

# VAS 294 011A



## Granule jet blasting device







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## 1.1 Information regarding this manual

**Note** Legislation stipulates that users must be trained in the use of manually operated blasting equipment.

**State-of-the-art** The granule jet blasting device is state of the art. To ensure that the equipment operates safely, it must be operated in a proper and safe manner.

**Technical modifications** In the interests of quality assurance, we reserve the unrestricted right to apply technical modifications arising out of further developments in technology and product improvements without prior notification.

**Reading the instruction manual** Read the instruction manual carefully before using the device.

**Handling** All handling necessary to ensure correct operation is described in the instruction manual.

**Faults** No working method which is not expressly approved by the manufacturer may be used. If the device malfunctions during use, only trained technical personnel are permitted to repair it.

## 1.2 Permitted operators



**The owner/operator of the machine must make the operating instructions available to the operator and ensure that they have been read and understood. Only then may the operator start up the device.**

## 1.3 Explanation of symbols

Several sections of these operating instructions are marked with internationally recognised warning signs, danger notes and general prohibition signs. Please comply with all notes and safety rules! The individual symbols are explained in the following.

**Follow all instructions and safety rules.**



Follow the instruction manual



Wear hear protection



**WARNING**

Use of this machine with nut granulates will produce allergenic dust.



Observe the general instructions



Wear gloves



Persons allergic to nuts should not use this machine without adequate respiratory safety equipment.



Wear face mask














Wear protective clothing







## 1.3 Explanation of symbols

	Warning General source of danger		Blow out with air		Arrow to clarify compression
	Warning System under pressure		Clean with air/granule mixture		Arrow indicating direction
	Risk of hearing damage		Audibly engage		For further information see chapter...
	Warning - noise with high sound pressure level		Please note the following!		

## 2.1 Intended use

**The granule jet blasting device complies with the machinery directive 2006/42 EC and is used to treat the surface of metal by means of a jet of granules blasted onto the metal surface. Compressed air is used to propel the blast medium.**



The granule jet blasting device is used to remove carbonized material from the inlet channel and valves of internal combustion engines.



The jet blasting device may only be operated in combination with the vacuum adapters that are approved for the particular engine type and a vacuum cleaner with sufficient suction power.



Unauthorised modifications or changes to the device are not permitted for safety reasons.

## 2.2 Sources of danger

The granule jet blasting device is safe if used for its correct purpose.



**If it is used incorrectly and/or negligently by untrained personnel, serious injuries could be caused by the granules emerging from the device.**



**The blasting probe must never be used without the suction adapter intended for it and a suction device of sufficient power.**



**Never direct the blasting probe at persons or look into the opening of the blasting probe. Risk of injury!**

## 2.2 Sources of danger

The device must only be operated using hoses which are approved for the purpose of use and the operating pressure of the device.



**The device may only be used by trained personnel.**

- Never throw or drop the granule jet blasting device.
- The granule jet blasting device may only be used at ambient temperatures of between 5 °C and 45 °C.
- The granule jet blasting device must not be used in potentially explosive areas!
- The device must never be operated without suitable protective clothing, such as a safety mask and safety shoes. Risk of injury!



**The compressed air must be disconnected and the device depressurised before maintaining and cleaning or filling the device with granules.** chap. 5.1

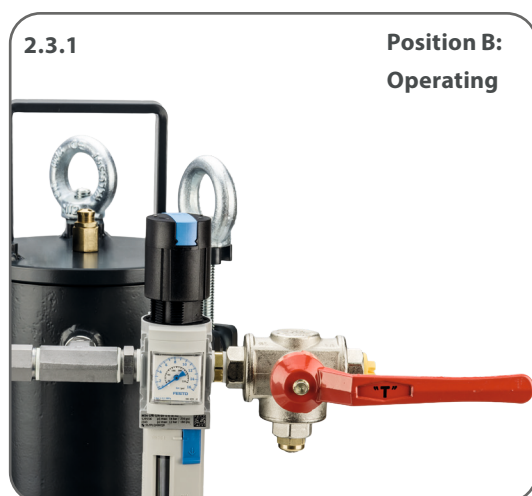
The granule jet blasting device may only be operated with compressed air.



**The granule jet blasting device must always be set up on a level surface or the floor of the workshop. The device must not be set up on tables, workbenches or other objects. (Tank is under pressure!)** chap. 2.4

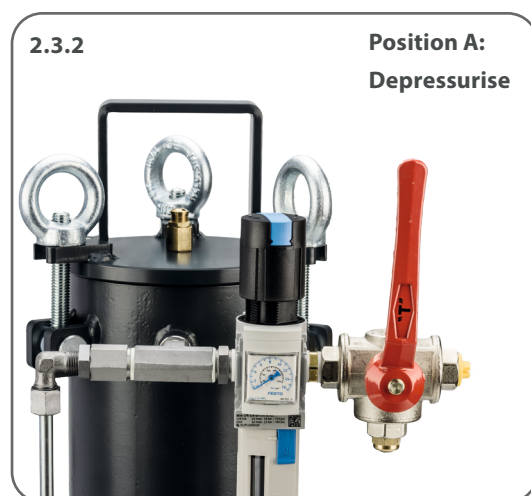
Hoses and supply lines must be routed in such a way that they cannot be damaged or disconnected! The hoses must also be routed in a way that prevents people from tripping over them.

## 2.3 Safety devices



**Fig. 2.3.1**

The compressed air must be disconnected and the device depressurised.



**Fig. 2.3.2**

In the "Depressurise" position, the tank and the control system are switched to depressurise.



## 2.3 Safety devices



**Fig. 2.3.3**

There is a 2-way ball valve on the handle of the blasting probe. This can be operated in the event of failure of a control function. When the ball valve is closed, no air or blasting medium can emerge from the probe.



**If a control function fails, the device must be taken out of service immediately and repaired by a trained technical personnel!**



**There is a pressure gauge on the granules tank. The operating pressure of the device must never exceed 8 bar. A safety valve is installed on the granules tank that controls the maximum operating pressure of the device. The valve opens at pressure of approx. 8.5 bar.**



**If the safety setup location malfunction, the device must be taken out of service immediately! The device should undergo preventive maintenance at least once per annum by a specialist company!**

## 2.4 Safety measures at the setup location

**Fig. 2.4.1**

The surface where the device is installed must be level and of suitable load carrying capacity for the weight of the device and must be stable.

The device may only be operated in association with the suction adapters designed for the particular engine type and a vacuum cleaner of sufficient size and power.

Hoses and feed pipes must be laid so that they cannot be damaged or disconnected! The hoses must also be routed in a way that prevents people from tripping over them.



## 3.1 Unpacking the device

3.1.1



- Place the box on a level surface.
- Open the box and carefully remove the device.
- Check the scope of supply:
  - Operating instructions
  - Granules tank with hose assembly attached and handle
  - Straight blasting probe
  - Angled blasting probe
  - 2x seals
  - Suction hose 90°
  - Suction hose 250 mm
  - Container with nutshell granules

## 3.2 Identification and description of the device components

### Main elements of the granule jet blasting device:

Granule blasting medium tank with 3-way ball valve, granules control valve, compressed air control valve and safety valve.

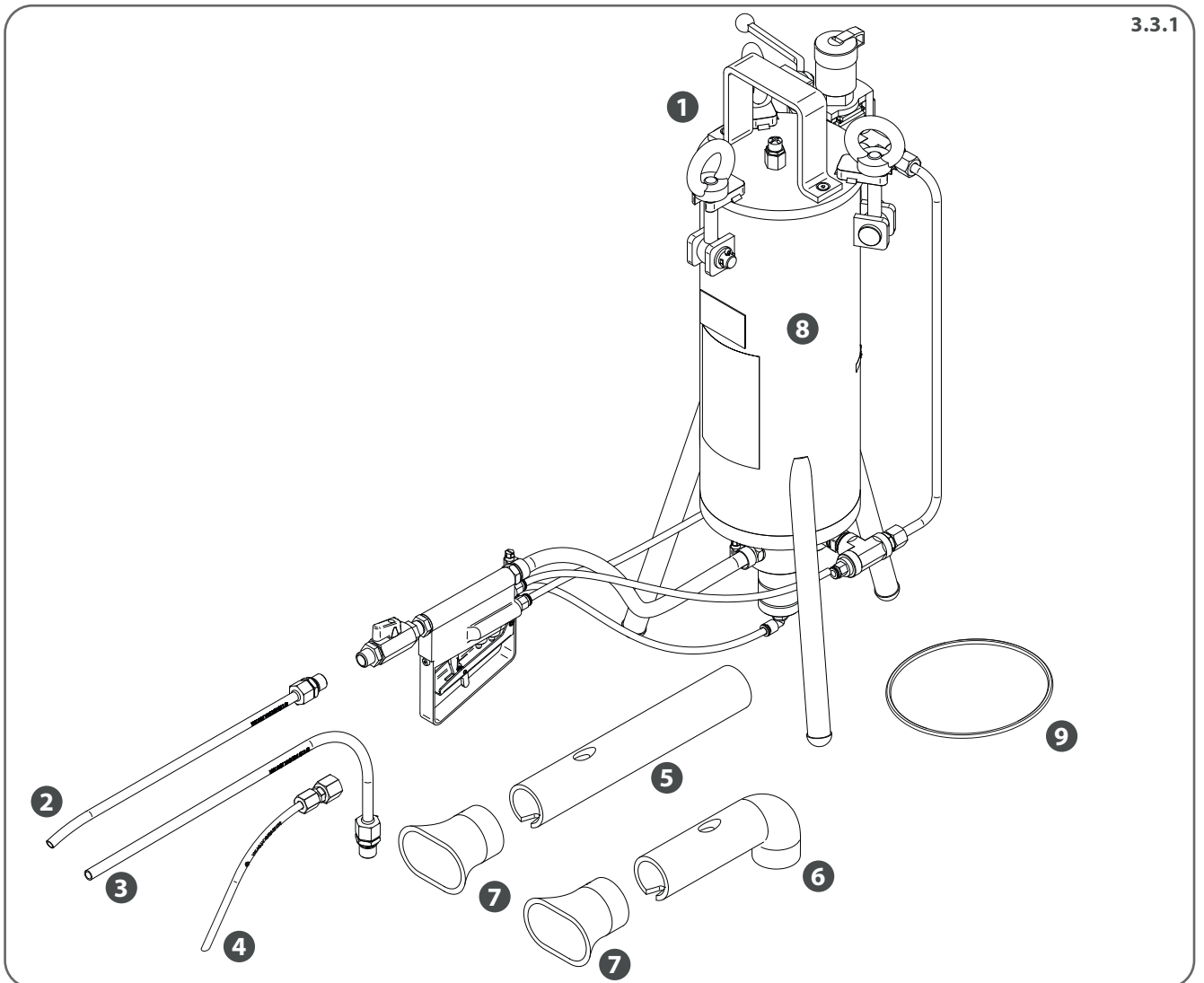
Hose assembly with granules delivery hose and three colour-coded control hoses.

Handle with 2-way ball valve and connection for the blasting probe. The control function in the handle is activated using two control valves connected in series. The operating lever is fitted with a safety device to prevent the equipment restarting unintentionally.

### 3.3 Device components

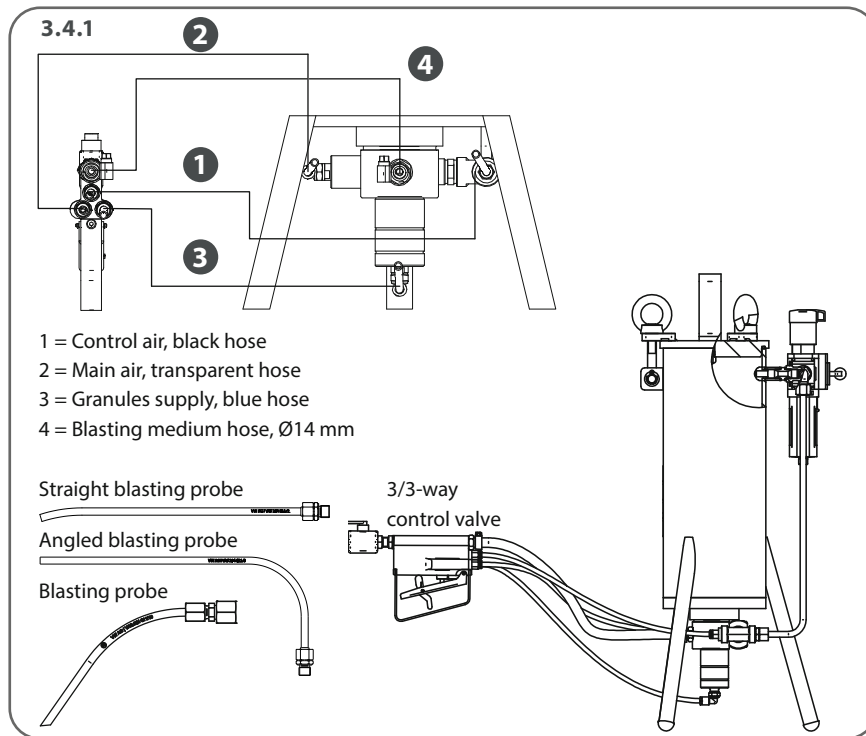


3.3.1



No.	Title	Quantity
1	Granule blasting device	1
2	Straight blasting probe	1
3	Angled blasting probe	1
4	Blasting probe	1
5	Suction hose 90°	1
6	Suction hose 250 mm	1
7	Seal	2
8	Cleaning granulate	-
9	Instruction manual, complete	2

## 3.4 Technical Data



Length	approx 290 mm
Width	approx 280 mm
Height	610 mm
Max. operating pressure	8 bar
Container volume	5 l
Weight	16 kg
Hose package working length	4 m

Length and weight without hoses

## 4.1 Operation of the granule jet blasting device

- Fill with blasting granules.
- Connect the suction hose to the suction unit.
- Connect the seal and suction hose together.
- Attach the blasting probe to the handle.
- Attach the granule jet blasting device to the compressed air supply.
- Connect the suction hose to the opening on the engine and push the seal on the engine.
- Plug the blasting probe into the opening of the suction hose.
- Start the cleaning process.
- Clean the inlet valves and the inlet channel.
- Blow out: blast with air.
- Stop the compressed air supply.
- Shut down the device.
- Maintain the granule jet blasting device.



**Always check the condition of the hoses before starting up the device!  
Stop using defective hoses immediately. Risk of injury!**

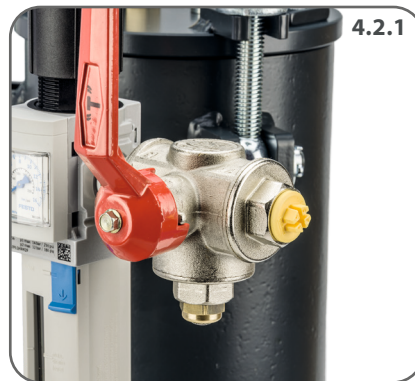


## 4.2 Preparing and connecting the granule jet blasting device



**Fig. 4.2.1**

The device is supplied from the factory without a compressed air coupling. The ball valve has a ¼ inch female threaded connection. The thread is fitted with a seal cap.



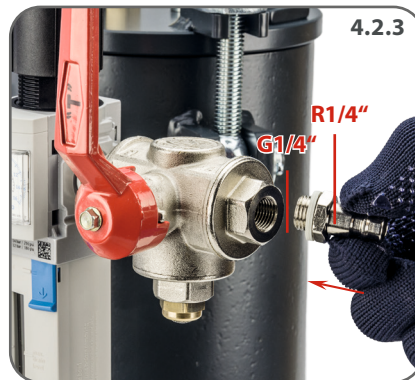
**Fig. 4.2.2**

Remove the sealing cap.



**Fig. 4.2.3**

Insert a suitable compressed air connector with seal into the thread.



**Fig. 4.2.4**

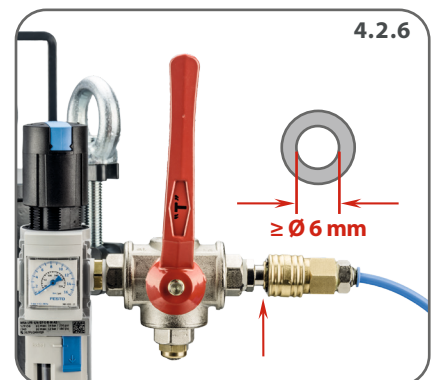
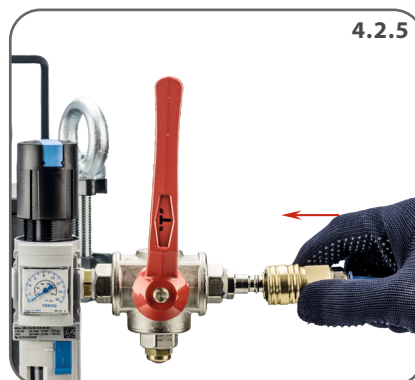
Tighten the compressed air connector using a suitable tool.



**The device must only be operated using dry, oil-free compressed air!**

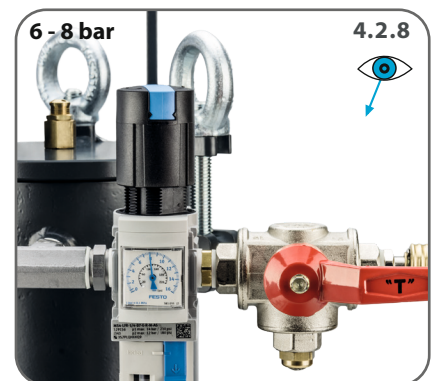
**Fig. 4.2.6**

The granule jet blasting device has an integrated supply unit which enables you to adjust the operating pressure.



**Fig. 4.2.7 / 4.2.8**

The operating pressure of the device should be between 6 and 8 bar, and must never exceed an operating pressure of 8 bar!



## 4.3 Filling with blasting medium



**Fig. 4.3.1**

3-way ball valve in "Depressurise" position (red lever).



**Fig. 4.3.2**

Pressure gauge must zero pressure.

**Fig. 4.3.3**

Undo eye bolts and swivel out swivelling screw fitting.



**Warning!** You must only fill the device when the tank is depressurised and disconnected from the supply line.



**Fig. 4.3.4**

Remove the cover from the tank.



**Fig. 4.3.5**

Fill with granules.

**Fig. 4.3.6**

Max. filling level 20–30 mm below air inlet connection.



**Only use a blasting medium which is approved by the manufacturer. The blasting medium must be free of impurities.**

**Never re-use blasting medium.**





## 4.3 Filling with blasting medium

**Fig. 4.3.7**

Check sealing cap. The seal must be clean and must not show any signs of damage.



**Fig. 4.3.8**

Place the cover on the tank.



**Fig. 4.3.9**

Engage the swivelling screw fitting.



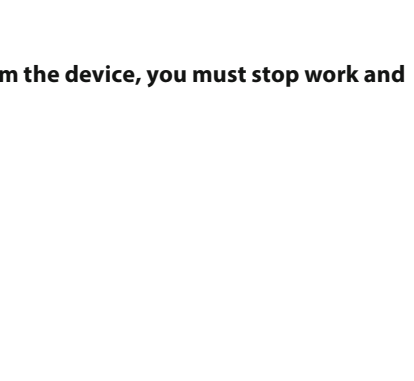
**Fig. 4.3.10**

Tighten eye bolts by hand.



**Fig. 4.3.11**

3-way ball valve in "Depressurise" position.



**Check device for leaks!**

**If compressed air is leaking from the device, you must stop work and eliminate the cause!**



## 4.4 Connecting the suction hose to the suction unit

**Fig. 4.4.1**

Connect the suction hose to an industrial vacuum cleaner.



**Make sure that the suction hose is firmly and securely connected to the vacuum cleaner.**



## 4.4 Connecting the suction hose to the suction unit



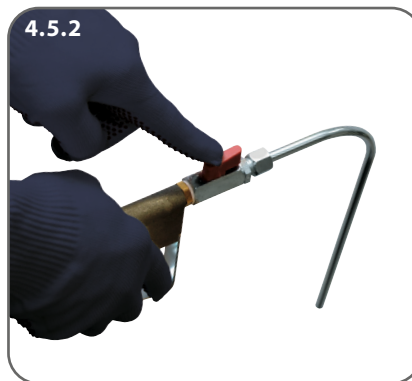
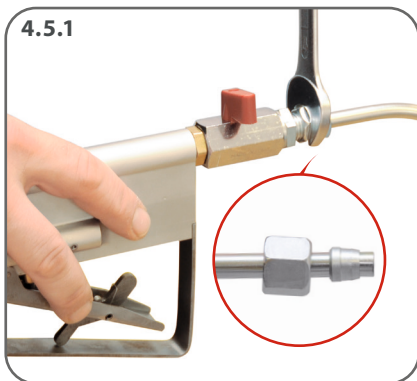
**Fig. 4.4.2**

Fix the suction hose in the inlet channel of the cylinder head.  
Then, push the seal onto the engine block.



**Use the 90° suction hose (red) for transverse engines!**  
**Use the 250 mm suction hose (black) for longitudinal engines!**  
**Close or cover all openings except the one which is being worked on.**

## 4.5 Attaching blasting probe to handle



**Fig. 4.5.1**

Screw the correct blasting probe on to the 2-way ball valve.

**Fig. 4.5.2**

Turn the 2-way ball valve to the open position.

**Fig. 4.5.3**

Slowly turn 3-way ball valve to the operating position.



**Fig. 4.5.4**

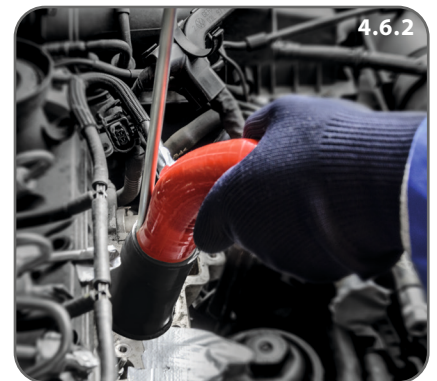
No air must come out of the blasting probe unless the hand lever is operated.

**The device is now ready for operation!**



## 4.6 Starting the cleaning process

Before the cleaning process is started, the operator must put on the prescribed protective clothing!



**This device must only be used by trained and instructed technical personnel!**

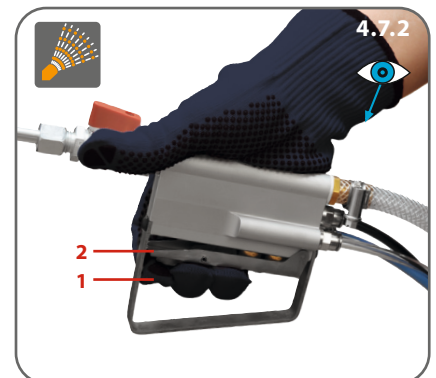
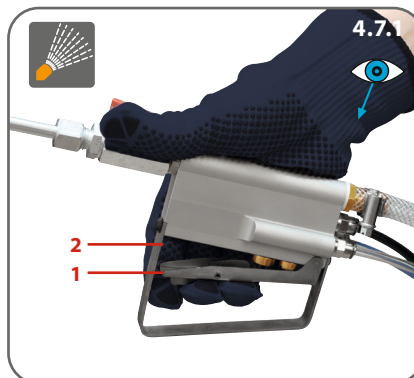
## 4.7 Blasting

**Fig. 4.7.1**

### **Blasting with air / blowing out**

When the trigger is moved to position 1 (half-way position) only air comes out of the blasting probe.

This operating position is used to blow out the area to be cleaned.



**Fig. 4.7.2**

### **Blasting with air/granules mixture / cleaning**

When the trigger is moved to position 2 (pushed all the way) air and granules flow out of the blasting probe with considerable power.

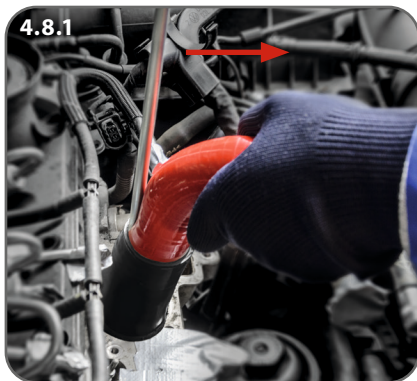
This operating position is used to clean the coked areas).



**Never pull the blasting probe out of the suction adapter during the cleaning process!  
Risk of injury!**



## 4.8 Cleaning the inlet valves and the inlet channel



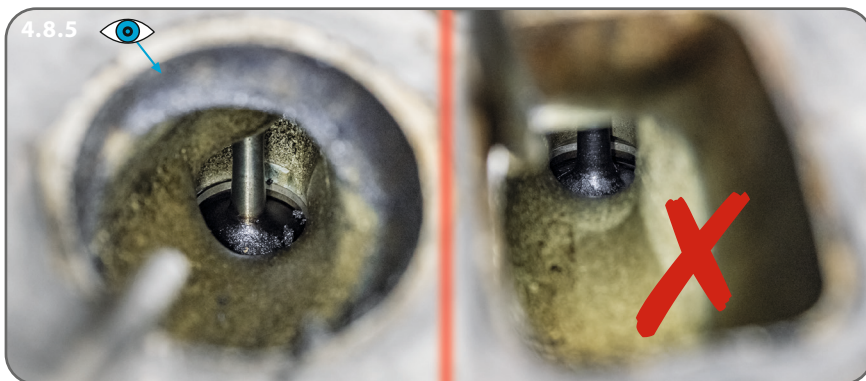
**Fig. 4.8.1 – 4.8.4**

The blasting probe must be positioned close to the surfaces being cleaned. The cleaning phases should last no more than 2-3 seconds. Then the area being cleaned should be blown out again with air.

Alternate between cleaning and blowing out several times. Each time the blasting probe must be moved to a different position so that the entire coked area is cleaned.

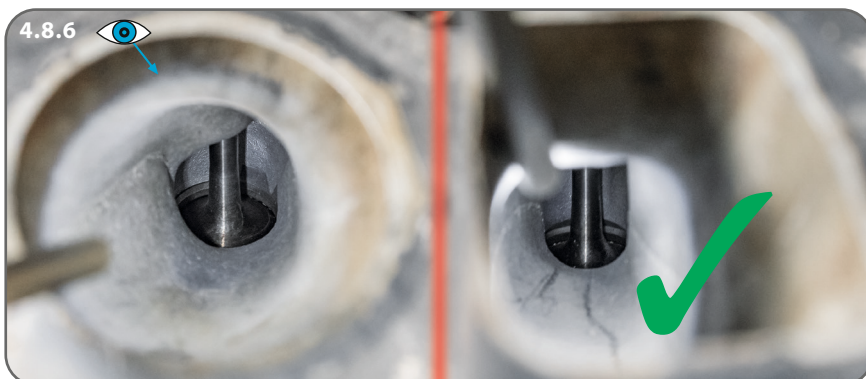


**When cleaning and blowing out, blasting medium must not escape from the suction adapter! If blasting medium is escaping, the power of the suction unit is not sufficient.**



**Fig. 4.8.5**

After all cleaning positions have been blasted once, the cleaning result must be visually inspected. If the result is unsatisfactory, the process must be repeated and/or the operating pressure of the device increased. **Max. 8 bar!**



**Fig. 4.8.6**

**The inlet valves and the inlet channel area should be bare and free of carbonisation.**



## 4.9 Shutting down the device

**Fig. 4.9.1**

After each operation the 3-way ball valve must be moved to the "Depressurise" position.

**Fig. 4.9.2**

The compressed air supply line can be disconnected when zero pressure is indicated on the pressure control valve.

**Fig. 4.9.3**

Remove cover of blasting device and remove any remaining granules.



**The granules must always be stored in a dry place!**

**Never re-use granules!**



## 5.1 Maintenance / cleaning

**Warning! The blasting medium hose is also subject to wear during operation, and must be checked for damage at least every two months.**

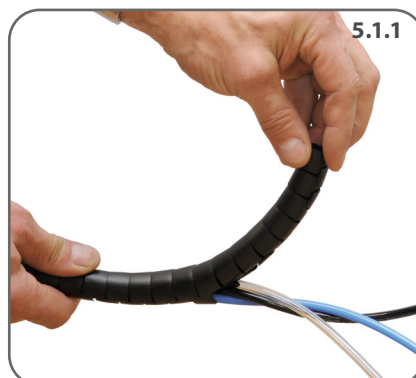
**The blasting material hose should be replaced once per annum if the device is used regularly!**

**Fig. 5.1.1**

Remove hose with protective braiding from hose package.

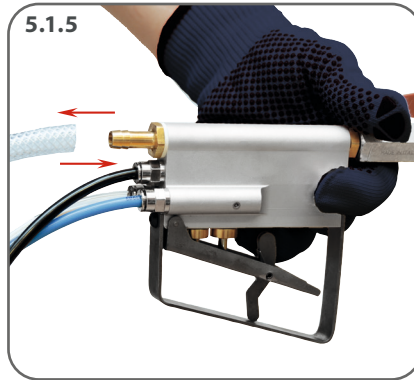
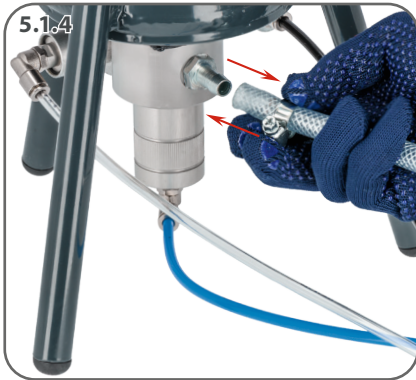
**Fig. 5.1.2, 5.1.3**

Undo the hose clamps from the nozzle on the control valve and on the handle.





## 5.1 Maintenance / cleaning



**Fig. 5.1.4, 5.1.5**

Removing and replacing the hose with a new one.

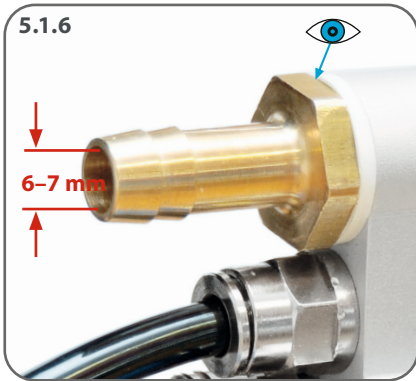
**Fig. 5.1.6**

Use this occasion to examine all the hose nozzles and connection nipples on the control valve and on the handle.



**If the size of the hole has been increased significantly by the flow of blasting material, it must be replaced!**

<b>Original diameter</b>	<b>6 mm</b>
<b>Wear limit diameter</b>	<b>7 mm</b>

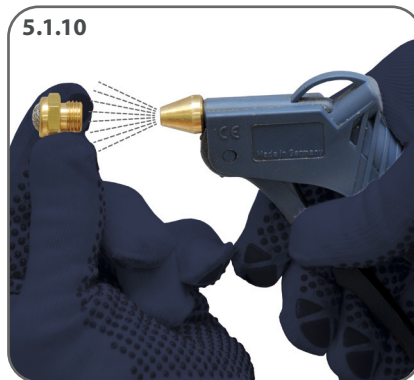
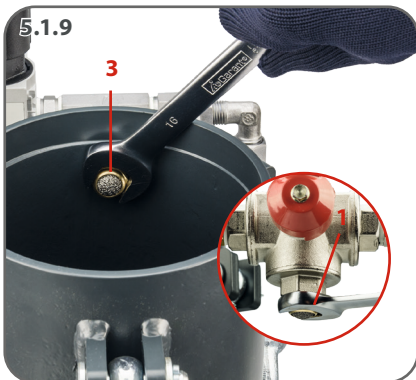


**Fig. 5.1.7 – 5.1.9**

Clean the filter inserts in the blasting medium tank and the cover of the device at regular intervals - after the tank has been filled 10-15 times at most!

**Fig. 5.1.10**

Unscrew all filter inserts and blow them out with a compressed air blow-out gun from threaded side until all granule or dust residue has been removed. After cleaning, the filter inserts must be screwed back into the relevant positions.



**Independently of the normal cleaning and maintenance work, the device must be checked and maintained at least once per annum by a specialist company!**

## 5.2 Spare parts and accessories for the granule jet blasting device



5.2.1



Item No.	Article Number	Title
1	VAS 294 011/1A	Granule blasting device
2	VAS 294 011/2	Straight blasting probe
3	VAS 294 011/3	Angled blasting probe
4	VAS 294 011/4	Suction hose 90°
5	VAS 294 011/5	Suction hose 250 mm
6	VAS 294 011/7	Seal
7	VAS 294 011/8	Cleaning granulate
8	VAS 294 011/9	O-ring
9	VAS 294 011/10	Blasting probe

## 5.3 Warranty conditions

This device complies with the current safety regulations and was tested before leaving the factory. We provide a 24 month warranty and are obliged to carry out all repairs caused by material and/or manufacturing faults that become necessary during this time.

### **Warranty restrictions**

1. The warranty is invalidated if repairs are made to the device by anyone other than a specialist company or the manufacturer.
2. The warranty is invalidated if the device is used for any other than its intended purpose.
3. The warranty is invalidated if the operating instructions are not followed and the maintenance work has not be carried out as stipulated.
4. The warranty is invalidated if the device is used incorrectly and/or the permitted operating parameters are exceeded.
5. The warranty is invalidated in the event of external effects such as transport damage and damage caused by impacts or collisions.
6. Repairs which have been carried out by unauthorised third parties.
7. Normal wear to the blasting probes, blasting hoses including handle and the granule control valve is not covered by the warranty.

### Service address

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Internet [www.tkrgroup.com](http://www.tkrgroup.com)



# EU Declaration of Conformity

In accordance with EU Machinery Directive  
2006/42/EC

**Manufacturer:** TKR Spezialwerkzeuge GmbH  
Am Waldesrand 9–11  
58285 Gevelsberg, Germany

**Person authorised to compile  
the technical documents:** Thorsten Weyland

**Equipment type:** Pneumatically operated  
granule jet blasting device  
**Type designation:** VAS 294 011A

Has been developed and designed in  
accordance with the standards  
and guidelines of

TKR Spezialwerkzeuge GmbH  
Am Waldesrand 9–11  
58285 Gevelsberg, Germany

**Harmonised standards  
applied:** German Product Safety Act (ProdSG)  
EN 286-1; EN 614-1; EN ISO 4414;  
EN ISO 13849-1

**Serial number range:** 00001 – 05000

**EU Machinery Directive:** 2006/42/EC  
**As manufacturer, we declare:** The products marked accordingly fulfil the requirements  
of the directive and standards listed.

*Thorsten Weyland*

Gevelsberg, 14 February 2019 Thorsten Weyland  
Technical Director



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