

VULKAN
LOKRING

LOKRING & LOKCLIP: REPAIR THE LEAK



**VULKAN
LOKRING**

LOKRING & LOKCLIP
REPAIR THE LEAK



CONTENT

LOKRING & LOKCLIP: REPAIR THE LEAK

- > Advantages
- > Areas of application
- > Repair possibilities
- > Technical specifications
- > Test laboratory
- > LOKRING assembly instructions
- > LOKCLIP assembly instructions
- > Customer support
- > Conclusion
- > Practice

**VULKAN
LOKTING**

ADVANTAGES
IN COMPARISON TO ORIGINAL
SPARE PARTS



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- > For universal use, independent of the vehicle type and model year



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- > **No waiting for expensive original spare parts**



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AREAS OF APPLICATION
ENDLESS POSSIBILITIES



ENDLESS POSSIBILITIES

AREAS OF APPLICATION

- > cars
- > trucks
- > busses
- > coaches
- > trains
- > utility vehicles
- > boats
- > ships
- > ...





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REPAIR POSSIBILITIES
WITH LOKRING & LOKCLIP



COST EXAMPLE - OPEL VECTRA REPAIR POSSIBILITIES

ORIGINAL SPARE PART



Material costs: approx. **250,- EUR**

Working time: approx. **90 min**

LOKRING

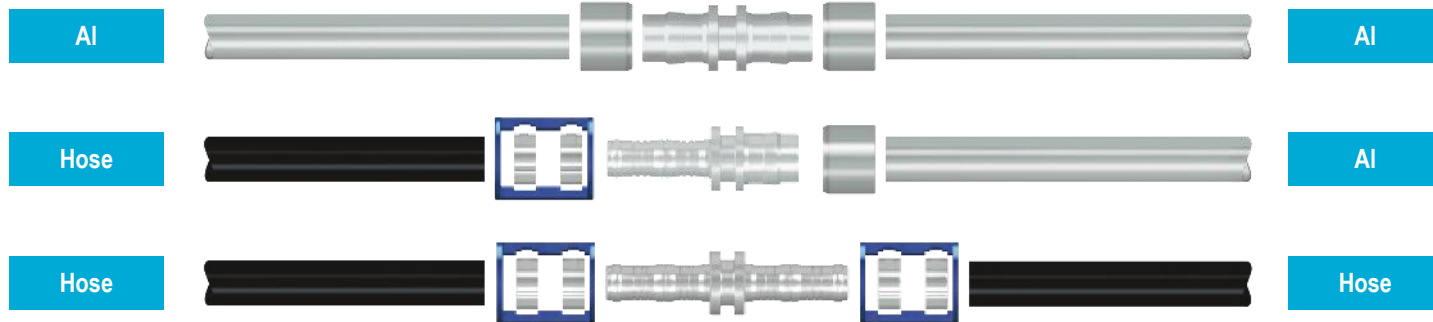


Material costs: **15.80 EUR**

Working time: approx. **40 min**

MATERIAL COMBINATIONS

REPAIR POSSIBILITIES



STARTER-KIT

REPAIR POSSIBILITIES

For a perfect start in the world of repairs to tubes and hoses in vehicle air conditioning systems.

- > Hand assembly tool and assembly jaws
- > LOKPREP 65G
- > Abrasive mat
- > Straight LOKRING connectors
- > Straight LOKRING reducing connectors
- > 45° and 90° aluminium elbows
- > LOKCLIP connectors



STRAIGHT LOKRING CONNECTORS REPAIR POSSIBILITIES

For connecting aluminium tubes with identical tube outer diameters.



STRAIGHT LOKRING REDUCING CONNECTORS REPAIR POSSIBILITIES

For connecting aluminium tubes with different tube outer diameters.



CONNECTORS WITH PRESSURE SWITCH CONNECTIONS REPAIR POSSIBILITIES

For replacing defective pressure switch connections.



CONNECTORS WITH R134A PRESSURE PORT CONNECTIONS REPAIR POSSIBILITIES

For replacing defective R134a pressure port connections.



LOKCLIP REPAIR POSSIBILITIES

- > Hose-to-LOKRING connectors
- > Hose-to-tube connectors
- > Hose connectors (Splicers)



HOSE-TO-TUBE CONNECTORS FOR STANDARD BARRIER HOSE

REPAIR POSSIBILITIES

- > For assembling hose-to-tube connections.
- > Can be used with LOKRING aluminium connectors and reducing connectors.



O-RING REPAIR FITTINGS

REPAIR POSSIBILITIES

For replacing faulty threads.

- > Straight connectors with inner thread
- > Straight connectors with outer thread (Male Insert)
- > 90° elbows with inner thread



ELBOWS

REPAIR POSSIBILITIES

For replacing aluminium tubes with a 45° or 90° elbow.



HEAT SHRINK SLEEVES REPAIR POSSIBILITIES

When used on applications with **dissimilar material** (e.g. Al to St) additional protection should be considered such as heat shrink sleeves.



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TECHNICAL SPECIFICATIONS
FOR LOKRING & LOKCLIP



LOKRING

TECHNICAL SPECIFICATIONS



Reference standards	EN 378-2 and ISO 14903
Max. operating pressure	25 bar (360 psi)
Admissible refrigerants	Suitable for R134a and HFO-1234yf. Other refrigerants on request.
Temperature range	-50°C up to 150°C (-58°F up to 302°F)
Tube diameter range	6 up to 19 mm (1/4" up to 3/4")
Approvals	TÜV UL (File SA12004)

LOKCLIP

TECHNICAL SPECIFICATIONS



Reference standards	EU directive 2006/40/EG
Max. operating pressure	25 bar (360 psi)
Admissible refrigerants	Suitable for R134a and HFO-1234yf. Other refrigerants on request.
Temperature range	-40°C up to 135°C (-40°F up to 275°F)
Tube diameter range	8 up to 19 mm (5/16" up to 3/4")

VULKAN
LOKING

TEST LABORATORY
FOR TESTS ACCORDING TO ISO 14903



TEST PROCEDURE

TEST LABORATORY

Unique test laboratory for performing tests in accordance with ISO 14903 is available in Germany:

- > Tightness test before load tests
- > Fatigue test
- > Freezing test
- > Vibration test
- > Pressure-temperature-cycle test
- > Vacuum test
- > Pressure test (static)
- > Tightness test after load tests



TEST PARAMETERS

TEST LABORATORY

14 test samples are necessary for making the tests. Before starting the tests, the following parameters need to be defined:

- > Max. Temperature
- > Min. Temperature
- > Max. Operating Pressure



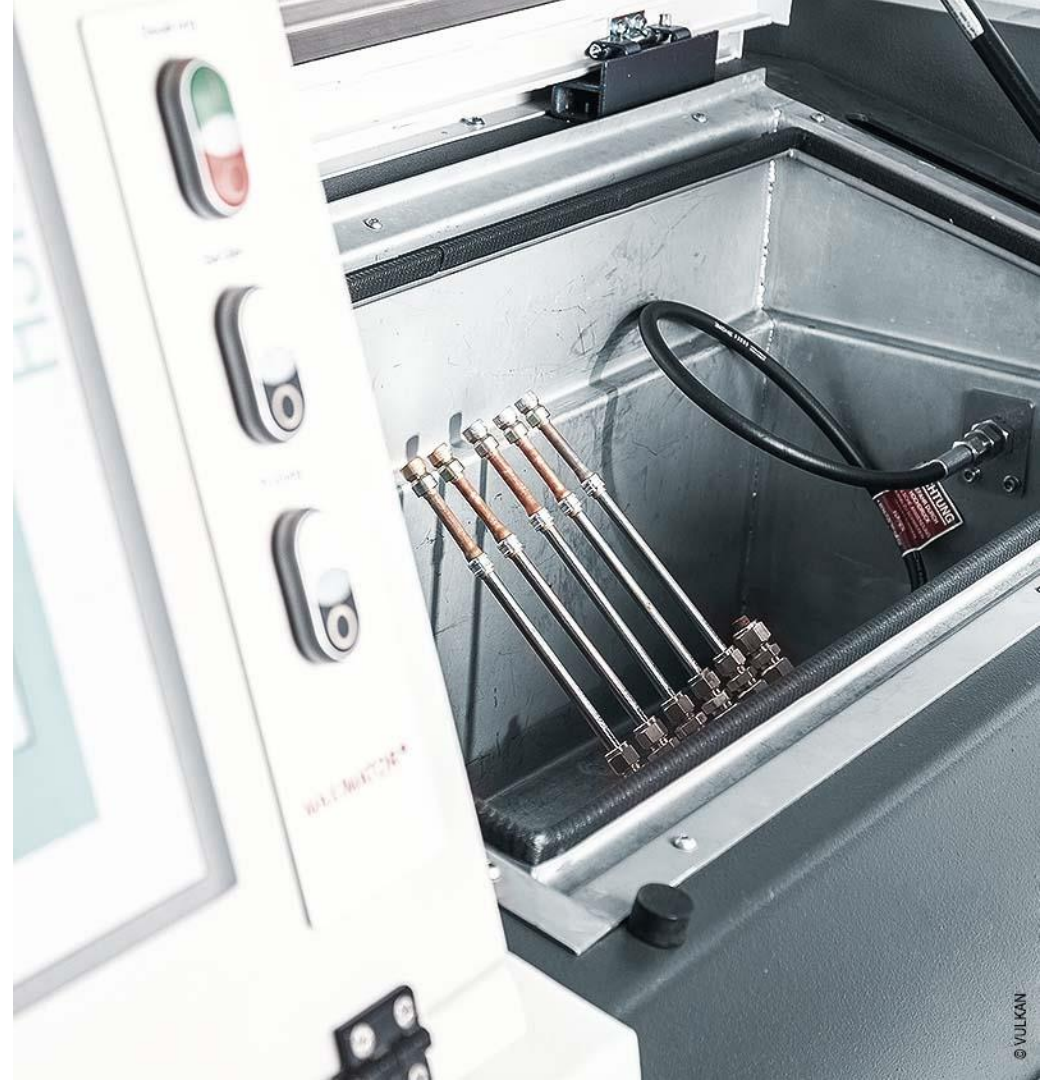
TIGHTNESS TEST BEFORE LOAD TESTS TEST LABORATORY

- > **Test gas:** Helium
- > **Temperature:** 20°C (68°F)
- > **Pressure difference:** 10 bar (145 psi)
- > **Max. leakage rate:** 7.5×10^{-6} mbar l/s



FATIGUE TEST TEST LABORATORY

250,000 cycles between Max. Operating Pressure and atmospheric pressure



FREEZING TEST TEST LABORATORY

Step 1

- > Test samples are submerged in a container under water
- > Pressure above water surface is reduced below 500 mbar (7.25 psi) for 10 minutes
- > Trapped air disappears from cavities
- > While restoring normal ambient air pressure cavities fill up with water

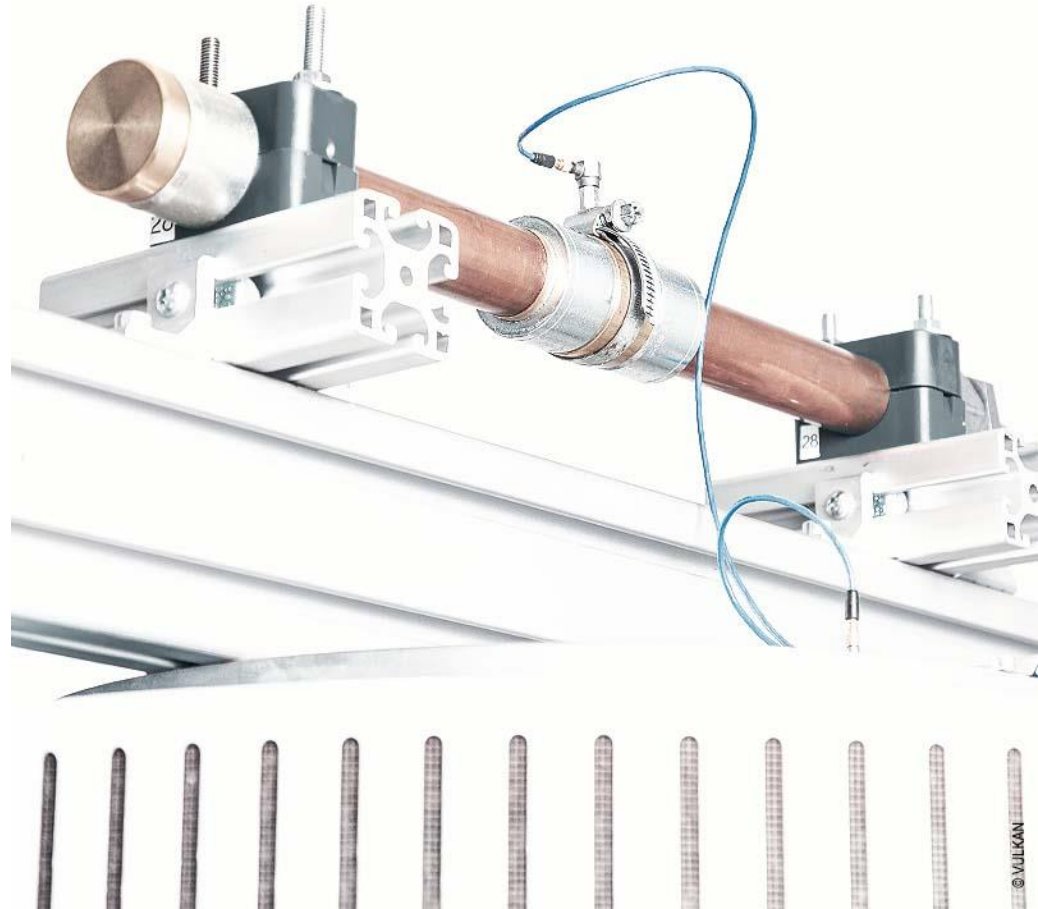
Step 2

- > Test samples are placed in a freezer for at least 30 minutes at max. -15°C (5°F)
- > Test samples are placed into water at room temperature to thaw for 5 minutes



VIBRATION TEST TEST LABORATORY

- > 2 million load cycles
- > Frequency: up to 200 Hz
- > Amplitude: depends on the size of the connection



PRESSURE-TEMPERATURE CYCLE TEST TEST LABORATORY

Step 1 (50 cycles)

- > Alternating temperature between Min. Temperature and Max. Temperature
- > When Max. Temperature is reached, test samples will be inflated to Max. Operating Pressure for 2 minutes

Step 2 (200 cycles)

- > Max. Temperature is held
- > Pressure alternates between atmospheric pressure and Max. Operating Pressure



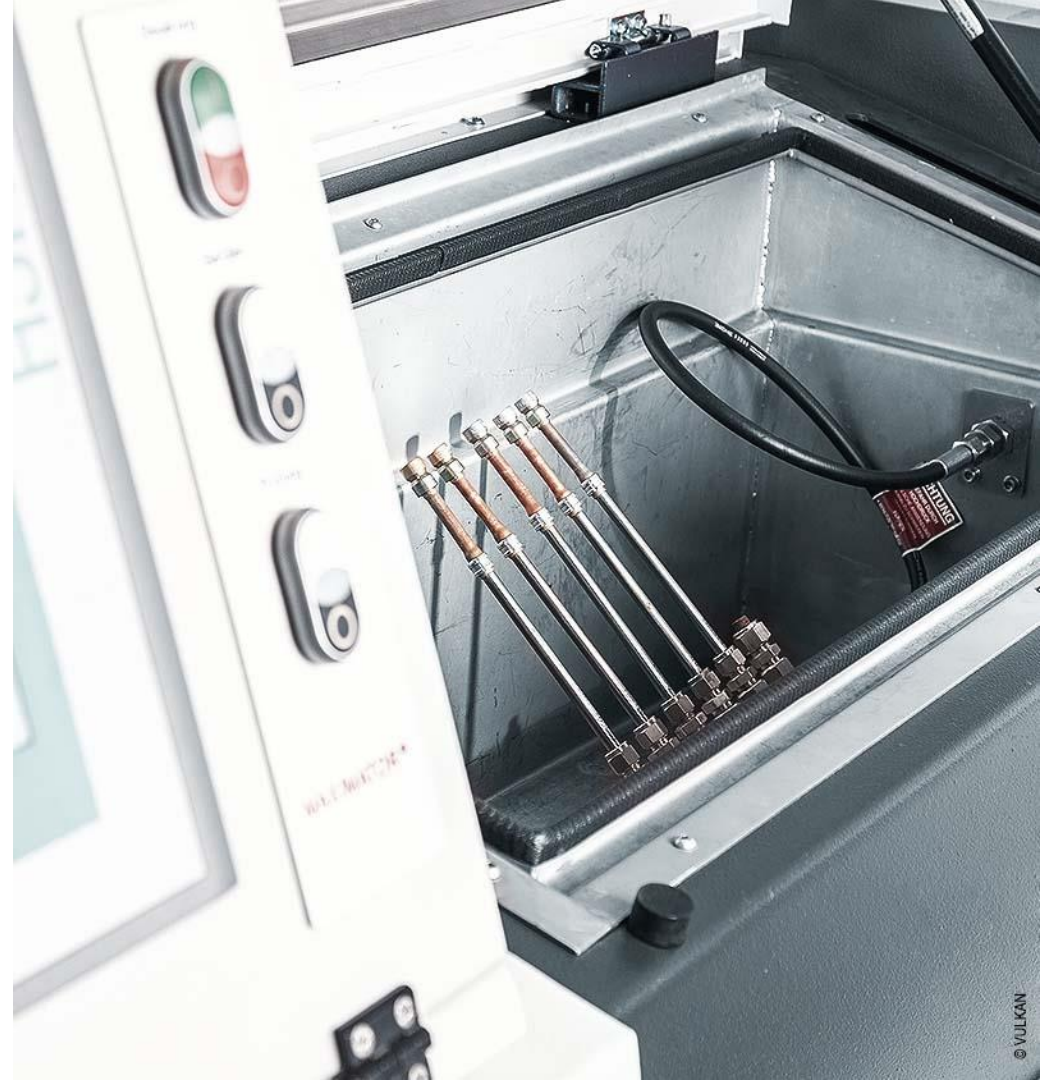
VACUUM TEST TEST LABORATORY

- > **Duration:** 1 hour
- > **Temperature:** 20°C (68°F)
- > **Max. pressure rise:** 0.2 kPa



PRESSURE TEST (STATIC) TEST LABORATORY

- > **Duration:** 1 minute
- > **Test pressure:** 5 times Max. Operating Pressure or theoretical maximum load of the tube



PRESSURE TEST (STATIC) TEST LABORATORY

The LOKRING connection is always stronger than the tube.



TIGHTNESS TEST AFTER LOAD TESTS TEST LABORATORY

- > **Test gas:** Helium
- > **Temperature:** 20°C (68°F)
- > **Pressure difference:** 10 bar (145 psi)
- > **Max. leakage rate:** 7.5×10^{-6} mbar l/s





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ASSEMBLY
OF LOKRING TUBE CONNECTIONS



LOKTOOL MZ-V

LOKRING ASSEMBLY

- > Specially developed for the LOKRING assembly.
- > Patented lever mechanism for assembly with minimum effort.
- > Assembly jaws are easy to change for different tube diameters.
- > Both handles bend for use in hard-to-reach areas.
- > Made in Germany!

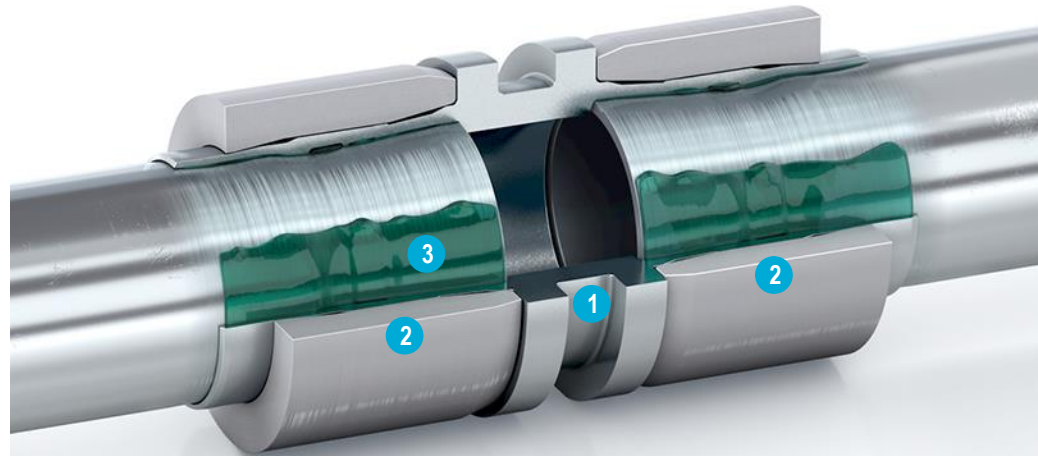


COMPONENTS

LOKRING ASSEMBLY

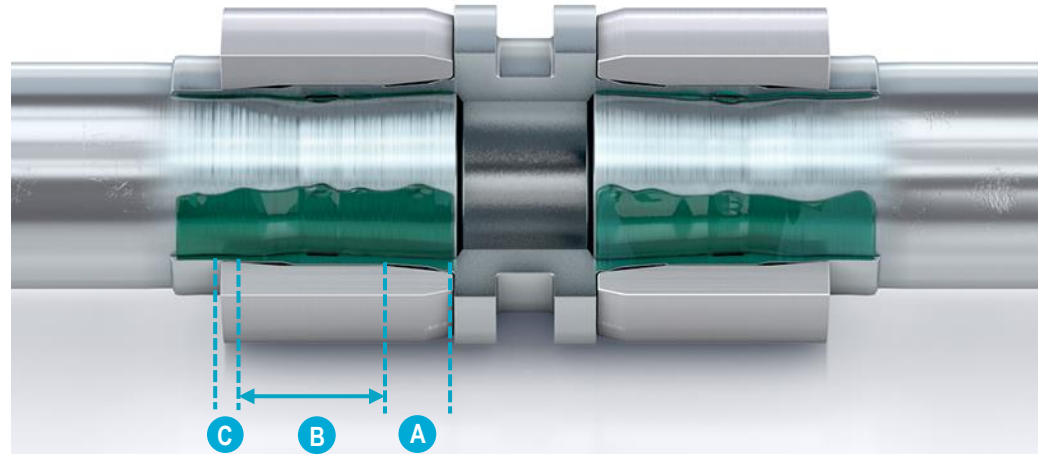


- 1 Joint
- 2 Rings
- 3 LOKPREP (anaerobic sealant)



FUNCTIONAL PRINCIPLE LOKRING ASSEMBLY

- A** Insertion area
- B** Stabilisation and sealing area
- C** Main sealing area



LOKPREP

LOKRING ASSEMBLY

LOKPREP 65G:



LOKPREP

LOKRING ASSEMBLY

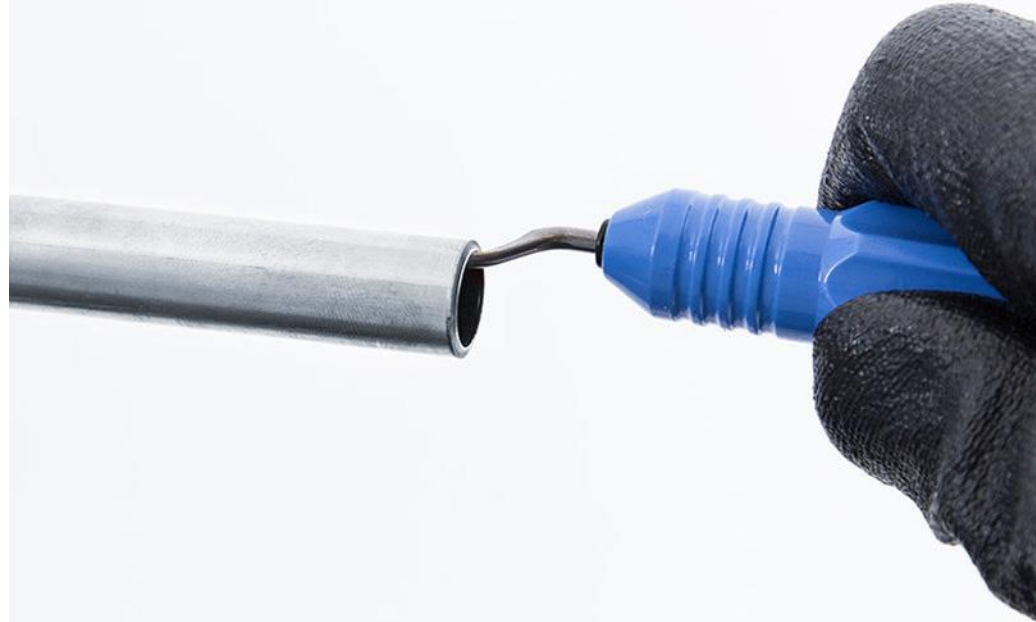
LOKPREP 65G:

- > Compensates for any unevenness in the tube surface
- > Hardens under oxygen exclusion and in contact with free metal ions
- > Stays elastic
- > Ensures that every LOKRING connection is hermetically sealed



DEBURR THE TUBE ENDS LOKRING ASSEMBLY

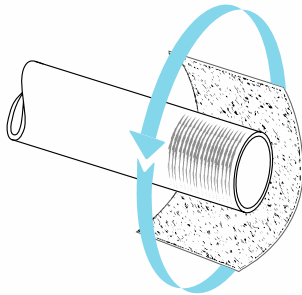
Deburr the tube end all the way round using a tube deburrer.



CLEAN THE TUBE ENDS

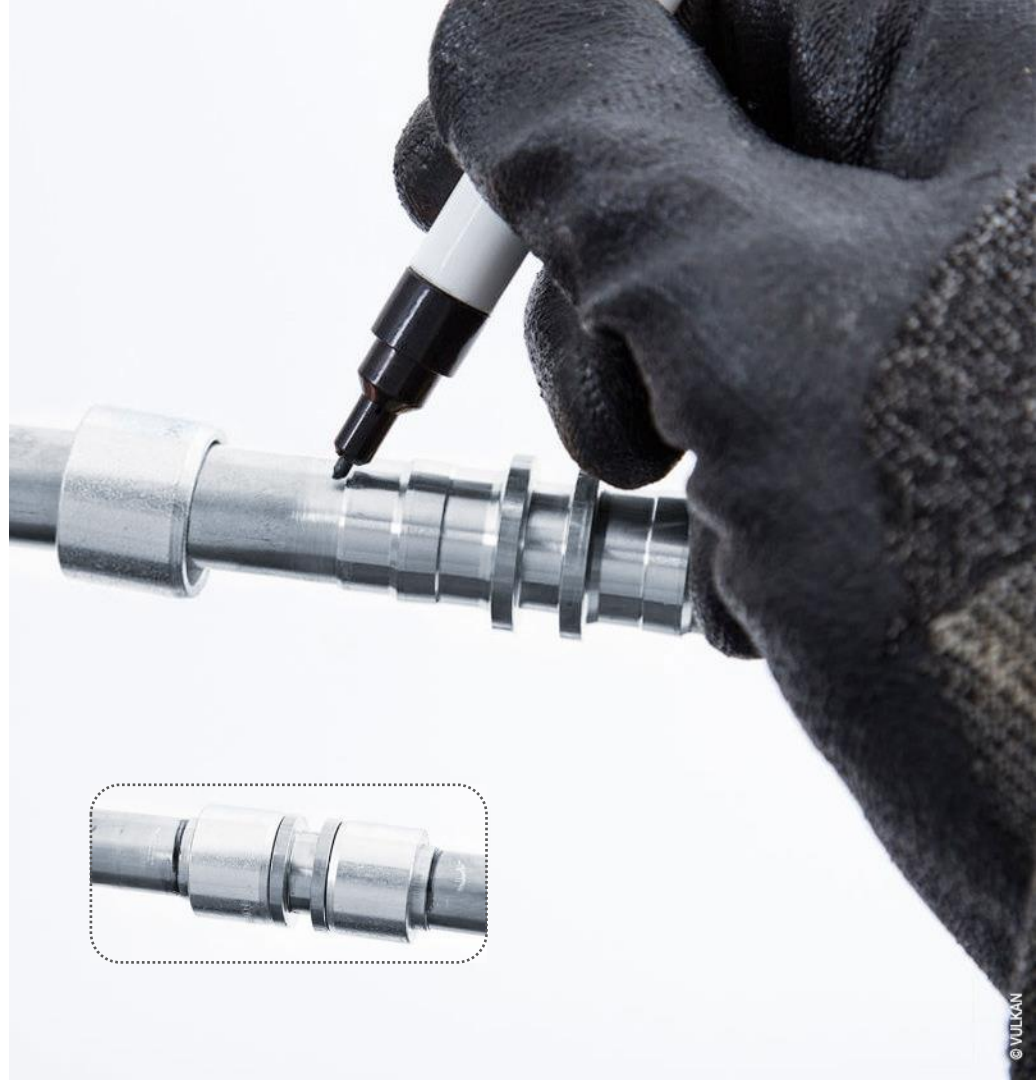
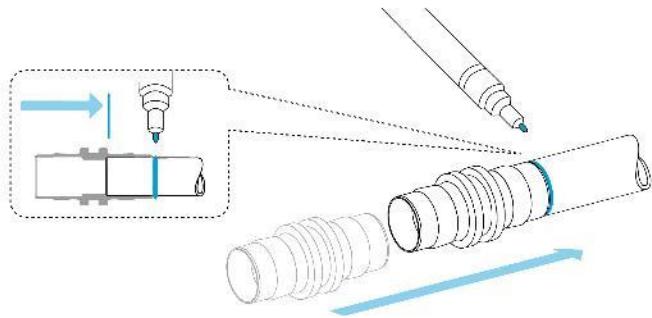
LOKRING ASSEMBLY

Clean the tube end by rubbing it in rotary movements using the abrasive mat.



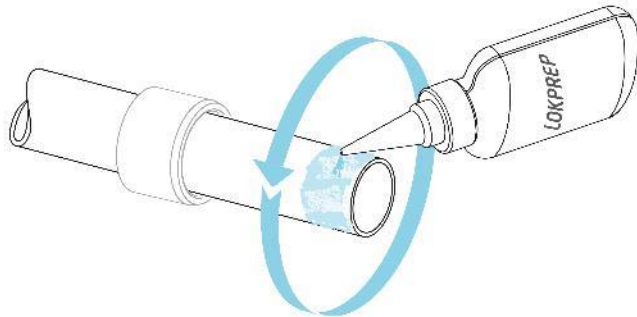
MARK THE INSERTION DEPTH LOKRING ASSEMBLY

- > Before applying LOKPREP 65G, push the joint onto the tube until you can feel the inner stop.
- > Mark the correct insertion depth on the tube.



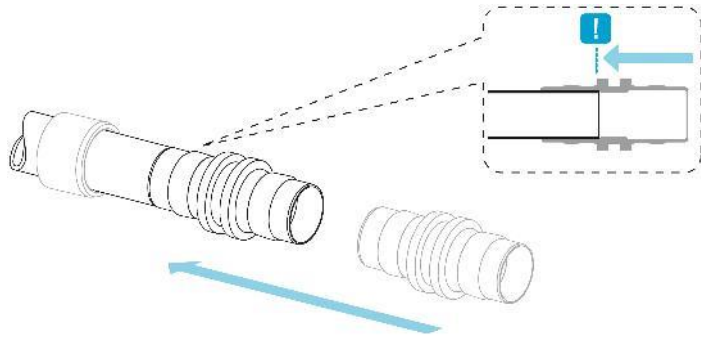
APPLY LOKPREP LOKRING ASSEMBLY

- > Apply LOKPREP 65G all the way round the sealing area of the tube end.
- > Respect the correct curing time of the LOKPREP 65G.



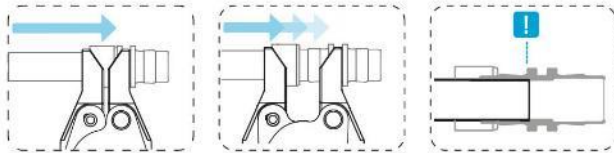
INSERT TUBE LOKRING ASSEMBLY

Push the connection joint onto the tube until it reaches the inner stop.



PUSH THE RING ONTO THE JOINT LOKRING ASSEMBLY

- > Put assembly jaws in place behind LOKRING and assembly stop of the joint.
- > Press tube connection together.
- > Do not change insertion depth of tube and connecting joint.
- > Press tube connection until the LOKRING is flush to assembly stop of the joint.



FINISHED LOKRING ASSEMBLY

Check the correct assembly/insertion depth on the basis of the position marking.



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ASSEMBLY
OF LOKCLIP HOSE CONNECTIONS

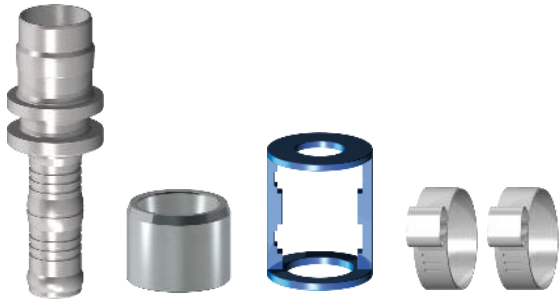


LOKTOOL LC FLEX LOKCLIP ASSEMBLY

- > For crimping the stainless steel clips of a LOKCLIP hose connection.
- > Suitable for all LOKCLIP hose connections.
- > Compact design makes it easy to access even in hard-to-reach areas.



COMPONENTS LOKCLIP ASSEMBLY



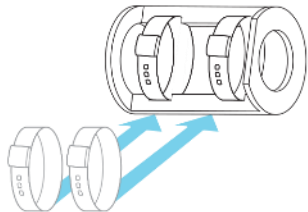
- 1 Joint
- 2 Ring
- 3 Plastic clip holder
- 4 Stainless steel clips



PREPARATION

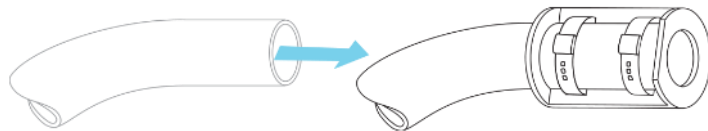
LOKCLIP ASSEMBLY

Insert the two stainless steel clips into the plastic clip holder.



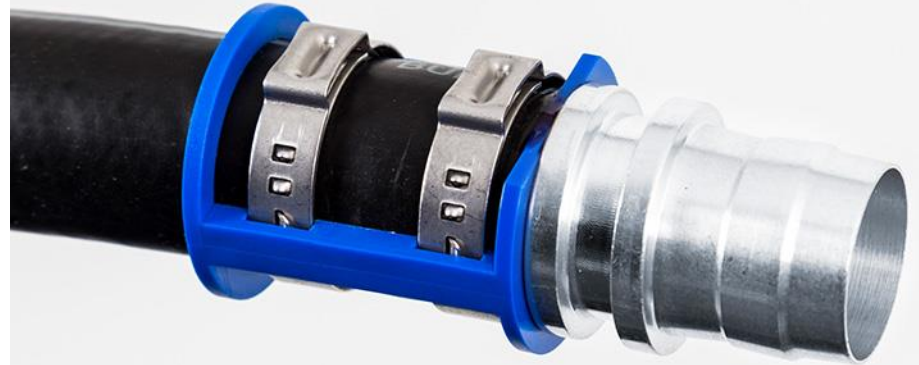
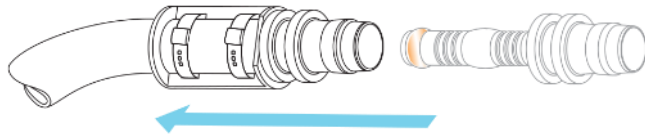
INSERT HOSE LOKCLIP ASSEMBLY

Insert the hose into the plastic clip holder as far as it will go.



INSERT JOINT LOKCLIP ASSEMBLY

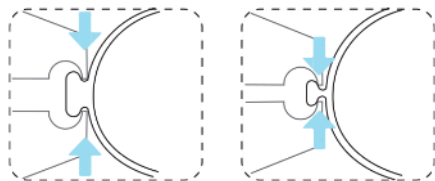
Lubricate the joint with a little refrigerant oil and push the joint into the hose as far as it will go.



PRESS STAINLESS STEEL CLIPS

LOKCLIP ASSEMBLY

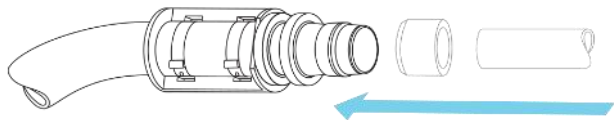
Press the stainless steel clips using LOKTOOL LC flex. Start with the clip positioned at the side of the hose.



FINISH THE CONNECTION

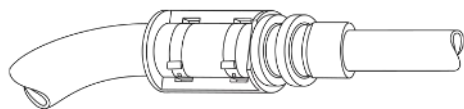
LOKCLIP ASSEMBLY

Finish the connection, depending on the type of LOKCLIP connector which is used.



FINISHED LOKCLIP ASSEMBLY

LOKCLIP connector is ready for service.





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VULKAN LOKRING
CUSTOMER SUPPORT



TRAINING CUSTOMER SUPPORT

Dedicated training system in place:

- > In-depth LOKRING theory
- > Practice
- > Certification



LOKBOX PRESENTATION CUSTOMER SUPPORT

LOKBOX Presentation VAC includes:

- > Assembly sample display
- > Hand assembly tool with jaws
- > LOKPREP 65G
- > Samples for practical LOKRING & LOKCLIP demonstrations



TECHNICAL INFORMATION CUSTOMER SUPPORT

Available on www.vulkan.com:

- > Catalogues
- > Brochures
- > Videos
- > Assembly instructions
- > Technical documentation



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CONCLUSION
OF THE PRESENTATION

Conclusion



LOKRING & LOKCLIP

REPAIR THE LEAK

- > For universal use, independent of the vehicle type and model year



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PRACTICE
LOKRING & LOKCLIP

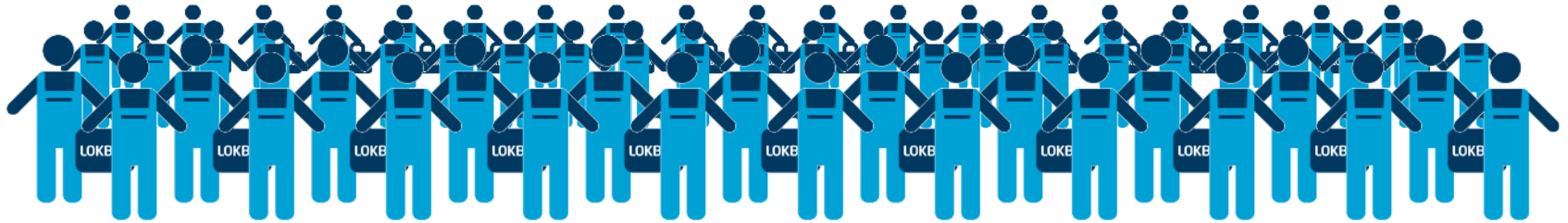


LOKRING & LOKCLIP PRACTICE

- > Assembly of a LOKRING connection
- > Assembly of a LOKCLIP connection
- > Tracer gas leak detection



YOU CAN JOIN NOW THE THOUSANDS OF LOKRING® USERS!



THANK YOU
FOR YOUR ATTENTION

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