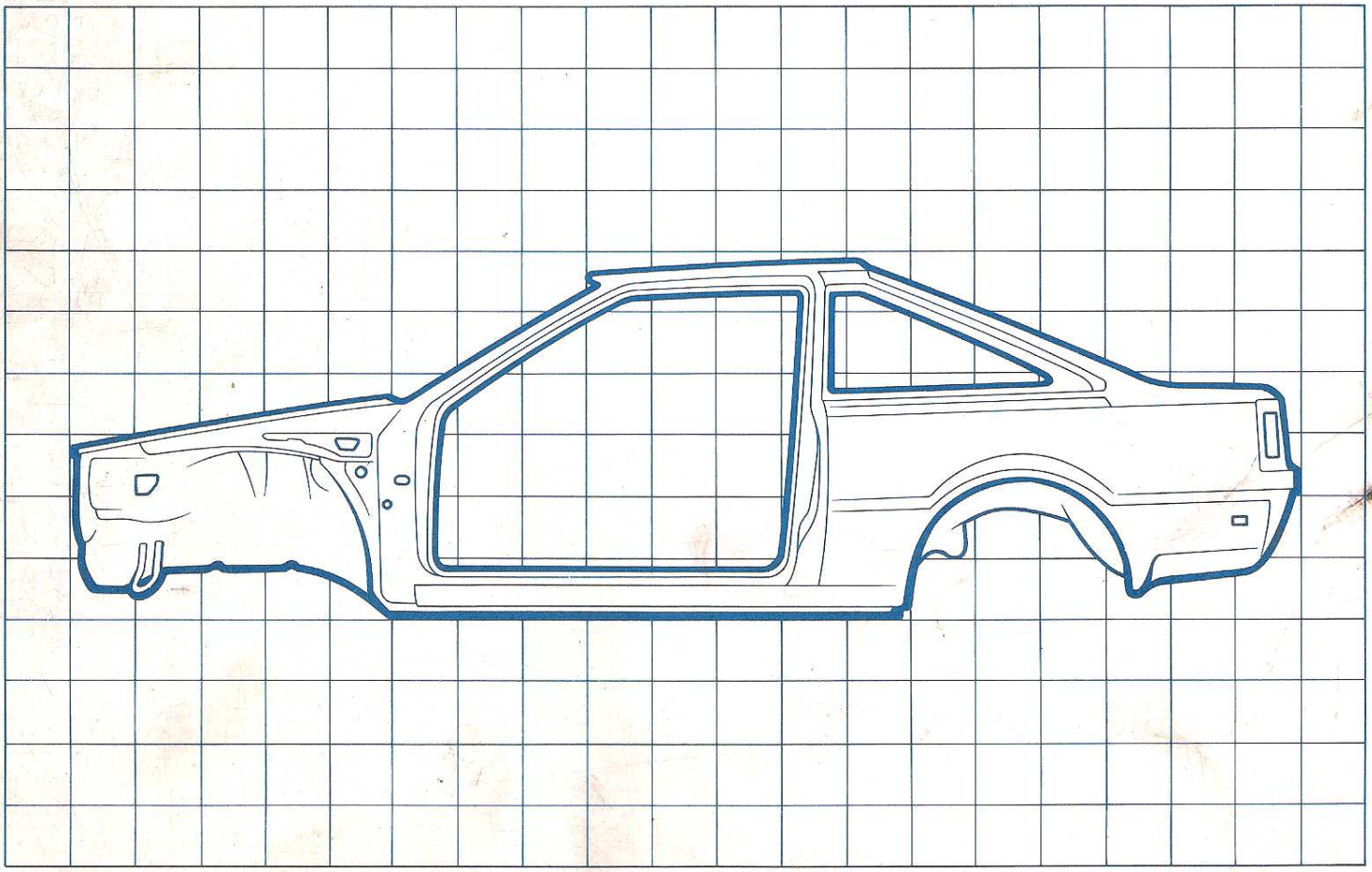
NISSAN

MODEL S12 SERIES

BODY REPAIR MANUAL



FOREWORD

This Body Repair Manual contains information, instructions and procedures for repairing the body structure of the Model S12 (200 SX). In order to achieve reliable repair work and ensure customer satisfaction, the technician should study this manual and familiarize himself with appropriate sections before starting repair and rebuilding work.

It is especially important that the section entitled PRECAUTIONS be read, understood and followed completely.

This Body Repair Manual is prepared for use by technicians who are assumed to have a high level of skill and experience in repairing collision-damaged vehicles and also use modern servicing tools and equipment. It is not recommended that persons unfamiliar with body repair techniques attempt to repair collision-damaged vehicles by using the manual.

Technicians are also required to read the S12 (200SX) Service Manual and Body Repair Manual (Fundamentals) in order to ensure that the original functions and quality of the vehicle can be maintained.

Please note that these manuals are prepared for worldwide usage, and as such, certain procedures might not apply in some regions or countries.

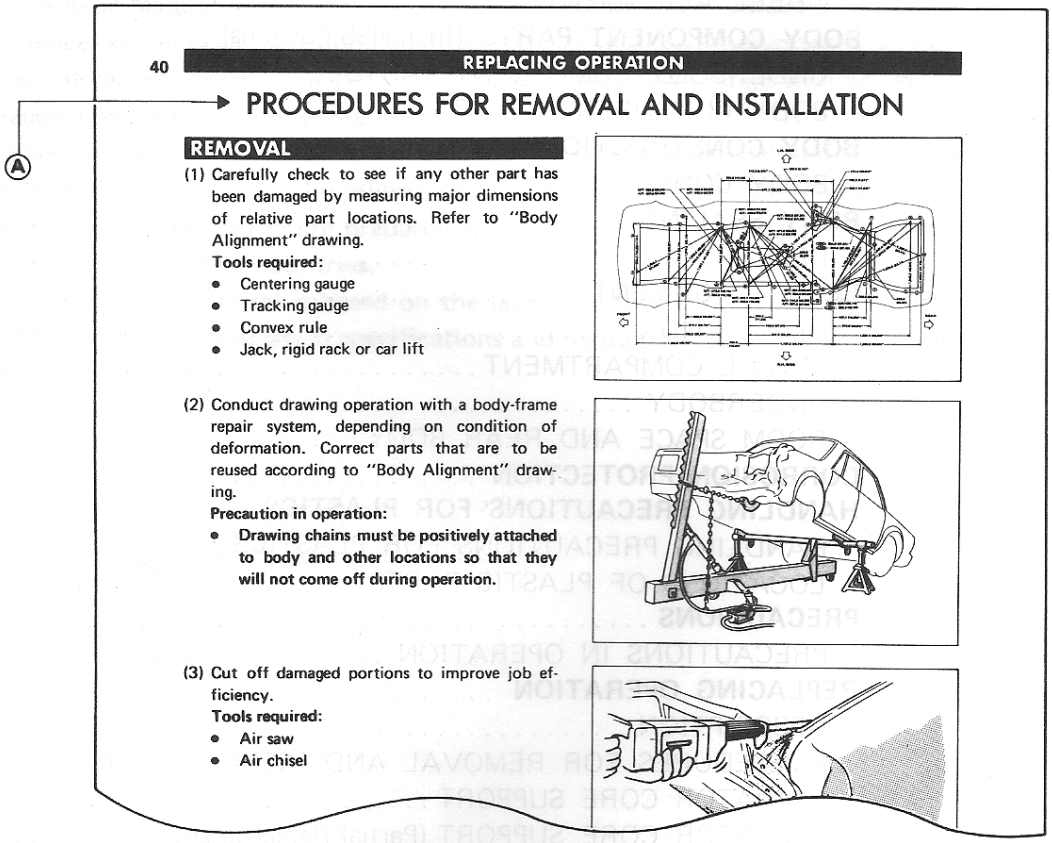
All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

NISSAN MOTOR CO., LTD.

CONTENTS

HOW TO USE THIS MANUAL

In the "REPLACING OPERATION" section, service points and notes for performing proper body repair work for the damaged vehicles are described. Please read this very carefully in order to gain full understanding of the purpose, and then proceed with the body repair work.


40 REPLACING OPERATION

PROCEDURES FOR REMOVAL AND INSTALLATION

Ⓐ

REMOVAL

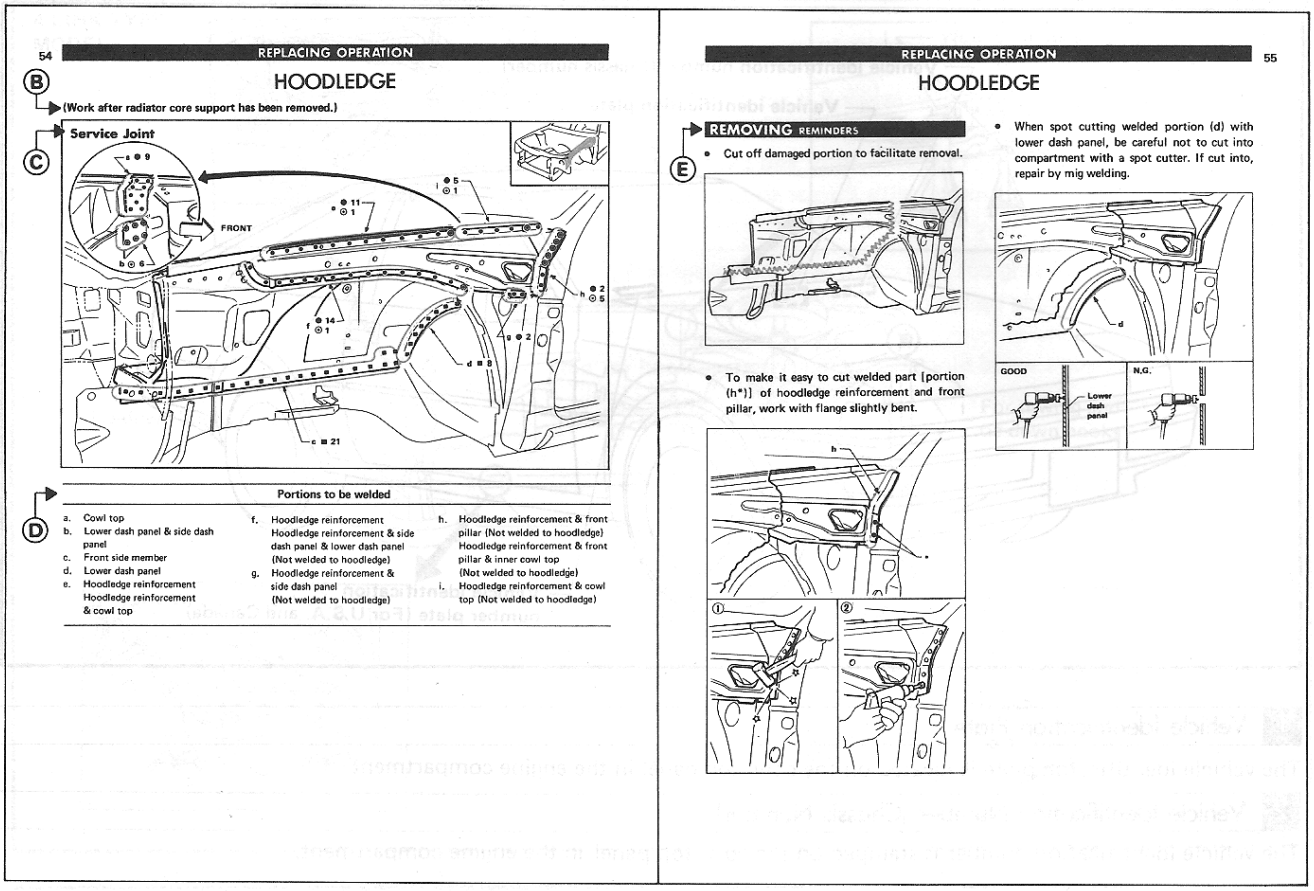
(1) Carefully check to see if any other part has been damaged by measuring major dimensions of relative part locations. Refer to "Body Alignment" drawing.
Tools required:
- Centering gauge
- Tracking gauge
- Convex rule
- Jack, rigid rack or car lift

(2) Conduct drawing operation with a body-frame repair system, depending on condition of deformation. Correct parts that are to be reused according to "Body Alignment" drawing.
Precaution in operation:
- Drawing chains must be positively attached to body and other locations so that they will not come off during operation.

(3) Cut off damaged portions to improve job efficiency.
Tools required:
- Air saw
- Air chisel

Ⓐ PROCEDURES FOR REMOVAL AND INSTALLATION:
In this section, service procedures and points for body repair work are explained in order. Service points and procedures that are almost the same for most replacing work are described.

HOW TO USE THIS MANUAL



Ⓑ **(Work after RADIATOR CORE SUPPORT has been removed):**
The replacement operation of the hoodledge panel is shown here, beginning from the condition where the radiator core support have already been removed. If the radiator core support and the hoodledge reinforcement are installed on the car to be serviced, refer to "REPLACING RADIATOR CORE SUPPORT".

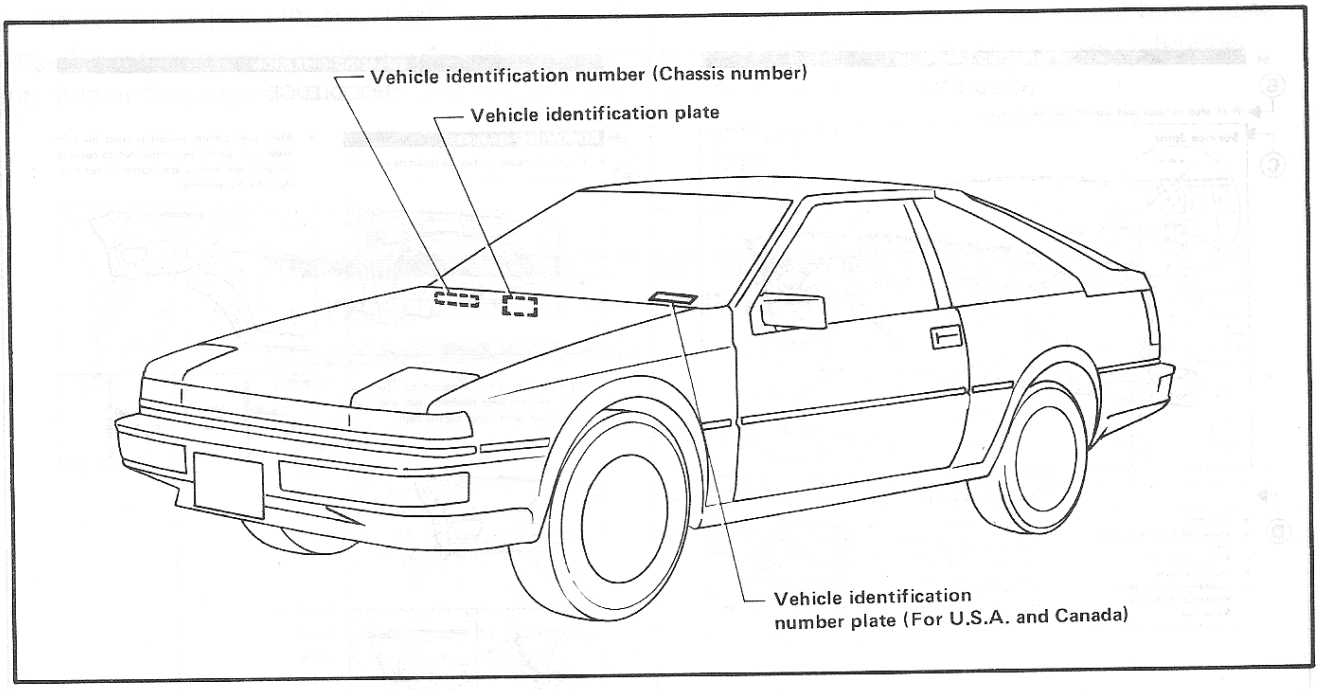
Ⓒ **SERVICE JOINT:**
Welding methods and No. of welding points are described when performing body repair work (replacement of body parts).
To maintain the function of the car body, work should be done, observing what is described here (particularly No. of welding points).
[Example]

Portion — a • 9
a — Portion
9 — No. of welding points
• — 2-spot weld (See symbol mark on page 39.)

Ⓓ **PORTIONS TO BE WELDED:**
This section describes those portions to which the portion under the subtitle (ex. Hoodledge panel) will be welded. Portions to be welded are listed.

Ⓔ **REMOVING/INSTALLING REMINDERS**
Main service points and reminders when performing body repair work are described.

IDENTIFICATION NUMBERS



1 Vehicle Identification Plate

The vehicle identificaton plate is located on the cowl top panel in the engine compartment.

2 Vehicle Identification Number (Chassis Number)

The vehicle identification number is stamped on the cowl top panel in the engine compartment.

For U.S.A. and Canada

R P L J S12 S F E U

- □ : Coupe
- R : Hatchback
- P : CA20E engine
- □ : CA18ET engine
- L : L.H. drive
- □ : I.R.S.
- J : 4-link

- U : Non-California models for U.S.A.
- V : California models
- N : Canada models
- E : E.F.I. models
- T : Turbo models
- F : 5-speed floor shift manual transmission
- A : Automatic transmission
- □ : SGL model
- S : GL model

Note: □ means no indication.

For Europe

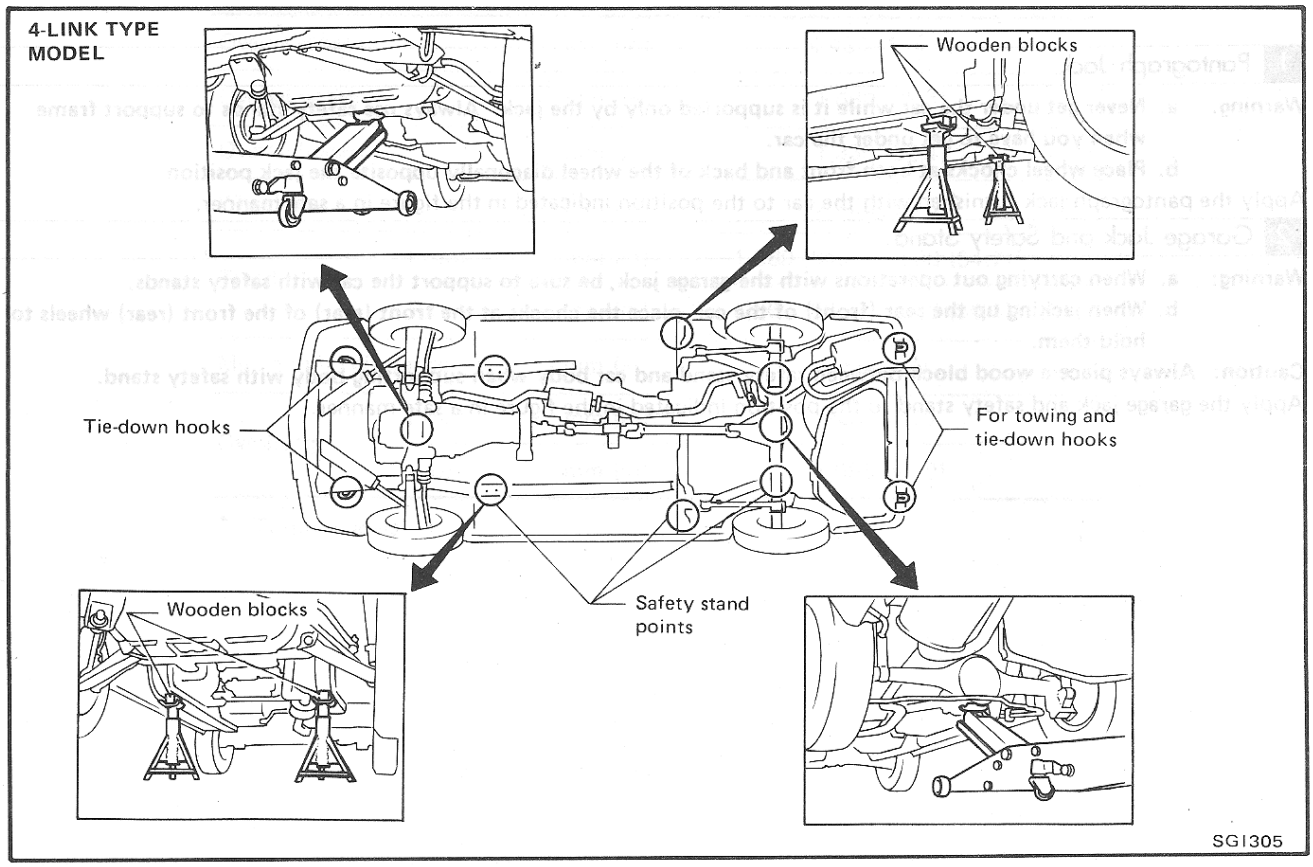
JN1 O R U S12 U O XXXXXX

- JN1 : Nissan
- O : Stopgap (no meaning)
- R : Hatchback
- O : CA18 engine
- U : FJ20 engine

- Vehicle serial number
- O : Stopgap (no meaning)
- U : For Europe
- Model

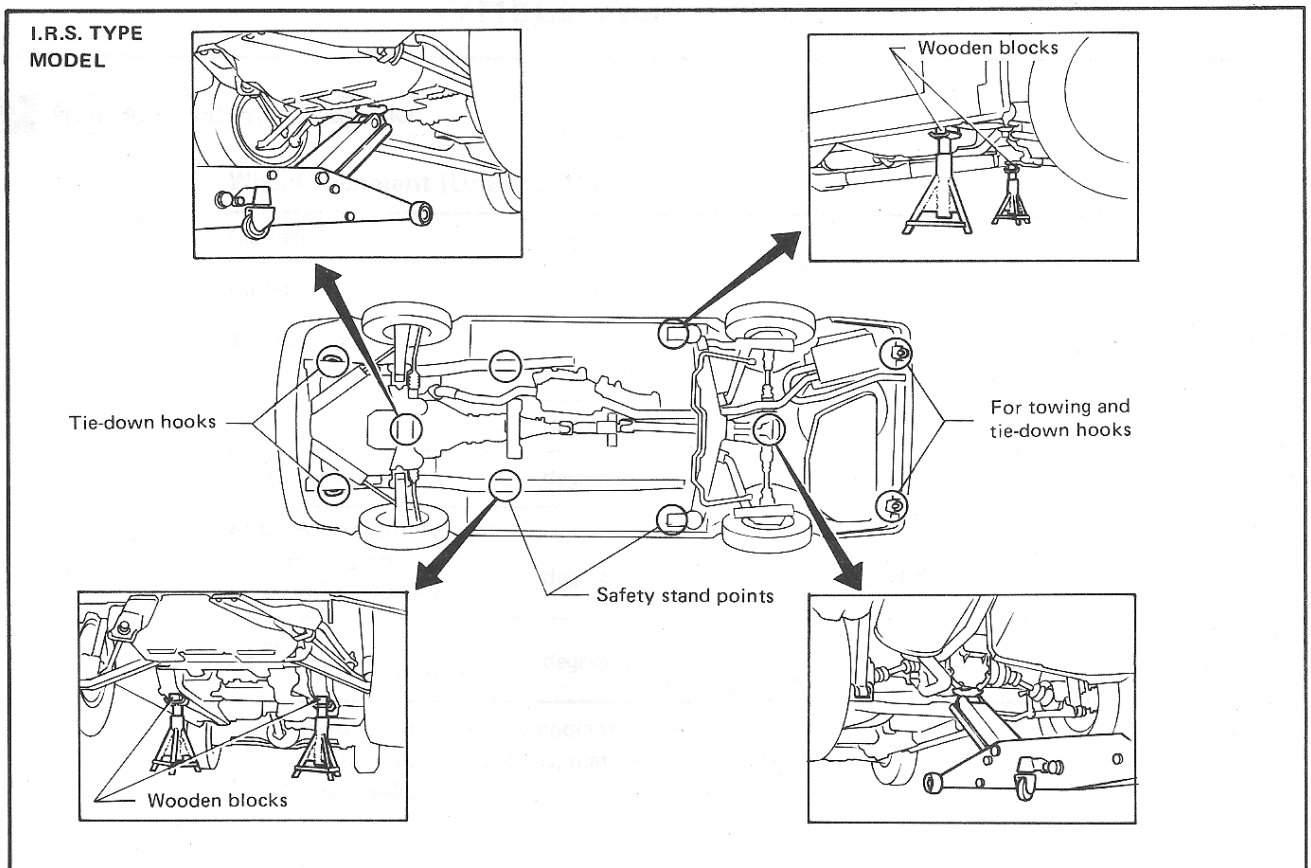
LIFTING POINTS

4-LINK TYPE MODEL



SGI305

I.R.S. TYPE MODEL



SGI306

LIFTING POINTS

1 Pantograph Jack

Warning: a. **Never get under the car while it is supported only by the jack. Always use safety stands to support frame when you have to get under the car.**

b. **Place wheel chocks at both front and back of the wheel diagonally opposite the jack position.**

Apply the pantograph jack furnished with the car to the position indicated in the figure in a safe manner.

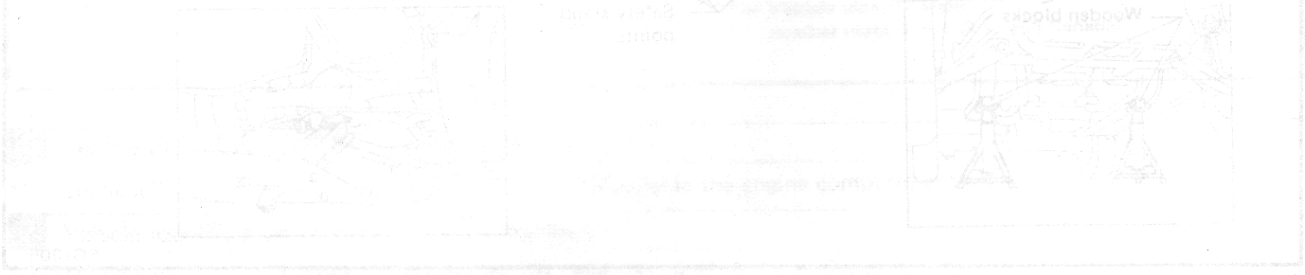
2 Garage Jack and Safety Stand

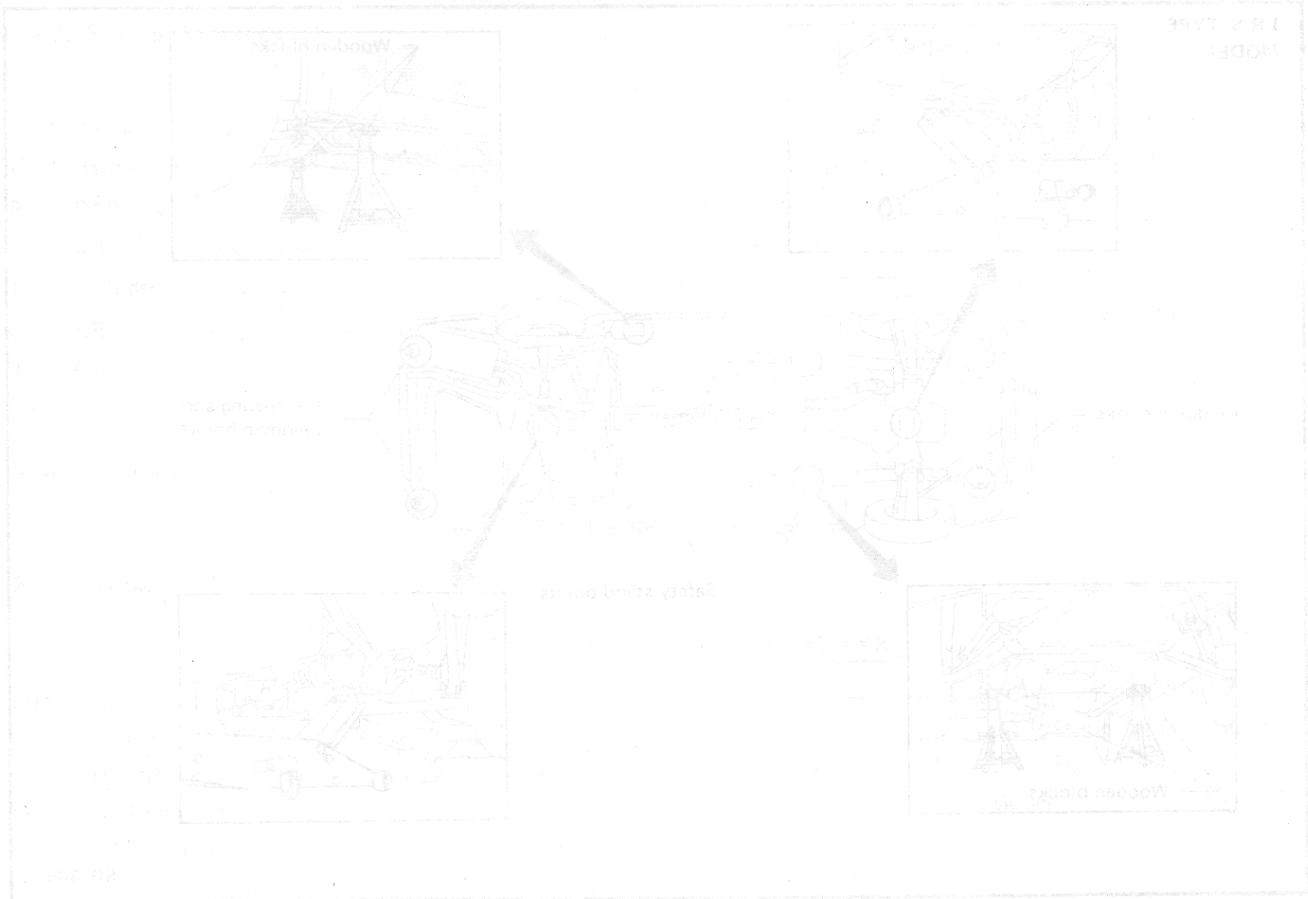
Warning: a. **When carrying out operations with the garage jack, be sure to support the car with safety stands.**

b. **When jacking up the rear (front) of the car, place the chocks at the front (rear) of the front (rear) wheels to hold them.**

Caution: Always place a wood block between safety stand and car body when supporting body with safety stand.

Apply the garage jack and safety stand to the position indicated in the figure in a safe manner.





VEHICLE DIMENSION

Overall length		mm (in)	4,430 (174.4)
Overall width		mm (in)	1,660 (65.4)
Overall height		mm (in)	1,330 (52.4)
Wheelbase		mm (in)	2,425 (95.5)
Tread	Front	mm (in)	1,380 (54.3), 1,390 (54.7)*
	Rear	mm (in)	1,360 (53.5), 1,425 (56.1)*
Min. ground clearance		mm (in)	155 (6.1)
Overhang	Front	mm (in)	940 (37.0)
	Rear	mm (in)	1,065 (41.9)

*: Turbo models

WHEEL ALIGNMENT

1 Front Axle and Front Suspension

Wheel alignment (Unladen *1)

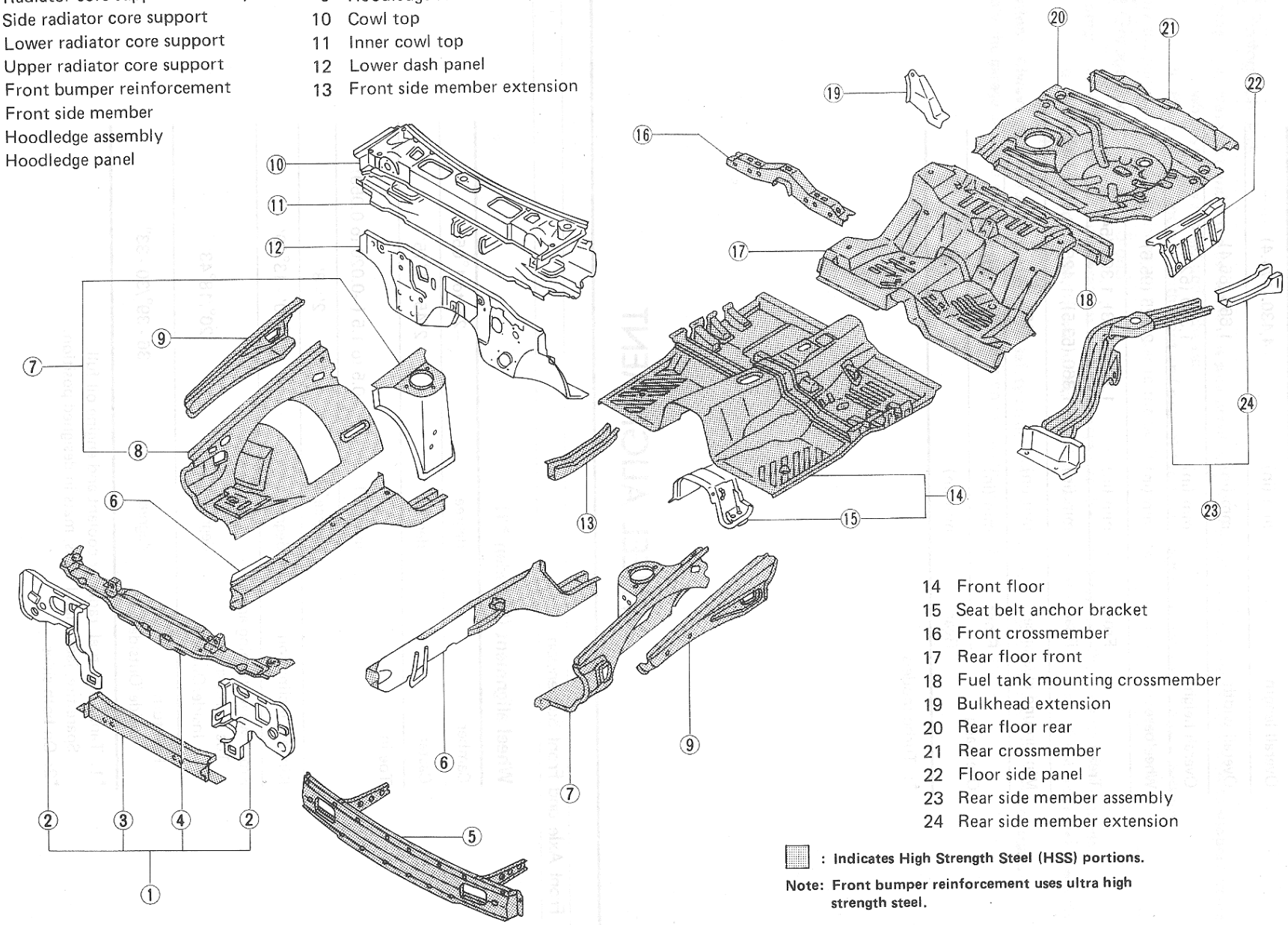
Camber	degree	–25′ to 1°05′
Caster	degree	2°45′ - 4°15′
Toe-in	mm (in)	–0.5 to 1.5 (–0.020 to 0.059)
	degree*2	2′ - 8′
Kingpin inclination	degree	11°40′ - 13°10′
Front wheel turning angle Toe-out-turn Inside/Outside	degree	20°/18°43′
Full turn Inside/Outside	degree	36 - 39°/30 - 33°

*1: Tankful of fuel, radiator coolant and engine oil full.
Spare tire, jack, hand tools, mats in designed position.
*2: On both sides

UNDERBODY COMPONENT PARTS

HATCHBACK & COUPE

1 Radiator core support assembly
2 Side radiator core support
3 Lower radiator core support
4 Upper radiator core support
5 Front bumper reinforcement
6 Front side member
7 Hoodledge assembly
8 Hoodledge panel
9 Hoodledge reinforcement
10 Cowl top
11 Inner cowl top
12 Lower dash panel
13 Front side member extension



14 Front floor
15 Seat belt anchor bracket
16 Front crossmember
17 Rear floor front
18 Fuel tank mounting crossmember
19 Bulkhead extension
20 Rear floor rear
21 Rear crossmember
22 Floor side panel
23 Rear side member assembly
24 Rear side member extension

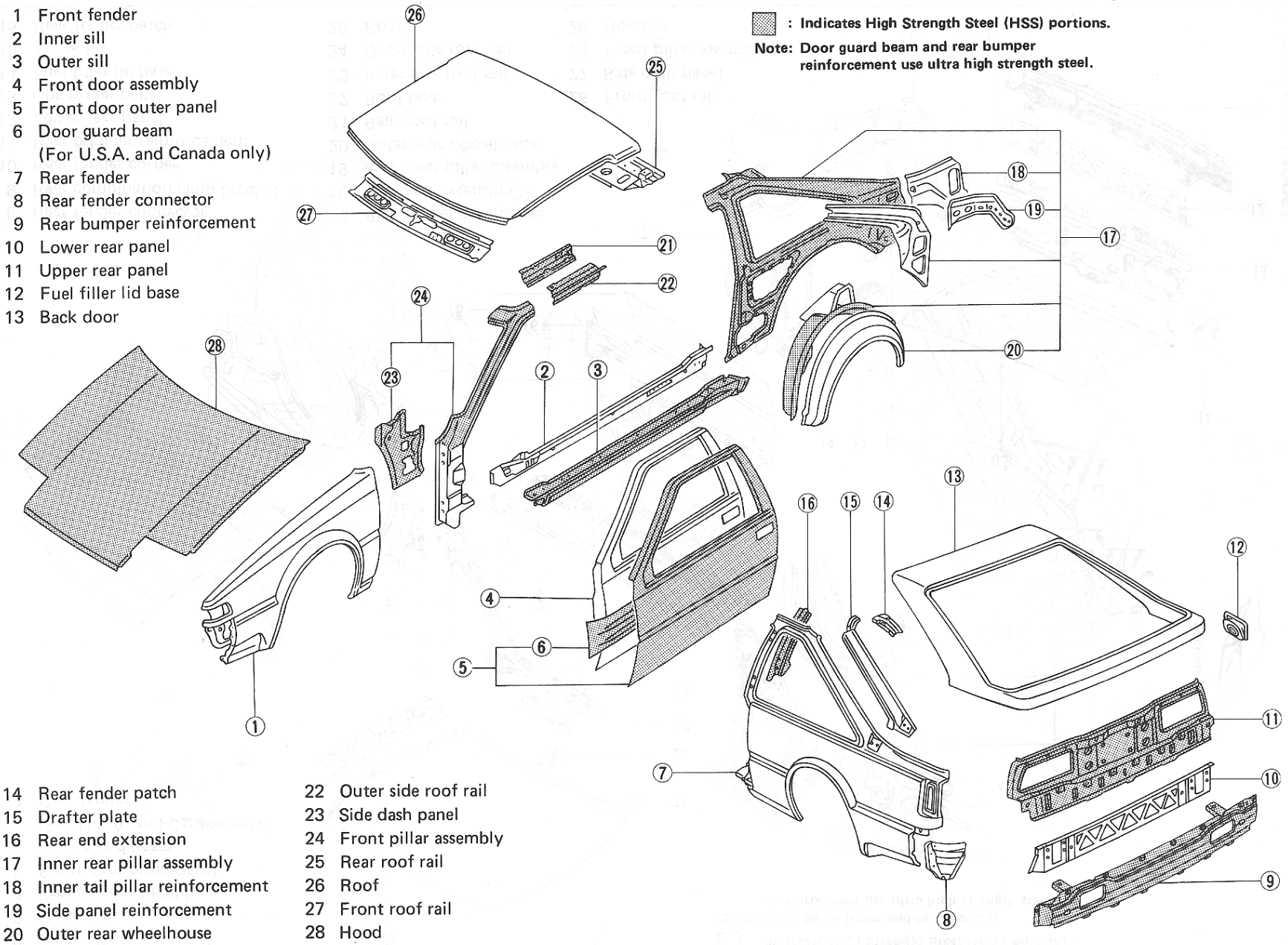
: **Indicates High Strength Steel (HSS) portions.**

Note: Front bumper reinforcement uses ultra high strength steel.

1 Front fender
2 Inner sill
3 Outer sill
4 Front door assembly
5 Front door outer panel
6 Door guard beam
(For U.S.A. and Canada only)
7 Rear fender
8 Rear fender connector
9 Rear bumper reinforcement
10 Lower rear panel
11 Upper rear panel
12 Fuel filler lid base
13 Back door

: Indicates High Strength Steel (HSS) portions.

Note: Door guard beam and rear bumper reinforcement use ultra high strength steel.

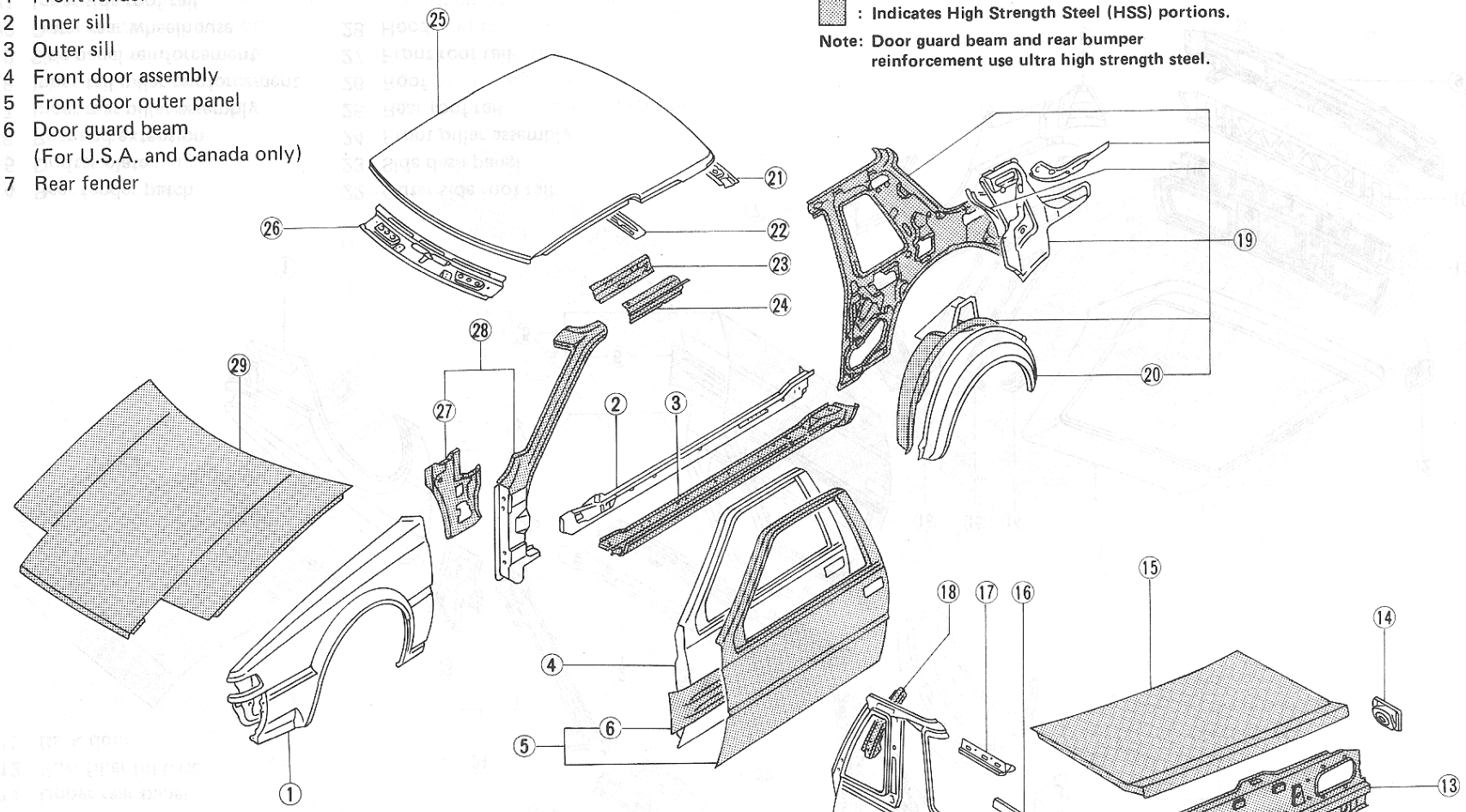


14 Rear fender patch
15 Drafter plate
16 Rear end extension
17 Inner rear pillar assembly
18 Inner tail pillar reinforcement
19 Side panel reinforcement
20 Outer rear wheelhouse
21 Inner side roof rail
22 Outer side roof rail
23 Side dash panel
24 Front pillar assembly
25 Rear roof rail
26 Roof
27 Front roof rail
28 Hood

1 Front fender
2 Inner sill
3 Outer sill
4 Front door assembly
5 Front door outer panel
6 Door guard beam
(For U.S.A. and Canada only)
7 Rear fender

: Indicates High Strength Steel (HSS) portions.

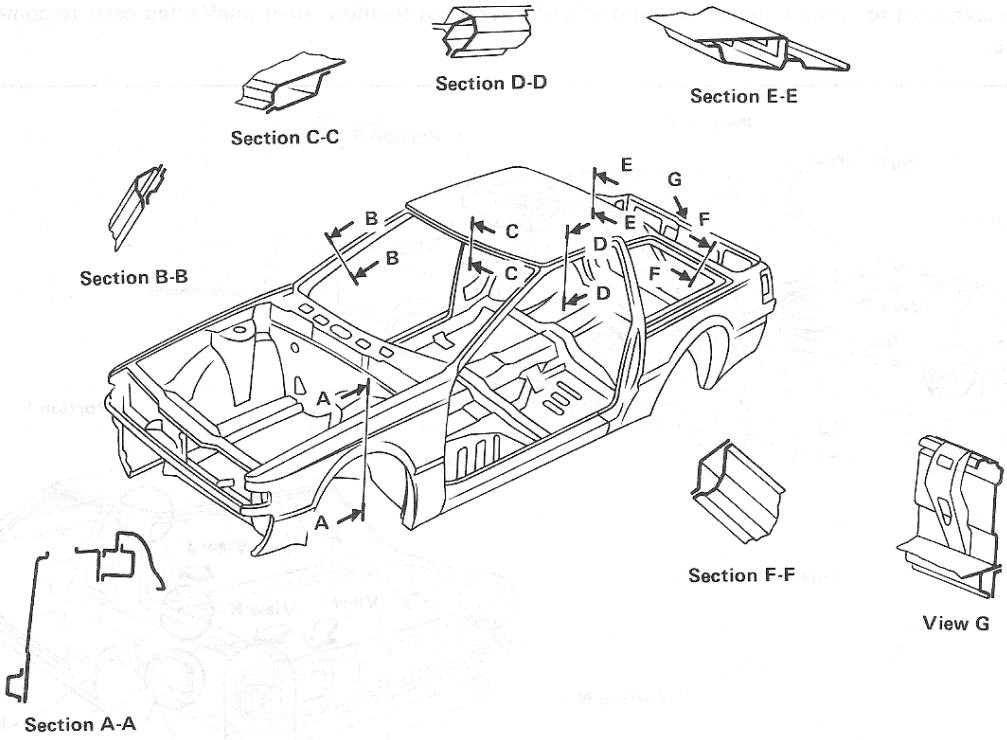
Note: Door guard beam and rear bumper reinforcement use ultra high strength steel.



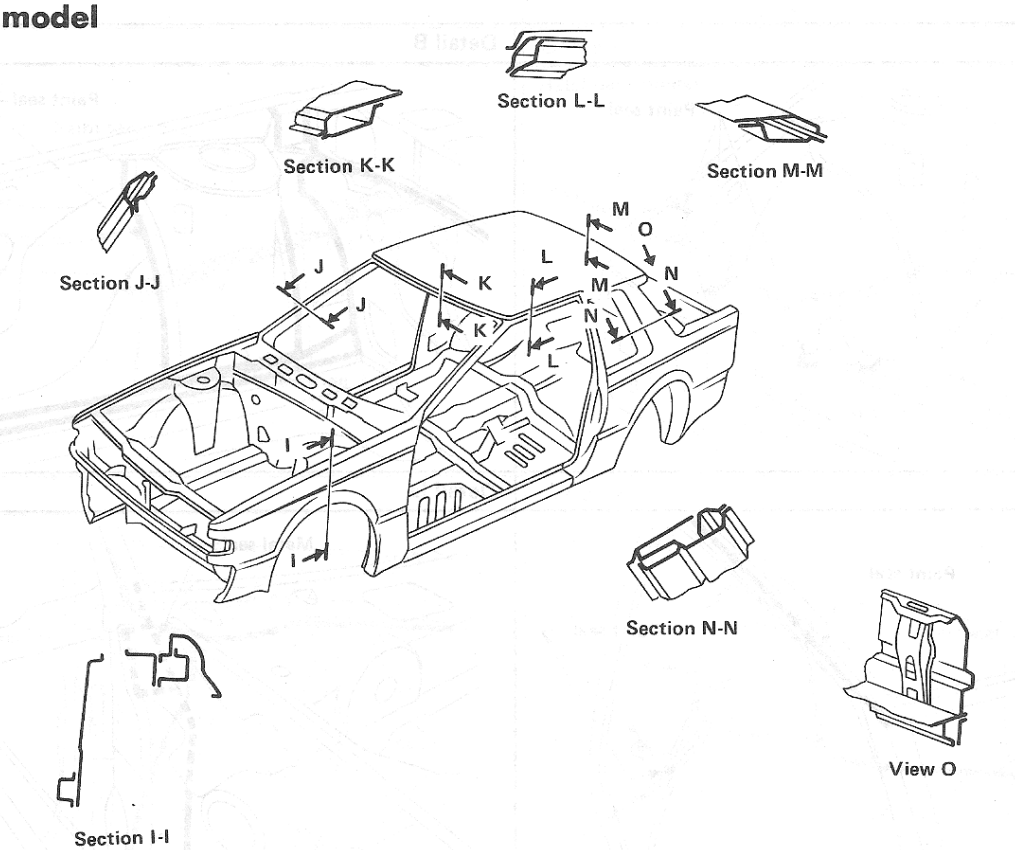
8 Rear fender connector
9 Rear combination lamp bracket
10 Rear fender corner
11 Rear bumper reinforcement
12 Lower rear panel
13 Upper rear panel
14 Fuel filler lid base
15 Trunk lid
16 Rear fender patch
17 Rear fender extension
18 Rear end extension
19 Inner rear pillar assembly
20 Outer rear wheelhouse
21 Rear roof rail
22 Roof bow
23 Inner side roof rail
24 Outer side roof rail
25 Roof
26 Front roof rail
27 Side dash panel
28 Front pillar assembly
29 Hood

BODY CONSTRUCTION

Hatchback model

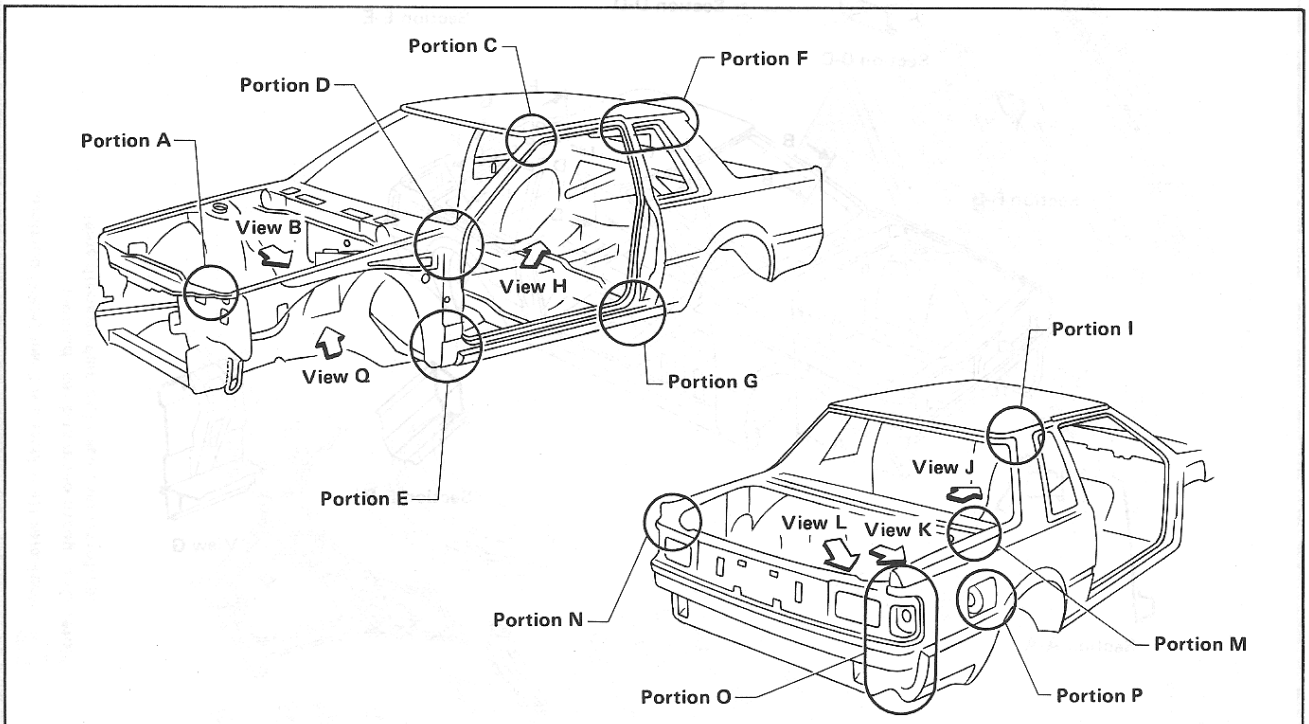


Coupe model

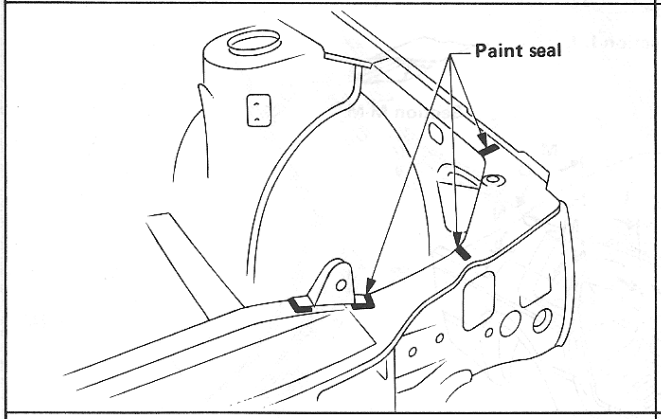


DESCRIPTION

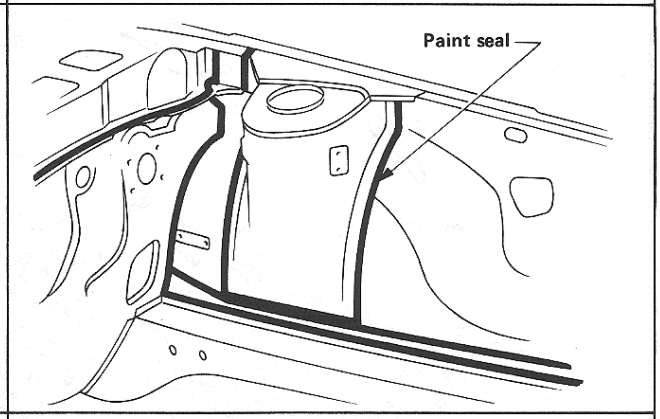
The following figure shows the areas which are sealed at a factory. Sealing which has been applied to these areas should be smooth and free from cuts or gaps.
Care should be taken not to apply an excess amount of sealing and not to allow other unaffected parts to come into contact with the sealing.



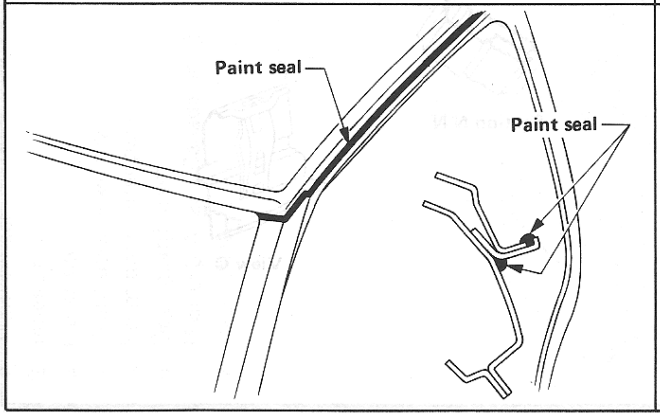
Detail A



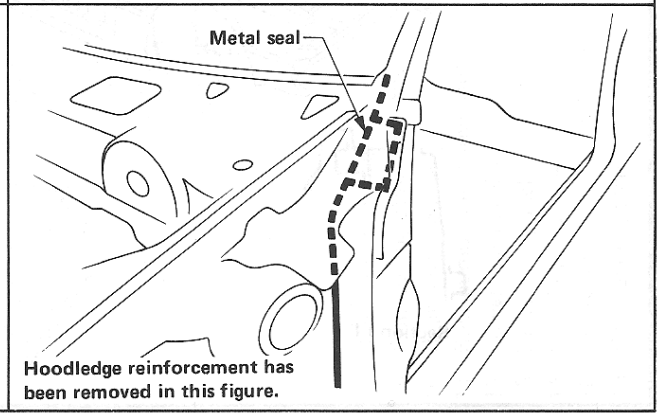
Detail B



Detail C

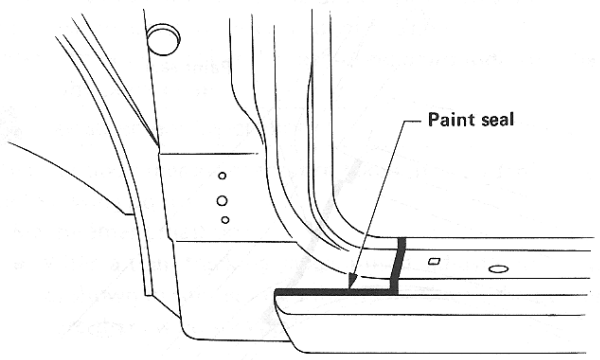


Detail D

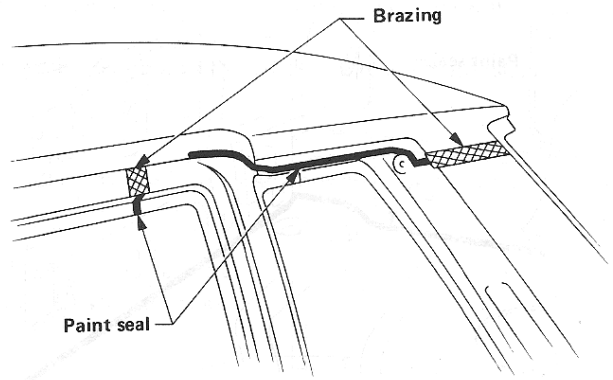


DESCRIPTION

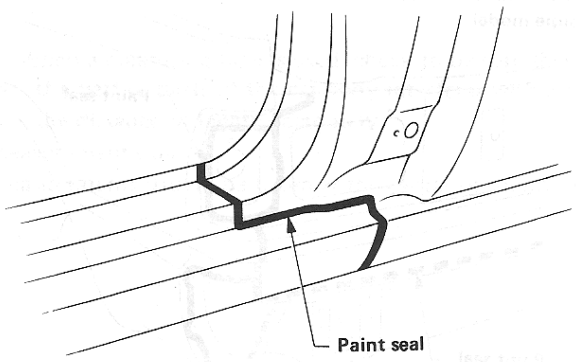
Detail E



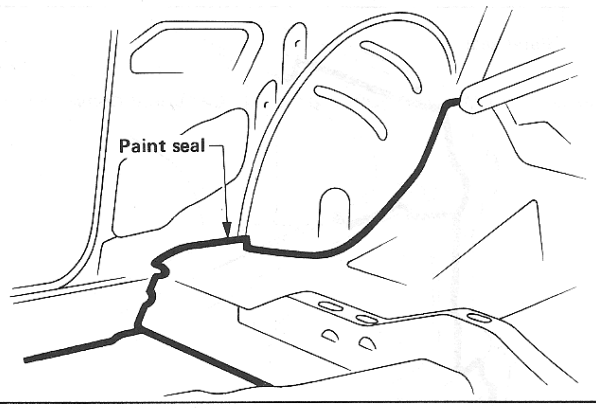
Detail F



Detail G

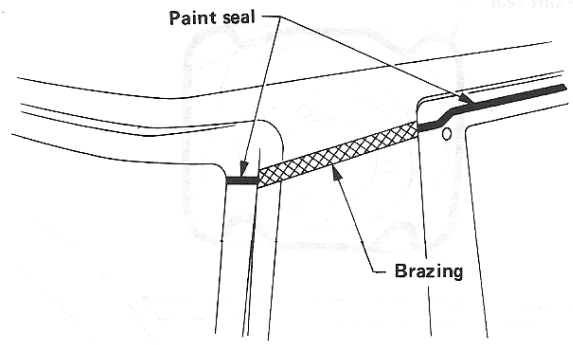


Detail H



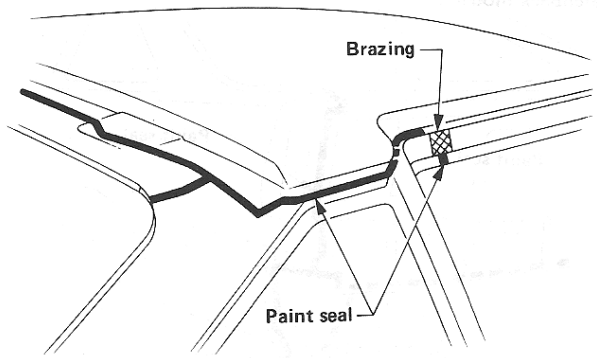
Detail I

Coupe model

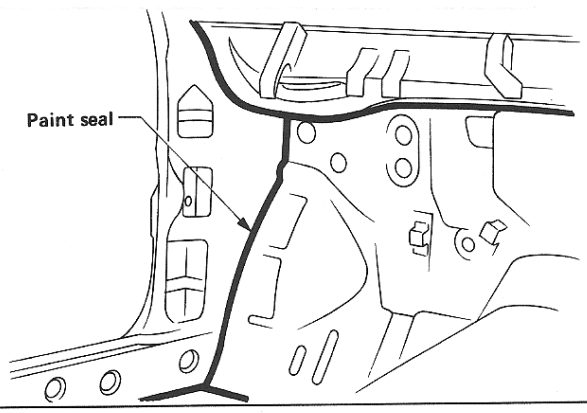


Detail I

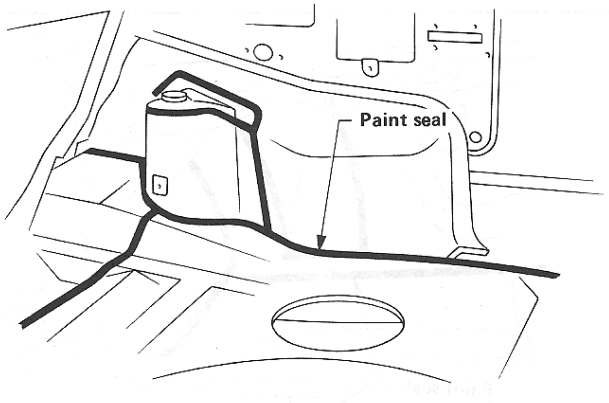
Hatchback model



Detail J

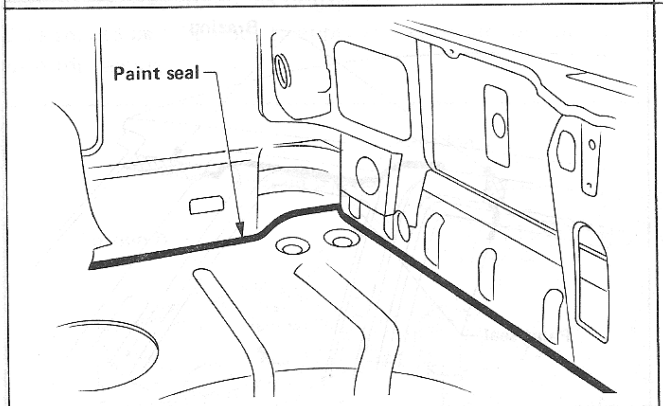


Detail K

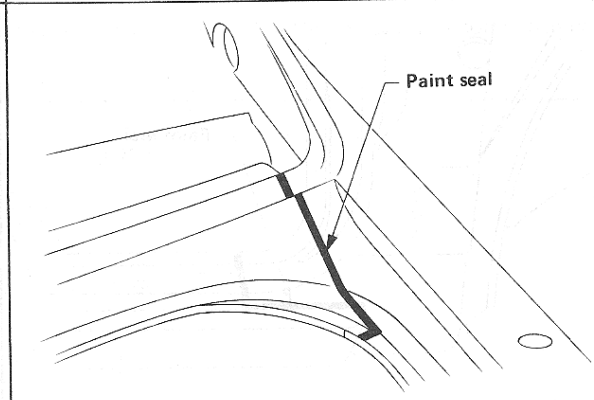


DESCRIPTION

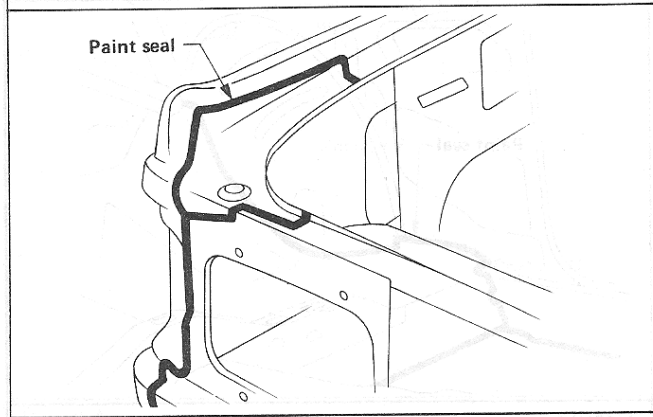
Detail L



Detail M

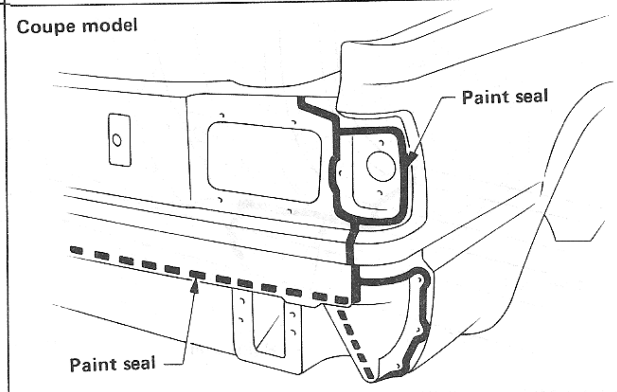


Detail N



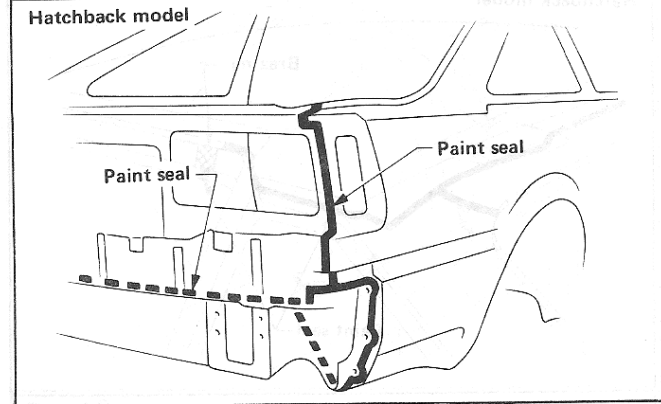
Detail O

Coupe model

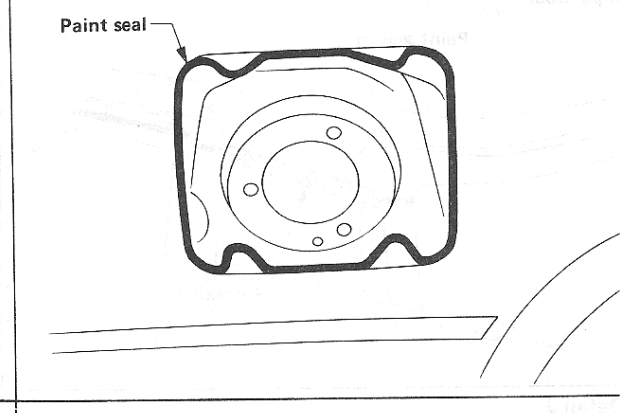


Detail O

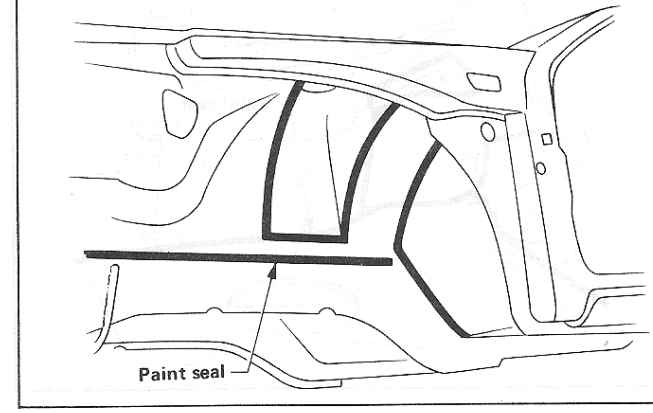
Hatchback model



Detail P



Detail Q



DESCRIPTION

1 Dimension Lines

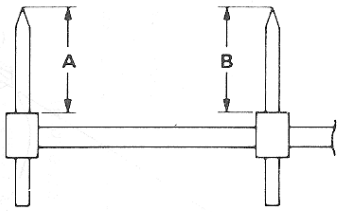
All dimensions indicated in the drawings/illustrations are the standard design values. These values, along with their dimension lines, are colored for easy identification.

Note: An asterisk (*) at the measuring point indicates that the measuring point on the other side is symmetrically the same value.

2 Measurement Operations

When car body measurements are taken in accordance with the red dimension line, careful consideration should be given to the following points.

1. Measurement method
   - When a tram tracking gauge is used, adjust pointers (A) and (B) to equal lengths as shown in the figure to the right. Check the pointers and gauge itself to make sure there is no free play.

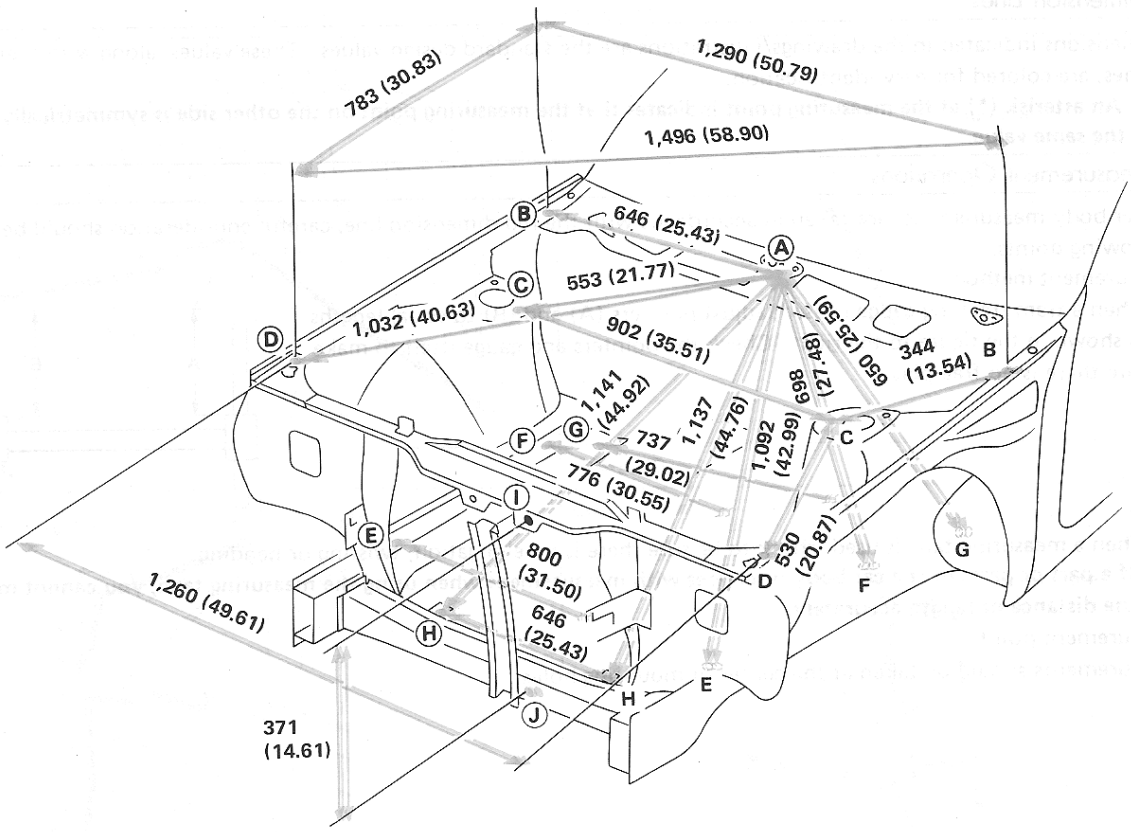


   - When a measuring tape is used, check to be sure there is no elongation, twisting or bending.

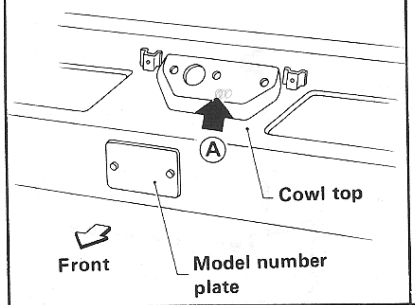
Note: If a part or parts of the car body interferes with measurement when using the measuring tape, you cannot measure the distance or length accurately.

2. Measurement point
   Measurements should be taken at the center of mounting holes.

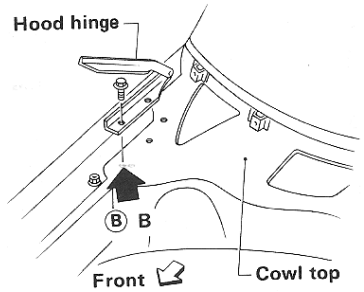
ENGINE COMPARTMENT



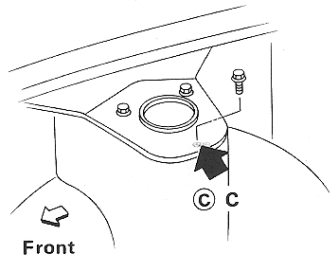
7 (0.28) dia.



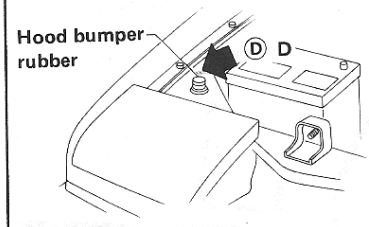
12 (0.47) dia.



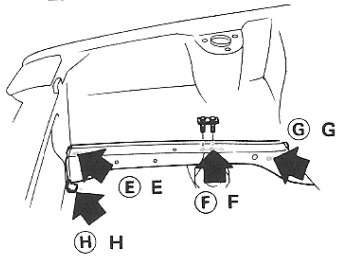
11 (0.43) dia.



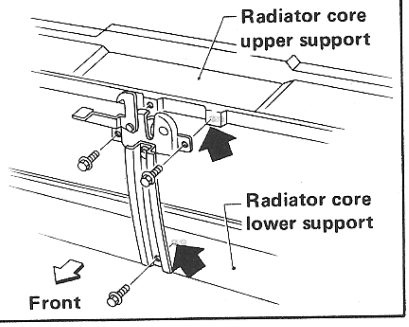
8 (0.31) dia.



Ⓔ E: 16 (0.63) dia.
Ⓕ F: 14 (0.55) dia.
Ⓖ G: 16 (0.63) dia.
Ⓗ H: R.H. side 16 (0.63) dia.
L.H. side 16 x 22 (0.63 x 0.87)

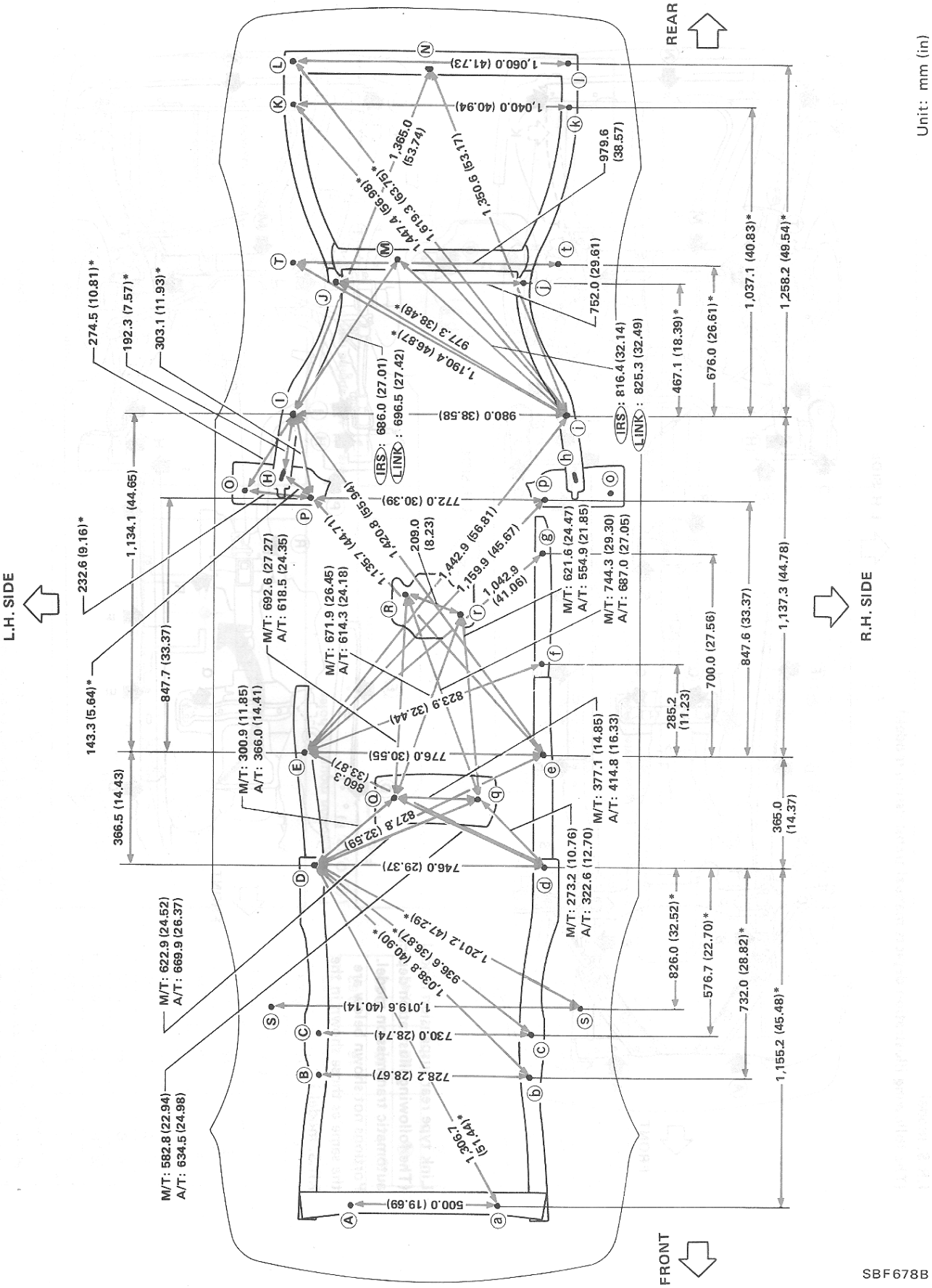


Ⓘ: 12 (0.47) dia.
Ⓙ: 11 (0.43) dia.



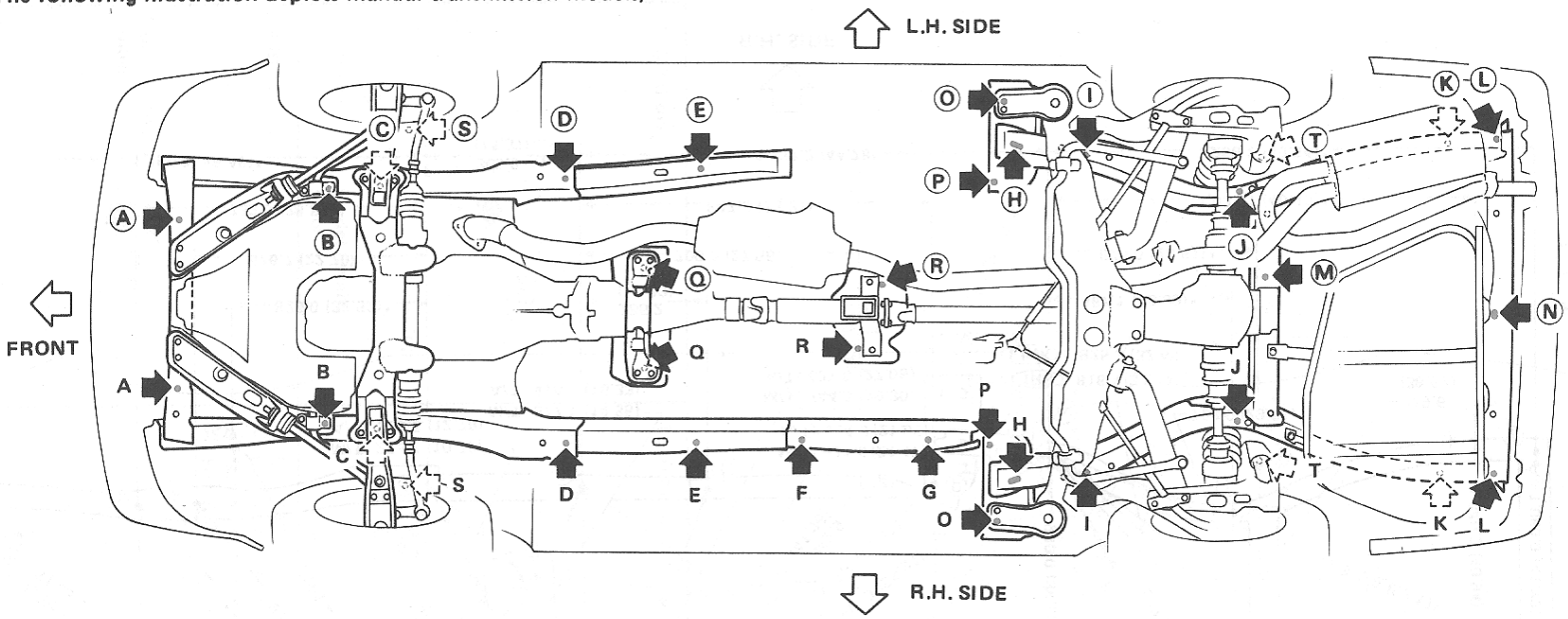
Unit: mm (in)

UNDERBODY

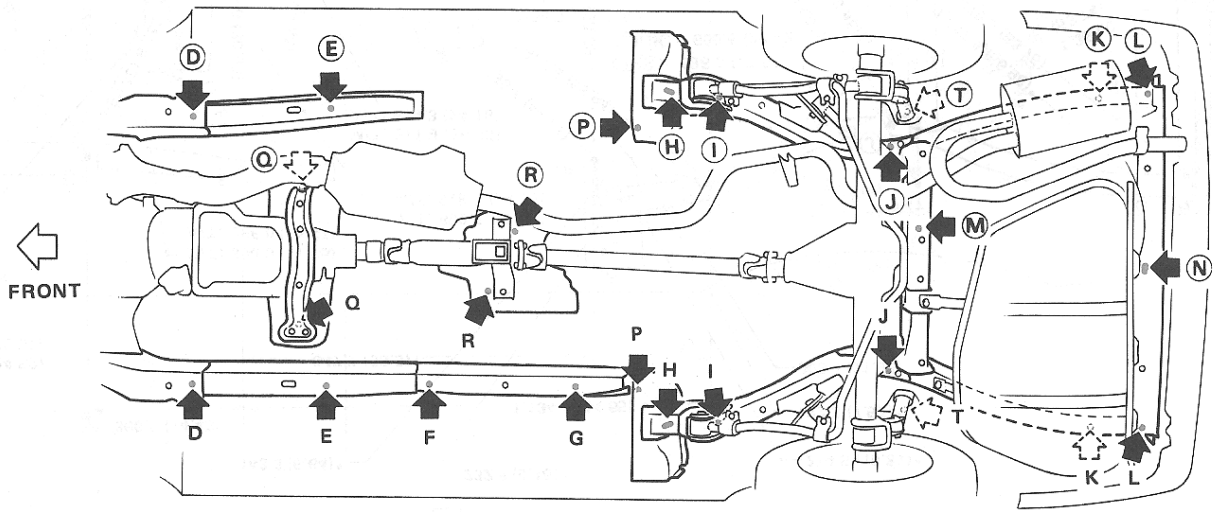


SBF678B

I.R.S. model
(The following illustration depicts manual transmission model.)

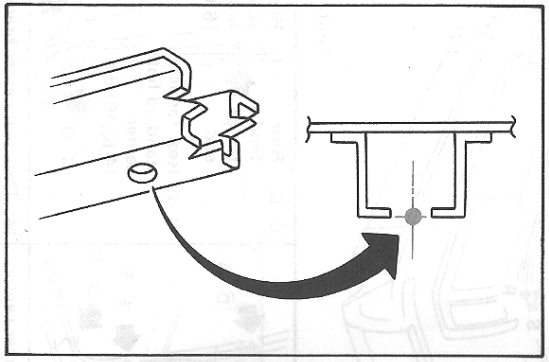


Link type rear suspension model
(The following illustration depicts automatic transmission model. Portions not shown below are the same as those shown in the I.R.S. model.)

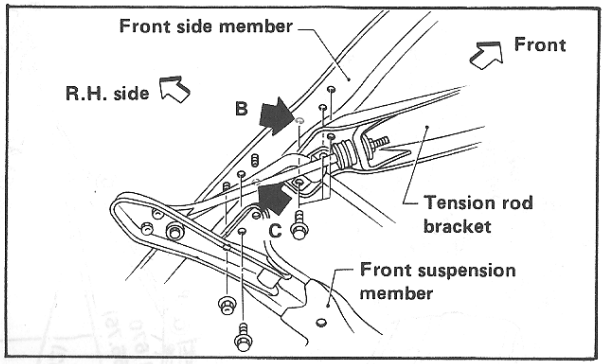


Measuring points	Measurement (dia.)	
	mm	in
Ⓐ, A	14	0.55
Ⓑ, B	13	0.51
Ⓒ, C	14	0.55
Ⓓ, D	14	0.55
Ⓔ, E	16	0.63
F	18	0.71
G	18	0.71
Ⓗ, H	30 x 17	1.18 x 0.67
Ⓘ, I	16	0.63
Ⓙ, J	14	0.55
Ⓚ, K	16	0.63
Ⓛ, L	15	0.59
Ⓜ	12	0.47
Ⓝ	20 x 25	0.79 x 0.98
Ⓞ, O	13	0.51
Ⓟ, P	10	0.39
Ⓠ, Q	12	0.47
Ⓡ, R	10	0.39
Ⓢ, S	84	3.31
Ⓣ, T	12.5	0.492

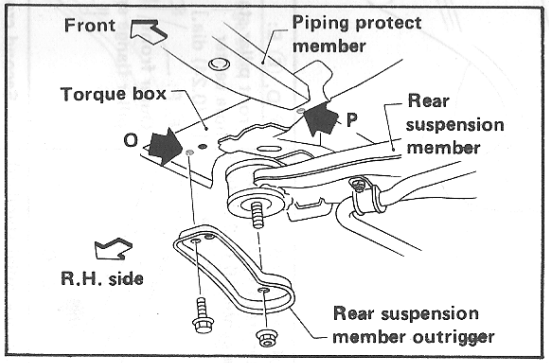
Hole for locating at underside of member
(Ⓐ A, Ⓓ D, Ⓔ E, F, G, Ⓗ H, Ⓘ I, Ⓙ J, Ⓚ K, Ⓛ L, Ⓜ, Ⓝ)



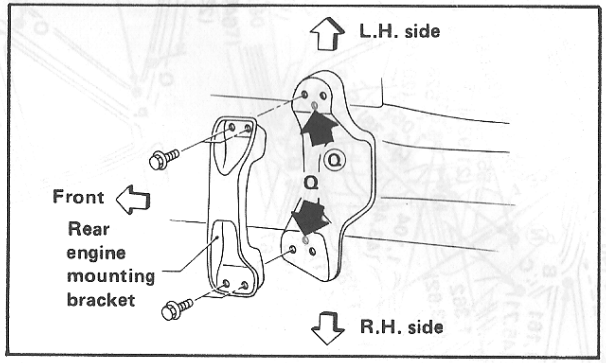
Front suspension mounting holes
(Ⓑ B, Ⓒ C)



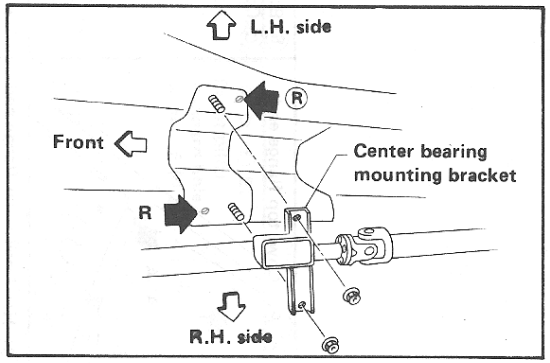
Rear suspension mounting holes
(Ⓞ O, Ⓟ P)



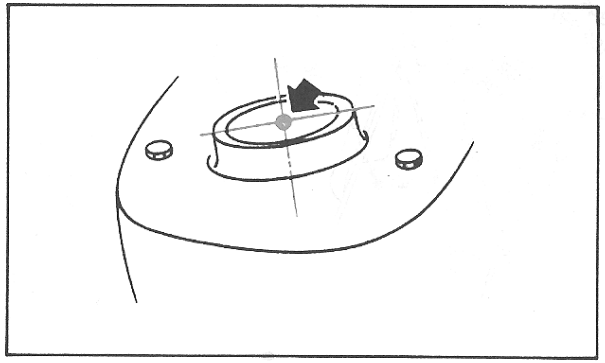
Hole for rear engine mounting (Ⓠ Q)



Hole for locating at center bearing mounting reinforcement (Ⓡ R).

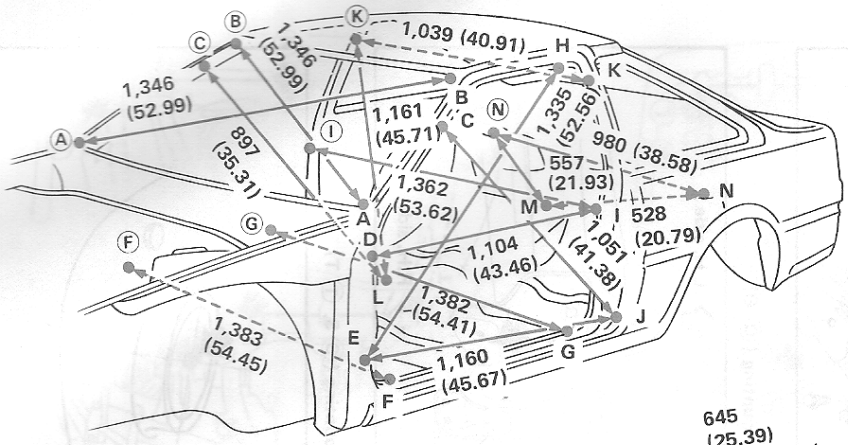


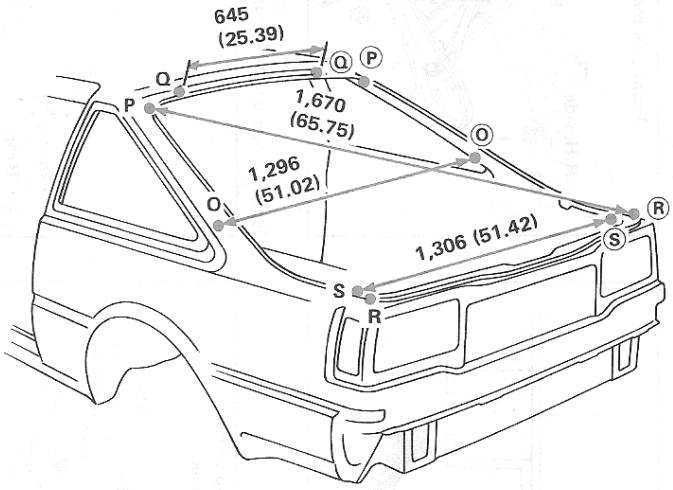
Suspension upper mounting (Ⓢ S, Ⓣ T)



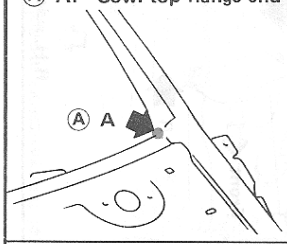
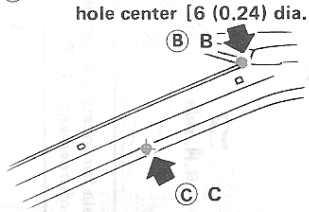
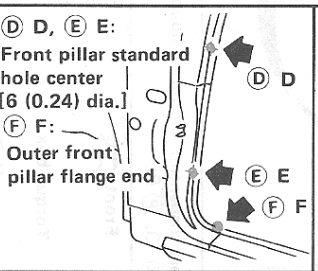
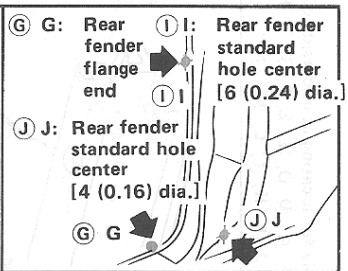
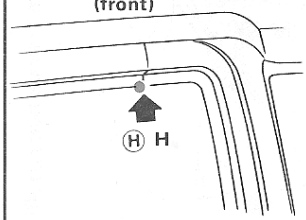
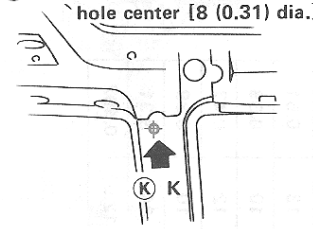
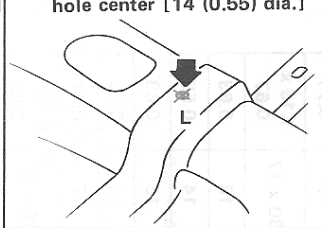
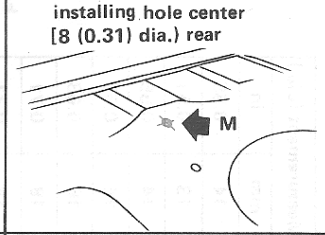
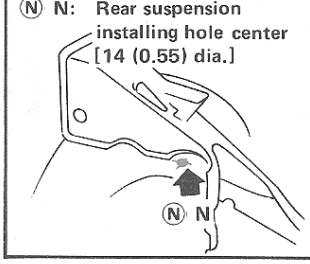
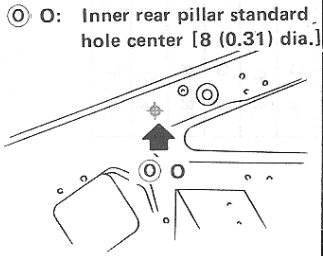
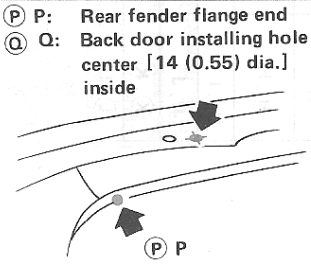
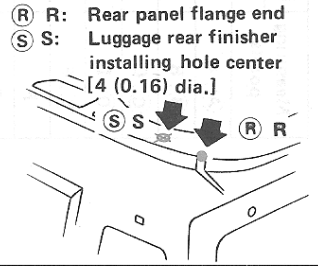
ROOM SPACE AND REAR BODY

HATCHBACK



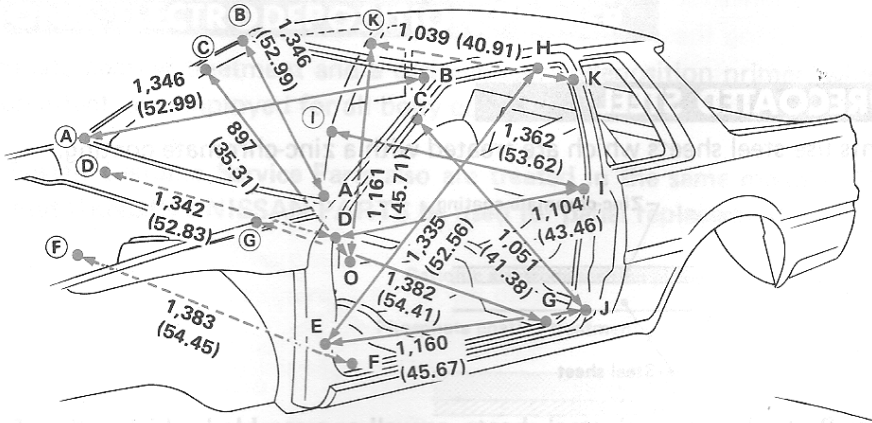


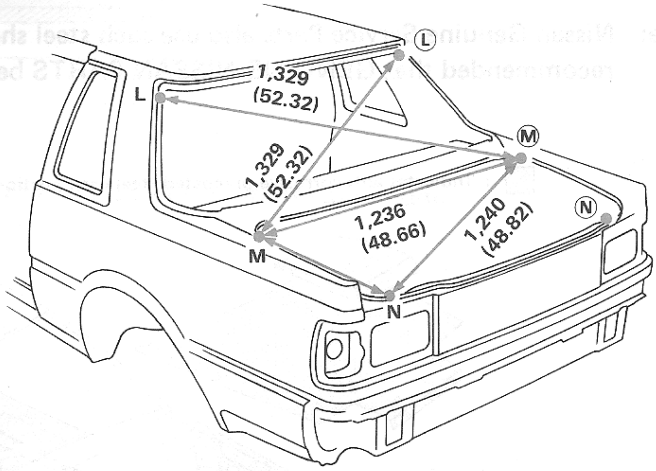
Unit: mm (in)

Ⓐ A: Cowl top flange end 	Ⓑ B: Roof flange end Ⓒ C: Outer front pillar standard hole center [6 (0.24) dia.] 	Ⓓ D, Ⓔ E: Front pillar standard hole center [6 (0.24) dia.] Ⓕ F: Outer front pillar flange end 	Ⓖ G: Rear fender flange end Ⓘ I: Rear fender standard hole center [6 (0.24) dia.] Ⓙ J: Rear fender standard hole center [4 (0.16) dia.] 
Ⓗ H: Lock pillar flange end (front) 	Ⓚ K: Inner lock pillar standard hole center [8 (0.31) dia.] 	L: Second crossmember center hole center [14 (0.55) dia.] 	M: Rear seat center bracket installing hole center [8 (0.31) dia.) rear 
Ⓝ N: Rear suspension installing hole center [14 (0.55) dia.] 	Ⓞ O: Inner rear pillar standard hole center [8 (0.31) dia.] 	Ⓟ P: Rear fender flange end Ⓠ Q: Back door installing hole center [14 (0.55) dia.] inside 	Ⓡ R: Rear panel flange end Ⓢ S: Luggage rear finisher installing hole center [4 (0.16) dia.] 

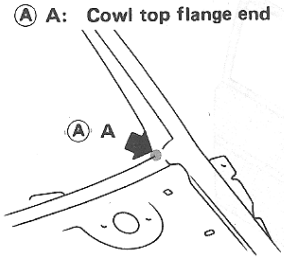
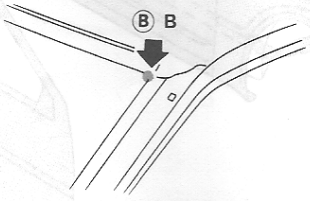
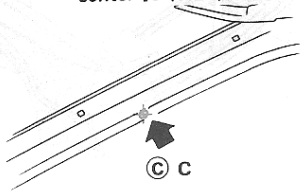
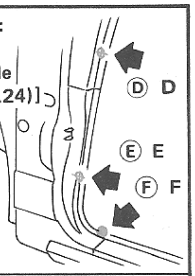
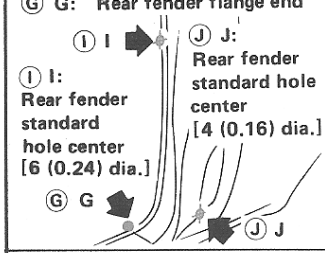
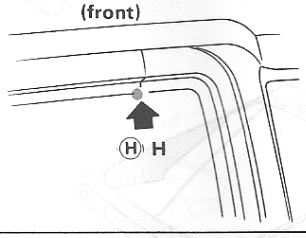
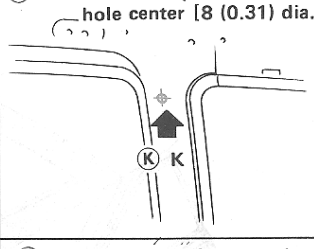
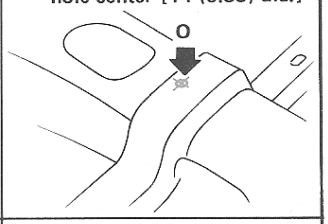
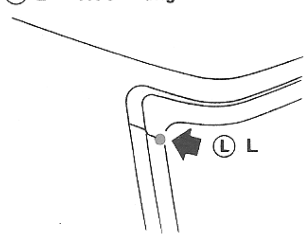
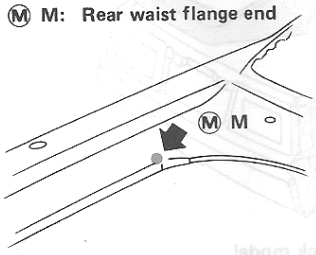
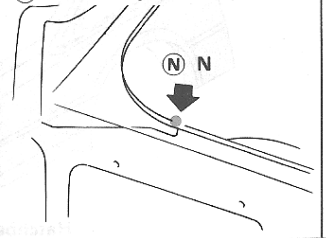
ROOM SPACE AND REAR BODY

COUPE





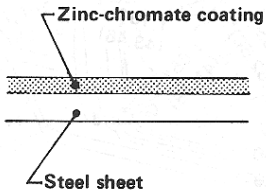
Unit: mm (in)

Ⓐ A: Cowl top flange end 	Ⓑ B: Roof flange end 	Ⓒ C: Front pillar standard hole center [6 (0.24) dia.] 	Ⓓ D, Ⓔ E: Front pillar standard hole center [6 (0.24)] dia.] Ⓕ F: Outer front pillar flange end 
Ⓖ G: Rear fender flange end Ⓘ I: Rear fender standard hole center [6 (0.24) dia.] Ⓙ J: Rear fender standard hole center [4 (0.16) dia.] 	Ⓗ H: Lock pillar flange end (front) 	Ⓚ K: Inner lock pillar standard hole center [8 (0.31) dia.] 	O: Second crossmember center hole center [14 (0.55) dia.] 
Ⓛ L: Roof flange end 	Ⓜ M: Rear waist flange end 	Ⓝ N: Rear panel flange end 	

In order 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 practice anti-corrosive measures.

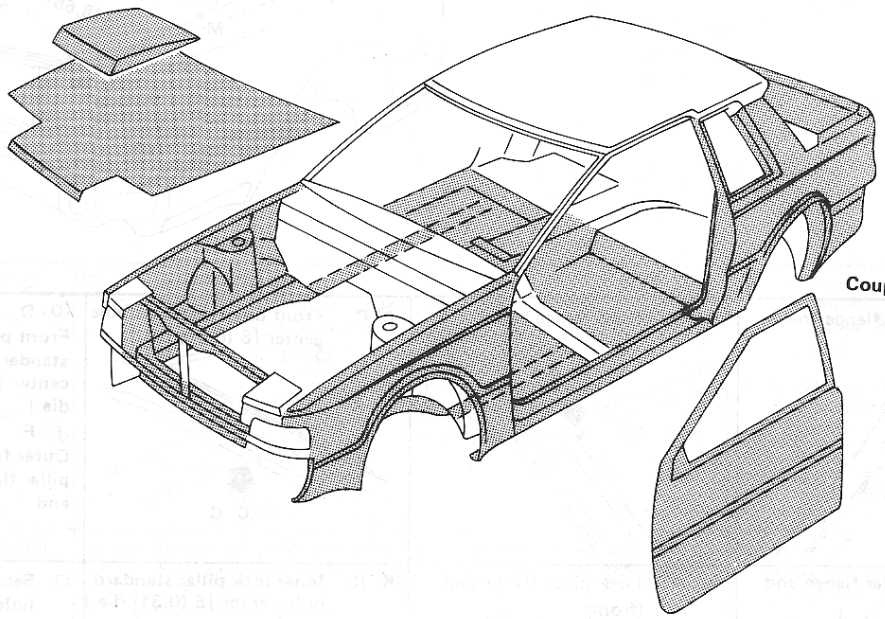
ANTI-CORROSIVE PRECOATED STEEL

Some of the body components use steel sheets which are treated with a zinc-chromate coating.

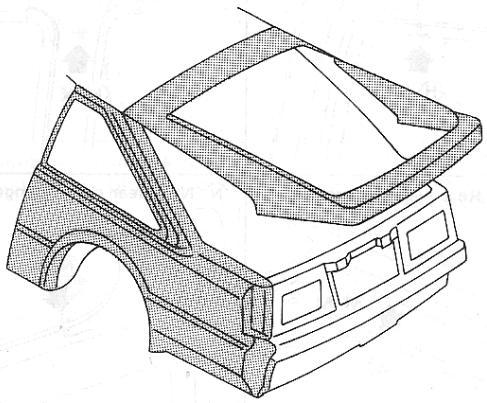


Note: Nissan Genuine Service Parts also use such steel sheets, as well as assembled vehicles, therefore, it is recommended that GENUINE NISSAN PARTS be used for panel replacement.

: Indicates anti-corrosive precoated steel used portions.



Coupe model

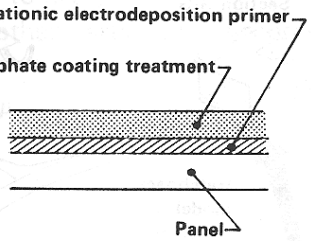


Hatchback model

PHOSPHATE COATING TREATMENT AND CATIONIC ELECTRODEPOSITION PRIMER

A phosphate coating treatment and a cationic electrodeposition primer, which provide an excellent anti-corrosion effect, are employed for all body components.

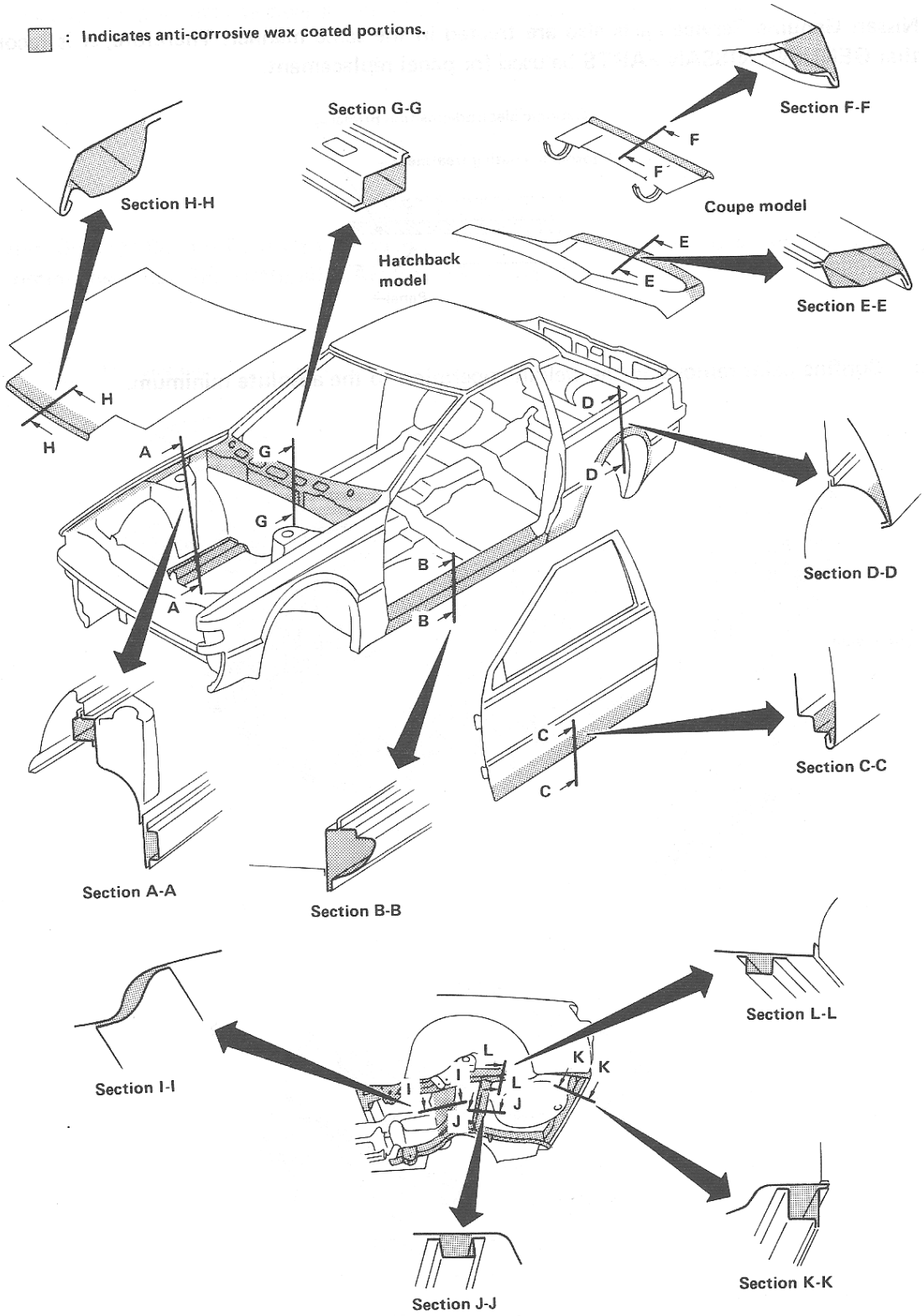
Note: **Nissan Genuine Service Parts also are treated in the same manner. Therefore, it is recommended that GENUINE NISSAN PARTS be used for panel replacement.**



Caution: **Confine paint removal in the welding operation to the absolute minimum.**

ANTI-CORROSIVE WAX

In order to improve corrosion resistance, anti-corrosive wax is applied inside the side member, body sill, and so on. Accordingly, when replacing these parts, be sure to apply anti-corrosive wax to the pertinent portions of the new parts. Select an excellent anti-corrosive wax which will penetrate after application and deteriorate less during storage.



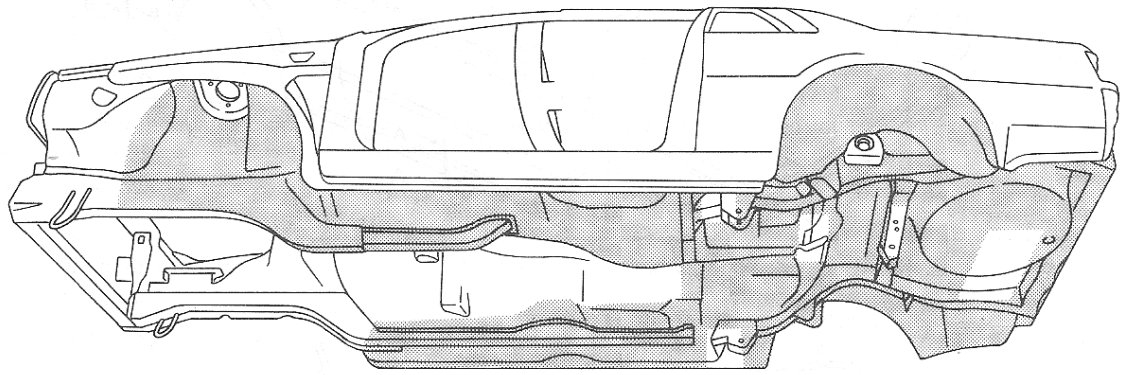
UNDERCOATING

The undersides 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.

Precautions in undercoating

1. Do not apply undercoating to any place unless specified (such as the areas above the muffler and catalyst converter which are subjected to heat).
2. Do not undercoat the exhaust pipe, other parts which become hot, and rotary parts such as the propeller shaft, etc.
3. Apply undercoating thicker than 500 μ.

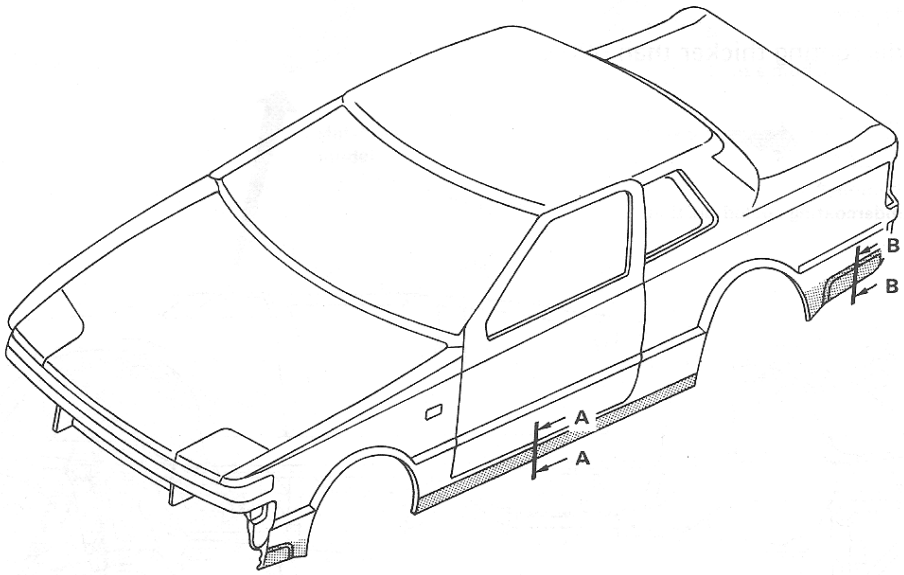
▨ : **Indicates undercoating coated portions.**

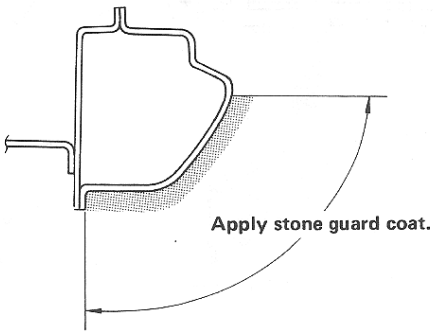


STONE GUARD COAT

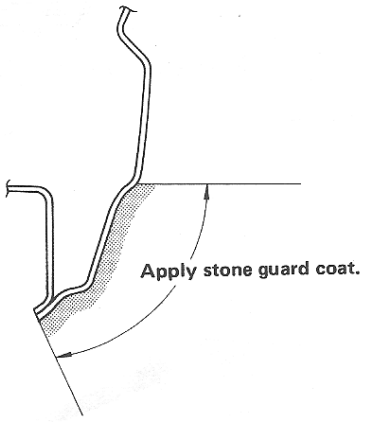
In order to prevent damage caused by stones, the outer body panels (fender, door, etc.) have an additional layer of Stone Guard Coat over the ED primer coating on the undersides. Thus, in replacing or repairing these panels, apply undercoating to the same portions as before. Use a coat which is rust preventive, durable, shock-resistant and deteriorates little when stored.

▨ : Indicates stone guard coat coated portions.





Section A-A



Section B-B

HANDLING PRECAUTIONS FOR PLASTICS

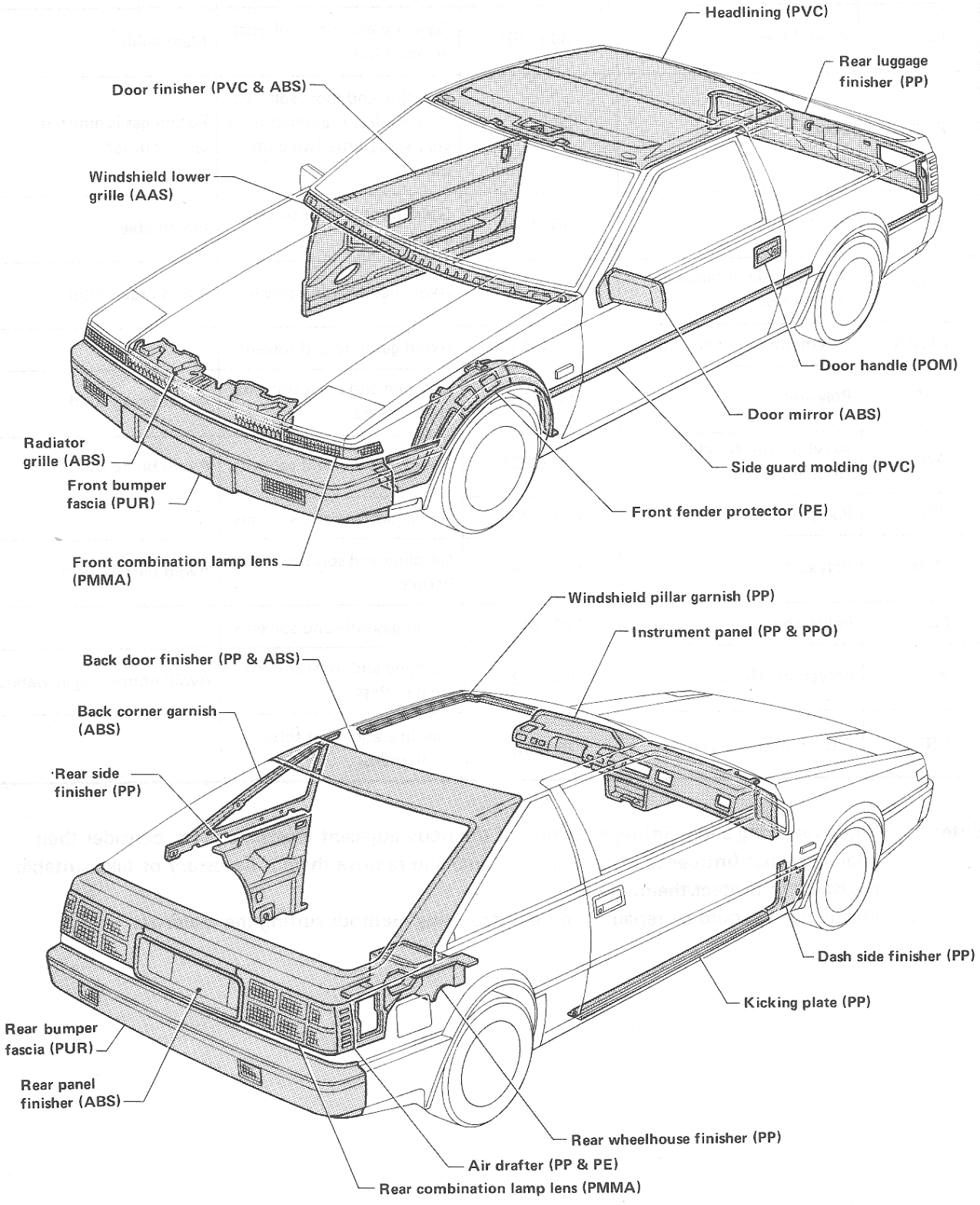
Abbreviation	Material name	Heat resisting temperature °C (°F)	Resistance to gasoline and solvents	Other cautions
PE	Polyethylene	80 (176)	Gasoline and most solvents are harmless.	Flammable
PVC	Polyvinyl chloride	90 (194)	Gasoline and most solvents are harmless if applied for a very short time (wipe up quickly).	Poison gas is emitted when burned.
PP	Polypropylene	90 (194)	Gasoline and most solvents are harmless.	Flammable
ABS	Acrylonitrile butadiene styrene resin	90 (194)	Avoid gasoline and solvents	Avoid brake fluid.
PMMA	Polymethyl methacrylate	90 (194)	Avoid gasoline and solvents	
PUR	Polyurethane	90 (194)	Gasoline and most solvents are harmless.	Avoid brake fluid.
AAS	Acrylonitrile Acrylic Rubber Styrene	95 (203)	Avoid gasoline and solvents.	Avoid brake fluid.
PPO	Polyphenylene oxide	110 (230)	Avoid gasoline and solvents.	
POM	Polyacetal	120 (248)	Gasoline and solvents are harmless.	Avoid battery acid.
PC	Polycarbonate	120 (248)	Avoid gasoline and solvents.	
PA	Polyamide (Nylon)	150 (302)	Gasoline and most solvents are harmless.	Avoid immersing in water.
FRP	Fiber reinforced plastics	170 (338)	Gasoline and most solvents are harmless	

Note: 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.**

LOCATIONS OF PLASTIC PARTS

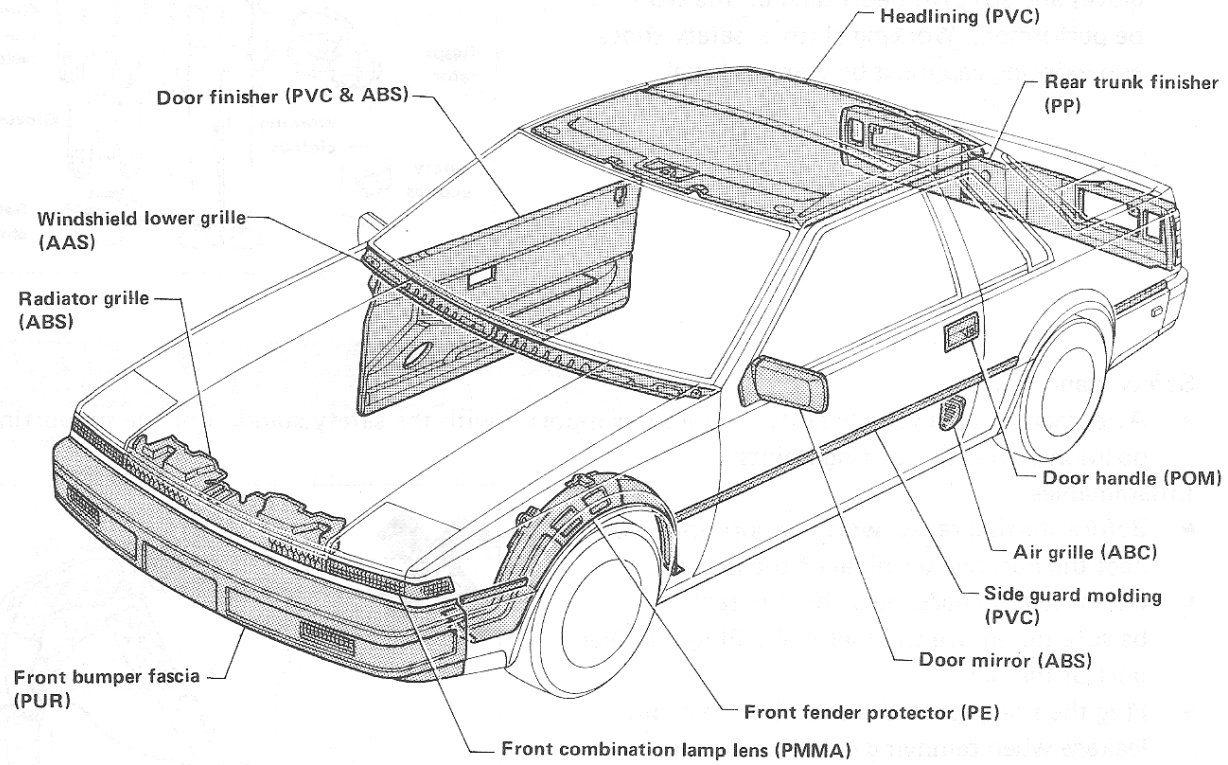
HATCHBACK

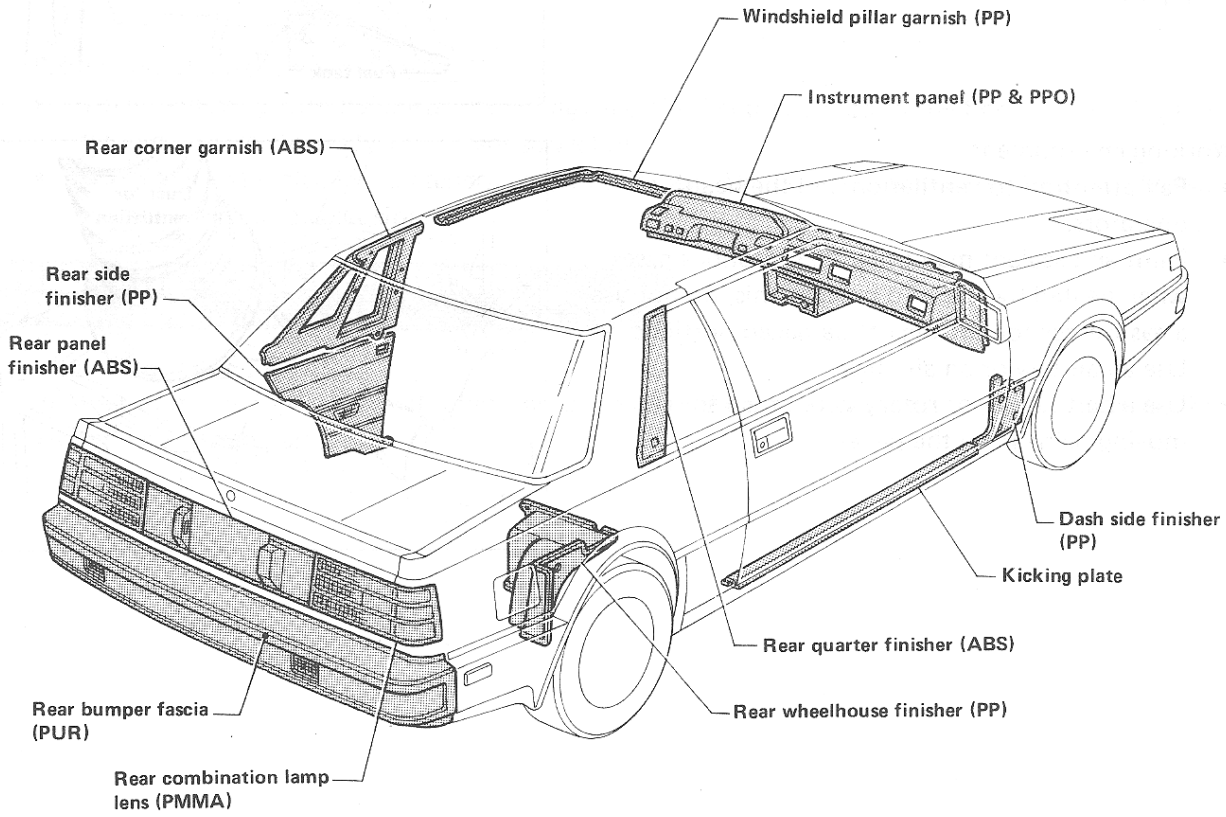


LOCATIONS OF PLASTIC PARTS

COUPE

Portions where resinous material is used (Coupe)

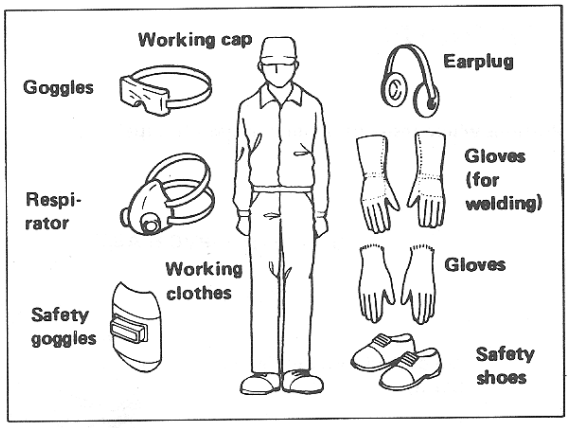




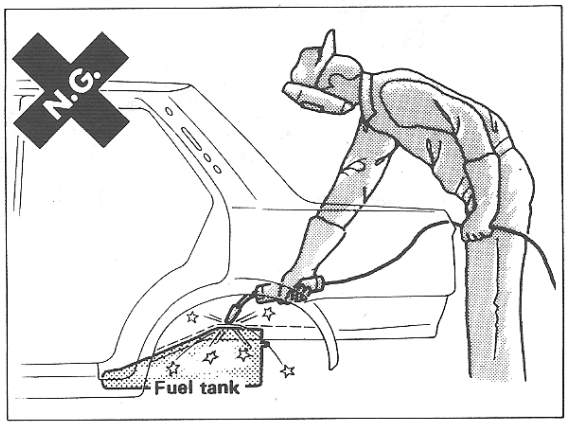
PRECAUTIONS IN OPERATION

SAFETY PRECAUTIONS

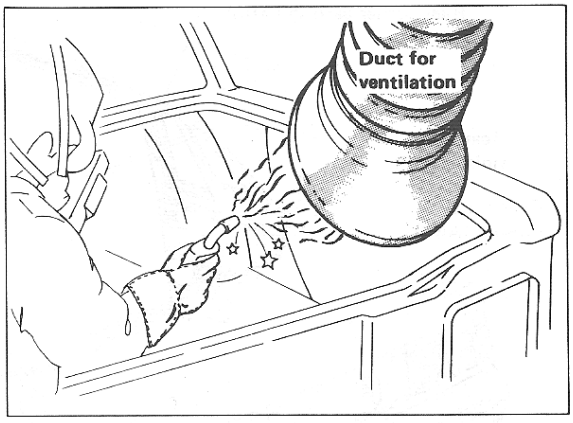
1. Wear protectors
   - Be sure to wear goggles, earplugs, respirator, gloves and so forth depending on the work to be performed. Working clothes, safety shoes, and working cap must be worn as usual.



2. Safety stand
   - After jacking up a vehicle body, be sure to support it with the safety stand. For the supporting positions, refer to "Lifting Points".
3. Inflammables
   - Before starting repair work, be sure to disconnect the negative terminal of the battery.
   - When welding parts near the fuel tank, be sure to remove the fuel tank. Plug the filler port of the tank.
   - Plug the fuel pipe and brake pipes to avoid leakage when removing connectors from the pipes.

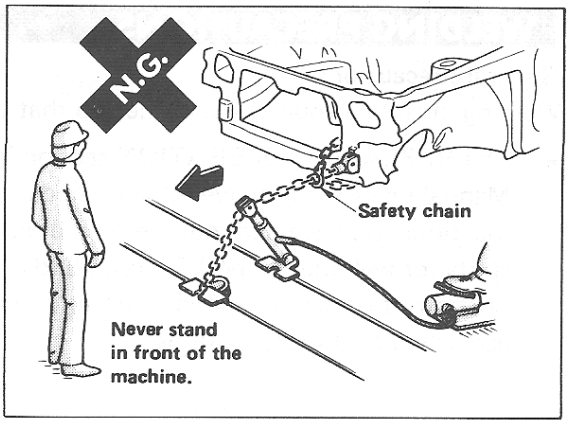


4. Working environment
   - Pay attention to ventilation and the health of operators.
   - Paint and sealant may generate poisonous gases when heated by fire. To prevent this, do not use a gas welder for cutting off damaged portions. Use an air saw or an air chisel.
   - Use a belt sander or rotary wire brush for removing paint from the panel.



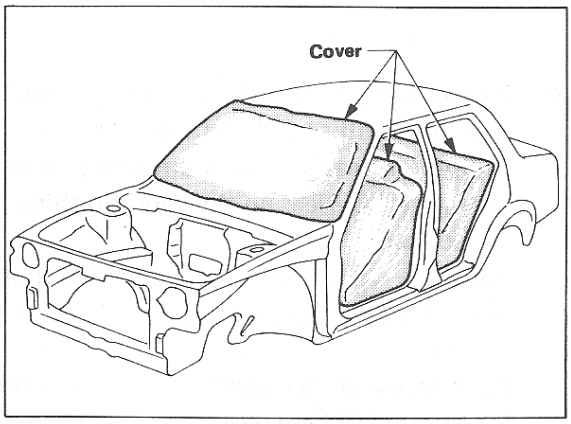
PRECAUTIONS IN OPERATION

5. Vehicle body straightener
   - Be sure to use correctly according to the instruction manual prepared by the manufacturer of the straightener. When straightening a damaged portion, never stand in front of the machine in the direction that the body is to be straightened. Equip with a safety chain in case of emergency.



PROTECTION OF BODY AND EXTERNALLY ATTACHED PARTS

1. Protection of body
   - Remove or cover interior components (seats, instruments, carpet).
   - When welding, cover glasses, seats, instruments and carpet with a heat-resistant material. (This protection is necessary especially when CO_2 arc welding.)



2. Protection of exterior parts
   - When removing external parts (mouldings and finishers) attached to the body, apply cloth or protection tape to the body to prevent scratching.
   - If the painted surface is scratched, be sure to repair that portion: even a small flaw in the painted surface may cause corrosion.

PRECAUTIONS IN REPLACING OPERATION

Use of genuine parts

- In order to maintain the original functions and high quality of the vehicle, it is recommended that you use genuine Nissan parts.

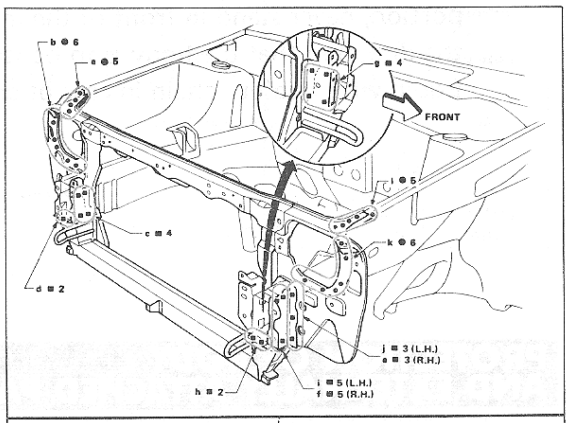
PRECAUTIONS IN OPERATION

WELDING PRECAUTIONS

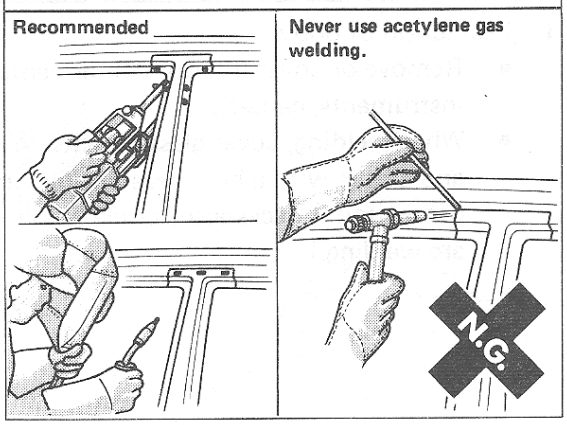
General precautions

Welding must be properly performed so that car body will retain sufficient strength and durability.

- The REPLACING OPERATION section in the Manual deals with the welding methods, locations to be welded, number of welding spots (or welding pitches) for each body portion. It is recommended to perform welding according to the descriptions.



- Resistance spot welding is superior in weld strength to other welding processes. In addition, it features a low amount of thermal strain, a short welding time and finishing is unnecessary.
  For these reasons, it is recommended that resistance spot welding be used whenever possible.
  Further, use of mig welding is recommended for locations where resistance spot welding cannot be utilized.
  Caution: Gas welding (oxyacetylene gas welding) must not be used because it causes a decline in strength of areas surrounding the welded parts.



Note: There are a variety of resistance spot welders on the market. Be sure to use a welder with a sufficient capacity to secure weld strength. Also, inspect welded parts to confirm weld strength.

PRECAUTIONS IN OPERATION

Spot welding

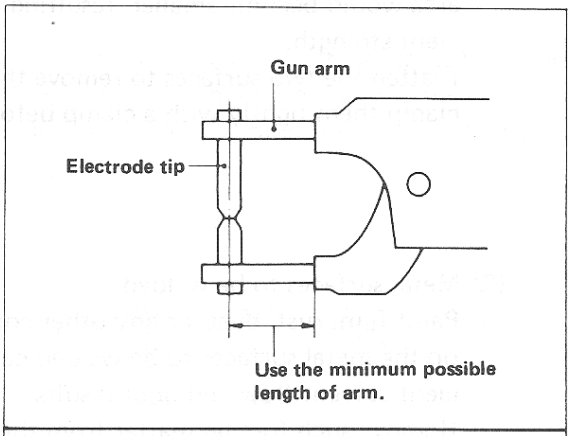
1. Spot welder

To obtain sufficient strength at the spot welded portions, perform the following checks and adjustment on the spot welding machine before starting operation.

(1) Adjustment of arm

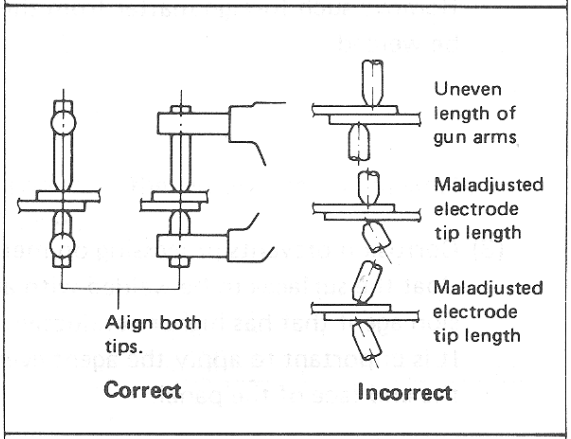
a. Keep the gun arm as short as possible to obtain the maximum pressure for welding.

b. Securely tighten the gun arm and tips so that they will not become loose during operation.



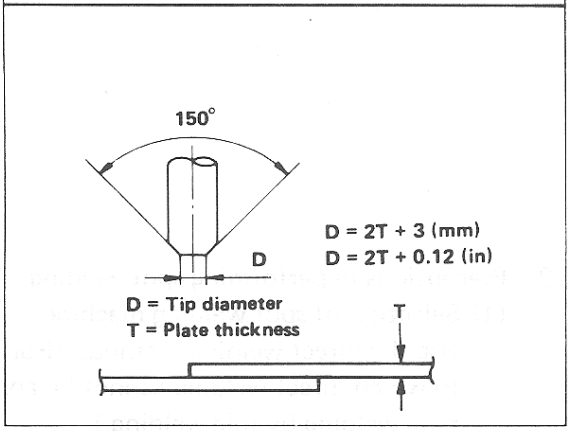
(2) Alignment of electrode tips

Align the upper and lower electrode tips on the same axis. Poor alignment of the tips causes insufficient pressurizing, and this results in insufficient current density and insufficient strength at the welded portions.



(3) Diameter of electrode tip

The tip diameter must be properly controlled to obtain the desired welding strength. Before starting operation, make sure that the tip diameter (D) is kept the proper size, and file it cleanly to remove burnt or foreign matter from the surface of the tip.



Unit: mm (in)

Thickness (T)	Diameter (D)	Thickness (T)	Diameter (D)
0.6 (0.024)	4.2 (0.165)	1.0 (0.039)	5.0 (0.197)
0.7 (0.028)	4.4 (0.173)	1.2 (0.047)	5.4 (0.213)
0.8 (0.031)	4.6 (0.181)	1.4 (0.055)	5.8 (0.228)
0.9 (0.035)	4.8 (0.189)	1.6 (0.063)	6.2 (0.244)

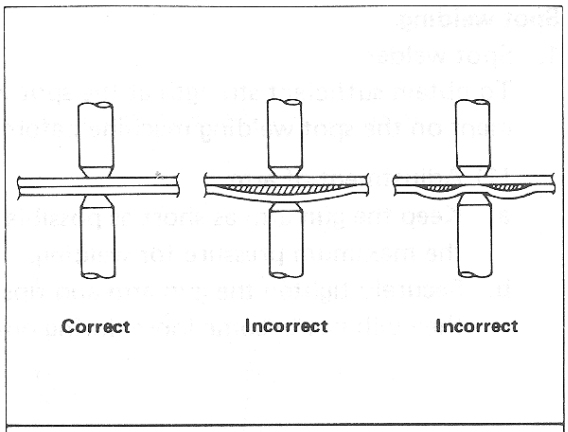
2. Condition of the panel

Presence of a gap, paint film, rust, or dust on the surface of the panel causes poor current flow and reduction is spot area and these lead to unsuccessful welding.

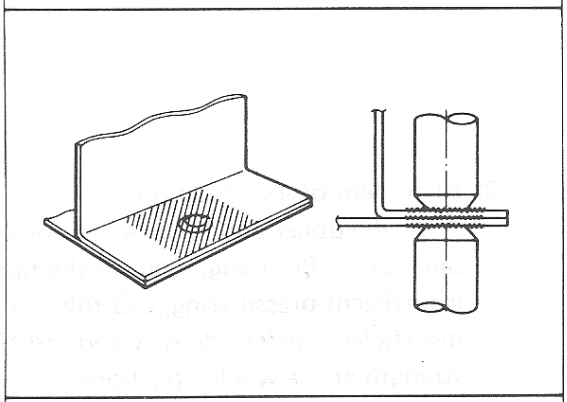
Before beginning, it is necessary to thoroughly check the condition of the panel, and make any necessary corrections.

PRECAUTIONS IN OPERATION

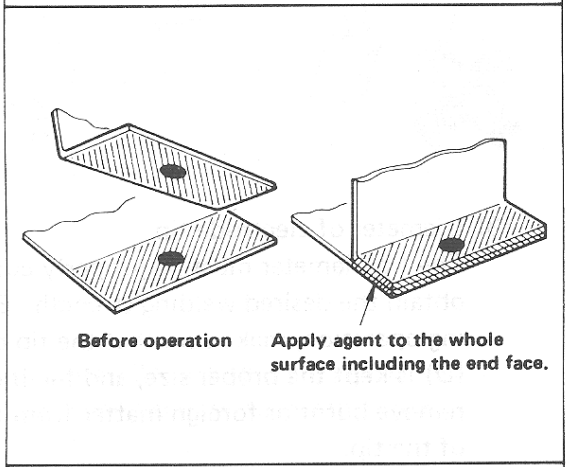
(1) Clearance between welding surfaces
Any clearance between the surfaces to be welded causes poor current flow. Even if welding can be made without removing such gap, the welded area would become smaller, resulting in insufficient strength.
Flatten the two surfaces to remove the gaps, and clamp them tightly with a clamp before welding.



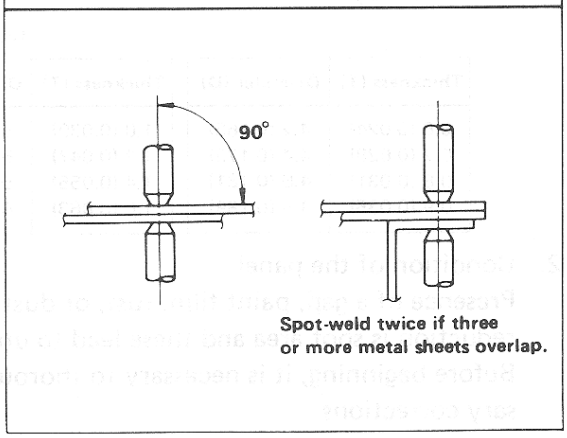
(2) Metal surfaces to be welded
Paint film, rust, dust, or any other contamination on the metal surfaces to be welded cause insufficient current flow and poor results.
Remove such foreign matter from the surfaces to be welded.



(3) Corrosion prevents processing on metal surface
Coat the surfaces to be welded witn an anti-corrosion agent that has higher conductivity.
It is important to apply the agent evenly even to the end face of the panel.



3. Precautions in performing spot welding
(1) Selection of spot welding machine
Use the direct welding method. (For the portions to which direct welding cannot be applied, use plug welding by mig welding.)
(2) Application of electrode tips
Apply electrodes at right angle to the panel. If the electrodes are not applied at right angle, the current density will be low resulting in insufficient welding strength.
(3) Lap welding of more than three metal sheets
For the portion where three or more metal sheets are overlapping, spot welding should be done twice.



PRECAUTIONS IN OPERATION

(4) No. of points of spot-welding

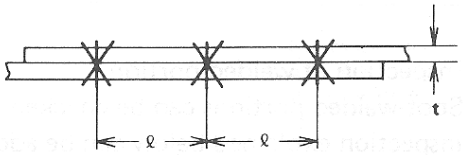
Generally, the capacity of spot welding machines available in a repair shop is smaller than that of welding machines at the factory. Accordingly, the number of points of spot-welding should be increased by 20 to 30% in a service shop compared to spot-welding in the factory.

(5) Minimum welding pitch

The minimum welding pitch varies with the thickness of plates to be welded. In general, the values given in the following table must be observed. Note that excessively small pitch allows the current to flow through surrounding portions, and this results in insufficient welding strength of the metal.

Unit: mm (in)

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



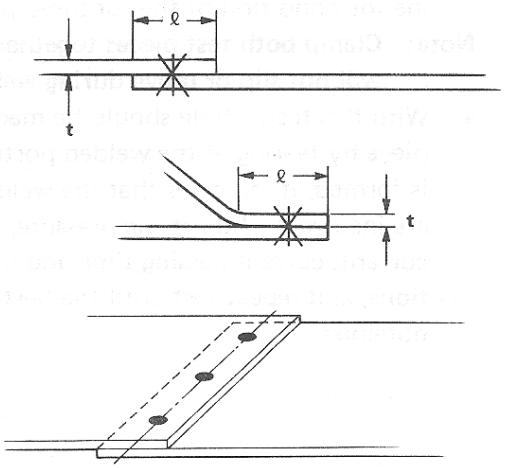
(6) Minimum lap of panels

Observe the following values for the lap distance of panels. If the lap distance is too small, it results in insufficient strength and also in a strained panel.

Unit: mm (in)

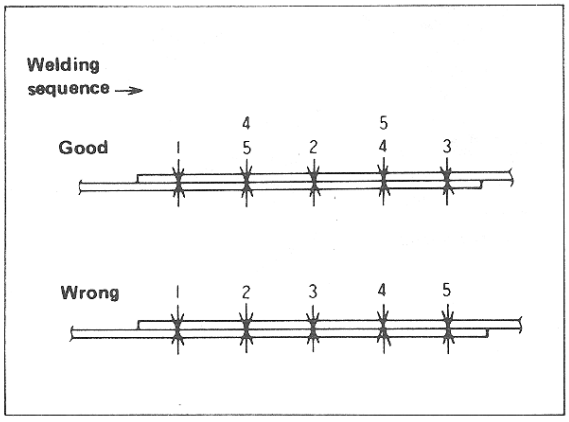
Thickness (t)	Minimum pitch (ℓ)
0.6 (0.024)	11 (0.43)
0.8 (0.031)	11 (0.43)
1.0 (0.039)	12 (0.47)
1.2 (0.047)	14 (0.55)
1.6 (0.063)	16 (0.63)
1.8 (0.071)	17 (0.67)

Note: Be sure to spot weld at the center of the overlapped portion.



(7) Spotting sequence

Do not spot continuously in one direction only. This method provides weak welding due to the shunt effect of the current. If the welding tips become hot and change their color, stop welding and allow the tips to cool.



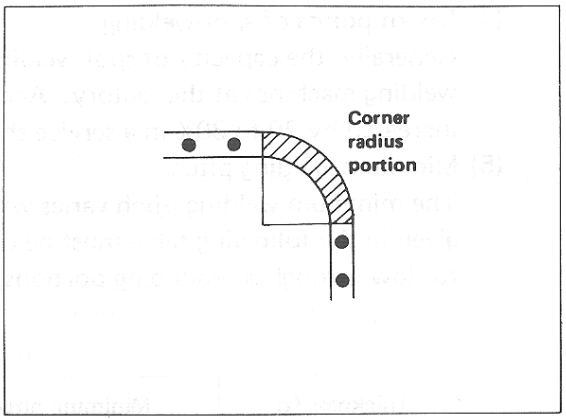
PRECAUTIONS IN OPERATION

(8) Welding corners

Do not weld the corner radius portion. Welding this portion results in stress concentration of stress which leads to cracks.

Examples

- Upper corner of front and center pillars
- Front upper portion of rear fender
- Corner portion of front and rear windows



4. Inspection of welded portion

Spot-welded portions can be checked by visual inspection and destructive inspection. The destructive inspection explained below can be adopted easily at the time of welding. Before and after welding, be sure to perform this destructive inspection to check the strength of the welded portions.

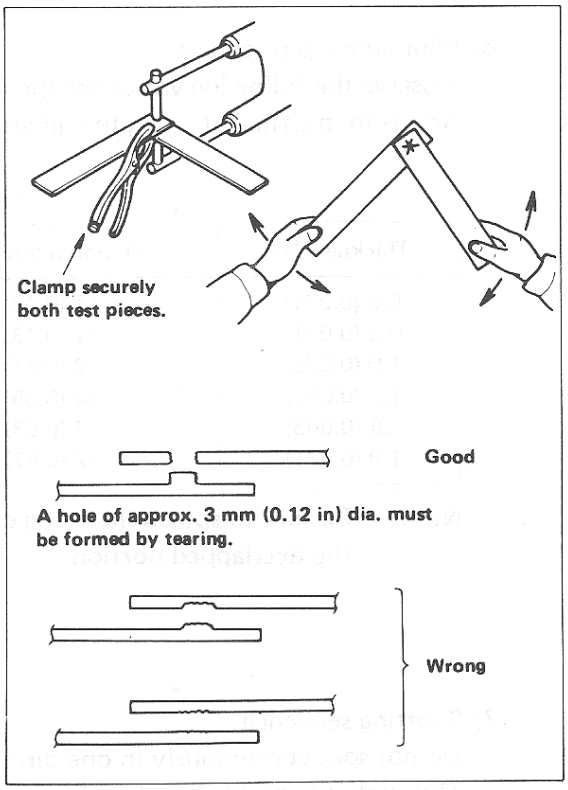
The welding spots should be spaced equally and arranged at the center of the flange to be welded.

(1) Check by using test piece (Confirmation before operation)

- Prepare test pieces having the same thickness as the panel to be welded and weld them together. Break the welded portion by twisting and examine the condition of the ruptured portion.

Note: Clamp both test pieces together so that they will not slip or move during welding.

- With this test, a hole should be made on one test piece by tearing at the welded portion. If no hole is formed, it indicates that the welding conditions are incorrect. Adjust the pressure, welding current, current passing time and other conditions, and repeat test until the best result is obtained.



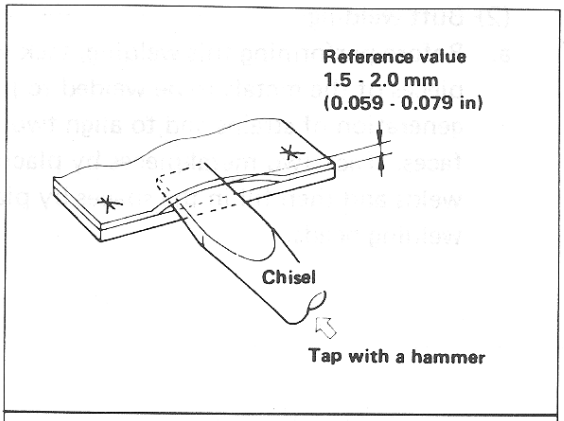
PRECAUTIONS IN OPERATION

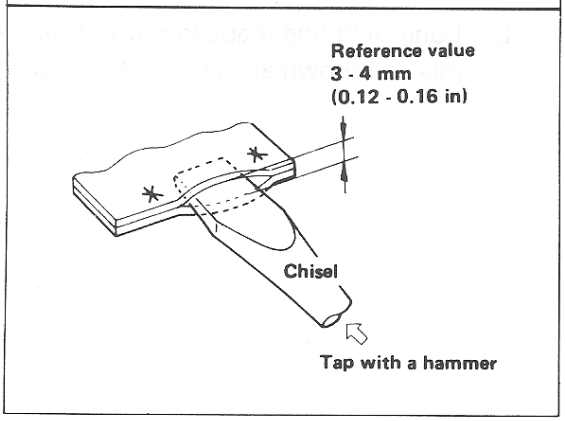
(2) Check by using chisel and hammer (Confirmation after welding)

- Insert the tip of a chisel between the welded plates, and tap the end of the chisel until the clearance of 3 to 4 mm (0.12 to 0.16 in) [when the plate thickness is 0.8 to 1.0 mm (0.031 to 0.039 in)] is formed between the plates. If the welded portions remain normal, it indicates that the welding has been done properly.

Note: This clearance varies with the location of the welded spots, length of the flange, plate thickness, welding pitch, and other factors. Note that the value shown above is only a reference value.

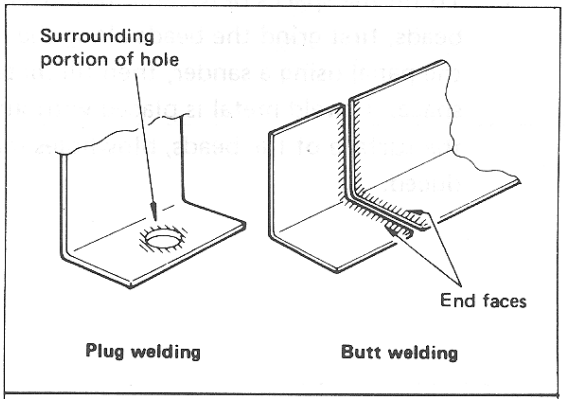
- If the thickness of the plates is not equal, the clearance between the plates must be limited to 1.5 to 2.0 mm (0.059 to 0.079 in). Note that further opening of the plates can become a destructive test.
- Be sure to repair the deformed portion of the panel after inspection.



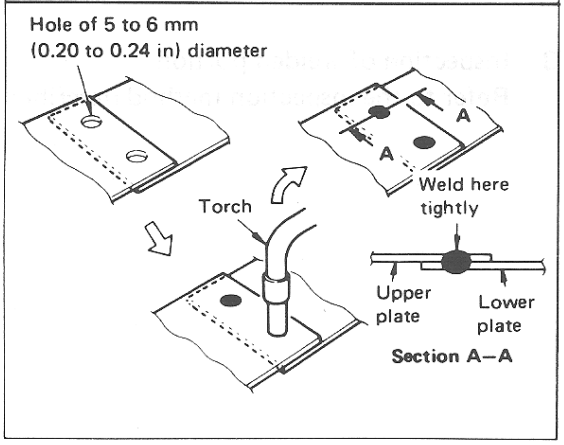


Mig Welding

1. Condition of panel to be welded
   Paint film, rust, or oils attached to the surface of the panel reduces the welding conditions, causing blowholes and spatter. Thoroughly remove any foreign matter from the surface to be welded by using a belt sander or wire brush.



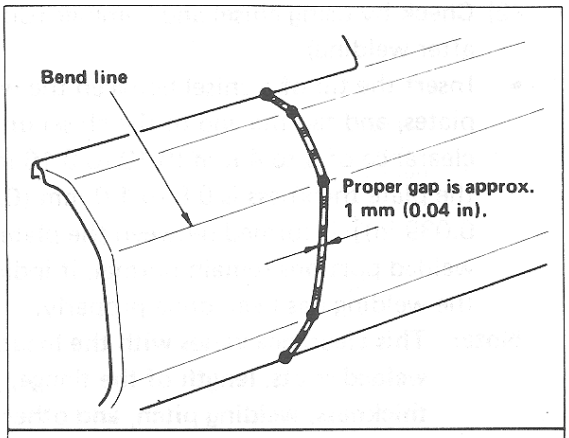
2. Precautions in welding
   (1) Plug welding
   a. Open a hole of 5 to 6 mm (0.20 to 0.24 in) diameter on one of the two metal plates to be welded and keep the upper plate and lower plate in tight contact.
   b. Apply the torch at right angle to the plate and fill metal into the hole at a stretch. Note that intermittent welding leads to the generation of oxide film on the surface and this causes blowholes. If this occurs remove the oxide film with a wire brush.
   c. Make sure that the upper and lower plates are welded together tightly.



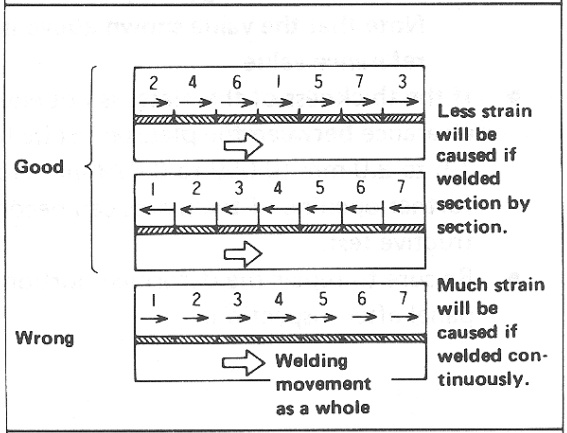
PRECAUTIONS IN OPERATION

(2) Butt welding

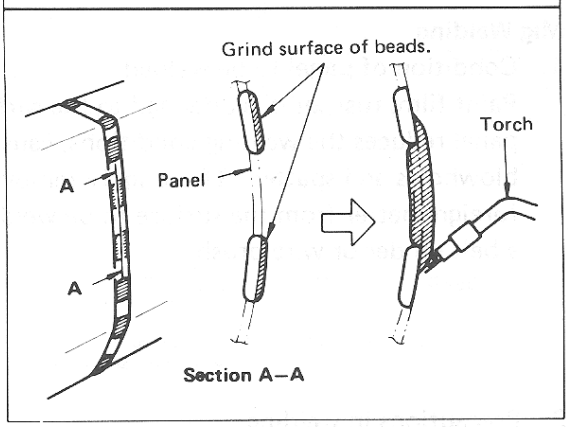
a. Before performing this welding, tack-weld two pieces of the metals to be welded to prevent generation of strains and to align two metal surfaces. Tack two metal pieces by placing point welds and then fill in the spaces by placing short welding beads.



b. Long weld line is apt to cause strain. Use the method shown at the right to reduce strain.



c. To fill the spaces between intermittently placed beads, first grind the beads along the surface of the panel using a sander, then fill metal into the space. If weld metal is placed without grinding the surface of the beads, blowholes may be produced.

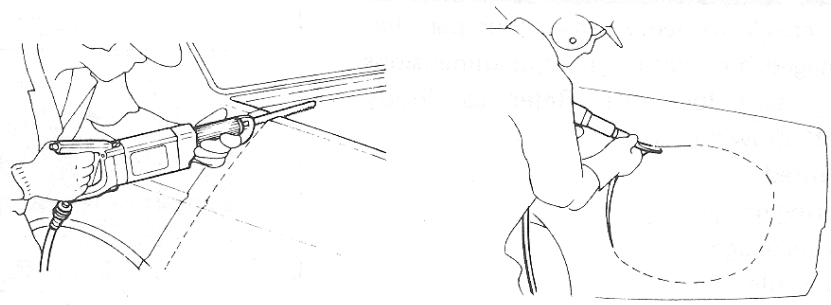
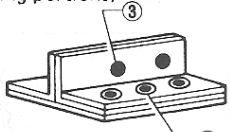
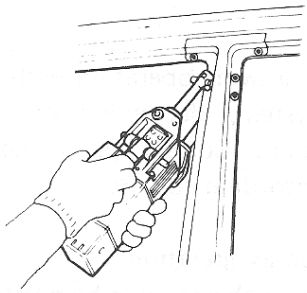
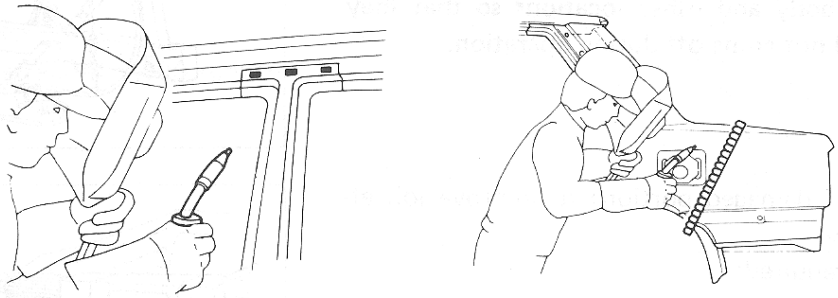
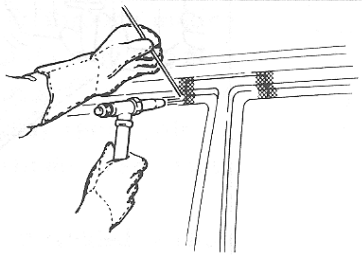
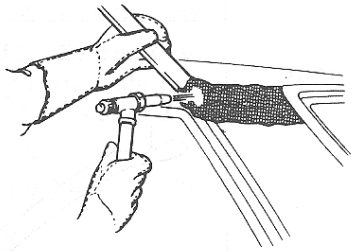
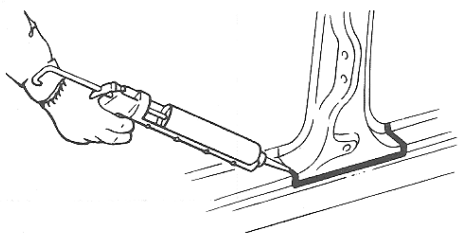


3. Inspection of welded portion
Refer to the inspection method described for spot welding.

DESCRIPTION

SYMBOLS FOR CUTTING AND WELDING/BRAZING OPERATIONS

The identification of the cutting and the welding/brazing symbols used throughout this guide is given in the following pages.

Saw cut or air chisel cut		
Spot weld	● ● ● ● 2-spot welds	2-spot welds (2-panel overlapping portions) ③  ② 3-spot welds (3-panel overlapping portions) 
	⊙ ⊙ ⊙ ⊙ 3-spot welds	**Note: The value in parentheses ( ) indicates the number of spot welds.**
■ ■ ■ Mig plug weld		
Mig seam weld/ Point weld		
Brazing		
Soldering		
Sealing		

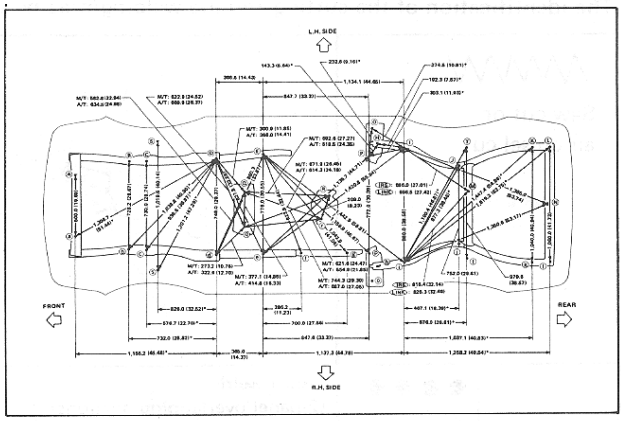
PROCEDURES FOR REMOVAL AND INSTALLATION

REMOVAL

(1) Carefully check to see if any other part has been damaged by measuring major dimensions of relative part locations. Refer to "Body Alignment" drawing.

Tools required:

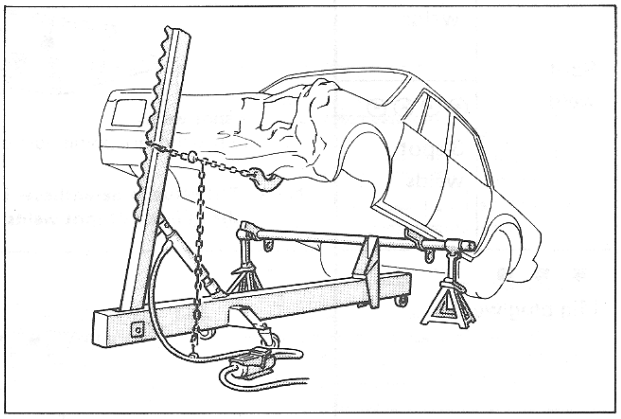
- Centering gauge
- Tracking gauge
- Convex rule
- Jack, rigid rack or car lift



(2) Conduct drawing operation with a body-frame repair system, depending on condition of deformation. Correct parts that are to be reused according to "Body Alignment" drawing.

Precaution in operation:

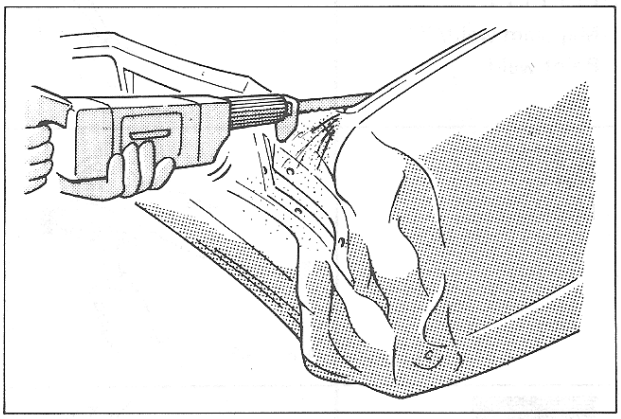
- **Drawing chains must be positively attached to body and other locations so that they will not come off during operation.**



(3) Cut off damaged portions to improve job efficiency.

Tools required:

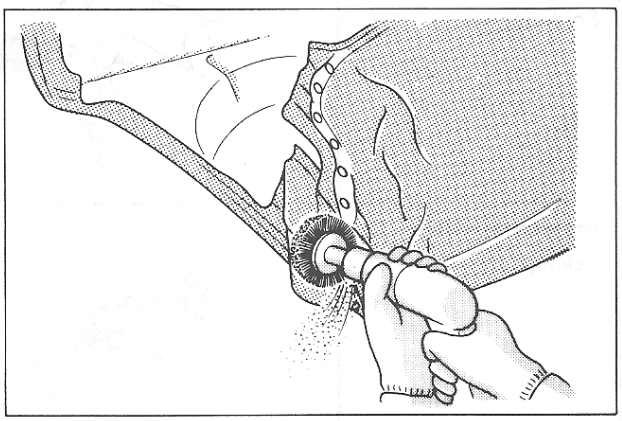
- Air saw
- Air chisel



(4) When spot welded portions are not apparent, remove paint with a rotary wire brush.

Tools required:

- Rotary wire brush



PROCEDURES FOR REMOVAL AND INSTALLATION

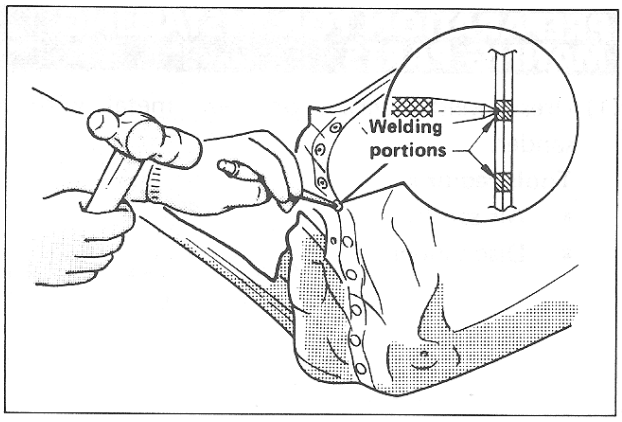
(5) Center punch spot welded portion for positioning a drill.

Tools required:

- Hammer
- Center punch

Precautions in operations:

- **Drive center punch deeply in center of spot weld nugget. Nugget cannot be completely cut by a drill if center punched out of position. Also, if hole location is marked shallowly, drill may move around which is dangerous.**
- **In principle, punching must be done from sides of parts that are to be removed.**



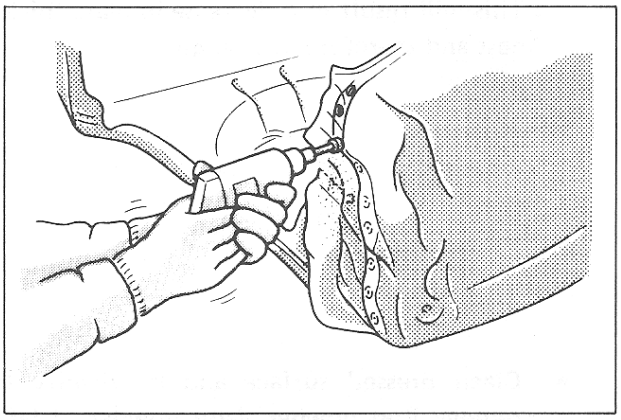
(6) Drill spot welded portions with a spot cutter or air drill.

Tools required:

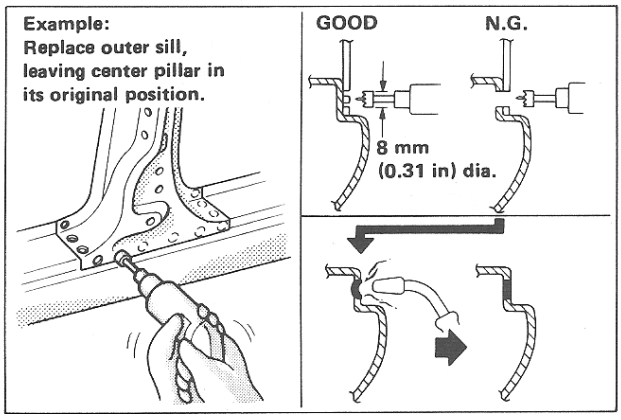
- Spot cutter
- Air drill

Precautions in operations:

- **Use a drill running at about 1,000 rpm for ease of work.**



- **Be careful not to cut hole through mating part. If hole is made, stop it up by mig plug welding. If the hole is left as it is, a decline in strength of that part may result. Also, a hole facing to compartment can cause water leakage.**
- **When using hole drilled in welded portion as plug welding hole for new parts, use a drill of a small diameter [below 8 mm (0.31 in)], and try to finish welding as few at times as possible.**



(7) When there remains welded part after drilling, remove it with a chisel.

Tools required:

- Chisel
- Hammer

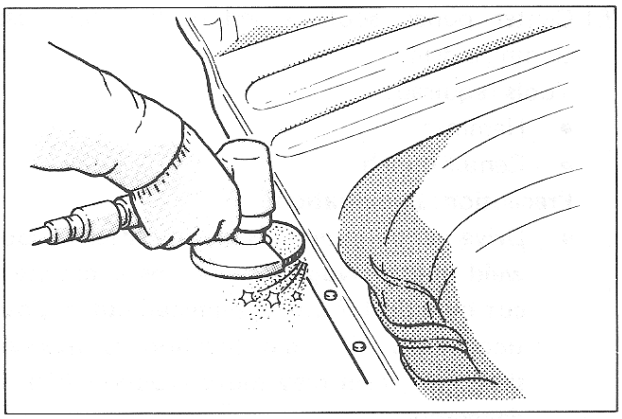
PROCEDURES FOR REMOVAL AND INSTALLATION

PREPARATION FOR INSTALLING MATING PARTS

(1) Dress weld nuggets on base metal with a sander.

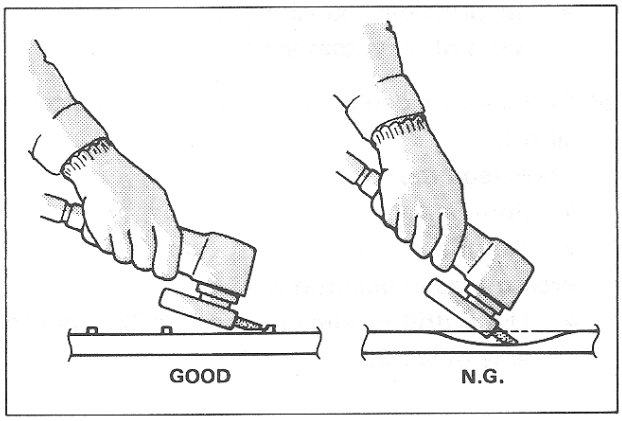
Tools required:

- Air sander
- Disc sander

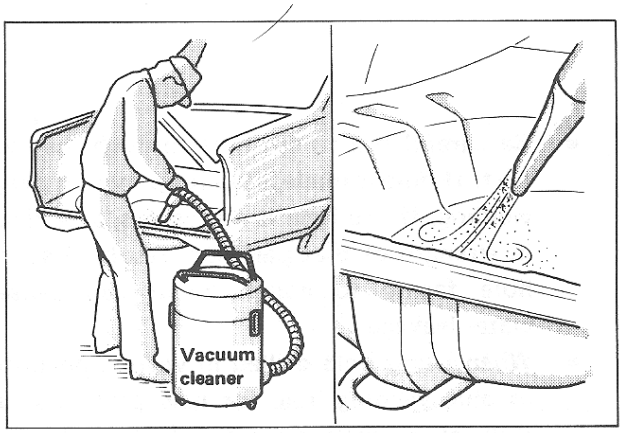


Precautions in operations:

- **Be careful not to cut base metal too much. This will result in a decrease in plate thickness and therefore in strength.**



- **Clean dressed surface and its vicinity to remove iron powder. Iron powder, if left, can corrode, penetrating into base metal.**



PROCEDURES FOR REMOVAL AND INSTALLATION

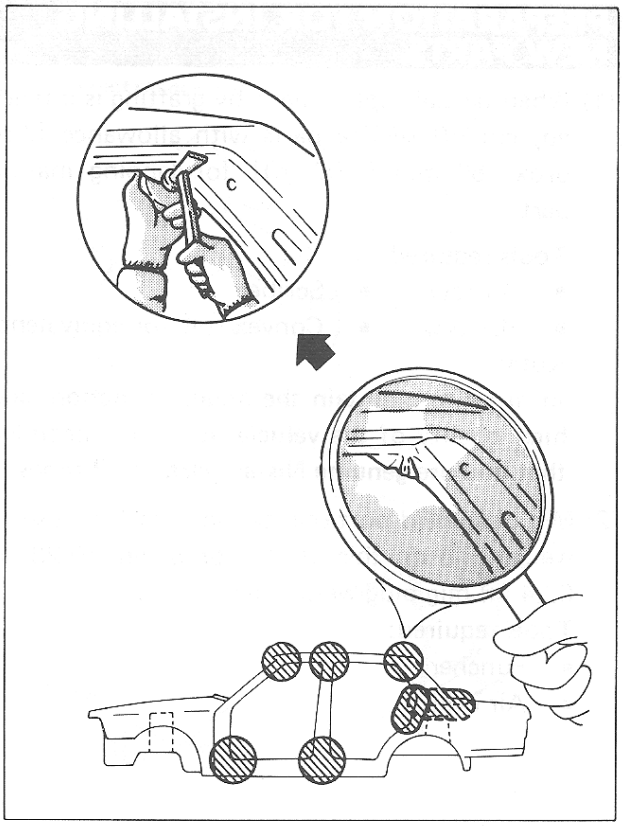
(2) Correct deformed area with a hammer and dolly.

Tools required:

- Hammer
- Dolly

Precaution in operation:

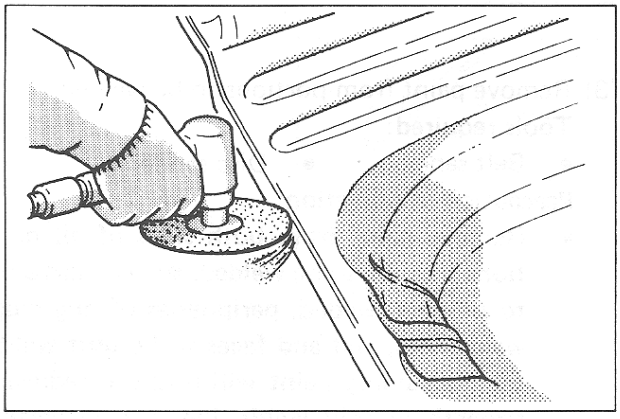
- **Carefully check for damage of inner panels that are hard to find, and be sure to repair the smallest deformity. A deformed part, if left, will cause a decrease in strength due to stress concentration there.**



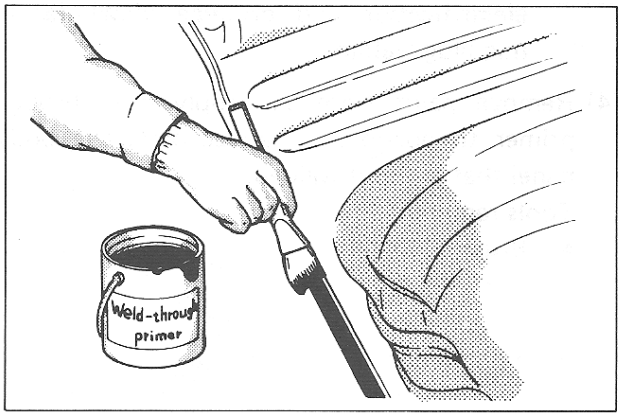
(3) Remove paint at welded portions.

Tools required:

- Belt sander
- Disc sander



(4) Apply weld-through primer to portions of new parts and body panel that are to be welded.



PROCEDURES FOR REMOVAL AND INSTALLATION

PREPARATION FOR INSTALLING NEW PARTS

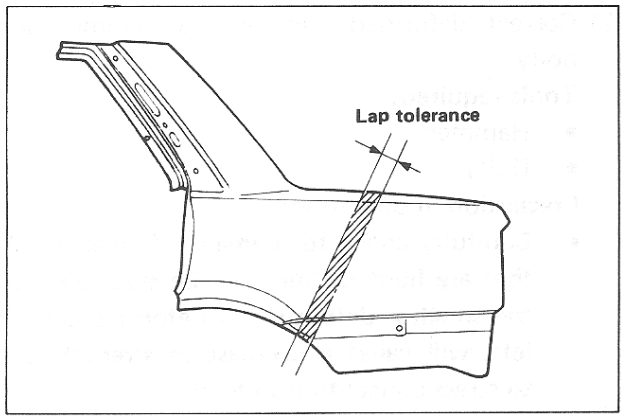
(1) When partial replacement by grafting is intended, cut off service parts with allowance [Approx. 50 mm (1.97 in)] for lapping mating part.

Tools required:

- Air saw
- Scriber
- Hacksaw
- Convex rule (or equivalent)

Note:

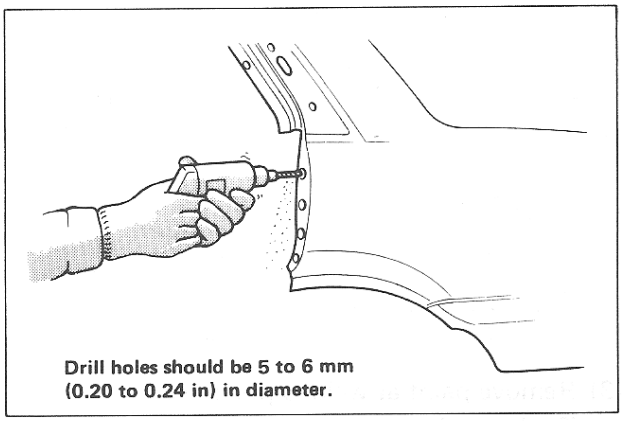
In order to maintain the original functions and high quality of the vehicle, it is recommended that you use genuine Nissan parts at all times.



(2) Mig plug weld portions beyond reach of a spot welder. To do this, drill 5 or 6 mm (0.20 or 0.24 in) mig plug weld holes.

Tools required:

- Puncher
- Air drill



Drill holes should be 5 to 6 mm (0.20 to 0.24 in) in diameter.

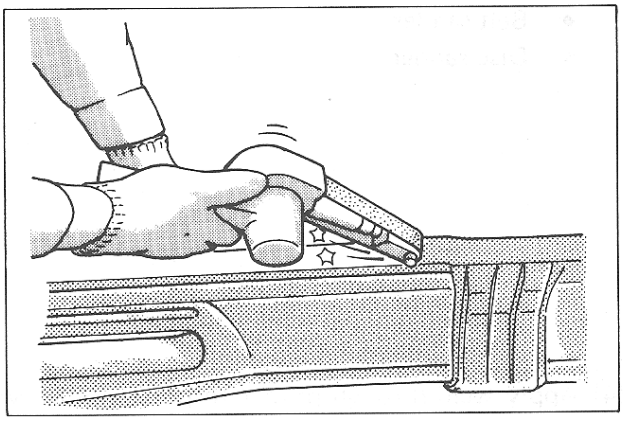
(3) Remove paint from portions to be welded.

Tools required:

- Belt sander
- Disc sander

Precaution in operation:

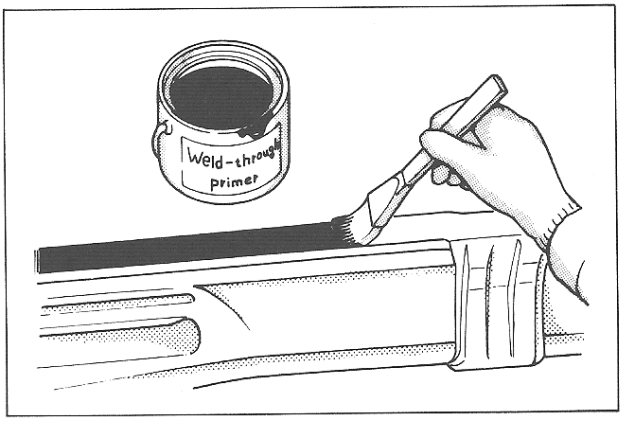
- **Remove paint from both sides of all portions that are to be welded, such as surfaces to be spot welded, peripheries of mig plug weld holes, and end faces to be butt welded. Remaining paint will result in reduced strength of spot welds due to insufficient electrification and produce blowholes in mig plug welding.**



(4) Remove paint from and apply weld-through primer to portions of service parts and body panel that are spot welded.

Tools required:

- Brush



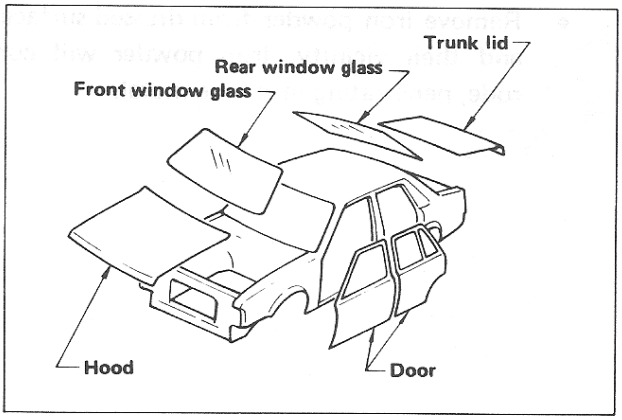
PROCEDURES FOR REMOVAL AND INSTALLATION

INSTALLATION

(1) Temporarily install new service parts.

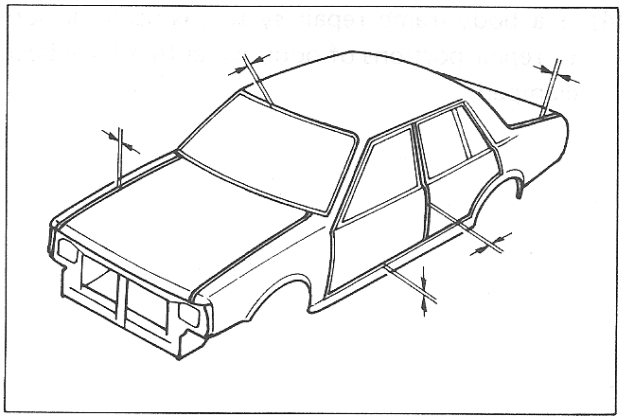
Tools required:

- Vise clamps
- Convex rule
- Tracking gauge
- Centering gauge
- Portable power
- Jack
- Spot welder
- Mig welder



Precautions in operations:

- **Service parts must be located in place as indicated in "Body Alignment" drawing.**
- **Temporarily install new parts to openings (such as windshield glass, door, hood and trunk lid). Check and adjust clearances, grades and parallelism.**
- **After adjusting alignment, hold these parts stationary with vise clamps, spot welding, etc.**



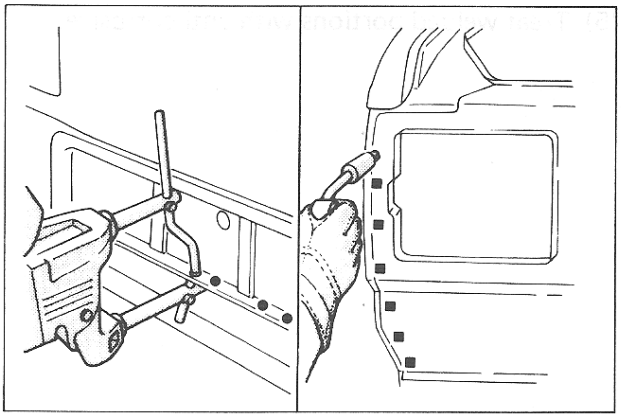
(2) Weld all necessary portions.

Tools required:

- Spot welder
- Mig welder

Precaution in operation:

- **Welding must be positively carried out, referring to "Precautions when welding".**



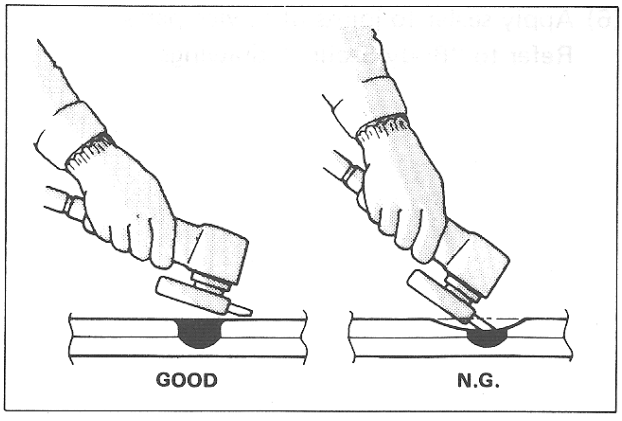
(3) Dress mig welds with a sander.

Tools required:

- Air sander
- Disc sander

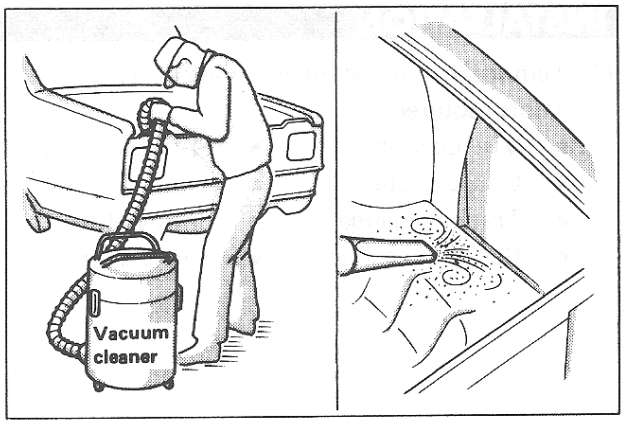
Precautions in operations:

- **Be careful not to cut welded portions too much. Otherwise, thickness of panel will decrease and therefore strength decline.**

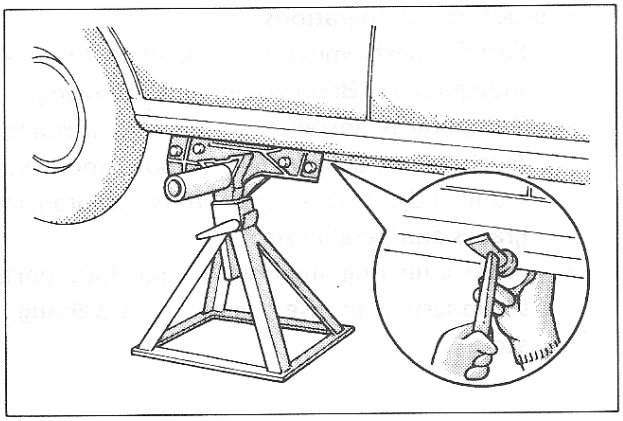


PROCEDURES FOR REMOVAL AND INSTALLATION

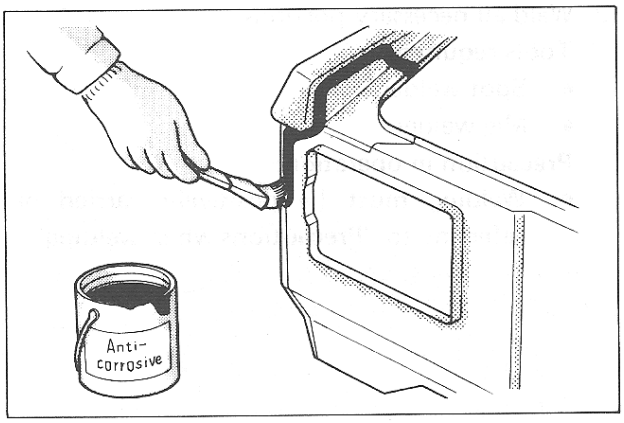
- **Remove iron powder from dressed surfaces and their vicinity. Iron powder will corrode, penetrating into base metal.**



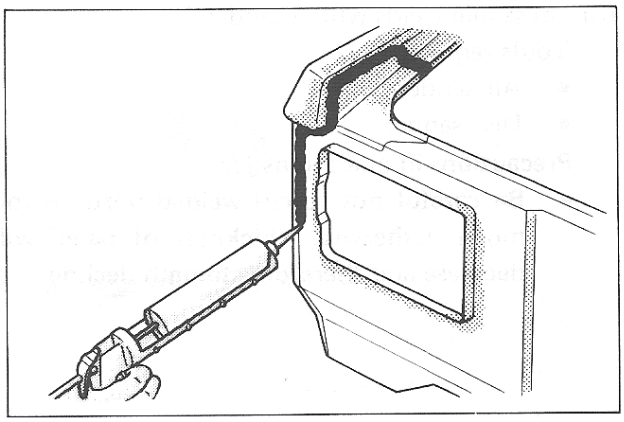
(4) If a body-frame repair system is used, be sure to repair portions of body panel that have been clamped.



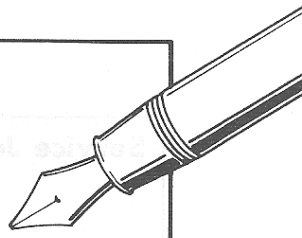
(5) Treat welded portions with anti-corrosive.



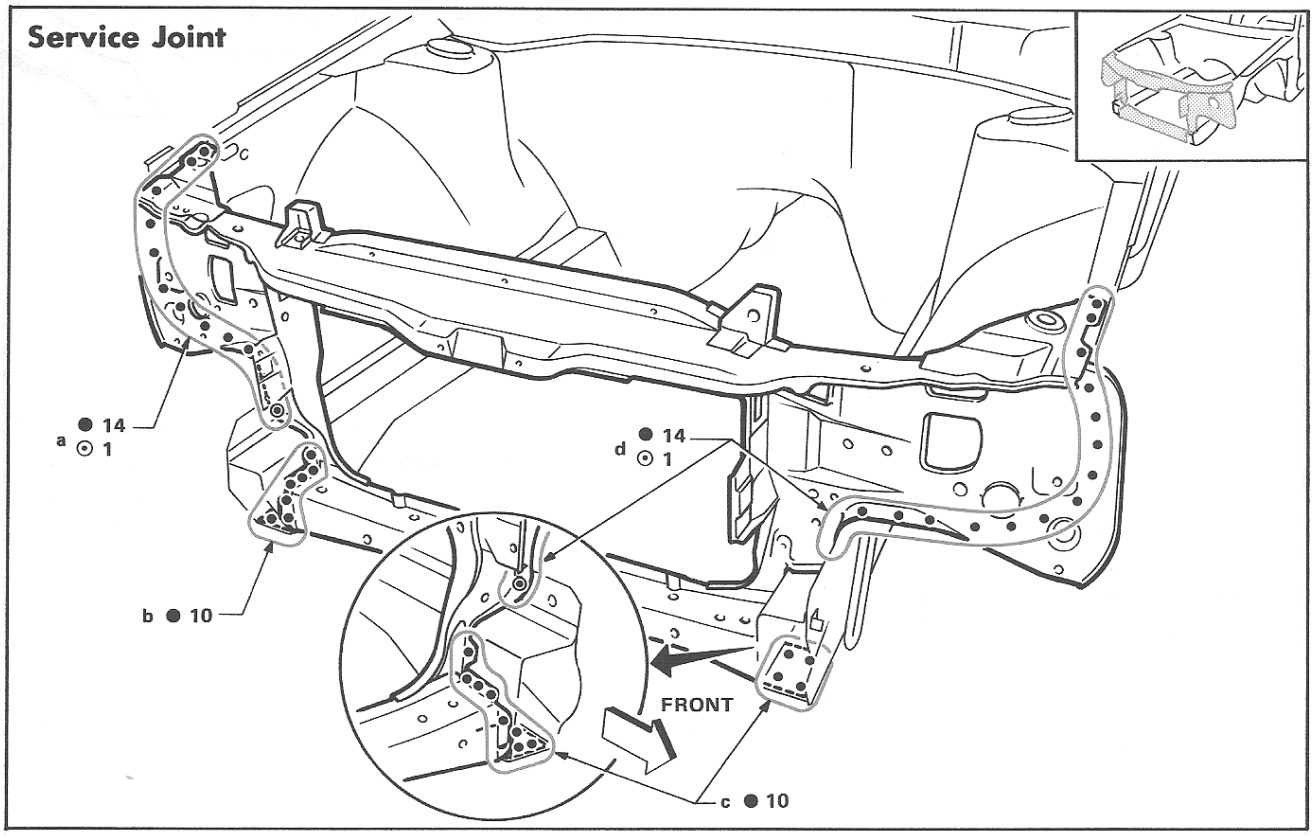
(6) Apply sealer to joints of service parts. Refer to "Body Sealing" drawings.



Note



RADIATOR CORE SUPPORT



Portions to be welded

a. Hoodledge
Front side member closing plate

b. Front side member

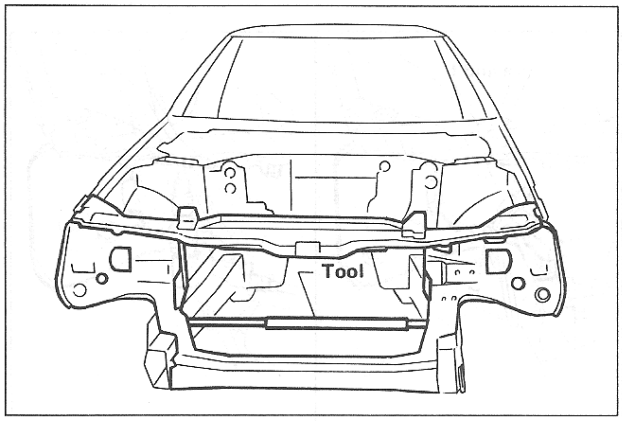
c. Front side member

d. Hoodledge
Front side member closing plate

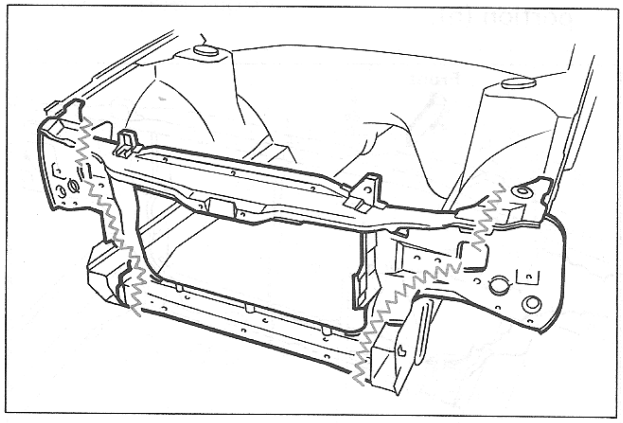
RADIATOR CORE SUPPORT

REMOVING REMINDERS

- Before making a rough cut, hold side member stationary using Tool.

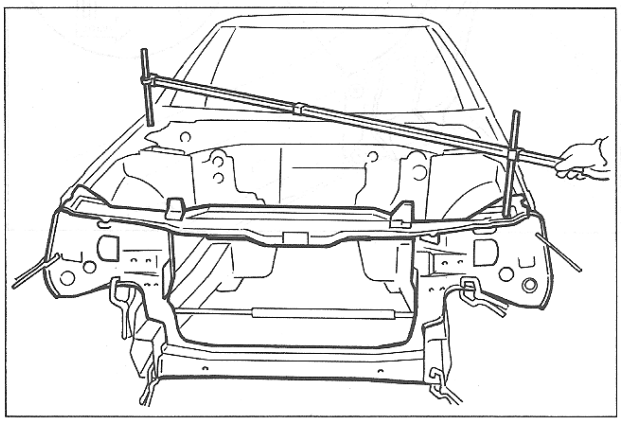


- Cut off damaged portion so that welded portion can be easily spot cut later.

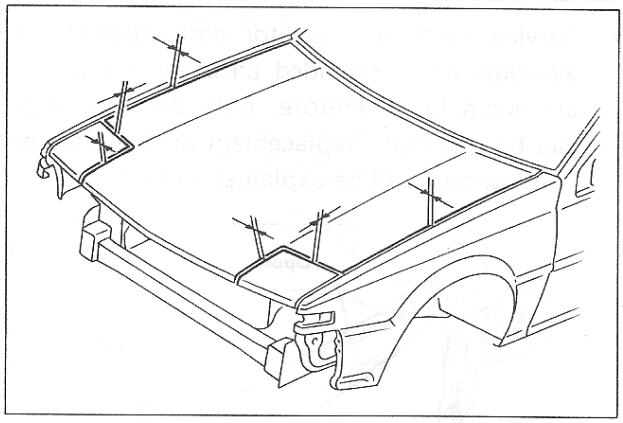


INSTALLING REMINDERS

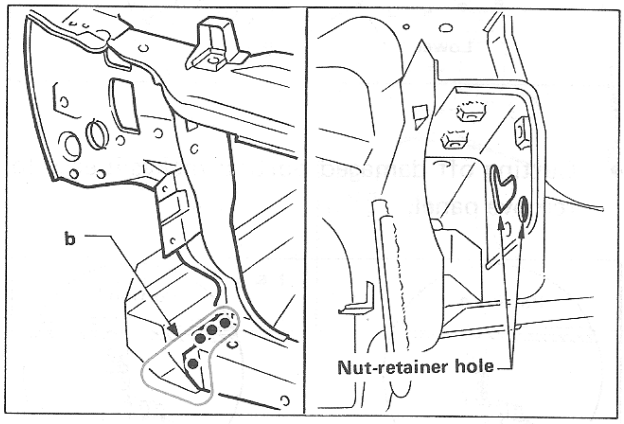
- Install service part and adjust its position in accordance with "BODY ALIGNMENT" drawing.



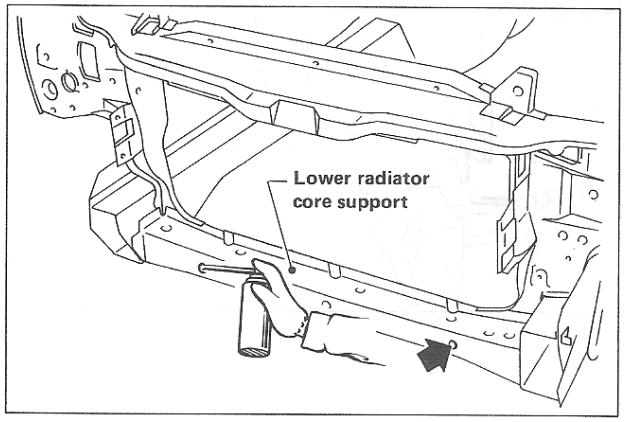
- Install hood, fender, headlamp bracket and headlamp lid. Check clearances, grades and parallelism.



- Spot weld portion (b) with welder's tip using nut-retainer hole inside of side member.



- Apply anti-corrosive wax to inside of lower radiator core support.

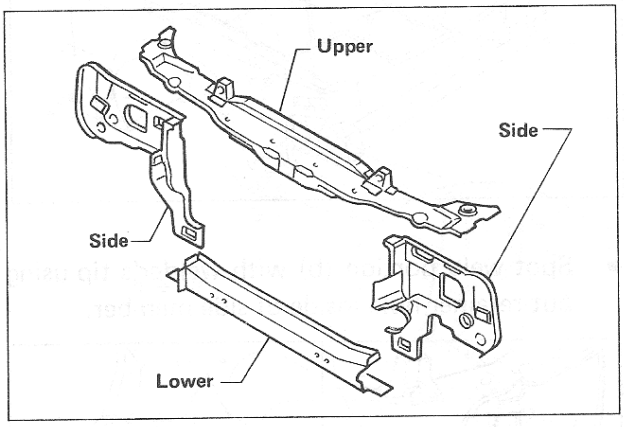


RADIATOR CORE SUPPORT (Partial Replacement)

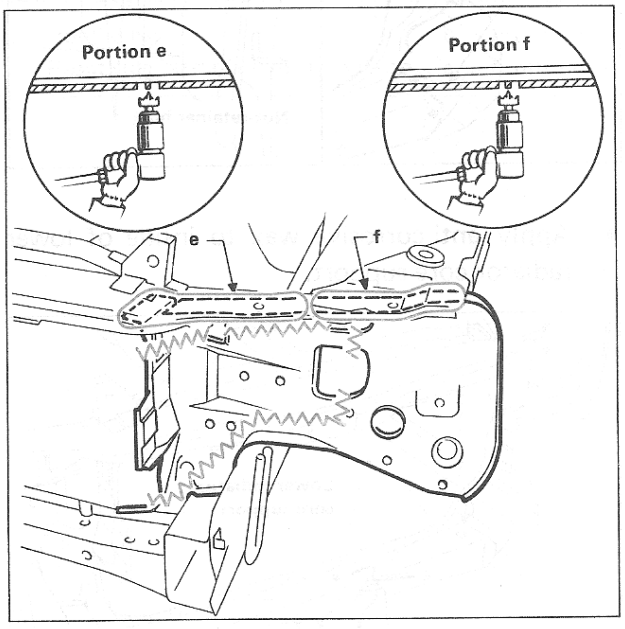
Refer to Service Joint drawing under RADIATOR CORE SUPPORT.

REMOVING REMINDERS

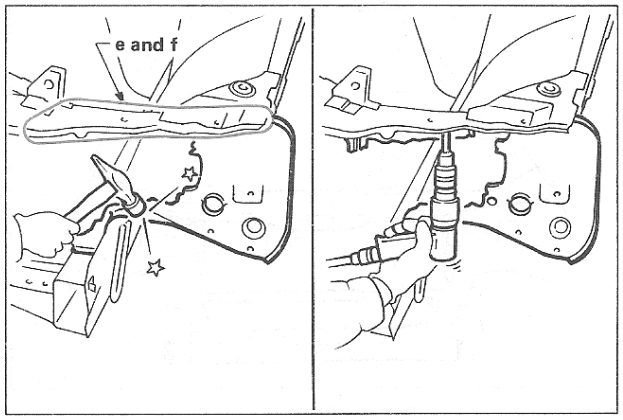
- Service parts for radiator core support are available in four-divided parts in addition to an assembly. Therefore, only damaged part can be replaced. Replacement of side radiator core support will be explained hereunder.



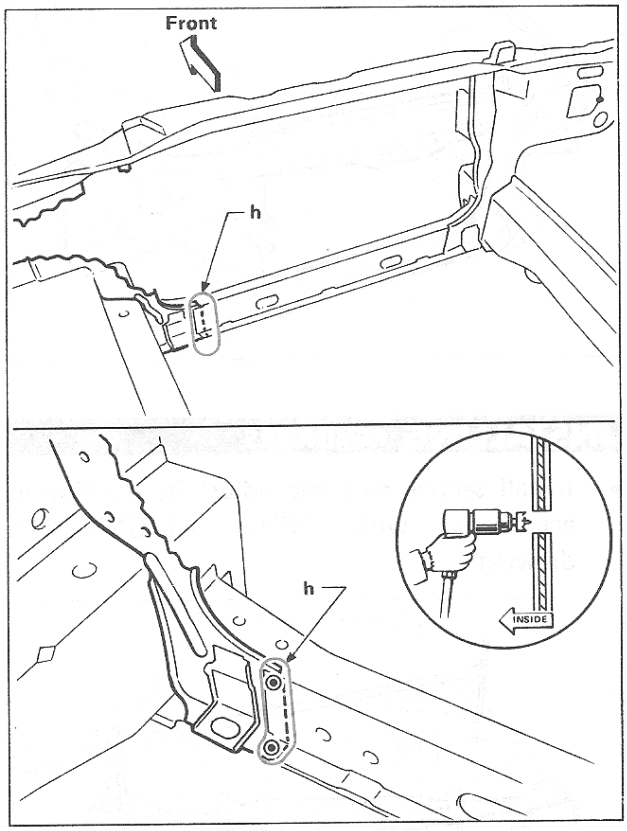
- Cutting off damaged portion makes it easy to remove panel.



- Bend flange downward so that portions (e) and (f) can be spot cut.

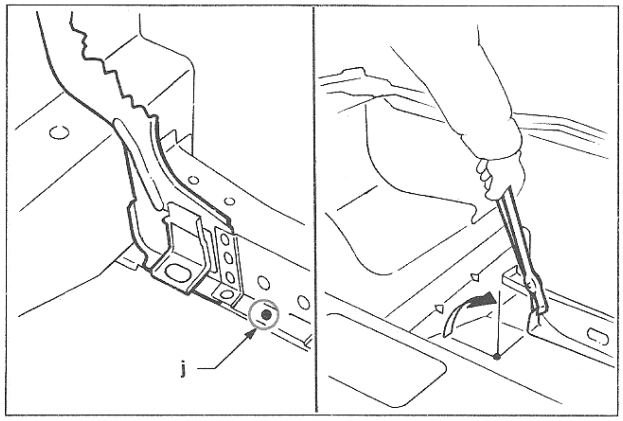


- Spot cut completely through 3-layered part at portion (h).



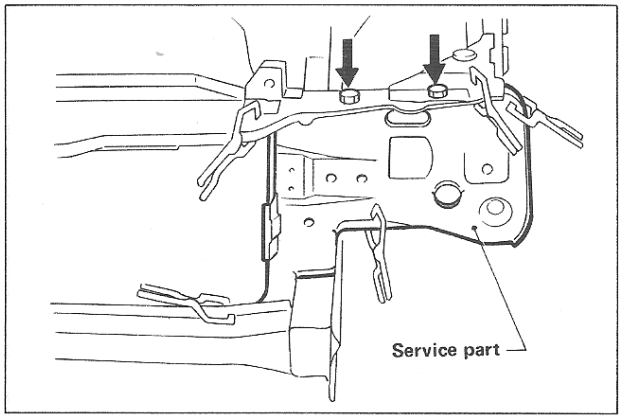
RADIATOR CORE SUPPORT (Partial Replacement)

- Spot cutting portion (j) permits easy removal of side panel by bending lower panel.

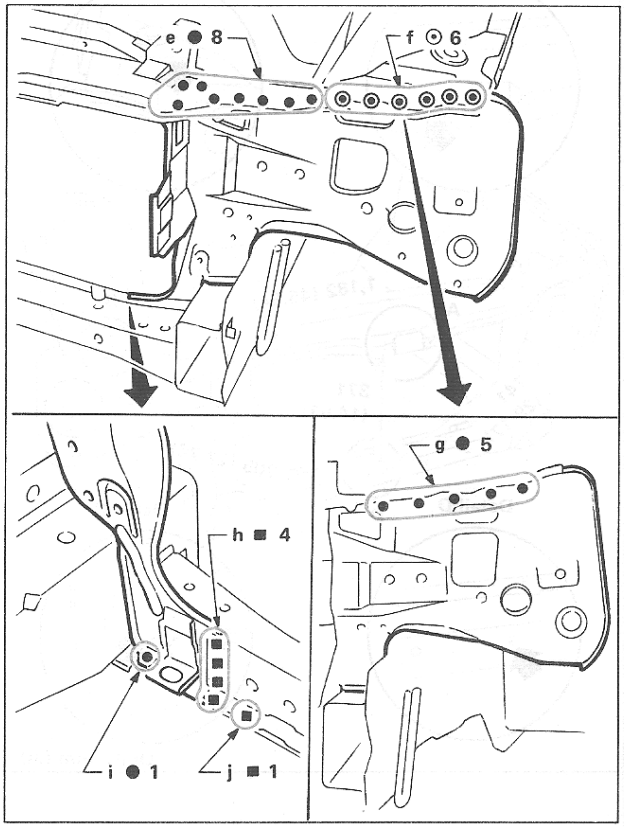


INSTALLING REMINDERS

- Install service part with its bolt holes aligned with upper support's.

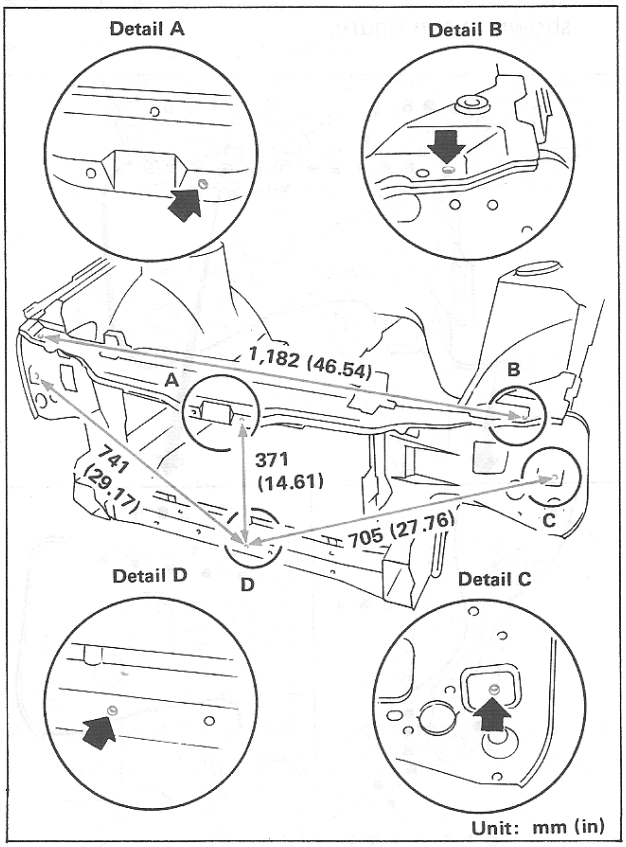


- Additional spot welding portions such as side, upper and lower panels that are necessary when replacing side radiator core support are shown in the figure.

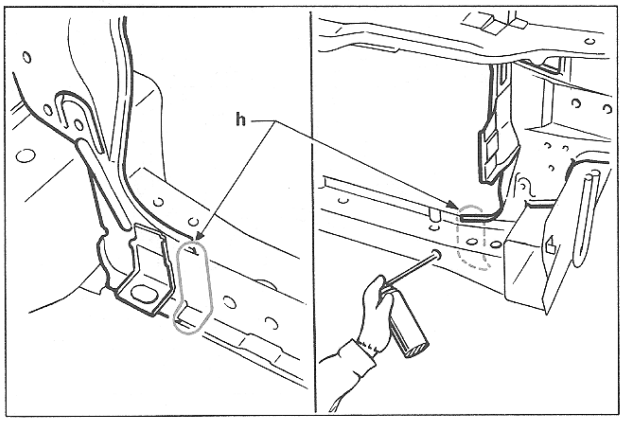


RADIATOR CORE SUPPORT (Partial Replacement)

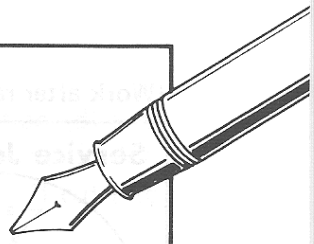
- Adjust for proper positioning and dimensions shown in the figure.



- Apply anti-corrosive agent to inside of portion (h).

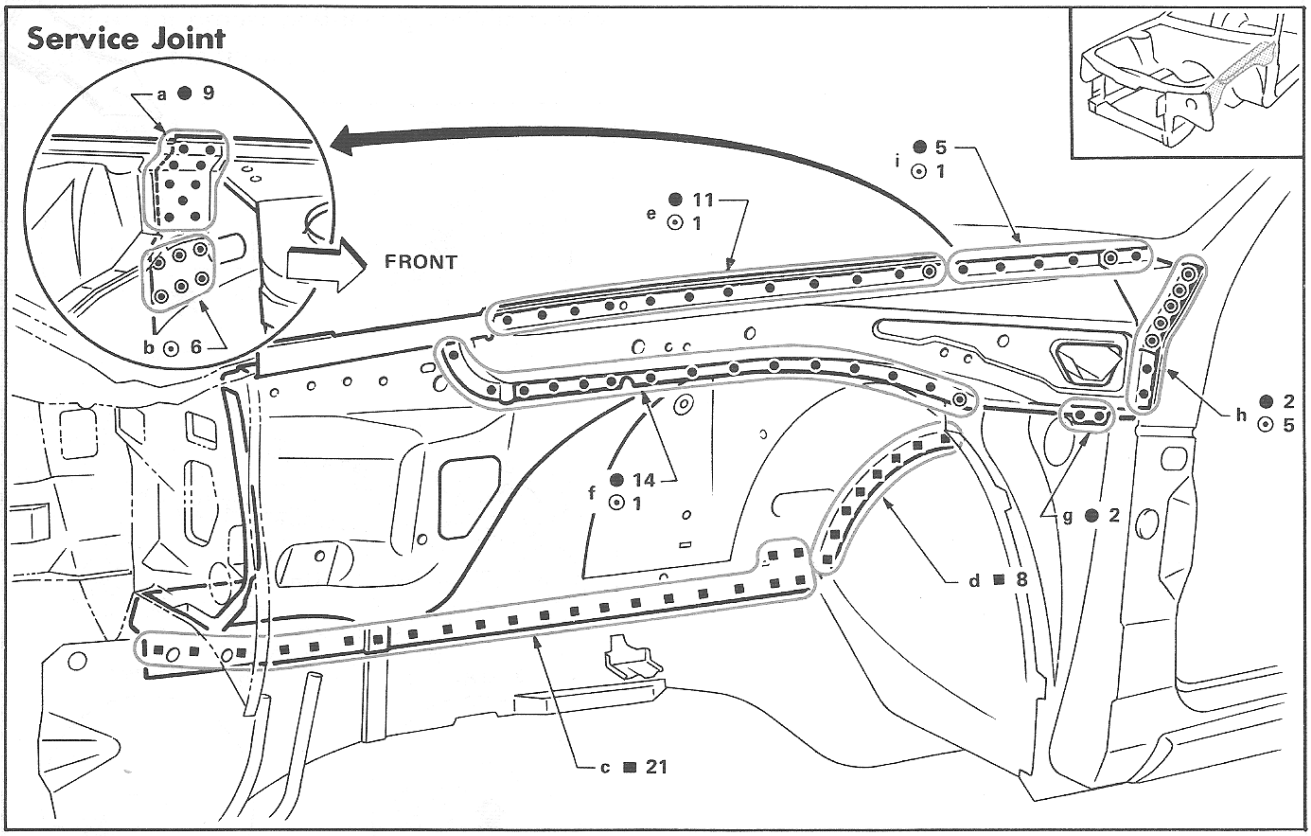


Note



HOODLEDGE

(Work after radiator core support has been removed.)



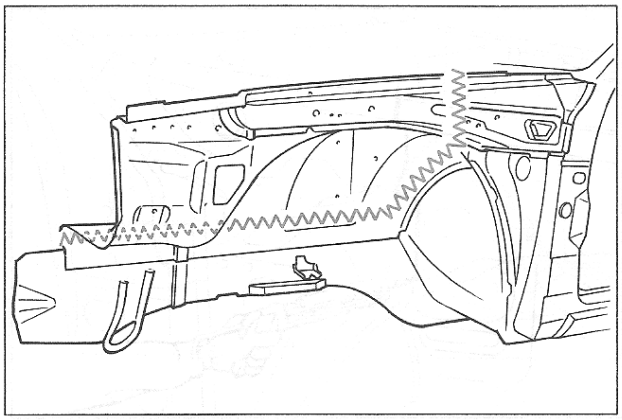
Portions to be welded

a. Cowl top
b. Lower dash panel & side dash panel
c. Front side member
d. Lower dash panel
e. Hoodledge reinforcement
Hoodledge reinforcement & cowl top
f. Hoodledge reinforcement
Hoodledge reinforcement & side dash panel & lower dash panel (Not welded to hoodledge)
g. Hoodledge reinforcement & side dash panel (Not welded to hoodledge)
h. Hoodledge reinforcement & front pillar (Not welded to hoodledge)
Hoodledge reinforcement & front pillar & inner cowl top (Not welded to hoodledge)
i. Hoodledge reinforcement & cowl top (Not welded to hoodledge)

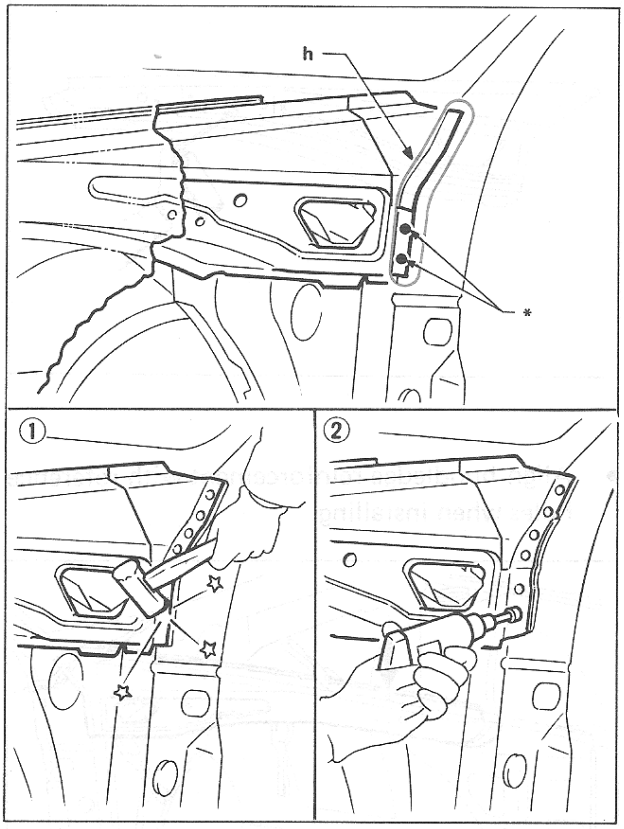
HOODLEDGE

REMOVING REMINDERS

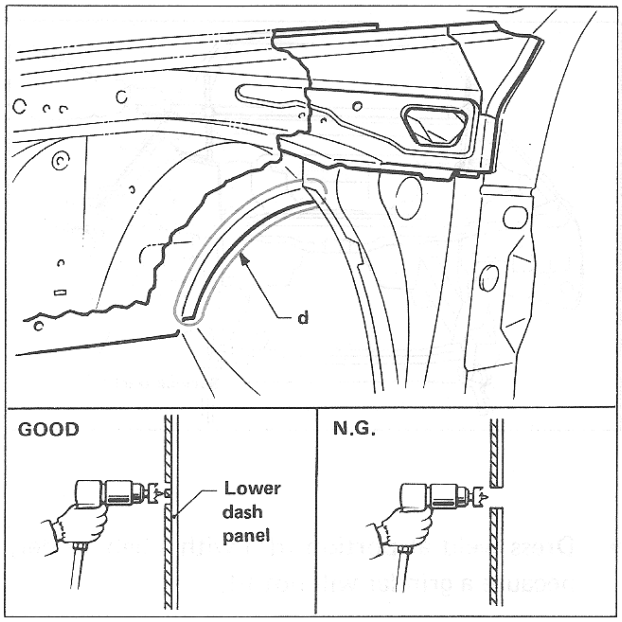
- Cut off damaged portion to facilitate removal.



- To make it easy to cut welded part [portion (h*)] of hoodledge reinforcement and front pillar, work with flange slightly bent.



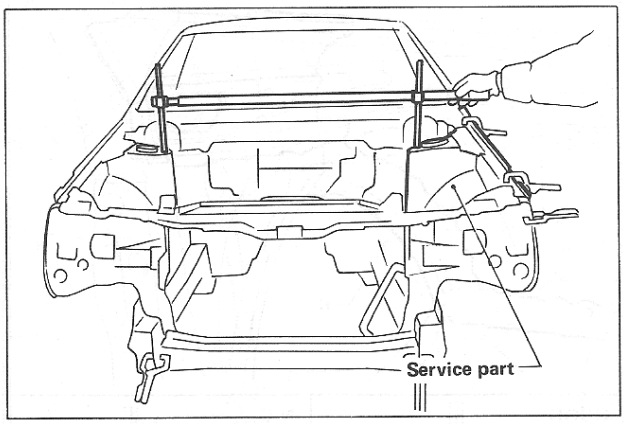
- When spot cutting welded portion (d) with lower dash panel, be careful not to cut into compartment with a spot cutter. If cut into, repair by mig welding.



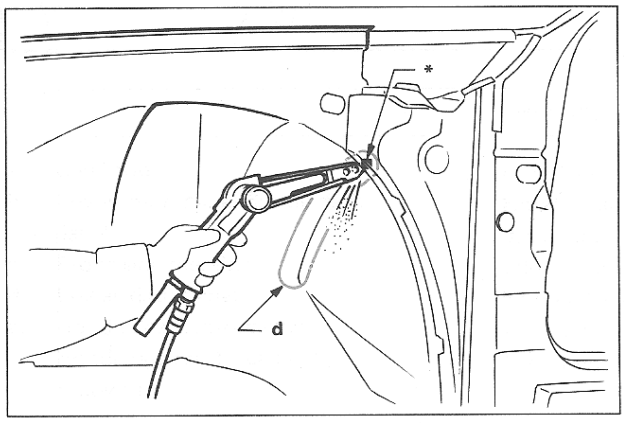
HOODLEDGE

INSTALLING REMINDERS

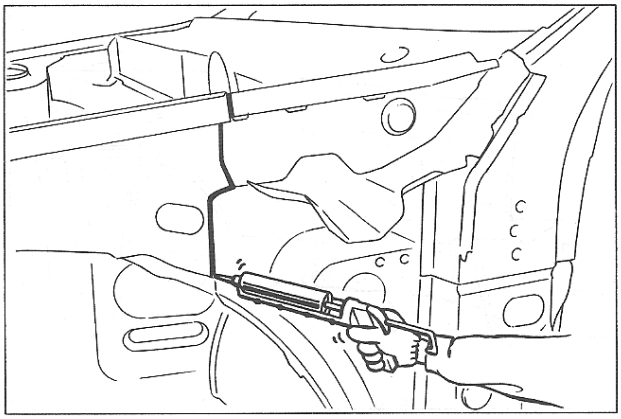
- Install service hoodledge and radiator core support. Check clearances, grades and parallelism.



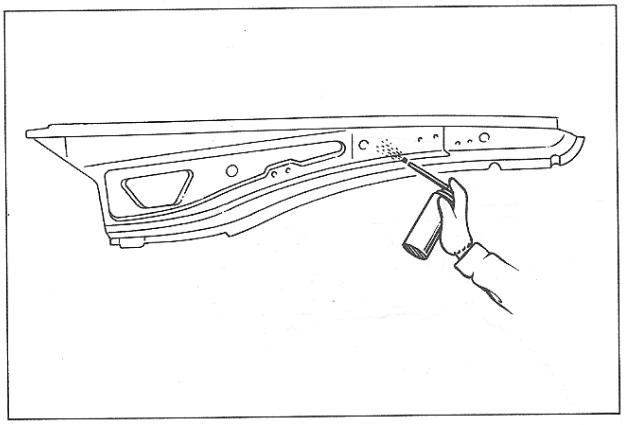
- Dress weld at portion (d*) with a belt sander, because a grinder will not fit.



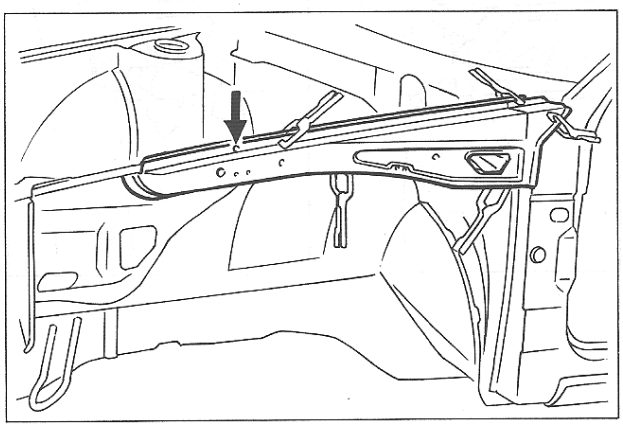
- Apply sealer to welding portion of cowl top and front pillar before installing hoodledge reinforcement.



- Apply anti-corrosive wax to inside of hoodledge reinforcement.

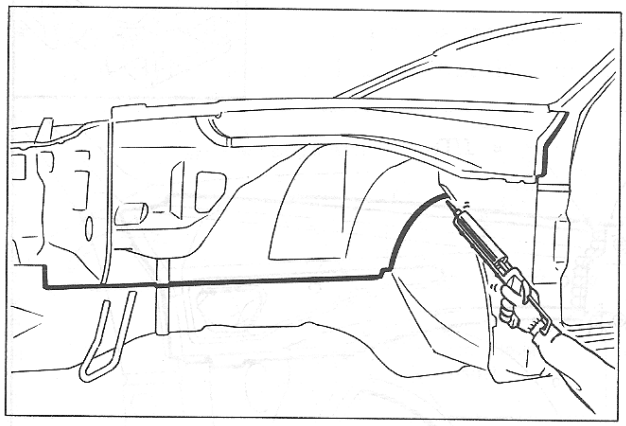


- Align hoodledge reinforcement with reference holes when installing.



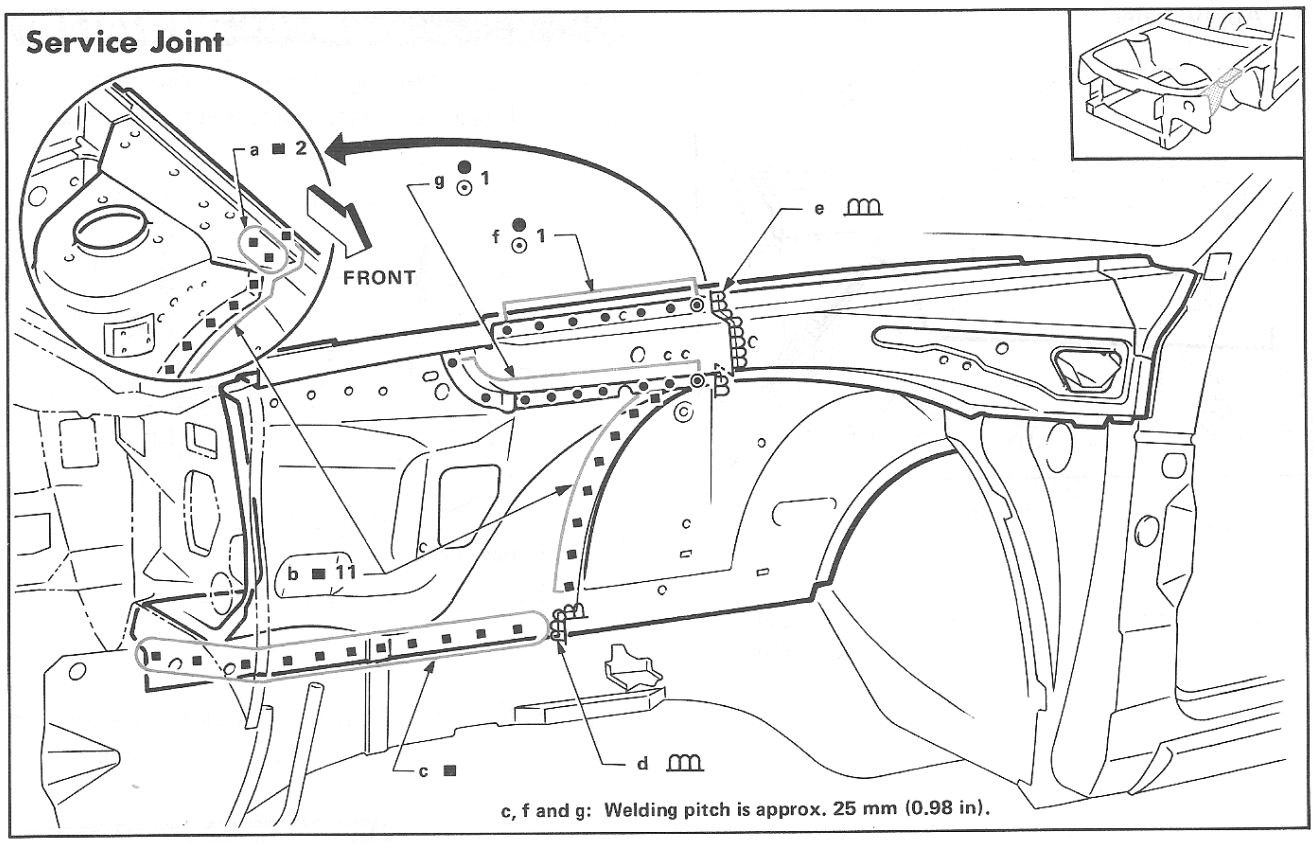
HOODLEDGE

- Apply sealer.



HOODLEDGE (Partial Replacement)

(Work after radiator core support has been removed.)



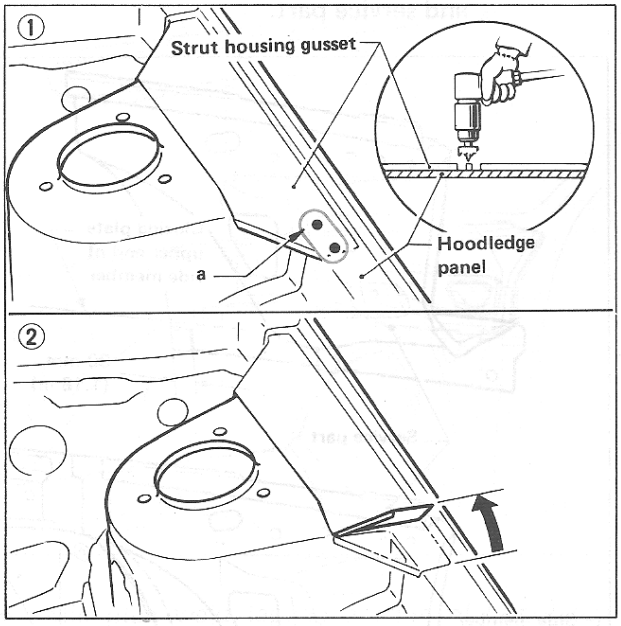
Portions to be welded

a. Strut housing gusset
b. Strut housing
c. Front side member closing plate
d. Hoodledge
   Front side member closing plate
e. Hoodledge reinforcement
   (Not welded to hoodledge)
f. Hoodledge reinforcement
   Hoodledge & hoodledge reinforcement
g. Hoodledge reinforcement
   Hoodledge & hoodledge reinforcement

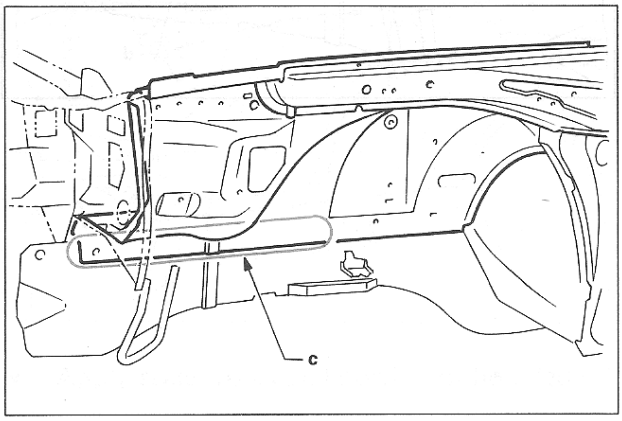
HOODLEDGE (Partial Replacement)

REMOVING REMINDERS

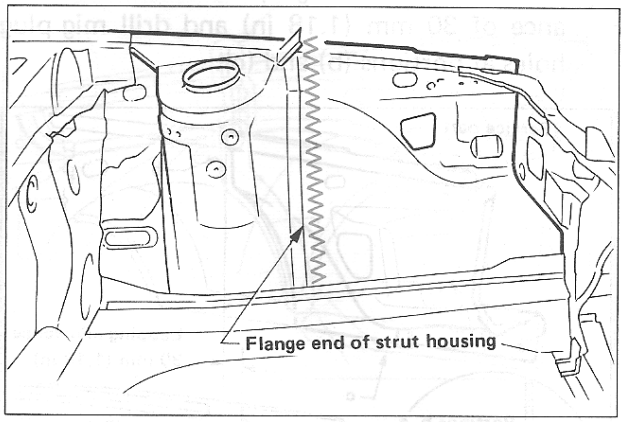
- To facilitate cutting of hoodledge panel, cut spot welds and bend strut housing gusset.



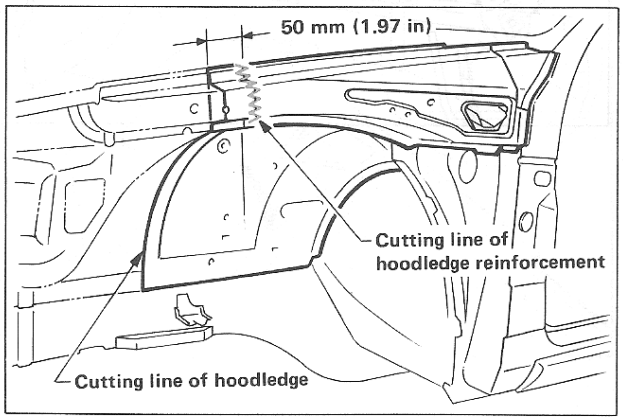
- Spot cut weld at portion (c) as far as strut housing flange end.



- Cut hoodledge panel along flange end of strut housing.



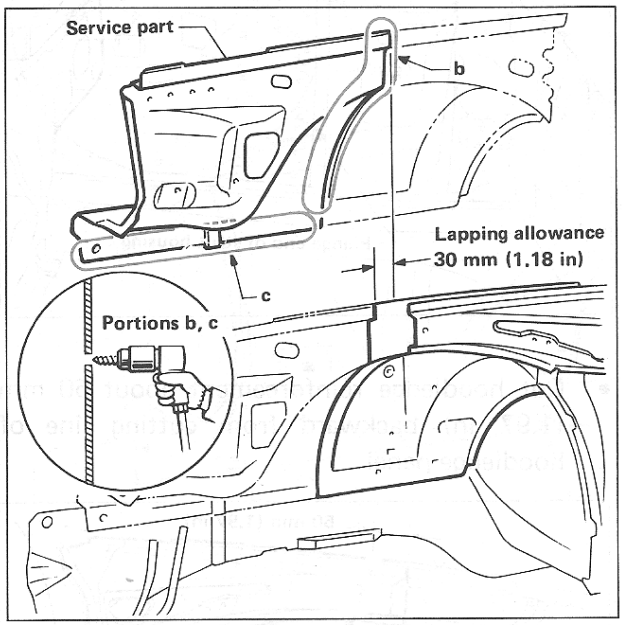
- Cut hoodledge reinforcement about 50 mm (1.97 in) backward from cutting line of hoodledge panel.



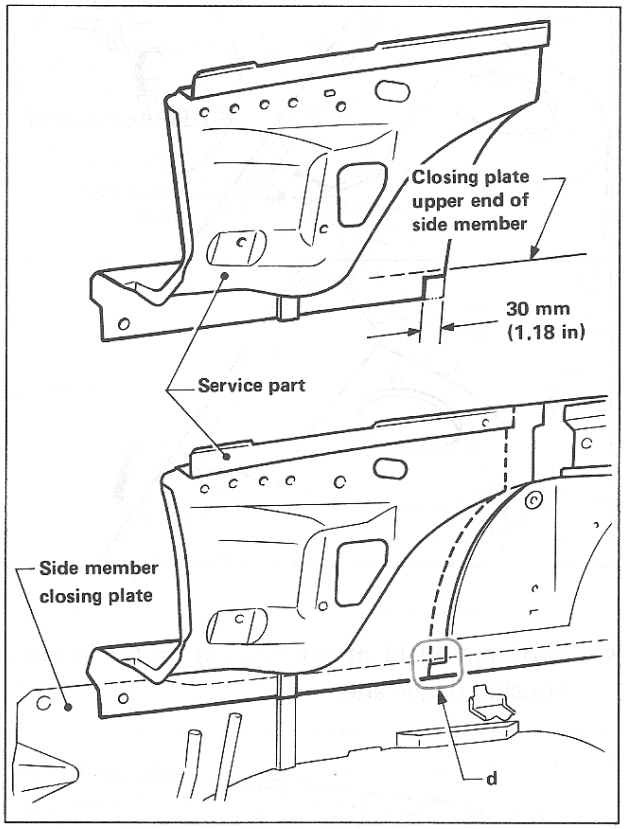
HOODLEDGE (Partial Replacement)

INSTALLING REMINDERS

- Cut service hoodledge panel with an allowance of 30 mm (1.18 in) and drill mig plug holes at portions (b) and (c).

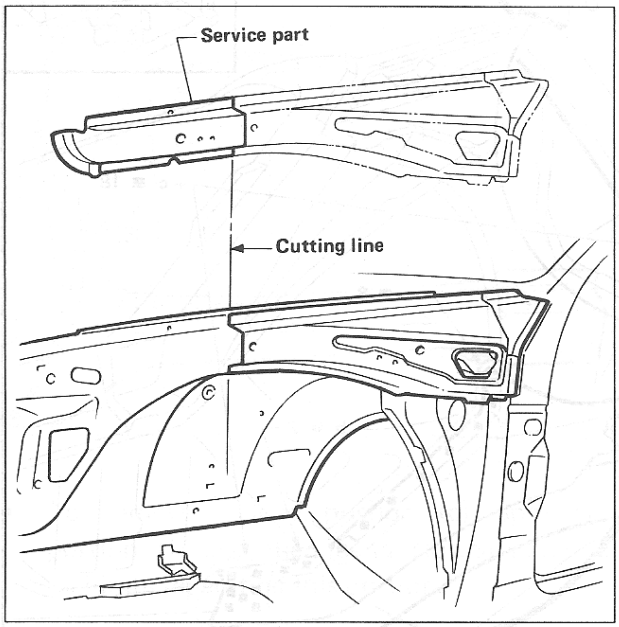


Note: When cutting service part of hoodledge panel, cut service part as shown in the figure in order to create tight sealing of front member closing plate and service part.

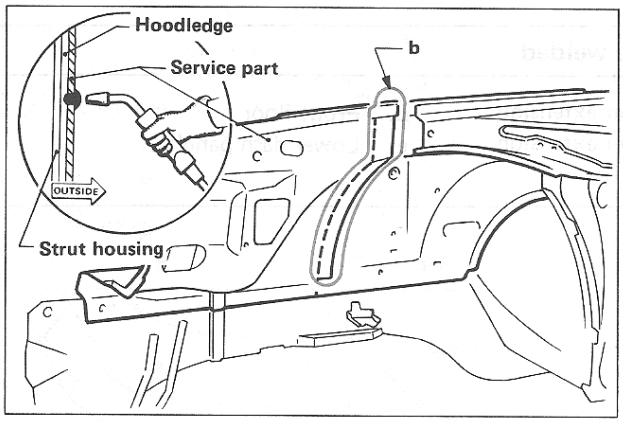


HOODLEDGE (Partial Replacement)

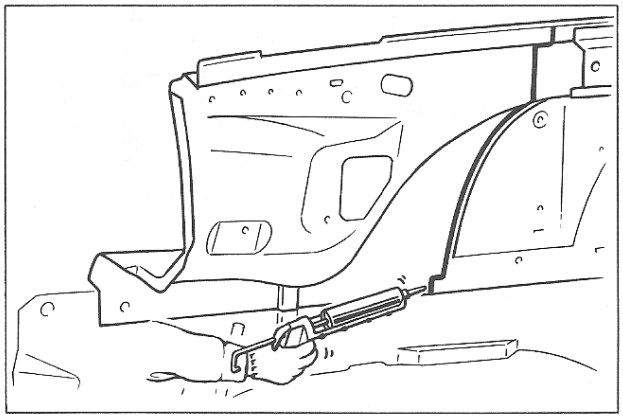
- Cut hoodledge reinforcement accurately in line with cutting line on body.



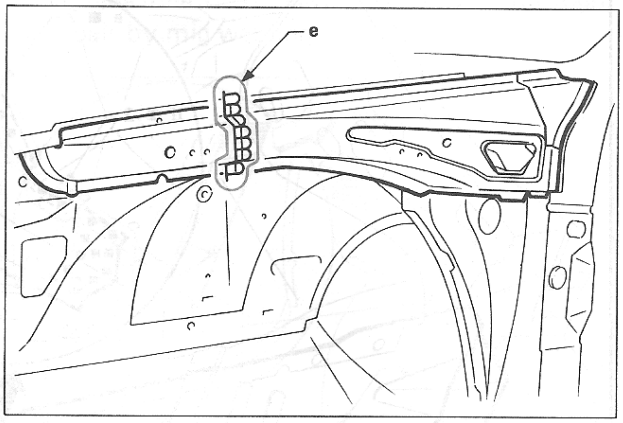
- Mig plug weld lapped portion of hoodledge panel.



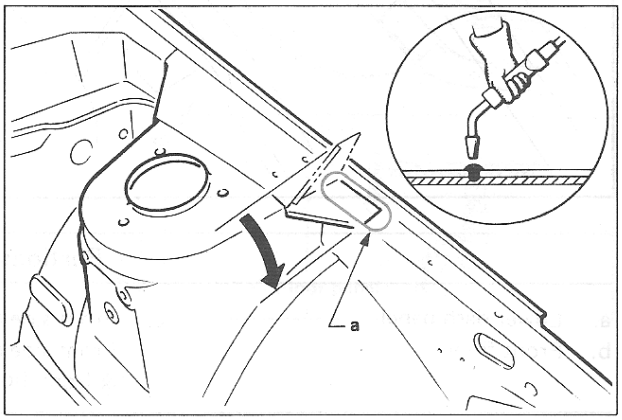
- Apply sealer to lapped portion of hoodledge.



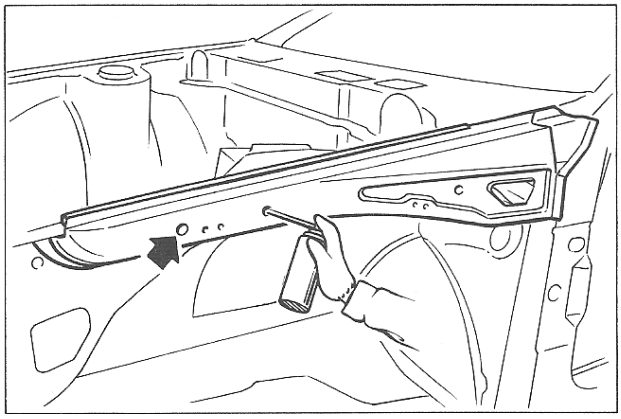
- Mig seam weld hoodledge reinforcement.



- Put back strut housing gusset and mig plug weld.

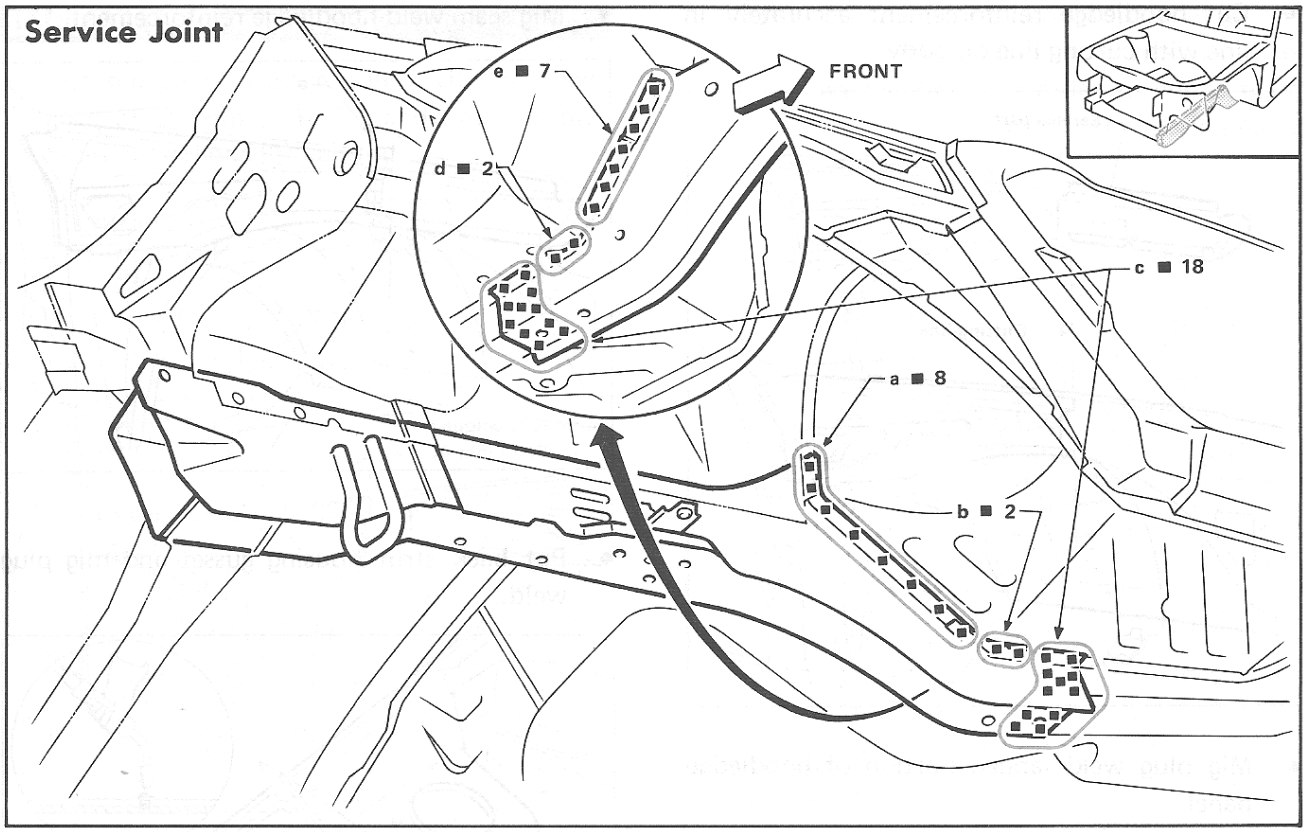


- Apply anti-corrosive wax to butt portion of hoodledge reinforcement.



FRONT SIDE MEMBER

(Work after hoodledge has been removed.)

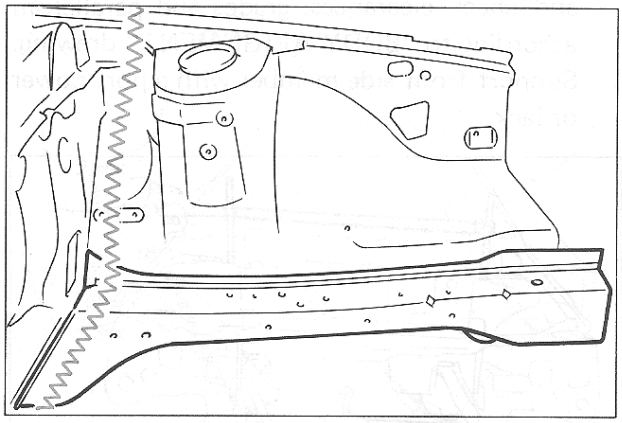


Portions to be welded		
a. Lower dash panel	c. Front side member extension	d. Front floor
b. Front floor	Front side member extension & front floor	e. Lower dash panel

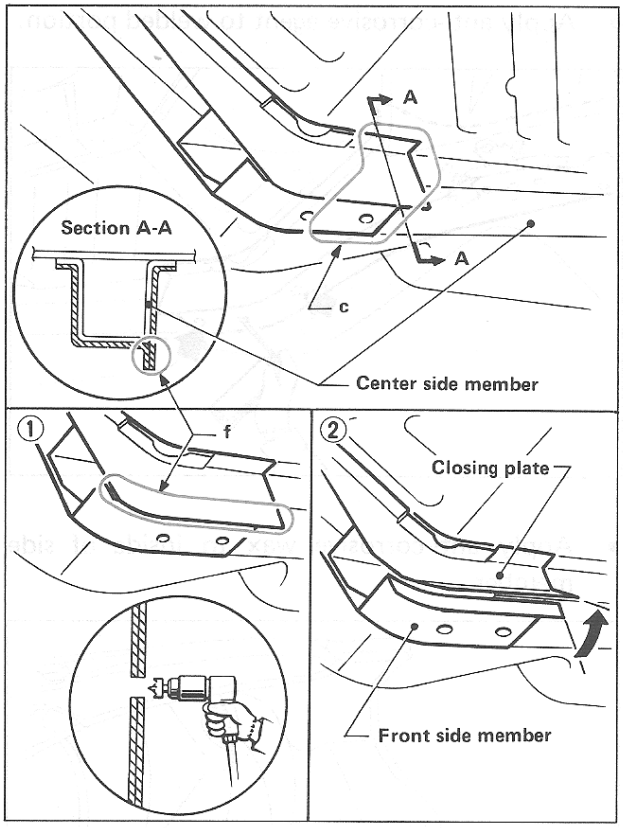
FRONT SIDE MEMBER

REMOVING REMINDERS

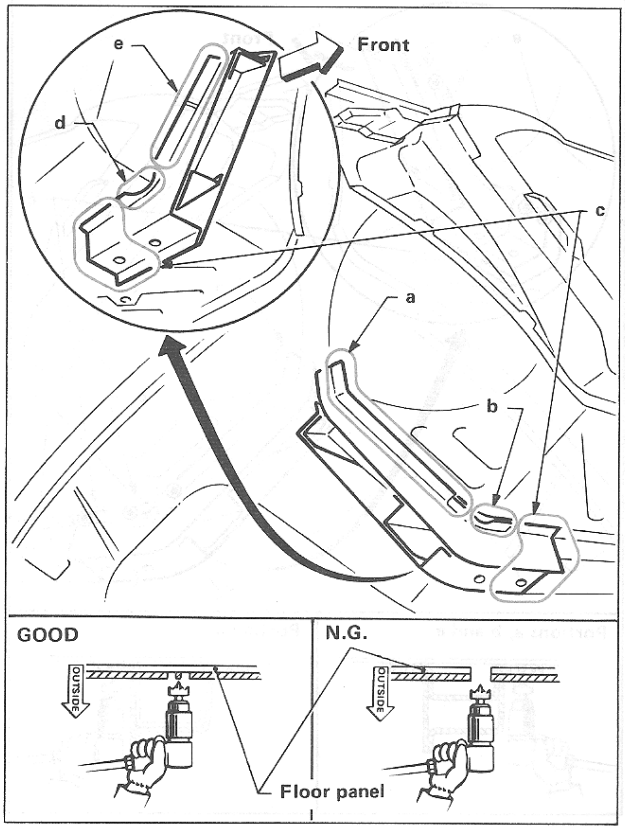
- Cut off damaged portion to facilitate removal.



- To remove welded portion (c), spot cut portion (f) and then bend closing plate to facilitate separating this portion.

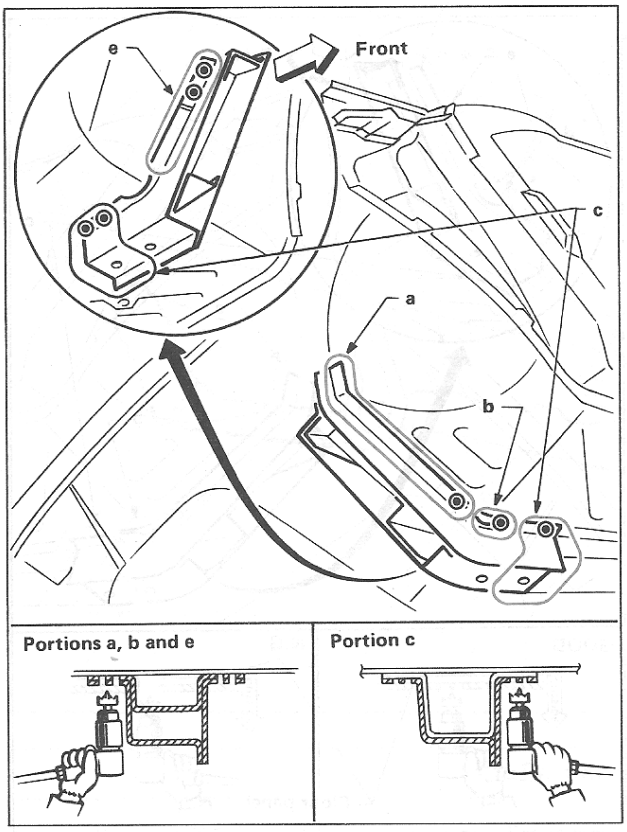


- When spot cutting, do not cut through into compartment. If accidentally cut through, repair by mig welding.



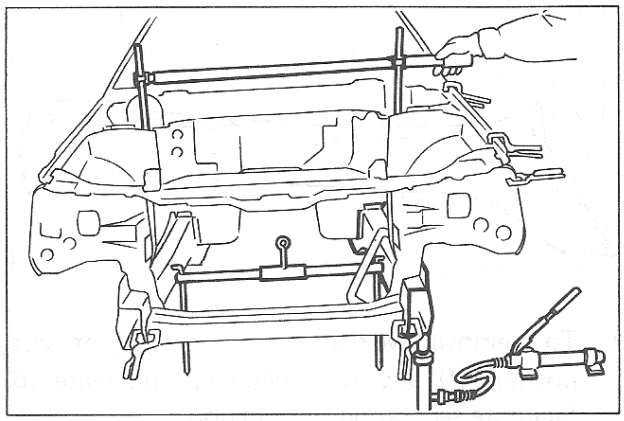
FRONT SIDE MEMBER

- Spot cut two upper plates of 3-layered part at portions (a), (b), and (e). Spot cut only one plate of 3-layered part at portion (c).

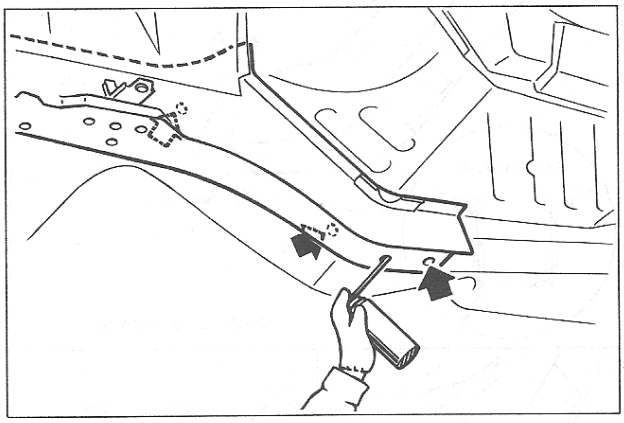


INSTALLING REMINDERS

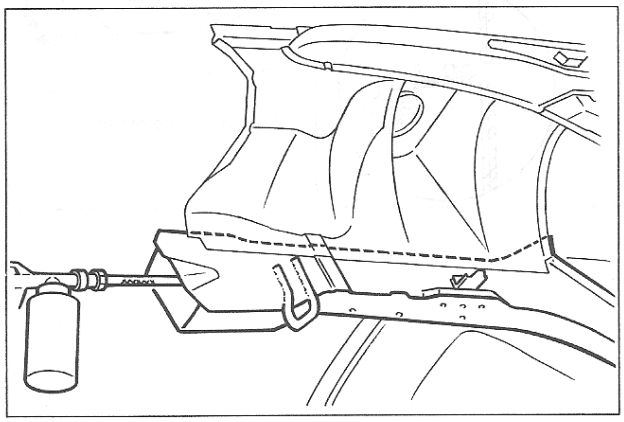
- Install hoodledge, radiator core support, etc. and check clearances, grades and parallelism according to "BODY ALIGNMENT" drawing. Support front side member with a port power or jack.



- Apply anti-corrosive agent to welded portion.

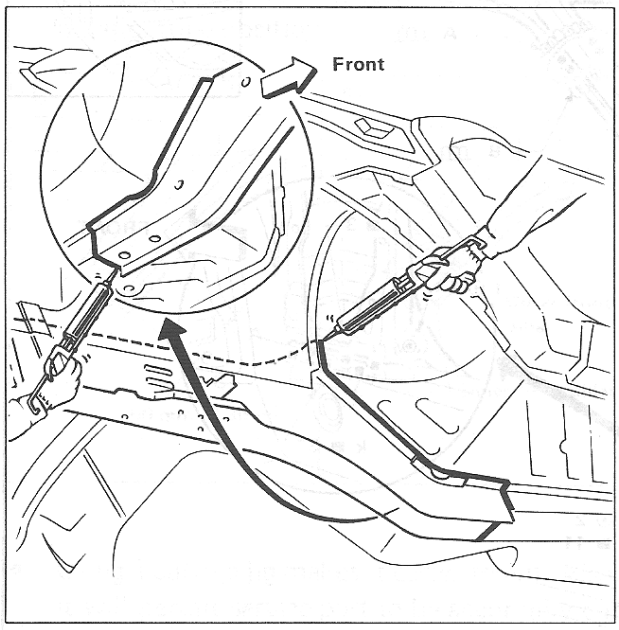


- Apply anti-corrosive wax to inside of side member.



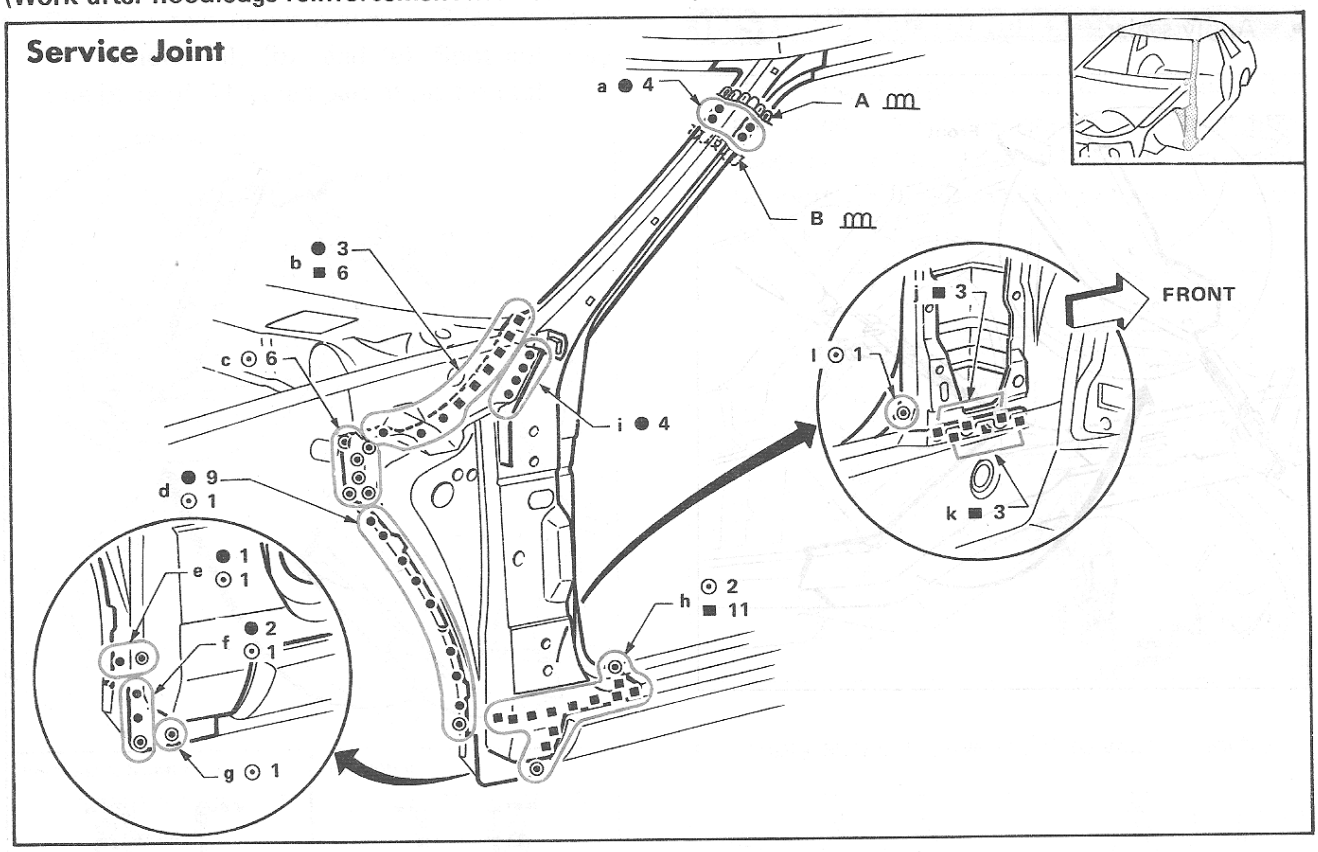
FRONT SIDE MEMBER

- Apply sealer.



FRONT PILLAR

(Work after hoodledge reinforcement has been removed.)

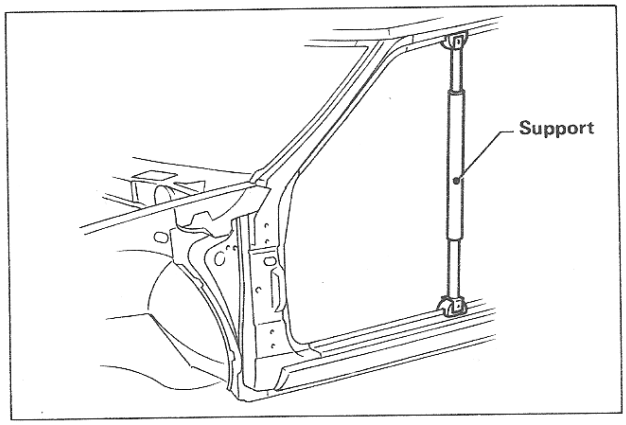


Portions to be welded

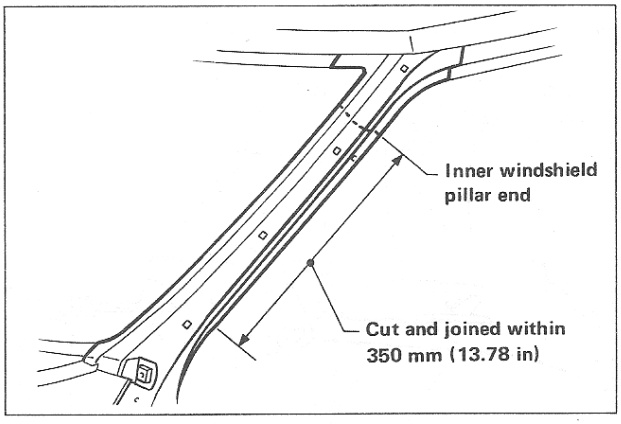
a. Front pillar
b. Inner cowl top
c. Lower dash panel & hoodledge
d. Lower dash panel
Lower dash panel & inner sill
e. Inner sill
f. Inner sill
Inner sill & lower dash panel
g. Inner sill & front floor
h. Outer sill
Outer sill & inner sill
i. Inner cowl top
j. Outer sill & inner sill reinforcement
k. Outer sill
Outer sill & inner sill & inner sill reinforcement
l. Inner sill reinforcement

REMOVING REMINDERS

- Support roof to prevent it from coming down.

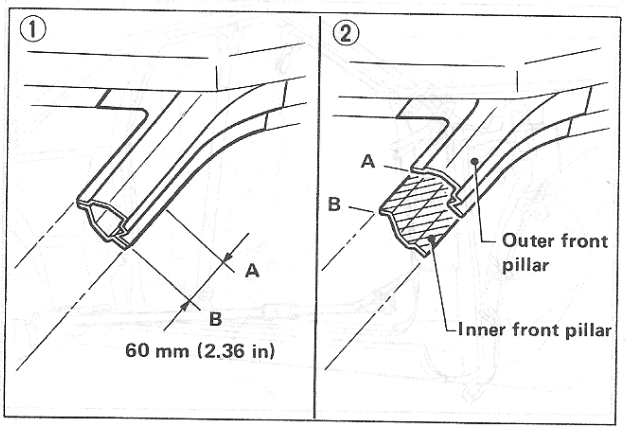


- Front pillar can be cut and joined anywhere within 350 mm (13.78 in) from end of inner windshield pillar.

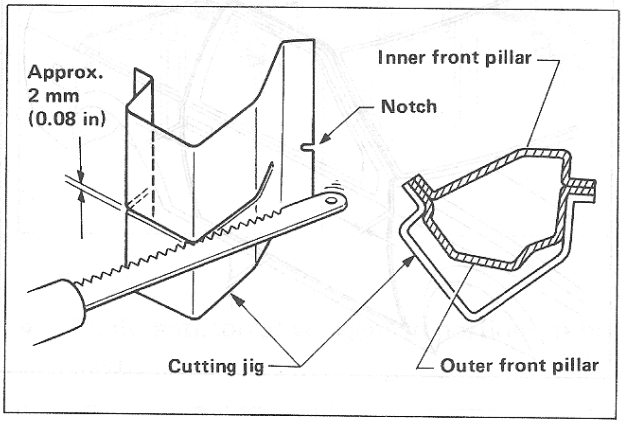


FRONT PILLAR

- Decide cutting position within above range. Cut inner pillar 60 mm (2.36 in) below outer pillar cutting position.

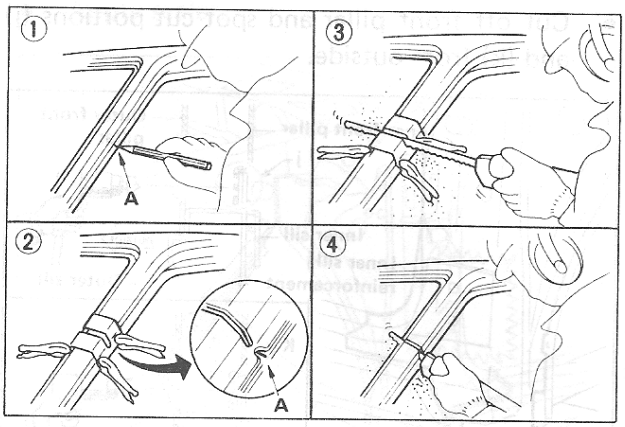


- Using a cutting jig makes it easier to cut. Also, it will permit service part to be accurately cut at joint position.



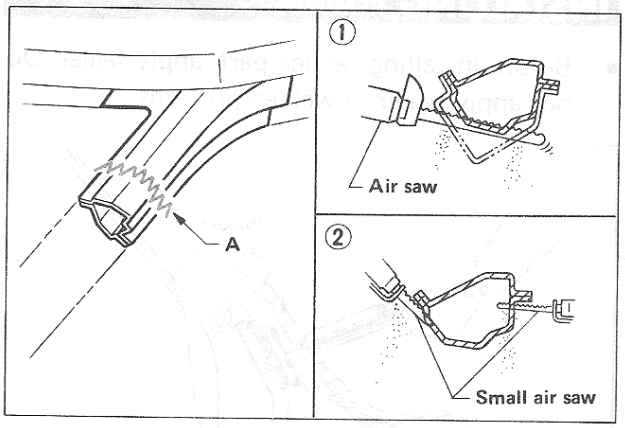
- An example of service operation using a cutting jig is as follows.

1. Mark a cutting line (A).
2. Align cutting line with mark on jig and clamp jig.
3. Cut off along groove of jig.
4. Remove jig and cut remaining portions.

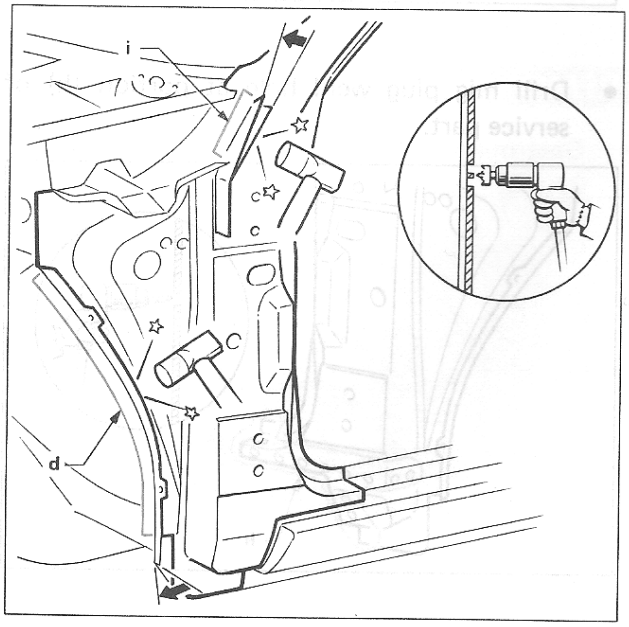


- To avoid scratching mating part, use a small air saw or an air saw blade.

Note: If inner front pillar is accidentally cut, repair it with mig weld.

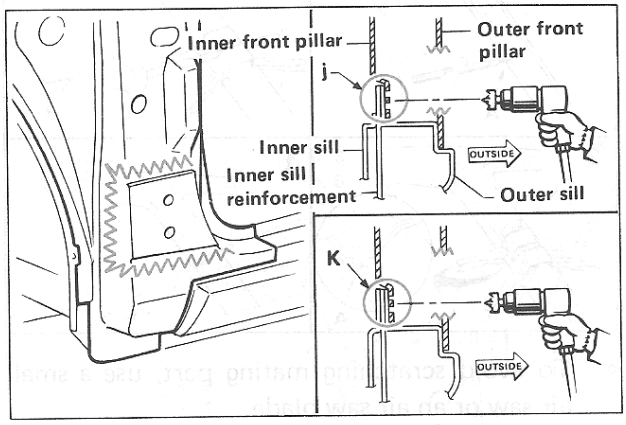


- Bend flanged parts at portions (d) and (i) so that welded portions can be easily spot cut later.



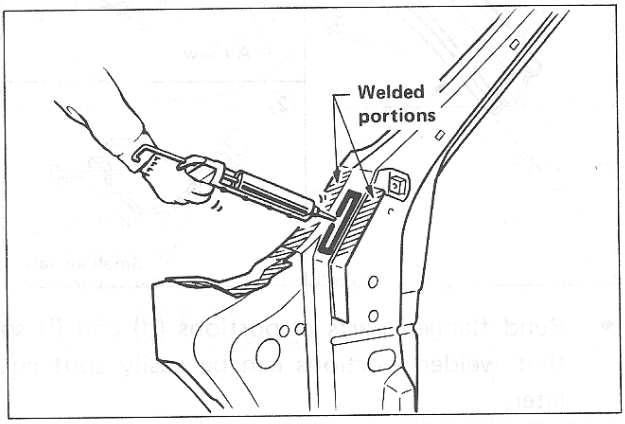
FRONT PILLAR

- Cut off front pillar and spot cut portions (j) and (k) from outside.

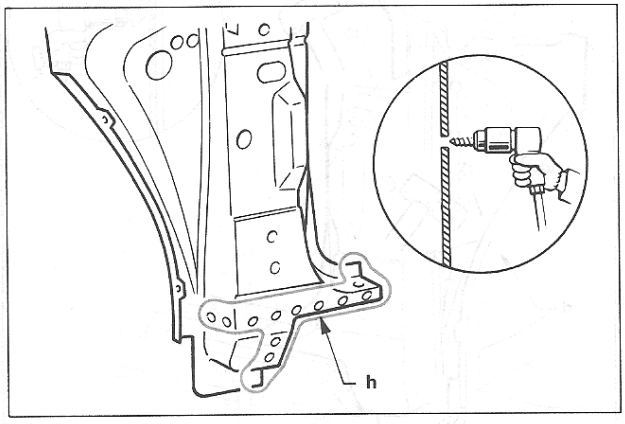


INSTALLING REMINDERS

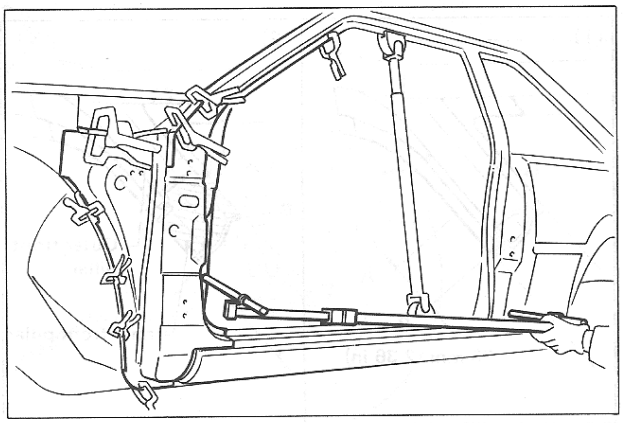
- Before installing service part, apply sealer. Do not apply sealer to welded portions.



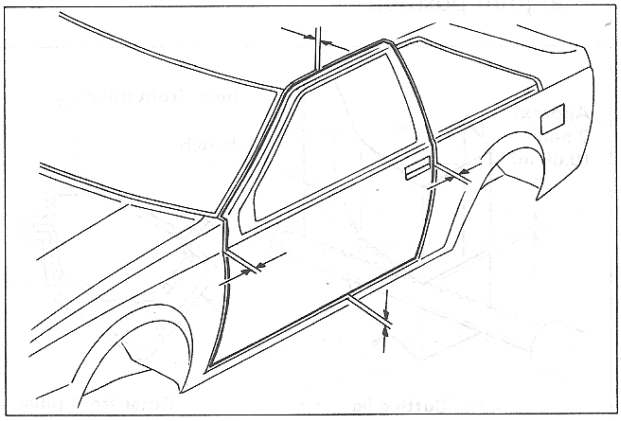
- Drill mig plug weld hole at portion (h) of service part.



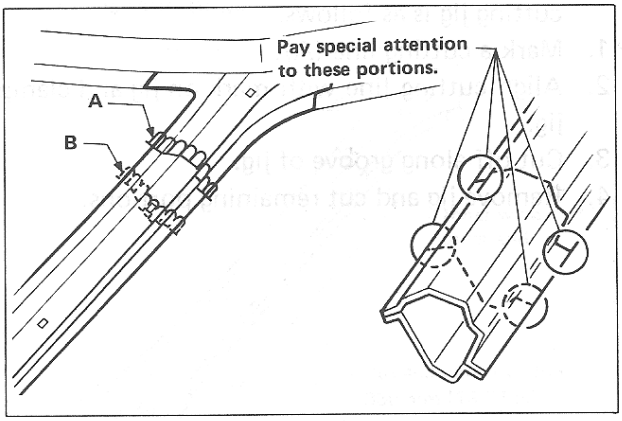
- Properly position service part according to "BODY ALIGNMENT" drawing when installing.



- Install door and front fender. Check clearances, grades and parallelism.

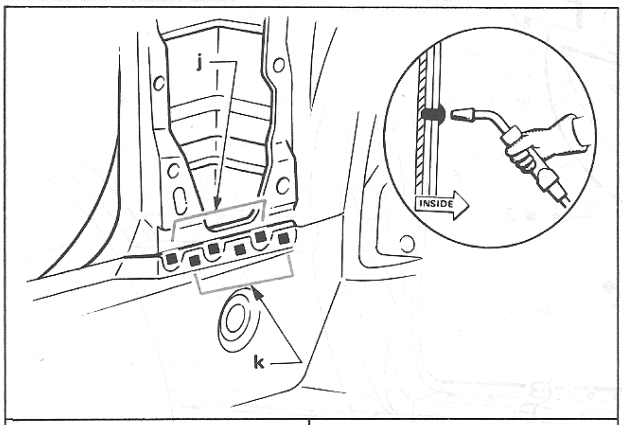


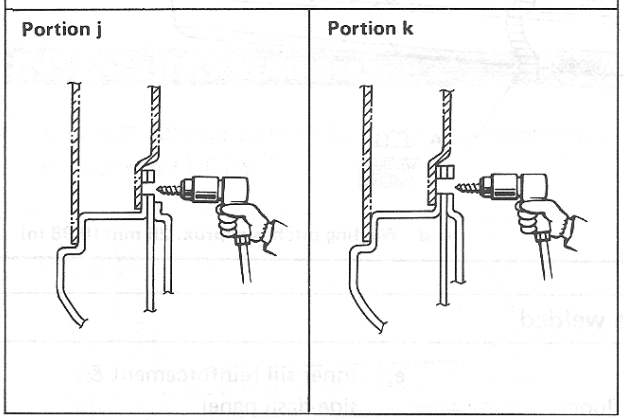
- Positively butt weld front pillar as far as end of flanged part.



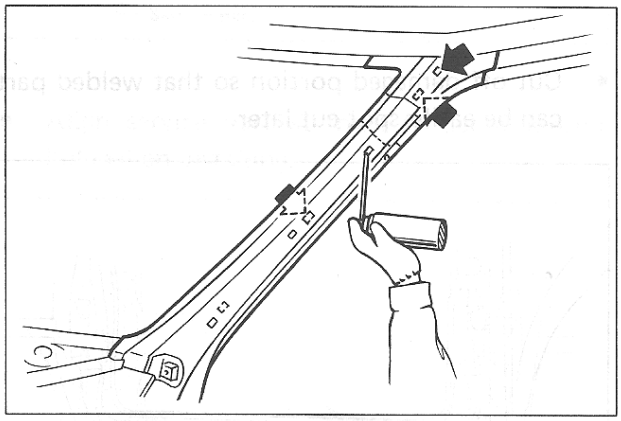
FRONT PILLAR

- Portions (j) and (k) should be welded by drilling mig plug holes in vehicle body and mig plug welding from inside of compartment side.

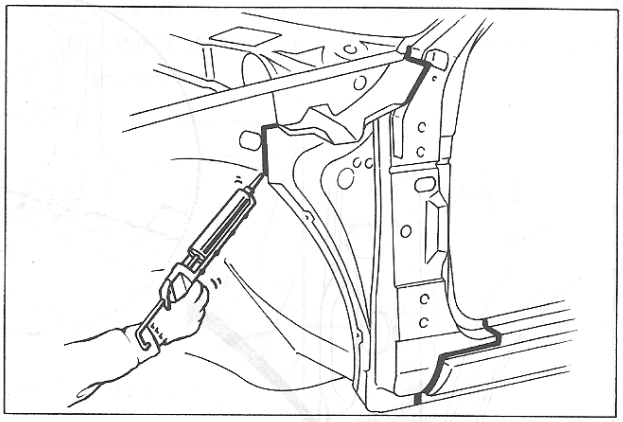




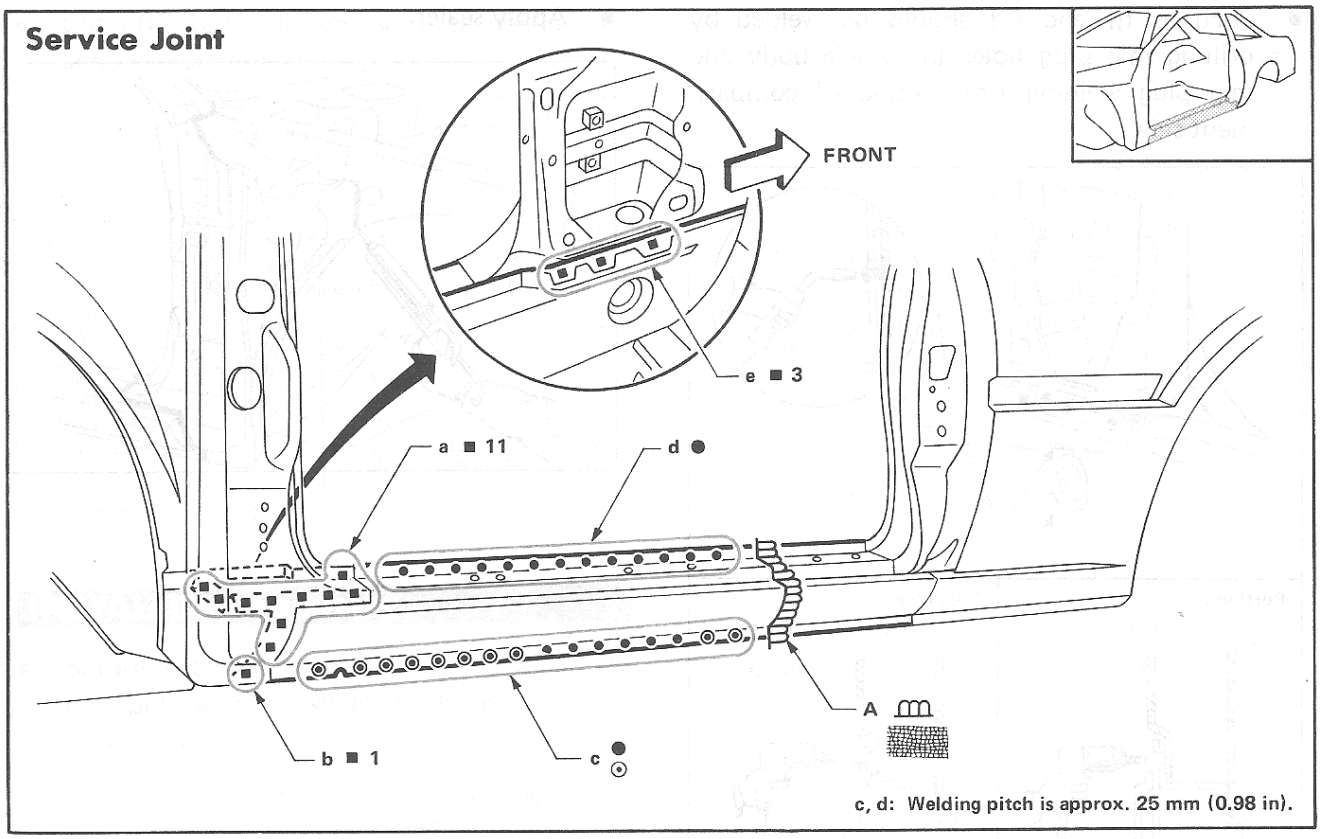
- Apply anti-corrosive agent to portions of butt weld.



- Apply sealer.



OUTER SILL (Partial Replacement)

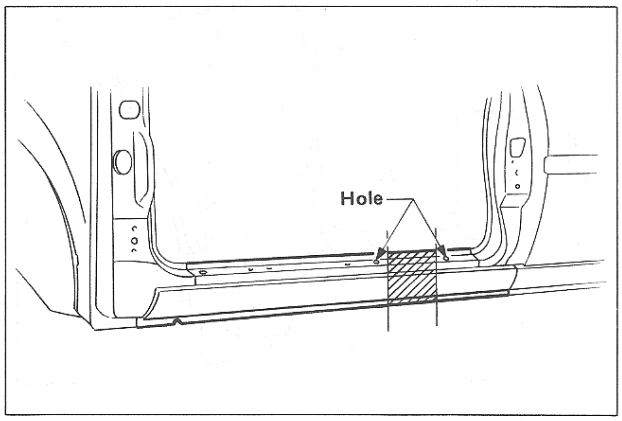


Portions to be welded

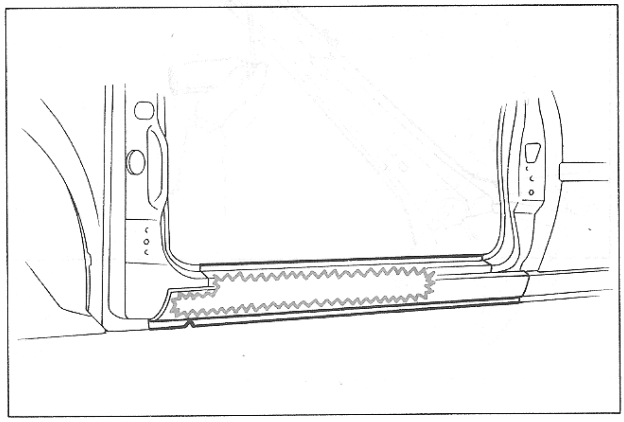
a. Front pillar
Front pillar & inner sill
b. Front pillar
c. Inner sill
Inner sill & front floor
d. Inner sill
e. Inner sill reinforcement & side dash panel

REMOVING REMINDERS

- Determine butt joint position off holes.

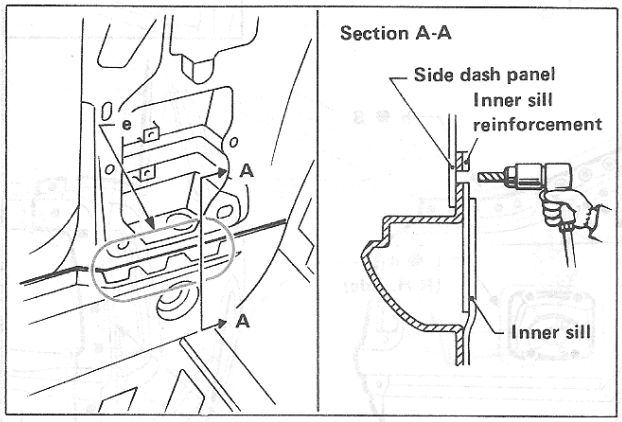


- Cut off damaged portion so that welded part can be easily spot cut later.



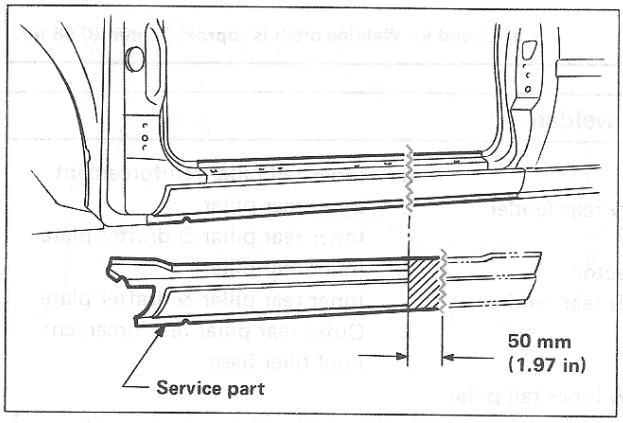
OUTER SILL (Partial Replacement)

- Spot cut two panels of 3-layered part at portion (e) from inside of passenger compartment by using a drill with a flat tip.

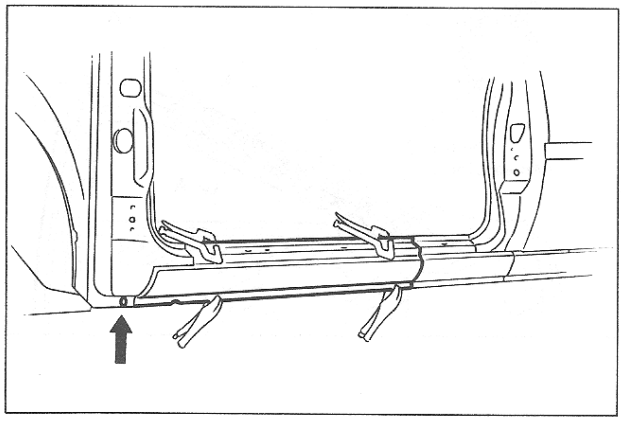


INSTALLING REMINDERS

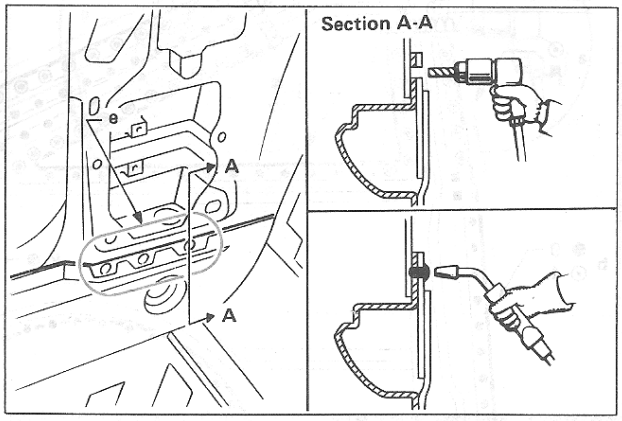
- Cut off service part with a lapping allowance of 50 mm (1.97 in).



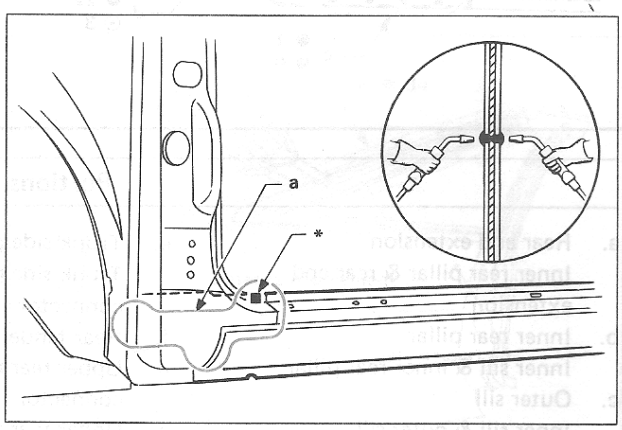
- Align service part at front fender mounting hole when installing.



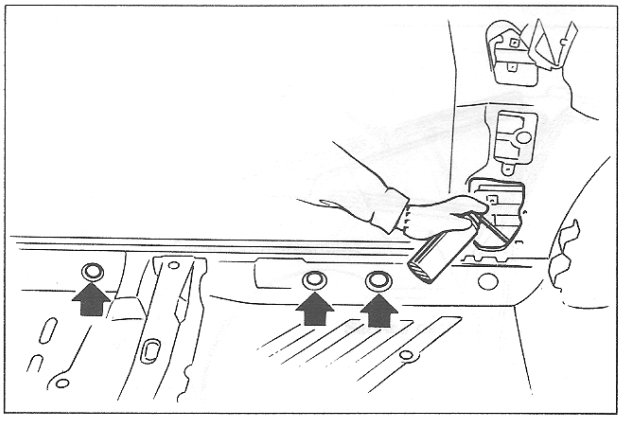
- Drill a mig plug hole at portion (e) of service part by using a drill with a flat tip and mig plug weld it from inside the passenger compartment.



- Mig plug weld portion (a*) from both sides.

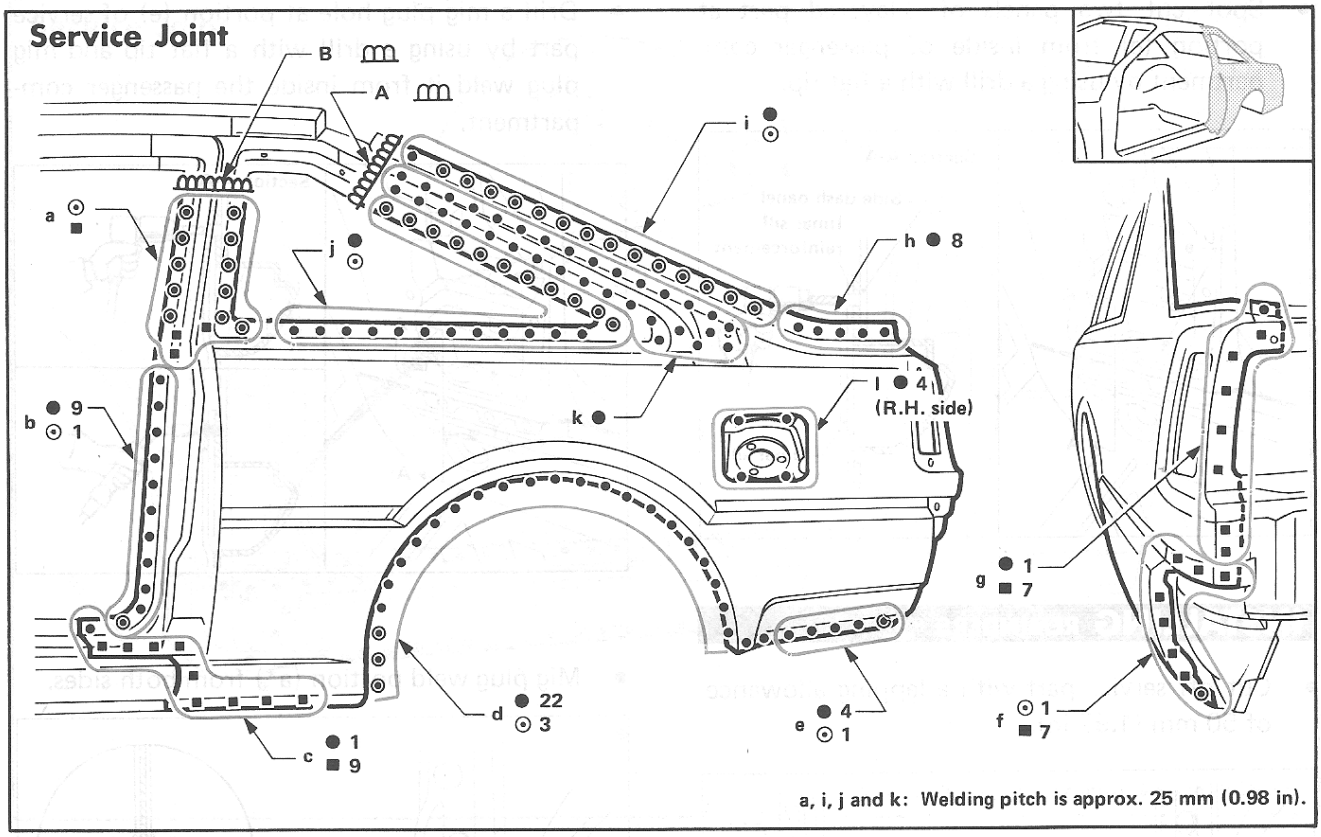


- Apply anti-corrosive wax inside the outer sill.



REAR FENDER

HATCHBACK



Portions to be welded

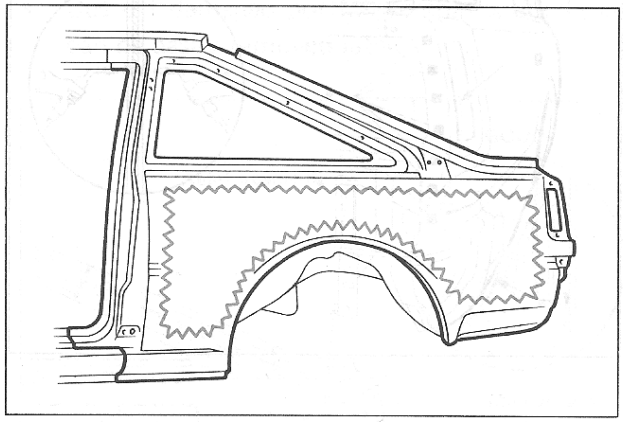
a. Rear end extension
   Inner rear pillar & rear end extension
b. Inner rear pillar
   Inner sill & inner rear pillar
c. Outer sill
   Inner sill & outer sill
d. Outer wheelhouse
   Outer sill & outer wheelhouse
e. Trunk side panel
   Trunk side panel & rear fender connector
f. Rear fender connector
   Upper rear panel & rear fender connector
g. Upper rear panel
   Upper rear panel & inner tail pillar reinforcement
h. Inner tail pillar reinforcement
i. Inner rear pillar
   Inner rear pillar & drafter plate
j. Inner rear pillar
   Inner rear pillar & drafter plate
k. Outer rear pillar reinforcement
l. Fuel filler base

REAR FENDER

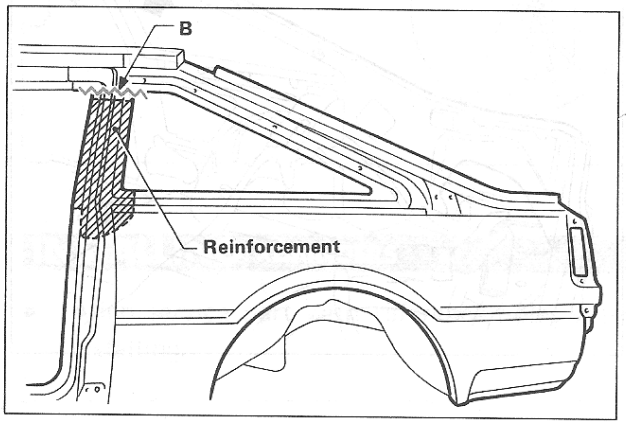
HATCHBACK

REMOVING REMINDERS

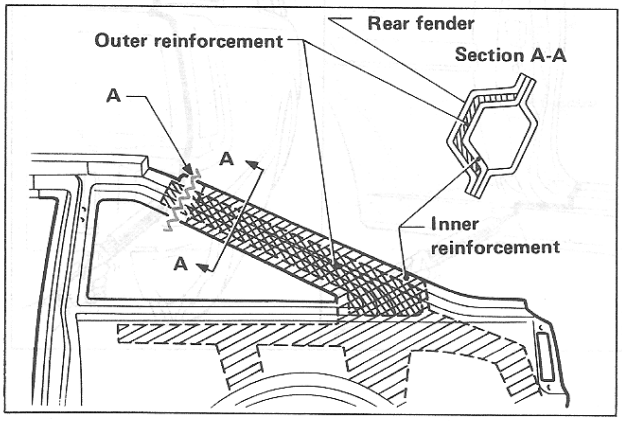
- Cut off damaged portion with a mini air saw. Be careful not to cut reinforcement.



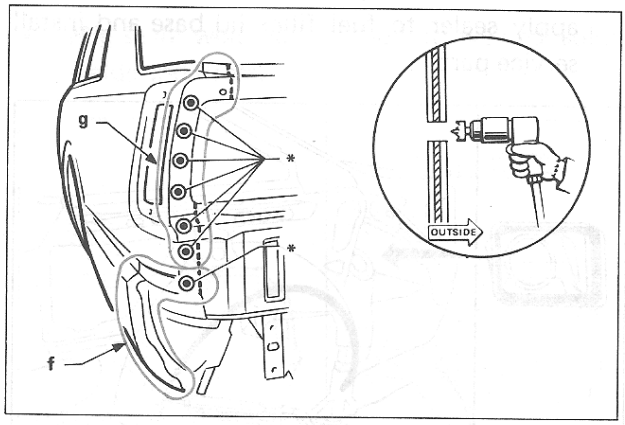
- Cut off portion (B). Avoid cutting reinforcement.



- Cut off portion (A) together with outer reinforcement.

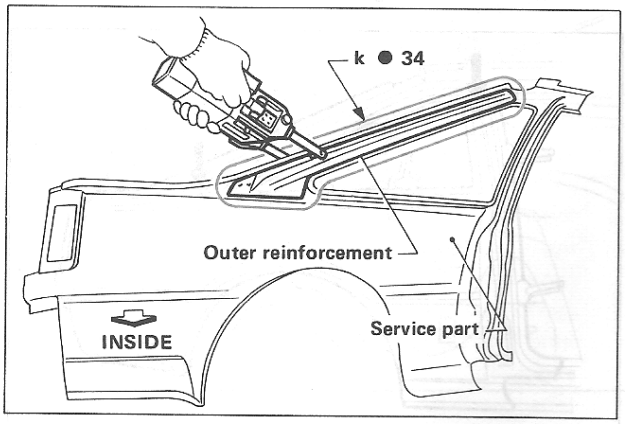


- Spot cut welds at portions (f*) and (g*).

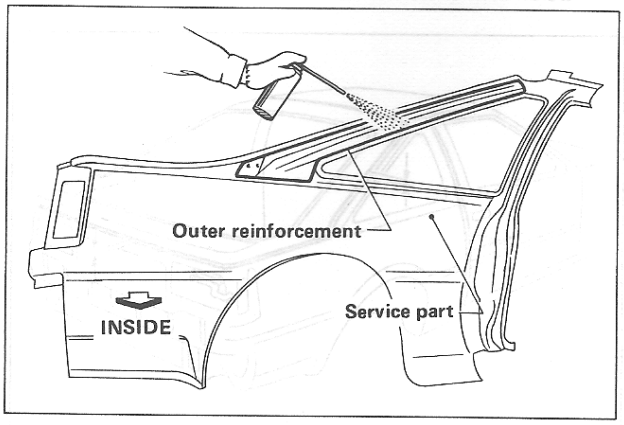


INSTALLING REMINDERS

- Before installing service part, spot weld outer reinforcement to rear fender.



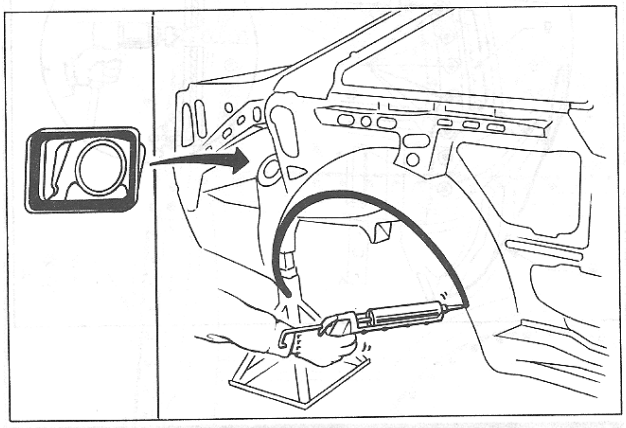
- Apply anti-corrosive agent to outer reinforcement.



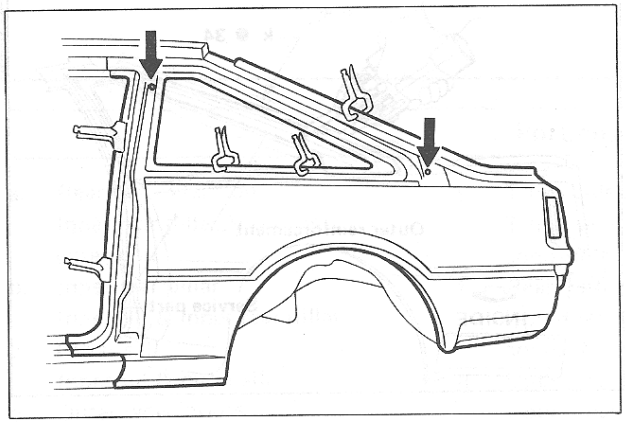
REAR FENDER

HATCHBACK

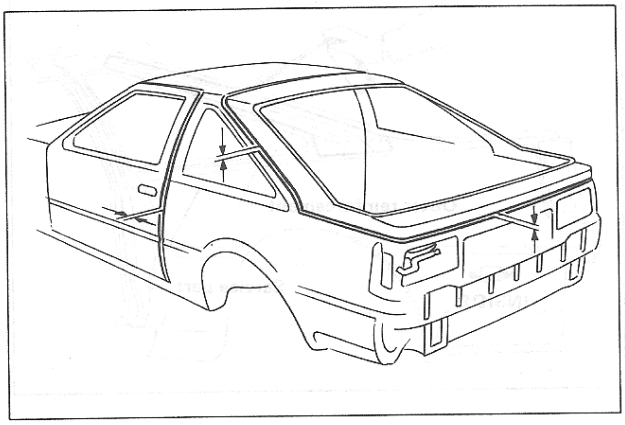
- Before installing service part, apply sealer to wheel arch. Also, for right-hand service part, apply sealer to fuel filler lid base and install service part.



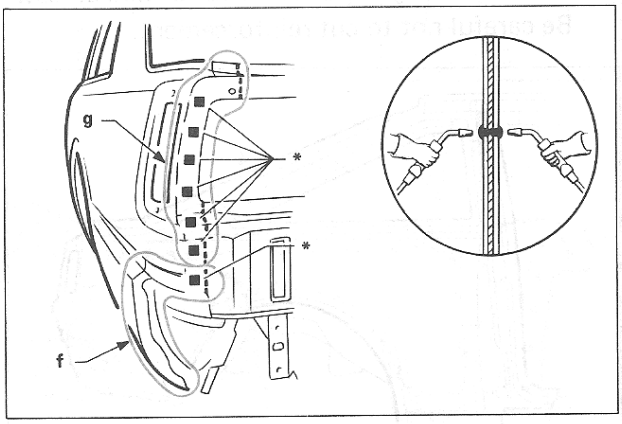
- Align service part with locating holes, and install in accordance with "BODY ALIGNMENT" drawing.



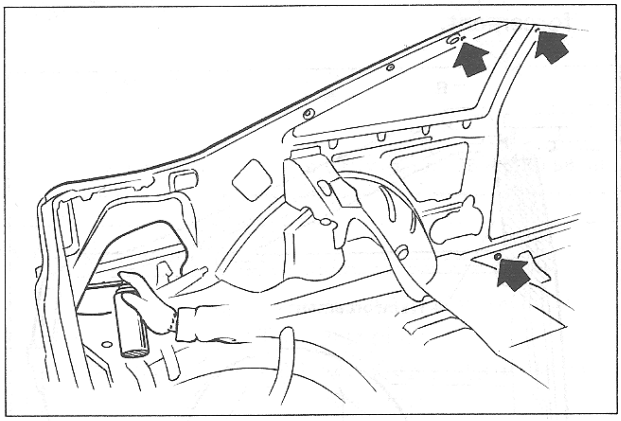
- Check clearances, grades and parallelism of door and back door.



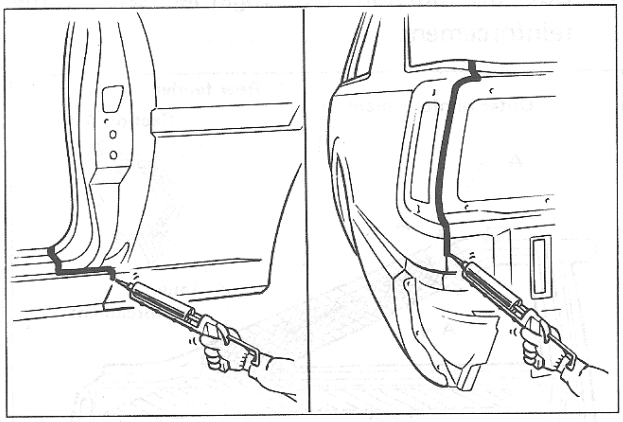
- Portions (f*) and (g*) are cut through. Mig plug weld both sides.



- Apply anti-corrosive agent.



- Apply sealer.

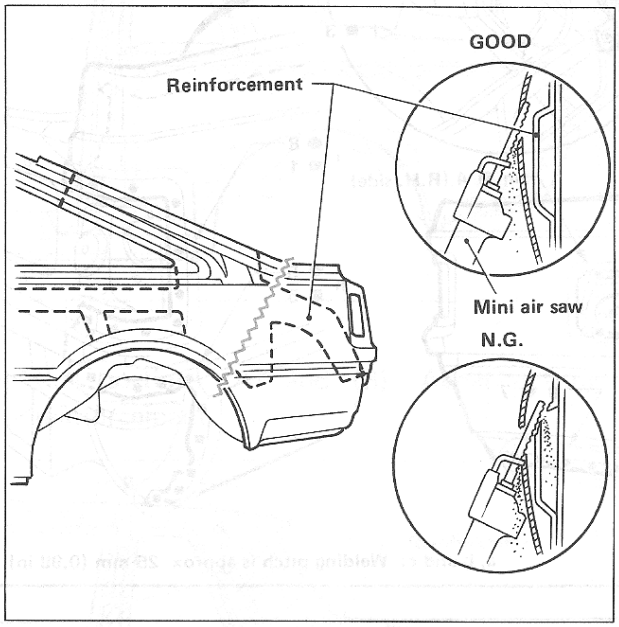


REAR FENDER (Partial Replacement) HATCHBACK

Refer to Service Joint drawing under REAR FENDER.

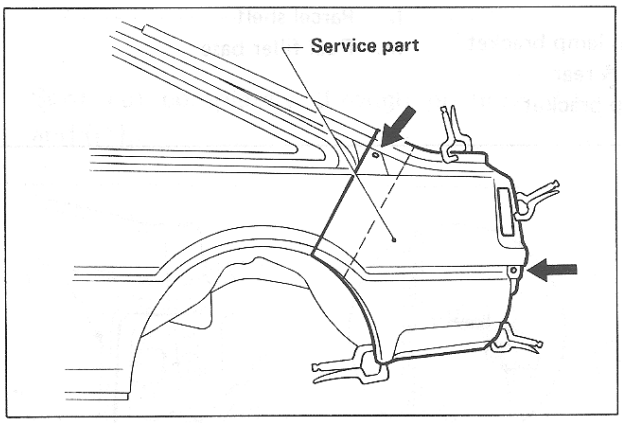
REMOVING REMINDER

- Cut off damaged portion so that welded part can be easily removed later.

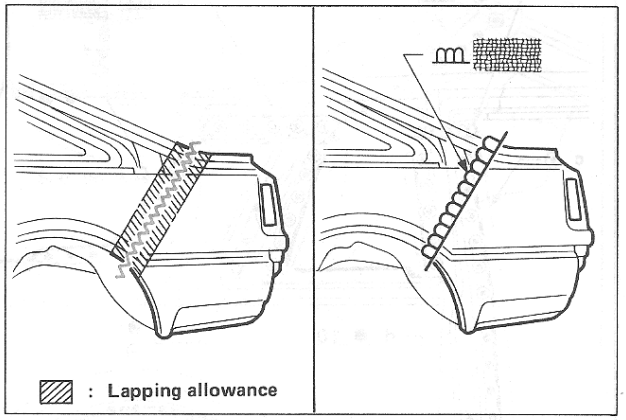


INSTALLING REMINDERS

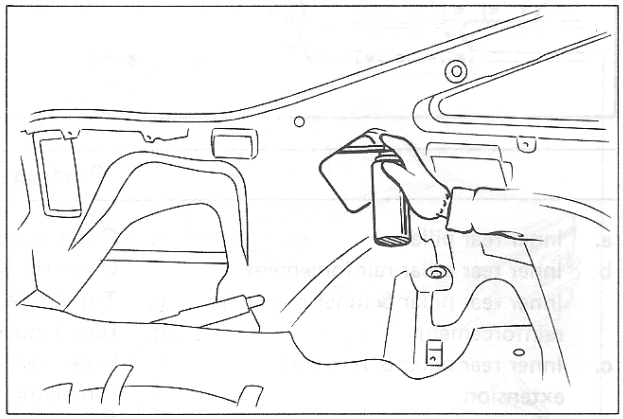
- Align service part with reference holes when installing.



- Mig seam weld parts to be butt welded, solder welds and dress.

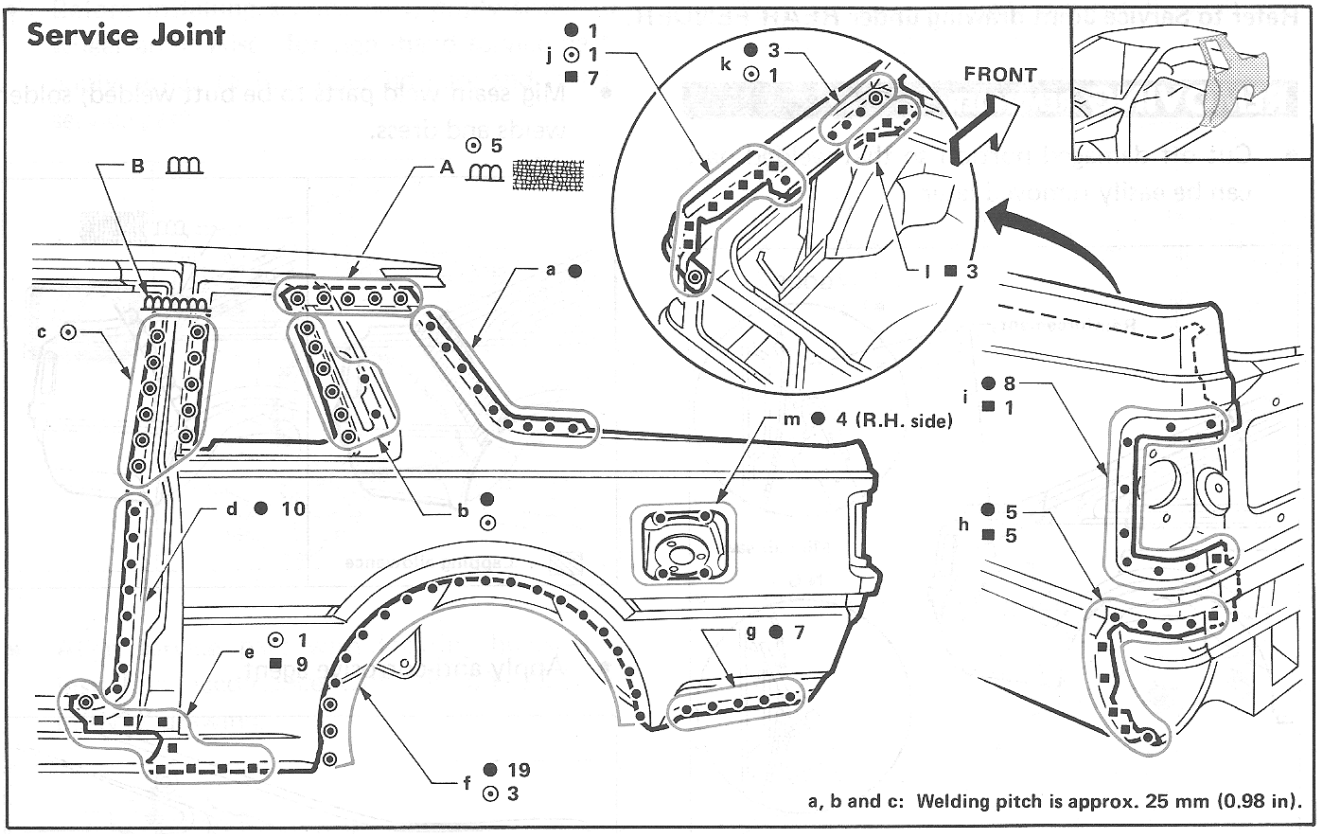


- Apply anti-corrosive agent.



REAR FENDER

COUPE



Portions to be welded

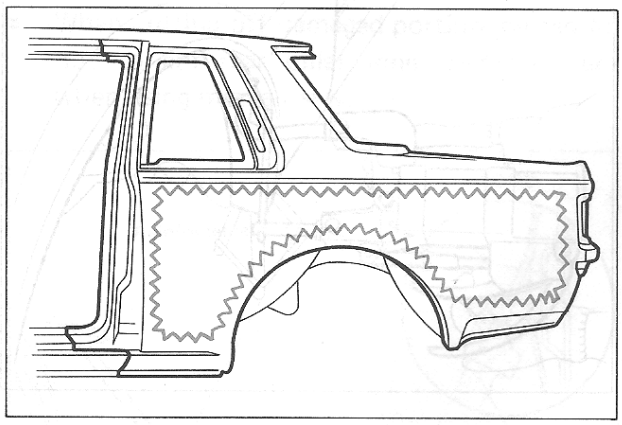
a. Inner rear pillar
b. Inner rear pillar reinforcement
Inner rear pillar & inner rear pillar reinforcement
c. Inner rear pillar & rear end extension
d. Inner rear pillar
e. Outer sill
Inner sill & outer sill
f. Outer wheelhouse
Outer sill & outer wheelhouse
g. Trunk side panel
h. Rear fender connector
Upper rear panel & rear fender connector
i. Rear combination lamp bracket
Upper rear panel & rear combination lamp bracket
j. Rear fender corner
Rear fender corner & rear combination lamp bracket
k. Inner rear pillar
Inner rear pillar & parcel shelf
l. Parcel shelf
m. Fuel filler base

REAR FENDER

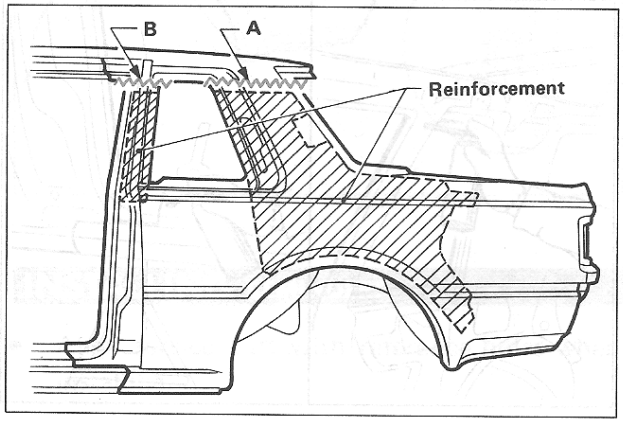
COUPE

REMOVING REMINDERS

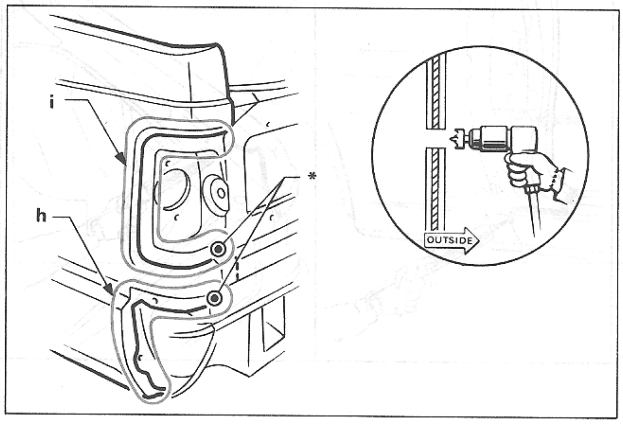
- Cut off damaged portion to facilitate removal.



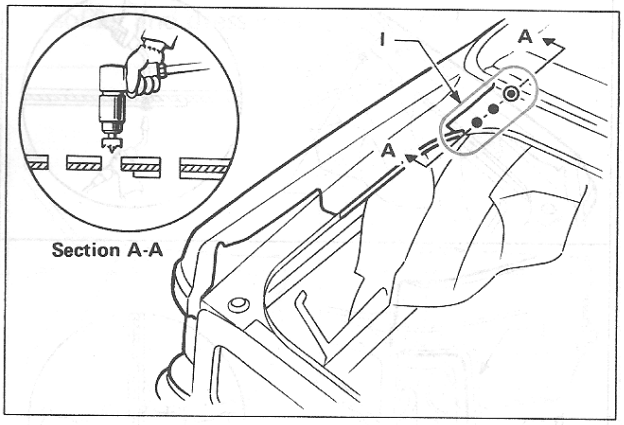
- Cut portions (A) and (B). Avoid cutting reinforcement.



- Spot cut completely through portions (h*) and (i*).

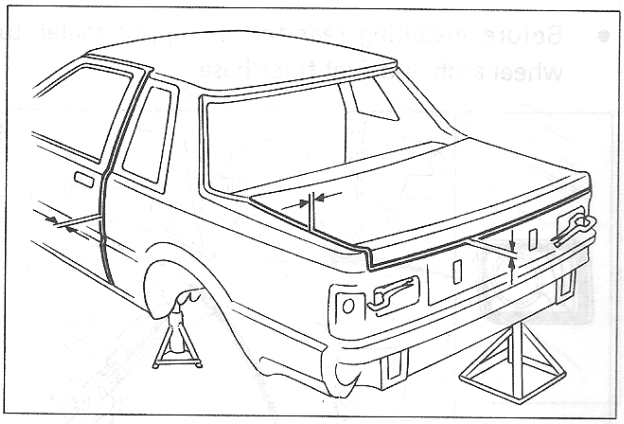


- Spot cut completely through portion (I) for better job efficiency.



INSTALLING REMINDERS

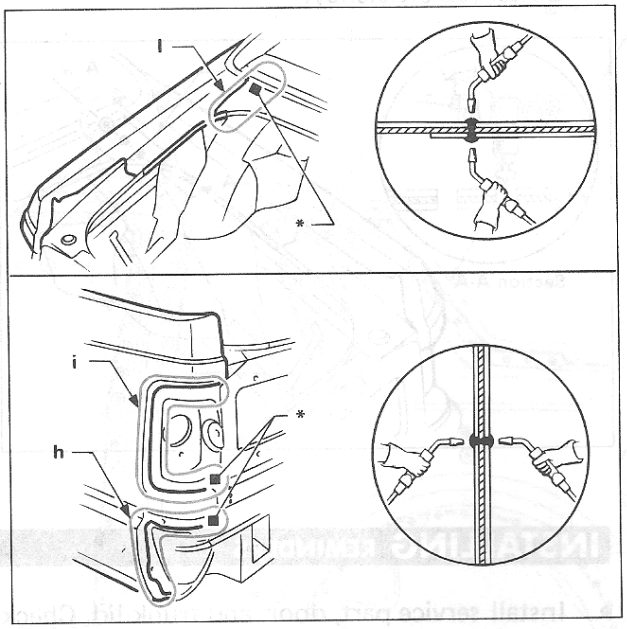
- Install service part, door, and trunk lid. Check clearances, grades and parallelism.



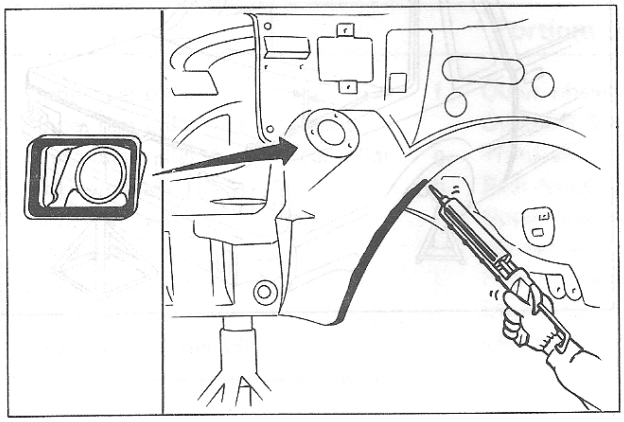
REAR FENDER

COUPE

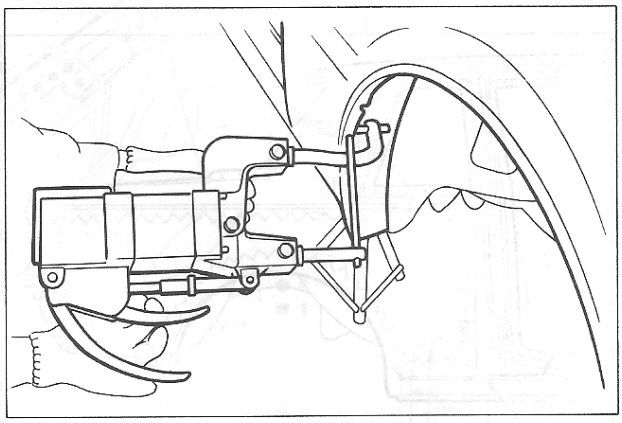
- Mig plug weld (h*), (i*), and (l*) from both sides.



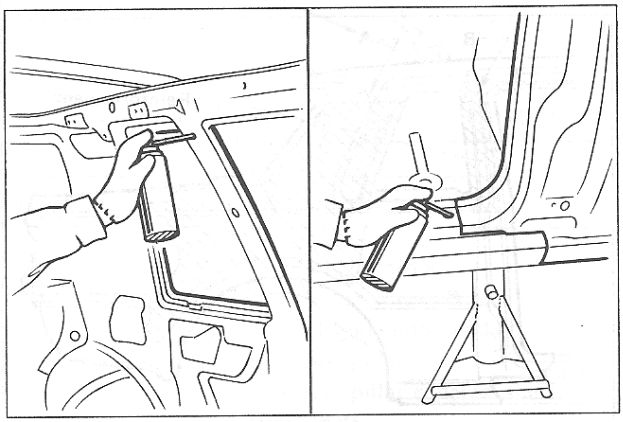
- Before installing rear fender, apply sealer to wheel arch and fuel filler base.



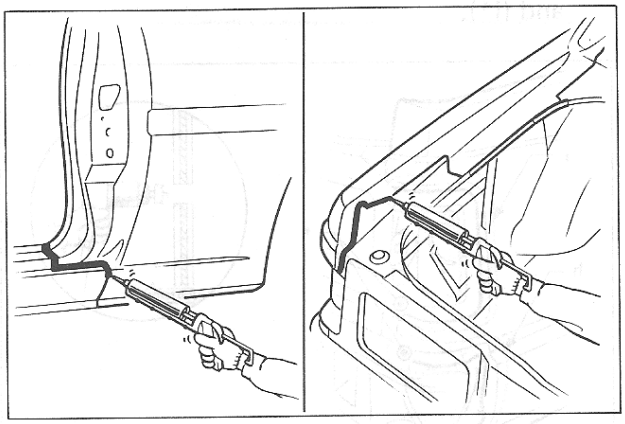
- When spot welding portion (f) (outer wheel-house), use arms such as are shown in the figure.



- Apply anti-corrosive agent to welded portions.



- Apply sealer.

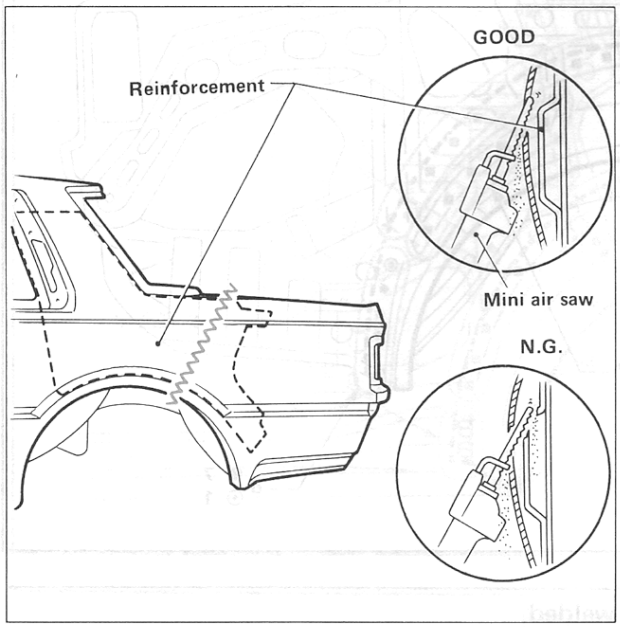


REAR FENDER (Partial Replacement) COUPE

Refer to Service Joint drawing under REAR FENDER.

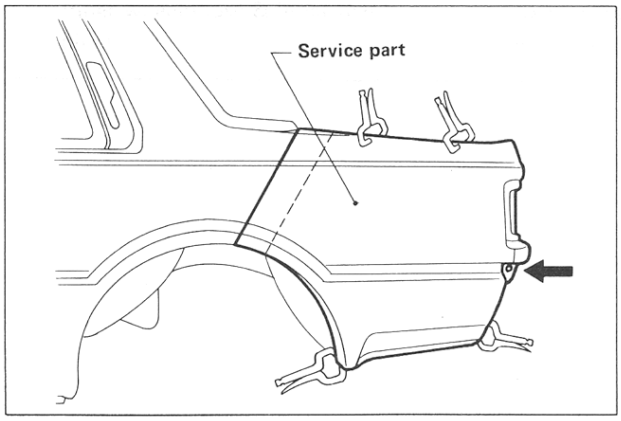
REMOVING REMINDER

- When cutting off damaged portion, be careful not to cut rear pillar inner reinforcement when using mini air saw.

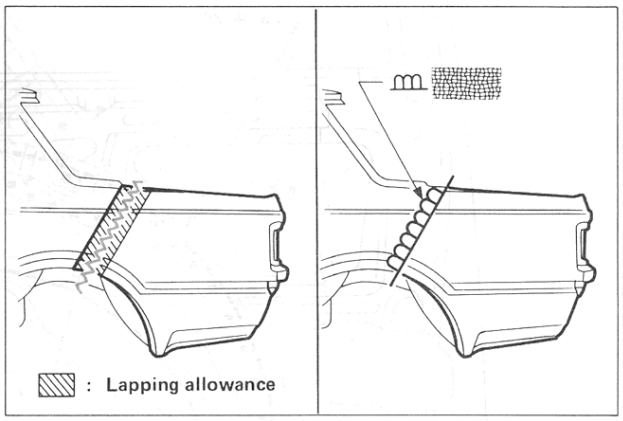


INSTALLING REMINDERS

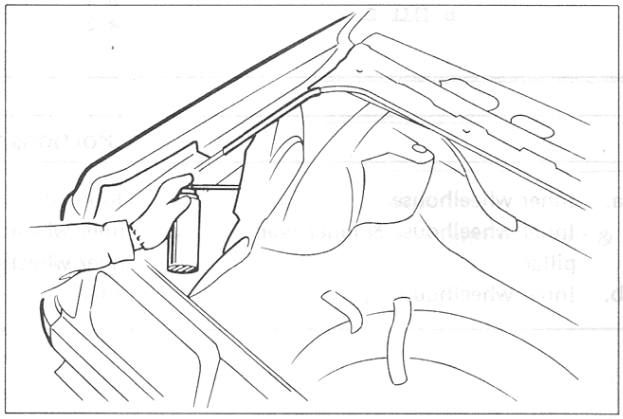
- Align service part with reference holes when installing.



- Mig seam weld parts to be butt welded, and solder and dress welds.



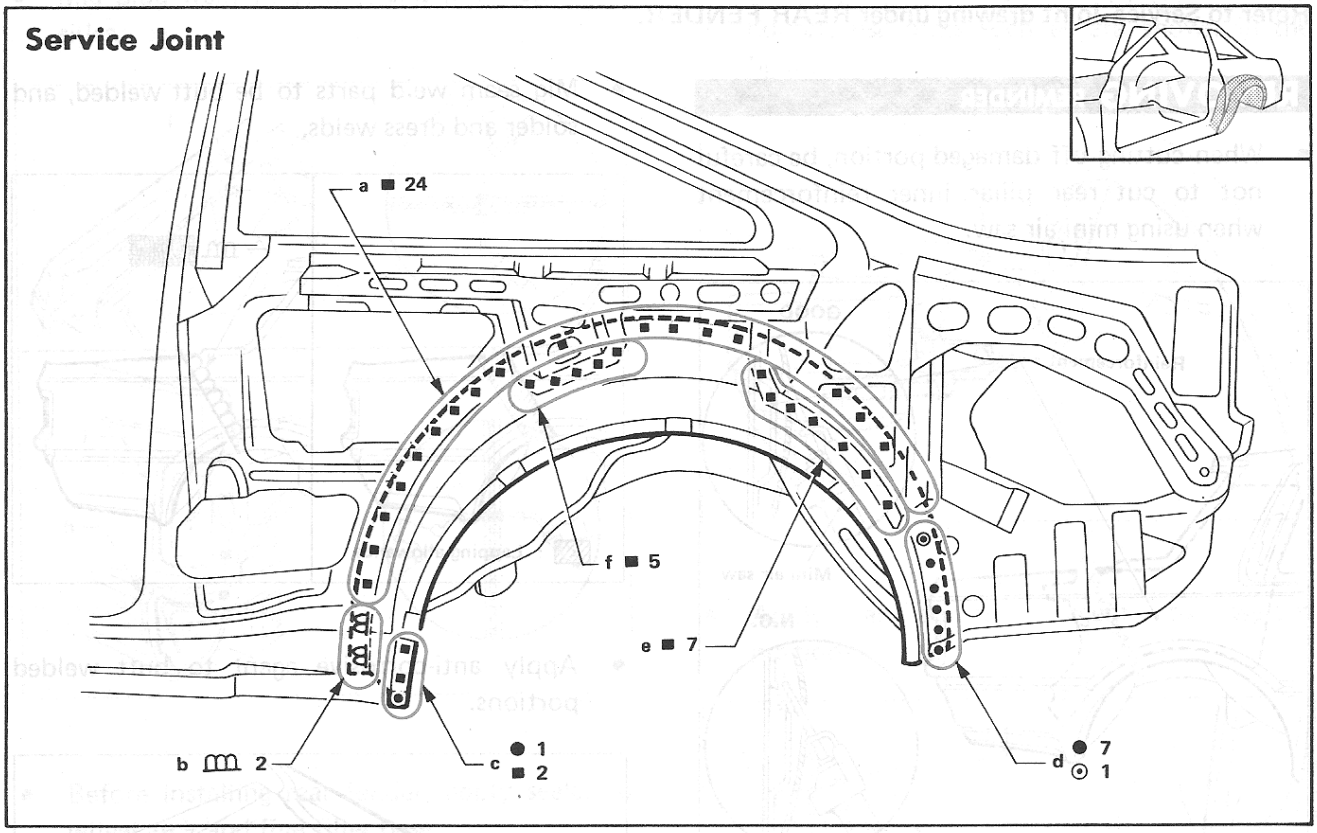
- Apply anti-corrosive agent to butt welded portions.



OUTER WHEELHOUSE

HATCHBACK

(Work after rear fender has been removed.)



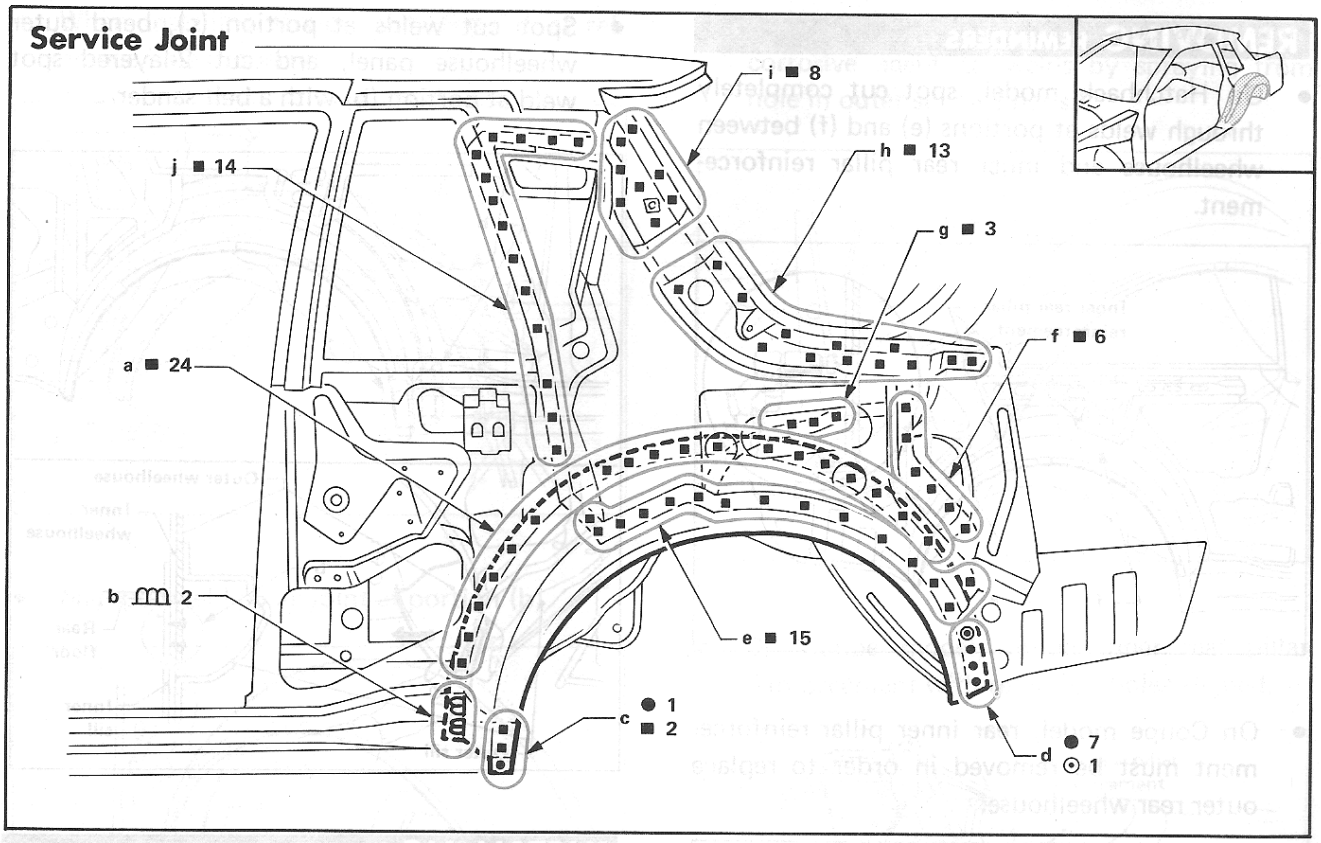
Portions to be welded

a. Inner wheelhouse
Inner wheelhouse & inner rear pillar
b. Inner wheelhouse
c. Outer sill
d. Inner wheelhouse
Inner wheelhouse & inner rear pillar
e. Outer wheelhouse
f. Outer wheelhouse

OUTER WHEELHOUSE

COUPE

(Work after rear fender has been removed.)



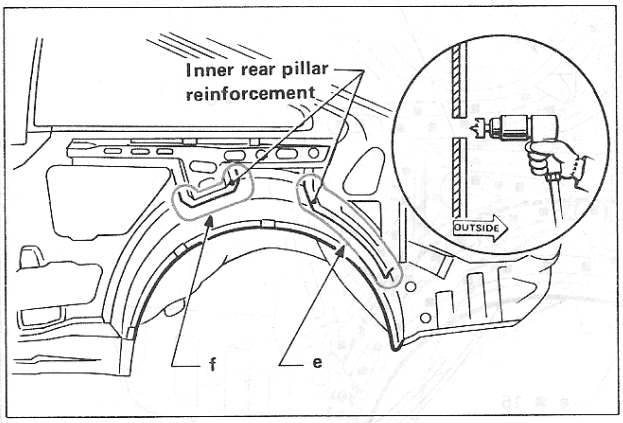
Portions to be welded

a. Inner wheelhouse
Inner wheelhouse & inner rear pillar
b. Inner wheelhouse
c. Outer sill
d. Inner wheelhouse
Inner wheelhouse & inner rear pillar
e. Outer wheelhouse
f. Inner rear pillar
Inner rear pillar reinforcement & inner rear pillar
g. Inner rear pillar
h. Inner rear pillar
Inner rear pillar reinforcement & inner rear pillar
i. Inner rear pillar
Inner rear pillar reinforcement & inner rear pillar
j. Inner rear pillar

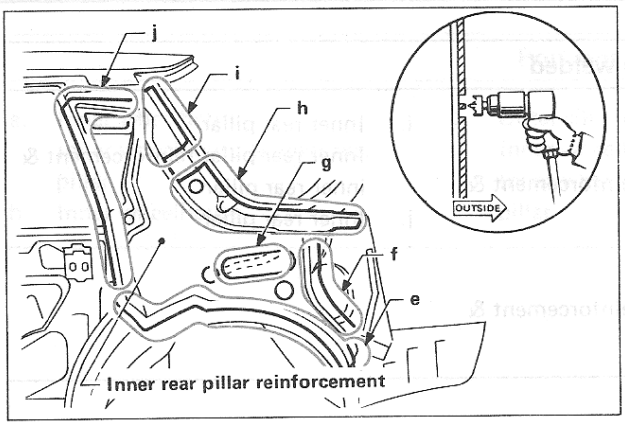
OUTER WHEELHOUSE

REMOVING REMINDERS

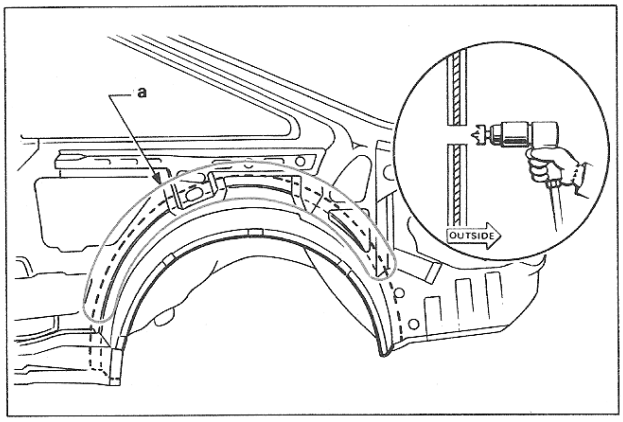
- On Hatchback model, spot cut completely through welds at portions (e) and (f) between wheelhouse and inner rear pillar reinforcement.



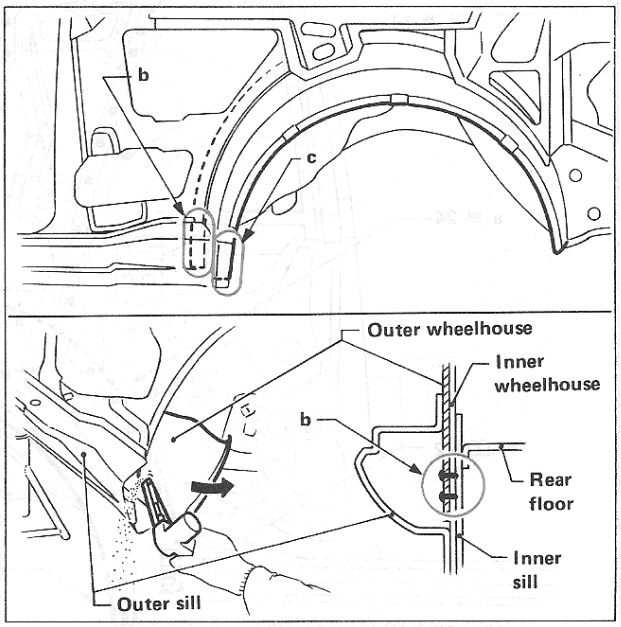
- On Coupe model, rear inner pillar reinforcement must be removed in order to replace outer rear wheelhouse.



- Spot cut completely through portion (a).

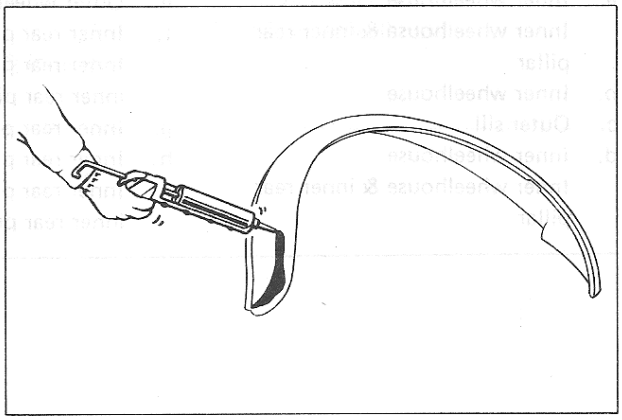


- Spot cut welds at portion (c), bend outer wheelhouse panel, and cut 2-layered spot weld at portion (b) with a belt sander.



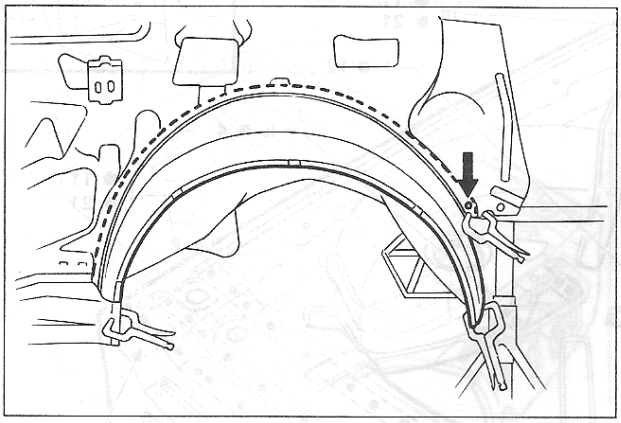
INSTALLING REMINDERS

- Be sure to apply sealer to joint with outer sill.

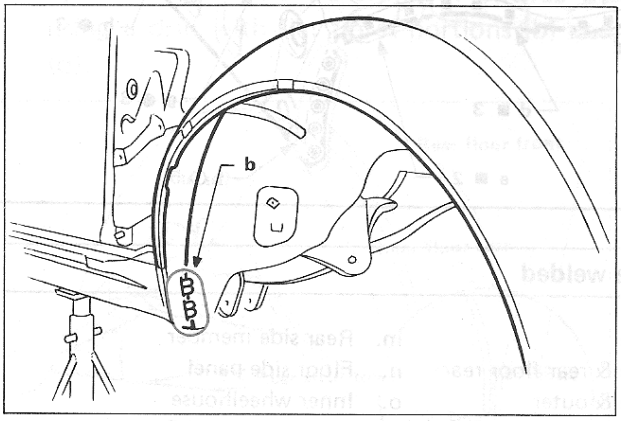


OUTER WHEELHOUSE

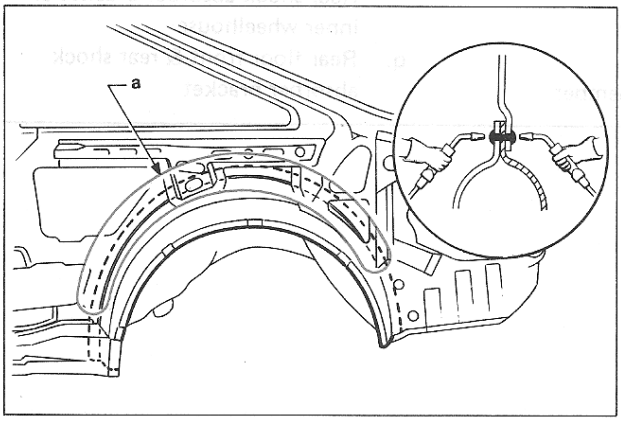
- When installing service part, align it at reference hole properly.



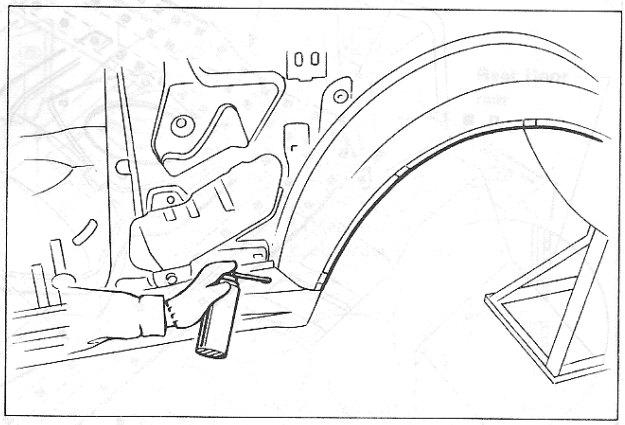
- Mig spot weld panel joint at portion (b).



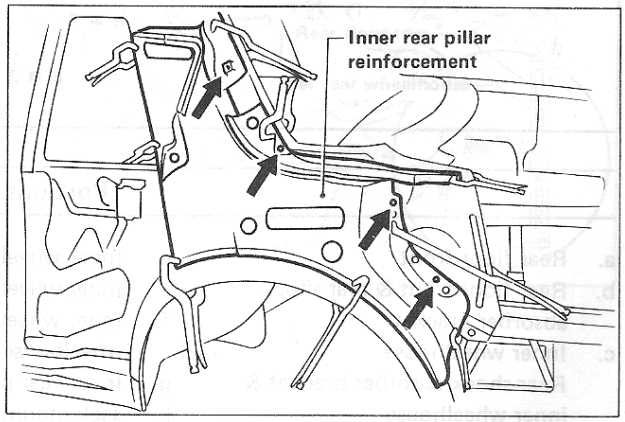
- Mig plug weld both sides at portion (a).



- After mig welding portion (b), apply anti-corrosive agent to welds by spraying from hole in outer sill or inner sill.

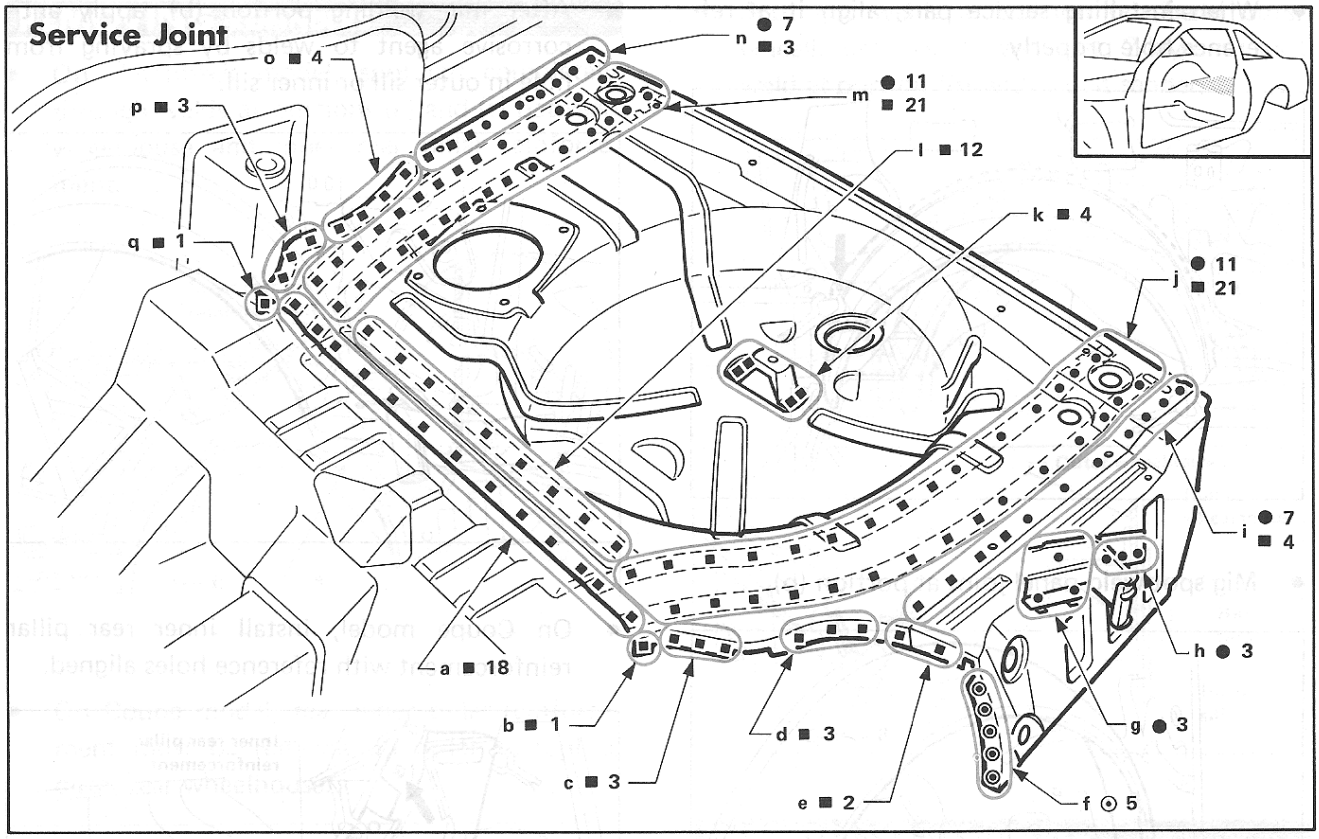


- On Coupe model, install inner rear pillar reinforcement with reference holes aligned.



REAR FLOOR REAR

(Work after rear panel and rear crossmember have been removed.)



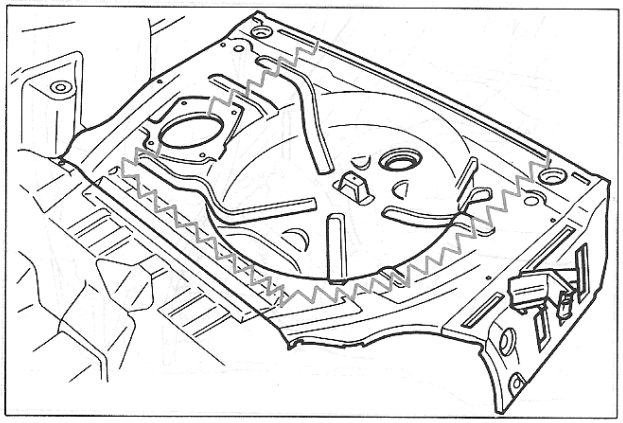
Portions to be welded

a. Rear floor front
b. Rear floor front & rear shock absorber bracket
c. Inner wheelhouse
Rear shock absorber bracket & inner wheelhouse
d. Inner wheelhouse
Inner wheelhouse & floor side panel
e. Inner wheelhouse
Inner wheelhouse & rear floor rear
f. Inner wheelhouse & outer wheelhouse
g. Inner rear pillar
h. Jack mounting bracket
i. Floor side panel
j. Rear side member
k. Spare tire bracket
l. Tank mounting member
m. Rear side member
n. Floor side panel
o. Inner wheelhouse
Floor side panel & inner wheelhouse
p. Inner wheelhouse
Rear shock absorber bracket & inner wheelhouse
q. Rear floor front & rear shock absorber bracket

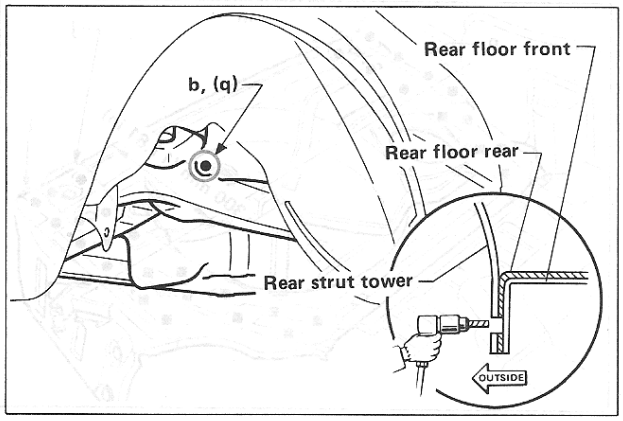
REAR FLOOR REAR

REMOVING REMINDERS

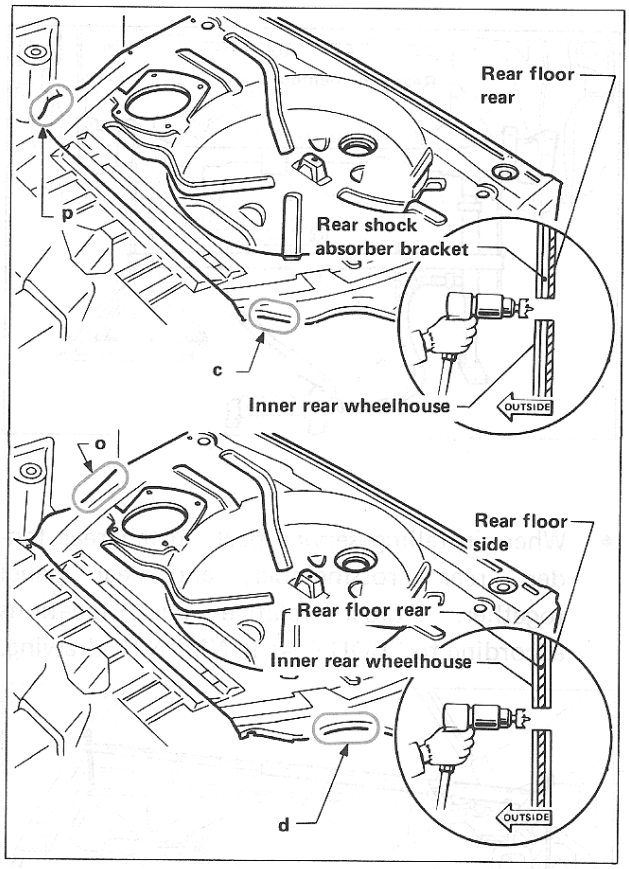
- Cut off damaged portion to facilitate removal.



- Spot cut only two panels from outside by using a drill with flat tip at portions (b) and (q).



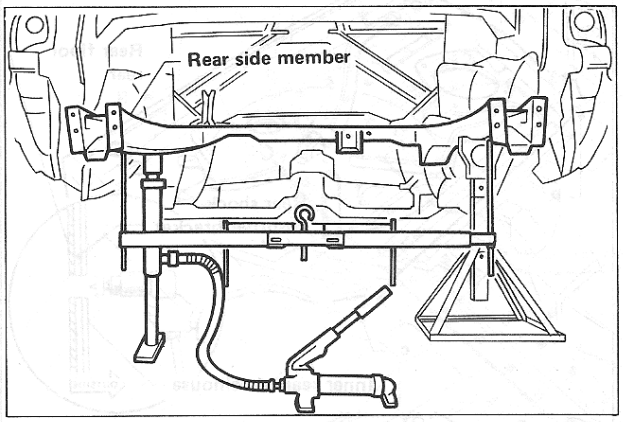
- Spot cut through mating part at welded portions with inner wheelhouse (c), (d), (o), and (p) from outside.



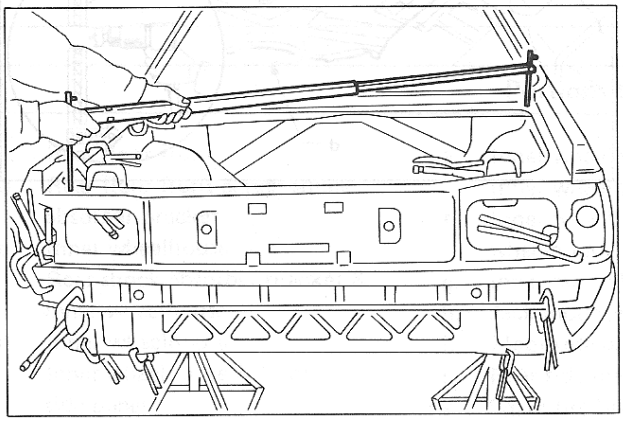
REAR FLOOR REAR

INSTALLING REMINDERS

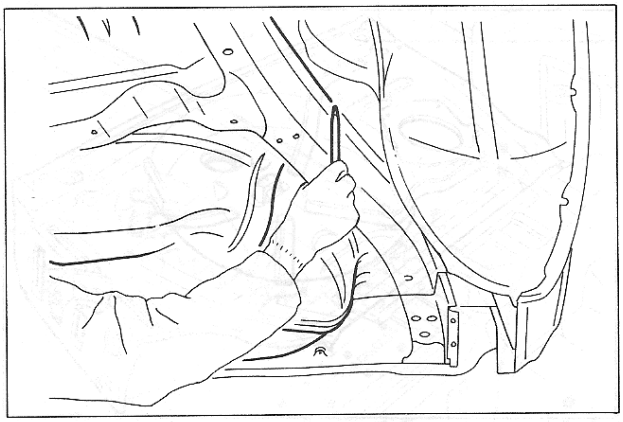
- Adjust rear side member location according to "BODY ALIGNMENT" drawing.



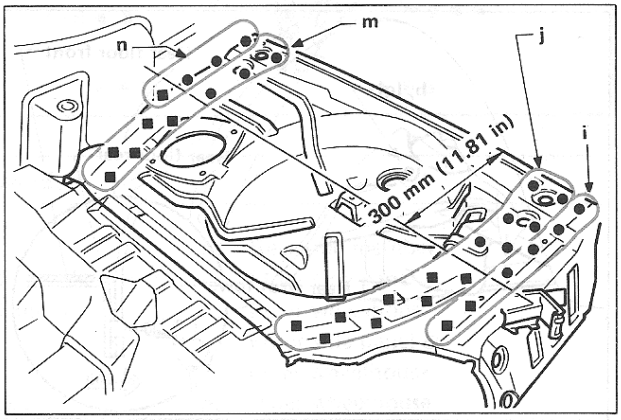
- When installing service part, install rear fender, rear crossmember, and rear panel together. Adjust relative part locations according to "BODY ALIGNMENT" drawing.



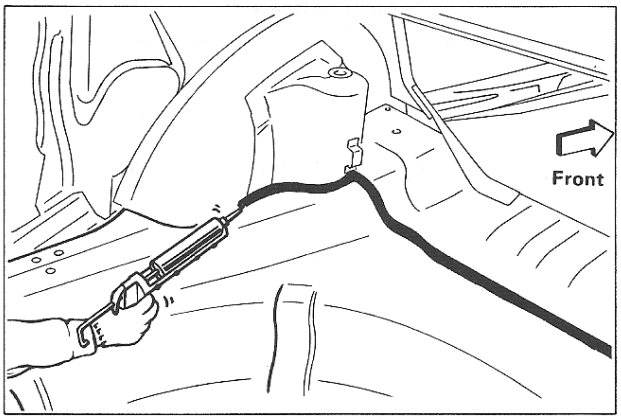
- To use as reference for drilling mig plug weld holes, scribe a line on service part along flanged end of side member.



- Spot weld rear side member to trunk (floor) side 300 mm (11.81 in) from rear end of panel. Mig plug weld the remainder.

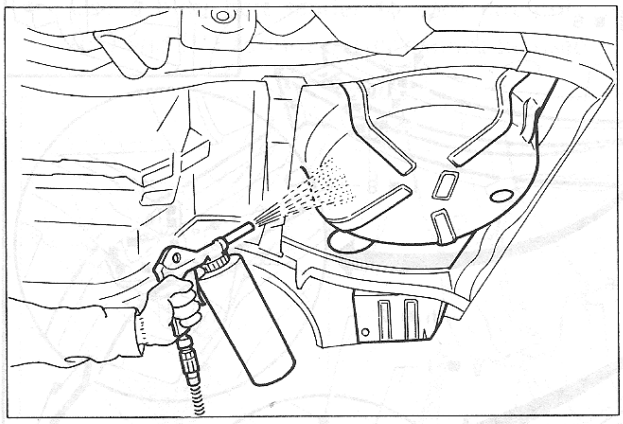


- Apply sealer.



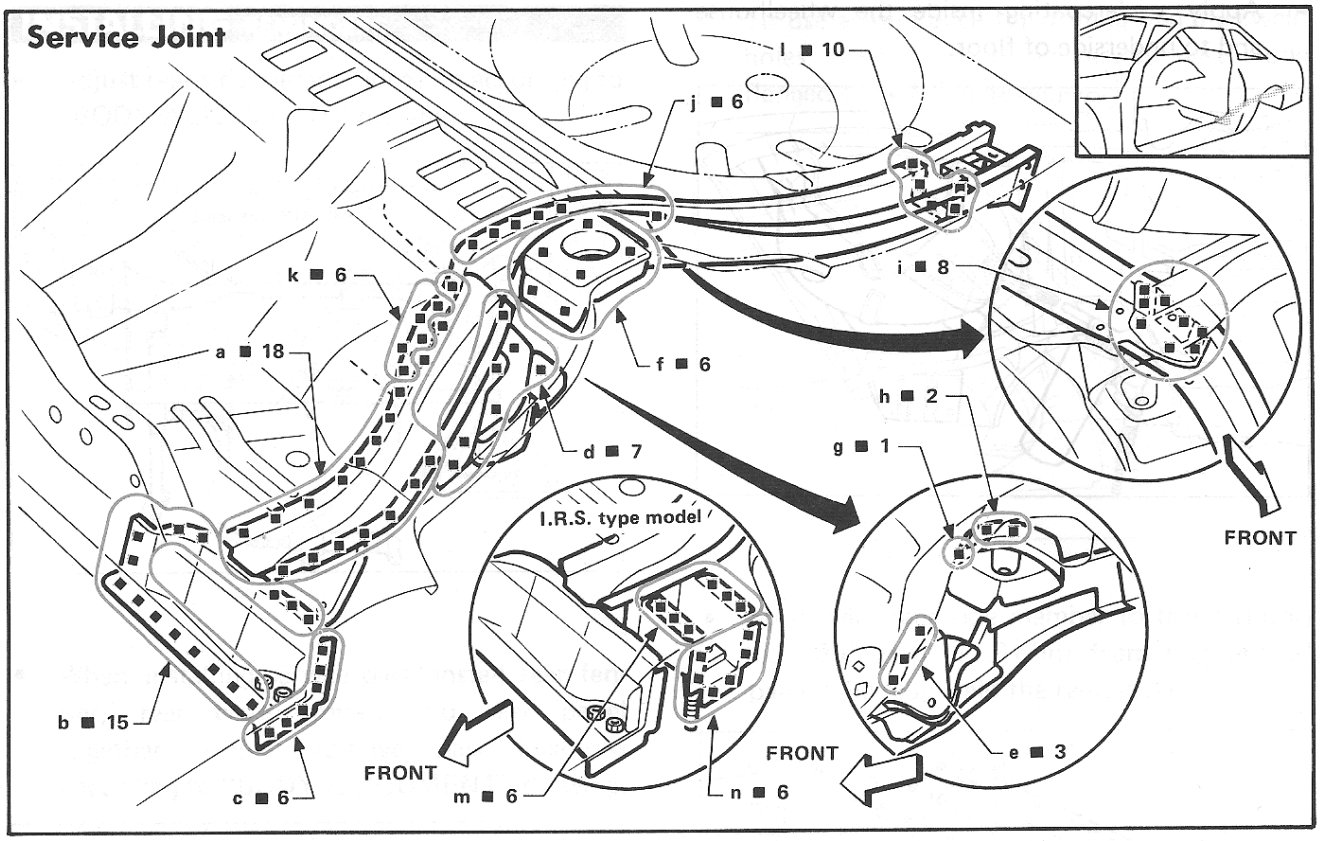
REAR FLOOR REAR

- Apply undercoating inside the wheelhouse and to underside of floor.



REAR SIDE MEMBER

(Work-after rear floor rear has been removed.)



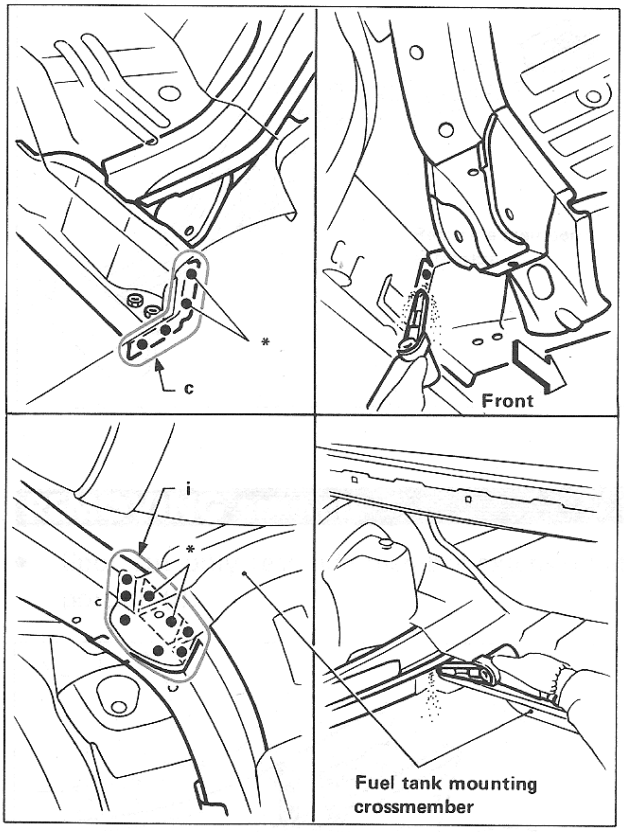
Portions to be welded

a. Rear floor front
   Rear floor front & rear seat anchor reinforcement
b. Rear floor front
   Rear floor front & front floor
c. Inner sill
d. Rear floor front
e. Inner wheelhouse
   Inner wheelhouse & rear floor front
f. Rear floor front
g. Inner wheelhouse
h. Rear shock absorber bracket
   Rear shock absorber bracket & inner wheelhouse
i. Fuel tank mounting crossmember
j. Rear floor front
   Rear floor front & seat side extension
k. Rear seat anchor reinforcement
l. Rear side member extension
m. Rear floor front
n. Inner sill

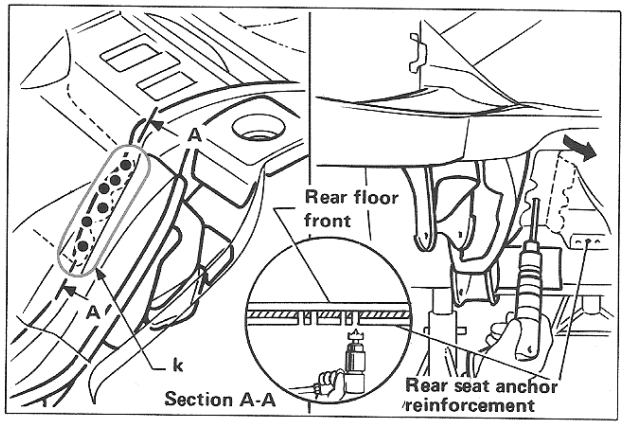
REAR SIDE MEMBER

REMOVING REMINDERS

- Use a mini belt sander to spot cut portions (c*) and (i*) as spot cutter cannot be used.

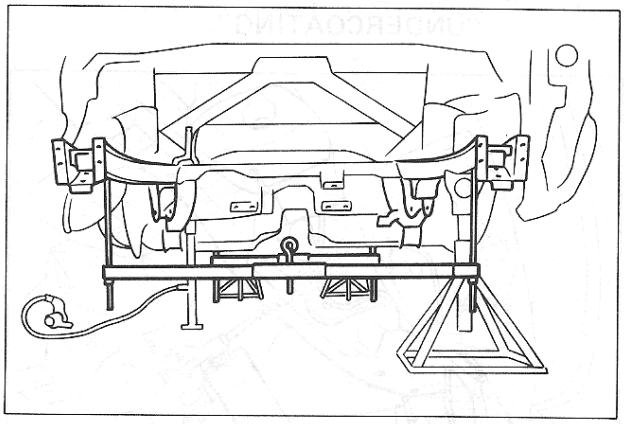


- The spot weld at portion (k) cannot be seen from inside the passenger compartment. Spot cut from outside. To facilitate removal of rear side member, bend rear seat anchor reinforcement downwards as indicated by the dotted line.

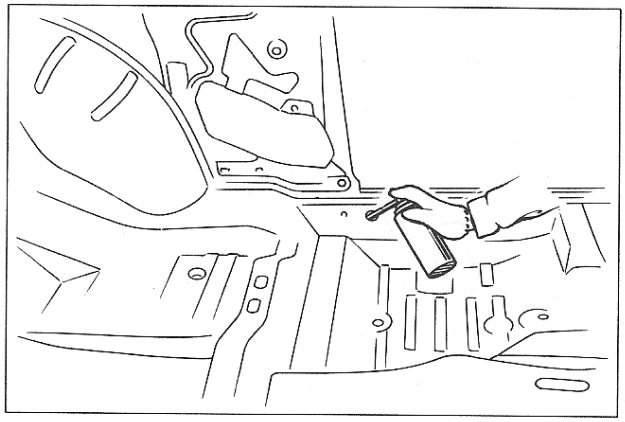


INSTALLING REMINDERS

- Install service part by checking front-to-rear and side-to-side torsion of service part using centering gauge and adjust as necessary.



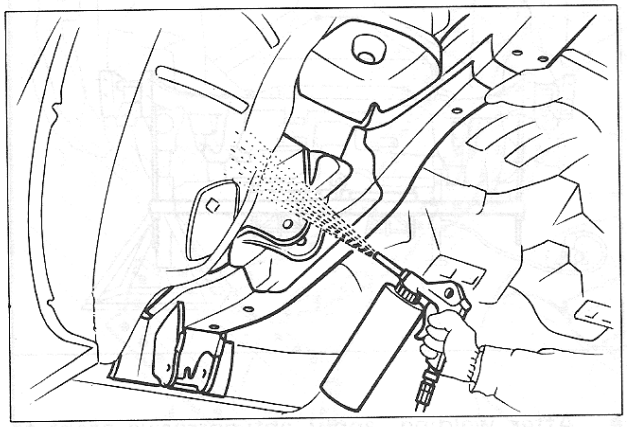
- After welding, apply anti-corrosive agent to inner sill at portion (c).



REAR SIDE MEMBER

- Apply undercoating to underside of floor and inside the wheelhouse as mentioned in "UNDERCOATING".

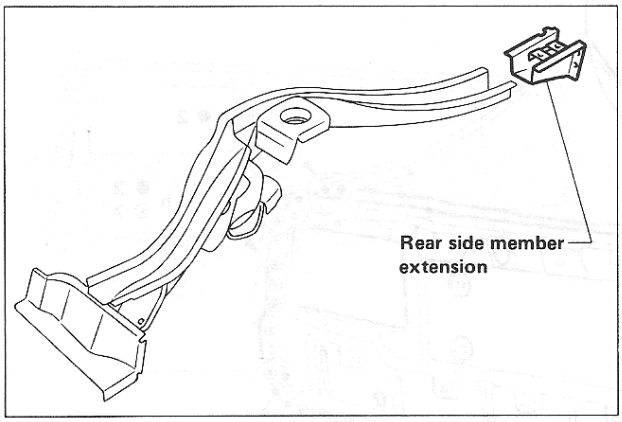
  Note: Apply anti-corrosive wax inside the rear side member as mentioned in "UNDERCOATING".



REAR SIDE MEMBER EXTENSION

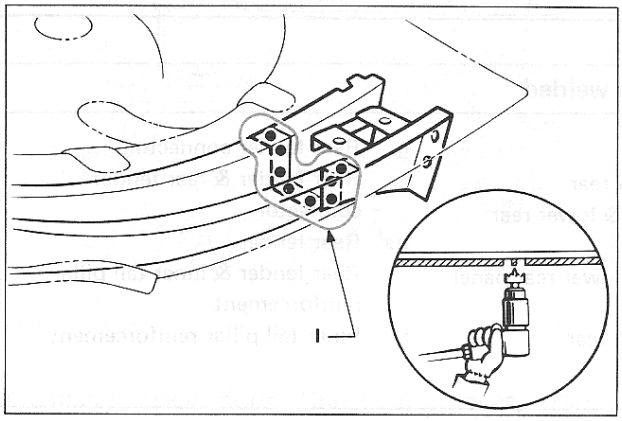
Refer to Service Joint drawing under REAR SIDE MEMBER.

- If only rear side member extension is damaged, it can be replaced.



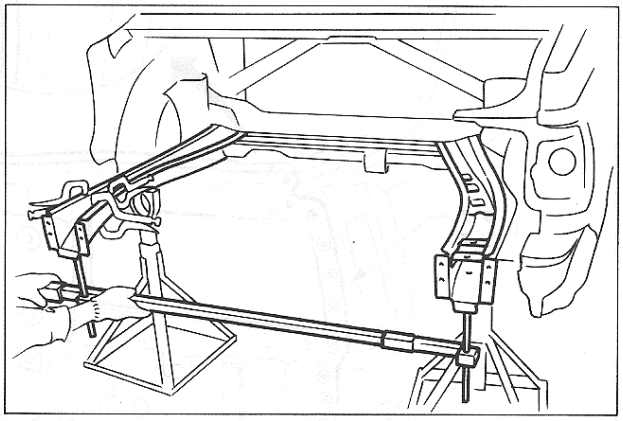
REMOVING REMINDER

- Spot cut only rear side member extension at portion (I).

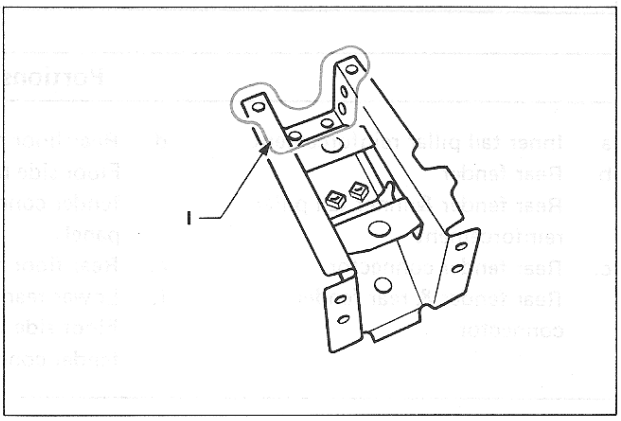


INSTALLING REMINDERS

- Install service part and adjust its position according to "BODY ALIGNMENT" drawing.

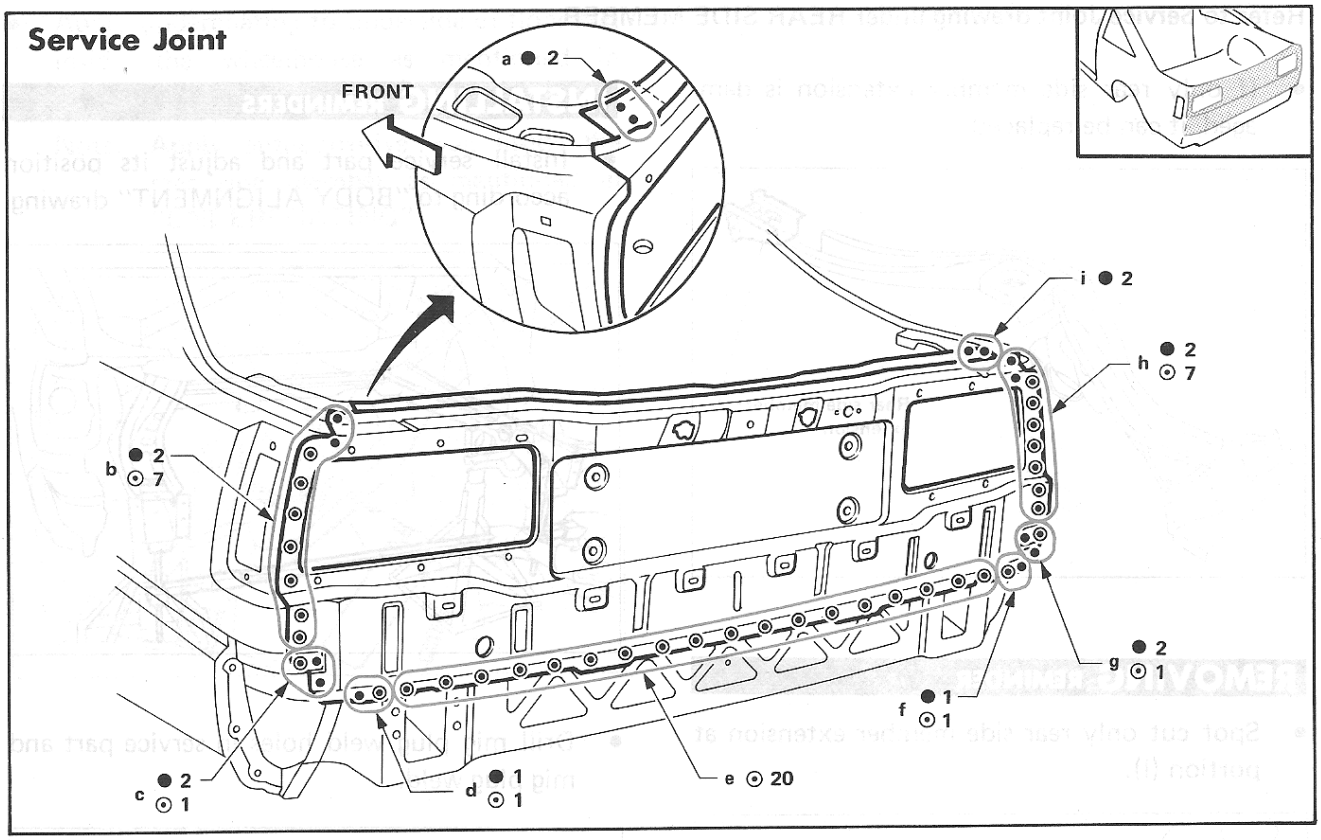


- Drill mig plug weld holes in service part and mig plug weld.



UPPER REAR PANEL

HATCHBACK



Portions to be welded

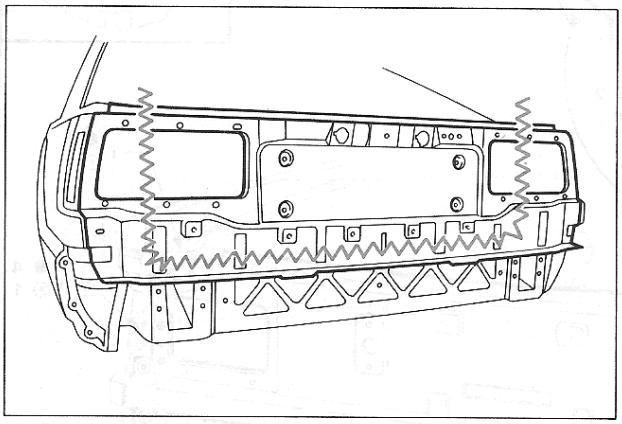
a. Inner tail pillar reinforcement
b. Rear fender
   Rear fender & inner tail pillar reinforcement
c. Rear fender connector
   Rear fender & rear fender connector
d. Rear floor panel
   Floor side panel & rear fender connector & lower rear panel
e. Rear floor rear & lower rear panel
f. Lower rear panel
   Floor side panel & rear fender connector
g. Rear fender connector
   Rear fender & rear fender connector
h. Rear fender
   Rear fender & inner tail pillar reinforcement
i. Inner tail pillar reinforcement

UPPER REAR PANEL

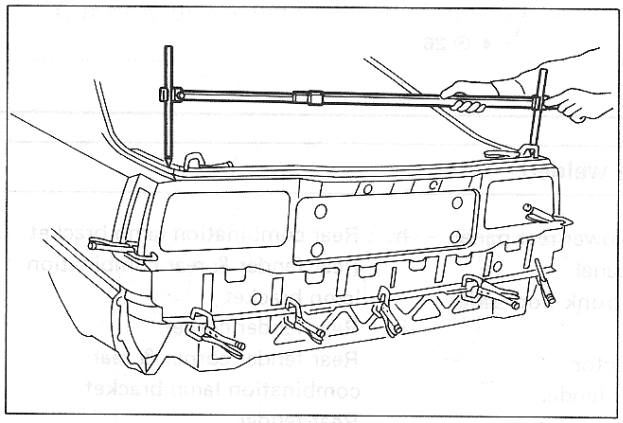
HATCHBACK

REMOVING REMINDER

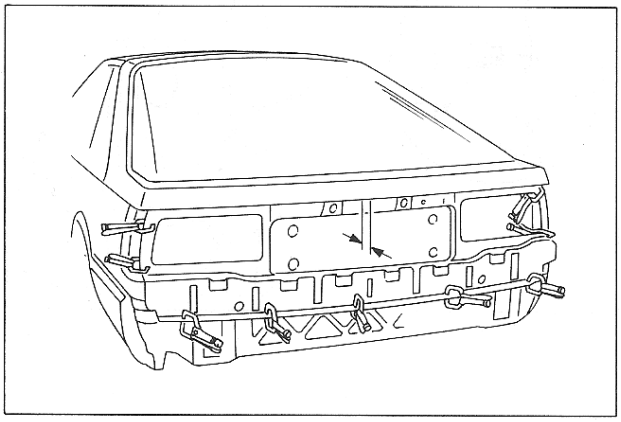
- Cut off damaged portion to facilitate removal.



- Install service part and adjust for proper alignment according to "BODY ALIGNMENT" drawing.

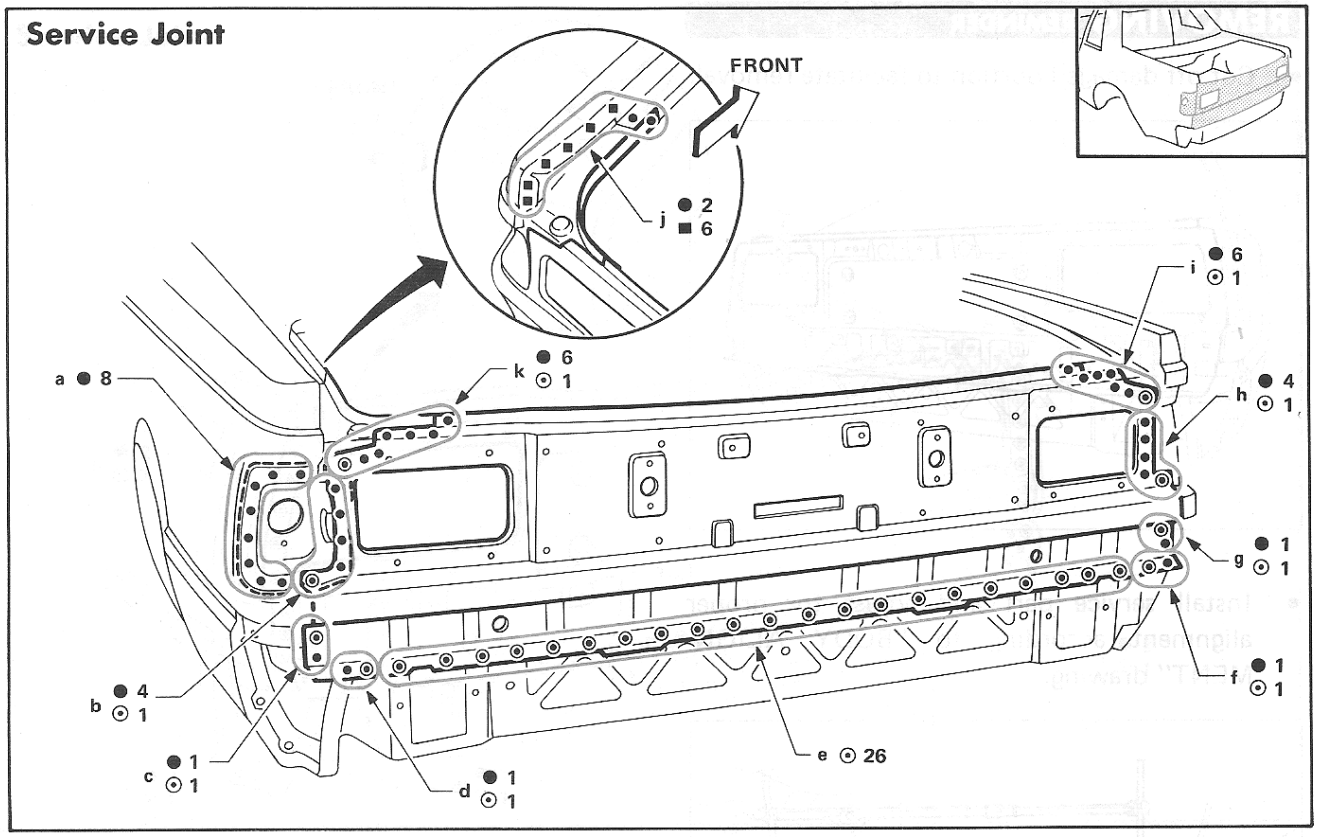


- Install back door. Check clearances, grades and parallelism.



UPPER REAR PANEL

COUPE



Portions to be welded

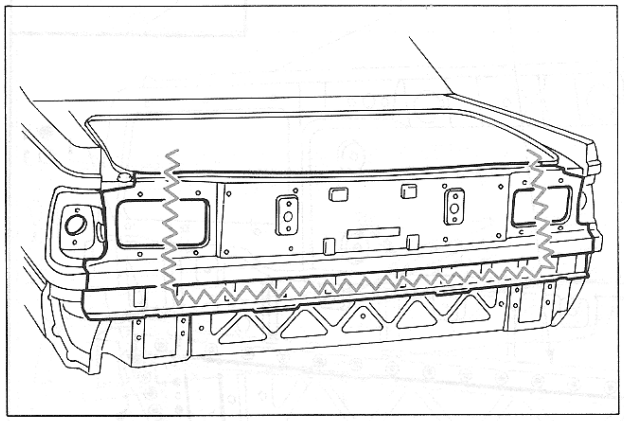
a. Rear fender
b. Rear combination lamp bracket
Rear fender & rear combination lamp bracket
c. Rear fender connector
Rear fender & rear fender connector
d. Trunk floor side panel
Rear floor rear & trunk floor side panel
e. Rear floor rear & lower rear panel
f. Trunk floor side panel
Rear floor rear & trunk floor side panel
g. Rear fender connector
Rear fender & rear fender connector
h. Rear combination lamp bracket
Rear fender & rear combination lamp bracket
i. Rear fender corner
Rear fender corner & rear combination lamp bracket
j. Rear fender

UPPER REAR PANEL

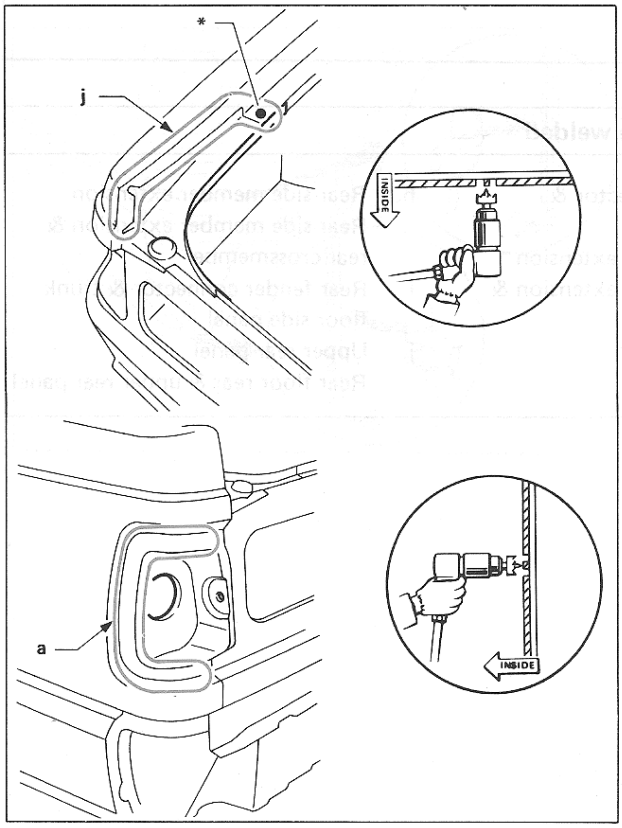
COUPE

REMOVING REMINDERS

- Cut off damaged portion to facilitate removal.

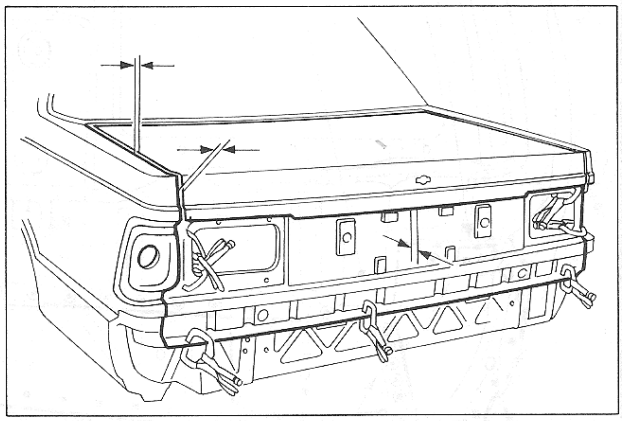


- Spot cut completely through welds at portion (j) except the part marked with (*). Spot cut only one panel at asterisk part from inside. Cut only one panel at welds of portion (a).

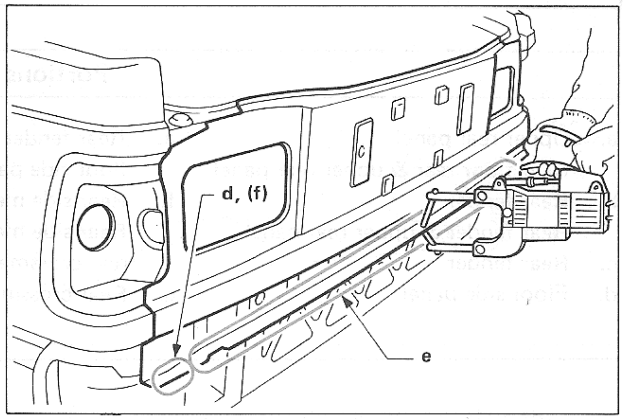


INSTALLING REMINDERS

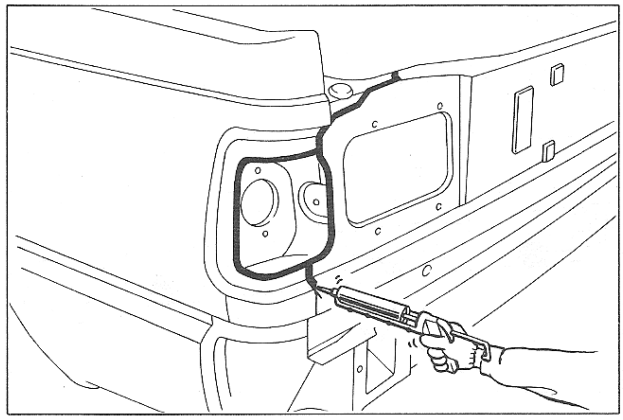
- Install service part according to "BODY ALIGNMENT" drawing. Then install trunk lid and check clearances, grades and parallelism.



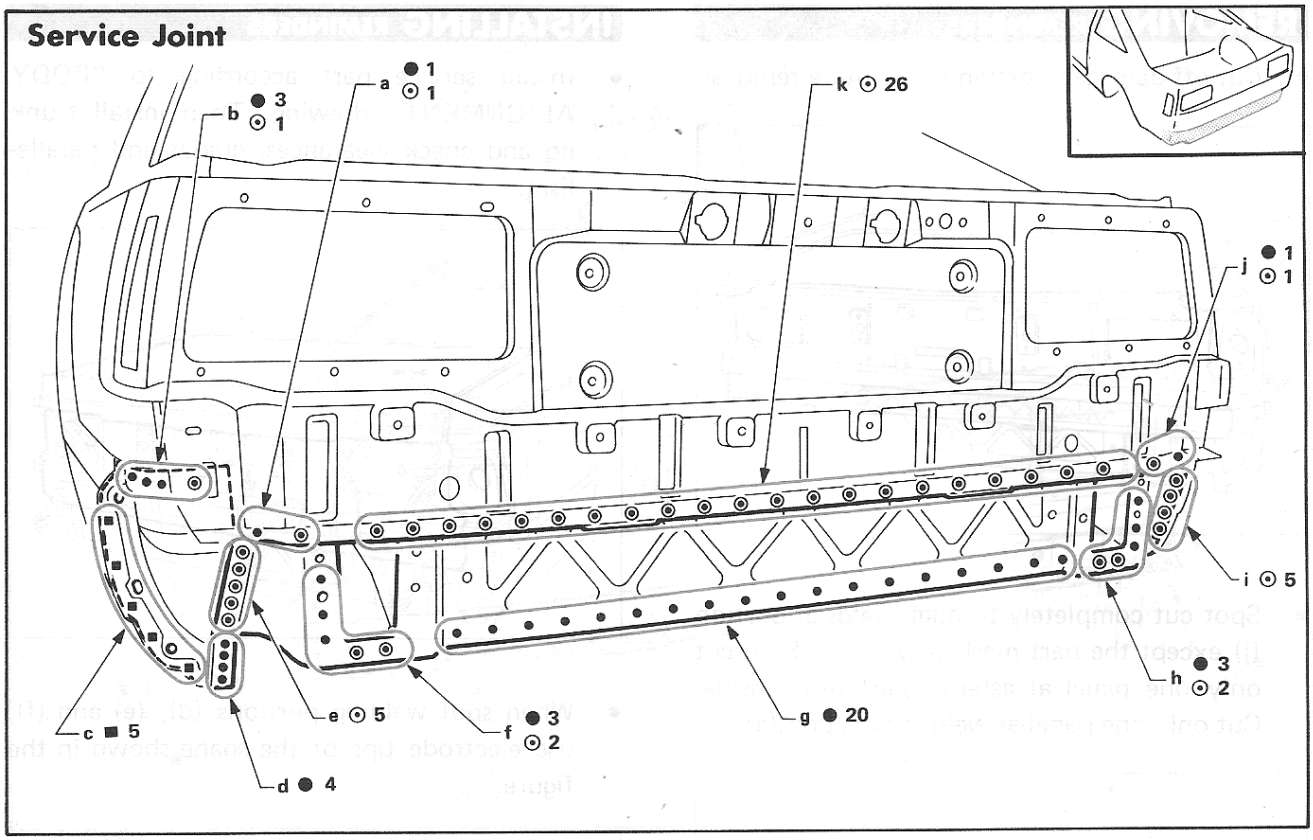
- When spot welding portions (d), (e) and (f), use electrode tips of the shape shown in the figure.



- Apply sealer.



LOWER REAR PANEL



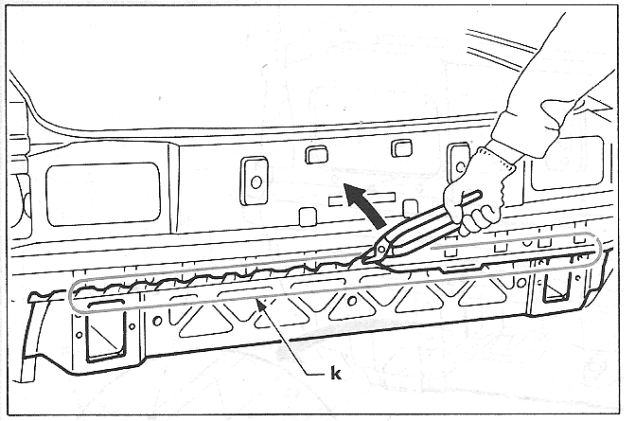
Portions to be welded

a. Upper rear panel
Rear floor rear & upper rear panel
b. Rear fender
Rear fender & upper rear panel
c. Rear fender
d. Floor side panel
e. Rear fender connector & floor side panel
f. Rear side member extension
Rear side member extension & rear crossmember
g. Rear crossmember
h. Rear side member extension
Rear side member extension & rear crossmember
i. Rear fender connector & trunk floor side panel
j. Upper rear panel
Rear floor rear & upper rear panel

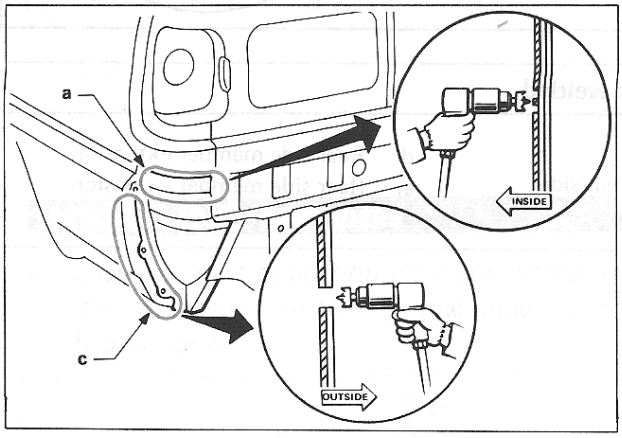
LOWER REAR PANEL

REMOVING REMINDERS

- Bend flanged part of portion (k) up to facilitate spot cutting.

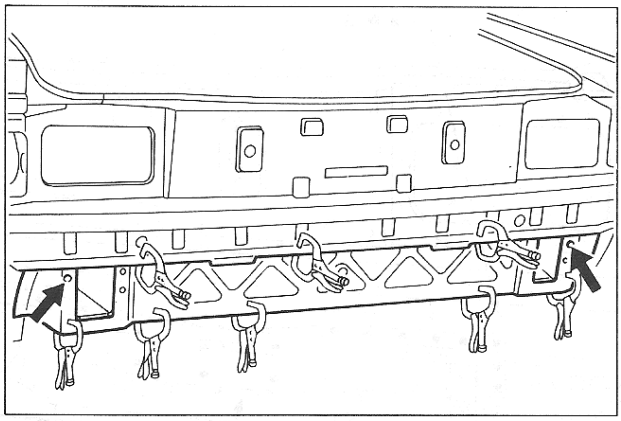


- When removing rear fender connector, cut only one panel at spot welds of portion (b) from inside. Spot cut completely through portion (c).

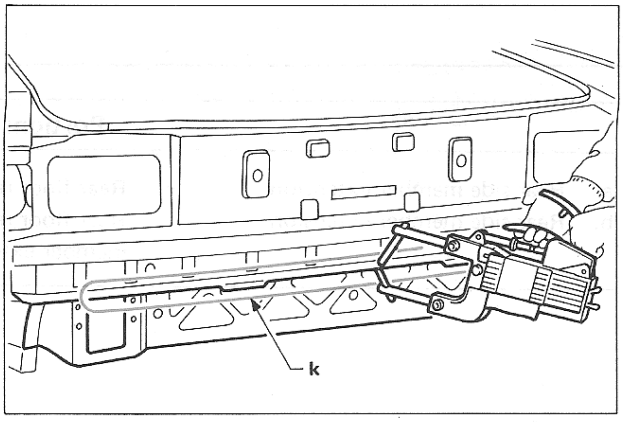


INSTALLING REMINDERS

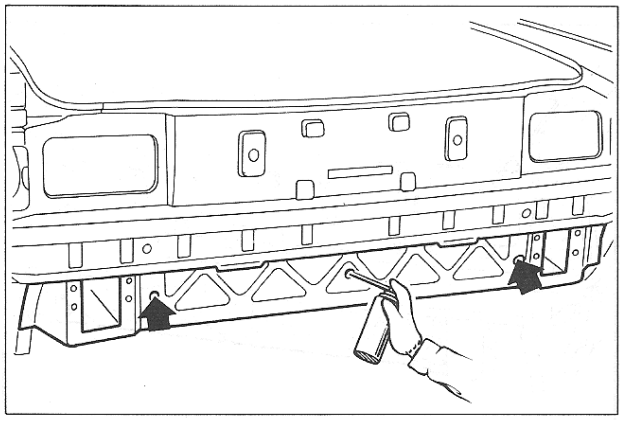
- Align service part at reference holes when installing.



- When welding flanged part of portion (k), use the same kind of spot welder as shown in the figure.

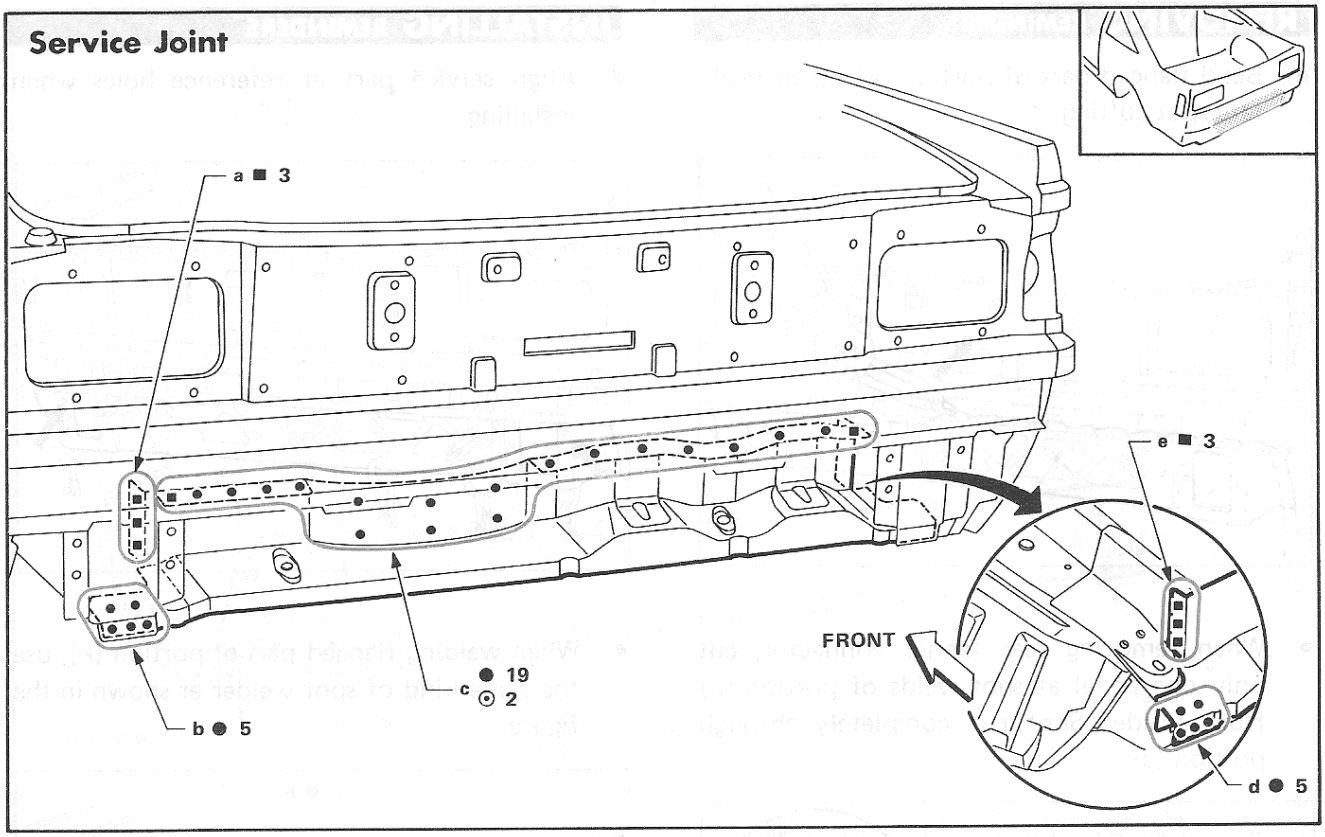


- Apply anti-corrosive wax inside the rear crossmember and rear lower panel.



REAR CROSSMEMBER

(Work after rear lower panel has been removed.)

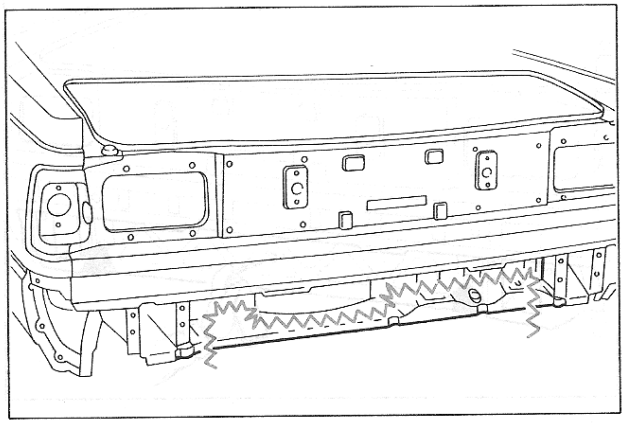


Portions to be welded

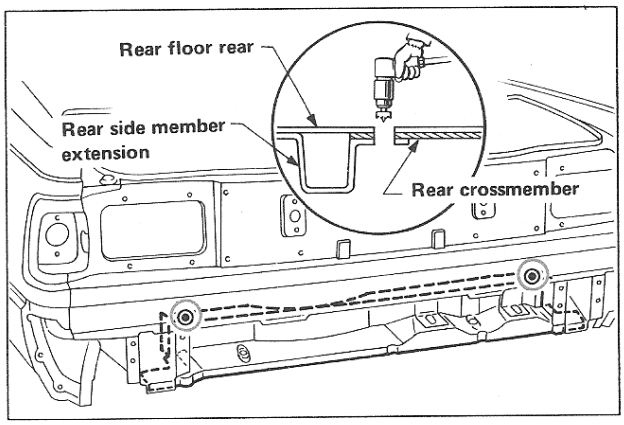
a. Rear side member extension
b. Rear side member extension
c. Rear floor rear
Rear floor rear & rear side member extension
d. Rear side member extension
e. Rear side member extension

REMOVING REMINDERS

- Cut off damaged portion so that welded part can be easily spot cut later.

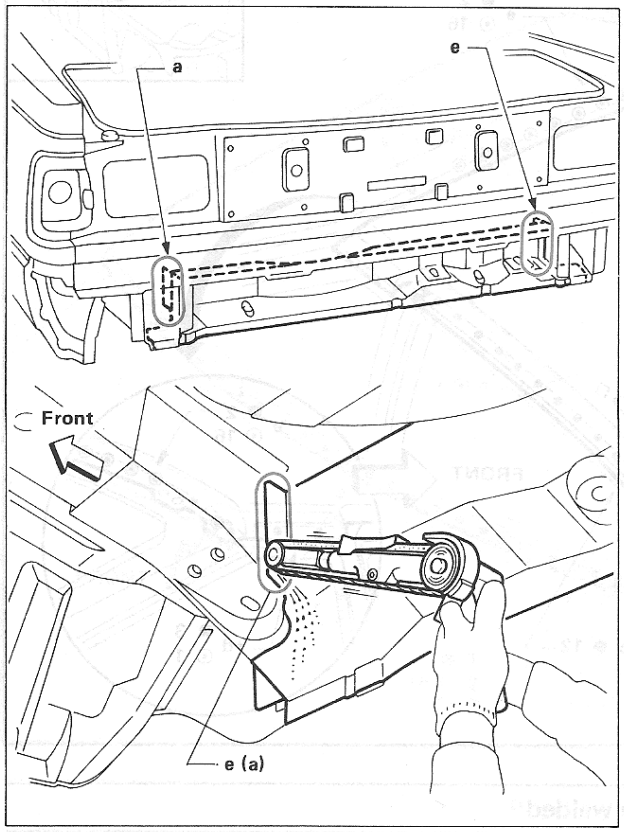


- Spot cut completely through 3-layered part at portion (c).



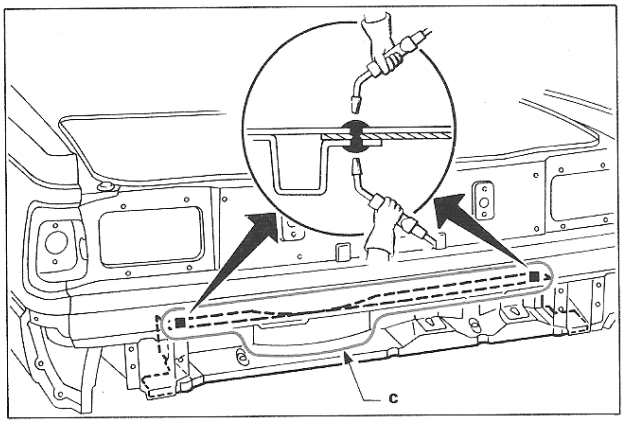
REAR CROSSMEMBER

- Use a mini belt sander to cut (a) and (e) instead of spot cutter.

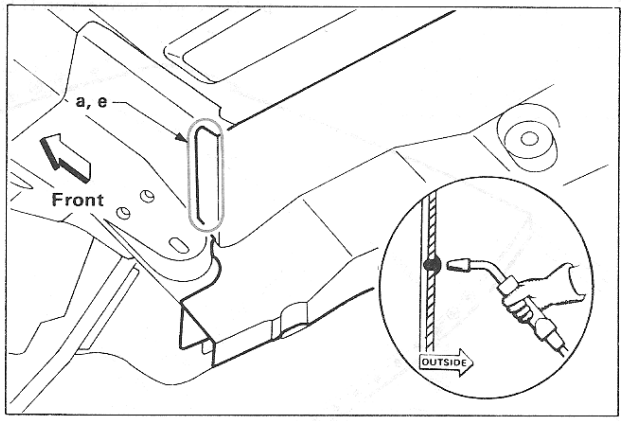


INSTALLING REMINDERS

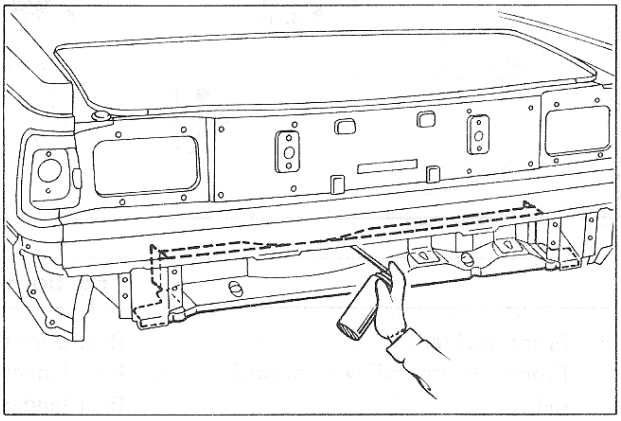
- 3-layered part at portion (c) is completely cut through. When installing, mig plug weld it from both sides.



- Mig plug weld portions (a) and (e).



- Apply anti-corrosive wax inside the rear cross-member.

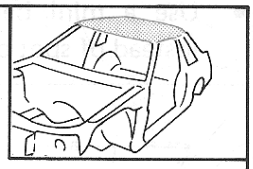


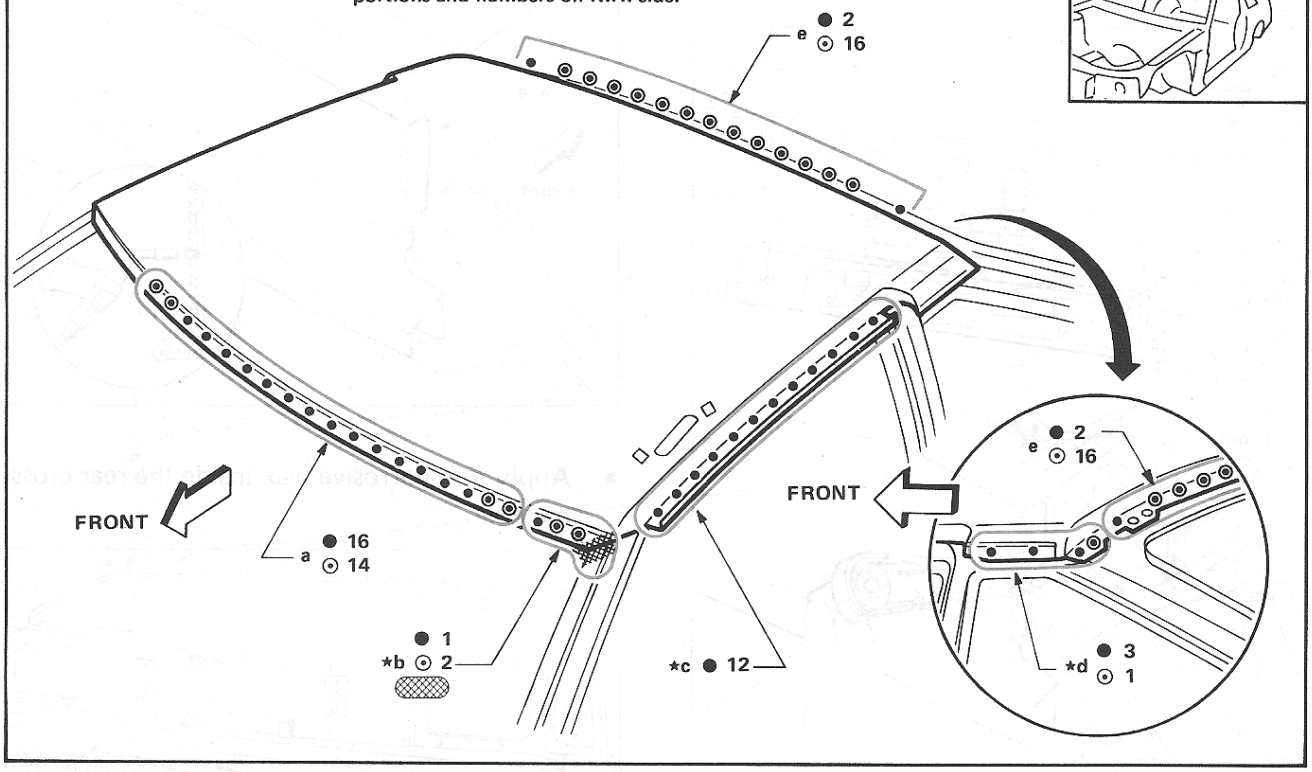
ROOF PANEL

HATCHBACK

Service Joint

Note: Welding portions with ⋆ marks indicate that there are the same welding portions and numbers on R.H. side.





Portions to be welded

a. Front roof rail
Front side roof rail & front roof rail

b. Front side roof rail
Front pillar & front side roof rail

c. Rear drip rail

d. Rear fender
Rear fender & rear roof rail

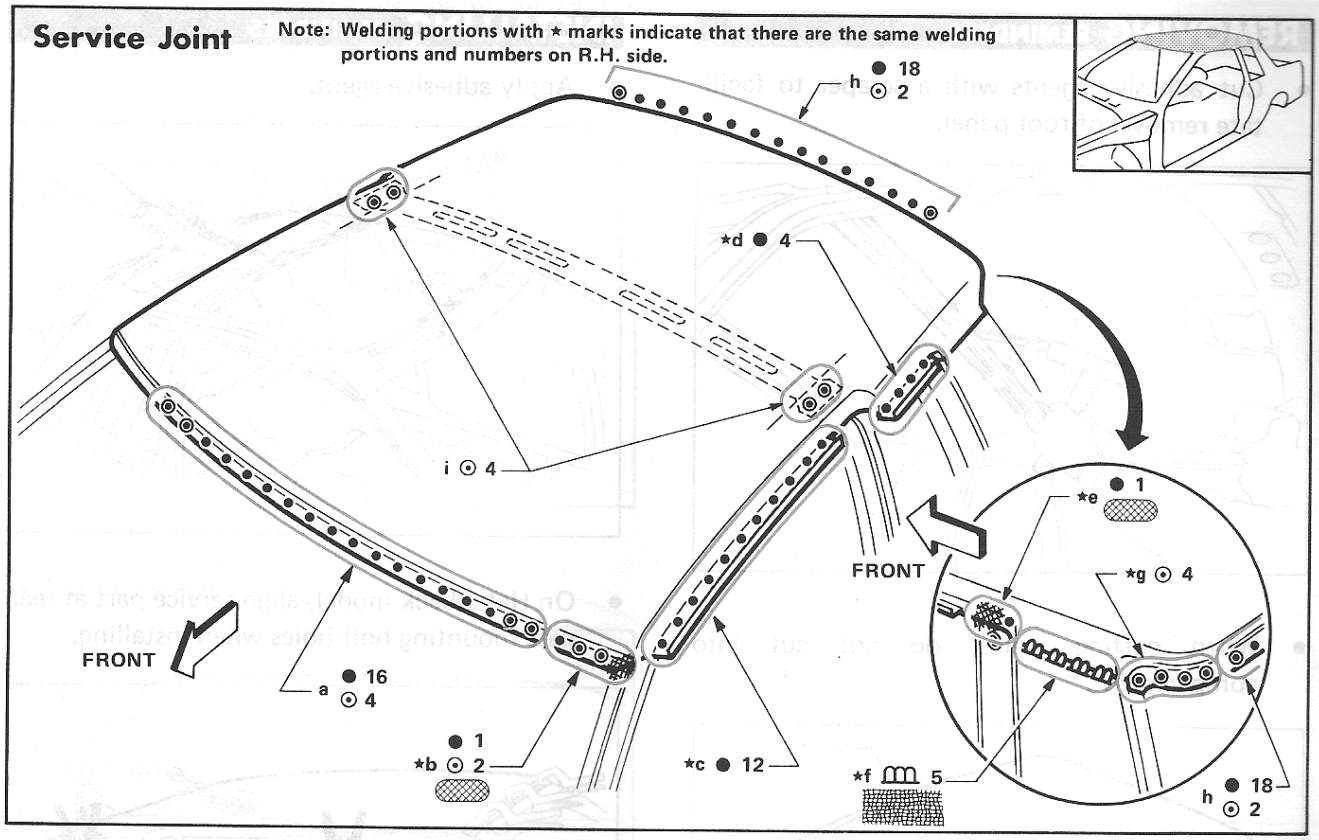
e. Inner rear roof rail
Outer rear roof rail & inner rear roof rail

ROOF PANEL

COUPE

Service Joint

Note: Welding portions with ⋆ marks indicate that there are the same welding portions and numbers on R.H. side.



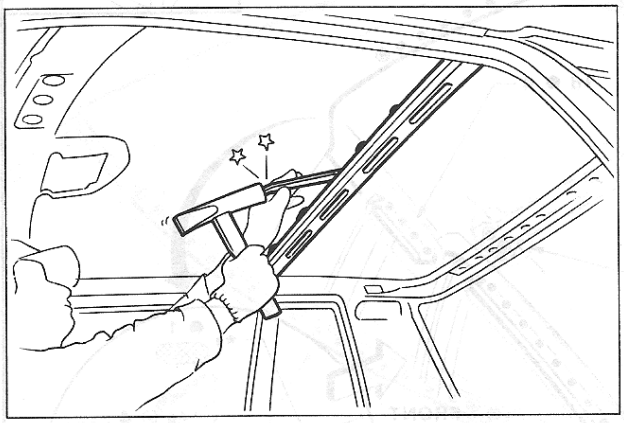
Portions to be welded

a. Front roof rail
Front side roof rail & front roof rail
b. Front side roof rail
Front pillar & front side roof rail
c. Outer side roof rail
d. Rear drip rail
e. Rear fender
f. Rear fender
g. Rear fender & inner rear pillar
h. Rear roof rail
Inner rear pillar & rear roof rail
i. Rear fender & inner rear pillar

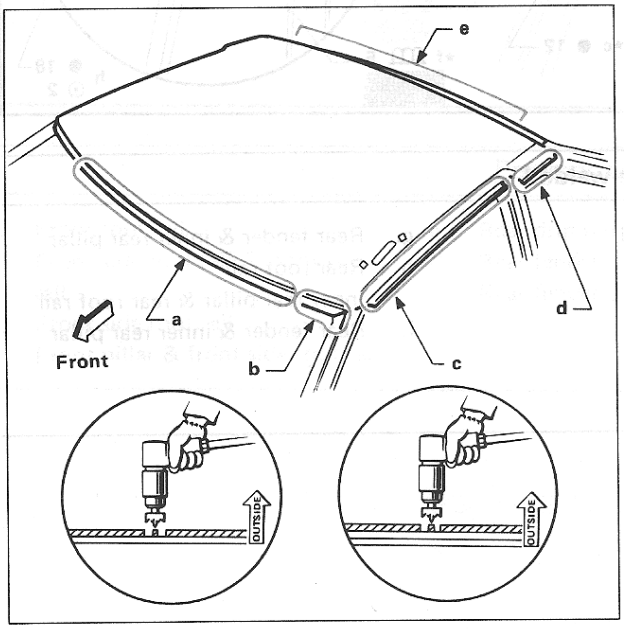
ROOF PANEL

REMOVING REMINDERS

- Cut adhesive agents with a scraper to facilitate removal of roof panel.

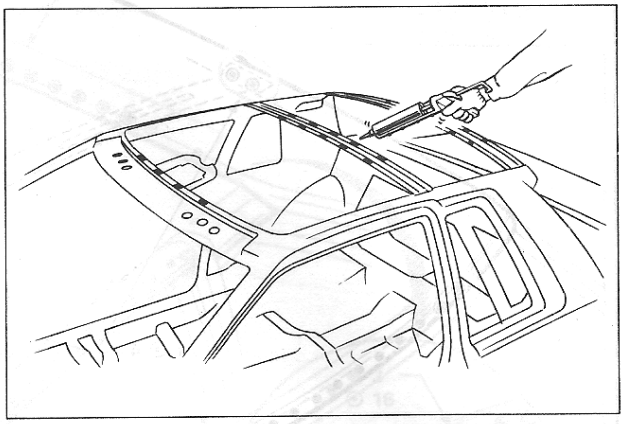


- When cutting welds, do not cut into compartment.

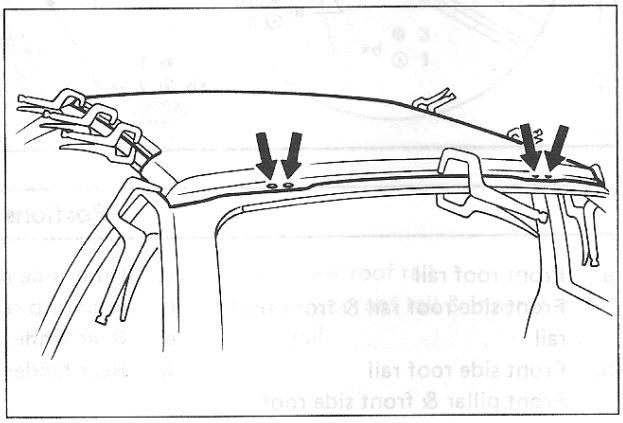


INSTALLING REMINDERS

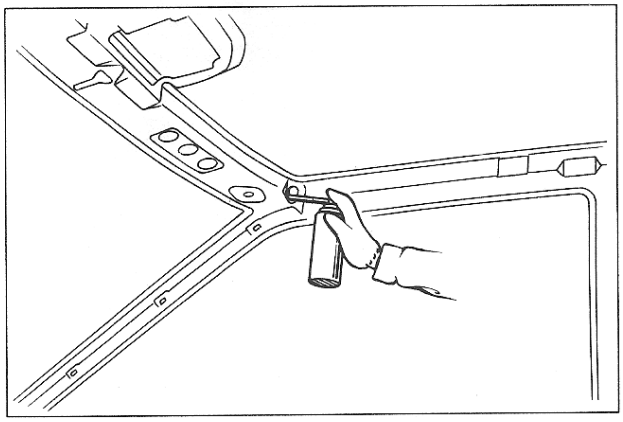
- Apply adhesive agent.



- On Hatchback model, align service part at rear gate mounting bolt holes when installing.

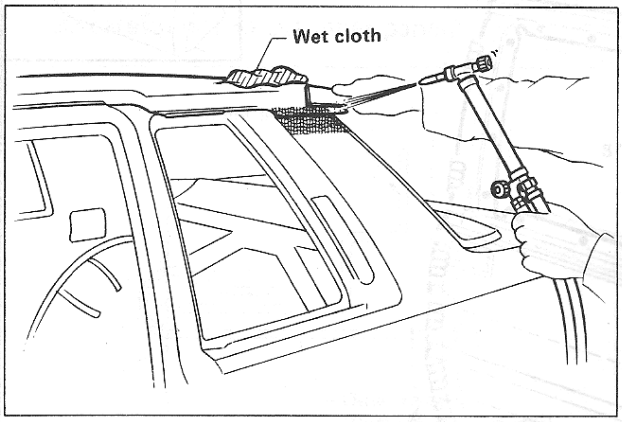


- Apply anti-corrosive agent to inside of brazed portions.

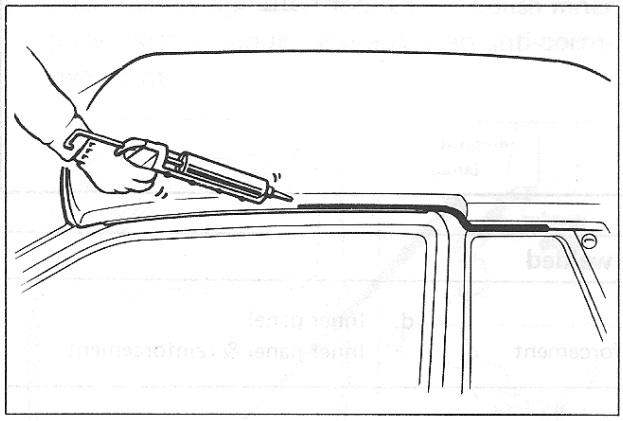


ROOF PANEL

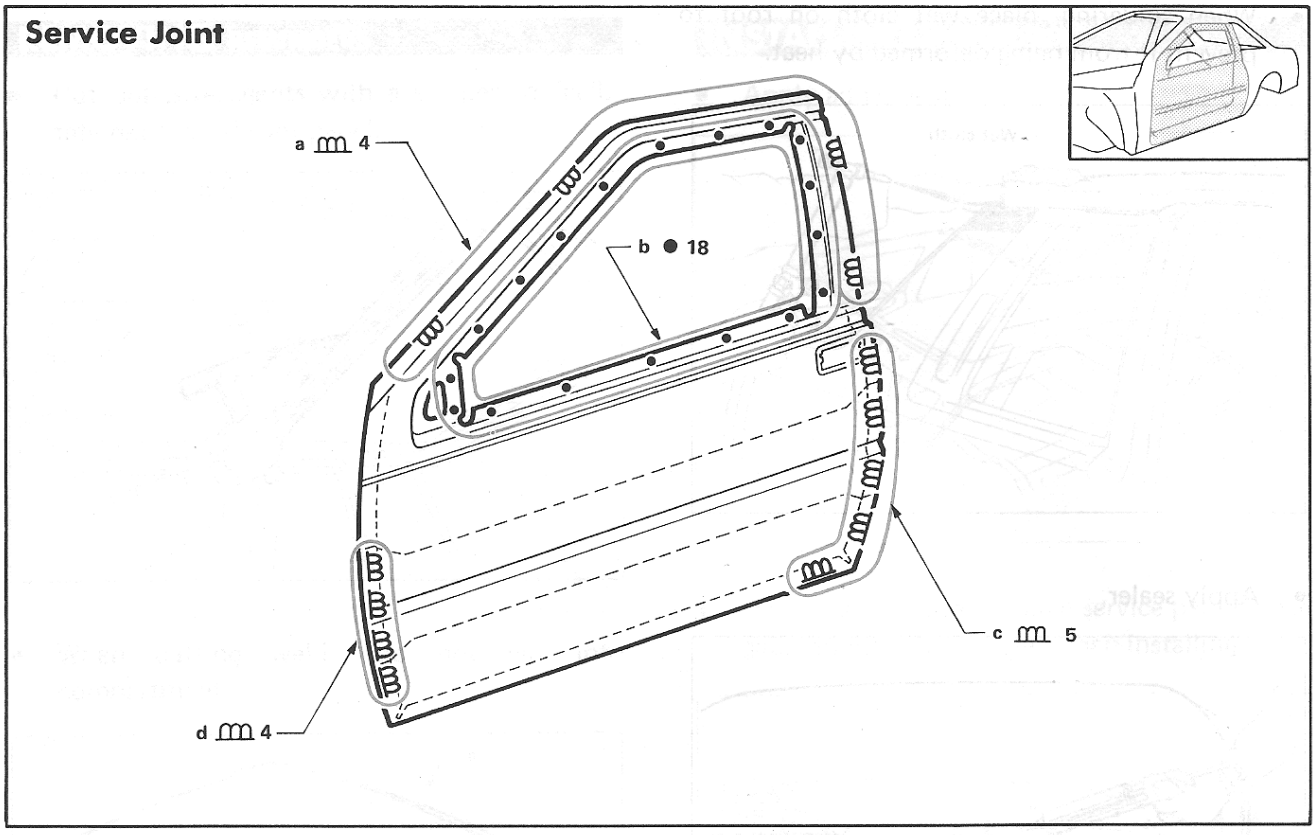
- When soldering, place wet cloth on roof to prevent it from being deformed by heat.



- Apply sealer.



OUTER DOOR PANEL

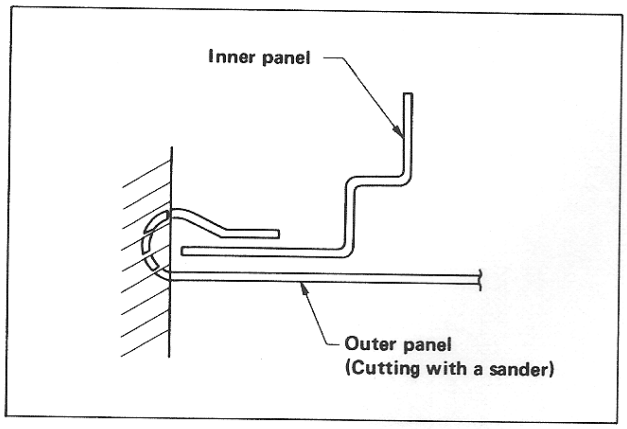


Portions to be welded		
a. Inner panel b. Inner panel	c. Inner panel Inner panel & reinforcement	d. Inner panel Inner panel & reinforcement

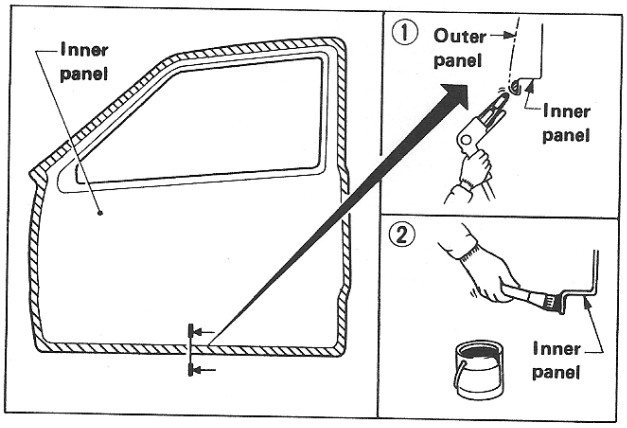
OUTER DOOR PANEL

REMOVING REMINDERS

- Cut off outer door panel hem with a sander. Be careful not to cut inner panel.

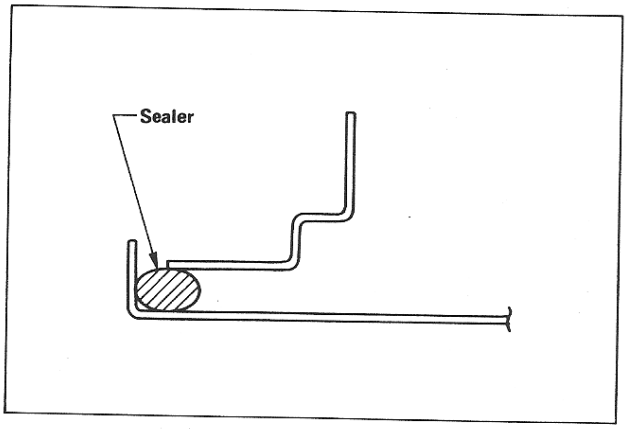


- After removing outer door panel, polish inner panel with a sander and apply an anti-corrosive agent.

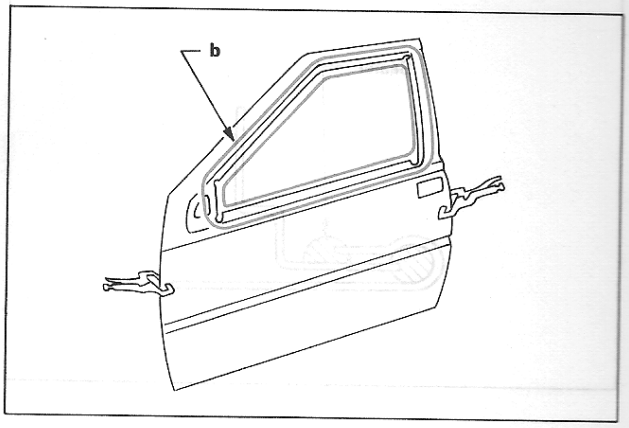


INSTALLING REMINDERS

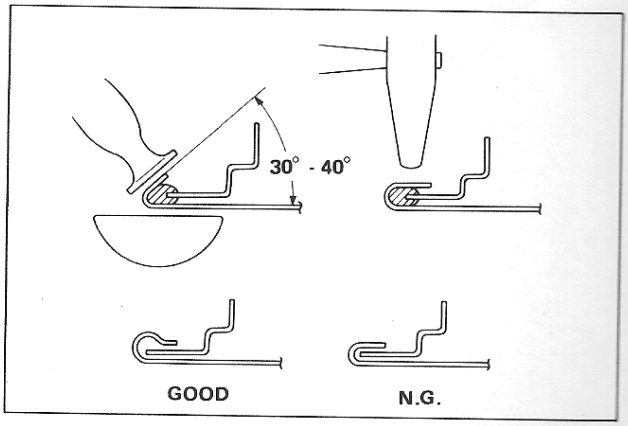
- Coat outer door panel hem with sealer.



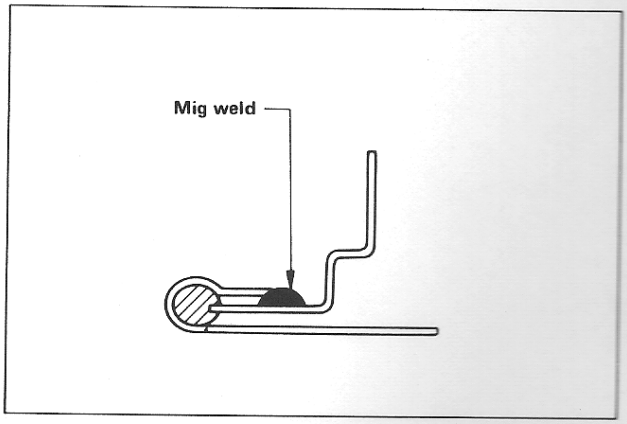
- Spot weld portion (b) before doing hemming work. This allows panel to be held stationary during hemming work.



- Carry out hemming work in two steps.
  Note: Be sure to hem the entire periphery of panel.

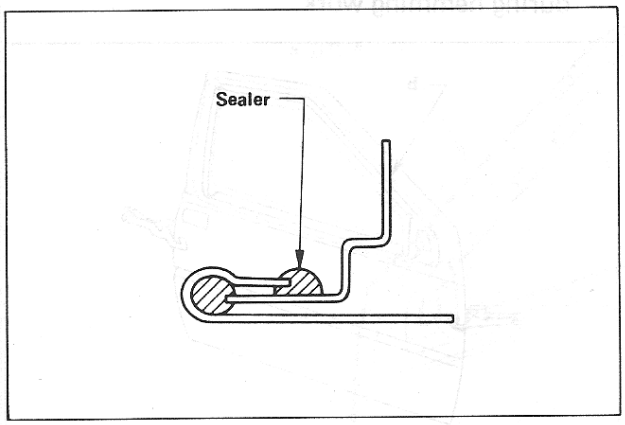


- Mig weld after hemming work.



OUTER DOOR PANEL

- Apply sealer to the entire edge of panel's hemmed part.



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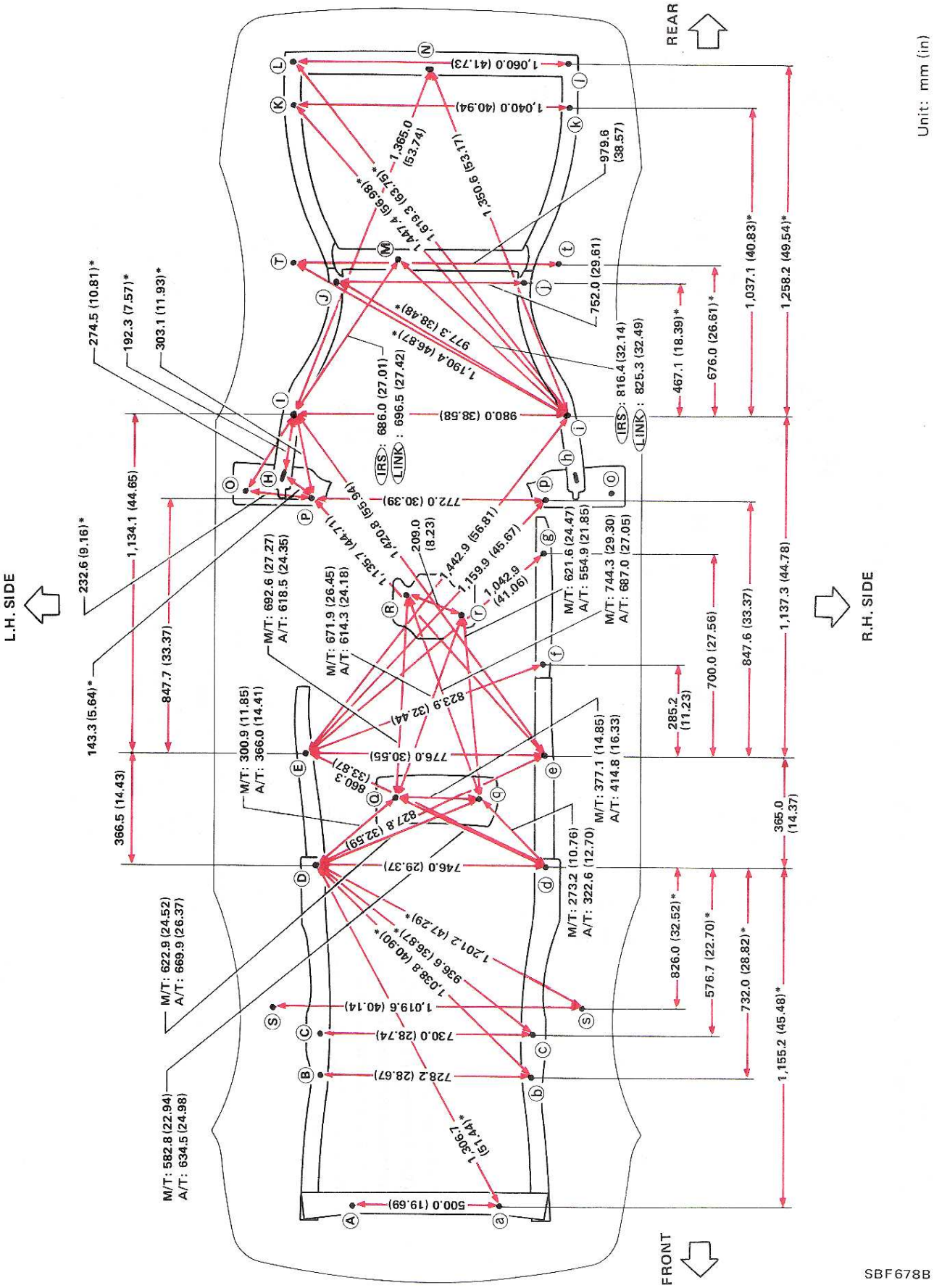
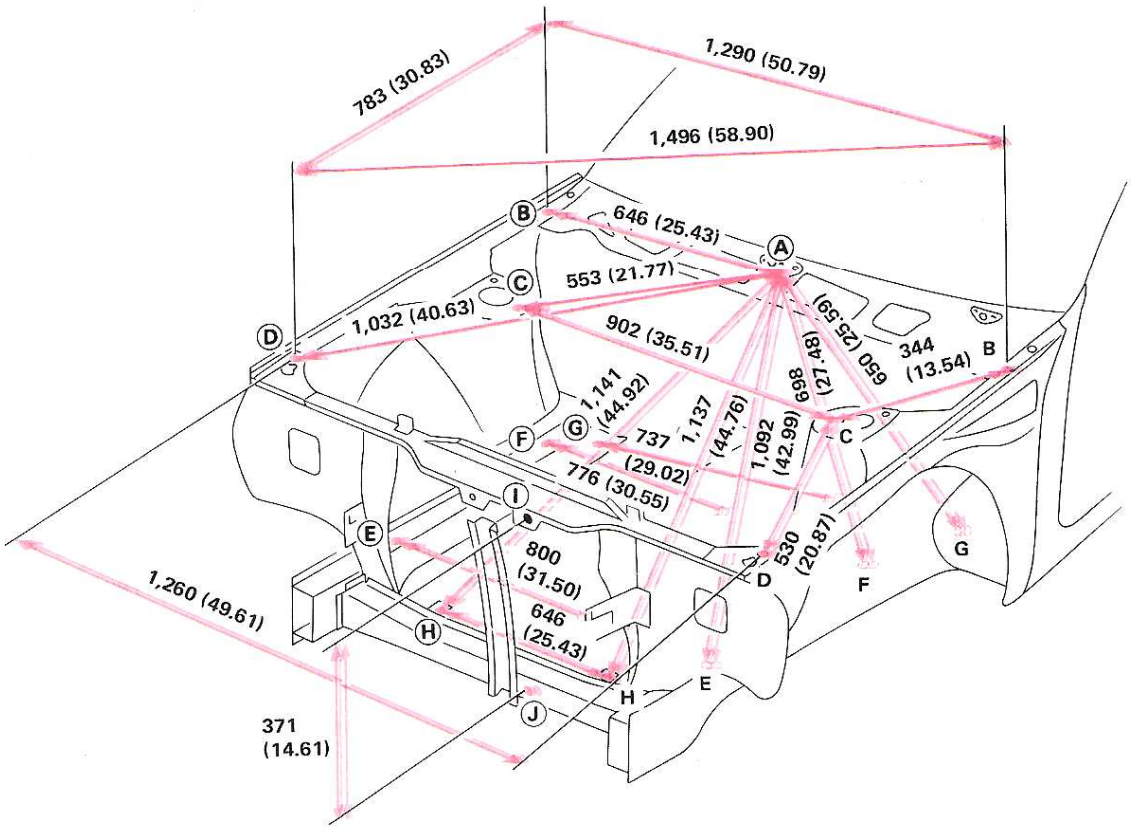
UNDERBODY

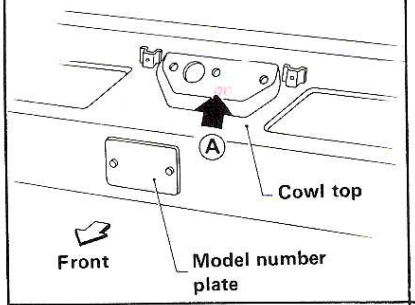


SBF678B

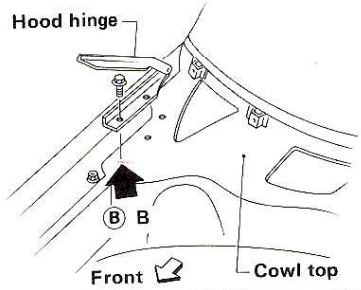
ENGINE COMPARTMENT



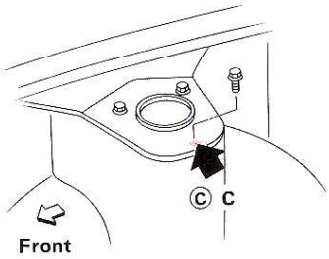
7 (0.28) dia.



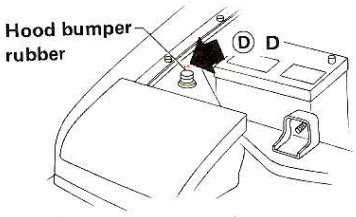
12 (0.47) dia.



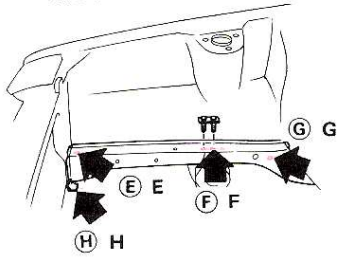
11 (0.43) dia.



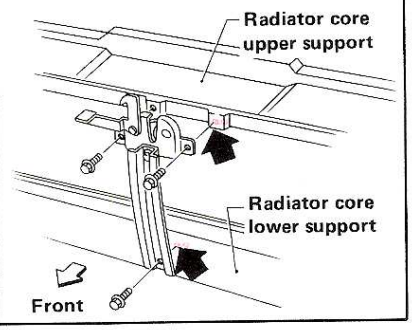
8 (0.31) dia.



Ⓔ E: 16 (0.63) dia.
Ⓕ F: 14 (0.55) dia.
Ⓖ G: 16 (0.63) dia.
Ⓗ H: R.H. side 16 (0.63) dia.
L.H. side 16 x 22 (0.63 x 0.87)



Ⓘ: 12 (0.47) dia.
Ⓙ: 11 (0.43) dia.



Unit: mm (in)