ABBREVIATIONS USED IN THIS MANUAL

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

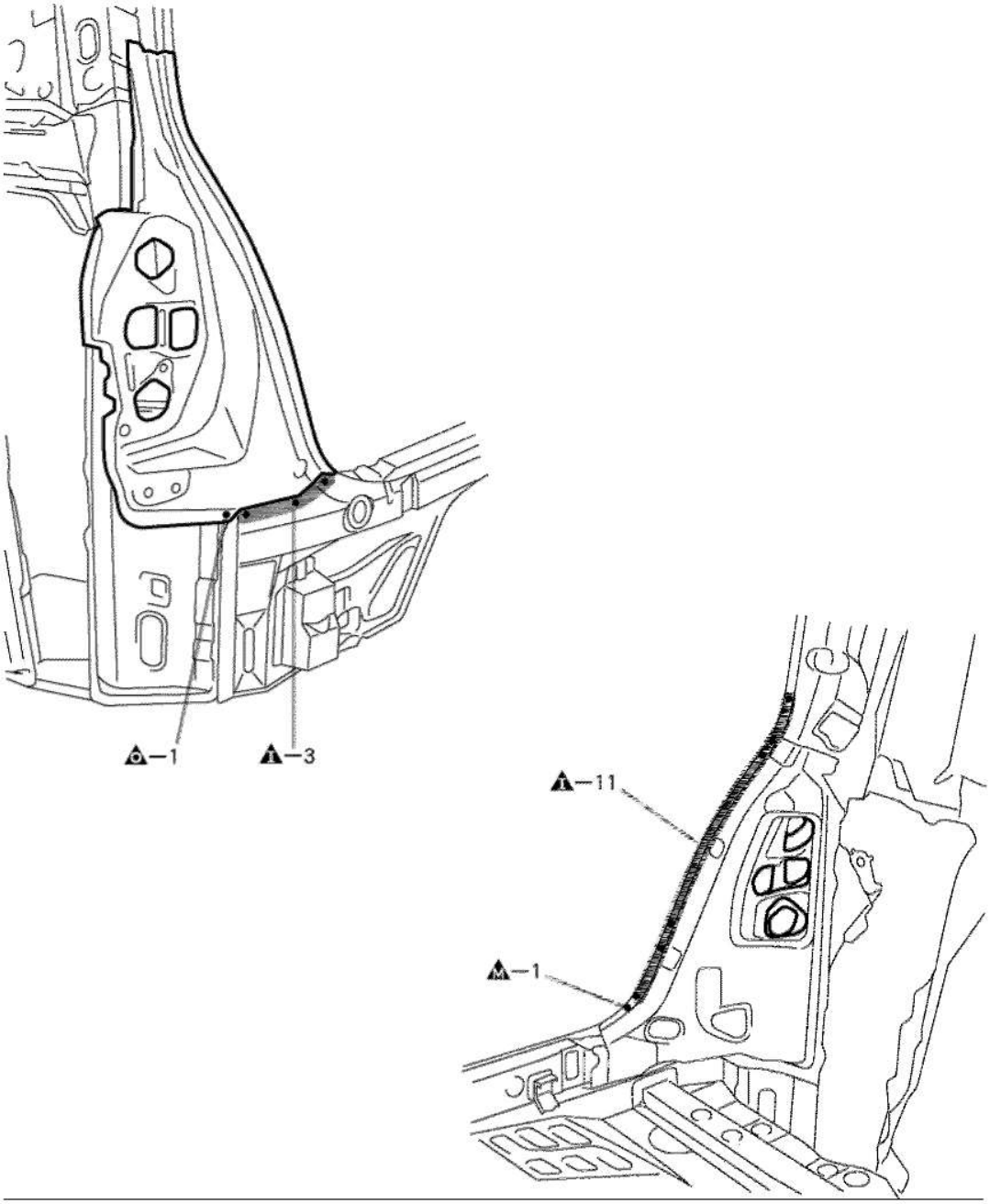
ABS	Antilock Brake System
A/C	Air Conditioner
assy	assembly
ECT	Electronic Controlled Transmission
ECU	Electronic Control Unit
e.g.	Exempli Gratia (for Example)
Ex.	Except
FWD	Front Wheel Drive Vehicles
2WD	Two Wheel Drive Vehicles
4WD	Four Wheel Drive Vehicles
in.	inch
LH	Left-hand
LHD	Left-hand Drive
MIG	Metal Inert Gas
M/Y	Model Year
PPS	Progressive Power Steering
RH	Right-hand
RHD	Right-hand Drive
SRS	Supplemental Restraint System
SSM	Special Service Materials
w/	with
w/o	without

BACK DOOR OPENING TROUGH (ASSY)


F16776A

REPLACEMENT
With the quarter panel removed.

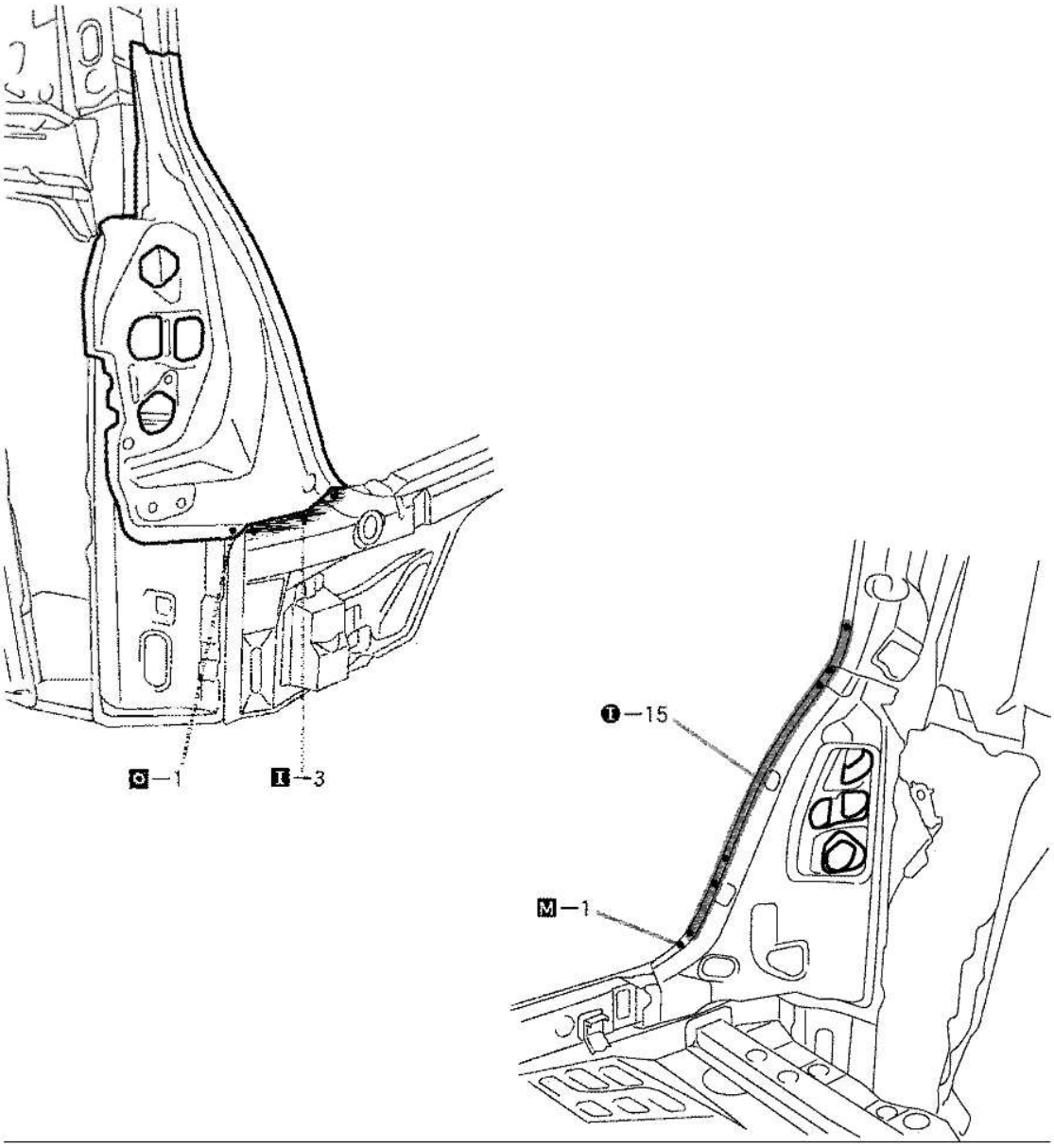
REMOVAL



F16776

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



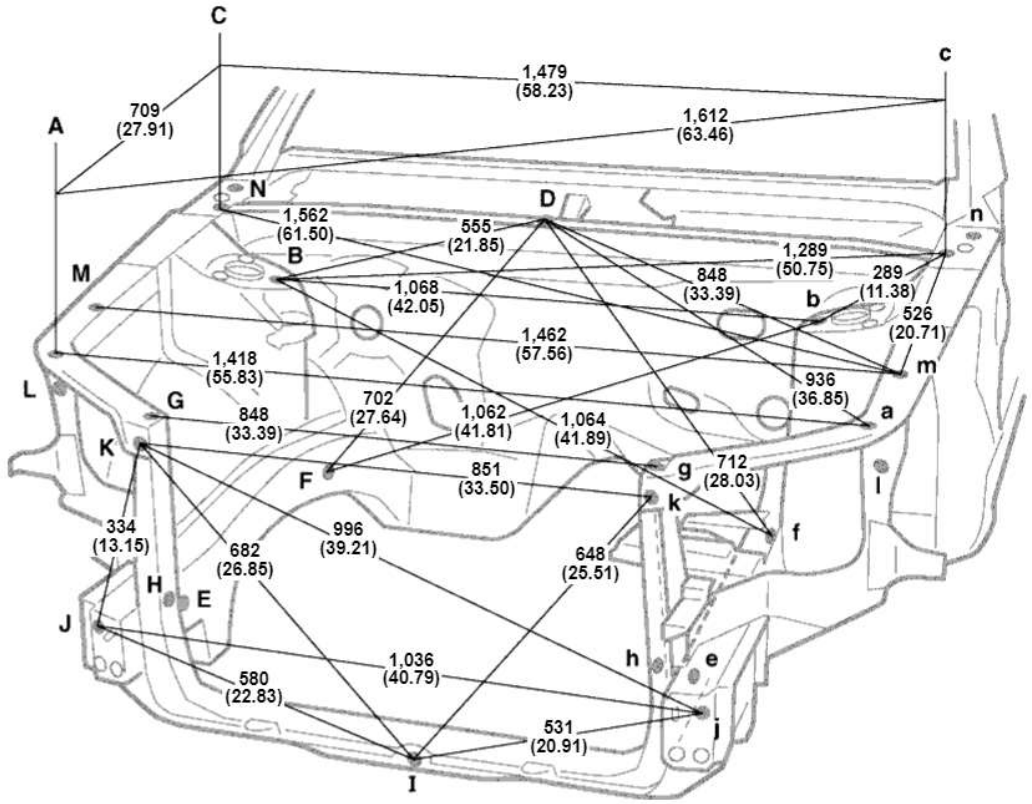
F16777

POINT

1 Inspect the fitting of the quarter panel, back door and rear combination light, etc., before welding, since this affects the appearance of the finish.

BODY DIMENSION DRAWINGS
ENGINE COMPARTMENT

(Three-Dimensional Distance)



Vehicle Dimensions

C-N or c-n	D-E	D-e	H-h	L-l
106 (4.17)	988 (38.90)	985 (38.78)	860 (33.86)	1,461 (57.52)

Height from Imaginary Standard Line

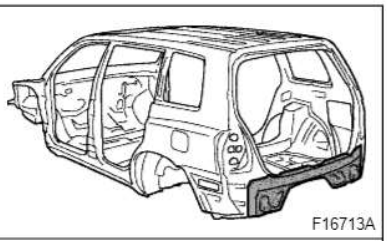
A, a	G, g	N, n
756 (29.76)	724 (28.50)	858 (33.78)

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

mm (in.)

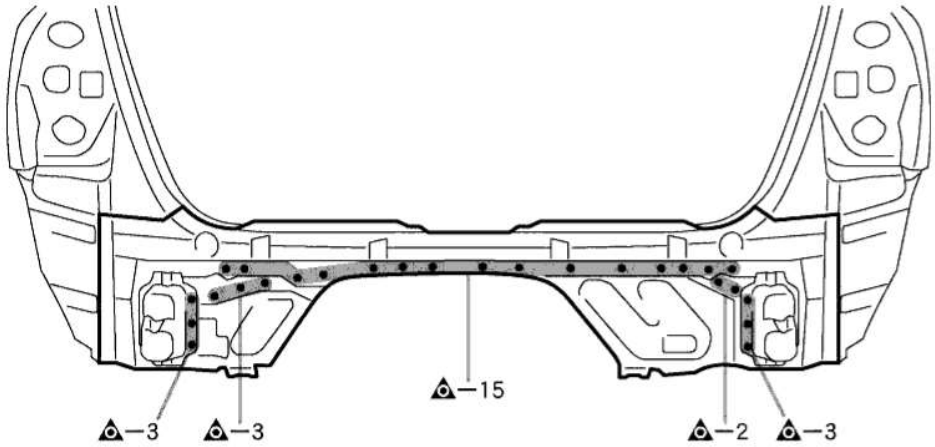
Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front fender installation nut-front	6 (0.24) nut	H, h	Front crossmember side gusset standard hole	15 (0.59)
B, b	Front spring support hole-inner	11 (0.43)	I	Hood lock support installation nut	6 (0.24) nut
C, c	Front fender installation nut-rear	6 (0.24) nut	J, j	Front bumper reinforcement installation nut	10 (0.39) nut
D	Cowl top inner panel standard hole	8 (0.31)	K, k	Radiator upper support installation nut	6 (0.24) nut
E, e	Front side member standard hole	18 (0.71)	L, l	Radiator support standard hole	10 (0.39)
F, f	Front side member standard hole	RH : 18 (0.71) LH : 13 (0.51)	M, m	Front Fender apron to cowl side member standard hole	10 (0.39)
			N, n	Hood hinge installation nut-rear	8 (0.31) nut
G, g	Radiator upper support installation nut	6 (0.24) nut	—	—	—

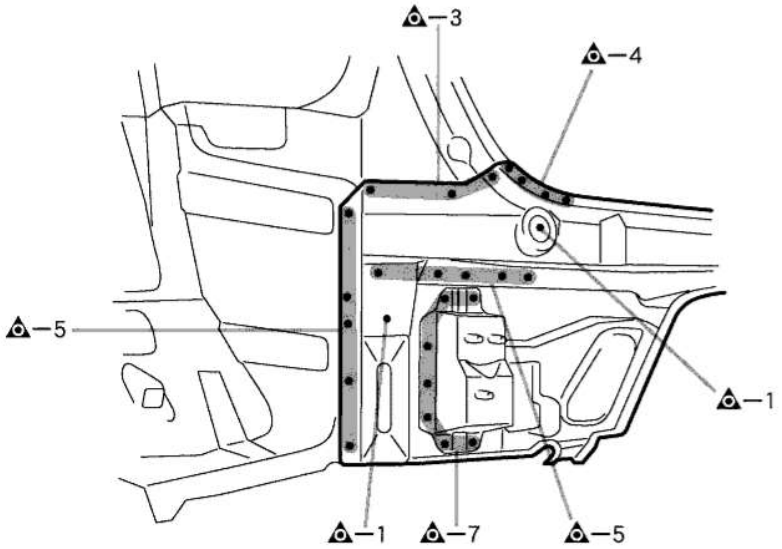
BODY LOWER BACK PANEL (ASSY)


F16713A

REPLACEMENT

REMOVAL

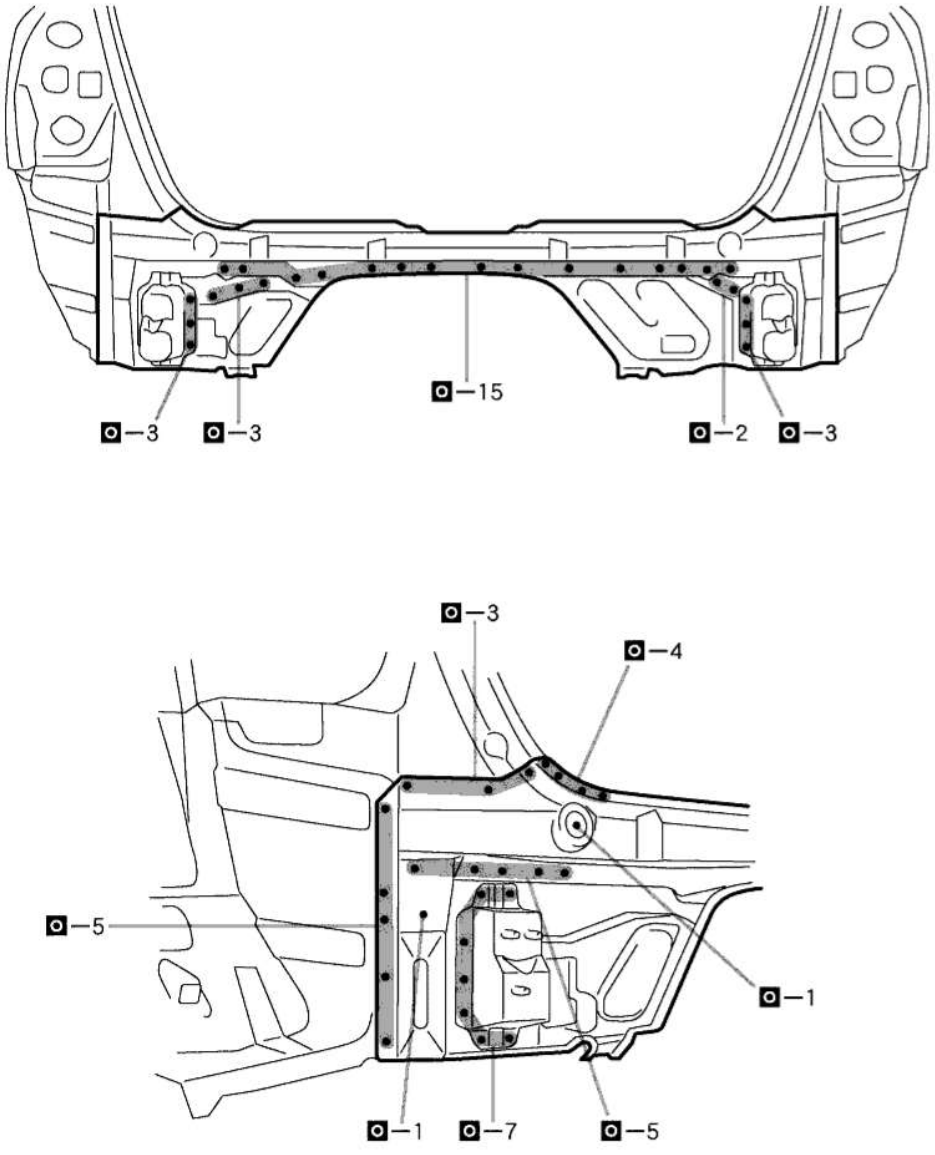




F16713

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



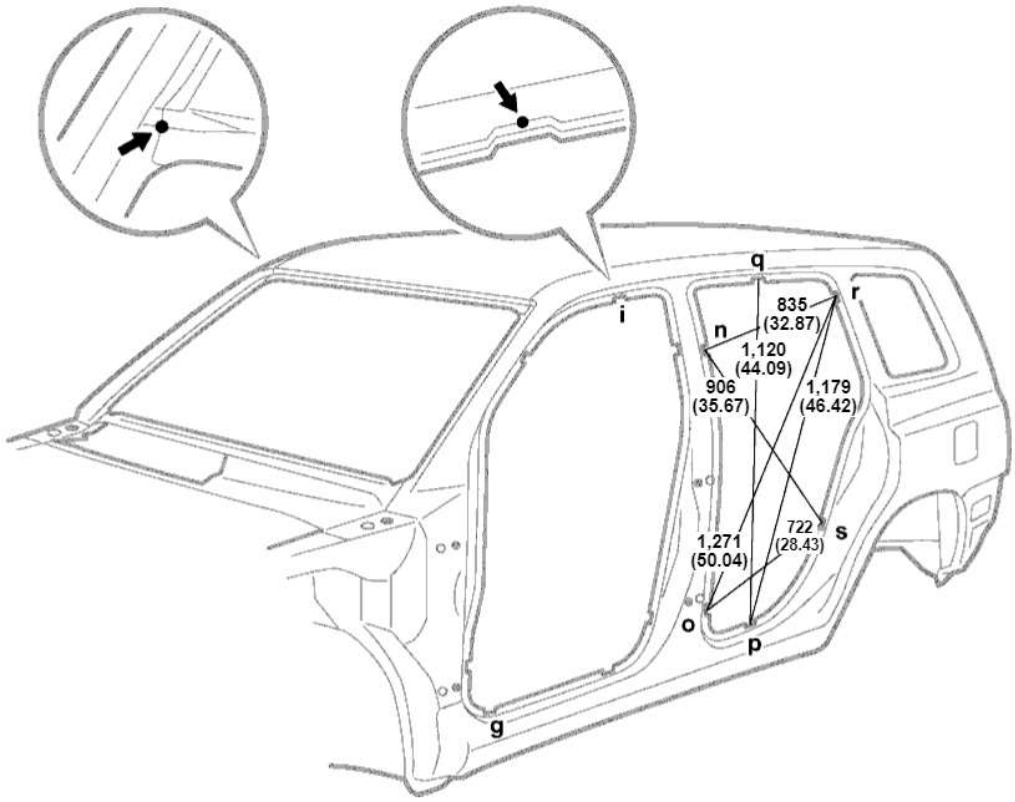
F16714

POINT

1 Inspect the fitting of the back door etc., before welding, since this affects the appearance of the finish.

BODY OPENING AREAS (Side View: Rear)

(Three-Dimensional Distance)



Vehicle Dimensions Left ↔ Right

N-n	O-o	P-p	Q-q	R-s	S-s
1,395 (54.92)	1,502 (59.13)	1,502 (59.13)	1,197 (47.13)	1,254 (49.37)	1,499 (59.02)

G-p or g-P	I-q or i-Q	N-p or n-P	N-r or n-R	N-s or n-S	O-s or o-S	P-q or p-Q	R-s or r-S
1,928 (75.91)	1,389 (54.69)	1,729 (68.07)	1,564 (61.57)	1,706 (67.17)	1,665 (65.55)	1,747 (68.78)	1,580 (62.20)

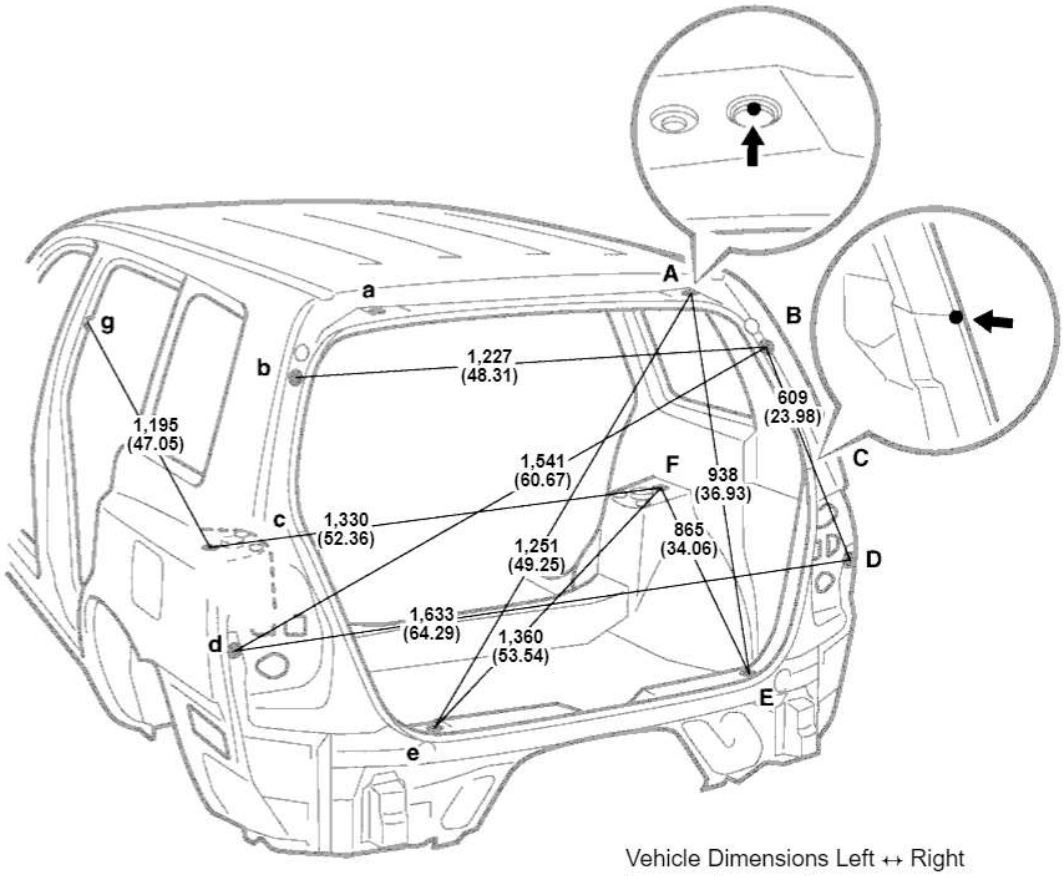
HINT: For symbols, capital letters indicate right side of vehicle, small letters indicate left side of vehicle (seen from rear).

mm (in.)

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

BODY OPENING AREAS (Rear View)

(Three-Dimensional Distance)



Vehicle Dimensions Left ↔ Right

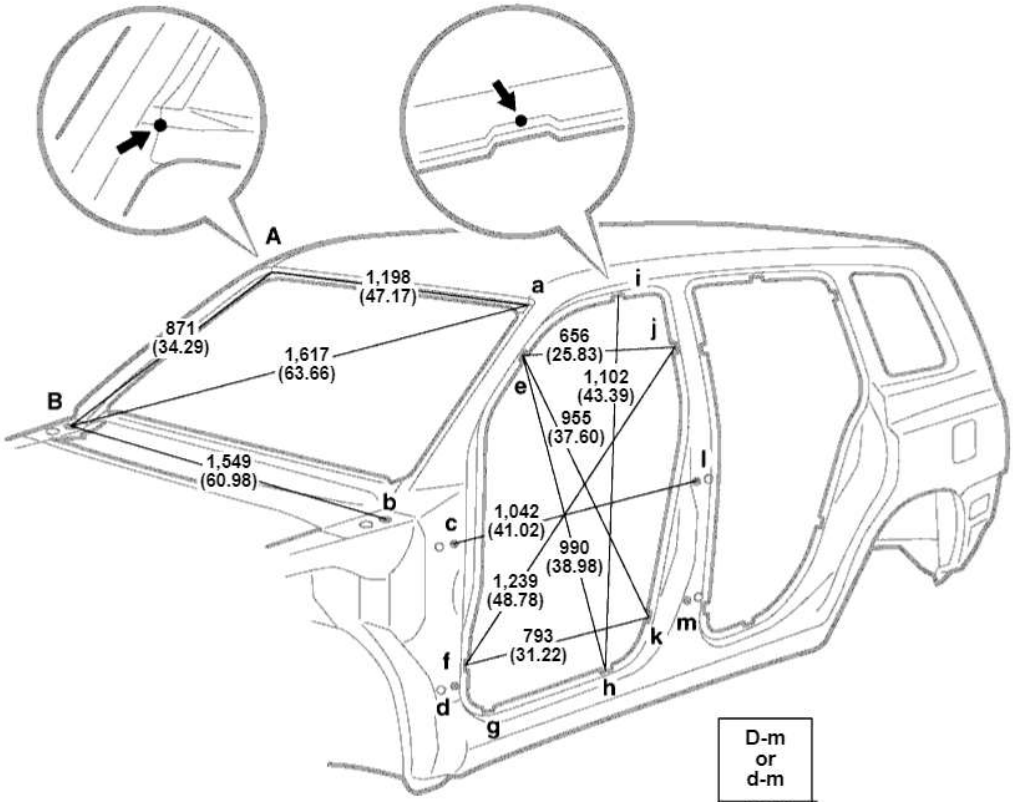
C-c	F-g or f-G
1,325 (52.17)	1,812 (71.34)

mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Back door hinge installation hole-outer	15 (0.59)	D, d	Quarter panel standard hole	10 (0.39)
B, b	Back door damper stay installation nut	6 (0.24) nut	E, e	Deck trim side panel installation hole	7 (0.28)
C, c	Roof side inner front panel / Roof side inner panel adjoining portion	—	F, f	Rear spring support hole outer	12.5 (0.492)
			G, g	Center body pillar assembly mark	—

BODY OPENING AREAS (Side View: Front)

(Three-Dimensional Distance)



D-m or d-m
1,011 (39.80)

Vehicle Dimensions Left ↔ Right

E-e	F-f	G-g	H-h	I-i	J-j	K-k
1,339 (52.72)	1,502 (59.13)	1,502 (59.13)	1,502 (59.13)	1,210 (47.64)	1,369 (53.90)	1,502 (59.13)

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
1,651 (65.00)	1,729 (68.07)	1,504 (59.21)	1,895 (74.61)	1,698 (66.85)	1,741 (68.54)	1,657 (65.24)

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

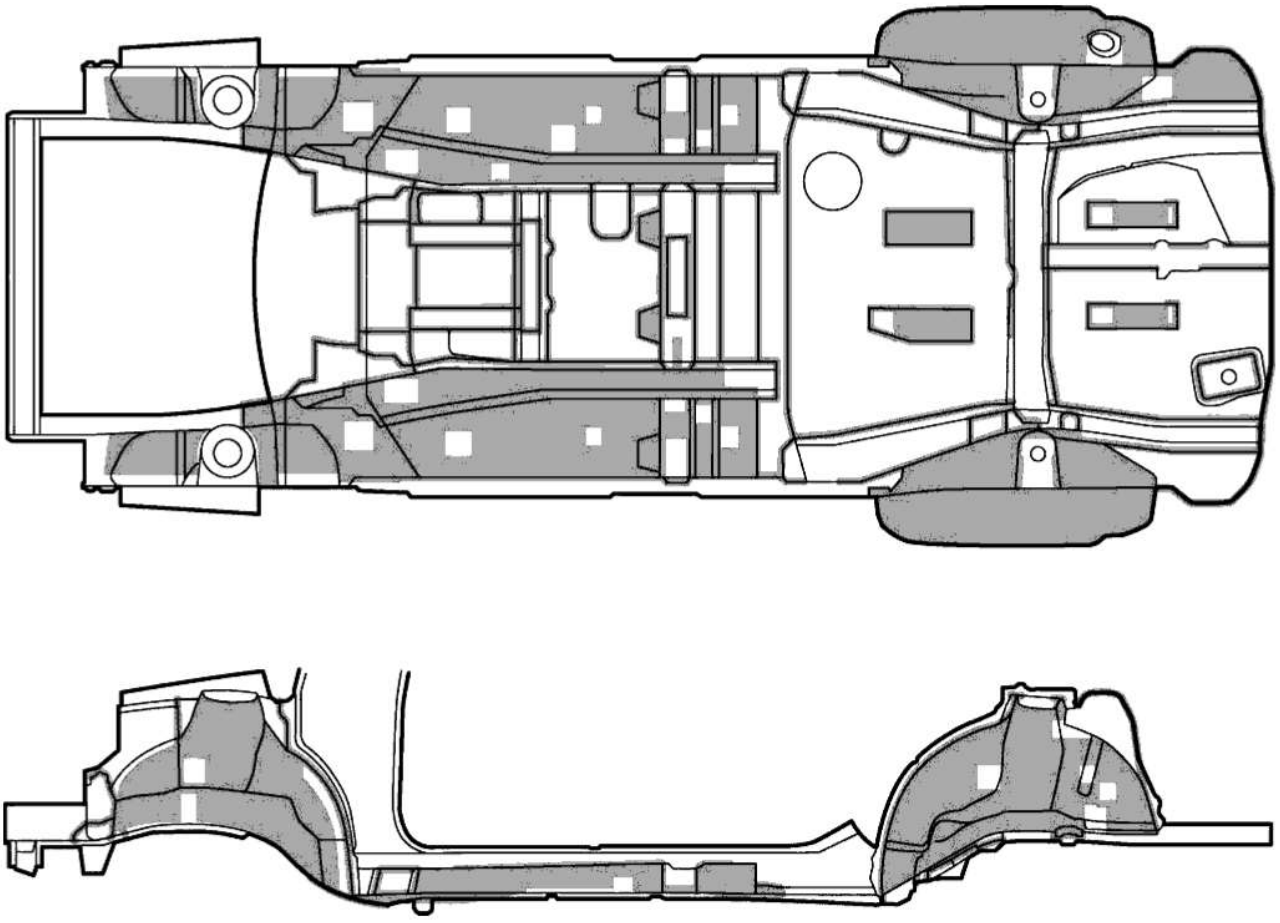
mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Roof panel / Front body pillar adjoining portion	—	H, h	Rocker panel assembly mark	—
B, b	Hood hinge installation nut-rear	8 (0.31) nut	I, i	Roof side rail assembly mark	—
C, c	Front door hinge installation nut	8 (0.31) nut	J, j	Center body pillar assembly mark	—
D, d	Front door hinge installation nut	8 (0.31) nut	K, k	Center body pillar assembly mark	—
E, e	Front body pillar assembly mark	—	L, l	Rear door hinge installation hole	13 (0.51)
F, f	Front body pillar assembly mark	—	M, m	Rear door hinge installation nut	8 (0.31) nut
G, g	Rocker panel assembly mark	—	—	—	—

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 accidently 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.*



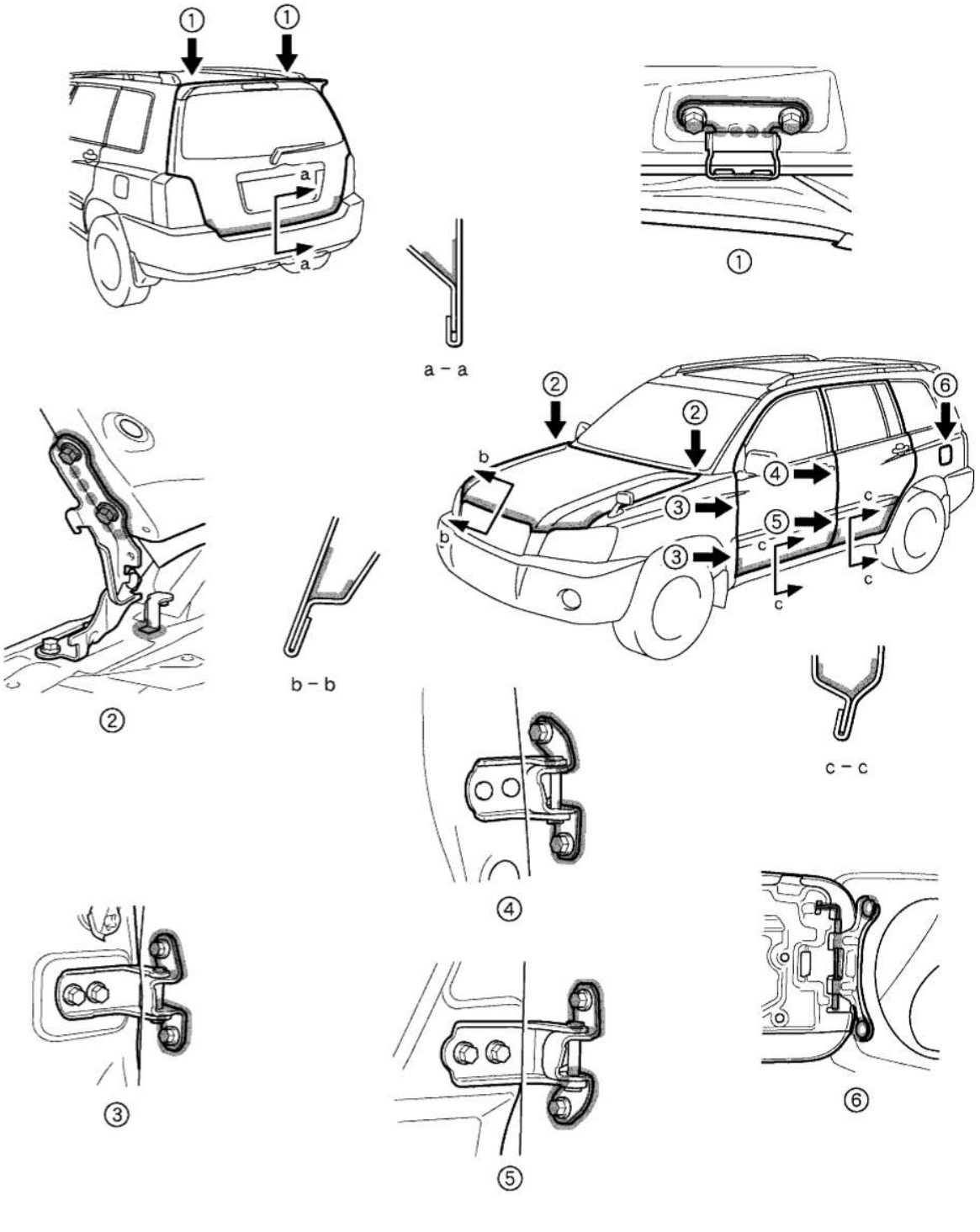
F16736

REFERENCE

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

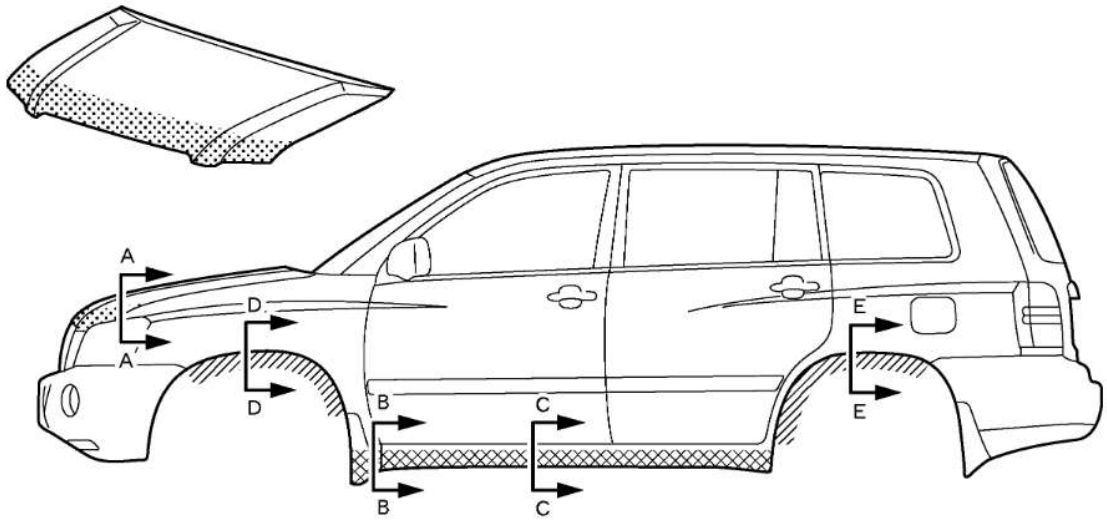
BODY PANEL ANTI-RUST AGENT (WAX) APPLICATION AREAS

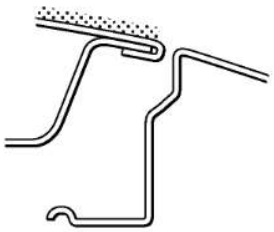
HINT:
1) *Whenever adjusting the doors and hoods, apply anti-rust agent (wax) around the hinges.*
2) *Even if partially repairing a part, apply anti-rust agent (wax) over the entire application area of the part.*
3) *Wipe off the anti-rust agent immediately with a rag soaked in a grease, wax and silicone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



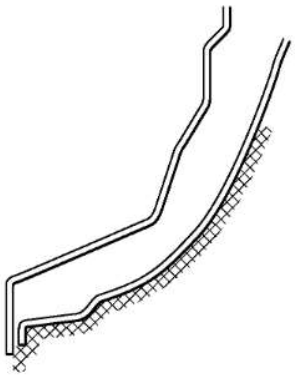
BODY PANEL ANTI-CHIPPING PAINT APPLICATION AREAS

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 of the paint immediately with a rag soaked in grease, wax and silicone remover.*

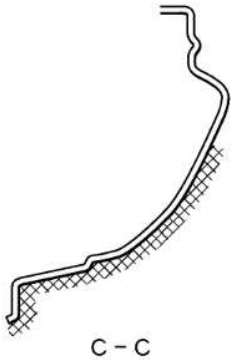




A – A



B – B



C – C



D – D



E – E

F16740

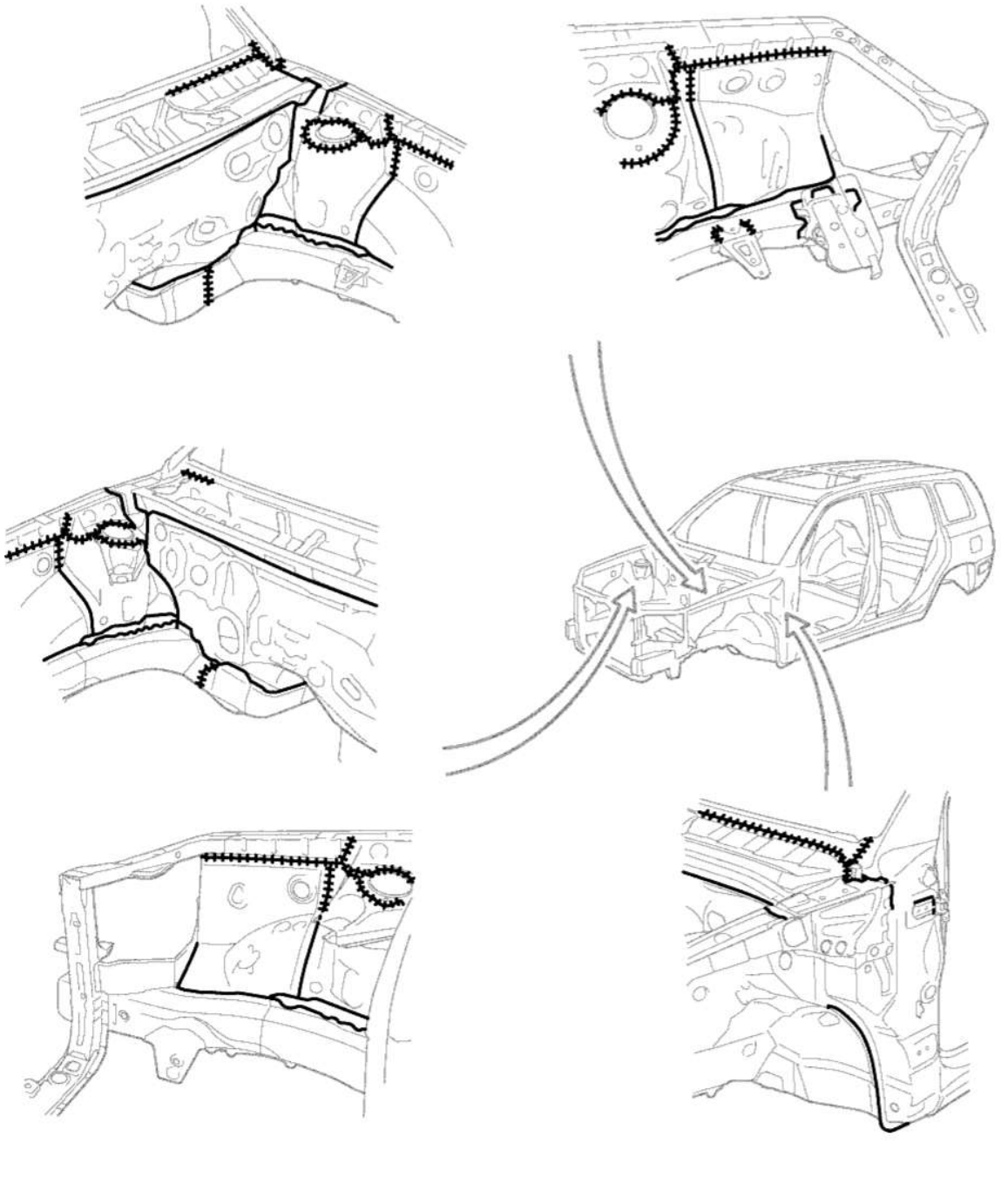
	PVC Chipping Primer		Urethane Primer		Soft-Chip (Poly Olefine)

BODY PANEL SEALING AREAS

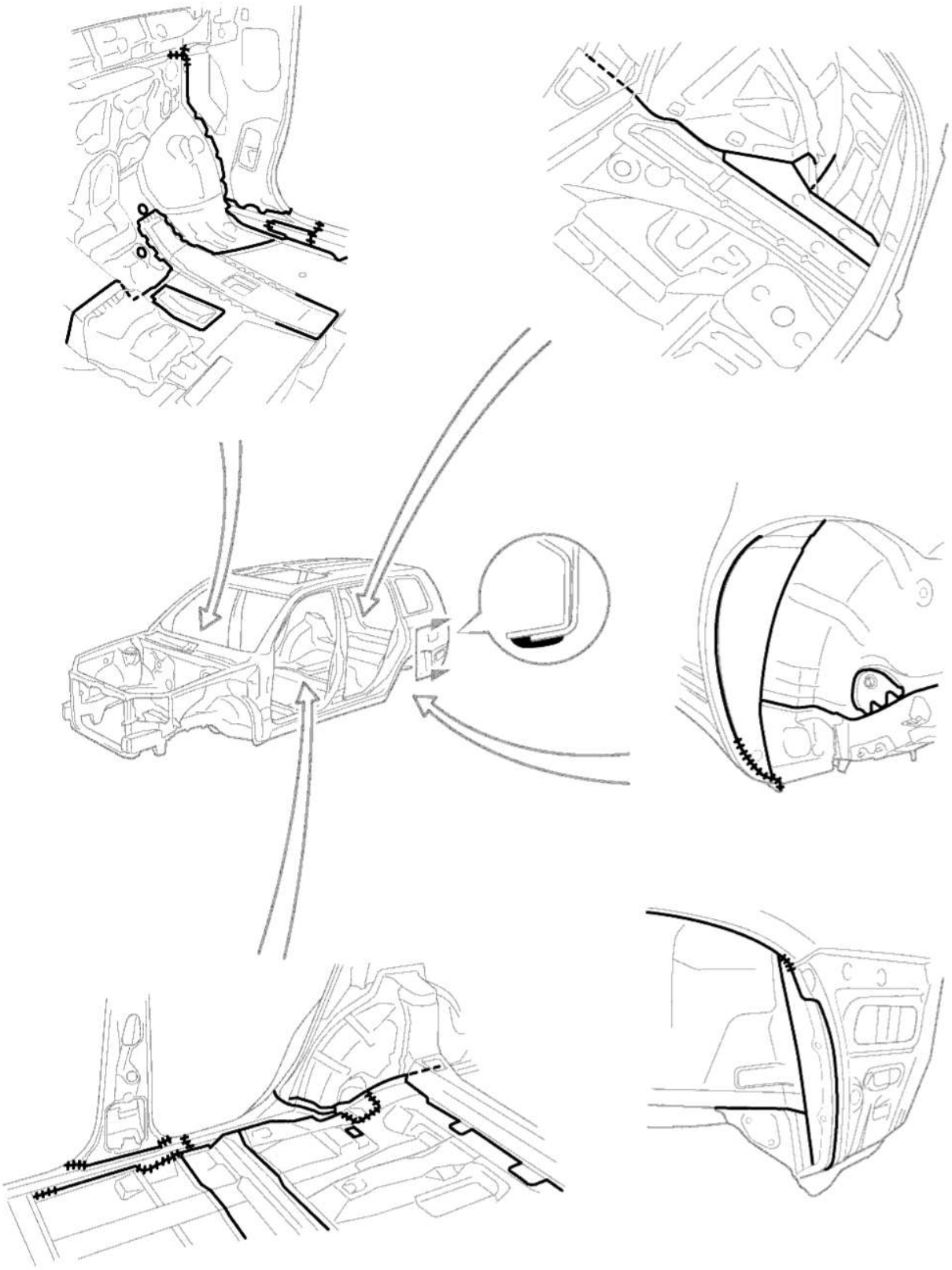
HINT:
1) *Prior to applying body sealer, clean the area with a rag soaked in grease, wax and silicone remover.*
2) *If weld-through primer was used, first wipe off any excess and coat with anti-corrosion primer before applying body sealer.*
3) *Wipe off excess body sealer with a rag soaked in a grease,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

++++++++++	Flat Finishing	————	No Flat Finishing

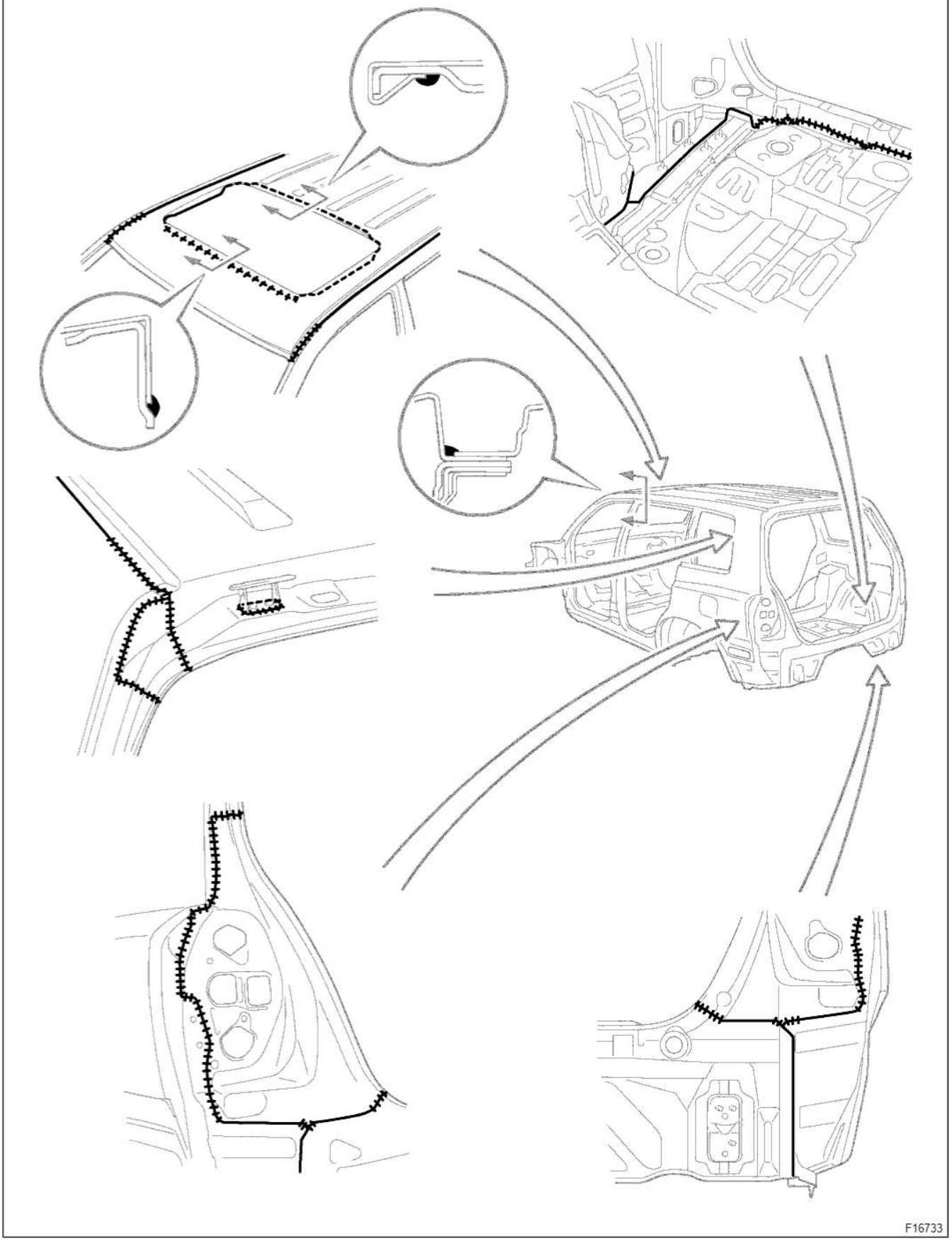
1. ENGINE COMPARTMENT



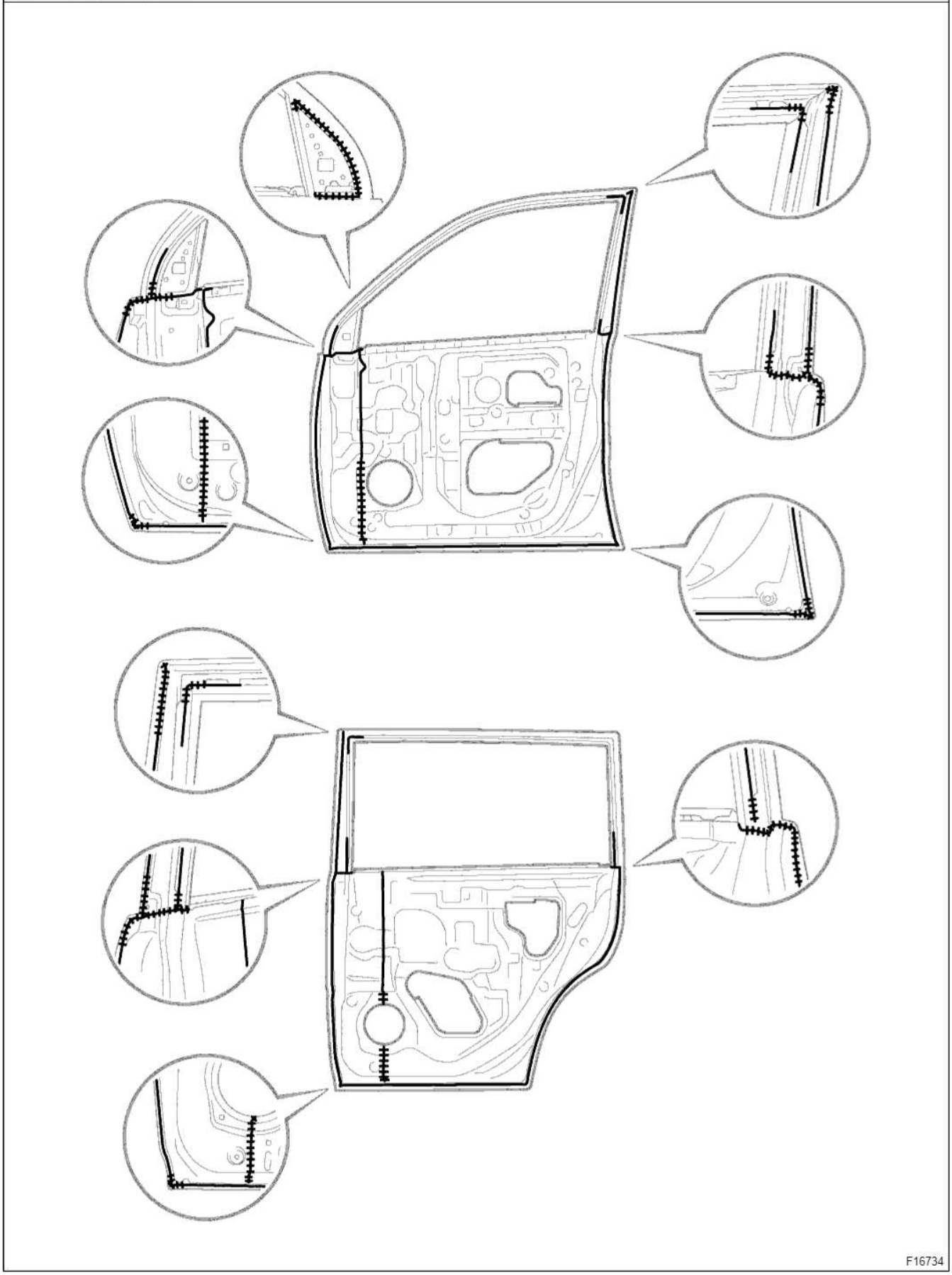
2. INSIDE

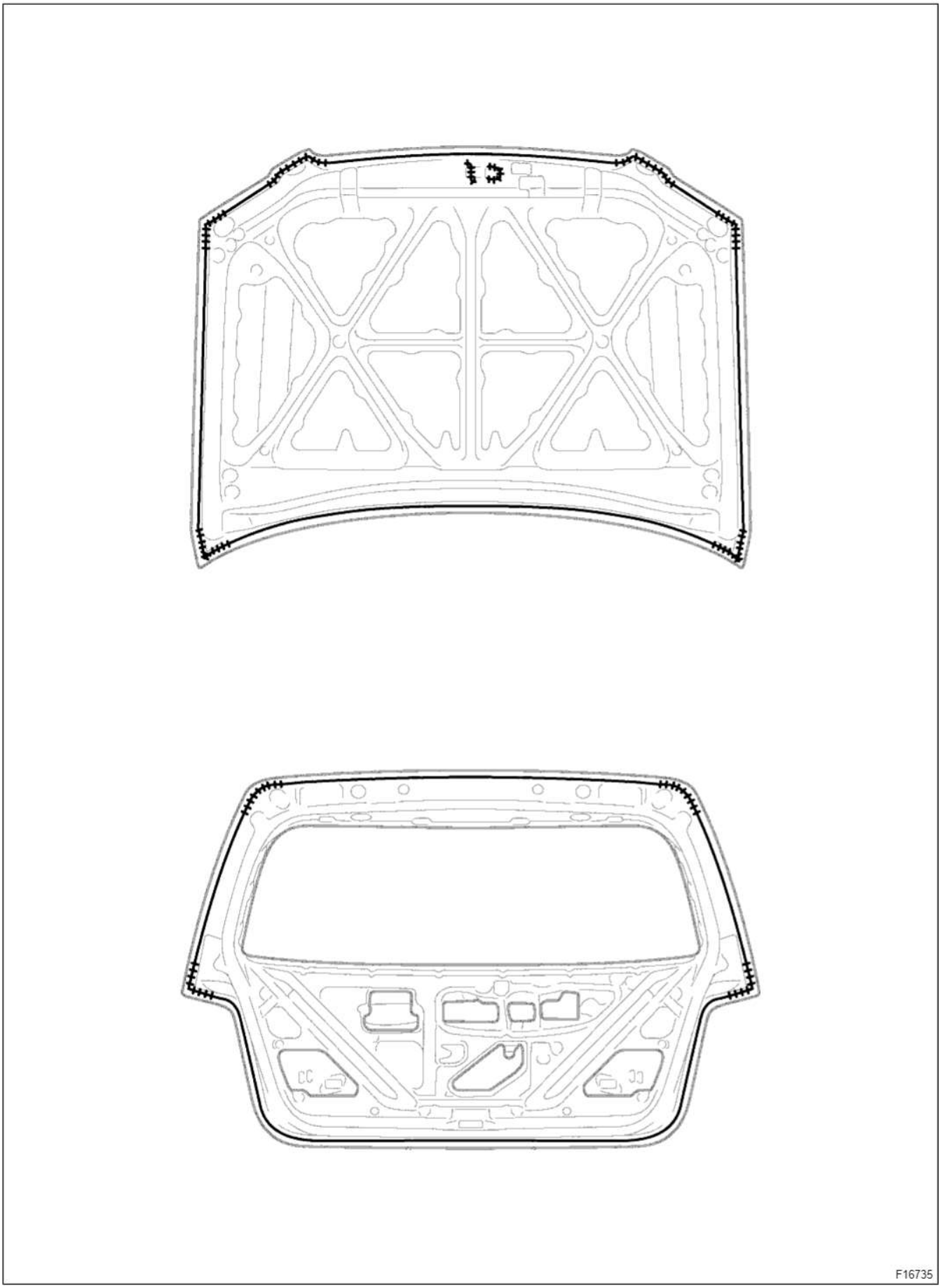


3. REAR LUGGAGE COMPARTMENT

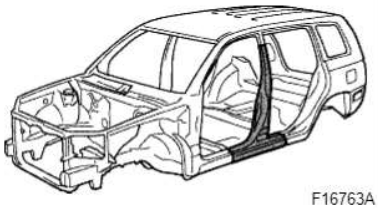


4. DOOR PARTS



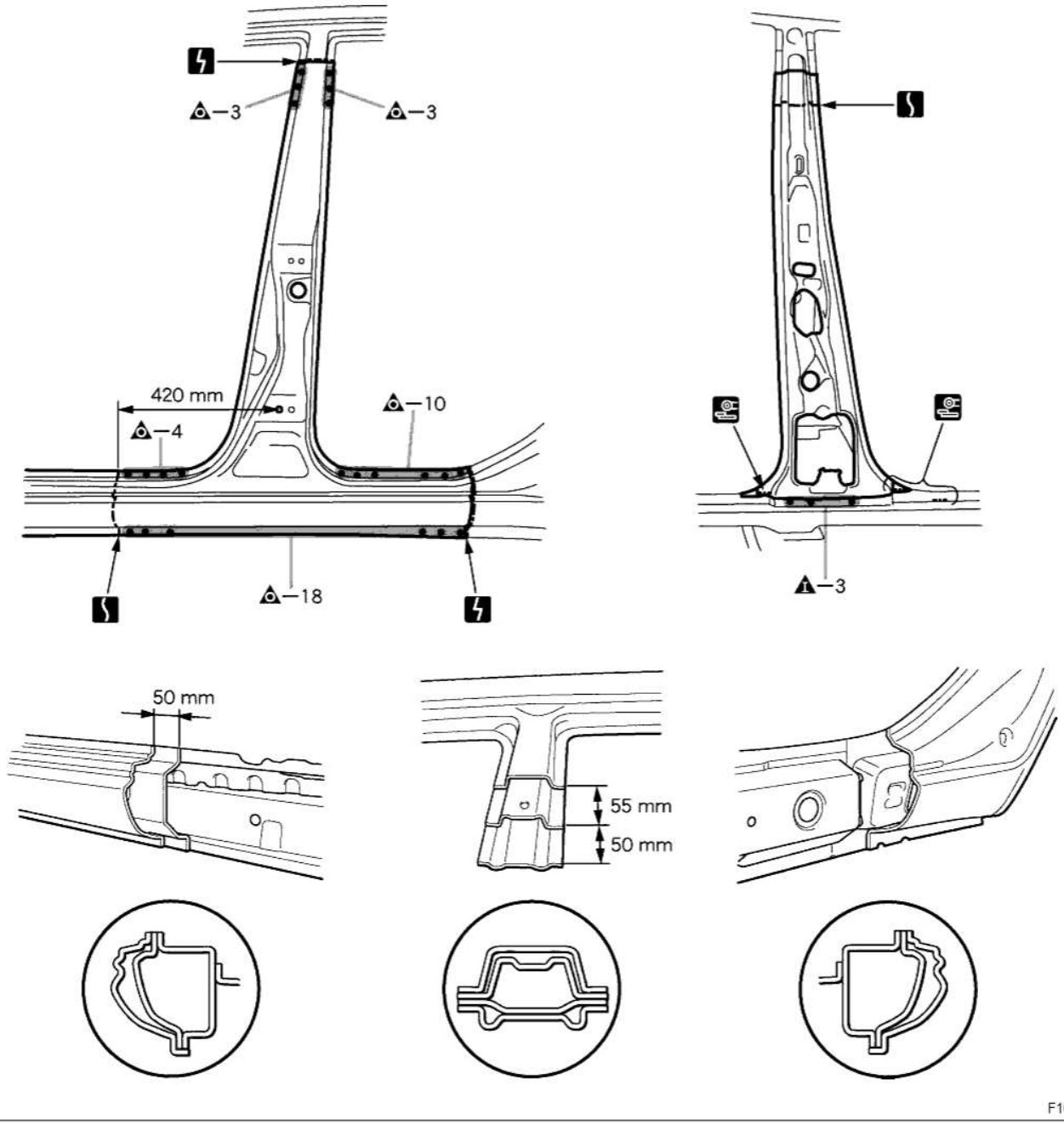

F16735

CENTER BODY PILLAR (CUT)


F16763A

REPLACEMENT

REMOVAL

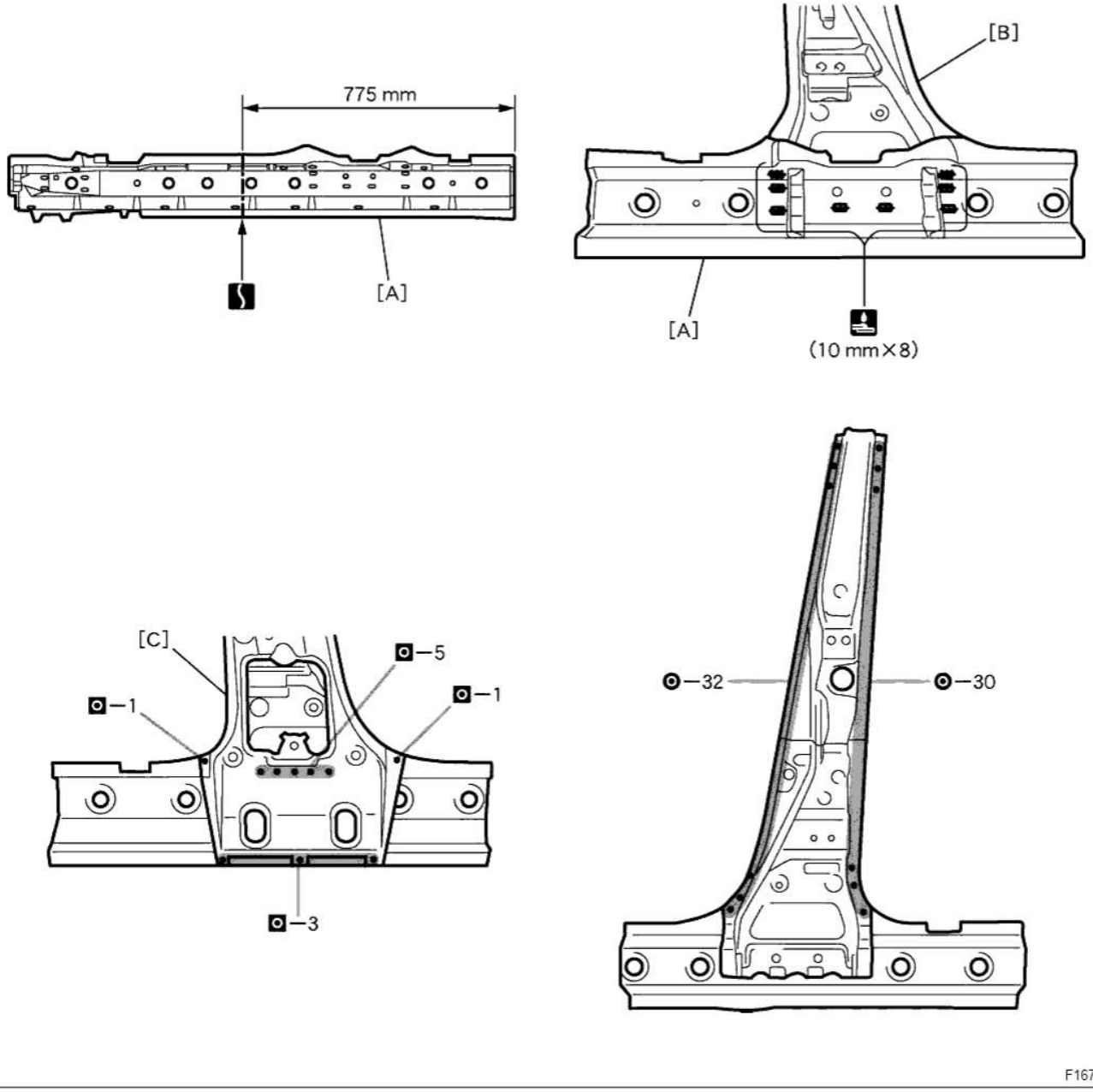


F16763

50 mm (1.97 in.) 55 mm (2.17 in.) 420 mm (16.54 in.)

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



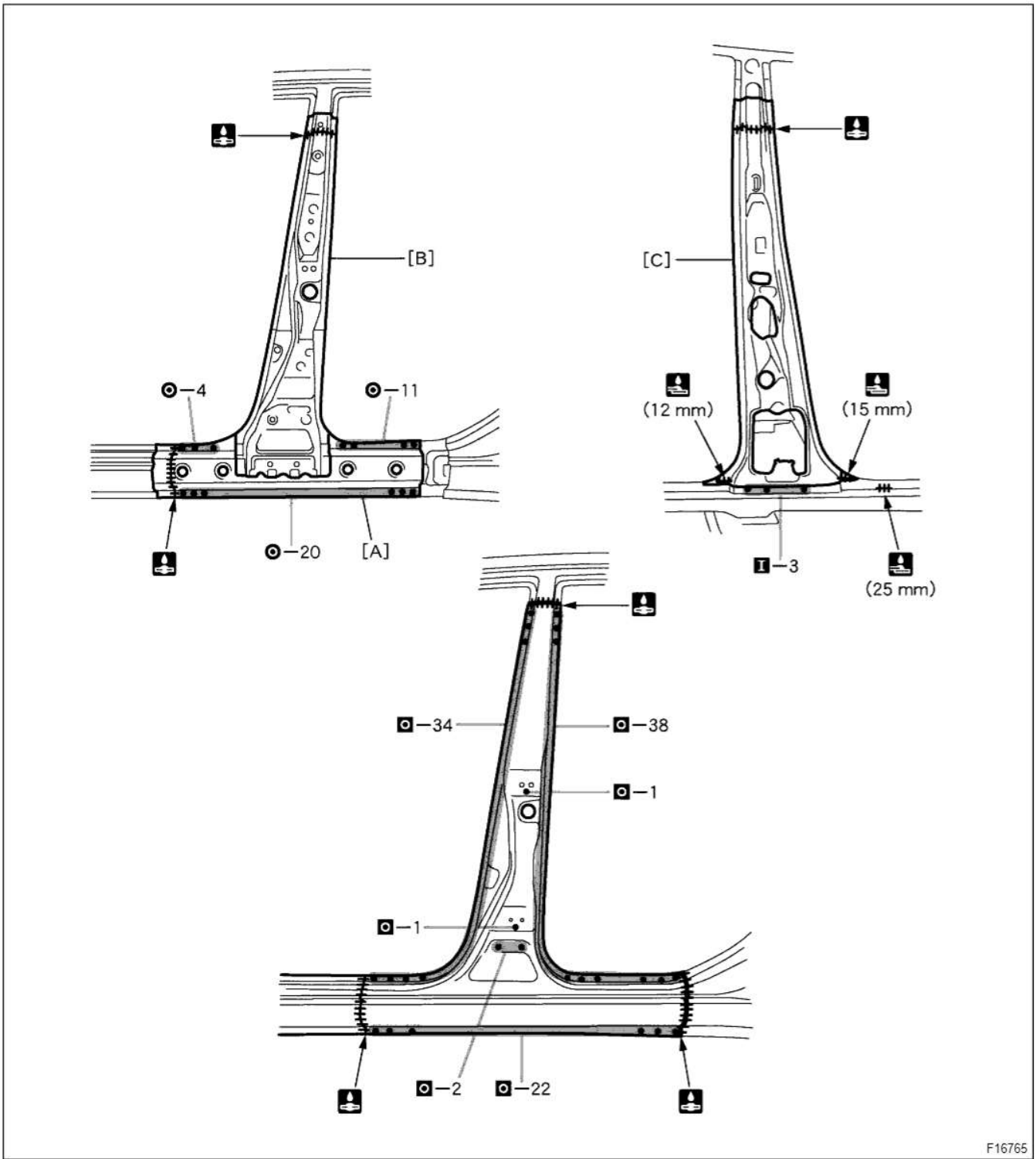
POINT

1 Before temporarily installing the new parts, weld the [A], [B] and [C] with standard points.

PART NAME

[A] Rocker Outer Reinforcement [B] Center Body Pillar Reinforcement [C] Center Body Inner Pillar

10 mm (0.39 in.) 775 mm (30.51 in.)



POINT

1 Inspect the fitting of the front door and rear door etc., before welding, since this affects the appearance of the finish.

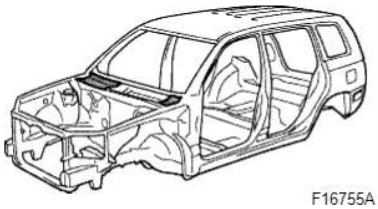
2 After welding the [A], [B] and [C] to the vehicle, install the outer panel.

PART NAME

[A] Rocker Outer Reinforcement [B] Center Body Pillar Reinforcement [C] Center Body Inner Pillar

12 mm (0.47 in.) 15 mm (0.59 in.) 25 mm (0.98 in.)

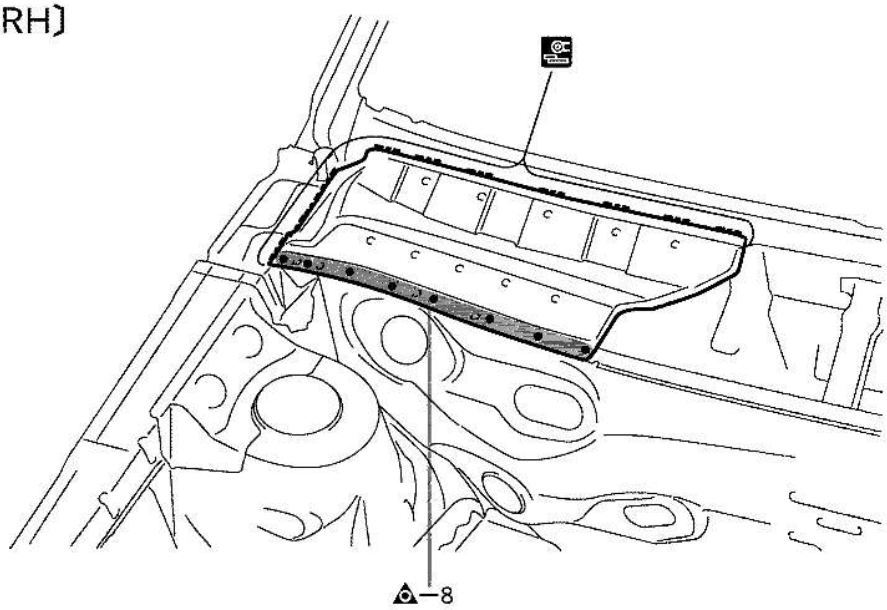
COWL TOP TO APRON BRACE (ASSY)


F16755A

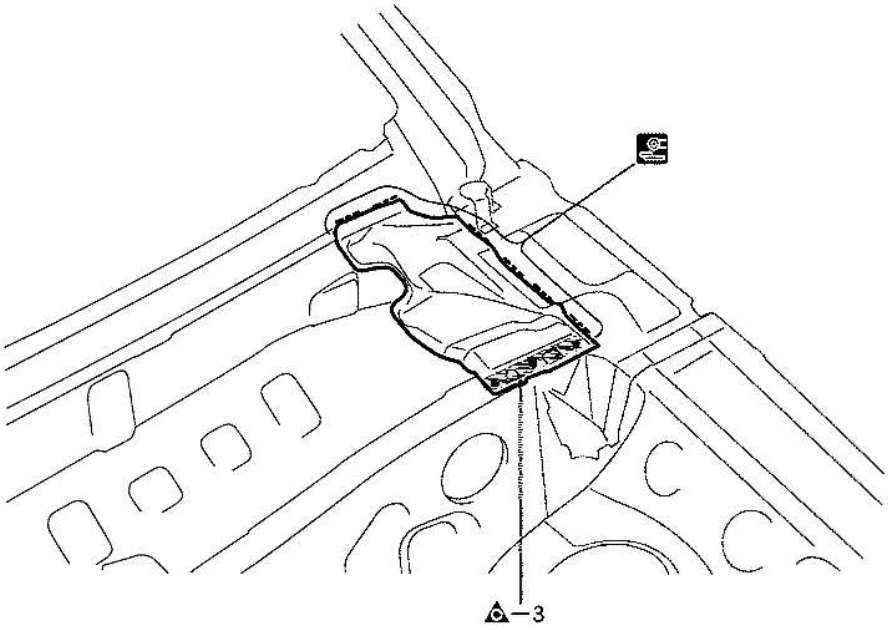
REPLACEMENT

REMOVAL

(RH)



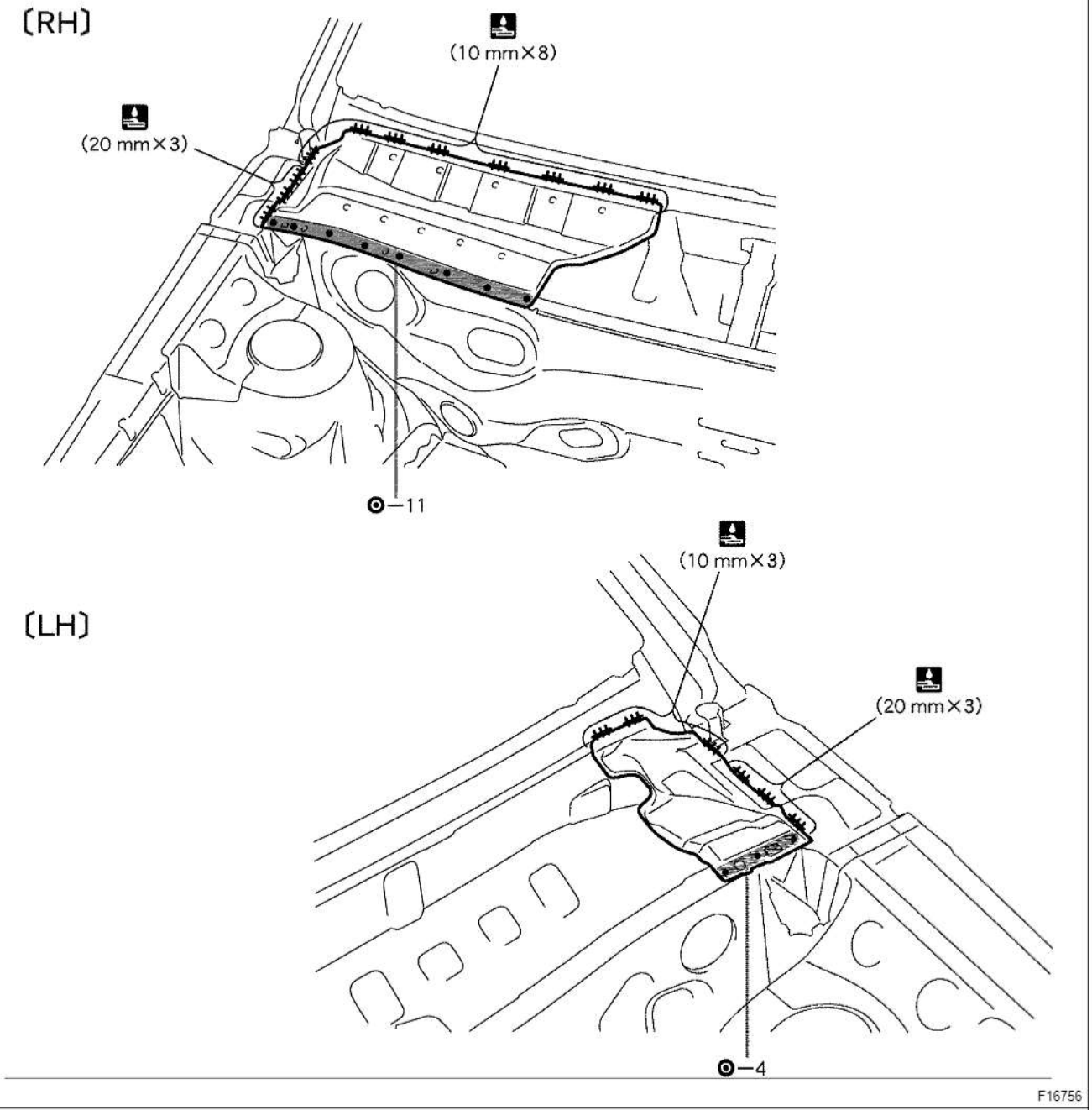
(LH)



F16755

INSTALLATION

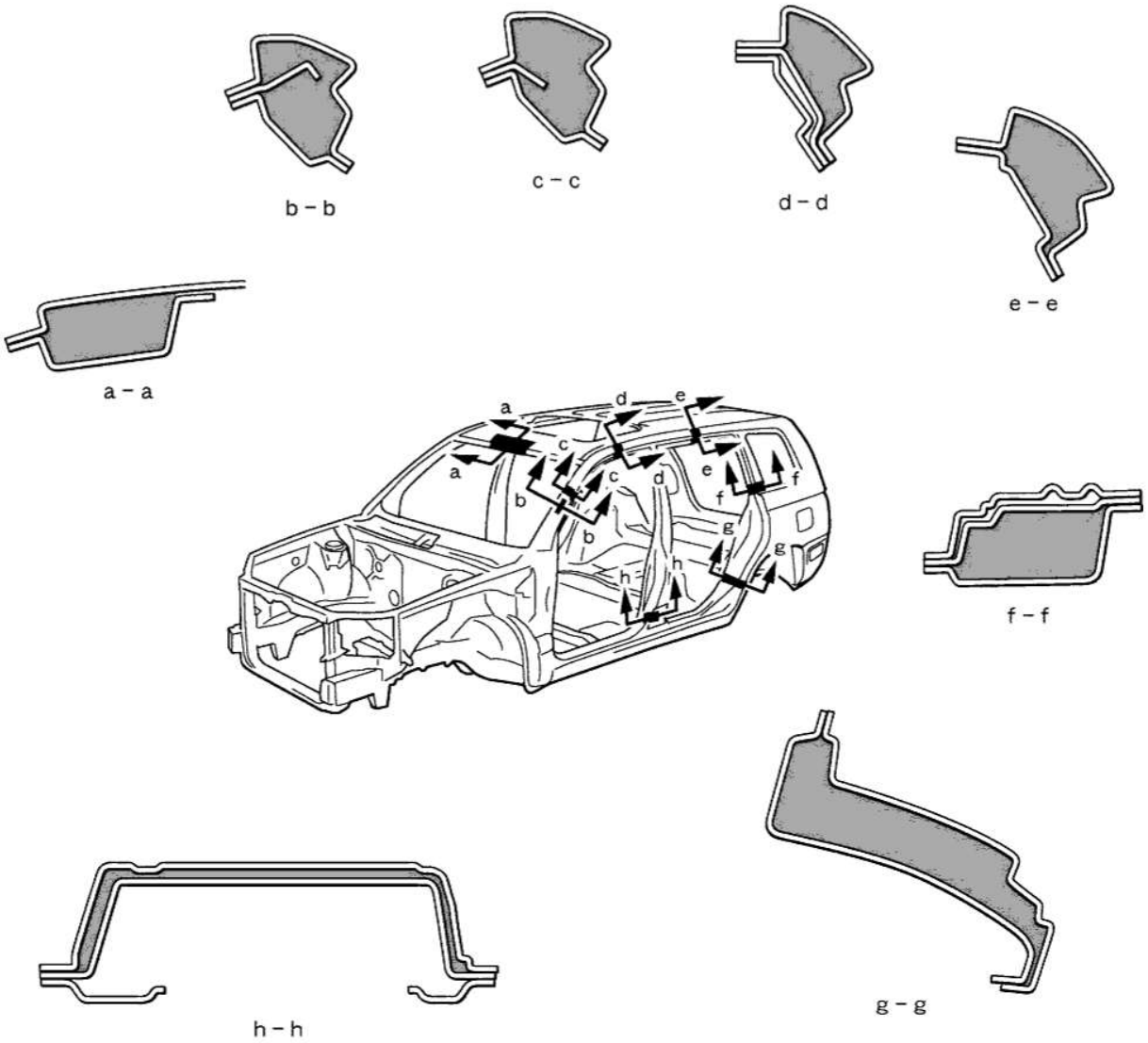
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



10 mm (0.39 in.) 20 mm (0.79 in.)

FOAMED MATERIAL APPLICATION AREAS

The sections shown in the figure below are filled with foamed material to provide noise insulation.
After repairing these sections or their peripheries, refill with foamed materials
HINT:
1) Use the service holes located on the reverse side of the body panel to refill with foamed materials.
2) When handling foamed material, follow the directions of the material's manufacturer.



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 HIGHLANDER/KLUGER.

Applicable models: ACU20, 25 series
MCU23, 28 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 model 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.

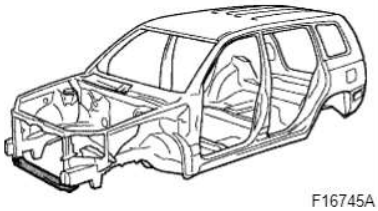
For the repair procedures and specifications other than collision-damaged body components of the TOYOTA HIGHLANDER/KLUGER refer to the repair manuals.

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.

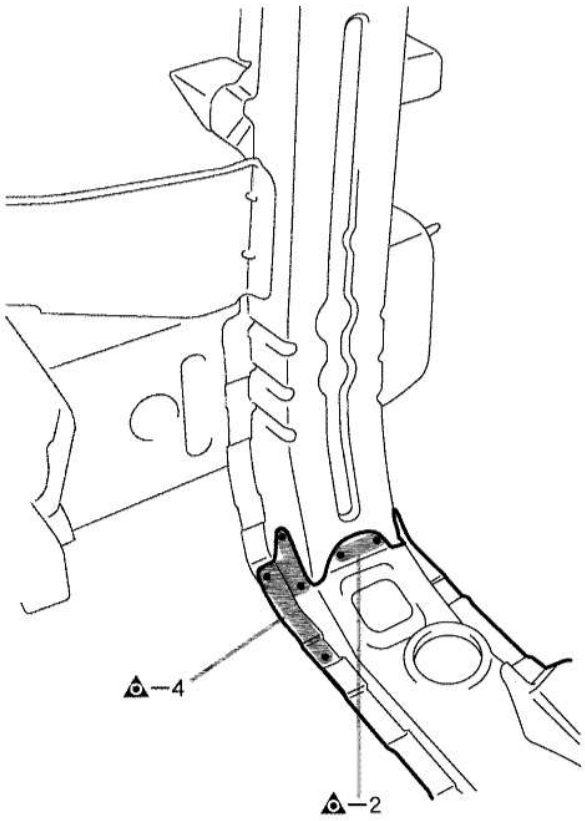
TOYOTA MOTOR CORPORATION

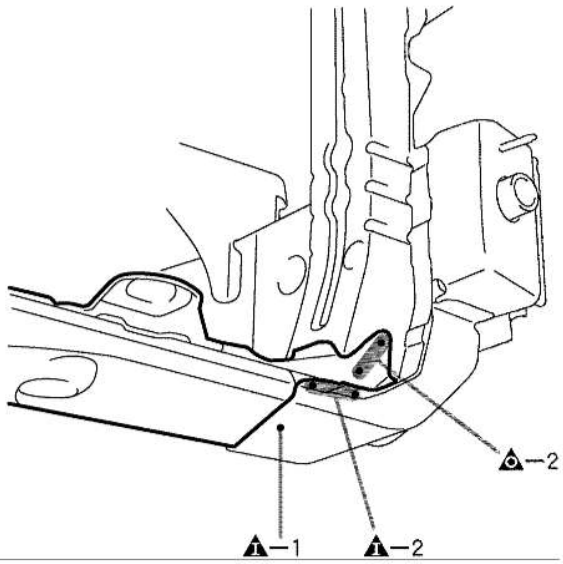
FRONT CROSSMEMBER (ASSY)


F16745A

REPLACEMENT

REMOVAL

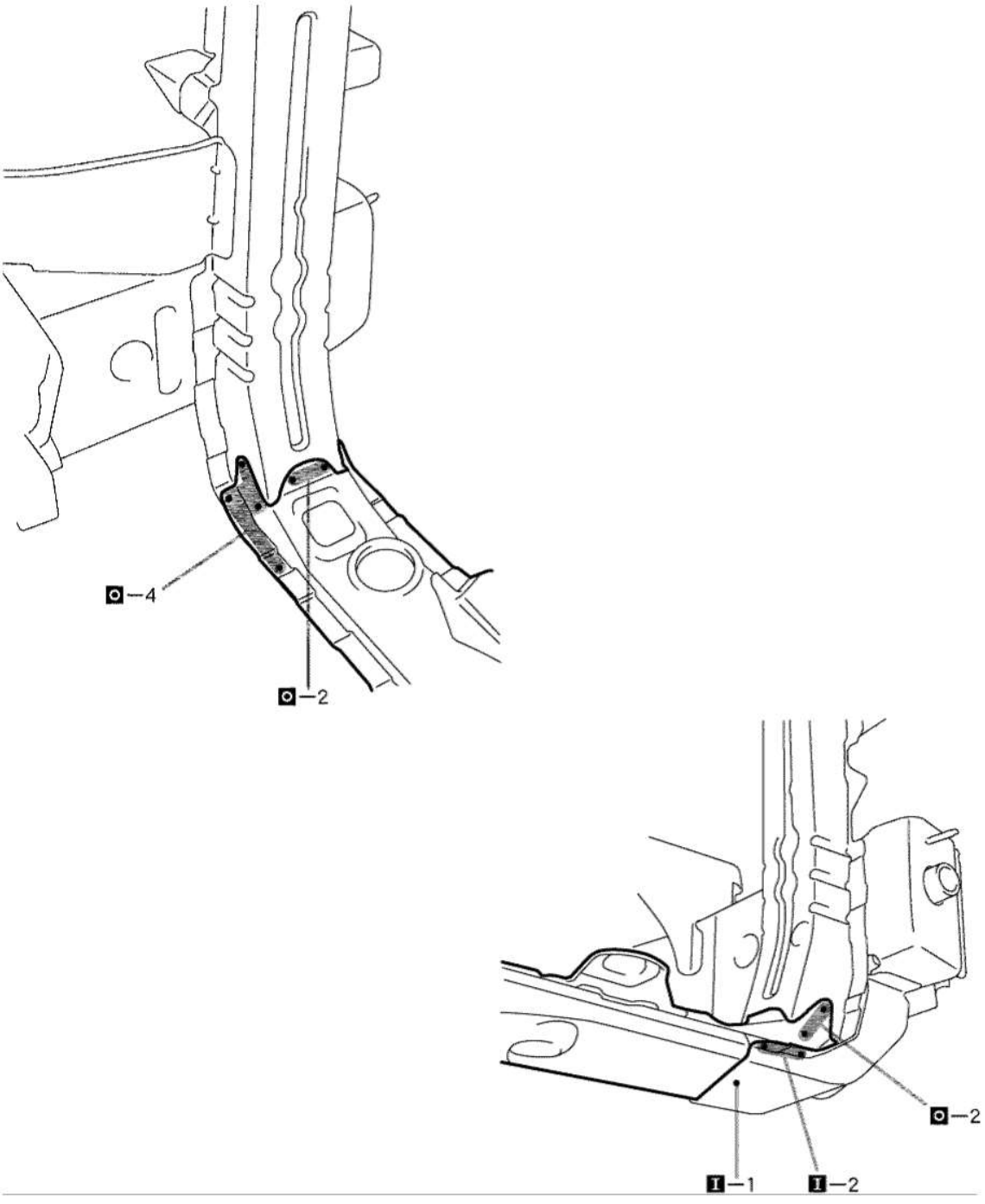




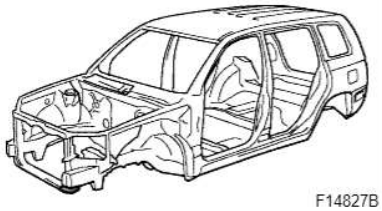
F16745

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



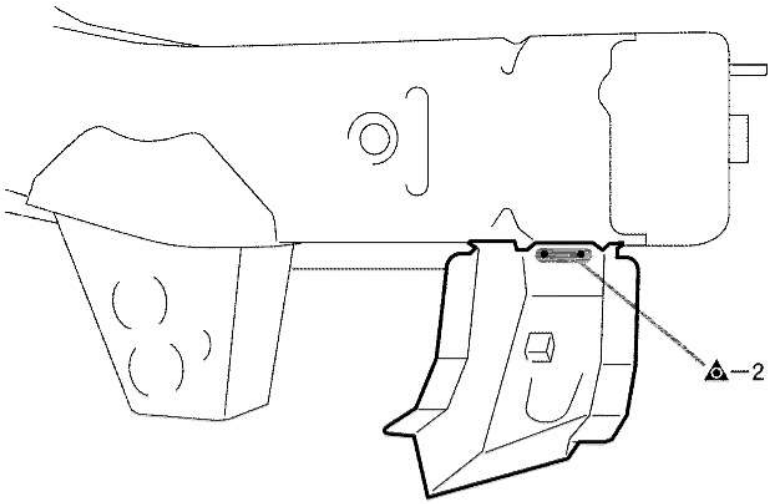
FRONT CROSSMEMBER NO.1 REINFORCEMENT (ASSY)

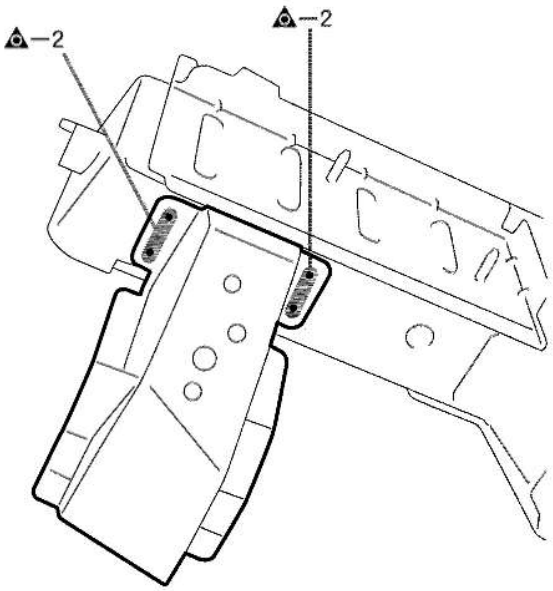

F14827B

REPLACEMENT

With the radiator side support, front crossmember side gusset and front crossmember removed.

REMOVAL

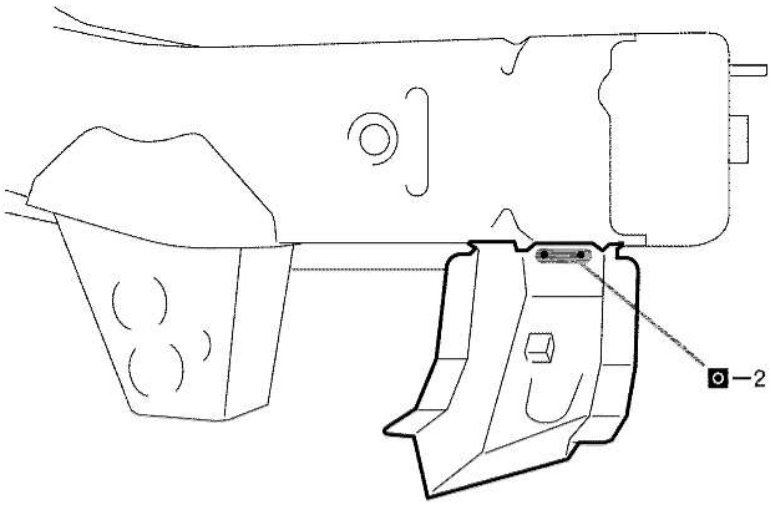


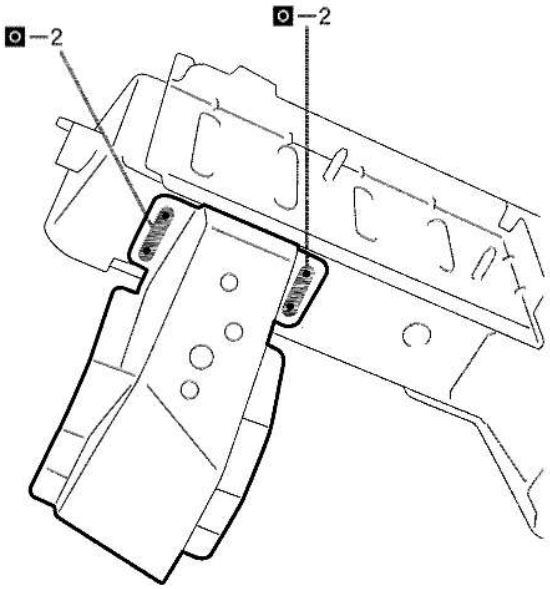


F14827

INSTALLATION

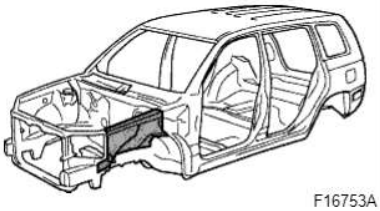
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.





F14828

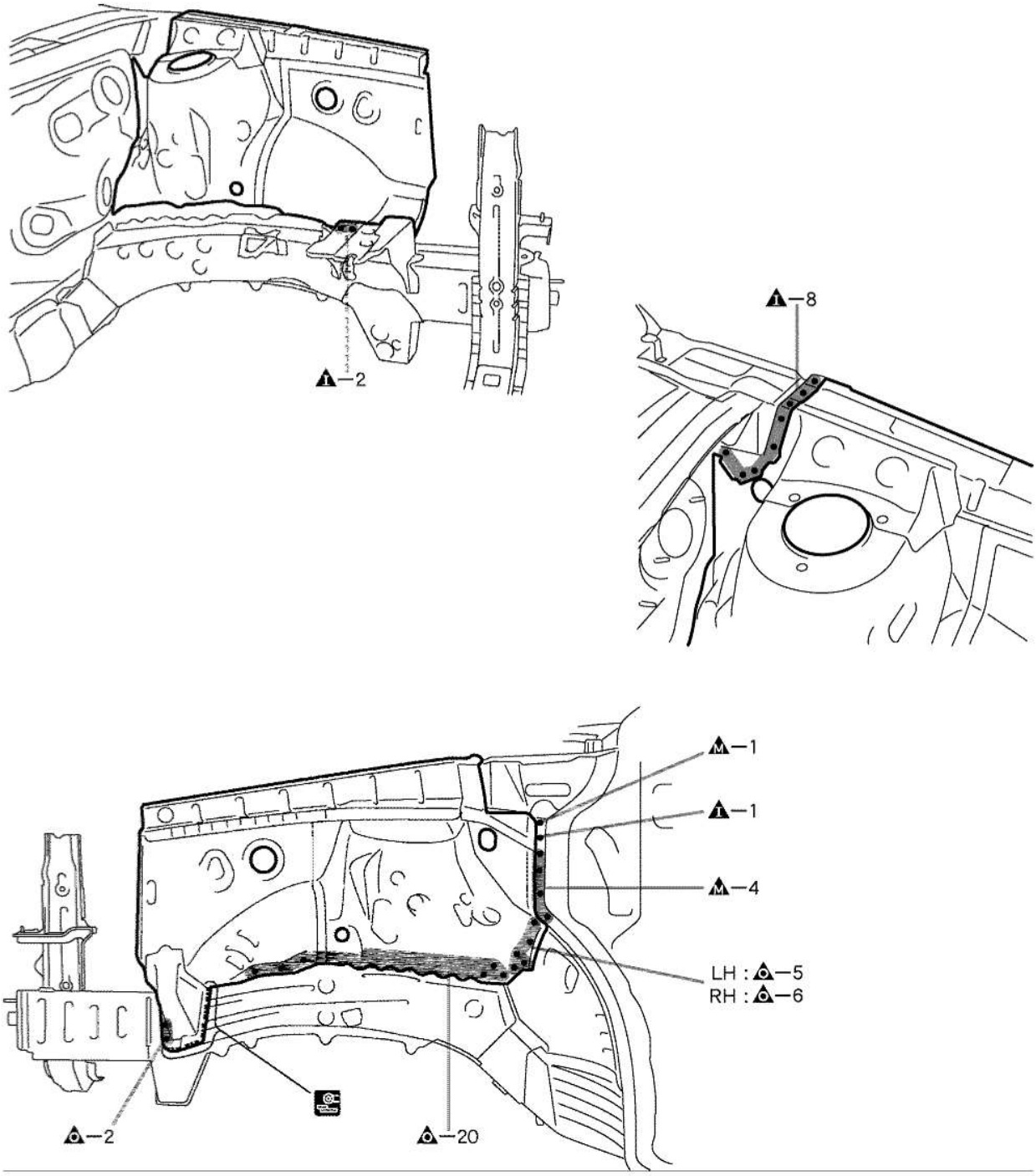
FRONT FENDER APRON (ASSY)


F16753A

REPLACEMENT

With the radiator side support and front body pillar lower gusset removed.

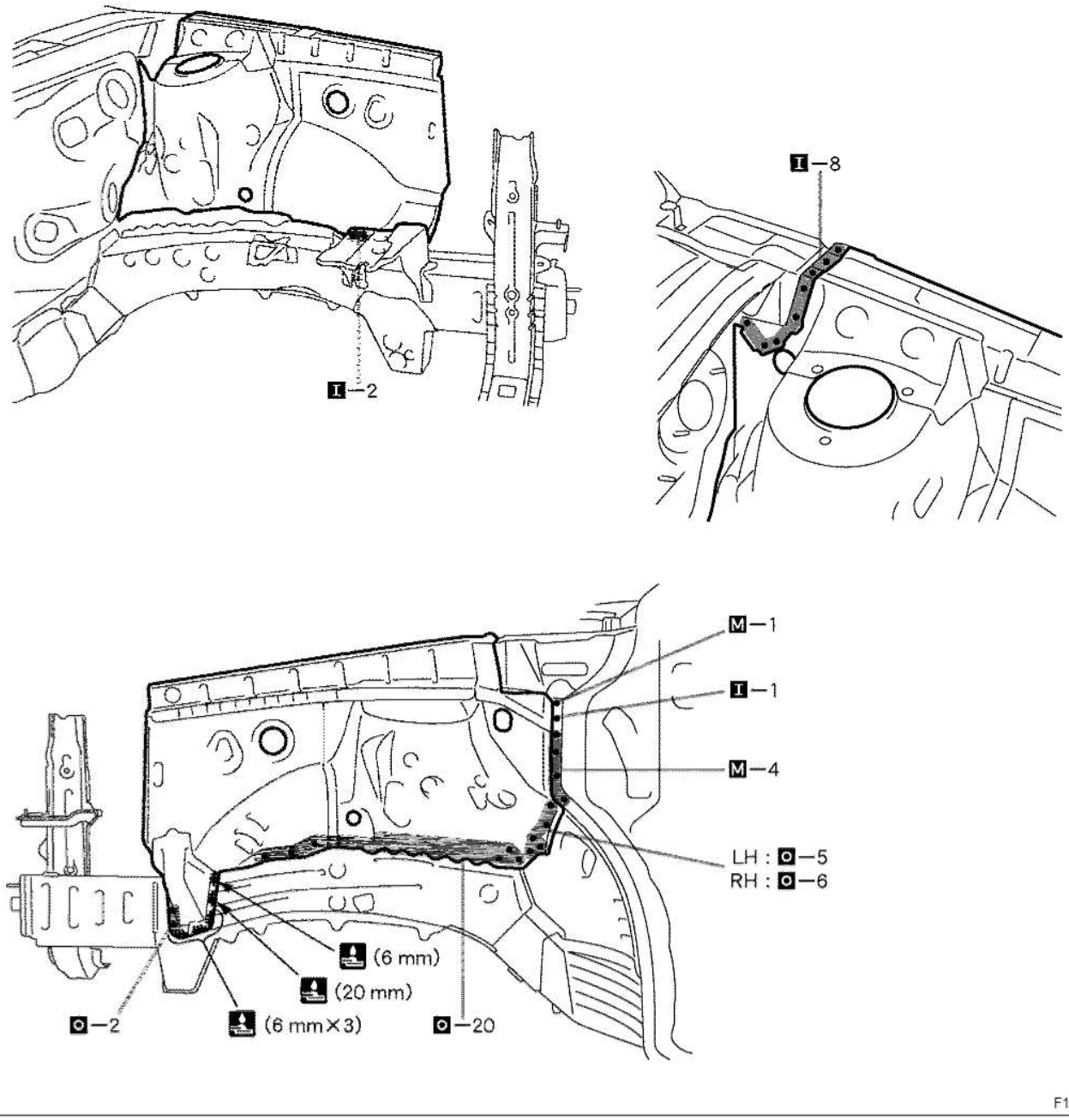
REMOVAL



F16753

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



F16754

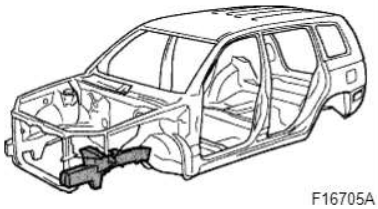
POINT

1 Inspect the fitting of the front fender and hood, etc., before welding, since this affects the appearance of the finish.

2 Make sure each measurment is corect, as this parts affects the front wheel alignment.

6 mm (0.24 in.) 20 mm (0.79 in.)

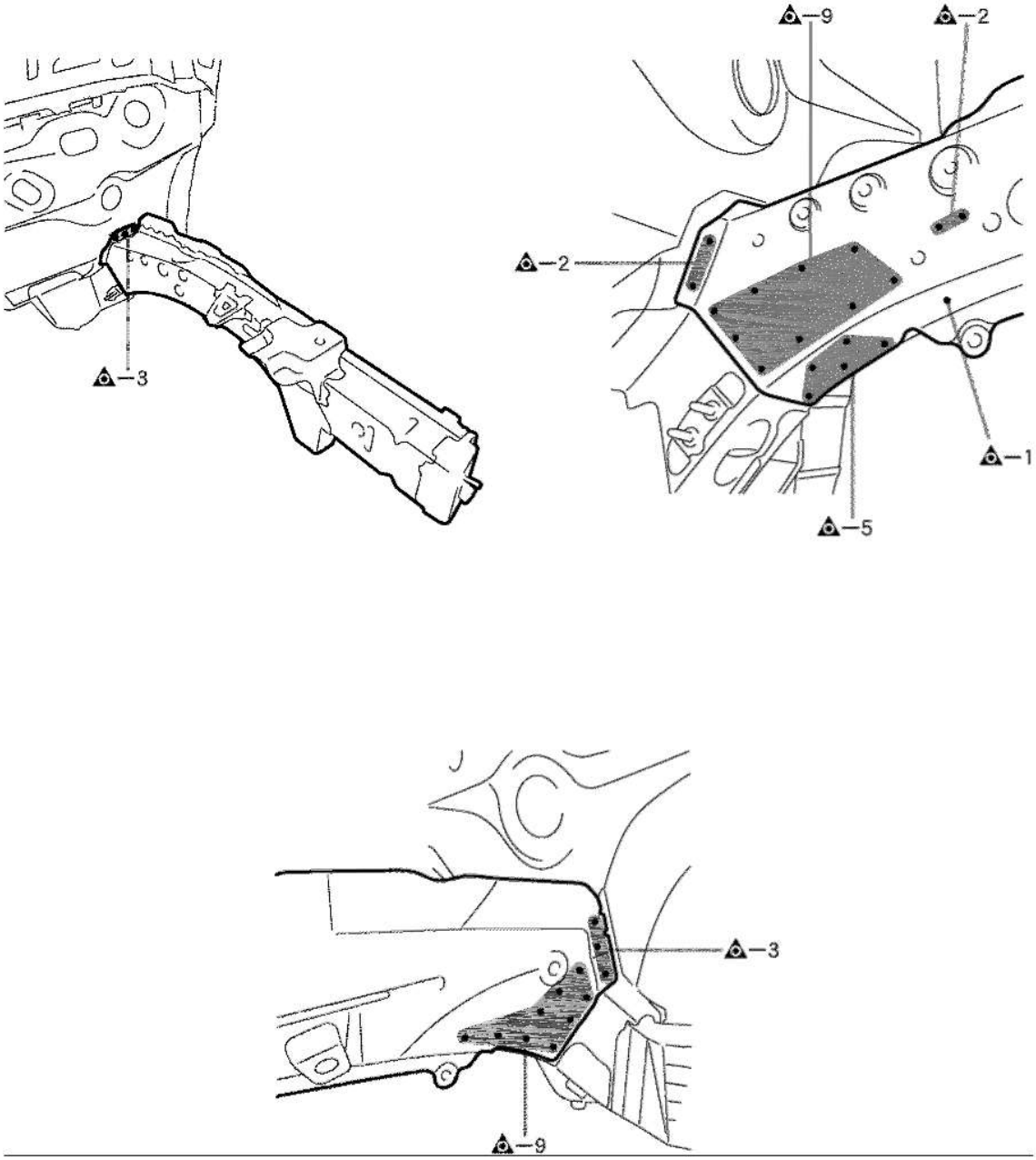
FRONT SIDE MEMBER (ASSY)


F16705A

REPLACEMENT

With the front fender apron and front crossmember No.1 reinforcement removed.

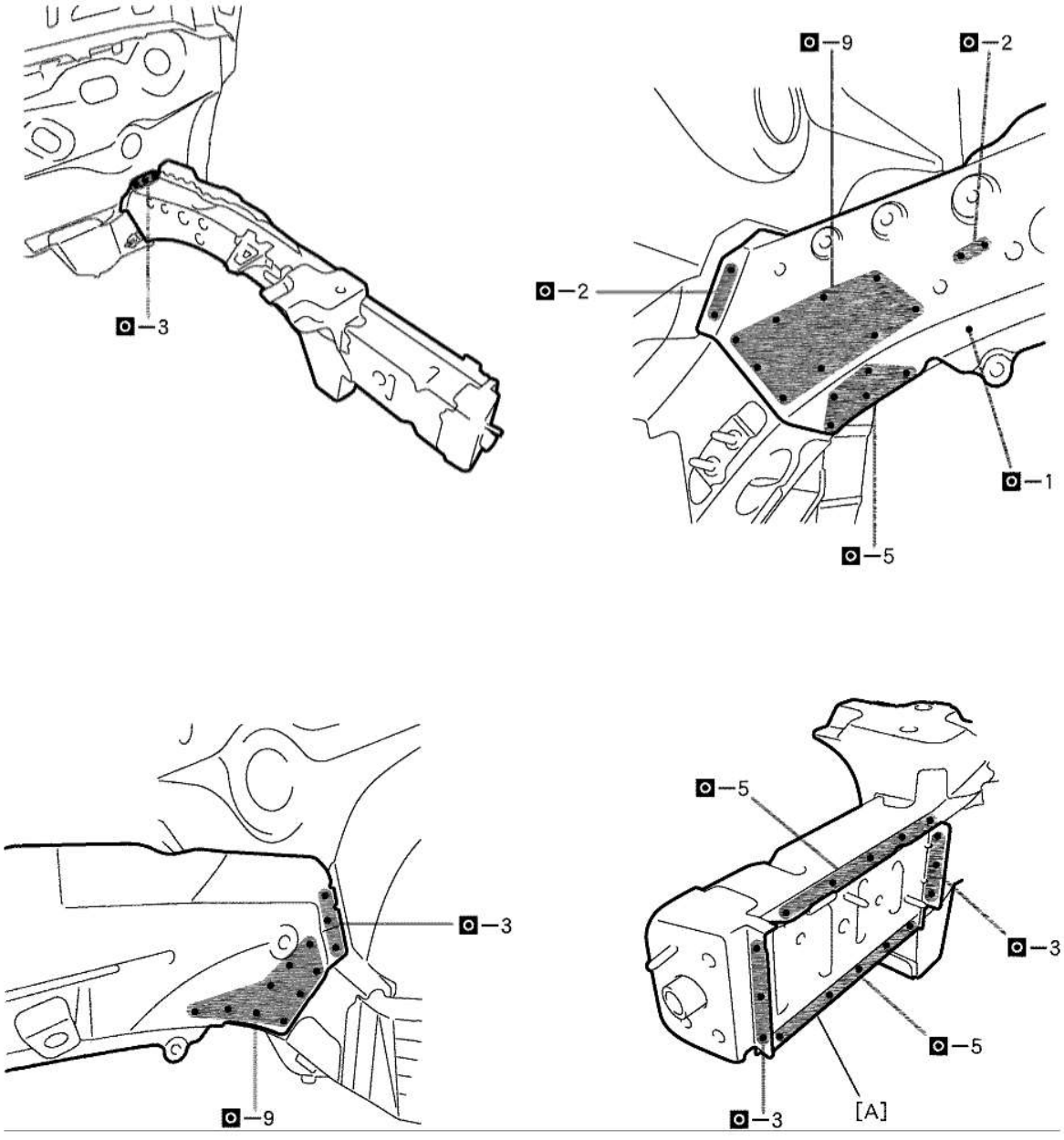
REMOVAL



F16705

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



F16706

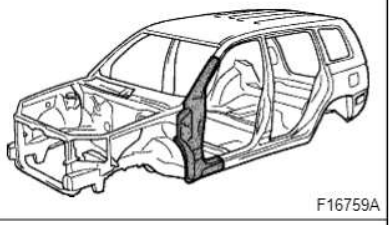
POINT

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

PART NAME

[A] Front Side Member Extension

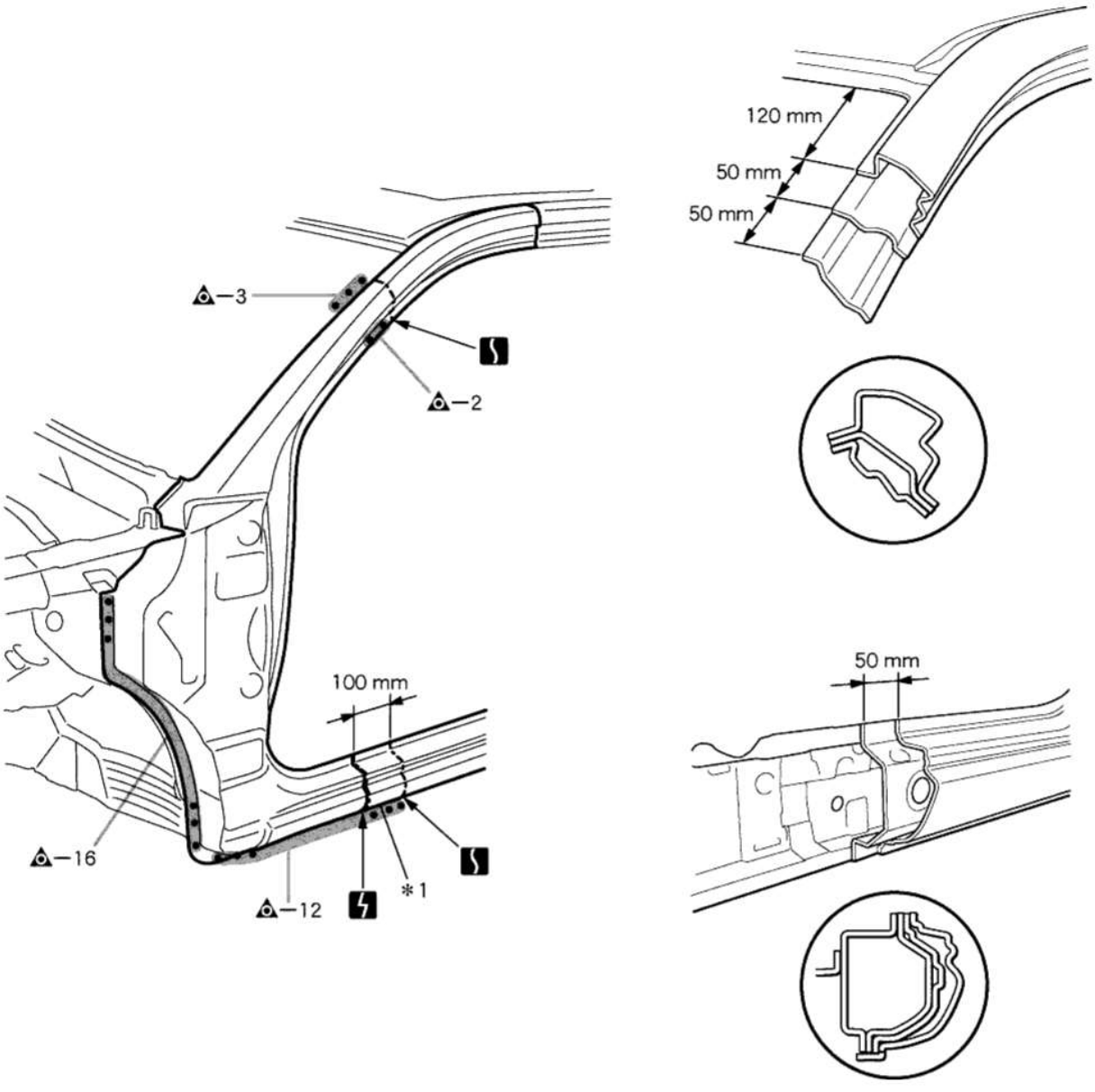
FRONT BODY PILLAR (CUT)


F16759A

REPLACEMENT

With the cowl top to apron brace and front body pillar lower gusset removed.

REMOVAL

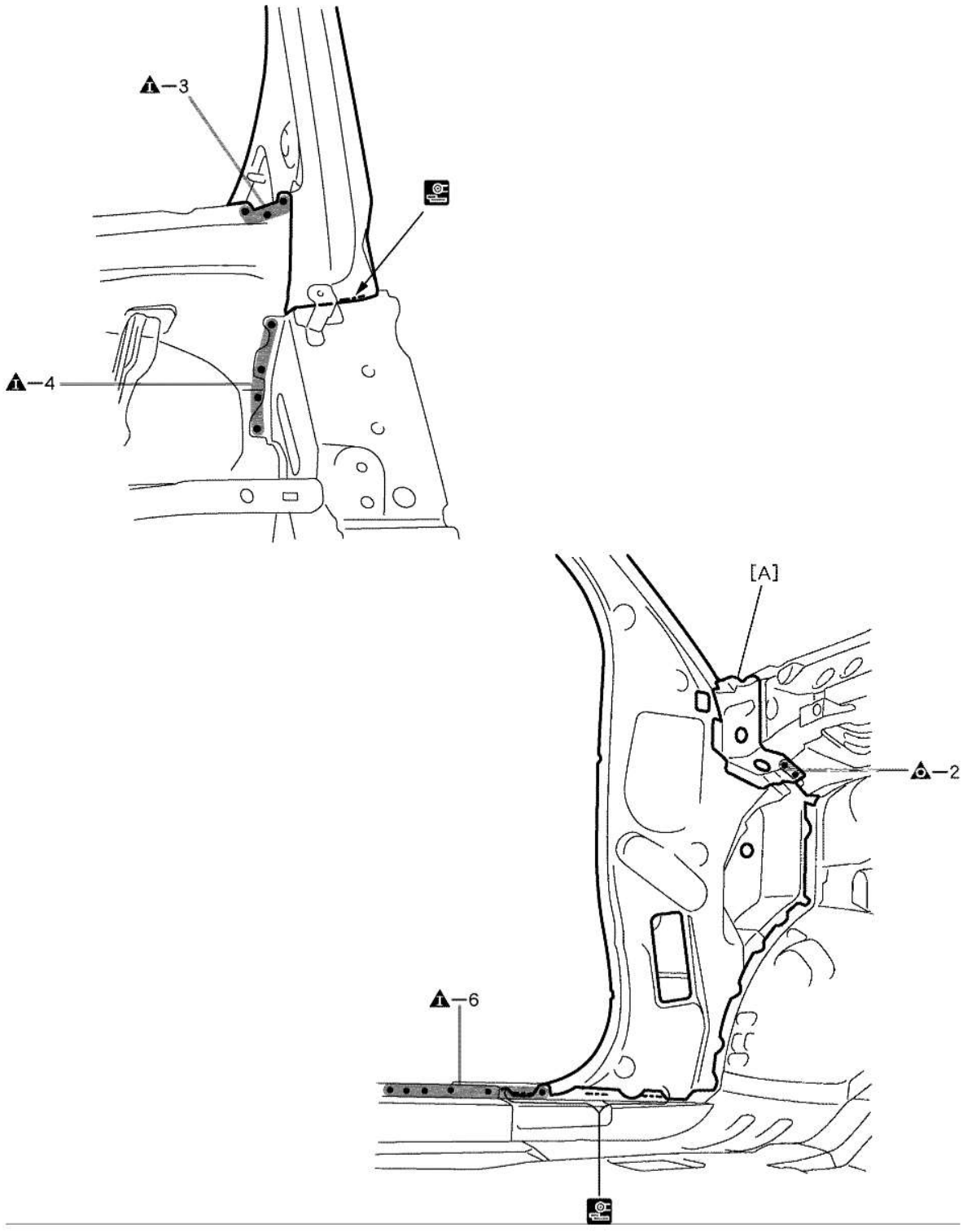


F16759

POINT

1 *1: This part of the outer panel is reused, because the rocker panel section is cut off at the rear position behind the supplied parts cut position of the outer panel.

50 mm (1.97 in.) 100 mm (3.94 in.) 120 mm (4.72 in.)



POINT

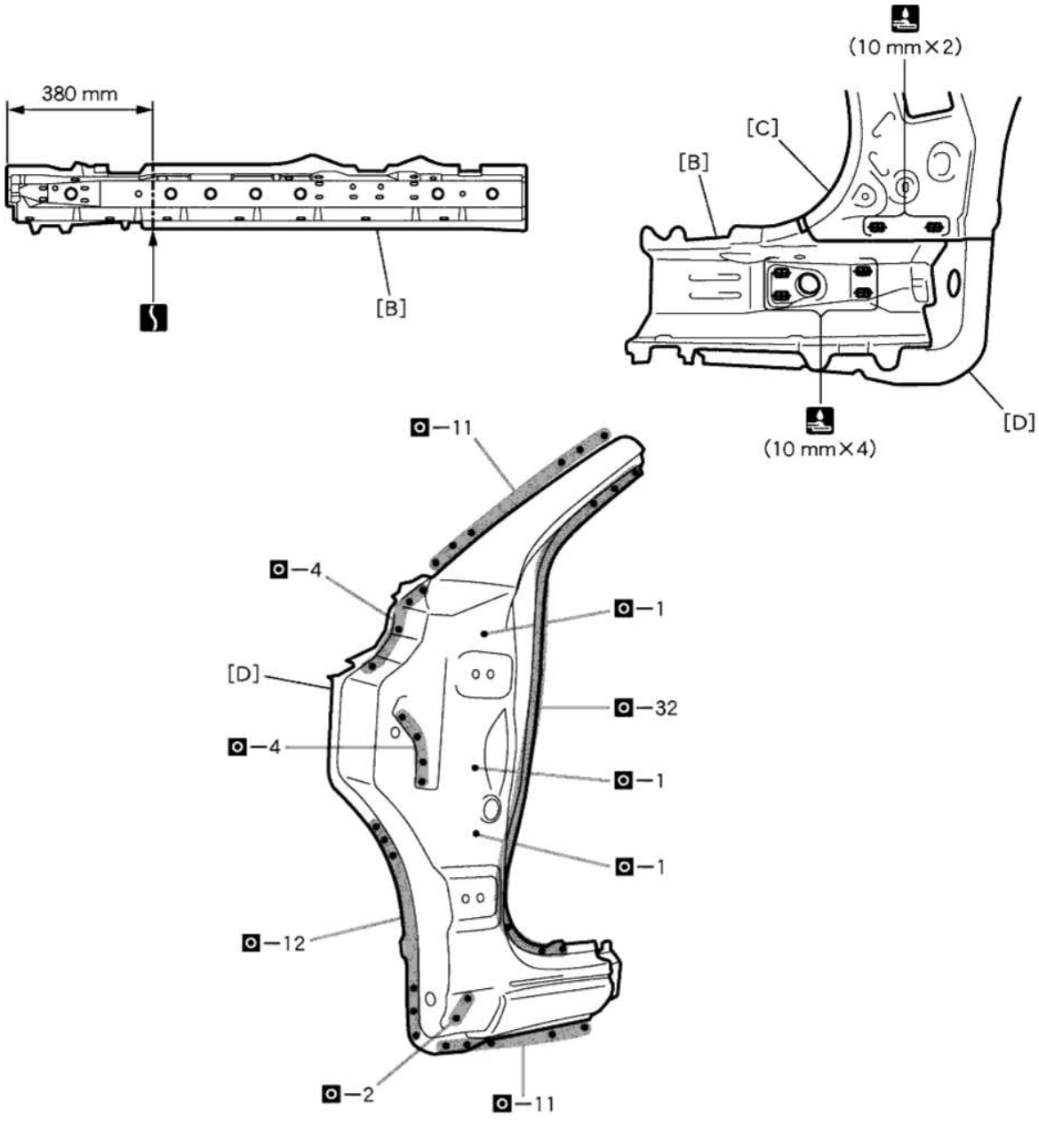
1 Remove the [A] at the same time.

PART NAME

[A] Front Pillar Upper Inner Extension

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



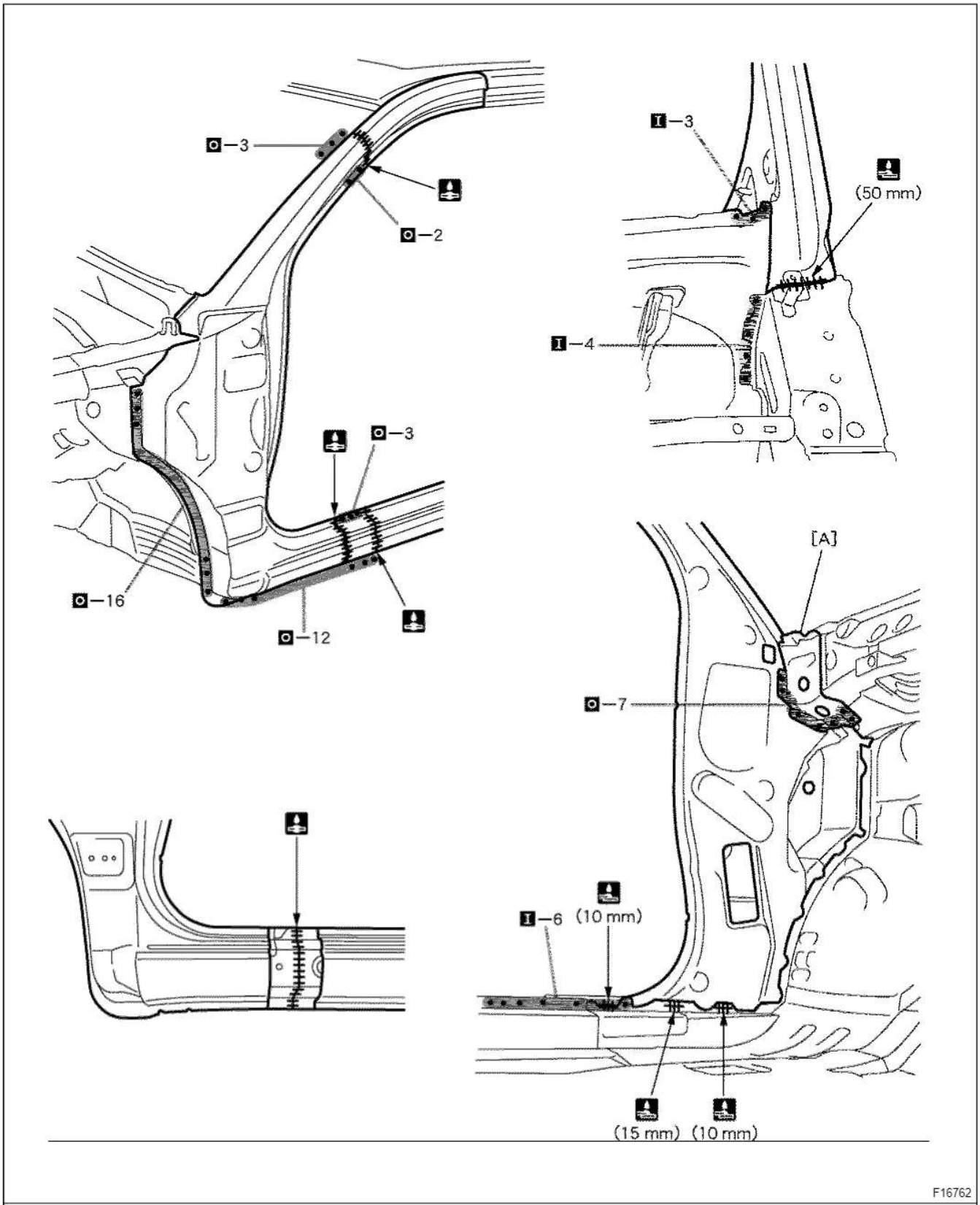
POINT

1 Before temporarily installing the new parts, weld the [B], [C] and [D] with standard points.

PART NAME

[B] Rocker Outer Reinforcement [C] Front Body Upper Inner Pillar [D] Outer Panel

10 mm (0.39 in.) 380 mm (14.96 in.)



POINT

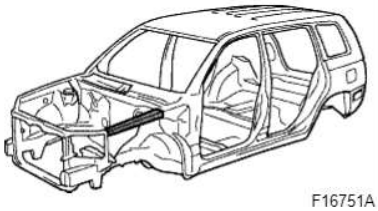
1 Inspect the fitting of the front door, front fender and windshield glass, etc., before welding, since this affects the appearance of the finish.

PART NAME

[A] Front Pillar Upper Inner Extension

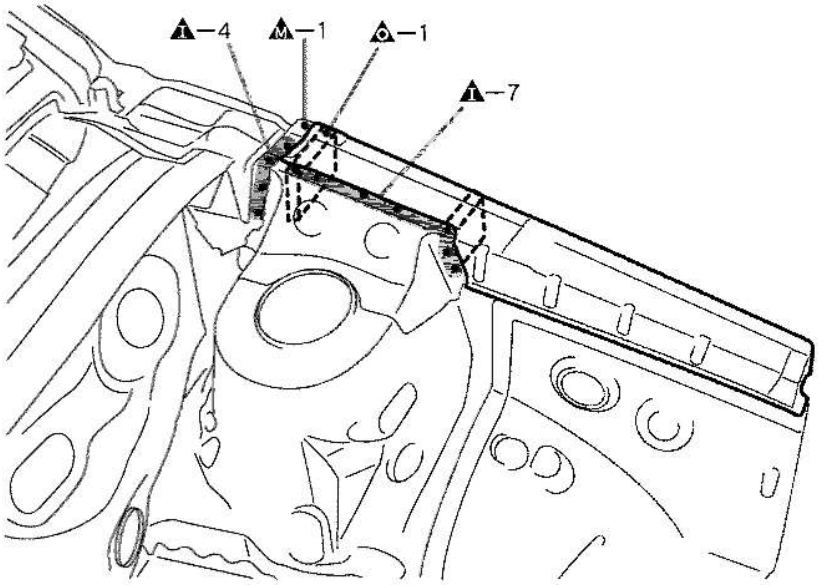
10 mm (0.39 in.) 15 mm (0.59 in.) 50 mm (1.97 in.)

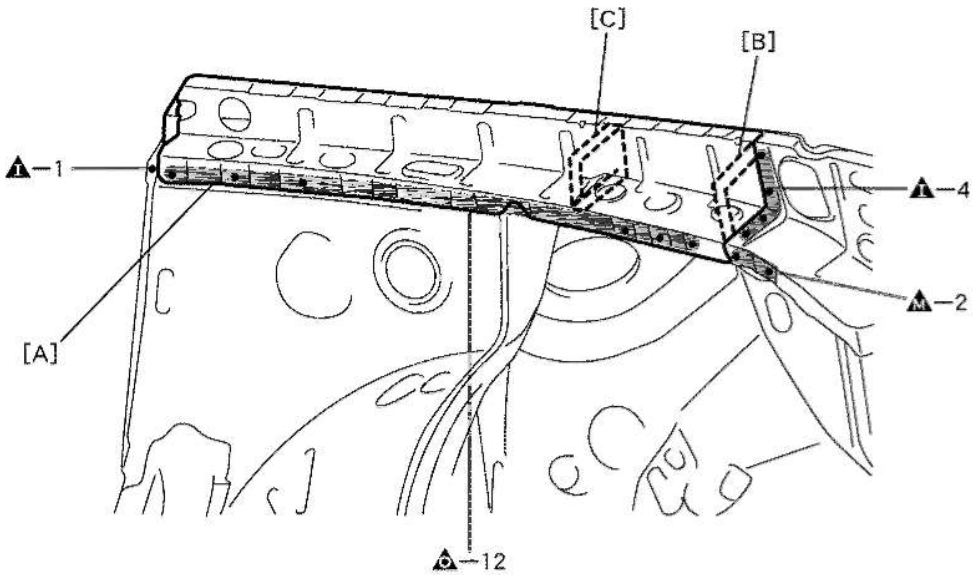
FRONT APRON TO COWL SIDE UPPER MEMBER (ASSY)


F16751A

REPLACEMENT
With the radiator side support removed.

REMOVAL





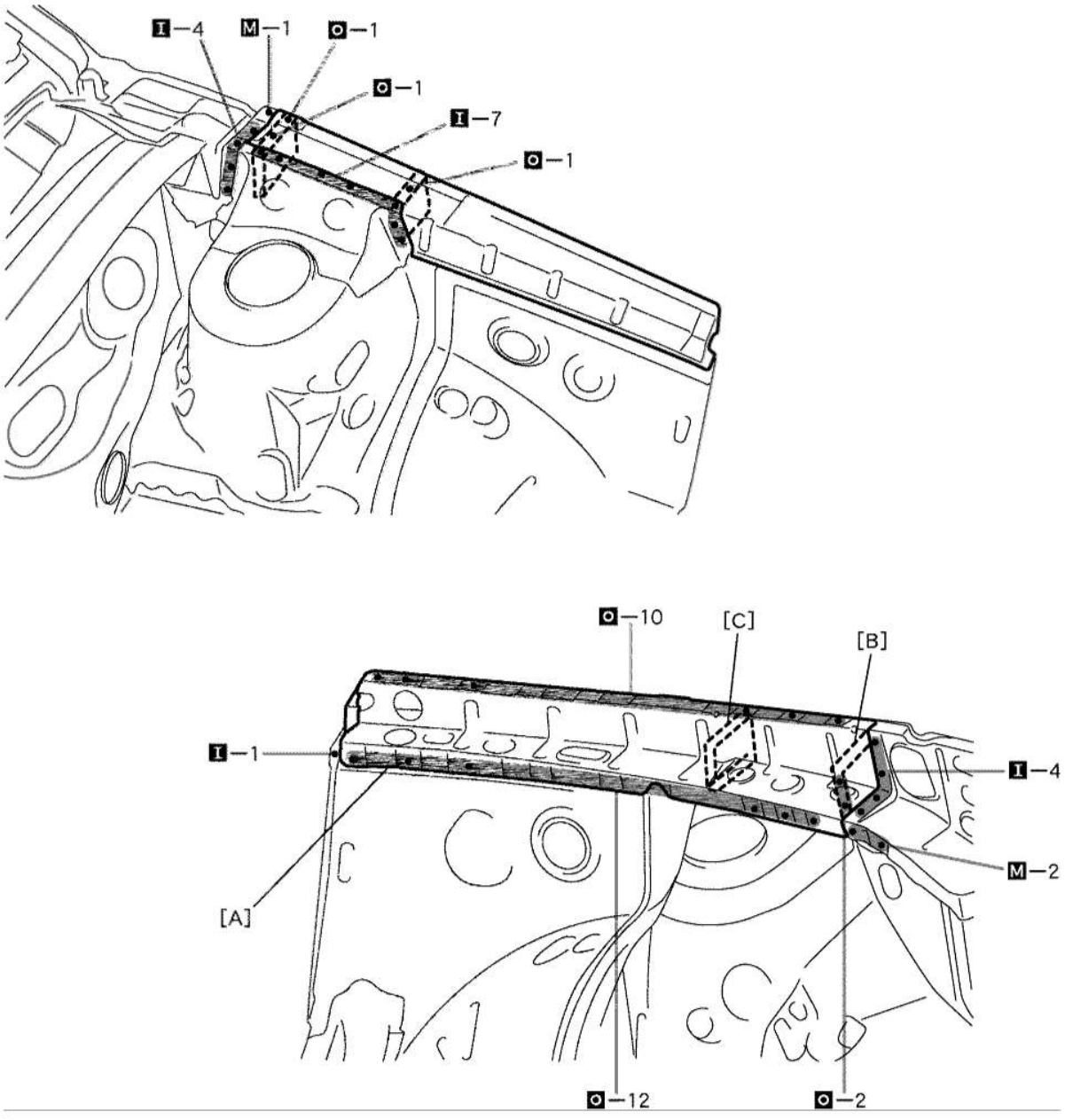
F16751

POINT
1 Remove the [A], [B] and [C] at the same time.

PART NAME
[A] Front Apron To Cowl Side Lower Member [B] Cowl Top Side Reinforcement
[C] Cowl Top To Cowl Inner No.2 Brace (LH), Cowl Top To Cowl Inner No.1 Brace (RH)

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



POINT

1 Inspect the fitting of the front fender and hood, etc., before welding, since this affects the appearance of the finish.

PART NAME

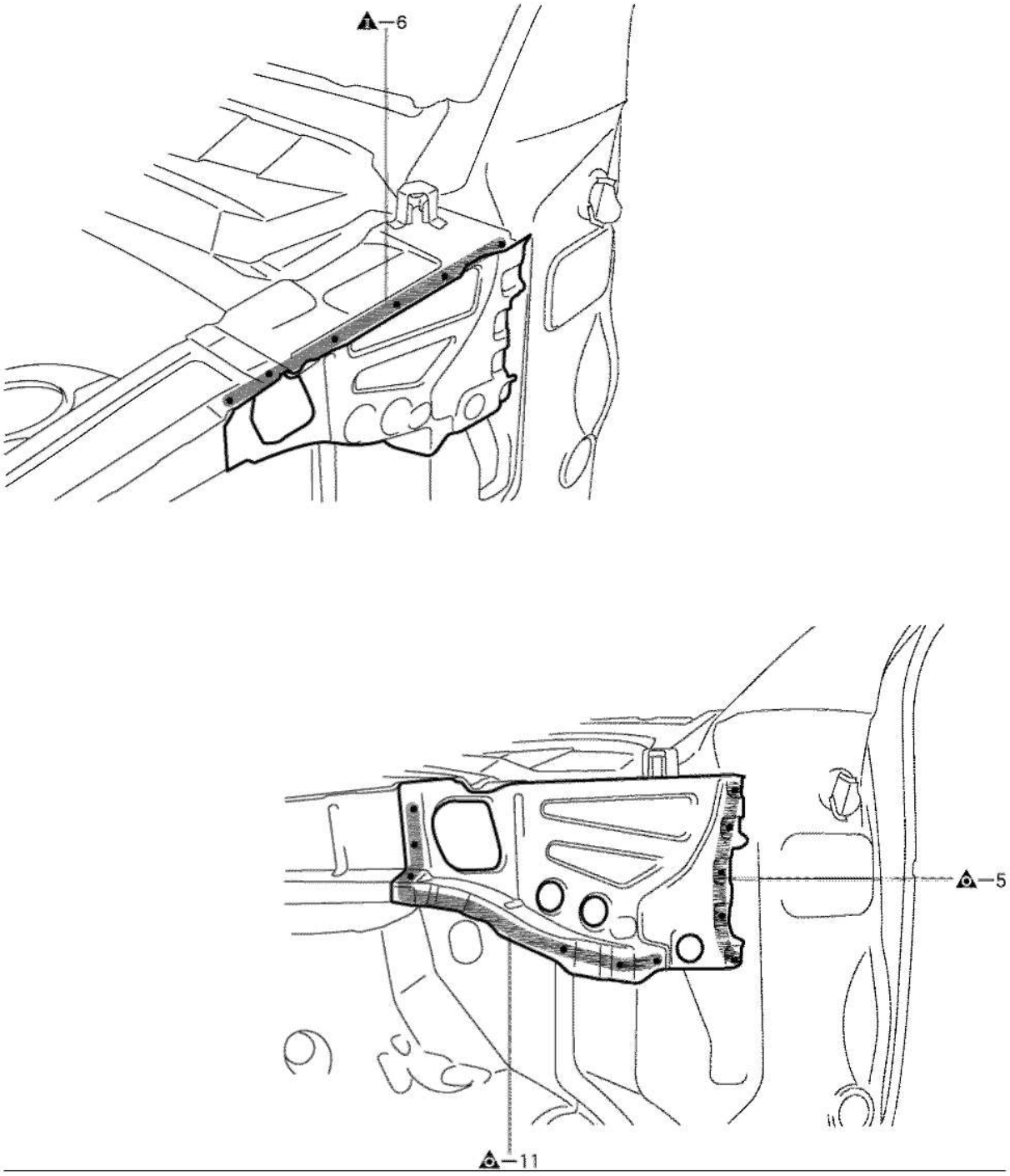
[A] Front Apron To Cowl Side Lower Member [B] Cowl Top Side Reinforcement
[C] Cowl Top To Cowl Inner No.2 Brace (LH), Cowl Top To Cowl Inner No.1 Brace (RH)

FRONT BODY PILLAR LOWER GUSSET (ASSY)


F16757A

REPLACEMENT

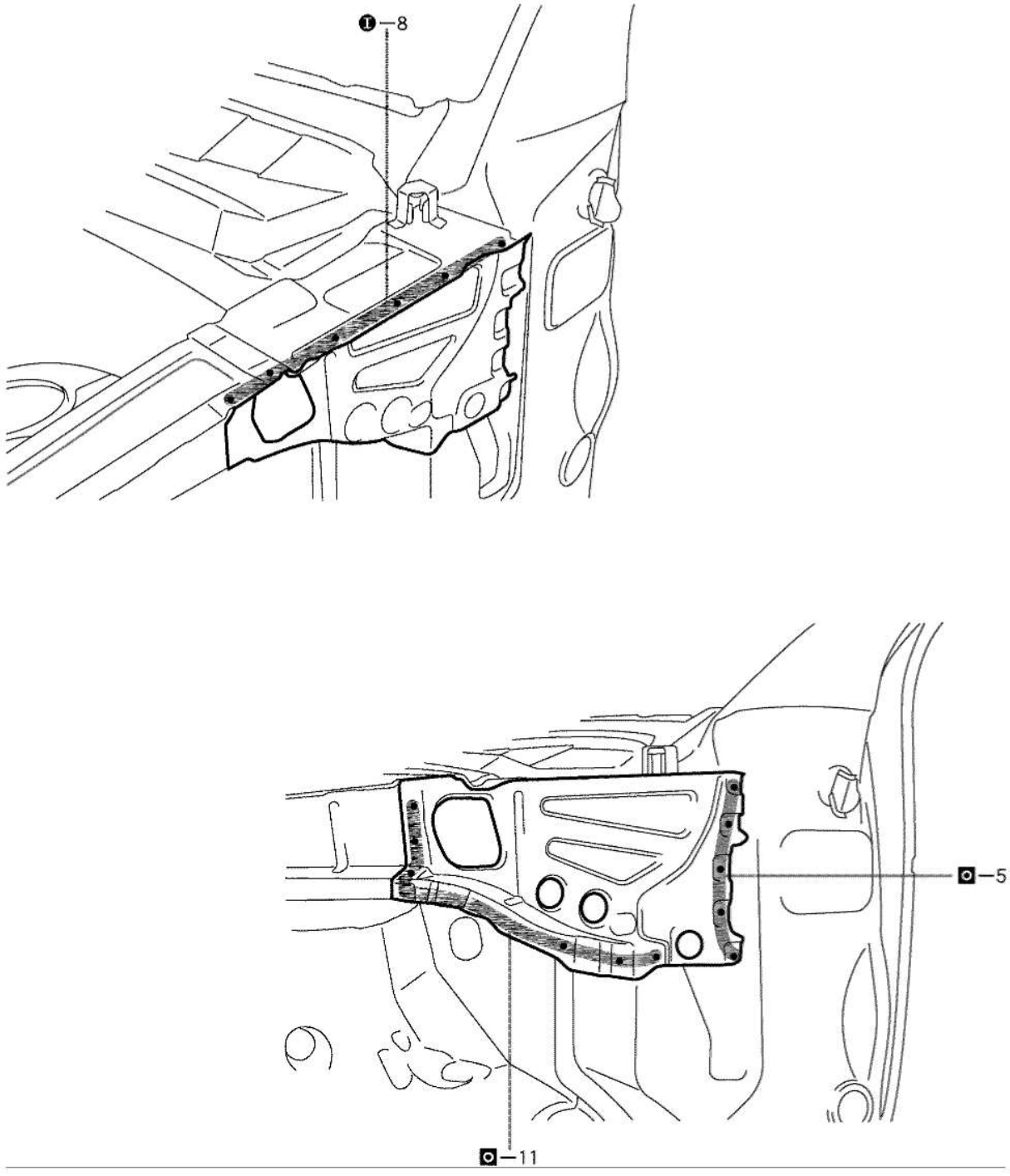
REMOVAL



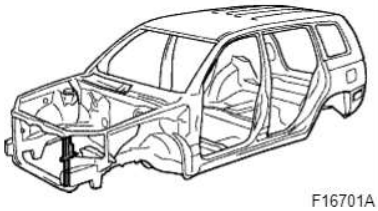
F16757

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



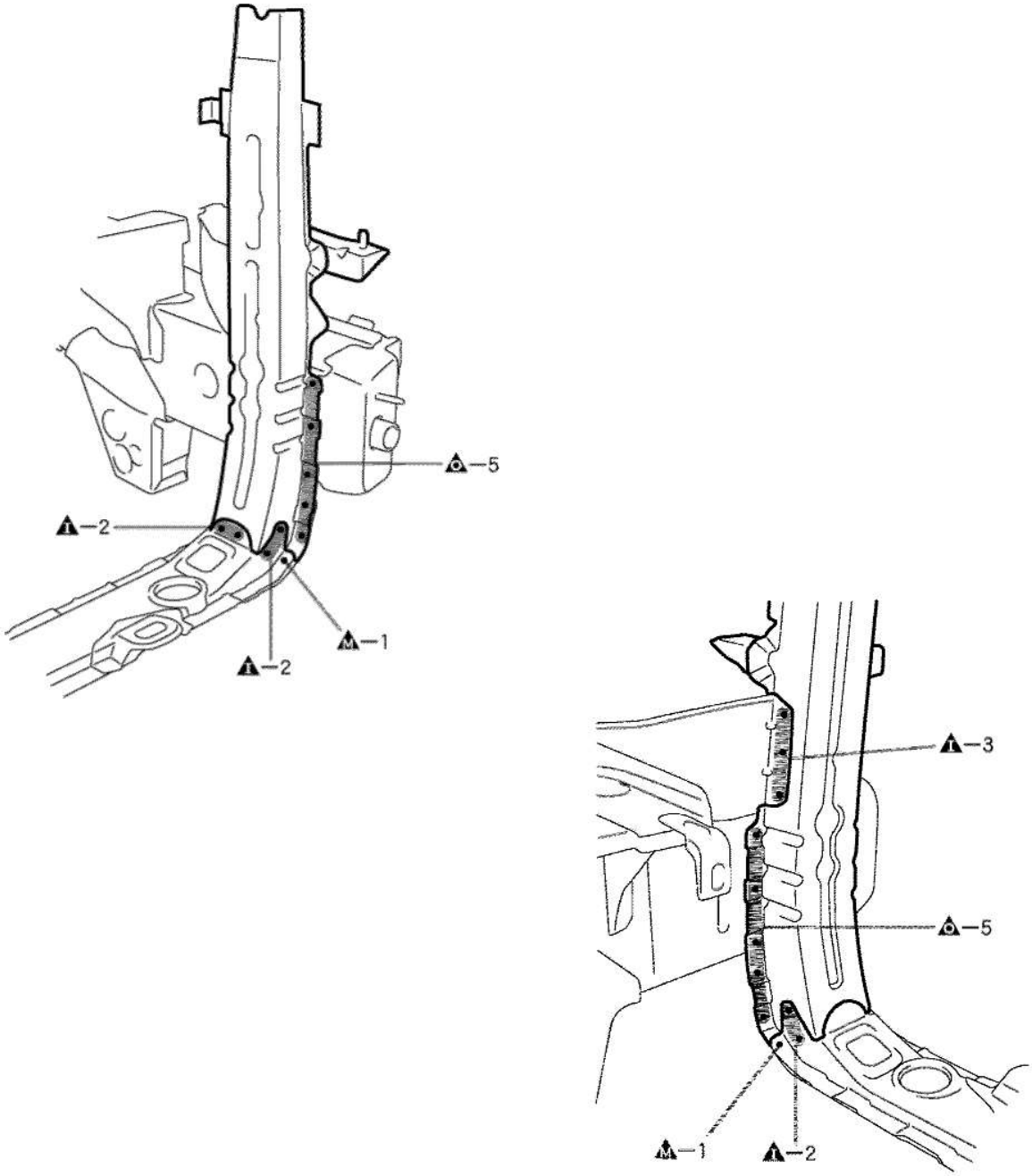
FRONT CROSSMEMBER SIDE GUSSET (ASSY)


F16701A

REPLACEMENT

With the radiator upper support removed.

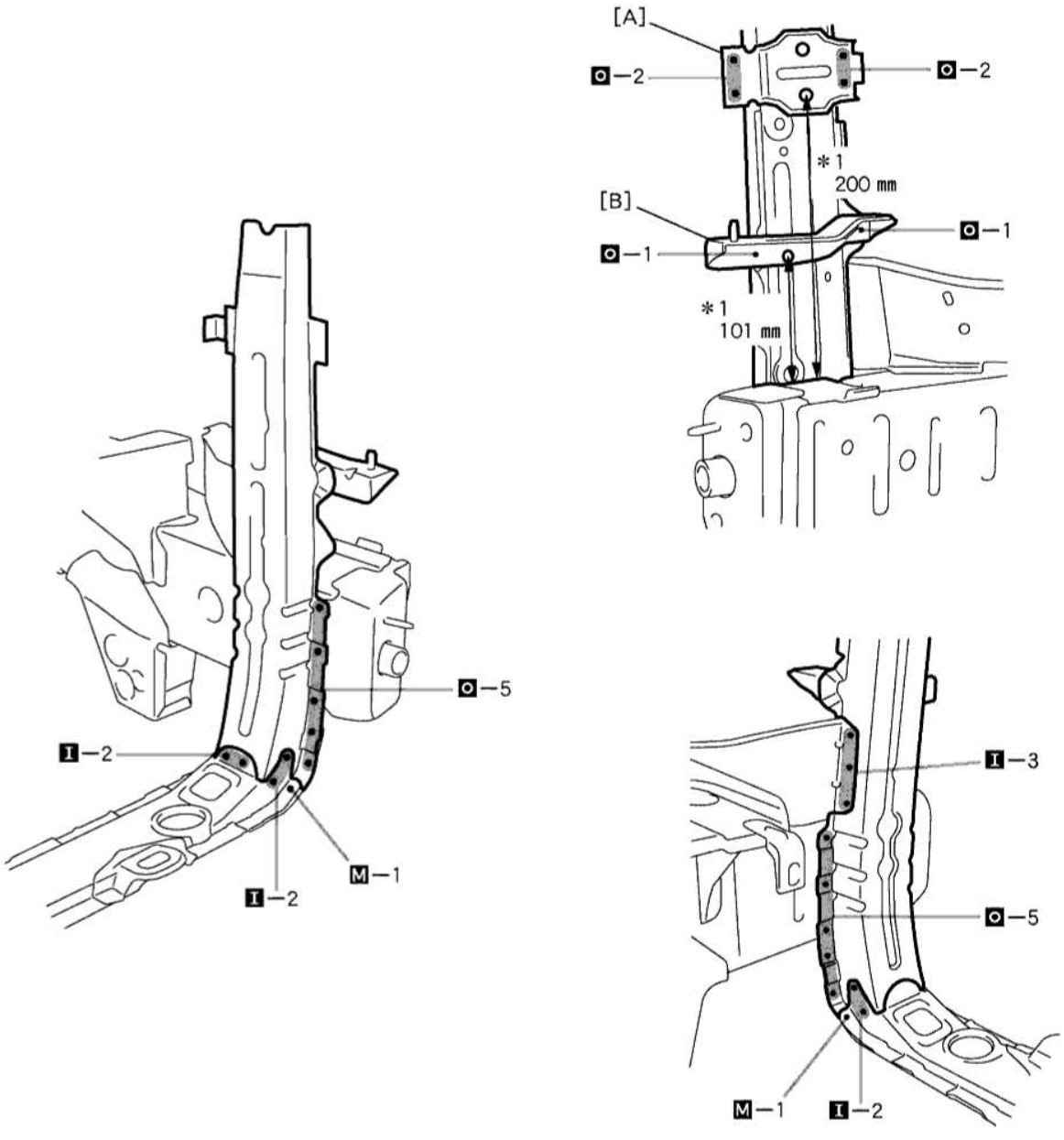
REMOVAL



F16701

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



POINT

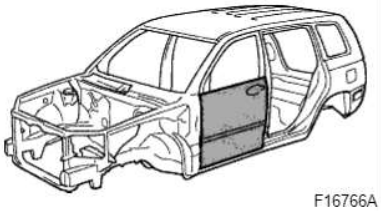
1 *1: Reference value

PART NAME

[A] Radiator Support Extension [B] Front Bumper Support

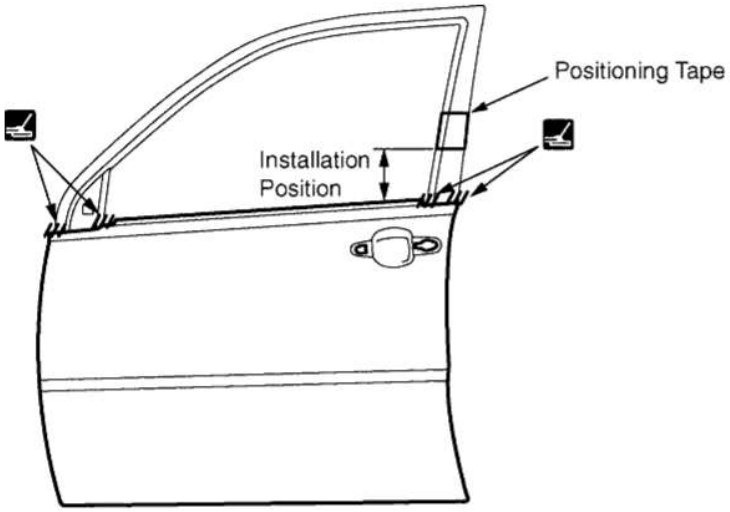
101 mm (3.98 in.) 200 mm (7.87 in.)

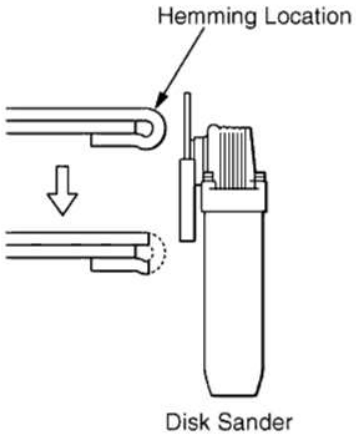
FRONT DOOR OUTER PANEL (ASSY)


F16766A

REPLACEMENT

REMOVAL





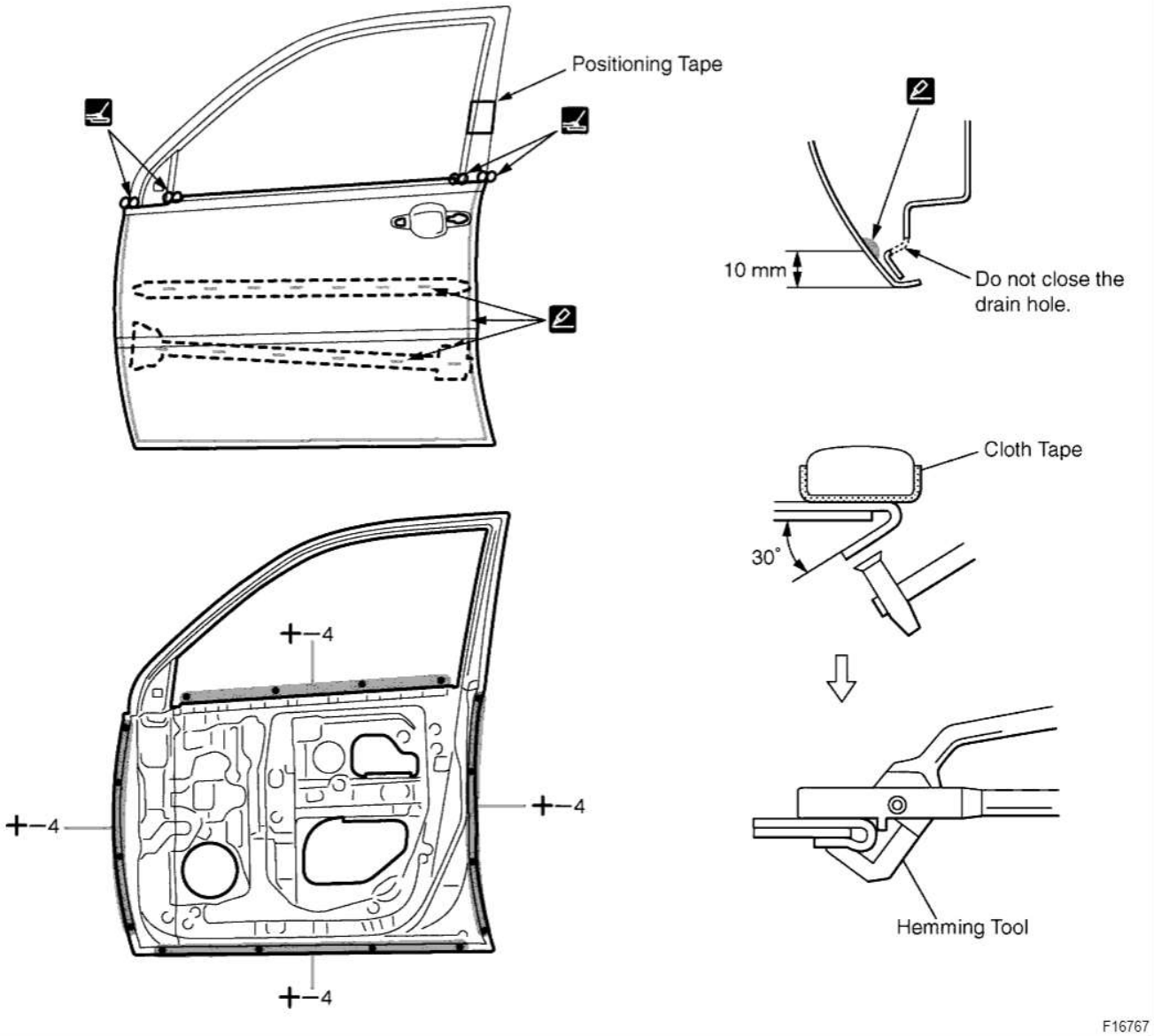
F16766

POINT

1 Before removing the outer panel, make the installation position with a tape.
2 Before removing the outer panel, establish its exact position in relation to the window frame using a reference marker, etc.
3 After grinding off the hemming location, remove the outer panel.

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



POINT

1 Before temporarily installing the new parts, apply body sealer to the reinforcement, side impact protection beam and back side of the new parts.
HINT:
1) Apply sealer evenly about 10 mm (0.39 in.) from the flange and 3 mm (0.12 in.) in diameter to the outer panel and apply just enough sealer for the reinforcement and side impact protection beam to make contact.

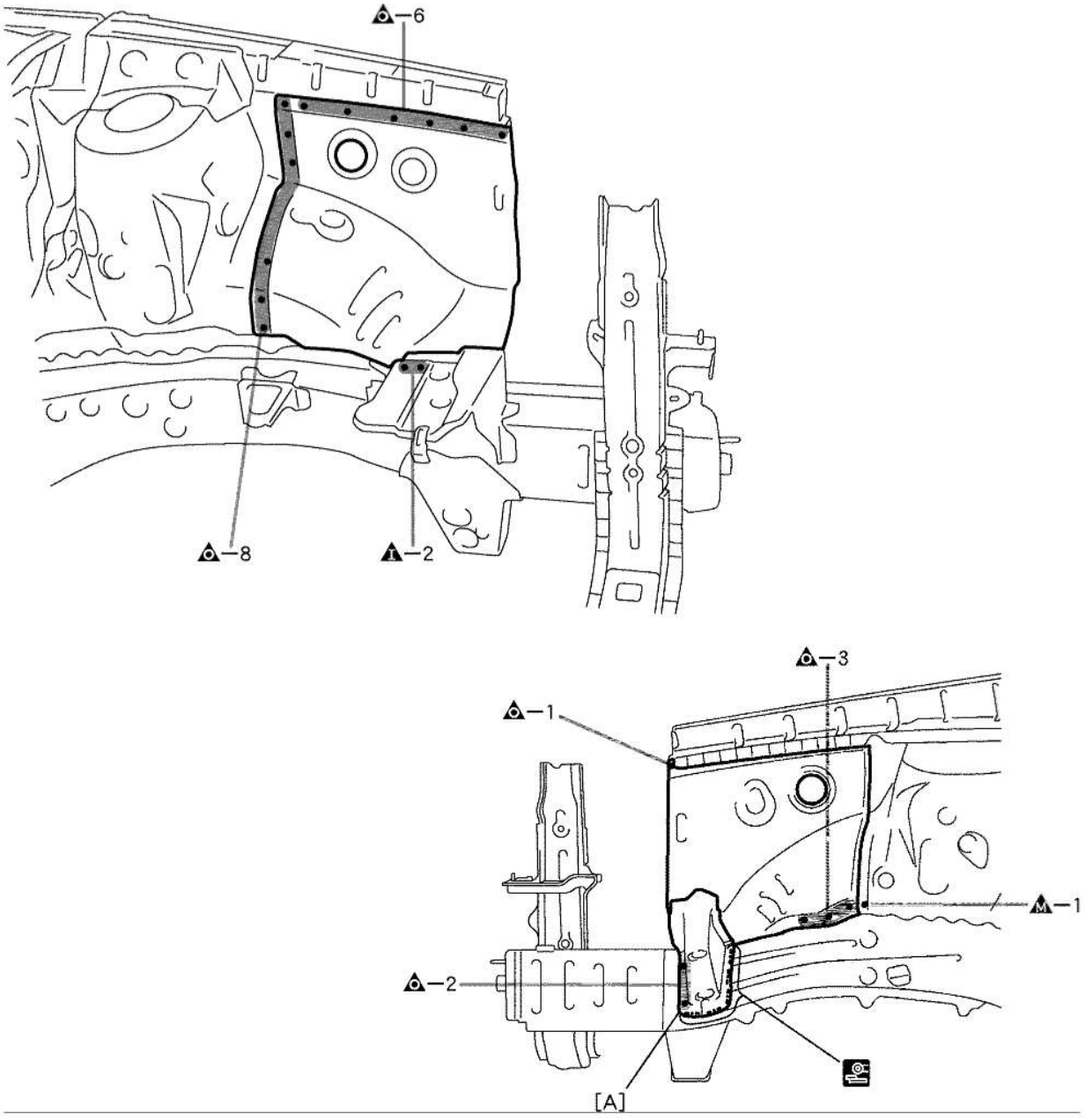
2 Bend the flange hem about 30° with a hammer and dolly, then fasten tightly with a hemming tool.
HINT:
1) Perform hemming in three steps, being careful not to warp the panel.
2) If a hemming tool cannot be used, hem with a hammer and dolly.

FRONT FENDER FRONT APRON (ASSY)


F16749A

REPLACEMENT
With the radiator side support removed.

REMOVAL



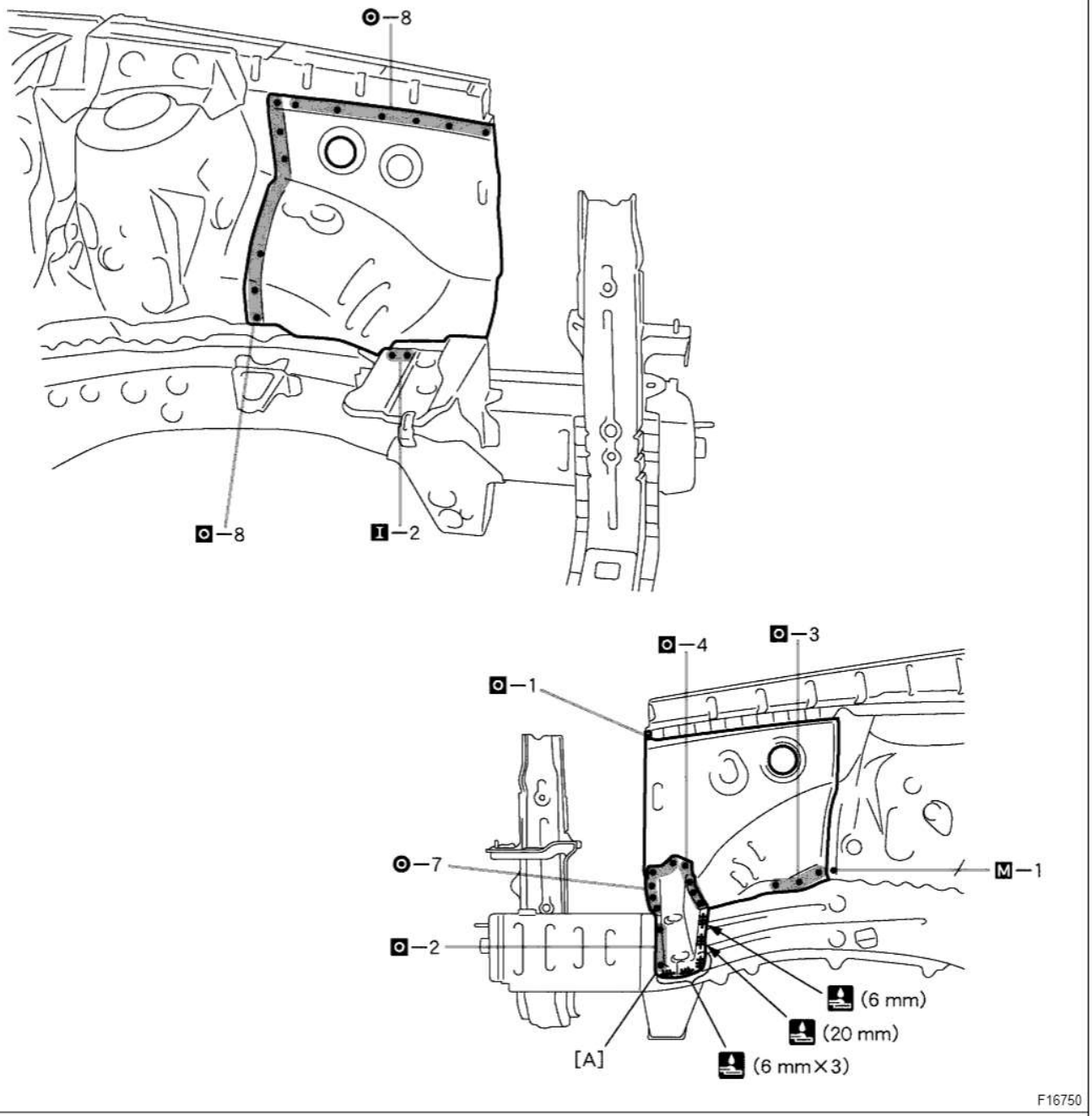
F16749

POINT
1 Remove the [A] at the same time.

PART NAME
[A] Front Fender Apron Wind Guide Gusset

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



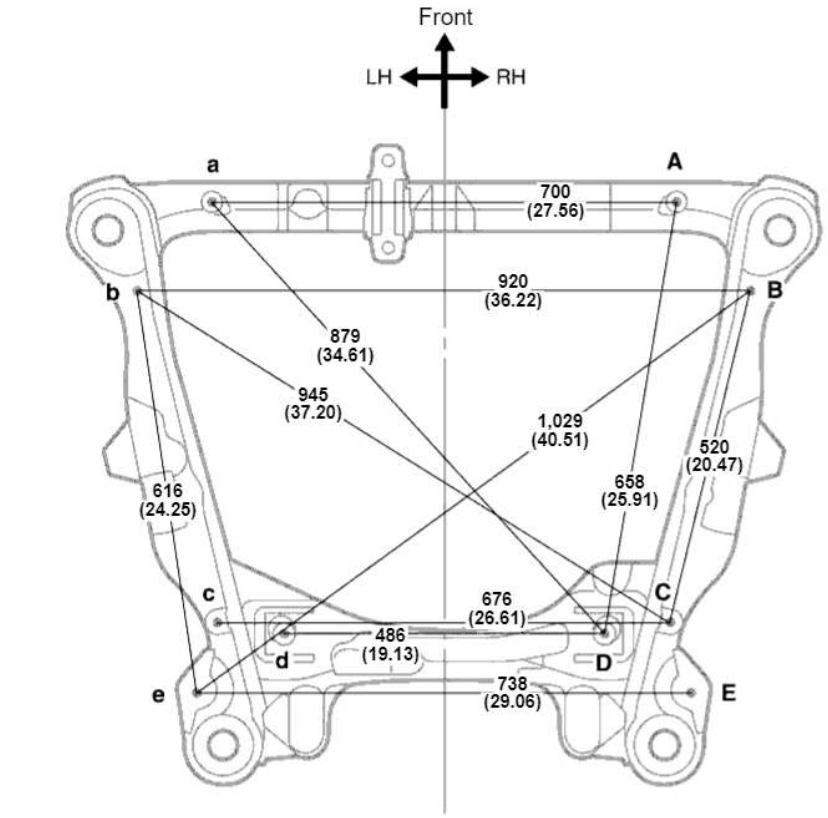
PART NAME

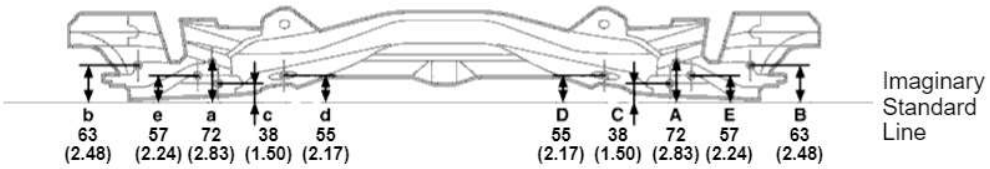
[A] Front Fender Apron Wind Guide Gusset

6 mm (0.24 in.) 20 mm (0.79 in.)

FRONT FRAME

(Three-Dimensional Distance)



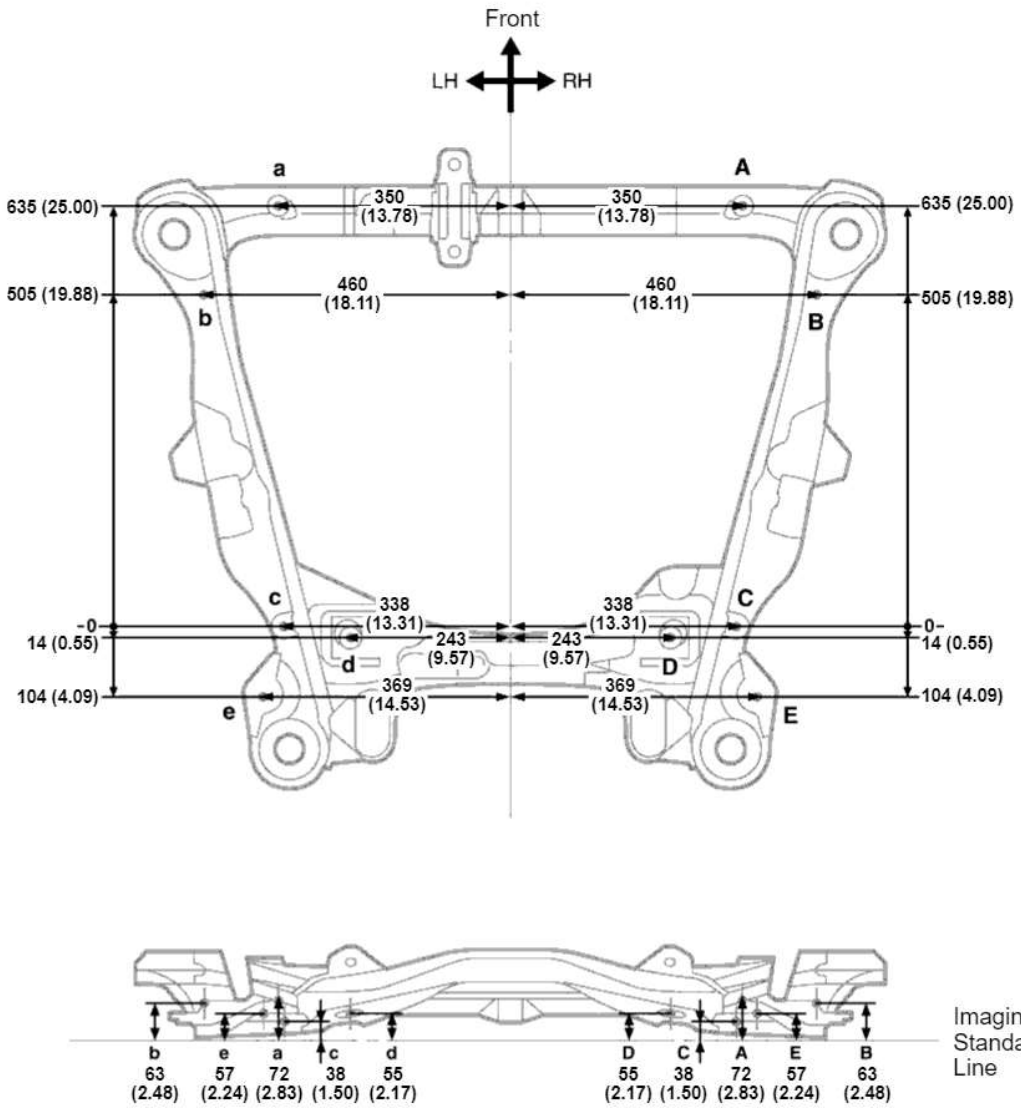


mm (in.)

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 arm installation hole	15 (0.59)
C, c	Front frame standard hole	13 (0.51)	—	—	—

FRONT FRAME

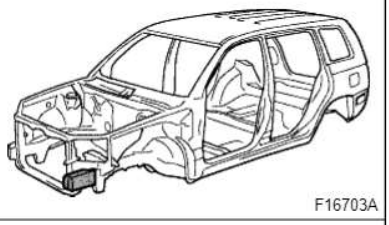
(Two-Dimensional Distance)



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 arm installation hole	15 (0.59)
C, c	Front frame standard hole	13 (0.51)	—	—	—

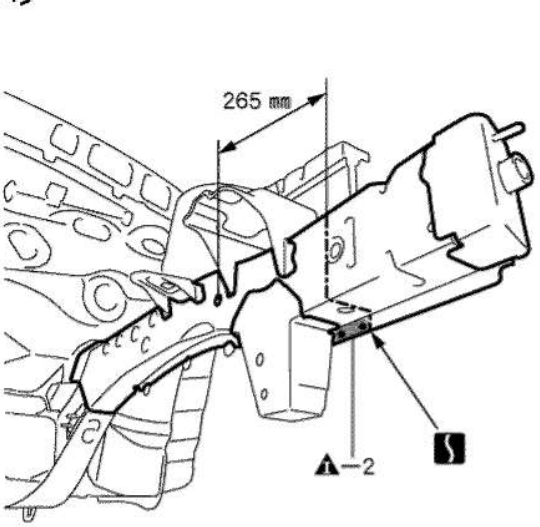
FRONT SIDE MEMBER (CUT-P)

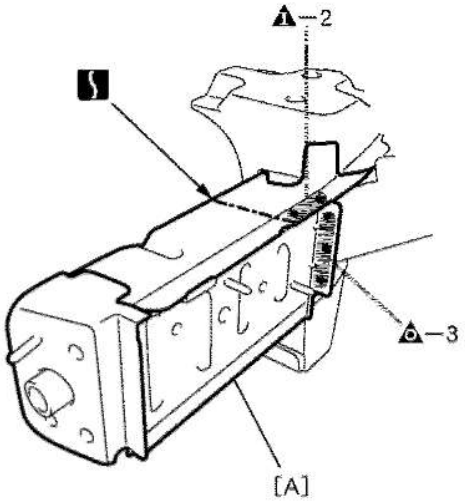

F16703A

REPLACEMENT
With the front crossmember No.1 reinforcement removed.

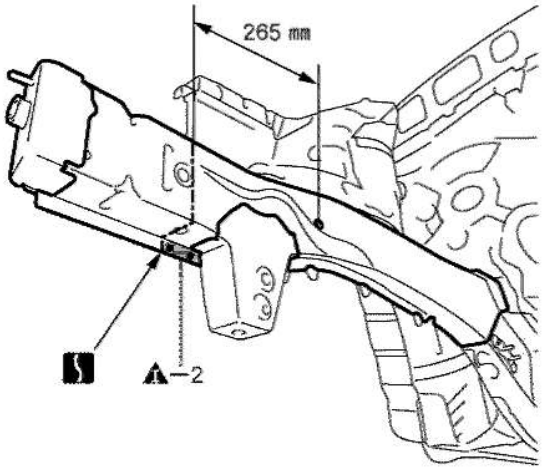
REMOVAL

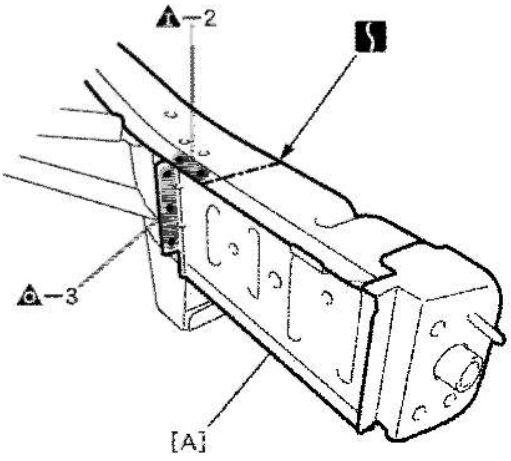
(LH)





(RH)





F16703

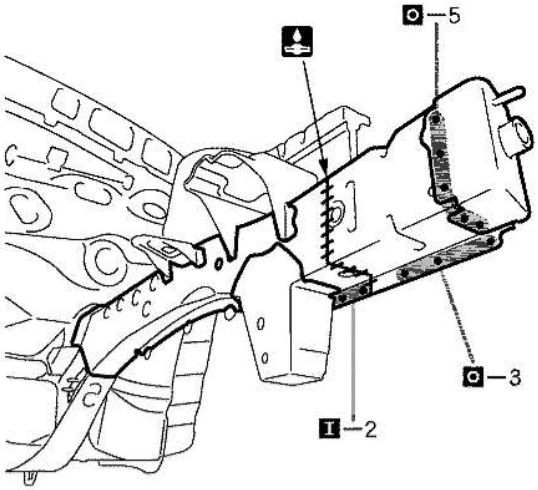
PART NAME
[A] Front Side Member Extension

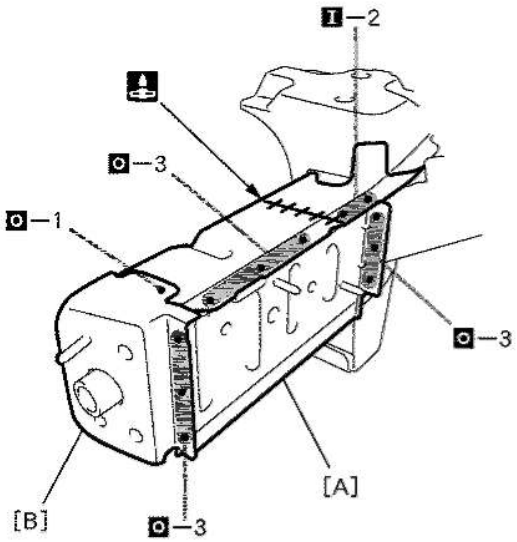
265 mm (10.43 in.)

INSTALLATION

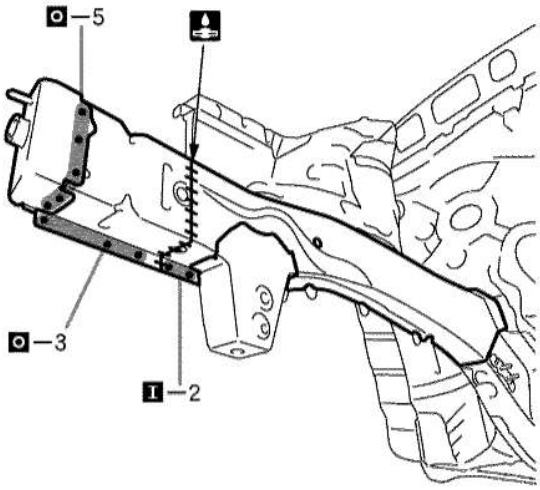
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

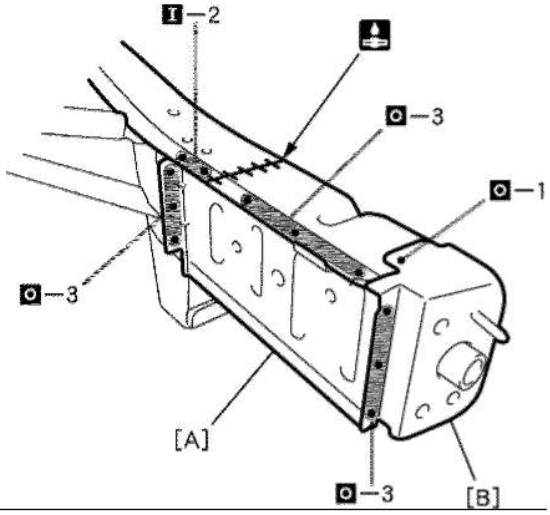
(LH)





(RH)

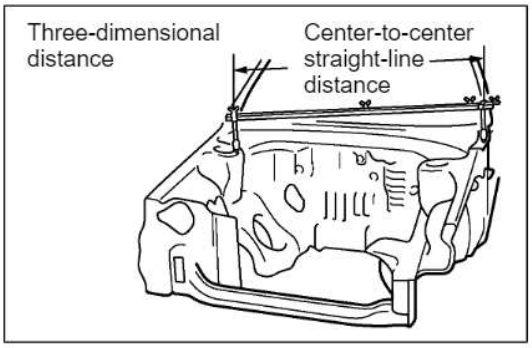




F16704

PART NAME

[A] Front Side Member Extension [B] Body Mounting No.1 Bracket



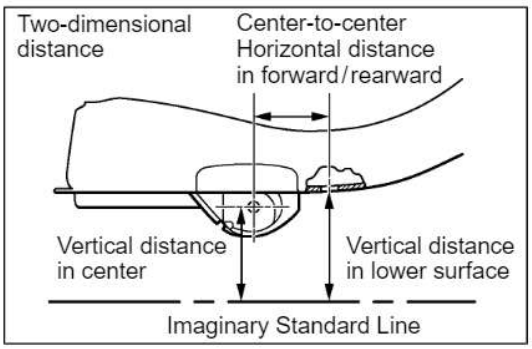
GENERAL INFORMATION

1. BASIC DIMENSIONS

(a) There are two types of dimensions in the diagram.

(1) (Three-dimensional distance)

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

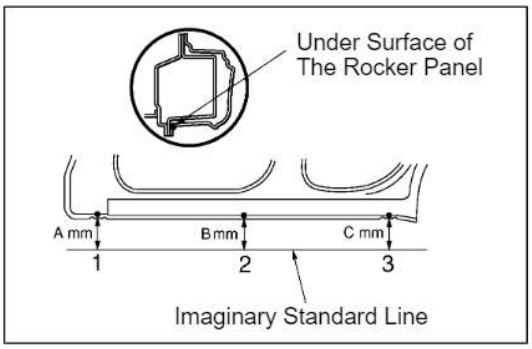


(2) (Two-dimensional distance)

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

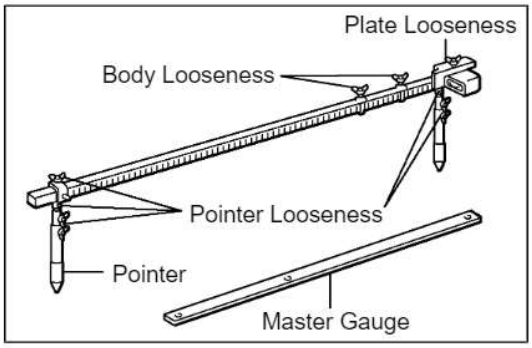
(b) In cases in which only one dimension is given, left and right are symmetrical.

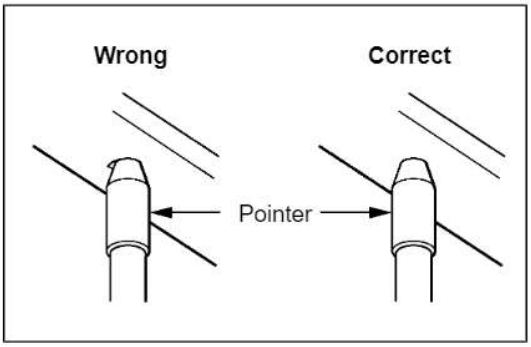
(c) The dimensions in the following drawing indicate actual distance. Therefore, please use the dimensions as a reference.



(d) The line that connects the places listed below is the imaginary standard line when measuring the height. (The dimensions are printed in the text.)

SYMBOL	Name
1	The place that was lowered A mm from the under surface of the rocker panel centered on the front jack up point.
2	The place that was lowered B mm from the under surface of the rocker panel centered between 1 and 3.
3	The place that was lowered C mm from the under surface of the rocker panel centered on the rear jack up point.





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.

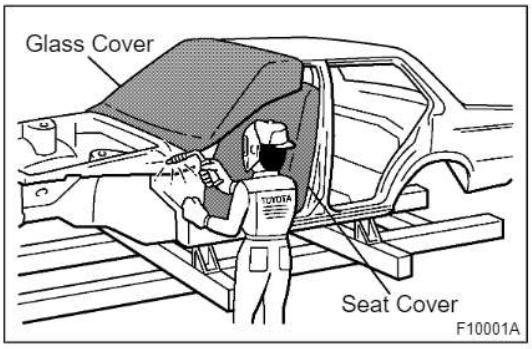
HINT:

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.

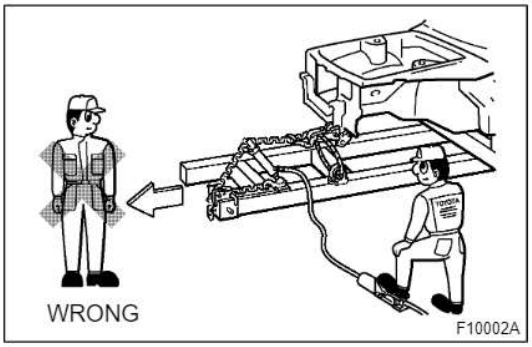
GENERAL REPAIR INSTRUCTIONS

1. WORK PRECAUTIONS



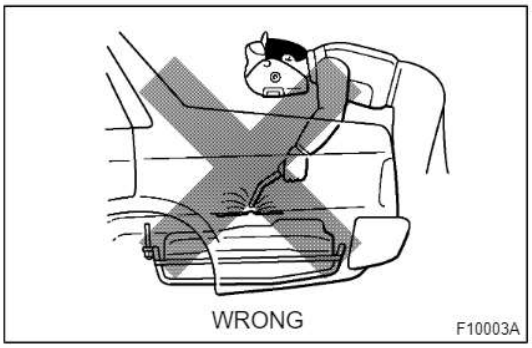
(a) VEHICLE PROTECTION

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



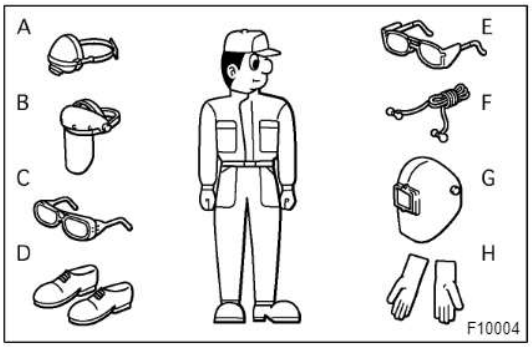
(b) SAFETY

(1) 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.



(2) Before performing repair work, check for fuel leaks. If a leak is found, be sure to close the opening totally.

(3) If it is necessary to use a flame in the area of the fuel tank, first remove the tank and plug the fuel line.



(c) SAFETY WORK CLOTHES

(1) 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.

Code	Name
A	Dust-Prevention Mask
B	Face Protector
C	Eye Protector
D	Safety Shoes
E	Welder's Glasses
F	Ear Plugs
G	Head Protector
H	Welder's Gloves

2. HANDLING PRECAUTIONS OF PLASTIC BODY PARTS

(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 table.

(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 applid 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.

3. LOCATION OF PLASTIC BODY PARTS

Parts Name	Code
Radiator Grille	ABS
Headlight	PC/PP
Front Bumper Cover	TSOP
Front Bumper Hole Cover	TSOP
Fog Light	PC
Front Fender Mudguard	PP/EPDM
Outer Rear View Mirror	ABS/PA
Cowl Top Ventilator Louver	PP
Door Outside Handle (Front, Rear)	PC/PA • PA
Door Outside Moulding (Front, Rear)	PP
Quarter Panel Mudguard	PP/EPDM
Rear Bumper Cover	TSOP
Back Door Outside Garnish	ABS
Back Door Outside Handle	PA
Rear Combination Light	PMMA/AAS
License Plate Light	PC/PA
Center Stop Light	PC
Rear Spoiler	ABS

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

HANDLING PRECAUTIONS ON RELATED COMPONENTS

1. BRAKE SYSTEM

The brake system is one of the most important safety components. Always follow the directions and notes given in brake (32) section of the repair manual for the relevant model when handling brake system parts.

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

2. 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 section.

Component to be aligned	Section of repair manual for relevant model
Front Wheels	Front Suspension (26) section
Rear Wheels	Rear Suspension (27) section
Propeller Shaft	Propeller Shaft (30) section

3. 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.

4. ECU (ELECTRONIC CONTROL UNIT)

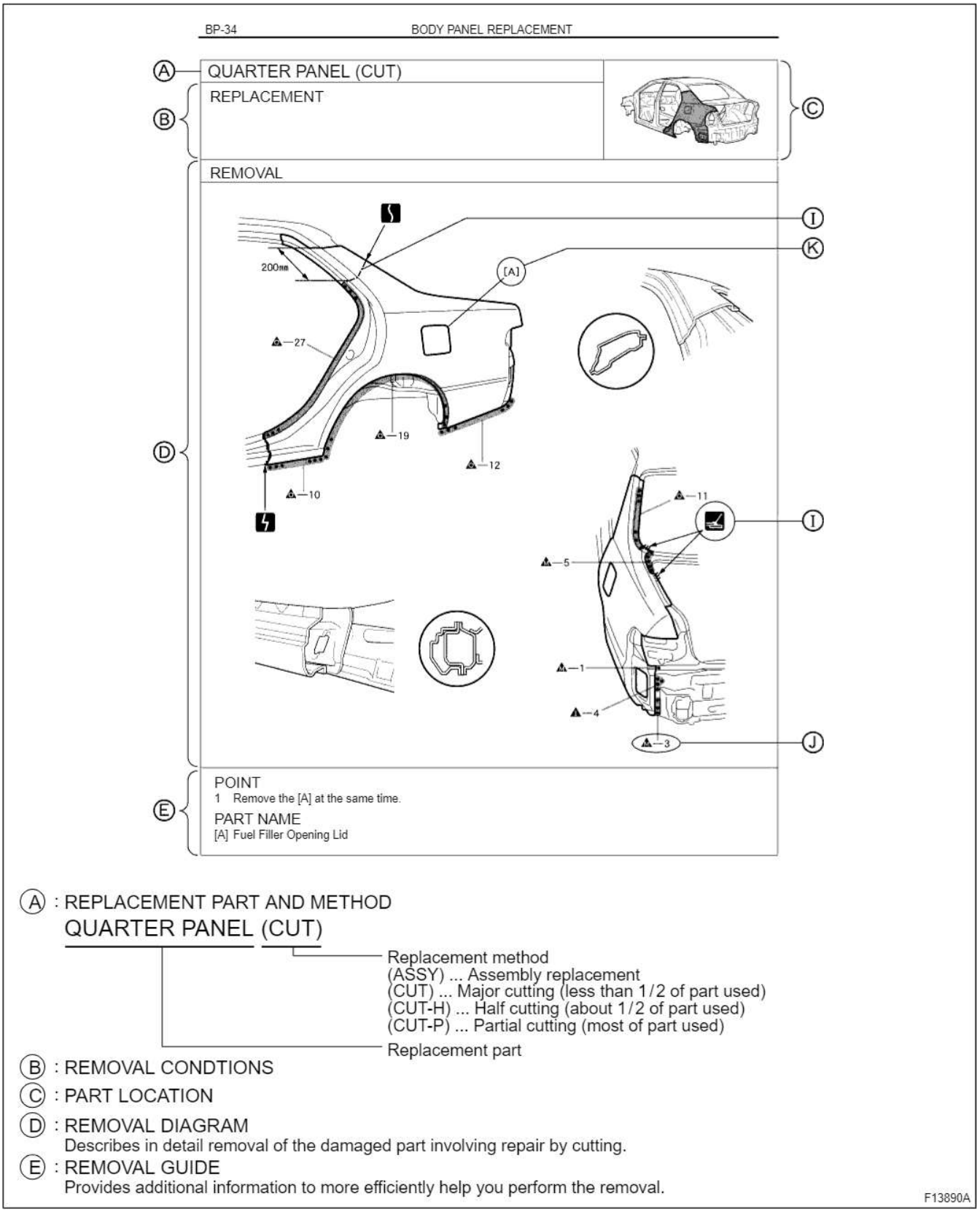
Many ECUs are mounted in this vehicle.
Take the following precautions during body repair to prevent damage to the ECUs.

- Before starting electric welding operations, disconnect the negative (-) terminal cable from the battery.
  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 each memory system. Then when work is finished, reset the clock and audio systems as before.
  When the vehicle has tilt and telescopic steering, power seat and outside rear view mirror, which are all equipped with memory function, it is not possible to make a record of the memory contents. So when the operation is finished, it will be necessary to explain this fact to the customer, and request the customer to adjust the features and reset the memory.
- Do not expose the ECUs to ambient temperatures above 80°C (176°F).

  NOTICE: If it is possible the ambient temperature may reach 80° C (176° F) or more, remove the ECUs from the vehicle before starting work.
- Be careful not to drop the ECUs and not to apply physical shocks to them.

HOW TO USE THIS MANUAL

1. BODY PANEL REPLACEMENT THIS MANUAL



Ⓐ : REPLACEMENT PART AND METHOD

QUARTER PANEL (CUT)

- Replacement method
  - (ASSY) ... Assembly replacement
  - (CUT) ... Major cutting (less than 1/2 of part used)
  - (CUT-H) ... Half cutting (about 1/2 of part used)
  - (CUT-P) ... Partial cutting (most of part used)
- Replacement part

Ⓑ : REMOVAL CONDTIONS

Ⓒ : PART LOCATION

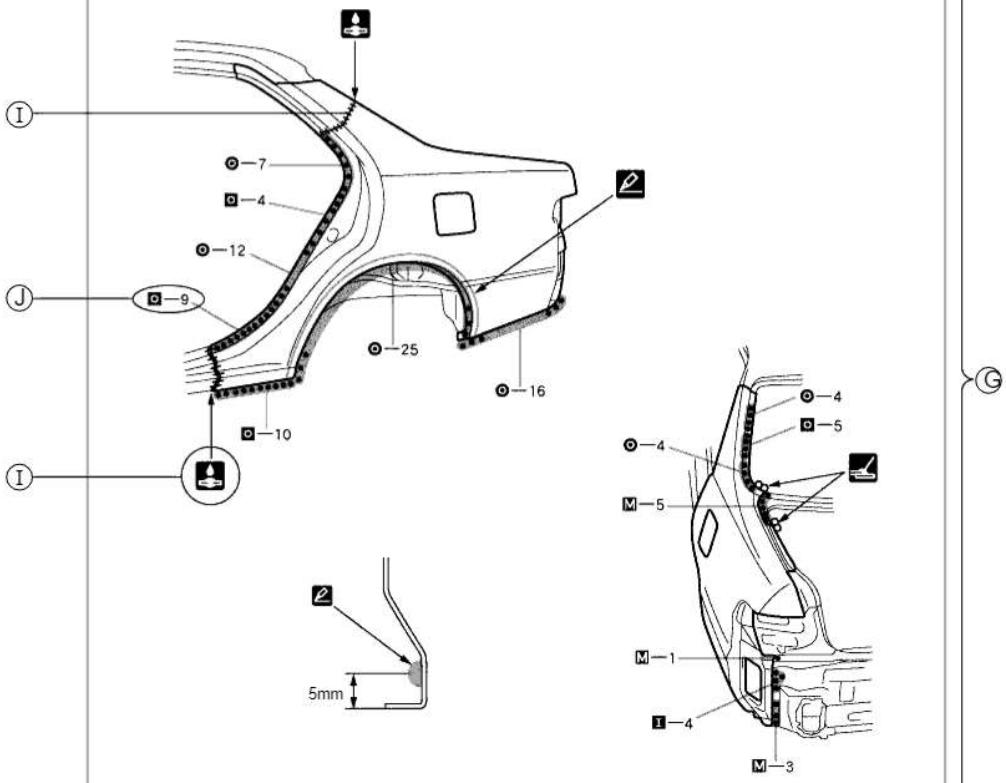
Ⓓ : REMOVAL DIAGRAM
Describes in detail removal of the damaged part involving repair by cutting.

Ⓔ : REMOVAL GUIDE
Provides additional information to more efficiently help you perform the removal.

F13890A

INSTALLATION
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fiting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

(F)



(G)

POINT
1 Before temporarily installing the new parts, apply body sealer to the wheel arch.
HINT:
1) Apply body sealer about 5mm (0.20in.) front the flange, avoiding any oozing.
2) Apply sealer evenly, about 3 - 4mm (0.12 - 0.16in.) in diameter.
3) For other sealing points, refer to section PC.

PART NAME
[A] Fuel Filler Opening Lid [B] Waterproof Rivet

(H)

(F) : INSTALLATION CONDITIONS

(G) : INSTALLATION DIAGRAM
Describes in detail installation to the new part involving repair by welding and/or cutting, but excluding painting.

(H) : INSTALLATIOLN GUIDE
Provides additional information to more efficiently help you perform the installation.

(I) : SYMBOLS
(See page IN-7)

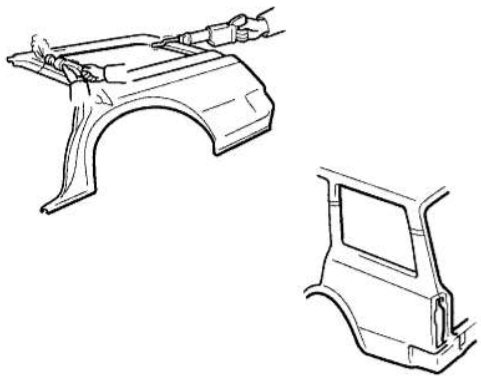
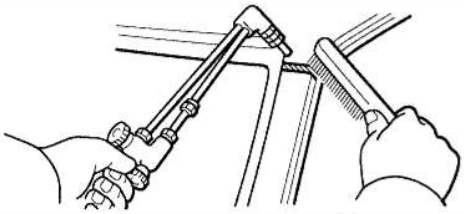
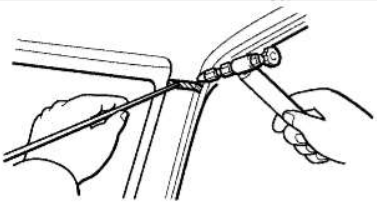
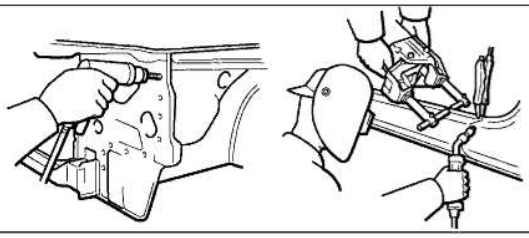
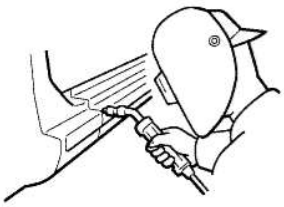
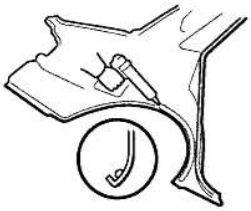
(J) : ILLUSTRATION OF WELD POINTS
Weld method and panel position symbols (See page IN-9)

(K) : PART NAME

F13891A

2. SYMBOLS

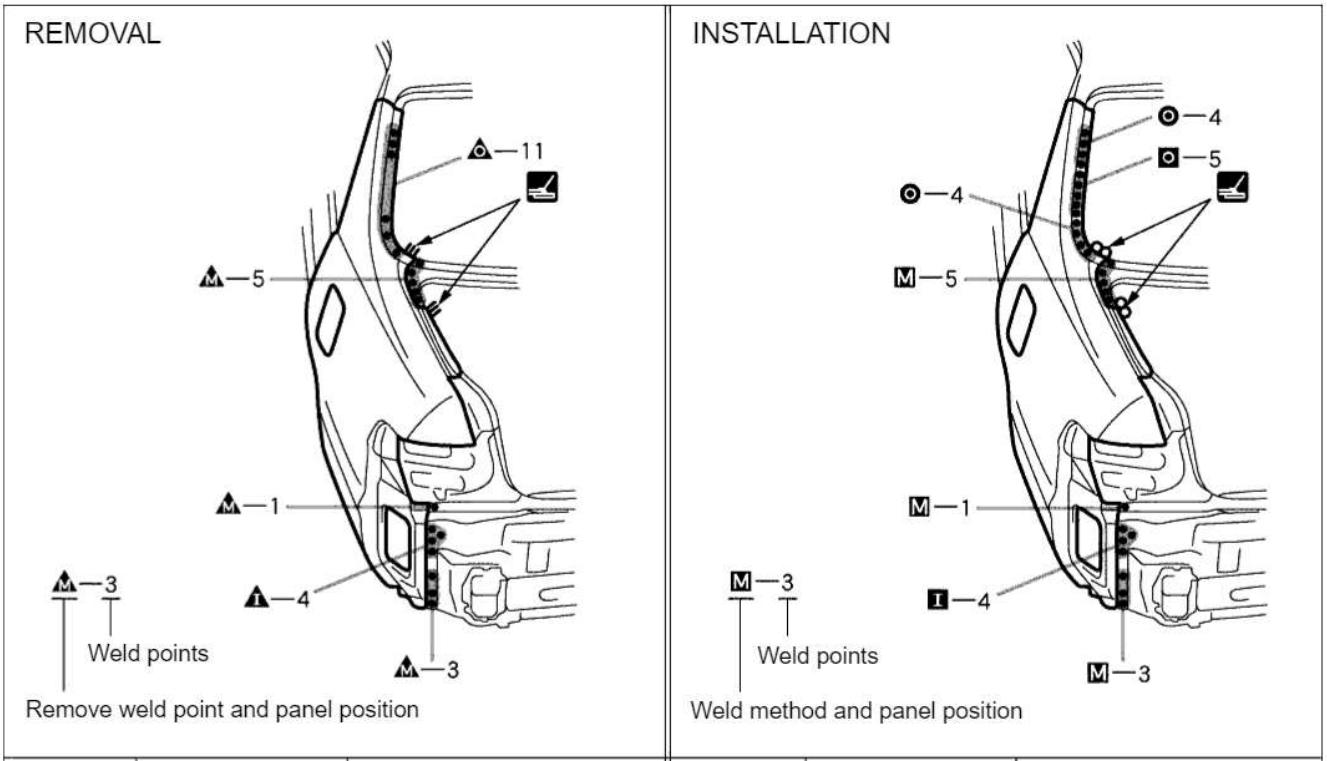
The following symbols are used in the welding diagrams in section BP of this manual to indicate cutting areas and the types of weld required.

SYMBOLS		MEANING	ILLUSTRATION
-·-·-·-		CUT AND JOIN LOCATION (SAW CUT)	
		CUT AND JOIN LOCATION (Cut Location for Supply Parts)	
		CUT LOCATION	
		CUT WITH DISC SANDER, ETC.	
/////		BRAZE (Removal)	
OOOO		BRAZE (Installation)	
●●●●●●	—	WELD POINTS	
O M I O M I O M I	—	SPOT WELD OR MIG PLUG WELD (See Page IN-9)	
++++		CONTINUOUS MIG WELD (BUTT WELD)	
		CONTINUOUS MIG WELD (TACK WELD)	
▬▬		BODY SEALER	 F13893A

SYMBOLS		MEANING	ILLUSTRATION
—		Assembly Mark	
	—	BODY SEALER (Flat Finishing)	
	—	BODY SEALER (No flat Finishing)	
			F13894A

3. ILLUSTRATION OF WELD POINT SYMBOLS

EXAMPLE:



SYMBOLS	MEANING	ILLUSTRATION
O M I	Remove Weld Points	
O	(Outside)	
M	(Middle)	
I	(Inside)	

HINT: Panel position symbols are as seen from the working posture.

SYMBOLS	MEANING	ILLUSTRATION
O M I	Spot Weld	
O M I	MIG Plug Weld	
+	Spot MIG Weld	

F13892A

PRECAUTIONS FOR REPAIRING BODY STRUCTURE PANELS



1. HEAT REPAIR FOR BODY STRUCTURE PANELS

Toyota prohibits the use of the heat repair method on body structure panels when repairing a vehicle damaged in a collision.

Panels that have high strength and rigidity, as well as a long life span for the automobile body are being sought after.

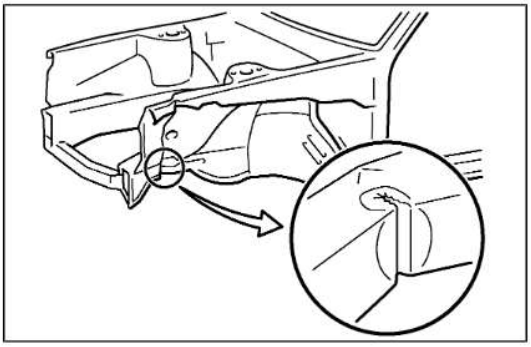
At Toyota, in order to fulfill these requirement, we use high tensile strength steel sheets and rust preventive steel sheets on the body.

High tensile steel sheets are made with alloy additives and a special heat treatment in order to improve the strength.

To prevent the occurrence of rust for a long period of time, the surface of the steel is coated with a zinc alloy.

If a body structure parts are heat repaired with an acetylene torch or other heating source, the crystalline organization of the steel sheet will change and the strength of the steel sheet will be reduced.

The ability of the body to resist rust is significantly lowered as well since the rust resistant zinc coating is destroyed by heat and the steel sheet surface is oxidized.

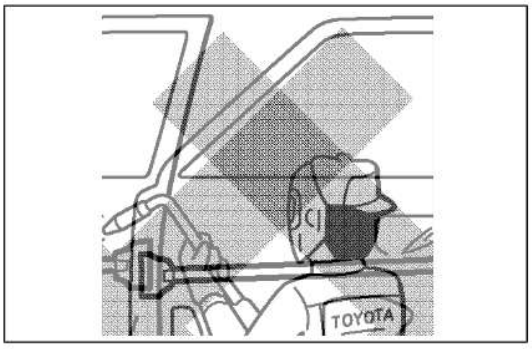


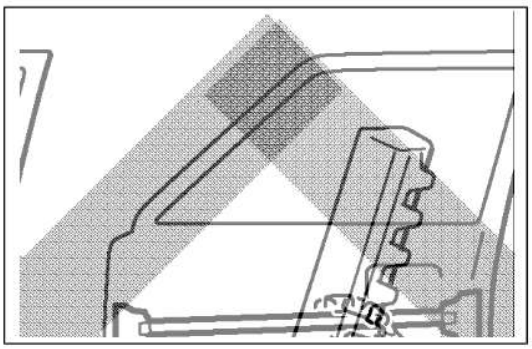
2. STRUCTURE PANEL KINKS

A sharp deformation angle on the panel that cannot be returned to its original shape by pulling or hammering is called a kink.

Since structure parts were designed to exhibit a 100% performance when they were in their original shape, if they are deformed in an accident, or if the deformed parts are repaired and reused, they become unable to exhibit the same performance as intended in the design.

It is necessary to replace the part where the kink has occurred.





3. IMPACT BEAM REPAIR

The impact beam and bracket are necessary and important parts in maintaining a survival space for passengers in a side collision.

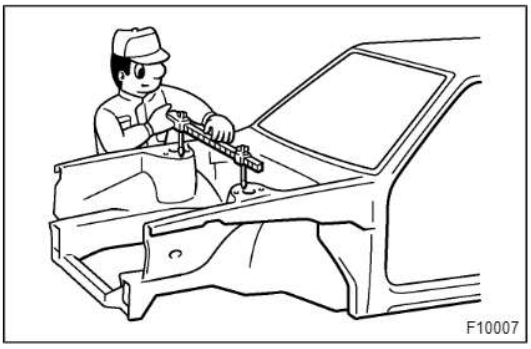
For impact beam, we use special high tensile strength steel.

The high tensile strength steel maintains its special crystalline organization by heat treatment or alloy additives.

Since these parts were designed to exhibit a 100% performance when they were in their original shape, if they are deformed in an accident, or if the deformed parts are repaired and reused, they become unable to exhibit the same performance as intended in the design.

It is necessary to replace the door assembly when impact beam or bracket is damaged.

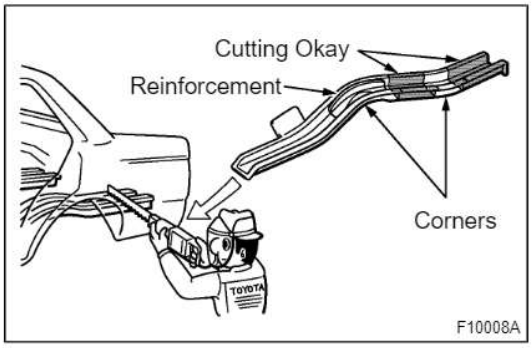
PROPER AND EFFICIENT WORK PROCEDURES


F10007

1. REMOVAL

(a) PRE-REMOVAL MEASURING

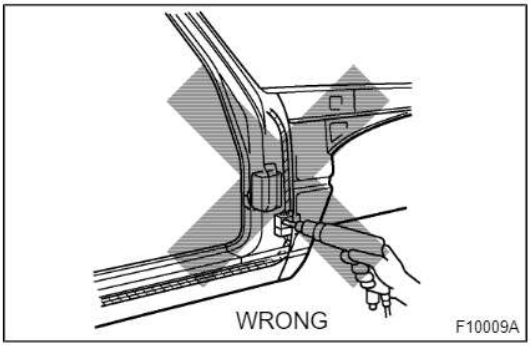
(1) Before removal or cutting operations, take measurements in accordance with the dimension diagram. Always use a puller to straighten a damaged body or frame.



F10008A

(b) CUTTING AREA

(1) Always cut in a straight line and avoid reinforced area.

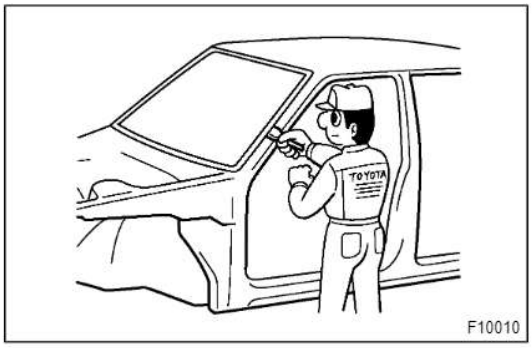


F10009A

(c) PRECAUTIONS FOR DRILLING OR CUTTING

(1) 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-15.

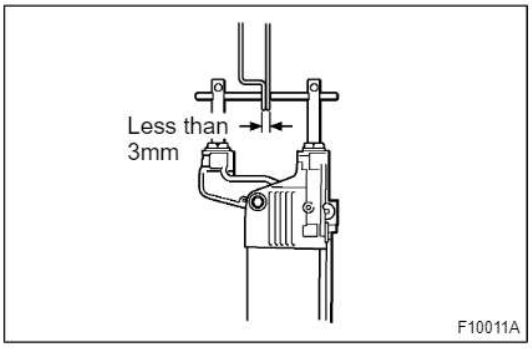


F10010

(d) REMOVAL OF ADJACENT COMPONENTS

(1) 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-15.

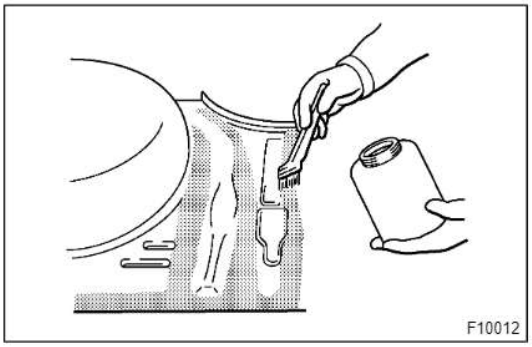


2. PREPARATION FOR INSTALLATION

(a) SPOT WELD POINTS

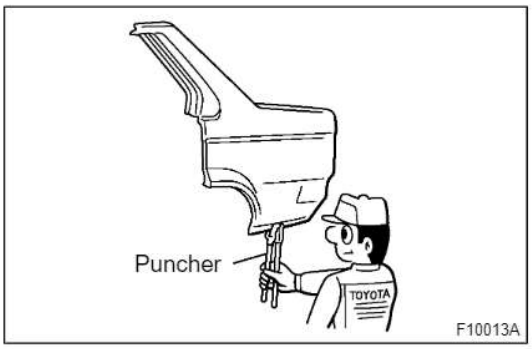
(1) When welding panels with a combined thickness of over 3mm (0.12in.), use a MIG (Metal Inert Gas) welder for plug welding.

HINT: Spot welding will not provide sufficient durability for panels over 3mm (0.12in.) thick.



(b) APPLICATION OF WELD-THROUGH PRIMER (SPOT SEALER)

(1) Remove the paint from the portion of the new parts and body to be welded, and apply weld-through primer.

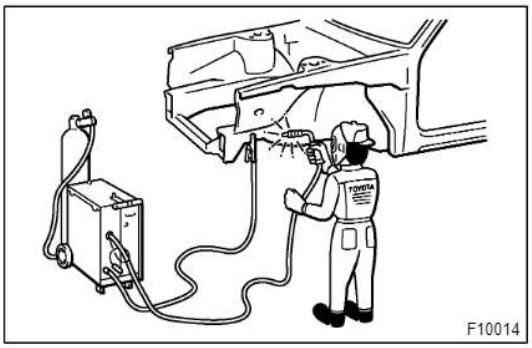


(c) MAKING HOLES FOR PLUG WELDING

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

REFERENCE: mm (in.)

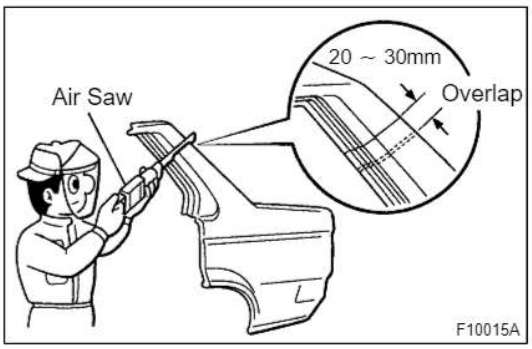
Thickness of welded portion	Size of plug hole
1.0 (0.04) under	5 (0.20) ø over
1.0 (0.04) - 1.5 (0.06)	6.4 (0.25) ø over
1.5 (0.06) over	8 (0.31) ø over



(d) SAFETY PRECAUTIONS FOR ELECTRICAL COMPONENTS

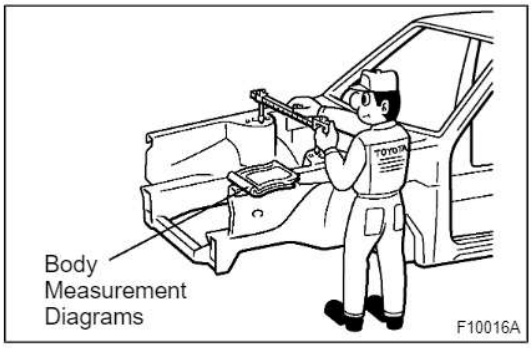
(1) When welding, there is a danger that electrical components will be damaged by the electrical current flowing through the body.

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



(e) ROUGH CUTTING OF JOINTS

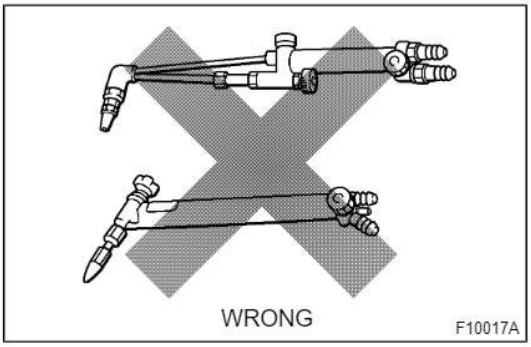
(1) For joint areas, rough cut the new parts, leaving 20 - 30mm (0.79 - 1.18in.) overlap.



3. INSTALLATION

(a) PRE-WELDING MEASUREMENTS

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

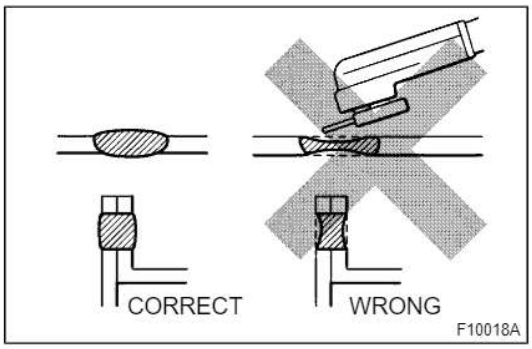


(b) WELDING PRECAUTIONS

(1) The number of welding spots should be as follows.

Spot weld: 1.3 X No. of manufacturer's spots.
Plug weld: More than No. of manufacturer's plugs.

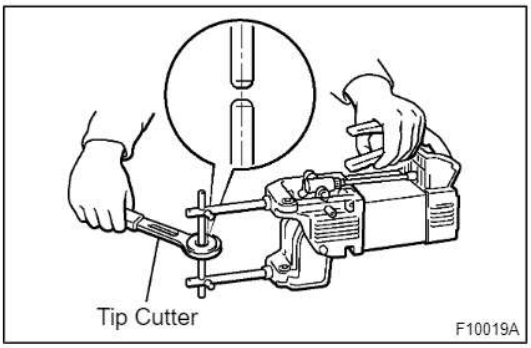
(2) Plug welding should be done with a MIG (Metal Inert Gas) welder. Do not gas weld or braze panels at areas other than specified.



(c) POST-WELDING REFINISHING

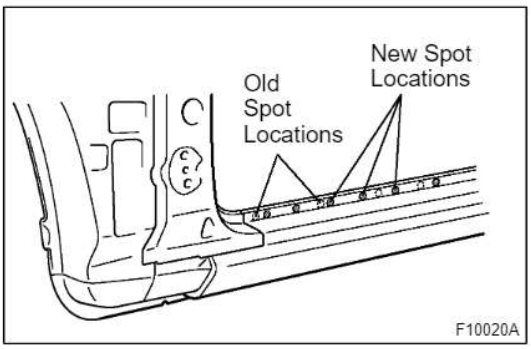
(1) Always check the welded spots to insure they are secure.

(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.



(d) SPOT WELD LOCATIONS

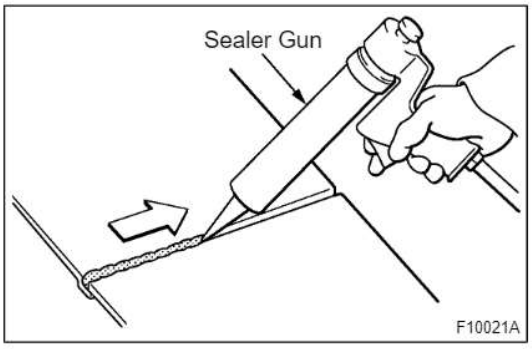
(1) Try to avoid welding over previous spots.



(e) SPOT WELDING PRECAUTIONS

(1) The shape of the welding tip point has an effect on the strength of the weld.

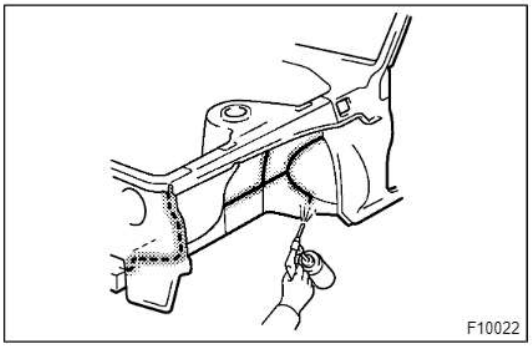
(2) Always insure that the seams and welding tip are free of paint.



4. ANTI-RUST TREATMENT

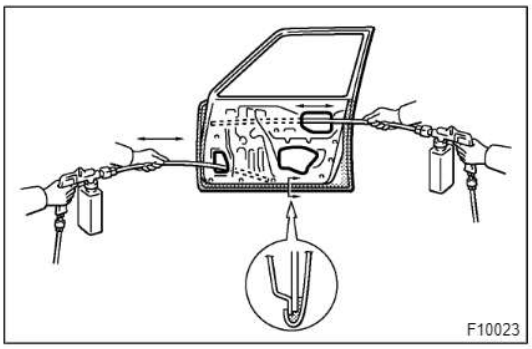
(a) BODY SEALER APPLICATION

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



(b) UNDERCOAT APPLICATION

(1) 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.



5. ANTI-RUST TREATMENT AFTER PAINTING PROCESS

(a) ANTI-RUST AGENT (WAX) APPLICATION

(1) 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.

6. ANTI-RUST TREATMENT BY PAINTING

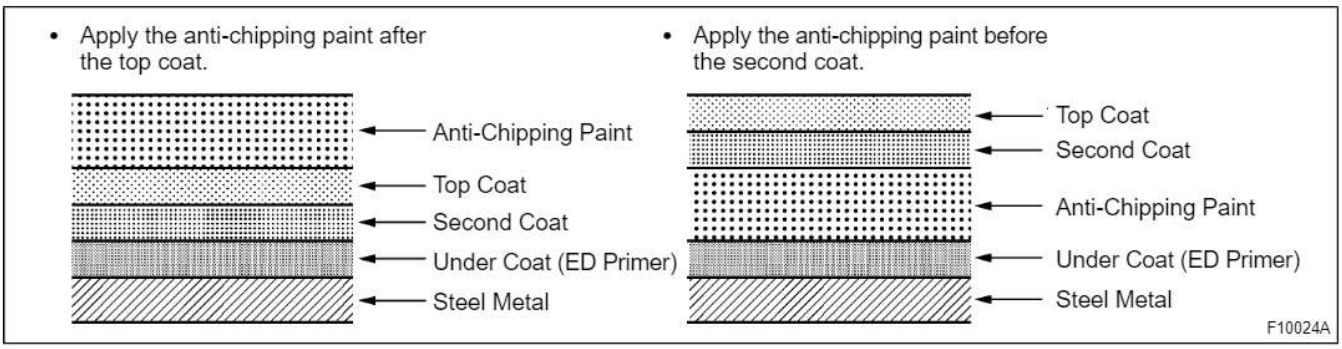
REFERENCE:

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

(a) ANTI-CHIPPING PAINT

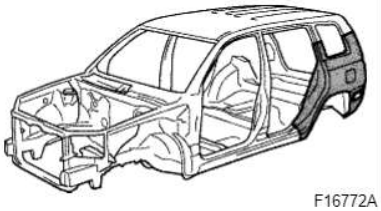
(1) To prevent corrosion and protect the body from damage by flying stones, etc., apply anti-chipping paint to the rocker panel, wheel arch areas, balance panel, etc.

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.



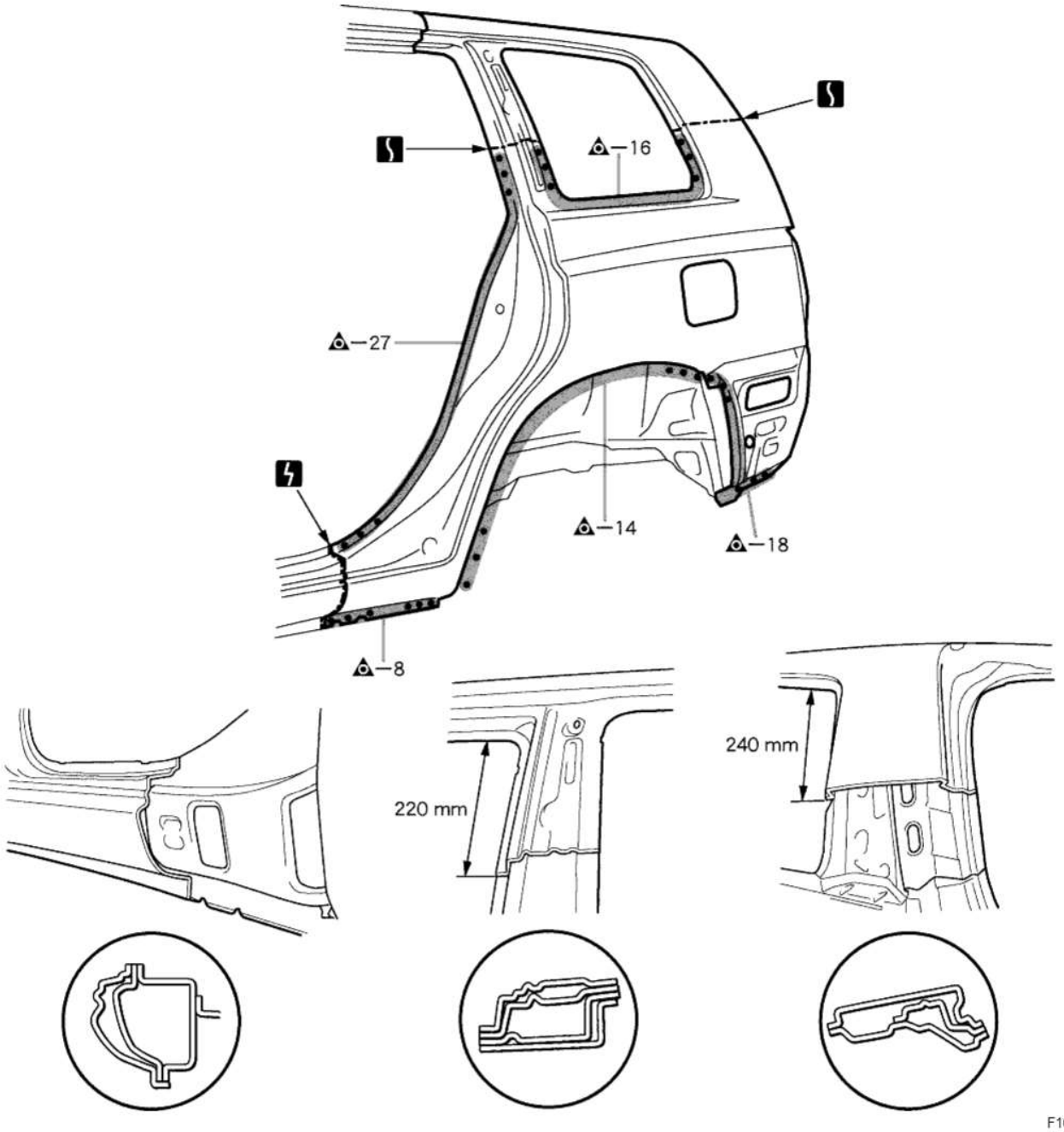
QUARTER PANEL (CUT)

REPLACEMENT



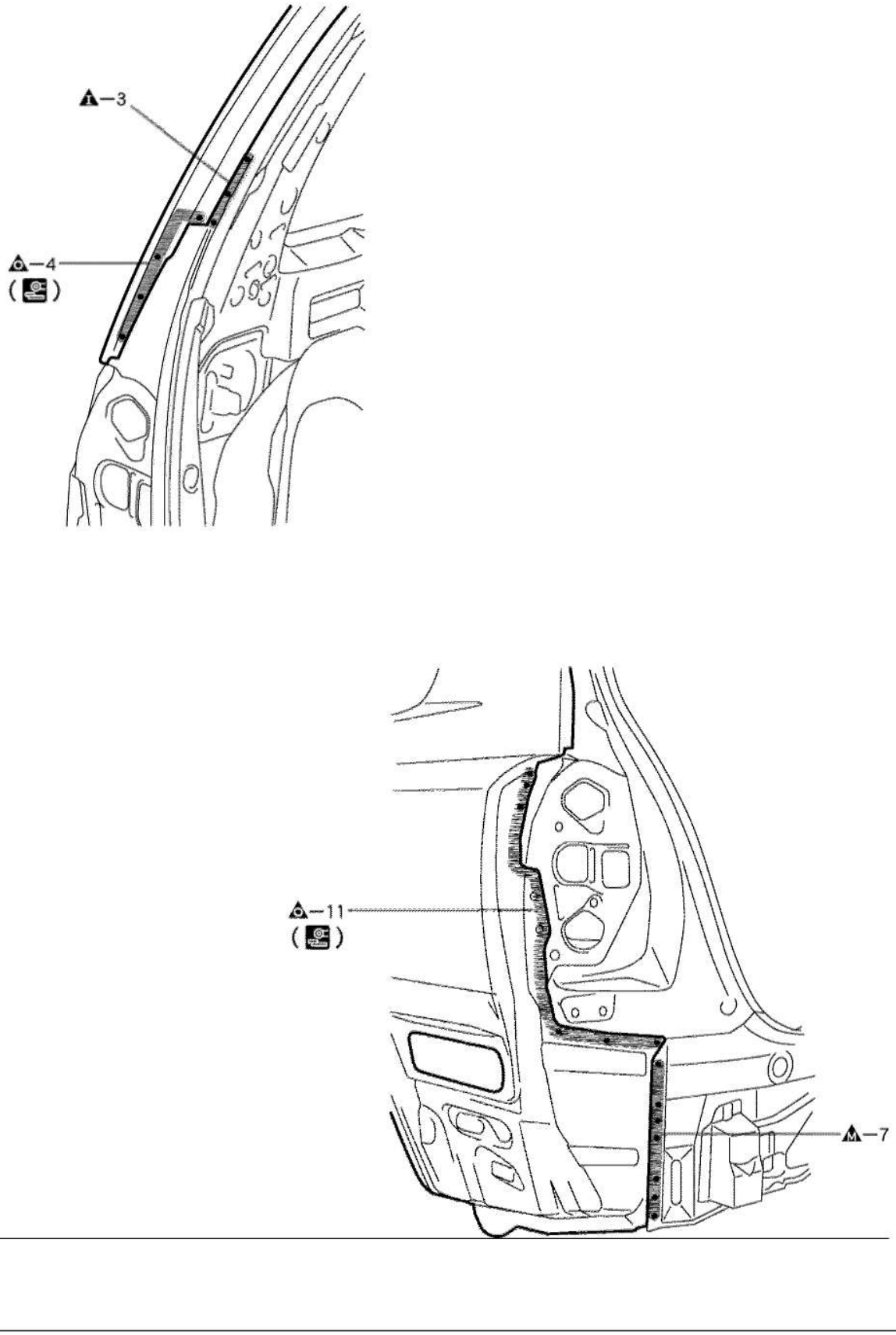
F16772A

REMOVAL



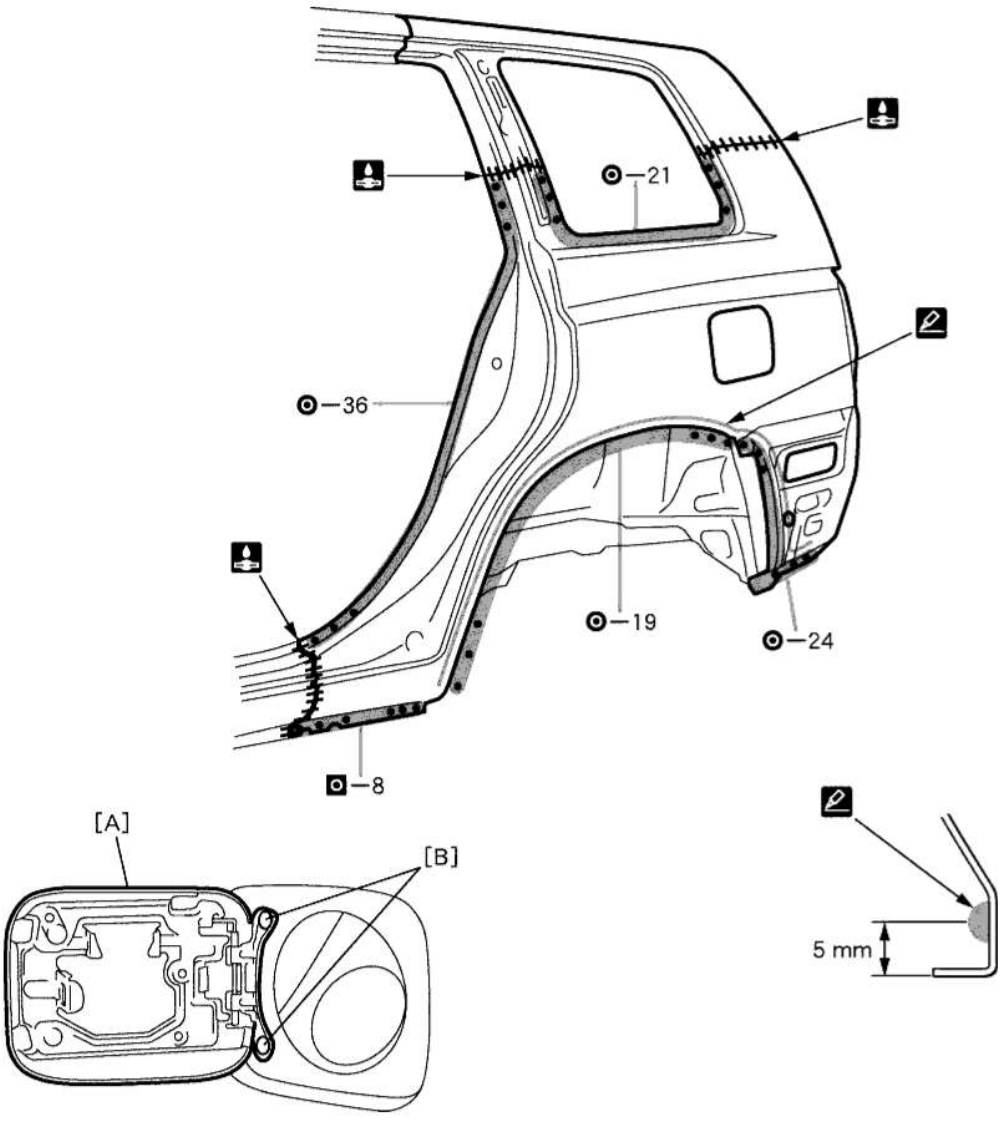
F16772

220 mm (8.66 in.) 240 mm (9.45 in.)


A-3
A-4
(A)
A-11
(A)
M-7
F16773

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



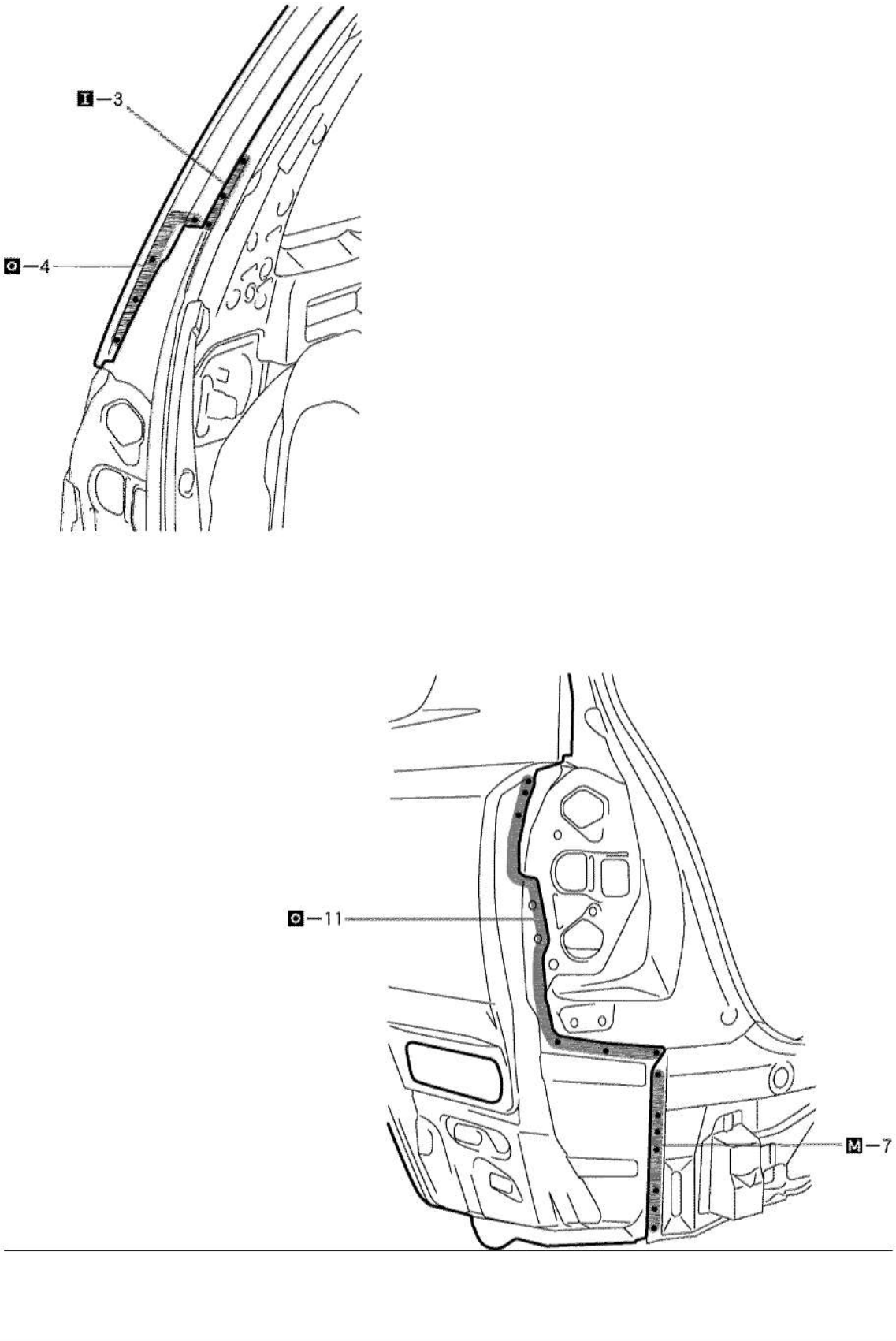
POINT

1 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.

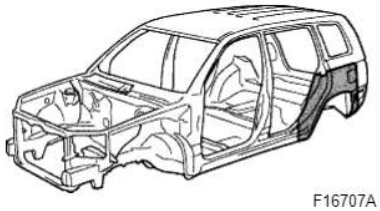
2 Inspect the fitting of the front door, luggage compartment door and rear combination light, etc., before welding, since this affects the appearance of the finish.

PART NAME

[A] Fuel Filler Opening Lid [B] Waterproof Rivets

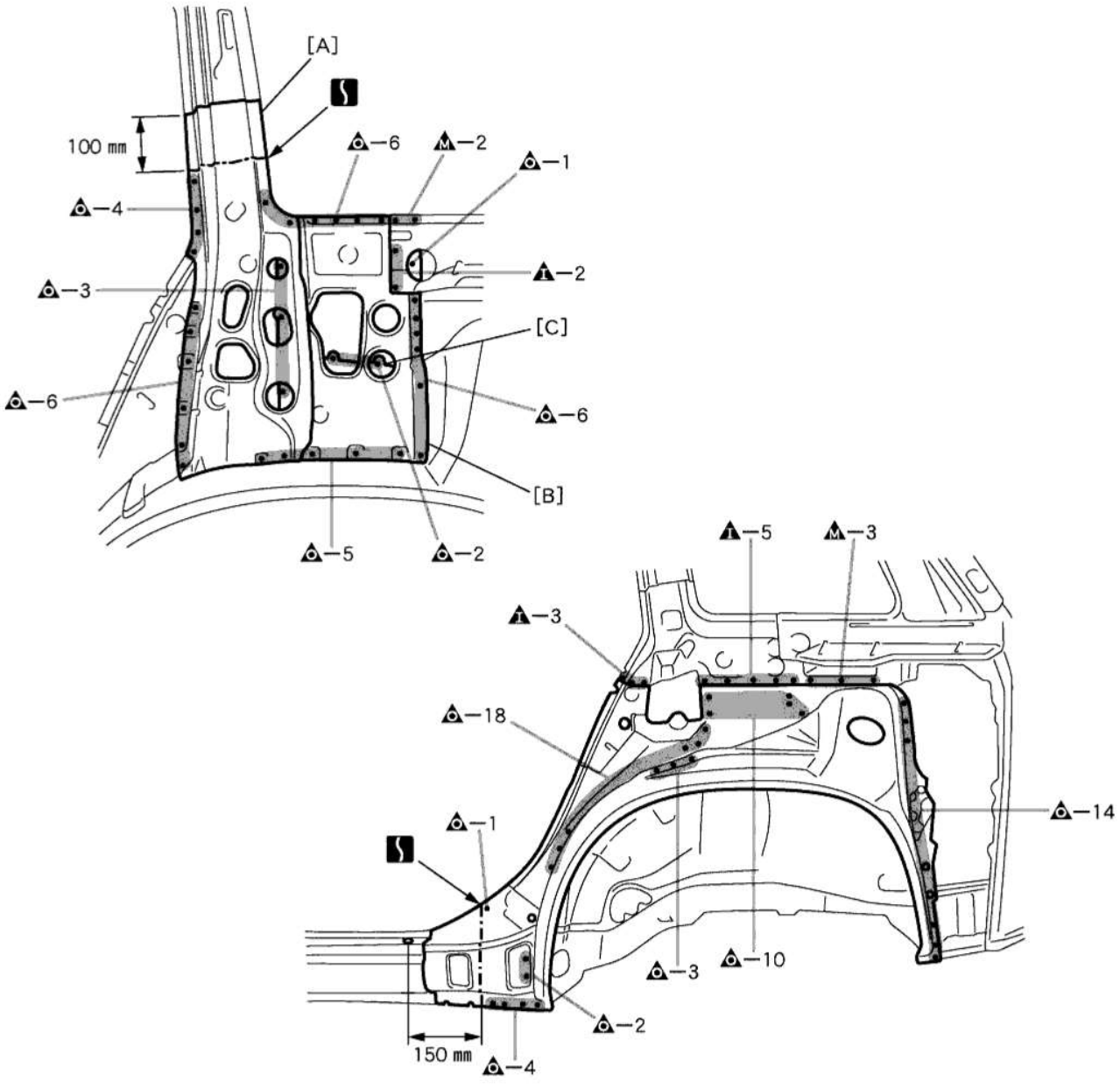

I —3
—4
—11
M —7
F16775

QUARTER WHEEL HOUSING OUTER PANEL (ASSY): LH


F16707A

REPLACEMENT
With the quarter panel removed.

REMOVAL



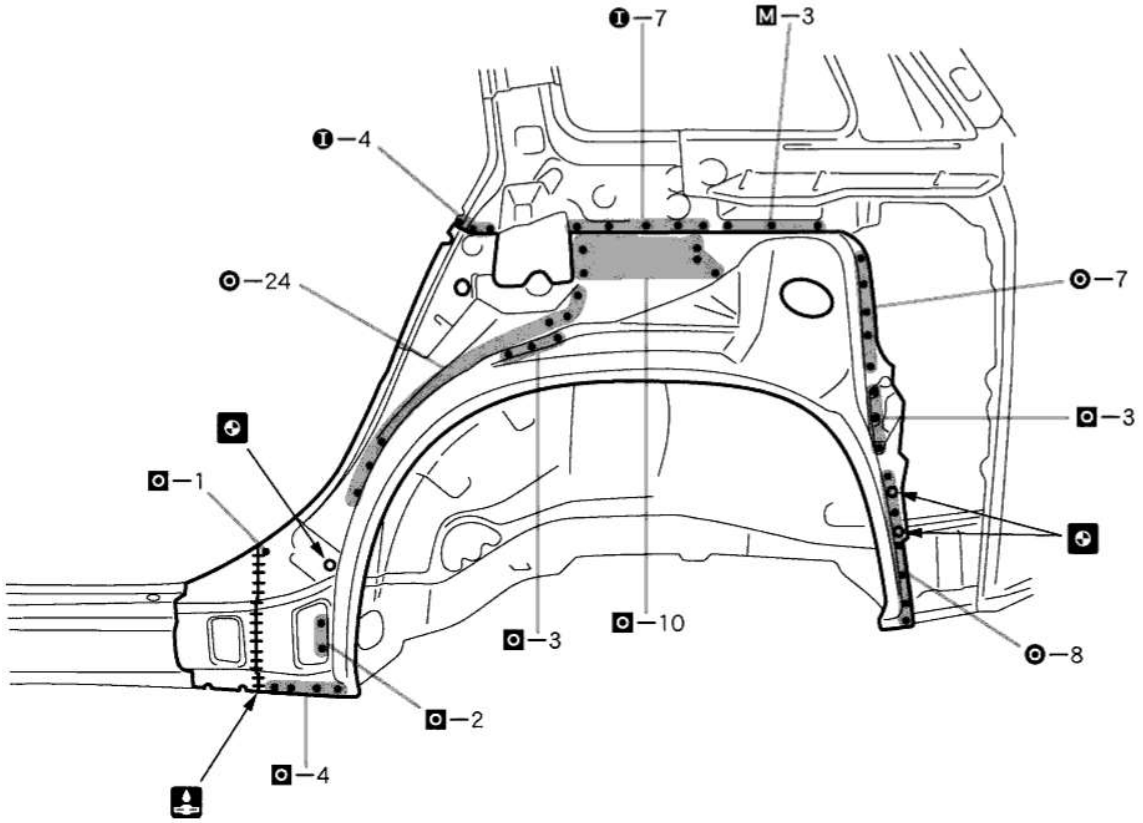
F16707

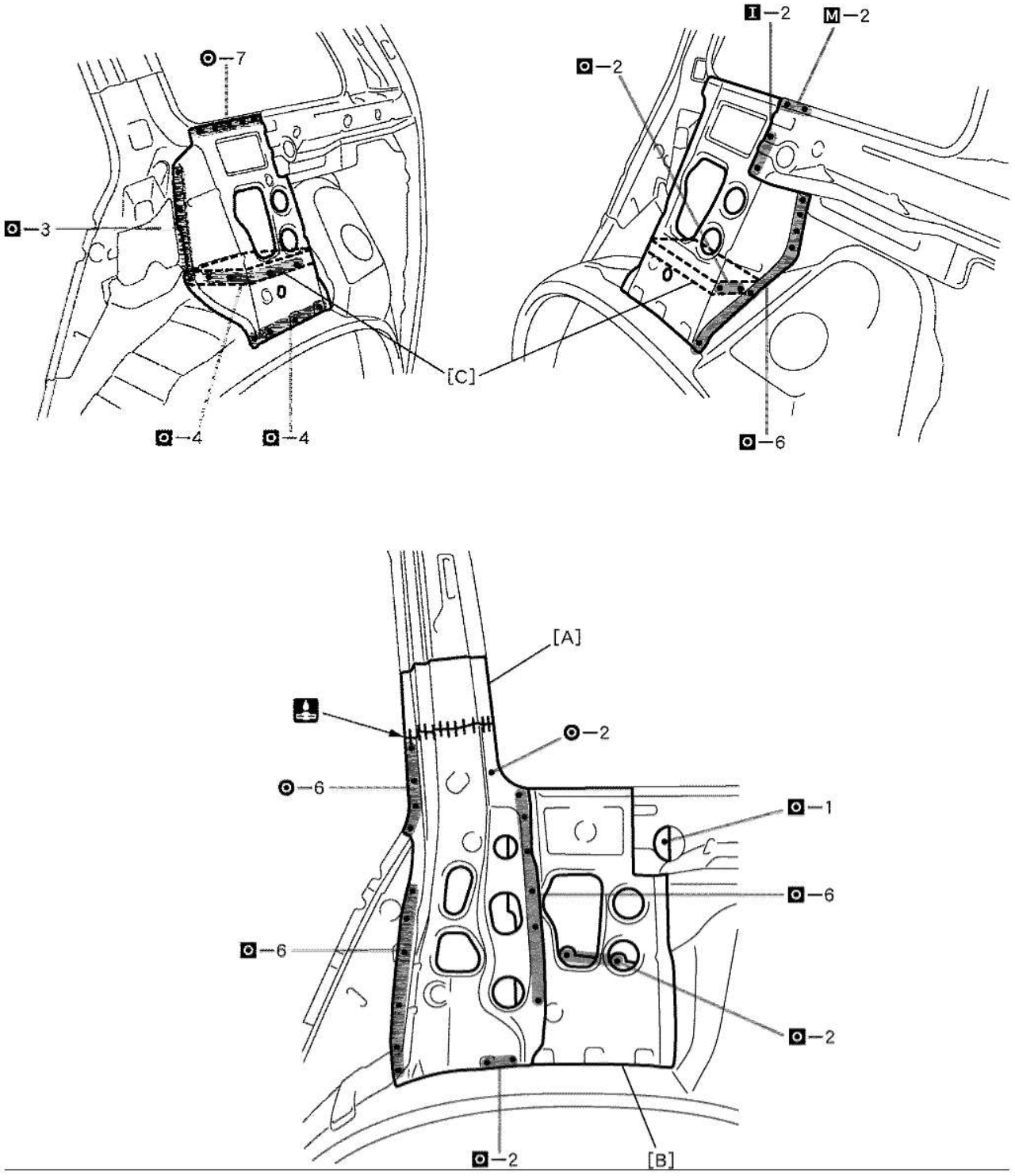
POINT
1 After removing the [A], [B] and [C], remove the quarter wheel housing outer panel.

PART NAME
[A] Roof Side Outer Reinforcement [B] Roof Side Outer Panel
[C] Quarter Wheel Housing Center Gusset
100 mm (3.94 in.) 150 mm (5.91 in.)

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

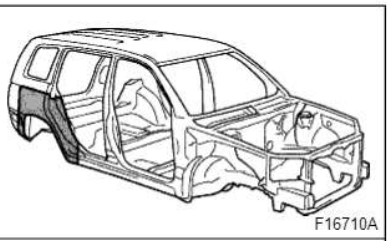




PART NAME

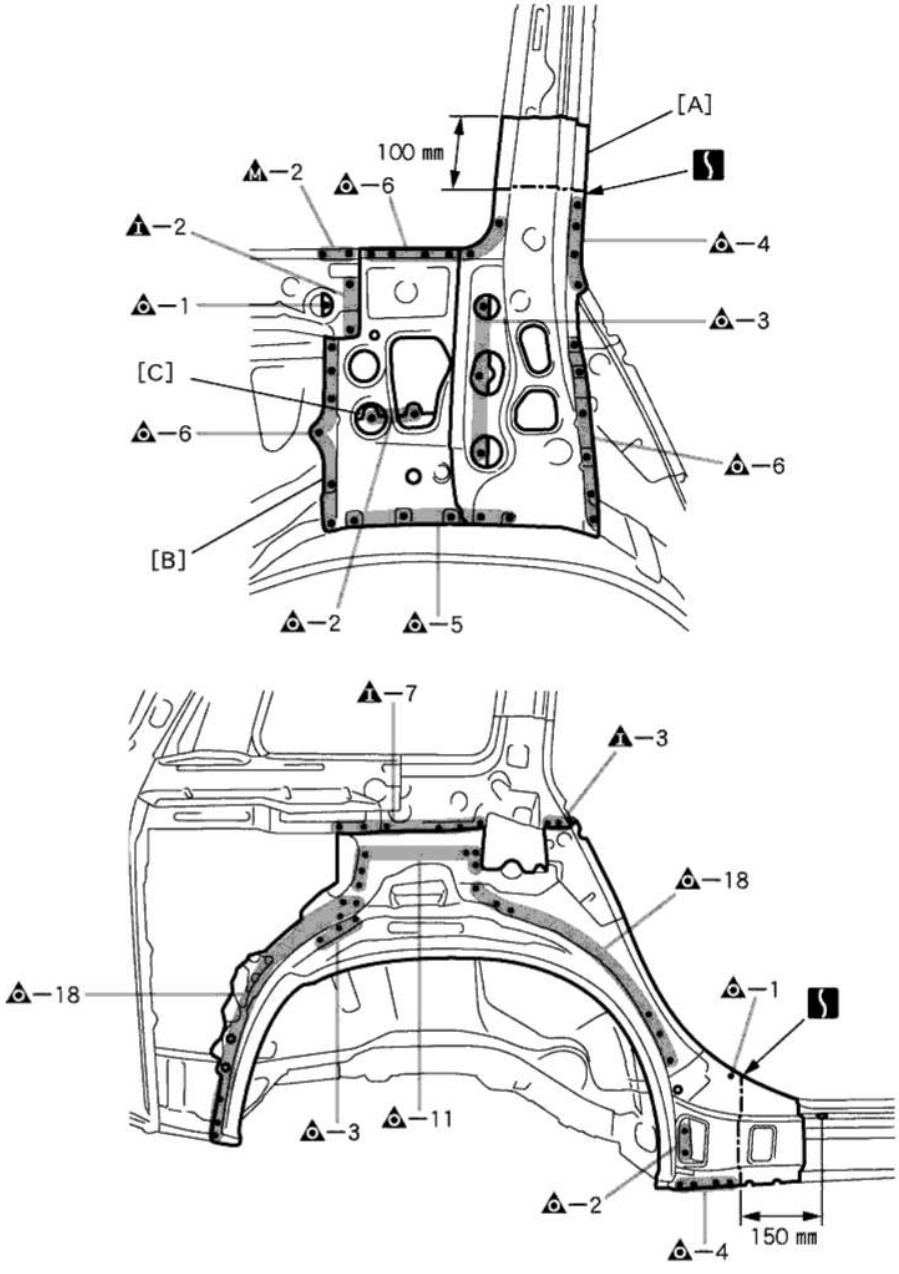
[A] Roof Side Outer Reinforcement [B] Roof Side Outer Panel
[C] Quarter Wheel Housing Center Gusset

QUARTER WHEEL HOUSING OUTER PANEL (ASSY): RH


F16710A

REPLACEMENT
With the quarter panel removed.

REMOVAL



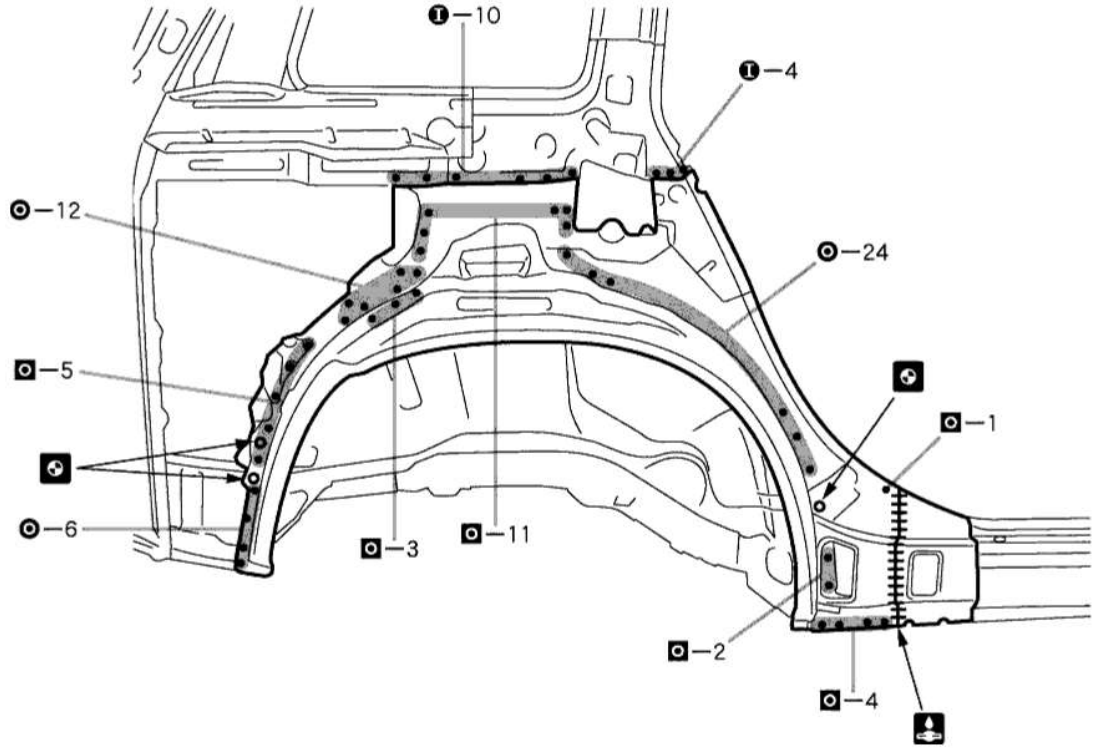
F16710

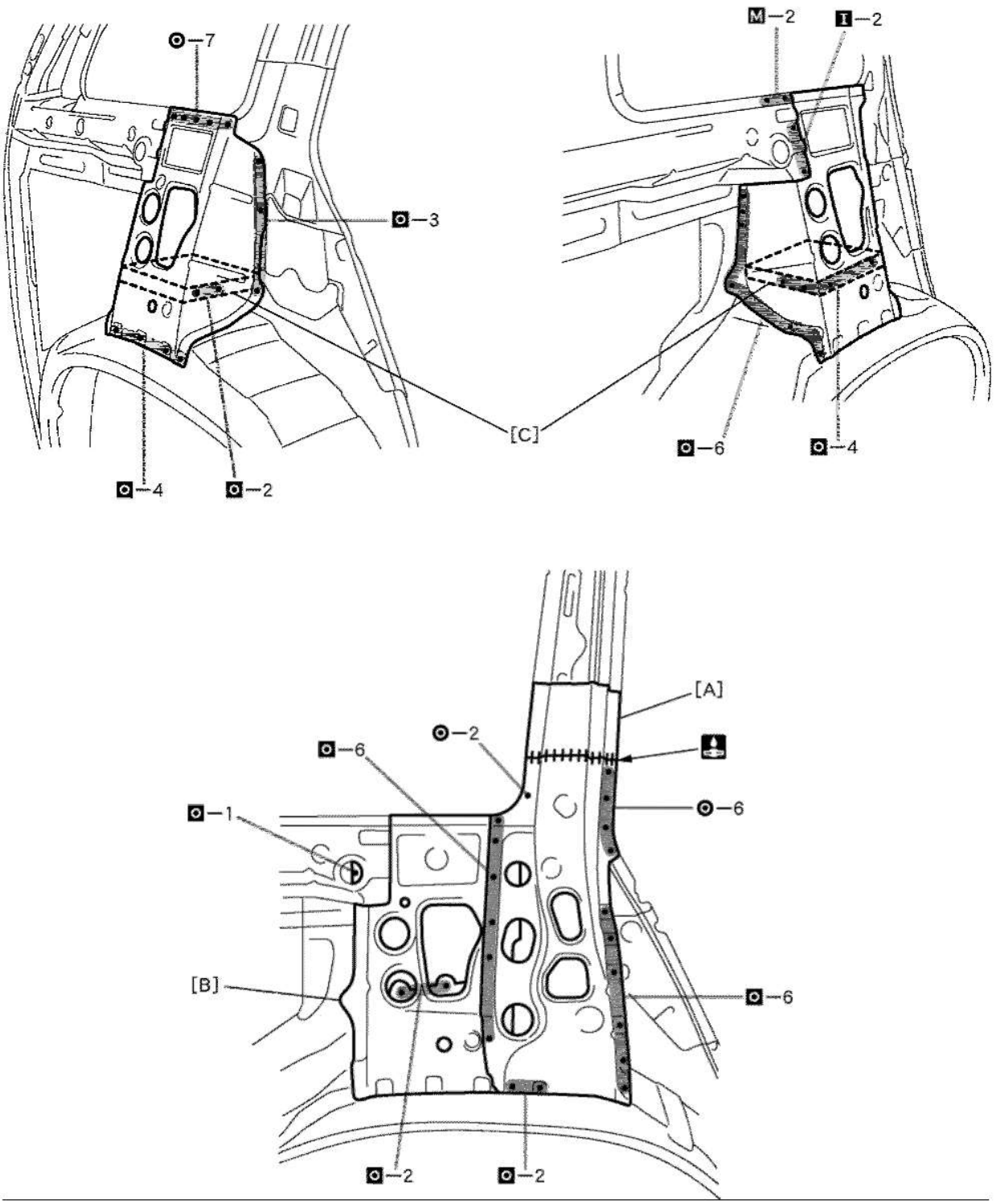
POINT
1 After removing the [A], [B] and [C], remove the quarter wheel housing outer panel.

PATE NAME
[A] Roof Side Outer Reinforcement [B] Roof Side Outer Panel
[C] Quarter Wheel Housing Center Gusset
100 mm (3.94 in.) 150 mm (5.91 in.)

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



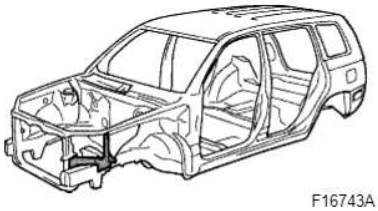


F16712

PART NAME

[A] Roof Side Reinforcement [B] Roof Side Outer Panel
[C] Quarter Wheel Housing Center Gusset

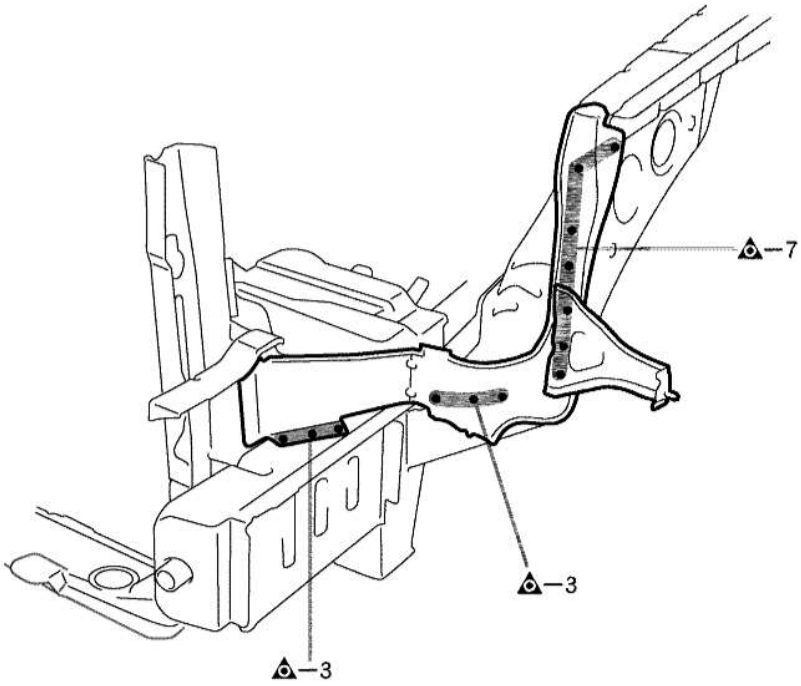
RADIATOR SIDE SUPPORT (ASSY)

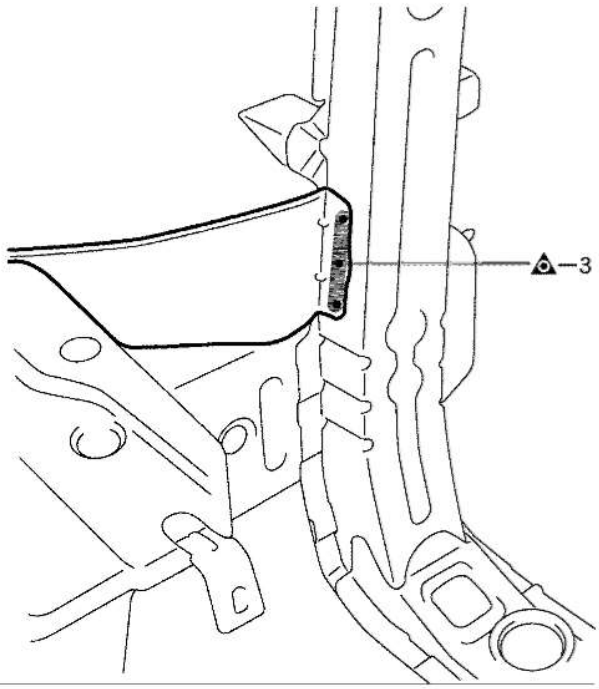

F16743A

REPLACEMENT

With the radiator upper support removed.

REMOVAL

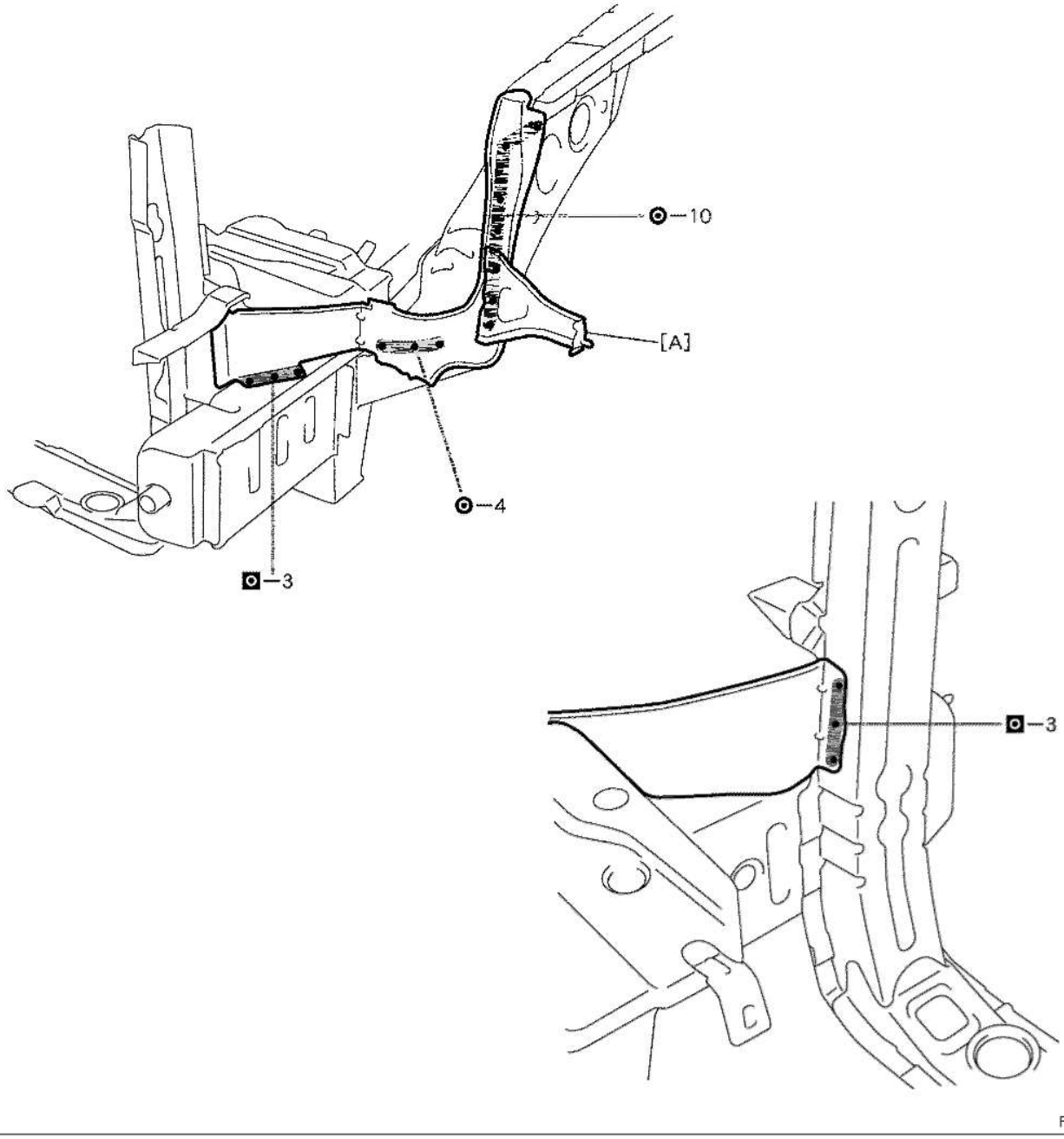




F16743

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



POINT

1 Inspect the fitting of the front fender and hood, etc., before welding, since this affects the appearance of the finish.

PART NAME

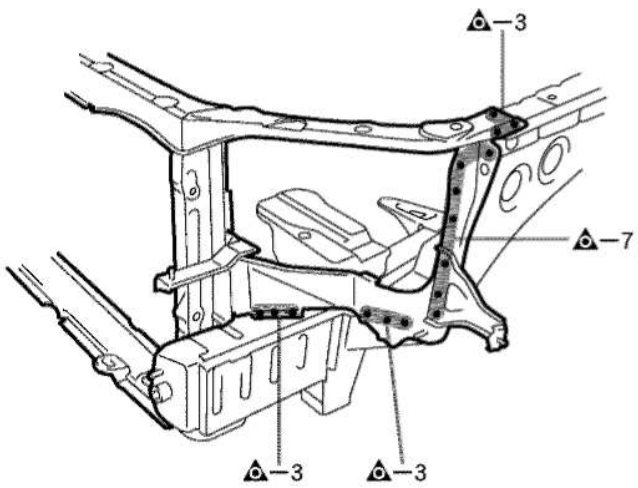
[A] Radiator Support To Front Fender Bracket

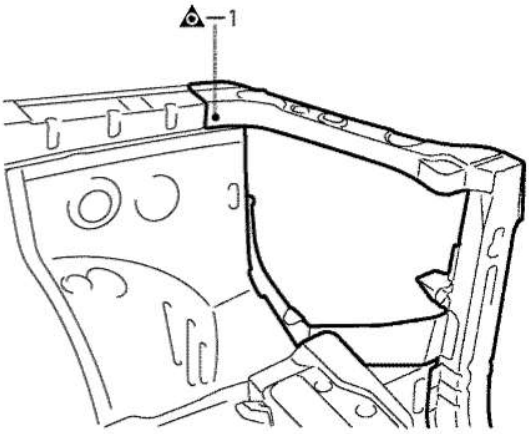
RADIATOR SUPPORT (ASSY)

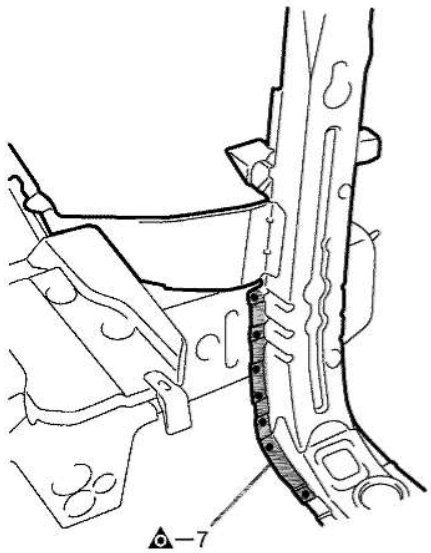

F16747A

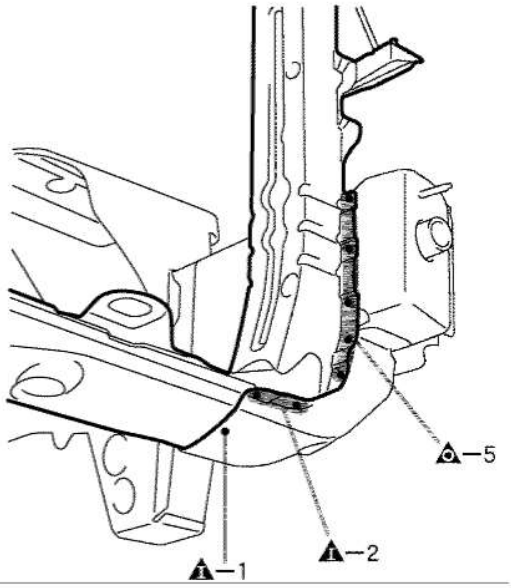
REPLACEMENT

REMOVAL





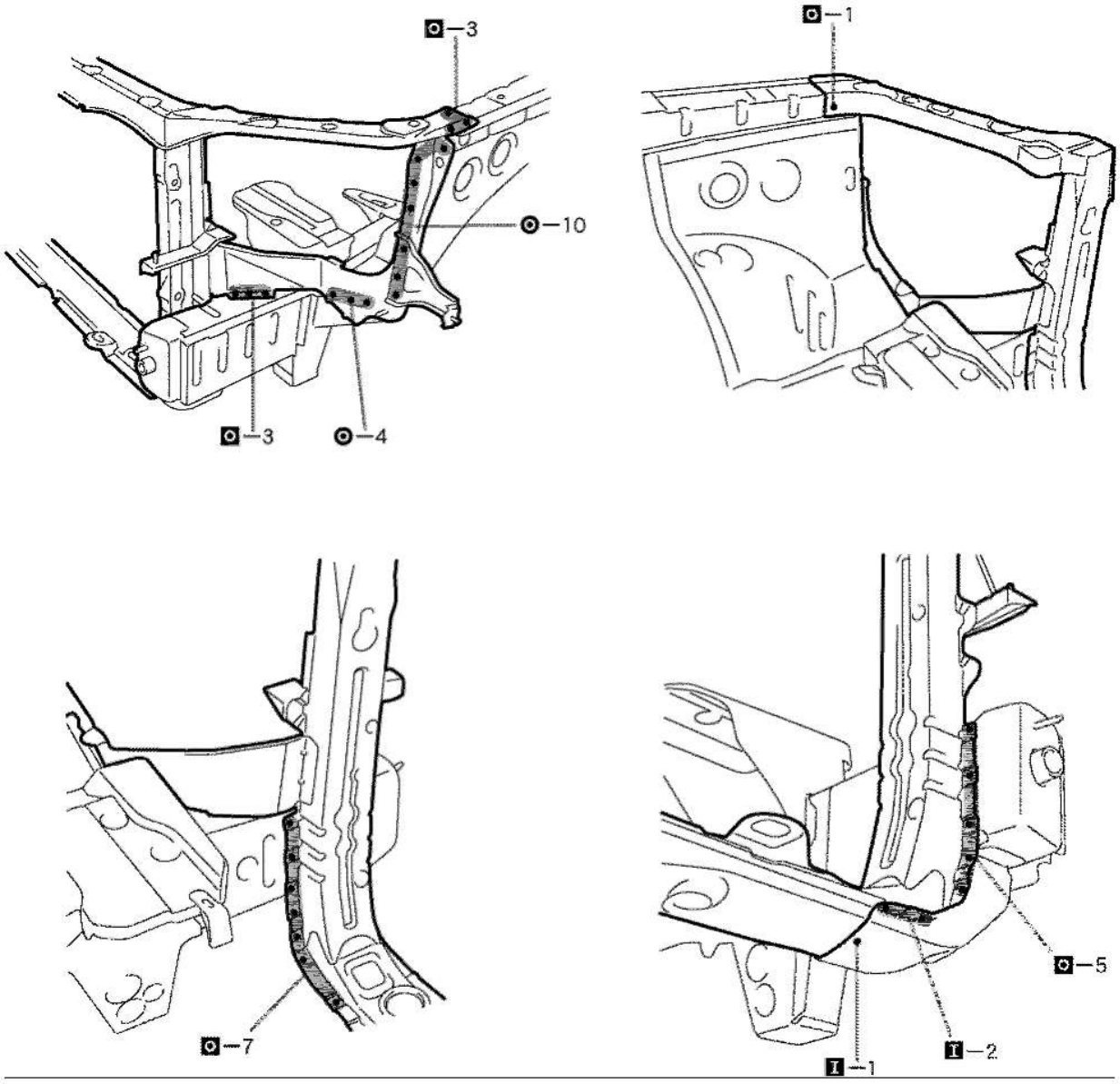




F16747

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

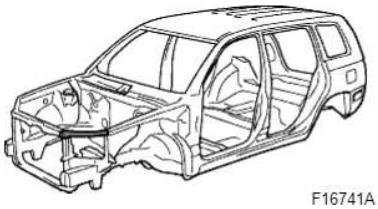


F16748

POINT

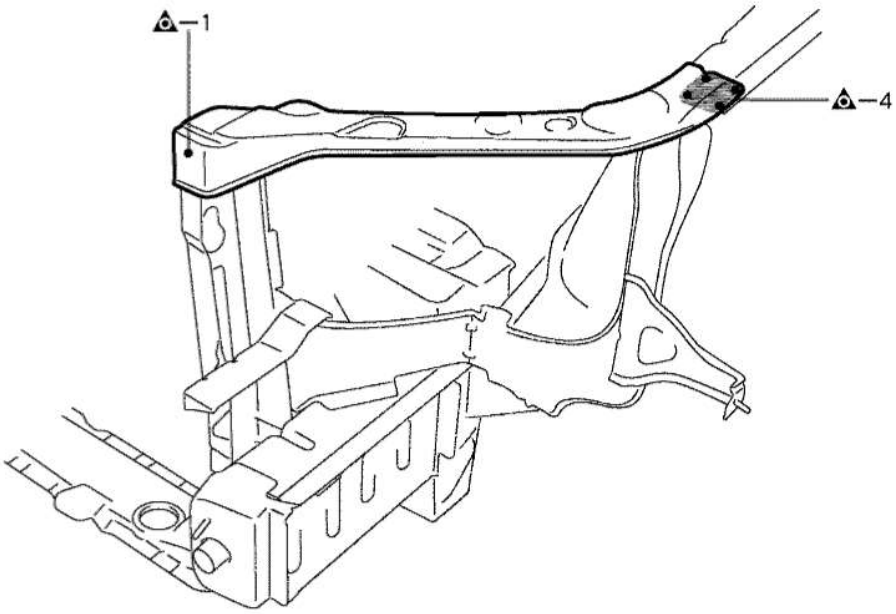
1 Inspect the fitting of the headlight, front fender and hood, etc., before welding, since this affects the appearance of the finish.

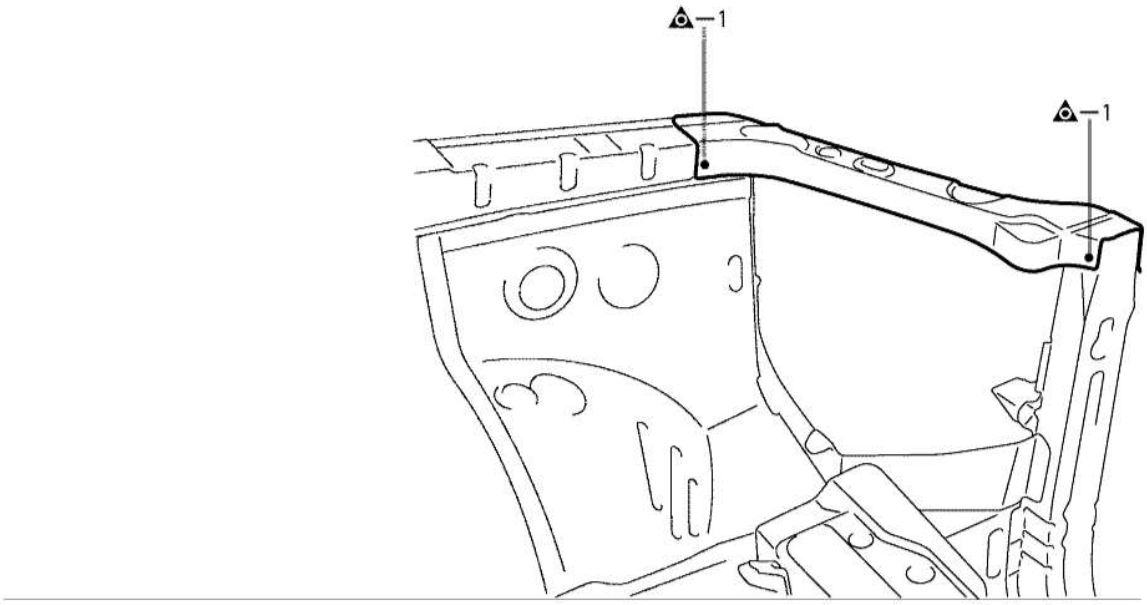
RADIATOR UPPER SUPPORT (ASSY)


F16741A

REPLACEMENT

REMOVAL

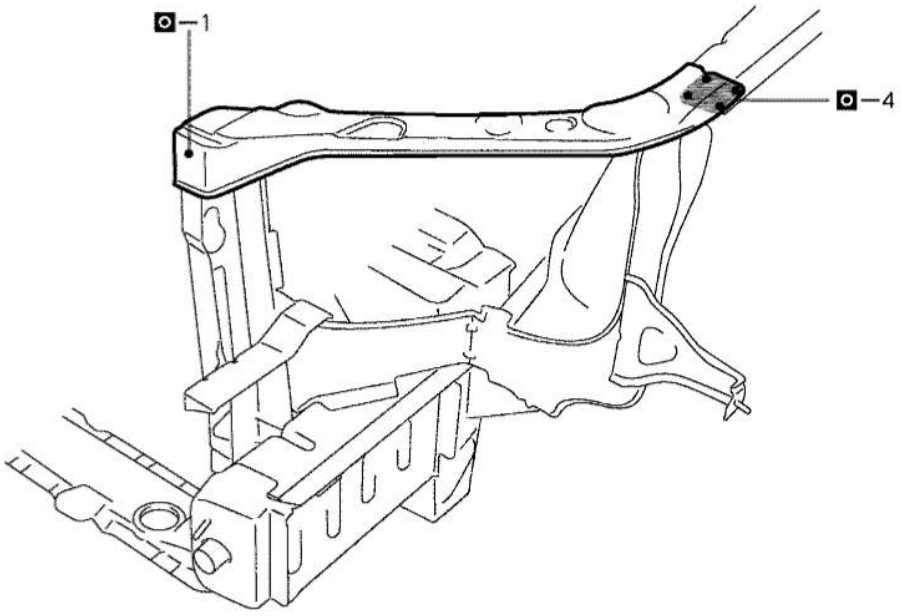


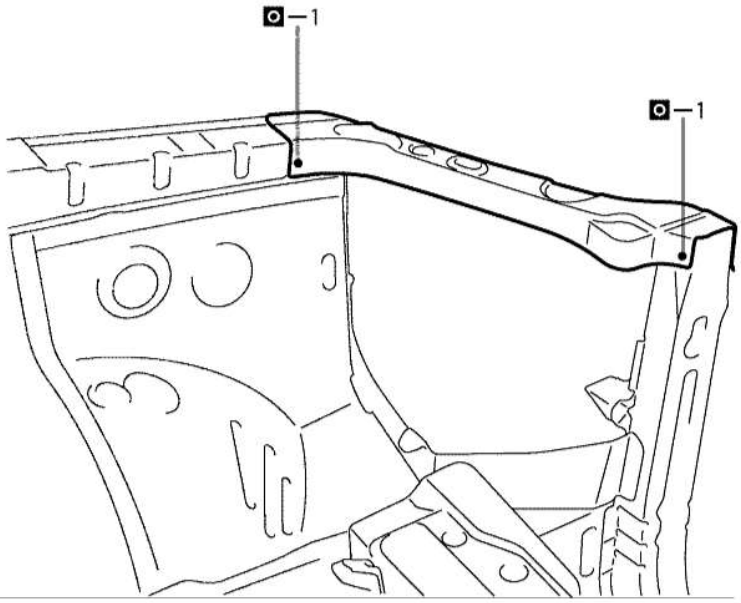


F16741

INSTALLATION

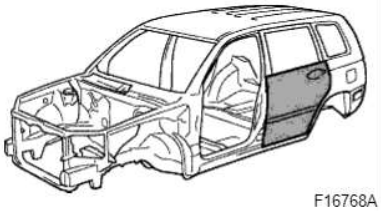
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.





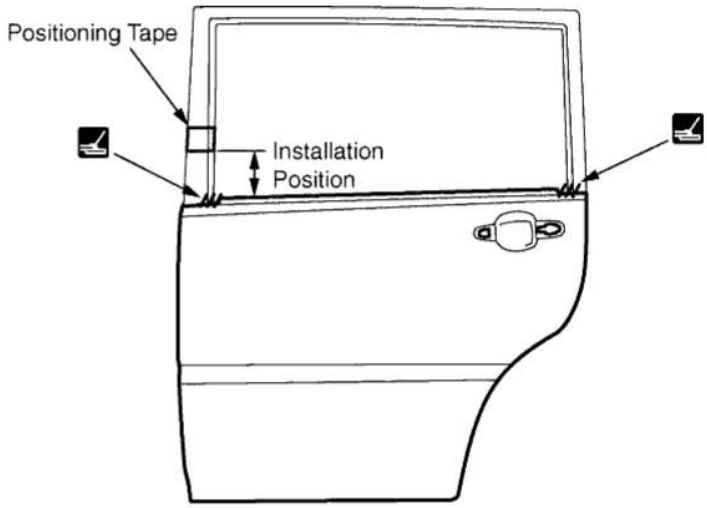
F16742

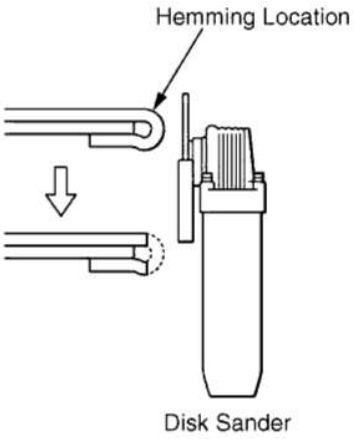
REAR DOOR OUTER PANEL (ASSY)


F16768A

REPLACEMENT

REMOVAL





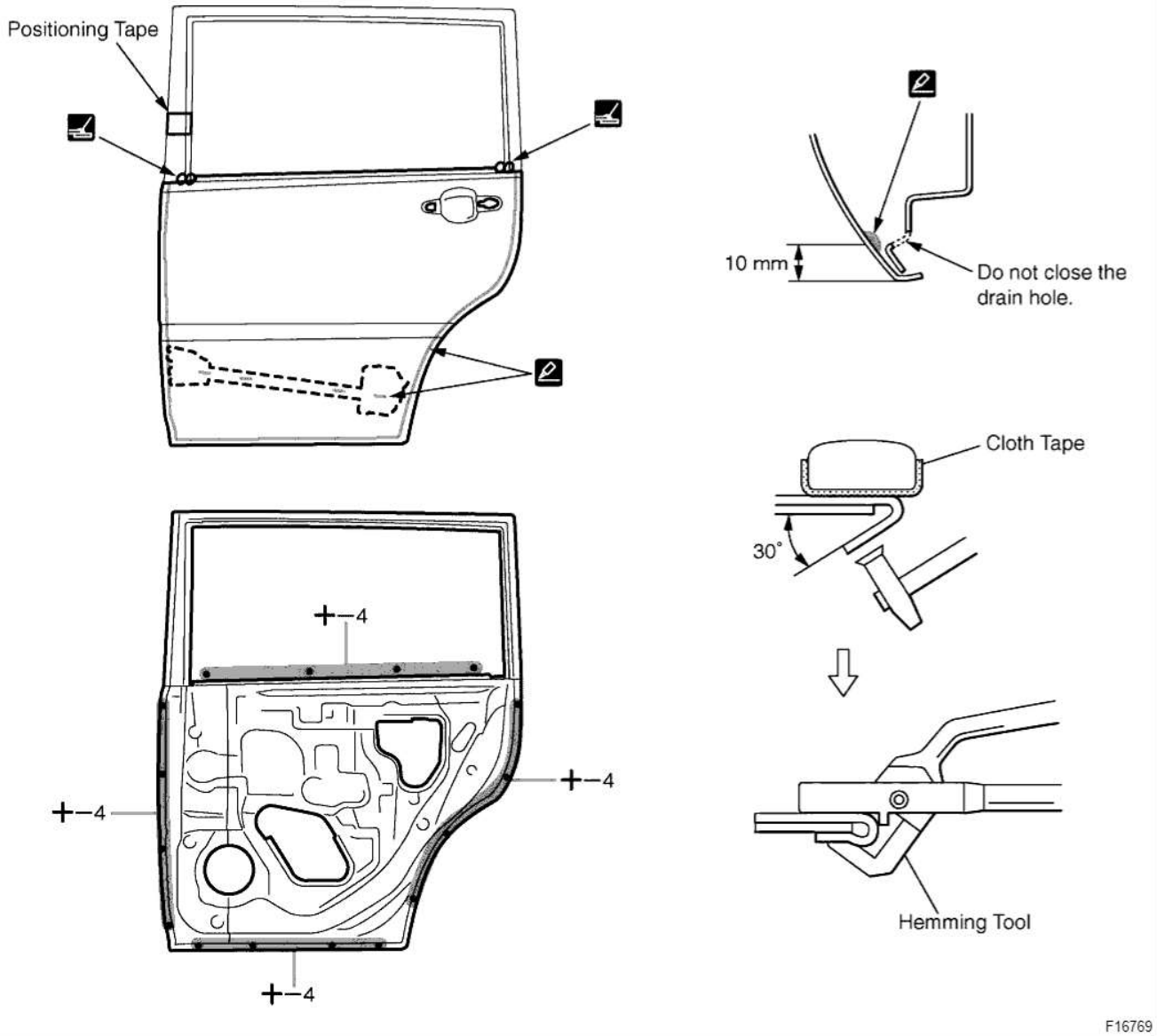
F16768

POINT

1 Before removing the outer panel, make the installation position with a tape.
2 Before removing the outer panel, establish its exact position in relation to the window frame using a reference marker, etc.
3 After grinding off the hemming location, remove the outer panel.

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

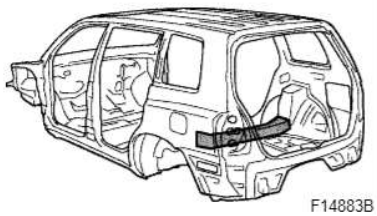


POINT

1 Before temporarily installing the new parts, apply body sealer to the reinforcement, side impact protection beam and back side of the new parts.
HINT:
1) Apply sealer evenly about 10 mm (0.39 in.) from the flange and 3 mm (0.12 in.) in diameter to the outer panel and apply just enough sealer for the reinforcement and side impact protection beam to make contact.

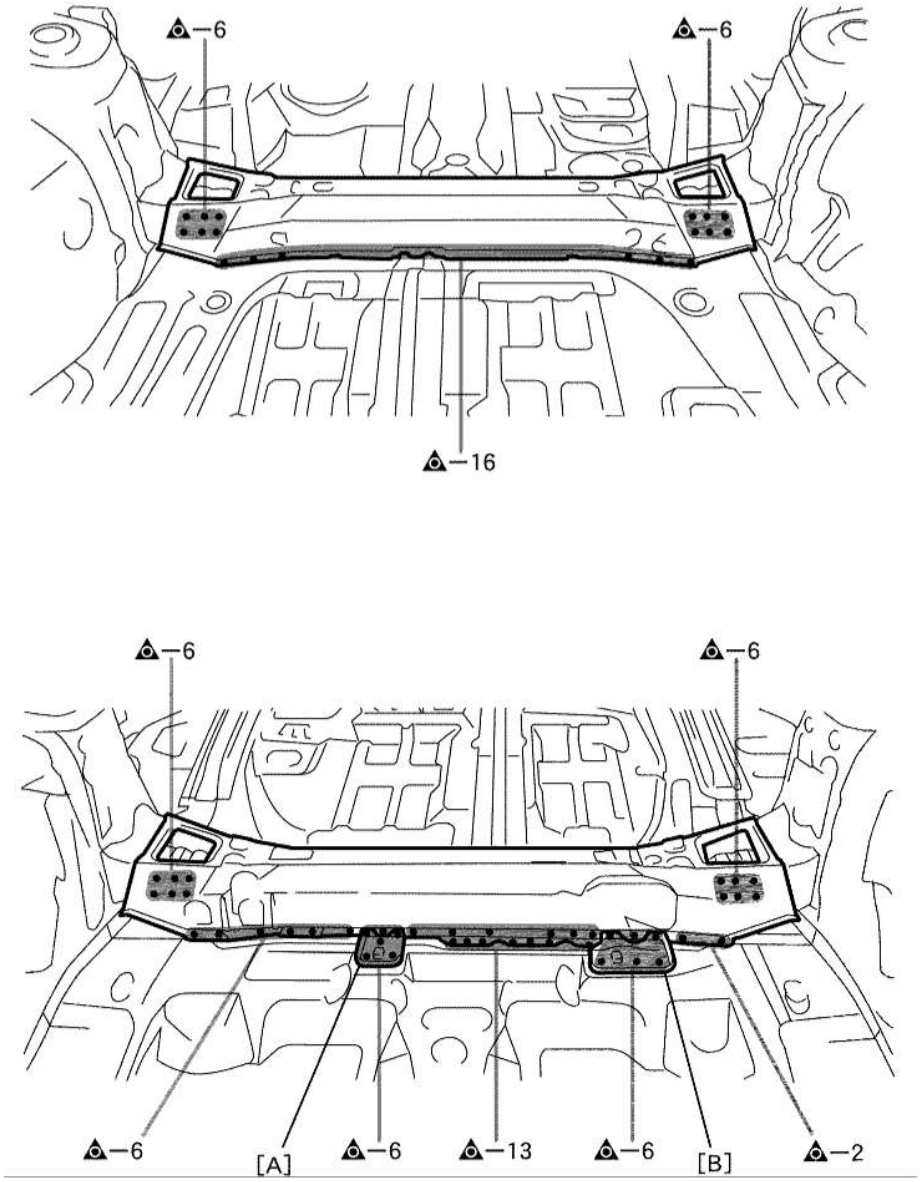
2 Bend the flange hem about 30° with a hammer and dolly, then fasten tightly with a hemming tool.
HINT:
1) Perform hemming in three steps, being careful not to warp the panel.
2) If a hemming tool cannot be used, hem with a hammer and dolly.

REAR FLOOR CENTER CROSSMEMBER (ASSY)


F14883B

REPLACEMENT

REMOVAL



F14883

POINT

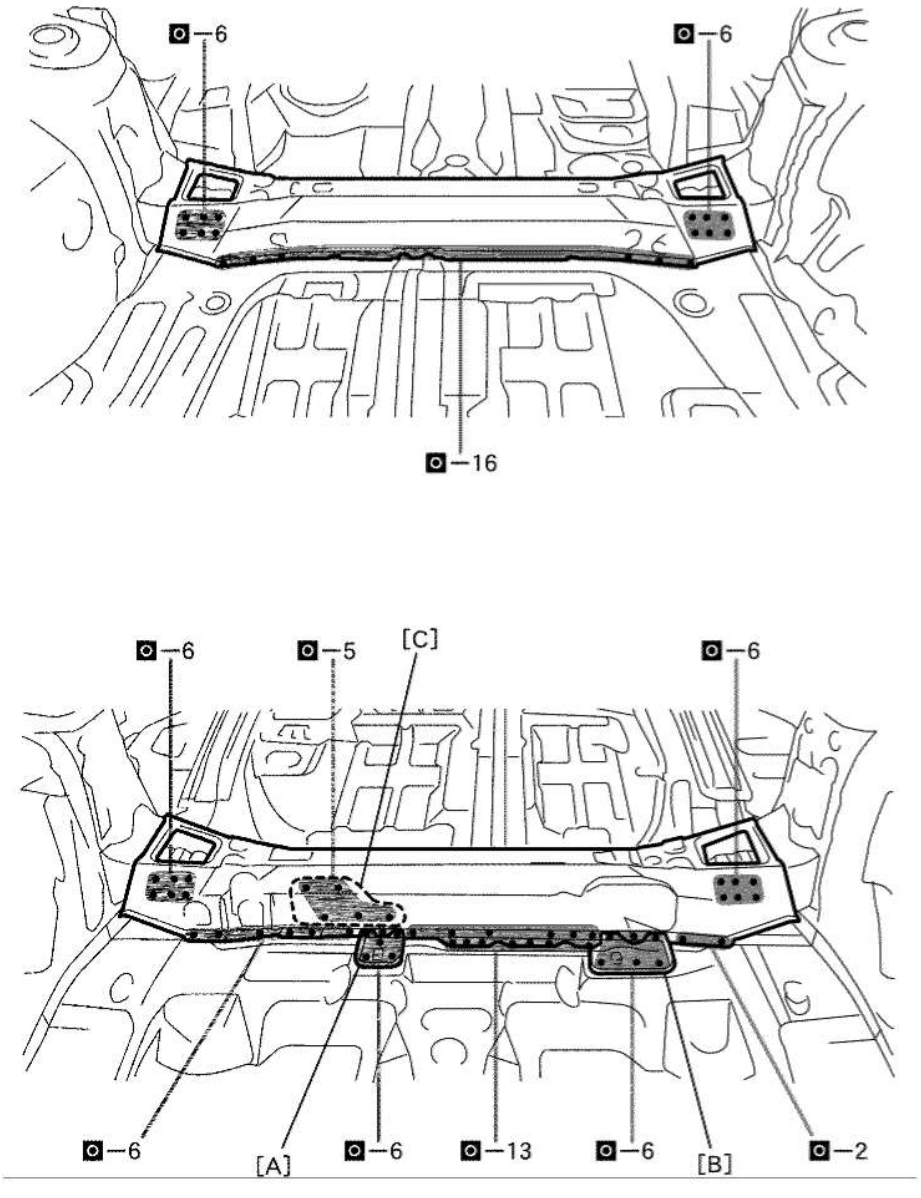
1 Remove the [A] and [B] at the same time.

PART NAME

[A] Front Floor Panel Side Plate [B] Fuel Tank Support Bracket

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

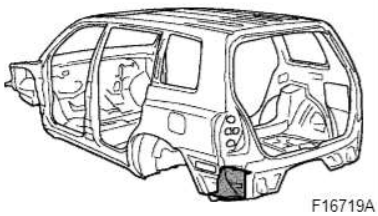


F14884

PART NAME

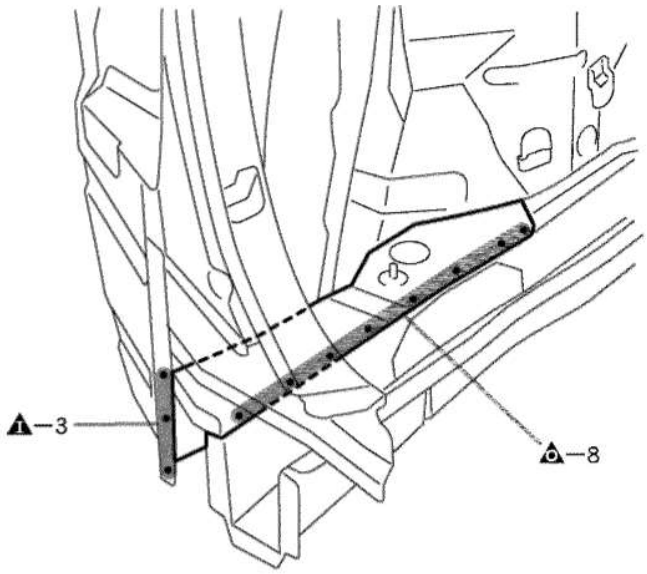
[A] Front Floor Panel Side Plate [B] Fuel Tank Support Bracket
[C] Rear Floor Crossmember No.2 Reinforcement

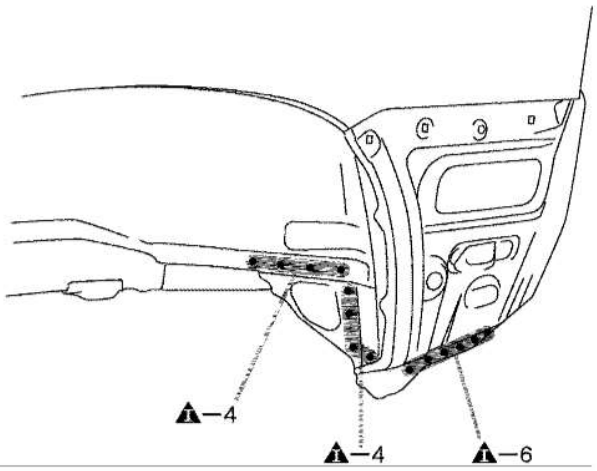
REAR FLOOR PAN TO QUARTER PANEL EXTENSION (ASSY)


F16719A

REPLACEMENT
With the rear floor pan removed.

REMOVAL

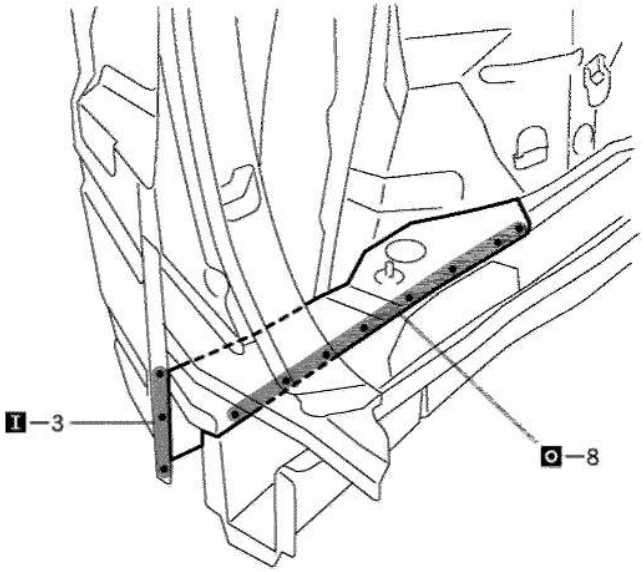


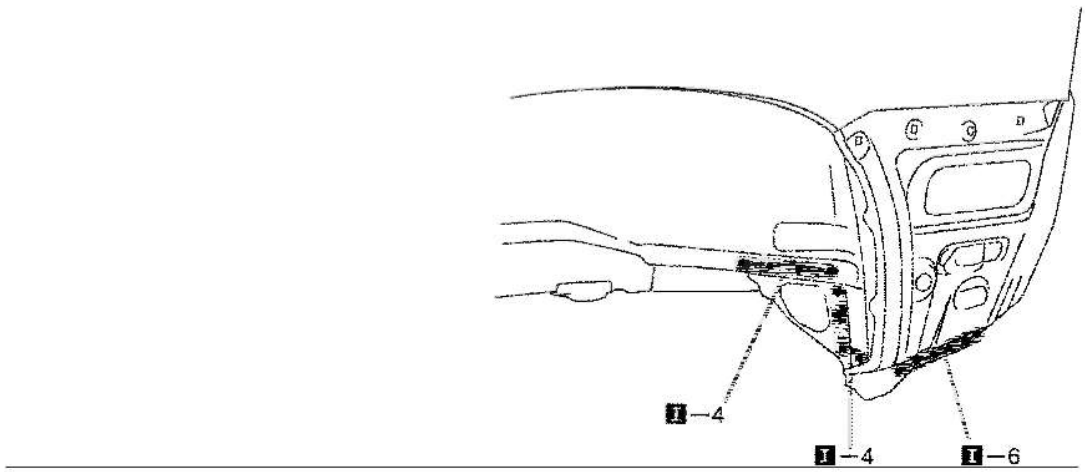


F16719

INSTALLATION

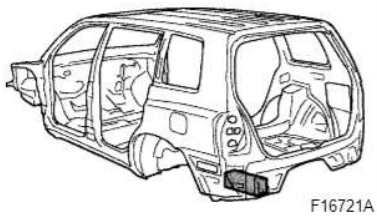
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.





F16720

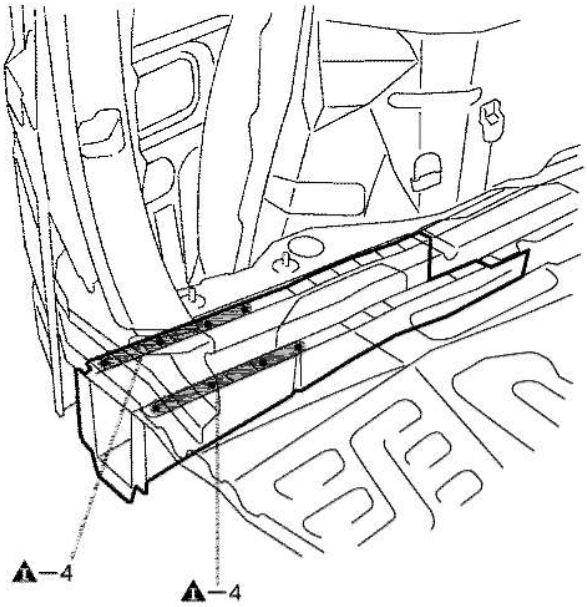
REAR FLOOR SIDE REAR MEMBER (CUT-H)

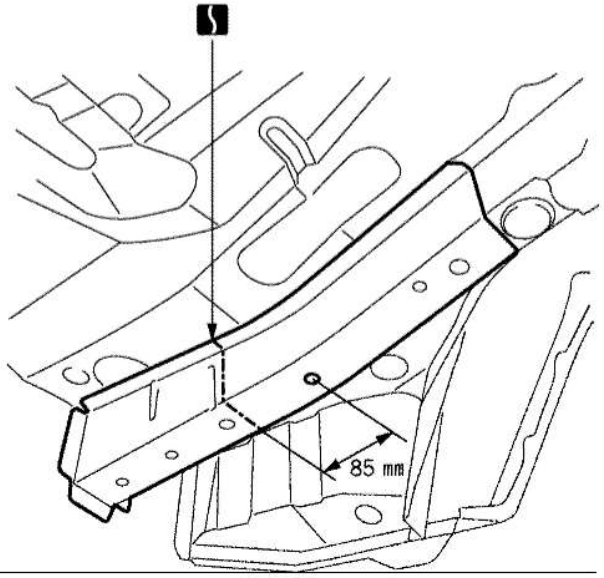

F16721A

REPLACEMENT

With the body lower back panel removed.

REMOVAL



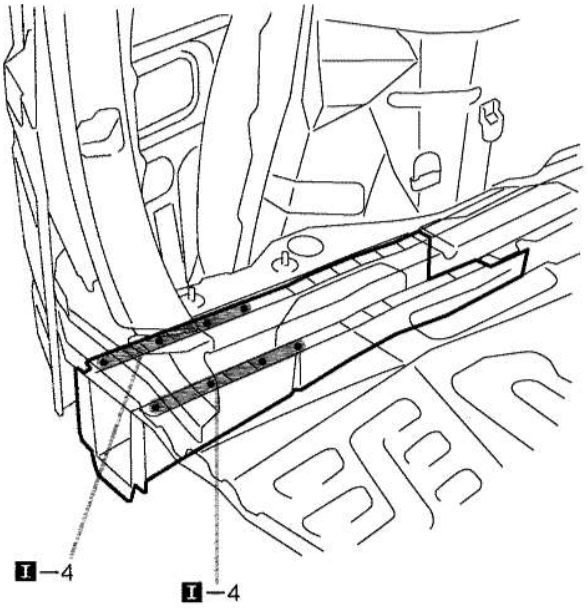


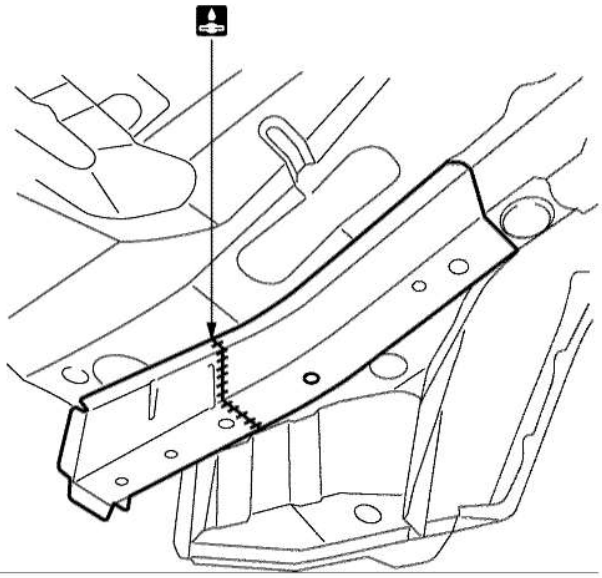
F16721

85 mm (3.35 in.)

INSTALLATION

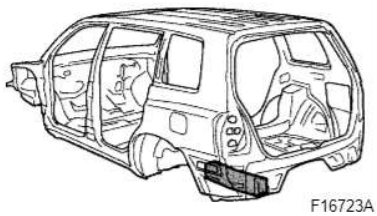
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.





F16722

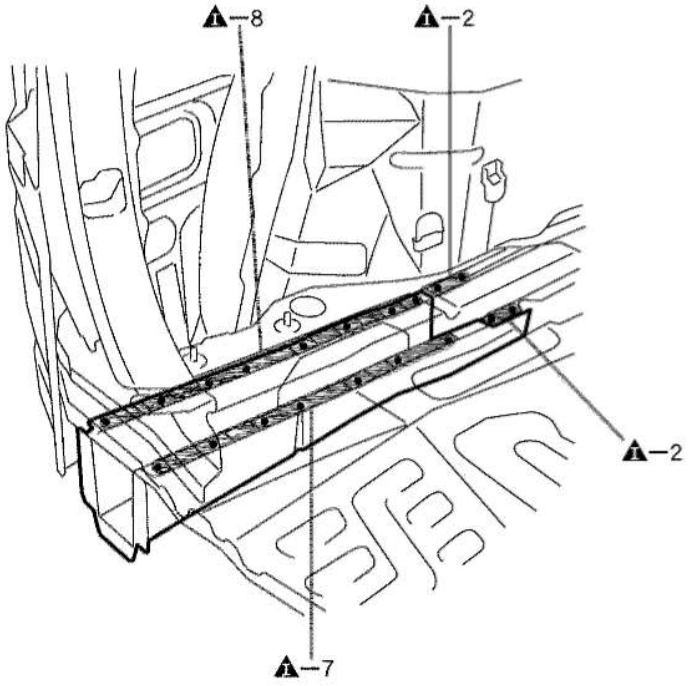
REAR FLOOR SIDE REAR MEMBER (ASSY)

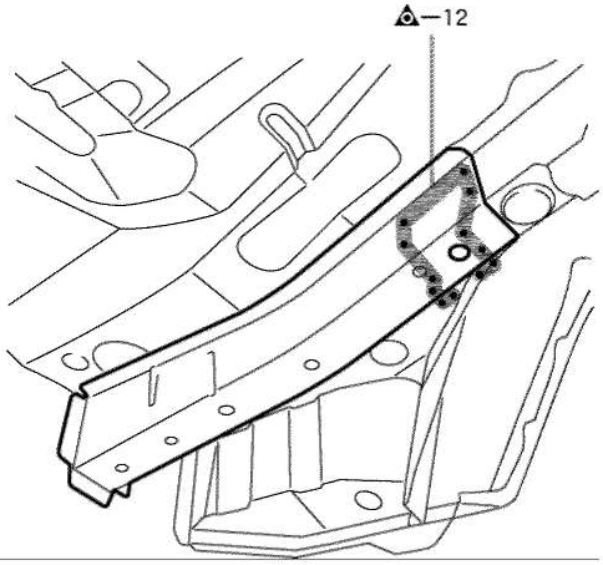

F16723A

REPLACEMENT

With the body lower back panel removed.

REMOVAL

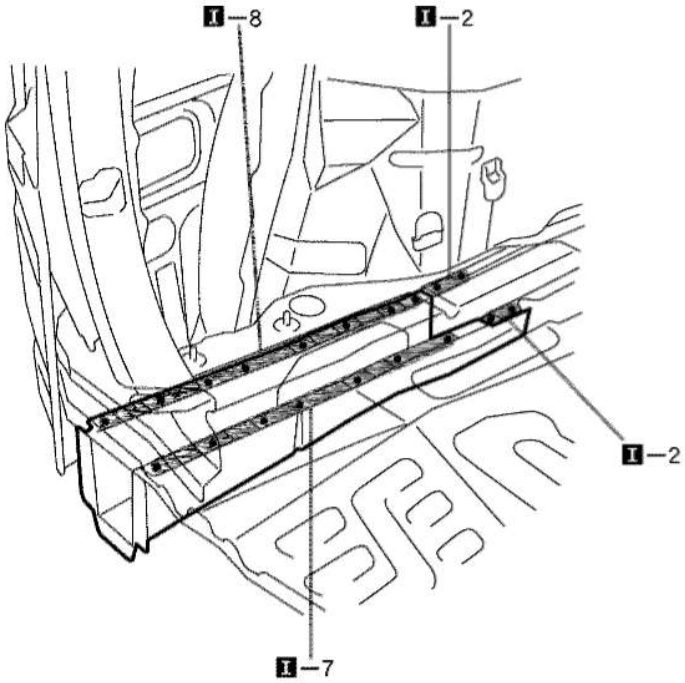


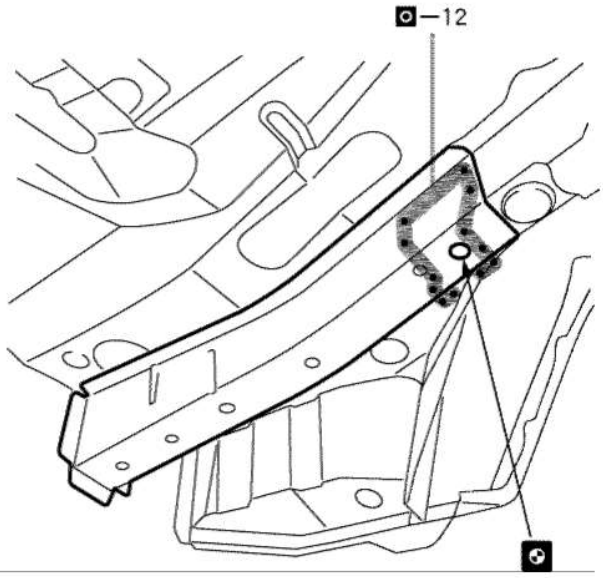


F16723

INSTALLATION

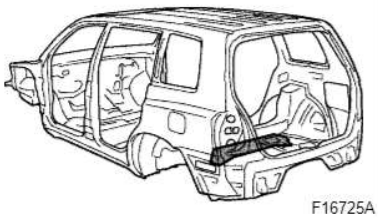
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.





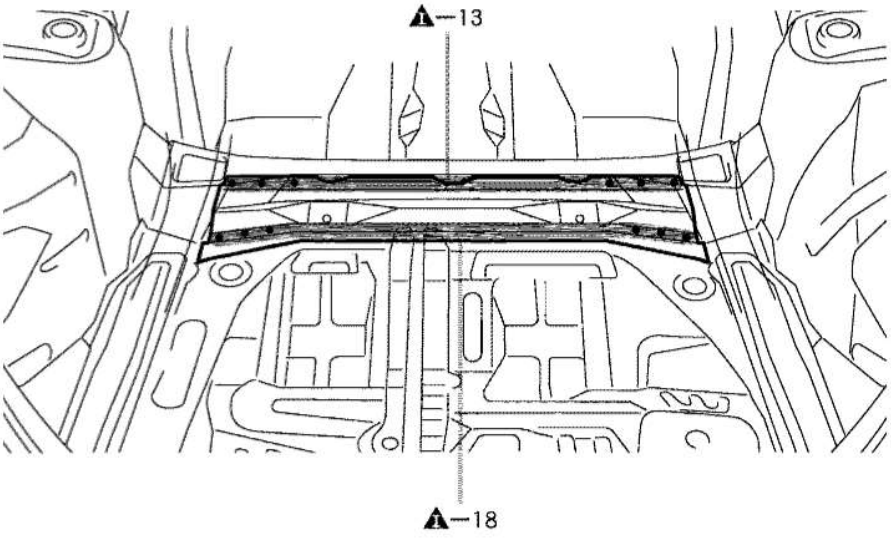
F16724

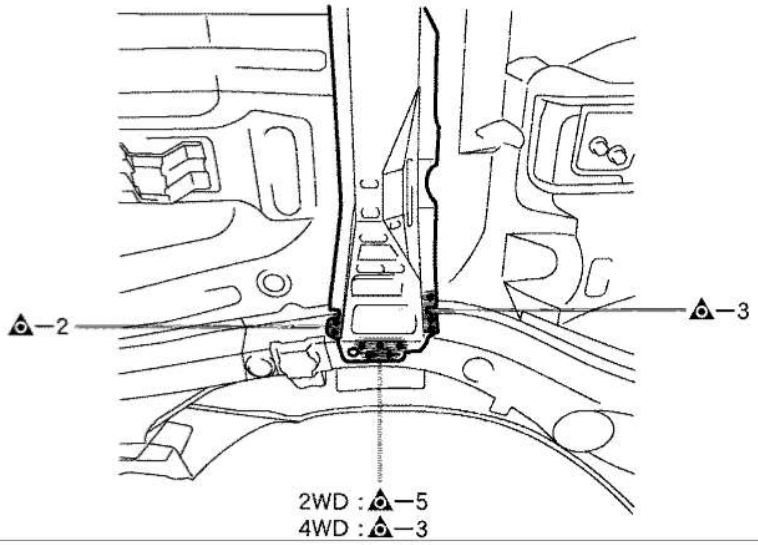
REAR FLOOR NO.2 CROSSMEMBER (ASSY)


F16725A

REPLACEMENT

REMOVAL

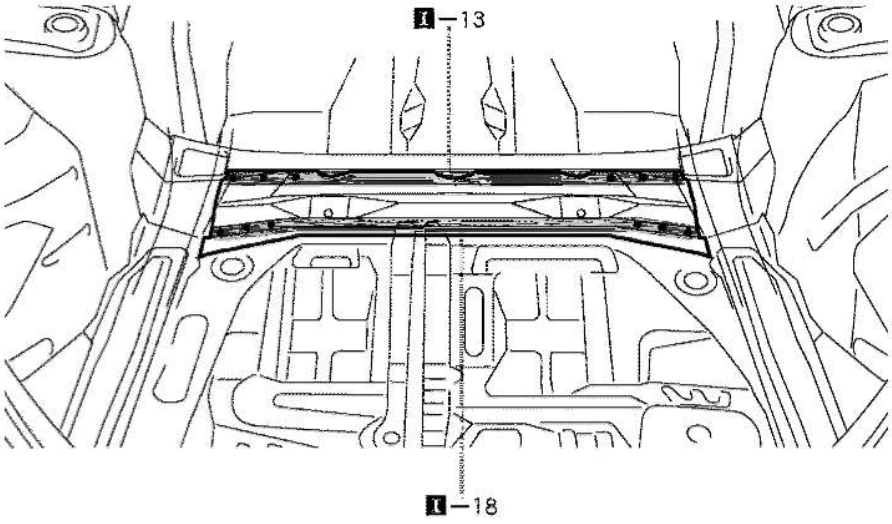


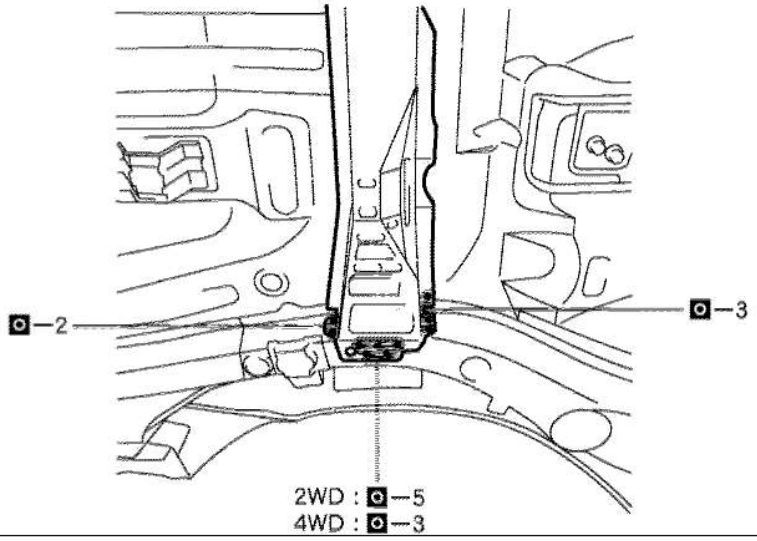


F16725

INSTALLATION

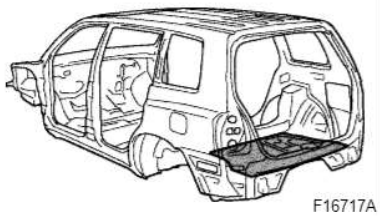
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.





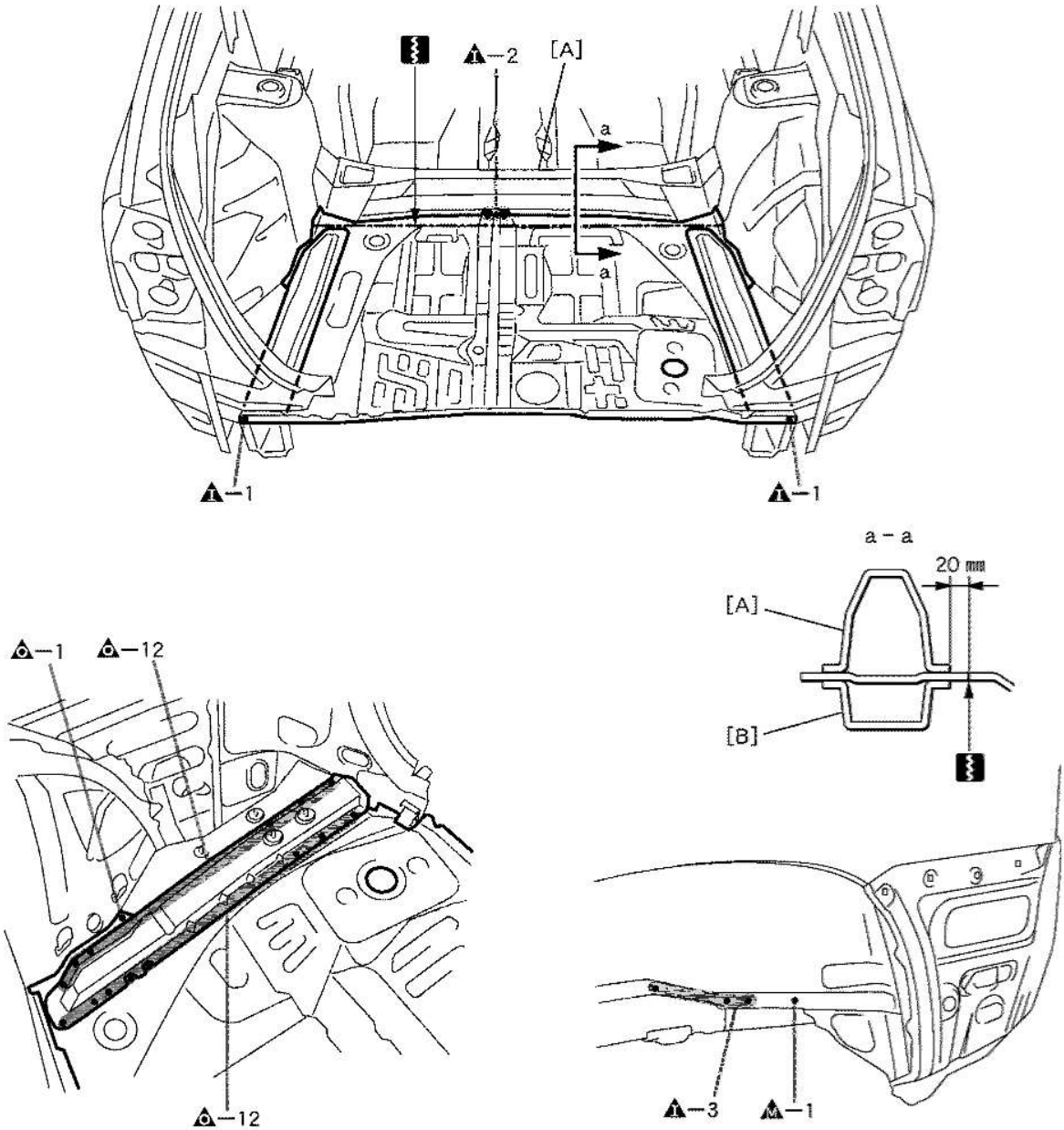
F16726

REAR FLOOR PAN (CUT)


F16717A

REPLACEMENT
With the body lower back panel removed.

REMOVAL



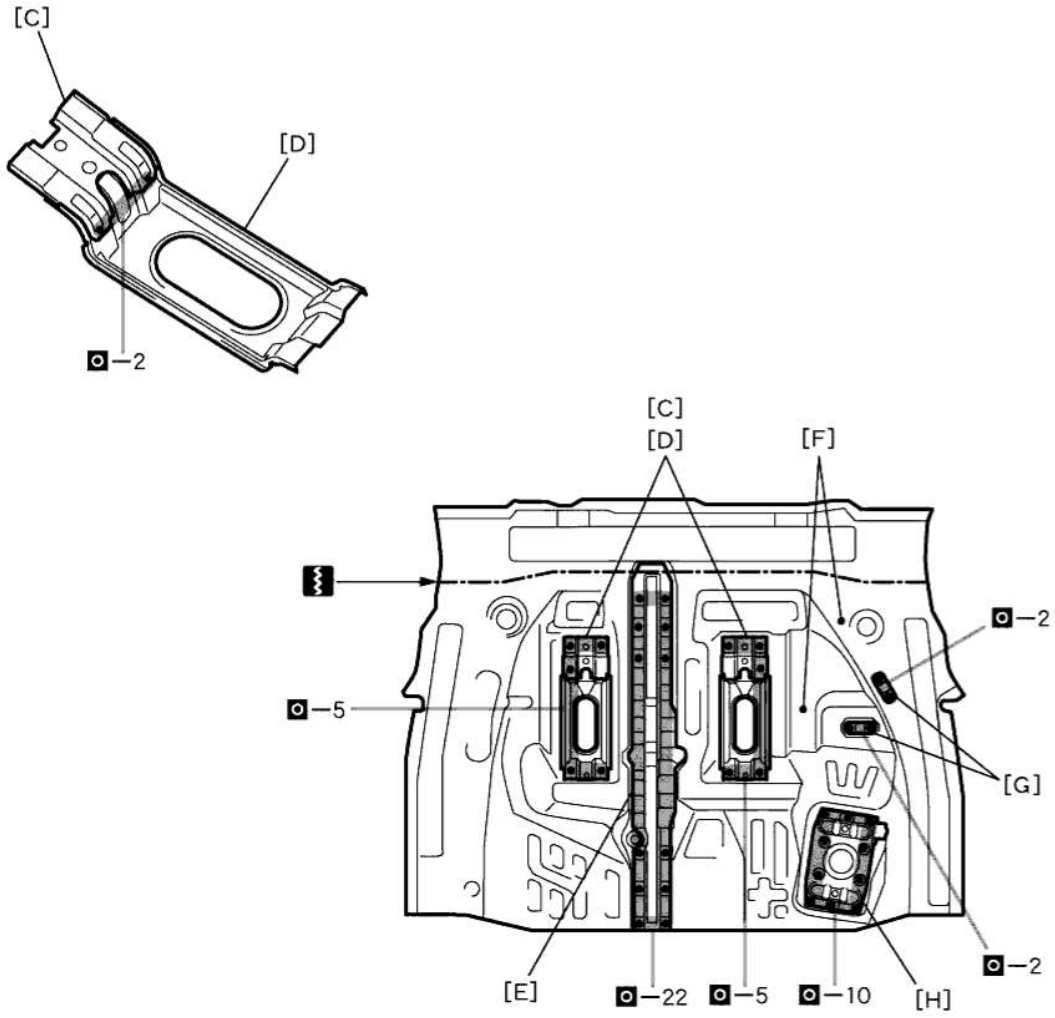
F16717

PART NAME
[A] Rear Floor Center Crossmember [B] Rear Floor No.2 Crossmember

20 mm (0.79 in.)

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



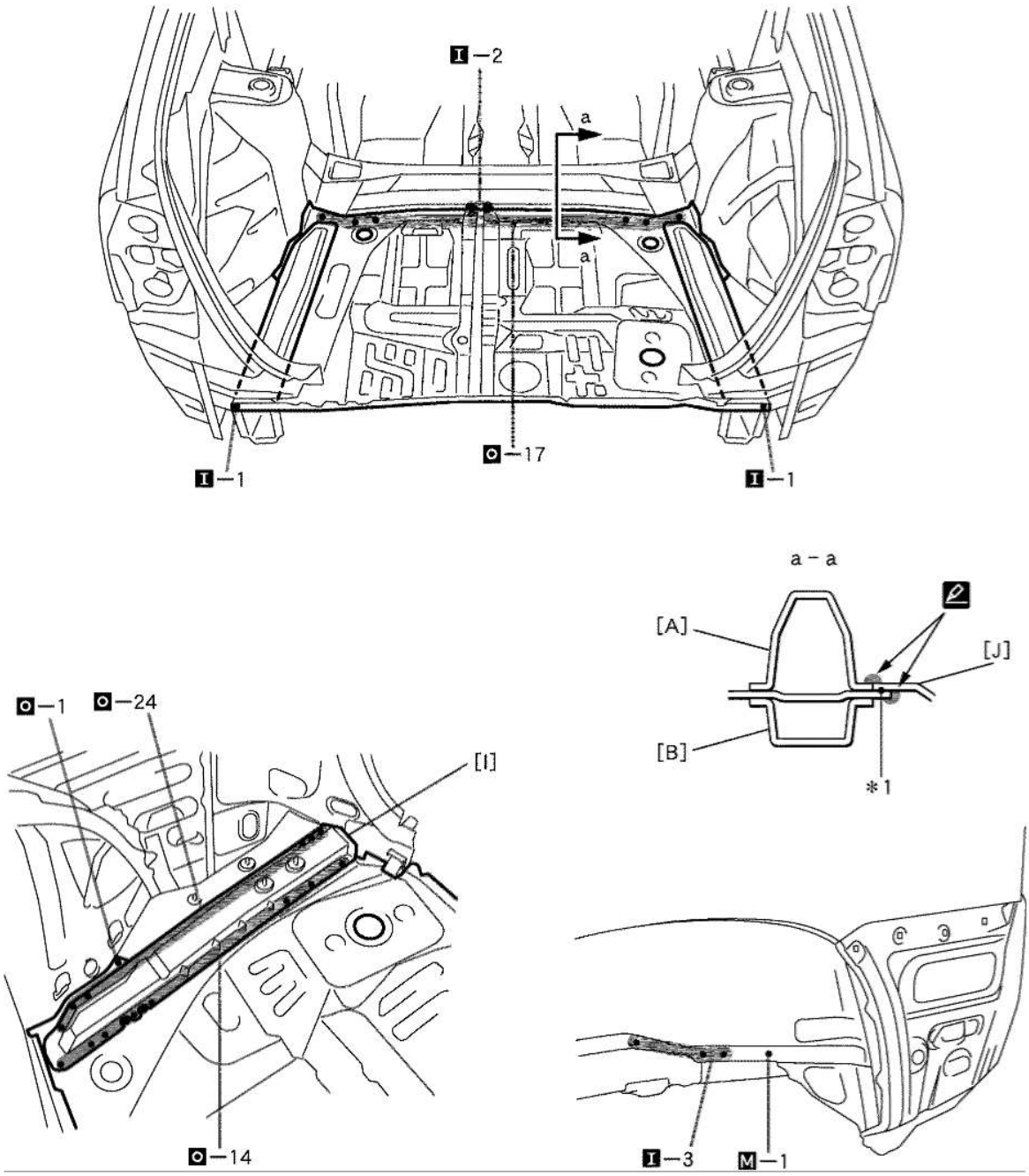
F12093

POINT

1 Cut the new part so that it overlaps the previous cut location by approximately 20 mm (0.79 in.).
2 Attach the weld bolt to center of the bearing surface.

PART NAME

[C] Rear Floor Side Panel Rear Extension [D] Rear Floor Panel Extension
[E] Rear Floor Pan No.2 Extension [F] Weld Bolt [G] Rear Floor Heat Insulator No.3 Bracket
[H] Spare Wheel Carrier Bracket



F16718

POINT

1 *1: Plug weld the overlapping portion of the [J].
HINT:
1) Be sure the portion to be welded are align and not loose.

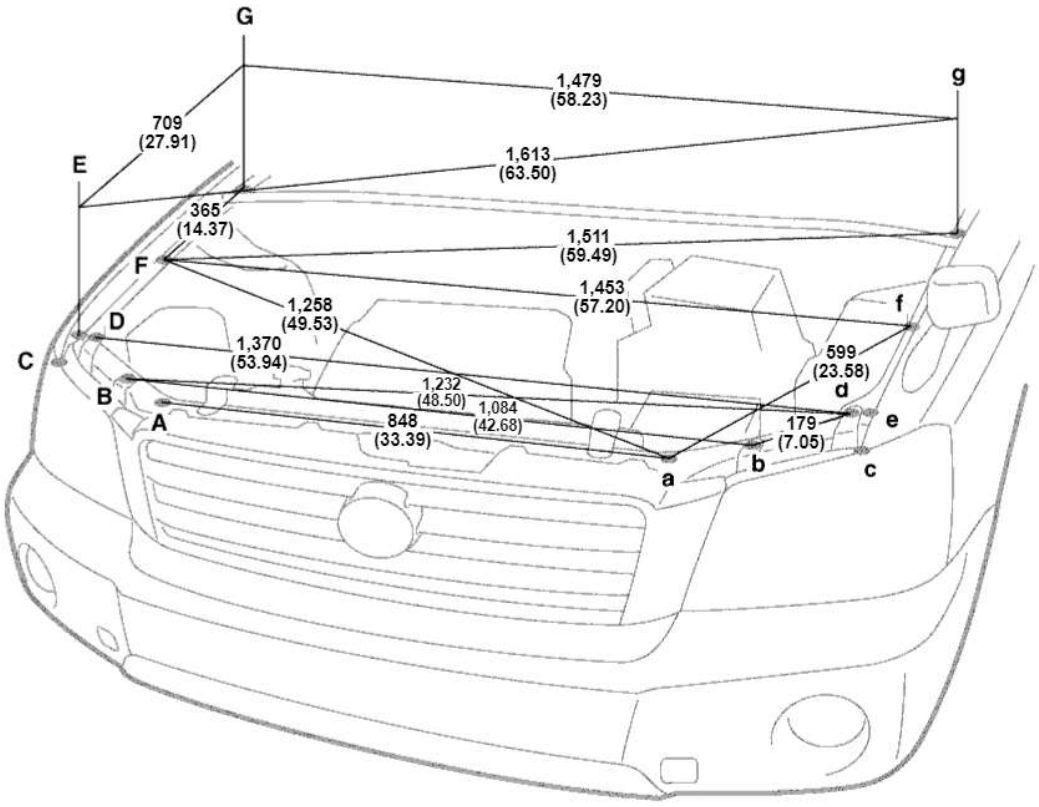
2 Coat the overlapping opening portion from the both sides with body sealer.

PART NAME

[A] Rear Floor Center Crossmember [B] Rear Floor No.2 Crossmember
[I] 3rd Seat Floor Side Panel [J] New Part

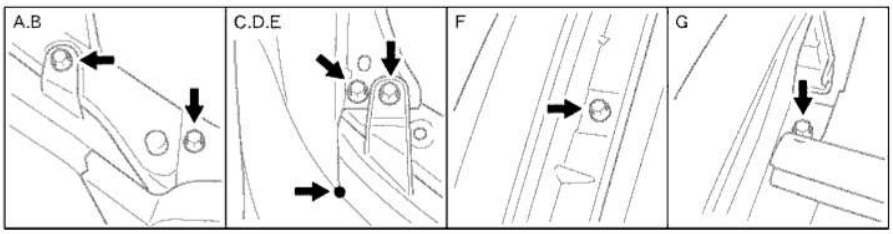
REFERENCE VALUE
ENGINE COMPARTMENT

(Three-Dimensional Distance)



Vehicle Dimensions

A-e or a-E	A-E or a-e	C-c	D-g or d-G	D-G or d-g
1,145 (45.08)	332 (13.07)	1,435 (56.50)	1,590 (62.60)	711 (27.99)



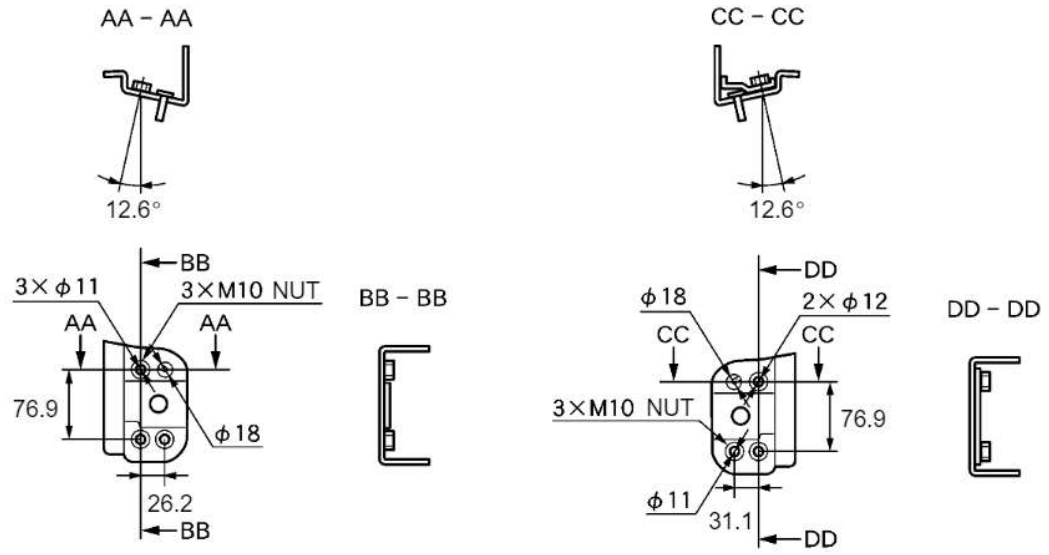
mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Radiator upper support installation bolt	—	E, e	Front fender installation bolt	—
B, b	Headlight installation screw	—	F, f	Front fender installation bolt	—
C, c	Front end of front fender	—	G, g	Front fender installation bolt	—
D, d	Headlight installation screw	—	—	—	—

UNDER BODY

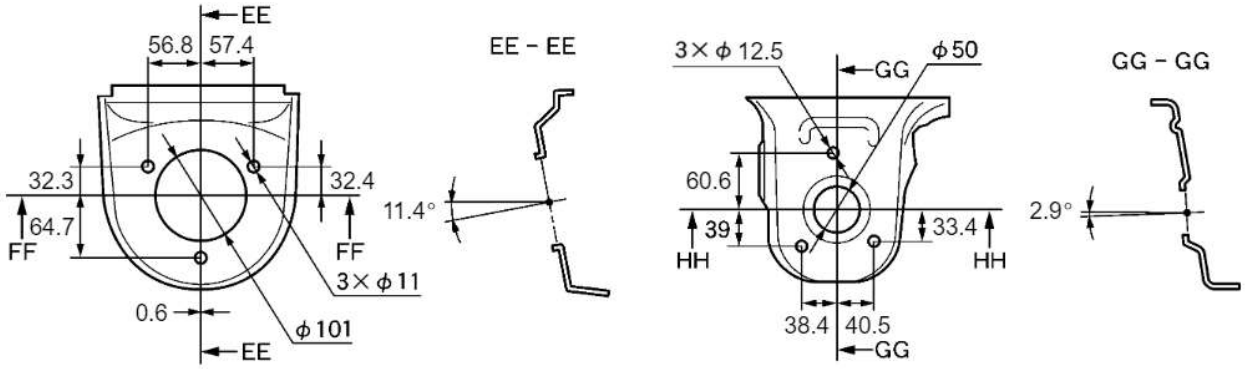
(Two-Dimensional Distance)

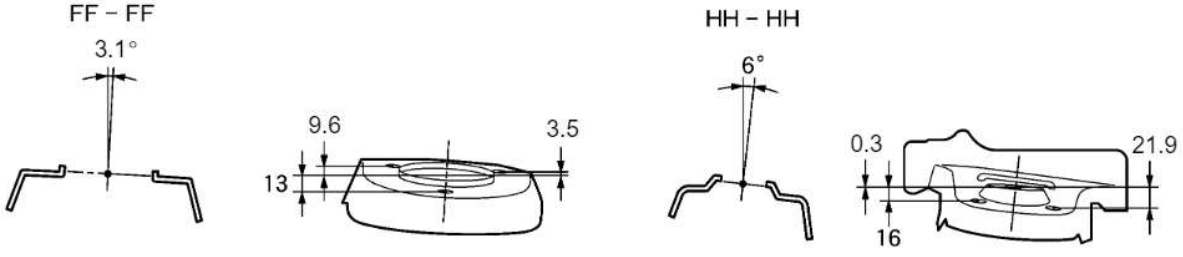
Front bumper reinforcement



Front spring support

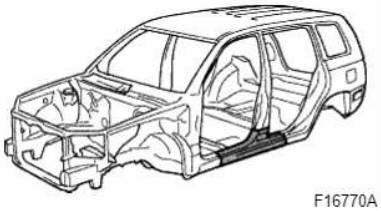
Rear spring support





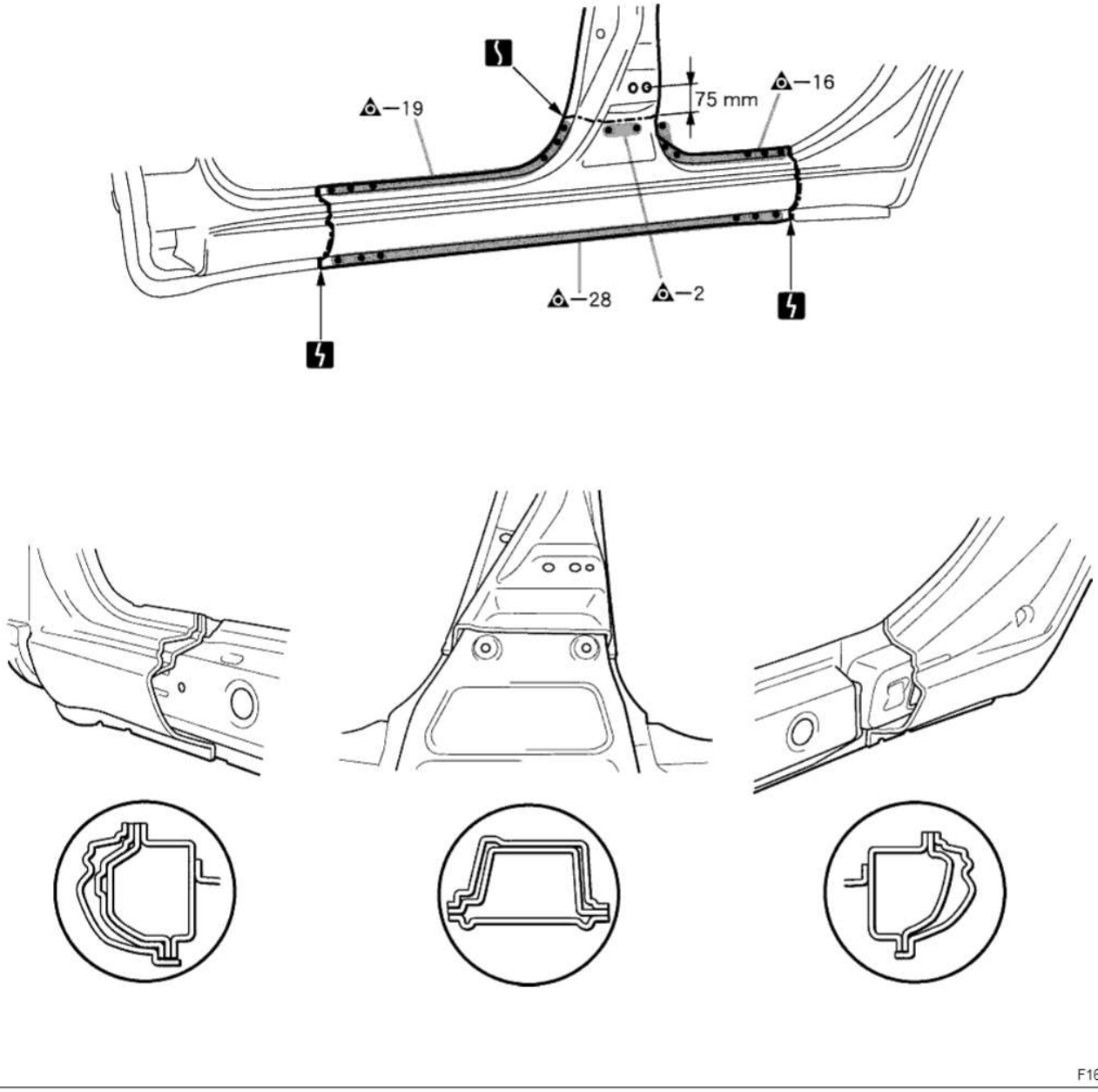
mm

ROCKER PANEL (CUT)


F16770A

REPLACEMENT

REMOVAL

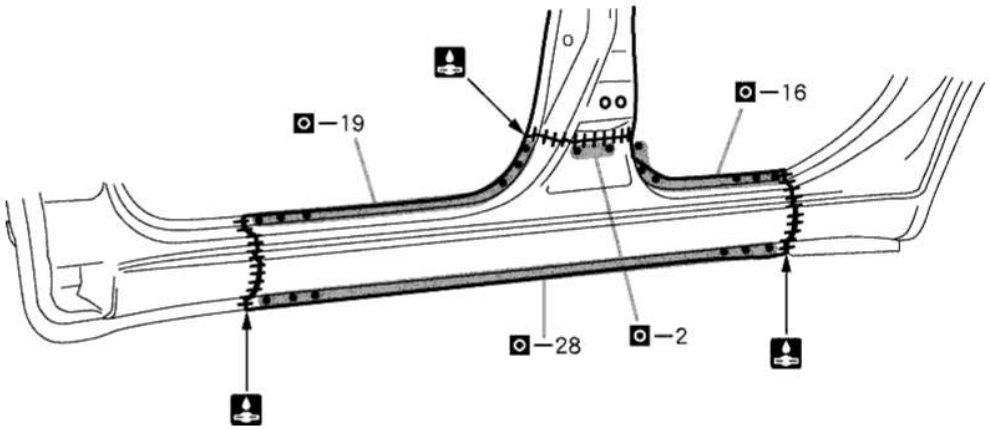


F16770

75 mm (2.95 in.)

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

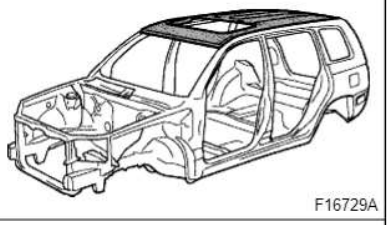


F16771

POINT

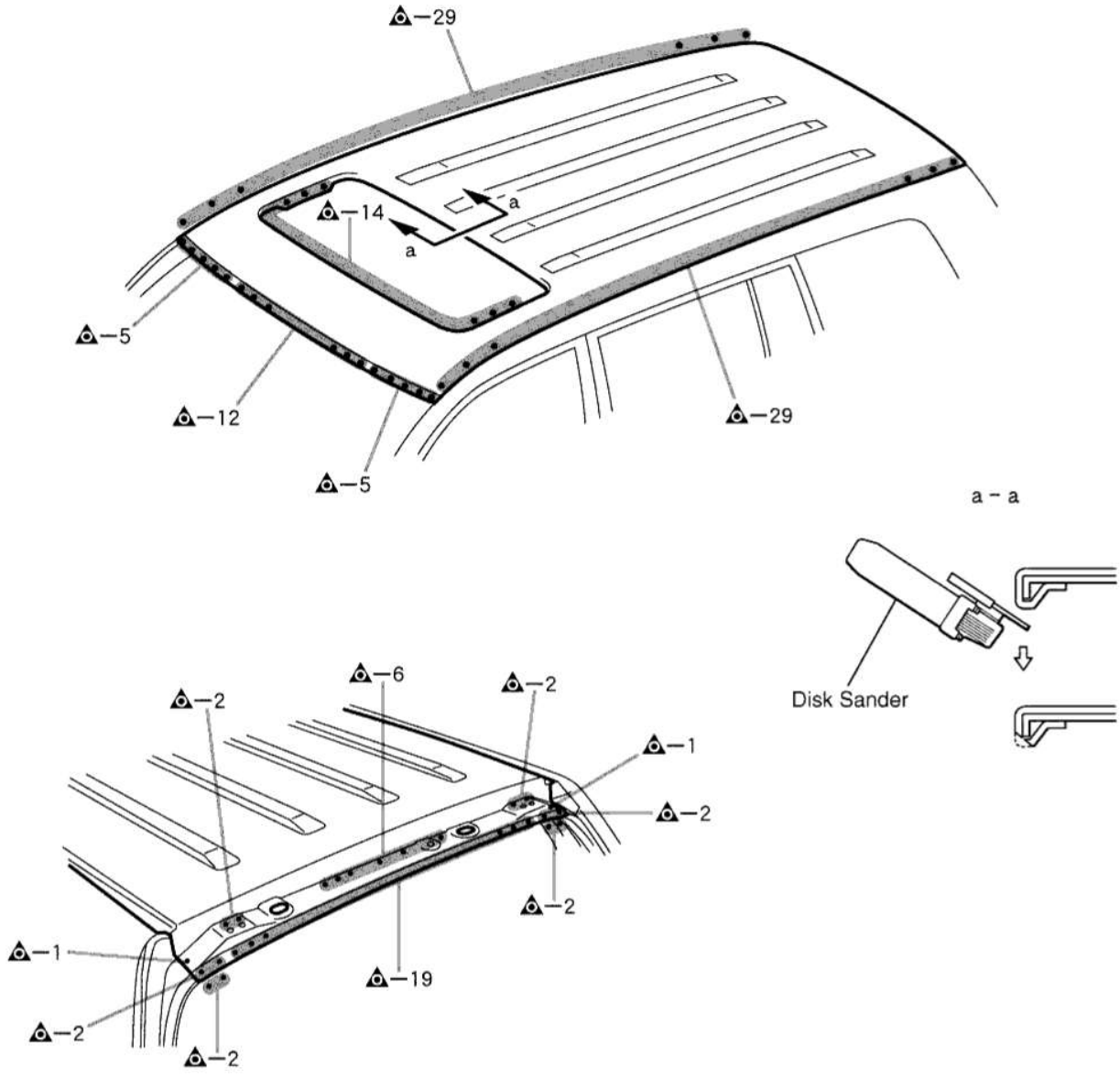
1 Inspect the fitting of the front door and rear door, etc., before welding, since this affects the appearance of the finish.

ROOF PANEL (ASSY): w/ Moon Roof


F16729A

REPLACEMENT

REMOVAL



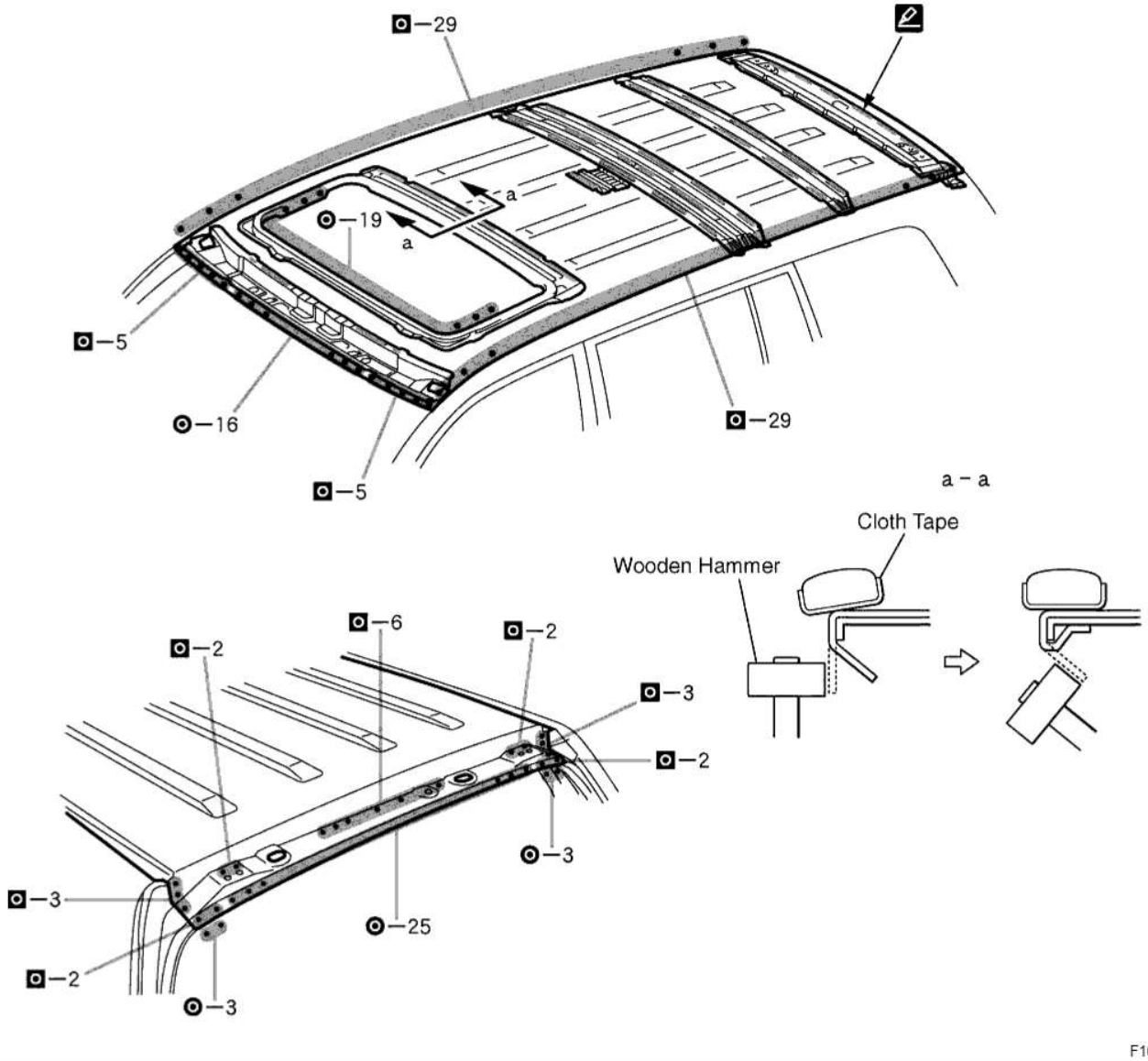
F16729

POINT

1 If reusing the roof panel reinforcement, trim the hemming location using a disc sander, etc.

INSTALLATION

- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.

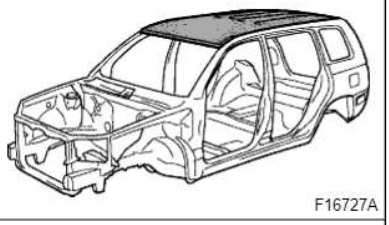


POINT

1 Before temporarily installing the new parts, apply body sealer to the windshield header panel, roof panel reinforcement and back door opening frame.
HINT:
1) Apply just enough sealer for the new parts to make contact.

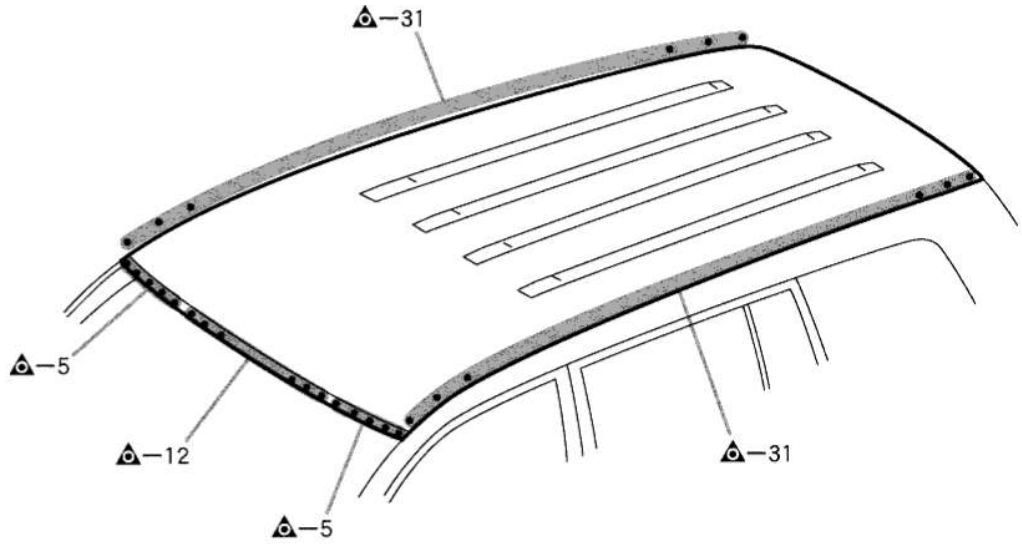
2 Bend the flange hem with a wooden hammer and dolly.
HINT:
1) Perform hemming three steps, being careful not to warp the panel.

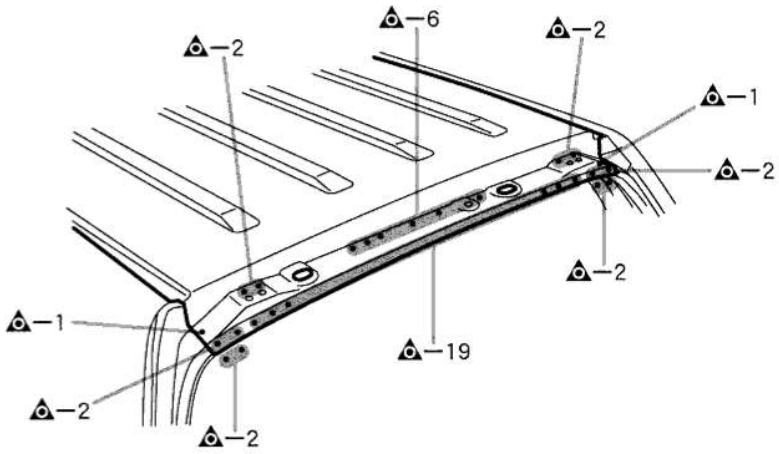
ROOF PANEL (ASSY): w/o Moon Roof


F16727A

REPLACEMENT

REMOVAL

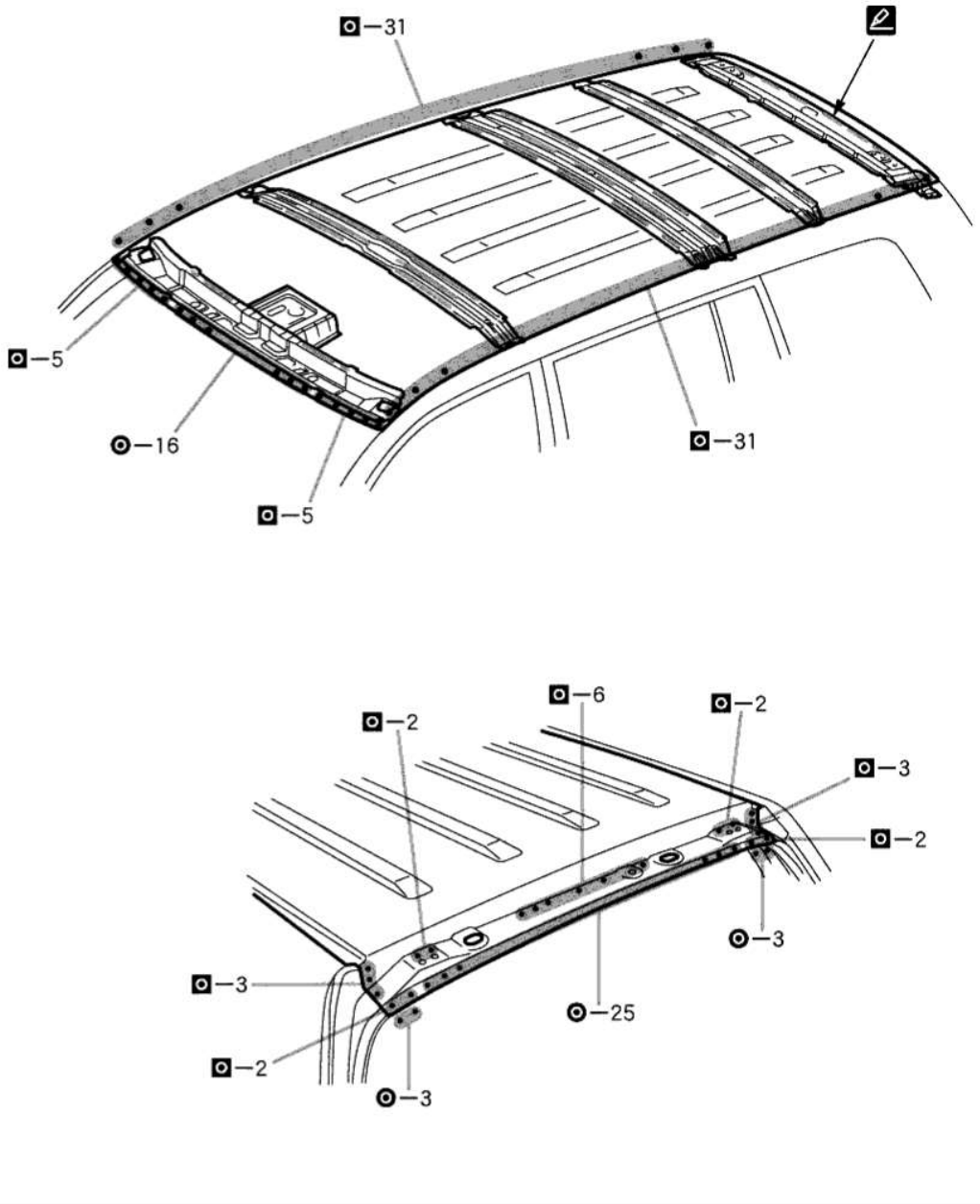




F16727

INSTALLATION

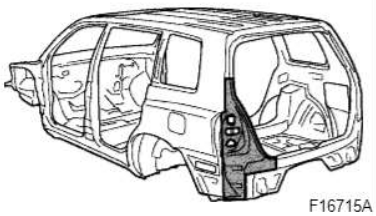
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



POINT

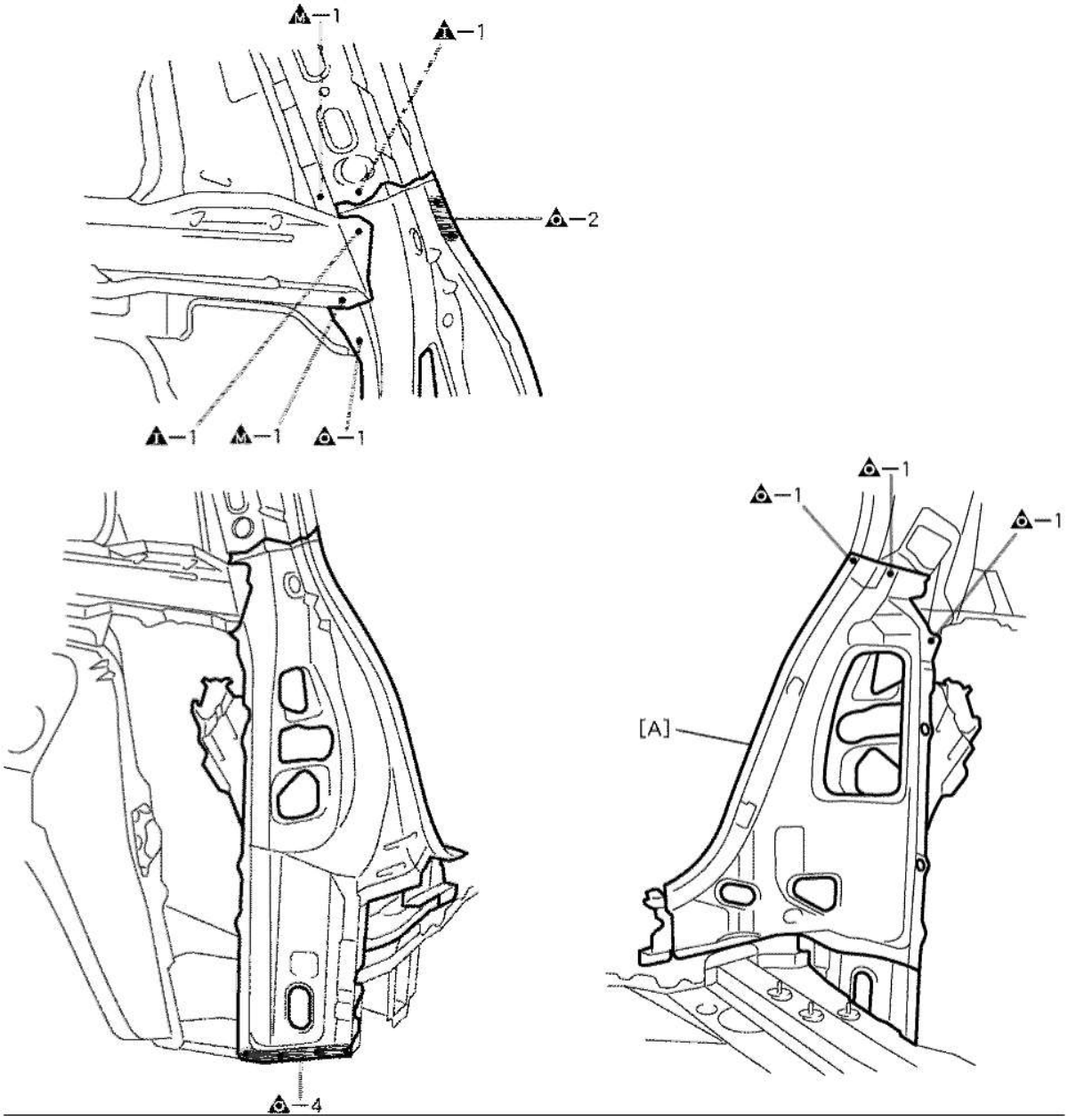
1 Before temporarily installing the new parts, apply body sealer to the windshield header panel, roof panel reinforcement and back door opening frame.
HINT:
1) Apply just enough sealer for the new parts to make contact.

ROOF SIDE INNER REAR PANEL (ASSY)


F16715A

REPLACEMENT
With the back door opening trough and body lower back panel removed.

REMOVAL



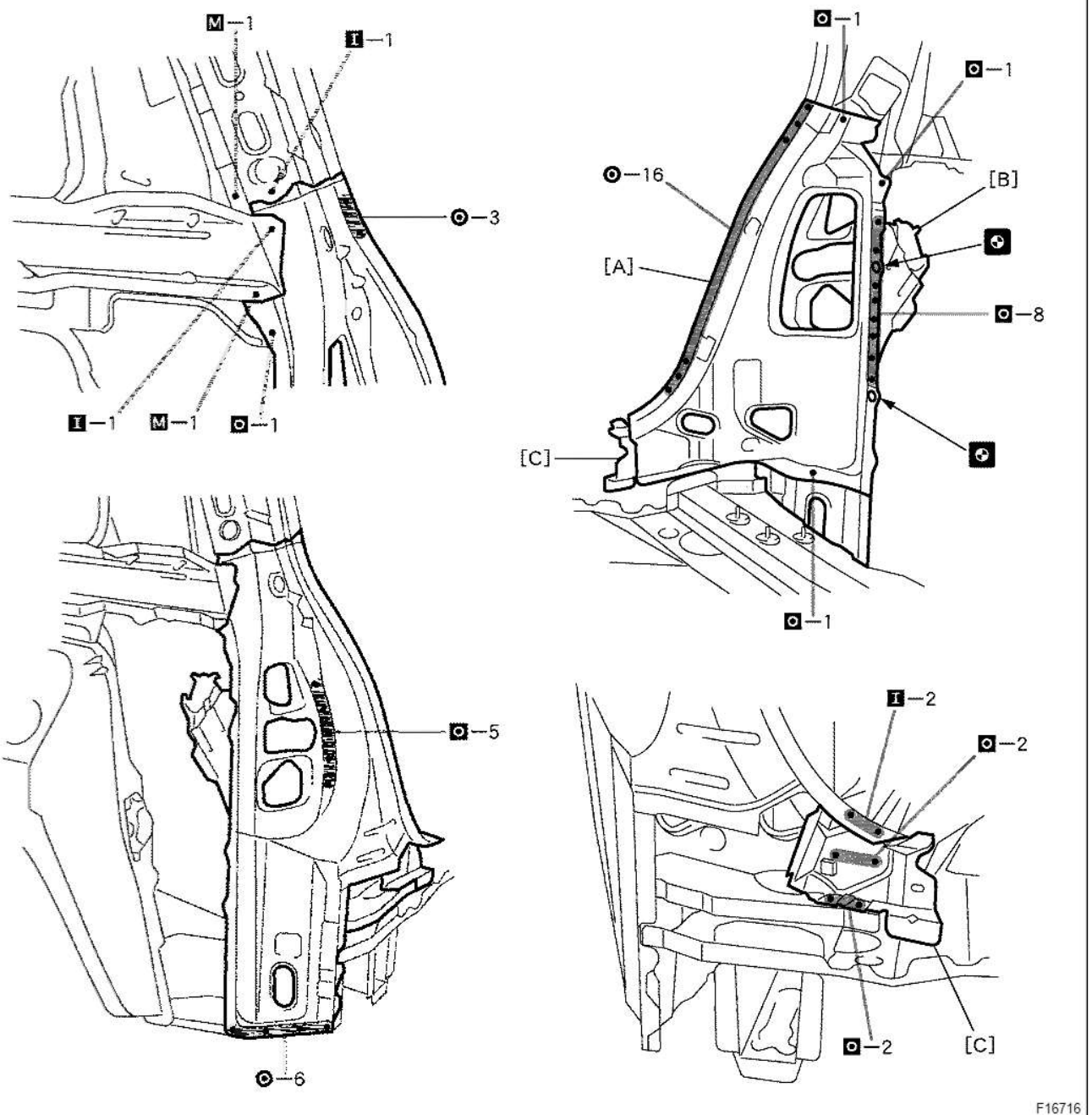
F16715

POINT
1 Remove the [A] at the same time.

PART NAME
[A] Quarter Inner Panel

INSTALLATION

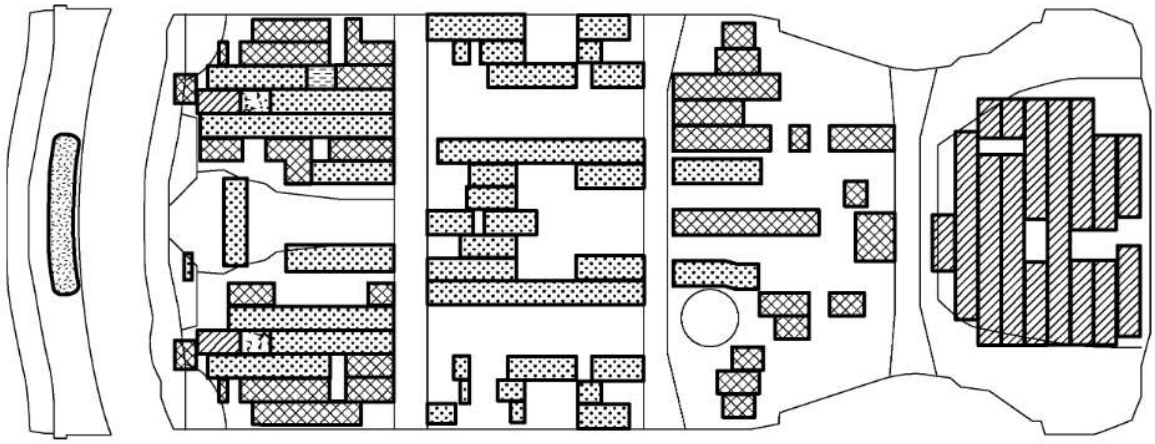
- Temporarily install the new parts and measure each part of the new parts in accordance with the body dimension diagram. (See the body dimension diagram)
- Inspect the fitting of the related parts around the new parts before welding. This affects the appearance of the finish.
- After welding, apply the polyurethane foam to the corresponding parts.
- After welding, apply body sealer and under-coating to the corresponding parts.
- After applying the top coat layer, apply anti-rust agent to the inside of the necked section structural weld spots.



PART NAME

[A] Quarter Inner Panel [B] Seat Belt Anchor No.1 Upper Reinforce
[C] Body Lower Back No.2 Reinforcement

SILENCER SHEET INSTALLATION AREAS



F16739

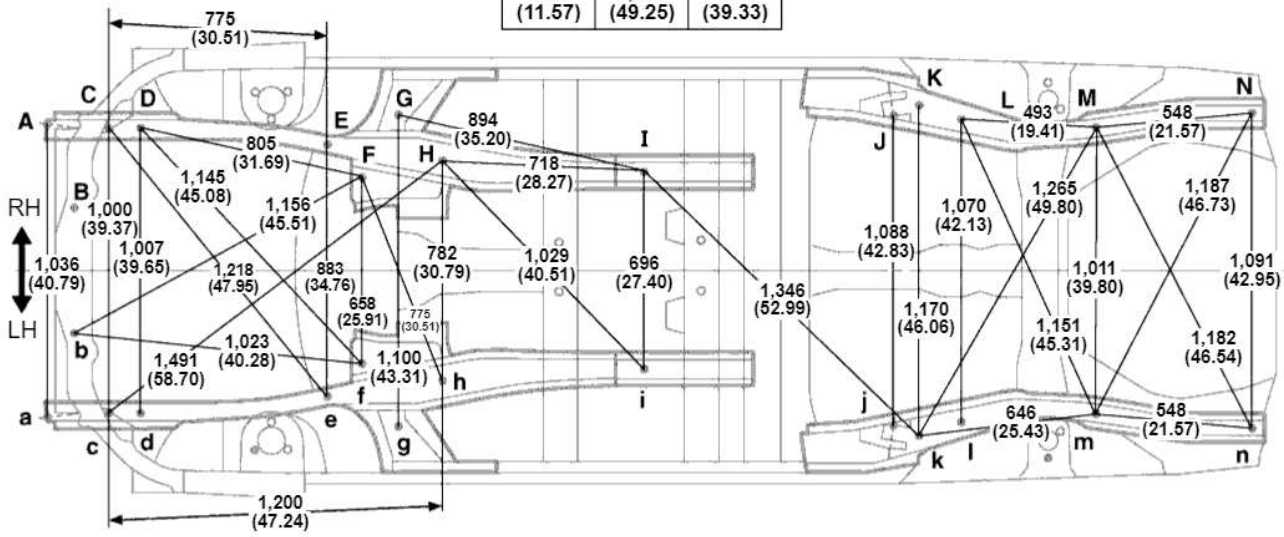
Thickness of Silencer Sheet					
	1.5 mm (0.059 in.)		1.5～2.0 mm (0.059～0.079 in.)		2.0 mm (0.079 in.)
	3.0 mm (0.118 in.)		2.0～5.0 mm (0.079～0.197 in.)		5.0 mm (0.197 in.)

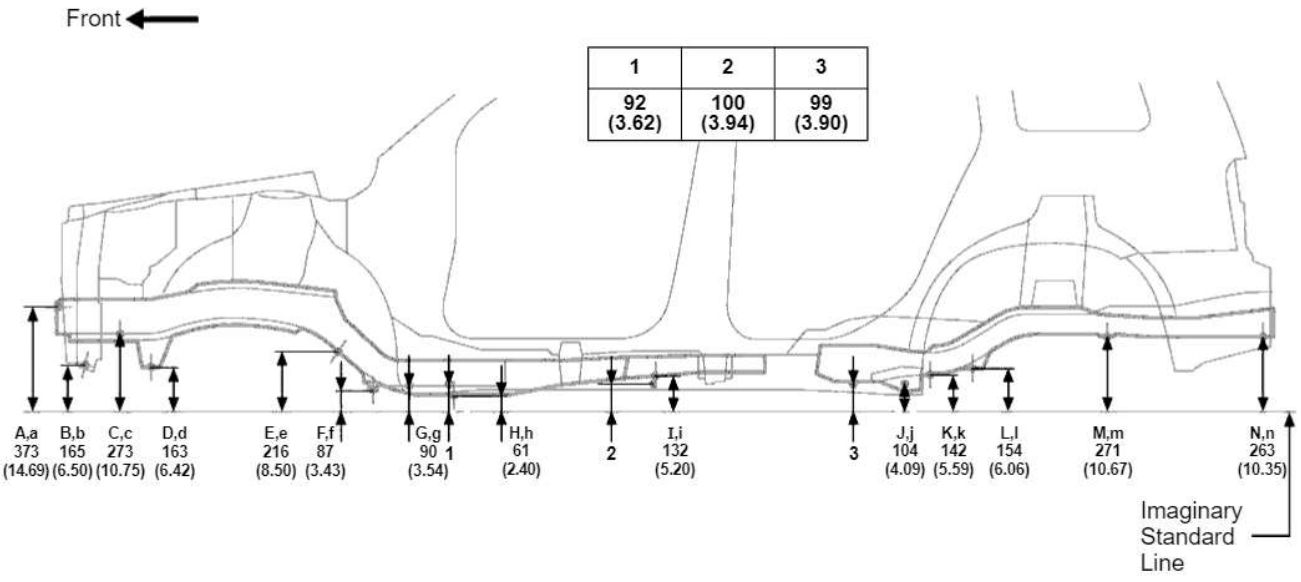
UNDER BODY
4WD

(Three-Dimensional Distance)

Vehicle Dimensions

F-H or f-h	G-i or g-I	I-K or i-k
294 (11.57)	1,251 (49.25)	999 (39.33)



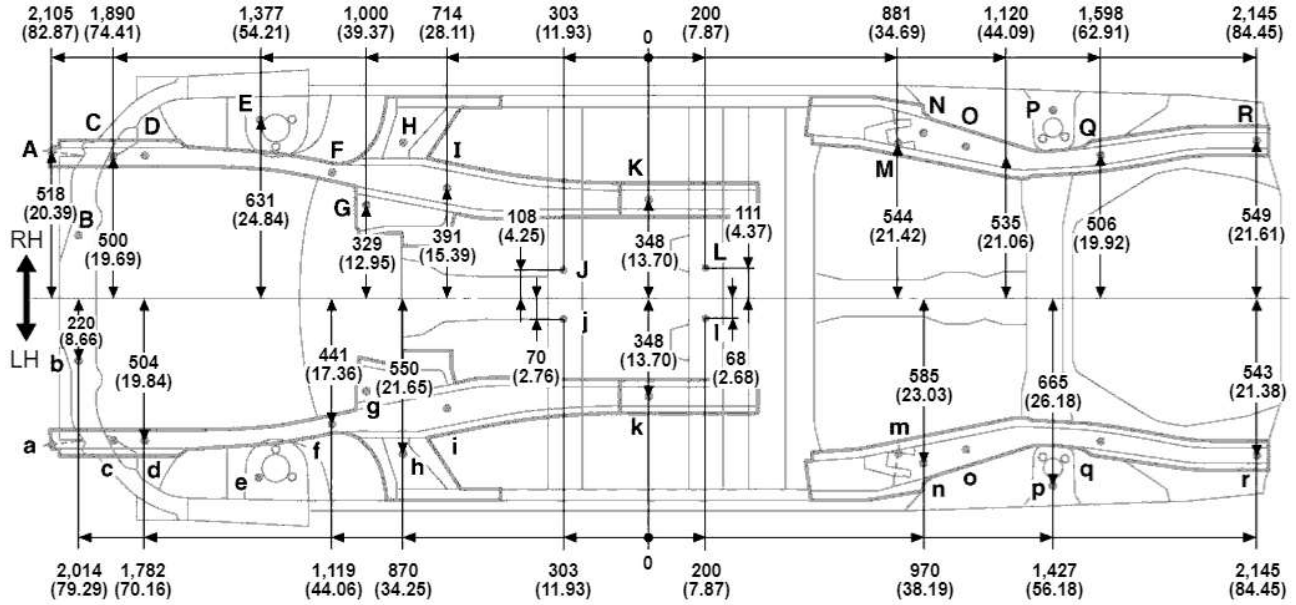


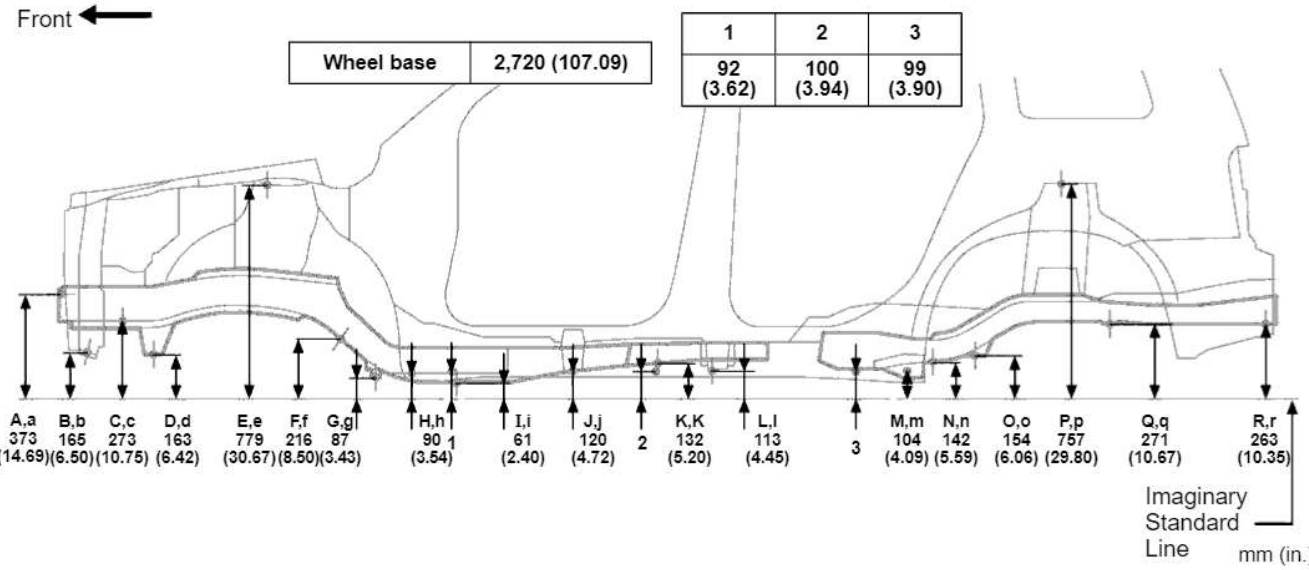
mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front bumper reinforcement installation nut	10 (0.39) nut	H, h	Front side member standard hole	25 (0.98)
B, b	Front crossmember lower standard hole	15 (0.59)	I, i	Front floor under reinforcement standard hole	18 (0.71)
C, c	Front side member standard hole	18 (0.71)	J, j	Rear strut bar installation hole inner	12 (0.47)
D, d	Front frame installation nut	16 (0.63) nut	K, k	Rear floor side member standard hole	18 (0.71)
E, e	Front side member standard hole	10 (0.39)	L, l	Rear suspension member installation nut	14 (0.55) nut
F, f	Front frame installation nut	16 (0.63) nut	M, m	Rear suspension member installation nut	10 (0.39) nut
G, g	Torque box front standard hole	25 (0.98)	N, n	Transport hook installation nut	10 (0.39) nut

UNDER BODY
4WD

(Two-Dimensional Distance)





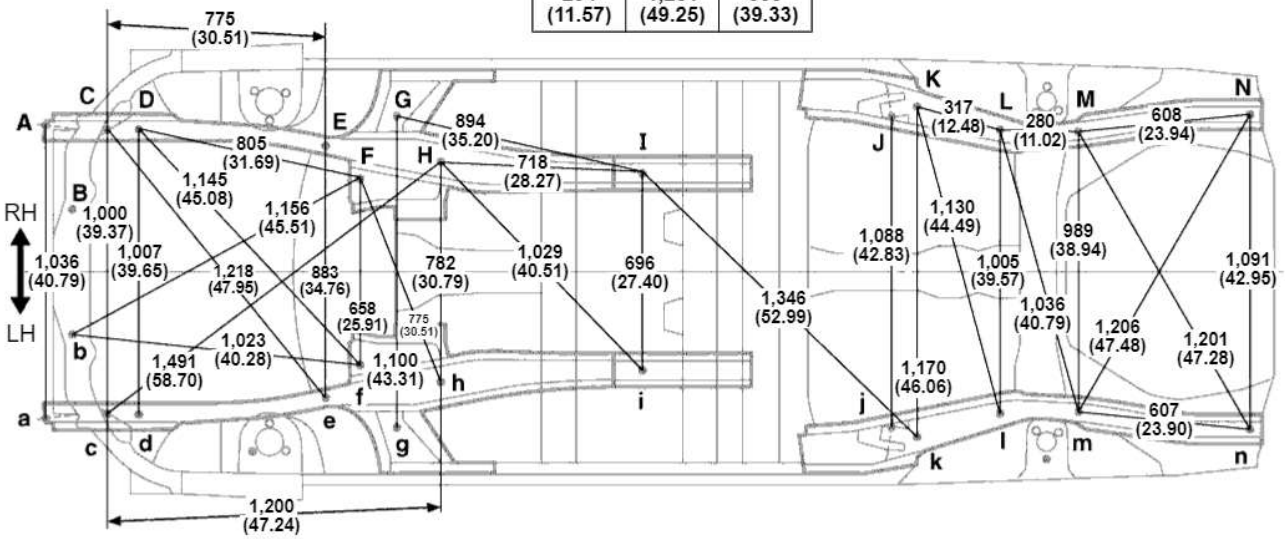
Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front bumper reinforcement installation nut	10 (0.39) nut	K, k	Front floor under reinforcement standard hole	18 (0.71)
B, b	Front crossmember lower standard hole	15 (0.59)	L, l	Propeller shaft center support bearing installation nut	10 (0.39) nut
C, c	Front side member standard hole	18 (0.71)			
D, d	Front frame installation nut	16 (0.63) nut	M, m	Rear strut bar installation hole inner	12 (0.47)
E, e	Front spring support hole outer-front	11 (0.43)	N, n	Rear floor side member standard hole	18 (0.71)
F, f	Front side member standard hole	10 (0.39)	O, o	Rear suspension member installation nut	14 (0.55) nut
G, g	Front frame installation nut	16 (0.63) nut	P, p	Rear spring support hole outer	12.5 (0.492)
H, h	Torque box front standard hole	25 (0.98)	Q, q	Rear suspension member installation nut	10 (0.39) nut
I, i	Front side member standard hole	25 (0.98)	R, r	Transport hook installation nut	10 (0.39) nut
J, j	Propeller shaft center support bearing installation nut	10 (0.39) nut	—	—	—

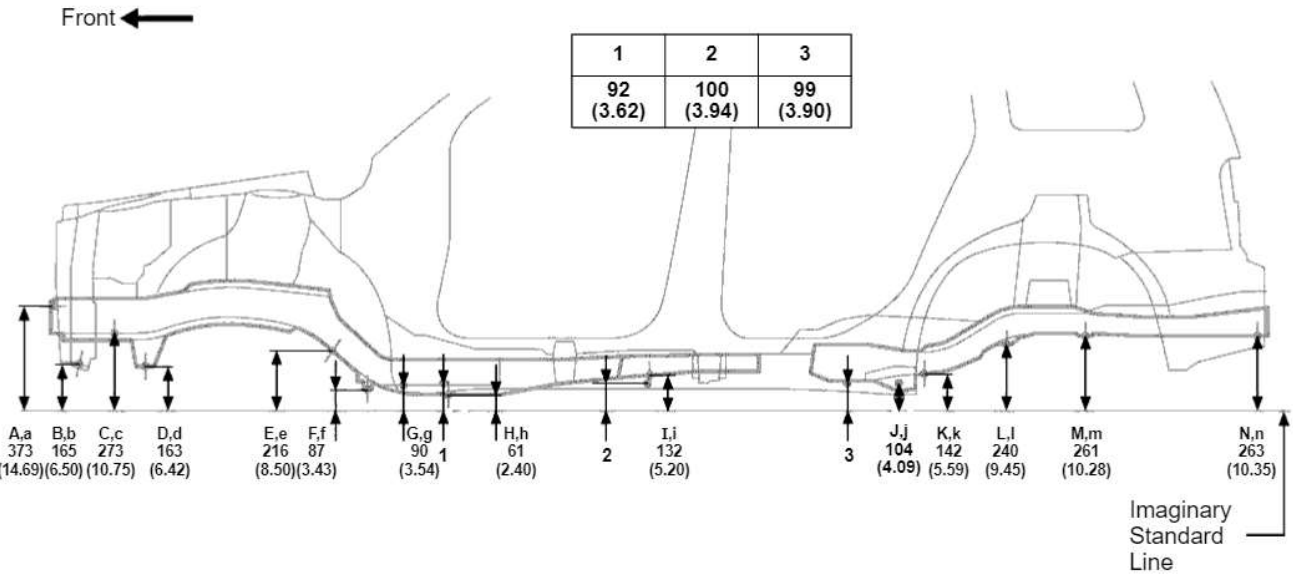
UNDER BODY
2WD

(Three-Dimensional Distance)

Vehicle Dimensions

F-H or f-h	G-i or g-I	I-K or i-k
294 (11.57)	1,251 (49.25)	999 (39.33)



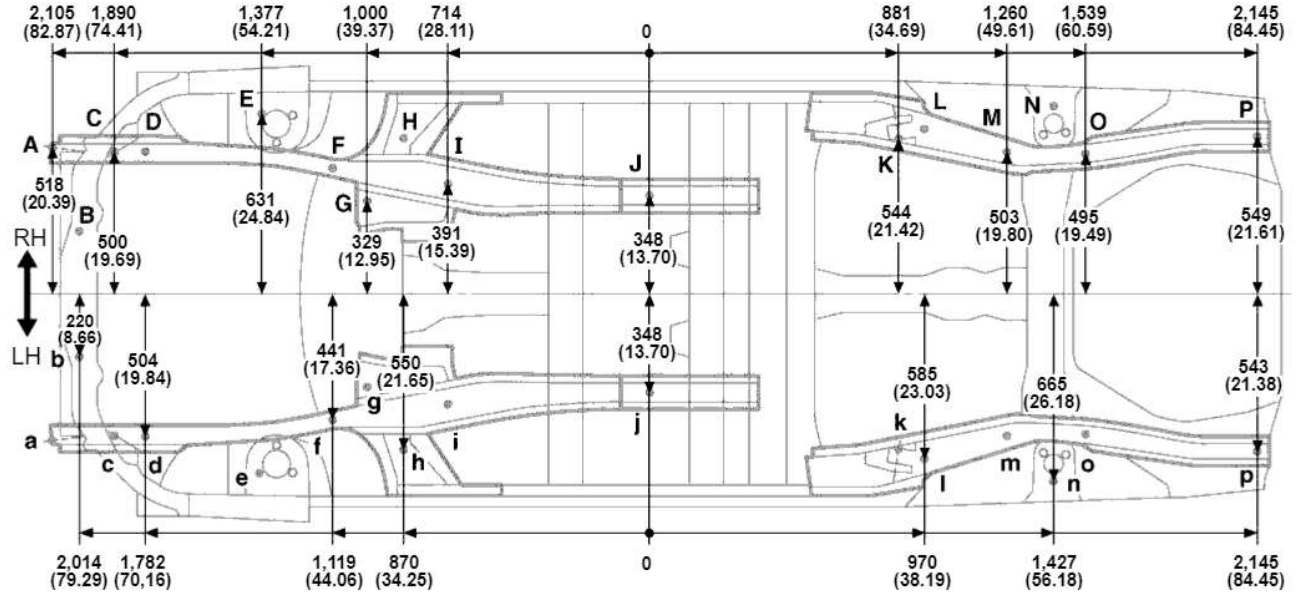


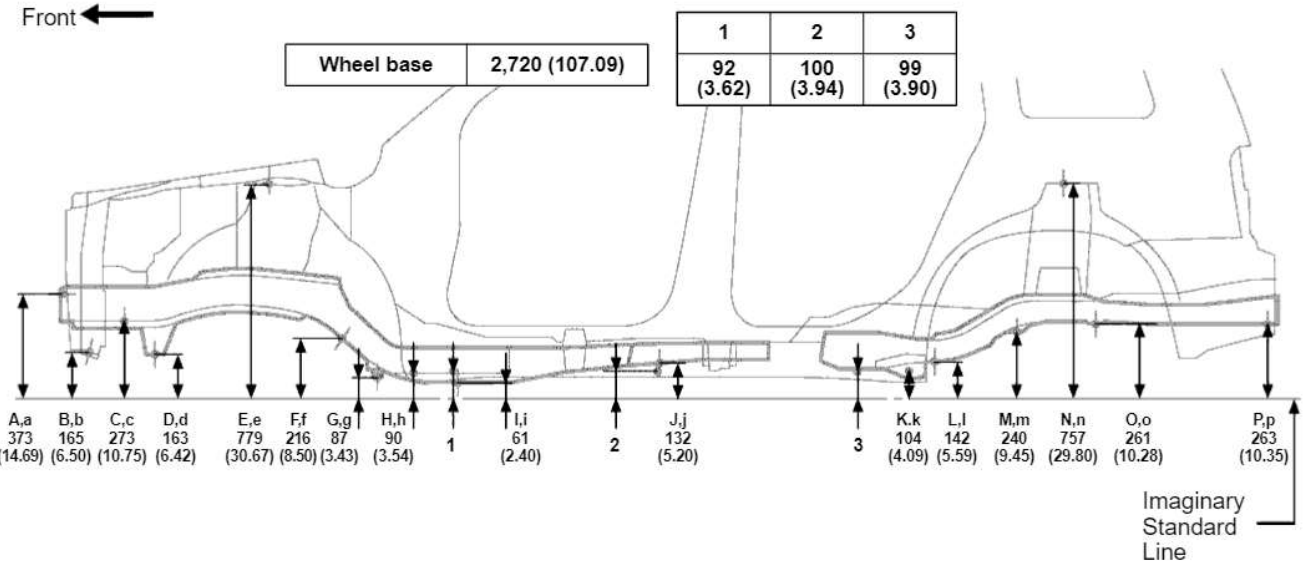
mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front bumper reinforcement installation nut	10 (0.39) nut	H, h	Front side member standard hole	25 (0.98)
B, b	Front crossmember lower standard hole	15 (0.59)	I, i	Front floor under reinforcement standard hole	18 (0.71)
C, c	Front side member standard hole	18 (0.71)	J, j	Rear strut bar installation hole inner	12 (0.47)
D, d	Front frame installation nut	16 (0.63) nut	K, k	Rear floor side member standard hole	18 (0.71)
E, e	Front side member standard hole	10 (0.39)	L, l	Rear suspension member installation nut	12 (0.47) nut
F, f	Front frame installation nut	16 (0.63) nut	M, m	Rear suspension member installation nut	12 (0.47) nut
G, g	Torque box front standard hole	25 (0.98)	N, n	Transport hook installation nut	10 (0.39) nut

UNDER BODY
2WD

(Two-Dimensional Distance)





mm (in.)

Symbol	Name	Hole dia.	Symbol	Name	Hole dia.
A, a	Front bumper reinforcement installation nut	10 (0.39) nut	I, i	Front side member standard hole	25 (0.98)
B, b	Front crossmember lower standard hole	15 (0.59)	J, j	Front floor under reinforcement standard hole	18 (0.71)
C, c	Front side member standard hole	18 (0.71)	K, k	Rear strut bar installation hole inner	12 (0.47)
D, d	Front frame installation nut	16 (0.63) nut	L, l	Rear floor side member standard hole	18 (0.71)
E, e	Front spring support hole outer-front	11 (0.43)	M, m	Rear suspension member installation nut	12 (0.47) nut
F, f	Front side member standard hole	10 (0.39)	N, n	Rear spring support hole outer	12.5 (0.492)
G, g	Front frame installation nut	16 (0.63) nut	O, o	Rear suspension member installation nut	12 (0.47) nut
H, h	Torque box front standard hole	25 (0.98)	P, p	Transport hook installation nut	10 (0.39) nut

VIEWS OF THIS TEXT

Scope of the repair work explanation

- This text explains the welding panel replacement instructions from the vehicle's white body condition. We have abbreviated the explanations of the removal and reinstallation of the equipment parts up to the white body condition and of the installation, inspection, adjustment and final inspection of equipment parts after replacing the weld panel.

Section categories

- Each section has been divided as shown below.

Section Title	Contents	Examples
INTRODUCTION	Explanation of general body repair. Views of weld panel replacement instructions.	Cautionary items. Views of weld panel replacement instructions.
BODY PANEL REPLACEMENT	Instructions for replacing the weld panels from the white body condition, from which bolted parts have been removed, with individual supply parts.	Front side member replacement. Quarter panel replacement.
BODY DIMENSIONS	Body aligning measurements.	Dimension diagrams.
PAINT • COATING	Scope and type of anti-rust treatment, etc. together with weld panel replacement.	Under coat. Body sealer.

Abbreviation of contents in this text.

- The following essential procedures have been abbreviated. When actually working, conduct this work properly.
  (1) Jack and lift operations.
  (2) Clean and wash removed parts, if necessary.
  (3) Visual inspection.