STRAIGHTENINGACOMPONENT:DESCRIPTION

1. REMOVING DENTS FROM STEEL COMPONENTS

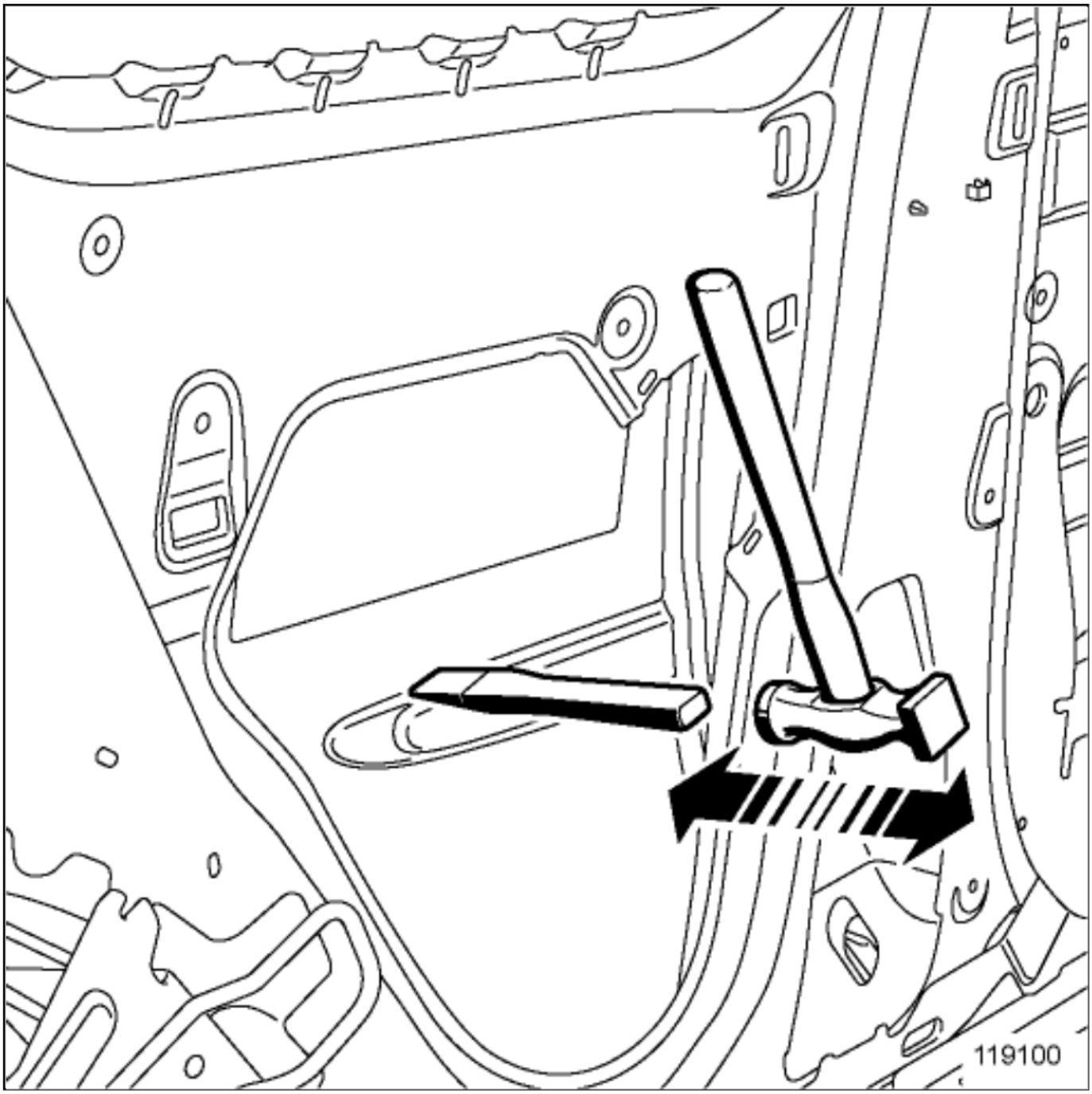
- Used only for straightening visible external components:
  - rear wing panels,
  - door panels,
  - side panels,
  - lining components without a primary structural function (e.g.: wheel arches, floor).

It does not require heavy straightening equipment and can be performed anywhere in the bodyshop.

For all dent removal or heating operations, always start at the outside of the deformity and work towards the centre.

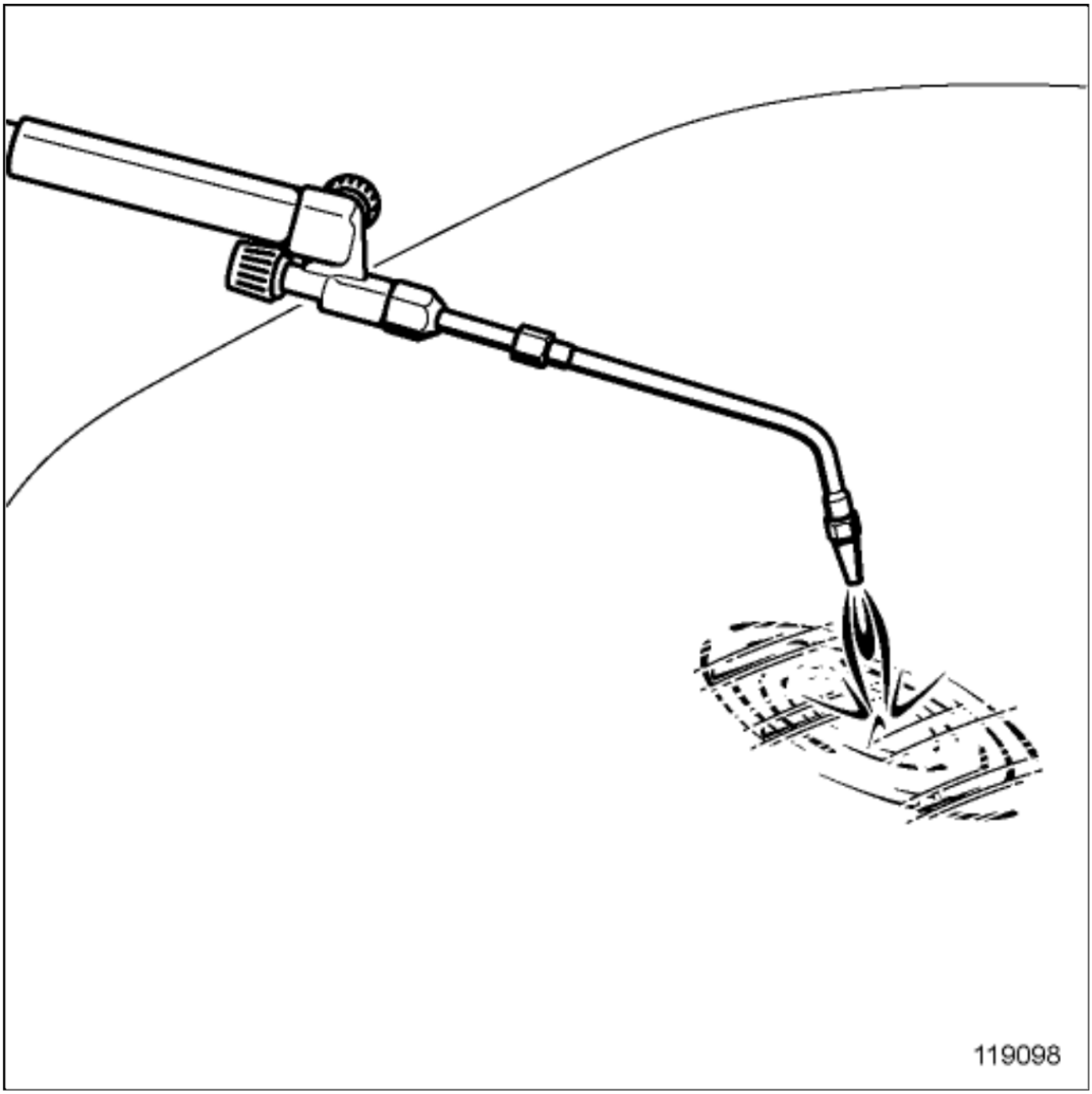
1- DENT REMOVAL WITH ACCESS VIA THE INTERNAL FACE

1)STRAIGHTENING



Straighten the internal face using a drift, stake or hammer until as close as possible to the required shape, then use a planishing hammer or mallet and a suitable stake to strike "the opposite way" .

2)HEATING



The operation is performed using an oxyacetylene torch, a flat stake and a mallet.

Note:

For steel, this operation destroys all original anti-corrosion protection on the internal and external faces of the heated zones. It is essential to carry out a painting procedure on the internal faces.

By definition, shape finishing on a zone accessible via the internal face must be by "planishing" and heating. Under no circumstances should the component panel be filed or ground, so as not to reduce its thickness.

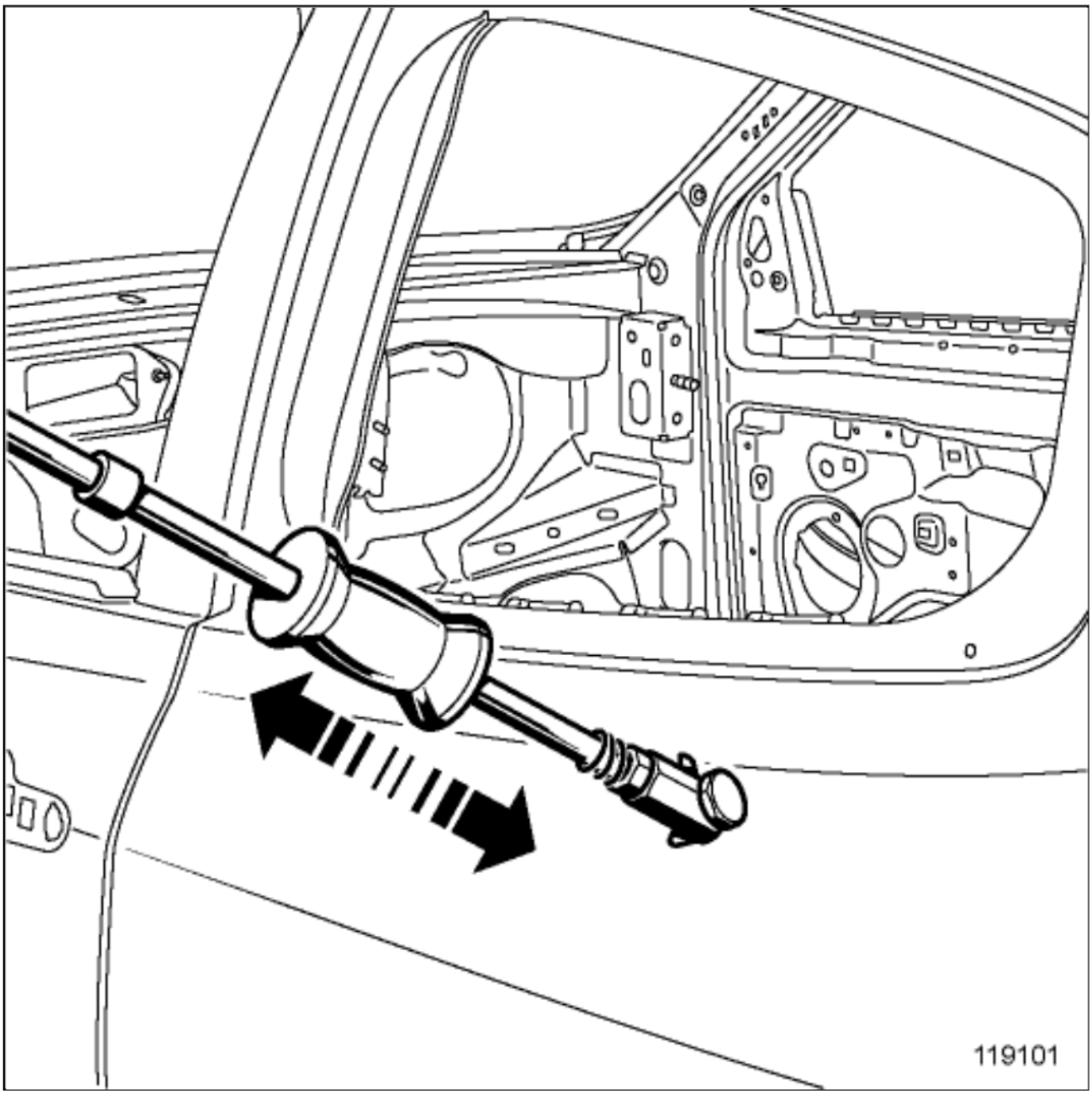
2- DENT REMOVAL WITHOUT ACCESS VIA INTERNAL FACE

This type of straightening is performed with a "welding/puller" type tool, using two techniques depending on the force to be applied.

1)SINGLE POINT INERTIA STRAIGHTENING

Note:

During an operation of this type on the B-pillar, disconnect the side airbags inertia switch electrical connector.

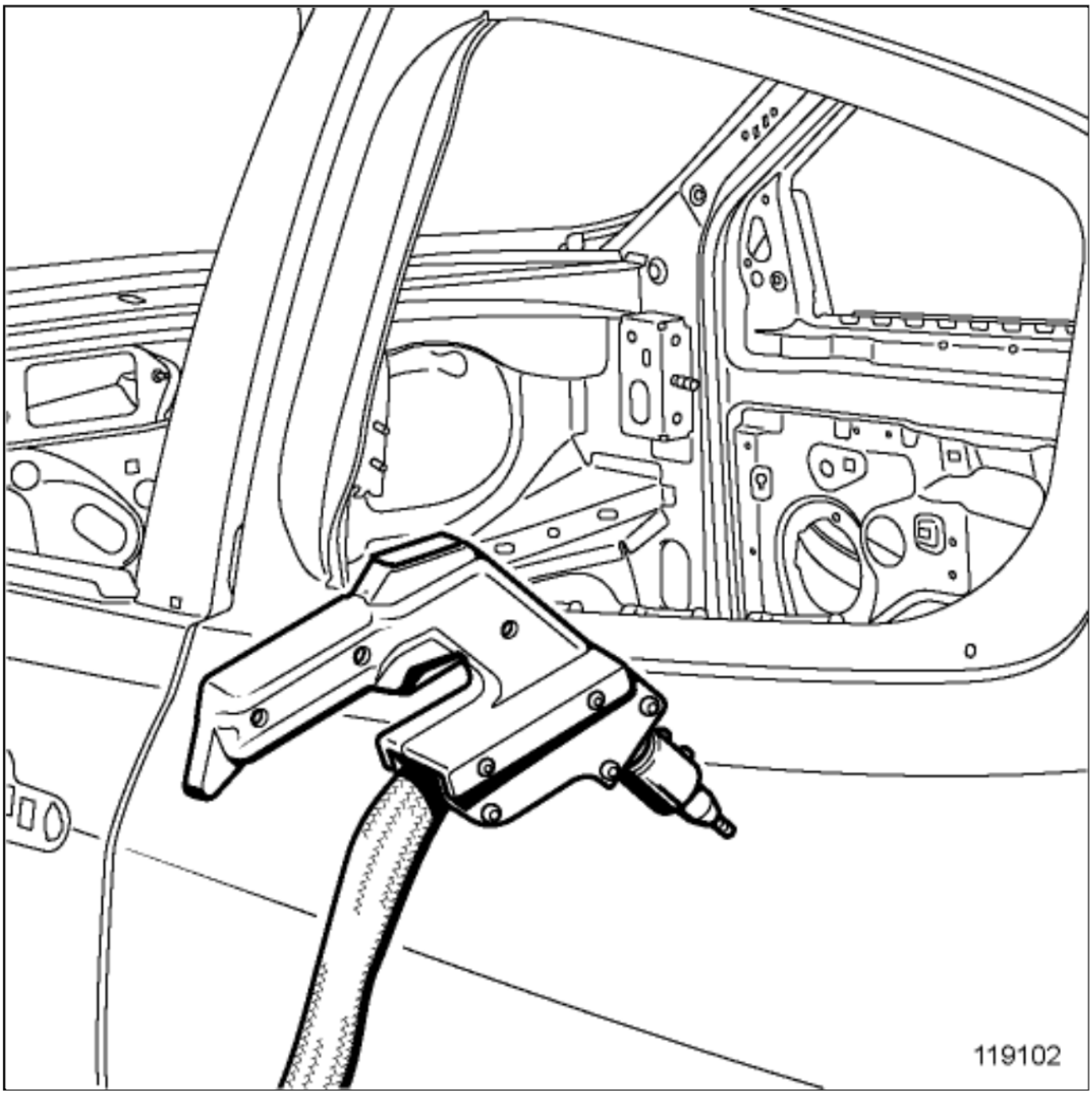


Steel :

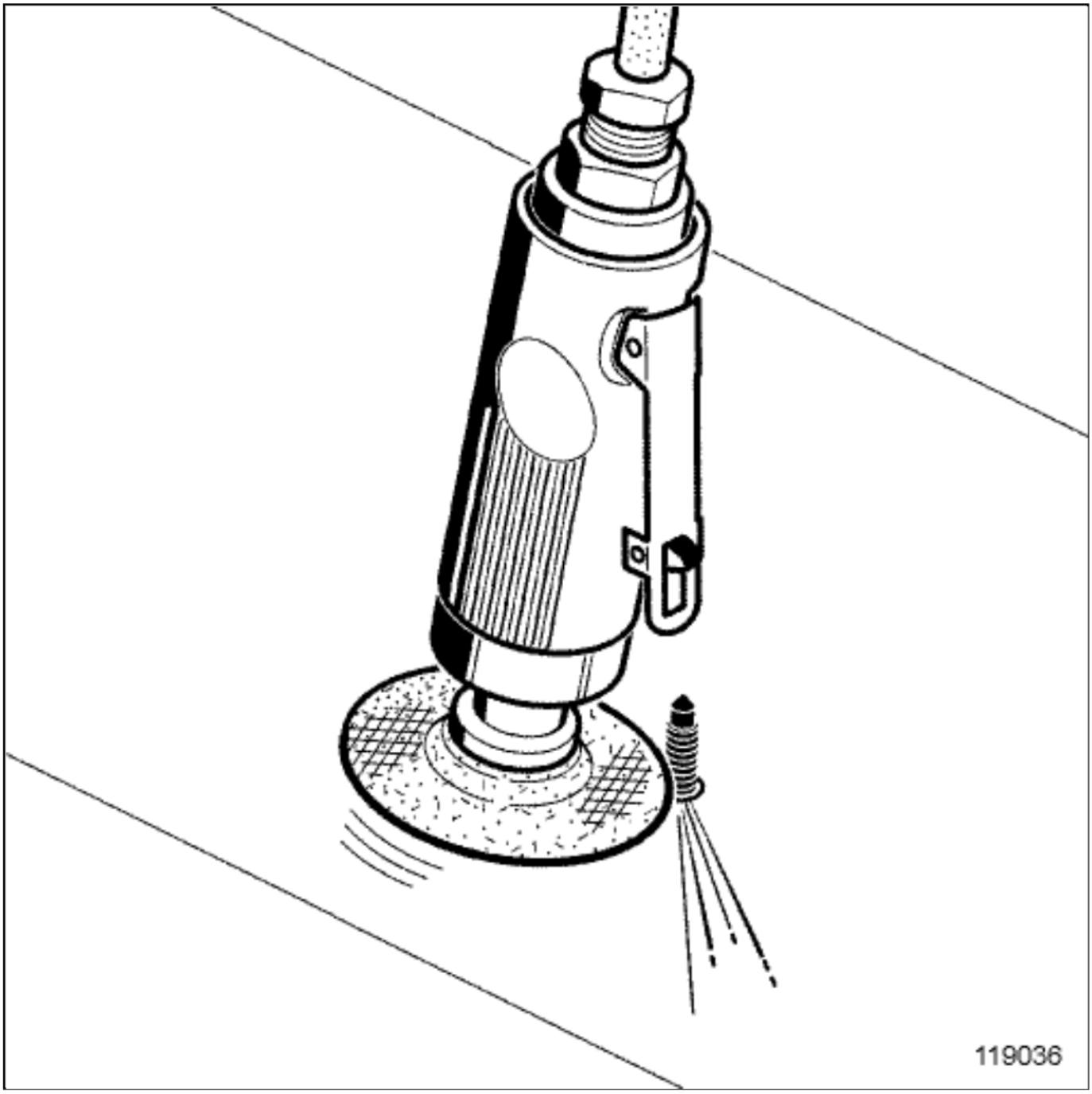
■ the operation consists of repeatedly welding a star shape into the recesses of the dent. This is fixed at the end of a rod, along which an inertia weight slides.

Note:

Always start the repair from the outside edge and work inwards, finishing at the centre.

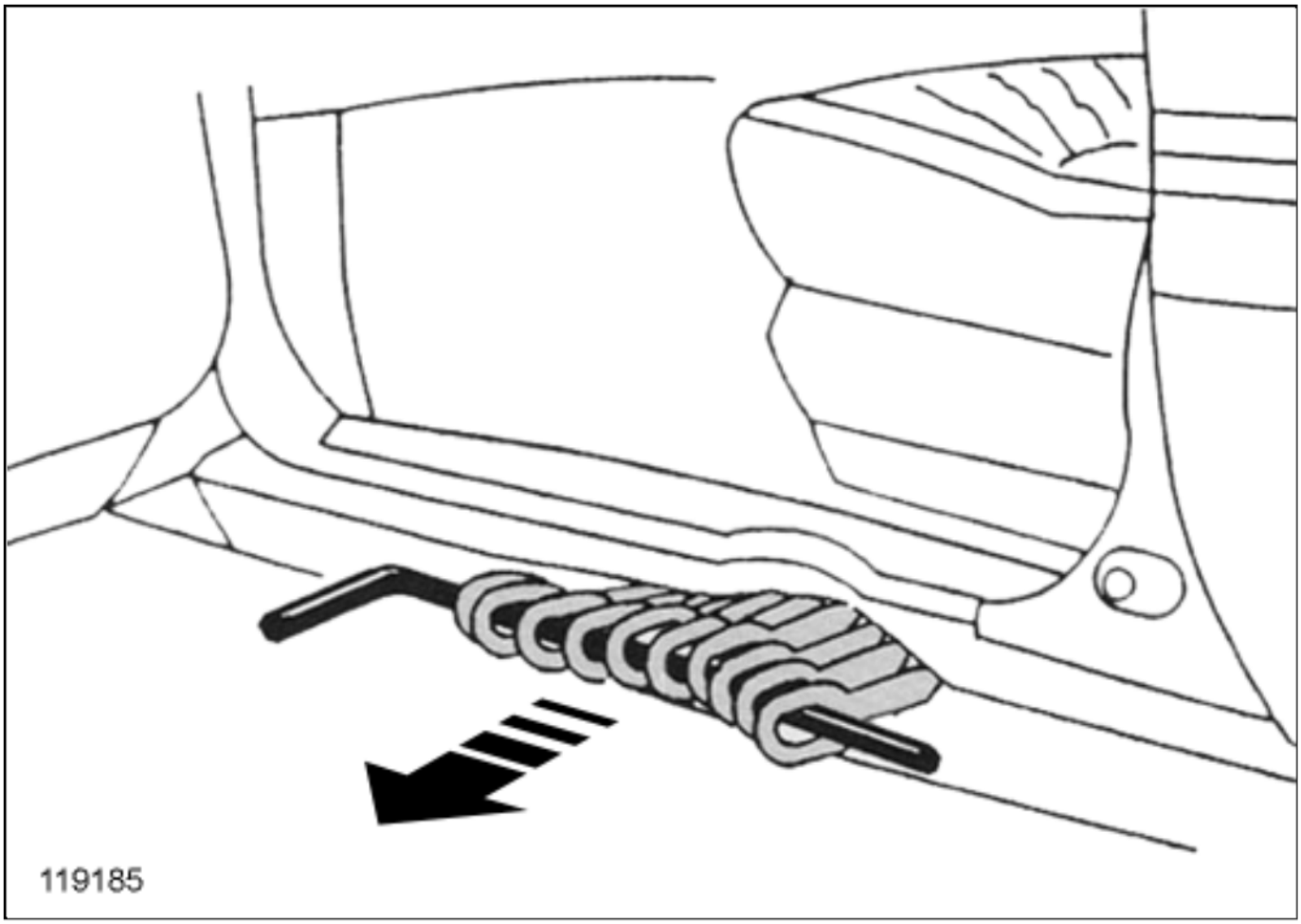


- Aluminium :
  - this requires a specific technique and equipment, consisting of welding a threaded stud onto which the pulling device is screwed.



When the operation is complete, the stud is cut then ground. Do not under any circumstances reduce the thickness of the panel, to avoid weakening the component.

2)STRAIGHTENING BY MULTIPOINT PULLING



This technique is used for straightening deep gouge marks; it consists of welding a series of parallel rings in the recess of the deformity, into which a rod is fitted to allow a lever system equipped with a "clamp" to be attached. The advantage is that it can be used to straighten a significant deformation with a single pull.

3)HEATING

Note:

For steel, this operation destroys all original anti-corrosion protection on the internal and external faces of the heated zones. It is essential to inject wax into the hollow sections to protect the internal faces.

Steel :

■ an inductor type tool may be used, however in this process the metal is only hardened on the surface to avoid blistering; lengthening of the panel cannot be reduced.

Note:

In the event of excessive lengthening of the panel without access to the internal face, the component must be replaced.

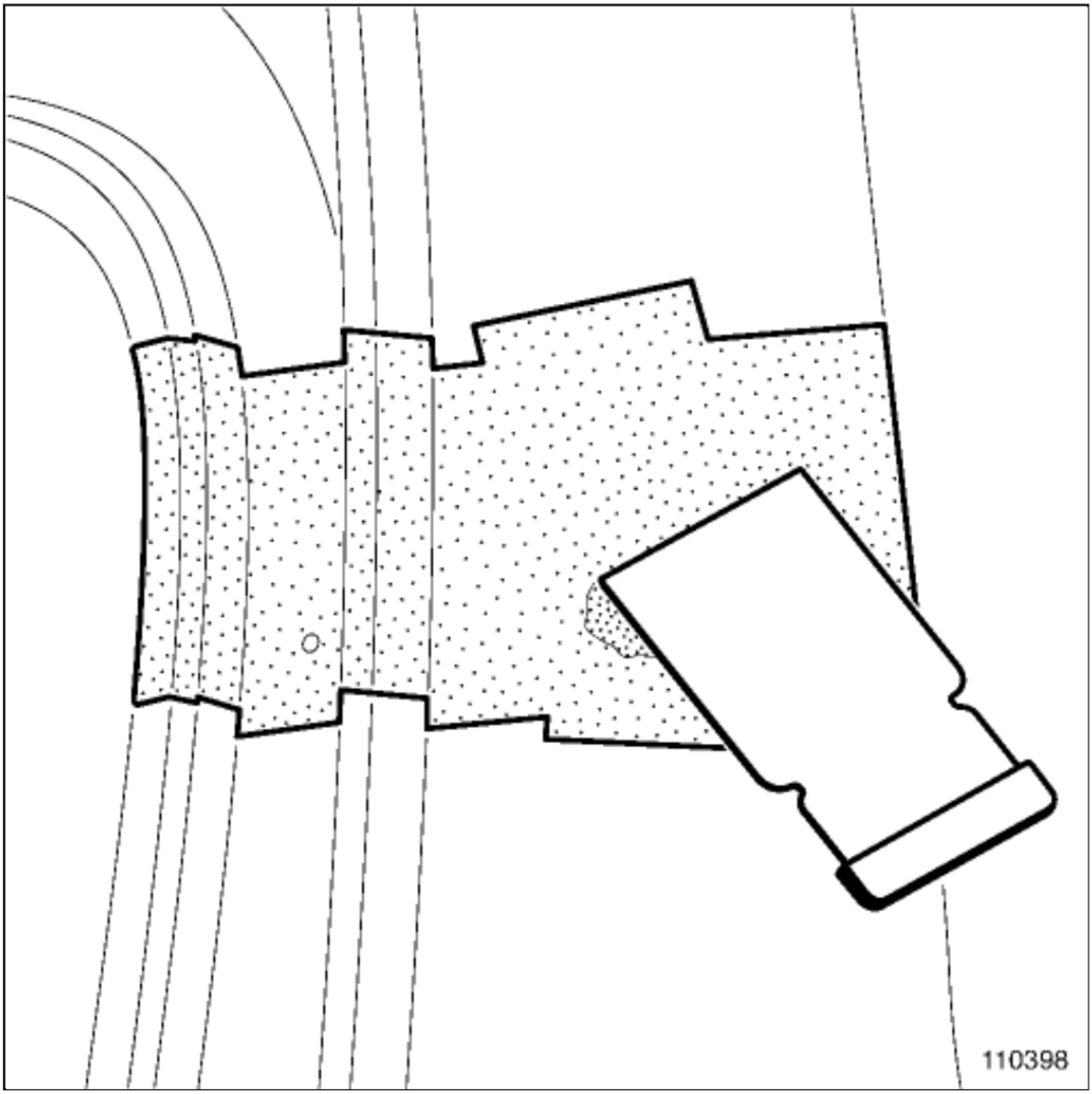
4)SHAPE FINISHING

In accordance with the new European directive on vehicle recycling, vehicles manufactured after the 1st July 2003 should not contain any lead based products.

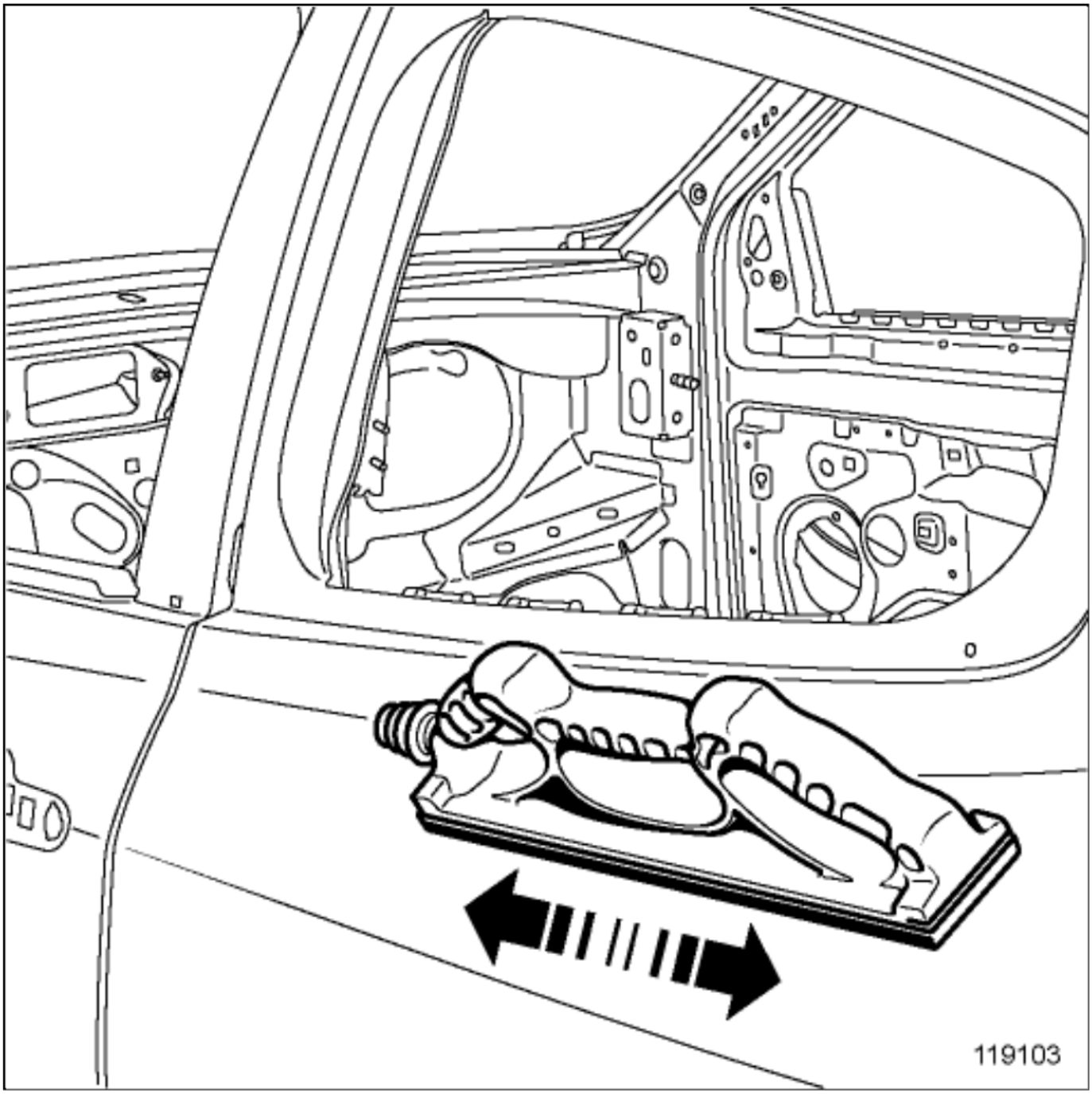
Furthermore, with regard to bodywork repairs, these vehicles should not be repaired using tin, which contains a large amount of lead.

The replacement solution for this type of operation is to use dual component polyester mastic containing aluminium. Aluminium panels are shape finished using "special aluminium" polyester mastic.

It is important that the thickness of the residual mastic following sanding does not exceed 1 mm.



Polyester mastic is applied using a block or broad knife.



Sanding during shaping should be done using P100dry sand paper with a large "file" type block.

Surface finishing should be via light sanding using P150sand paper.

Never use an "orbital" sander to sand during shape finishing, as the motion of this type of equipment is not suitable for the operation.

2. REMOVING DENTS FROM ALUMINIUM COMPONENTS

1- TOOLS

The basic tools used are the same as for repairing steel panels.

Only use tools and abrasive discs specifically used for repairing aluminium, in order to prevent contamination of the aluminium surface with steel particles, which could result in galvanic corrosion.

Favour the use of mallets, wooden stakes or possibly plastic stakes.

In order to prevent any impact marks and scratches, the metal tools should not have any sharp edges, and their surfaces should be smooth and polished.

Consequently, finishing hammers (grooved face) must not be used.

The edges of the files for soft metals should be rounded.

2- DENT REMOVAL

There is a higher risk of lengthening aluminium panels than steel panels; for this reason, the planishing operation should be carried out gently.

Panel lengthening can be eliminated by supplying heat (150˚C) which can be controlled using a temperature indicator.

Note:

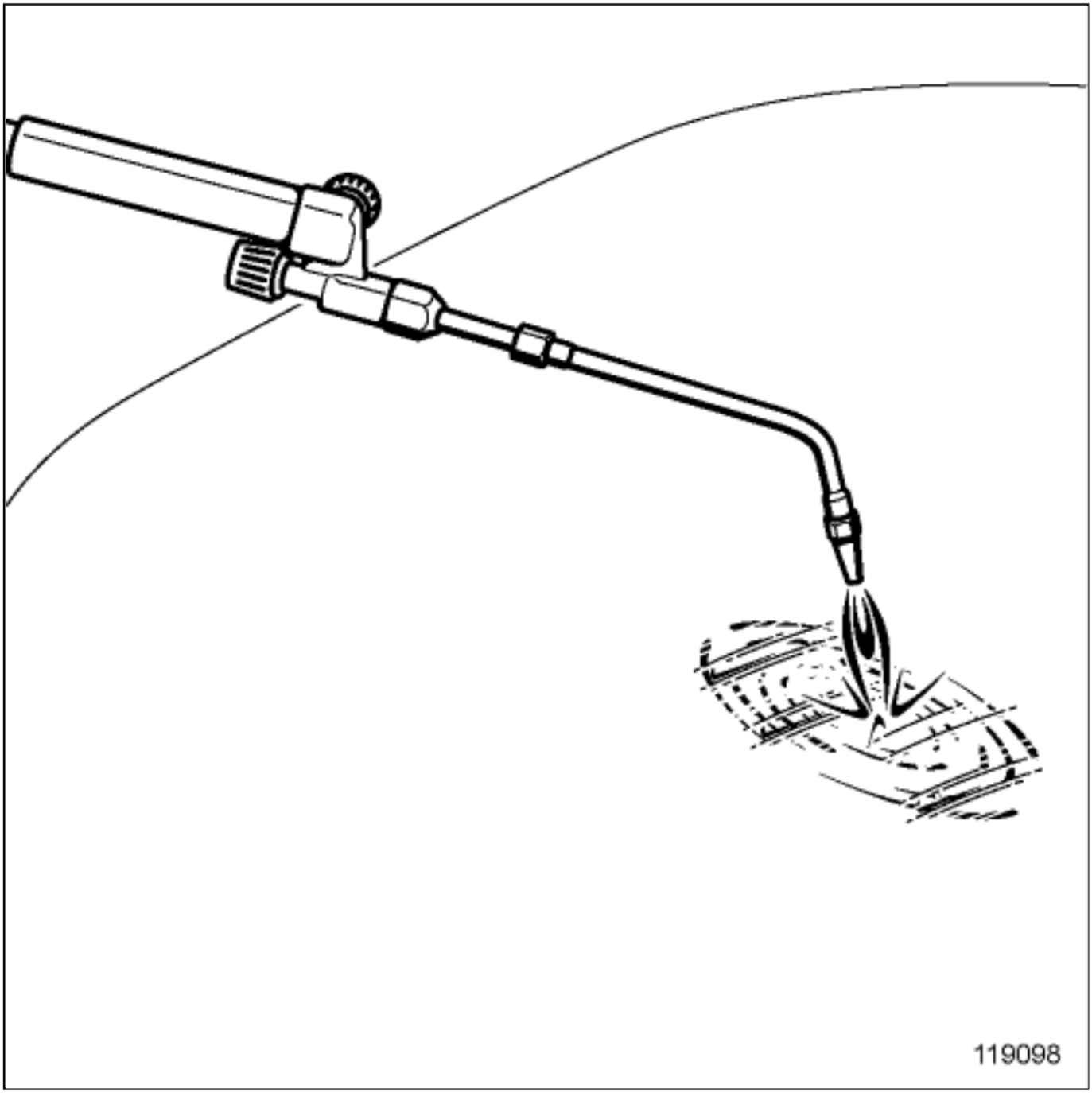
Use a 150˚ Heat Markerto control the heating temperature correctly (see IXELL product catalogue).

1)CHECKING THE TEMPERATURE

Before heating, remove any sign of coating (paint, primer, cataphoretic coating), as these can affect the temperature reading.

The flame of the blowtorch should be adjusted so that there is slightly more acetylene in relation to oxygen.

Mark the area using the pencil.



The marks will melt when the temperature is reached.

3- FINISHING

Aluminium bodywork component: Preparation and paint range (94A, Paint application range for panels).

3. JACKING

For reasons of passive safety, all jacking and straightening operations for structural components which have undergone deformation beyond the elastic limit (marked crumpling) must be followed by a planishing operation.

This applies to all structural components, irrespective of the type of panel. They must be replaced if they cannot be straightened cold.

It is very difficult to cold straighten an ultra high elastic limit panel, and you are strongly advised not to heat the material to make it malleable.

- For major impacts, it may be necessary to perform preliminary jacking in order to:
  - detach the electrical wiring harnesses,
  - release the mechanical components to be removed,
  - gain access to a joint.

This should not affect the choice of jacking equipment; this is made according to the type of repair to be carried out (see below).

4. LIGHT JACKING

1- JACKING PARTS OF A VEHICLE WHICH DO NOT HAVE A DIRECT INFLUENCE ON STRUCTURAL BEHAVIOUR (E.G.: REAR END PANEL, WHEEL ARCH, FLOOR, LININGS)

All the straightening techniques described above may be used for any parts which are not directly visible and whose primary function is not structural.

2- JACKING AND STRAIGHTENING A STRUCTURAL COMPONENT

For all straightening operations on one of these components, perfectly align the "edges" and blanks by "planishing" with a suitable stake and hammer.

Note:

Never use an inertia type straightening device.

To do this, detach the component's closure panel to gain access to the internal face during straightening.

You are strongly advised not to use shape finishing mastic on a structural component to hide residual crumpling.

1)JACKING WITHOUT SUBFRAME CHECKS

When there is no need for geometry checks (e.g.: rear end panel, scuttle side panel upper

reinforcement, front or rear side member ends), repair without parts replacement is carried out on a standard small straightening bench (See: Garage equipment catalogue).

2)JACKING WITH SUBFRAME CHECKS

When geometry checks are necessary (e.g.: assembled side members, front half unit or all parts comprising mechanical mounting points), repair without parts replacement is carried out on a small straightening bench equipped with special raised anchoring clamps to allow a geometry checking system to be positioned underneath the vehicle.

5. HEAVY JACKING AND REBUILDING WITH SUBFRAME CHECKS

The parts concerned by this procedure are identified in each vehicle MR in sub-section 40A**Structural components to be positioned on the repair bench: Description** .

The parts may be partially replaced, except for ultra high elastic limit components, for which complete replacement is compulsory.

When straightening or replacing these parts, it is essential to check the geometry of the components; repairs are carried out on a repair bench (body jig bench) (See: Garage equipment catalogue.

- The repair bench consists of several components, each of which fulfils a distinct function:
  - The body jig bench: rigid base plate which simultaneously supports and secures the vehicle. This is equipped with an anchoring system comprising four anchoring clamps which may be fitted with additional retaining devices for the three-dimensional checks.
  - The jacking system: must comprise at least a 10 tonne bracket, a special “pulling” chain and a gripping device.
  - The geometry checking system: this may be either positive, or use three-dimensional measuring. It is used to check and realign important structural points during straightening operations, and the spatial positioning of replaced components in relation to the body.