VOLKSWAGEN

AKTIENGESELLSCHAFT

Usage Information

VAS 6321 A

Usage information VAS 6321 A
Version 2021/05

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.

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 the company Carbon, but also made a future-oriented decision - we do hope that your work is successful with this equipment.

We have prepared this usage information with important notes to avoid possible dangers, 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 with the repairs.

Our aim is to ensure the high quality of our products also 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 ideas or complaints about our product. We will be grateful for your feedback.

Carbon GmbH
Haldenhöfe 3
78253 Eigeltingen-Heudorf

E-mail: service@carbon.ag

Table of Contents

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 sheets of metal by using the copper electrode.

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

Structural changes, even minor, are not permitted and lead to the exclusion of the legal guarantee!

CARBON GmbH disclaims any liability for damages to persons, animals, property and the machine itself, which are caused by a non-conforming use of the safety criteria specified in this usage information, even by minor manipulations, as well as 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. The 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 strongly recommended!

Safety instructions

Read the instructions carefully. Failure to observe the safety regulations and basic precautions may result in serious physical injury and property damage. Make sure that employees working next to you are not injured, such as 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 VAS 6321 A!

Important: Explosion hazard!

Do not make repairs to sheet metal or containers that 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 the front side, as well as on the back side of the metal sheet, e.g. zinc, lacquers, sealing material, anti-drumming material, etc.
To avoid poisoning, appropriate precautions such as good ventilation in the workplace or the wearing of respirators with insufficient ventilation must be observed.

Always work attentively and concentrate!

Magnetic fields

Please note that the VAS 6321 A/13 welding inverter 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 switched off according to the vehicle manufacturer's specifications before using the VAS 6321 A/13!

2. Use / Guarantee

2.1 Appropriate use

Our CBR Carbon Body Repair System is designed and manufactured exclusively for commercial use in repairing damage to the body outer skin.

Usage in the non-commercial sector is expressly not recommended due to the lack of knowledge in car body repair and especially in welding equipment, as well as lacking specific training.

Intended 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 must not be used any further!

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 and overloading
- Transport and damage due to violence
- Failure to observe the information in this usage information
- Failure to adhere to the safety regulations

Any guarantee claim is void if conversions, changes and corrections 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

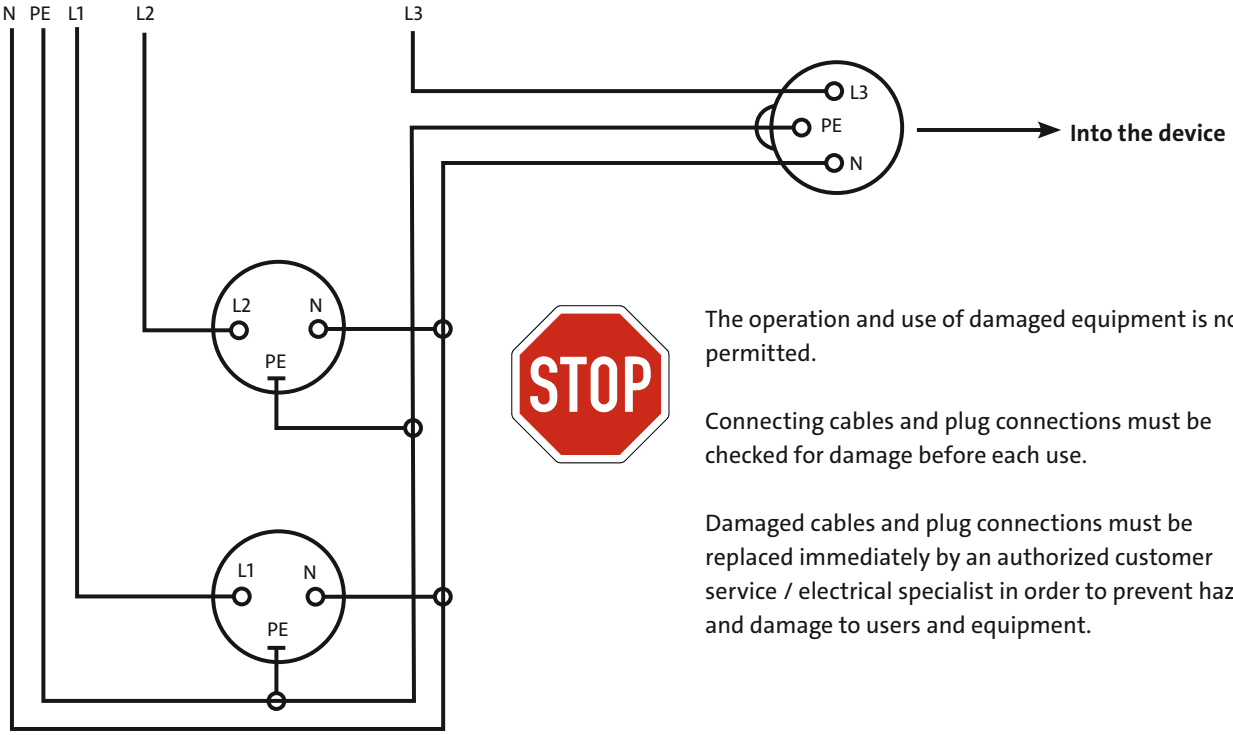
The VAS 6321 A trolley is supplied with a connection cable with a 16A plug type EN 60309-1. The connection cable must be connected to a three-phase, grounded 400V (50-60 Hz) socket (L1, L2, L3, N and PE) with neutral and protective conductor connected in accordance with the regulations and current standards 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 plug DIN 60309, type Multigrip, 3-pole, 6h / 200-250V 2P. This is connected to a 230V (50-60Hz) socket DIN 60309 (coupling), 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



The operation and use of damaged equipment is not permitted.

Connecting cables and plug connections must be checked for damage before each use.

Damaged cables and plug connections must be replaced immediately by an authorized customer service / electrical specialist in order to prevent hazards and damage to users and equipment.

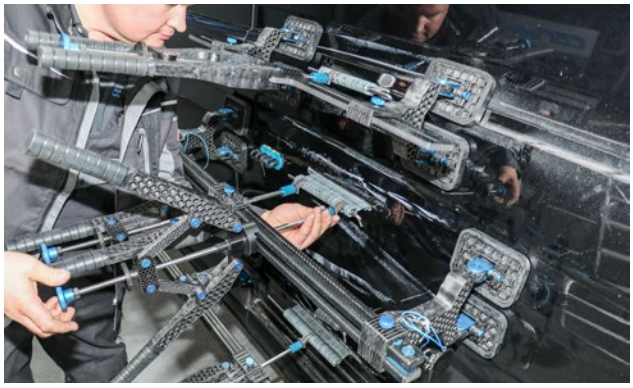
4. The VAS 6321 A in use

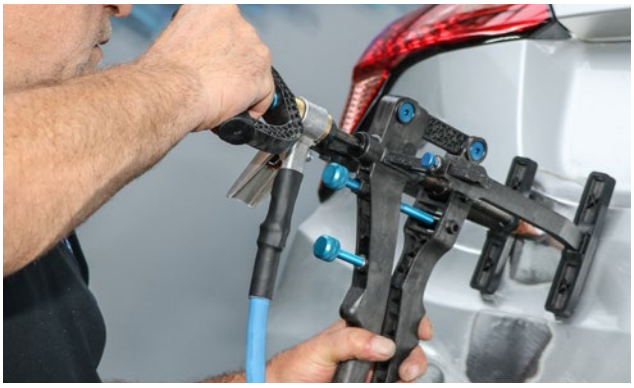
The VAS 6321 A is a complete, innovatively designed repair system for the economical and high-quality repair of the car body outer skin.

By means of resistance welding techniques, various straightening devices and adhesive systems, almost unbelievable repair results can be achieved with experienced craftsman after they have received instruction and training.

The combination with optional tools / accessories from the Paint damage-free Dent Removal (AOL) technology and the Push / Pull System open up further possibilities in body repair.

Application images

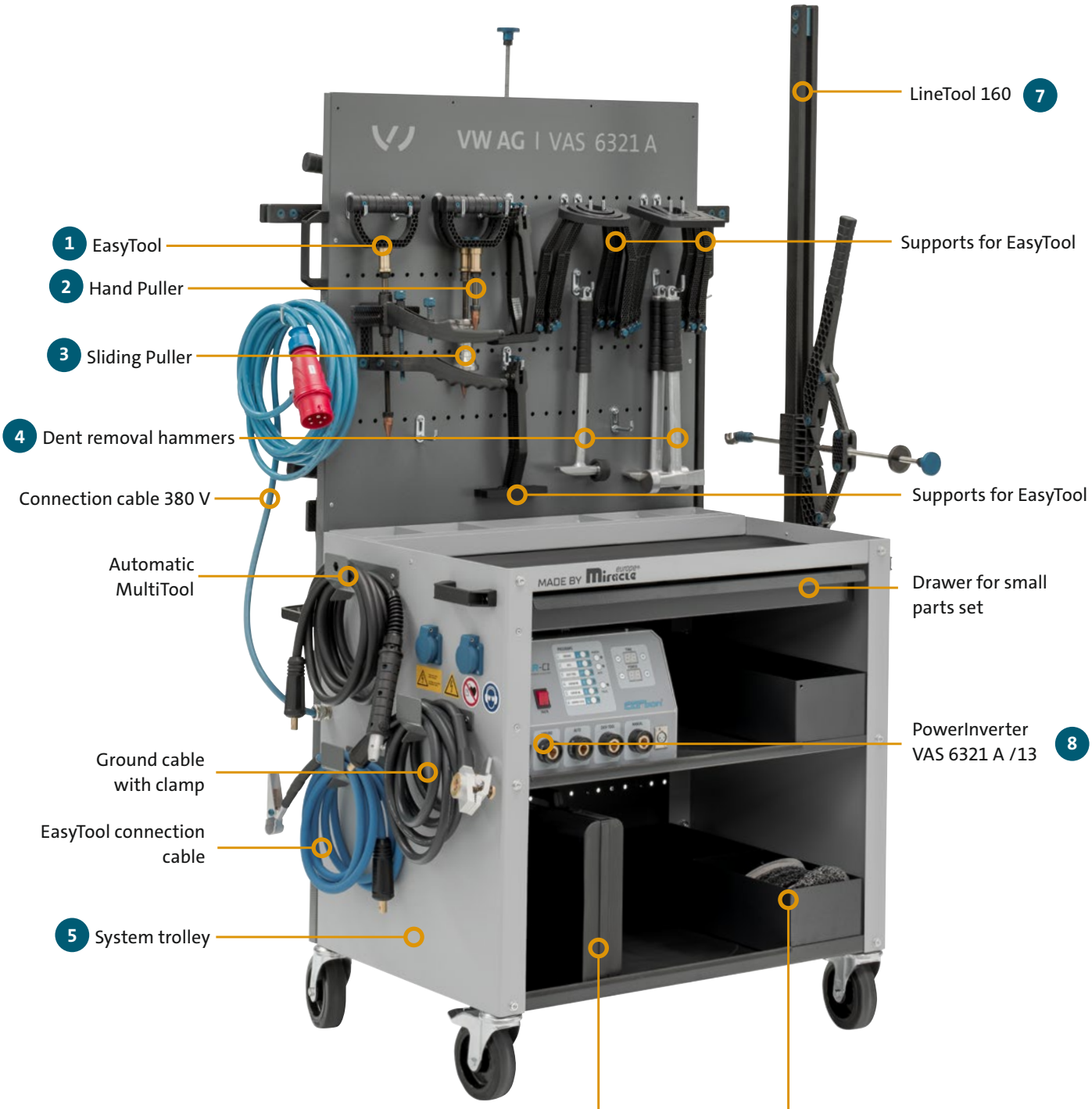




5. Typical damage

Attachment parts, as well as welded and bonded parts

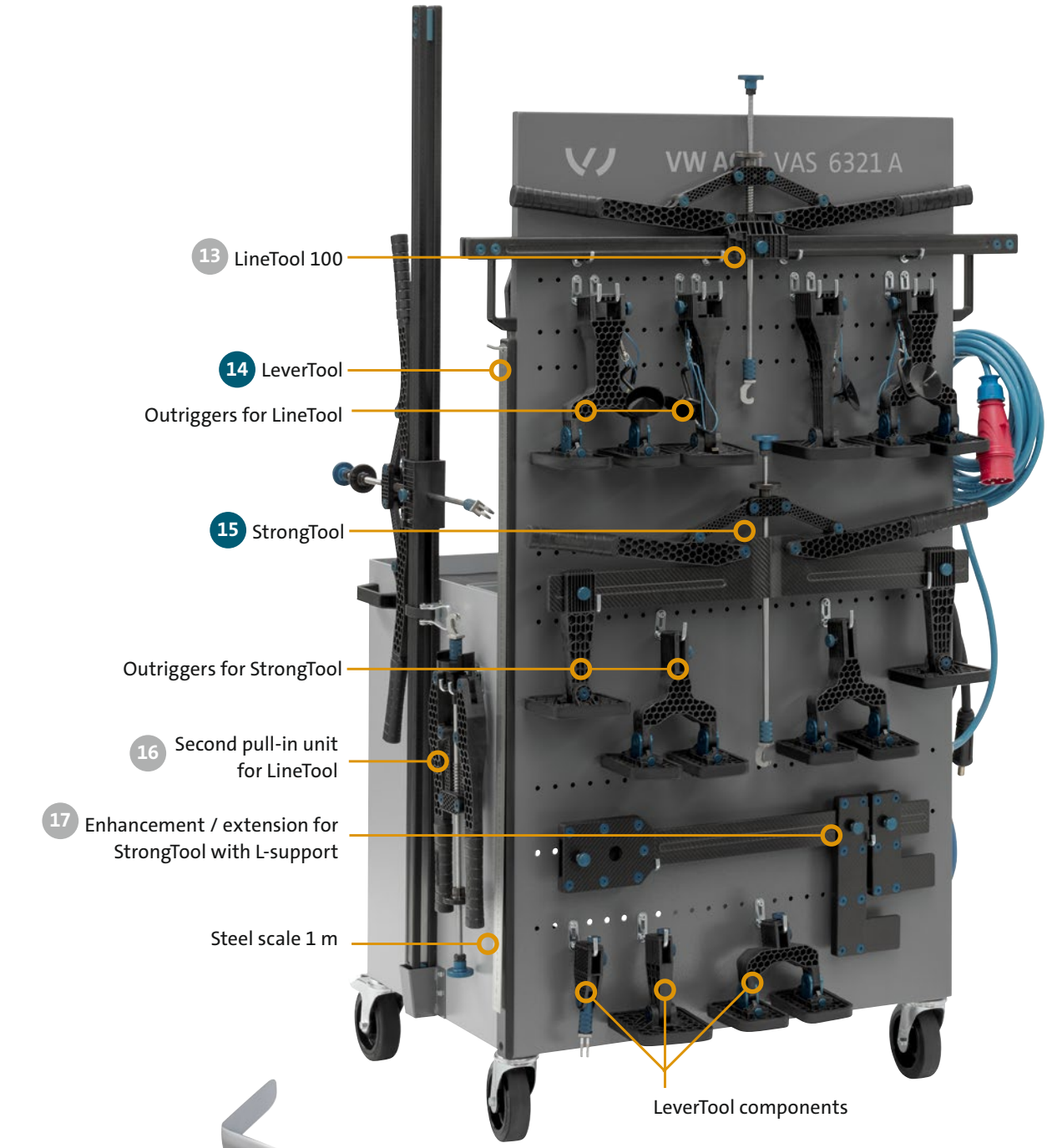
6. The VAS 6321 A at a glance

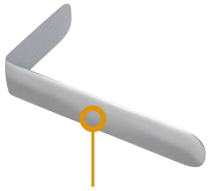


6 Manual MultiTool

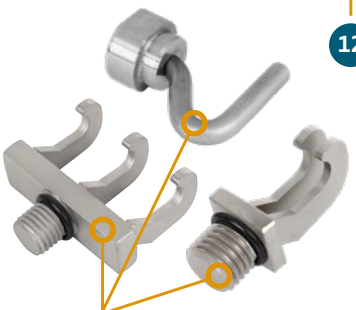
● = VAS 6321 A

● = Supplement and accessories

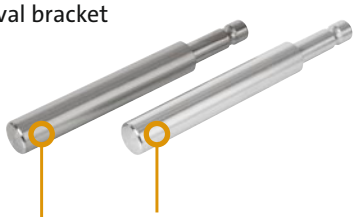




12 L-dent removal bracket

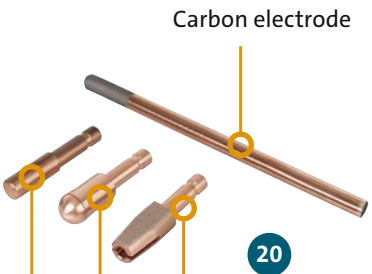


11 CBR triple pull hook
CBR double pull hook
Rotating pull hook



19 Aluminum pull-in electrode

18 Stainless steel pull-in electrode



Carbon electrode

20

Bit holding electrode - Narrow

Copper electrode - Ball

Copper electrode - Flat

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

VAS 6321 A / 5	CBR EasyTool with three round and three square supports each, as well as four straight feet	1
CBR-ZH-01	CBR hand puller	2
CBR-ZH-02	CBR sliding puller	3
H01-HG	CBR dent removal hammer small with removable rubber cap	
H03-H	CBR dent removal hammer large with horizontal fin	4
H03-V	CBR dent removal hammer large with vertical fin	
CBR-029	VAS 6321 A trolley for clear storage of the individual components	5
VAS 6321 A / 7	CBR LineTool 160 with pull-in 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, as well as 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	*

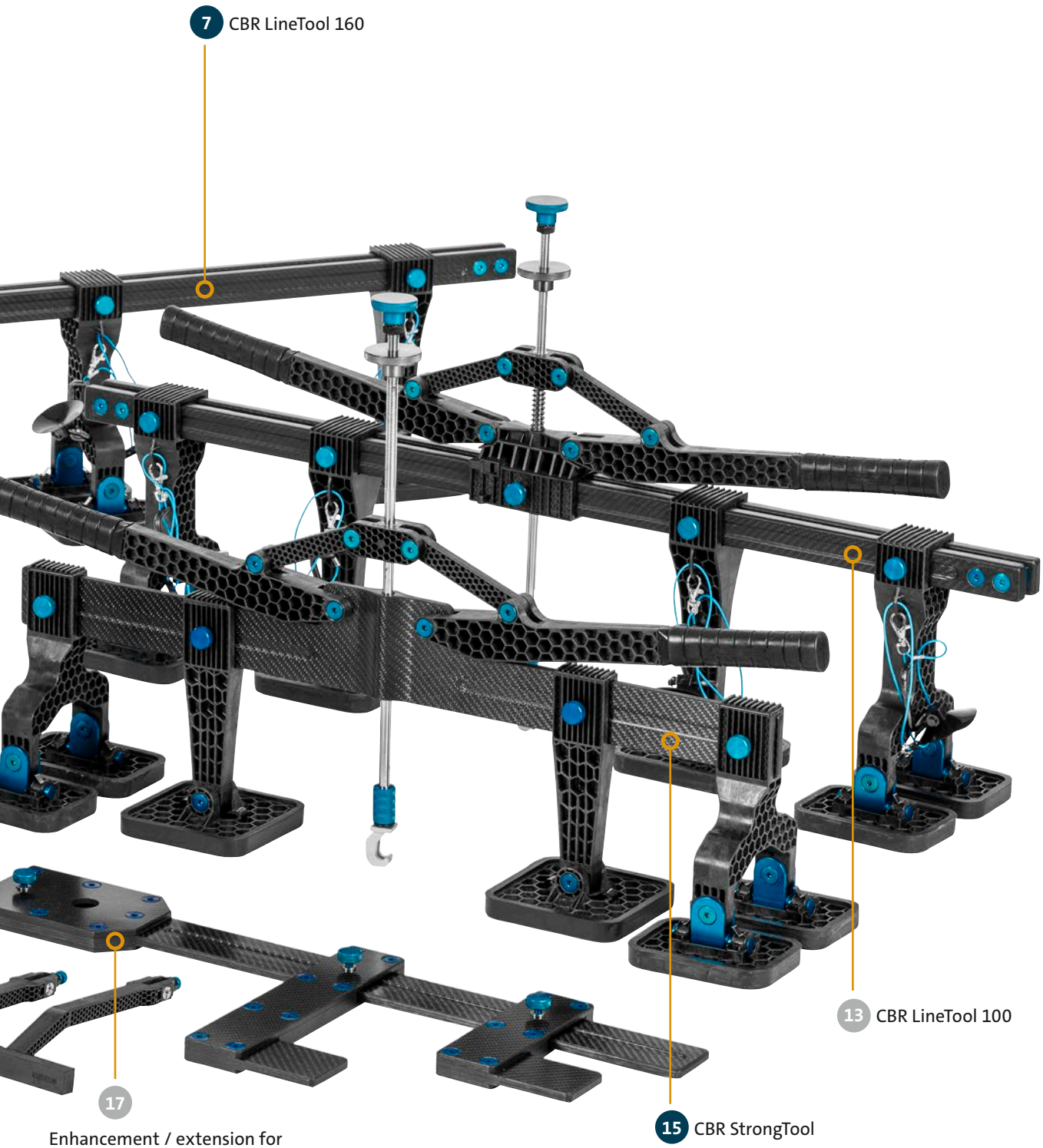
* without illustration

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 pull-in unit and double pull hook	13
VAS 6321 A / 3	Second pull-in unit with double hooks for VAS 6321 A / 1 and VAS 6321 A / 7	16
VAS 6321 A / 2	Enhancement / extension for CBR StrongTool CBR-ST-00	17
CBR-U-B17	Stainless steel pull-in electrode for aluminum sheets	18
CBR-U-B16	Aluminum pull-in electrode for aluminum sheets	19
C1-17	MultiTool for VAS 6321 A / 13 for upsetting and pull-in with connection cable	*
VAS 6321 A / 9	CBR adhesive system set for VAS 6321 A	*
VAS 6321 A / 10	CBR GlueTech plus for VAS 6321 A	*
VAS 6321 A / 11	CBR adhesive system set EasyTool	*
CBR-080	Cover hood for VAS 6321 A trolley	*
VAS 6321 A / 14	Push / Pull System	*

* without illustration

7. CBR pulling tools at a glance



Enhancement / extension for
CBR StrongTool with L-support

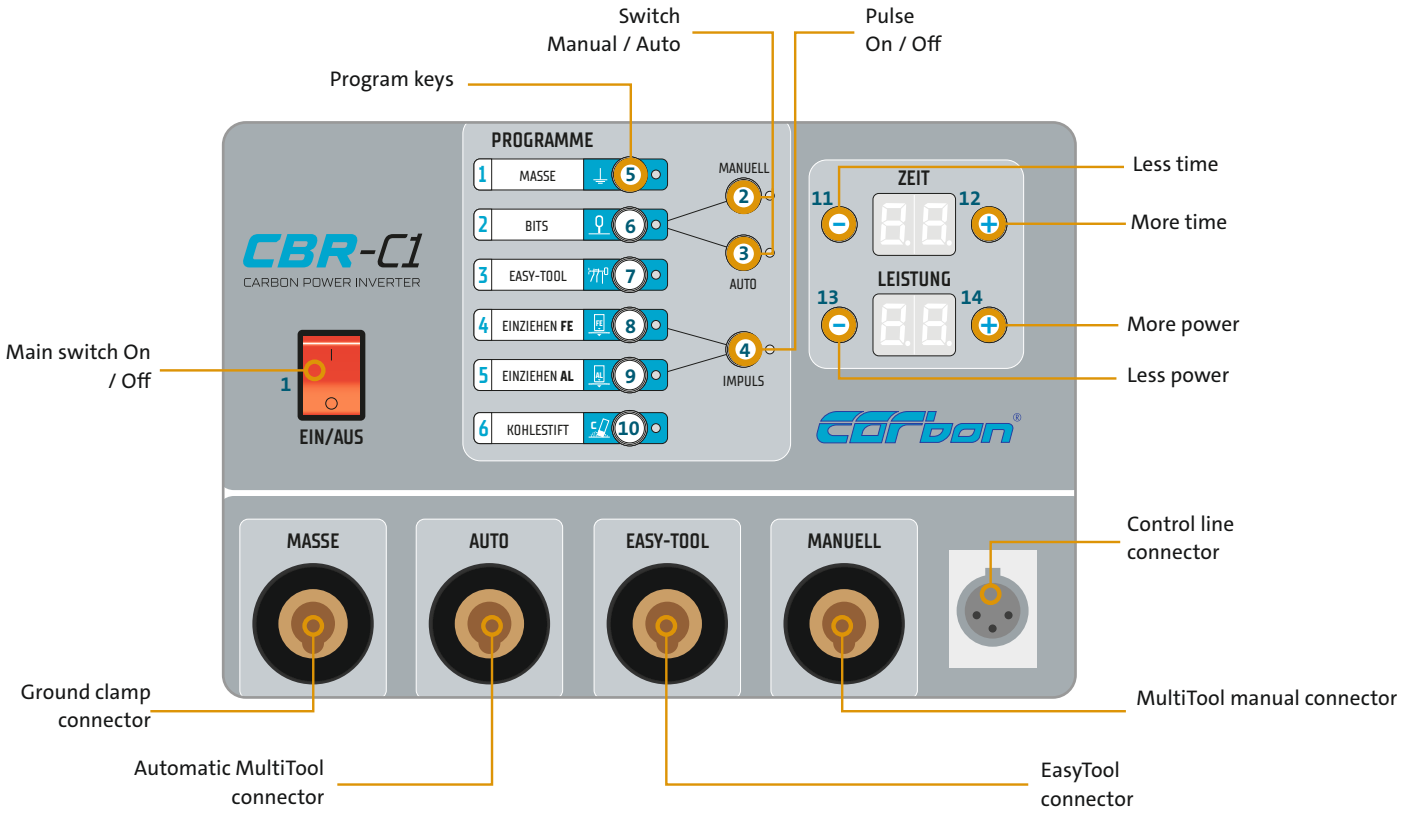
8. CBR-C1 PowerInverter | Power Source (VAS 6321 A/13)

8.1 The CBR-C1 PowerInverter

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

The user has 6 programs available for different tasks, which are selected via pushbuttons (5-10). For all programs, our technicians have worked out basic values which are stored in the control electronics of the SQ and are automatically set after selecting the program.

The preset settings can be changed step by step and independently of each other with the keys (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).



8.2 The operation of the SQ

After switching on the SQ via 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, whereby 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), as well as in manual mode (welding process is triggered at the press of a button on the MultiTool).

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

If the automatic mode is selected, the SQ switches to standby mode after 5 minutes of inactivity. To reactivate the SQ, 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 easy handling of the pushbuttons of the SQ to quickly recall the respective programs.

Important

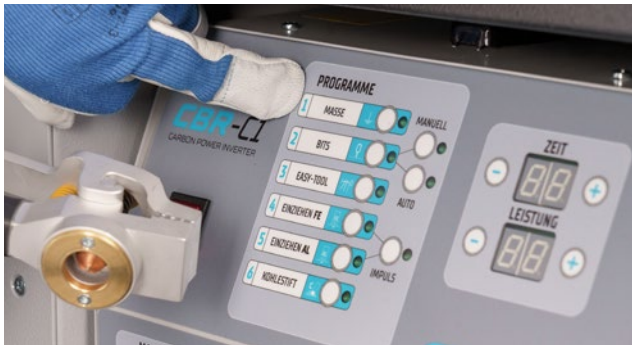
For all work with the VAS 6321 A, make sure that the zinc coating is removed from the sheet metal without leaving any residue. This should be done with nylon discs or similar at low speed to introduce as little heat as possible into the sheet metal being machined.

8.3 Attaching the ground clamp with program 1

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be switched off according to 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 SQ, switch on the SQ at the main switch and select program 1.

Important: To ensure optimum process reliability for all work on the body panels, care must be taken to ensure that the zinc coatings are removed without leaving any residue.



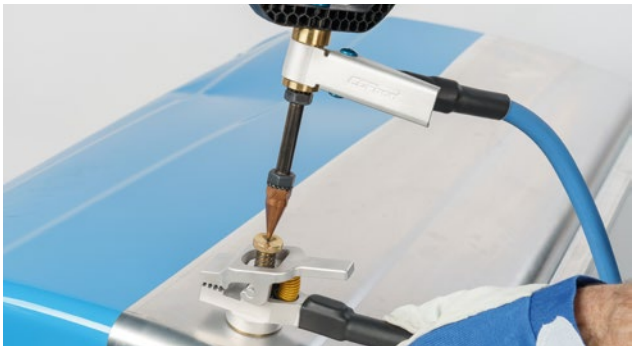
After switching on the SQ, select program "GROUND" and press "AUTO" on the panel.

8.4 Welding on the ground clamp

Plug the MultiTool with connection cable into the Auto socket on the SQ and insert the pull-in tool into the MultiTool. The ground clamp can be quickly and easily welded onto a bare surface 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 pull-in tool. As soon as the welding tip of the bolt touches the bare body part, the automatic welding process starts - if you are working in manual mode, you must trigger this process with a keystroke. By turning the knurled screw, the welded joint can be released quickly and easily.

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



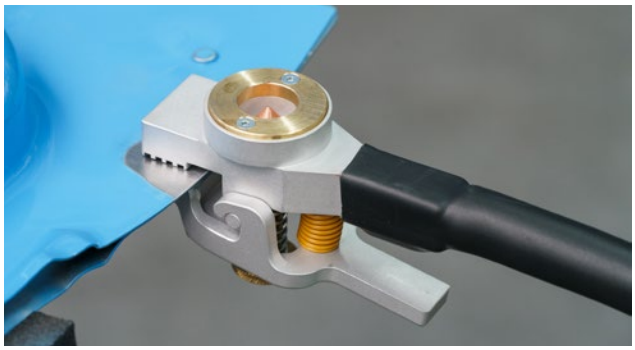
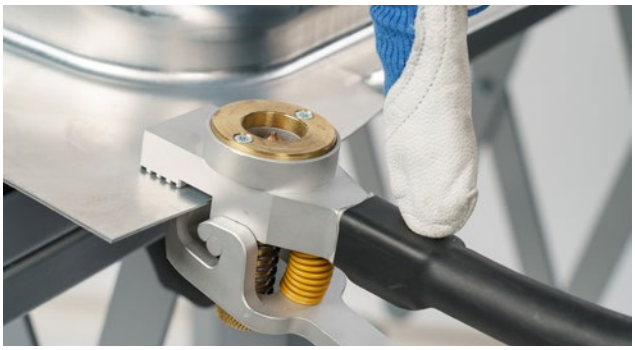



You can trigger the contact to apply the ground to the sheet metal with any CBR tool.

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 body part - otherwise faulty welding or even hole burn-through may occur!

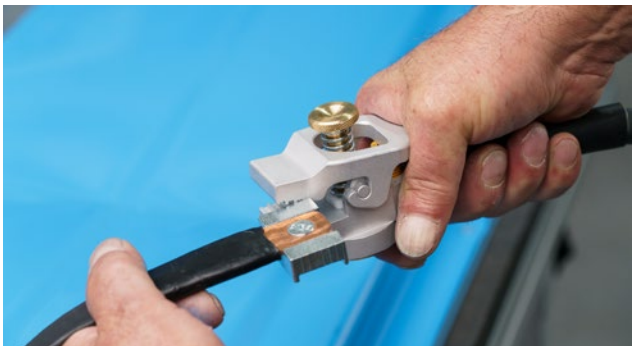
For your consideration: The VAS 6321 A/13 requires a secure ground connection to the vehicle body to achieve a good result.

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.
Then screw the screw sleeve upwards until the welding tip protrudes.
Insert the pull-in tool into the MultiTool (C1-04), center the welding tip on the bare spot and place the MultiTool with the pull-in 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 body part.

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

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



1. Place the ground clamp in the specified recess of the extension.
2. Hold the ground extension onto the sheet metal and press the welding handle onto the sheet metal at specific points.
3. Turn the knurled screw up to the sheet metal for fixing the ground tip.

Important: When applying the ground tip to the car body, slight burn-offs occur on the tip. To ensure process reliability, it is recommended to regularly care for the tip with the CBR diamond file.

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, as well as the CBR PressSystem and the surfaces and edges of the body outer skin to be repaired.

The straight CBR Bits

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

They are ideally intended 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 in the area of 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 switched off according to 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.

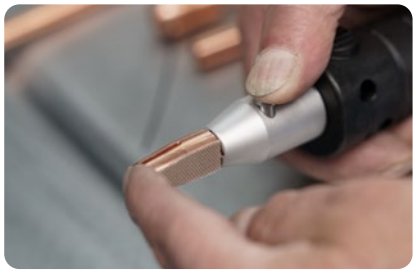
You can choose whether you want to weld on the bits in automatic mode (triggers welding process when the bit touches the ground bare body part) or in manual mode (keystroke on the MultiTool triggers welding process).

Manual mode has the benefit that you can position the bit exactly where you want it before the welding process - for this you need the optionally available MultiTool with probe 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 SQ at the main switch and select program 2. Select the desired mode via the Auto / Manual key.

- 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 in the desired spot with light pressure and weld on according to the selected mode.
- Evaluate bit welds - and change parameters if necessary.



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 - there must not be any hole in the sheet metal!

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

9.3 Useful and interesting facts about bits

If you adjust the adjustment 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 metal sheet thickness: Low metal sheet thickness = low power, high metal sheet thickness = high power. If metal sheet thickness 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

- The short welding time prevents thermal overload and thus melting of the body panels.
- The high power allows a firm spot welding of the bits to the body panel.
- Due to the low heat exposure during welding, the properties of the body panels are not changed.
- There is almost no burning of the corrosion protection on the back side of the body panel - the zinc coating of the sheets of metal is not damaged.

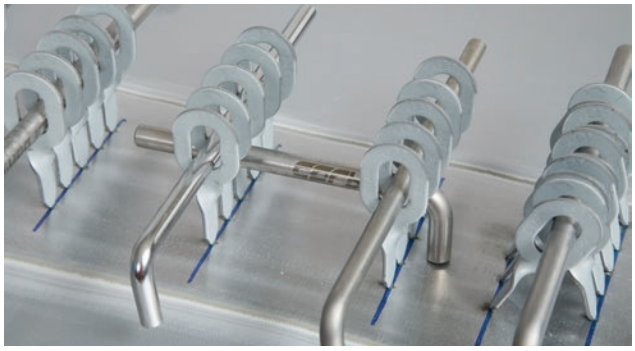
Possible causes if there is any powerful sparking, burn marks and poor adhesion of the bits

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

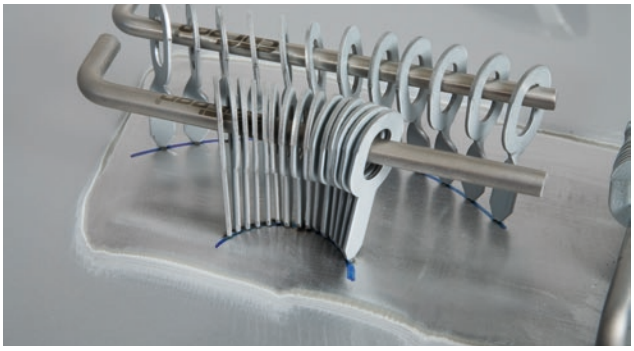
- Insufficient contact pressure during welding.
- Unsafe, hesitant handling.
- Poor ground connection.
- Insufficient power supply (VAS 6321 A/13 is operated with extension cable).
- Power is set too low.
- Shunt (adjacent bit is touched during welding).
- The welding surface of the bits is not clean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

9.4 Important notes on welding on the bits:

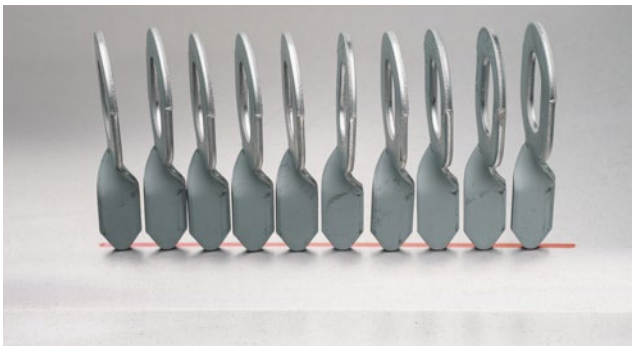
- Start welding on the bits at the deepest spot of the damage.
- Do not choose the gaps between the bits too large.
- To avoid shunts when welding on tightly welded bits, weld the bits at an angle and then twist them up.
- For deeper damage, leave the outer bits at an angle.
- Align bits so that the pull rod can be inserted.
- In circular and curved areas, align the bits so that a straight pull rod can be inserted despite the curvature.



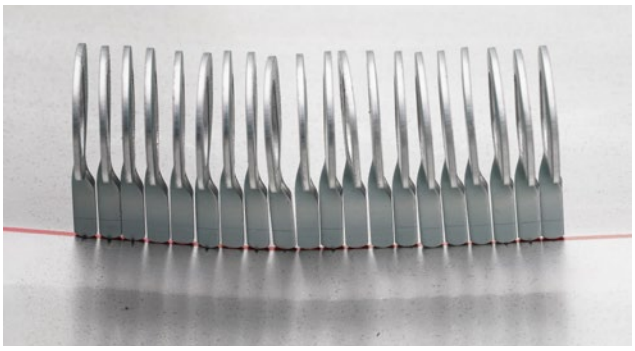
Arrangement of bits for two edges with wide distances



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 stable edge area, it is important to apply longitudinal welding to the edge. If you use the straight bits, you would have a cross weld. This 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 above as an example. However, by using our PowerBits (due to the new geometry), we bring twice the number of bits to the same length - and thus a much higher pulling force without hole formation.

9.5 The CBR pull rods

According to the number of bits welded on, select the appropriate pull rod, which is inserted 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 advance to greater depths of damage by tilting the outer bits.


Ø 7 mm

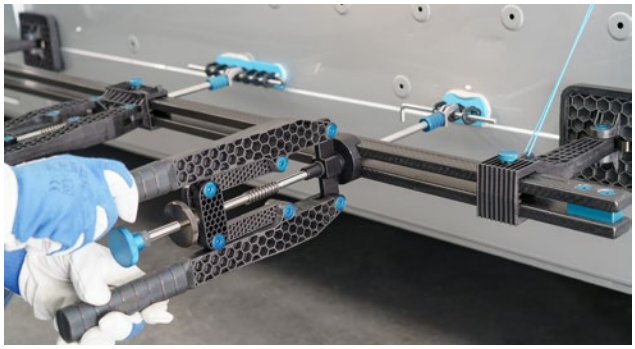

Ø 8 mm

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 pull rods with diameter 8 mm.

The pull rods with Ø 7 mm (and here especially the long pull rods) have the benefit that they bend easily at higher pulling forces and thus allow a desired overstretching. e.g. for soft deformations in surfaces such as on side walls and doors.

Select the length of the pull rods depending on the damage pattern.


For soft contours and curvatures, it is recommended to use the pull rods with Ø 7 mm.


For hard contours it is recommended to use the pull rods with Ø 8 mm.

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 the same length of the bits used. 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 vice. Make sure that the waste opening at the bottom is exposed.
- Connect the compressed air hose (5-8 bar).
- Make an adjustment of the stop to the desired dimension - always start with position 1 for uncut bits - make sure that the stop snaps back into place after twisting.
- Insert straight bits flat, rotated bits on edge and hold against stop.
- Press 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 makes sure that bits of the same length are always available.

For your consideration: 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 and tightened if necessary.

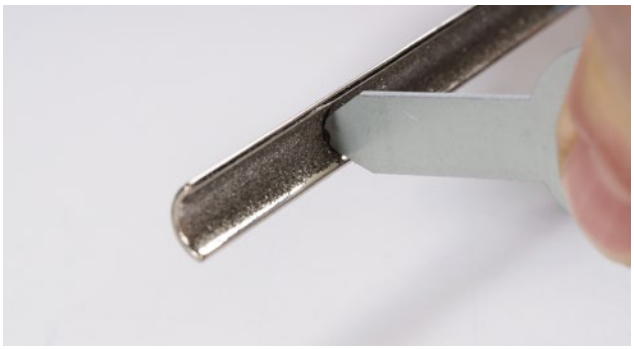
It is recommended to store the cut bits according to their length on the rings provided.

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 matched 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 forces are required during straightening, always use new or freshly recut bits. If possible, always recut bits together, or store bits that have been recut different numbers of times separately.

On the following pictures you can see how to remove light welding residue on the various bits with the CBR diamond file without leaving any residue, thus ensuring process reliability during the next welding process.



With any strong burn-off, as on the left picture, it is recommended to cut the bits.

11. CBR StrongTool (VAS 6321 A/4)

As the name suggests, the CBR StrongTool is the pulling tool in the VAS 6321 A that can be used to build up the highest pulling forces.

It is preferred in areas that are very stable, such as sills, on A-, B- and C-pillars and other angular areas. Due to the lever transmission, this tool can be used to realize pulling forces of up to 2 tons manually.

The perfect ergonomics and the very low weight of only 4.0 kg, including the outriggers, allow the user easy and fatigue-free handling.

With this tool, precise, sensitive and fast reshaping of damage to the car body outer skin is also 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 with targeted blows with the aluminum hammers or the plastic wedges. The machined surface is thus stabilized again.

The pull height can be precisely adjusted by means of 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 support in the engaged state

11.1 Components of the CBR StrongTool

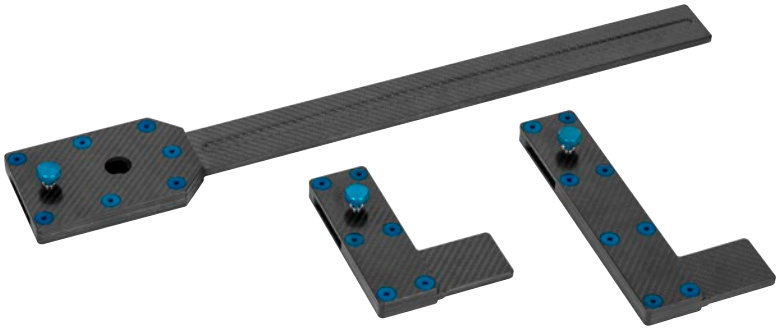
Important: If the support points on the body are far apart or at very different levels, the optionally available VAS 6321 A/2 enhancement / extension is a powerful help when using the StrongTool. Here, too, make sure that the support point is exactly in the center of the outriggers.

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

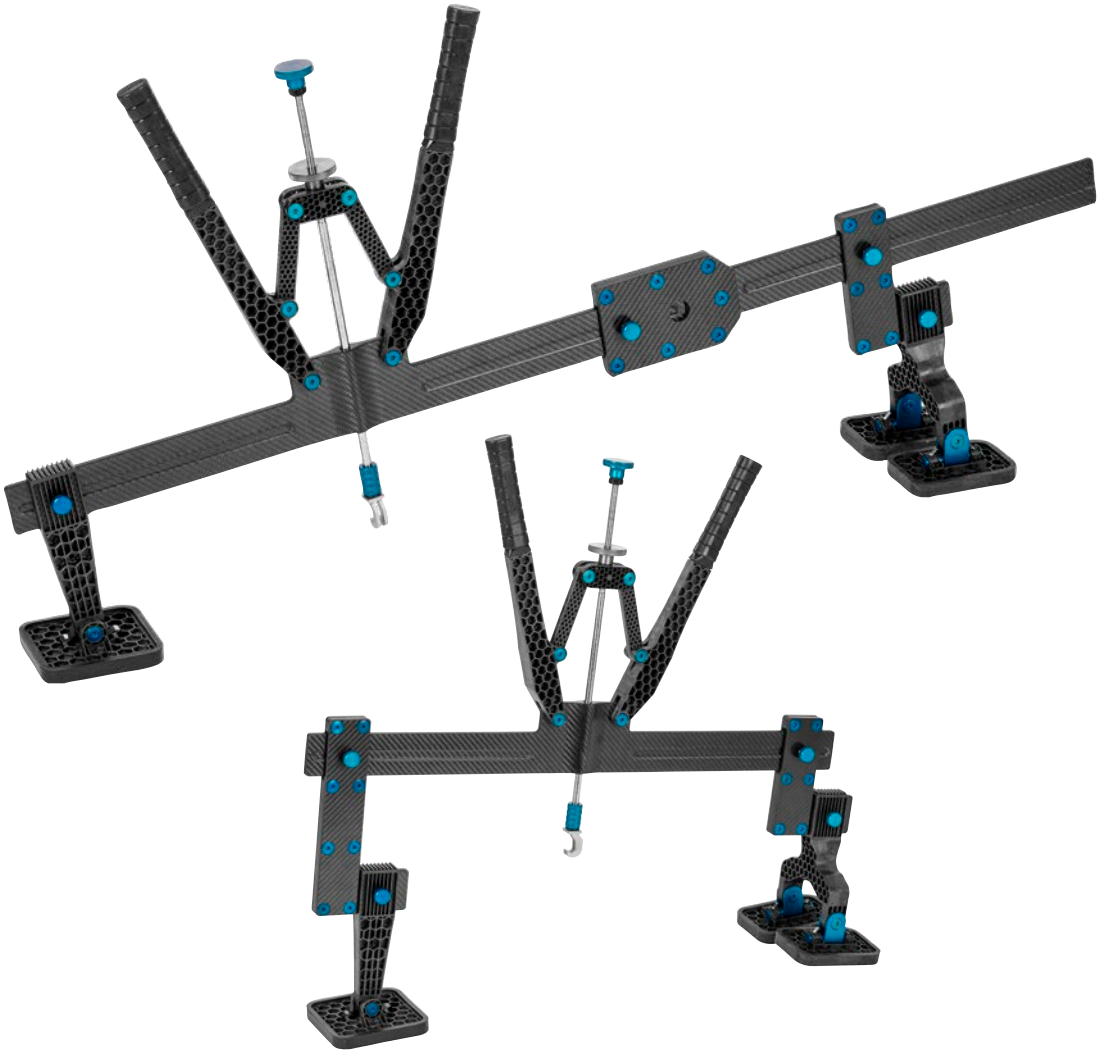
Double foot for StrongTool

Single foot for StrongTool

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



Extension blade, as well as small and large L-supports



With the many possible combinations of the various individual parts, a suitable solution can be found in practice for every challenge.

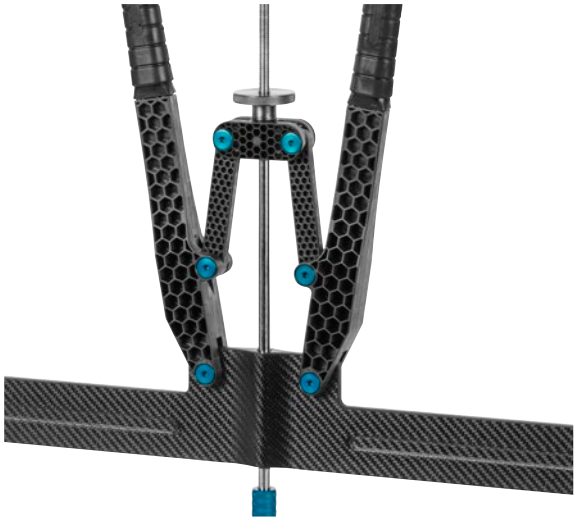
11.3 Working with the CBR StrongTool

Incorrect

Correct Foot must be placed centrally to the edge.

Incorrect

Correct Foot must be placed centrally to the edge.



With the large knurled nut, you adjust the length of the pull rod steplessly and quickly when working with the StrongTool.

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

The outriggers may only ever be loaded vertically when pulling – as soon as a transverse pull occurs, it is essential to use the double outriggers.

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

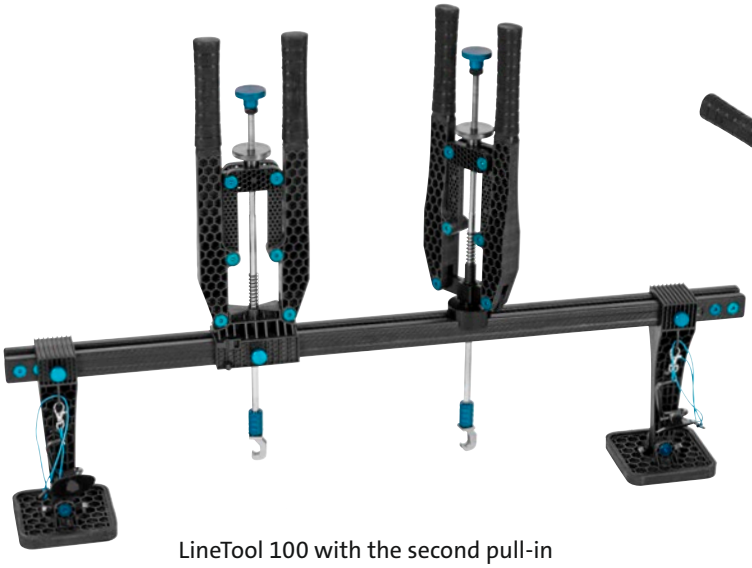
The CBR LineTool is an important component of the VAS 6321 A system. It works in a similar way to the CBR StrongTool, but it can also be used to reach widely spaced support points on the body.

This enables the user to repair large-area damage, especially on doors, hoods, side panels and body parts that are not alloyed with 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 is a very universally applicable tool due to its sliding pull-in unit.

LineTool 160 with straight feet

LineTool 100 with double feet



LineTool 100 with the second pull-in unit and the straight feet

Second pull-in unit can be used for both LineTools

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

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

Here, too, different outriggers allow a wide range of options for reshaping damage in the body outer skin.

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

11.4 Working with the CBR LineTool

When working with the LineTool, the same procedure, process and instructions apply as when working 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). However, this area should not be completely reshaped right away, but the upper and then the middle line should be processed next.

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

The outriggers may only ever be loaded vertically when pulling - as soon as a transverse pull occurs, it is essential to use the double outriggers.

Incorrect

Correct Foot must be placed centrally to the edge.

Incorrect

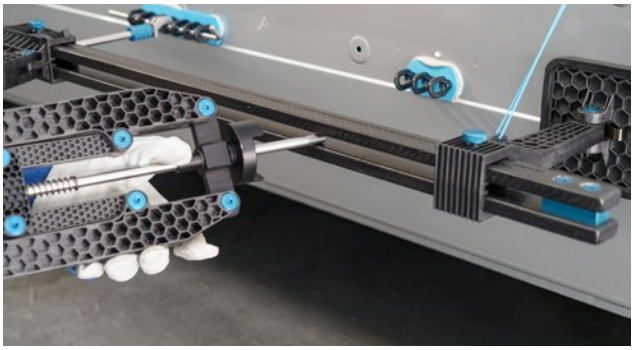
Correct Foot must be placed centrally to the edge.

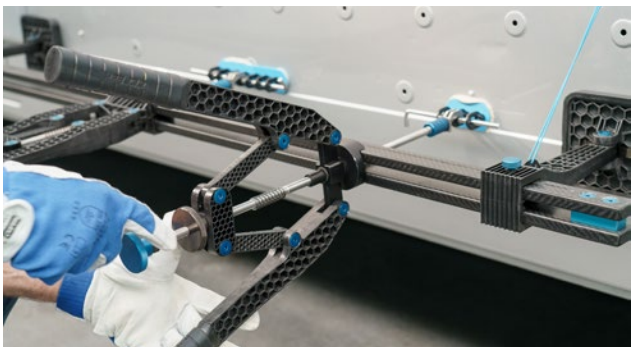
Important: Very high pulling forces can occur, especially with the short LineTool. This makes it all the more important to use the straight and split double feet at the correct angle to the direction of pull.

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

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

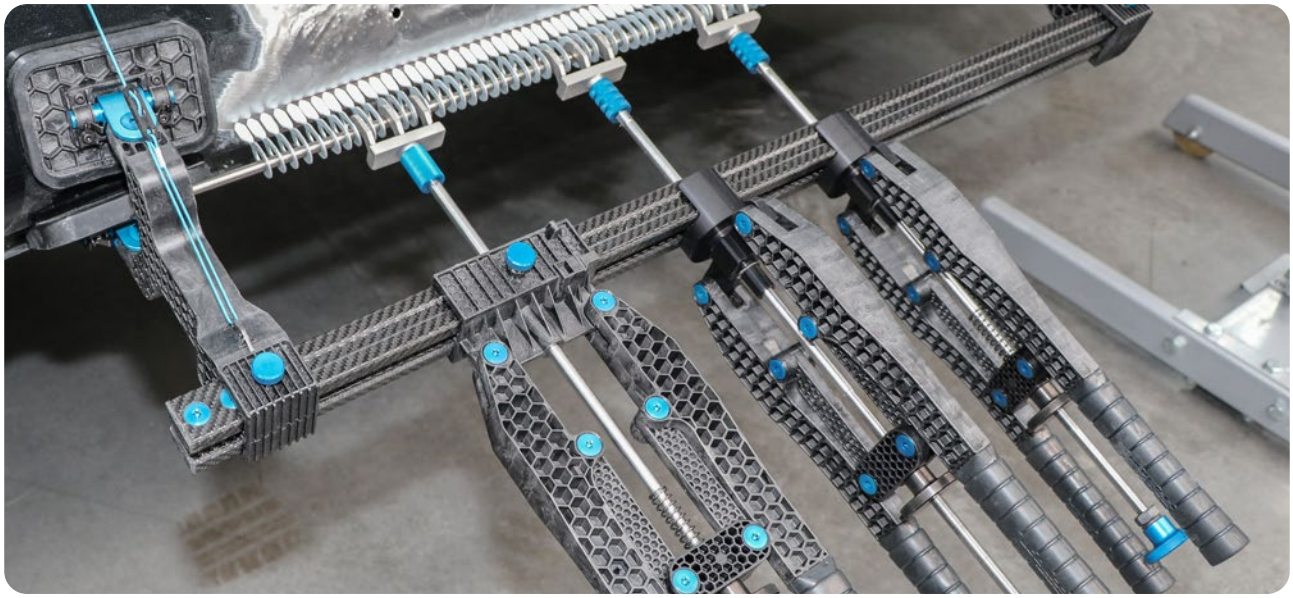
You can now effortlessly hook the pull hook into the pull rod. The suction cups makes it easier to work and secure the LineTool against unwanted loosening.





Attaching the second pull-in unit is very simple, as can be seen in these pictures.

The LineTool 160 with the pull-in unit in conjunction with the adhesive system.



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

13. CBR EasyTool (VAS 6321 A/5)

The CBR StrongTool, LineTool and LeverTool are mainly used on large-area damage. After repair with these tools, minor damage often remains, which is then removed with subsequent finishing work.

The CBR EasyTool is ideal for finish work, but also for the quick removal of grazing damage or parking dents.

Possible applications of the CBR EasyTool

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

Benefits of the CBR EasyTool

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

Supports of the CBR EasyTool

The CBR EasyTool is supplied with various supports - these are selected and used depending on the size, geometry and damage of the damaged body part.

- Square supports for flat and slightly curved surfaces
- Round supports for strongly curved surfaces
- Narrow, straight supports mainly for grazing damage

12.1 Components of the CBR EasyTool

12.2 Working with the CBR EasyTool in program 3

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be switched off according to the vehicle manufacturer's specifications before using the VAS 6321 A/13!

In the first step, assess the damage site and select the appropriate support and attach it to the CBR EasyTool. Then make the basic setting of the CBR EasyTool.

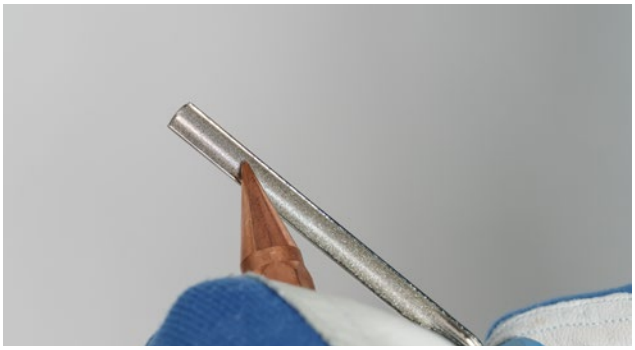
To do this, first adjust the handles to the user's hand using adjustment screw 1. Then place the tool on a flat surface and limit the desired pull height with adjustment screw 2.

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

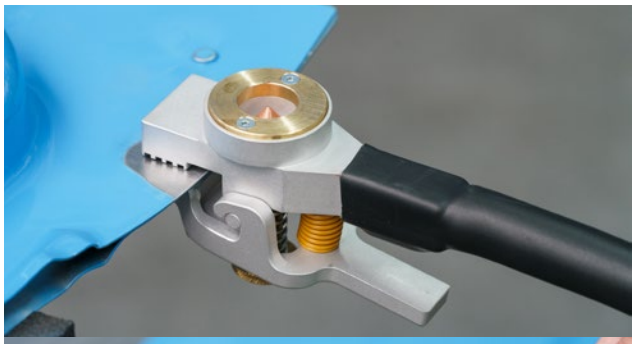
Finally, reverse the spindle by 2 full turns to the left - clamp the connection cable and the EasyTool is ready for use.

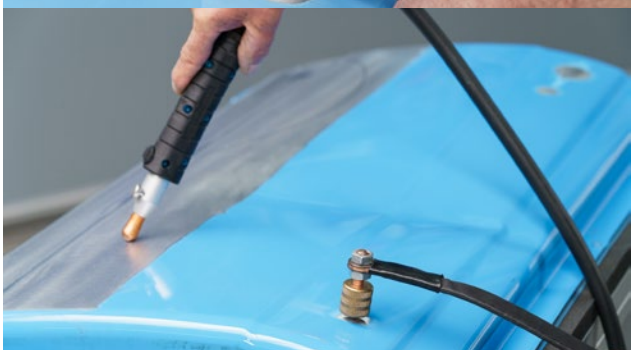
For your consideration: Regularly clean the sliding surface of the cable clamp, the spindle and all moving parts of the EasyTool and lubricate them with our **High-Tef. spray (TEF-01).**



Also in this application, the VAS 6321 A/13 requires a secure ground connection to the vehicle body to achieve a good result. Connect the connection cable to the VAS 6321 A/13, switch on the SQ and select program 3 Automatic.



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

Notes: With any minor damage, work is carried out from the center - with any 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 best heat dissipation and low wear.

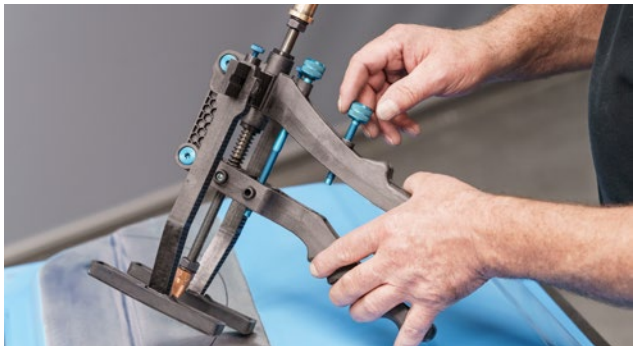
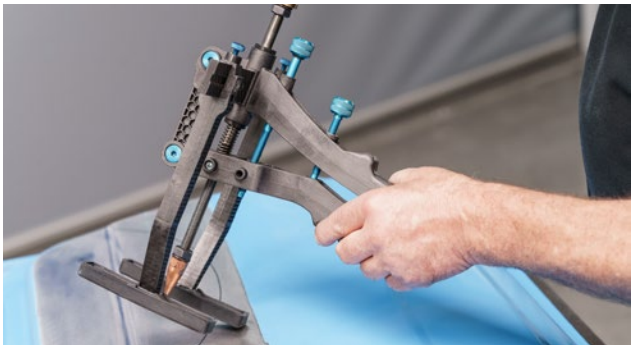
Do not press on the welding tip when welding, but place it lightly and quickly on the surface. First make 3 to 4 welds without pulling until some material builds up at the welding tip - the weld holds better and the welding tip wears less!

Do not make too strong a pull - many small pulls result in a better surface quality than a few strong pulls! With the CBR EasyTool you can restore surfaces very sensitively and precisely - putty and filler work is reduced to a minimum.

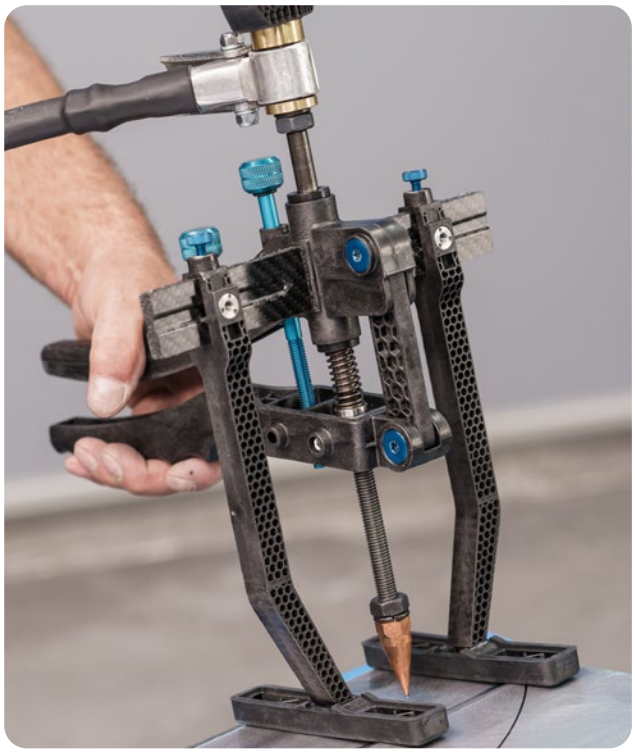
12.3 Program setting with the CBR EasyTool

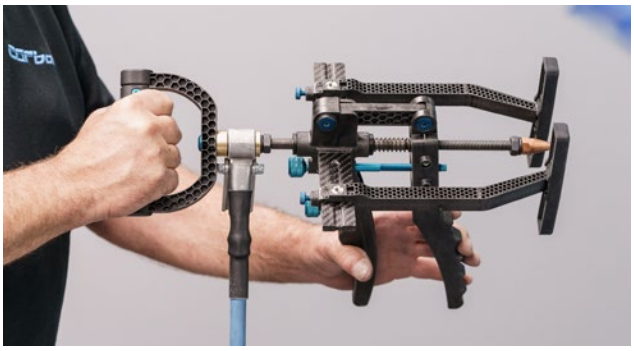
Press “Program 3” and “AUTO” and possibly make a fine adjustment with “TIME” and “POWER”.



Adjustment of the EasyTool handles to the individual hand size.





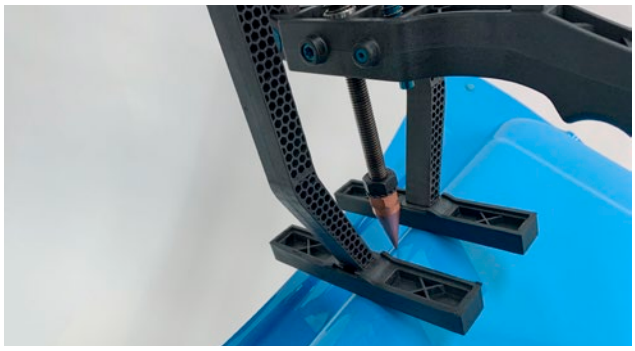
Place the EasyTool on the damaged spot with the handles pulled together and slowly loosen the handles. When the welding tip makes contact, the welding process is triggered automatically. Gently pull the handles together and use them to pull the surface of the body part upwards. To detach the welding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

Select the correct outriggers depending on the damage. A total of ten different attachments are available for this purpose. Depending on the damage, position the outriggers correctly to the damage pattern as shown below:

Incorrect

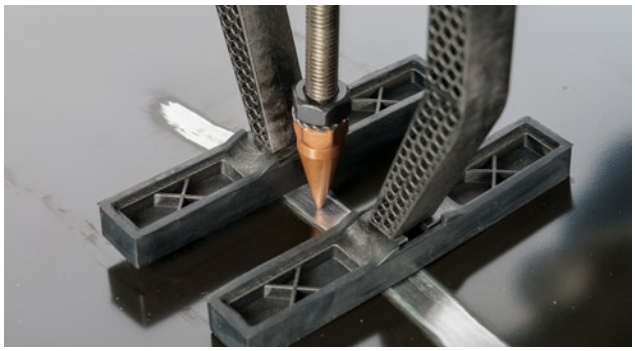
Correct The pressure point of the outriggers must be diagonal to the edge.

Incorrect



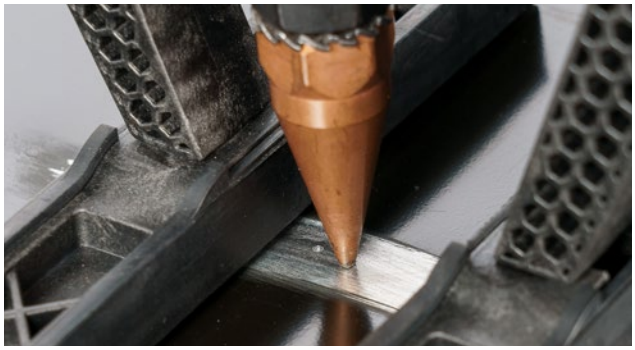
Correct The pressure point of the outriggers must be diagonal to the edge.

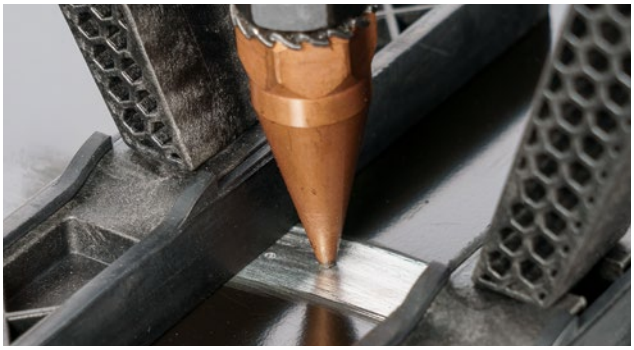
In the edge and border area, it is recommended to work with the half feet.



For grazing damage, the EasyTool is a very effective tool. It is recommended to fix one foot 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.





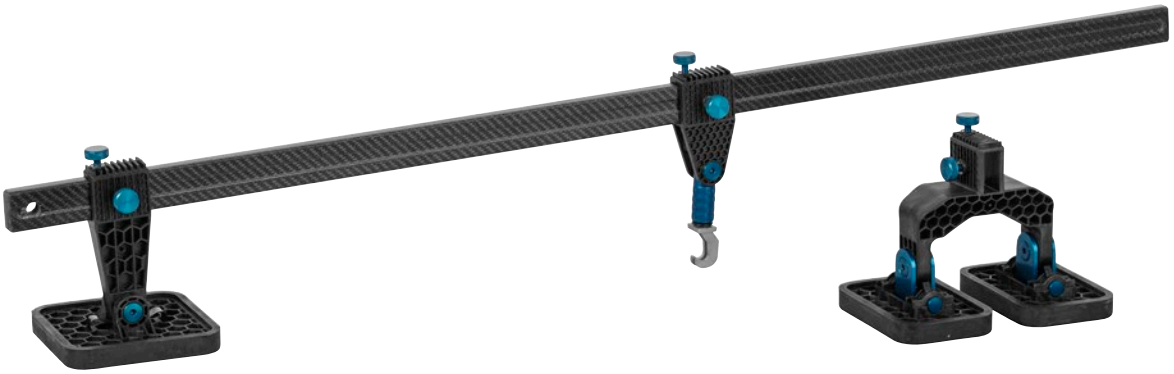
14. CBR LeverTool (VAS 6321 A/8)

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

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

When repairing larger and complicated damage, this tool can be used to supplement the StrongTool and LineTool.

The LeverTool offers many application possibilities due to its individual configurations.



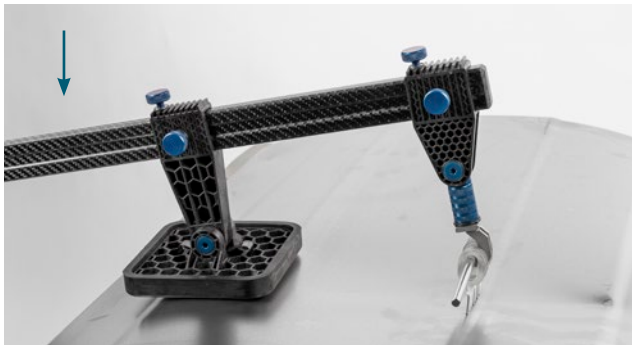
14.1 Working with the CBR LeverTool

The LeverTool is mostly used where there is only one possibility of support.
The LeverTool can be converted from pushing to pull-in in just a few steps by exchanging the outrigger and pull carriage.

The LeverTool can be used to quickly extract deep deformations in surfaces.

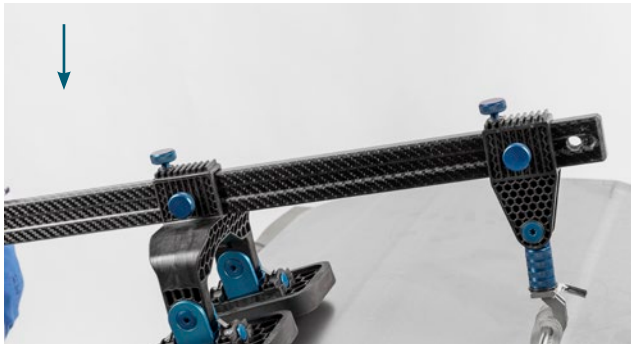
Note: Unlike the StrongTool and LineTool, the LeverTool cannot be snapped into place under tension.

When using the StrongTool and LineTool for dent removal work, the LeverTool is often an ideal supplement for quickly eliminating residual deformations in the edge area.

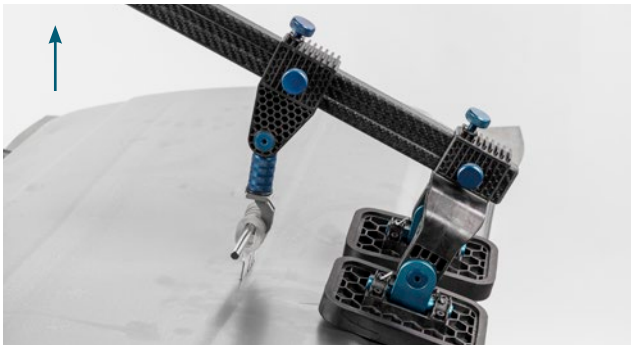


Insert with single foot when pressing

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 technician 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 sliding puller prove to be useful supplements to the VAS 6321 A. These tools are mostly used where the use of the EasyTool is not possible.

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 the sheet metal while simultaneously relaxing them with the aluminum hammer.

Pull-in of small dents and peaks in the sheet metal.

Use of the CBR sliding puller

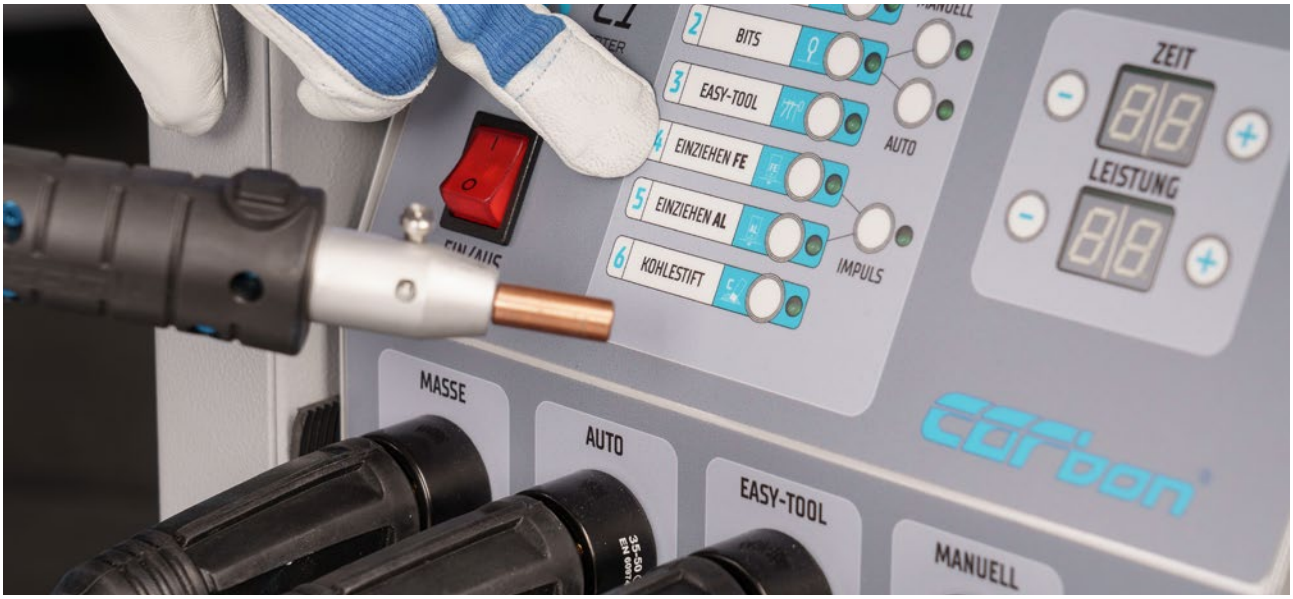
Removal of small, hard dents when the damaged spot is still under tension with the StrongTool or LineTool engaged.

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

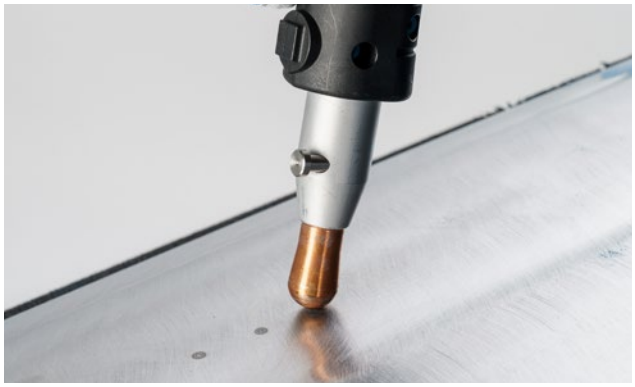
16. Pull-in with the CBR

16.1 The pull-in of steel sheets

The benefit of this method is that dent removal and pull-in work can be performed with the same tool, saving time while keeping the heat impact 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 SQ switches off.

Clean the copper electrode from time to time.

17. Thermal pull-in – copper electrode - ball

17.1 The pull-in of steel sheets with program 4

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be switched off according to the vehicle manufacturer's specifications before using the VAS 6321 A/13!

If the damage on 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 various tools and options for this purpose.

For your consideration: Make sure that during pull-in the VAS 6321 A/13 has a secure ground connection to the vehicle body in order to achieve a good result.

17.2 Pull-in with the copper electrode – ball

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

Note: The MultiTool can heat up strongly during intensive pull-in - we recommend the optionally available special MultiTool for pull-in (C1-17) for this case.

Plug in the copper electrode - ball (CBR-U-B12) into the MultiTool and select program 4 (key 8) on the SQ.

You can select whether you want to heat (pull-in) the sheet metal with continuous current or three pulses by pressing the PULSE key on the SQ (key 4).

The pull-in process starts automatically when you press the electrode onto the bare body part and unroll it - do not pull the electrode off again until the SQ has switched off.

In manual mode, you need the MultiTool with probe (C1-06) and the MANUAL socket on the SQ - in addition, the control cable must be plugged into the SQ for this application.

Plug in the copper electrode - ball (CBR-U-B12) into the MultiTool and select program 4 (key 8) on the SQ.

By pressing the PULSE key (key 4), you can select whether you want to heat (pull-in) the sheet metal with continuous current, or pulsing three times.

The pull-in process starts when you press the electrode onto the bare body part, press the probe on the MultiTool and unroll the electrode - do not pull the electrode off again until the SQ has switched off.

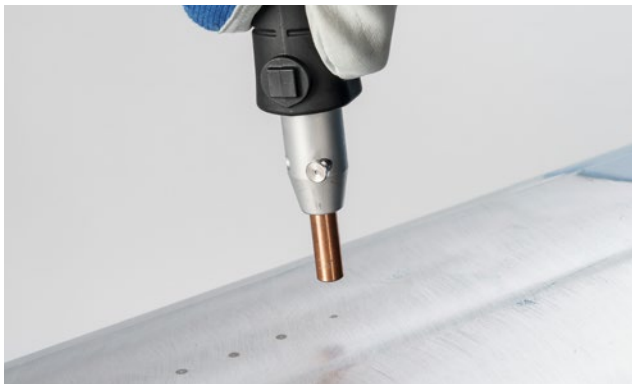
18. Thermal pull-in – copper electrode - flat

18.1 Pull-in 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 unrolled, but pressed onto the excess material with the flat head at specific points. This reduces the formation of dents during pull-in and avoids any reworking that may be necessary.

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

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

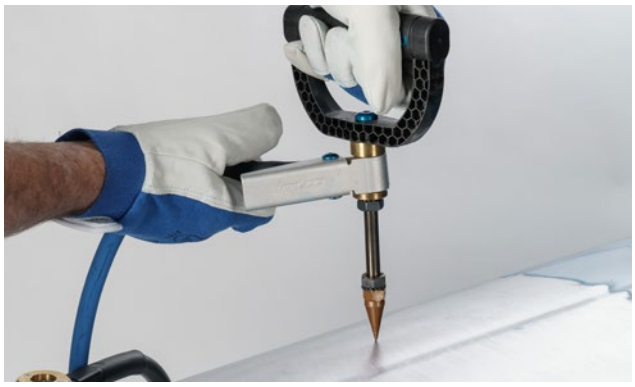


Pull-in with EasyTool, sliding puller or hand puller

For small spots and bulge points that are too high, you can also pull-in with EasyTool, sliding puller or hand puller.

Connect the tools with the connection cable for the EasyTool and the EasyTool socket in the SQ.

Select program 3 Automatique on the SQ 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.



By pressing lightly on the handle when welding on, each point is a small pull-in.

19. Thermal pull-in - carbon electrode

19.1 Pull-in and stabilizing with the carbon electrode

This method should only be used for pull-in, or stabilizing, soft, thin deep-drawing metal sheets of older vehicles.

With the thin but stiff sheet metal currently in use, only the copper electrodes should be used, since pull-in with the carbon electrode can lead to intergranular corrosion.

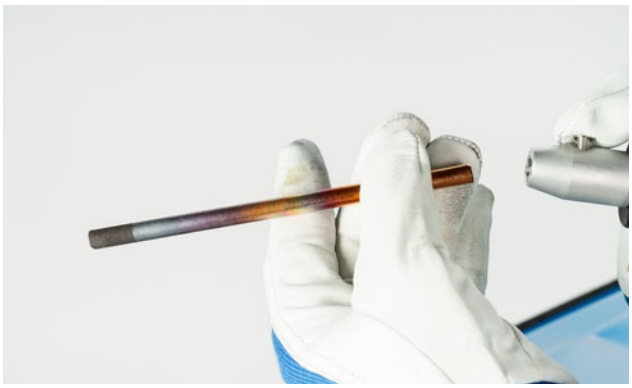
Note that the sheet metal hardened by the introduced carbon can no longer be filed.

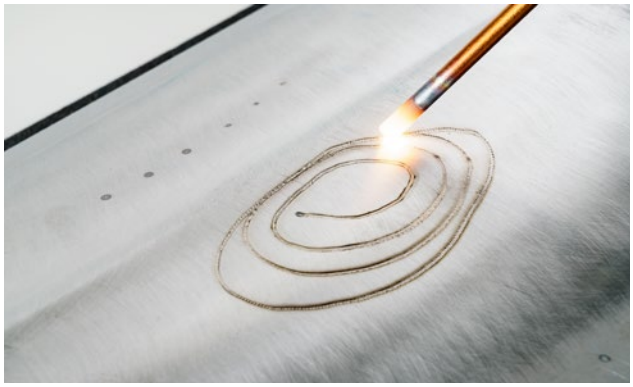
Insert the carbon electrode into the MultiTool by pressing the fixing button at the front end of the MultiTool all the way in and pushing the electrode in as far as it will go.
Select program 4 Automatique on the SQ and then touch the spot to be machined on the bare body part.

Do not stay at one point, but move the electrode over the surface to be stabilized - spirally or longitudinally, depending on the damage.

During this process, the electrode burns off slowly, the carbon is fed to the steel sheet and the sheet metal is hardened in the process. Rapid cooling with a damp sponge or with compressed air causes the heated surface to be pulled-in.

Important notes: Do not press on the carbon electrode too hard - it may break! The carbon electrode becomes very hot – risk of burns!





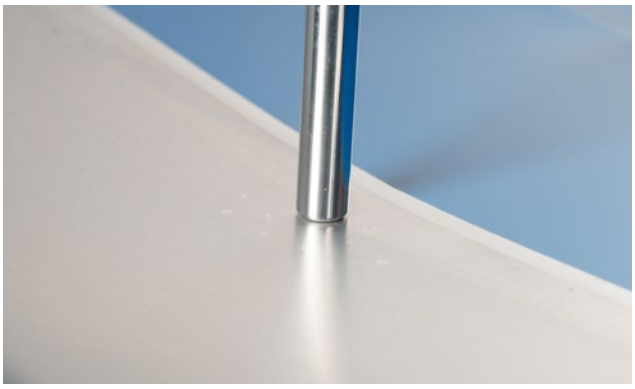
20. Thermal pull-in aluminum sheets

20.1 Pull-in aluminum sheets

Important: To avoid damage to the vehicle electronics, the vehicle's electrical system must be switched off according to 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 pull-in electrode



Stainless steel pull-in electrode

Please note: Machining and the pull-in of aluminum sheets requires intensive knowledge about aluminum, which we cannot go into 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, a wide as well as a 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 stress relieving of edges or beads as well as surfaces while being reshaped.

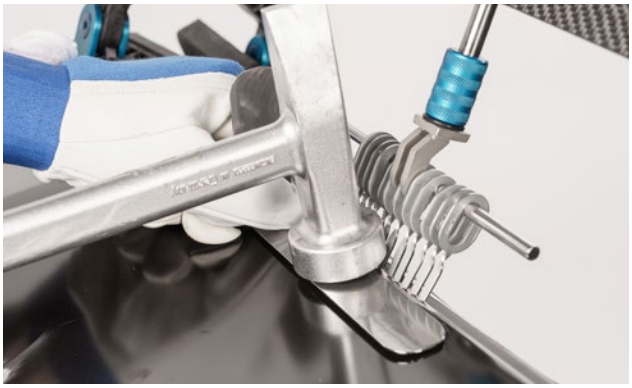
Application

- The hammers are mainly used to remove stresses in the surface and to stabilize edges.
- Depending on the access, the transverse or longitudinal fin can be attached to stabilize edges. In addition, the plastic wedges with their pointed side can also be used here.
- Use a second hammer to hit the hammer that is placed on top.
  Note: There is no danger from splintering parts as with steel hammers!
- For relaxing surfaces and minor damage to edges, the surfaces of the aluminum hammers and the aluminum hammer with the rubber cap are quite suitable.
- In addition, 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 is to remove the tension from the sheet metal under tension at the right time.

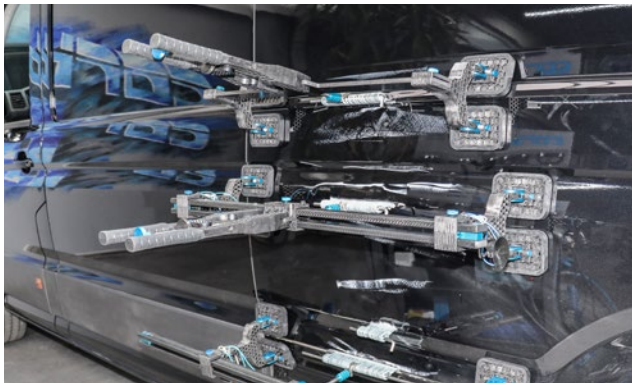
On the following pictures you can see different procedures.

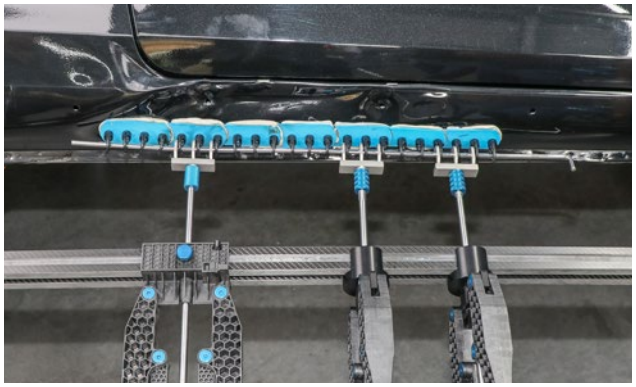
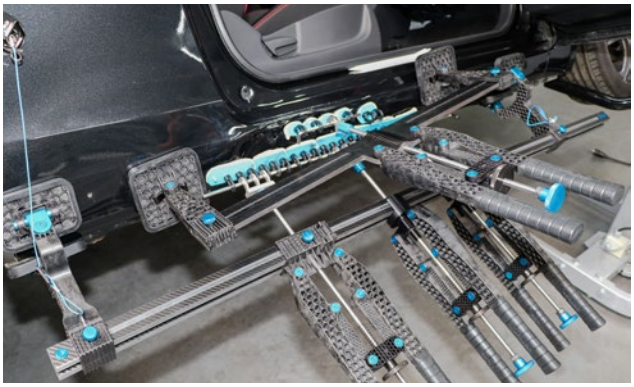
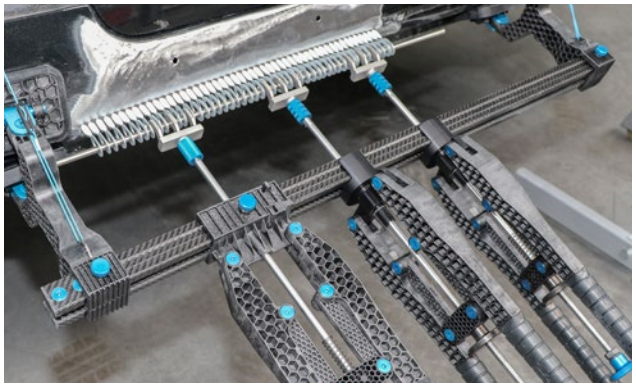
A very efficient tool for this purpose is the L-dent removal bracket with part no. **CSH-65-0150-8**. It is ideal for most dent removal work.

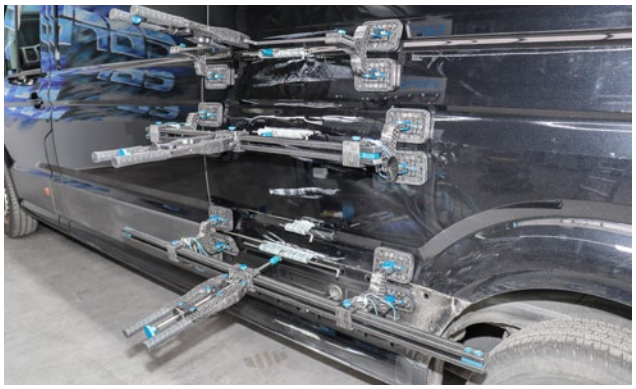
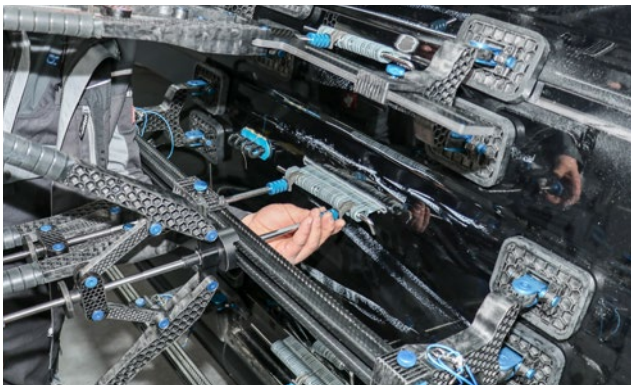


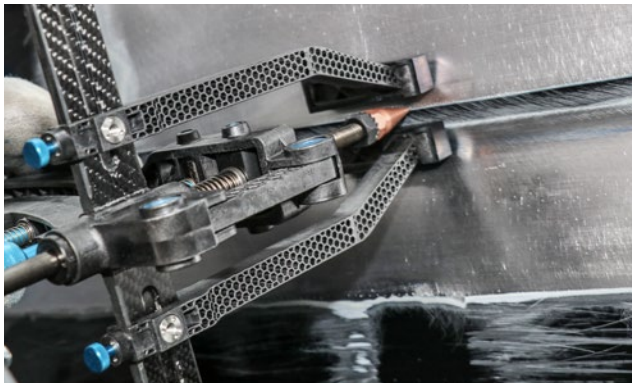
The hammer with rubber cap is used when relaxing the surface with light blows.

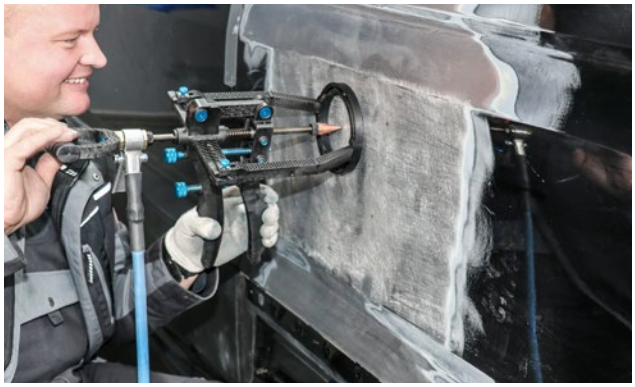
22. Creative approaches to different repair methods

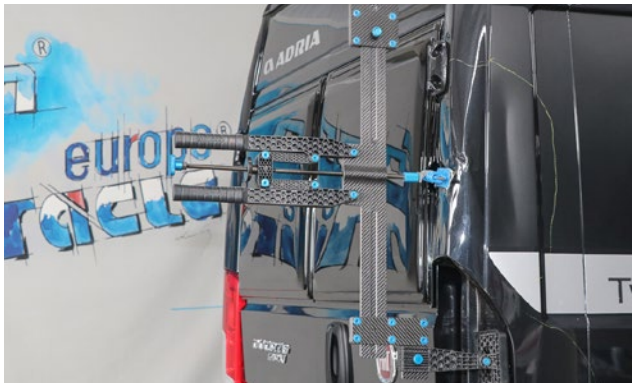


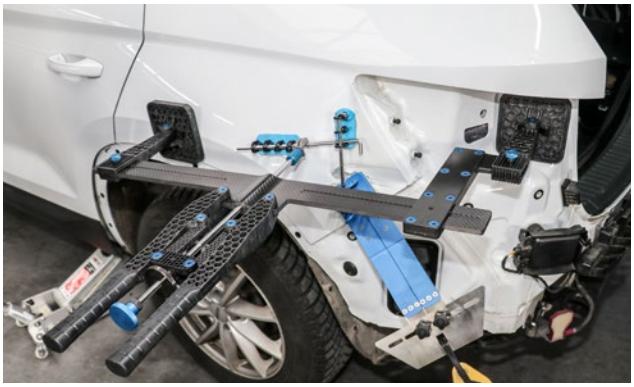









ADRIA



23. CBR EasyTool adhesive system (VAS 6321 A/11)

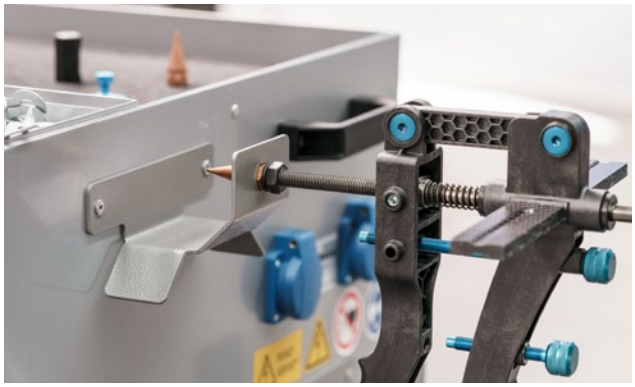
23.1 Paintless dent removal with the CBR adhesive system

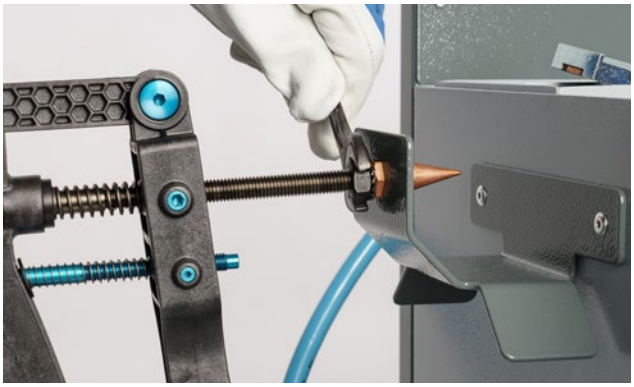
Damage patterns without paint damage can be repaired by applying the adhesive system with existing CBR pull-in devices.

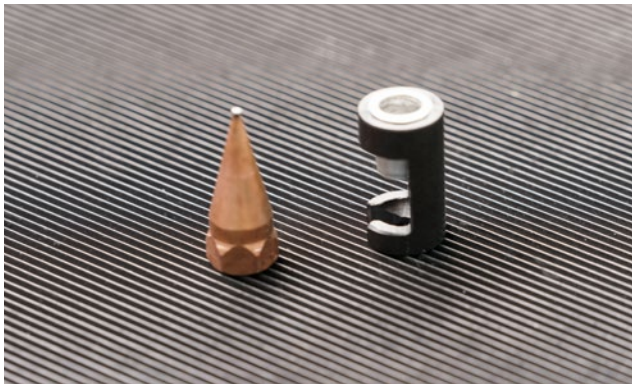
Plastic pull bolts and special pads are used, which enable sufficient bonding to the surface with heated special plastic adhesive. After stripping the damaged areas, the adhesive is removed from the painted surface without leaving any residue.

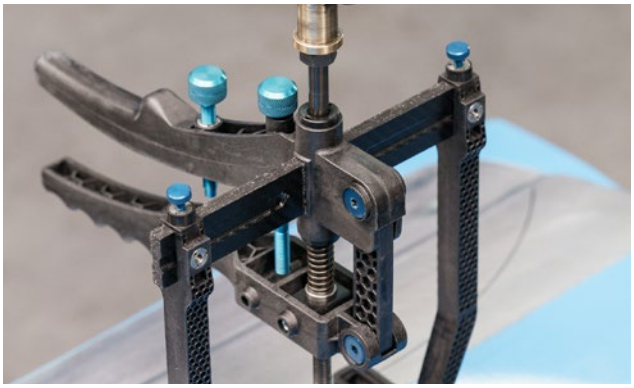
23.2 Adhesive system with the EasyTool

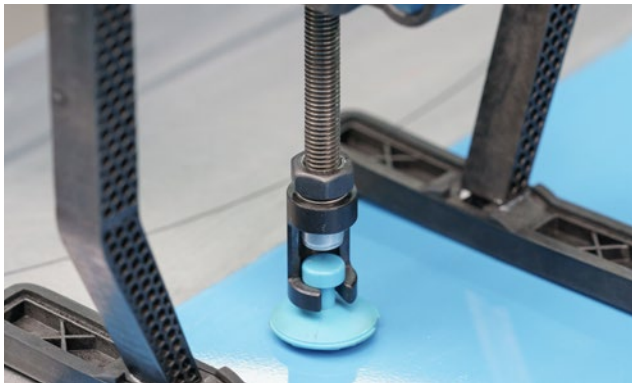
- The welding pull tip of the EasyTool is unscrewed and the pull stud holder is mounted.
- The damaged area is cleaned with cleaner to achieve sufficient bonding of the adhesive with the surface.
- Apply the adhesive using a hot glue gun and place the pull bolt in the center of the dent.
- Hook in the pull stud holder and gentle pull (fulling) with the EasyTool.
- Spray with cleaner and loosen the pull bolt.
- Side pressing of the bolt and removal of the adhesive.
- Residual tension is released by gentle blows with a Teflon striking tool.











23.3 Equipping the EasyTool with the adhesive system

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

24. CBR adhesive system (VAS 6321 A/9)

24.1 Adhesive system with the StrongTool / LineTool / LeverTool

For larger areas of damage, the Strong- or LineTool is used analogously 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 course of damage, two or more pads can also be used.

1

Apply special cleaner to soft cloth and clean the surface of the adhesive pad.

2

For optimum adhesive effect, the damaged area must be thoroughly cleaned.

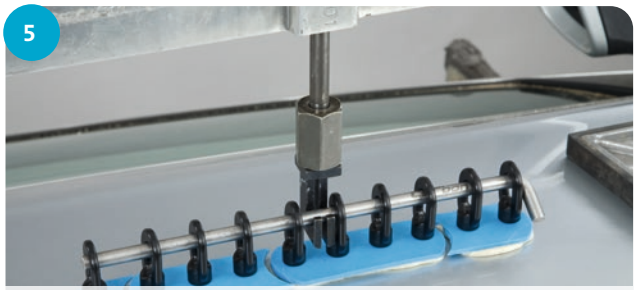
3

Apply adhesive thickly in the form of beads.

4

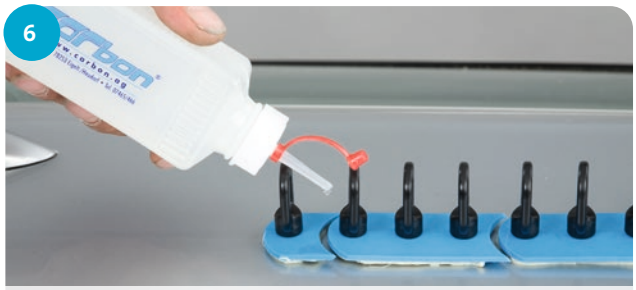
Place pad on top, press down and allow to cool.

5



Reshaping: Hold in tension and release residual tension by tapping with aluminum-titanium hammer.

6



To remove the pads, allow some cleaner to act briefly in the edge zones.

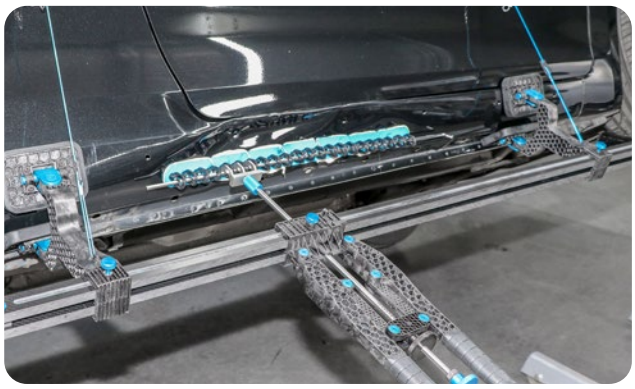
7

Removing the pads with the plastic wedge included in the set.

8

Peel off adhesive, the pads are reusable.

24.2 Adhesive system with the LineTool



24.3 Adhesive system with the StrongTool

24.4 Adhesive system with the LeverTool

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

Particularly with extensive damage to sills, sidewalls, hoods, doors or the rear section, a longitudinal or transverse pull with the pull tabs of the GlueTech Plus is very efficient. The pulling force can be controlled very finely.

The procedure for applying the adhesive and setting the pull tab is identical to the CBR adhesive system (VAS 6321 A/9).

MGT-200 GlueTech Plus adhesive 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 SQ.
- Disconnect the cables from the SQ and store the cables on the cable holders provided.
- Protect the SQ against the ingress of liquids and foreign bodies.

Final decommissioning

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

Disposal via private household waste or via 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 die 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 Richtlinen:

Eigeltingen - Heudorf, Dezember 2019

Geschäftsführerin/CEO, Edeltraud Holle

28. Notes

CARBON GmbH
Haldenhöfe 3
D-78253 Eigeltingen-Heudorf
Phone +49 7465 466
Fax +49 7465 2217
Mail info@carbon.ag

In collaboration with:
© Volkswagen Aktiengesellschaft
Konzern Abteilung
Brieffach 1848-2
38436 Wolfsburg
Deutschland