
ABBREVIATIONS USED IN THIS MANUAL

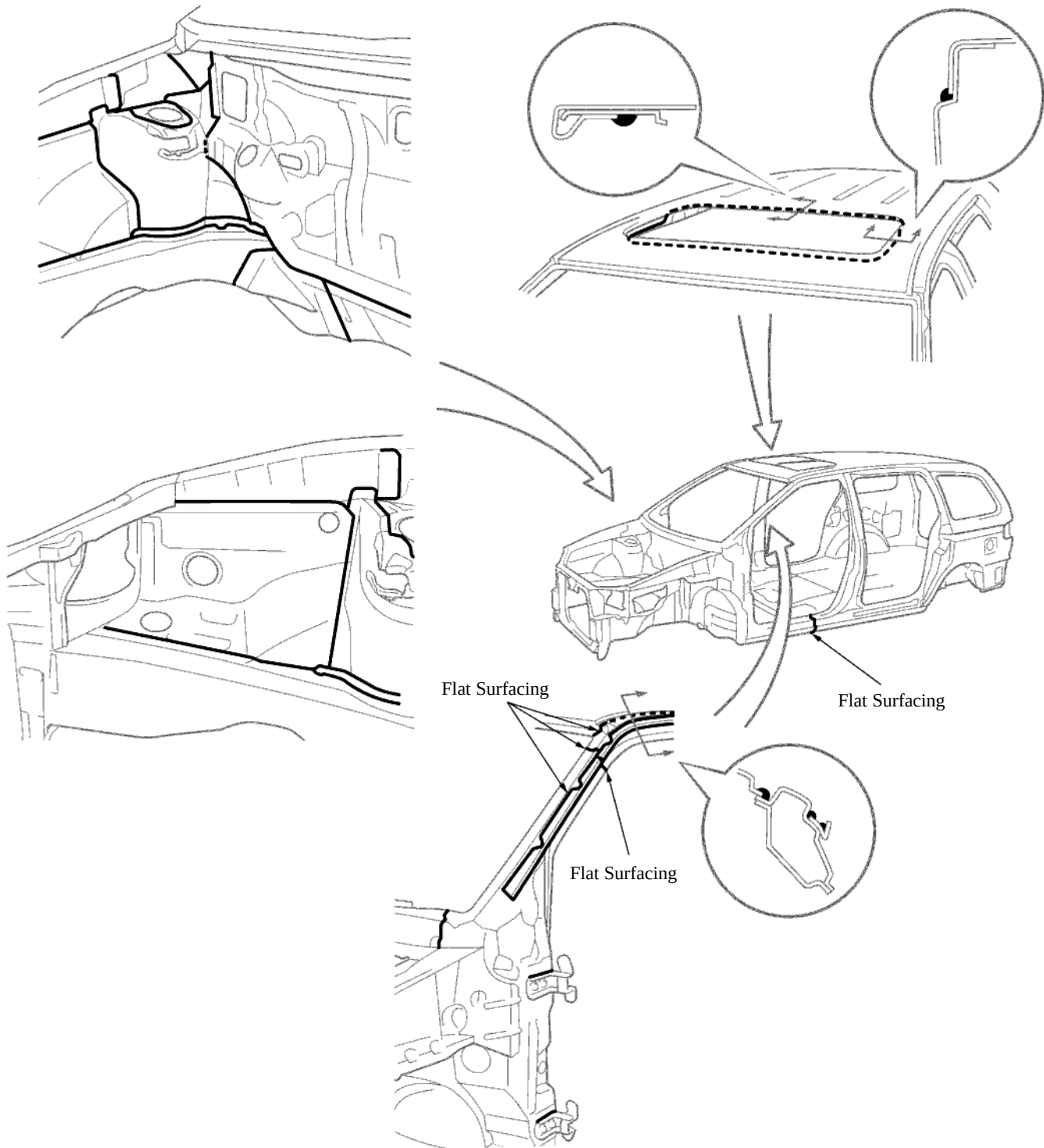
For convenience, the following abbreviations are used in this manual.

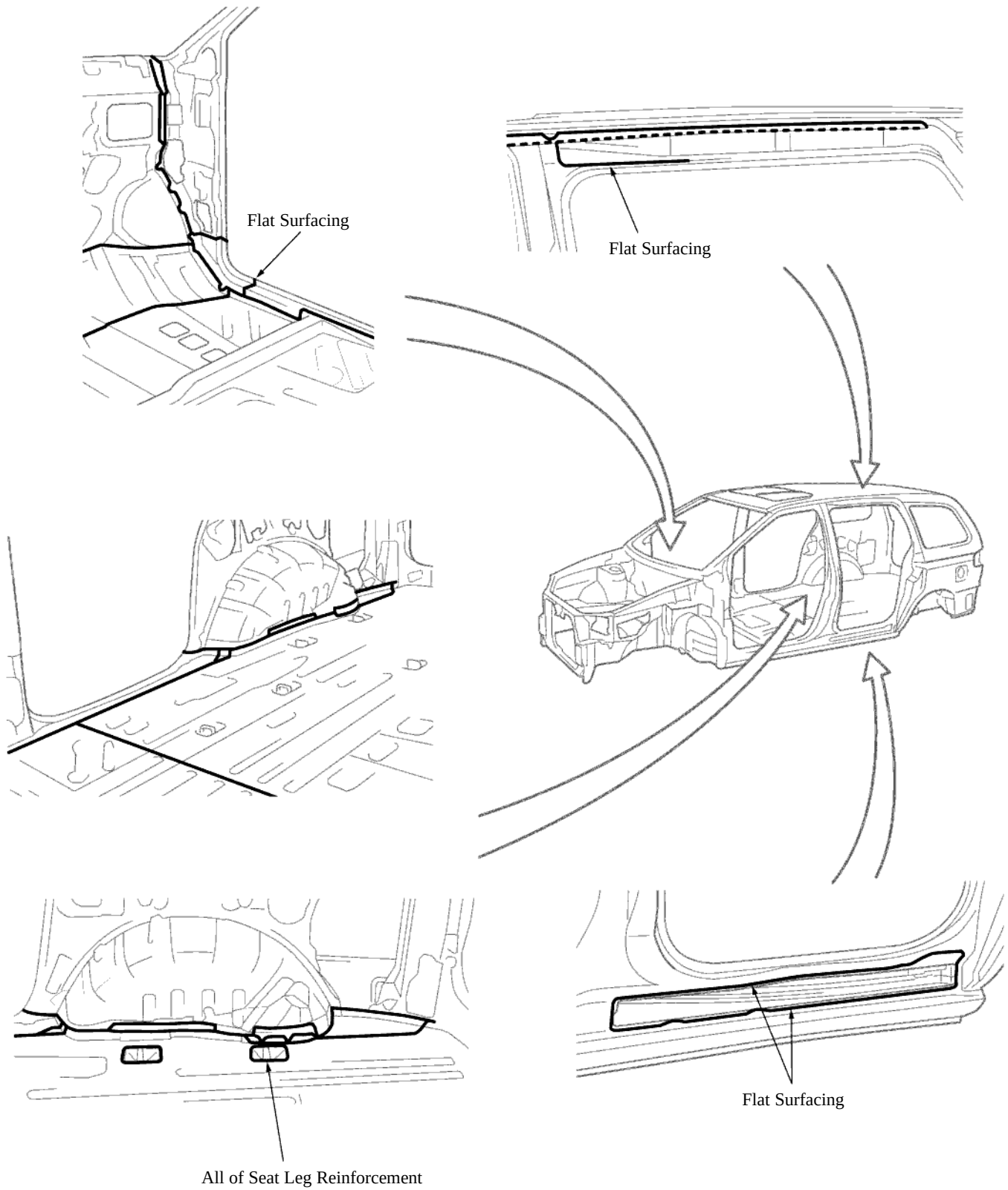
ABS	Antilock Brake System
A/C	Air Conditioner
assy	assembly
ECT	Electronic Controlled Transmission
ECU	Electronic Control Unit
e.g.	Exempli Gratia (for Example)
Ex.	Except
FWD	Front Wheel Drive Vehicles
4WD	Four Wheel Drive Vehicles
in.	inch
LH	Left-hand
LHD	Left-hand Drive
MIG	Metal Inert Gas
M/Y	Model Year
PPS	Progressive Power Steering
RH	Right-hand
SRS	Supplemental Restraint System
SSM	Special Service Materials
w/	with
w/o	without

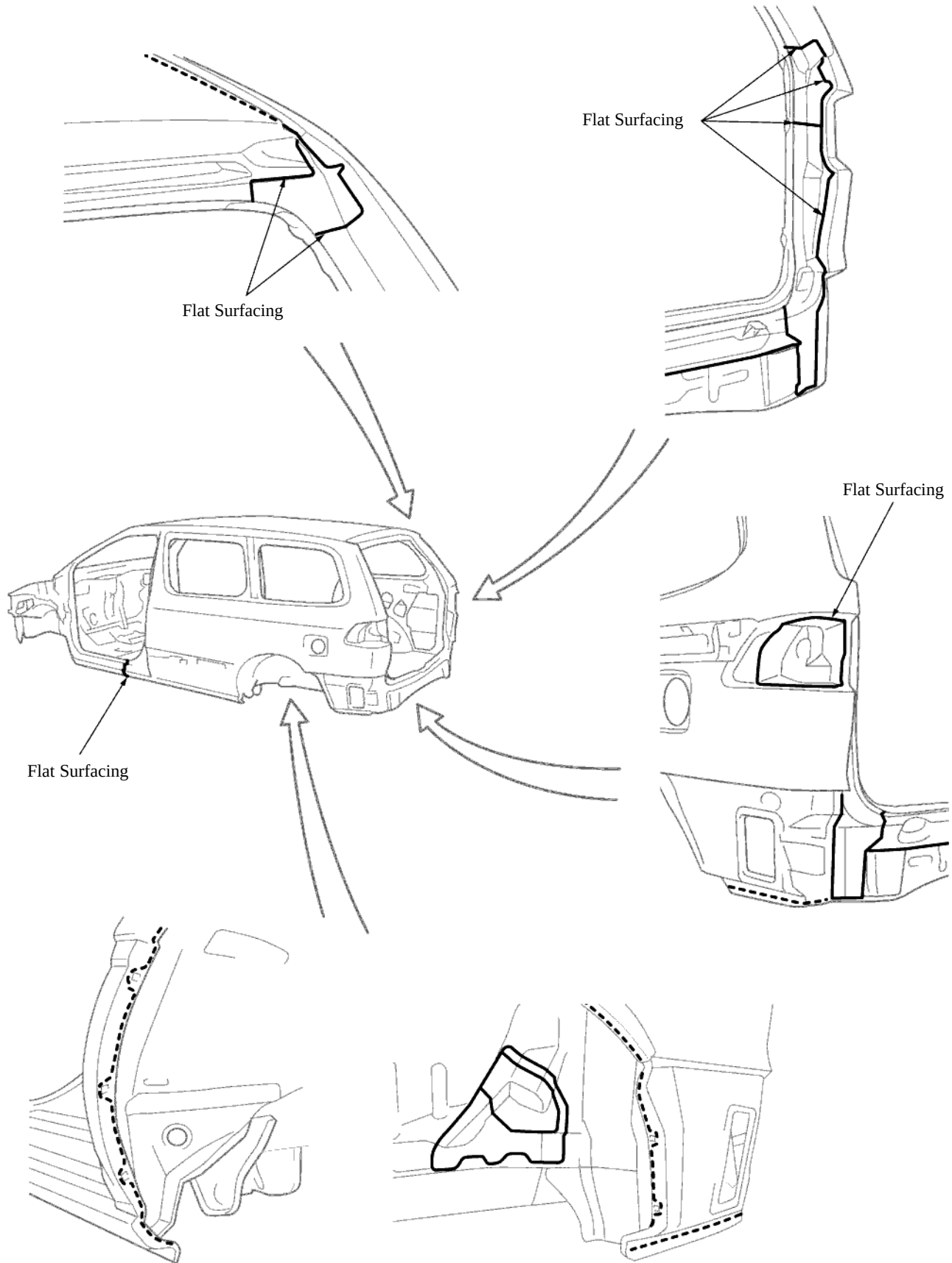
BODY PANEL SEALING AREAS

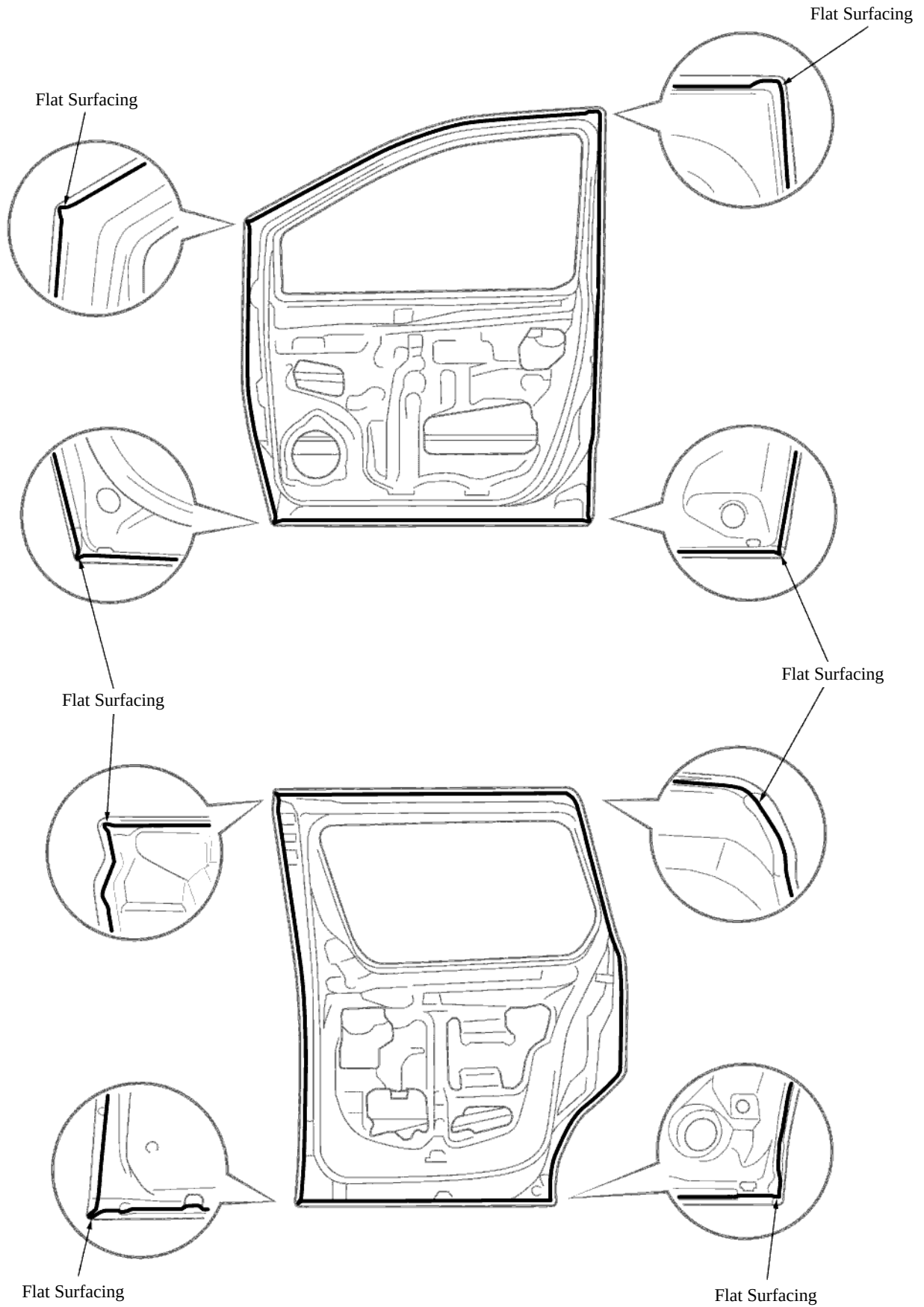
HINT:

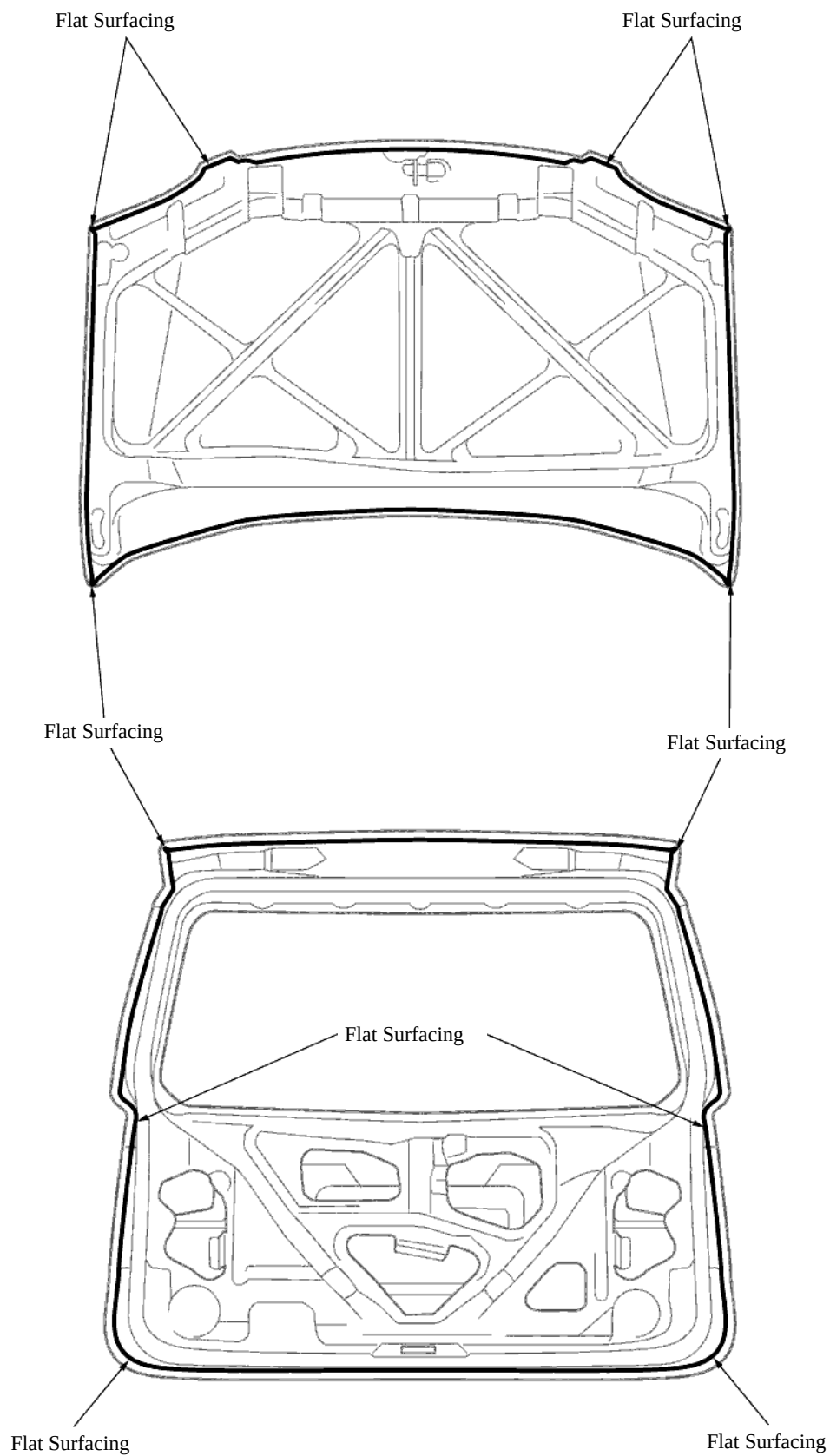
1. Prior to applying body sealer, clean the area with a rag soaked in a grease, wax and silicone remover.
2. If weld-through primer was used, first wipe off any excess and coat with anti-corrosion primer before applying body sealer.
3. Wipe off excess body sealer with a rag soaked in a grease, wax and silicone remover.
4. If body sealer is damaged by peeling, cracks, etc., be sure to repair as necessary.







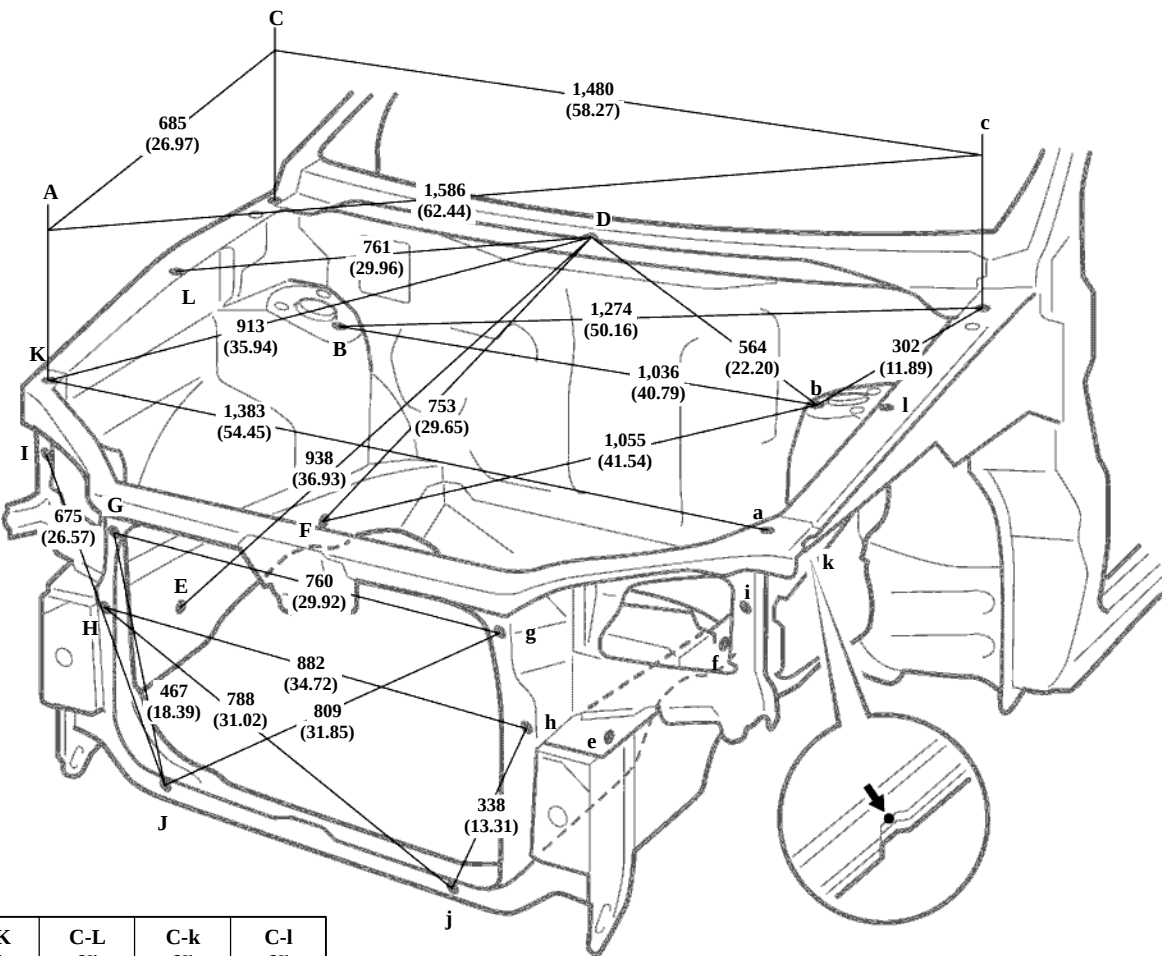




BODY DIMENSION DRAWINGS

ENGINE COMPARTMENT

(Three-Dimensional Distance)

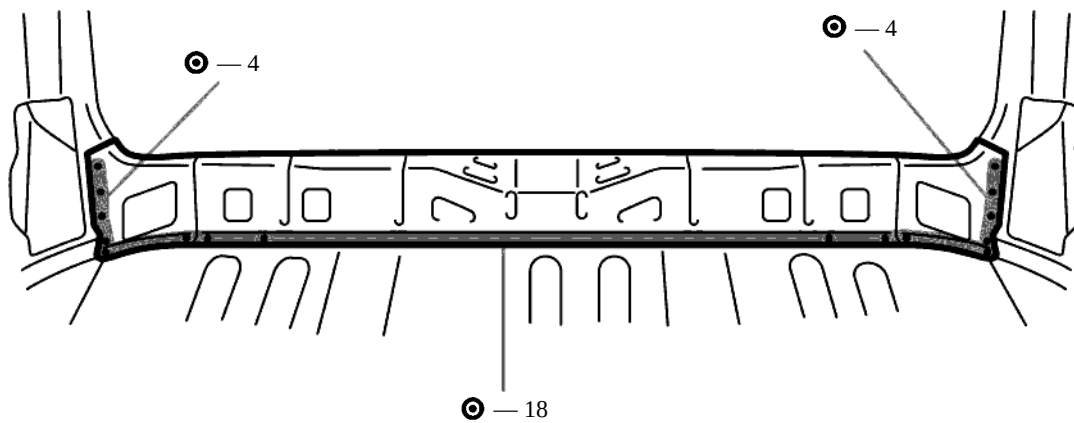
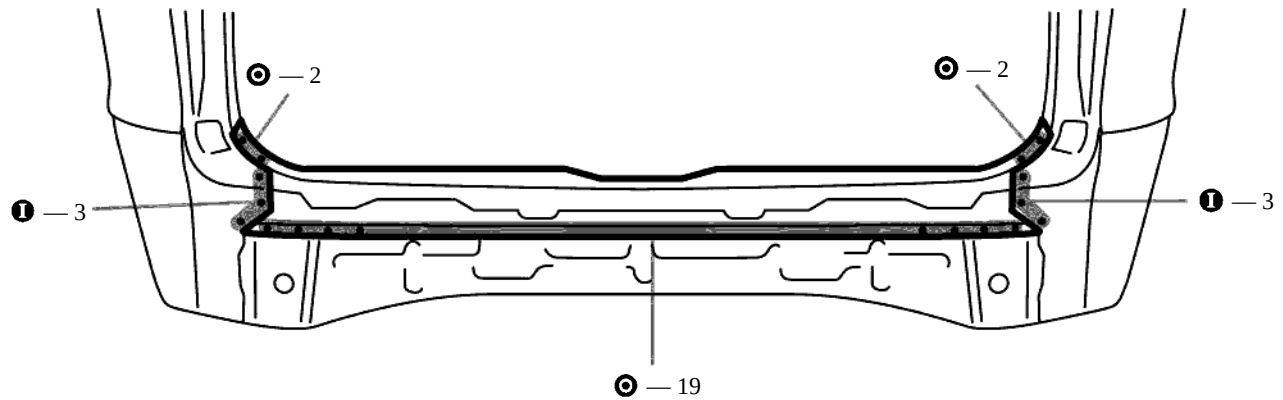
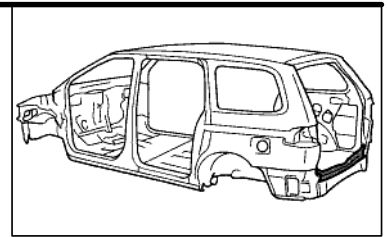


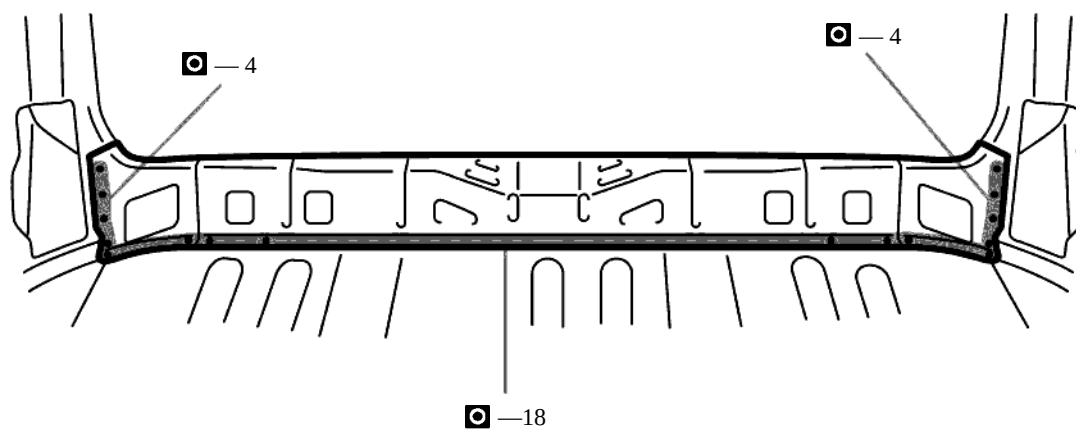
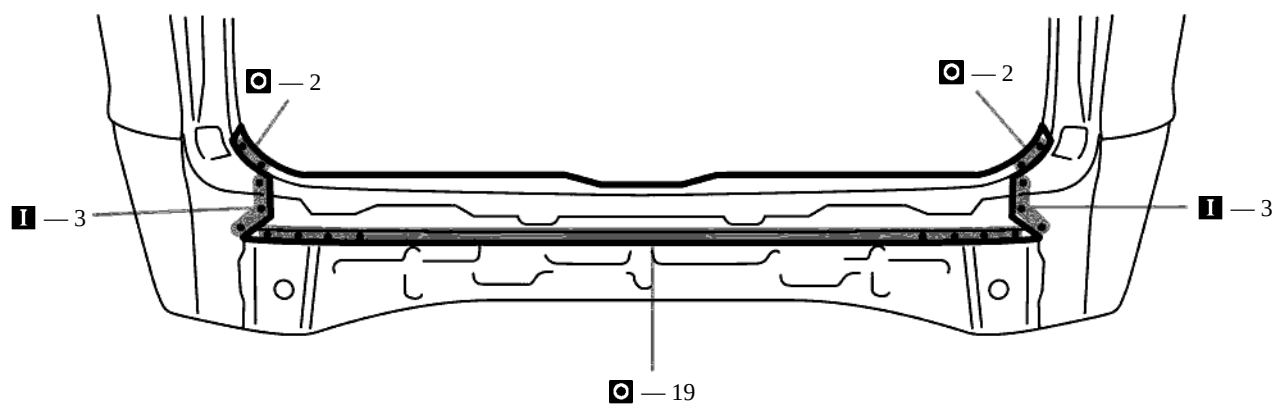
K-k	L-l	C-K or c-k	C-L or c-l	C-k or c-K	C-l or c-L
1,519 (59.80)	1,439 (56.65)	674 (26.54)	335 (13.19)	1,644 (64.72)	1,497 (58.94)

HINT: For symbols, capital letters indicate right side of vehicle, small letters indicate left side of vehicle (Seen from rear).

mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front fender installation nut	6 (0.24) nut	G, g	Radiator support standard hole	10 (0.39)
B, b	Front spring support hole-inner	11 (0.43)	H, h	Radiator support standard hole	10 (0.39)
C, c	Hood hinge installation nut-rear	8 (0.31) nut	I, i	Radiator support standard hole	10 (0.39)
D	Cowl top panel vehicle center mark	3 (0.12) R	J, j	Front crossmember standard hole	12 (0.47)
E, e	Front side member standard hole	13 (0.51)	K, k	Front fender apron cut-out portion	—
F, f	Front side member standard hole	17 (0.67)	L, l	Front fender installation nut	6 (0.24) nut

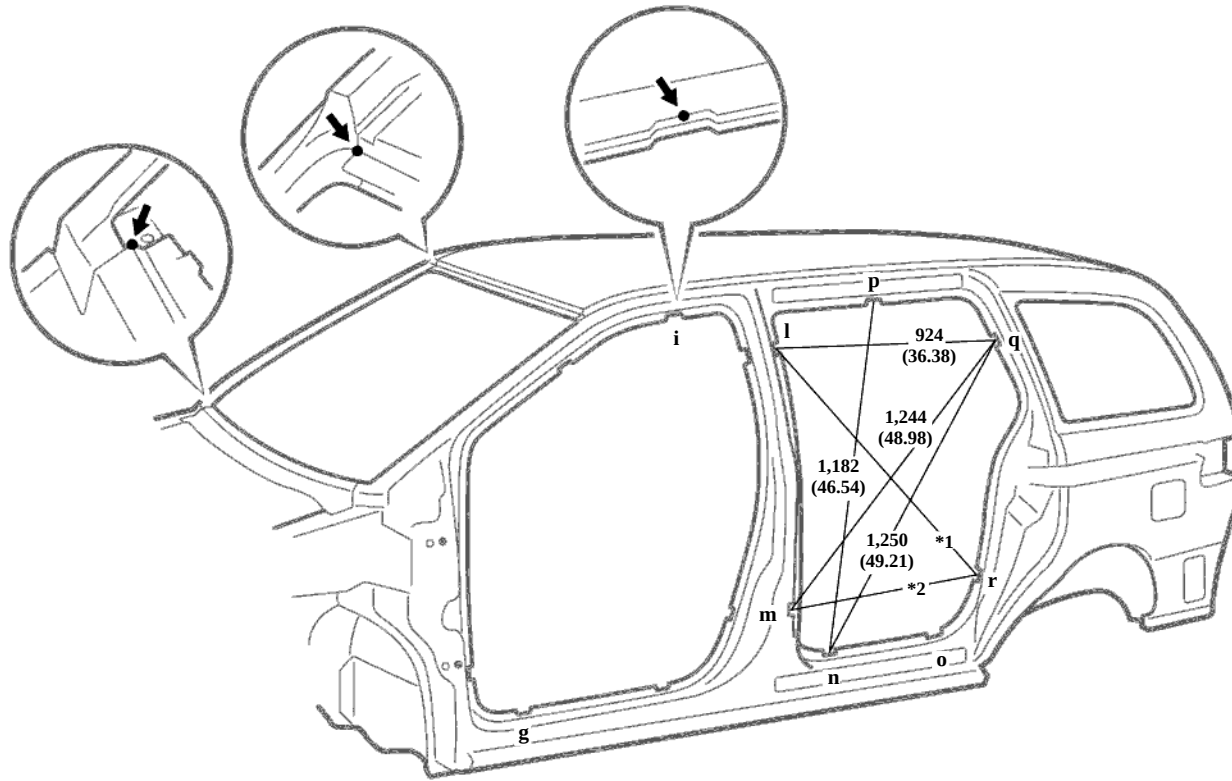
BODY LOWER BACK PANEL (ASSY)**REMOVAL**

INSTALLATION

1. Temporarily install the new parts and check the fit of the back door.

BODY OPENING AREAS (Side View: Rear)

(Three-Dimensional Distance)



*1	
L-R	l-r
1,138 (44.80)	1,136 (44.72)

*2	
M-R	m-r
757 (29.80)	755 (29.72)

HINT: For symbols, capital letters indicate right side of vehicle, small letters indicate left side of vehicle (Seen from rear).

Vehicle Dimensions Left ↔ Right

L-l	M-m	N-n	O-o	P-p	Q-q	R-r
1,381 (54.37)	1,621 (63.82)	1,610 (63.39)	1,610 (63.39)	1,240 (48.82)	1,392 (54.80)	1,626 (64.02)

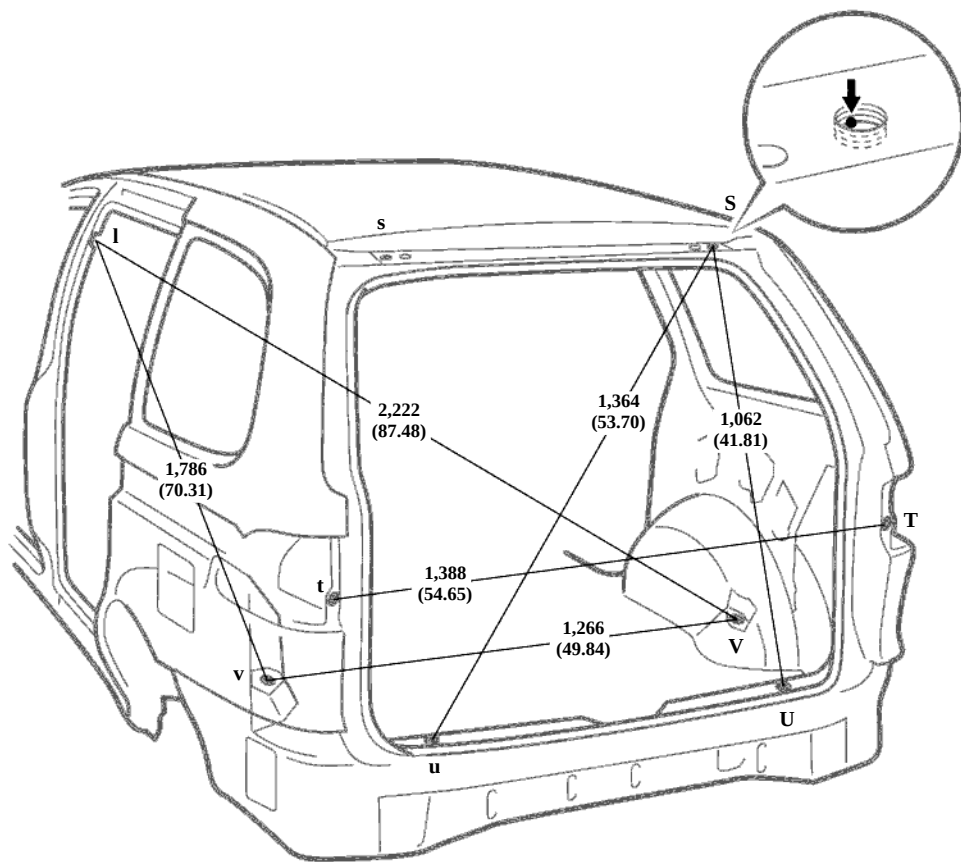
G-o or g-O	I-p or i-P	L-q or l-Q	L-r	l-R	M-r	m-R	N-p or n-P	O-q or o-Q
2,192 (86.30)	1,512 (59.53)	1,666 (65.59)	1,881 (74.06)	1,881 (74.06)	1,790 (70.47)	1,791 (70.51)	1,842 (72.52)	1,816 (71.50)

mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
G, g	Rocker panel assembly mark	—	O, o	Rocker panel assembly mark	—
I, i	Roof side rail assembly mark	—	P, p	Roof side rail assembly mark	—
L, l	Center body pillar assembly mark	—	Q, q	Quarter panel assembly mark	—
M, m	Center body pillar assembly mark	—	R, r	Quarter panel assembly mark	—
N, n	Rocker panel assembly mark	—	—	—	—

BODY OPENING AREAS (Rear View)

(Three-Dimensional Distance)



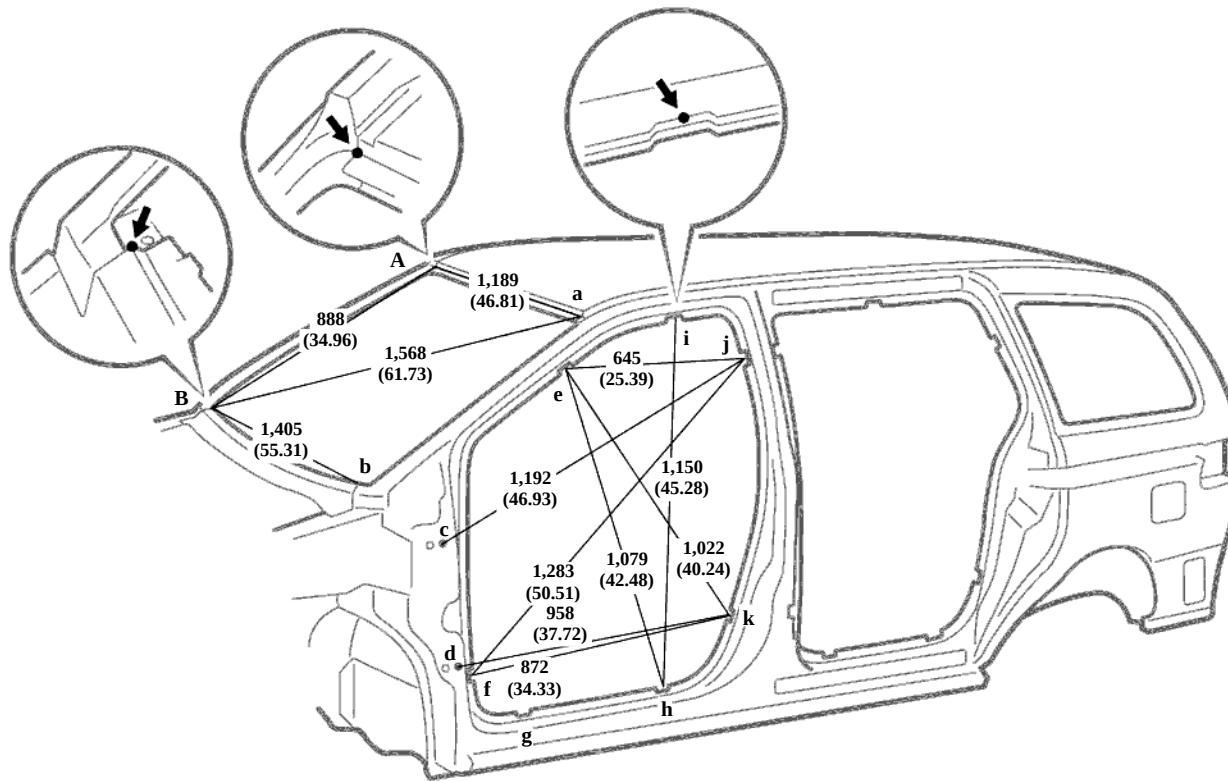
HINT: For symbols, capital letters indicate right side of vehicle, small letters indicate left side of vehicle (Seen from rear).

mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
L, l	Center body pillar assembly mark	—	U, u	Rear floor finish plate installation hole	8.5 (0.335)
S, s	Back door hinge installation hole-outer	11 (0.43)	V, v	Shock absorber installation hole	16 (0.63)
T, t	Quarter panel standard hole	10 (0.39)	—	—	—

BODY OPENING AREAS (Side View: Front)

(Three-Dimensional Distance)



HINT: For symbols, capital letters indicate right side of vehicle, small letters indicate left side of vehicle (Seen from rear).

Vehicle Dimensions Left ↔ Right

E-e	F-f	G-g	H-h	I-i	J-j	K-k
1,359 (53.50)	1,535 (60.43)	1,537 (60.51)	1,546 (60.87)	1,260 (49.61)	1,404 (55.28)	1,559 (61.38)

E-f or e-F	E-h or e-H	E-j or e-J	F-j or f-J	F-k or f-K	H-i or h-I	J-k or j-K
1,708 (67.24)	1,807 (71.14)	1,525 (60.04)	1,950 (76.77)	1,776 (69.92)	1,808 (71.18)	1,710 (67.32)

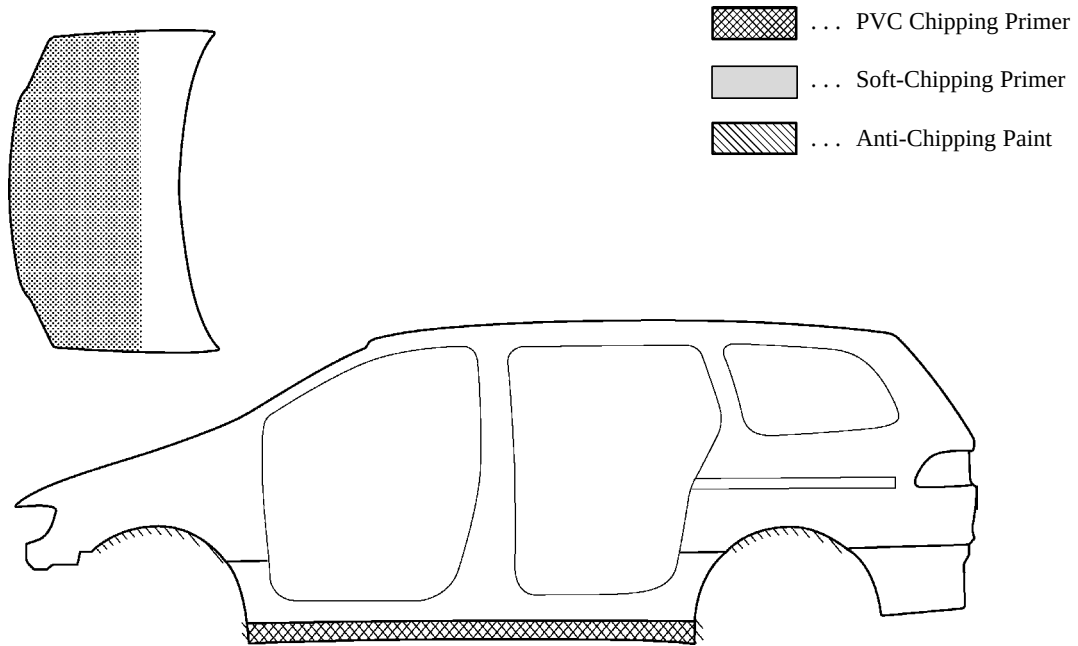
mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Roof panel/Front body pillar adjoining portion	—	G, g	Rocker panel assembly mark	—
B, b	Cowl top panel/Front body pillar adjoining portion	—	H, h	Rocker panel assembly mark	—
C, c	Front door hinge installation nut-rear	8 (0.31) nut	I, i	Roof side rail assembly mark	—
D, d	Front door hinge installation nut-rear	8 (0.31) nut	J, j	Center body pillar assembly mark	—
E, e	Front body pillar assembly mark	—	K, k	Cneter body pillar assembly mark	—
F, f	Front body pillar assembly mark	—	—	—	—

BODY PANEL ANTI-CHIPPING PAINT APPLICATION AREAS

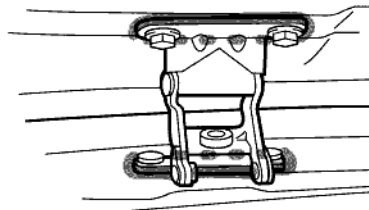
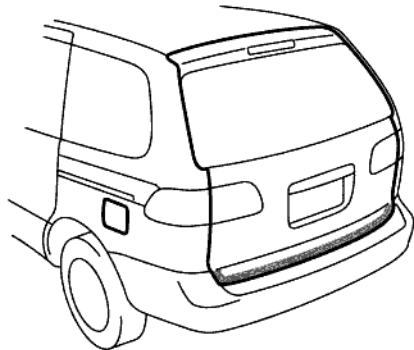
HINT:

1. Anti-chipping paint should be applied to some areas before the second coat and to others after the top coat.
2. If other areas are accidentally coated. Wipe off the paint immediately with a rag soaked in a grease, wax and silicone remover.



BODY PANEL ANTI-RUST AGENT (WAX) APPLICATION AREAS*HINT:*

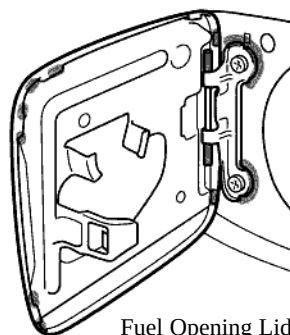
1. Whenever adjusting the doors and hoods, apply anti-rust agent (wax) around the hinges.
2. Even if partially repairing a part, apply anti-rust agent (wax) over the entire application area of the part.
3. Wipe off the anti-rust agent immediately with a rag soaked in a grease, wax and silicone remover, if accidentally applied to other areas.



Back Door Hinge



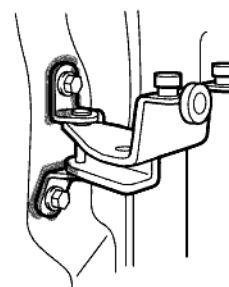
Door



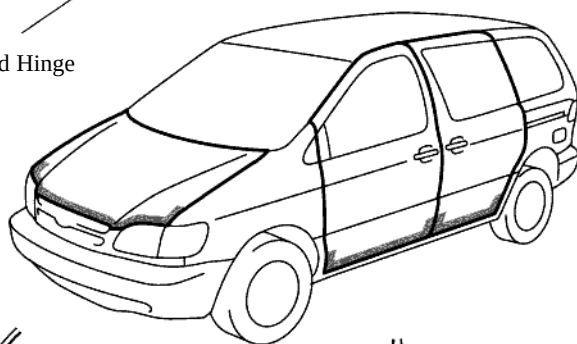
Fuel Opening Lid



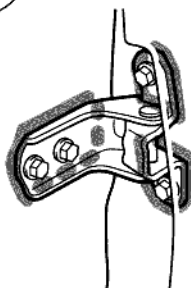
Hood Hinge



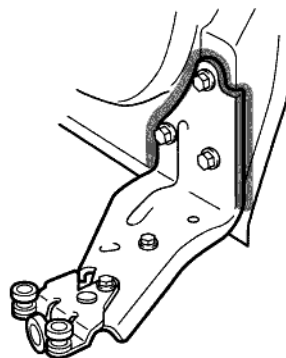
Slide Door Center Rail



Hood



Front Door Hinge

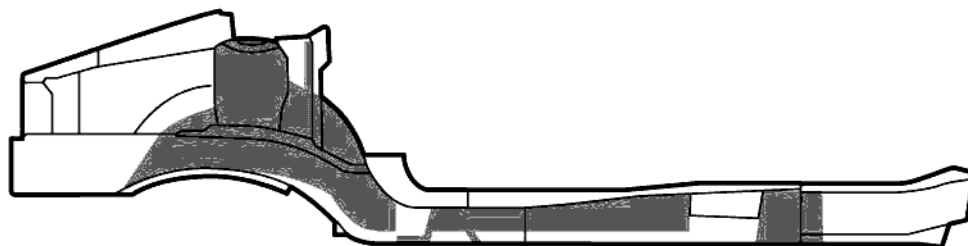
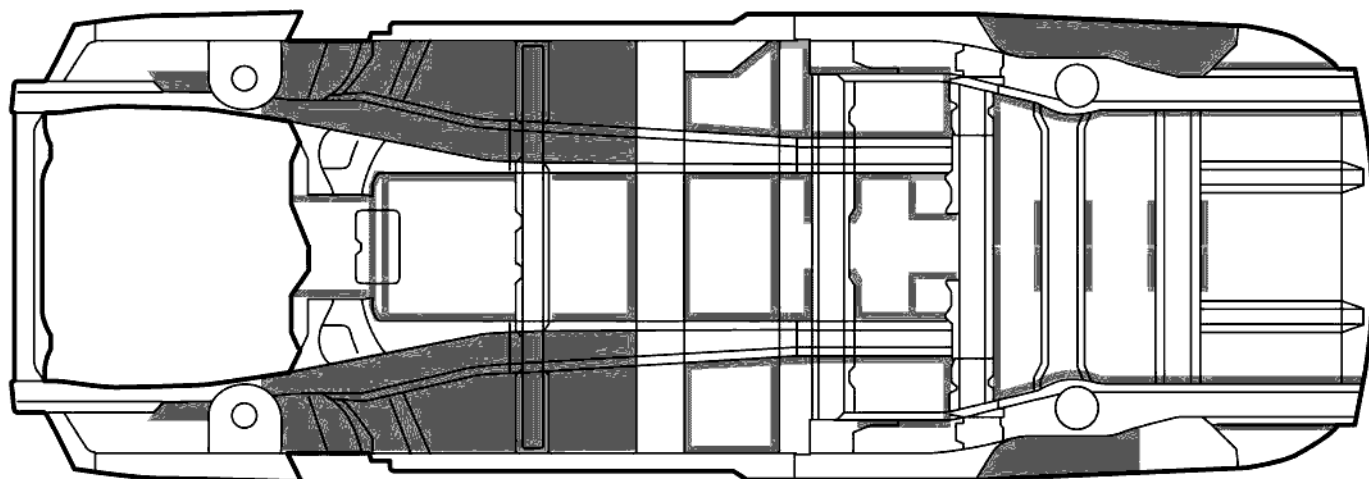


Slide Door Lower Rail

BODY PANEL UNDERCOATING AREAS

HINT:

1. First wipe off any dirt, grease or oil with a rag soaked in a grease, wax and silicone remover.
2. Cover the surrounding areas with masking paper to avoid coating unnecessary areas. If other areas are accidentally coated, wipe off the coating immediately.
3. Apply the first coating of undercoat to all welded areas and panel joints, then apply a second coat over the entire area.
4. Do not coat parts which become hot, such as the tailpipe, or moving parts, such as the propeller shaft.
5. Besides the locations described below, apply undercoating to all weld points under the body to insure corrosion prevention.
6. Be sure to seal the edge of the flange of the member and bracket with undercoating.
7. If undercoat is damaged by peeling, cracks, etc., be sure to repair as necessary.
8. Before the undercoat apply sealer allowing rust prevention to be attained.

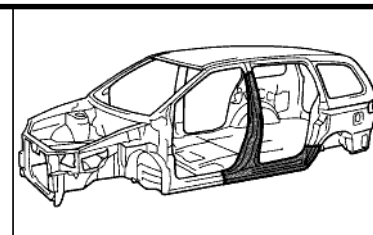


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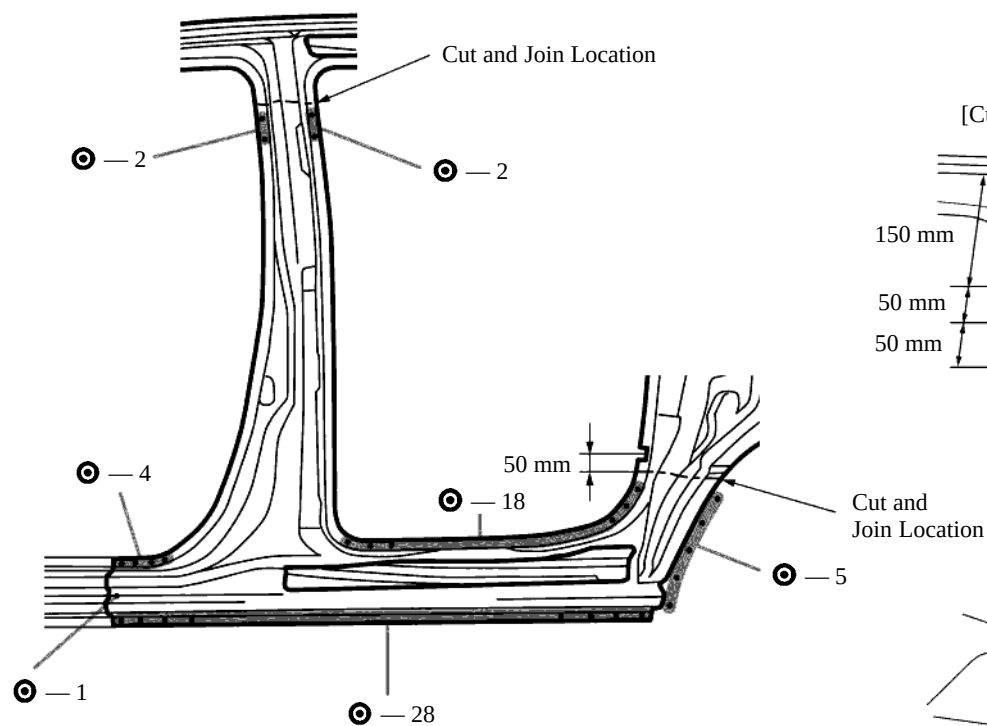
REFERENCE: Referring to the notes above, undercoating should be applied according to the specifications for your country.

CENTER BODY PILLAR (CUT)

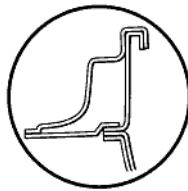
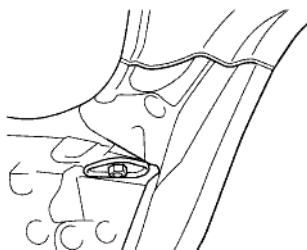
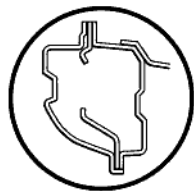
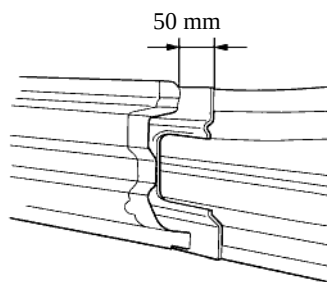
REMOVAL



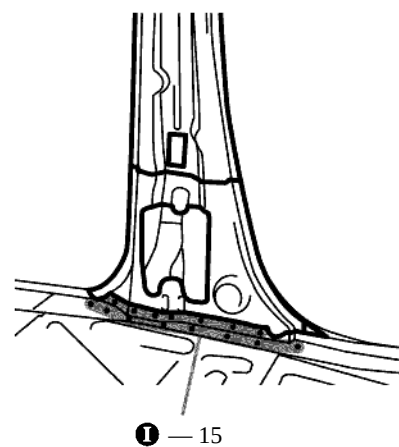
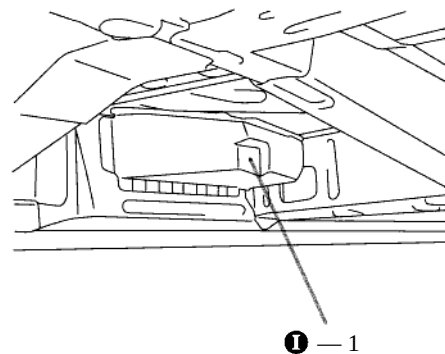
[Cut and Join Location]



[Cut and Join Locations]



mm	in.
50	1.97
150	5.91

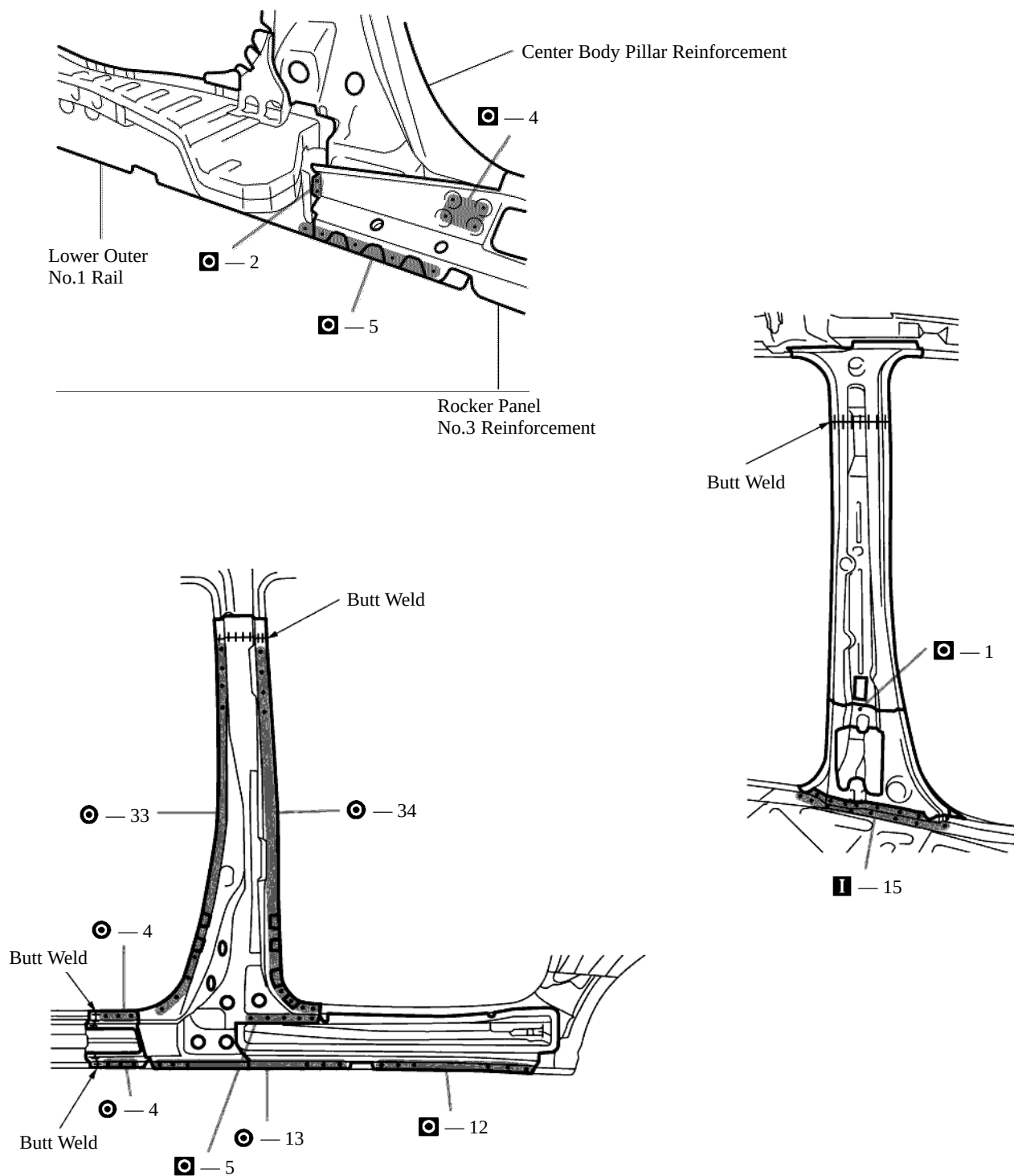


1. Cut and join the parts at the locations as shown above.

HINT:

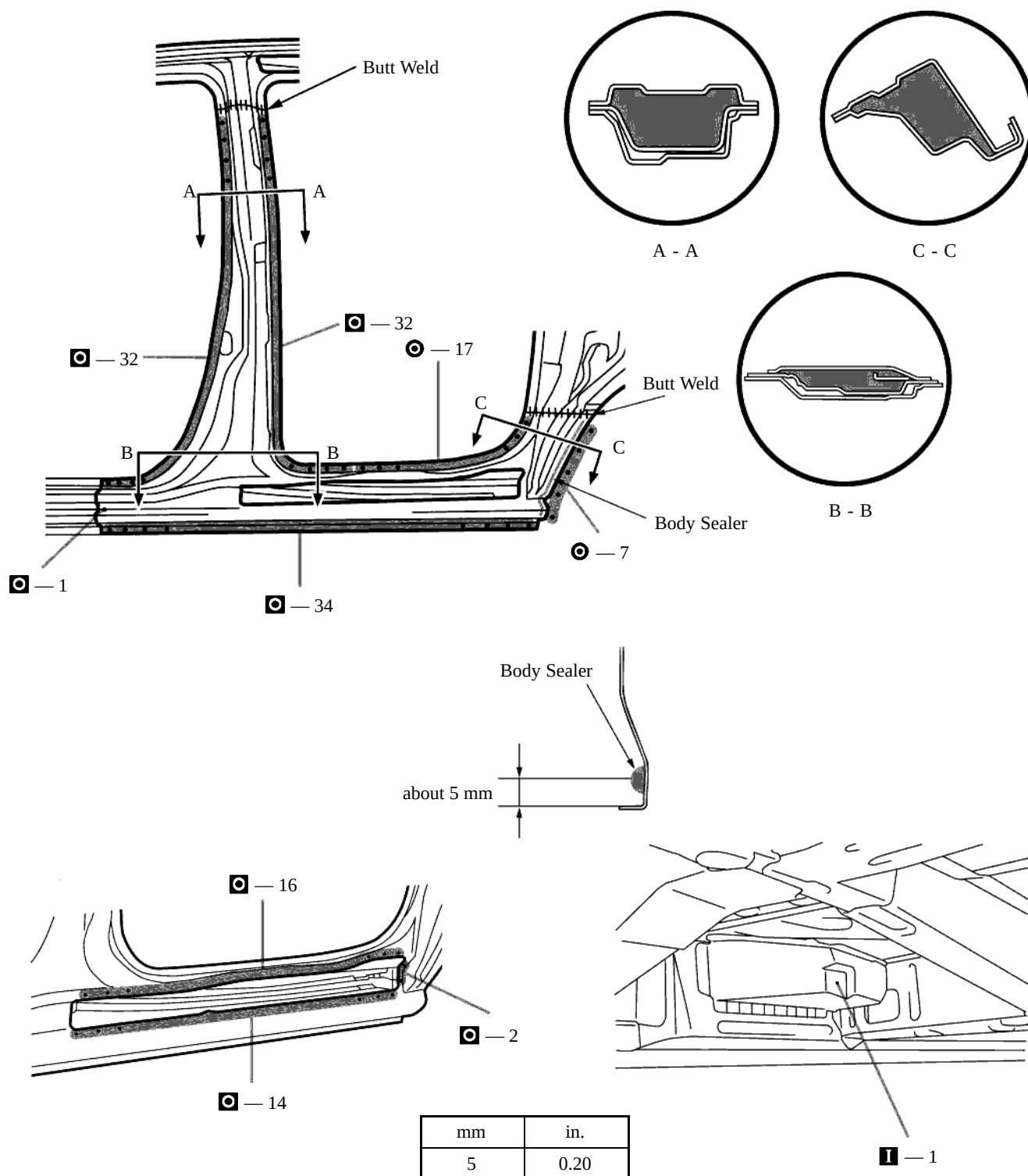
- 1) Shift the each cut and join locations of the center outer pillar, reinforcement and inner pillar.
- 2) Shift the each cut and join locations of the rocker outer panel and rocker No.3 reinforcement.

INSTALLATION



1. Before temporarily installing the new parts, weld the rocker panel No.3 reinforcement and center body pillar reinforcement and lower outer No.1 rail with standard points.
2. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.
3. Before welding the new parts, check the fit of the front door and slide door.

[Foamed Material Application Areas]



4. Before temporarily installing the new parts, apply body sealer to the wheel arch.

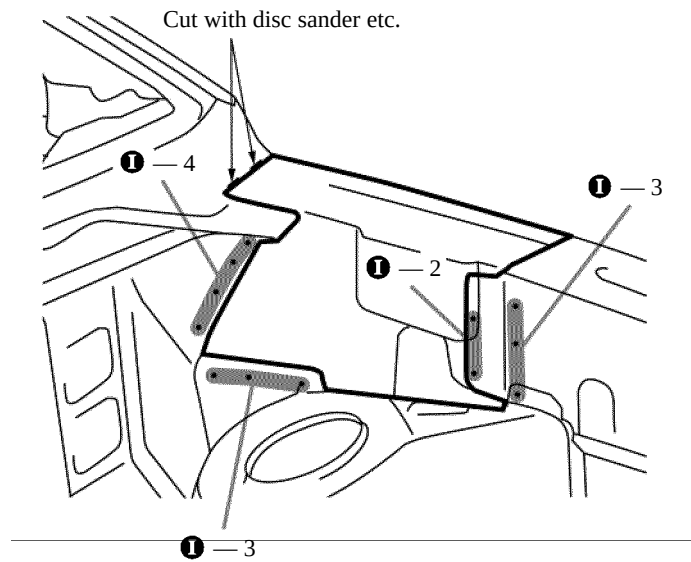
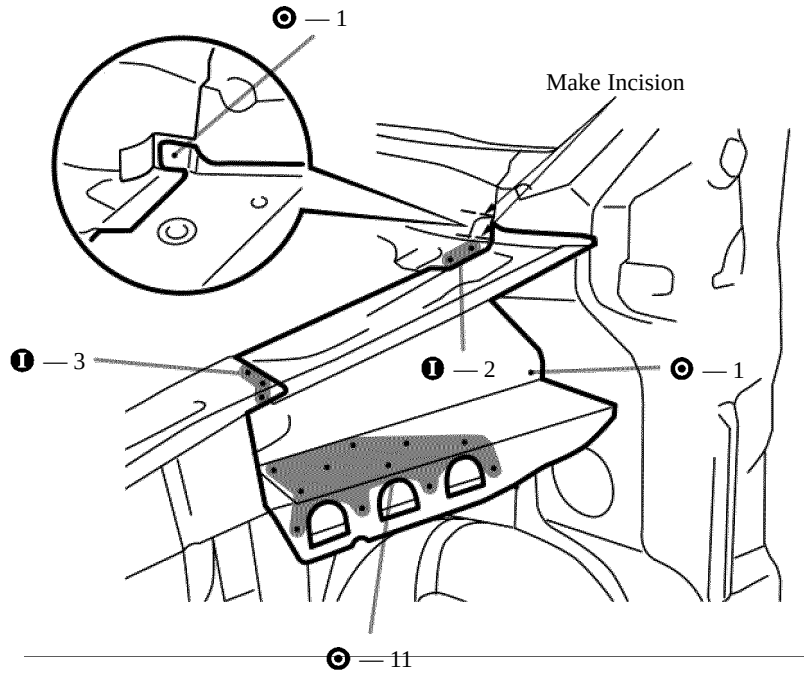
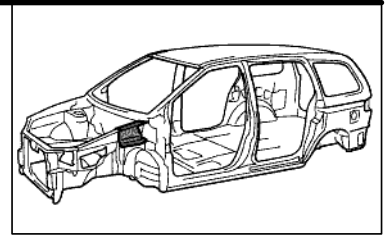
HINT:

- 1) Apply body sealer about 5 mm (0.20 in.) from the flange avoiding any oozing.
- 2) Apply sealer evenly, about 3 - 4 mm (0.12 - 0.16 in.) in diameter.
- 3) For other sealing points, refer to section AR.

5. After welding the center and rocker reinforcement and inner pillar to the vehicle install the outer pillar.
6. Apply foamed material to the pillar and quarter sections.

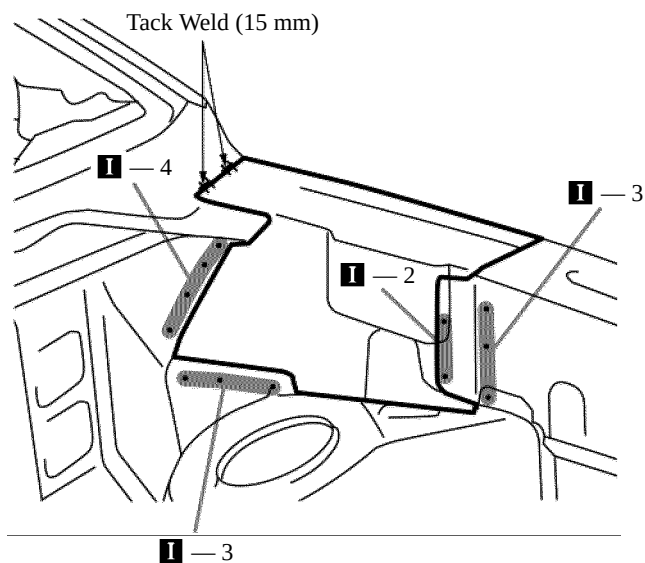
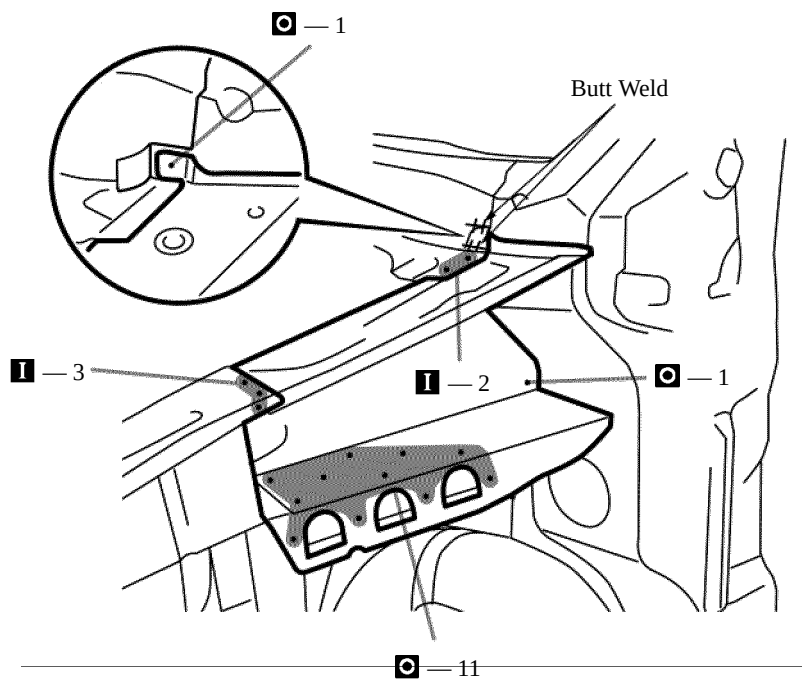
COWL TOP SIDE INNER PANEL (ASSY)

REMOVAL (With the cowl top side outer panel removed.)



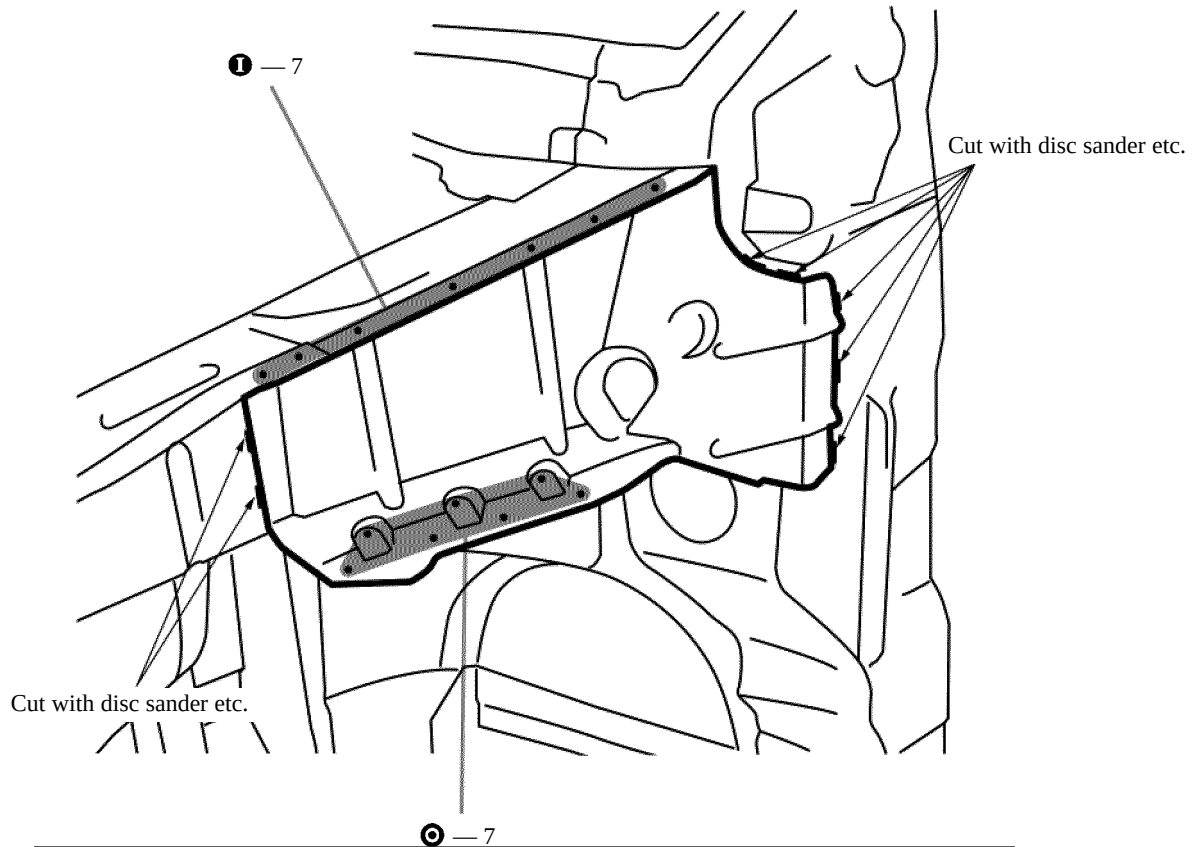
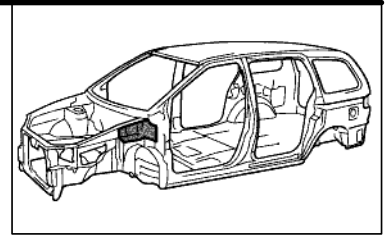
1. Make an incision in the cowl top panel and bend as shown above. Drill out the spot welds and separate the cowl top side inner panel.

INSTALLATION

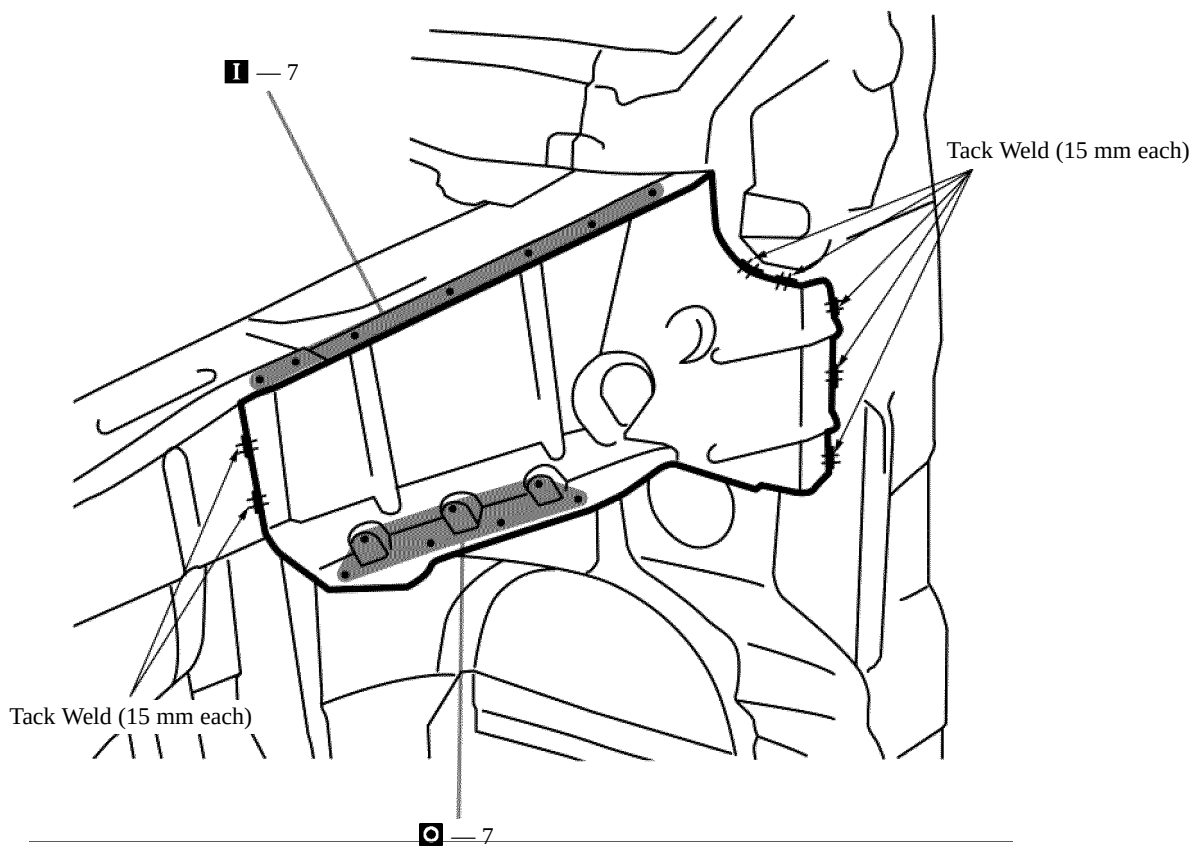


mm	in.
15	0.59

1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

COWL TOP SIDE OUTER PANEL (ASSY)**REMOVAL**

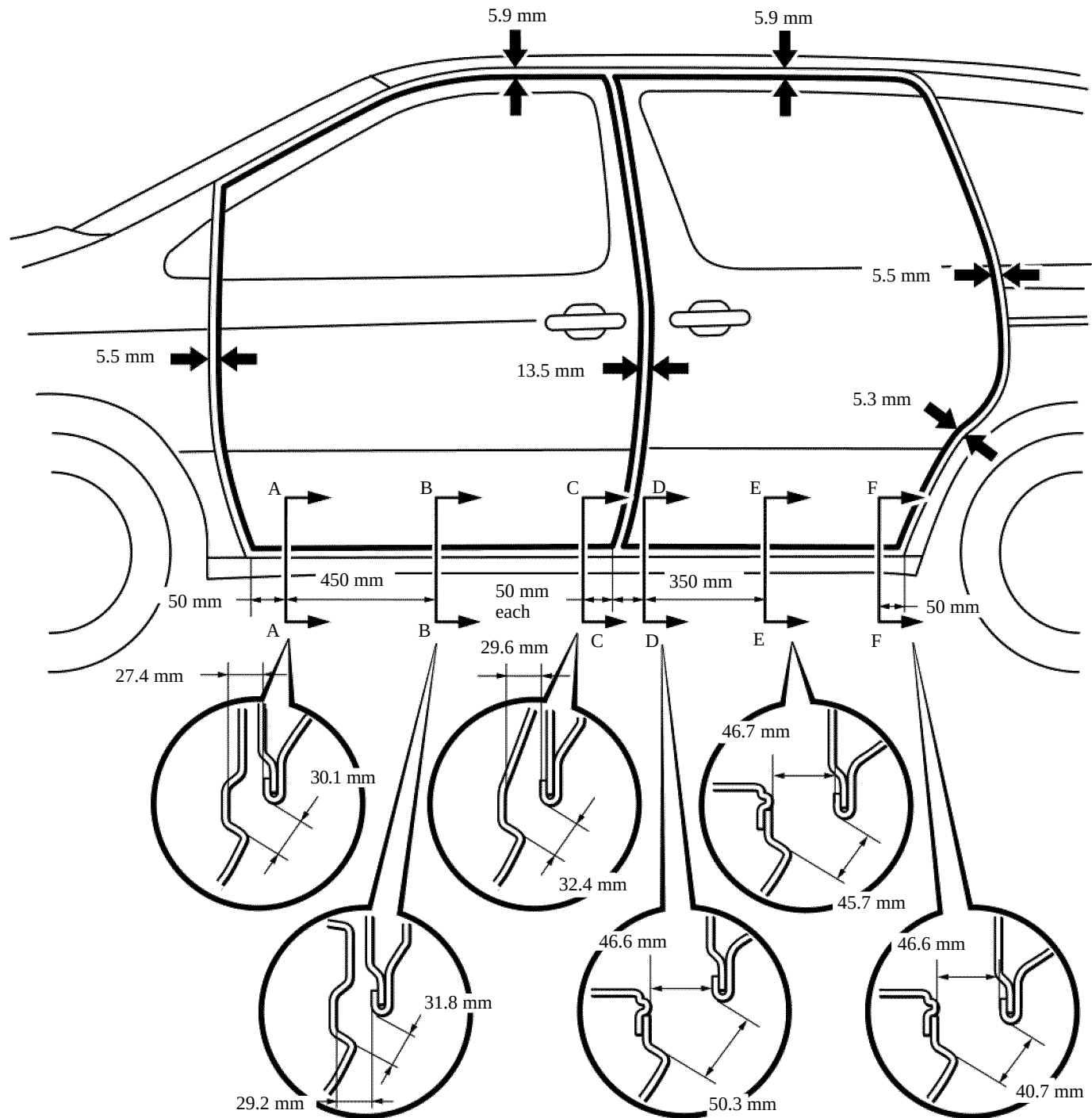
INSTALLATION

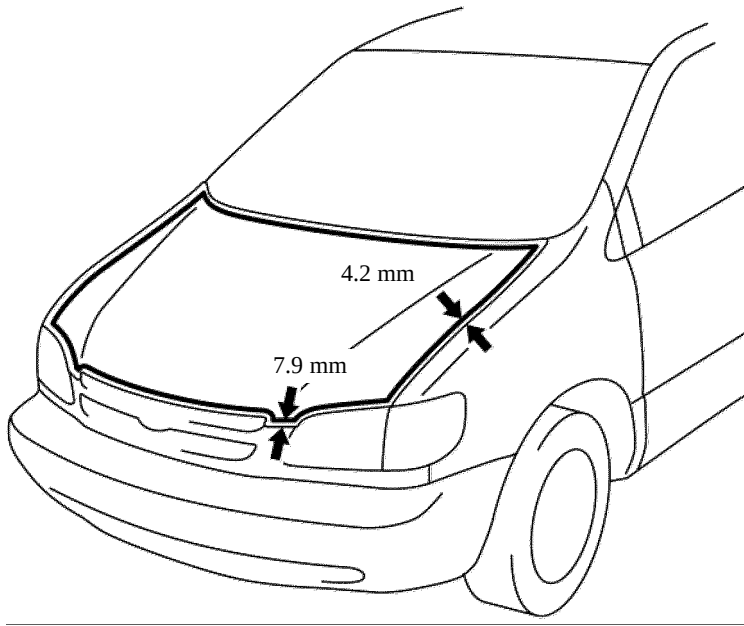


mm	in.
15	0.59

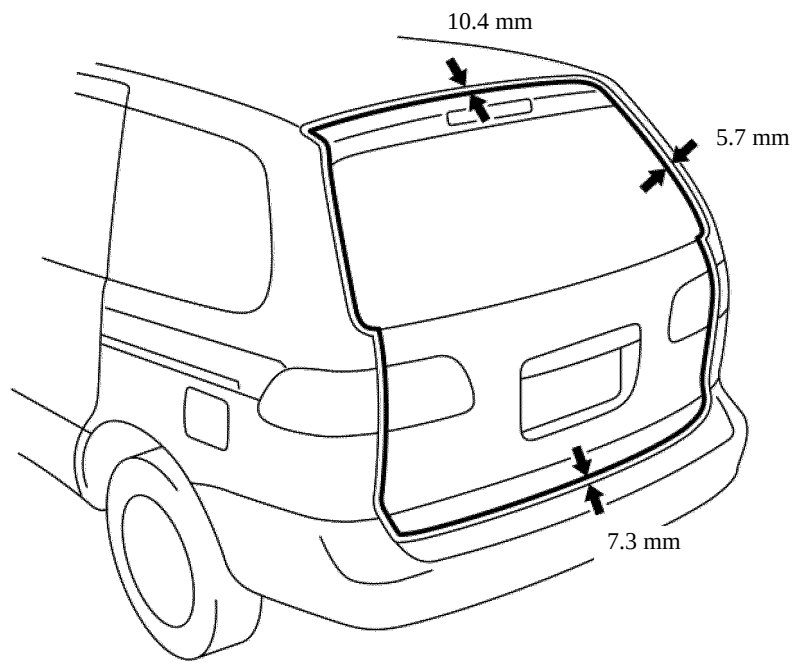
FIT STANDARDS

After doors and the engine hood are installed, be sure to perform fit adjustment to prevent abnormal wind noise and ensure a good appearance.





mm	in.
4.2	0.165
5.3	0.209
5.5	0.217
5.7	0.224
5.9	0.232
7.3	0.287
7.9	0.311
10.4	0.409
13.5	0.531
27.4	1.079
29.2	1.150
29.6	1.165
30.1	1.185
31.8	1.252
32.4	1.276
40.7	1.602
45.7	1.799
46.6	1.835
46.7	1.839
50	1.97
50.3	1.980
350	13.78
450	17.72



FOREWORD

This repair manual has been prepared to provide essential information on body panel repair methods (including cutting and welding operations, but excluding painting) for the TOYOTA SIENNA.

Applicable models: MCL10 series

This manual consists of body repair methods, exploded diagrams and illustrations of the body components and other information relating to body panel replacement such as handling precautions, etc. However, it should be noted that the front fenders of the TOYOTA models is bolted on and require no welding.

When repairing, don't cut and join areas that are not shown in this manual. Only work on the specified contents to maintain body strength.

Body construction will sometimes differ depending on specifications and country of destination. Therefore, please keep in mind that the information contained herein is based on vehicles for general destinations.

For the repair procedures and specifications other than collision-damaged body components of the TOYOTA SIENNA refer to the repair manuals.

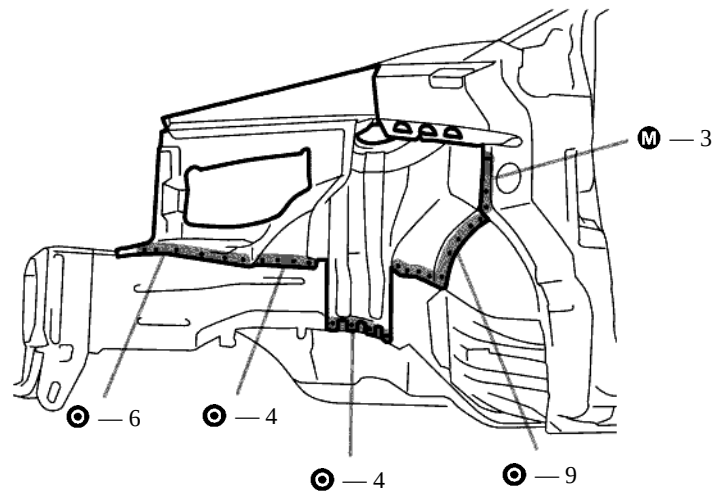
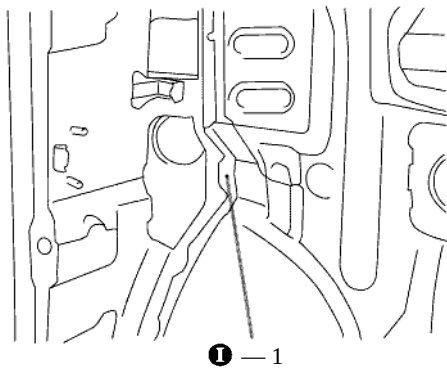
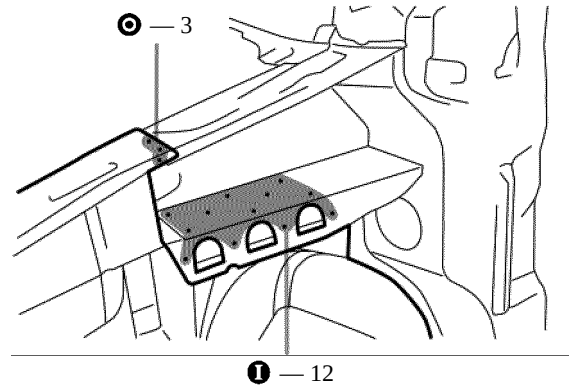
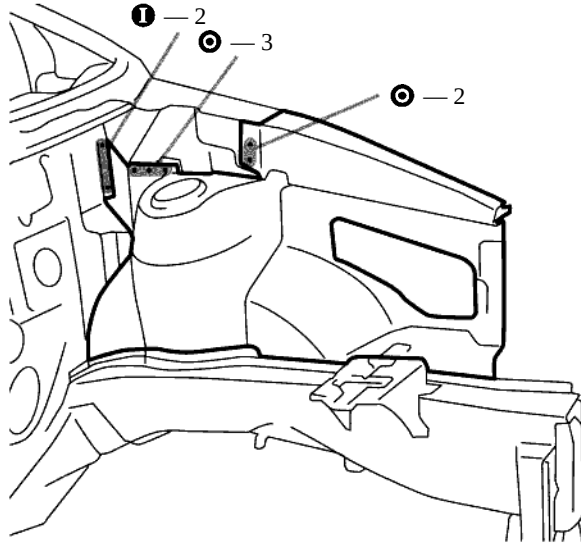
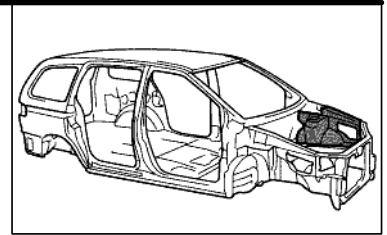
If you require the above manuals, please contact your TOYOTA Dealer.

All information contained in this manual is the most up-to-date at the time of publication. However, specifications and procedures are subject to change without prior notice.

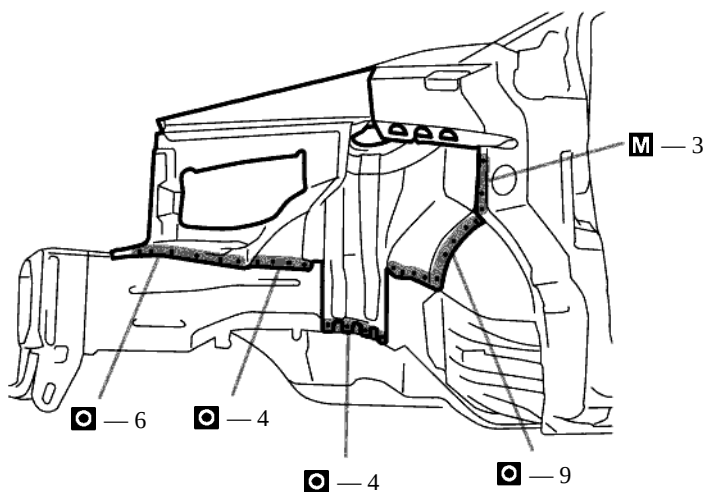
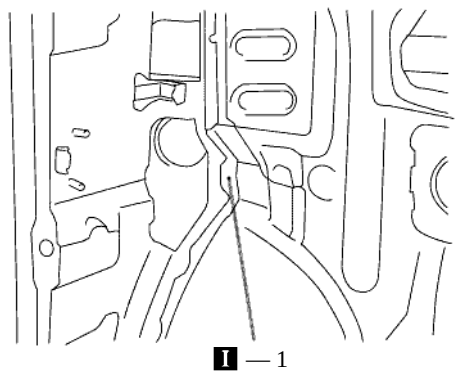
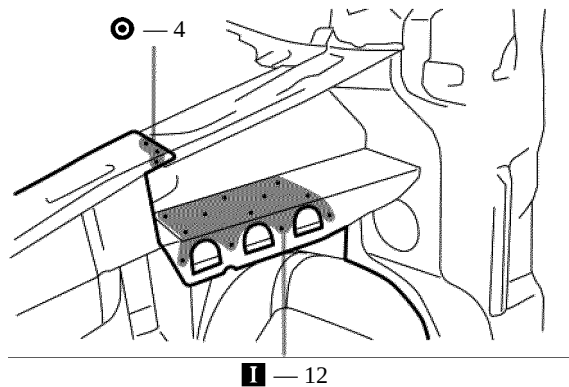
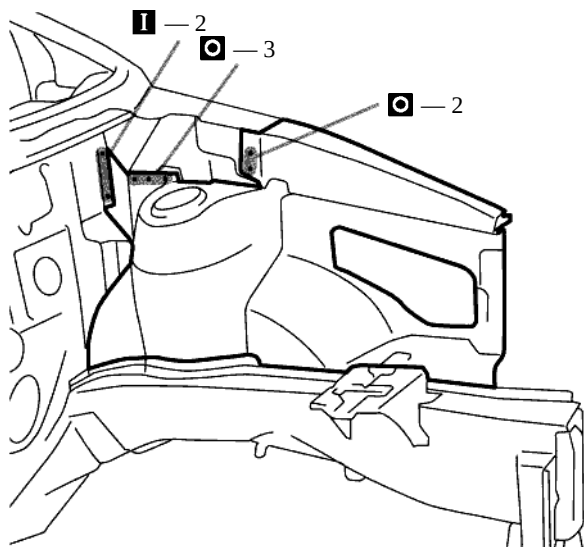
TOYOTA MOTOR CORPORATION

FRONT FENDER APRON (ASSY)

REMOVAL (With the radiator side support, cowl top side outer panel removed.)



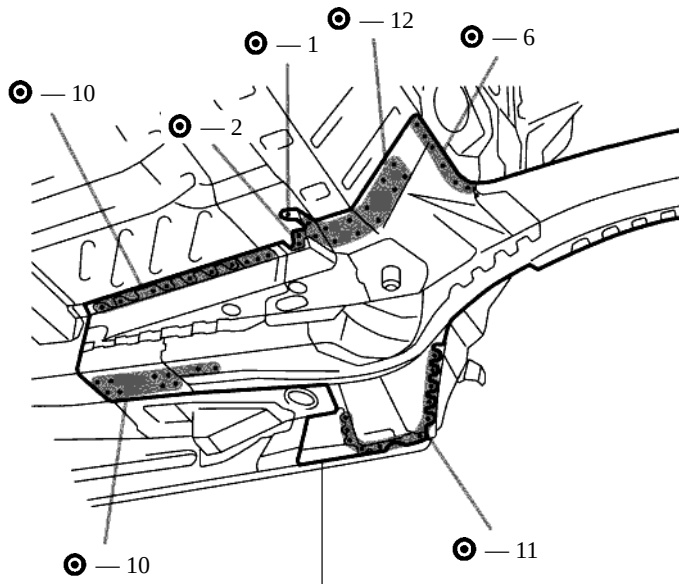
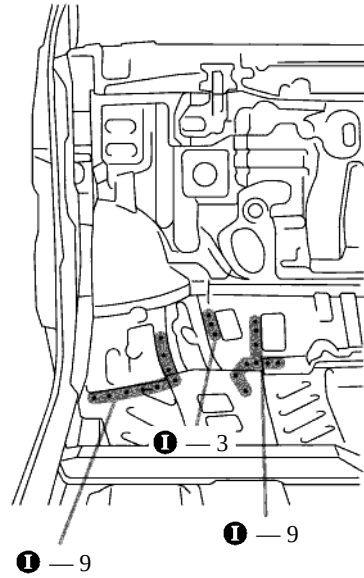
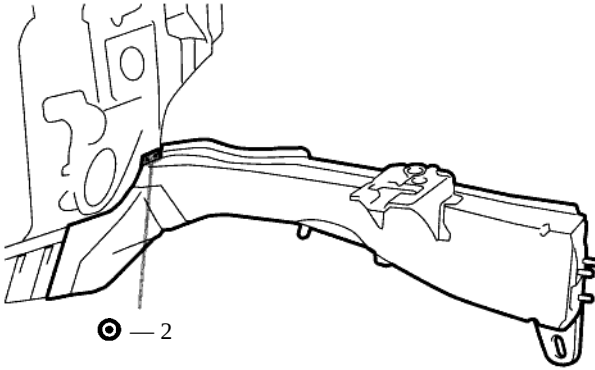
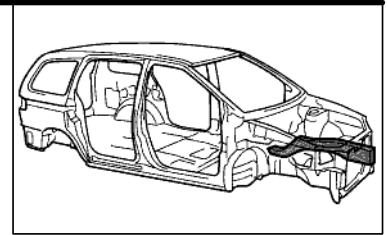
INSTALLATION



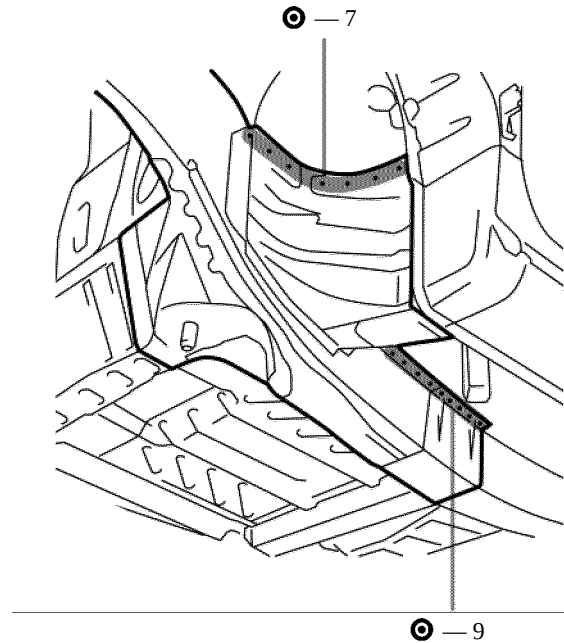
1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.
2. Measurements must be accurate with the body dimension diagram, as this affects the front wheel alignment.
3. Temporarily install the front fender and hood, and check the fit.

FRONT SIDE MEMBER (ASSY)

REMOVAL (with the front crossmember, front fender apron removed.)

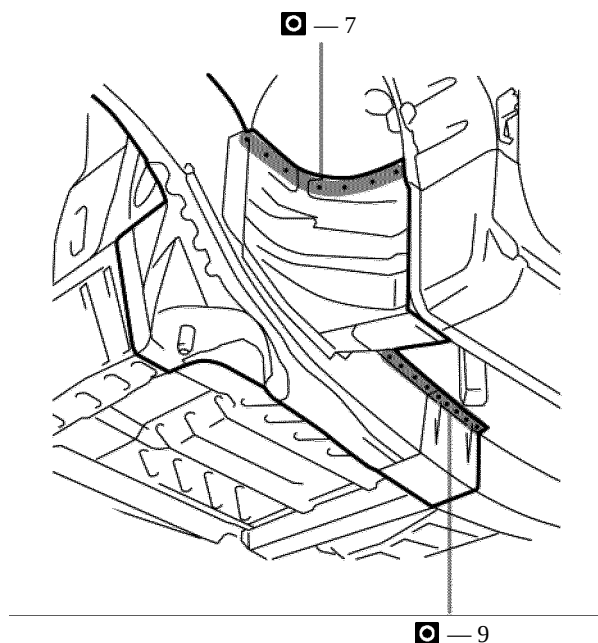
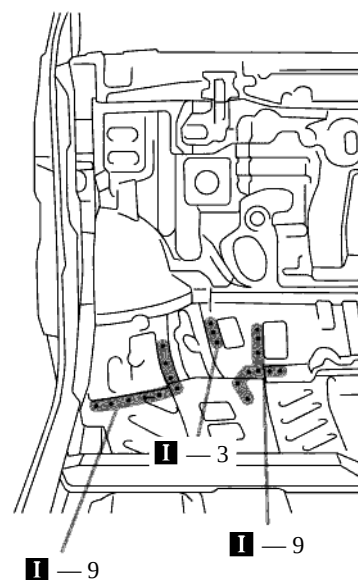
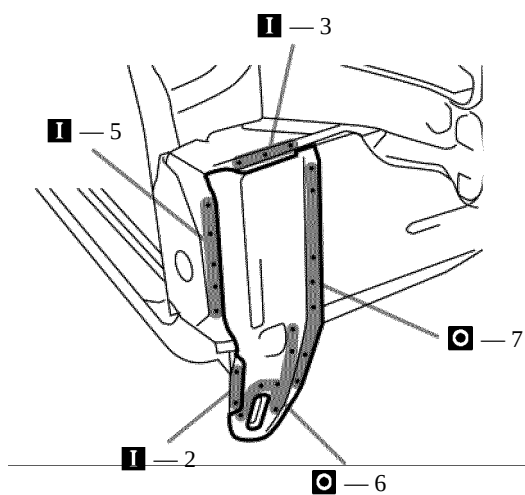
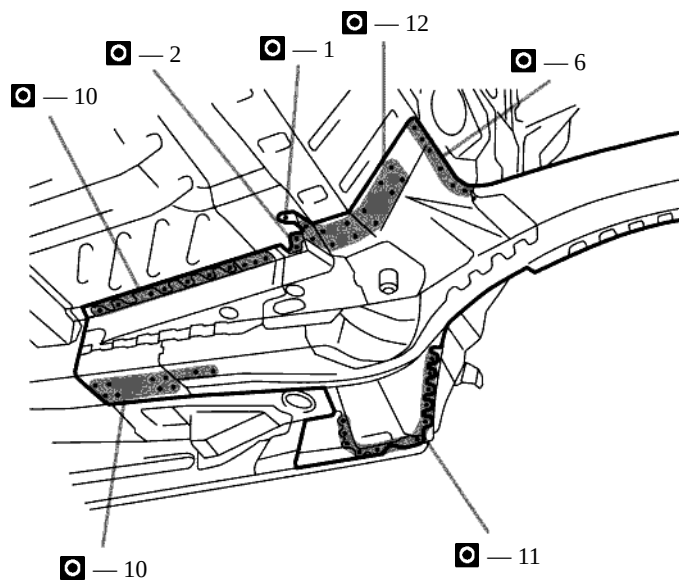
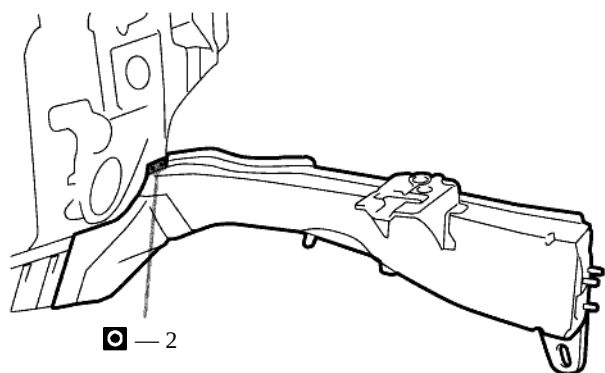


Floor Side Member No.1 Reinforcement



1. Leave the floor side member No.1 reinforcement to the vehicle. Remove the front side member.

INSTALLATION

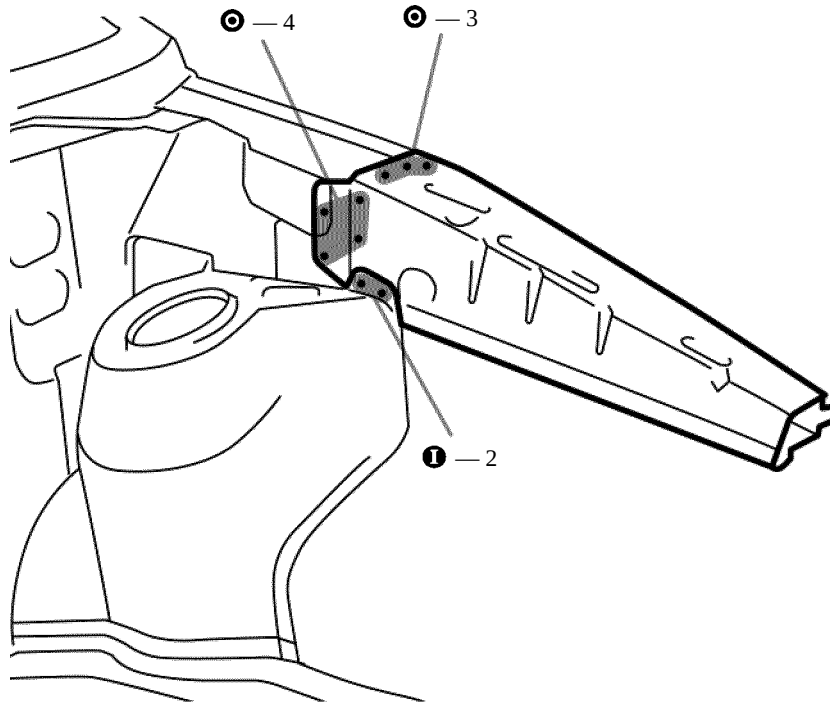
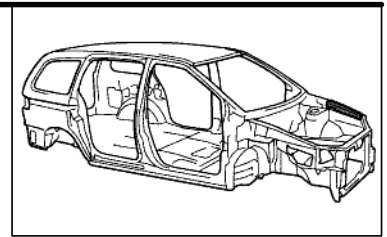


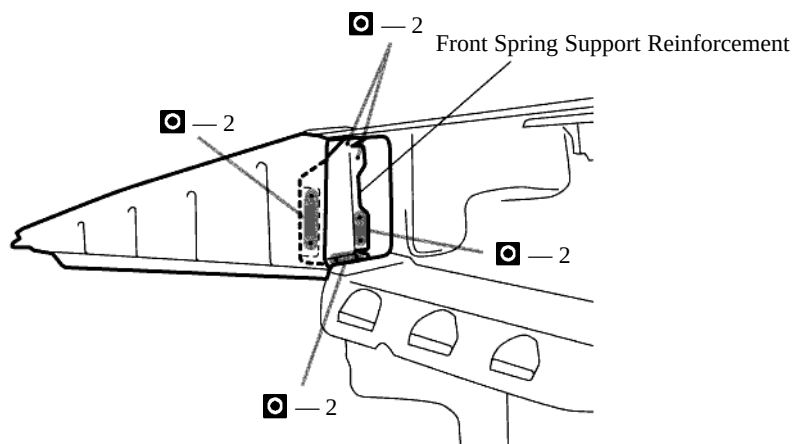
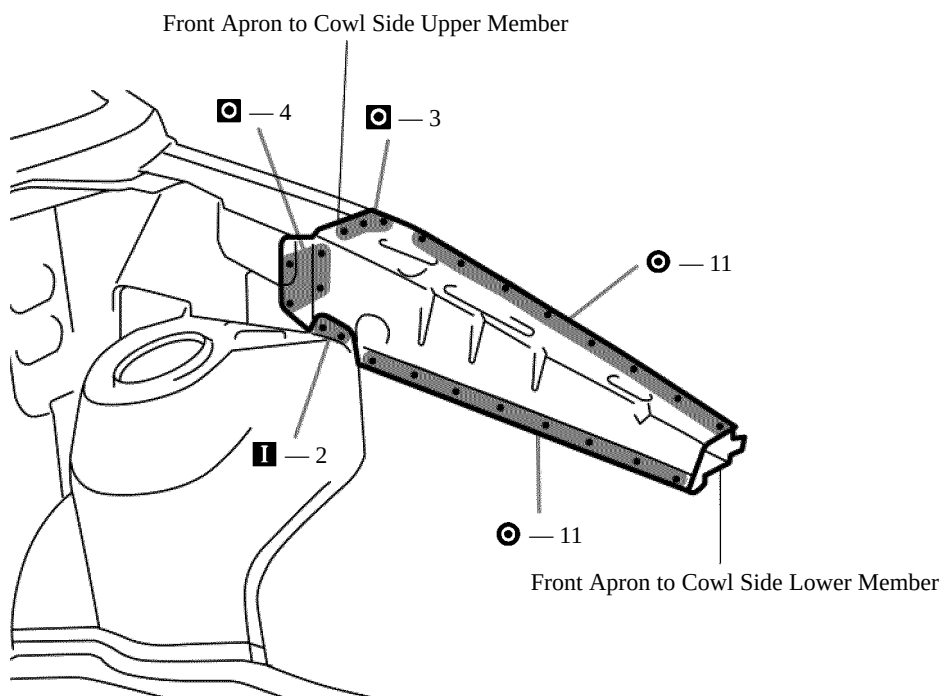
1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

HINT: Make sure each measurement is correct, as this parts affects the front wheel alignment.

FRONT APRON TO COWL SIDE MEMBER (ASSY)

REMOVAL (With the front fender front apron, cowl top side outer panel removed.)

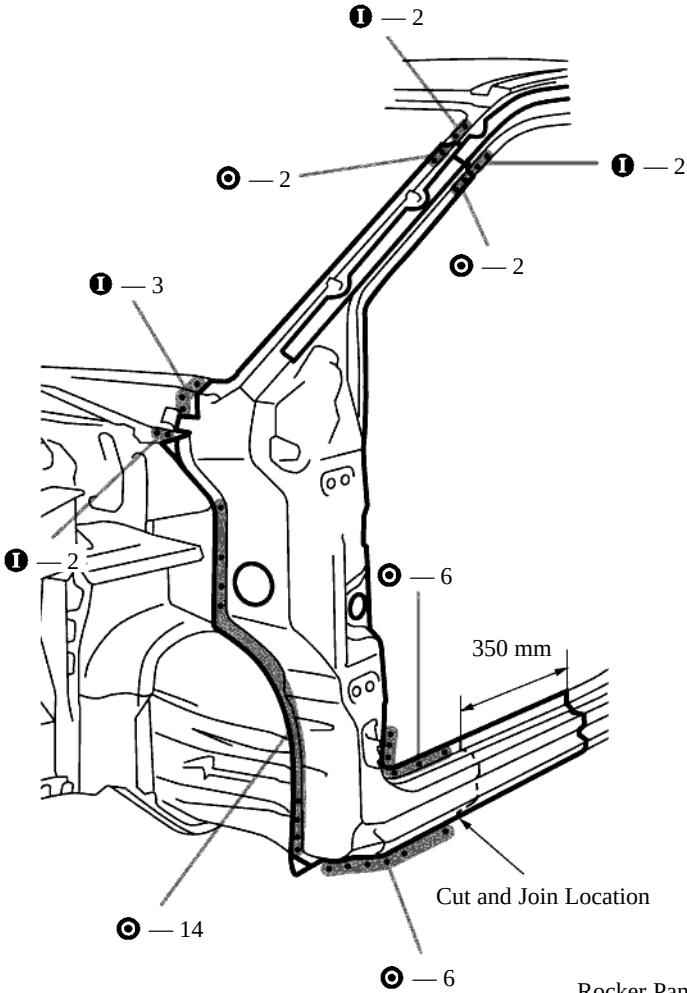
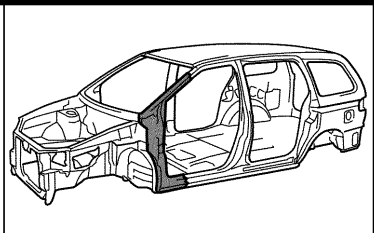


INSTALLATION

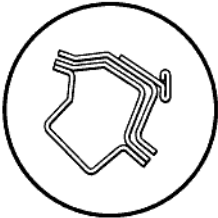
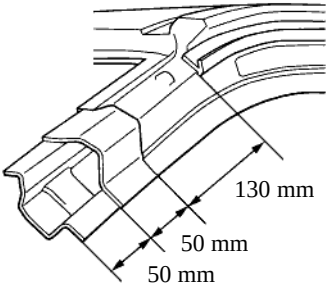
1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

FRONT BODY PILLAR (CUT)

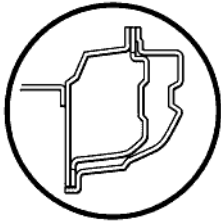
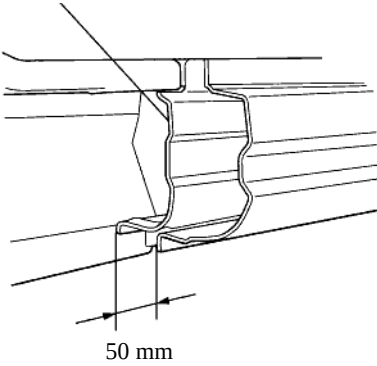
REMOVAL (With the cowl top side inner panel removed.)



[Cut and Join Locations]

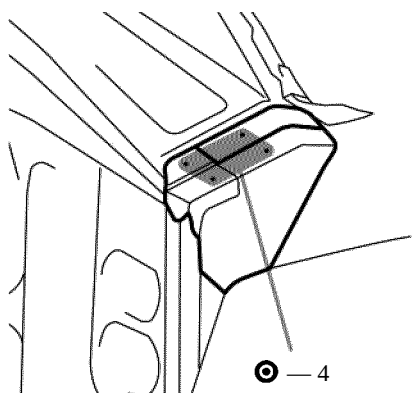
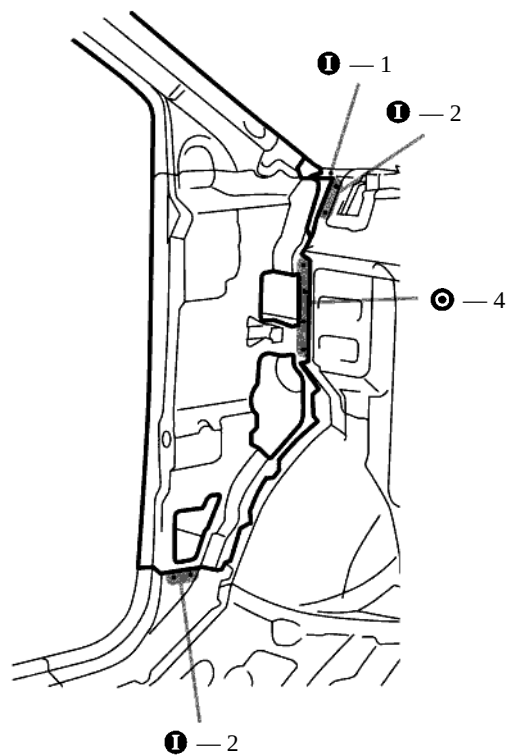
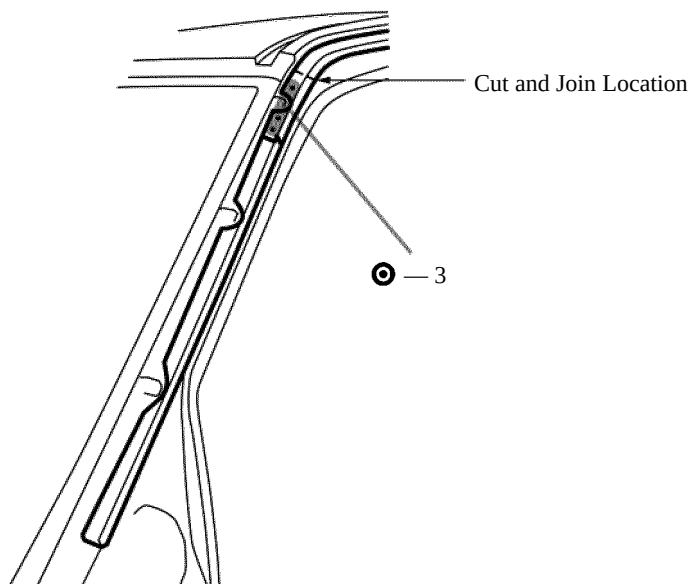


Rocker Panel No.3 Reinforcement

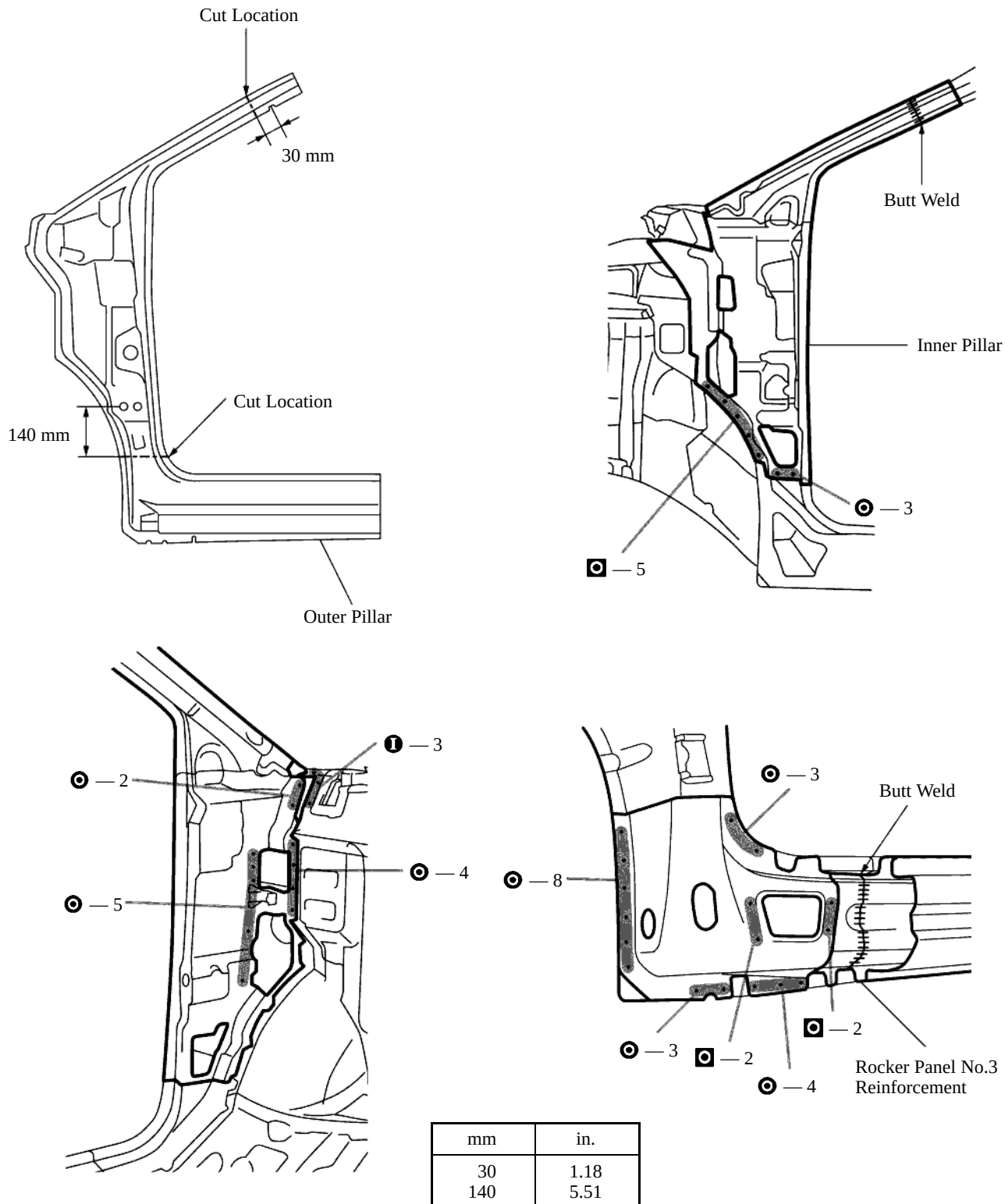


mm	in.
50	1.97
130	5.12
350	13.78

1. Cut and join the parts at the locations as shown above.
2. Shift the each cut and join locations of the outer pillar, reinforcement, inner pillar and roof drip channel.
3. Shift the each cut and join locations of the outer panel, rocker panel No.3 reinforcement.



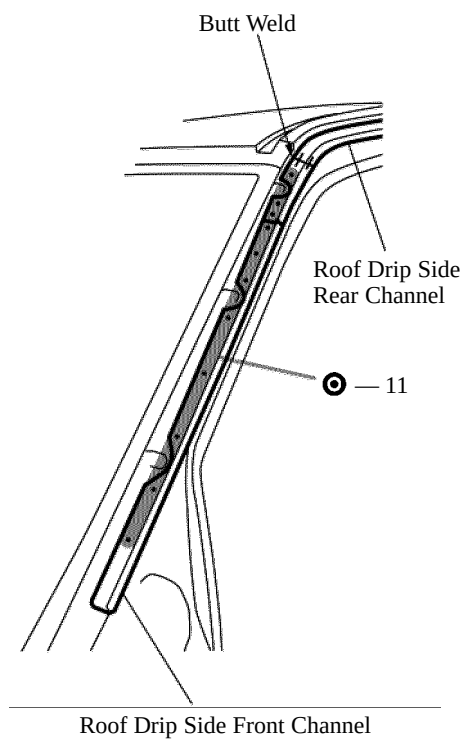
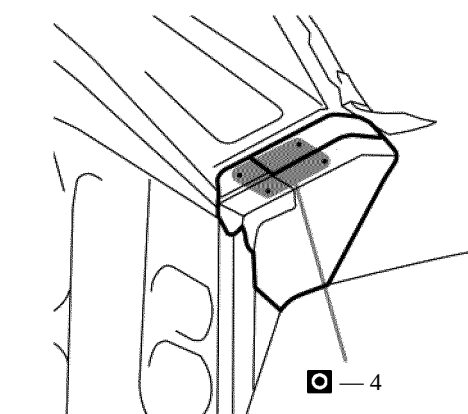
INSTALLATION



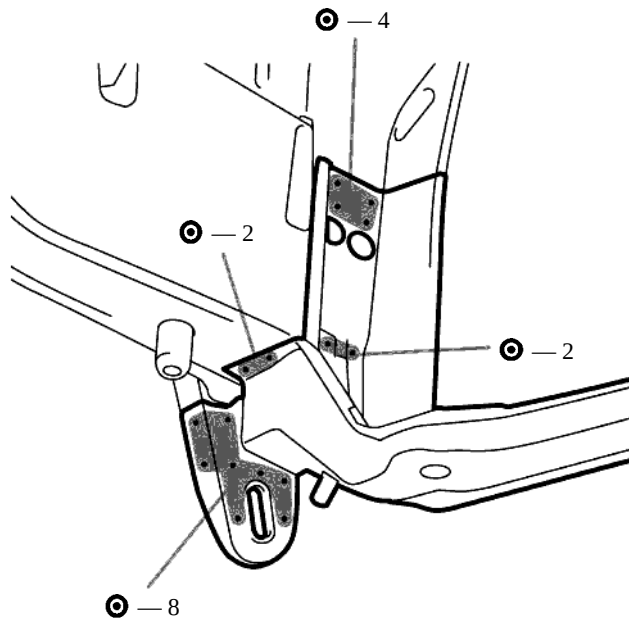
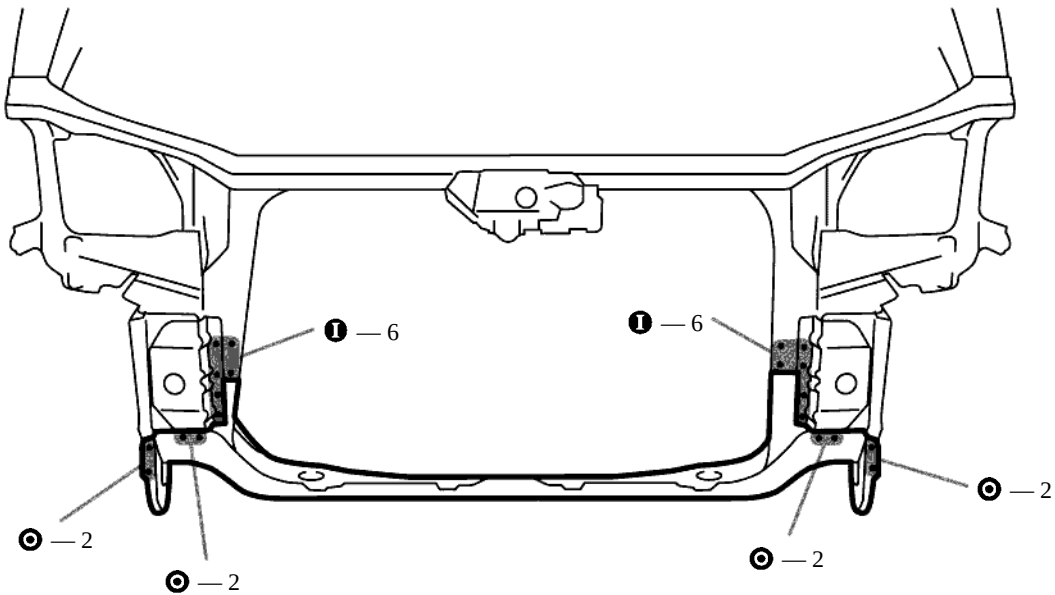
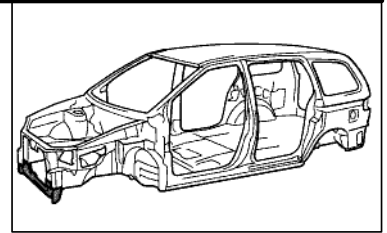
1. Cut the new parts for the outer pillar at the shown above.

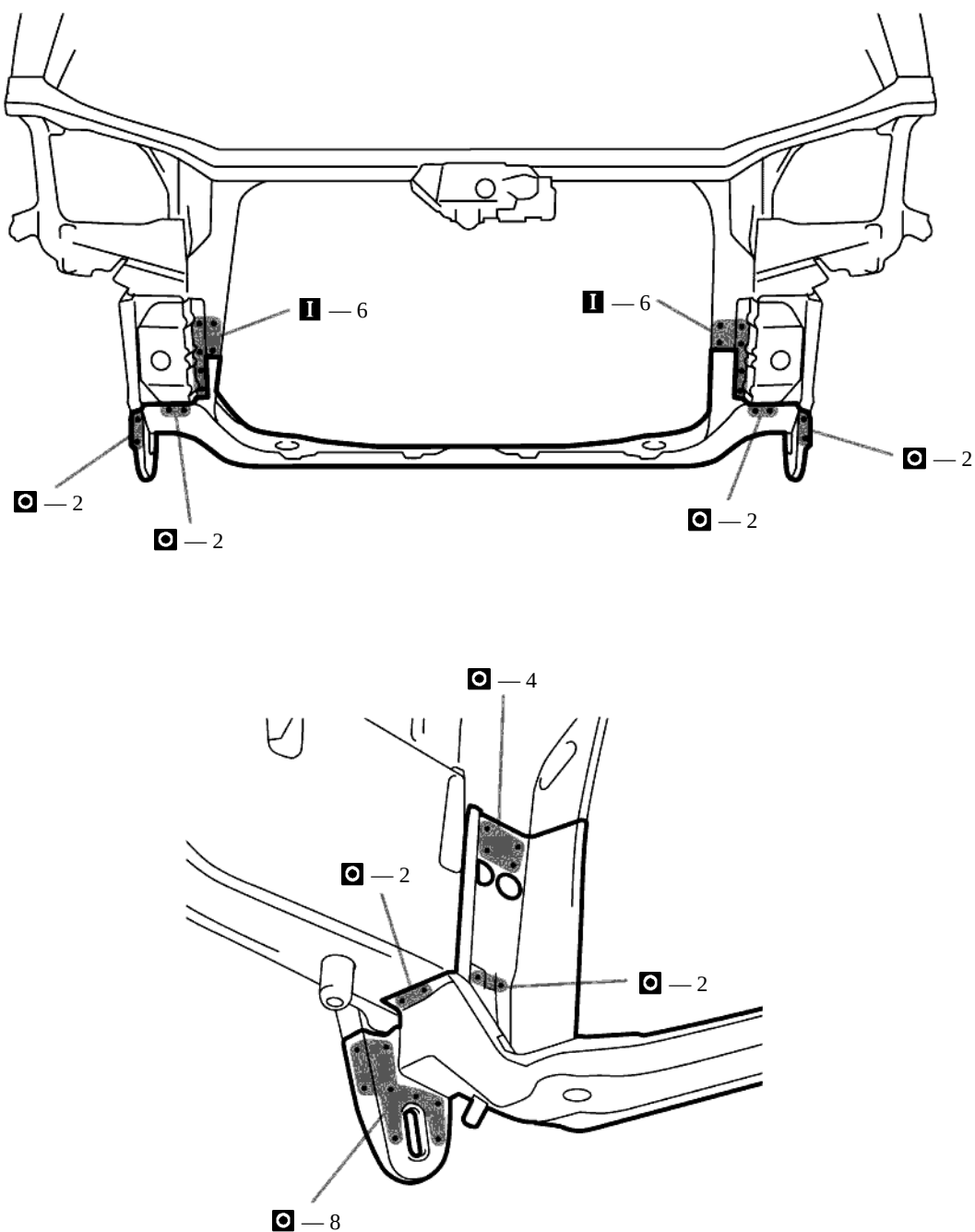
2. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

HINT: After butt welding the rocker panel No.3 reinforcement and front body pillar reinforcement attach it to the upper and lower area of the outer pillar.

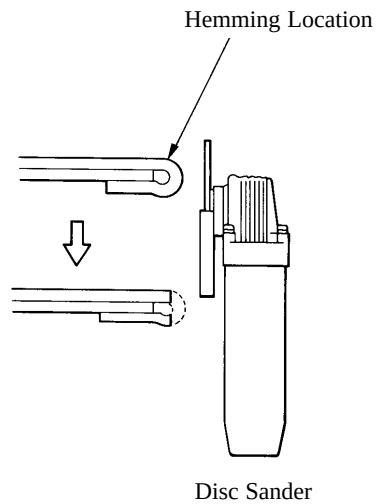
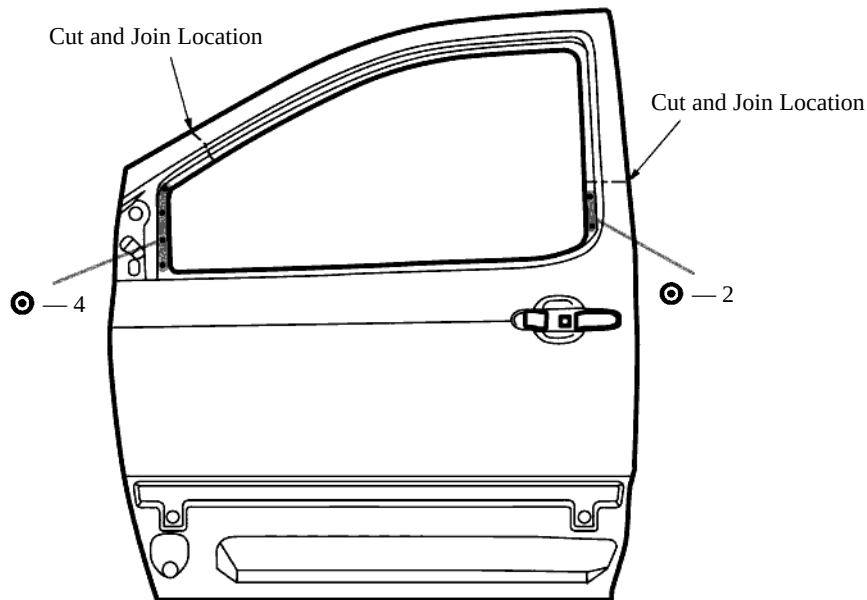
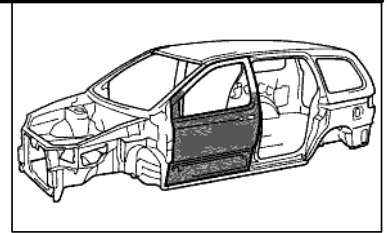


3. Before welding the new parts, check the fit of the front door, front fender and windshield glass.
4. After installing the new parts, apply foamed material.

FRONT CROSSMEMBER (ASSY)**REMOVAL**

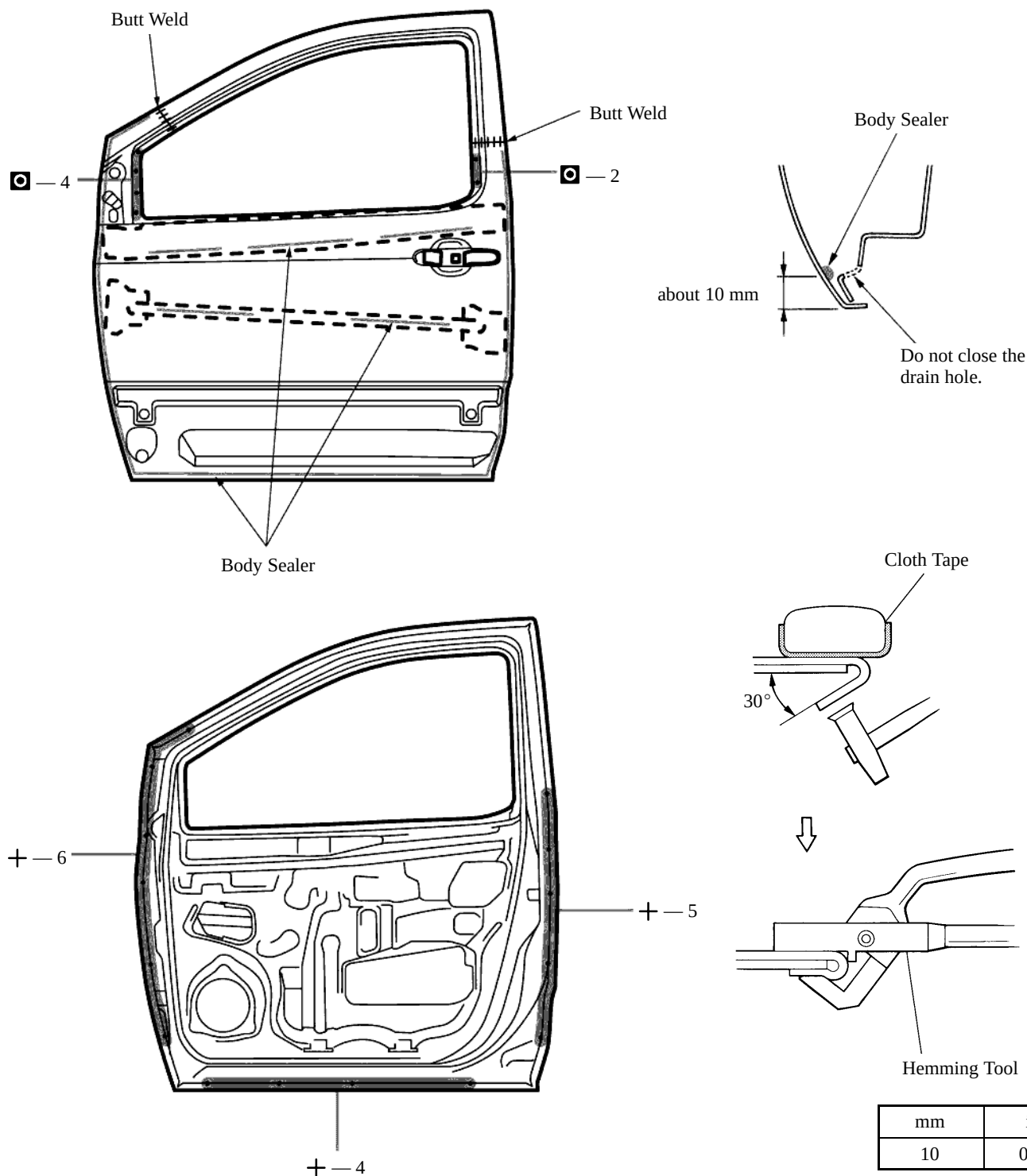
INSTALLATION

1. Temporarily install the new parts and measure each part in accordance with body dimension diagram.

FRONT DOOR OUTER PANEL (CUT)**REMOVAL**

1. Cut and join the parts at the locations as shown above.
2. After grinding off the hemming location, remove the outer panel.

INSTALLATION



- Before temporarily installing the new parts, apply body sealer to the reinforcement, side impact protection beam and back side of the new parts.

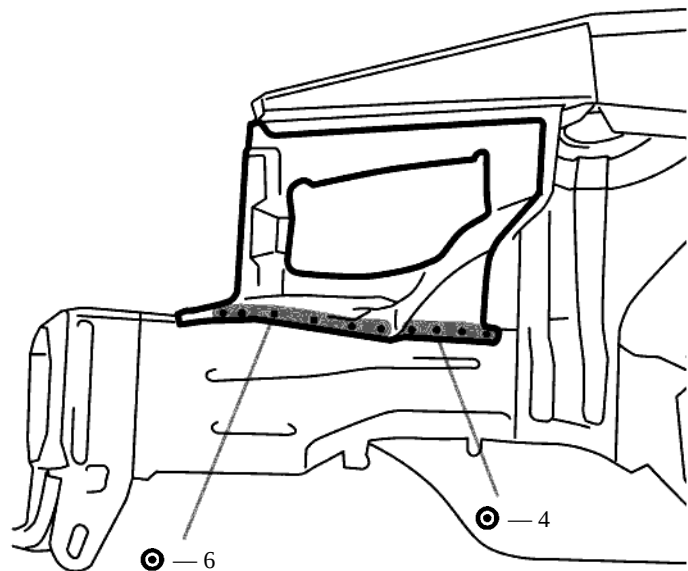
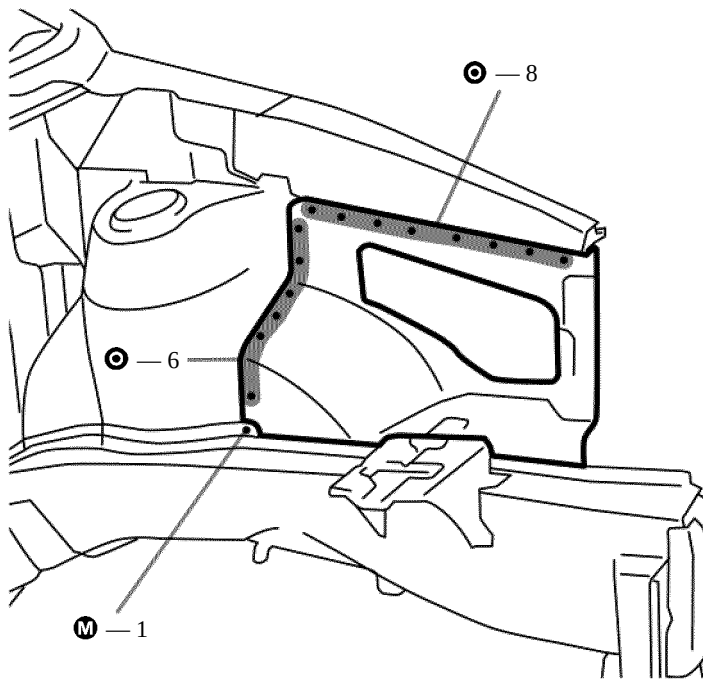
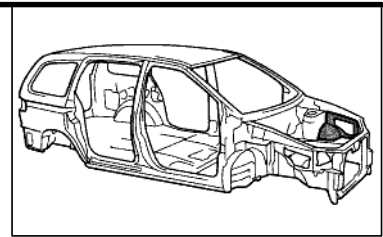
HINT:

- Apply just enough sealer for the reinforcement and side impact beam to touch the new panel. Apply sealer evenly around the flange area, about 10 mm (0.39 in.) from the edge, as shown.
- For other sealing points, refer to section AR.

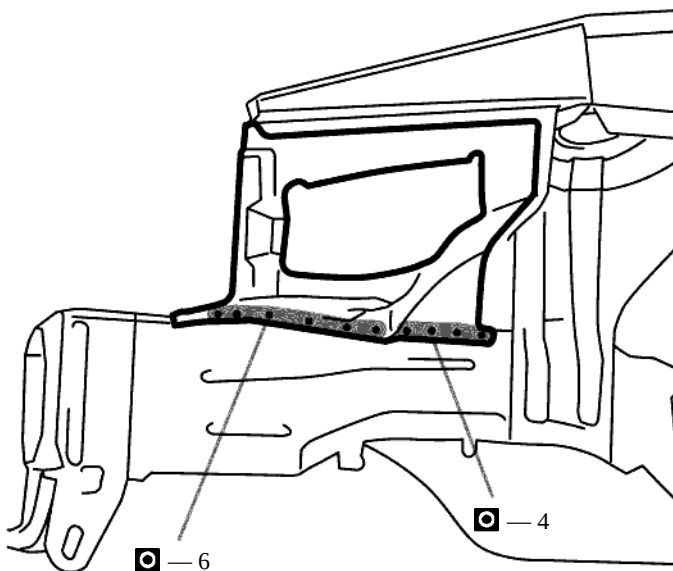
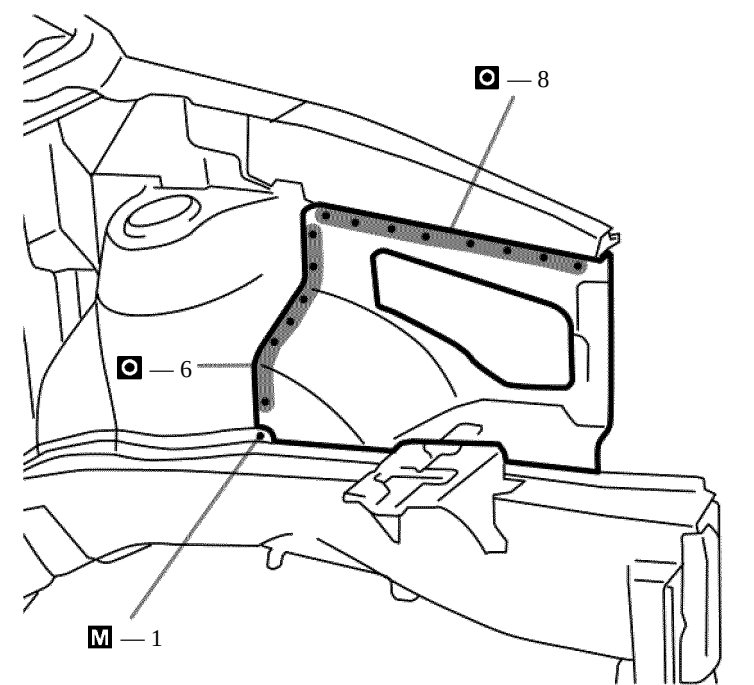
- Bend the flange hem about 30° with a hammer and dolly, then fasten tightly with a hemming tool.

HINT:

- Perform hemming in three steps, being careful not to warp the panel.
- If a hemming tool cannot be used hem with a hammer and dolly.

FRONT FENDER FRONT APRON (ASSY)**REMOVAL (With the radiator side support removed.)**

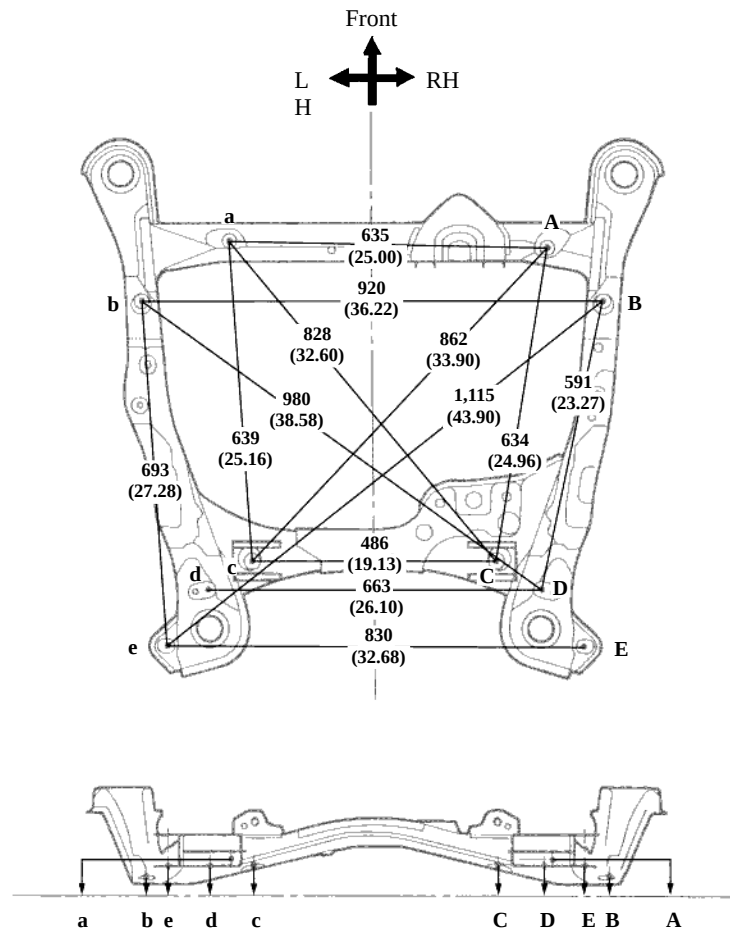
INSTALLATION



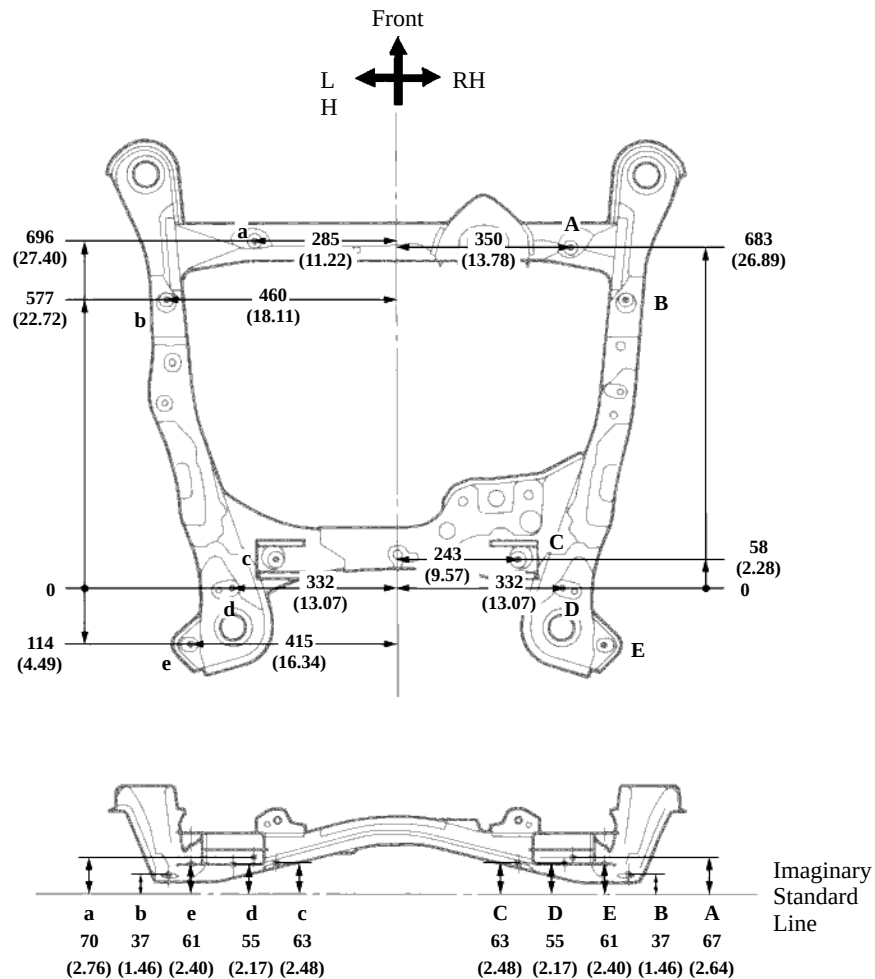
1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

FRONT FRAME

(Three-Dimensional Distance)



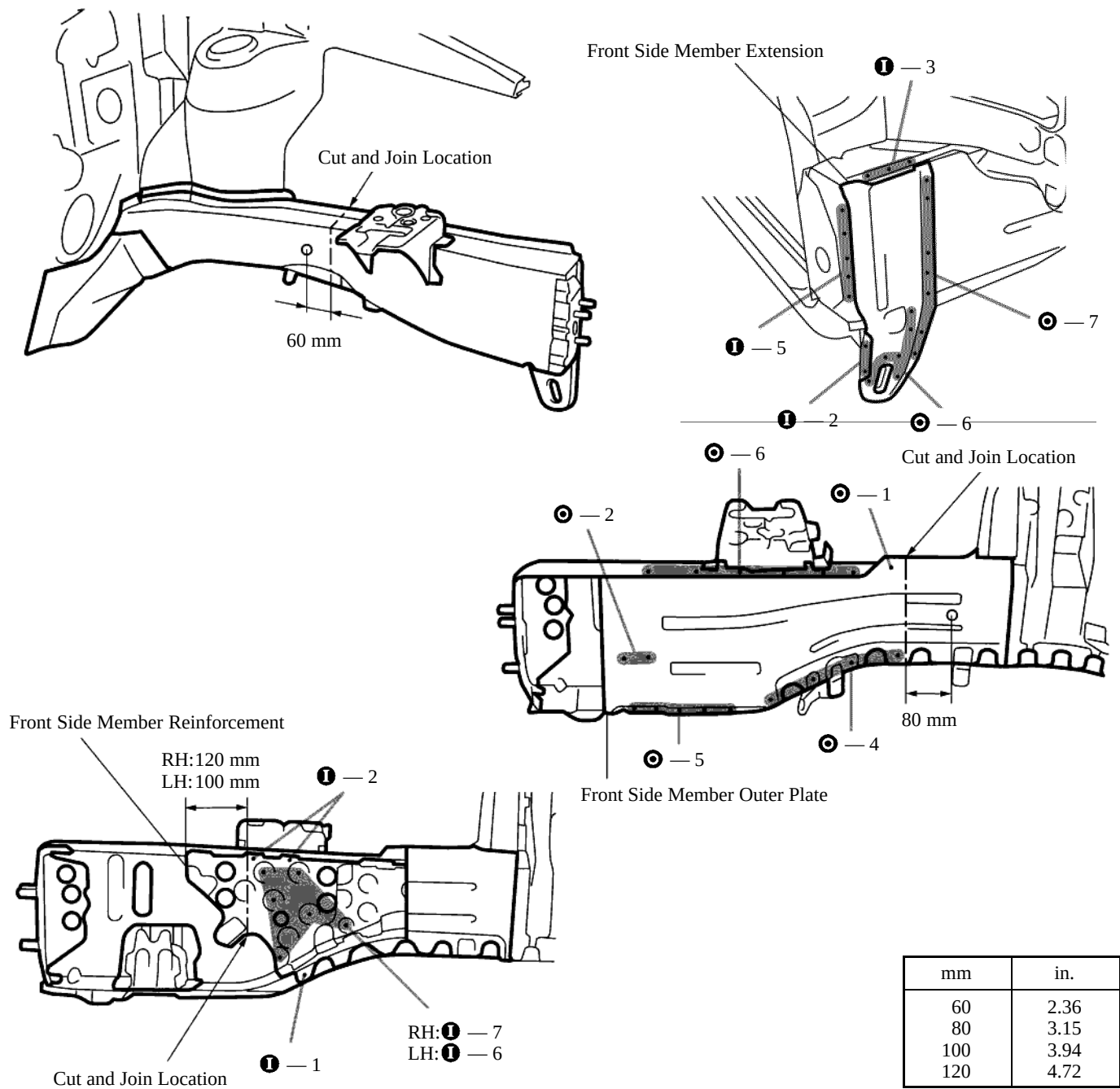
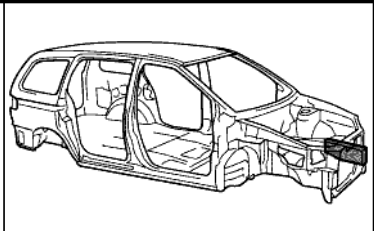
(Two-Dimensional Distance)



mm (in.)					
Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front frame standard hole	13 (0.51)	D, d	Front frame standard hole	13 (0.51)
B, b	Front frame standard hole	13 (0.51)	E, e	Lower control link installation hole - lower	15 (0.59)
C, c	Front frame standard hole	13 (0.51)	—	—	—

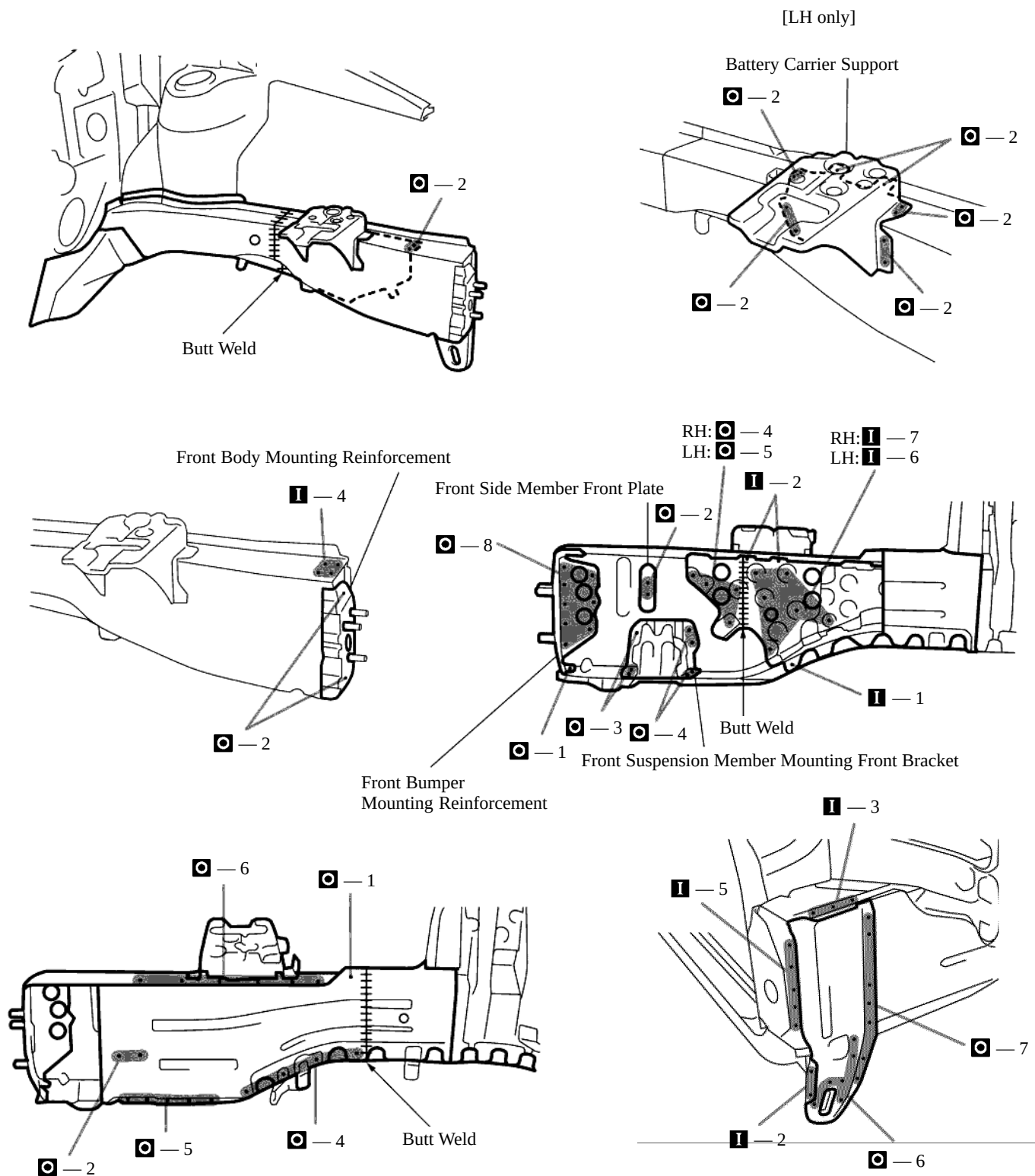
FRONT SIDE MEMBER (CUT-P)

REMOVAL (With the front crossmember, front fender front apron removed.)

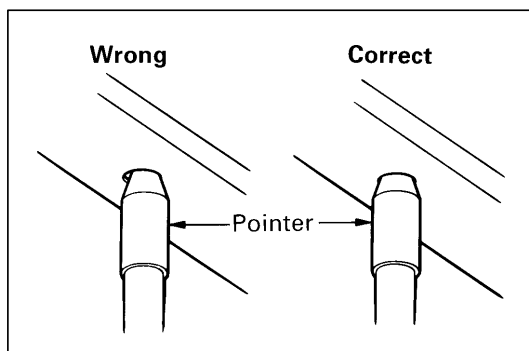
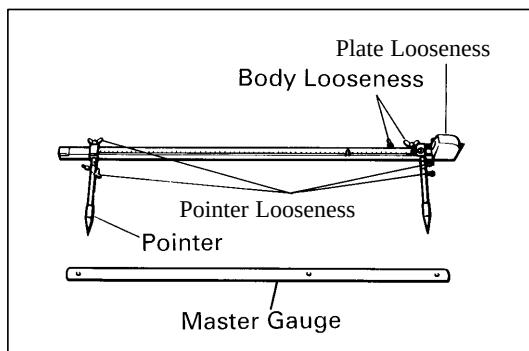
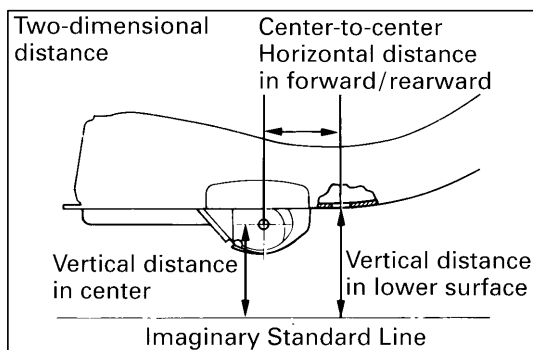
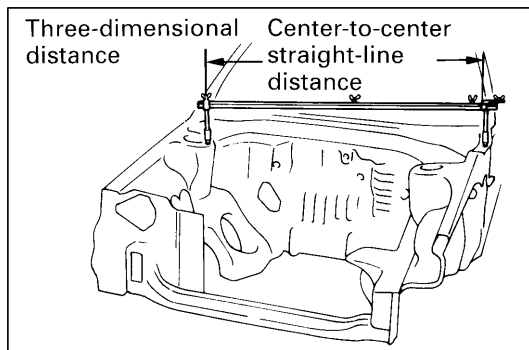


1. After removing the front side member outer plate and front side member extension, remove the front side member reinforcement.
2. Shift each cut and join locations of the front side outer member, front side inner member and front side member reinforcement.

INSTALLATION



1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.



Front Spring Support Inner Hole

GENERAL INFORMATION

1. BASIC DIMENSIONS

- (a) There are two types of dimensions in the diagram.
(Three-dimensional distance)

- Straight-line distance between the centers of two measuring points.

(Two-dimensional distance)

- Horizontal distance in forward/rearward between the centers of two measuring points.
- The height from an imaginary standard line.

- (b) Incases in which only one dimension is given, left and right are symmetrical.
(c) The dimensions in the following drawing indicate actual distance. Therefore, please use the dimensions as a reference.

2. MEASURING

- (a) Basically, all measurements are to be done with a tracking gauge. For portions where it is not possible to use a tracking gauge, a tape measure should be used.
(b) Use only a tracking gauge that has no looseness in the body, measuring plate, or pointers.

HINT:

1. The height of the left and right pointers must be equal.
2. Always calibrate the tracking gauge before measuring or after adjusting the pointer height.
3. Take care not to drop the tracking gauge or otherwise shock it.
4. Confirm that the pointers are securely in the holes.

- (c) When using a tape measure, avoid twists and bends in the tape.
(d) When tracking a diagonal measurement from the front spring support inner hole to the suspension member upper rear installation hole, measure along the front spring support panel surface.

GENERAL INFORMATION

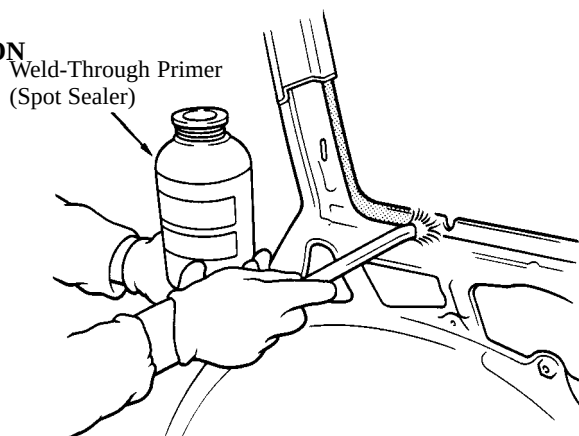
Anti-rust treatment is necessary before welding and before and after the painting process.

ANTI-RUST TREATMENT BEFORE WELDING

1. WELD-THROUGH PRIMER (SPOT SEALER) APPLICATION

For anti-corrosion measures, always apply the weld-through primer (spot sealer) to welding surfaces where the paint film has been removed.

HINT: Apply the weld-through primer (spot sealer) so that it does not ooze out from the joining surfaces.

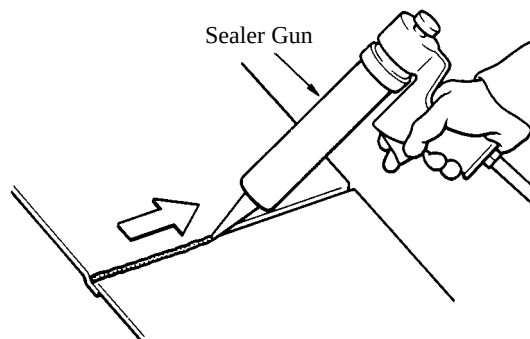


WELD-THROUGH PRIMER (SPOT SEALER) APPLICATION

ANTI-RUST TREATMENT BEFORE PAINTING PROCESS

1. BODY SEALER APPLICATION

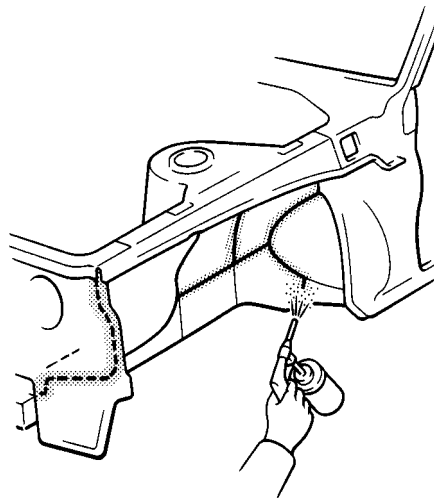
For water-proofing and anti-corrosion measures, always apply the body sealer to the body panel seams and hems of the doors, hoods, etc.



BODY SEALER APPLICATION

2. UNDERCOAT APPLICATION

To prevent corrosion and protect the body from damage by flying stones, always apply sufficient undercoat to the bottom surface of the under body and inside of the wheel housings.

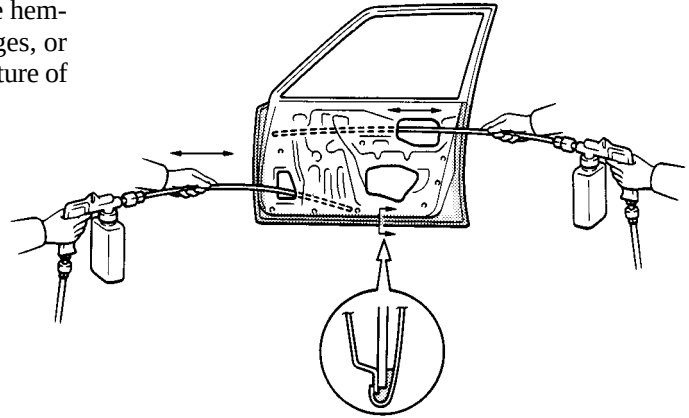


UNDERCOAT APPLICATION

ANTI-RUST TREATMENT AFTER PAINTING PROCESS

1. ANTI-RUST AGENT (WAX) APPLICATION

To preserve impossible to paint areas from corrosion, always apply sufficient anti-rust agent (wax) to the inside of the hemming areas of the doors and hoods, and around the hinges, or the welded surfaces inside the boxed cross-section structure of the side member, body pillar, etc.



ANTI-RUST AGENT (WAX) APPLICATION

REFERENCE: ANTI-RUST TREATMENT BY PAINTING

Painting prevents corrosion and protects the sheet metal from damage. In this section, anti-chipping paint only for anti-corrosion purpose is described.

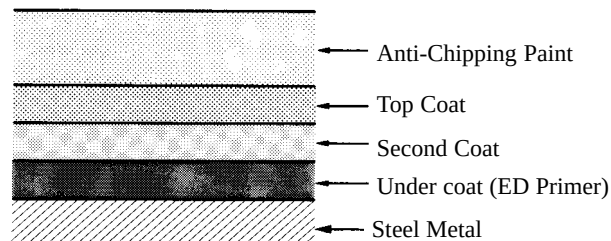
1. ANTI-CHIPPING PAINT

To prevent corrosion and protect the body from damage by flying stones, etc., apply anti-chipping paint to the rocker panel, wheel arch areas, valance panel, etc.

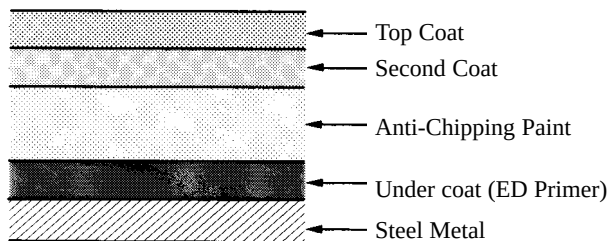
HINT:

Depending on the model or the application area, there are cases where the application of anti-chipping paint is necessary before the second coat or after the top coat.

- Apply the anti-chipping paint after the top coat.



- Apply the anti-chipping paint before the second coat.



GENERAL REPAIR INSTRUCTIONS

Work Precautions

SAFETY

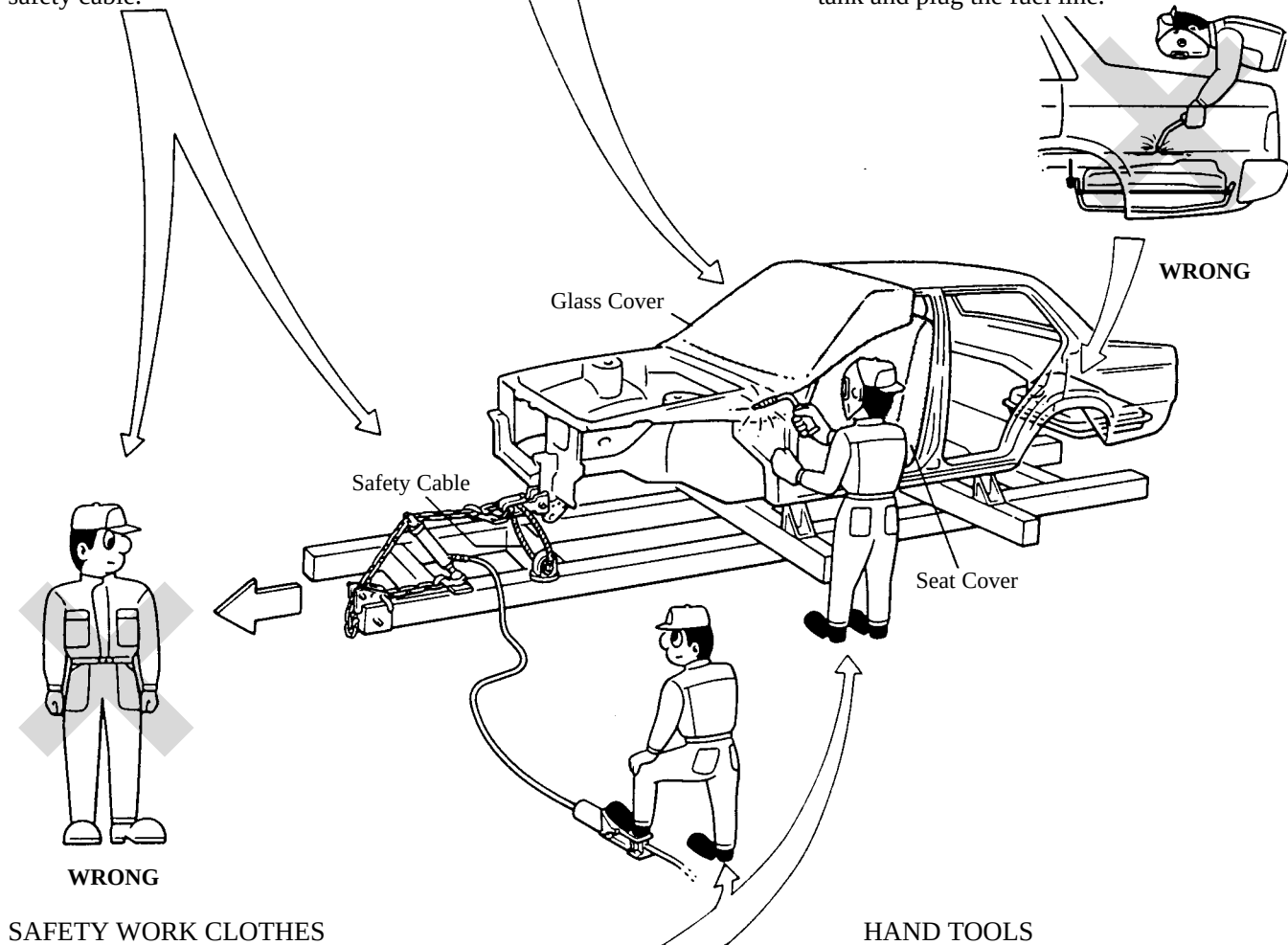
Never stand in direct line with the chain when using a puller on the body or frame, and be sure to attach a safety cable.

VEHICLE PROTECTION

When welding, protect the painted surfaces, windows, seats and carpet with heat-resistant, fire-proof covers.

SAFETY

1. Before performing repair work, check for fuel leaks. If a leak is found, be sure to close the opening totally.
2. If it is necessary to use a frame in the area of the fuel tank, first remove the tank and plug the fuel line.



SAFETY WORK CLOTHES

In addition to the usual mechanic's wear, cap and safety shoes, the appropriate gloves, head protector, glasses, ear plugs, face protector, dust-prevention mask, etc. should be worn as the situation demands.

HAND TOOLS

Keeping your hand tools in neat order improve your work efficiency.

Dust-
Prevention
Mask



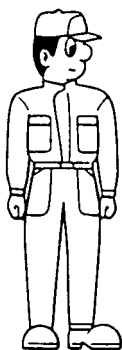
Face
Protector



Eye
Protector



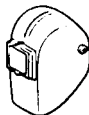
Safety
Shoes



Welder's
Glasses



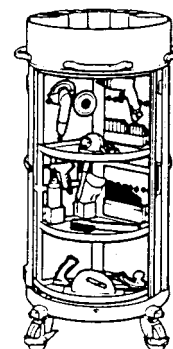
Ear
Plugs



Head
Protector



Welder's
Gloves



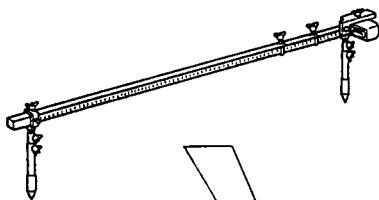
Body
Tools
Stand

Proper and Efficient Work Procedures

REMOVAL

PRE-REMOVAL MEASURING

Before removal or cutting operations, take measurements in accordance with the dimension diagram. Always use a puller to straighten a damaged body or frame.



NUMBER OF SPOT WELDS AND PANEL POSITIONS

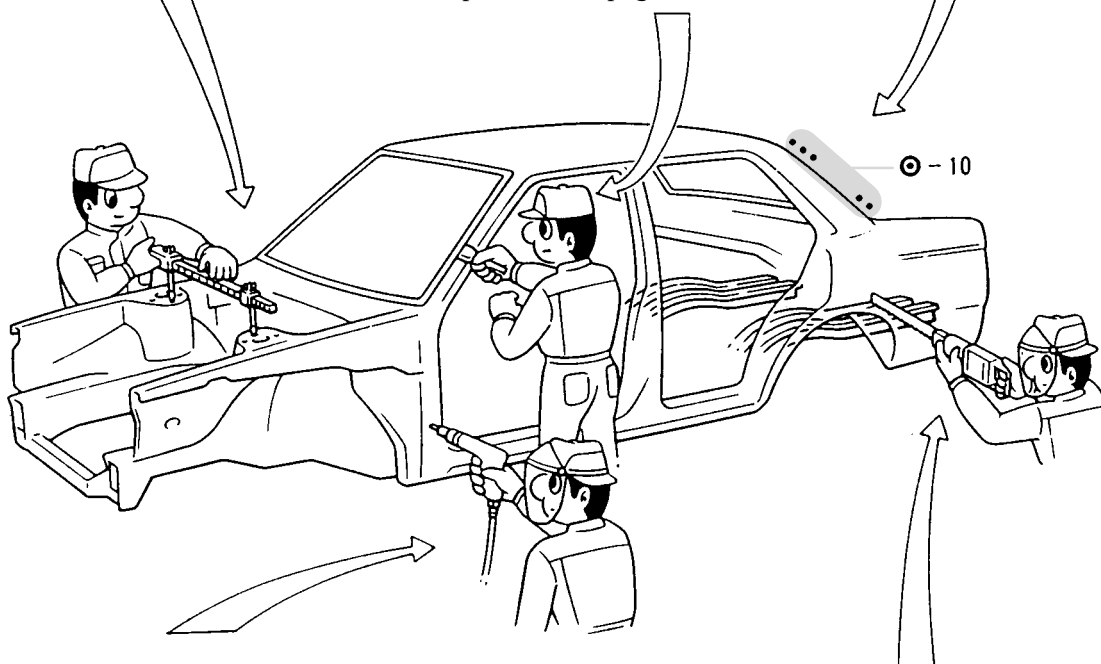
The number of spot welds and the panel positions to be removed are shown for your reference.

HINT: See "Symbols" on page IN-4,5.

REMOVAL OF ADJACENT COMPONENTS

When removing adjacent components, apply protective tape to the surrounding body and your tools to prevent damage.

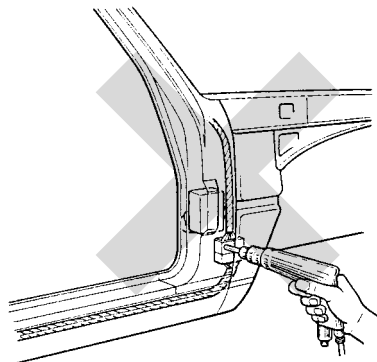
HINT: See "Handling Precautions on Related Components" on page IN-6.



PRECAUTIONS FOR DRILLING OR CUTTING

Check behind any area to be drilled or cut to insure that there are no hoses, wires, etc., that may be damaged.

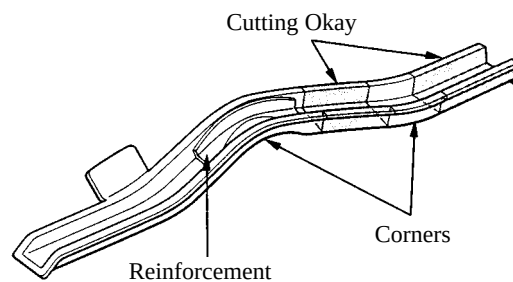
HINT: See "Handling Precautions on Related Components" on page IN-6.



WRONG

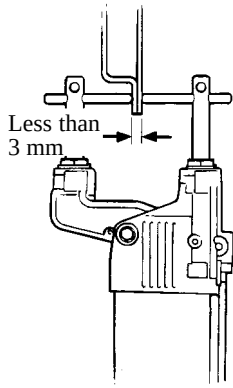
CUTTING AREA

Always cut in a straight line and avoid reinforced area.



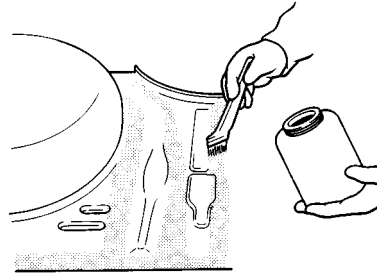
PREPARATION FOR INSTALLATION

SPOT WELD POINTS



When welding panels with a combined thickness of over 3 mm (0.12in.), use a MIG (Metal Inert Gas) welder for plug welding.
HINT: Spot welding will not provide sufficient durability for panels over 3 mm (0.12in.) thick.

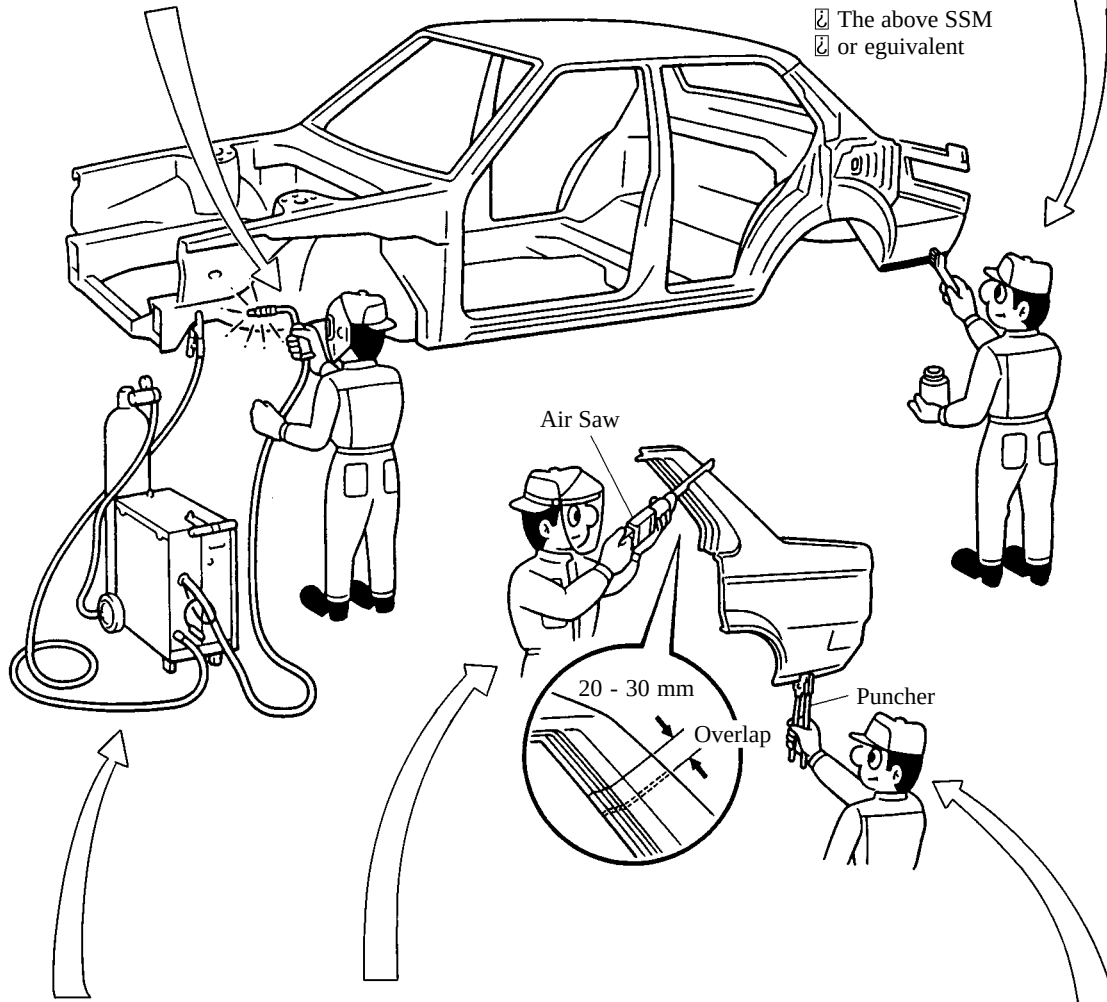
APPLICATION OF WELD-THROUGH PRIMER (SPOT SEALER)



Remove the paint from the portion of the new parts and body to be welded, and apply weld-through primer.
HINT: See "ANTI-RUST TREATMENT" on page AR-2.

Parts Name	Parts Number
Spot Sealer	08839-00070

- ☑ The above SSM
- ☑ or equivalent



SAFETY PRECAUTIONS FOR ELECTRICAL COMPONENTS.

When welding there is a danger that electrical components will be damaged by the electrical current flowing through the body.

Before starting work disconnect the negative terminal of the battery and ground the welder near the welding location of the body.

ROUGH CUTTING OF JOINTS

For joint areas, rough cut the new parts, leaving 20 - 30 mm (0.79 - 1.18in.) overlap.

MAKING HOLES FOR PLUG WELDING

For areas where a spot welder cannot be used, use a puncher or drill to make holes for plug welding.

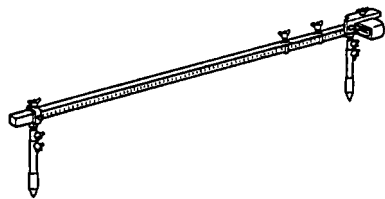
REFERENCE: mm (in.)

Thickness of welded portion	Size of plug hole
1.0 (0.04) under	5 (0.20) ø over
1.0 (0.04) - 1.5 (0.06)	6.5 (0.26) ø over
1.5 (0.06) over	8 (0.31) ø over

INSTALLATION

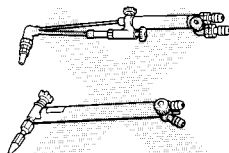
PRE-WELDING MEASUREMENTS

Always take measurements before installing underbody or engine components to insure correct assembly. After installation, confirm proper fit.



WELDING PRECAUTIONS

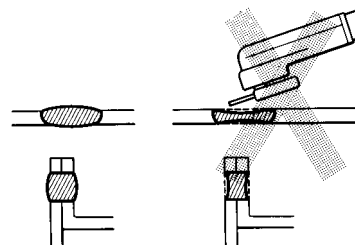
1. The number of welding spots should be as follows.
Spot weld: $1.3 \times \text{No. of manufacturer's spots}$.
Plug weld: More than No. of manufacturer's plugs.



WRONG

POST-WELDING REFINISHING

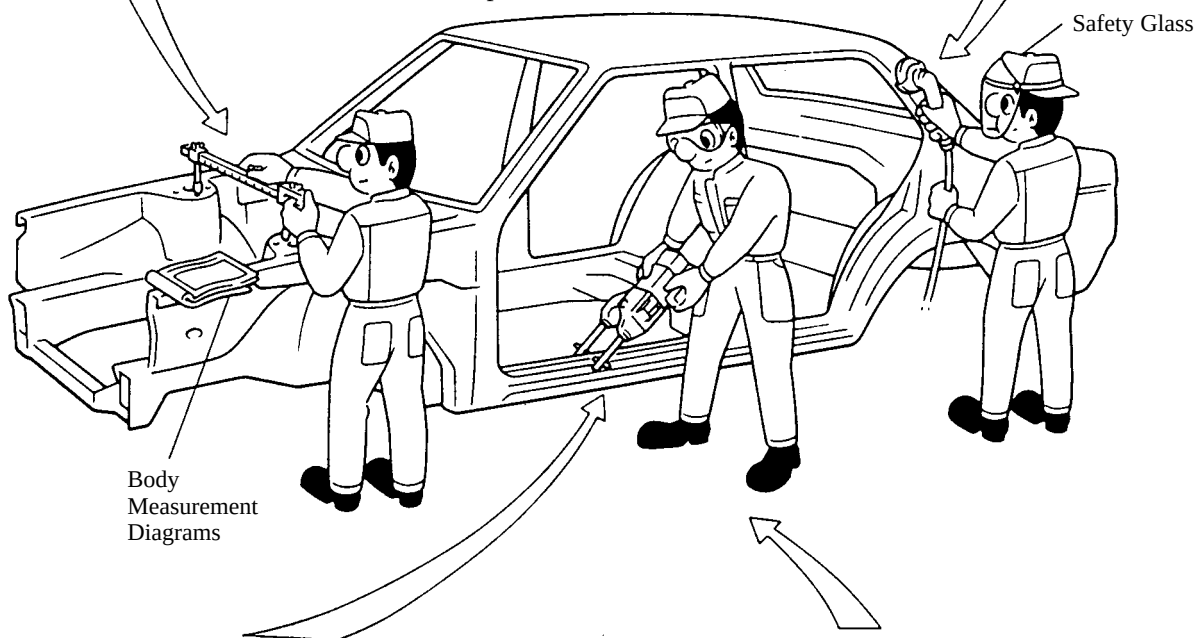
1. Always check the welded spots to insure they are secure.
2. When smoothing out the weld spots with a disc grinder, be careful not to grind off too much as this would weaken the weld.



OKAY

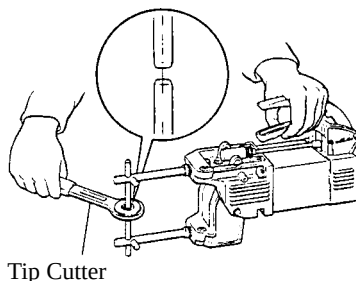
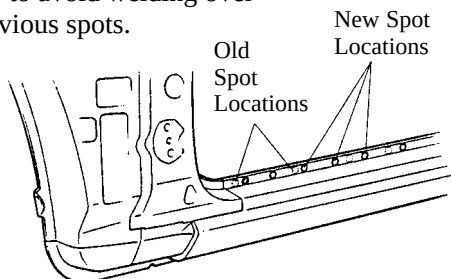
WRONG

2. Plug welding should be done with a MIG (Metal Inert Gas) welder. Do not gas weld or braze panels at areas other than specified.



SPOT WELD LOCATIONS

Try to avoid welding over previous spots.



SPOT WELDING PRECAUTIONS

1. The shape of the welding tip point has an effect on the strength of the weld.
2. Always insure that the seams and welding tip are free of paint.

ANTI-RUST TREATMENT

When replacing body panels, always apply body sealer, anti-rust agent or undercoat according to the requirements of your country.

HINT: For further details, see the description given in Section AR of this manual.

BODY SEALER

Apply body sealer to the required areas.



Cartridge Type



Tube Type

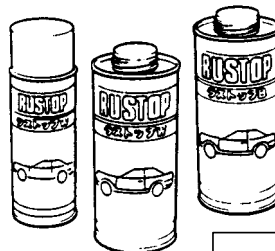
Parts Name	Parts Number
Body Sealer, White (Cartridge Type)	08839-00020
Body Sealer, White (Tube Type)	08839-00030
Body Sealer, Black (Cartridge Type)	08839-00040

☐ The above SSM or equivalent

ANTI-RUST AGENT (WAX)

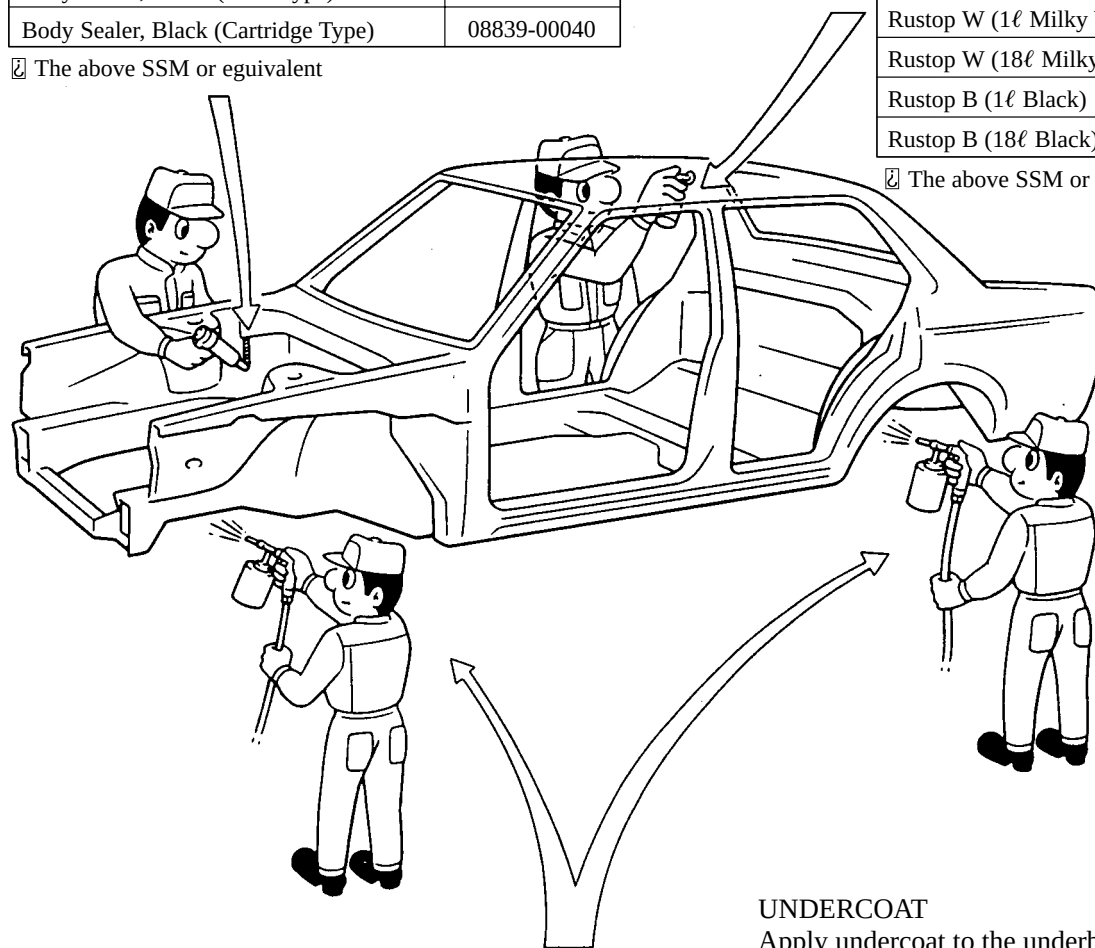
Apply anti-rust agent to following sections.

- Inside of the hems of the doors and hood.
- Around the hinges of the doors and hood.
- Inside of the welded parts with boxed cross-section.



Parts Name	Parts Number
Rustop W (Aerosol)	08860-00200
Rustop W (1ℓ Milky White)	08860-00210
Rustop W (18ℓ Milky White)	08860-00230
Rustop B (1ℓ Black)	08860-00220
Rustop B (18ℓ Black)	08860-00240

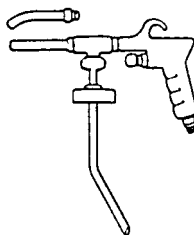
☐ The above SSM or equivalent



Undercoating
(Oil base)



Undercoating
(Water base)



Spray Gun

UNDERCOAT

Apply undercoat to the underbody and wheel housings.

Parts Name	Parts Number
Pastar UC (Oil Base)	08836-00155
Pastar UW (Water Base)	08836-00115
Pastar Gun (For thick application)	08836-00091

☐ The above SSM or equivalent

HANDLING PRECAUTIONS

1. The repair procedure for plastic body parts must conform with the type of plastic material.
2. Plastic body parts are identified by the codes in the following chart.
3. When repairing metal body parts adjoining plastic body parts (by brazing, frame cutting, welding, painting etc.), consideration must be given to the property of the plastic.

Code	Material name	Heat* resistant temperature limit °C (°F)	Resistance to alcohol or gasoline	Notes
AAS	Acrylonitrile Acrylic Styrene	80 (176)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid gasoline and organic or aromatic solvents.
ABS	Acrylonitrile Butadiene Styrene	80 (176)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid gasoline and organic or aromatic solvents.
AES	Acrylonitrile Ethylene Styrene	80 (176)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid gasoline and organic or aromatic solvents.
ASA	Acrylonitrile Styrene Acrylate	80 (176)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid gasoline and organic or aromatic solvents.
CAB	Cellulose Acetate	80 (176)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid gasoline and organic or aromatic solvents.
EPDM	Ethylene Propylene	100 (212)	Alcohol is harmless. Gasoline is harmless if applied only for short time in small amounts.	Most solvents are harmless but avoid dipping in gasoline, solvents, etc.
FRP	Fiber Reinforced Plastics	180 (356)	Alcohol and gasoline are harmless.	Avoid alkali.
EVA	Ethylene Acetate	70 (158)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid gasoline and organic or aromatic solvents.
PA	Polyamide (Nylon)	80 (176)	Alcohol and gasoline are harmless.	Avoid battery acid.
PBT	Polybutylene Terephthalate	160 (320)	Alcohol and gasoline are harmless.	Most solvents are harmless.
PC	Polycarbonate	120 (248)	Alcohol is harmless.	Avoid gasoline brake fluid, wax, wax removers and organic solvents. Avoid alkali.

*Temperatures higher than those listed here may result in material deformation during repair.

Code	Material name	Heat* resistant temperature limit °C (°F)	Resistance to alcohol or gasoline	Notes
PE	Polyethylene	80 (176)	Alcohol and gasoline are harmless.	Most solvents are harmless.
PET	Polyethylene Terephthalate	75 (167)	Alcohol and gasoline are harmless.	Avoid dipping in water.
PMMA	Polymethyl Methacrylate	80 (176)	Alcohol is harmless if applied only for short time in small amounts.	Avoid dipping or immersing in alcohol, gasoline, solvents, etc.
POM	Polyoxymethylene (Polyacetal)	100 (212)	Alcohol and gasoline are harmless.	Most solvents are harmless.
PP	Polypropylene	80 (176)	Alcohol and gasoline are harmless.	Most solvents are harmless.
PPO	Modified Polyphenylene Oxide	100 (212)	Alcohol is harmless.	Gasoline is harmless if applied only for quick wiping to remove grease.
PS	Polystyrene	60 (140)	Alcohol and gasoline are harmless if applied only for short time in small amounts.	Avoid dipping or immersing in alcohol, gasoline, solvents, etc.
PUR	Polyurethane	80 (176)	Alcohol is harmless if applied only for very short time in small amounts (e.g., quick wiping to remove grease).	Avoid dipping or immersing in alcohol, gasoline, solvents, etc.
PVC	Polyvinylchloride (Vinyl)	80 (176)	Alcohol and gasoline are harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid dipping or immersing in alcohol, gasoline, solvents, etc.
SAN	Styrene Acrylonitrile	80 (176)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid dipping or immersing in alcohol, gasoline, solvents etc.
TPO	Thermoplastic Olefine	80 (176)	Alcohol is harmless. Gasoline is harmless if applied only for short time in small amounts.	Most solvents are harmless but avoid dipping in gasoline, solvents, etc.
TPU	Thermoplastic Polyurethane	80 (176)	Alcohol is harmless if applied only for short time in small amounts (e.g., quick wiping to remove grease).	Avoid dipping or immersing in alcohol, gasoline, solvents, etc.
TSOP	TOYOTA Super Olefine Polymer	80 (176)	Alcohol and gasoline are harmless.	Most solvents are harmless.
UP	Unsaturated Polyester	110 (233)	Alcohol and gasoline are harmless.	Avoid alkali.

*Temperatures higher than those listed here may result in material deformation during repair.

HANDLING PRECAUTIONS ON RELATED COMPONENTS

1. FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER

The TOYOTA SIENNA is equipped with an SRS (Supplemental Restraint System), such as the driver airbag and front passenger airbag and seat belt pretensioners.

Failure to carry out service operations in the correct sequence could cause the supplemental restraint system to unexpectedly deploy during servicing, possibly leading to a serious accident.

Further, if a mistake is made in servicing the supplemental restraint system, it is possible the SRS may fail to operate when required. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedure described in this manual.

- Malfunction symptoms of the supplemental restraint system are difficult to confirm, so the diagnostic trouble codes become the most important source of information when troubleshooting.
When troubleshooting the supplemental restraint system, always inspect the diagnostic trouble codes before disconnecting the battery.
- Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.
(The supplemental restraint system is equipped with a back-up power source so that if work is started within 90 seconds of disconnecting the negative (-) terminal cable from the battery, the SRS may deploy.)
When the negative (-) terminal cable is disconnected from the battery, memory of the clock and audio systems will be cancelled. So before starting work, make a record of the contents memorized by the audio memory system.
Then when work is finished, reset the clock and audio systems as before.
To avoid erasing the memory of each memory system, never use a back-up power supply from outside the vehicle.
- Even in cases of a minor collision where the SRS does not deploy, the passenger's airbag assembly, the steering wheel pad and seat belt pretensioners should be inspected.
- Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.
- Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.
- Never disassemble and repair the airbag sensor assembly, steering wheel pad in order to reuse it.
- If the airbag sensor assembly, steering wheel pad have been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace them with new ones.
- Do not expose the airbag sensor assembly, steering wheel pad directly to hot air or flames.
- Use a volt/ohmmeter with high impedance (10 k Ω /V minimum) for troubleshooting of the electrical circuit.
- Information labels are attached to the periphery of the SRS components. Follow the instructions on the notices.
- After work on the supplemental restraint system is completed, check the SRS warning light.
- Before repairing the body, remove the SRS parts if, during repair, shocks are likely to be applied to the sensors due to vibrations of the body or direct tapping with tools or other parts.
- Do not expose the SRS parts directly to hot air or flames.

NOTICE:

- 1) *The maximum ambient temperature tolerance is 120°C (248°F) for the front airbag sensor, 105°C (221°F) for the center airbag sensor assembly and 93°C (200°F) for the steering wheel pad, and front passenger airbag assembly. If it is possible that the ambient temperature may reach or exceed the temperature limit, remove the sensors and the steering wheel pad from the vehicle or protect them with a hot insulation material before starting work.*
 - 2) *Prior to welding, remove adjacent SRS parts from the vehicle or protect them with fire-proof covers.*
- If the vehicle is damaged, visually inspect for damage to the steering wheel pad using the inspection procedures described in section RS of the repair manual for the relevant model year.

STEERING WHEEL PAD (with Airbag)

- When removing the steering wheel pad or handling a new steering wheel pad, it should be placed with the pad top surface facing up.
In this case, the twin-lock type connector lock lever should be in the locked state and care should be taken to place it so the connector will not be damaged. In addition do not store a steering wheel pad on top of another one. Storing the pad with its metallic surface up may lead to a serious accident if the airbag inflates for some reason.
- Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)
- Grease should not be applied to the steering wheel pad and the pad should not be cleaned with detergents of any kind.
- Store the steering wheel pad where the ambient temperature remains below 93°C (200°F), without high humidity and away from electrical noise.
- When using electric welding, first disconnect the airbag connector (yellow color and 2 pins) under the steering column near the combination switch connector before starting work.
- When disposing of a vehicle or the steering wheel pad alone, the airbag should be deployed using an SST before disposal.
Carry out the operation in a safe place away from electrical noise.

FRONT PASSENGER AIRBAG ASSEMBLY

- Always store a removed or new front passenger airbag assembly with the airbag deployment direction facing up. Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.
- Never measure the resistance of the airbag squib.
(This may cause the airbag deploy, which is very dangerous.)
- Grease should not be applied to the front passenger airbag assembly and the airbag door should not be cleaned with detergents of any kind.
- Store the airbag assembly where the ambient temperature remains below 93°C (200°F), without high humidity and away from electrical noise.
- When using electric welding, first disconnect the airbag connector (yellow color and 2 pins) installed on the glove compartment finish plate at the left side of the glove compartment before starting work.
- When disposing of a vehicle or the airbag assembly alone, the airbag should be deployed using an SST before disposal.
Perform the operation in a safe place away from electrical noise.

SEAT BELT PRETENSIONER

- Before doing any operation which will apply a strong shock to the vehicle, or before removing the seat belt pretensioner, be sure to apply the sensor shock.
- Never disassemble the seat belt pretensioner.
- Do not subject the seat belt pretensioner to shocks or bring magnets close to it.
- Do not expose the seat belt pretensioner to high temperature or fire.
- Do not drop the seat belt pretensioner. Never use a seat belt pretensioner which has been dropped.
- Never install the seat belt pretensioner in another vehicle.
- Store removed seat belt pretensioners on a flat, stable surface.
- After frontal collision, always check whether the seat belt pretensioners have been activated.
- When disposing of a vehicle or the pretensioner by itself, always activate the pretensioner before disposal.
- The seat belt pretensioner is hot when activated, so let it cool down fully before you dispose of it.
Never apply water to the seat belt pretensioner.

AIRBAG SENSOR ASSEMBLY

- Never reuse the airbag sensor assembly involved in a collision when the SRS has deployed.
- The connectors to the airbag sensor assembly should be connected or disconnected with the sensor mounted on the floor. If the connectors are connected or disconnected while the airbag sensor assembly is not mounted to the floor, it could cause undesired ignition of the supplemental restraint system.
- Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery, even if only loosening the set bolts of the airbag sensor assembly.

WIRE HARNESS AND CONNECTOR

- The SRS wire harness is integrated with the cowl wire harness assembly and floor wire harness assembly. The wires for the SRS wire harness are encased in a yellow corrugated tube. All the connectors for the system are also a standard yellow color. If the SRS wire harness becomes disconnected or the connector becomes broken due to an accident, etc., repair or replace it as shown on page.

2. BRAKE SYSTEM

The brake system is one of the most important safety components. Always follow the directions and notes given in section BR of the repair manual for the relevant model year when handling brake system parts.

NOTICE: When repairing the brake master cylinder or TRAC system, bleed the air out of the TRAC system.

3. DRIVE TRAIN AND CHASSIS

The drive train and chassis are components that can have great effects on the running performance and vibration resistance of the vehicle. After installing components in the sections listed in the table below, perform alignments to ensure correct mounting angles and dimensions. Particularly accurate repair of the body must also be done to ensure correct alignment.

HINT: Correct procedures and special tools are required for alignment. Always follow the directions given in the repair manual for the relevant model during alignment and section DI of this manual.

Component to be aligned	Section of repair manual for relevant model
Front Wheels	Suspension and Axle (SA) section
Rear Wheels	Suspension and Axle (SA) section

4. COMPONENTS ADJACENT TO THE BODY PANELS

Various types of component parts are mounted directly on or adjacently to the body panels. Strictly observe the following precautions to prevent damaging these components and the body panels during handling.

- Before repairing the body panels, remove their components or apply protective covers over the components.
- Before prying components off using a screwdriver or a scraper, etc., attach protective tape to the tool tip or blade to prevent damaging the components and the body paint.
- Before removing components from the outer surface of the body, attach protective tape to the body to ensure no damage to painted areas.

HINT: Apply touch-up paint to any damaged paint surfaces.

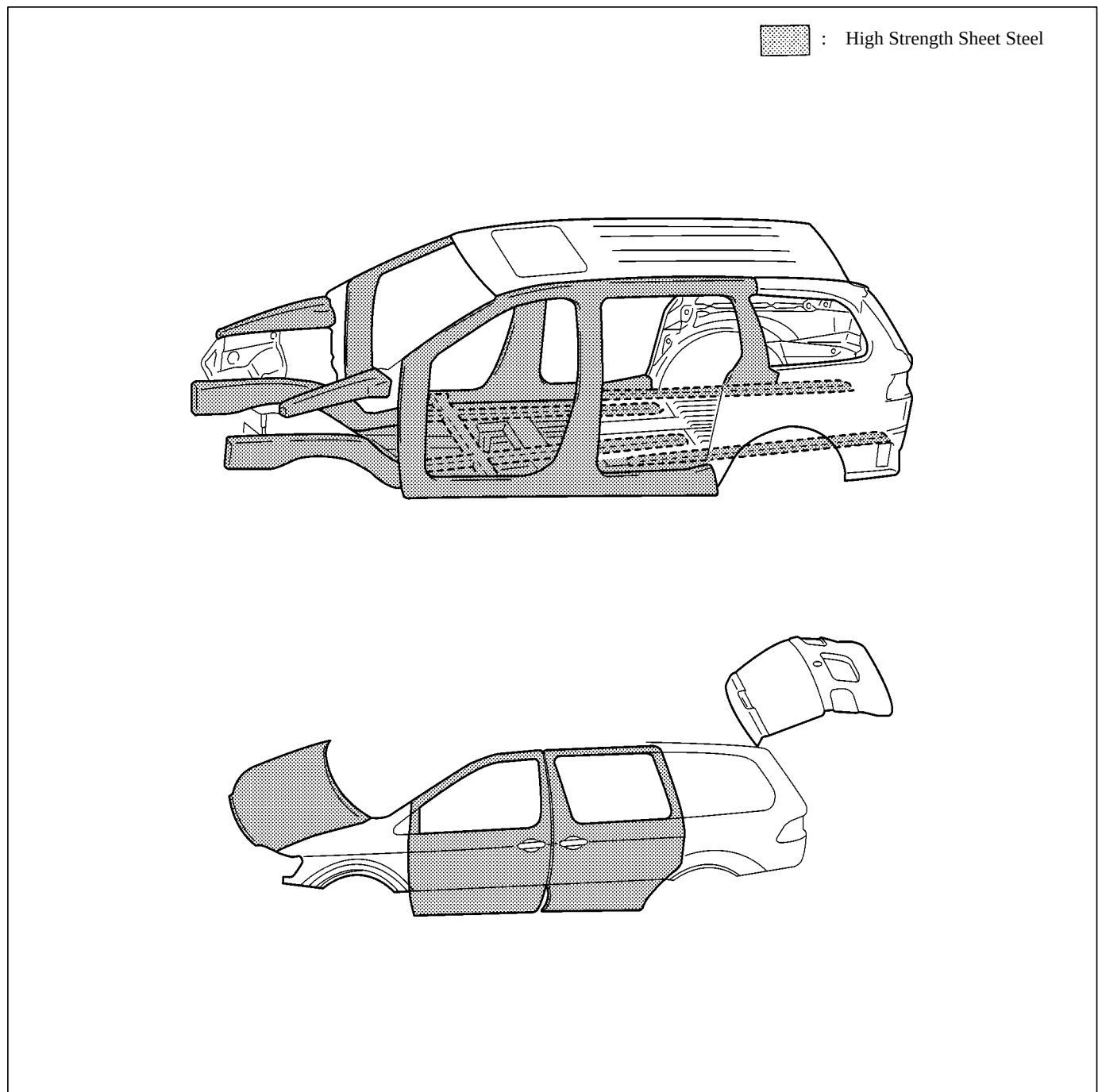
- Before drilling or cutting sections, make sure that there are no wires, etc. on the reverse side.

HIGH-STRENGTH STEEL (HSS) PARTS

Generally, High-Strength Steel (HSS) is that which has an intensity value of at 35 kgf/mm² (343 MPa), and distinguished from mild steel.

The handling of HSS is the same as for mild steel, but the following should be observed.

1. **Panel Hammering:** Because HSS is thinner than mild steel, care should be taken to avoid warping during hammering operations.
2. **Removing Spot Welds:** Because HSS is tougher than mild steel, damage will occur more easily to a regular drill. Therefore, an HSS Spot Cutter is recommended. Also, use a high-torque drill at low speed, and supply grinding oil to the drill use.
3. **Panel Welding:** Panel welding procedures for HSS are exactly the same as for mild steel. Plug welding should be done with MIG (Metal Inert Gas) welder. Do not gas weld or braze panels at areas other than specified.



HOW TO USE THIS MANUAL

Each repair method description provided in Section RE of this manual comprises two pages, divided into 2 blocks (REMOVAL AND INSTALLATION) and includes illustrations to facilitate body repair.

RE-40

BODY PANEL REPLACEMENT

QUARTER PANEL (CUT): 4-Door Left Side

REMOVAL

mm	in.
110	4.33
150	5.91
230	9.06

B

C

D

E

F

G

H

1. Cut and join the parts at the locations as shown above.

A : REPLACEMENT PARTS AND METHOD

QUARTER PANEL (CUT)

Replacement method

(ASSY) Assembly replacement

(CUT) Major cutting (less than 1/2 of parts used)

(CUT-H) Half cutting (about 1/2 of parts used)

(CUT-P) Partial cutting (most of parts used)

Replacement Parts

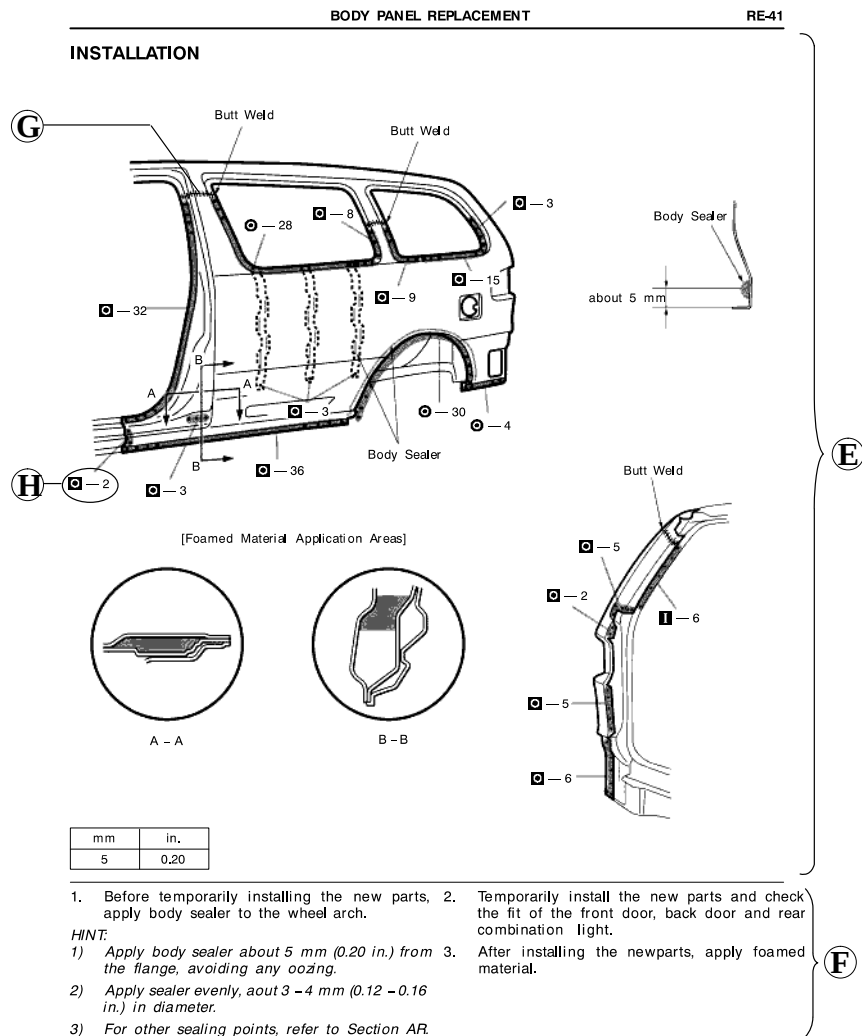
B : PARTS LOCATION

C : REMOVAL DIAGRAM

Describes in detail removal of the damaged parts involving repair by cutting.

D : REMOVAL GUIDE

Provides additional information to more efficiently help you perform the removal.

**(E) : INSTALLATION DIAGRAM**

Describes in detail installation of the new parts involving repair by welding and/or cutting, but excluding painting.

(F) : INSTALLATION GUIDE

Provides additional information to more efficiently help you perform the installation.

(G) : SYMBOLS

See page IN-4.

(H) : ILLUSTRATION OF WELD POINTS

Weld method and panel position symbols.
See page IN-5.

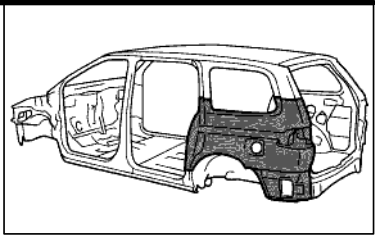
LOCATION OF PLASTIC BODY PARTS

Parts Name	Code
Front Bumper Cover	TSOP
Radiator Grille	ABS/AES
Front Turn Signal Light	PMMA/PP
Cowl Top Ventilator Louver	PP
Outside Moulding (Fender · Front Door · Slide Door · Quarter)	TSOP
Outside Handle (Front Door · Slide Door)	PC
Front Fender Garnish	AAS
Outer Rear View Mirror	ASA
Slide Door Center Rail Garnish	ABS
Center Stop Light	PC
Rear Combination Light	PMMA/PP
Rear Light	PMMA/PP/PC
Back Door Garnish	PP
License Plate Light	PC/PA/ABS
Back Door Outside Moulding	PP
Rear Bumper Cover	PC
Roof Drip Side Finish Moulding	PVC

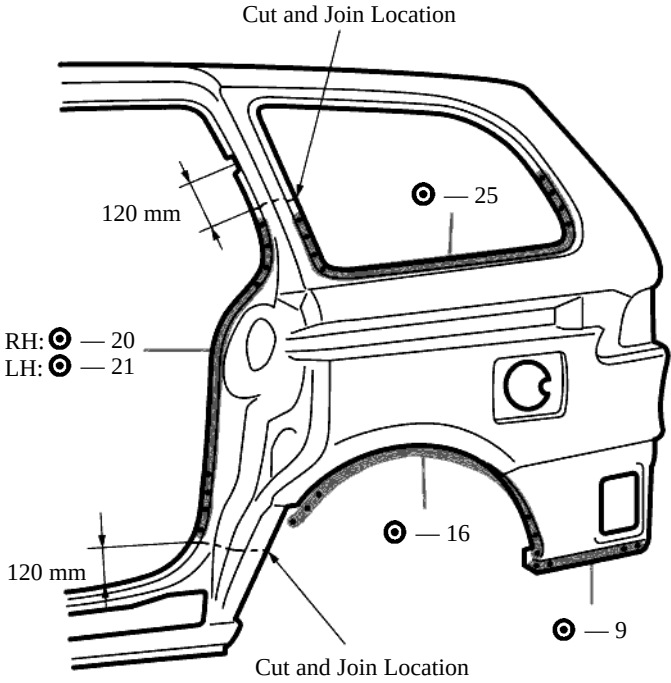
HINT:

- Resin material differs with model.
- / Made up of 2 or more kinds of materials.

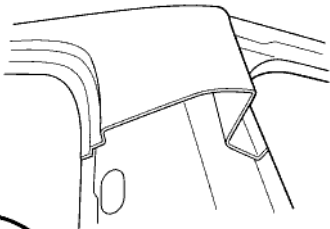
QUARTER PANEL (CUT): 4-Door Right Side, 5-Door



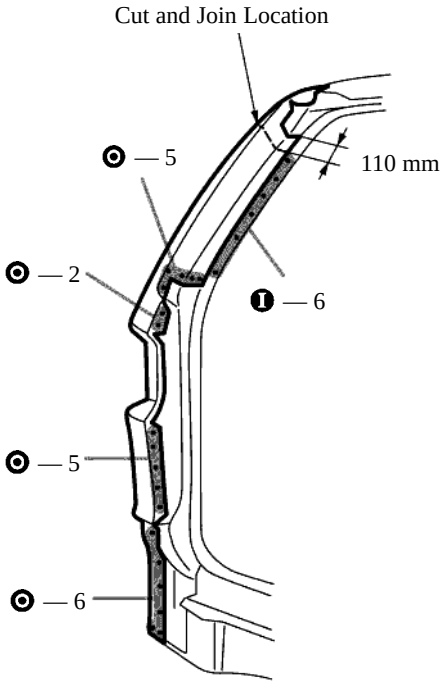
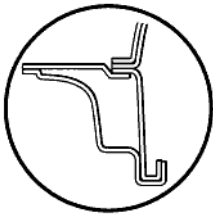
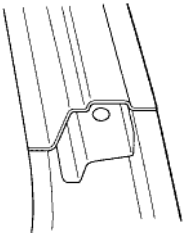
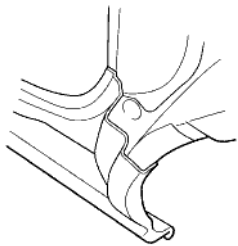
REMOVAL



[Cut and Join Location]



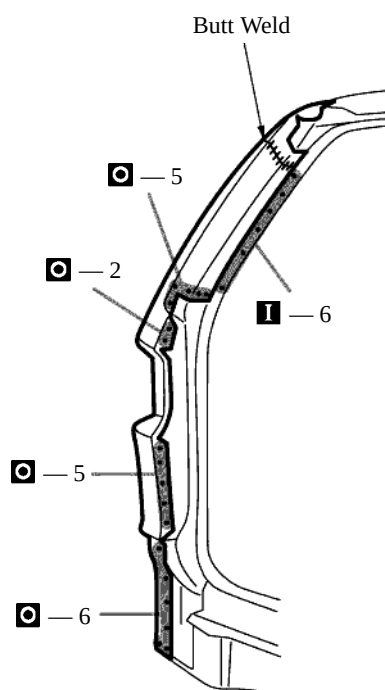
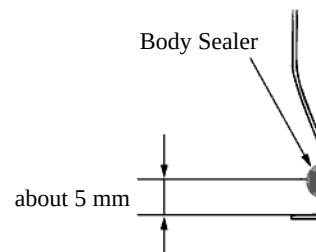
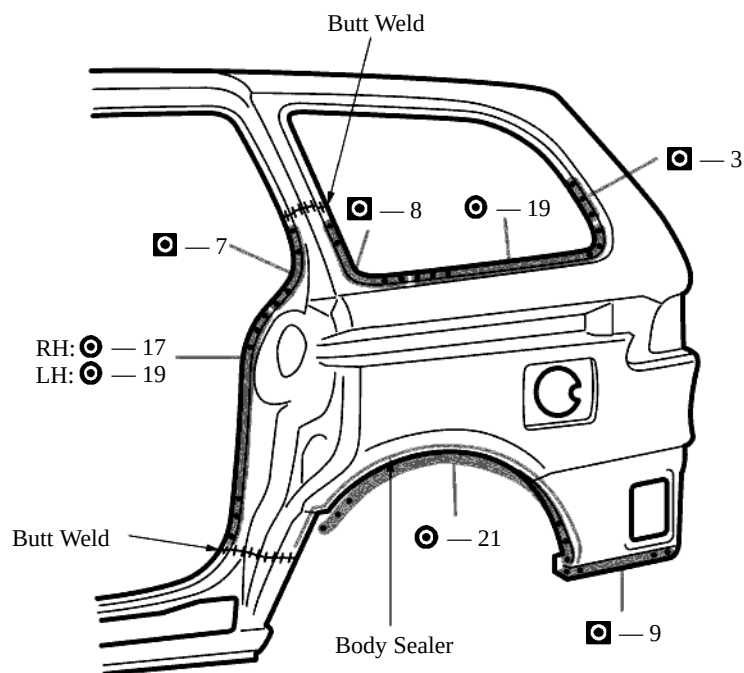
[Cut and Join Locations]



1. Cut and join the parts at the locations as shown above.

mm	in.
110	4.33
120	4.72

INSTALLATION

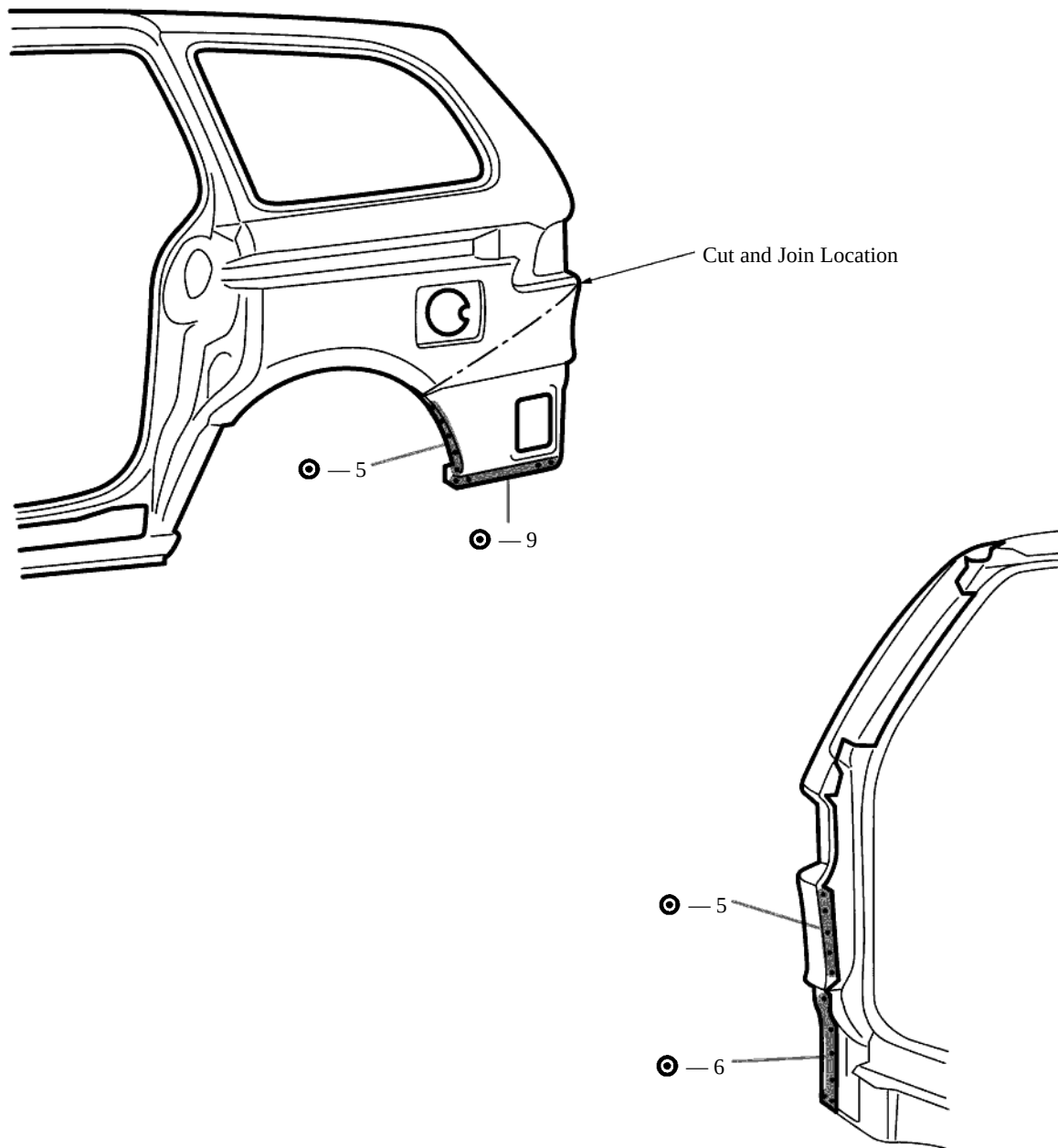
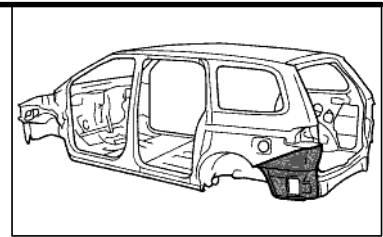


mm	in.
5	0.20

1. Before temporarily installing the new parts, apply body sealer to the wheel arch.
2. Temporarily installing the new parts, check the fit of the slide door, back door and rear combination light.

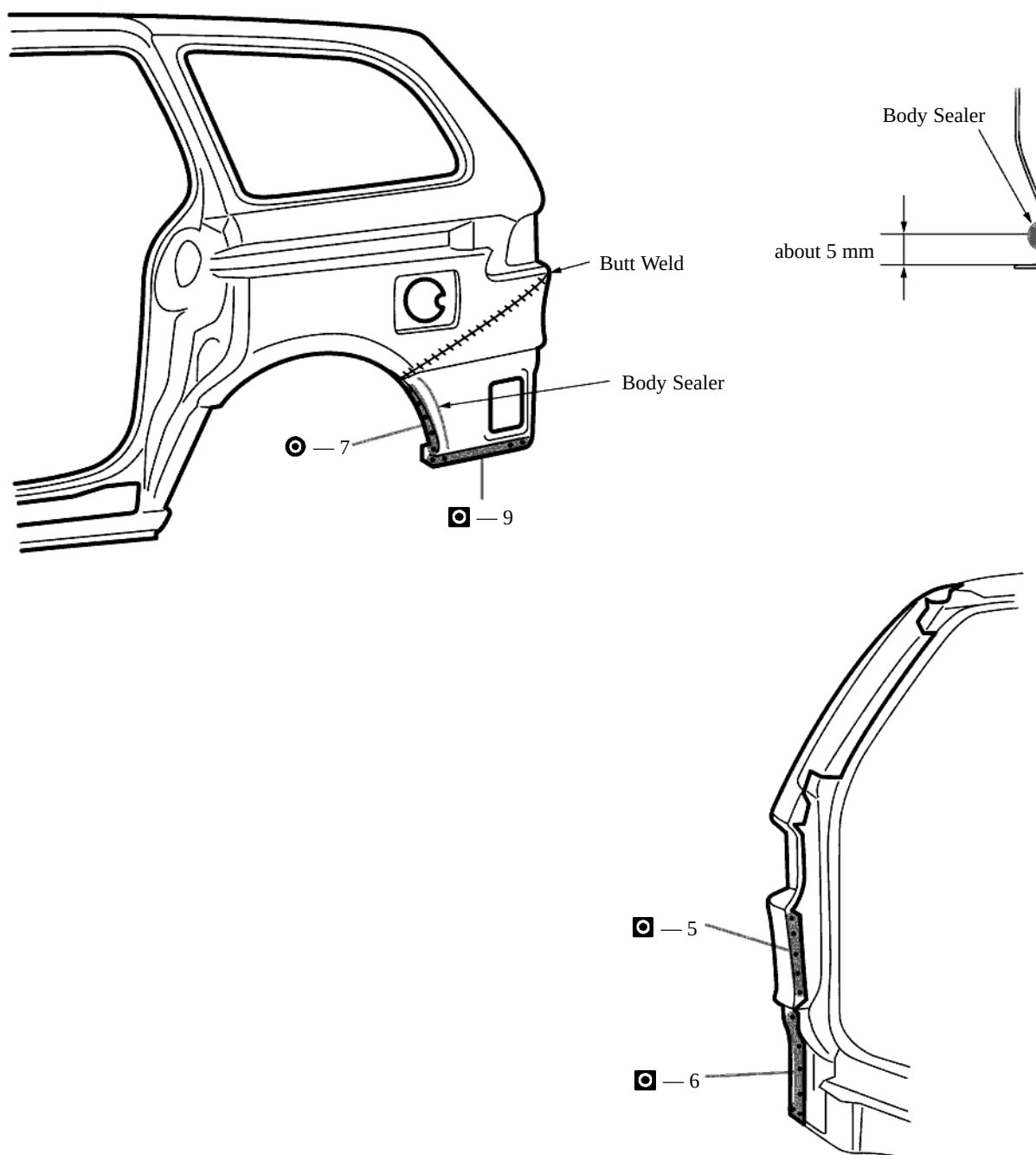
HINT:

- 1) Apply body sealer about 5 mm (0.20 in.) from the flange, avoiding any oozing.
- 2) Apply sealer evenly, about 3 - 4 mm (0.12 - 0.16 in.) in diameter.
- 3) For other sealing points, refer to section AR.

QUARTER PANEL (CUT-P)**REMOVAL**

1. Cut and join the parts at the location as shown above.

INSTALLATION



mm	in.
5	0.20

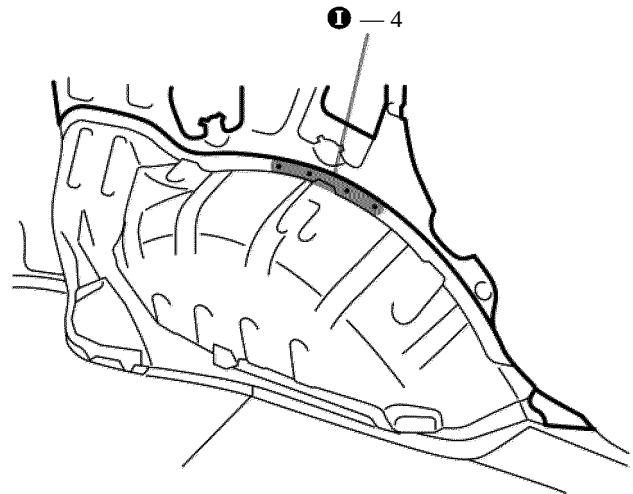
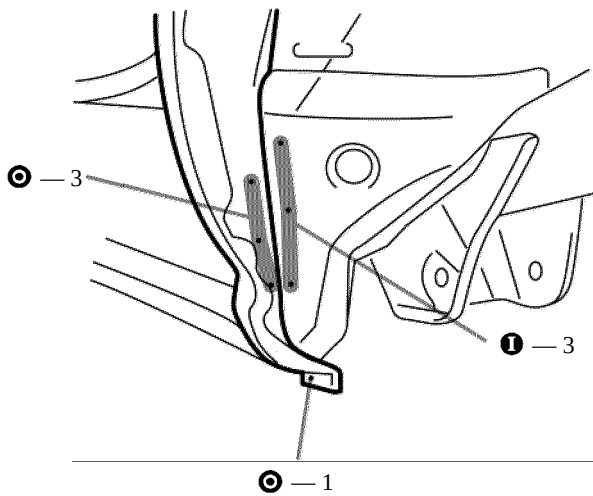
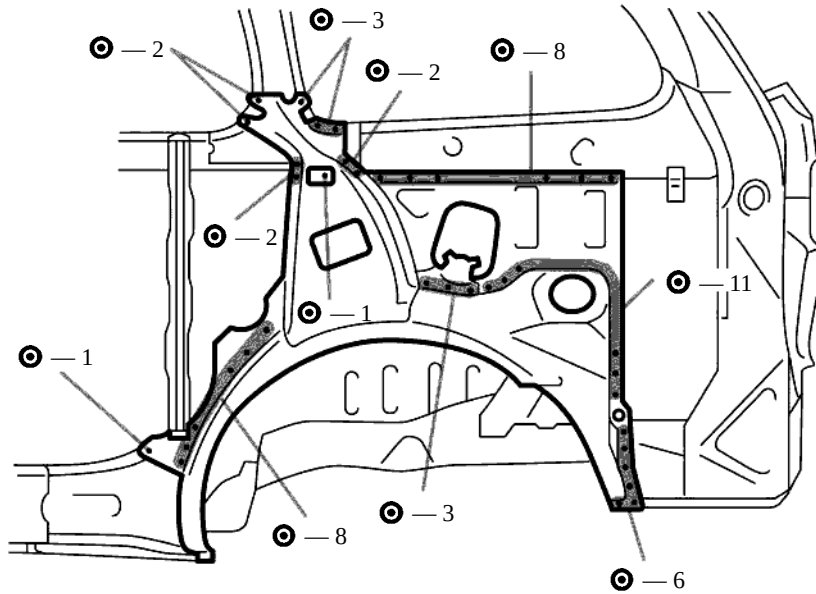
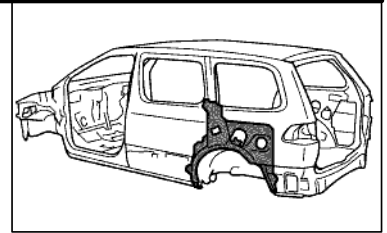
1. Before temporarily installing the new parts, apply body sealer to the wheel arch.
2. Temporarily installing the new parts, check the fit of the back door.

HINT:

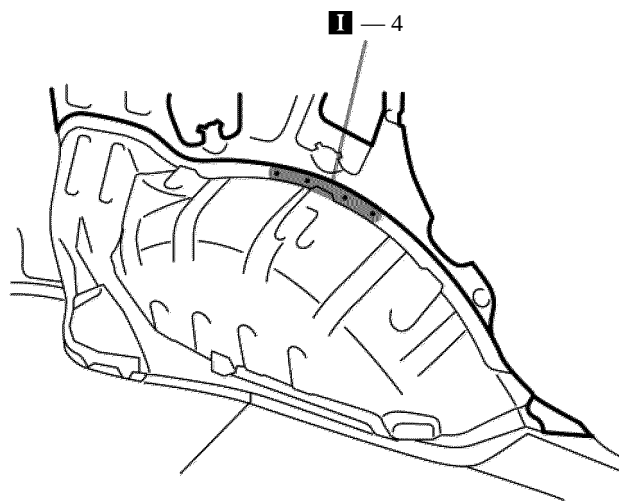
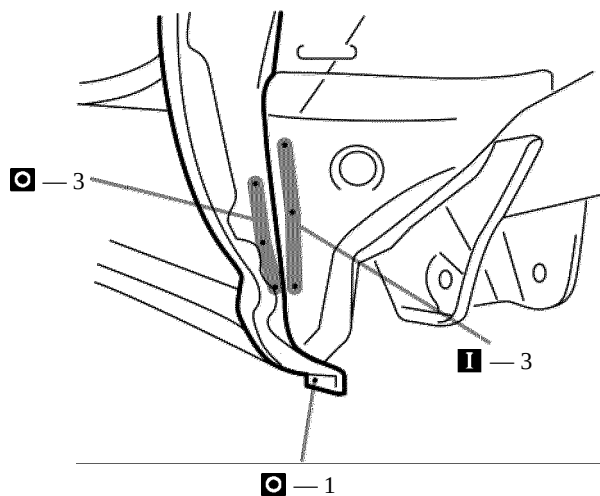
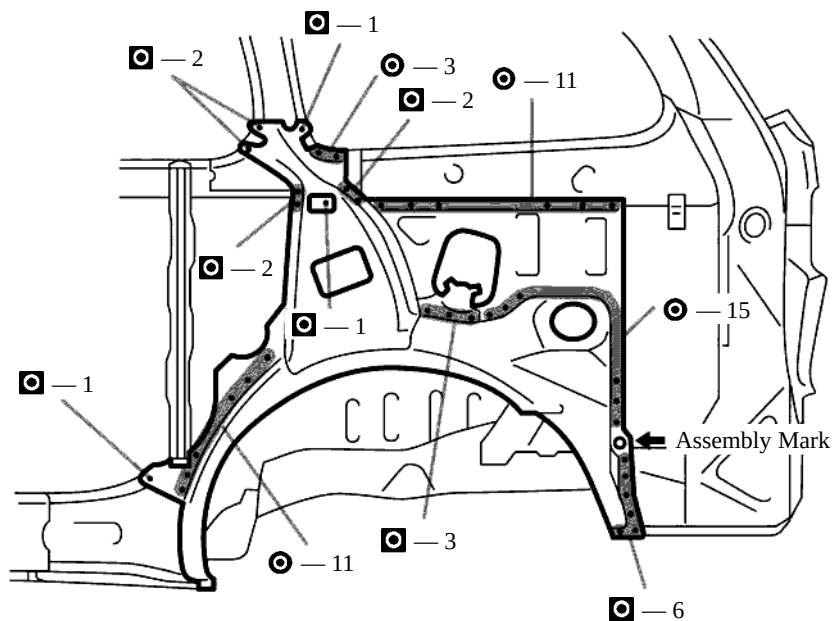
- 1) Apply body sealer about 5 mm (0.20 in.) from the flange, avoiding any oozing.
- 2) Apply sealer evenly, about 3 - 4 mm (0.12 - 0.16 in.) in diameter.
- 3) For other sealing points, refer to section AR.

QUARTER WHEEL HOUSING OUTER PANEL (ASSY): 4-Door Left Side

REMOVAL (With the quarter panel removed.)

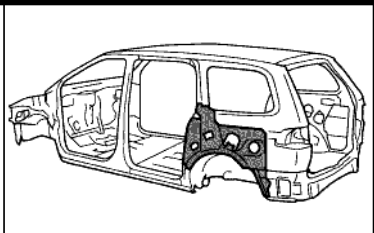


INSTALLATION

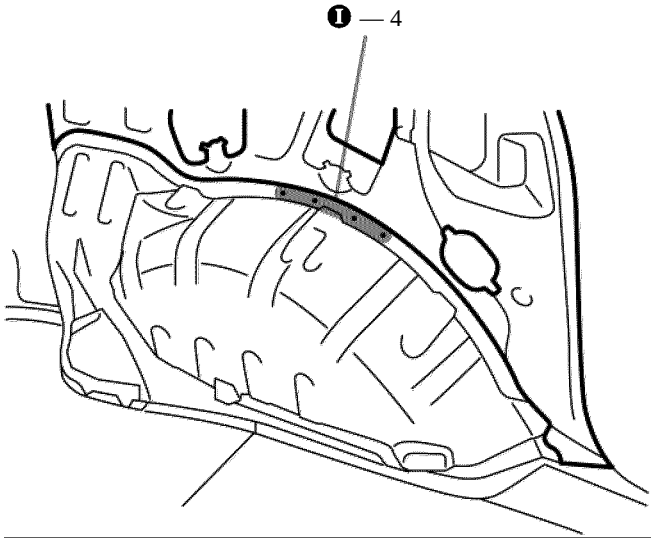
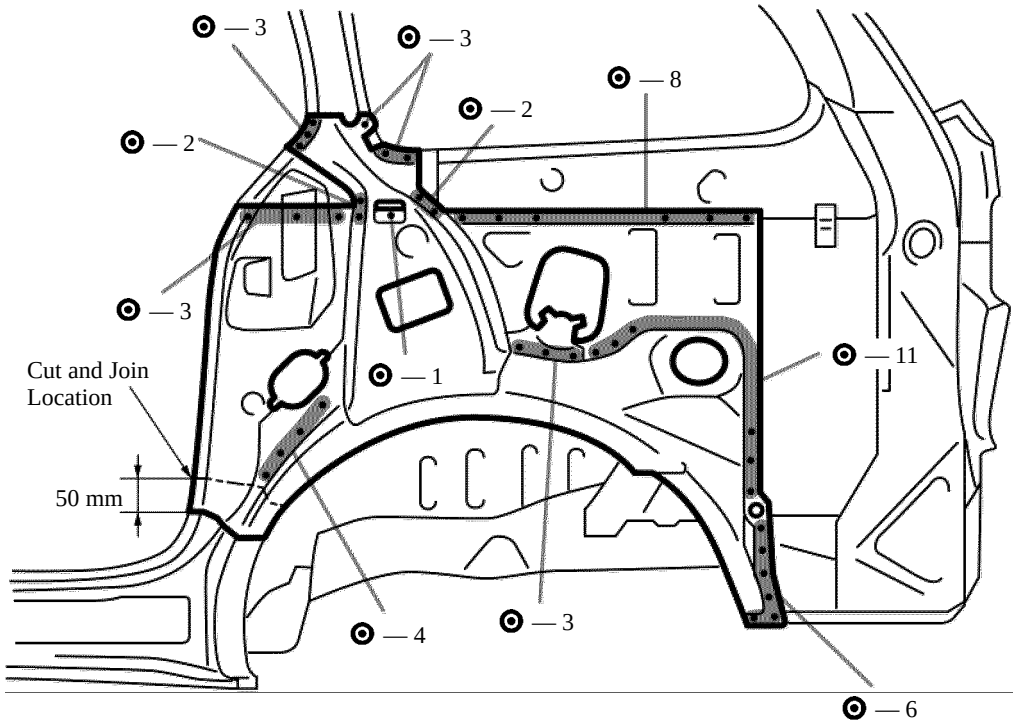


1. Determine the position of the new parts by the assembly marks of the inner and outer panels.
2. Before welding the new parts, temporarily install the quarter panel and check the fit.

**QUARTER WHEEL HOUSING OUTER PANEL
(CUT): 5-Door Left Side**



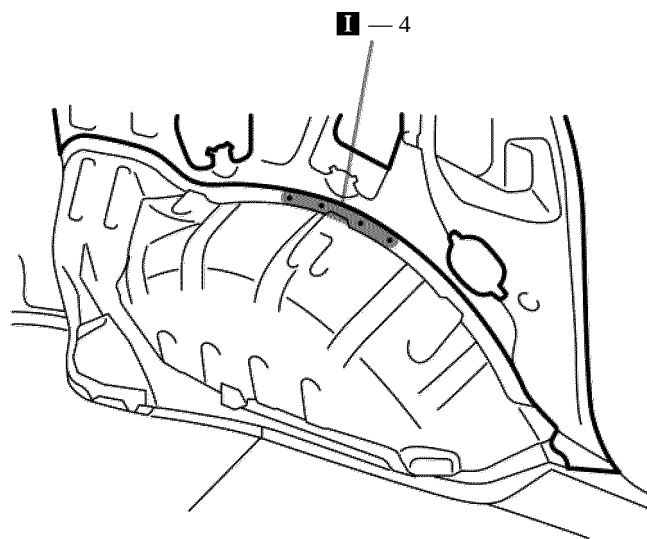
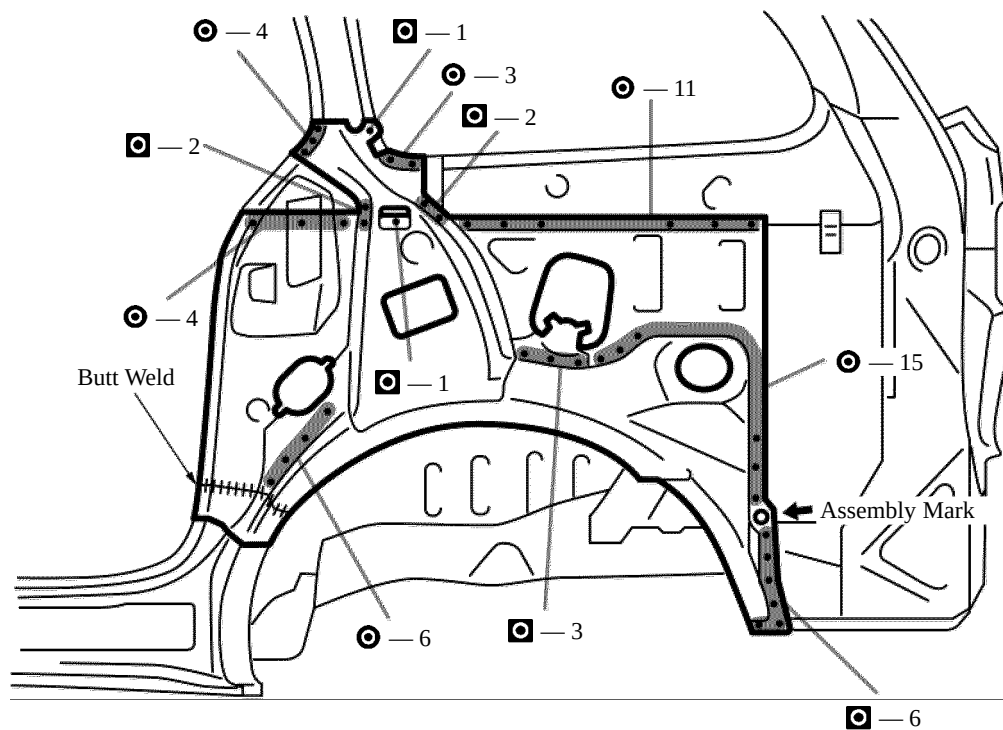
REMOVAL (With the quarter panel removed.)



mm	in.
50	1.97

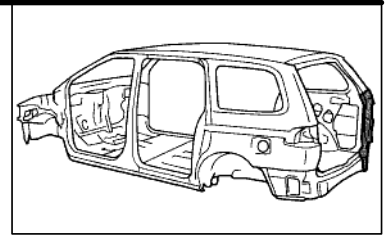
1. Cut and join the parts at the location as shown above.

INSTALLATION

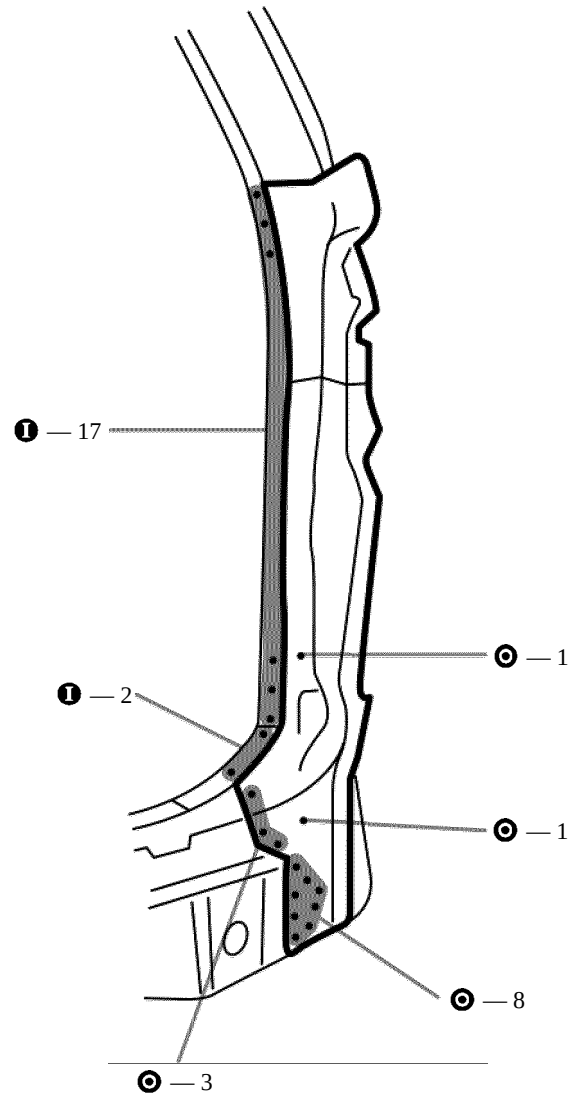


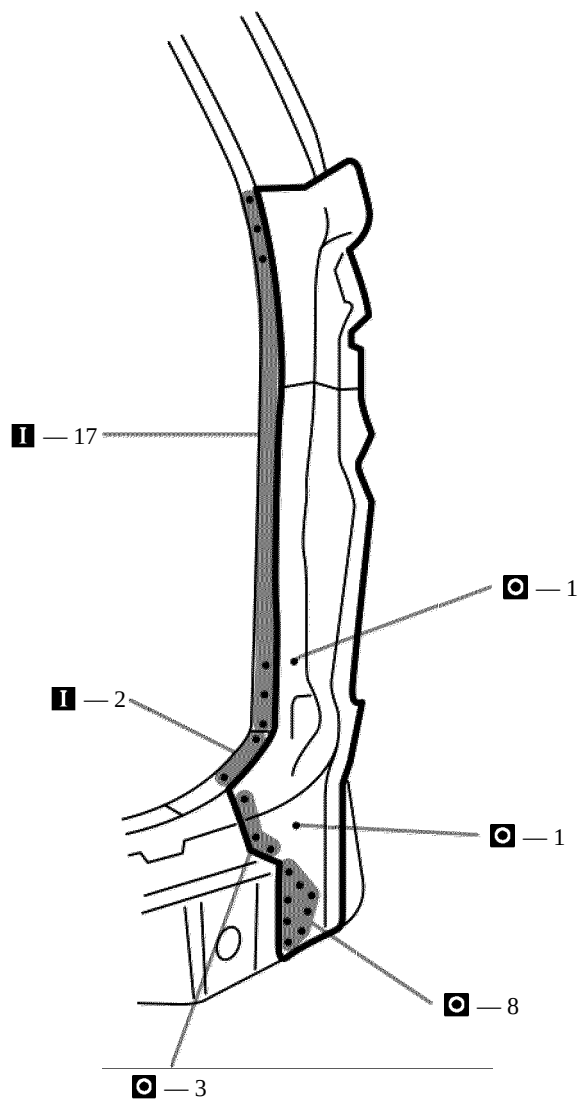
1. Determine the position of the new parts by the assembly marks of the inner and outer panels.
2. Before welding the new parts, temporarily install the quarter panel and check the fit.

QUARTER PANEL REAR LOWER EXTENSION (ASSY)



REMOVAL (With the quarter panel removed.)

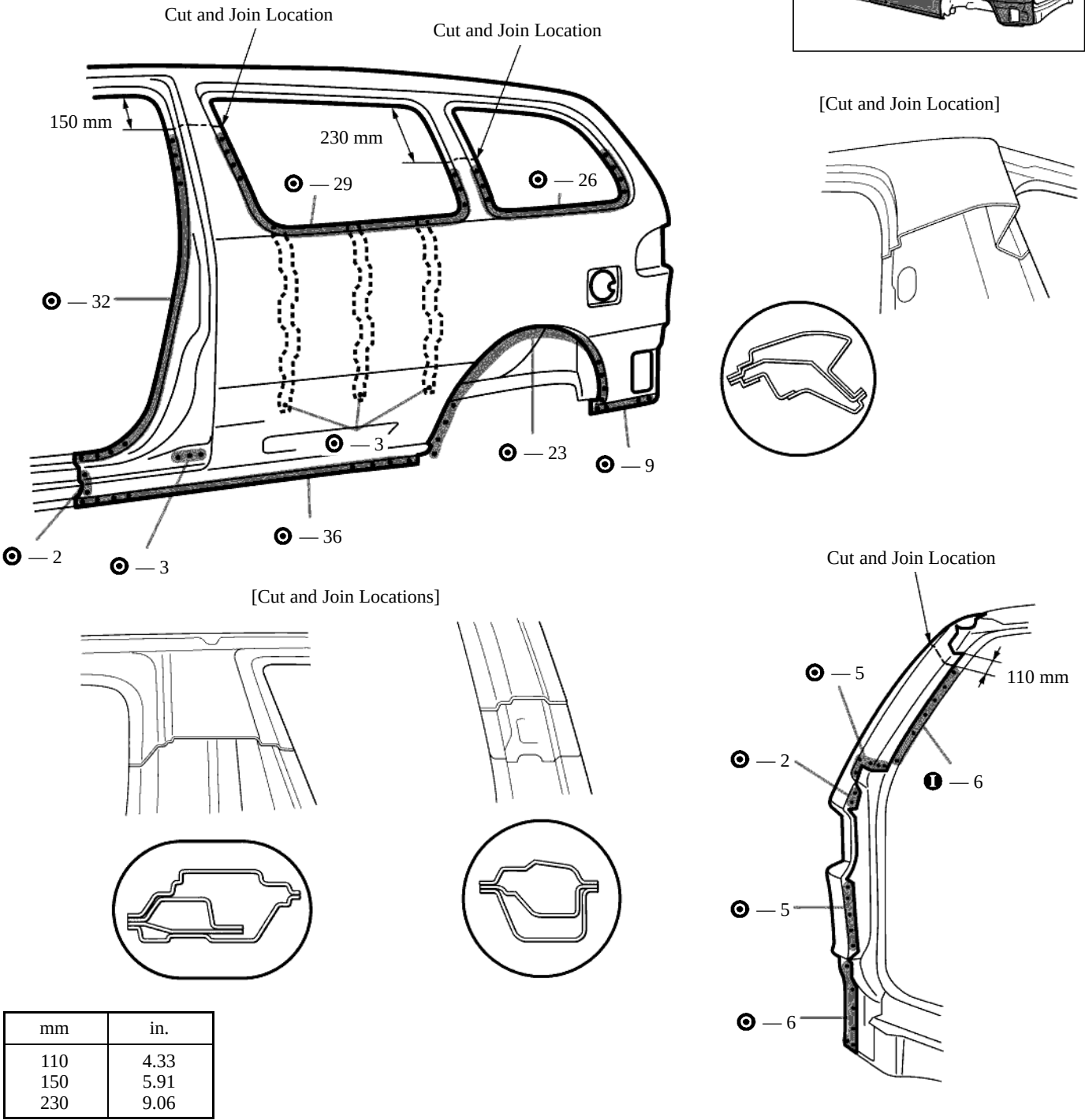


INSTALLATION

1. Before welding the new parts, temporarily install the quarter panel and check the fit.

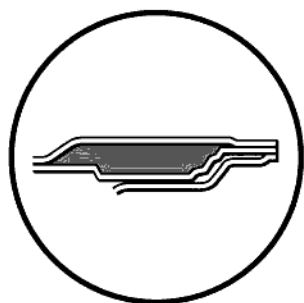
QUARTER PANEL (CUT): 4-Door Left Side

REMOVAL

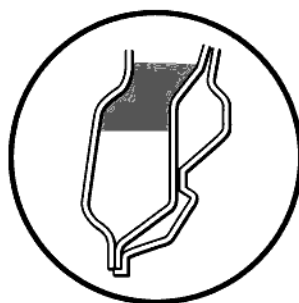


1. Cut and join the parts at the locations as shown above.

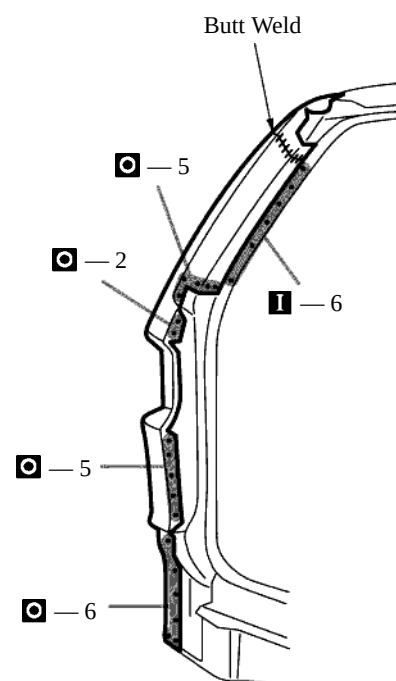
INSTALLATION



A - A



B - B



mm	in.
5	0.20

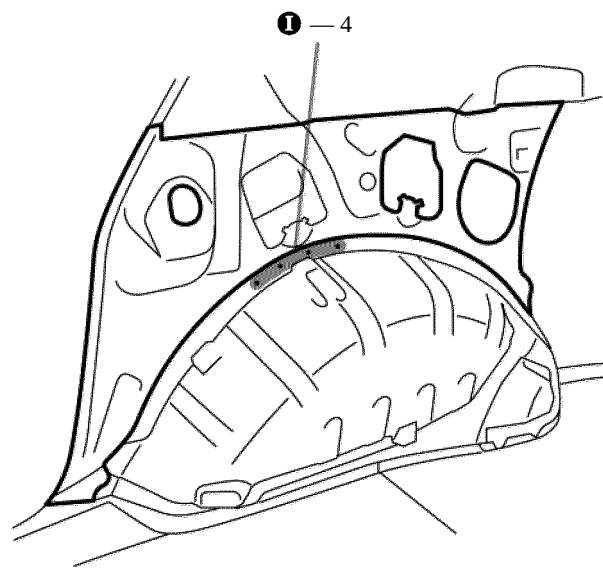
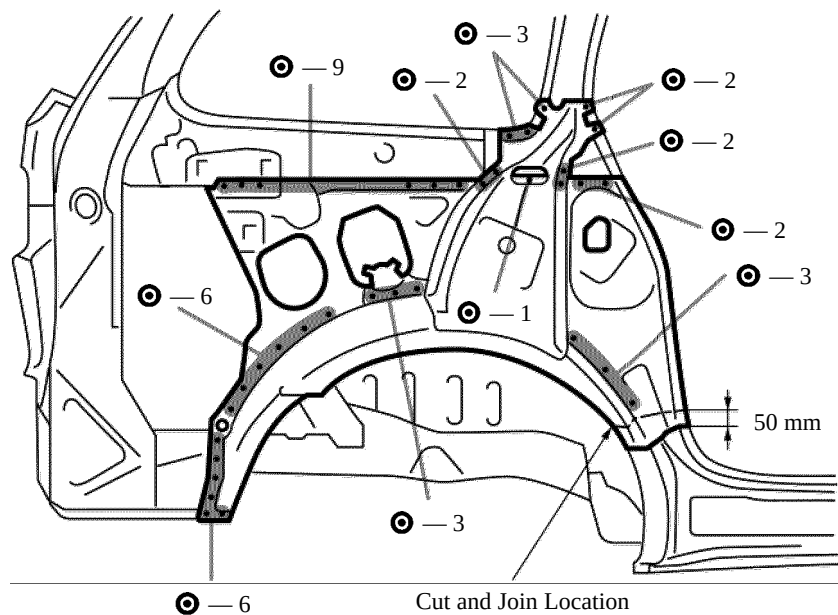
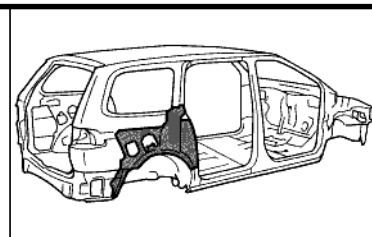
1. Before temporarily installing the new parts, apply body sealer to the wheel arch.
2. Temporarily install the new parts and check the fit of the front door, back door and rear combination light.
3. After installing the new parts, apply foamed material.

HINT:

- 1) Apply body sealer about 5 mm (0.20 in.) from the flange, avoiding any oozing.
- 2) Apply sealer evenly, about 3 - 4 mm (0.12 - 0.16 in.) in diameter.
- 3) For other sealing points, refer to Section AR.

QUARTER WHEEL HOUSING OUTER PANEL (CUT): Right Side

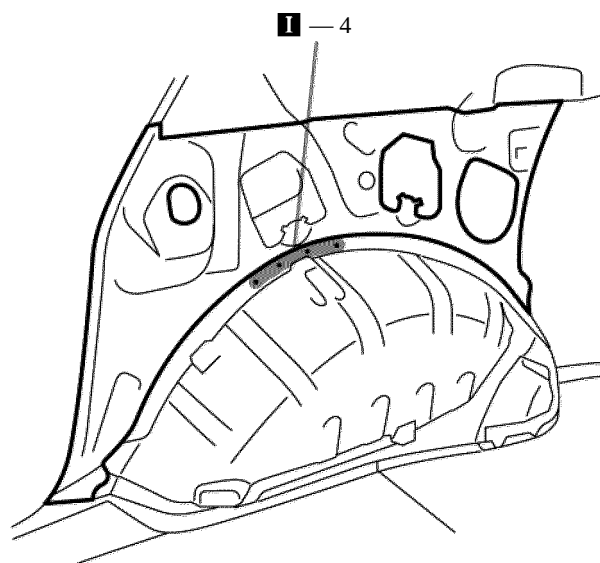
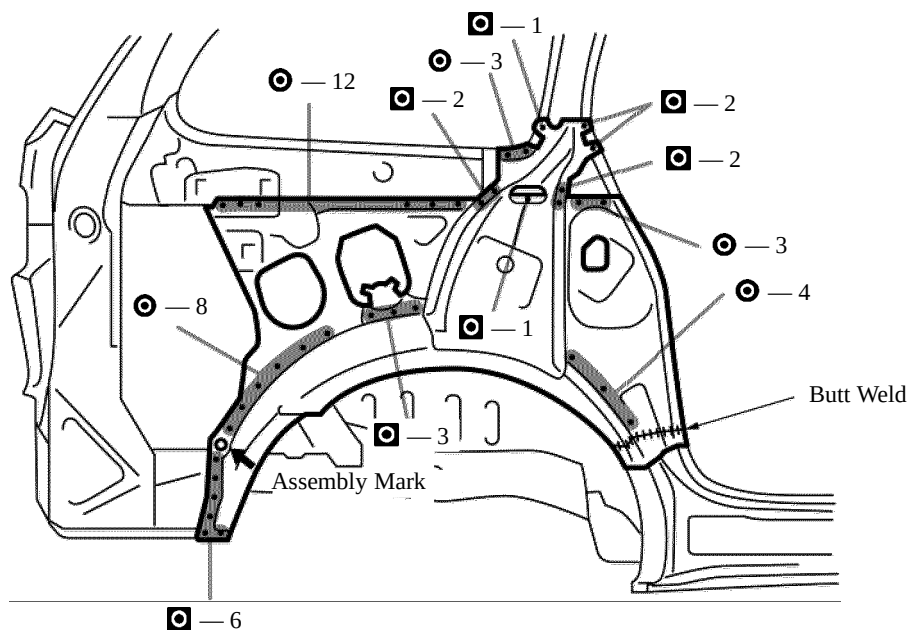
REMOVAL (With the quarter panel removed.)



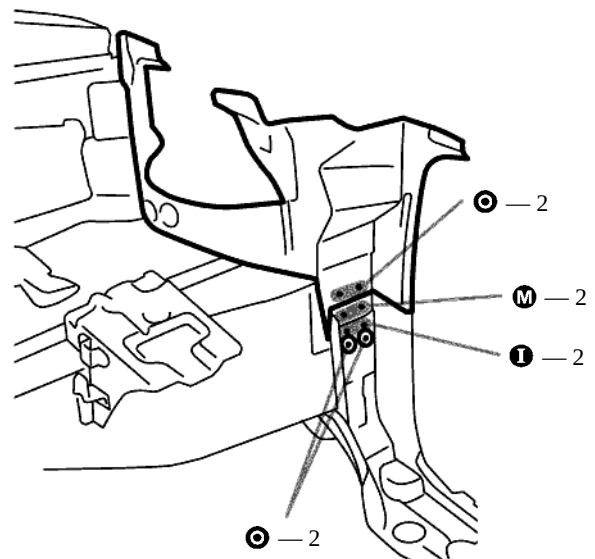
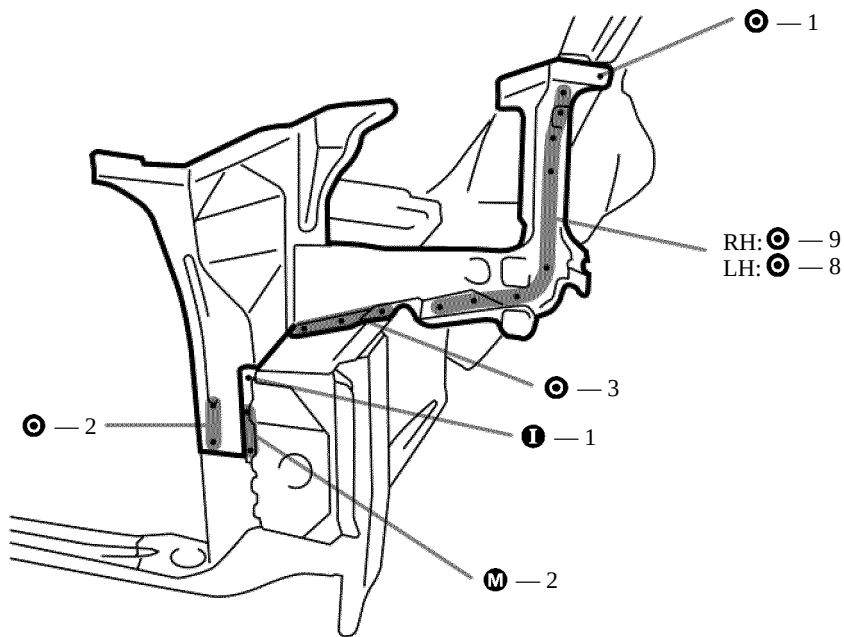
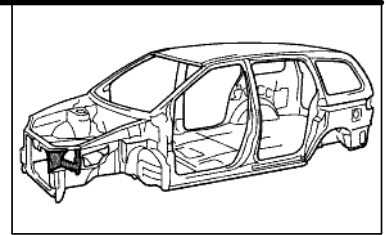
mm	in.
50	1.97

1. Cut and join the panels at the location as shown above.

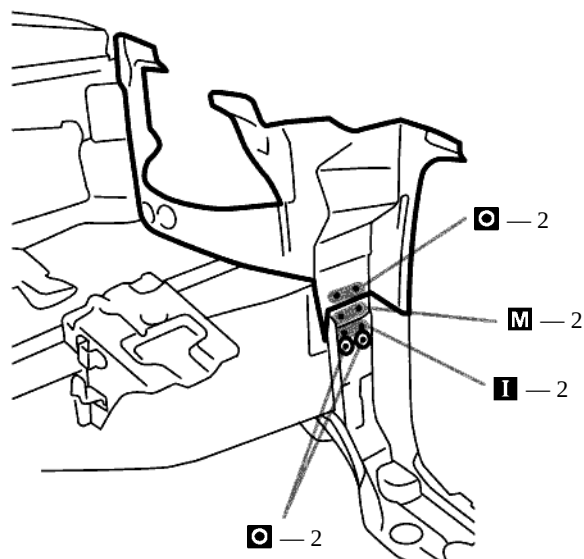
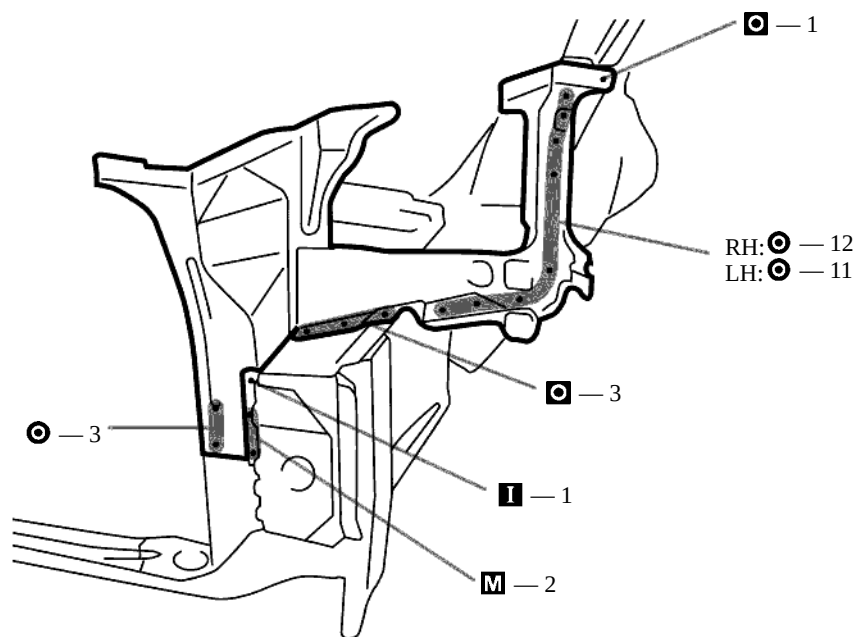
INSTALLATION



1. Determine the position of the new parts by the assembly marks of the inner and outer panels.
2. Before welding the new parts, temporarily install the quarter panel and check the fit.

RADIATOR SIDE SUPPORT (ASSY)**REMOVAL (With the radiator upper support removed.)**

INSTALLATION

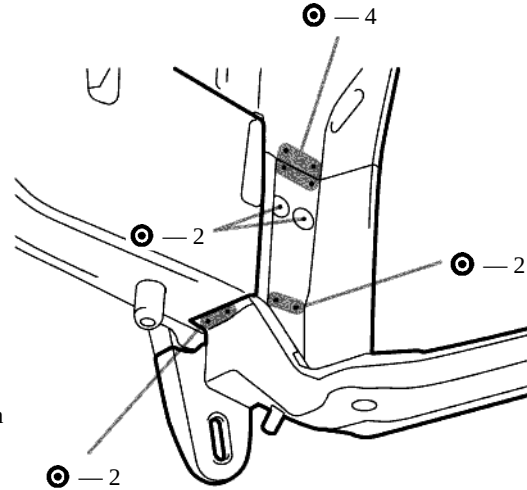
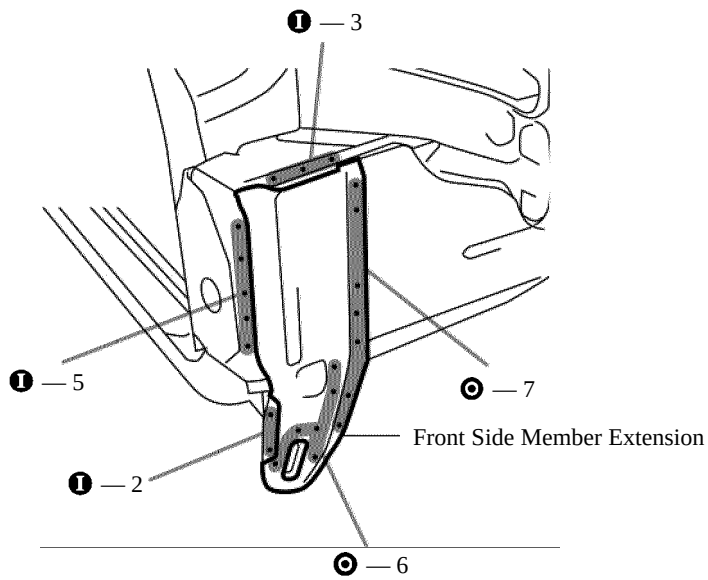
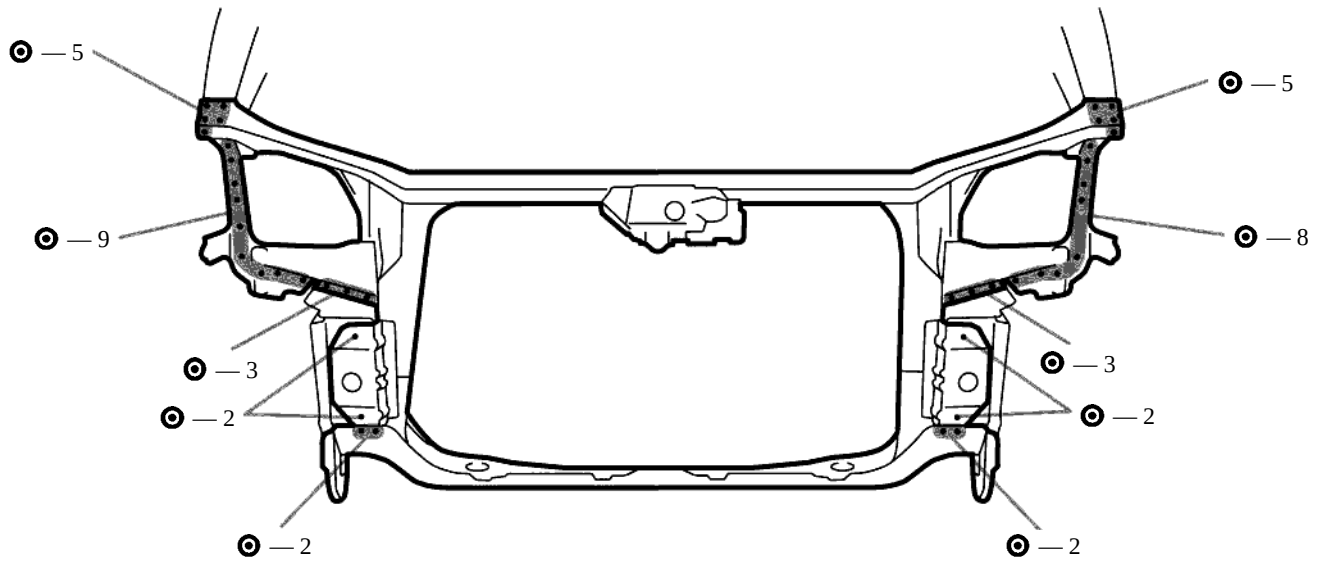
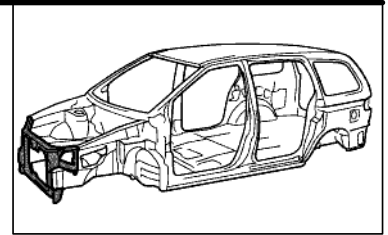


1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

HINT: First install the radiator upper support.

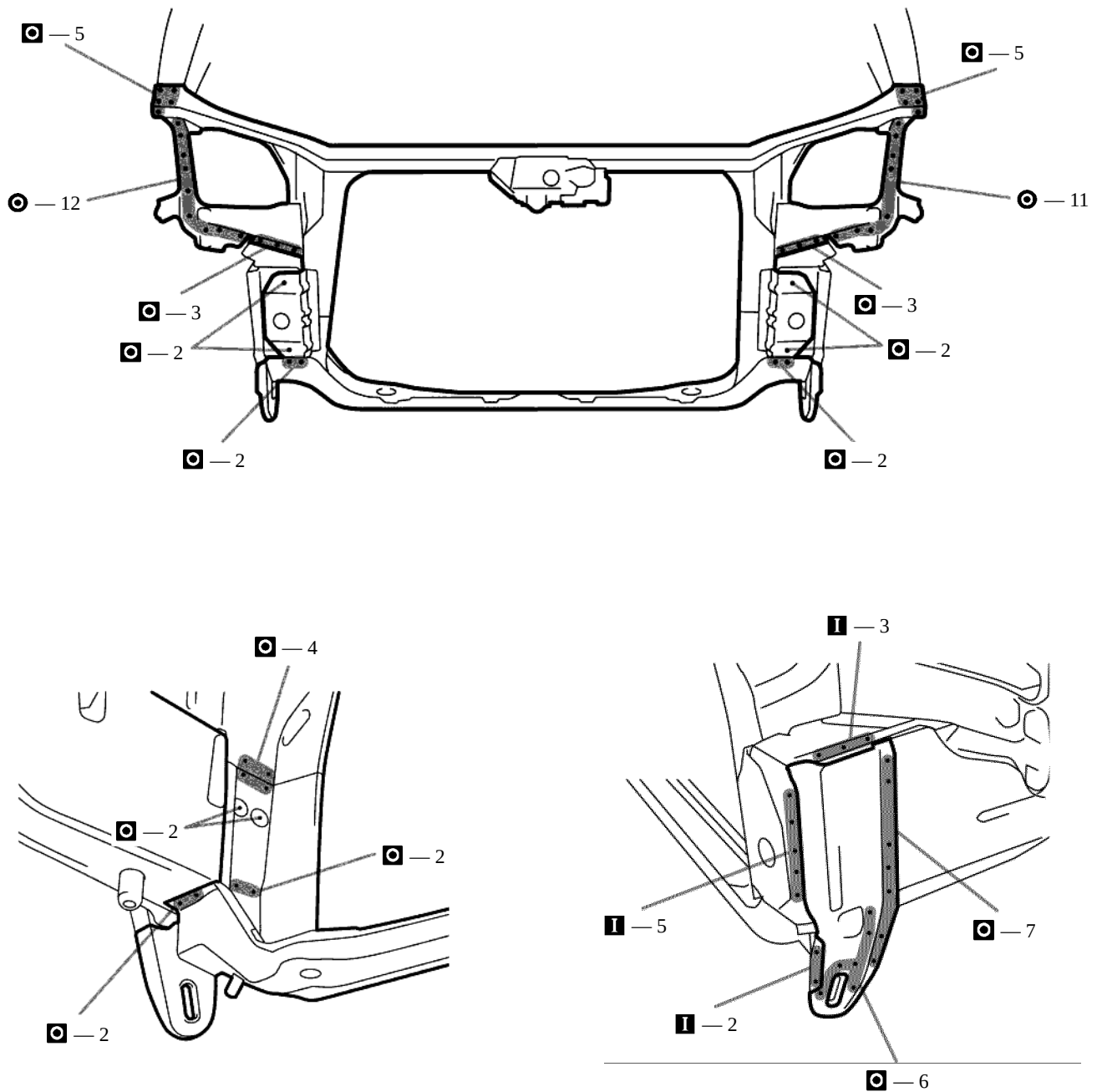
RADIATOR SUPPORT (ASSY)

REMOVAL

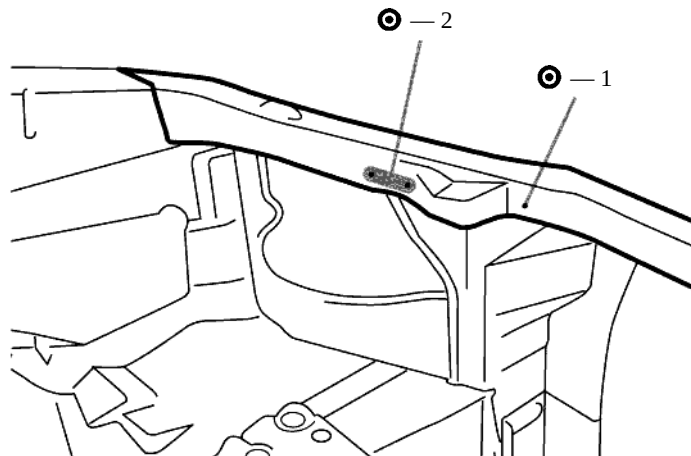
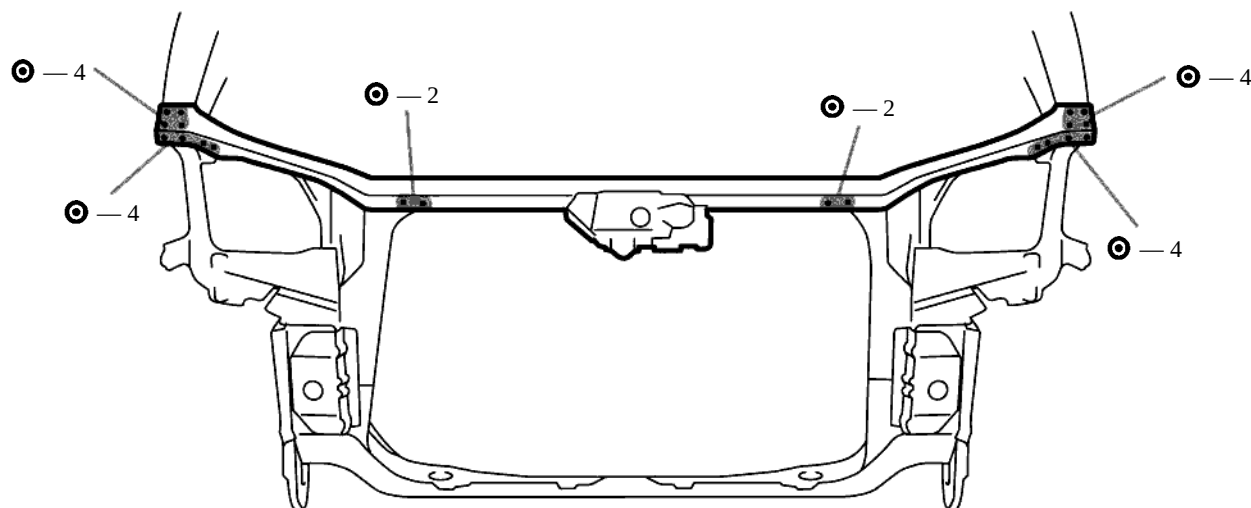
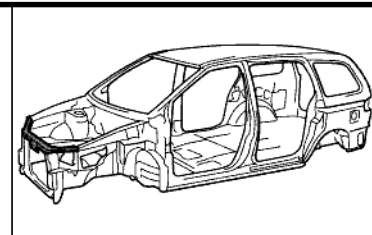


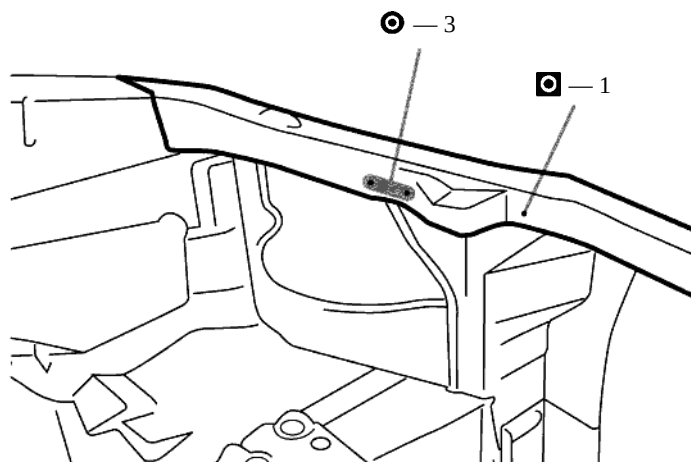
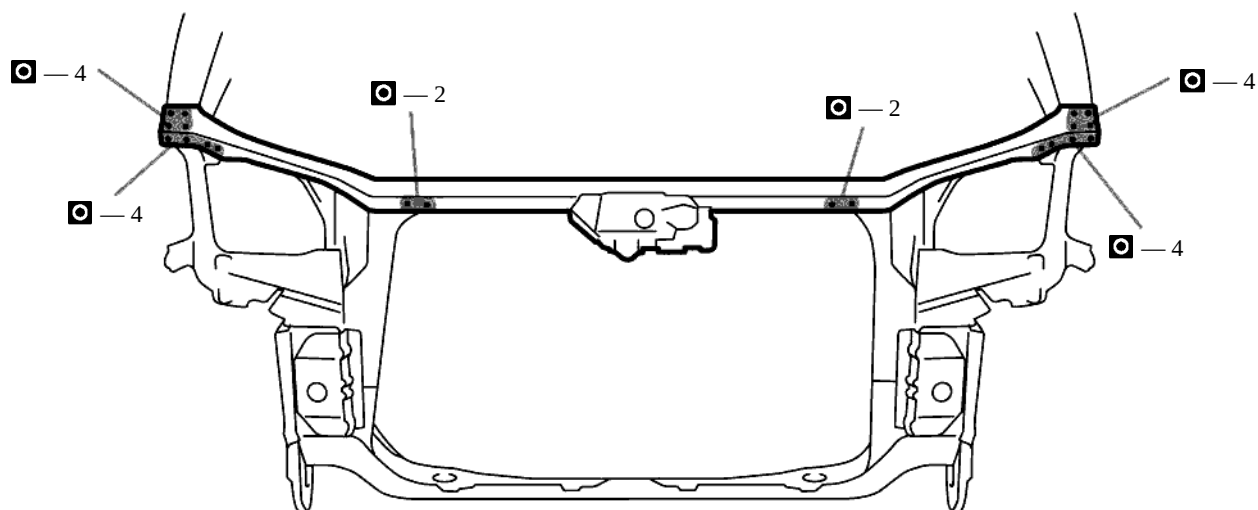
1. After removing the front side member extension, remove the radiator support.

INSTALLATION



1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

RADIATOR UPPER SUPPORT (ASSY)**REMOVAL**

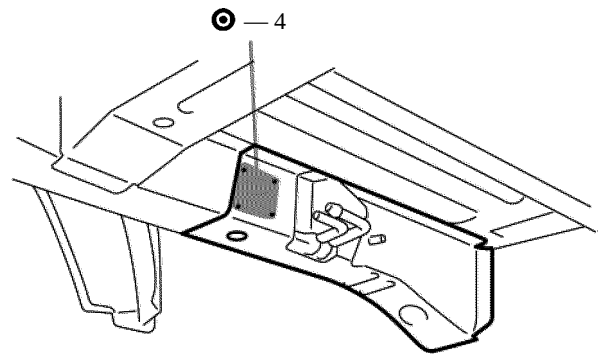
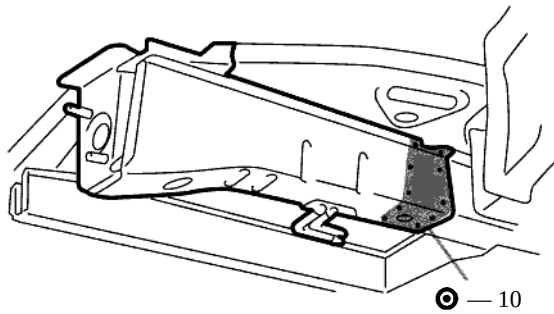
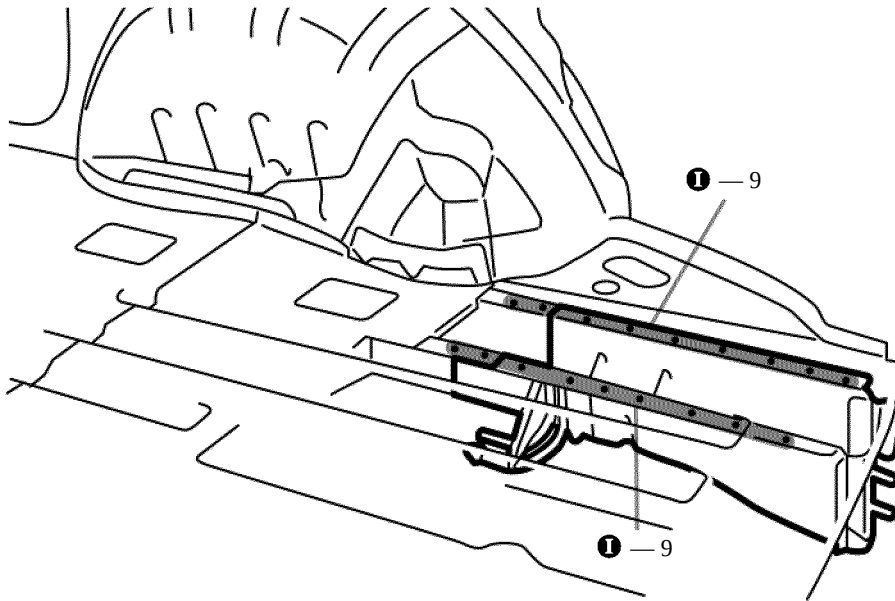
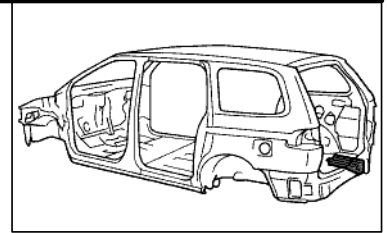
INSTALLATION

1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

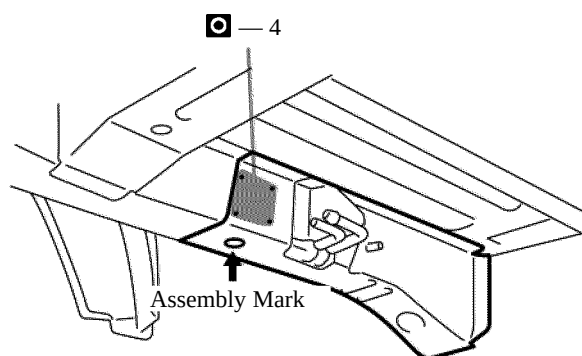
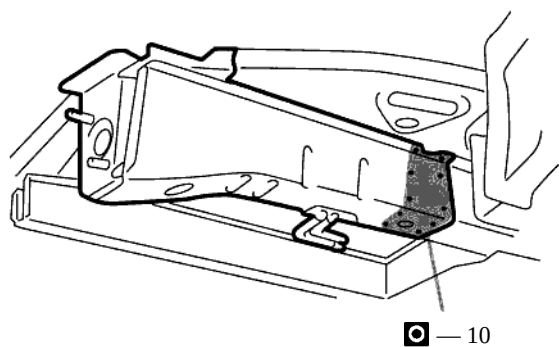
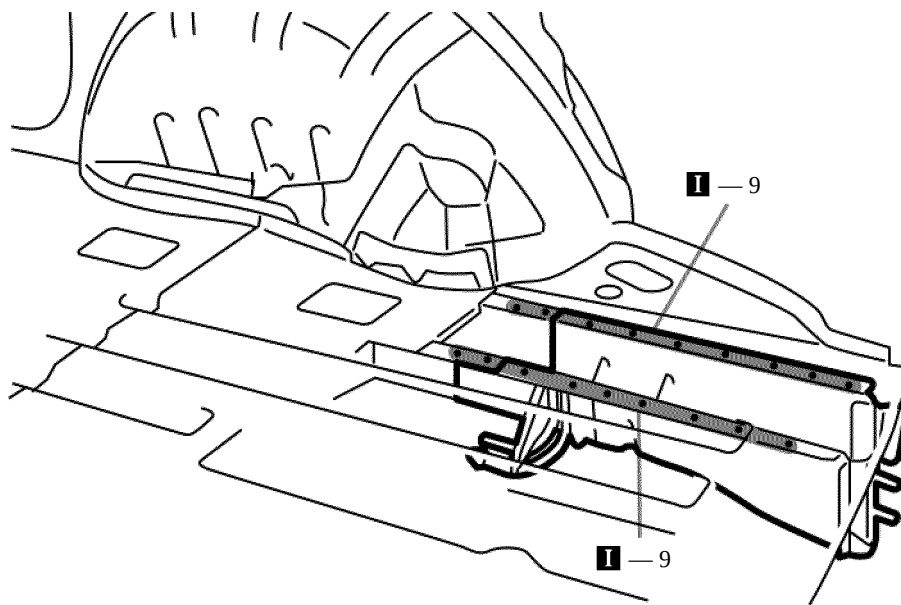
HINT: First install the hood lock support.

REAR FLOOR SIDE REAR MEMBER (ASSY)

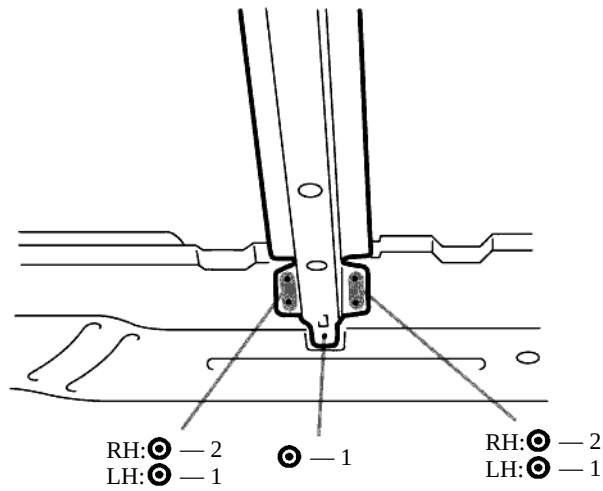
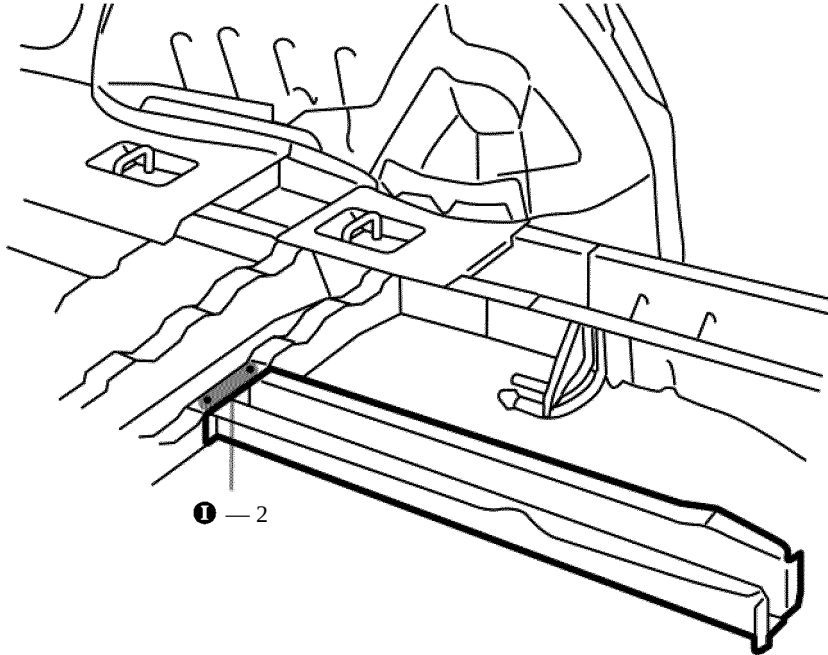
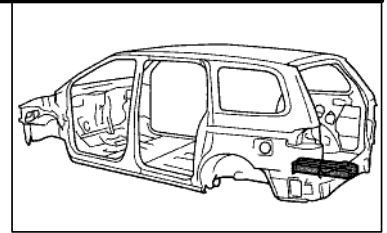
REMOVAL (With the roof side inner panel, rear floor No.6 crossmember removed.)



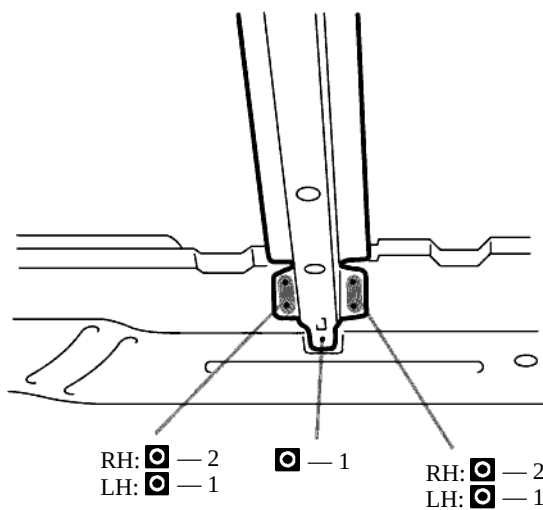
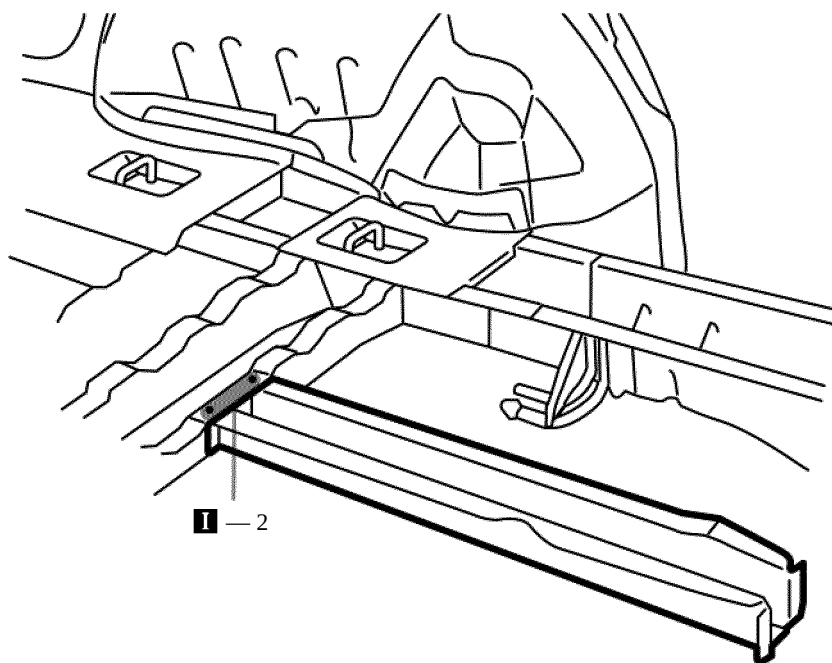
INSTALLATION

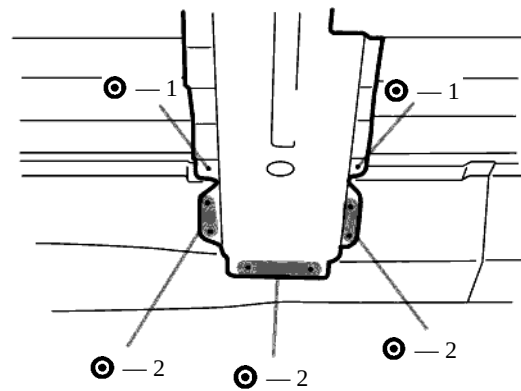
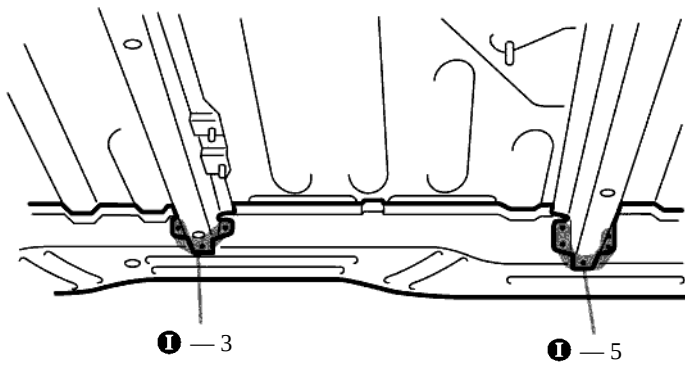
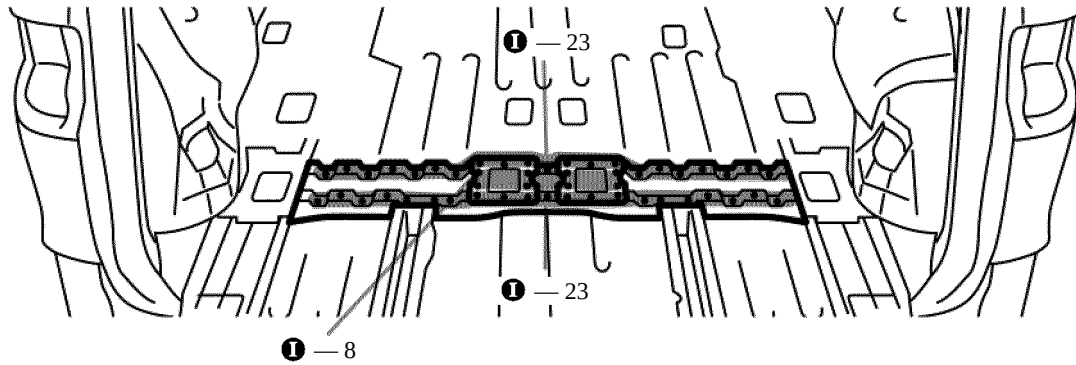
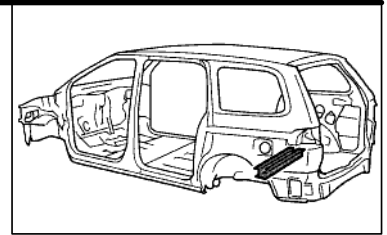


1. When temporarily installing the new parts, determine the installation position by the assembly mark. Then, measure each part i accordance with the body dimension diagram.

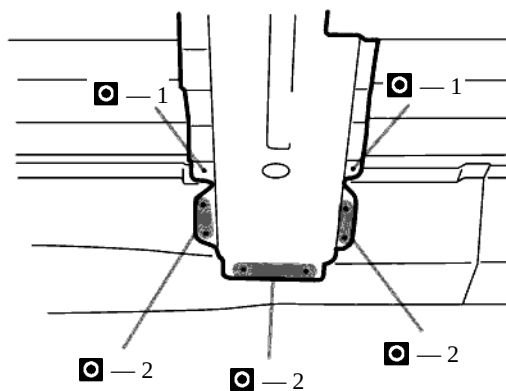
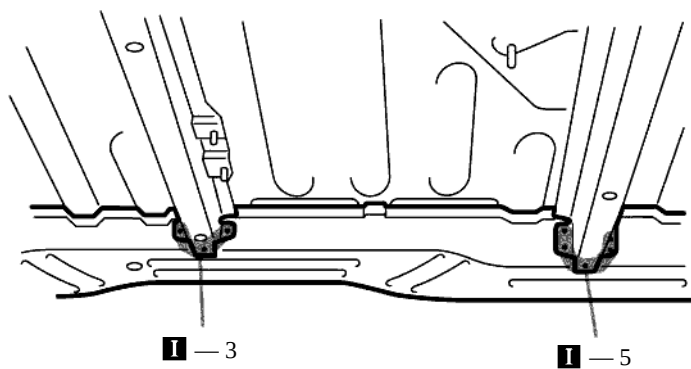
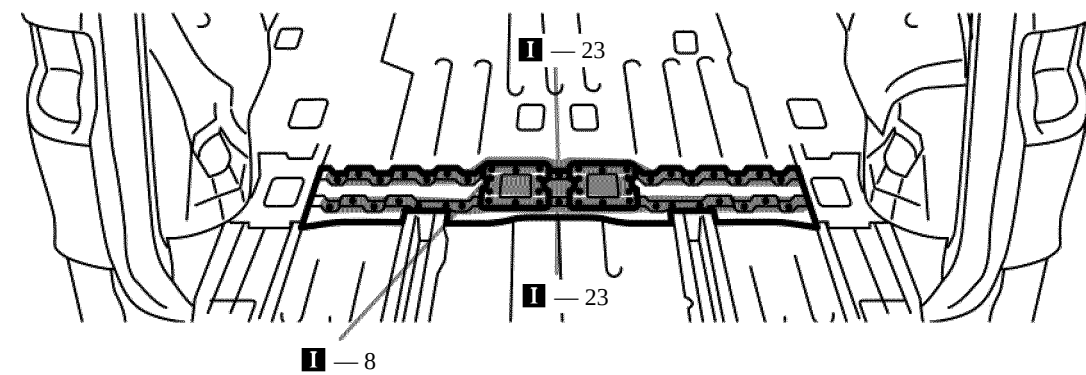
REAR FLOOR PAN REINFORCEMENT (ASSY)**REMOVAL (With the rear floor pan removed.)**

INSTALLATION



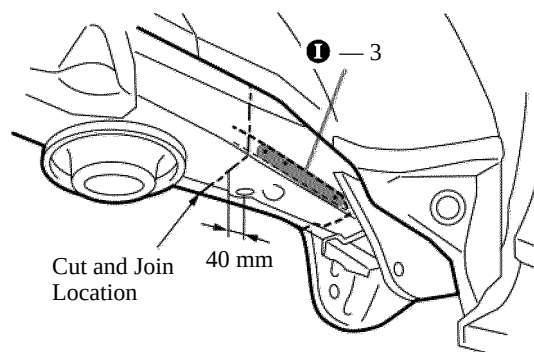
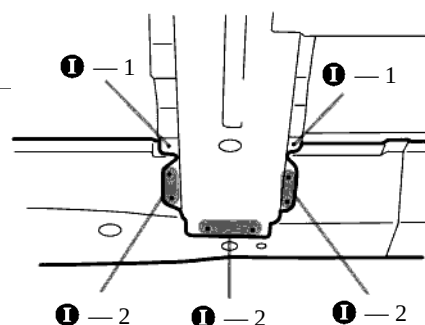
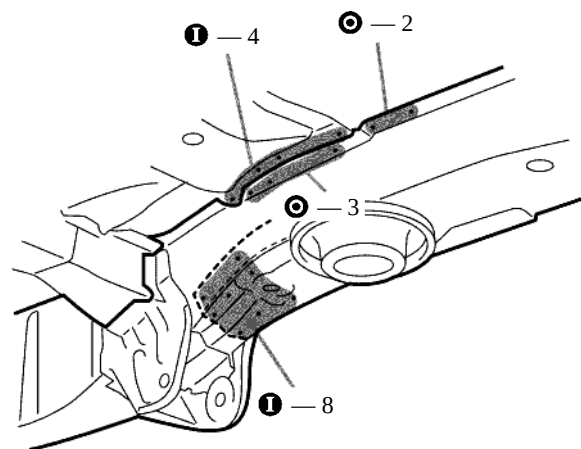
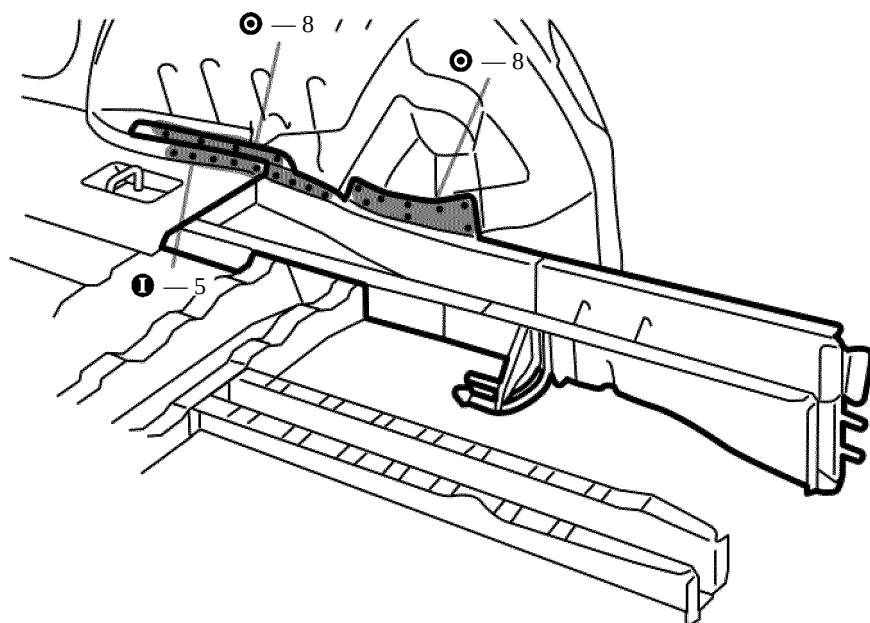
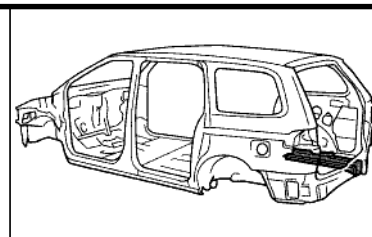
REAR FLOOR No.5 CROSSMEMBER (ASSY)**REMOVAL**

INSTALLATION



REAR FLOOR SIDE MEMBER (CUT)

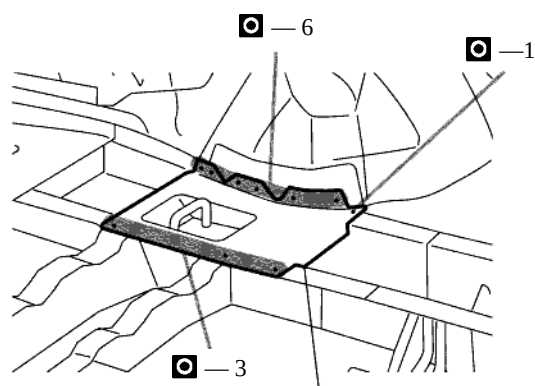
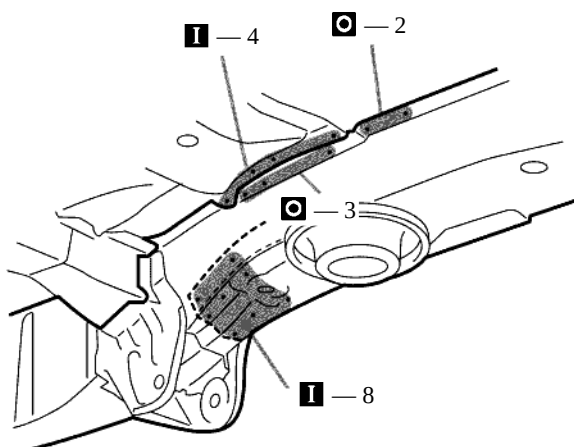
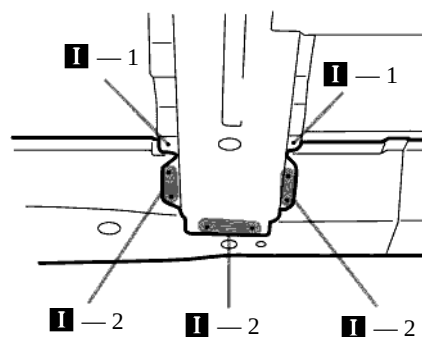
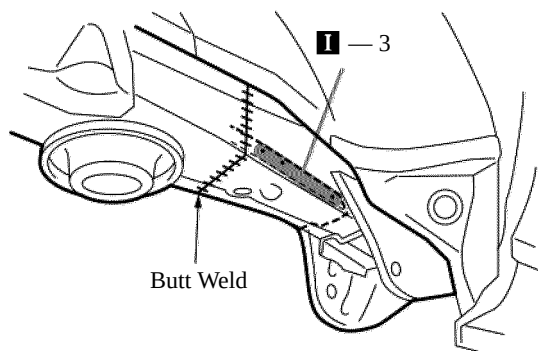
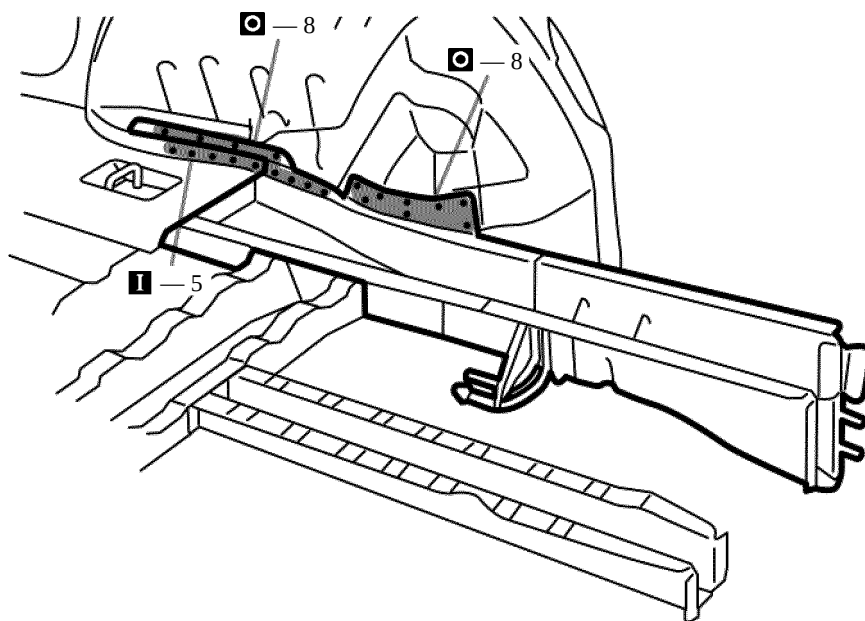
REMOVAL (With the rear floor pan, roof side inner panel removed.)



mm	in
40	1.57

1. Cut and join the parts at the location as shown above.

INSTALLATION

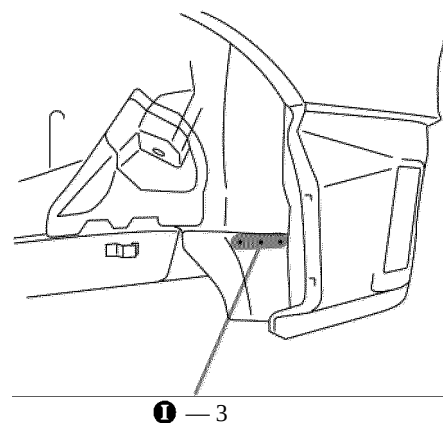
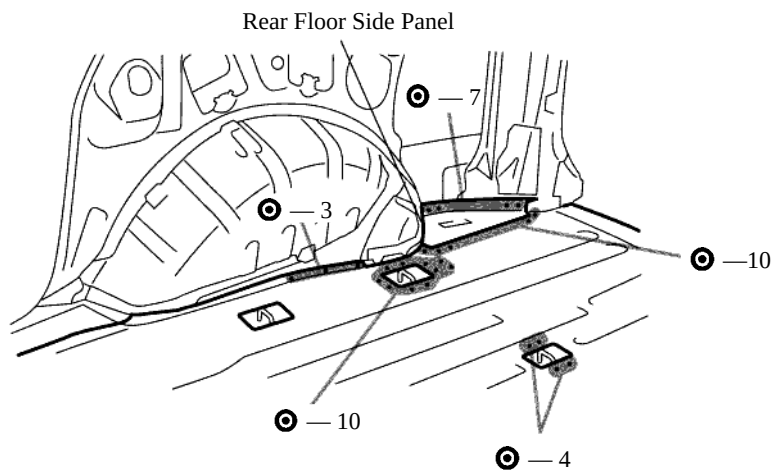
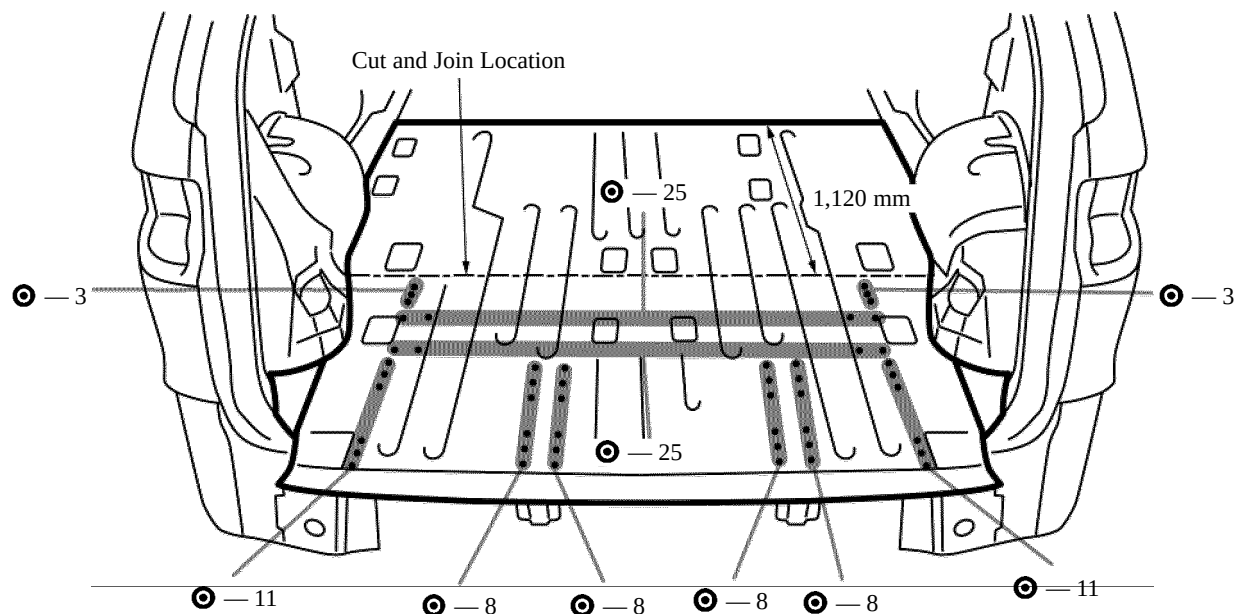
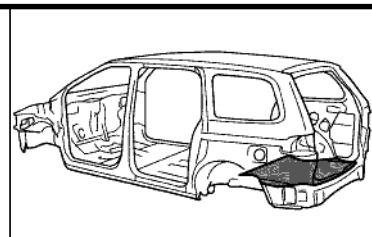


Rear Seat Leg No.2 Reinforcement

1. Temporarily install the new parts and measure each part in accordance with the body dimension diagram.

REAR FLOOR PAN (CUT)

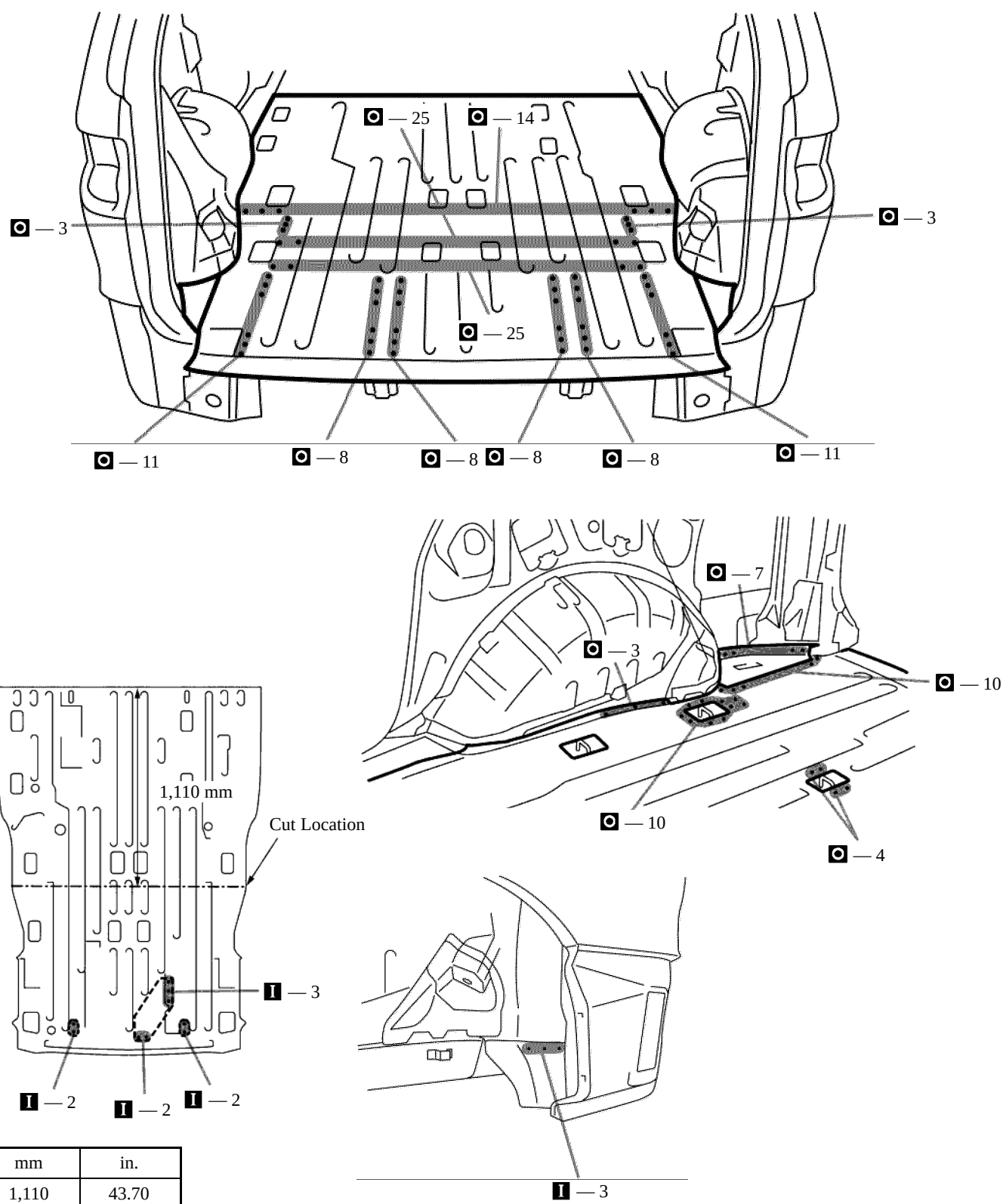
REMOVAL (With the body lower back panel, rear floor No.6 crossmember removed.)



mm	in.
1,120	44.09

1. Cut and join the parts at the location as shown above.
2. Replace the rear floor side panel at the same time.

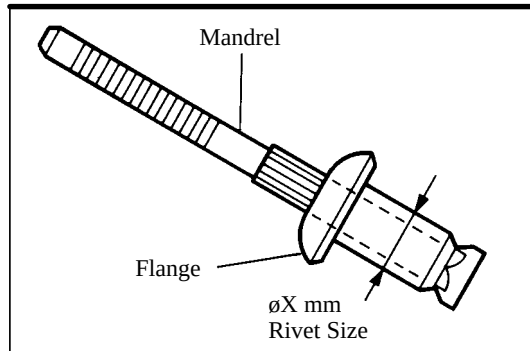
INSTALLATION



1. Cut the new parts at the location as shown above.
2. Plug weld the overlapping portion of the new parts.

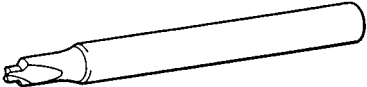
HINT: Be sure the portion to be welded are align and not loose.

3. Coat the overlapping opening poriton from the both sides with body sealer.

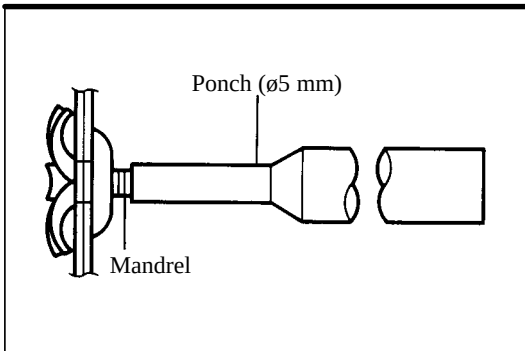
RIVET REMOVAL AND INSTALLATION**PARTS NAME AND VARIETY OF RIVET**

	Aluminum-Rivet	Steel-Rivet	Waterproof-Rivet	T-Rivet
External Appearance	Before installation	Before installation	Before installation	Before installation
	After installation	After installation	After installation	After installation
Charac- teristics	Outer Inner	Outer Inner	Outer Inner	Outer Inner
	• Small nonwaterproof rivet • No magnetic adherence	• Small nonwaterproof rivet • Magnetic adherence	• Small waterproof rivet • Waterproof seal	• Large waterproof rivet • Mandrel sticks out after installation

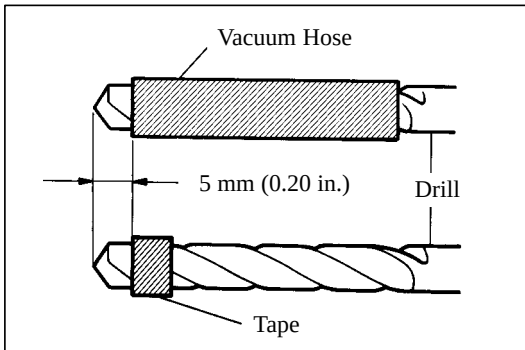
RIVET REMOVAL**1. SELECTION OF CUTTING TOOL**

	Cutting tool	Note								
Aluminum-Rivet Steel-Rivet T-Rivet with ø6.4 mm	Drill blade <table><tr><td>Rivet size</td><td>Blade size</td></tr><tr><td>ø4 mm</td><td>ø4 mm</td></tr><tr><td>ø4.8 mm</td><td>ø5 mm</td></tr><tr><td>ø6.4 mm</td><td>ø6.5 mm</td></tr></table>	Rivet size	Blade size	ø4 mm	ø4 mm	ø4.8 mm	ø5 mm	ø6.4 mm	ø6.5 mm	● Cutting can be done with drill blade or rivet cutter for an aluminum-rivet with ø4.8 mm. ● When a rivet cutter is used for an aluminum-rivet (except ø4.8 mm), a steel-rivet, or a T-rivet with ø6.4 mm, it is possible that the drill will spin abnormally damaging the rivet hole and breaking the rivet cutter.
Rivet size	Blade size									
ø4 mm	ø4 mm									
ø4.8 mm	ø5 mm									
ø6.4 mm	ø6.5 mm									
Waterproof special-Rivet with ø4.0 mm	Drill blade with ø4.0 mm									
Aluminum-Rivet with ø4.8 mm Waterproof-Rivet with ø4.8 mm or ø6.0 mm	Rivet Cutter (P/N 09060-60350) 	● When a ordinary cutter is used for a waterproof-rivet with ø4.8 mm or ø6.0 mm, the rivet can not be cut as it spins with the cutter.								

2. RIVET REMOVAL



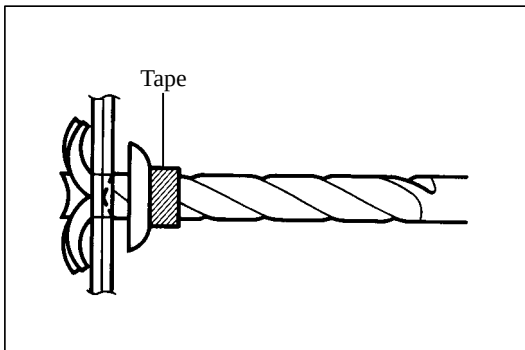
- (1) T-Rivet with $\phi 6.4$ mm:
Using a punch with $\phi 5$ mm, stamp out the mandrel.



- (2) Put tape around the drill blade 5 mm (0.20 in.) from the tip or insert a vacuum hose.

NOTE: Use of tape or a vacuum hose prevents damage to the rivet hole.

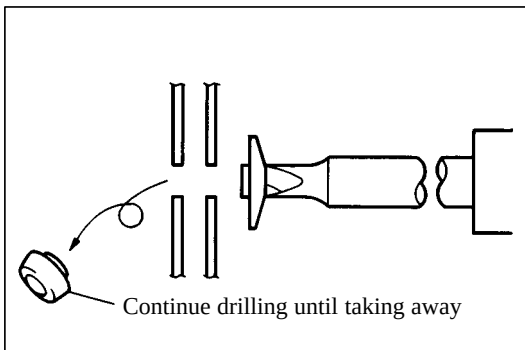
- (3) Attach the drill blade or a rivet cutter to the drill.



- (4) Gently and vertically put the drill to the rivet, and cut the rivets flange.

NOTE:

- While upward drilling, wear a protective glasses.
- If a drill is strongly pushed deeply in to a rivet, the rivet can't be cut as it spins together with the drill.
- Prizing the hole with a drill can lead to damage to the rivet hole or the breaking of the rivet cutter.
- Take care as the cut rivet is hot.



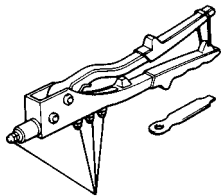
- (5) Aluminum-Rivet and Waterproof-Rivet with $\phi 4.8$ mm or $\phi 6.0$ mm:

Even if flange is taken off, continue drilling and push out remaining fragments with the drill.

- (6) Steel-Rivet:
If the flange is taken off, stop drilling and pull out the remaining fragments with a pliers.

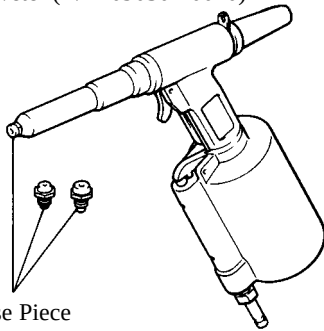
- (7) T-Rivet with $\phi 6.4$ mm:
If the flange is taken off, stop drilling and push out the remaining fragments with a punch with $\phi 5$ mm or pull out the remaining fragments with pliers.

Hand Riveter



Nose Piece

Air Riveter (P/N 09050-20010)



Nose Piece

RIVET INSTALLATION

1. RIVET INSTALLATION

- (1) Apply touch-up paint at the area.
- (2) Select an installation tool.

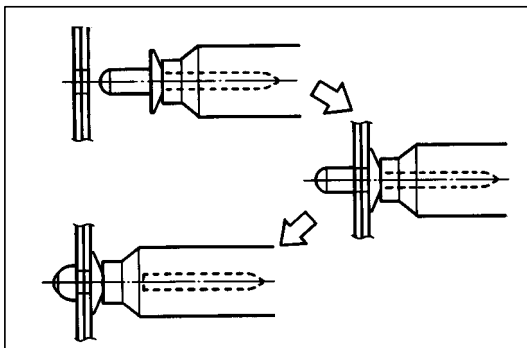
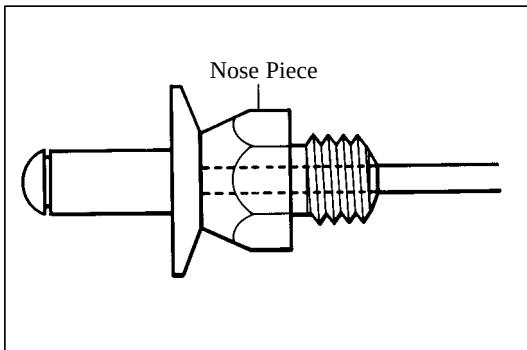
Item	Installation tool
Aluminum-Rivet Waterproof-Rivet with $\varnothing 4.8$ mm	Hand Riveter or Air Riveter
Steel-Rivet Waterproof-Rivet with $\varnothing 6.0$ mm T-Rivet with $\varnothing 6.4$ mm	Air Riveter

- (3) Select the smallest a nose piece possible for a rivets mandrel.

NOTE: Wrong selection of a nose piece may cause the riveter to be damaged or bad tightening.

<Reference> Nose piece of Air Riveter

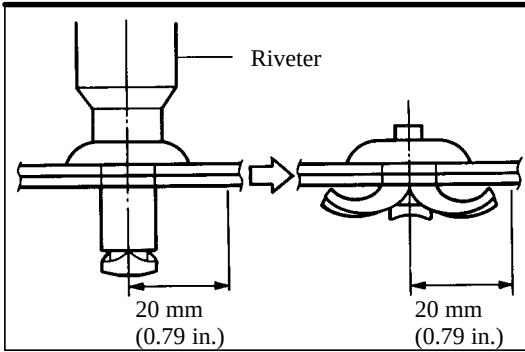
Parts Name	Parts Number	Color	Rivet type
Nose piece No. 1	09050-02020	Silver	$\varnothing 4.0$ mm Aluminum $\varnothing 4.0$ mm Steel $\varnothing 4.8$ mm Waterproof
Nose piece No. 2	09050-02030	Copper	$\varnothing 4.8$ mm Aluminum $\varnothing 4.8$ mm Steel
Nose piece No. 3	09050-02040	Black	$\varnothing 6.4$ mm T-Rivet
Nose piece No. 4	09050-02050	Black	$\varnothing 4.0$ mm Waterproof Special



- (4) Insert the nose piece to the riveter and then the mandrel of the new rivet into the nose piece.
- (5) Vertically insert the rivet into a hole and keep place it strongly.

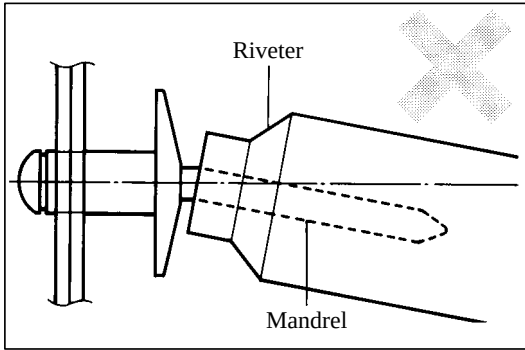
NOTE:

- If the tip of the rivet is not deformed or the mandrel is not cut, repeat process (5) again.

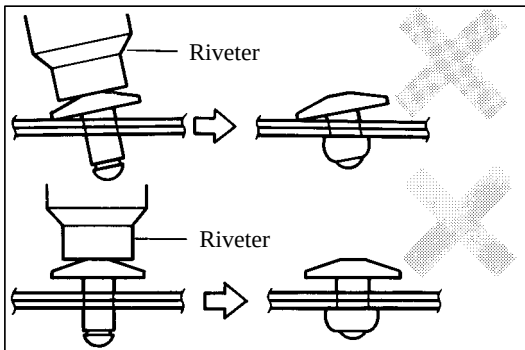


- **T-Rivet with $\varnothing 6.4$ mm:**

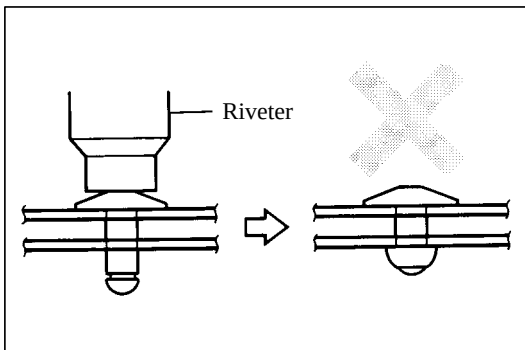
Do not place your hands or the wire harness within a radius of 20 mm (0.79 in.) from the rivet, as the rivet is cut and opened in this area.



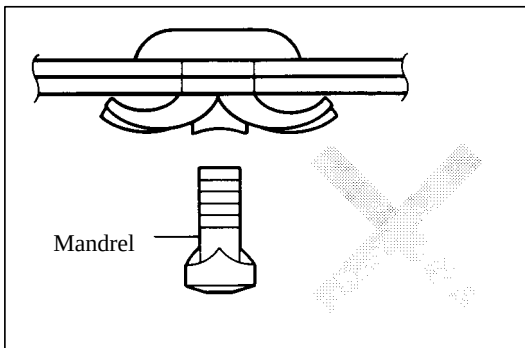
- **Prizing a riveter damages the riveter showing that it is not tightened correctly and bends the mandrel.**



- **Loose tightening may result from either tilting the riveter while handling or the riveter not connecting to the material.**



- **Loose tightening also occurs when a rivet is applied between materials without touching.**

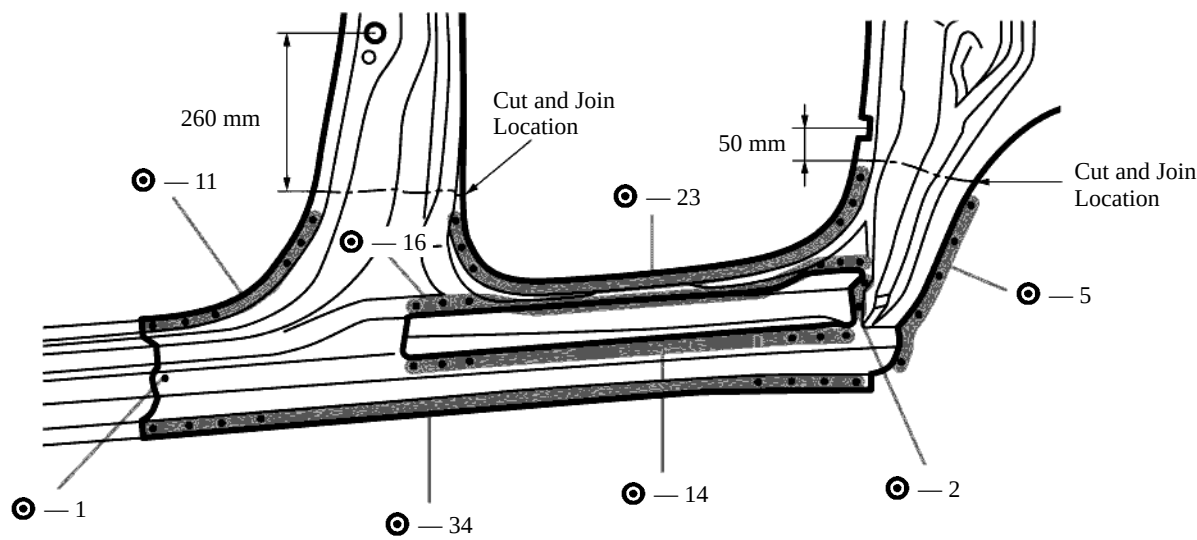
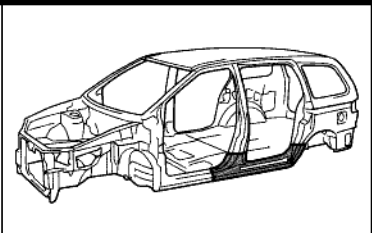


- **T-Rivet with $\varnothing 6.4$ mm:**

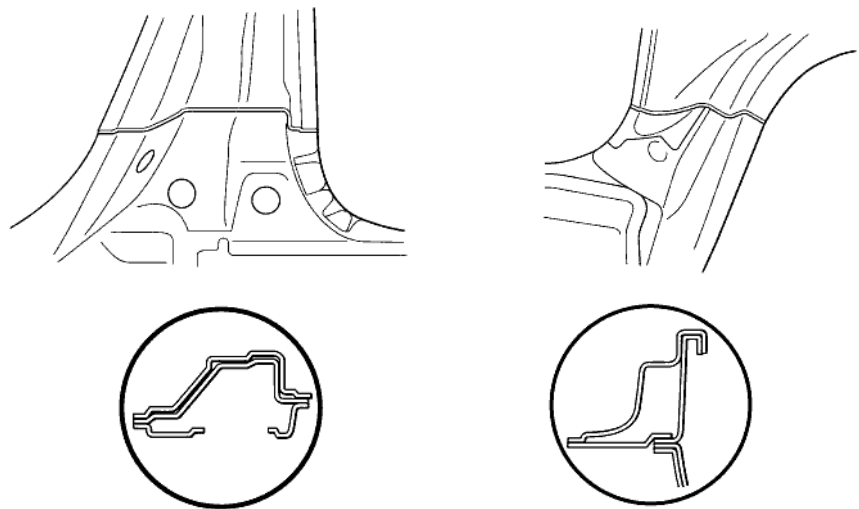
When a mandrel of a rivet is lost, the rivet should be replaced to prevent loose tightening.

ROCKER OUTER REAR PANEL (CUT)

REMOVAL



[Cut and Join Locations]

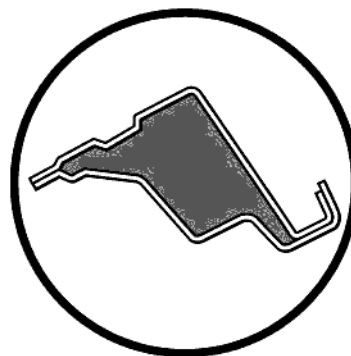
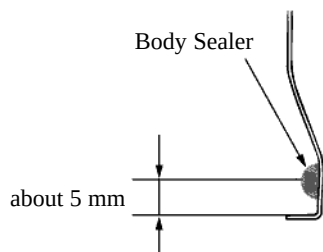


mm	in.
50	1.97
260	10.24

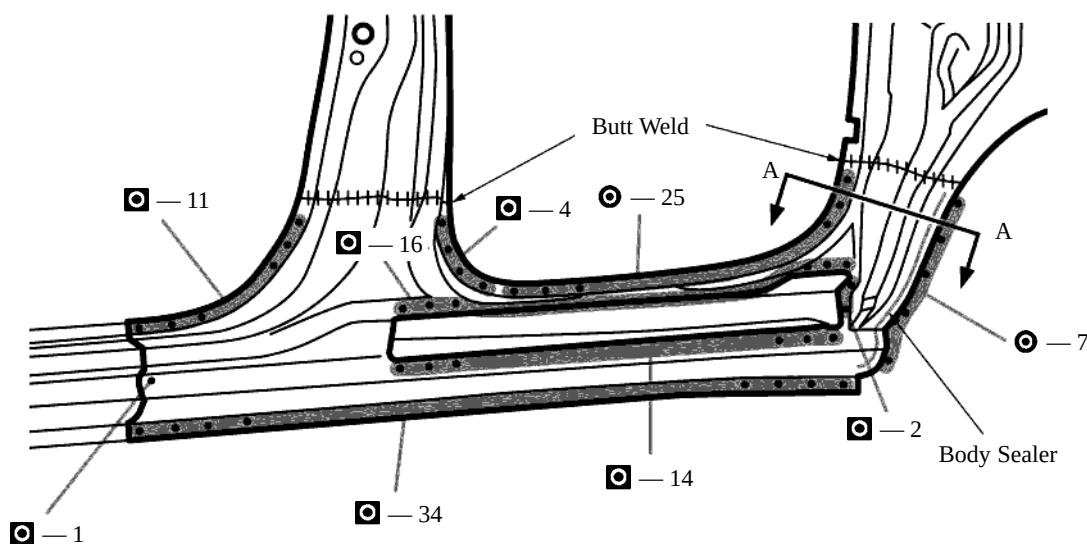
1. Cut and join the parts at the locations as shown above.

INSTALLATION

[Foamed Material Application Area]



A - A

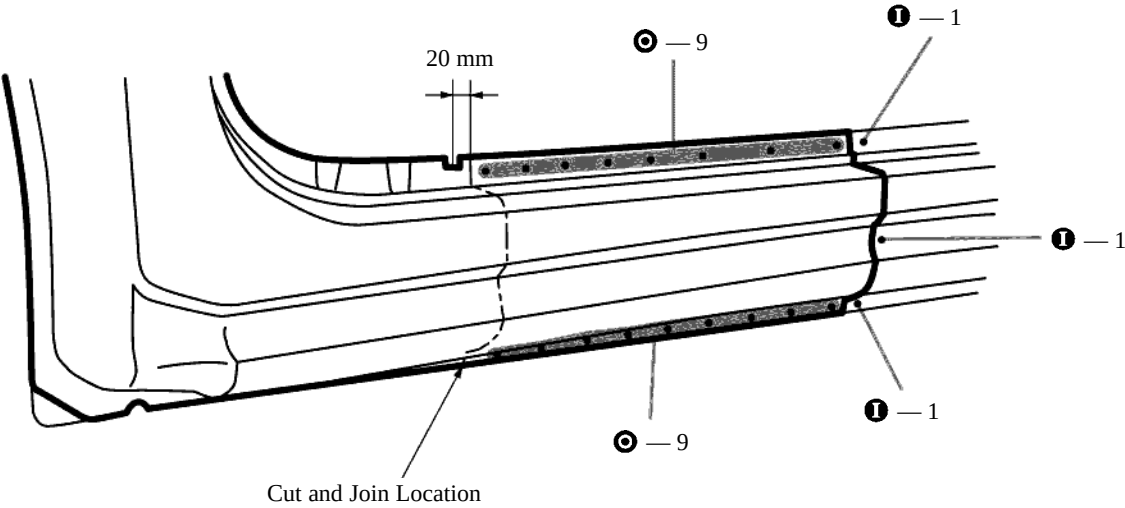
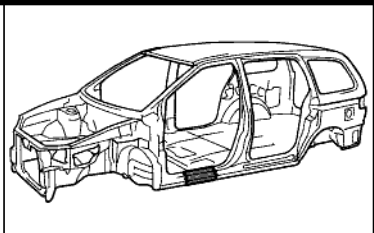


mm	in.
5	0.20

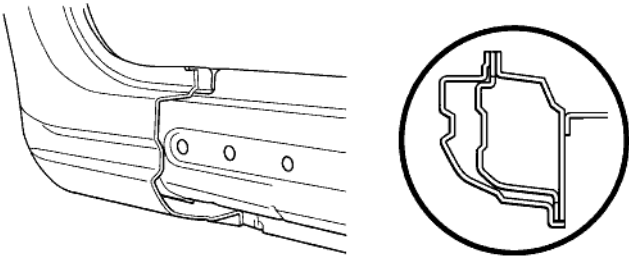
- Before temporarily installing the new parts, apply body sealer to the wheel arch.
 - Temporarily install the new parts and check the fit of the front door and slide door.
 - Apply foamed material to the quater section.
- HINT:**
- Apply body sealer about 5 mm (0.20 in.) from the flange, avoiding any oozing.
 - Apply sealer evenly, about 3 - 4 mm (0.12 - 0.16 in.) in diameter.
 - For other sealing points, refer to section AR.

ROCKER OUTER PANEL (CUT)

REMOVAL

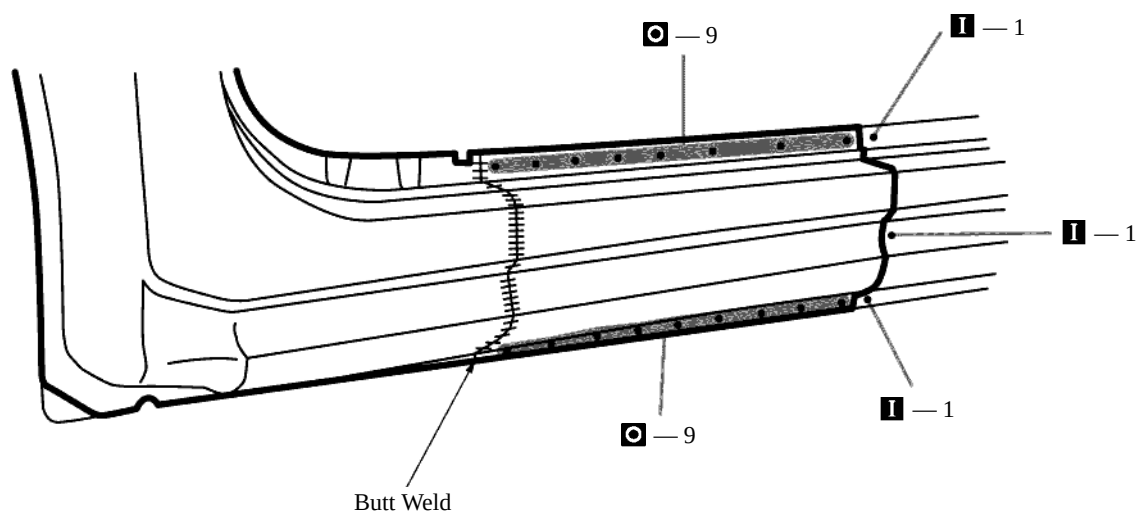


[Cut and Join Location]



mm	in.
20	0.79

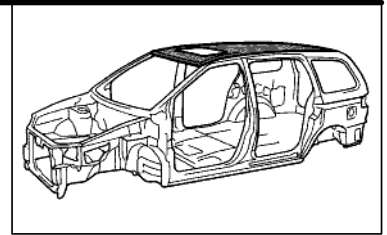
1. Cut and join the parts at the location as shown above.

INSTALLATION

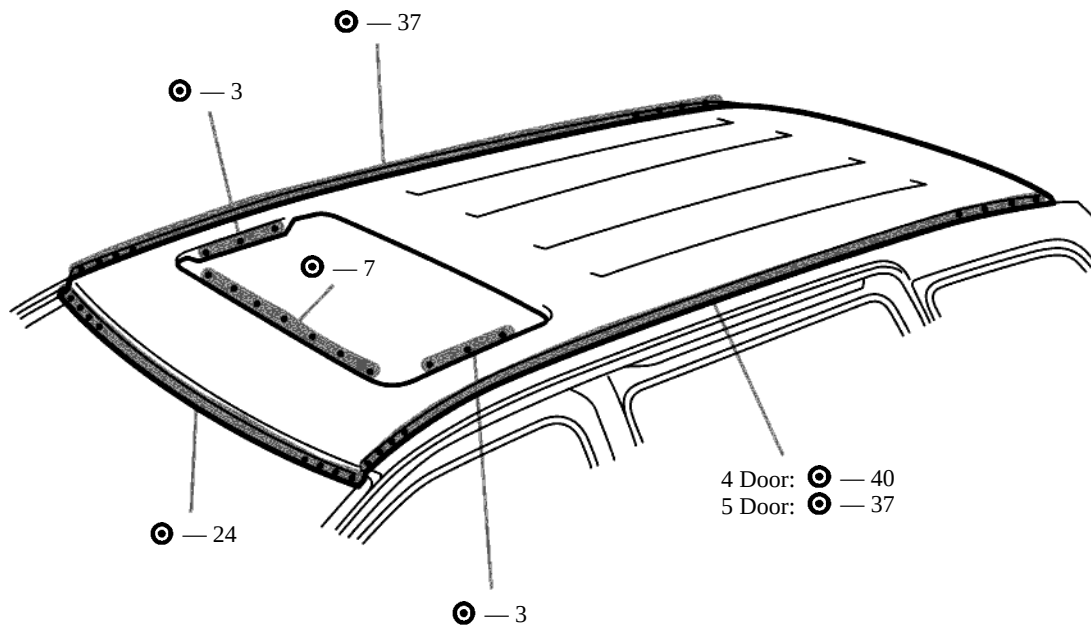
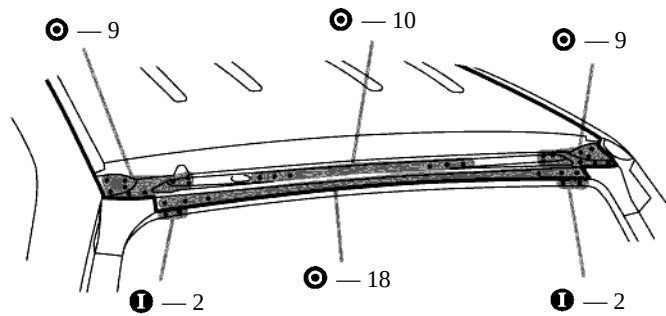
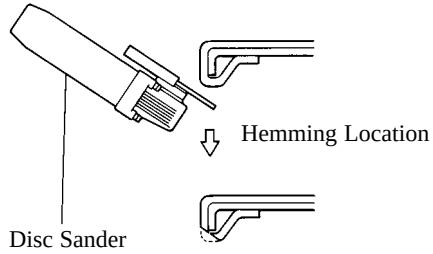
1. Temporarily install the new parts and check the fit of the front door.

ROOF PANEL (ASSY): Sun Roof

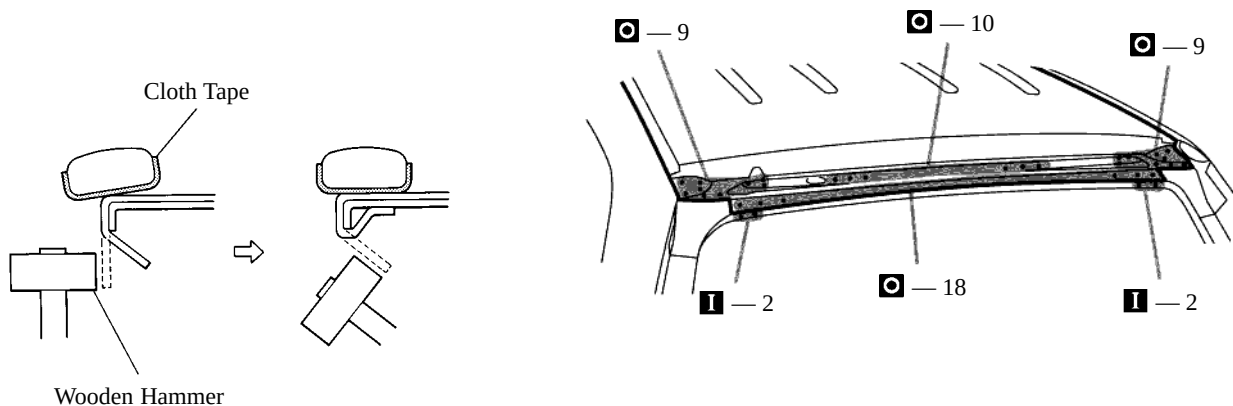
REMOVAL



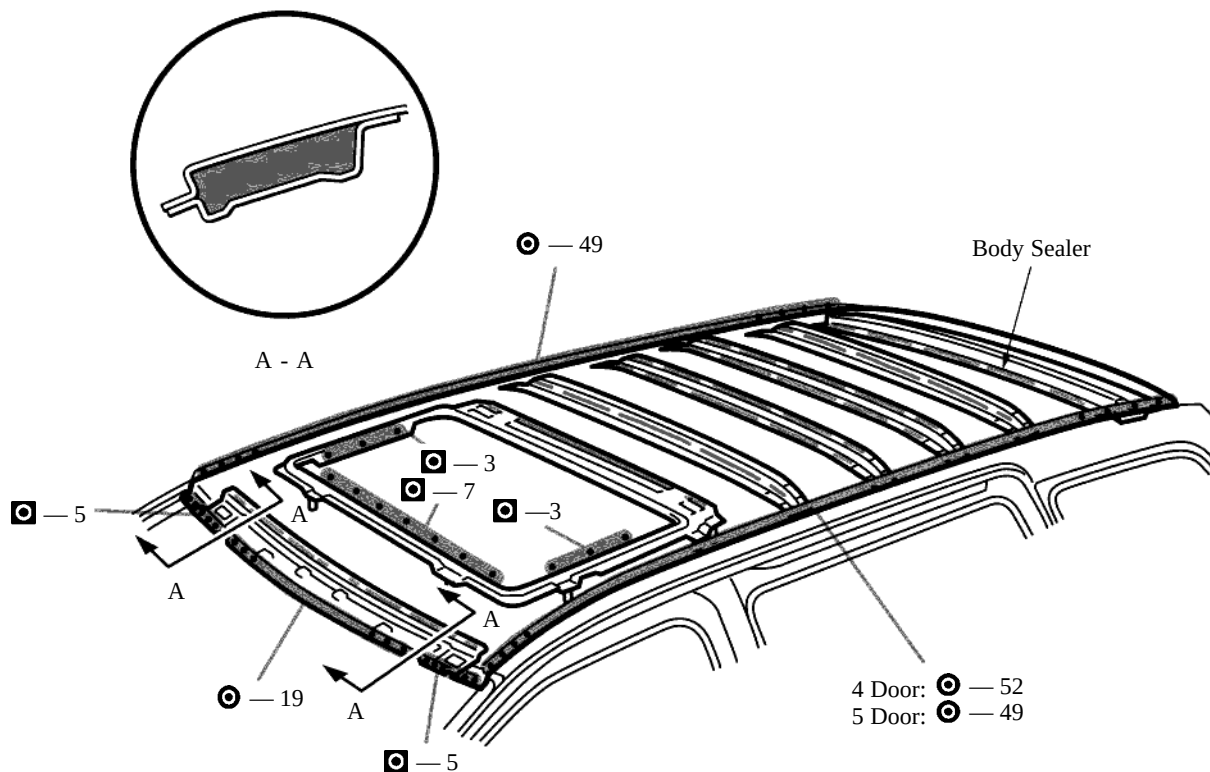
[If resusing the roof panel reinforcement]



INSTALLATION



[Foamed Material Application Areas]



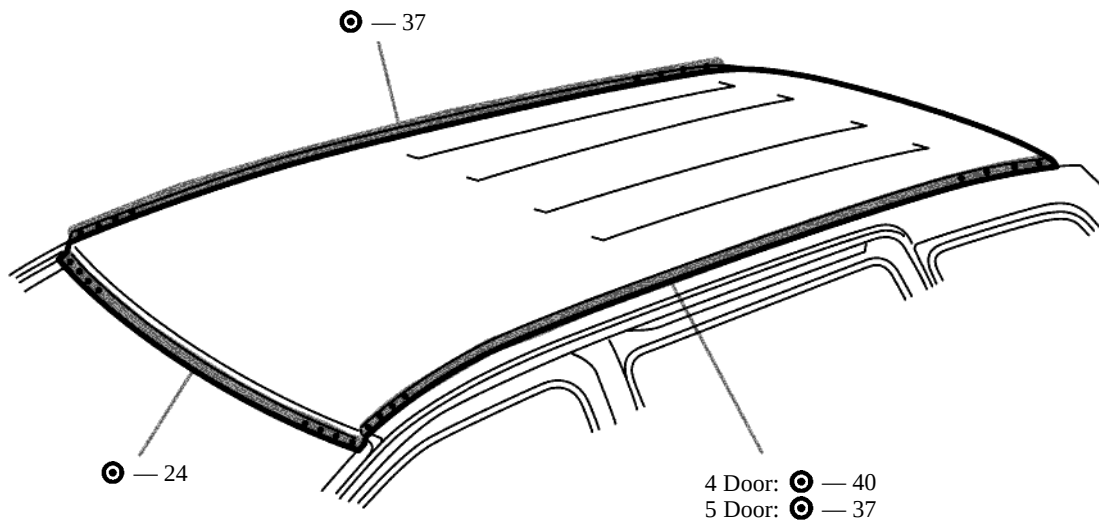
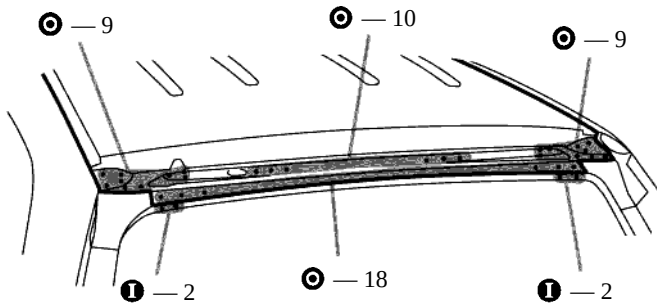
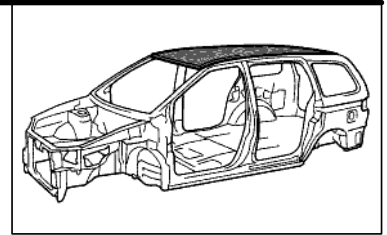
1. Before temporarily installing the new parts, apply body sealer to the windshield header panel, roof panel reinforcement and back window frame.

HINT:

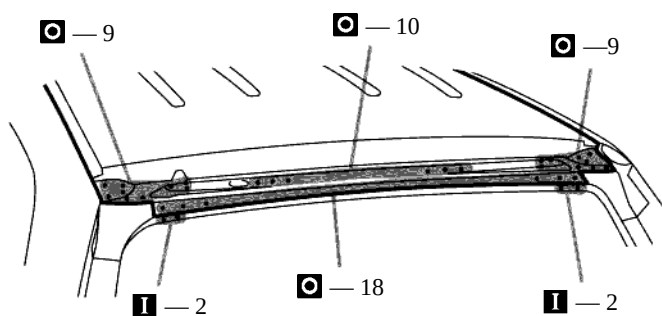
- 1) Apply just enough sealer for the new parts to make contact.
- 2) For other sealing points, refer to Section AR.

2. Bend the flange hem with a wooden hammer and dolly.

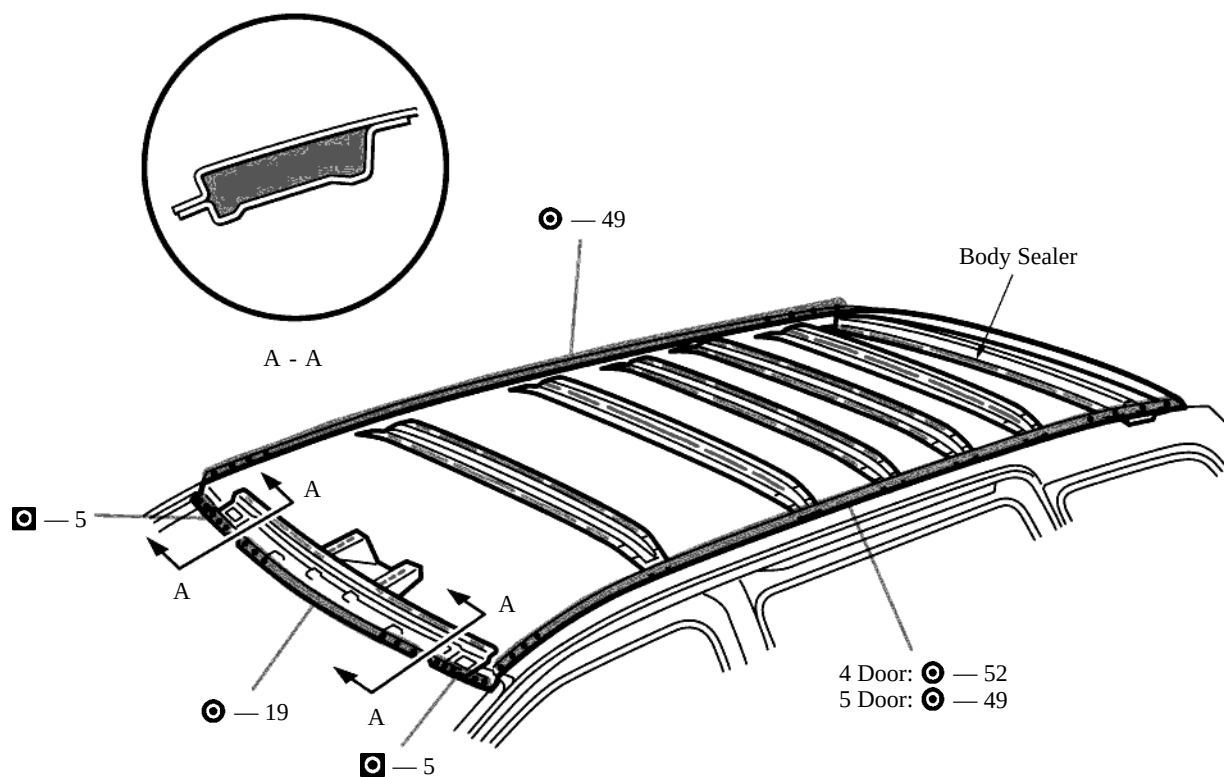
HINT: Perform hemming three steps, being careful not to warp the panel.

ROOF PANEL (ASSY): Nomal Roof**REMOVAL**

INSTALLATION



[Foamed Material Application Areas]



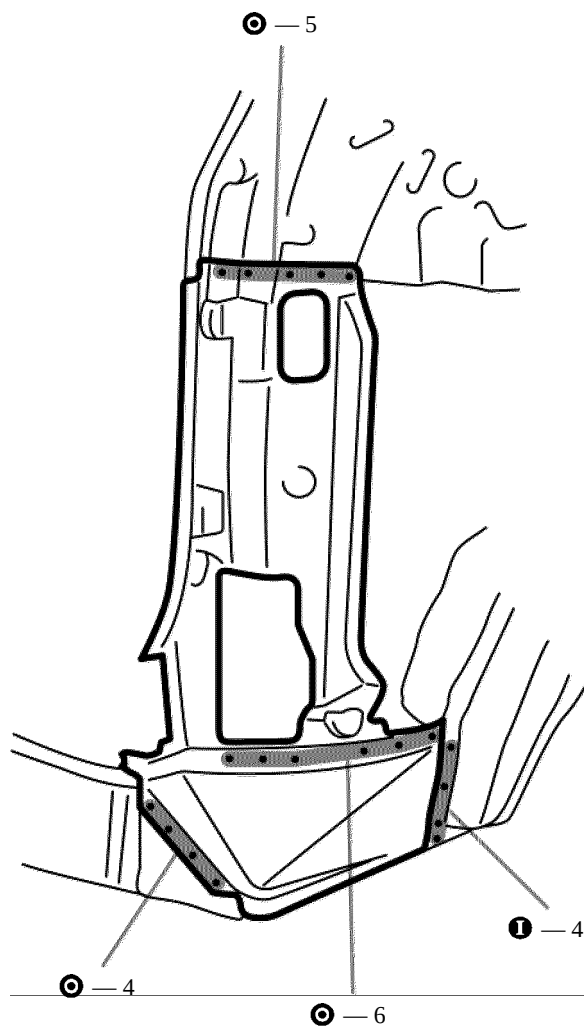
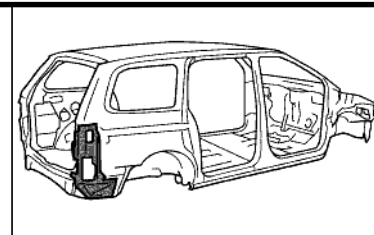
1. Before temporarily installing the new parts, apply body sealer to the windshield header panel, roof panel reinforcement and back window frame.

HINT:

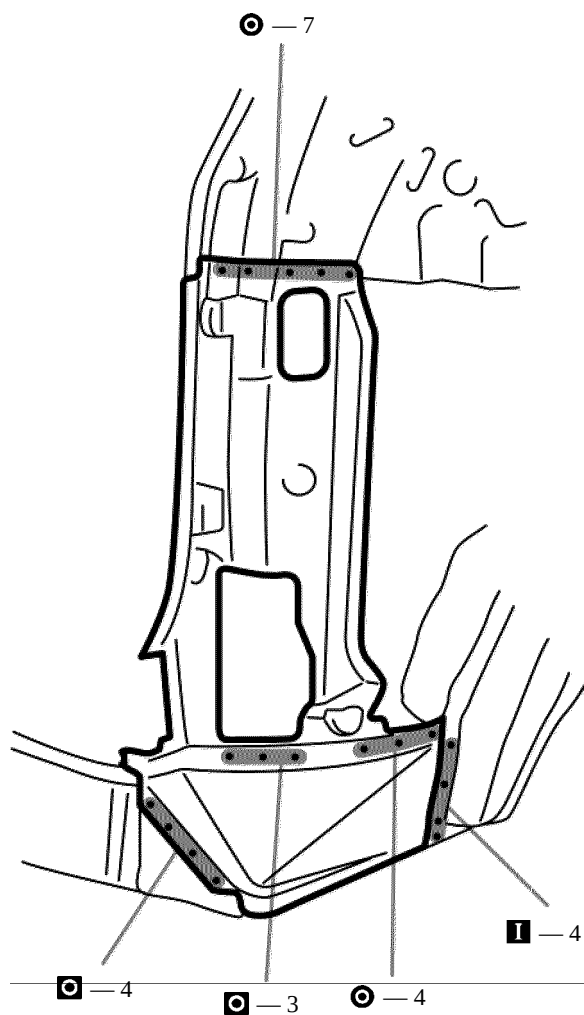
- 1) Apply just enough sealer for the new parts to make contact.
- 2) For other sealing points, refer to Section AR.

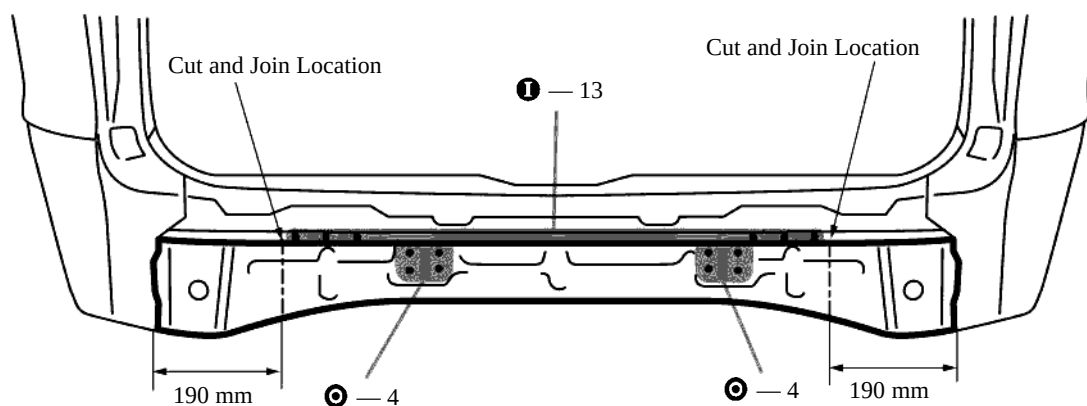
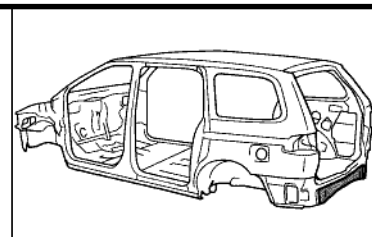
ROOF SIDE INNER PANEL (ASSY)

REMOVAL (With the body lower back panel, roof side outer panel removed.)



INSTALLATION

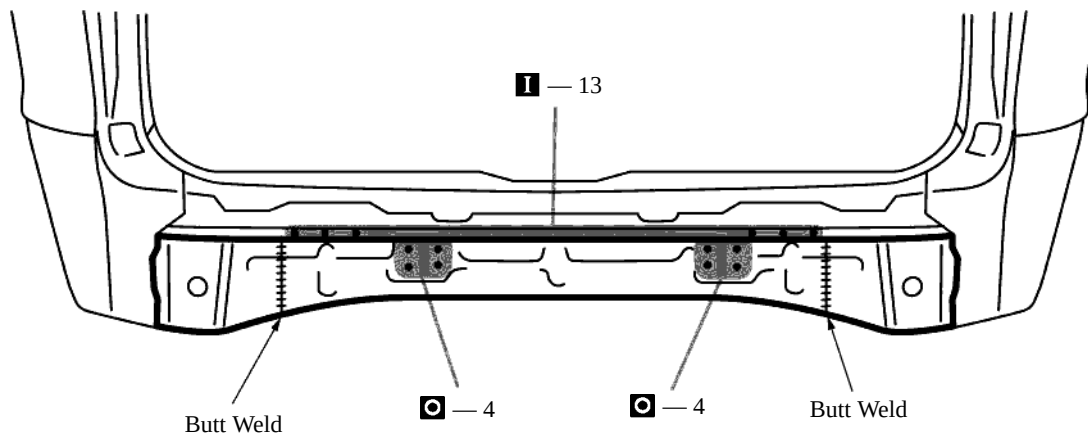


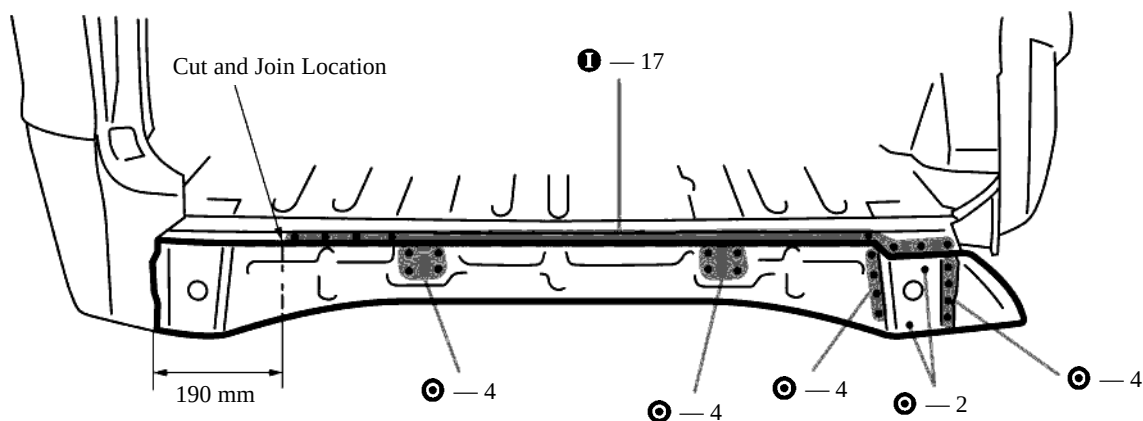
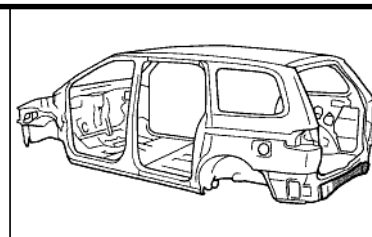
REAR FLOOR No.6 CROSSMEMBER (CUT)**REMOVAL**

mm	in.
190	7.48

1. Cut and join the panels at the locations as shown above.

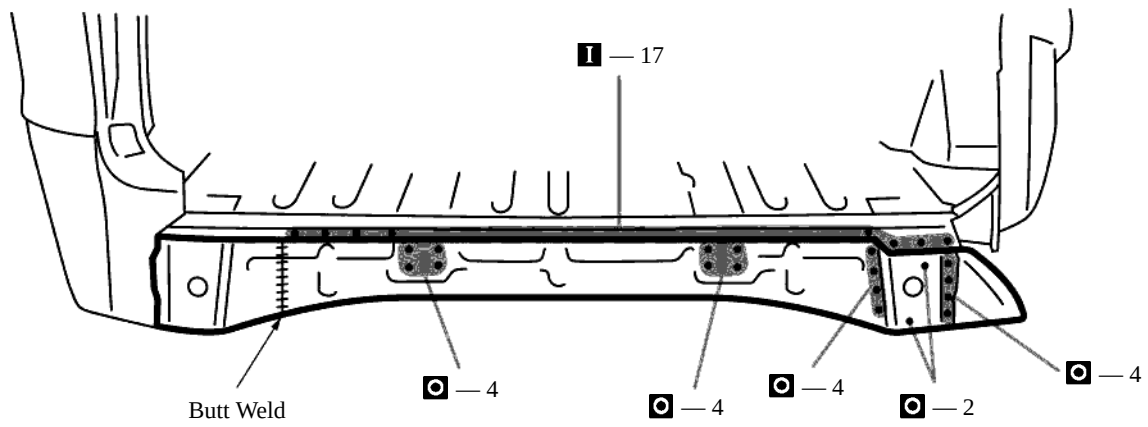
INSTALLATION



REAR FLOOR No.6 CROSSMEMBER (CUT)**REMOVAL (With the roof side inner panel removed.)**

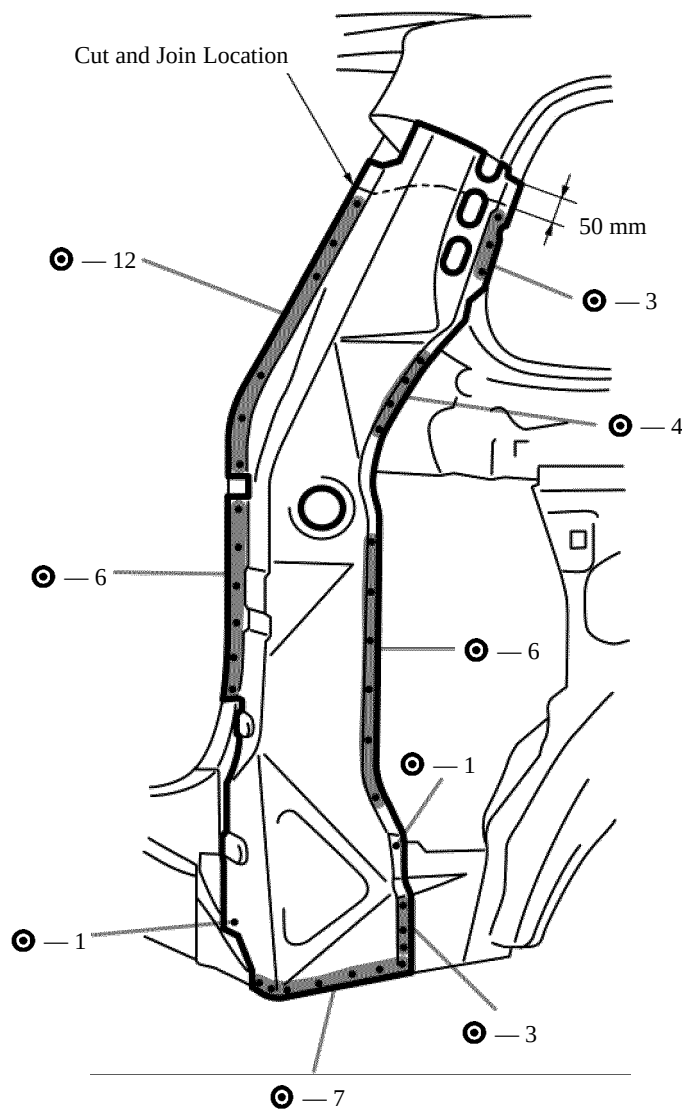
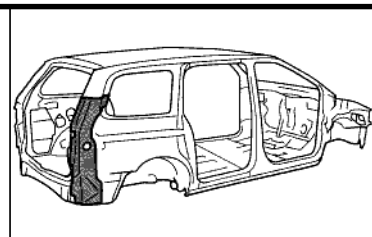
mm	in.
190	7.48

1. Cut and join the parts at the location as shown above.

INSTALLATION

ROOF SIDE OUTER PANEL (CUT)

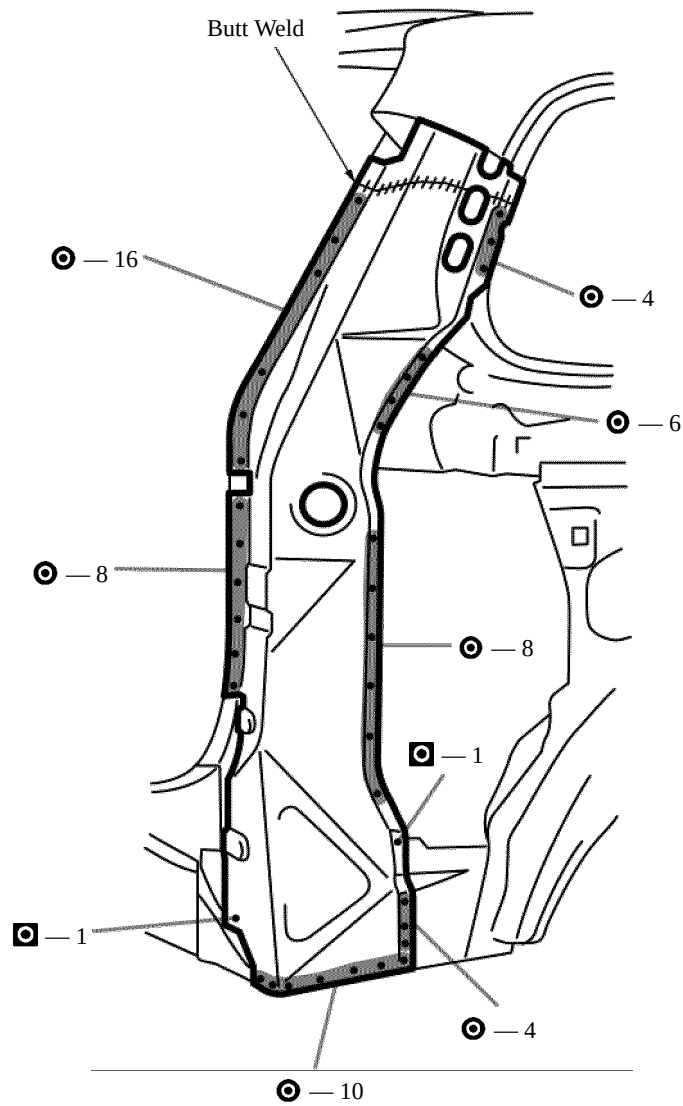
REMOVAL (With the quarter panel rear lower extension removed.)



mm	in.
50	1.97

1. Cut and join the parts at the location as shown above.

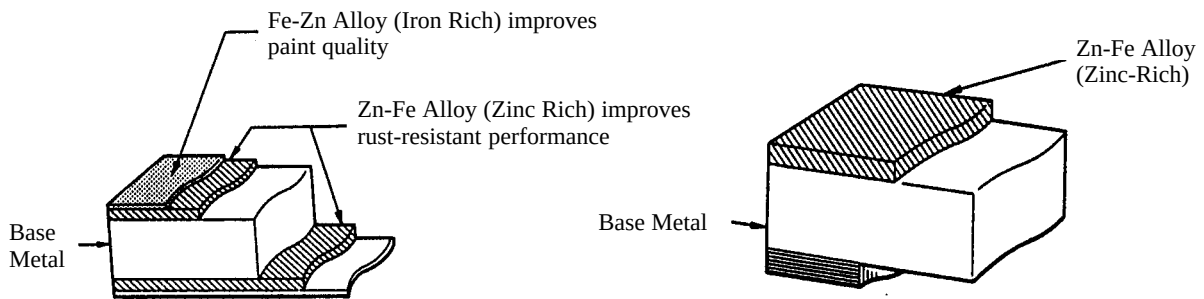
INSTALLATION



RUST-RESISTANT SHEET STEEL PARTS

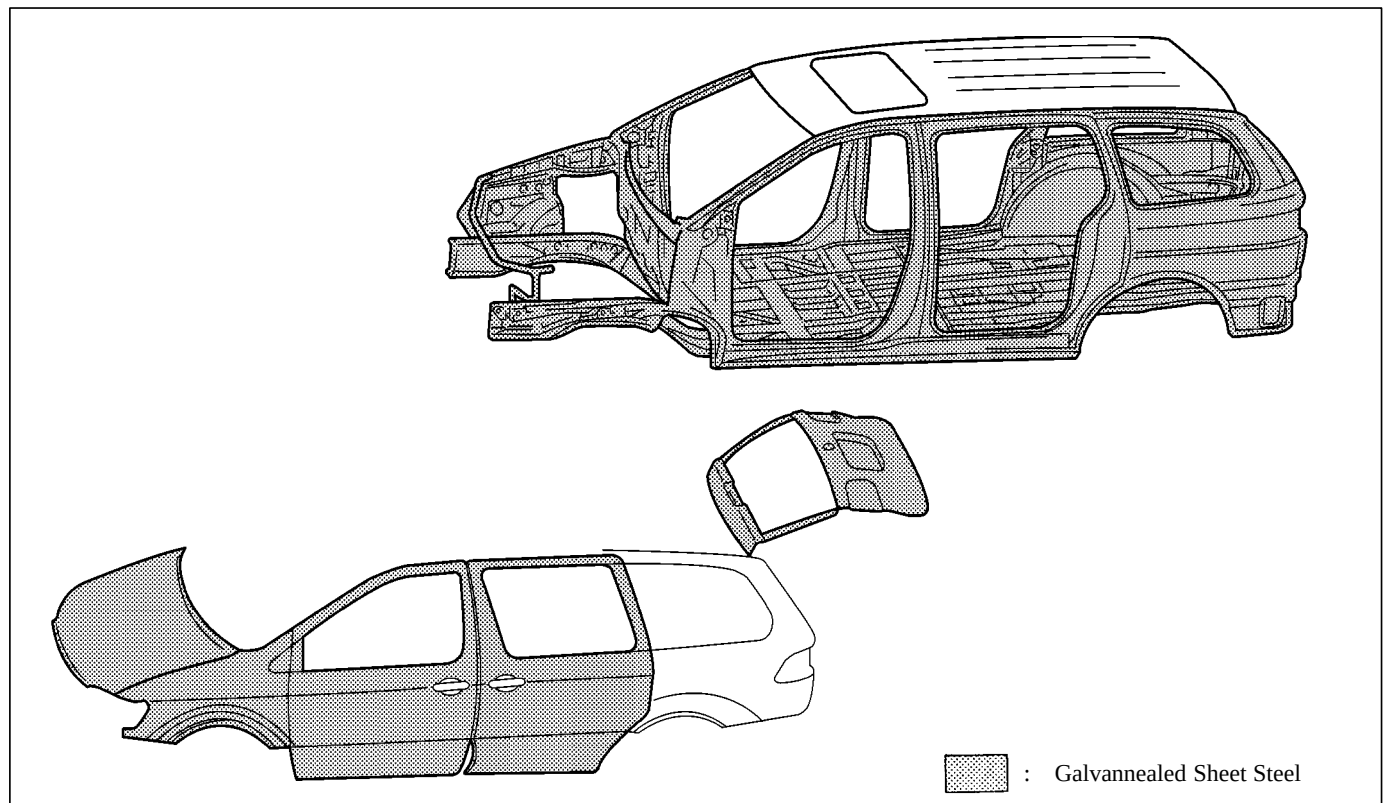
Rust-Resistant Sheet Steel have zinc, tin or aluminum etc, plating over the base metal surface in order to improve the corrosion resistance of the sheet metal. This sheeting is used on areas that require anti-corrosive abilities but there is no need to distinguish the differences between rust resistant sheet steel and ordinary sheet steel in body repair.

Body panels on TOYOTA models are made of two different melted galvanized sheet steel. The ordinary melted galvanized sheet steel has a zinc plating over the base metal surface and when heated a zinc-iron alloy plating. The zinc-iron double layered galvanized sheet has a iron rich and another zinc-rich layer above the sheet steel. These 2 layers improve paint adhesion. These two melted galvanized sheet steels are used selectively according to need.



The handling of Rust-Resistant Sheet Steel is the same as for ordinary sheet steel, but the following should be observed.

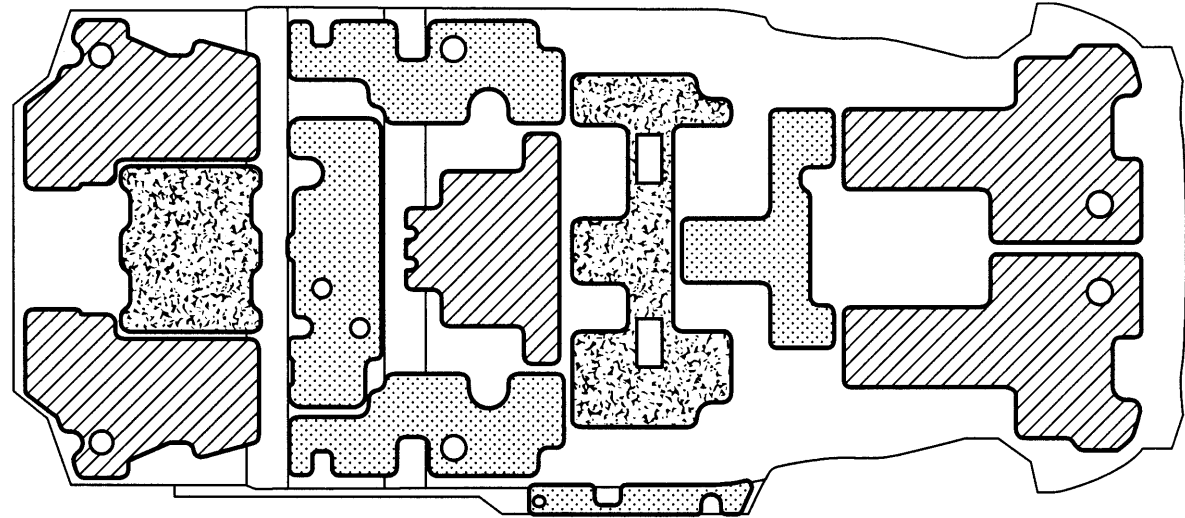
1. **Panel Welding:** The paint as well as the zinc portion must be removed completely from the welding area to guarantee good welding integrity.
2. **Anti-Rust Treatment:** Since the zinc plating is lost after welding, anti-rust treatment of the welded area must be thoroughly performed (refer to section AR).

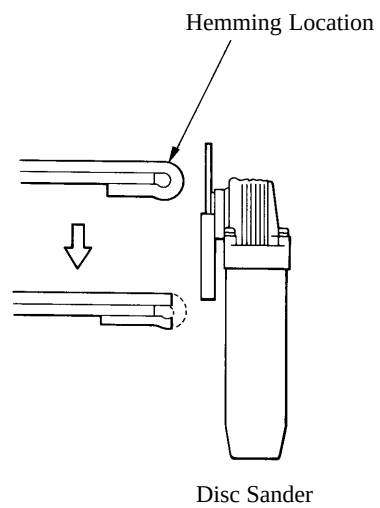
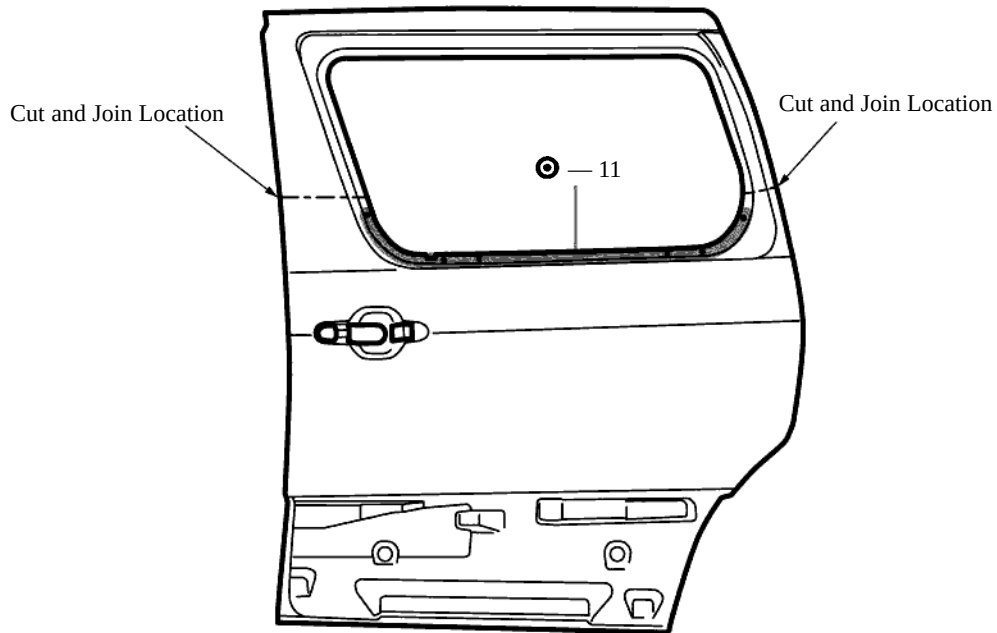
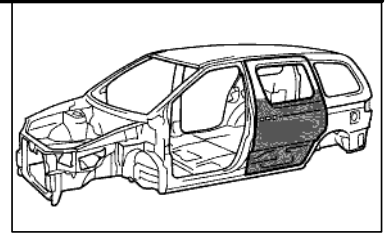


SILENCER SHEET INSTALLATION AREAS

Thickness of Silencer Sheet

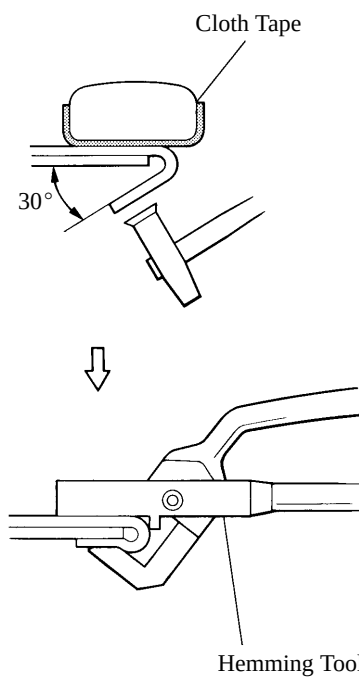
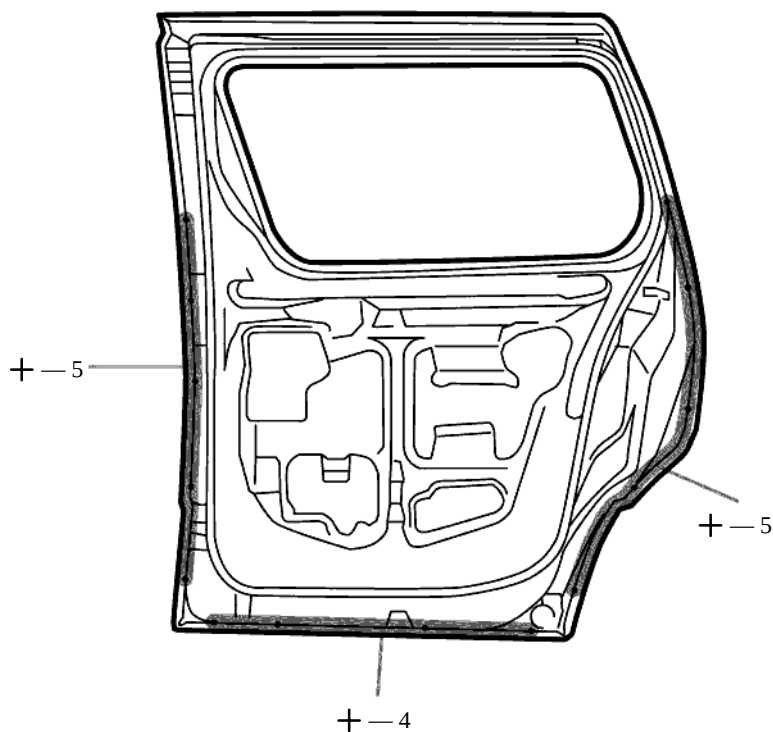
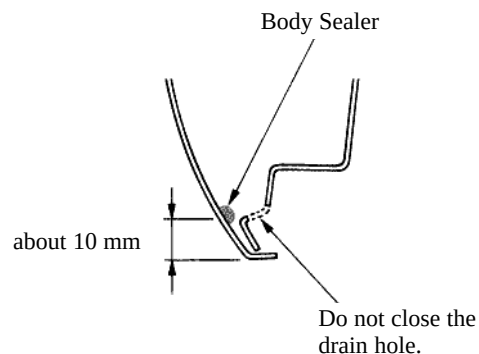
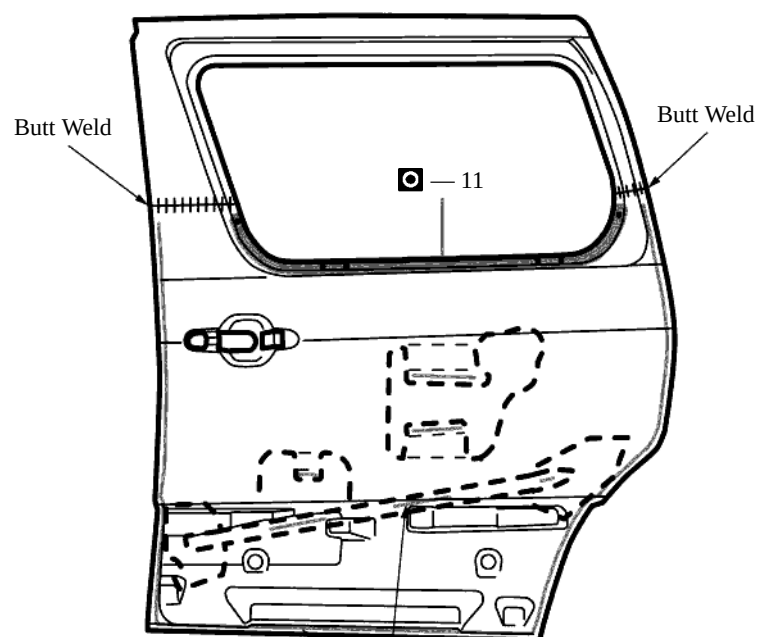
- .. 1.5 mm (0.059 in.)
- .. 3.0 mm (0.118 in.)
- .. 4.5 mm (0.177 in.)



SLIDE DOOR OUTER PANEL (CUT)**REMOVAL**

1. Cut and join the parts at the locations as shown above.
2. After grinding off the hemming location, remove the outer panel.

INSTALLATION



mm	in.
10	0.39

- Before temporarily installing the new parts, apply body sealer to the reinforcement, side impact protection beam and back side of the new parts.

HINT:

- Apply just enough sealer for the reinforcement and side impact beam to touch the new panel. Apply sealer evenly around the flange area, about 10 mm (0.39 in.) from the edge, as shown.
- For other sealing points, refer to section AR.

- Bend the flange hem about 30° with a hammer and dolly, then fasten tightly with a hemming tool.

HINT:

- Perform hemming in three steps, being careful not to warp the panel.
- If a hemming tool cannot be used, hem with a hammer and dolly.

SYMBOLS

The following symbols are used in the Welding Diagrams in Section RE of this manual to indicate cutting areas and the types of weld required.

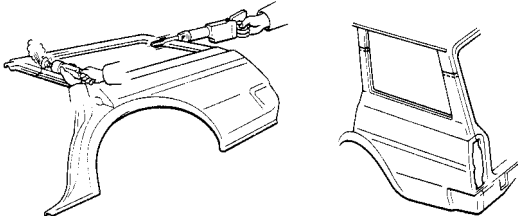
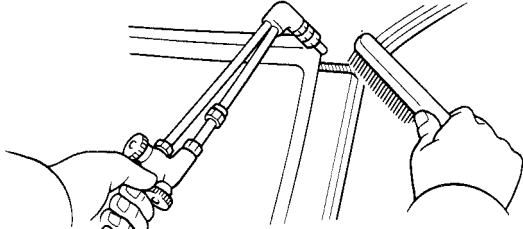
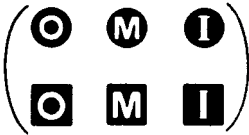
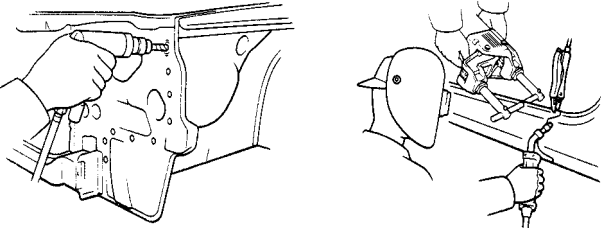
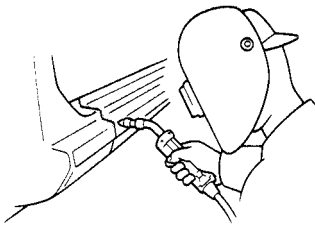
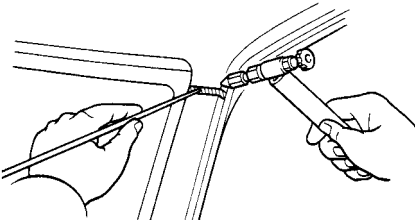
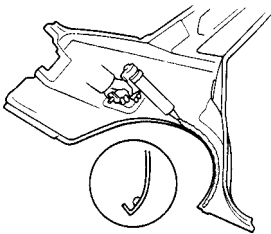
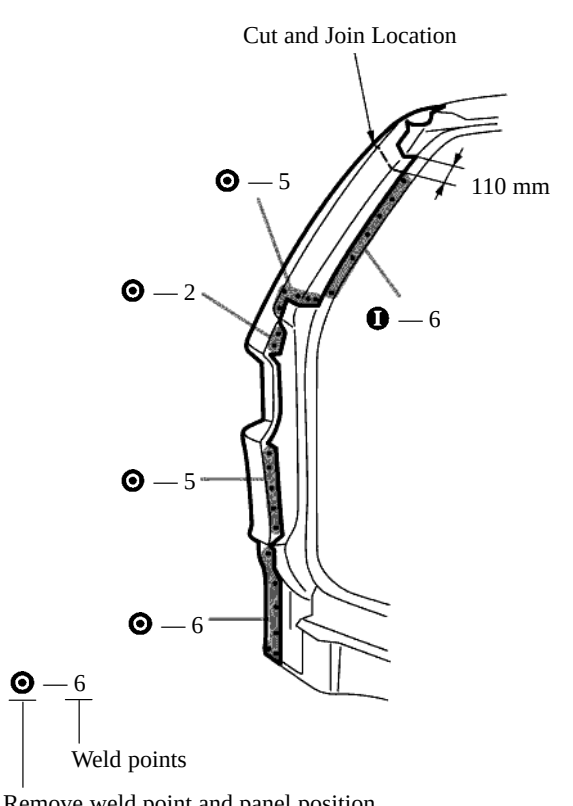
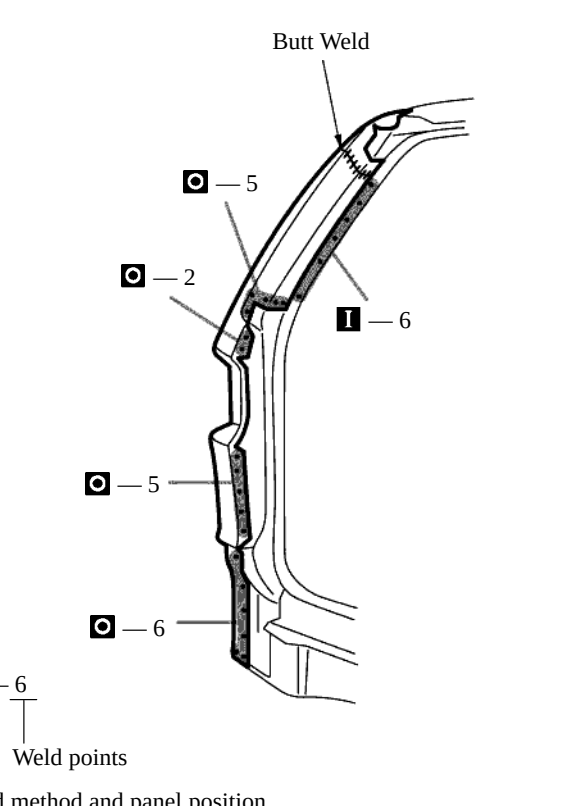
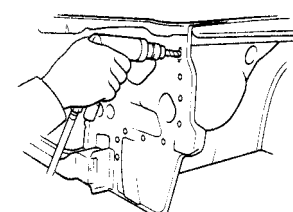
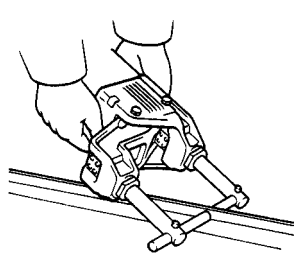
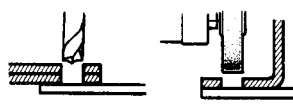
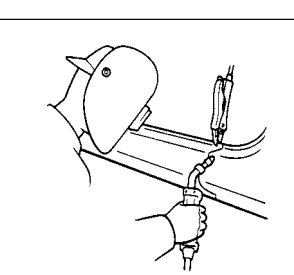
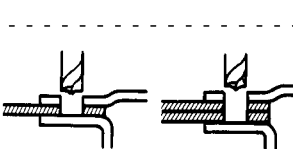
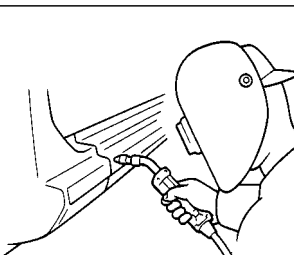
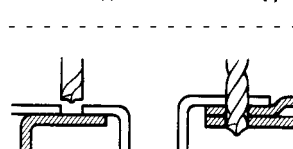
SYMBOLS	MEANING	ILLUSTRATION
	SAW CUT OR ROUGH CUT	
	REMOVE BRAZE	
 	WELD POINTS SPOT WELD OR MIG PLUG WELD (See page IN-5)	
	CONTINUOUS MIG WELD (BUTT WELD OR TACK WELD)	
	BRAZE	
	BODY SEALER	

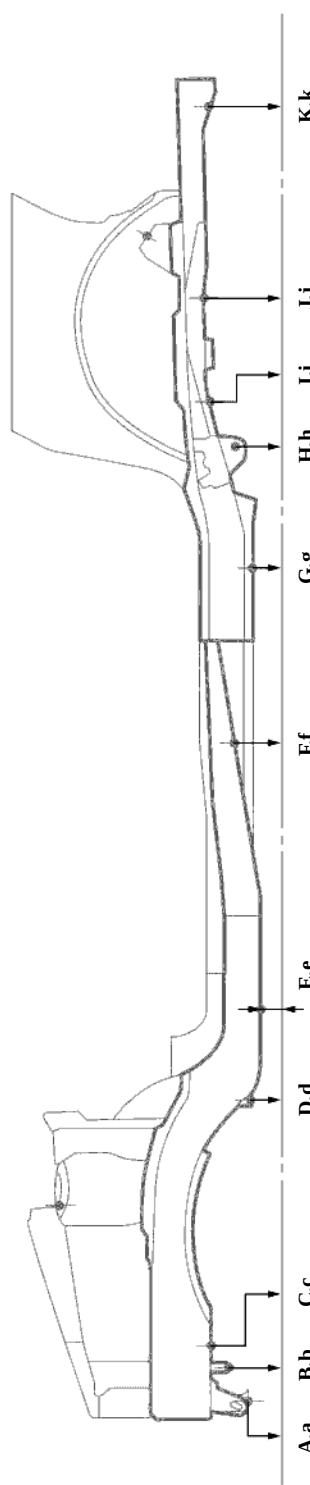
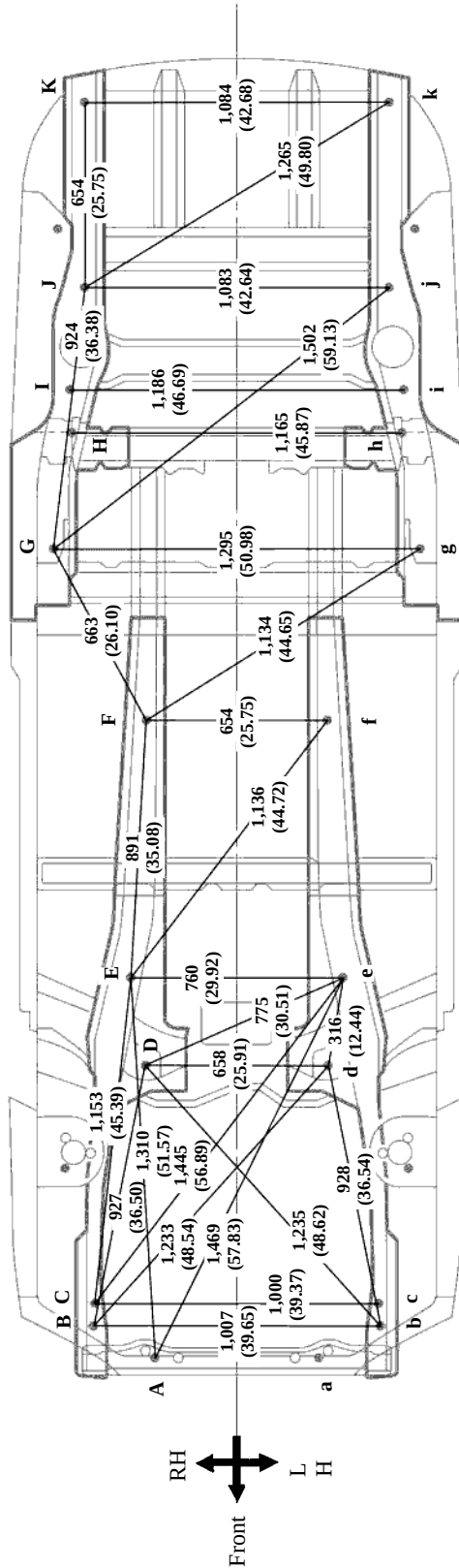
Illustration of Weld Point Symbols

EXAMPLE:

REMOVAL			INSTALLATION		
 Remove weld point and panel position			 Weld method and panel position		
SYMBOL	MEANING	ILLUSTRATION	SYMBOL	MEANING	ILLUSTRATION
○ M I	Remove Weld Points		○ M I	Spot Weld	
○	(Outside)		○ M I	Mig Plug Weld	
M	(Middle)		+	Spot MIG Weld	
I	(Inside)				
HINT: Panel position symbols are as seen from the working posture.					

UNDER BODY

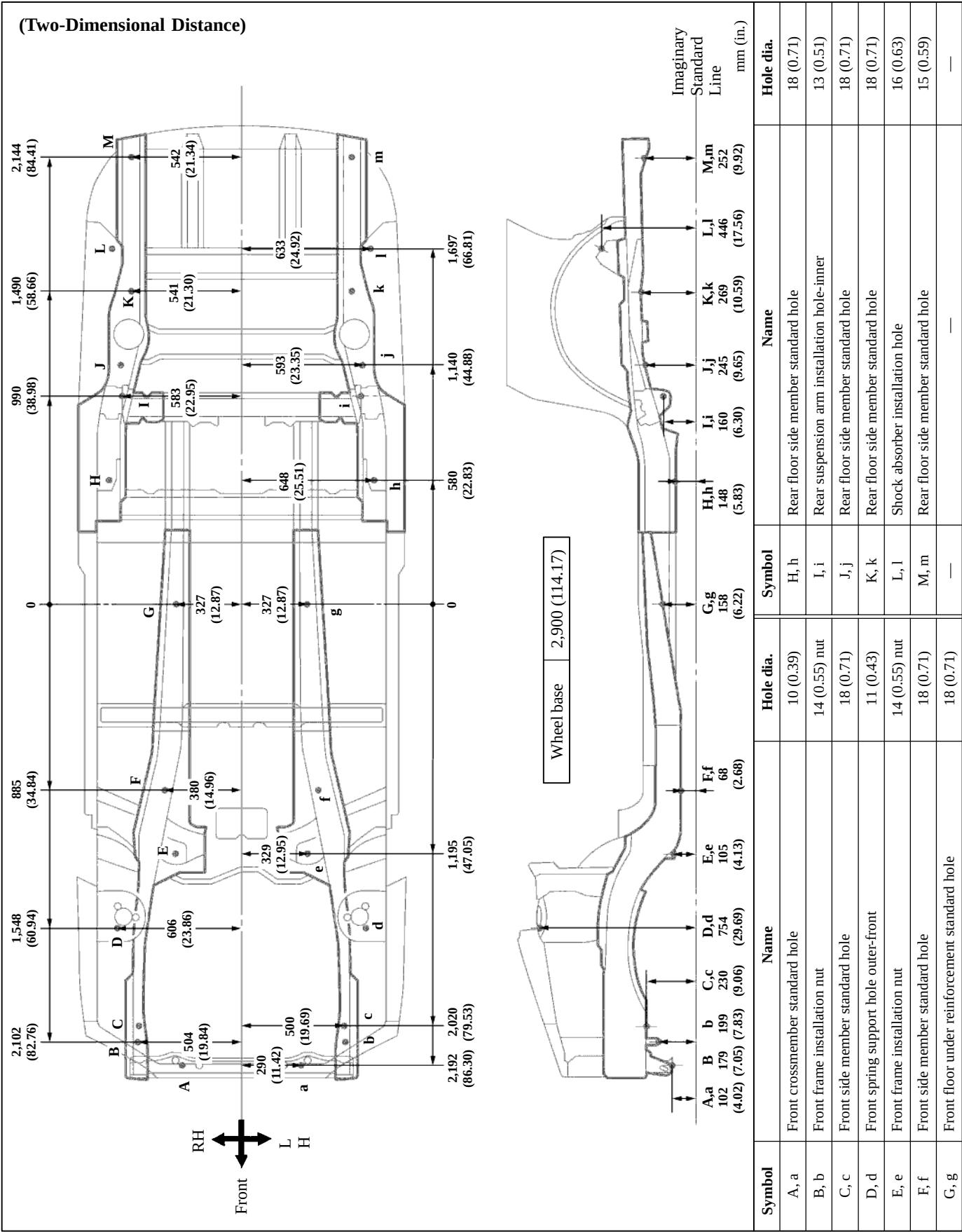
(Three-Dimensional Distance)



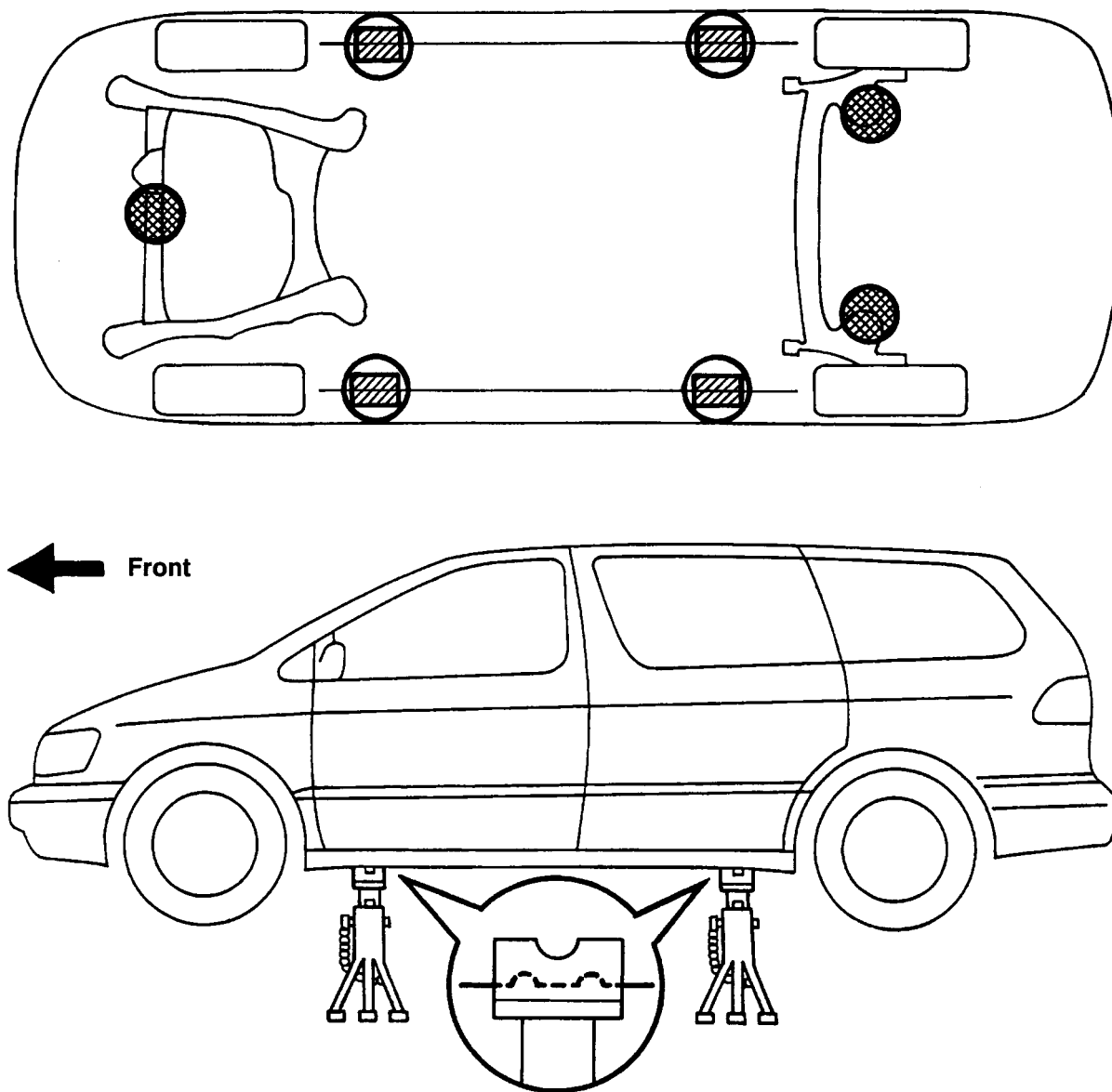
mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front crossmember standard hole	10 (0.39)	G, g	Rear floor side member standard hole	18 (0.71)
B, b	Front frame installation nut	14 (0.55) nut	H, h	Rear suspension arm installation hole-inner	13 (0.51)
C, c	Front side member standard hole	18 (0.71)	I, i	Rear floor side member standard hole	18 (0.71)
D, d	Front frame installation nut	14 (0.55) nut	J, j	Rear floor side member standard hole	18 (0.71)
E, e	Front side member standard hole	18 (0.71)	K, k	Rear floor side member standard hole	15 (0.59)
F, f	Front floor under reinforcement standard hole	18 (0.71)	—	—	—

UNDER BODY (Cont'd)



VEHICLE LIFT AND SUPPORT LOCATIONS



JACK POSITION

Front - - - - - Front crossmember

Rear - - - - - Rear axle beam

CAUTION : When jacking-up the rear and front, make sure the car is not carrying any extra weight.

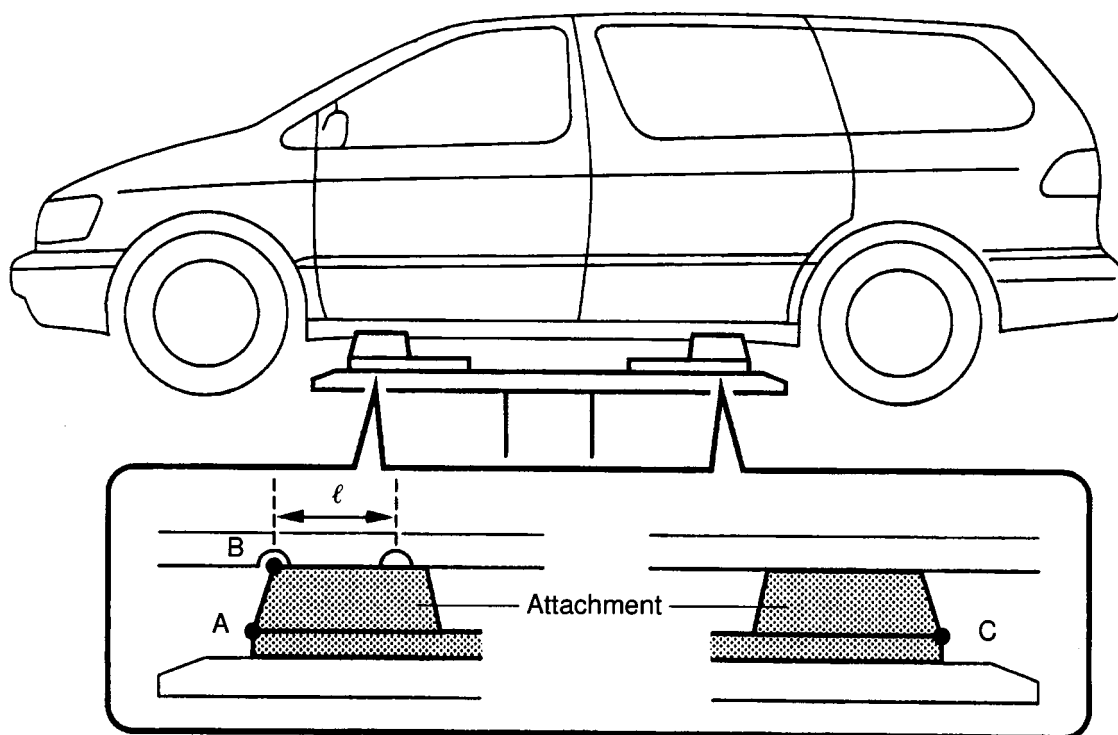
NOTICE :

Do not jack up at the center of the rear axle beam. If the vehicle is lifted at the center of the rear axle beam, the rear axle beam will be damaged.

PANTOGRAPH JACK POSITION

SUPPORT POSITION

Safety stand and swing arm type lift - - - - -

PLATE TYPE LIFT**NOTICE :**

Set the rear side attachment so that it is behind the parting line between Front Door and Sliding Door.

HINT :

Left and right set position

Front and rear set position

Place the vehicle over the center of the lift.

- Align the cushion gum ends of the plate with the attachment lower ends (A, C).
- Align the attachment upper end (B) with the front jack supporting point (ℓ).

Attachment dimensions