

VOLKSWAGEN

AKTIENGESELLSCHAFT

Usage Information

VAS 6321 A



Usage information VAS 6321 A
Version 2021/06

Read this usage information **carefully before** using the VAS 6321 A for the first time. Keep the instructions for later use and pass this usage information on to other/further users.

The dissemination or reproduction of these instructions or the re-use or communication of its contents are **not** permitted, unless expressly authorized.

All rights reserved, including the right to make technical changes and corrections.

Dear Customer,

Congratulations on your decision to purchase our VAS 6321 A.

With this repair system, you have not only purchased a quality product from Carbon GmbH, but also made a future-oriented decision – we wish you success when working with this equipment.

We have prepared this usage information with important notes to avoid potential hazards, to increase the service life of the tools, and last but not least to support you in your daily work as well as to achieve a better result when carrying out repairs.

It is also our aim to ensure the high quality of our products by continuously developing the construction and features of our products and the accessories available for them. This may result in deviations between this usage information and your product - no claims can therefore be derived from the information, illustrations and descriptions.

The data and information contained in this usage information have been compiled with the greatest possible care. We have done all that we can to ensure that the information contained in this usage information was accurate and up to date at the time of dispatch.

Nevertheless, we are unable to guarantee that this information is absolutely error-free.

If you discover any errors or ambiguities while reviewing this usage information, please inform us. Please also let us know if you have any suggestions or complaints relating to our product. We will be grateful for your feedback.

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1. Important safety instructions



Scope of application of the dent removal system

Perform body repair work, such as dent removal, using resistance welding techniques and straightening devices. Local heating of the metal sheets using the copper electrode.

The VAS 6321 A/13 inverter welder and the pulling and straightening tools may not be used for other purposes!

No structural changes, even minor ones, are permitted; these will render the legal guarantee void!

CARBON GmbH accepts no liability for damages to persons, animals, property or the machine itself resulting from improper application of the safety criteria specified in this usage information, even through minor manipulations, or through the use of non-original or non-compatible spare parts.

Persons

The use of qualified personnel is recommended when carrying out work with the VAS 6321 A. Any persons working with the system must in any case have been made aware of the possible risks and must have read and understood this usage information.

Participation in the familiarization training is highly recommended!

Safety instructions

Read the instructions carefully. Failure to observe the safety regulations and basic precautions may result in serious physical injury and damage to property. Make sure that employees working next to you are not injured, for instance by sparks that may occur during the work process.



Protective clothing

Wear work clothes with long sleeves, gloves, safety shoes, headgear, safety glasses, and hearing protection if necessary. The equipment heats sheets of metal to high temperatures and can spray sparks. To avoid burns and other possible injuries, the general safety regulations of welding equipment and body repair must be observed when working with the CBR dent removal system!



Important: Explosion hazard!

Do not make repairs to sheet metal or containers that have contained inflammable materials, such as a fuel tank.

Avoid a potentially explosive environment.

To avoid any risk, do not use the device near inflammable liquids, gases or other flammable and dangerous objects. The sparks generated when using the device can otherwise lead to explosions.



Important: Risk of burns and poisoning!

The sheet metal parts to be machined can be heated to very high temperatures. Toxic vapors or gases may be generated, depending on the composition of the surface coating on both the front and the back of the metal sheet, e.g. zinc, lacquers, sealing material, anti-drumming material, etc.

To avoid poisoning, it is essential to observe appropriate precautions such as good ventilation in the workplace or the wearing of respirators in the event that there is insufficient ventilation.



Always work attentively and concentrate!



Magnetic fields

Please note that the VAS 6321 A/13 PowerInverter included in the VAS 6321 A generates powerful magnetic fields that exert powerful attractive forces on magnetic metals. Watches, magnetic cards and data carriers can be damaged by this.

Wearers of pacemakers must always consult their physician before approaching the welding area!

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be disconnected from the power source in accordance with the vehicle manufacturer's specifications before using the VAS 6321 A/13!

2. Use / Guarantee

2.1 Proper use

Our VAS 6321 A is designed and manufactured exclusively for commercial use in repairing damage to the vehicle body.

Use in the non-commercial sector is expressly not recommended due to the frequent lack of knowledge of vehicle body repair and especially of welding equipment, as well as a lack of specific training.

Proper use also includes observing and understanding this usage information, observing the intervals and conditions for tests and maintenance work on electrical components (in accordance with applicable legal regulations), as well as regular and conscientious inspection of the pulling and striking tools for possible damage – damaged tools may no longer be used!

2.2 Guarantee

Please refer to our General Terms and Conditions for the scope of guarantee for our VAS 6321 A.

The guarantee does not cover damage caused by:

- ordinary wear and tear;
- improper use or overloading;
- damage caused by transport or abuse;
- failure to observe the instructions in this usage information;
- failure to adhere to safety regulations.

Any claim under guarantee shall be void if alterations or modifications are made to our products, and if service and repair work is not carried out by persons authorized by us.

At this point, we expressly point out that only spare parts, additional devices, components and consumables approved by us may be used. The same shall accordingly apply to products and structural components installed by our suppliers.

3. Electrical supply

Important safety instruction regarding the electrical supply

The VAS 6321 A trolley is supplied with a connection cable with a 16A type EN 60309-1 plug. The cable must be connected to a three-phase, grounded 400V (50-60 Hz) socket (L1, L2, L3, N and PE) with neutral and protective conductor connected in compliance with the regulations and current standards for electrical installations.

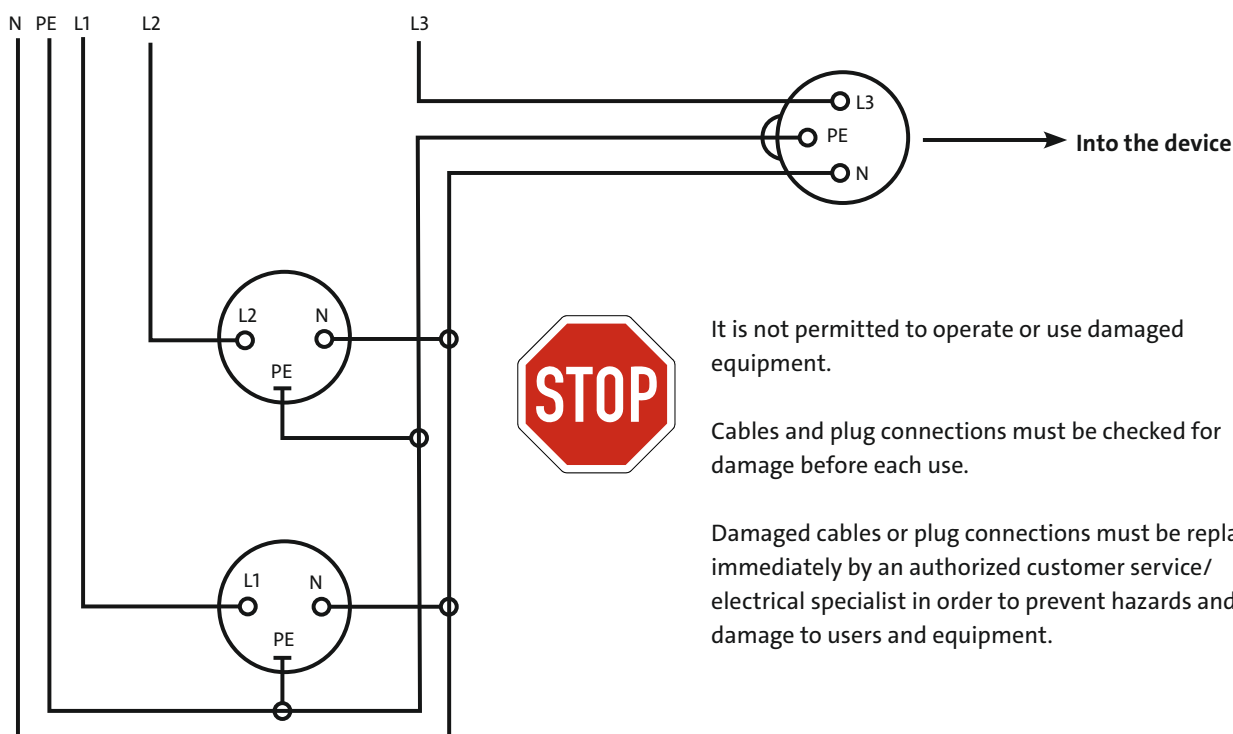
Even if a cable extension is used, it is essential to ensure that all conductors (L1, L2, L3, neutral and PE) are present and properly connected.

The VAS 6321 A/13 PowerInverter is supplied with a 16A DIN 60309 plug, type Multigrip, 3-pole, 6h / 200-250V 2P. This is connected to a 230V (50-60Hz) DIN 60309 (coupling) socket, 3-pole, 6h / 230V 2P with grounding, located inside the VAS 6321 A trolley.



If operation of the PowerInverter outside the VAS 6321 A trolley is desired, the PowerInverter must be connected to a single-phase 230V (50/60Hz) power supply (L, N and PE) with a connected neutral and protective conductor using a suitable adapter cable or an adapter plug.

From the mains



4. The VAS 6321 A in use

The VAS 6321 A is a complete, innovatively designed repair system for the economical and high-quality repair of the vehicle body.

Almost unbelievable results can be achieved by experienced craftsmen who have received instruction and training in effecting repairs using resistance welding techniques, a variety of straightening devices and glue technology.

Combining optional tools/accessories from the Paint damage-free Dent Removal (PDR) technology and the PushPull system opens up further possibilities for body repair.

Application images

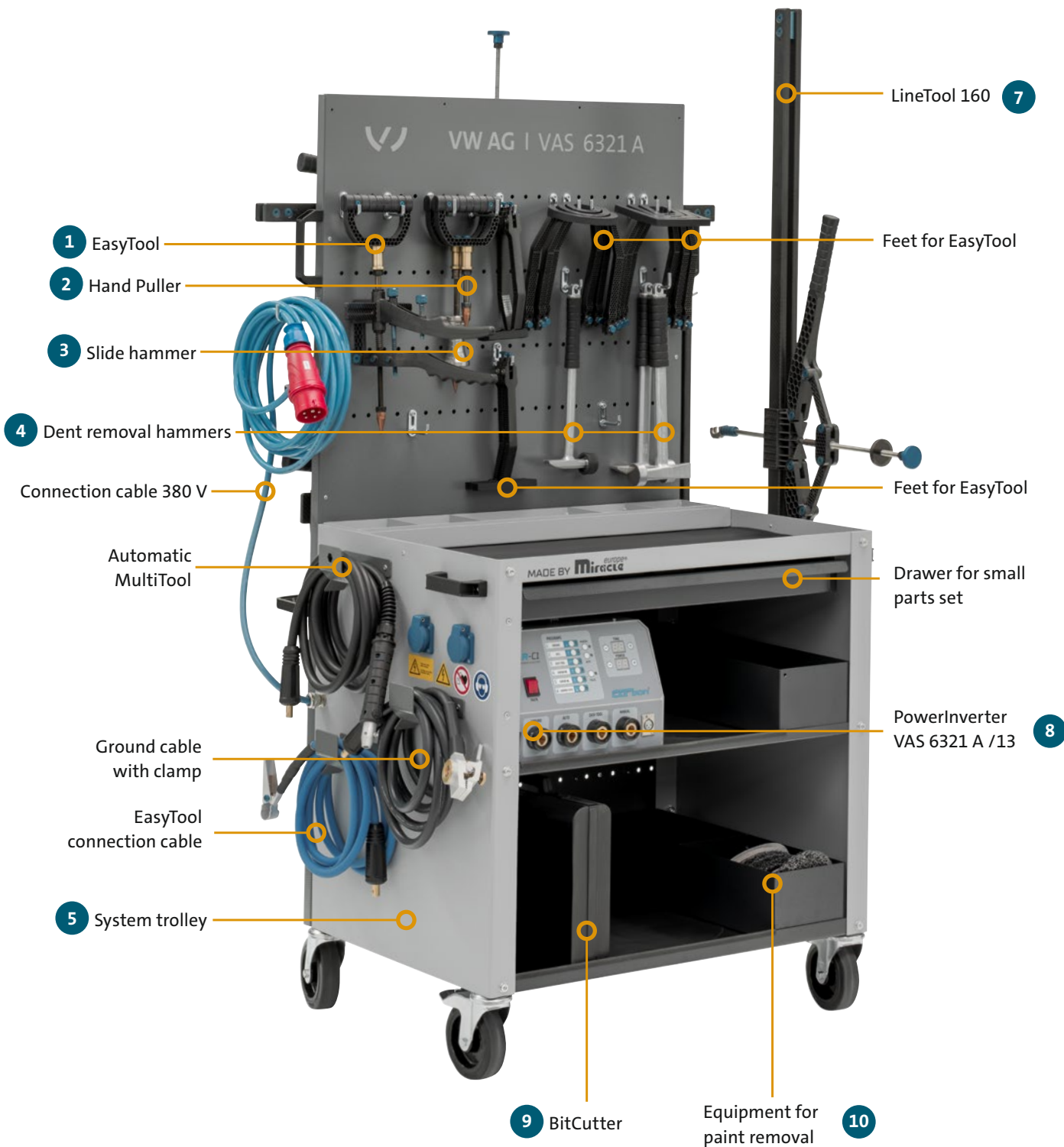


5. Typical damage

Attachment parts, as well as welded and bonded parts



6. The VAS 6321 A at a glance

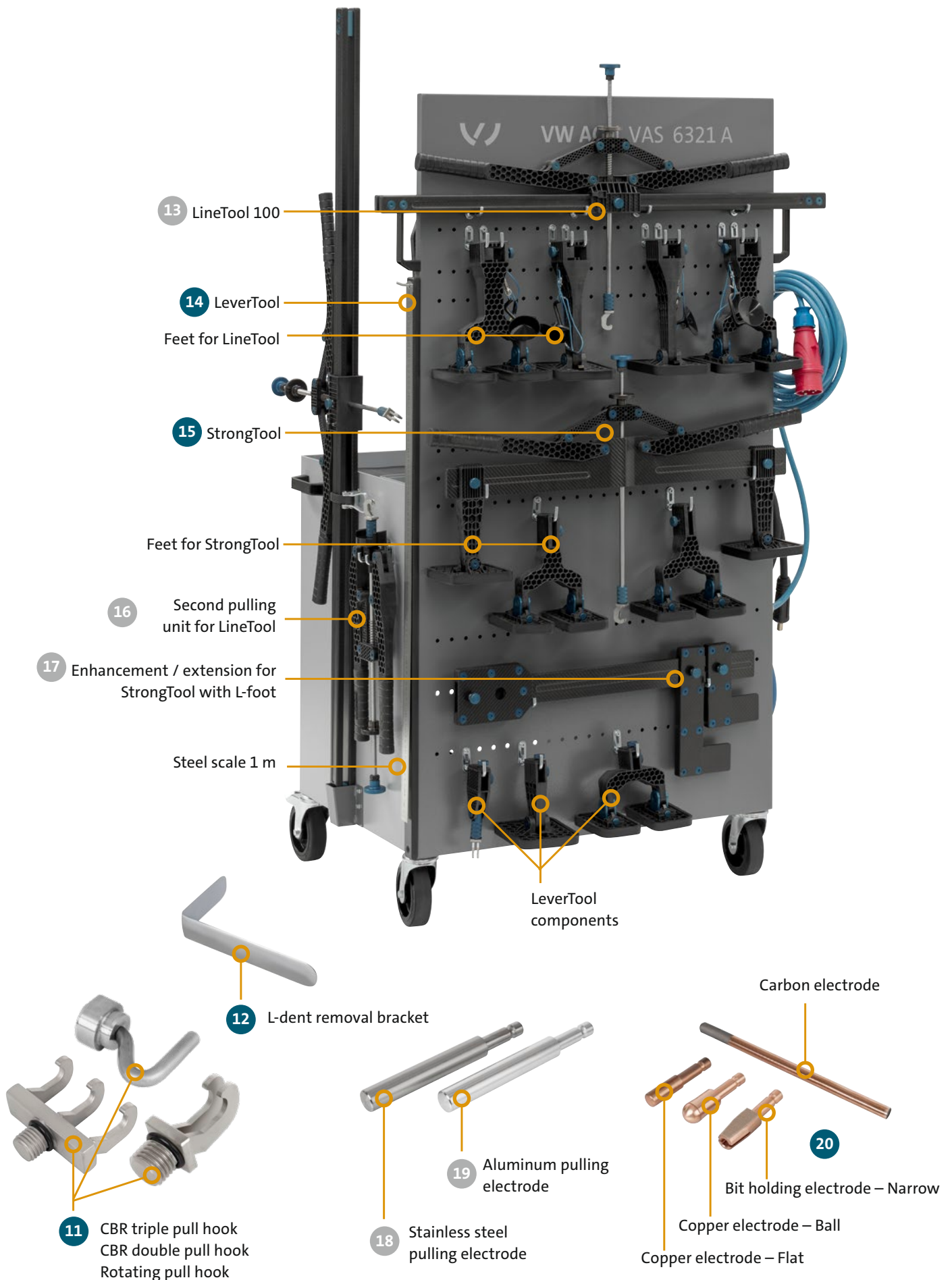


● = VAS 6321 A

● = Supplement and accessories



6 Manual MultiTool



The VAS 6321 A consists of the components listed below. Their use and application is described in more detail in this usage information:

VAS 6321 A / 5	CBR EasyTool, each with three round and three PSuare feet, and four straight feet	1
CBR-ZH-01	CBR hand puller	2
CBR-ZH-02	CBR slide hammer	3
H01-HG	CBR small dent removal hammer with removable rubber cap	
H03-H	CBR large dent removal hammer with horizontal fin	4
H03-V	CBR large dent removal hammer with vertical fin	
CBR-029	VAS 6321 A trolley for manageable storage of the individual components	5
VAS 6321 A / 7	CBR LineTool 160 with pulling unit and double pull hooks, two single and two double feet	7
VAS 6321 A / 13	PowerInverter with MultiTool (automatic) and connection cable, ground cable with ground clamp and connection cable for EasyTool	8
CM-024	BitCutter	9
CM-023	Equipment for paint removal	10
CMA-121-1/2/3	CBR double pull hook / triple pull hook / rotating pull hook	11
CSH-65-0150-80	L-dent removal bracket	12
VAS 6321 A / 8	CBR LeverTool with a single and a double foot, and a pull carriage with double pull hook	14
VAS 6321 A / 4	CBR StrongTool with two single and two double feet and double pull hook	15
CBR-U-B14/B12/ B22/B10	Carbon electrode / Copper electrode – Ball / Copper electrode – Flat / Bit holding electrode – Narrow	20
CM-060	Various small parts and accessories	*
CM-025	CBR pull rods diameter 7 mm	*
CM-026	CBR pull rods diameter 8 mm	*

* without illustration

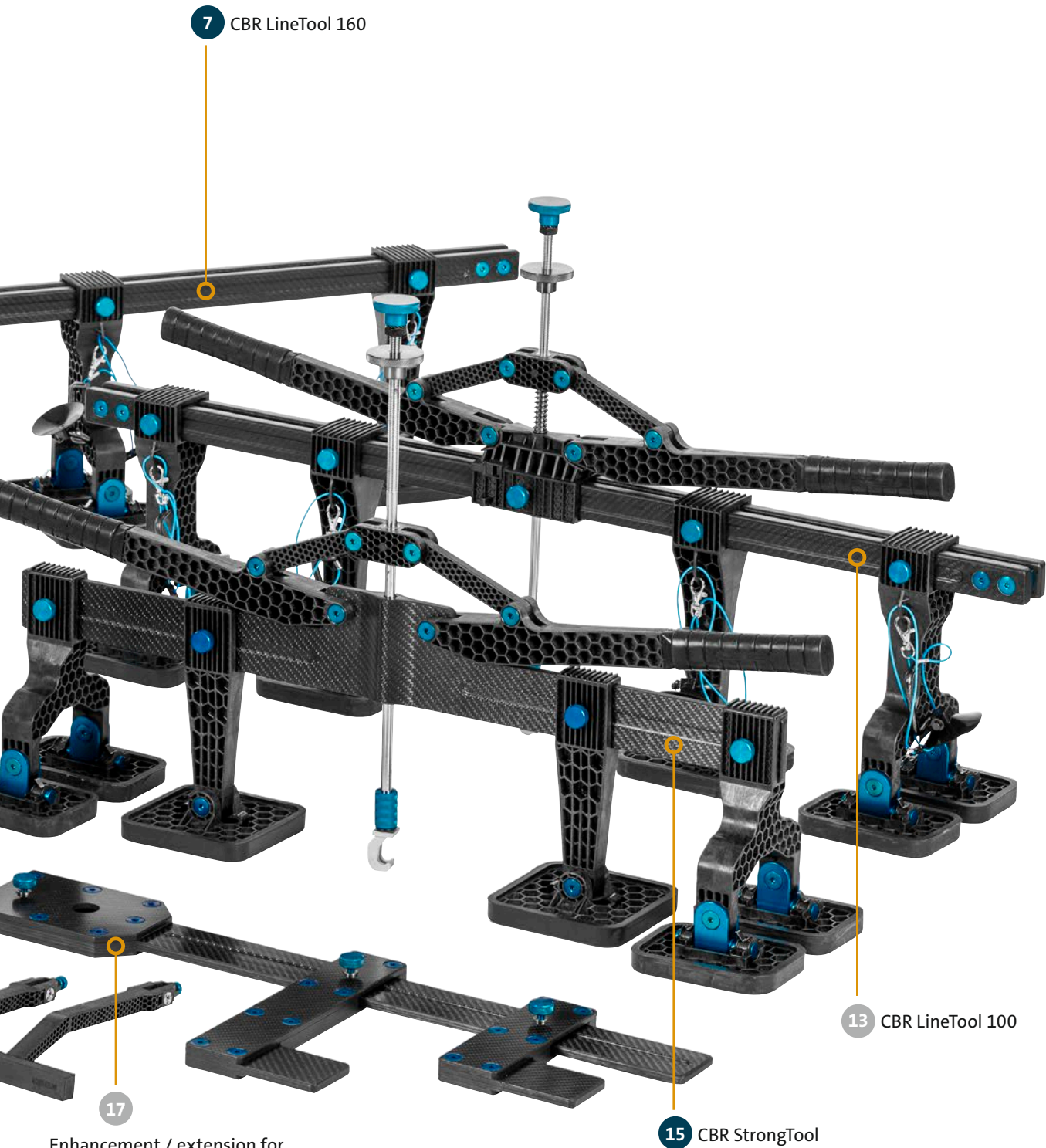
Das VAS 6321 A kann mit **optionalen Teilen** ergänzt werden:

C1-06	MultiTool for VAS 6321 A / 13 (Manual) with control line and connection cable	6
VAS 6321 A / 1	CBR LineTool 100 with pulling unit and double pull hook	13
VAS 6321 A / 3	Second pulling unit with double hooks for VAS 6321 A / 1 and VAS 6321 A / 7	16
VAS 6321 A / 2	Enhancement / extension for CBR StrongTool VAS 6312 A / 4	17
CBR-U-B17	Stainless steel pulling electrode for aluminum sheets	18
CBR-U-B16	Aluminum pulling electrode for aluminum sheets	19
C1-17	MultiTool for VAS 6321 A / 13 for swaging and shrinking with connection cable	*
VAS 6321 A / 9	CBR glue technology set for VAS 6321 A	*
VAS 6321 A / 10	CBR GlueTech plus for VAS 6321 A	*
VAS 6321 A / 11	CBR glue technology set EasyTool	*
CBR-080	Cover hood for VAS 6321 A trolley	*
VAS 6321 A / 14	PushPull System	*

* without illustration

7. CBR pulling tools at a glance





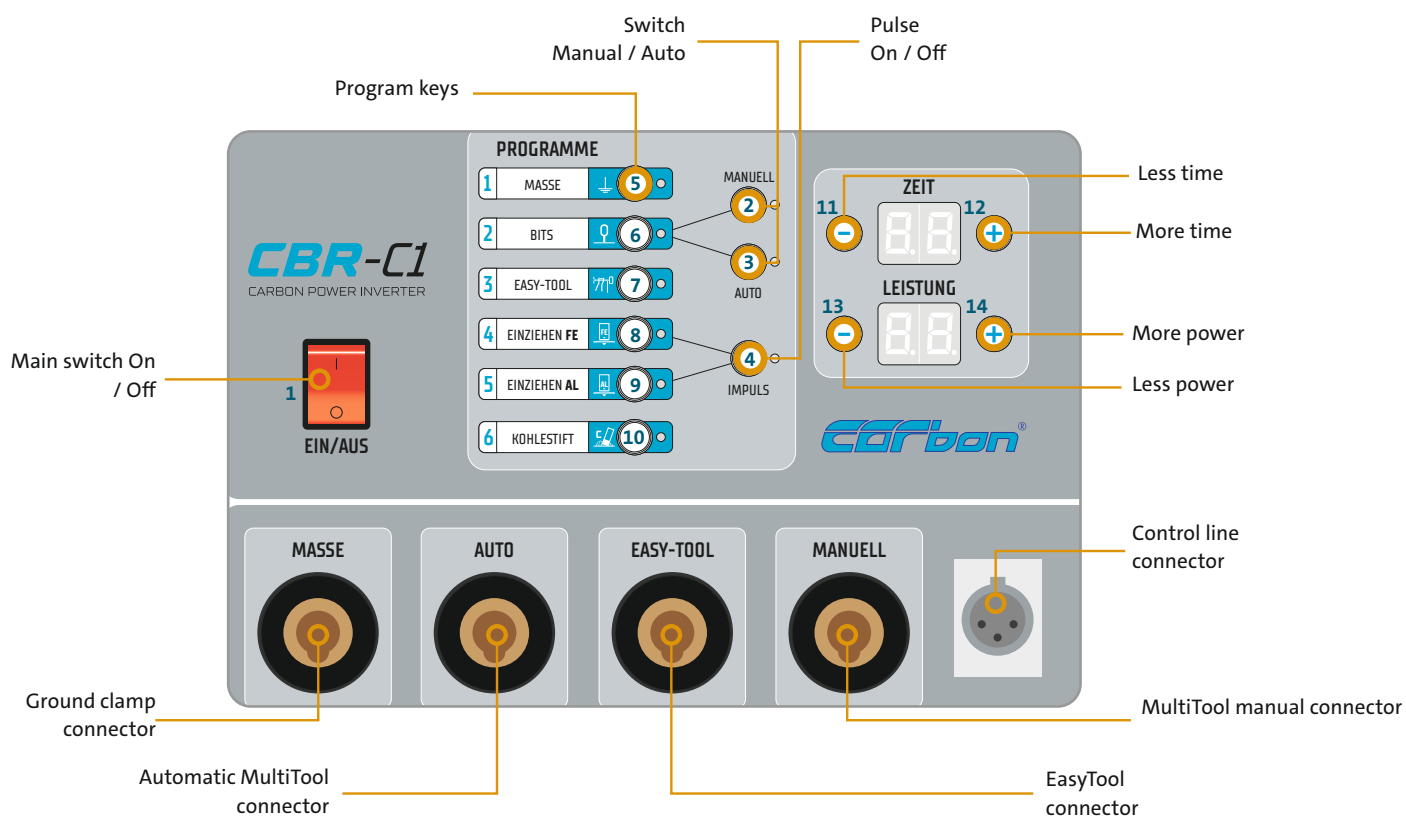
8. PowerInverter | Power Source (VAS 6321 A/13)

8.1 The PowerInverter

The VAS 6321 A/13 PowerInverter is the multifunctional power source (hereinafter referred to as PS) at the heart of the VAS 6321 A. It enables a wide range of applications in the repair of damage to the vehicle body.

There are 6 programs available to the user for different tasks, which are selected via pushbuttons (5-10). Our technicians have established basic values for each of these programs, and these are stored in the control electronics of the PS and automatically set after the program is selected.

The predefined settings can be changed step by step and independently of each other with the buttons (11-14), or adapted to the respective conditions (material quality, metal sheet thickness, etc.) – the adaptation is shown in the displays for time (11/12), or power (13/14) respectively.



8.2 Operation of the PS

After switching on the PS with the main switch (1), the MANUAL (2) and GROUND (5) LEDs light up. This basic setting ensures that no accidental short circuit can occur between the MultiTool and the ground clamp.

Programs 1 and 3 to 6 are operated in automatic mode, and in program 4 it is possible to select between continuous current and pulsing three times.

Program 2 can be executed in automatic mode (welding process is triggered on contact with the bare surface), or in manual mode (welding process is triggered at the press of a button on the MultiTool).

Note that use of the PS in Manual mode requires the optional MultiTool with button (part number C1-06).

If automatic mode is selected, the PS switches to standby mode after 5 minutes of inactivity. To reactivate the PS, one of the programs must be selected.

For your consideration: By selecting the program indicated by the illuminated LED again, the previously adjusted values for time or for power remain valid.



The pictures above show the simple operation of the pushbuttons on the PS for quick retrieval of the respective programs.

Important

Whenever working with the VAS 6321 A, make sure that the zinc coating is removed from the sheet metal without leaving any residue. This should be done with nylon discs or similar at low speed in order to introduce as little heat as possible into the sheet metal being machined.

8.3 Attaching the ground clamp with program 1

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be disconnected from the power source in accordance with the vehicle manufacturer's specifications before using the VAS 6321 A/13!

To establish a ground connection to the vehicle, you must plug the ground clamp with connection cable into the ground socket on the PS, switch on the PS at the main switch and select program 1.



Important: To ensure the optimum safety conditions when carrying out any work on the body panels, make sure that all zinc coatings are removed without leaving any residue.

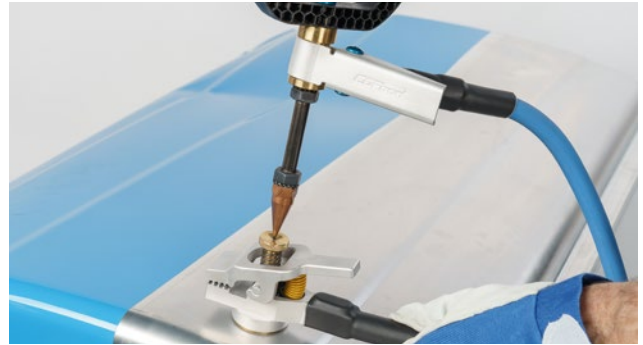


After switching on the PS, select program "GROUND" and press "AUTO" on the panel.

8.4 Welding on the ground clamp

Plug the MultiTool with connection cable into the Auto socket on the PS and insert the shrinking tool into the MultiTool. The ground clamp can be welded onto a bare surface quickly and easily with the welding tip. To do this, place the ground clamp on the sheet metal so that the lower ring (contact surface) lies flat. Press on the bolt of the ground clamp with the shrinking tool. As soon as the welding tip of the bolt touches the bare panel, the automatic welding process starts – if you are working in manual mode, you must trigger this process by pushing a button. The welded joint can be released quickly and easily by turning the knurled screw.

Important: With this type of ground connection, it must be ensured that the entire contact surface of the ground clamp lies flat on the bare surface of the panel in order to avoid loss of performance, high wear/damage to the ground clamp and damage to the panel!

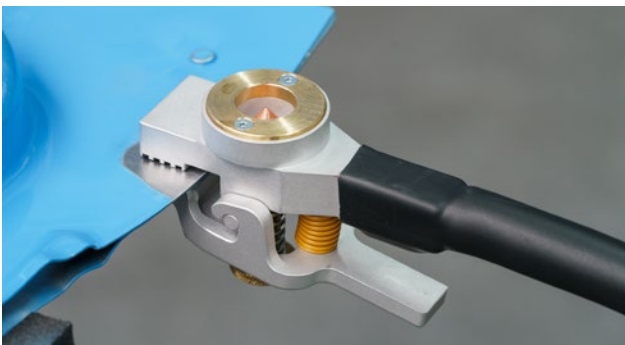


You can trigger welding of the clamp with any CBR tool.

8.5 Clamping the ground clamp

If an edge is available, clamp the ground clamp directly to the ground bare edge.

Important: If the edge is ground off on one side, the fixed and not the moving part of the ground clamp should have contact with the panel – otherwise faulty welding or even hole burn-through may occur!



For your consideration: In order to achieve a good result, the VAS 6321 A/13 requires a secure ground connection to the vehicle body.

8.6 Attaching the flexible ground

The flexible ground is also welded on using program 1.

To do this, insert the rectangular connector of the flexible ground into the open clamp.

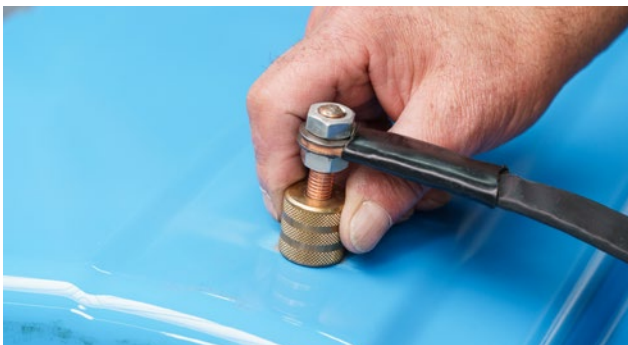
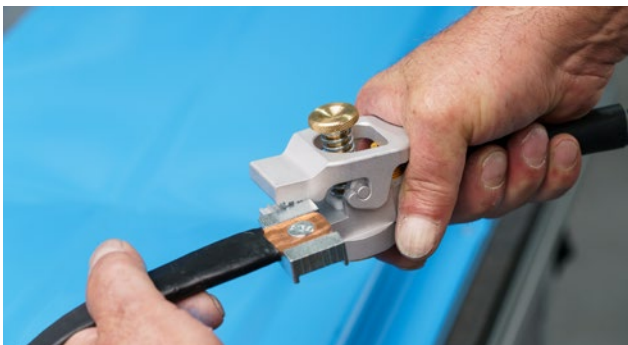
In order to attach the flexible ground to the body part at a suitable spot, a surface corresponding to the outer diameter of the screw sleeve must first be ground bare.

The screw sleeve should then be screwed upwards until the welding tip protrudes.

Insert the shrinking tool into the MultiTool (C1-04), center the welding tip on the bare spot, and place the MultiTool with the shrinking tool on another bare spot – the welding tip will be welded on. Now carefully screw down the screw sleeve until the sleeve rests firmly on the bare panel.

Please note: The welded-on ground connections are only suitable for work where little current flows – if possible, always use the clamped ground connection.

Please note: In order to achieve a good result, the VAS 6321 A/13 requires a secure ground connection to the vehicle body.



1. Place the ground clamp in the recess provided on the extension.
2. Hold the ground extension onto the sheet metal and press the welding handle onto the sheet metal on selected points.
3. Turn the knurled screw up to the sheet metal to fix the ground tip.



Important: When applying the ground tip to the vehicle body, slight burn-offs occur on the tip. To ensure safe processing, regular maintenance of the tip with the CBR diamond file is recommended.

9. Working with the CBR Bits

9.1 The CBR Bits

The CBR Bits serve as a force-transmitting medium between the CBR StrongTool, the CBR LineTool, the CBR LeverTool and CBR PushPull System, and the surfaces and edges of the vehicle body to be repaired.



The straight CBR Bits

The straight CBR Bits (MB-2) can be welded onto the damage at very small intervals, allowing high pulling forces without tearing out the sheet metal.

They are ideal for stable areas, such as sills, elbows and stable edges.



The rotated CBR Bits

The rotated CBR Bits (MB-3) are used for repairing light to medium damage to edges and contours, especially contours situated on large surfaces and wheel arches.



The CBR PowerBits

The CBR PowerBits (MB-4 rotated, MB-5 straight) are made of specially alloyed material and are particularly suitable for the repair of modern, high-strength sheet metal, such as sill plates.

Due to the slim geometry of the PowerBits, they can also be welded on very tightly in the rotated version in order to achieve high, friction-locked pulling forces.

9.2 Welding on the bits with program 2

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be disconnected from the power source in accordance with the vehicle manufacturer's specifications before using the VAS 6321 A/13!

First, grind bare the spot where you want to weld the bits.

Important: Paint layers, primer and zinc coating must be **completely** removed.

If necessary, scribe edges and contours or mark them with a thin marker.

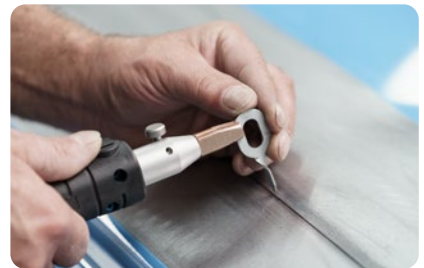
You can choose whether you want to weld on the bits in automatic mode (triggers welding process when the bit touches the ground bare panel) or in manual mode (pushing the button on the MultiTool triggers welding process).

The advantage of manual mode is that you can position the bit exactly where you want it before the welding process – for this you need the optional MultiTool with button and connection cable, part number C1-06.

Plug the MultiTool with connection cable into the corresponding socket (AUTO or MANUAL) on the VAS 6321 A/13. Insert the bit-holding electrode into the selected MultiTool. When using the C1-06, plug the control cable into the VAS 6321 A/13.

Switch on the PS at the main switch and select program 2. Select the desired mode with the Auto/Manual button.

- Insert the bit-holding electrode (CBR-U-B10) into the MultiTool.
- Insert the bit into the bit-holding electrode and hold it in place.
- Place the bit on the desired spot using light pressure, and weld on according to the selected mode.
- Check the bit welds – and change parameters if necessary.



Please note: A test weld is recommended. To do this, weld on the bit, check that it is firmly seated and then remove it by twisting off – this must not leave a hole in the sheet metal!

Please note: In order to achieve a good result, the VAS 6321 A/13 requires a secure ground connection to the vehicle body.

9.3 Useful and interesting facts about bits

If you adjust the setting of the CBR PowerInverter to the respective conditions when welding on the bits, you should do this primarily with the power, not with the time – extending the time usually only causes unnecessary heating of the body panels and the tools.

Adjust the power to the thickness of the metal sheet: Thinner metal sheets = low power, thicker metal sheets = high power. If the thickness of the metal sheet is not known, start with low power first and check bits for good welding.

Adjust the contact pressure of the bits during welding to the power – high power = high contact pressure, low power = low contact pressure.

Benefits of high current and short time when welding on the bits

- A short welding time prevents thermal overload and thus melting of the body panels.
- High power allows strong spot welding of the bits to the body panel.
- Because there is only low exposure to heat during welding, the properties of the body panels are not changed.
- There is almost no burning of the corrosion protection on the back of the body panel – the zinc coating on the sheets is not damaged.

Possible causes if there is any powerful sparking, burn marks and poor adhesion of the bits

The surface of the body panel has not been ground sufficiently bare (paint residues, rust, zinc coating) or the surface of the body panel is dirty (oil, grease, wax, etc.).

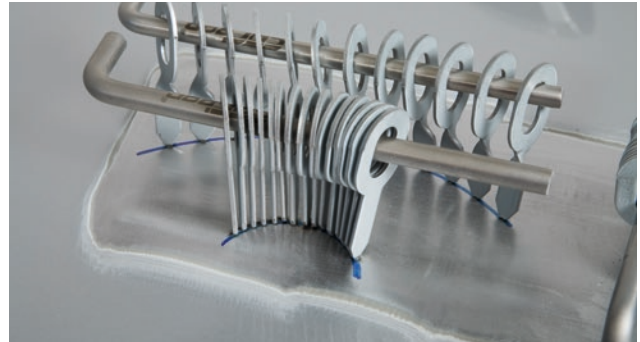
- Insufficient contact pressure during welding.
- Unsafe, hesitant handling.
- Poor ground connection.
- Insufficient power supply (VAS 6321 A/13 is operated with extension cable).
- Power is set too low.
- Shunt (adjacent bit is touched during welding).
- The welding surface of the bits is not clean or the bits have not been recut with the BitCutter.

9.4 Important notes on welding on the bits:

- Start welding on the bits on the spot where the damage is deepest.
- Do not make the intervals between the bits too large.
- To avoid shunts when bits are welded on tightly, weld the bits on at an angle and then twist them up.
- Where damage is deeper, leave the outer bits at an angle.
- Align bits so that it is possible to slide in the pull rod.
- In circular and curved areas, align the bits so that a straight pull rod can be inserted despite the curvature.



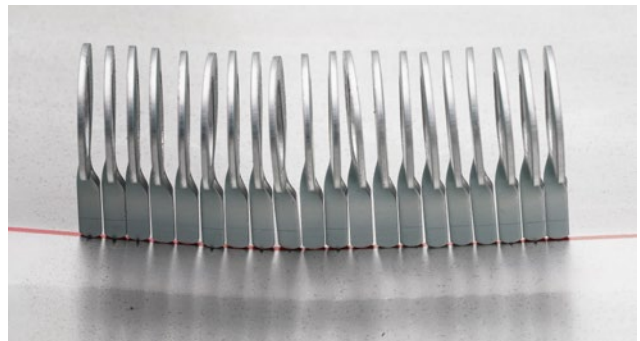
Arrangement of bits for two edges with wide distances



Arrangement of bits for circular and curved areas



With a length of 10 cm there are 10 rotated bits.



For the same length we bring twice the amount:
20 PowerBits

In the area where the edge is stable, it is important to apply longitudinal welding to the edge. If you use the straight bits, this would result in a cross weld, which in turn would cause the edge to twist.

The contour of the rotated bits thus results in a weld of 10 bits over a length of 10 cm, as shown in the example above. However, because of the new geometry of our PowerBits, using these results in twice the number of bits being applied to the same length, thus creating a much higher pulling force without forming any holes.

9.5 The CBR pull rods

Select the appropriate pull rod for the number of bits welded on, and insert this through the slotted holes of the bits.

If the damage to the body part is slightly deeper than the height of the slotted holes, it is possible to reach the deeper parts of the damage by tilting the outer bits.

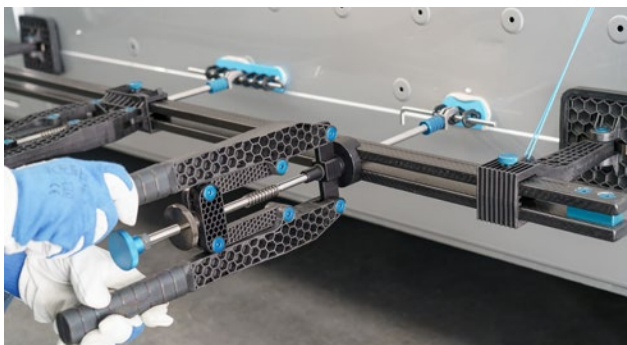


9.6 When to use which pull rods / pull rod diameter

The pull rods are available in two diameters (Ø 7 mm and Ø 8 mm) and in four different lengths. For rigid deformations such as sills, elbows, etc., choose the thicker 8 mm diameter pull rods.

The 7 mm diameter pull rods (and in this case especially the long pull rods) have the advantage that they bend easily at higher pulling forces and thus allow desired overstretching, e.g. for soft deformations in surfaces such as on side panels and doors.

Select the length of the pull rods according to the pattern of damage.



For gentle contours and curvatures, use of 7 mm diameter pull rods is recommended.



For sharp contours 8 mm diameter pull rods are recommended.

10. BitCutter & recutting bits

10.1 The BitCutter and how it is used

The BitCutter is used to cut bits that have already been welded on several times, in order to obtain a defined geometry of the bit tip and to be able to use the same length of bits. Straight bits can be cut to length up to 10 times and rotated bits up to 7 times.

To cut the bits to length, proceed as follows:

- Clamp the bit cutter with the lower, solid end in a vise. Make sure that the waste opening at the bottom is exposed.
- Connect the compressed air hose (5-8 bar).
- Adjust the stop to the desired dimension – always start with position 1 for uncut bits – ensure that the stop snaps back into place after twisting.
- Insert straight bits flat, rotated bits on edge and hold against stop.
- Push the operating lever and remove the recut bit.

Important: To recut the PowerBits (MB-4 rotated, MB-5 straight), the BitCutter must be converted with the CM-024-3 conversion kit.

You should store the recut bits on the wire rings provided.
This ensures that bits of the same length are always available.

Please note: The BitCutter must be oiled regularly, and the cutting head must be checked regularly to ensure that it is firmly seated in the pressure cylinder: tighten if necessary.



It is advised that the cut bits should be stored on the rings provided in order of their length.



Conversion kit for cutting PowerBits

10.2 Important notes on use and care of the bits

Only use original CBR Bits – these bits are made of a special alloy and are coordinated to the performance characteristics of the VAS 6321 A/13. This ensures a high level of process reliability. Remove the bits after use by twisting them off the body panel – improper bending can cause holes in the body panel. The bits should be recut after being welded on 4-5 times (see section BitCutter).

If high force needs to be applied when straightening, always use new or freshly recut bits. Always recut bits together if possible, or store bits that have been recut different numbers of times separately.

The following pictures show how to remove light welding residue completely from the various bits with the CBR diamond file, thus ensuring that they are clean and safe to use during the next welding operation.



If there is strong burn-off, such as that seen in the picture on the left, cutting the bits is recommended.

11. CBR StrongTool (VAS 6321 A/4)

As the name suggests, the CBR StrongTool is the pulling tool offered by the VAS 6321 A for building up the highest pulling forces.

It is the preferred tool in areas that are very stable, such as sills, on A, B and C pillars, and other angular areas. The lever transmission enables the user of this tool to achieve pulling forces of up to 2 tons manually.

The perfect ergonomics and the very light weight of only 4.0 kg, including the feet, make it easy to use without tiring the user.

In addition, it makes precise, sensitive and fast reshaping of damage to the vehicle body possible.

Special features of the CBR StrongTool

The pull levers engage in the vertical position when reshaping under tension and hold the damaged body part under tension – in this position, stresses in the sheet metal can be removed using targeted blows with the aluminum hammers or the plastic wedges. The machined surface is thus re-stabilized.

The pull height can be precisely adjusted using the quick adjustment on the pull spindle, with one turn of the quick adjustment corresponding to a change of 1.5 mm.



The StrongTool with the optional foot in the engaged position.

11.1 Components of the CBR StrongTool

Important: If the support points on the body are far apart or at very different levels, the optionally available VAS 6321 A/2 enhancement/extension is extremely helpful when using the StrongTool. In this case, too, make sure that the support point is exactly in the center of the feet.



Either one of the double feet can be rotated as desired to ensure that the body is supported perfectly.

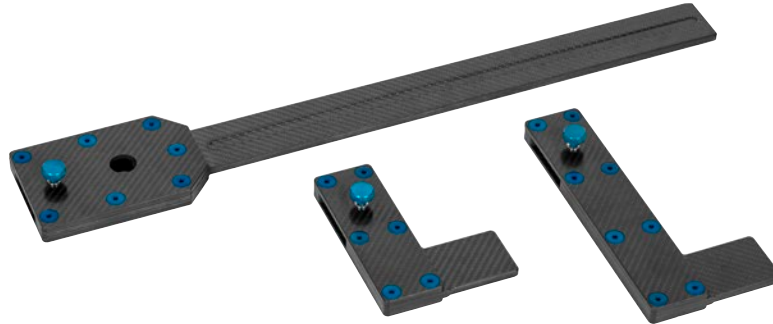


Double foot for StrongTool

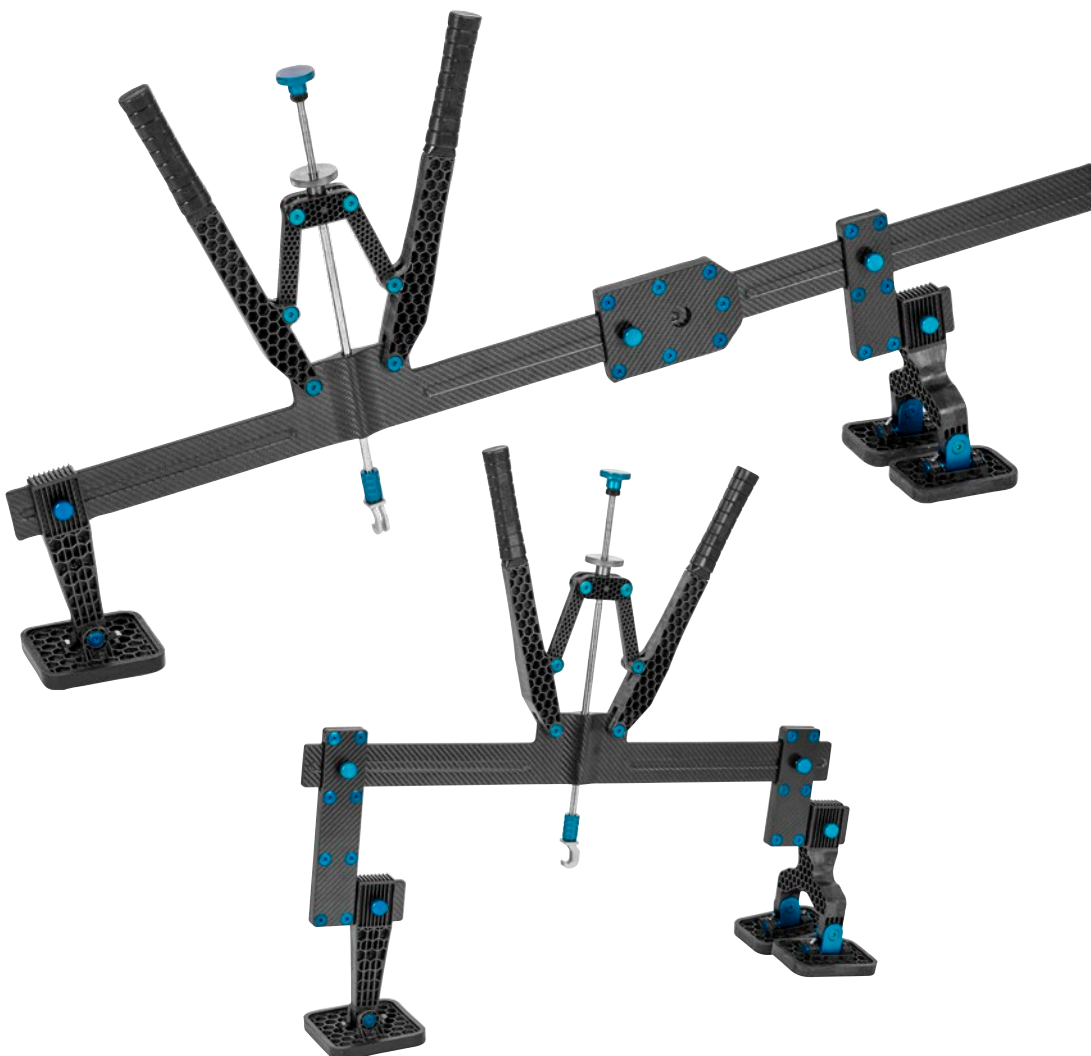


Single foot for StrongTool

11.2 CBR StrongTool enhancement set (VAS 6321 A/2)



Extension blade, and small and large L-feet



The various individual parts allow many possible combinations, thus in practice a suitable solution can be found for any challenge.

11.3 Working with the CBR StrongTool (VAS 6321 A/2)



Incorrect



Correct

Foot must be placed central to the edge.



Incorrect



Correct

Foot must be placed central to the edge.



The large knurled nut allows fast, infinitely variable adjustment of the pull rod when working with the StrongTool.

Important: When working with the straight feet and supporting them on an edge, it is essential to ensure that the support point is exactly in the center of the feet. If the support point is beyond the center of the feet and the pulling forces are high, this will generate a bending moment which can cause the feet to break.

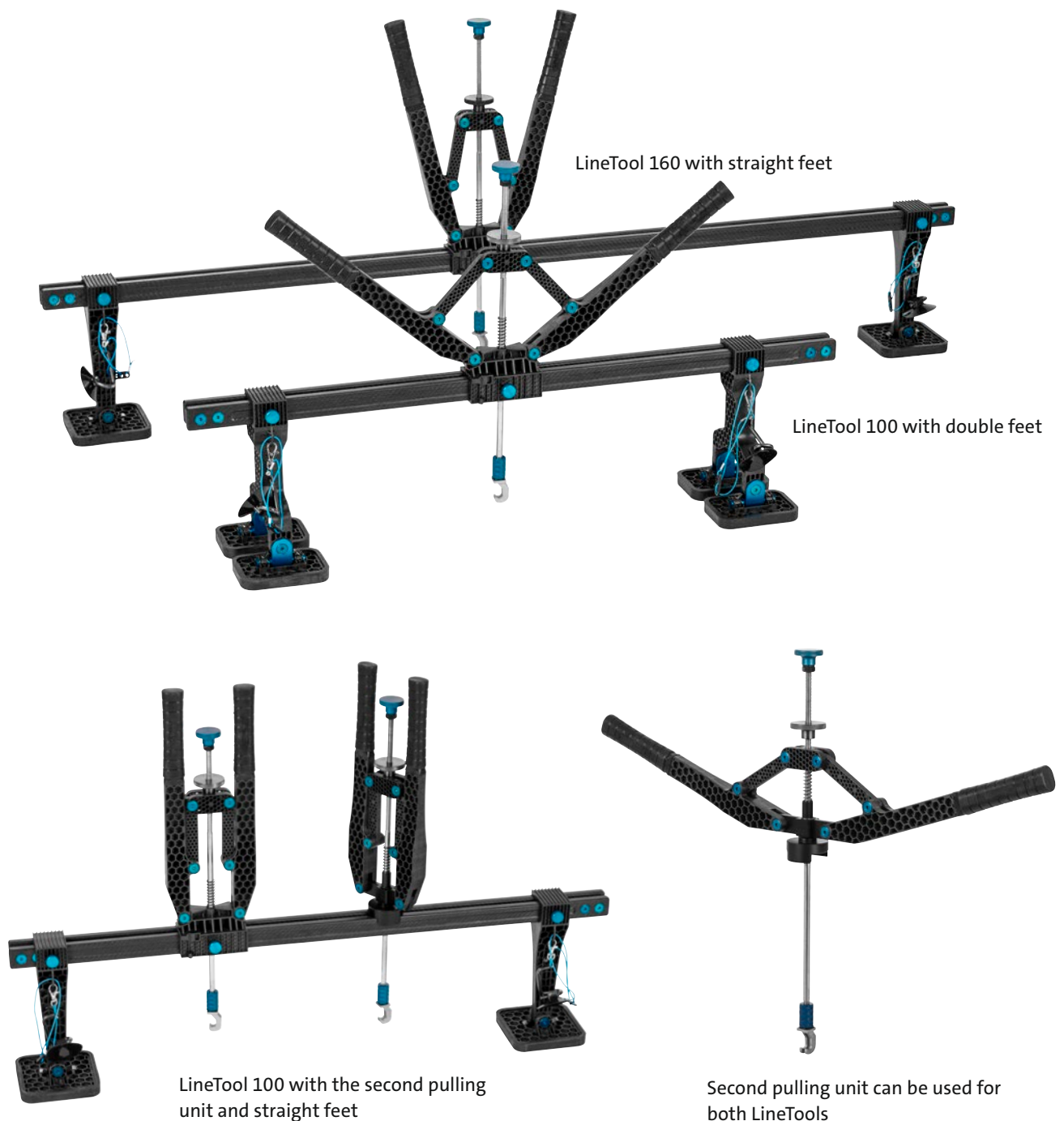
The feet may only ever be put under vertical pressure when pulling – whenever a transverse pull is performed it is essential to use the double feet.

12. CBR LineTool (VAS 6321 A/6 and VAS 6321 A/7)

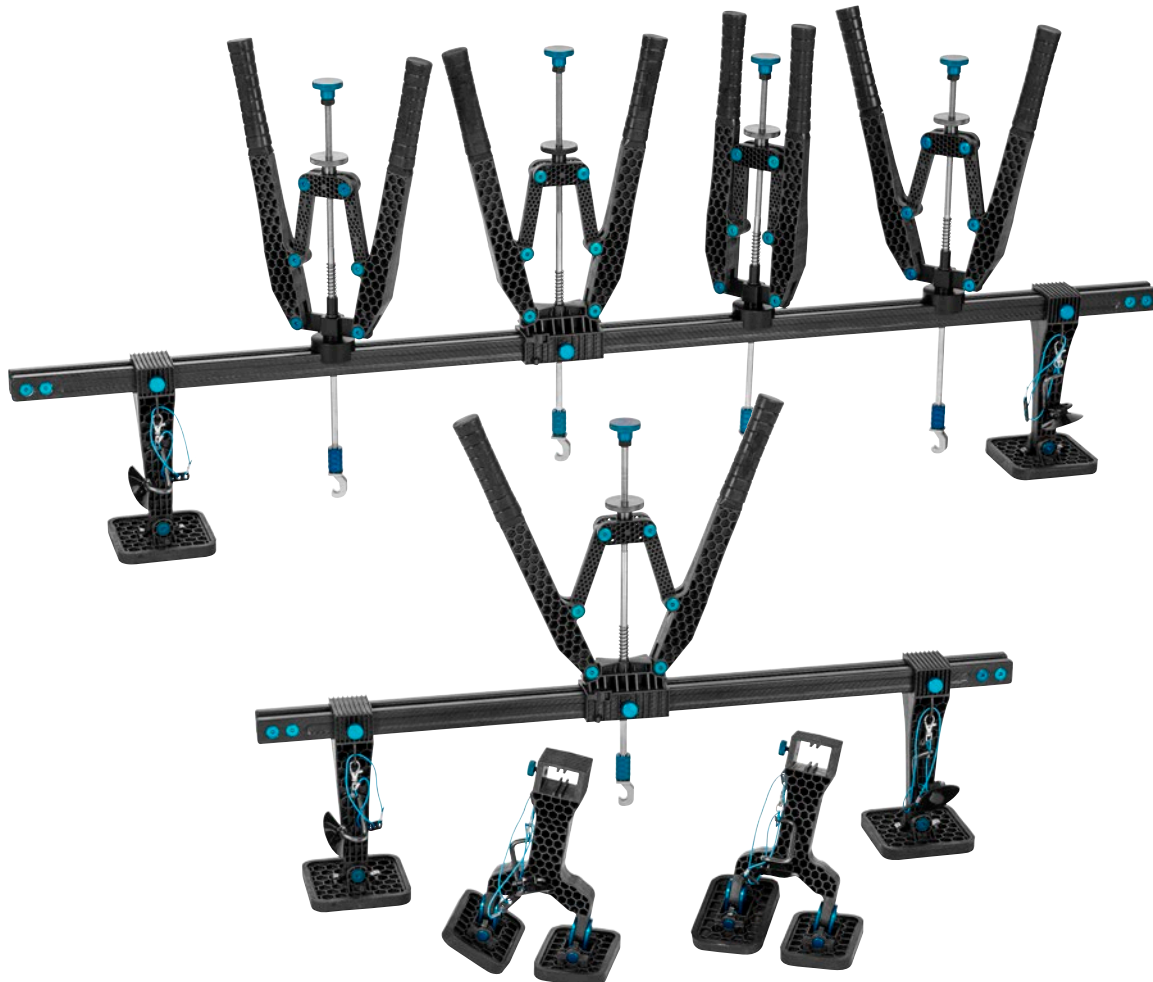
The CBR LineTool is an important component of the Carbon VAS 6321 A. It works in a similar way to the CBR StrongTool, but it can also be used to reach widely spaced support points on the body.

This enables the user to repair large areas of damage, especially on doors, hoods, side panels and body parts that are not alloyed to a higher strength.

The CBR LineTool is available in two lengths (1600 mm in the basic version of the VAS 6321 A and 1000 mm as an option), and because of its sliding pulling unit it is very much a universally applicable tool.



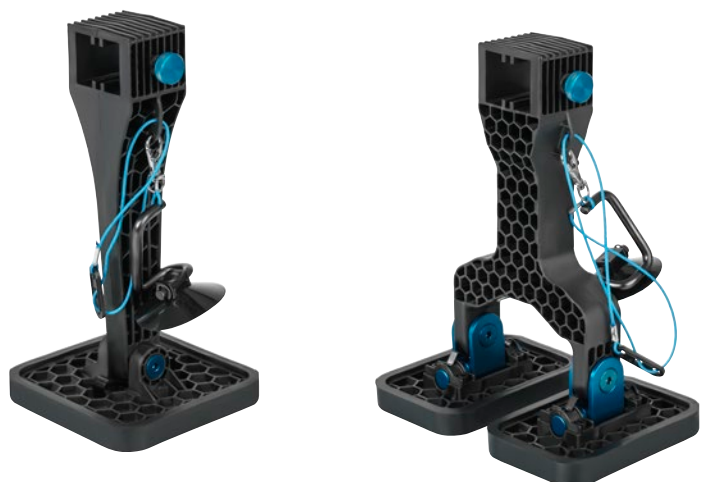
The LineTool can be supplemented with additional pulling units that can be positioned independently on the LineTool. Thus, you can create the option to pull at several points at the same time.



The individual elements of the double feet can be rotated as desired to provide perfect support on the body.

Here, too, different feet allow a wide range of options for reshaping damage in the vehicle body.

The LineTool also has two suction cups with which it can be fixed to the vehicle body or glass surfaces at the desired working height.



12.1 Working with the CBR LineTool

When working with the LineTool, the same procedure, process and instructions apply as with the StrongTool.

With any extensive damage to doors and side panels, it is important to start at the bottom or strongest line (bead, edge). This area should, however, not be completely reshaped right away; work should be carried out first on the upper and then the middle line.

Important: When working with the single feet and positioning them on an edge, it is essential to ensure that the support point is exactly in the center of the feet. If the support point is outside the center of the feet, they could break under high pulling forces due to the bending moment.

The feet may only ever be put under vertical pressure when pulling – whenever a transverse pull is performed it is essential to use the double feet.



Incorrect



Correct

Foot must be placed central to the edge.



Incorrect



Correct

Foot must be placed central to the edge.

Important: Very high pulling forces can occur, especially with the short LineTool. This makes it all the more important to use the straight and split double feet at the correct angle to the direction of pull.

Place the suction cups of the LineTool in the desired position and press them onto the cleaned surface using light pressure. Fix the length with the blue line.

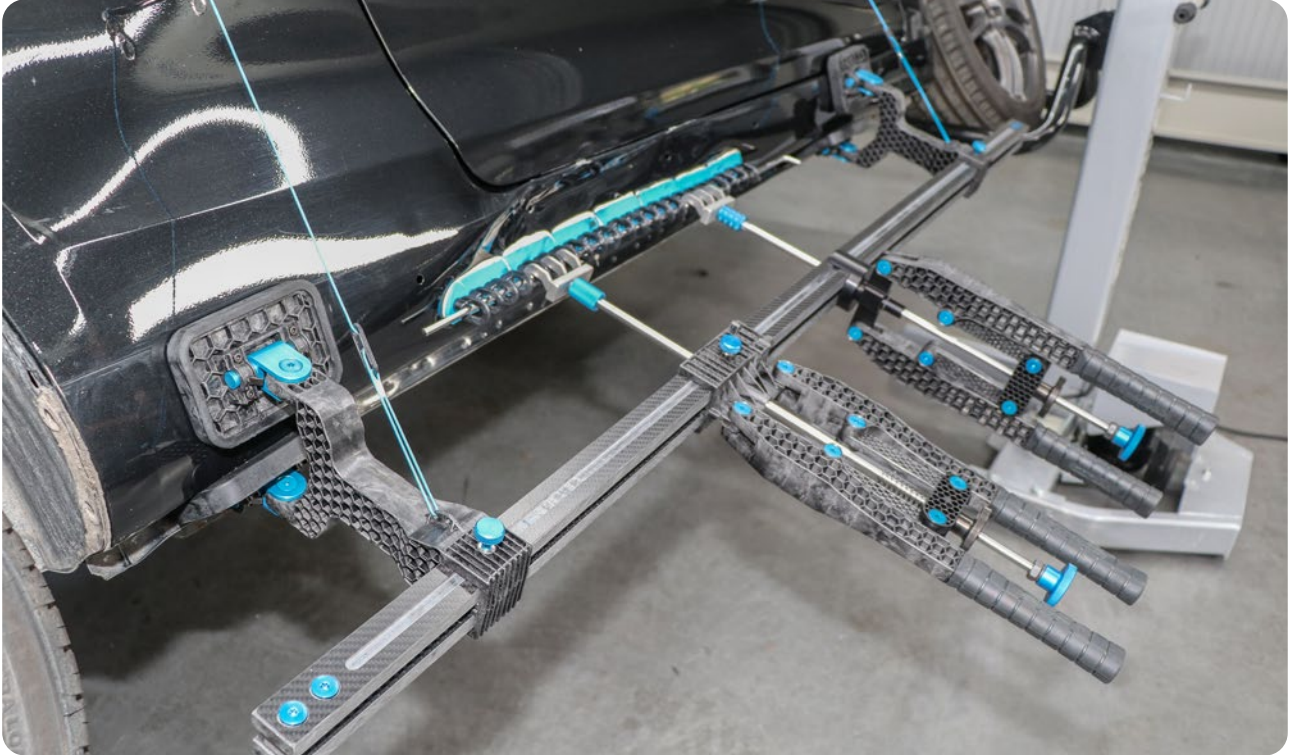


After attaching the suction cups and fixing the lines correctly, the LineTool hangs in the desired working position.

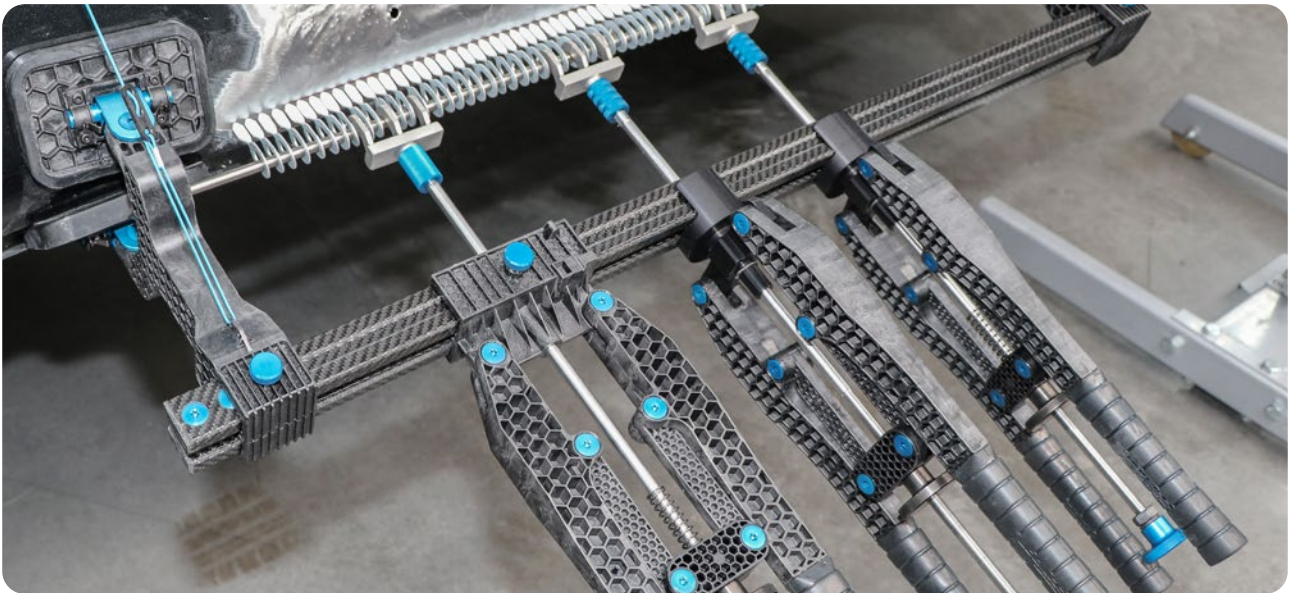
You can now effortlessly hook the pull hook into the pull rod. The suction cups make it easier to work and secure the LineTool against unwanted loosening.



It is very easy to attach the second pulling unit, as can be seen in these pictures.



The LineTool 160 with the pulling unit in combination with the glue technology.



The LineTool 100 with two additional pulling units in the hard sill area.

13. CBR EasyTool (VAS 6321 A/5)

The CBR StrongTool, LineTool and LeverTool are mainly used on large areas of damage. After repairs have been carried out with these tools, minor damage often remains; this is removed with subsequent finishing work.

The CBR EasyTool is ideal for finishing work, as well as for fast removal of damage from sideswipes or parking dents.

Possible applications of the CBR EasyTool

- Machining of residual damage on reshaped surfaces
- Quick removal of damage from sideswipes
- Easy repair of hail damage and parking dents
- Shrinking of smaller irregularities in sheet metal
- Paintless dent removal (in conjunction with the glue set)

Benefits of the CBR EasyTool

- Very good ergonomics, low weight
- Versatile, easy to use
- Precise, sensitive straightening of the surface
- Low-noise working

CBR EasyTool feet

The CBR EasyTool is supplied with various feet – these are selected and used depending on the size, geometry and extent of damage to the body panel.

- PSquare feet for flat and slightly curved surfaces
- Round feet for heavily curved surfaces
- Narrow, straight feet mainly for sideswipe damage

13.1 CBR EasyTool components



13.2 Working with the CBR EasyTool in program 3

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be disconnected from the power source in accordance with the vehicle manufacturer's specifications before using the VAS 6321 A/13!

The first step is to assess the site of the damage, select the appropriate foot and attach it to the CBR EasyTool. Then carry out the basic setting of the CBR EasyTool.

To do this, first adjust the handles to the user's hand using adjustment screw 1. Then place the tool on a flat surface and limit the desired pull height with adjustment screw 2.

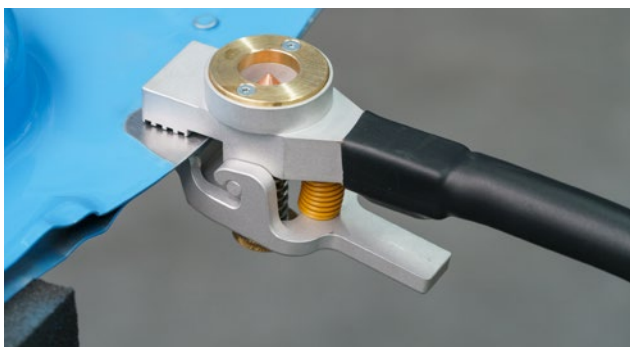
Now pull the handles together and twist the spindle until the welding tip touches the surface.

Finally, reverse the spindle by 2 full turns to the left – clamp the connection cable and the EasyTool is ready for use.

Please note: Clean the sliding surface of the cable clamp, the spindle and all moving parts of the EasyTool regularly and lubricate them with our **High-Tef. Spray (TEF-01)**.



Using this setup, the VAS 6321 A/13 also requires a secure ground connection to the vehicle body to achieve a good result. Connect the cable to the VAS 6321 A/13, switch on the PS and select program 3: Automatic.



As with all other welding programs, you can attach the ground to the sheet metal in the desired position.

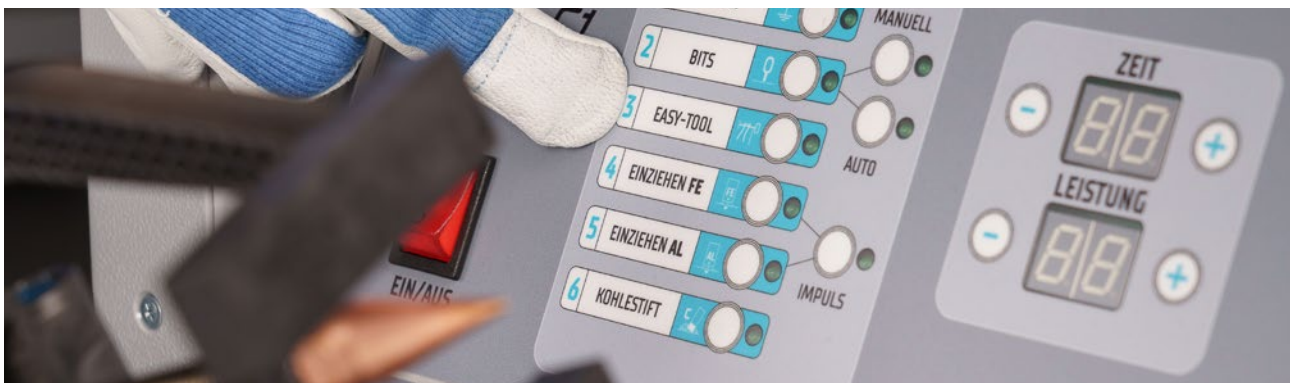
Please note: If damage is minor, work is carried out from the center – in the case of major damage, repair work is carried out from the outside in a circular pattern towards the center.

Use only original CBR welding tips – these are made of a special alloy. The dimensions and geometry of the tips have been adjusted for the most effective heat dissipation and low wear.

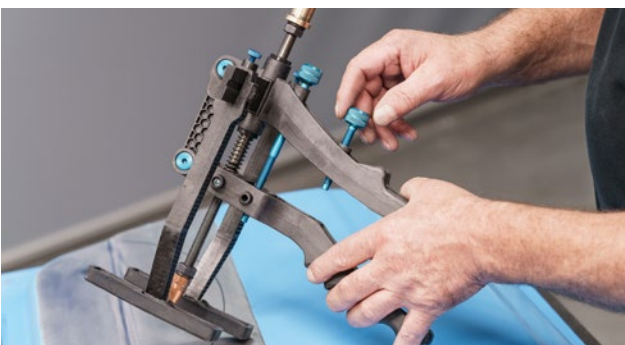
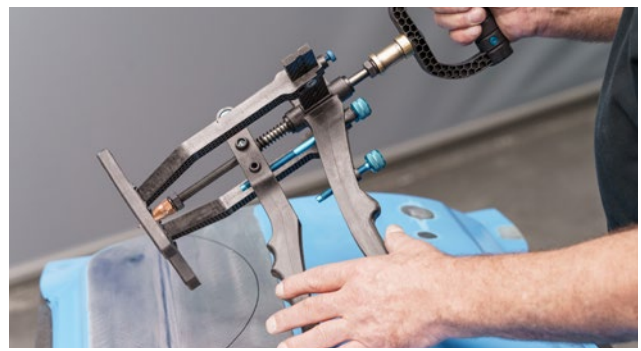
Do not put pressure on the welding tip while welding, but apply it to the surface lightly and quickly. Start by making 3 to 4 welds without pulling until some material builds up at the welding tip – the weld will hold better and there will be less wear on the welding tip!

Do not make too strong a pull – it is preferable to carry out many small pulls rather than a few strong pulls, as these results in a better surface quality! The CBR EasyTool allows for subtle and precise restoration of the surface, and putty and filler work is reduced to a minimum.

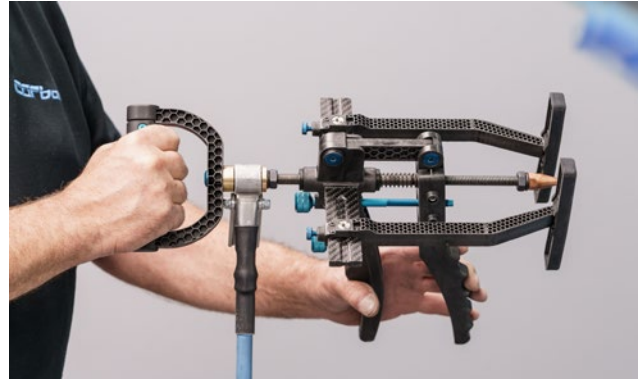
13.3 Program setting with the CBR EasyTool



Press “Program 3” and “AUTO” and if necessary make a fine adjustment to “TIME” and “POWER”.



Adjustment of the EasyTool handles to fit individual hand size.



Place the EasyTool on the damaged spot with the handles pulled together and slowly loosen the handles. When the welding tip makes contact, the welding process is triggered automatically. Gently pull the handles together and use them to pull the surface of the body panel upwards. To detach the welding tip, twist the handle of the spindle in the unloaded position.

Select the correct feet depending on the damage. There is a total of ten different attachments available for this purpose. Depending on the damage, position the feet correctly to the damage pattern as shown below:



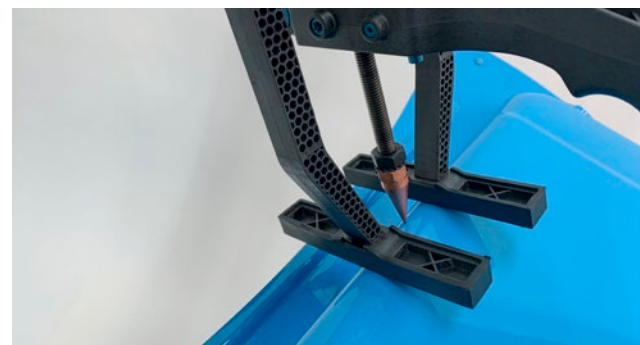
Incorrect



Correct The pressure point of the feet must be diagonal to the edge.

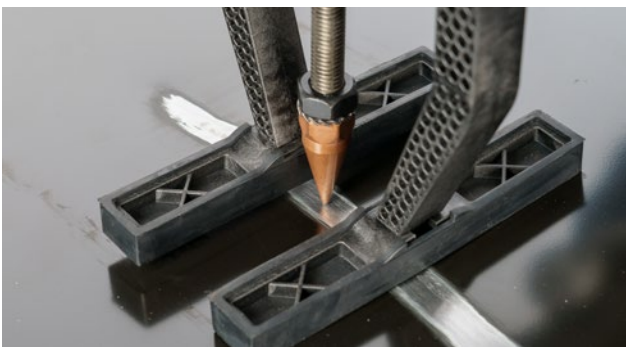


Incorrect



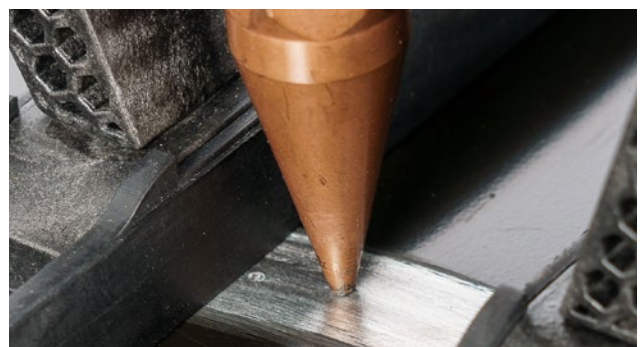
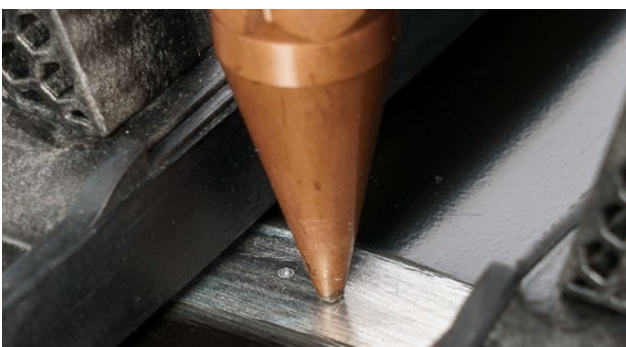
Correct The pressure point of the feet must be diagonal to the edge.

In the edge and border area, it is recommended to work with the half feet.



The EasyTool is a very effective tool for repairing damage caused by sideswipes. It is recommended that one foot should be fixed at a distance of 2-3 cm in the direction to be worked. The other foot should be close to the welding tip.

In the magnification, you can see exactly how the sheet metal rests against the more tightly fixed foot and remains stable when pulled.



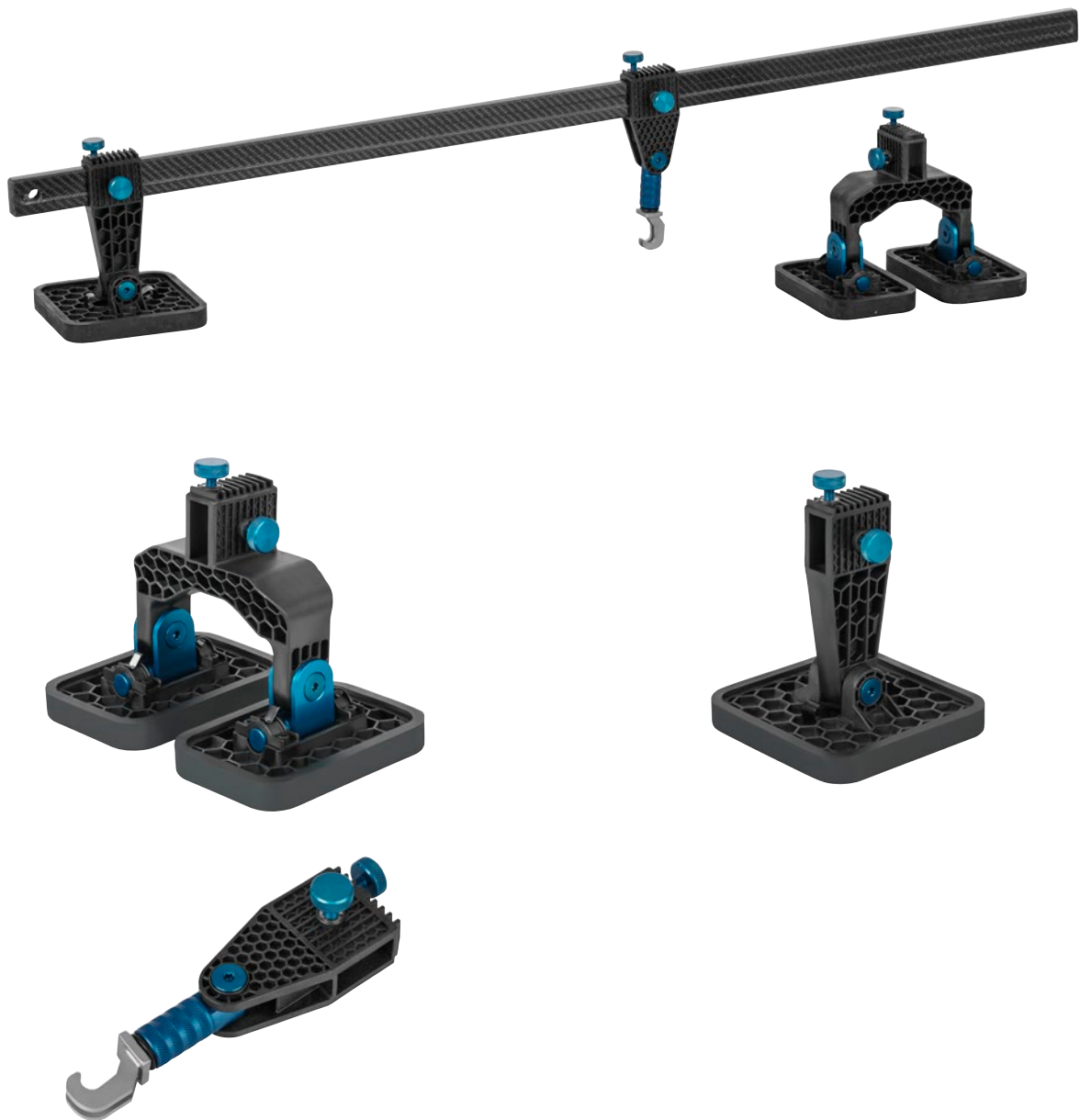
14. CBR LeverTool (VAS 6321 A/8)

The CBR LeverTool is used when the condition around the damage does not allow the use of the StrongTool or LineTool.

The LeverTool can be used with both single and double feet.

When repairing larger and more difficult damage, this tool can be used in addition to the StrongTool and LineTool.

The individual configurations possible on the LeverTool make it suitable for many applications.



14.1 Working with the CBR LeverTool

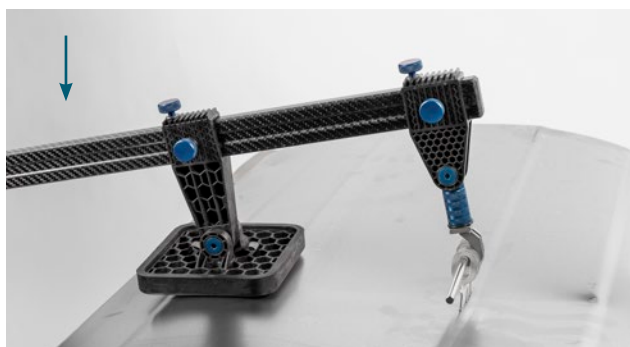
The LeverTool is mostly used where there is only one way of providing support.

The LeverTool can be used for pushing or pulling, and it can be converted to one or the other use in just a few steps by exchanging the foot and the pulling carriage.

The LeverTool can be used to pull deep deformations out of surfaces quickly.

Please note: Unlike the StrongTool and LineTool, the LeverTool cannot be locked into place under tension.

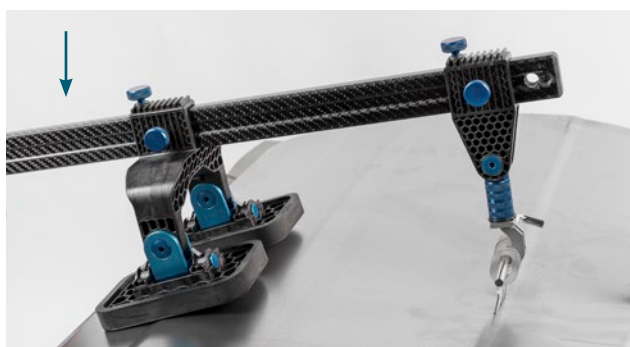
When using the StrongTool and LineTool for dent removal work, the LeverTool is often an ideal extra tool for fast removal of eliminating and remaining deformations around the edges.



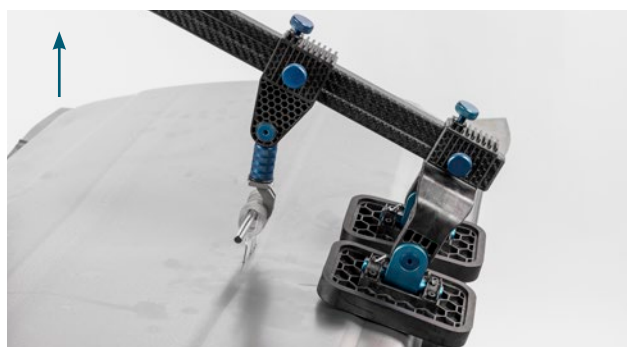
Insert with single foot when pressing



Insert with single foot when pulling



Insert with double foot when pressing



Insert with double foot when pulling



In the picture on the left, you can see the way the technician is holding the LeverTool in tension with his body and releasing the residual tension in the sheet metal with the aluminum hammer. The StrongTool is completely under tension.

15. CBR hand pullers & impact hammer

15.1 The hand puller & the sliding puller

The CBR hand puller and the CBR slide hammer have proved to be useful additions to the VAS 6321 A. These tools are mostly used when it is not possible to use the EasyTool.



Adjustment program 3 "EASY-TOOL"



Important:

The fixed part of the ground with the cable must always be placed on the bare spot of the body.



15.2 Working with the CBR HandTool

Use of the CBR hand pullers

Pulling large, soft dents in sheet metal while simultaneously easing them out with the aluminum hammer.

Shrinking of small dents and dings in sheet metal.

Use of the CBR sliding puller

Removal of small, rigid dents when the damaged spot is still under tension with the StrongTool or LineTool engaged.

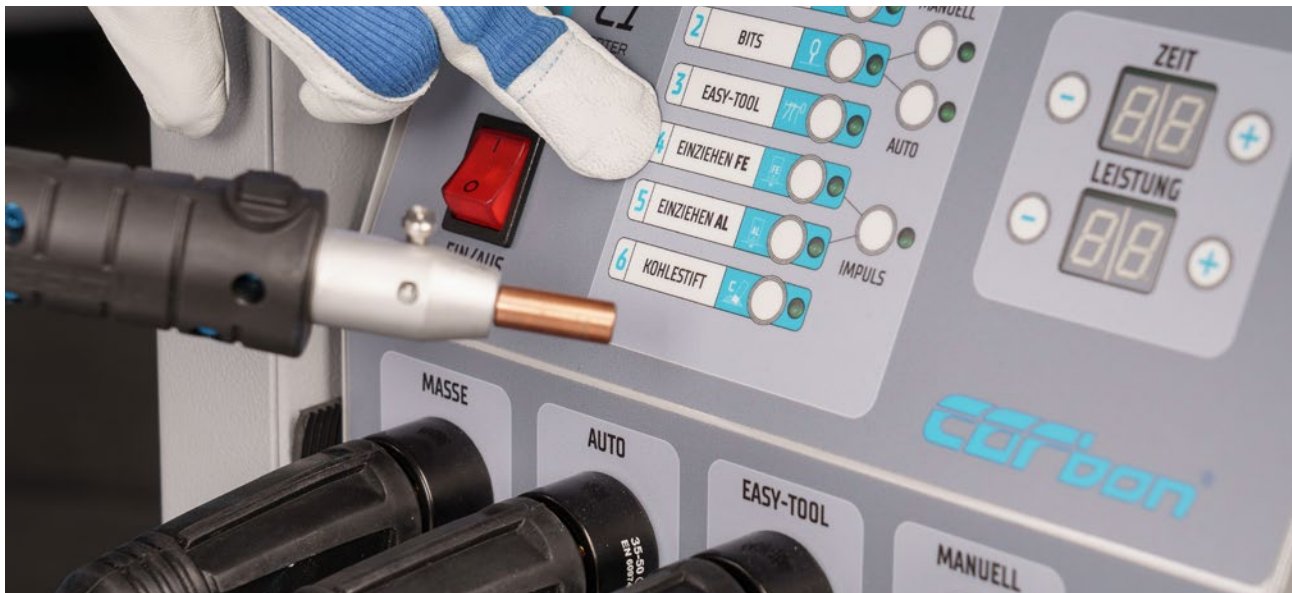
Dent removal in deep, angled and hard-to-reach places.



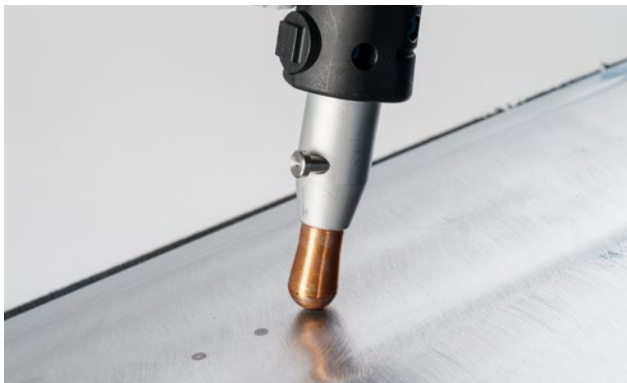
16. Shrinking with the VAS 6321 A

16.1 Shrinking steel sheets

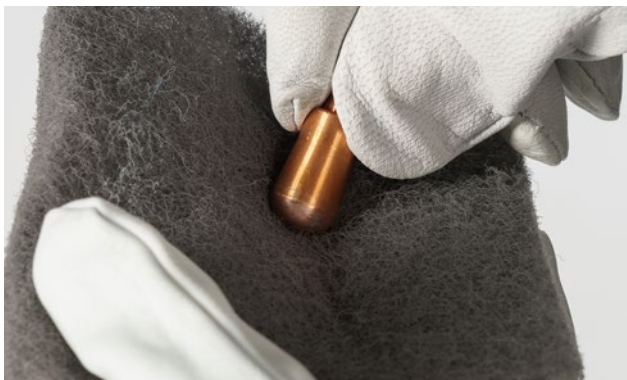
The benefit of this method is that dent removal and pulling work can be performed with the same tool, which both saves time and keeps the impact of heat on the sheet metal very low.



Important: Select program 4. With or without pulse, depending on the application.



Important: Press the swaging electrode onto the sheet metal until the PS switches off.



Clean the copper electrode from time to time.

17. Thermal shrinking – copper electrode – ball

17.1 Shrinking steel sheets with program 4

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be disconnected from the power source in accordance with the vehicle manufacturer's specifications before using the VAS 6321 A/13!

If the damage to the body part or improper straightening on the body part has resulted in too much material due to over stretching of the sheets of metal, the excess material must be pulled in by applying heat to specific points – the VAS 6321 A/13 offers you a variety of tools and options for this purpose.

For your consideration: In order to achieve a good result when shrinking, make sure that the VAS 6321 A/13 has a secure ground connection to the vehicle body.

17.2 Shrinking with the copper electrode – ball

Select whether the shrinking process is to be triggered automatically or manually – in automatic mode, select the MultiTool without button (C1-04) and the AUTO socket on the PS.

Please note: The MultiTool can get very hot during intensive shrinking – we recommend the optionally available special MultiTool for shrinking (C1-17) in this case.

Plug the copper electrode – ball (CBR-U-B12) into the MultiTool and select program 4 (button 8) on the PS.

You can select whether you want to heat (shrink) the sheet metal with continuous current or three pulses by pressing the PULSE key on the PS (button 4).

The shrinking process starts automatically when you press the electrode onto the bare body panel and roll it over - do not pull the electrode off again until the PS has switched off.

In manual mode, you need the MultiTool with switch (C1-06) and the MANUAL socket on the PS – the control cable must also be plugged into the PS for this application.

Plug the copper electrode – ball (CBR-U-B12) into the MultiTool and select program 4 (button 8) on the PS.

By pressing the Pulse button (button 4), you can select whether you want to heat (shrink) the sheet metal with continuous current, or by pulsing three times.

The shrinking process starts when you press the electrode onto the bare body panel, push the button on the MultiTool and roll the electrode over the panel - do not pull the electrode off again until the PS has switched off.

18. Thermal shrinking – copper electrode – flat

18.1 Shrinking with the copper electrode – flat

In both modes, you can also use the copper electrode – flat (CBR-U-B22) instead of the copper electrode – ball (CBR-U-B12), however, this is not rolled over but pressed onto the excess material at specific points with the flat head. This reduces the formation of dents during the shrinking process and avoids any reworking that may be necessary.

Important notes: Applying no or too little contact pressure with the electrodes can lead to burnout of the sheet metal! Cool the heated sheet metal with a damp sponge.

Please note: Do not make any changes (e.g. by regrinding) to the copper electrodes, as their shape is specially calculated – occasional cleaning with sandpaper (400 grit) is sufficient.



Shrinking with the EasyTool, slide hammer or hand puller

For small spots and points where bulges are too high, you can also shrink with the EasyTool, slide hammer or hand puller.

Connect the tools with the cable for the EasyTool and the EasyTool socket in the PS.

Select program 3: Automatic on the PS and place the tools with their welding tip on the spot with the excess material – at the start of the welding process press the tool against the deformation while turning the handle.



Pressing lightly on the handle when welding on creates a small indentation at each point.

19. Thermal shrinking – carbon electrode

19.1 Shrinking and stabilizing with the carbon electrode

This method should only be used for shrinking, or stabilizing, soft, thin deep-drawn metal sheets on older vehicles.

Only the copper electrodes should be used on the thin but stiff sheet metal currently in use, since shrinking with the carbon electrode can lead to intergranular corrosion.

Note that sheet metal hardened by the carbon that is applied can no longer be filed.

Insert the carbon electrode into the MultiTool by pressing the fixing button at the front end of the MultiTool all the way in and pushing the electrode in as far as it will go.

Select program 4: Automatic on the PS and then touch the electrode to the spot on the bare body panel that is to be repaired.

Do not hold the electrode at one point, but move it over the surface to be stabilized - spirally or in straight lines, depending on the damage.

During this process the electrode burns off slowly, the carbon is fed to the steel sheet and at the same time the sheet metal is hardened. Rapid cooling with a damp sponge or with compressed air causes the heated surface to shrink.

Important notes: Do not press on the carbon electrode too hard – it may break!

The carbon electrode becomes very hot – risk of burns!



20. Thermal shrinking with aluminum sheets

20.1 Shrinking aluminum sheets

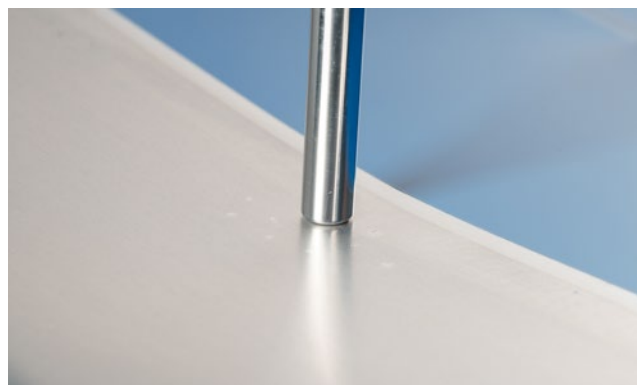
Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be disconnected from the power source in accordance with the vehicle manufacturer's specifications before using the VAS 6321 A/13!



Select program 5 for “Aluminum”. With or without pulse, depending on the application.



Aluminum shrinking electrode



Stainless steel shrinking electrode

Please note: Machining and shrinking of aluminum sheets require intensive knowledge of aluminum, which we cannot cover here.

21. CBR aluminum hammers

21.1 The CBR aluminum hammers and plastic wedges

The scope of delivery of the VAS 6321 A includes three different aluminum hammers, one wide and one narrow plastic wedge.

The hammers differ not only in size, but also in the different position of their fins - these are arranged vertically or horizontally to the hammer handle. The hammers are used for dent removal and as chisels for easing out edges or beads as well for knocking out surfaces.

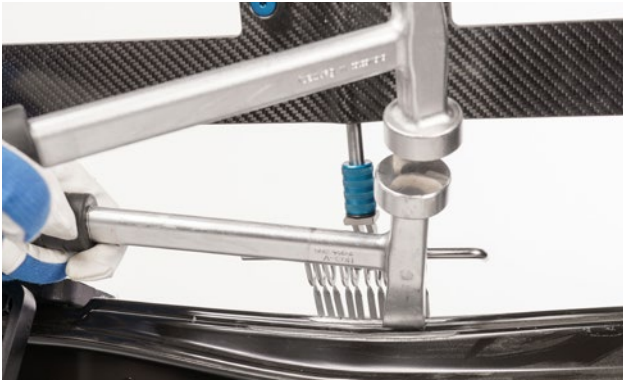


Application

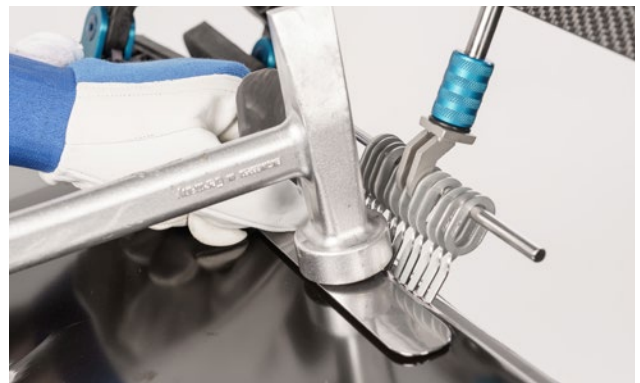
- The hammers are mainly used to remove stresses in the surface and to stabilize edges.
- Either the transverse or the longitudinal fin can be attached to stabilize edges, depending on the angle of access. If required, the pointed side of the plastic wedges can also be used here.
- Use a second hammer to hit the hammer that is placed on the surface.
Please note: There is no danger from splintering parts as there is with steel hammers!
- The surfaces of aluminum hammers and the aluminum hammer with the rubber cap are excellent for easing out surfaces and minor damage to edges.
- The wide sides of the plastic wedges can also be used as “dampers” between the hammer and the sheet metal.

A very important step in dent removal work with the VAS 6321 A where sheet metal is under tension is to remove the tension at the right time.

On the following pictures you can see different procedures.



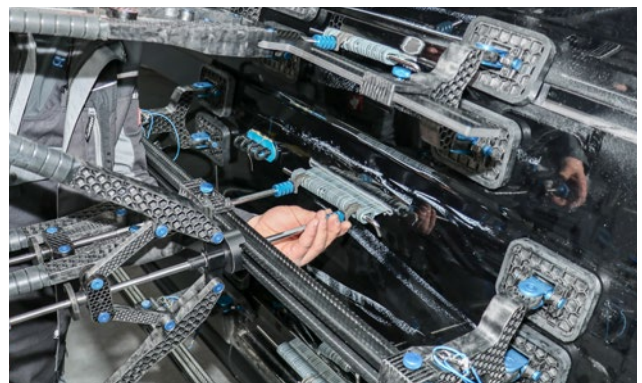
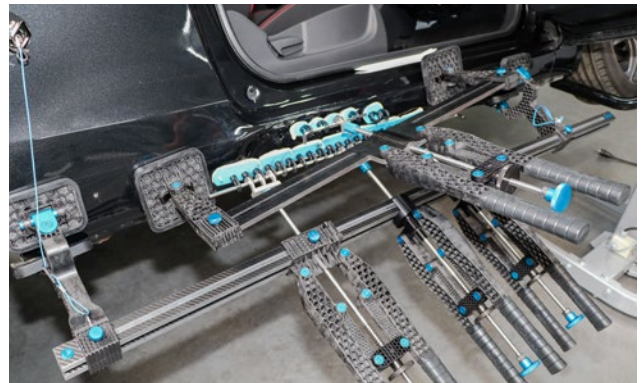
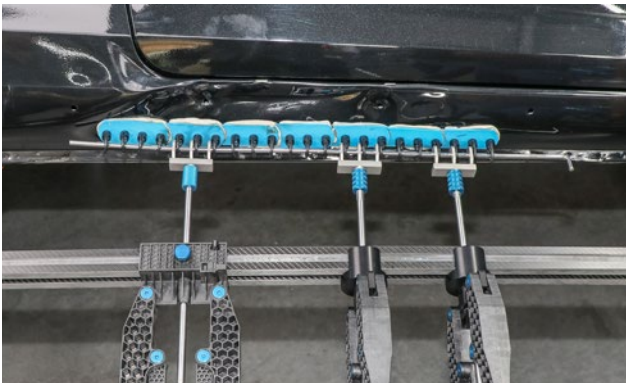
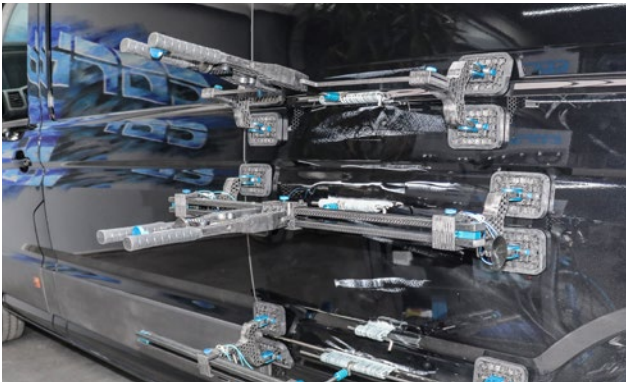
A very efficient tool for this purpose is the L-dent removal bracket with part no. **CSH-65-0150-8**. It is ideal for most dent removal work.

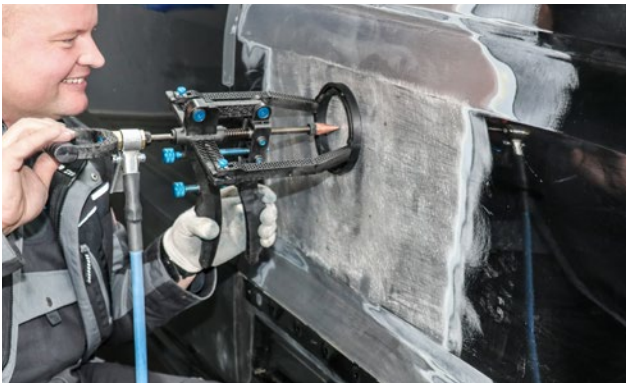


The hammer with rubber cap is used when relaxing the surface with light blows.



22. Creative approaches to different repair methods





23. CBR EasyTool glue technology (VAS 6321 A/11)

23.1 Paintless dent removal with the CBR glue technology

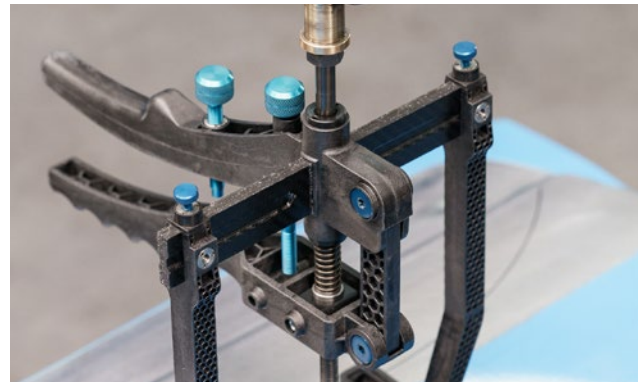
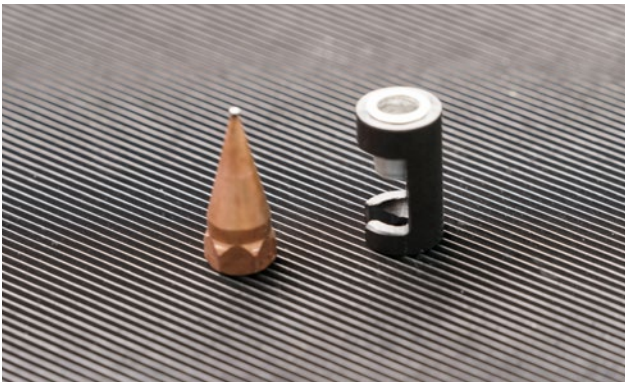
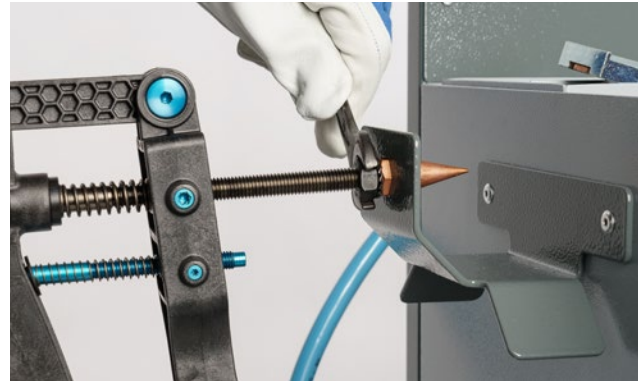
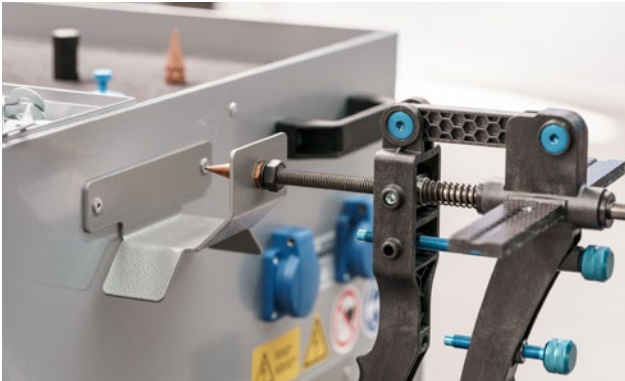
Damage patterns with no damage to paint can be repaired by using the glue technology with the available CBR pullers.

This involves using plastic pulling bolts and special pads, which enable good bonding to the surface with heated special plastic glue. After shrinking the damaged areas, the glue is removed from the painted surface without leaving any residue.

23.2 Glue technology with the EasyTool

- Unscrew the welding pull tip from the EasyTool and mount the pull bolt holder.
- Clean the damaged area with detergent to allow the glue to bond well to the surface.
- Apply the glue using a hot glue gun and place the pulling bolt in the center of the dent.
- Hook in the pulling bolt holder and pull gently (fulling) with the EasyTool.
- Spray with cleaner and loosen the pulling bolt.
- Push the bolt off sideways and peel off the glue.
- Residual tension is released by gentle blows with a Teflon striking tool.





23.3 Equipping the EasyTool with the adhesive system

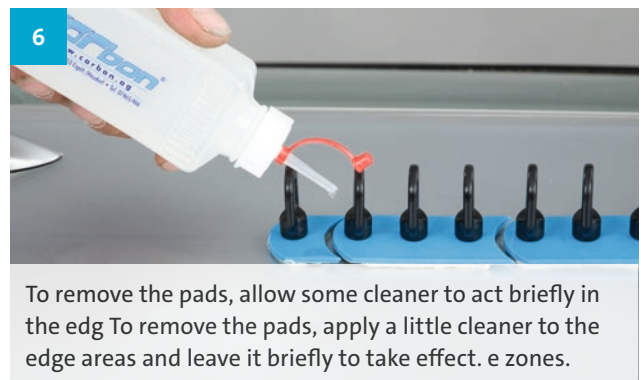
On the upper cable holder on the left side of the VAS 6321 A trolley there is a punched out hexagon. Plug the welding shrinking tip into the punched hole and loosen the nut behind it using a 17 mm open-end wrench. Twist off the welding tip and screw the pad adapter onto the M10 thread of the EasyTool. Tightening the adapter by hand is sufficient.

24. CBR glue technology (VAS 6321 A/9)

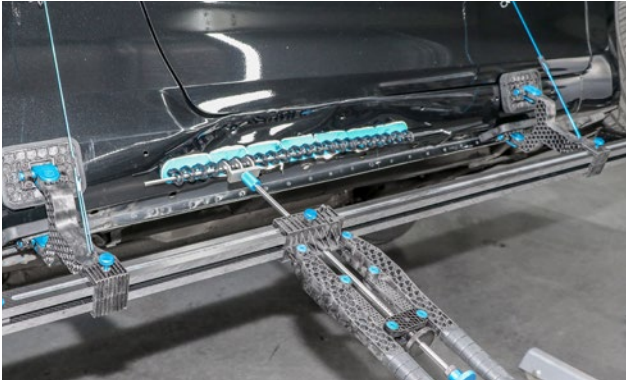
24.1 Glue technology with the StrongTool / LineTool / LeverTool

For larger areas of damage, the StrongTool or LineTool is used in a similar way to the repair with welded-on bits. Special plastic pads are used for bonding with the surface. The procedure for adhesion is the same as for repairing with bits. With the StrongTool / LineTool engaged, the residual tension is released by tapping with a plastic hammer or an aluminum hammer with rubber cap. Depending on the extent of the damage, two or more pads can also be used.





24.2 Glue technology with the LineTool



24.3 Glue technology with the StrongTool



24.4 Glue technology with the LeverTool



25. CBR GlueTech+ (VAS 6321 A/10)



Particularly in cases where there is extensive damage to sills, side panels, hoods, doors or the tail section, performing a longitudinal or transverse pull with the pull tabs of the GlueTech Plus is very effective. It is possible to control the shrinking force very finely.

The procedure for applying the glue and placing the pull tab is identical to the CBR glue technology (VAS 6321 A/9).



MGT-200 GlueTech Plus
glue pad set blue



MGT-11 GlueTech Plus pull tab blue



MGT-10 GlueTech Plus pull plate



MGT-05



MGT-04



MGT-03



MGT-02



MGT-01

26. Decommissioning the VAS 6321 A

Temporary decommissioning

- Switch off the PS.
- Disconnect the cables from the PS and store the cables on the cable holders provided.
- Protect the PS against penetration by liquids and foreign bodies.

Final decommissioning

We expressly point out that with termination of use, disposal must be carried out exclusively by the manufacturer or a specialist disposal company.

Disposal with private household waste or at municipal collection points is therefore excluded.

27. Declaration of Conformity

DICHIARAZIONE DI CONFORMITA'
DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE'
KONFORMITÄTSERKLÄRUNG



Sie dichiara che l'apparecchio:
We hereby state that the machine:
On déclare que la machine:
Die Maschine vom:



Anno/year/année/Jahr
2019

Tipo/type/type/Typ:

CBR-C1

Codice/code/code/Code:

80550550

S/N:

Tensione di ingresso/Supply voltage:
Tension d'alimentation/Versorgungsspannung:

U1 2 ~ 50Hz U1n 230V

Potenza nominale al 50% duty cycle/rated output at 50% duty cycle:
Puissance nominale au 50%/Nennleistung bei 50%:

Sn 3 KVA

Corrente di ingresso massima/full load current:
Courant d'entrée maximal/maximaler Eingangsstrom:

In 16 A

è conforme alle direttive:

is in compliance with the directives:

2014/35/UE

est conforme aux directives:

2014/30/UE

entspricht den Richtlinien:

Eigeltingen - Heudorf, Dezember 2019

Geschäftsführerin/CEO, Edeltraud Holle

28. Notes

[illegible]

[illegible]

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