

DEADENING, SOUND ABSORBING, SOUNDPROOFING AND EXPANDED POLYURETHANE FOAM PRODUCTS

DEADENERS

Materials applied to the sheet metal by melting or glueing: their purpose is to deaden vibration resonance waves.

SOUND ABSORBING MATERIALS

Panels on the roof panel, under the bonnet, parcel shelf and inside the engine compartment. The purpose of these panels is to isolate the passenger compartment of the car from noise coming from the luggage compartment, engine compartment and from outside. They are made from porous materials such as textile and polyurethane fibres and are rested or glued on the surfaces to be treated.

SOUNDPROOFING MATERIALS

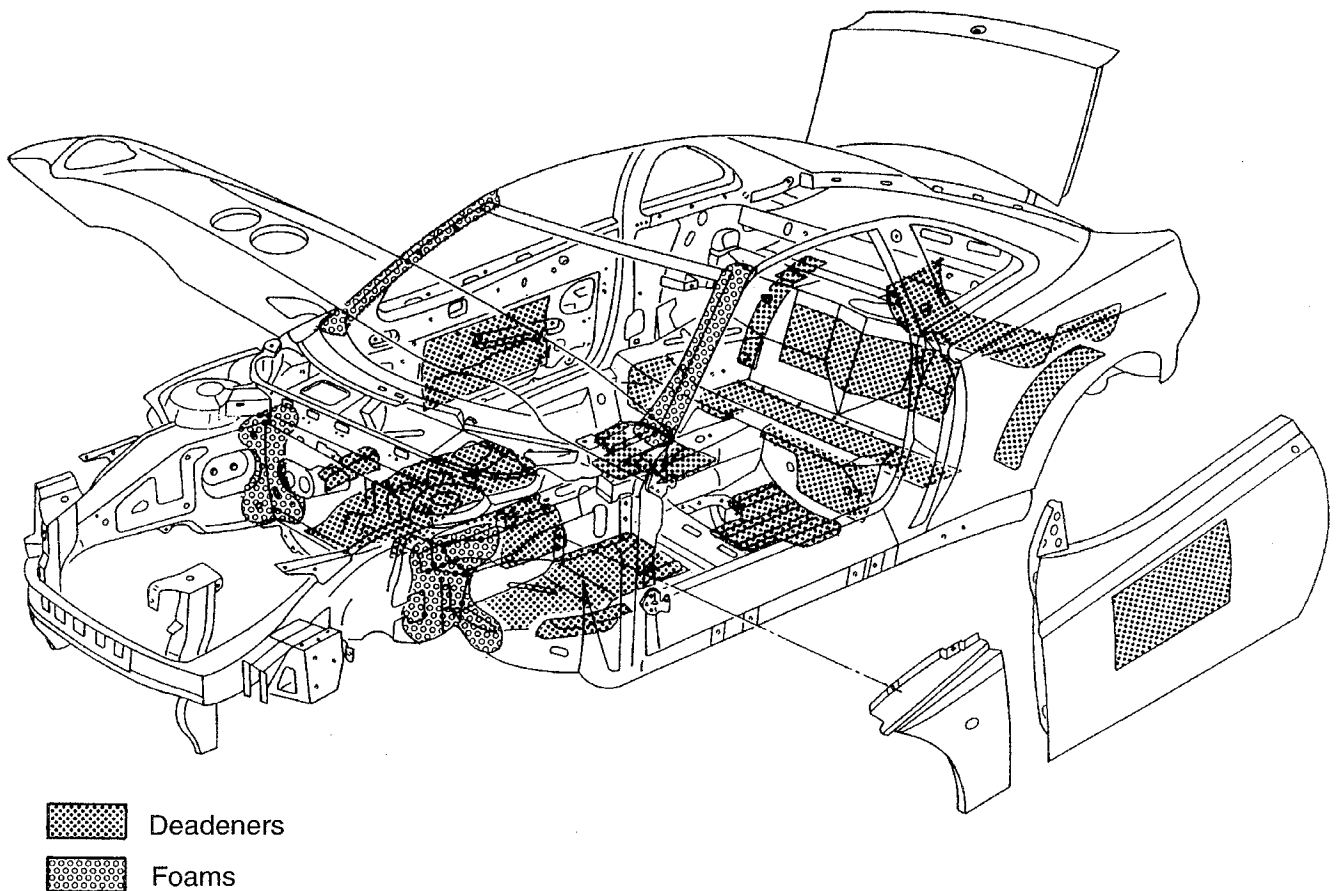
Coatings applied on the floor, pedal unit and bulkhead between the engine and passenger compartments.

FOAMS

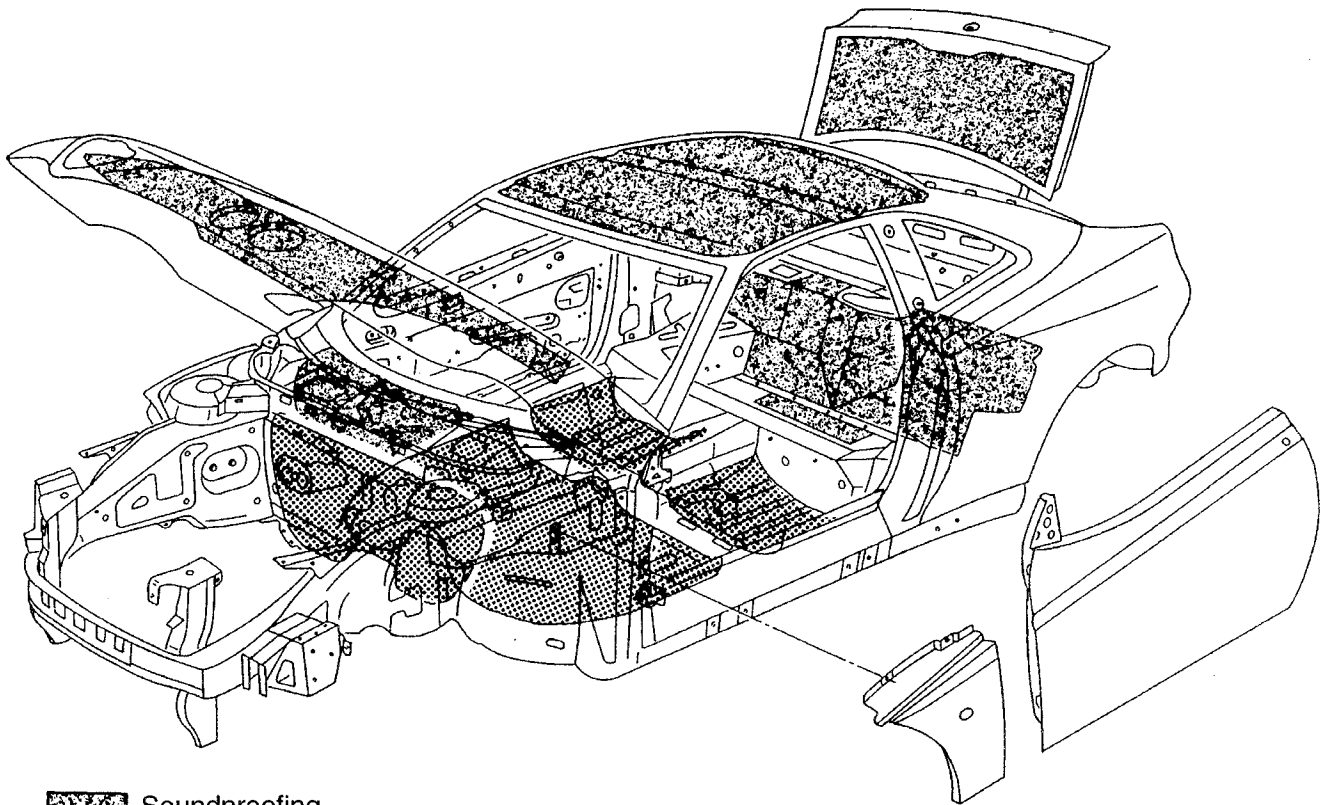
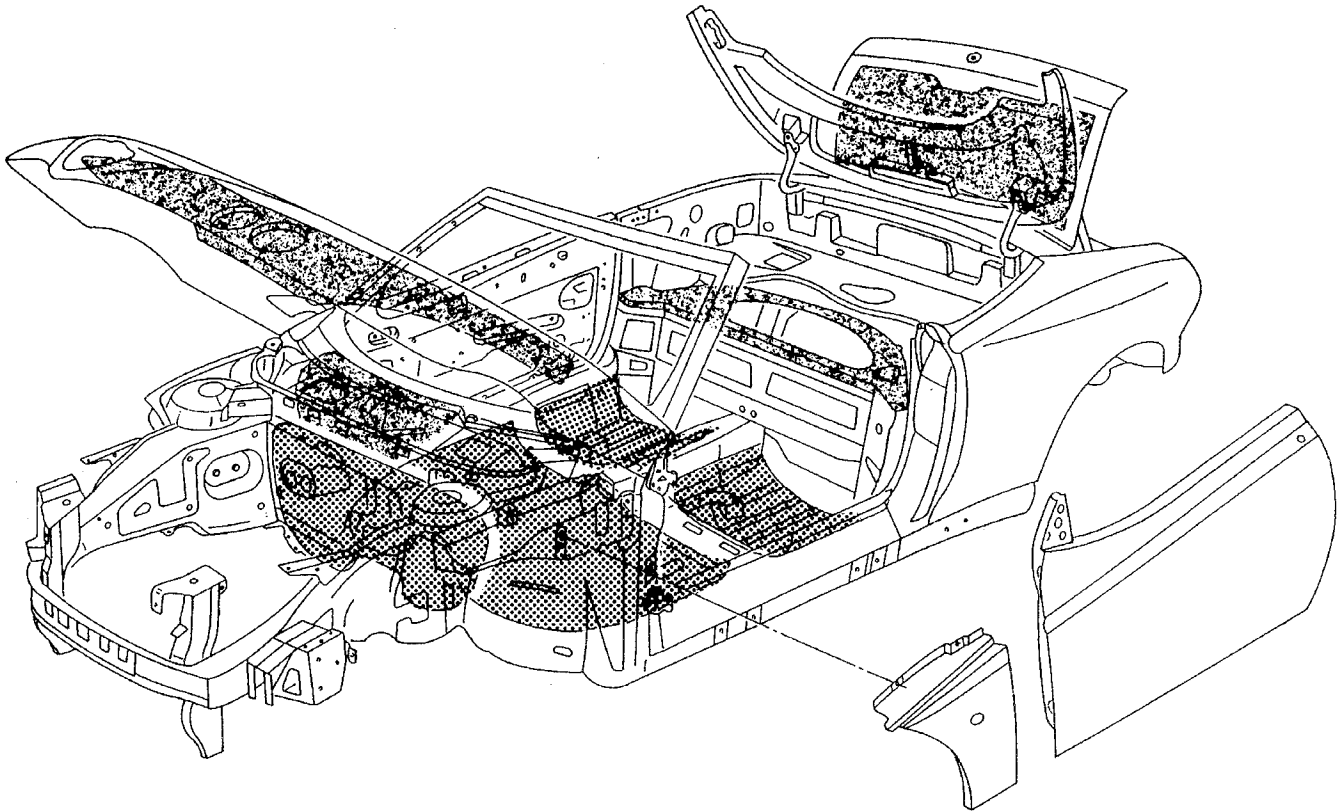
The foams are polyurethane.



They are used to isolate the passenger compartment from the mechanical units and neutralise the transmission of noise.

DEADENERS AND EXPANDED POLYURETHANE FOAM



SOUNDPROOFING - SOUND ABSORBING PRODUCTS



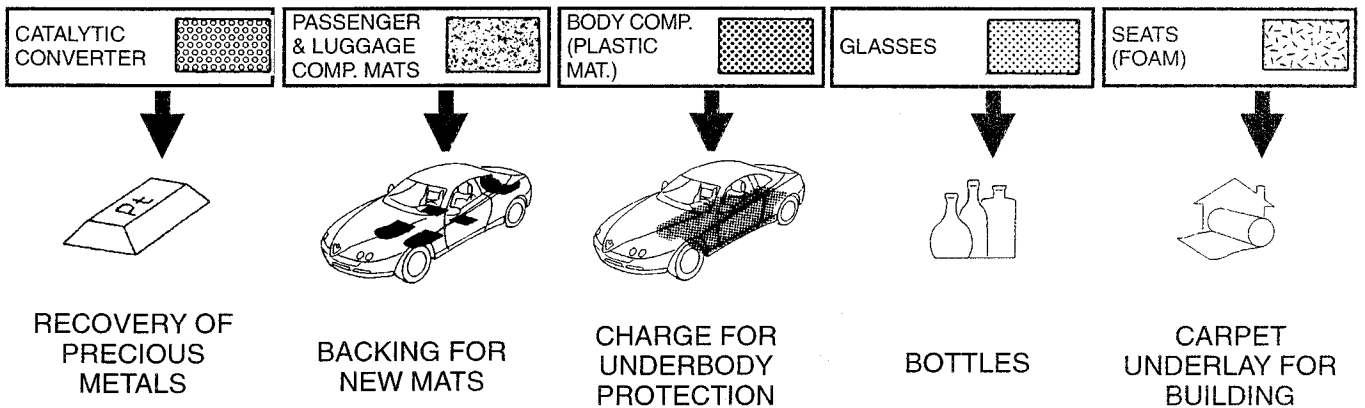
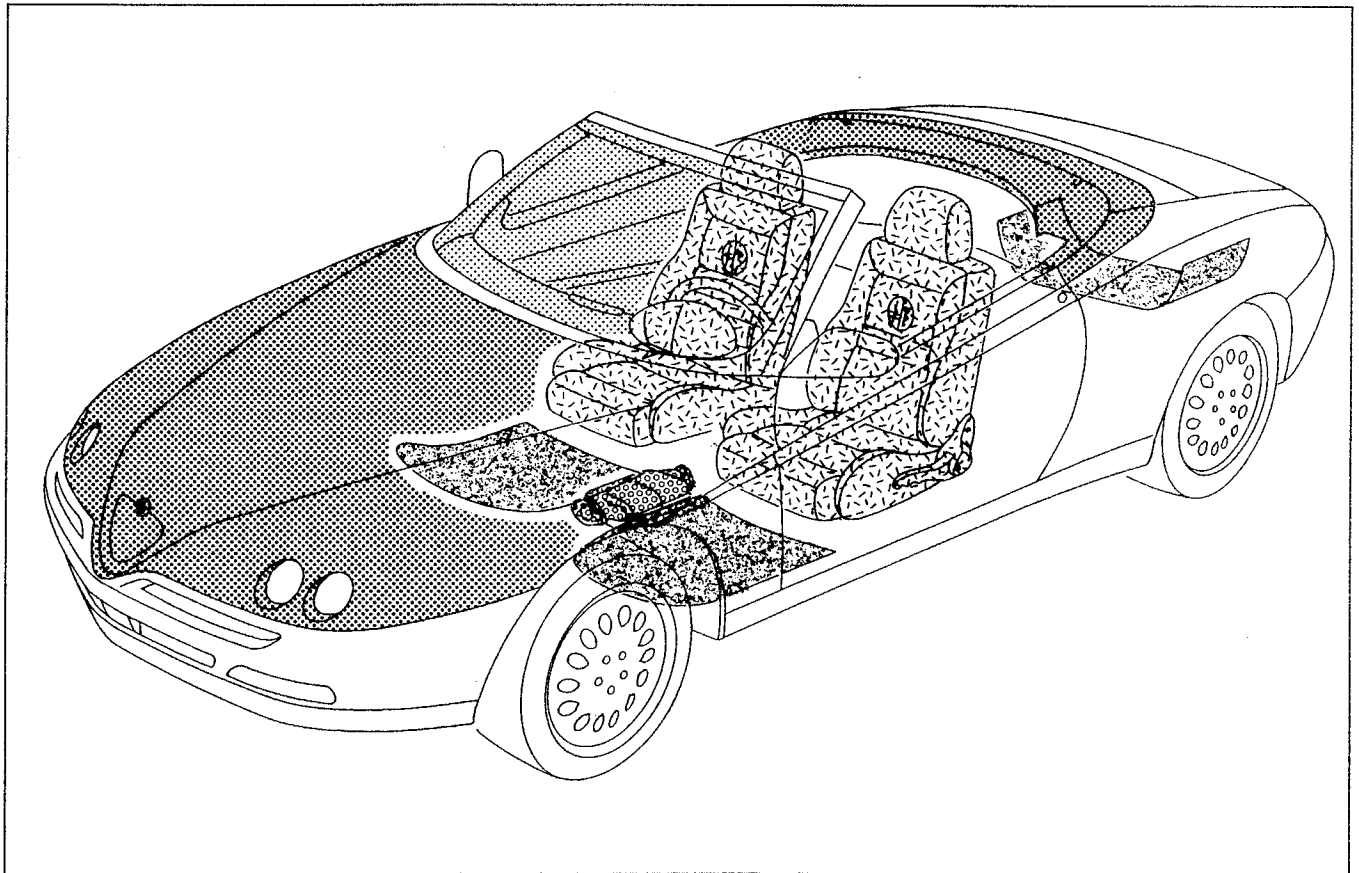
-  Soundproofing
-  Sound absorbing

RECYCLING 

The SPIDER/GTV car has been designed so that all its components are recyclable at the end of the car's life.

The philosophy of this whole re-use project for the materials involves the so-called "**cascade recycling**" process within the production cycle of the car, namely re-use for less committing purposes down to final recovery of the residual energy content burning the material as alternative fuel.

For other materials which are not recyclable as car components, possibilities still exist in other sectors.



In addition to the glass and metals that were already re- used in the past **PLASTIC MATERIALS** are now the focus of attention

To facilitate the recognition, during recycling, of plastic and elastomer (rubber) components - of over 50 g in weight -, these are **marked with coded symbols** identifying their name and type.

Examples of some of these symbols are given in the following table:

Thermosetting and thermoplastic materials:

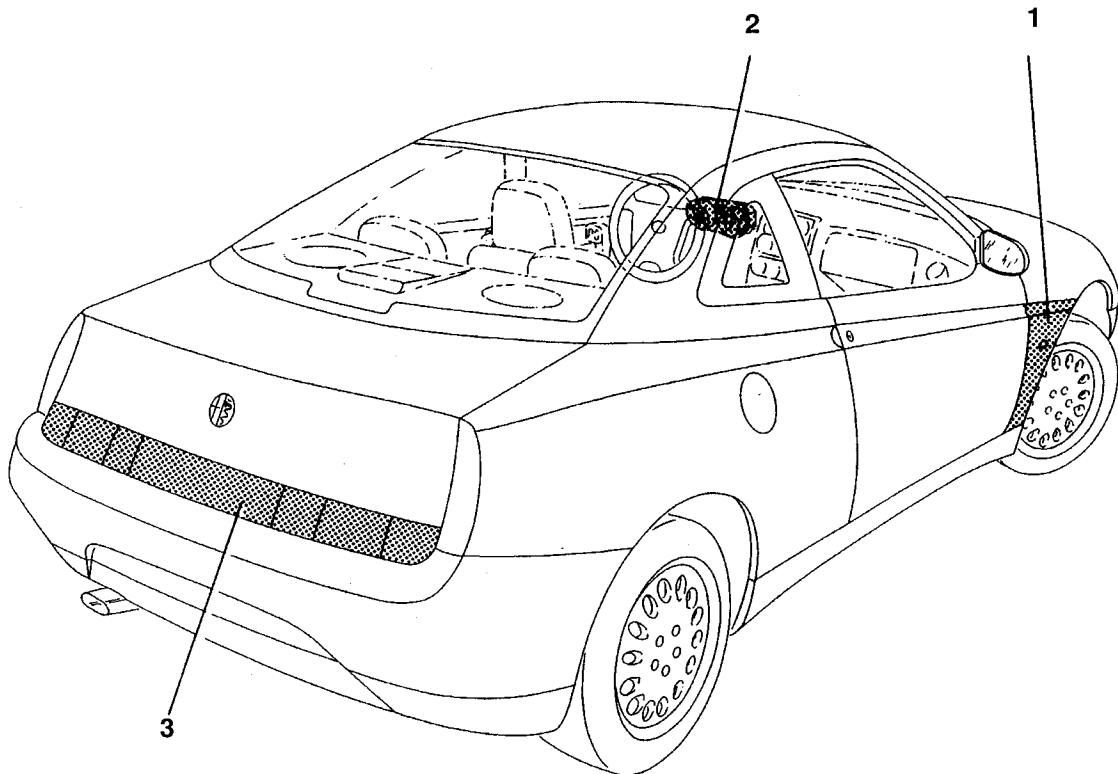
ISO SYMBOL	FAMILY NAME	
ABS	ACRYLONITRILE-BUTADIENE-STYRENE	
CA	CELLULOSE	
PA 6	POLYAMIDES WITH:	6 atoms of C in monomeric structure
PA 66		2 monomeric structures, each with 6 atoms of C
PA 11		11 atoms of C in monomeric structure
PA 12		12 atoms of C in monomeric structure
PA		AROMATIC POLYAMIDES
PA+ABS	POLYAMIDE ALLOYS + ABS	
PBT	POLYESTERS	Poliibutylenterephthalate
PET		Polyethylenterephthalate
PC	POLYCARBONATES	
PC+ABS	POLYCARBONATE/ABS ALLOYS	
PE-LD	POLYETHYLENES	Low density polyethylene
PE-HD		High density polyethylene
PMMA	METACRYLICS	
POM	ACETYLICS	
PP	POLYPROPYLENES	
PPE	MODIFIED POLYPHENYL OXIDES	
PPE+PA	THERMOPLASTIC ALLOYS (POLYPHENYL-OXIDES/POLYAMIDES)	
PSE	POLYSTYROLS (EXPANDED)	
PVC	POLYVINYLCHLORIDE (RIGID VINYL)	
PVDC	POLYCHLORIDEVINYLIDENE	
PCTFE	POLYCHLORTRIFLUORETHYLENE	
PTFE	POLYTETRAFLUORETHYLENE	
PVC-P	FLEXIBLE VINYL (PLASTIFIED)	
SAN	STYROLS	Copolymer styrol-acrylnitryl
SMA		Copolymer styrol-maleic anhydride
MF	MELAMINES	
PF	PHENOLIC	
PUR	POLYURETHANES	
UF	UREIC	
UP	POLYESTERS	For compression moulding (SMC)
	UNSATURATED THERMOSETTING	For injection moulding (BMC)

For composite materials, the reinforcement material and its percentage is stated next to the base material:

Charges and reinforcements:

ISO SYMBOL	FAMILY NAME
GB	Glass balls
GF	Glass fibre
GM	Glass mattress
M	Generic mineral charges
T	Talc
WD	Ground or fibre wood/cellulose
SF	Textile fibres (synthetic or natural)
K	Calcium carbonate

For mixtures and copolymers the component materials are separated respectively by a "+" or a "/".

Examples of designation:**1. Front mudguard: >PUR - GF 20<**

composite material: polyurethane with 20% glass fibre reinforcement

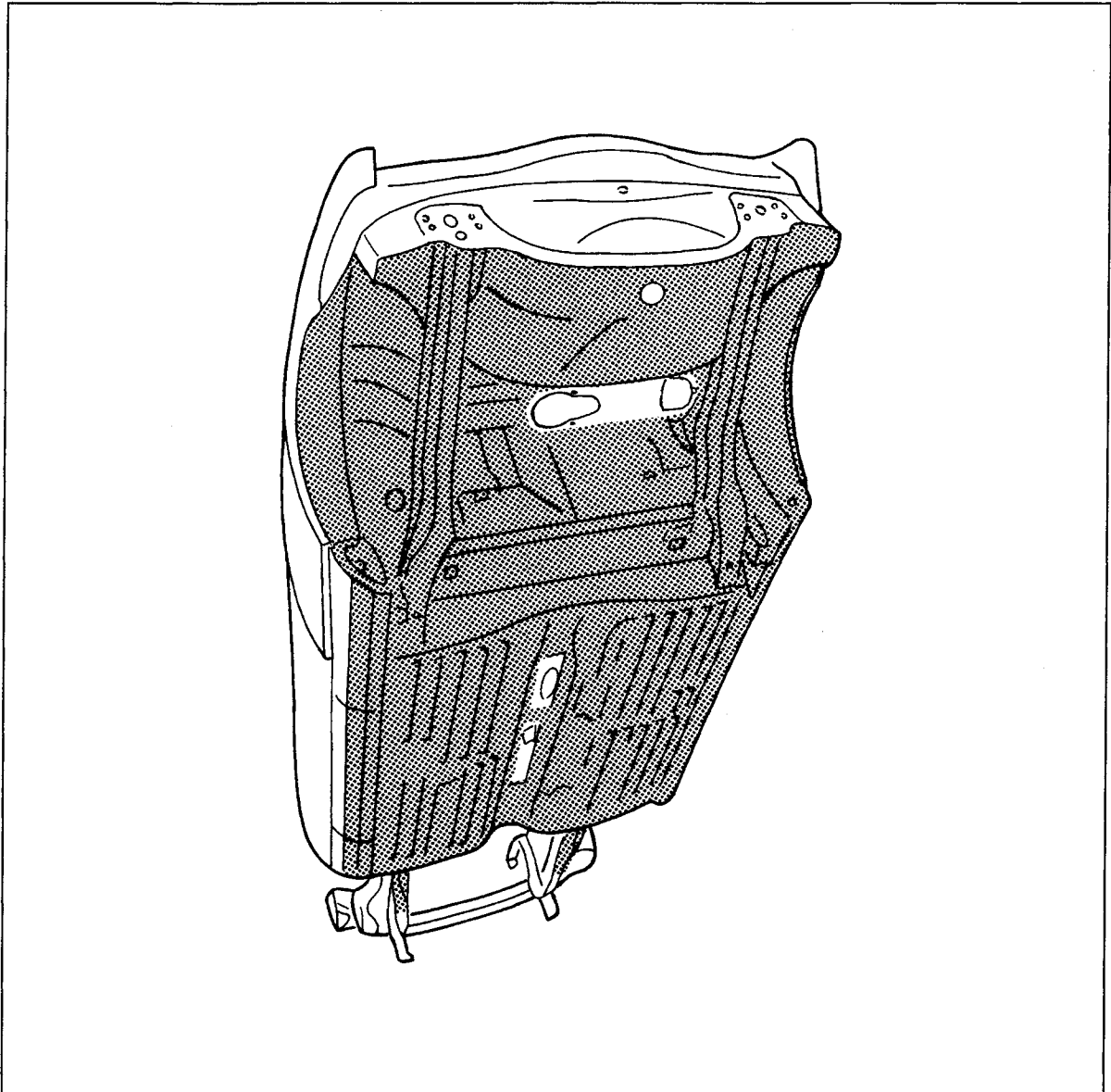
2. Instrument cluster: >PP - M 40<

composite material: polypropylene with 40% mineral reinforcement

3. Tail light cluster: >ABS - PMMA<

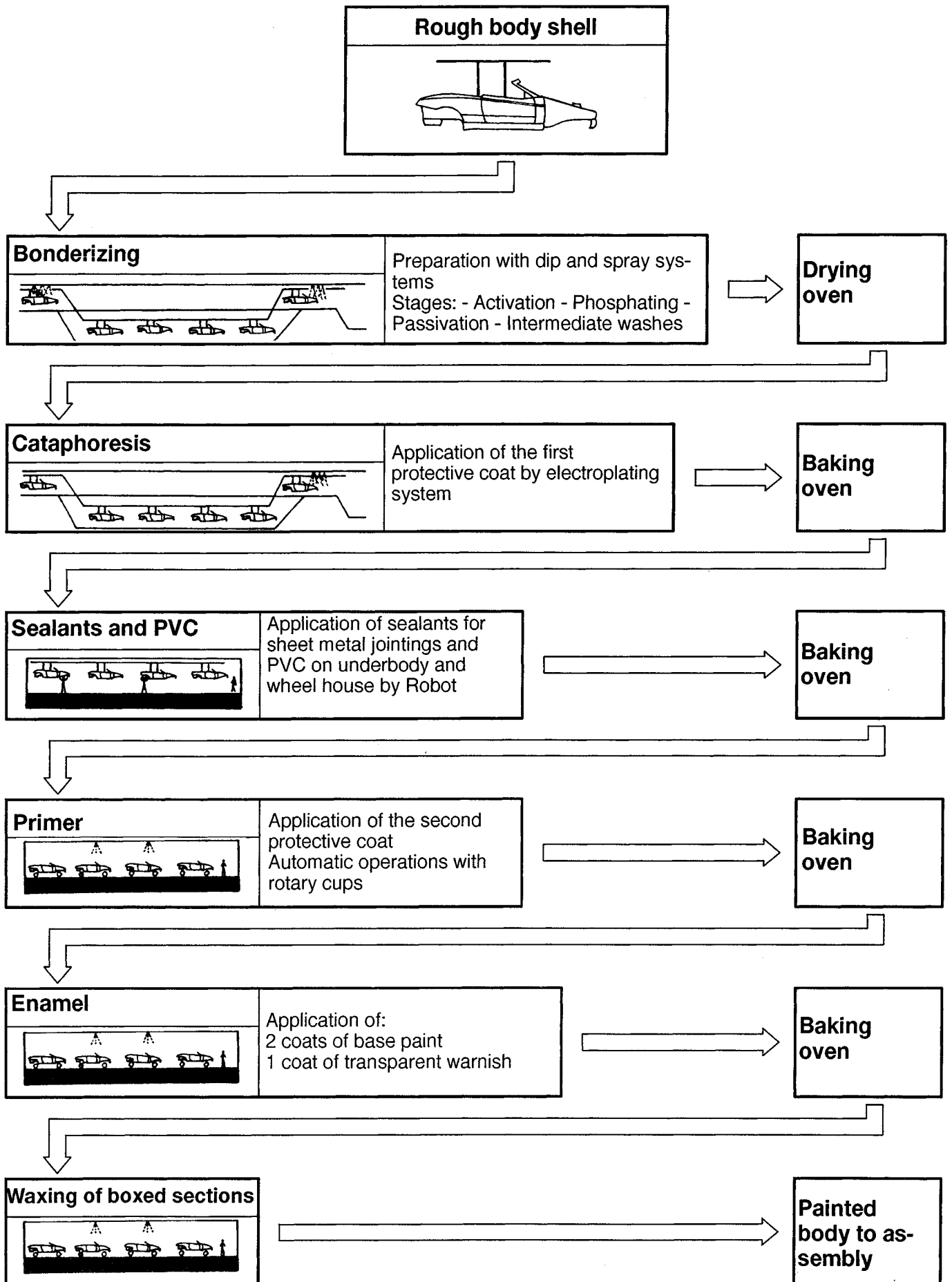
acrylnitril-butadiene-styrene with metacrylics

APPLICATION OF UNDERBODY PROTECTION (PVC)

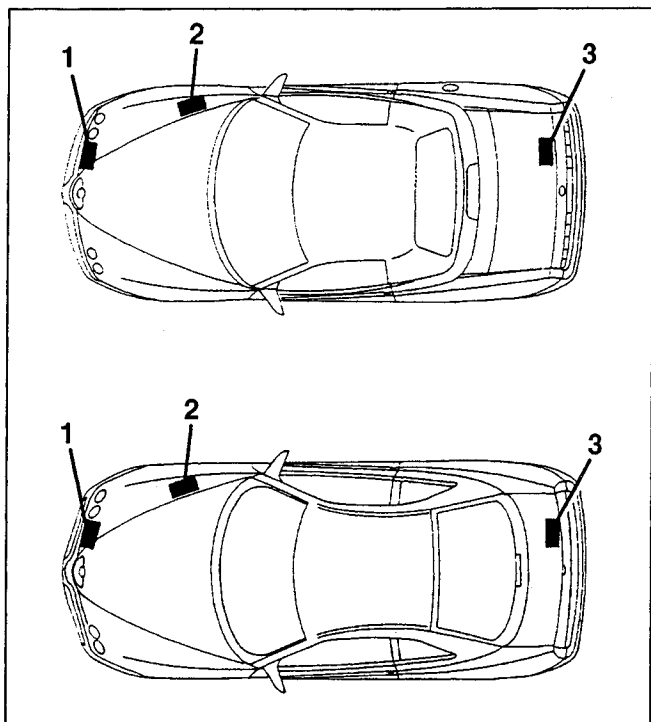


Application area (PVC)

BODY PAINTING CYCLE IN PRODUCTION



IDENTIFICATION LABELS

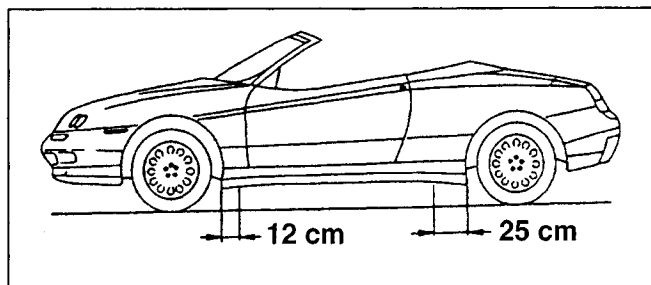


1. Identification data
 2. Body marking
 3. Bodywork paint label
- For the identification codes see: GROUP 00.

CAR LIFTING POINTS

With arm hoist or workshop jack.

- The car should be lifted setting the ends of the arms or the jack in the areas shown.



CAR TOWING POINTS

The car has two threaded couplings, one at the front and one at the rear, in which to screw the hitch which is to be found in the tool bag, in the luggage compartment.

Closely adhere to the regulations in force on the subject of towing.

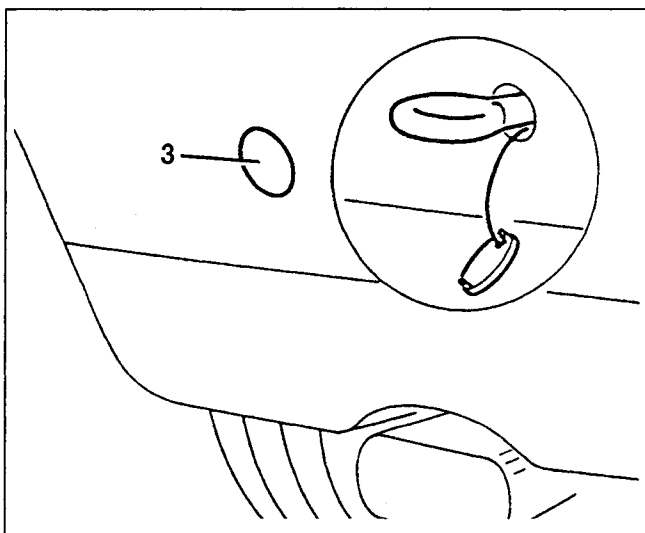
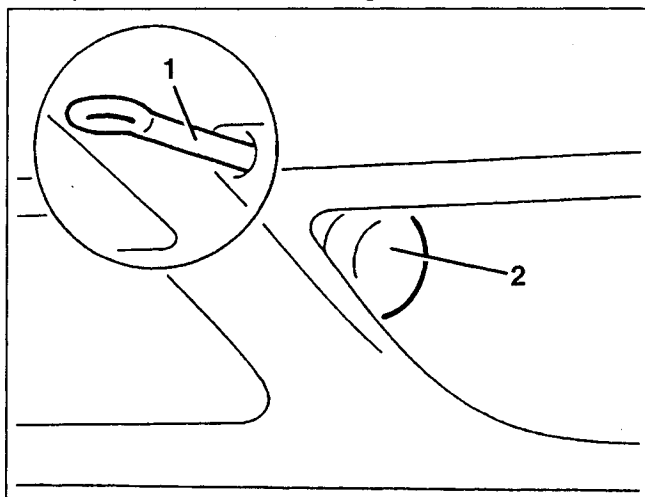


CAUTION:

Before towing the ignition key of the towed car should be turned to **MAR** and then returned to **STOP** without removing it; this will prevent the steering from locking.

Also bear in mind that when the car is towed, the vacuum is not created in the servobrake, therefore considerably more effort on the pedal is required during braking.

In addition, when the engine is not running, the power steering circuit is not operational, therefore more effort is required to turn the steering wheel.



1. Tow hitch
2. Front bumper slot
3. Rear bumper cover

BODYWORK RESTORATION AND PAINTING CYCLES SPECIFIED FOR THE SERVICE NETWORK AND INCLUDED IN THE FLAT RATE MANUAL

INTRODUCTION

The word "repainting" means the operation of restoration carried out on a painted surface.

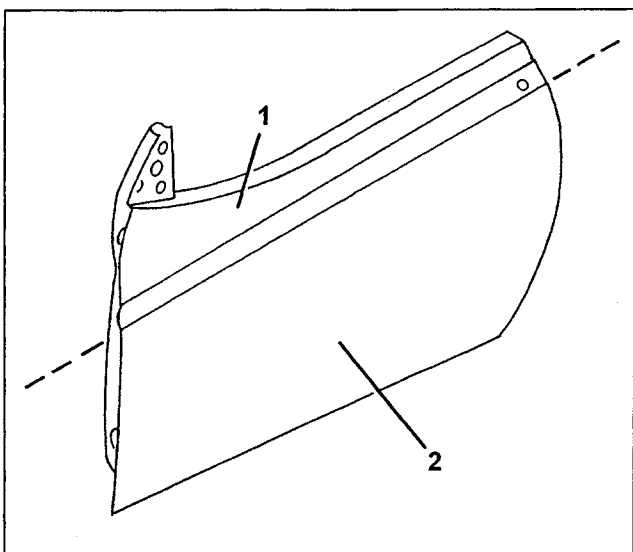
When a surface is only partially involved, the operation is called touch-up. Depending on the type of repair work, the following repainting cycles have been defined:

- Painting of replaced fixed sheet metal part;
- Painting of replaced mobile sheet metal part (or plastic part);
- Repainting of damaged sheet metal part (or plastic part);
- Cosmetic repainting (touch-up) of sheet metal part (or plastic part);
- Restoration of sheet metal parts without painting: "dent removal".

For repainting purposes it is important to define the term "panel".

To clarify this concept the door depicted in the diagram has been taken as an example.

The whole door is a panel, but for reasons of convenience, it can be considered as two areas: the upper area and the lower area. So, area means a surface included between two delimitations.



1. Upper area

2. Lower area

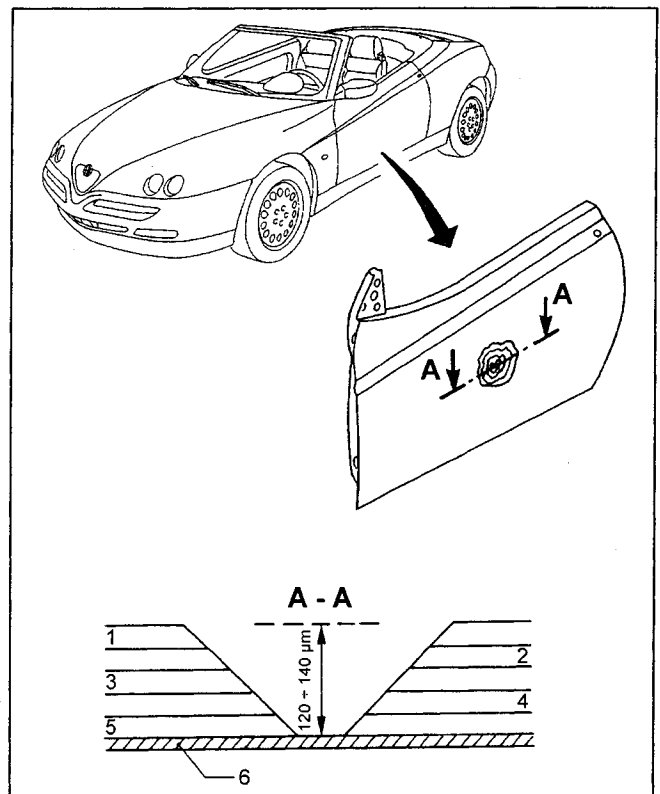
The procedures necessary for repair and painting operations on a sheet metal part (or plastic part) supplied as a spare are listed below.

NOTE:

The sheet metal parts supplied as spares have undergone cataphoresis treatment. The plastic parts have been treated with an adherence primer.

Preparation

Wash the part concerned, judge the amount of damage, then sand the area concerned with the most appropriate sandpaper.



1. Transparent varnish
2. Paint
3. Undercoat
4. Cataphoresis (primer)
5. Galvanization (only for sheet metal)
6. Sheet metal (or plastic part)

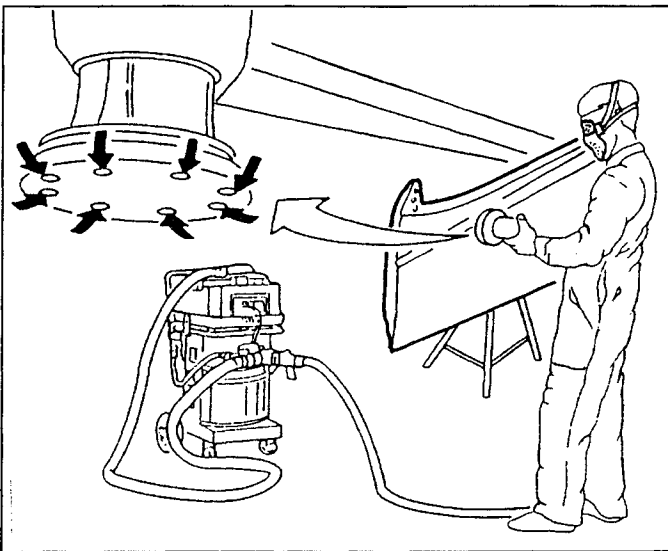
Then clean thoroughly using silicone-proof products.

Surfacing or filling

Repair operations on sheet metal (or plastic parts) usually require a surfacing and/or filling stage. It is very important to blend the product well, then apply a coating sufficient to cover the existing undulations without exceeding the specified thickness.

Sanding

Dry sanding may be carried out by hand or using an electric or pneumatic sander fitted with the specified sandpaper.



Sealing

Sealing must be carried out on sheet metals, to prevent the penetration of water or damp and is carried out with the use of different products.

Sealants are products that fill, insulate and protect and are to be used on sheet metal joints.

Sealant should be applied with a brush or suitable spray gun.

Undercoating

Due to its thickness, the undercoating eliminates any imperfections of the layer beneath.

The undercoat must be prepared and applied following the instructions given in the corresponding painting cycle.

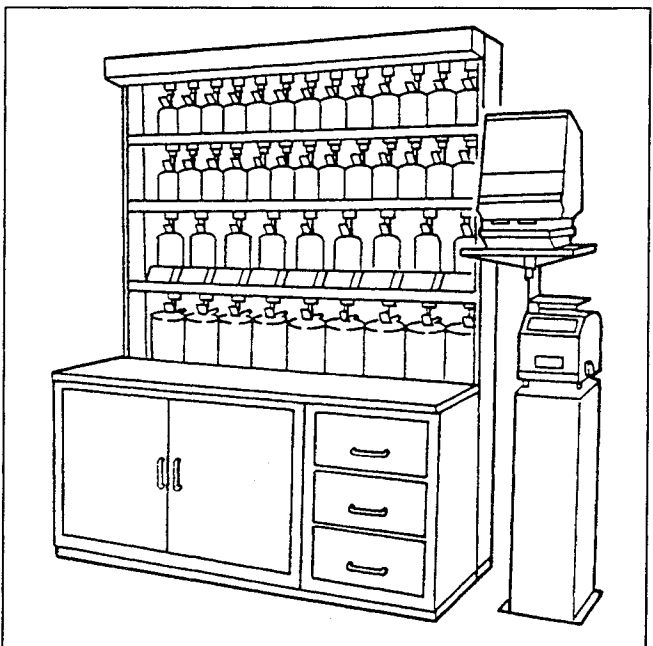
Sanding the undercoat

Sanding is necessary due to the thickness of the undercoat.

During this operation, to locate and remove any imperfections and waviness, it is advisable to spray a fine film of enamel (spy coat) on the surface concerned.

Preparation of paints

For the catalysis and dilution proportions for the preparation of painting products, closely adhere to the Manufacturer's Instructions.



Masking

The areas surrounding the parts to be repaired should be masked with sheets of paper fixed to the surface with adhesive tape.

The importance of this operation should not be underestimated and it should be carried out, like all the others, taking all the necessary precautions to avoid painting parts not involved in the operation.

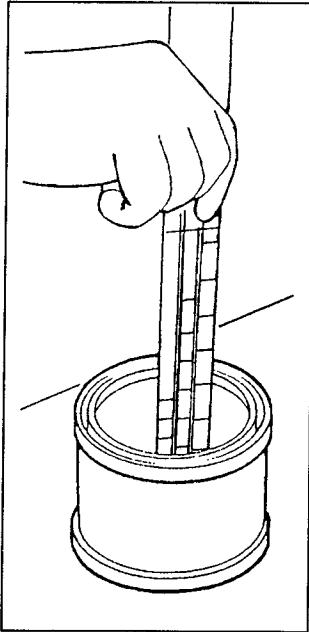
Masking should be applied:

- before coating with Primer;
- before undercoating;
- before coating with paint.

Coating with Primer

Primer is to be applied to bare metal surfaces, as protection against corrosion.

Paint application



The required colour may be prepared mixing the basic colours in the proportions given in the applicable colour formula. The enamels obtained in this way do not have the viscosity suitable for use; before use they should be mixed with a catalyst and thinned to the proportions indicated by the manufacturer, using a rod scale. It is extremely important to use paint at the correct viscosity to avoid certain defects (running, pinholing, etc.).

Before application, check that the colour of the prepared enamel corresponds exactly to the colour of the vehicle.

Waxing

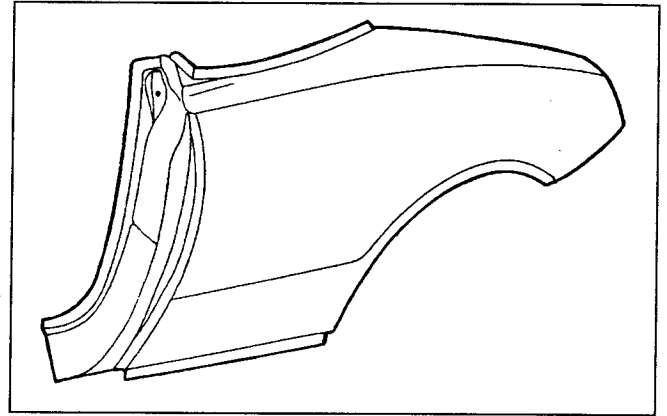
This is an extra wax oil-based protection for boxed components; it prolongs protection against corrosion over the course of time and is applied through special holes in the body. Refer to the diagram of page 117 for the areas involved.

Foaming

The purpose of foaming is to prevent the passage of swirling air and to sound deaden the components concerned in the treatment. Refer to the diagram on page 121 to locate the areas involved.

PAINTING OF CHANGED FIXED METAL PART (complete cycle)

Below is the sequence of operations concerning painting operations for a changed fixed sheet metal part:



1. Preparation (washing, sanding and cleaning)
2. Filling
3. Sanding
4. Masking
5. Primer Coating (on bare metals)
6. Sealing
7. Undercoating
8. Sanding
9. Masking
10. Coating with paint (base + transparent varnish)

- Wash the area concerned, dry sand the cathaphoresis protection, blow with compressed air, clean with a cloth soaked in silicone-proofing product and dry accurately.
- Fill any imperfections and leave to dry completely.
- Sand, level the filler and accurately clean the treated surface.
- Mask the necessary areas, apply the Primer on the bare metal and leave to dry in the air.
- Apply the specified sealant on the jointing areas and dry.
- Apply the undercoat and spy coat (paint).
- Dry sand, remove the masking and blow with compressed air cleaning again with silicone-proofing product.
- Mask the area surrounding the sanded surface and suitably cover the remaining parts of the car.
- Blow with compressed air and clean the surface with Tack-Rag.
- Apply the paints (base + transparent varnish) prepared previously (for the times between coats, follow the manufacturer's instructions).

PAINTING OF CHANGED MOBILE SHEET METAL PART (OR PLASTIC PART) (complete cycle)

Below is the sequence of operations concerning painting operations for a changed mobile sheet metal part (or plastic part):

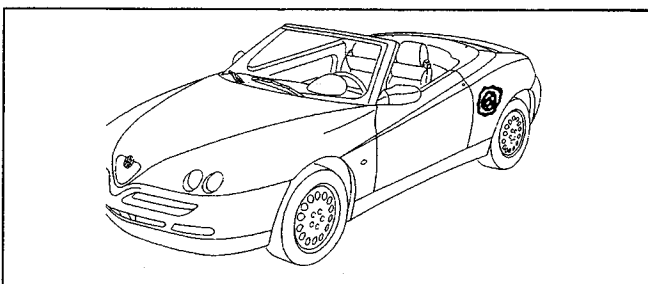
1. Preparation (washing, sanding and cleaning)
2. Revision and/or filling (revision only for plastic part)
3. Sanding
4. Primer Coating on bare metals (not for plastic parts)
5. Sealing (not for plastic parts)
6. Undercoating
7. Sanding
8. Coating with paint (base + transparent varnish)

– On the bench work on the part concerned washing it, then dry sand the cathoretic protection (primer for plastic parts) with P240 sandpaper to improve the grip of the next product; blow with compressed air, clean with a cloth soaked in silicone-proofing product and dry accurately.

- Correct any imperfections with a fine layer of filler.
- Sand, level the filler and accurately clean the treated surface.
- Apply the Primer on the bare metal and leave to dry in the air (not for plastic parts).
- Apply the specified sealant on the jointing areas and dry.
- Apply the undercoat and the spy coat (paint).
- Dry sand and blow with compressed air cleaning again with silicone-proofing product.
- Apply the paints (base + transparent varnish) prepared previously (for the times between one coat and the next follow the manufacturer's instructions).

REPAINTING DAMAGED SHEET METAL

When repairing a fixed or mobile part, repair the defect in the metal and then proceed as described in PAINTING OF CHANGED FIXED SHEET METAL PART (complete cycle).



COSMETIC PAINTING OF SHEET METAL

This cycle is to be followed in the event of the following defects:

- Water blistering
- Running
- Widespread opacity
- Orange peeling
- Surface dirt
- Transparency
- Shading
- Undercoat scores
- Colour change
- Evident touch-ups
- Flaking
- Cissing
- Stains
- Roughness
- Chalking

Below is the sequence of operations concerning painting operations for the cosmetic painting of a sheet metal part:

1. Preparation
2. Sanding (elimination of faults)
3. Opaqueing with scotch brite on the whole panel
4. Masking
5. Coating with paint (base + transparent varnish)

– Wash the area concerned, dry sand, clean with a cloth soaked in silicone-proofing product and dry accurately.

- Sand eliminating the defects on the part concerned.
- Opaque with brite the whole panel concerned.
- Mask the area surrounding the sanded surface and suitably cover the remaining parts of the car.
- Blow with compressed air and clean the surface with Tack-Rag.
- Apply the paints (base + transparent varnish) prepared previously (for the times between one coat and the next follow the manufacturer's instructions).

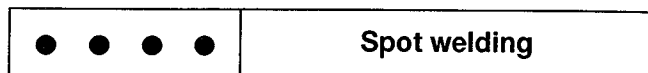
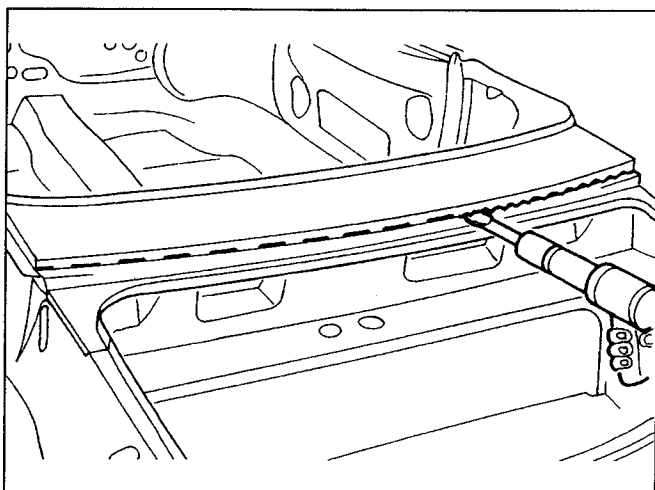
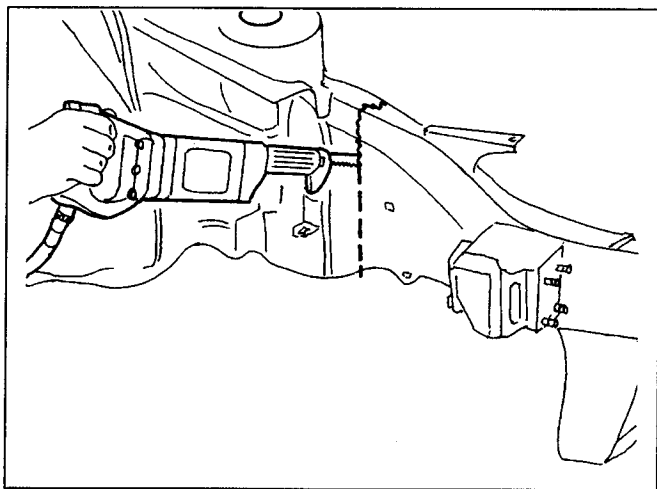
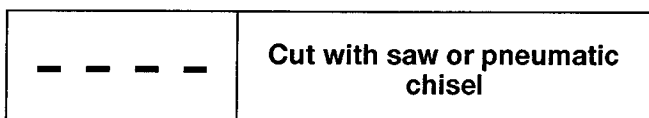
**RESTORING A SHEET METAL PART
WITHOUT PAINTING (dent removal)**

This procedure makes it possible to eliminate small dents from the bodywork using special tools avoiding filling and painting, therefore maintaining the initial characteristics of the metal sheet.

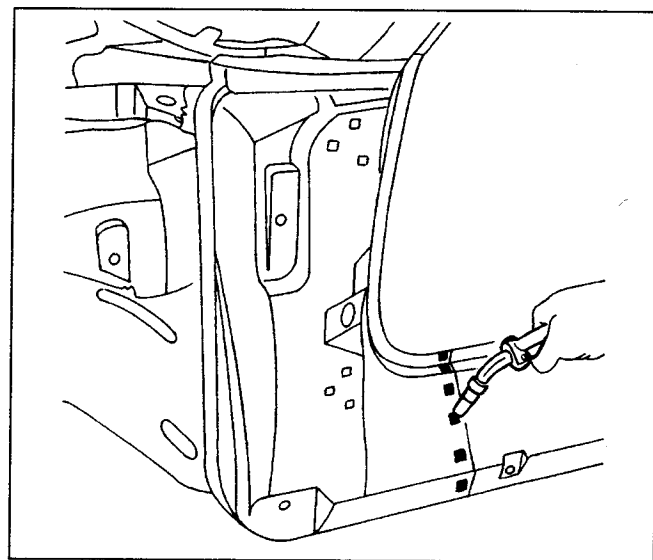
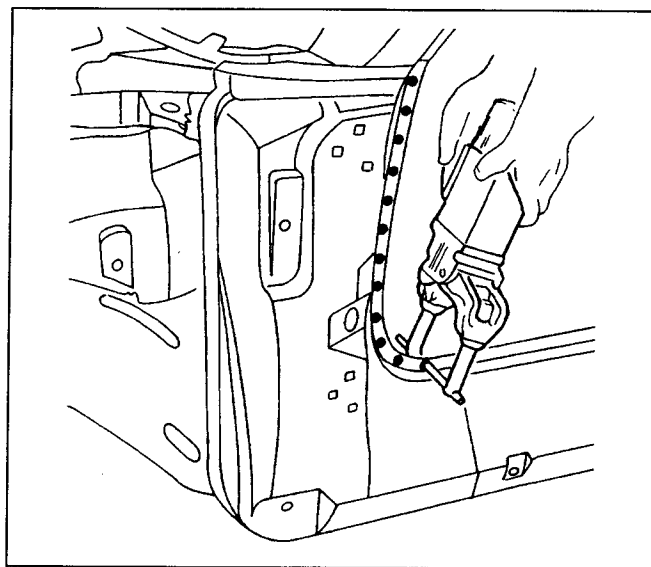
**GENERAL INFORMATION
REGARDING REMOVAL AND
INSTALLATION OPERATIONS**

SYMBOLS

The symbols regarding operations of: cutting, welding/brazing, dewelding, the use of protective products, sealants, corrosion inhibitors, etc. adopted in the Manual are shown in the following diagrams.



NOTE:
To simplify the graphic representation, there is no symbolic distinction between the welding of two sheet metals and the welding of three metals.

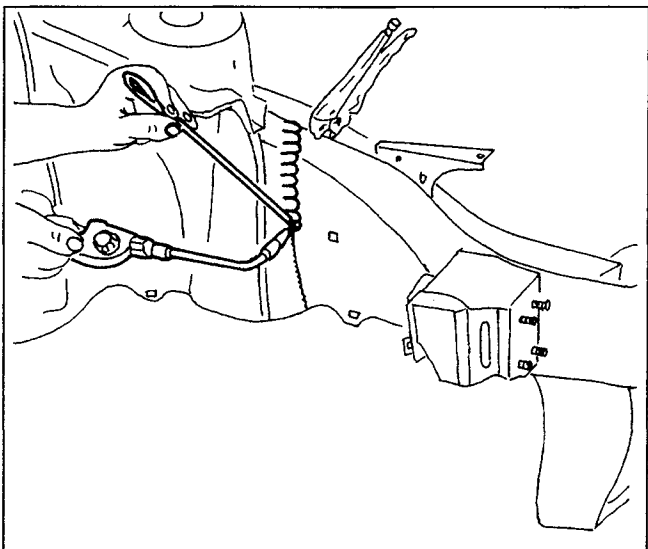
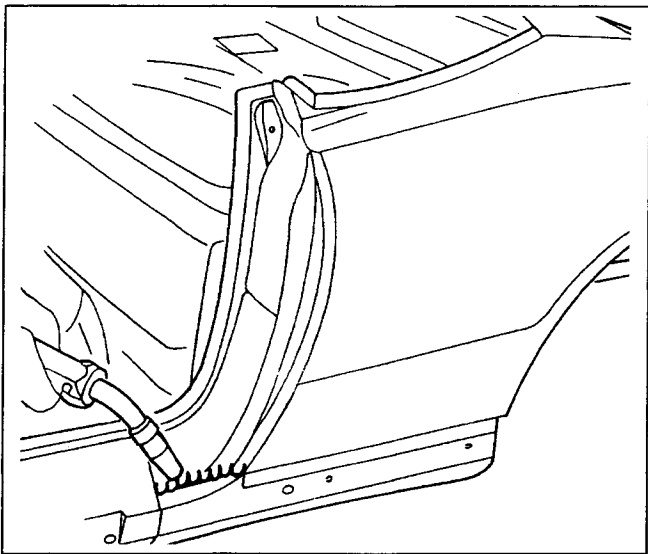


In order to synthesize the information concerning the type and number of welding spots to be carried out in the procedures for replacing components, the following symbols have been used:

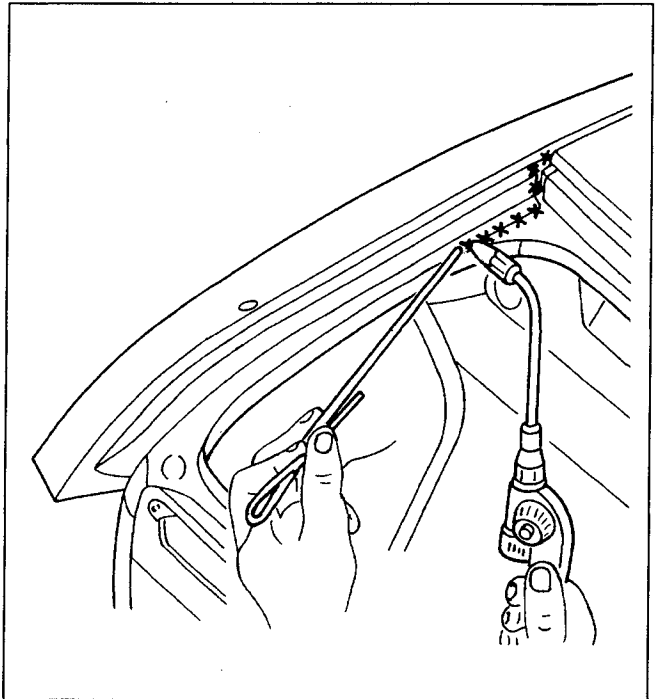
2 • (6)

— number of welding spots
— type of welding to be employed
— progressive stages of the procedure

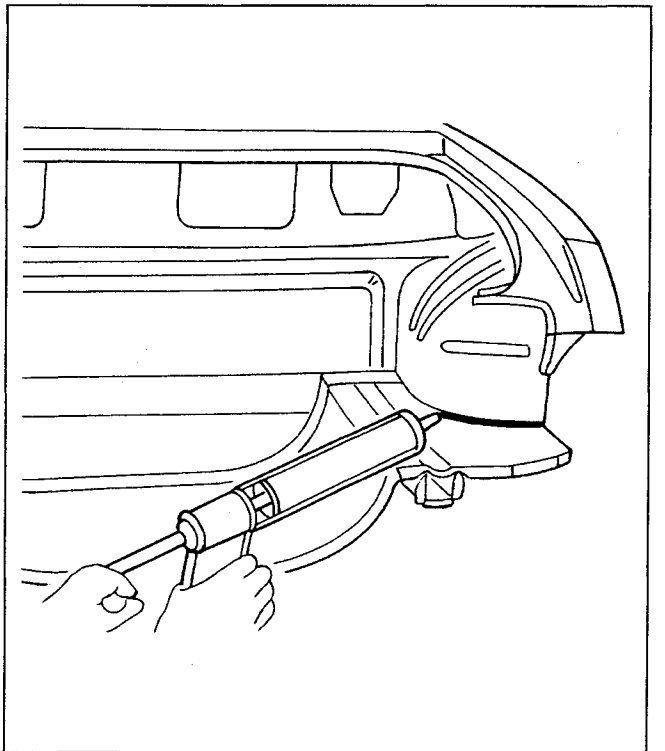
m m m m m	Seam-intermittent MIG welding
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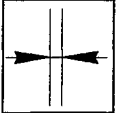
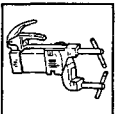
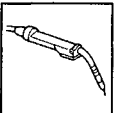

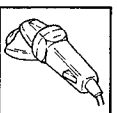



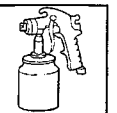
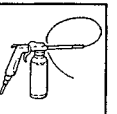

XXXXXXXXXX	Brazing
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—	Sealing
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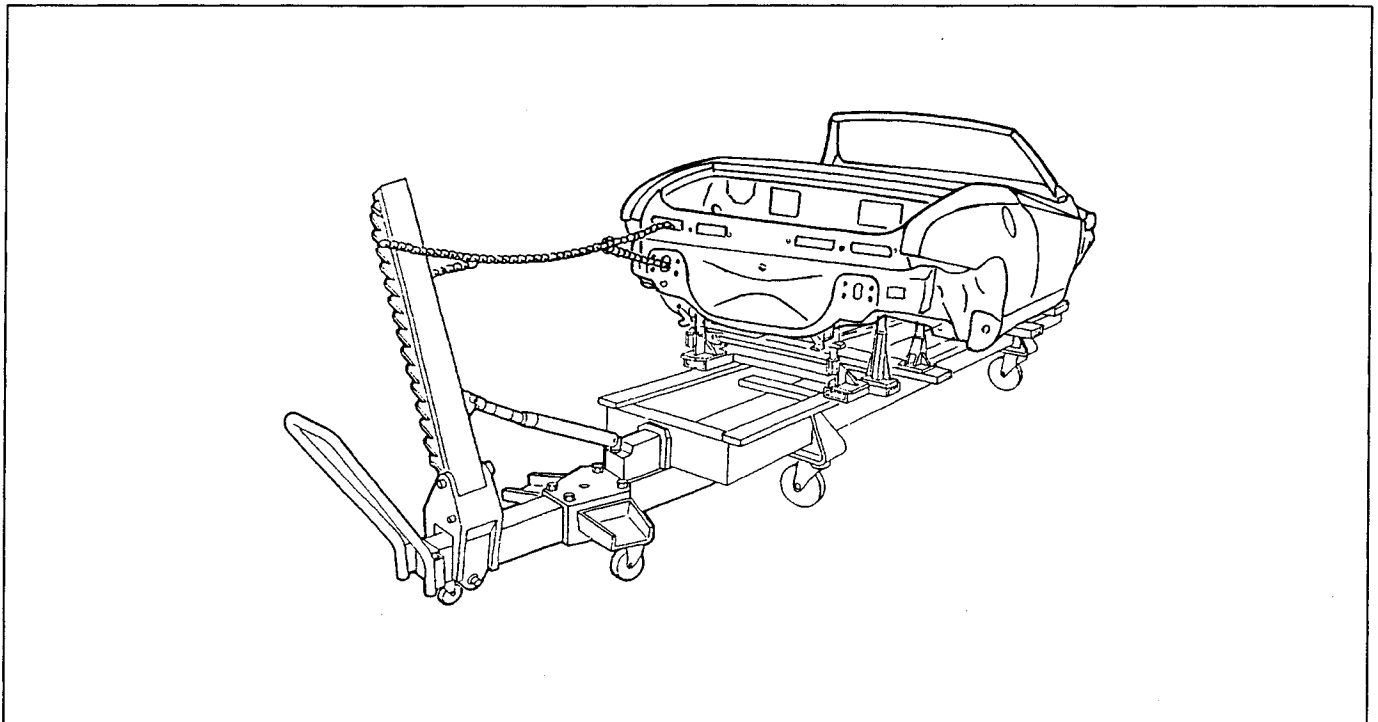
CUT WITH A JIG SAW	
CUT WITH A CIRCULAR SAW	
CLEAN WITH A ROTATING BRUSH	
REMOVE WELDS WITH A CHAMFERING MACHINE	
REMOVE WELDS WITH A DRILL	
HOLE FOR MIG WELDING	
SHEET METAL OUTLET WITH CHISEL	
PERFORATION FOR MIG WELDING	
APPLY ELECTROWELDABLE PROTECTION	
THICK ELECROWELDABLE PROTECTIONS APPLICATION	
CENTER THE COMPONENTS	
MEASUREMENT	
SECURE COMPONENTS	
THREADED RIVET ATTACHMENTS	

CHECK GAPS AND ALIGNMENTS	
SPOT WELD	
MIG WELD	
WELD WITH OXYACETYLENE TORCH	
GRIND	
APPLY RUST PROOFING	
APPLY SEALANT	
APPLY UNDERBODY PROTECTION	
APPLY PAINTS	
APPLY WAX TREATMENT	
APPLY FOAM TREATMENT PRODUCTS	

REMOVING COMPONENTS

- a. Ensure that all the damaged parts have been identified, measuring the main squaring values. See "Body squaring".
- b. Pull the body using equipment suited to the extent of the damage and apply the pulling force in the opposite direction to that of the crash. Removed parts can be re-used provided that they meet the requirements listed in "Body Squaring".

CAUTION:
Pay special attention when securing tension chains to the body, to avoid accidental release during the operations.



- c. Cut away the damaged parts.

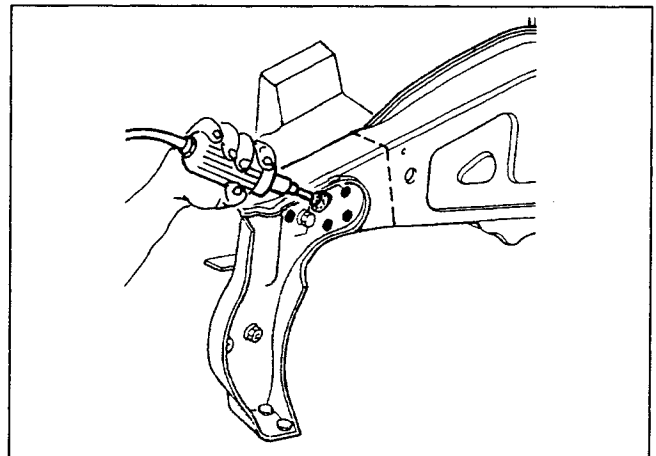
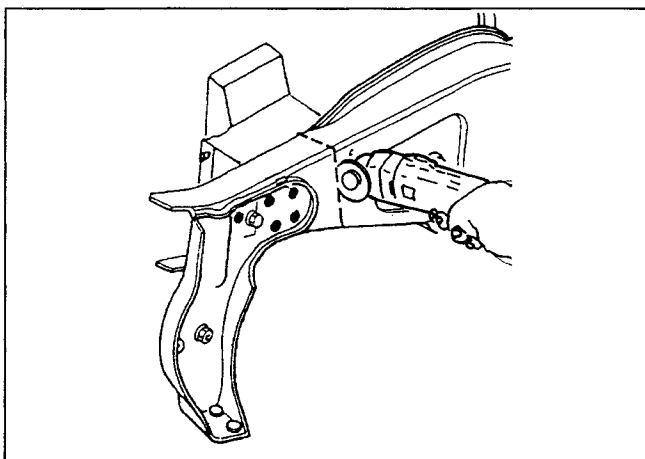
Tools required:

- Reciprocating or circular saw
- Pneumatic chisel

- d. If the welding spots are not visible, remove the paint using a metal brush.

Tools required:

- Rotary brush.



e. Where necessary punch the welding spots to make a centering point for a drill bit.

Tools required:

- Hammer
- Graver.

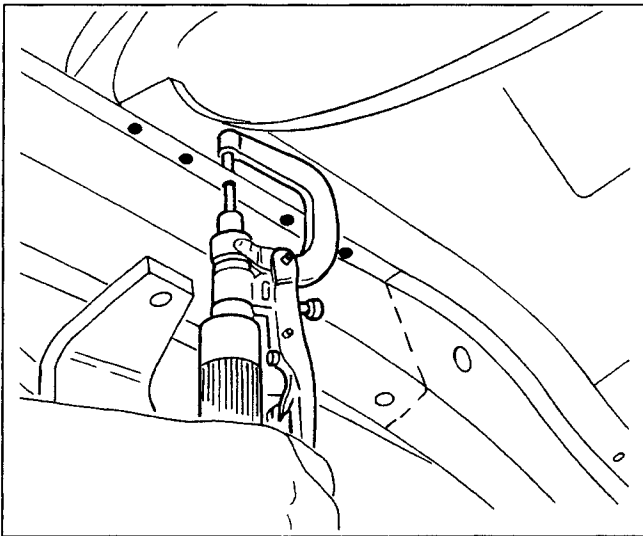
CAUTION:

Punch in depth and at the centre of each welding spot. An off-centre punch will not allow complete removal of the welding spot, while a weak punch will not allow the drill bit to be securely guided.

f. Remove the welding spots using a de-welder or drill.

Tools required:

- De-welder
- Drill



NOTE:

Where access with a de-welder or drill is not possible, use a chisel. The chisel is particularly suitable for dewelding fine sheets from thick sheets.



WARNING:
Use protective gloves and goggles.



CAUTION:

- Position the de-welder over the centre of the spot to be removed.
- To facilitate the operation, a cutting speed of appr. 1000 rpm should be used.
- Adjust the milling depth using the screw.
- Care should be taken to avoid drilling the mating components. Plug any holes by welding.
- Holes reduce the strength of the component concerned and can also give rise to water seepage.

g. Remove the remaining traces of the welding spot using a chisel.

Tools required:

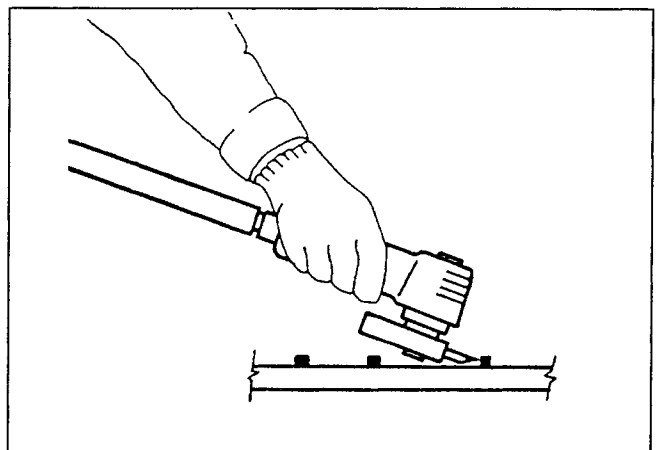
- Chisel
- Hammer.

PREPARATION

a. Grind the metal sheet at the welding spots to remove all traces.

Tools required:

- Prelü with brush
- Disk sander.



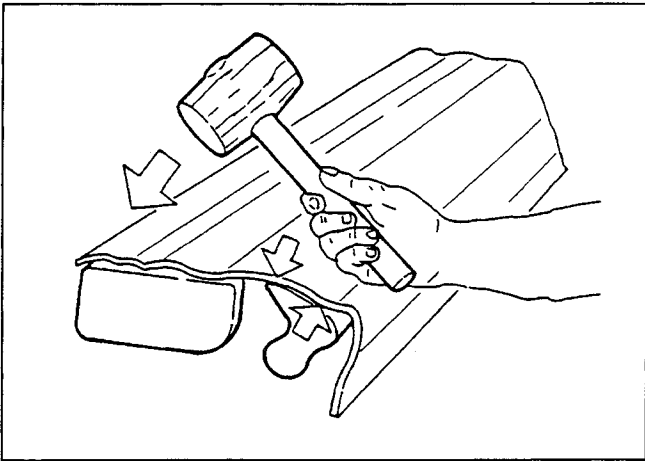
CAUTION

- Do not overgrind on the metal base: this would reduce the thickness of the metal sheet and may adversely affect the welding strength.
- Thoroughly clean the metal dust from the ground surfaces and surrounding areas.
- Metal dust reduces welding strength and can lead to corrosion.

b. Straighten the buckled areas using a hammer and dolly block.

Tools required:

- Hammer
- Dolly block.

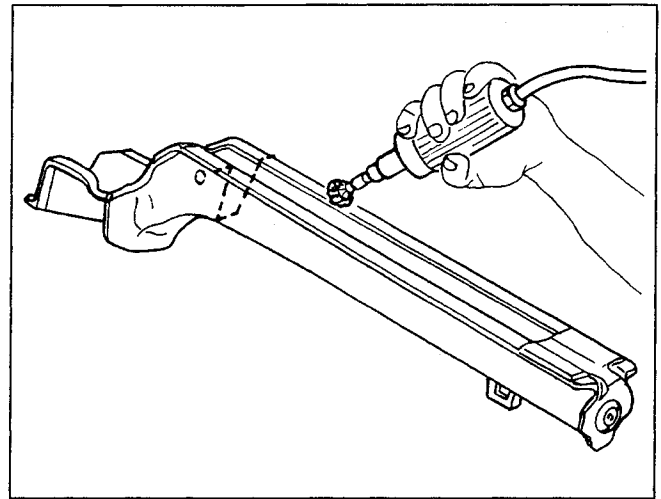
**CAUTION:**

- Ensure that even the slightest buckling is removed, particularly on the inner panels or in hidden positions.
- Otherwise problems may arise during assembly operations, in addition to a reduction in strength due to the concentration of stresses.
- Carefully inspect the joint areas of each pillar.

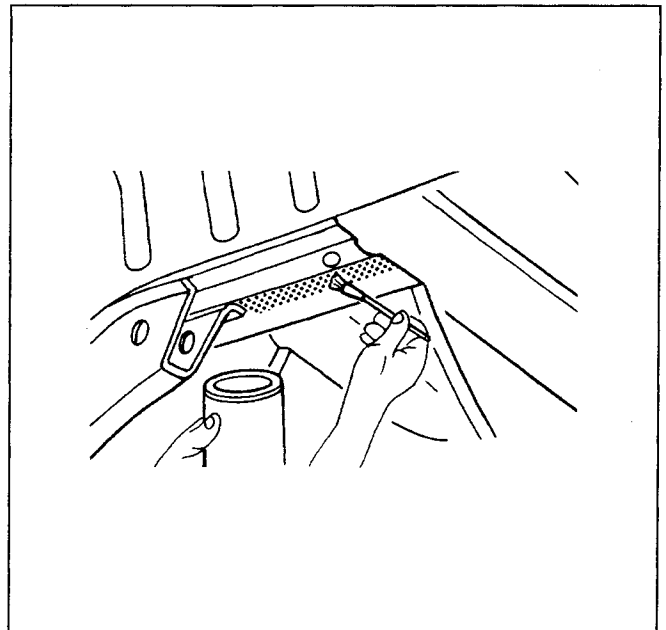
c. Remove the from the edges and from the welding surfaces.

Tools required:

- Rotary brush.
- Belt sander
- Disk sander



d. Apply electrically-weldable protections on the edges of all the panels to be spot-welded.

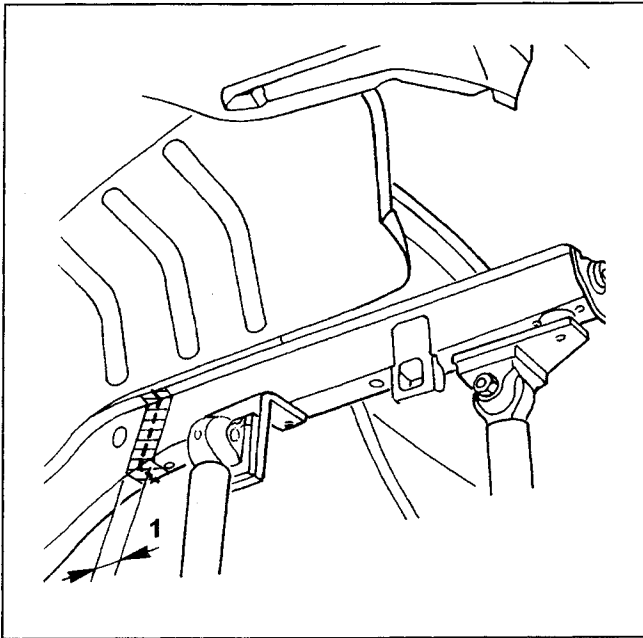
**NOTE:**

In certain areas it is necessary to use high thickness electrically-weldable protections to obtain sealing between the edges as well as protection.

e. If the components are to be partially replaced, maintain an overlapping tolerance of appr. 50 mm during cutting of the damaged parts, to have a large enough mating surface.

Tools required:

- Reciprocating or circular saw
- Hand saw
- Scribe
- Shears.



1. Overlapping tolerance

POSITIONING AND CHECKING

a. Provisory assembly of new components.

Tools required:

- Adjustable clamp
- Squaring tool (sliding caliper)
- Chassis dimensional control system (template).

CAUTION:

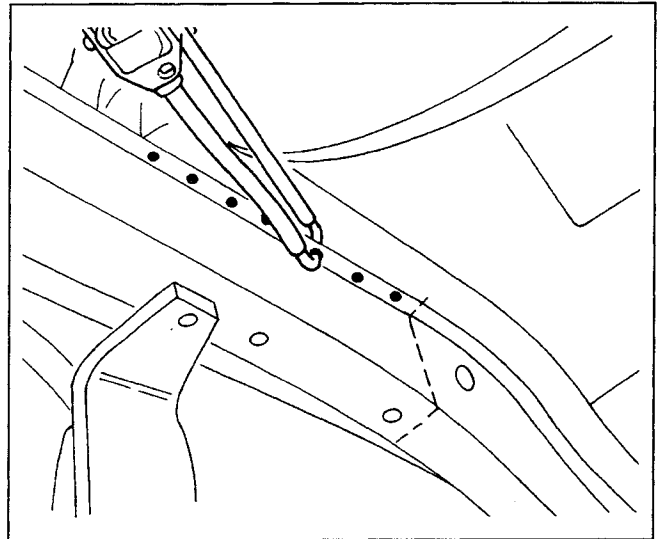
- Position the components as shown in the diagrams of "BODY SQUARING".
- Correctly position the edges of the parts to be welded.
- Position mobile body parts (doors, bonnet and boot lid) then check the gaps, parallelism and squaring.
- Secure the parts to be welded with clamps or a few spot welds.

WELDING AND FINISHING THE SHEET METAL PART

a. All weldings should be carried out following the instructions given in "WELDING INSTRUCTIONS".

Tools required:

- Spot welder
- MIG welder
- Oxy-acetylene torch

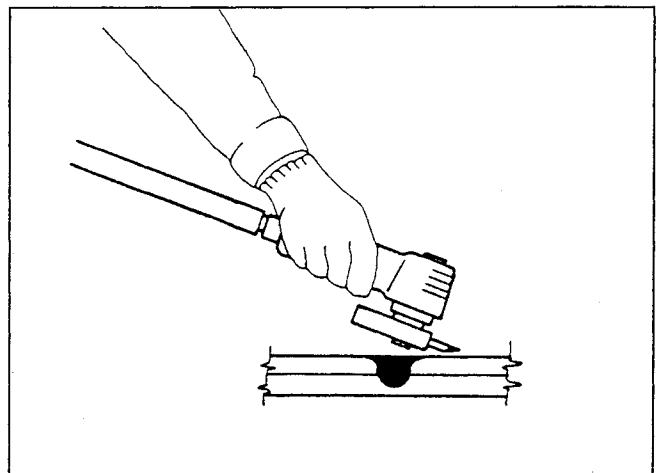


b. After welding, remove the clamps used for securing the edges and remove any dints produced by them.

c. Smooth all welds using a sander.

Tools required:

- Pneumatic sander
- Disk sander
- Prelù with milling cutter.

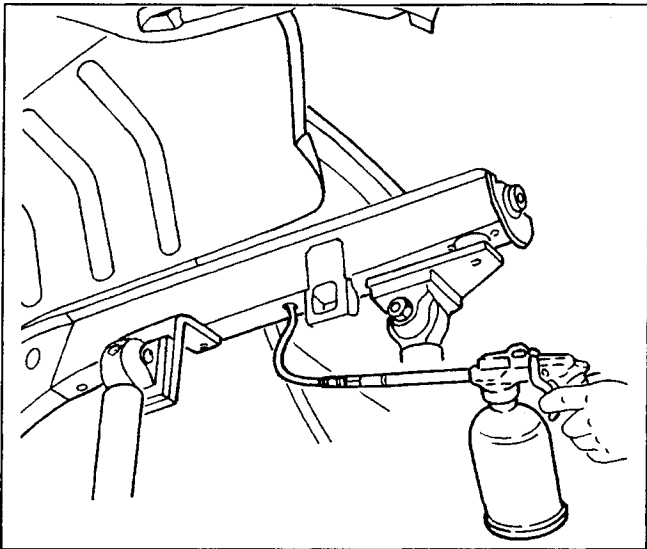


CAUTION:

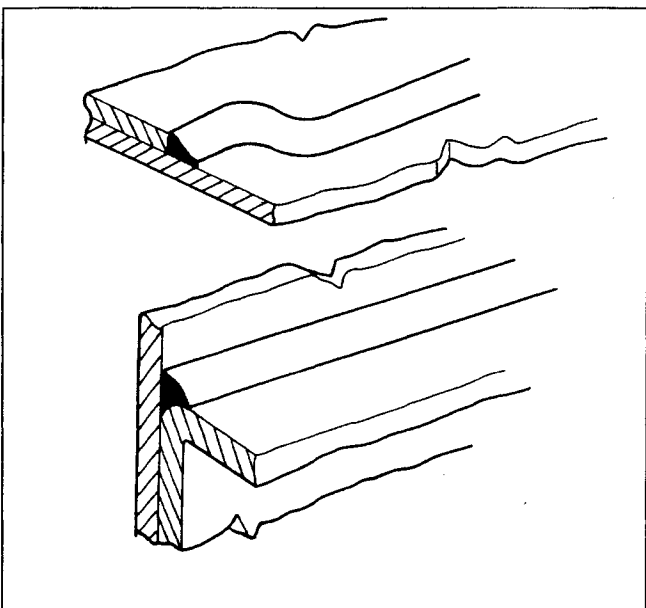
- When using the sander, care should be taken to avoid excessively reducing the thickness of the metal sheet as this may adversely affect welding strength.
- Remove the metal dust from the sanded surfaces and surrounding areas.
- Metal dust may cause corrosion.

PROTECTIONS

a. Apply rust proofing to components after MIG welding and oxy-acetylene torch welding.



b. Apply the specified sealant on the joints and overlaps of the sheets, seamlessly, along the entire profile, as shown below.

**CAUTION:**

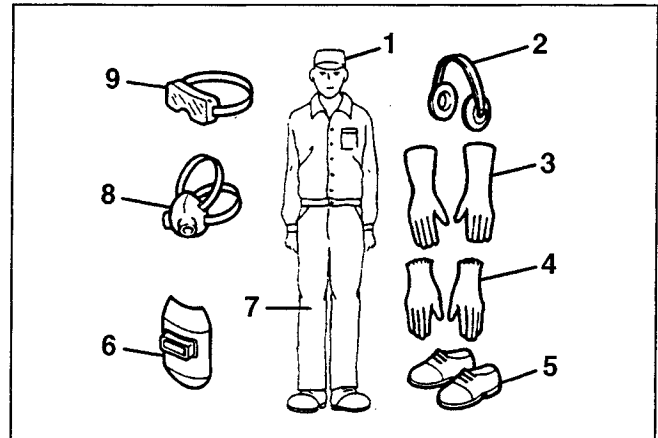
Avoid applying excess sealant and prevent areas not involved in sealing from coming into contact with the sealant.

c. Proceed with foaming, painting and waxing (see specific paragraphs).

WARNINGS FOR OPERATORS**PREVENTION OF ACCIDENTS**

a. Protective clothing.

– Depending on the nature of the work to be carried out, make sure that protective goggles, ear muffs and dust masks are worn. As a general rule, work clothes, gloves, safety shoes and cap should be worn.



1. Cap
2. Ear muffs
3. Welding gloves
4. Gloves
5. Safety shoes
6. Protective shield
7. Overall
8. Dust mask
9. Goggles

b. Safety supports.

– After raising the vehicle ensure that safety supports are adequately positioned. Refer to "LIFTING AND TOWING POINTS" for the location of bearing points.

c. Inflammable materials.



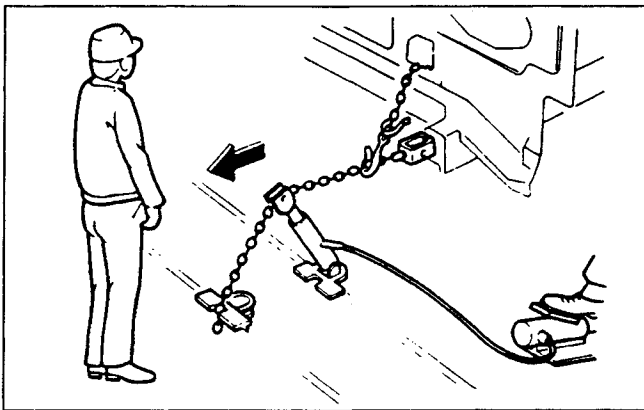
- Ensure that the earth lead is disconnected from the battery before undertaking repairs.
- In the event of welding near the fuel tank, remove it from its housing and plug the filler neck.
- Plug the open ends of the fuel and brake fluid hoses when they are disconnected.
- Remove the electronic control units before carrying out electric welding on the vehicle.

d. Work environment.

- To guarantee the safety of the operators the work environment must be well ventilated and lit.
- As paints and sealants produce toxic gasses when heated, preferably use a saw or pneumatic chisel rather than a blow torch for cutting and removing damaged metal sheets.
- To remove paint from the metal sheet, use a belt grinder or rotary brush.
- To minimise dust use a suction hood.

e. Vehicle bodywork straightener.

- Make sure that the straightener is used correctly, according to the procedures given in the Manufacturer's Instruction Manual.



WARNING:
During body straightening, never stand in front of the straightener in the direction in which it is pulling.

PROTECTING THE TRIM AND OUTSIDE COMPONENTS

a. Protecting the trim

- Remove or cover the interior trim (upholstery, instruments, mats).
- Cover with heat resistant materials: glass, instruments, upholstery and mats before undertaking welding operations.

b. Protection outside components.

- When removing outside components (bonnet, boot lid, mouldings, trims) the body surfaces must be protected to avoid scratching, using rags protective tape or other materials.

CAUTION

Painted surfaces with even only light scratches must be repaired: even light scratches can lead to corrosion.

INDICATIONS FOR REPLACEMENT

The use of genuine Alfa Romeo spares is recommended. These ensure the best results and maintenance of the original conditions of the vehicle.

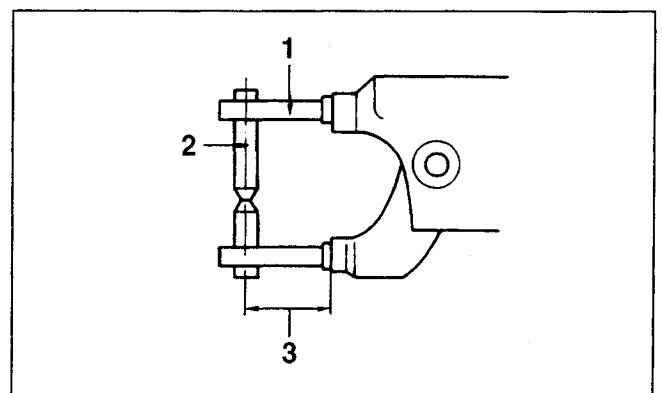
INSTRUCTIONS FOR WELDING

Before electric welding on the car, remove the electronic control units to avoid damaging them.

SPOT WELDING

The strength of weld spots depends on carrying out the following checks before welding begins:

- Adjustment of the welding arm.
 - Keep the arm as short as possible to achieve the maximum pressure between the electrodes.
 - Full tighten the arm and electrodes so that they do not work loose during welding.

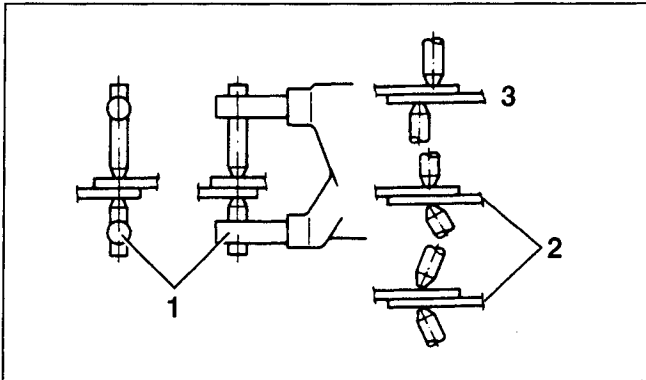


1. Welding arm
2. Tip of electrode

3. Minimum arm length possible

b. Alignment of electrodes.

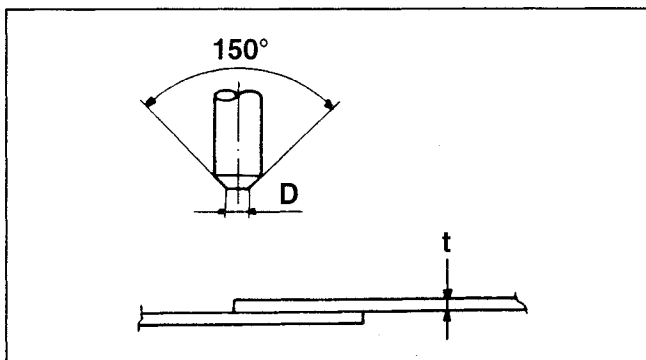
- Align the tips of the upper and lower electrodes. Any misalignment or offset of the electrodes causes low pressure on the welding points resulting in a reduction in strength.



1. Correct alignment of arms
2. Incorrect position of arms
3. Incorrect length of arms

c. Diameter of electrode tip.

- It is necessary to accurately check the diameter of the electrode tips to obtain the necessary welding strength. Before starting work ensure that the diameter of the tip (D) is adequate for the thickness of the metal sheet according to the formula below. Remove all traces of burns and foreign bodies from the electrode tips.



$D = t + 3 \text{ (mm)}$

$D = \text{Ø electrode tip}$

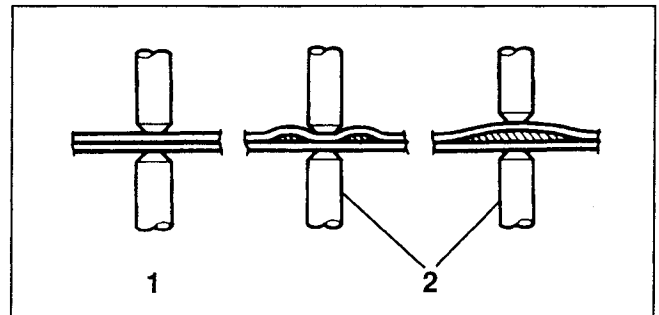
$t = \text{Sheet thickness}$

Condition and preparation of the panels to be welded

The presence of discontinuity in the surfaces to be welded, paint, rust or dust hinder the flow of the welding current, thereby reducing welding strength. Before beginning welding, check the condition of the mating surfaces and make any adjustment necessary.

a. Gaps between mating surfaces.

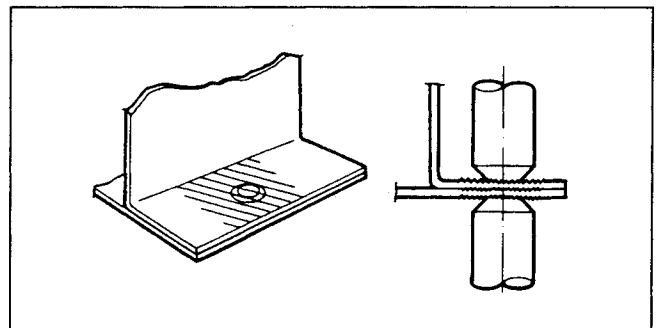
- Even a slight gap between the mating surfaces reduces the current intensity. This results in welds that will be too small or weak. Before welding, join the surfaces accurately and, when necessary, secure them with a clamp.



1. Correct coupling of mating surfaces
2. Incorrect coupling (gap) between mating surfaces

b. Welding metal surfaces.

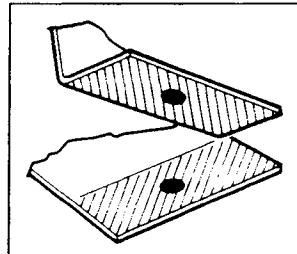
- Prepare the mating surfaces, removing all traces of impurities and foreign bodies (paint, dust, rust), to obtain the best results.



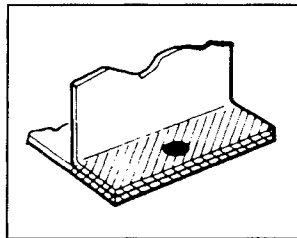
c. Corrosion prevention on metal surfaces.

- Coat the surfaces to be welded with a high conduction electrically-weldable protective product. This substance should be applied also on the contours of the parts to be welded.

PRELIMINARY OPERATION



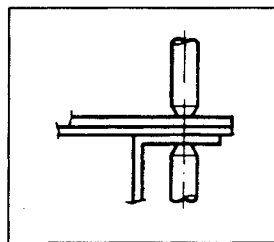
APPLY THE CORROSION PREVENTIVE PRODUCT ON ALL SURFACES AND AROUND THE EDGES



Precautions to be followed for spot-welding

a. Welding three or more overlaid sheets.

- When three or more sheets are overlaid, spot welding must be repeated a second time.



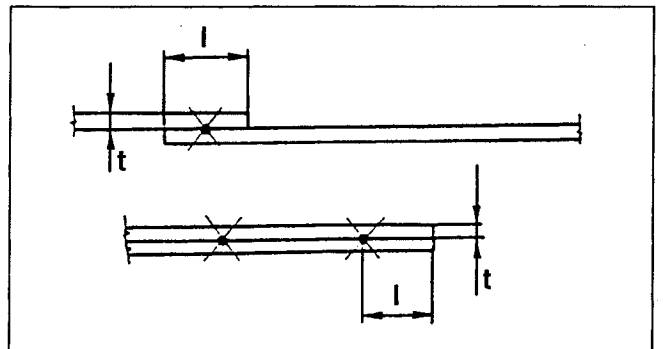
b. Number of spot welds.

- Carry out welding with the number of spots specified in this Manual.

c. Minimum distance of welding from the edge of the sheet.

- If welding is carried out near the edges of the sheet, follow the dimensions given in the table below:

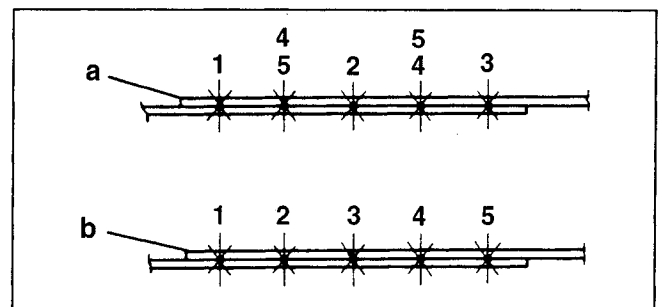
Thickness of sheet (t) mm	Minimum distance from sheet edge (l) mm
0.6	11
0.8	11
1.0	12
1.2	14
1.6	16
1.8	17



Welding too near the edge is not sufficiently strong and the sheet may warp.

d. Welding sequence.

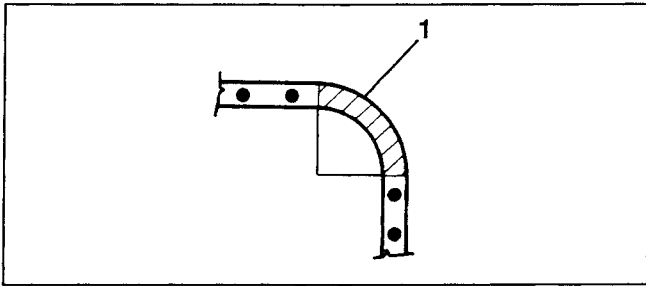
- Do not weld in one direction only. This method results in weak welds due to electricity shunting. If the electrodes overheat and change colour, leave them to cool and reshape the tips.



a. Correct welding sequence

b. Incorrect welding sequence

- e. Welding on angled surfaces.
- Do not weld on angled surfaces as a concentration of tension can cause breakage.



1. Angled surface without welding spots

Examples:

- Front pillar upper corner.
- Front part of rear wing.

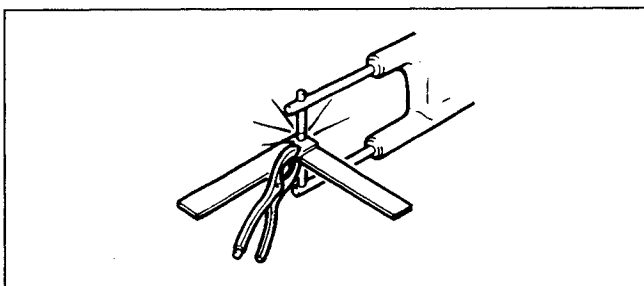
Inspecting the welding areas

The spot welding areas can be inspected in two ways: visually or by a destructive method.

The latter should be applied before and after welding. Spot welds should be equally spaced and positioned at the centre of the flange to be welded.

a. Sample test to be carried out before welding:

- Prepare the samples using sheet metal of the same thickness as the parts to be welded and secure them so that they do not move during welding. Carry out welding.

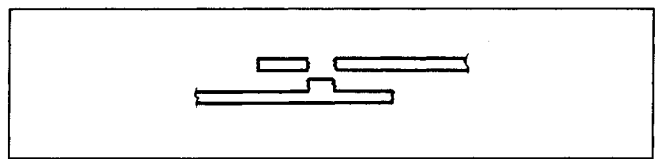


Rotate the samples around the spot weld until they detach and then inspect the break areas.

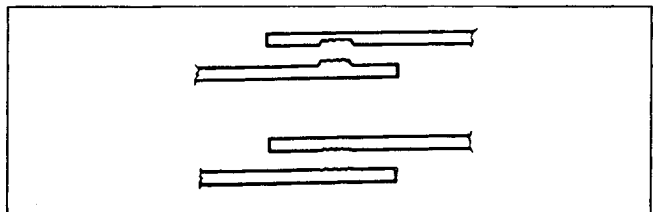
- The entire spot weld should remain on one of the two samples, while a circular hole should be on the other.

Otherwise the welding conditions are incorrect. Adjust the pressure, current, flow time and the other welding conditions, then repeat the test until satisfactory results are obtained.

CORRECT WELDING CONDITIONS

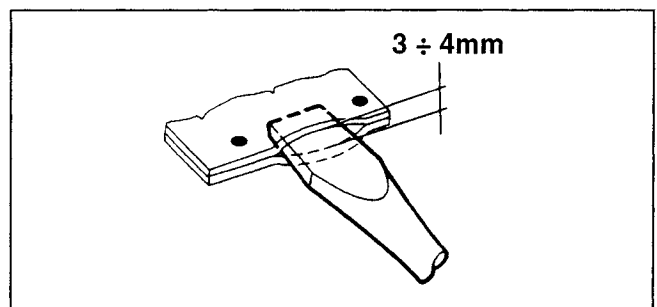


INCORRECT WELDING CONDITIONS



b. Test to be carried out after welding using a chisel and hammer.

- Insert the tip of the chisel between the welded metals and beat lightly on the chisel until a 3 ÷ 4 mm gap forms between the sheets; if warping does not occur in the weld, the result of the test is positive.



- If the sheets differ in thickness, the gap should be limited to 1.5 ± 2 mm.
- Bear in mind that the above-mentioned value is only for reference.
- This gap varies according to the position of the spot welds, the length of the flange, thickness of the sheet, angle of the weld and other factors. Do not exceed these limits to avoid detaching any spot welds.
- Make sure that, after the test, the warped part is repaired.

MIG WELDING

- Use the MIG welding method for parts for which spot welding is not possible.

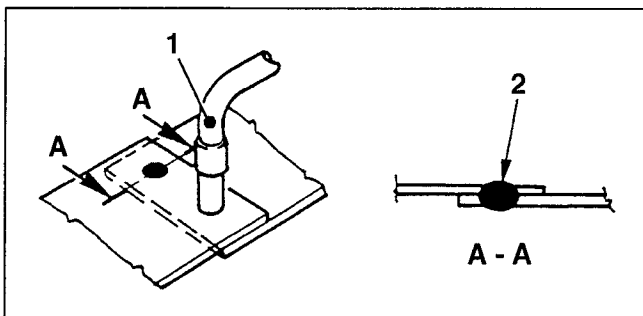
Conditions of the panel to be welded

Remove all traces of foreign matter by sanding or brushing. Paint, rust or oil on the surface of the sheet may reduce the welding strength and cause blistering.

Welding instructions

a. Filler weld (of prepared holes).

- Drill a hole $5 \div 6$ mm in diameter on one of the two sheets to be welded and clamp the sheets together.
- Position the blow pipe, fitted with an appropriate nozzle, at right angles to the sheet and fill the hole. At each interruption of the welding process a film of oxide is formed on the surface which causes blistering. If this occurs, remove the oxide with a brush.
- Ensure that the welding of the upper and lower sheets is perfect.



1. Blowpipe 2. Welding point

b. Butt welding.

- Tack the two mating surfaces by intermittent weld to prevent buckling and align them perfectly, then fill the empty spaces with small welding seams.

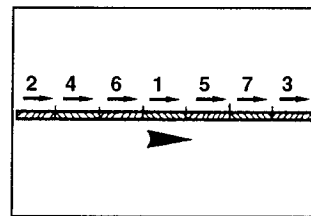
NOTE:

The correct gap is appr. 1 mm.

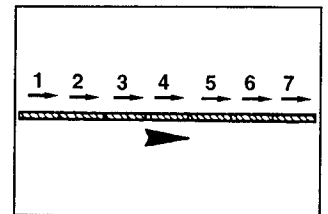
NOTE:

If the welding is intermittent distorsion is lower, if welding is continuous distorsion is higher.

- Do not weld a continuous seam as buckling may result. Proceed as illustrated to reduce buckling.

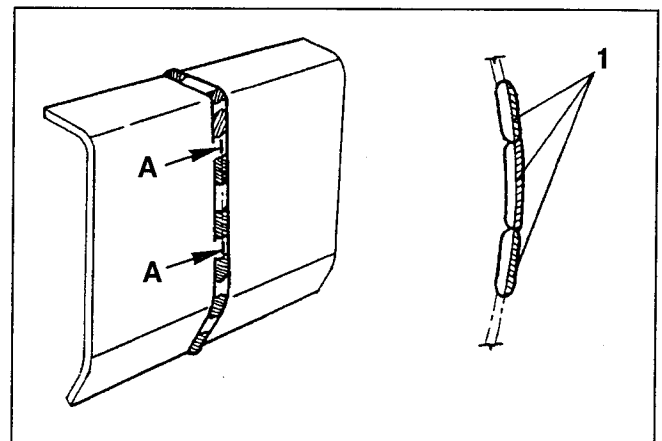


CORRECT



INCORRECT

- After welding, sand the weld following the profile of the part, if empty spaces remain, fill and sand.



1. Part of the seam to be flattened

Checking the fill weld

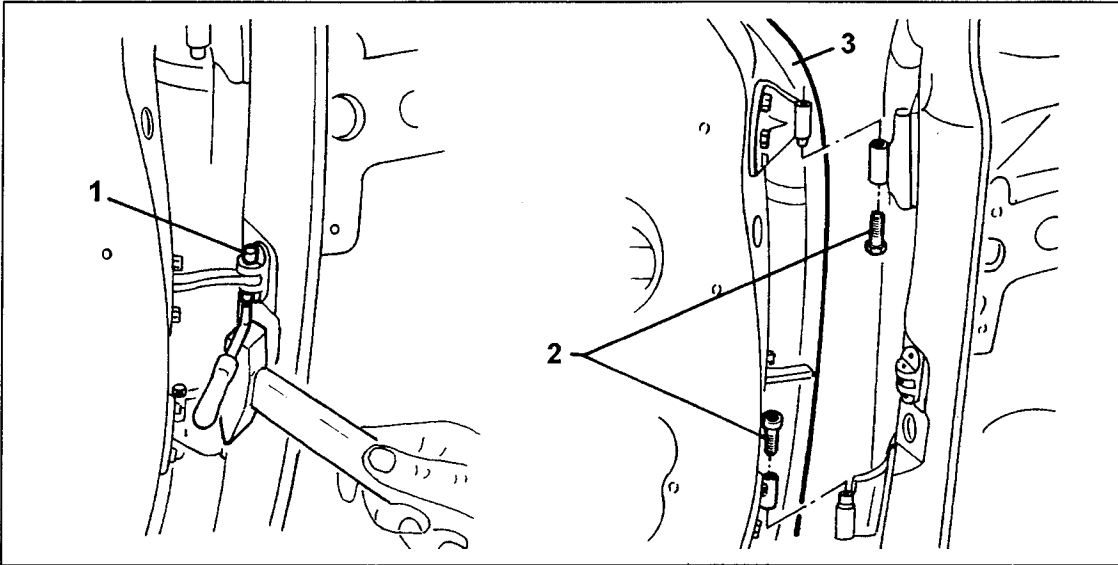
The welding test is substantially the same as described for spot welding.

BODY SQUARING

	L	L ^I	L ^{II}	L ^{III}	T	T ^I	T ^{II}	T ^{III}	T ^{IV}	T ^V	T ^{VI}	H	H ^I	H ^{II}	H ^{III}
Water radiator lower fastening	740	60			9 ± 0.5							192			
Water radiator upper fastening	288	309			692										
Dashboard crossmember and steering column fastenings	1364 ⁻² ₊₀				266 ± 1							526			
Gearbox fastenings	536.75	60	71.75		422	9	132					230			
Suspension crossmember front fastenings	938				270 ± 1							179 ± 1			
Front suspension shock absorber fastenings	206.35 ± 1	38.65	17.5		28.5	4.54						42	74	472.5	
Shock absorber connection pad fastenings	79	28.4			78										
Rear suspension crossmember fastenings	72	400			279.4 ± 1							24			
Engine fastenings	534.25	55	34		5	131									
Front bumper fastenings	1160 ± 2	1423			32	121	28.5	28				10	18.5	57.5	
Main hole	940 ± 1	710 ± 1	987 ± 0.5	487	640	678	2269					201			
Servobrake fastenings	222	193	176	233	193.2							228	220	24	9
Handbrake bracket and gearshift control support fastenings	280 ± 1	150			720	710	50	250	50	40		49.2			
Rear bumper fastenings	1430 ± 2	1427 ± 2	937.5 ± 1.5	62.5	46.5	8°	48.5					329	99	224	50
Rear suspension fastenings	11	12	25		58	481						141	24		

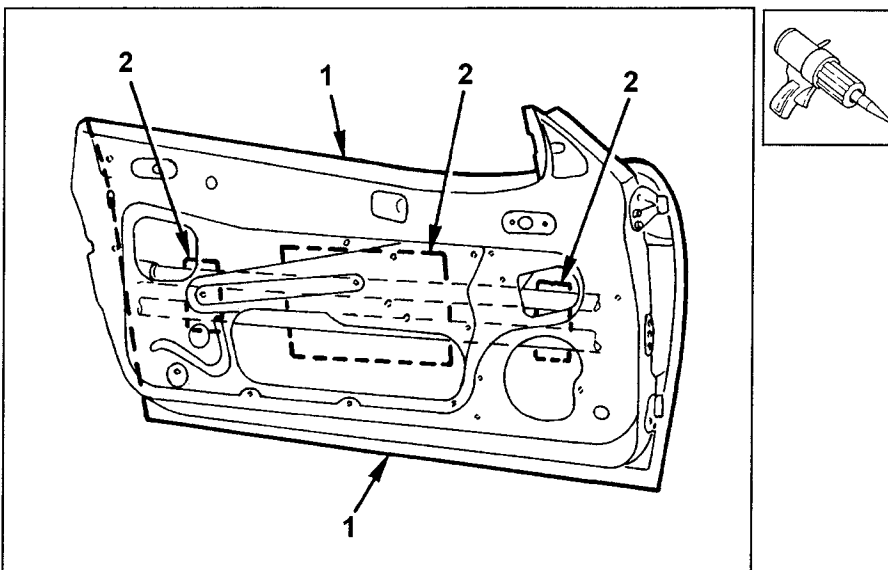
MOBILE BODY COMPONENTS**DOORS****REMOVING/REFITTING**

1. Remove the door check rod pin pulling upwards. Half close the door to move the rod in, then open again.
2. Slacken the two screws fastening the door to the hinges.
3. Raise the door until the hinge taper pins come out of their seats, then remove the door.



Refit the door reversing the sequence followed for removal observing the following instructions.

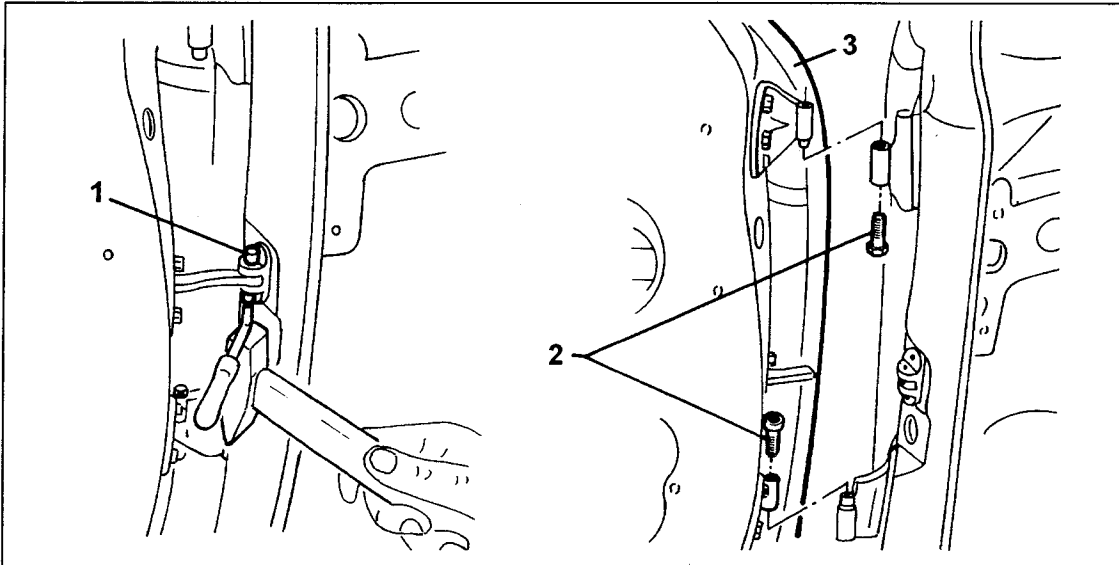
1. If a new door is fitted, apply the specified sealant around the inner perimeter.
2. Check that there are the damper panels inside the door.



– If necessary, adjust the door proceeding as described in the corresponding paragraph.

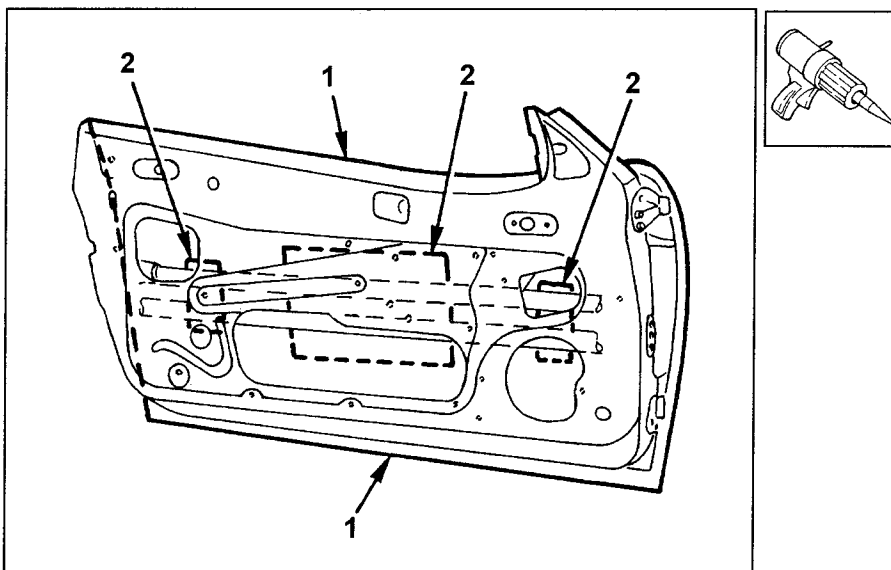
MOBILE BODY COMPONENTS**DOORS****REMOVING/REFITTING**

1. Remove the door check rod pin pulling upwards. Half close the door to move the rod in, then open again.
2. Slacken the two screws fastening the door to the hinges.
3. Raise the door until the hinge taper pins come out of their seats, then remove the door.



Refit the door reversing the sequence followed for removal observing the following instructions.

1. If a new door is fitted, apply the specified sealant around the inner perimeter.
2. Check that there are the damper panels inside the door.

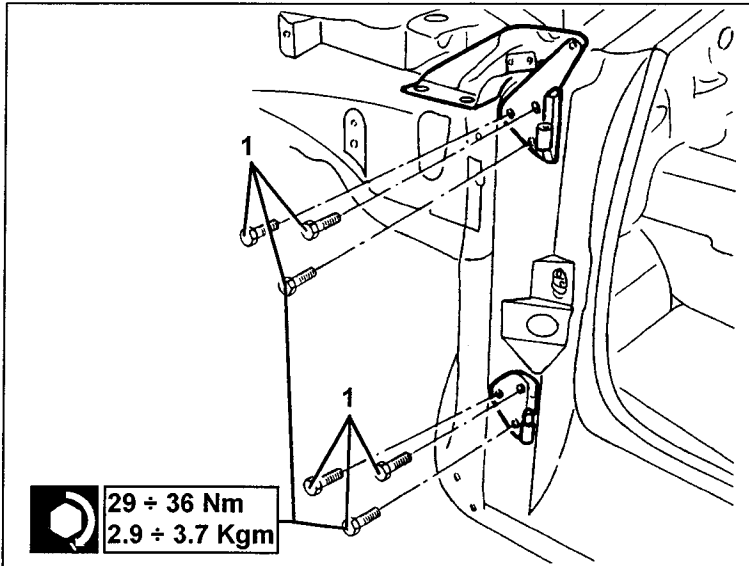


– If necessary, adjust the door proceeding as described in the corresponding paragraph.

HINGES**Removing/refitting**

– Remove the door (see specific paragraph).

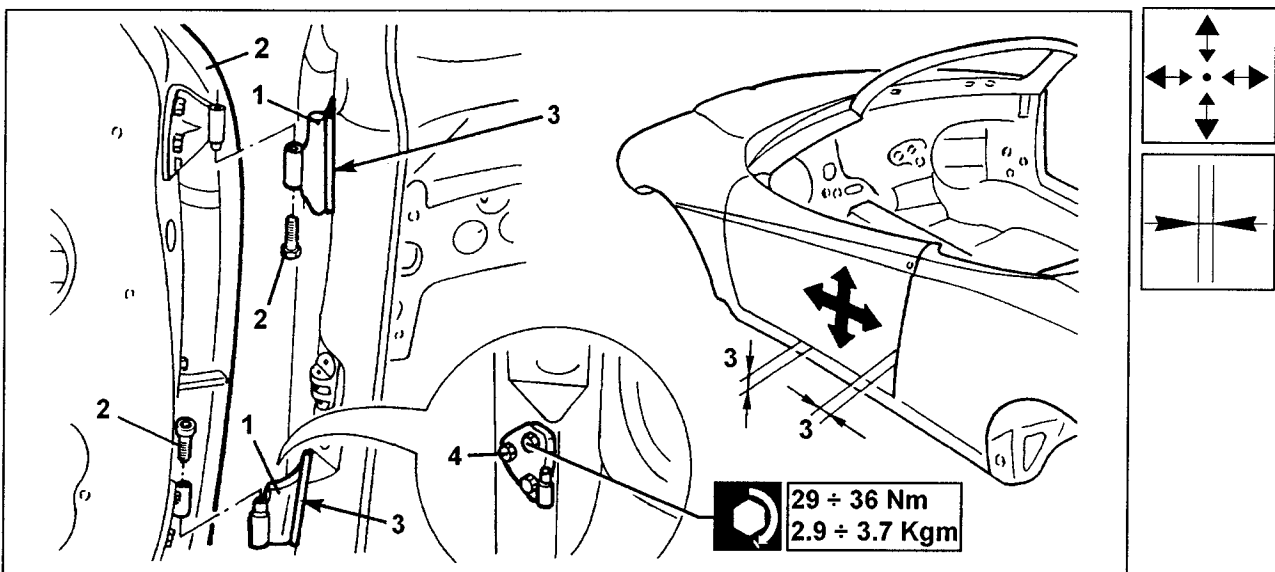
1. Slacken the three fastening screws and remove the hinges; to completely remove the upper hinges, it is also necessary to detach them from the bonnet (see specific paragraph).



Refit the hinges reversing the sequence followed for removal adjusting the door as described in the corresponding paragraph.

ADJUSTING DOORS AND HINGES

1. Install the hinges on the body (see specific paragraph) leaving the screws loose.
2. Install the door, completely tightening the hinge fastening screws.
3. Adjust the door longitudinally and in height, checking correct alignment of the gaps. If necessary, place some adjustment shims under the hinges.
4. Tighten the screws fastening the hinges to the body to the specified torque.

**NOTE:**

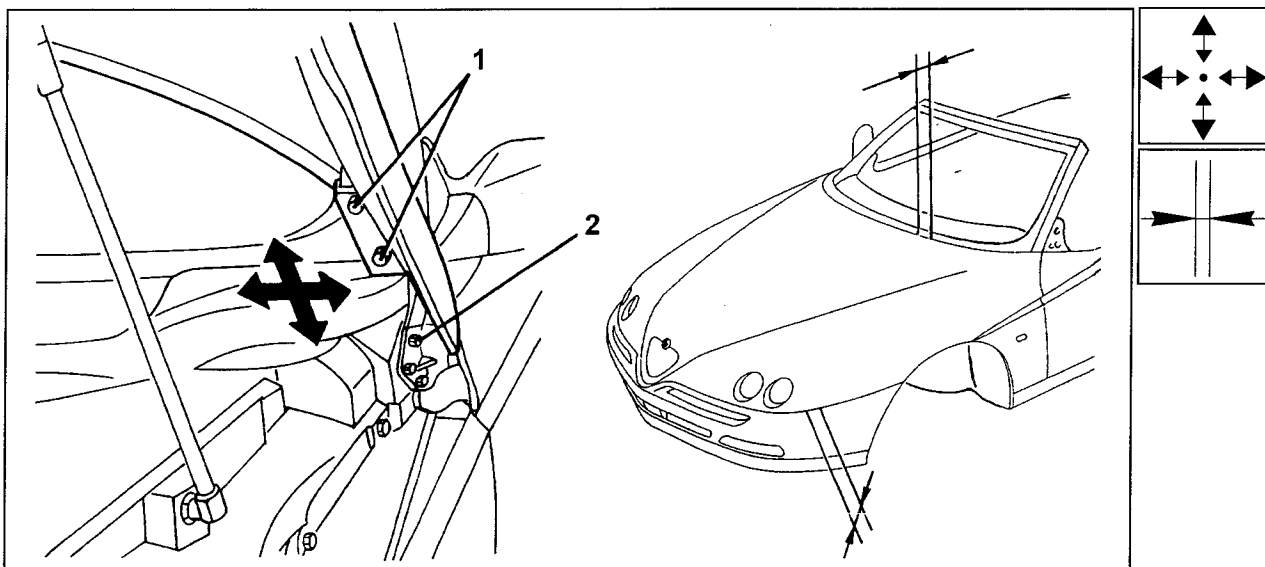
Before adjusting the door it should be fitted with the seals, lock and striker.

BONNET**REMOVING/REFITTING/ADJUSTMENT**

– The bonnet hinge is a single component with the upper door hinge

1. To remove the bonnet without adversely affecting door adjustment, it is necessary to slacken the screws shown leaving the hinge fastened to the body. (For removing/refitting/adjustment of the bonnet using these screws, see specific paragraph).

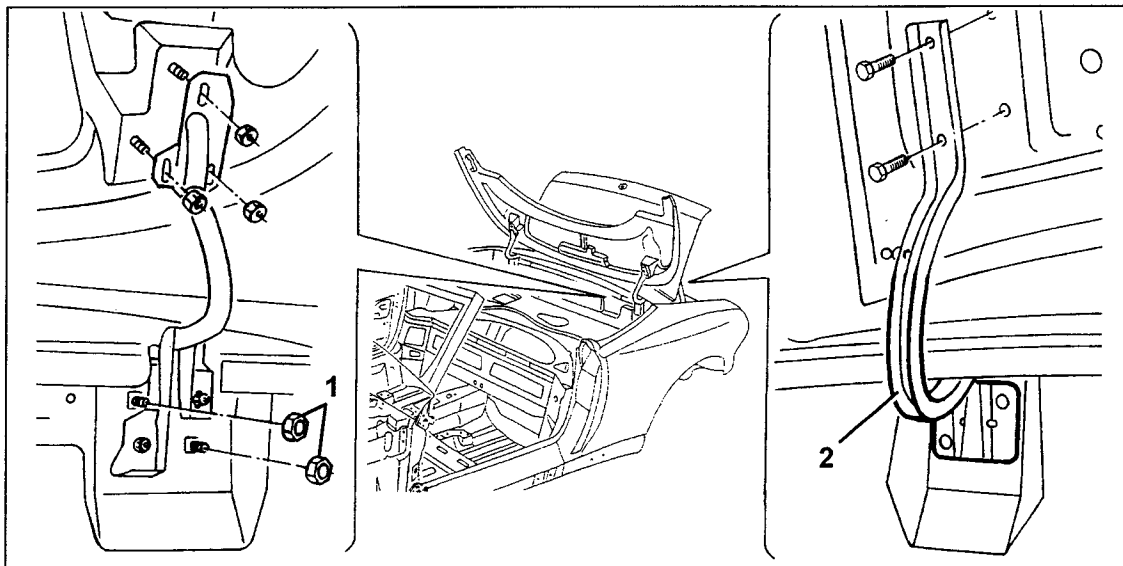
2. For removing the bonnet complete with hinges, refer to the paragraphs concerning "Removing/Refitting Hinges" of the doors and "Adjustment of Doors and Hinges".

**NOTE:**

To adjust the bonnet, the catch adjustment pin, damper pads and telescopic props must be installed.

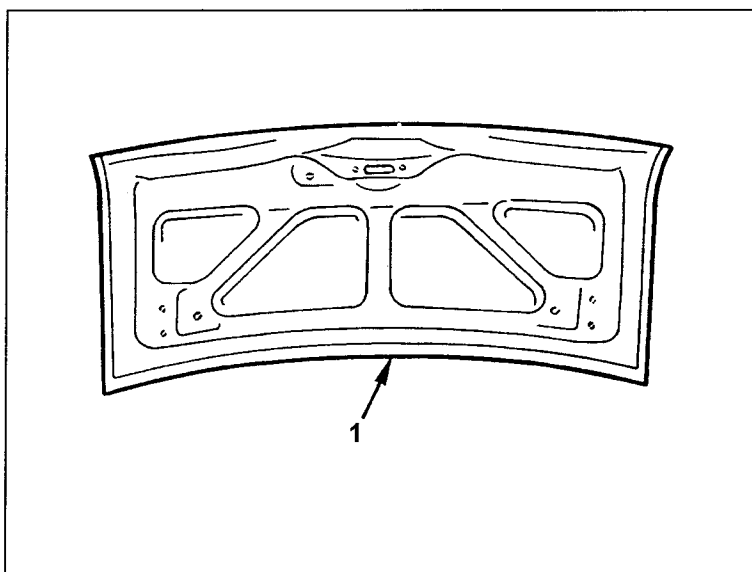
BOOT LID AND HINGES (for SPIDER)**REMOVING/REFITTING**

- Remove the boot lid (see specific paragraph).
- Open the hood compartment cover and support it appropriately.
- 1. From the hood compartment side, slacken (from both sides) the two nuts illustrated.
- 2. Remove the boot lid hinges.



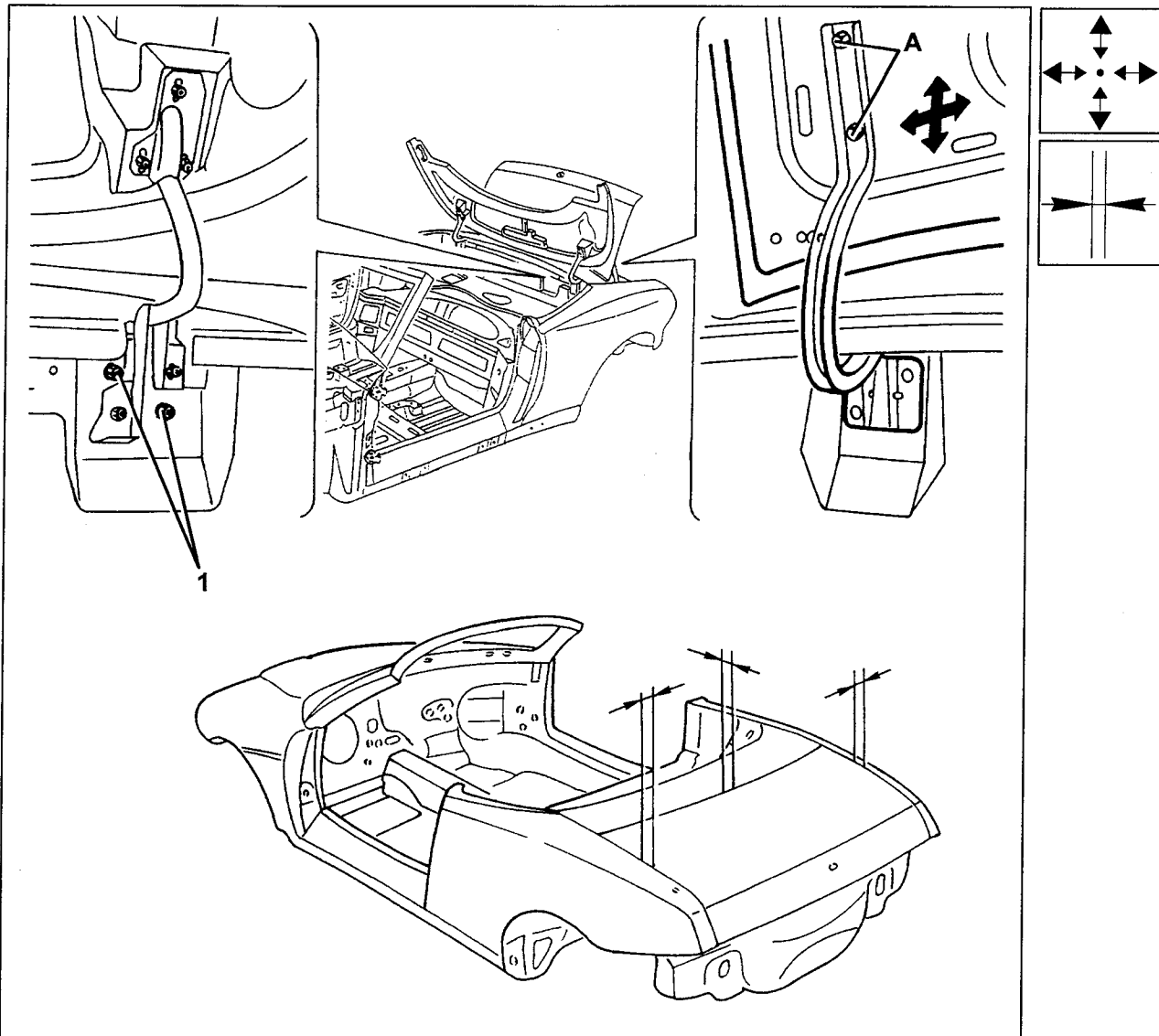
Refit the hinges and boot lid reversing the sequence followed for removal and observing the following instructions:

1. If a new boot lid is to be installed, before painting it, apply the specified sealant around the inner perimeter of the lid.



ADJUSTMENT

1. Working on the screws adjust the lid longitudinally and at the sides, checking the alignment and gaps; also bear in mind the further possibility of adjustment using screws A (see specific paragraph).



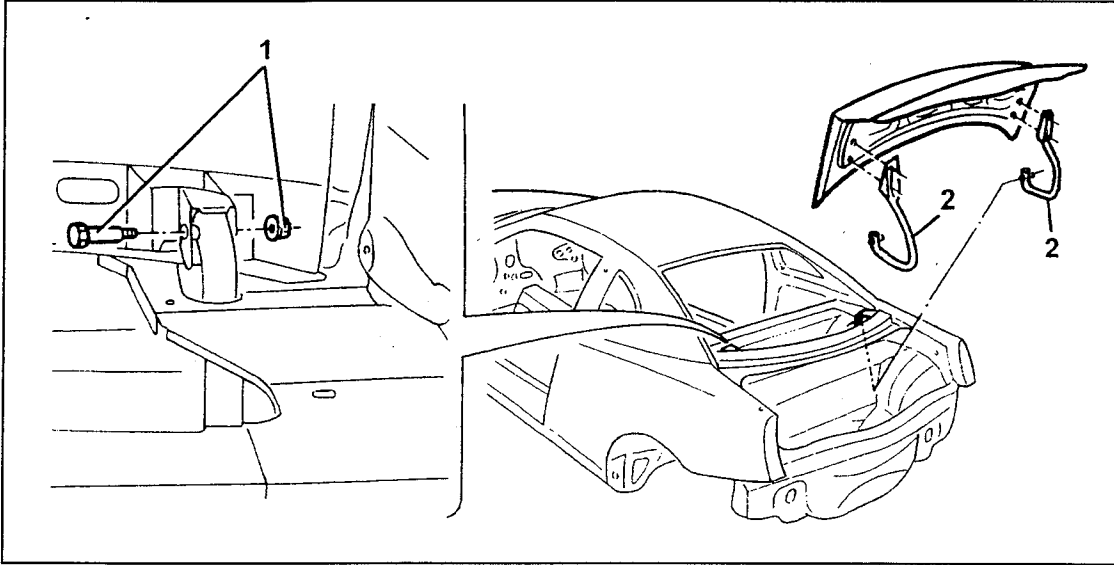
NOTE:

Before adjusting the boot lid, the seal, lock and telescopic props should be installed.

BOOT LID AND HINGES (for GTV)

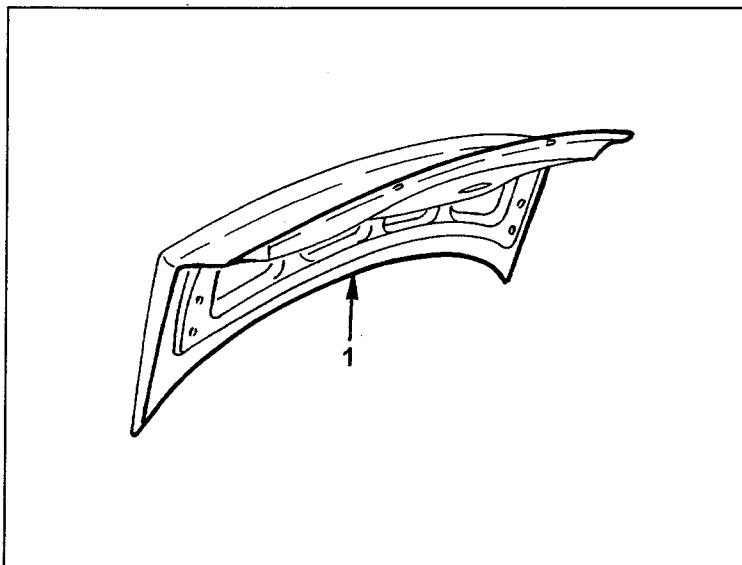
REMOVING/REFITTING

- Remove the boot lid (see specific paragraph).
- 1. From the passenger compartment side remove the nuts and withdraw the hinge pins.
- 2. Remove the boot lid hinges.



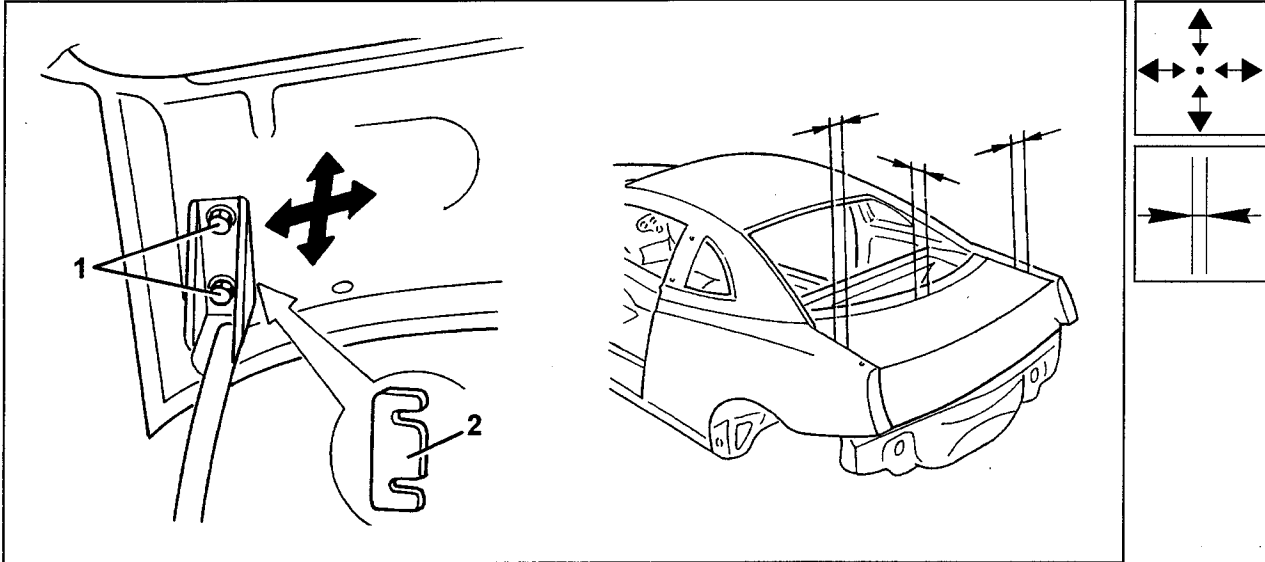
Refit the hinges and the boot lid reversing the sequence followed for removal and observing the following instructions:

- 1. If a new boot lid is to be installed, before painting it, apply the specified sealant around the inner perimeter of the lid.



ADJUSTMENT

1. Adjust the boot lid longitudinally and transversally, working on the screws fastening the hinges to the lid, checking the alignment and gaps.
2. If necessary, increase or reduce the shims for adjusting the lid in height.



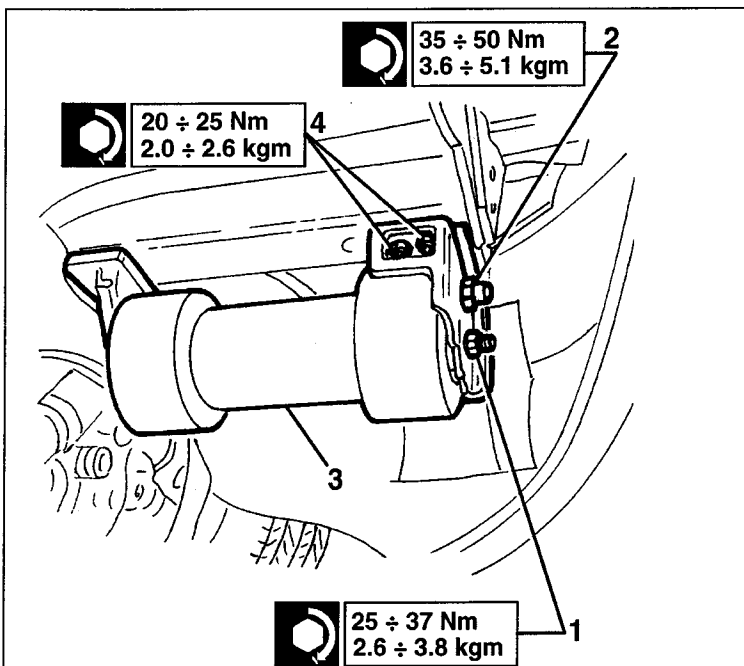
NOTE:

Before adjusting the boot lid, the seal, lock and telescopic props should be installed.

DAMPING MASS (SPIDER ONLY)

REMOVING

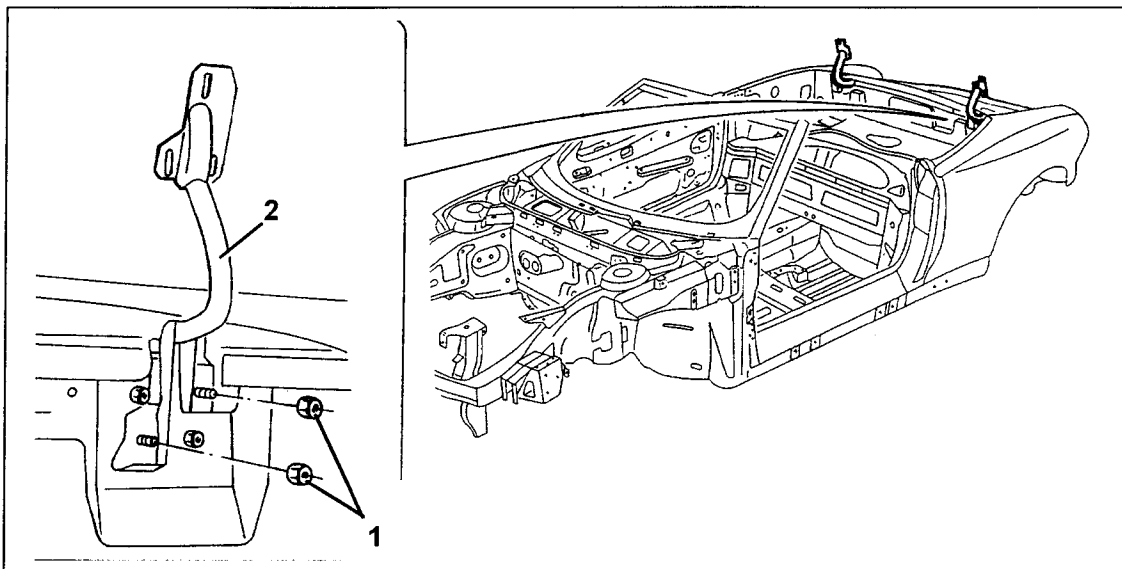
- Raise the car.
1. Slacken and remove the fastening nuts.
 2. Slacken and remove the stay screws.
 3. Remove the damping mass.
 4. If necessary, slacken the screws and remove the brackets.



Refit the damping mass reversing the sequence followed for removal and observing the specified tightening torques.

HOOD COMPARTMENT COVER AND HINGES (for SPIDER)**REMOVING/REFITTING**

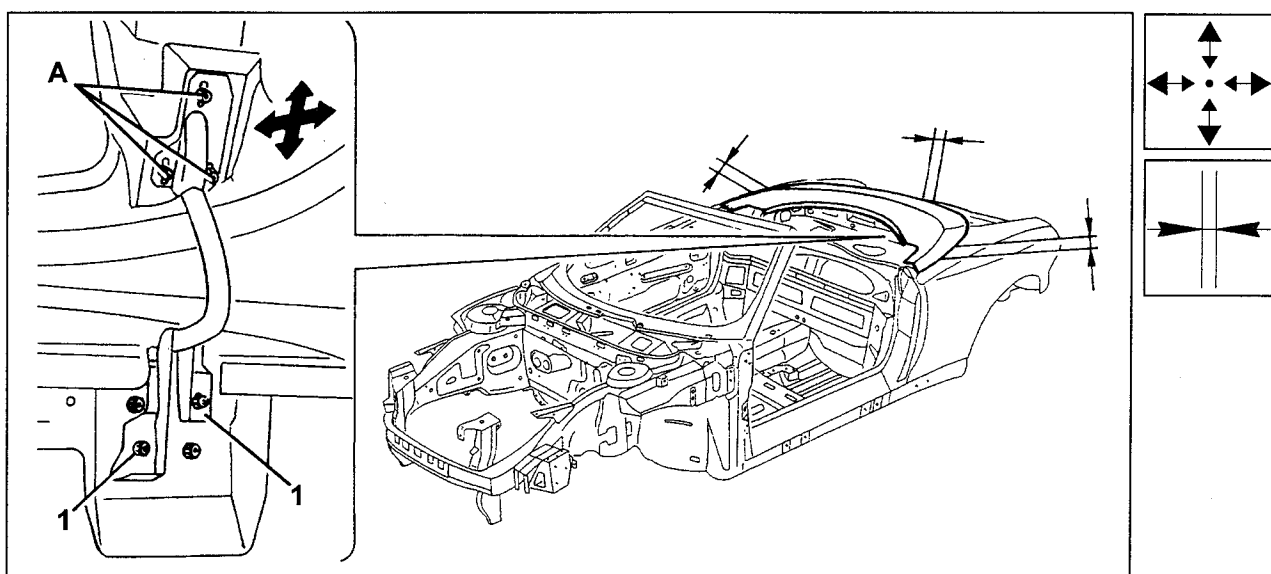
- Remove the hood compartment cover (see specific paragraph).
- 1. Slacken from both sides, the two nuts illustrated.
- 2. Remove the hinges of the hood compartment cover.



Refit the hood compartment reversing the sequence followed for removal.

ADJUSTMENT

1. Fit the hinges and the hood compartment cover, then working on the screws adjust longitudinally and at the sides, checking alignment and the gaps; also bear in mind the further possibilities of adjustment using screws A (see specific paragraph).

**NOTE:**

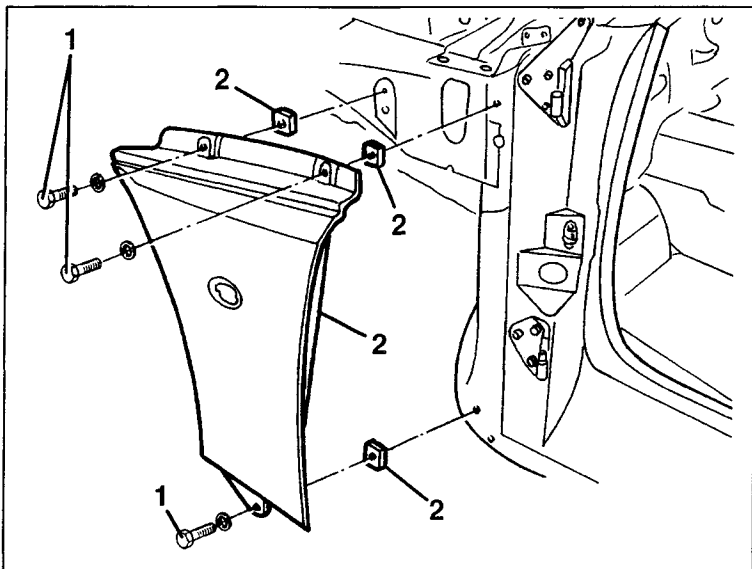
Before adjusting the hood compartment cover, the seal and locks should be installed.

FRONT WING

REMOVING/REFITTING

– Open the bonnet and support it suitably.

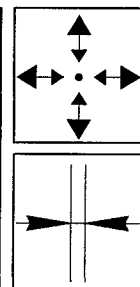
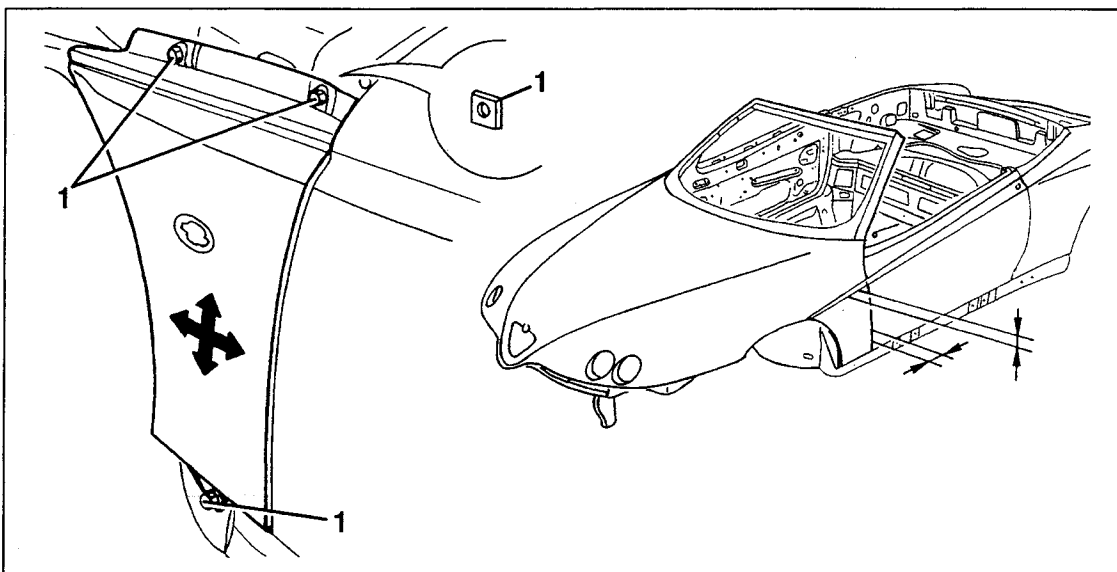
1. Slacken the three screws fastening the front wing to the structure.
2. Remove the front wind and any shims.



Refit the front wing reversing the sequence followed for removal.

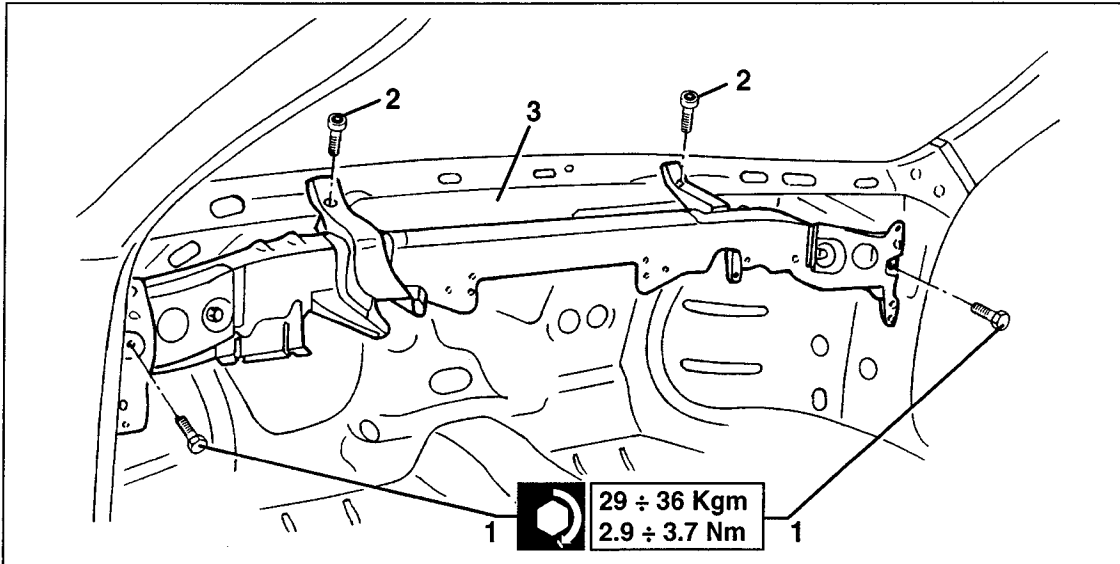
ADJUSTMENT

1. Adjust the front wing longitudinally and vertically working on the fastening screws, checking the alignment and gaps; if necessary add some shims.

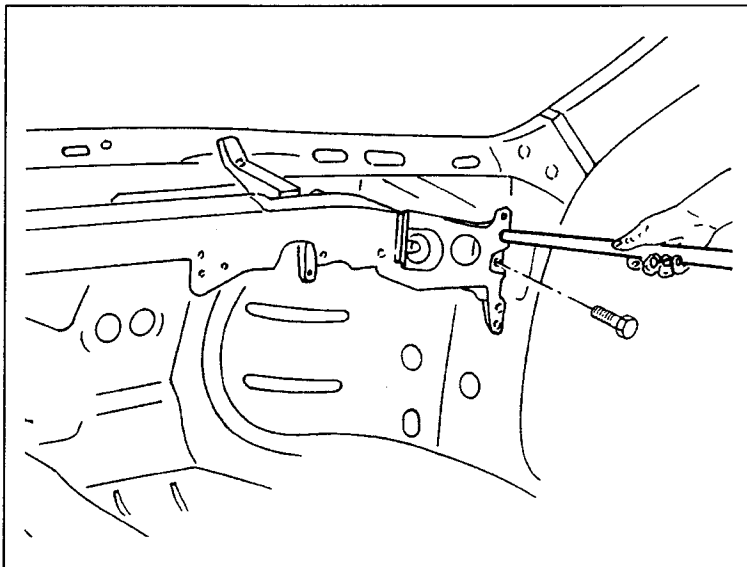


DASHBOARD SUPPORT CROSSMEMBER**REMOVING/REFITTING**

1. Slacken the two crossmember side fastening screws.
2. Slacken the two upper crossmember fastening screws.
3. Remove the dashboard support crossmember.



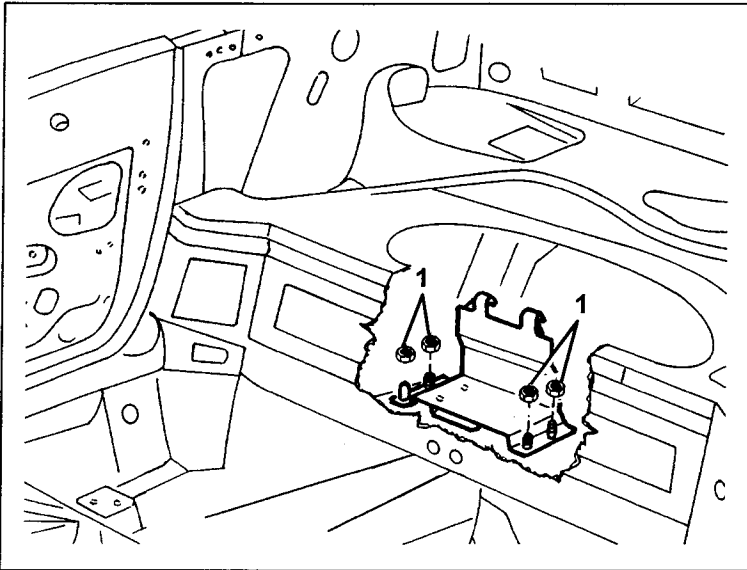
When refitting, to facilitate centering of the screw, use a lever on the hole provided, as illustrated.



BATTERY SUPPORT (only for SPIDER)

REMOVING/REFITTING

1. Slacken the four fastening nuts and remove the battery support.

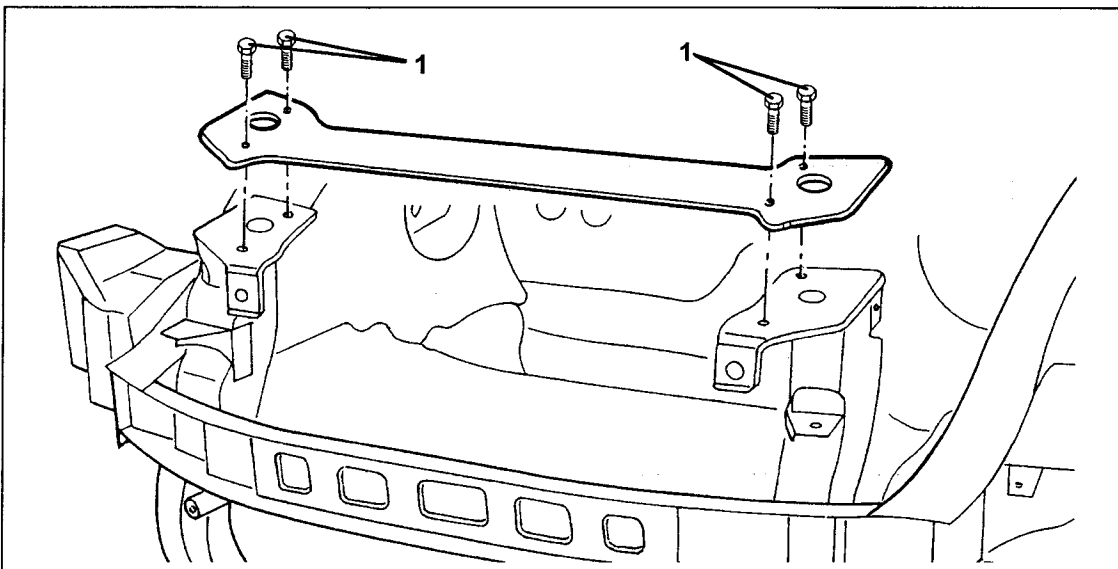


Refit the battery support reversing the sequence followed for removal.

RADIATOR COVER CROSSMEMBER

REMOVING/REFITTING

1. Slacken the four fastening screws and remove the radiator cover crossmember.

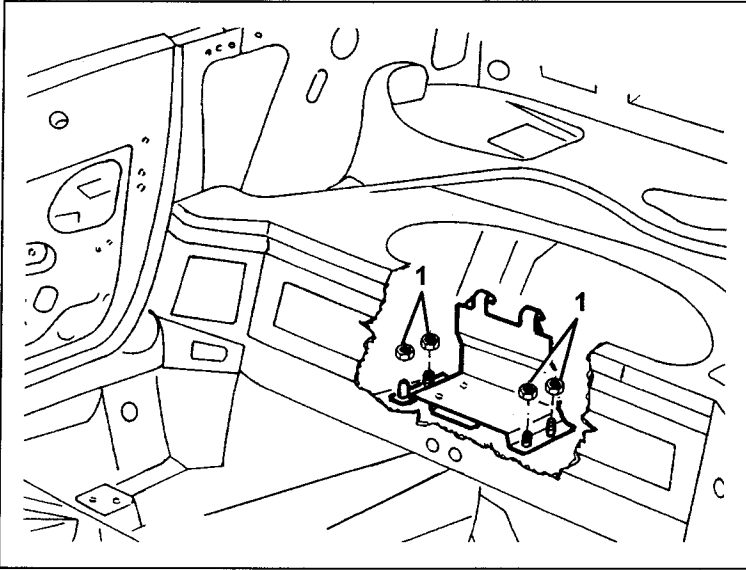


Refit the radiator cover crossmember reversing the sequence followed for removal.

BATTERY SUPPORT (only for SPIDER)

REMOVING/REFITTING

1. Slacken the four fastening nuts and remove the battery support.

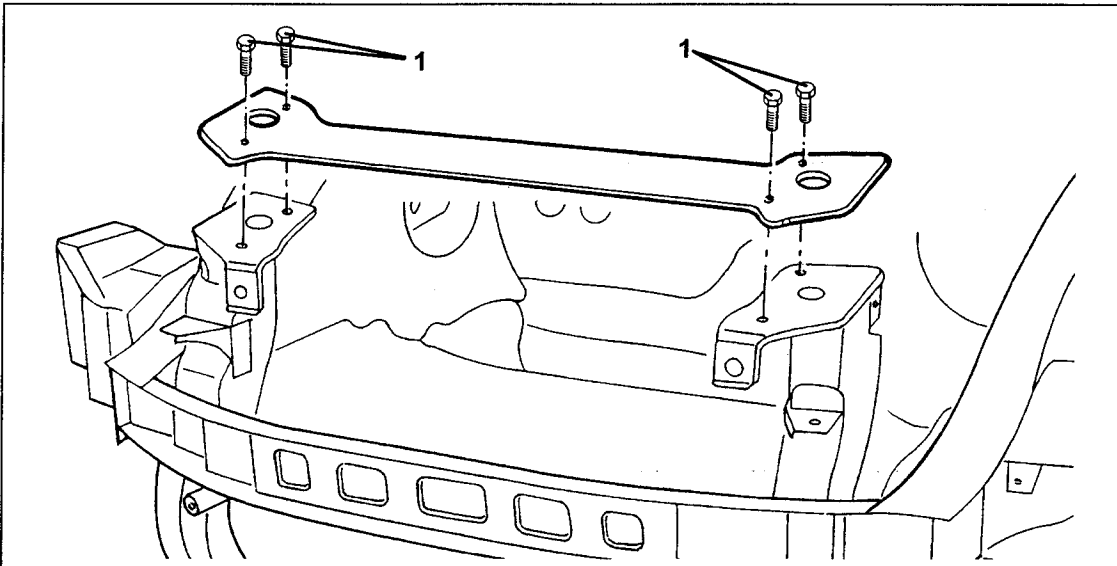


Refit the battery support reversing the sequence followed for removal.

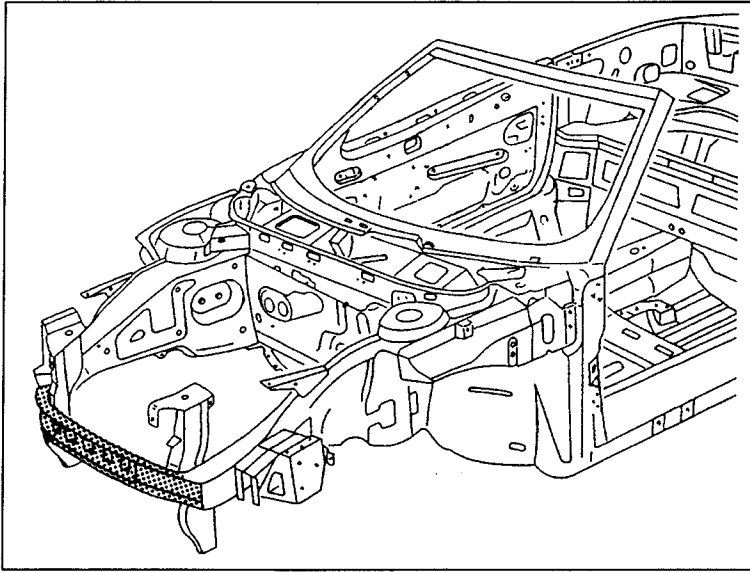
RADIATOR COVER CROSSMEMBER

REMOVING/REFITTING

1. Slacken the four fastening screws and remove the radiator cover crossmember.



Refit the radiator cover crossmember reversing the sequence followed for removal.

FIXED BODY COMPONENTS**REPLACING THE FRONT CROSSMEMBER**

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

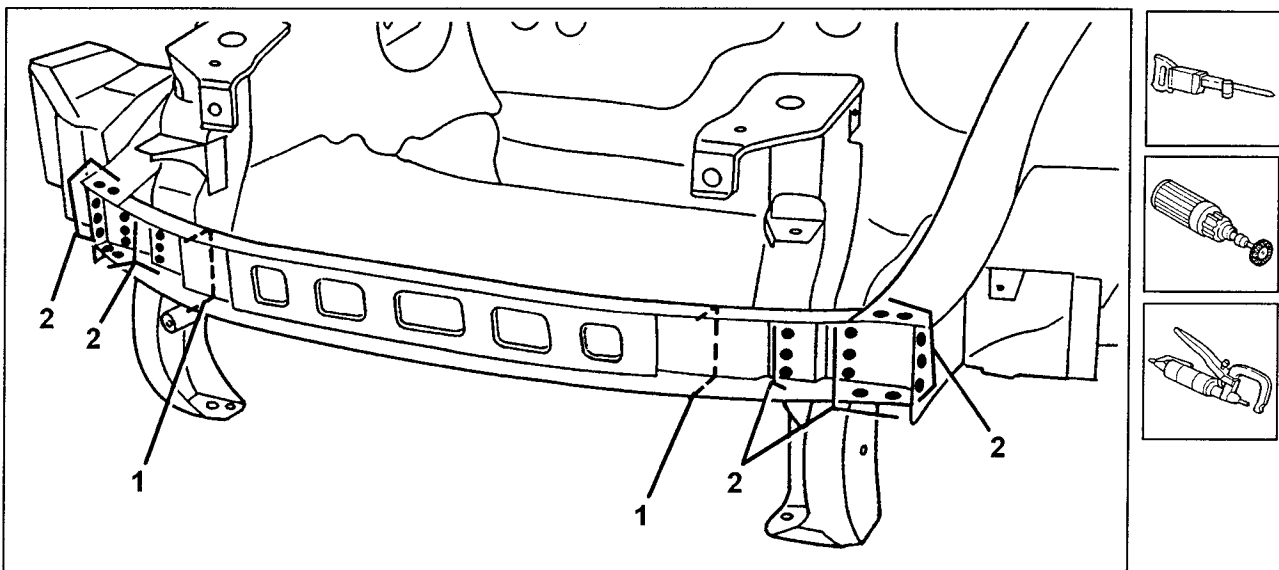
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

– Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

REMOVAL

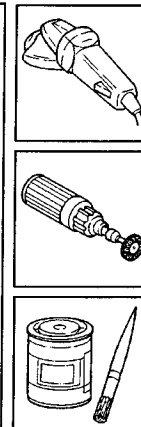
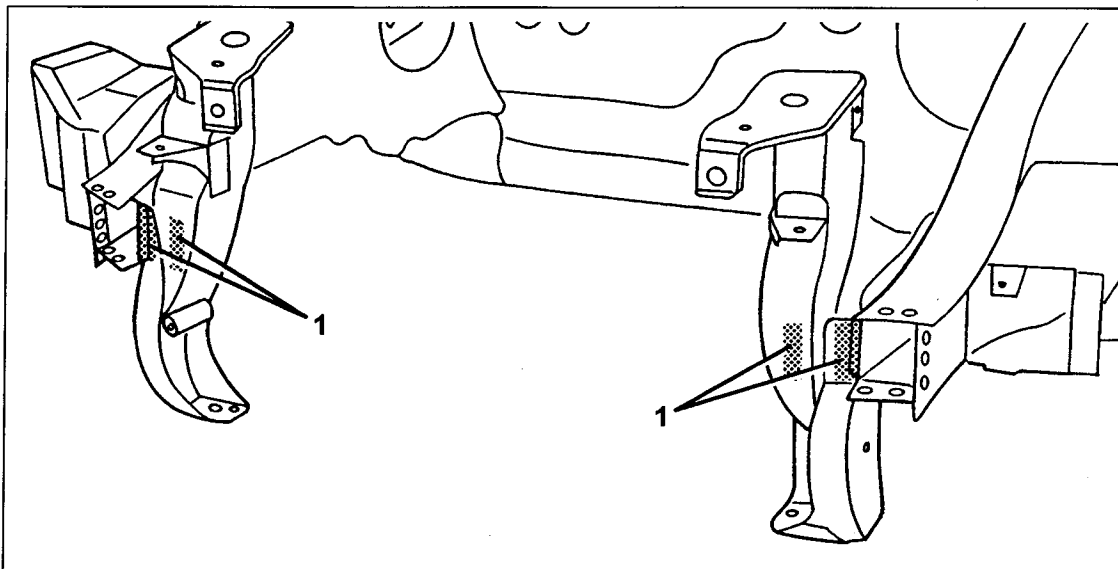
1. Using a hack saw, cut the front crossmember, following the lines shown in the illustration.
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
- Remove the two ends of the front crossmember.



When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

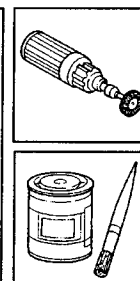
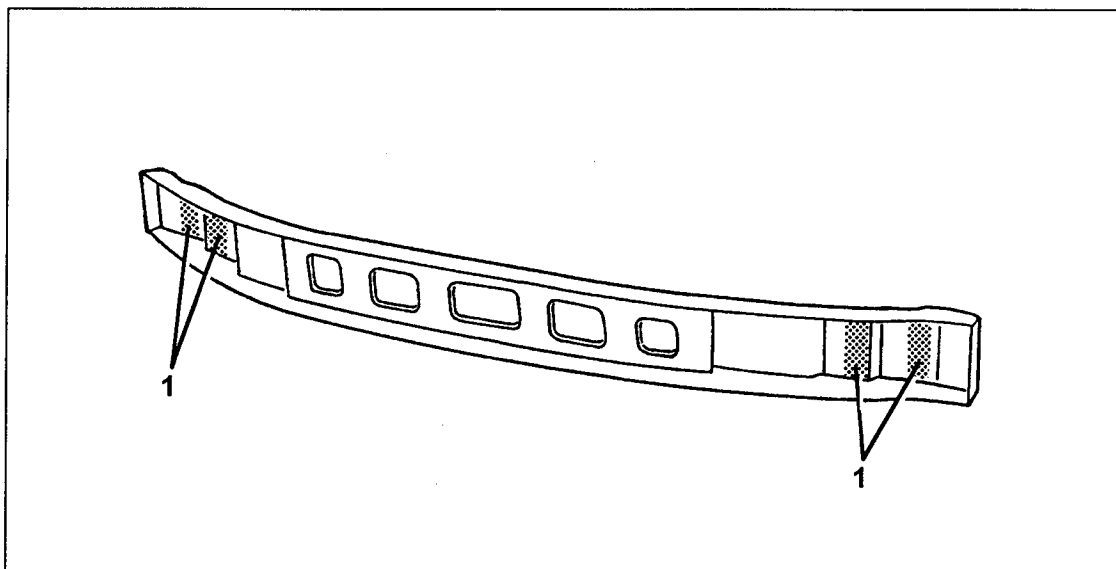
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



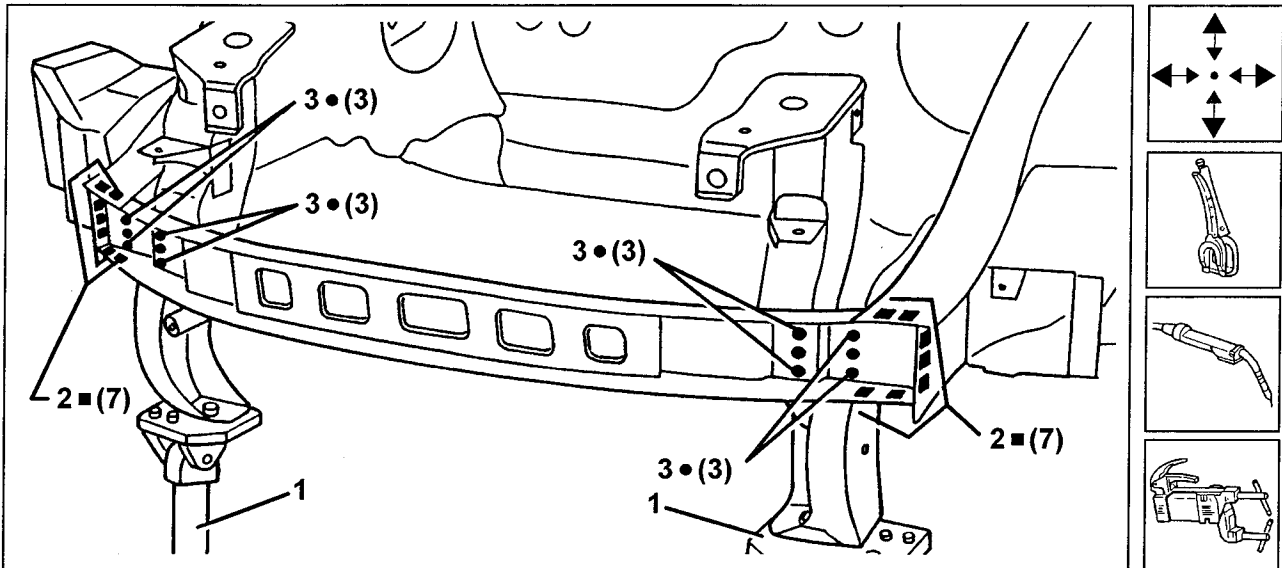
PREPARING THE SPARE - FRONT CROSSMEMBER

- Clean the areas of the front crossmember involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - FRONT CROSSMEMBER

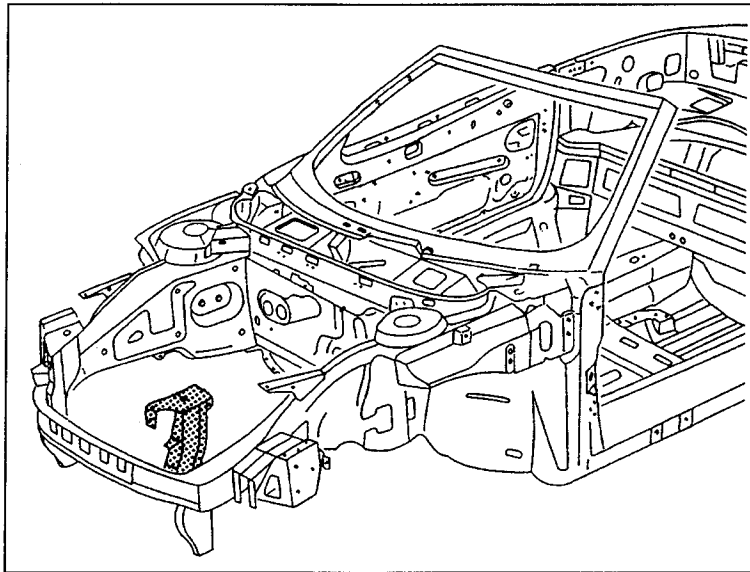
1. Position the front crossmember correctly using the template.
 - Clamp the components to be welded mating the edges and check alignment.
2. Fill weld using a MIG welder.
3. Spot weld, as illustrated.

**FINISHING OPERATIONS**

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE BONNET SUPPORT

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

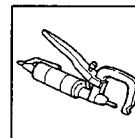
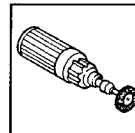
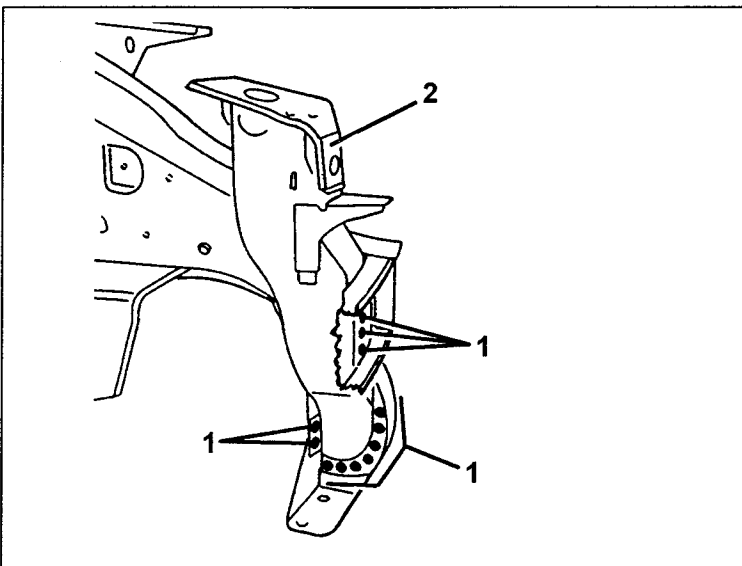
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

– Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

REMOVAL

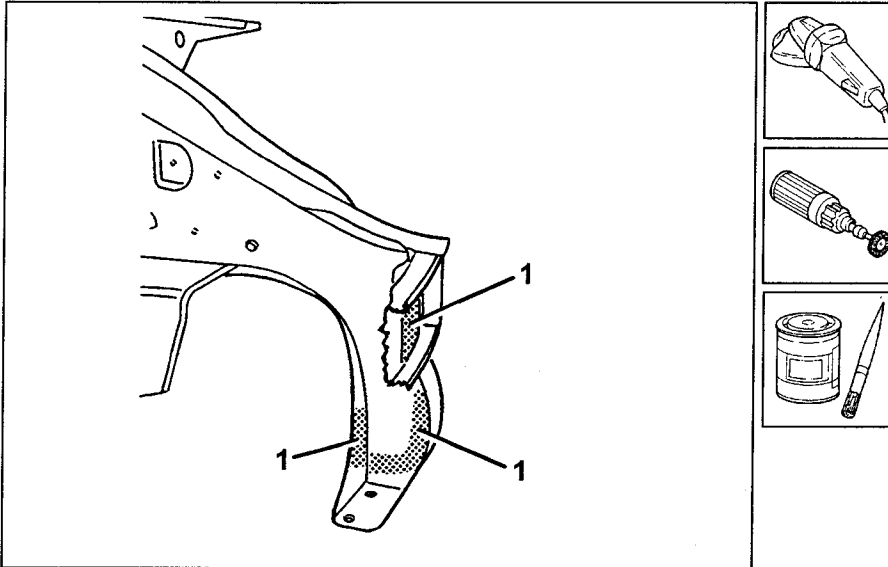
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- Remove the bonnet support.



When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

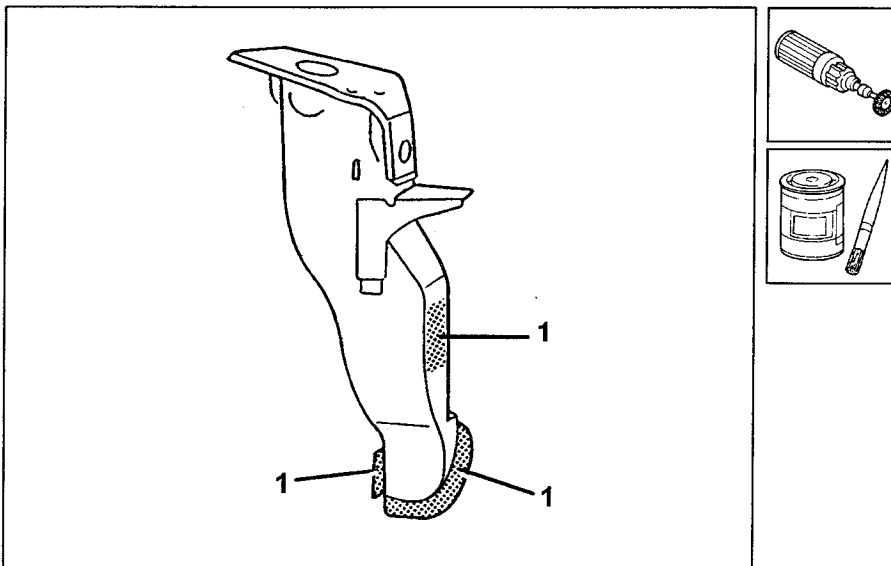
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



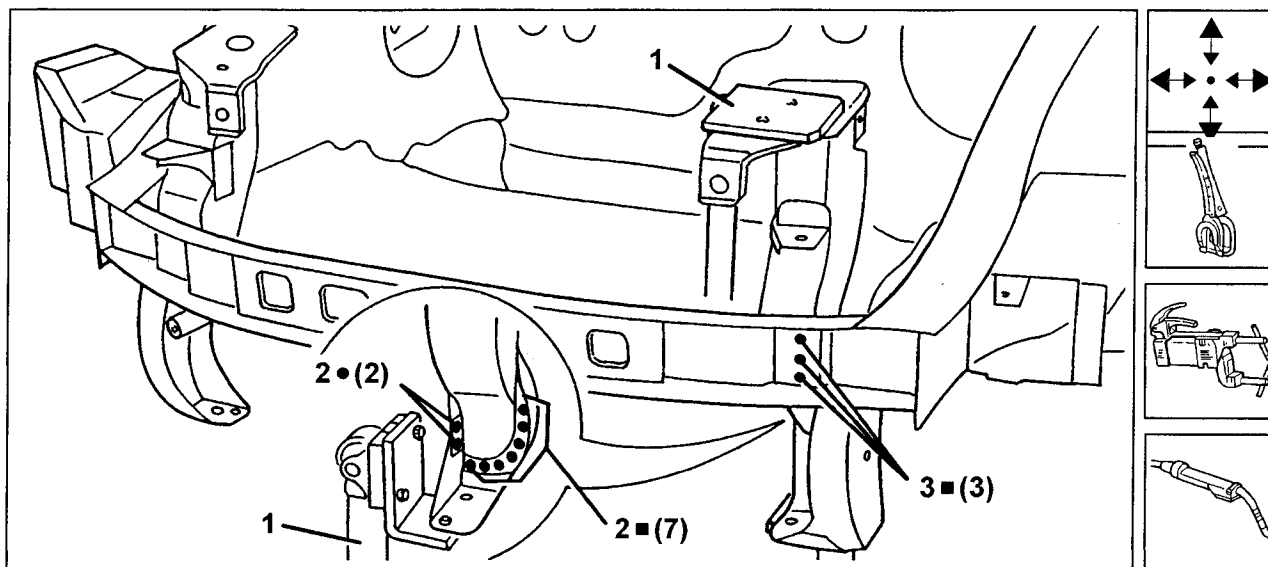
PREPARING THE SPARE - BONNET SUPPORT

- Clean the areas of the bonnet support involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - BONNET SUPPORT

1. Position the bonnet support correctly using the template.
 - Clamp the components to be welded mating the edges and check alignment.
2. Spot weld as illustrated.
3. Fill weld using an MIG welder.

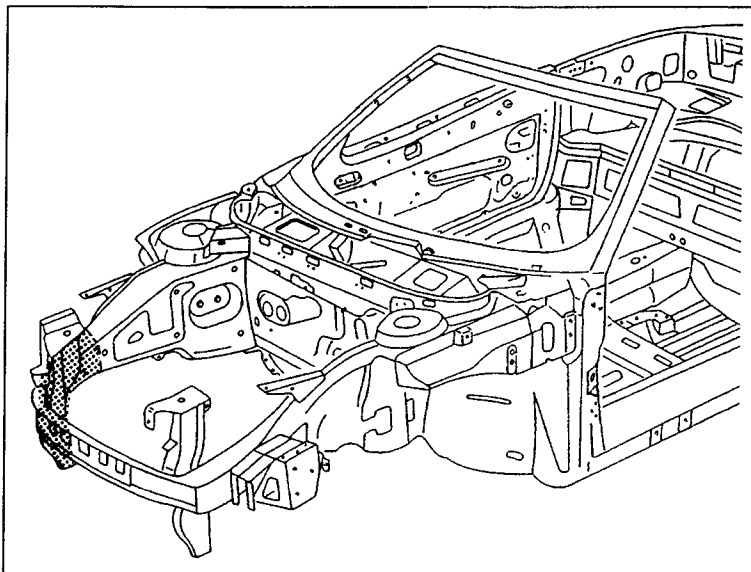


FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



PARTIALLY REPLACING THE FRONT SIDE PANEL END

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

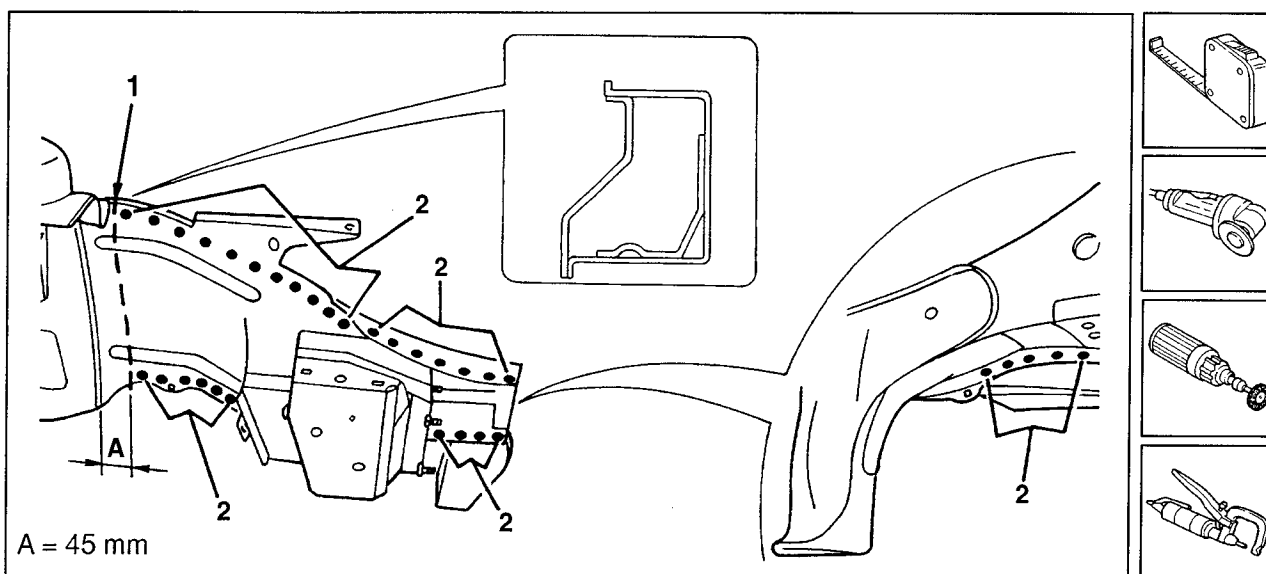
If necessary carry out body straightening operations before cutting the part. After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.
- Remove the front crossmember and bonnet support (see: "Changing the Front Crossmember" and "Changing the Bonnet Support").

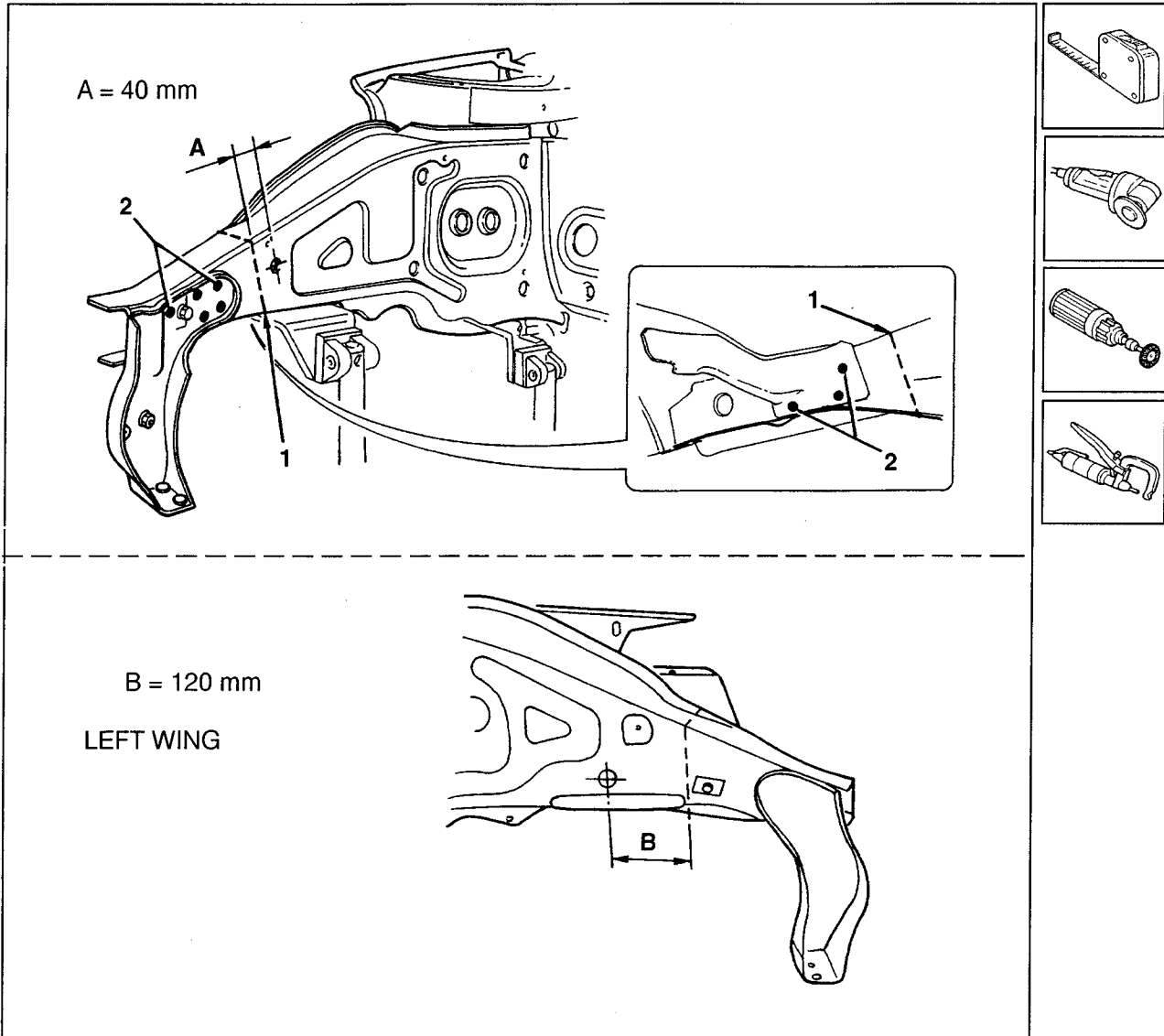
REMOVAL

- Using a circular saw, cut the outer side panel at the distance shown without damaging the reinforcement below. The section of sheet in the more important point is shown so that the operator can adjust the cutting depth.
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 2. Remove the welding spots using a de-welder.
- Remove the end of the front side panel.



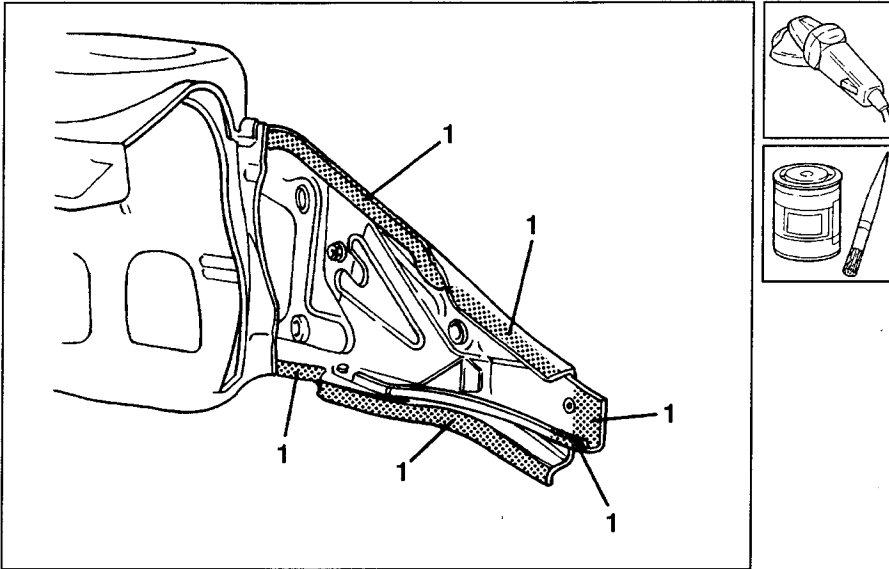
When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

1. Using a circular saw, cut the inner side panel at the distance shown, without damaging the reinforcement below.
– Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.



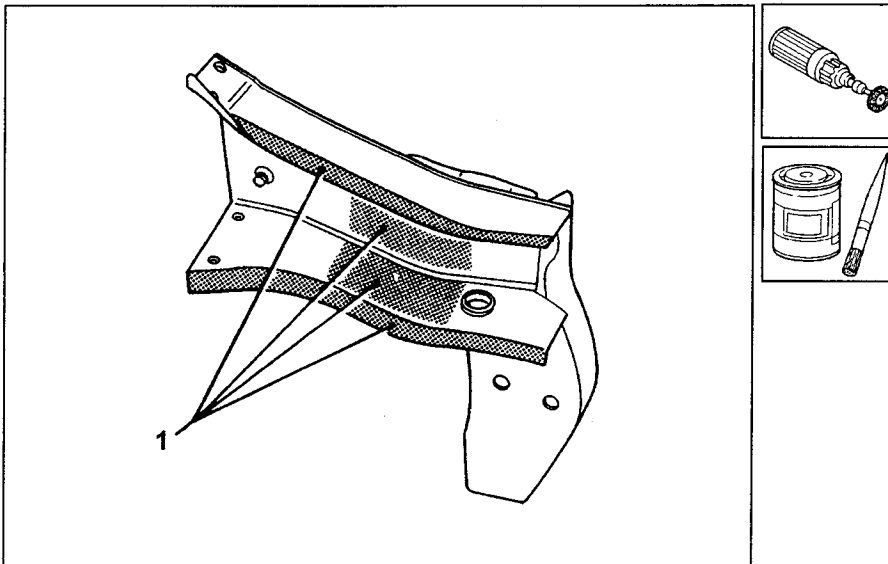
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
- Remove the welding spot remains using a disk sander.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.



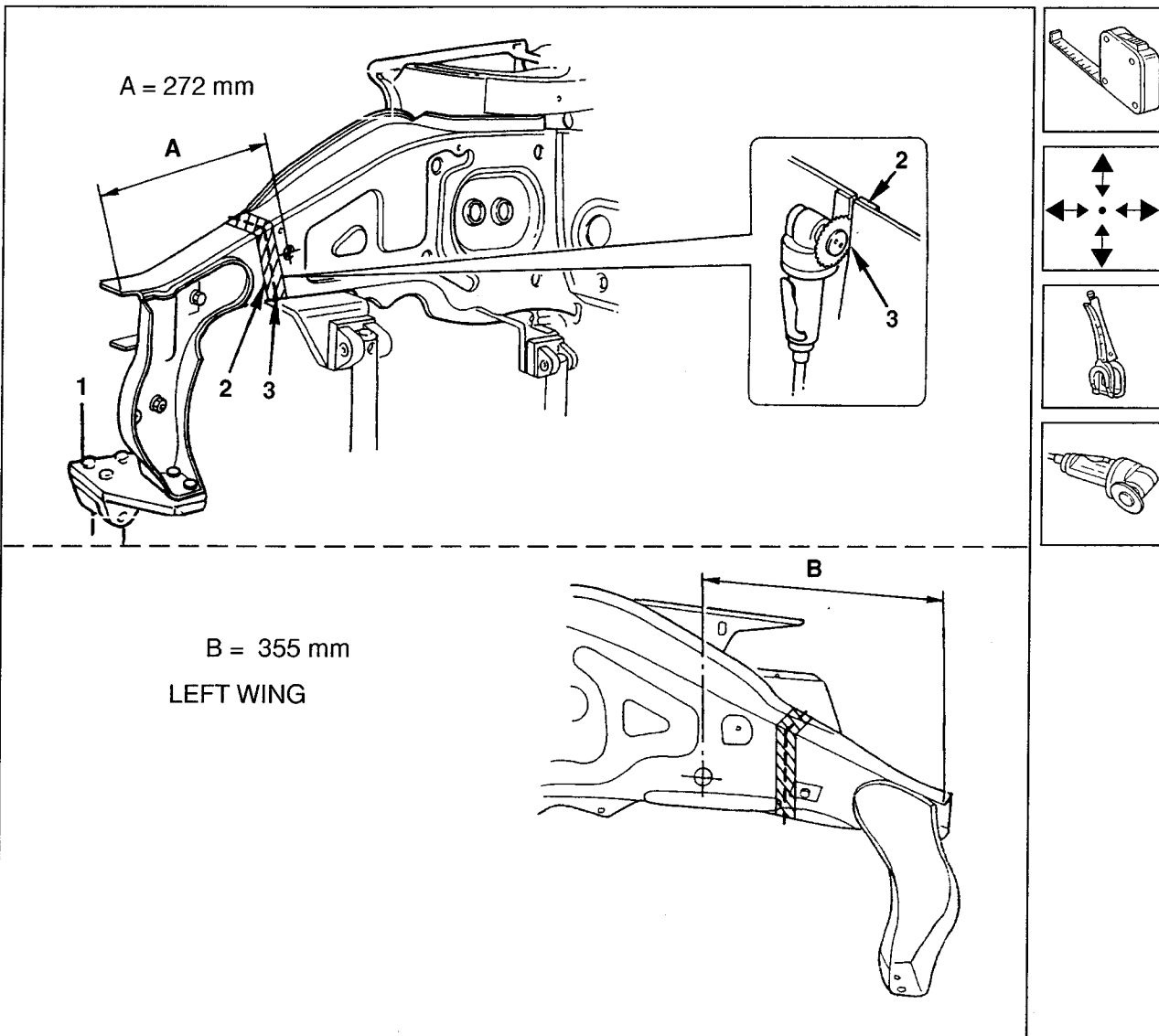
PREPARING THE SPARE - INNER SIDE PANEL

- Clean the perimeter of the inner side panel and the areas involved by welding using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.



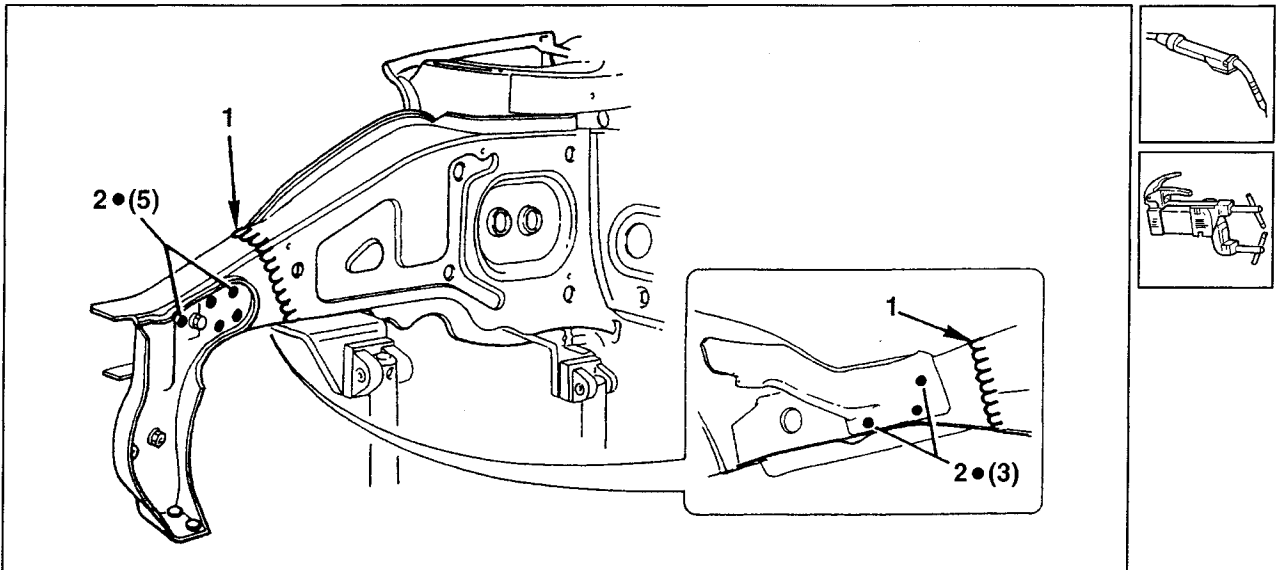
POSITIONING THE SPARE - INNER SIDE PANEL

1. Position the inner side panel correctly using the template and checking dimension A illustrated.
2. Overlay and clamp the components to be welded mating the edges and check alignment.
3. Trim the sheets eliminating the excess, using a circular saw; take care not to damage the reinforcement below.



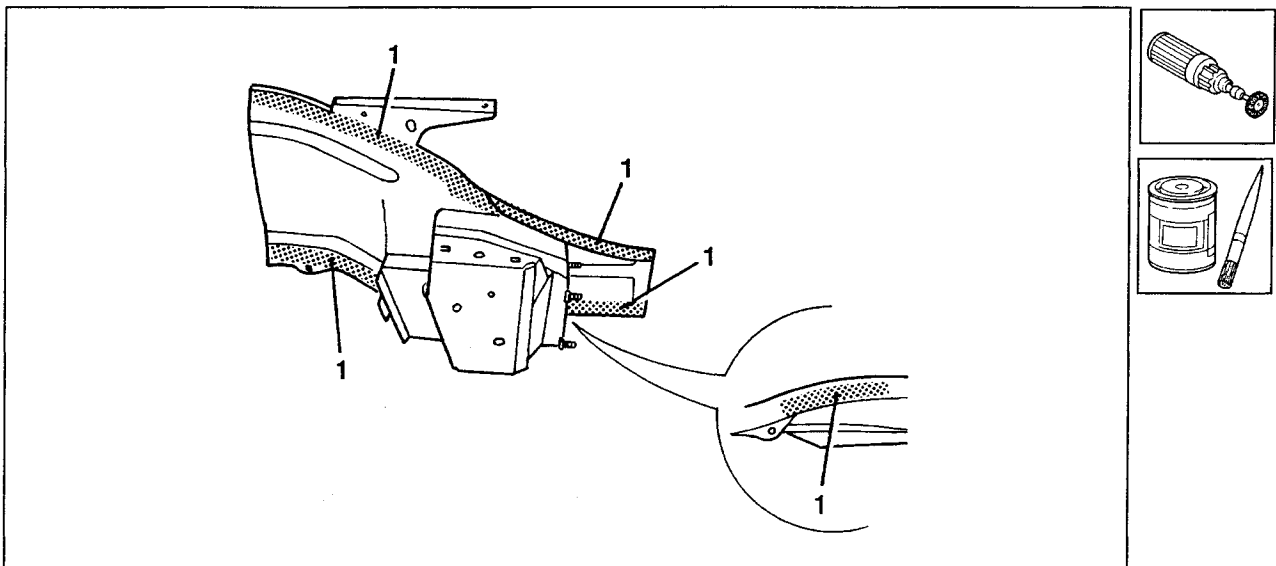
WELDING THE SPARE - INNER SIDE PANEL

1. Weld using a MIG welder.
2. Spot weld as illustrated (not present on left-hand inner side panel).



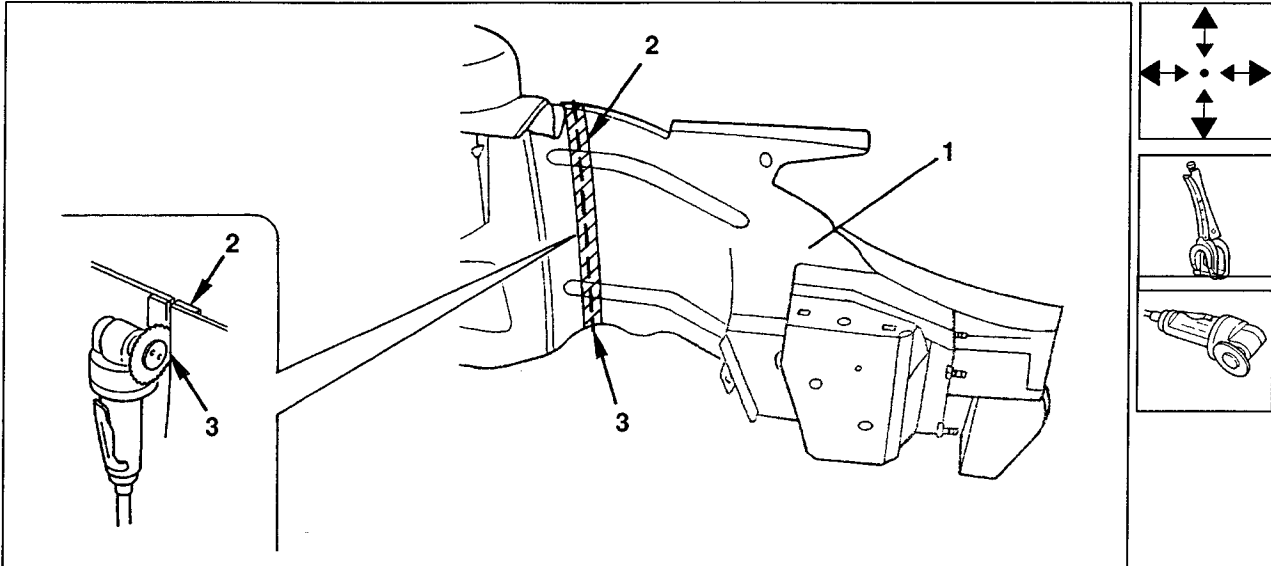
PREPARATION OF THE SPARE - OUTER SIDE PANEL

- Clean the perimeter of the outer side panel and the areas involved by welding using a rotary brush.
1. Apply rust proofing in the areas involved by spot- welding.



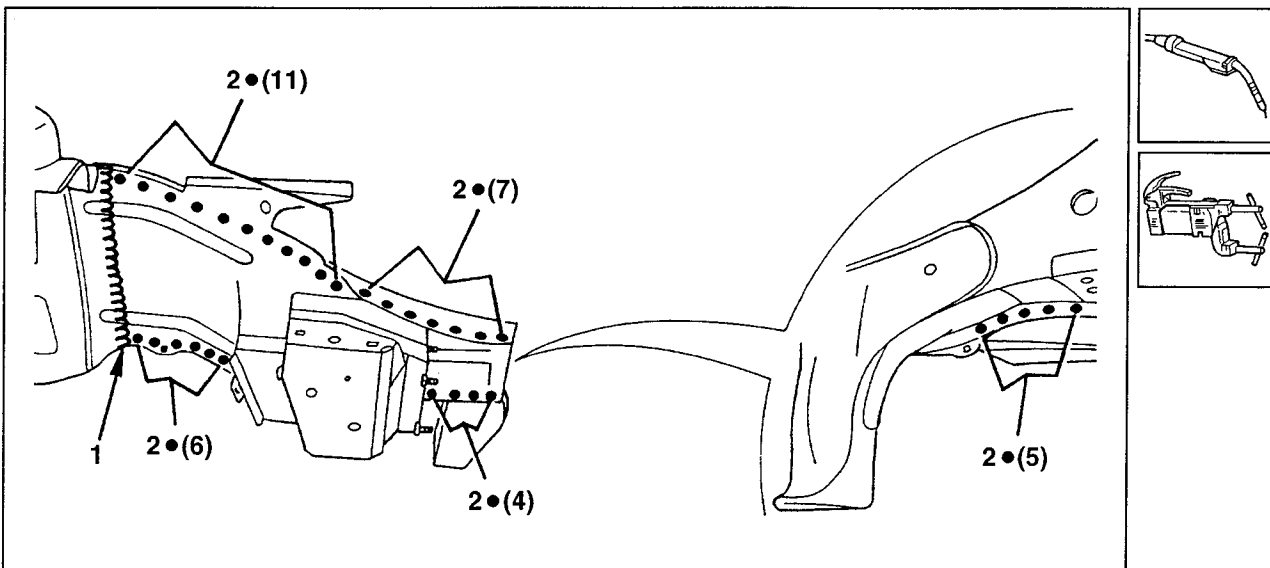
POSITIONING THE SPARE - OUTER SIDE PANEL

1. Position the outer side panel correctly.
2. Overlay and clamp the components to be welded mating the edges and check alignment.
3. Trim the sheets eliminating the excess, using a circular saw.



WELDING THE SPARE - OUTER SIDE PANEL

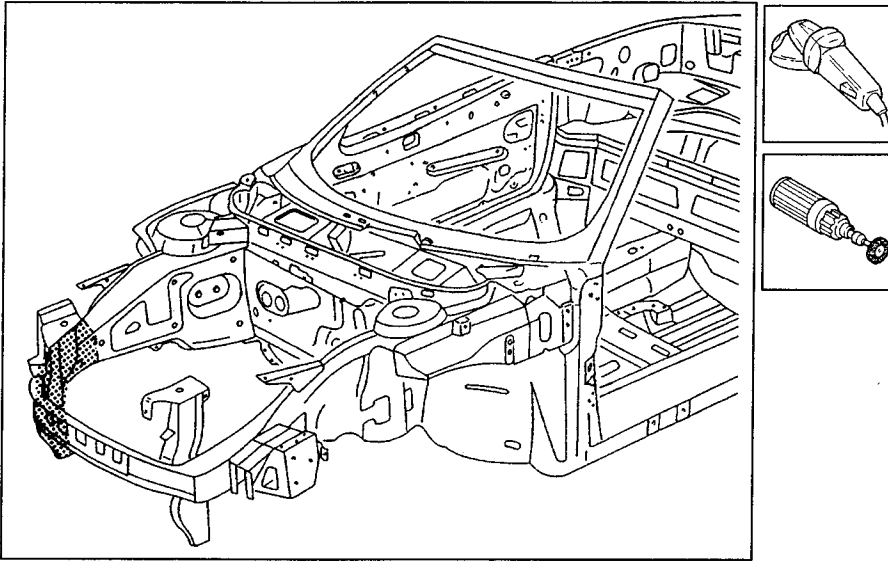
1. Seam weld using a MIG welder
2. Spot weld as illustrated.



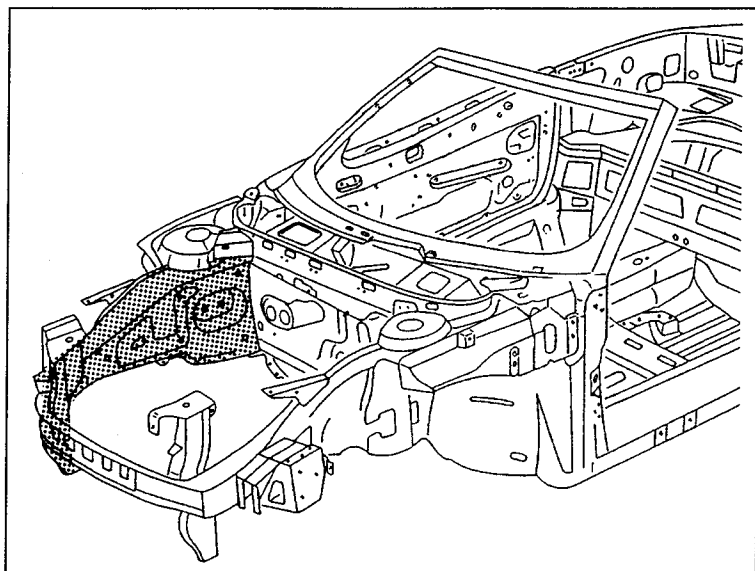
– Assemble the front crossmember and bonnet support (see: "Replacing the Front Crossmember" and "Replacing the Bonnet Support").

FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

**PROTECTION**

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints, carry out the rust-proofing treatments and apply foam referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting and waxing operations.



PARTIAL REPLACEMENT OF FRONT SIDE PANEL

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

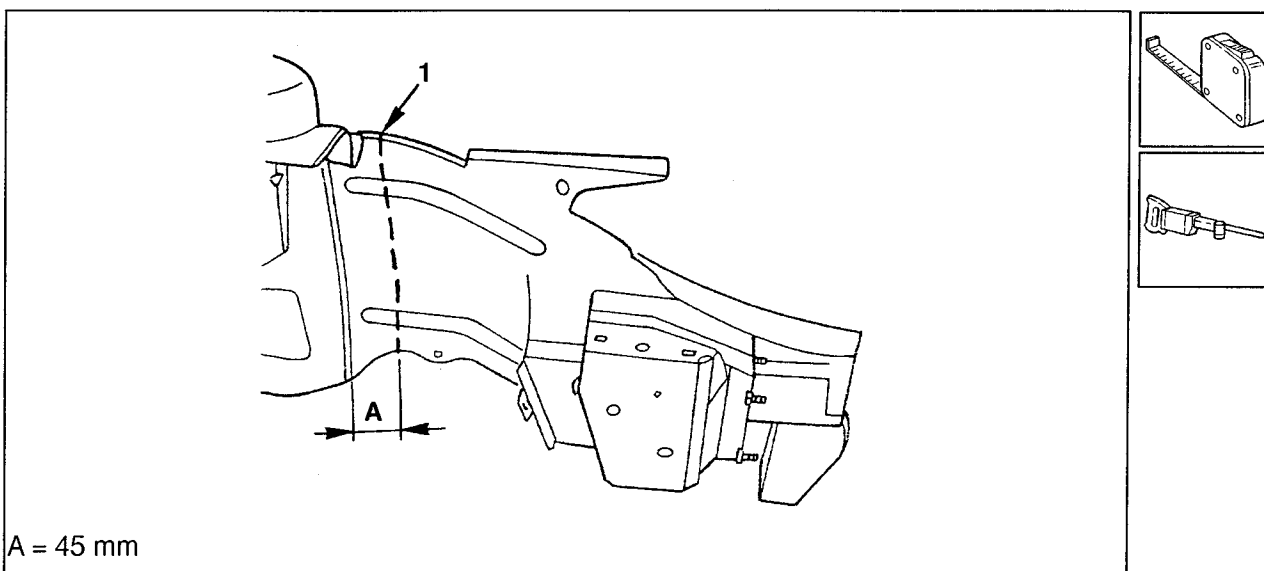
If necessary carry out body straightening operations before cutting the part. After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.
- Remove the front crossmember and the bonnet support (see: "Replacing the Front Crossmember" and "Replacing the Bonnet Support").

REMOVAL

1. Using a hack saw, cut the outer and inner panel at the distance shown, as illustrated.

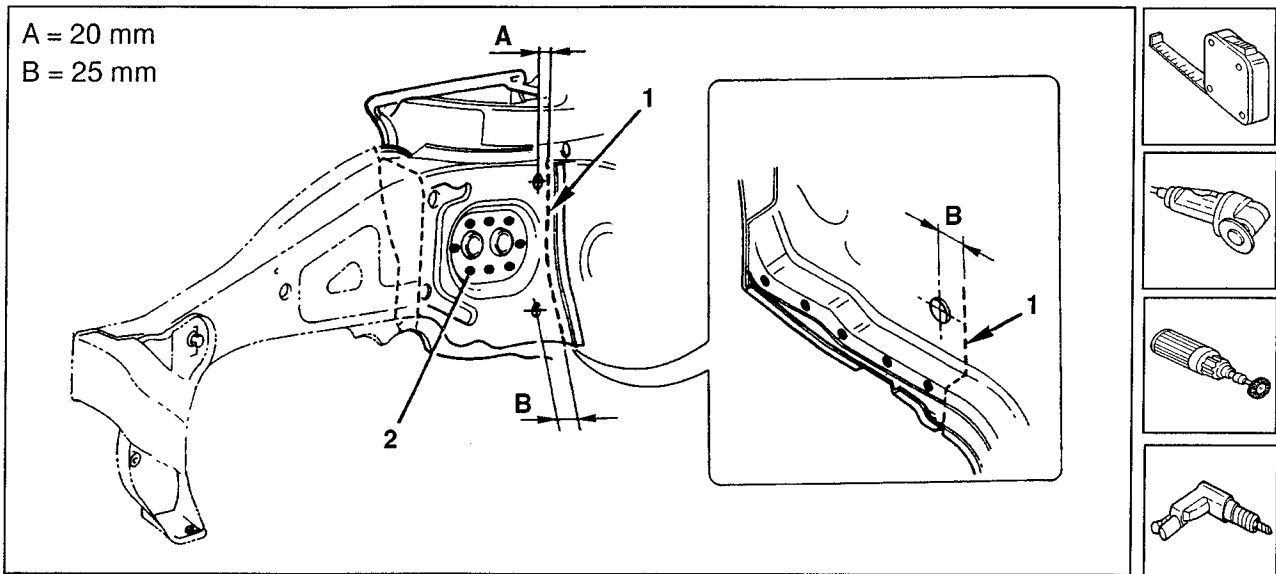


A = 45 mm



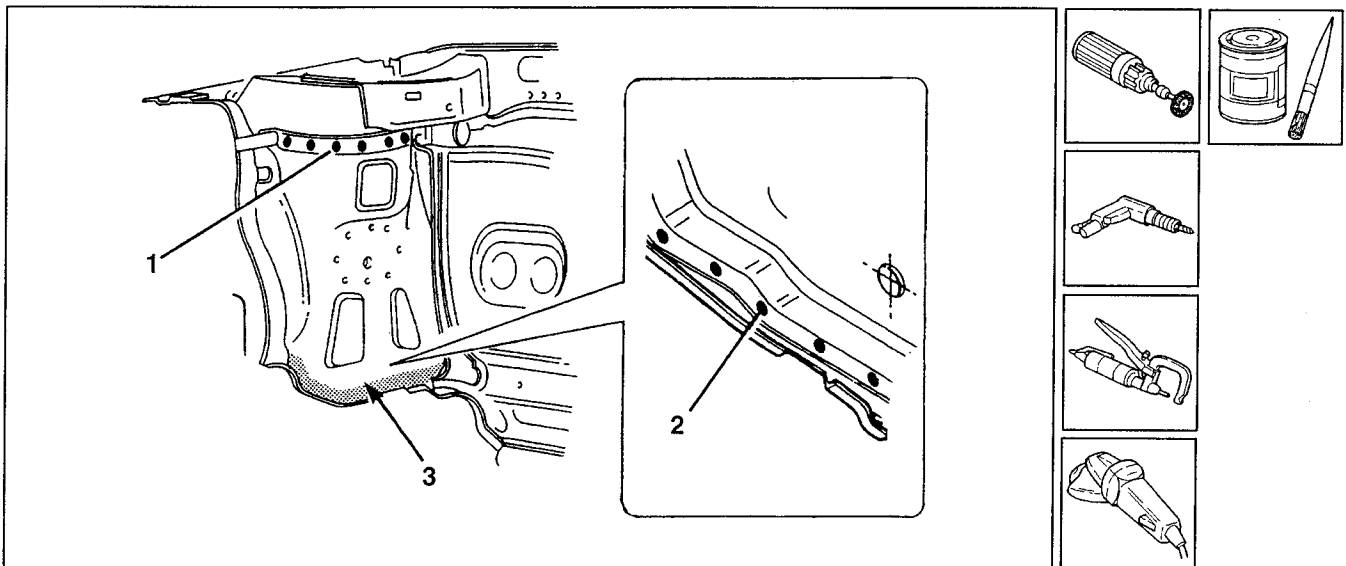
When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

1. Using a circular saw, cut the inner part of the panel following the line illustrated maintaining the distance given in the diagram and without damaging the outer part of the panel.
 - Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a drill.



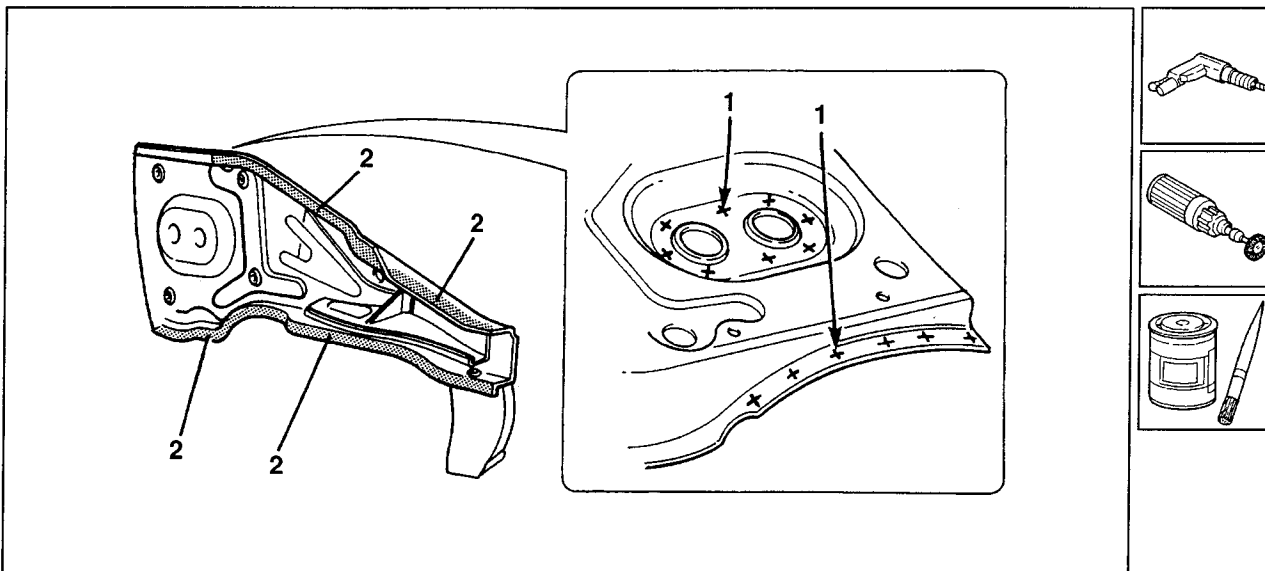
REMOVING CUTTINGS AND PREPARING THE EDGES OF THE BODY

- Clean the area to be de-welded using a rotary brush to reveal the welding spots.
1. Remove the welding spots using a drill.
 2. Remove the welding spots using a de-welder.
- Remove the sheet cuttings and straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
3. Apply electro-galvanizing paint on the areas involved by spot welding.



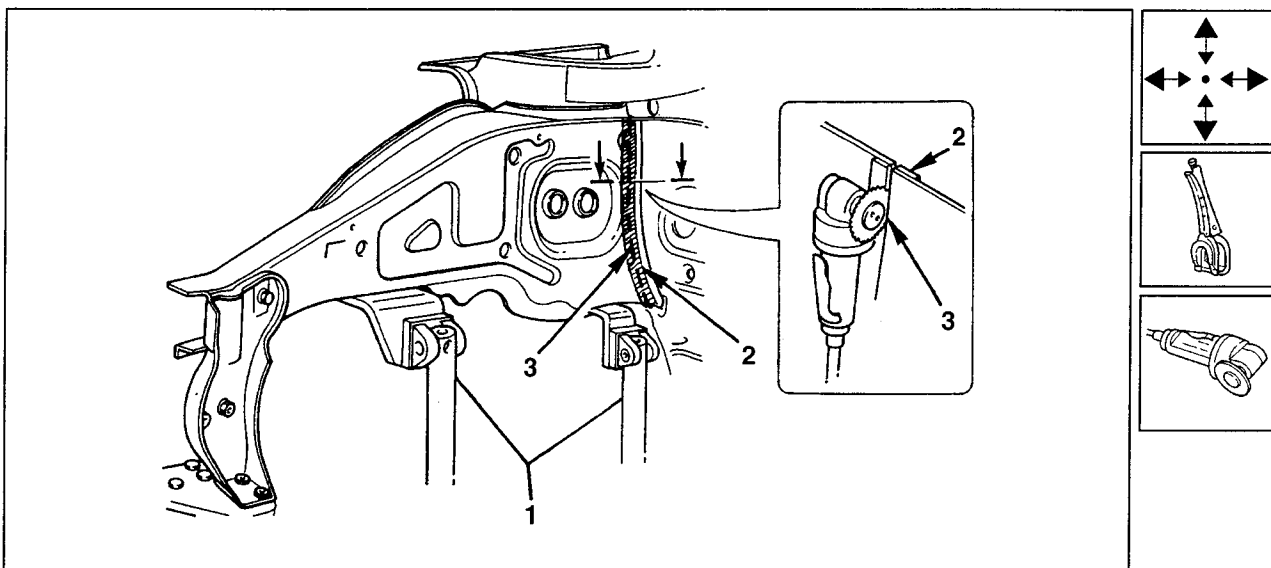
PREPARING THE SPARE - INNER SIDE PANEL

1. Trace the inner panel and drill using a drill with \varnothing 5 mm. bit, as illustrated. the perimeter of the inner panel and the areas involved by welding, using a rotary brush.
2. Apply electro-galvanizing paint on the areas involved by spot welding.



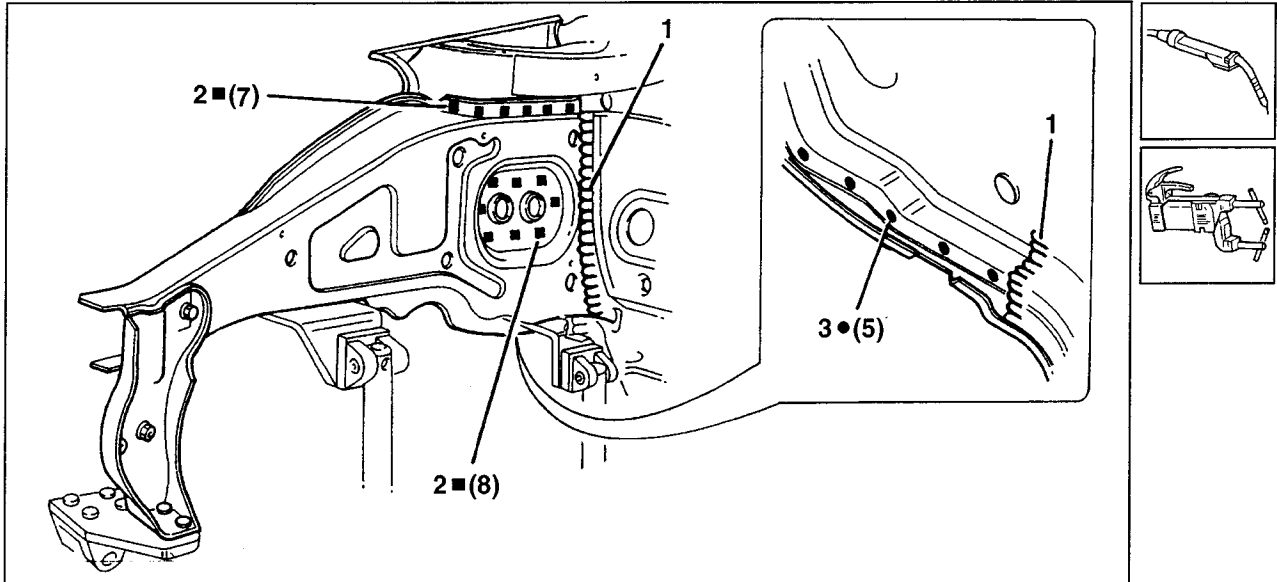
POSITIONING THE SPARE - INNER PANEL

1. Position the inner side panel correctly using the template.
2. Overlay and clamp the components to be welded mating the edges and check alignment.
3. Trim the sheets eliminating the excess, using a circular saw.



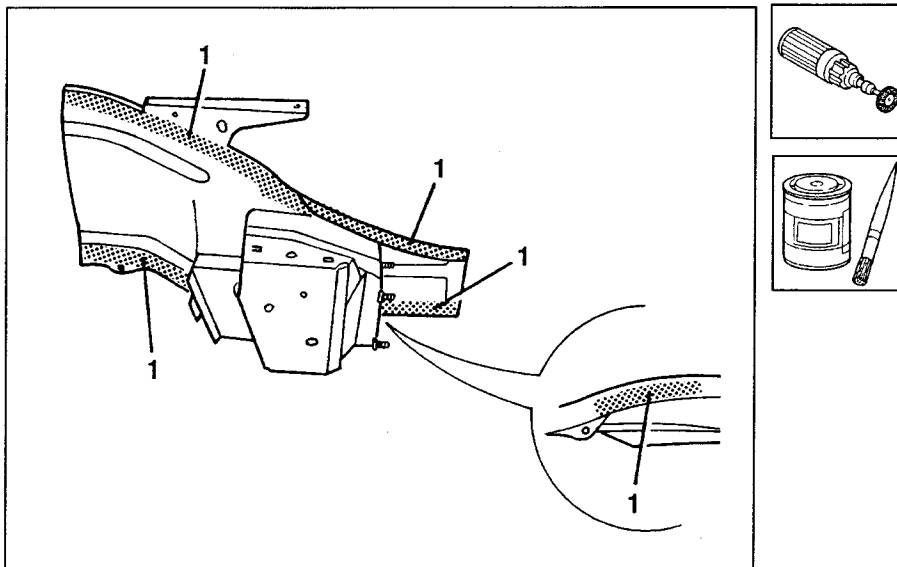
WELDING THE SPARE - INNER PANEL

1. Seam weld using a MIG welder.
2. Fill weld, using an MIG welder.
3. Spot weld, as illustrated.



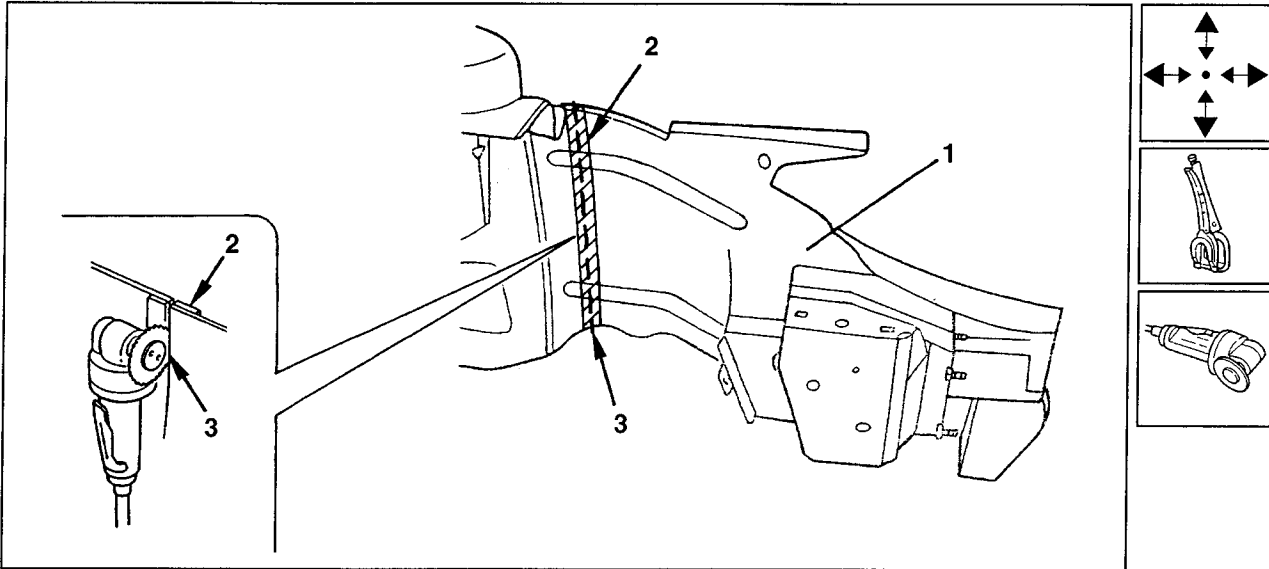
PREPARING THE SPARE - OUTER PANEL

- Clean the perimeter of the outer panel and the areas involved in welding, using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.



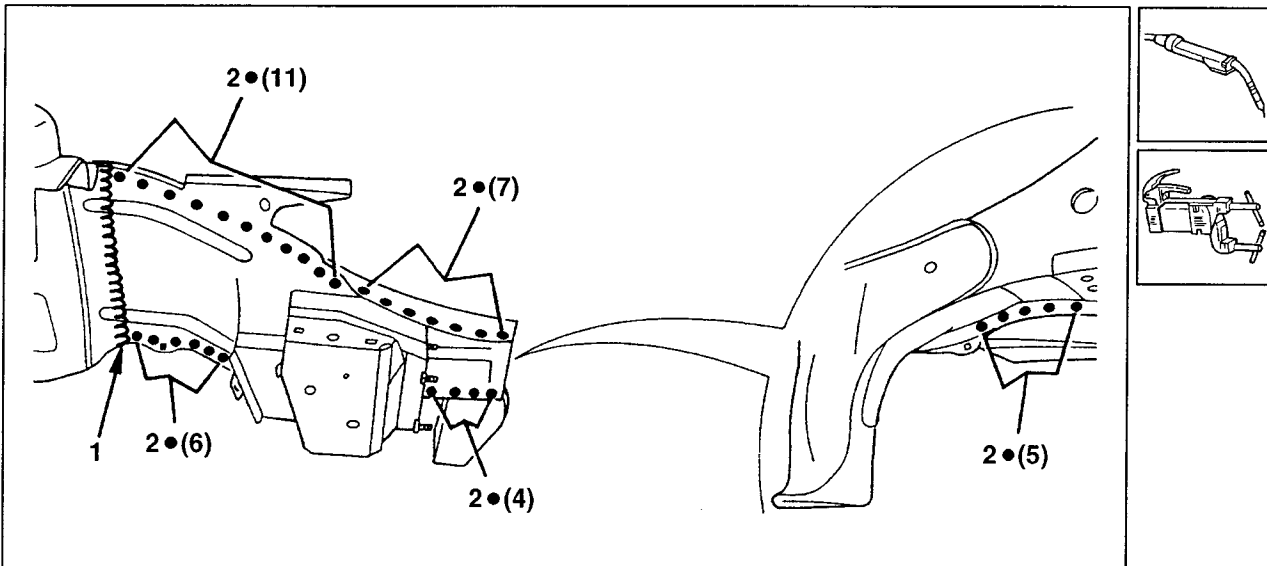
POSITIONING THE SPARE - OUTER PANEL

1. Position the outer side panel correctly.
2. Overlay and clamp the components to be welded mating the edges and check alignment.
3. Trim the sheets eliminating the excess, using a circular saw.



WELDING THE SPARE - OUTER PANEL

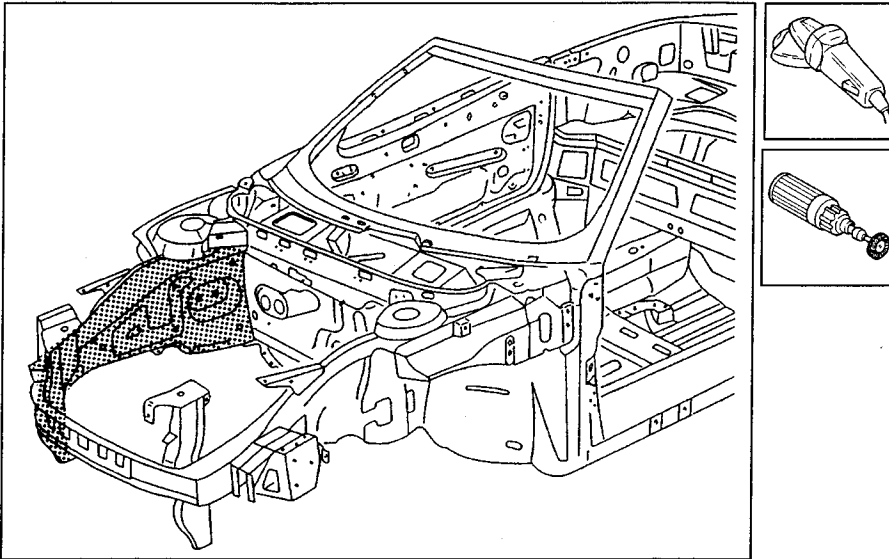
1. Seam weld using a MIG welder.
2. Spot weld, as illustrated.



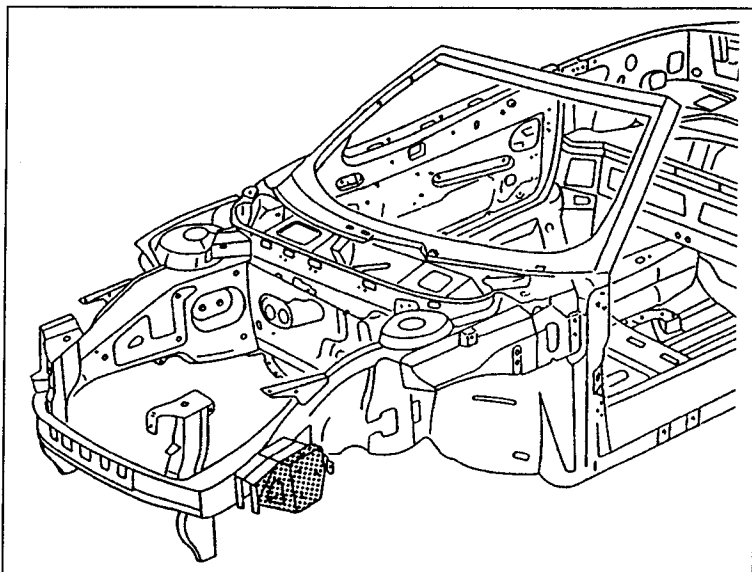
- Assemble the front crossmember and bonnet support (see: "Replacing the Front Crossmember" and "Replacing the Bonnet Support").

FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

**PROTECTIONS**

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints, carry out the rust-proofing treatments, and foam referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting and waxing operations.



REPLACING THE OUTER BOXED SECTION OF THE SIDE BRACKET

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

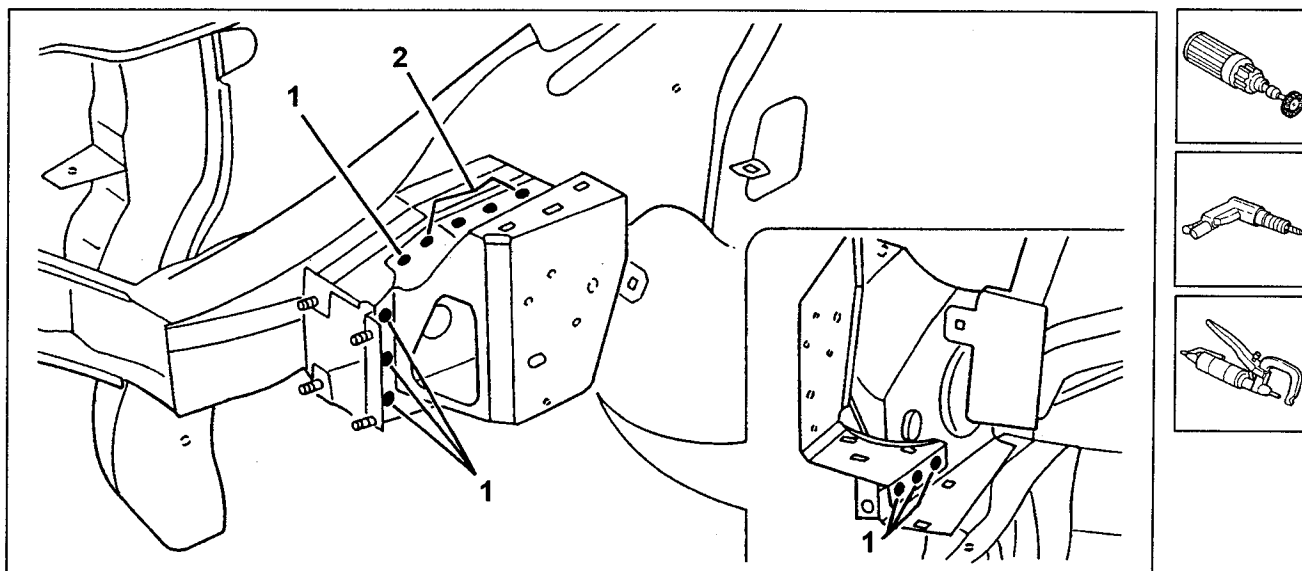
If necessary carry out body straightening operations before cutting the part. After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

REMOVAL

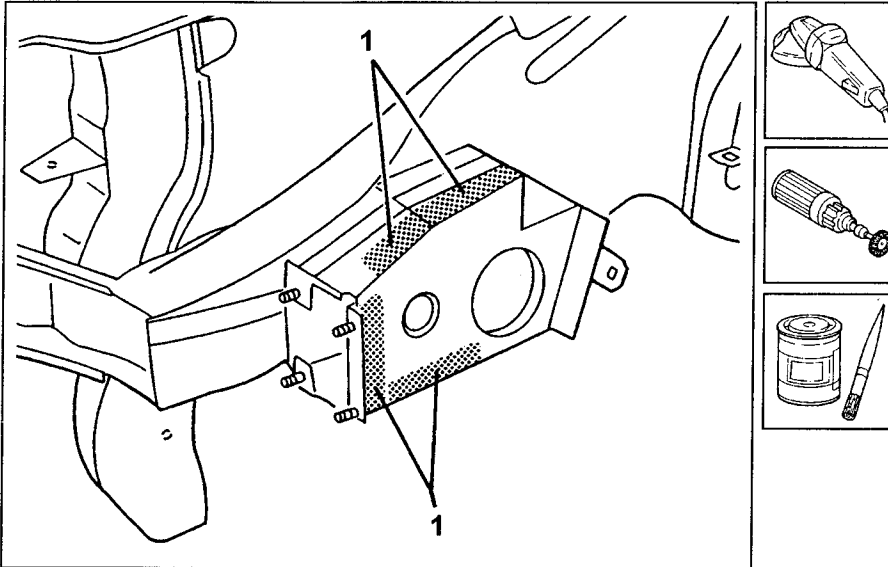
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- 2. Remove the welding spots using a drill.
- Remove the outer boxed section.



When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

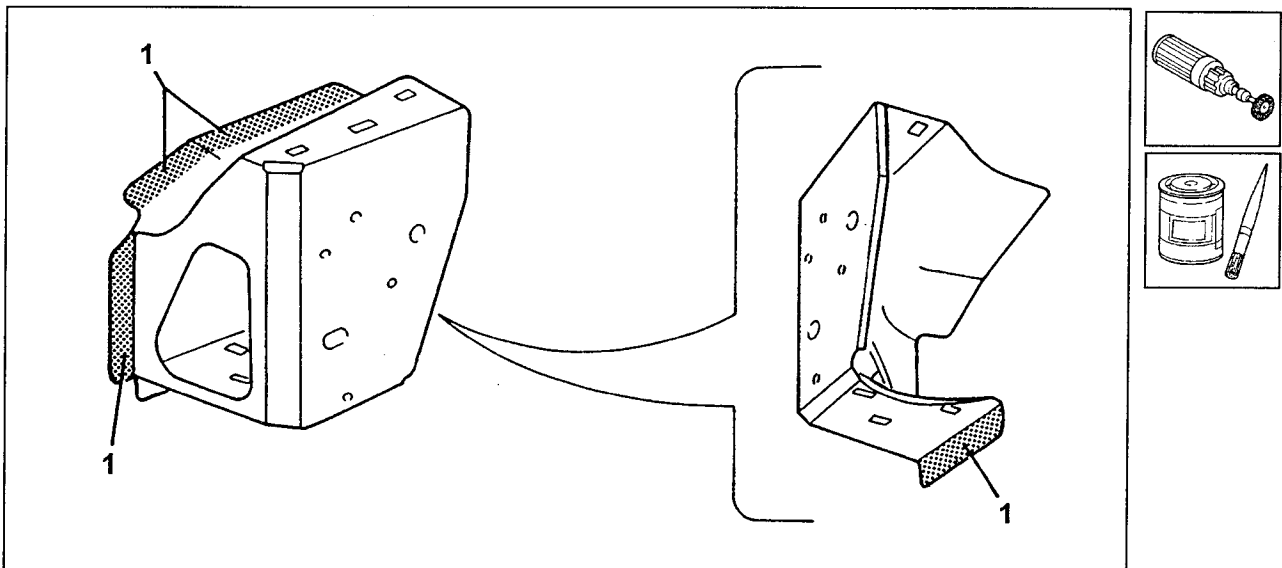
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



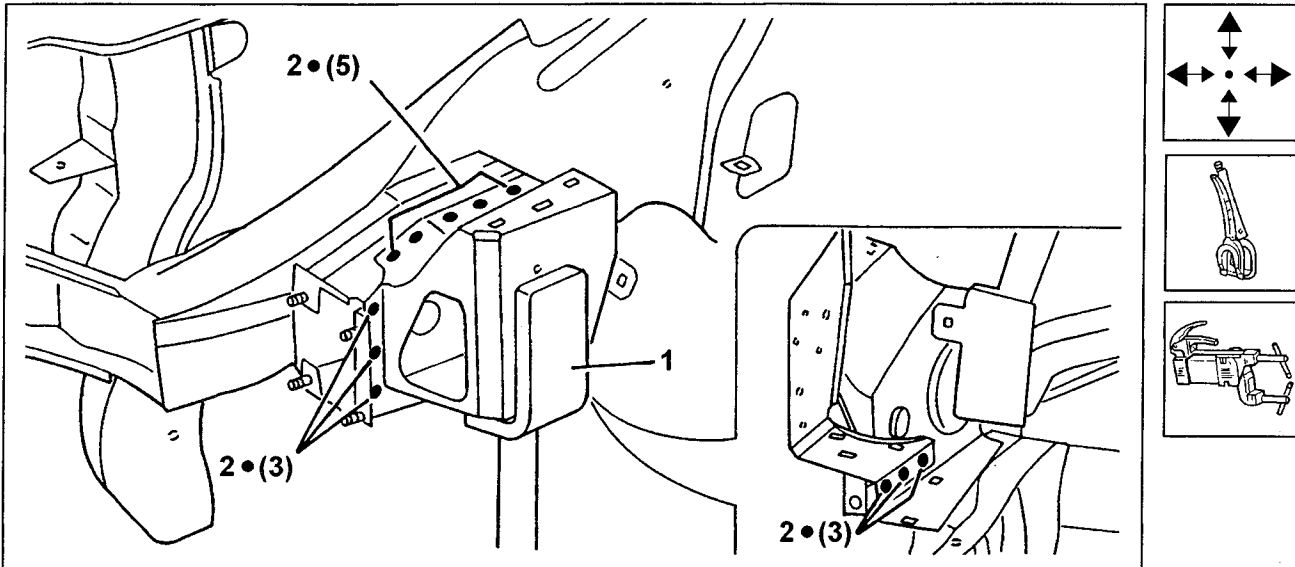
PREPARING THE SPARE - OUTER BOXED SECTION OF SIDE BRACKET

- Clean the areas of the boxed section involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - BOXED SECTION OF SIDE BRACKET

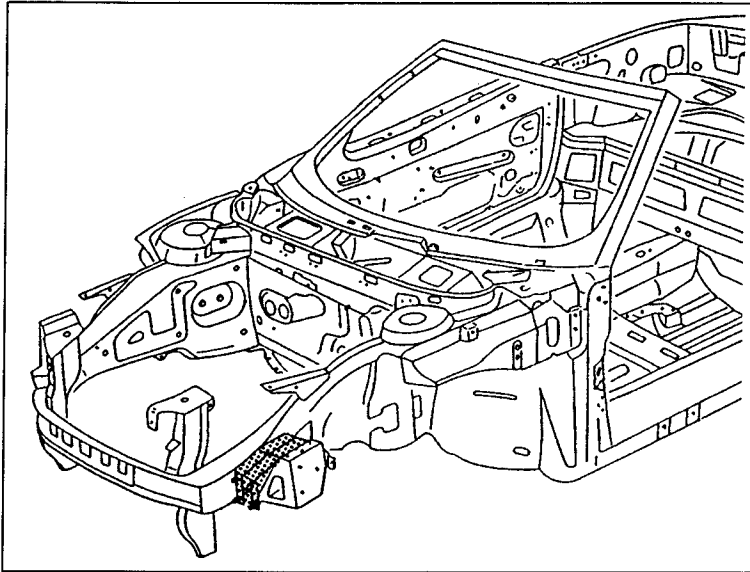
1. Position the boxed section correctly.
 - Clamp the components to be welded mating the edges and check alignment.
2. Spot weld, as illustrated.

**FINISHING OPERATIONS**

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE SIDE BRACKET

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

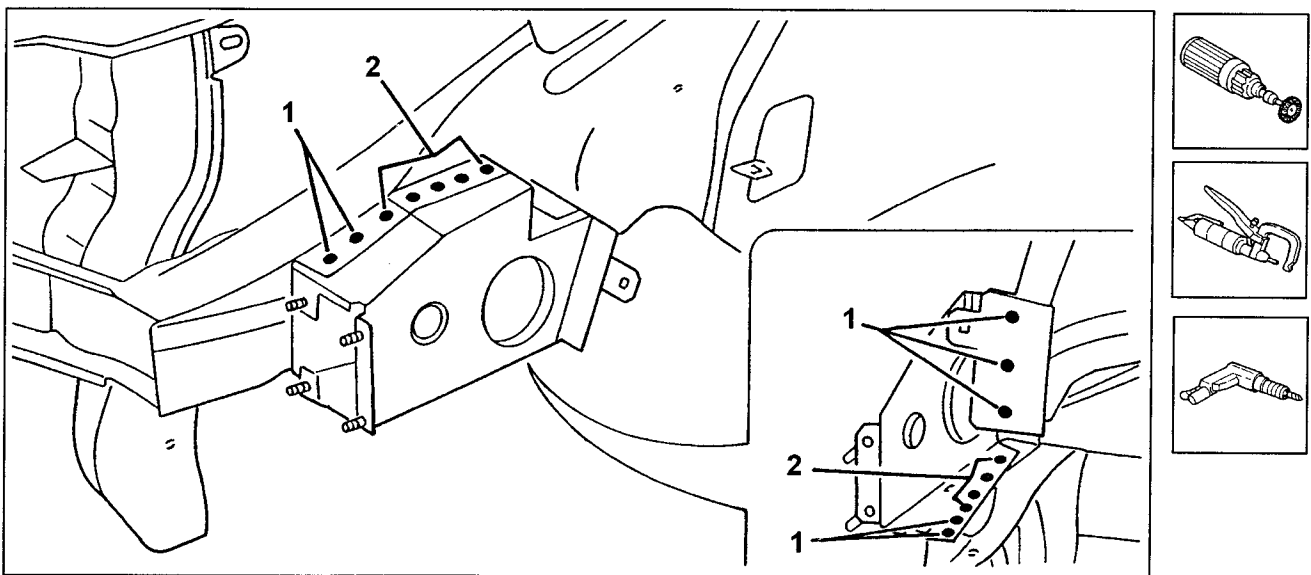
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.
- Remove the boxed section of the side bracket (see: "Replacing the Outer Boxed Section of the Side Bracket").

REMOVAL

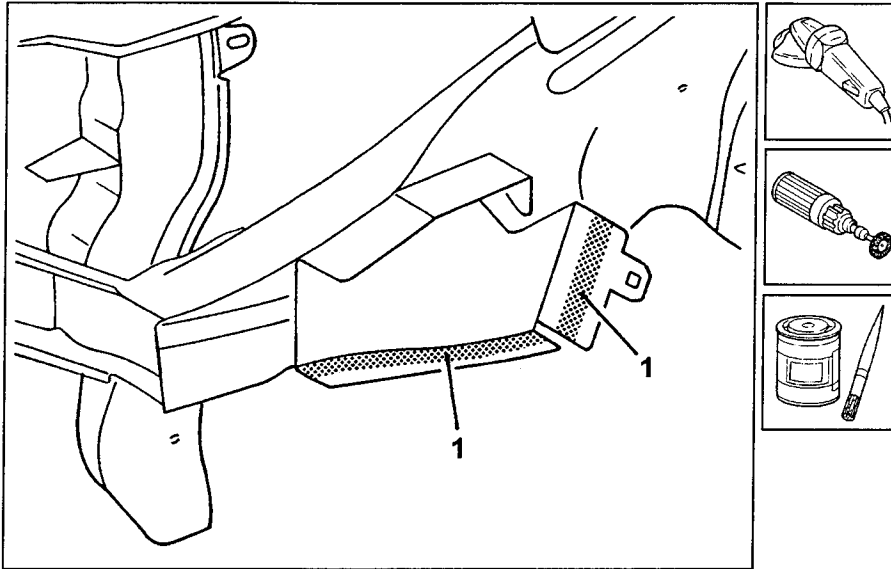
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- 2. Remove the welding spots using a drill.
- Remove the side bracket.



When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

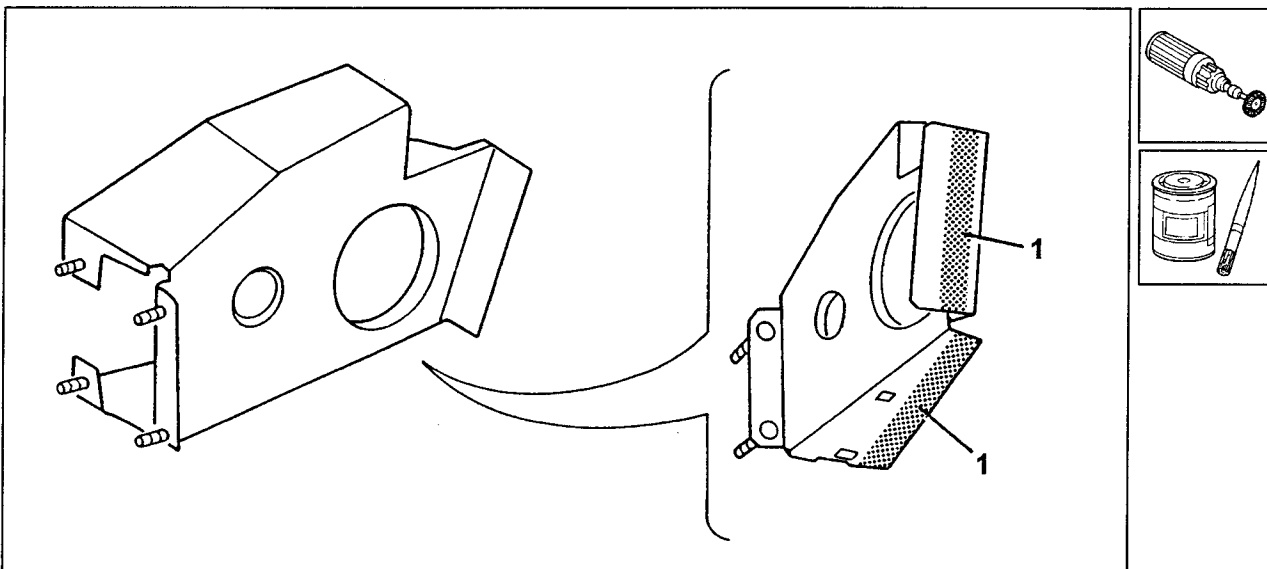
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



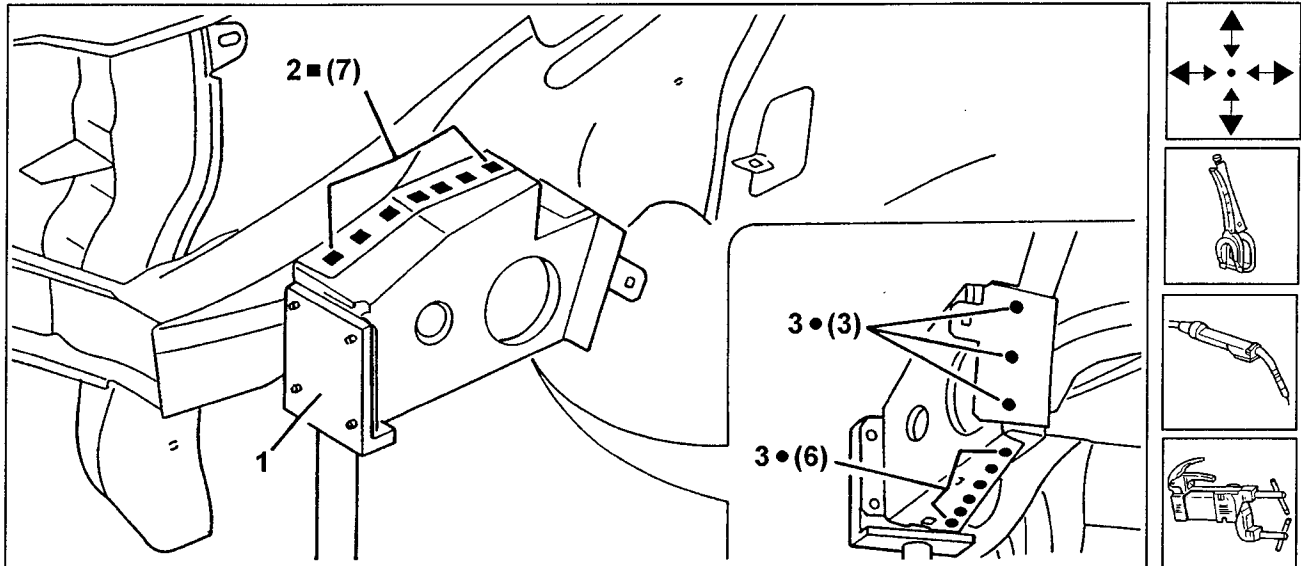
PREPARING THE SPARE - SIDE BRACKET

- Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - SIDE BRACKET

1. Position the side bracket correctly using the template.
 - Clamp the components to be welded mating the edges and check alignment.
2. Fill weld, using an MIG welder.
3. Spot weld, as illustrated.



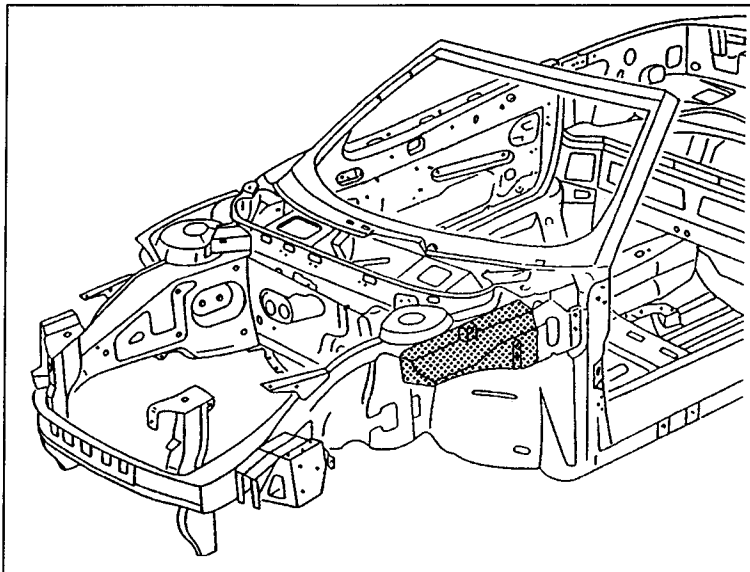
- Install the side bracket outer boxed section (see "Replacing the Outer Boxed Section of Side bracket").

FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust-proofing in the areas involved by MIG welding
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE LOWER PANEL

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

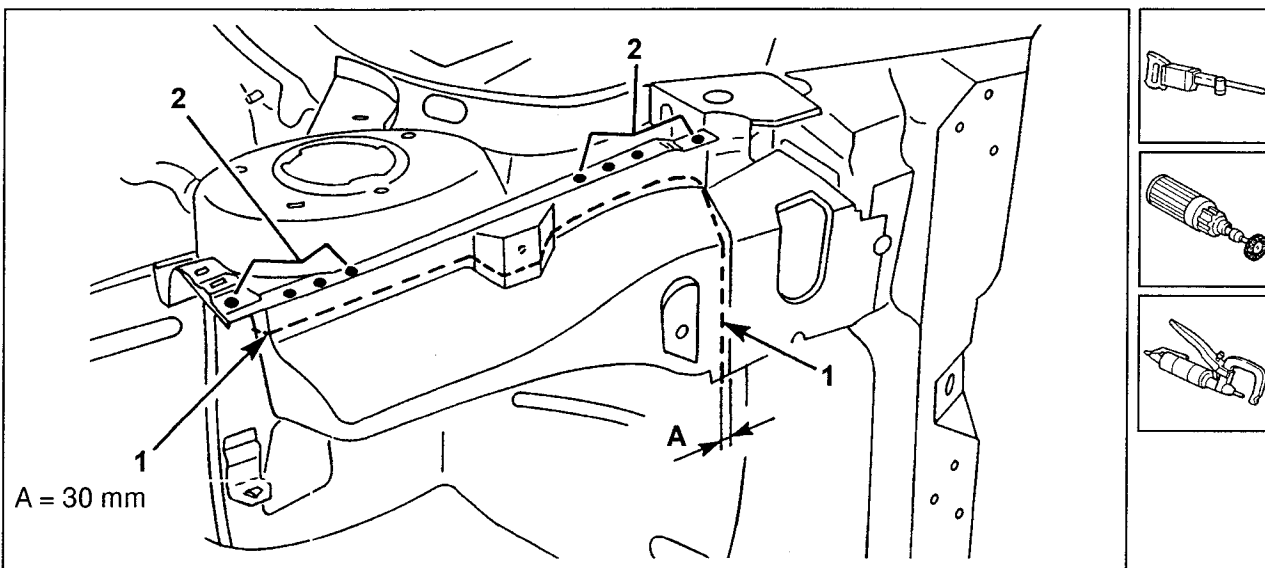
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

– Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

REMOVAL

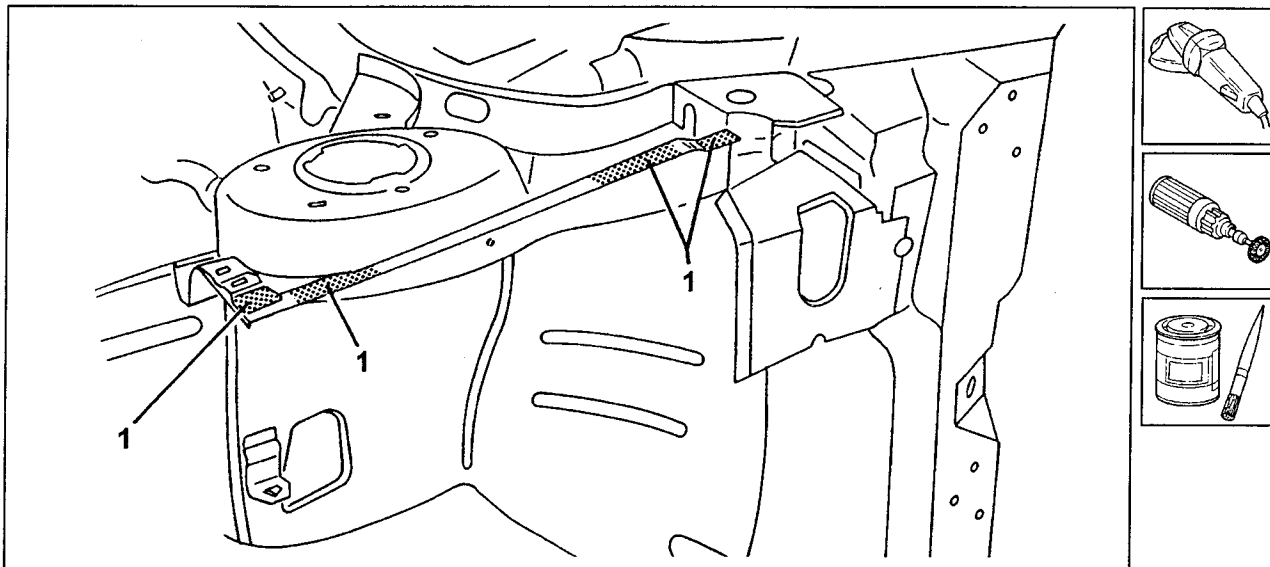
1. Using a hack saw, cut the lower panel, following the lines shown in the illustration, without damaging the parts below.
 - Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
 - Remove the lower panel.



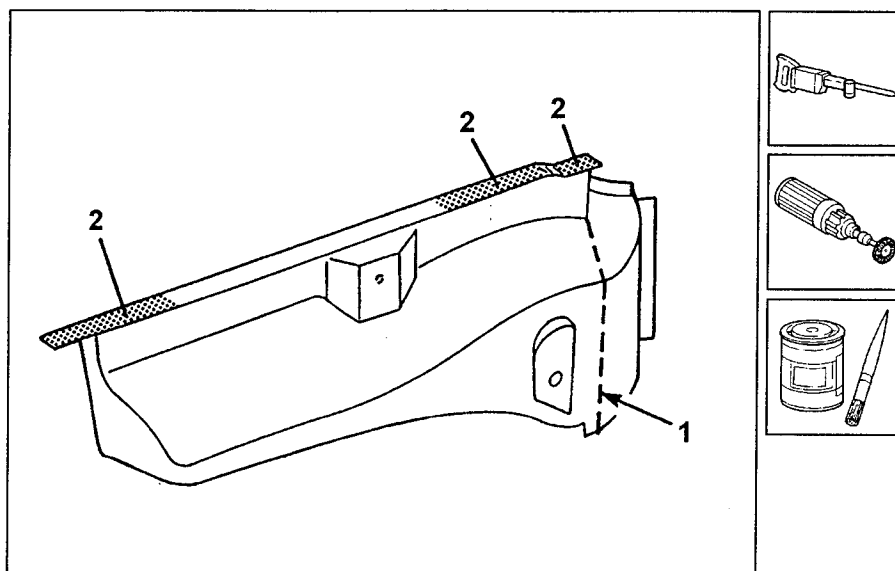
When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.

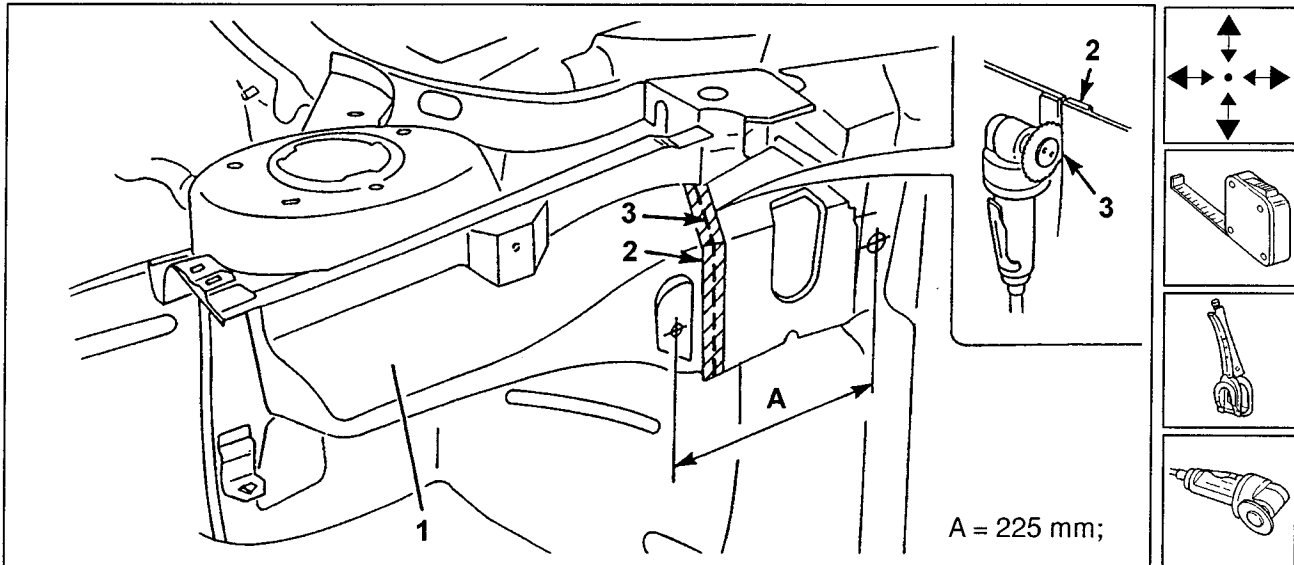
**PREPARING THE SPARE - LOWER PANEL**

1. Working on the bench, trace and cut the new lower panel using a pneumatic saw and cut leaving an extra piece for overlapping.
 - Clean the areas involved by welding, using a rotary brush.
2. Apply electro-galvanizing paint on the areas involved by spot welding.

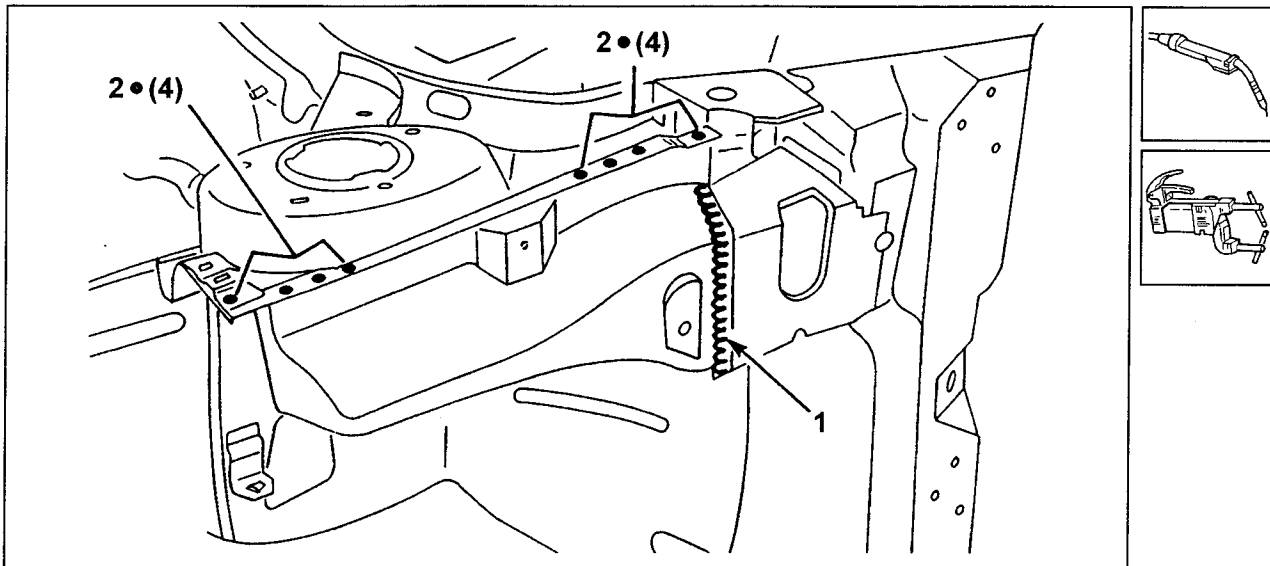


POSITIONING AND WELDING THE SPARE - LOWER PANEL

1. Position the lower panel correctly checking dimension A shown in the diagram.
2. Overlay and clamp the components to be welded mating the edges and check alignment.
3. Trim the sheets eliminating the excess parts, using a circular saw; take care not to damage the parts below.

**WELDING THE SPARE PART - LOWER PANEL**

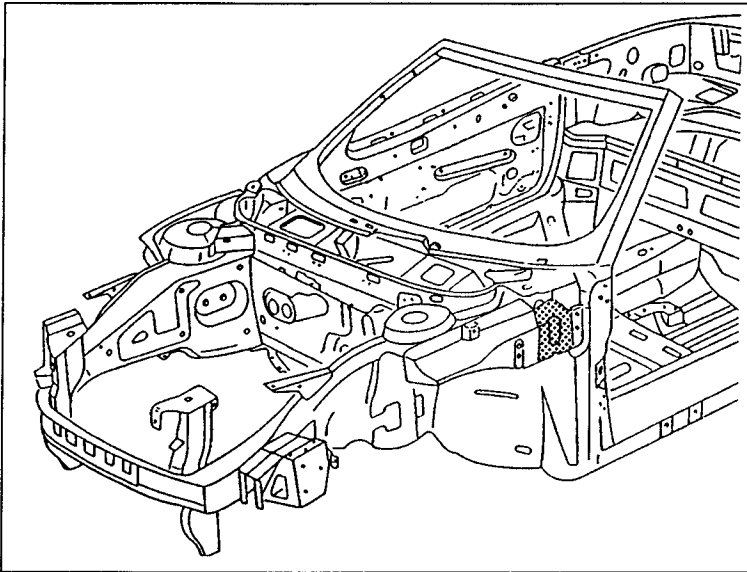
1. Seam weld using an MIG welder.
2. Spot weld as illustrated.

**FINISHING OPERATIONS**

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE BRACKET FASTENING THE BRACKET TO THE PILLAR

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

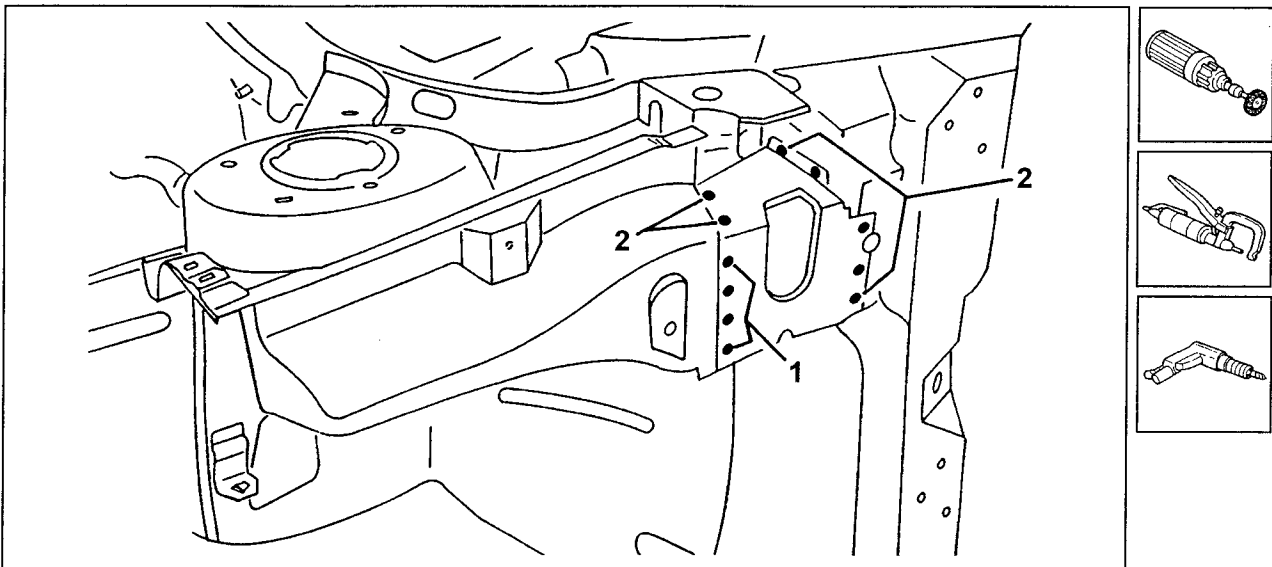
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

REMOVAL

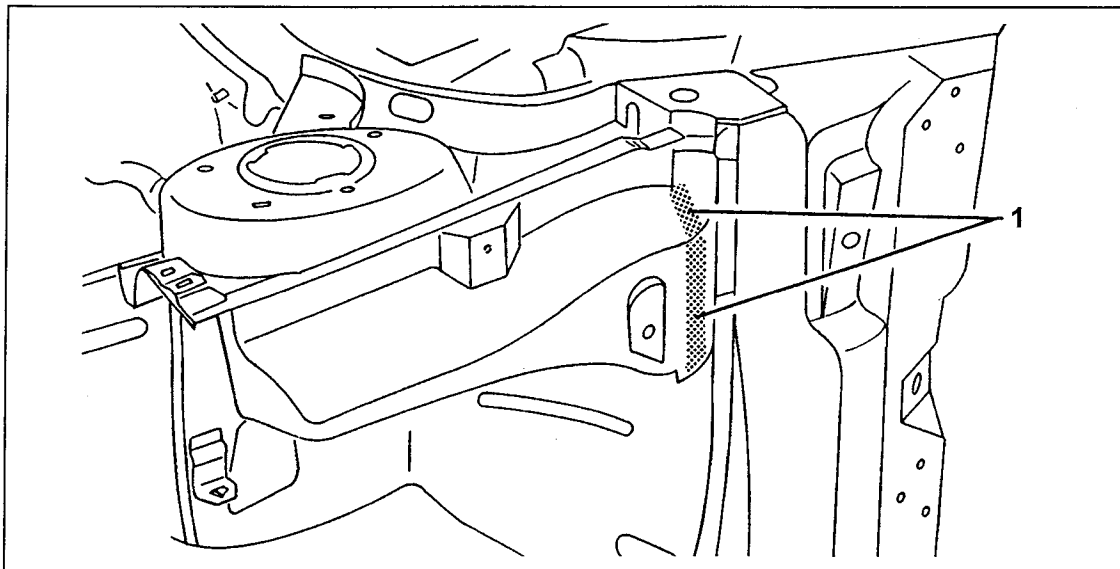
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- 2. Remove the welding spots using a drill.
- Remove the bracket.



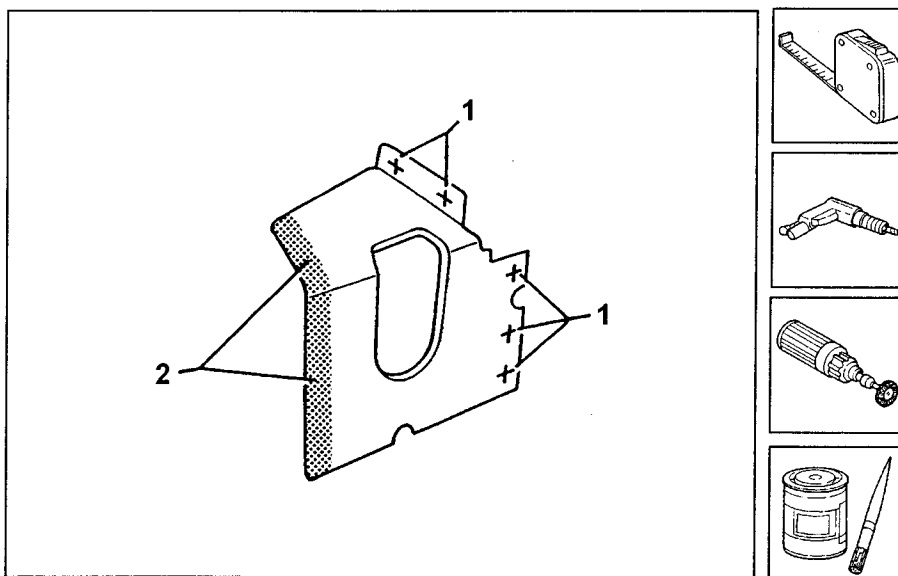
When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.

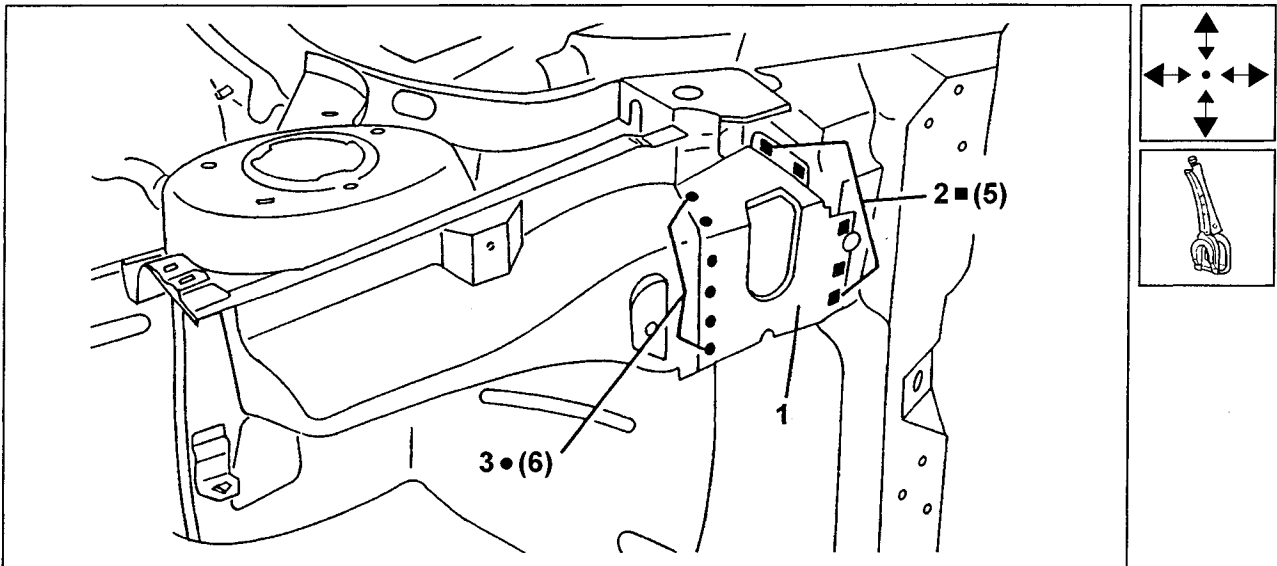
**PREPARING THE SPARE - BRACKET FASTENING BRACKET TO PILLAR**

1. Working on the bench, trace the bracket and drill with a $\varnothing 5$ mm. bit as illustrated.
 - Clean the areas involved by welding, using a rotary brush.
2. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - BRACKET FASTENING BRACKET TO PILLAR

1. Position the bracket correctly.
 - Clamp the components to be welded mating the edges and check alignment.
2. Fill weld using a MIG welder.
3. Spot weld, as illustrated.

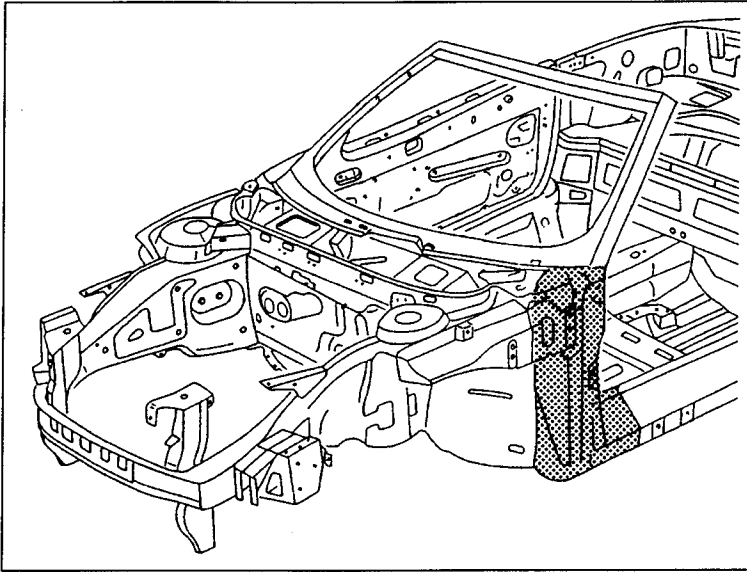


FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE FRONT PILLAR

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

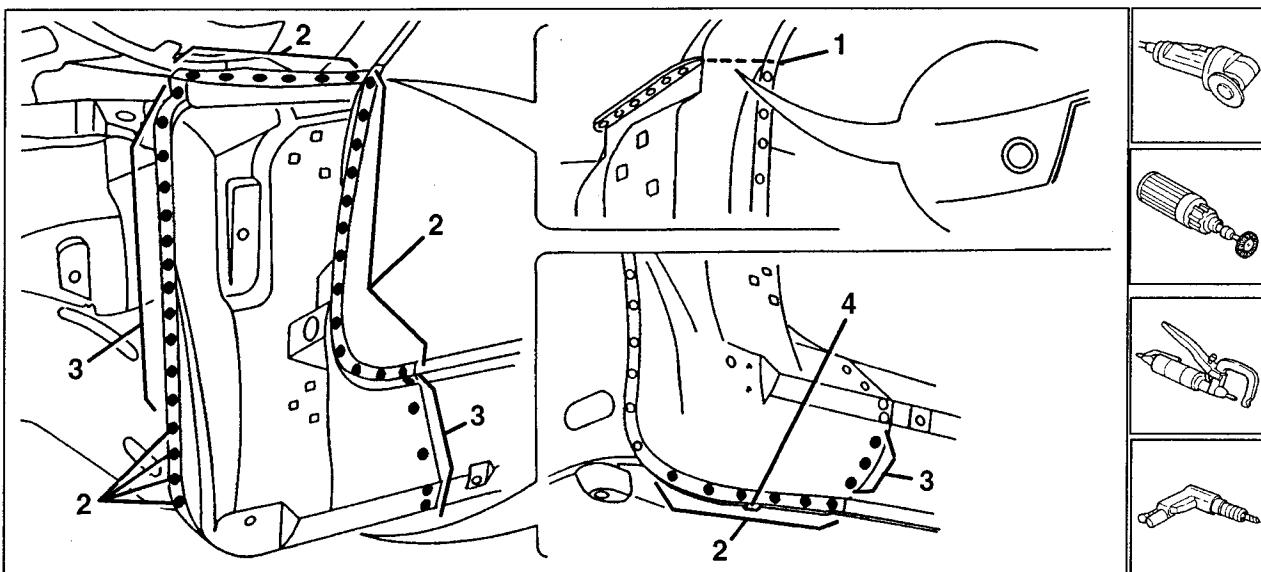
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.
- Remove the bracket fastening the bracket to the front pillar (see: "Replacing the Bracket Fastening the Bracket to the Pillar").

REMOVAL

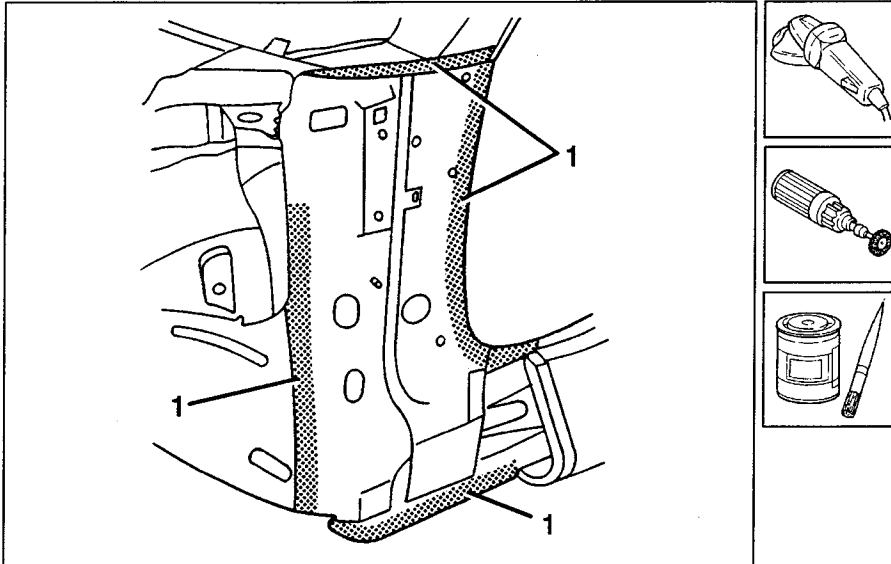
1. Using a circular saw, cut the pillar following the lines illustrated, without damaging the reinforcement below. The section of sheet in the more important point is shown so that the operator can adjust the cutting depth.
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
3. Remove the welding spots using a drill.
4. Open the clinching tab.
- Remove the front pillar.



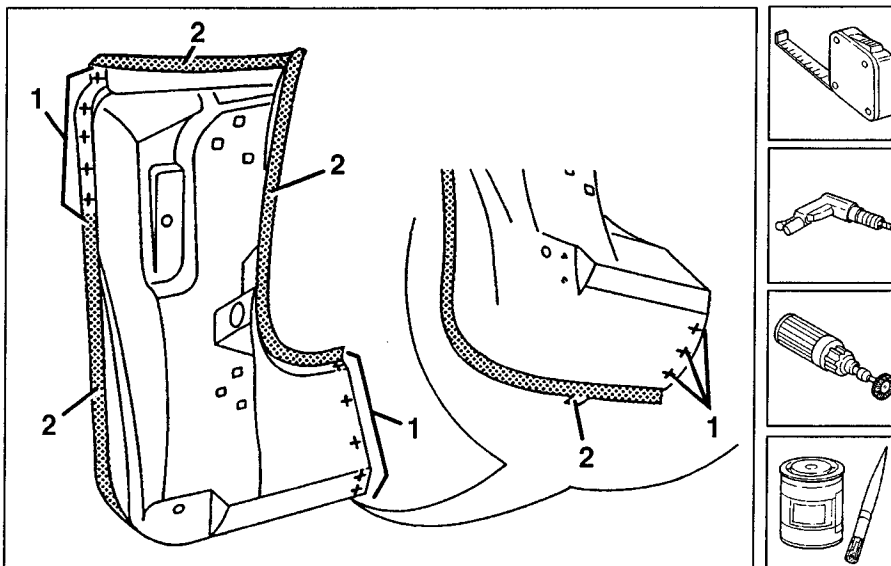
When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.

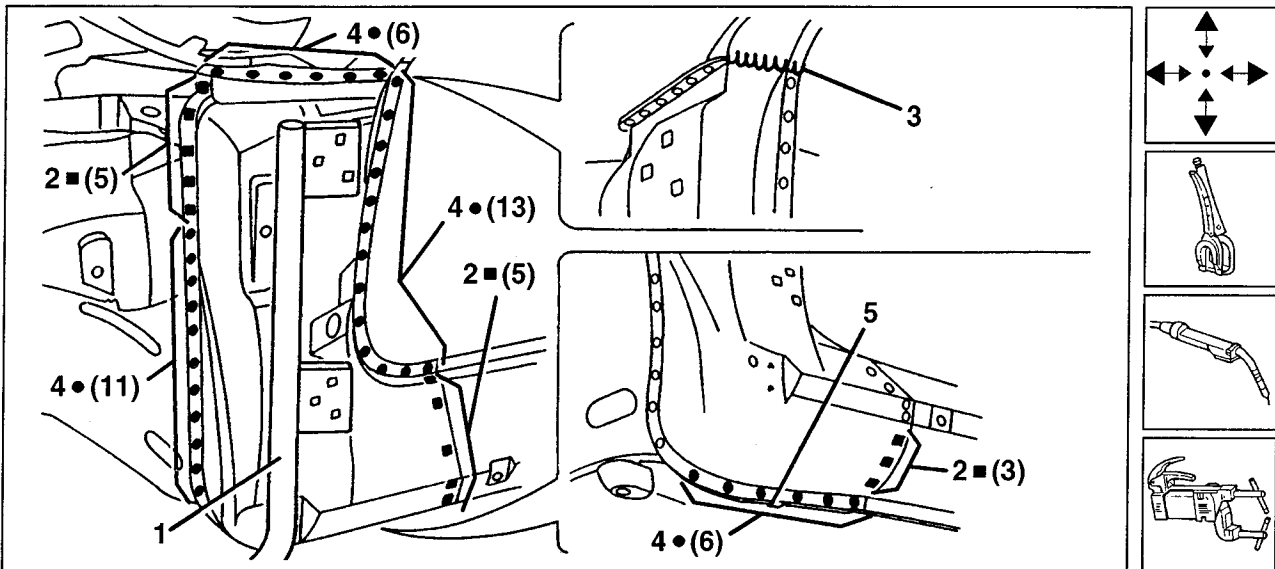
**PREPARING THE SPARE - PILLAR WITH REINFORCEMENT**

1. Working on the bench trace the pillar using a drill with ϕ 5 mm bit as illustrated.
 - Clean the areas involved by welding on the vehicle, using a rotary brush.
2. Apply electro-galvanizing paint on the areas involved by spot welding.

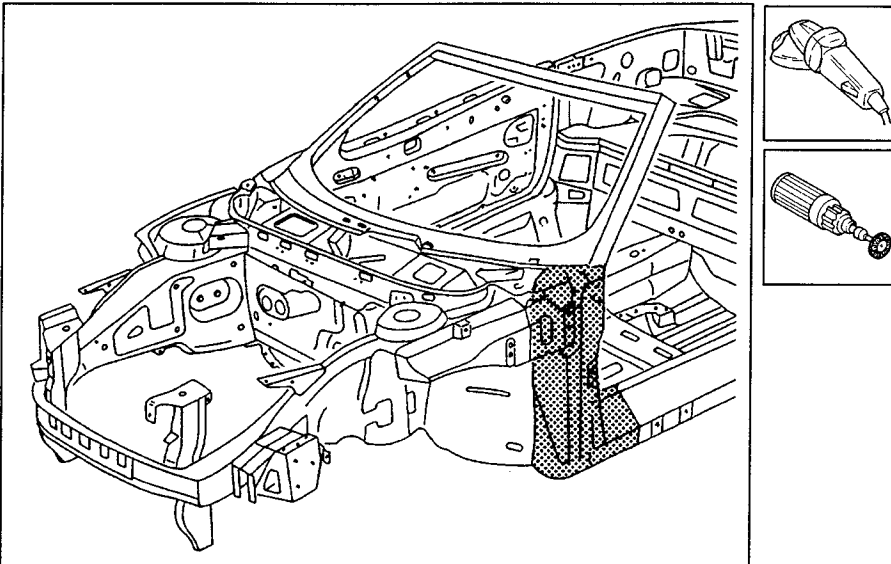


POSITIONING AND WELDING THE SPARE - PILLAR WITH REINFORCEMENT

1. Position the pillar correctly using the template.
 - Clamp the components to be welded mating the edges and check alignment.
2. Fill weld using a MIG welder.
3. Seam weld using a MIG welder.
4. Spot weld, as illustrated.
5. Bend the clinching tab.

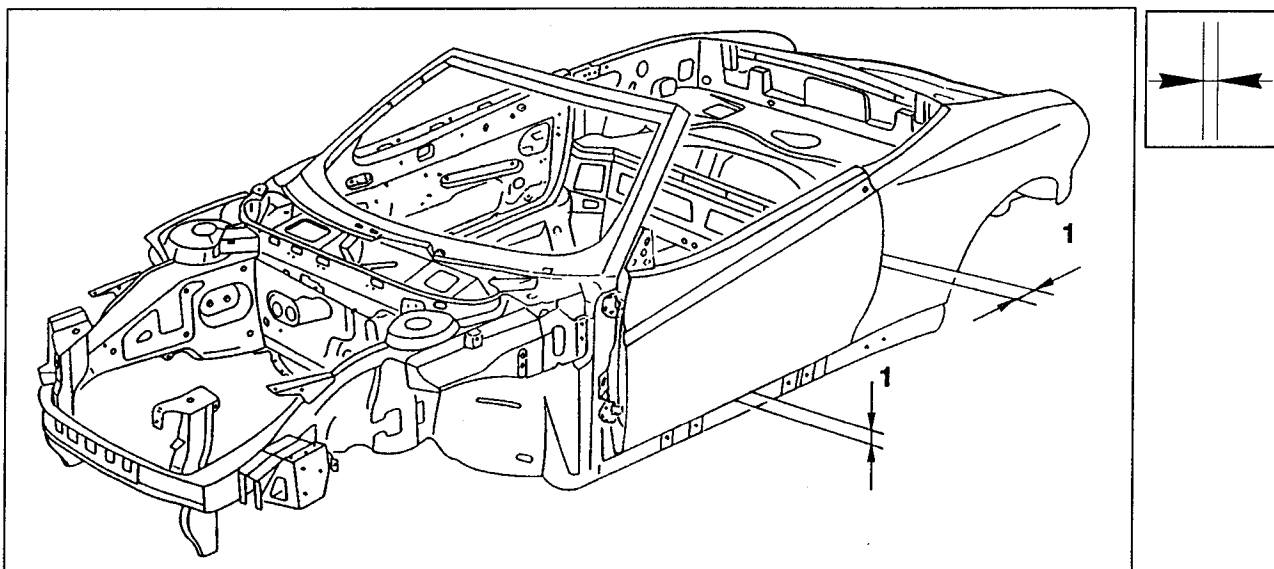
**FINISHING OPERATIONS**

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.



CHECKING ALIGNMENTS

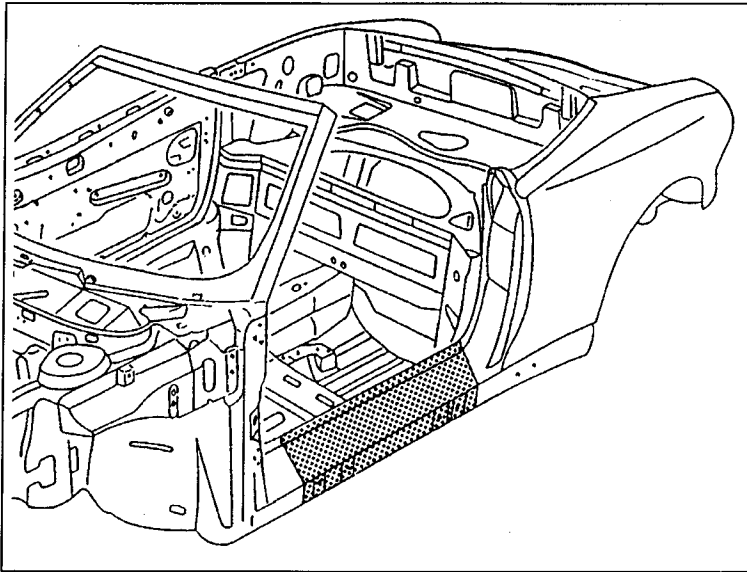
1. Check parallelism, gaps and angles (this involves assembly of the mobile components removed previously with seals and the parts which once assembled make it possible to check that the operations are perfectly successful).



– Assemble the bracket fastening the bracket to the pillar (see: "Replacing the Bracket fastening the Bracket to the Pillar").

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing and foaming treatments, apply the sound-deadening panels referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE UNDERDOOR PANEL

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

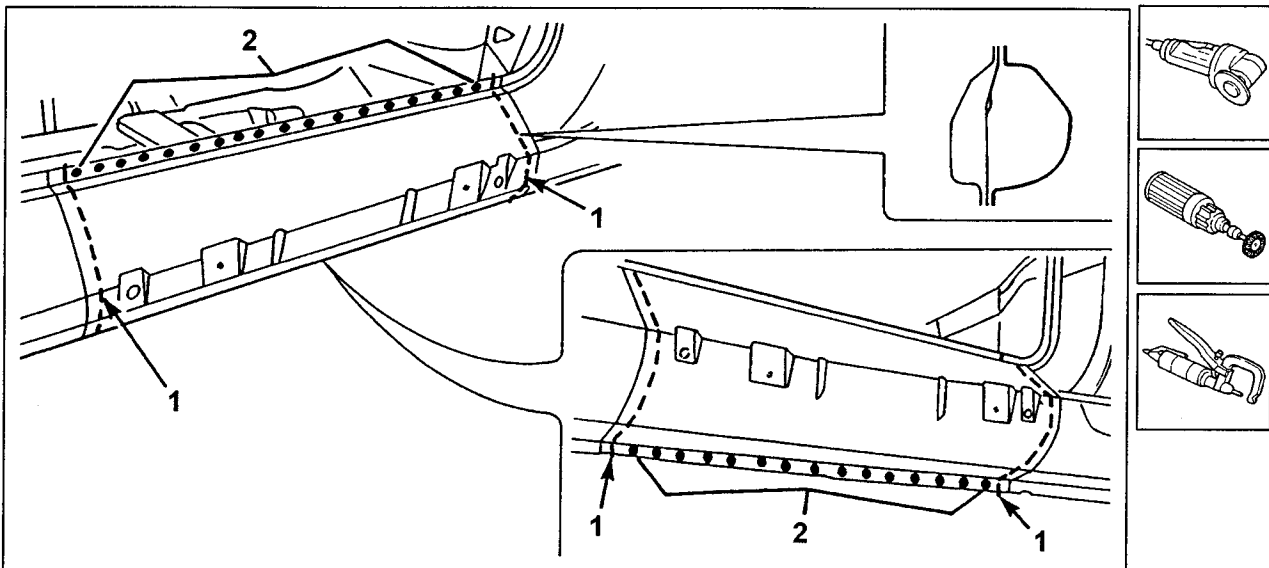
If necessary carry out body straightening operations before cutting the part.
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

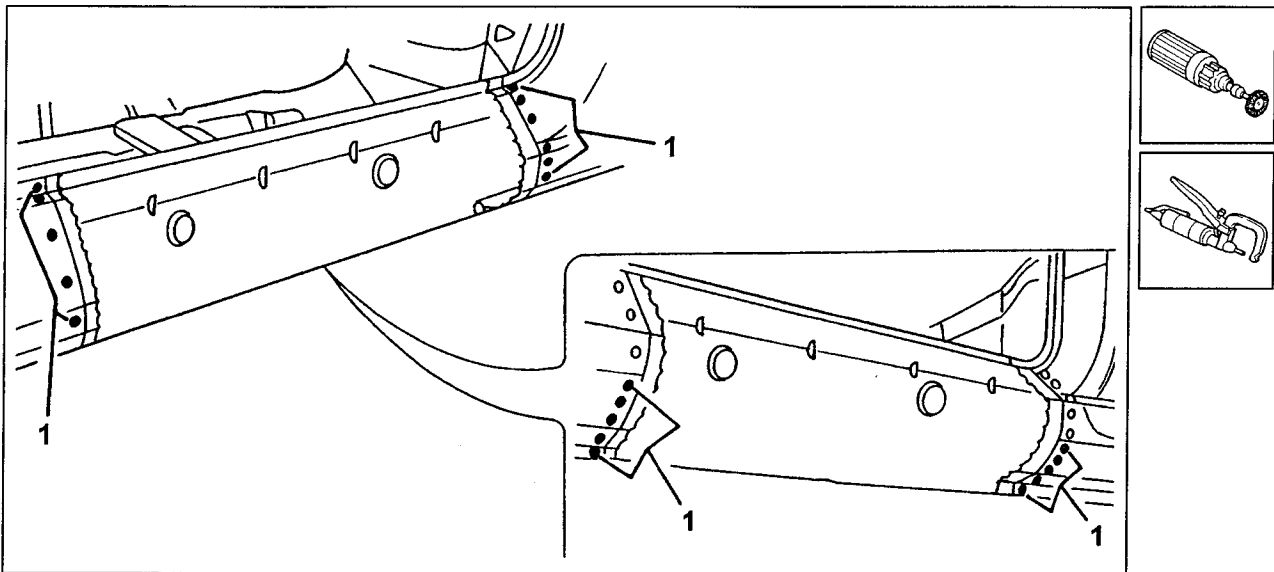
REMOVAL

1. Using a circular saw, cut the underdoor panel following the lines illustrated, without damaging the reinforcement below.
The section of sheet in the more important point is shown so that the operator can adjust the cutting depth.
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
- Remove the centre part of the underdoor panel.



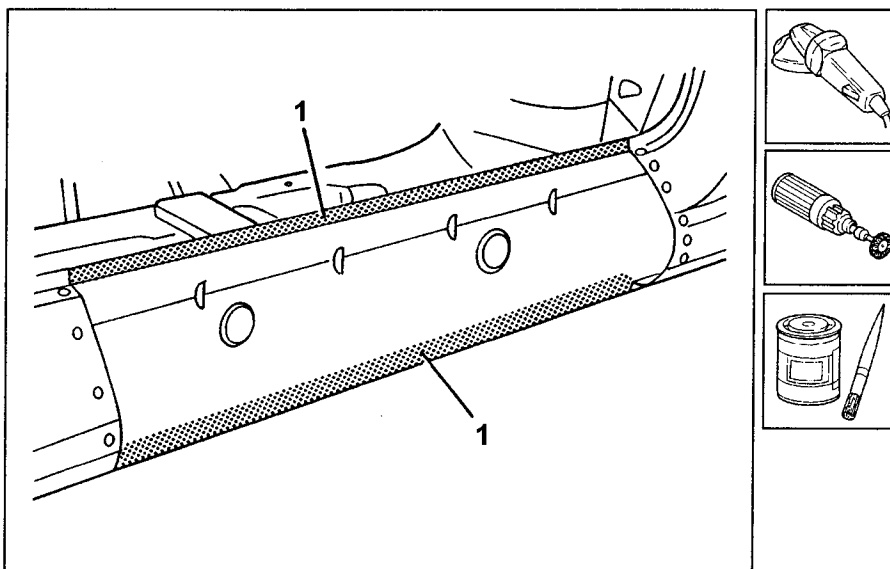
When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- Remove the ends of the underdoor panel.



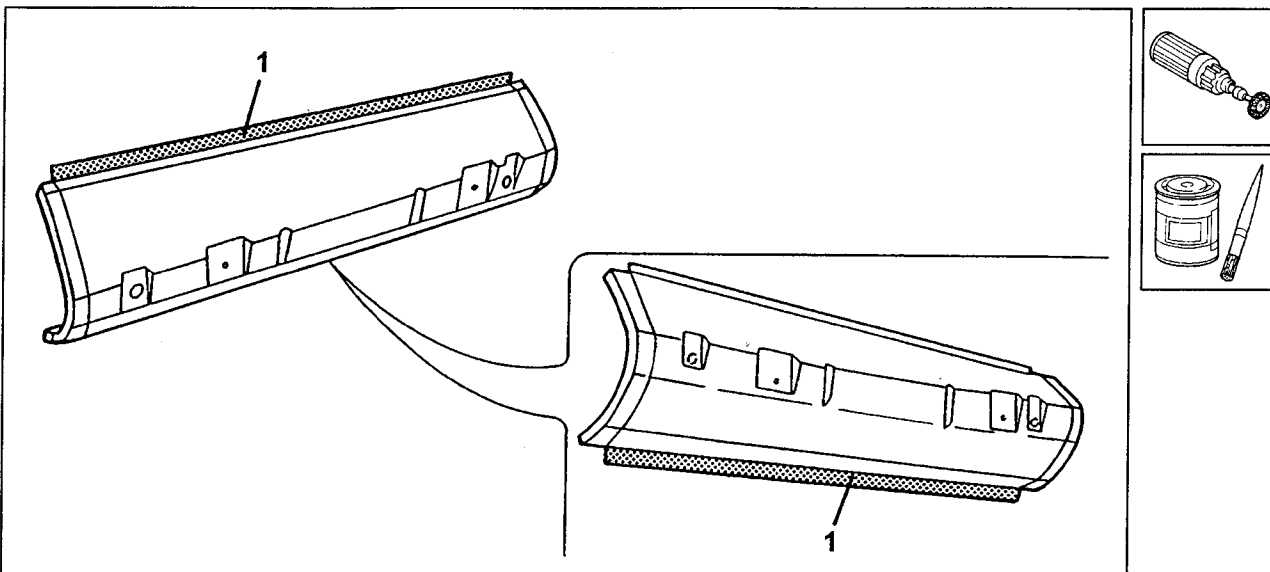
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
- Remove the welding spot remains using a disk sander.
- Clean the areas involved by welding, using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.

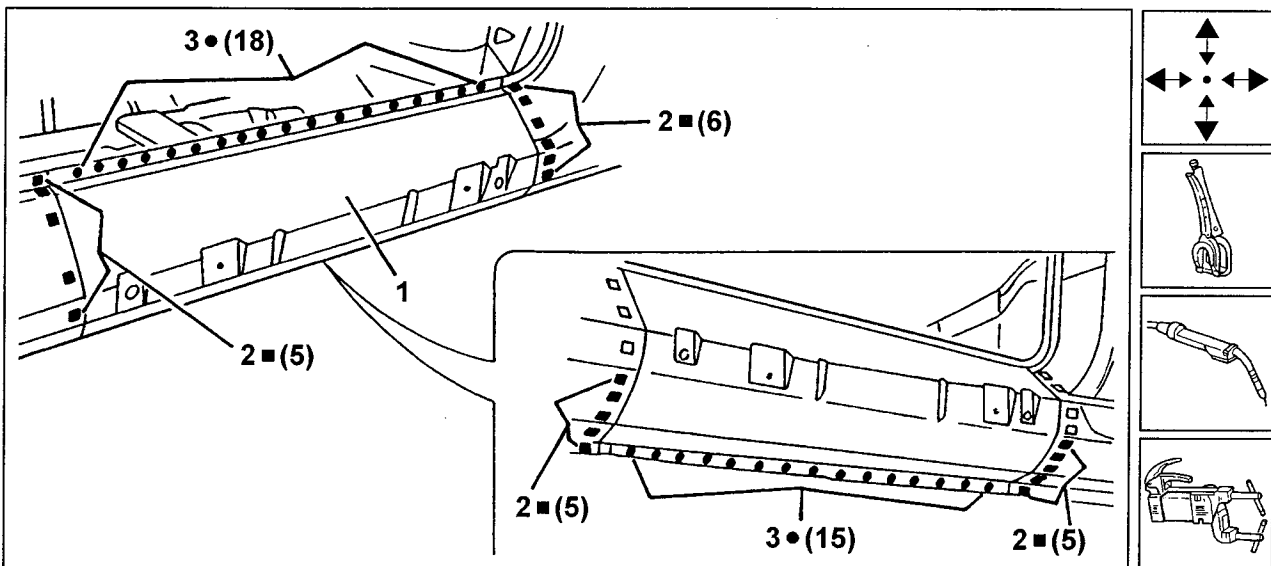


PREPARING THE SPARE - UNDERDOOR PANEL

- Clean the areas of the underdoor panel involved by welding using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.

**POSITIONING AND WELDING THE SPARE - UNDERDOOR PANEL**

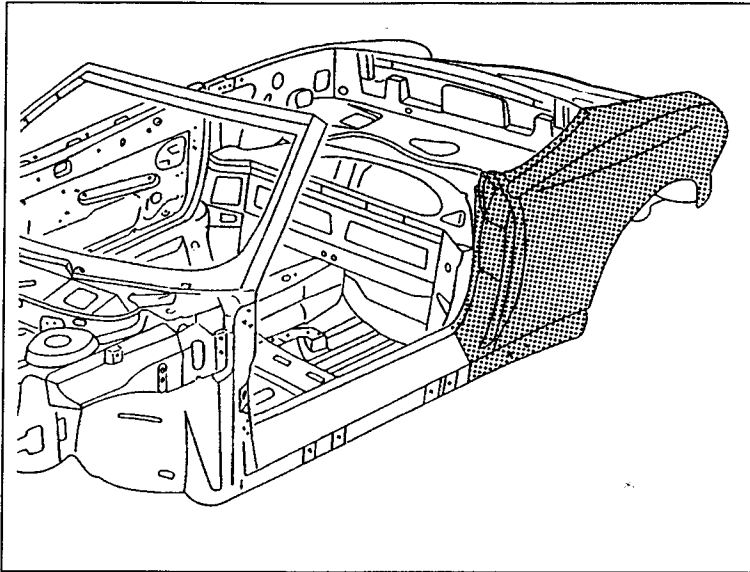
1. Position the underdoor panel correctly.
 - Clamp the components to be welded mating the edges and check alignment.
2. Fill weld using a MIG welder.
3. Spot weld, as illustrated.

**FINISHING OPERATIONS**

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE REAR WING (Only for spider)

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

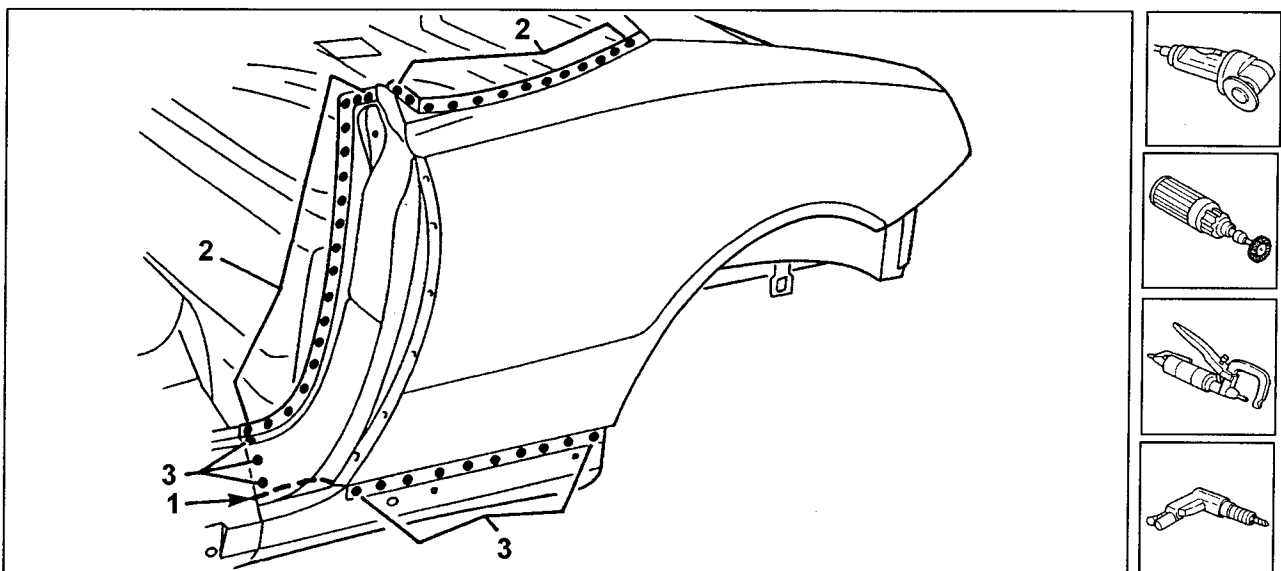
If necessary carry out body straightening operations before cutting the part.
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

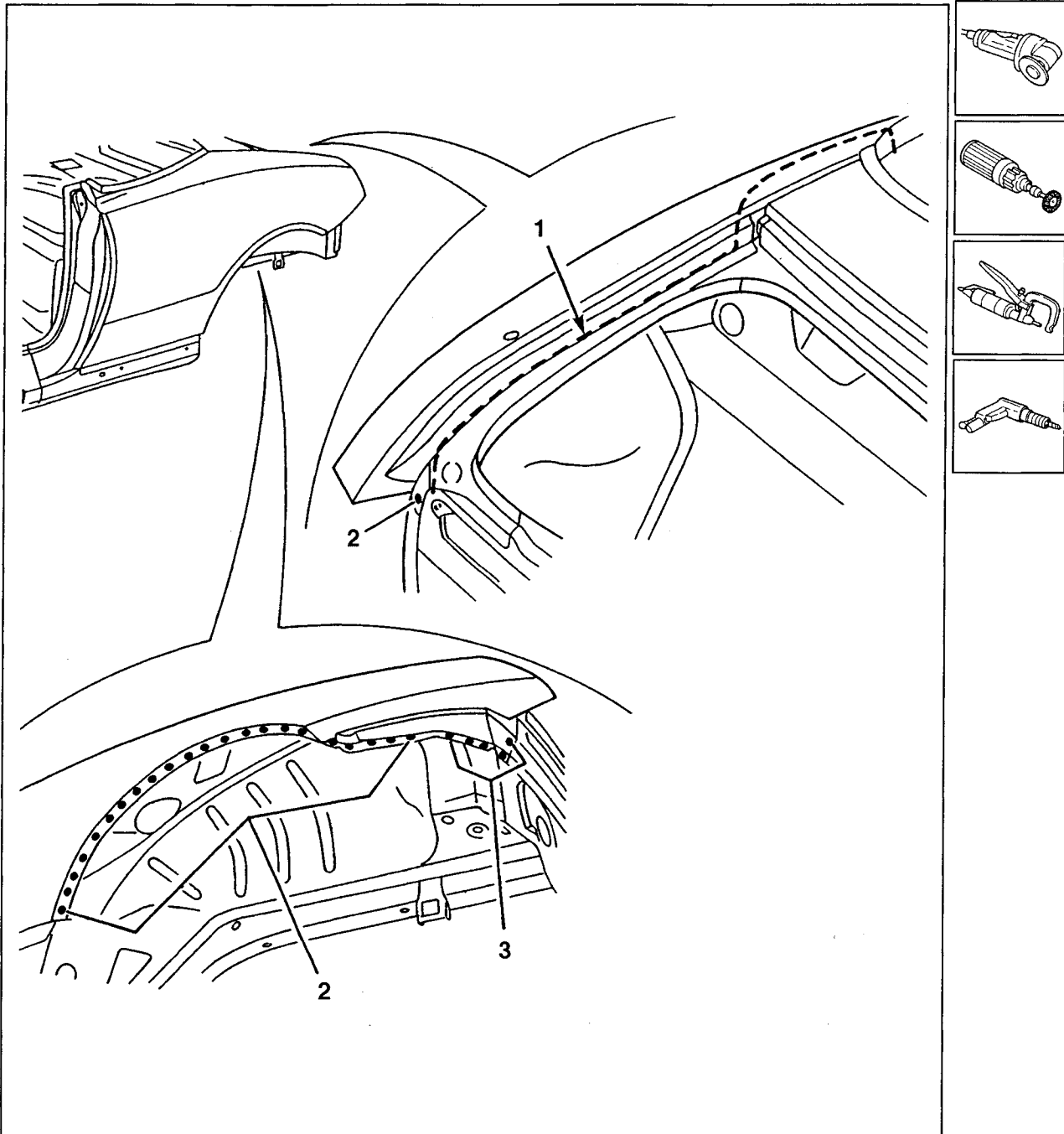
REMOVAL

1. Using a circular saw, cut the rear wing following the lines illustrated, without damaging the reinforcement below.
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
3. Remove the welding spots using a drill.

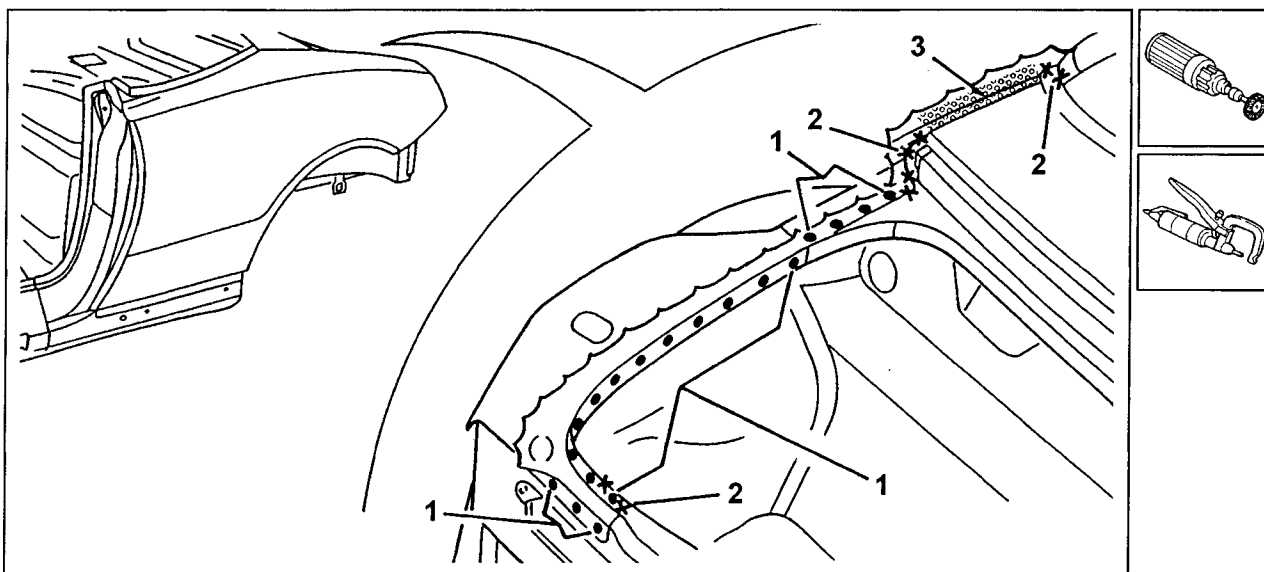


When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

1. Using a circular saw, cut the rear wing following the lines illustrated, without damaging the parts below.
 - Using a rotary brush clean the area to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
3. Remove the welding spots using a drill.

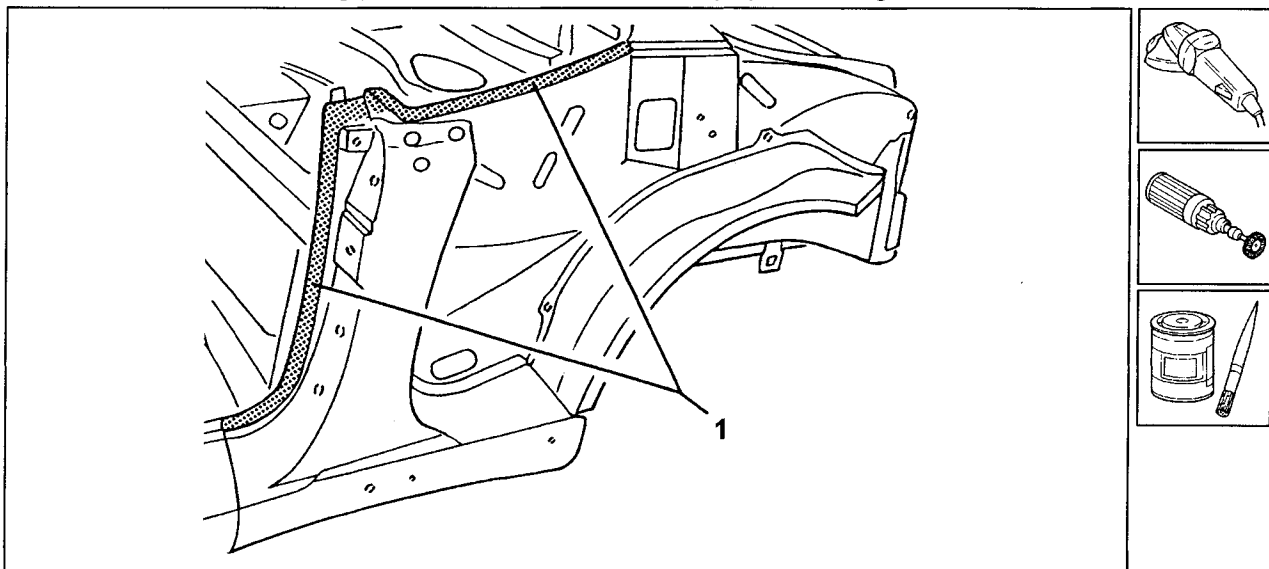


- Using a rotary brush clean the area to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- 2. Remove the braze welding in the area illustrated.
- 3. Remove the rear wing detaching it from the glue in the area illustrated.

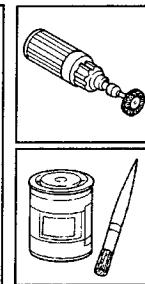
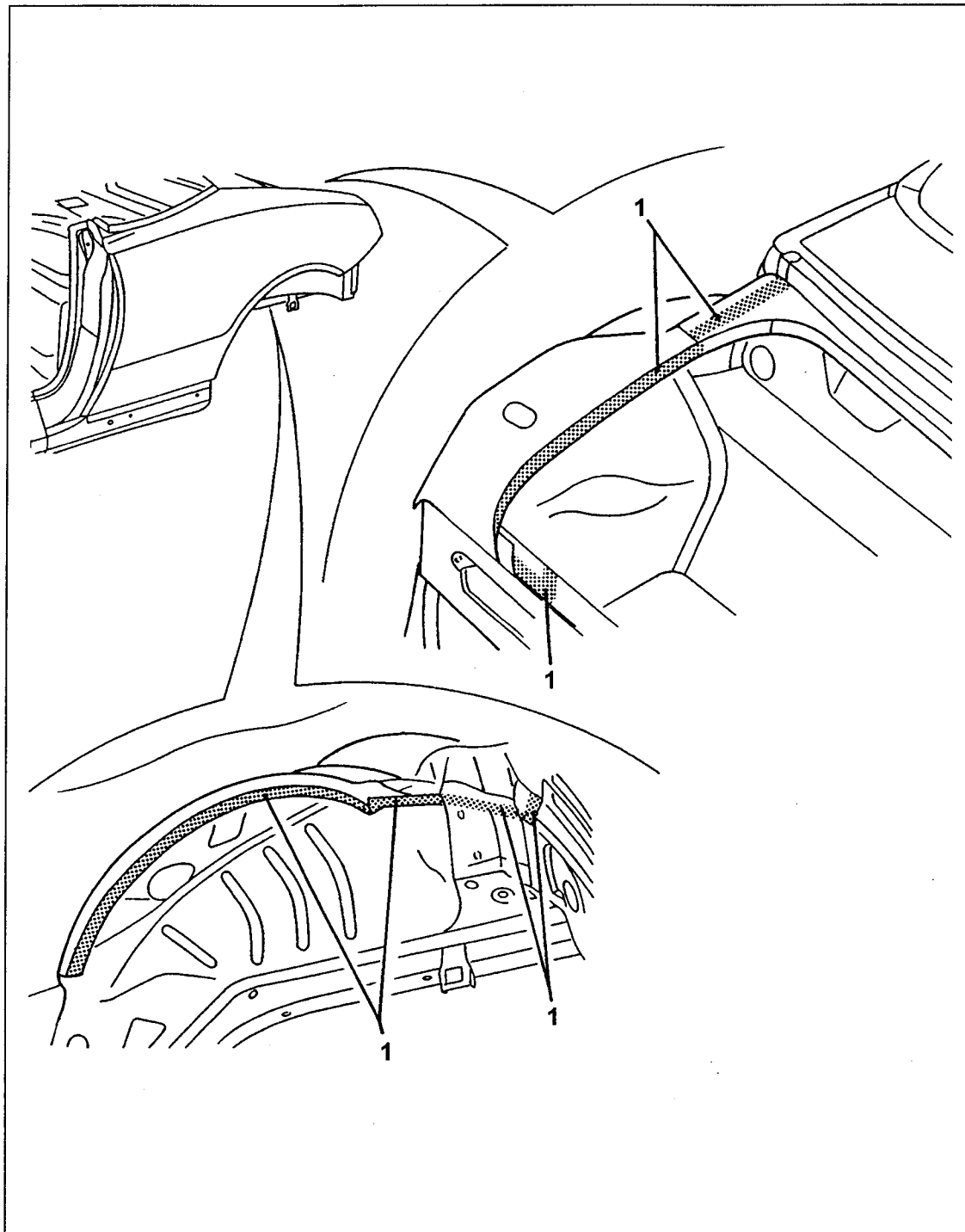


PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
- Remove the welding spot remains using a disk sander.
- Clean the areas involved by welding, using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.

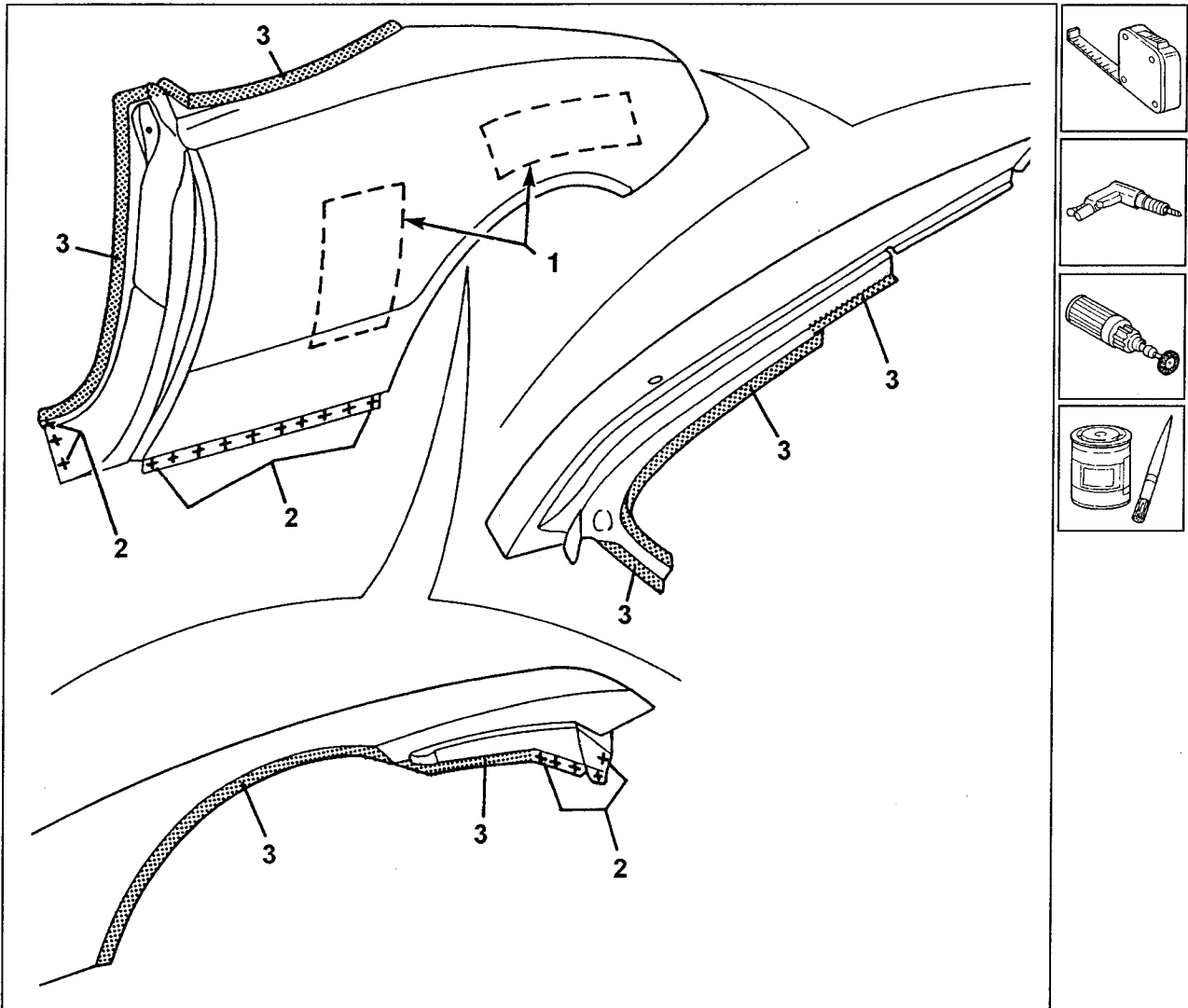


- Clean the areas involved by welding using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.



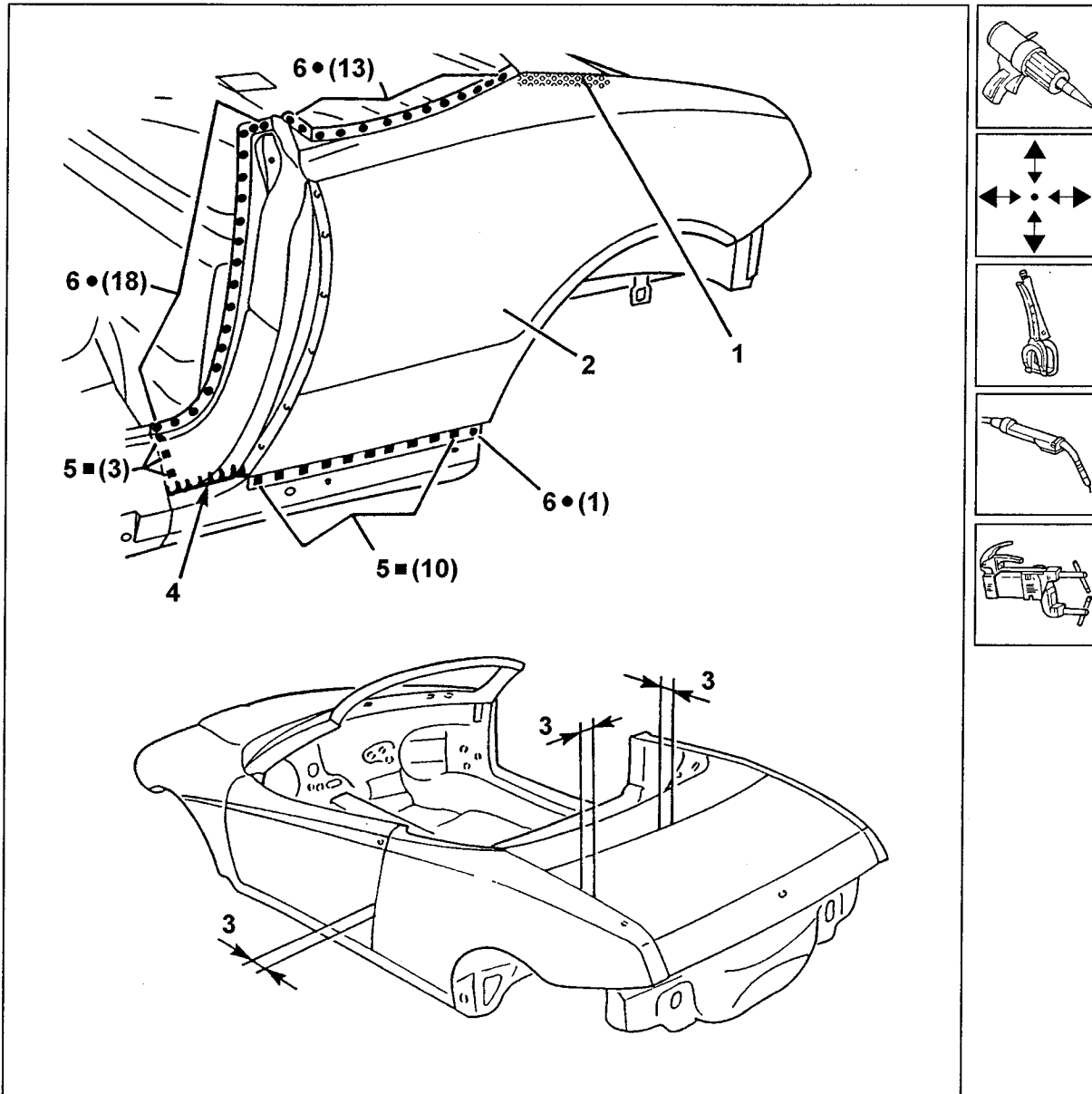
PREPARING THE SPARE - REAR WING

1. Check for the presence of the sound-deadener panels and fit them if they are lacking.
2. Working on the bench trace the wing and drill using a \varnothing 5 mm bit as illustrated.
 - Clean the areas involved by welding on the vehicle, using a rotary brush.
3. Apply electro-galvanizing paint on the areas illustrated involved by spot welding.

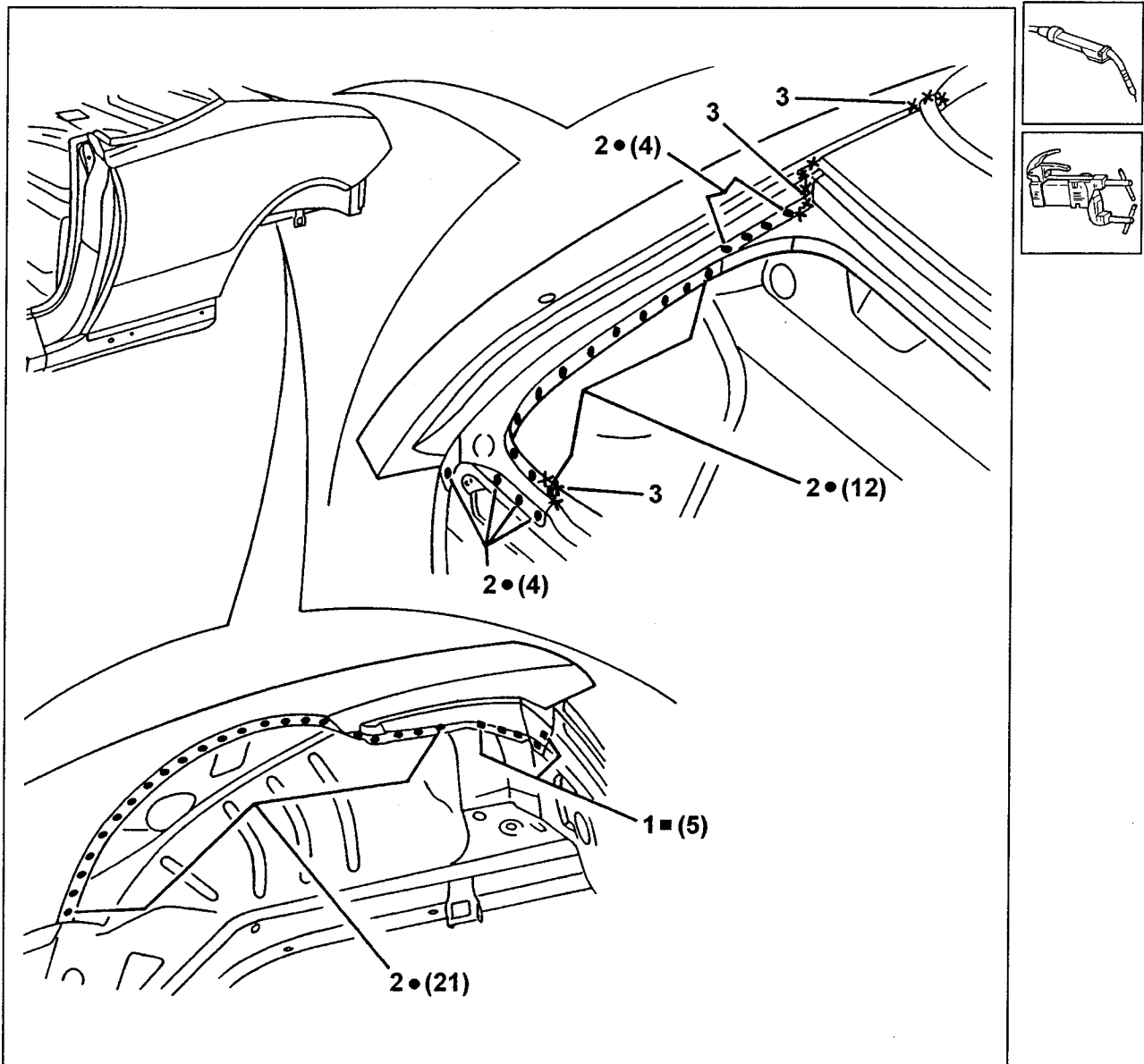


POSITIONING AND WELDING THE SPARE - REAR WING

1. Apply the sealant in the area illustrated.
2. Position the rear wing correctly.
3. Clamp the components to be welded mating the edges and check alignment.
4. Seam weld using a MIG welder.
5. Fill weld using a MIG welder.
6. Spot weld, as illustrated.



1. Fill weld using a MIG welder.
2. Spot weld, as illustrated.
3. Braze weld in the areas illustrated.

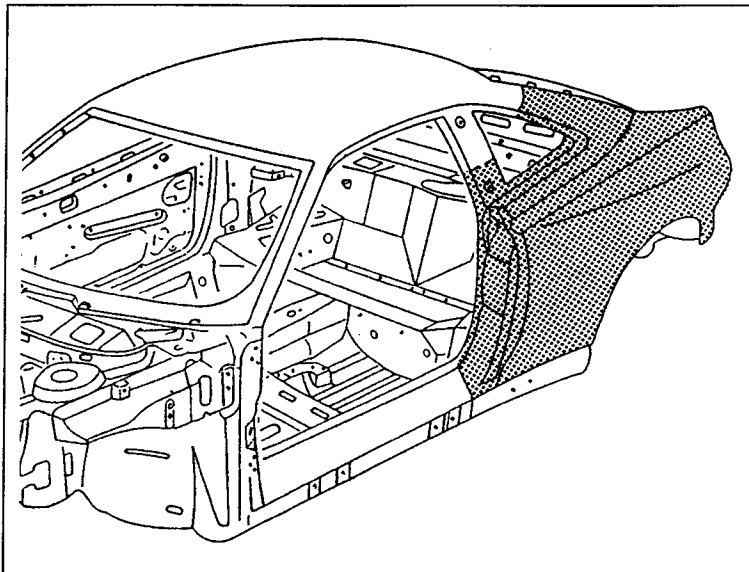


FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments, referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE REAR WING (Only for GTV)

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

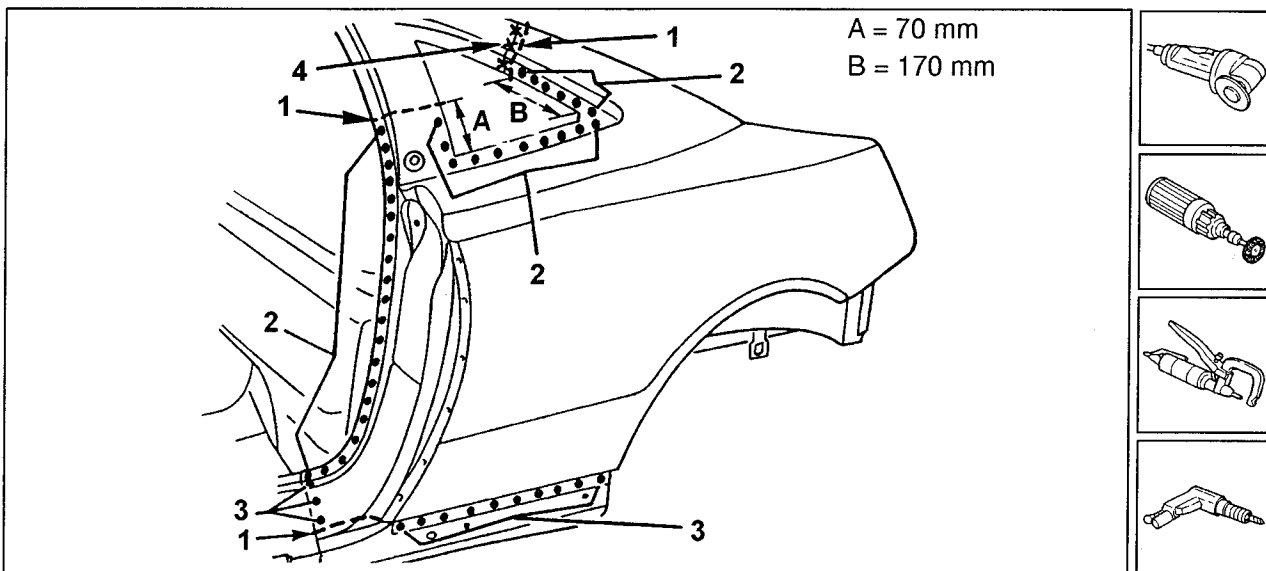
If necessary carry out body straightening operations before cutting the part. After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.

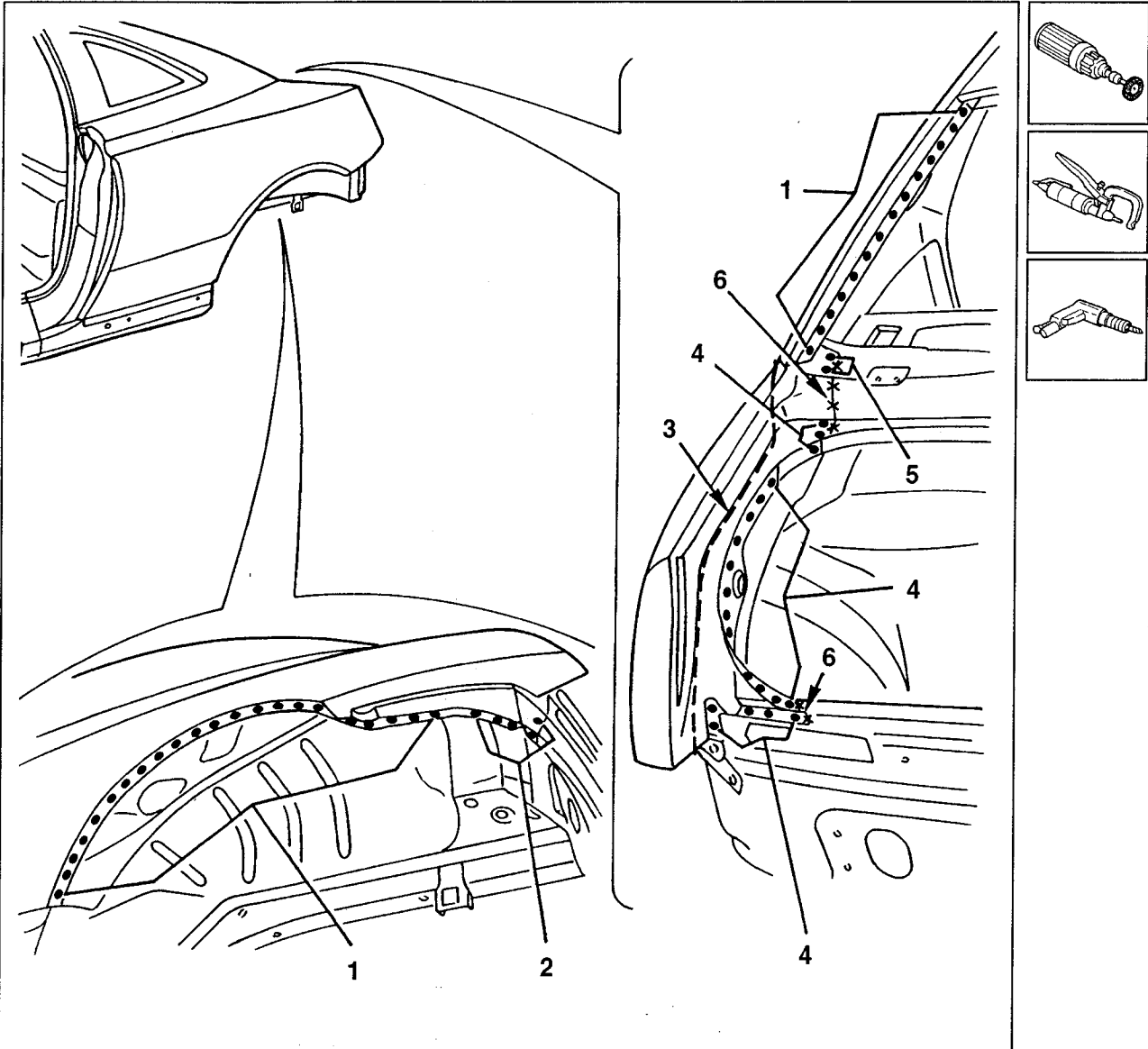
REMOVAL

1. Using a circular saw, cut the rear wing following the lines and dimensions illustrated, without damaging the parts below.
 - Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
3. Remove the welding spots using a drill.
4. Remove the braze welds in the area illustrated.



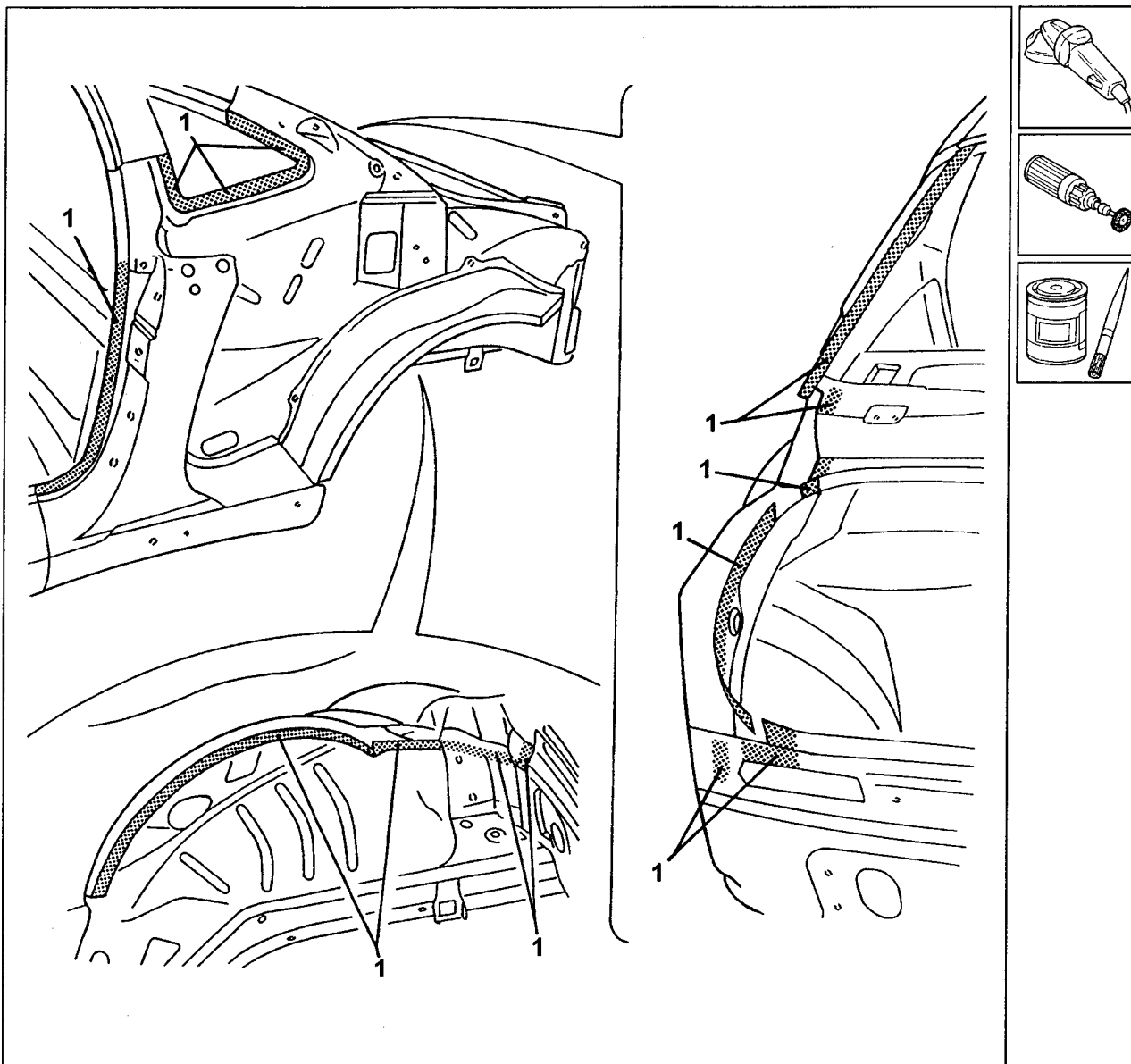
When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

- Using a rotary brush clean the area to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- 2. Remove the welding spots using a drill.
- 3. Using a circular saw, cut the rear wing following the lines illustrated without damaging the parts below.
- Remove the rear wing.
- 4. Remove the welding spots using a de-welder.
- 5. Remove the welding spots using a drill.
- 6. Remove the braze welding in the area illustrated.
- Remove the rear wing cuttings.



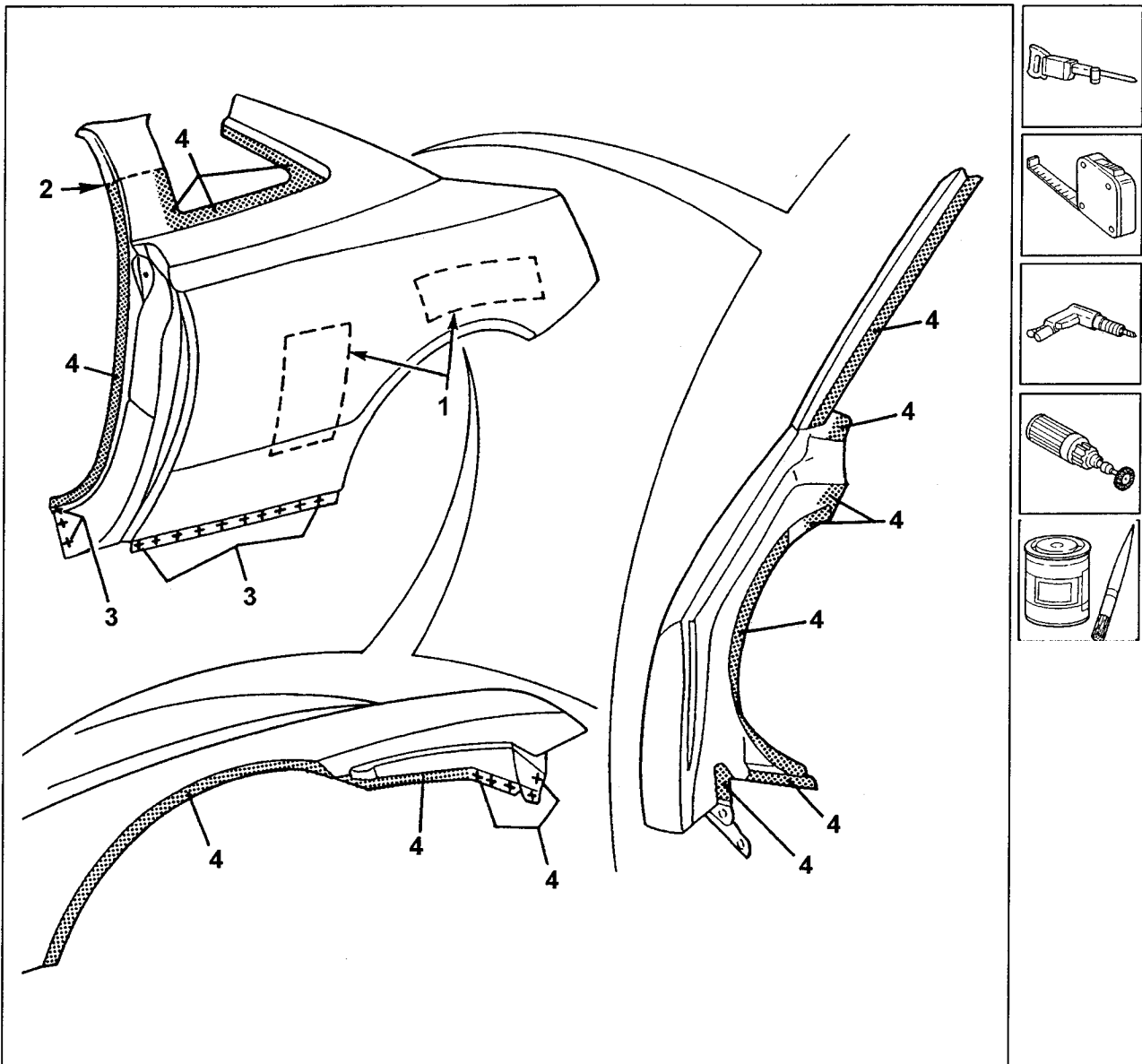
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
- Remove the welding spot remains using a disk sander.
- Clean the areas involved by welding, using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.



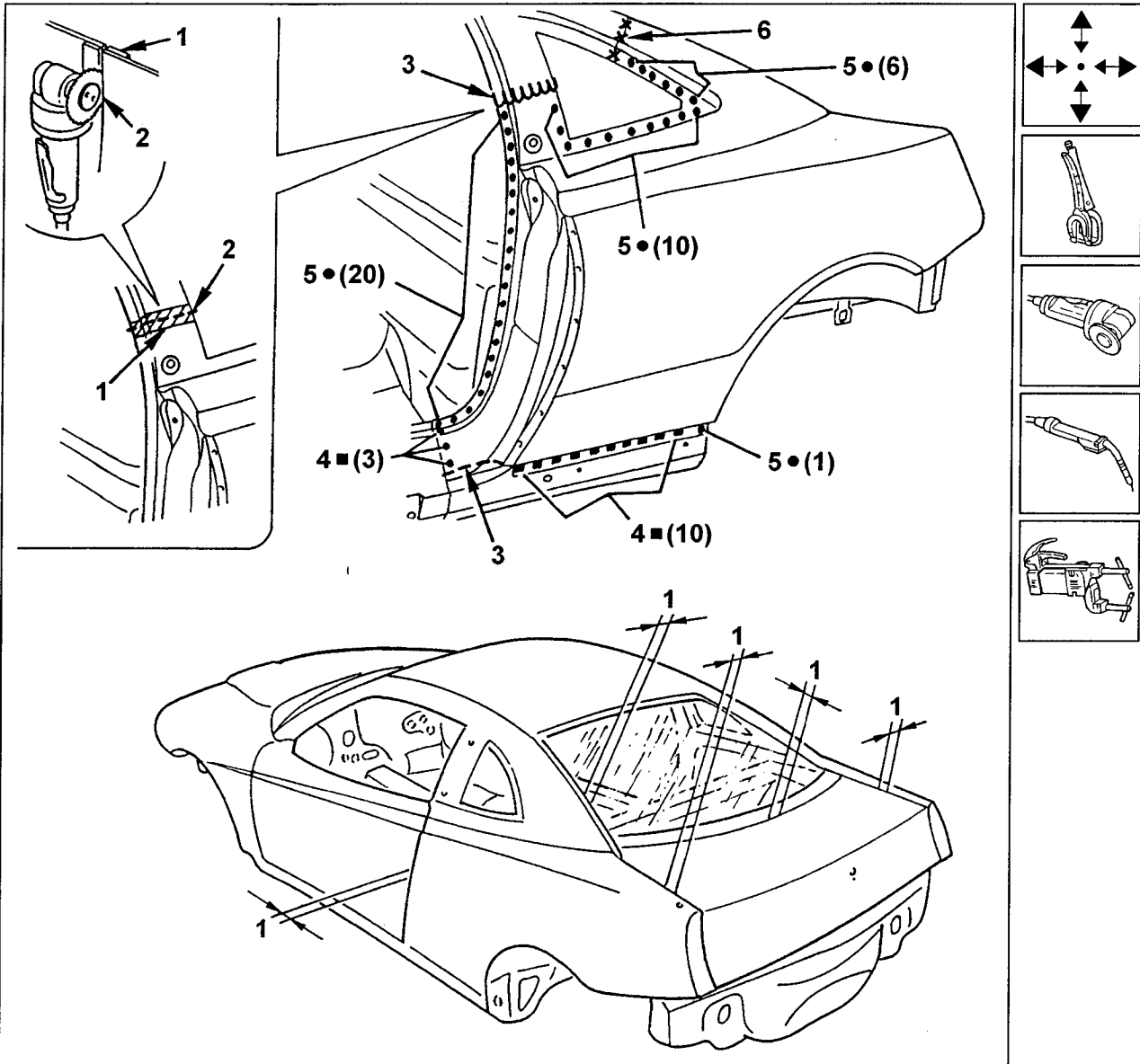
PREPARING THE SPARE - REAR WING

1. Check for the presence of the sound-deadener panels and fit them if they are lacking.
2. Working on the bench using a hacksaw cut the new wing as illustrated keeping a section of sheet metal for overlapping.
3. Trace the wing and drill as illustrated using a $\varnothing 5$ mm bit.
 - Clean the areas involved by welding on the vehicle, using a rotary brush.
4. Apply electro-galvanizing paint on the areas illustrated involved by spot welding.

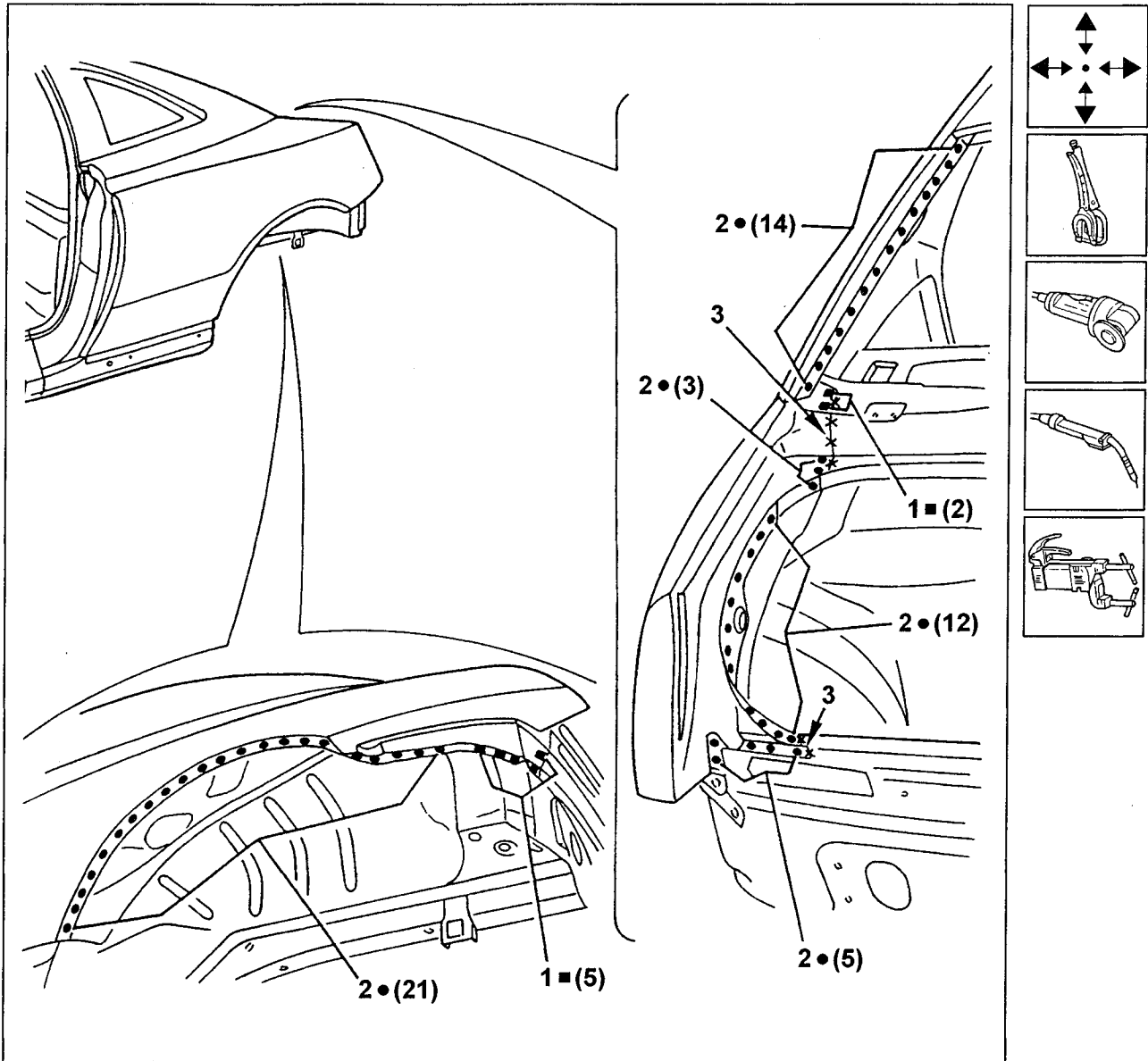


POSITIONING AND WELDING THE SPARE - REAR WING

- Position the rear wing correctly.
- 1. Overlay and clamp the components to be welded mating the edges and check alignment.
- 2. Trim the sheets eliminating the excess, using a circular saw; take care not to damage the part below.
- 3. Seam weld using a MIG welder.
- 4. Fill weld using a MIG welder.
- 5. Spot weld, as illustrated.
- 6. Braze weld in the area illustrated.



1. Fill weld using a MIG welder.
2. Spot weld, as illustrated.
3. Braze weld in the areas illustrated.

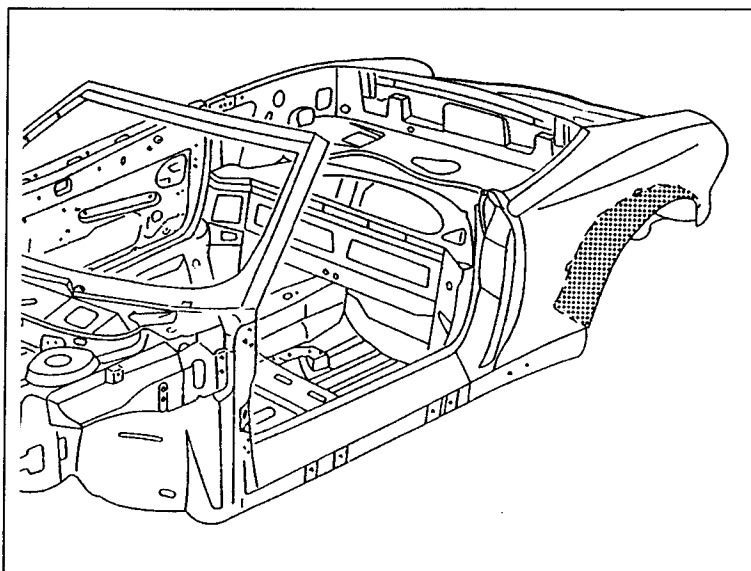


FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments, referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE REAR OUTER WHEEL HOUSE

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

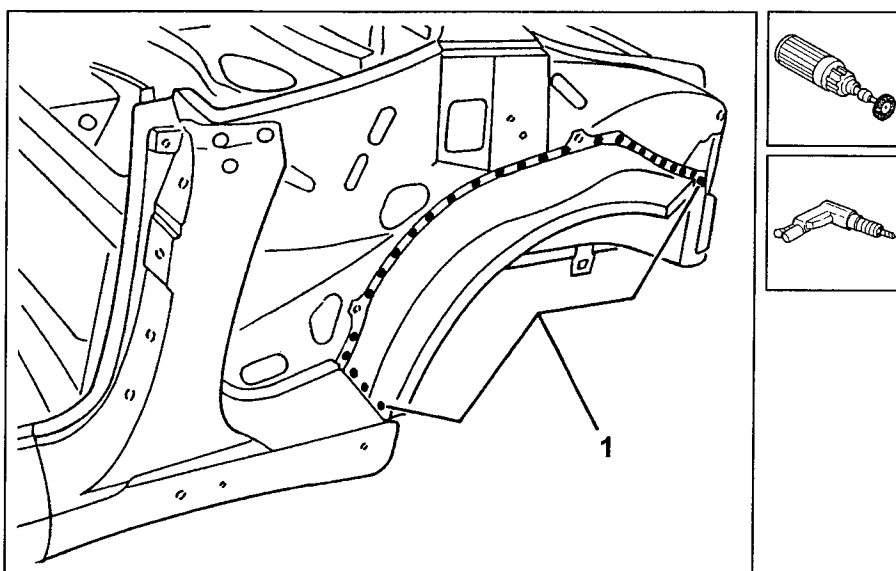
If necessary carry out body straightening operations before cutting the part. After this operation check that the parts that do not need replacing are intact.


PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.
- Remove the rear wing (see: "Replacing the Rear Wing").

REMOVAL

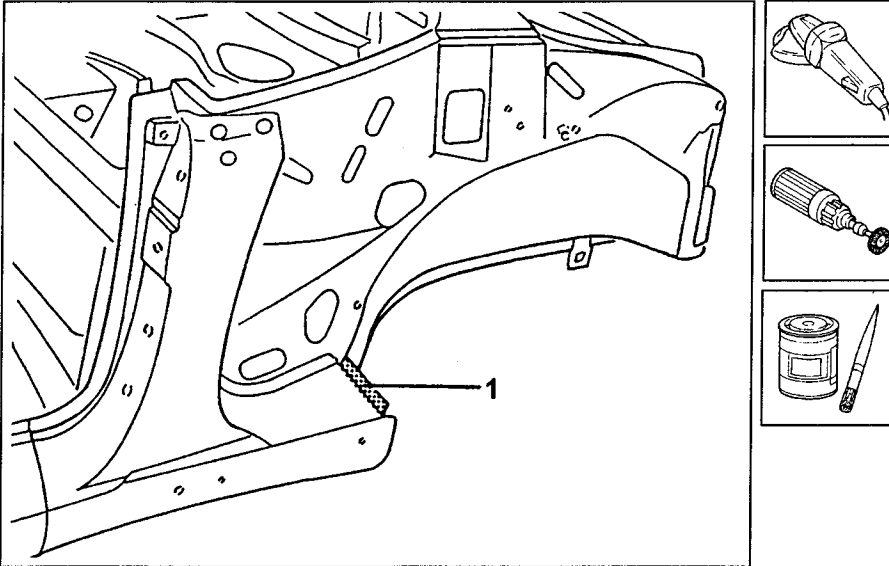
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a drill.
- Remove the wheelhouse.



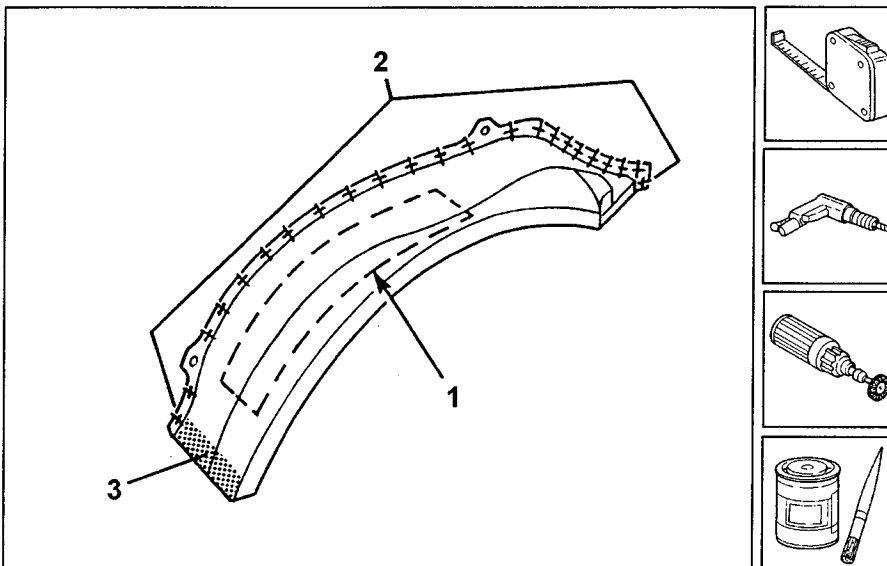
 When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.

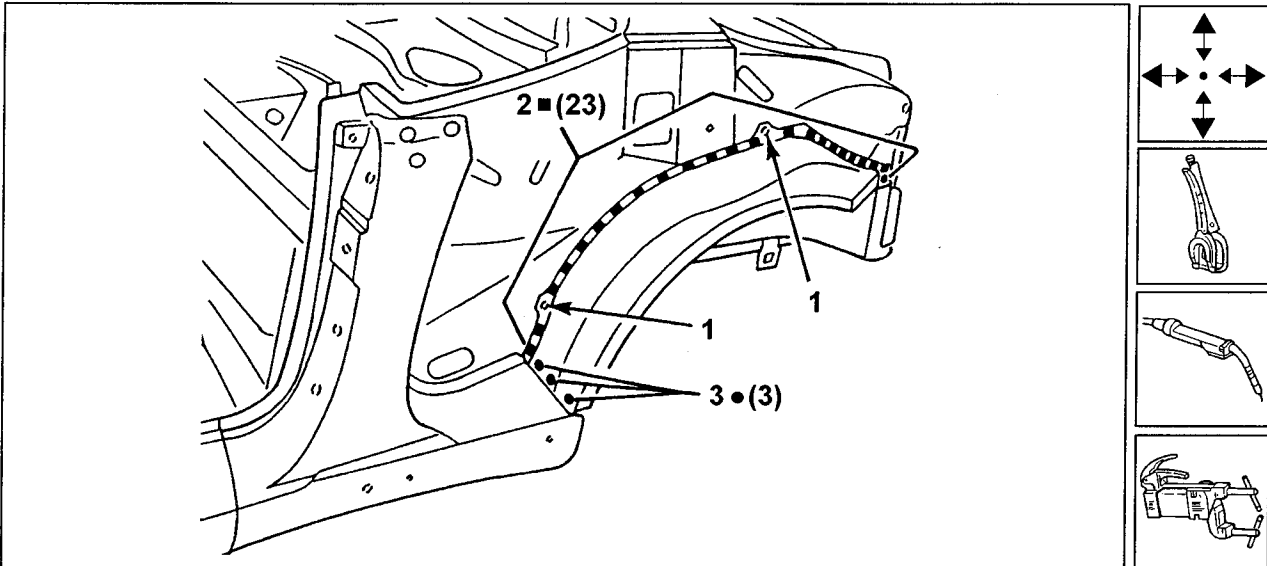
**PREPARING THE SPARE - REAR OUTER WHEELHOUSE**

1. Check for the presence of the sound-deadening panel and fit it if it is lacking.
 2. Working on the bench, trace the wheelhouse and drill using a $\varnothing 5$ mm bit as illustrated.
- Clean the areas of the wheelhouse involved by welding, using a rotary brush.
3. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - REAR OUTER WHEELHOUSE

1. Position the rear wheelhouse correctly using the centering holes.
 - Clamp the components to be welded mating the edges and check alignment.
2. Fill weld using a MIG welder.
3. Spot weld, as illustrated.



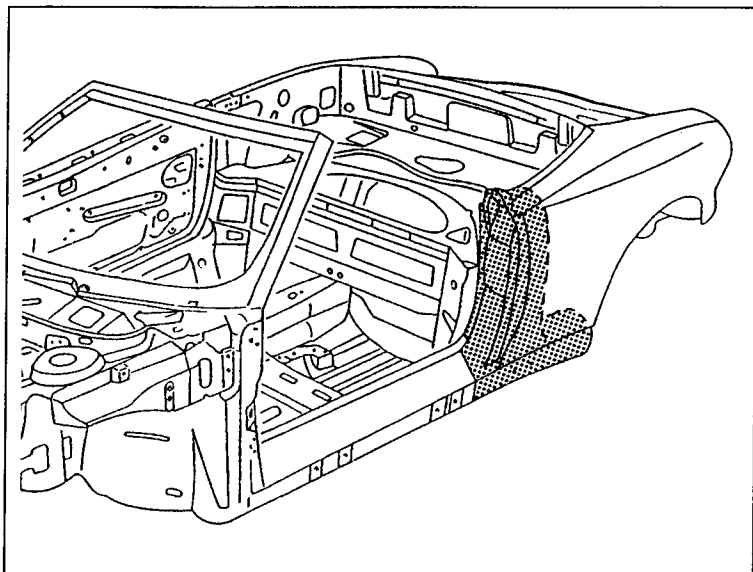
- Refit the rear wing (see "Replacing the Rear Wing").

FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE REAR PILLAR

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

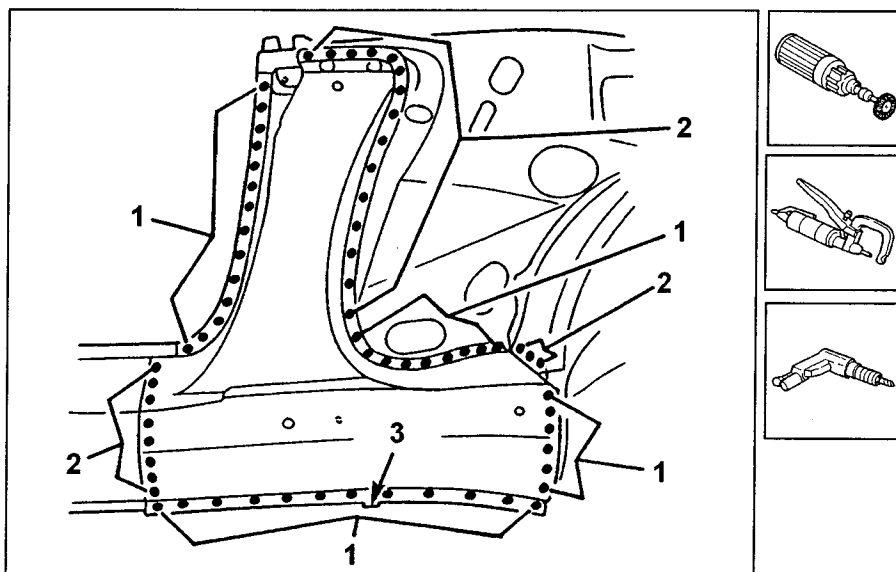
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.
- Remove the rear wing (see: "Replacing the Rear Wing").

REMOVAL

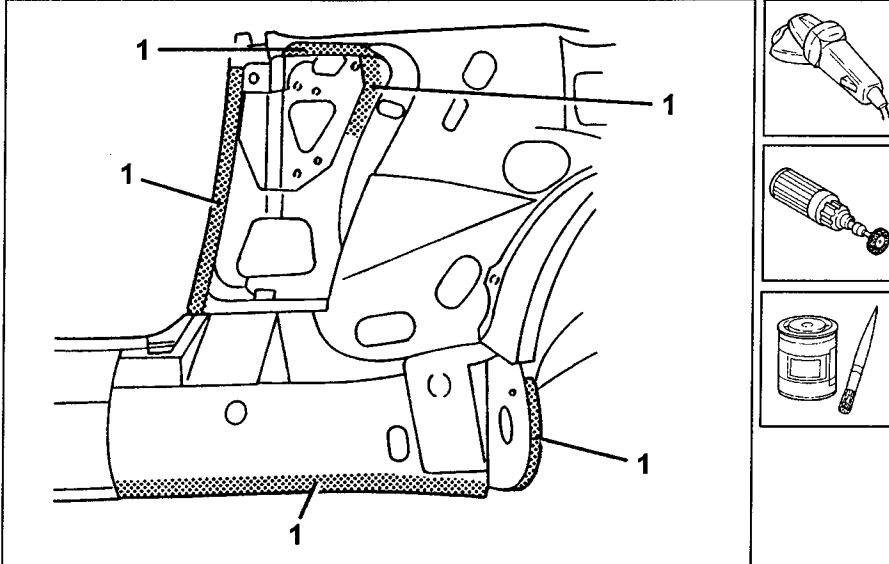
- Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
- 1. Remove the welding spots using a de-welder.
- 2. Remove the welding spots using a drill.
- 3. Open the clinching tab.
- Remove the rear pillar.



When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

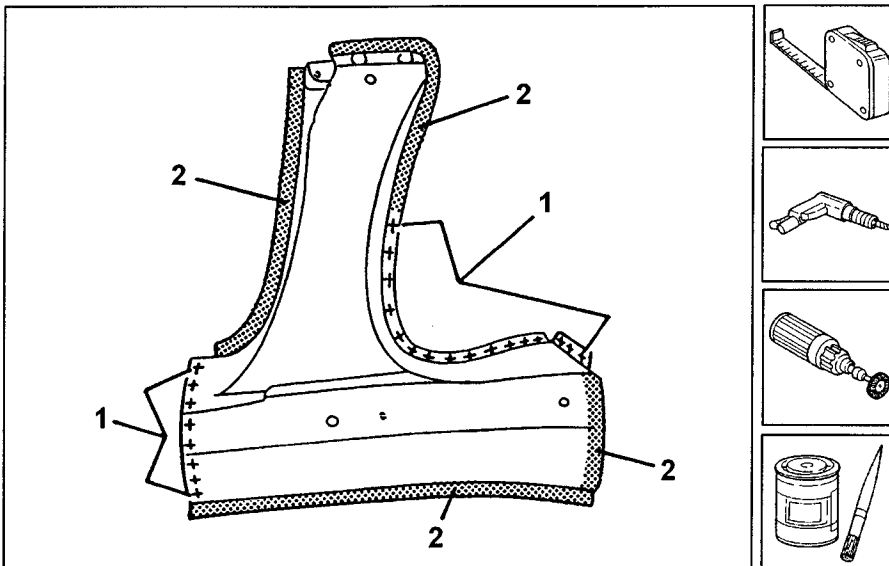
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
 - Remove the welding spot remains using a disk sander.
 - Clean the areas involved by welding, using a rotary brush.
1. Apply electro-galvanizing paint on the areas involved by spot welding.



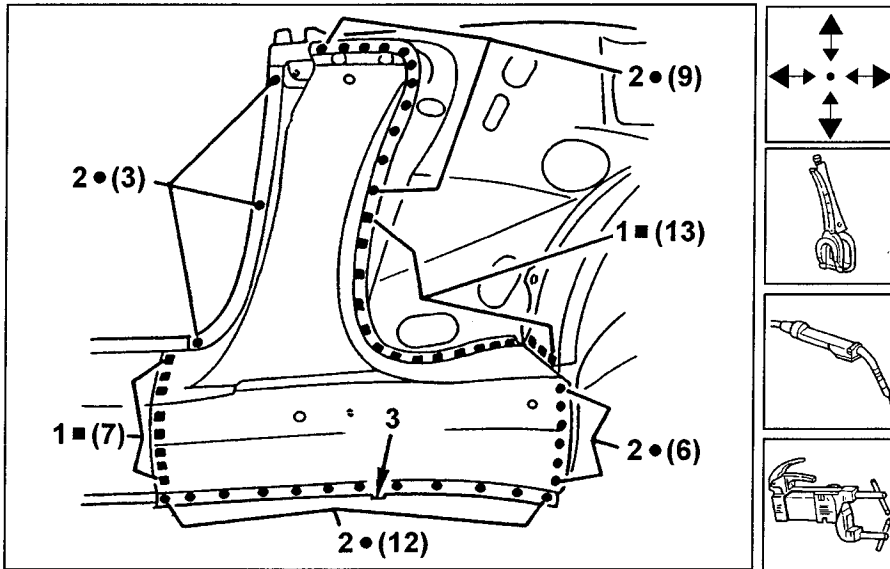
PREPARING THE SPARE - REAR PILLAR

1. Working on the bench trace the new rear pillar using a drill with \varnothing 5 mm bit as illustrated.
- Clean the areas involved by welding on the rear pillar, using a rotary brush.
2. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - REAR PILLAR

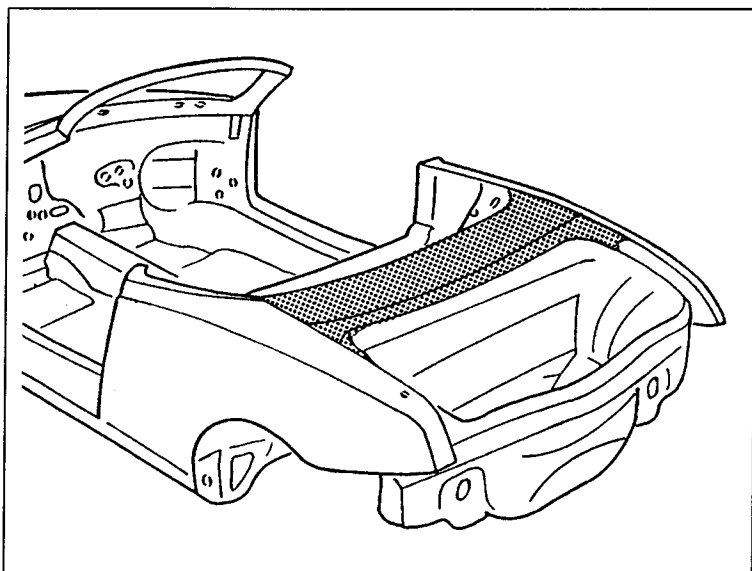
- Position the pillar correctly.
 - Clamp the components to be welded mating the edges and check alignment.
1. Fill weld using a MIG welder.
 2. Spot weld, as illustrated.
 3. Bend the clinching tab.

**FINISHING OPERATIONS**

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.
- Refit the rear wing (see: Replacing the Rear Wing).

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments, referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.



REPLACING THE COMPLETE UPPER CROSSMEMBER CONNECTING THE REAR WINGS (only for SPIDER)

The part for which the replacement procedure is described is shown in the opposite diagram.

PRELIMINARY PROCEDURES

Establish the amount of damage, check the connected parts for buckling, controlling the body squaring dimensions given in the Manual using suitable measuring tools (locating benches, templates or gauges).

If necessary carry out body straightening operations before cutting the part.

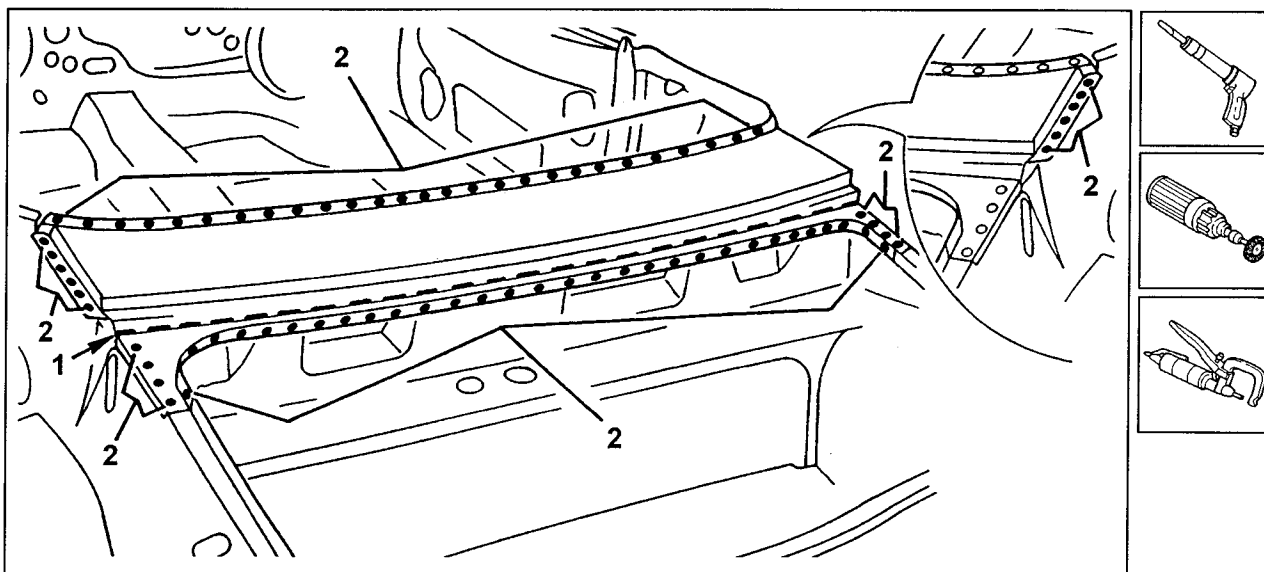
After this operation check that the parts that do not need replacing are intact.

PRELIMINARY DIS-ASSEMBLY OPERATIONS

- Remove the mobile body components, inner trim, electrical and mechanical components that might hinder the repair operations or get damaged during them.
- Remove the rear wings (see: "Replacing the Rear Wing").

REMOVAL

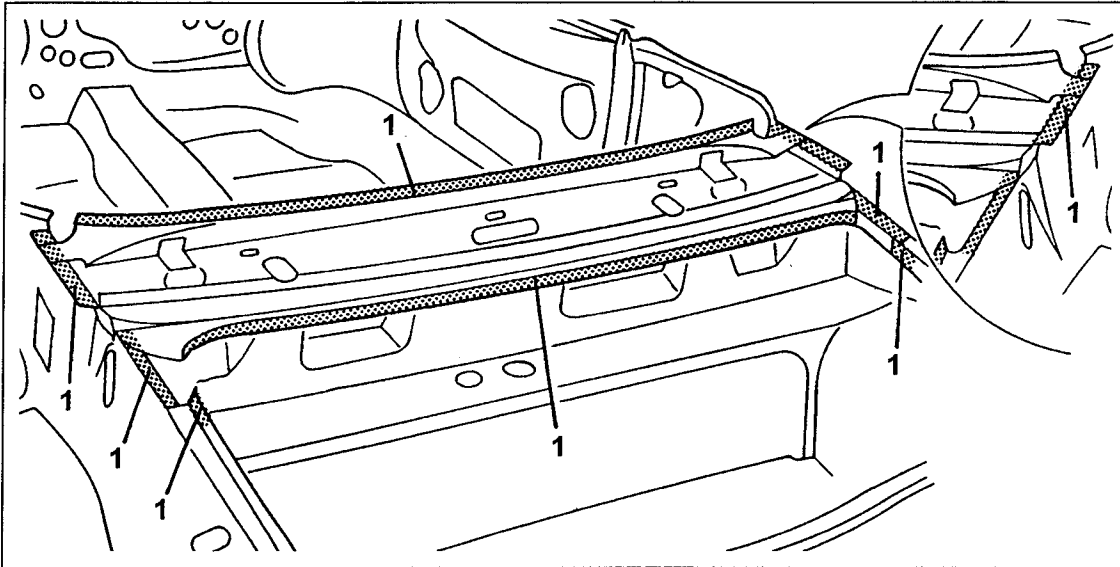
1. Using a chisel, cut the crossmember, following the lines shown in the illustration, without damaging the part below.
 - Using a rotary brush, clean the areas to be de-welded to reveal the welding spots.
2. Remove the welding spots using a de-welder.
 - Remove the two parts of the crossmember.



When carrying out the above-mentioned operations closely adhere to accident prevention regulations. Wear safety shoes, noise muffs and gloves when cutting, protective goggles, dust masks and gloves during sanding and brushing, mask and gloves during welding operations, mask and gloves during painting operations. Also see paragraph "PRECAUTIONS FOR OPERATORS".

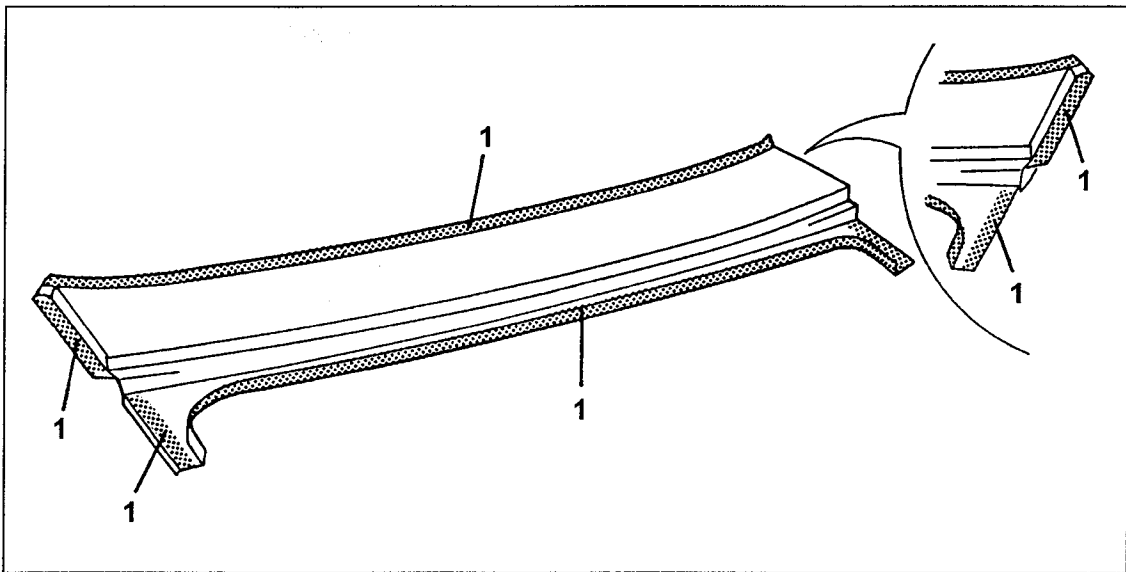
PREPARING THE EDGES OF THE BODY

- Straighten the edges of the body.
- Remove the welding spot remains using a disk sander.
- Clean the areas involved by welding, using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.



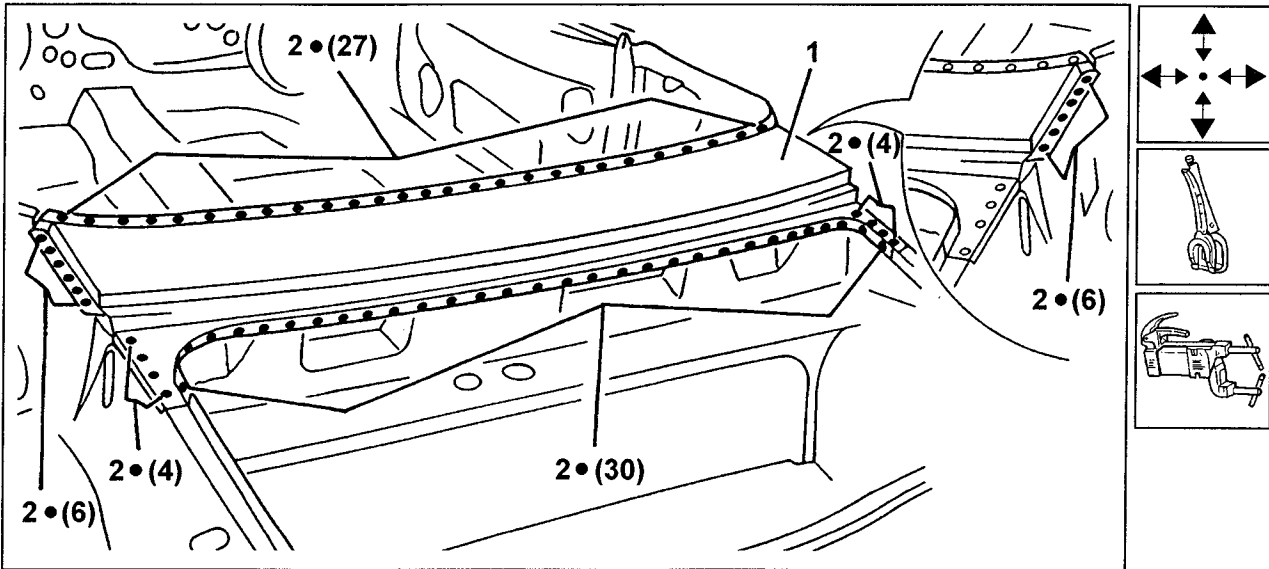
PREPARING THE SPARE - UPPER CROSSMEMBER CONNECTING REAR WINGS

- Clean the areas of the crossmember involved by welding, using a rotary brush.
- 1. Apply electro-galvanizing paint on the areas involved by spot welding.



POSITIONING AND WELDING THE SPARE - UPPER CROSSMEMBER CONNECTING REAR WINGS

1. Position the upper crossmember correctly.
 - Clamp the components to be welded mating the edges and check alignment.
2. Spot weld, as illustrated.



FINISHING OPERATIONS

- Remove and level remains of welding, using a sander.
- Clean the welded areas, using a rotary brush.
- Assemble the rear wings (see: "Replacing Rear Wing").

PROTECTIONS

- Apply rust proofing in the areas involved by MIG welding.
- Seal the joints and carry out the rust-proofing treatments referring to the general tables given in the Manual for the areas to be treated and the products to be used.
- Proceed with painting operations.