

# FOREWORD

This Body Repair Manual contains information and instructions for repairing the body structure of the 1999 NISSAN QUEST (V41) model. In order to achieve reliable repair work and ensure customer satisfaction, the technician should study this manual and become familiar with appropriate sections before starting repair and rebuilding work.

This Body Repair Manual is prepared for technicians who have attained a high level of skill and experience in repairing collision-damaged vehicles and also use modern service tools and equipment. Persons unfamiliar with body repair techniques should not attempt to repair collision-damaged vehicles by using this manual.

**Technicians are also encouraged to read the 1999 NISSAN QUEST (V41) Service Manual and Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained. The Body Repair Manual (Fundamentals) contains additional information, including cautions and warnings, that are not included in this manual. Technicians should refer to both manuals to ensure proper repairs.**

Please note that these manuals are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries. In the U.S.A. it is recommended that a MIG welder be used by a trained technician.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

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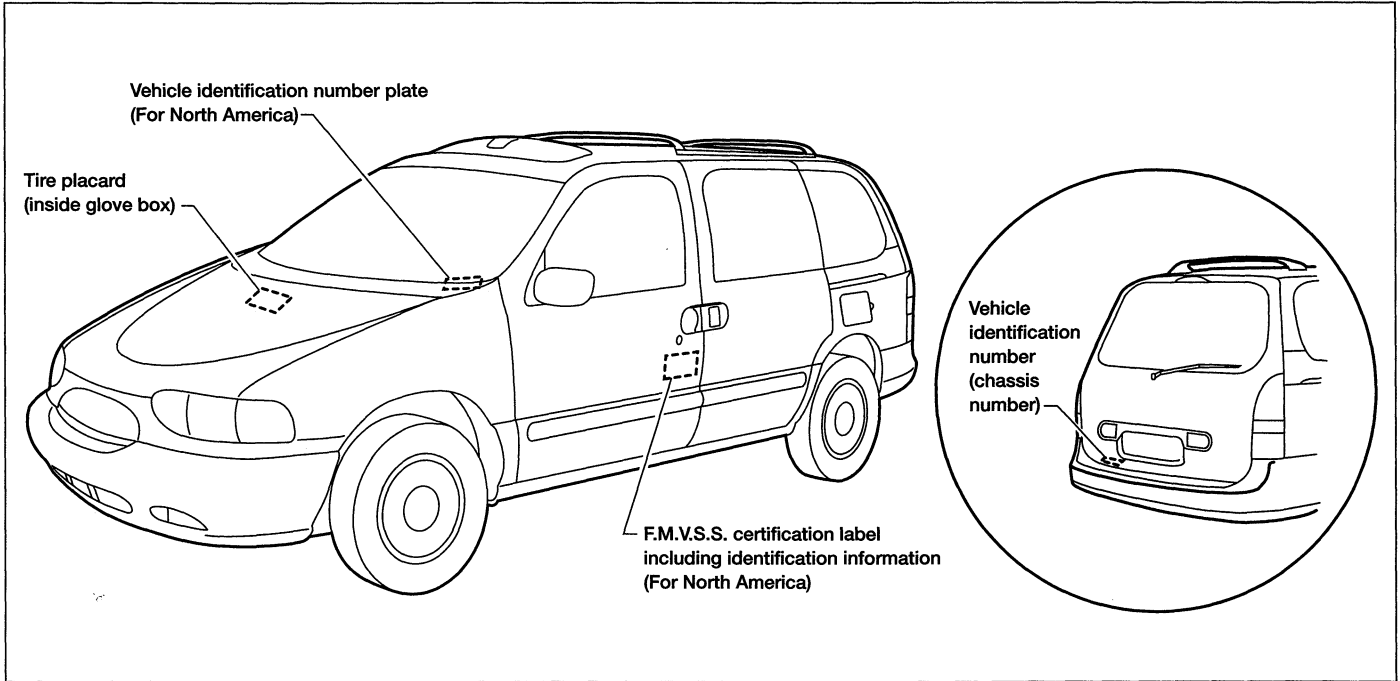


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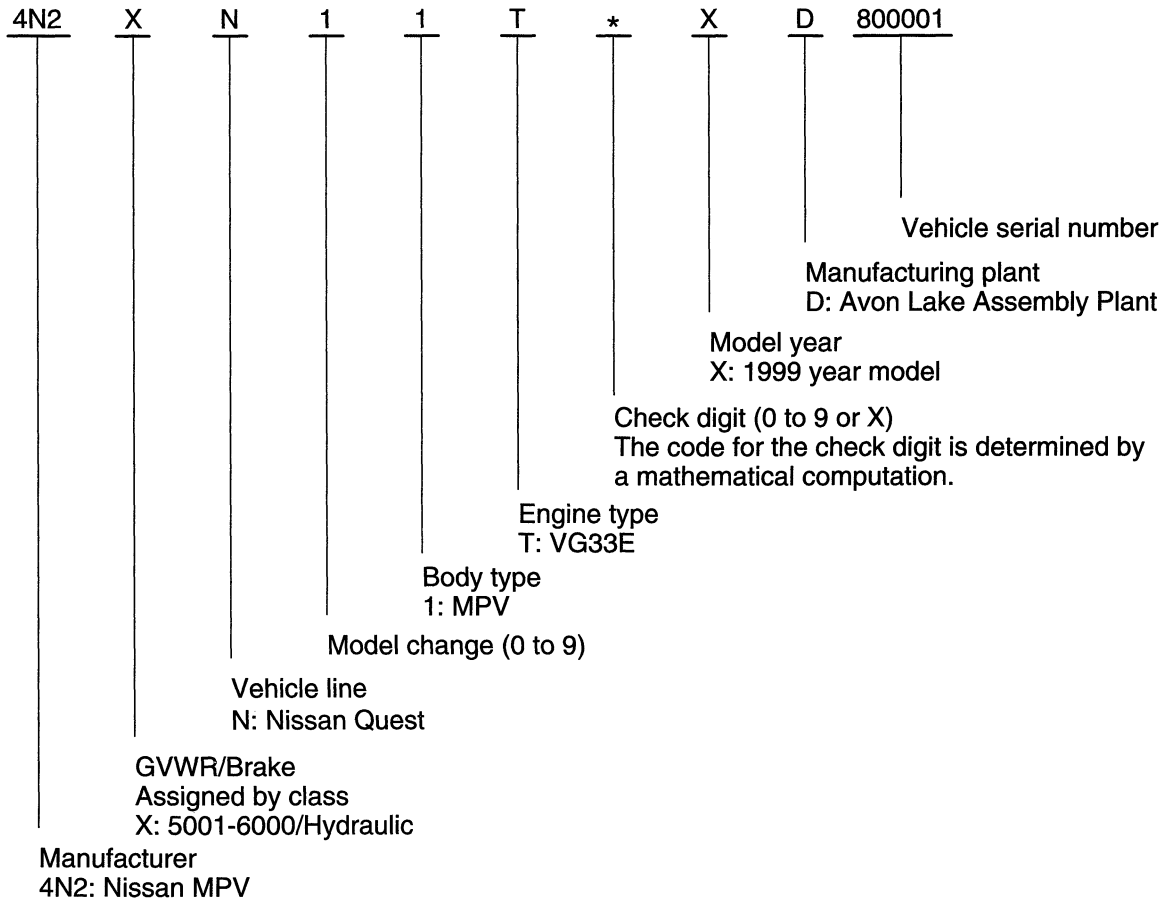


# Identification Number



## VEHICLE IDENTIFICATION NUMBER

Prefix and suffix designations:  
(For North America)



GENERAL INFORMATION

Identification Number (Cont'd)

F.M.V.S.S. CERTIFICATION LABEL

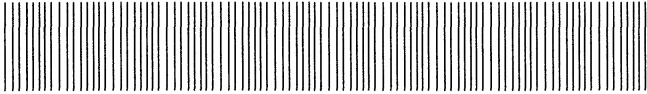
For U.S.A.

MFD. BY FORD MOTOR CO. IN U.S.A. DATE: XXXX  
 FOR NISSAN MOTOR CO., LTD.

GYWR: XXXXXXXXXXXXXXXX REAR GAWR: XXXXXXXX XXXXXXXX  
 FRONT GAWR: XXXXXXXX XXXXXXXX WITH XXXXXXXXXXXXXXXX TIRES  
 WITH XXXXXXXXXXXXXXXX TIRES XXXXXXXX RIMS  
 XXXXXXXX RIMS AT XXX PSI COLD AT XXX PSI COLD XXXX

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE  
 SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: XXXXXXXXXXXXXXXXXXXX MODEL: XXXXXXXXXXXXXXXXXXXXXXXX



COLOR	TRIM	XXXXX
XXXXXX   XXXXXX   XXXXXX	XXX	06200   XXXXX

For Canada

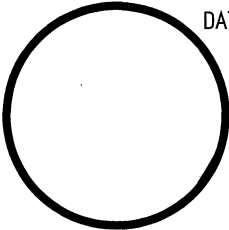
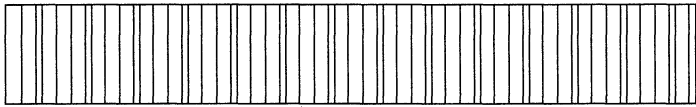
MFD. BY FORD MOTOR CO. U.S.A. FOR NISSAN MOTOR CO., LTD.

DATE: XXXXXX GVWR/PNBV: XXXXXXLB6/ XXXXXX KG

FRONT GAWR/PNBE AV: - REAR GAWR/PNBE AR:  
 XXXXXXLBS/XXXXXXXKG - XXXXXXLBS. XXXXXXKG  
 XXXXXXXXXXXXXXXX TIRES/PNEUS XXXXXXXXXXXXXXXX  
 XXXXXXXXXXXXXXXX RIMS/JANTES XXXXXXXXXXXXXXXX  
 AT/A PSI/kPa XXXX/XXX COLD/A FR01D

VIN: XXXXXXXXXXXXXXXXXXXX TYPE: XXXXXXXXXXXXXXXXXXXXXXXX

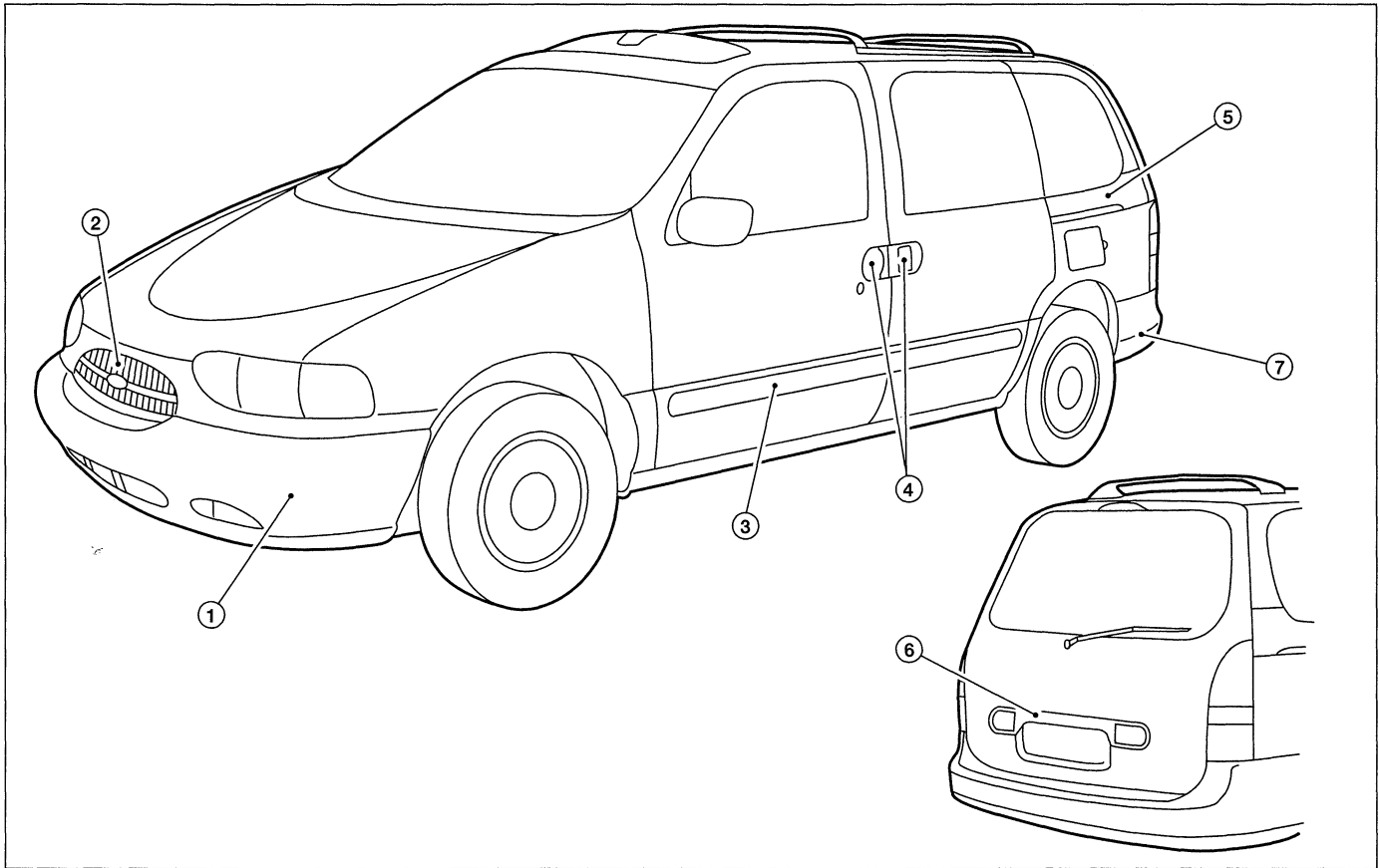
COMPLIES/CONFORME: ICES-2

COLOR	TRIM	XXXXX
XXXXXX   XXXXXX   XXXXXX	XXX	1B620   XXXXX

# Body Exterior Paint Color

Monotone

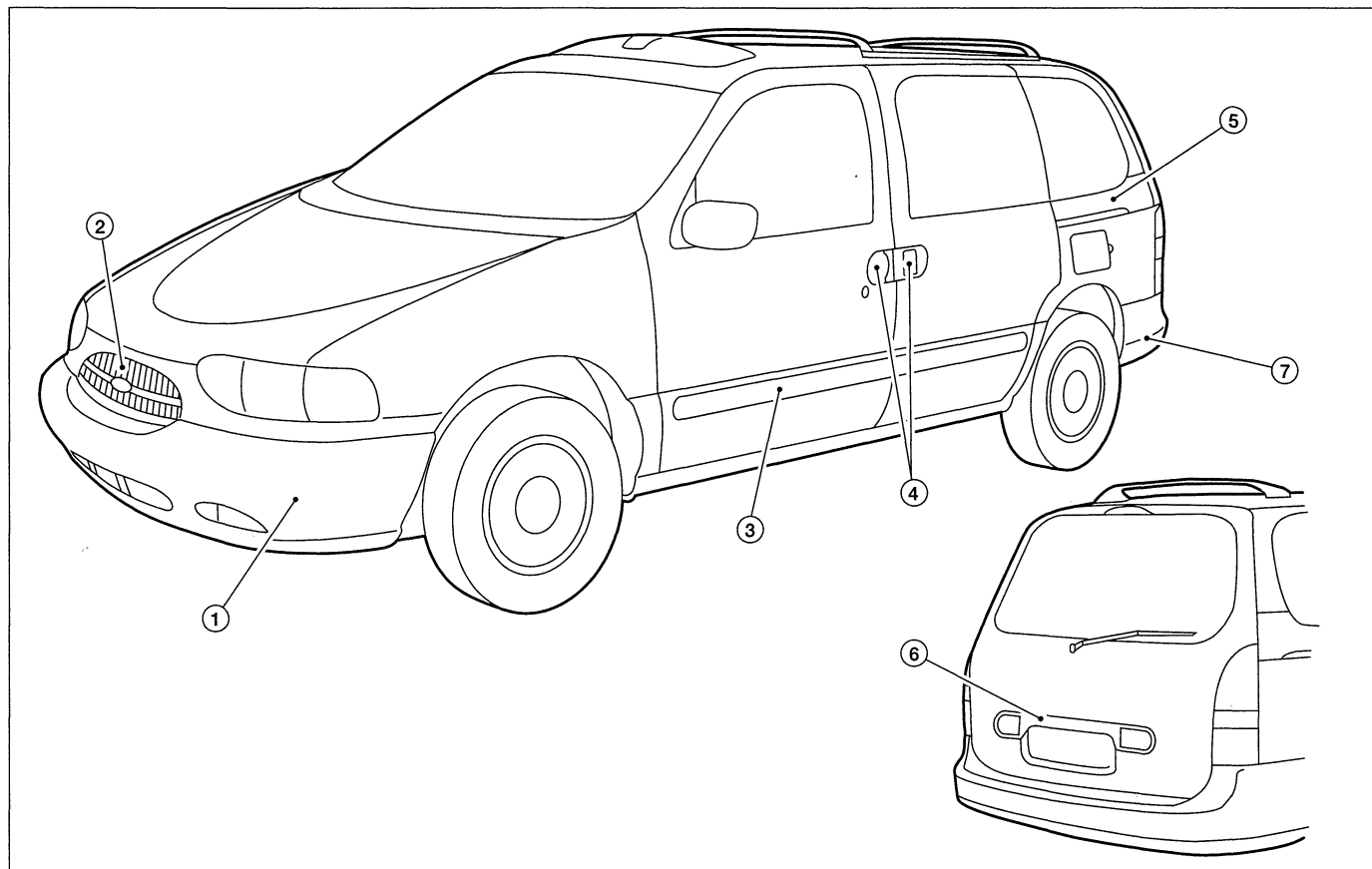


Component	Color code	BQVO	BKL2	BGT0	BBV2	BKS4	BET2	BAP4	BJT1
	Description	Nordic White	Quick Silver	Classic Black	Stone Washed Blue	Mystic Sage	Sandstone	Sunset Red	Evergreen Dusk
	Paint type	S	M	2S	M	M	M	2P	M
	Applied Hard Clear Coat	—	—	—	—	—	—	—	—
①	Bumper fascia	BQVO	BKL2	BGT0	BBV2	BKS4	BET2	BAP4	BJT1
②	Radiator grill	G03-2	G03-2	G03-2	G03-2	G03-2	G03-2	G03-2	G03-2
③	Side guard molding	BQVO	BKL2	BGT0	BBV2	BKS4	BET2	BAP4	BJT1
④	Door outside handle	BQVO	BKL2	BGT0	BBV2	BKS4	BET2	BAP4	BJT1
⑤	Waist rail cover	BQVO	BKL2	BGT0	BBV2	BKS4	BET2	BAP4	BJT1
⑥	Back door finisher	BQVO	BKL2	BGT0	BBV2	BKS4	BET2	BAP4	BJT1
⑦	Rear bumper fascia	BQVO	BKL2	BGT0	BBV2	BKS4	BET2	BAP4	BJT1

2S : 2-coat solid    2P : 2-coat pearl    S : Solid Paint    M : Metallic Paint

## Body Exterior Paint Color (Cont'd)

Two-tone

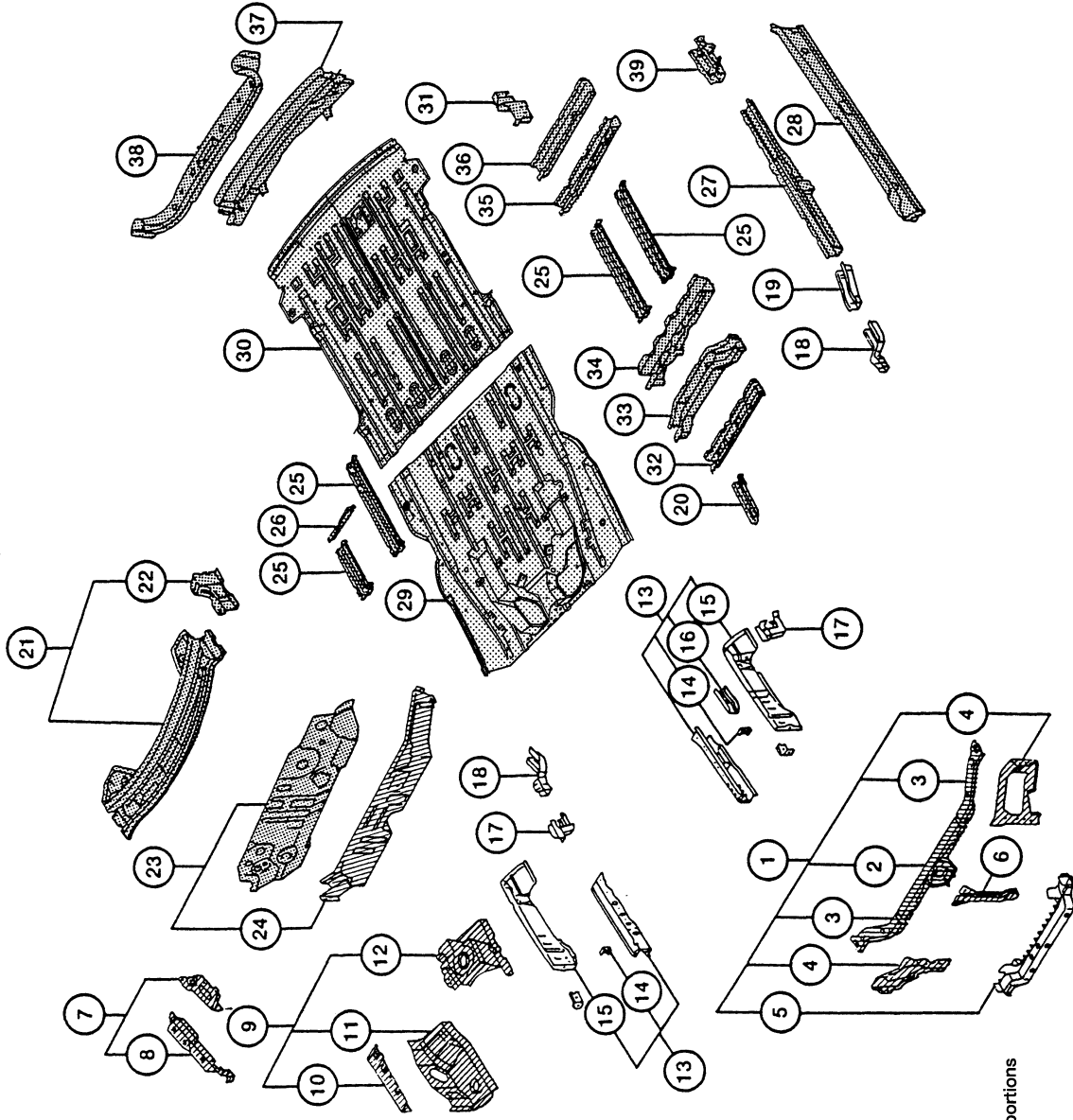


Component	Color code	B1V7	B1V5	B4T2	B1V4	B9P4
	Description	Chestnut/ Sandstone	Deep Blue Metallic/ Stone Washed Blue	Classic Black/ Quick Silver	Evergreen Dusk/ Mystic Sage	Sunset Red/ Quick Silver
	Paint type	M/M	M/M	2S/M	M/M	2P/M
	Applied Hard Clear Coat	—	—	—	—	—
①	Front bumper fascia	BCT2/ BET2	BKT5/ BBV2	BGT0/ BKL2	BJT1/ BKS4	BAP4/ BKL2
②	Radiator grill	G03-2	G03-2	G03-2	G03-2	G03-2
③	Side guard molding	BET2	BBV2	BKL2	BKS4	BKL2
④	Door outside handle	BCT2	BKT5	BGT0	BJT1	BAP4
⑤	Waist rail cover	BCT2	BKT5	BGT0	BJT1	BAP4
⑥	Back door finisher	BCT2	BKT5	BGT0	BJT1	BAP4
⑦	Rear bumper fascia	BET2	BBV2	BKL2	BKS4	BKL2

2S : 2-coat solid    2P : 2-coat pearl    S : Solid Paint    M : Metallic Paint



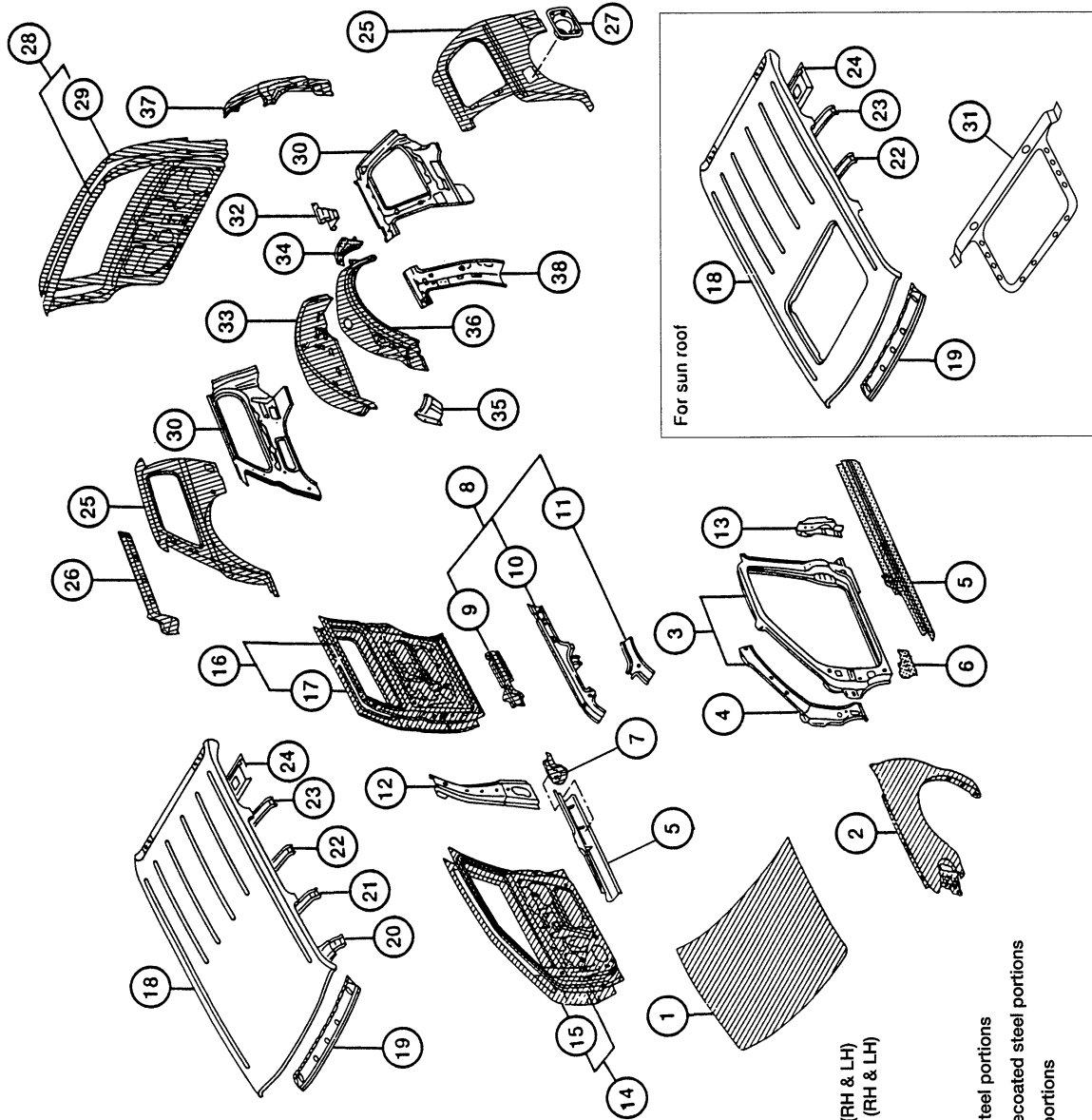
# Underbody Components Parts





- 1. Radiator core support assembly
- 2. Center upper radiator core support
- 3. Side upper radiator core support
- 4. Side radiator core support
- 5. Lower radiator core support
- 6. Hood lock stay
- 7. Hoodledge reinforcement (RH & LH)
- 8. Front hoodledge reinforcement (RH & LH)
- 9. Hoodledge assembly (RH & LH)
- 10. Upper hoodledge (RH & LH)
- \*11. Front lower hoodledge (RH & LH)
- 12. Front strut housing (RH & LH)
- \*13. Front side member assembly
- \*14. Bumper stay reinforcement
- \*15. Front side member closing plate assembly
- \*16. Front side member front reinforcement
- \*17. Front suspension mounting member
- \*18. Front side member front extension
- \*19. Front side member center extension (RH & LH)
- 20. Front center member
- 21. Cowl assembly
- 22. Cowl top-side
- 23. Lower dash assembly
- 24. Lower dash crossmember
- 25. 2nd seat mounting member
- 26. 2nd seat mounting member support (RH only)
- \*27. Rear side member (RH & LH)
- 28. Inner sill (RH & LH)
- 29. Front floor
- 30. Rear floor
- 31. Rear floor side (RH & LH)
- 32. 2nd crossmember
- 33. 3rd crossmember
- 34. 4th crossmember
- 35. 5th crossmember
- 36. 6th crossmember
- 37. Rear crossmember lower end
- 38. Rear crossmember upper end
- 39. Rear side member extension (RH & LH)

: Indicates anti-corrosive pre-coated steel portions  
 : Indicates two-side anti-corrosive pre-coated steel portions  
 \* : Indicates high strength steel (HSS) portions

Body Component Parts



- \* 1. Hood
- 2. Front fender (RH & LH)
- 3. Body side assembly (RH & LH)
- \* 4. Inner front pillar (RH & LH)
- 5. Outer sill
- 6. Outer sill reinforcement (RH & LH)
- 7. Outer side rail
- 8. Side roof rail assembly (RH & LH)
- 9. Outer side roof rail (RH & LH)
- 10. Inner side roof rail (RH & LH)
- 11. Front roof rail brace (RH & LH)
- \*12. Inner center pillar (RH & LH)
- 13. Center pillar lower bracket (RH & LH)
- 14. Front door assembly (RH & LH)
- 15. Outer front door panel (RH & LH)
- 16. Sliding door assembly (RH & LH)
- 17. Outer sliding door panel (RH & LH)
- 18. Roof
- 19. Front roof rail
- 20. No. 1 roof bow
- 21. No. 2 roof bow
- 22. No. 3 roof bow
- 23. No. 4 roof bow
- 24. Rear roof rail
- 25. Rear fender
- 26. Waist rail guide (RH & LH)
- 27. Fuel filler base
- 28. Back door assembly
- 29. Outer back door panel
- 30. Inner rear side panel
- 31. Roof reinforcement
- 32. Inner rear side brace (RH & LH)
- 33. Inner rear wheelhouse (RH & LH)
- 34. Inner rear wheelhouse rear extension (RH & LH)
- 35. Inner rear wheelhouse front extension (RH & LH)
- 36. Outer rear wheelhouse (RH & LH)
- 37. Back pillar channel (RH & LH)
- 38. Outer rail assembly (RH & LH)

 : Indicates anti-corrosive pre-coated steel portions  
 : Indicates two-side anti-corrosive pre-coated steel portions  
 \* : Indicates high strength steel (HSS) portions

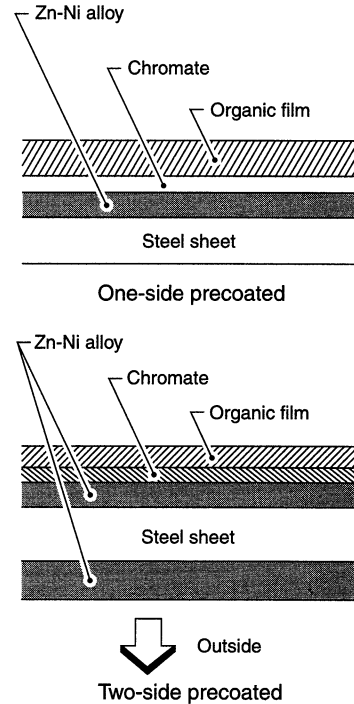
## Description

To provide improved corrosion prevention, the following anti-corrosive measures have been implemented in our production plants. When repairing or replacing body panels, it is necessary to use these same anti-corrosive measures.

### ANTI-CORROSIVE PRECOATED STEEL (DURASTEEL)

To improve repairability and corrosion resistance, a new type of anti-corrosive pre-coated steel sheet has been adopted replacing conventional zinc-coated steel sheet. Durasteel is electroplated zinc-nickel alloy under organic film, which provides excellent corrosion resistance.

Durasteel is classified as either one-side pre-coated steel or two-side pre-coated steel. The two-side pre-coated steel provides excellent corrosion resistance.



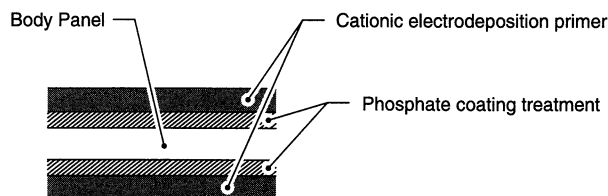
**Nissan Genuine Service Parts are fabricated from durasteel sheets. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain the anti-corrosive performance built into the vehicle at the factory.**

### PHOSPHATE COATING TREATMENT AND CATIONIC ELECTRODEPOSITION PRIMER

A phosphate coating treatment and a cationic electrodeposition primer, which provide excellent corrosion protection, are employed on all body components.

#### Caution:

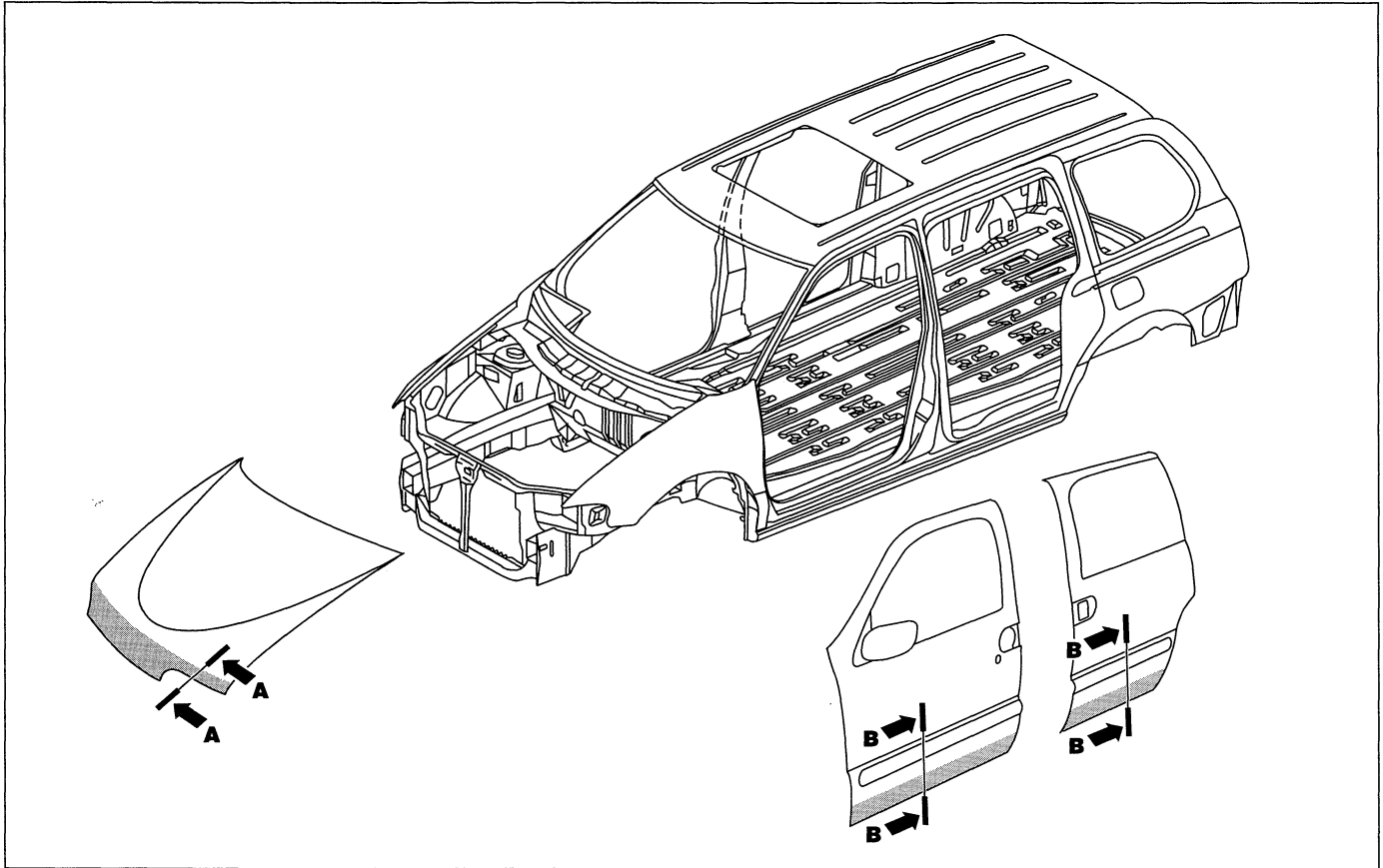
**Confine paint removal during welding operations to an absolute minimum.**



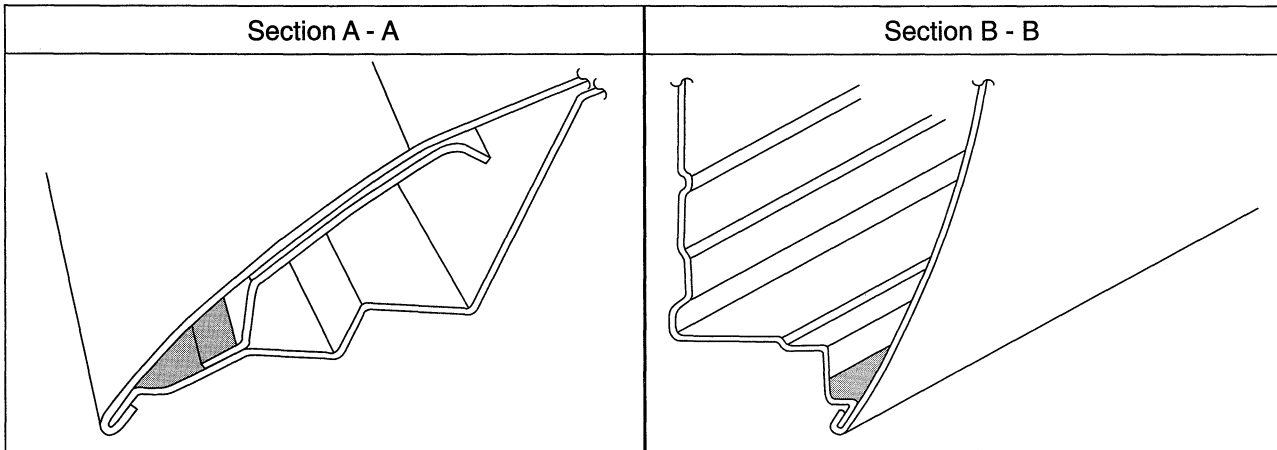
**Nissan Genuine Service Parts are also treated in the same manner. Therefore, it is recommended that GENUINE NISSAN PARTS or equivalent be used for panel replacement to maintain anti-corrosive performance built into the vehicle at the factory.**

# Anti-Corrosive Wax

To improve corrosion resistance, anti-corrosive wax is applied inside the body sill and inside other closed sections. Accordingly, when replacing these parts, be sure to apply anti-corrosive wax to the appropriate areas of the new parts. Select an excellent anti-corrosive wax which will penetrate after application and has a long shelf life.



 : Indicates anti-corrosive wax coated portions.



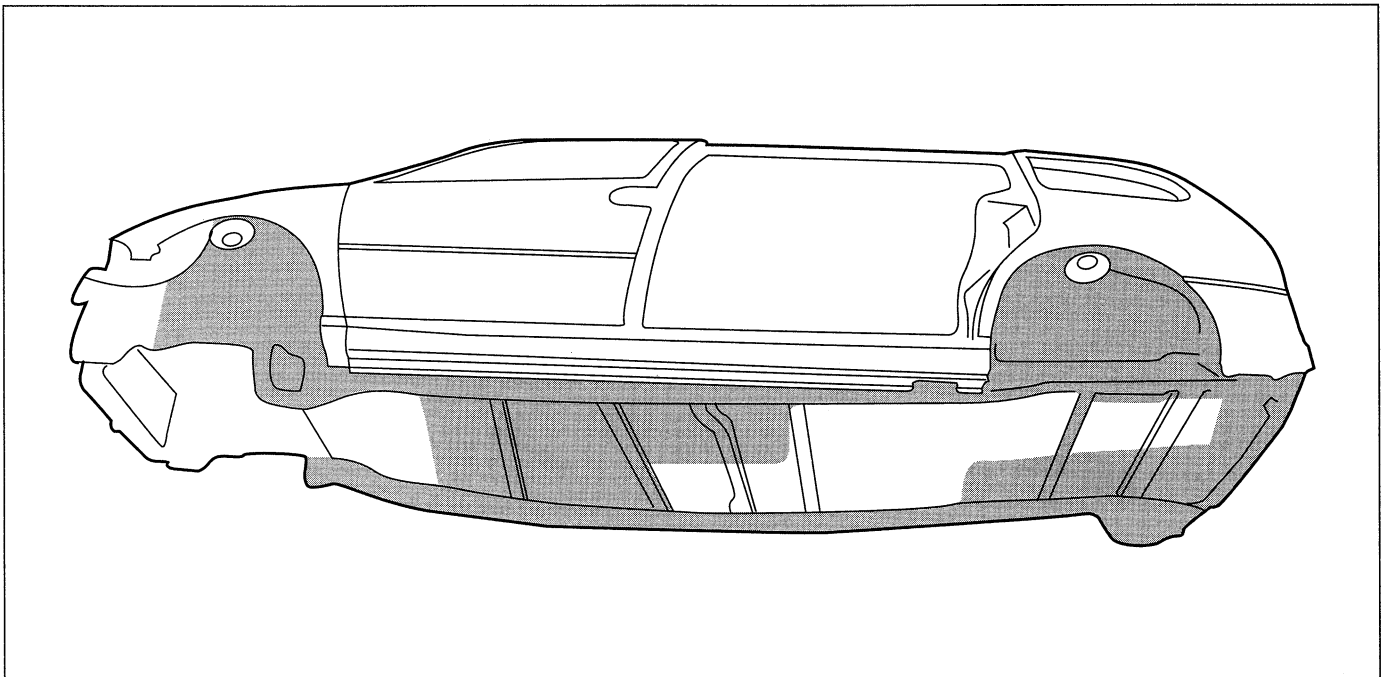
## Undercoating

The underside of the floor and wheelhouse are undercoated to prevent rust, vibration, noise and stone chipping. Therefore, when such a panel is replaced or repaired, apply undercoating to that part. Use an undercoating which is rust preventive, soundproof, vibration-proof, shock-resistant, adhesive, and durable.

### Precaution in undercoating

1. Do not apply undercoating to any place unless specified (such as the areas above the muffler and catalytic converter which are subjected to heat).
2. Do not undercoat the exhaust pipe or other parts which become hot.
3. Do not undercoat rotating parts.
4. Apply bitumen wax after applying undercoating.

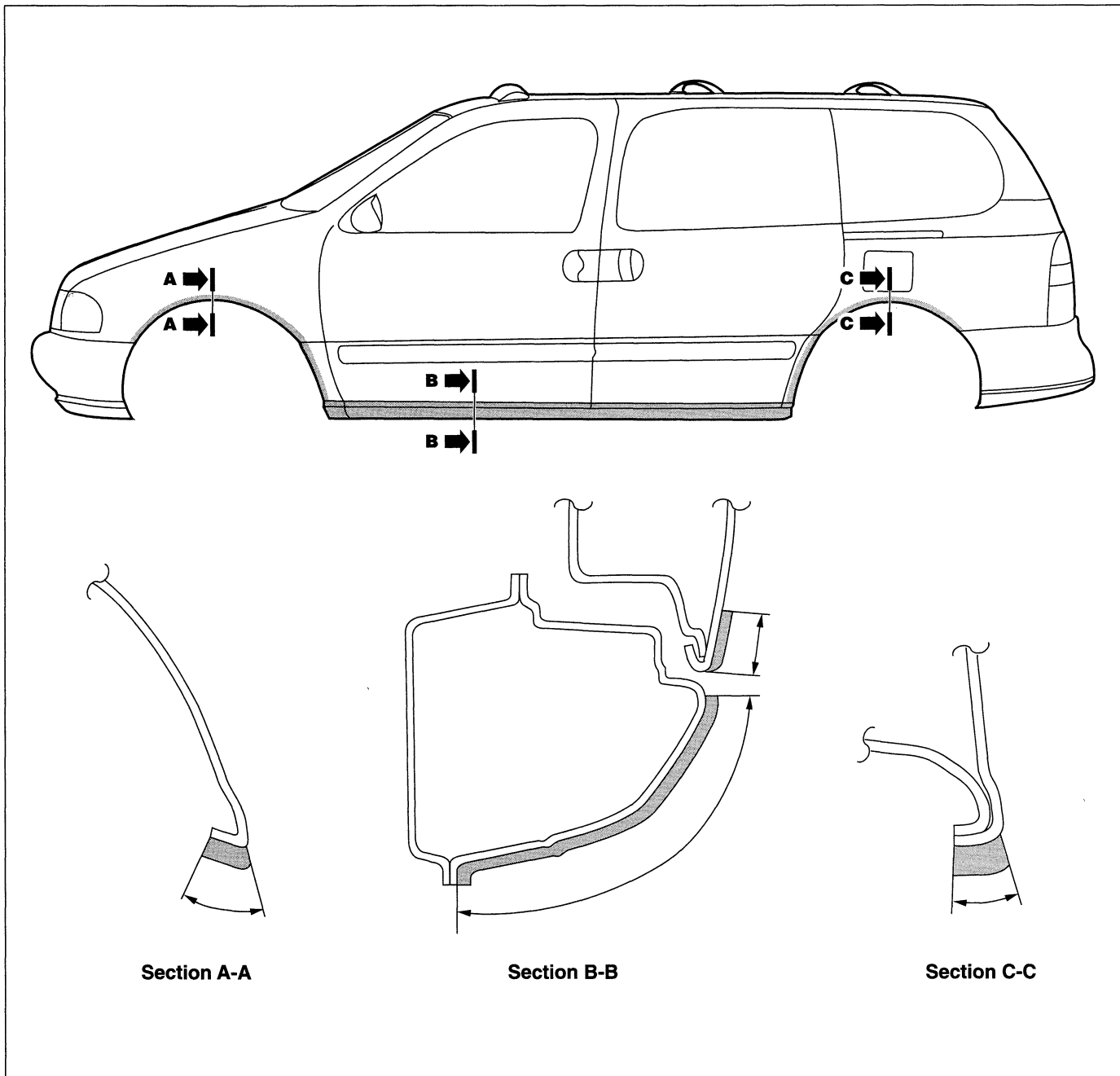
 : Indicates undercoated portions.



# Stone Guard Coat

To prevent damage caused by stones, the lower outer body panels (fender, door, etc.) have an additional layer of Stone Guard coating over the ED primer coating. When replacing or repairing these panels, apply Stone Guard coating to the same portions as before. Use a coating which is rust preventive, durable, shock-resistant and has a long shelf life.

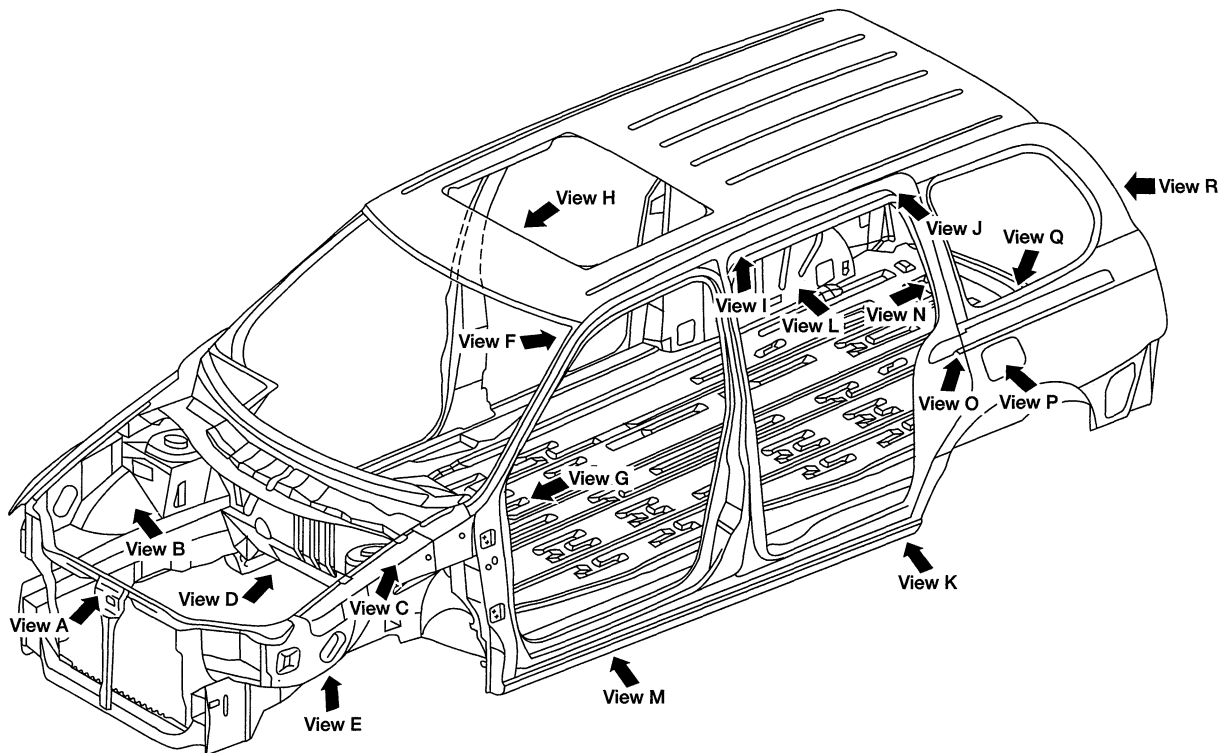
 : Indicates Stone Guard coated portions.



# Description

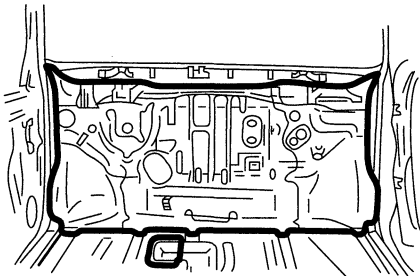
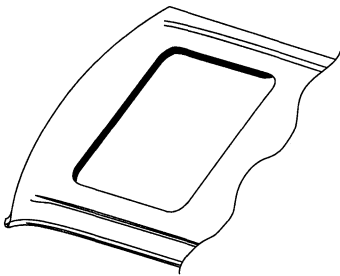
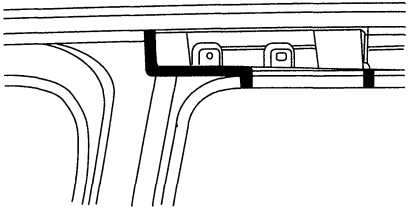
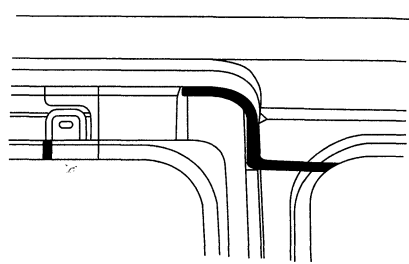
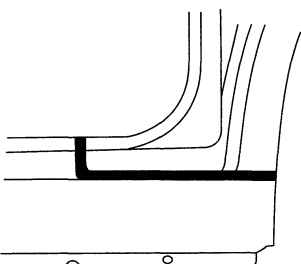
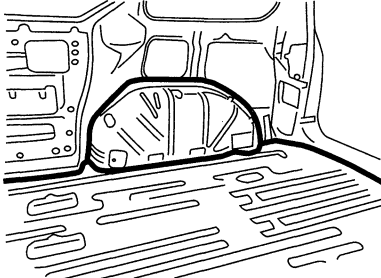
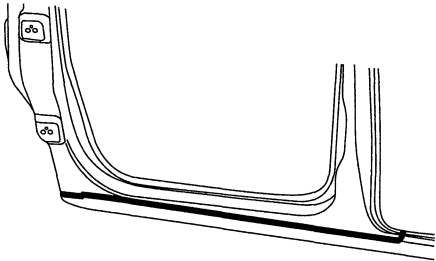

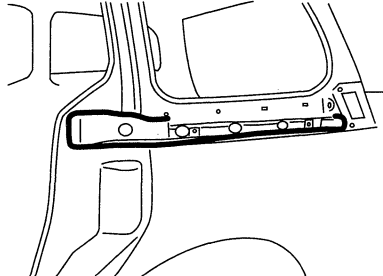
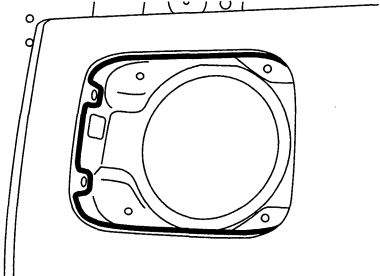
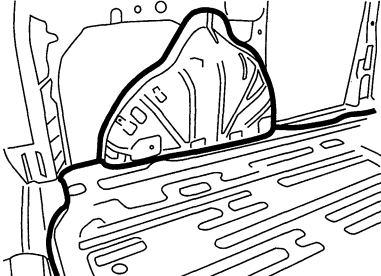
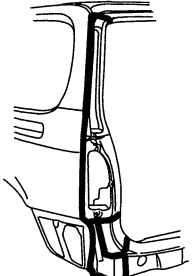
The following figure shows the areas which are sealed at the factory. Sealant which has been applied to these areas should be smooth and free from cuts or gaps.

Care should be taken not to apply an excess amount of sealant and not to allow other unaffected parts to come into contact with the sealant.



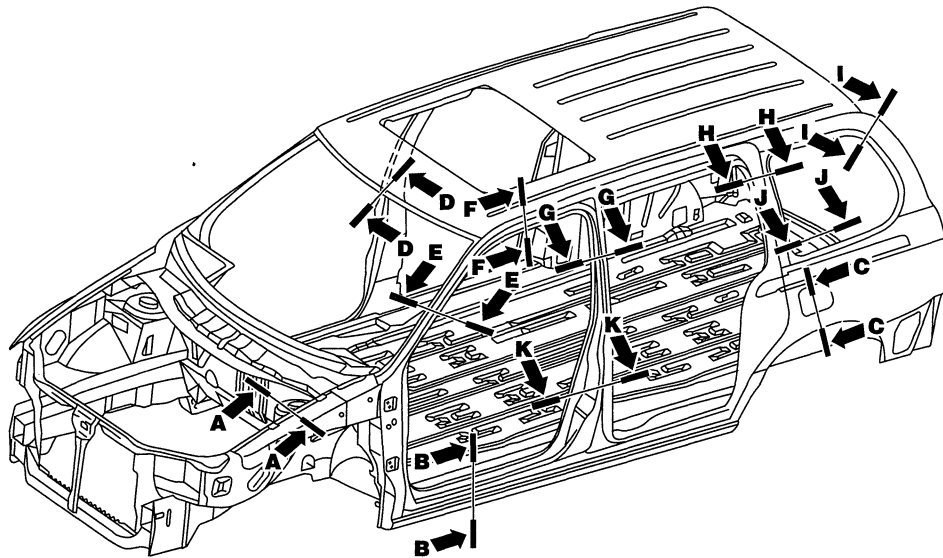
View A	View B	View C
View D	View E	View F

Description (Cont'd)

<p>View G</p> 	<p>View H</p> 	<p>View I</p> 
<p>View J</p> 	<p>View K</p> 	<p>View L</p> 
<p>View M</p> 	<p>View N</p> 	<p>View O</p> 
<p>View P</p> 	<p>View Q</p> 	<p>View R</p> 



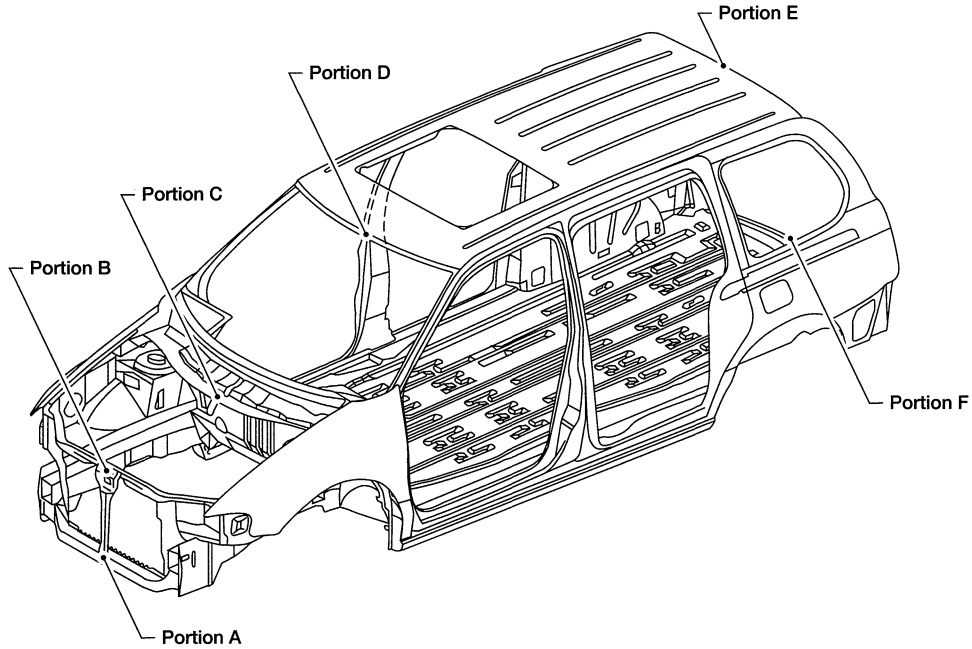
# Body Construction

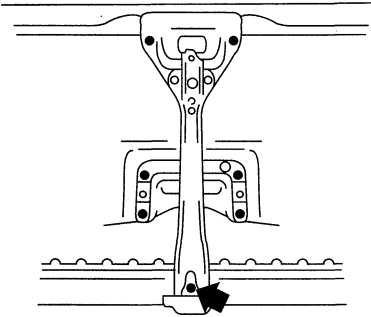
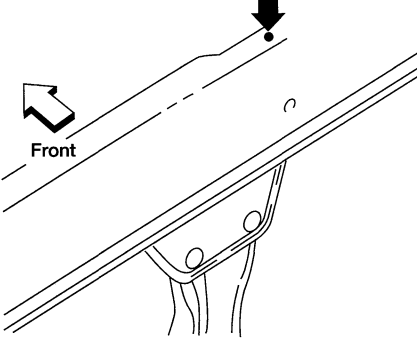
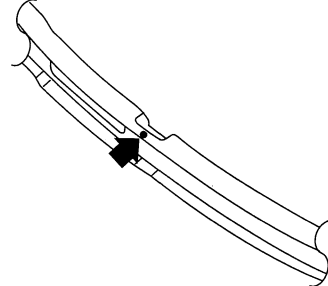
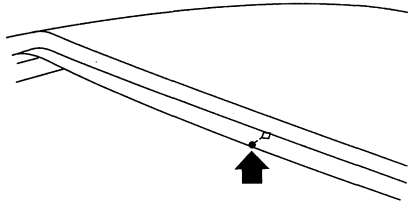
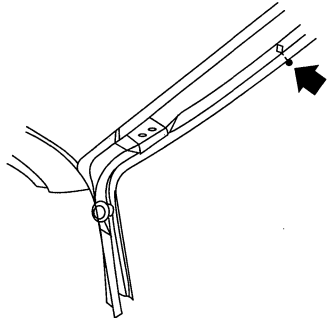
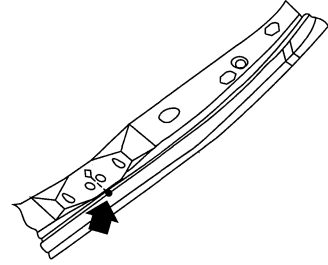


Section A - A	Section B - B	Section C - C	Section D - D
Section E - E	Section F - F	Section G - G	Section H - H
Section I - I	Section J - J	Section K - K	

# Body Center Marks

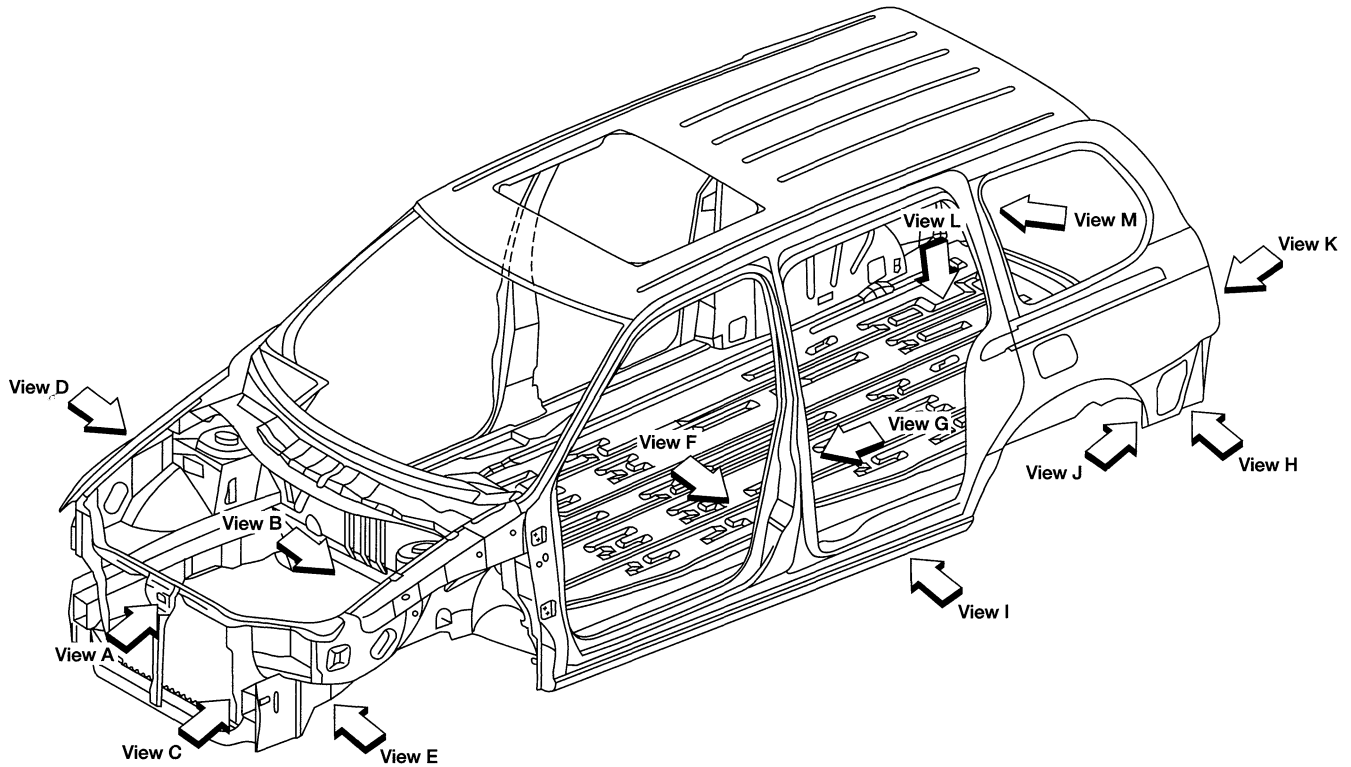
A mark has been placed on each part of the body to indicate the vehicle center. When repairing parts damaged by an accident which might affect the vehicle frame (members, pillars, etc.) more accurate, effective repair will be possible by using these marks together with body alignment data.



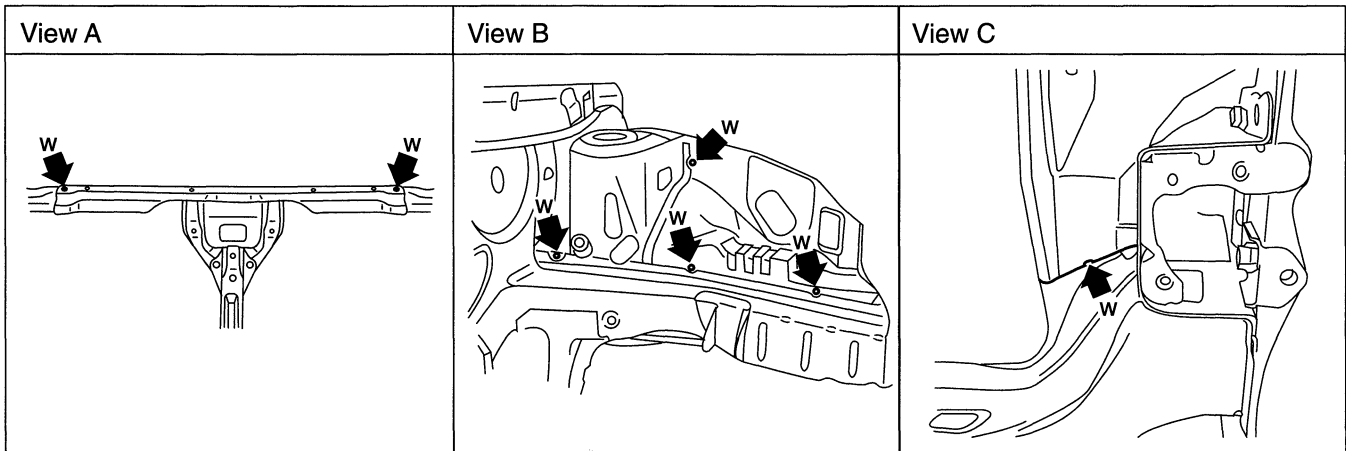
Portion A	Portion B	Portion C
 <p>● Lower radiator core support/hood lock stay</p>	 <p>● Center upper radiator core support</p>	 <p>● Cowl top</p>
Portion D	Portion E	Portion F
 <p>● Front roof</p>	 <p>● Rear roof</p>	 <p>● Upper rear crossmember</p>

# Panel Parts Matching Marks

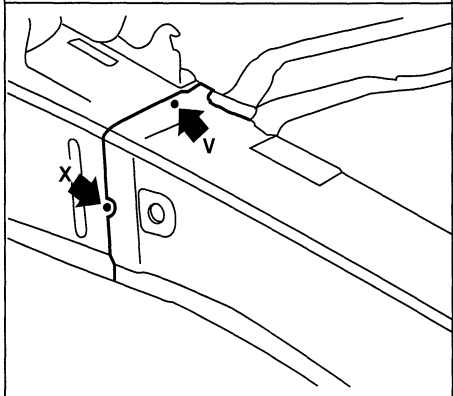
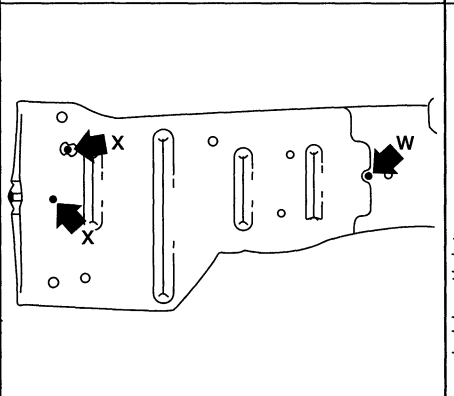
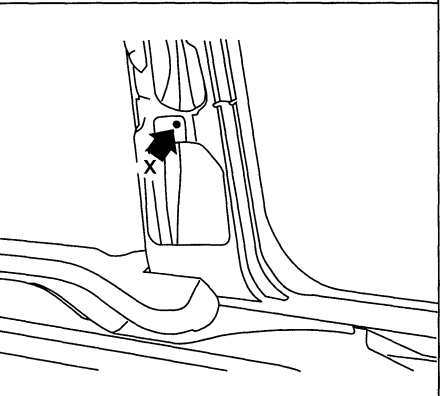
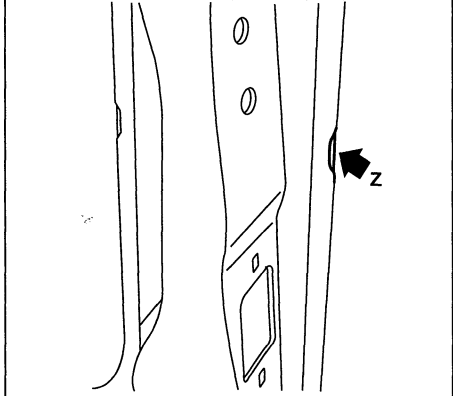
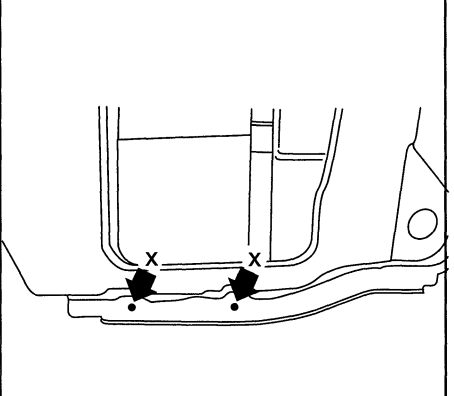
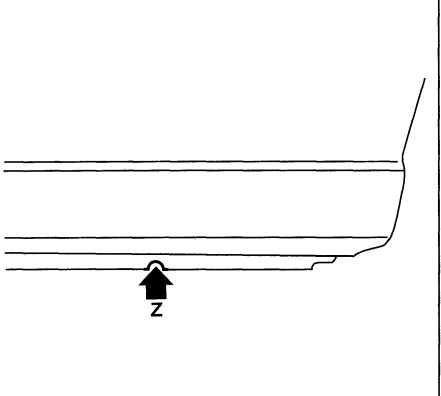
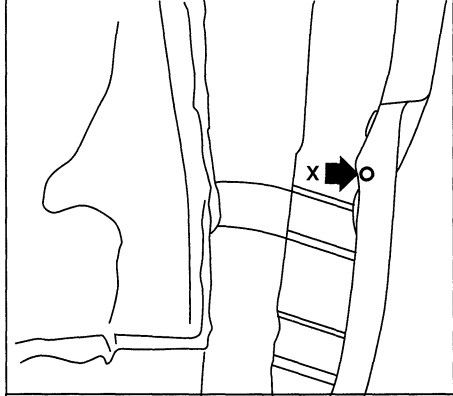
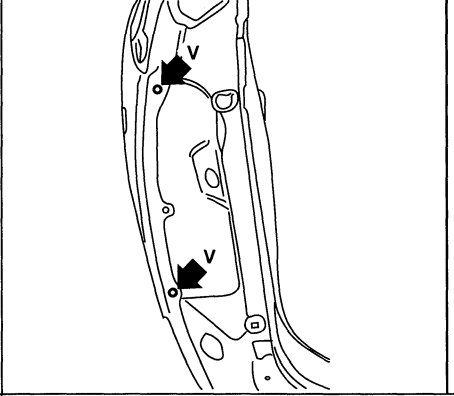
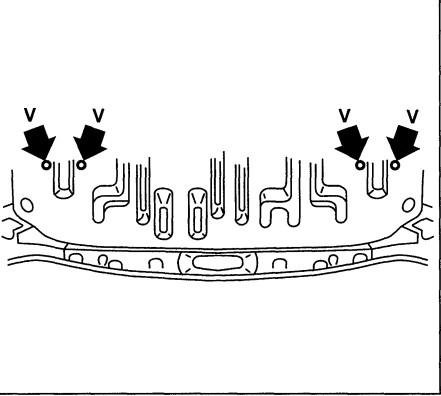
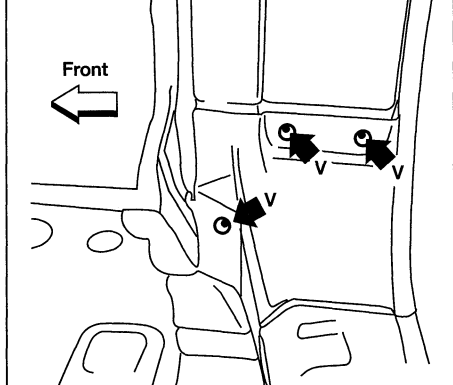
A mark has been placed on each body panel to indicate the parts' matching positions. When repairing parts damaged by an accident which might affect the vehicle structure (members, pillars, etc.) more accurate, effective repair will be possible by using these marks together with body alignment specifications.



- Type V : ○ ..... ≡ ≡
- Type W : ● ..... ≡ ≡
- Type X : ○ ..... ≡ ≡
- Type Z : ◌ ..... ≡

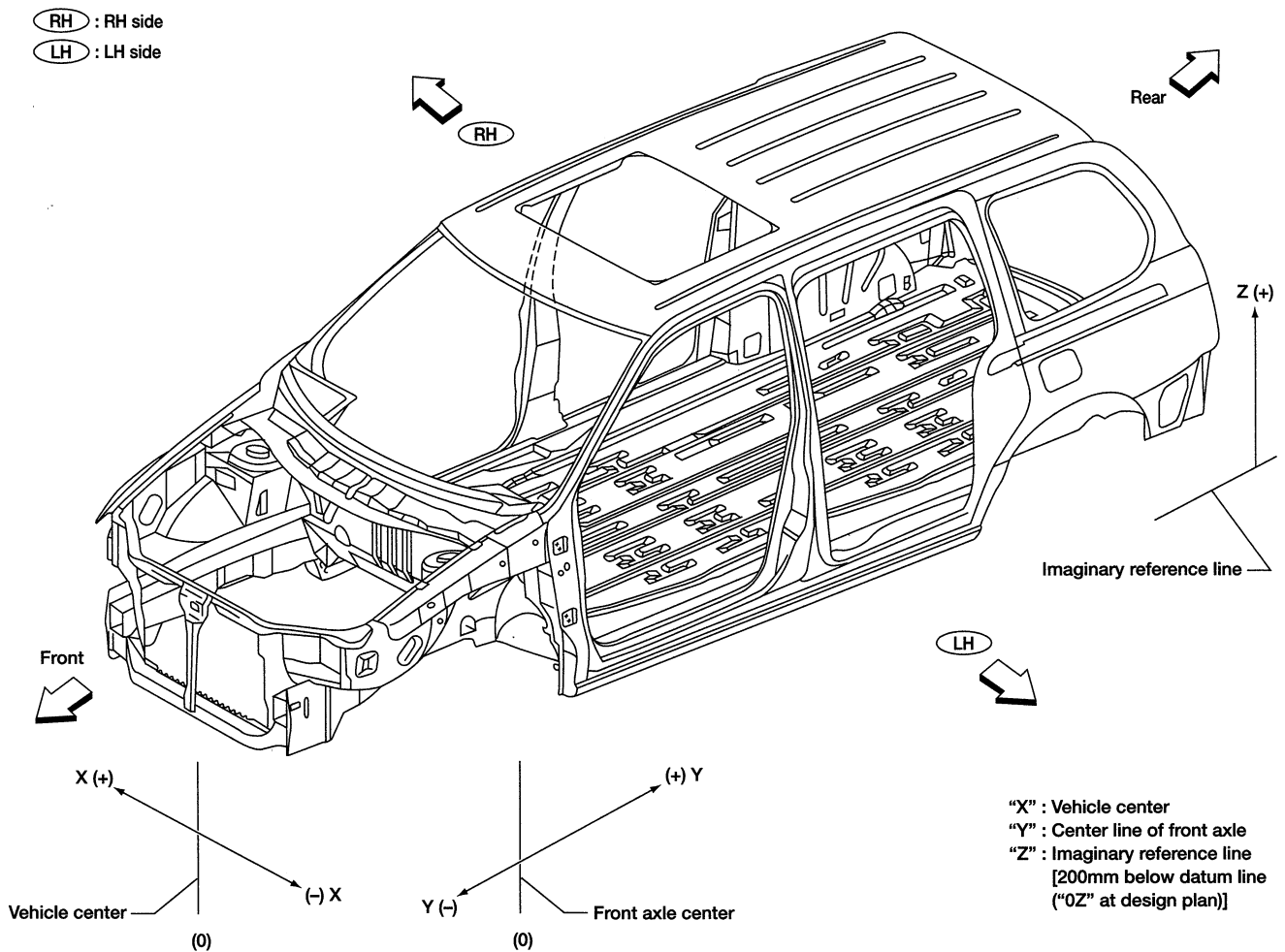


Panel Parts Matching Marks (Cont'd)

<p>View D</p> 	<p>View E</p> 	<p>View F</p> 
<p>View G</p> 	<p>View H</p> 	<p>View I</p> 
<p>View J</p> 	<p>View K</p> 	<p>View L</p> 
<p>View M</p> 		

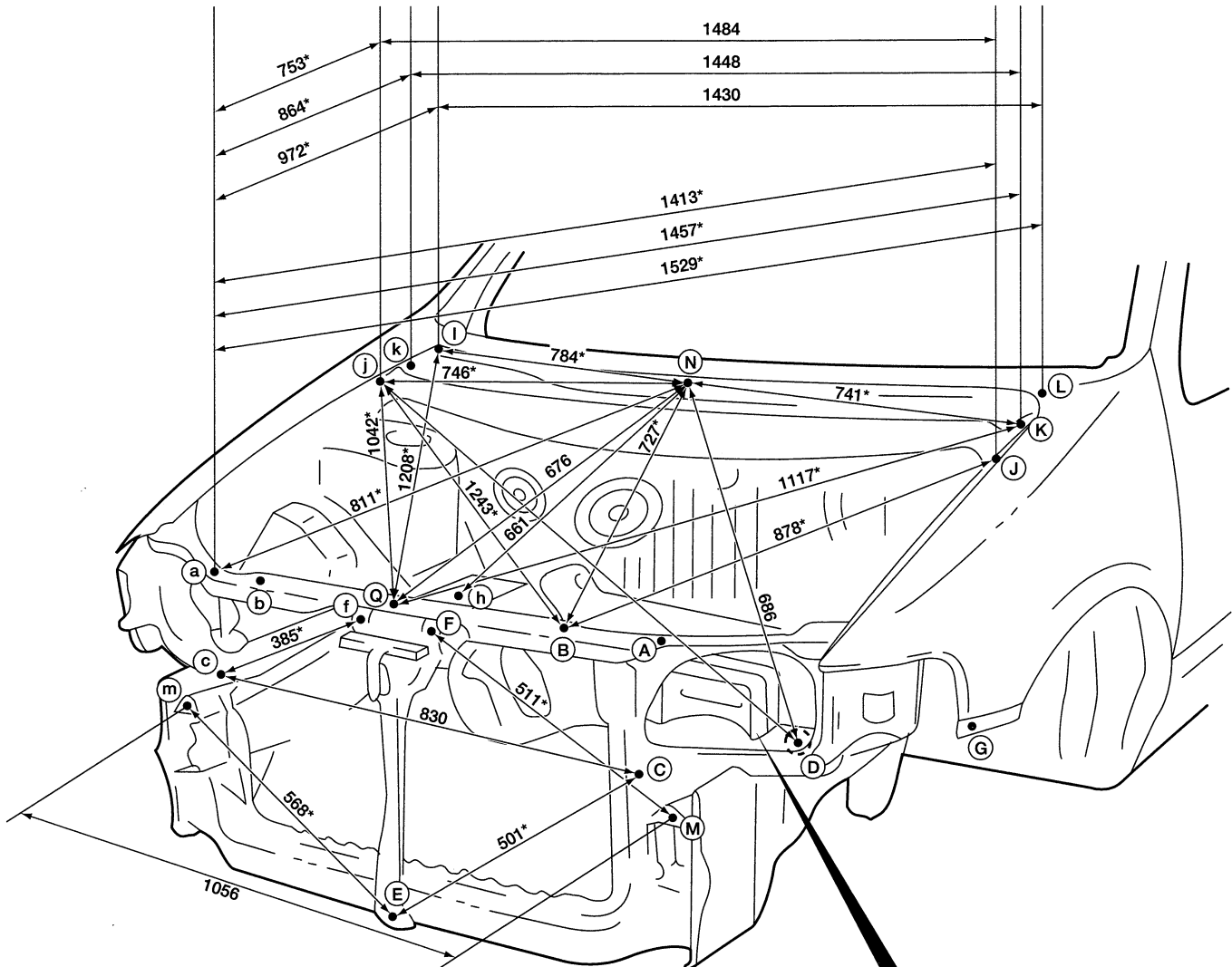
# Description

- All dimensions indicated in the figures are actual.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and the gauge to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (\*) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of "X", "Y" and "Z".

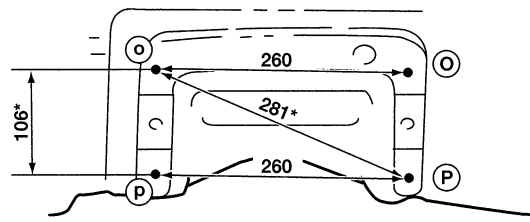


# Engine Compartment

**MEASUREMENT**



Steering gear mount



Unit: mm

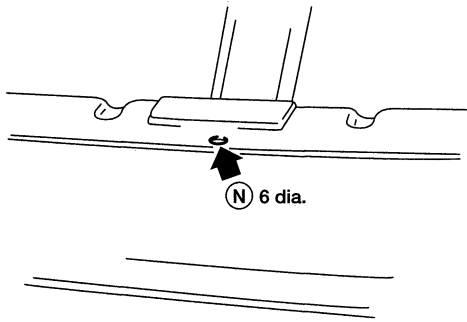
Figures marked with a \* indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Engine Compartment (Cont'd)

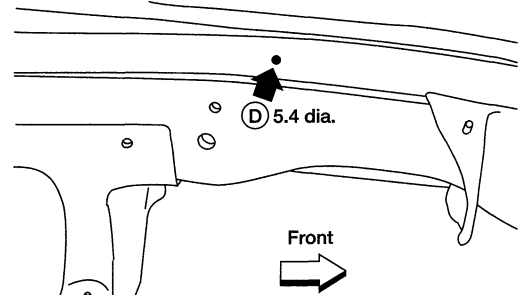
MEASUREMENT POINTS

Unit: mm

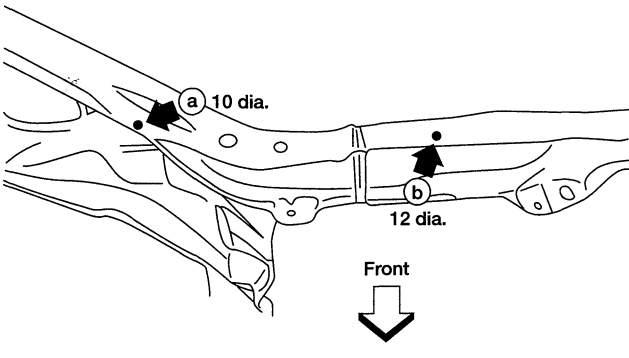
Cowl top center



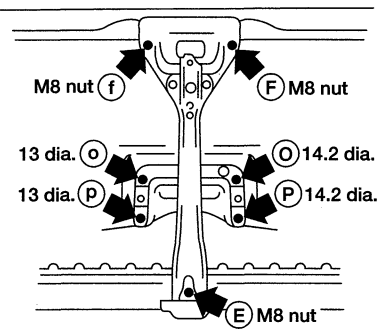
LH side member



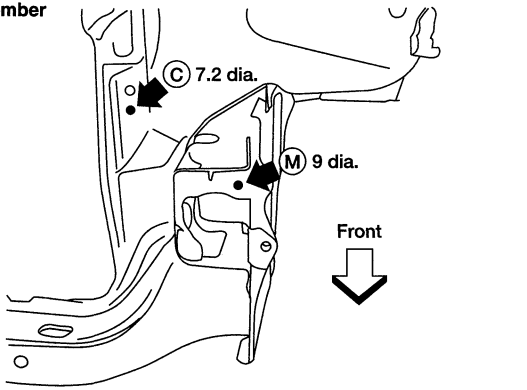
Radiator support



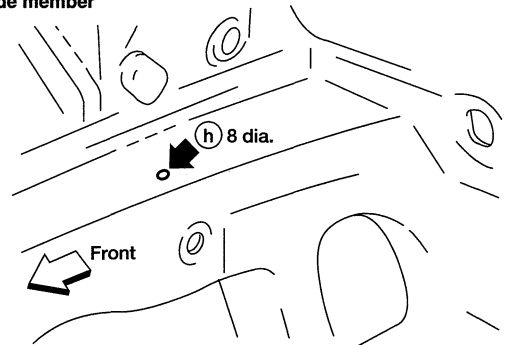
Hood lock stay



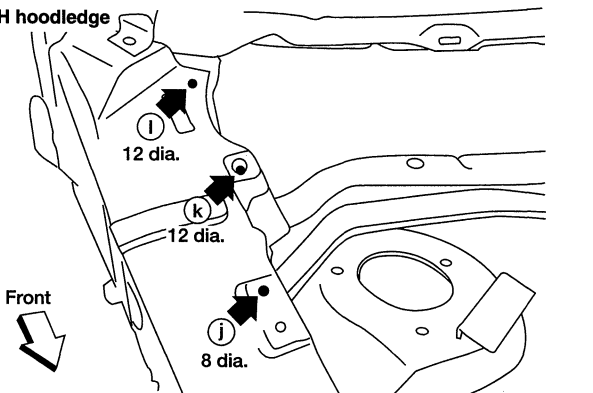
LH side member



RH side member



RH hoodledge



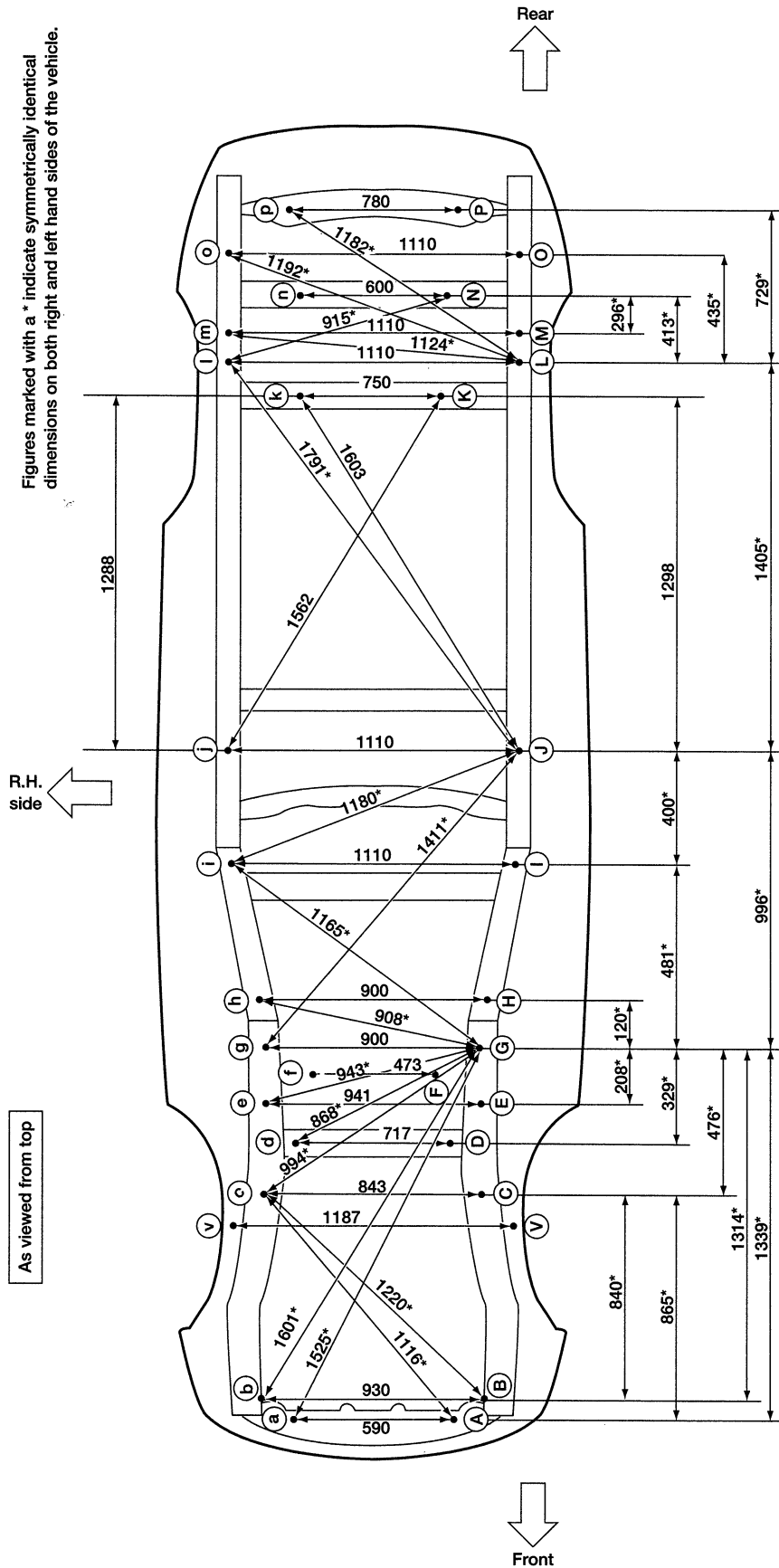
# BODY ALIGNMENT

## Underbody

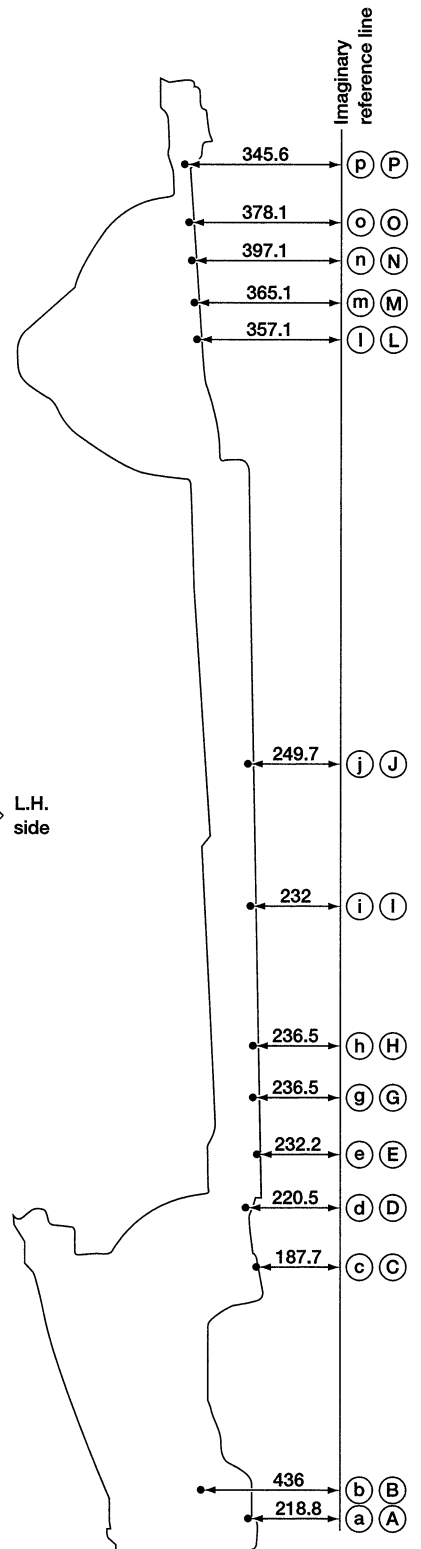
### MEASUREMENT

Unit: mm

Figures marked with a \* indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.



Measurement for centering gauge

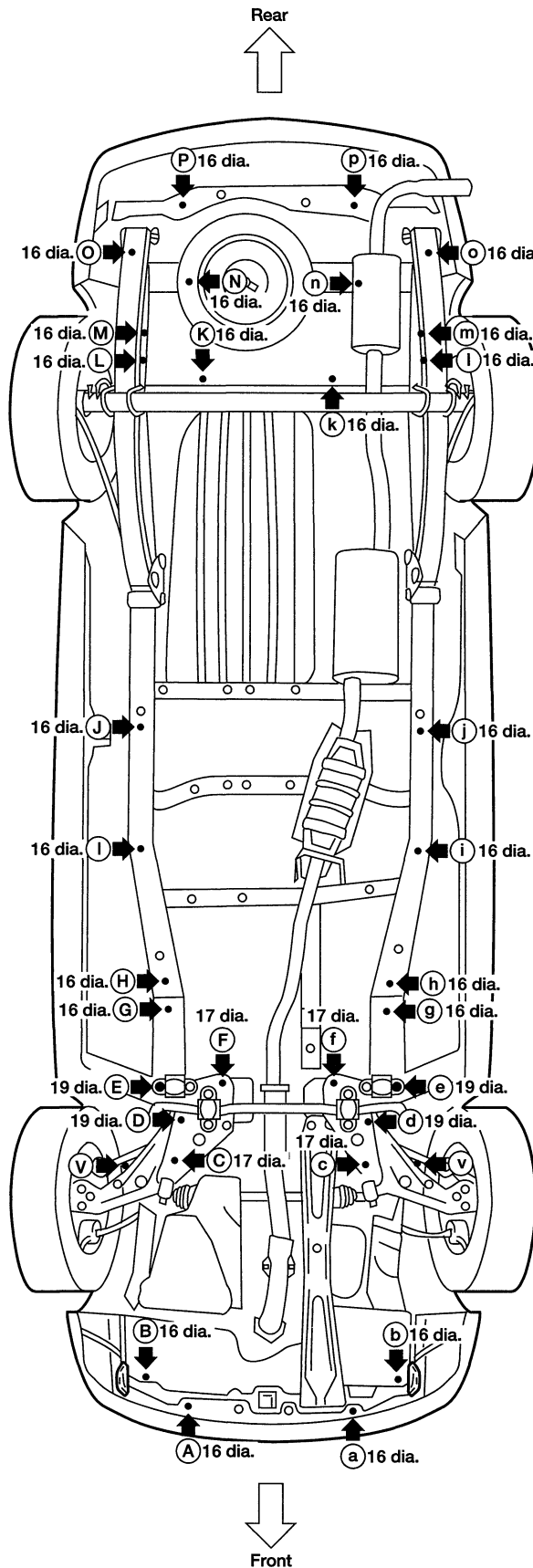




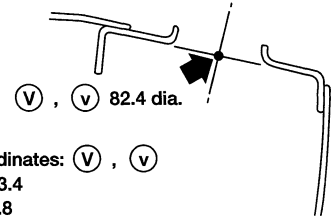
Underbody (Cont'd)

MEASUREMENT POINTS

- |          |          |
|----------|----------|
| (A), (a) | (O), (o) |
| X: 295   | X: 555   |
| Y: -750  | Y: 3410  |
| Z: 218.8 | Z: 378.1 |
| (B), (b) | (P), (p) |
| X: 465   | X: 390   |
| Y: -734  | Y: 3685  |
| Z: 436   | Z: 345.6 |
| (C), (c) |          |
| X: 421.5 |          |
| Y: 105   |          |
| Z: 187.9 |          |
| (D), (d) |          |
| X: 358.8 |          |
| Y: 264.4 |          |
| Z: 220.5 |          |
| (E), (e) |          |
| X: 470.5 |          |
| Y: 373.3 |          |
| Z: 232.2 |          |
| (F), (f) |          |
| X: 236.5 |          |
| Y: 373.3 |          |
| Z: 232.2 |          |
| (G), (g) |          |
| X: 450   |          |
| Y: 580   |          |
| Z: 236.5 |          |
| (H), (h) |          |
| X: 450   |          |
| Y: 700   |          |
| Z: 236.5 |          |
| (I), (i) |          |
| X: 555   |          |
| Y: 1170  |          |
| Z: 232   |          |
| (J), (j) |          |
| X: 555   |          |
| Y: 1570  |          |
| Z: 249.7 |          |
| (K)      |          |
| X: 340   |          |
| Y: 2850  |          |
| Z: 353.7 |          |
| (k)      |          |
| X: 410   |          |
| Y: 2850  |          |
| Z: 379.1 |          |
| (L), (l) |          |
| X: 555   |          |
| Y: 2975  |          |
| Z: 357.1 |          |
| (M), (m) |          |
| X: 555   |          |
| Y: 3150  |          |
| Z: 365.1 |          |
| (N), (n) |          |
| X: 300   |          |
| Y: 3300  |          |
| Z: 397.1 |          |



Front strut tower centers

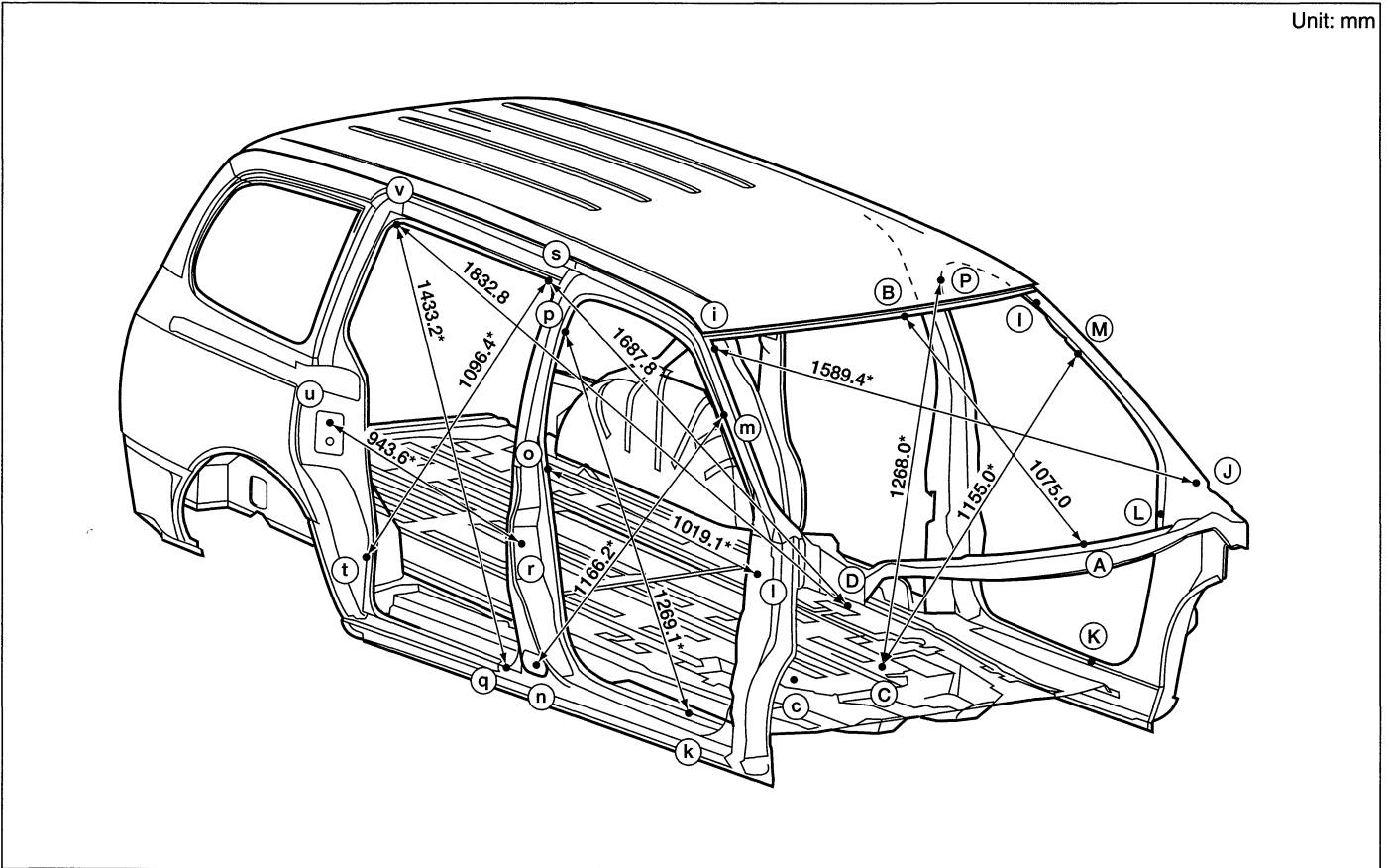


Coordinates: (V), (v)  
 X: 593.4  
 Y: 14.8  
 Z: 853.1

# Passenger Compartment

## MEASUREMENT

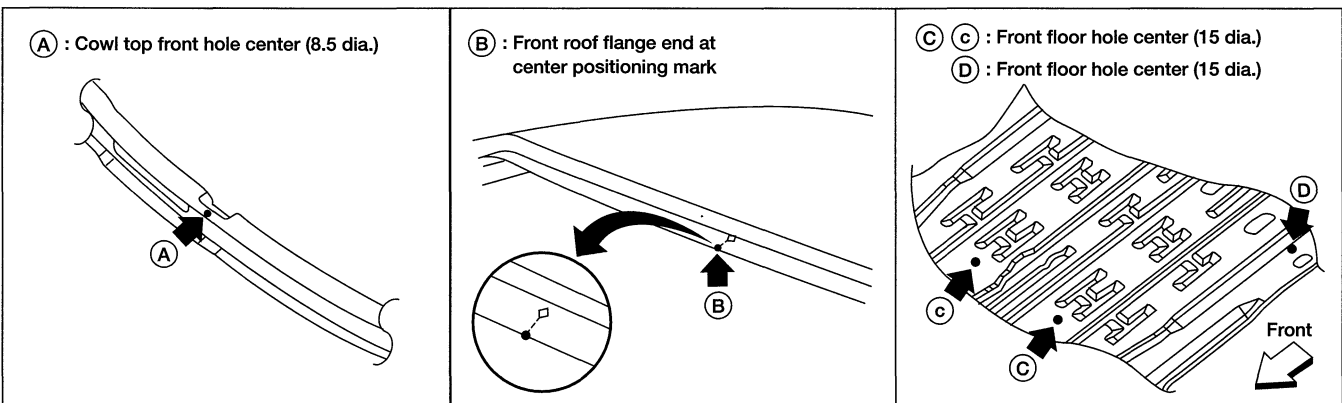
Unit: mm



Figures marked with a \* indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

Point	Dimension	Point	Dimension	Point	Dimension
C - c	420	M - m	1384.8	S - s	1284
I - i	1273.4	N - n	1703.8	T - t	1634.8
J - j	1576.8	O - o	1635.4	U - u	1702.4
K - k	1545	P - p	1444.4	V - v	1266.4
L - l	1578.2	R - r	1621		

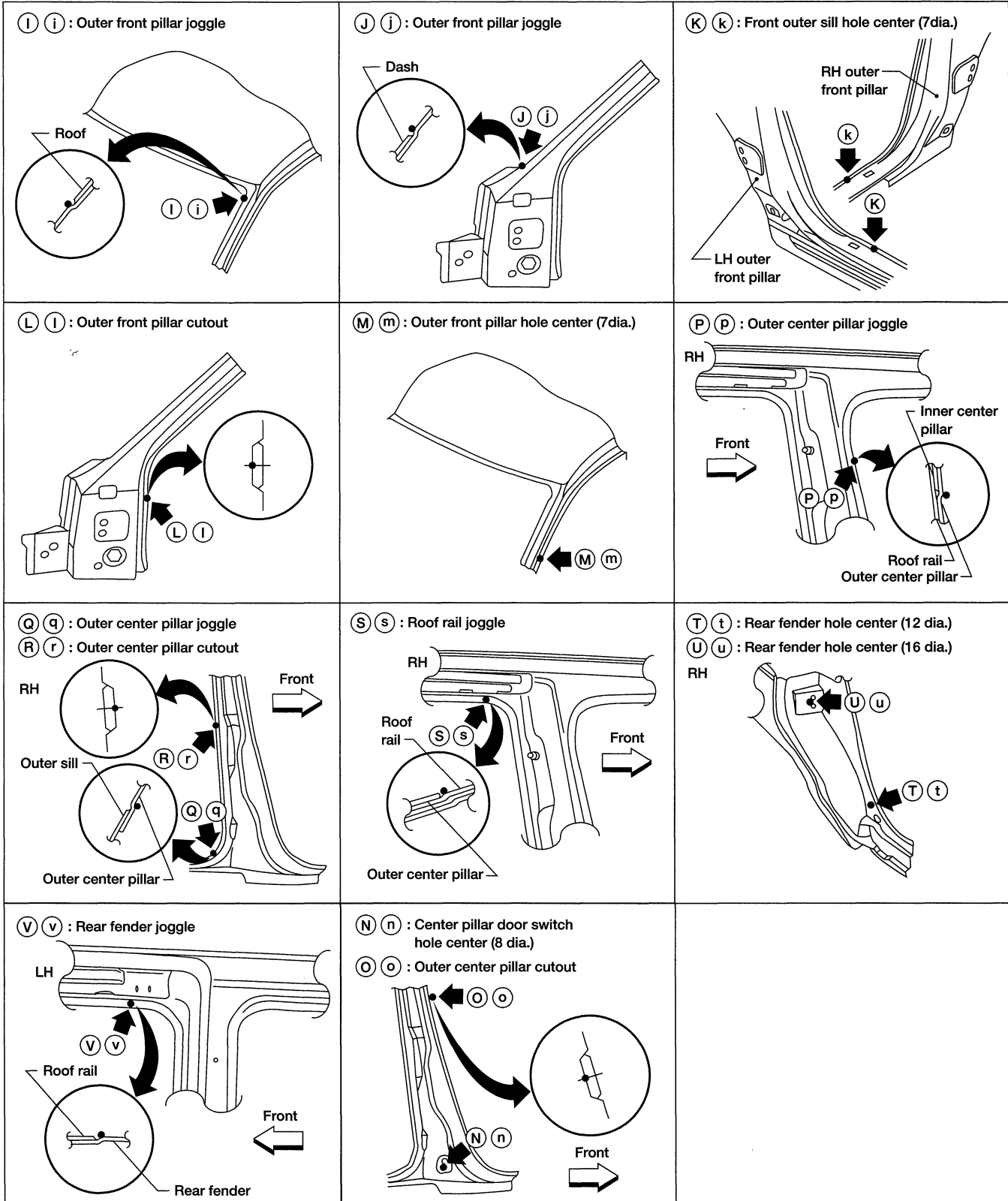
## MEASUREMENT POINTS



Passenger Compartment (Cont'd)

MEASUREMENT POINTS

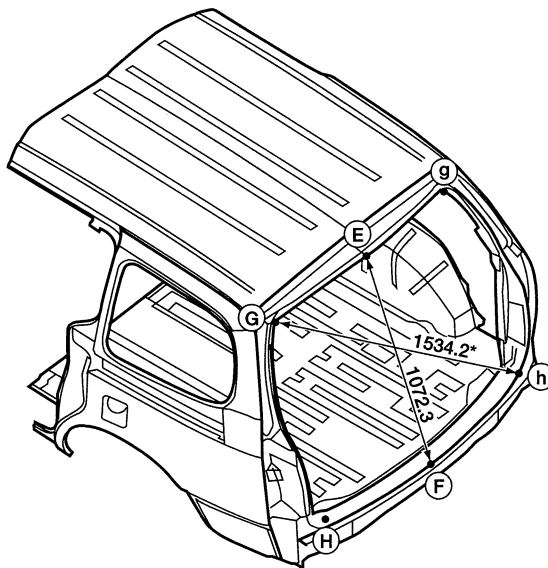
Unit: mm



# Rear Body

**MEASUREMENT**

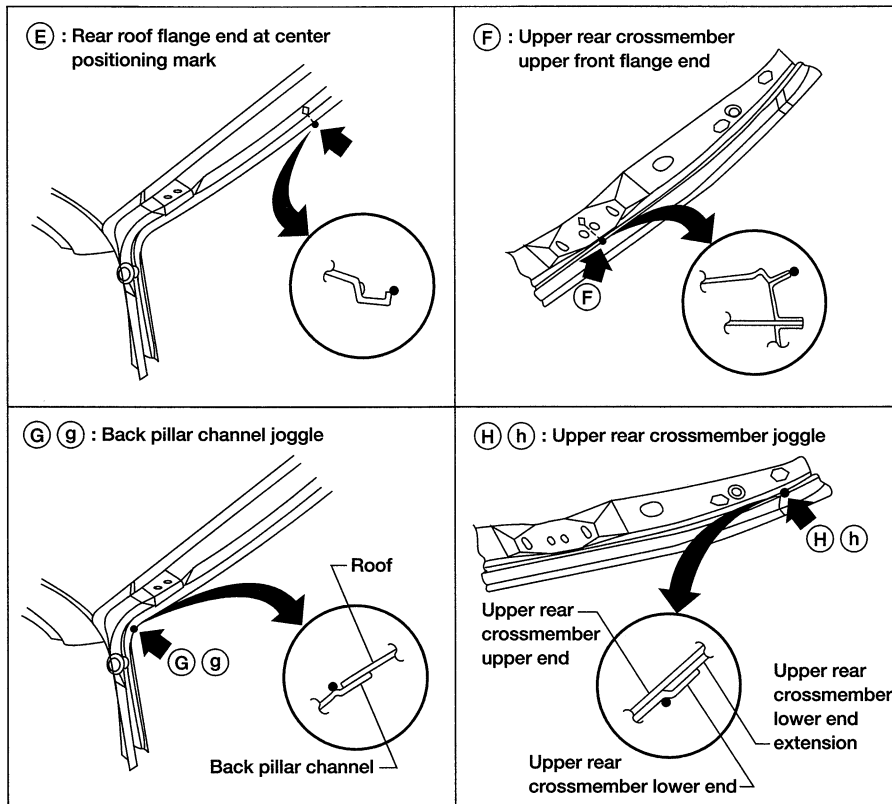
Unit: mm



Point	Dimension
G - g	1,088
H - h	1,196

Figures marked with a \* indicate symmetrically identical dimensions on both right and left hand sides of the vehicle.

**MEASUREMENT POINTS**

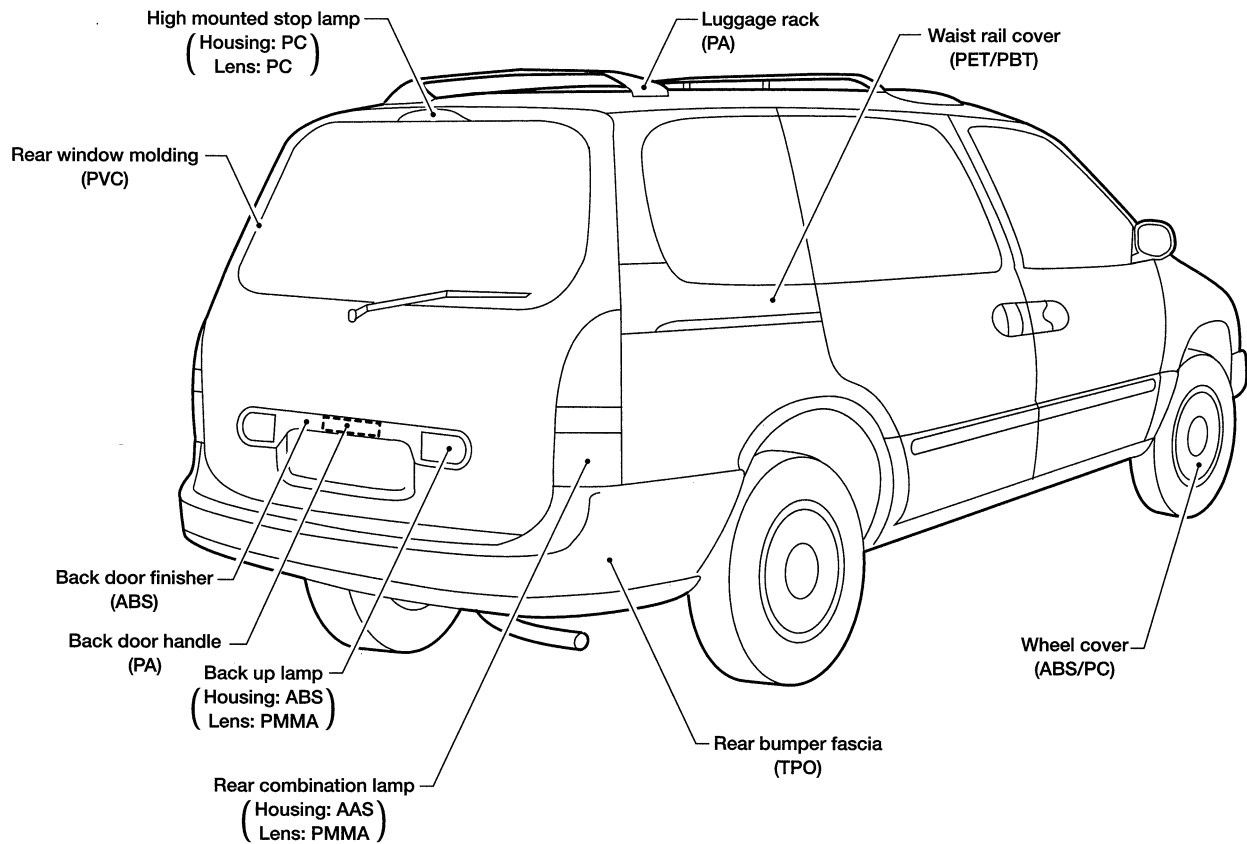
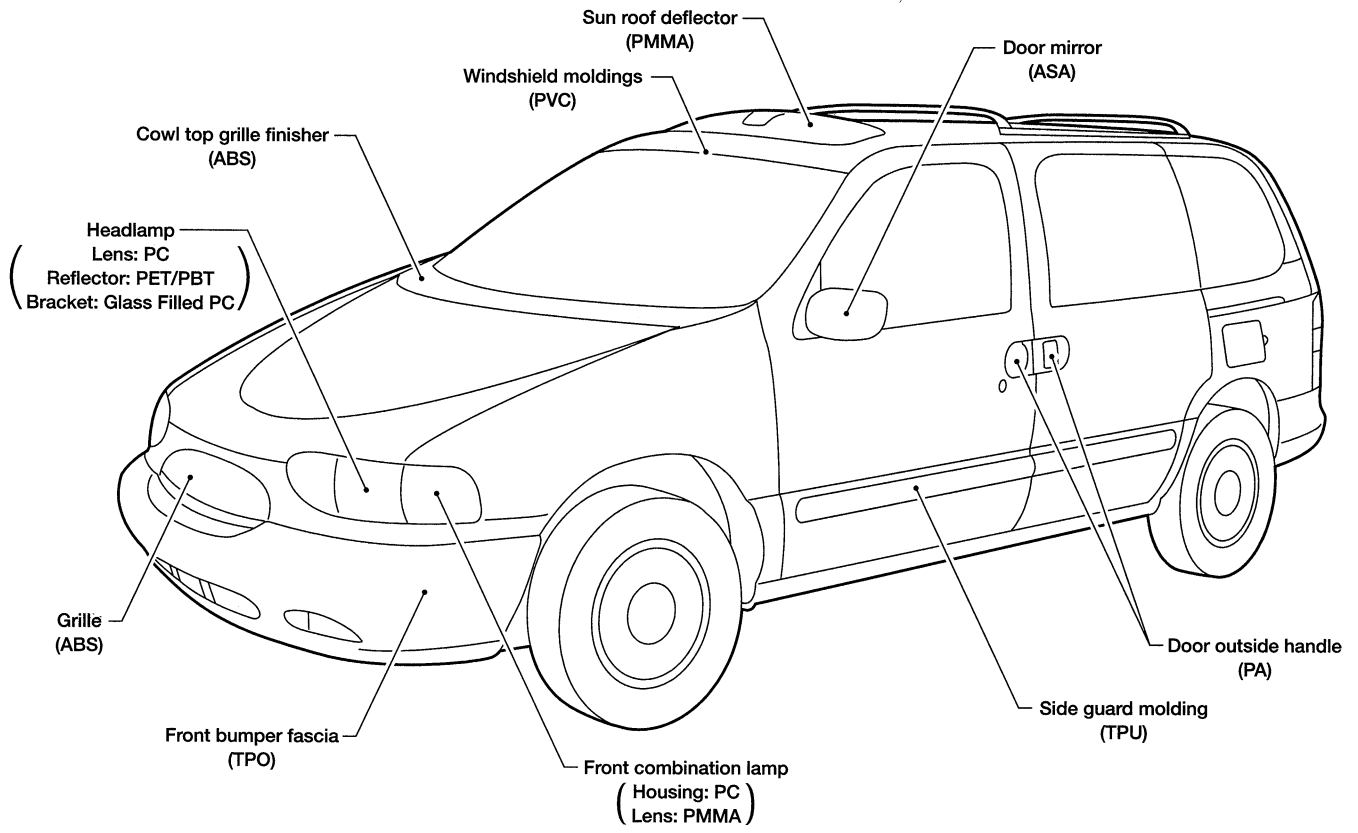


## Handling Precautions for Plastics

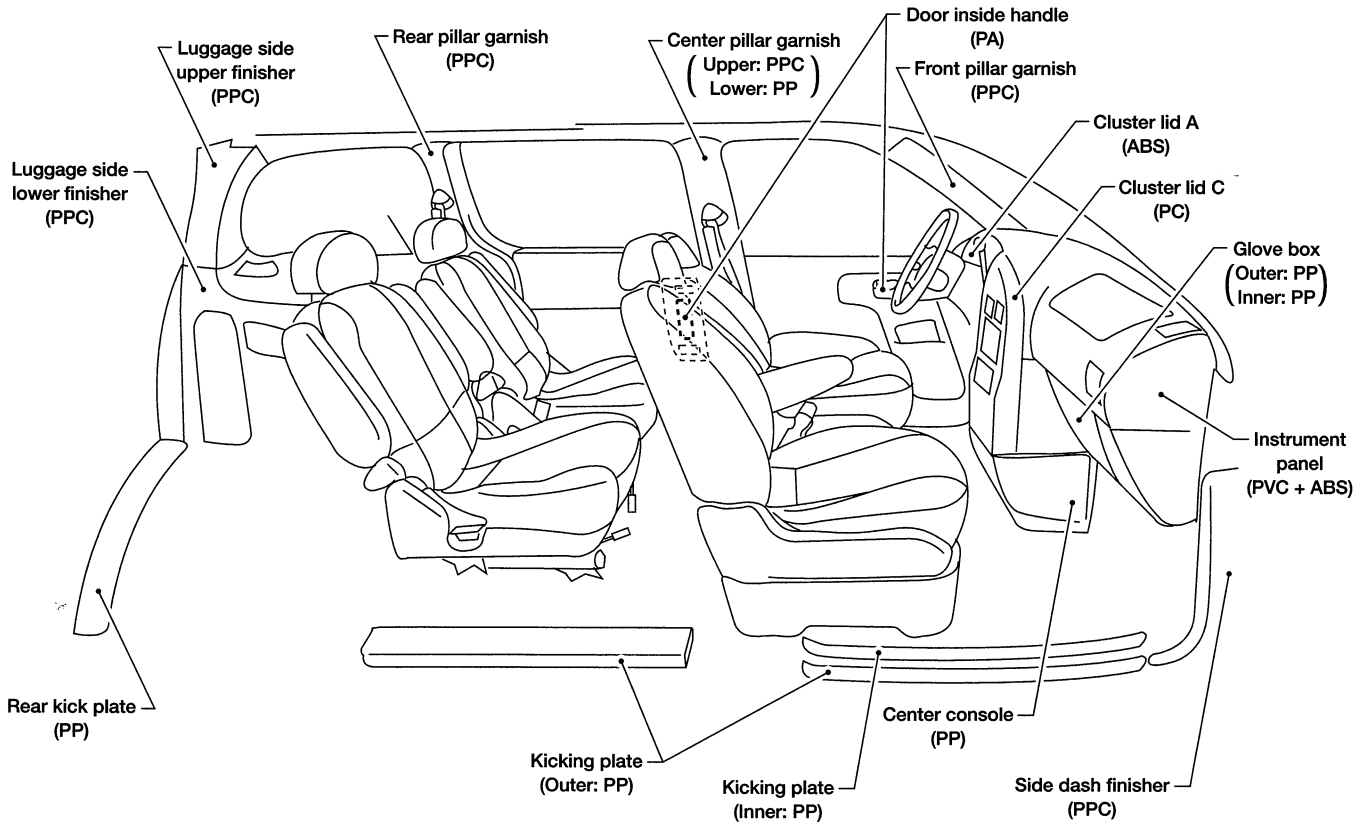
<b>Abbreviation</b>	<b>Material name</b>	<b>Heat resisting temperature °C (°F)</b>	<b>Resistance to gasoline and solvents</b>	<b>Other cautions</b>
PVC	Polyvinyl chloride	80 (176)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Poison gas is emitted when burned.
ABS	Acrylonitrile butadiene styrene resin	80 (176)	Avoid gasoline and solvents.	
PMMA	Polymethyl methacrylate	85 (185)	Avoid gasoline and solvents.	Flammable
ASA (AAS)	Acrylonitrile styrene acrylate (Acrylonitrile acrylic styrene)	85 (185)	Avoid gasoline and solvents.	Flammable
PC	Polycarbonate	120 (248)	Avoid gasoline and solvents.	
PET/(PBT)	(Polyester Polyethylene terephthalate/ Polybutylene terephthalate)	140 (284)	Gasoline and most solvents are harmless.	Avoid battery acid
(TEO) TPO	Thermoplastic olefine	80 (176)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PA	Polyamide (Nylon)	140 (284)	Gasoline and most solvents are harmless.	Avoid immersing in water
TPU	Thermoplastic urethane	110 (230)	Gasoline and most solvents are harmless.	
PE	Polyethylene	60 (140)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PP	Polypropylene	90 (194)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable
PPC	Polypropylene composite	115 (239)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Flammable

1. When repairing and painting a portion of the body adjacent to plastic parts, consider their characteristics (influence of heat and solvent) and remove them if necessary or take suitable measures to protect them.
2. Plastic parts should be repaired and painted using methods suiting the materials' characteristics.

# Location of Plastic Parts



# Location of Plastic Parts (Cont'd)



## Precautions In Repairing High Strength Steel

High strength steel is used in body panels in order to reduce vehicle weight.

Accordingly, precautions in repairing automotive bodies made of high strength steel are described below:

### High Strength Steel (HSS) Used In Nissan Vehicles

Tensile strength	Nissan designation	Major applicable parts
373 N/mm <sup>2</sup> (38 kg/mm <sup>2</sup> , 54 klb/sq in)	SP130	<ul style="list-style-type: none"><li>• Side member</li><li>• Hoodledge</li><li>• Pillar</li><li>• Hood</li><li>• Trunk lid outer</li></ul>
785 – 981 N/mm <sup>2</sup> (80 – 100 kg/mm <sup>2</sup> , 114 – 142 klb/sq in)	SP150	<ul style="list-style-type: none"><li>• Bumper reinforcement</li><li>• Door guard bar</li></ul>

SP130 is the most commonly used HSS.

SP150 HSS is used only on parts that require much more strength.



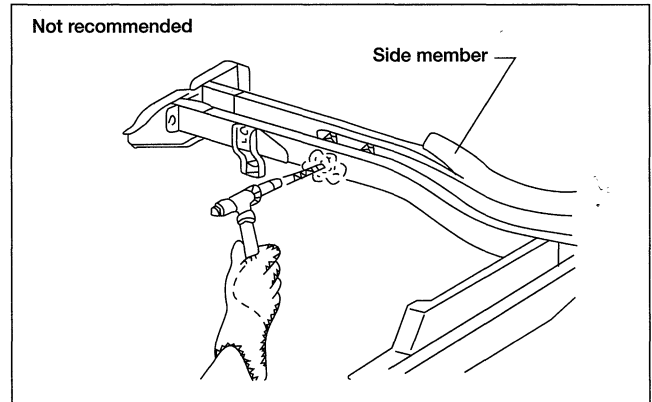
## Precautions In Repairing High Strength Steel (Cont'd)

Read the following precautions when repairing HSS:

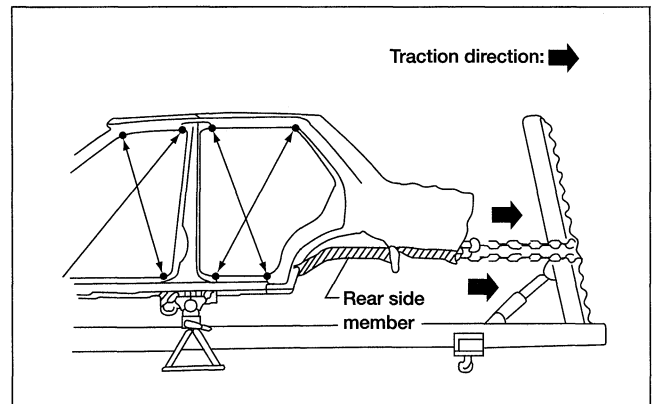
1. Additional points to consider

- The repair of reinforcements (such as side members) by heating is not recommended since it may weaken the component. When heating is unavoidable, do not heat HSS parts above 550°C (1,022°F).

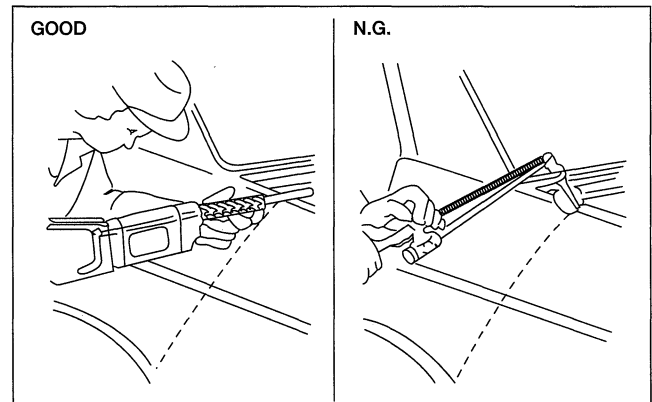
Verifying heating temperature with a thermometer. (Crayon-type and other similar type thermometers are available.)



- When straightening body panels, use caution when pulling any HSS panel. Because HSS is very strong, pulling may cause deformation in adjacent portions of the body. In this case, increase the number of measuring points, and carefully pull the HSS panel.

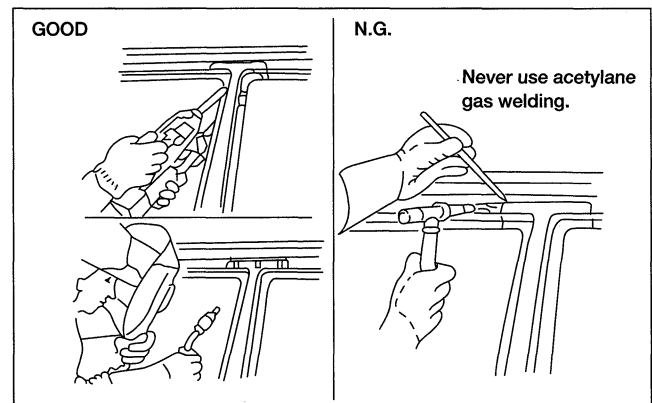


- When cutting HSS panels, avoid gas (torch) cutting if possible. Instead, use a saw or a hand cutter to avoid weakening surrounding areas due to heat. If gas (torch) cutting is unavoidable, allow a minimum margin of 50 mm (1.97 in).



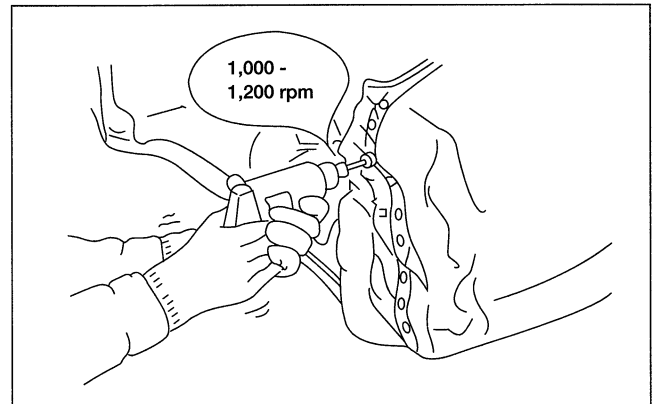
- When welding HSS panels, use spot welding whenever possible in order to minimize weakening surrounding areas due to heat.

If spot welding is impossible, use MIG welding. Do not use gas (torch) welding because it is inferior in welding strength.



## Precautions In Repairing High Strength Steel (Cont'd)

- The spot weld on HSS panels is harder than that of an ordinary steel panel.  
Therefore, when cutting spot welds on a HSS panel, use a low speed high torque drill (1,000 to 1,200 rpm) to increase drill bit durability and facilitate the operation.



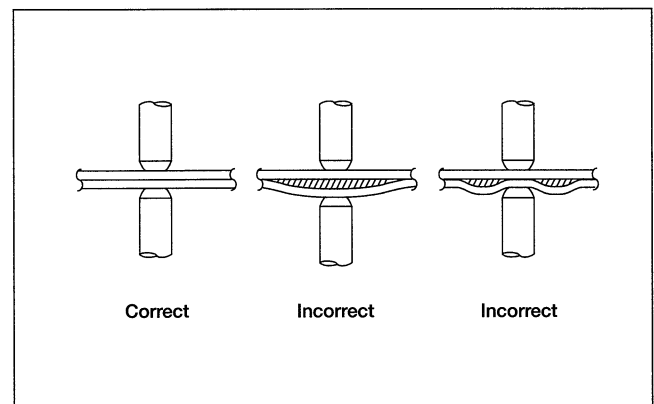
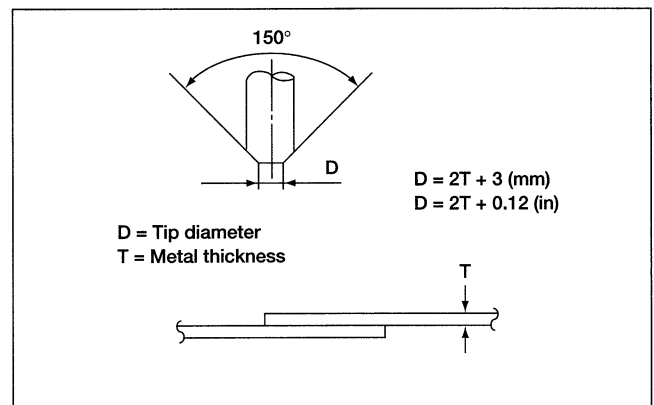
- SP150 HSS with a tensile strength of 785 to 981 N/mm<sup>2</sup> (80 to 100 kg/mm<sup>2</sup>, 114 to 142 klb/sq in), used as reinforcement in the door guard beams and in the bumper, is too strong to repair. When these HSS parts are damaged, the outer panels also sustain substantial damage; therefore, the door assembly or bumper assembly must be replaced.

### 2. Precautions in spot welding HSS

This work should be performed under standard working conditions.

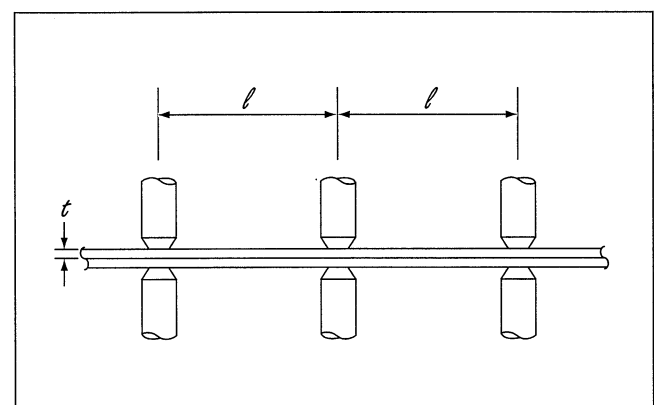
Always note the following when spot welding HSS:

- The electrode tip diameter must be sized properly according to the metal thickness.
- The panel surfaces must fit flush to each other, leaving no gaps.




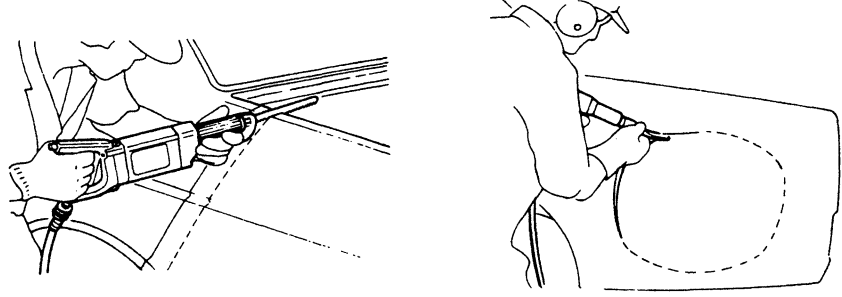
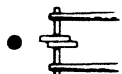


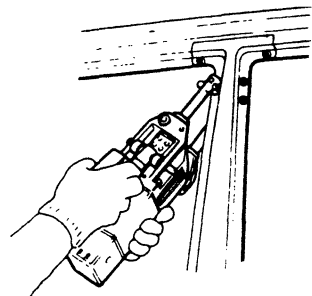

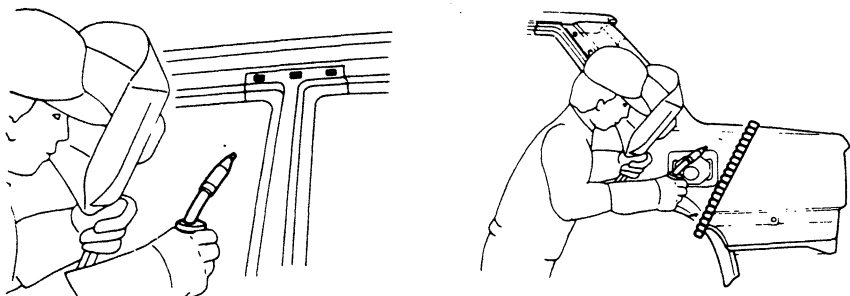

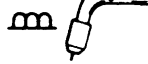
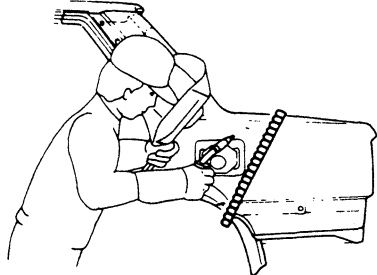


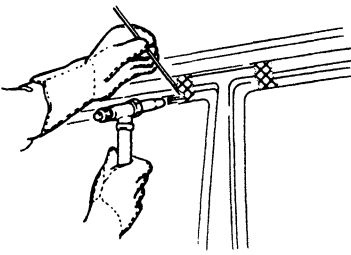


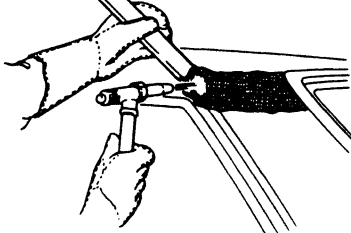

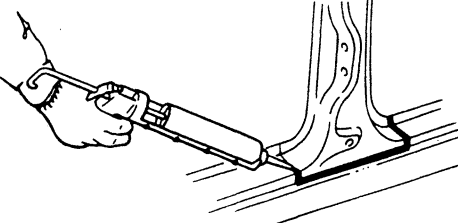
- Follow the specifications for the proper welding pitch.

Unit: mm (in)	
Thickness (t)	Minimum pitch (ℓ)
0.6 (0.024)	10 (0.39) or over
0.8 (0.031)	12 (0.47) or over
1.0 (0.039)	18 (0.71) or over
1.2 (0.047)	20 (0.79) or over
1.6 (0.063)	27 (1.06) or over
1.8 (0.071)	31 (1.22) or over



# Description

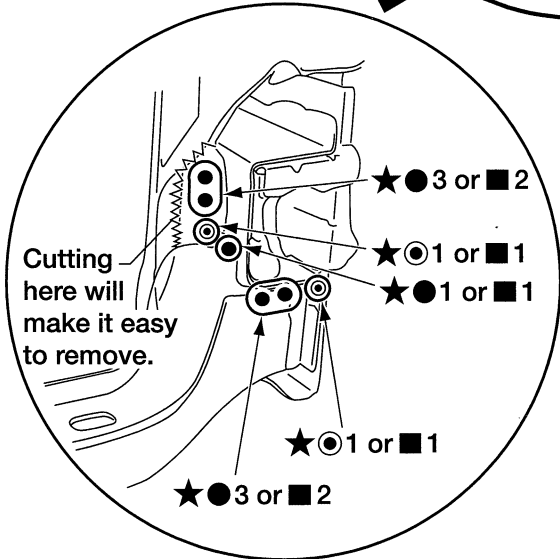
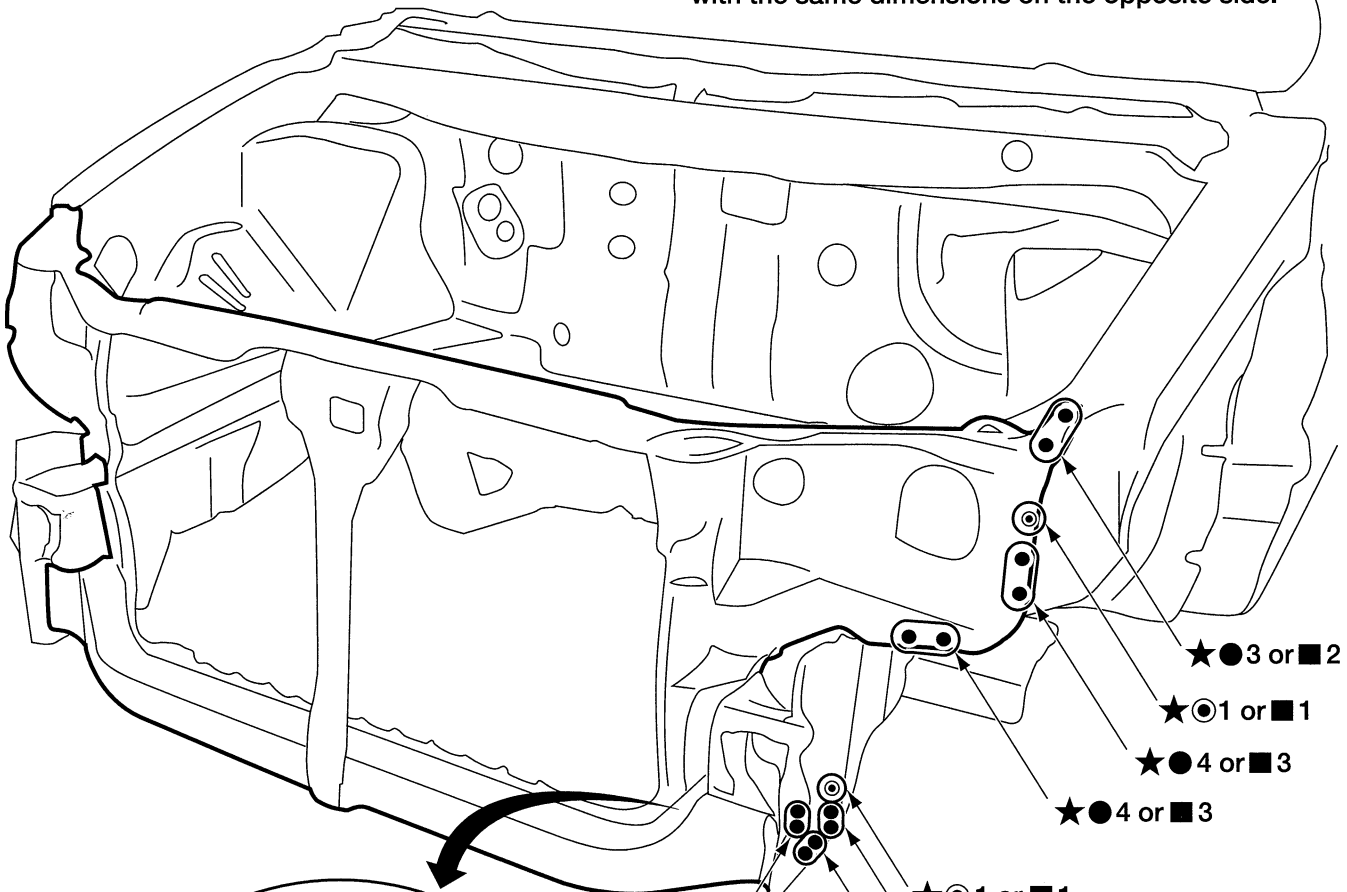
The symbols used in this manual for cutting and welding/brazing operations are shown below.

 <p>Saw cut or air chisel cut</p>		
<p>Spot weld</p> <p>● ● ● ●</p> <p>2-spot welds</p>  <p>⊙ ⊙ ⊙ ⊙</p> <p>3-spot welds</p> 	<p>2-spot welds (2-panel overlapping portions)</p>  <p>3-spot welds (3-panel overlapping portions)</p>	
<p>■ ■ ■</p> <p>MIG plug weld</p> 		
 <p>MIG seam weld/ Point weld</p> 		
 <p>Brazing</p> 		
 <p>Soldering</p> 		
 <p>Sealing</p>		

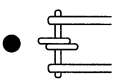
# Radiator Core Support

## Service Joint

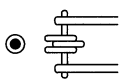
★ Indicates there is an equivalent welding portion with the same dimensions on the opposite side.



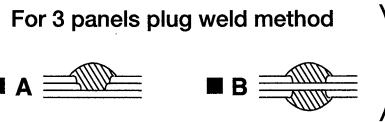
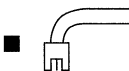
2-spot welds



3-spot welds



MIG Plug weld

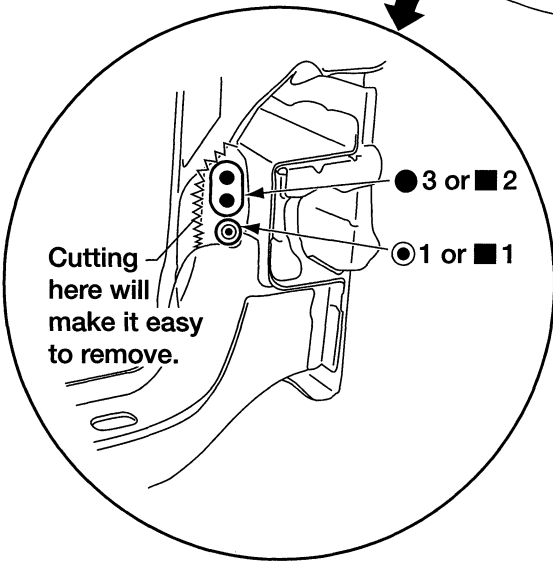
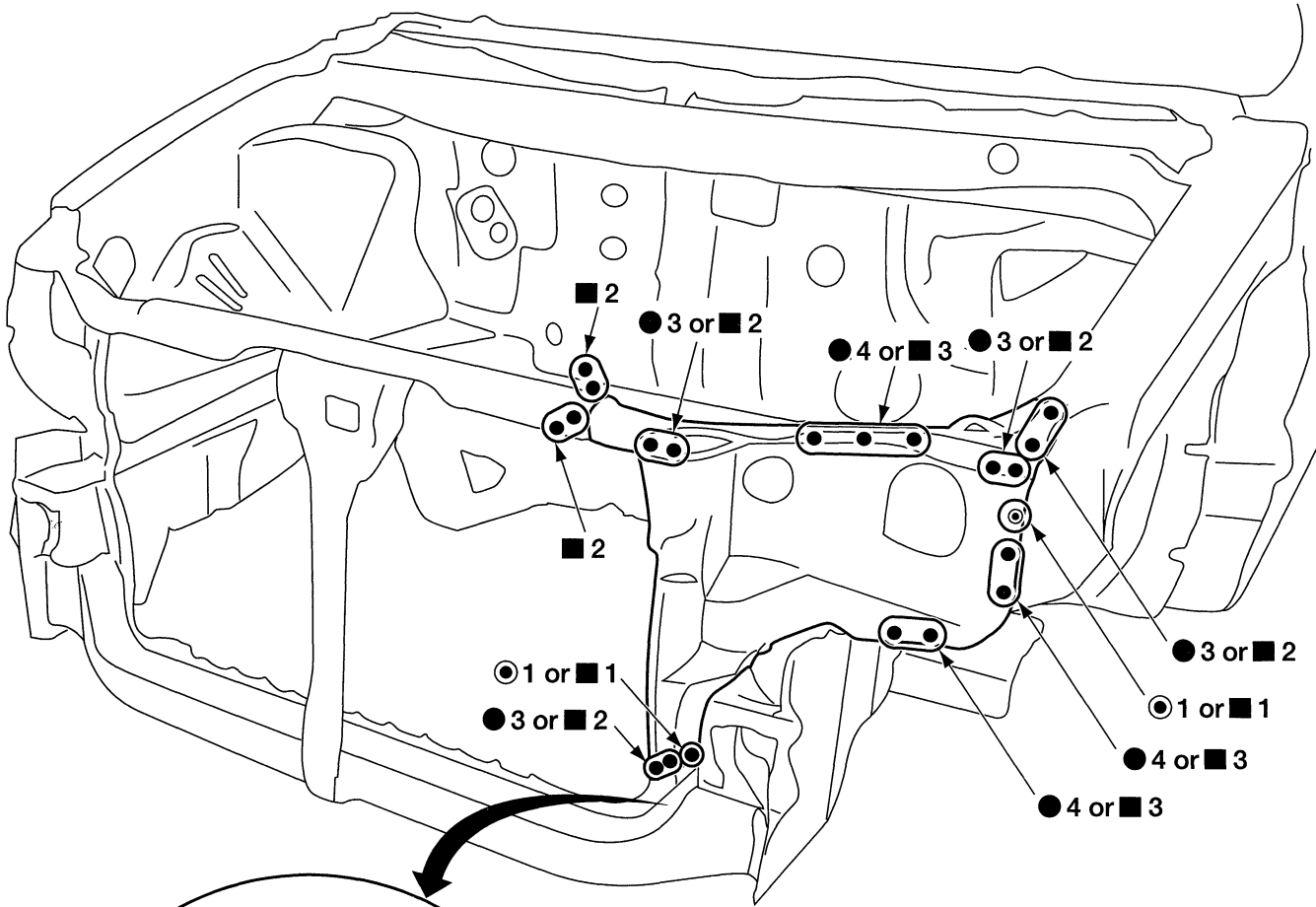


MIG seam weld/  
Point weld

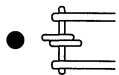


# Radiator Core Support (Partial Replacement)

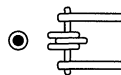
## Service Joint



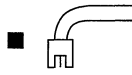
2-spot welds



3-spot welds



MIG Plug weld



For 3 panels plug weld method

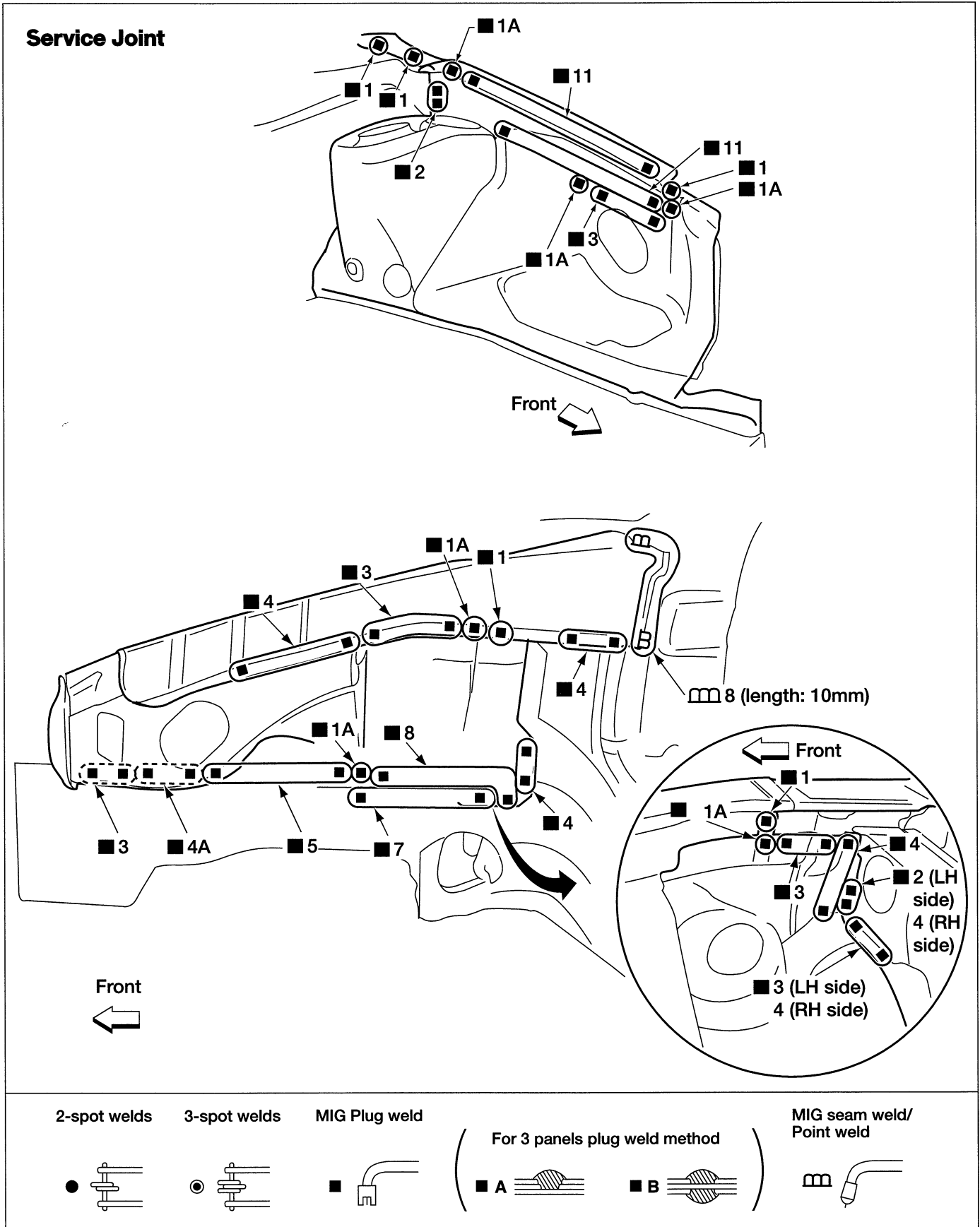


MIG seam weld/  
Point weld



# Hoodledge

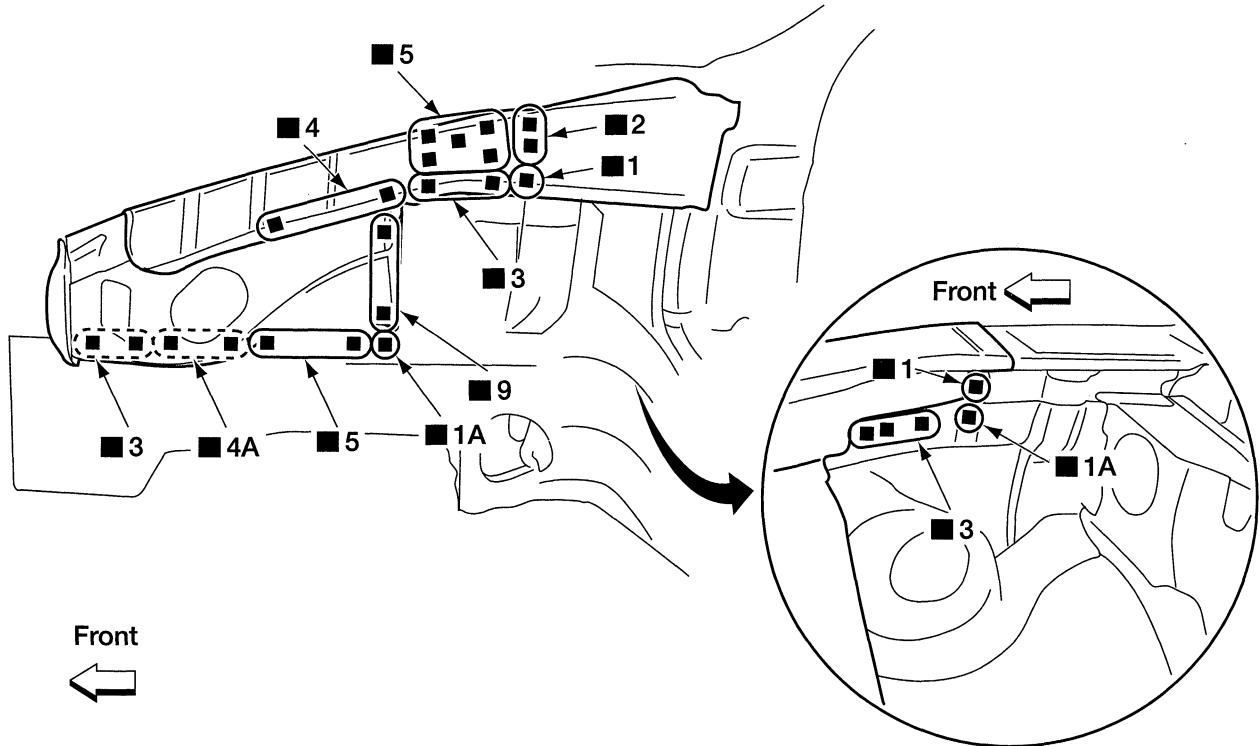
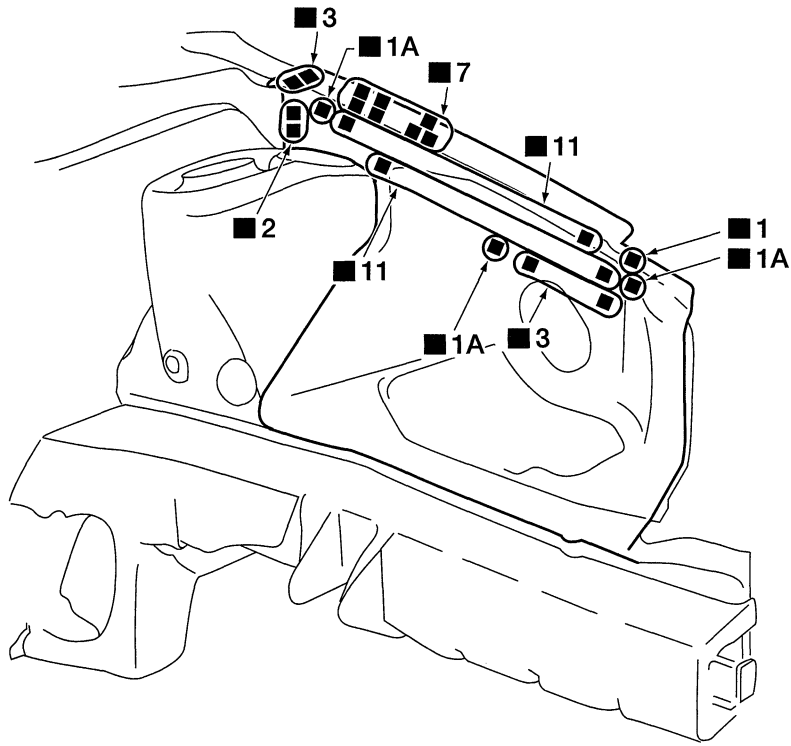
● Work after radiator core support has been removed.



# Hoodledge (Partial Replacement)

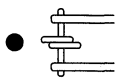
● Work after radiator core support has been removed.

## Service Joint

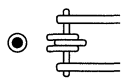


Front  
←

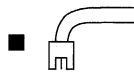
2-spot welds



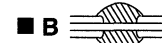
3-spot welds



MIG Plug weld



( For 3 panels plug weld method )

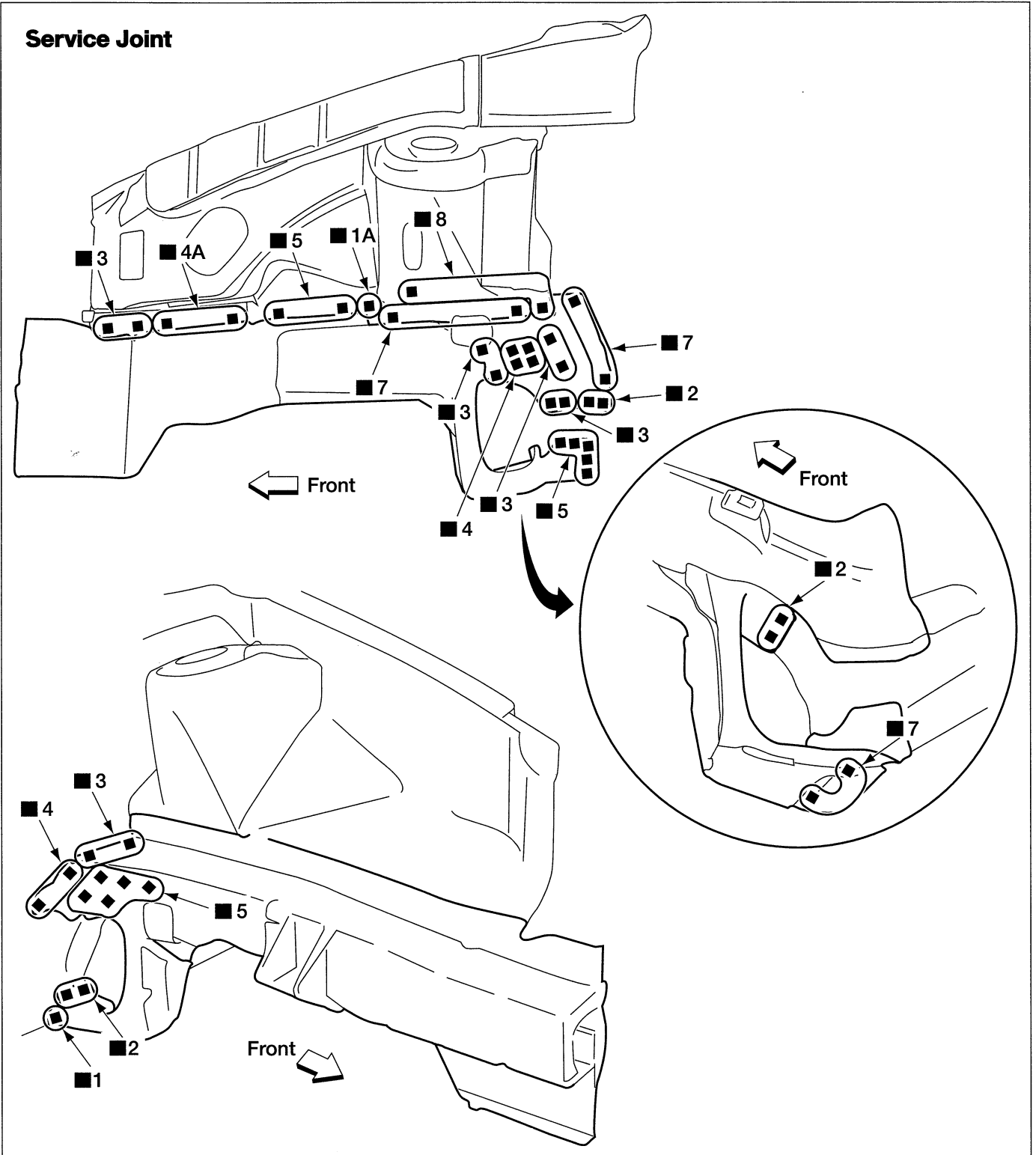


MIG seam weld/  
Point weld



# Front Side Member

● Work after radiator core support has been removed.



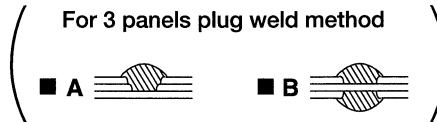
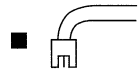
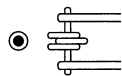
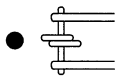
2-spot welds

3-spot welds

MIG Plug weld

( For 3 panels plug weld method )

MIG seam weld/  
Point weld

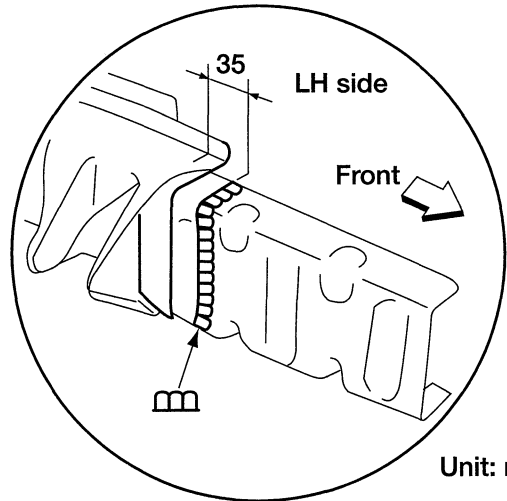
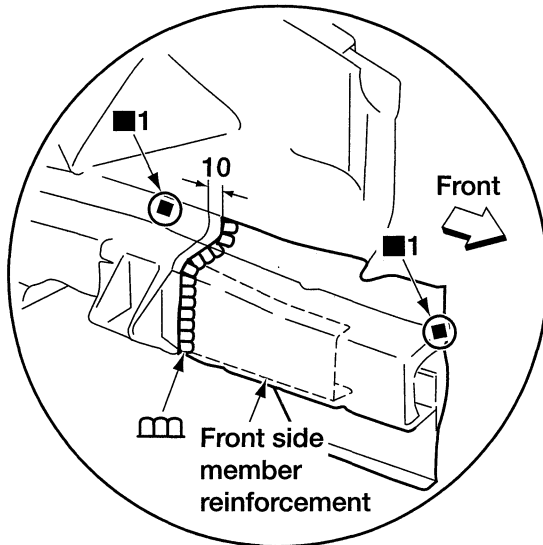
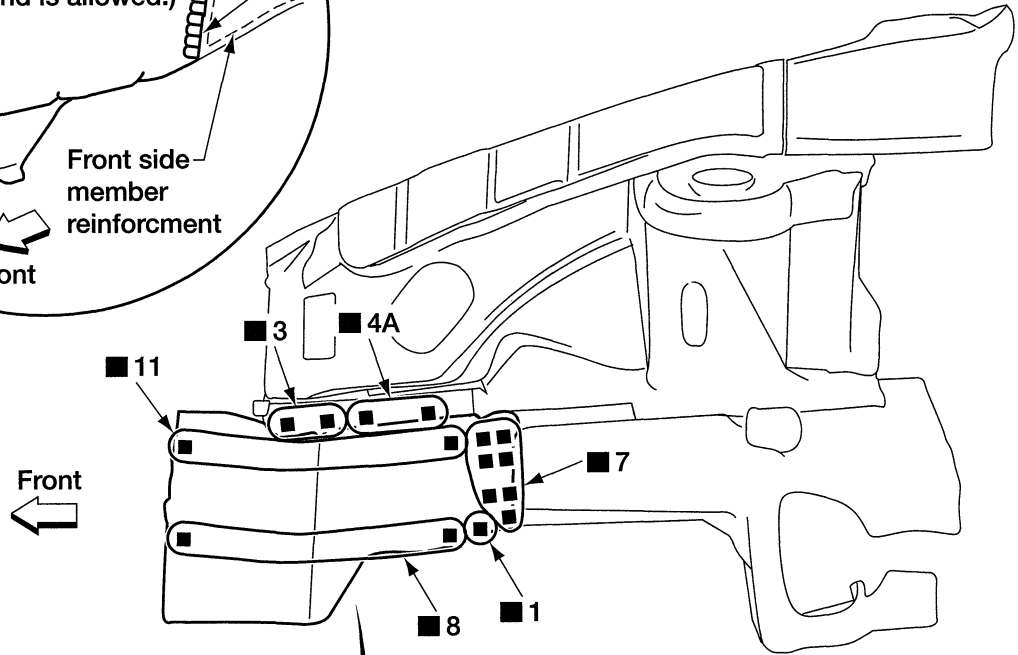
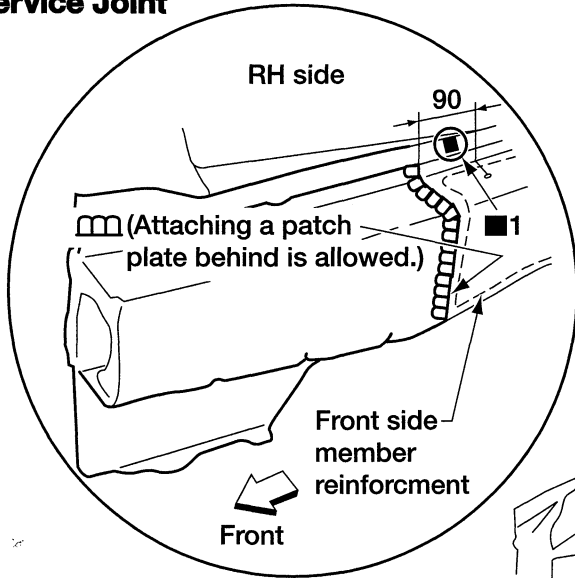




# Front Side Member (Partial Replacement)

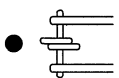
● Work after radiator core support has been removed.

## Service Joint

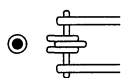


Unit: mm

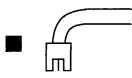
2-spot welds



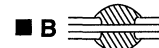
3-spot welds



MIG Plug weld



( For 3 panels plug weld method )

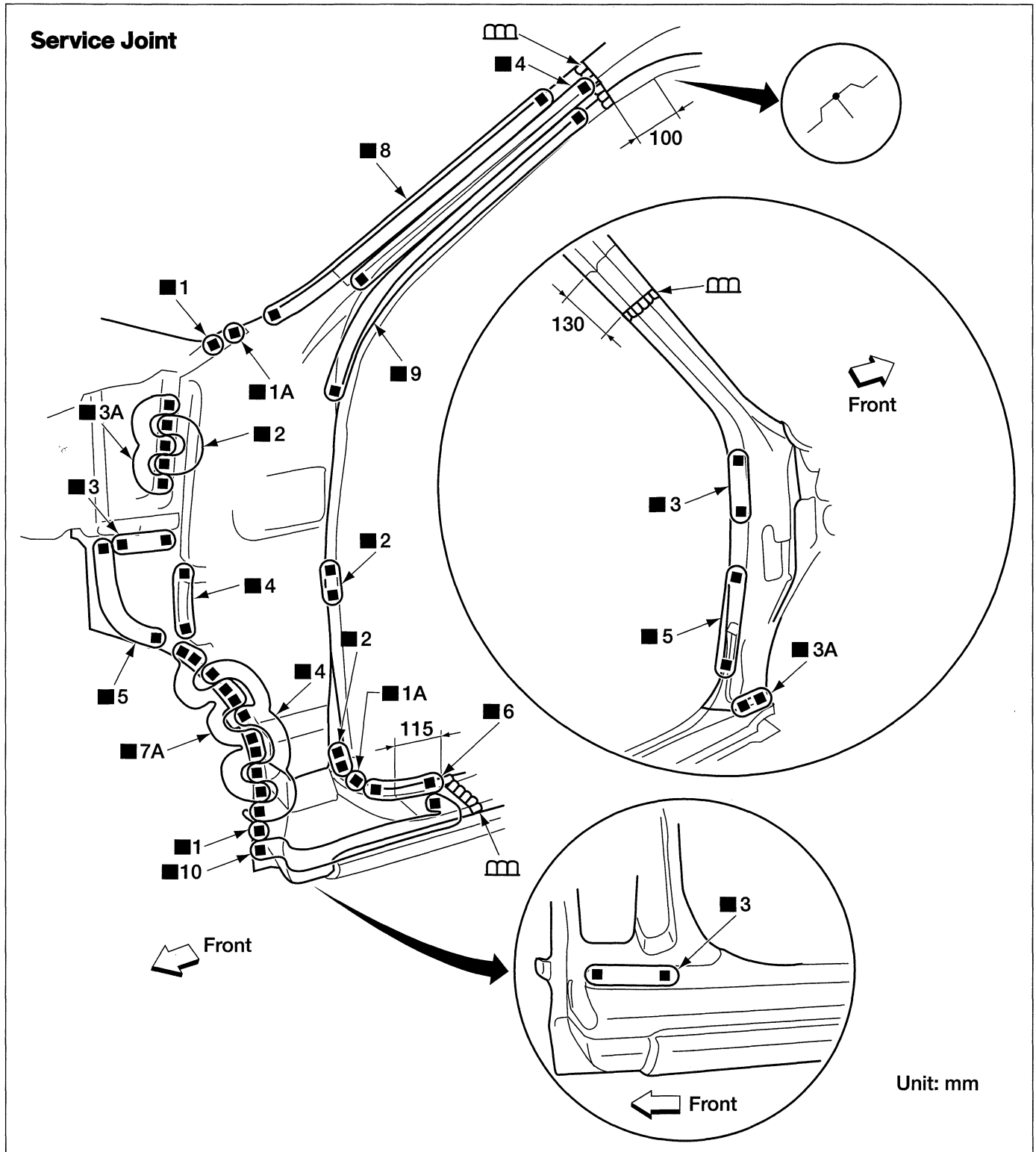


MIG seam weld/  
Point weld

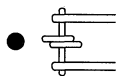


# Front Pillar

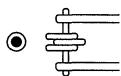
- See REPLACEMENT NOTES.
- Work after hoodedge reinforcement has been removed.



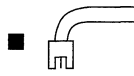
2-spot welds



3-spot welds



MIG Plug weld



For 3 panels plug weld method

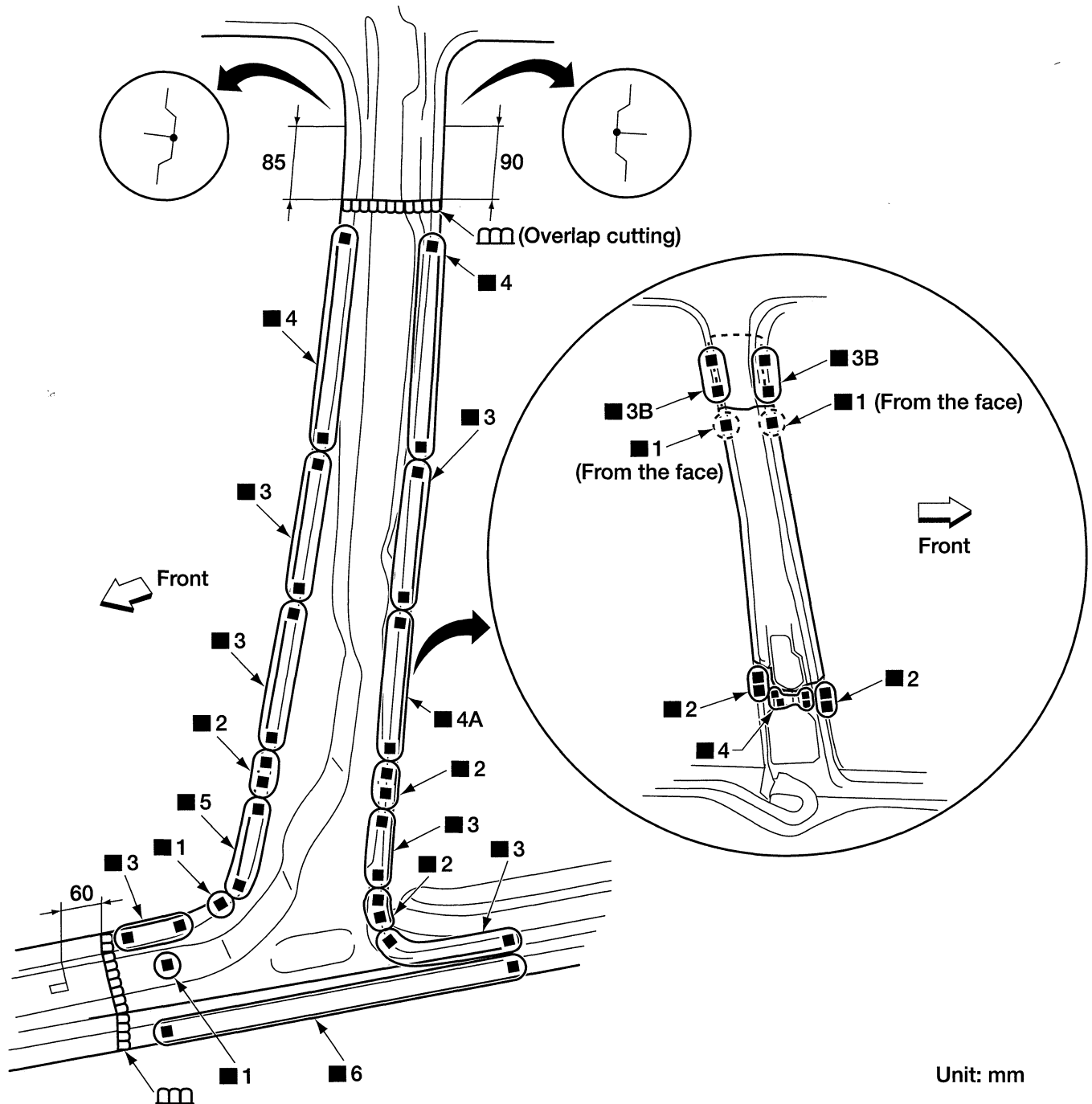


MIG seam weld/  
Point weld



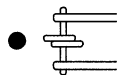
# Center Pillar

## Service Joint

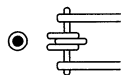


Unit: mm

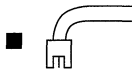
2-spot welds



3-spot welds



MIG Plug weld



( For 3 panels plug weld method )



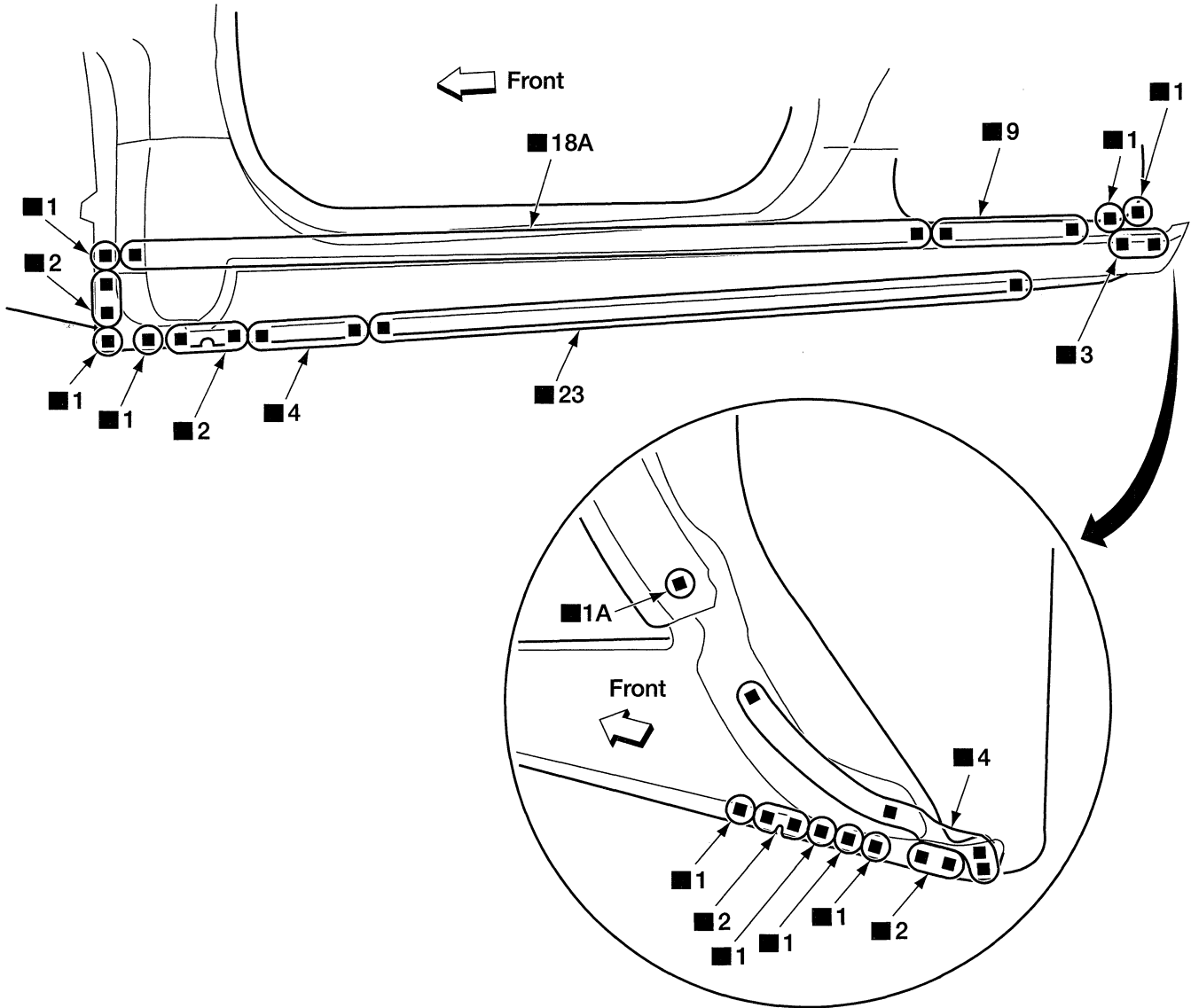
MIG seam weld/  
Point weld



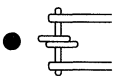
# Outer Sill

● See REPLACEMENT NOTES.

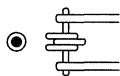
## Service Joint



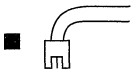
2-spot welds



3-spot welds



MIG Plug weld



For 3 panels plug weld method



MIG seam weld/  
Point weld

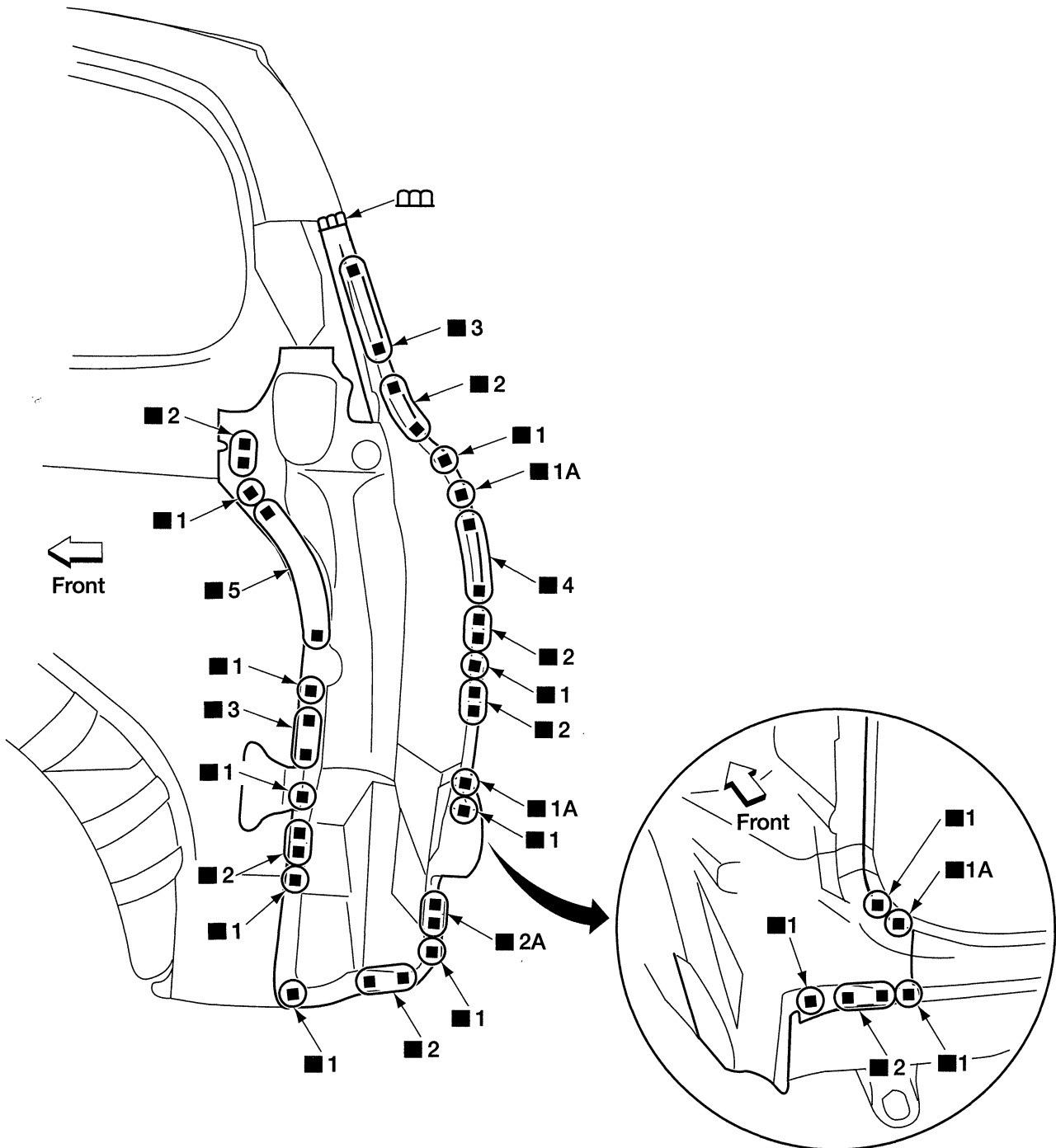




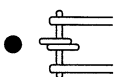
# Back Pillar Channel

● Work after rear fender has been removed.

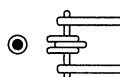
## Service Joint



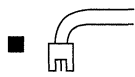
2-spot welds



3-spot welds



MIG Plug weld



( For 3 panels plug weld method )



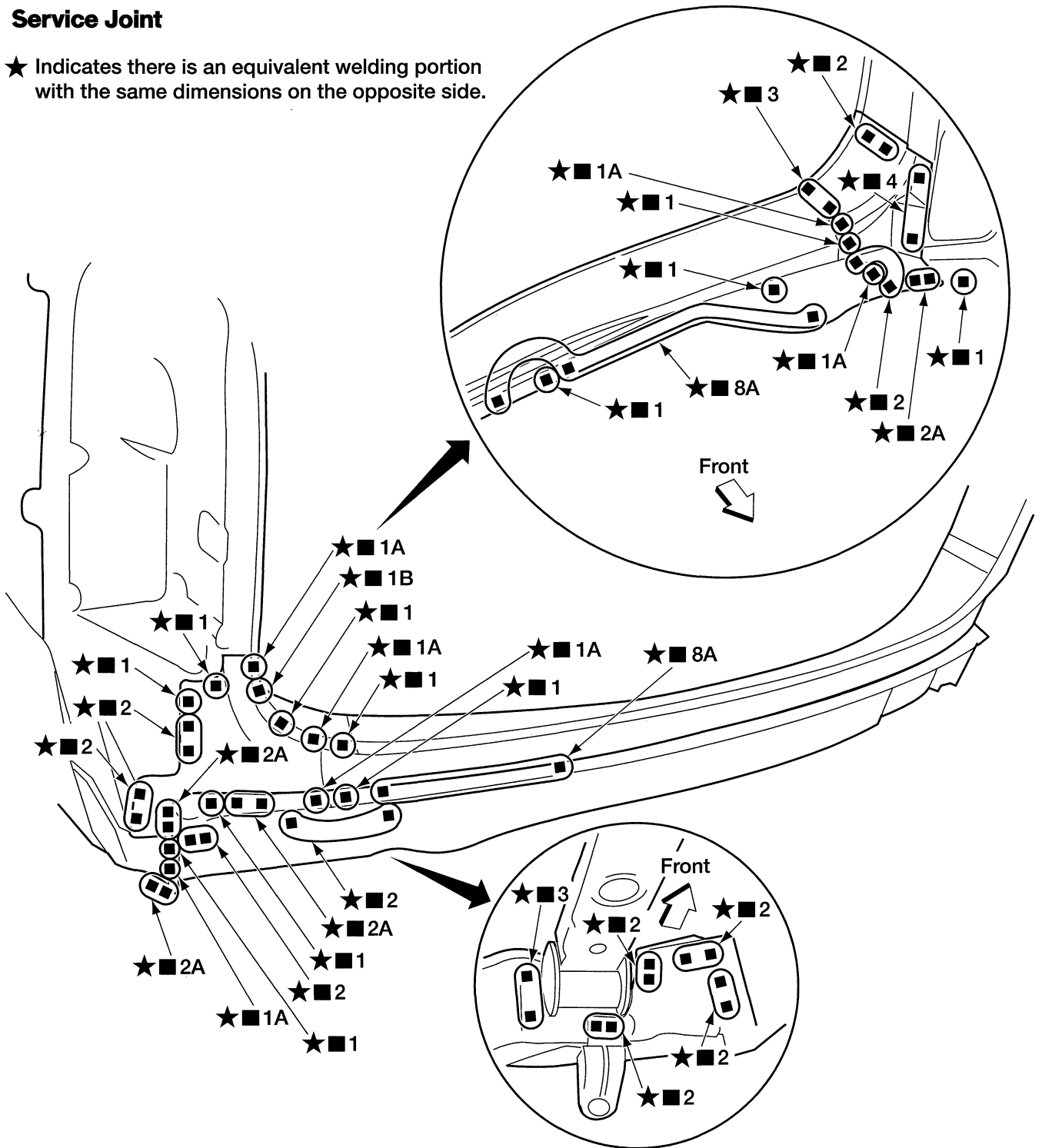
MIG seam weld/  
Point weld



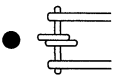
# Rear End Crossmember

## Service Joint

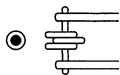
★ Indicates there is an equivalent welding portion with the same dimensions on the opposite side.



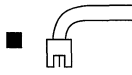
2-spot welds



3-spot welds



MIG Plug weld



( For 3 panels plug weld method )



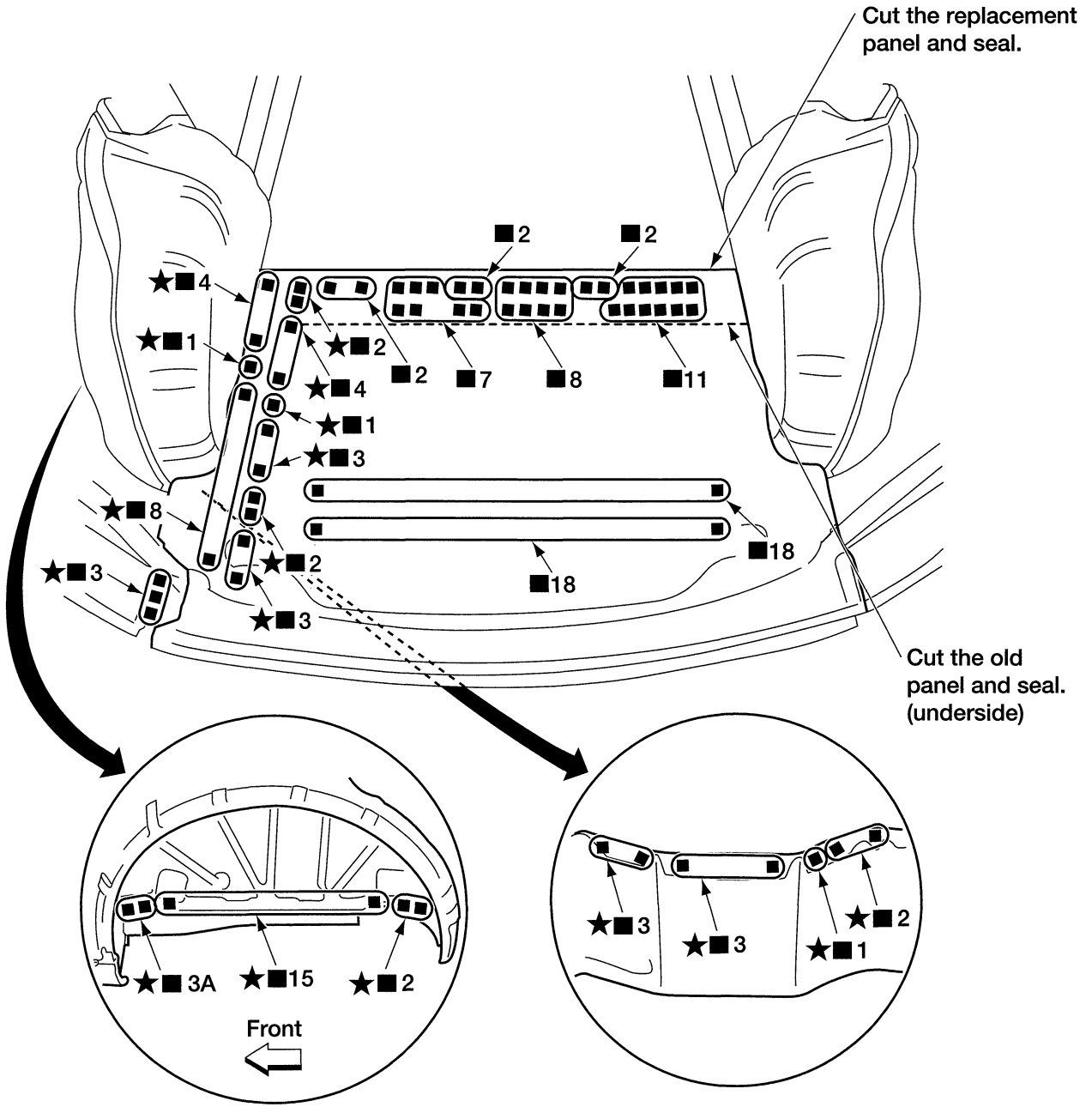
MIG seam weld/  
Point weld



# Rear Floor Rear

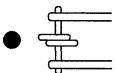
- Work after rear end crossmember has been removed.

## Service Joint

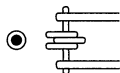


★ Indicates there is an equivalent welding portion with the same dimensions on the opposite side.

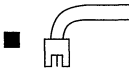
2-spot welds



3-spot welds



MIG Plug weld



( For 3 panels plug weld method )



MIG seam weld/  
Point weld

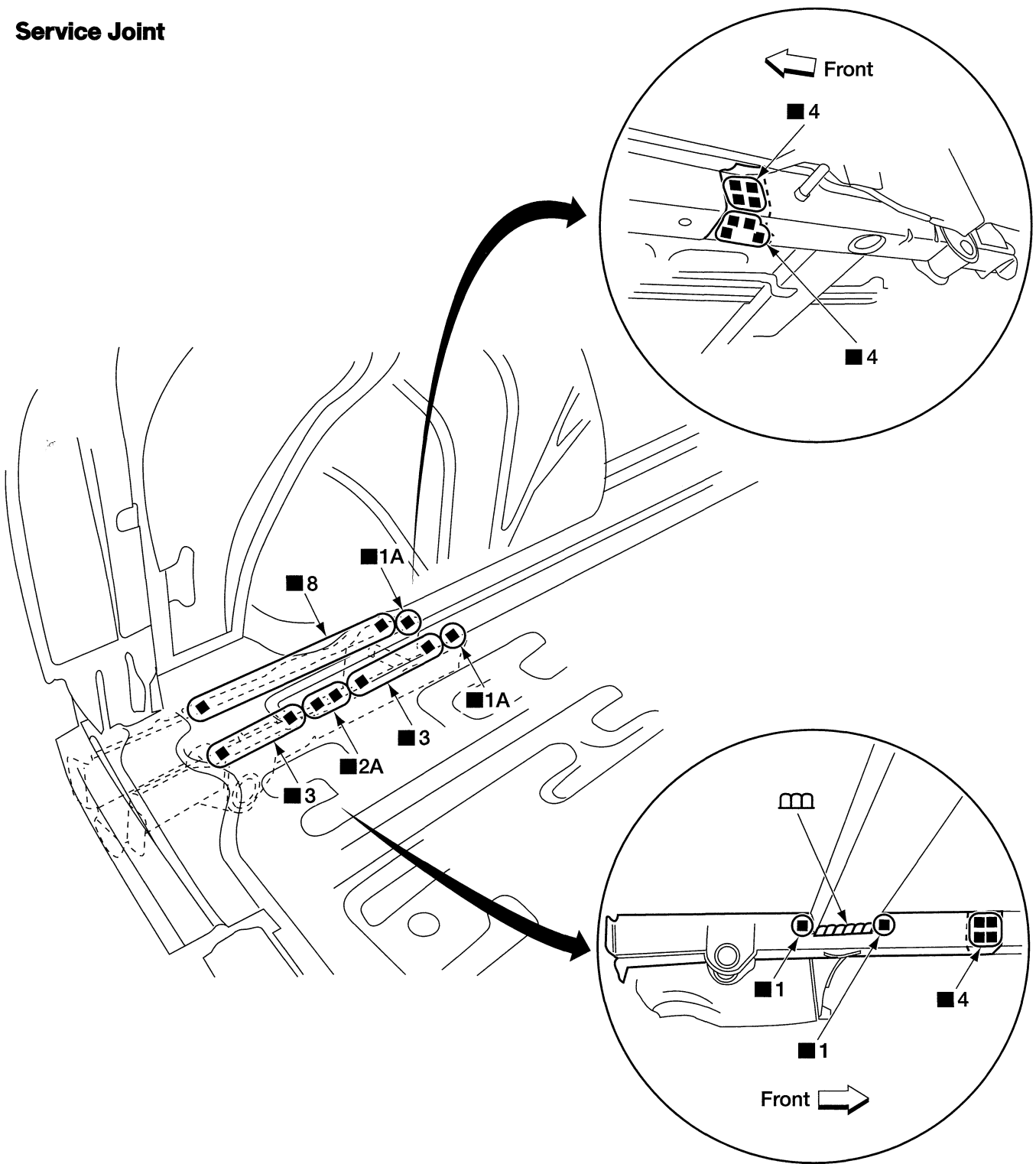




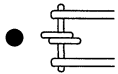
# Rear Side Member Extension

- Work after rear end crossmember has been removed.

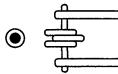
## Service Joint



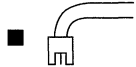
2-spot welds



3-spot welds



MIG Plug weld



( For 3 panels plug weld method )



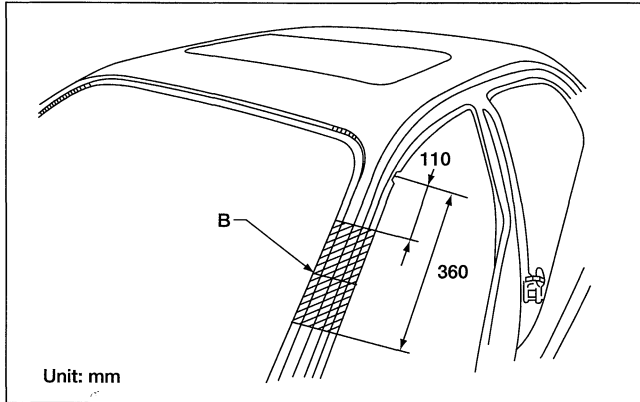
MIG seam weld/  
Point weld



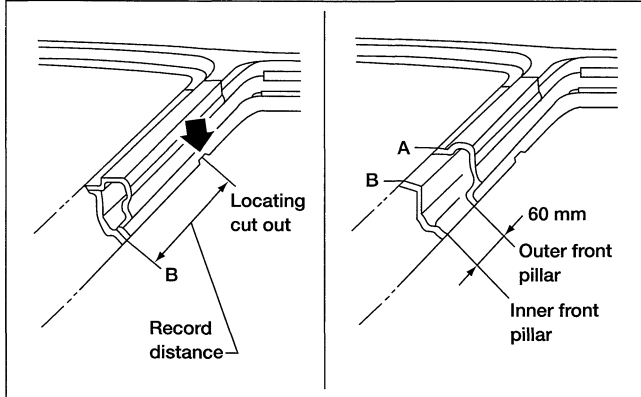
## Front Pillar

- Front pillar butt joint can be located anywhere within shade area as shown in the figure.

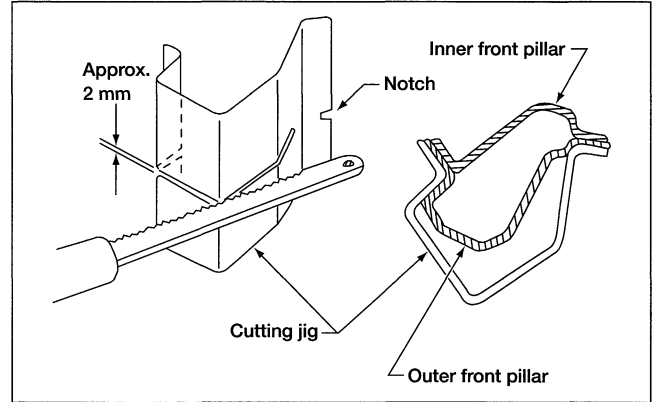
The best location for the butt joint is at position B [160 mm (6.30 in.) from cutout] due to the construction of the vehicle.



- Determine cutting position and record distance from location cutout. Use this distance when cutting service part. Cut outer front pillar 60 mm (2.36 in.) above inner front pillar cut position.

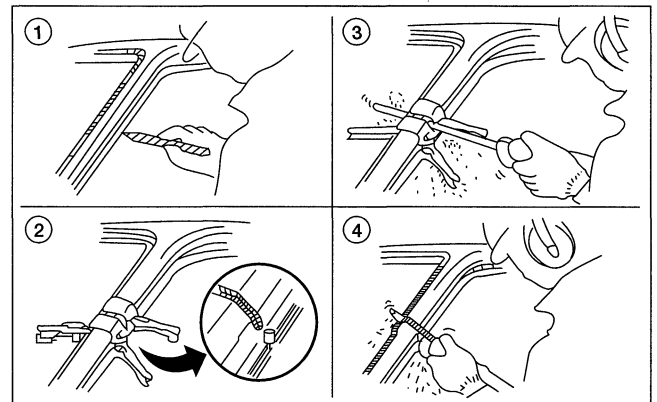


- Preparing a cutting jig makes it easier to cut. Also, this will permit service part to be accurately cut at joint position.



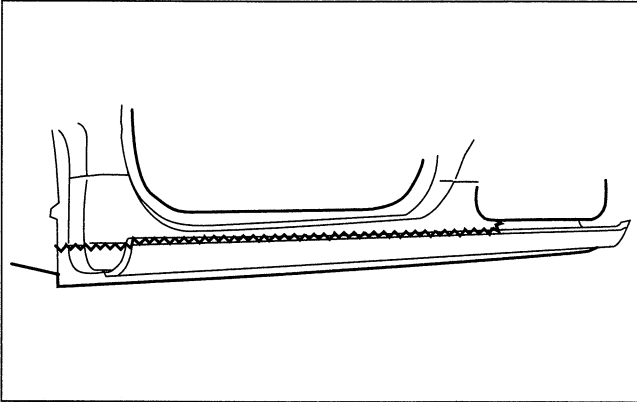
- An example of cutting operation using a cutting jig is as follows:

- ① Mark cutting lines.  
A: Cut position of outer pillar  
B: Cut position of inner pillar
- ② Align cutting line with notch on jig. Clamp jig to pillar.
- ③ Cut off along groove of jig. (At position A)
- ④ Remove jig and cut remaining portions.
- ⑤ Cut off at position (B) in same manner.

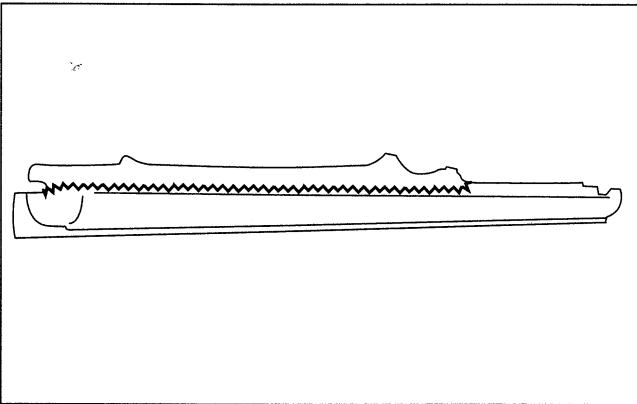


## Outer Sill

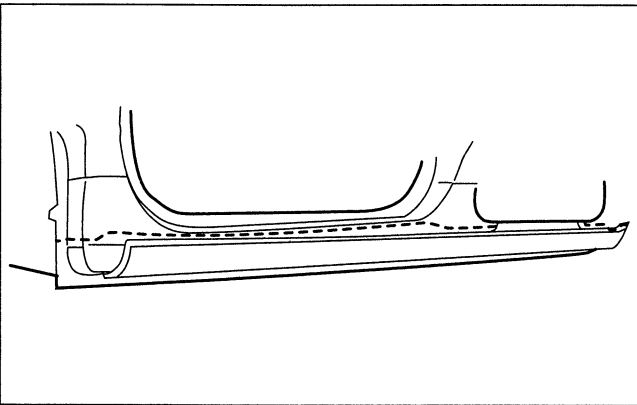
- Cut the damaged sill under the body side panel.



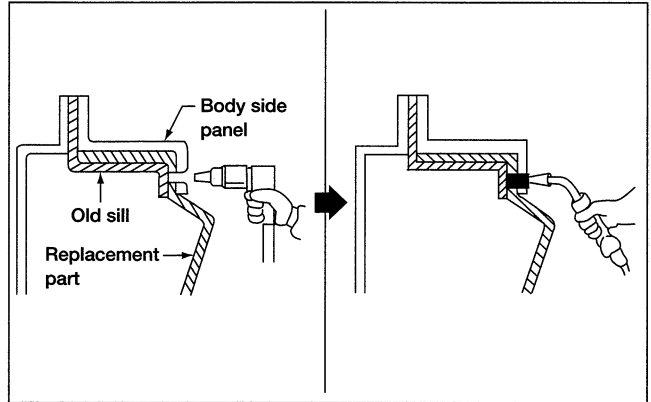
- Cut the replacement part under the bend.



- Using a flat drill, cut spot welds on the bottom end of the body side panel.
- Insert the replacement part between the old sill and the body side panel.



- Using a flat drill, drill MIG plug weld holes for the replacement part using spot cut holes on the bottom end of the body side panel.
- MIG plug weld the holes.



Notes

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