2004-2011 RX-8 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 Motor Corporation reserves the right to alter the specifications and contents of this manual without
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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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VEHICLE IDENTIFICATION NUMBERS (VIN)

JM1	FE172*9#	400001—
JM1	FE174*9#	400001—
JM1	FE17M*9#	400001—
JM1	FE17P*9#	400001—

GENERAL INFORMATION

00
SECTION

00–00 GENERAL INFORMATION

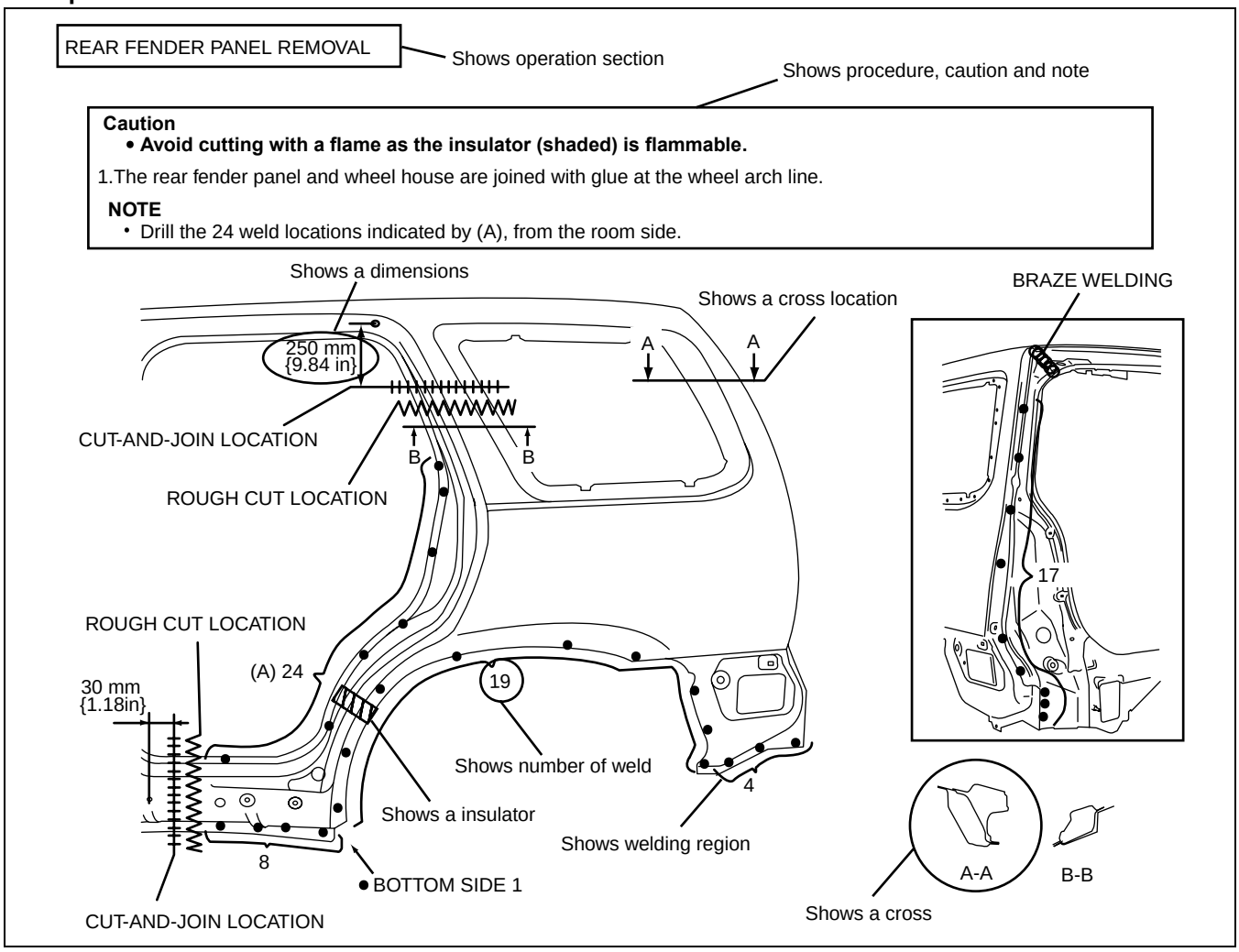
HOW TO USE THIS MANUAL

CHU000000001B01

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



MZZ2010B001

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

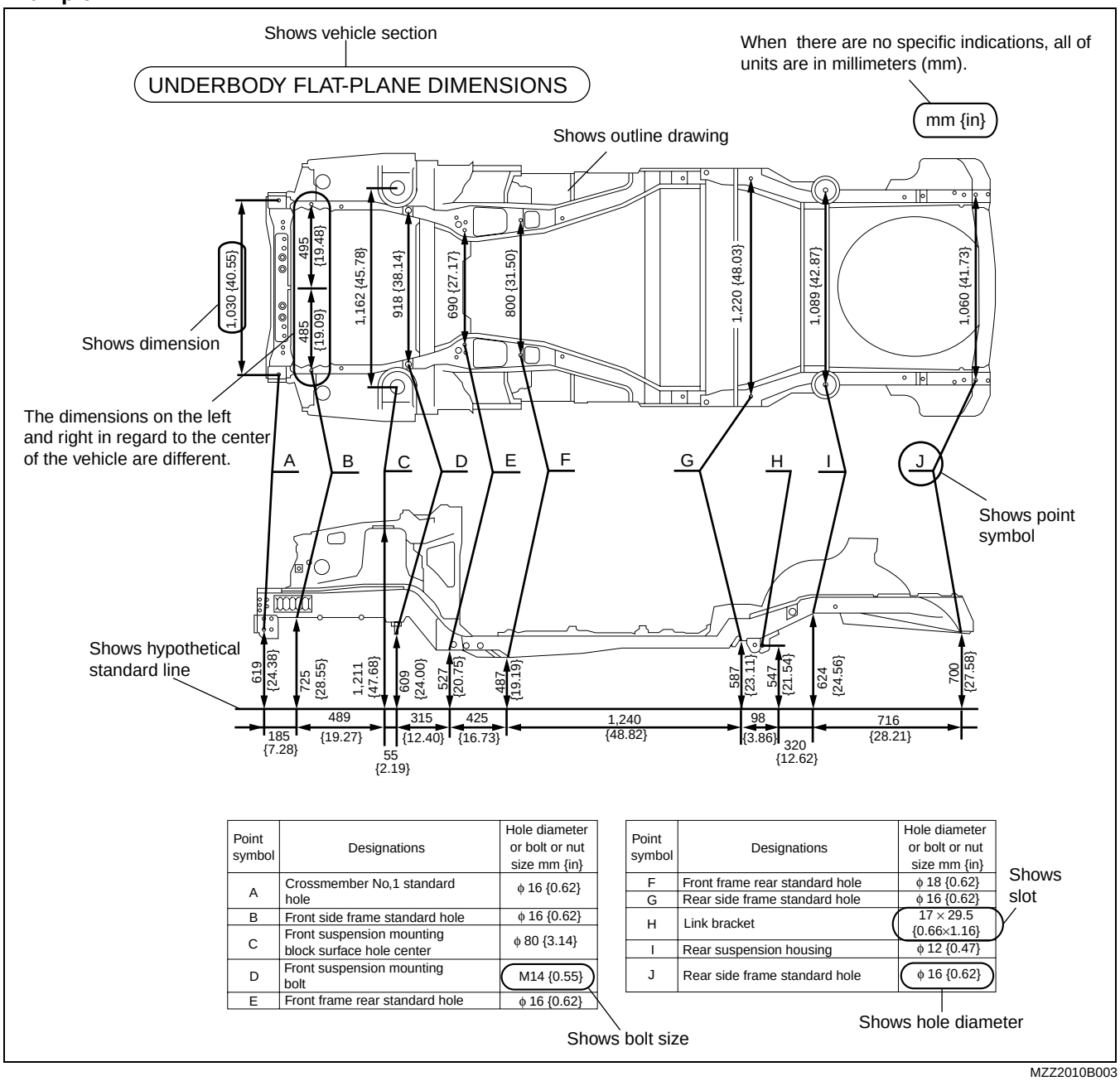
SYMBOL	MEANING
|||||	Continuous MIG welding (Cut-and-join location)
○○○	Braze welding
⩘⩘	Rough cut location

MZZ2010B002

Body Dimensions (Flat-plane Dimensions)

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

Example



Point symbol	Designations	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	Designations	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}

Shows slot

Shows hole diameter

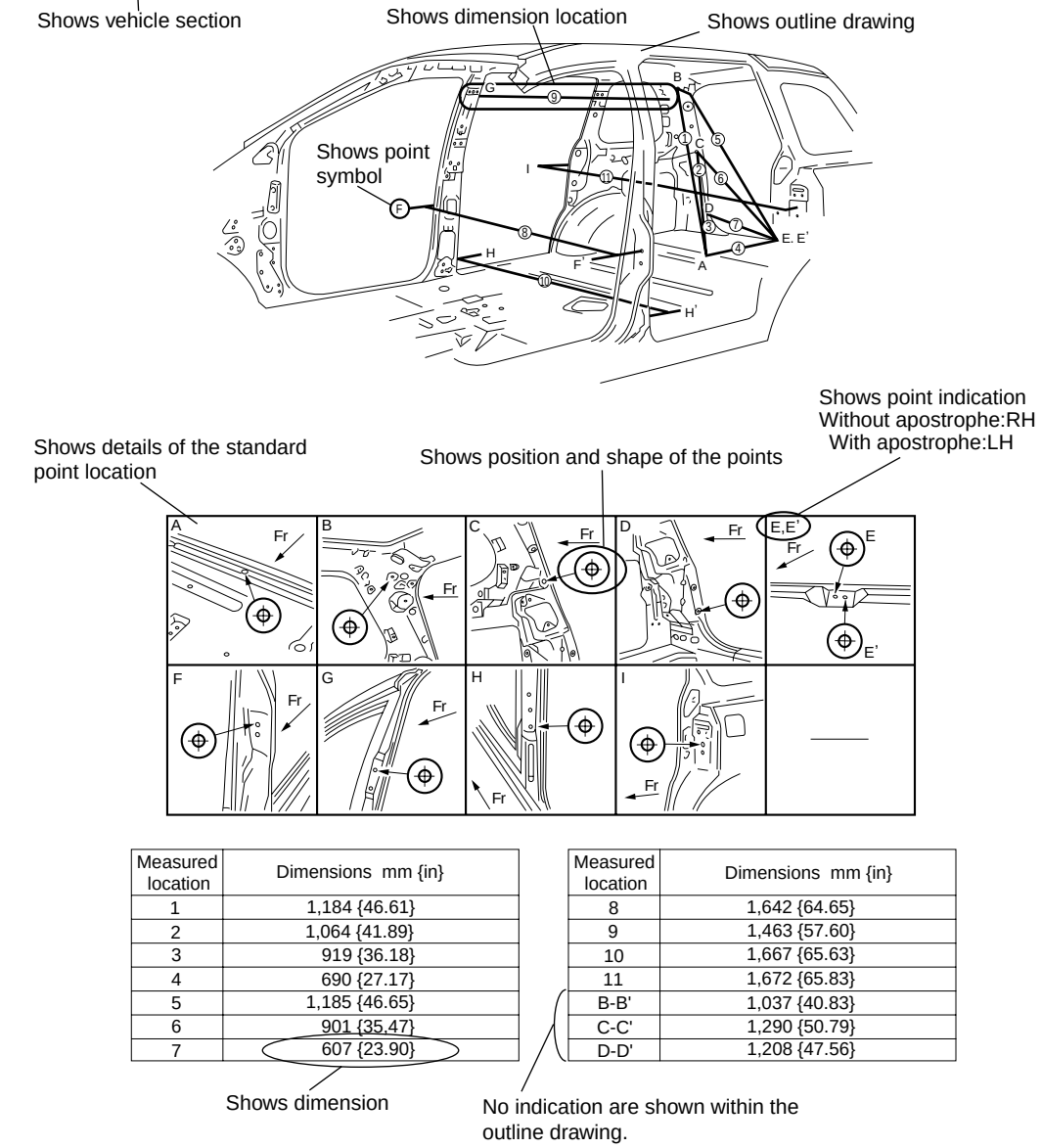
MZZ2010B003

Body Dimensions (Straight-line Dimensions)

- Straight-line dimensions are the actual dimensions between two standard points.
- 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 (2)



Measured location	Dimensions mm {in}
1	1,184 {46.61}
2	1,064 {41.89}
3	919 {36.18}
4	690 {27.17}
5	1,185 {46.65}
6	901 {35.47}
7	607 {23.90}

Measured location	Dimensions mm {in}
8	1,642 {64.65}
9	1,463 {57.60}
10	1,667 {65.63}
11	1,672 {65.83}
B-B'	1,037 {40.83}
C-C'	1,290 {50.79}
D-D'	1,208 {47.56}

MZZ2010B004

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

SYMBOL	MEANING
●↙	Panel seam, bead, etc.
← (arrow only)	Bolt tip
⊕	Center of rectangular-shaped hole

MZZ2010B005

SERVICE PRECAUTIONS

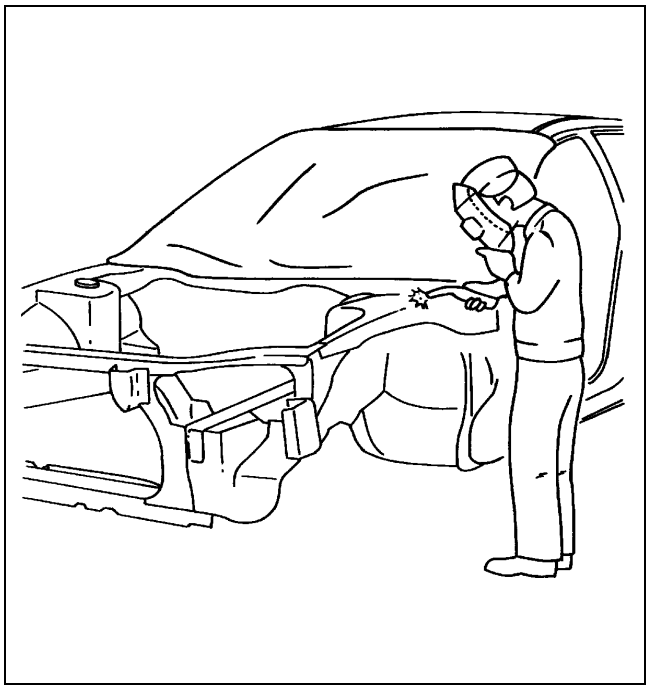
CHU000000014B01

Arrangement of Workshop

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

Vehicle Protection

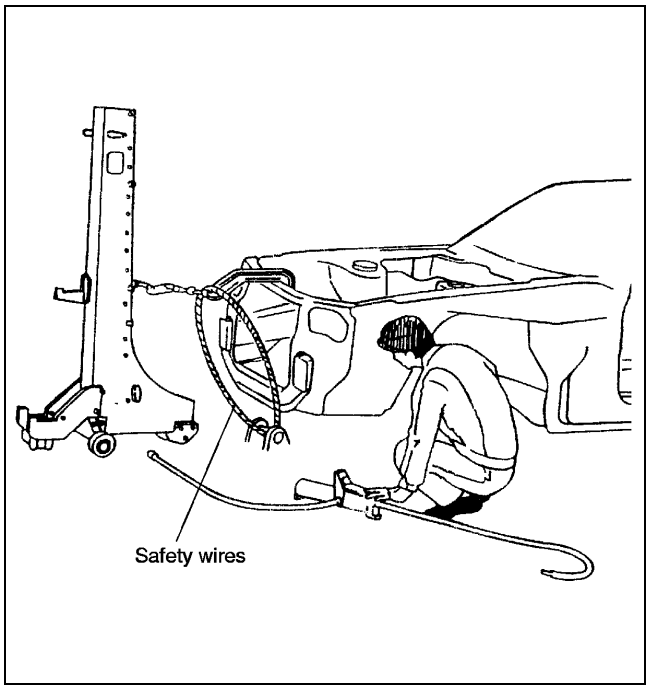
- Use seat covers and floor covers.
- Use heat-resistant protective covers to protect glass areas and seats from heat or sparks during welding.
- Protect items such as moldings, garnishes, and ornaments with tape when welding.



YMU980PA5

Use of Pulling Equipment

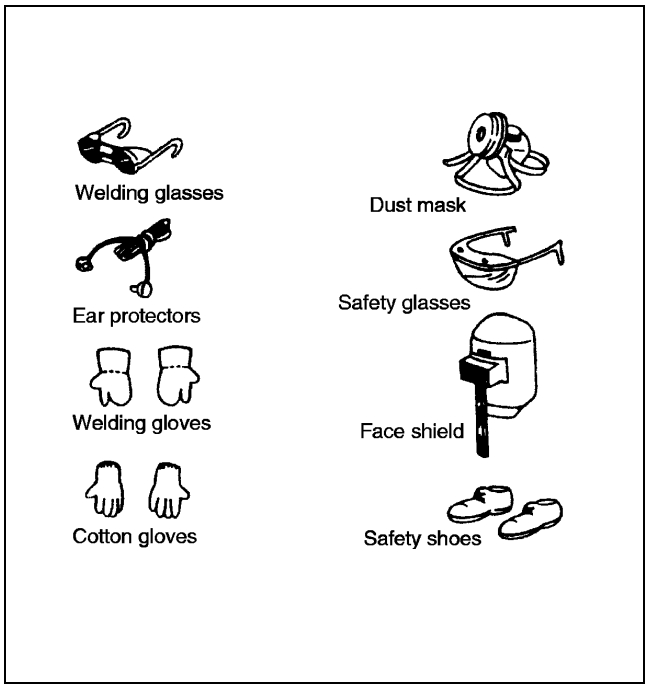
- When using pulling equipment, keep away from the pulling area and use safety wires to prevent accidents.



YMU980PA6

Safety Precautions

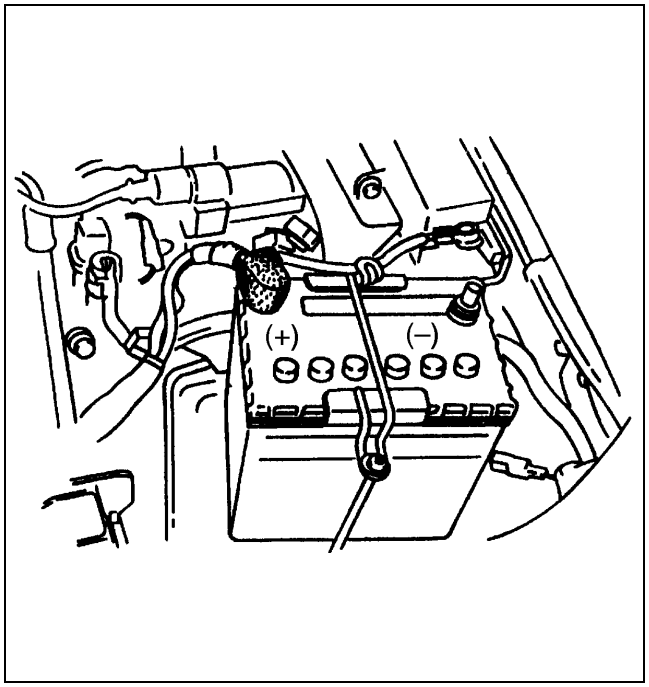
- Protective head covering and safety shoes should always be worn. Depending upon the nature of the work, gloves, safety glasses, ear protectors, face shield, etc., should also be used.



YMU980PA7

Prevent Short Circuits

- When removing a wiring harness or electrical component, disconnect the negative battery cable.



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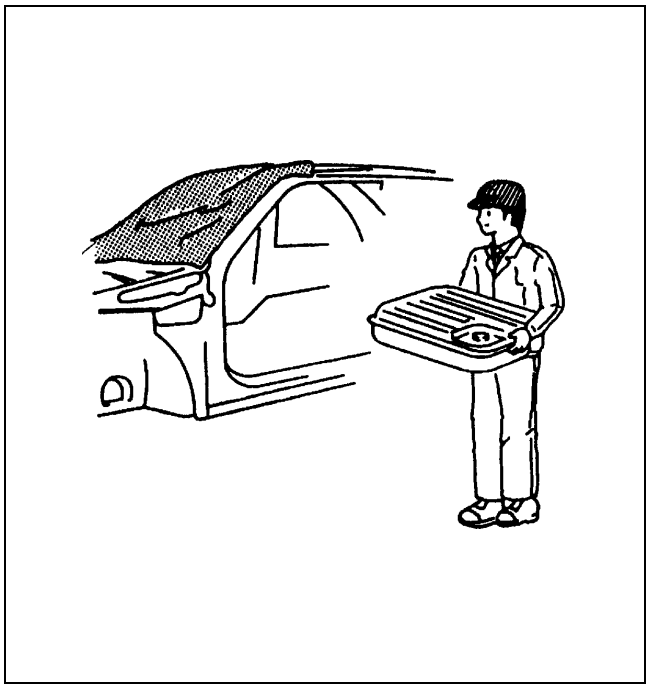
Remove Dangerous Articles

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



YMU980PA9

EFFICIENT REMOVAL OF BODY PANELS

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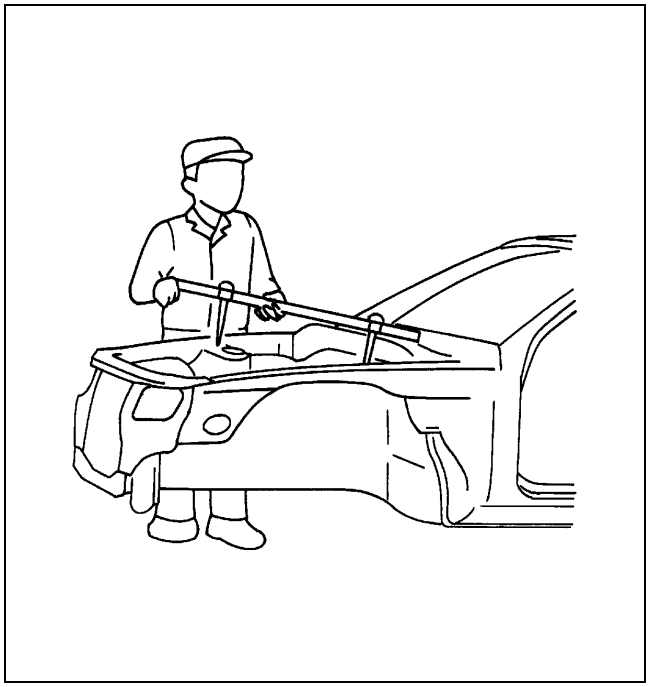
Body Measurements

- 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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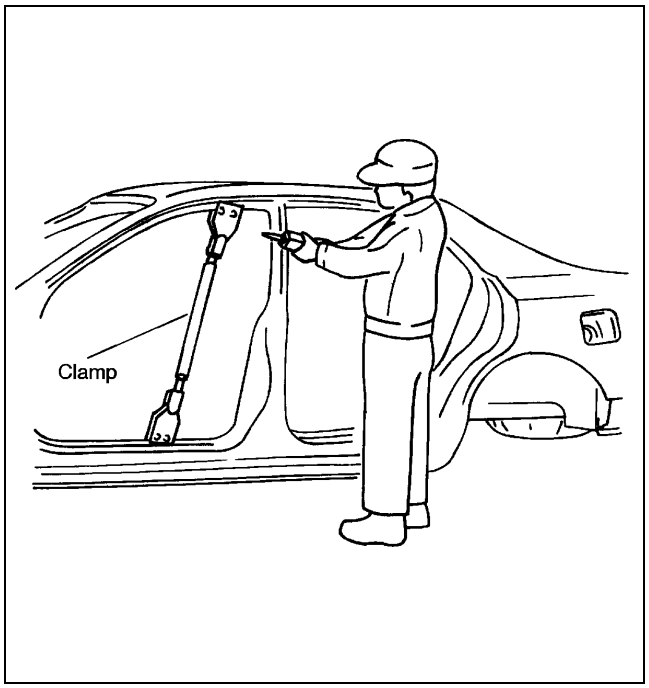
Prevention of Body Deformation

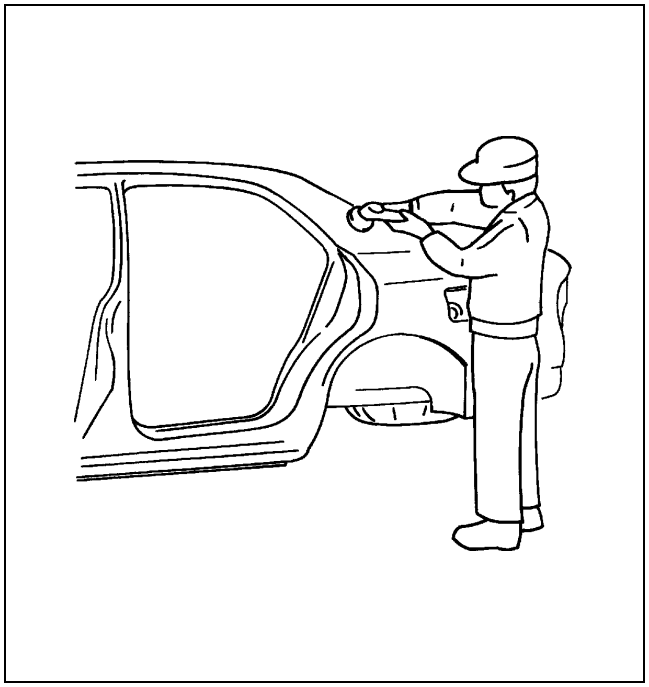
- Use a clamp or a jack for removal and reinforce at and around the rough-cutting location to prevent deforming of the body.



YMU980PAB

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.



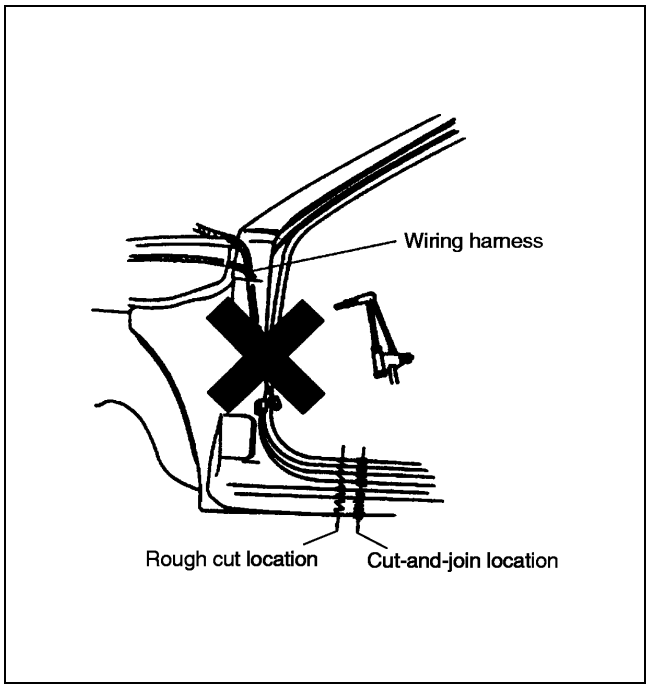
YMU980PAC

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.



YMU980PAD

INSTALLATION PREPARATIONS

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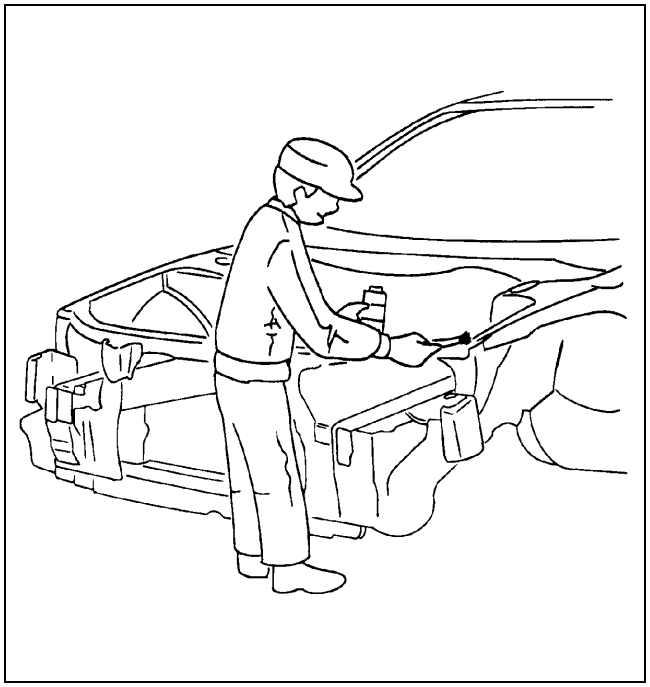
Application of Weld-through Primer

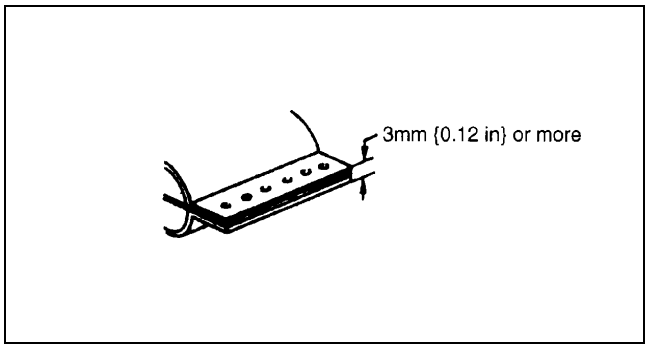
- For treatment against corrosion, remove the paint grease, and other material from the portion of new part and body to be welded, and apply weld-through primer.



YMU980PAE

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.



YMU980PAF

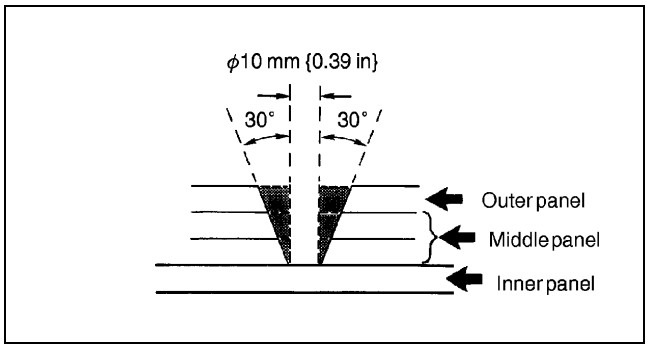
Making Holes for CO_2 Arc Welding

- 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 (ϕ)	Hole diameter (ϕ)
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.



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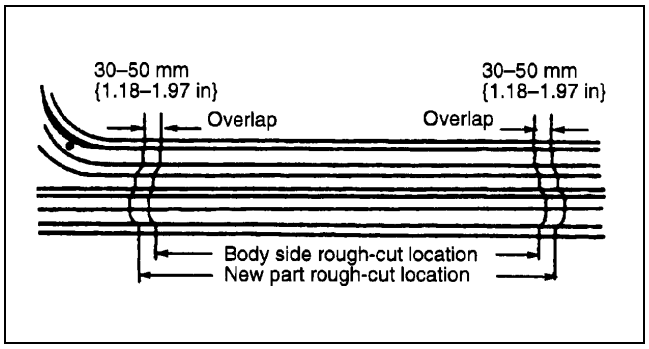
Rough Cutting of New Parts

- 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.



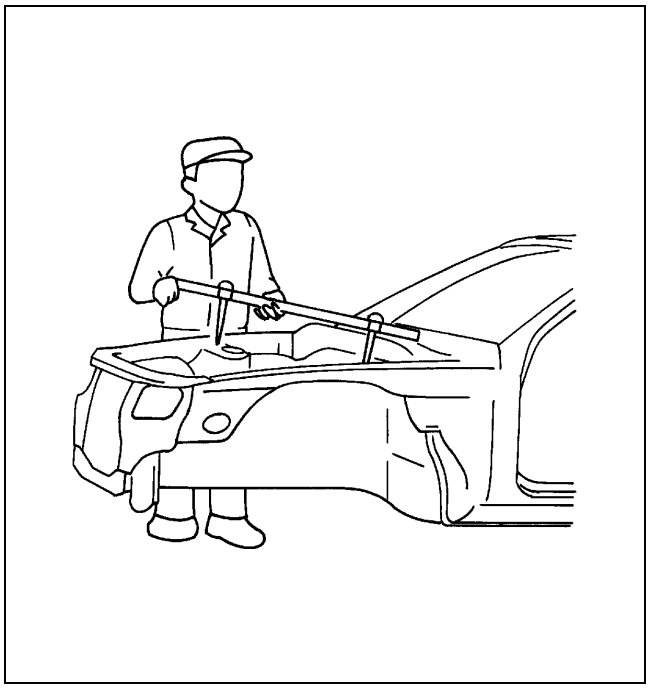
YMU980PAH

EFFICIENT INSTALLATION OF BODY PANELS

CHU000000017B01

Checking Preweld Measurements And Watching

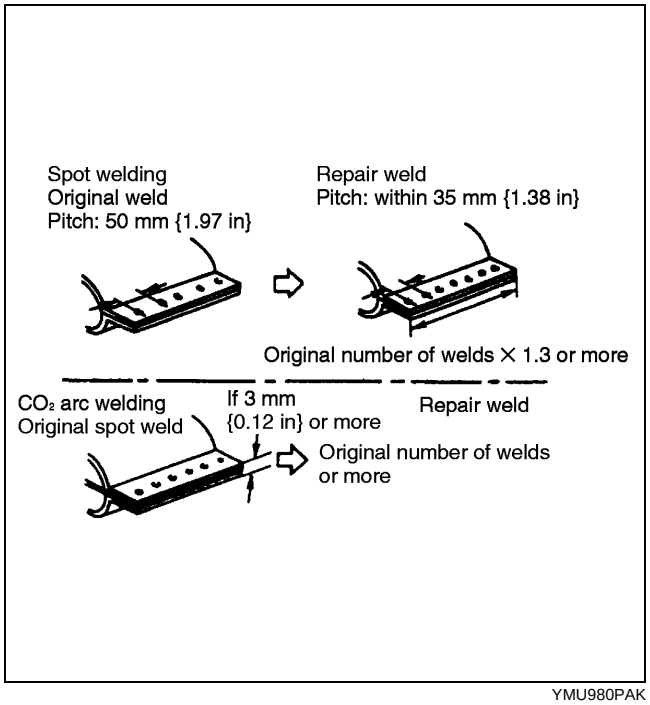
- Align to the standard reference dimensions, based upon the body dimensions illustration, so that new parts are installed in the correct position.



YMU980PAJ

Welding Notes

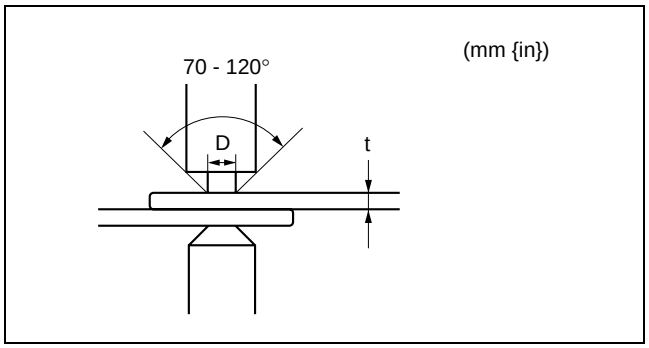
- For the number of weld points, welding should be performed in accordance with the following reference standards.



YMU980PAK

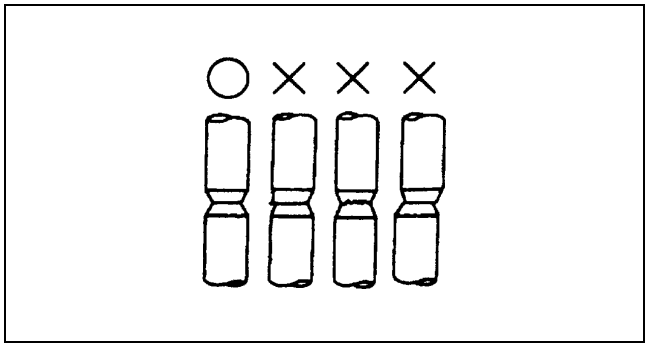
Spot Welding Notes

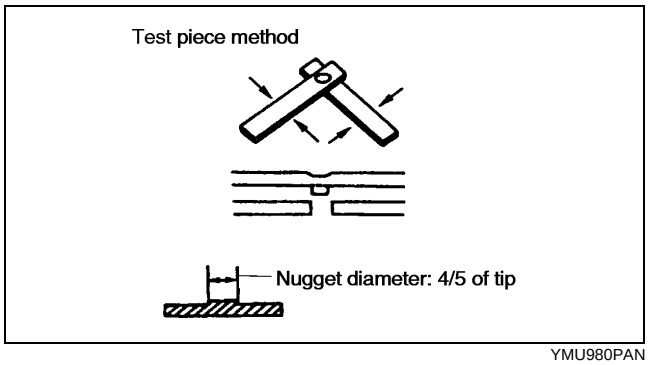
- The shape of the spot welder tip is D=(2×t)+3. If the upper panel thickness is different from that of the under panel, adjust to the thinner one.
- Because the weld strength is affected by the shape of the spot welder tip, the optimum condition of the tip should always be maintained.



YMU980PAL

- Spot welds should be made at points other than the originally welded points.
- Before spot welding, make a trial weld using the same material as the body panel to check the weld strength.

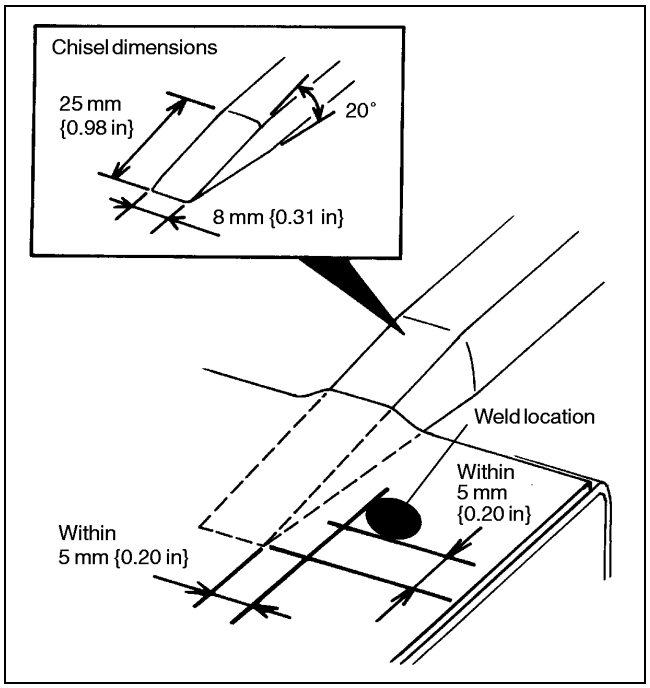

YMU980PAM



YMU980PAN

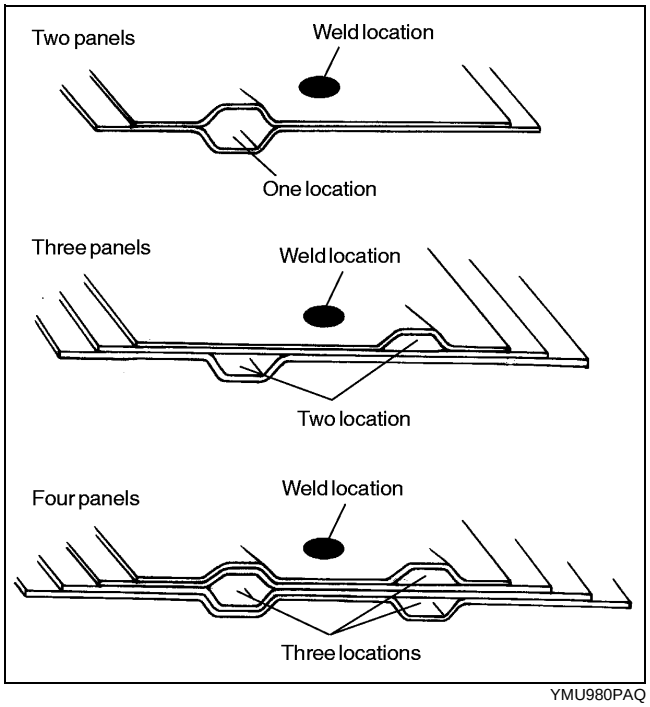
Checking Weld Strength

- 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.
- Drive the chisel between the panels according to the number of panels as shown below.



YMU980PAP

- 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.



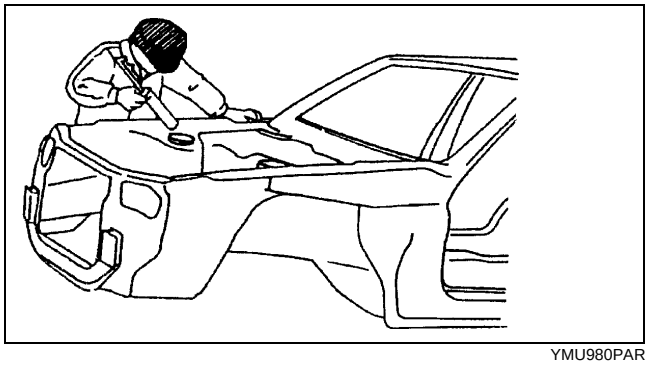
YMU980PAQ

ANTICORROSION, SOUND INSULATION, AND VIBRATION INSULATION

CHU000000018B01

Body Sealing

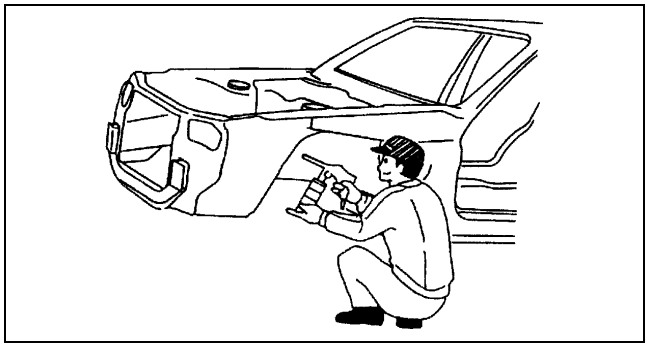
- Apply body sealer where necessary.
- For locations where application of body sealer is difficult after installation, apply it before installation.



YMU980PAR

Application of Undercoating

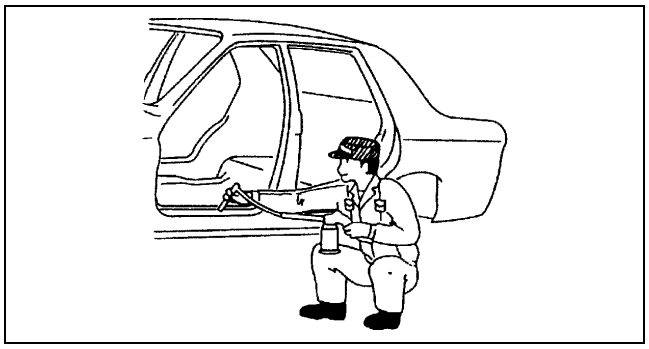
- Apply an undercoat to the required location of the body.



YMU980PAS

Application of Rust Inhibitor

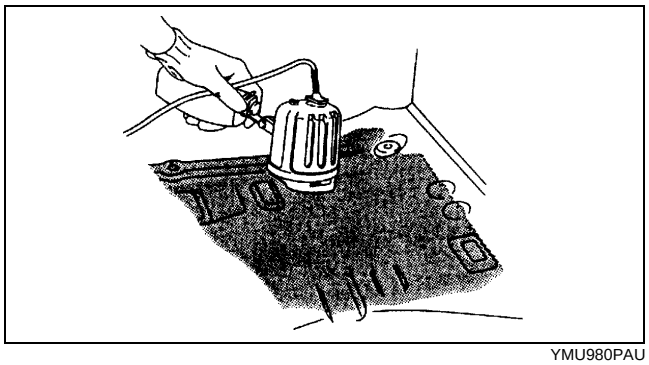
- Apply rust inhibitor (wax, oil, etc.) to the back of the welded areas.



YMU980PAT

Application of Floor Silencer

- Apply floor silencer by heating with an infrared ray lamp.



YMU980PAU

ABBREVIATION

CHU000000011B01

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

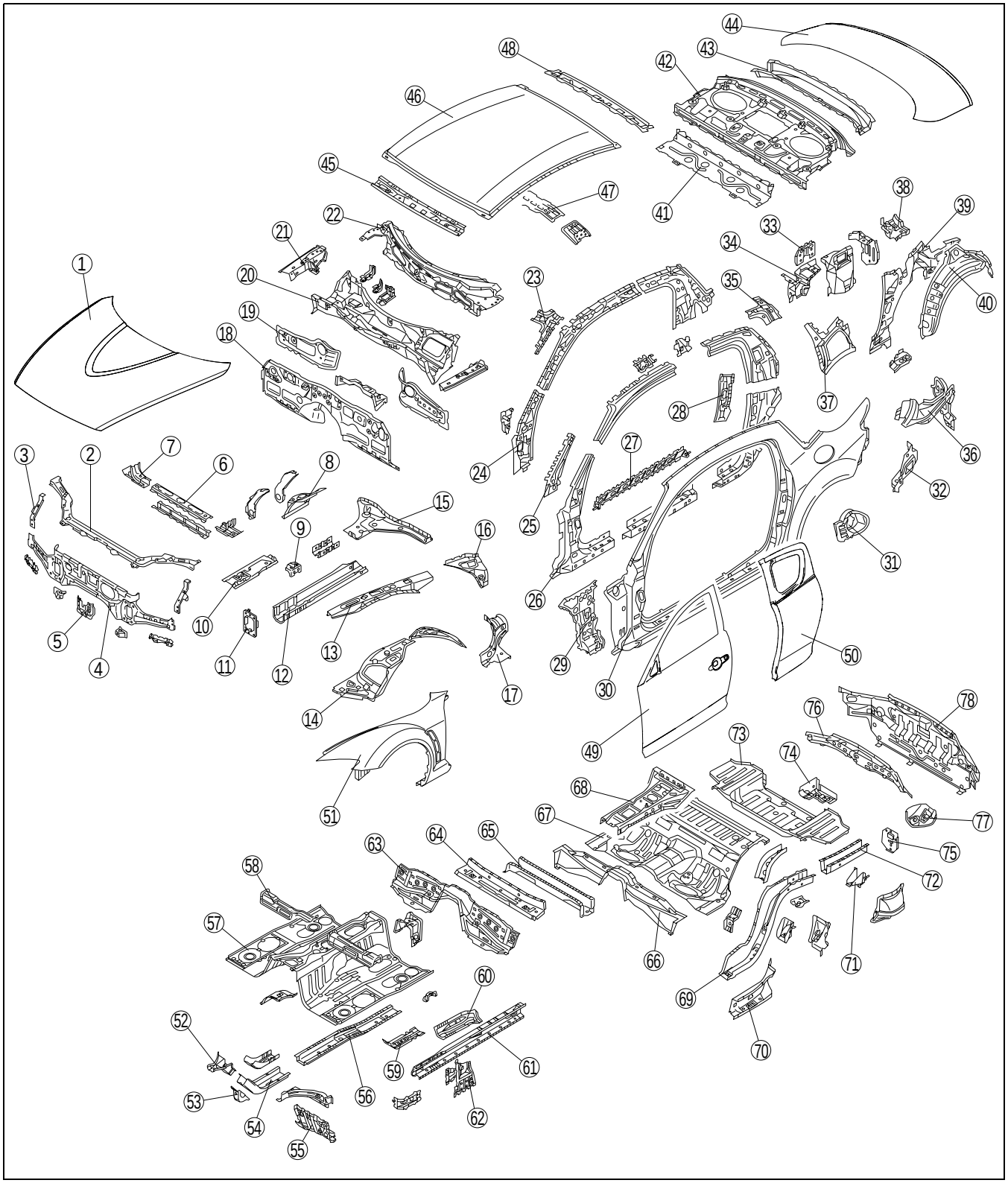
BODY STRUCTURE

09
SECTION

09–80A BODY STRUCTURE [CONSTRUCTION]

BODY COMPONENTS CONSTRUCTION

CHU098007000B01



CHU0980B094

x:Applied
-:Not applied

No.	Part Name		High- tension steel	Rust proof steel	Thickness (mm) {in}
1	Hood (*)		-	-	0.90 {0.035}
2	Radiator shroud upper panel		-	x	0.80 {0.031}
3	Radiator shroud side stay		-	x	0.70 {0.028}
4	Radiator shroud lower panel		-	x	0.70 {0.028}
5	Hood rock bracket		-	x	0.80 {0.031}
6	Crossmember No.1	Fr	x	x	0.80 {0.031}
		Rr	x	x	0.70 {0.028}
7	Crossmember No.1 side bracket		x	x	0.80 {0.031}
8	Suspension housing	Upper	x	x	1.40 {0.055}
		Lower	x	x	2.00 {0.079}
9	ABS HU/CM bracket		x	x	1.60 {0.063}
10	Front side frame outer		x	x	1.40 {0.055}
11	Front bumper bracket		x	x	2.60 {0.102}
12	Front side frame inner		x	x	2.00 {0.079}
13	Apron reinforcement upper		x	x	0.90 {0.035}
14	Wheel apron panel		-	x	0.65 {0.026}
15	Front side frame rear reinforcement		x	x	2.00 {0.079}
16	Apron reinforcement lower		x	x	0.75 {0.030}
17	Frame reinforcement		x	x	1.60 {0.063}
18	Dash lower panel		-	x	0.80 {0.031}
19	Dash lower member		x	-	1.60 {0.063}
20	Dash cowl panel		-	x	0.65 {0.026}
21	Cowl upper plate		x	x	1.00 {0.039}
22	Cowl panel		-	x	0.65 {0.026}
23	Front pillar reinforcement		x	-	1.20 {0.047}
24	Side panel inner	Fr	x	-	2.00 {0.079}
		Ctr	x	-	1.40 {0.055}
		Rr	x	-	1.20 {0.047}
25	Hinge reinforcement		x	-	1.60 {0.063}
26	Side panel reinforcement front	Upper	x	-	1.60 {0.063}
		Lower	x	-	1.80 {0.071}
	Side panel reinforcement center		x	-	1.20 {0.047}
	Side panel reinforcement rear	Upper	x	-	1.20 {0.047}
		Lower	x	-	1.00 {0.039}
27	Side sill gusset		-	-	0.90 {0.035}
28	Rear hinge reinforcement	Upper	x	-	1.20 {0.047}
		Lower	x	-	2.30 {0.091}
29	Cowl side reinforcement		x	x	1.20 {0.047}
30	Side panel outer			x	0.70 {0.028}
31	Filler box		-	x	0.70 {0.028}
32	Rear fender lower panel		-	x	0.70 {0.028}
33	Rear suspension housing upper		x	-	1.40 {0.055}
34	Package reinforcement		x	-	0.80 {0.031}
35	Roof rail reinforcement		x	-	0.80 {0.031}
36	Rear fender rain rail		-	x	0.70 {0.028}
37	C-pillar reinforcement		x	-	0.90 {0.035}
38	Package gusset		-	-	0.80 {0.031}
39	Rear pillar inner		-	x	0.70 {0.028}
40	Wheel house inner		-	x	0.65 {0.026}
41	Package member front		-	-	0.70 {0.028}
42	Package tray		-	-	0.55 {0.022}

No.	Part Name		High- tension steel	Rust proof steel	Thickness (mm) {in}
43	Package member rear		-	-	0.60 {0.024}
44	Trunk lid panel		-	-	0.75 {0.030}
45	Front header		-	-	0.90 {0.035}
46	Roof panel		-	-	0.85 {0.033}
47	Roof reinforcement		-	-	0.80 {0.031}
48	Rear header		-	-	0.90 {0.035}
49	Front door		-	x	0.70 {0.028}
50	Rear door (*)		-	-	0.90 {0.035}
51	Front fender panel		-	x	0.75 {0.030}
52	Front frame rear upper		x	x	1.60 {0.063}
53	Lower arm bracket		-	x	2.30 {0.091}
54	Front frame rear		x	x	1.60 {0.063}
55	Torque box		-	x	1.20 {0.047}
56	Front B-frame		x	x	1.40 {0.055}
57	Front Floor pan		-	x	0.65 {0.026}
58	Crossmember No.2		x	-	1.40 {0.055}
59	Front floor reinforcement		x	x	1.20 {0.047}
60	Crossmember No.2.5		-	x	1.20 {0.047}
61	Side sill inner		x	x	1.40 {0.055}
62	Side sill reinforcement		x	-	1.80 {0.071}
63	Crossmember No.3	RH	x	x	1.00 {0.039}
		Ctr	-	x	1.60 {0.063}
		LH	x	x	1.00 {0.039}
64	Crossmember No.4		x	x	1.00 {0.039}
65	Crossmember No.5		x	x	0.90 {0.035}
66	Crossmember No.3 front		-	x	1.20 {0.047}
67	Center floor pan		-	x	0.65 {0.026}
68	Tunnel reinforcement rear		-	-	0.90 {0.035}
69	Rear side frame		x	x	1.40 {0.055}
70	Side sill inner rear		x	x	1.40 {0.055}
71	Rear bumper bracket		x	x	1.20 {0.047}
72	Rear side frame rear		x	x	1.40 {0.055}
73	Rear floor pan		-	x	0.65 {0.026}
74	Hook bracket		x	x	1.20 {0.047}
75	Rear side reinforcement		x	x	1.80 {0.071}
76	Rear end member		-	-	0.65 {0.026}
77	Anchor reinforcement		-	x	1.80 {0.071}
78	Rear end panel		-	x	0.60 {0.024}

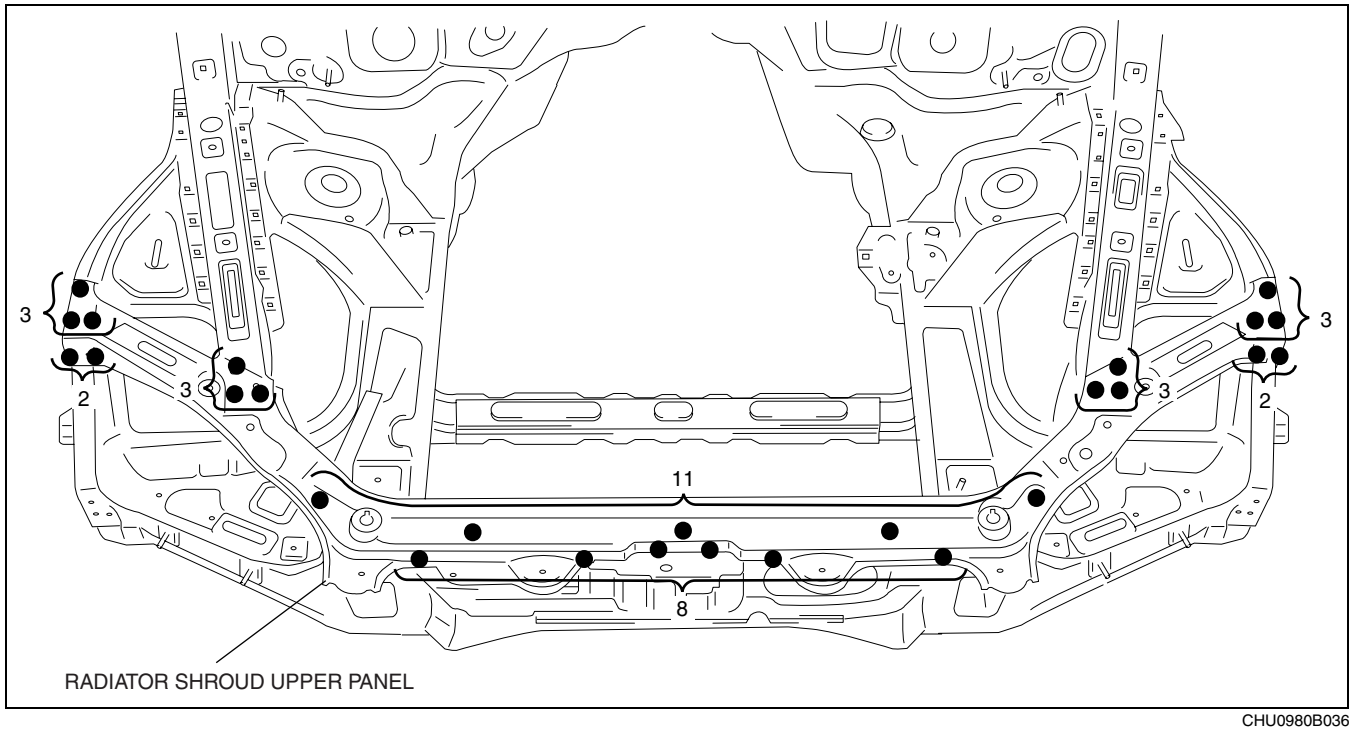
(*) : Material of hood and rear door are aluminum.

09–80B BODY STRUCTURE [PANEL REPLACEMENT]

RADIATOR SHROUD UPPER PANEL REMOVAL

CHU098053100B01

1. Remove the radiator shroud upper panel.

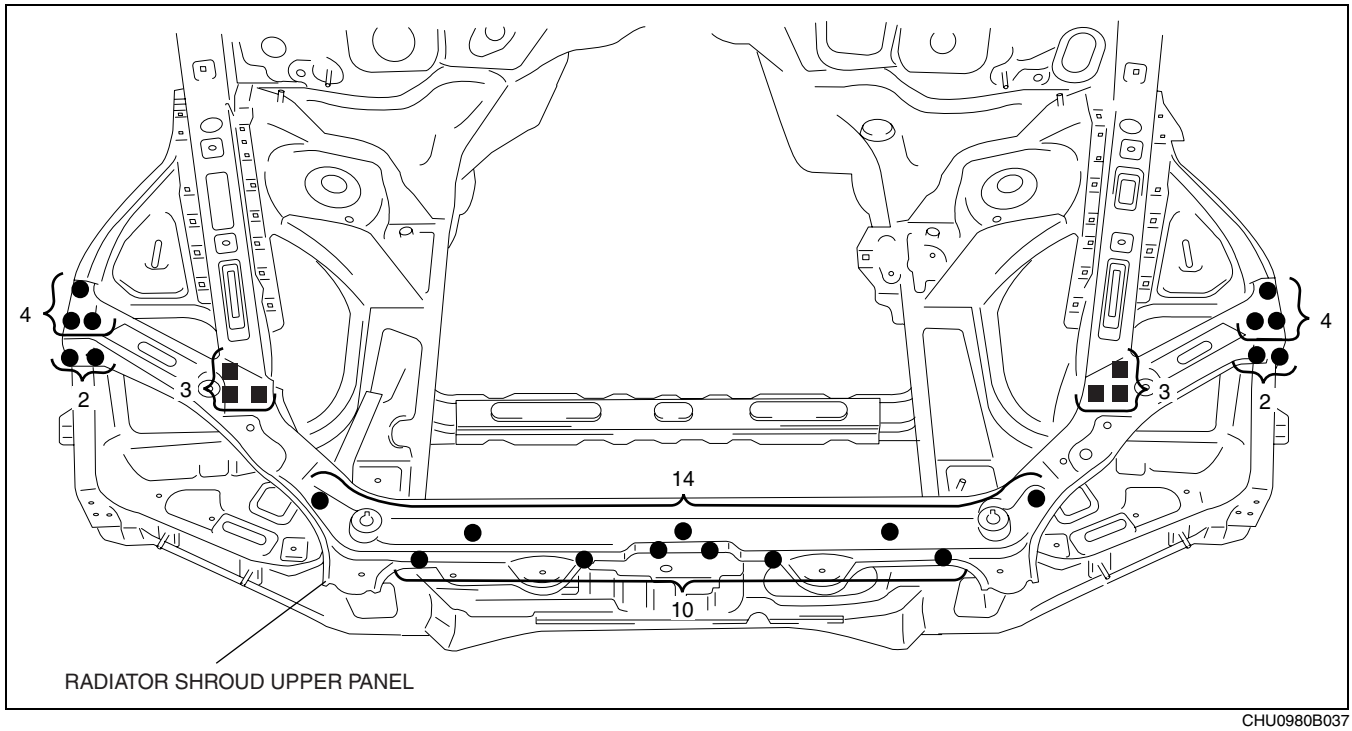


CHU0980B036

RADIATOR SHROUD UPPER PANEL INSTALLATION

CHU098053100B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



CHU0980B037

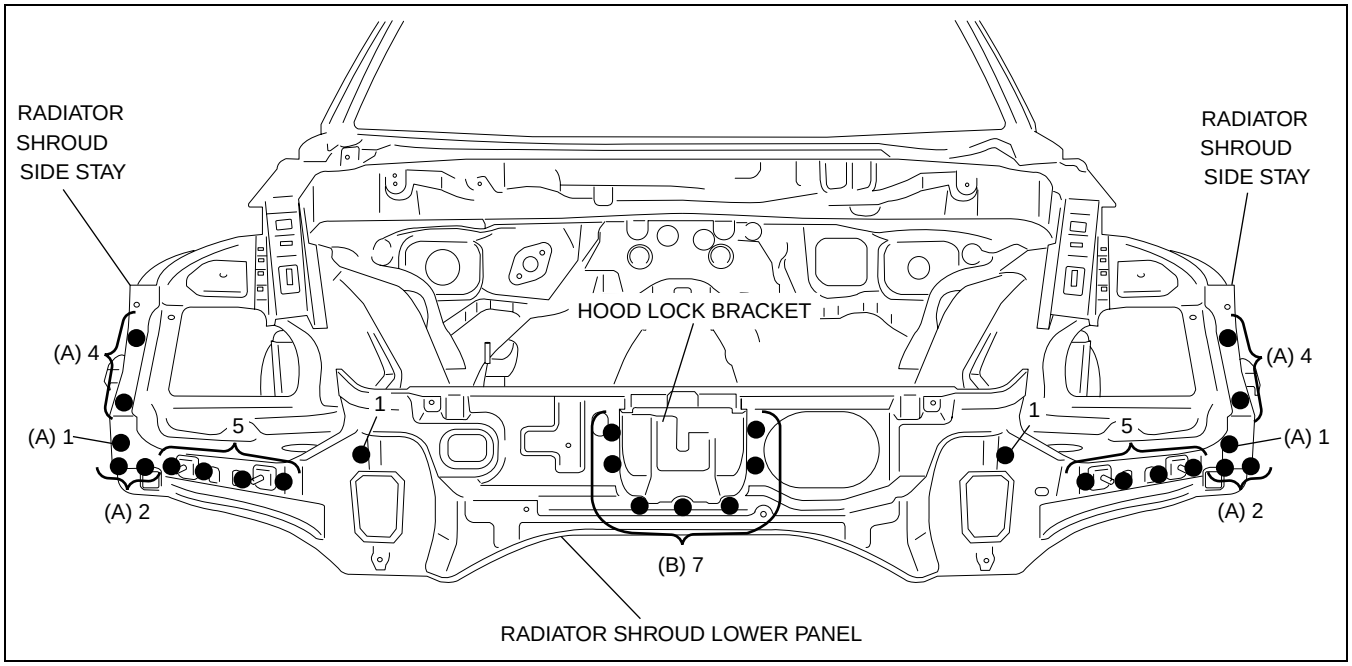
RADIATOR SHROUD LOWER PANEL REMOVAL

CHU098053100B03

1. Remove the radiator shroud lower panel.

Note

- When removing the radiator shroud side stay and the hood lock bracket separately, drill the 14 weld locations indicated by (A) and the seven weld locations indicated by (B).



CHU0980B038

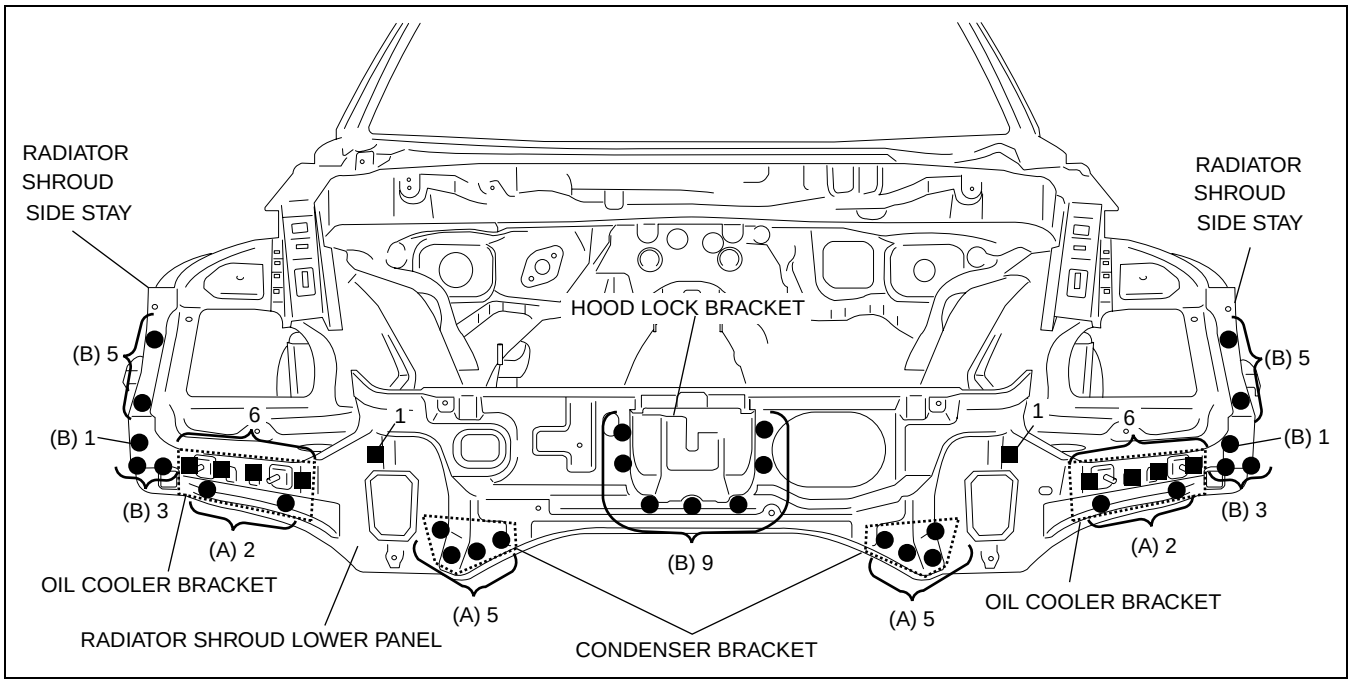
RADIATOR SHROUD LOWER PANEL INSTALLATION

CHU098053100B04

1. Weld the 14 locations indicated by (A), then temporarily install the condenser bracket and oil cooler bracket.
2. When installing new parts, position each part so that the section measurement aligns with the body dimension.
3. Drill holes for plug welds before installing new parts.
4. Weld the remaining weld locations and install the radiator shroud lower panel.
5. After temporarily installing new parts, make sure the related parts fit properly.

Note

- When replacing the radiator shroud side stay and the hood lock bracket separately, weld the 27 locations indicated by (B).

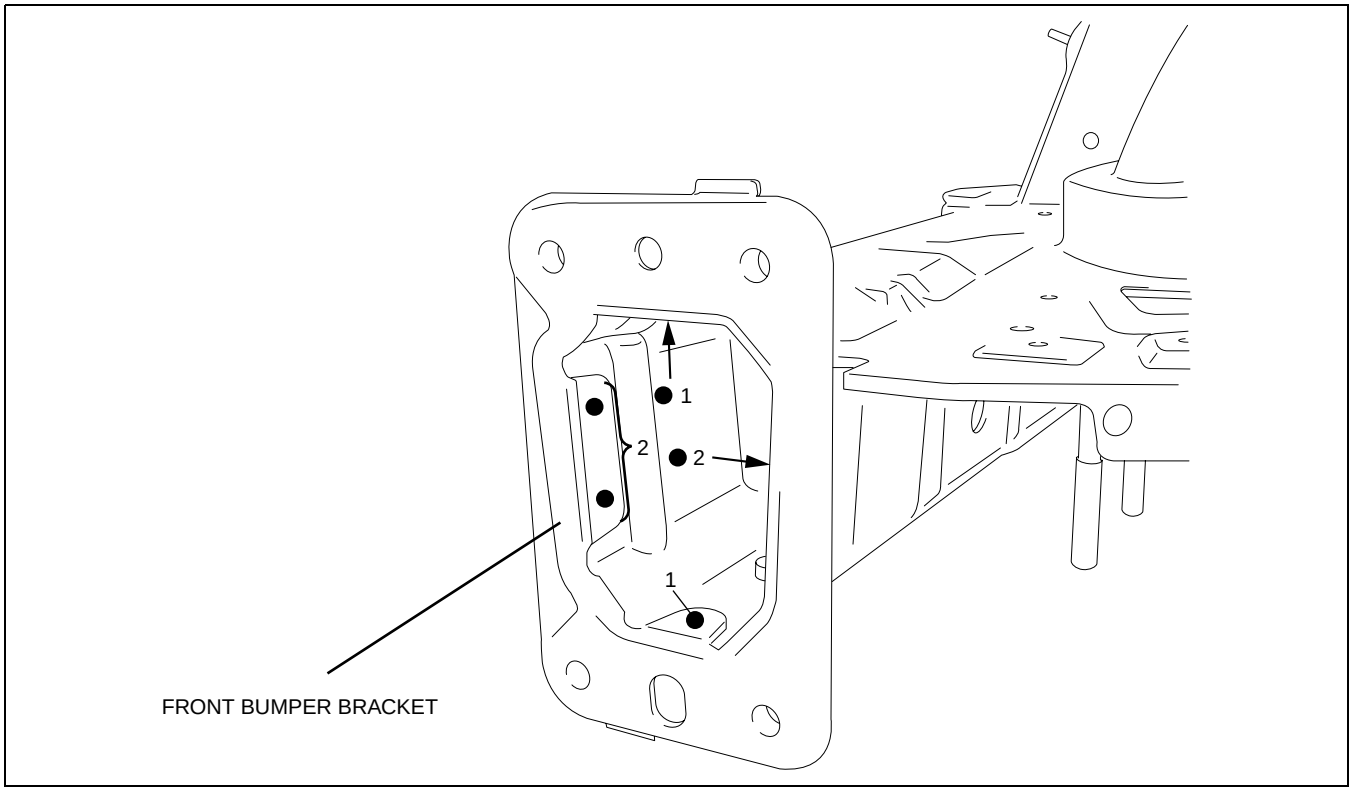


CHU0980B039

FRONT BUMPER BRACKET REMOVAL

CHU098053896B01

1. Remove the front bumper bracket.

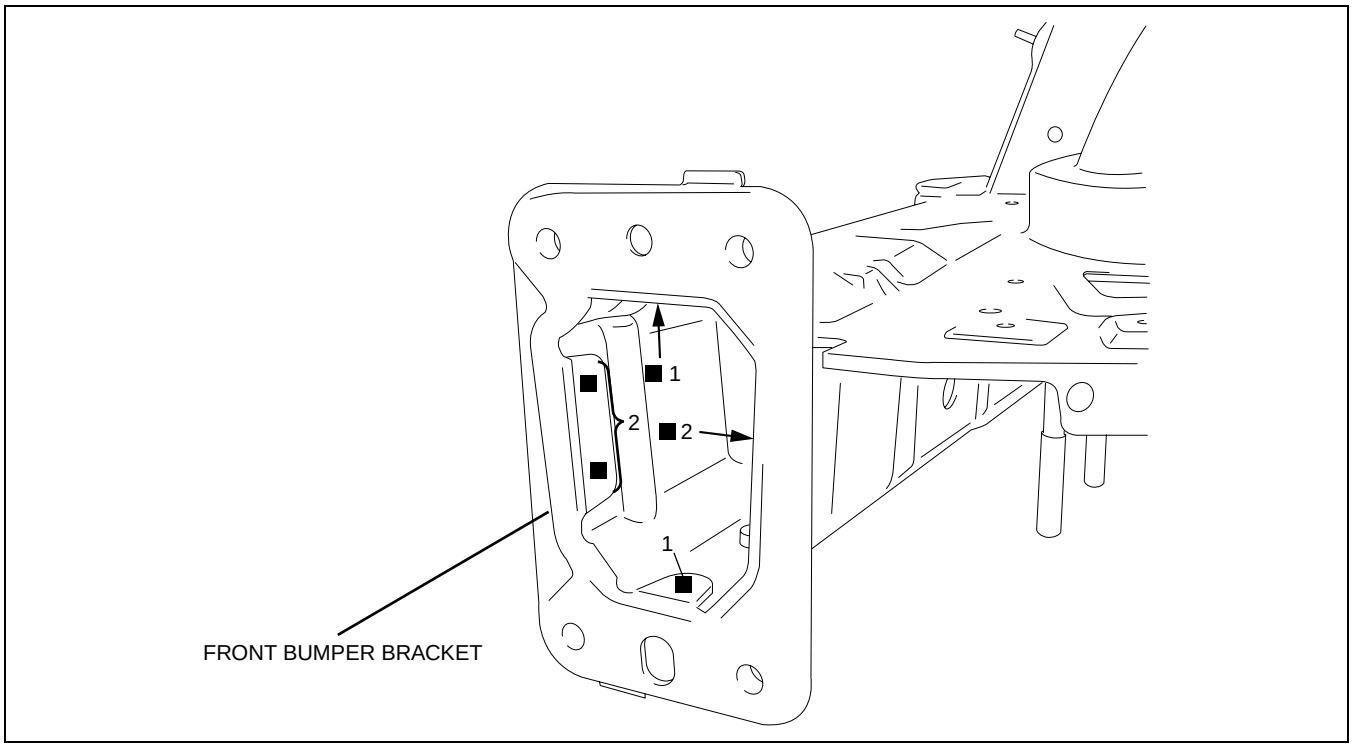


CHU0980B032

FRONT BUMPER BRACKET INSTALLATION

CHU098053896B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

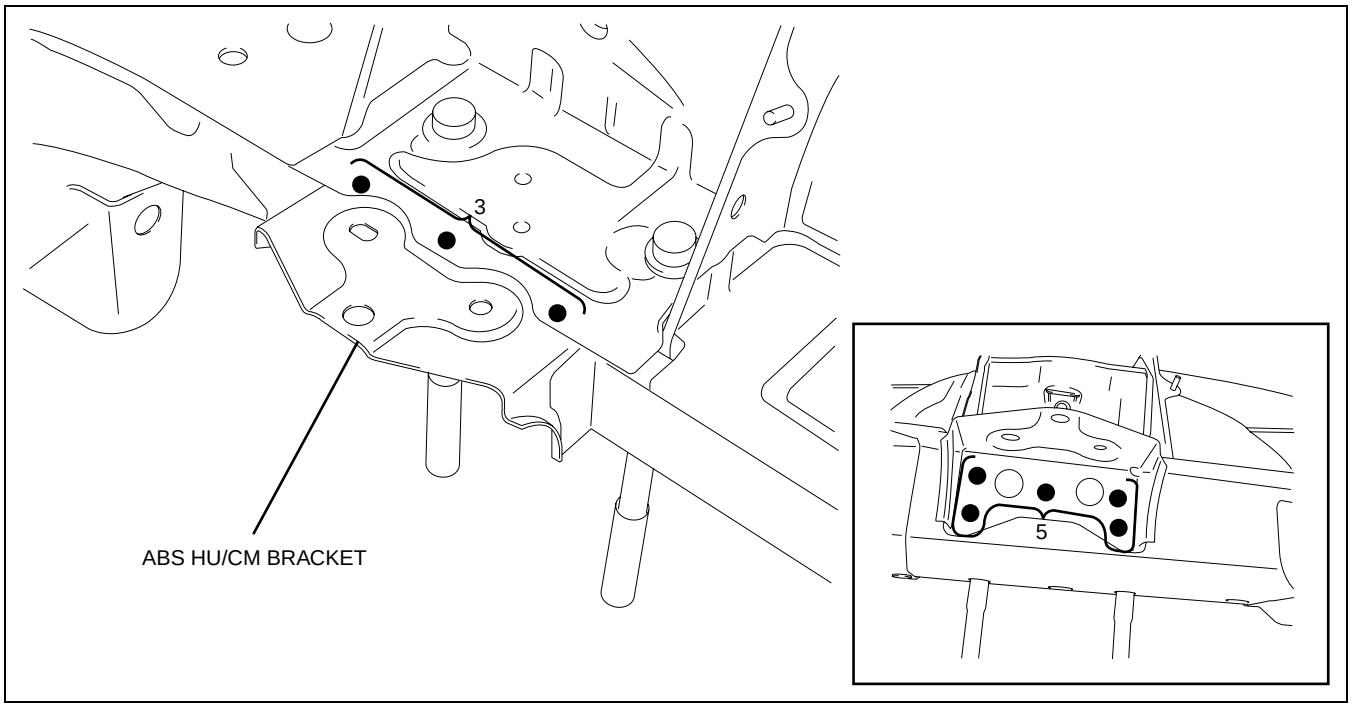


CHU0980B033

ABS HU/CM BRACKET REMOVAL

CHU098053318B01

1. Remove the ABS HU/CM bracket.

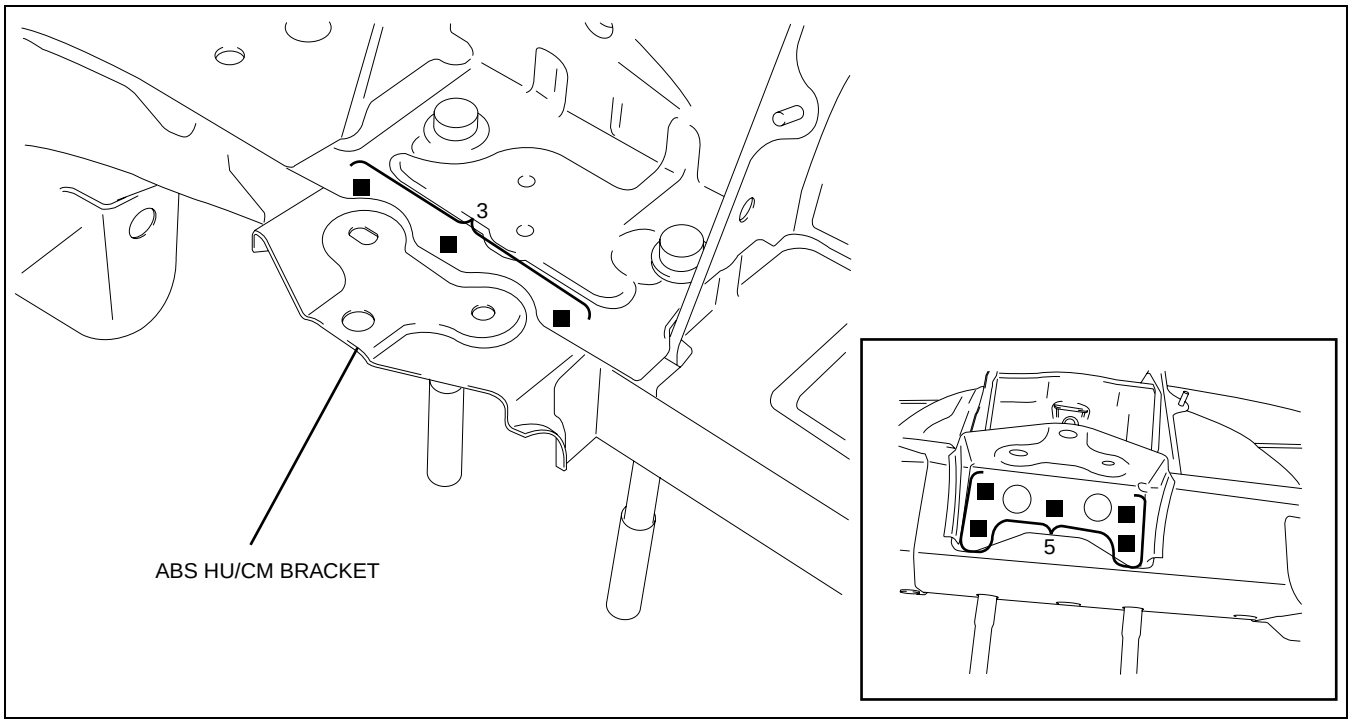


CHU0980B034

ABS HU/CM BRACKET INSTALLATION

CHU098053318B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

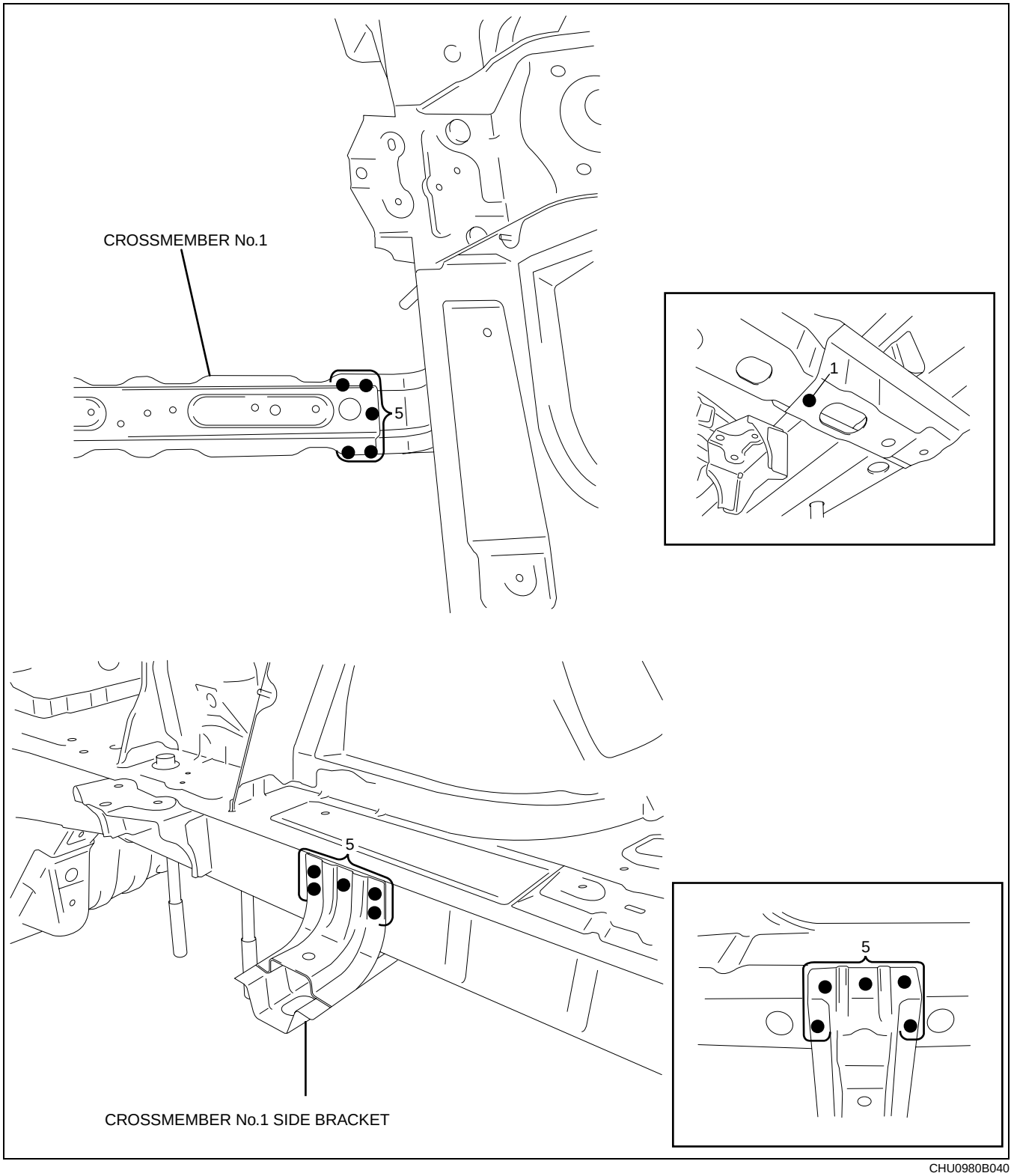


CHU0980B035

CROSSMEMBER NO.1 REMOVAL

CHU098053160B01

1. Remove the crossmember No.1.
2. Remove the crossmember No.1 side bracket.

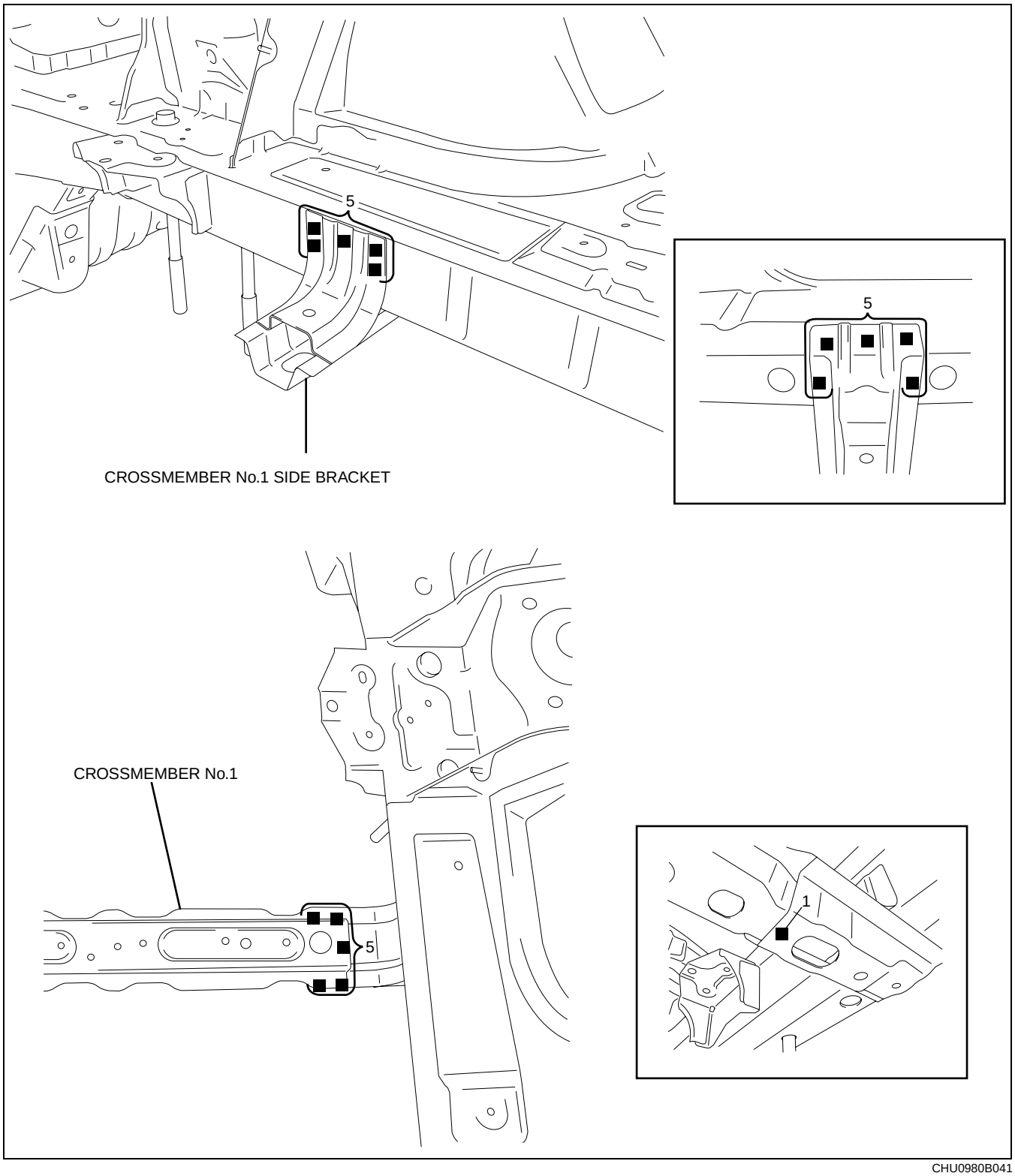


CHU0980B040

CROSSMEMBER NO.1 INSTALLATION

CHU098053160B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

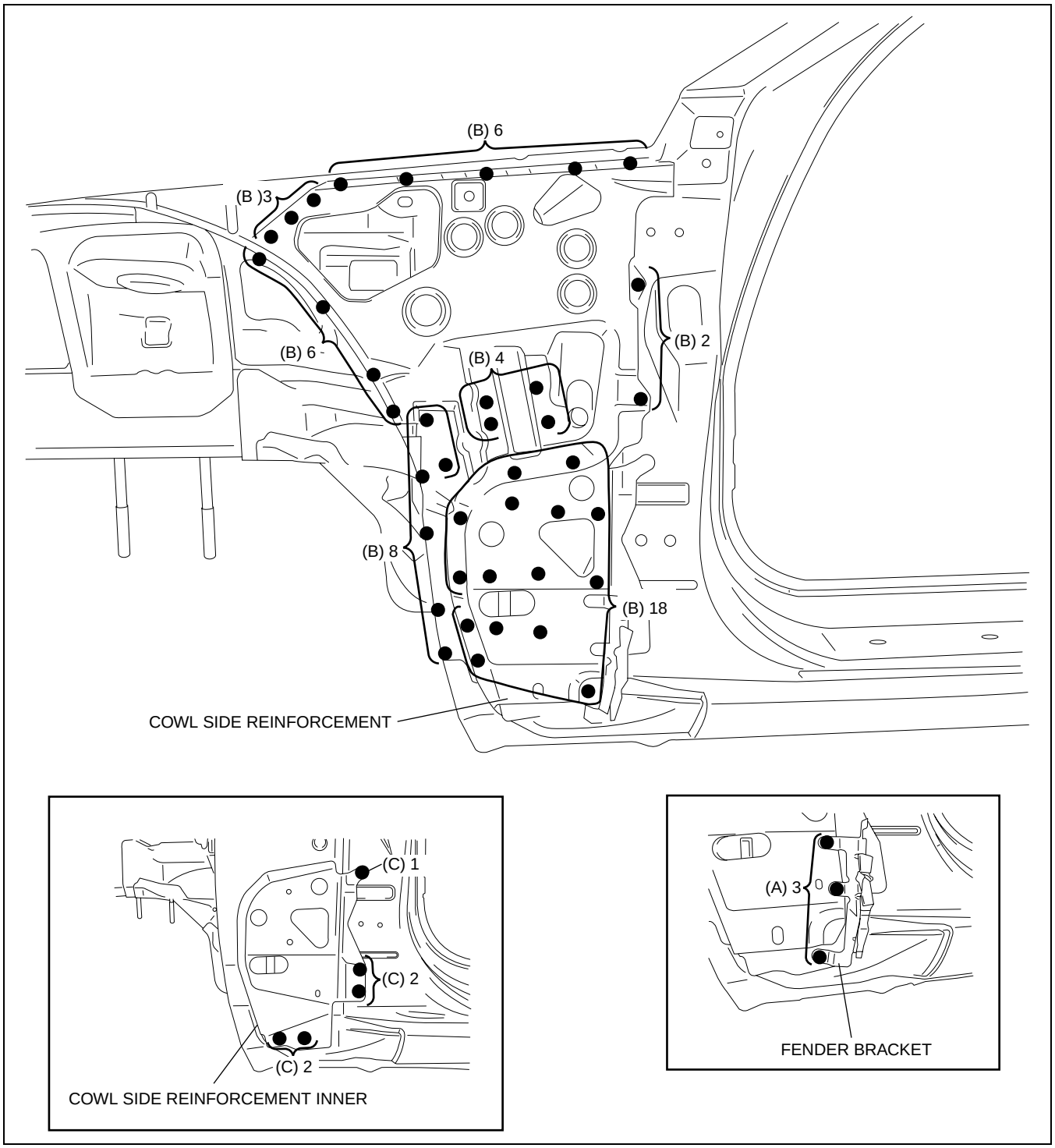


CHU0980B041

COWL SIDE REINFORCEMENT REMOVAL

CHU098053290B01

1. Drill the three weld locations indicated by (A) and remove the fender bracket.
2. Drill the 47 weld locations indicated by (B) and remove the cowl side reinforcement.
3. Drill the five weld locations indicated by (C) and remove the cowl side reinforcement inner.

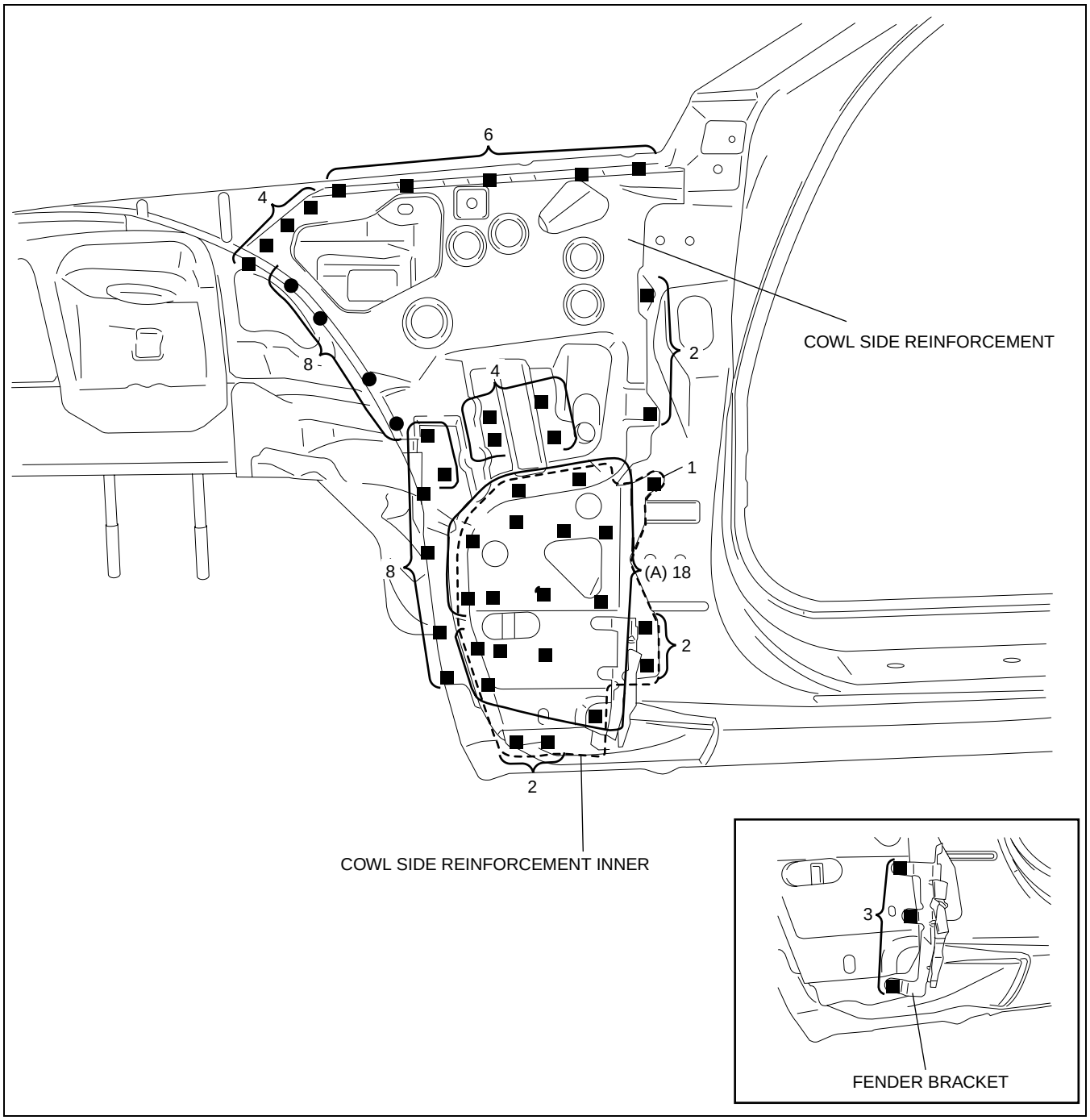


CHU0980B042

COWL SIDE REINFORCEMENT INSTALLATION

CHU098053290B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. Weld the 18 locations indicated by (A), then temporarily installing the cowl side reinforcement inner and cowl side reinforcement.
4. After temporarily installing new parts, make sure the related parts fit properly.

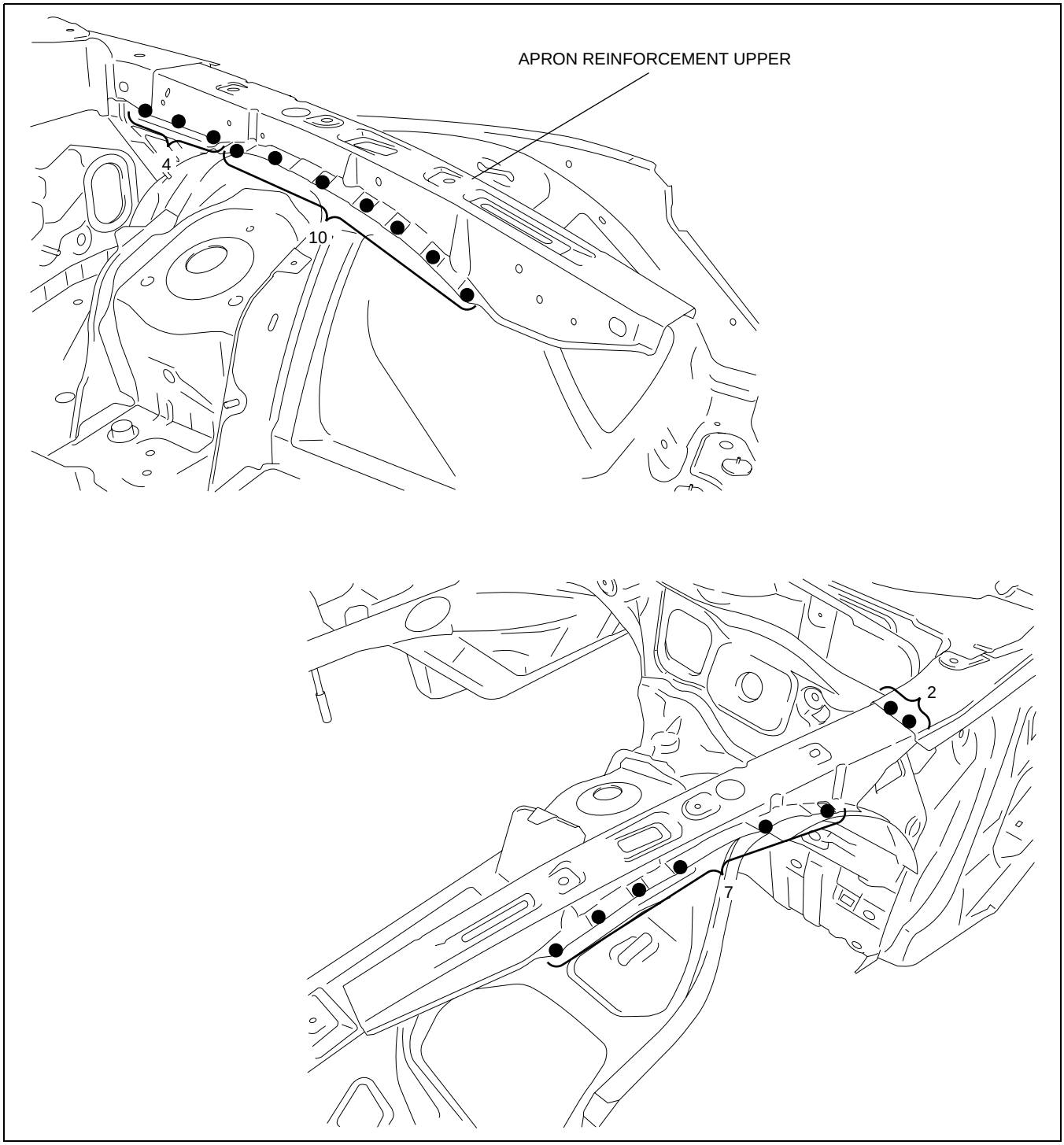


CHU0980B043

APRON REINFORCEMENT UPPER REMOVAL

CHU098053260B01

1. Remove the apron reinforcement upper.

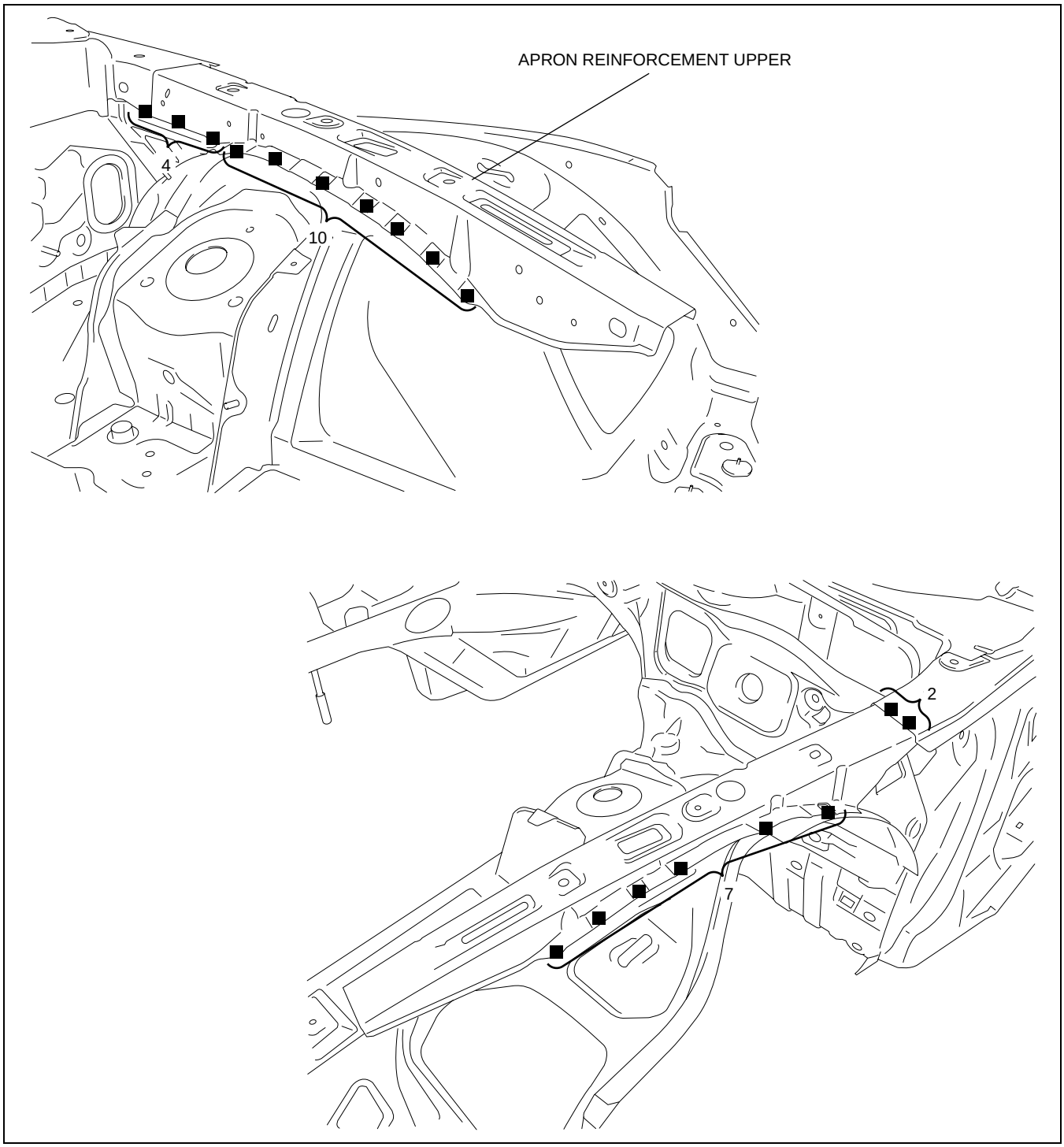


CHU0980B044

APRON REINFORCEMENT UPPER INSTALLATION

CHU098053260B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

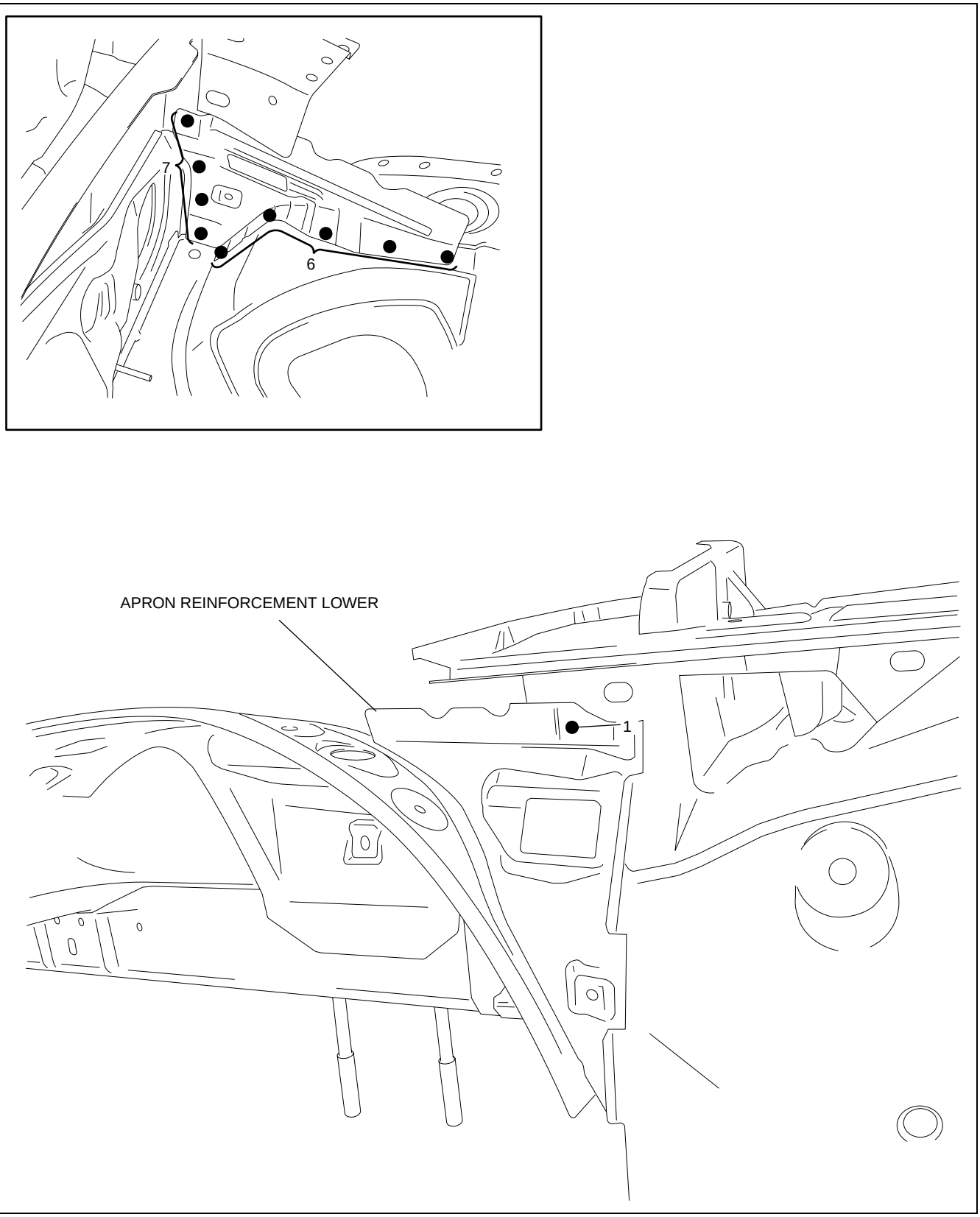


CHU0980B045

APRON REINFORCEMENT LOWER REMOVAL

CHU098053260B03

1. Remove the apron reinforcement lower.

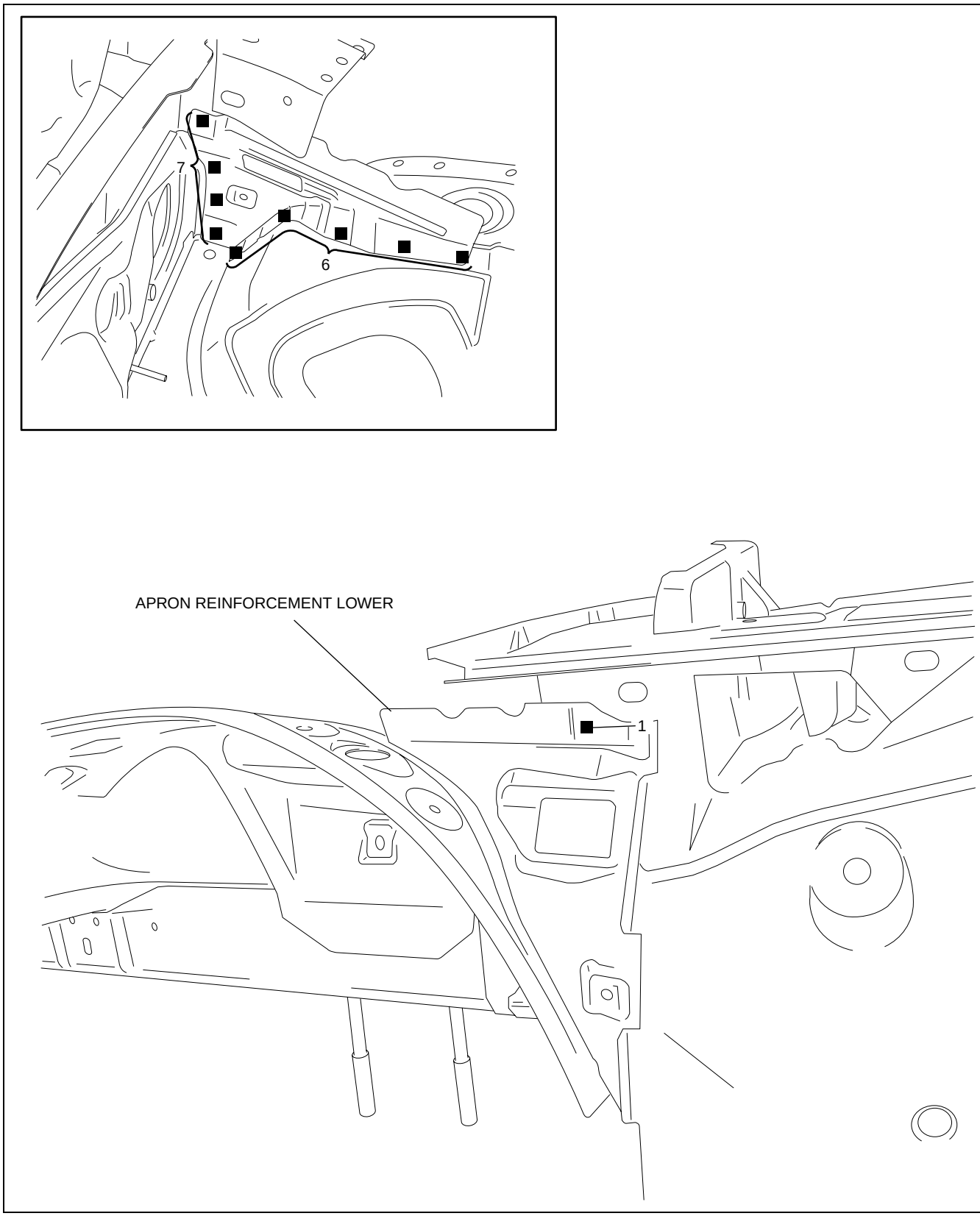


CHU0980B046

APRON REINFORCEMENT LOWER INSTALLATION

CHU098053260B04

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



CHU0980B047

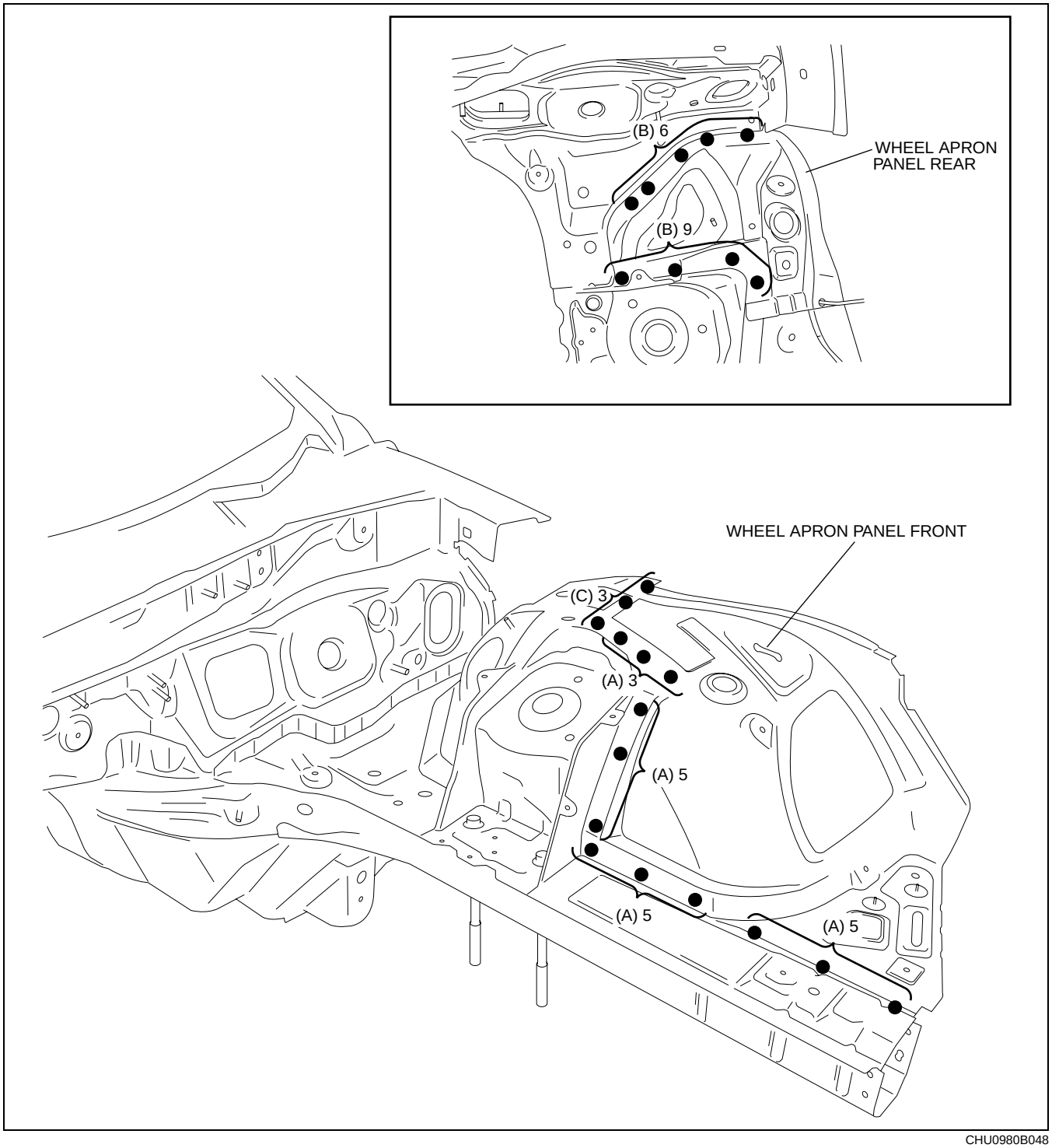
WHEEL APRON PANEL COMPONENT REMOVAL

CHU098053210B01

1. Drill the 18 weld locations indicated by (A) and 15 locations (B), then remove the wheel apron panel component.

Note

- When removing the wheel apron panel front and the wheel apron panel rear separately, drill the 18 weld locations indicated by (A) and the three weld locations by (C).



CHU0980B048

WHEEL APRON PANEL COMPONENT INSTALLATION

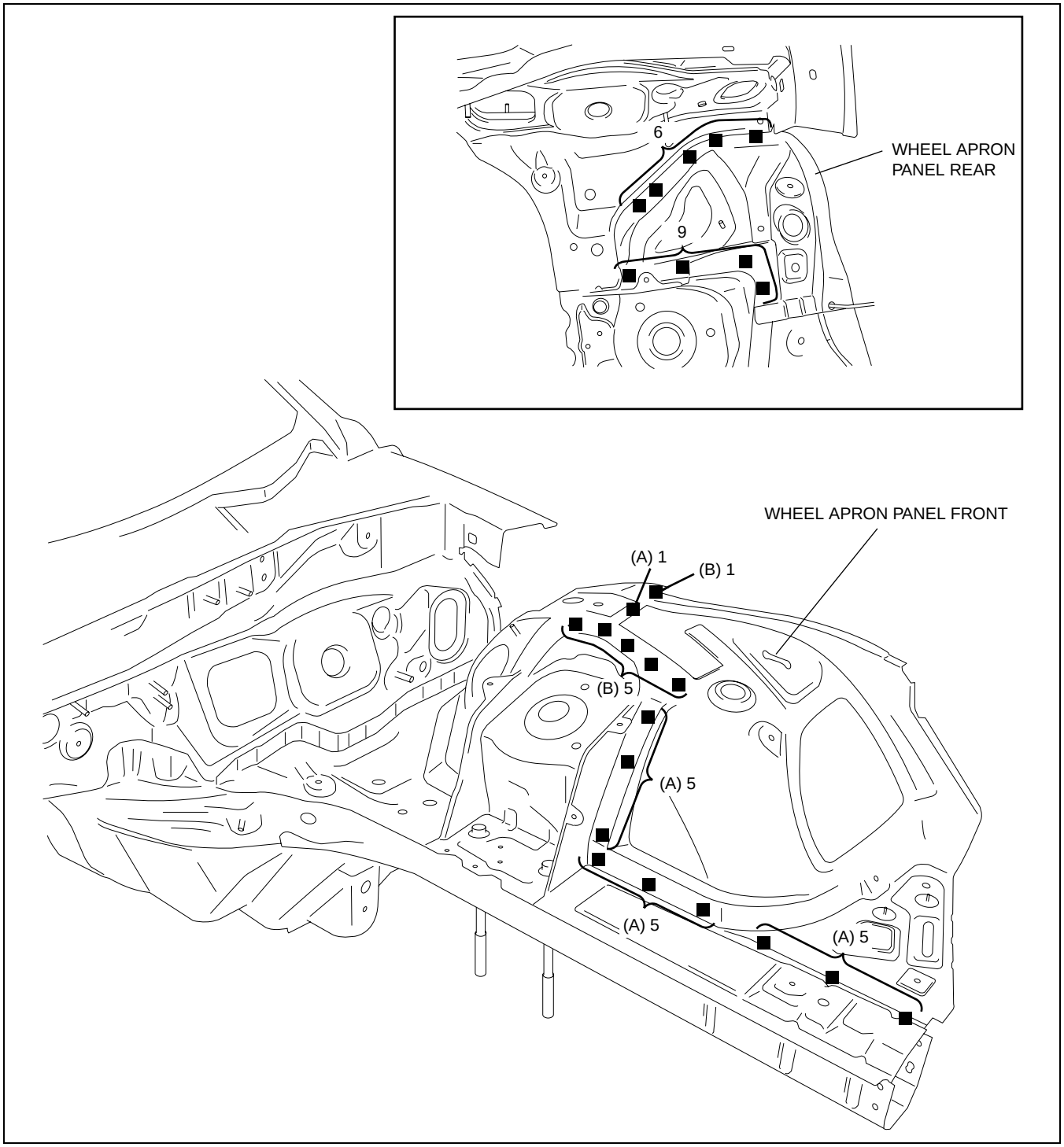
CHU098053210B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
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 wheel apron panel front and the wheel apron panel rear separately, weld 16 locations indicated by (A).

4. Plug the six weld location indicated by (B) when installing the apron reinforcement upper.

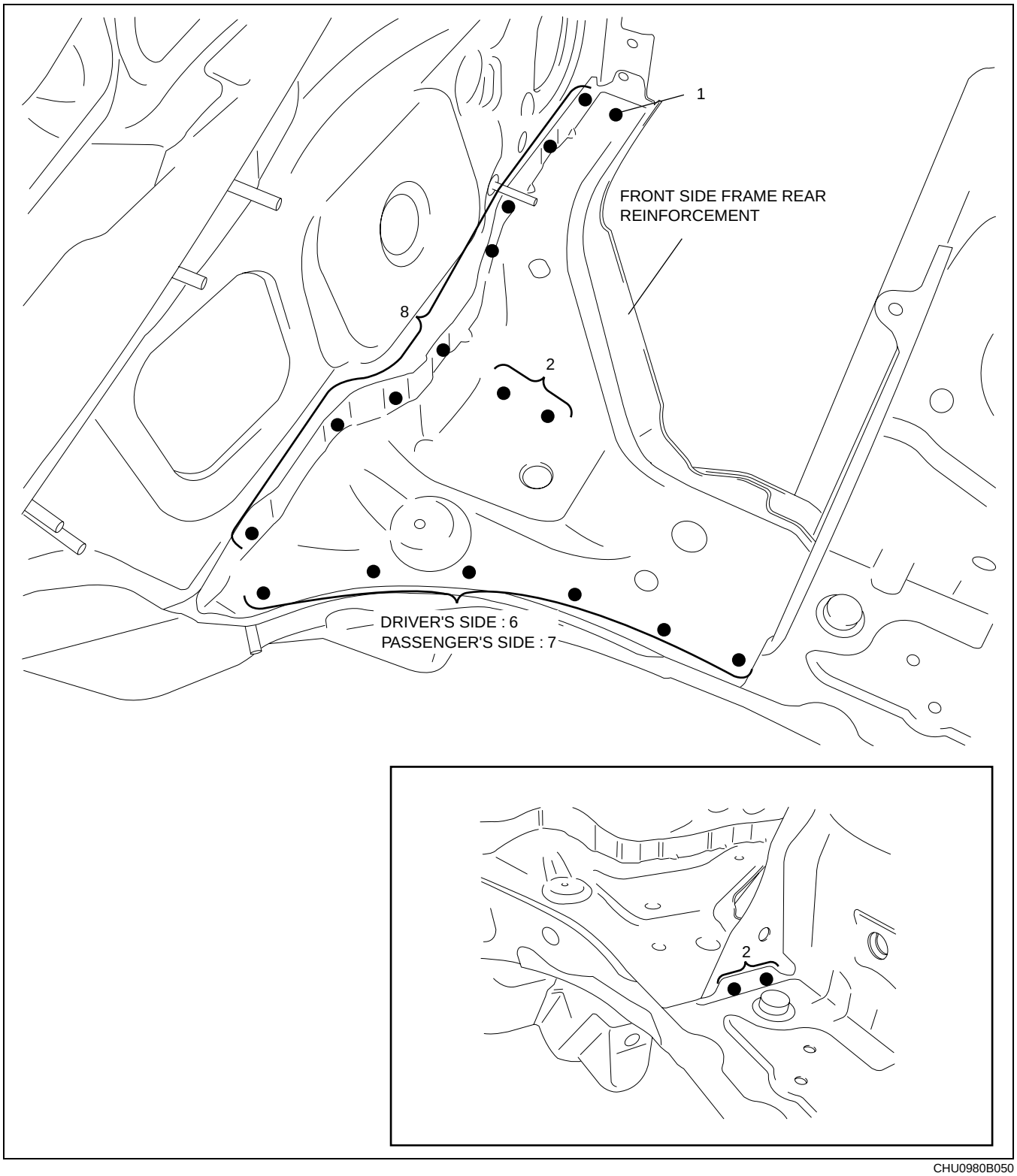


CHU0980B049

FRONT SIDE FRAME REAR REINFORCEMENT REMOVAL

CHU098053396B01

1. Remove the front side frame rear reinforcement.

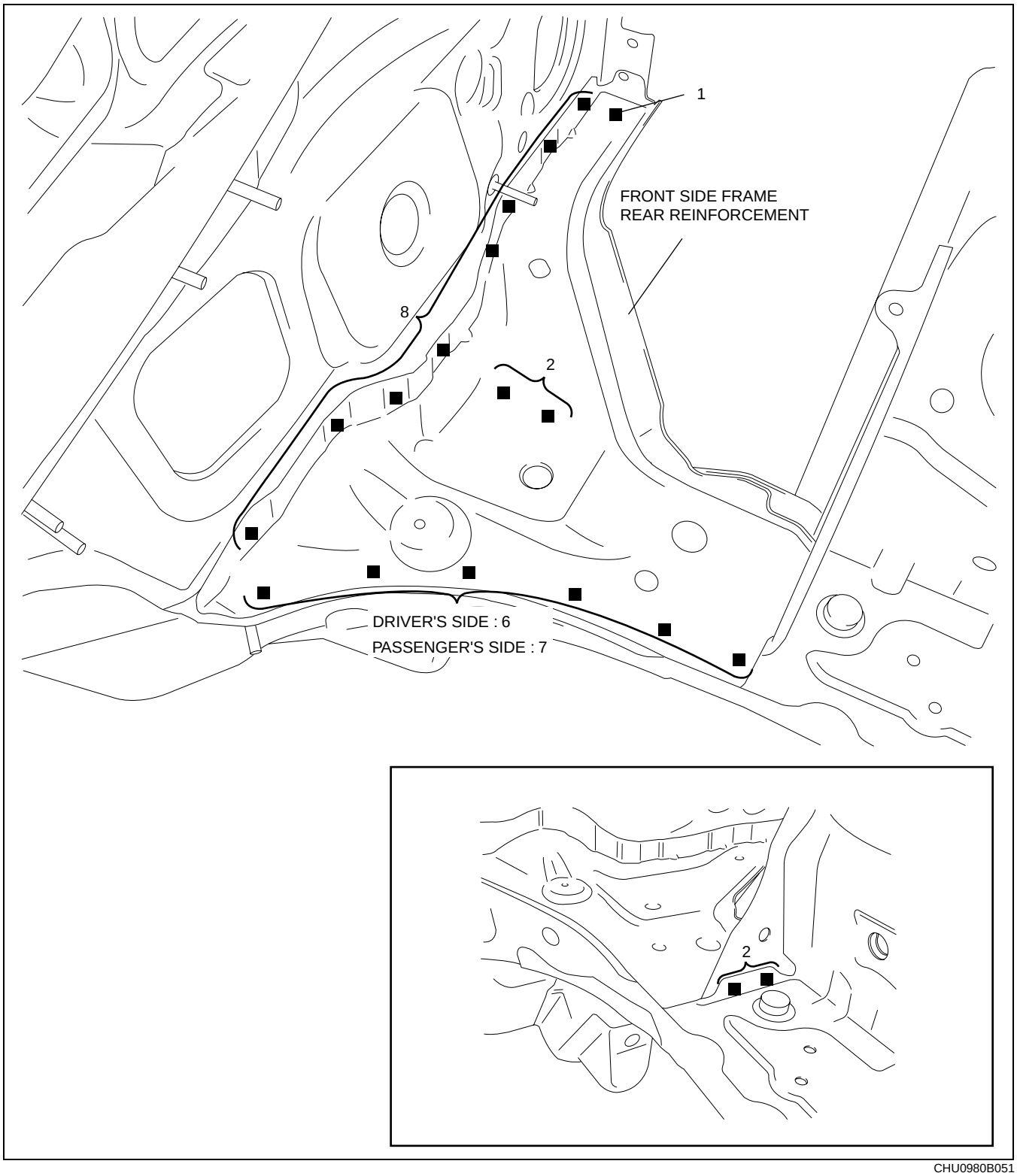


CHU0980B050

FRONT SIDE FRAME REAR REINFORCEMENT INSTALLATION

CHU098053396B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

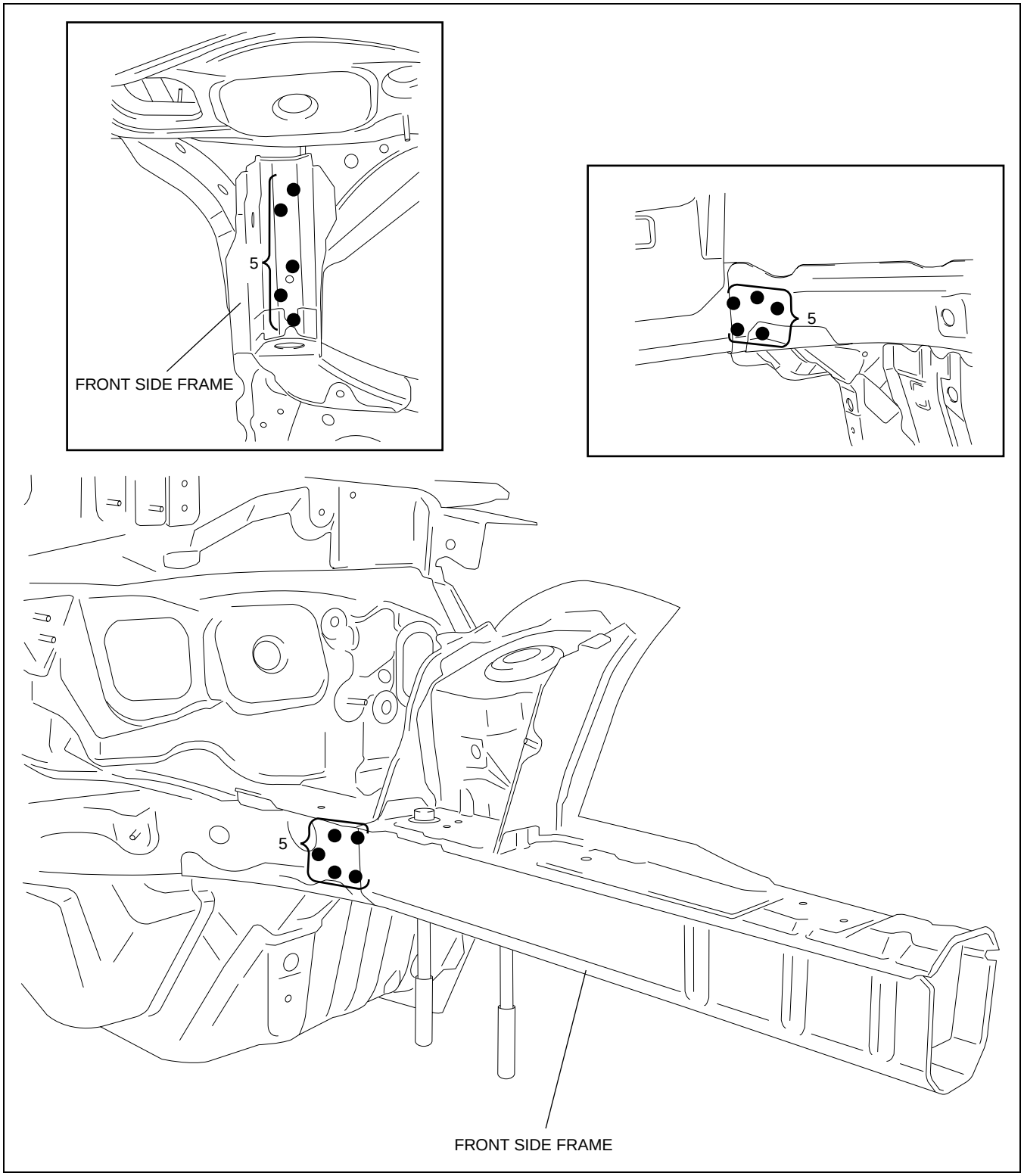


CHU0980B051

FRONT SIDE FRAME REMOVAL

CHU098053300B01

1. Remove the front side frame.

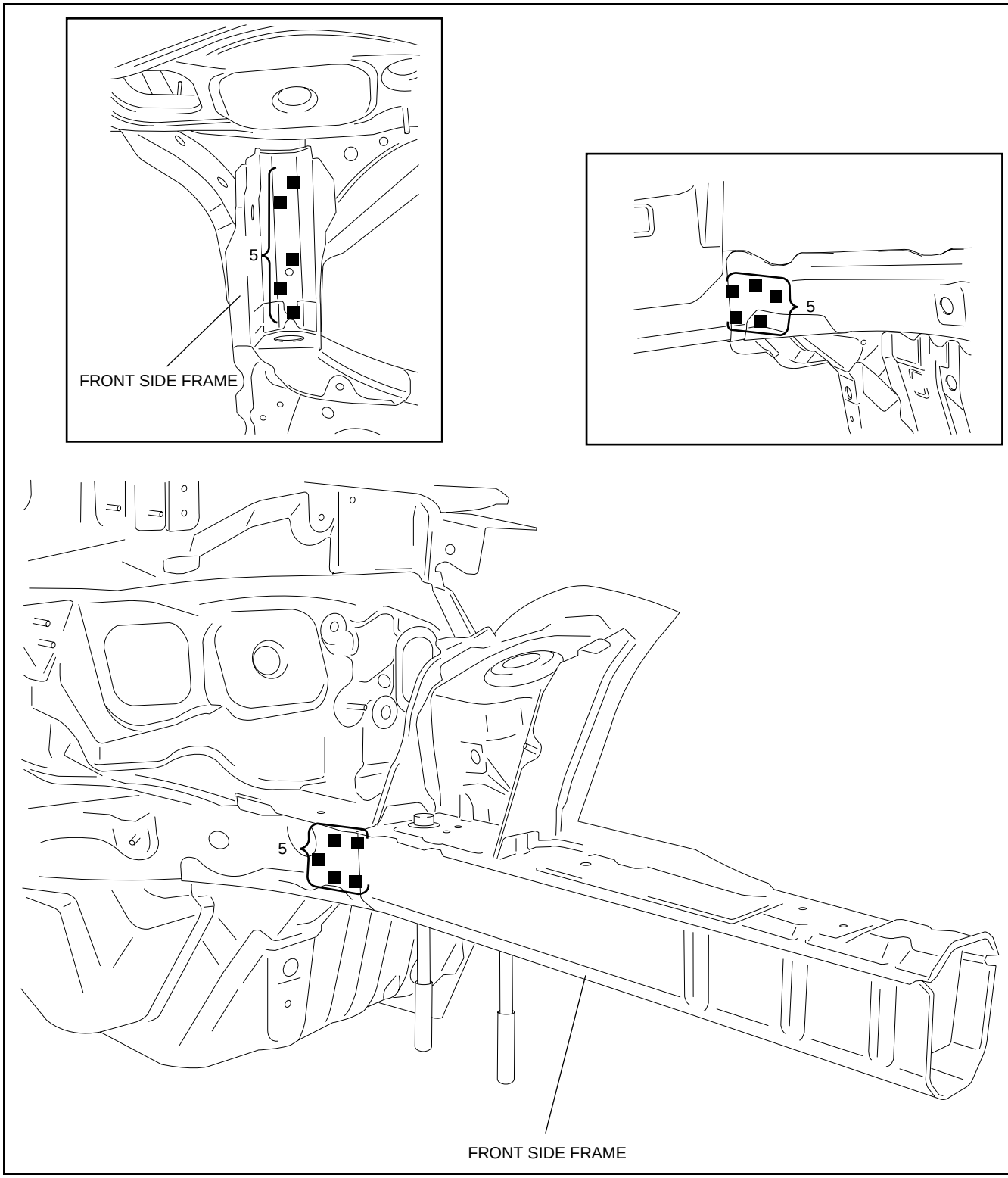


CHU0980B052

FRONT SIDE FRAME INSTALLATION

CHU098053300B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

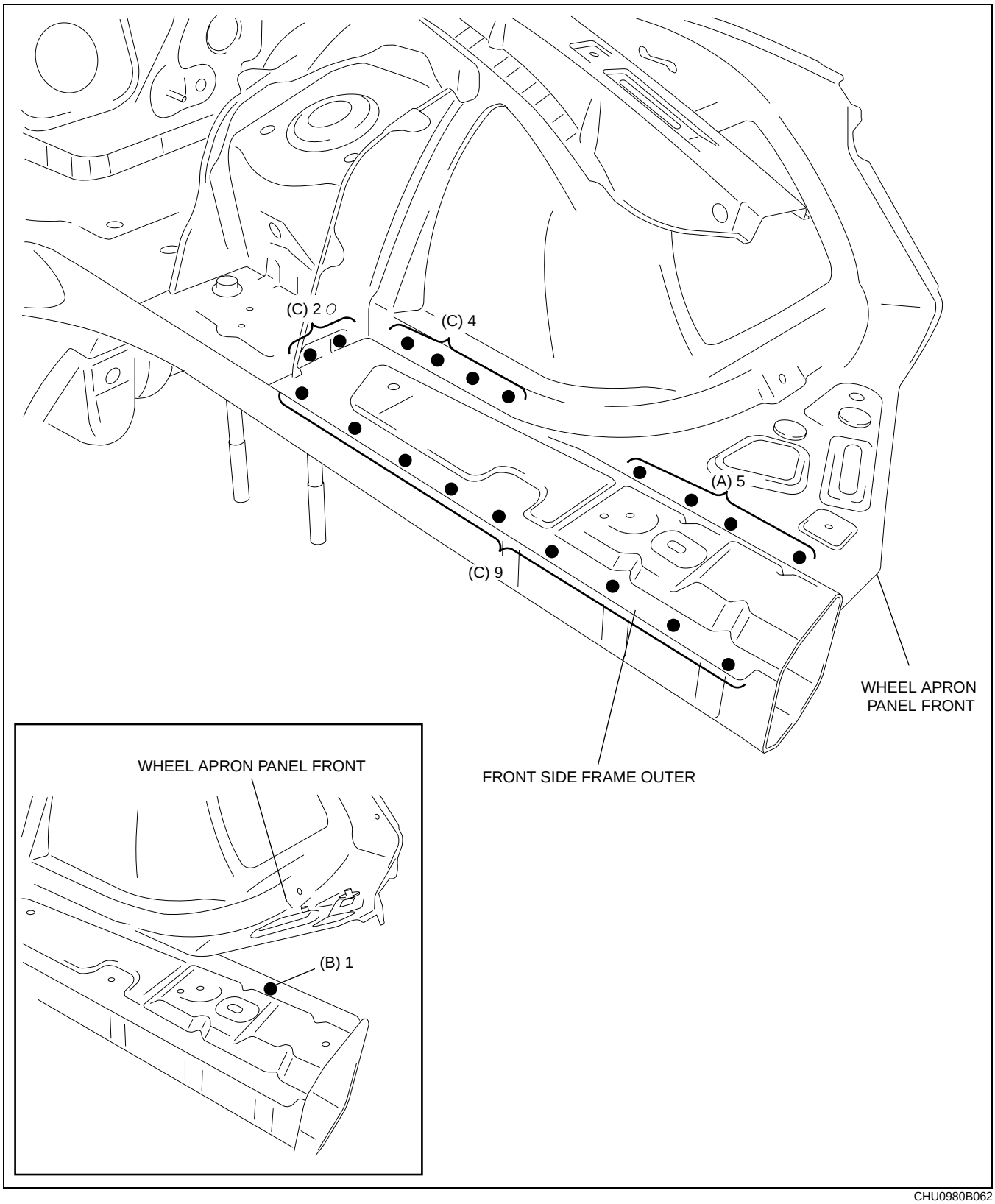


CHU0980B053

FRONT SIDE FRAME OUTER REMOVAL

CHU098053300B03

1. To facilitate removal of the front side frame outer, drill the five weld locations indicated by (A) and bend the wheel apron panel front upward.
2. Drill the one weld locations indicated by (B) and 15 weld locations (C) then remove the front side frame outer.

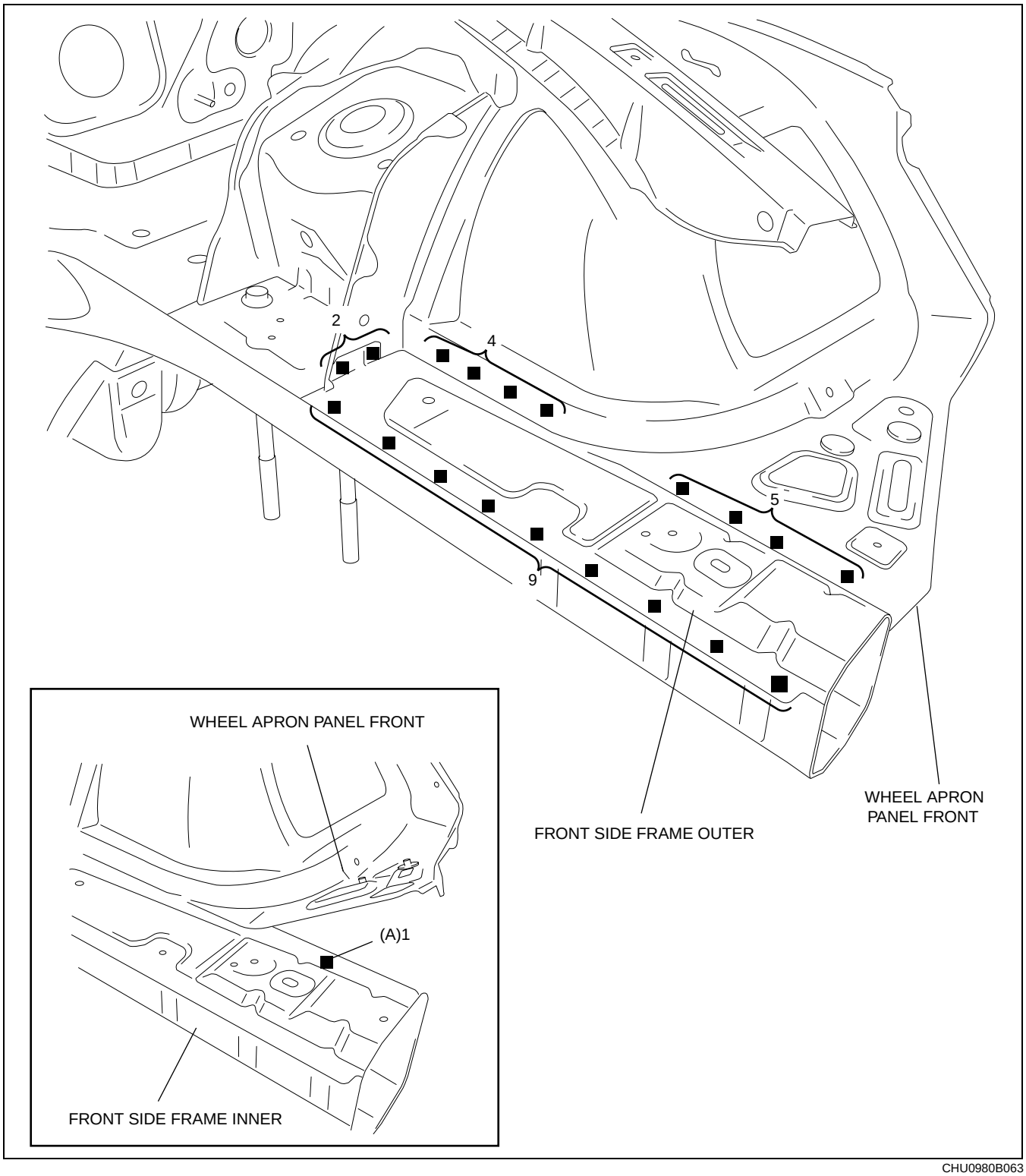


CHU0980B062

FRONT SIDE FRAME OUTER INSTALLATION

CHU098053300B04

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. Weld the one locations indicated by (A), then temporarily installing the inner and outer.
4. After temporarily installing new parts, make sure the related parts fit properly.

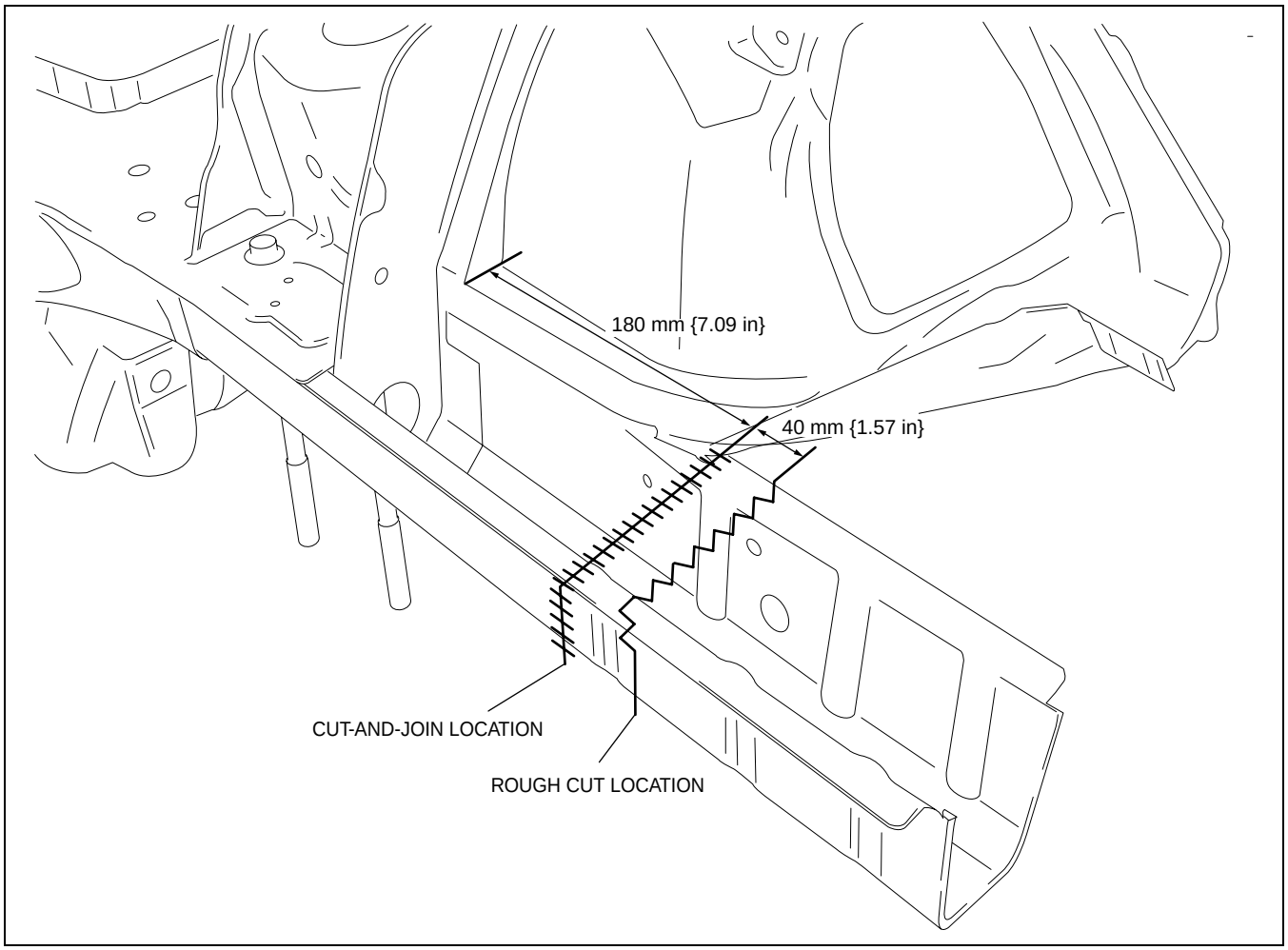


CHU0980B063

FRONT SIDE FRAME (PARTIAL CUTTING) REMOVAL

CHU098053300B05

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



CHU0980B056

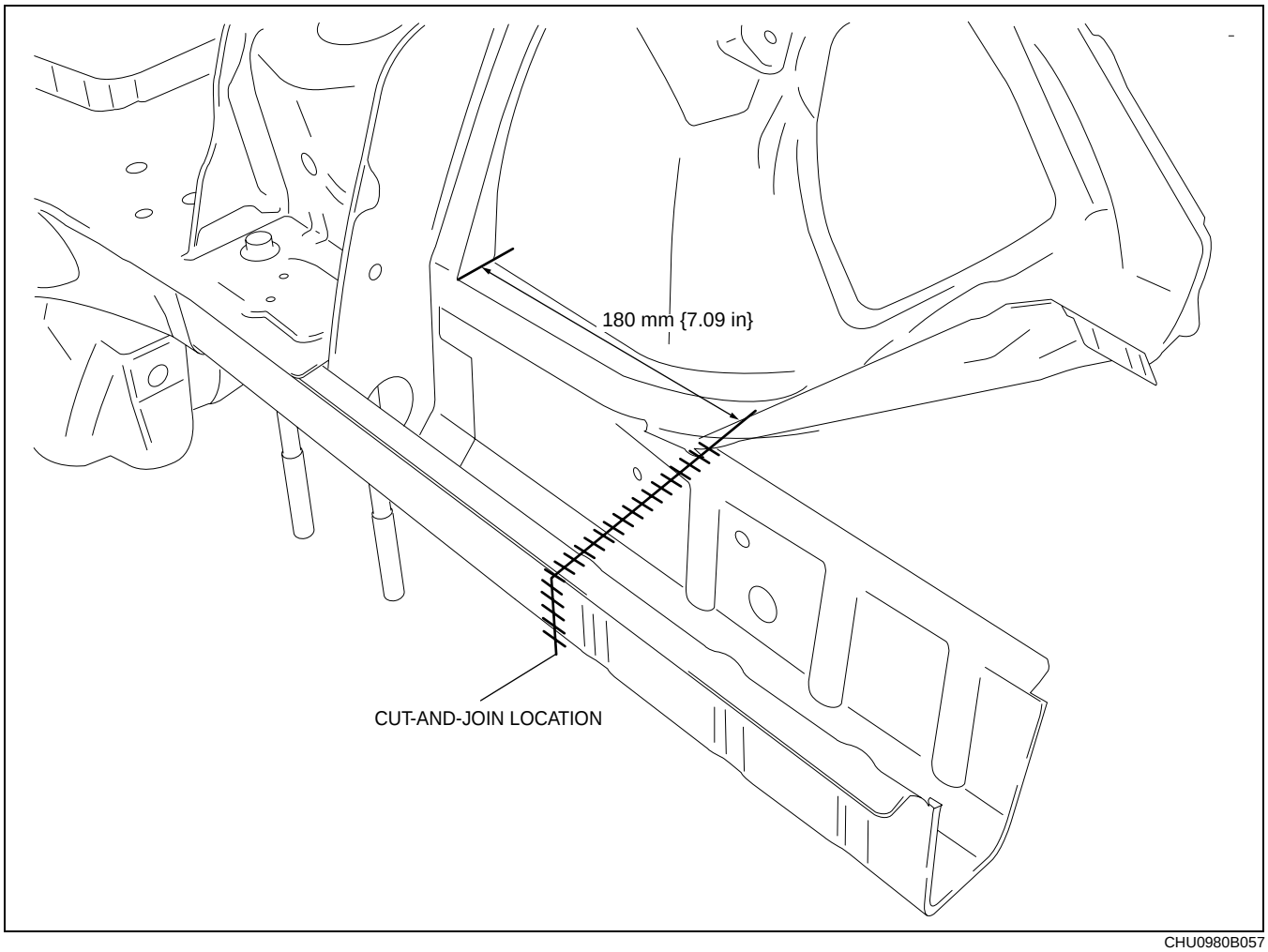
FRONT SIDE FRAME (PARTIAL CUTTING) INSTALLATION

CHU098053300B06

1. Cut the new and old parts at the cut-and-join location, and bevel the parts.
2. To cut-and-join the new part, cut at the locations indicated in the figure below and bevel the cut-and-join locations of the new parts.
3. When installing the new parts, trial-fit them to the body, and position each part so that the each section alignment matches the body dimensions.
4. After temporarily installing new parts, make sure the related parts fit properly.

Caution

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

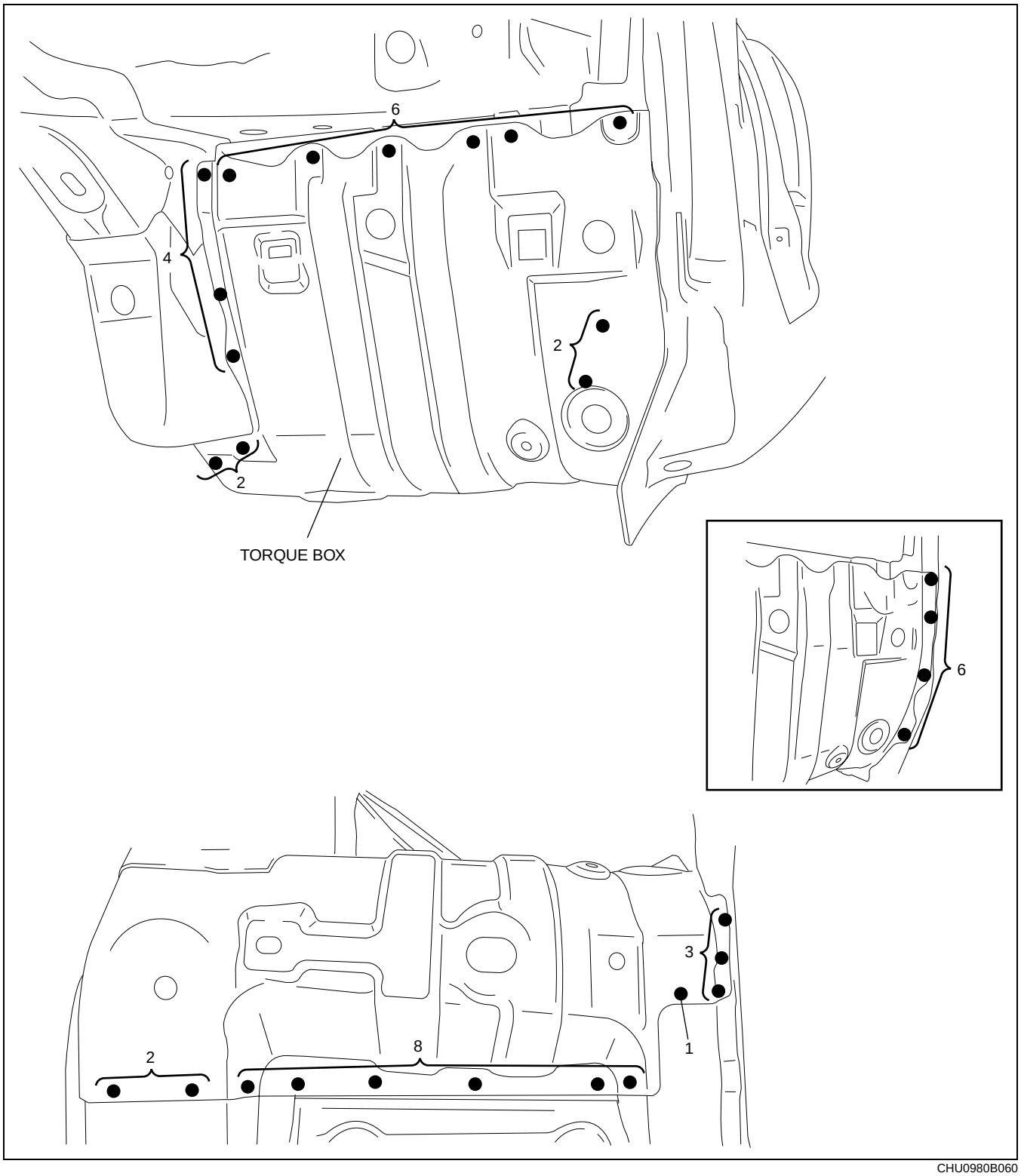


CHU0980B057

TORQUE BOX REMOVAL

CHU098053381B01

1. Remove the torque box.

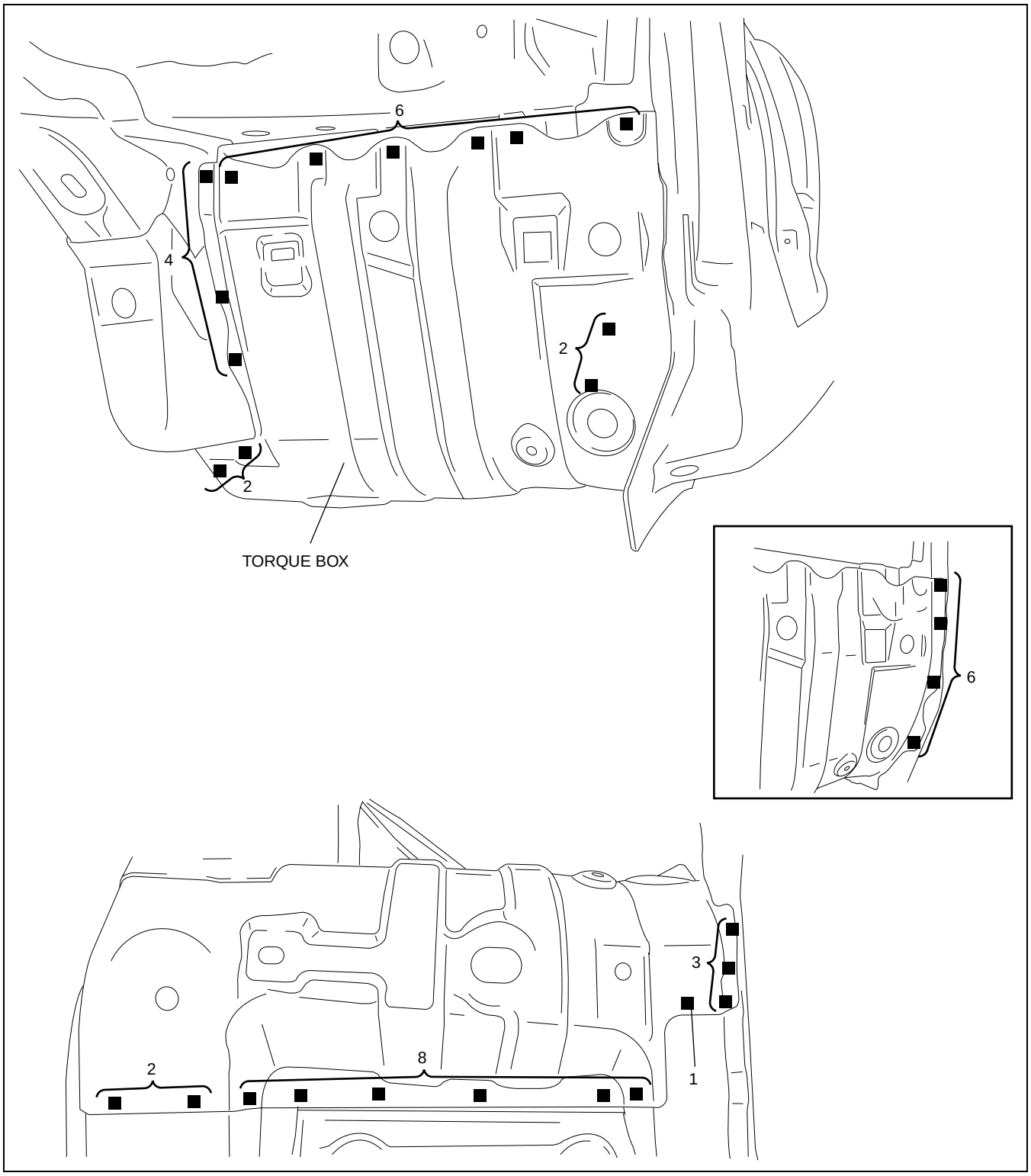


CHU0980B060

TORQUE BOX INSTALLATION

CHU098053381B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

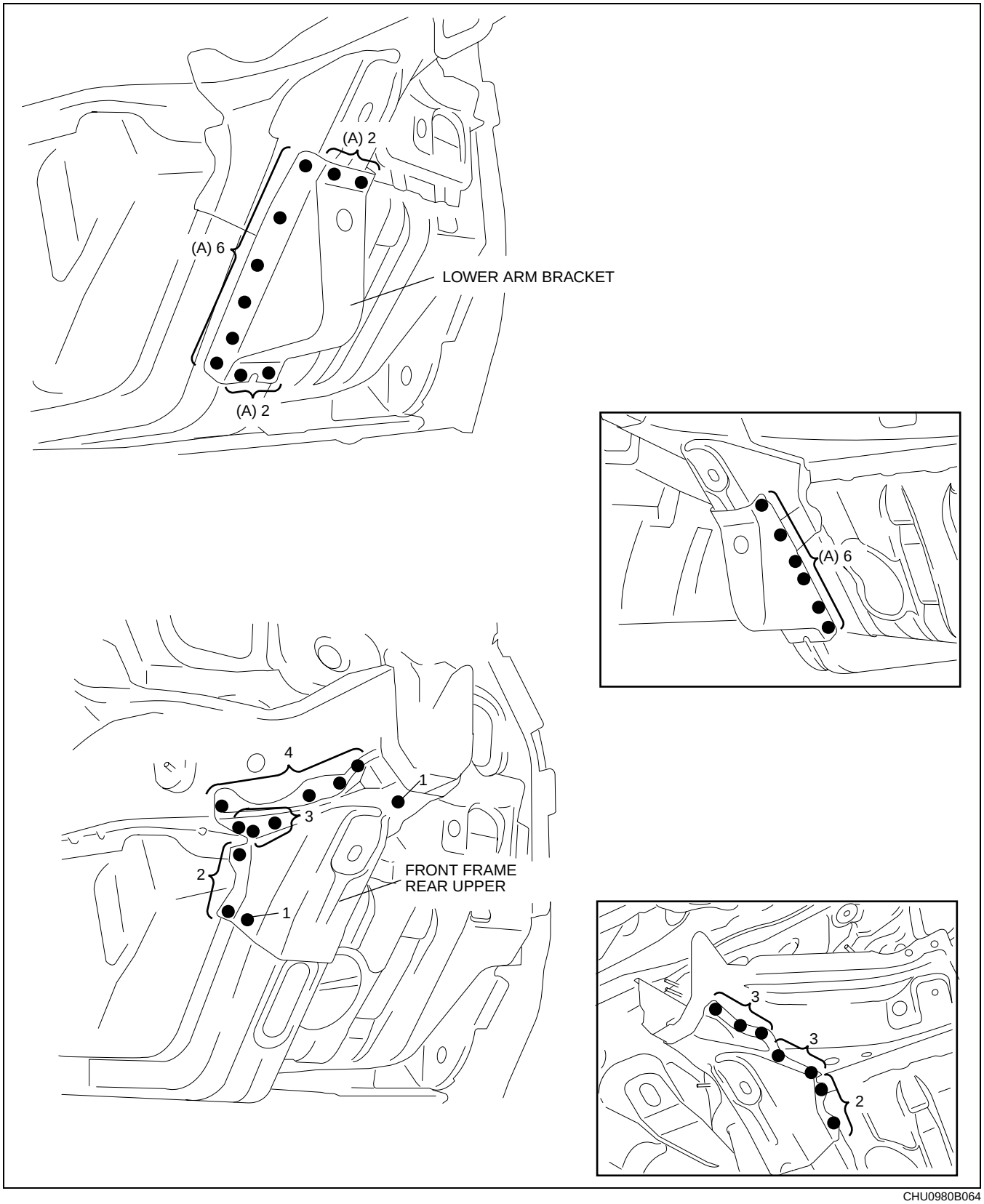


CHU0980B061

FRONT FRAME REAR UPPER REMOVAL

CHU098053390B01

1. Drill the 16 weld locations indicated by (A) and remove the lower arm bracket.
2. Drill the remaining weld locations and remove the front frame rear upper.

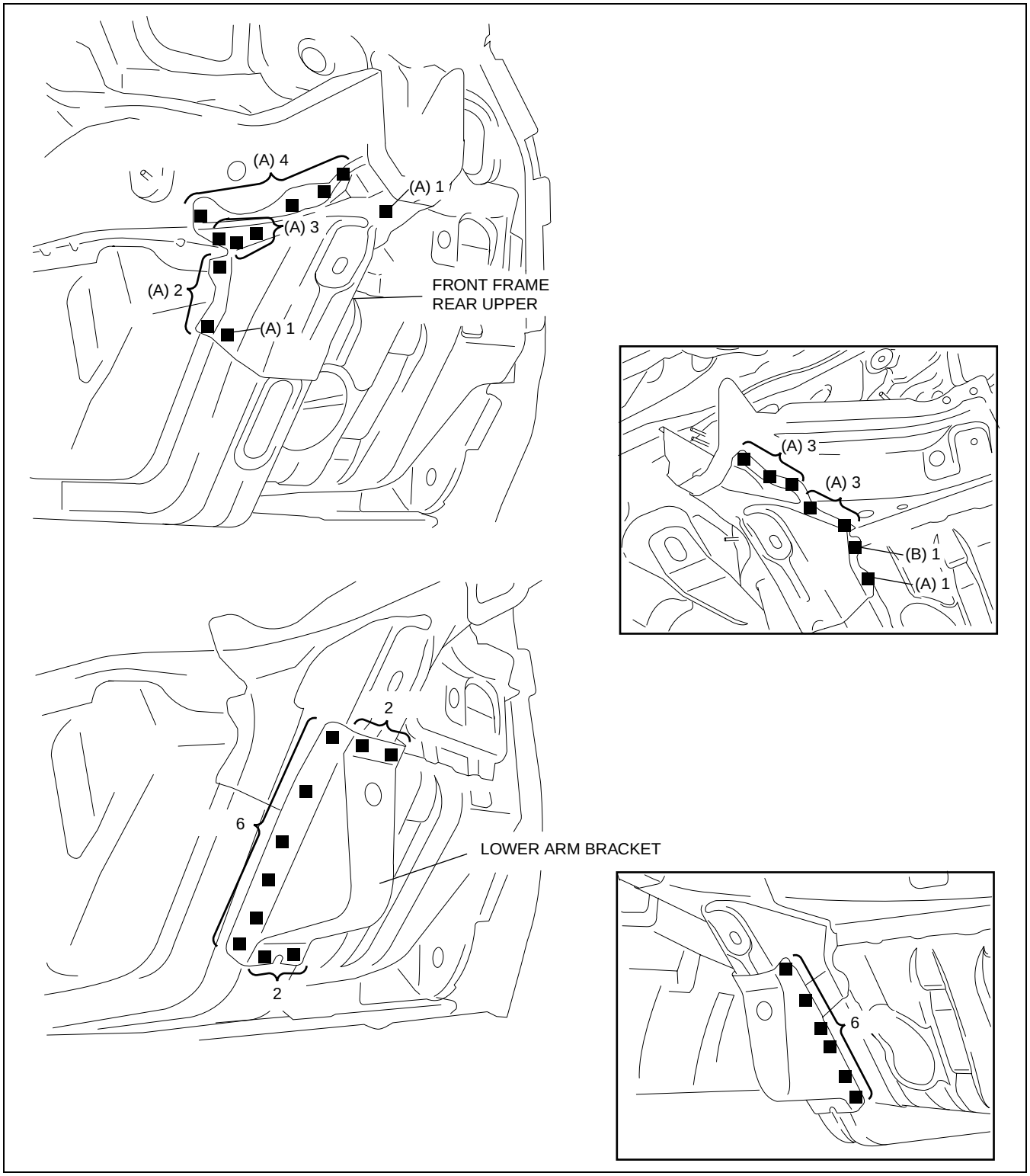


CHU0980B064

FRONT FRAME REAR UPPER INSTALLATION

CHU098053390B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. Weld the 18 locations indicated by (A) and install the front frame rear upper.
4. After temporarily installing new parts, make sure the related parts fit properly.
5. Plug the one weld location indicated by (B) when installing the torque box.

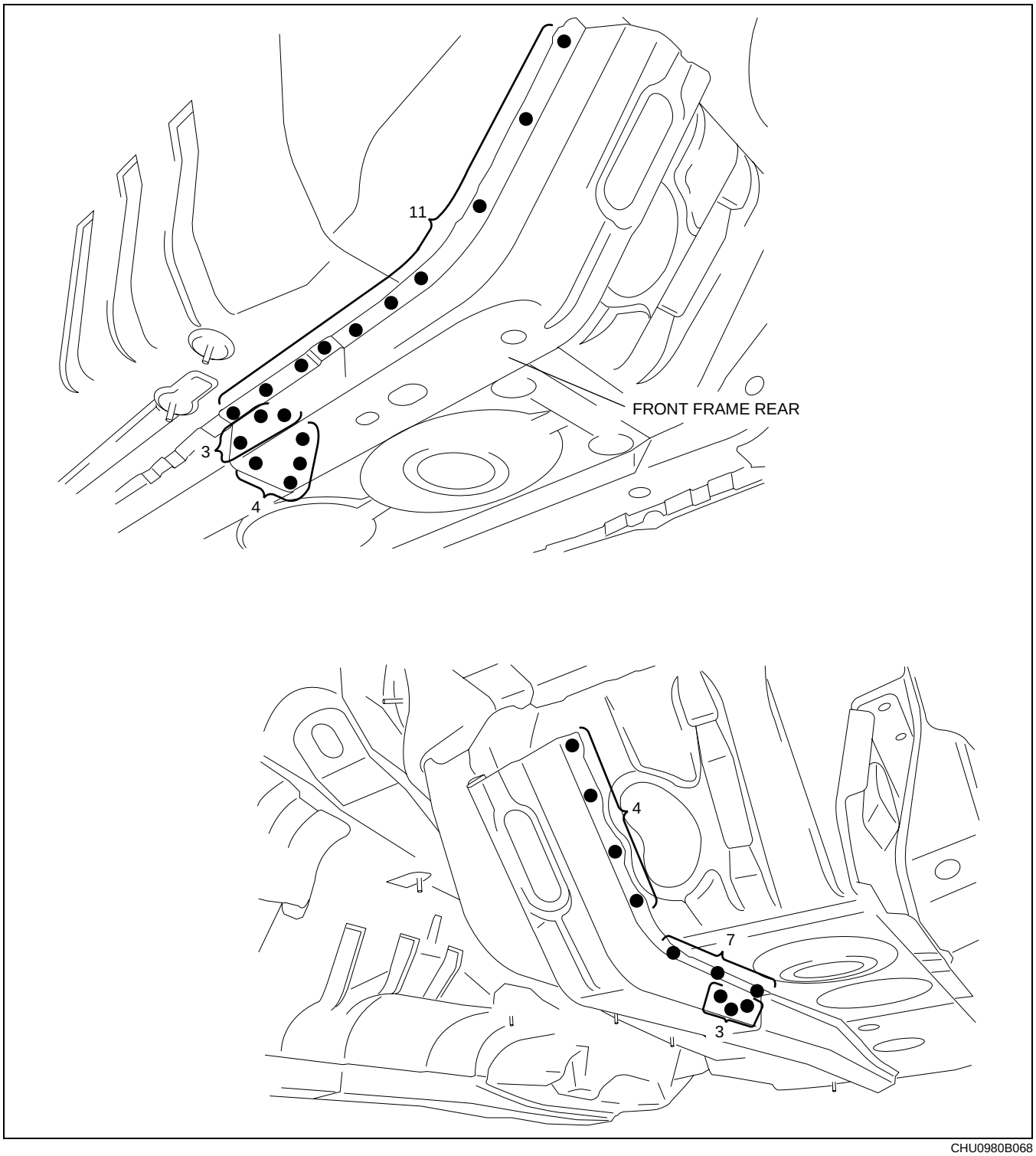


CHU0980B065

FRONT FRAME REAR REMOVAL

CHU098053390B03

1. Remove the front frame rear.

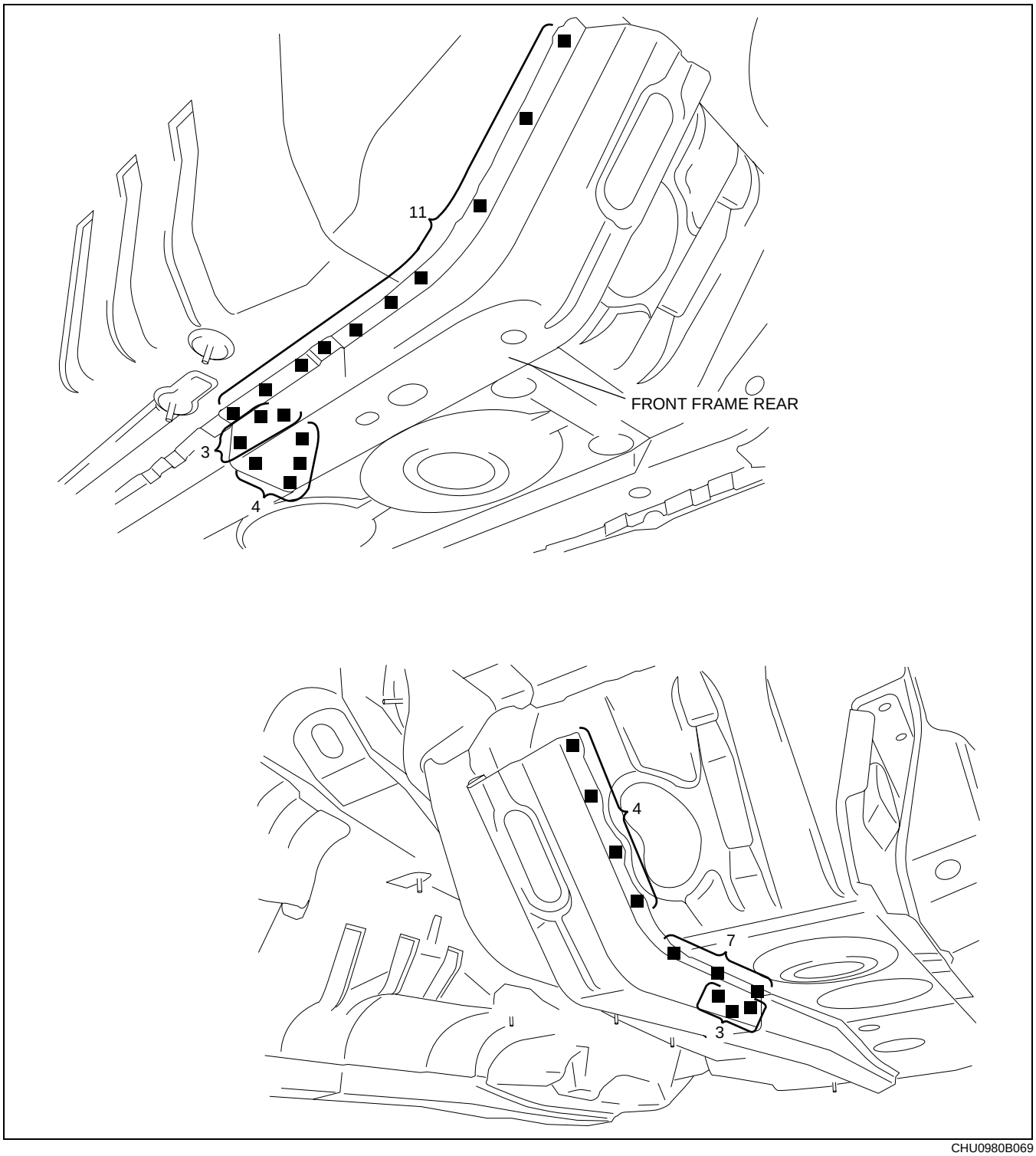


CHU0980B068

FRONT FRAME REAR INSTALLATION

CHU098053390B04

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



CHU0980B069

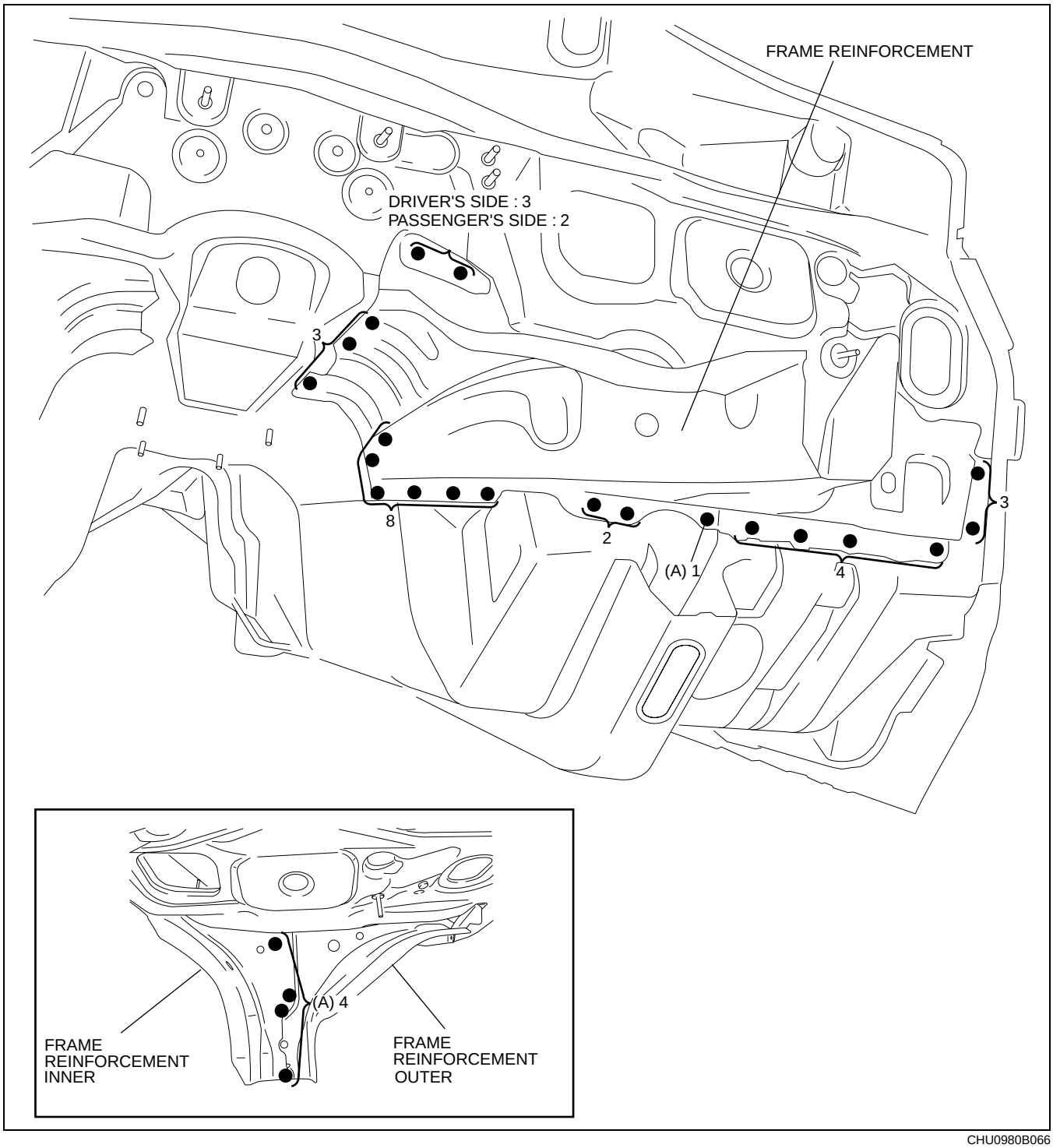
FRAME REINFORCEMENT REMOVAL

CHU098053342B01

1. Remove the frame reinforcement.

Note

- When removing the frame reinforcement inner and the frame reinforcement outer separately, drill the five weld locations indicated by (A).



CHU0980B066

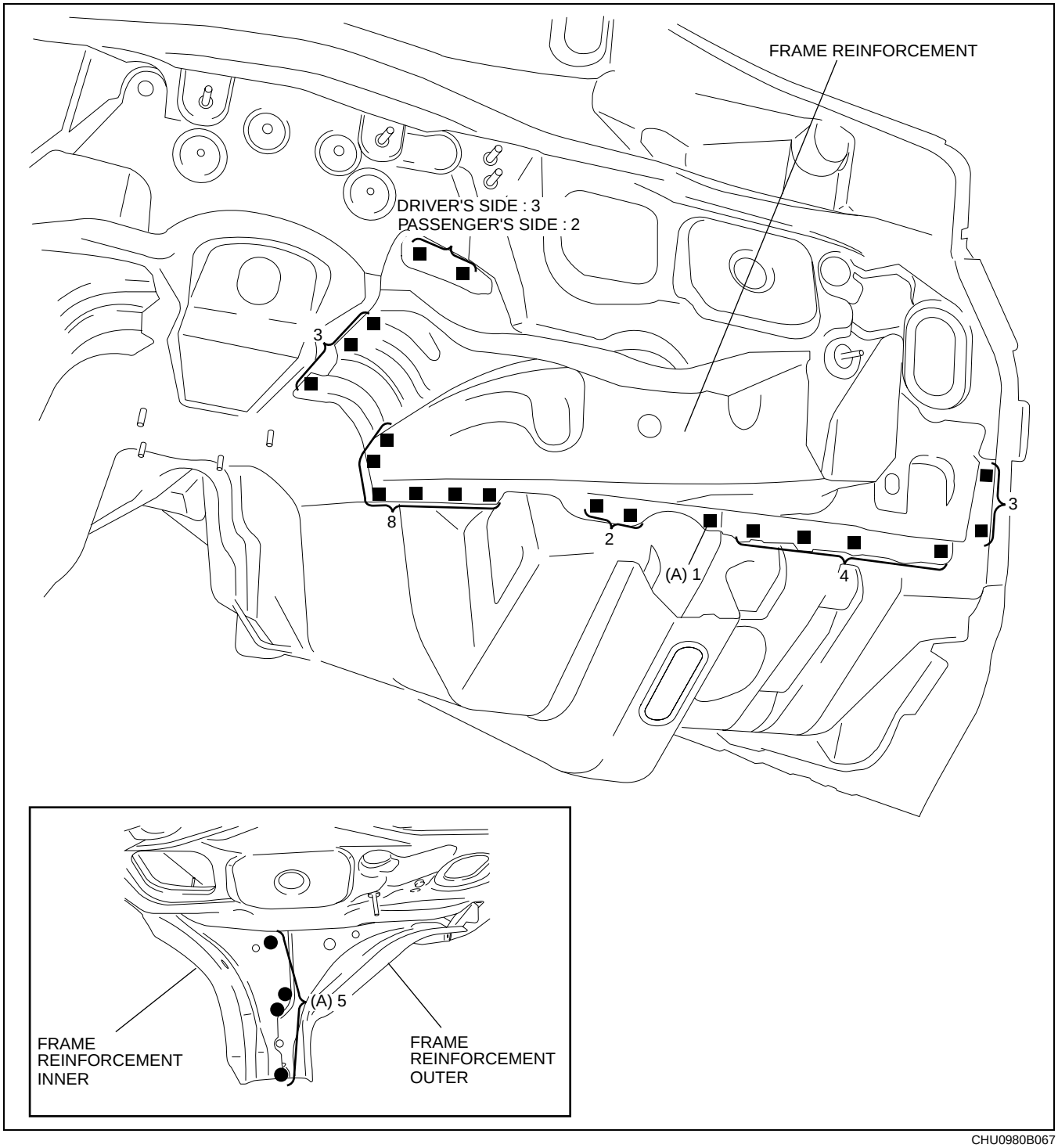
FRAME REINFORCEMENT INSTALLATION

CHU098053342B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
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 frame reinforcement inner and the frame reinforcement outer separately, weld six weld locations indicated by (A).



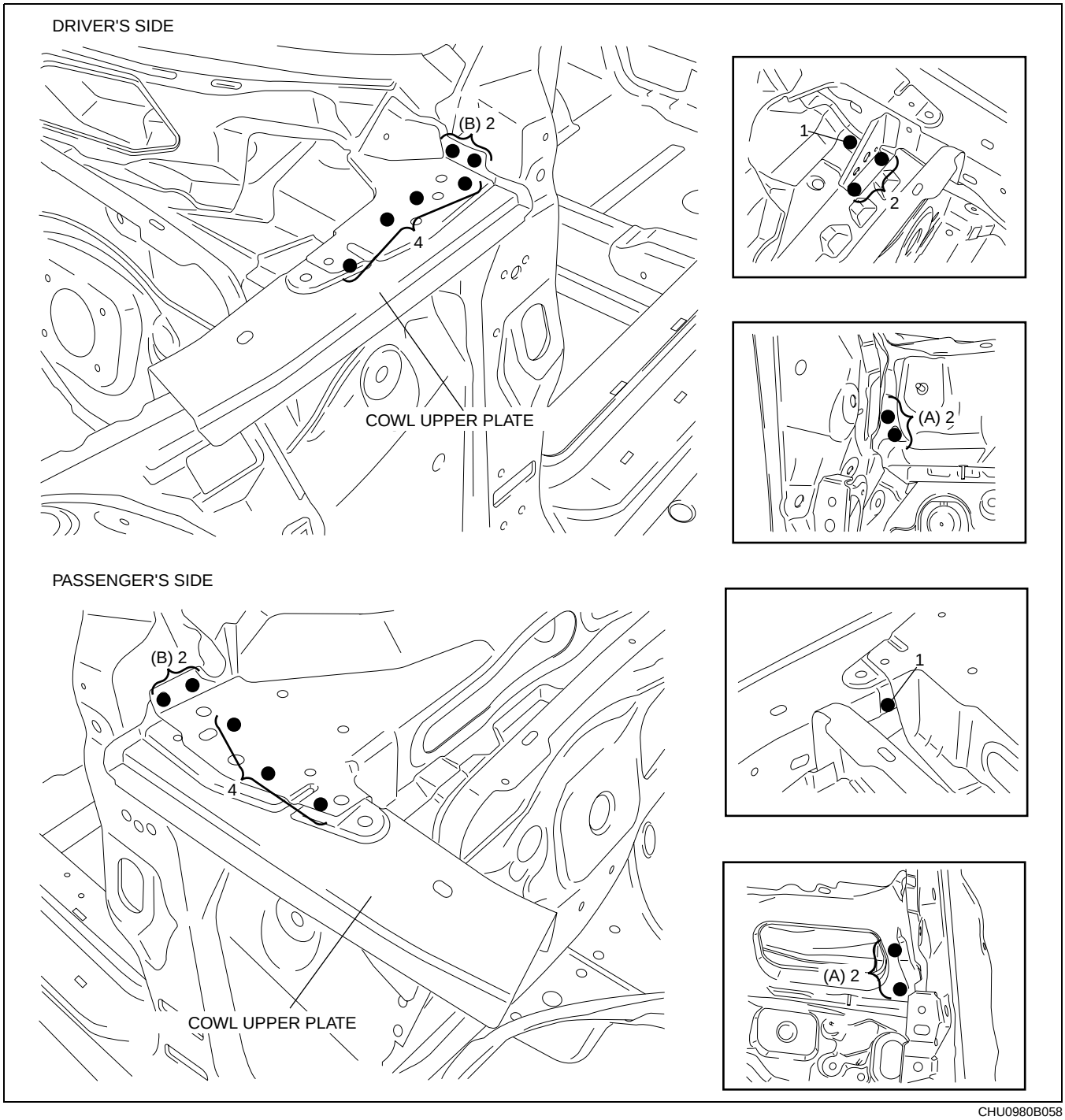
CHU0980B067

COWL UPPER PLATE REMOVAL

CHU098053580B01

1. Drill the four weld locations indicated by (A), from the room side.
2. Remove the cowl upper plate.

Caution
- **Be careful not to damage the windshield when drilling the location indicated by (B).**



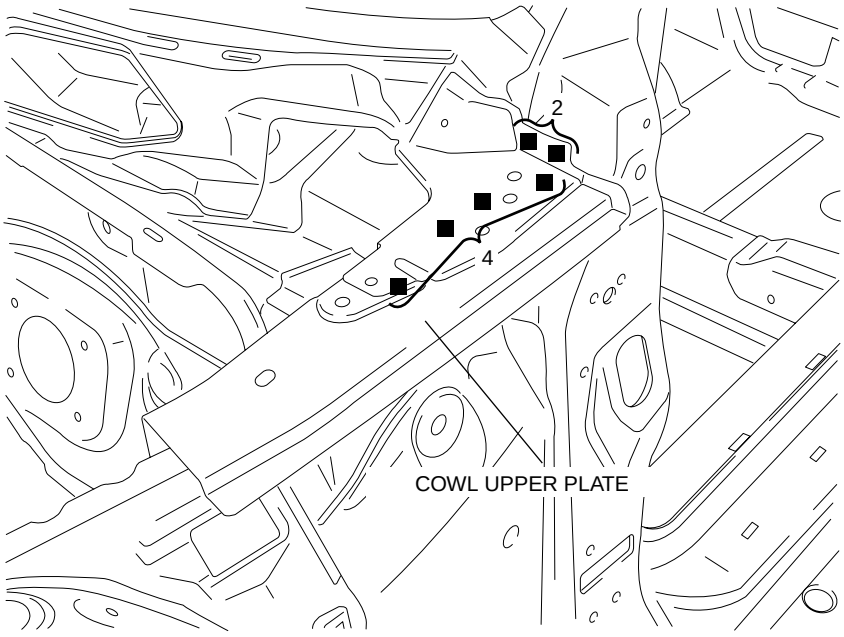
CHU0980B058

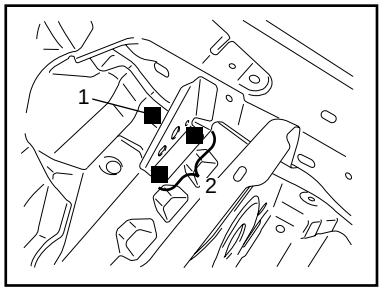
COWL UPPER PLATE INSTALLATION

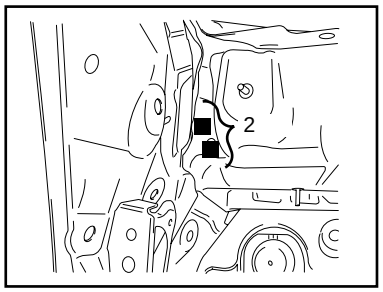
CHU098053580B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

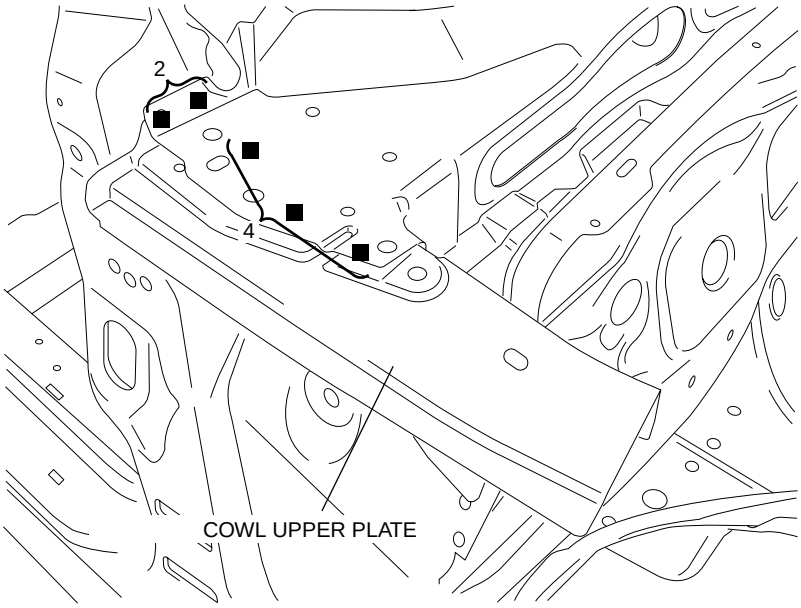
DRIVER'S SIDE

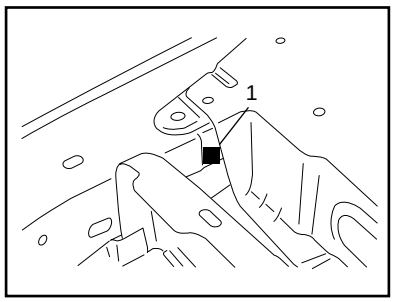


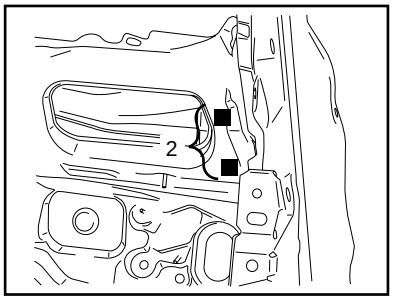




PASSENGER'S SIDE







CHU0980B059

FRONT PILLAR REMOVAL

CHU098074090B01

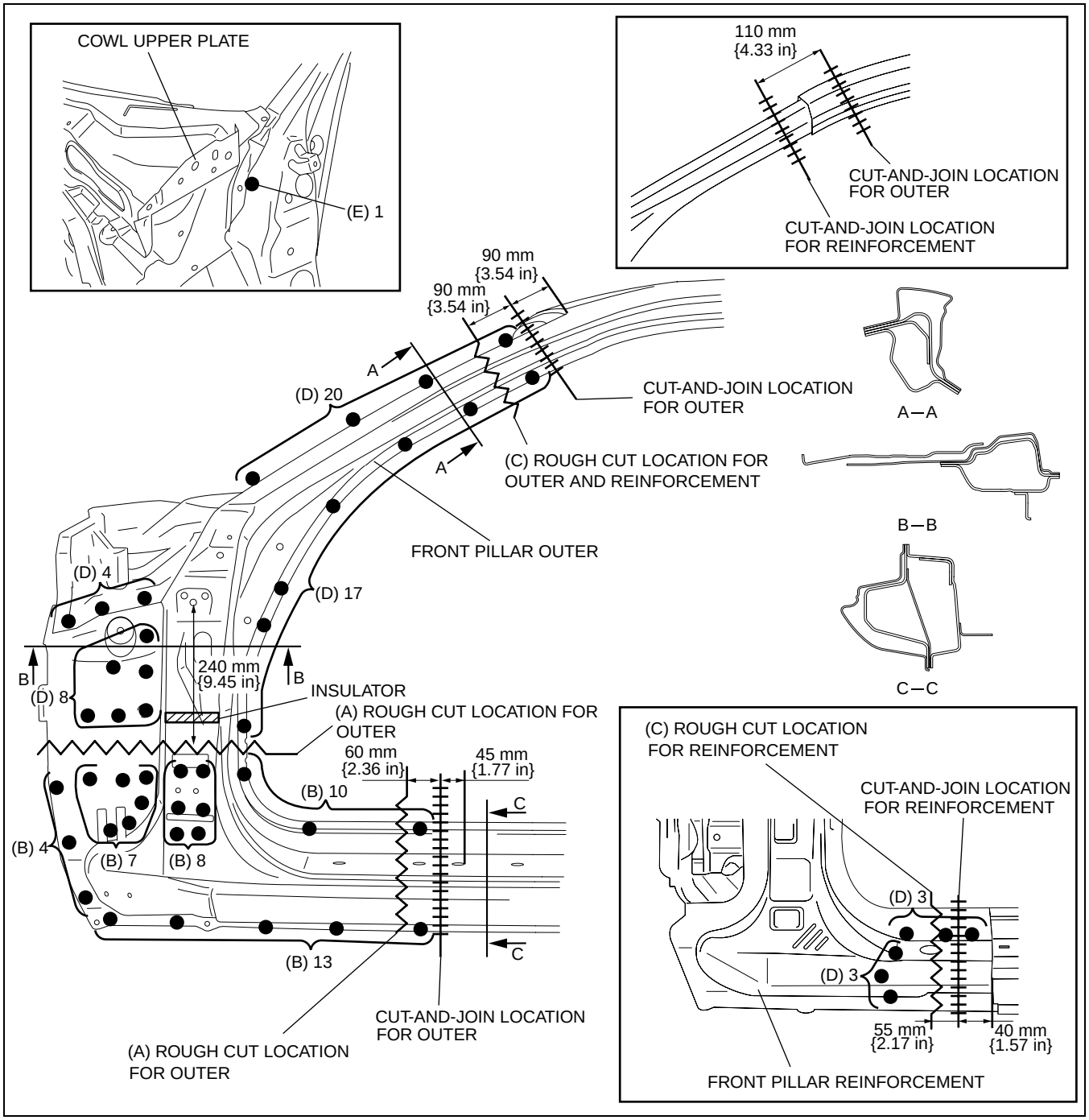
1. Rough cut area (A), drill the 42 weld locations indicated by (B), then remove the lower part of the front pillar outer.

Caution
- **Avoid cutting with a blowtorch or similar tools as the insulator (shaded area) is flammable.**

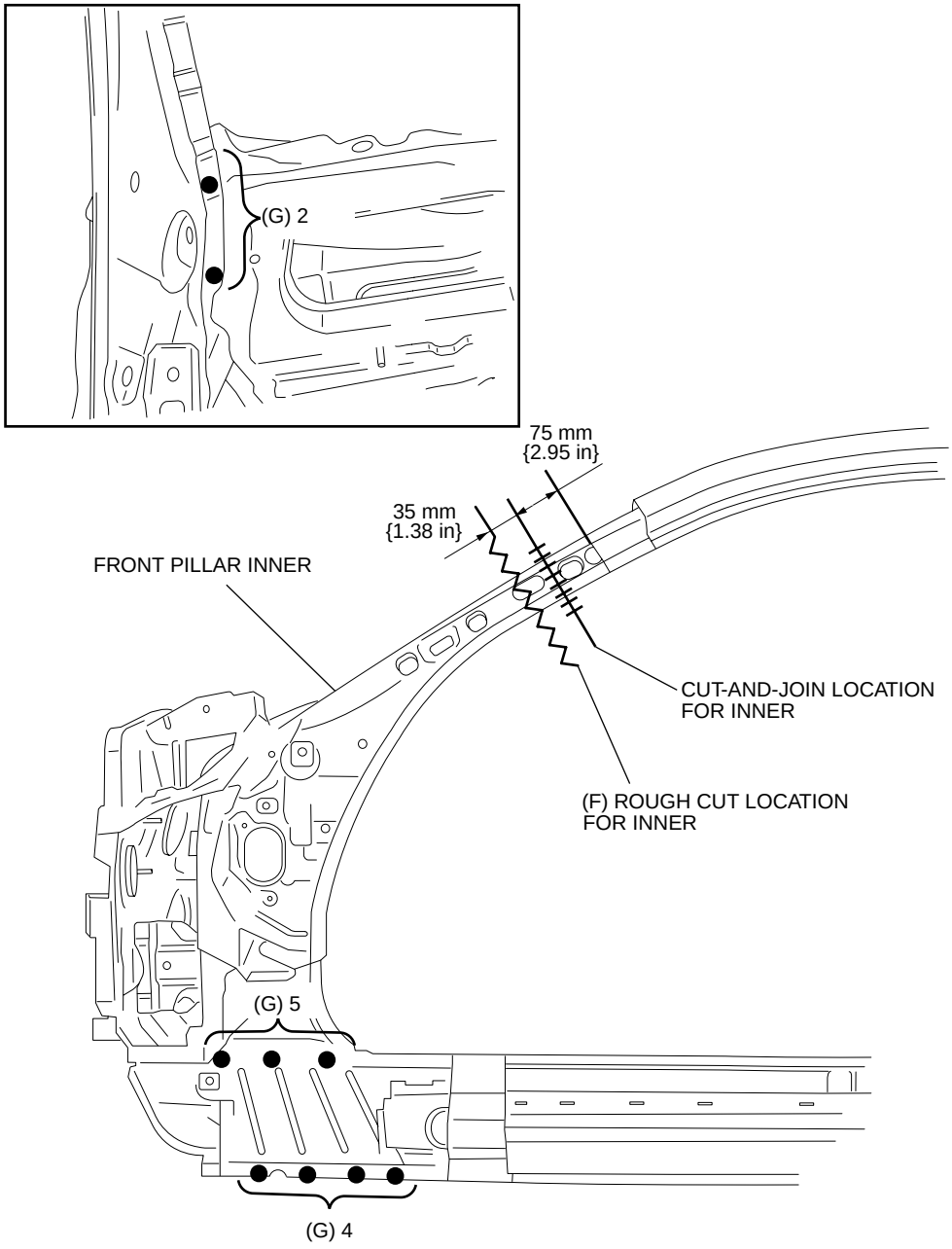
2. Rough cut area (C), drill the 55 weld locations indicated by (D) and one location (E), then remove the front pillar outer and reinforcement.

Note
- For weld location (E), partially bend back the cowl upper plate before drilling.

3. Rough cut area (F), drill the 11 weld locations indicated by (G), then remove the front pillar inner.



CHU0980B070



CHU0980B071

FRONT PILLAR INSTALLATION

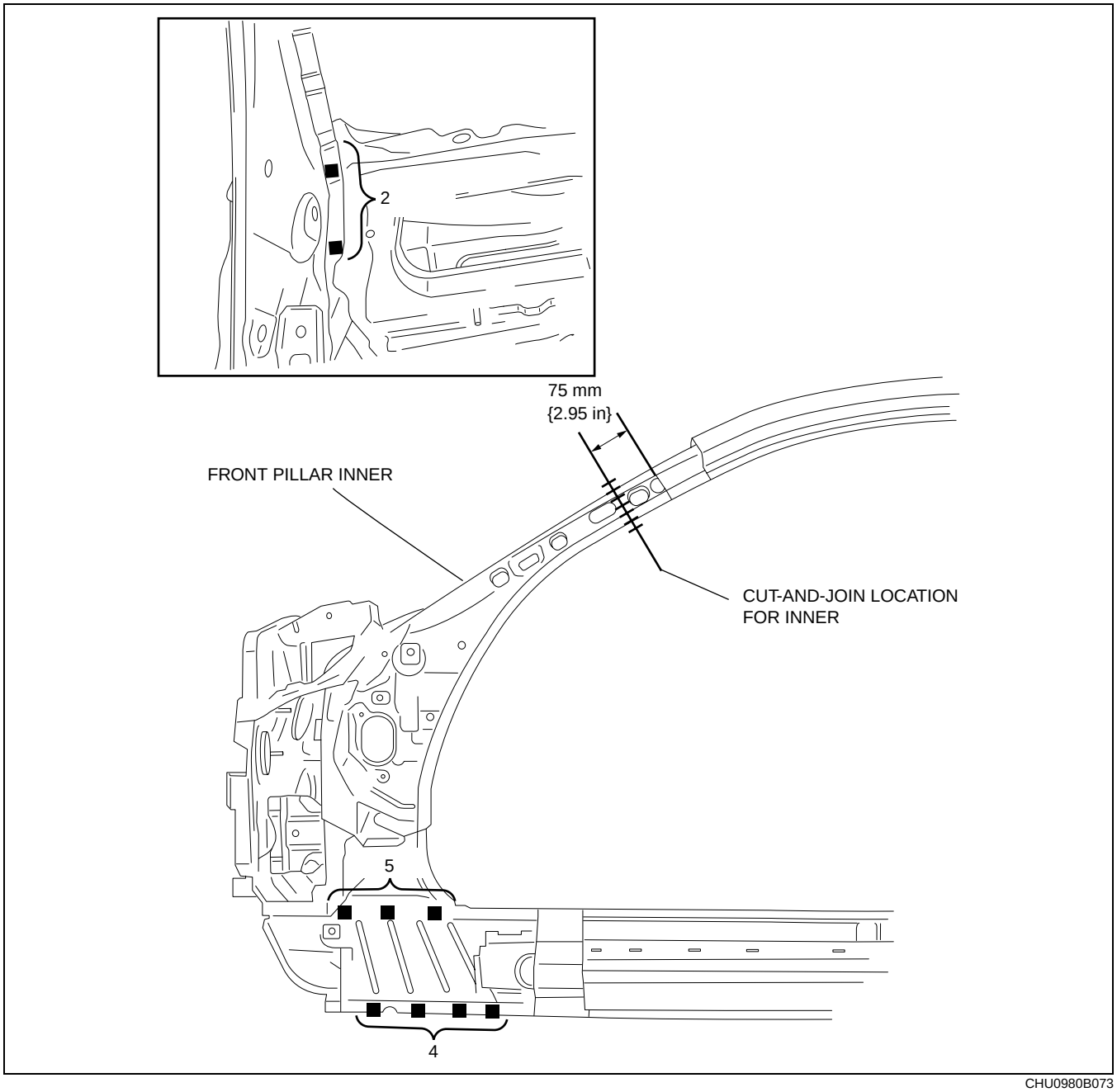
CHU098074090B02

1. When joining the new and old parts, temporarily install and fit the new part in position, measure each dimension according to the body dimension, then adjust the position to align it to the standard dimensions.
2. Drill holes for plug welds before installing new parts.

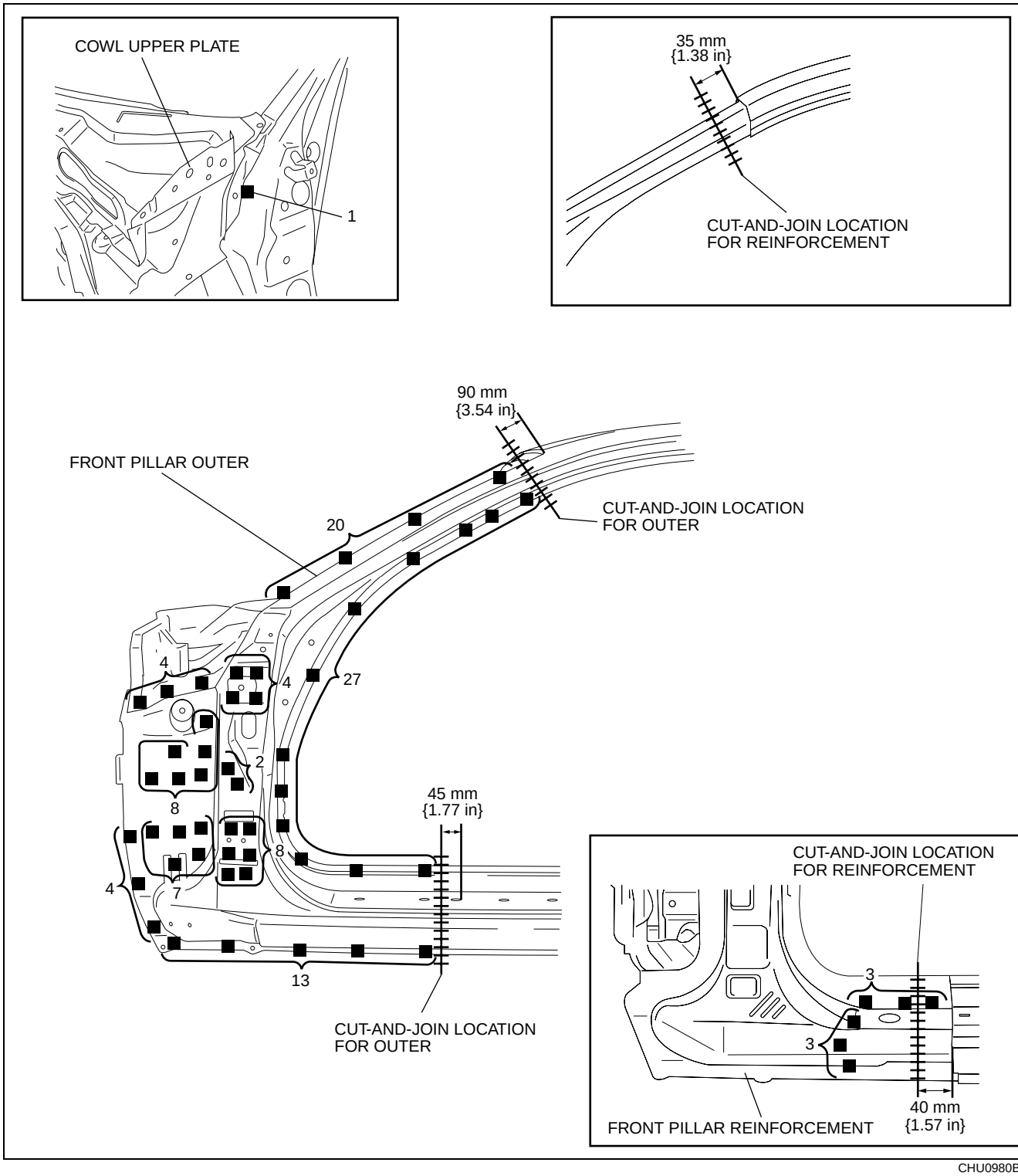
Note

- In areas where the outer, reinforcement, inner, etc. are in 3-4 layers, drill holes for plug welds in all but the innermost panel.

3. After temporarily installing new parts, make sure the related parts fit properly.



CHU0980B073



CHU0980B072

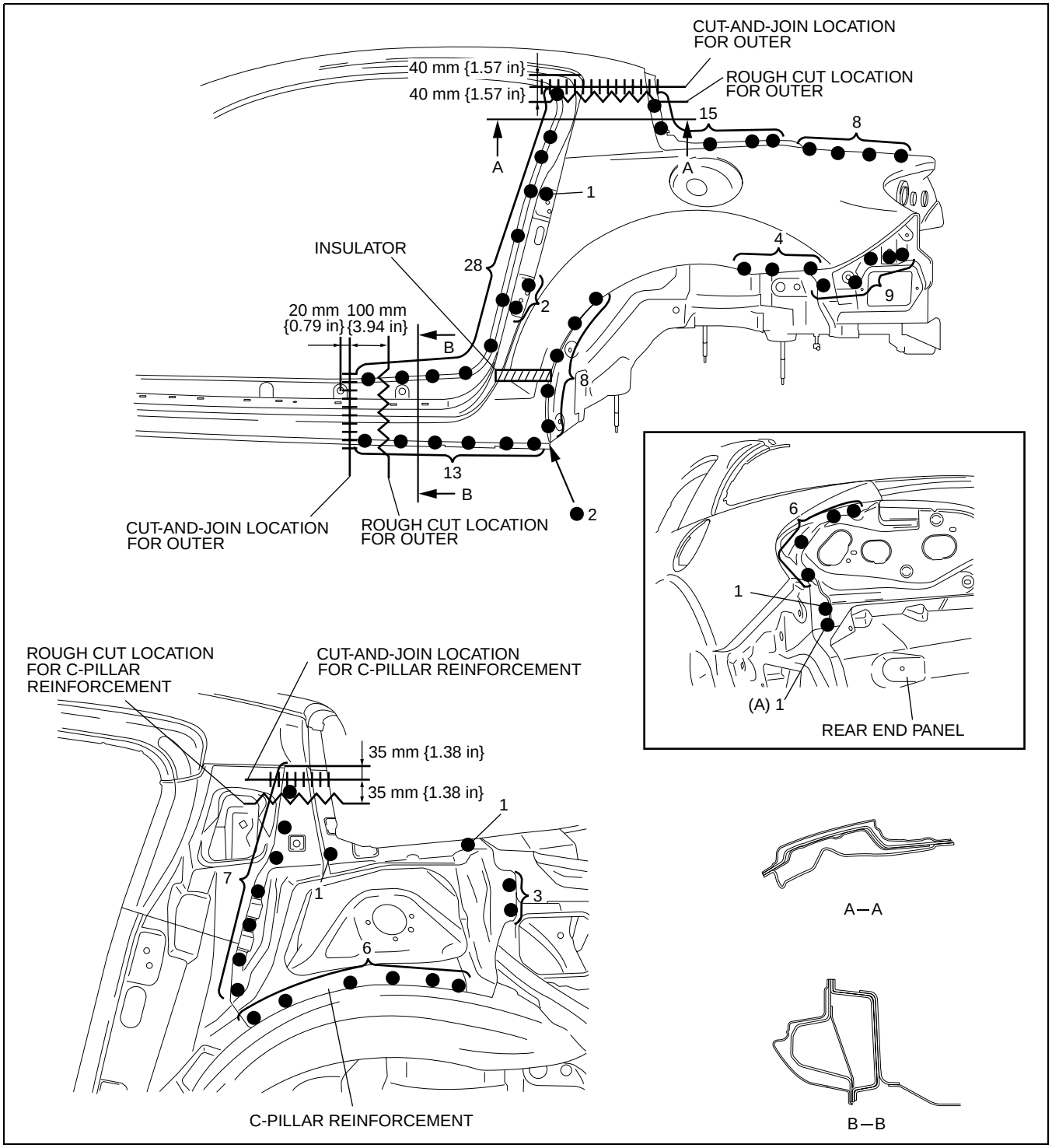
REAR FENDER PANEL REMOVAL

CHU098074100B01

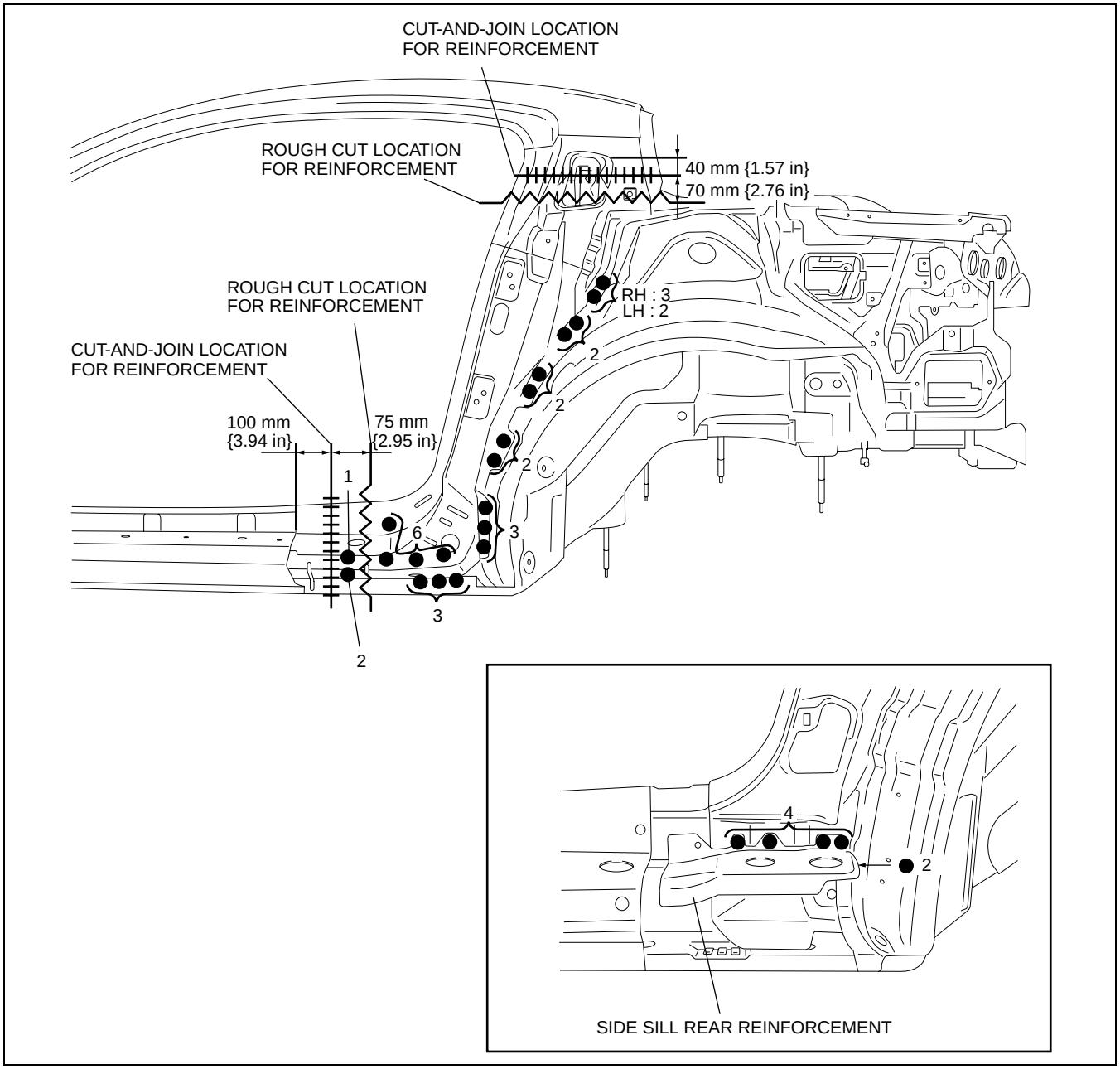
Caution
- **Avoid cutting with a blowtorch or similar tools as the insulator (shaded area) is flammable.**

Note
- For weld location (A), partially bend back the rear end panel before drilling.

1. The rear fender panel and the rear pillar inner are joined with glue at the wheel arch line. Use a chisel or other to separate the rear fender panel from the rear pillar inner, then remove the rear fender panel.



CHU0980B074

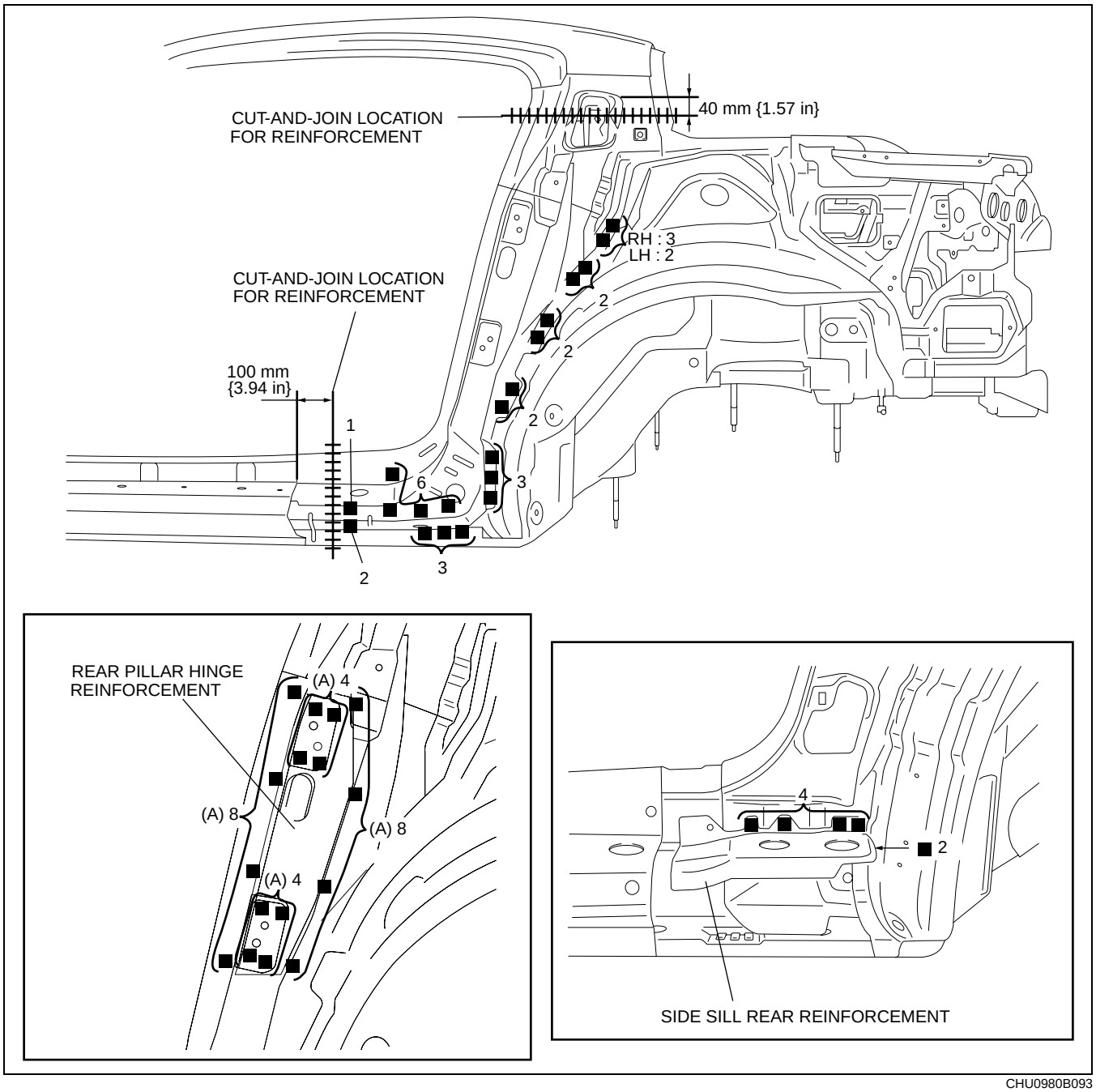


CHU0980B075

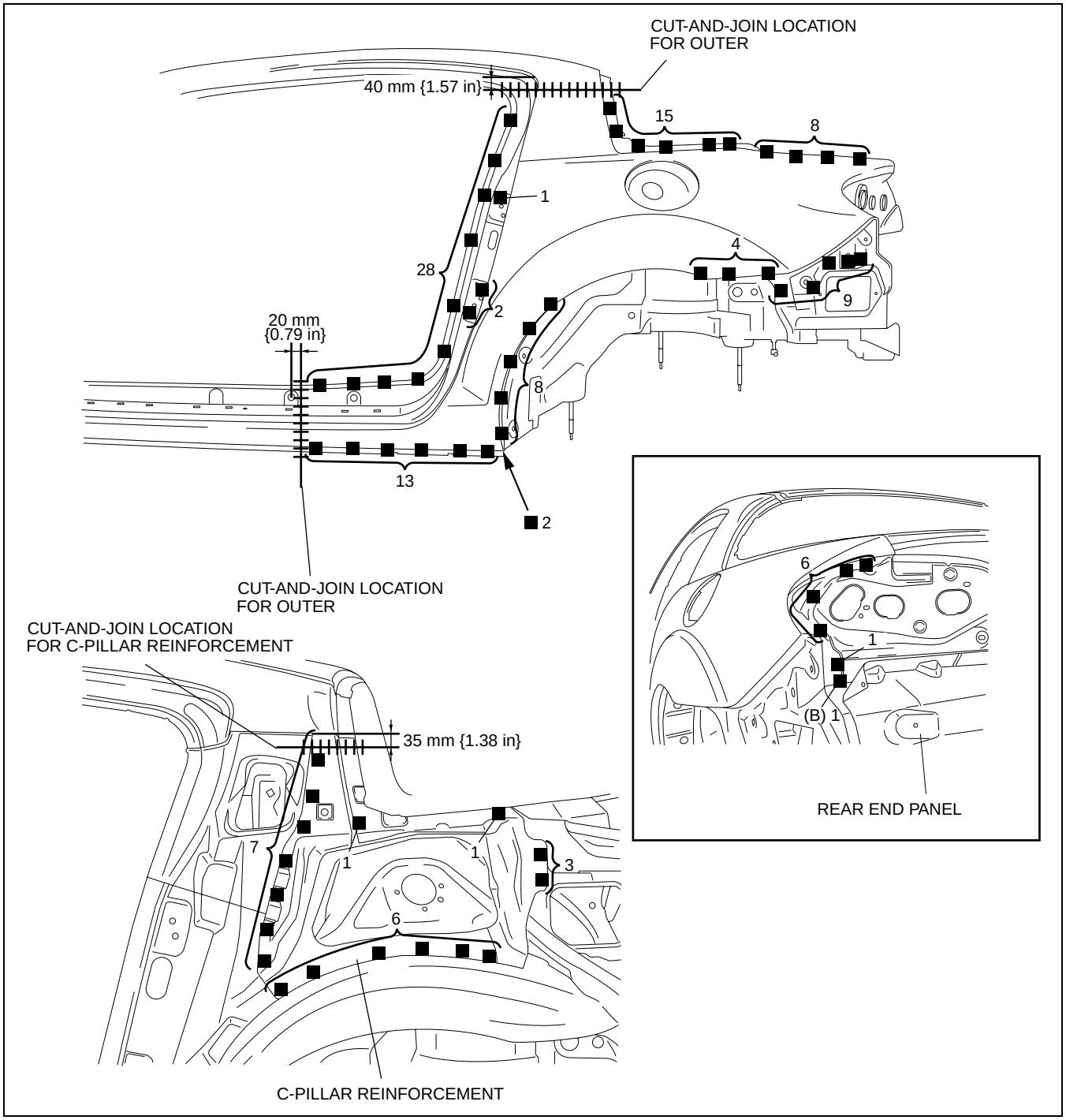
REAR FENDER PANEL INSTALLATION

CHU098074100B02

1. When joining the new and old parts, temporarily install and fit the new part in position, measure each dimension according to the body dimension, then adjust the position to align it to the standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. Weld in 24 locations indicated by (A), then temporarily installing the rear pillar hinge reinforcement.
4. Plug the one weld location indicated by (B), when installing the rear end panel.
5. After temporarily installing new parts, make sure the related parts fit properly.



CHU0980B093

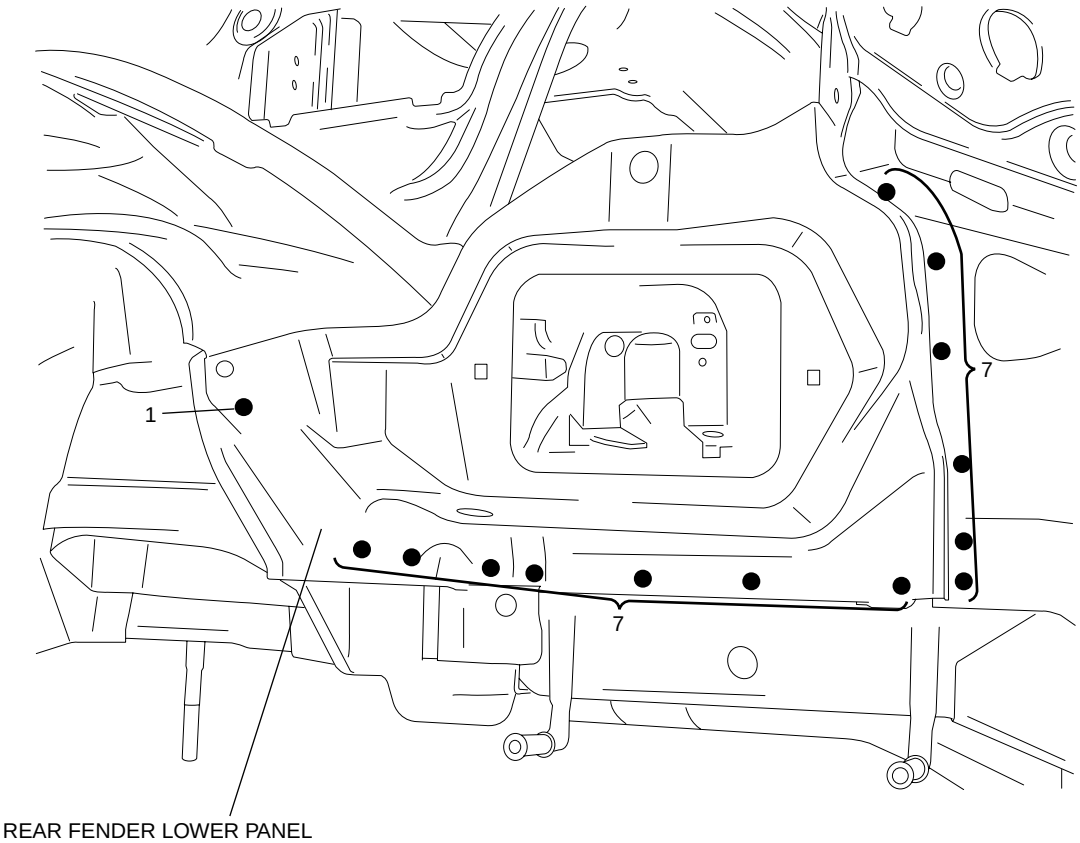


CHU0980B092

REAR FENDER LOWER PANEL REMOVAL

CHU098074100B03

1. Remove the rear fender lower panel.

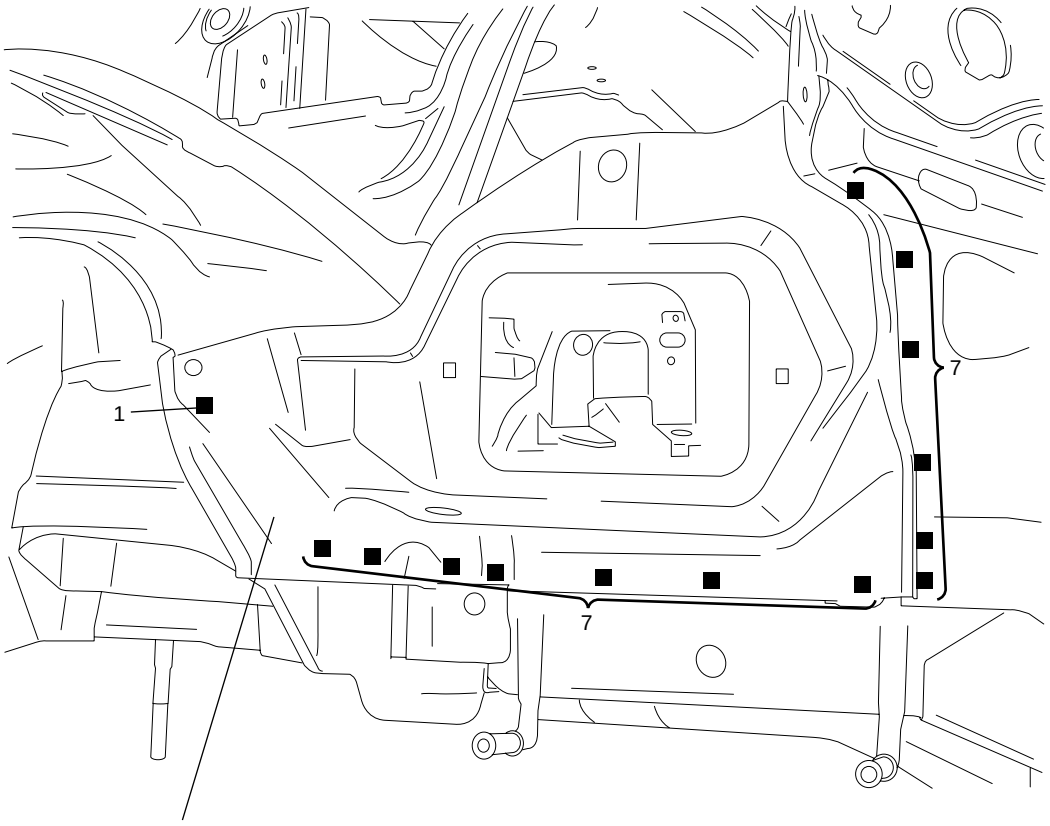


CHU0980B076

REAR FENDER LOWER PANEL INSTALLATION

CHU098074100B04

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.

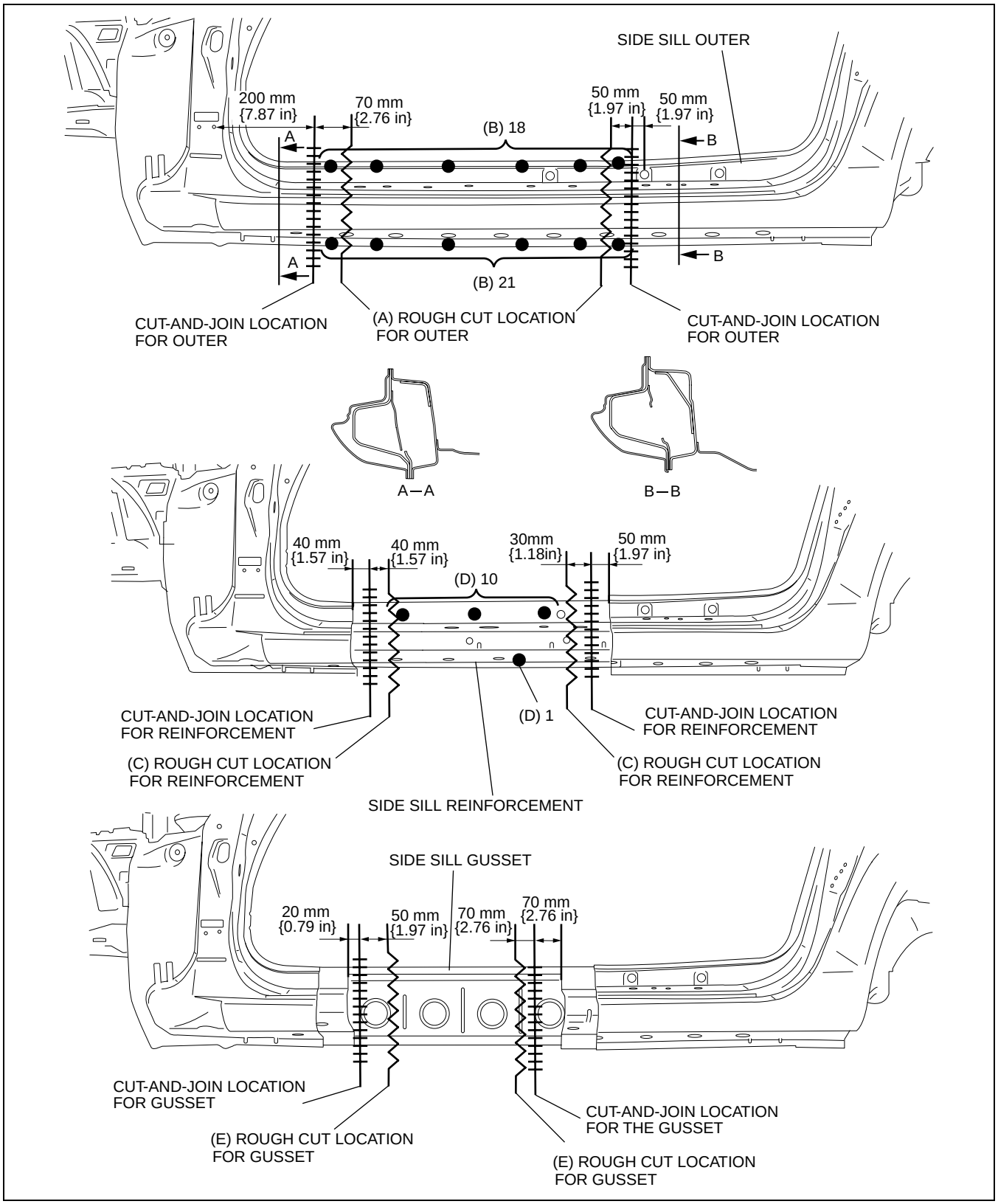


CHU0980B077

SIDE SILL PANEL FRONT REMOVAL

CHU098070270B01

1. Rough cut area (A) and drill the 39 weld locations indicated by (B), then remove the side sill outer.
2. Rough cut area (C) and drill the 11 weld locations indicated by (D), then remove the side sill reinforcement.
3. Rough cut area (E) and remove the side sill gusset.



CHU0980B086

SIDE SILL PANEL FRONT INSTALLATION

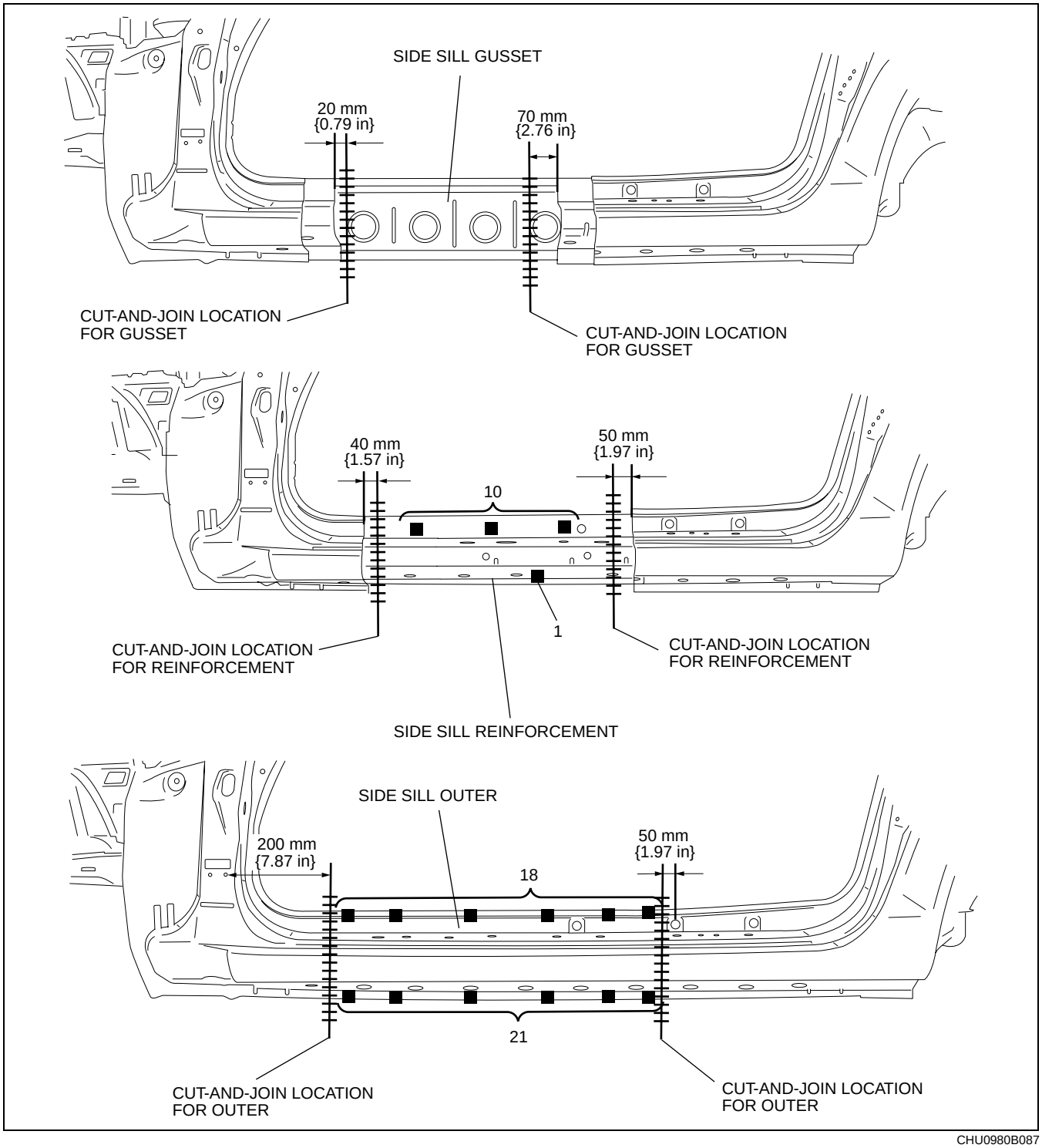
CHU098070270B02

1. When joining the new and old parts, temporarily install and fit the new part in position, measure each dimension according to the body dimension, then adjust the position to align it to the standard dimensions.

Caution

- **When cutting and joining the side sill reinforcement, make sure not to damage or scratch the side sill gusset.**

2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



CHU0980B087

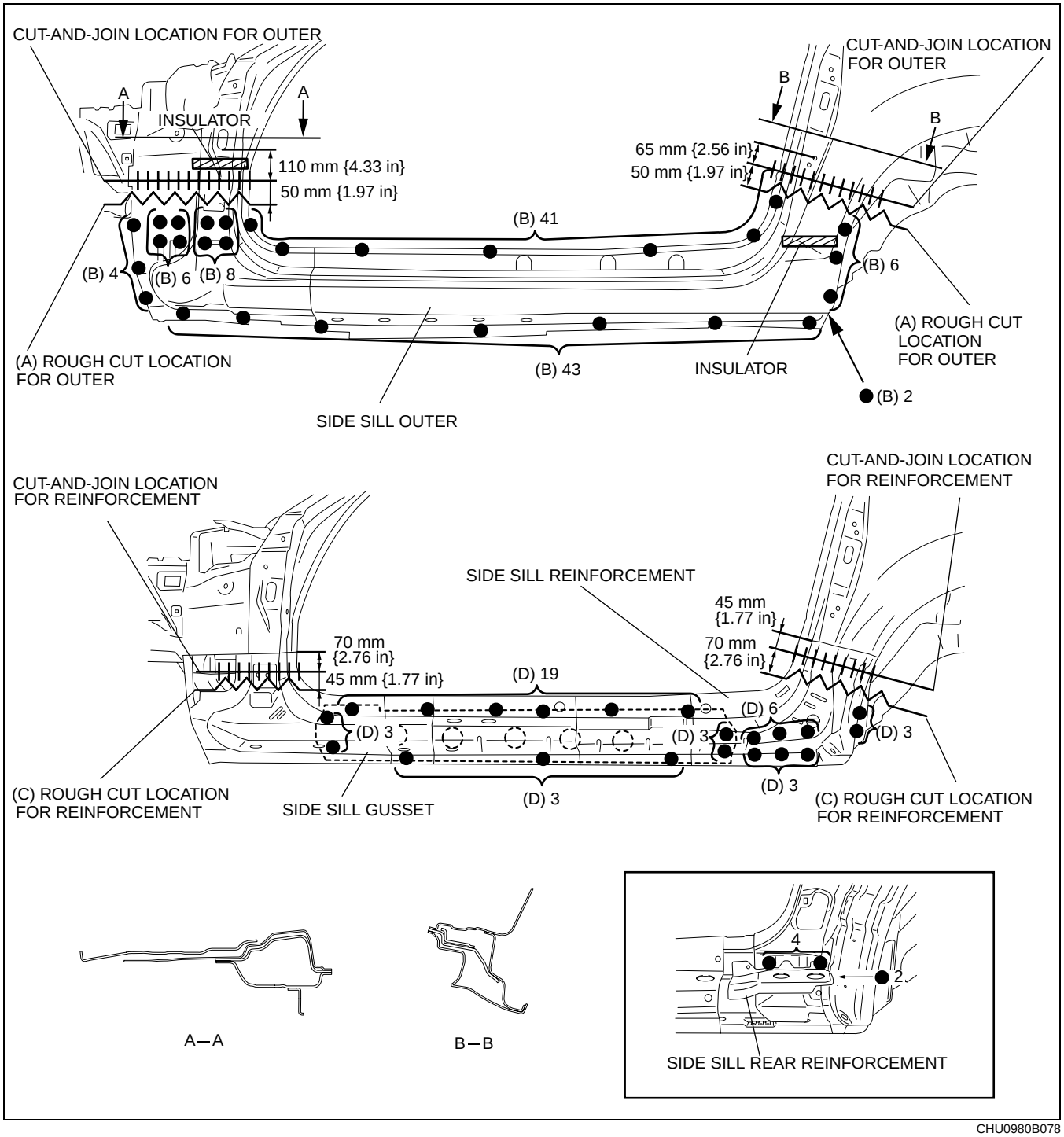
SIDE SILL PANEL REMOVAL

CHU098070270B03

1. Rough cut area (A) and drill the 110 weld locations indicated by (B), then remove the side sill outer.

Caution
- **Avoid cutting with a blowtorch or similar tools as the insulator (shaded area) is flammable.**

2. Rough cut area (C) and drill the 40 weld locations indicated by (D), then remove the side sill reinforcement.
3. Remove the side sill rear reinforcement.

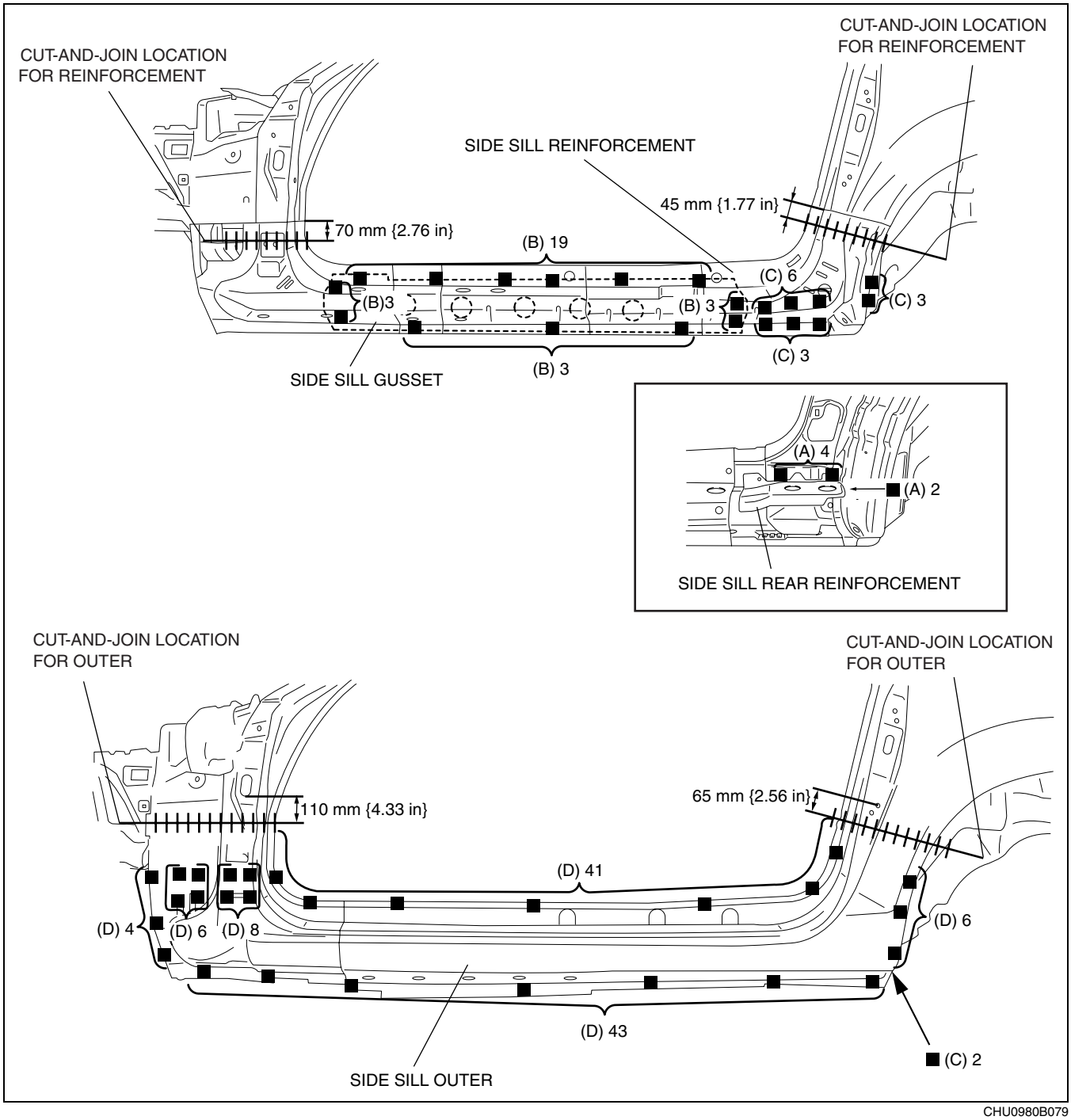


CHU0980B078

SIDE SILL PANEL INSTALLATION

CHU098070270B04

1. When joining the new and old parts, temporarily install and fit the new part in position, measure each dimension according to the body dimension, then adjust the position to align it to the standard dimensions.
2. Drill holes for plug welds before installing new parts.
3. Weld the six locations indicated by (A) and install the side sill rear reinforcement.
4. Weld the 28 locations indicated by (B), then temporarily install the side sill gusset.
5. Weld the 12 locations indicated by (C) and install the side sill reinforcement.
6. Weld the 110 locations indicated by (D) and install the side sill outer.
7. After temporarily installing new parts, make sure the related parts fit properly.



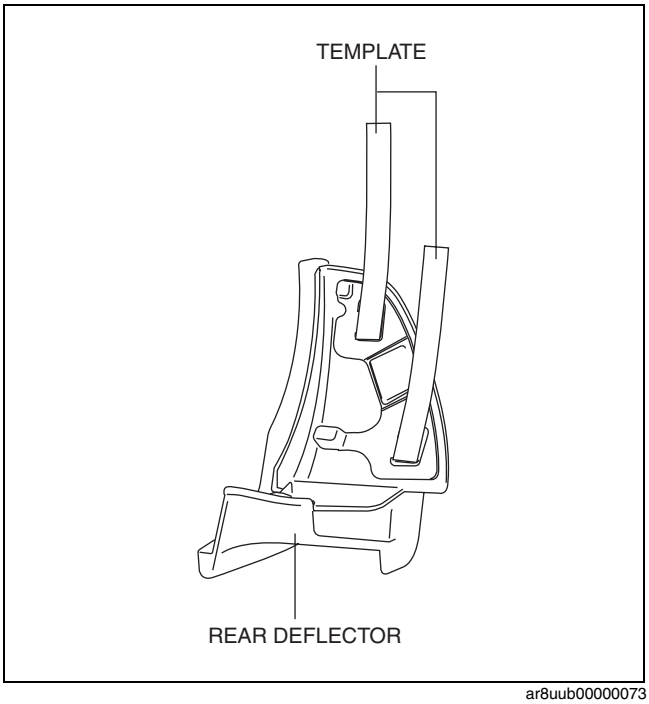
CHU0980B079

Drill Hole Install for Rear Deflector

1. Cut out the templates along the cut lines.
2. Face the printed side of the templates to the rear deflector, align two sides of the templates, and affix them to the rear deflector using double-sided adhesive tape.

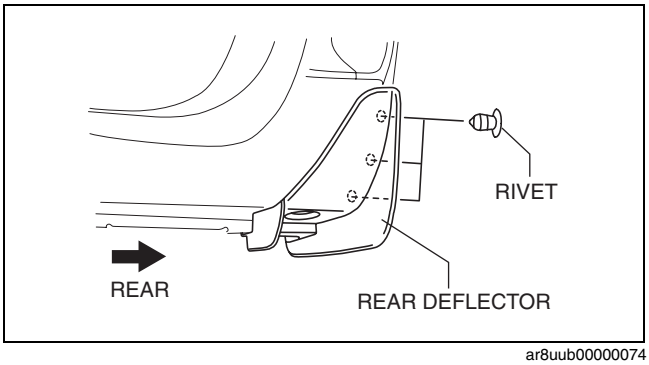
Caution
- **Affix double-sided adhesive tape on the printed side of the templates.**

Note
- Paper type double-sided adhesive tape is recommended.



ar8uub00000073

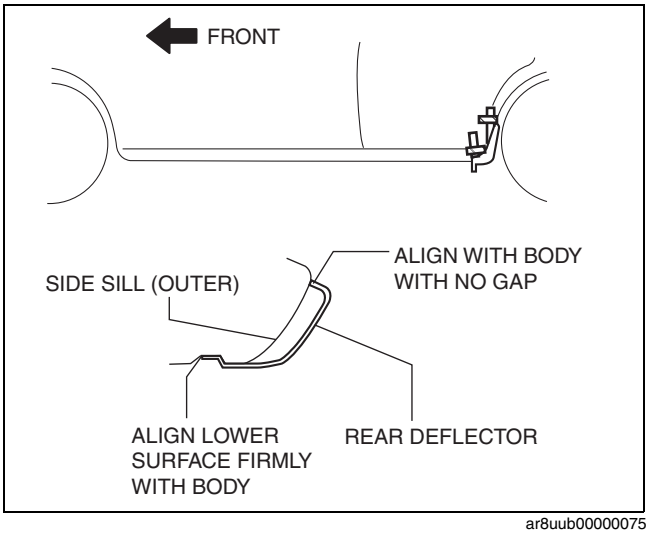
3. Align the rear deflector with the installation position with no clearance with the body, and temporarily fix using a rivet.



ar8uub00000074

4. Align the rear deflector bottom surface with the body, press it so that there is no clearance with the body.

Caution
- **Be careful of the alignment of the rear deflector with the body and verify that it is firmly attached to the lower surface of the rear deflector with its height equal with the body from front to back.**

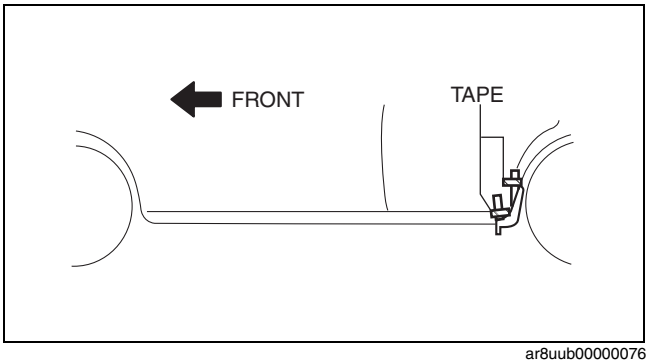


ar8uub00000075

Added 3/2008 (Ref. No. R045/08)

5. Place the templates along the bodyline and affix them using tape.
6. Remove the fastener and remove the rear deflector with the templates affixed to the body.

Caution
- **When removing the rear deflector, be careful that the templates do not slip or become ripped.**

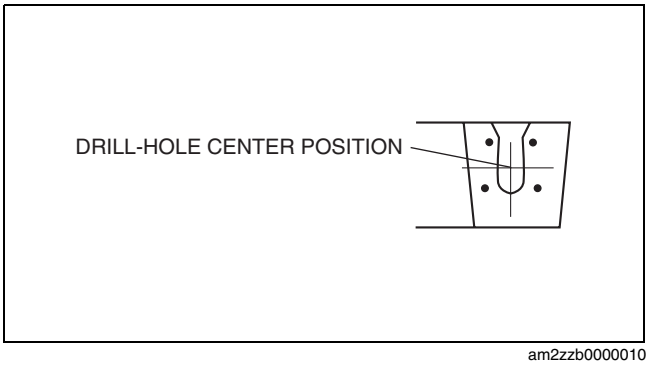


ar8uub00000076

7. Place the templates along the bodyline and punch holes through the center of the templates.

Caution
- **Punch holes through the center of the templates with the templates affixed to the body.**

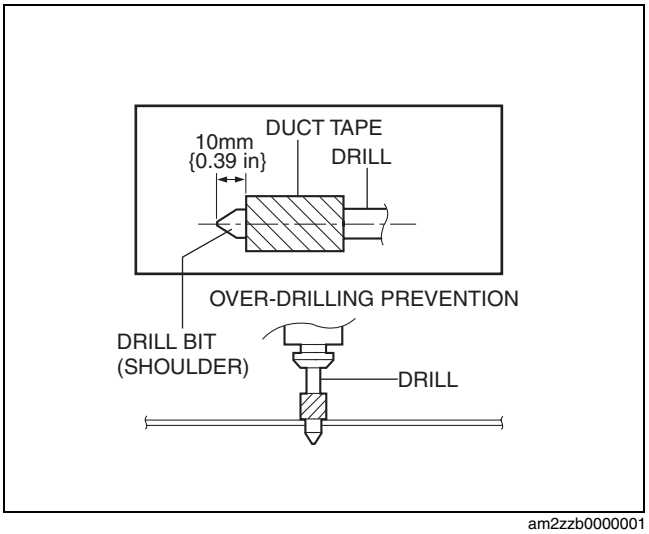
8. Remove the templates.



am2zzb0000010

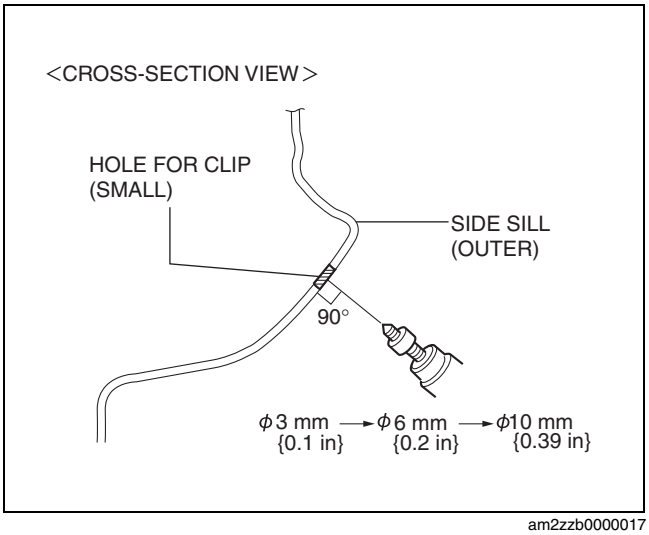
9. Wrap packing tape around the drill bit.

Note
- To prevent damage and overdrilling.



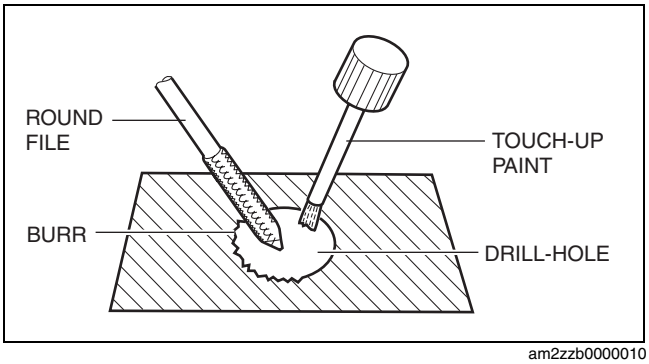
am2zzb0000001

10. With the drill bit pointed perpendicular to the body, drill a hole gradually using a ϕ3 mm {0.1in}, ϕ6 mm {0.2in}, then ϕ10mm {0.39in} drill bit.



am2zzb0000017

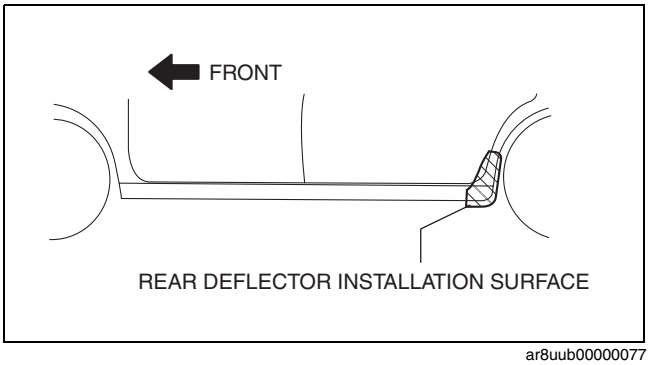
11. Grind the drilled hole to remove any metal burrs with a round file to finish the surface.



am2zzb0000010

12. Wipe off dirt from the rear deflector installation surface on the body using a clean rag dampened with isopropyl alcohol.
13. Apply sealant for rust protection.
14. Apply touch-up paint.

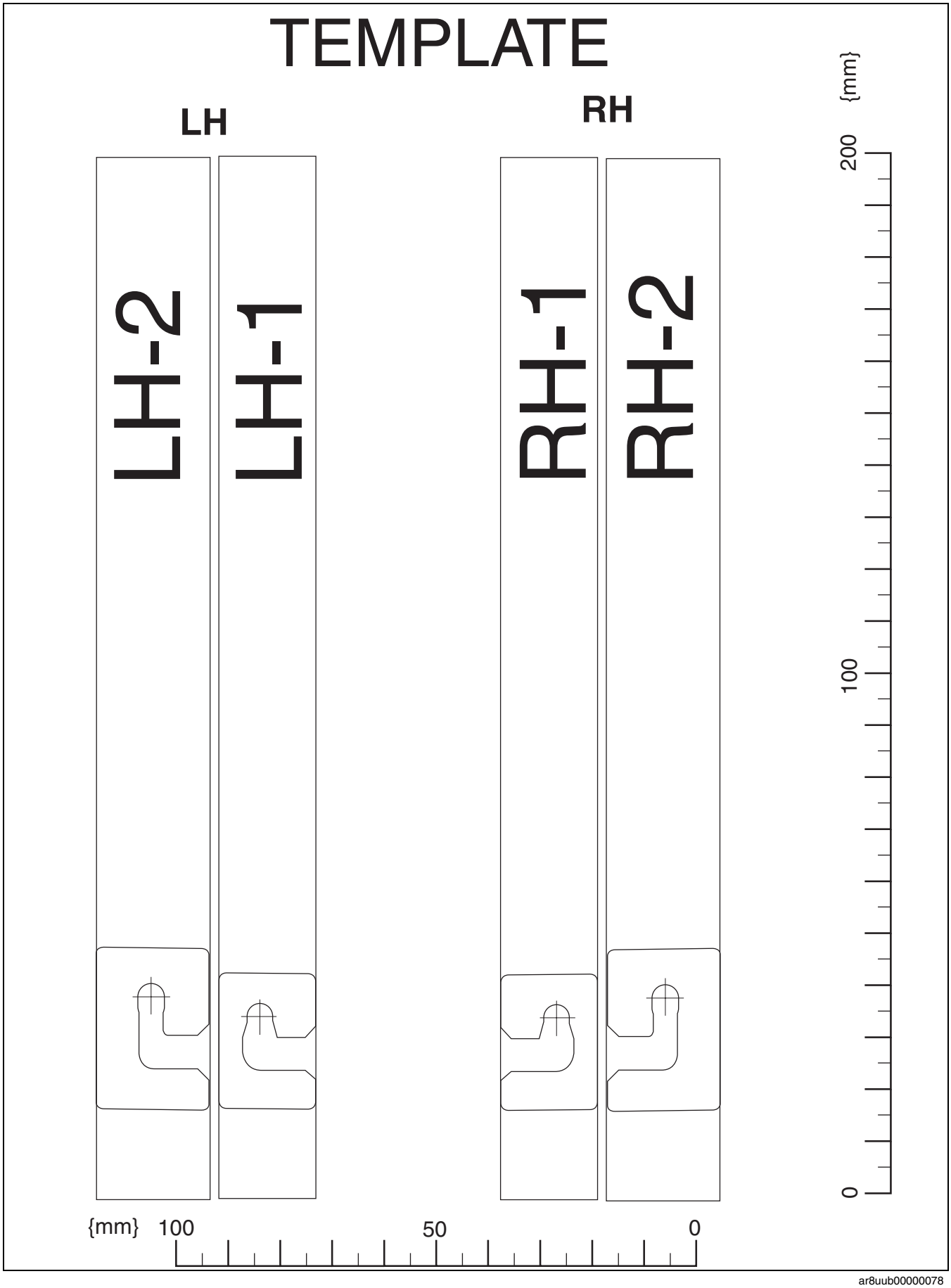
Caution
- **Make sure rust protection is performed properly.**



ar8uub00000077

Added 3/2008 (Ref. No. R045/08)

Template



ar8uub00000078

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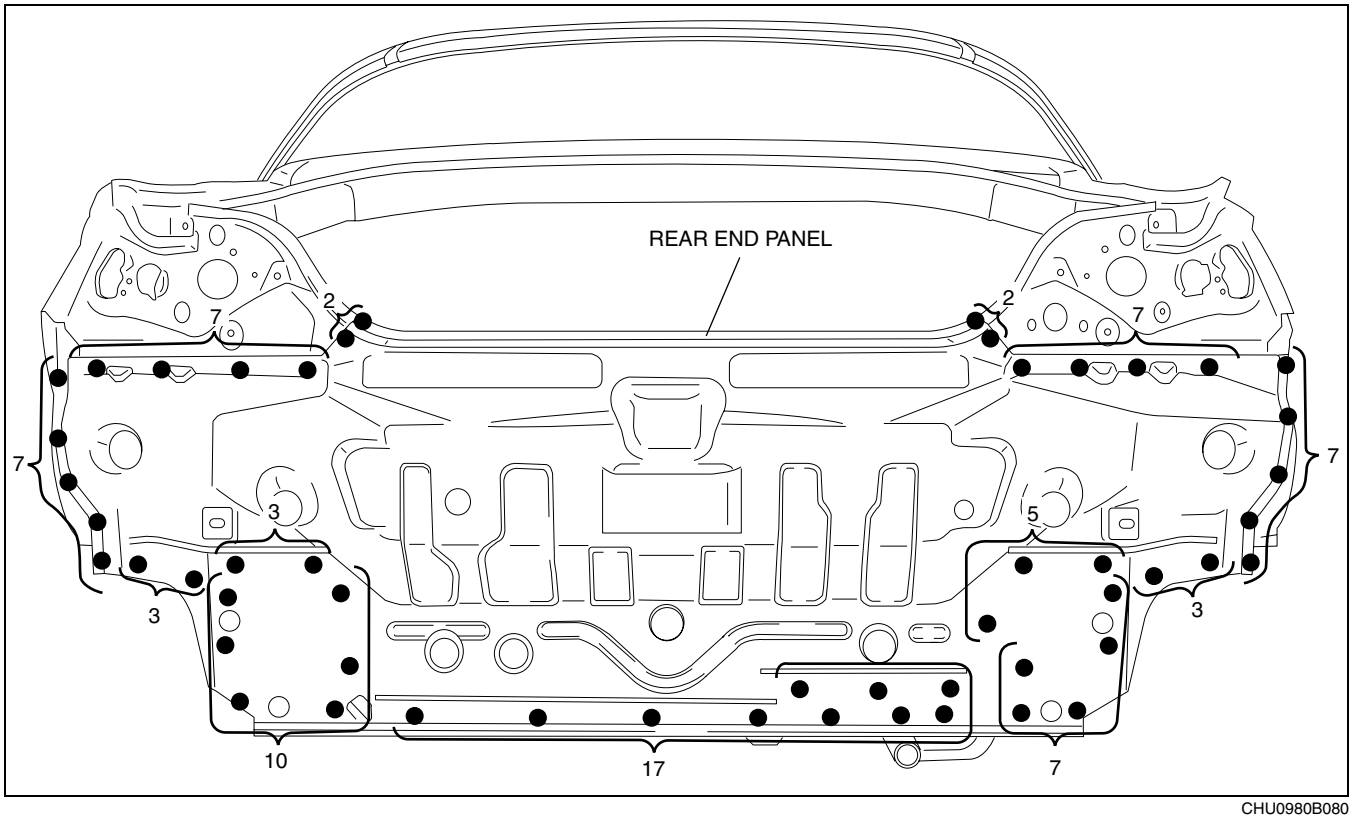
REAR END PANEL REMOVAL

CHU098070750B01

1. Remove the rear end panel.

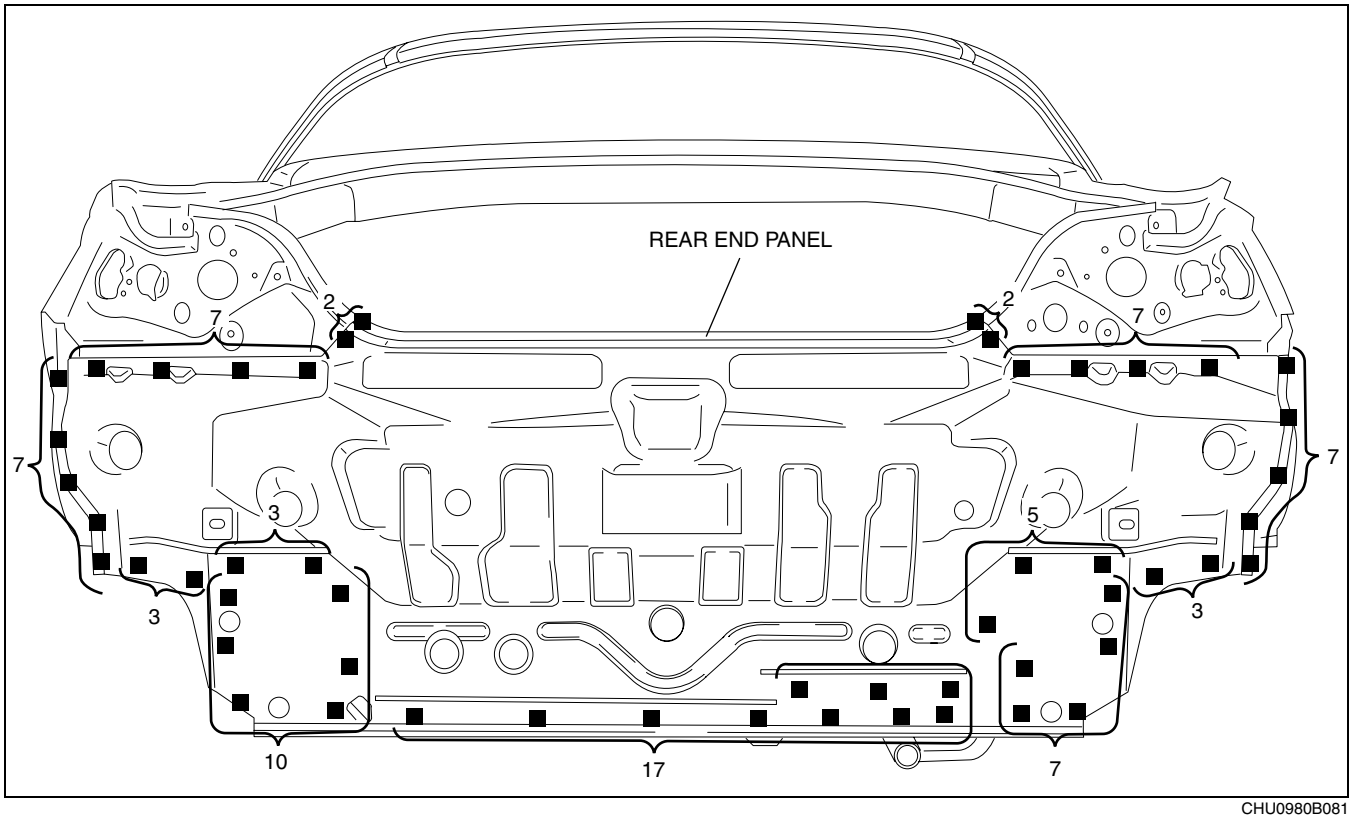


CHU0980B080

REAR END PANEL INSTALLATION

CHU098070750B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



CHU0980B081

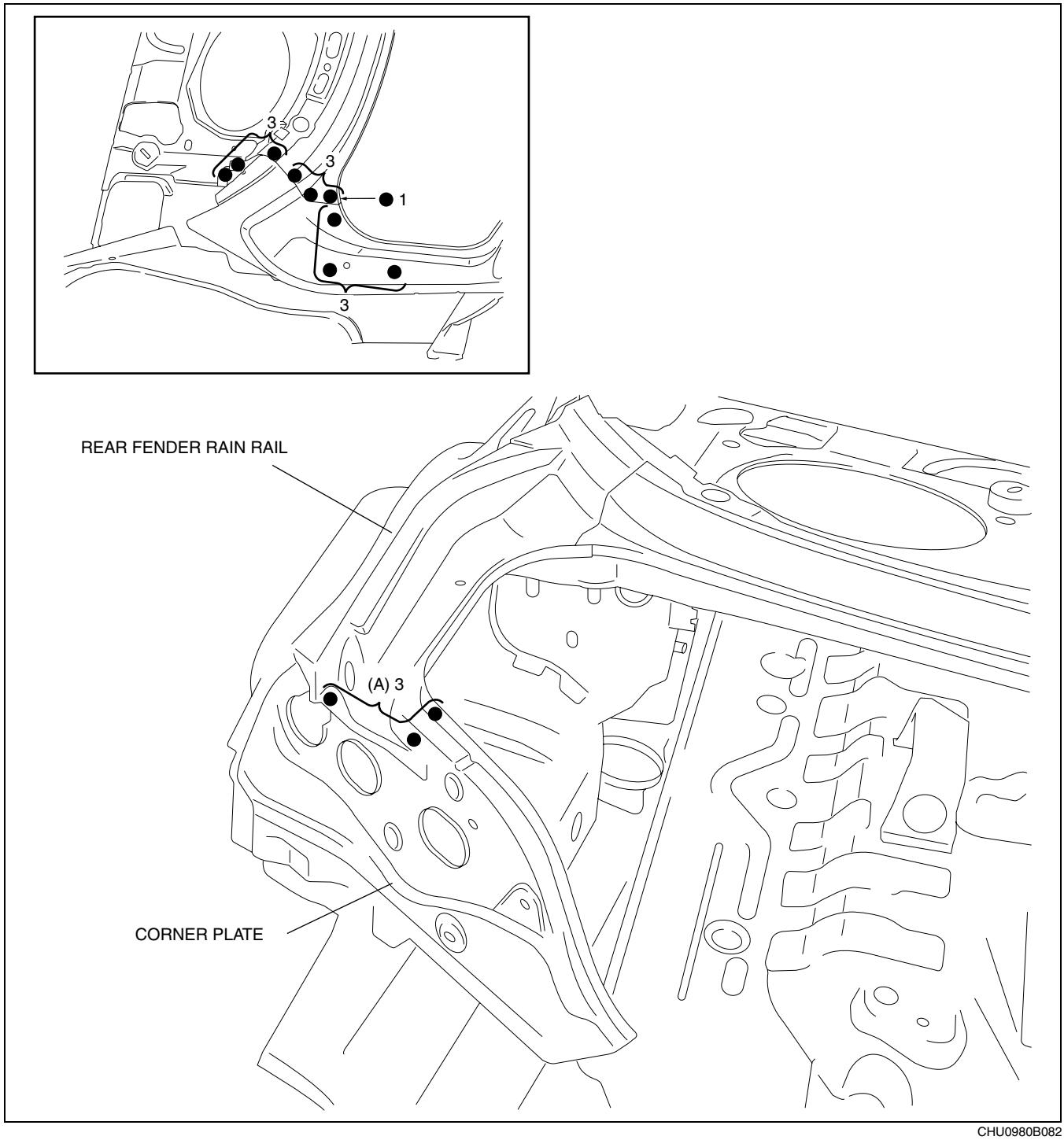
REAR FENDER RAIN RAIL AND CORNER PLATE REMOVAL

CHU098070440B01

1. Remove the rear fender rain rail and corner plate.

Note

- When removing the rear fender rain rail and the corner plate separately, drill three weld locations indicated by (A).



CHU0980B082

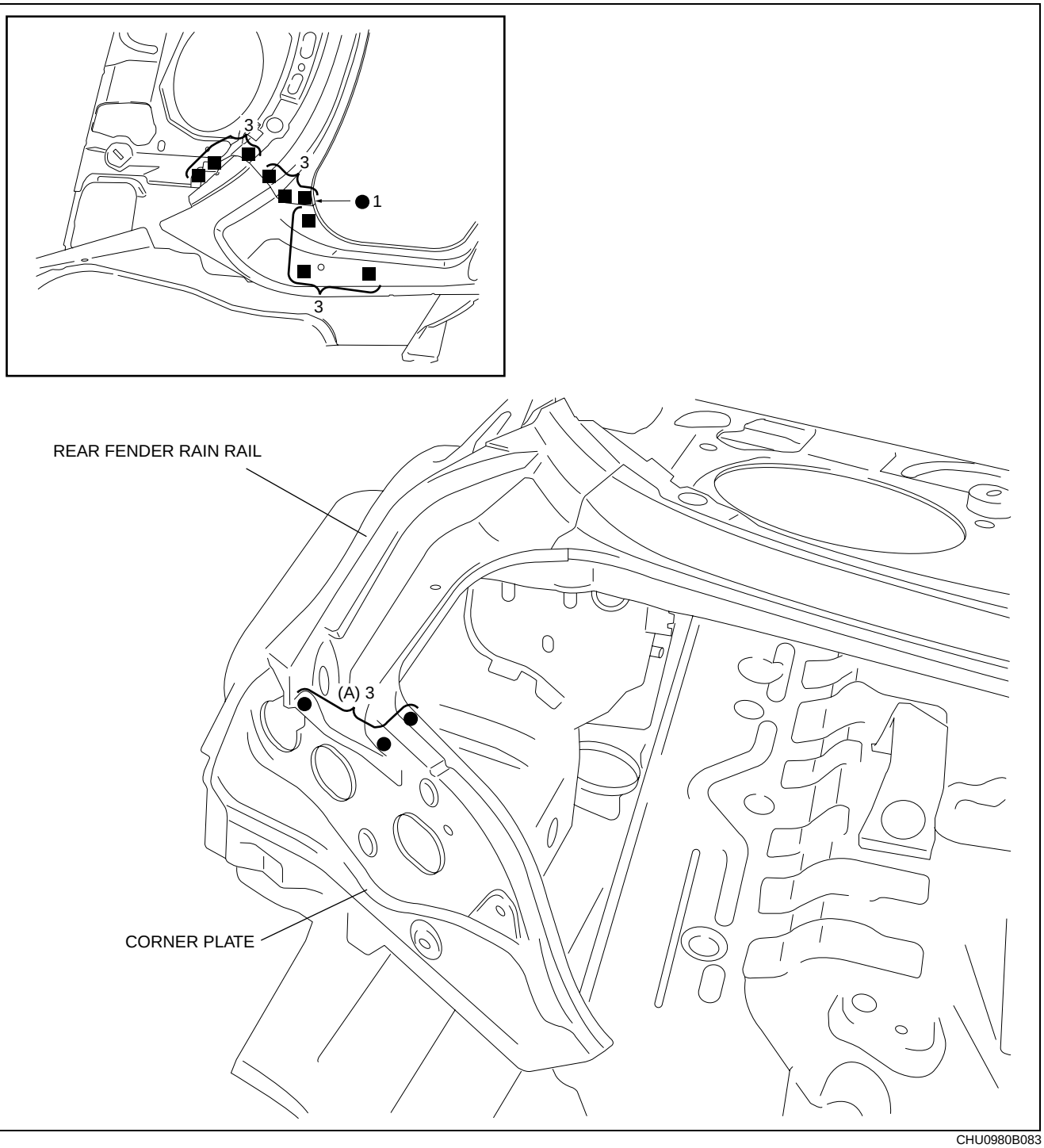
REAR FENDER RAIN RAIL AND CORNER PLATE INSTALLATION

CHU098070440B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension
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 rear fender rain rail and the corner plate separately, weld three locations indicated by (A).

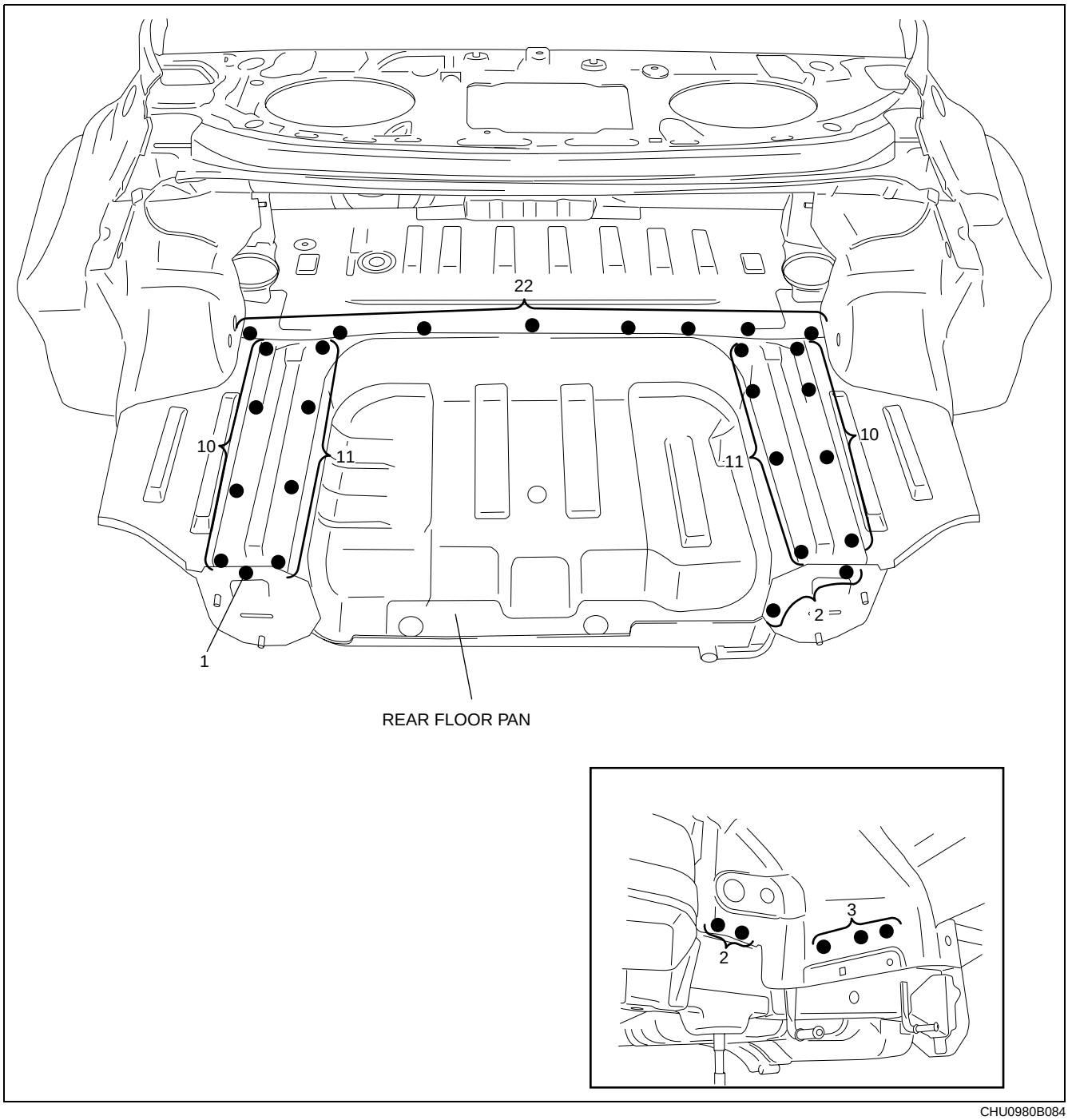


CHU0980B083

REAR FLOOR PAN REMOVAL

CHU098053750B01

1. Remove the rear floor pan.

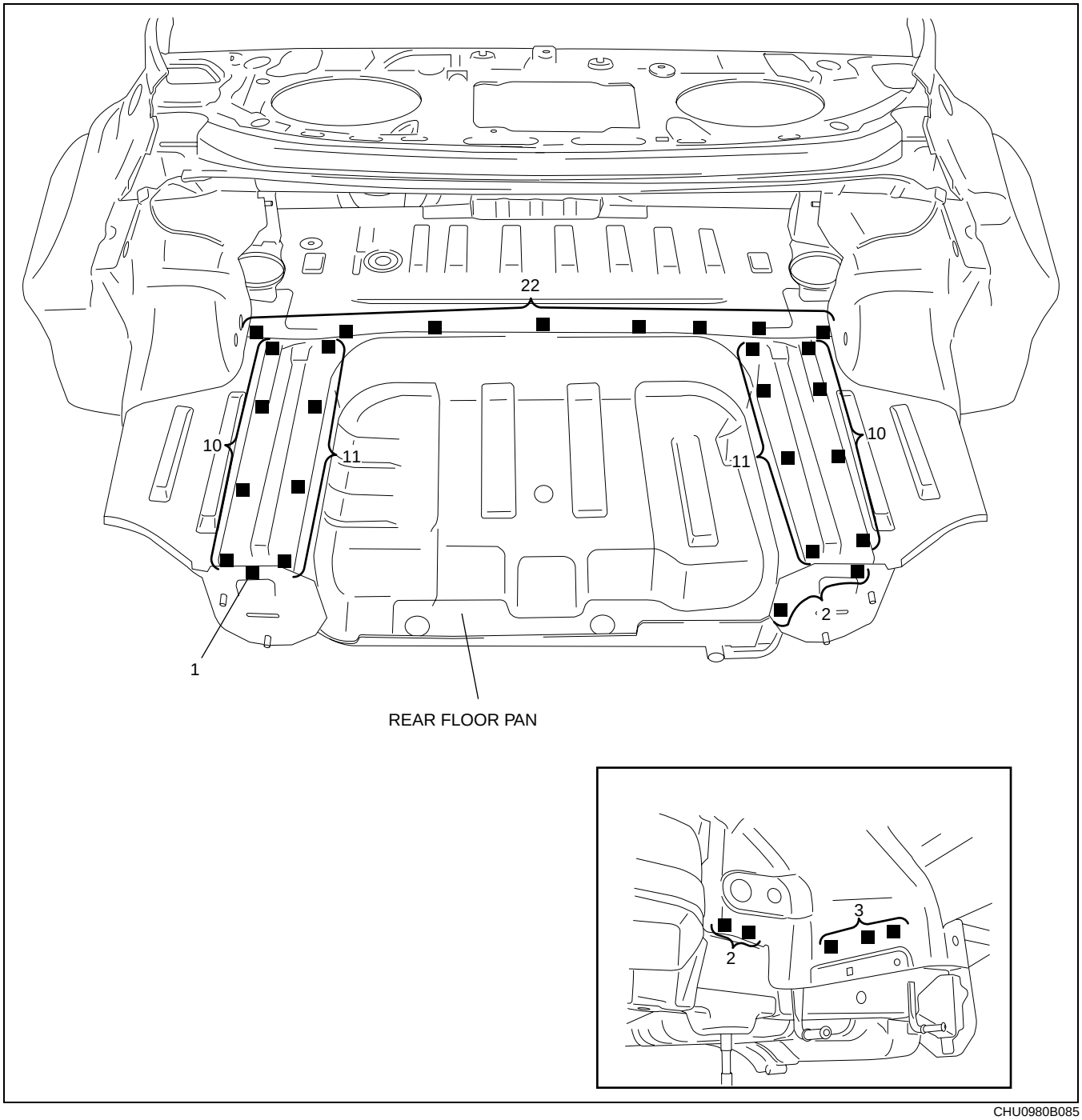


CHU0980B084

REAR FLOOR PAN INSTALLATION

CHU098053750B02

1. Drill holes for plug welds before installing new parts.
2. After temporarily installing new parts, make sure the related parts fit properly.

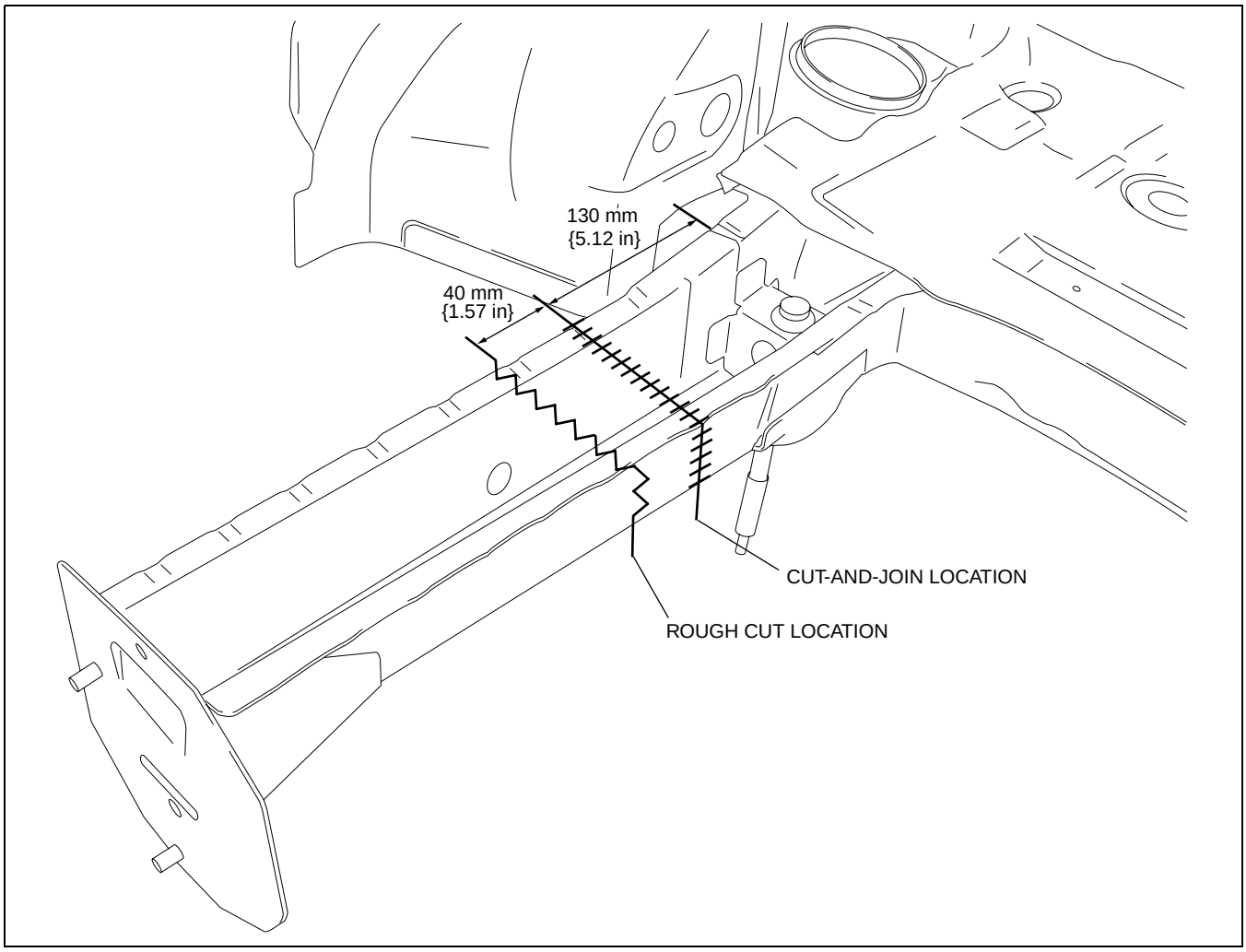


CHU0980B085

REAR SIDE FRAME (PARTIAL CUTTING) REMOVAL

CHU098053810B01

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



CHU0980B088

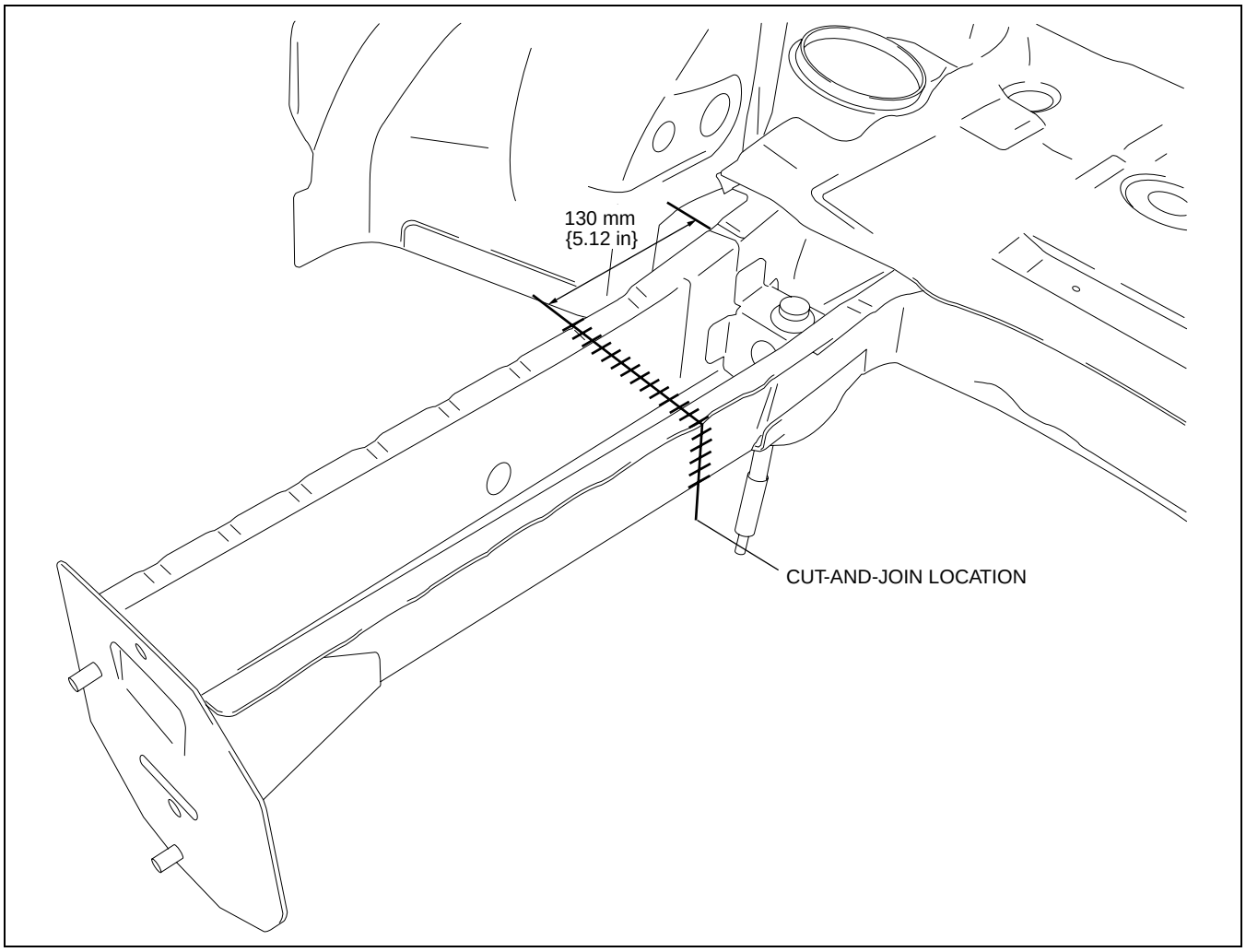
REAR SIDE FRAME (PARTIAL CUTTING) INSTALLATION

CHU098053810B02

1. Cut the new and old parts at the cut-and-join location, and bevel the parts.
2. To cut-and-join the new part, cut at the locations indicated in the figure below and bevel the cut-and-join locations of the new parts.
3. When installing the new parts, trial-fit them to the body, and position each part so that the each section alignment matches the body dimensions.
4. After temporarily installing new parts, make sure the related parts fit properly.

Caution

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

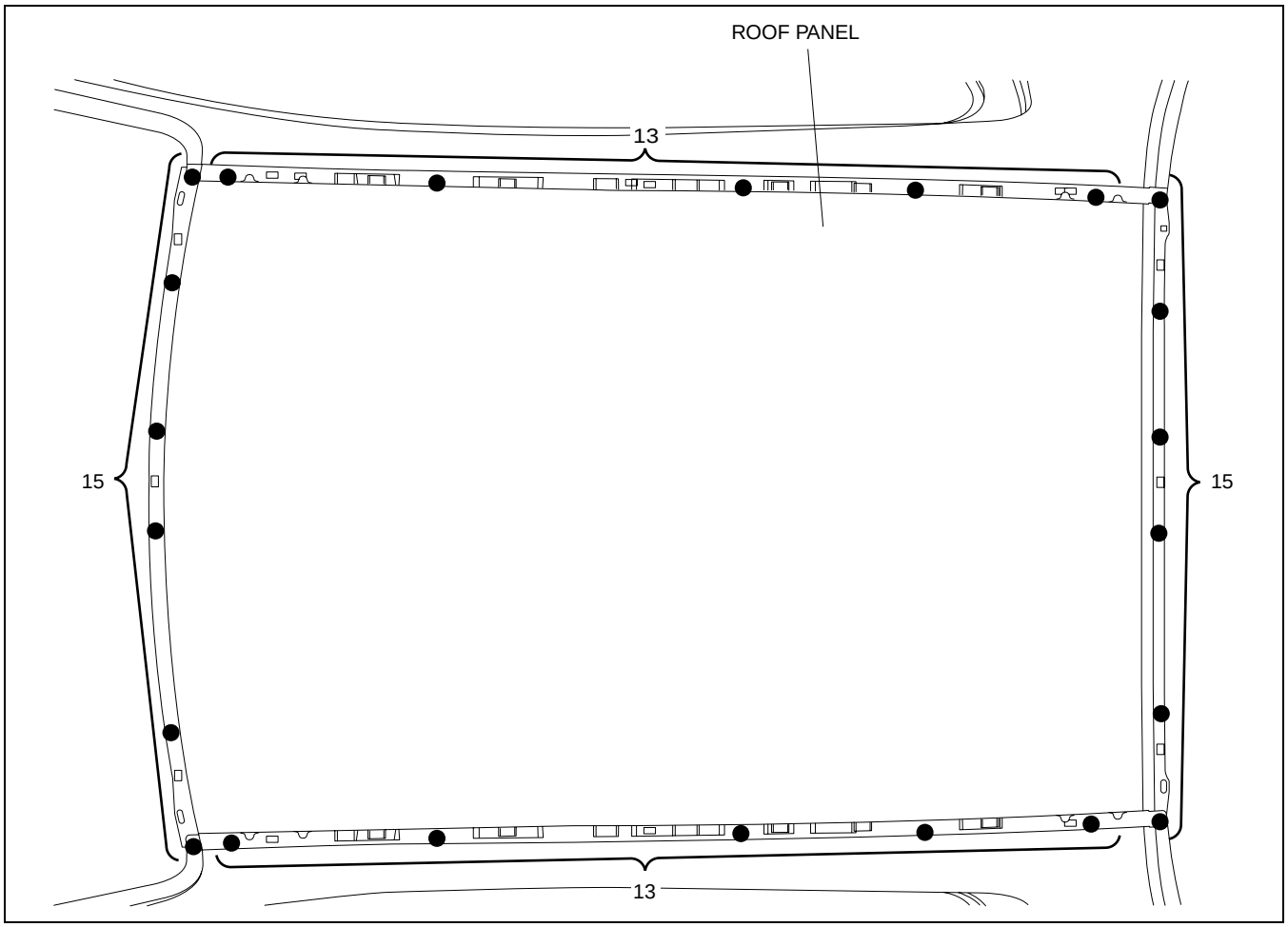


CHU0980B089

ROOF PANEL REMOVAL

CHU098070600B01

1. Remove the roof panel.

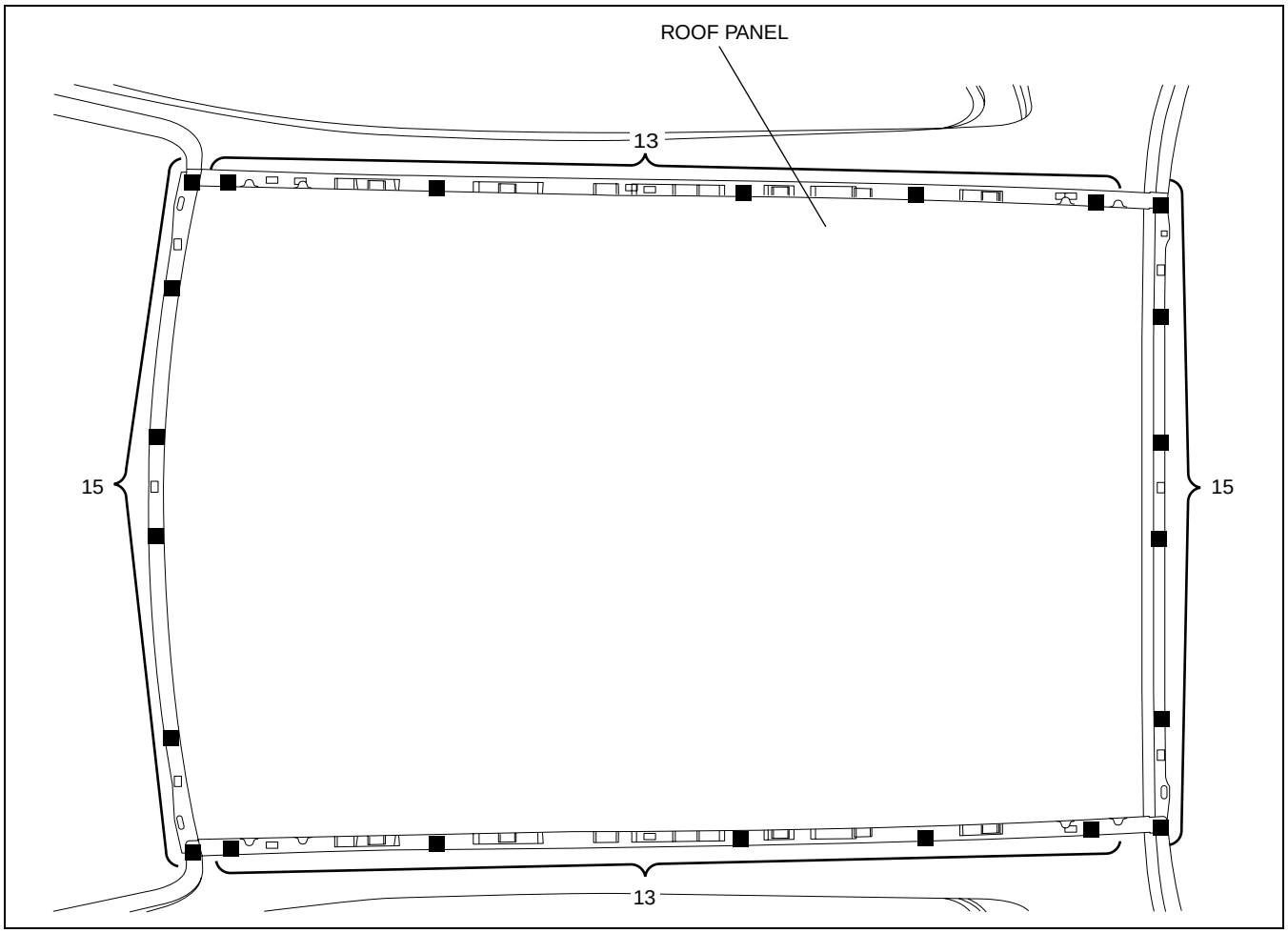


CHU0980B090

ROOF PANEL INSTALLATION

CHU098070600B02

1. When installing new parts, position each part so that the section measurement aligns with the body dimension.
2. Drill holes for plug welds before installing new parts.
3. After temporarily installing new parts, make sure the related parts fit properly.



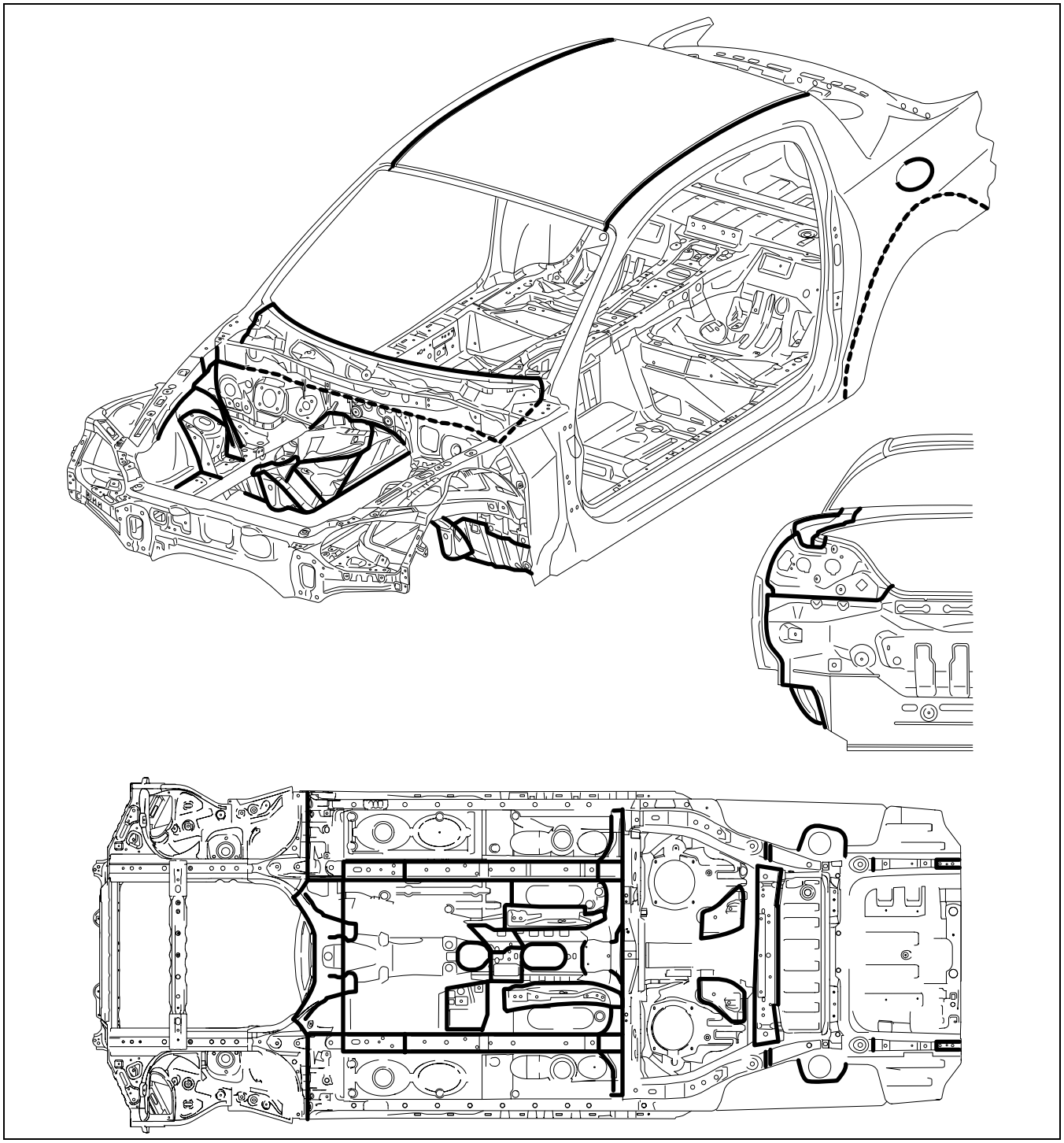
CHU0980B091

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

BODY SEALING

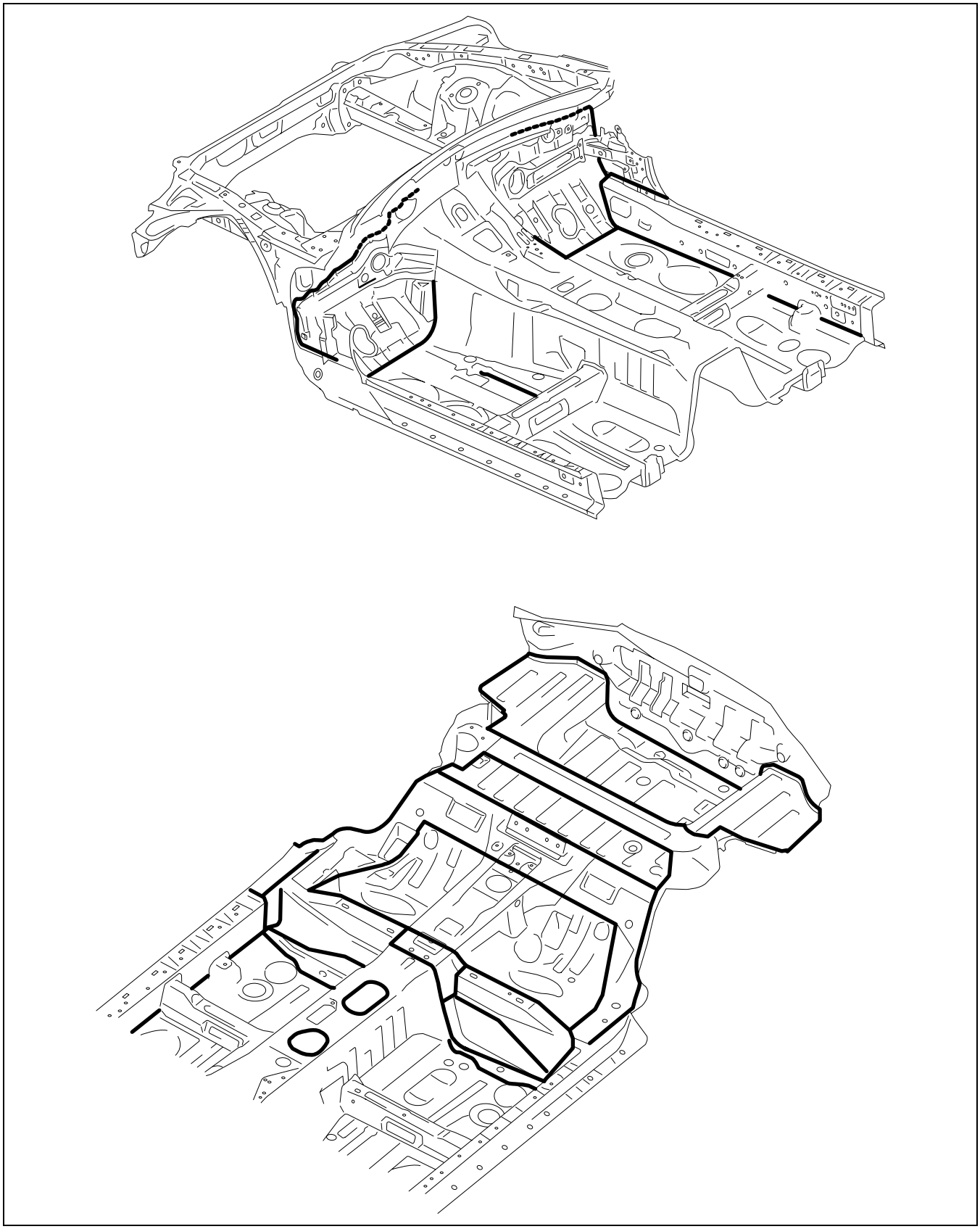
CHU098007000B02

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.



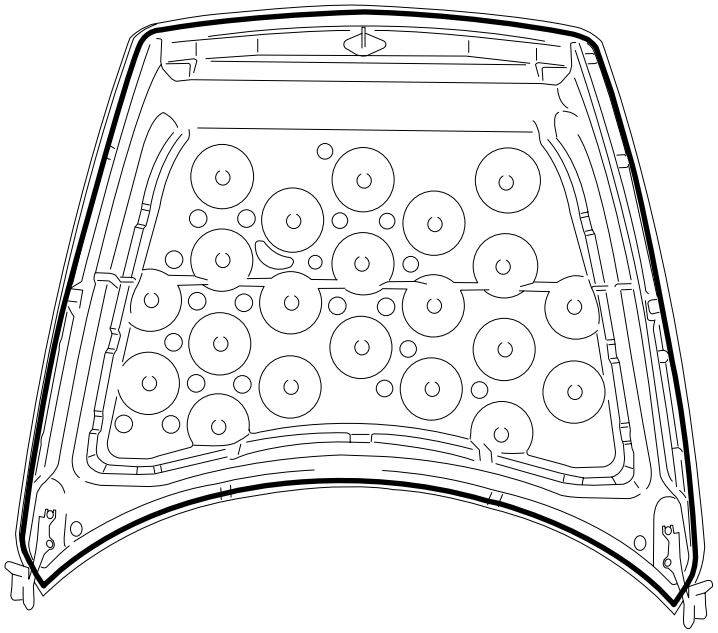
CHU0980B024

BODY STRUCTURE [WATER-PROOF AND RUST PREVENTIVE TREATMENT]

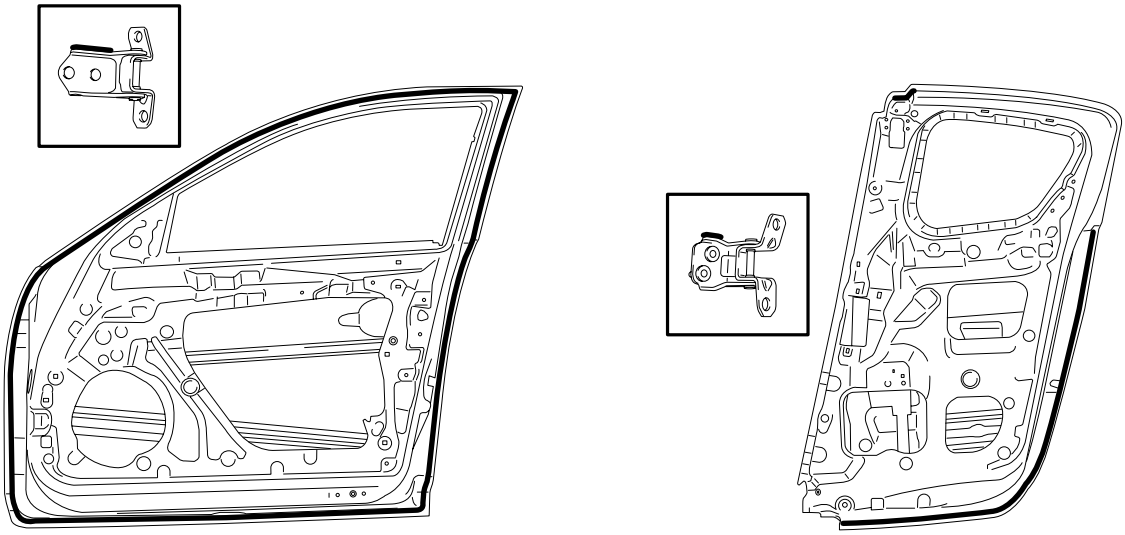


CHU0980B025

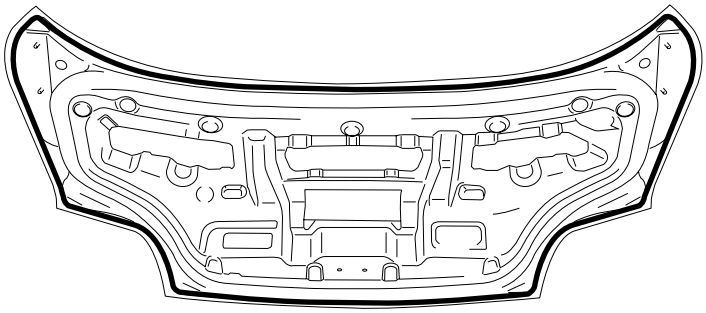
HOOD



DOOR



TRUNK LID

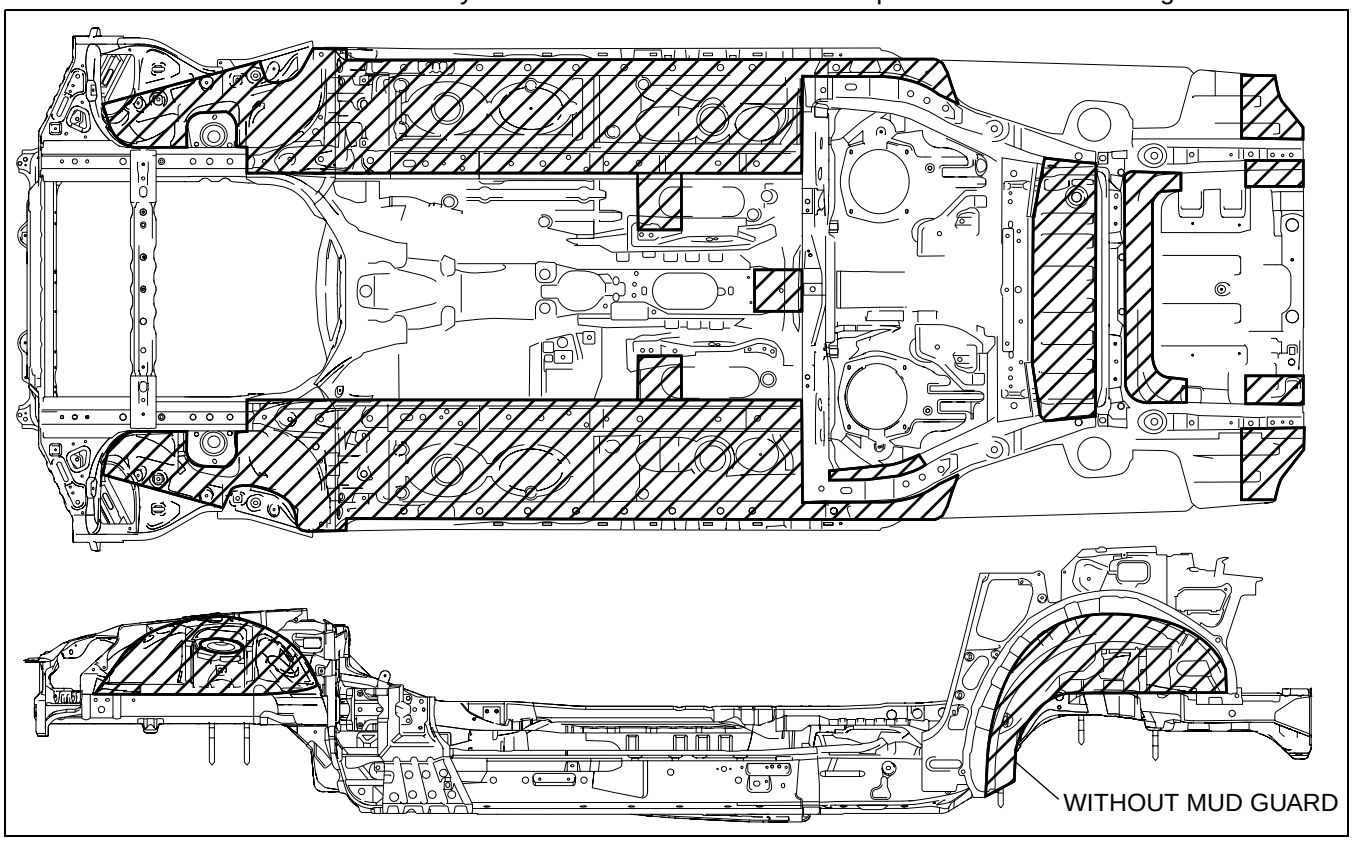


CHU0980B026

UNDER COATING

CHU098007000B03

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

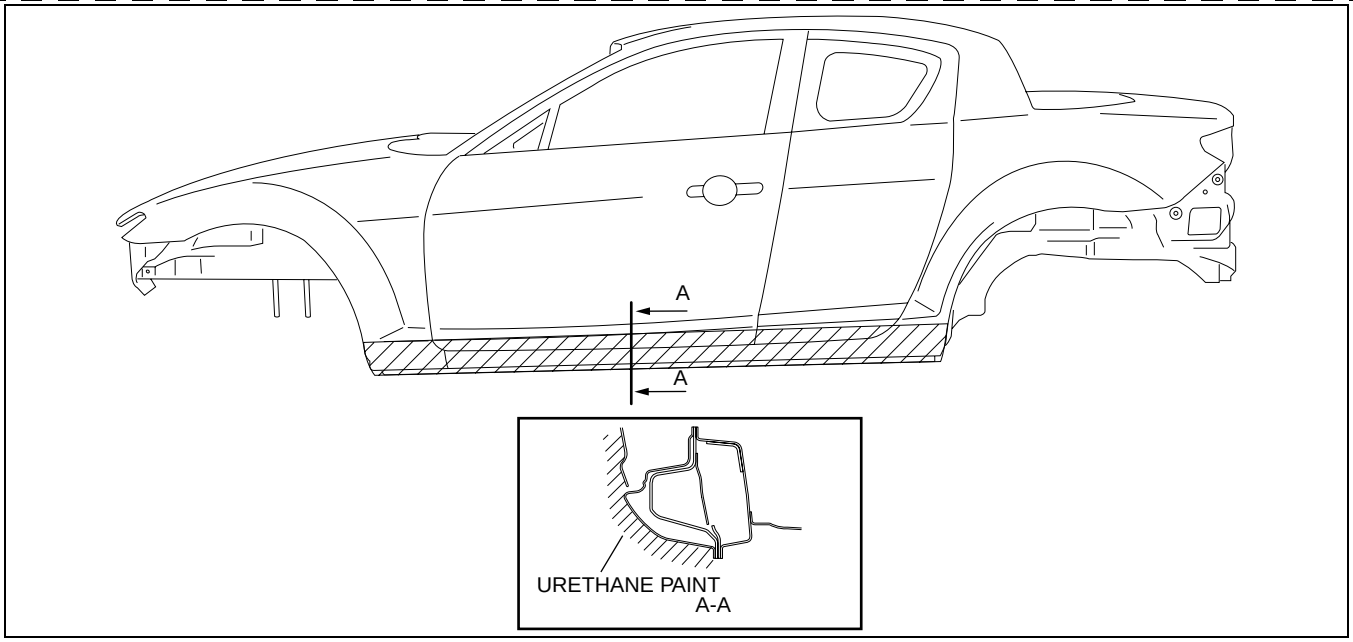


CHU0980B227

CHIPPING-RESISTANT COATING

CHU098007000B04

The coating locations are indicated by the shaded areas.

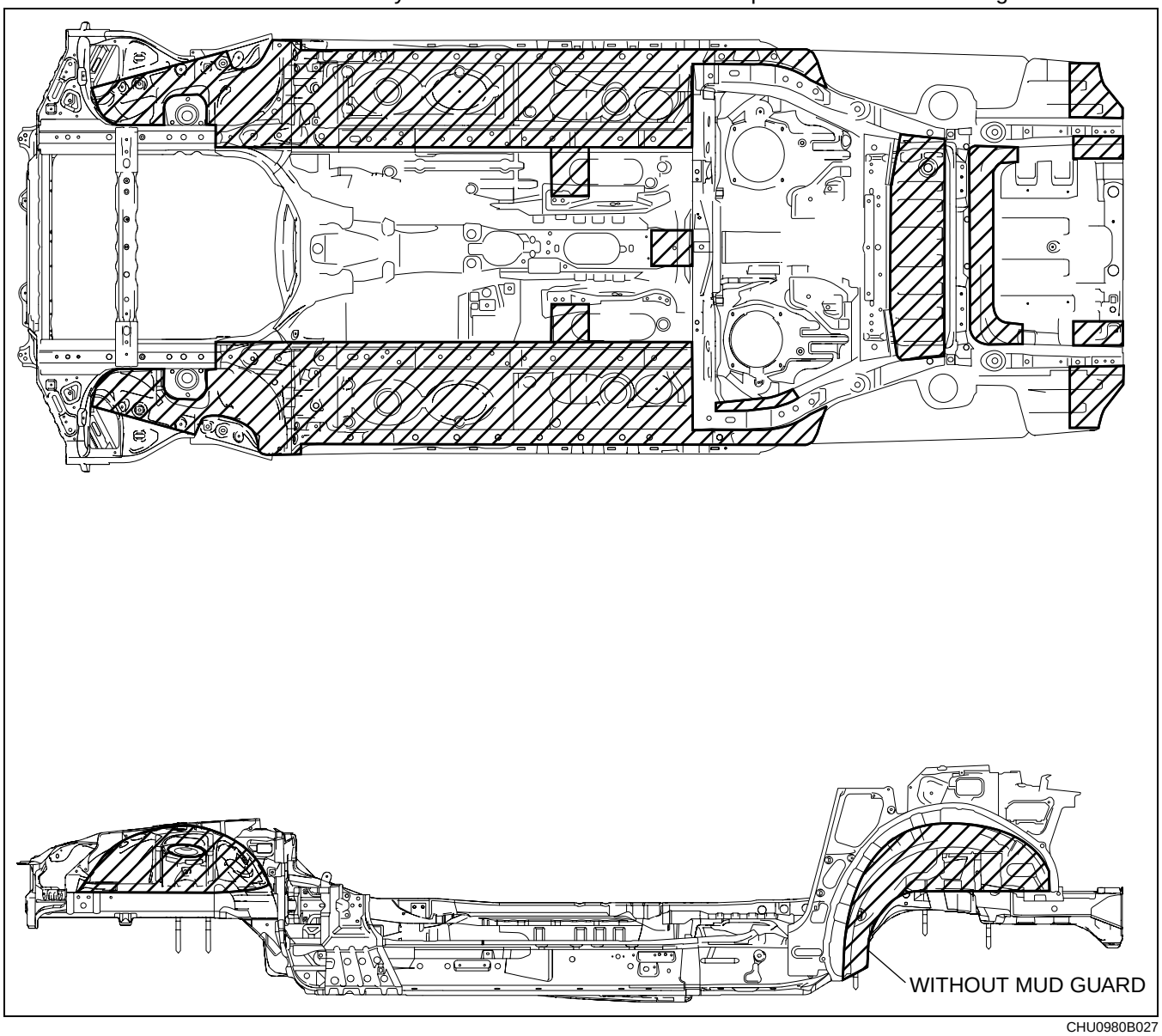


CHU0980B228

UNDER COATING

CHU098007000B03

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

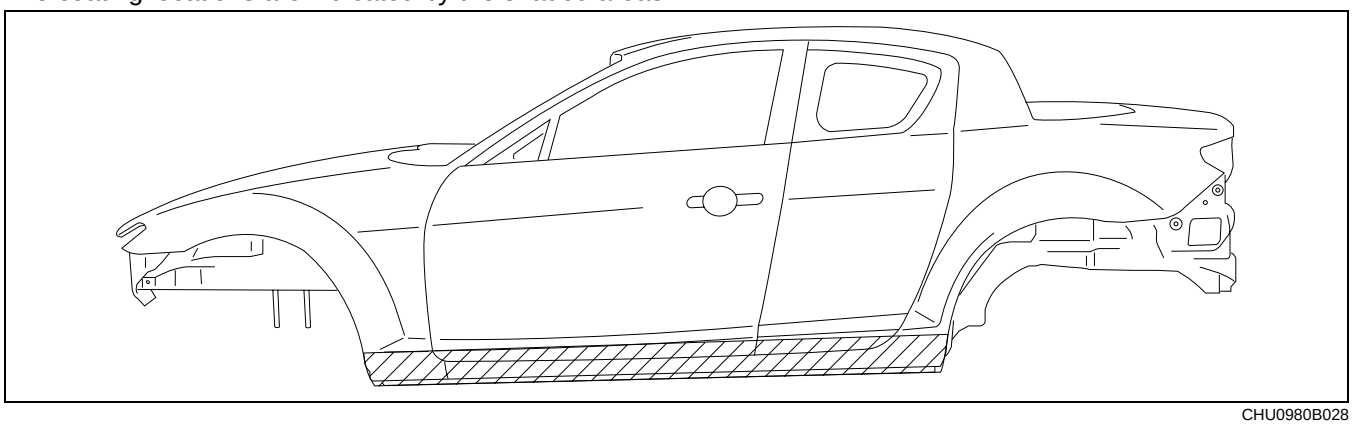


CHU0980B027

PCV PAINTING

CHU098007000B04

The coating locations are indicated by the shaded areas.

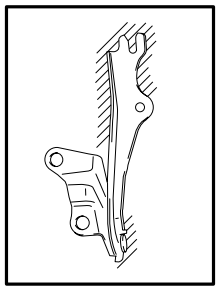


CHU0980B028

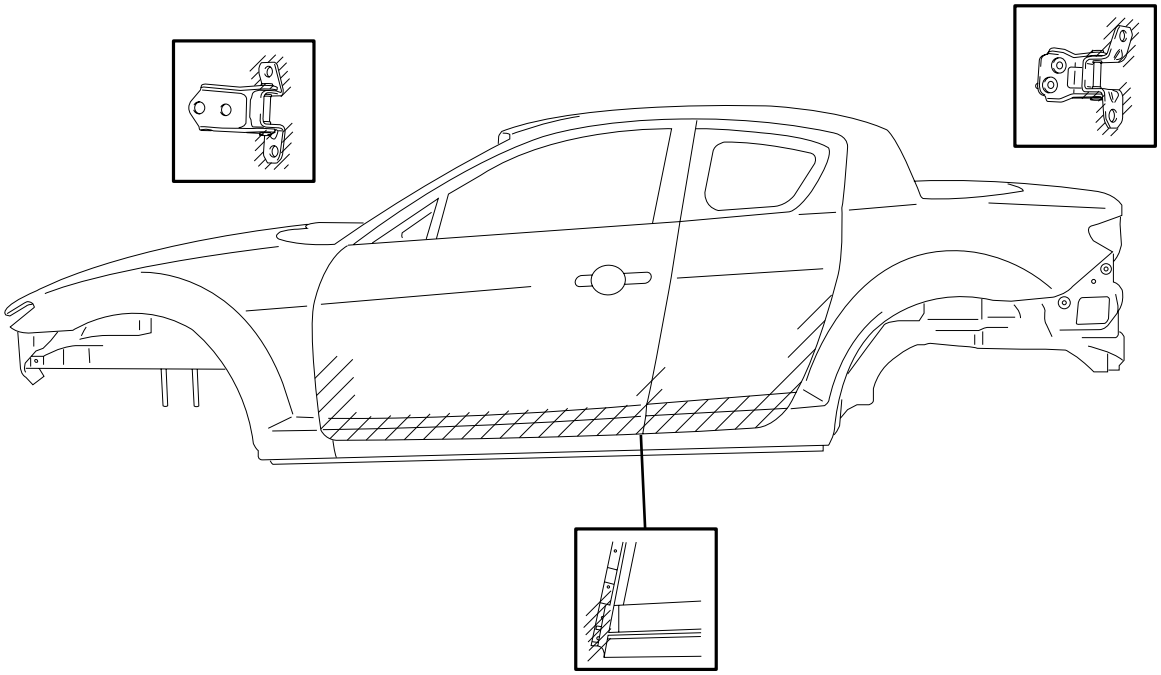
RUST PREVENTIVE TREATMENT

CHU098007000B05

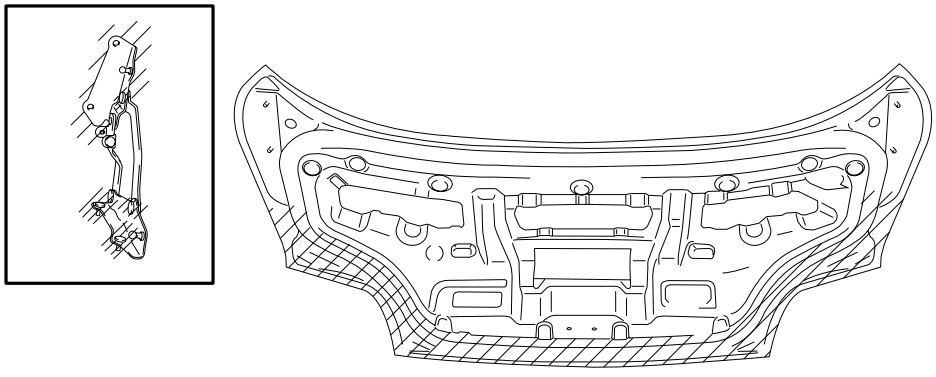
HOOD HINGE



DOOR



TRUNK LID

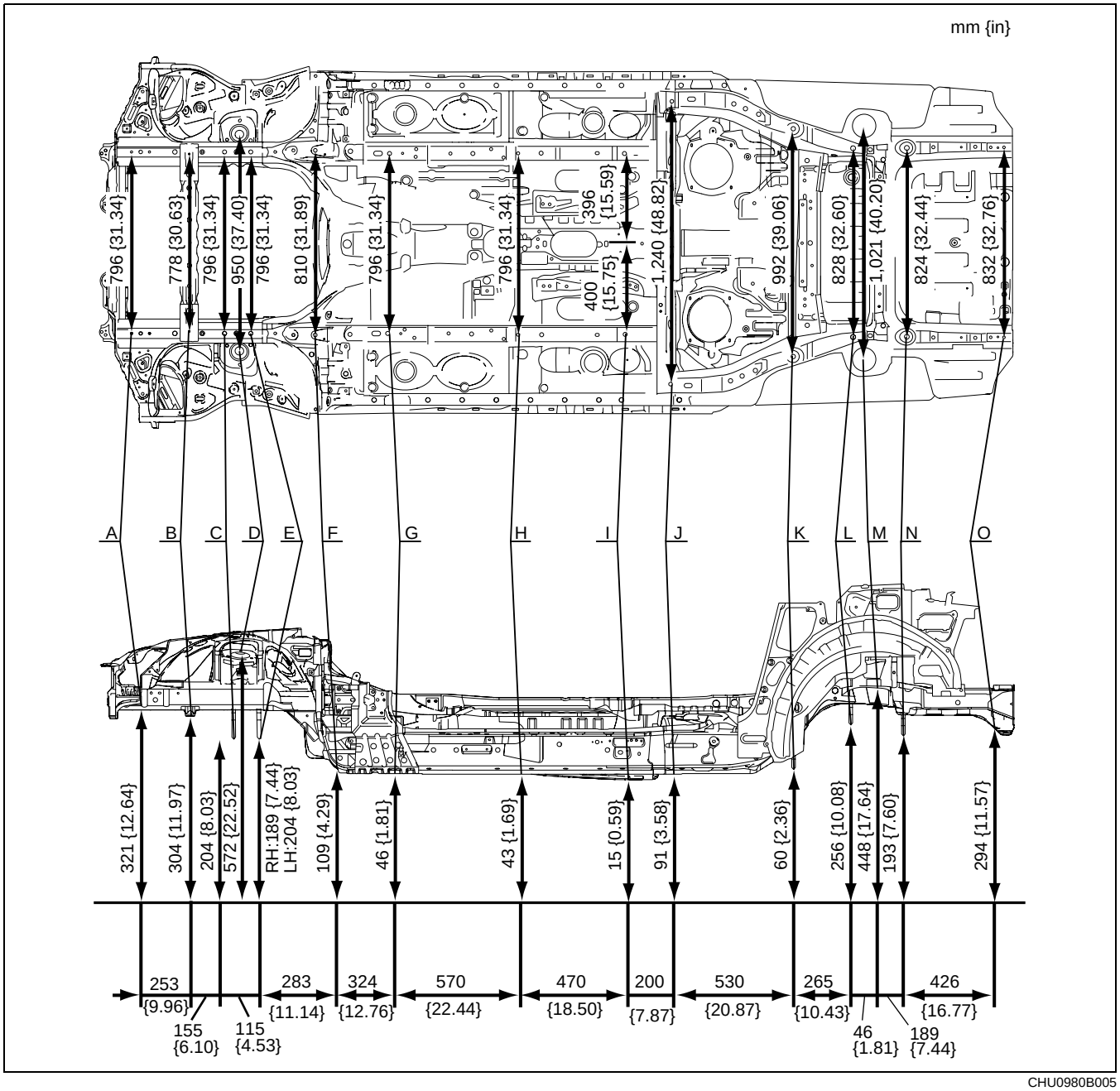


CHU0980B029

09–80D BODY STRUCTURE [DIMENSIONS]

UNDERBODY FLAT-PLANE DIMENSIONS

CHU098053010B01



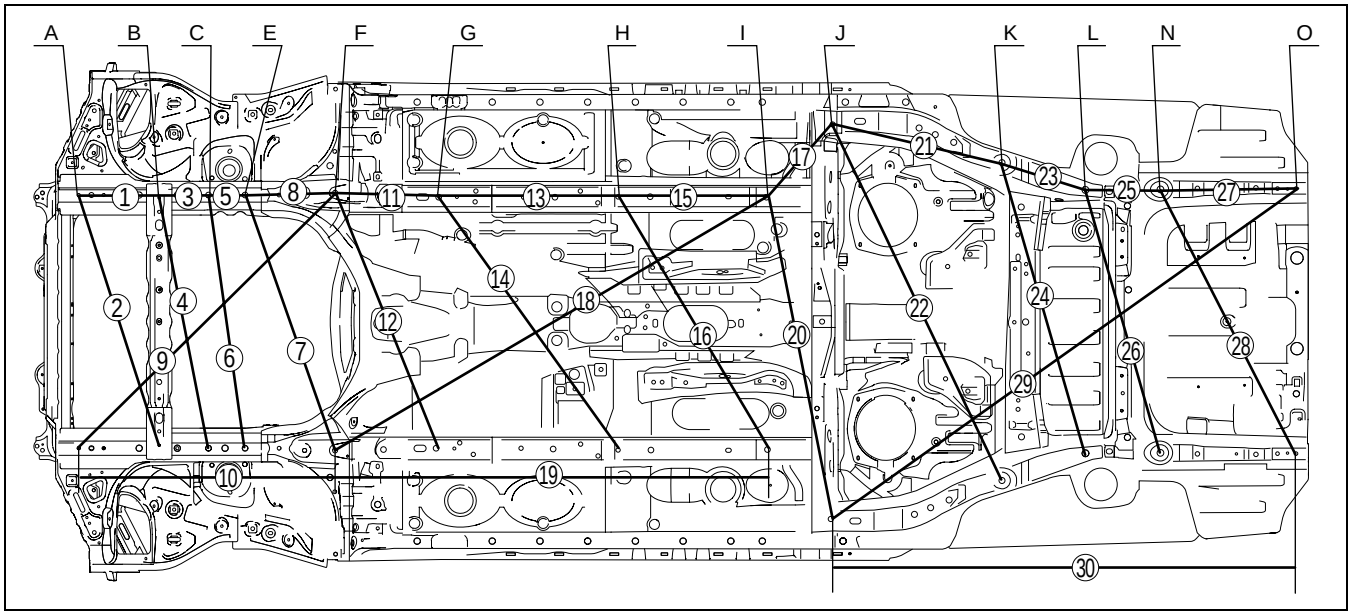
CHU0980B005

Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
A	Front side frame standard hole	ø9.8 {0.39}
B	Crossmember No.1 standard hole	ø7 {0.28}
C	Front crossmember mounting bolt	M14 {0.55}
D	Front suspension mounting block	ø44 {1.73}
E	Front crossmember mounting bolt	M14 {0.55}
F	Front frame rear standard hole	ø16 {0.63}
G	Front frame rear standard hole	16 × 20 {0.63 × 0.79}
H	Front B frame standard hole	M14 {0.55}

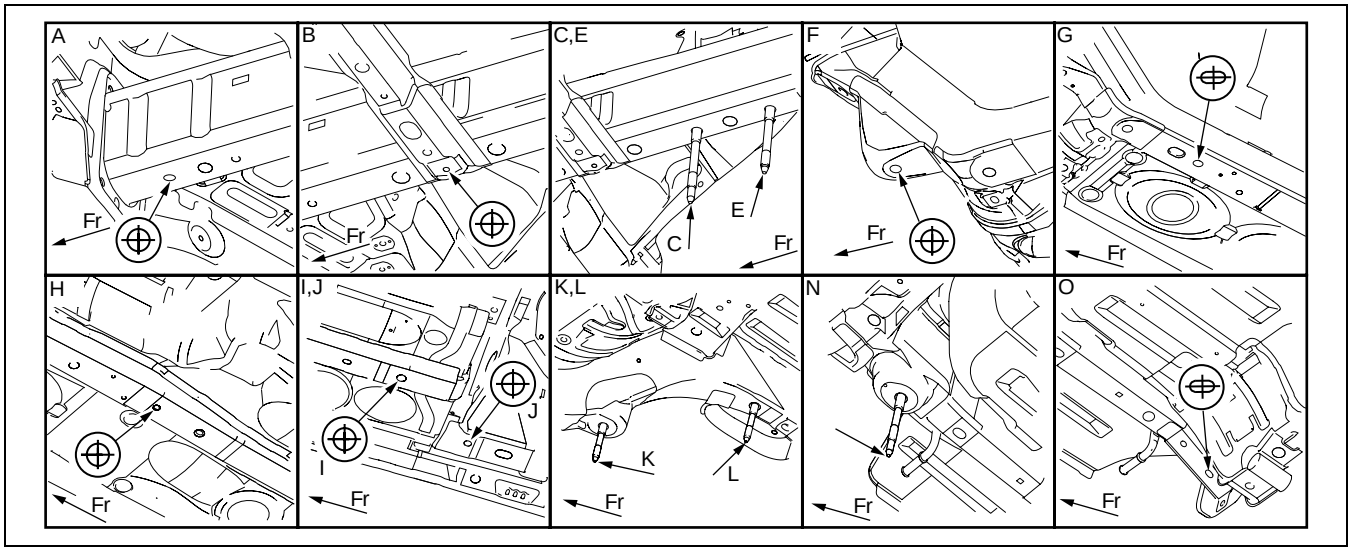
Point symbol	Designation	Hole diameter or bolt or nut size mm {in}
I	Front B frame standard hole	ø20 {0.79}
J	Rear side frame standard hole	ø16 {0.63}
K	Rear crossmember mounting bolt	M14 {0.55}
L	Rear crossmember mounting bolt	M14 {0.55}
M	Rear suspension mounting block	ø97 {3.82}
N	Rear crossmember mounting bolt	M14 {0.55}
O	Bumper bracket standard hole	14 × 10 {0.55 × 0.39}

UNDERBODY STRAIGHT-LINE DIMENSIONS

CHU098053010B02



CHU0980B006



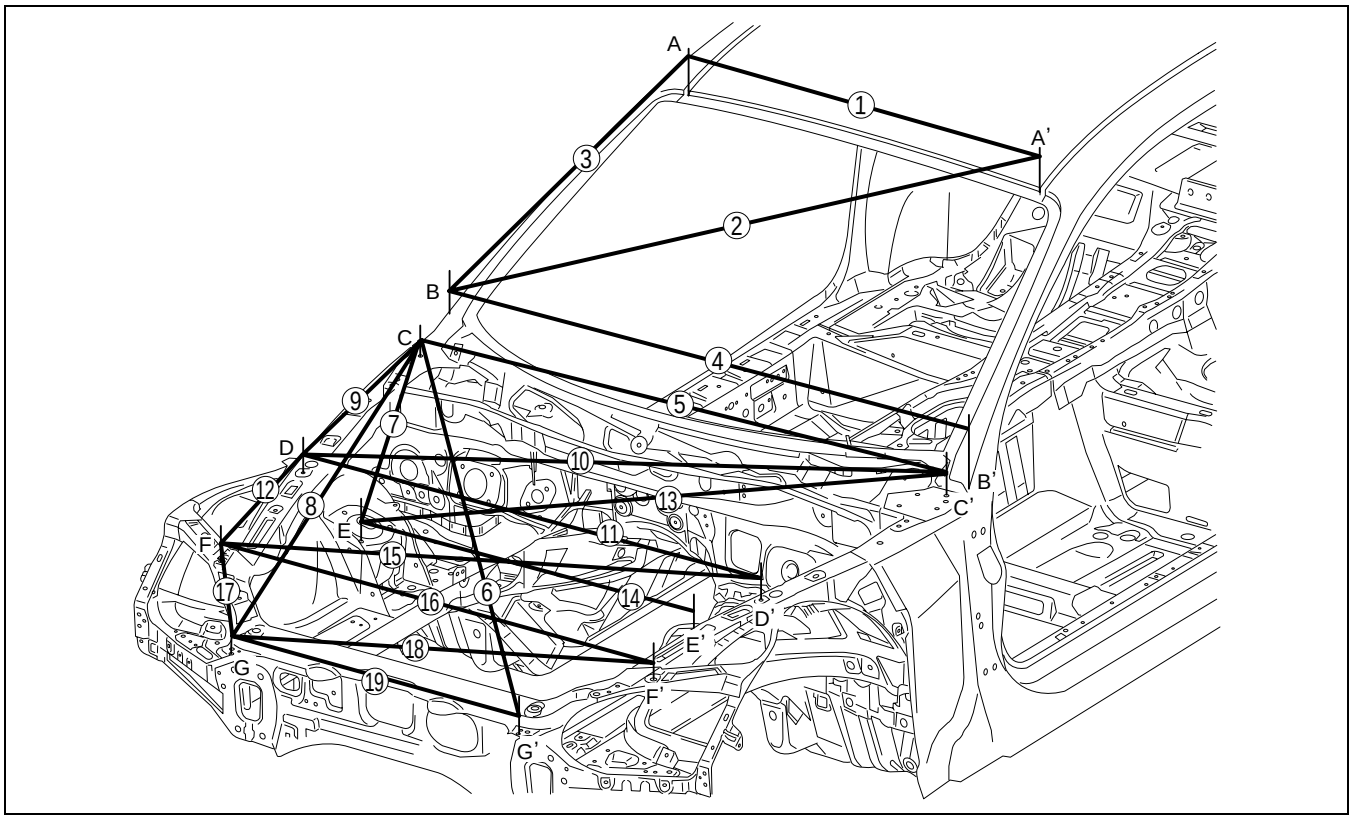
CHU0980B007

Measured location	Dimensions mm {in}
1	254 {10.00}
2	827 {32.56}
3	184 {7.24}
4	808 {31.81}
5	RH:116 {4.57}, LH:115 {4.53}
6	804 {31.65}
7	RH:855 {33.66}, LH:857 {33.74}
8	RH:294 {11.57}, LH:299 {11.77}
9	1,157 {45.55}
10	833 {32.80}
11	330 {12.99}
12	868 {34.17}
13	570 {22.44}
14	979 {38.54}
15	471 {18.54}

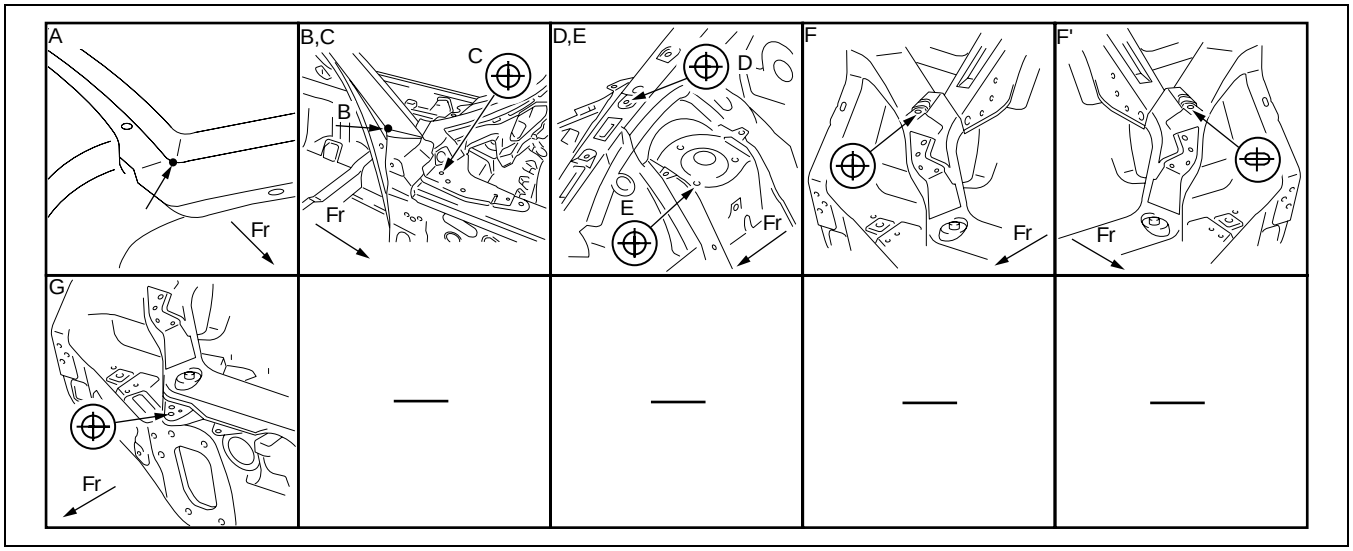
Measured location	Dimensions mm {in}
16	RH:923 {36.34}, LH:927 {36.50}
17	RH:307 {12.09}, LH:310 {12.20}
18	RH:1,585 {62.40}, LH:1,587 {62.48}
19	1,367 {53.82}
20	RH:1,042 {41.02}, LH:1,039 {40.91}
21	545 {21.46}
22	1,236 {48.66}
23	339 {13.35}
24	968 {38.11}
25	243 {9.57}
26	861 {33.90}
27	438 {17.24}
28	937 {36.89}
29	1,799 {70.83}
30	1,485 {58.46}

FRONT BODY STRAIGHT-LINE DIMENSIONS (1)

CHU098053020B01



CHU0980B008



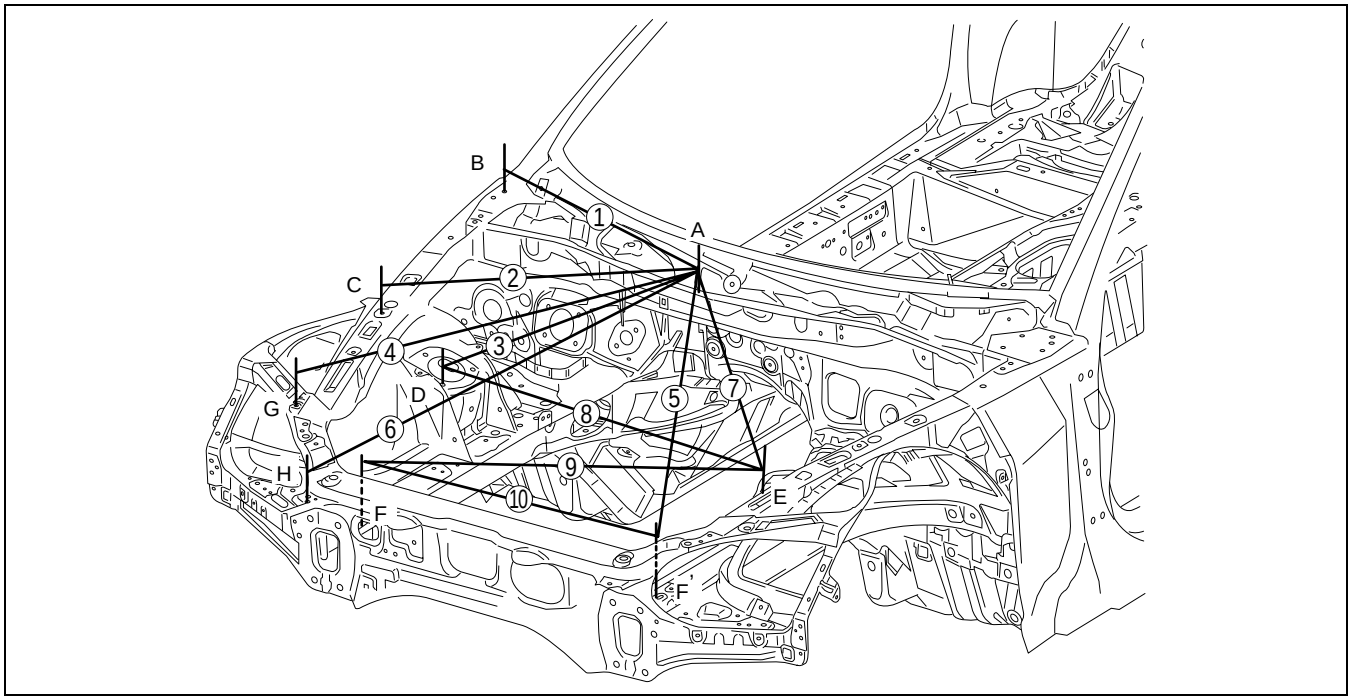
CHU0980B009

Measured location	Dimensions mm {in}
1	954 {37.56}
2	1,350 {53.15}
3	676 {26.61}
4	1,430 {56.30}
5	1,406 {55.35}
6	1,604 {63.15}
7	675 {26.57}
8	1,214 {47.80}
9	584 {22.99}
10	1,450 {57.09}

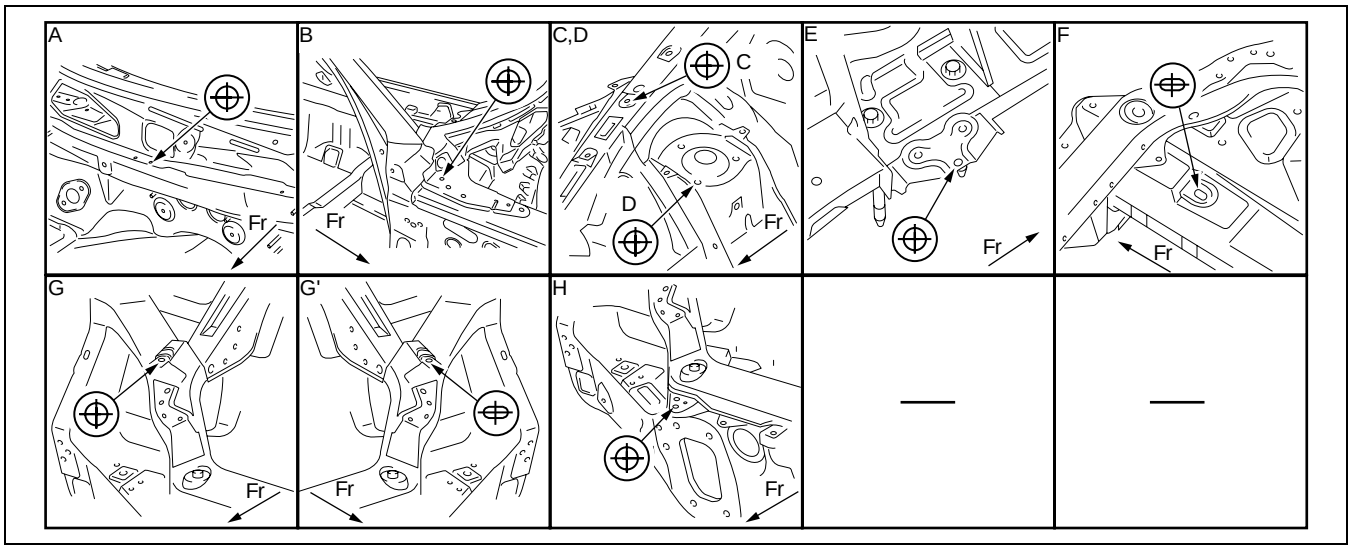
Measured location	Dimensions mm {in}
11	1,254 {49.37}
12	358 {14.09}
13	1,313 {51.69}
14	903 {35.55}
15	1,266 {49.84}
16	1,176 {46.30}
17	314 {12.36}
18	1,010 {39.76}
19	783 {30.83}

FRONT BODY STRAIGHT-LINE DIMENSIONS (2)

CHU098053020B02



CHU0980B010



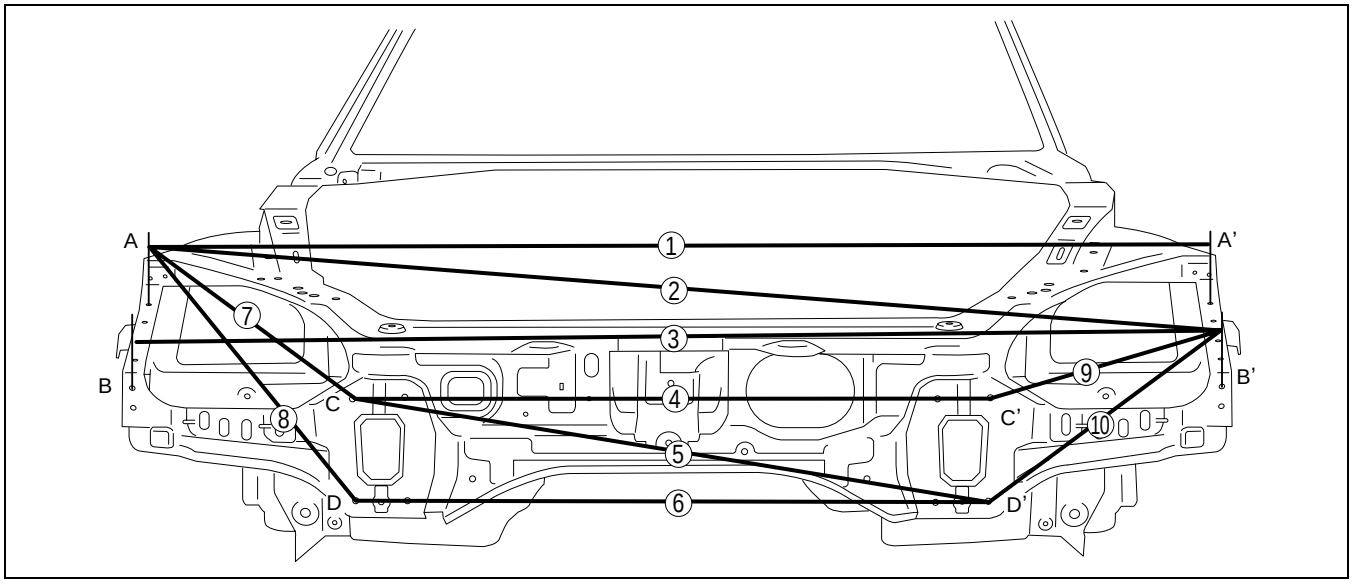
CHU0980B011

Measured location	Dimensions mm {in}
1	760 {29.92}
2	696 {27.40}
3	585 {23.03}
4	882 {34.72}
5	868 {34.17}

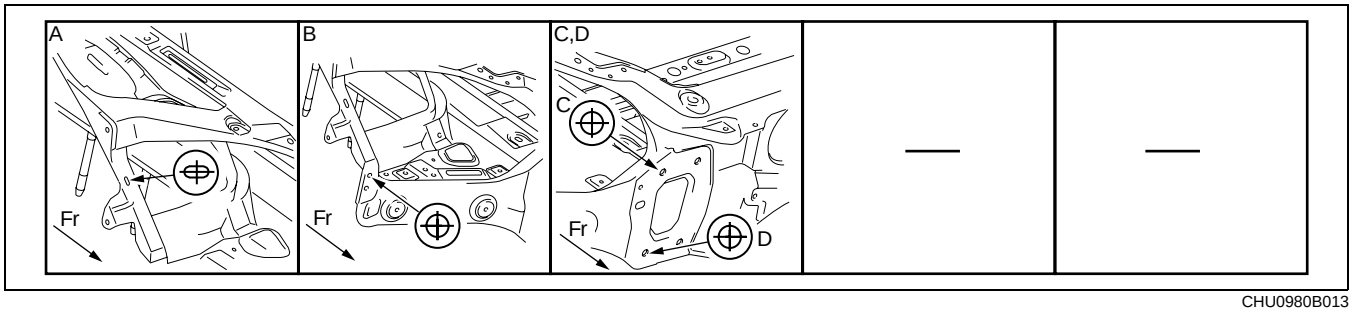
Measured location	Dimensions mm {in}
6	983 {38.70}
7	512 {20.16}
8	758 {29.84}
9	816 {32.13}
10	796 {31.34}

FRONT BODY STRAIGHT-LINE DIMENSIONS (3)

CHU098053020B03



CHU0980B012



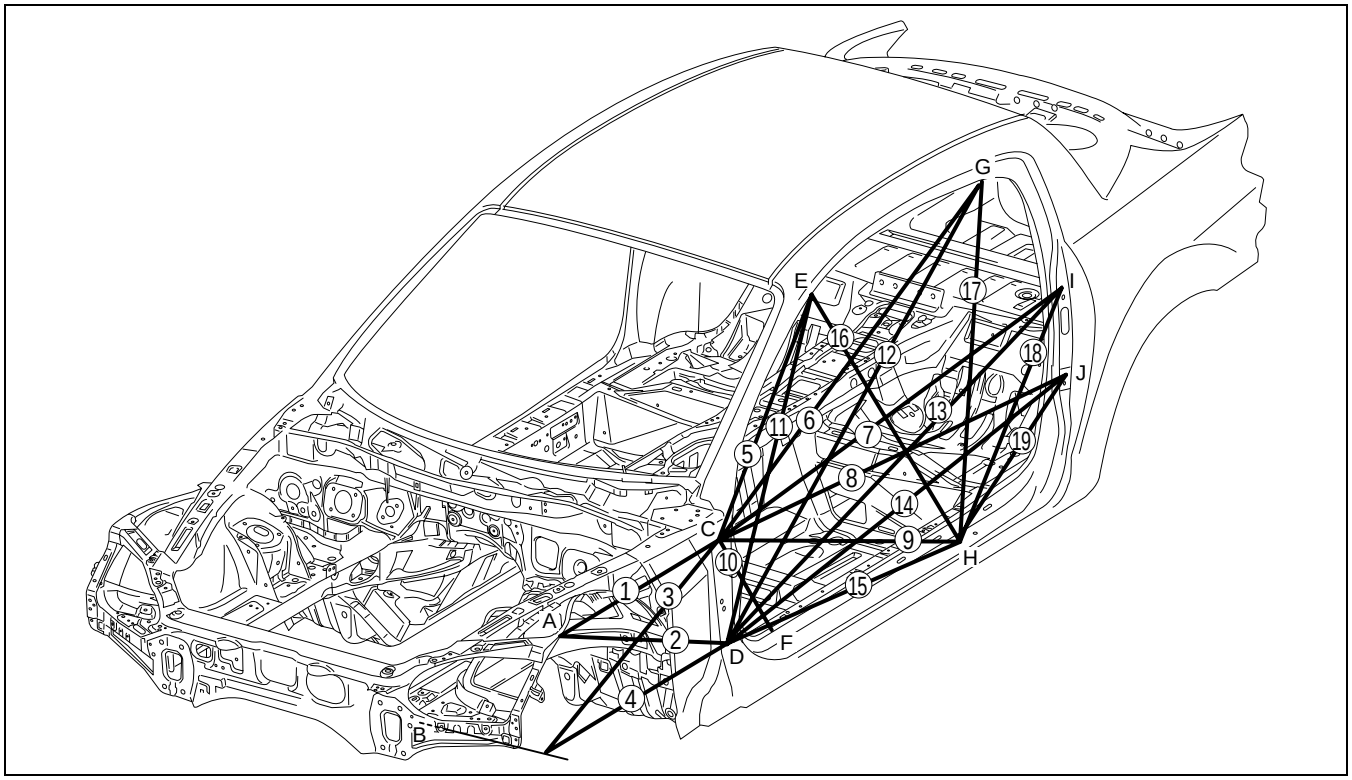
CHU0980B013

Measured location	Dimensions mm {in}
1	1,550 {61.02}
2	1,554 {61.18}
3	1,547 {60.91}
4	868 {34.17}
5	879 {34.61}

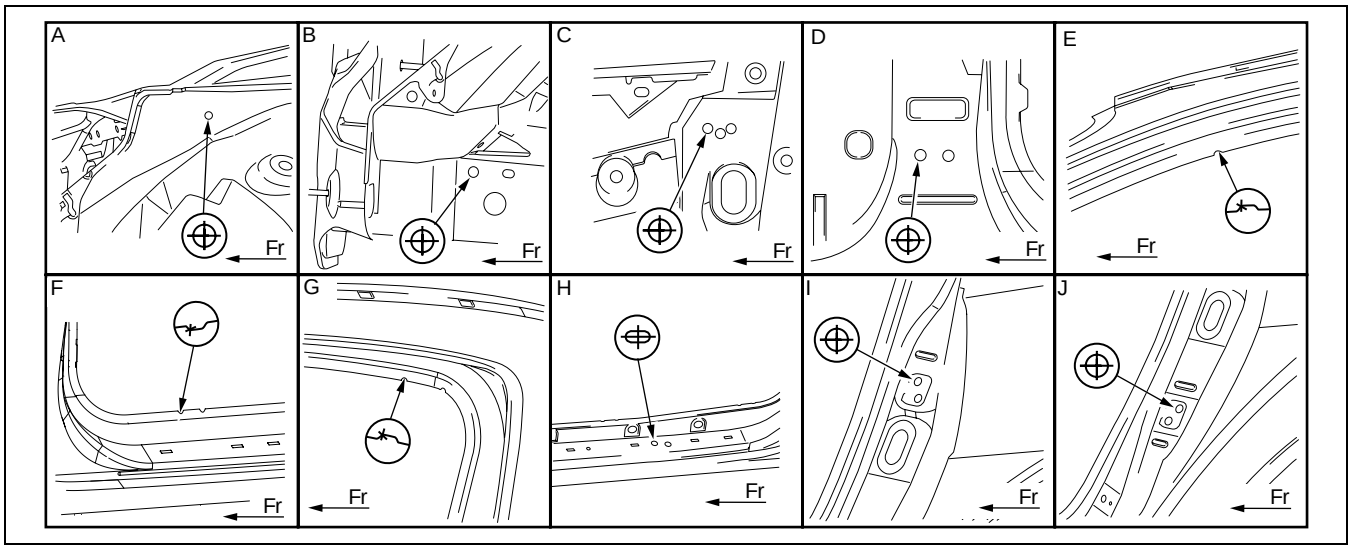
Measured location	Dimensions mm {in}
6	868 {34.17}
7	405 {15.94}
8	461 {18.15}
9	356 {14.02}
10	384 {15.12}

CABIN SIDE FRAME STRAIGHT-LINE DIMENSIONS (1)

CHU098070010B01



CHU0980B014



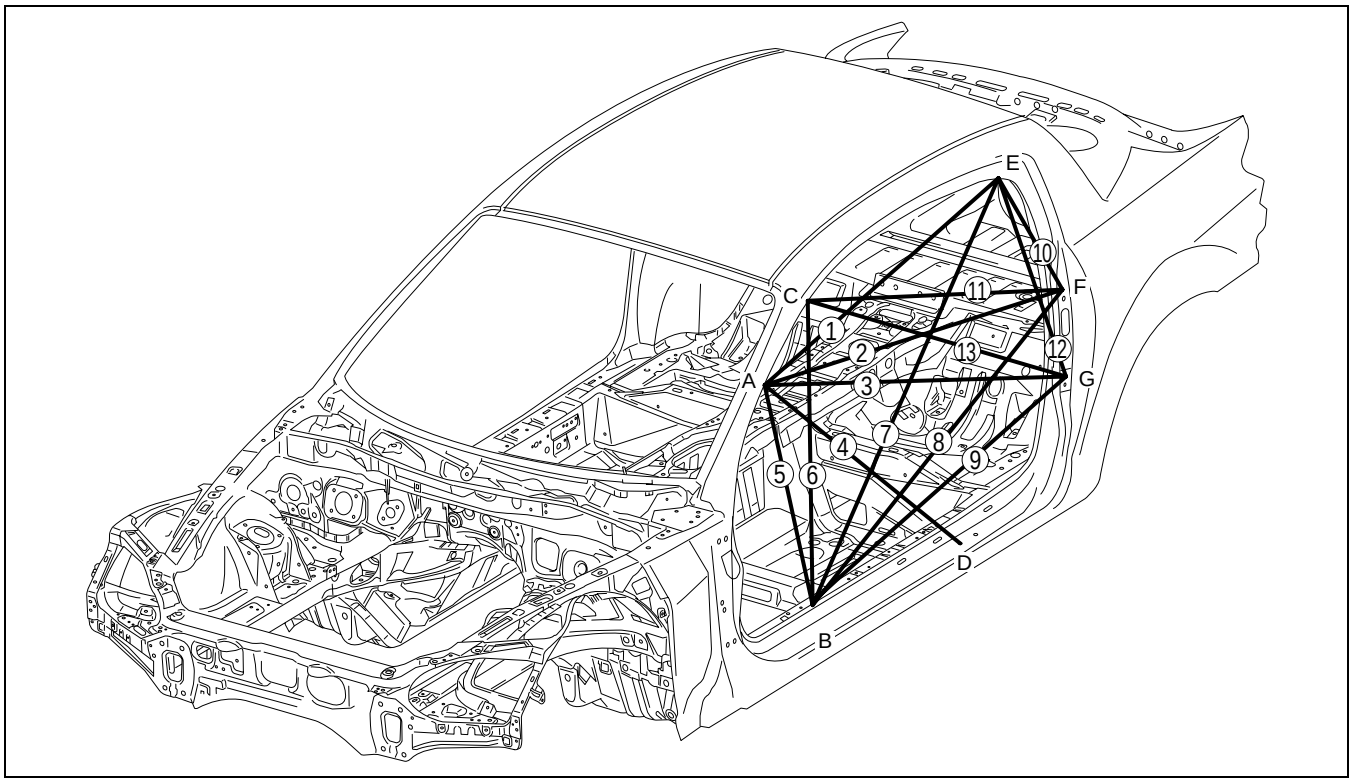
CHU0980B015

Measured location	Dimensions mm {in}
1	785 {30.91}
2	840 {33.07}
3	1,036 {40.79}
4	1,015 {39.96}
5	901 {35.47}
6	1,686 {66.38}
7	1,706 {67.17}
8	1,653 {65.08}
9	1,230 {48.43}
10	484 {19.06}

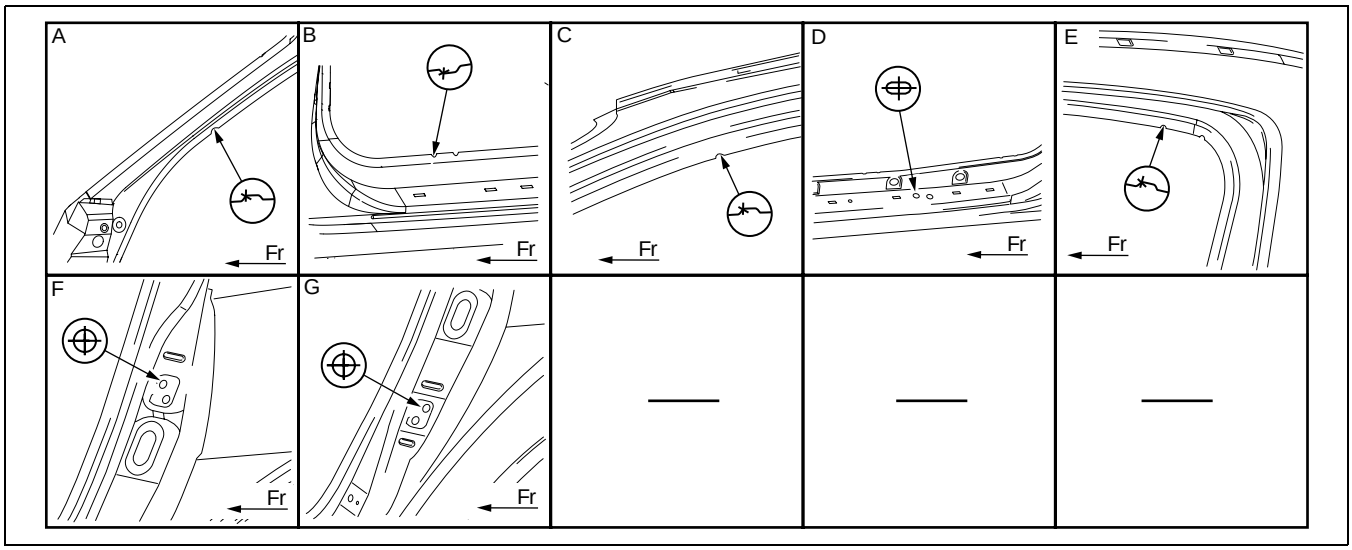
Measured location	Dimensions mm {in}
11	1,103 {43.43}
12	1,809 {71.22}
13	1,765 {69.49}
14	1,667 {65.63}
15	1,162 {45.75}
16	993 {39.09}
17	1,039 {40.91}
18	788 {31.02}
19	592 {23.31}

CABIN SIDE FRAME STRAIGHT-LINE DIMENSIONS (2)

CHU098070010B02



CHU0980B016



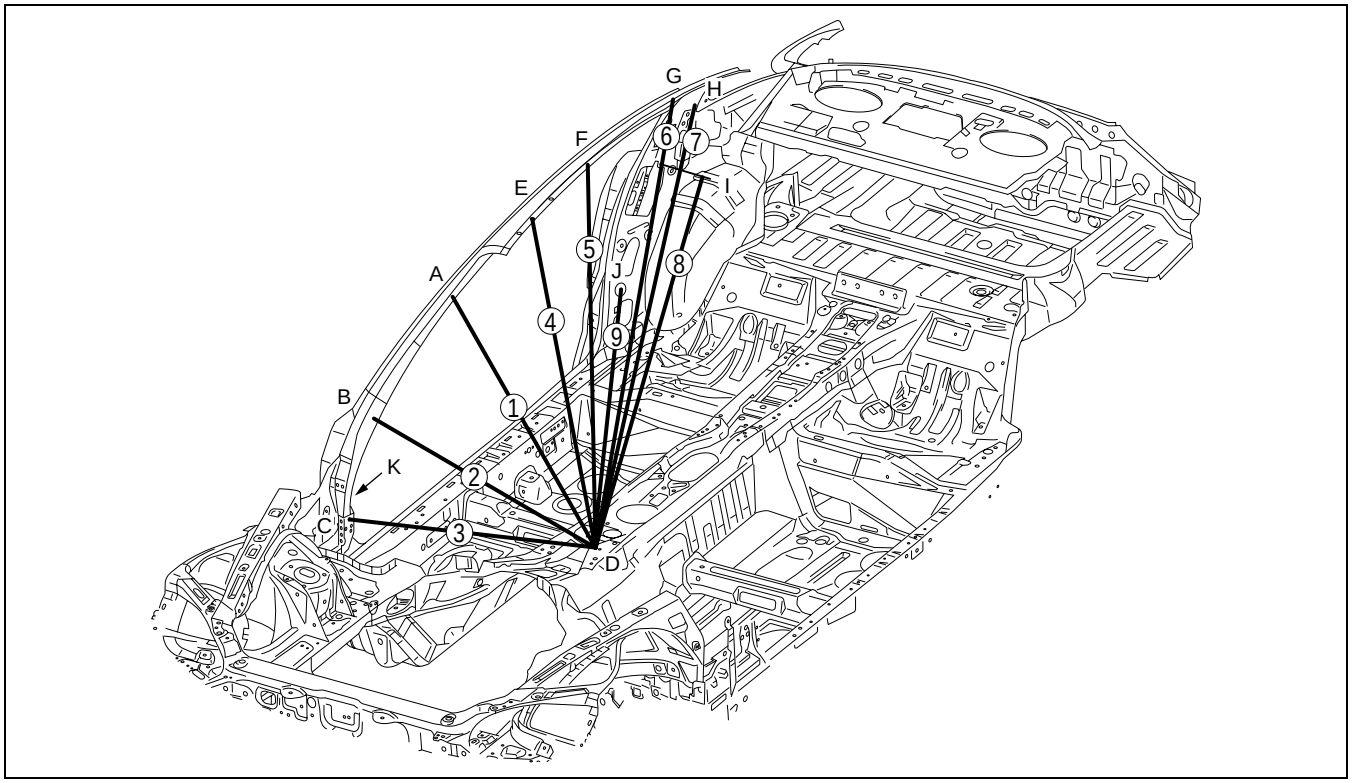
CHU0980B017

Measured location	Dimensions mm {in}
1	1,217 {47.91}
2	1,310 {51.57}
3	1,315 {51.77}
4	1,045 {41.14}
5	681 {26.81}
6	964 {37.95}
7	1,571 {61.85}

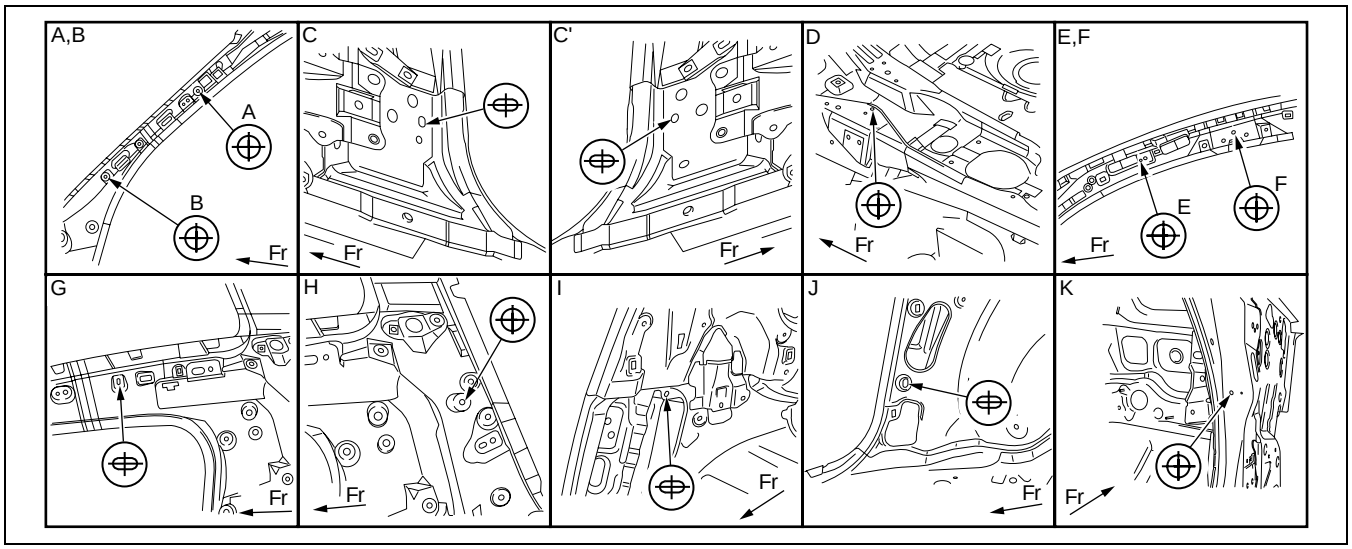
Measured location	Dimensions mm {in}
8	1,492 {58.74}
9	1,376 {54.17}
10	403 {15.87}
11	1,016 {40.00}
12	631 {24.84}
13	1,080 {42.52}

ROOM STRAIGHT-LINE DIMENSIONS (1)

CHU098070001B01



CHU0980B018



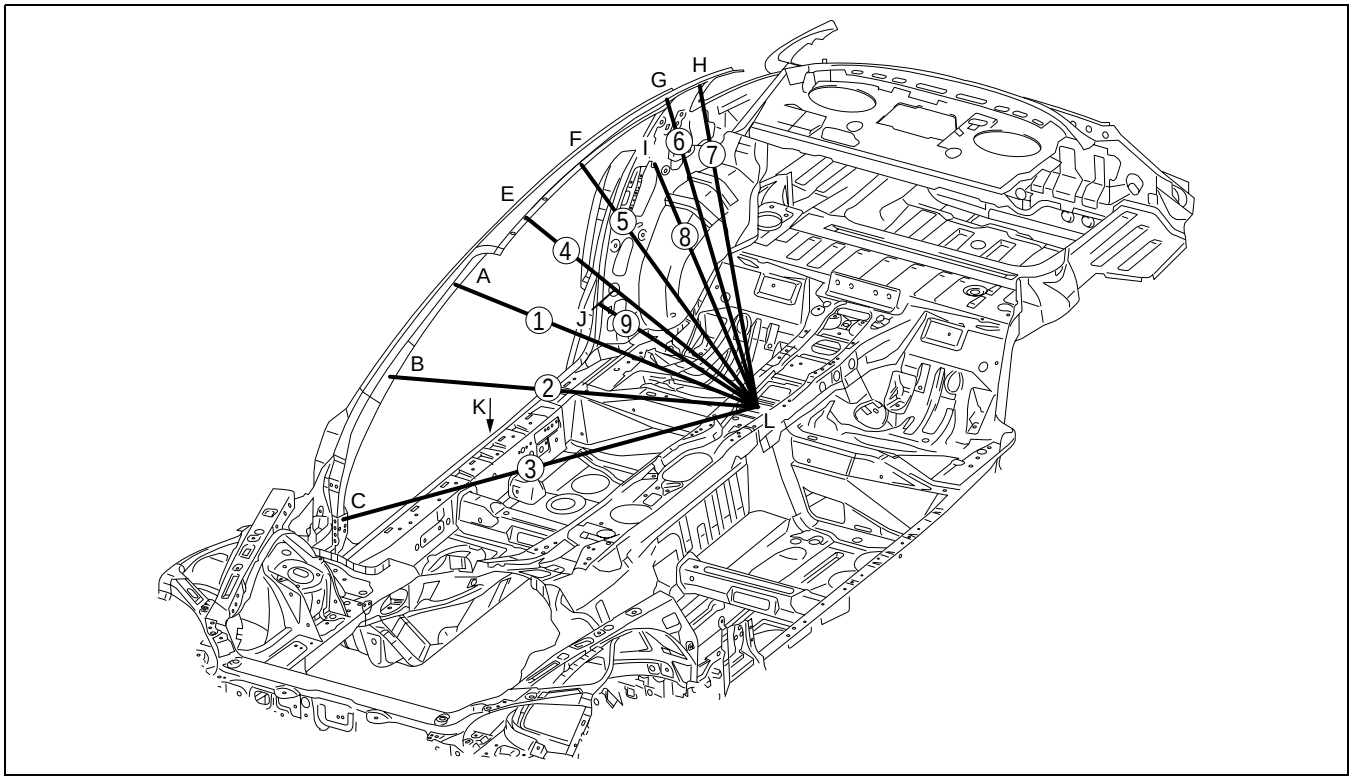
CHU0980B019

Measured location	Dimensions mm {in}
1	RH:892 {35.12}, LH:839 {33.03}
2	RH:800 {31.50}, LH:734 {28.90}
3	RH:788 {31.02}, LH:711 {27.99}
4	RH:1,160 {45.67}, LH:1,125 {44.29}
5	RH:1,367 {53.82}, LH:1,337 {52.64}

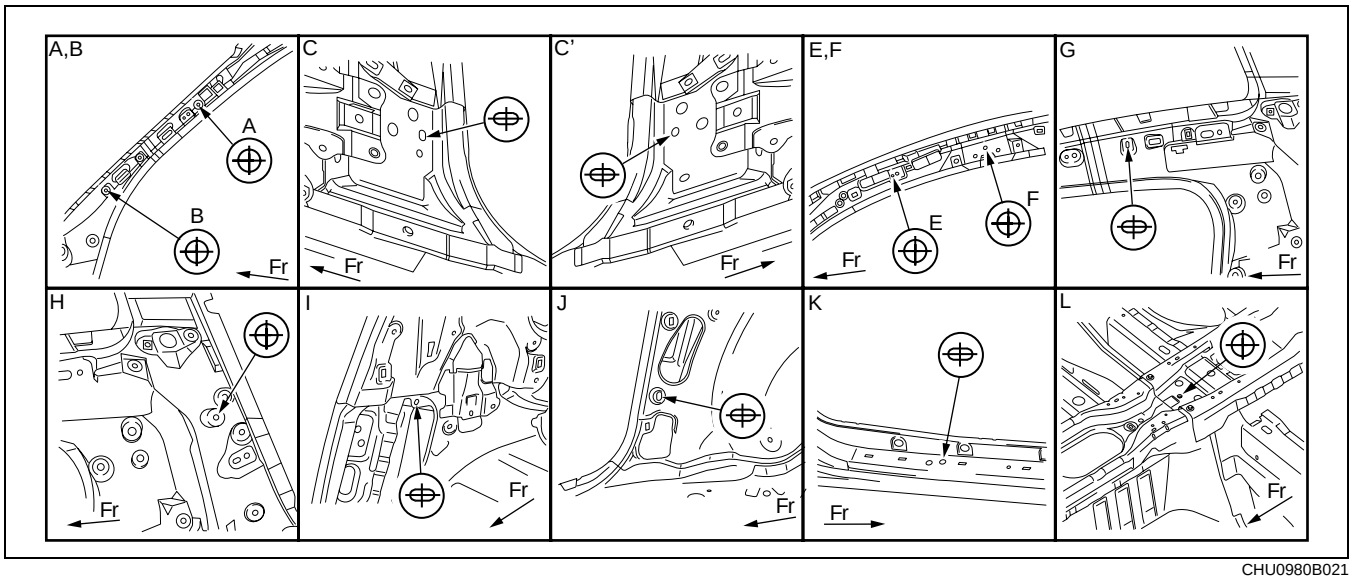
Measured location	Dimensions mm {in}
6	RH:1,618 {63.70}, LH:1,593 {62.72}
7	RH:1,886 {74.25}, LH:1,862 {73.31}
8	RH:1,742 {68.58}, LH:1,710 {67.32}
9	RH:1,529 {60.20}, LH:1,490 {58.66}
K-K’	1,512 {59.53}

ROOM STRAIGHT-LINE DIMENSIONS (2)

CHU098070001B02



CHU0980B020



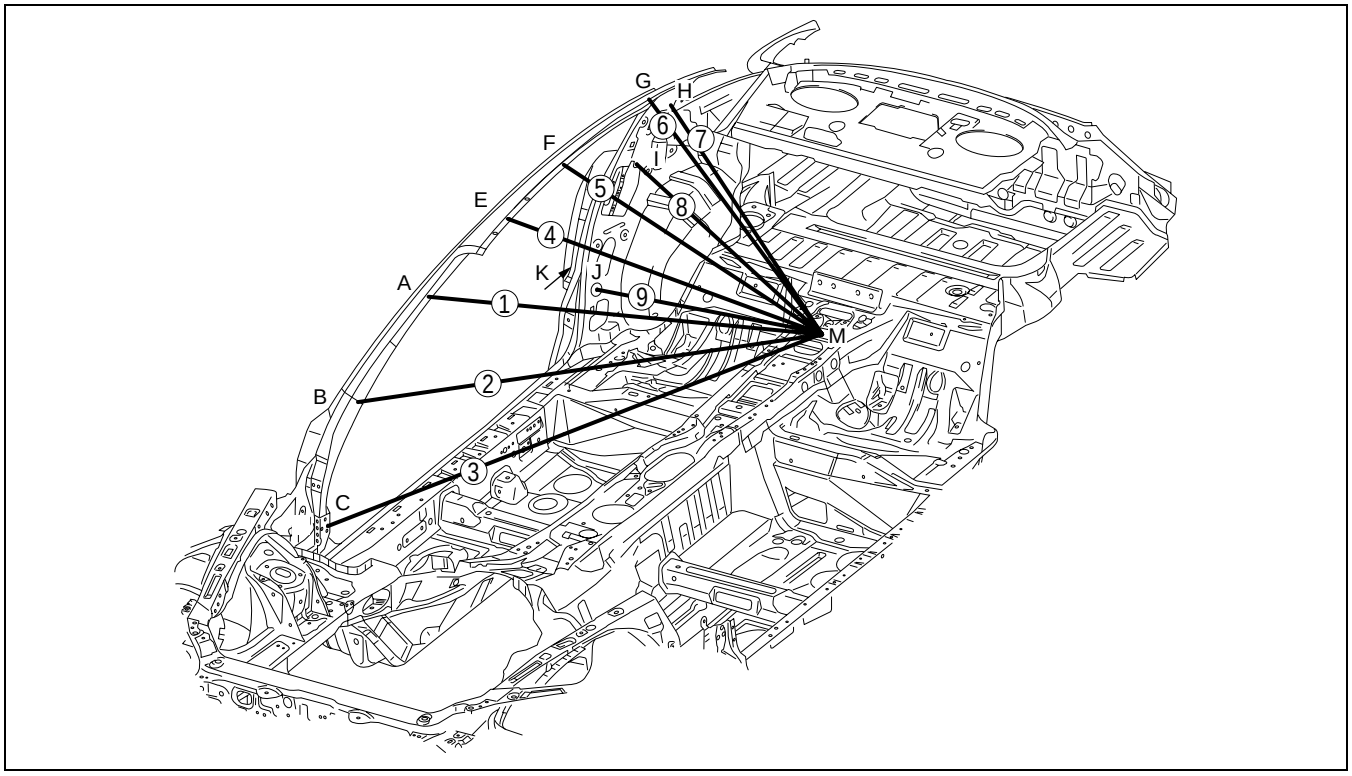
CHU0980B021

Measured location	Dimensions mm {in}
1	1,115 {43.90}
2	1,265 {49.80}
3	1,350 {53.15}
4	978 {38.50}
5	951 {37.44}
6	1,015 {39.96}

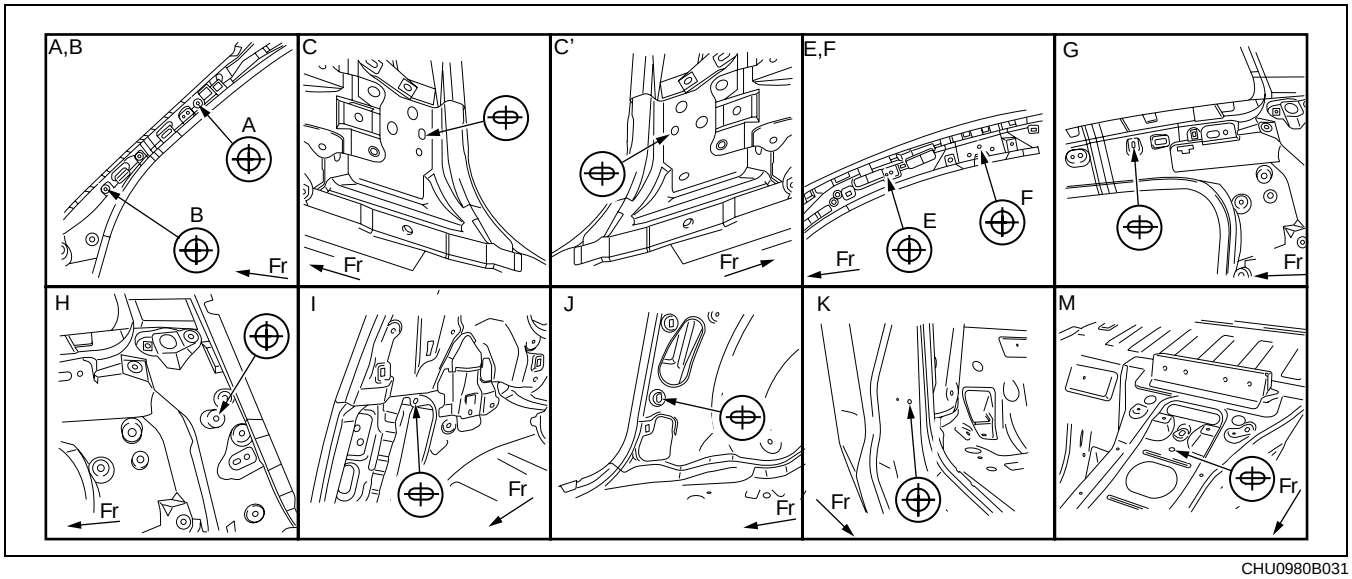
Measured location	Dimensions mm {in}
7	1,144 {45.04}
8	1,007 {39.65}
9	822 {32.36}
F-F'	1,001 {39.41}
K-K'	1,568 {61.73}

ROOM STRAIGHT-LINE DIMENSIONS (3)

CHU098070001B03



CHU0980B030



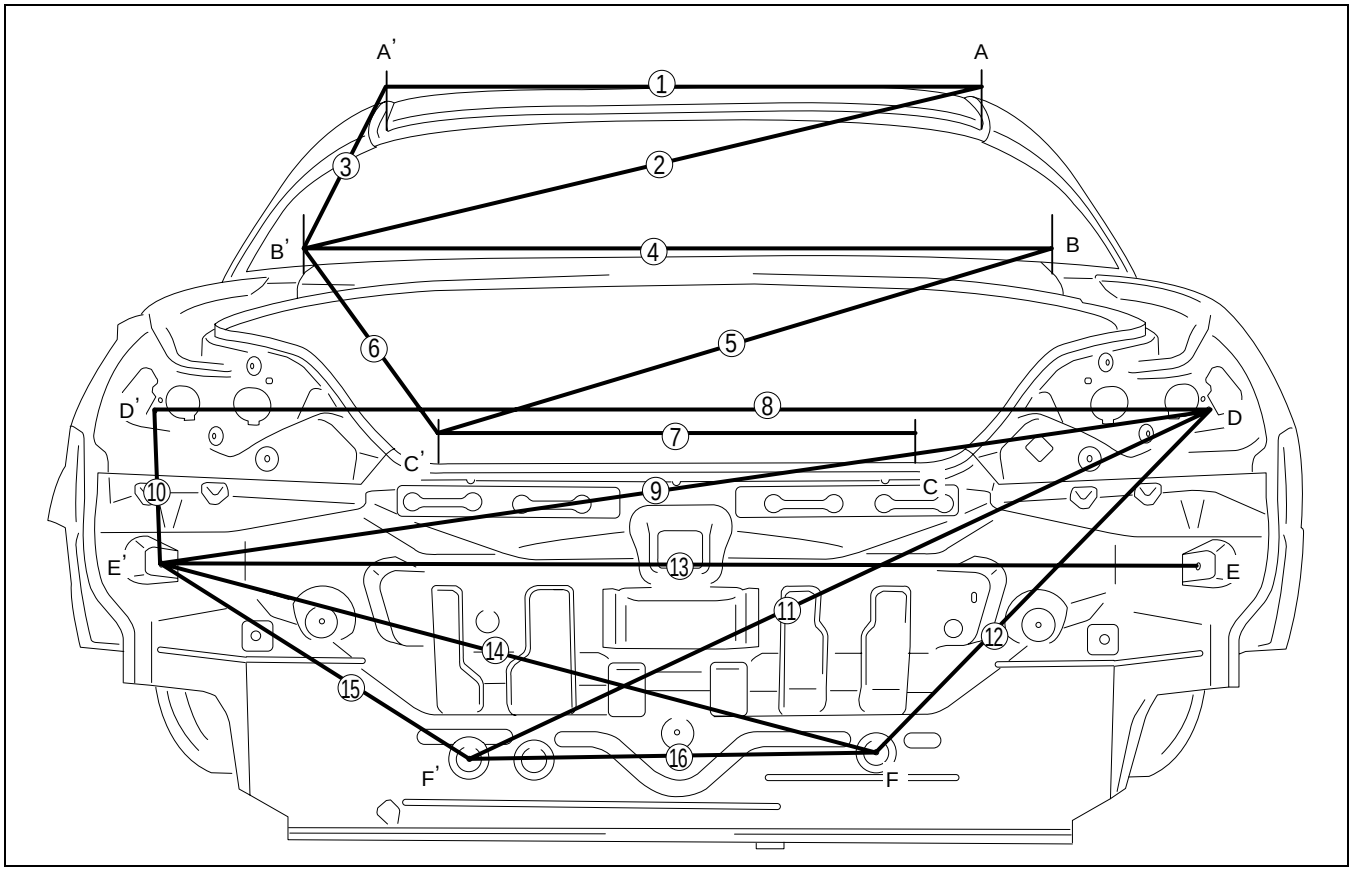
CHU0980B031

Measured location	Dimensions mm {in}
1	1,524 {60.00}
2	1,737 {68.39}
3	1,858 {73.15}
4	1,225 {48.23}
5	1,049 {41.30}

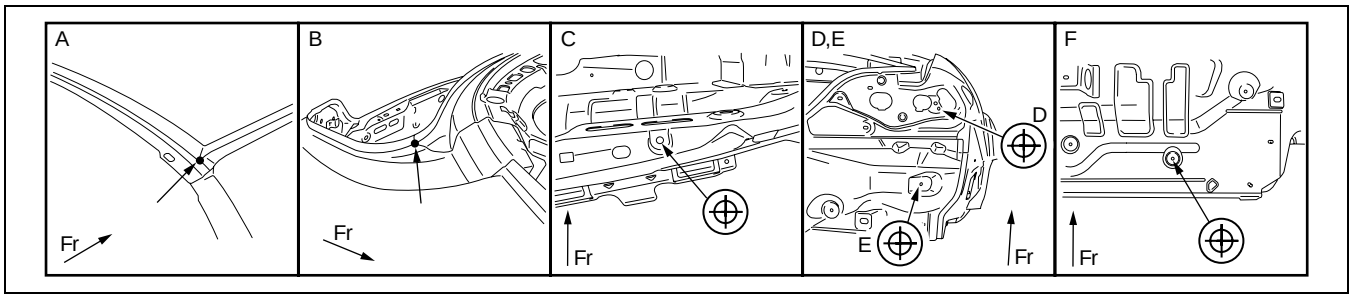
Measured location	Dimensions mm {in}
6	921 {36.26}
7	862 {33.94}
8	794 {31.26}
9	752 {29.61}
K-K'	1,546 {60.87}

REAR BODY STRAIGHT-LINE DIMENSIONS

CHU098070002B01



CHU0980B022



CHU0980B023

Measured location	Dimensions mm {in}
1	885 {34.84}
2	1,120 {44.09}
3	592 {23.31}
4	1,022 {40.24}
5	849 {33.43}
6	491 {19.33}
7	470 {18.50}
8	1,268 {49.92}

Measured location	Dimensions mm {in}
9	1,253 {49.33}
10	198 {7.80}
11	RH:968 {38.11}, LH:952 {37.48}
12	RH:576 {22.68}, LH:574 {22.60}
13	1,207 {47.52}
14	RH:873 {34.37}, LH:853 {33.58}
15	RH:433 {17.05}, LH:427 {16.81}
16	467 {18.39}

09–80E BODY STRUCTURE [PLASTIC BODY PARTS]

PLASTIC PARTS HEAT RESISTING TEMPERATURE

CHU098050000B01

Part Name		Code	Material Name	Heat resisting Temperature°C {°F}
WINDSHIELD MOULDING		PVC	POLYVINYLCHLORIDE	95 {203}
COWL GRILLE		PP	POLYPROPYLENE	100 {212}
FRONT COMBINATION LIGHT	LENS	PC	POLYCARBONATE	130 {266}
	HOUSING	PP	POLYPROPYLENE	95 {203}
FRONT BUMPER		PP	POLYPROPYLENE	100 {212}
FRONT SIDE MARKER LIGHT	LENS	PMMA	ACRYLIC	75 {167}
	HOUSING	ASS	ASS	80 {176}
OUTER HANDLE	HANDLE BASE	PC-PET	POLYCARBONATE-PET	80 {176}
	HANDLE LEVER	PC-PBT	POLYCARBONATE-PBT	80 {176}
OUTSIDE MIRROR		ABS	ABS	90 {194}
REAR COMBINATION LIGHT	LENS	PMMA	ACRYLIC	80 {176}
	HOUSING	AES	AES	70 {158}
REAR BUMPER		PP	POLYPROPYLENE	100 {212}
HIGH-MOUNT BRAKE LIGHT		PC	POLYCARBONATE	100 {212}
ROOF MOULDING		PVC	POLYVINYLCHLORIDE	95 {203}
BELTLINE MOLDING		PVC	POLYVINYLCHLORIDE	95 {203}
FENDER GRILLE		PP	POLYPROPYLENE	100 {212}

Note

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

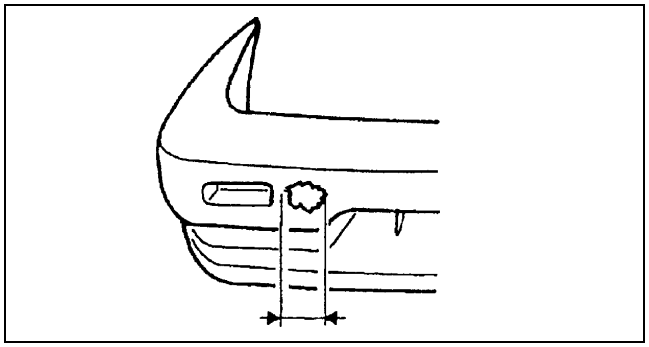
REPAIRABLE RANGE OF POLYPROPYLENE BUMPERS

CHU098050010B01

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.

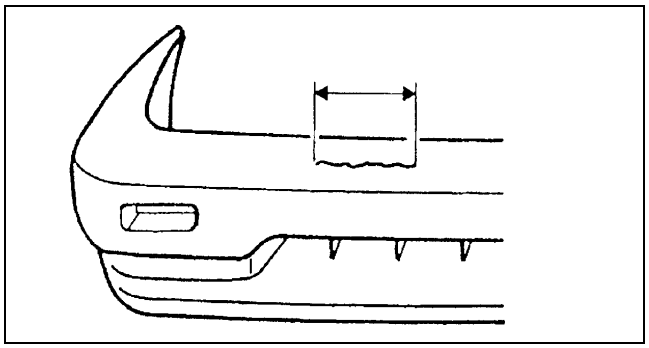
Repairable Bumpers

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



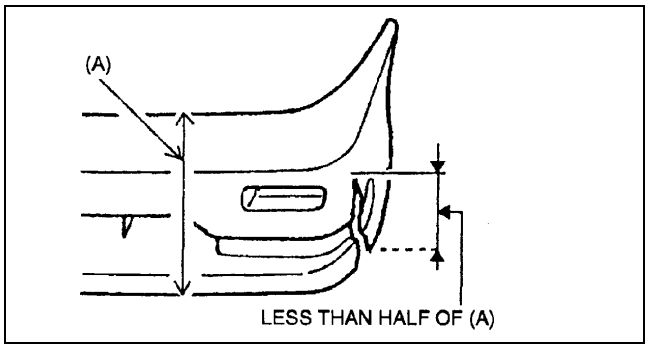
YMU980PCM

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



YMU980PCN

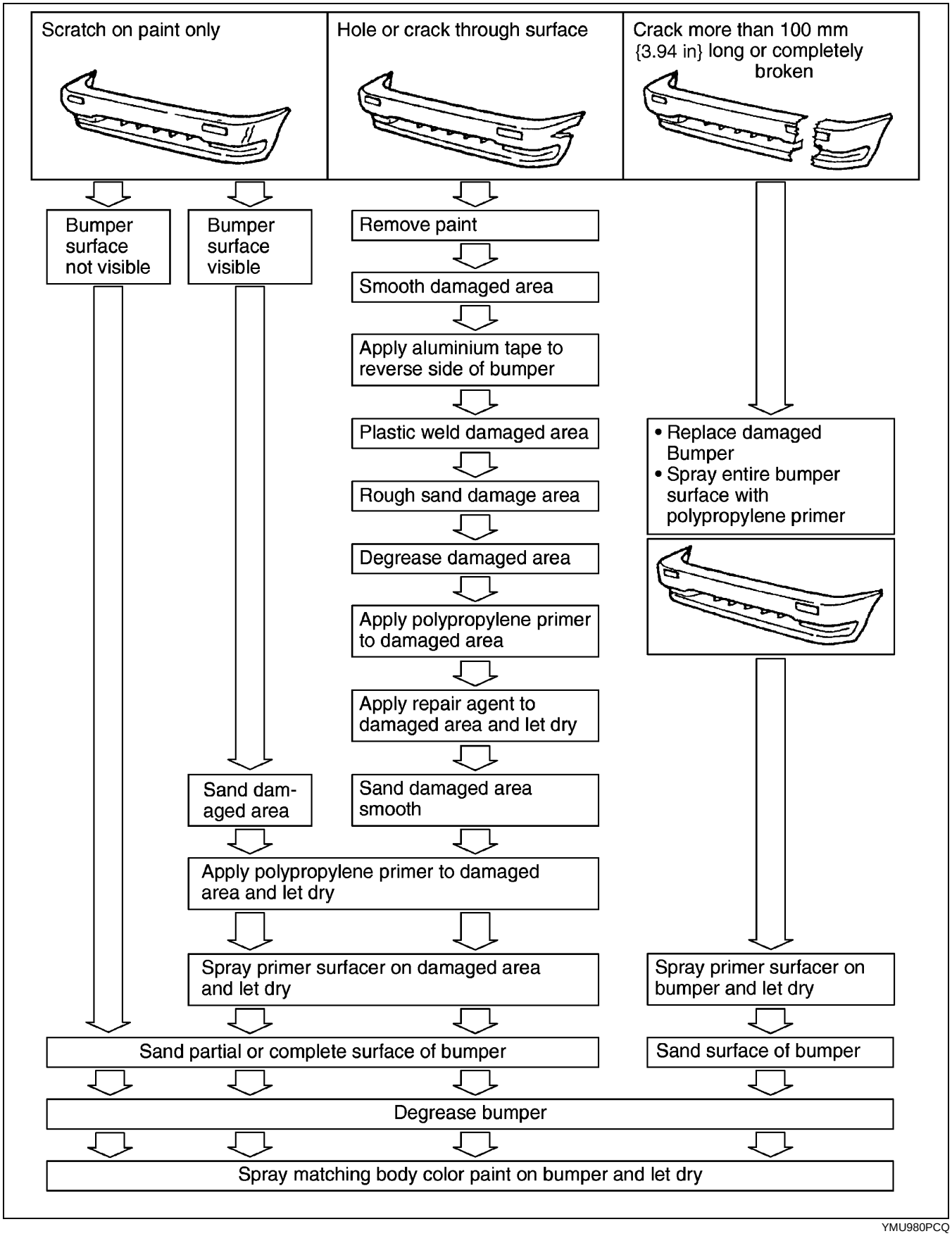
3. A bumper with a crack less than 100 mm {3.94 in} in length that is less than half of the width of the bumper.



YMU980PCP

POLYPROPYLENE BUMPER REPAIR

CHU098050010B02

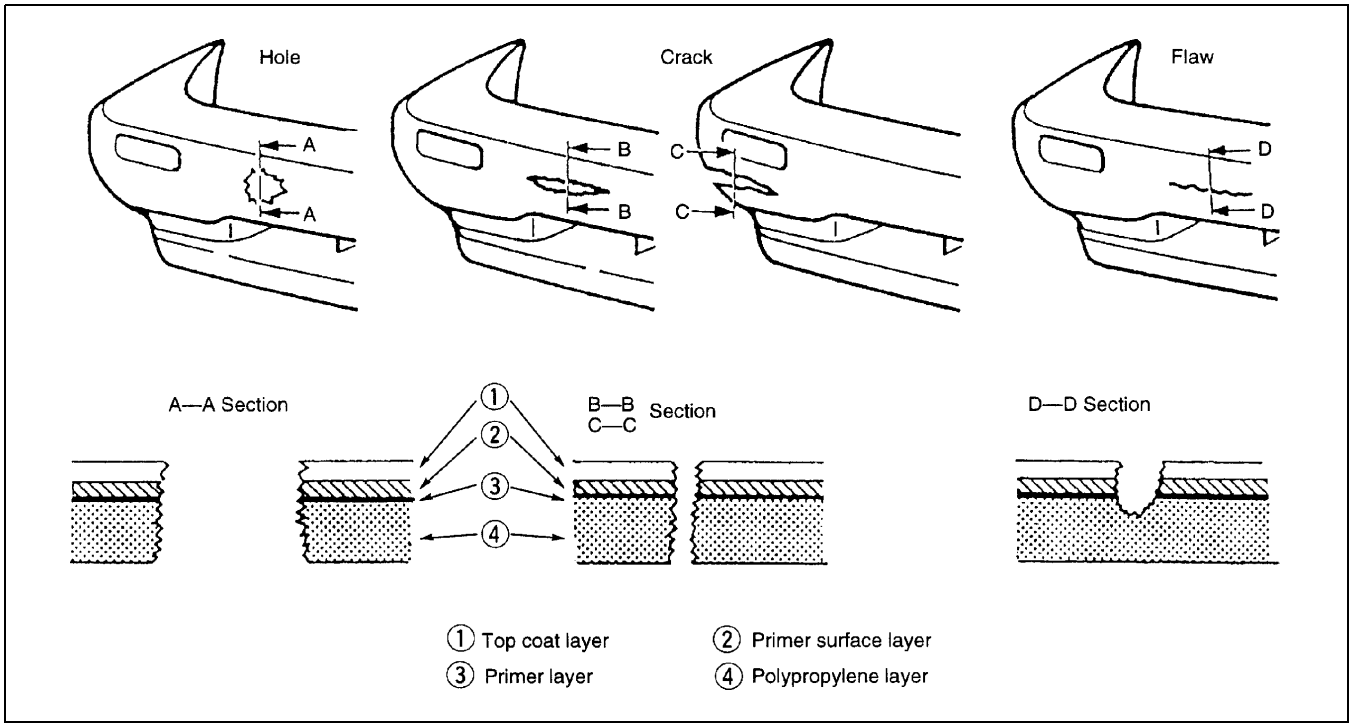


YMU980PCQ

PROCEDURE

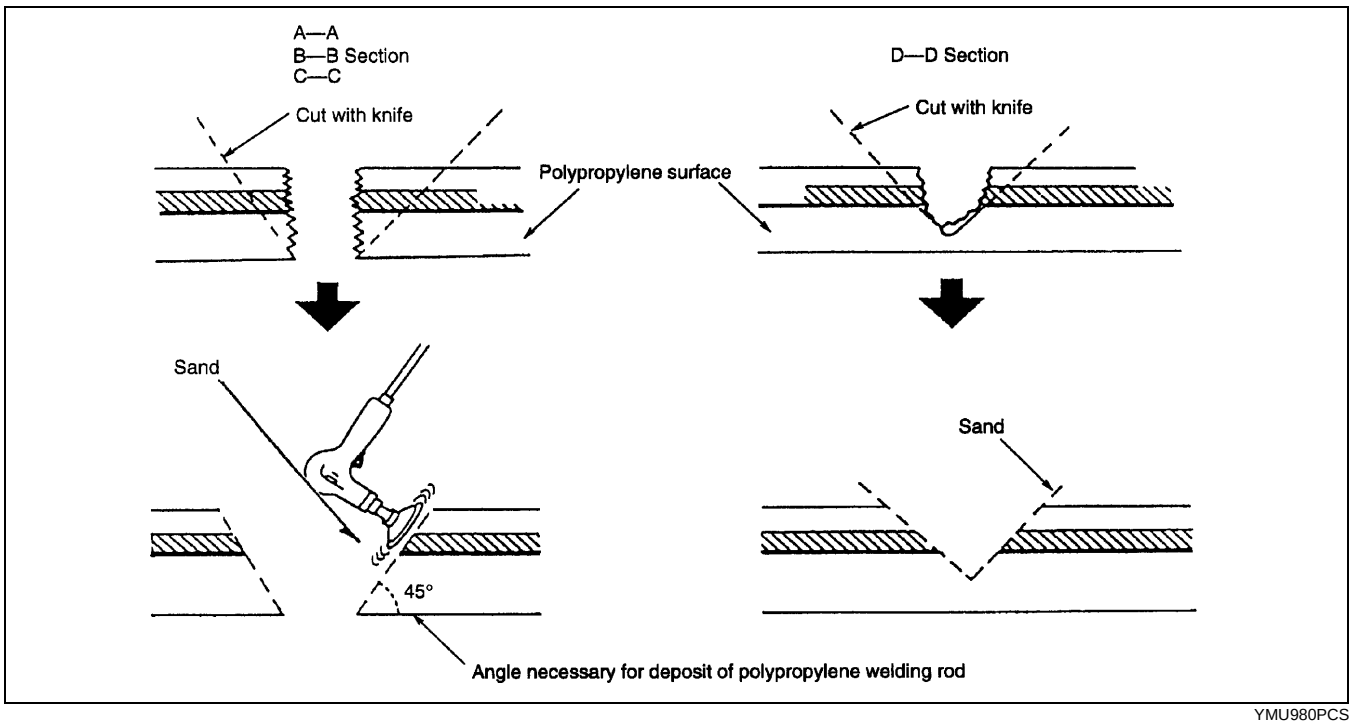
CHU098050010B03

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



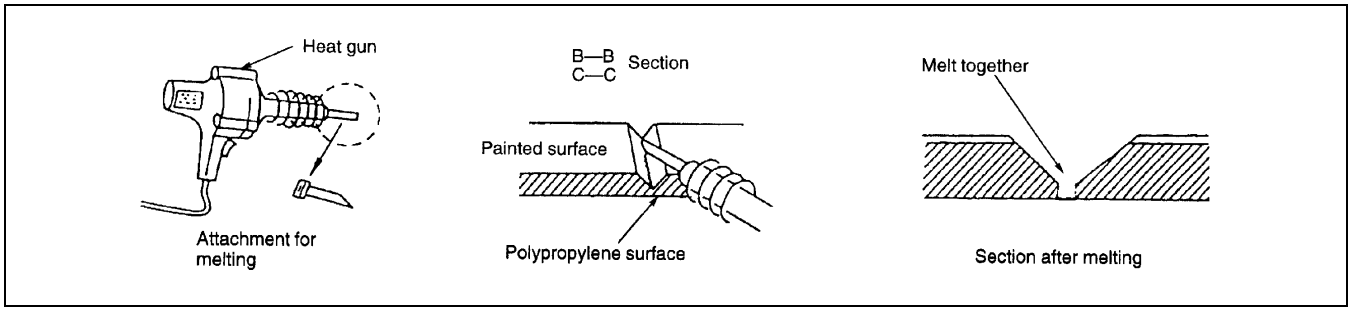
YMU980PCR

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°.



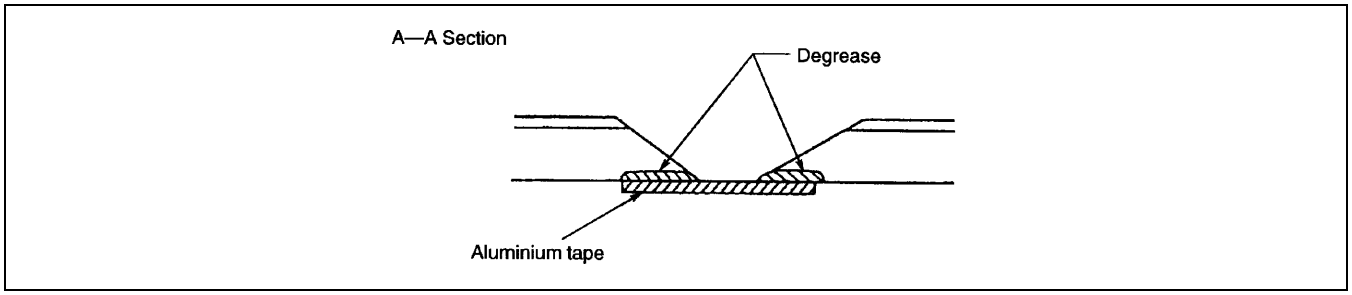
YMU980PCS

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



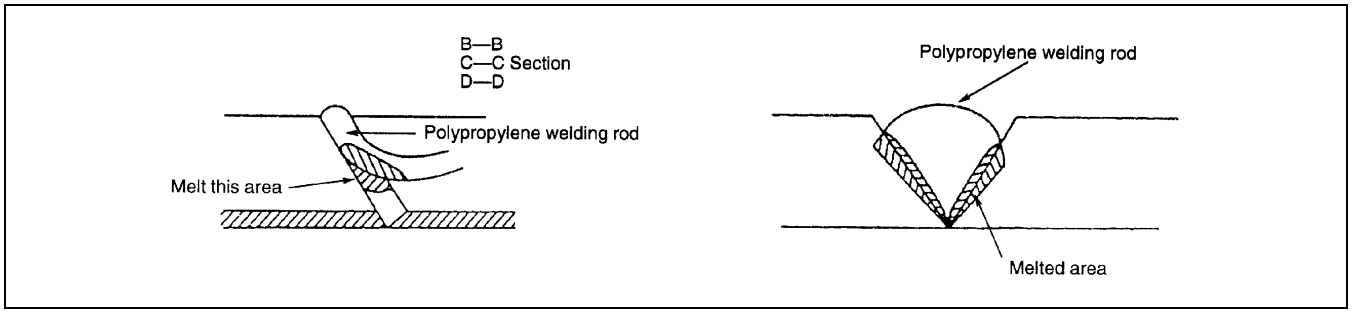
YMU980PCT

   - 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.



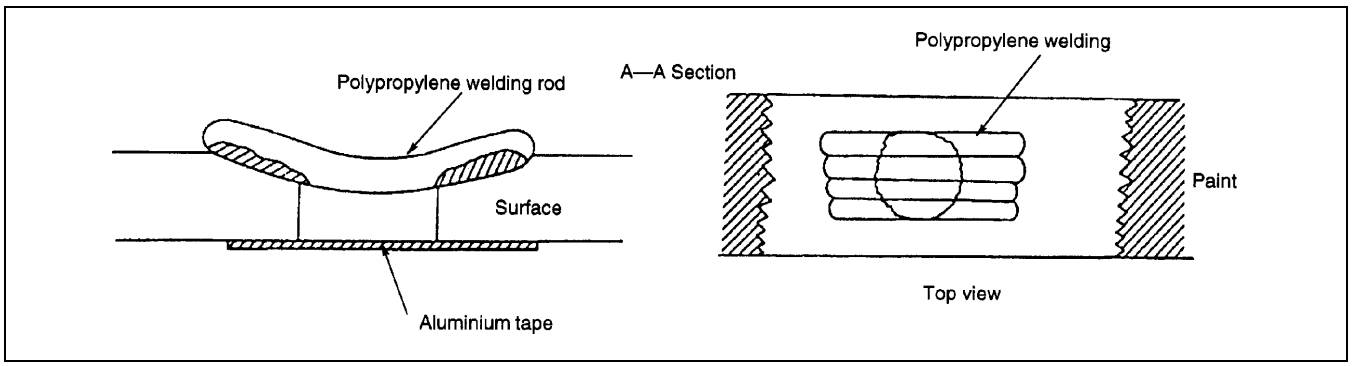
YMU980PCU

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



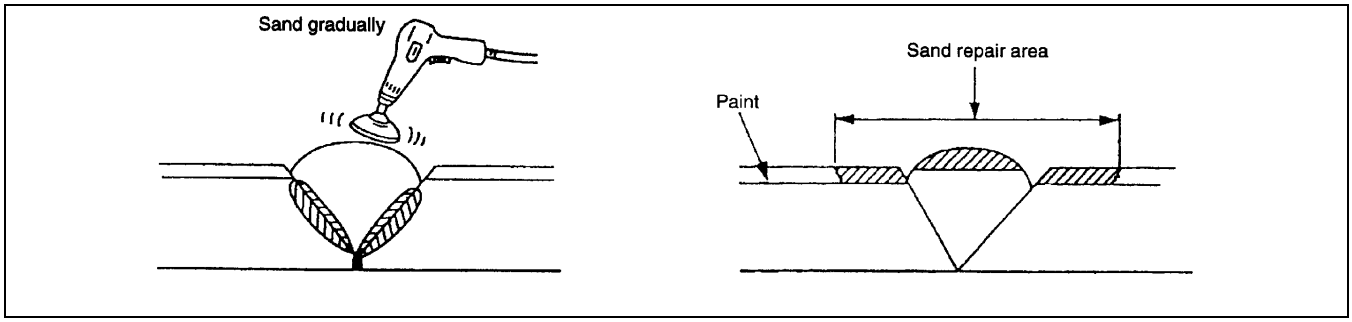
YMU980PCV

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.



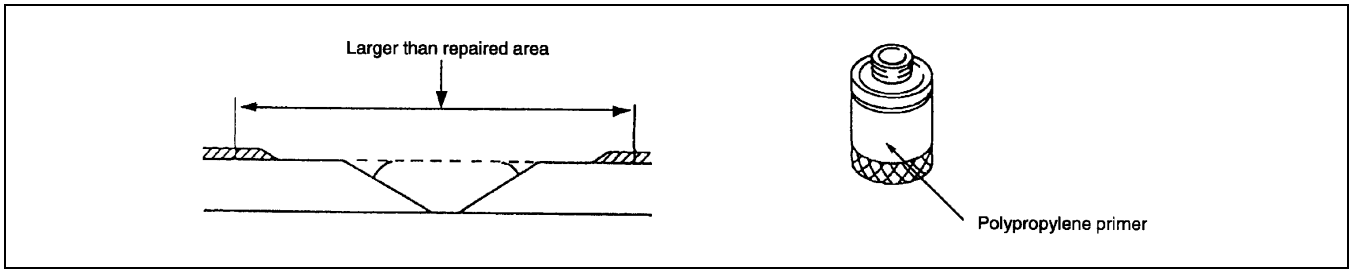
YMU980PCW

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

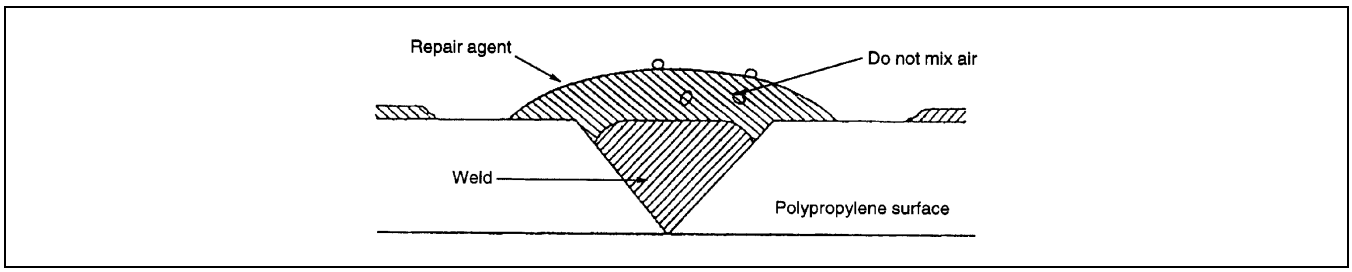
5. Uniformly apply polypropylene primer with a brush to an area larger than the repaired area. Allow to dry about 10 minutes at 20 °C {68 °F}.



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.

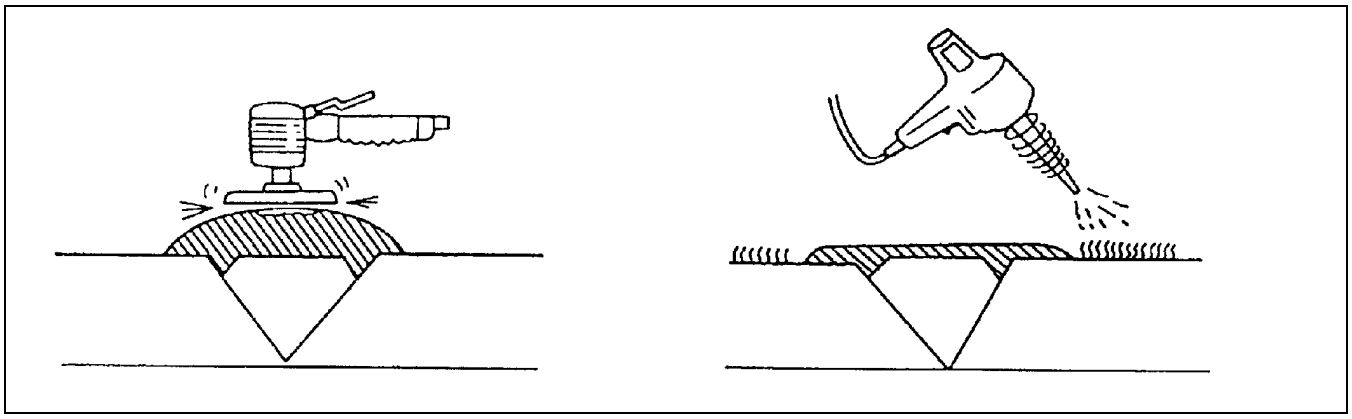


YMU980PCZ

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.

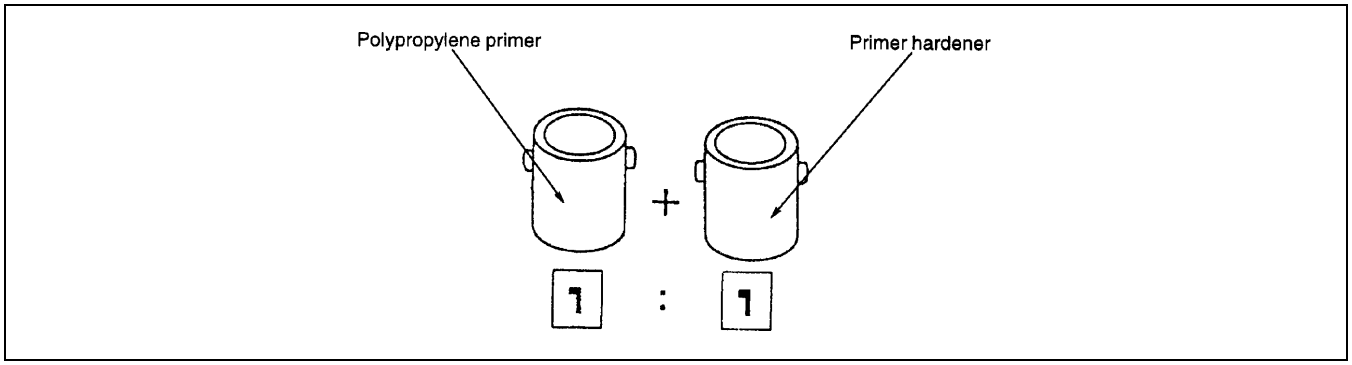
7. Sand the area with #180—240 sandpaper.

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.



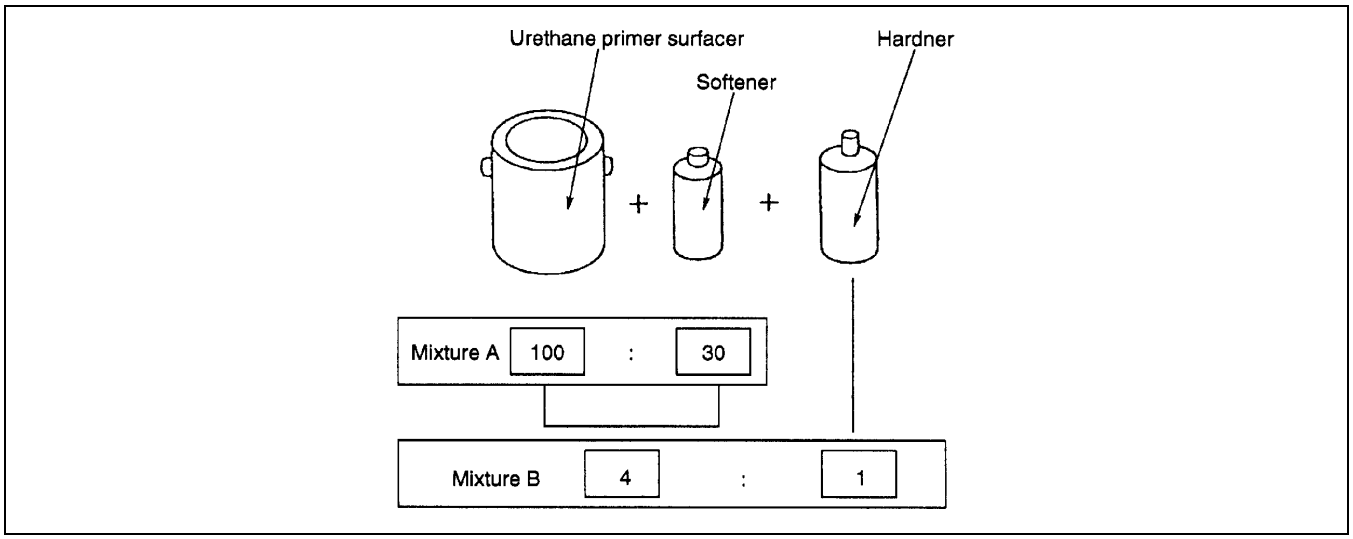
YMU980PD1

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 surfacrer 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.