

**GROUP 49****BODYWORK****INDEX**

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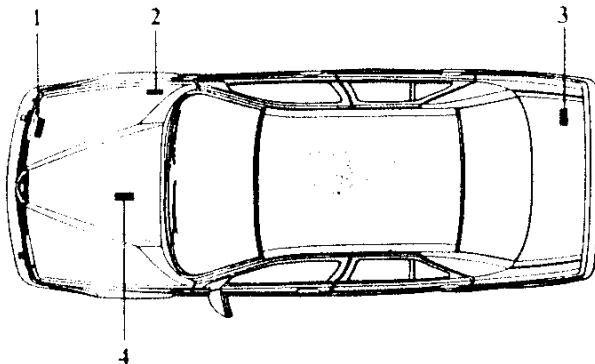
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**BODYWORK****GENERAL INFORMATION****IDENTIFICATION DATA****Homologation and vehicle identification labels**

See: CHARACTERISTICS AND VEHICLE MAINTENANCE - GR. 00 - Vehicle identification data.

ALFA ROMEO	A	
	B	
	C	D
	E	Kg
P	F	Kg
	1- G	Kg
O	2- H	Kg
	I	
N	L	
	M	

MOTORE - ENGINE I  
VERSIONE - VERSION L  
N° PER RICAMBI / N° FOR SPARES M



1. Identification label
2. Body label
3. Bodywork paint label
4. Engine label

**BODYWORK PAINT LABEL**

This is located inside the luggage compartment and carries the following information:

- A. Paint manufacturer
- B. Name of colour
- C. Colour code
- D. Touch-up/repainting colour code

Verniciatura originale Peinture originale/Original painting Originallackierung/Pintado original	A
Colore / Teinte / Colour Farbton / Color	B
Codice / Code / Código	C
PER RITOCCHI E VERNICIATURE	D

**IDENTIFICATION LABEL**

This is located in the engine compartment.

It carries the following information:

- A. Name of manufacturer
- B. Homologation number
- C. Vehicle type identification number
- D. Chassis serial number
- E. Maximum gross vehicle weight
- F. Maximum gross vehicle weight including trailer
- G. Maximum gross weight on front axle
- H. Maximum gross weight on rear axle
- I. Engine code
- M. Number for spareparts
- N. Smoke opacity index (for diesel and turbo diesel)
- O. Supplier code
- P. Production state



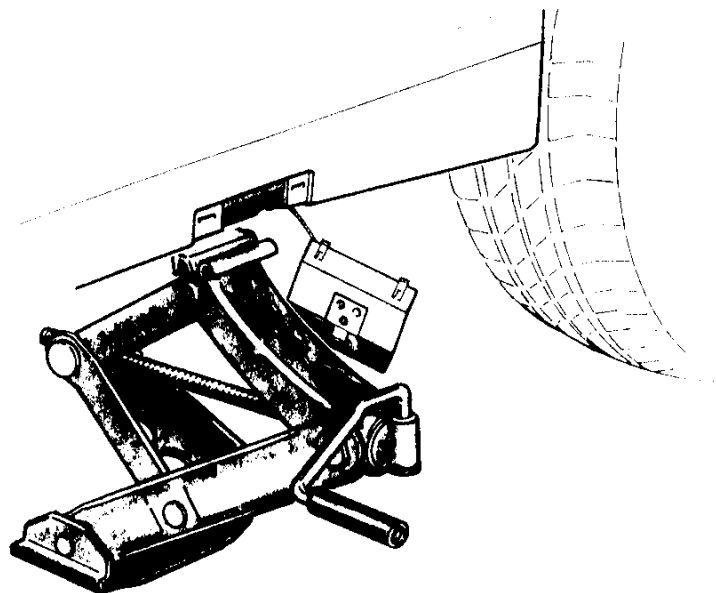
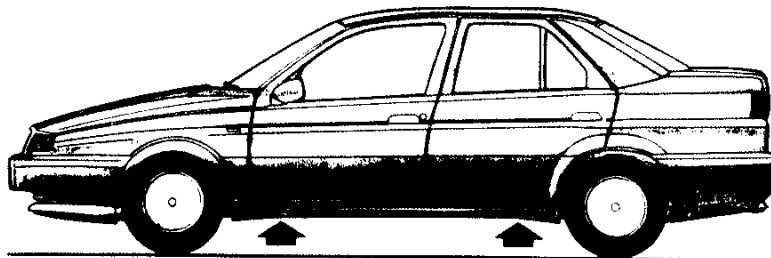
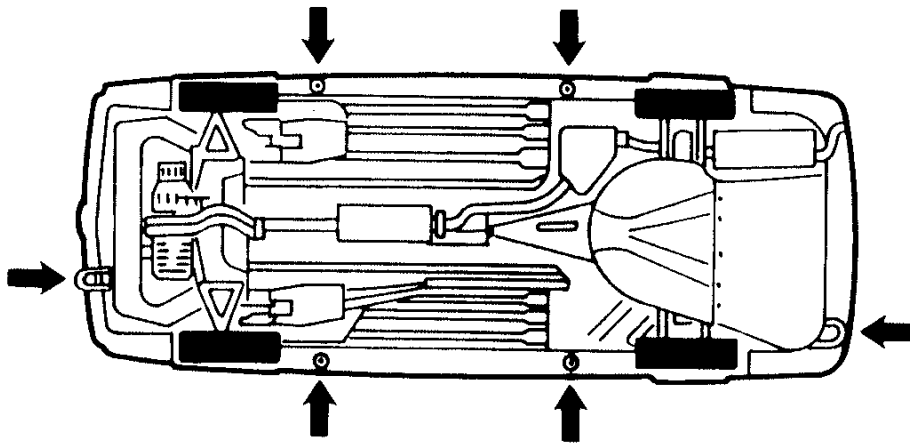
**LIFTING AND TOWING POINTS**

- When the the vehicle needs to be raised and/or towed, position the jacks and/or attach the tow bar to the points shown in the diagram.



**WARNING:**

- After raising with a jack, the weight of the vehicle must be supported by safety stands.
- Before raising the rear (front) of the vehicle block the front (rear) wheels with chocks.





## DESCRIPTION

The body has for the most part been designed following the finished element method. In this way a high degree of torsional rigidity is obtained which renders the geometry indeformable and ensures precision with regard to assembly tolerances and cancellation of noise and squeaking; the stresses are also reduced to within absolute safety limits.

As a further defense against corrosion the vehicle is almost entirely pre-treated by electrogalvanization.

In addition, the following features further contribute to the prevention of corrosion:

- A reduction in the number of component parts forming the body and consequent reduction in the number of joints;
- An appreciable reduction in the number of welding points and, at the same time an increase in the amount of spot welding carried out automatically;
- A reduction in the joints treated by seam welding to an overall length of only one metre. Seam welding is the form of welding which is most subject to imperfections;
- The integral sealing of the bodywork;
- Box-type components, located in covered areas have been fitted with ventilation holes to prevent the formation of condensation;
- Treatment of the underbody with PVC which protects, soundproofs and offers resistance to abrasion, is included in the painting cycle;
- The final body protection cycle involves the injection of wax- oil into most of the boxed parts.

The painting processes follow a particularly distinct cycle which include the following phases:

- Deoxidation;
- Degreasing;
- Phosphatization and passivation (bonderizing) with full body immersion;
- Cataphoresis;
- Oven drying;
- Application of sealants, PVC coating on underbody and wheelhousing etc.;
- Application of primer coating on external parts;
- Oven drying;

- Application of primer paints and transparent enamel (which gives further protection and particular luster), in an automatic booth using the rotating cup system that ensures an even thickness of the coating.

## BODYWORK RESTORATION AND PAINTING

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

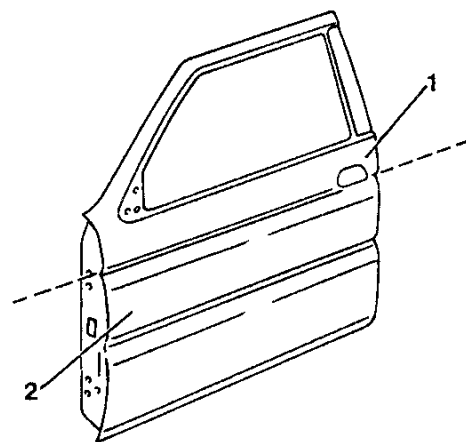
When a surface is only partially affected, the operation is called "repainting". Depending on the type of repair work to be carried out the following repainting cycles have been defined:

- Painting of replaced fixed metal sheet;
- Painting of replaced mobile metal sheet;
- Repainting of flawed metal sheet;
- Repainting of metal sheet with surface defect;
- Restoration of metal sheet 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 entire door is a panel but for reasons of convenience it can be subdivided into two areas: the upper area and the lower area. Area then, means a surface included between two delimitations.



1. Upper area
2. Lower area

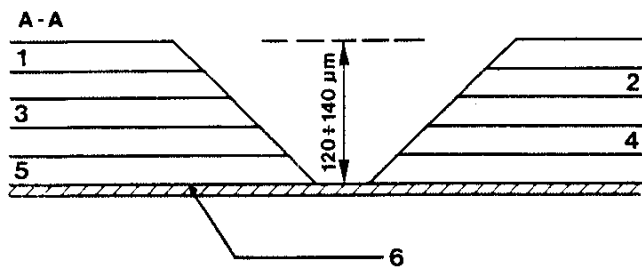
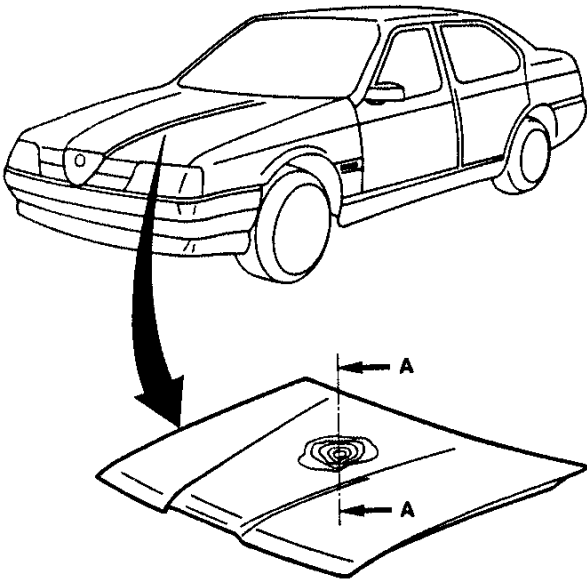


The procedures necessary for repair and painting operations carried out on metal sheet supplied as a spare part are listed below.

**NOTE:** Metal sheeting supplied as a spare part is treated by cataphoresis.

**PREPARATION (sanding and cleaning)**

Operate on the affected part by feathering the existing layers of paint with the prescribed abrasive paper.



- 1. Paint
- 2. Enamel
- 3. Undercoat
- 4. Cataphoresis (Primer)
- 5. Galvanization
- 6. Sheet metal

Thoroughly clean the the affected areas with silicone-proof products.

**SURFACING**

Repair operations carried out on sheet metal usually involve a surfacing phase.

Prepare filler by adding the relevant catalyst in the proportions recommended by the manufacturer; mix the product and apply a coating sufficient to cover the existing undulations. Allow the filler to dry completely before proceeding to the next stage.

**SANDING**

Dry or wet sanding may be carried out by hand or using an electric or pneumatic sander fitted with the prescribed abrasive paper.

**MASKING**

The areas surrounding the area 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 should be carried out, like all other operations, taking all the necessary precautions to avoid possible damage.

Masking should be applied after the filling has been sanded, and removed after the primer has been sanded (as the masking paper becomes impregnated with dust, fumes and abrasive particles) and replaced before enamelling.

**PRIMER APPLICATION**

Primer is applied to bare metal surfaces as a protection against corrosion; when the primer is dry and after curing, apply the undercoat.



**SEALING**

Sealing is required in order to avoid penetration of water or humidity and is carried out by the application of different products.

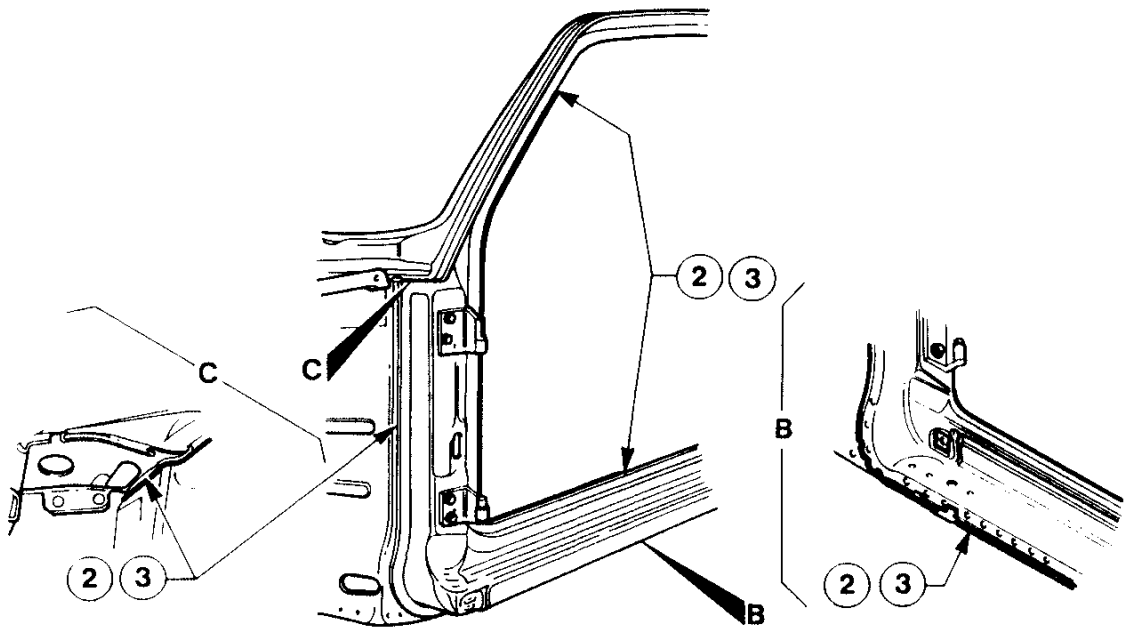
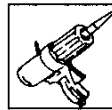
Sealants are products that fill, insulate and protect and are applied to the joints between metal panels.

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

**NOTE:** The detailed illustration of all the sealing interventions relative to the components of the body is given in the paragraphs **REPLACING FIXED COMPONENTS** and **REPLACING MOBILE COMPONENTS**.  
The key to the symbols used is given below.

Seal along the lines shown by a heavy line in the illustration.

THIS SYMBOL INDICATES THE NECESSITY FOR SEALING



**NOTE:** Visible sealing must be smooth, uninterrupted and free from ribbiness.



**CAUTION:**

Do not apply too much sealant and apply only where indicated.



**FOAM TREATMENT**

Carry out the foam treatment of the boxed components by applying the specified product through the holes in the area indicated by the arrows.

**NOTE:** The detailed illustration of all the foam treatment interventions relative to the components of the body is given in the paragraphs REPLACING FIXED COMPONENTS and REPLACING MOBILE COMPONENTS.

The key to the symbols used is given below.

Carry out foam treatment through the holes indicated by the reference numbers relative to the procedural steps.

THIS SYMBOL INDICATES THE NECESSITY FOR FOAM TREATMENT 

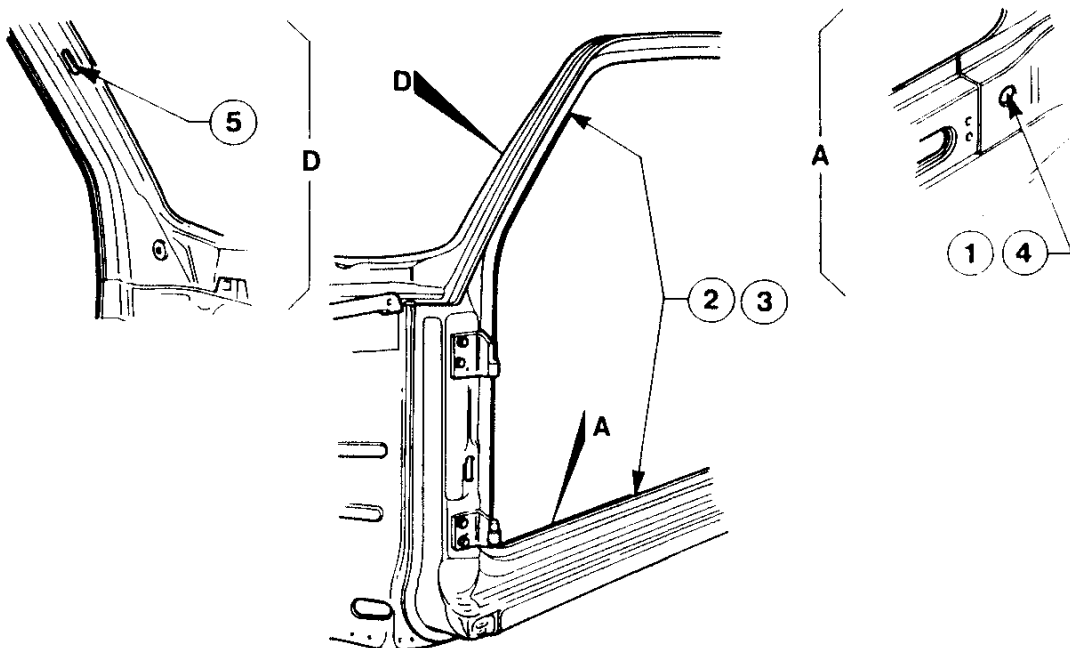
**WAXING**

Carry out the waxing of the boxed components by applying the specified product through the holes in the area indicated by the arrows and symbol.

**NOTE:** The detailed illustration of all the waxing interventions relative to the components of the body is given in the paragraphs REPLACING FIXED COMPONENTS and REPLACING MOBILE COMPONENTS.  
The key to the symbols used is given below.

Carry out waxing through the holes indicated by the reference numbers relative to the procedural steps.

THIS SYMBOL INDICATES THE NECESSITY FOR WAX TREATMENT 







### APPLICATION OF UNDERCOAT

The undercoating, due to its thickness ensures that the coats below are properly insulated and eliminates any imperfections of the layer beneath.

The best results are obtained by applying the undercoat in a spray booth remembering to wipe the affected areas with a Tack-rag before beginning application.

The undercoat should be prepared and applied as specified in the painting schedule.

At this point it is advisable to spray a light coating of enamel (spy coat) which will show up any imperfections. Allow the enamel to dry for the prescribed time and then dry or wet sand either manually or with a sander using the prescribed abrasive paper.

Removal of the spy coat shows up any imperfections, and levels the undercoat in preparation for enamelling.

Clean the area thoroughly with compressed air to eliminate any traces of moisture or dust.

It is also advisable to clean the area with silicone-proof solvent and then dry with compressed air.

Finally, rub the area with a Tack-rag.

### PAINT PREPARATION

Mix the catalyst and thinner following the manufacturers recommendations.

### PAINT APPLICATION

The required colour may be prepared by mixing the basic colours in the ratio indicated by the applicable colour formula. The enamels obtained in this way do not have the same viscosity values suitable for application and should therefore be mixed with a catalyst and thinned to the proportions indicated by the manufacturer, using a rod-scale.

It is extremely important that the enamel is thinned correctly in order to avoid defects (running, pin punctures etc).

Before application, check that the colour of the prepared enamel corresponds exactly to the colour of the vehicle. For this purpose the operator should apply the prepared product to a sample of sheet metal using the same procedure which will be used for painting the vehicle.

The paint sample should then be compared with one or more areas of the car body and any differences in colour should be corrected by adding the base components.

Once the correct colour has been obtained, and before painting the vehicle, the operator should check that the affected area is perfectly dry and free from grease or dust. Surfaces ready for spraying should never be touched by hand.

In addition to these precautions, some environmental conditions, temperature and humidity for example, may influence the final outcome.

An environmental temperature which is too high will cause the thinner to evaporate too quickly; this begins the moment the paint is emitted from the spray gun, and will therefore prevent the paint from forming a uniform coat which will in turn influence the degree of luster.

High environmental humidity on the other hand prevents the thinner from evaporating and results in the thinner drying (increasing the risk of straining).

Each pass of paint should overlap the previous one by half its width.

Application of the paint is usually carried out by successive applications with adequate intervals being left between coats to allow drying.

Metallic colours may vary in appearance depending on the dispersion of aluminium particles on the surface.

Metallic colours can be lightened or darkened by drier or more humid application; by applying drier coats, the flakes of aluminium are more uniformly spread over the thickness of the layer of paint, reflecting more light and rendering the colour apparently lighter.

Allow the paint to dry in strict accordance with the manufacturer's instructions.



## **PAINTING OF REPLACED FIXED METAL SHEET (complete cycle)**

The successive phases relative to the painting of a replaced fixed metal sheet are as follows:

1. Preparation (sanding and cleaning)
2. Surfacing
3. Sanding
4. Masking
5. Primer application (where applicable)
6. Sealing
7. Undercoat application
8. Sanding
9. Masking
10. Enamel application

Dry or wet sand the cataphoresis, blow-off with compressed air, clean with a silicone-proof solvent and dry thoroughly.

Surface any imperfections and leave until completely dry.

Sand, level the filler and clean the treated surface thoroughly.

Mask the surrounding areas, apply primer to the treated area and leave to air-dry.

Spread sealant on the mating surfaces using a brush or spray gun and then dry.

Apply undercoat and spy coat (enamel).

Wet or dry sand, remove the masking and clean with compressed air and silicone-proof solvent.

Mask the area surrounding the sanded surface and adequately cover the remaining parts of the vehicle.

Blow-off with compressed air and clean the surface with a Tack-Rag.

Prepare and apply the enamel (one or two coats).

After application allow the prescribed dry-time and then cure as prescribed.

Apply wax protection to box-type elements.

## **PAINTING OF REPLACED MOBILE METAL SHEETS (complete cycle)**

The successive phases relative to the painting of replaced mobile metal sheets are as follows:

1. Preparation (sanding and cleaning)
2. Primer application
3. Sealing
4. Application of undercoat
5. Masking
6. Enamel application

Remove the affected component and dry or wet sand the cataphoresis coating; remove dust with compressed air, clean the surface with silicone-proof solvent and dry thoroughly.

Apply primer to affected area and leave to air-dry.

Apply undercoat on the inner and outer surfaces and allow to dry.

Apply spy coat.

Manually or using a sander, dry or wet sand, blow off dust with compressed air, clean with silicone-proof solvent and dry thoroughly with compressed air.

Clean with a Tack-rag.

Following the manufacturer's instructions, prepare the enamel and apply.

Allow the prescribed drying time and then cure the enamel.

Install component when cool.

Apply wax protection.

## **REPAINTING OF DAMAGED METAL SHEET**

In the event of repairs or repair being carried out on fixed or mobile parts, repair the defect in the metal and then proceed as described in PAINTING OF REPLACED FIXED METAL SHEET.

## **REPAINTING OF METAL SHEET WITH A SURFACE DEFECT**

When the damage to be repaired is in a position which is not too exposed, it is possible to touch-up the affected part.



Interventions of this type though, require techniques gained through experience.

When the damage is superficial, repairs can be limited to the application of enamel, but when the damage affects the metal sheet, the operations preceding finishing must be carried out.

Manually sand the affected area until the defect is removed.

Opaque the rest of the panel. Clean the surfaces and mask the area around the opaqued area. Degrease with a silicone-proof product and clean with a Tack-rag.

Prepare and apply the enamel and leave to dry for the prescribed time. Once curing is complete, remove the masking and allow to cool.

### **RESTORATION OF METAL SHEET WITHOUT PAINTING**


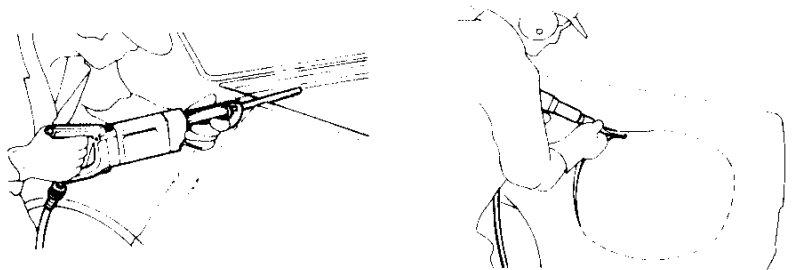

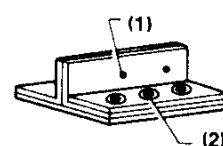

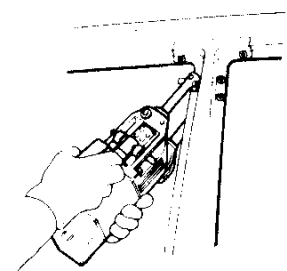

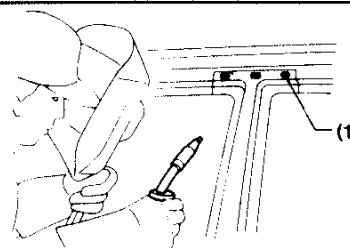

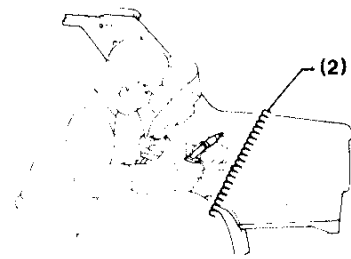

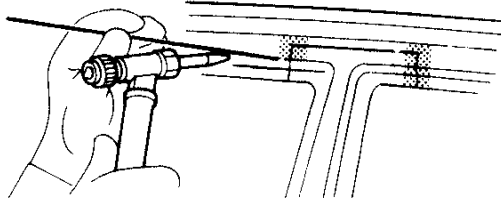

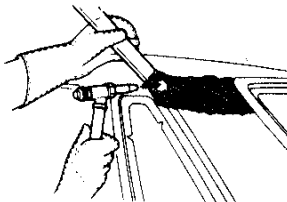

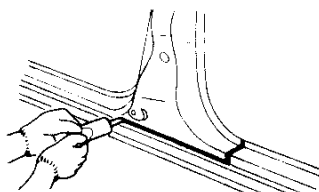
This procedure enables small dents to be removed from the bodywork using suitable tools and avoiding surfacing and painting and therefore maintaining the initial characteristics of the metal sheet.



# GENERAL INFORMATION REGARDING REMOVAL AND INSTALLATION

## SYMBOLS

The symbols regarding operations of cutting, welding/brazing, chamfering, the use of protective products, sealants, corrosion inhibitors etc., used in this manual are shown in the following diagrams.

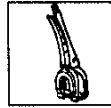
<p>Cut with a pneumatic chisel</p> 	
<p>Spot welding for two overlapping sheets (1)</p> 	
<p>Spot welding for three overlapping sheets (2)</p> 	
<p>MIG welding for filling</p> 	
<p>Continuous/spot MIG welding</p> 	
<p>Braze-welding</p> 	
<p>Spot cutting: spot cutter (1) drill (2)</p> 	
<p>Sealing</p> 	



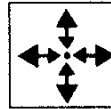
Clean with a rotating brush



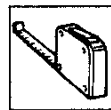
Secure the components



Centre the components



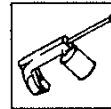
Measure



Use rust-proofing



Wax boxed parts



Use oxide converter

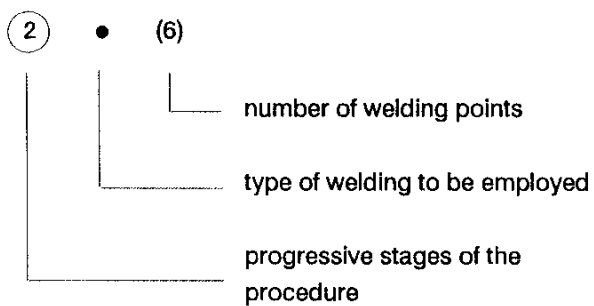


Paint





In order to synthetise the information relative to the operations described in the procedures for replacing components, the following technique has been adopted:



**REMOVAL OF COMPONENTS**

1. Ensure that all the damaged parts have been identified by measuring the main squaring values. See "Body Squaring".

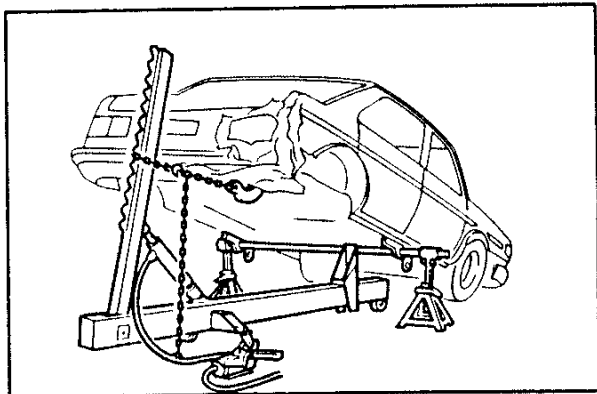
Tools required:

- Centering tool
- Squaring tool
- Convex rule
- Rack-and-pinion jack or vehicle hoist

2. Pull the body using a tool which is suitable to the extent of damage. Removed parts can be re-used providing they meet the requirements listed in "Body Squaring".

**CAUTION:**

- Pay special attention when securing tension chains to the body in order to avoid accidental release during the operations.
- Apply the tension load against the direction of impact



3. Cut away the damaged parts.

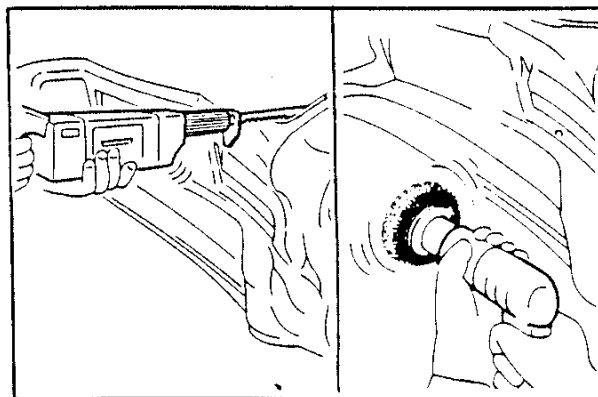
Tools required:

- Pneumatic saw
- Pneumatic chisel

4. If the spot welds are not visible remove the paint with a wire brush.

Tools required:

- Rotating brush



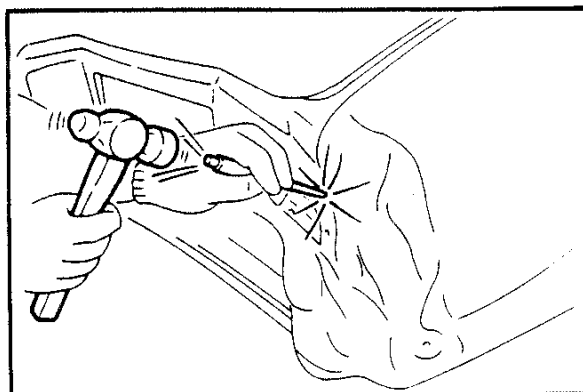
5. Punch each welding point to make a centering point for a drill bit.

Tools required:

- Hammer
- Graver

**CAUTION:**

- Centre punching of each welding point should be deep and exactly centered. An off-centre punch will not permit the welding point to be completely removed while a weak punch will not allow the drill bit to be securely guided.
- As a general rule centre punching should be carried out around the edges of the components to be replaced.

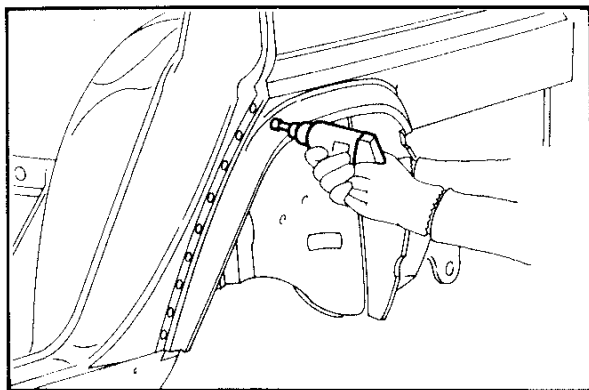




6. Remove the spot welds using a chamfering machine or a pneumatic drill.

Tools required:

- Spot-cutter.
- Pneumatic drill.



**CAUTION:**

Use protective gloves and glasses



**CAUTION:**

- Position the chamfering machine over the centre of the spot to be removed.
- To facilitate the operation, a cutting speed of approx. 1,000 r.p.m. should be employed.
- Adjust the milling depth by acting on the screw.
- Care should be taken to avoid drilling mating components. Plug any holes with autogenous welds or projection welds.
- Holes can reduce component rigidity and give rise to water seepage.
- When existing holes in welded parts are used for new components (as in hole welding) use a small diameter drill (less than 8mm.) and carry out welding as quickly as possible.

7. Using a chisel remove all traces of welding.

Tools required:

- Chisel.
- Hammer.



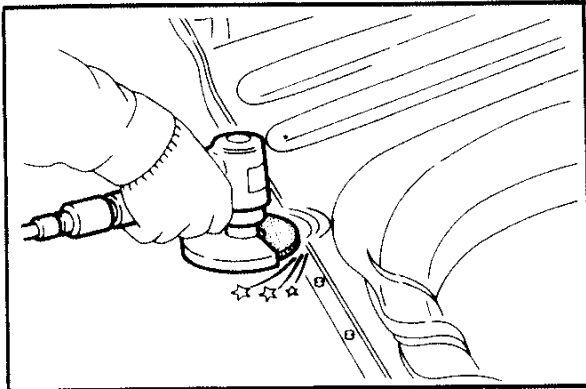


**PREPARATION OF MATING SURFACES**

1. Grind the metal sheet at the welding points using a sander.

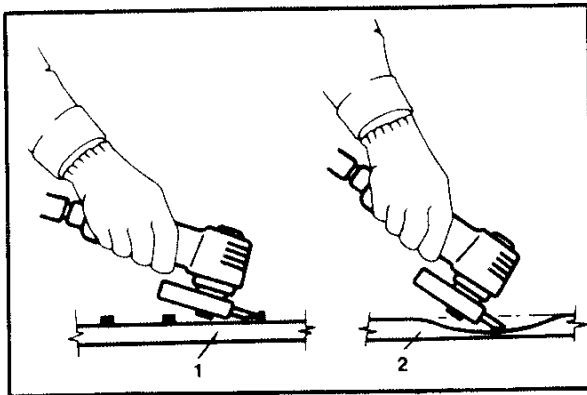
Tools required:

- Pneumatic sander.
- Disk-sander.



**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.
- Thoroughly clean the metal dust from the ground surfaces and surrounding areas.
- Metal dust reduces welding strength and can lead to corrosion.



1. Correct
2. Incorrect

PA4655D1000000

2. Straighten the buckled areas with a hammer and dolly block.

Tools required:

- Hammer.
- Dolly block.



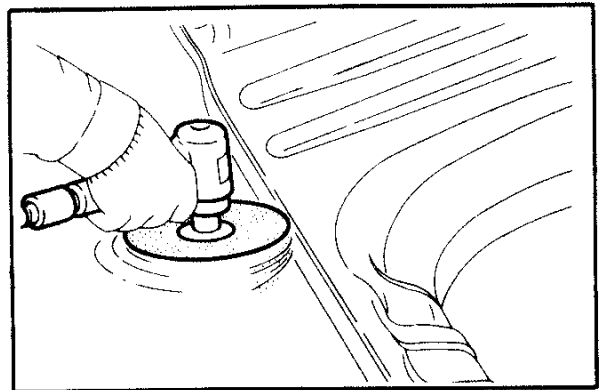
**CAUTION:**

- Ensure that even the slightest buckling is removed, particularly on the inner panels or in hidden positions.
- If all buckling is not removed problems may arise during installation in addition to a reduction in strength due to the concentration of stresses.
- Carefully inspect the joint areas of each pillar.

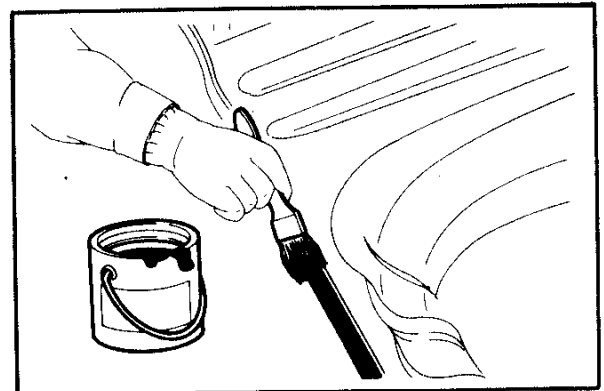
3. Remove all traces of paint from the welding surfaces.

Tools required:

- Belt-sander.
- Disk-sander.



4. Apply primer to the edges of the new components and body panels to be welded.





Before welding apply anti-rust conductive paint to the edges of all metal sheets to be installed.

Metal sheets should be welded 15 minutes after the application of the conductive paint (paint drying time).

The thickness of the coating should be between 0.005 and 0.025 mm. after curing.

### PREPARATION FOR THE INSTALLATION OF NEW COMPONENTS

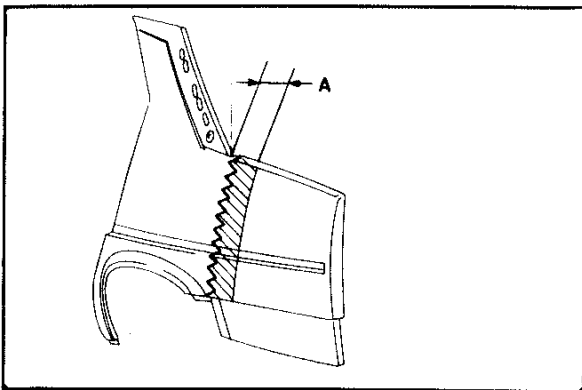
1. If the components are to be partially replaced, maintain an overlapping tolerance of 50 mm. during cutting of the damaged parts in order to have a large enough mating surface.

Tools required:

- Pneumatic saw.
- Hand saw.
- Scribe.
- Shears.
- Convex rule (or equivalent).



The use of genuine Alfa Romeo spare parts is recommended. This ensures successful results with regard to repair and restoration of vehicle serviceability.

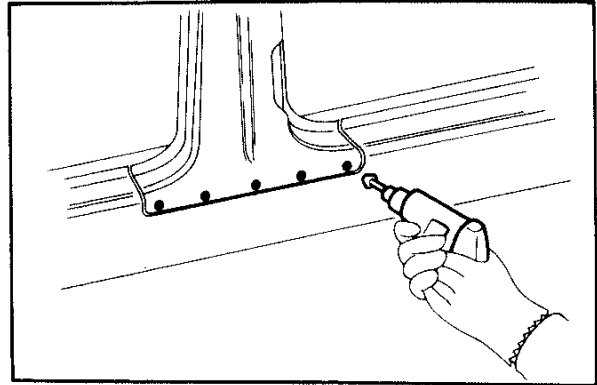


a. Overlapping tolerance

2. Filling MIG welding. This technique should be used in areas where spot welding is not possible. For this operation drill 5 - 6 mm. holes in the welding points.

Tools required:

- Punch.
- Pneumatic drill.



3. Remove all traces of paint from the components to be welded.

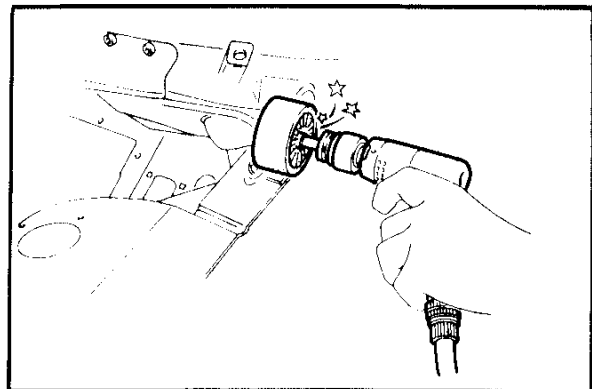
Tools required:

- Belt-sander.
- Disk-sander.



### CAUTION:

- Remove the paint from both sides of the component to be welded such as spot-welding surfaces, spot-welding outlines and butt-welding laps.
- Residues of paint prevent the flow of electricity during spot welding and result in a weak spot weld and depressions in MIG welds.

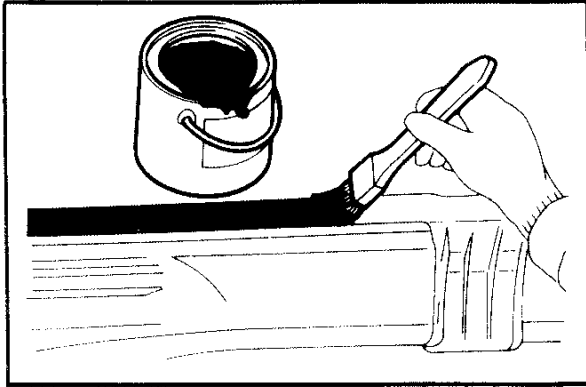




4. Apply primer to the areas of the components and the body which are to be spot welded.

Tools required:

- Brush.
- Anti-rust conductive paint.



#### INSTALLATION OF COMPONENTS

1. Temporary installation of new components.

Tools required:

- Adjustable clamp.
- Convex rule.
- Squaring tool (sighted).
- Centering tool.
- Chassis dimensional control system (Dime).
- Jack.
- Spot welder.
- MIG welder.



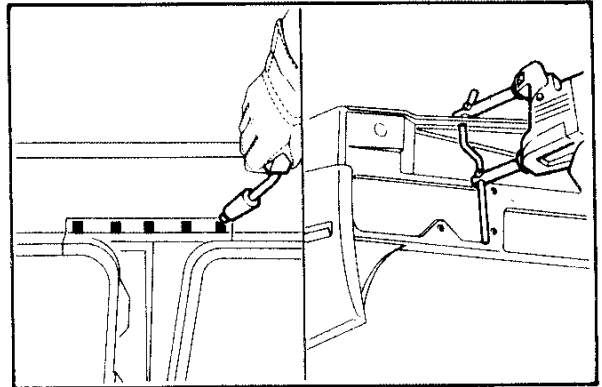
#### CAUTION:

- Position the components as indicated in the diagrams in the "BODY SQUARING" paragraph.
- Position mobile body parts (doors, bonnet and boot lids) and check for proper installation by verifying gaps, parallelism and squaring. If necessary adjust the metal sheet in order to obtain the correct position.
- Secure the parts to be welded with clamps or a few spot-welds.

2. All welding should be carried out in strict accordance with the indications in "WELDING PRECAUTIONS.

Tools required:

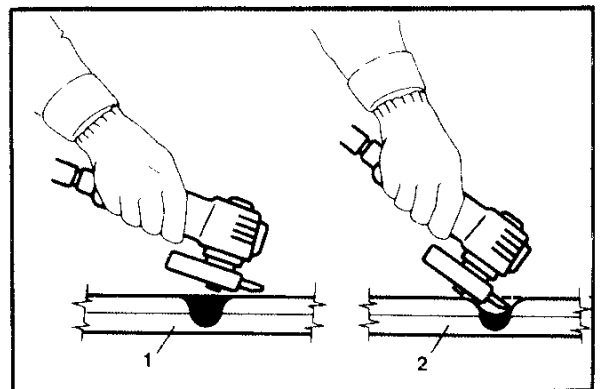
- Spot-welder.
- MIG-welder.
- Autogenous-welder.



3. Smooth all MIG-welds using a sanding machine.

Tools required:

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



1. Correct

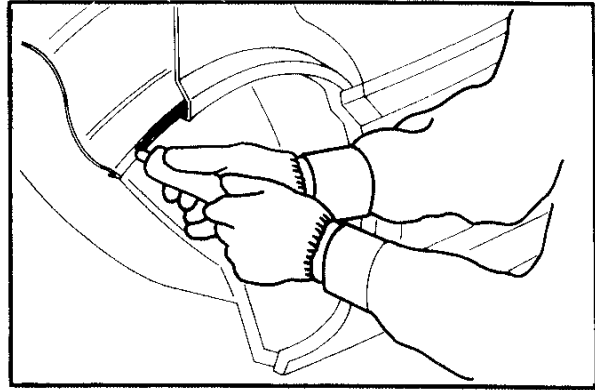
2. Incorrect

**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 metal dust from the surfaces that have been smoothed and the surrounding areas.
- Metal dust may cause corrosion.

4. After welding, remove any securing clamps and eliminate any traces of buckling if present.
5. Apply rust-proofing to the welded components.
6. Apply sealant to the joints.

**NOTE:** Steps 5 and 6 should be carried out with care in order to avoid corrosion of the welded joints. Refer to the diagrams in the "Sealing" paragraph.



7. Apply a protective coat 4 mm. on thickness to the underbody.

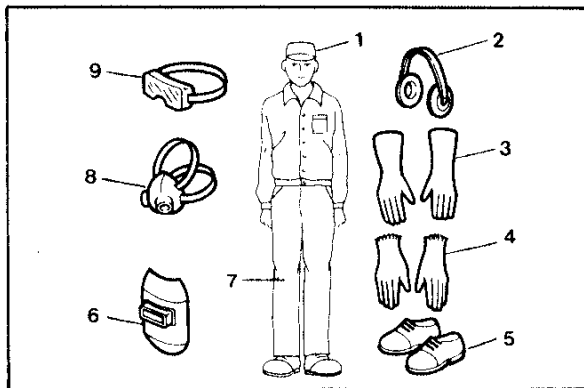


## INDICATIONS FOR OPERATORS

### PREVENTION OF WORK ACCIDENTS

#### 1. Protective clothing.

- Depending on the nature of the work to be carried out ensure that adequate protective glasses, ear protectors and dust masks are worn. As a general rule work clothes, safety shoes and cap should be worn while working.



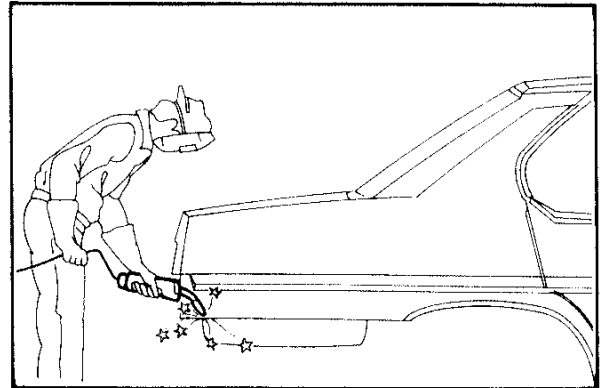
- |                   |                       |
|-------------------|-----------------------|
| 1. Cap            | 6. Protective shield  |
| 2. Ear protectors | 7. Work clothes       |
| 3. Welding gloves | 8. Dust mask          |
| 4. Gloves         | 9. Protective glasses |
| 5. Safety shoes   |                       |

#### 2. Safety supports.

- After the vehicle has been raised ensure that safety supports are adequately positioned. Refer to "LIFTING AND TOWING POINTS" for the location of bearing points.

#### 3. Inflammable materials.

- Ensure that the negative lead is disconnected from the battery before undertaking repairs.
- If welding has to be carried out near the fuel tank, remove it and plug the filler neck.
- Plug the open ends of the fuel and brake fluid hoses when they are disconnected.
- Remove the electronic control unit before carrying out electric welding on the vehicle.

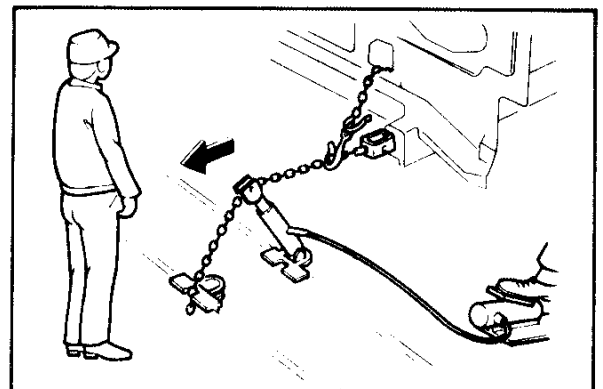


#### 4. Work environment.

- To guarantee the safety of the operators the work environment should be well ventilated and lighted.
- As paints and sealants produce toxic gasses when heated it is advisable to use pneumatic chisels or saws instead of oxyhydrogen flame to cut and remove damaged metal sheets.
- To remove paint from the metal sheet, a belt-sander or rotating brush should be used.

#### 5. Vehicle bodywork straightener.

- Ensure that the straightener is used in strict accordance with the procedures given in the Manufacturer's Instruction Manual. During straightening of the damaged part never stand in front of the straightener in the direction of the tension load.



#### CAUTION:

Never stand in front of the straightener.



### PROTECTION OF BODY AND EXTERNAL COMPONENTS

1. Protection of bodywork.
  - Remove or cover the interior furnishings of the vehicle (upholstery, instruments, carpets).
  - Cover glass, instruments, upholstery and carpets with heat resistant materials before attempting welding operations, particularly when arc welding is carried out in a CO<sub>2</sub> atmosphere.
2. Protection of external components.
  - When external components (bonnet, boot, mouldings, trimming) are removed they must be adequately protected from scratching by using rags, protective tape or other materials.
  - Painted surfaces which only show signs of scratching should also be repaired as even light scratches can lead to corrosion.

### INDICATIONS FOR REPLACEMENT



The use of genuine Alfa Romeo spare parts is recommended. These ensure the best results with regard to repairs and maintenance of vehicle serviceability.

### INDICATIONS FOR WELDING



Before electric welding, remove the electronic control units from the vehicle to avoid damaging them.

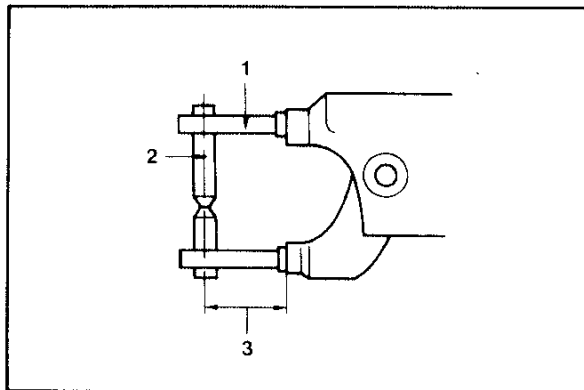
### SPOT WELDING

#### Spot-welder.

The strength of spot-welds depends on the execution of the following checks before welding operations begin:

1. Adjustment of the welding arm.
  - Keep the arm as short as possible in order to maintain maximum loading between electrodes.

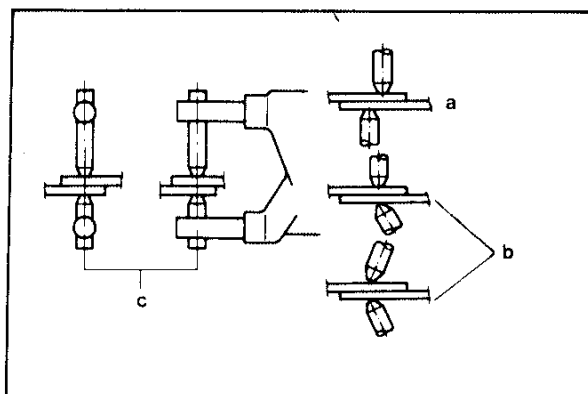
- Fully tighten the arm and electrodes so that they do not work loose during welding.



- a. Welding arm
- b. Tip of electrode
- c. Minimum arm length

#### 2. Alignment of electrodes.

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

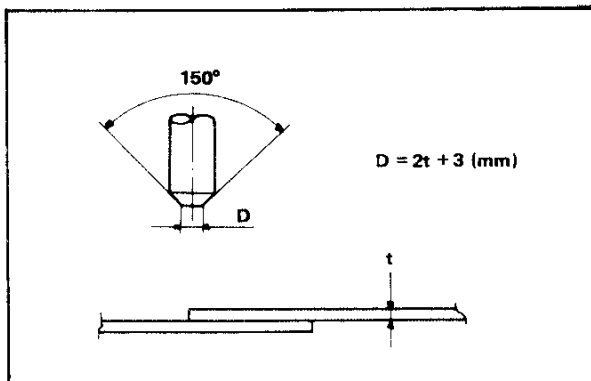


- a. Incorrect arm length
- b. Incorrect position of arms
- c. Correct alignment of arms



### 3. Diameter of electrode tip.

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



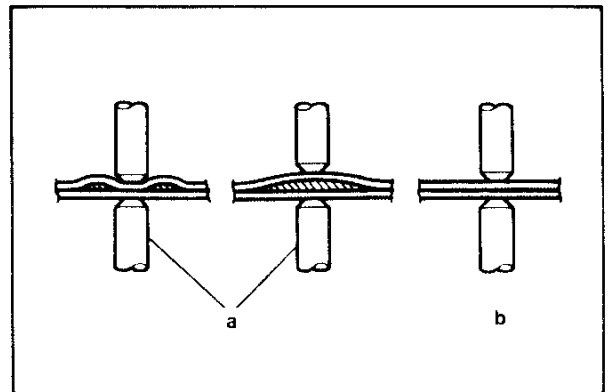
D = Diameter of the electrode tip  
t = Plate thickness

### Condition and preparation of the panels to be welded.

The presence of discontinuity, paint, rust or dust on panel edges prevents the flow of electricity and thus reduces welding strength. Before beginning welding, check the condition of the mating surfaces and make any adjustment necessary.

### 1. Gaps between mating surfaces.

- Even a slight gap between the surfaces to be welded reduces the intensity of the flow of electricity resulting in welds that will be too small or weak. Before welding join the surfaces and, when necessary, secure them with a clamp.

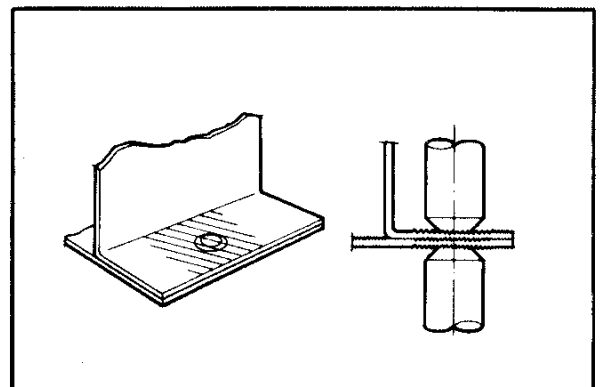


a. Incorrect

b. Correct

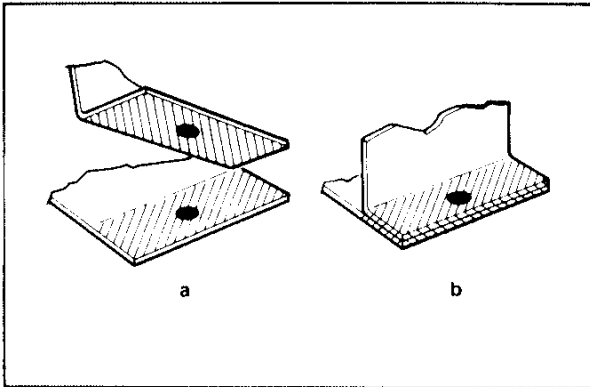
### 2. Welding of metal surfaces.

- To obtain the best results prepare the surfaces to be welded by removing all traces of impurities and foreign bodies (paint, dust, rust).





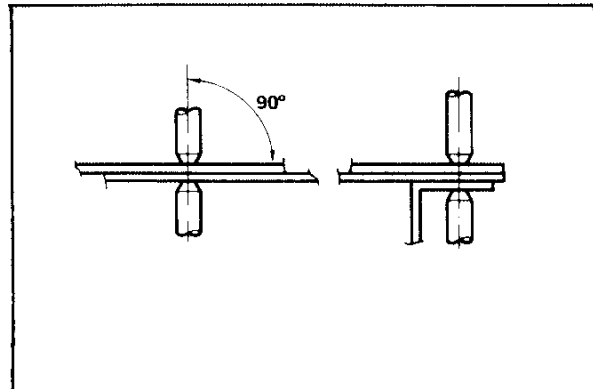
- 3. Corrosion prevention on metal surfaces.
  - Coat the areas to be welded with a high conductive corrosion preventive product. The edges should also be coated with this product.



- a. Preliminary operations
- b. Apply the corrosion preventive product on all surfaces and around the edges

**Indications to be followed for spot-welding.**

- 1. Choosing spot-welding.
  - Use seam welding where MIG welding cannot be applied.
- 2. Installing electrodes
  - Electrodes should be perpendicular to the metal sheet otherwise electrical intensity will be low and welding strength will consequently be reduced.
- 3. Welding of three or more overlapping sheets.
  - Where three or more sheets are to be welded, spot welding should be repeated.

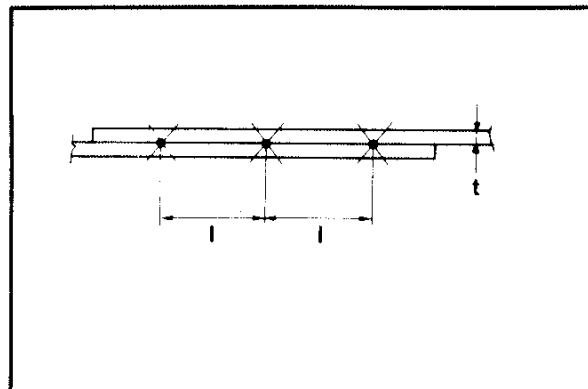


**CAUTION:**

When three or more sheets are to be welded, welding should be repeated.

- 4. Number of spot-welds.
  - Carry out welding in accordance with the number of spots indicated in this manual.
- 5. Minimum distance between spot-welds.
  - The minimum distance between spot-welds depends on the total thickness of the sheet to be welded. As a general rule the following values should be employed:

Thickness (t) mm	Minimum distance (t) mm
0.6	10
0.8	12
1.0	18
1.2	20
1.6	27
1.8	31







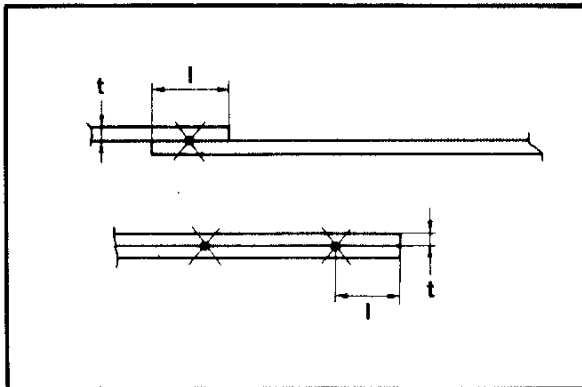
**CAUTION:**

The distances listed above should not be reduced excessively as this results in dispersion of electricity into the surrounding areas and welding strength is reduced as a consequence.

6. Distances between welding and the edge of the panel.

- If welding is carried out close to the edges of the panel, the following dimensions should be followed:

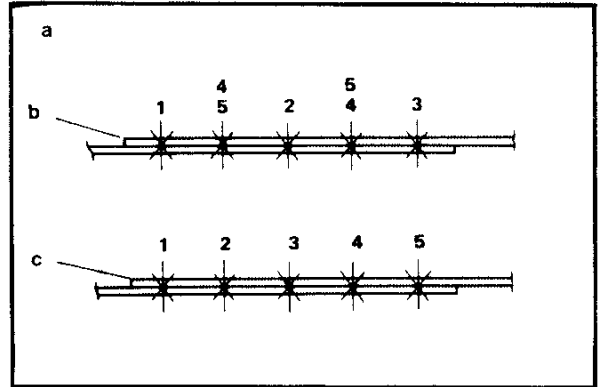
Thickness (t) mm	Minimum distance (t) mm
0.6	11
0.8	11
1.0	12
1.2	14
1.6	16
1.8	17



Welding carried out too close to the edge will not be strong enough and sheets may be subject to warping.

7. Welding sequence.

- Do not weld in one direction only as this results in weak welds due to electricity shunting. If the electrodes overheat and change colour, interrupt the operation, leave them to cool and re-shape the the tips.



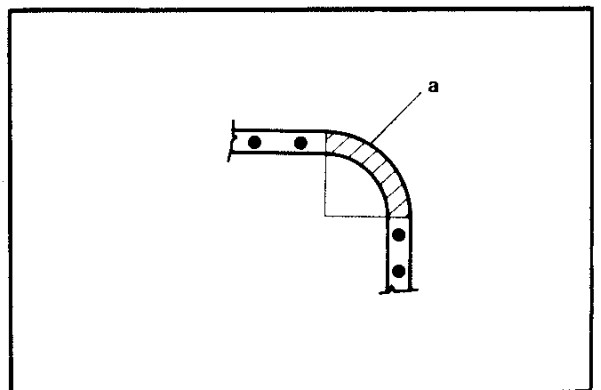
- a. Welding sequence
- b. Correct
- c. Incorrect

8. Welding on angled surfaces.

- Do not weld on angled surfaces as a concentration of tension is created which can cause breakage.

Examples:

- Front pillar upper corner.
- Front part of rear wing.
- Front and rear window corners.



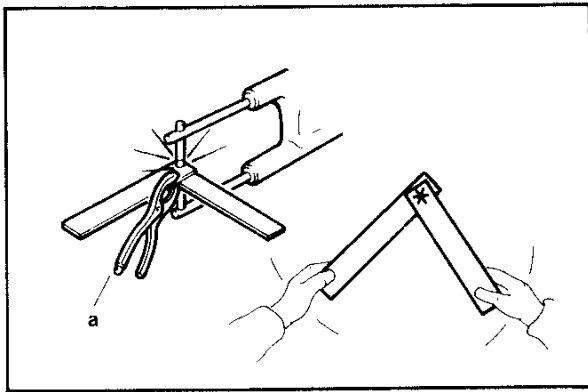
- a. Angular surfaces



**Inspecting the welding areas.**

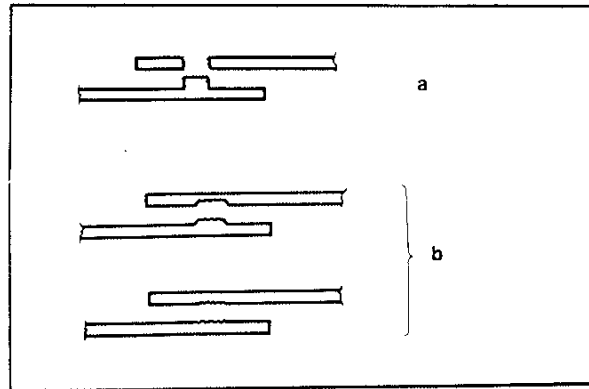
The spot-welding areas can be inspected either visually or by using a destructive method. This last method should be applied before and after welding. Spot-welds should be equally spaced and positioned at the centre of the flange.

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



a. Safety clamping of the two parts

- Rotate the samples around the spot-weld until they detach and then inspect the break. The entire spot-weld should remain on one of the two samples and a circular hole should be on the other. If this condition is not met welding conditions are incorrect. Adjust the pressure, electricity and electricity flow time and other welding parameters and repeat the test until better results are obtained.



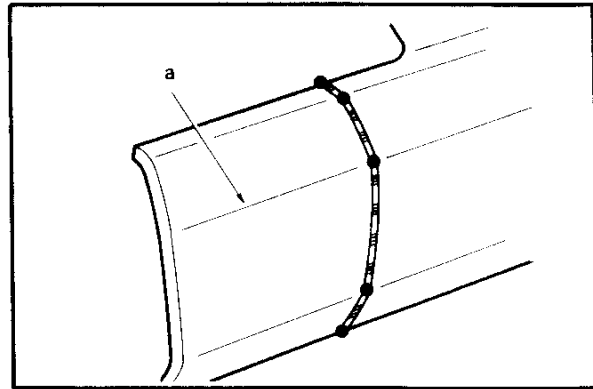
- a. Correct
- b. Incorrect
- c. An opening of about  $\phi = 3$  mm should form by exerting traction





- Position the blowpipe at right angles to the sheet and fill the hole. At each interruption in the welding process an oxide coating is formed on the surface which causes blistering. If this occurs remove the oxide with a brush.
- Ensure that welding of the upper and lower sheets is perfect.

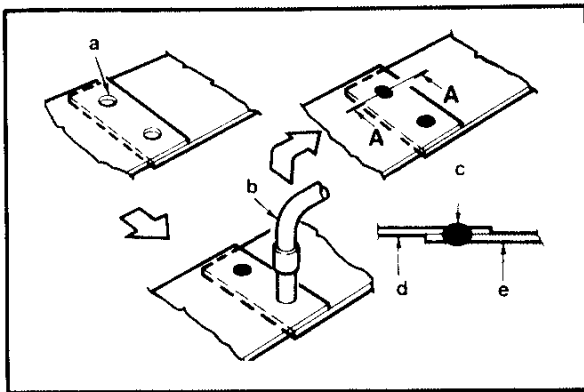
**NOTE:** The correct gap is approx. 1 mm.



a. Bending line

**NOTE:** If the welding is intermittent, deformation is less. If welding is continuous, deformation is greater.

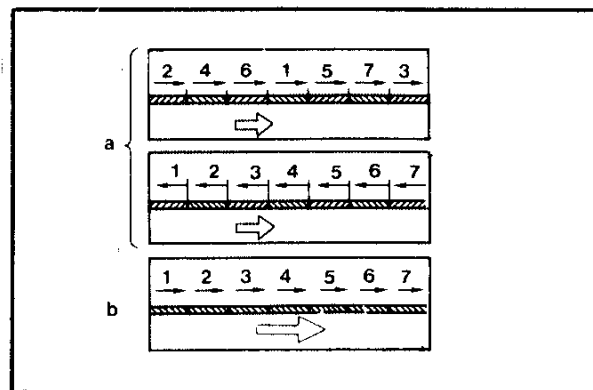
- Do not weld a continuous seam as buckling may occur. In order to reduce buckling proceed as shown in the diagram.



- a. 5 or 6 mm. hole
- b. Blowpipe
- c. Welding point
- d. Upper sheet
- e. Lower sheet

2. Head-welding.

- Tack the two surfaces, by welding intermittently, in order to align correctly and prevent buckling. Fill the empty spaces with small welding seams.



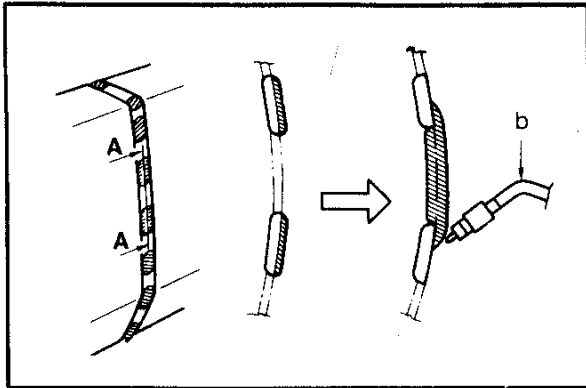
a. Correct

b. Incorrect

- Before filling the empty spaces flush the welding seams with a sander following the shape of the panel. If the seams are not flush, buckling can occur.



NOTE: Flush the welding seam



a. Panel

b. Blowpipe

**Welding test**

The welding test is similar to that previously described for spot-welding.



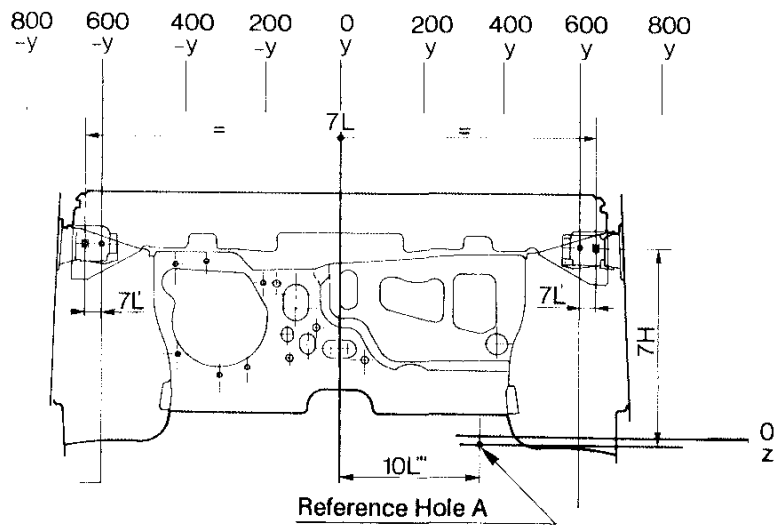
## BODY SQUARING

## SQUARING VALUES TABLE

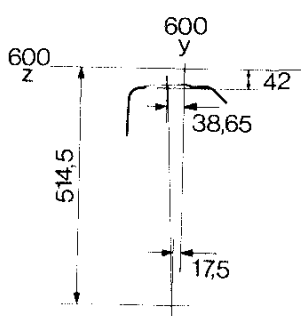
		L	L <sup>i</sup>	L <sup>ii</sup>	L <sup>iii</sup>	L <sup>iv</sup>	T	T <sup>i</sup>	T <sup>ii</sup>	H	H <sup>i</sup>
RH engine supports	1	116.25	30	55	471.25	501.25	16	126		254 <sup>±1</sup>	
LH engine supports	2	475	60				22	132	9	254 <sup>±1</sup>	
Front suspension supports	3	206.35 <sup>±1</sup>	79				28.58	178 <sup>±0.5</sup>	89		
Front suspension cross-member supports	4	938					270			179 <sup>±1</sup>	
Central engine supports	5	78					2.5	119			
Rear suspension cross-member support	6	144	83	400							
Dashboard and column crossmember supports	7	1280 <sup>±2</sup>	40				212	325 <sup>±1</sup>		504 <sup>±1</sup>	
Rear suspension supports	8	11	74.5	976	12		58	422 <sup>±1</sup>		141 <sup>±1.5</sup>	118
Holes A and B in relation to axis X	9						313				
Holes A and C in relation to axis Y	10	355	487								
Holes A and B in relation to axis Z	11									24	
Centre-to-centre distance between reference holes ABC on plane X-Y	12	710 <sup>±1</sup>	132.25 <sup>±1</sup>				2269 <sup>±2</sup>				



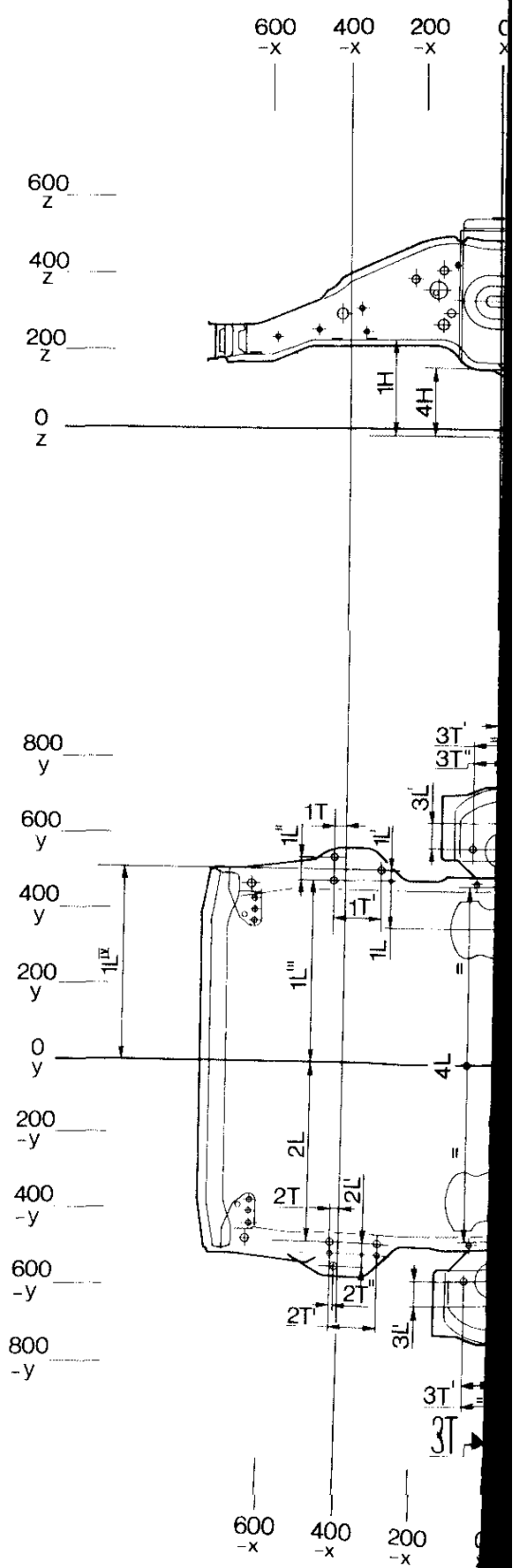
# SQUARING VALUES DIAGRAM

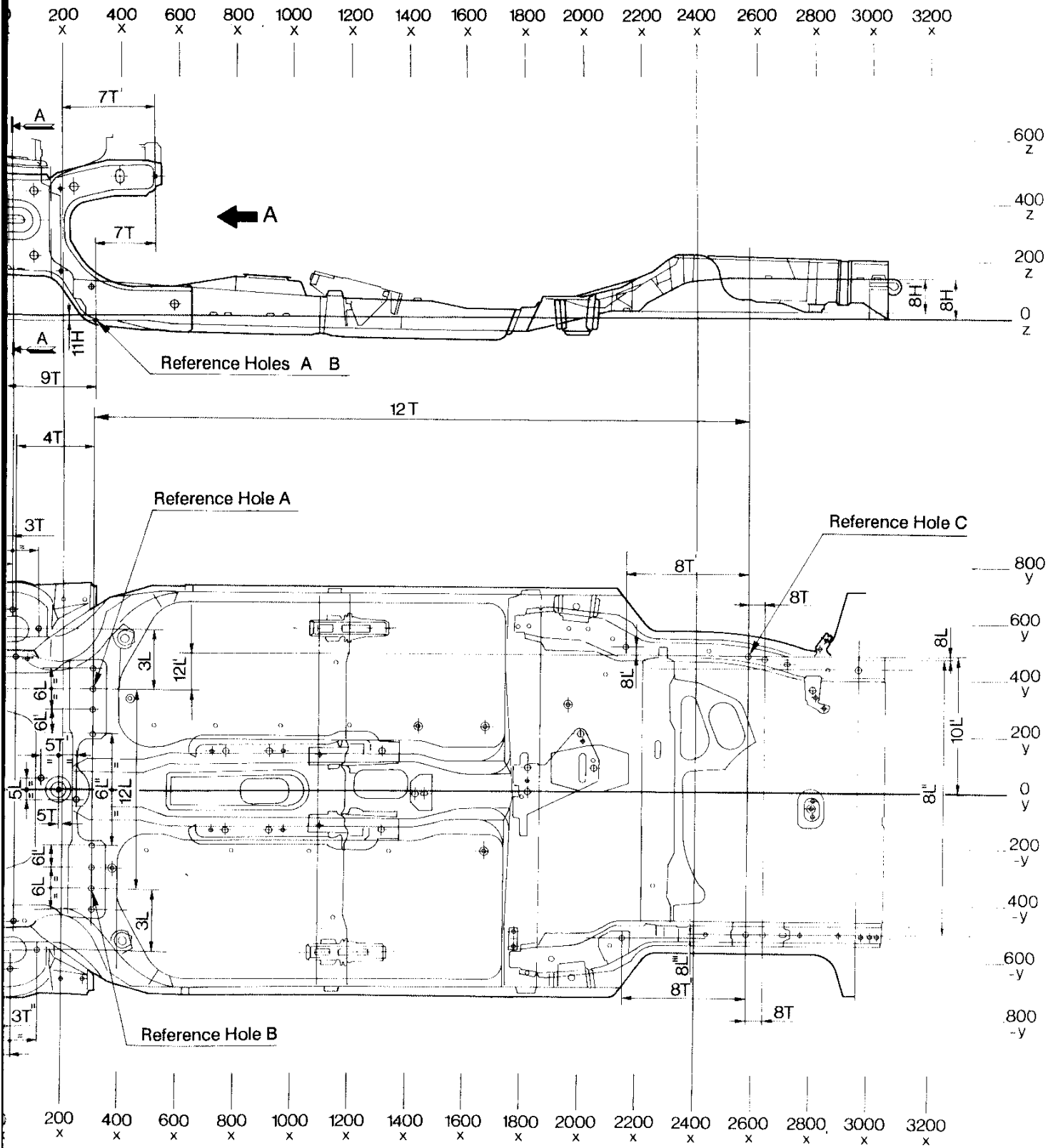


View from A



Section A-A







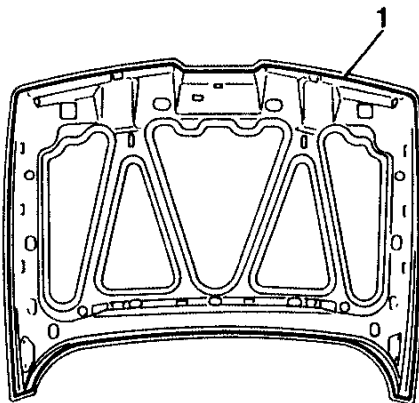
**REPLACEMENT OF MOBILE PARTS****BONNET****Removal**

See: GR. 56.

**Installation and adjustment**

Install by reversing the removal procedure following the indications given below:

1. When installing a new bonnet, seal the indicated parts with a Type A underbody protection then finish and paint the bonnet (see: PREPARATION FOR INSTALLATION OF NEW COMPONENTS) and make the adjustments described below.

**Bonnet position and height adjustment**

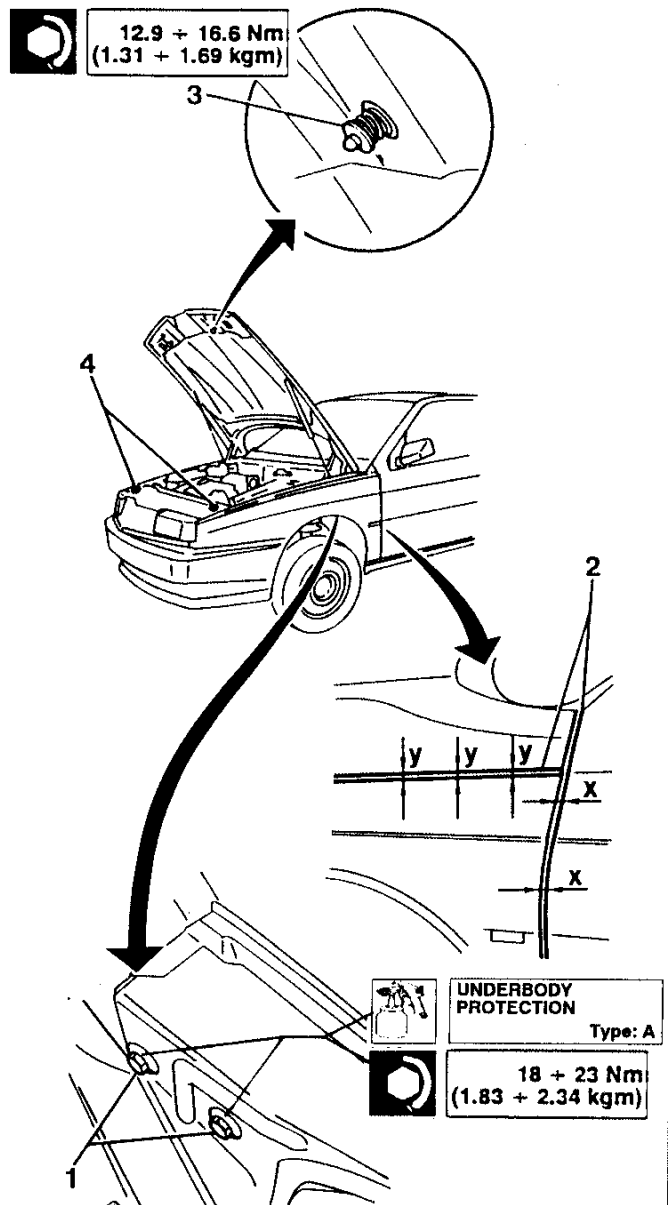
- Remove the front gravel guards (see: GR. 75).
1. Remove the protective covering from the screws securing the hinges to the body and loosen the screws.
  2. Position the bonnet so that longitudinally, the gap between bonnet and door is of the same size as between door and wing and transversally the alignment is correct between bonnet and wing, then lock the hinges to the prescribed torque.
- Protect the screws with Type A underbody protection.



Install the front gravel guards

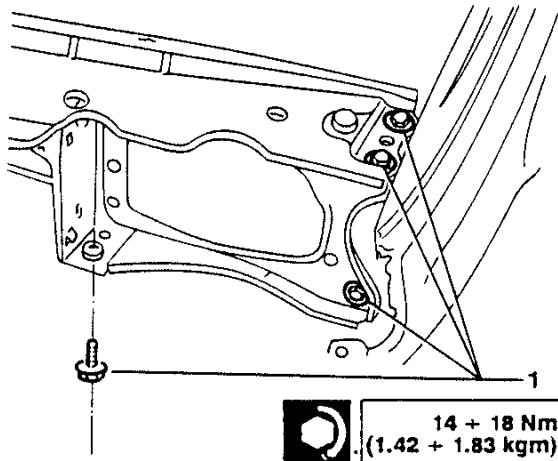
**NOTE:** The above adjustment is necessary both when substituting the bonnet and when substituting the hinges securing the bonnet to the body.

3. If necessary, in order to adjust the height of the bonnet, loosen the nut on the adjustment screw or unscrew the pin to obtain a uniform gap between the bonnet and the wing.
  - Carefully close the bonnet to permit the adjustment pin to centre itself.
  - Open the bonnet and tighten the locknut; close the bonnet again and check that it closes properly.
4. Adjust the rubber vibration buffers by screwing or unscrewing them until a uniform gap between wing and bonnet is obtained.



**HEADLIGHT HOUSING FRAME****Removal**

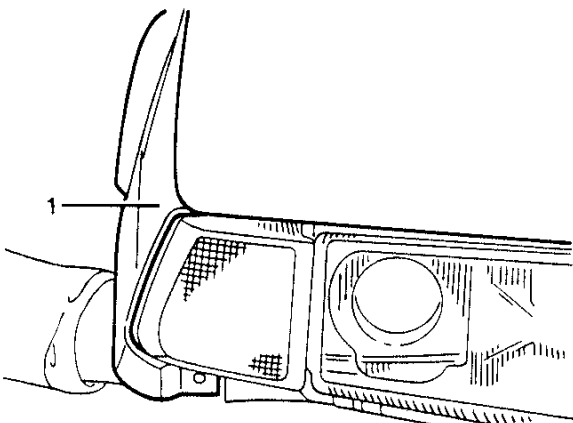
- Remove the headlight assembly, front bumper, radiator, horns and anything else which is secured to the crossmember (see: GR. 75 - GR. 40 etc. and REPAIR MANUAL - ENGINES - GR.07).
1. Unscrew the bolts and remove the headlight cross-member

**Installation and adjustment**

- Fix the headlight assembly to the frame (see: GR. 40).
1. Position the crossmembers and adjust its position transversally and longitudinally ensuring that the headlight assembly is correctly aligned with the wing. Tighten the bolts to the prescribed torque and ensure that the bonnet opens and closes properly.

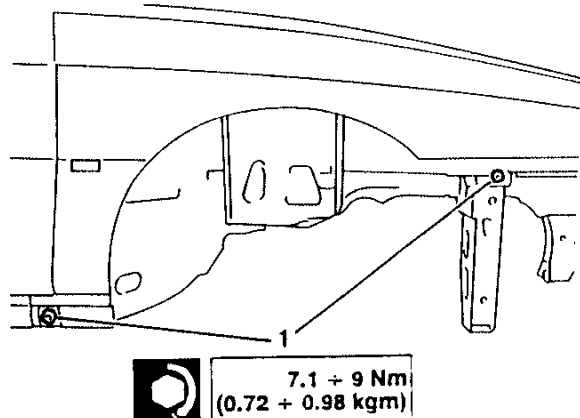
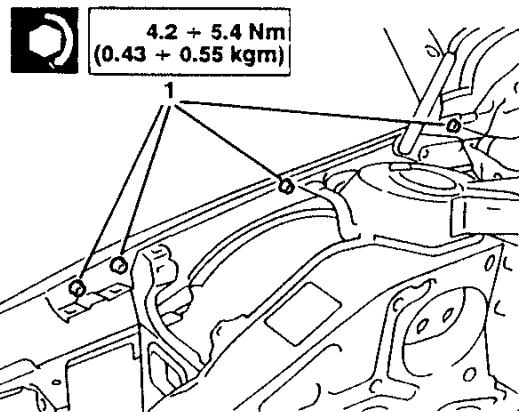


Install all the components which were previously removed.

**FRONT WING****Removal**

- Remove the headlight housing frame.
1. Unscrew the six screws securing the wing to the body
- Using a jet of hot air, heat the area between body and wing to loosen the sealant. Remove the wing.

**NOTE:** Both during removal and installation a blade should be used to facilitate the cutting and removal of the sealant.

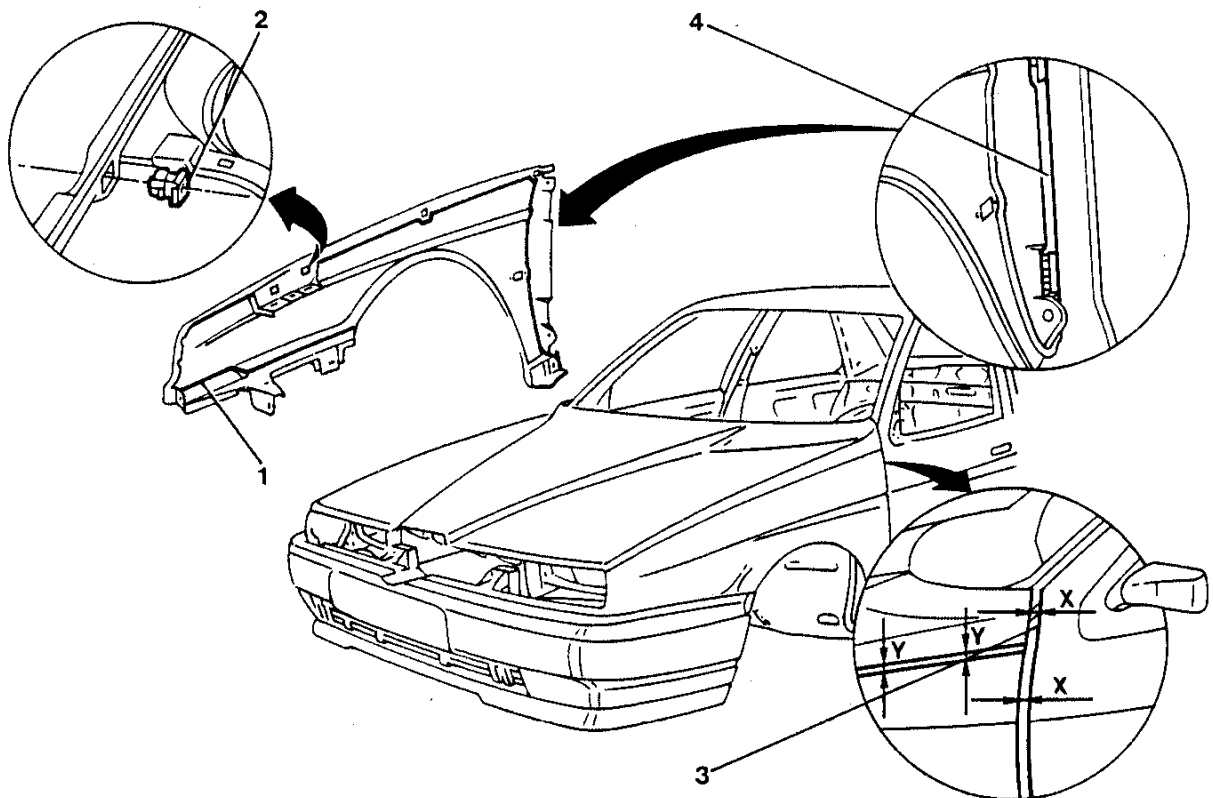


**Installation and adjustment**

- Remove all traces of sealant from the body.
- 1. When installing the wing, whether new or the one previously removed, the indicated parts should be sealed with a Type A product and then the wing should be finished and painted. (See: PREPARATION FOR THE INSTALLATION OF NEW COMPONENTS).
- 2. Check that the adjusting blocks have not been damaged and replace them if necessary.
- 3. Position the wing and, lowering the bonnet, check that the gaps between door and wing and between bonnet and wing are uniform.

- 4. Remove the wing and using a Type C sealant fill the space between wing and side panel.
- Using a type A sealant, cover the wing at the points where it comes into contact with the relative supports, correctly position the wing and tighten the screws to the prescribed torque.

**NOTE:** If, during removal of the sealant, a part of the anti-corrosion coating is accidentally removed, restore the affected parts with type A rust-proofing before installing the wing.

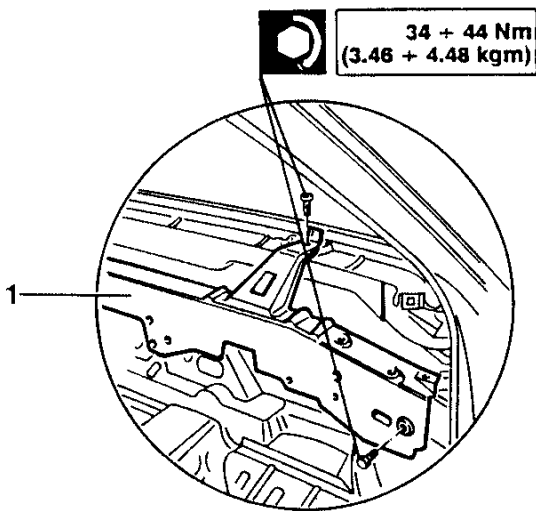


**DASHBOARD SUPPORT CROSSMEMBER****Removal and installation**

- Remove the steering wheel, dashboard and the heater (see: GR. 66 - GR. 80 and REPAIR MANUAL - MECHANICAL UNITS - GR. 23).
1. Unscrew the four screws securing the crossmember to the body and remove the crossmember.
  2. Install and tighten the screws to the prescribed torque.



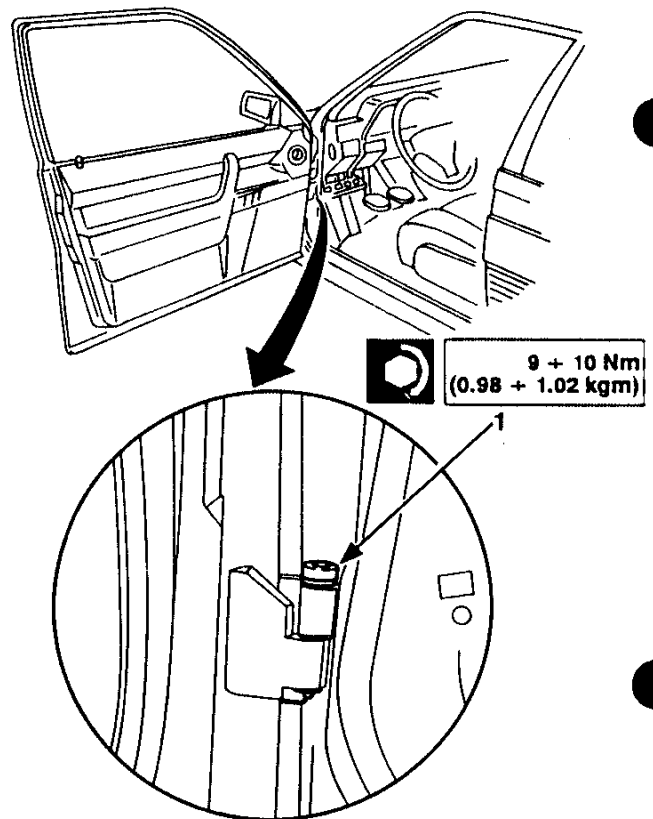
Install the previously removed components.

**FRONT DOORS****Removal and installation**

- Disconnect the door check strap and the electrical wiring (see: GR. 55).
1. Unscrew the hinge pin retaining screws and remove the door by sliding it off the pins.



Install by reversing the removal procedure and tightening the screws to the prescribed torque.





### Adjustment of doors and hinges

– In order to correctly align the front and rear doors and the front door and wing when substituting a door or a single hinge, adjustments should be made as follows:

1. Loosen the screws securing the hinge to the body.
2. Position the door and partially tighten the hinge pin retaining screws.

**NOTE:** The lock should be fitted to a new door before this is installed on the vehicle. (see: GR. 56).

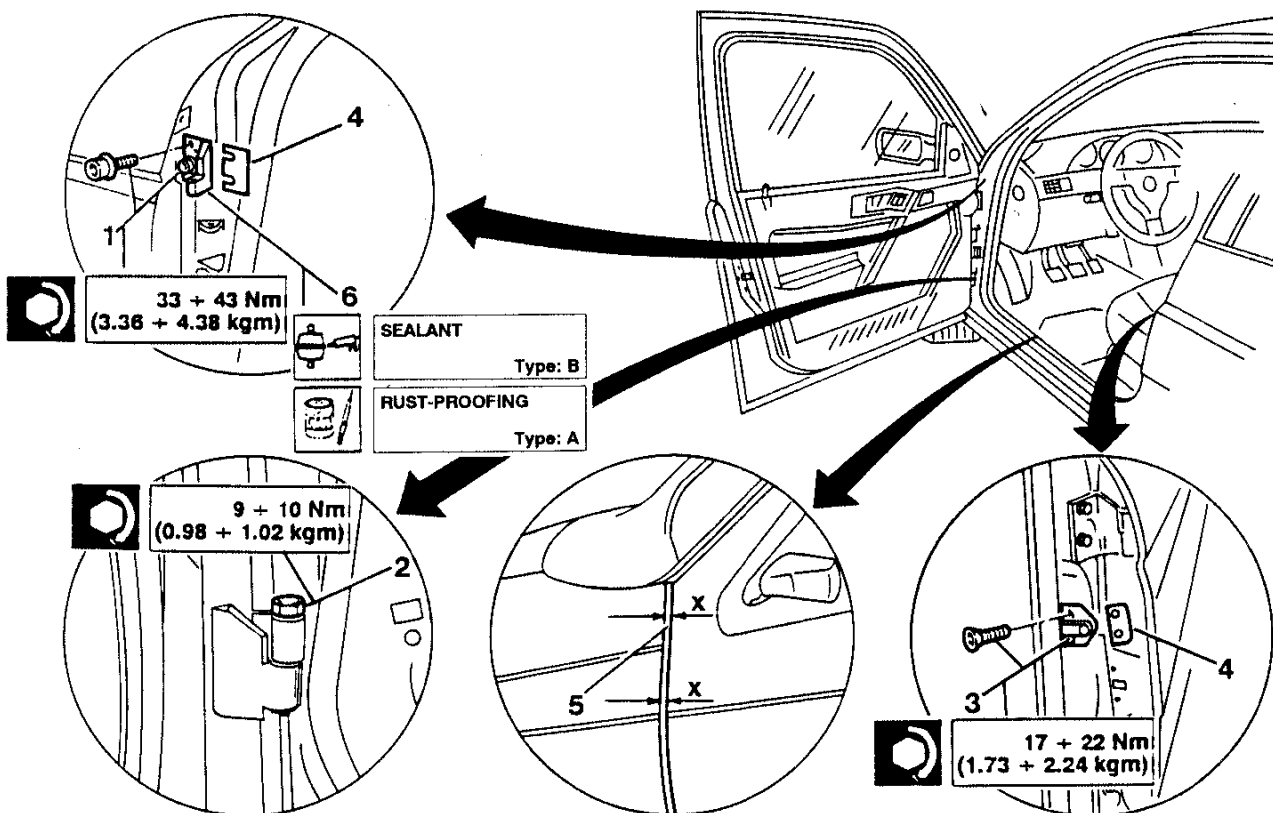
3. Loosen the screws securing the catch to the body.

4. If necessary, place some shims under the catch and under the hinge.
5. Correctly adjust the position of the door on the basis of the gap between door and wing and the correct alignment of the ribs between wing, front door and rear door and then remove the door.
  - Tighten the previously loosened screws to the prescribed torque.
6. Using the product indicated, seal around the edges of the hinge.



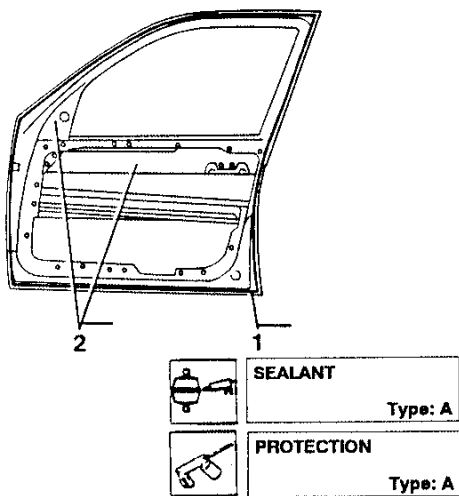
#### CAUTION:

When replacing the hinges, thoroughly clean the surfaces which will be in contact and cover them with a Type A anti-corrosion product.





- When installing a new door, after making the adjustments described above, remove the door from the hinge pin and the lock from the door and proceed as follows:
1. Using the product indicated, seal along the lines as shown in the diagram.
  2. After painting the door, using a Type A protection, wax the interior parts.



- Definitively install the door.

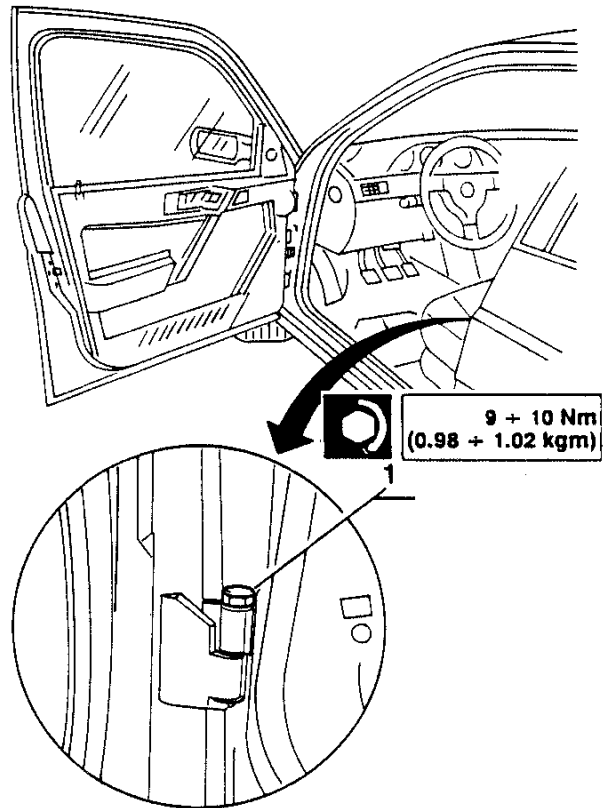
## REAR DOORS

### Removal and refitting

- Disconnect the door check strap and the electrical wiring (see: GR. 55).
1. Unscrew the screws securing the door to the hinge and slide the door off its hinges.



Install by reversing the removal procedure and tightening the screws to the prescribed torque.



**Adjustment of doors and hinges**

- In order to correctly align the rear and front doors and the rear door and wing when substituting a door or one of the hinges, make adjustments as follows:

  1. Loosen the screws securing the hinge to the body
  2. Position the door and partially tighten the hinge pin retaining screws.

**NOTE:** The lock should be fitted to the door before this is installed on the vehicle (see: GR. 56).

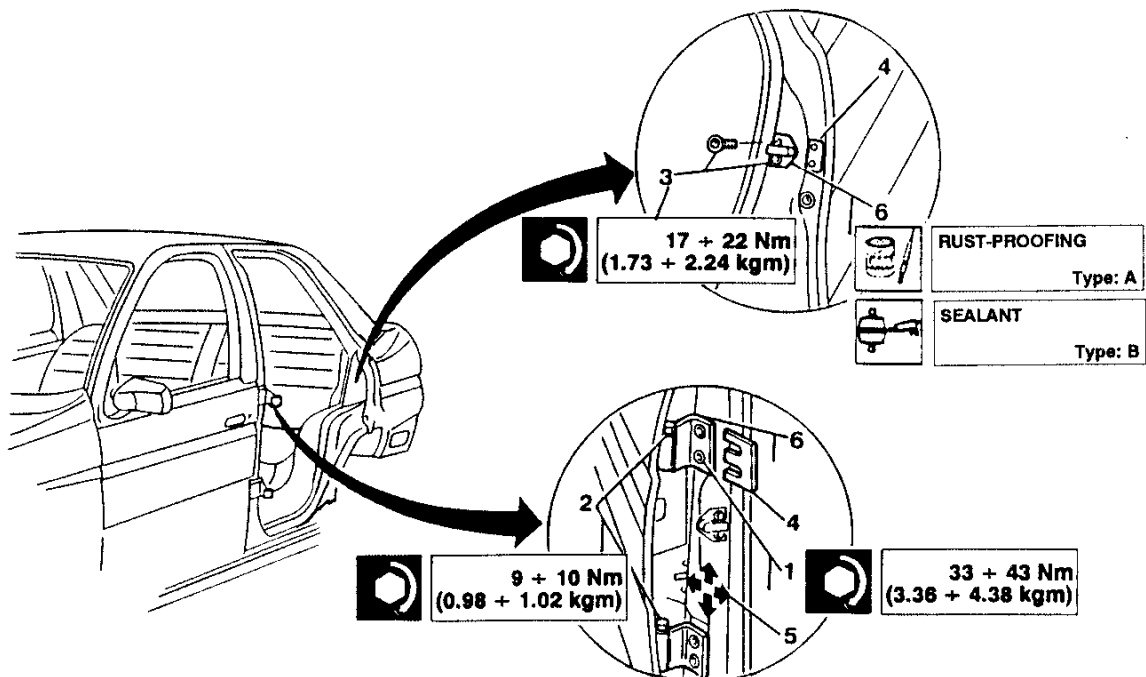
3. Loosen the screws securing the catch to the body.
4. If necessary place some shims under the catch and under the hinge.

5. Correctly adjust the position of the door on the basis of the gap between door and wing and on the correct alignment of the ribs between wing and front and rear doors.
- Tighten the previously loosened screws to the prescribed torque.

**CAUTION:**

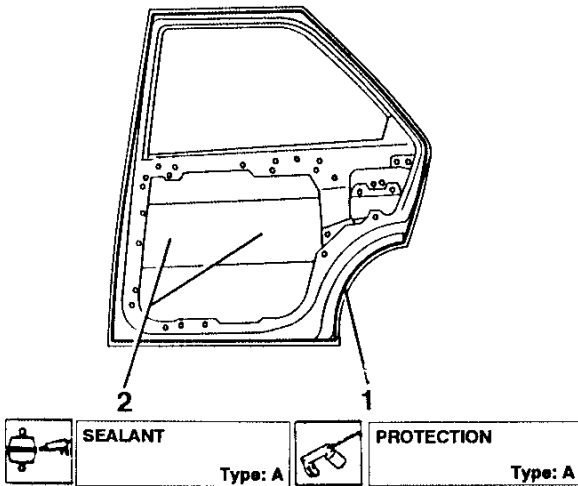
When replacing the hinges, thoroughly clean the surfaces which will be in contact and cover them with a Type A anti-corrosion product.

6. Using the product indicated, seal around the edges of the hinge.





- When installing a new door, after making the adjustments described above, remove the door from the hinge pin and the lock from the door and proceed as follows:
1. Using the product indicated, seal along the lines as shown in the diagram.
  2. After painting the door with a Type A protection, wax the interior parts.



- Definitively install the door.

## BOOT

### Removal

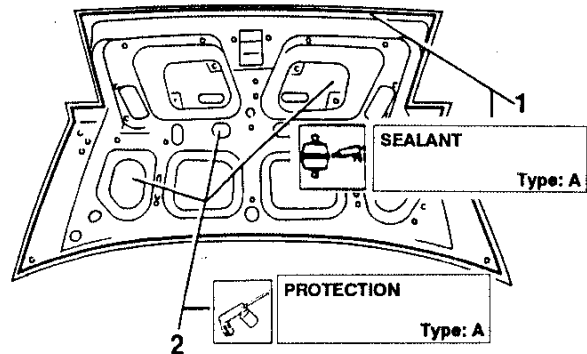
See: GR. 56.

### Installation and adjustment



Install by reversing the removal procedure following the indications given below:

1. When installing a new boot lid, seal the indicated parts with a Type A product then finish, and paint the boot lid (see: PREPARATION FOR INSTALLATION OF NEW COMPONENTS).
2. Using a type A protection wax the inner part of the lid and adjust as described below.





**Boot-lid position and height adjustment**

1. Loosen the catch retaining screws in the luggage compartment.
2. Fix the boot lid to the hinge and partially tighten the the screws and close the lid.

**NOTE:** The lock and gasket should be fitted to a new boot lid before this is installed on the vehicle (see: GR. 56).

**CAUTION**

When substituting the hinges, thoroughly clean the mating surfaces and cover them with a Type A anti-corrosion product before installation.

- Maintaining a uniform gap between boot lid and wing adjust the transversal and longitudinal position of the lid so that it is aligned with the wing.

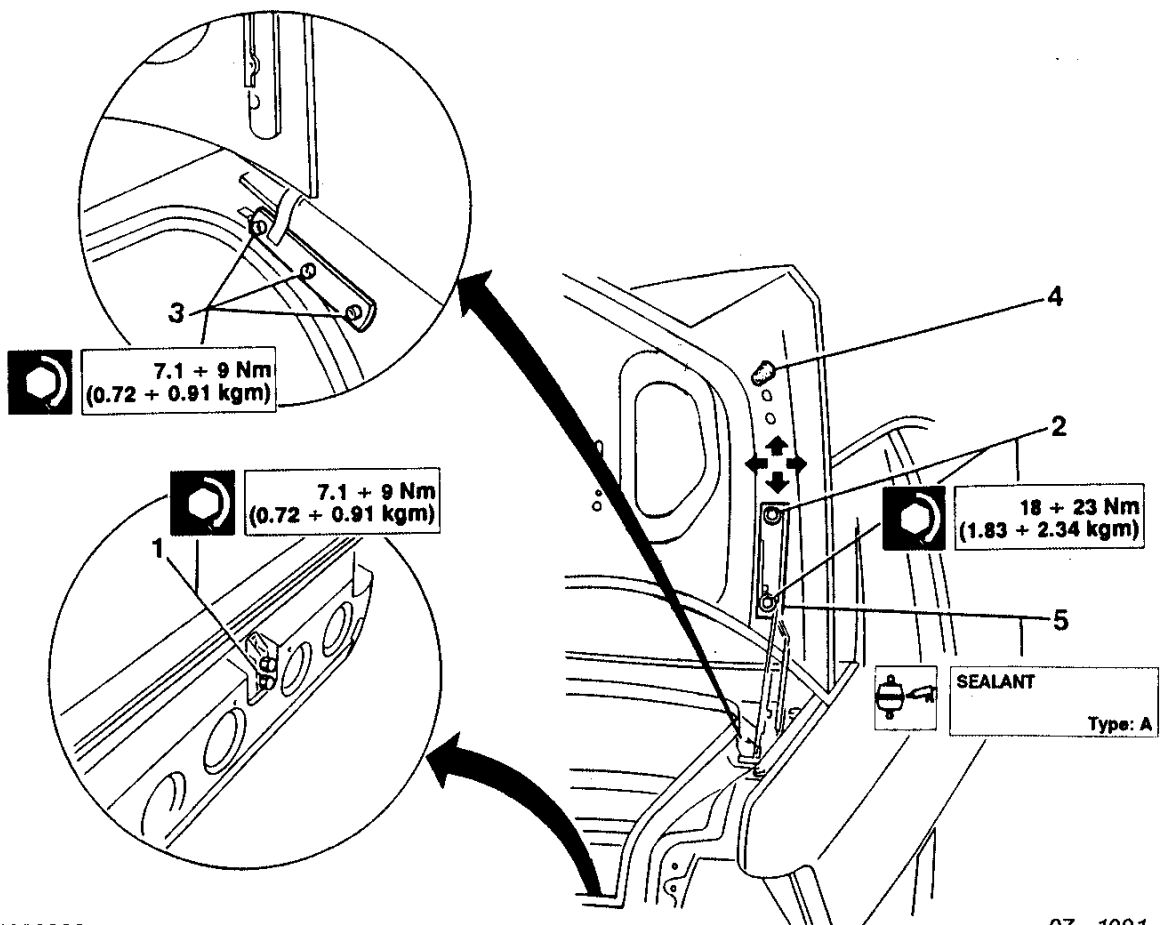
**NOTE:** The arrows indicate the permitted movement for boot lid adjustment.

3. Adjust the height between boot lid and wing by acting on the three screws securing the hinge to the body.
4. Correctly adjust the buffers by screwing or unscrewing them.

**CAUTION**

An incorrect adjustment of the buffers and an incorrect height between boot lid and wing will give rise to shrinkage of the lid or play in the closure mechanism which will in both cases damage these parts.

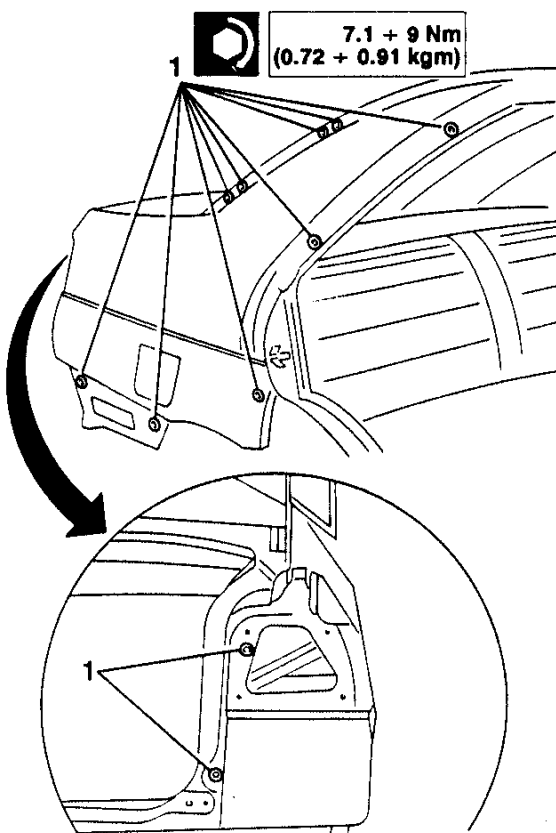
- Once the correct position has be found and the catch abuts the closure mechanism correctly, tighten the screws securing the hinge to the lid to the prescribed torque.
5. Using the indicated product seal along the lines as shown in the diagram.



**REAR WING****Removal**

- In order to permit removal of the rear wing the following components should first be removed:
  - External trimming (see: GR. 75).
  - Rear bumper (see: GR. 75).
  - Rear light assemblies (see: GR. 40).
  - Door seals (see: GR. 55).
  - Roof finishing (see: GR. 75).
  - Fuel tank filler (only for rear right wing: see: REPAIR MANUAL - ENGINES - GR. 04).
- 1. Unscrew the eleven screws securing the wing to the body.
- Using a jet of hot air heat the area between body and wing to loosen the sealant then remove the wing.

**NOTE:** Both during removal and installation a blade should be used to facilitate the cutting and removal of the sealant.



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**Installation and adjustment**

- Remove all traces of sealant from the body using a scraper.

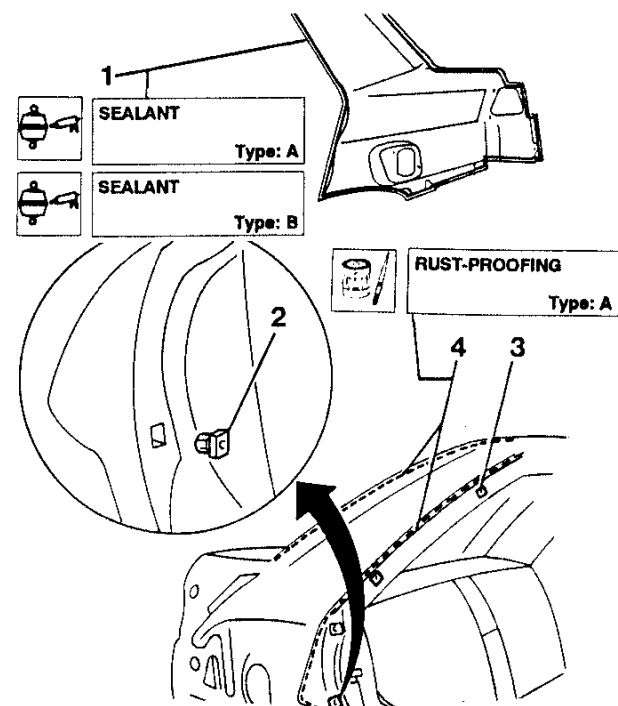
**CAUTION:**

Take precautions to avoid damaging the paintwork.

1. When installing a new wing, finish and paint the wing (see: PREPARATION FOR THE INSTALLATION OF NEW COMPONENTS) and seal the indicated parts with a type A product.
2. Check that the securing blocks have not been damaged and replace them if necessary.
3. Temporarily position the wing against the body and secure it to the door opening blocks and check that the wing and rear door are in line.
4. If, during removal of the sealant, part of the anti-corrosion coating is accidentally removed, restore the affected parts with Type A rust-proofing before installing the wing.



Tighten, to the prescribed torque, all the screws securing the wing to the body and install all the previously removed components.

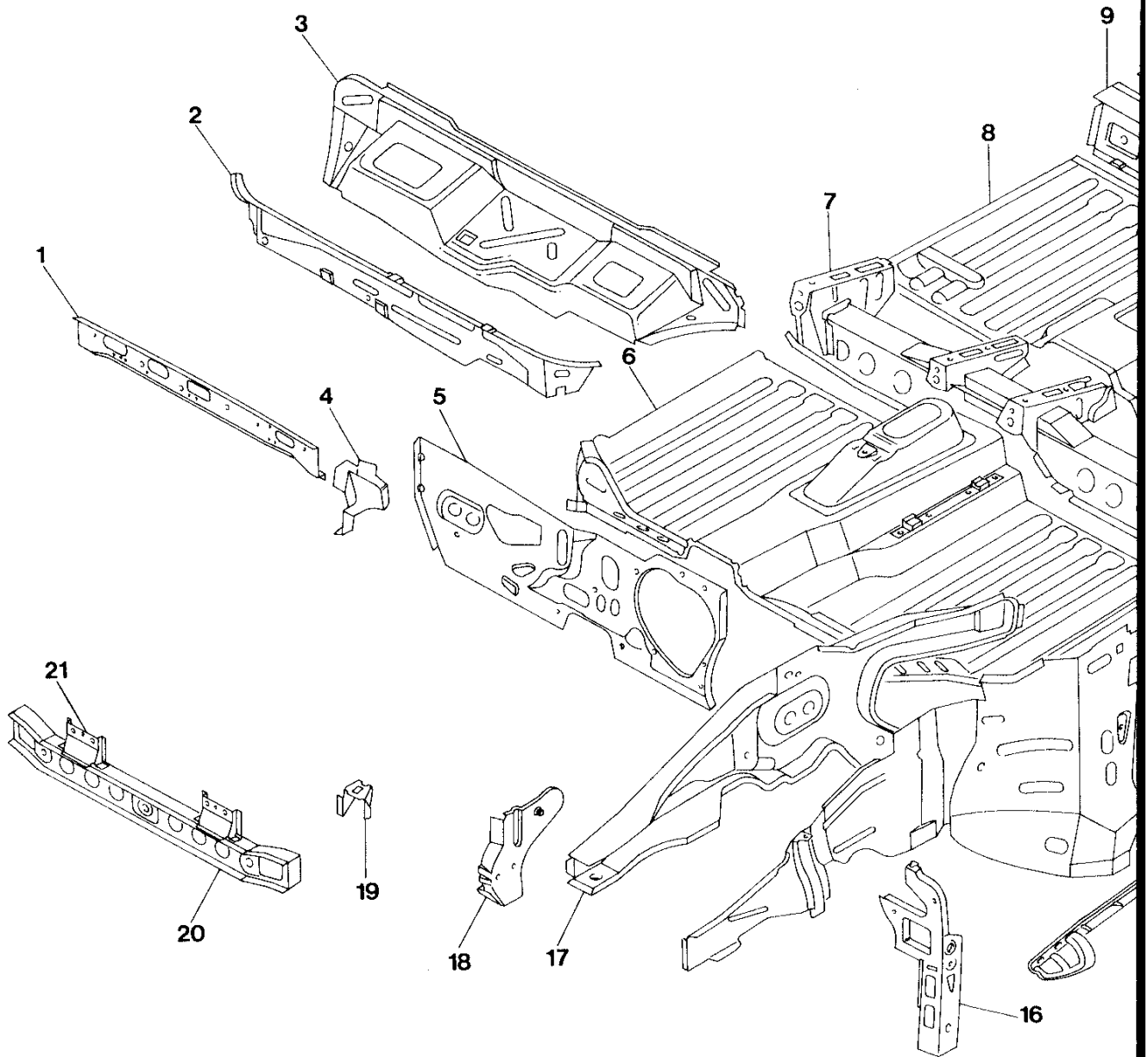


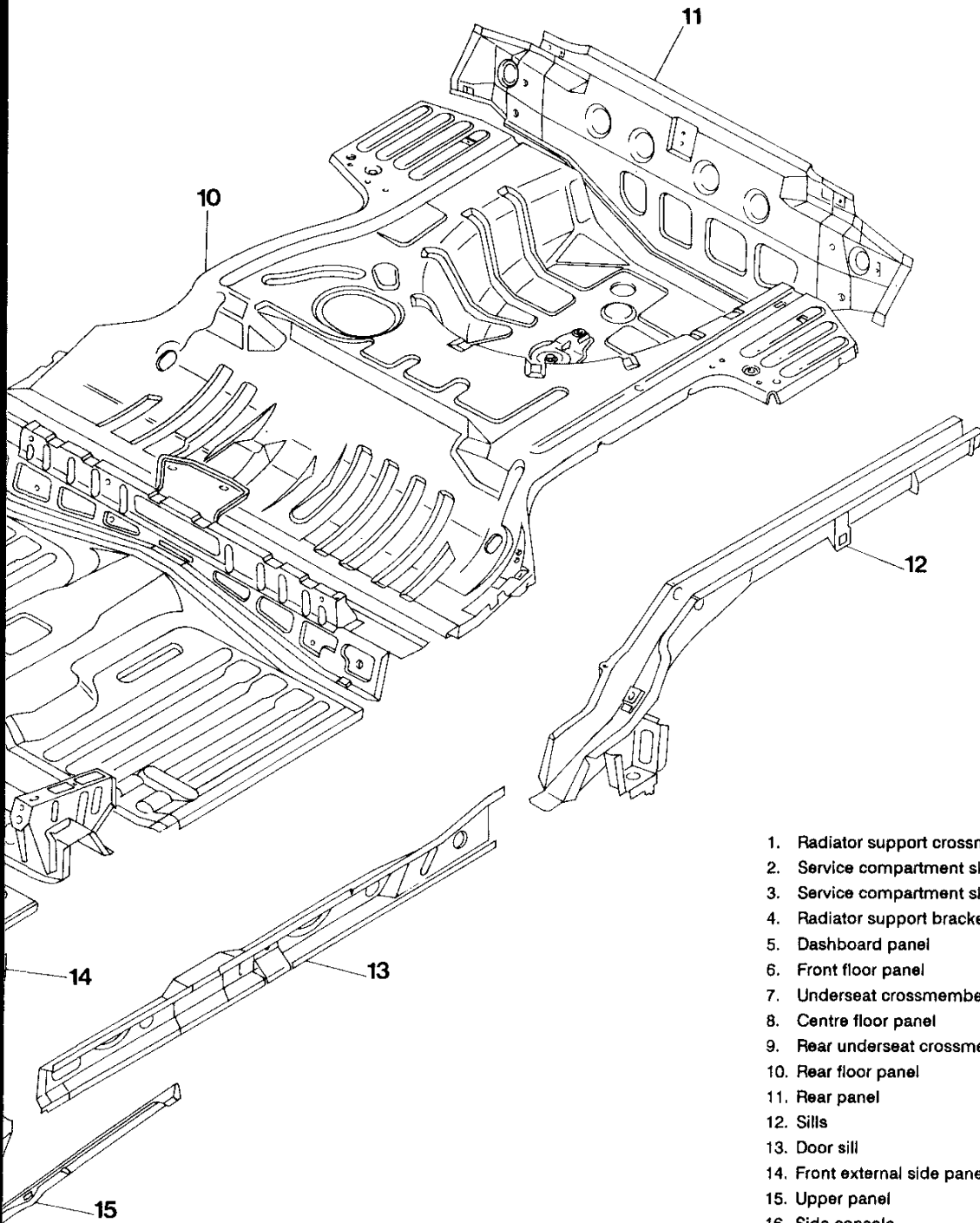
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# BODY COMPONENT PARTS

## UNDERBODY PARTS





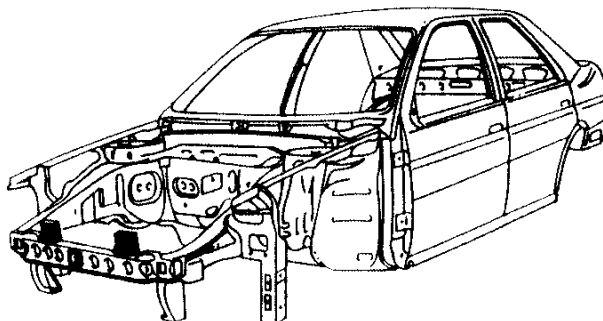
1. Radiator support crossmember
2. Service compartment skin (front)
3. Service compartment skin (rear)
4. Radiator support bracket
5. Dashboard panel
6. Front floor panel
7. Underseat crossmember
8. Centre floor panel
9. Rear underseat crossmember
10. Rear floor panel
11. Rear panel
12. Sills
13. Door sill
14. Front external side panel
15. Upper panel
16. Side console
17. Front inside side panel
18. Radiator attachment bracket
19. Front crossmember attachment bracket
20. Front crossmember
21. Front bumper attachment bracket



## REPLACING FIXED COMPONENTS

### FRONT BUMPER FIXING BRACKETS

- In order to facilitate successive operations the following components should be temporarily removed:
  - front bumper and external trim (see: GR. 75);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - headlight housing frame;
  - components of the air conditioning system if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

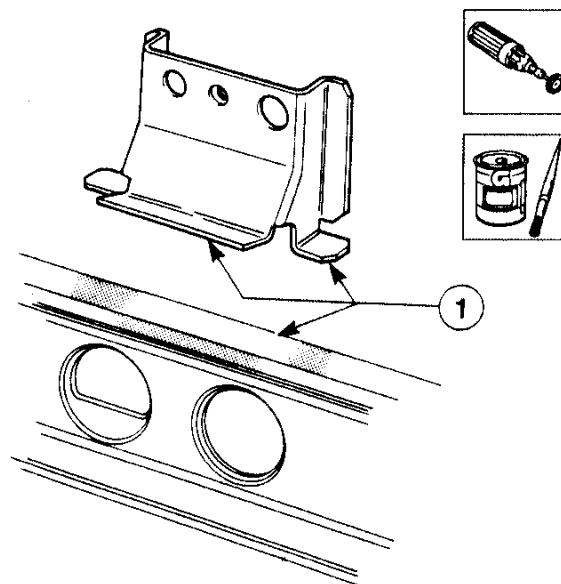
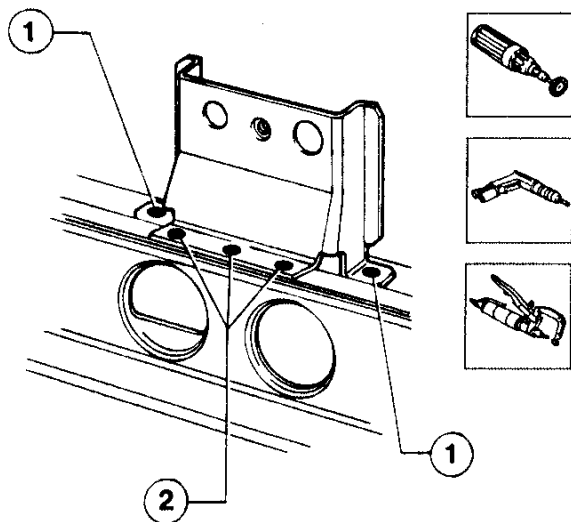


### Removal

- Using a rotating brush, clean the area to be chamfered in order to highlight the welds.
1. Remove the welds with a drill.
  2. Remove the welds with a chamfering machine.

### Preparation

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
1. Spread the surface indicated in the illustration with Type B electroweldable protection.



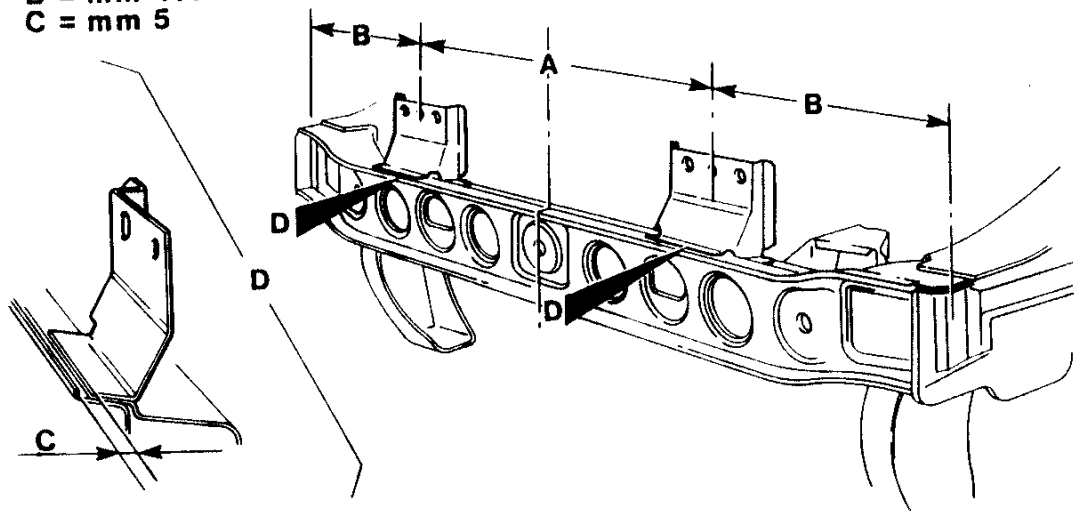


**Positioning**

- Position the brackets on the cross member using the following references as indicated in the illustration:

external face of the side panel, the central bracket hole and the centre of the vehicle.

A = mm 476  
 B = mm 110  
 C = mm 5

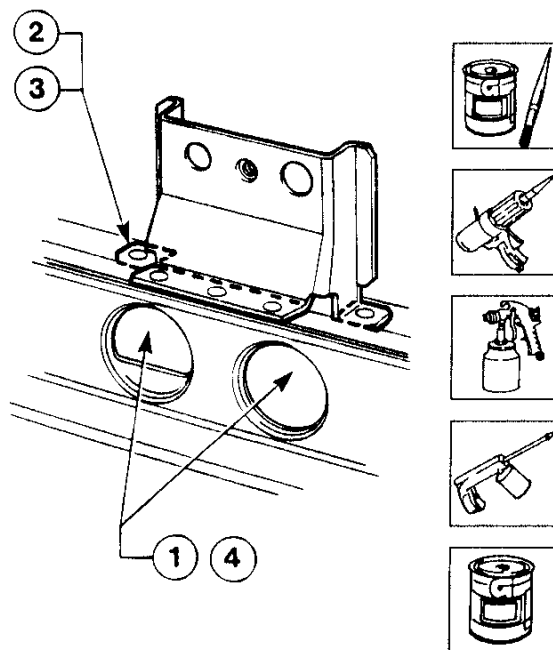
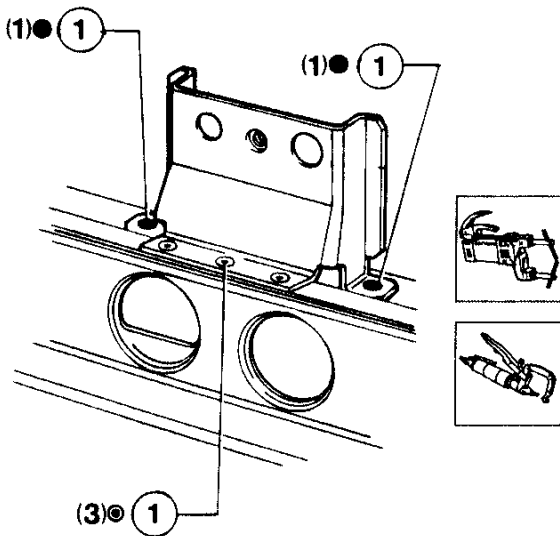


**Welding and finishing of the sheet metal**

1. Using a spot-welder operate as shown in the illustration.
- Using a rotating brush, clean the welded areas.
- Check that the components are correctly positioned after welding.

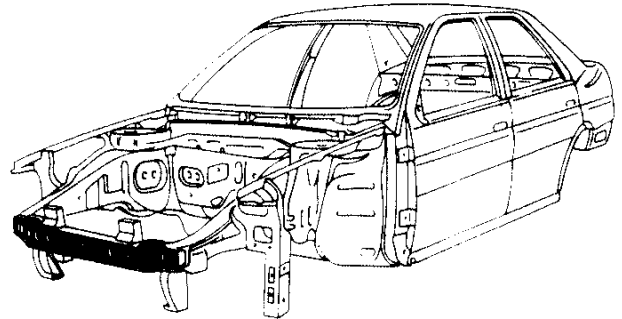
**Protection**

1. Apply Type B rust-proofing to the areas indicated in the illustration.
2. Apply a Type B protection to the areas indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.
- Proceed to the painting phase.
4. Proceed to the waxing phase.



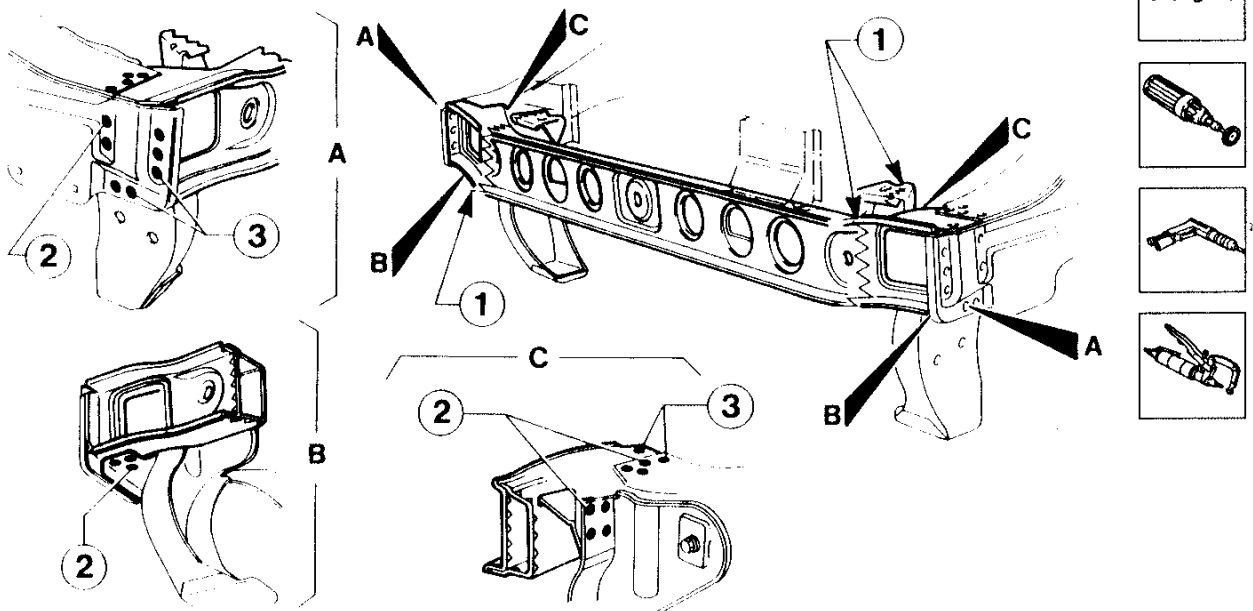
**FRONT CROSS MEMBER**

- In order to facilitate successive operations the following components should be removed temporarily:
  - front bumper and external trim (see: GR. 75);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - headlight housing frame;
  - components of the air conditioning system if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

1. Using a jig saw, cut along the lines shown in the illustration.
- Using a rotating brush, clean the areas to be chamfered in order to show up the welds.

2. Using a drill, remove the welds.
3. Using a chamfering machine, remove the welds.

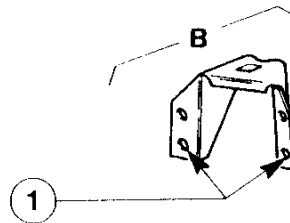
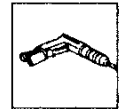
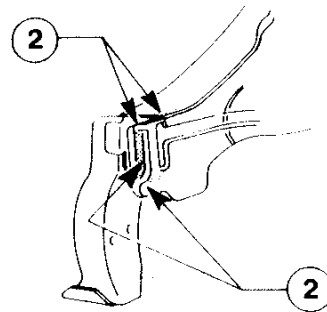
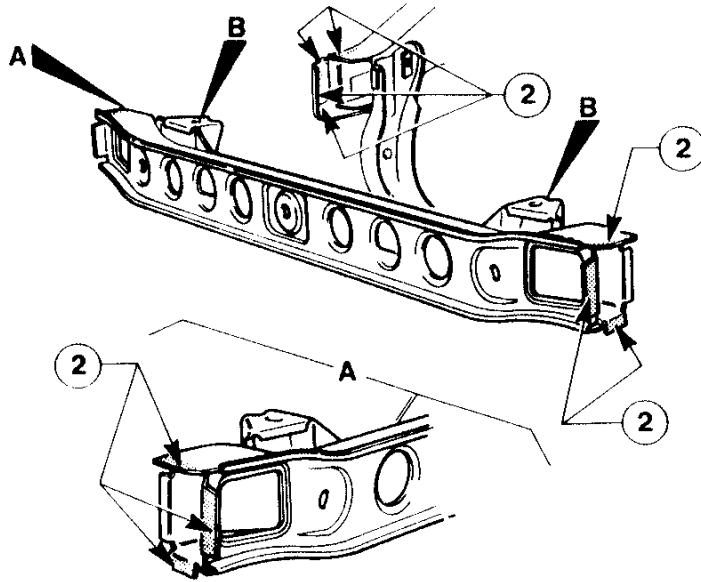




**Preparation**

- Using a rotating brush, clean the areas to be welded.
- 1. Prepare the holes on the bracket for MIG welding.

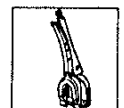
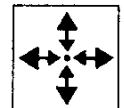
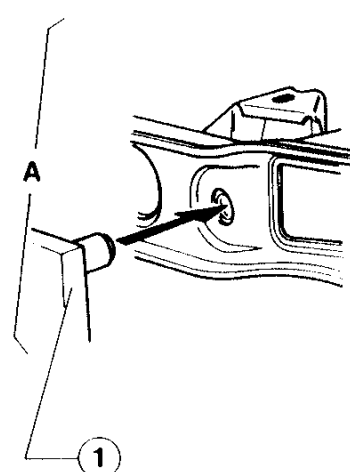
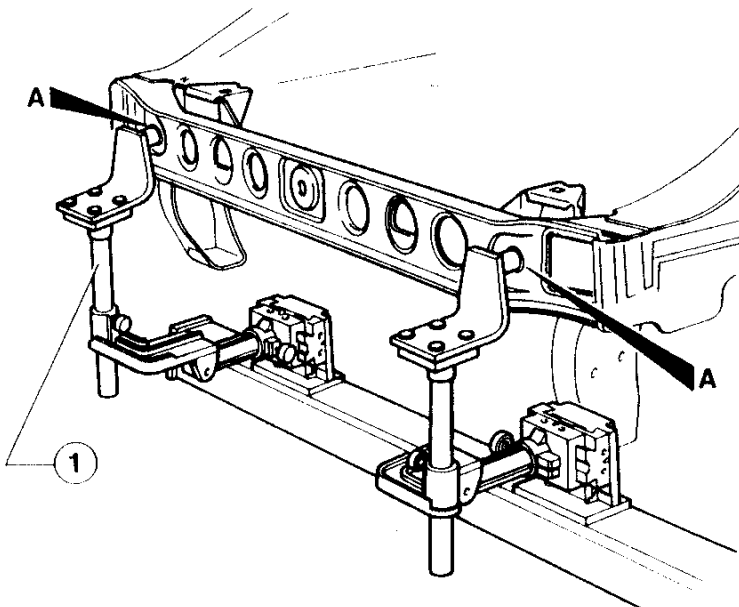
- 2. Spread the areas indicated in the illustration with Type A electroweldable protection.



**Positioning**

- 1. Using a jig, correctly position the part, secure it and

mate the edges of the side panel to the new cross member.





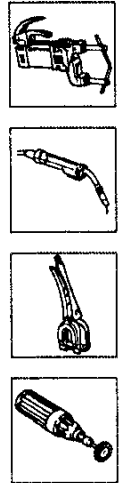
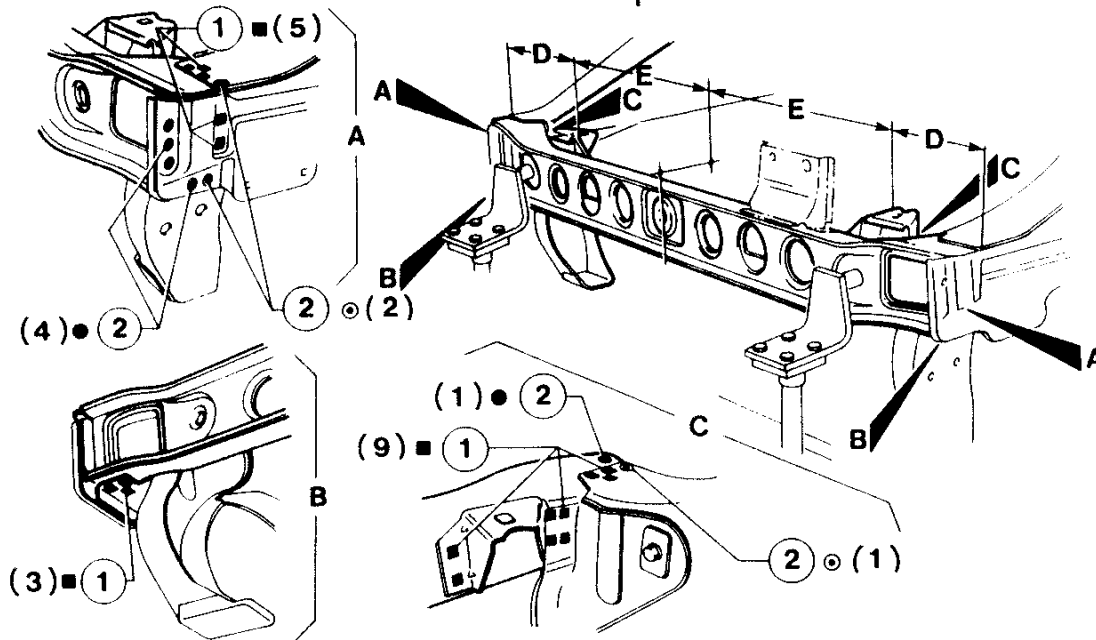


**Welding and finishing of the sheet metal**

1. Using a MIG welder carry out filling welds.
  2. Using a spot welder, operate as indicated in the illustration.
- Position the brackets as indicated in the illustration, using the outer face of the side panel, the central hole

In the brackets securing the bumper, and the centre of the vehicle as reference points.

- Using an abrasive grinding machine, remove and level the residues left by welding.
- Using a rotating brush, clean the welded areas.
- Check that the components are correctly positioned after welding.



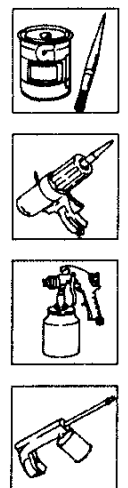
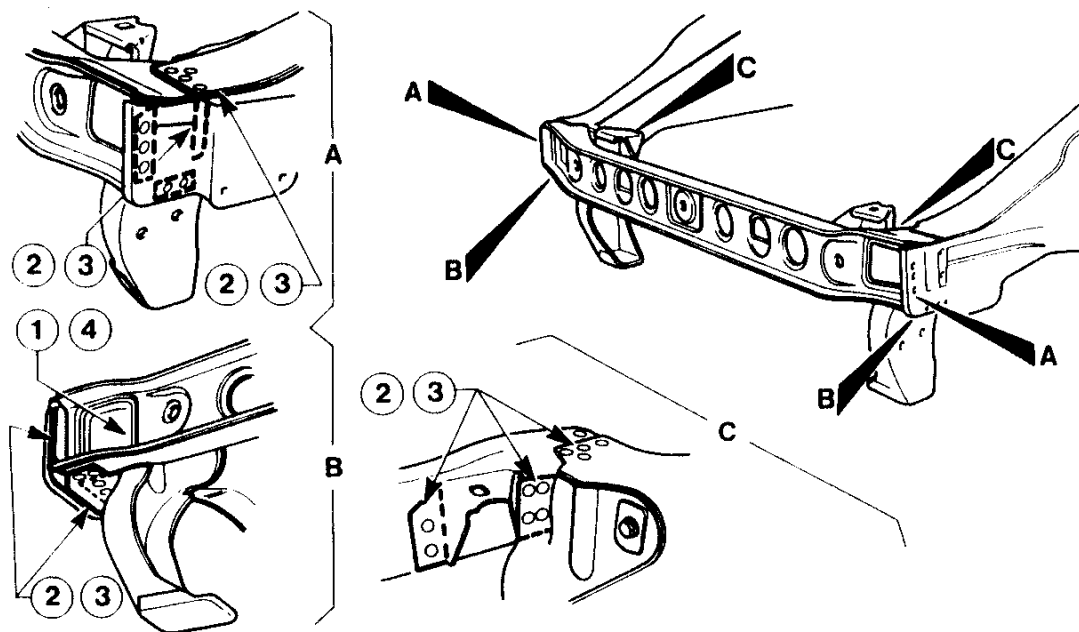
D = mm 155  
E = mm 355

**Protection**

1. Spread Type B rust-proofing inside the cross member as shown in the illustration.
2. Spread the areas shown in the illustration with Type A rust-proofing.

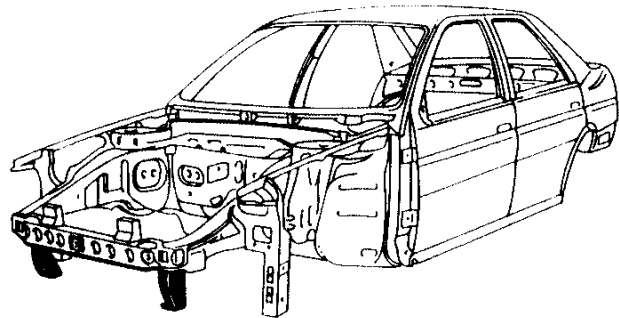
3. Apply Type A sealant to the areas shown in the illustration.

- Proceed to the painting phase.
- 4. Proceed to the waxing phase.



**RADIATOR ATTACHMENT BRACKET**

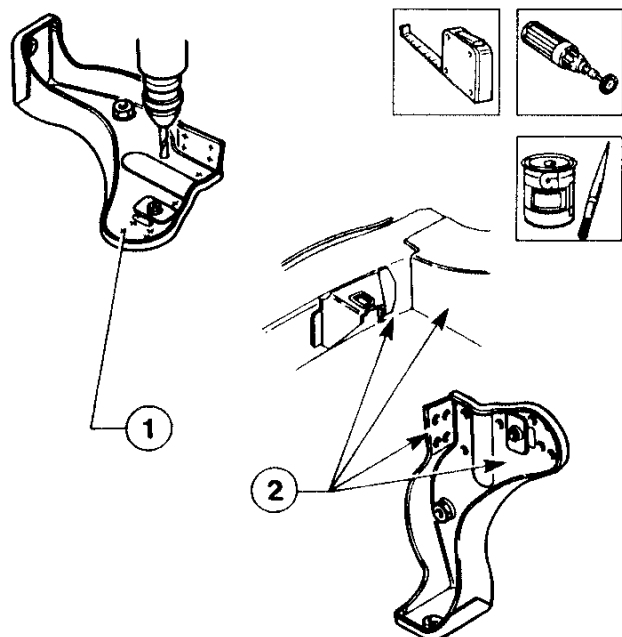
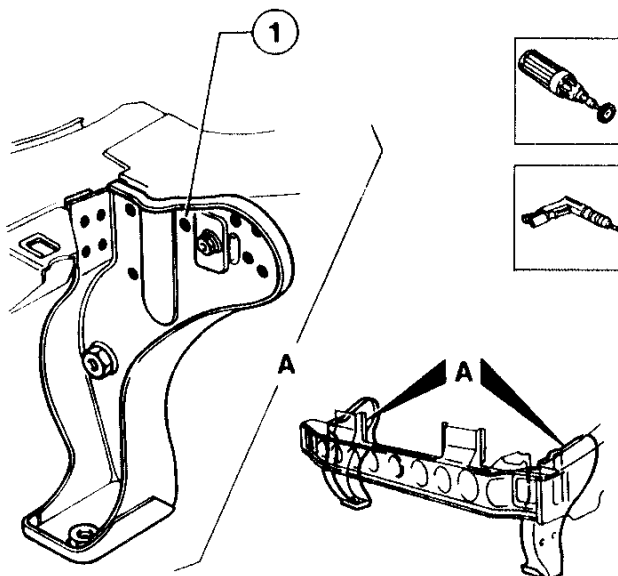
- In order to facilitate successive operations the following components should be removed temporarily:
  - front bumper and external trim (see: GR. 75);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - headlight housing frame;
  - components of the air conditioning system if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the areas to be welded in order to show up the welds.
1. Using a drill, remove the welds.

**Preparation**

1. Operating on a bench, trace the spare bracket and drill (11 holes) using a 5 mm  $\varnothing$  bit as shown in the illustration.
- Using a rotating brush clean the areas to be welded.
2. Spread the areas indicated in the illustration with Type A electroweldable protection.





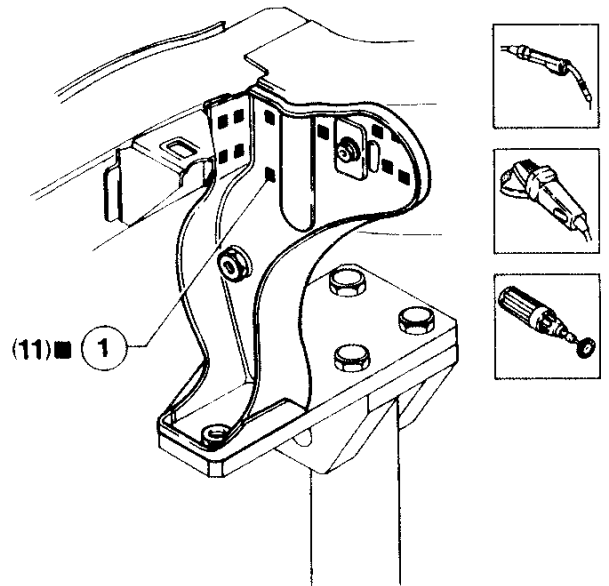
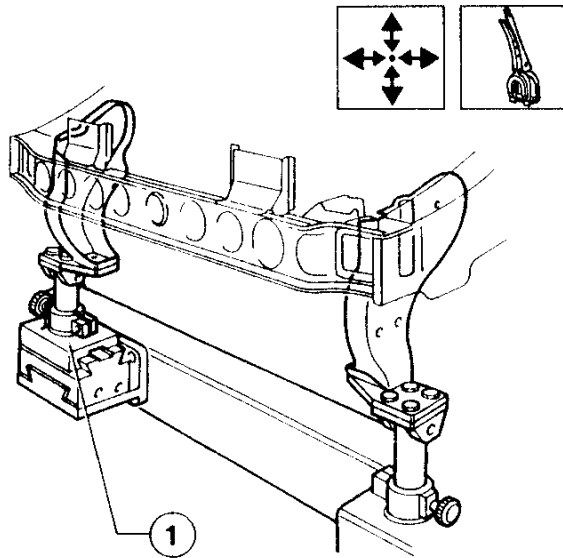
**Positioning**

1. Using the jig, correctly position the new part and secure and mate the edges.

**Welding and finishing of the sheet metal**

1. Using a MIG welder perform filling welding.

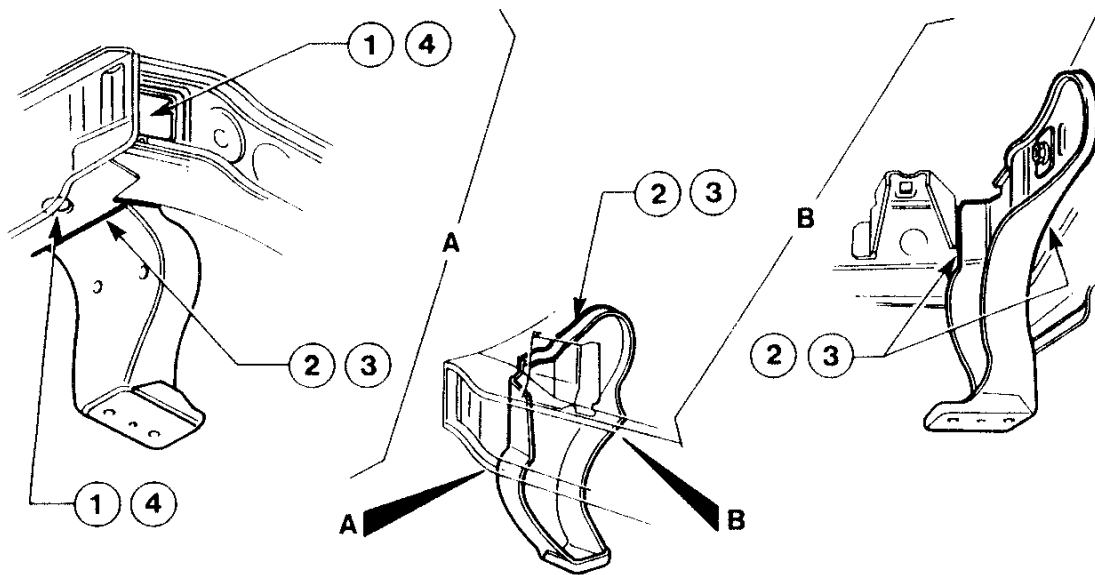
- Using an abrasive grinding machine remove and level the residues left by the welding.
- Using a rotating brush, clean the welded areas.
- Check that the components are correctly positioned after welding.



**Protection**

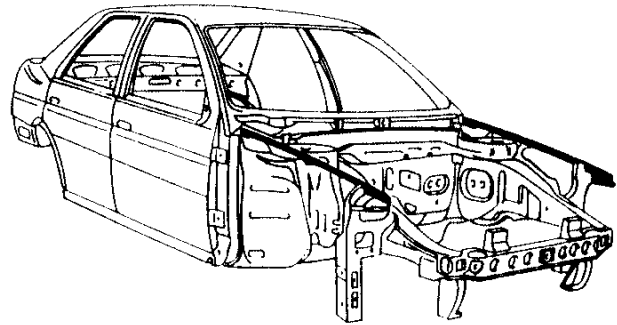
1. Spread the areas shown in the illustration with Type B rust-proofing.
2. Apply Type A rust-proofing to the areas shown in the illustration.

3. Apply Type A sealant to the areas shown in the illustration.
4. Proceed to the waxing phase.



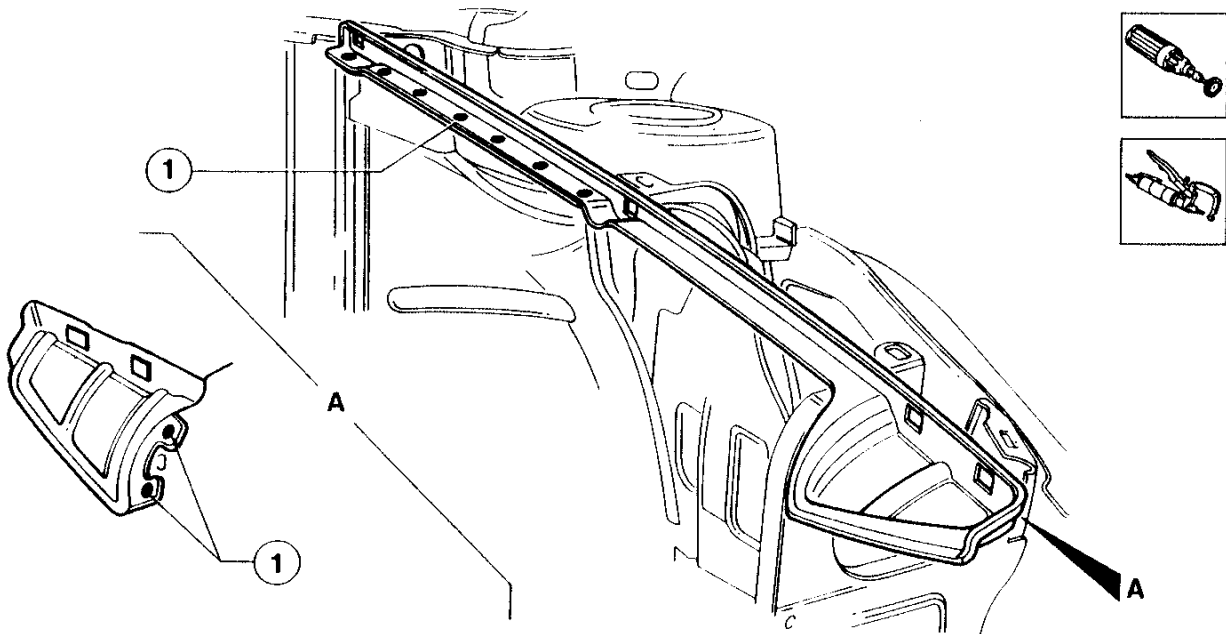
**UPPER PANEL**

- In order to facilitate successive operations the following components should be removed temporarily:
  - front bumper and external trim (see: GR. 75);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - headlight housing frame;
  - components of the air conditioning system if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the areas to be welded in order to show up the welds.

1. Using a chamfering machine, remove the welds as indicated.

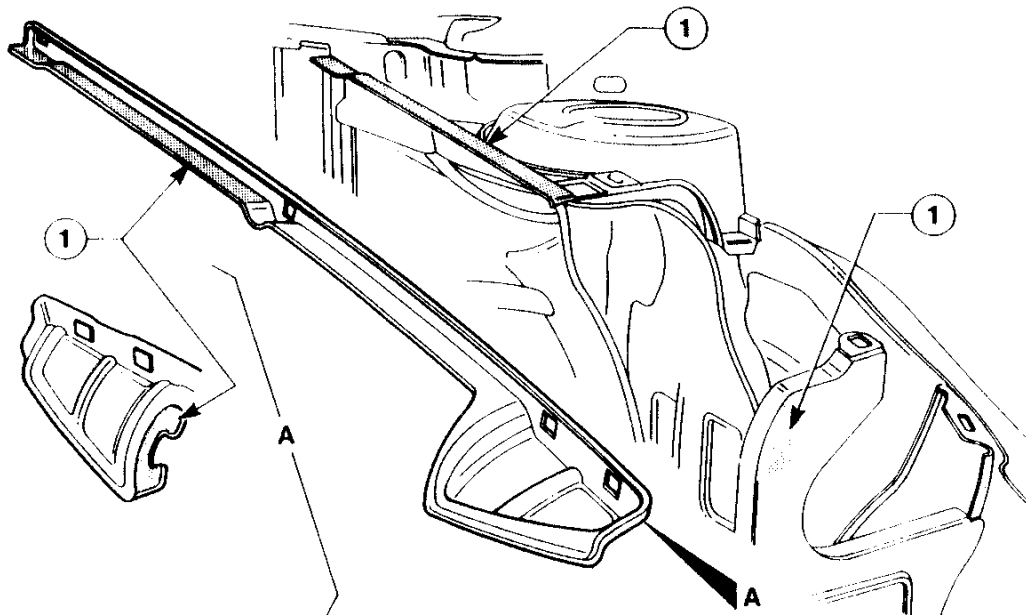




**Preparation**

- Using a rotating brush clean the areas to be welded.

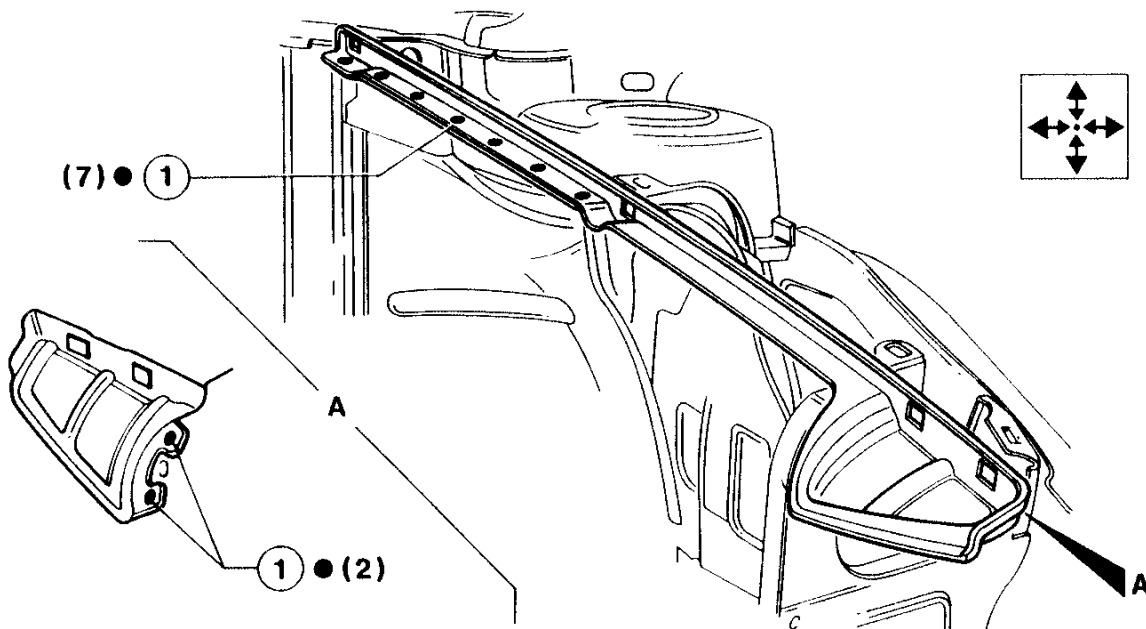
1. Spread the areas indicated in the illustration with Type A electroweldable protection.



**Positioning of welding and finishing of the sheet metal**

- Position the new part, secure the components, check alignment and mate the edges.

1. Using a spot welder proceed as shown in the illustration.
- Using a rotating brush clean the welded areas.

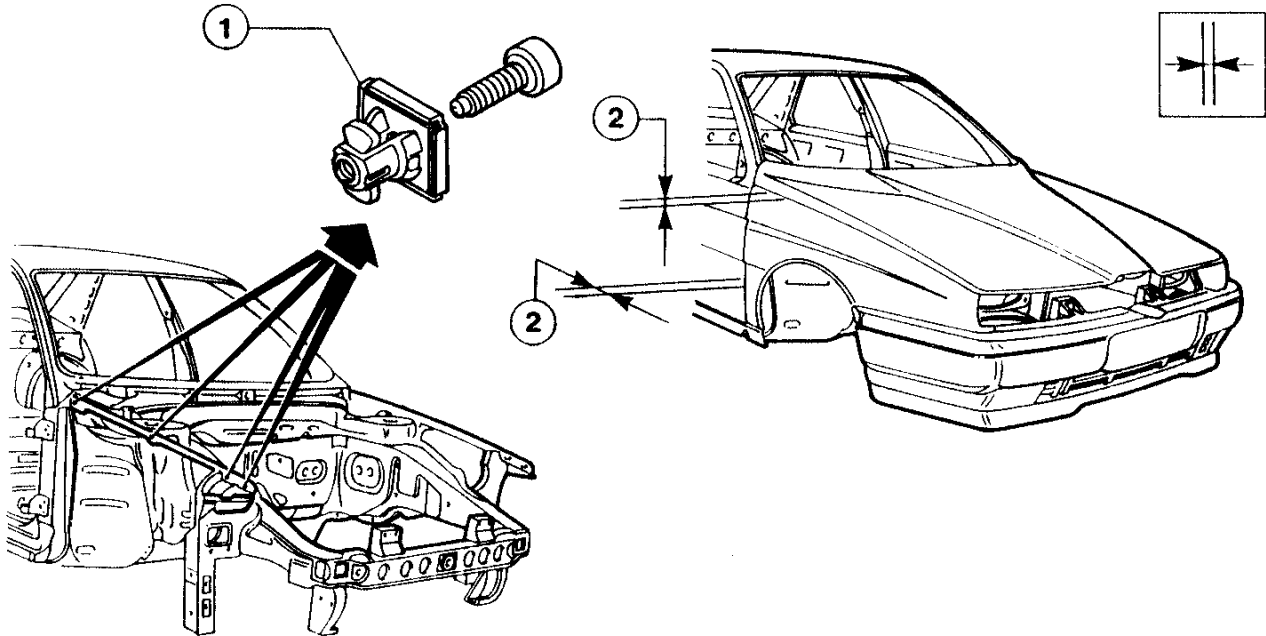




**Check**

1. Install the four blocks securing the front bumper.
2. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

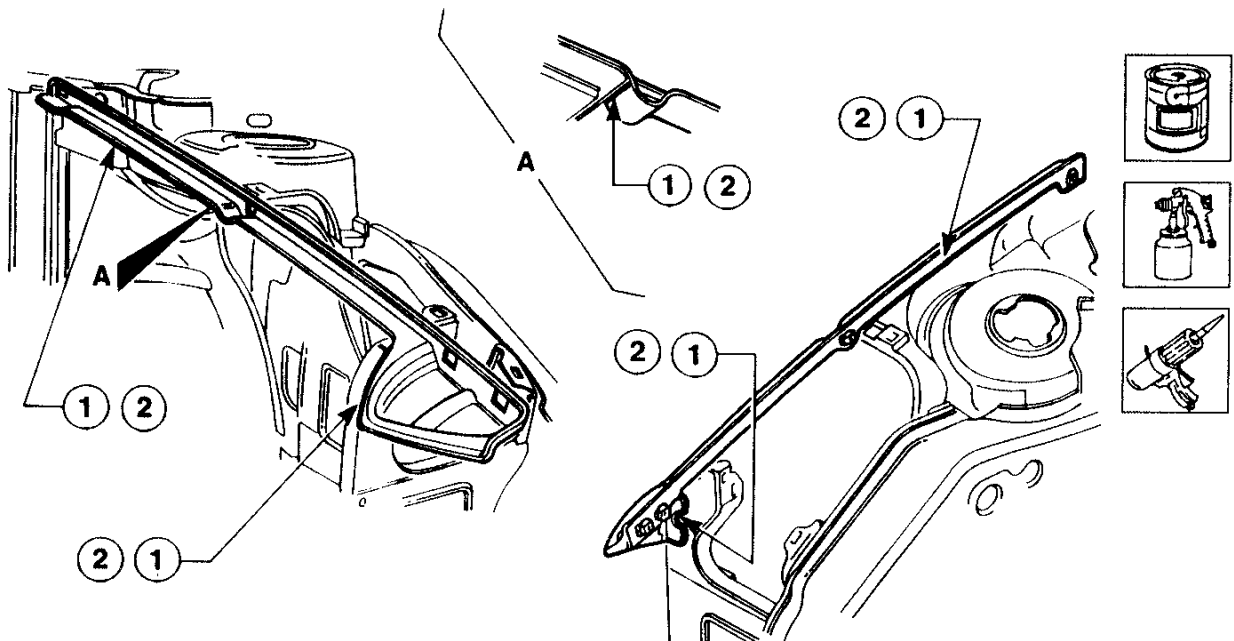
which were previously removed along with gaskets and parts which, when installed, which will make it possible to check the success of the the operation).



**Protection**

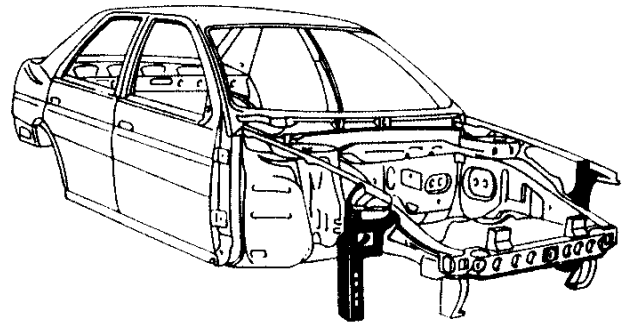
1. Spread Type A rust-proofing on the areas indicated in the illustration.
2. Apply Type A sealant to the areas shown in the illustration.

- Proceed to the painting phase.
- Install and successively adjust and check the front wing (see: REMOVAL OF MOBILE COMPONENTS - FRONT WING).



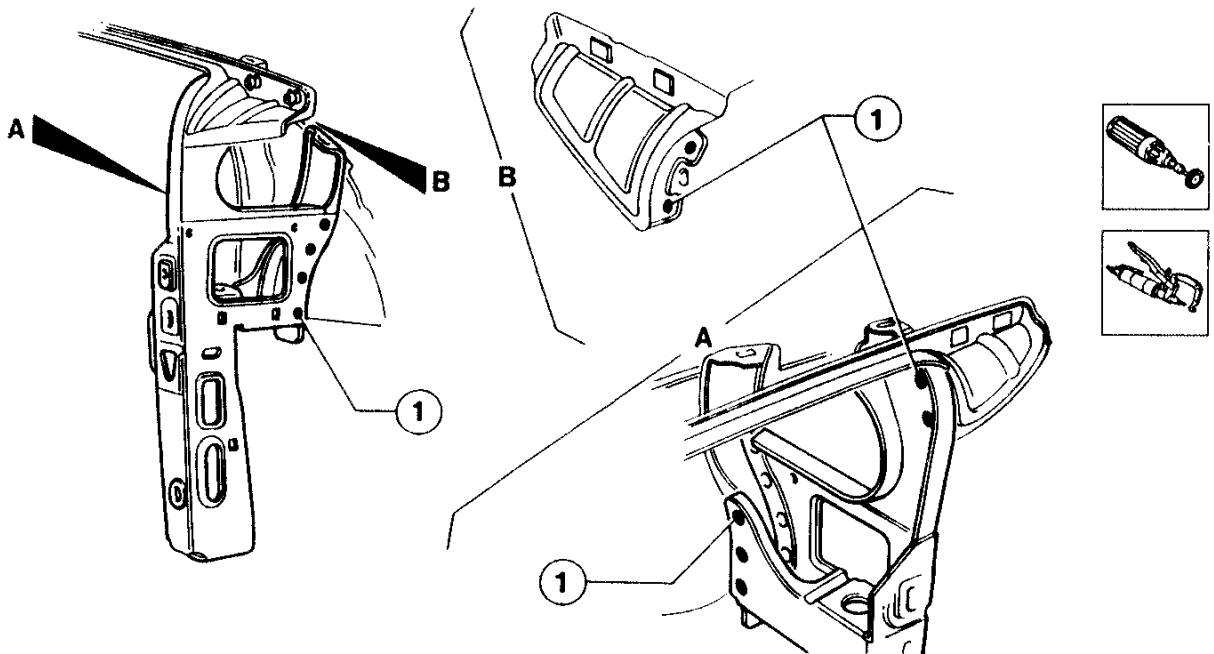
**SIDE CONSOLE**

- In order to facilitate the successive operations the following components should be removed temporarily:
  - front bumper and external trim (see: GR. 75);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - headlight support frame;
  - air conditioning system components if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.

1. Using a chamfering machine remove the welds indicated.

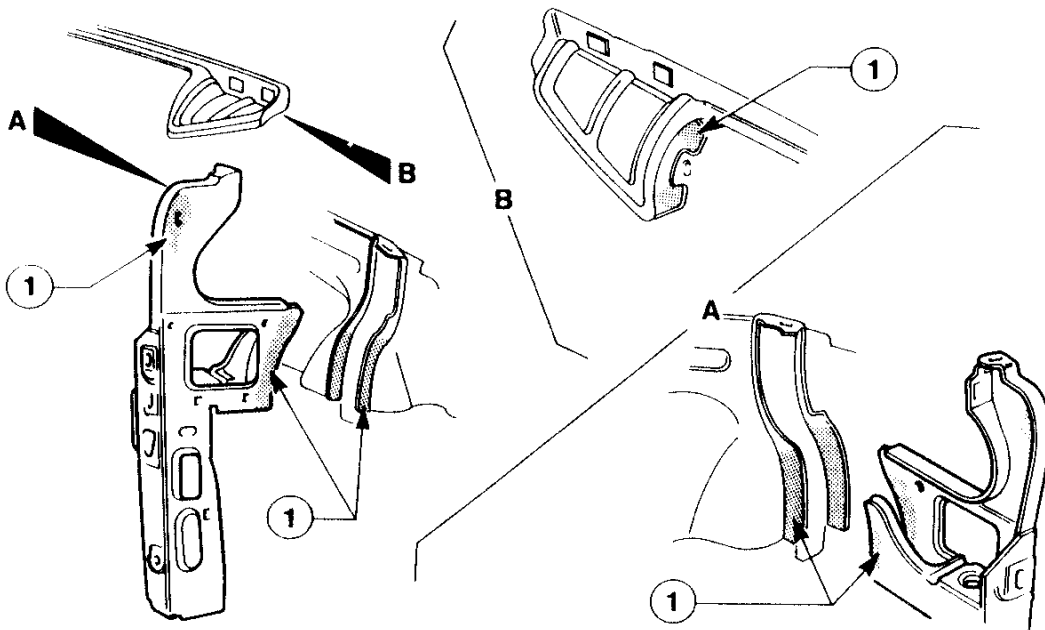




**Preparation**

- Using a rotating brush clean the welding areas.

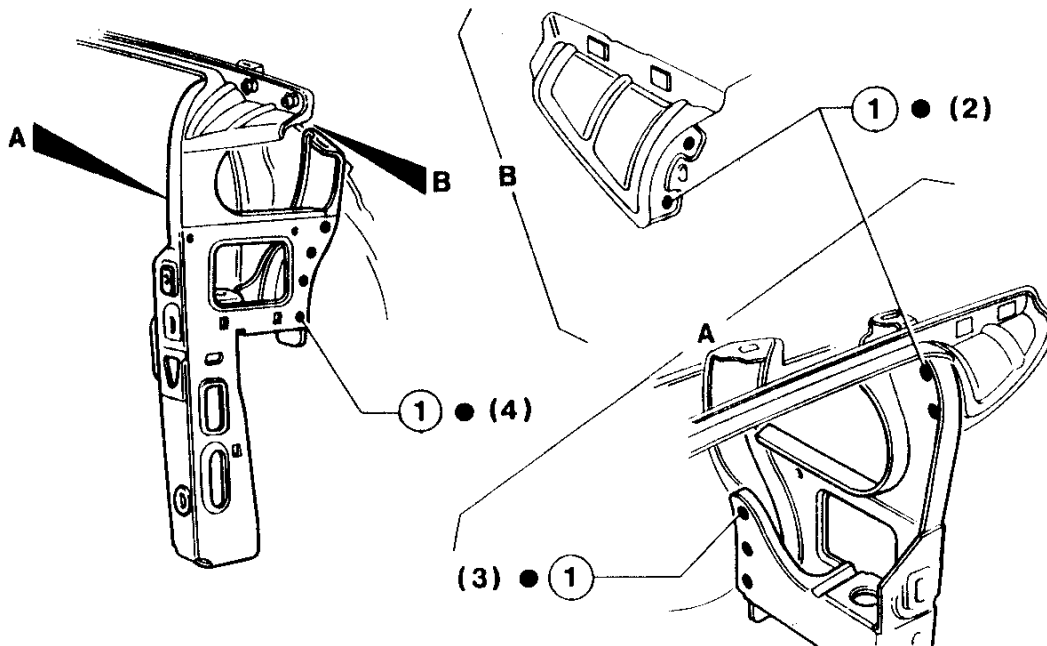
1. Spread the areas indicated in the illustration with Type A electroweldable protection.



**Welding position and finishing of sheet metal**

- Position the new part, secure the components, check alignment and mate the edges.

1. Using a spot welder, operate as shown in the illustration.
- Using a rotating brush clean the welding areas.



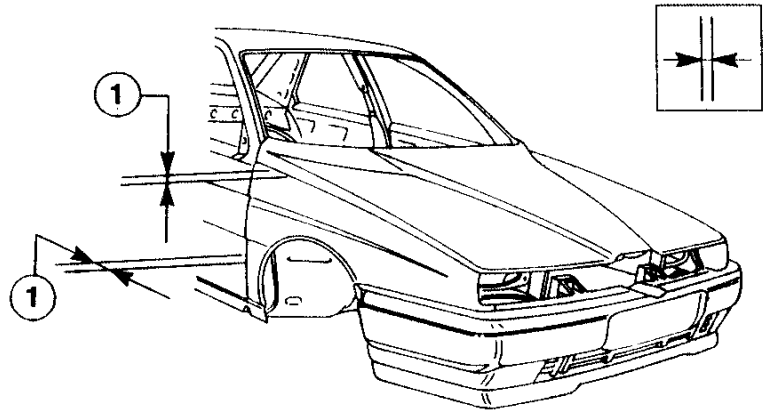
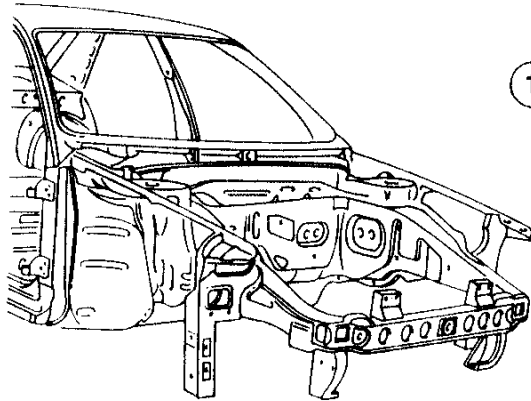




**Check**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

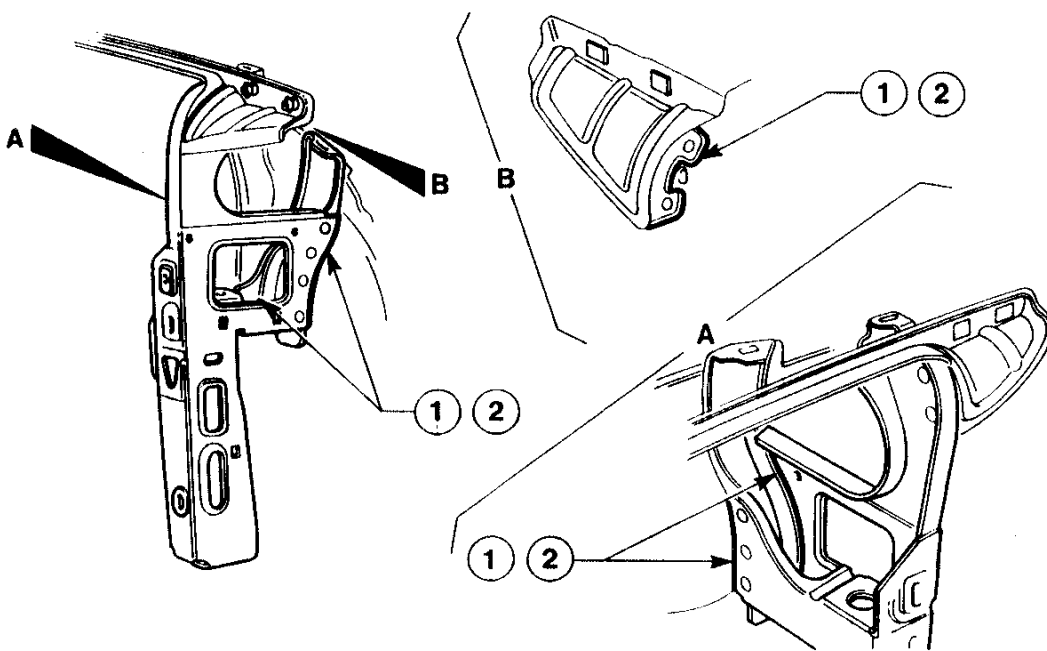
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operation).



**Protection**

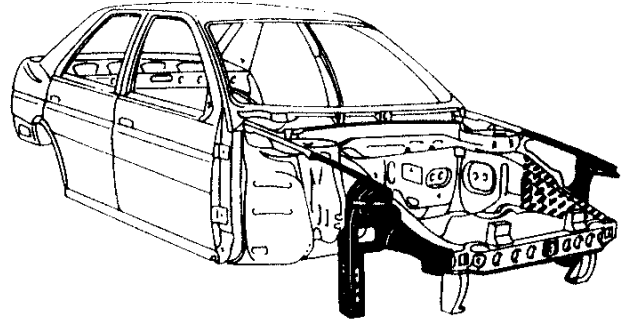
1. Spread the areas indicated in the illustration with Type A rust-proofing.
2. Apply Type A sealant to the areas shown in the illustration.

- Move on to the painting phase.
- Install and successively adjust and check the front wing (see: REPLACING MOBILE COMPONENTS - FRONT WING).



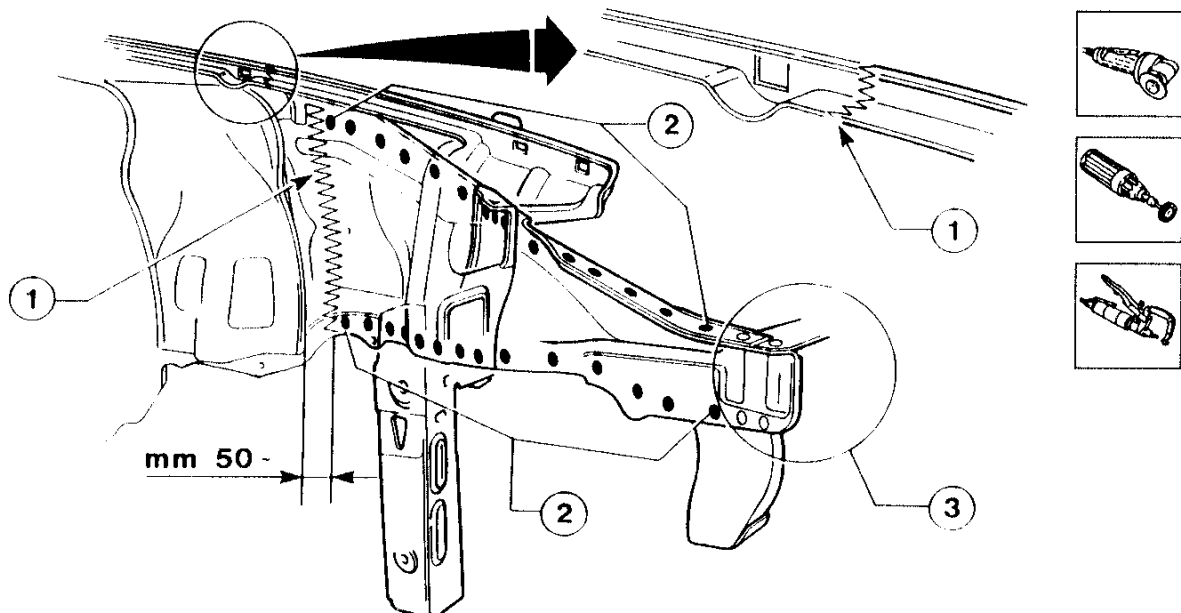
**SIDE PANEL-FRONT SECTION****Partial outer front section of side panel**

- In order to facilitate the successive operations the following components should be removed temporarily:
  - front bumper and external trim (see: GR. 75);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - headlight support frame;
  - air conditioning system components if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

1. Using a circular saw cut the outer side panel and the upper panel following the lines indicated in the illustration, paying attention to avoid damaging the underlying parts (Strut). The cut on the side panel must be approximately 50 mm away from the front suspension attachment pillar.

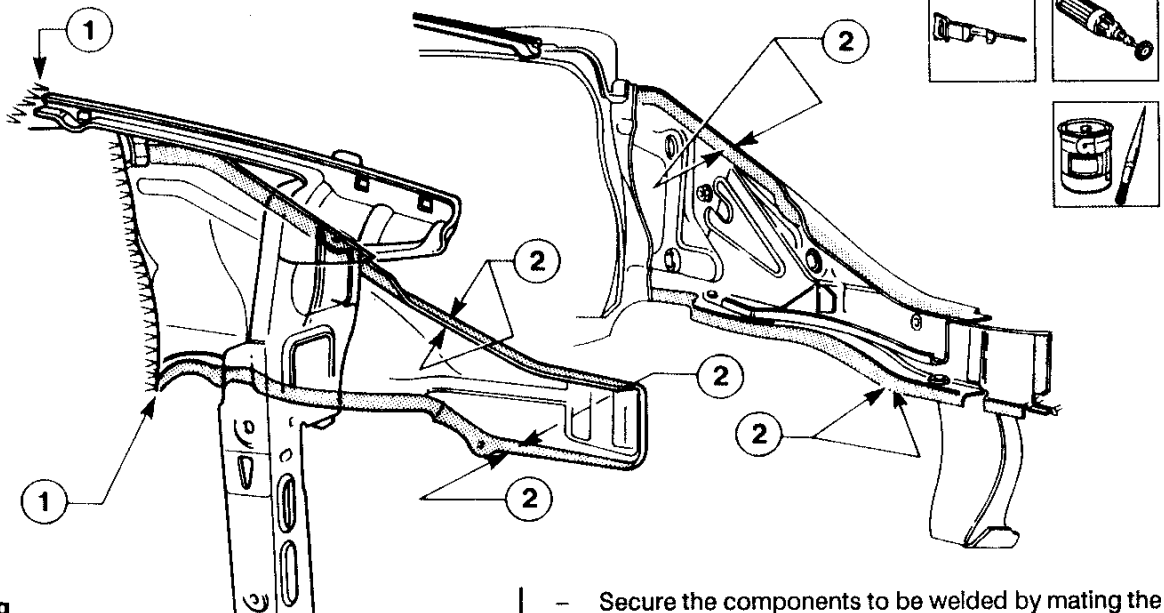
- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
- 2. Using a chamfering machine, remove the welds.
- 3. Remove the front cross member (see: FRONT CROSS MEMBER).



**Preparation**

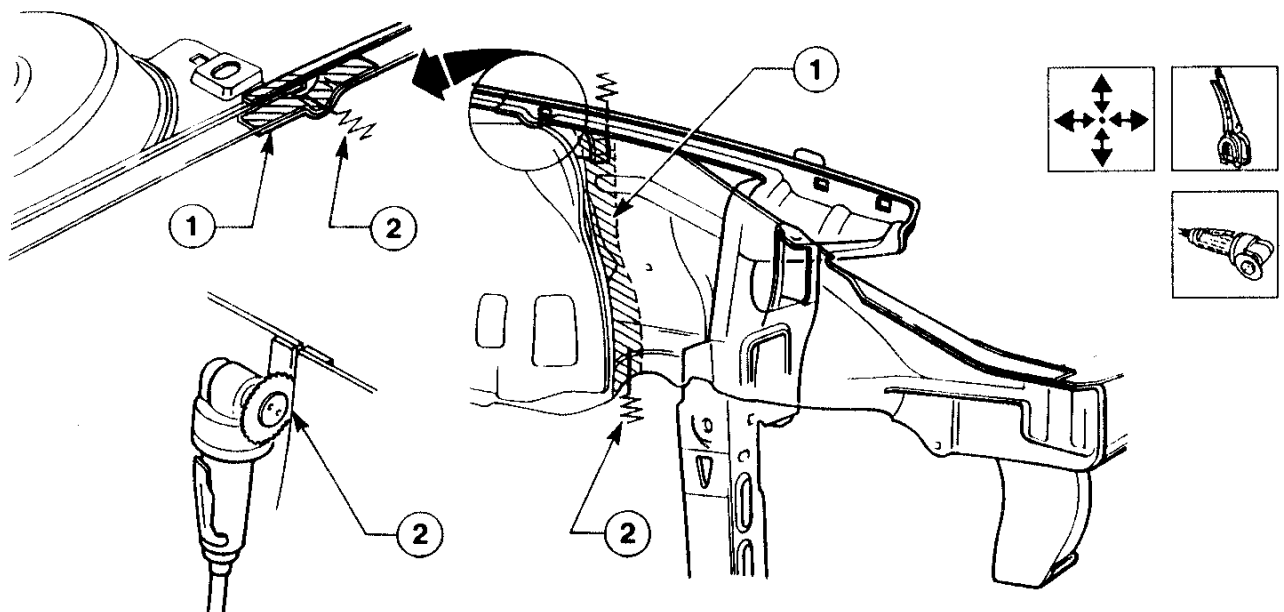
1. Operating on a bench, cut the new side panel with a jig saw remembering to leave enough margin for overlapping.

- Using a rotating brush clean the outer edge of the side panel and strut on both sides of the metal sheet.
- 2. Spread the areas indicated in the illustration with Type B electroweldable protection.

**Positioning**

1. Position the outer side panel and overlap as indicated in the illustration.

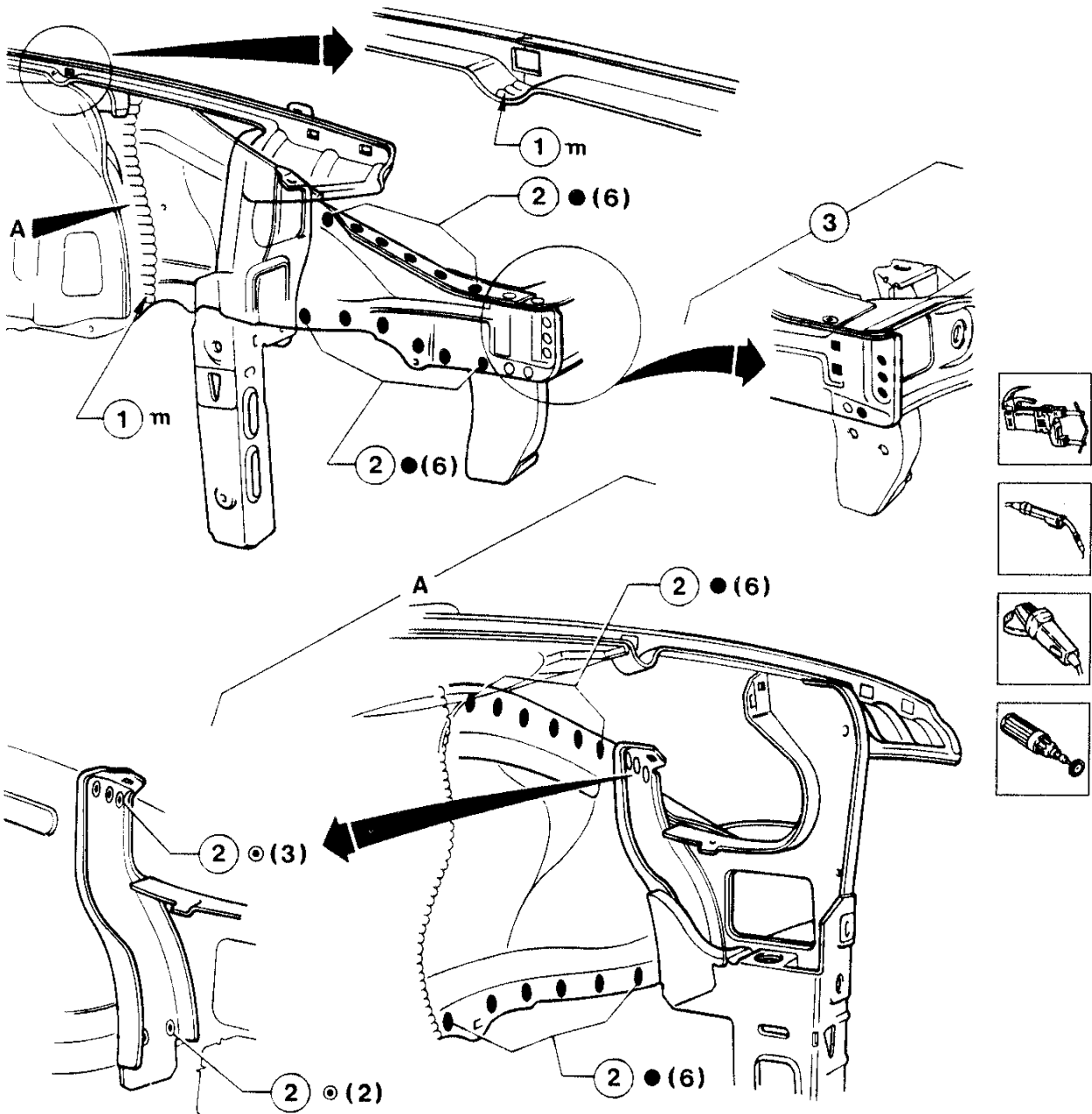
- Secure the components to be welded by mating the edges and then check alignment.
- 2. Using a circular saw trim the sheet metal and remove the excess parts.





**Welding and finishing of the sheet metal**

1. Seam weld using a MIG welder.
2. Using a spot welder, operate as indicated in the illustration.
3. Install the front cross member (see: FRONT CROSS MEMBER).
  - Using an abrasive grinding machine, remove and level the residues left by welding.
  - Using a rotating brush clean the welding areas.

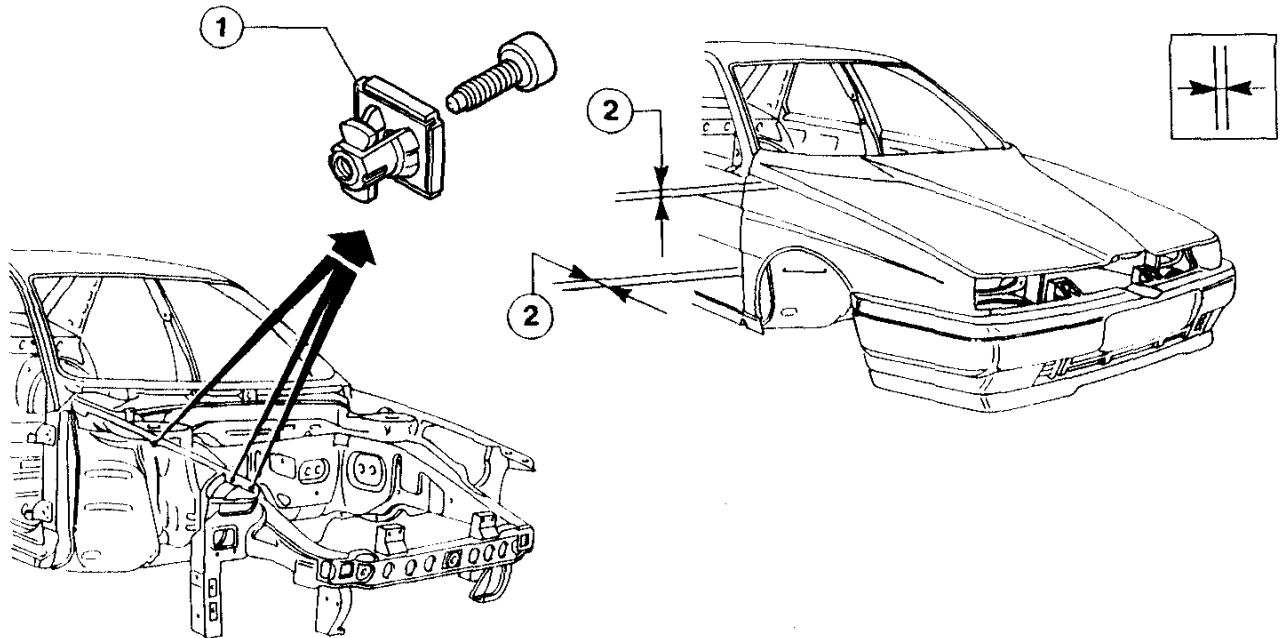




**Check**

1. Install the four blocks securing the front wing.
2. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

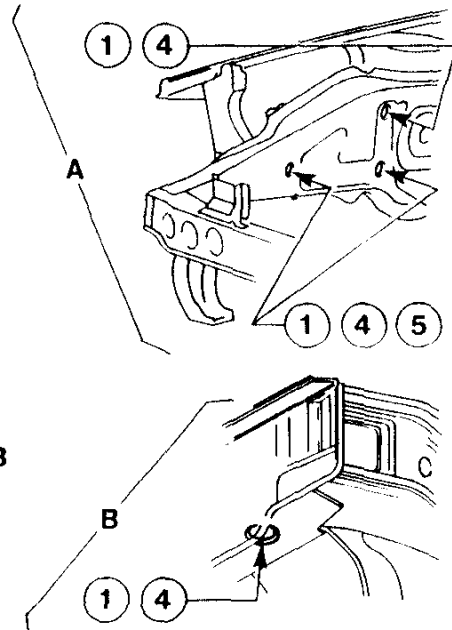
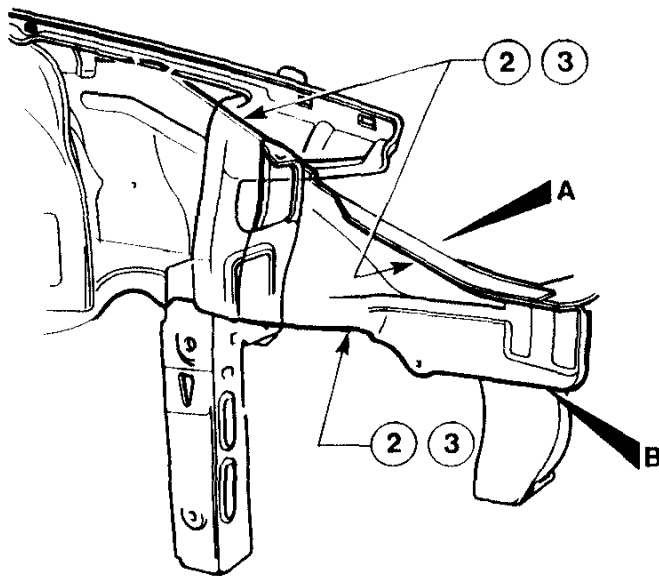
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operation).



**Protection**

1. Spread the surfaces indicated in the illustration with Type A rust-proofing.
2. Apply Type A sealant to the areas indicated in the illustration.

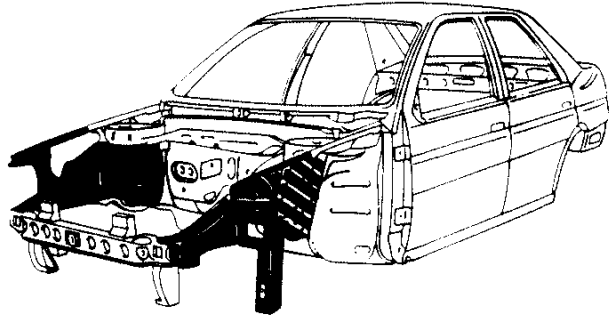
3. Spread the Type B rust-proofing on the inside of the side panel as indicated in the illustration.
  - Move on to the painting phase.
4. Move on to the waxing phase
5. Move on to the foam treatment phase.





### Partial Outer and Inner Front Side Panel Half

- In order to facilitate the successive operations the following components should be removed temporarily:
  - front bumper and external trim (see: GR. 75);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - headlight support frame;
  - air conditioning system components if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

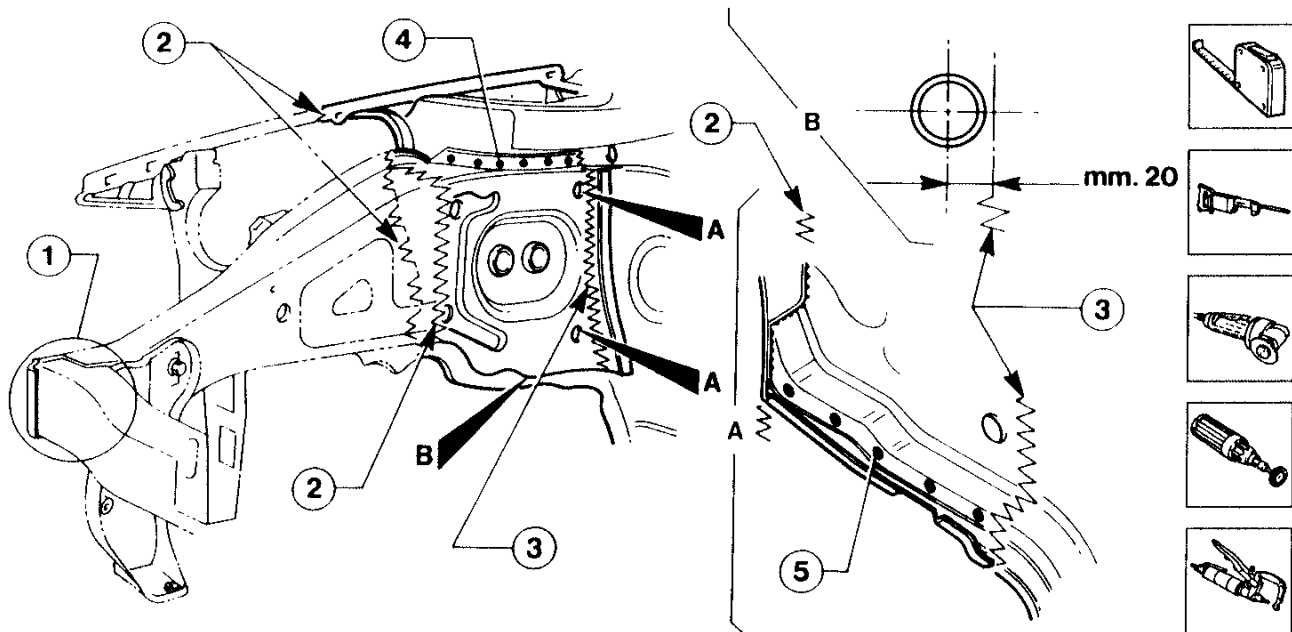


### Removal

1. Remove the front cross member (see: FRONT CROSS MEMBER).
2. Using a jig saw, cut the upper panel from the suspension attachment pillar to about 50 mm as shown in the illustration.
3. Using a circular saw, cut the inner part of the side panel following the lines indicated in the illustration

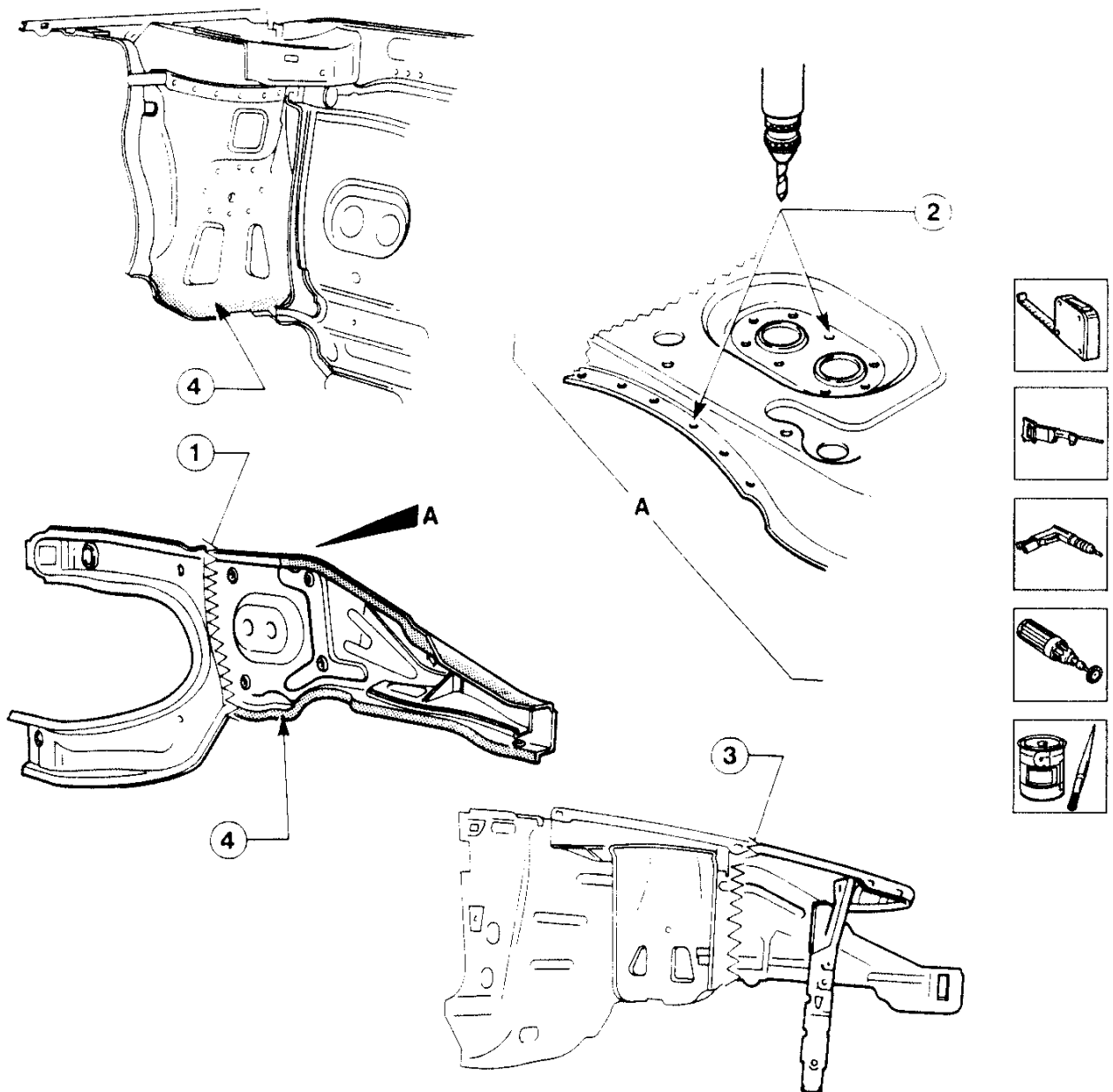
and maintaining a distance of approximately 20 mm from the holes indicated in the illustration. Avoid damaging the outer part of the side panel.

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
- 4. Remove the welds with a drill.
- 5. Remove the welds with a chamfering machine.



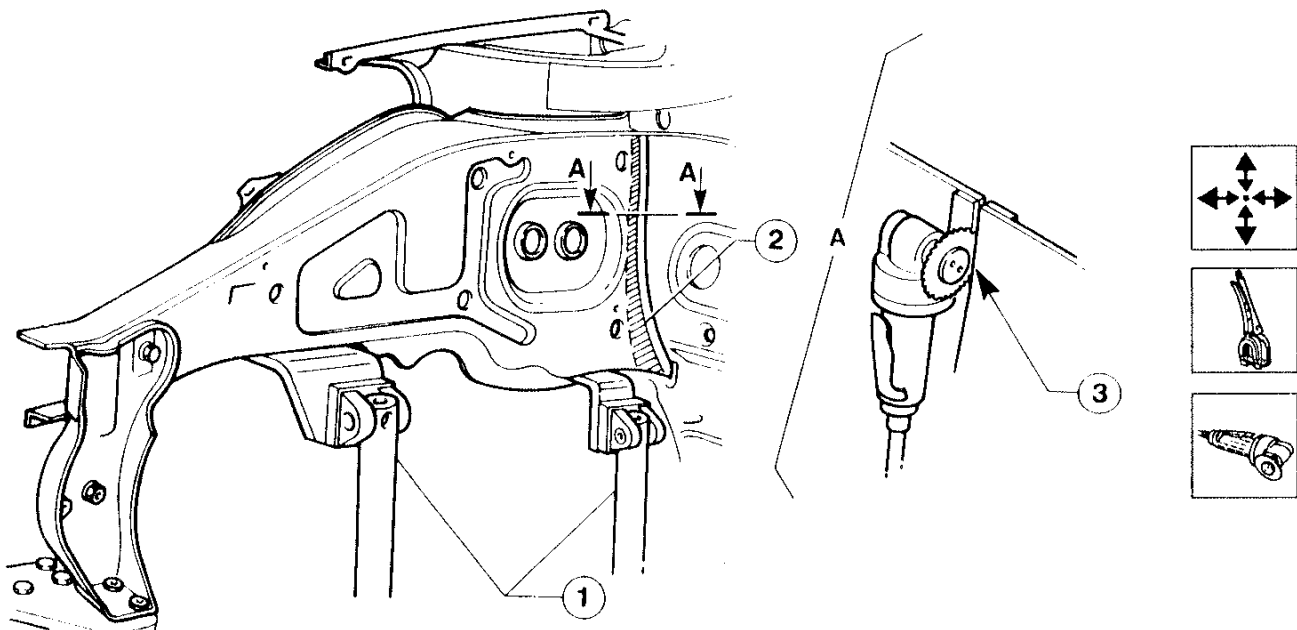
**Preparation**

1. Operating on a bench, cut the new inner side panel with a jig saw remembering to leave enough margin for overlapping.
2. Trace the inner side panel and drill using a 5 mm Ø bit as indicated in the illustration.
3. Remove along the indicated line (see: PARTIAL OUTER SIDE PANEL).
- Using a rotating brush, clean the perimeter of the inner and outer side panels and the welding areas.
4. Spread the spot welding areas with Type B electro-weldable protection.



**Positioning**

1. Using the jig, correctly position the partial inner side panel.
2. Overlap and secure the components to be welded and mate the edges; then check the alignment.
3. Using a circular saw trim the sheet metal and remove the excess parts.
4. Position the outer side panel (see: PARTIAL OUTER FRONT SIDE PANEL).

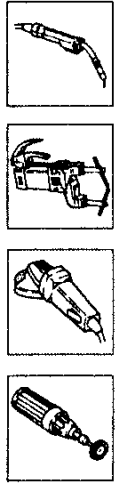
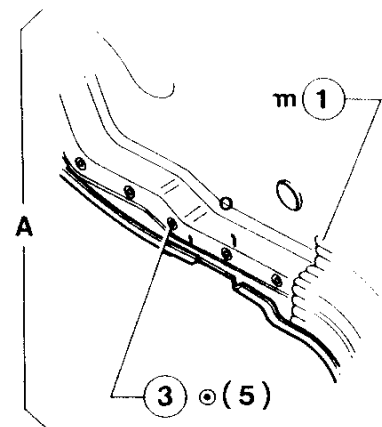
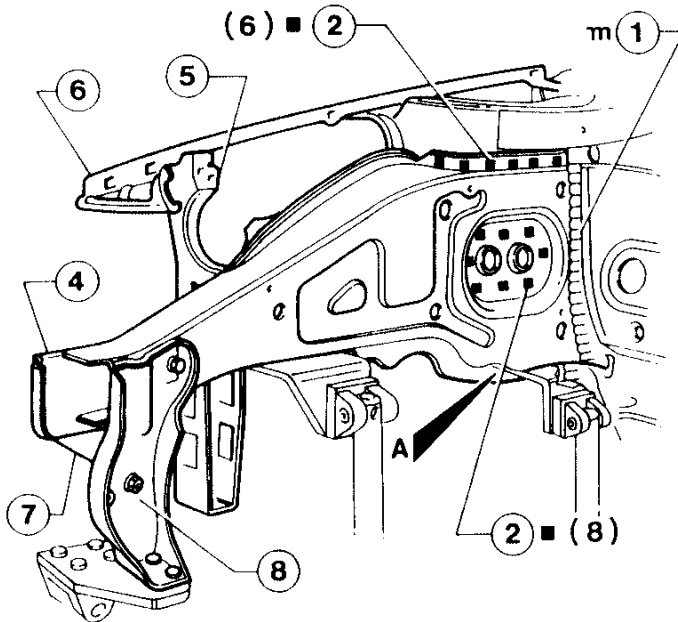






**Welding and finishing of the sheet metal**

1. Seam weld with a MIG welder.
2. Perform filling weld with a MIG welder.
3. Using a spot welder operate as indicated in the illustration.
  - Using an abrasive grinding machine remove and level the residues left by welding.
  - Using a rotating brush clean the welding areas.
4. Weld the outer side panel (see: PARTIAL OUTER FRONT SIDE PANEL - WELDING AND FINISHING OF SHEET METAL).
5. Install the side console (see: SIDE CONSOLE).
6. Install the partial upper panel (see: PARTIAL OUTER FRONT SIDE PANEL).
7. Install the front cross member and the bracket securing the radiator (see: FRONT CROSS-MEMBER AND RADIATOR BRACKET).

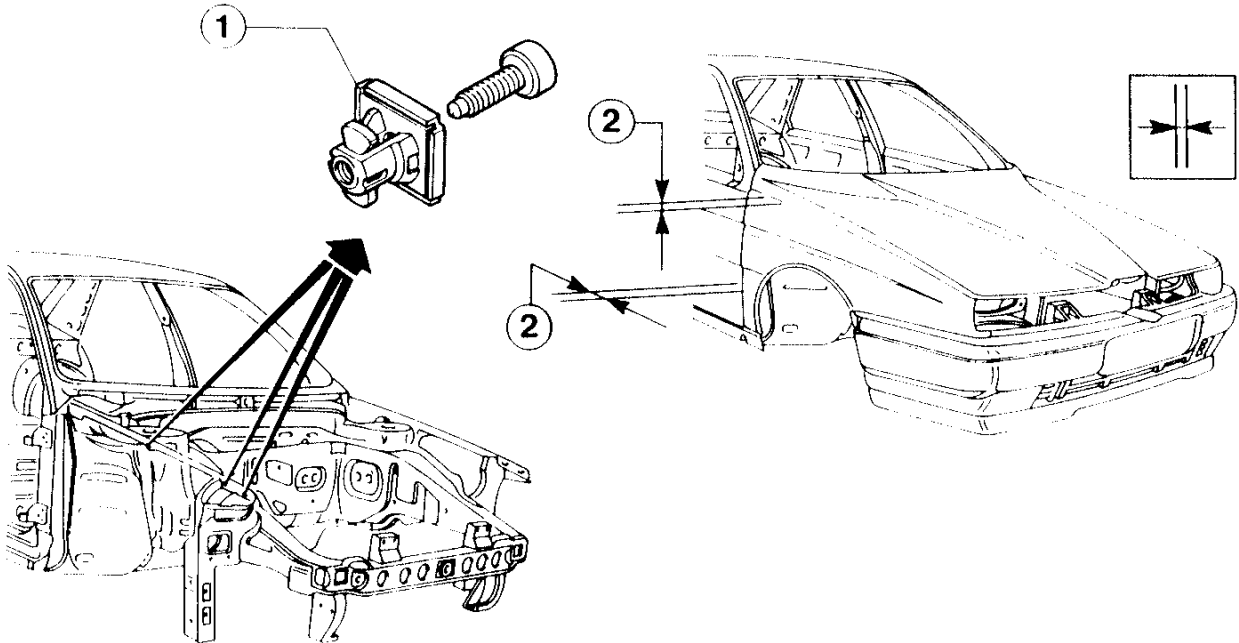




**Check**

1. Install the four blocks securing the front wing.
2. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

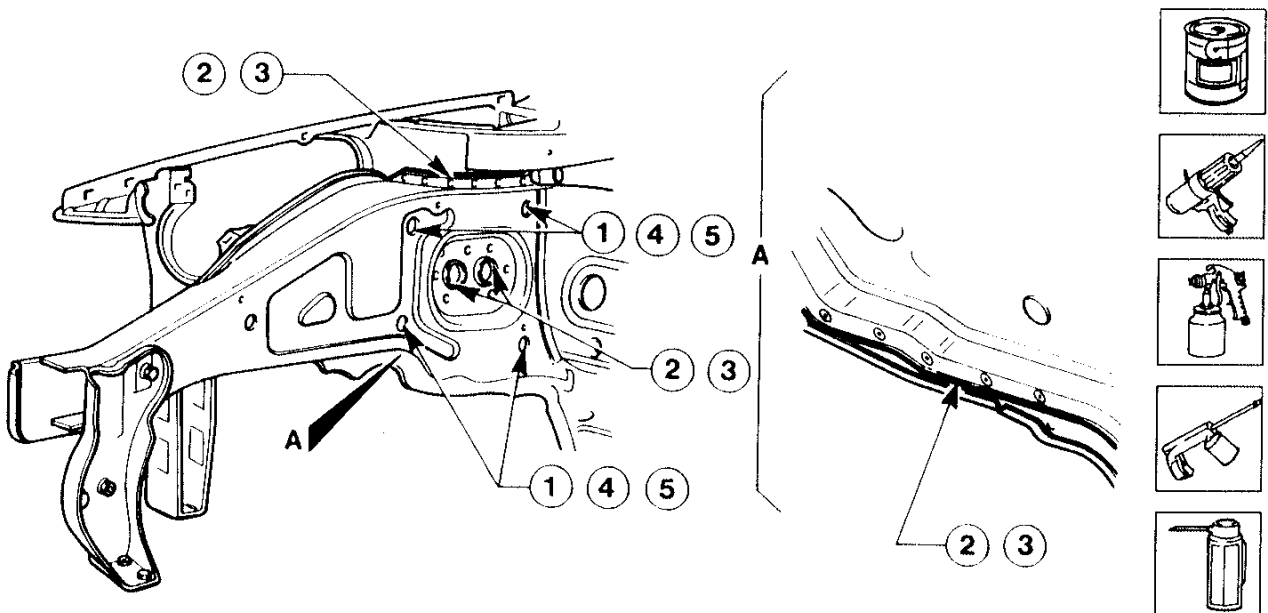
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operation).



**Protection**

1. Spread the inner surface of the side panel with Type B rust-proofing as indicated in the illustration.
2. Cover the areas indicated in the illustration with Type A rust-proofing.

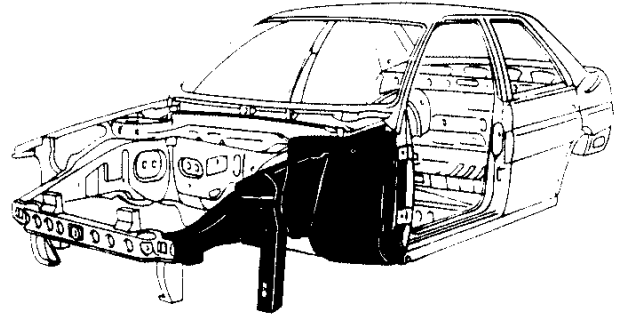
3. Apply Type A sealant to the areas indicated in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.





### Complete front side panel

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - front bumper and eternal trim (see: GR. 75);
  - Bonnet (see: GR. 56);
  - rear door (see: GR. 55);
  - front headlight assemblies (see: GR. 40);
  - engine cooling radiator (see: REPAIR MANUAL - ENGINES - GR. 07);
  - Headlight support frame;
  - air conditioning system components if present (see: GR. 80).
- Disconnect the battery and the control units (see: GR. 40-43).

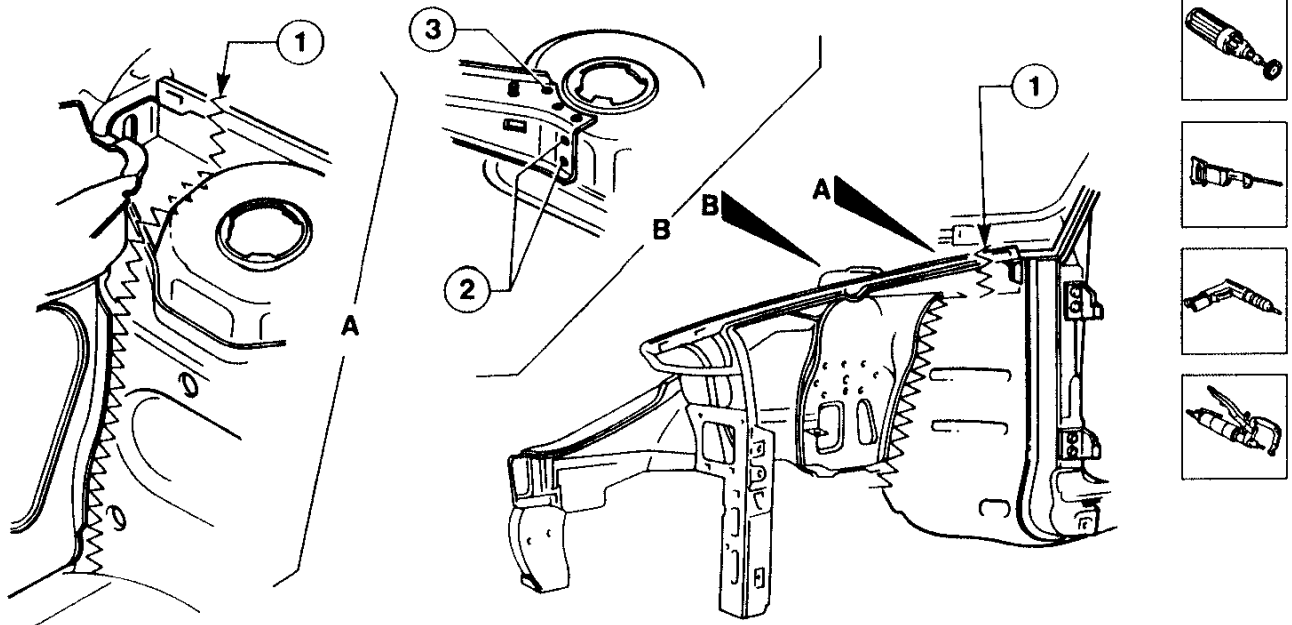


**NOTE:** In addition to the following indications, for information regarding: Preparation, welding and protection, see: PARTIAL OUTER AND INNER FRONT SIDE-PANEL HALF.

#### Removal

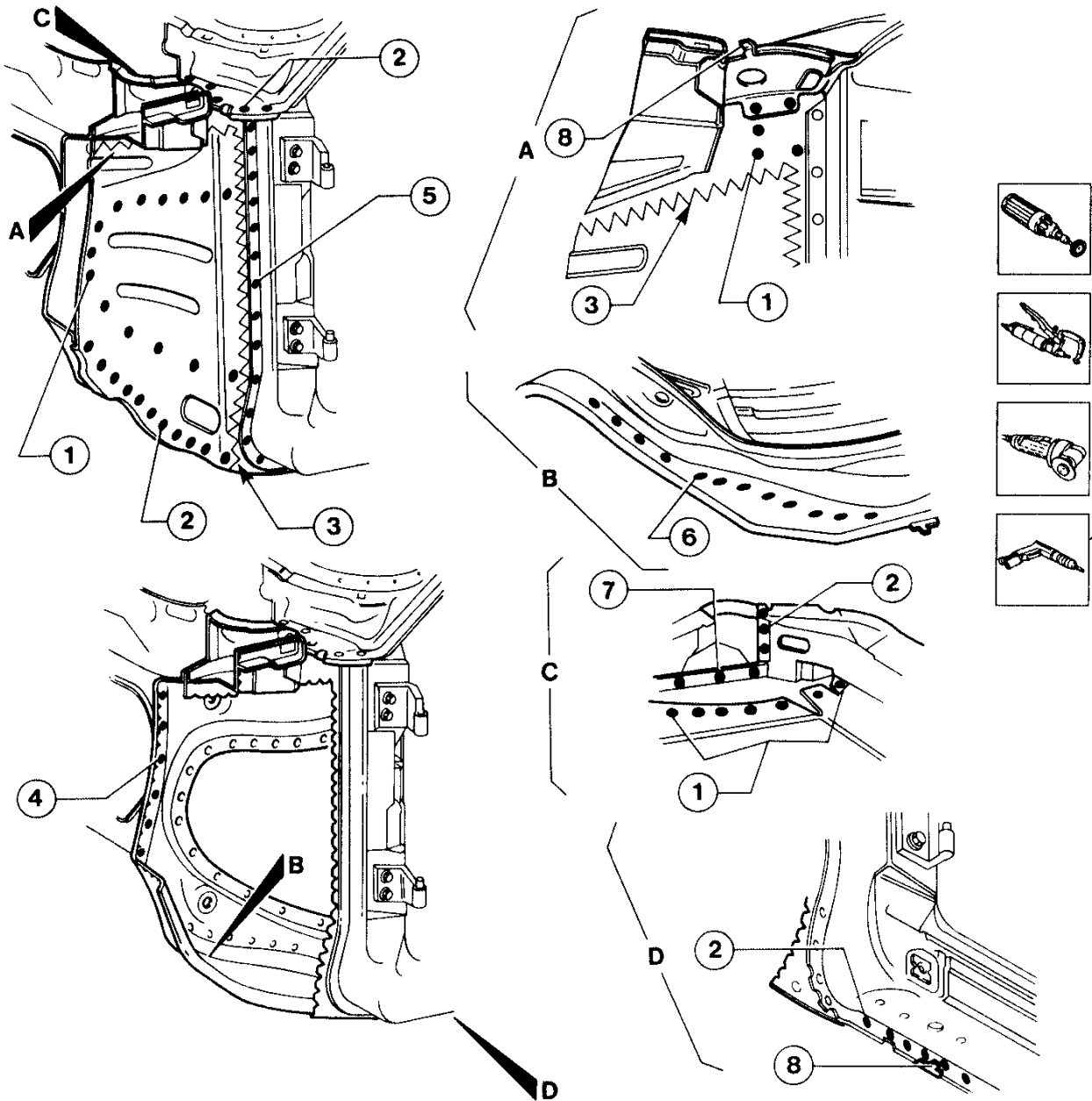
- Using a rotating brush, clean the area to be chamfered in order to show up the welds indicated in the following illustrations.
- 1. Using a jig saw cut along the lines indicated in the illustration, without damaging the underlying parts (discharge operation).

2. Remove the indicated welds with a drill.
3. Remove the indicated welds with a chamfering machine.



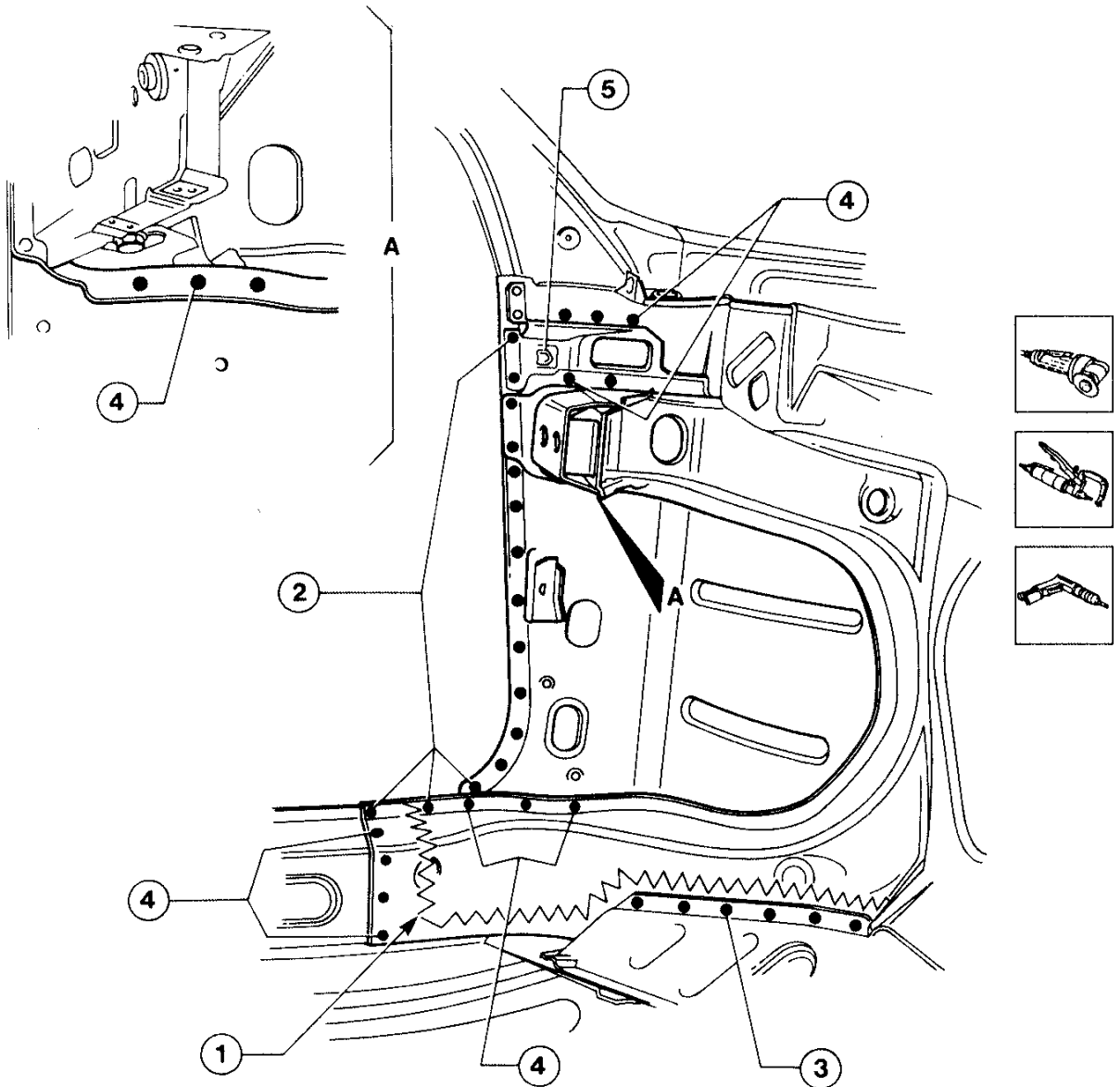


1. Remove the indicated welds with a drill.
2. Remove the indicated welds with a chamfering machine.
3. Using a circular saw, cut along the lines indicated in the illustration and remove the sheet metal.
4. Using a chamfering machine remove the welds indicated.
5. Using a drill, remove the indicated welds from inside.
6. Remove the indicated welds from below using a chamfering machine.
7. Using a pneumatic hammer, remove the welds indicated.
8. Open the clinch tabs.





1. Using a circular saw, cut along the lines indicated in the diagram without damaging the underlying parts.
2. Using a chamfering machine remove the indicated welds from the inside.
3. Using a chamfering machine remove the welds indicated.
4. Using a drill, remove the welds indicated.
5. Open the clinch tabs.

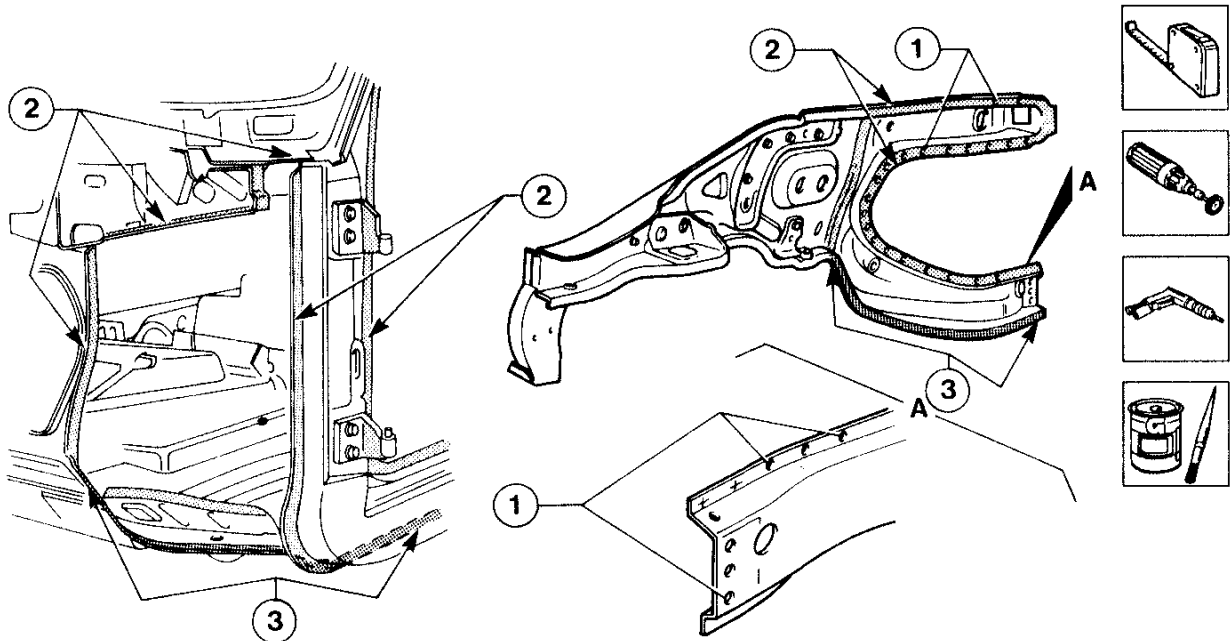




**Preparation of the inner front side panel**

1. Operating on a bench, trace out the side panel and drill using a 5mm Ø bit as indicated in the illustration.
- Using a rotating brush clean the perimeter of the inner side panel and the welding areas on the vehicle.

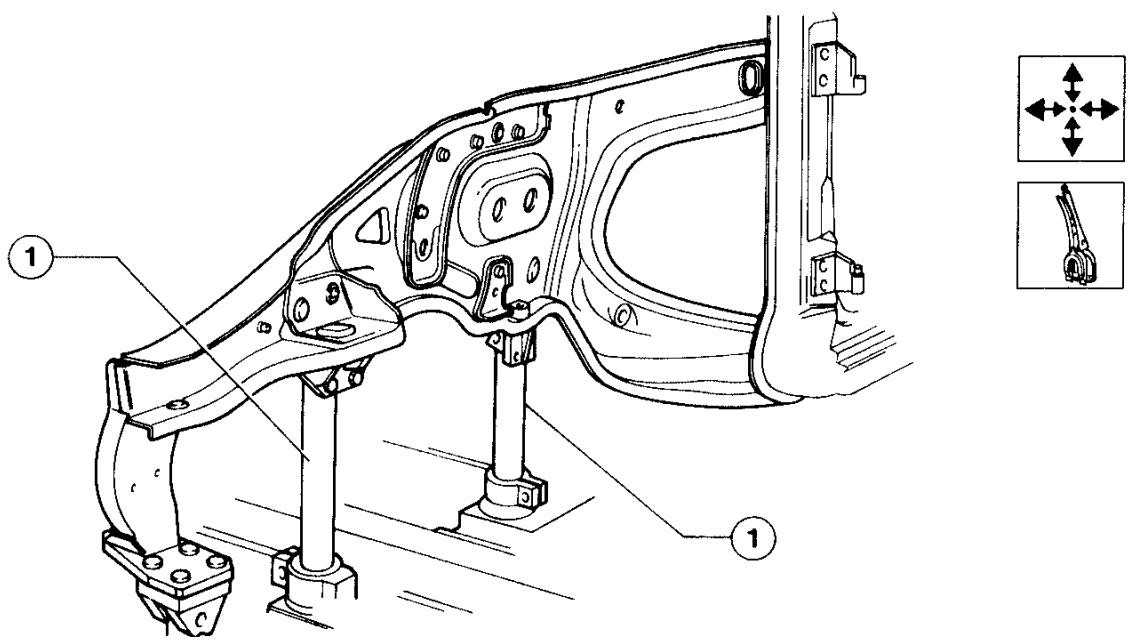
2. Spread Type B electroweldable protection on the spot welding surfaces.
3. Spread Type A electroweldable paste on the areas indicated in the illustration.



**Position the inner front side panel.**

1. Using a jig, correctly position the side panel.

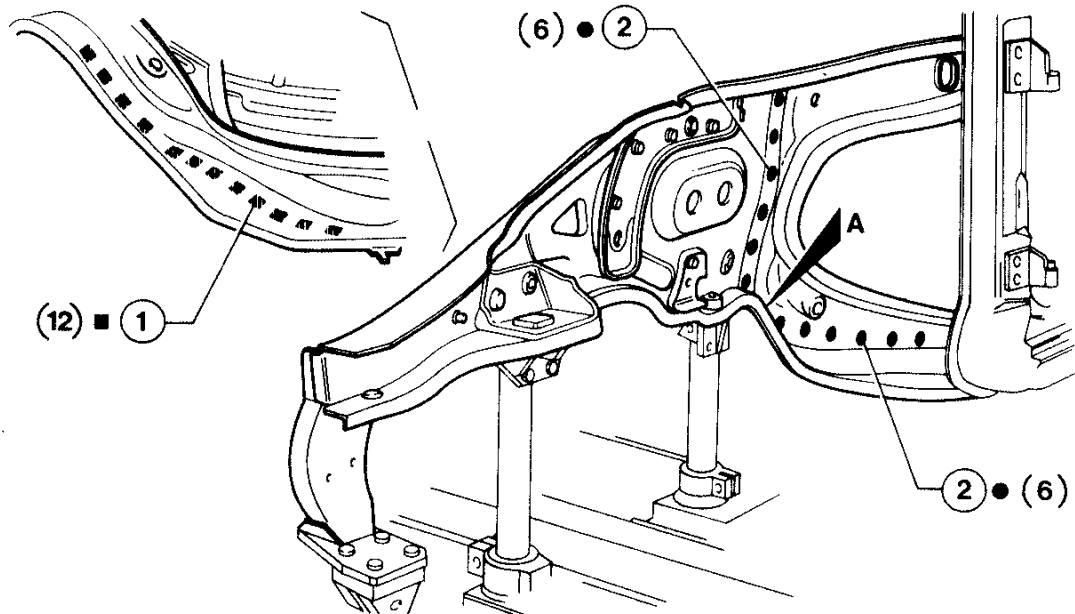
- Secure the components to be welded, mate the edges and check the alignment.



**Welding and finishing the inner front side panel**

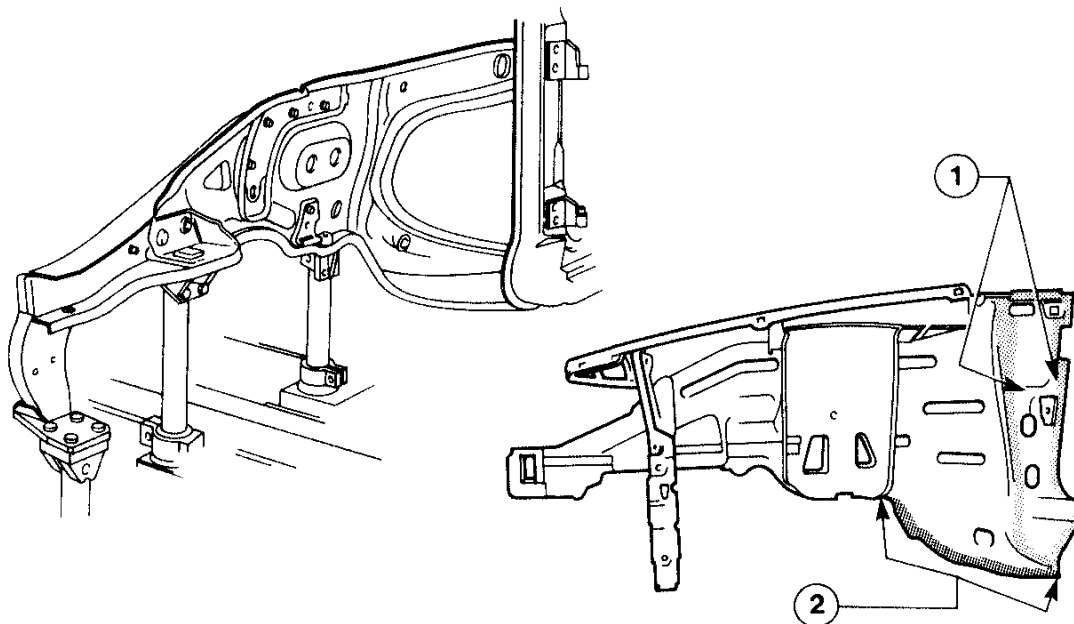
1. Perform filling welds with a MIG welder operating from the lower part of the component.
2. Using a spot welder, operate as indicated in the illustration.

- Using an abrasive grinding machine, remove and level the residues left by welding.
- Using a rotating brush clean the welding areas.

**Preparation of the outer front side panel**

- Using a rotating brush, clean the perimeter of the outer side panel and the welding areas on the vehicle.

1. Spread Type B electroweldable protection on the spot welding areas.
2. Spread Type A electroweldable paste on the areas indicated in the illustration.

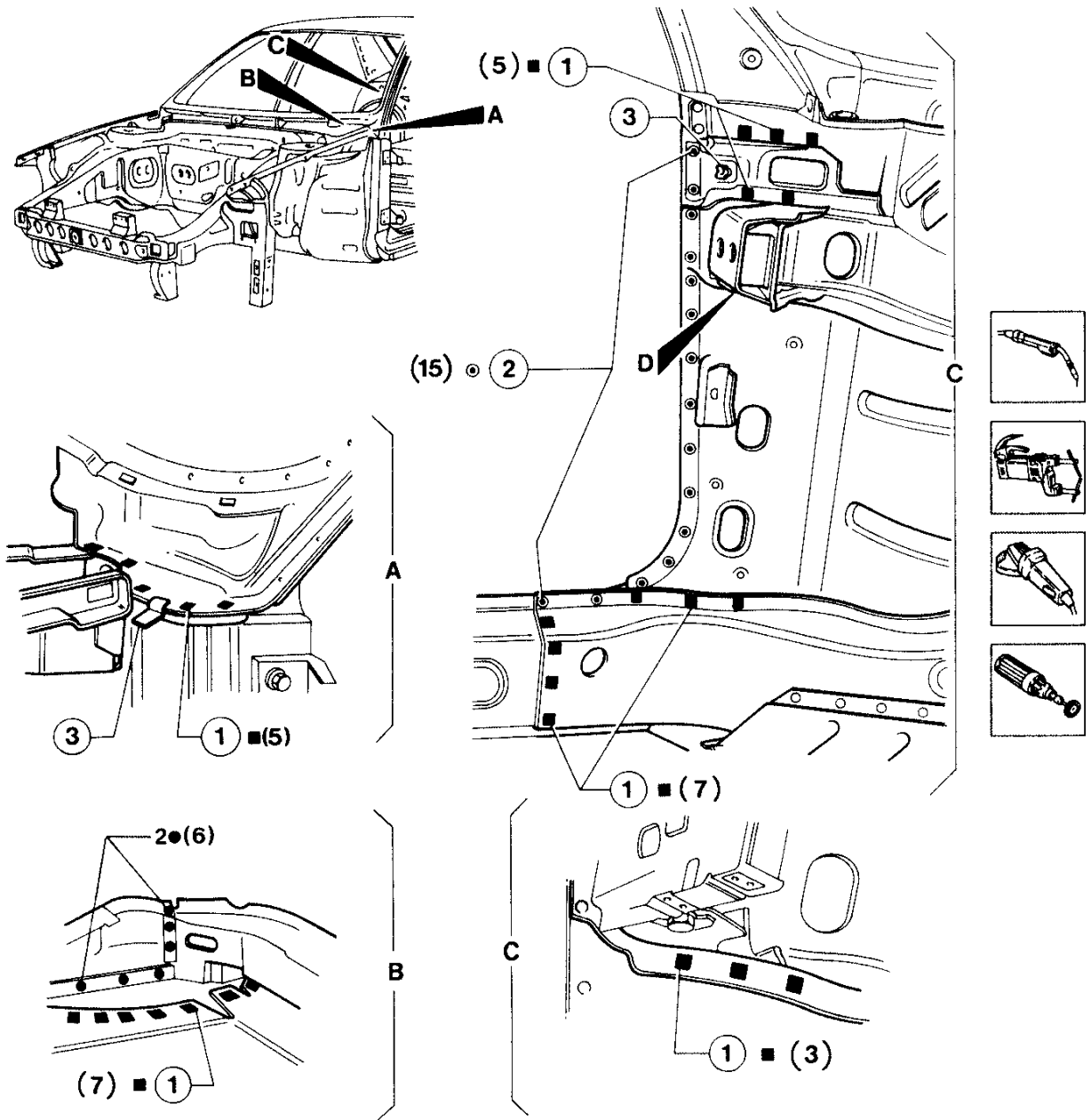








1. Carry out filling welds using a MIG welder.
2. Using a spot welder operate as indicated in the illustration.
3. Bend the clinch tabs.
  - Using an abrasive grinding machine remove and level the residues left by welding.
  - Using a rotating brush, clean the welding areas.

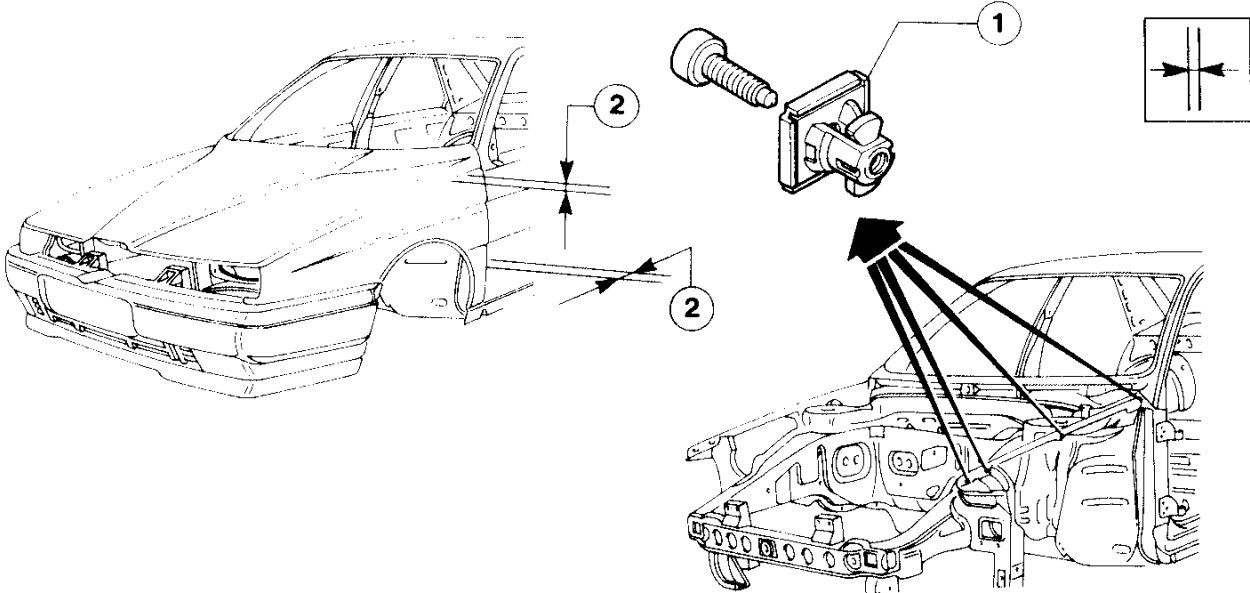




**Checks**

1. Install the four blocks securing the front wing.

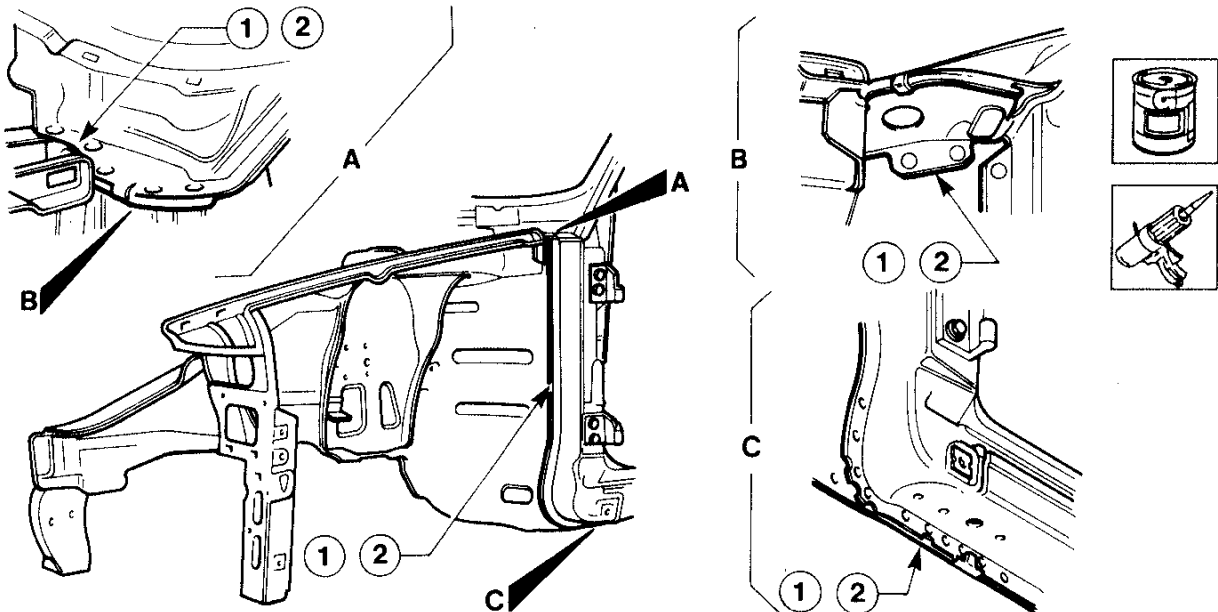
2. Check parallelism, gaps and angles (this necessitates the installation of the mobile components which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operations).



**Protection**

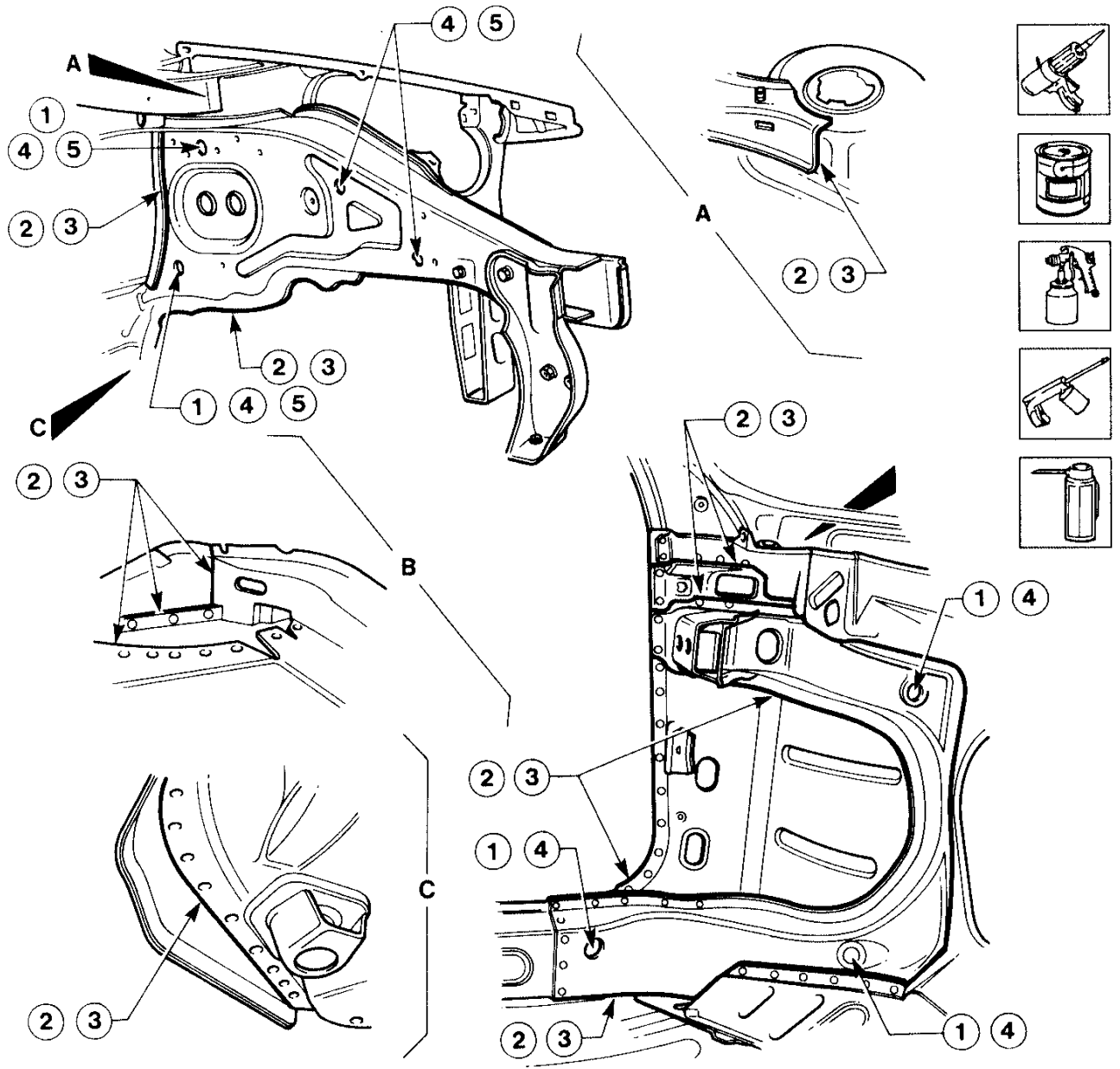
1. Spread Type A rust proofing on the areas indicated in the illustration.

2. Apply Type A sealant to the areas indicated in the illustration.





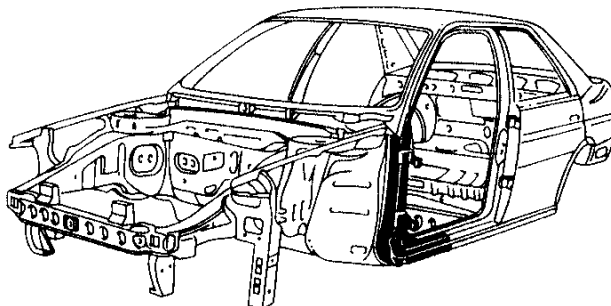
1. Apply Type B protection to the areas indicated in the illustration.
2. Spread Type B rust-proofing inside the side panel as indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.





**FRONT PILLAR**

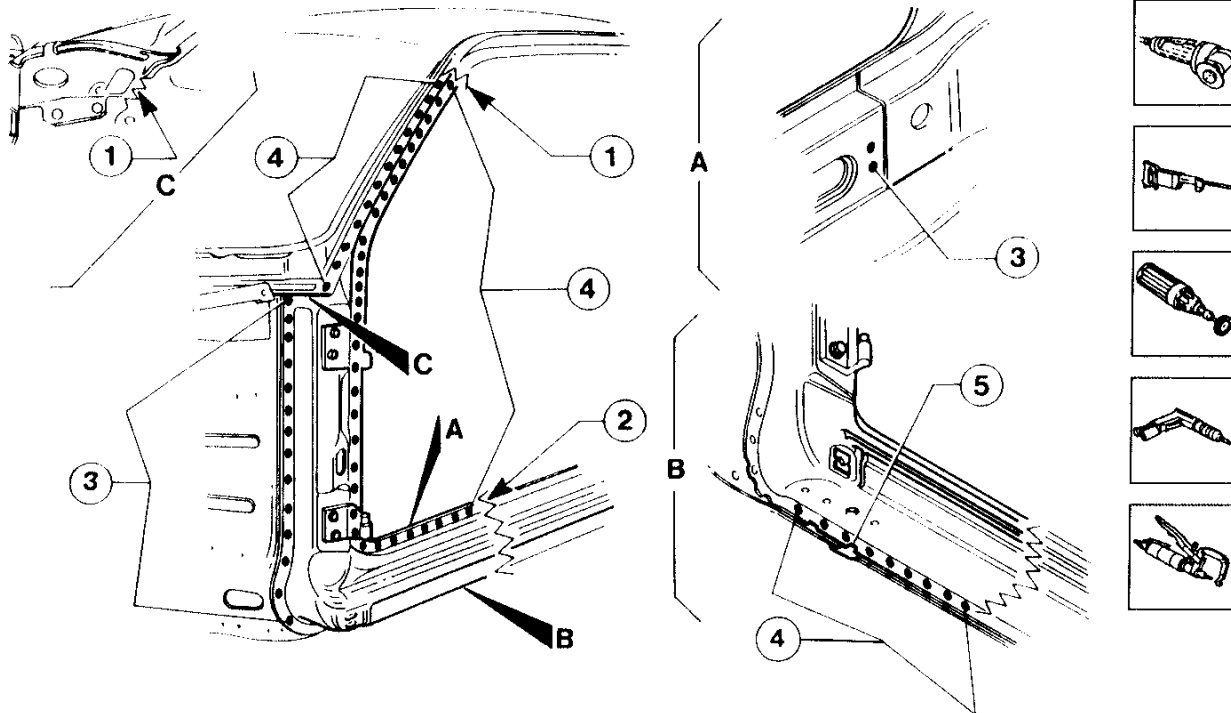
- In order to facilitate the successive operations the following components should be removed temporarily:
  - front bumper and external trim (see: GR. 75);
  - bonnet (see: GR. 56);
  - front door (see: GR. 55);
  - front wing (see: GR. 49 - REPLACING MOBILE PARTS);
  - front pillar trim (see: GR. 66);
  - front windscreen (see: GR. 75).
- Disconnect the battery and the control units (see: GR. 40-43).



**Removal**

1. Using a circular saw, cut along the lines indicated in the illustration without damaging the front windscreen frame.
2. Using a jig saw cut along the lines indicated in the illustration without damaging the underlying parts.

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
- 3. Using a drill, remove the welds.
- 4. Remove the welds using a chamfering machine.
- 5. Open the clinch tabs.

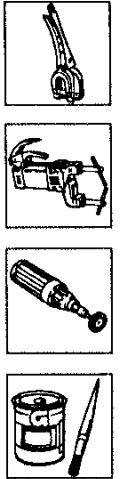
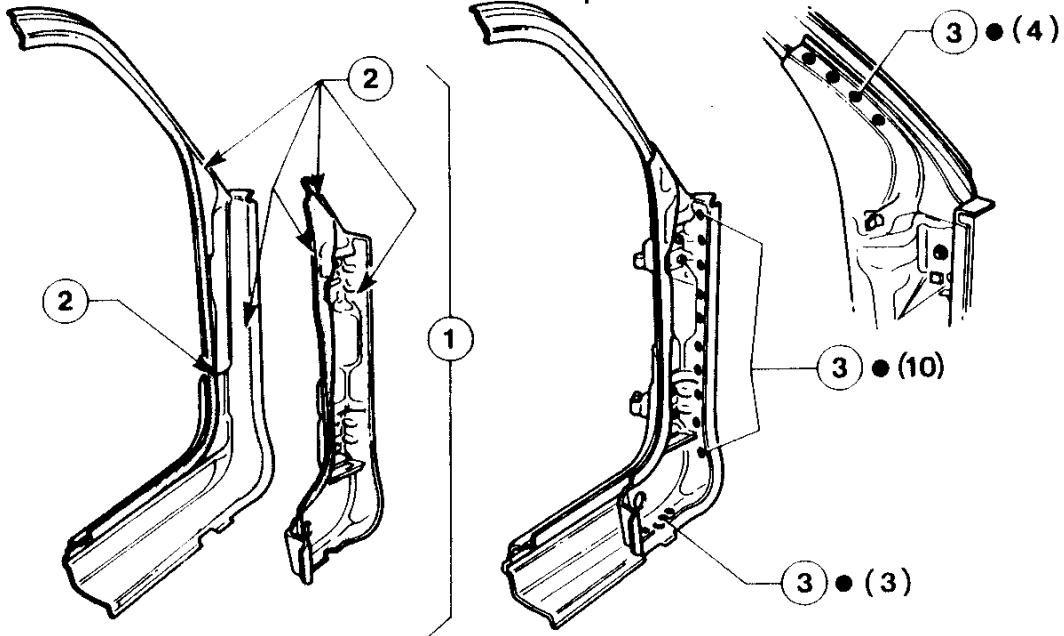




**Preparation**

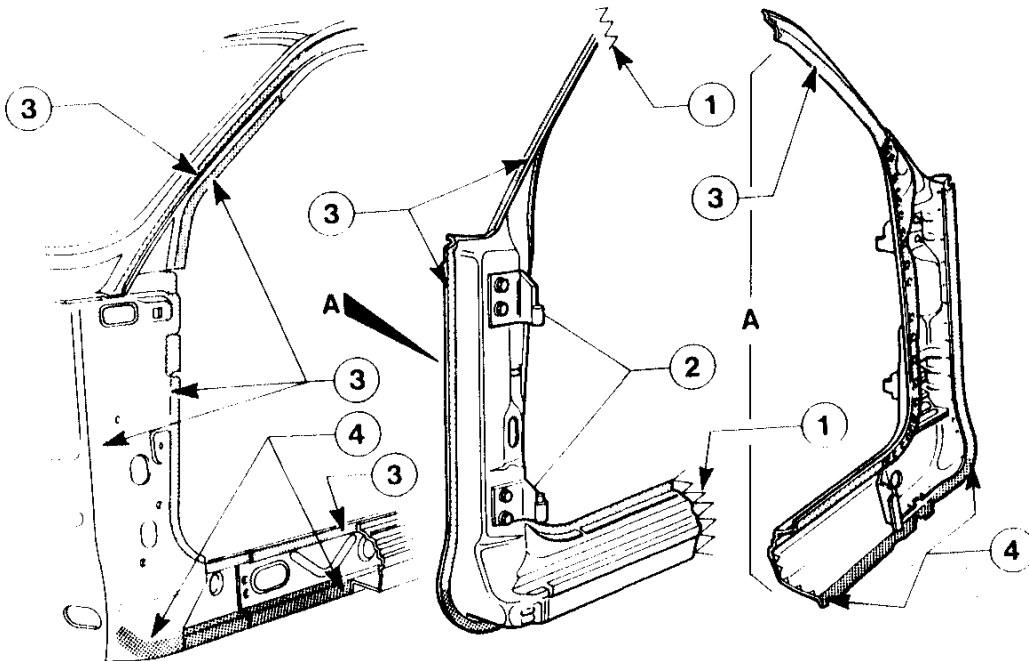
1. Working on a bench prepare for the installation of the front pillar and reinforcement.
  - Using a rotating brush clean the welding areas.

2. Spread Type B electroweldable protection on the areas shown in the illustration.
  - Position the reinforcement in the pillar and lock the components.
3. Using a spot welder operate as shown in the illustration.



1. Working on a bench, cut the new pillar with a jig saw leaving enough margin for overlapping.
  - Using a rotating brush clean the welding areas on the vehicle and on the pillar.
2. Install the two half-hinges.

3. Spread Type B electroweldable protection on the areas indicated in the illustration.
4. Spread Type A electroweldable paste on the areas indicated in the illustration.

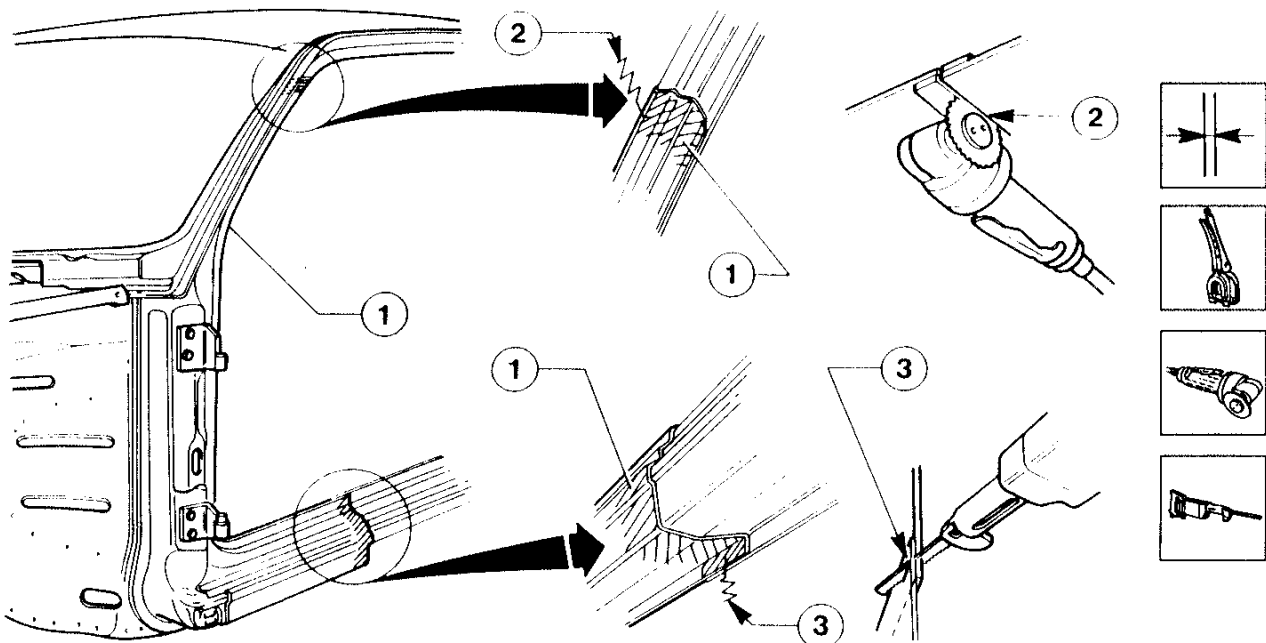


**Positioning**

1. Position the pillar as indicated in the illustration and secure and mate the edges.
  - Check parallelism, gaps and angles (this necessitates the installation of the mobile components which were previously removed along with the gaskets and parts which, when installed, will make it

possible to check the success of the operations) - (see: GR. 55 - FRONT DOORS).

2. Using a circular saw trim the sheet metal and remove the excess parts indicated in the illustration without damaging the windscreen frame.
3. Using a jig saw trim the sheet metal removing the excess parts as indicated in the illustration without damaging the underlying parts.

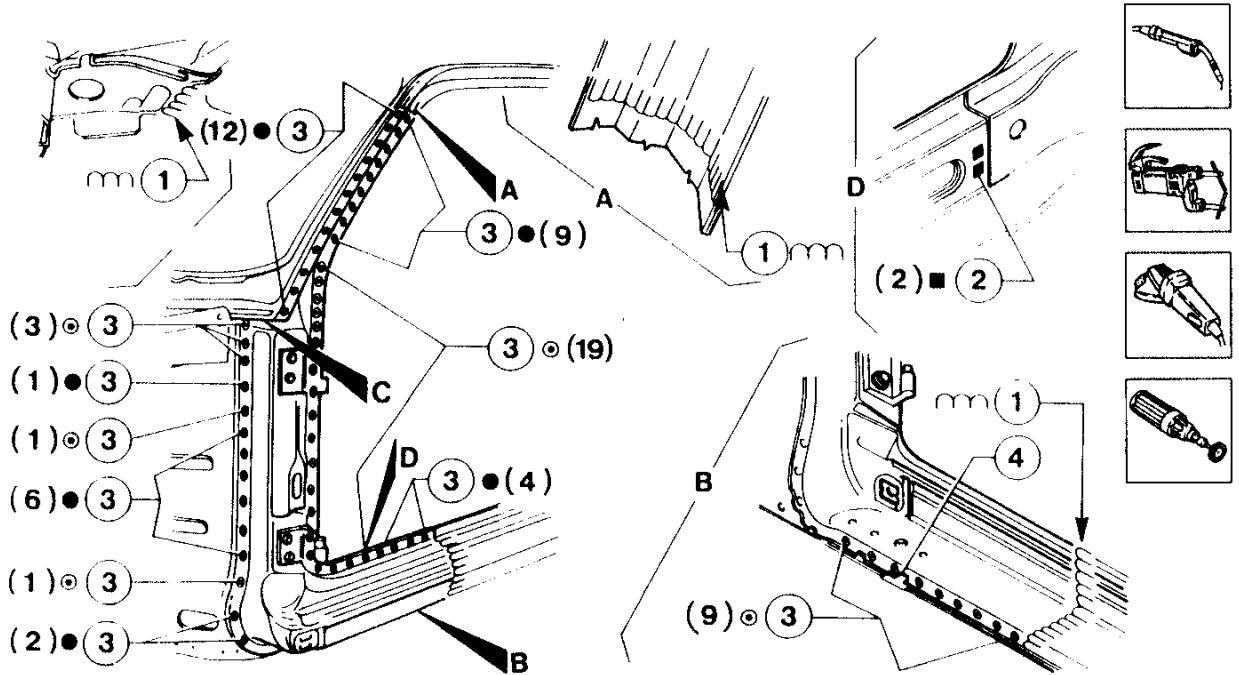




**Welding and finishing the sheet metal**

1. Carry out seam welding using a MIG welder.
2. Using a MIG welder carry out filling welds.
3. Using a spot welder, operate as indicated in the illustration.

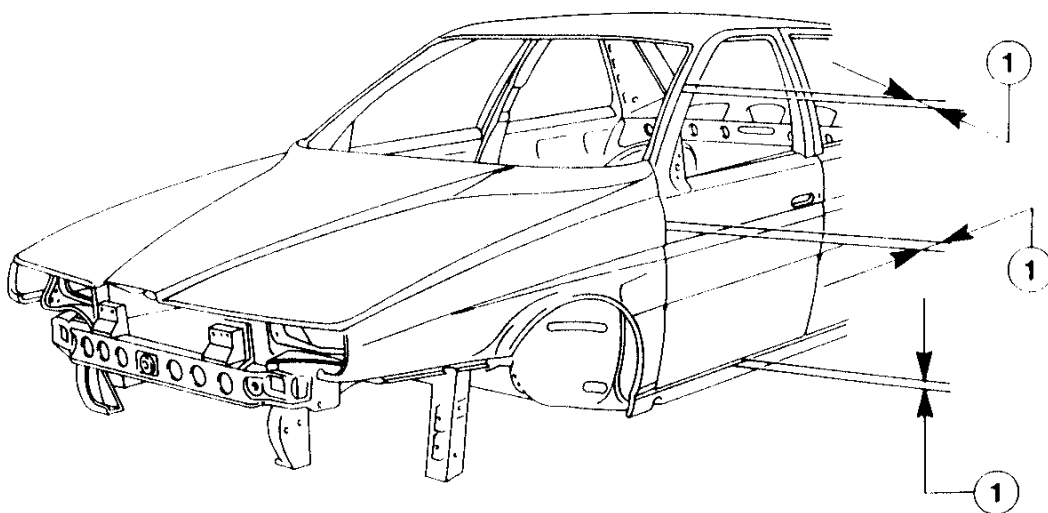
4. Bend the clinch tabs.
  - Using an abrasive grinding machine, remove and level the residues left by welding.
  - Clean the welding areas with a rotating brush.



**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

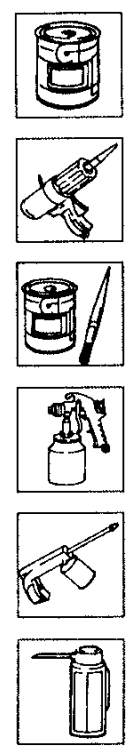
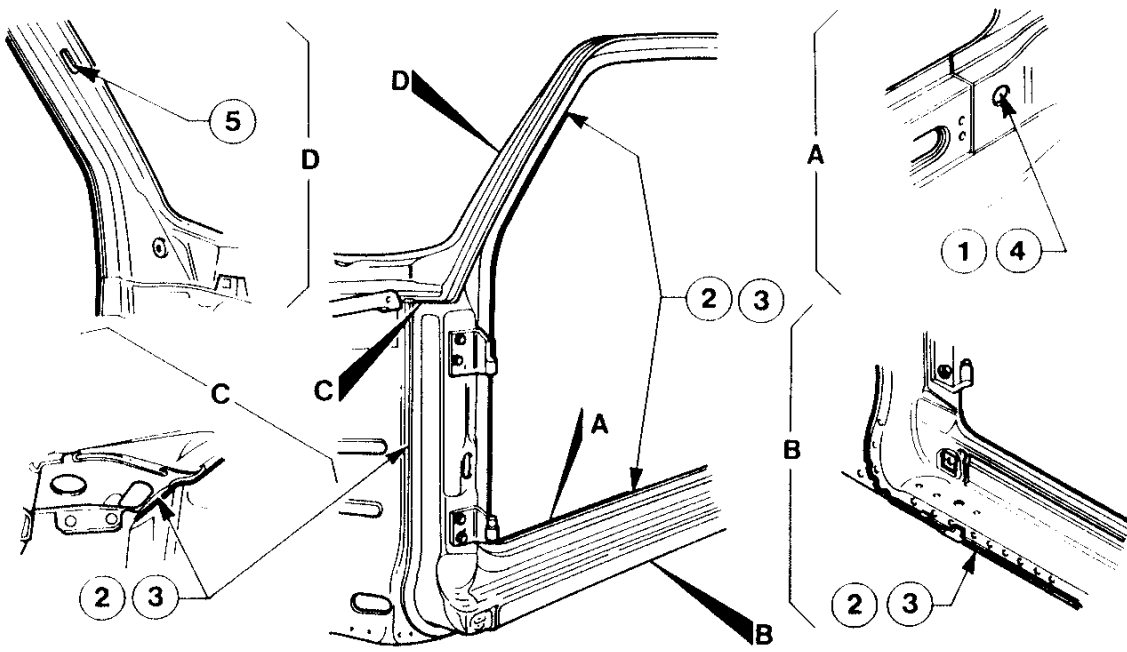
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operations).





**Protection**

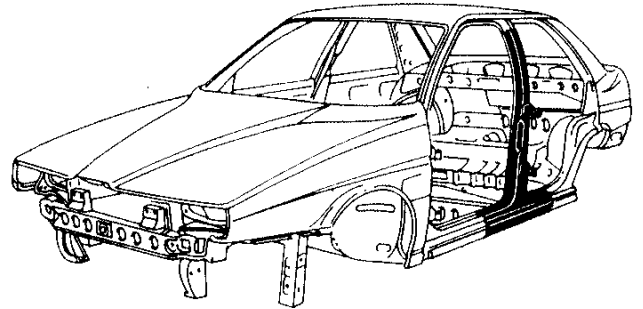
1. Apply Type B protection to the areas indicated in the illustration.
2. Apply Type B rust-proofing to the areas indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.





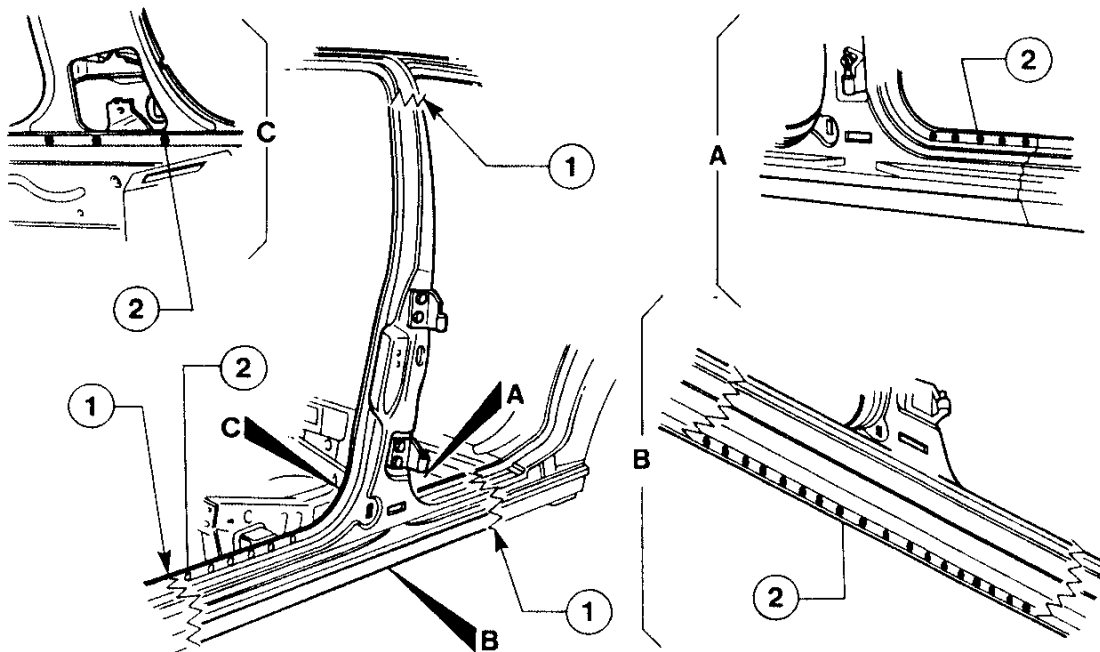
**CENTRAL PILLAR COMPLETE WITH INNER FRAME**

- In order to facilitate the successive operations the following components should be removed temporarily:
  - front and rear doors (see: GR. 55);
  - central pillar and safety belt trim (see: GR. 66);
  - Roof, seats and internal trim (see: GR. 66).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

1. Using a jig saw cut along the lines indicated in the illustration without damaging the underlying areas of the door sill.

- Using a rotating brush, clean the areas to be chamfered in order to show up the welds.
- 2. Remove the welds using a chamfering machine.

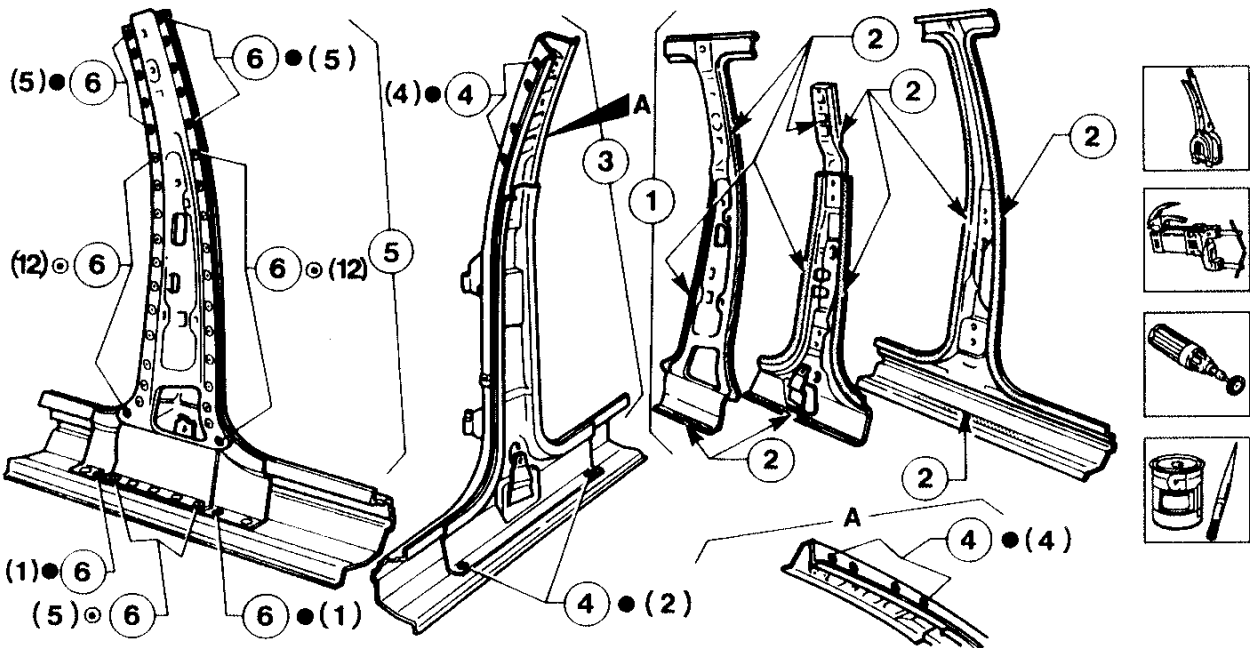




**Preparation**

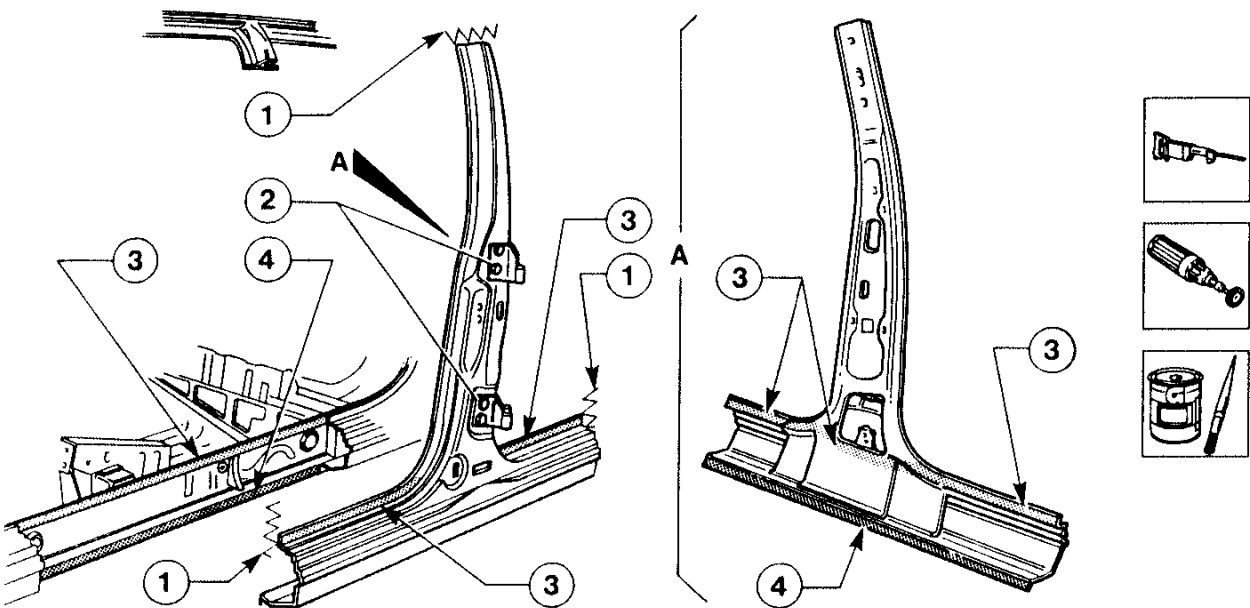
1. Working on a bench prepare for the installation of the pillar box, reinforcement and skin.
  - Using a rotating brush clean the welding areas.
2. Spread Type B electroweldable protection on the areas shown in the illustration.

3. Position and lock the pillar reinforcement in the skin and tack-weld.
4. Using a spot welder operate as shown in the illustration.
5. Position the pillar box on the previously tack-welded parts.
6. Using a spot welder operate as shown in the illustration.



1. Working on a bench, cut the new pillar with a jig saw leaving enough margin for overlapping.
  - Using a rotating brush clean the welding areas on the vehicle and on the pillar.
2. Install the two half-hinges.

3. Spread Type B electroweldable protection on the areas indicated in the illustration.
4. Spread Type A electroweldable paste on the areas indicated in the illustration.



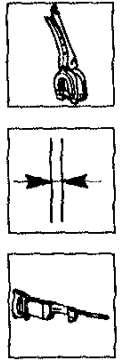
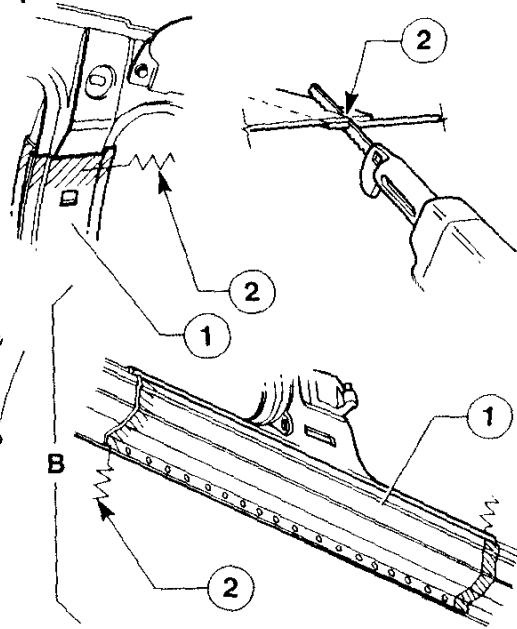
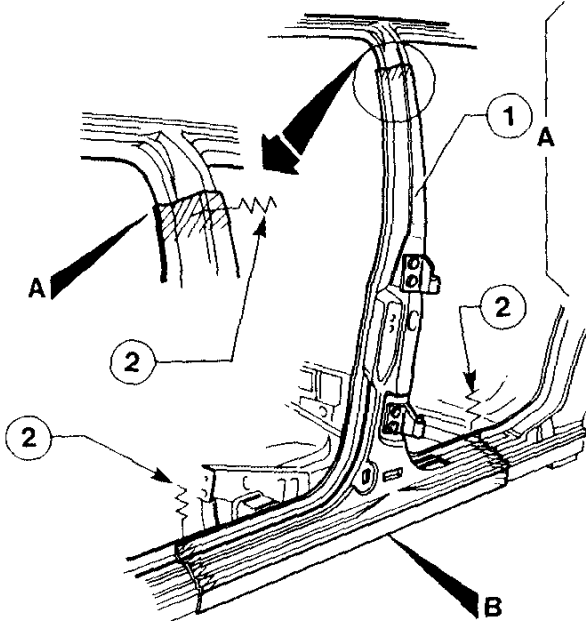


**Positioning**

1. Position the pillar as indicated in the illustration and secure and mate the edges.
- Check parallelism, gaps and angles (this necessitates the installation of the mobile components which were previously removed along with the gas-

kets and parts which, when installed, will make it possible to check the success of the operations) - (see: FRONT DOORS - REAR DOORS).

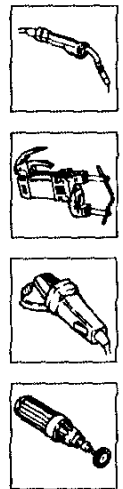
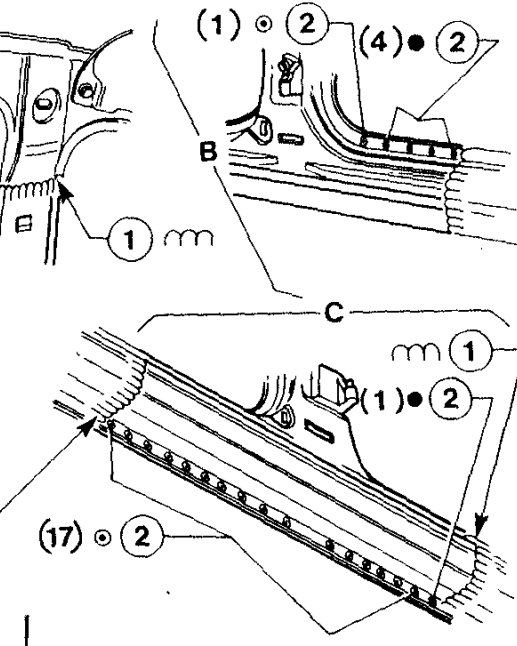
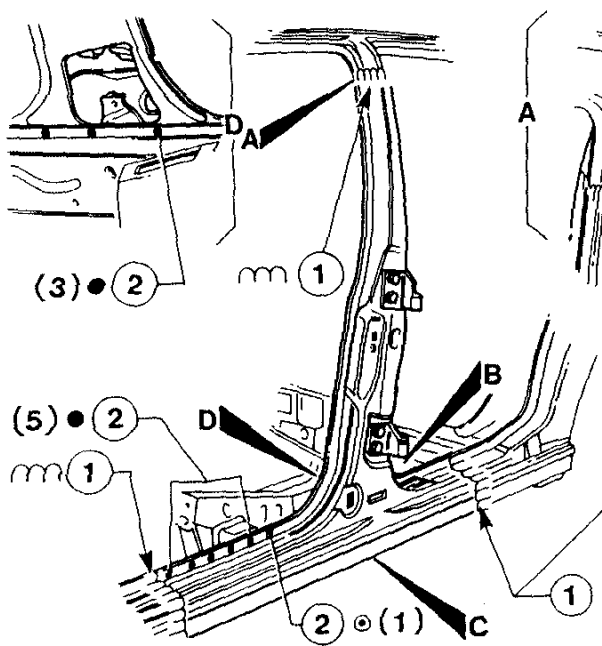
2. Using a jig saw trim the sheet metal removing the excess parts as indicated in the illustration without damaging the underlying parts of the door sill.



**Welding and finishing the sheet metal**

1. Carry out seam welding using a MIG welder.
2. Using a spot welder, operate as indicated in the illustration.

- Using an abrasive grinding machine remove and level the residues left by welding.
- Clean the welding areas with a rotating brush.

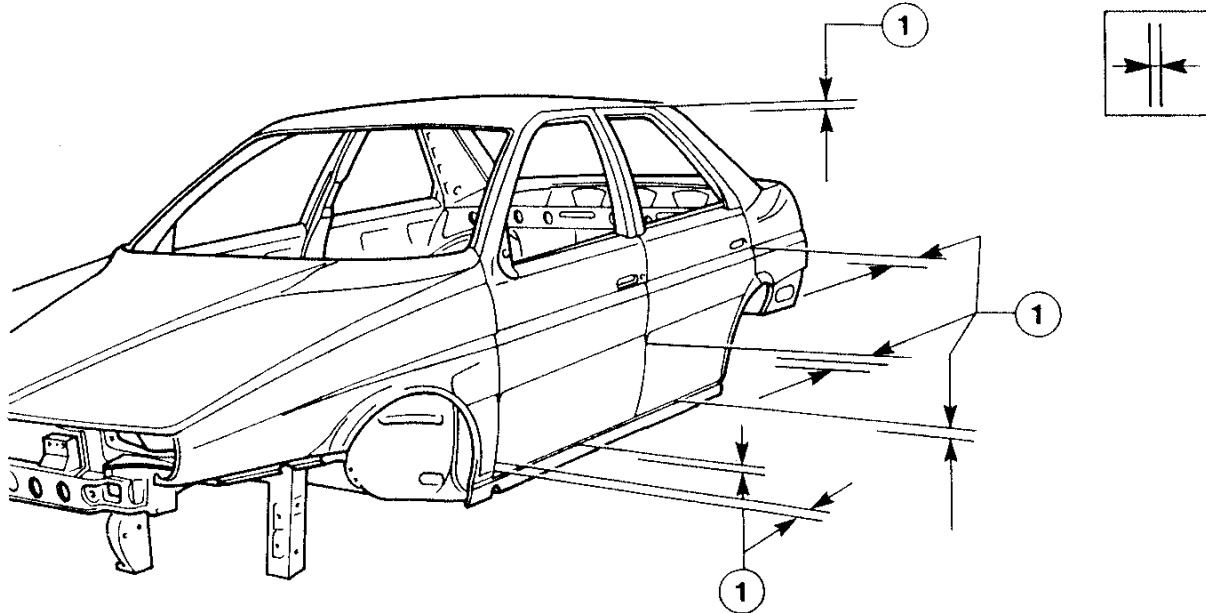




**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

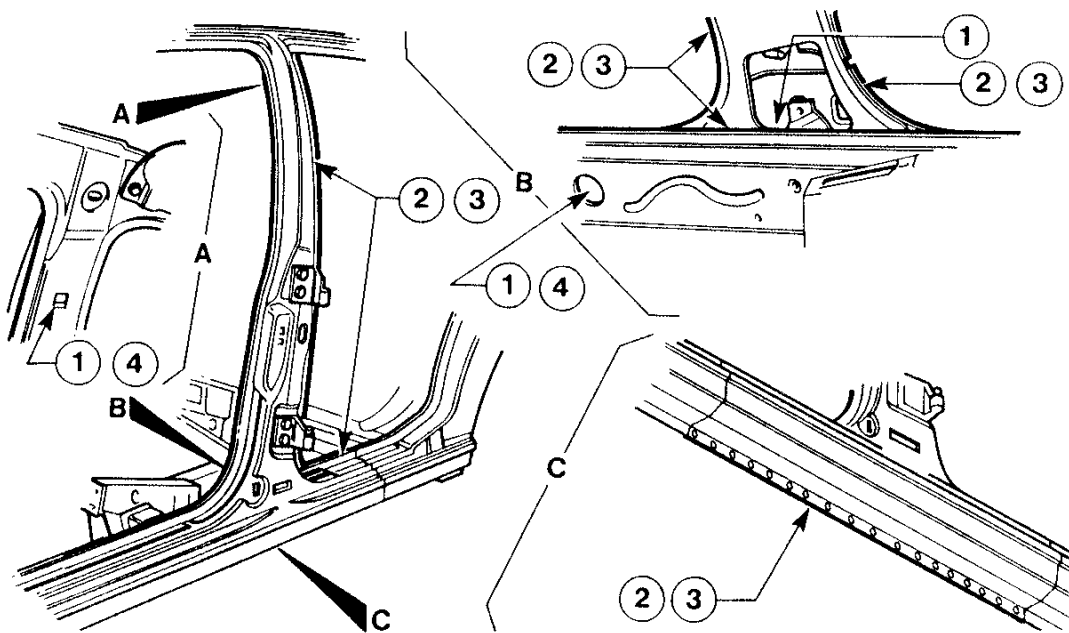
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operations).



**Protection**

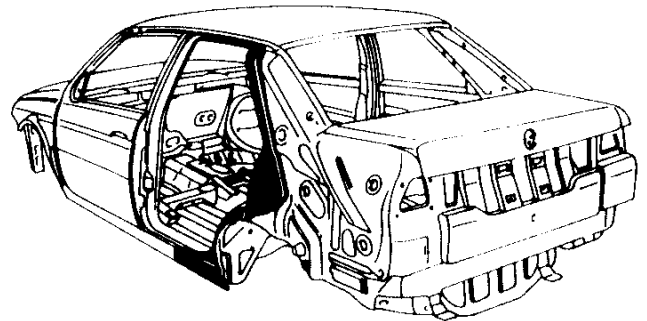
1. Apply Type B rust-proofing to the areas indicated in the illustration.
2. Apply Type A sealant to the areas indicated in the illustration.

3. Apply Type B protection to the areas indicated in the illustration.
4. Proceed to the waxing phase.

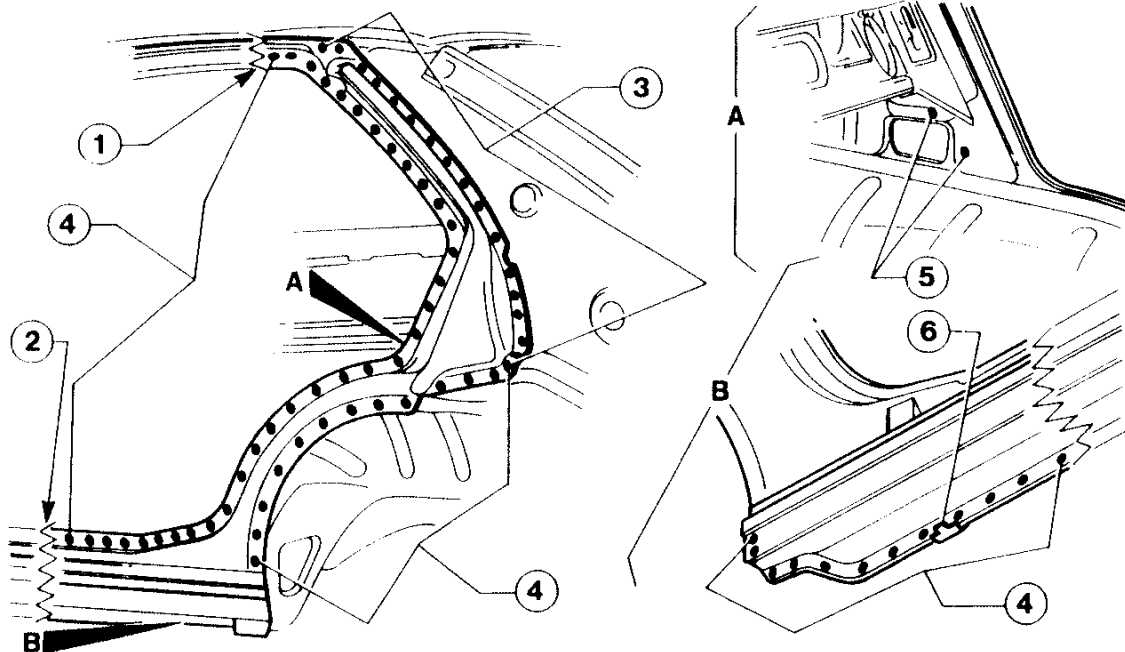


**REAR PILLAR**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear bumper and external trim (see: GR. 75);
  - rear door (see: GR. 55);
  - rear bumper (see: GR. 49 - REPLACING MOBILE COMPONENTS);
  - rear pillar trim (see: GR. 66);
  - roof, seats and internal trim (see: GR. 66).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

1. Using a circular saw cut along the lines indicated in the illustration without damaging the front wind-screen frame.
2. Using a jig saw cut along the lines indicated in the illustration without damaging the underlying parts.
3. Remove the welds indicated using a drill.
4. Remove the indicated welds with a chamfering machine.
5. Remove the indicated welds from inside using a chamfering machine.
6. Open the clinch tabs.

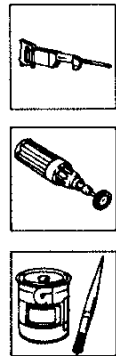
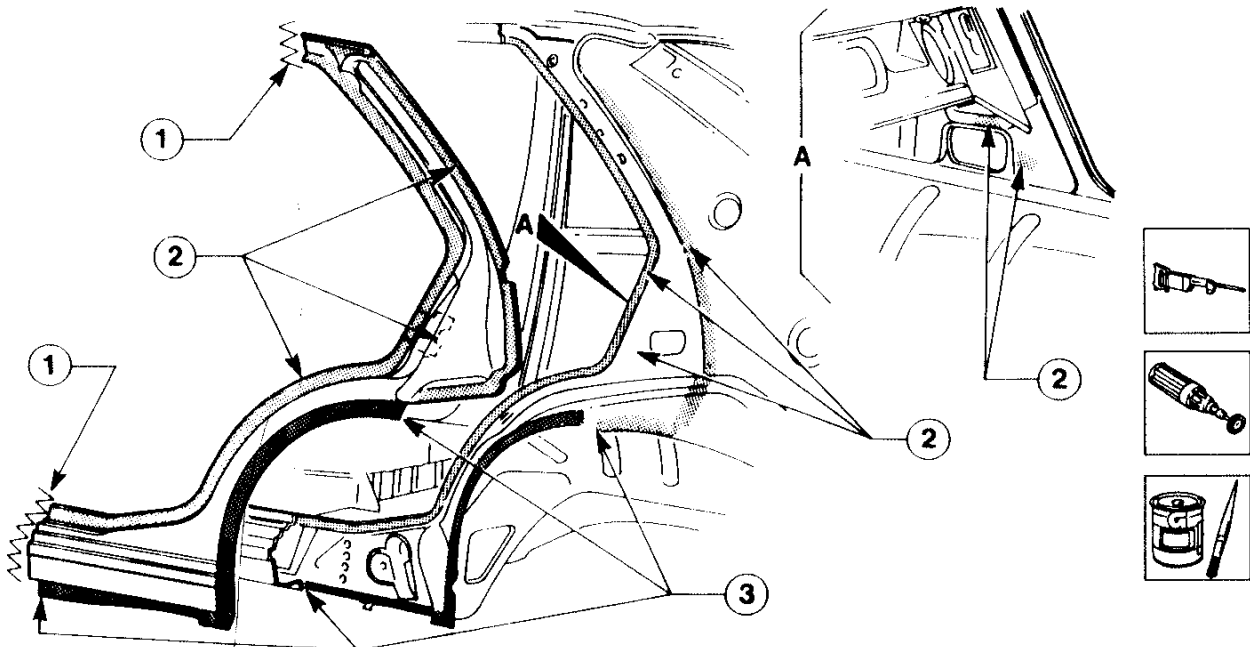




**Preparation**

1. Operating on a bench, cut the new pillar with a jig saw remembering to leave enough margin for overlapping.
- Using a rotating brush clean the perimeter of the pillar and the welding areas.

2. Spread Type B electroweldable protection on the spot welding areas.
3. Spread Type A electroweldable paste on the areas indicated in the illustration.

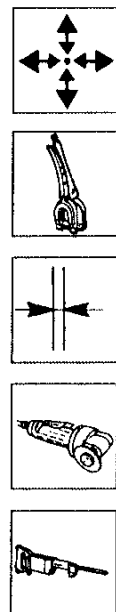
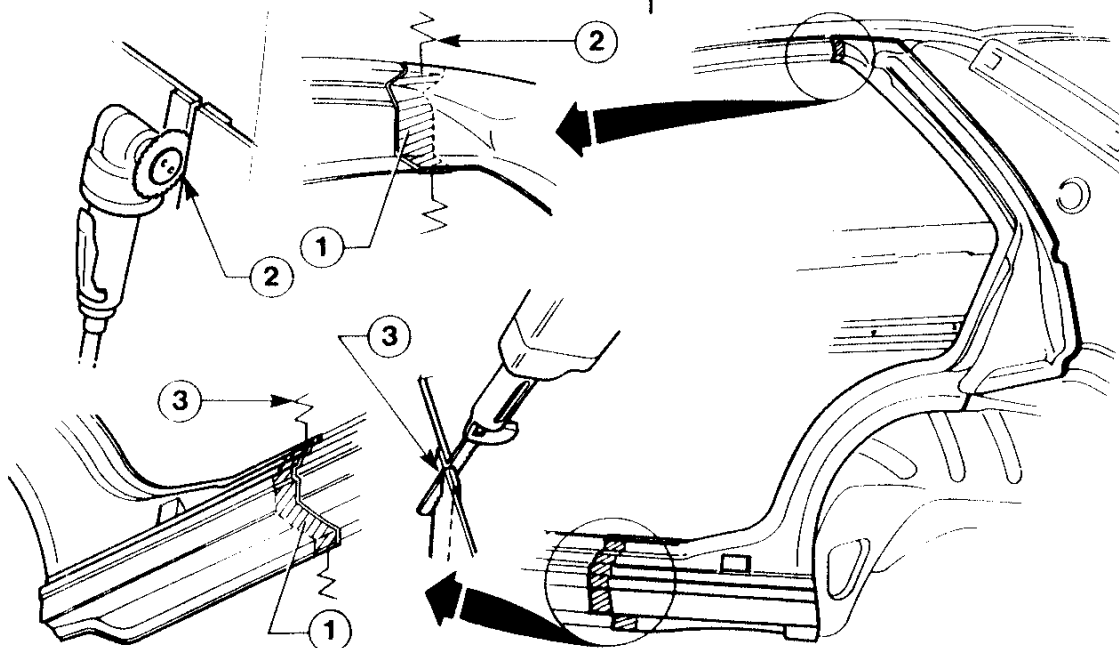


**Positioning**

1. Position the pillar as shown in the illustration and secure and mate the edges.
- Check parallelism, gaps and angles (this necessitates the installation of the mobile components which were previously removed along with the gaskets and parts which, when installed, will make it

possible to check the success of the operations) - (see: GR. 55 - REAR DOORS).

2. Using a circular saw trim the metal sheet and remove the excess parts indicated in the illustration, without damaging the underlying parts.
3. Using a jig saw, trim the metal sheets and remove the excess parts as indicated in the illustration without damaging the underlying parts.



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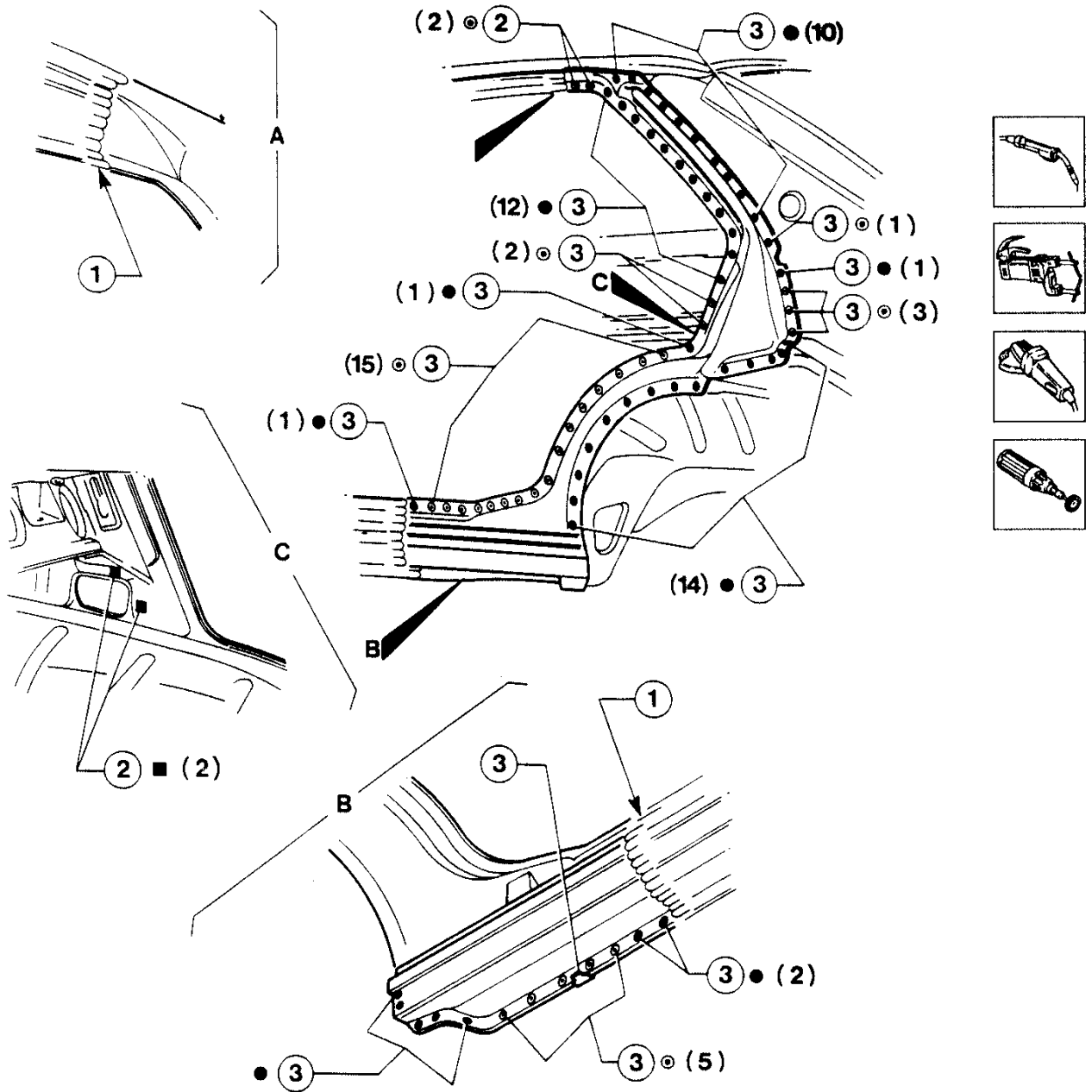
07 - 1991



**Welding and finishing the sheet metal**

1. Carry out seam welding using a MIG welder.
2. Carry out filling welding using a MIG welder
3. Using a spot welder, operate as shown in the illustration.

4. Bend the clinch tabs.
  - Using an abrasive grinding machine remove and level the residues left by welding.
  - Clean the welding areas with a rotating brush.

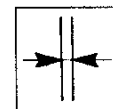
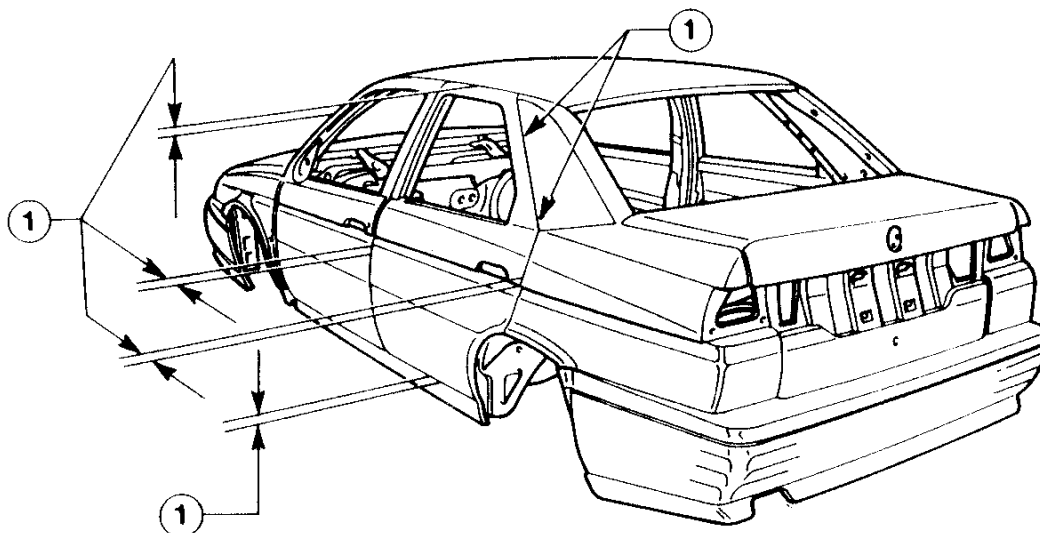




**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components which were previously removed along with the gas-

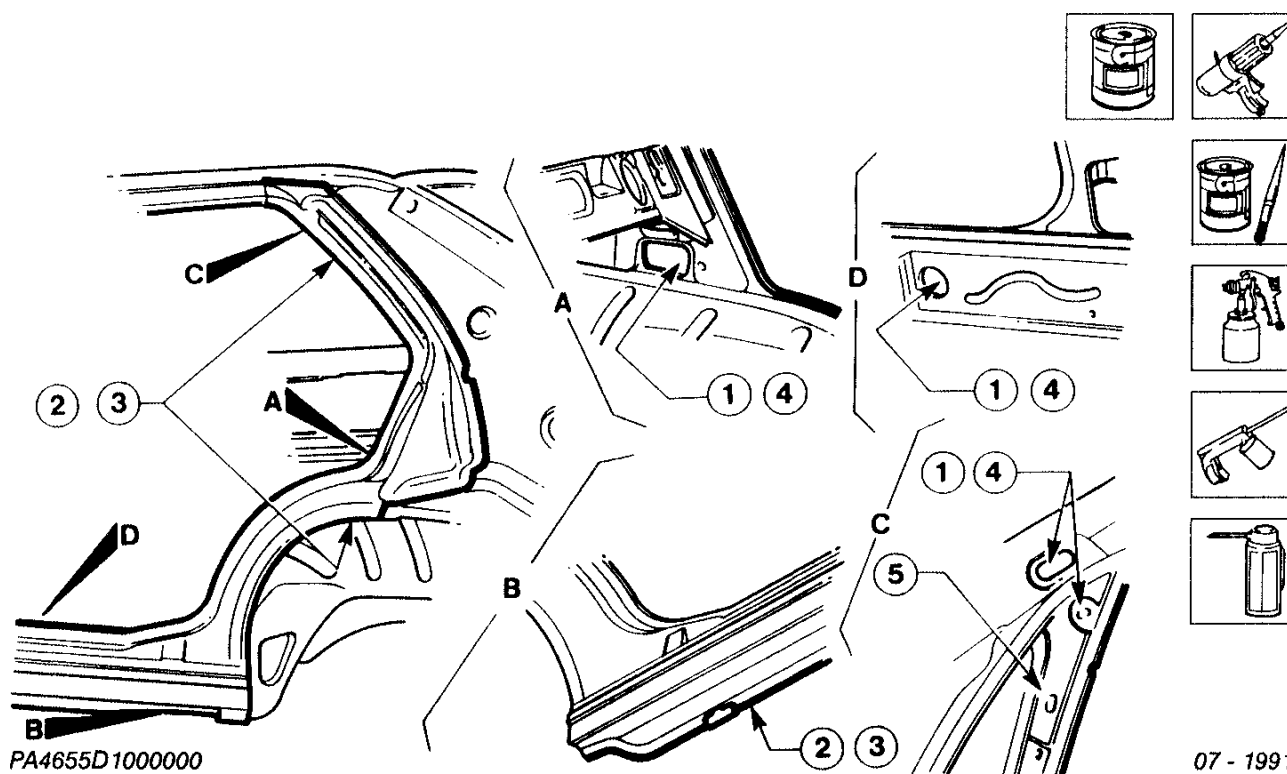
kets and parts which, when installed, will make it possible to check the success of the operations) - (see: REAR WING).



**Protection**

1. Apply Type B protection to the areas shown in the illustration.
2. Apply Type B rust-proofing to the areas shown in the illustration.

3. Apply Type A sealant to the areas shown in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.



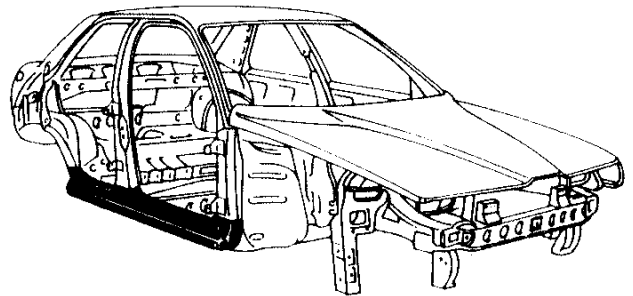
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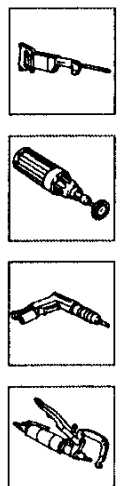
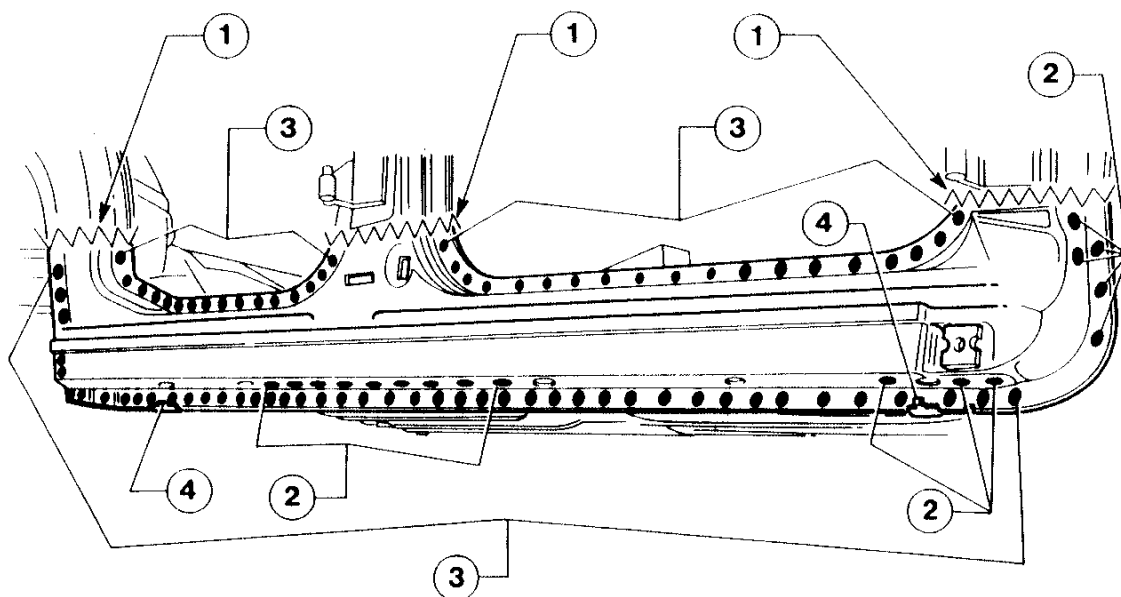
**DOOR SILL RAIL**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear and front doors (see: GR. 55);
  - central pillar and seat belt trim (see: GR. 66);
  - roof, seats and internal trim (see: GR. 66);
  - front and rear wings (see: GR. 49).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

1. Using a jlg saw cut along the lines shown in the illustration without damaging the underlying parts.
- Using a rotating brush clean the area to be chamfered in order to show up the welds.

2. Remove the welds with a drill.
3. Remove the welds with a chamfering machine.
4. Open the clinch tabs.

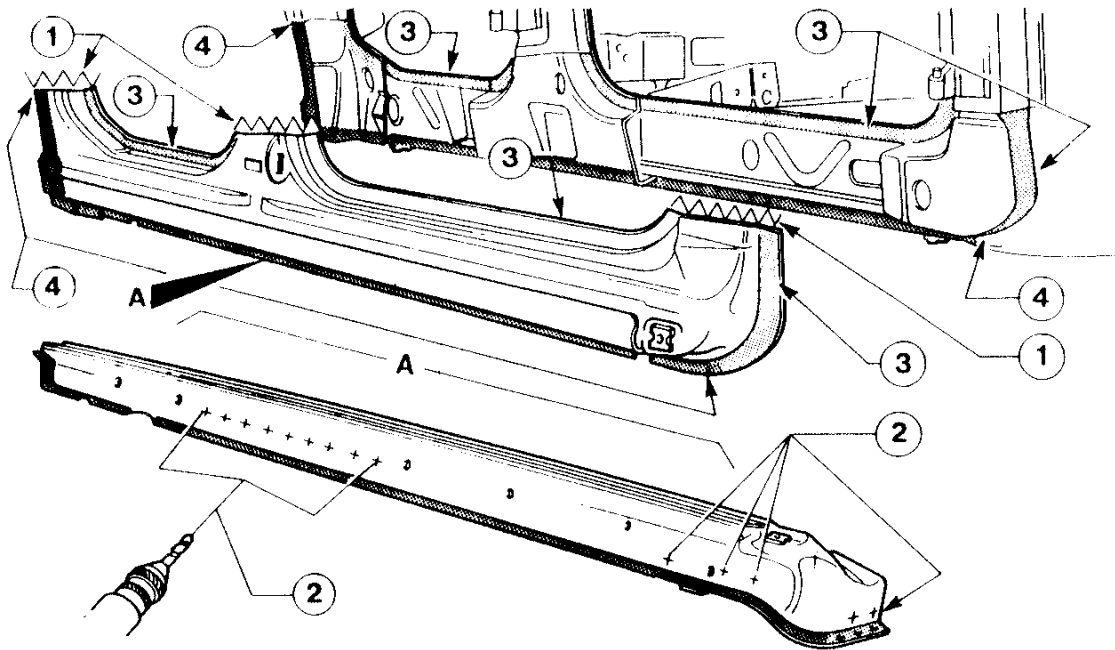




**Preparation**

1. Operating on a bench, cut the new door sill with a jig saw remembering to leave enough margin for overlapping.
2. Trace the trim and using a 5 mm. bit, drill as indicated in the illustration.

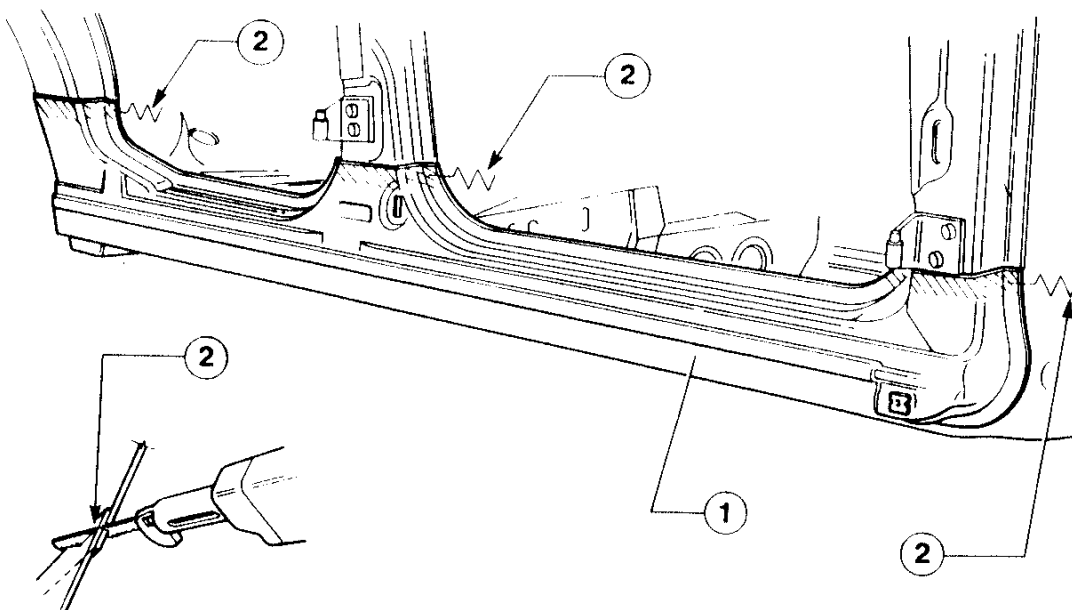
- Clean the welding areas using a rotating brush.
- 3. Spread the areas indicated in the illustration with Type B electroweldable protection.
- 4. Spread the areas indicated in the illustration with Type A electroweldable paste.



**Positioning**

1. Position the sill and overlap as indicated in the illustration.

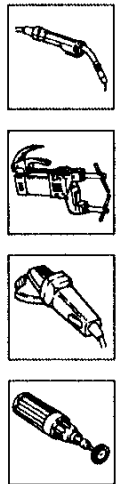
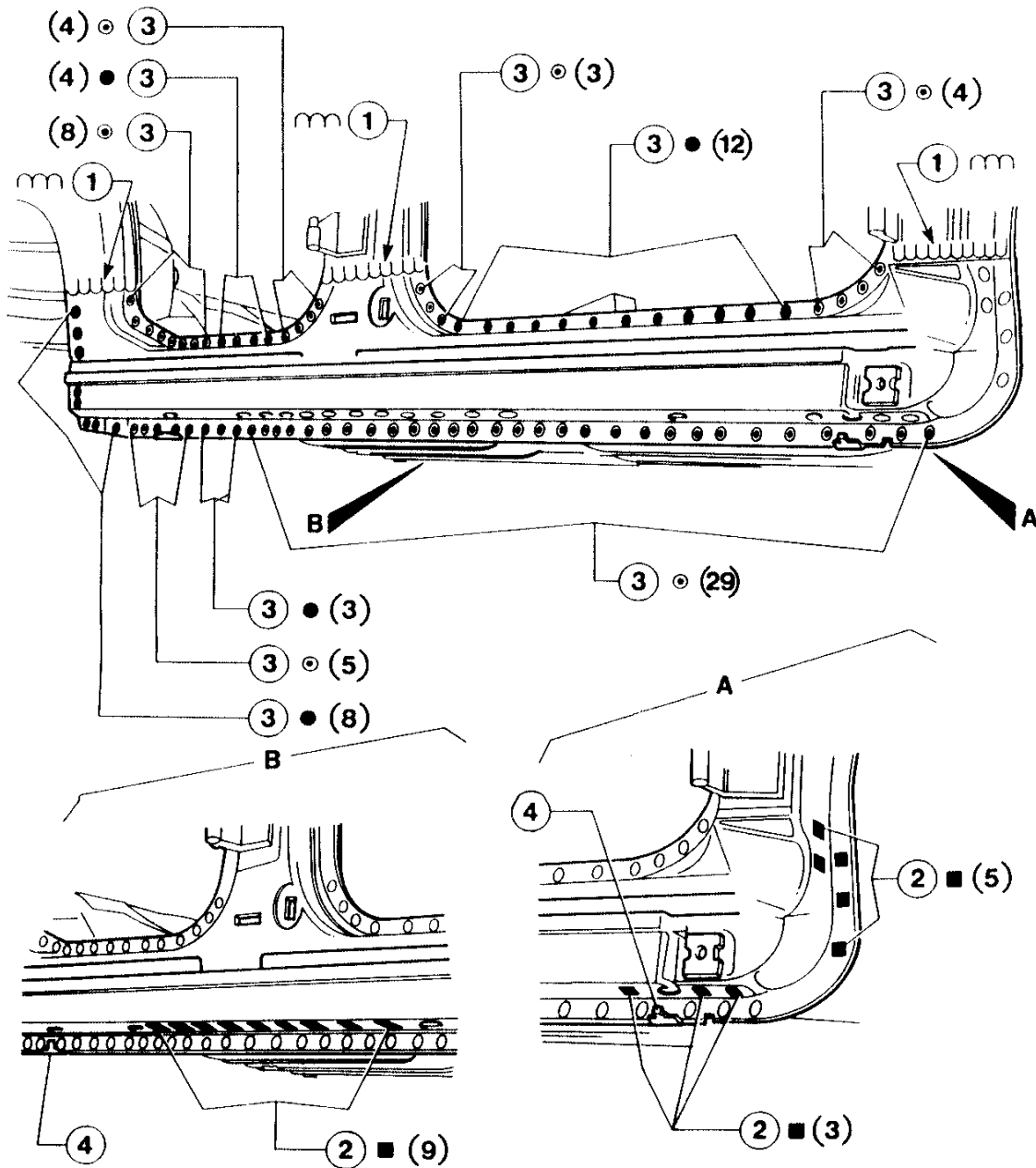
- Secure the components to be welded and, mate the edges and check alignment.
- 2. Using a jig saw, trim the sheet metal and remove the excess parts without damaging the underlying parts.





**Welding and finishing the sheet metal**

1. Carry out seam welding with a MIG welder.
2. Carry out filling welds using a MIG welder.
3. Using a spot welder operate as shown in the illustration.
4. Bend the clinch tabs.
  - Using an abrasive grinding wheel remove and level the residues left by welding.
  - Clean the welding areas with a rotating brush.

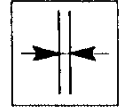
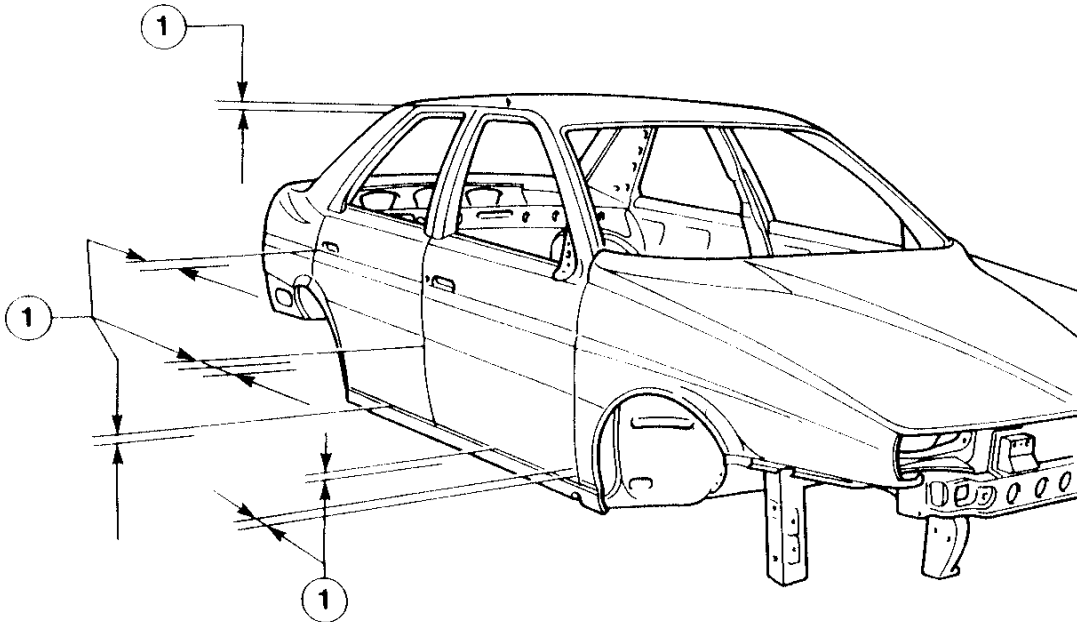




**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

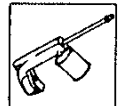
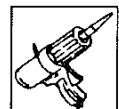
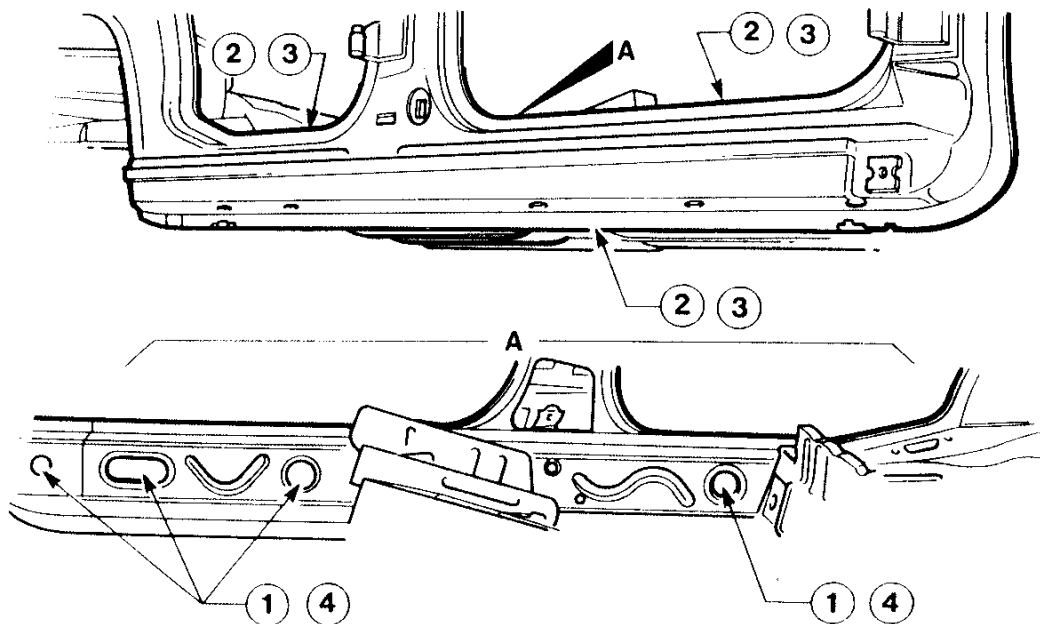
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operations).



**Protection**

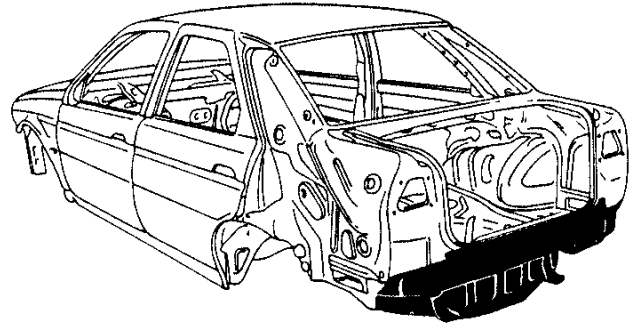
1. Spread the Inner surfaces of the of the side panel with Type B rust-proofing as indicated in the illustration.

2. Spread Type A rust-proofing on the areas shown in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.
- Proceed to the painting phase.
4. Proceed to the waxing phase.



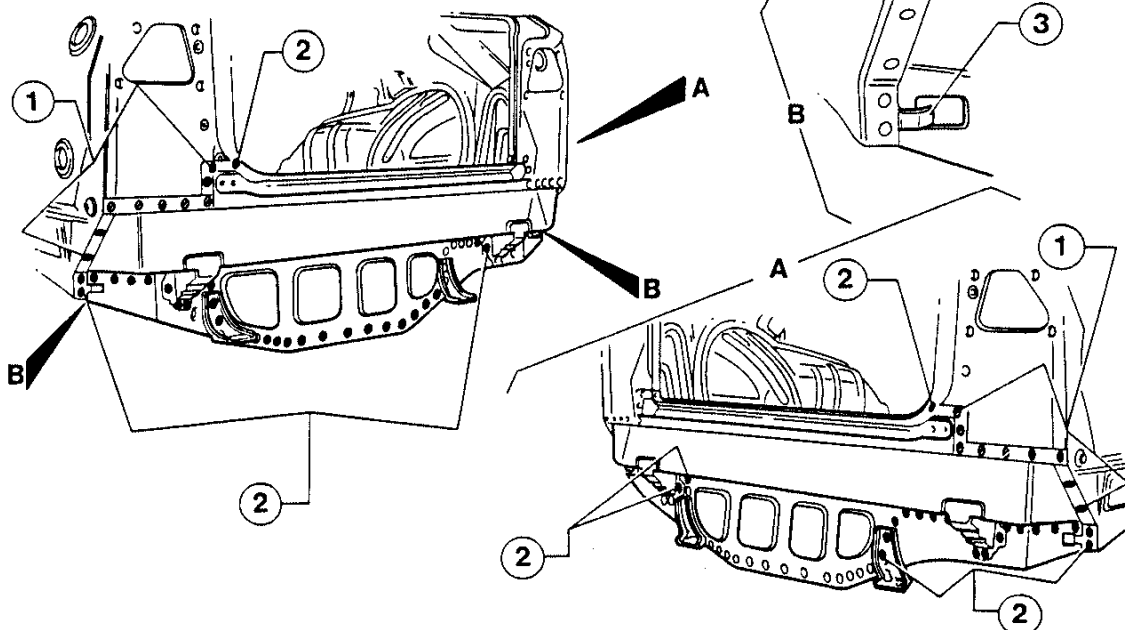
**REAR TRIM**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear light assemblies (see: GR. 40);
  - boot lid (see: GR. 56);
  - luggage compartment trim (see: GR. 66);
  - rear wings (see: GR. 49 - REPLACING MOBILE PARTS);
  - rear bumper and external trim (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the areas to be chamfered in order to show up the welds.

1. Using a drill remove the welds from inside the vehicle.
2. Remove the welds with a chamfering machine.
3. Open the clinch tabs.

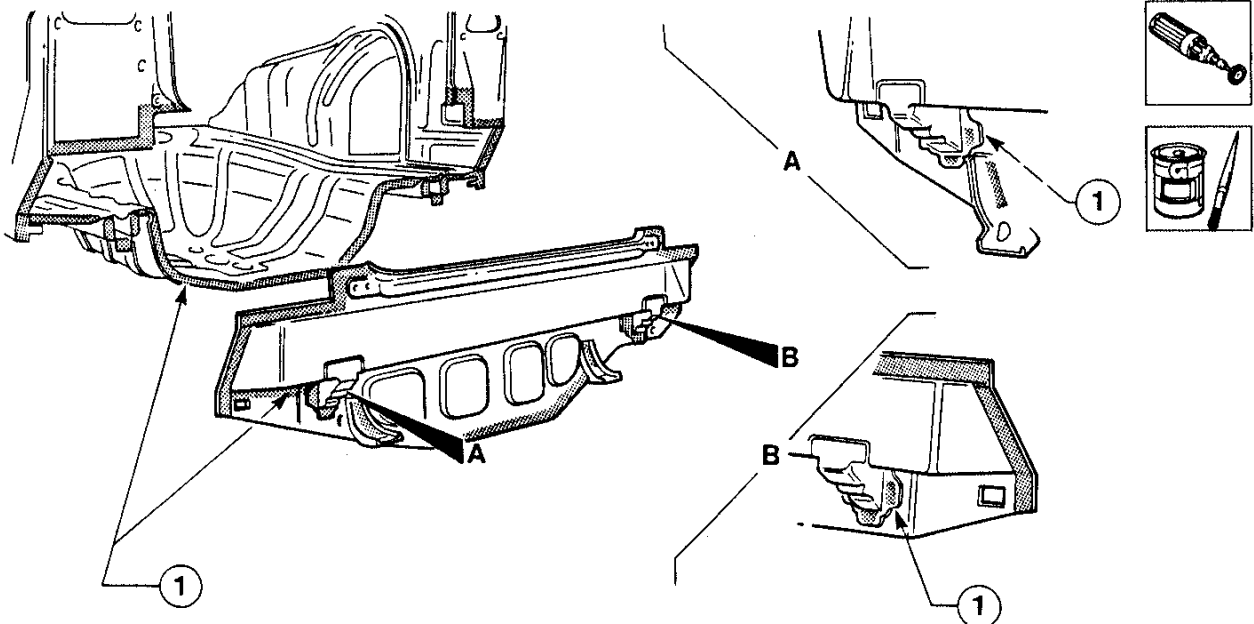




**Preparation**

- Clean the welding areas with a rotating brush.

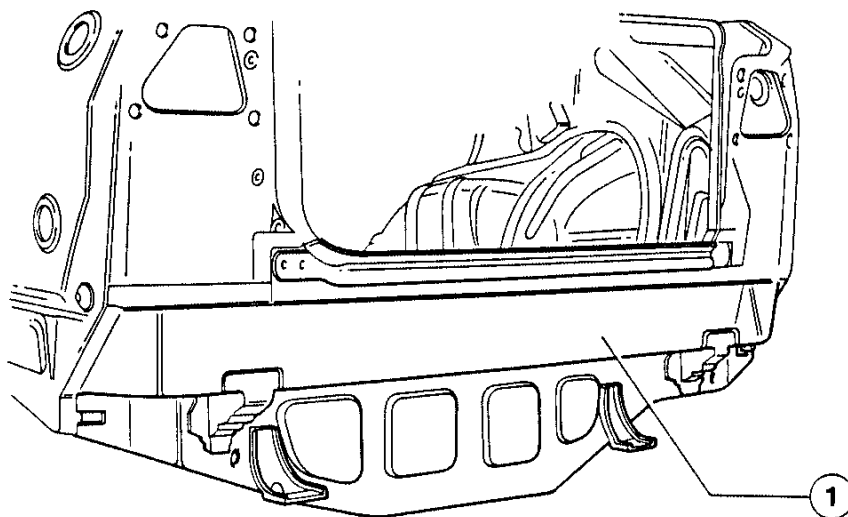
1. Cover the spot welding areas with Type A electro-weldable paste.



**Positioning**

- Position the rear trim, secure and mate the edges and

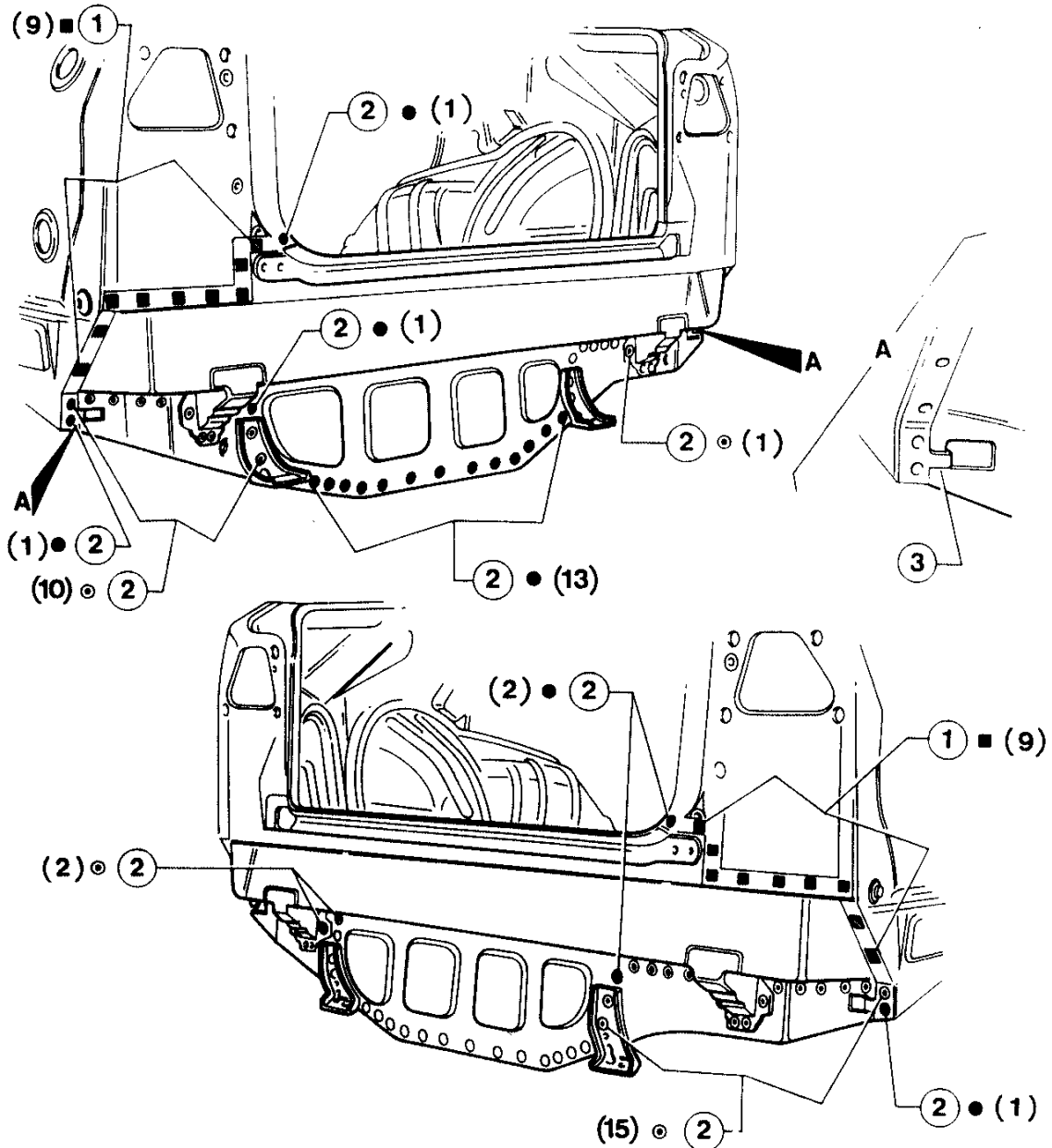
check the alignment.





**Welding and finishing the metal sheet**

1. Operating from inside the vehicle, carry out filling welds using a MIG welder.
2. Using a spot welder, operate as shown in the illustration.
3. Close the clinch tabs.
  - Using an abrasive grind wheel, remove and level the residues left by welding.
  - Clean the welding areas with a rotating brush.

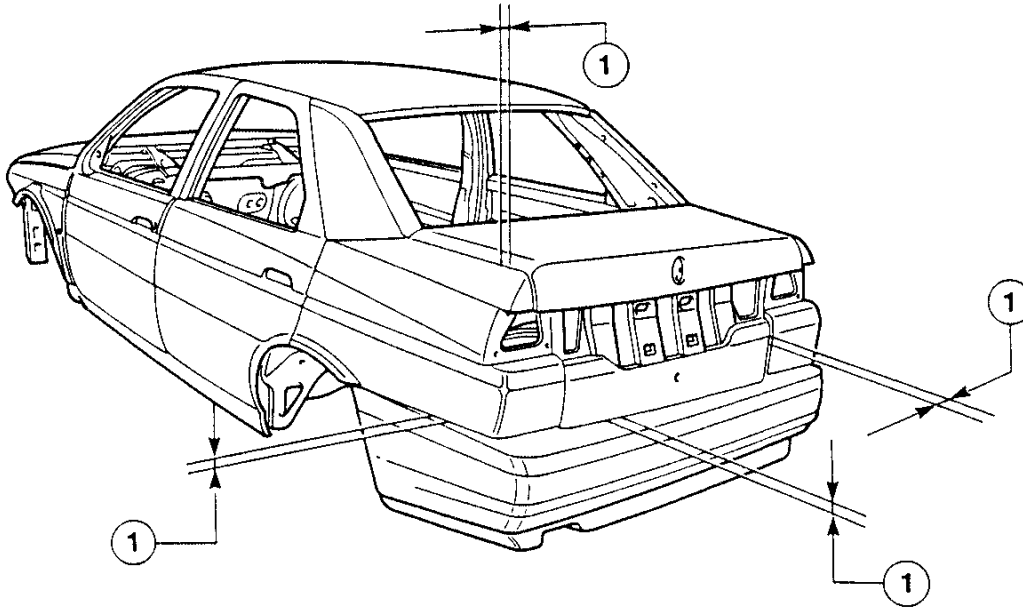




**Check**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

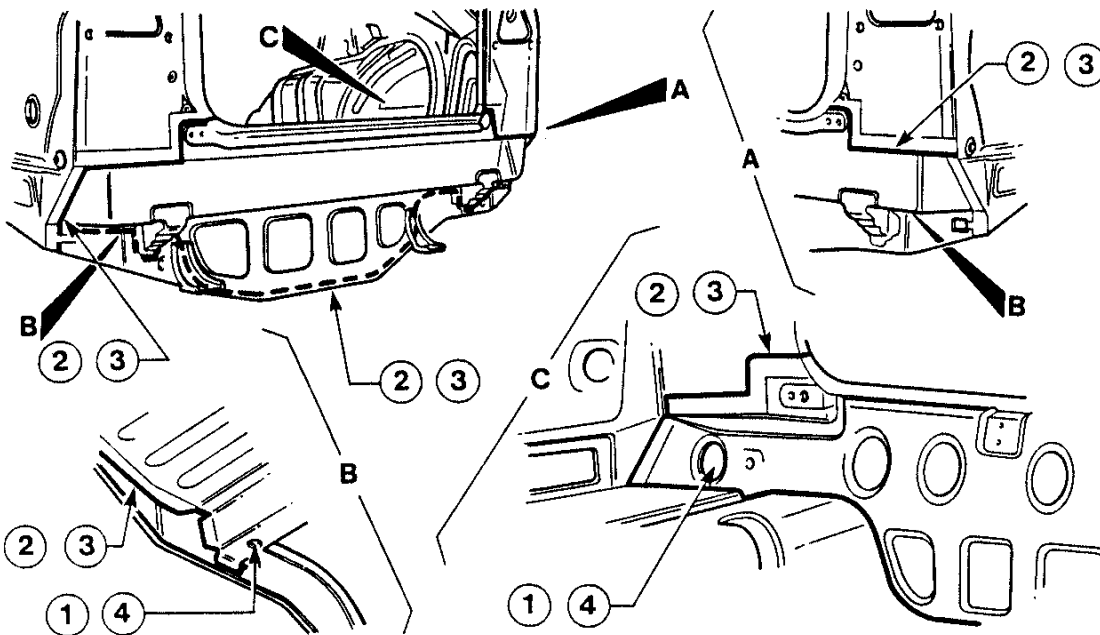
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operations).



**Protection**

1. Spread the inner surfaces of the side panel with Type B rust-proofing as shown in the illustration.
2. Spread the areas shown in the illustration with Type A rust-proofing.

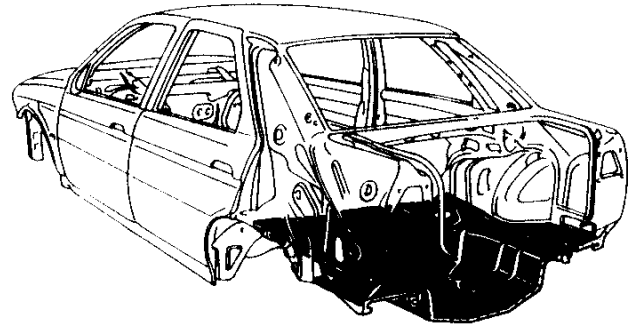
3. Apply Type A sealant to the areas shown in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.





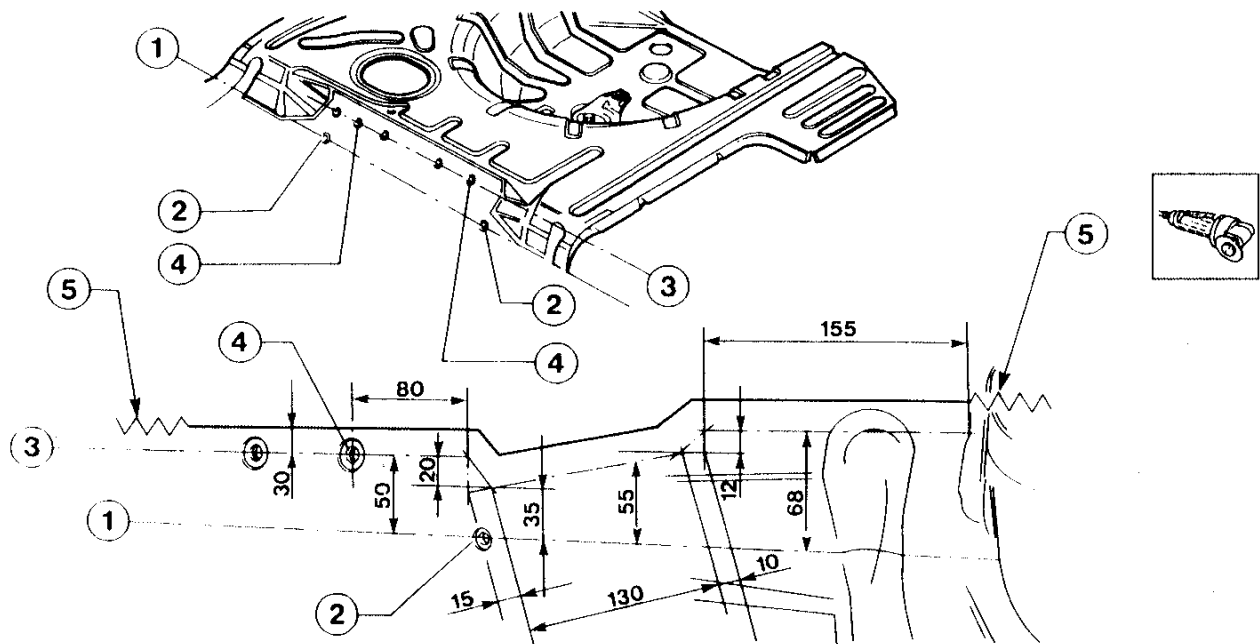
**PARTIAL REAR FLOOR PANEL**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear bumper and external trim (see: GR. 75);
  - boot lid (see: GR. 56);
  - rear wings (see: GR. 49 - REPLACING MOBILE PARTS);
  - luggage compartment trim (see: GR. 66);
  - rear windscreen (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).

**Removal**

- Following the measurements indicated, trace out the lines shown in the following illustration and description onto the area of the floor panel to be cut.
  1. Trace out the axis through the holes (2).
  2. Mark the reference holes for the axis (1).

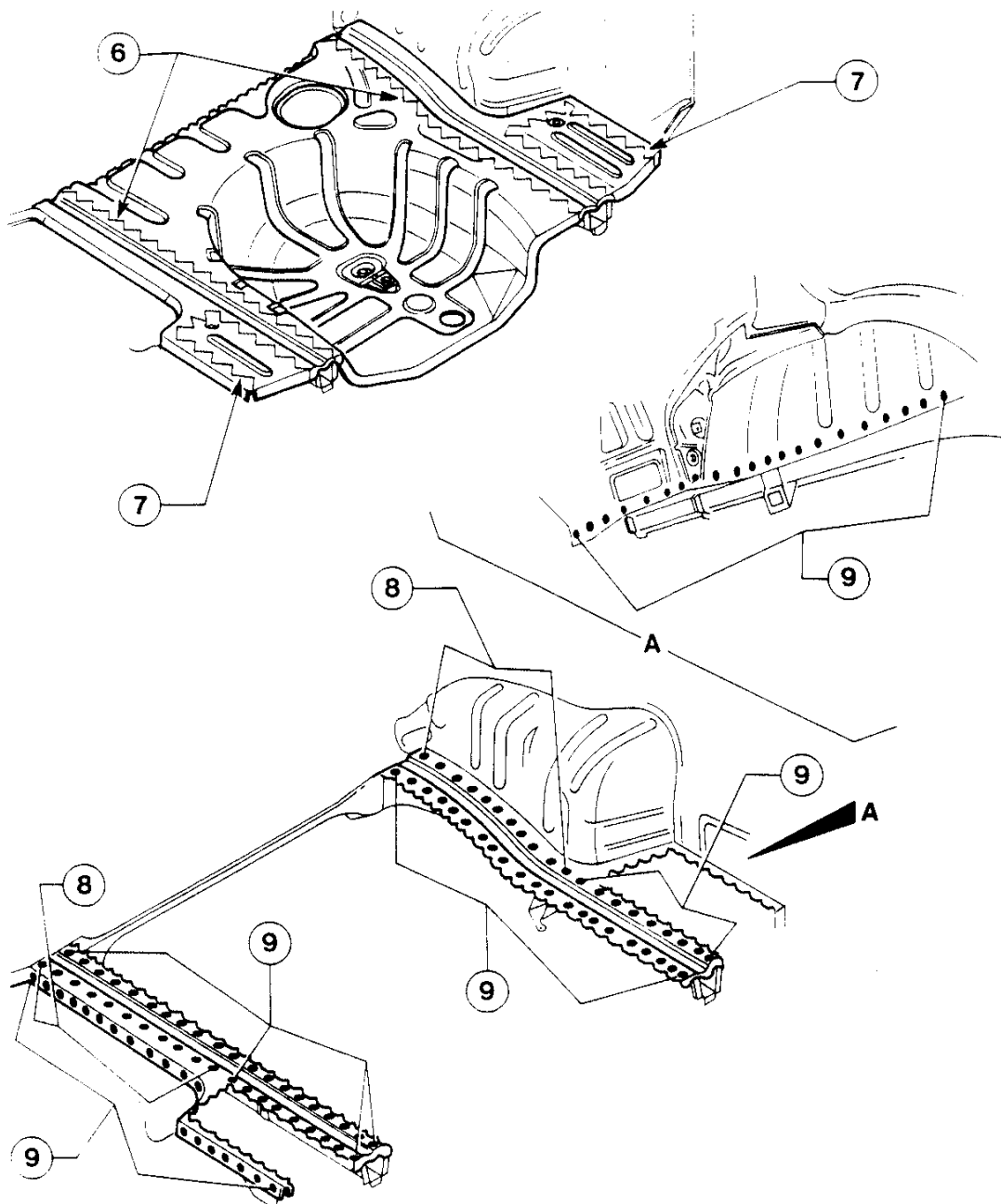
3. Trace out the axis through the holes (4) adhering to the measurements given.
4. Mark the reference holes for the axis (3).
5. Using circular and jig saws cut along the indicated line.





6. Using a jig saw cut along the lines indicated in the illustration as far as the intersection with the line which was previously cut.
7. Using a jig saw cut along the lines shown in the illustration.

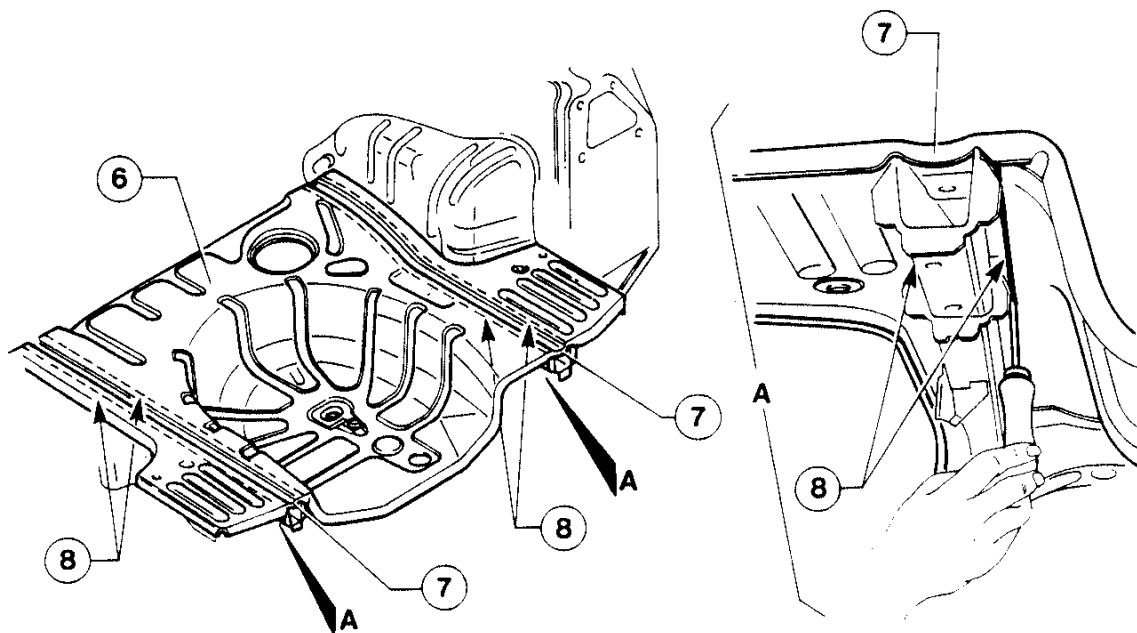
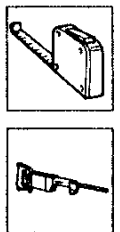
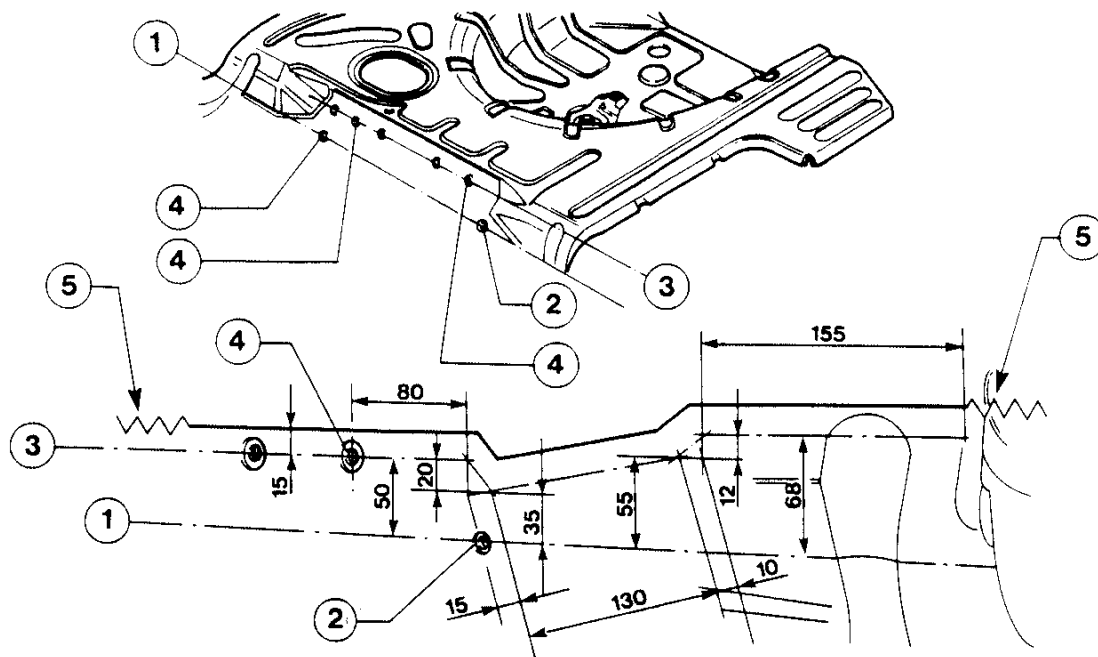
- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
- 8. Remove the welds with a drill.
- 9. Remove the welds with a chamfering machine.



**Preparation**

– Operating on a bench, trace out the new floor as indicated below:

1. Trace out the axis through the holes (2).
2. Mark the reference holes for the axis (1).
3. Trace out the axis through the holes (4) adhering to the measurements indicated.
4. Mark the reference holes for the axis (3).
5. Using a jigsaw, cut along the lines shown, leaving a margin of about 15 mm to permit overlapping.
6. Position the new floor on the vehicle.
7. Check the correct positioning of the floor against the door sill rails as indicated.
8. Using a surface gauge, trace out the lower part of the floor using the edges of the door sill rails as a guide.

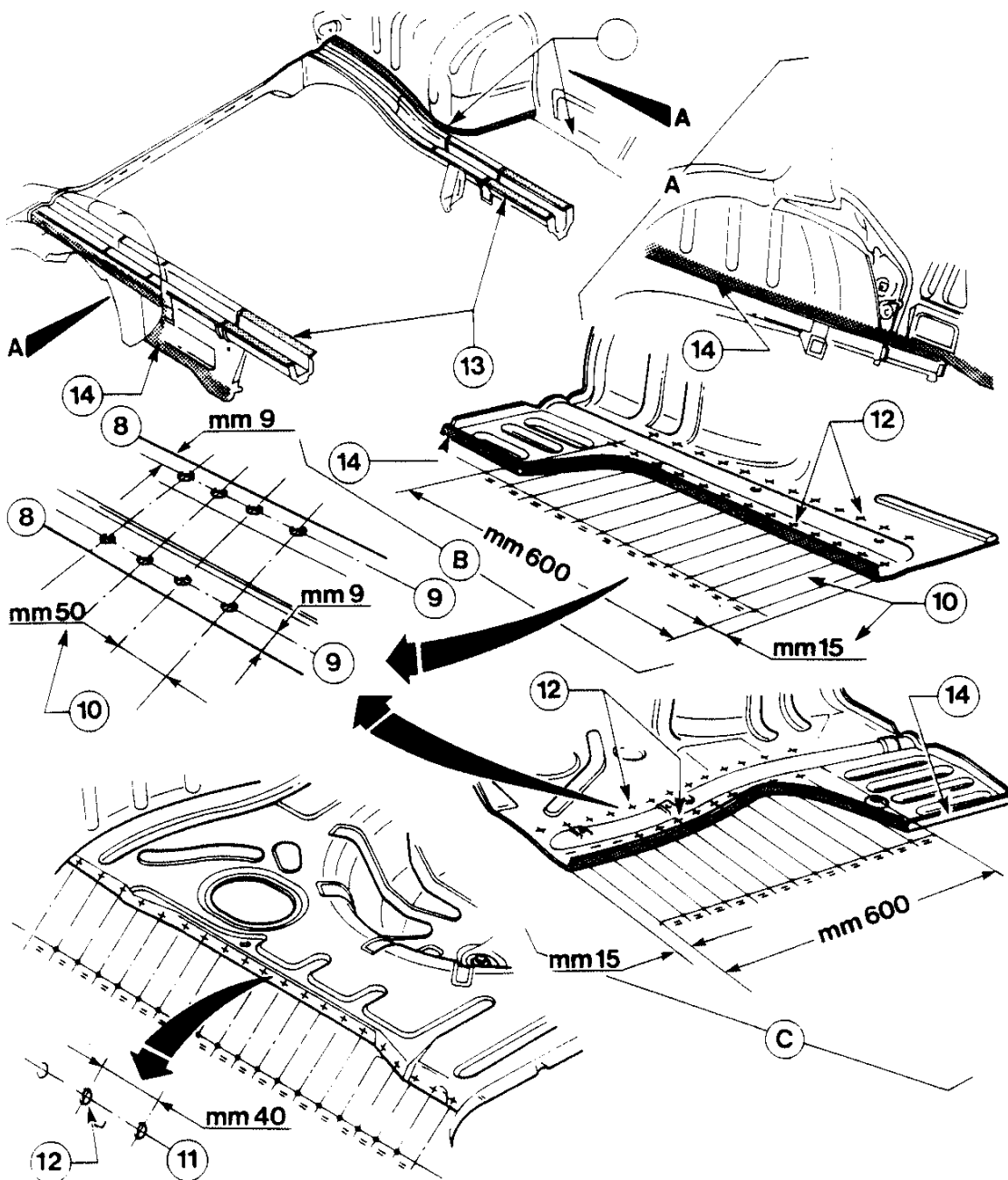




9. Keeping a distance of 9 mm from the traced lines (8), trace out the axes as indicated in the illustration.
10. Keeping a distance of 15 mm from the front edge, mark the axis of the welding holes maintaining a centre distance of 50 mm for a length of 600 mm.

**NOTE:** Details B and C show the floor seen from underneath.

11. Trace out the axes for the welding holes along the edge of the previously made cut.
12. Using a 5 mm  $\varnothing$  bit, drill as indicated in the illustration.
  - Using a rotating brush, clean the welding areas on both the floor and the vehicle.
13. Spread Type B electroweldable protection on the areas indicated in the illustration.
14. Spread the areas indicated in the illustration with Type A electroweldable paste.

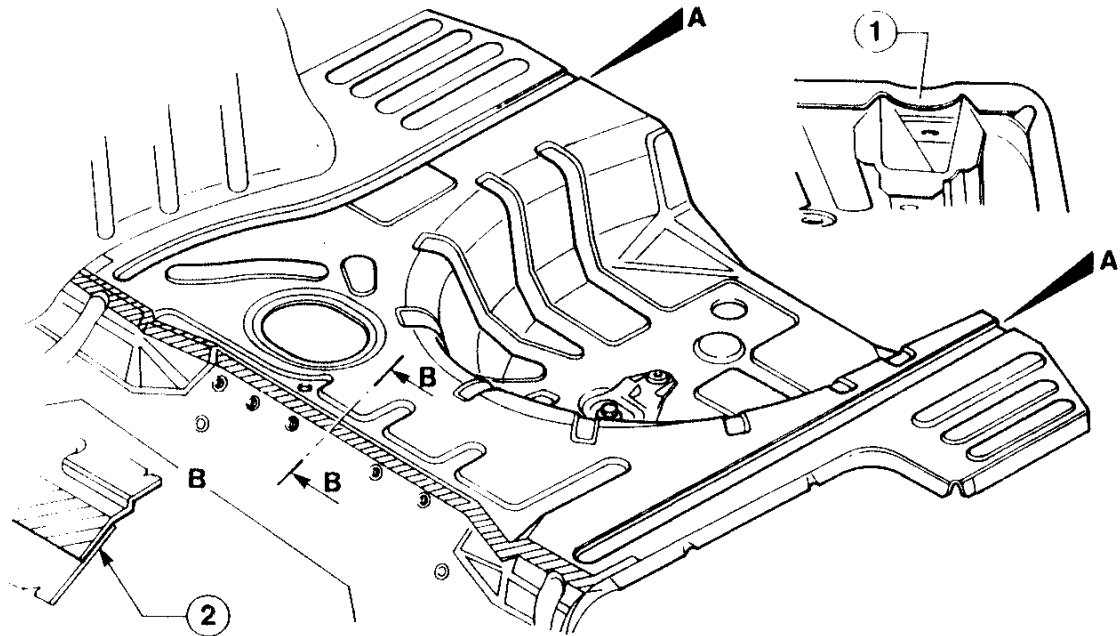




**Positioning**

- Position the floor on the vehicle.

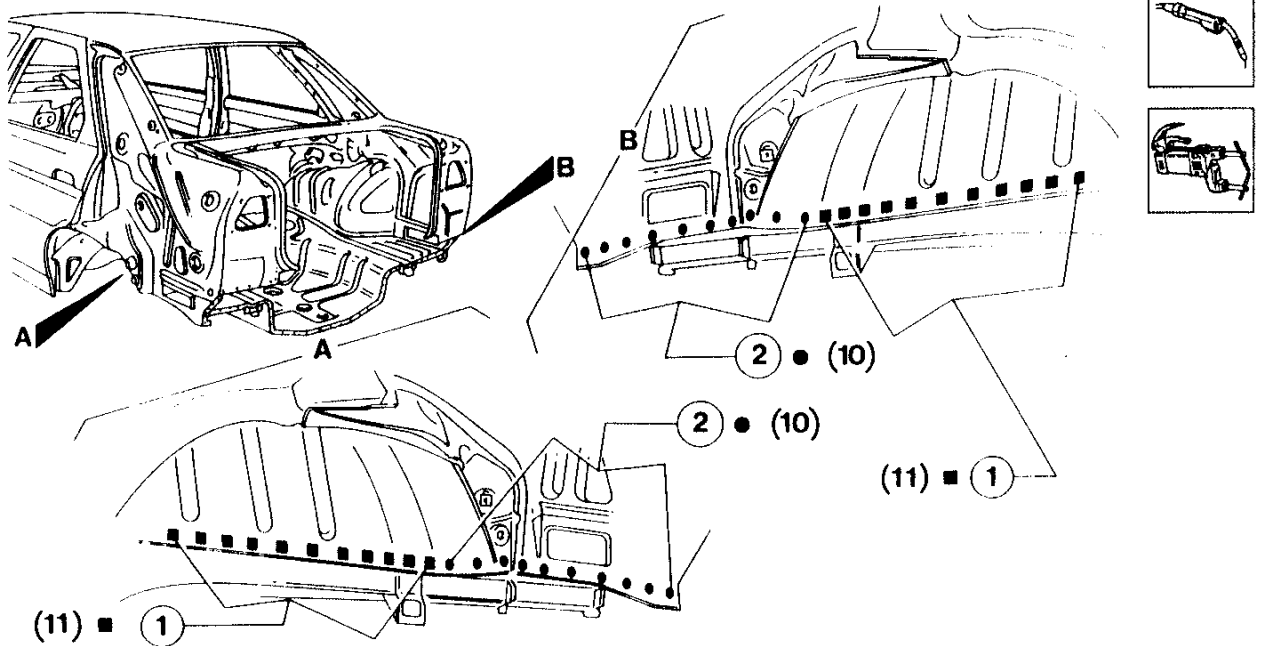
1. Check that the rear edge of the floor is correctly positioned against the door sill rail.
2. Secure the components to be welded, mating the edges and checking the alignment.



**Welding and finishing the sheet metal**

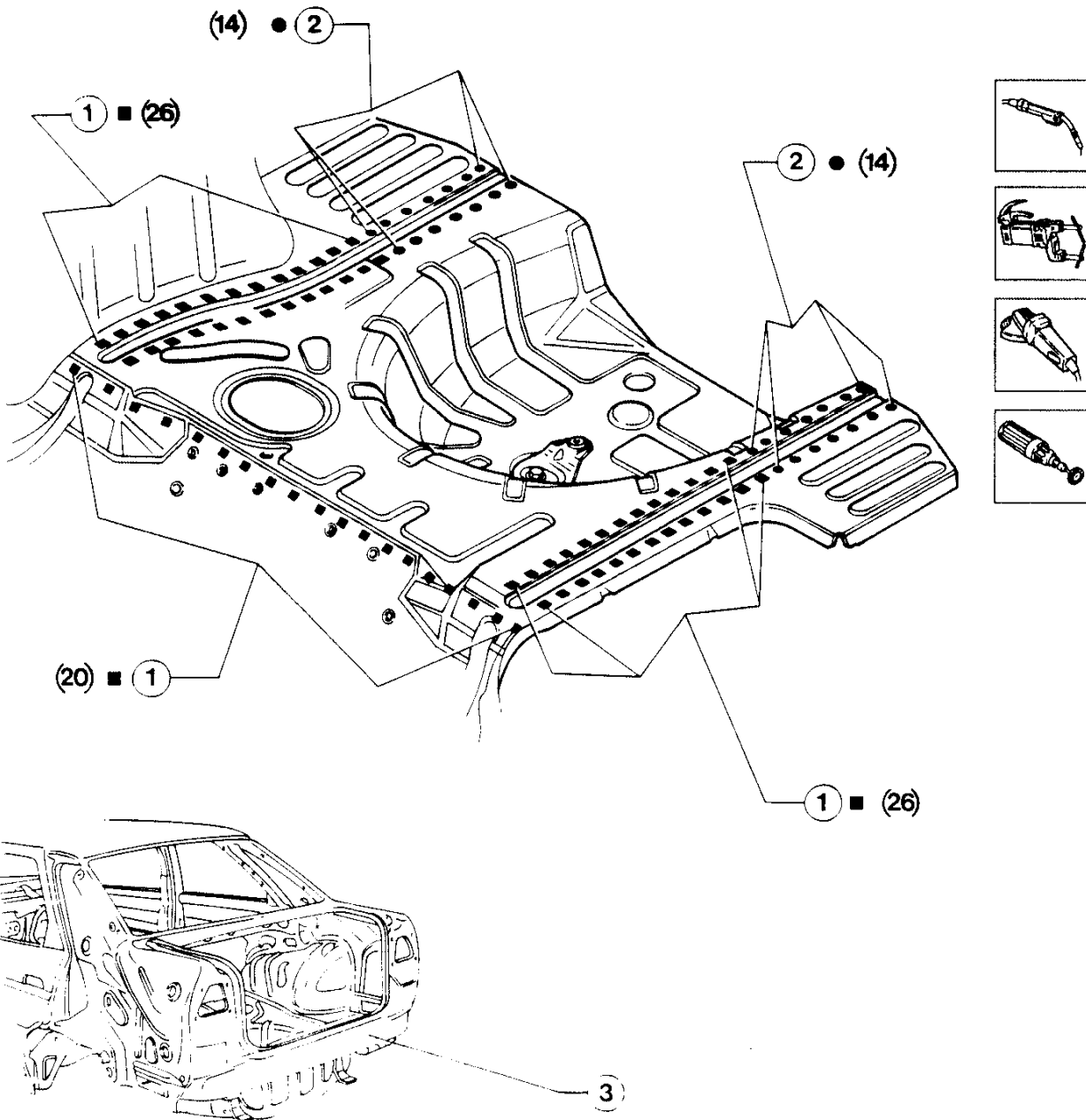
1. Carry out filling welding using a MIG welder.

2. Using a spot welder, operate as indicated in the illustration.





- 1. Carry out filling welds using a MIG welder.
- 2. Using a spot welder operate as shown in the illustration.
- Using an abrasive grind wheel remove and level the residues left by welding.
- Clean the welded areas with a rotating brush.
- 3. Install the REAR TRIM and check the correct positioning of the components.

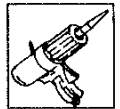
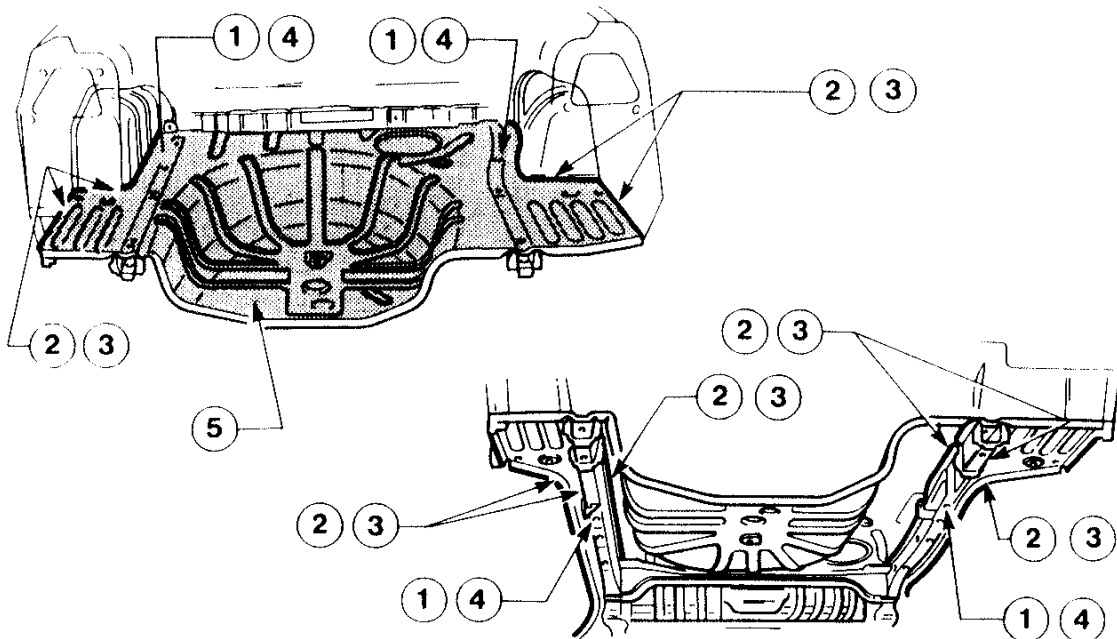




**Protection**

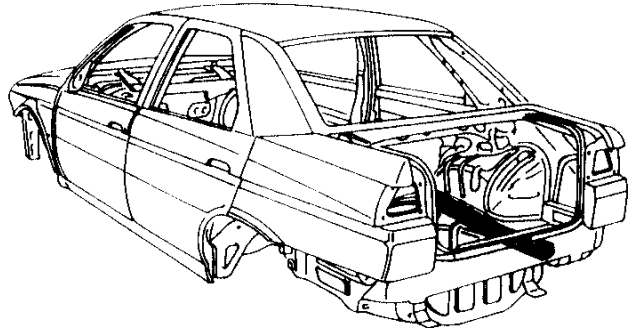
1. Apply Type A rust-proofing to the areas indicated in the illustration.
2. Apply Type A protection to the areas indicated in the illustration.

3. Apply Type A sealant to the areas indicated in the illustration.
4. Apply Type A soundproofing to the areas indicated in the illustration.  
- Proceed to the painting phase.
5. Proceed to the waxing phase.



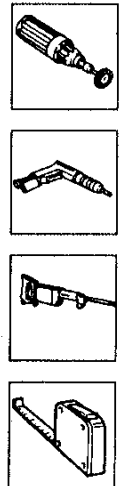
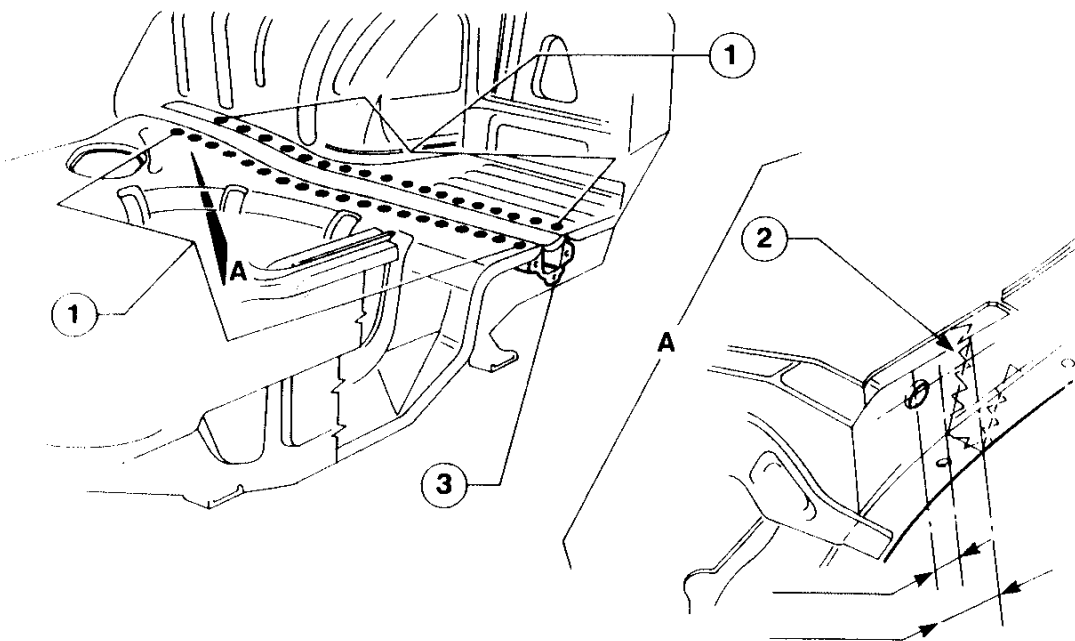
**REAR SIDE RAILS WITH FLOOR PANEL INSTALLED**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear bumper and external trim (see: GR. 75);
  - luggage compartment trim (see: GR. 66).
- Disconnect the battery and control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
1. Remove the welds with a drill.
  - Referring to the axis of the hole, trace out the measurements as indicated in the illustration (oblique cut).

2. Using a jig saw, cut along the lines indicated in the illustration without damaging the underlying parts.
3. Chamfer the welds between the rail and the rear trim (see: REAR TRIM).



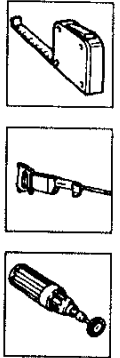
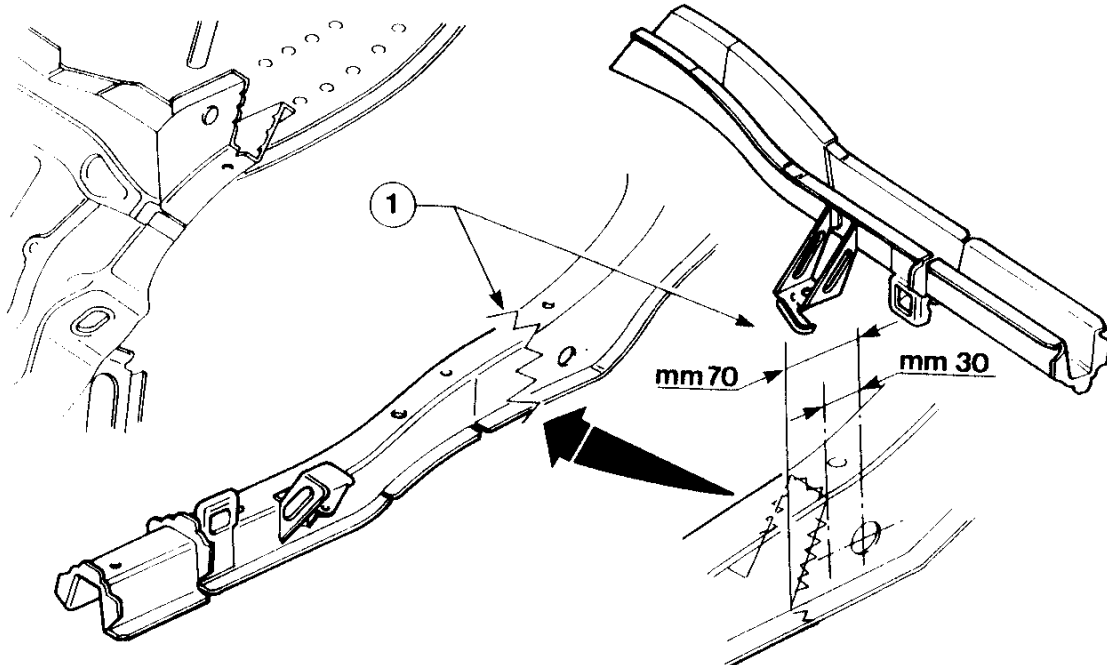


**Preparation**

1. Operating on a bench, trace out the cutting line as shown in the illustration and using a jig saw, cut the

new rail, remembering to leave enough margin to permit overlapping.

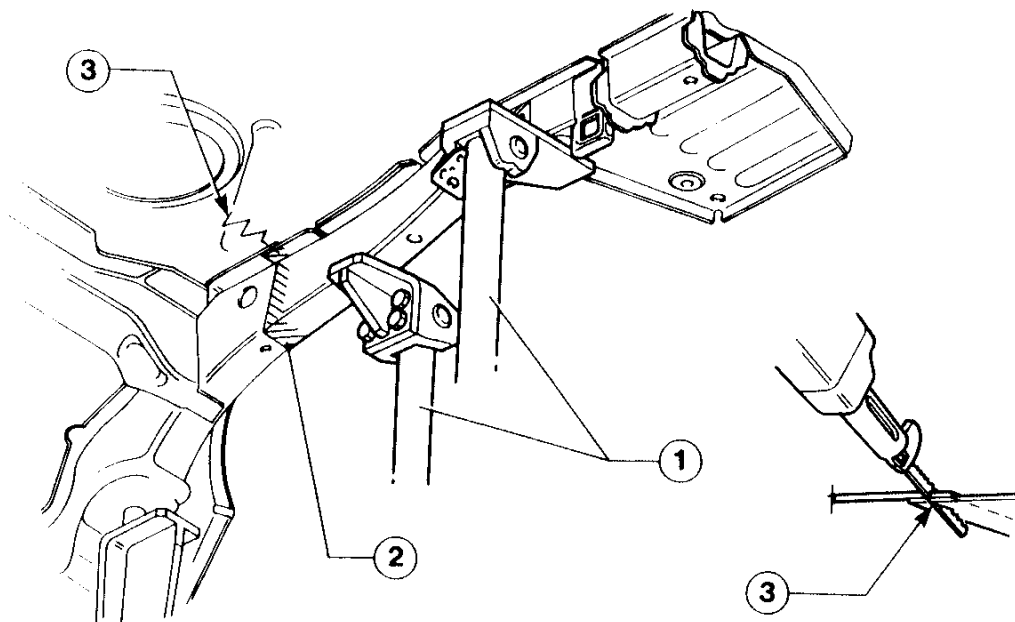
- Using a rotating brush, clean the welding areas on both the rail and the vehicle.

**Positioning**

1. Using the jig, correctly position the rail.

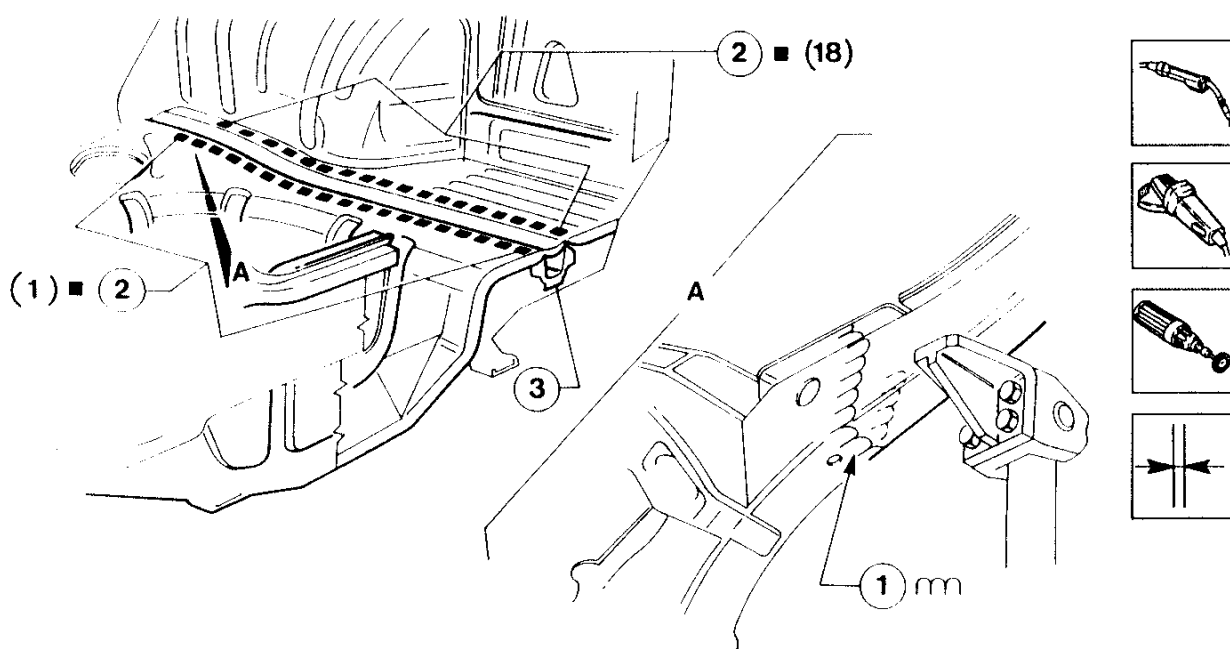
2. Overlap and secure the components to be welded and mate the edges.

3. Using a jig saw trim the sheet metal and remove the excess.



**Welding and finishing the sheet metal**

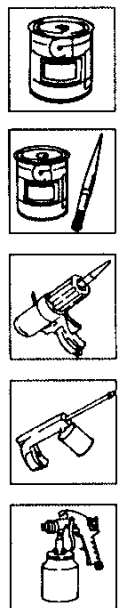
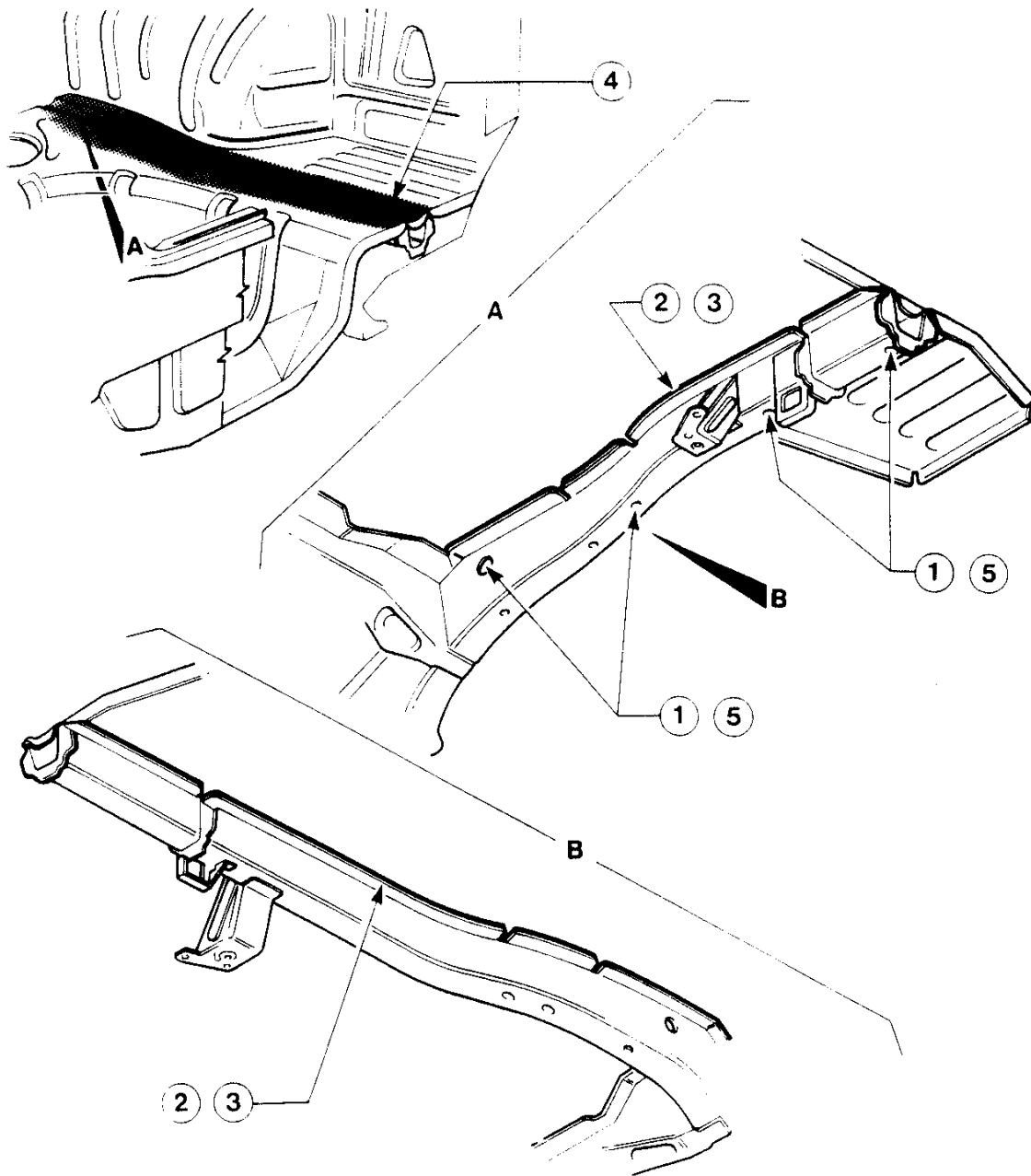
1. Carry out seam welding using a MIG welder.
  2. Carry out filling welding using a MIG welder.
  3. Weld between the rail and rear panel (see: REAR TRIM).
- Using an abrasive grinding wheel, remove and level the residues left by welding.
  - Clean the welded areas using a rotating brush.
  - After welding and after installing the REAR TRIM (see: REAR TRIM - CHECKS), check the correct positioning of the components





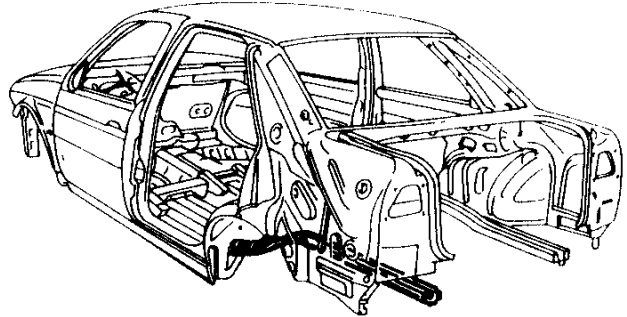
**Protection**

1. Apply Type A rust-proofing to the areas shown in the illustration.
2. Apply type A protection to the areas indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.
4. Apply Type A soundproofing to the areas indicated in the illustration.
5. Proceed to the waxing phase.
  - Proceed to the painting phase.



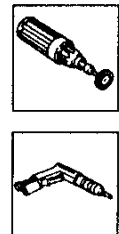
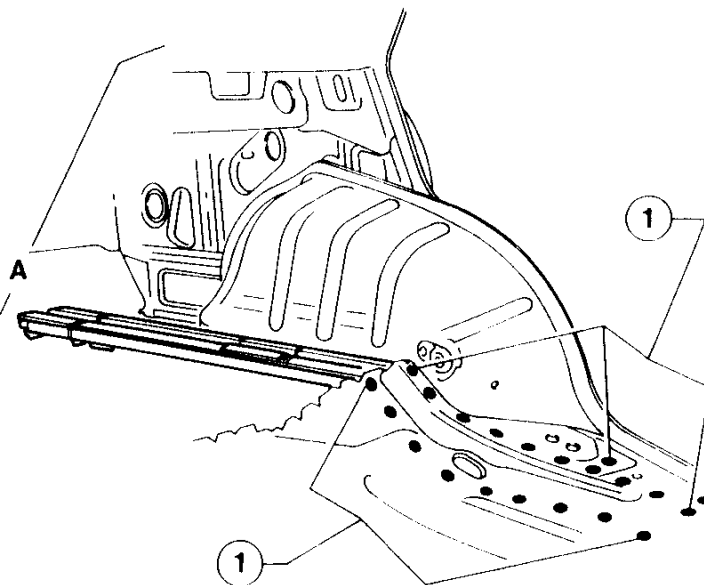
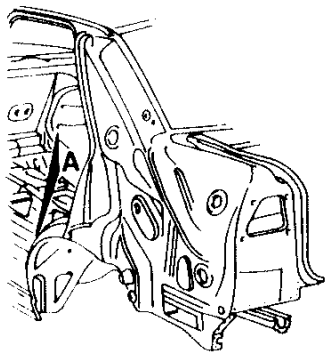
**COMPLETE RAILS WITH FLOOR REMOVED**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear bumper and external trim (see: GR. 75);
  - luggage compartment trim (see: GR. 66).
- Disconnect that battery and control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the areas to be chamfered in order to show up the welds.

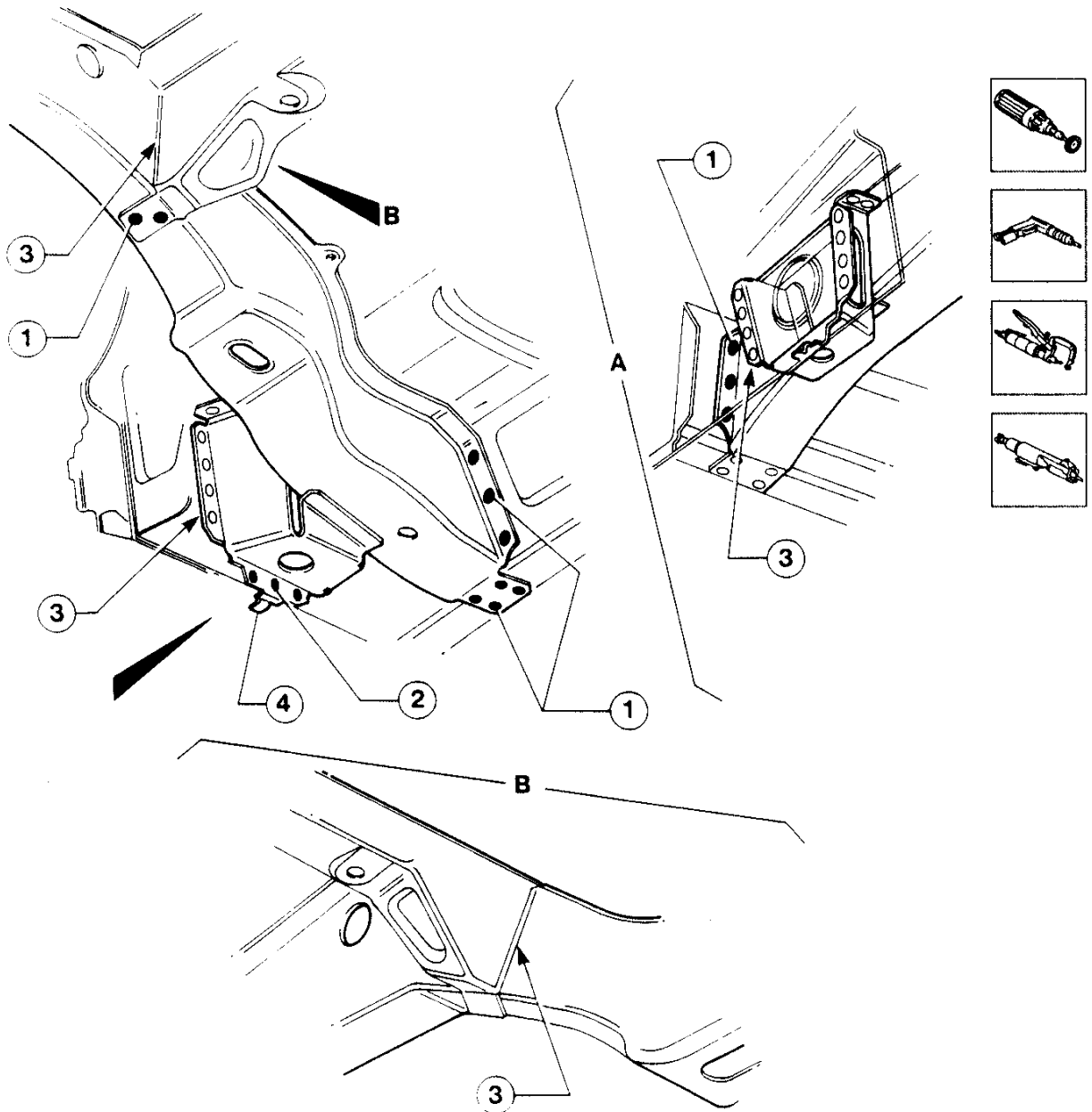
1. Remove the welds with a drill.





- Using a rotating brush, clean the areas to be chamfered in order to show up the welds.
- 1. Remove the welds with a drill.
- 2. Using a chamfering machine, remove the welds.

- 3. Remove the inaccessible welds with a chisel as indicated in the illustration.
- 4. Open the clinch tab.

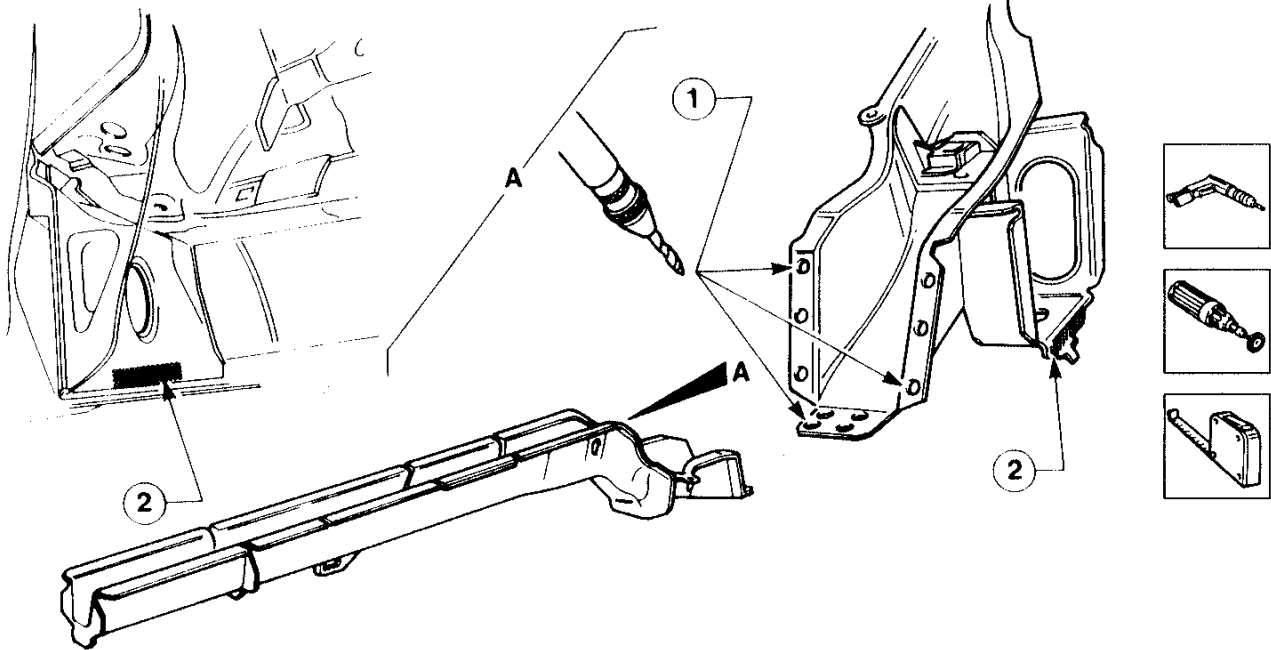




**Preparation**

1. Trace out the new rail and using a 5mm Ø bit, drill as shown in the illustration.

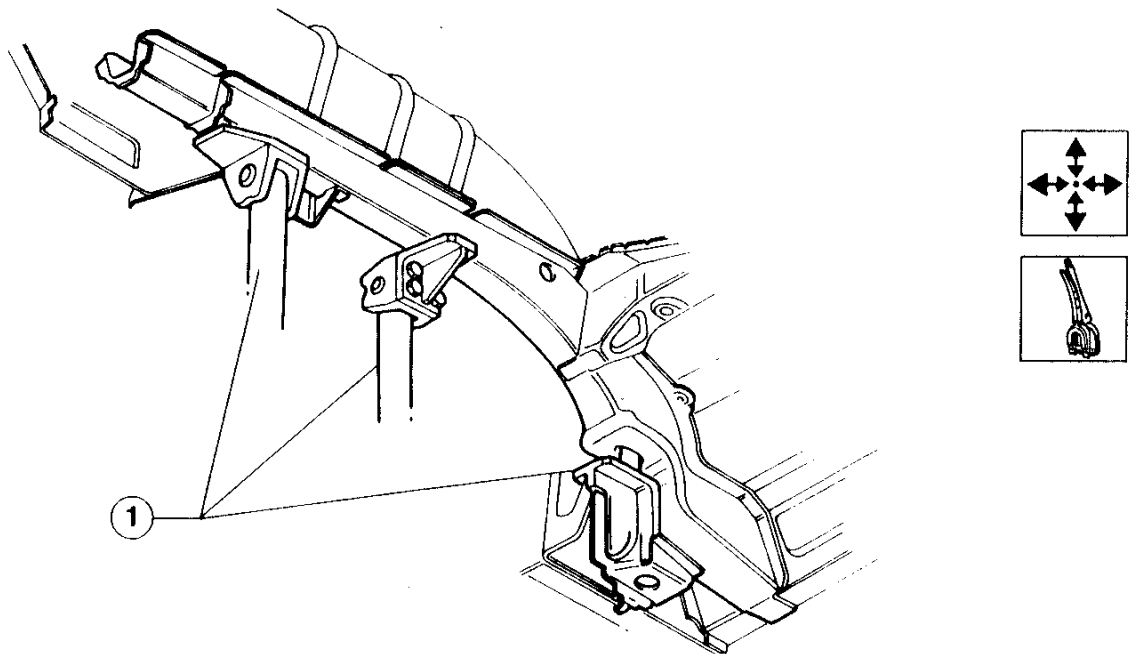
- Using a rotating brush, clean the welding areas on both the rail and the vehicle.
- 2. Spread electroweldable paste over the areas indicated in the illustration.



**Positioning**

1. Using the jig, correctly position the rail.

- Overlap and secure the components to be welded and mate the edges.





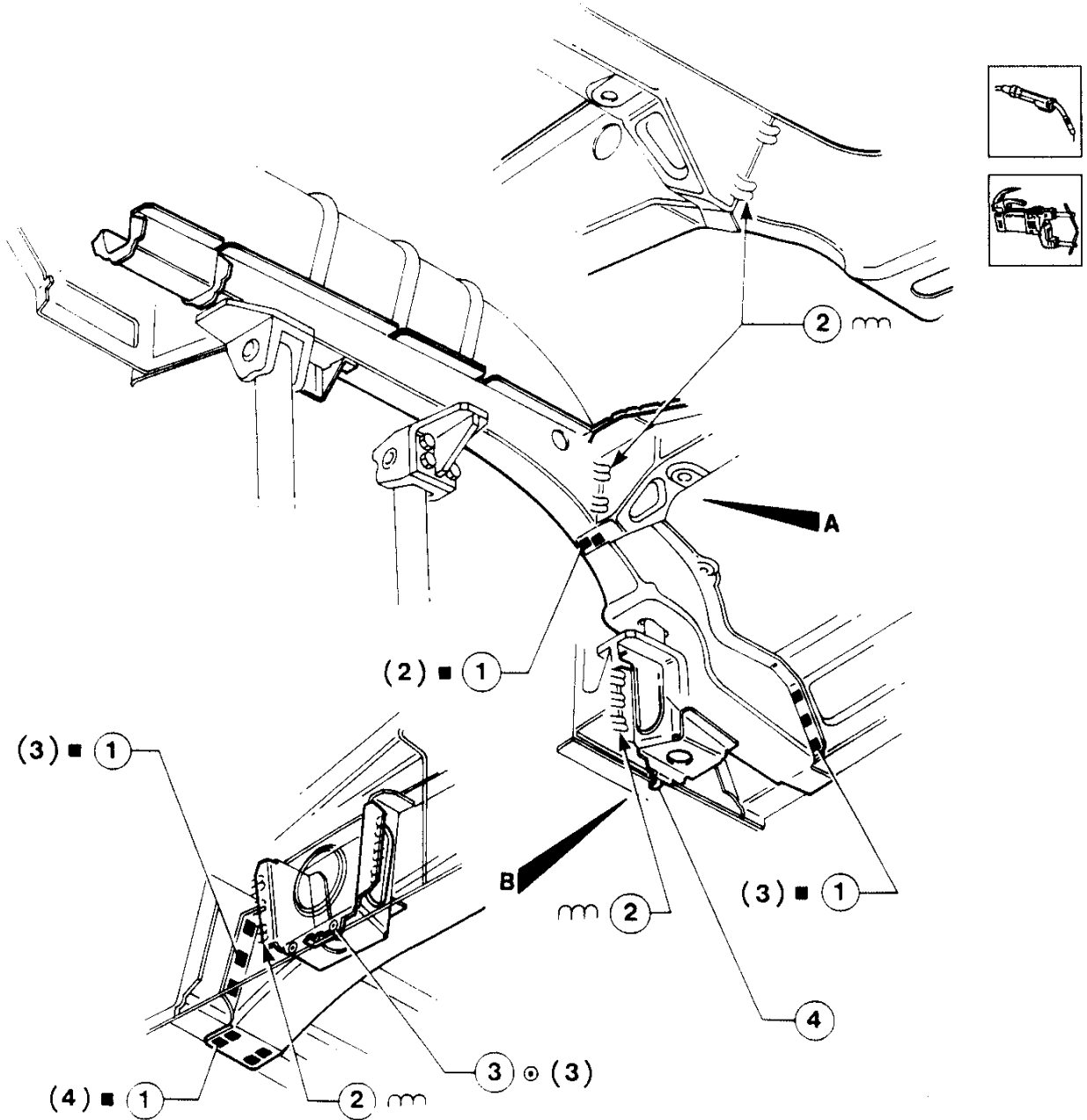
**Welding and finishing the sheet metal**

1. Carry out filling welding using a MIG welder.

2. Carry out seam welding using a MIG welder.

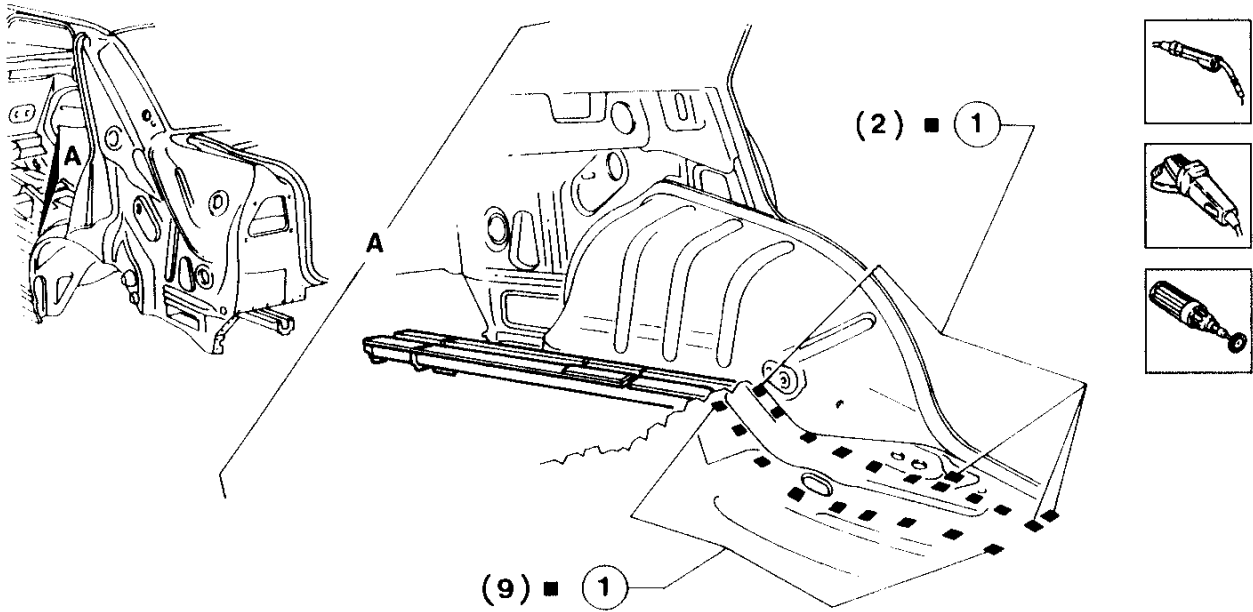
3. Using a spot welder, operate as indicated in the illustration.

4. Bend the clinch tab.





- 1. Using a MIG welder, carry out filling welding.
- Using an abrasive grinding wheel, remove and level the residues left by welding.
- Clean the welding areas with a rotating brush.

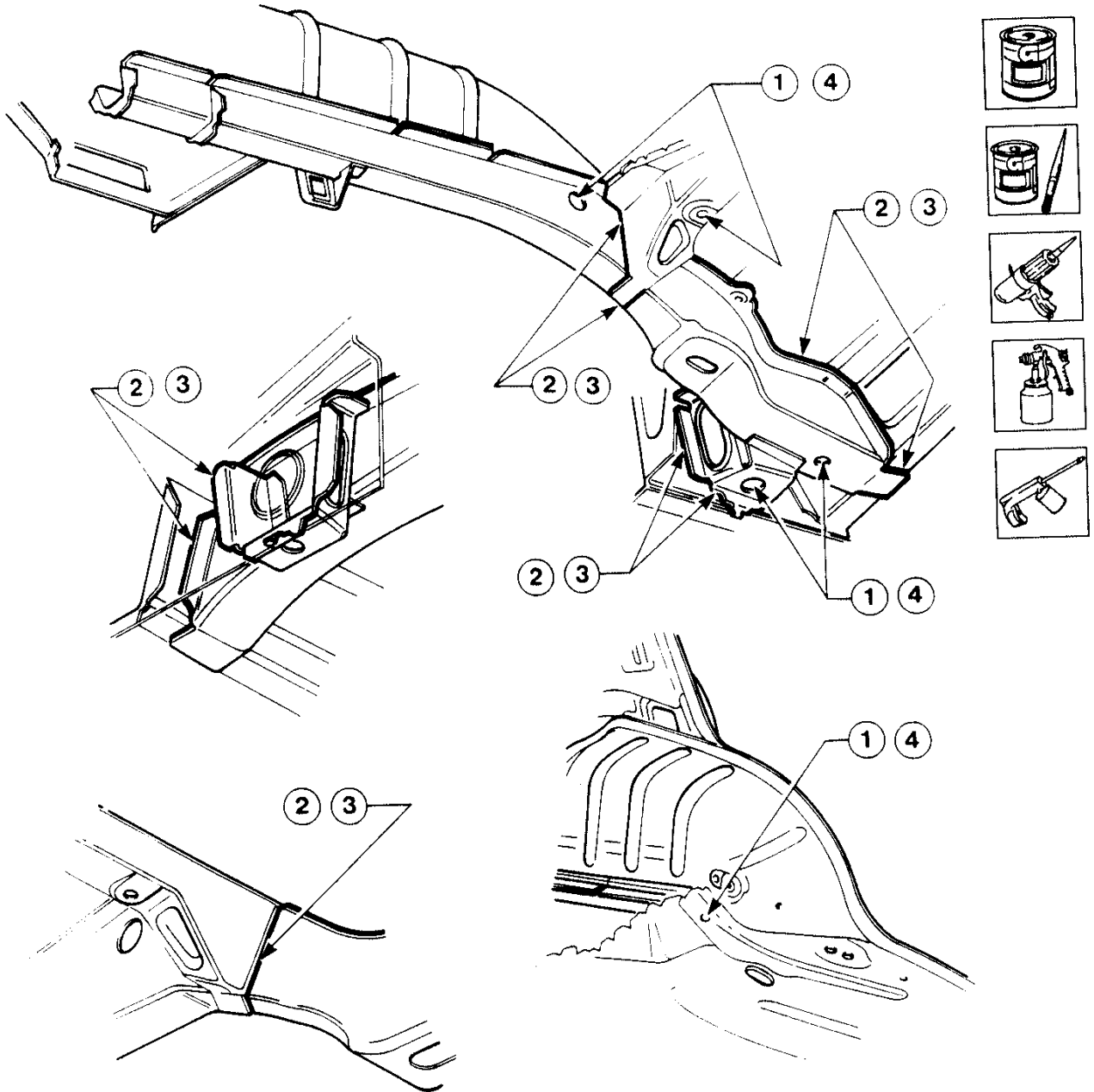






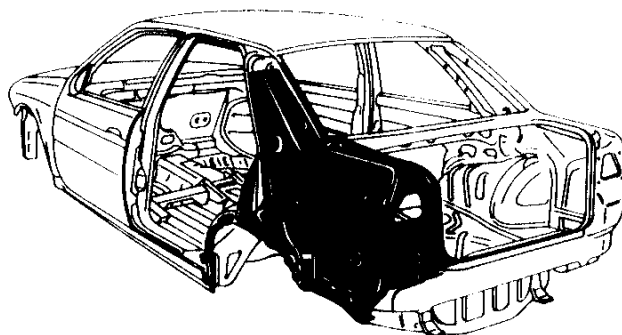
**Protection**

1. Apply Type A rust-proofing to the areas indicated in the illustration.
2. Apply Type A protection to the areas indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.

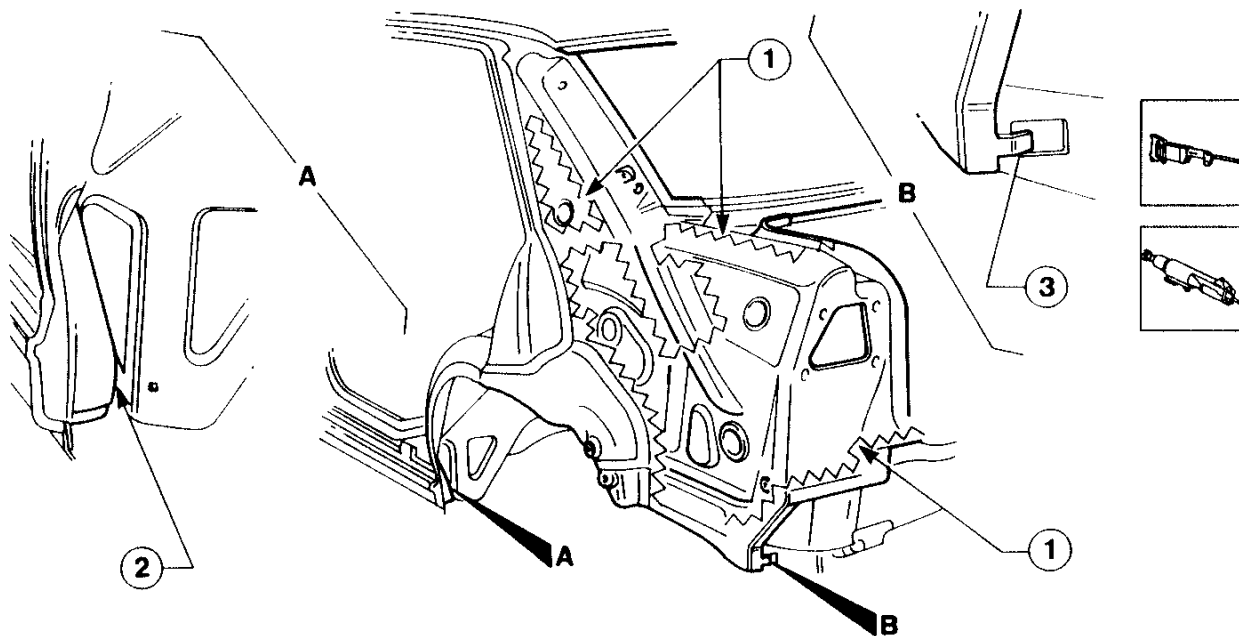


**COMPLETE INNER SIDE FRAME (skin)**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear bumper and external trim (see: GR. 75);
  - rear door (see: GR. 55);
  - boot lid (see: GR. 56);
  - rear wing (see: GR. 49 - REPLACING MOBILE PARTS);
  - luggage compartment trim (see: GR. 66);
  - rear windscreen (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).

**Removal**

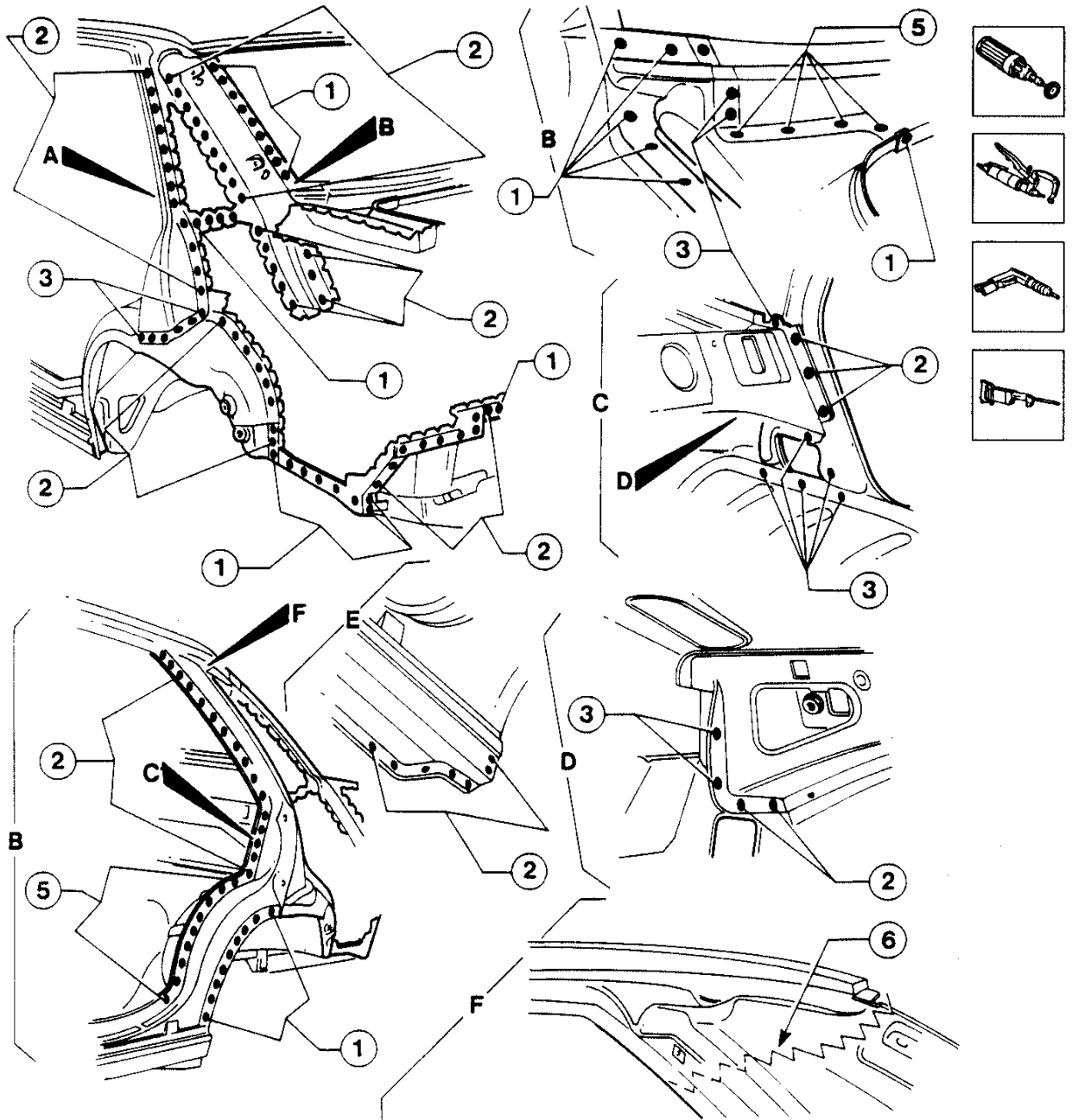
1. Using a jig saw make a discharge cut following the line indicated in the illustration without damaging the underlying parts.
2. Using a pneumatic chisel remove the welds shown in the illustration.
3. Open the clinch tab.





- Using a rotating brush, clean the areas to be chamfered in order to show up the welds.
- 1. Remove the welds with a chamfering machine.
- 2. Remove the welds from the inside of the vehicle using a chamfering machine.
- 3. Remove the welds with a drill.

- 4. Remove the welds shown by drilling clearance holes.
- 5. Using a jig saw cut along the lines indicated in the illustration without damaging the rear pillar.
- Withdraw the piece of sheet metal between the rear pillar and the inner frame.

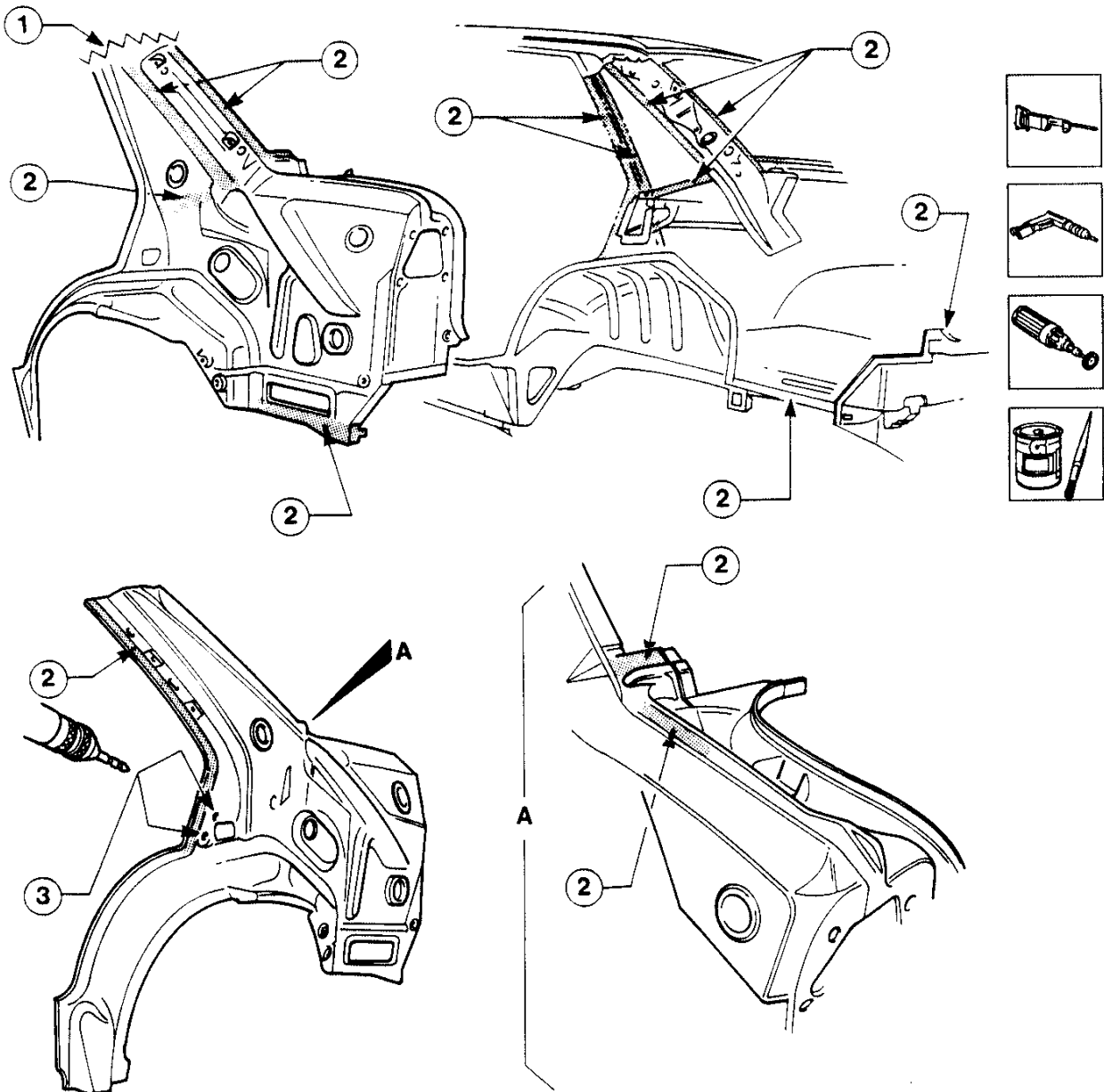




**Preparation**

1. Operating on a bench, and using a jig saw, cut the new side panel leaving enough margin to permit overlapping.
2. Using a drill, prepare the holes for MiG welding.

- Clean the welding areas on both the rear side panel and the vehicle using a rotating brush.
- 3. Spread the welding areas indicated in the illustration with Type A protection.

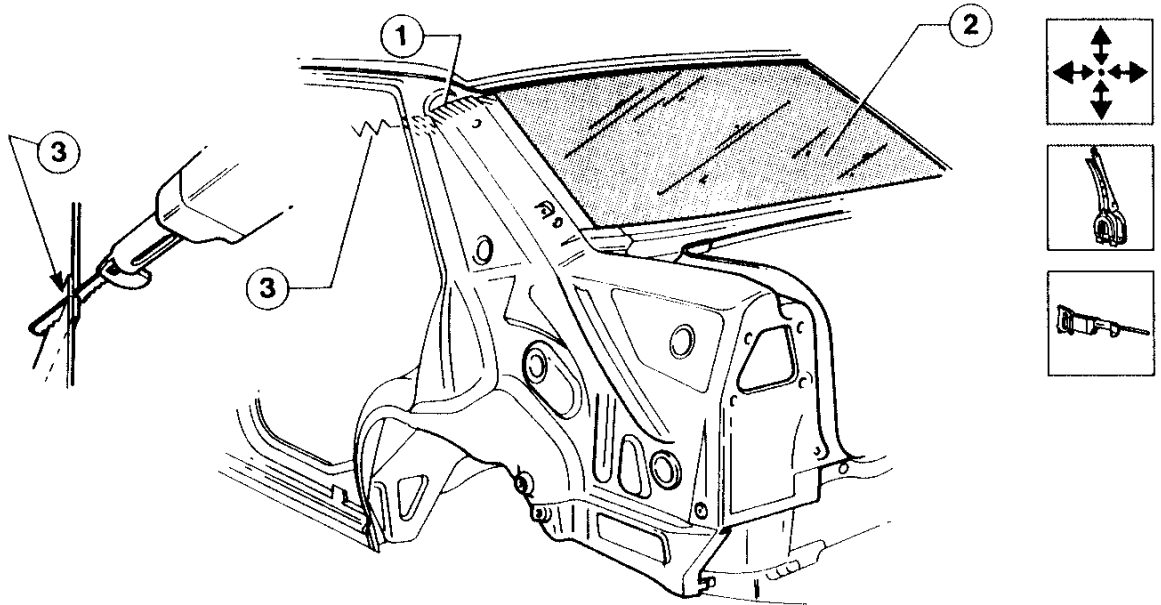




**Positioning**

1. Correctly position the rear side panel on the vehicle as shown in the illustration.
2. Using the rear windscreen as a guide, check the correct alignment of the glass housing.

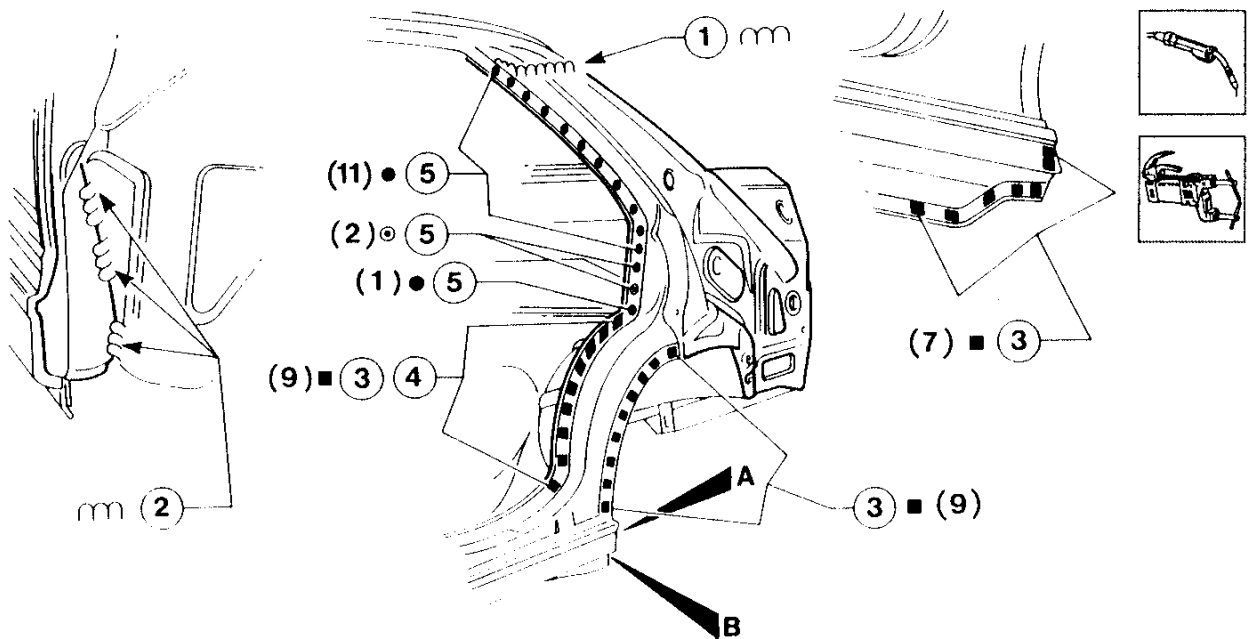
- Secure the components to be welded, mate the edges and check the alignment.
- 3. Using a jig saw, trim the metal sheet and remove the excess.



**Welding and finishing the metal sheet**

1. Carry out seam welding using a MIG welder.
2. Carry out intermittent welding using a MIG welder.
3. Carry out filling welding using a MIG welder.

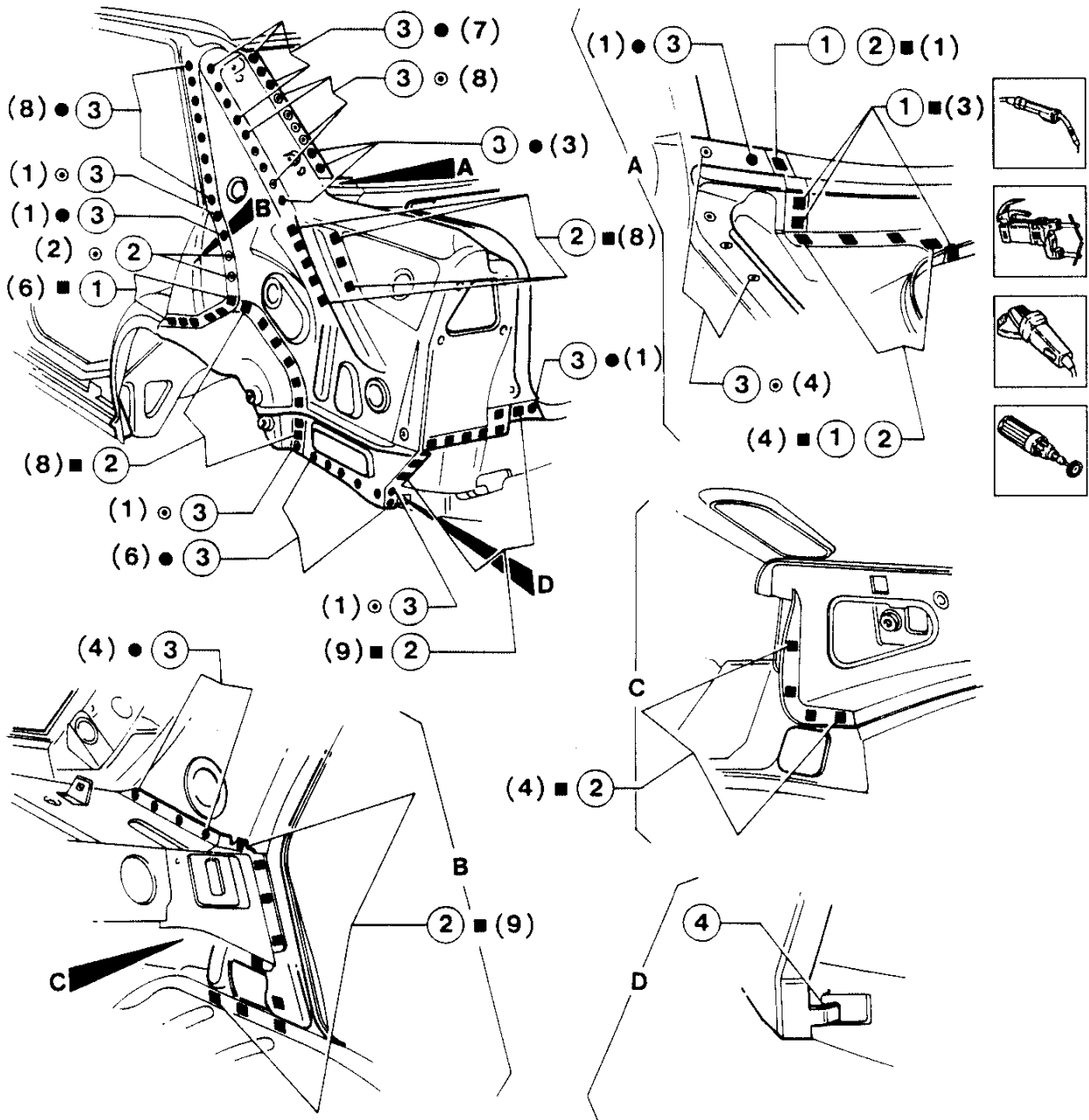
4. Operating inside the vehicle, carry out filling welding using a MIG welder.
5. Using a spot welder, operate as indicated in the illustration





1. Carry out filling welding using a MIG welder.
2. Operating inside the vehicle, carry out filling welding using a MIG welder.
3. Using a spot welder, operate as indicated in the illustration.

4. Bend the clinch tab.
  - Using an abrasive grinding wheel, remove and level the residues left by welding.
  - Clean the welding areas with a rotating brush.

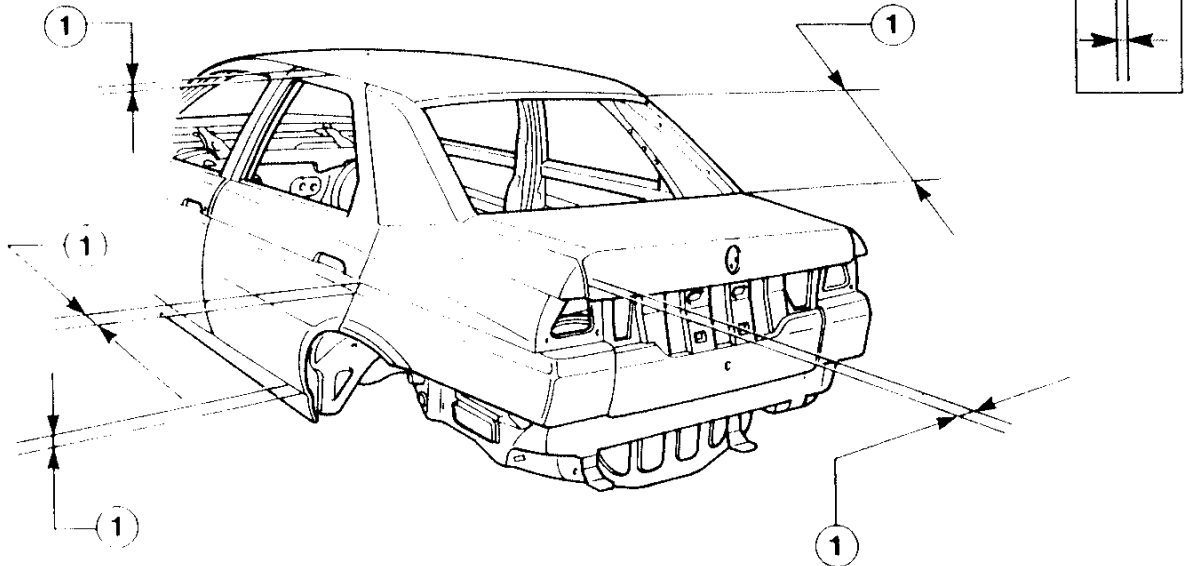




**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

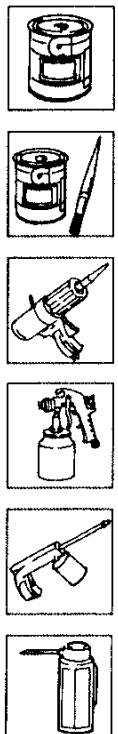
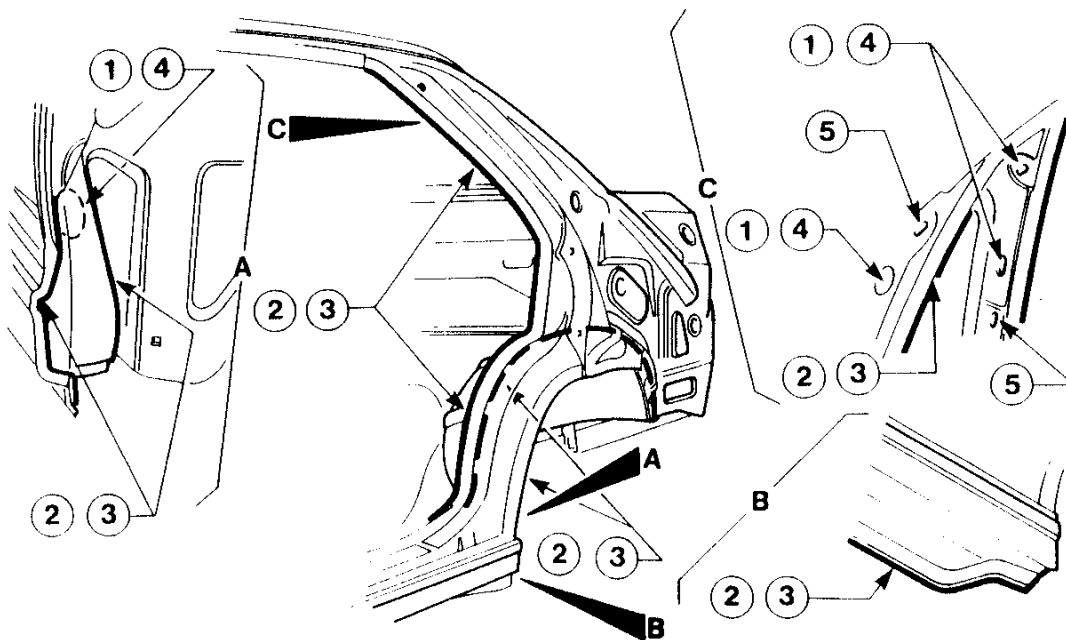
which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operations).



**Protection**

1. Apply Type A rust-proofing to the areas indicated in the illustration.
2. Apply Type A protection to the areas indicated in the illustration.

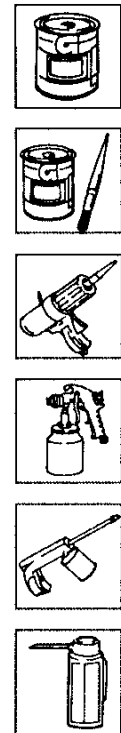
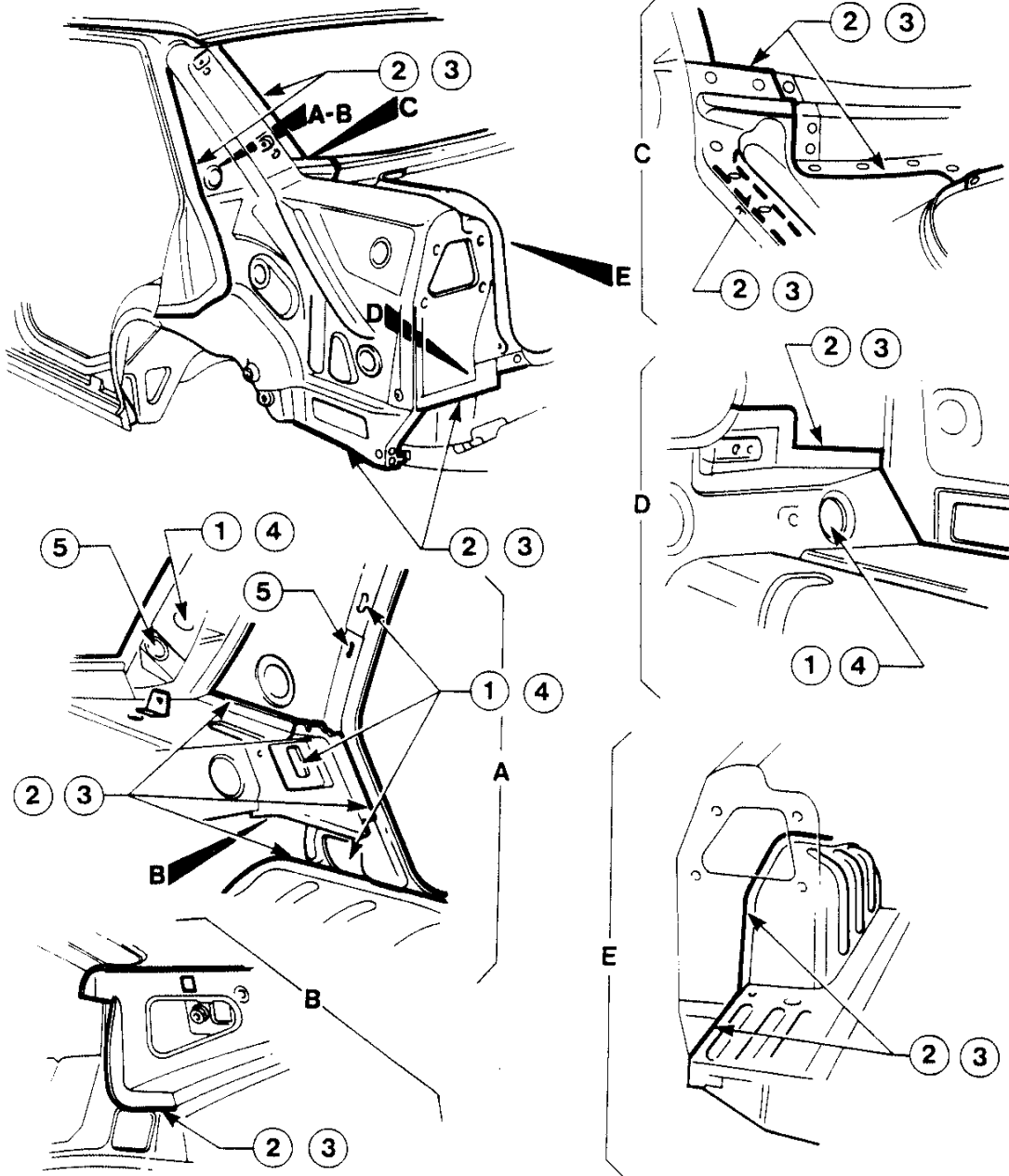
3. Apply Type A sealant to the areas indicated in the illustration.  
- Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.





1. Apply Type A rust-proofing to the areas indicated in the illustration.
2. Apply Type A protection to the areas indicated in the illustration.

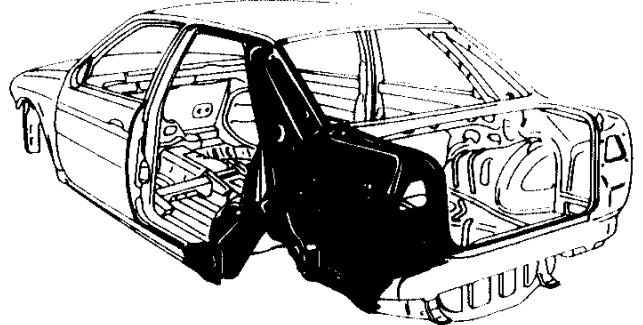
3. Apply Type A sealant to the areas indicated in the illustration.  
- Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase





**COMPLETE SIDE FRAME**

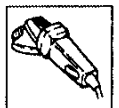
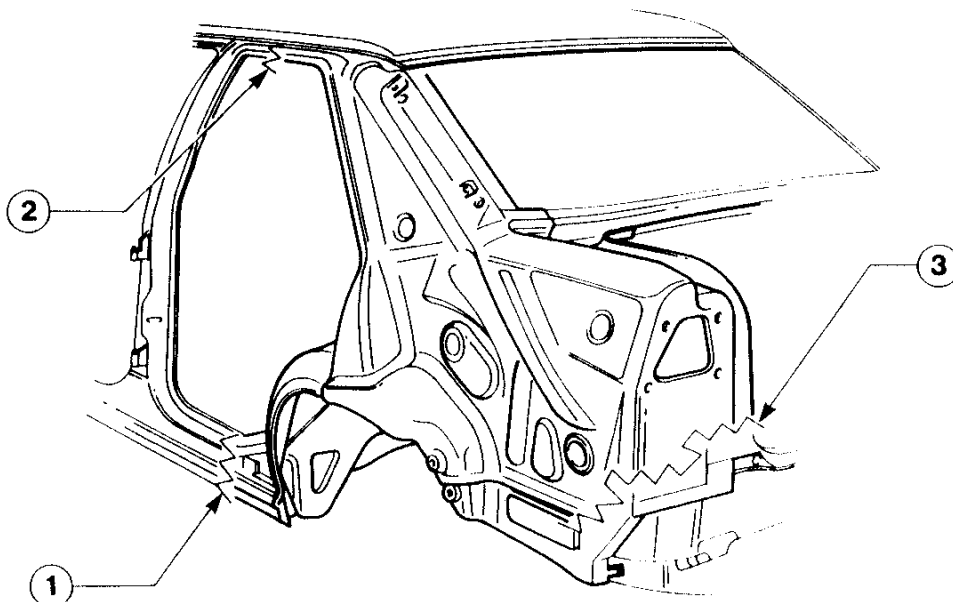
- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear bumper and external trim (see: GR. 75);
  - rear door (see: GR. 55);
  - rear wing (see: GR. 49 - REPLACING MOBILE PARTS);
  - rear pillar trim (see: GR. 66);
  - roof panel, seats and internal trim (see: GR. 66).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

1. Using a jig saw cut along the lines shown in the illustration without damaging the underlying parts, see removal of rear pillar.
- 2.

Using a circular saw cut the side panel (skin) following the line indicated in the illustration without damaging the underlying parts.

3. Using a jig saw cut along the lines indicated in the illustration.

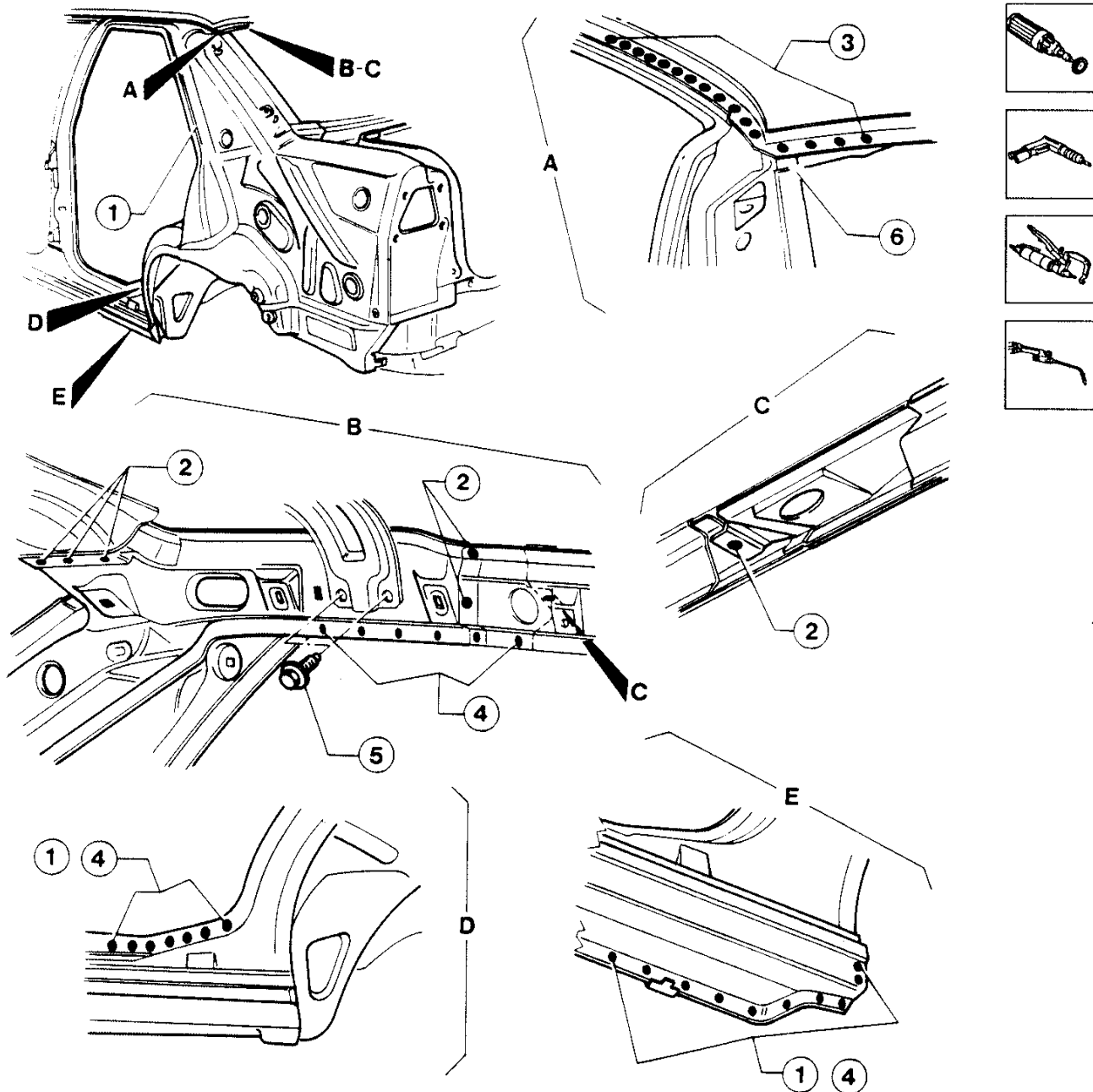




**Removal**

- Using a rotating brush, clean the welding areas to show up the welds.
- 1. See removal of rear pillar.
- 2. Using a drill, remove the welds.

- 3. Using a chamfering machine, remove the welds without damaging the roof panel.
- 4. Using a chamfering machine, remove the welds.
- 5. Remove the two screws from the hoop.
- 6. Using an oxyacetylene torch, unweld the side panel from the roof.



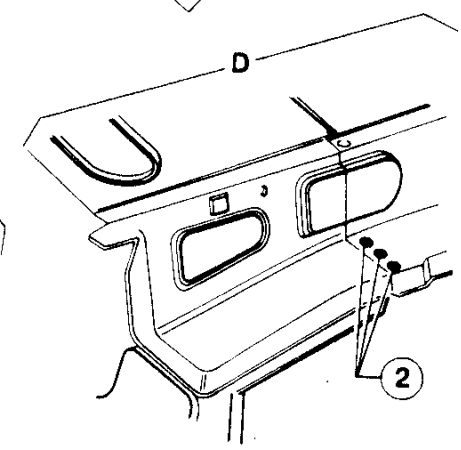
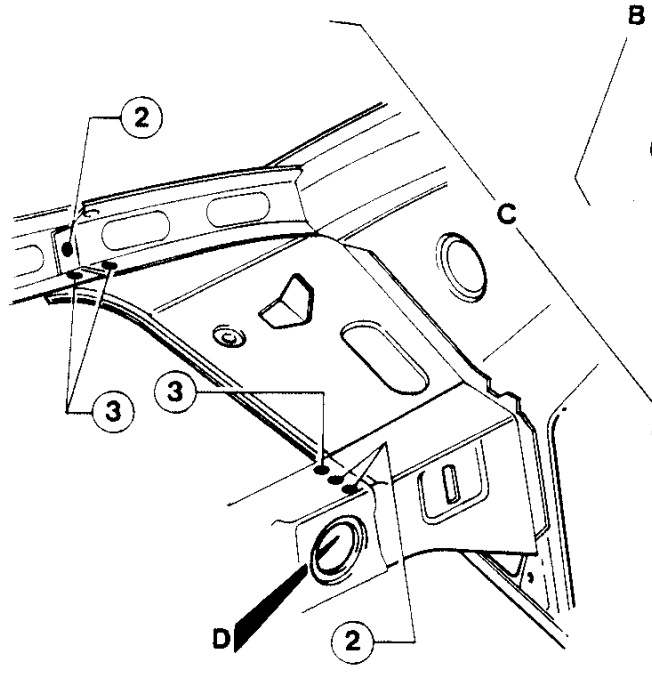
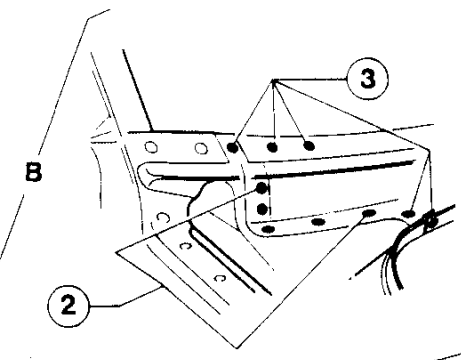
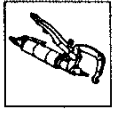
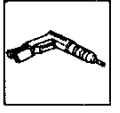
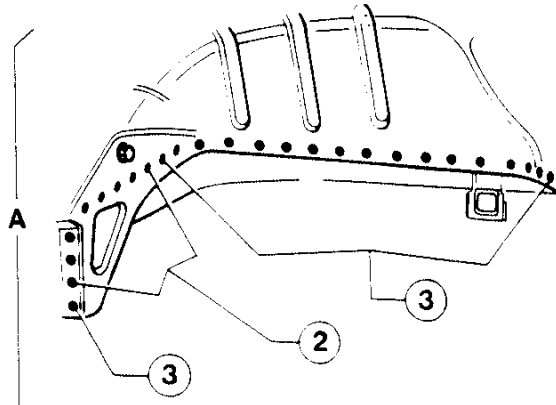
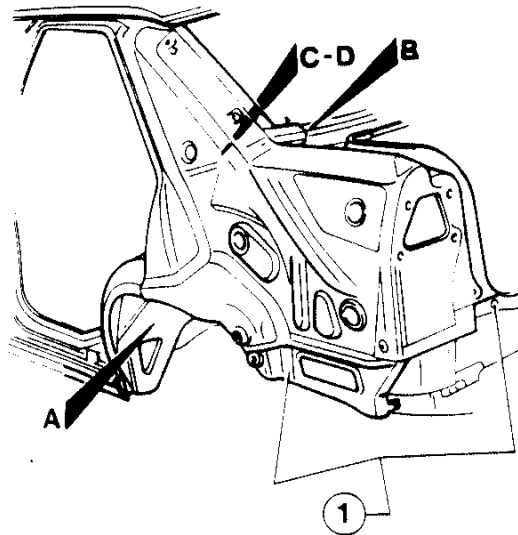


**Removal**

1. See removal of INNER SIDE FRAME (skin).

2. Remove the welds using a drill.

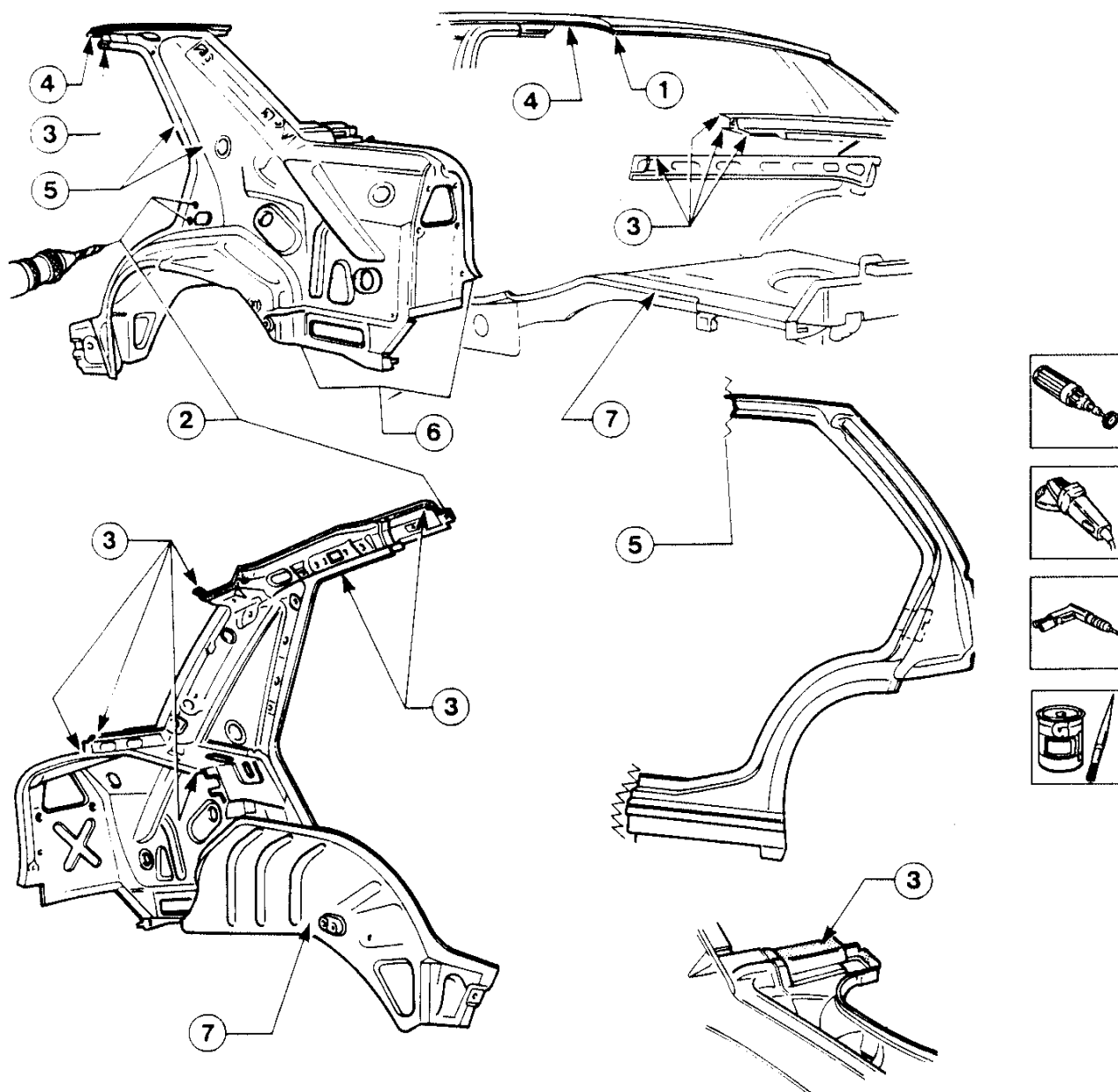
3. Remove the welds using a chamfering machine.



**Preparation**

- Using a rotating brush, clean the welding areas on the new side panel and on the vehicle.
- 1. Using an abrasive grinding wheel, remove and level the welding residues.
- 2. Prepare the holes for MIG welding using a drill.
- 3. Spread Type A electroweldable protection on the areas indicated in the illustration.

- 4. Spread Type A electroweldable paste on the areas indicated in the illustration.
- 5. See preparation of REAR PILLAR taking into consideration the position of the cut on the upper part of the pillar.
- 6. See preparation of INNER SIDE FRAME (skin).
- 7. See preparation of COMPLETE INNER WHEEL HOUSING.

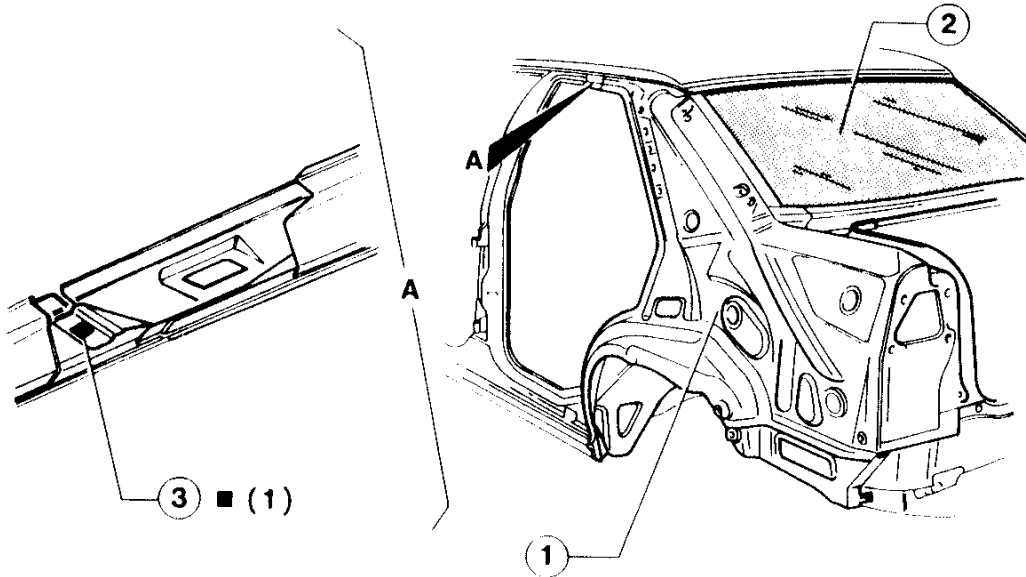




**Positioning the side panel**

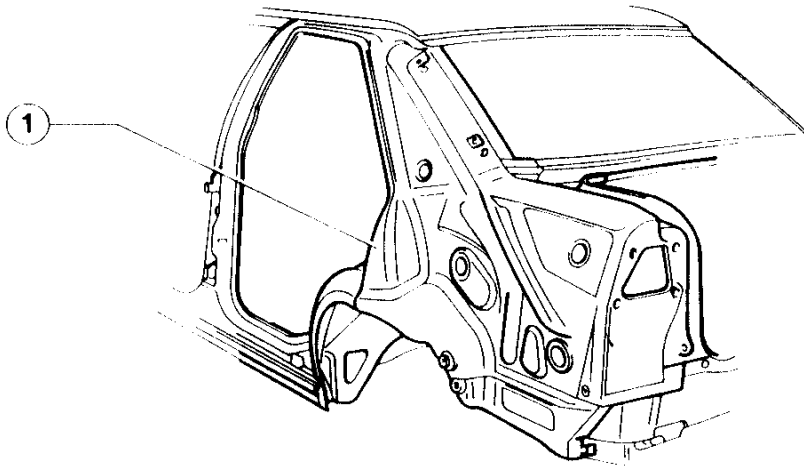
1. Correctly position the side panel on the vehicle.
2. Using the rear windscreen as a guide check the correct alignment of the window seating.

- Fix the components to be welded matching the surfaces and checking alignment.
- 3. Using a MIG welder carry out filling welding.



**Positioning the rear pillar**

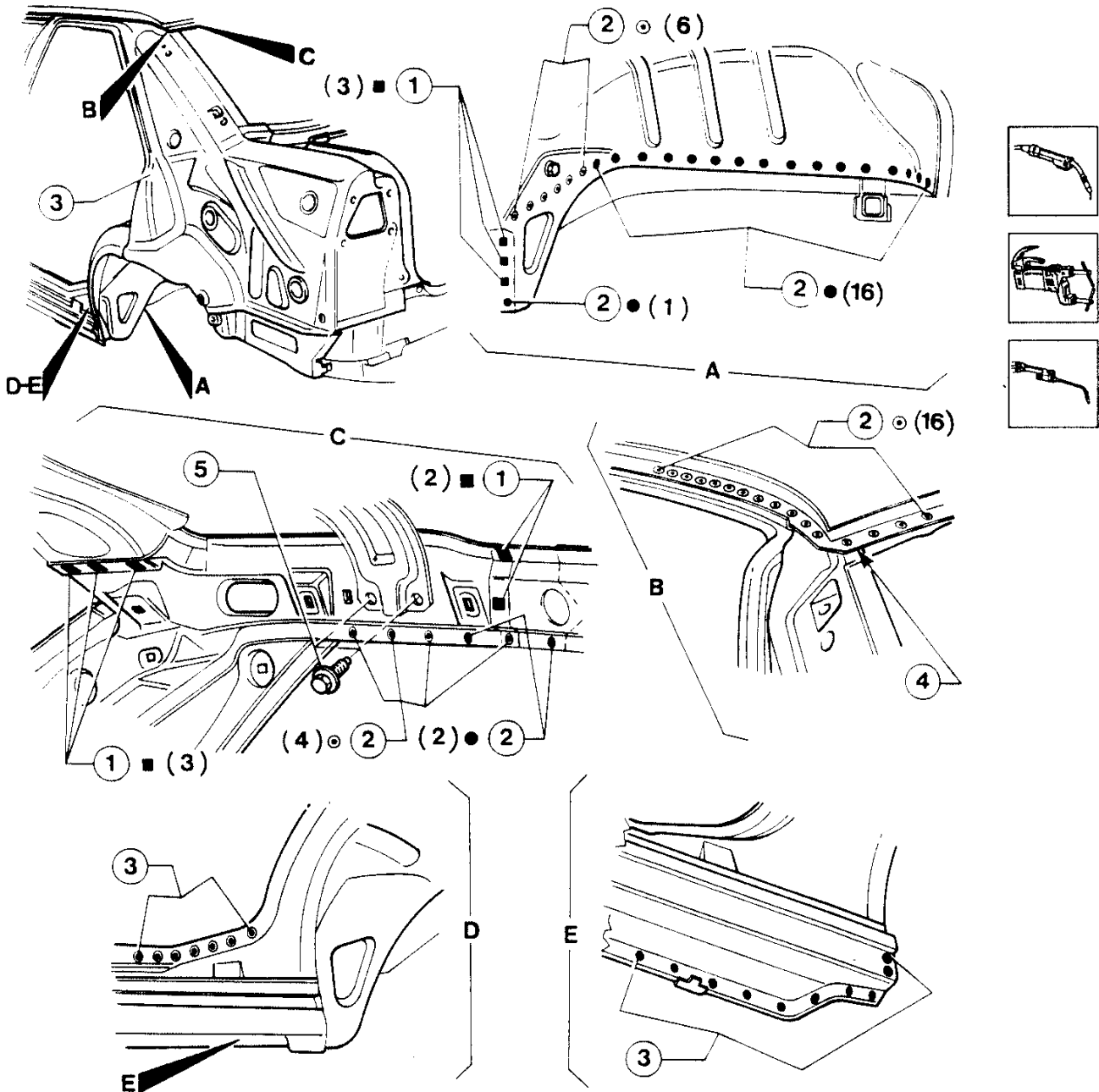
- See REAR PILLAR.





**Welding**

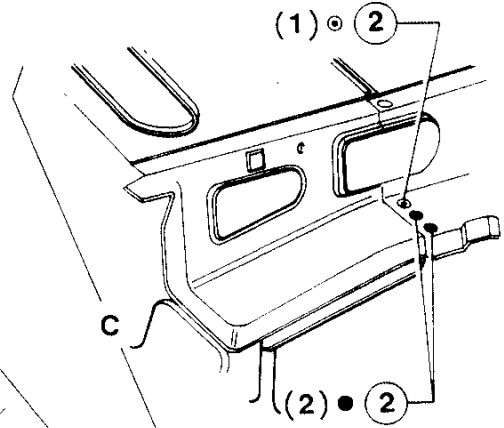
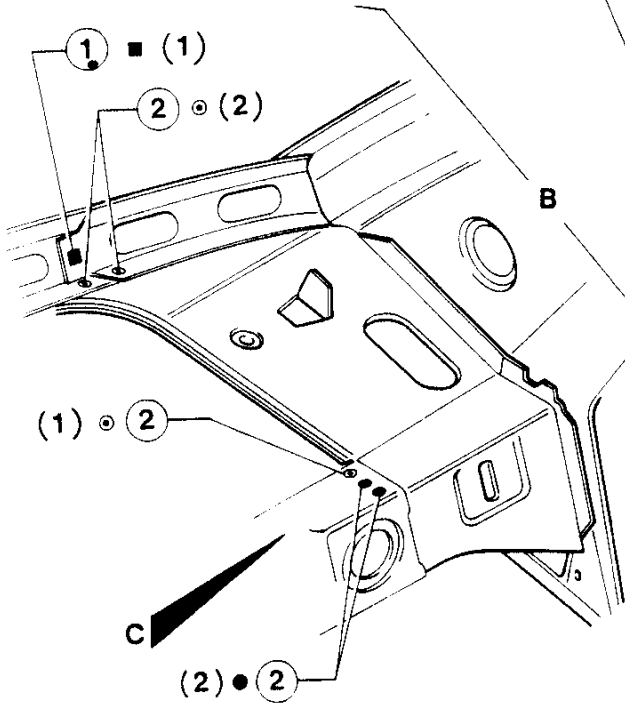
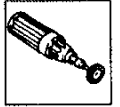
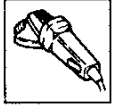
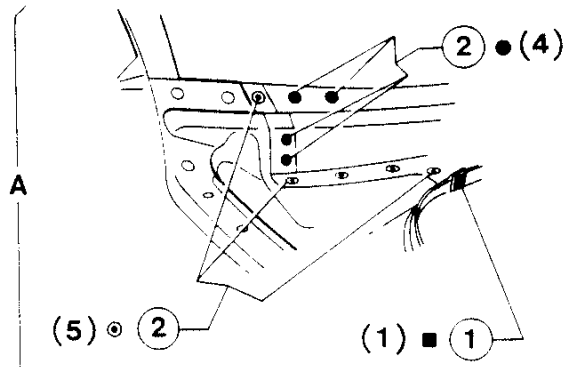
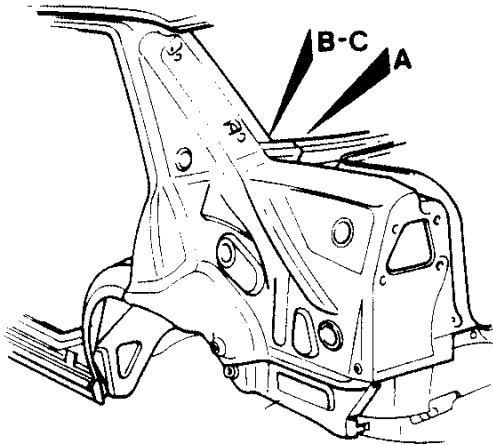
1. Using a MIG welder carry out filling welding.
2. Using a spot welder, weld as shown in the illustration.
3. See welding and finishing of REAR PILLAR sheet metal.
4. Braze-weld the corner of the roof panel to the side panel as indicated in the illustration.
5. Secure the hoop with two screws.





1. Using a MIG welder carry out filling welding.
2. Using a spot welder, weld as shown in the illustration.
3. See welding and finishing of COMPLETE SIDE FRAME sheet metal (skin).

- Using an abrasive grinding wheel remove and level the welding residues.
- Using a rotating brush clean the welding areas.

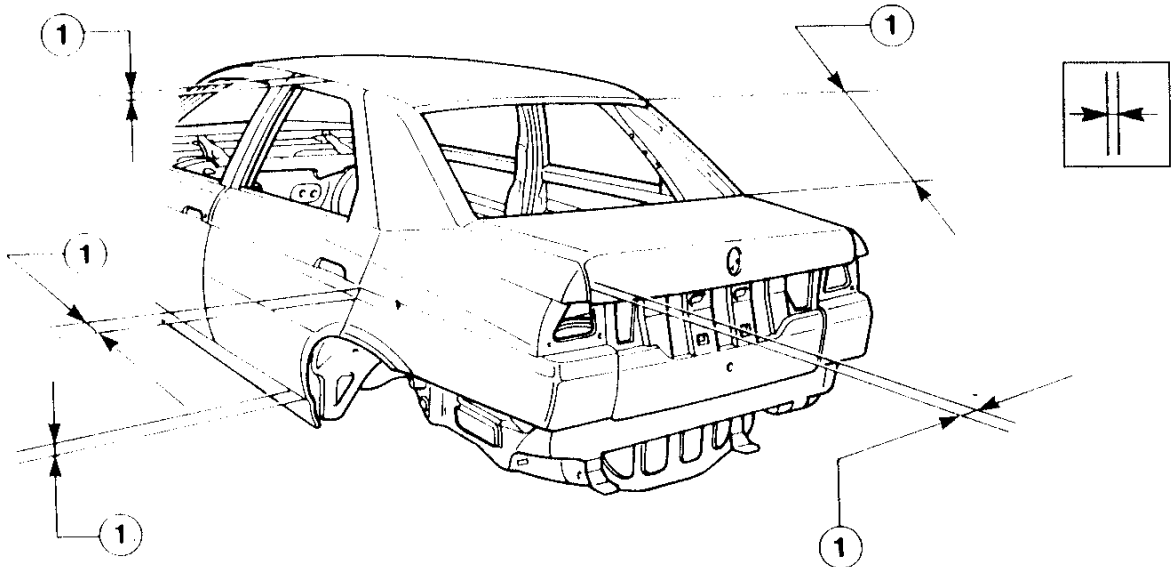




**Checking**

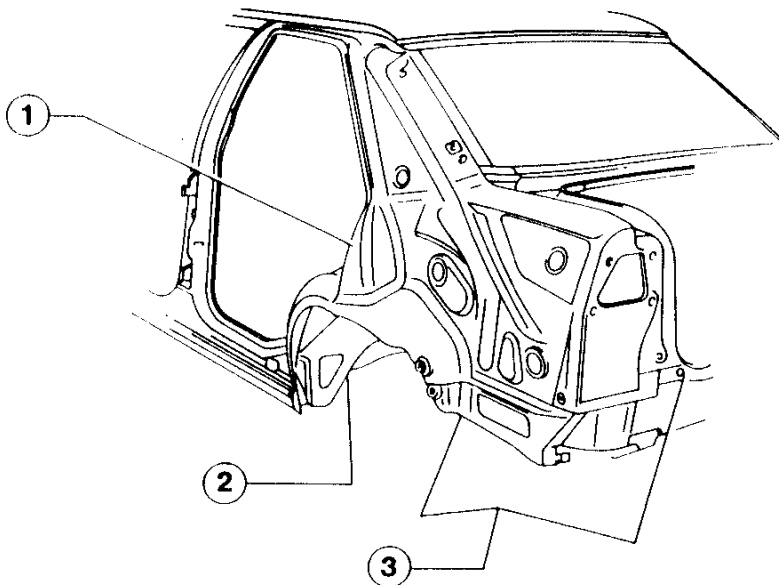
1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

which were previously removed along with the gaskets and parts which, when installed, will make it possible to check the success of the operations).



**Protection**

1. See REAR PILLAR protection.
2. See COMPLETE INNER WHEEL HOUSING protection.
3. See COMPLETE INNER SIDE FRAME (skin) protection.

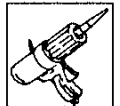
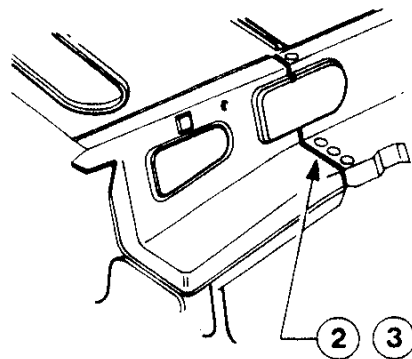
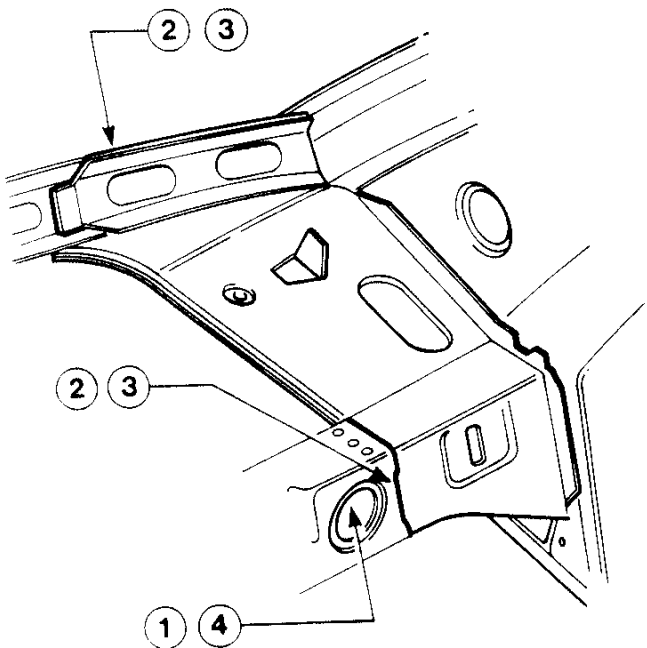
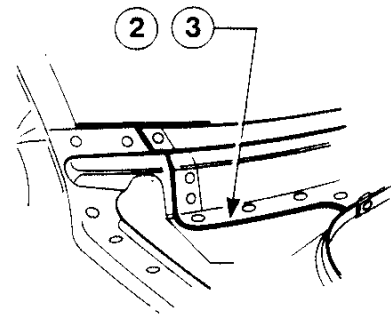
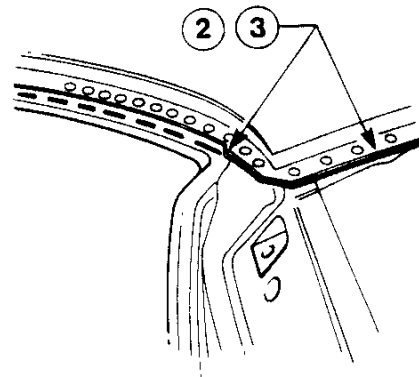
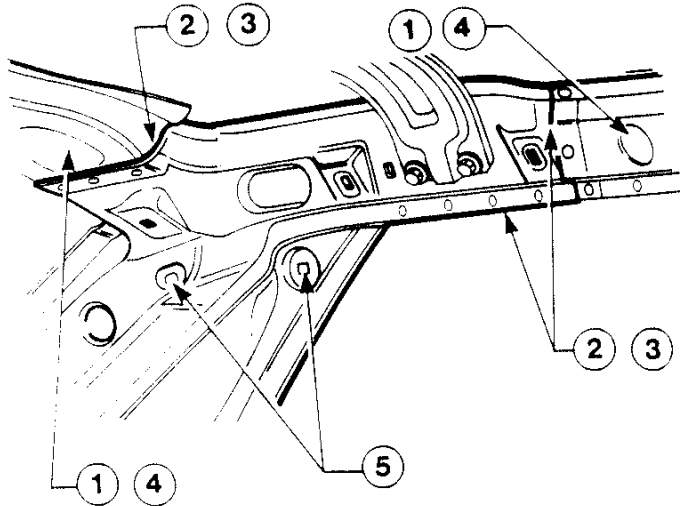






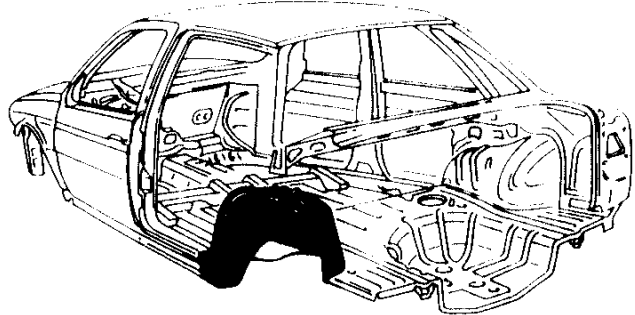
**Protection**

1. Apply Type A rustproofing to the areas indicated in the illustration.
2. Apply Type A protection to the areas indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.  
– Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.



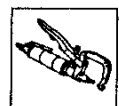
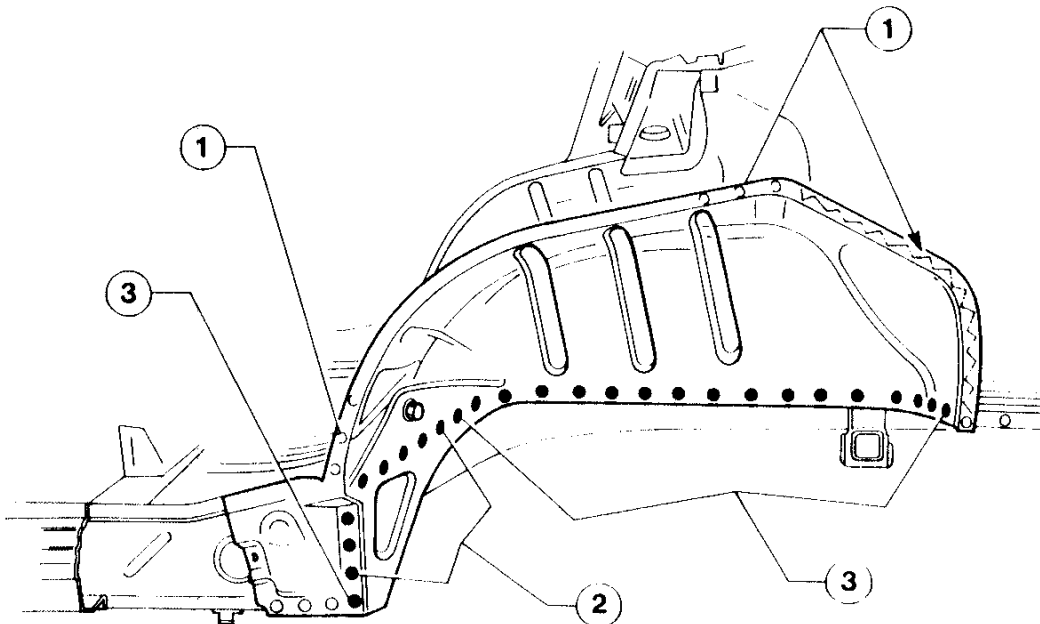
**COMPLETE INNER WHEEL HOUSING (pillar and rear side panel removed)**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - rear bumper and external trim (see: GR. 75);
  - rear door (see: GR. 55);
  - boot lid (see: GR. 56);
  - rear wing (see: GR. 49 - REPLACING MOBILE COMPONENTS);
  - luggage compartment trim (see: GR. 66);
  - rear windscreen (see: GR. 75).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

1. Removal of weld points and the discharge cut shown in the figure are to be carried out when removing the rear side panel.
- Using a rotating brush, clean the area to be chamfered in order to show up the welds.

2. Using a drill, remove the welds.
3. Using a chamfering machine, remove the welds.

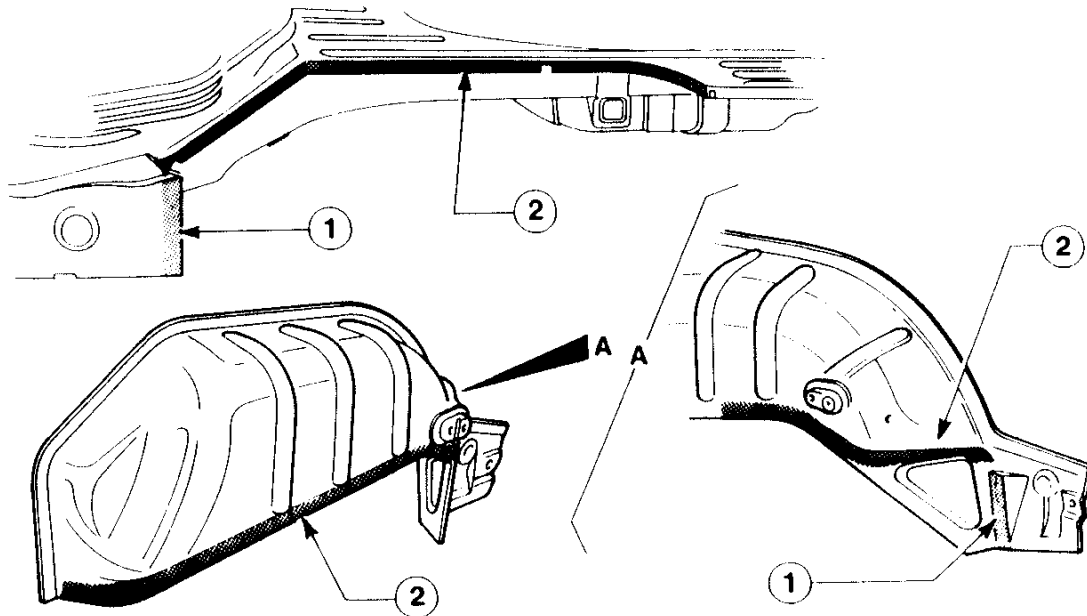




**Preparation**

- Using a rotating brush, clean the welding areas on the vehicle and on the wheel housing.

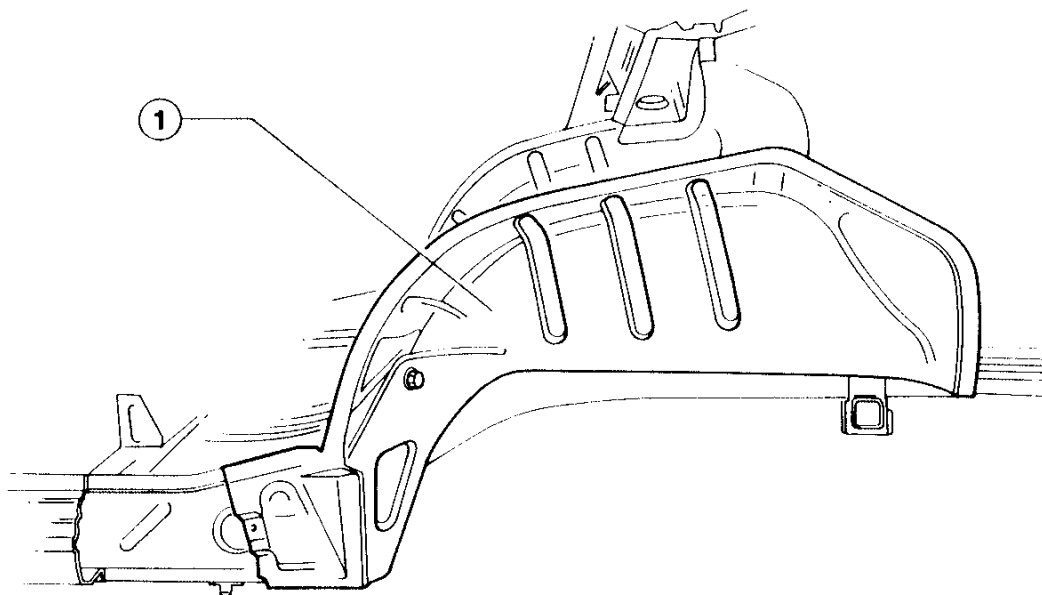
1. Spread Type B electroweldable protection on the areas shown in the illustration.
2. Spread Type A electroweldable protection on the areas shown in the illustration.



**Positioning**

1. Correctly position the new wheel housing on the

vehicle, secure the components to be welded and mate the edges.

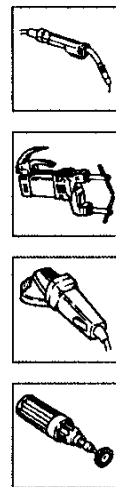
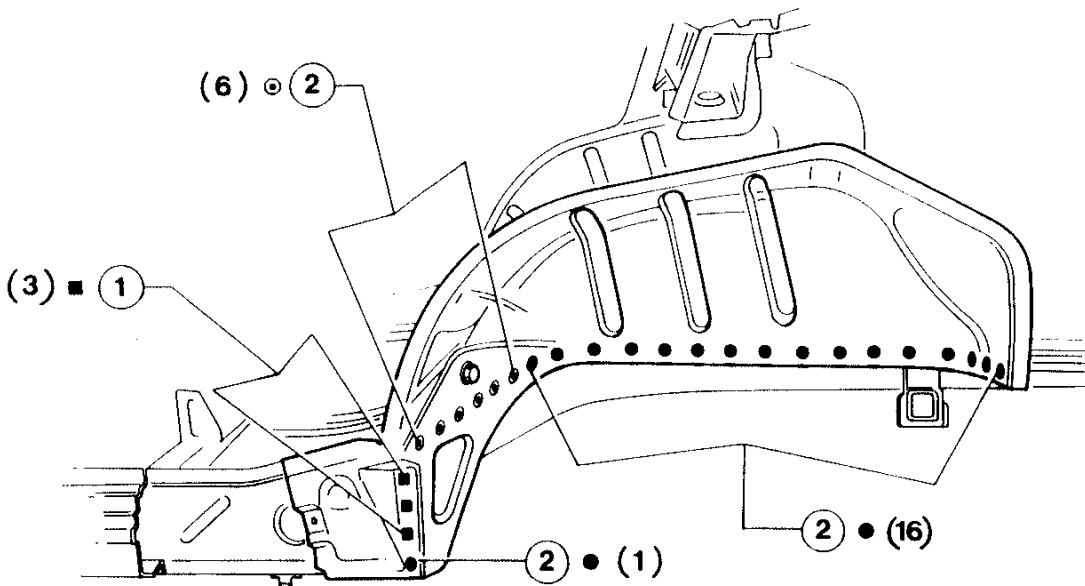




**Welding and finishing the sheet metal**

1. Using a MIG welder, carry out filling welding.
2. Using a spot welder operate as indicated in the illustration.

- Using an abrasive grinding wheel remove and level the residues left by welding.
- Using a rotating brush, clean the welding areas.

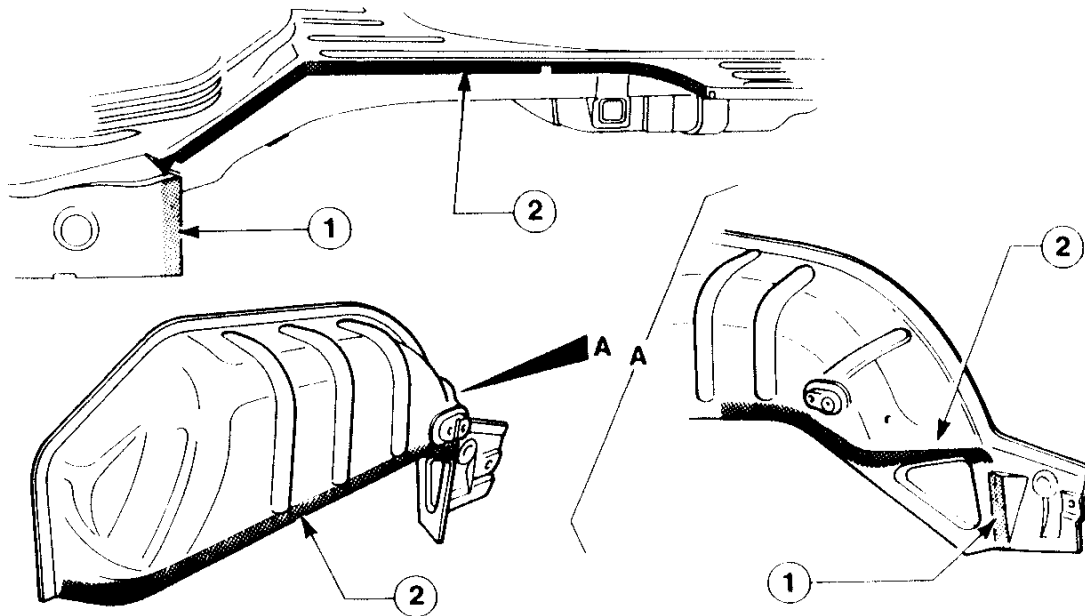




**Preparation**

- Using a rotating brush, clean the welding areas on the vehicle and on the wheel housing.

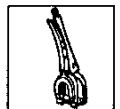
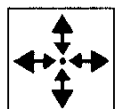
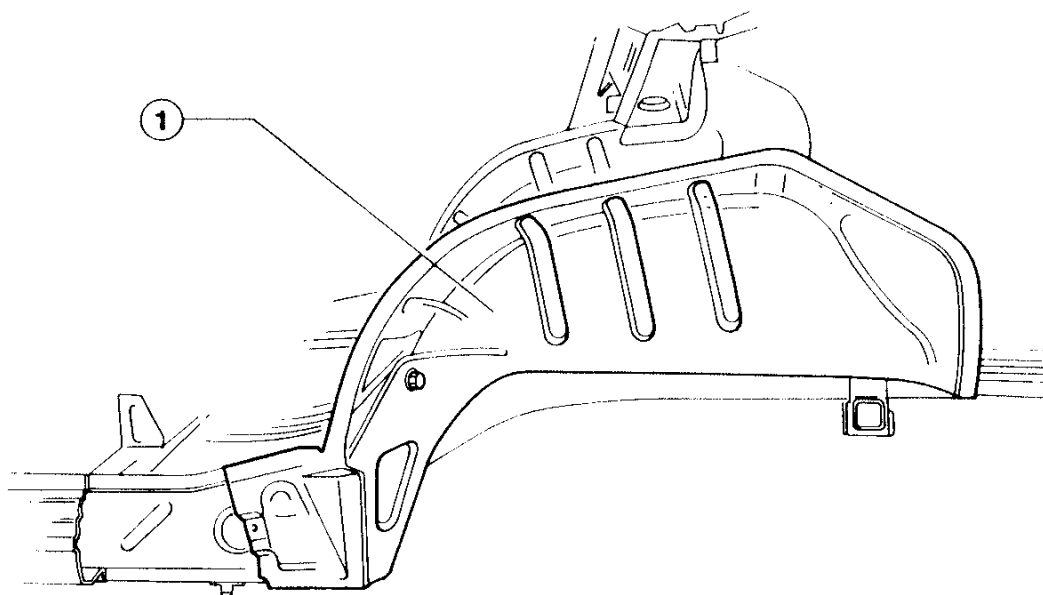
1. Spread Type B electroweldable protection on the areas shown in the illustration.
2. Spread Type A electroweldable protection on the areas shown in the illustration.



**Positioning**

1. Correctly position the new wheel housing on the

vehicle, secure the components to be welded and mate the edges.

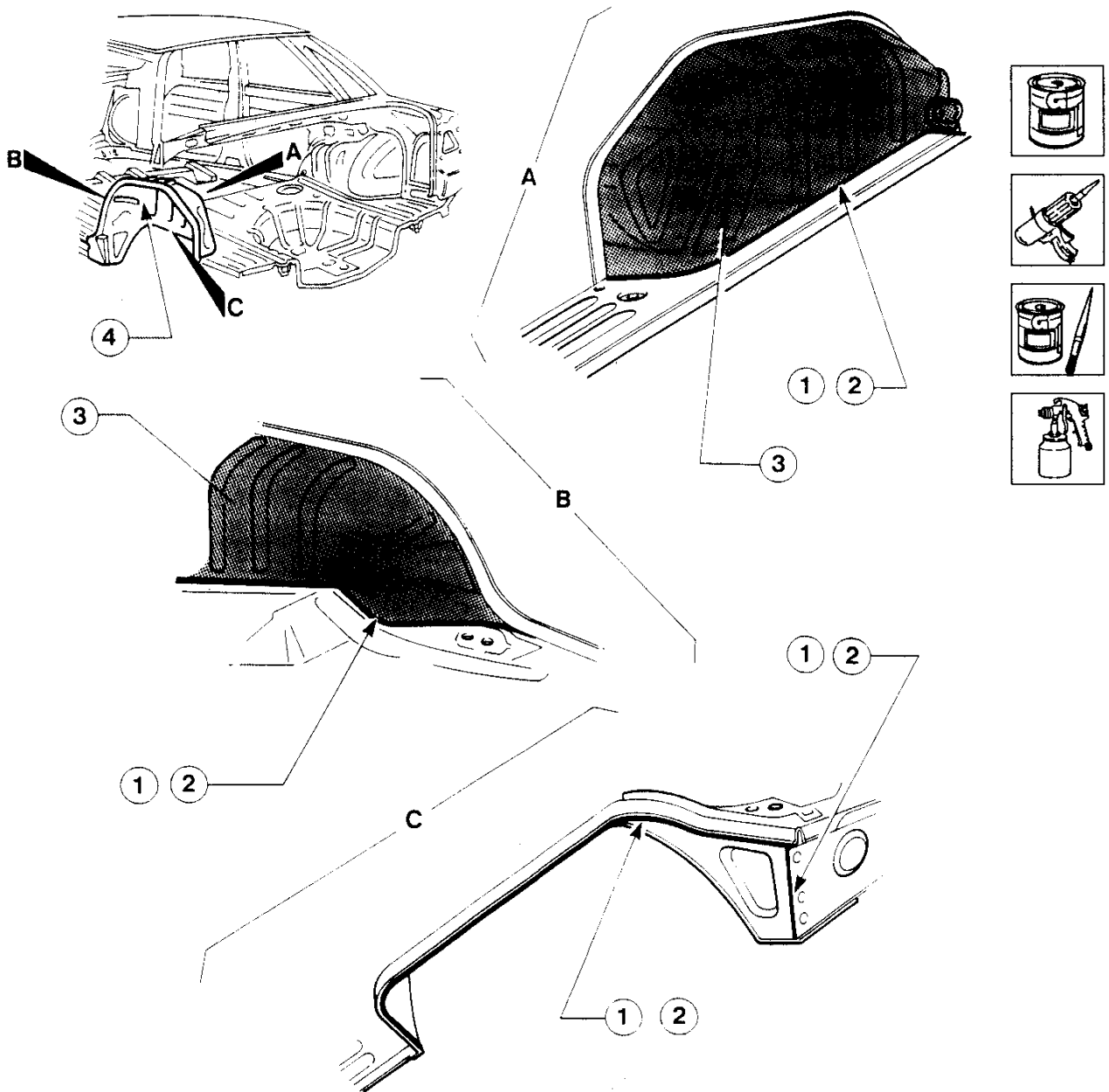




**Protection**

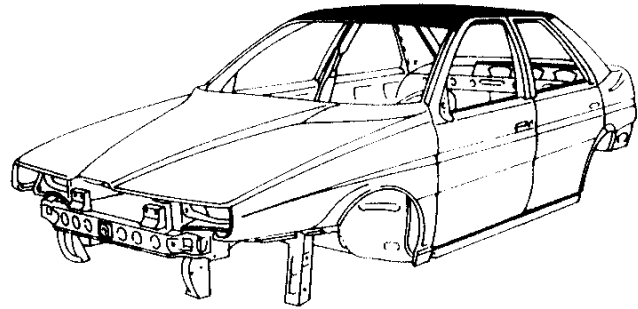
1. Spread the areas shown in the illustration with type A rust-proofing.
2. Apply Type A sealant to the areas shown in the illustration.

3. Apply Type A soundproofing to the areas shown in the illustration.
  4. Apply Type A underbody protection to the areas shown in the illustration.
- Proceed to the painting phase.



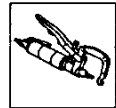
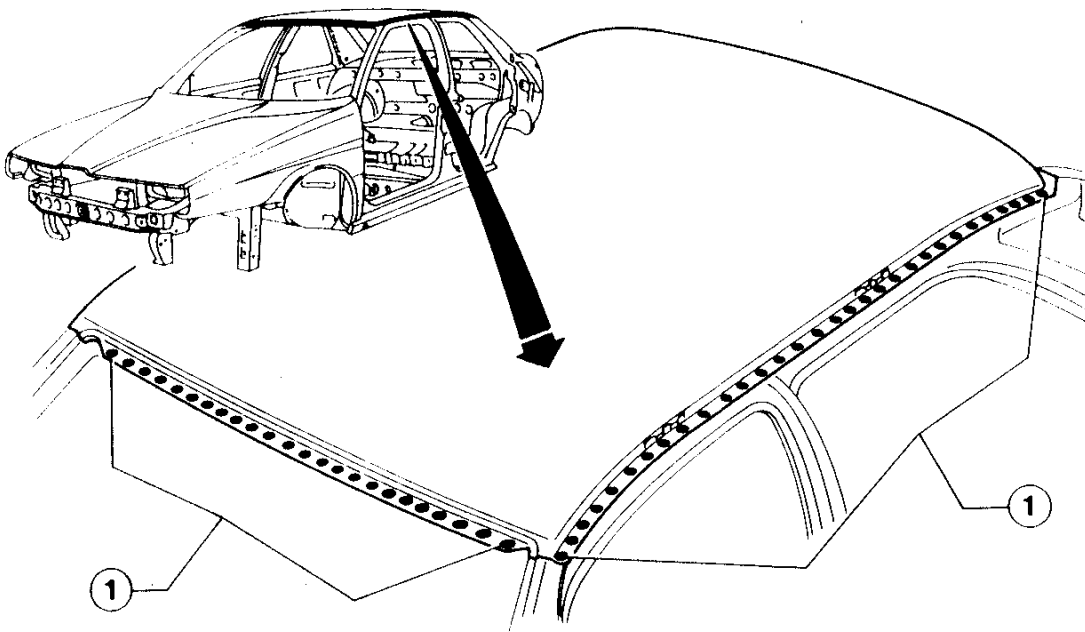
**ROOF PANEL**

- In order to facilitate the successive operations, the following components should be removed temporarily:
  - front and rear doors (see: GR. 55);
  - internal trim (see: GR. 66);
  - external trim (see: GR. 75);
  - rear and front windscreens (see: GR. 75).
- Disconnect the battery and the control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.

1. Using a chamfering machine remove the welds along the perimeter of the roof panel.

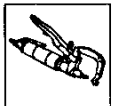
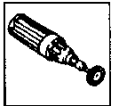
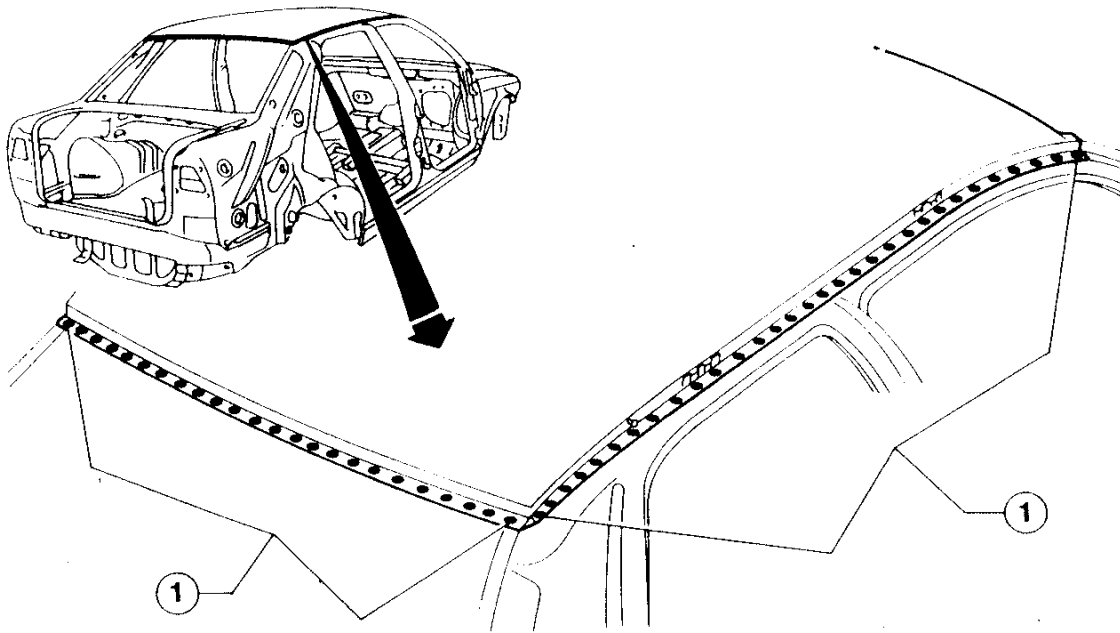




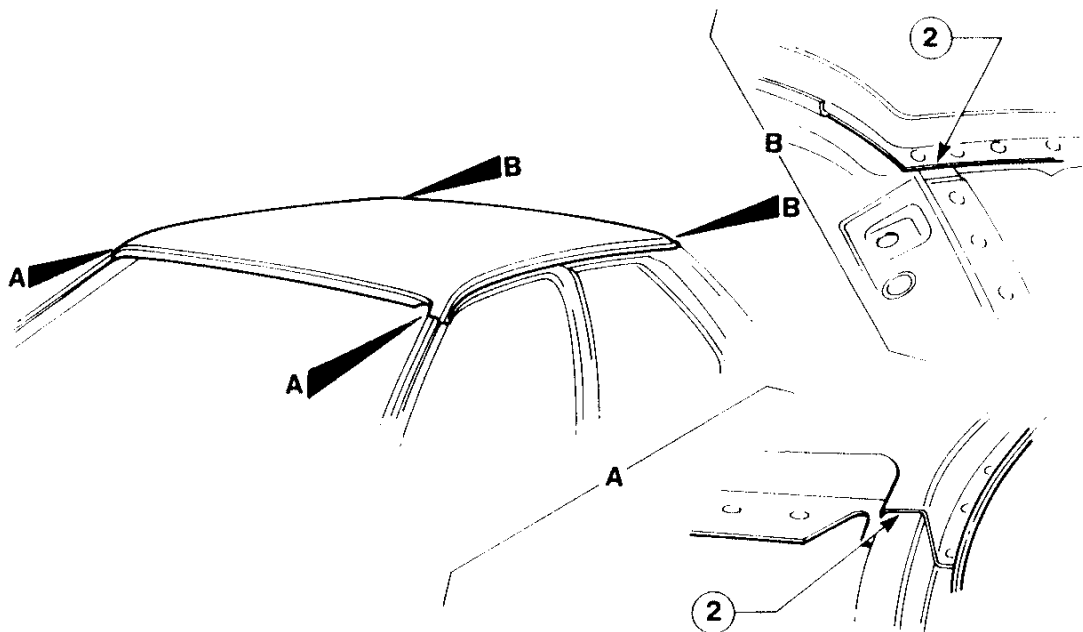
**Removal (continued)**

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.

1. Using a chamfering machine remove the welds along the perimeter of the roof panel.
2. Using an oxyacetylene torch, unweld the roof panel from the pillars.



**Removal (continued)**

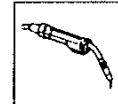
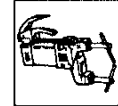
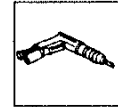
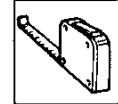
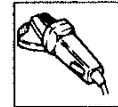
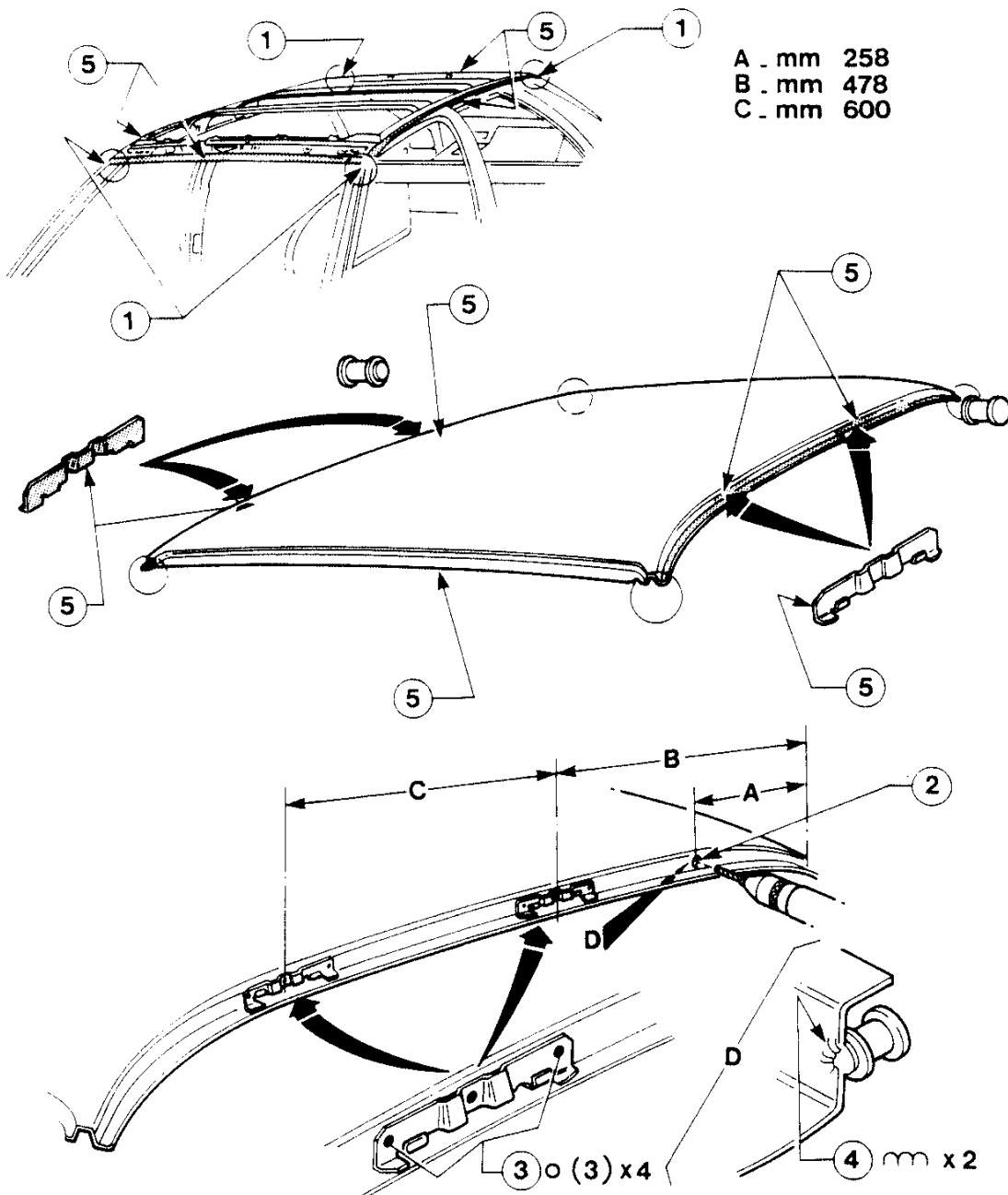




**Preparation**

- Using a rotating brush, clean the welding areas along the perimeter of the new roof panel and on the vehicle.
  - Remove any residues of old sealant from the vehicle along the front cross-member and the two hoops.
  - Clean the roof-rack brackets and the relative pins in addition to the corresponding areas on the new roof panel.
1. Using an abrasive grinding wheel remove and level the residues left by welding.

2. Trace out the positions of the four roof-rack brackets and the two pins to the distance indicated in the illustration.
3. Using a drill, make the holes for the pins.
4. Using a spot welder, weld the four roof-rack brackets.
5. Using a MIG welder, weld the two pins from inside the vehicle as indicated in the illustration.
5. Spread the areas shown in the illustration with Type A electroweldable paste except for the four corners which will be secured by braze welding.

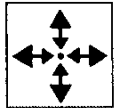
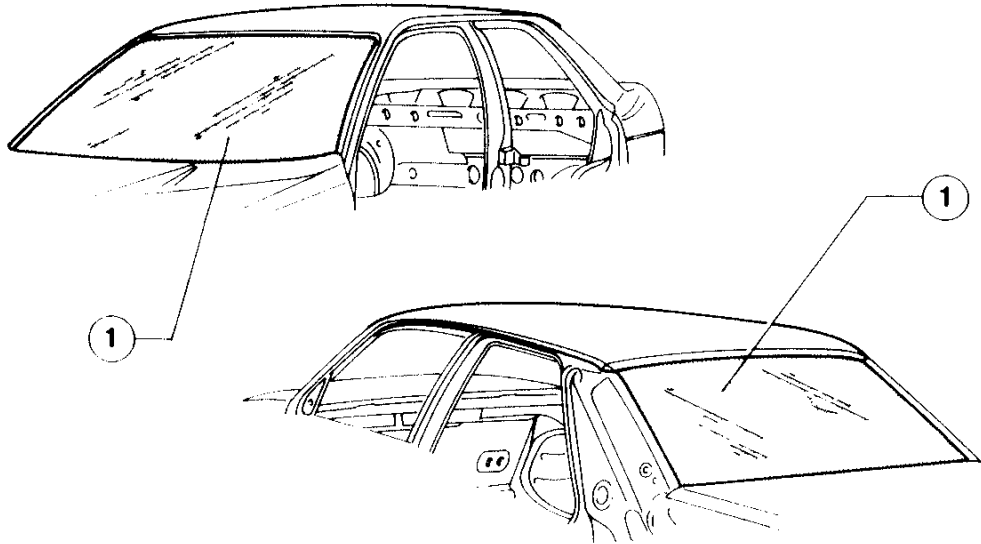




**Positioning**

1. Correctly position the roof panel on the vehicle and using the front and rear windcreens as a guide, check the alignment of the glass housings.

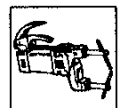
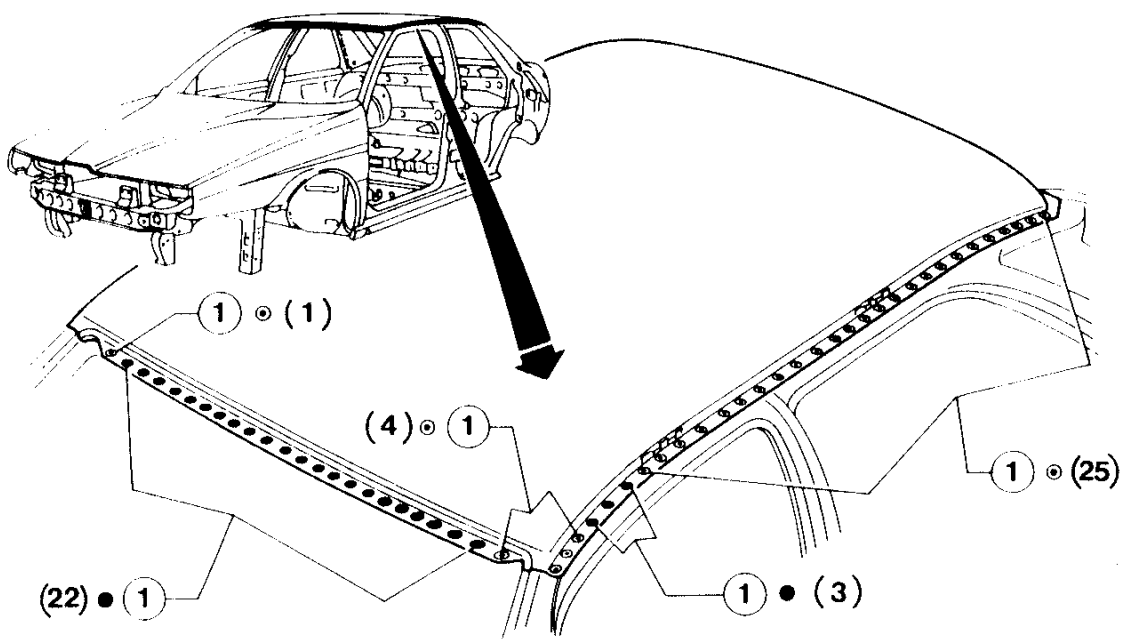
- Secure the components to be welded, mate the edges and check the alignment.



**Welding and finishing of the sheet metal**

1. Using a spot welder operate along the perimeter of the roof panel as indicated in the illustration.

- Using an abrasive grind wheel, remove and level the residues left by welding.
- Using a rotating brush, clean the welded areas.

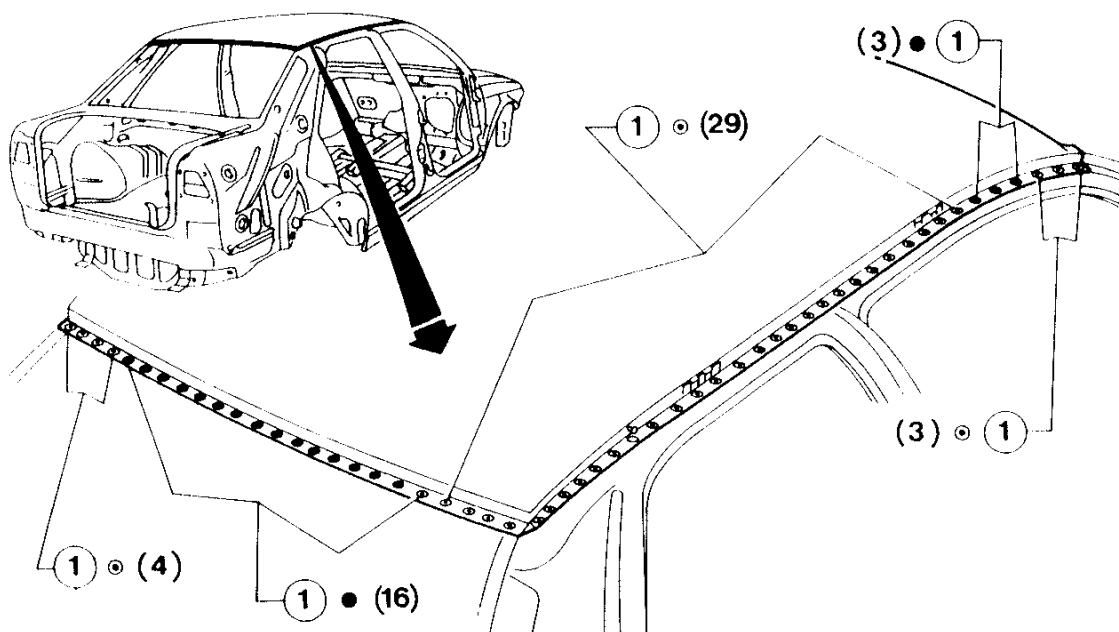




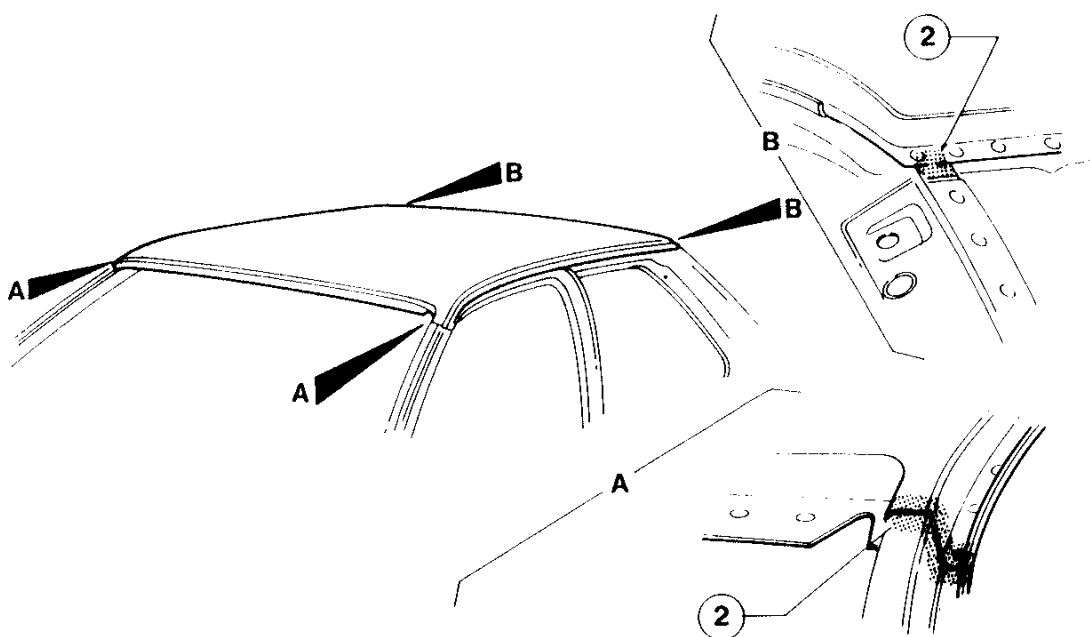
**Welding and finishing of the sheet metal (continued)**

1. Using a spot welder operate on the edge of the roof panel as shown in the illustration.
2. Using braze welding, attach the four corners of the roof panel to the pillars as shown in the illustration.

- Using an abrasive grinding wheel remove and smooth the welding residues.
- Using a rotating brush clean the welding areas.



**Welding and finishing of the sheet metal (continued)**



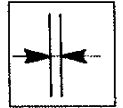
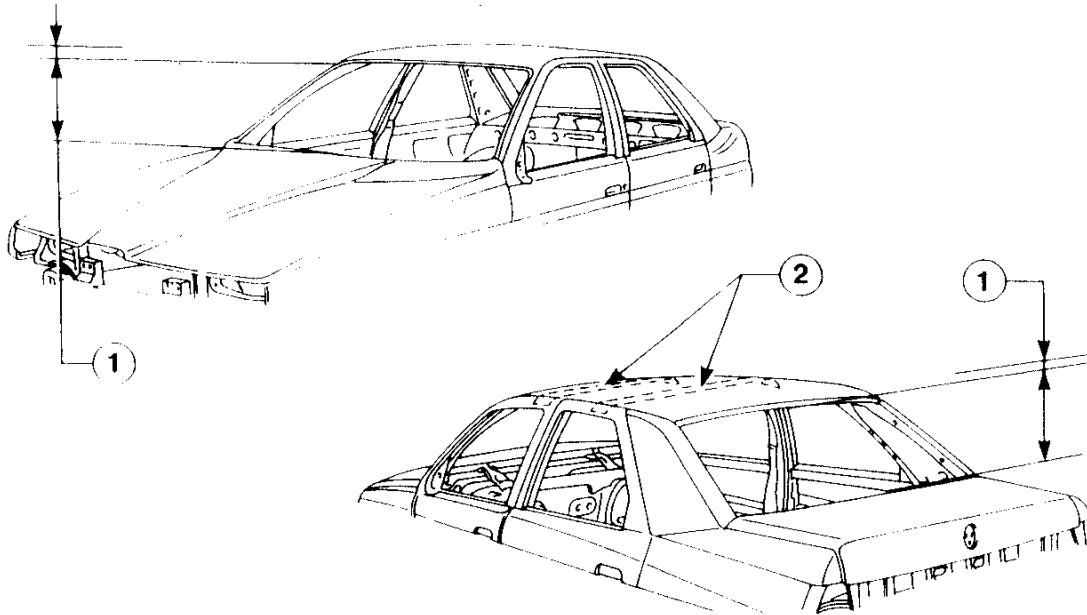


**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components which were previously removed along with the gas-

kets and parts which, when installed, will make it possible to check the success of the operations).

2. Install the two central hoops (see: ROOF PANEL HOOPS).

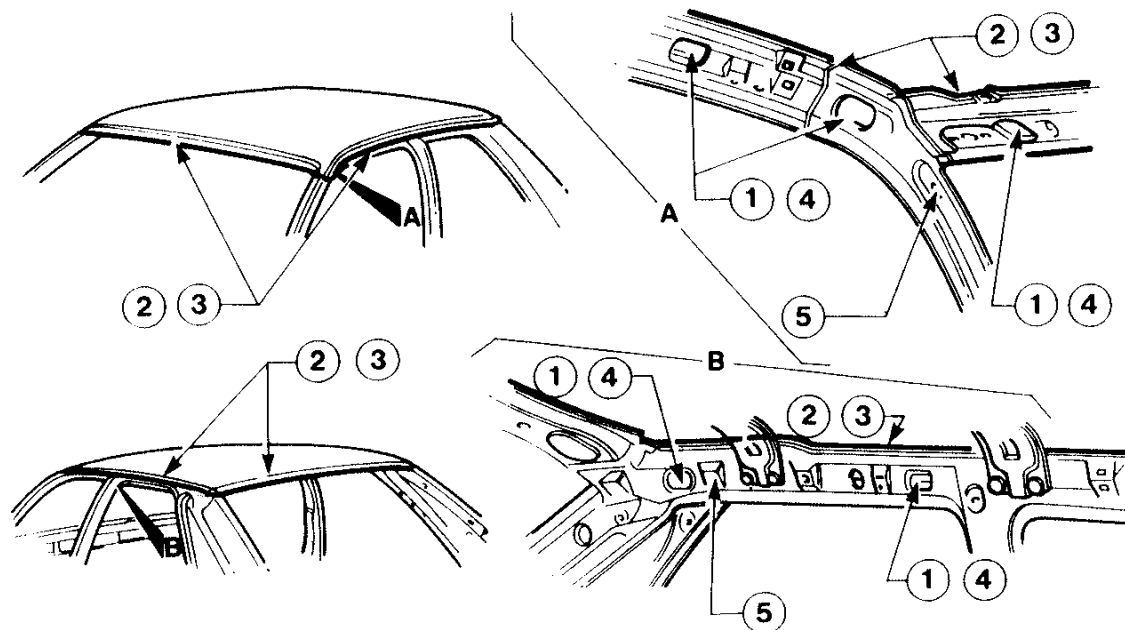


**Protection**

1. Spread Type B protection on the areas shown in the illustration.
2. Spread Type A rust-proofing on the areas shown in the illustration.

3. Apply Type B sealant to the areas shown in the illustration.

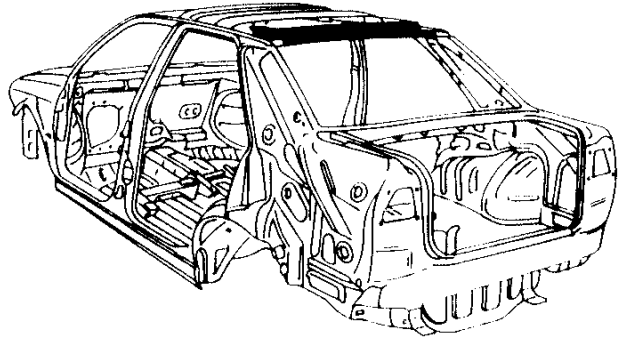
- Proceed to the painting phase.
- 4. Proceed to the waxing phase.
- 5. Proceed to the foam treatment phase.





### UPPER REAR CROSS-MEMBER (roof panel removed)

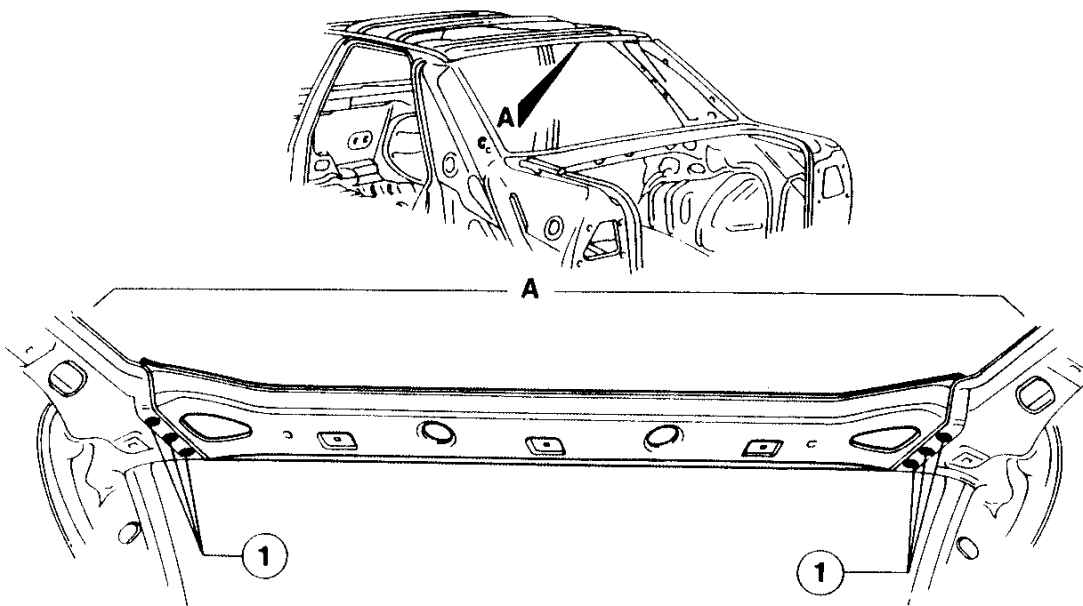
- In order to facilitate the successive operations, the following components should be temporarily removed:
  - front and rear doors (see: GR. 55);
  - internal trim (see: GR. 66);
  - external trim (see: GR. 75);
  - rear and front windscreens (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).



#### Removal

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.

1. Using a chamfering machine remove the welds.

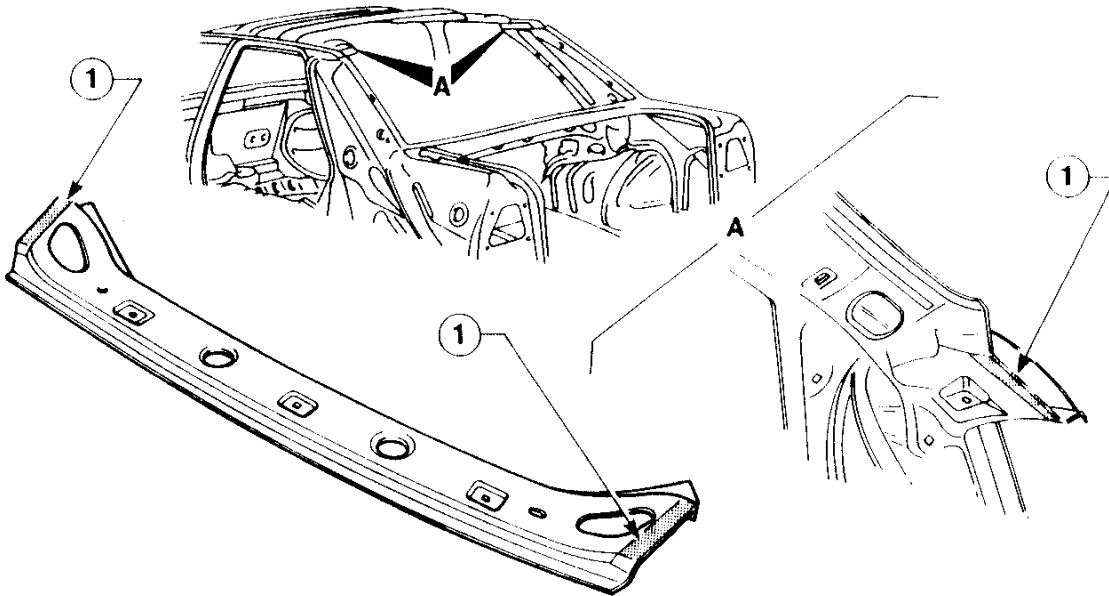




**Preparation**

- Using a rotating brush, clean the welding area on the cross-member and on the vehicle.

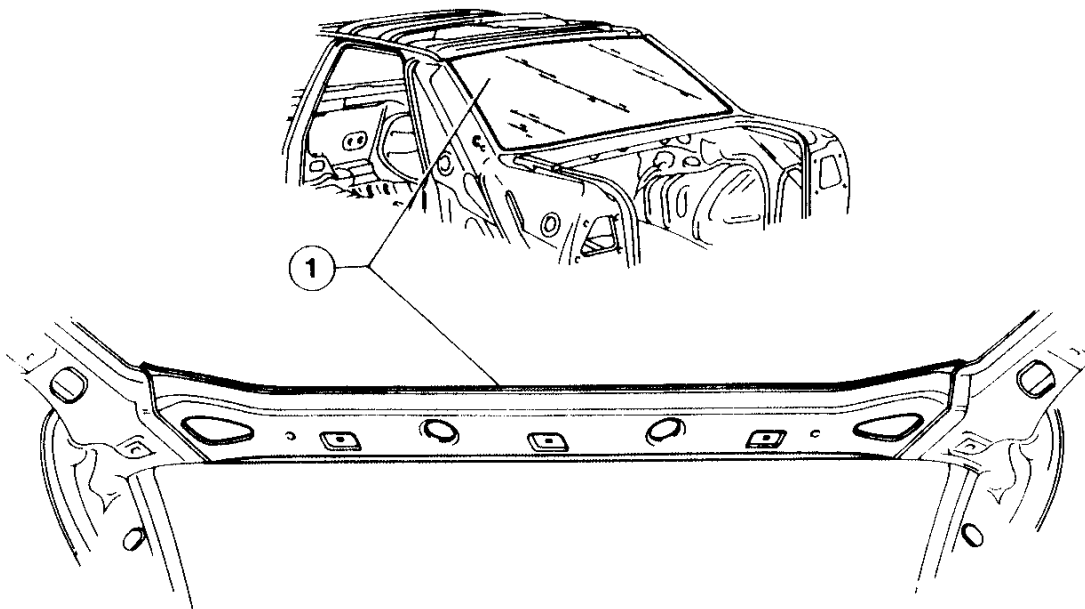
1. Spread Type B electroweldable paste on the spot welding areas.



**Positioning**

1. Correctly position the cross-member on the vehicle and using the rear windscreen as a dima, check the alignment of the glass housings.

- Secure the components to be welded, mate the edges and check the alignment.

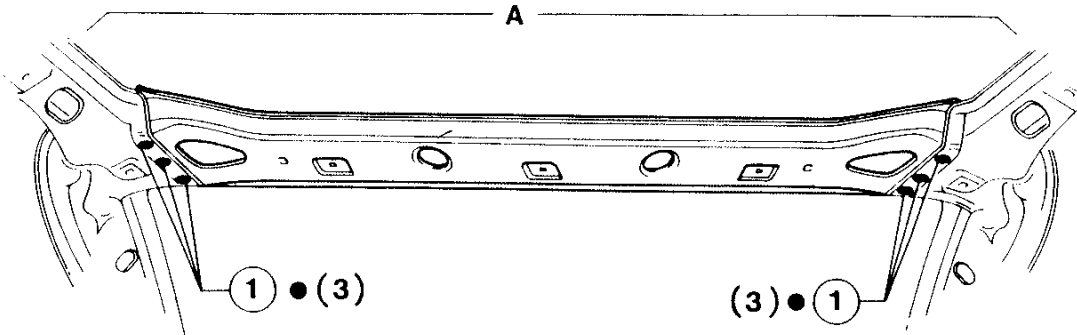
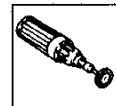
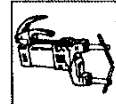
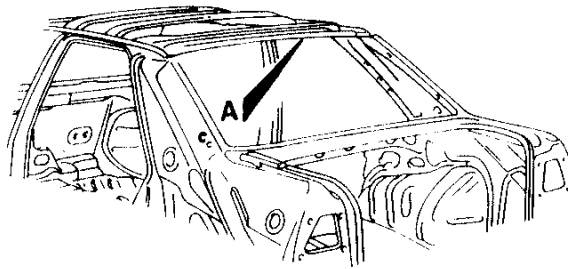




**Welding and finishing of the sheet metal**

1. Using a spot welder, operate as indicated in the illustration.
- Using a rotating brush, clean the welding areas.

**NOTE:** Checking the installation of the cross-member can only be carried out when the roof panel has been installed (see: ROOF PANEL - Checking).

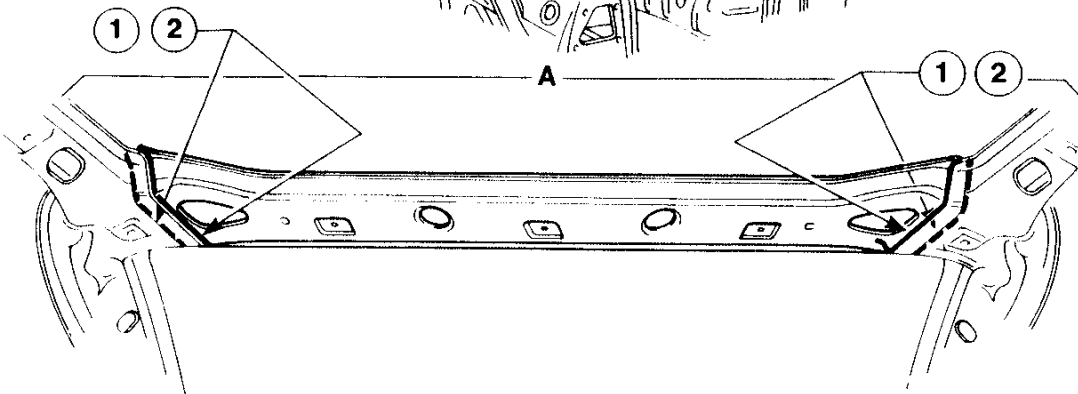
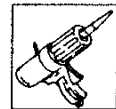
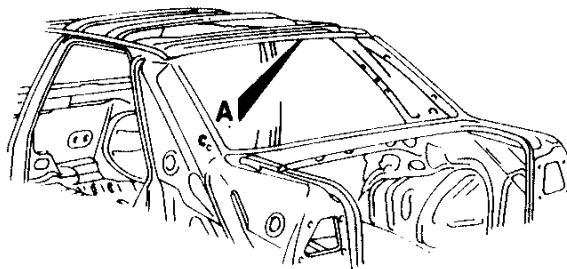


**Protection**

1. Spread Type B protection on the areas indicated in the illustration.

2. Apply Type A sealant to the areas indicated in the illustration.

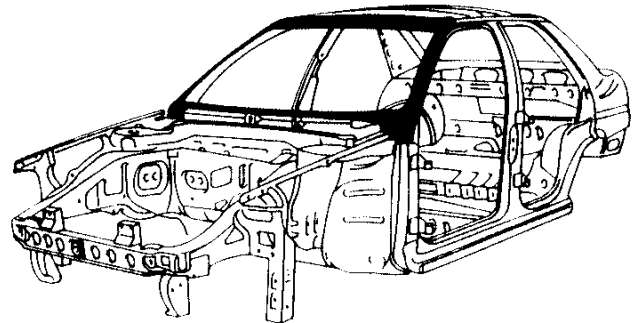
- Proceed to the painting phase.





### FRONT WINDSCREEN FRAME (skin) (roof panel removed)

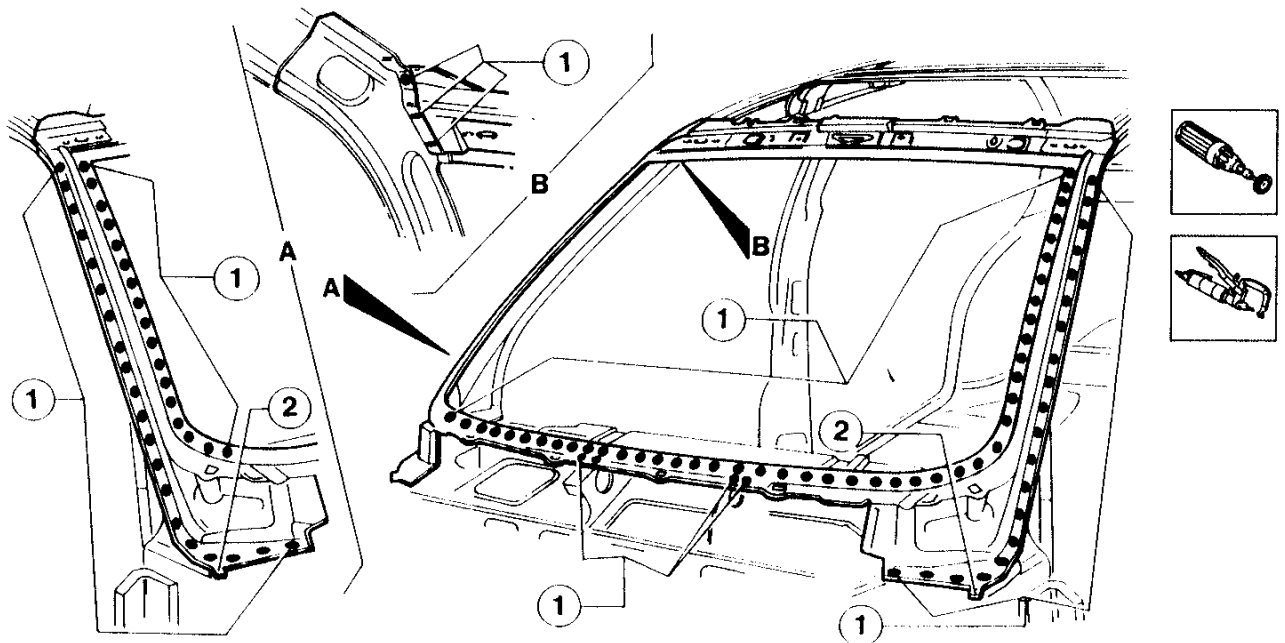
- In order to facilitate the successive operations, the following components should be temporarily removed:
  - front and rear doors (see: GR. 55);
  - internal trim (see: GR. 66);
  - external trim (see: GR. 75);
  - rear and front windscreens (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).



#### Removal

- Using a rotating brush, clean the areas to be chamfered in order to show up the welds.

1. Using a chamfering machine, remove the welds.
2. Open the clinch tab.



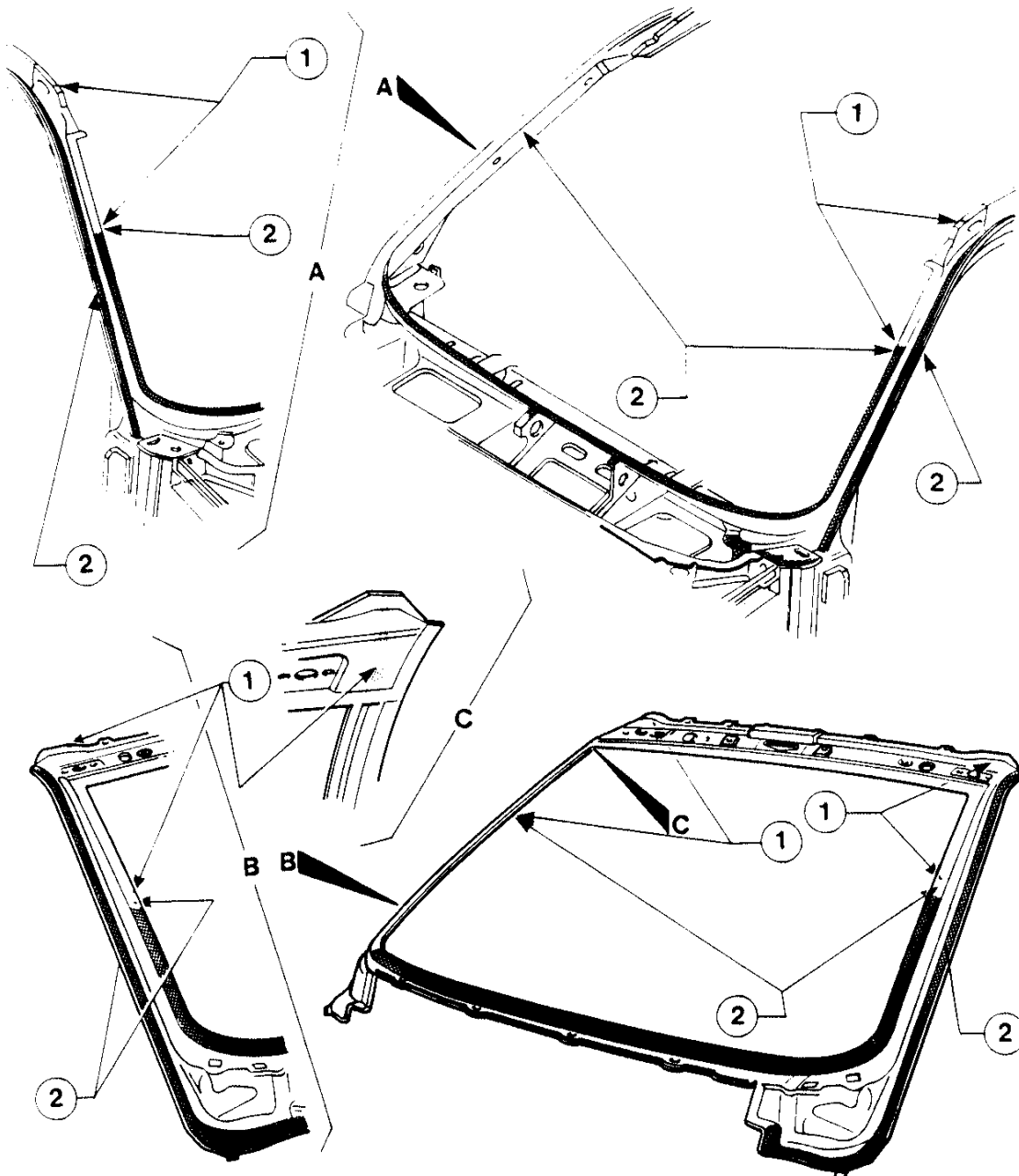




**Preparation**

- Using a rotating brush, clean the welding areas on the windscreen frame and on the vehicle.

1. Spread Type B rust-proofing on the spot welding areas.
2. Spread Type A electroweldable protection on the areas indicated in the illustration.

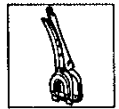
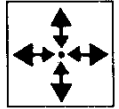
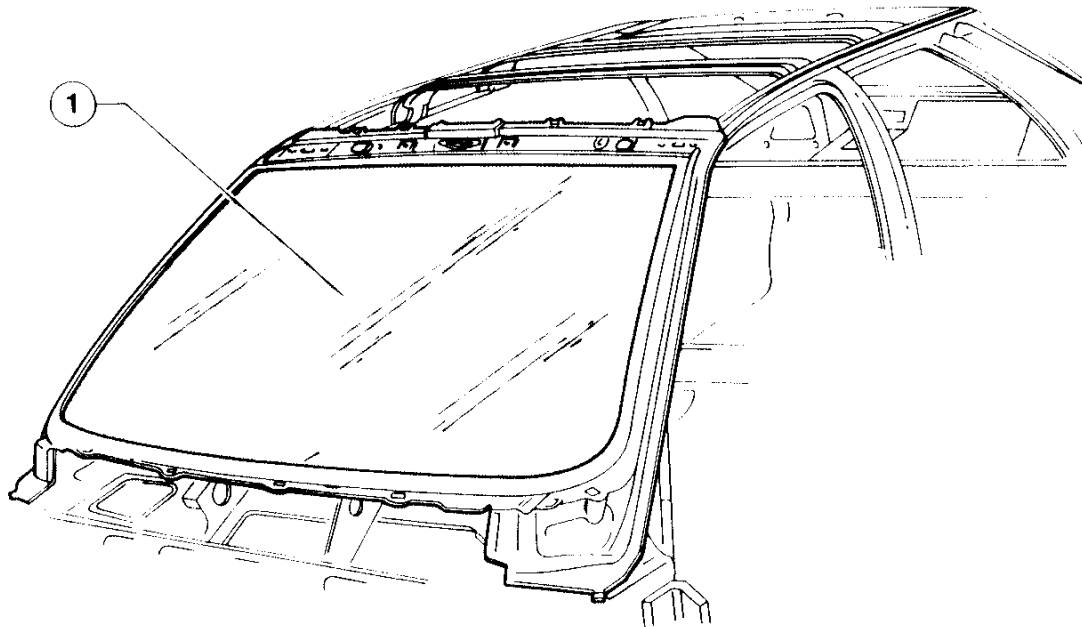




**Positioning**

- 1. Correctly position the windscreen frame on the vehicle and using the front windscreen and the rear doors as a dima, check the alignments.

- Secure the components to be welded, mate the edges and check alignment.

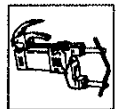
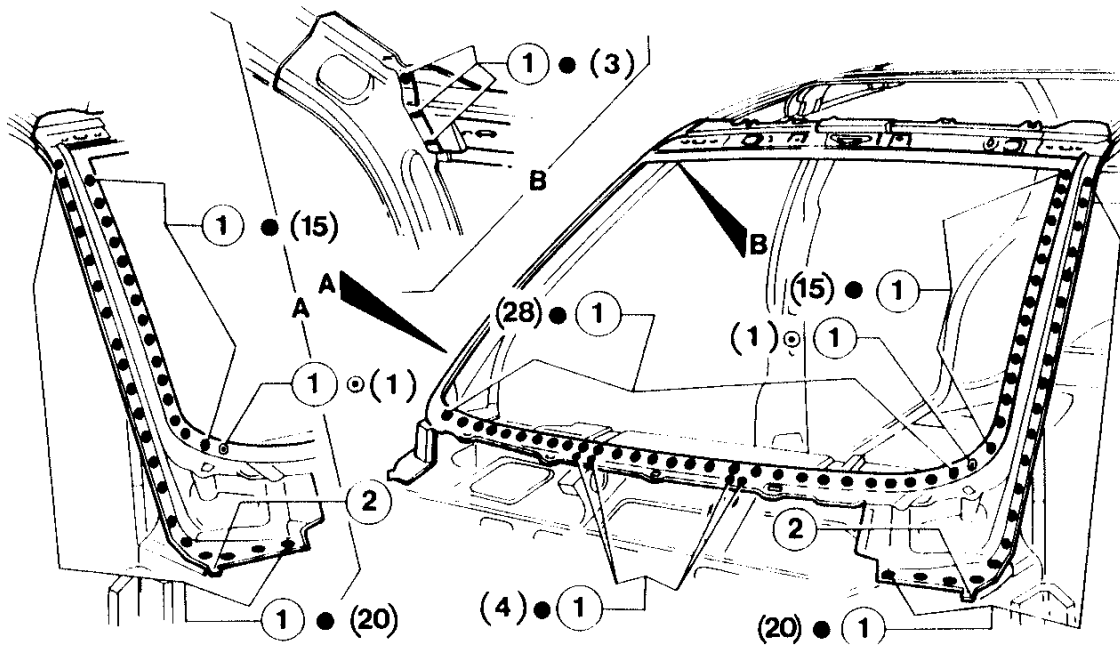


**Welding and finishing of the sheet metal**

- 1. Using a spot welder, operate as indicated in the illustration.
- 2. Prepare the clinching tabs.

- Using a rotating brush, clean the welding areas.

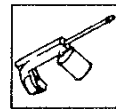
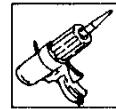
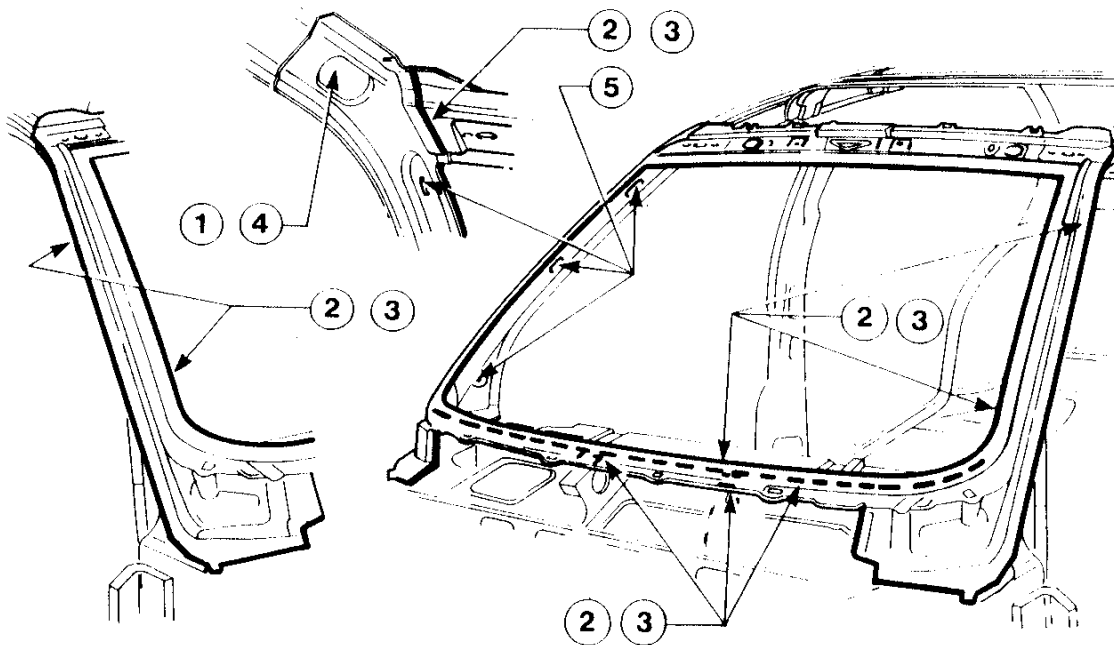
**NOTE:** Checking installation of the frame can only be carried out with the roof panel installed on the vehicle (see: ROOF PANEL - Checking).





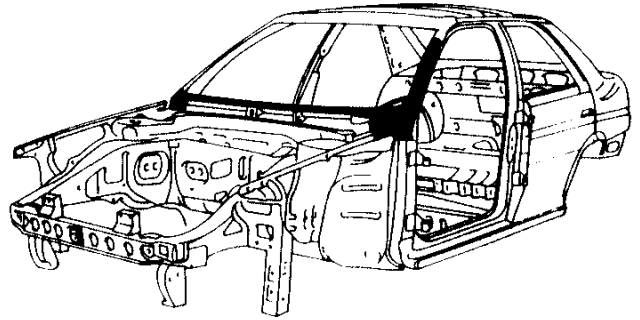
**Protection**

1. Spread the areas indicated in the illustration with Type B protection.
2. Spread Type A rust-proofing on the areas indicated in the illustration.
3. Apply Type B sealant to the areas indicated in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.



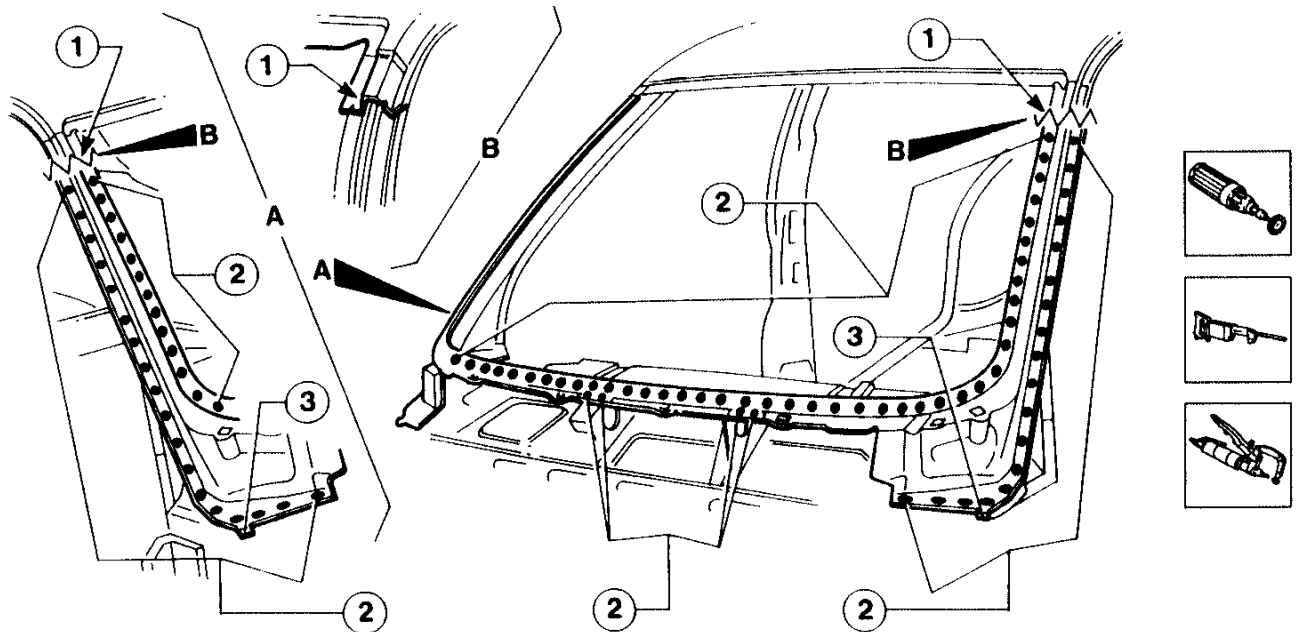
**PARTIAL FRONT WINDSCREEN FRAME (skin)**

- In order to facilitate the successive operations, the following components should be temporarily removed:
  - front doors and relative seals (see: GR. 55);
  - bonnet (see: GR. 56);
  - internal trim (see: GR. 66);
  - external trim (see: GR. 75);
  - front windscreen (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
1. Using a jig saw, cut along the lines indicated in the illustration without damaging the underlying parts.

2. Using a chamfering machine, remove the welds.
3. Open the clinch tab.

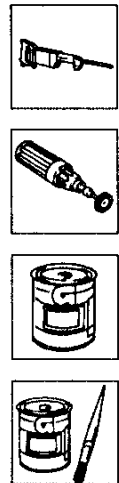
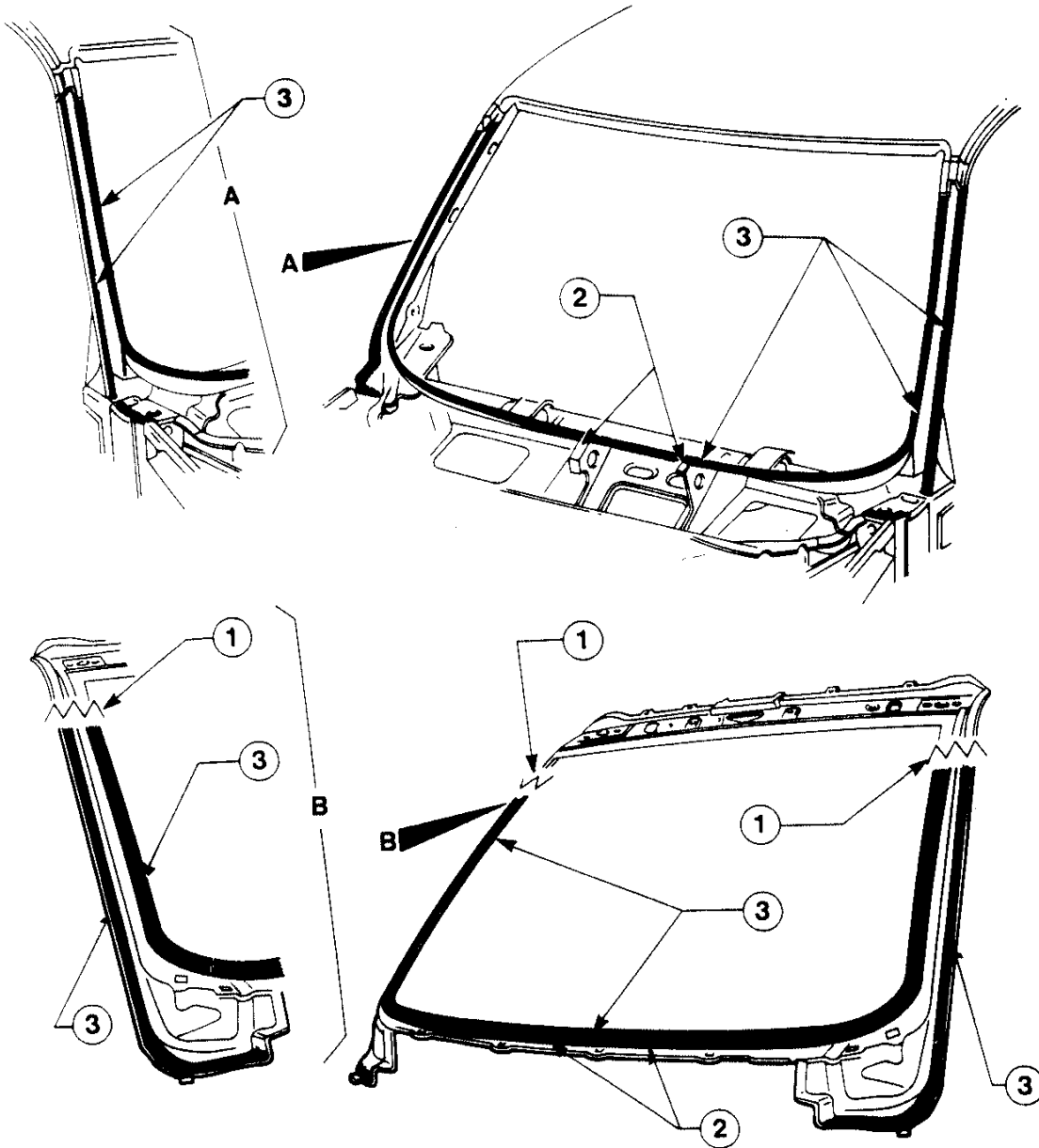




**Preparation**

1. Operating on a bench and using a jig saw, cut the new windscreen frame leaving enough margin to permit overlapping.

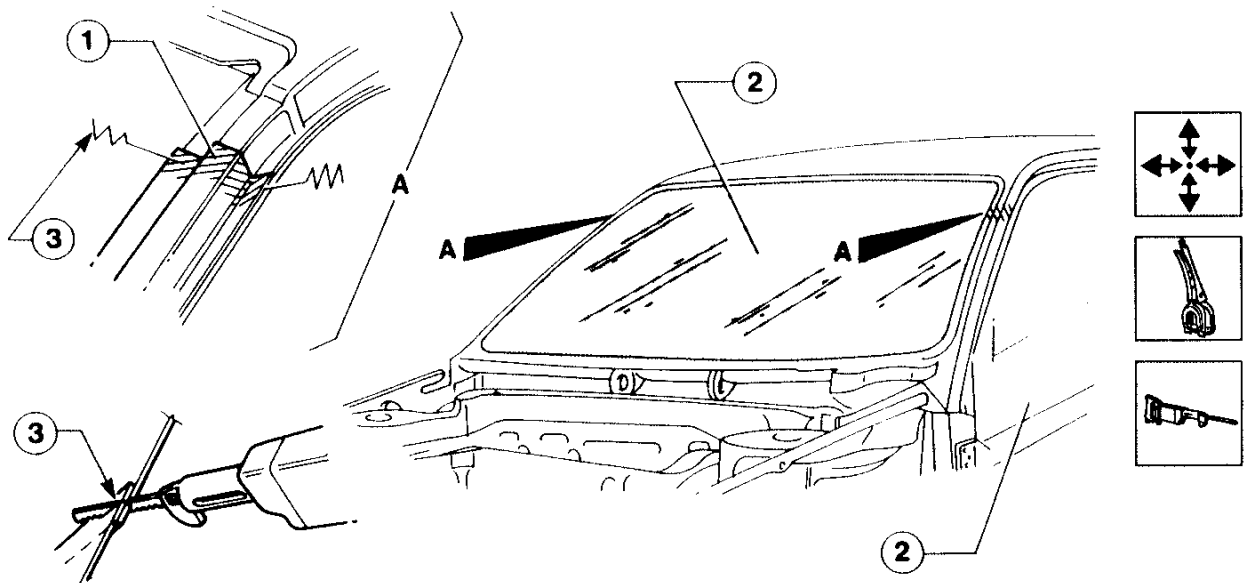
- Using a rotating brush, clean the welding areas on both the rear side panel and the vehicle.
- 2. Spread Type B rust-proofing on the areas indicated in the illustration.
- 3. Spread Type A protection on the areas indicated in the illustration.



**Positioning**

1. Correctly position the windscreen frame and overlap onto the vehicle as indicated.
2. Using the front windscreen and the rear doors as a guide, check the correct alignment of the components.

- Secure the components to be welded and mate the edges.
- 3. Using a jig saw, trim the sheet metal and remove the excess without damaging the underlying parts.

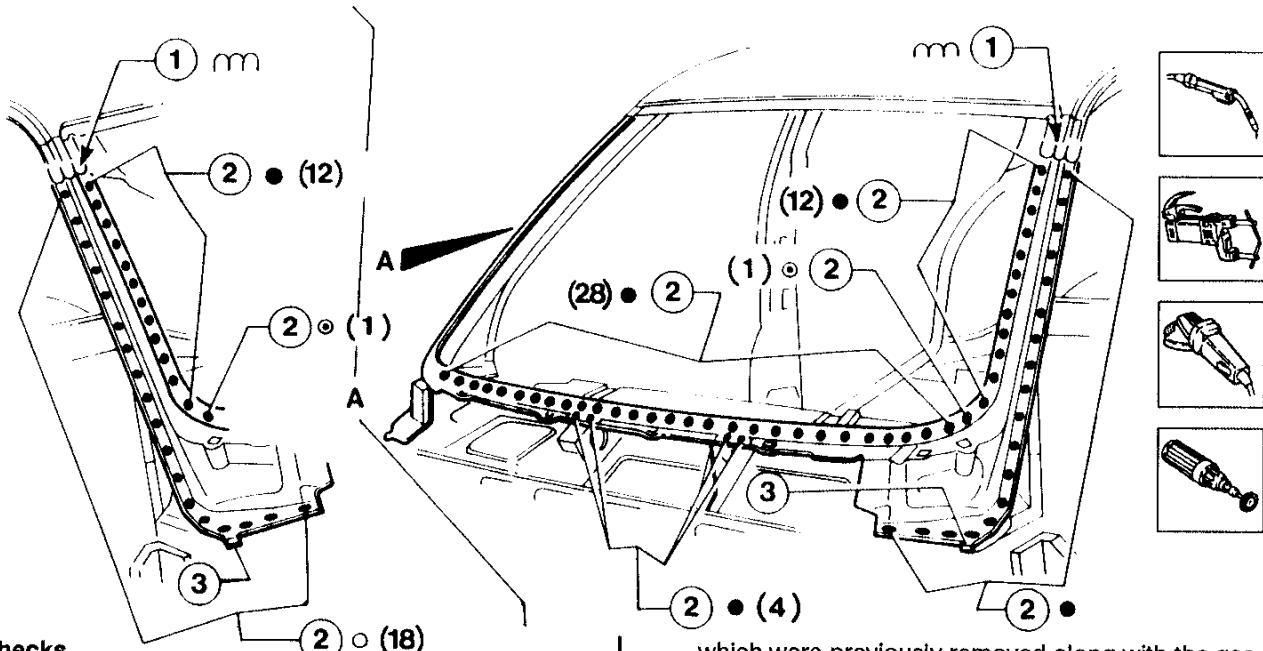




**Welding and finishing of the partial front windscreen frame (skin)**

1. Using a MIG welder, carry out seam welding.
2. Using a spot welder operate as indicated in the illustration.

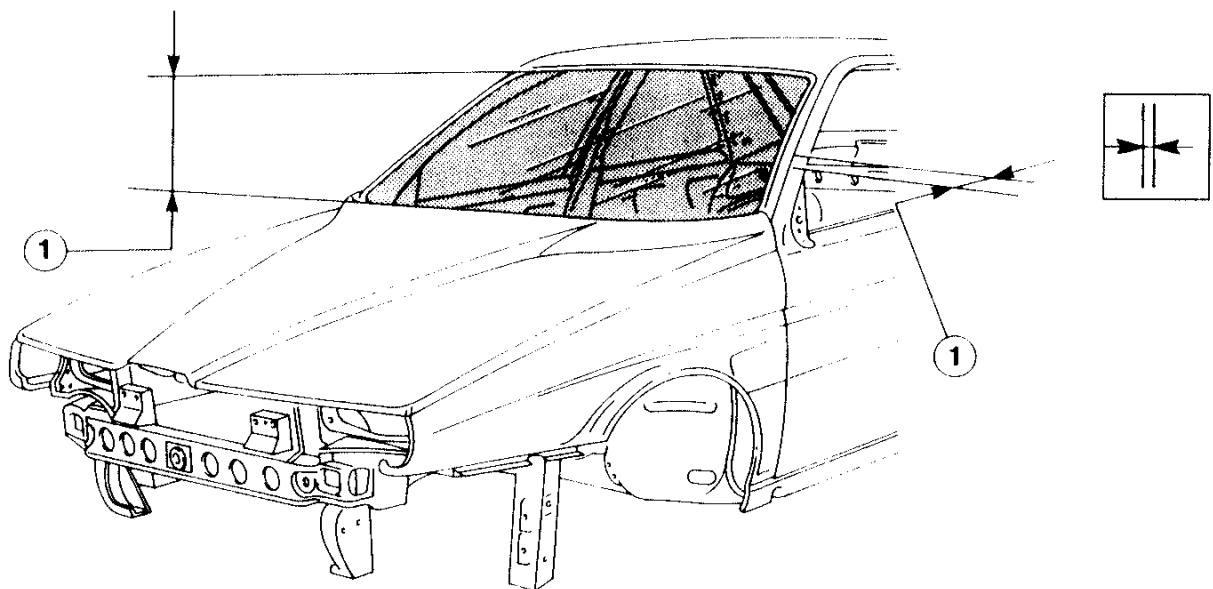
- Using an abrasive grinding wheel remove and level the residues left by welding.
- Using a rotating brush, clean the welded areas.
- 3. Bend the clinch tab.



**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

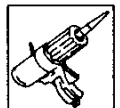
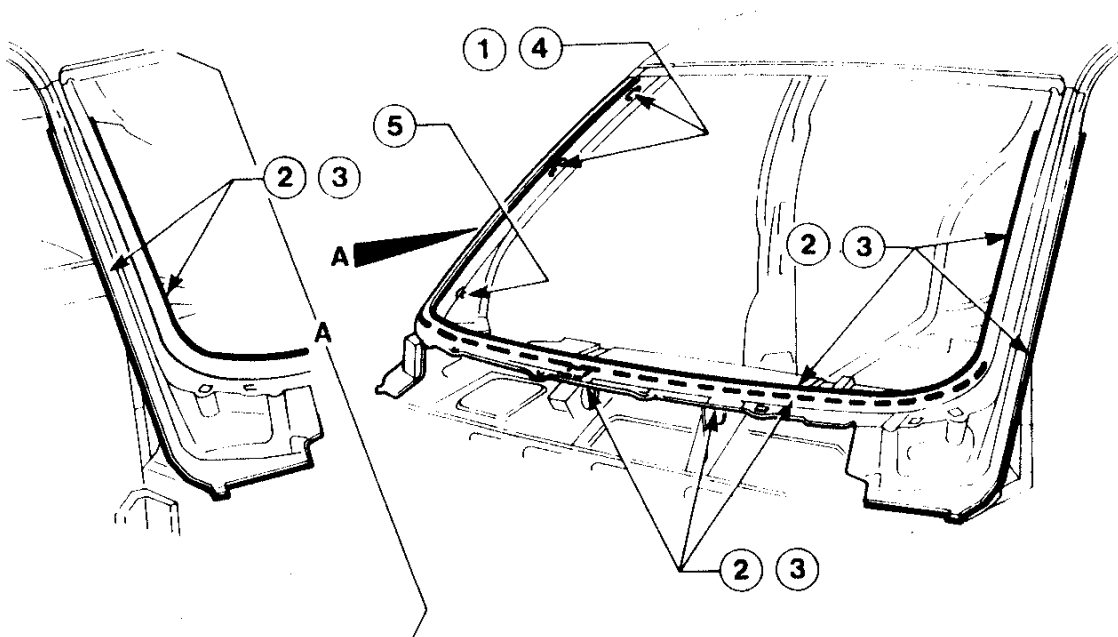
which were previously removed along with the gaskets and other parts which, when installed, will make it possible to check the success of the operations).





**Protection**

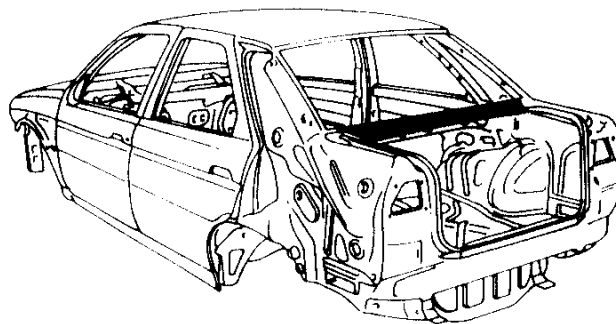
1. Apply Type B rust-proofing to the areas indicated in the illustration.
2. Apply Type B protection to the areas indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.
  - Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.





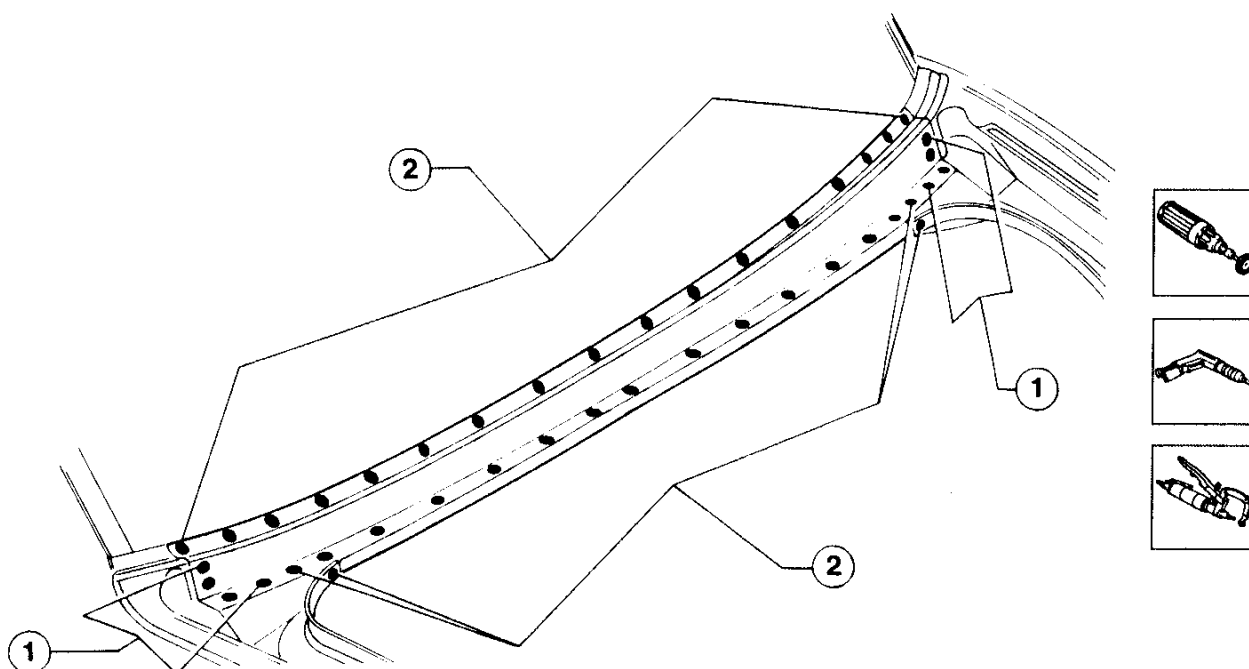
**REAR UNDERFRAME CROSSMEMBER (skin)**

- In order to facilitate the successive operations, the following components should be temporarily removed:
  - rear doors (see: GR. 55);
  - boot lid (see: GR. 56);
  - rear wing (see: GR. 49 - REPLACING MOBILE PARTS);
  - internal trim (see: GR. 66);
  - external trim (see: GR. 75);
  - rear windscreen (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.

1. Remove the welds with a drill.
2. Using a chamfering machine, remove the welds.

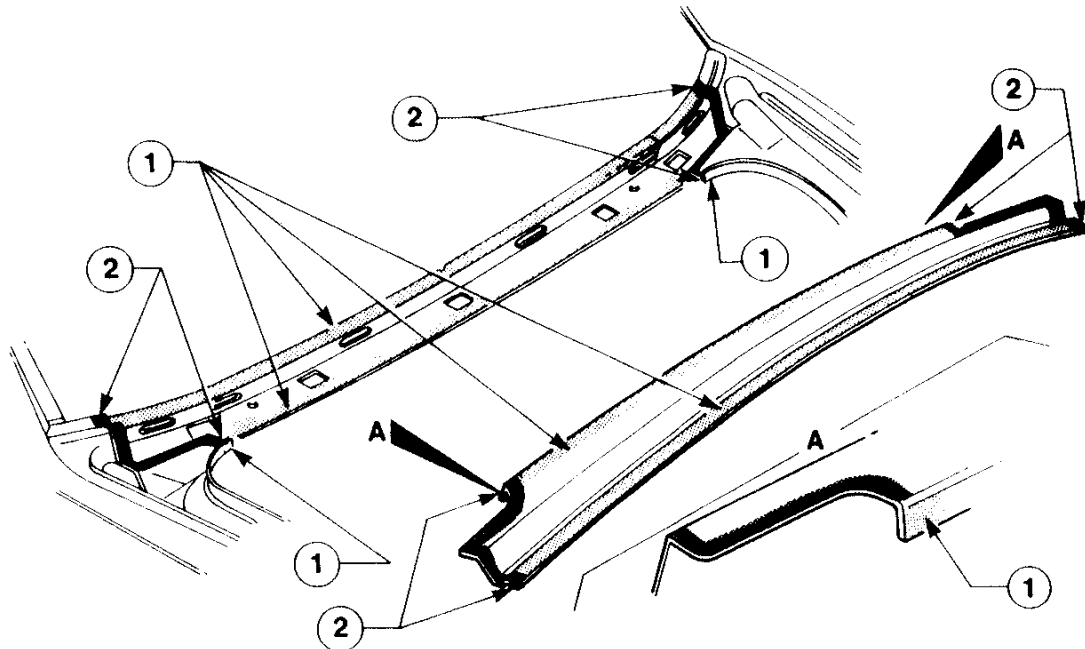




**Preparation**

- Using a rotating brush, clean the welding areas on the cross-member and on the vehicle.

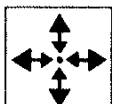
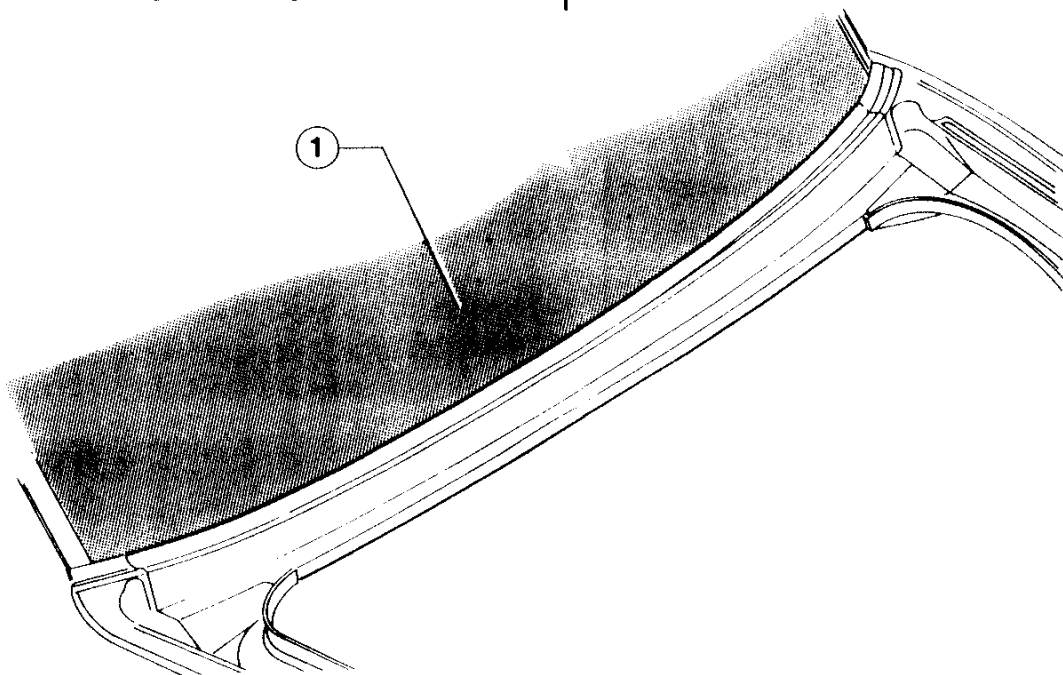
1. Spread Type B rust-proofing on the spot welding areas.
2. Spread Type A electroweldable protection on the areas indicated in the illustration.



**Positioning**

1. Correctly position the cross-member on the vehicle and using the rear windscreen as a guide, check the alignment of the glass housing.

- Secure the components to be welded and mate the edges.

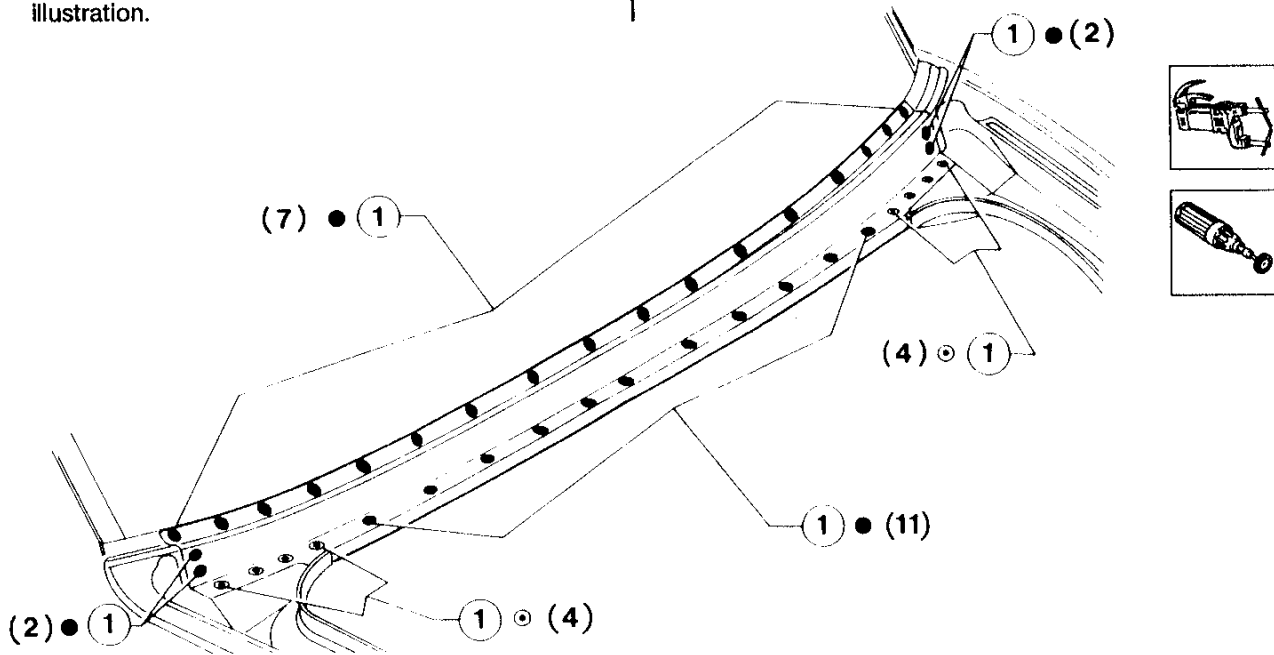




**Welding and finishing of the sheet metal**

1. Using a spot welder operate as indicated in the illustration.

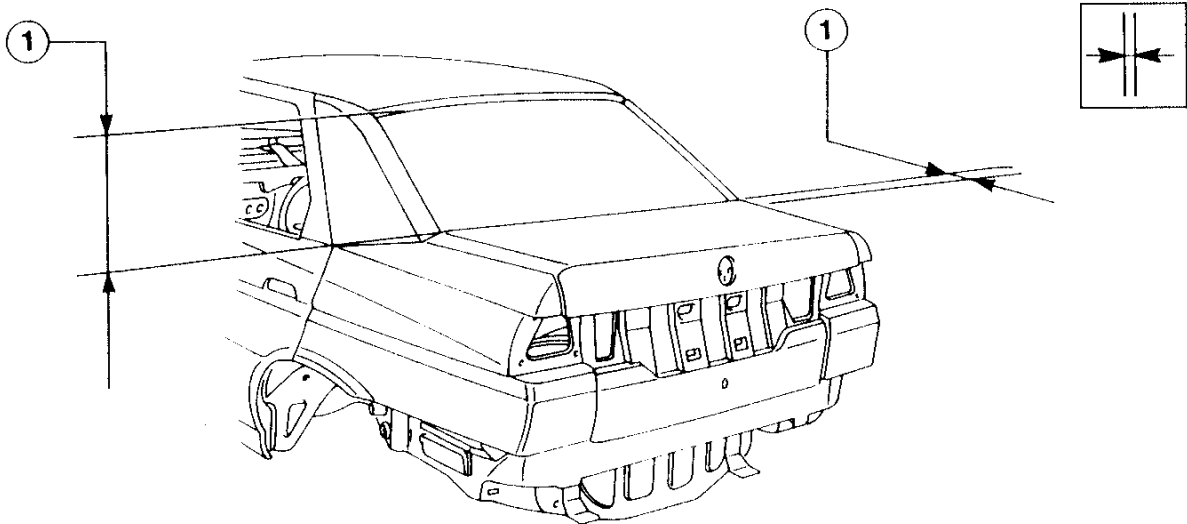
— Using a rotating brush, clean the welded areas.



**Checks**

1. Check parallelism, gaps and angles (this necessitates the installation of the mobile components

which were previously removed along with the gaskets and other parts which, when installed, will make it possible to check the success of the operations).

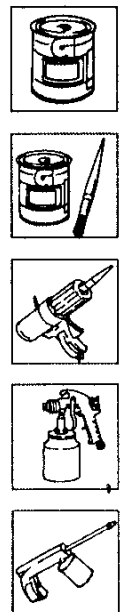
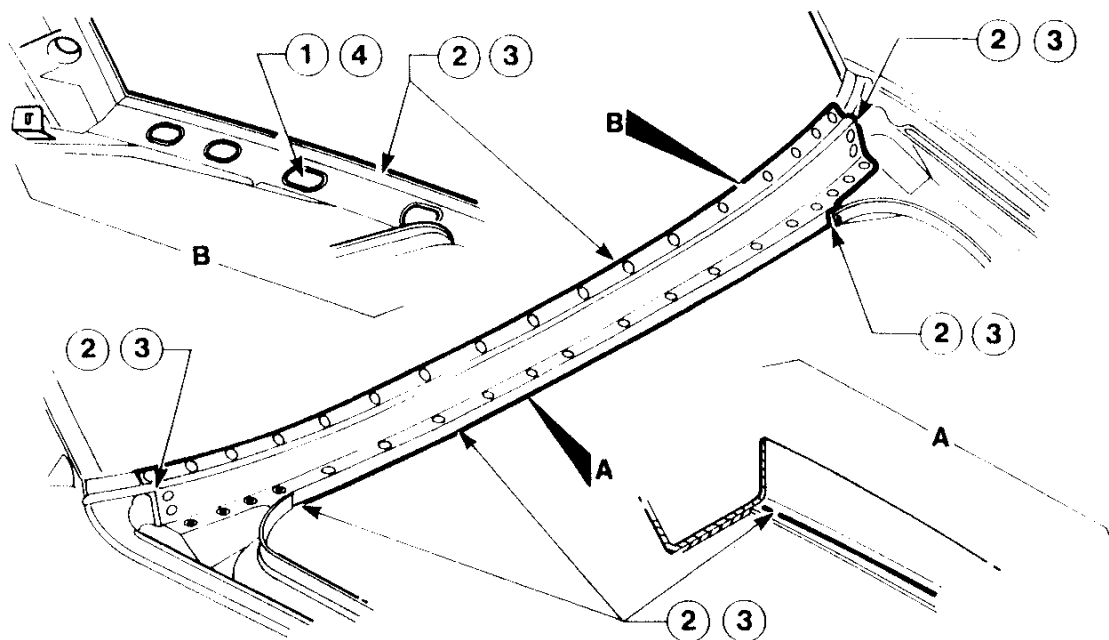




**Protection**

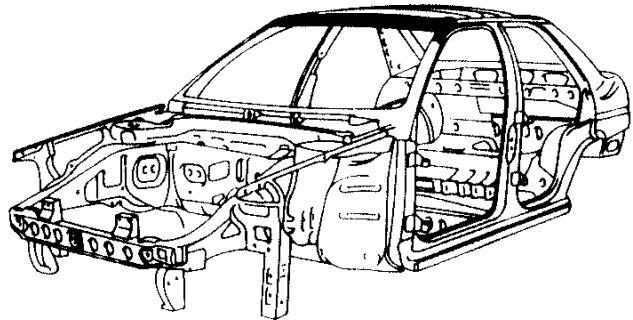
1. Apply Type B rust-proofing to the areas indicated in the illustration.
2. Apply Type B protection to the areas indicated in the illustration.

3. Apply Type A sealant to the areas indicated in the illustration.  
- Proceed to the painting phase.
4. Proceed to the waxing phase.



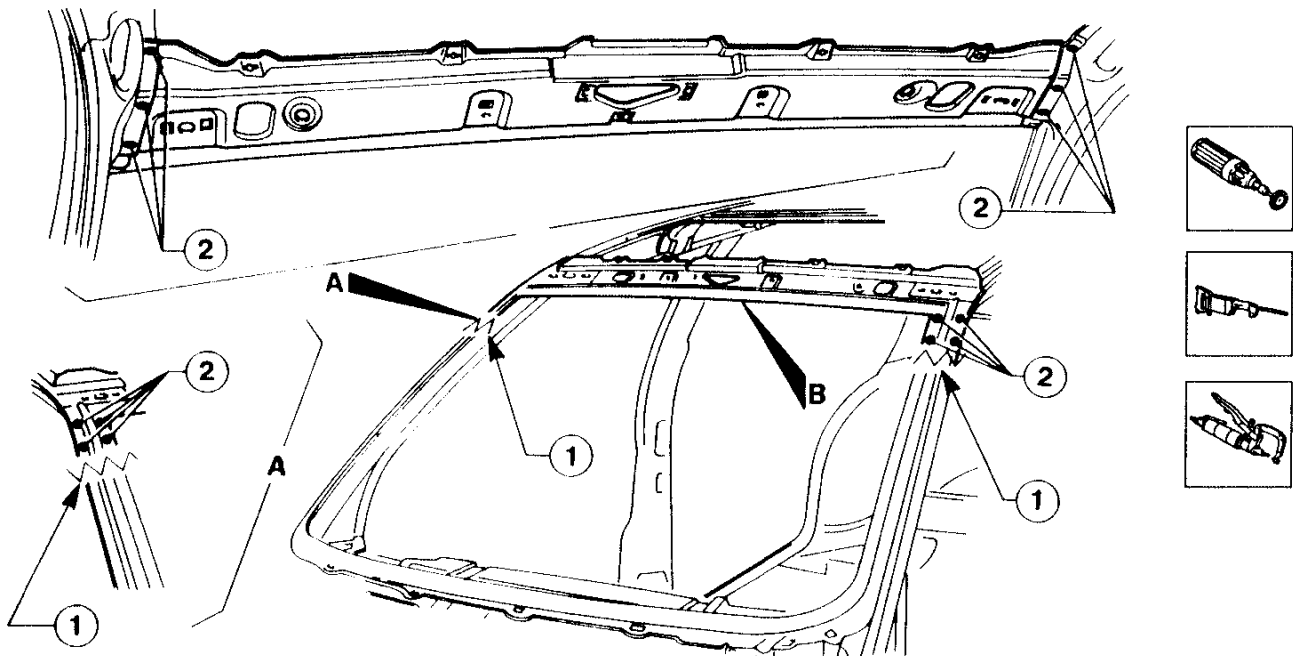
**INNER FRONT CROSS-MEMBER****(roof panel removed)**

- In order to facilitate the successive operations, the following components should be temporarily removed:
  - front and rear doors (see: GR. 55);
  - internal trim (see: GR. 66);
  - external trim (see: GR. 75);
  - front and rear windscreens (see: GR. 75).
- Disconnect the battery and control units (see: GR. 40-43).

**Removal**

- Using a rotating brush, clean the area to be chamfered in order to show up the welds.
1. Using a jig saw cut along the line indicated in the illustration without damaging the underlying parts.

2. Using a chamfering machine, remove the welds.

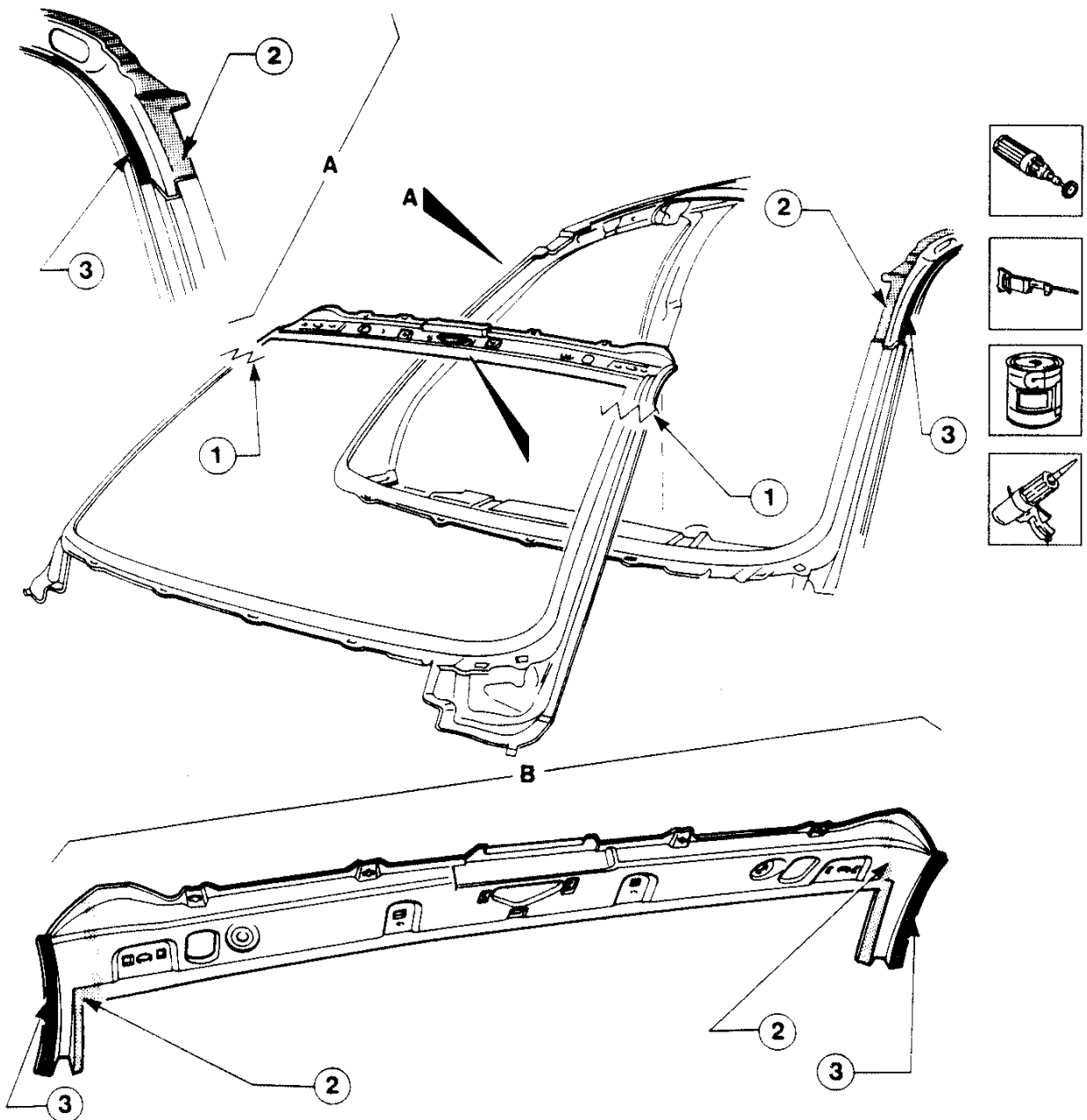




**Preparation**

- 1. Operate on a bench, using a jig saw cut the new crossmember leaving enough for overlapping.
- Using a rotating brush, clean the welding areas on the cross-member and on the vehicle.

- Remove the residual sealant from the vehicle (Roof).
- 2. Spread the spot welding areas with Type B rust proofing.
- 3. Apply Type A sealant to the areas indicated in the illustration.

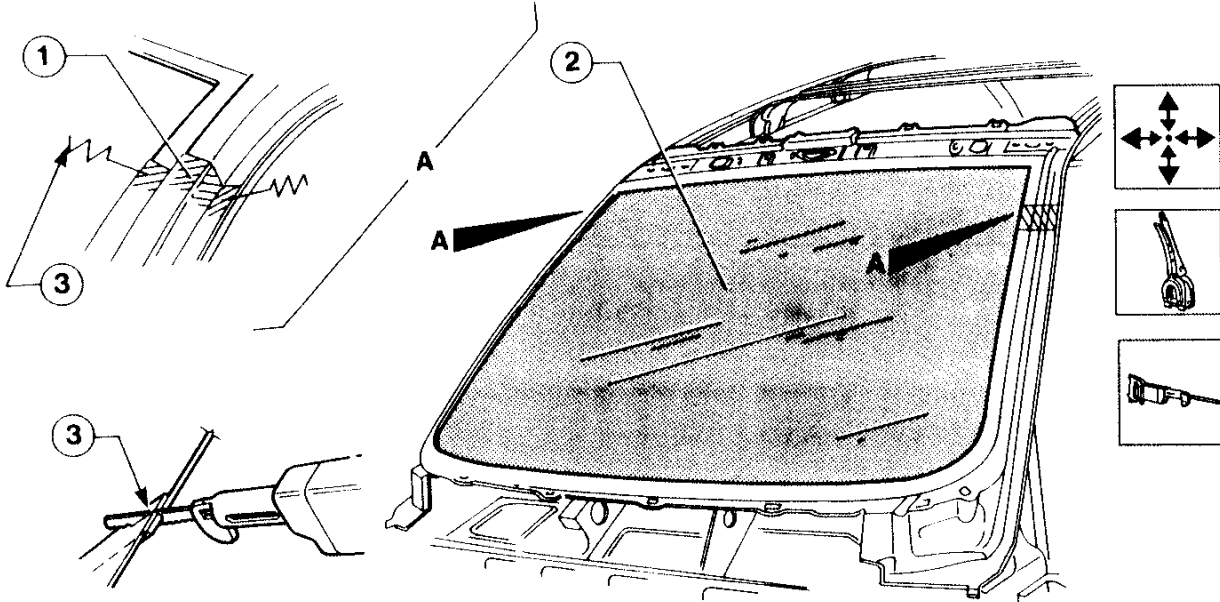




**Positioning**

1. Correctly position the cross-member and overlap on vehicle as illustrated.
2. Using the front windscreen as a reference point check the alignment of the window seating.

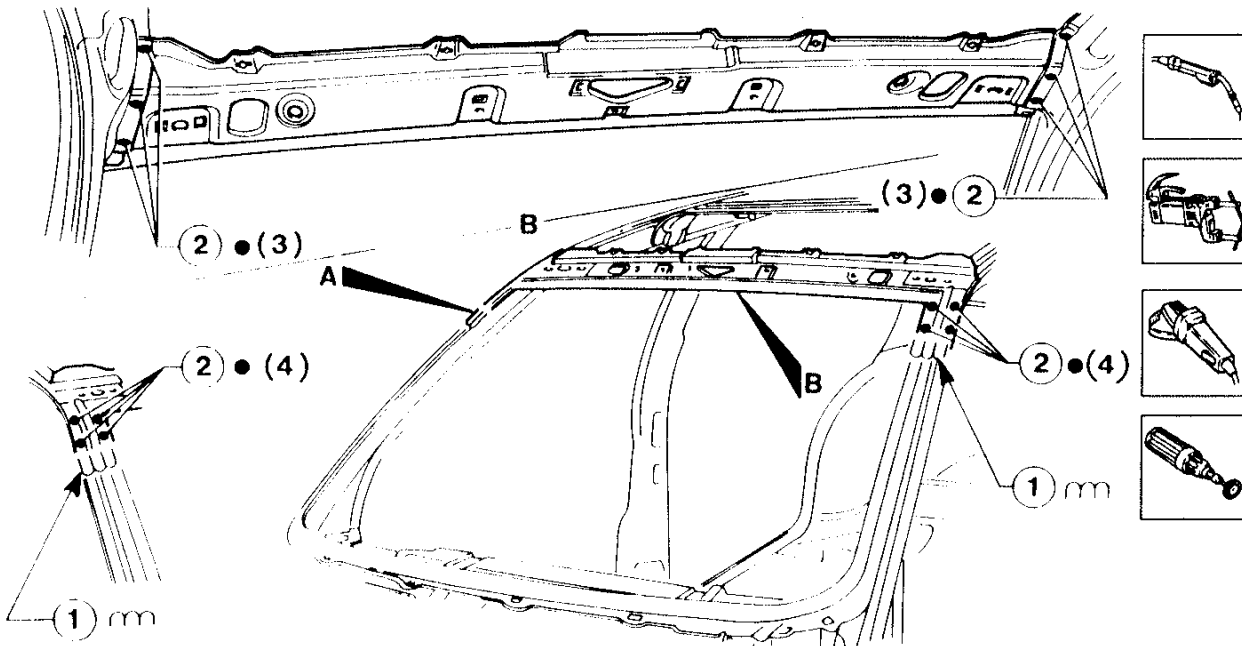
- Secure the components to be welded and mate the edges.
- 3. Using a jig saw remove the excess parts without damaging the underlying components.



**Welding and finishing of the sheet metal**

1. Seam weld with a MIG welder.
2. Using a spot welder operate as indicated in the illustration.

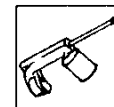
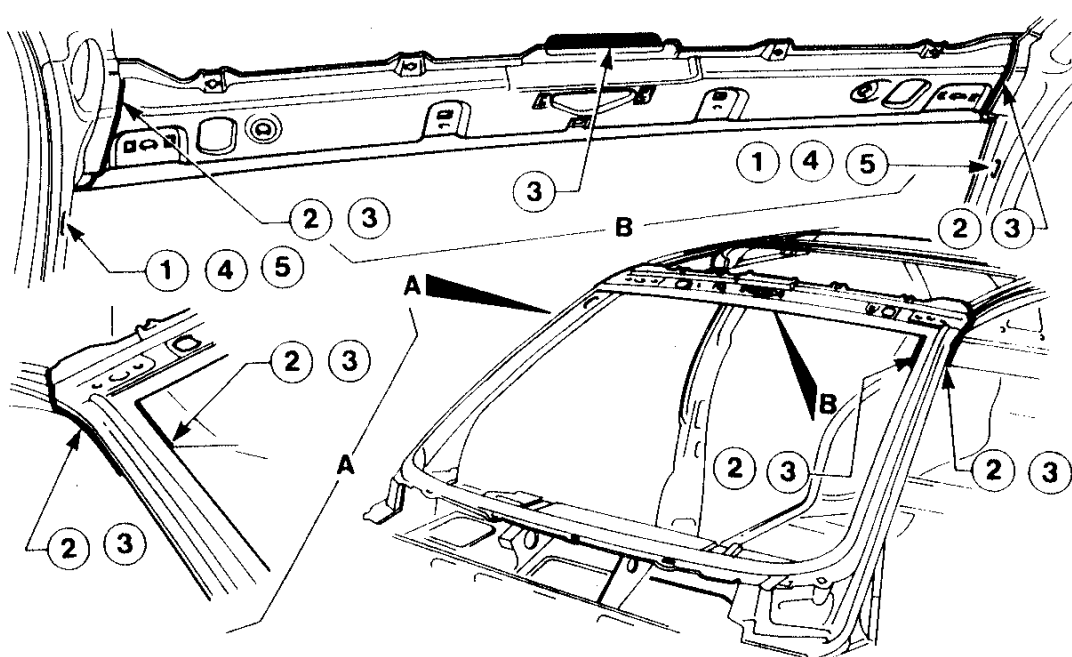
- Using an abrasive grinder, remove and smooth the welding residues.
- Using a rotating brush, clean the welded areas.





**Protection**

1. Apply Type B rust-proofing to the areas indicated in the illustration.
2. Apply Type B protection to the areas indicated in the illustration.
3. Apply Type A sealant to the areas indicated in the illustration.  
— Proceed to the painting phase.
4. Proceed to the waxing phase.
5. Proceed to the foam treatment phase.

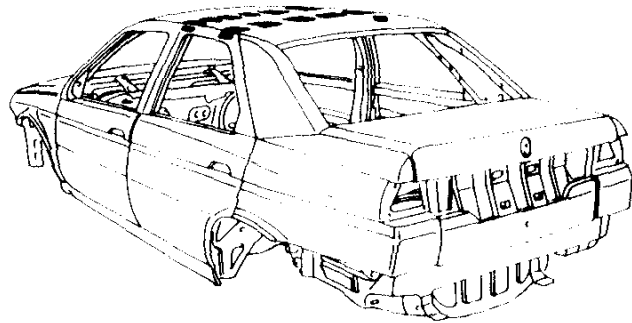






**ROOF PANEL HOOPS**

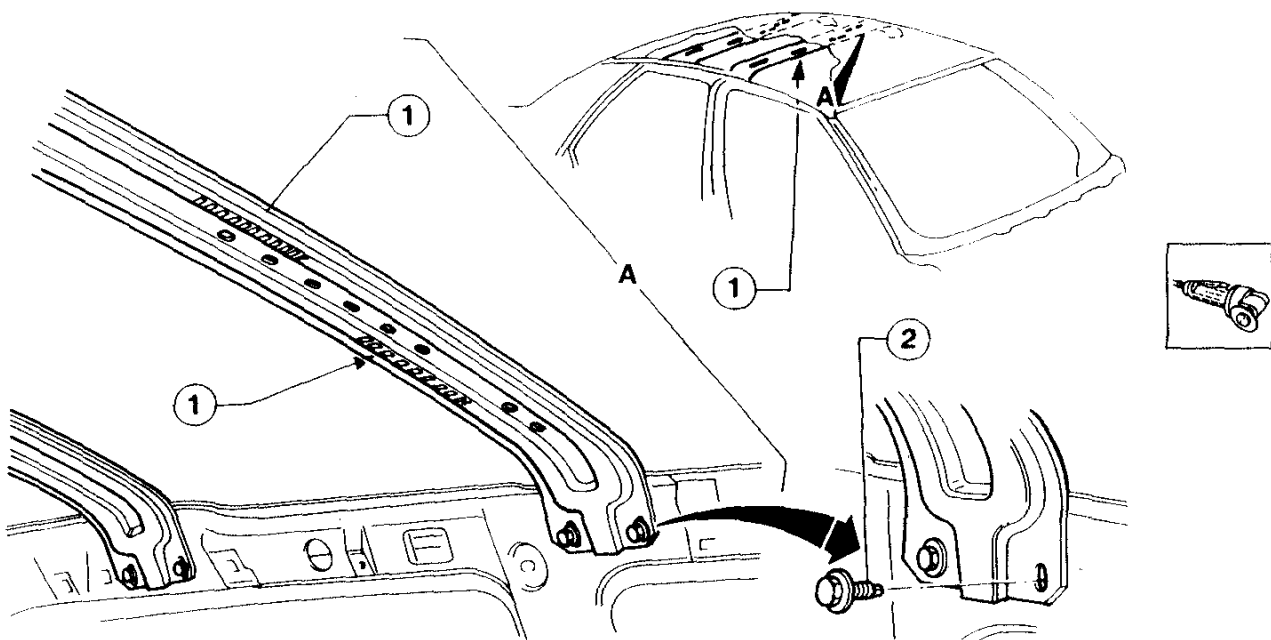
- In order to facilitate the successive operations, the following components should be temporarily removed:
  - internal trim (see: GR. 66).
- Disconnect the battery and control units (see: GR. 40-43).



**Removal**

1. Using a circular saw, cut the sealant between roof panel and hoops.

2. Remove the attachments as indicated in the illustration.

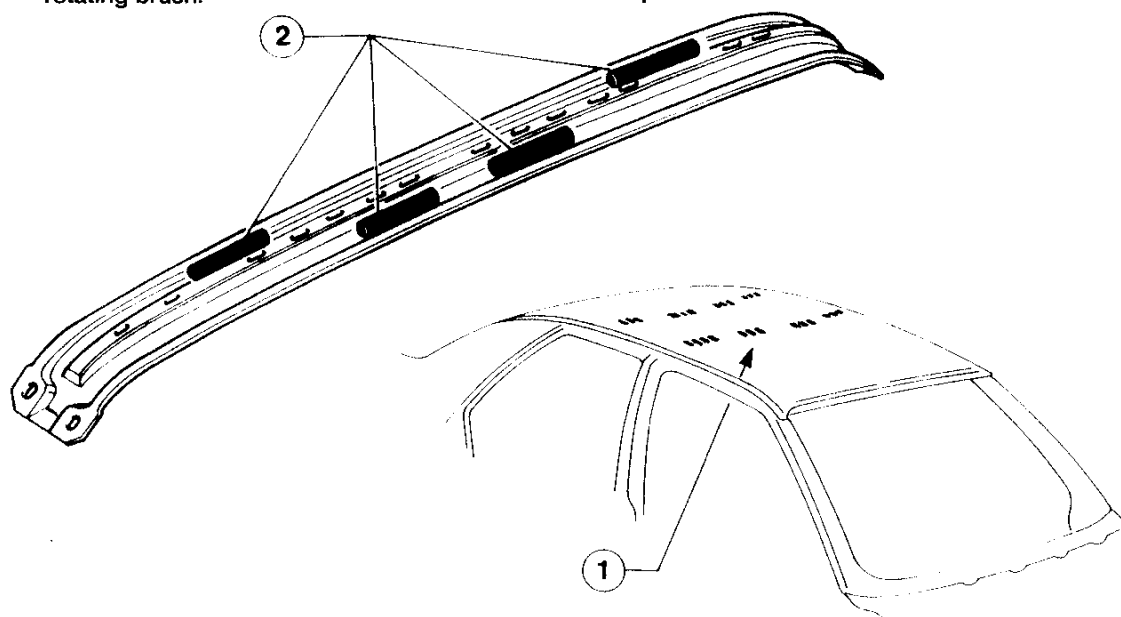




**Preparation**

1. Clean the residual sealant from the roof panel with a rotating brush.

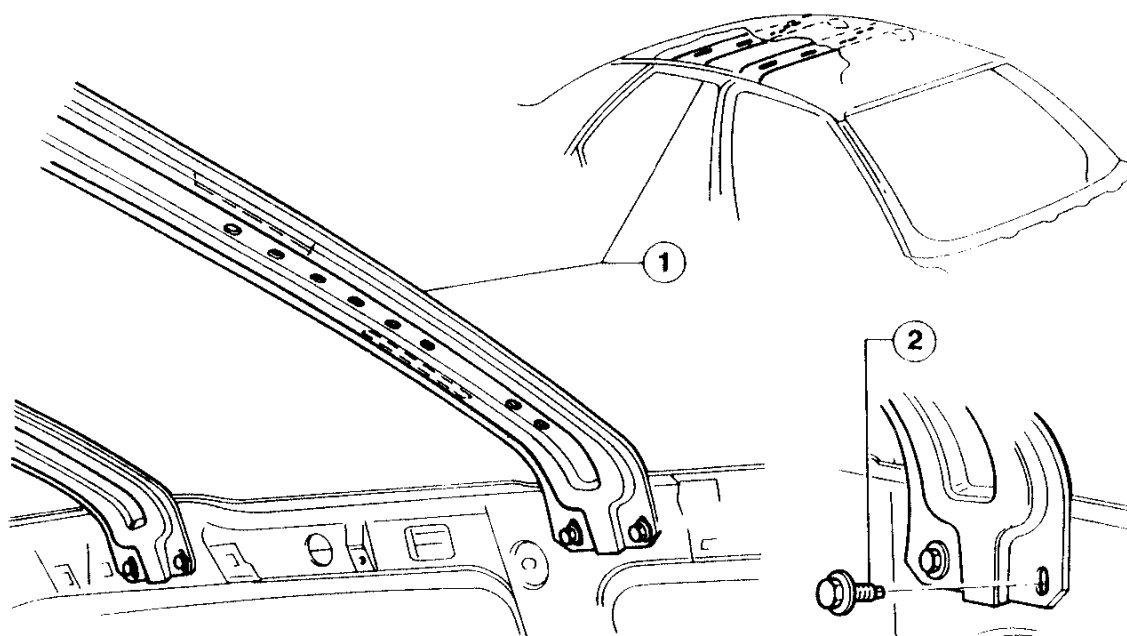
2. Spread Type A sealant on the hoops as indicated in the illustration



**Positioning and securing**

1. Position the hoops.

2. Secure the hoops using the devices shown in the illustration.





**ELECTROWELDABLE PROTECTIVE PRODUCTS**

TYPE	NAME	SUPPLIER	PRODUCT CODE	USE
A	GELFLEX	GELSON	C30501	Electroweldable protective products in paste
B				Electroweldable protective products (rust-proof paint) to be applied with brush



**RUST-PROOF PRODUCTS/OXIDE CONVERTERS**

TYPE	NAME	SUPPLIER	PRODUCT CODE	USE
A	ZINC COAT	GELSON	C20821	Electroweldable products to be applied with a brush for electro-galvanized metal sheet
B				Oxide converter products for boxed parts
C				Products for parts in aluminium



## SEALANTS

TYPE	NAME	SUPPLIER	PRODUCT CODE	USE
A	844	GELSON	C30161-C30162	To be applied by extrusion to hidden joins in sheet metal
B	GELFLEX SEALANT	GELSON	C30501	To be applied by extrusion to visible joins in sheet metal
C	EGOBON	GELSON	C30475-C30476	Preformed sealant to be used for cracks greater than 2 mm (section <input type="checkbox"/> and O)
D				Preformed sealant to be used for cracks greater than 2 mm (section <input type="checkbox"/> )
E	GELFLEX 336	GELSON	C30560	Structural sealant for doors and boot/bonnet lids

**SOUNDPROOFING PRODUCTS**

TYPE	NAME	SUPPLIER	PRODUCT CODE	USE
A	VIBRAGEL (Normal and Rhomboidal)	GELSON	C20630 - C20635	Thermically installed soundproofing material for vehicle interiors
B	VIBRAGEL (Normal and Rhomboidal)	GELSON	C20630 - C20635	Glued soundproofing materials for vehicle interiors
C	VIBRAFELT	GELSON	C20640	Preformed soundproof carpeting
D	GEL-FOAM	GELSON	C30750	Soundproofing product for foam treatment of boxed parts.

**PRODUCTS FOR UNDERBODY PROTECTION**

TYPE	NAME	SUPPLIER	PRODUCT CODE	USE
A	SIDE SCUDEX-UNDERBODY	GELSON	20721 - 20756 20101 - 20126	P.V.C. sound and gravel proofing spray-on product (hidden areas)
B	SIDE SCUDEX	GELSON	20721 - 20756	P.V.C. spray-on protection against gravel (visible areas)
C	BODY PROTECTION NERO GEL PROTEX NERO 87	GELSON	C20300 - C20301 C20303 - C20352	Bituminous wax protection for underbodies





## WAX PROTECTION PRODUCTS

TYPE	NAME	SUPPLIER	PRODUCT CODE	USE
A	GEL-PROTEX (Straw-coloured - transparent - brown - black 87)	GELSON	20351 - 20364	Protection for waxing of interior boxed parts
B	SPRAY-ON WAX PROTECTION	GELSON	C20501	Protective products for external finishing

**FILLER PRODUCTS (REPLACING HERMETIC SEALING)**

TYPE	NAME	SUPPLIER	PRODUCT CODE	USE
A	RAPID FILLER	GELSON	10240	Filler for metal parts

**TIGHTENING TORQUES**

Description	N·m	kg·m
Bonnet hinge retaining screws	18 ÷ 23	1.83 + 2.34
Bonnet lock pin	12.9 + 16.6	1.31 + 1.69
Headlight crossmember retaining screws	14 ÷ 18	1.42 + 1.83
Front wing upper retaining screws	7.1 ÷ 9	0.72 + 0.98
Front wing lower retaining screws	4.2 ÷ 5.4	0.43 + 0.55
Dashboard support crossmember retaining screws	34 + 44	3.46 + 4.48
Screws securing door hinge to door	9 ÷ 10	0.98 + 1.02
Screws securing door hinge to body	33 + 43	3.36 + 4.38
Screws securing door-lock catch to the body	17 + 22	1.73 + 2.24
Screws securing boot-lock catches	7.1 ÷ 9	0.72 + 0.98
Screws securing boot lid hinge to body	7.1 + 9	0.72 + 0.98
Screws securing boot lid hinge to lid	18 ÷ 23	1.83 + 2.34
Rear wing retaining screws	7.1 + 9	0.72 + 0.98

**FAULT DIAGNOSIS AND CORRECTIVE INTERVENTIONS****PAINTWORK DEFECTS**

TROUBLES AND DEFECTS	SEE TEST
DEFECTS IN THE APPLIED PRODUCT VISIBLE AFTER APPLICATION OR AFTER DRYING	<b>A</b>
DEFECTS IN THE APPLIED PRODUCT DUE TO AGING (EXPOSURE TO LIGHT, ATMOSPHERE AND CHEMICAL AGENTS)	<b>B</b>

**DEFECTS IN THE APPLIED PRODUCT AFTER APPLICATION OR AFTER DRYING****TEST A**

DEFECT	CAUSE	CORRECTIVE ACTION
<b>DIRT</b> (Dirt spots - Inclusions)  Shows up as pin pricks due to impurities building-up during baking or spraying.	Dust being deposited on the painted surface before this is dry or various types of dirt particles contained in the paint product. Inappropriate clothing worn by operator. Atmospheric dust. Imperfect filtering of enamel. Filters in oven no longer serviceable.	When the dust is on the surface rub with abrasive paste and polish. When dirt is persistent repaint after sanding the area affected.
<b>CISSING</b> (Cissing hole)  Is formed by a localized contraction of the wet paint causing small round depressions which uncover the layer below (cissing hole) or affect the paint layer only (cupel).	Variation in surface tension due to: grease particles or the presence of foreign matter on the primer; environmental contamination by silicone; steam saturation in the spray booth resulting in a build-up of condensate on the wet paint; inefficient spraying system.	The defect can be corrected by washing with antislicone products and sanding the affected areas, ensuring that the entire affected layer is reached. Resume the painting cycle after thoroughly cleaning the surfaces and repeat the treatment that originally showed up the defect.
<b>LOOK-THROUGH</b> (Missed coating)  A defect where the coat of paint allows the underlying colour to show through.	Insufficient thickness of the enamel, low covering capacity.	To correct this defect it is necessary to sand the surface and repeat painting.
<b>SPOTS</b> (Spotting)  Shows up as a variation in colour or brilliance on the painted surface.	The variation in brilliance is due to irregular absorption by the support area.	Sand and repaint.

**DEFECTS IN THE APPLIED PRODUCT AFTER APPLICATION OR AFTER DRYING****TEST A**

DEFECT	CAUSE	CORRECTIVE ACTION
<b>REMOVAL</b>  This defect arises when a product applied to the painted surface removes the underlying layer which normally shows up as wrinkling. This defect can arise both during painting and after, during drying off.	Imperfect drying of the primer or incompatibility between the product being used and the previous ones.	Whether the fault is found during application or drying off it is necessary to sand until a normal layer is reached and then repaint.
<b>SHADING</b>  The presence on metallic paint of areas or shading with variations in the normal colour tone.	Uneven distribution of metal particles in the product during application.	Sand and repaint.
<b>ORANGE PEEL</b>  Imperfect distribution of the product which leaves a wrinkled surface similar to the peel of an orange.	Spray viscosity too high; solvent too volatile; incorrect application (improper jet or pressure too low: insufficient or excessive); drying time too short or excessive application of the product.	Light orange peel: sand and polish with abrasive paste and polish. Deep orange peel: sand and repaint.



<b>DEFECTS IN THE APPLIED PRODUCT AFTER APPLICATION OR AFTER DRYING</b>	<b>TEST A</b>
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<b>DEFECT</b>	<b>CAUSE</b>	<b>CORRECTIVE ACTION</b>
<p><b>STRAINING (Sliding - sagging - cur-taining)</b></p> <p>The sliding of the applied paint re-sulting in irregular mounds such as drops, pockets, rims.</p>	<p>The force of gravity prevalling over the adhesion and cohesion capacity of the paint. This flaw occurs on ver-tical and inclined surfaces. If it oc-curs when the paint is applied it may be due to a low product viscosity, the spraying distance being too short, an unsuitable spray gun nozzle, low pressure or by the layer of paint being too thick or incomplete drying of the underlying layers.</p>	<p>Interventions should be carried out depending on the gravity of the flaw. For light straining allow the strained area to dry and cool off: sand with abrasive paste and polish. For heavy straining sand until the flaw is com-pletely removed and repaint the af-fected area.</p>
<p><b>PIN PUNCTURES (Pin holes - Burns - Boiling)</b></p> <p>The formation of small holes in the film of paint.</p>	<p>The presence of air bubbles or ir-regular evaporation of the solvent generating small craters in the wet film which are not able level out be-fore the film dries. In some cases it may be caused by porosity of the support or of the underlying layers, an excessively thick film or an insuf-ficient drying period.</p>	<p>Polish with abrasive paste and pol-ish; if this operation is not sufficient, sand the affected area until the inte-gral layer is reached (primer) and repaint.</p>
<p><b>SANDING RIBS</b></p> <p>Thin furrows on the surface of the paint, of variable length, which are easily visible to the naked eye.</p>	<p>These can be put down to scoring of the surface to be painted or by sand-ing of the primer coat with large grained abrasive paper.</p>	<p>If the defect is not too obvious, sand and polish with abrasive paste and polish. If the defect is too noticeable, sand and repaint.</p>

**DEFECTS IN THE APPLIED PRODUCT DUE TO AGING (EXPOSURE TO LIGHT, ATMOSPHERE AND CHEMICAL AGENTS)****TEST B**

DEFECT	CAUSE	CORRECTIVE ACTION
<p><b>BUBBLES</b> (Blistering)</p> <p>This shows as a localized swelling or bubbling on the surface which can in extreme cases affect the entire surface</p> <p>Enamel or primer blistering: the presence of mineral salts below the film of paint which absorb moisture through the surface of the paint by osmosis (due to the difference in salt concentration between absorbed water and external water) with consequent swelling.</p>	<p>Mineral salts contained in: water used to sand the primer, water used for rinsing; water absorbed by the primer and not eliminated. It can also be caused by a hand print inadvertently left on the surface to be painted.</p>	<p>Repaint the affected layer.</p>
<p><b>FLATTING</b></p> <p>A gradual loss of brilliance or shine of the painted surface. It may affect a restricted area, a specific component or the entire surface.</p>	<p>Primer cured to insufficient depth; Incorrect preparation of enamel; Inadequate or insufficient catalyst.</p>	<p>Polish with abrasive paste and polish; if this is not sufficient, sand and repaint.</p>



**DEFECTS IN THE APPLIED PRODUCT DUE TO AGING (EXPOSURE TO LIGHT, ATMOSPHERE AND CHEMICAL AGENTS)****TEST B**

DEFECT	CAUSE	CORRECTIVE ACTION
<p><b>CRACKS</b> (Fissuring - Reticulation)</p> <p>Cracking of a dry film forming simple or complex patterns. When the final film of paint is affected and the cracks are barely visible this is called <b>Crazing</b>. When cracking affects the entire final layer or more than one layer, this is known as <b>Checking-cracking</b>.</p> <p>Crazing only affects the layer of enamel.</p> <p>Checking-cracking can affect the entire protective coating and in severe cases may even reach the metal sheet.</p> <p>Below are given some examples of checking-cracking:</p>	<p>Faulty curing of the primer resulting in a marked shrinking of the layer causing superficial cracking.</p>	<p>Sand until an integral layer is reached and then repaint.</p>

**DEFECTS IN THE APPLIED PRODUCT DUE TO AGING (EXPOSURE TO LIGHT, ATMOSPHERE AND CHEMICAL AGENTS)****TEST B**

DEFECT	CAUSE	CORRECTIVE ACTION
<p><b>CRACKS</b> (Fissuring - Reticulation)</p> <p>Cracking of a dry film forming simple or complex patterns. When the final film of paint is affected and the cracks are barely visible, this is called crazing. When cracking affects the entire final layer or more than one layer this is known as checking-cracking. Crazing only affects the layer of enamel. Checking-cracking can affect the entire protective coating and in severe cases may even reach the metal sheet.</p>	<p>Faulty curing of the primer resulting in a marked shrinking of the layer causing superficial cracking.</p>	<p>Sand until an integral layer is reached and then repaint.</p>
<p><b>EXFOLIATION</b> (Exfoliation - Flaking)</p> <p>The separation of the film of paint from the supporting surface due to insufficient adherence.</p>	<p>Flaking: results when the primer coat is not sanded or is excessively cured provoking vitrification of the paint.</p> <p>Exfoliation: separation of the transparent paint from the metallic base may be caused by an excessively long interval between application of the base and the transparent film or by an excessively thick transparent film.</p>	<p>Remove the affected layer and repeat the painting cycle.</p>

**DEFECTS IN THE APPLIED PRODUCT DUE TO AGING (EXPOSURE TO LIGHT, ATMOSPHERE AND CHEMICAL AGENTS)****TEST B**

<b>DEFECT</b>	<b>CAUSE</b>	<b>CORRECTIVE ACTION</b>
<b>CHALKING</b>  The formation of a whitish powdery layer on the surface.	Gradual degradation of the solvent with the consequent release of pigment resulting from exposure to atmospheric agents and particularly to the U.V. rays of the sun.	Sand until an integral layer is reached and then repaint.
<b>COLOUR CHANGE</b>  A slight variation in colour which may affect one or more components or the entire surface.	Incorrectly prepared products; incorrect touching-up; aggressive action by atmospheric and/or chemical agents.	Sand and repaint.
<b>SPOTS DUE TO EXCESSIVE PEROXIDE CATALYST</b>  Variations in colour covering areas treated with filler.	Excessive quantities of catalyst in the polyester (peroxide) filler.	Sand until the flaw is removed and then repaint.
<b>BRONZING</b>  A bronze reflection on some paints containing blue or red pigment.	Gradual oxidation of the pigment.	Polish with abrasive paste and polish.

**DEFECTS IN THE APPLIED PRODUCT DUE TO AGING (EXPOSURE TO LIGHT, ATMOSPHERE AND CHEMICAL AGENTS)****TEST B**

DEFECT	CAUSE	CORRECTIVE ACTION
<p><b>SPOTS</b> (Acid attack)</p> <p>Regular spots of different colour which varying in depth and size.</p>	<p>Rain with high quantities of sulphuric acid being deposited on the flat surfaces of the vehicle. The concentration of sulfuric acid may increase with the evaporation of water. The acid then attacks the paint: on contact with metallic paint it can completely destroy the aluminium particles which lend the paint its metallic appearance.</p>	<p>Sand and repaint.</p>
<p><b>SPOTS</b> (Attack by vegetable resins)</p> <p>This phenomenon affects the horizontal surfaces of those vehicles which are often, or for long periods, parked under trees.</p>	<p>Minute drops of colourless resin cover the film of paint and if left to harden adhere to the film and are then extremely difficult remove.</p>	<p>Wash with hot water: if the spots remain wash again using technical octane diluted with water. If the surface of the paint is indented, polish with abrasive paste and polish; if this gives no results, sand and repaint.</p>
<p><b>TAR SPOTS</b></p> <p>A phenomenon which mostly affects the underside of the vehicle as this is the part which is most likely to come into contact with tar.</p>	<p>Driving on freshly tarred roads.</p>	<p>Clean the surfaces affected with a cloth soaked in a specific product.</p>

**DEFECTS IN THE APPLIED PRODUCT DUE TO AGING (EXPOSURE TO LIGHT, ATMOSPHERE AND CHEMICAL AGENTS)****TEST B**

DEFECT	CAUSE	CORRECTIVE ACTION
<b>SPOTS OF CEMENT</b>  Small particles or rough cement clouded stains which stick harder to the vehicle the longer they are left.	Parking near a cement factory where the horizontal surfaces of the vehicle may be covered in cement dust which may then harden on contact with humidity. Exposure to water running off cement objects (bridges, viaducts etc.)	Wash the vehicle with one of the following three water solutions: <ul style="list-style-type: none"><li>- with 50% vinegar</li><li>- with 4% acetic acid</li><li>- with 10% oxalic acid.</li></ul> Sand and paint is washing proves to be insufficient.
<b>SPOTS OF BIRD EXCREMENT</b>  Characteristic and well known by all. They leave no doubt as to their origins.	Bird excrement is acidic and if left for long periods attacks the bodywork of the vehicle.	Energetic polishing should suffice but if not, sand and repaint.