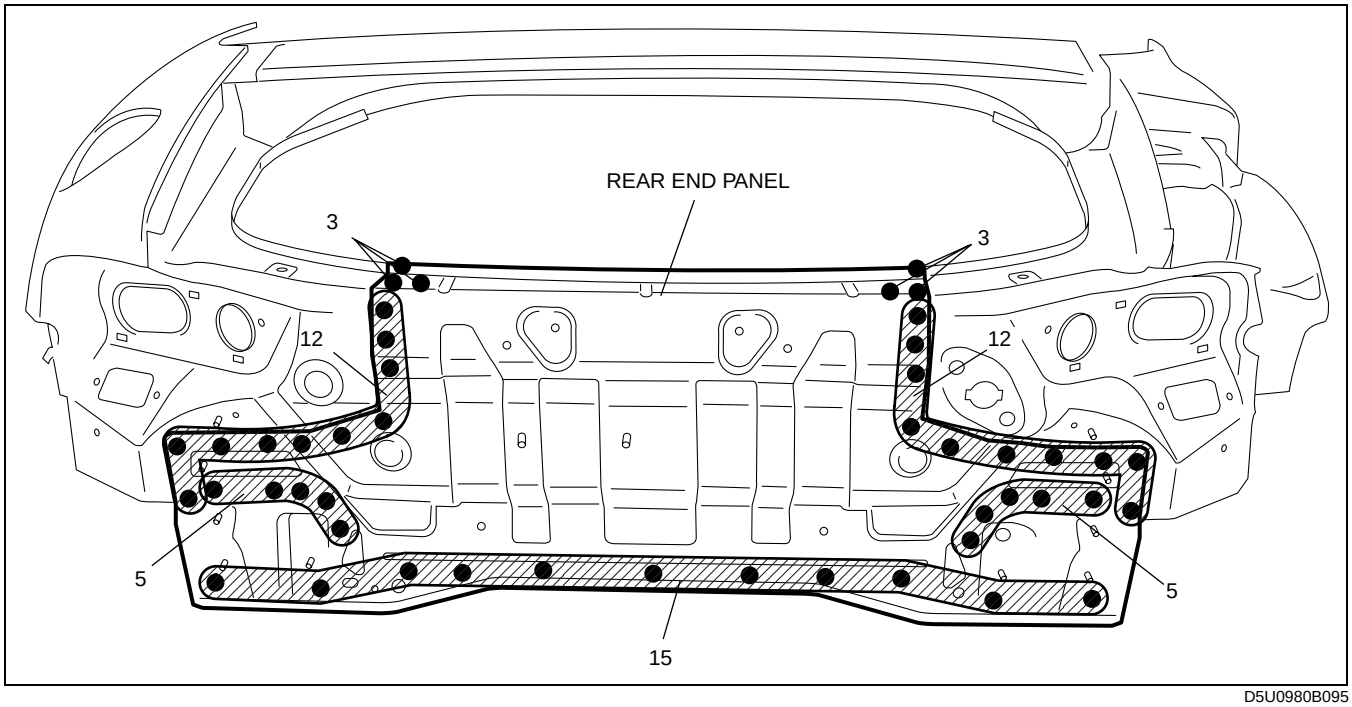


D5U0980B090

REAR END PANEL REMOVAL

D5U098070750B01

1. Remove the rear end panel.

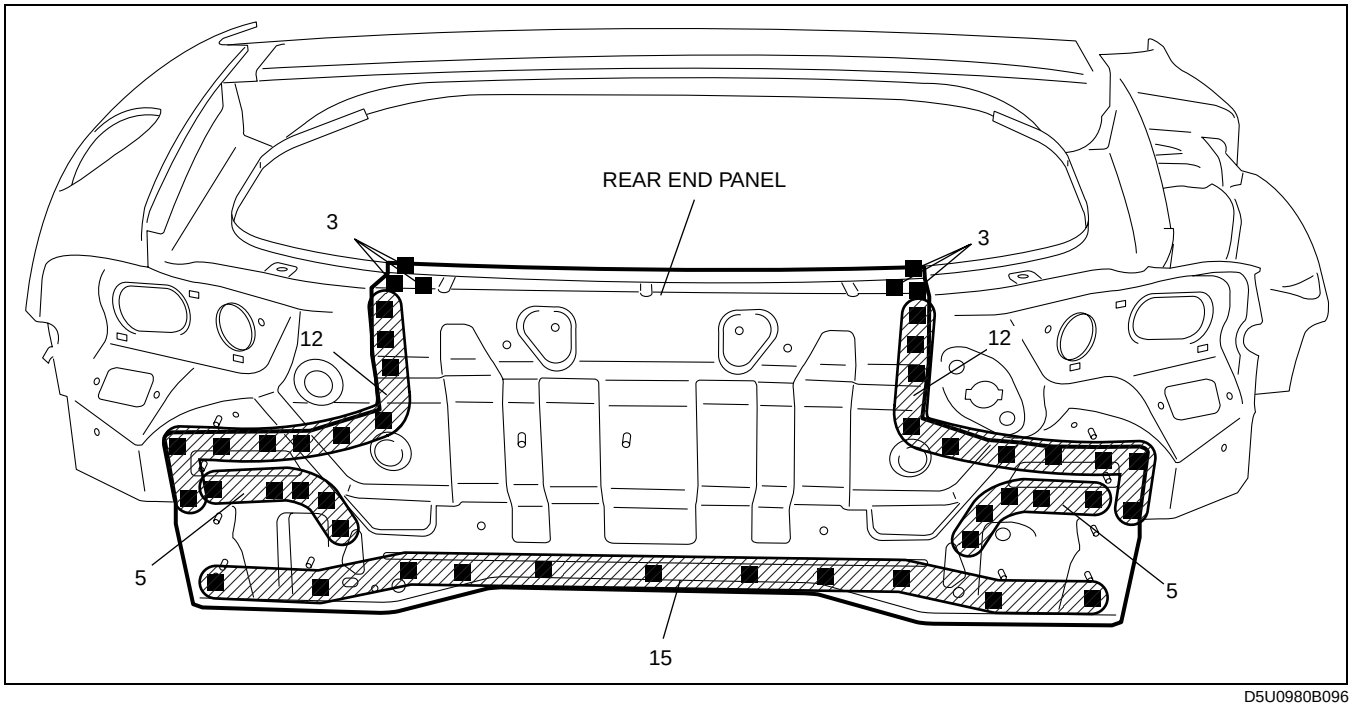


D5U0980B095

REAR END PANEL INSTALLATION

D5U098070750B02

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

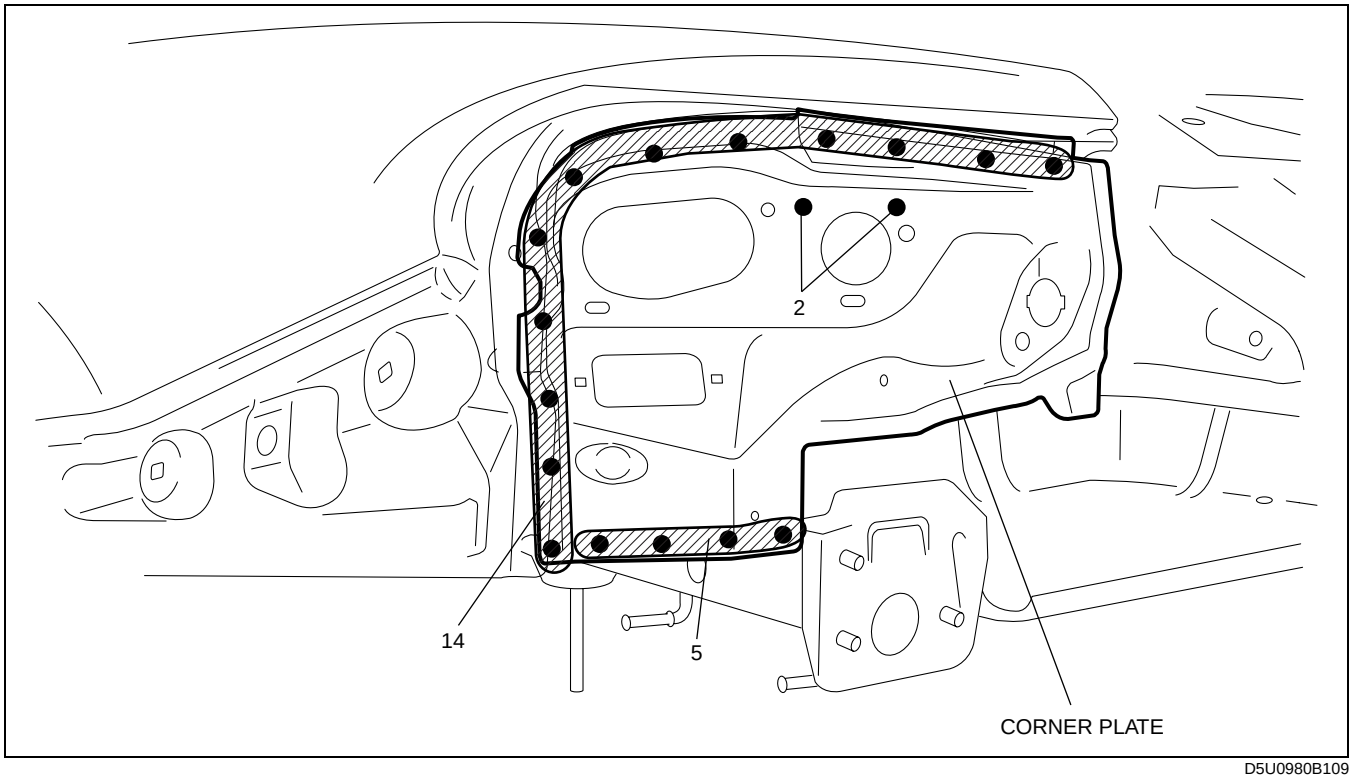


D5U0980B096

CORNER PLATE REMOVAL

D5U098070440B13

1. Remove the corner plate.

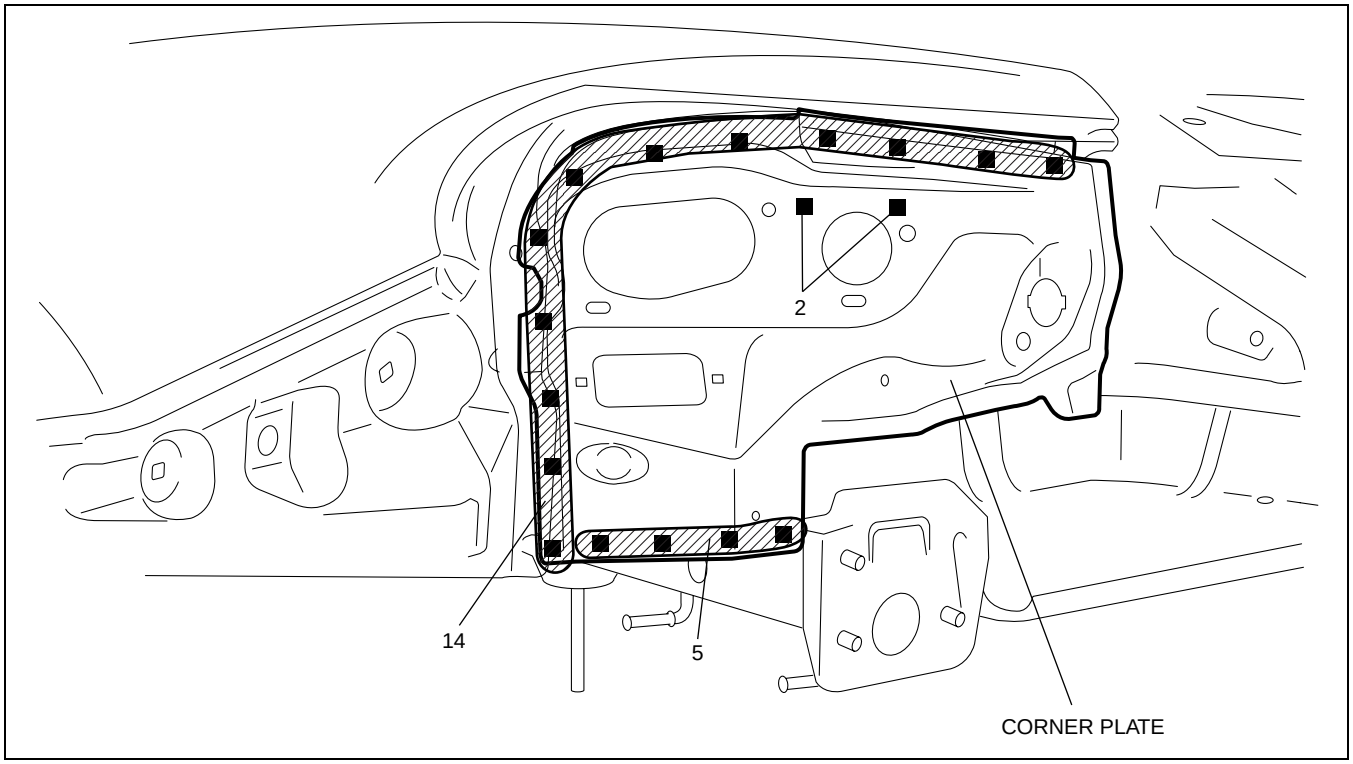


D5U0980B109

CORNER PLATE INSTALLATION

D5U098070440B14

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

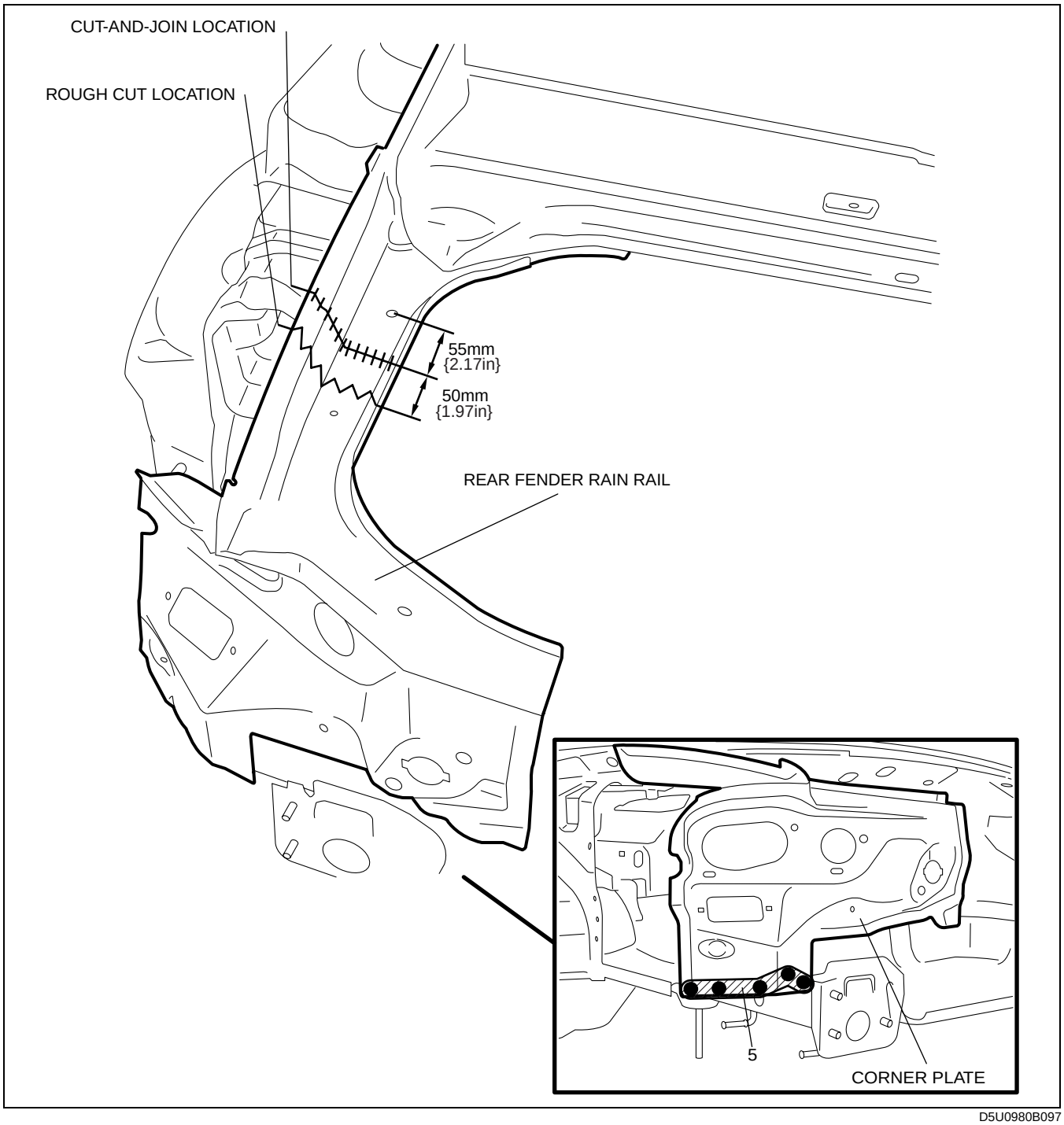


D5U0980B110

REAR FENDER RAIN RAIL (PARTIAL CUTTING) REMOVAL

D5U098070440B01

1. Rough cut at the locations shown in the figure to remove damaged parts.
2. Remove the rear fender rain rail and corner plate.

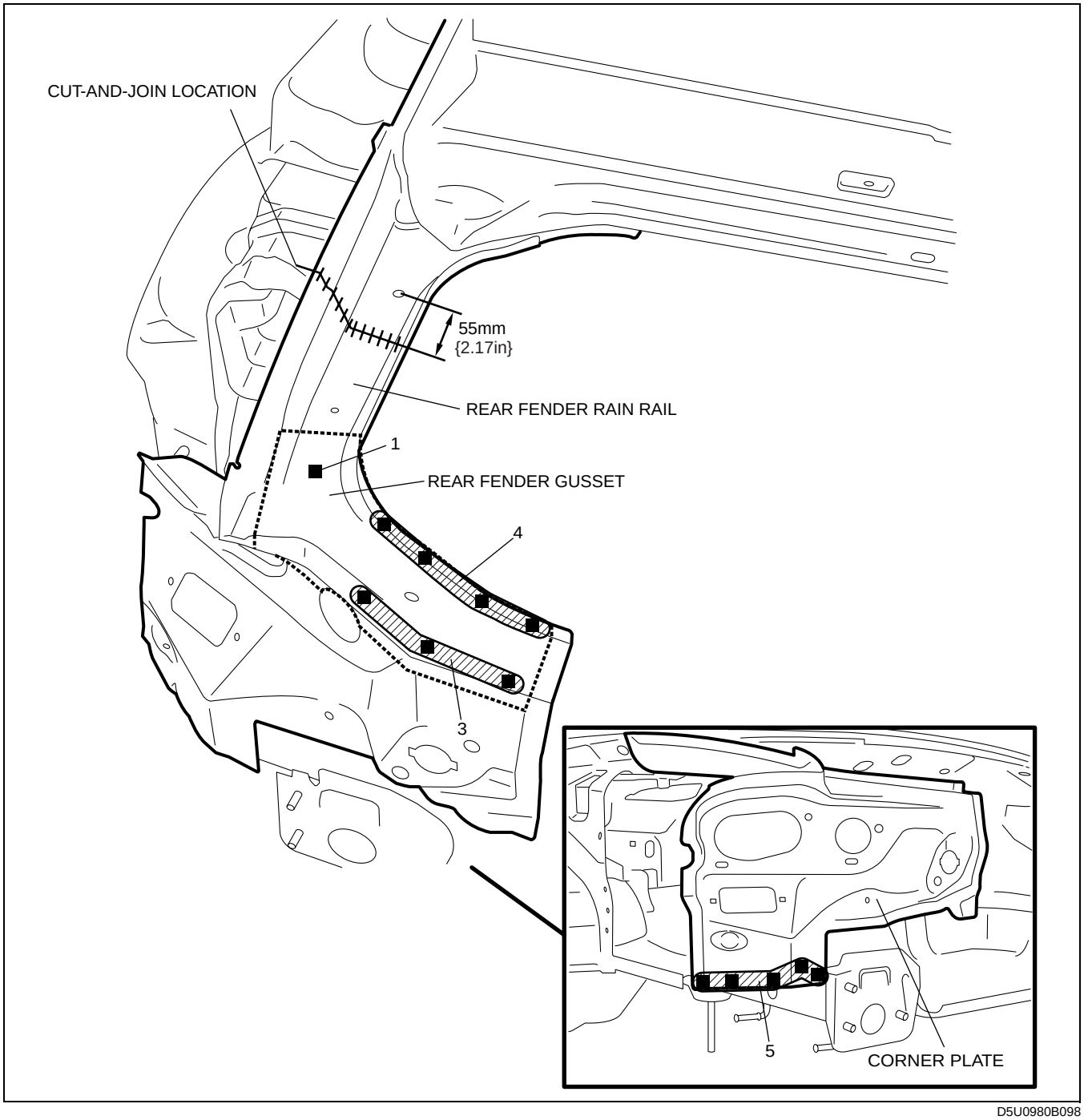


D5U0980B097

REAR FENDER RAIN RAIL (PARTIAL CUTTING) INSTALLATION

D5U098070440B02

1. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

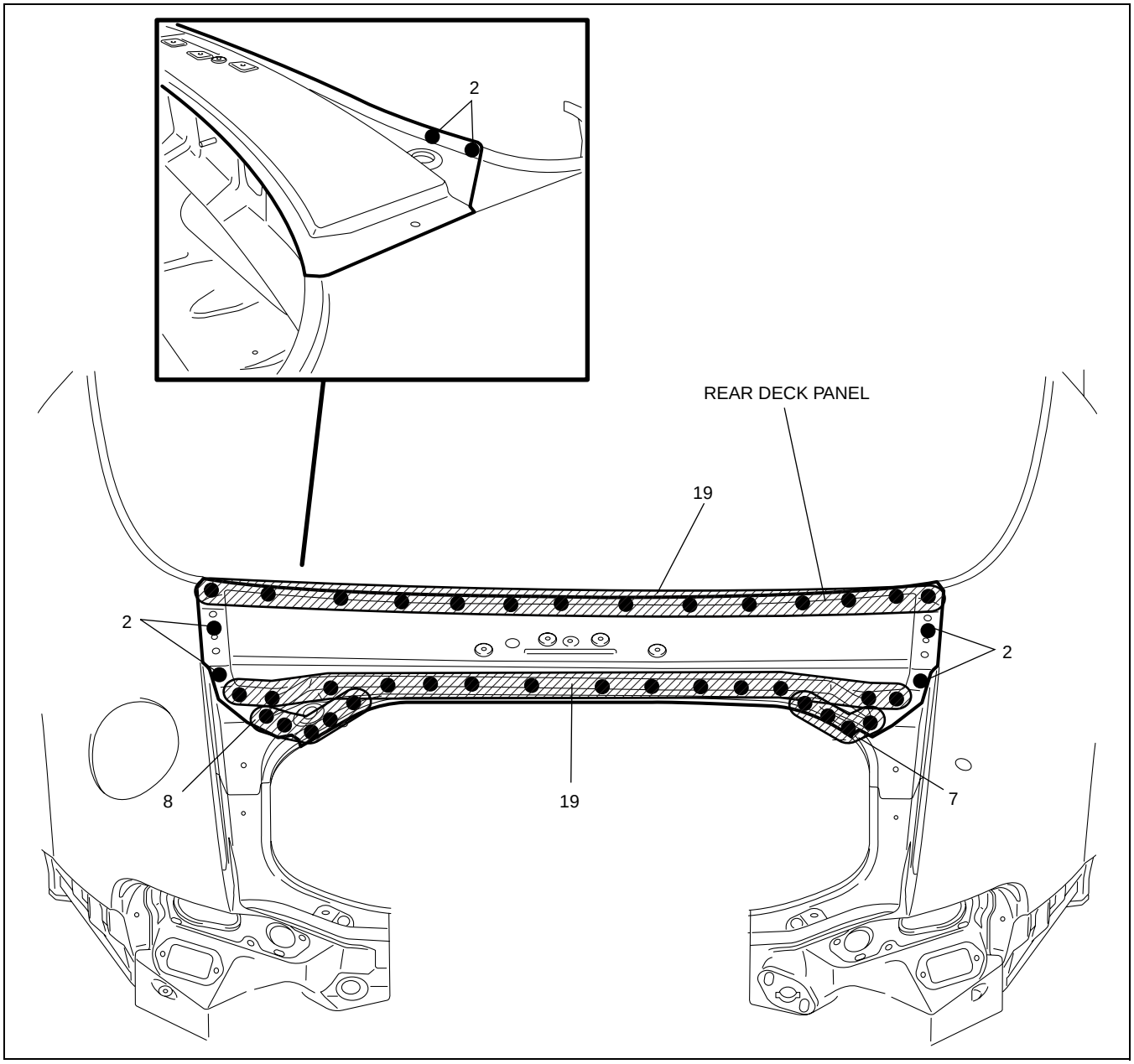


D5U0980B098

REAR DECK PANEL REMOVAL

D5U098070440B03

1. Remove the rear deck panel.

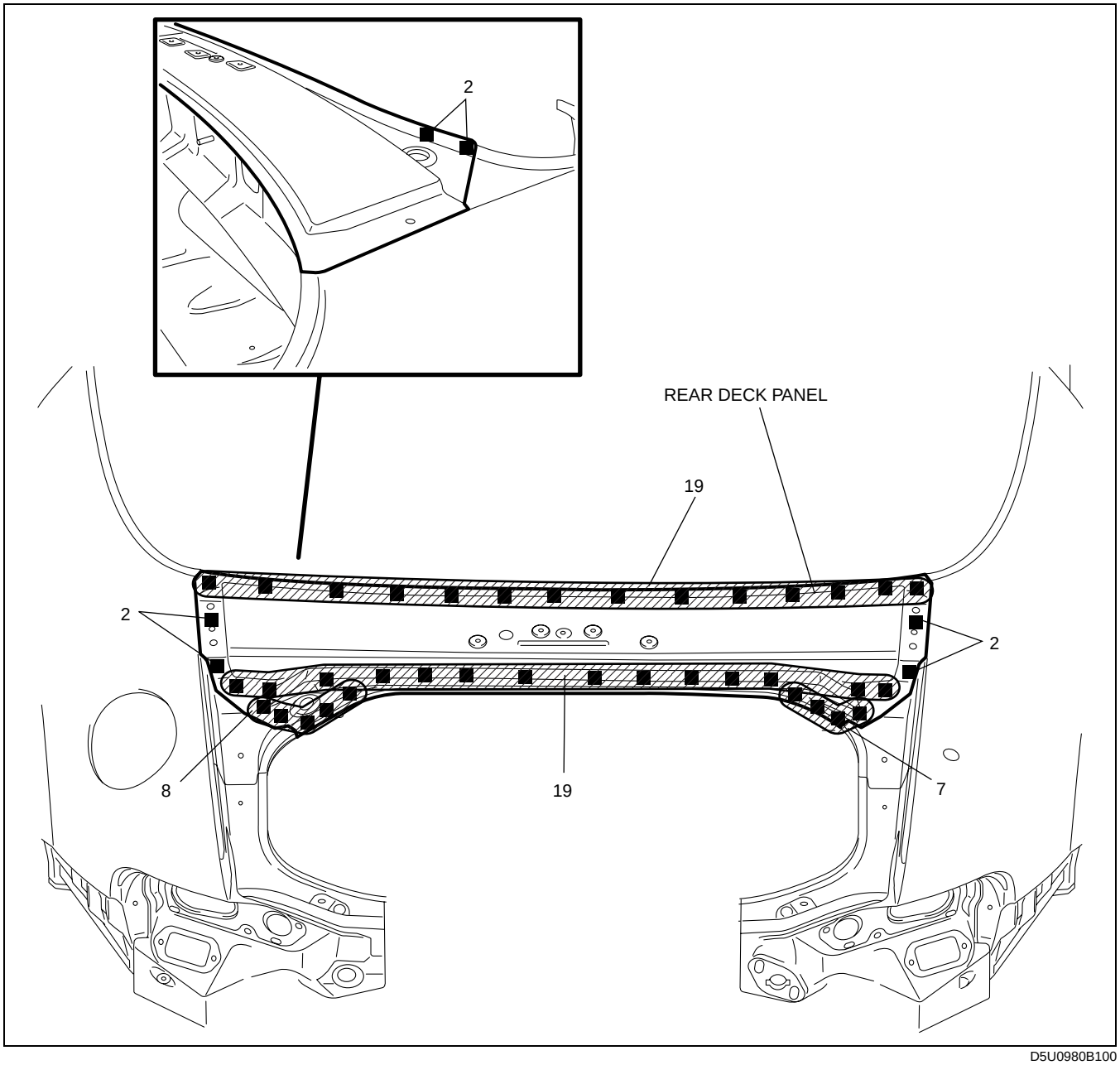


D5U0980B099

REAR DECK PANEL INSTALLATION

D5U098070440B04

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

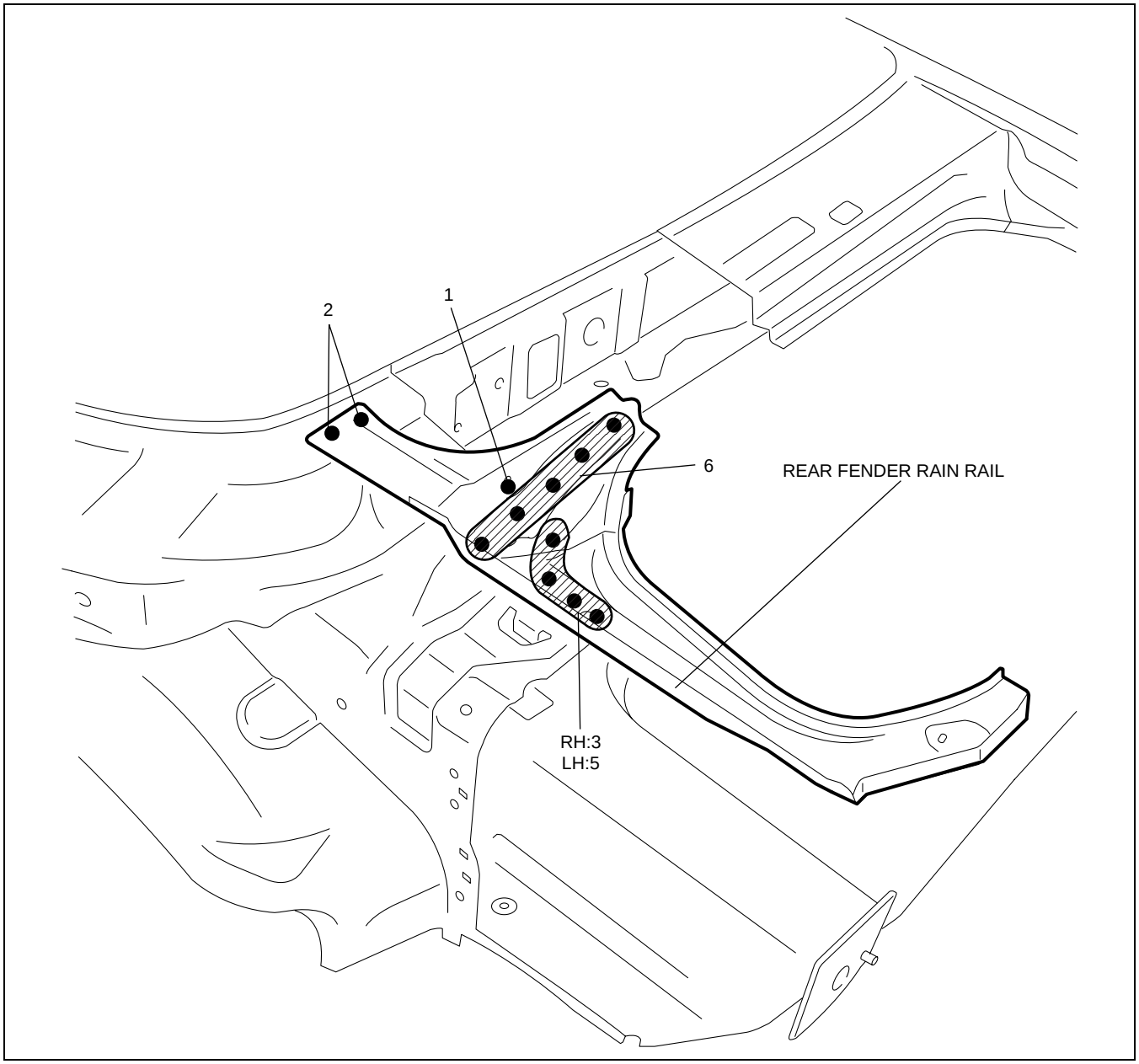


D5U0980B100

REAR FENDER RAIN RAIL REMOVAL

D5U098070440B05

1. Remove the rear fender rain rail.

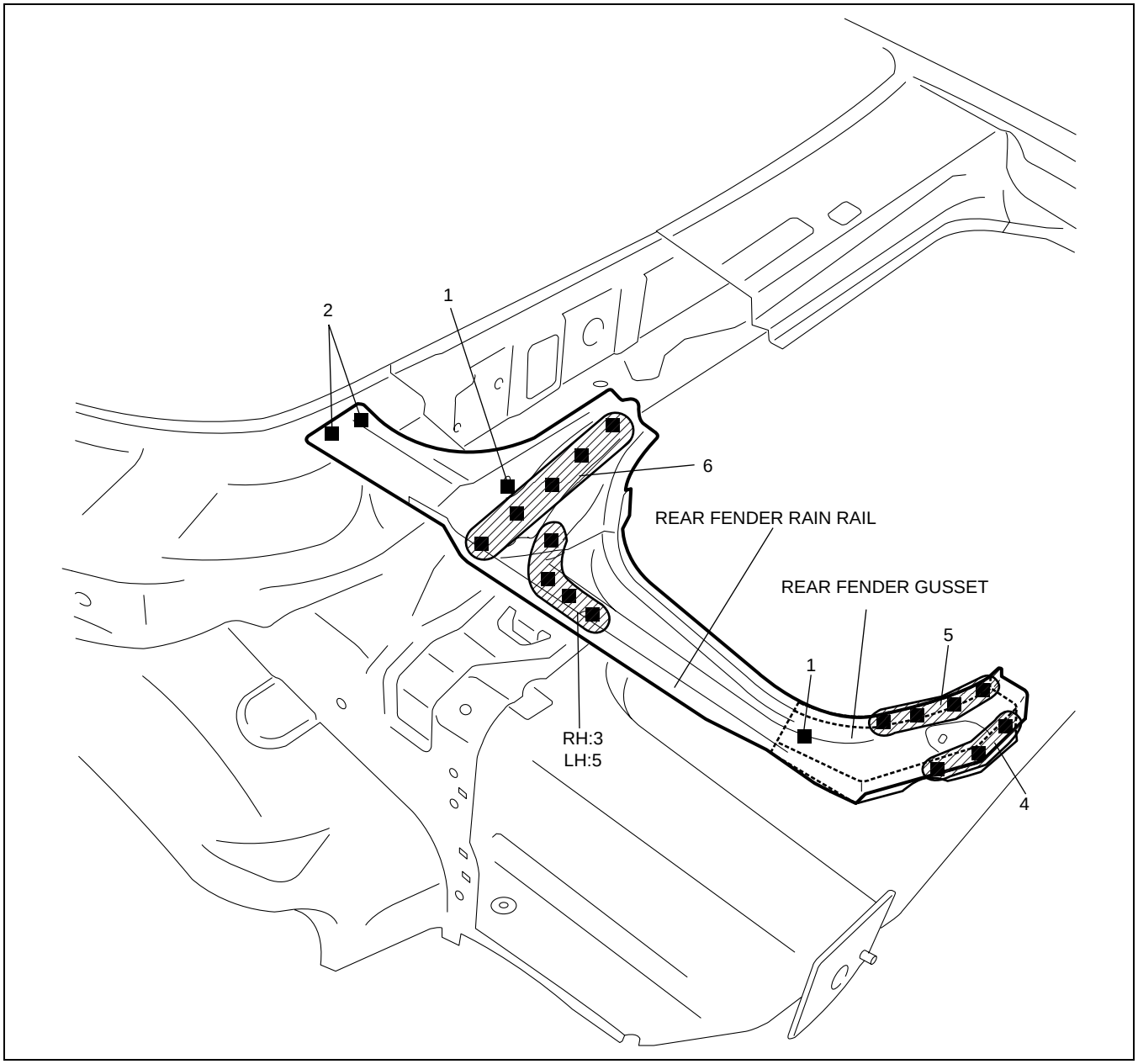


D5U0980B101

REAR FENDER RAIN RAIL INSTALLATION

D5U098070440B06

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

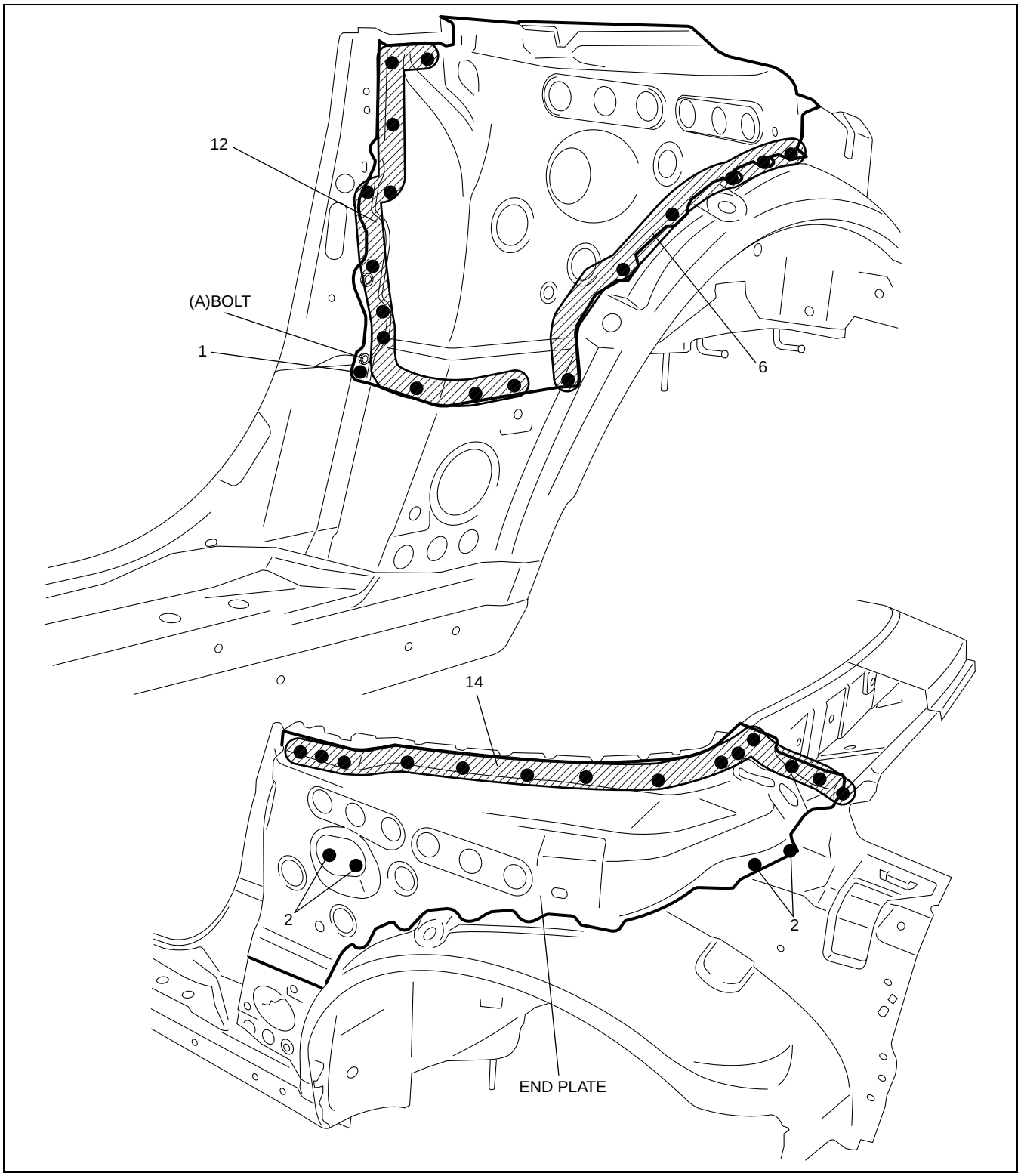


D5U0980B102

END PLATE REMOVAL

D5U098070440B07

1. Remove the bolt locations indicated by (A).
2. Remove the end plate.



D5U0980B103

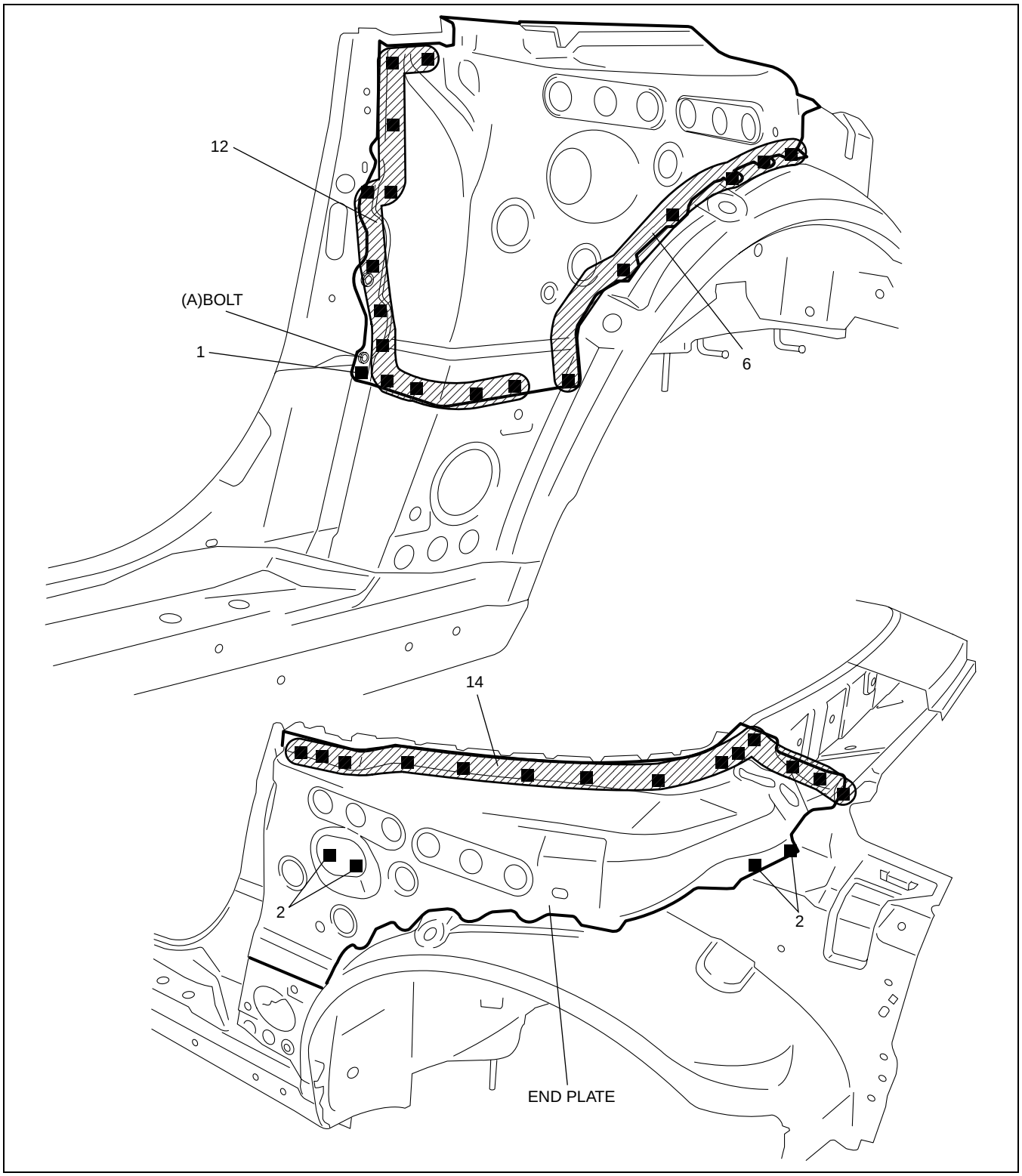
END PLATE INSTALLATION

D5U098070440B08

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.
4. Install the bolt locations indicated by (A).

Tightening torque
6.9—11.8 N·m {71—120 kgf·cm, 62—104 in·lbf}

5. Install the end plate.

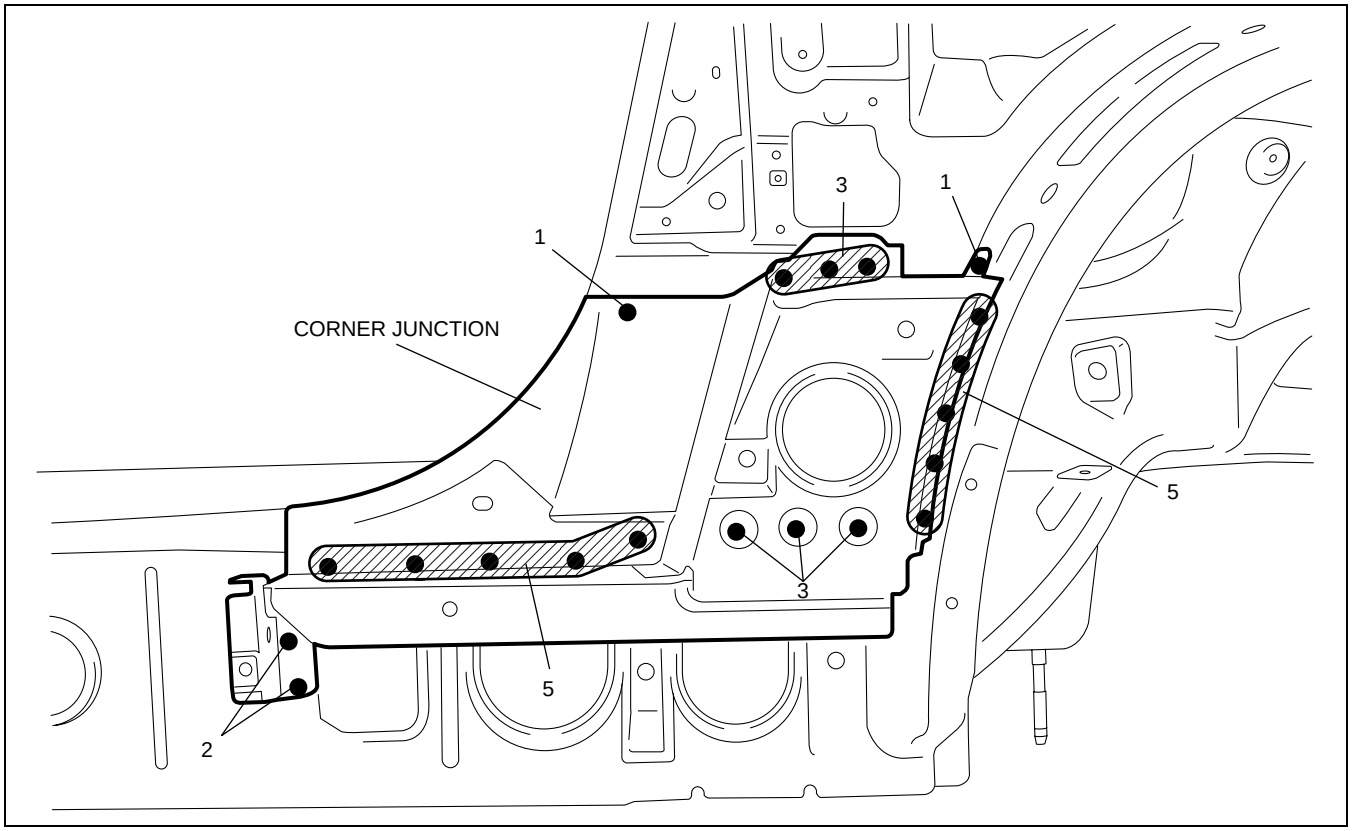


D5U0980B104

CORNER JUNCTION REMOVAL

D5U098070440B09

1. Remove the corner junction.

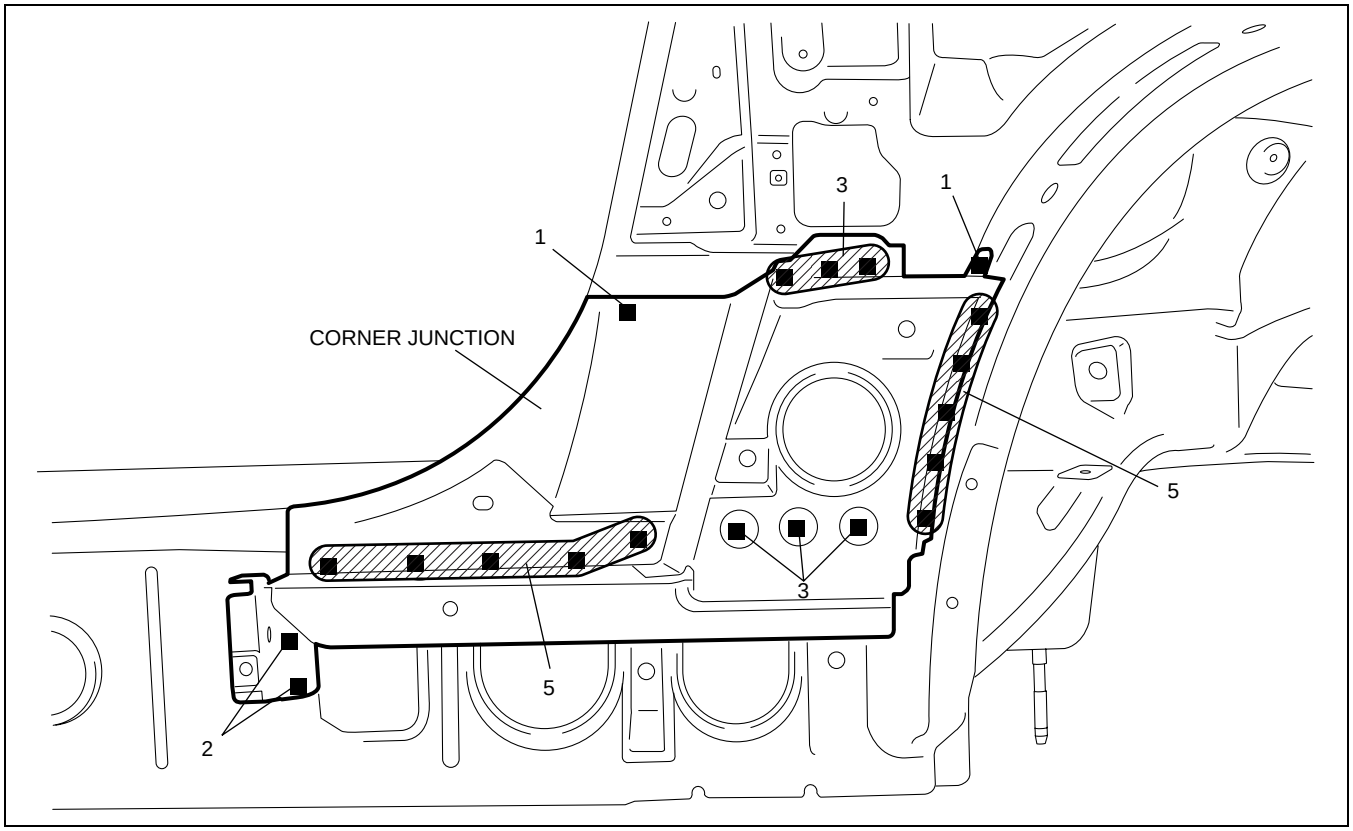


D5U0980B105

CORNER JUNCTION INSTALLATION

D5U098070440B10

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

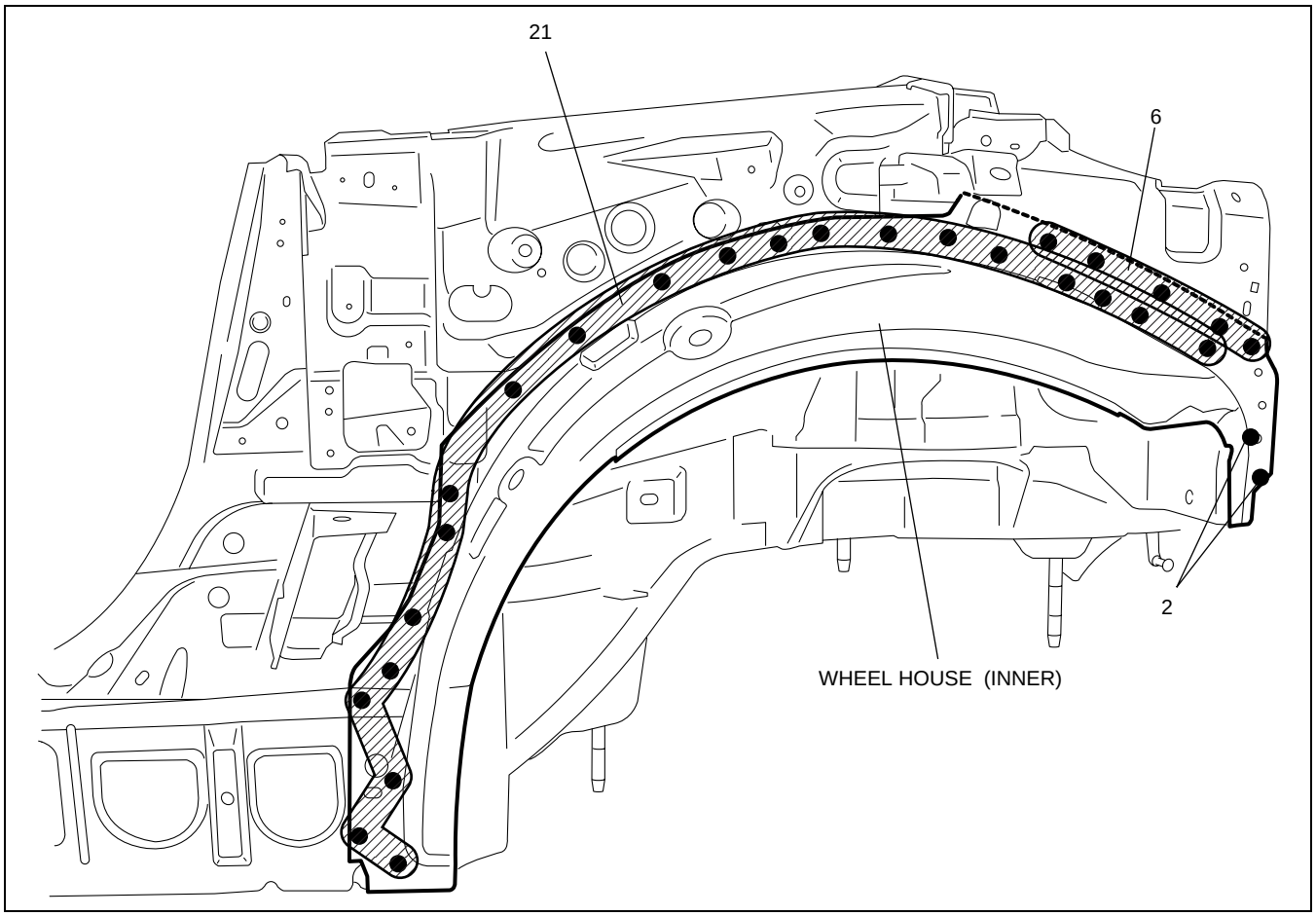


D5U0980B106

WHEEL HOUSE (INNER) REMOVAL

D5U098070440B11

1. Remove the wheel house (inner).
2. Remove the spot weld sealer using a disc grinder.

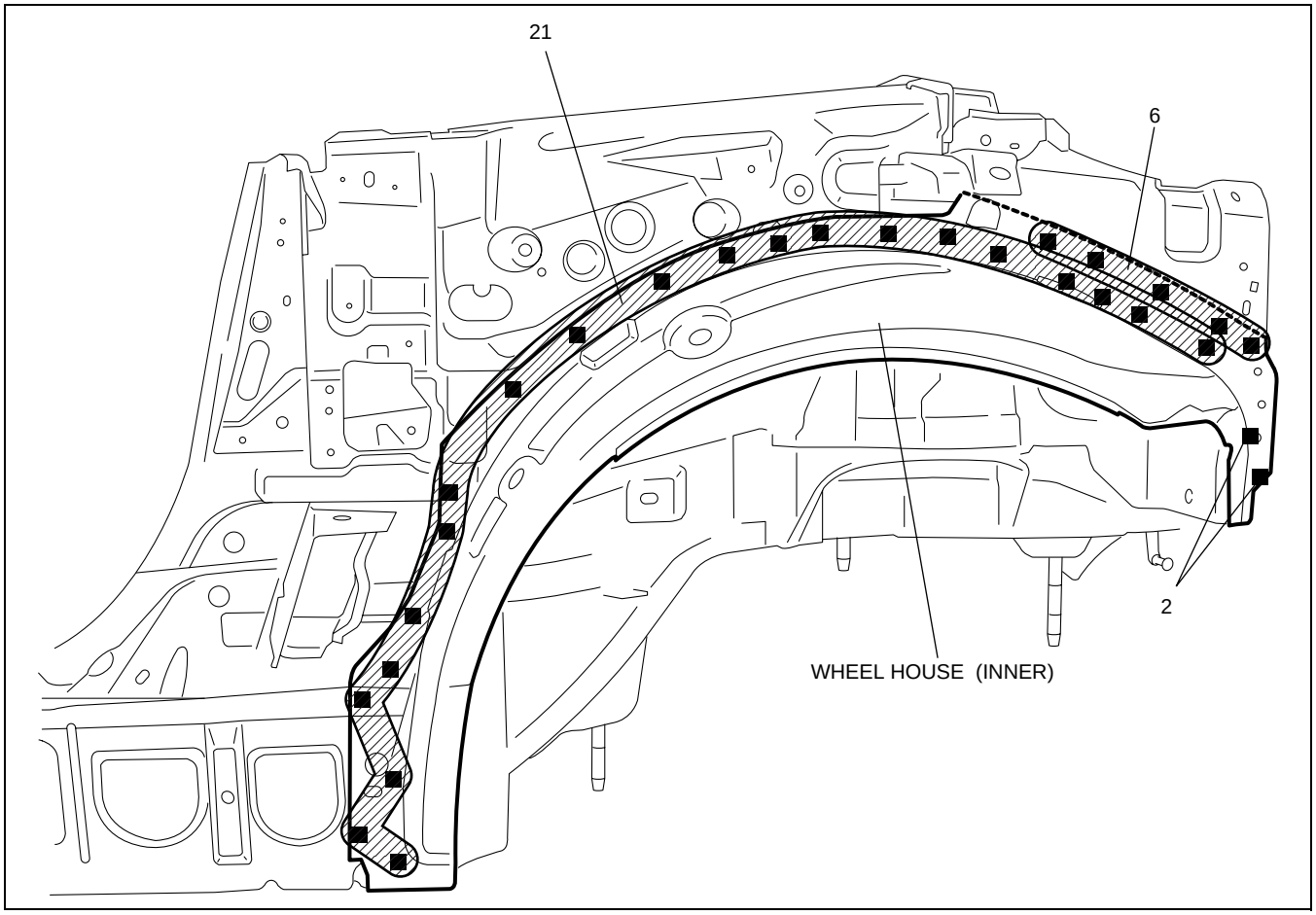


D5U0980B107

WHEEL HOUSE (INNER) INSTALLATION

D5U098070440B12

1. When installing new parts, measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. Before installing new parts, apply spot weld sealer to the wheel arch line.
4. After temporarily installing new parts, make sure the related parts fit properly.



D5U0980B108

REAR FLOOR PAN REMOVAL

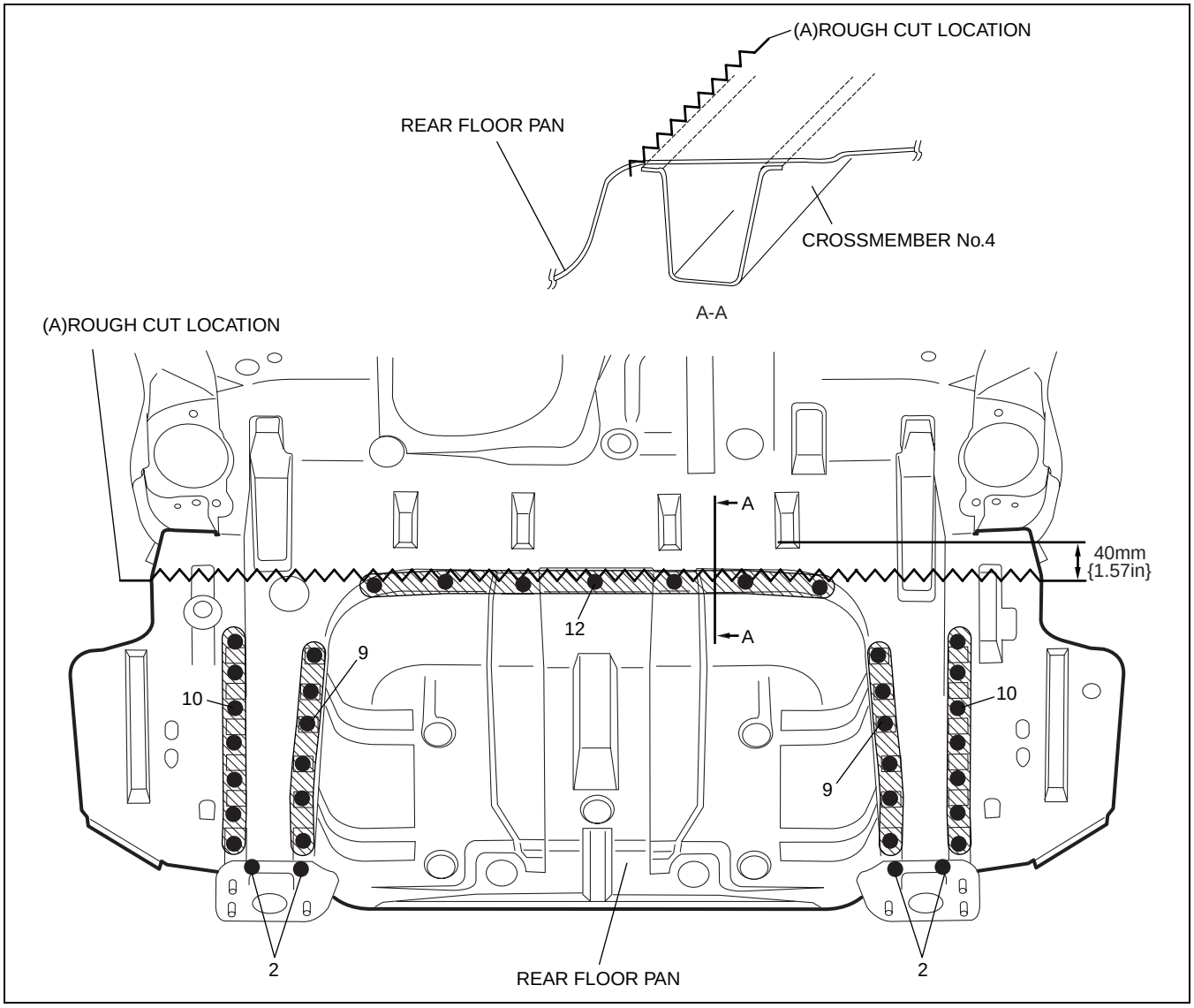
D5U098053750B01

1. Rough cut area (A).

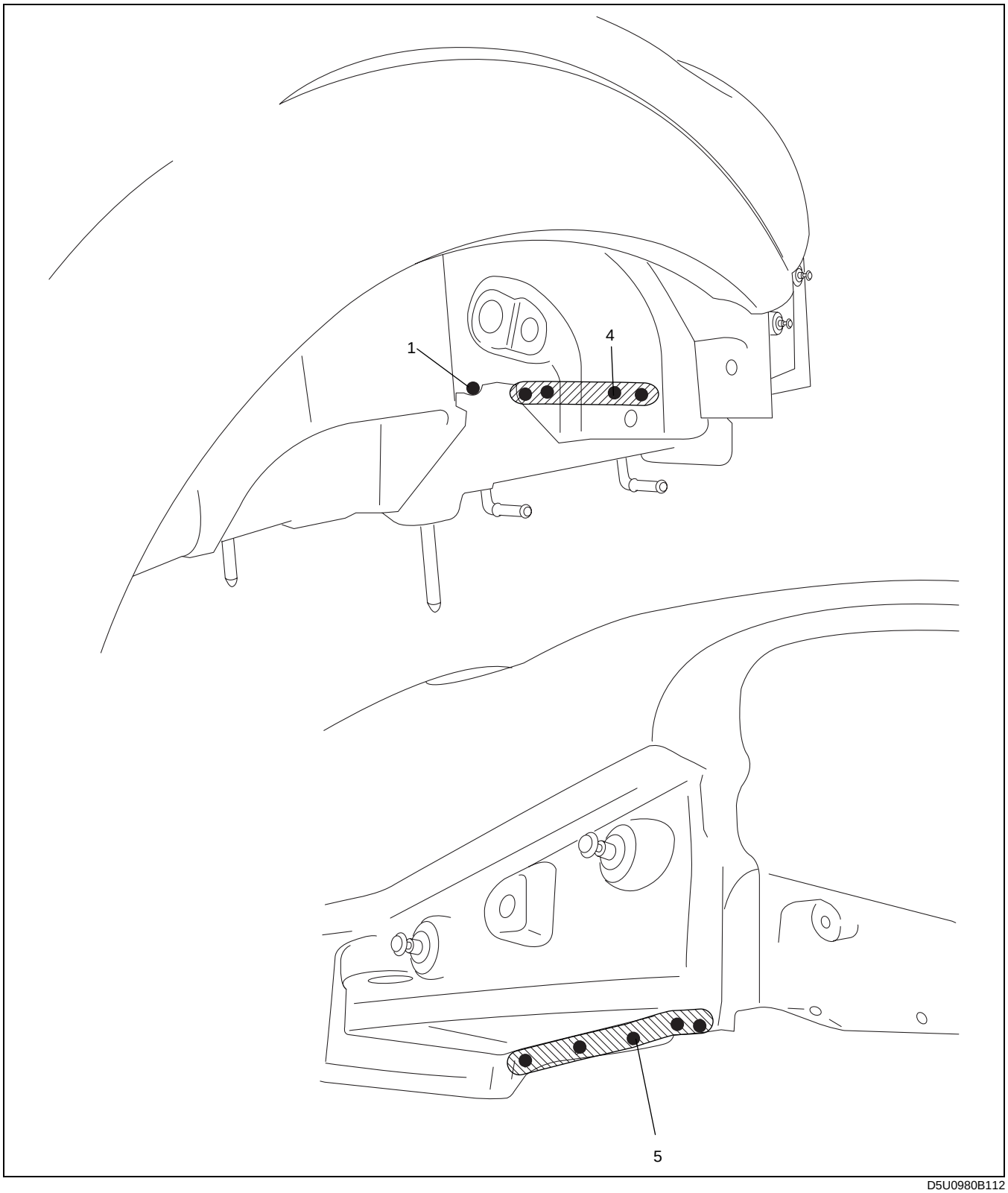
Caution

- **During rough cutting, be careful not to damage the crossmember No.4 indicated by dotted lines in the figure.**

2. Remove the rear floor pan.



D5U0980B111



D5U0980B112

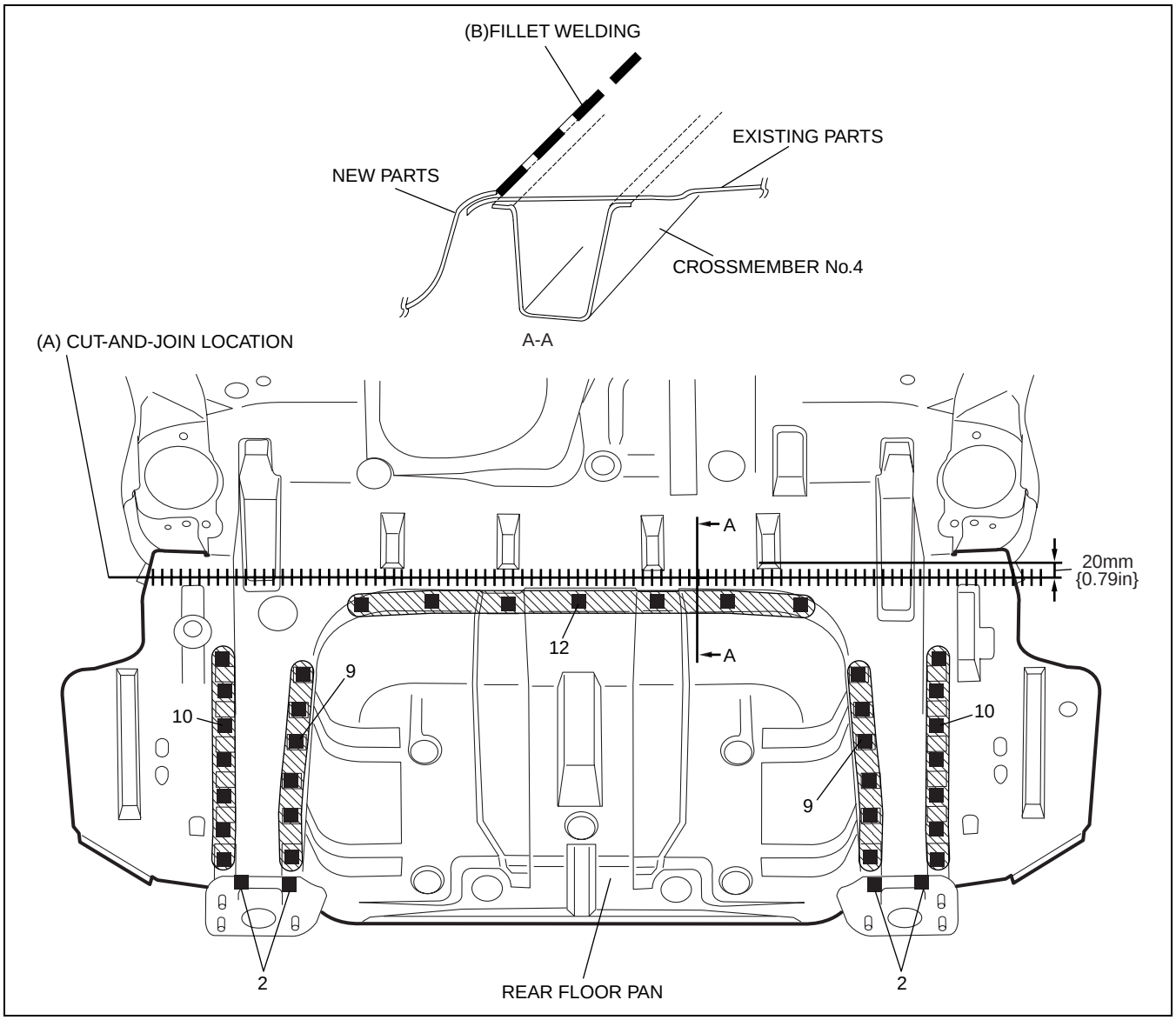
REAR FLOOR PAN INSTALLATION

D5U098053750B02

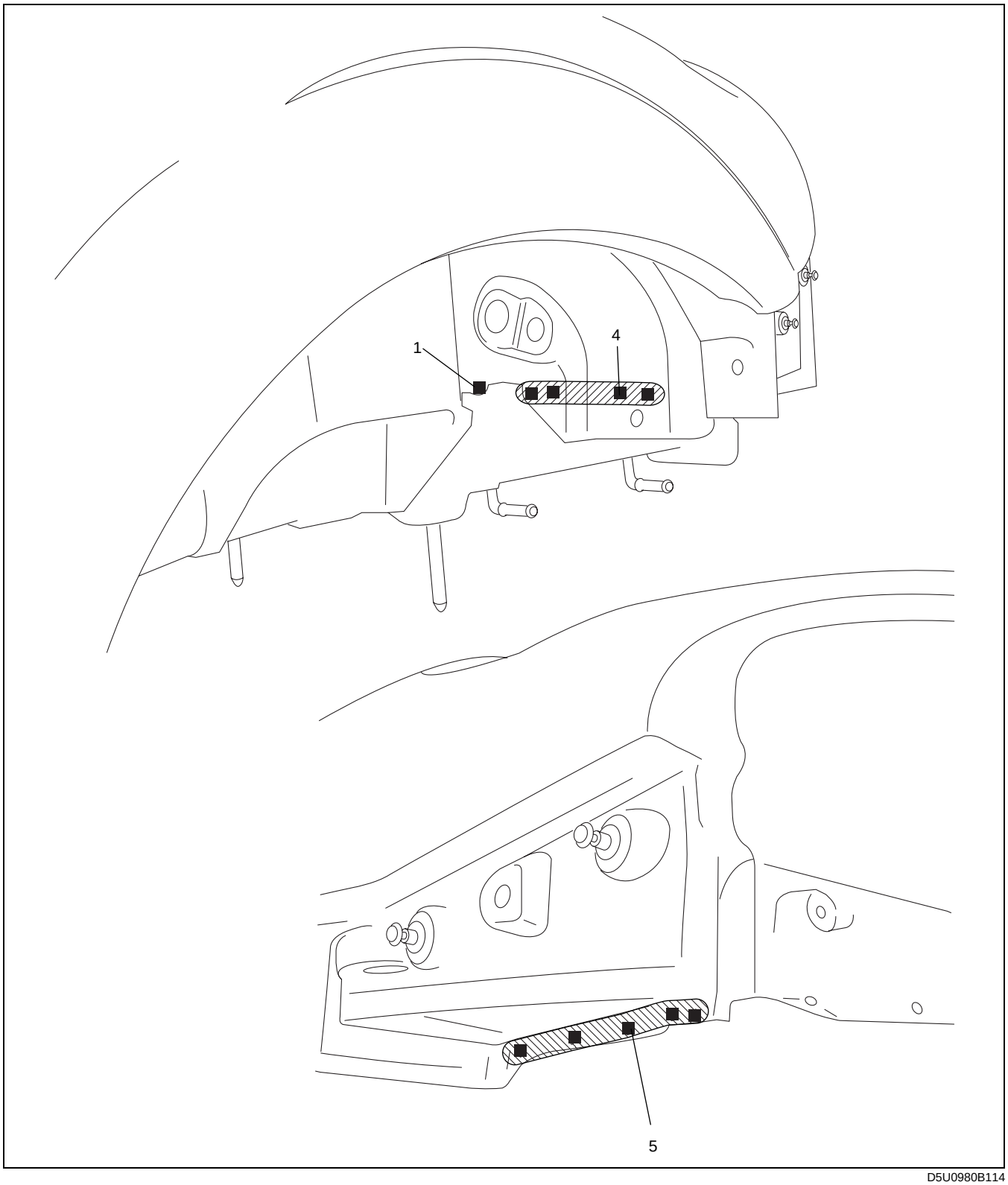
1. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
2. Cut area (A) on the new part.
3. Drill holes for plug welds before installing new parts.
4. Apply spot sealer to the areas where both the overlapping ends of the new and existing parts will be welded. Adhere the sections to be welded, and fillet weld along both seams at the locations indicated by (B).

Note
- Create a flange with flanging tool where new and existing parts are joined.

5. Weld the remaining weld locations and install the rear floor pan.



D5U0980B113

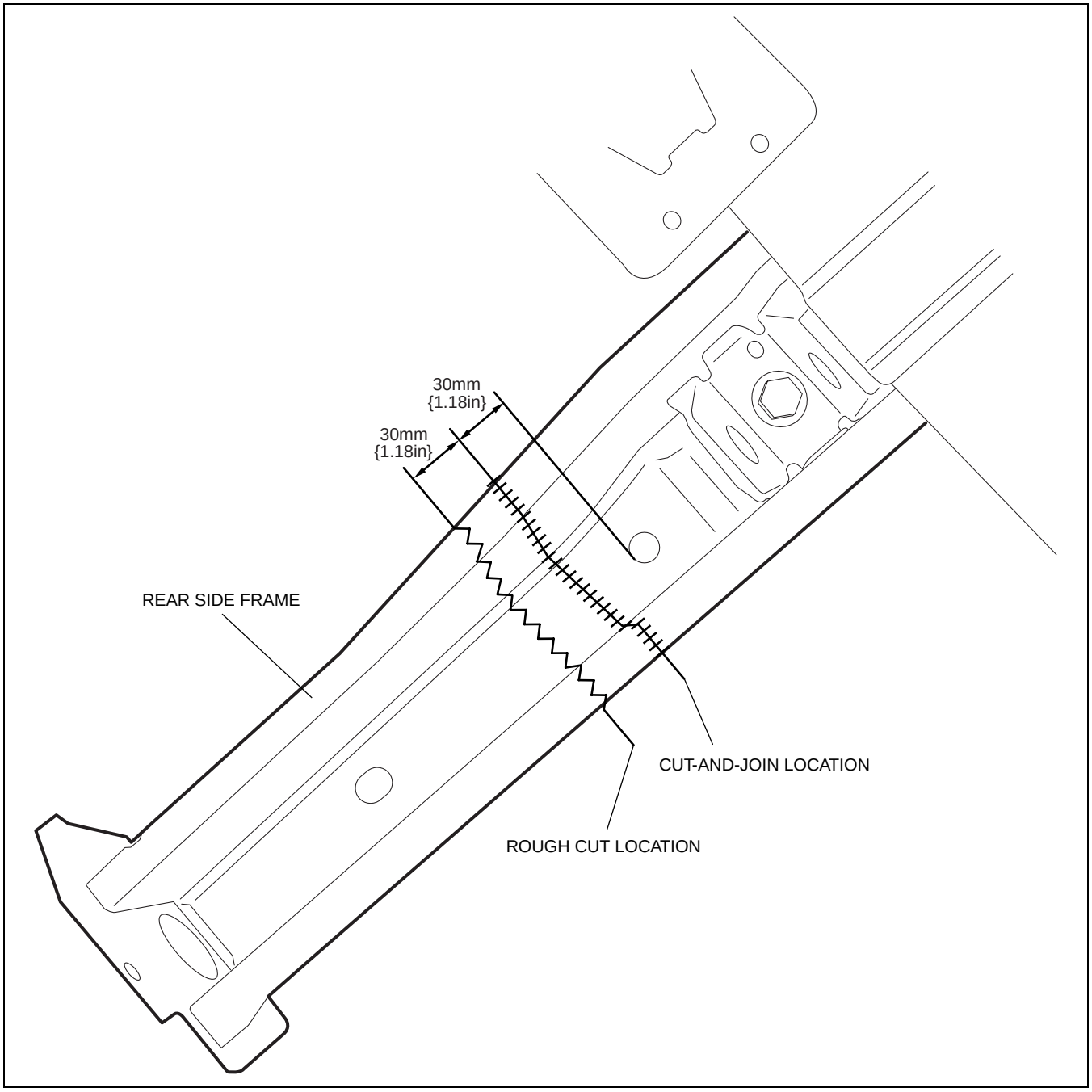


D5U0980B114

REAR SIDE FRAME (PARTIAL CUTTING) REMOVAL

D5U098053810B01

1. Rough cut and remove the damaged part of the rear side frame.



D5U0980B115

REAR SIDE FRAME (PARTIAL CUTTING) INSTALLATION

D5U098053810B02

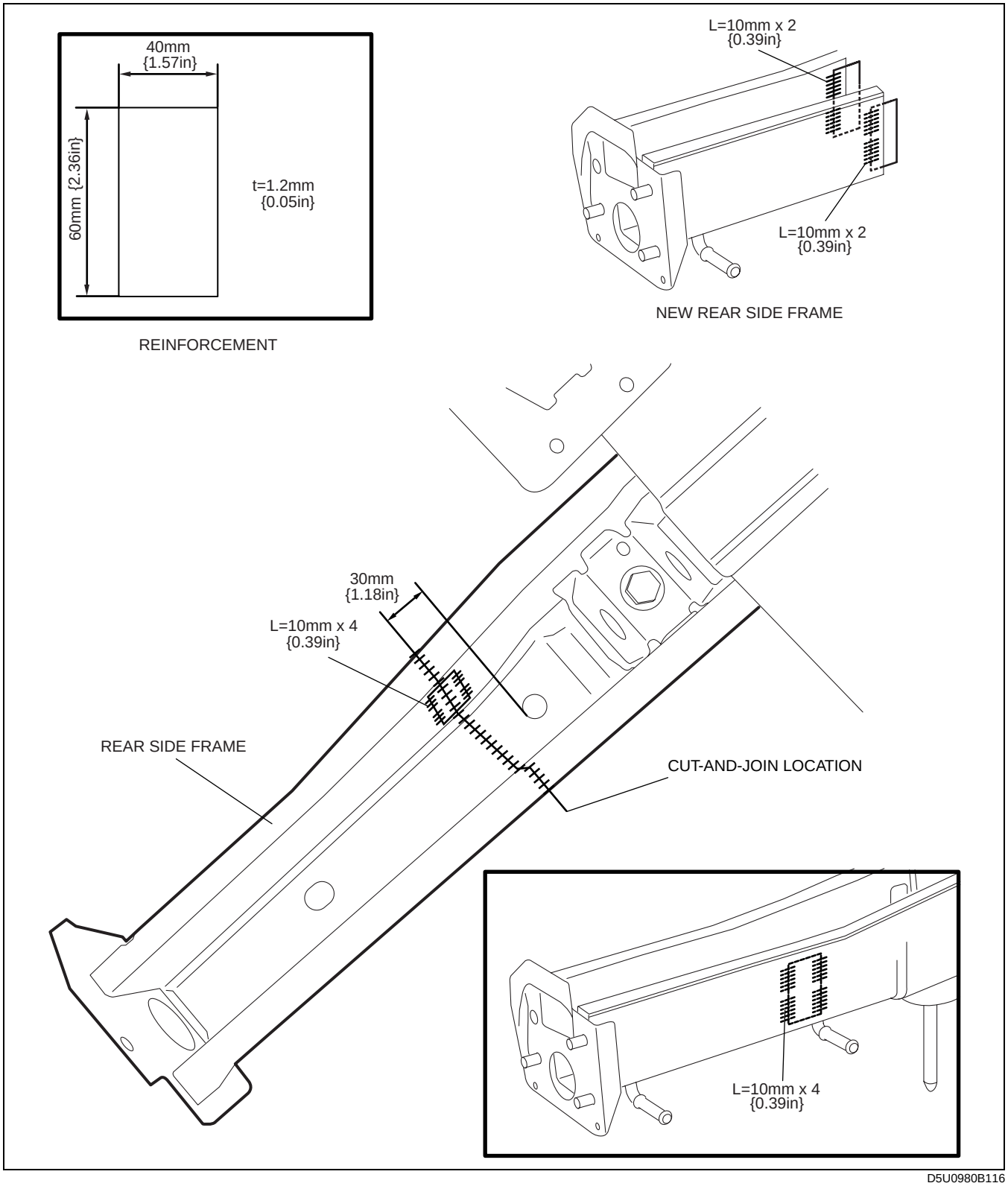
Caution

- **The cut-and-joint area indicates the maximum size range of the installation position.**

1. Make a reinforcement panel using the material from the rear side frame.
2. To cut and join the new and existing parts, cut the new part at the specified location shown in the figure, and chamfer the joint surfaces of the new and existing parts.
3. When installing the new parts, trial-fit new and existing parts, and then measure and adjust the body to conform with standard dimensions.
4. After temporarily installing new parts, make sure the related parts fit properly.
5. Trial-fit the new and existing parts, weld the existing parts and the reinforcement, and then butt weld the new and existing parts.

Caution

- **Press fit the reinforcement panel and the body side material, and then plug weld them.**



D5U0980B116

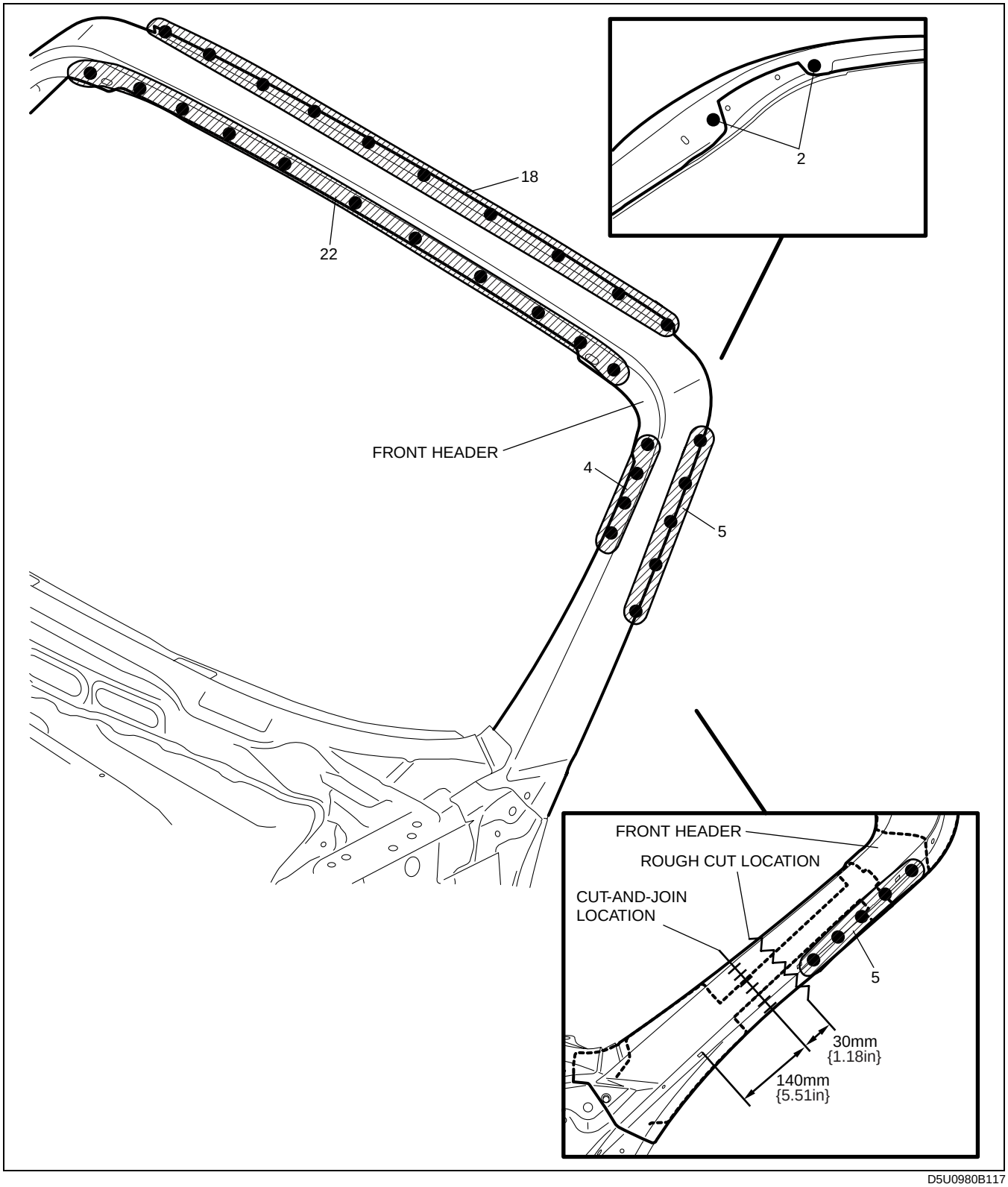
FRONT HEADER REMOVAL

D5U098070600B01

1. Rough cut and remove the damaged part of the front header.

Caution

- **During rough cutting, be careful not to damage the front pillar reinforcement indicated by dotted lines in the figure.**

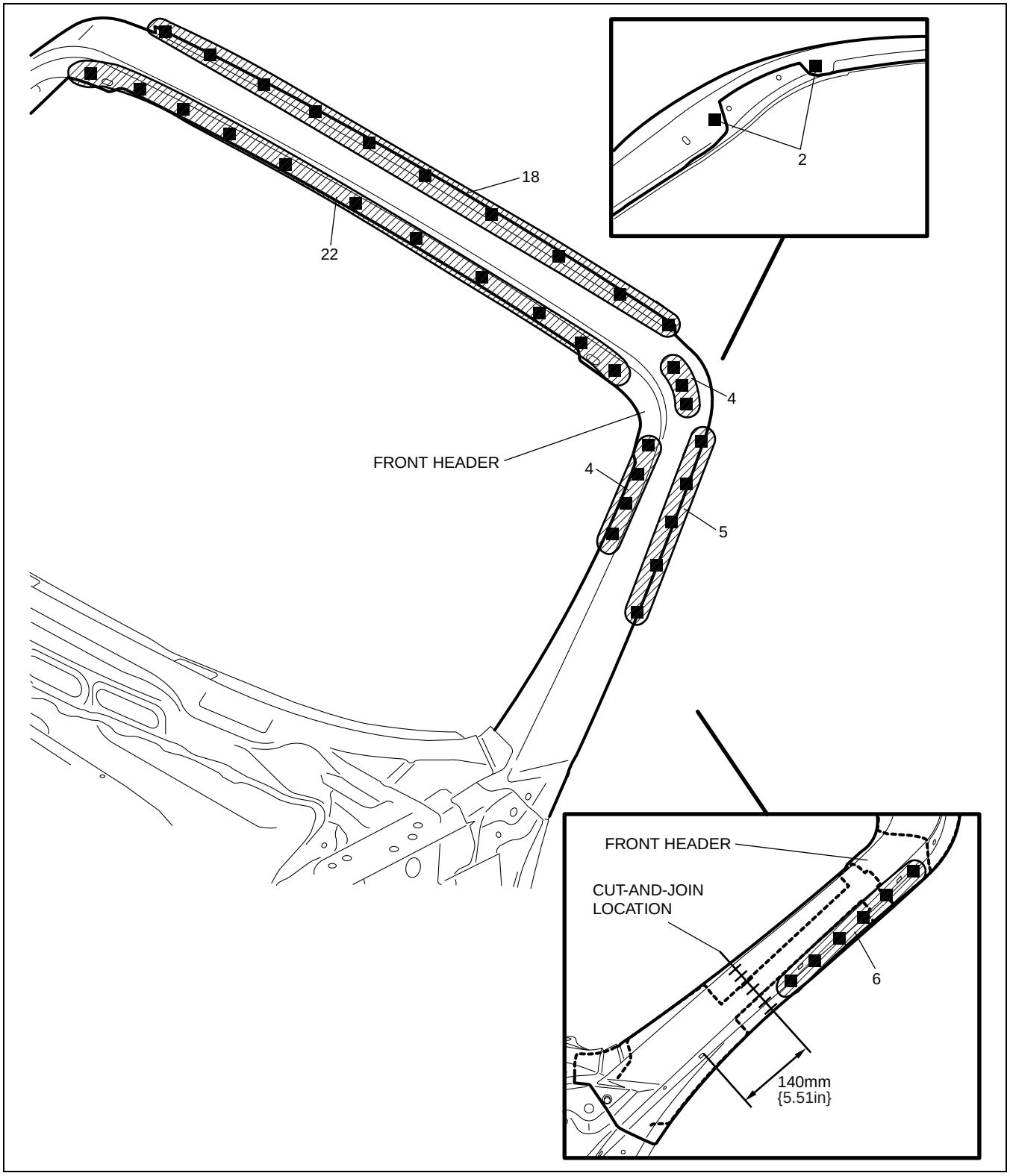


D5U0980B117

FRONT HEADER INSTALLATION

D5U098070600B02

1. When joining and cutting the new and existing parts, trial fit the new part in position, then measure and adjust the body as necessary to conform with standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



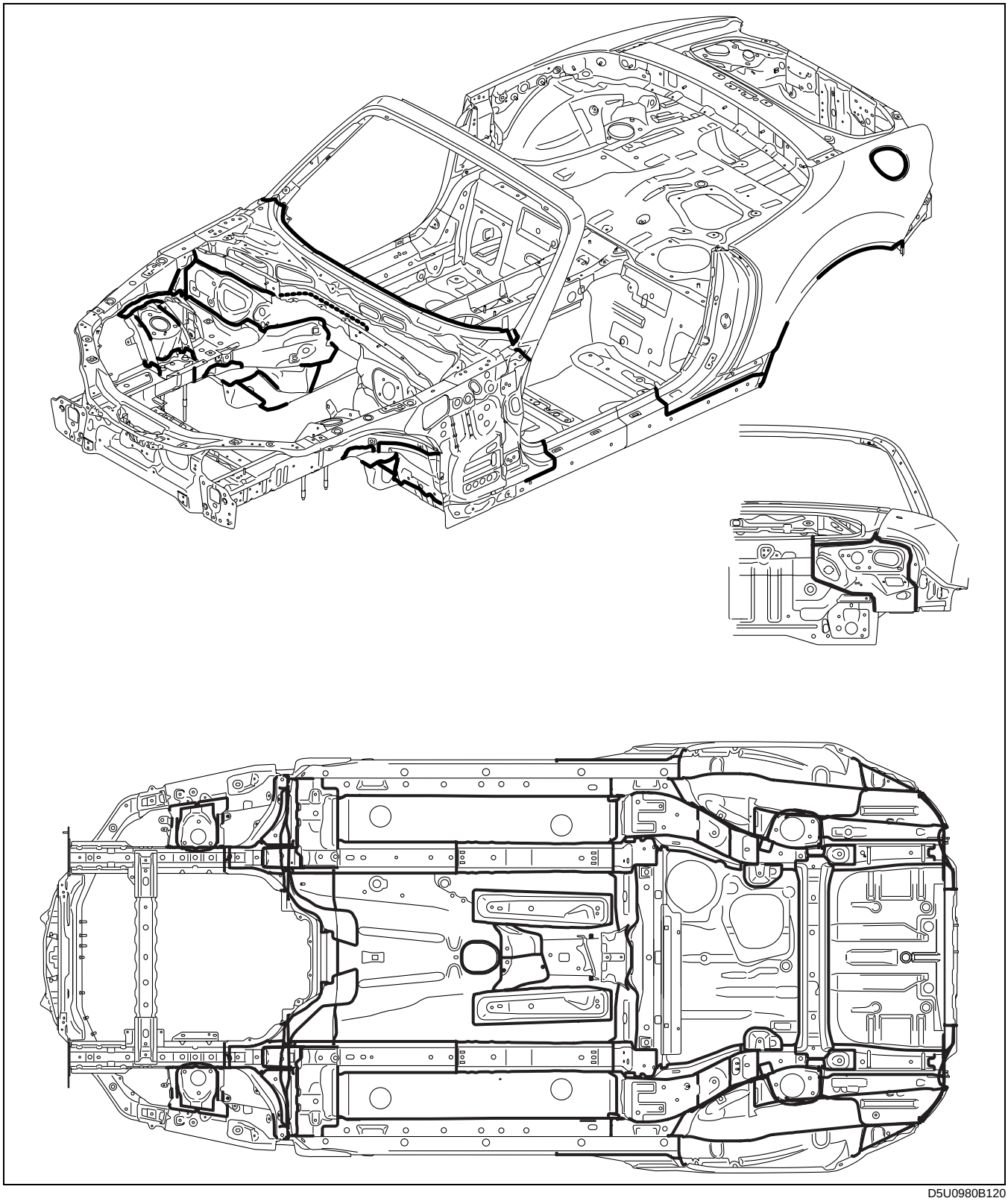
D5U0980B118

09–80C BODY STRUCTURE [WATER-PROOF AND RUST PREVENTIVE]

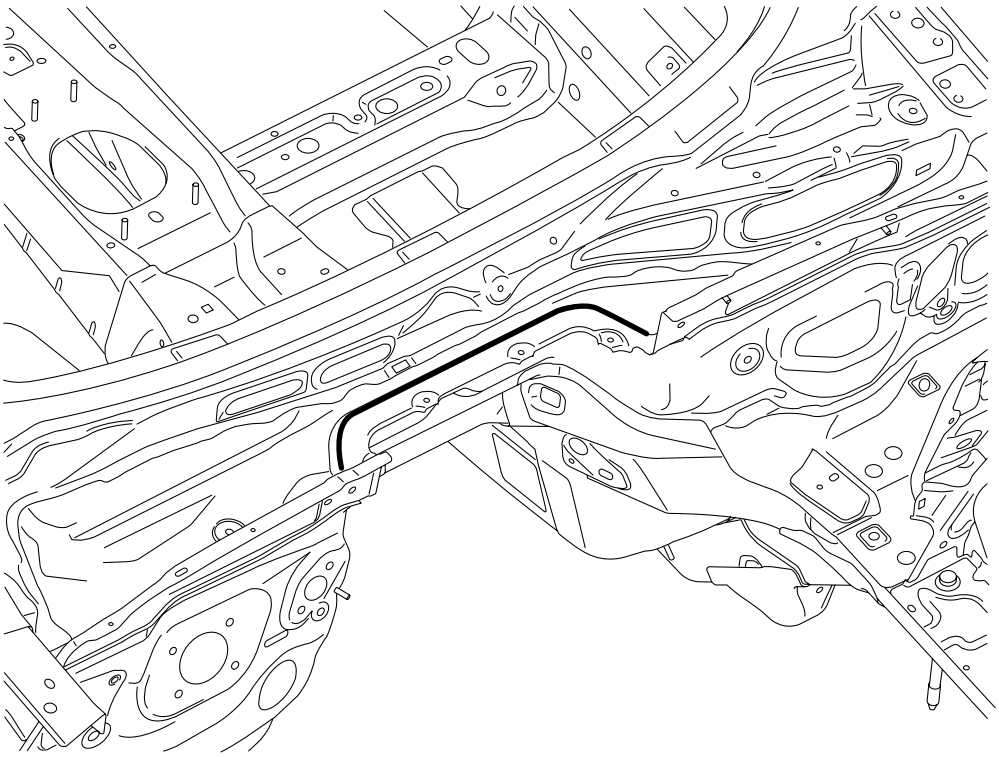
BODY SEALING

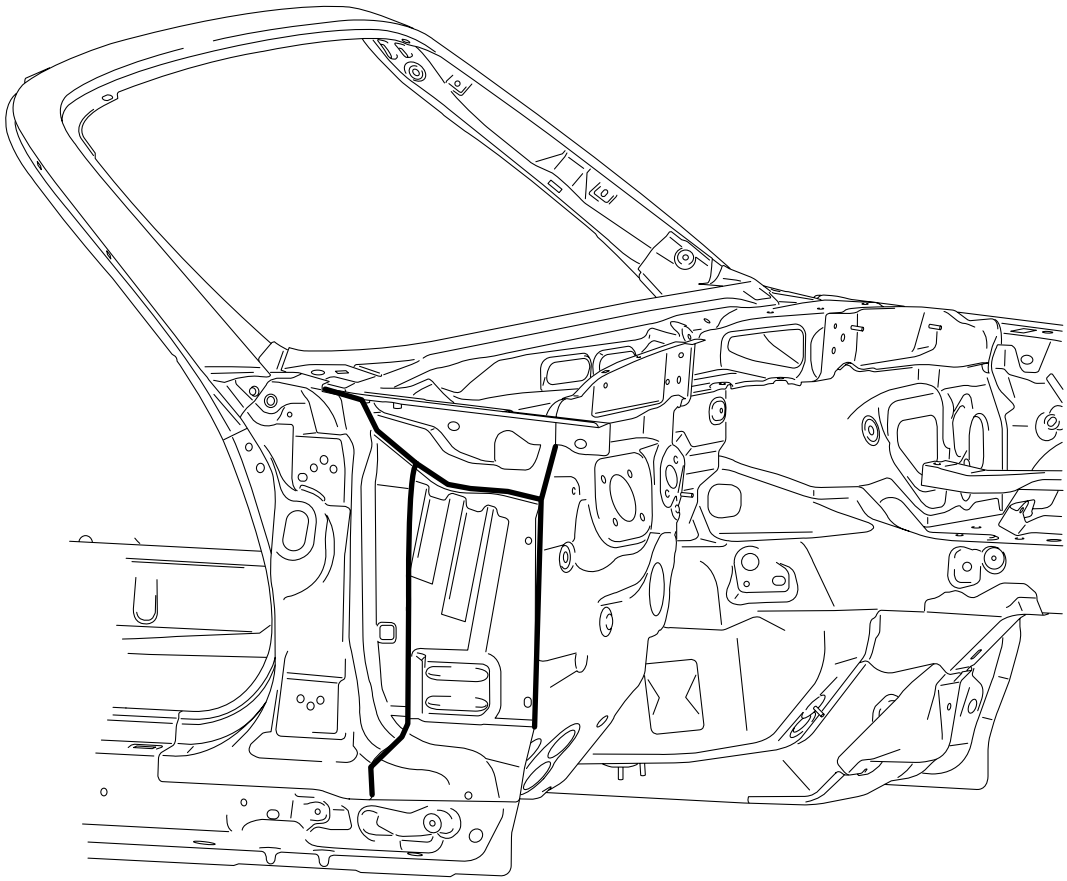
D5U098007000B03

Sealant is applied to the parts where the panels meet and to the hemmed parts of the door panel and hood panel to provide water proofing and rust proofing.

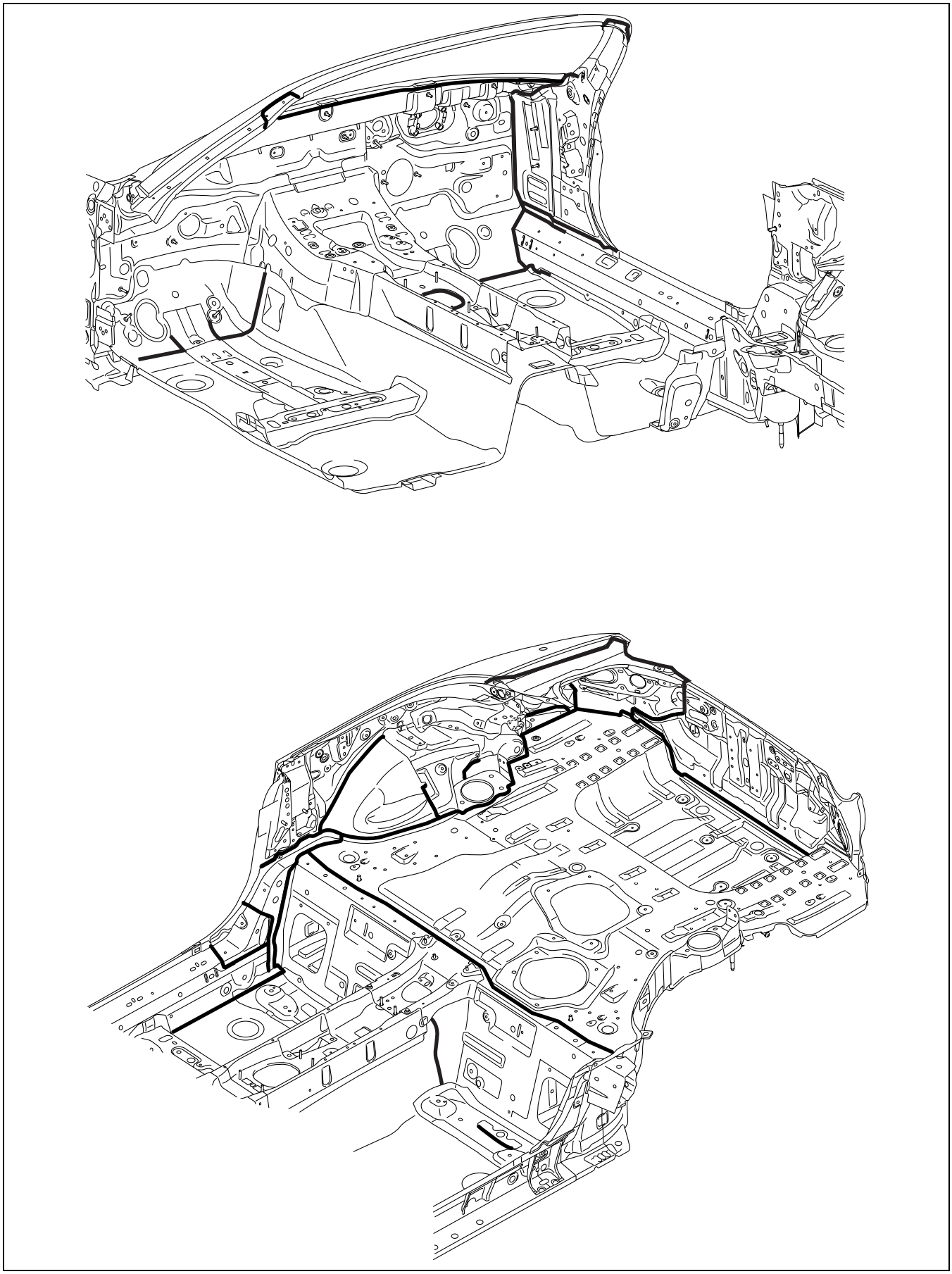


D5U0980B120

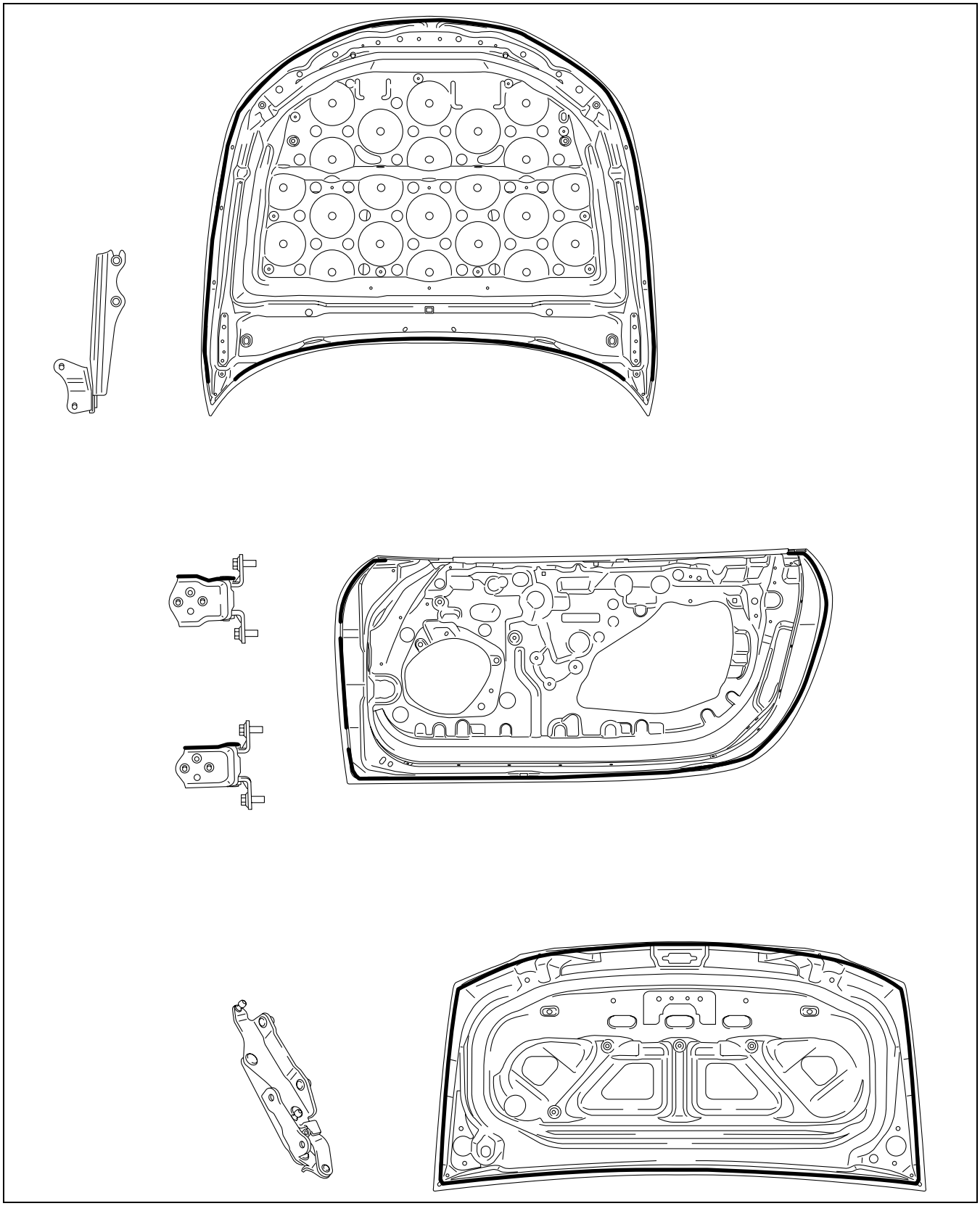




D5U0980B126



D5U0980B121

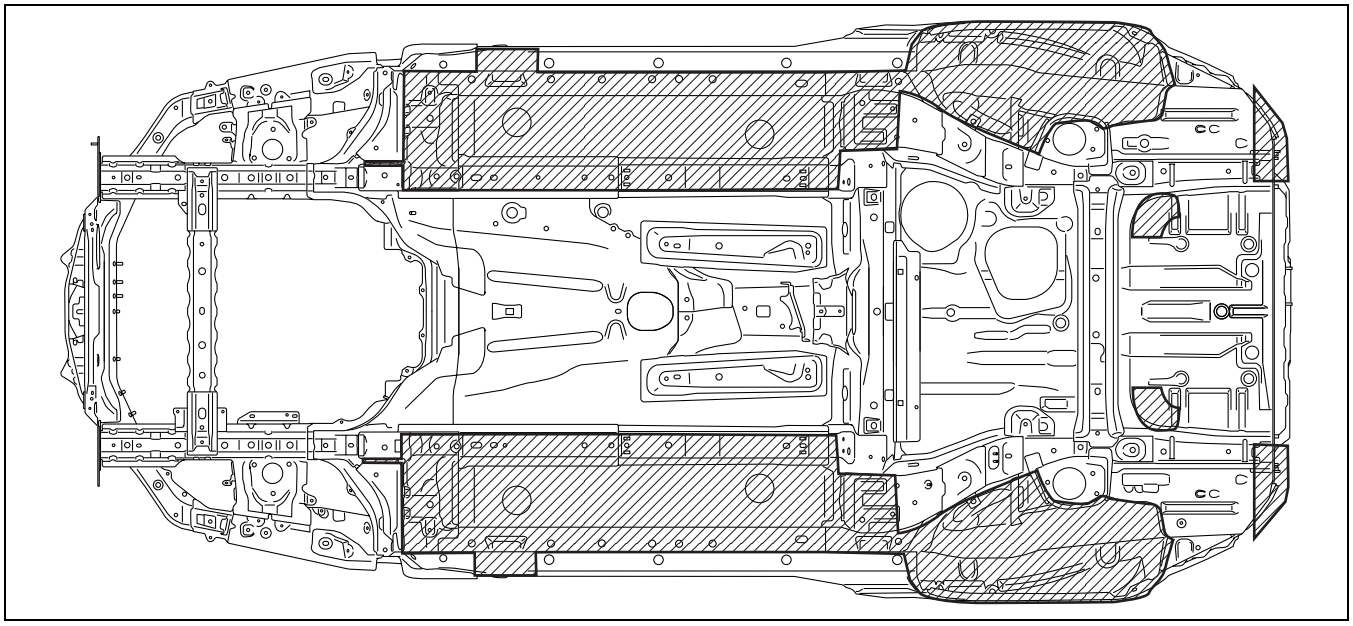


D5U0980B122

UNDER COATING

D5U098007000B04

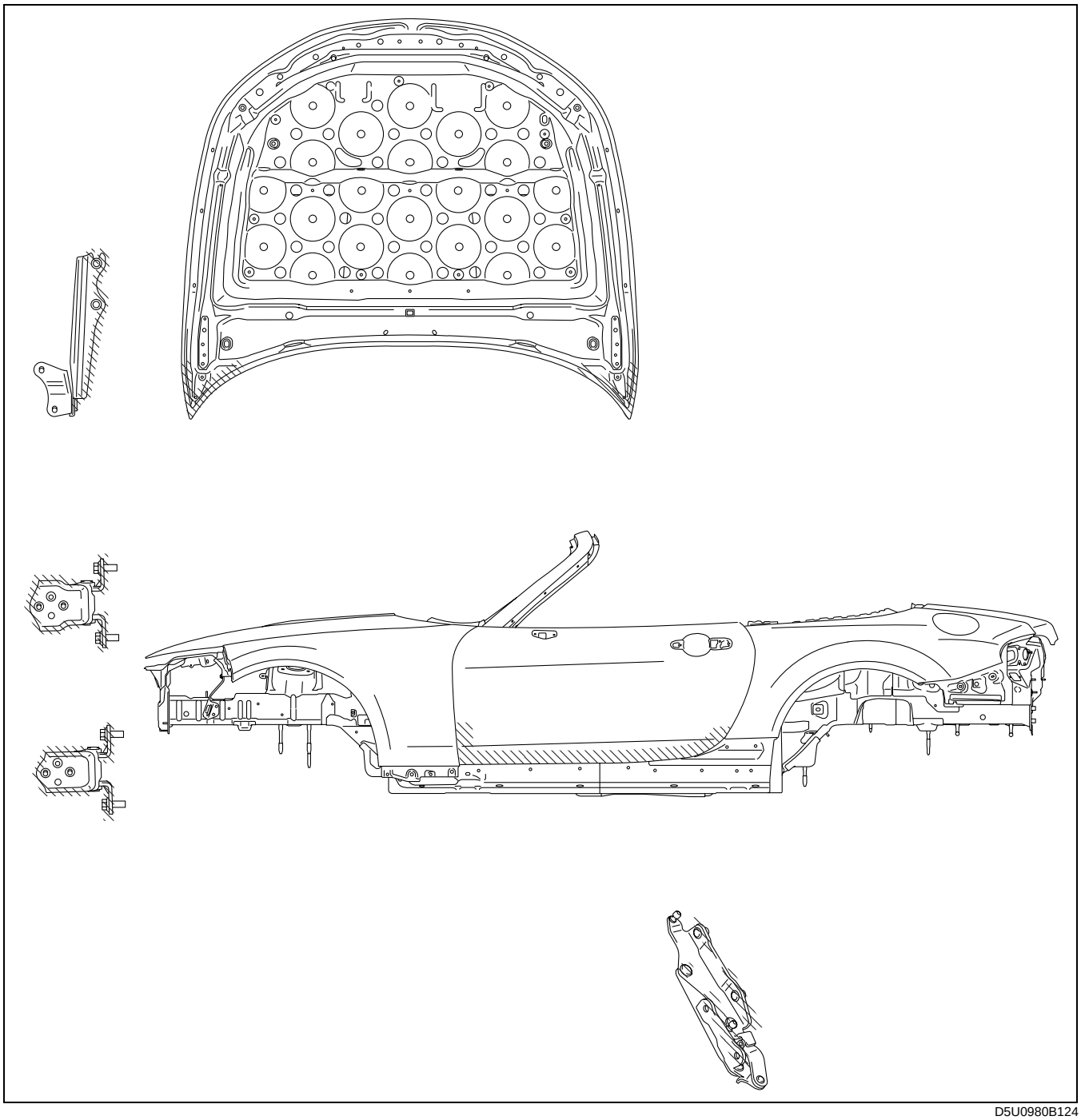
The shaded areas indicated under body locations that are undercoated to prevent noise and rusting.



D5U0980B123

RUST PREVENTIVE TREATMENT

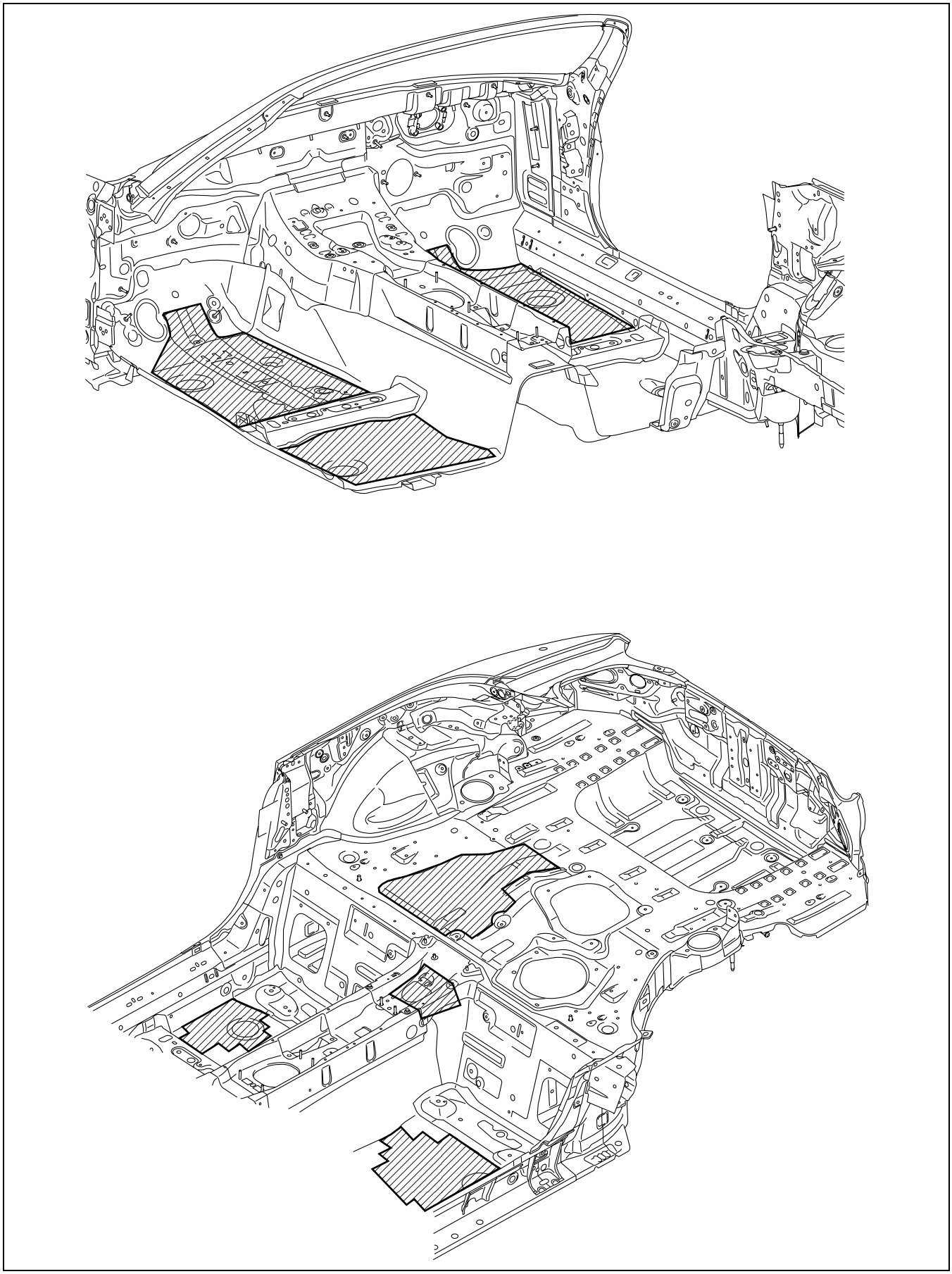
D5U098007000B06



D5U0980B124

DAMPING SHEET REPLACEMENT

D5U098007000B07



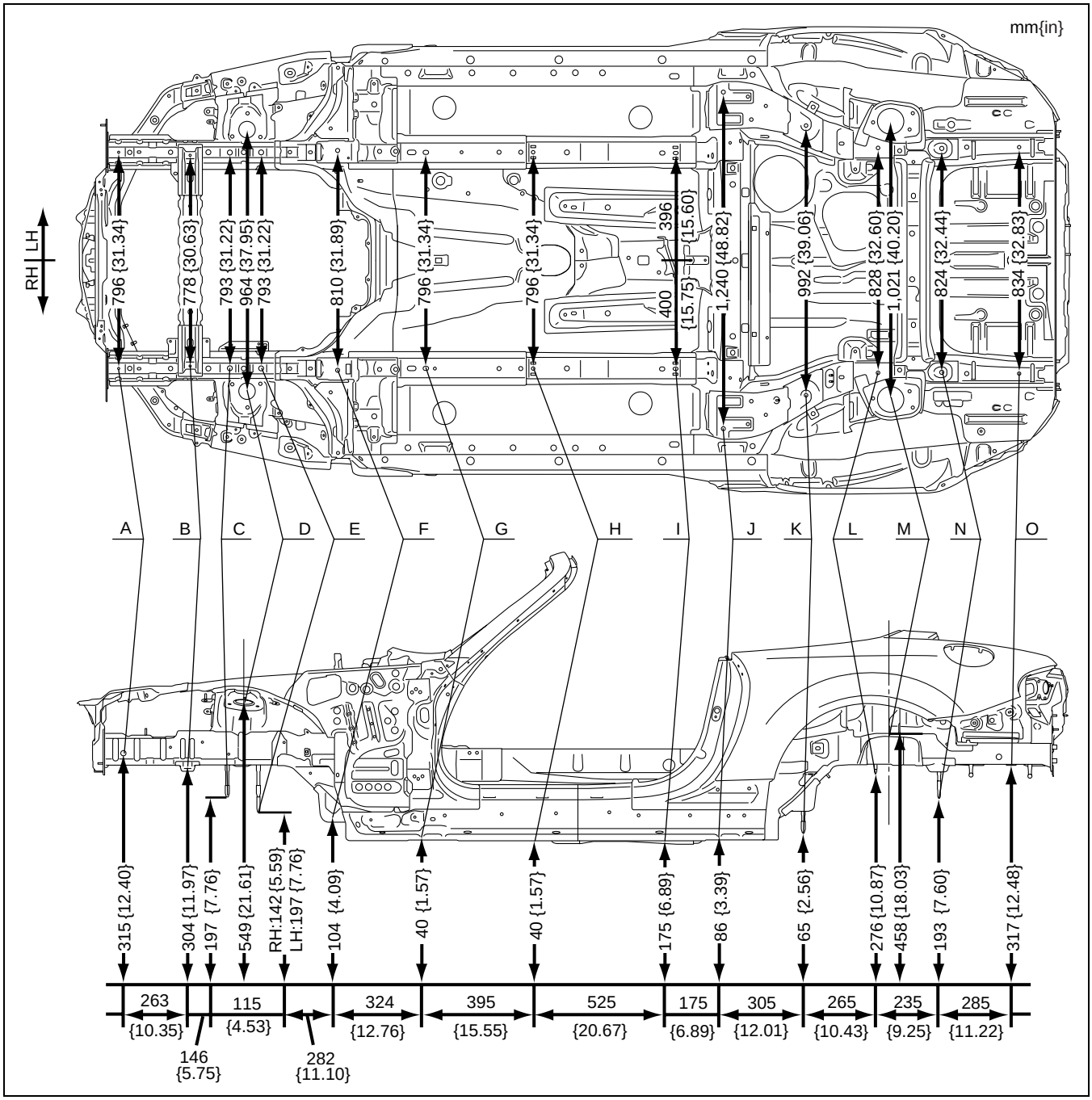
D5U0980B125

09–80D BODY STRUCTURE [DIMENSIONS]

UNDERBODY FLAT-PLANE DIMENSIONS

D5U098053010B01

- The following figures are bottom and side views.



D5U0980B001

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front side frame datum hole	ø7 {0.28}
B	Crossmember No.1 datum hole	ø7 {0.28}
C	Engine mounting bolt	M14 {0.55}
D	Front suspension mounting block	ø64 {2.52}
E	Engine mounting bolt	M14 {0.55}
F	Front frame rear datum hole	ø16 {0.63}
G	Front frame rear datum slot	ø16 x 20 {0.63 x 0.79}

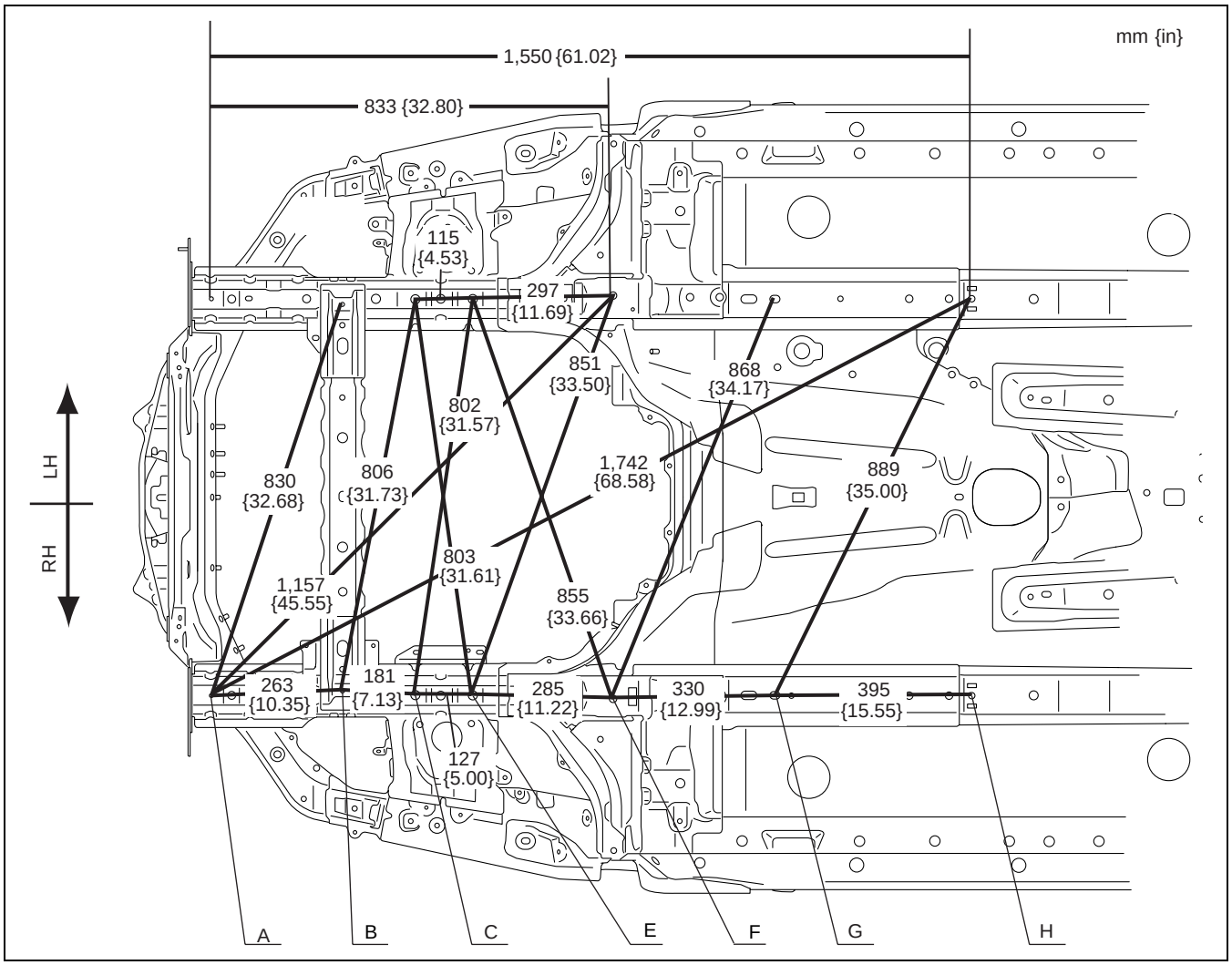
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
H	Front B frame datum hole	ø12 {0.47}
I	Front B frame datum slot	ø12 x 18 {0.47 x 0.71}
J	Rear side frame datum hole	ø16 {0.63}
K	Rear crossmember mounting bolt	M14 {0.55}
L	Rear crossmember mounting bolt	M14 {0.55}
M	Rear suspension mounting block	ø97 {3.82}

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
N	Rear crossmember mounting bolt	M14 {0.55}
O	Rear side frame datum slot	ø16 x 20 {0.63 x 0.79}

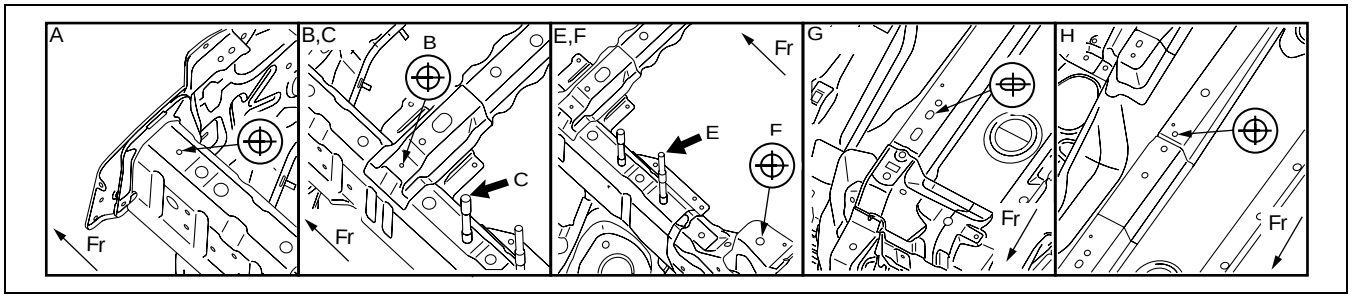
UNDERBODY FRONT STRAIGHT-LINE DIMENSIONS

D5U098053010B02

- The following figure is a bottom view.



D5U0980B020



D5U0980B021

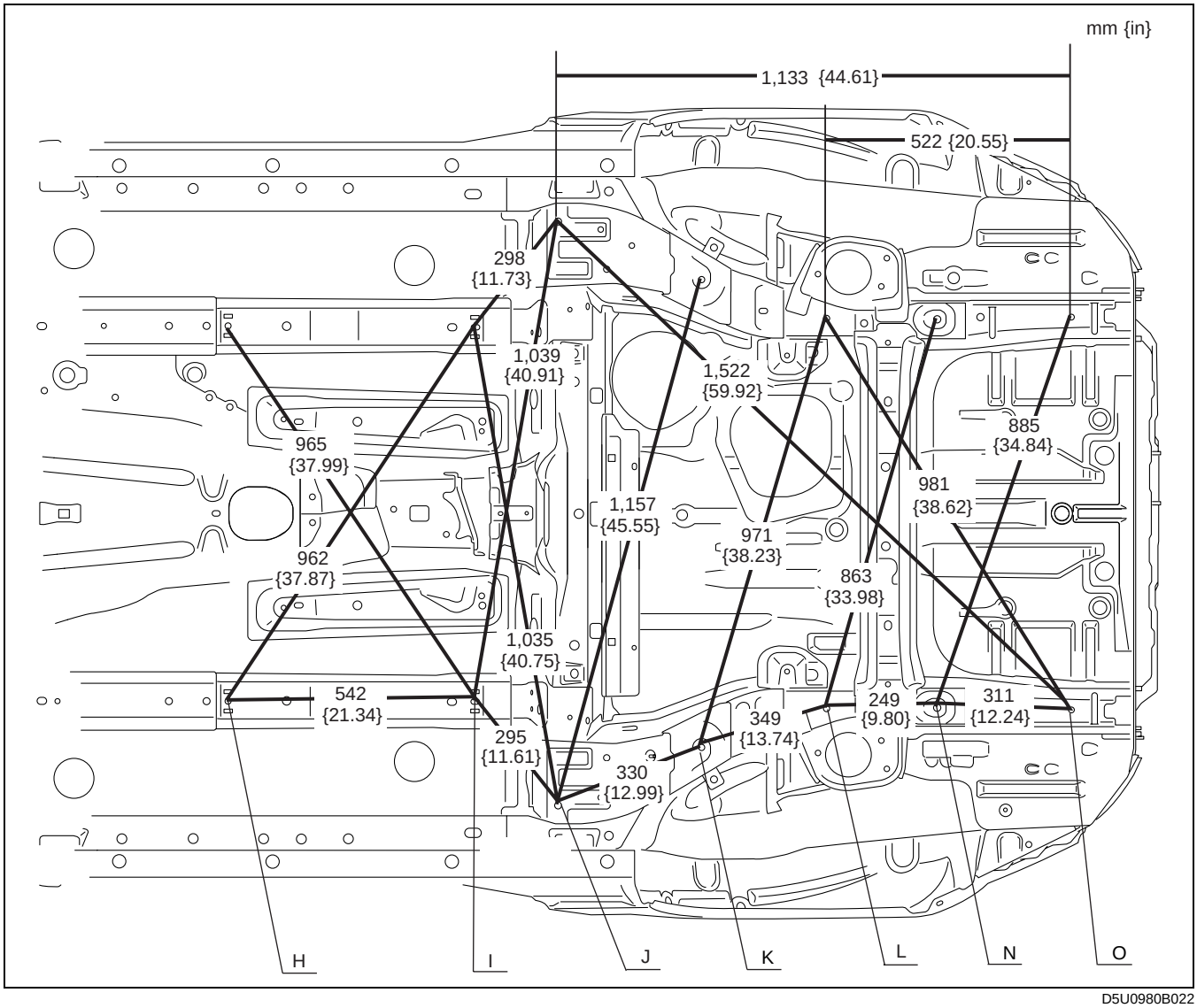
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front side frame datum hole	ø7 {0.28}
B	Crossmember No.1 datum hole	ø7 {0.28}
C	Engine mounting bolt	M14 {0.55}
E	Engine mounting bolt	M14 {0.55}

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
F	Front frame rear datum hole	ø16 {0.63}
G	Front frame rear datum slot	ø16 x 20 {0.63 x 0.79}
H	Front B frame datum hole	ø12 {0.47}

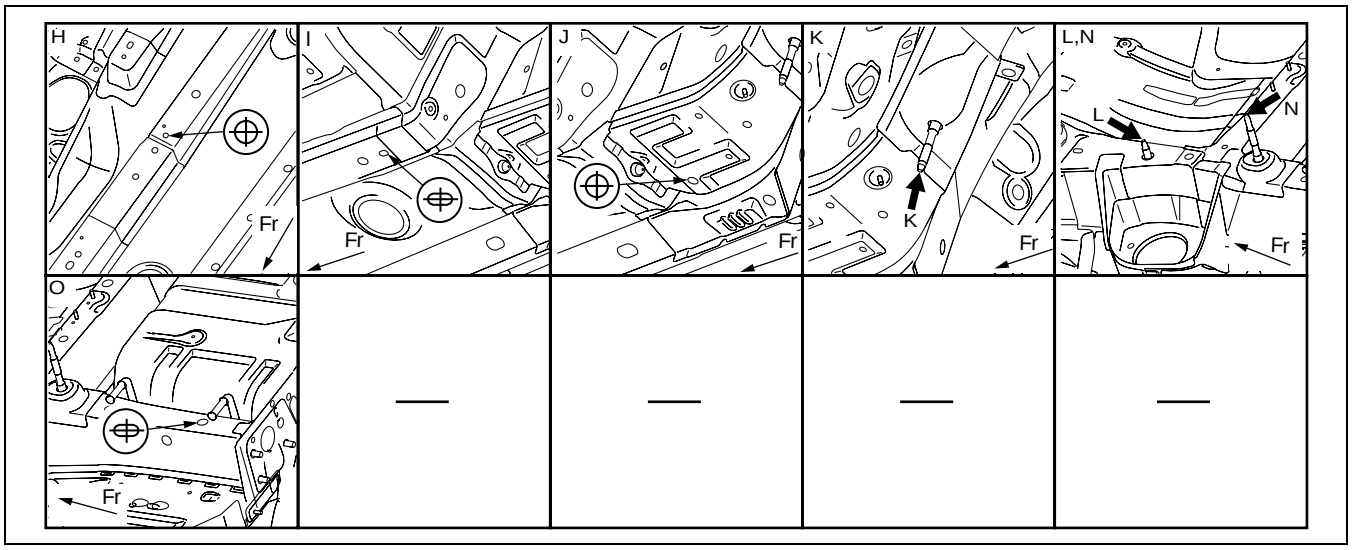
UNDERBODY REAR STRAIGHT-LINE DIMENSIONS

D5U098053010B03

- The following figure is a bottom view.



D5U0980B022



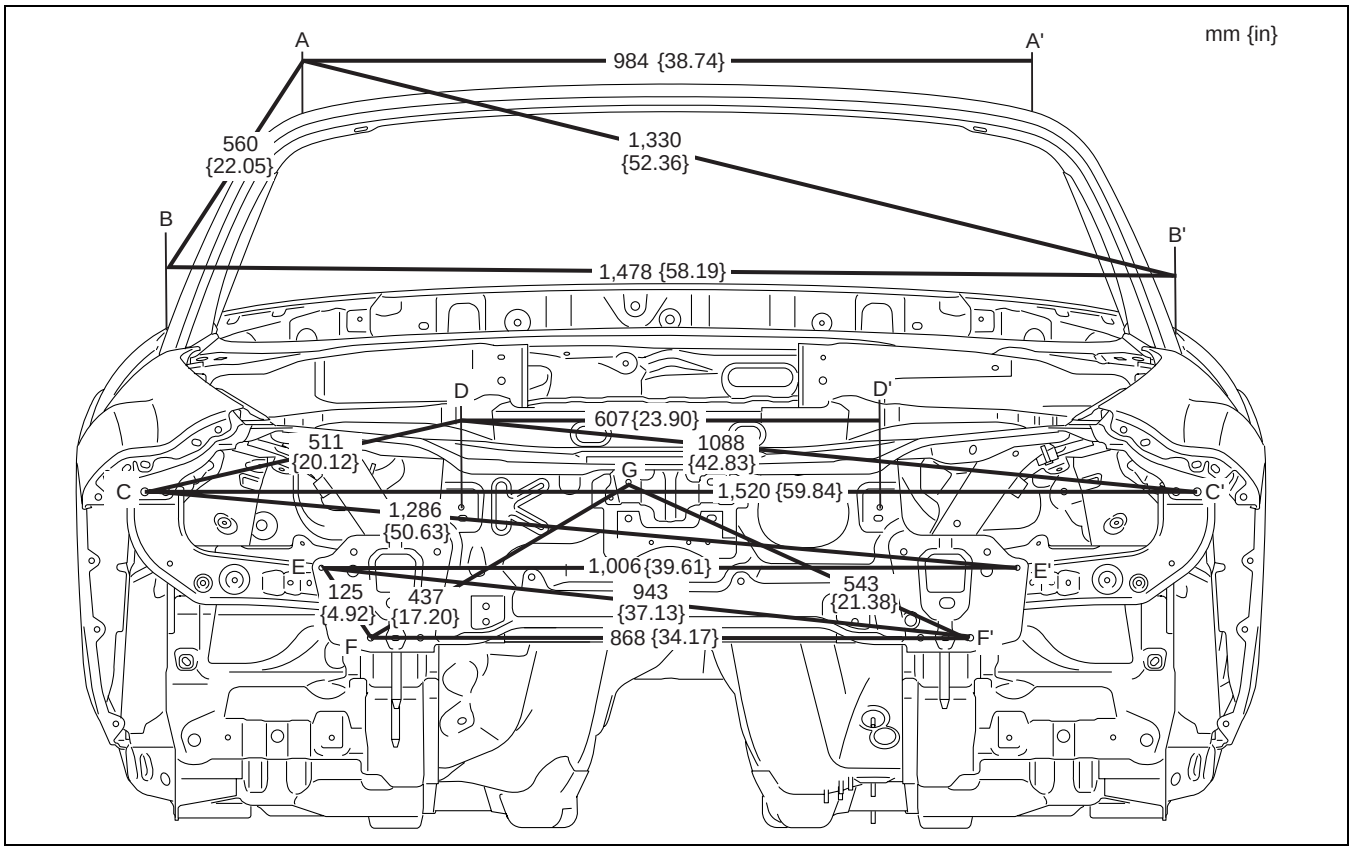
D5U0980B023

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
H	Front B frame datum hole	ø12 {0.47}
I	Front B frame datum slot	ø12 x 18 {0.47 x 0.71}
J	Rear side frame datum hole	ø16 {0.63}
K	Rear crossmember mounting bolt	M14 {0.55}

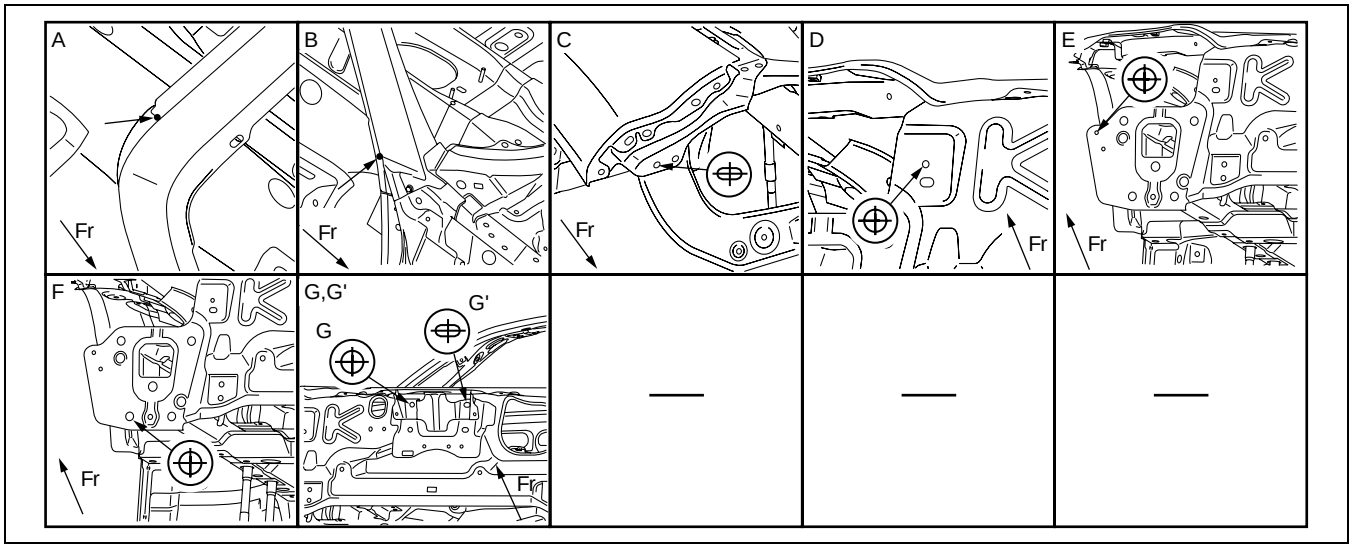
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
L	Rear crossmember mounting bolt	M14 {0.55}
N	Rear crossmember mounting bolt	M14 {0.55}
O	Rear side frame datum hole	ø16 x 20 {0.63 x 0.79}

FRONT BODY STRAIGHT-LINE DIMENSIONS (1)

D5U098053020B01



D5U0980B004



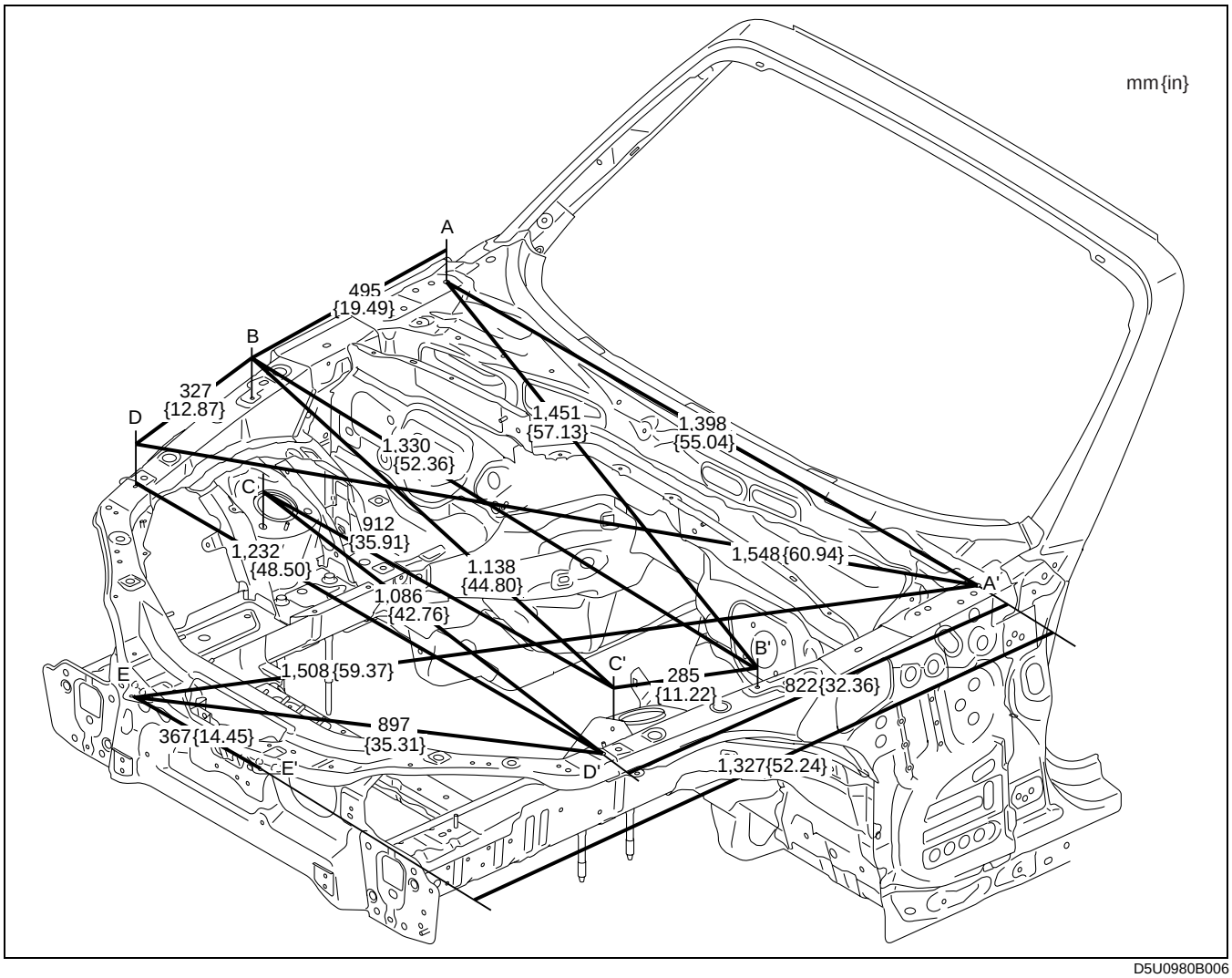
D5U0980B005

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front header notch	-
B	Front header projection location	-
C	Front fender installation slot	ø10 x 12 {0.39 x 0.47}
D	Front combination light installation hole	ø7 {0.28}

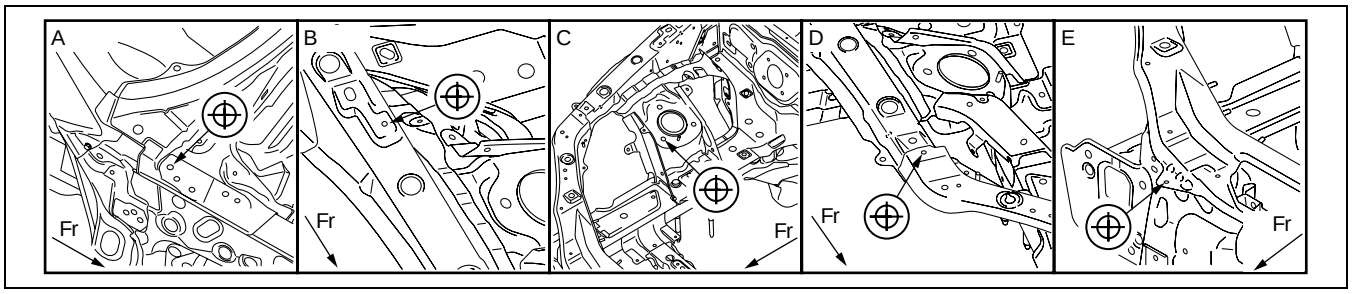
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
E	Front combination light installation hole	ø7 {0.28}
F	Front bumper reinforcement installation hole	ø14 {0.55}
G	Hood bracket datum hole	ø10 {0.39}
G’	Hood bracket datum slot	ø10 x 14 {0.39 x 0.55}

FRONT BODY STRAIGHT-LINE DIMENSIONS (2)

D5U098053020B02



D5U0980B006



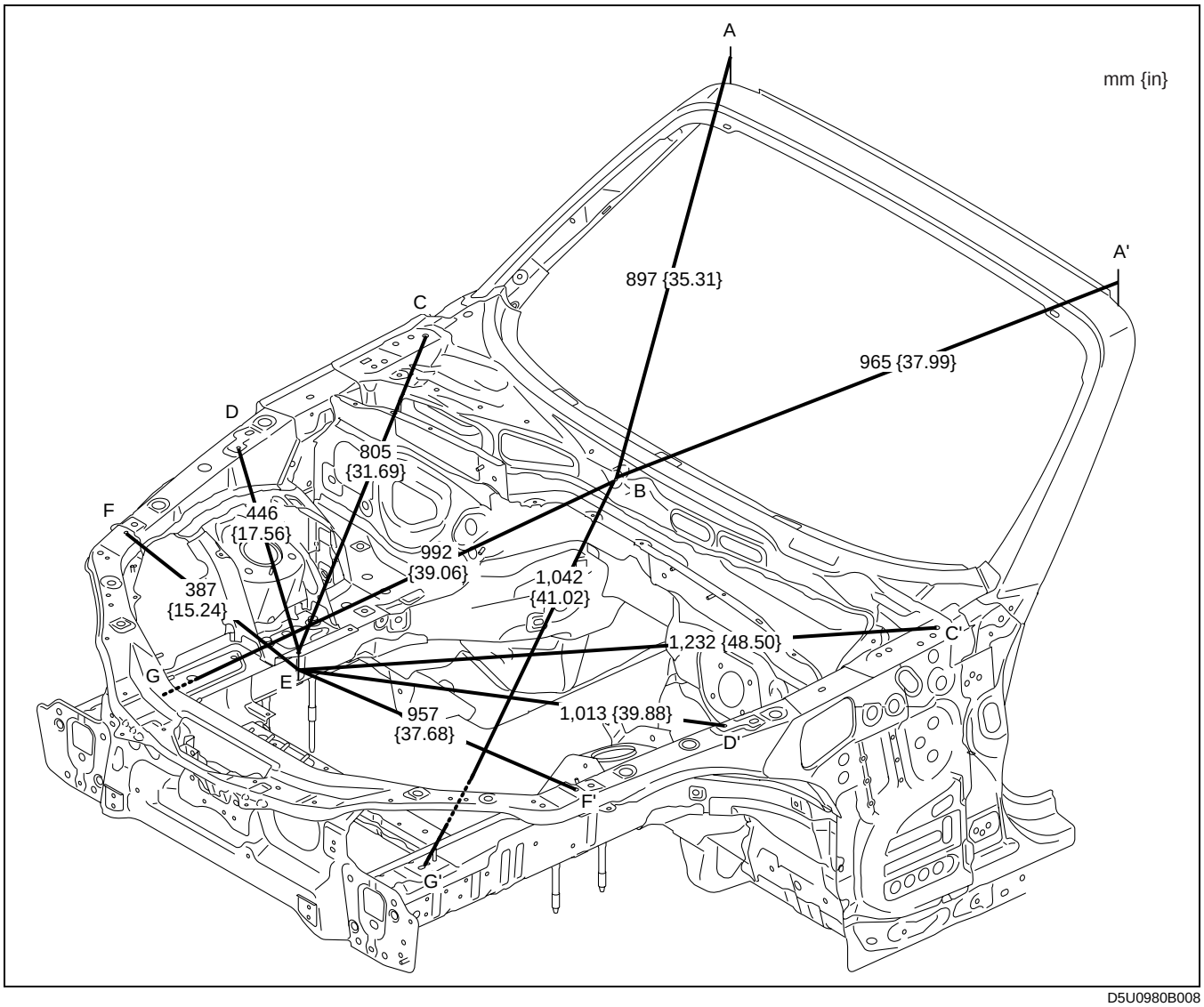
D5U0980B007

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Hood hinge installation hole	ø12 {0.47}
B	Front fender installation hole	ø7 {0.28}
C	Suspension housing upper datum hole	ø13 {0.51}

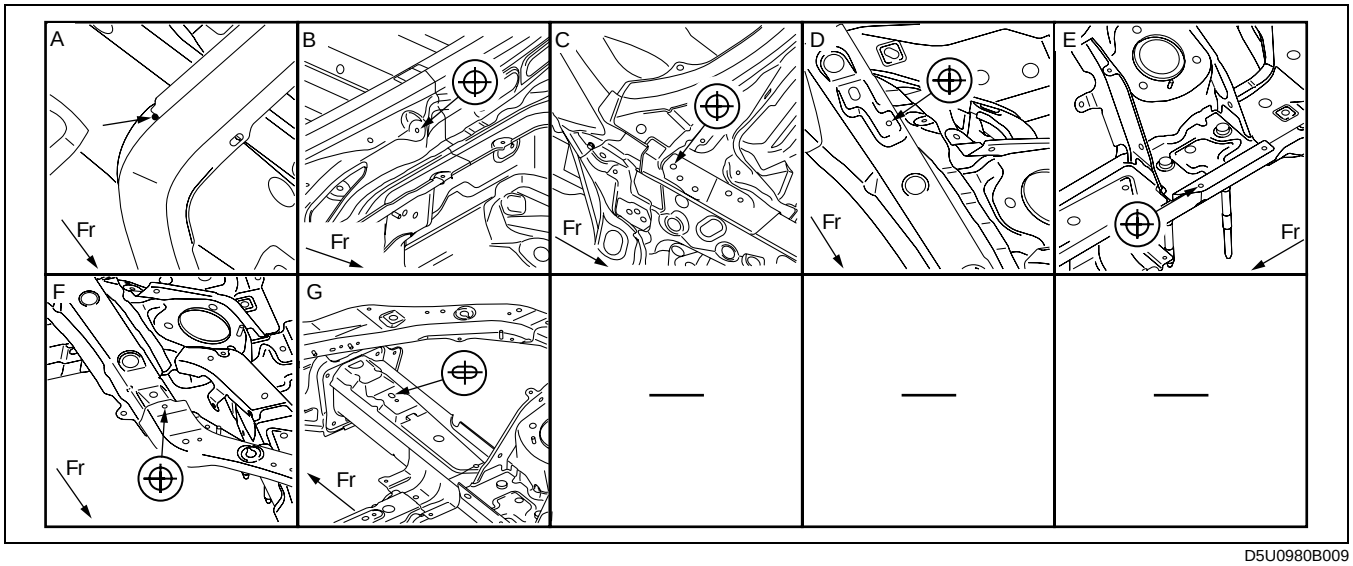
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
D	Front fender installation hole	ø10 {0.39}
E	Front bumper installation hole	ø7 {0.28}

FRONT BODY STRAIGHT-LINE DIMENSIONS (3)

D5U098053020B03



D5U0980B008



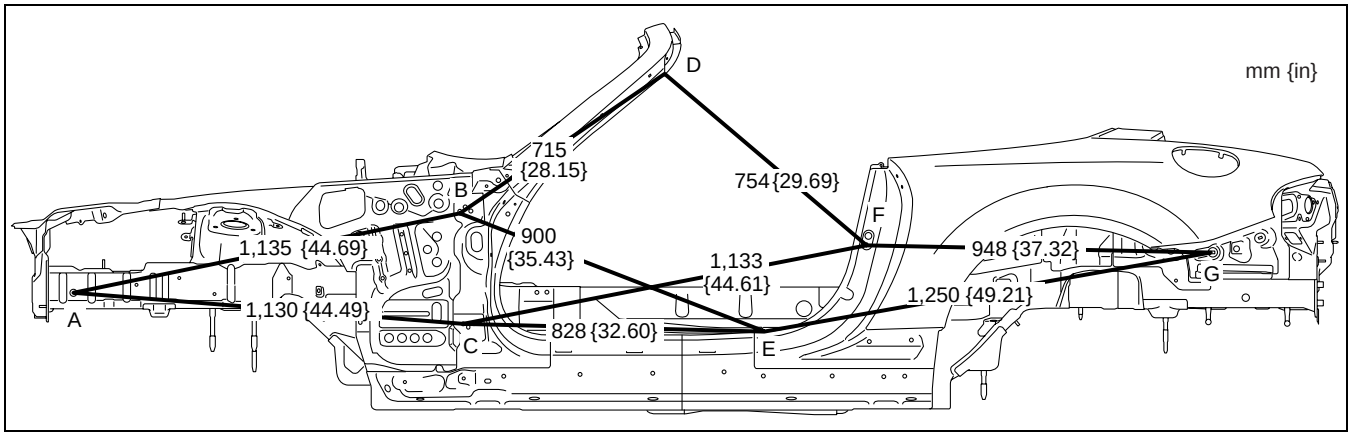
D5U0980B009

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front header notch	-
B	Wiper installation hole	ø7 {0.28}
C	Hood hinge installation hole	ø12 {0.47}
D	Front fender installation hole	ø7 {0.28}

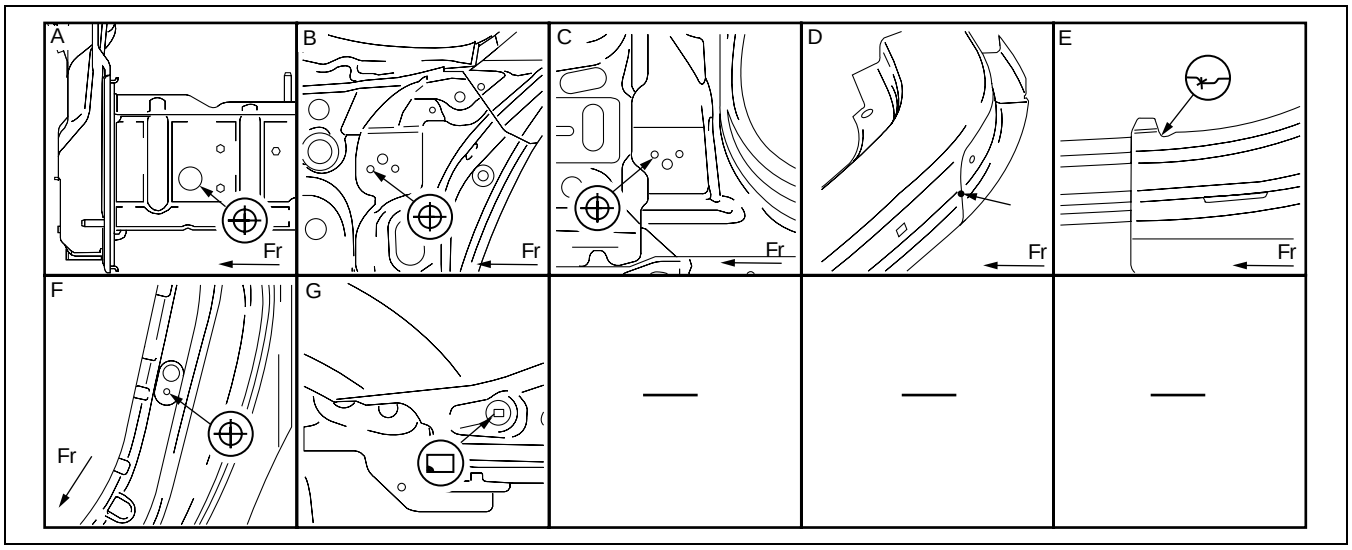
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
E	Suspension mounting reinforcement datum hole	ø8.2 {0.32}
F	Front fender installation hole	ø10 {0.39}
G	Front side frame outer datum slot	ø10 x 14 {0.39 x 0.55}

CABIN SIDE FRAME STRAIGHT-LINE DIMENSIONS

D5U098070010B01



D5U0980B010



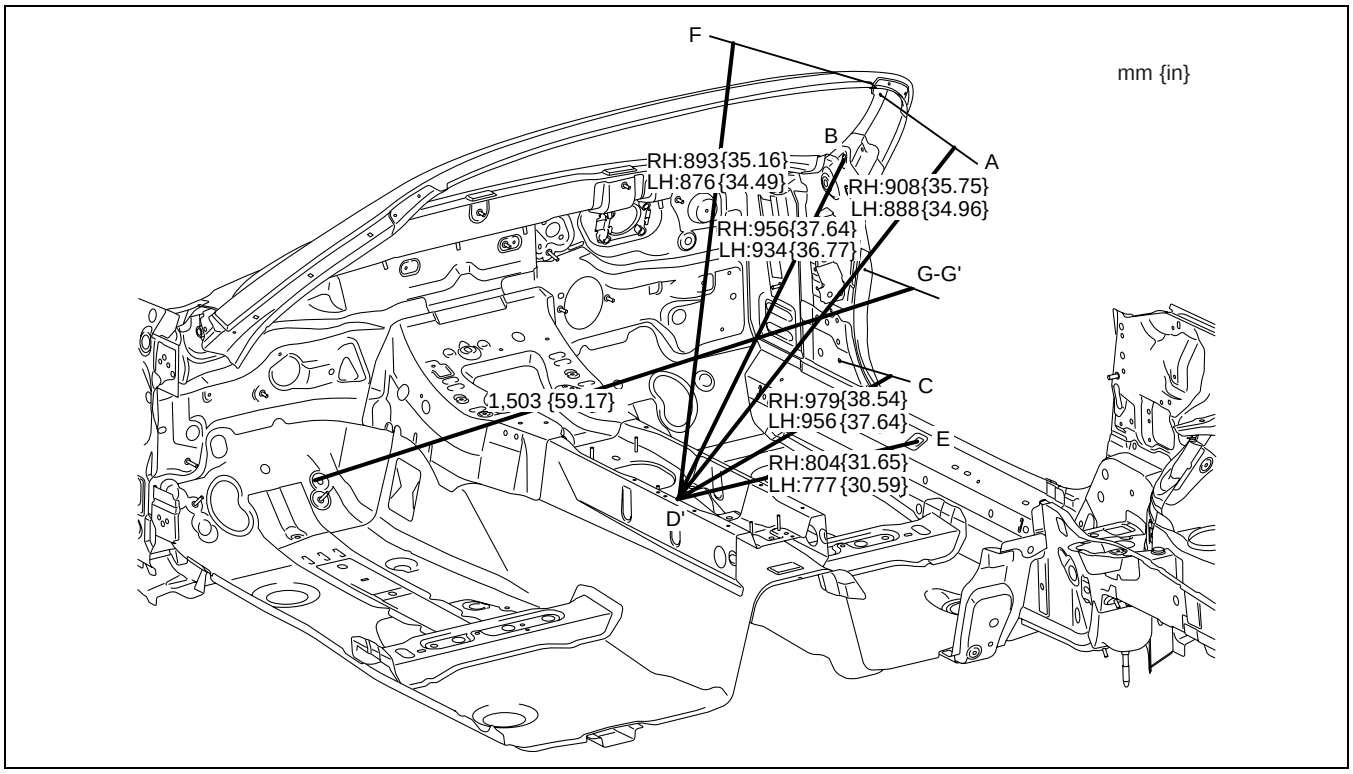
D5U0980B011

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front side frame datum hole	ø20 {0.79}
B	Door hinge installation hole	ø12 {0.47}
C	Door hinge installation hole	ø12 {0.47}
D	Front header notch	-

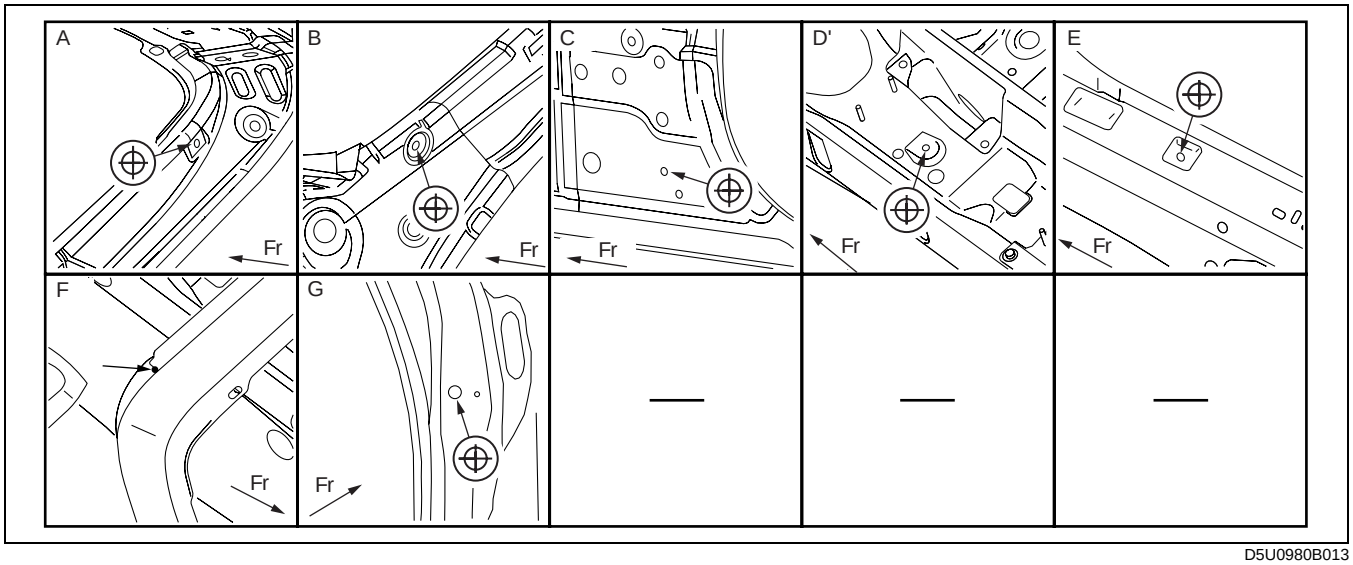
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
E	Rear pillar notch	-
F	Door switch installation hole	ø7.2 {0.28}
G	Rear fender panel standard square hole	8 x 10 {0.31 x 0.39}

ROOM STRAIGHT-LINE DIMENSIONS (1)

D5U098070001B01



D5U0980B012



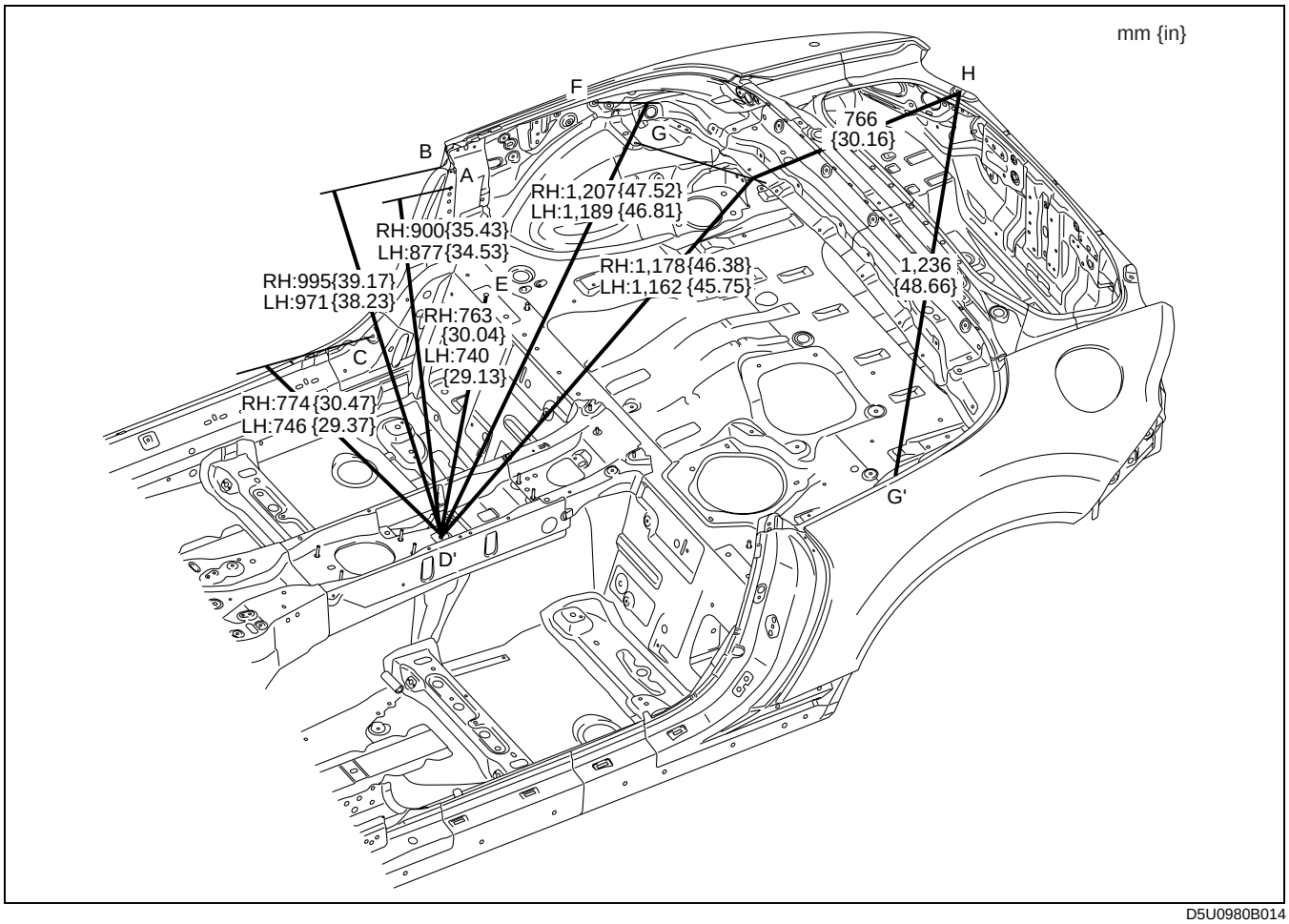
D5U0980B013

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front haeder inner datum hole	ø7 {0.28}
B	Hinge pillar inner datum hole	ø7 {0.28}
C	Hinge pillar inner datum hole	ø5.4 {0.21}
D'	Console installation hole	ø3.8 {0.15}

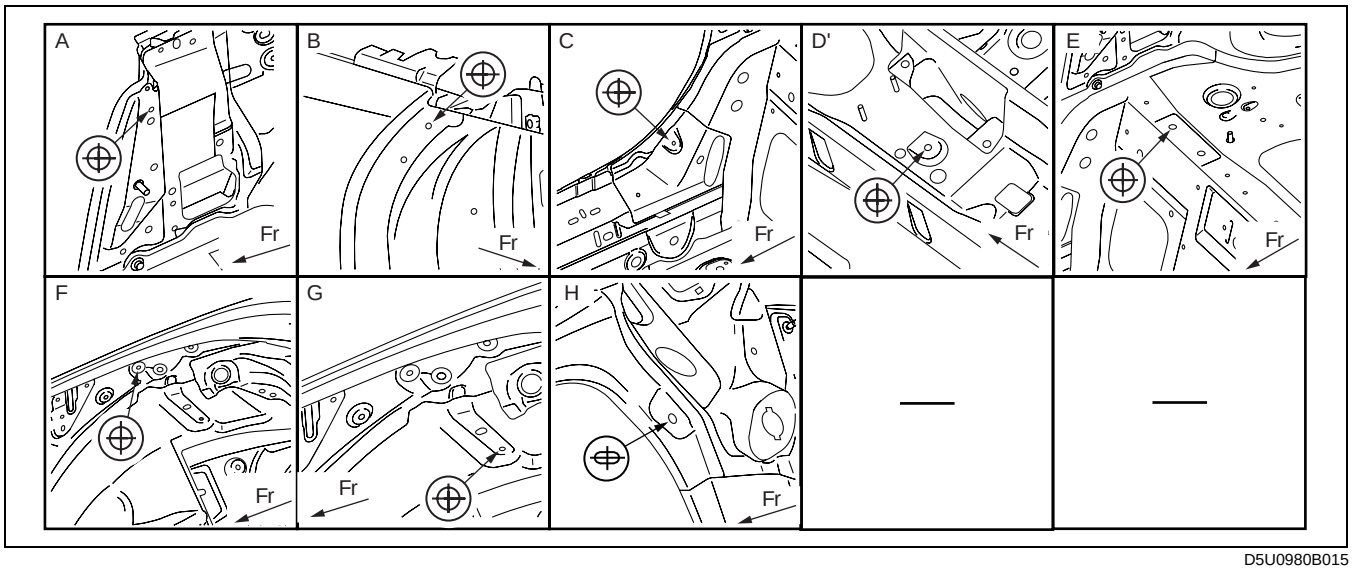
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
E	Side sill inner datum hole	ø7 {0.28}
F	Front header notch	-
G	Checker pin installation hole	ø10 {0.39}

ROOM STRAIGHT-LINE DIMENSIONS (2)

D5U098070001B02



D5U0980B014



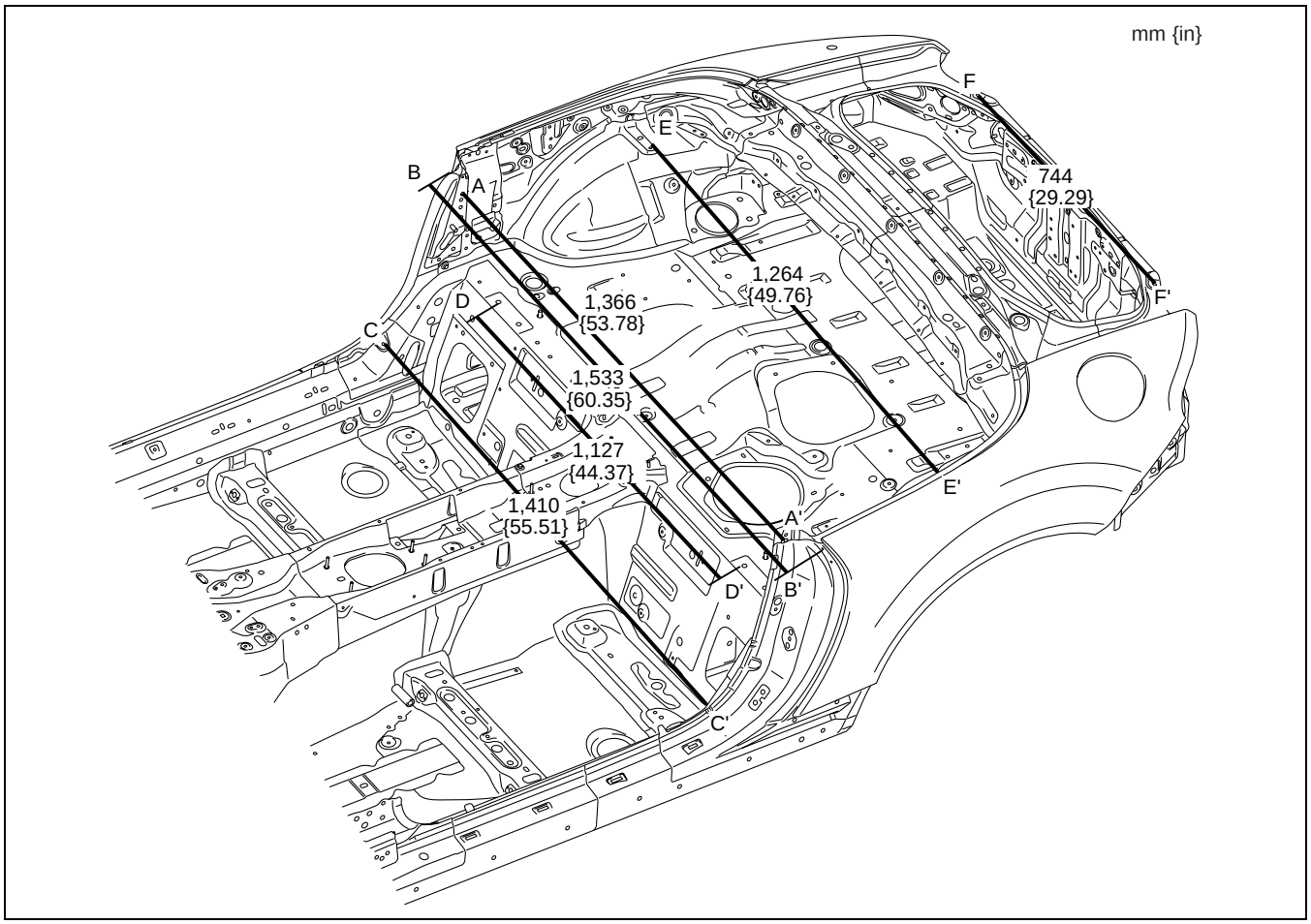
D5U0980B015

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Center pillar inner datum hole	ø14 {0.55}
B	Weather strip datum hole	ø5.2 {0.20}
C	Side sill inner rear datum hole	ø7 {0.28}
D'	Console installation hole	ø3.8 {0.15}

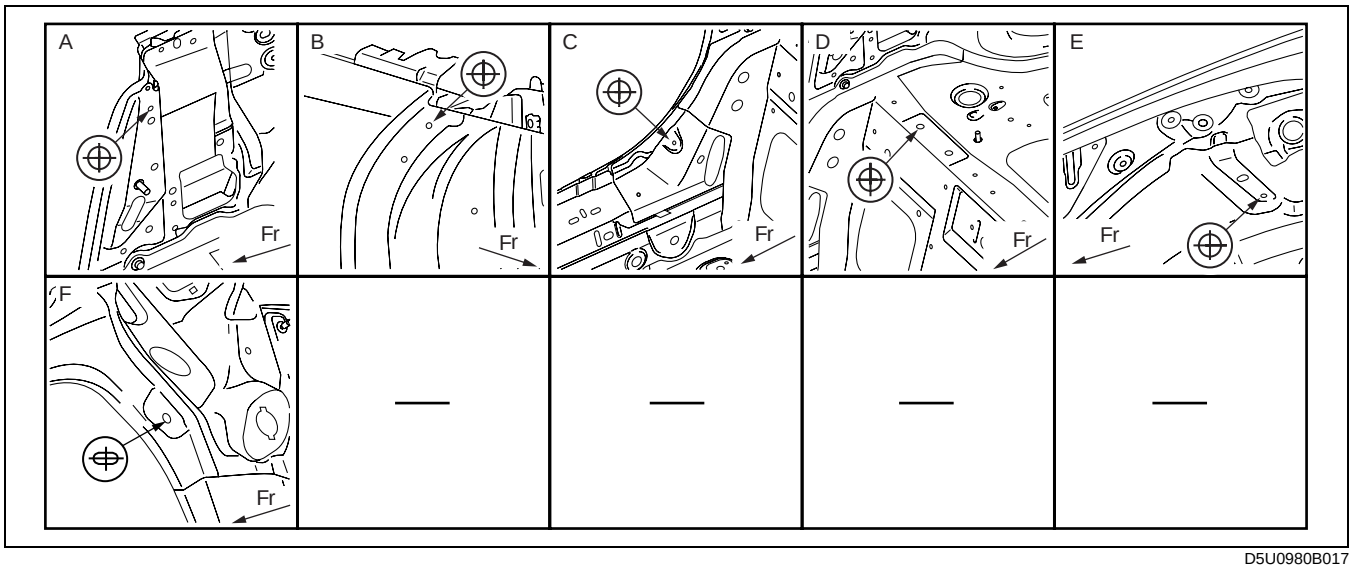
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
E	Center floor pan datum hole	ø12 {0.47}
F	Side brace datum hole	ø7 {0.28}
G	Wheel house inner datum hole	ø10 {0.39}
H	Rear rein rail datum slot	ø12 x 7.2 {0.47x0.28}

ROOM STRAIGHT-LINE DIMENSIONS (3)

D5U098070001B03



D5U0980B016



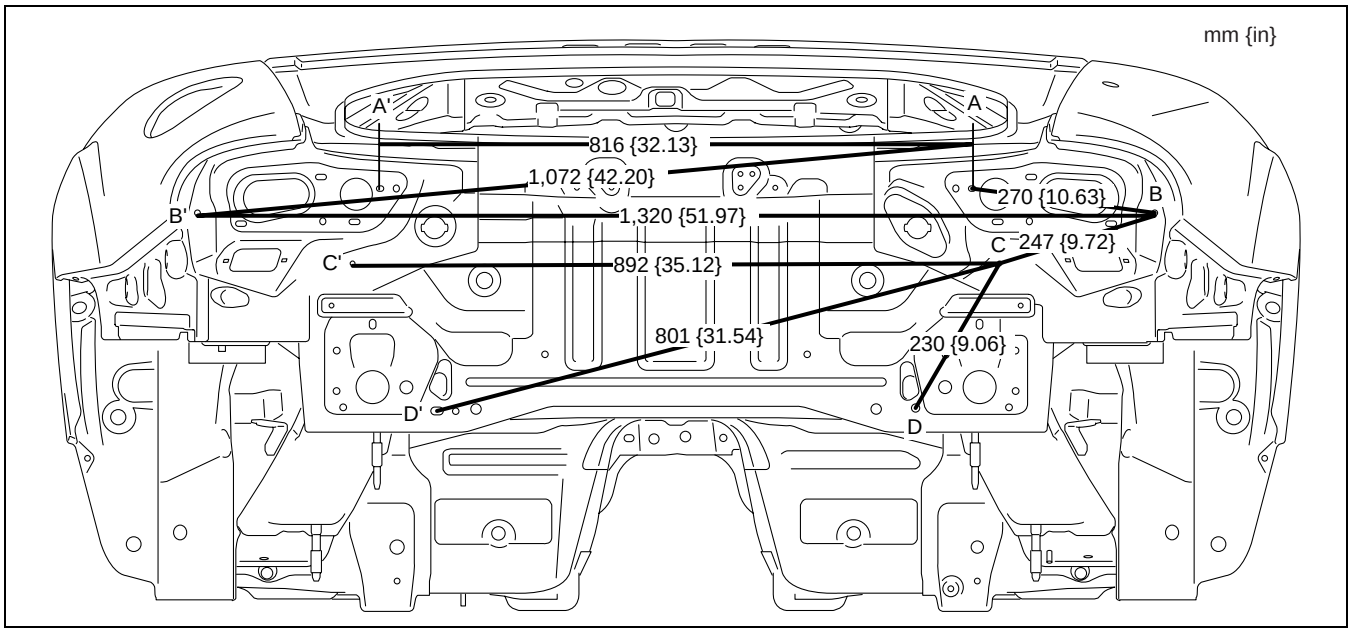
D5U0980B017

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Center pillar inner datum hole	ø14 {0.55}
B	Weather strip datum hole	ø5.2 {0.20}
C	Side sill inner rear datum hole	ø7 {0.28}

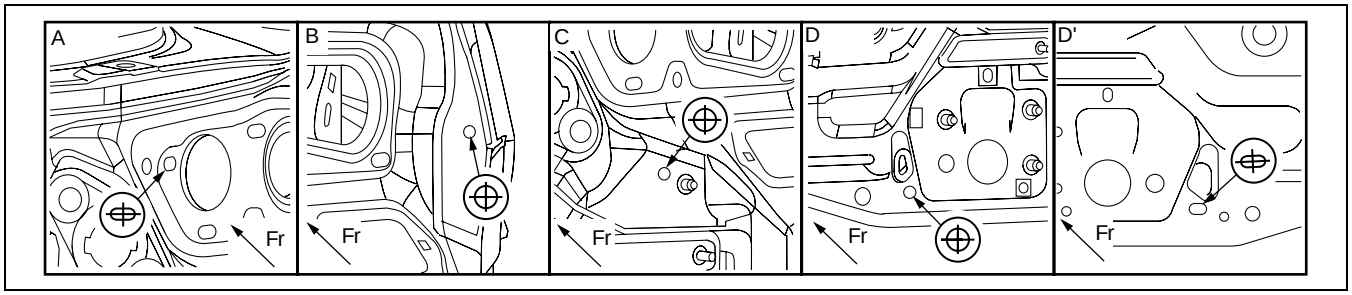
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
D	Center floor pan datum hole	ø12 {0.47}
E	Wheel house inner datum hole	ø10 {0.39}
F	Rear rein rail datum slot	ø12 x 7.2 {0.47x0.28}

REAR BODY STRAIGHT-LINE DIMENSIONS

D5U098070002B01



D5U0980B018



D5U0980B019

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Corner plate standard slot	ø8 x 12 {0.31 x 0.47}
B	Rear fender standard hole	ø8 {0.31}
C	Corner plate standard hole	ø7 {0.28}

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
D	Rear end panel datum hole	ø12 {0.47}
D'	Rear end panel datum slot	ø12 x 6 {0.47 x 0.24}

09–80E BODY STRUCTURE [PLASTIC BODY PARTS]

PLASTIC PARTS HEAT RESISTING TEMPERATURE

D5U098050000B01

Part Name		Code	Material Name	Heat resisting Temperature°C{°F}
FRONT COMBINATION LIGHT	LENS	PC	POLYCARBONATE	130 {266}
	HOUSING	PP	POLYPROPYLENE	125 {257}
FRONT BUMPER		PP	POLYPROPYLENE	110 {230}
FRONT SIDE MARKER LIGHT	LENS	PMMA	ACRYLIC	90 {194}
	HOUSING	ABS	ABS	88 {190}
OUTSIDE MIRROR	BASE	ABS	ABS	85 {185}
	BODY	ABS	ABS	85 {185}
	VISOR	AAS	AAS	88 {190}
SIDE STEP MOLDING		PP	POLYPROPYLENE	110 {230}
REAR BUMPER		PP	POLYPROPYLENE	110 {230}
REAR COMBINATION LIGHT	LENS	PMMA	ACRYLIC	95 {203}
	HOUSING	AAS	AAS	100 {212}
OUTER HANDLE	LEVER	PC-PBT	POLYCARBONATE-PBT	80 {176}
	BASE	PC-PET	POLYCARBONATE-PET	80 {176}
HIGH-MOUNT BRAKE LIGHT	LENS	PC	POLYCARBONATE	130 {266}
	HOUSING	PC	POLYCARBONATE	130 {266}
REFLECTOR	LENS	PMMA	ACRYLIC	90 {194}
	HOUSING	ABS	ABS	88 {190}
REAR DECK PLATE		ABS	ABS	100 {212}

Note

- The application of temperatures higher than heat resisting temperatures may result in part deformation.

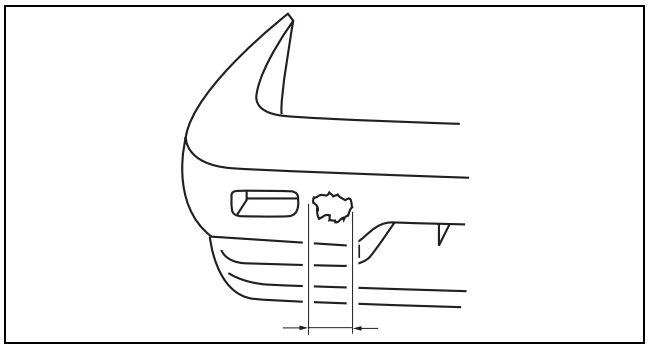
REPAIRABLE RANGE OF POLYPROPYLENE BUMPERS

D5U098050000B02

The three types of damaged bumpers shown below are considered repairable. Although a bumper which has been damaged greater than this could also be repaired, it should be replaced with a new one because such repair would detract from the looks and quality of the bumper. In addition, such repair is not considered reasonable in terms of work time.

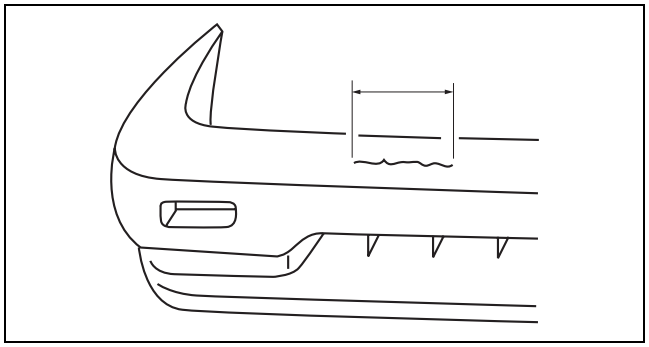
Repairable Bumpers

1. A bumper with a hole less than 50 mm {1.97 in} in diameter.



YMU980PCM

2. A bumper with a crack less than 100 mm {3.94 in} in length.



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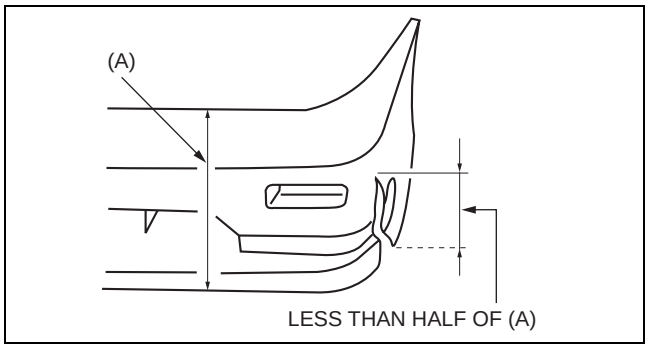
3. A bumper with a crack less than 100 mm {3.94 in} in length that is less than half of the width of the bumper.



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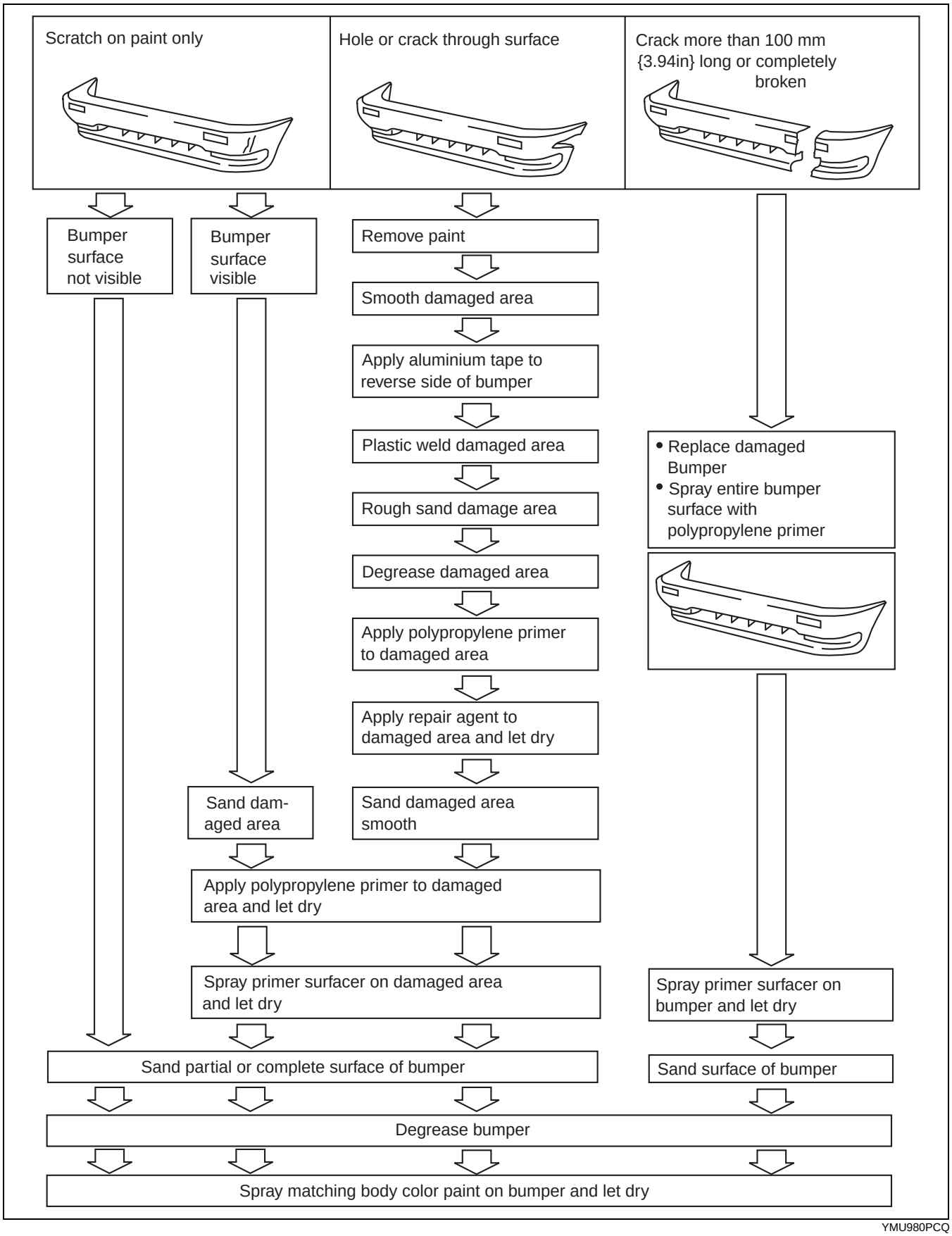
POLYPROPYLENE BUMPER REPAIR

D5U098050000B03



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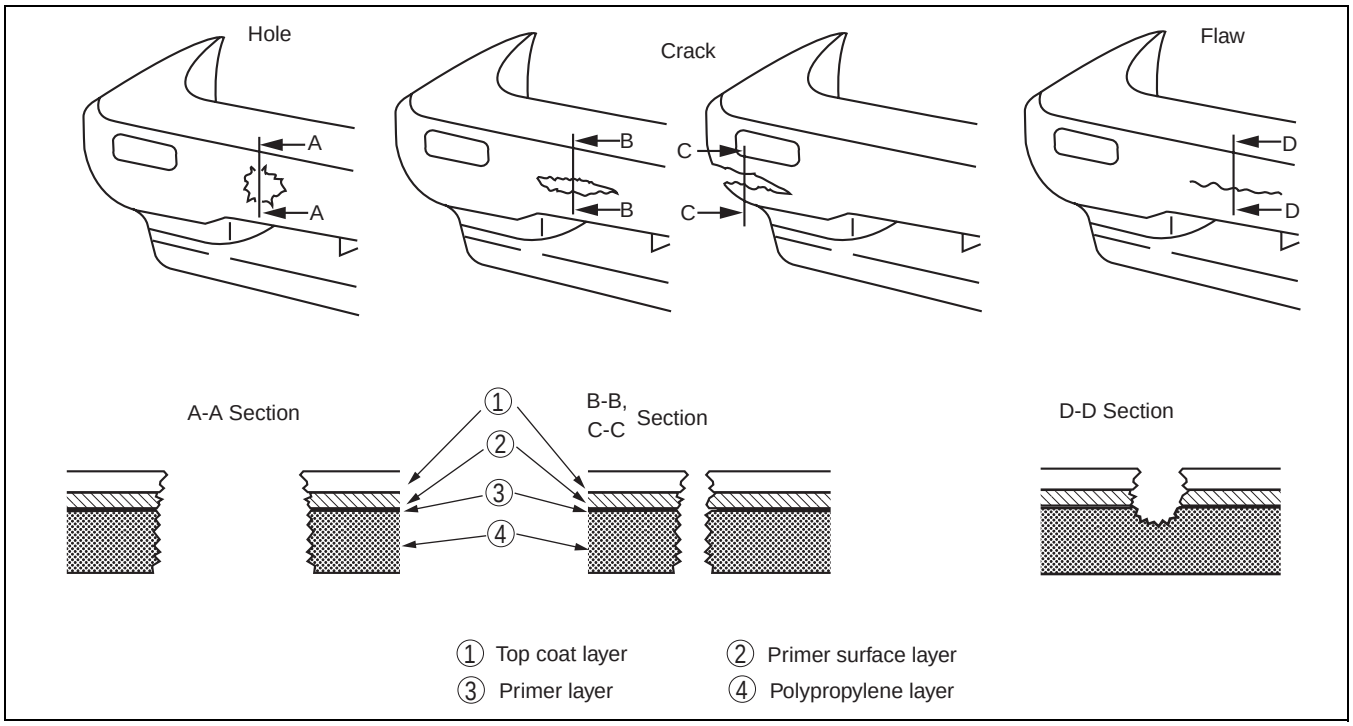
PROCEDURE

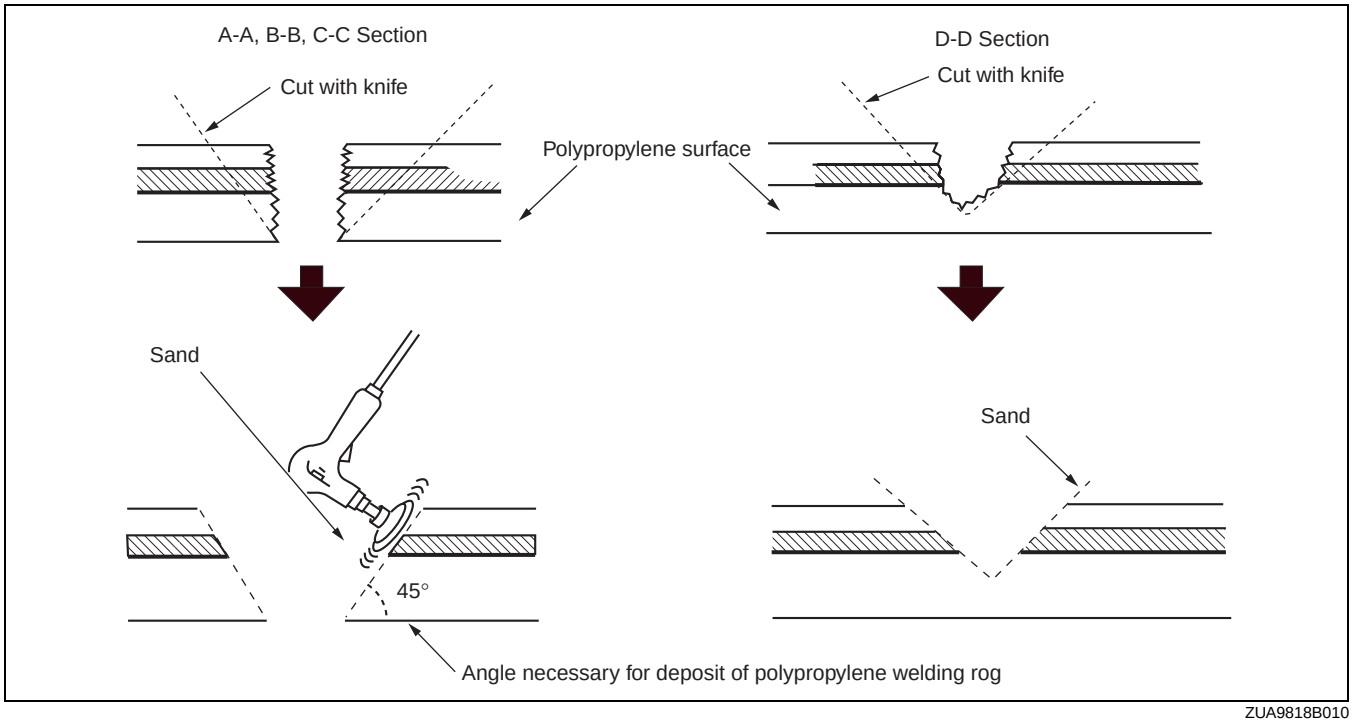
D5U098050000B04

Repair of polypropylene bumpers having damage that has reached the surface of the polypropylene and are too serious to be restored by painting only.



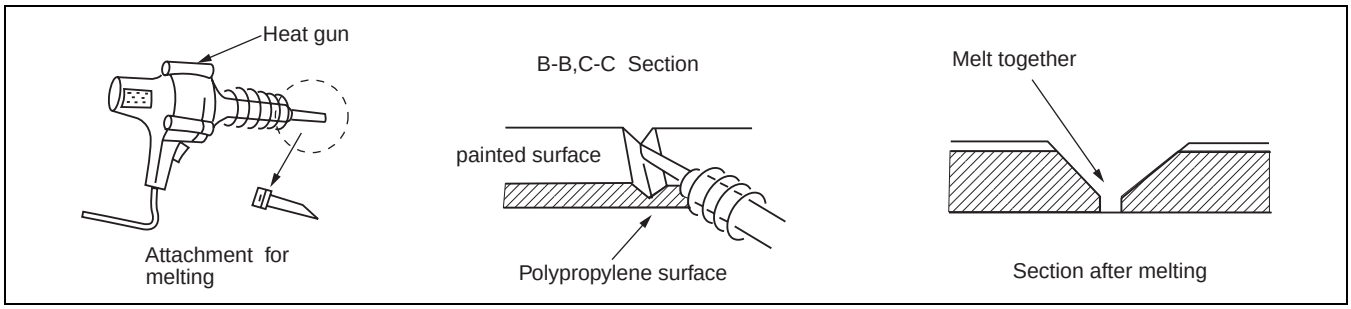
ZUA9818B001

1. Cut the rough edges around the damage with a knife to make it smooth. Sand the area with a sander to make an angle of about 45°.



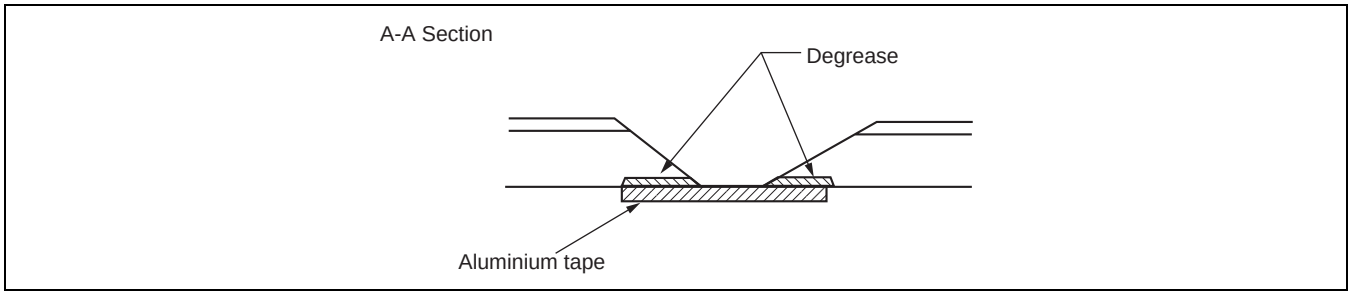
ZUA9818B010

2. Weld the damaged area.
   - For repair of a cracked area, melt the crack together with a heat gun and a melting attachment.



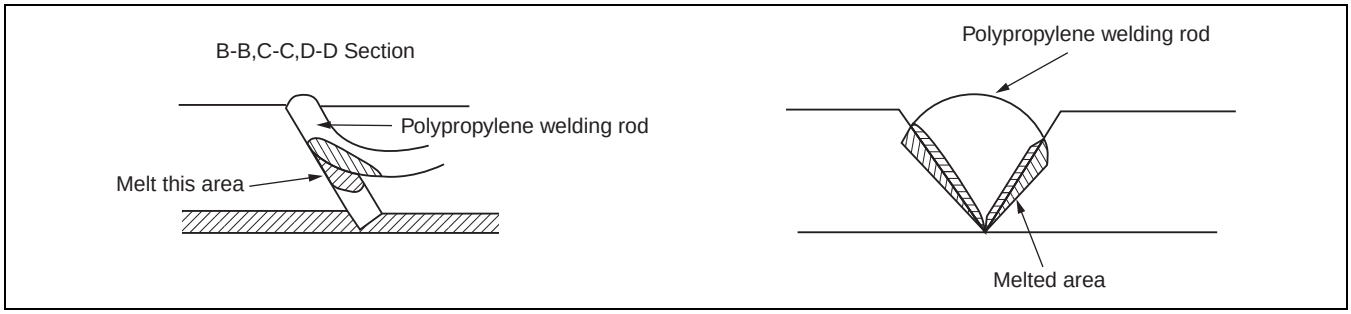
ZUA9818B003

   - For repair of a hole, degrease the area on both sides of the bumper and apply aluminium tape on the reverse side of the damage area.



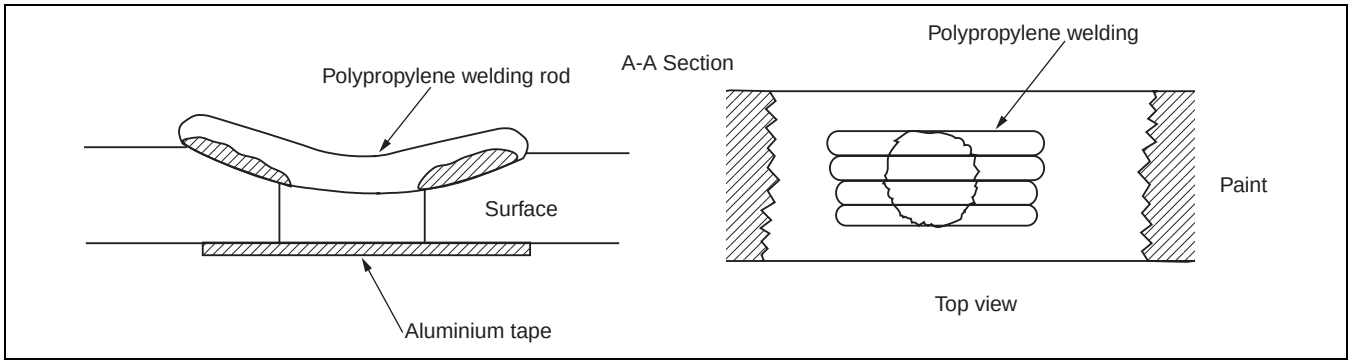
ZUA9818B005

3. Melt the polypropylene welding rod with a heat gun and deposit it the cracked area.



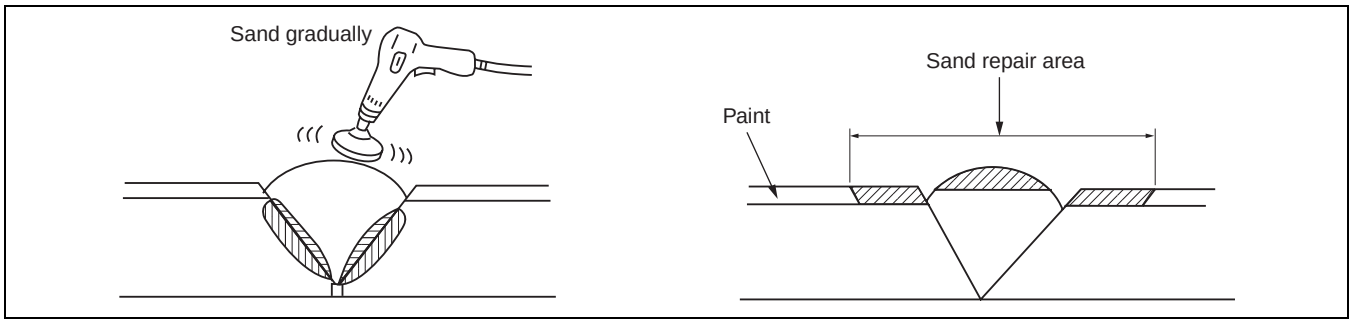
ZUA9818B004

Note
- Heat the shaded area to melt it.
- Take care not to overly melt welding rod. If the part is welded with the welding rod melted like jelly, the welding strength will be reduced.
- Hold the heat gun 10—20 mm {0.39—0.79 in} from the part being welded.
- Do not move the welding rod until the welded parts cool.



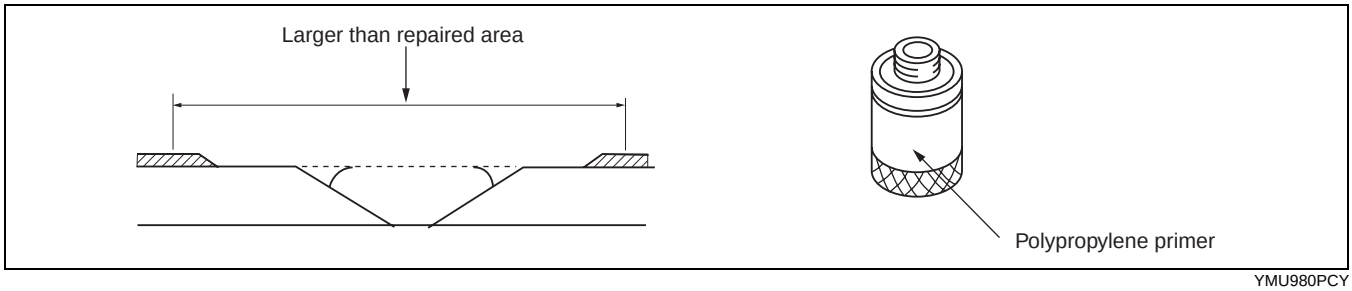
ZUA9818B006

4. Sand the surface of the polypropylene gradually as it is easily melted by the abrasion heat. Sand the area to which repair agent will be applied.



YMU980PCX

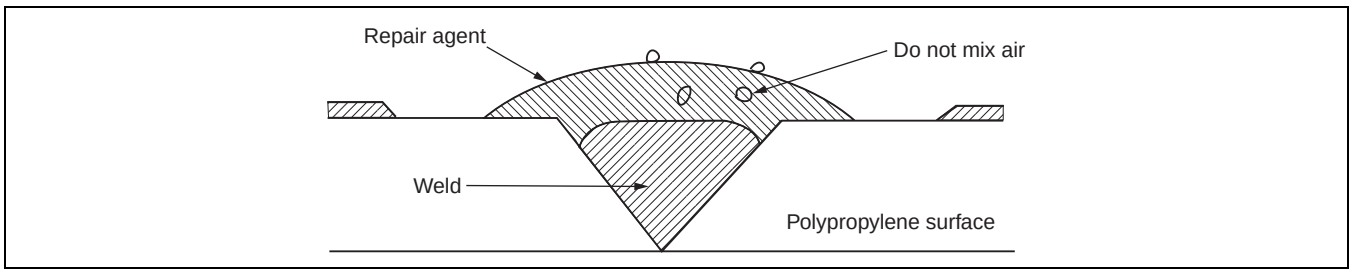
5. Uniformly apply polypropylene primer with a brush to an area larger than the repaired area. Allow to dry about 10 minutes at 20 °C {68 °F}.



YMU980PCY

6. Mix the main agent and the stiffening agent in a ratio of one to one. Apply the mixed repair agent to the damaged area.

Note
- When mixing the main and stiffening agents, take care not to allow bubbles to form.
- The repair agent hardens quickly (about 5 minutes); proceed with the work immediately after mixing the agents.
- Allow about 30 minutes to dry (20 °C {68 °F}) before sanding.

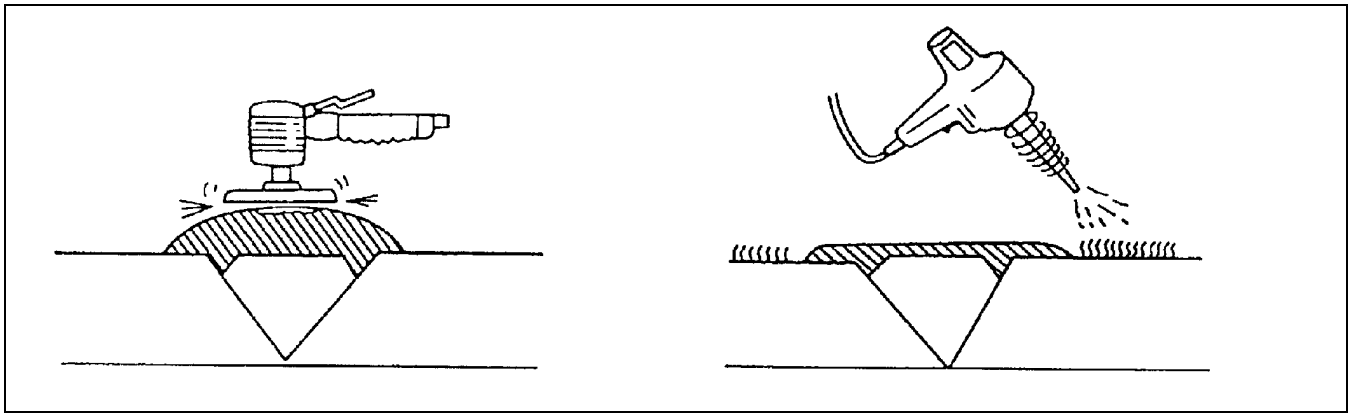


YMU980PCZ

The repair agent is a two part epoxy adhesive.
When the repair agent hardens, it will provide a good finish with the same flexibility as the polypropylens.
The repair agent for a **urethane** bumper is also a two part adhesive compound. However, this is different from that for a polypropylene bumper. If the incorrect repair agent is used, the repair will be faulty.

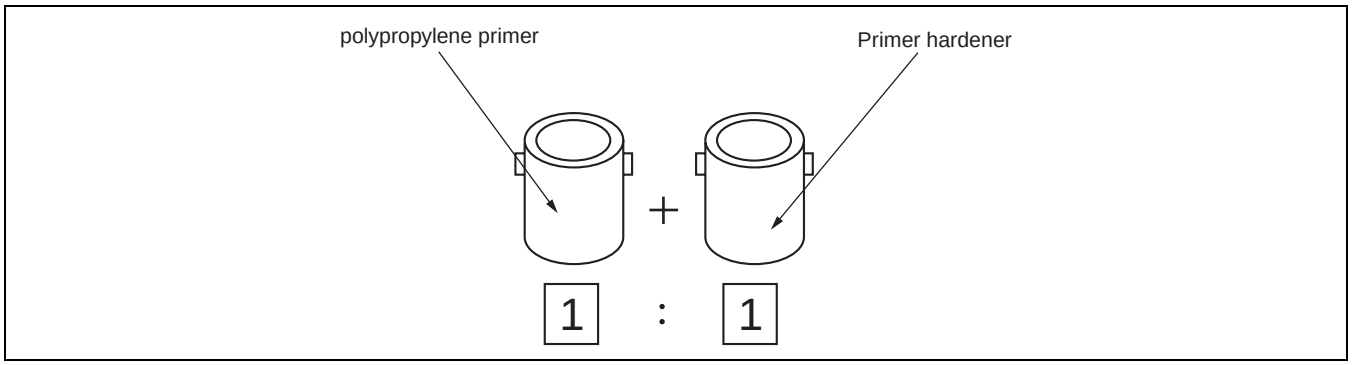
7. Sand the area with #180—240 sandpaper.

Note
- If excessive force is applied to the area when sanding, the surface will be damaged.
- If fuzz remains around the repaired area, melt it with a heat gun.



YMU980PD0

8. Degrease the painted surface.
9. Mix the primer and the hardener at a ratio of one to one. Apply the primer to the repaired area and the surface of the bumper with a brush or spray.

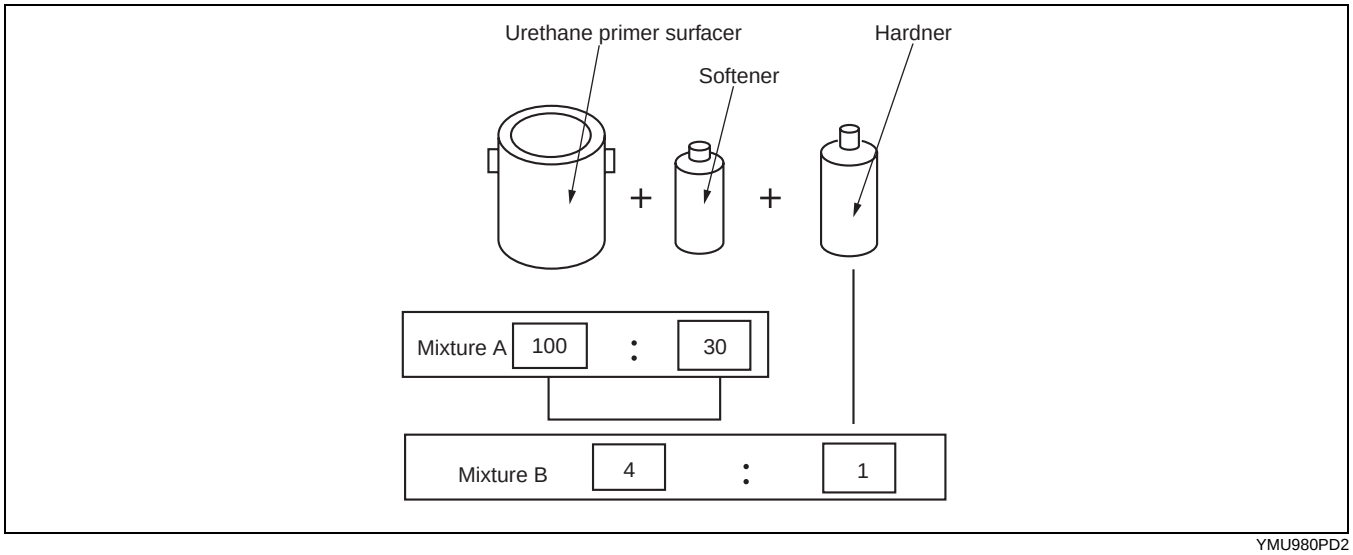


YMU980PD1

Use the primer within 16 hours after it is mixed.

Note
- Polypropylene primer will dissolve even after drying if it is wiped with solvent. Use only water to clean around the primer.

10. Allow the part to dry.
11. Add the softener to the urethane primer surfacer and spray it on the repaired area.
    a. Mixing method
       Urethane primer surfacer + Softener ..... Mixture A
       Mixture A + hardener ..... Mixture B
       Dilute mixture B with thinner to spray on bumper
    b. Viscosity
       14—16 seconds/viscosimeter 20 °C {68 °F}



YMU980PD2

Note
- Mix the solutions at the specified ratio.

    c. Spray pressure
       300—400 kPa {3—4 kg/cm^2, 43—57 psi}
    d. Standard film thickness
       30—40 μ
    e. Spray method
       Spot-spray primer surfacer on bumper three of four times
12. Air drying 20 °C {68 °F} — 8 hours minimum.
    Forced drying 60 °C {140 °F} — 1 hour
13. Lightly sand the complete surface of the bumper with #400—#600 sandpaper. Do not expose the surface of the polypropylene. (Wet or dry sanding is acceptable.)
14. Wipe the complete surface of the bumper with degreasing agent. Quickly wipe the surface with a clean rag to degrease it.
15. Apply a matching coat of body color to the polypropylene bumper.

Note
- Be sure to use only urethane primer for a urethane bumper and polypropylene primer for a polypropylene bumper. Other paints for repairing a polypropylene bumper are the same as those for the urethane bumper.

16. Air drying 20 °C {68 °F} — 8 hours minimum.
    Forced drying 60 °C {140 °F} — 1 hour

Note
- Let the part air dry when possible as forced drying could cause bubbles in the top coat.