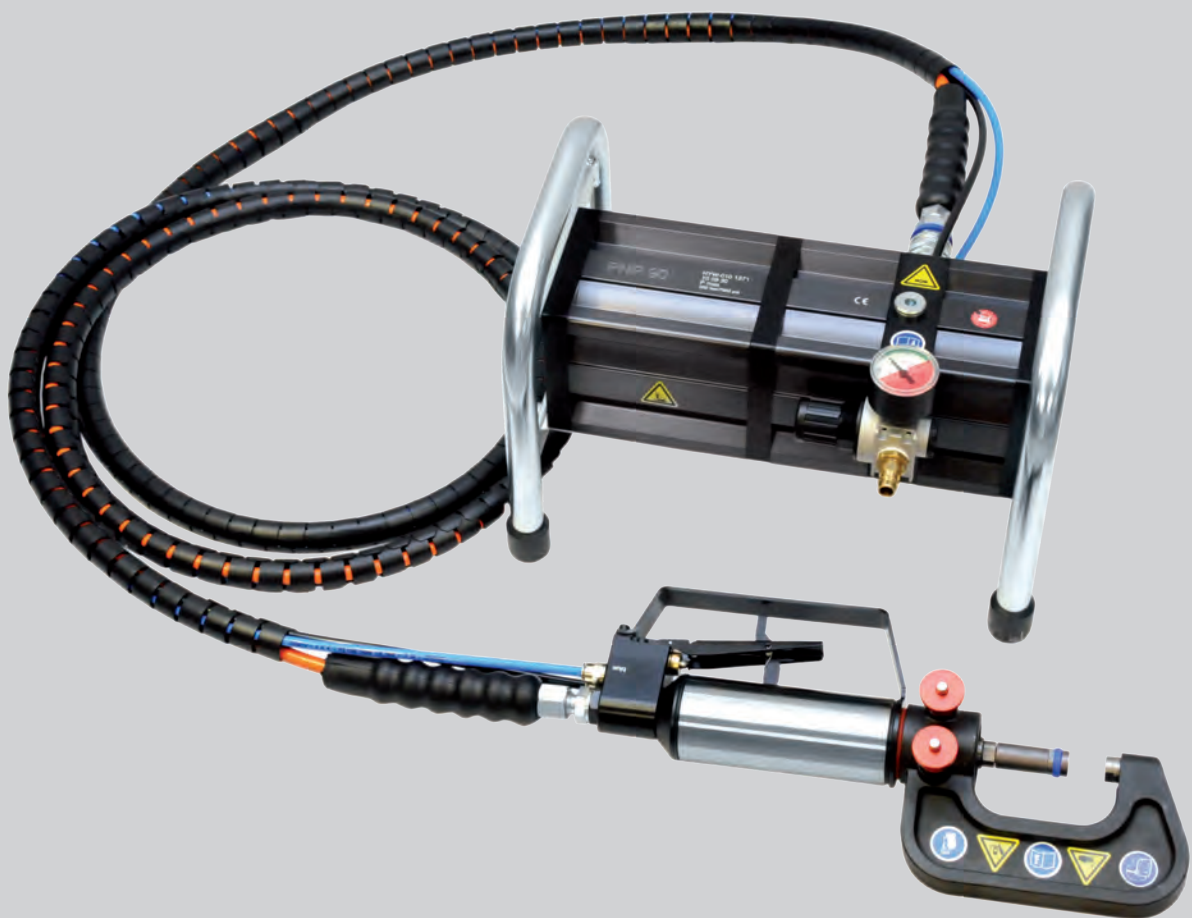


Pneumatic, hydraulic Universal Riveting Tool PNP 90

Instruction manual



(45765, rev 0) 2013-03 EN

CAR-O-LINER®

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1.1 Information regarding this manual

Information

Legislation stipulates that workers handling hydraulically-driven riveting tools must be protected. If desired, training can be provided at TKR in Gevelsberg or on site at the customer.

State of the technology

This riveting tool represents state-of-the-art technology. To ensure the functionality of the equipment, it must be operated in a proper and safe manner.

Read instruction manual

Read the instruction manual carefully before using the riveting tool.

Handling

All handling necessary to ensure correct operation is described in the instruction manual. No work method other than that expressly approved by the manufacturer may be used.

Faults

In the event of a fault, the user or owner may only carry out repair work for faults for which the relevant maintenance process is laid out in the instruction manual.

1.2 Explanation of symbols

In this instruction manual, some sections use internationally recognised warning symbols, warning notes and general instructional symbols.

The individual symbols are explained below. Follow all instructions and safety rules.



Observe
Instruction manual



Warning!
General source of danger



Please note the
following!



Observe
General instructions



Warning!
Hand could become
trapped



Arrow to clarify compres-
sion



Wear face mask



Warning!
Fingers could become
trapped



Arrow showing direction



Wear gloves



Warning!
Danger of environmental
contamination



For further information
see chapter...



Warning!
System under pressure



Audibly engage

1.3 Designations

Designations on the stamping and riveting tool



- | | |
|---|--|
| A | Type designation |
| B | Serial number |
| C | Manufacturer's designation, production date |
| D | Maximum permissible operating pressure (oil) |
| E | CE mark |
| F | Symbol to read the instruction manual |

2.1 Operating principles

The pneumatic/hydraulic universal tool PNP90-UN 2.0 was specially developed for all common riveting operations in thin sheet metal structures.

The equipment's universal technology enables adaption of various attachments for different applications.

The basic tool kit comprises the pneumo-hydraulic pressure intensifier PNP 90 and a hydraulic actuator with hose package. The kit is completed by an NB 40 rivet clamp and a fully equipped RIVKIT UN 2.0 riveting tool kit.

The hydraulic pump is a pneumatically driven pressure intensifier with a pressure ratio of 1:100. This means that hydraulic output pressure of 600 bars is generated with input air pressure of 6 bars. When the equipment's pre-set final pressure is reached, the pump stops automatically and keeps this pressure constant. The hydraulic pump has a pneumatically controlled pressure relief valve.

The hydraulic actuator is connected to the hydraulic pump via a high-pressure hose. The hose is connected to the pump via a leak-free quick release coupling. The coupling can only be connected to the equipment when it is depressurised.

The two pneumatic control lines are also connected to the pump. Make sure that the black and the blue hose are inserted into the couplings with the relevant markings.



Compressed air can be connected to the equipment as soon as the hydraulic hose and the control lines are connected to the pump.

The hydraulic actuator is equipped with a control valve that activates pump operation. The operating lever is equipped with a safety catch to prevent unintended operation.

If the valve is activated, the pump begins to run and the hydraulic plunger extends.

If the operating lever is released, the pump is deactivated and the hydraulic plunger retracts to its original position.

2.2 Scope of Supply and Accessories

2.2.1 47504



2.2.2 45711



2.2.3 45712



Scope of supply complete kit PNP 90 UN 2.0
Art.-No. 47504

1x Pressure intensifier PNP 90
1x Hydraulic actuator HP 35 UN
1x Rivet clamp NB 40
1x Riveting tool kit RIVKIT-UN 2.0
2x Locking bolts
Owner's Manual

Accessories (not part of the complete kit)

1x Rivet clamp NB 115, Art.-No. 45711
1x Rivet clamp NB 230, Art.-No. 45712
1x Pop rivet adaptor RIVPULL 2.0**
1x Oval hole punch tool PUNCH-OV**

** in preparation

Technical Specifications

Permissible hydraulic oil	Filling capacity 280 ccm/9,86 fl oz Branded hydraulic oils as per DIN 51524 ATF as per DIN 51562-1 Viscosity approx. 68 mm ² /s at 40 °C, Example: Shell Tellus TX 68, Dexron, Mercon, Hydroclear
Max. air pressure	6 bar / 87 psi
Compressed air	Quality class 2 as per ISO 8573-1
Ambient temperature	5–50 °C / 41 –122 °F
Prescribed safety clothing	Protective gloves, face mask
Noise emissions level	LP AI < 75 db(A)

The effective value of the acceleration assessed at the hydraulic tool measured in accordance with ISO/FDIS B662-11 is < 2.5 m/s²

2.3 Safety instructions



The hydraulic tool kit is strictly approved only for the purposes intended by the manufacturer.



Only genuine accessories may be used. Use of non-genuine tools or accessories presents a major safety hazard.



Ensure that only trained and instructed personnel use the equipment!



Use of the equipment by personnel that have not been trained and instructed is prohibited.



Ensure that the instruction manual is made available to operating personnel.



Observe the applicable national regulations for prevention of accidents.



Do not use any hoses or fittings that are not permitted for the equipment's operating pressure.



Protective gloves and a face mask must strictly be worn for all applications of the equipment, because metallic parts can break up and fly off with high energy if the tool is faulty or operated incorrectly.



As a result, there is a risk of severe bodily injury! See also ANSI Z87.1-1989.



Never throw the tool or allow it to fall. Never misuse the tool or lend it to untrained personnel.



The tool must only be used in ambient temperatures of above 5 °C and up to a maximum of 50 °C.

The tool must never be used in potentially explosive areas.

2.4 Principles for Handling the PNP 90 UN 2.0 Tool Kit



Risk of injury

Route all supply lines in a manner that prevents people from tripping over them. Correctly route and attach the compressed air hose. If a compressed air hose whips around wildly, it could cause severe physical injury.



Before starting work, check the preset air pressure! Incorrectly set air pressure could cause equipment damage or physical injury!



Max. air pressure

Make sure that the maximum permissible operating air pressure of 6 bar / 87 psi is never exceeded. Check the setting of the pressure regulating valve before each riveting operation!



Clean compressed air

Make sure that the pump is always supplied with clean and dry compressed air. Moisture and contamination could cause equipment malfunction and/or damage. Only use compressed air of quality class 2 as per ISO 8573-1.



Always disconnect the riveting tool from pressure when leaving the work site!



Warranty

The manufacturer accepts no liability for damage or injury caused by improper repair or use of replacement parts made by other manufacturers.



Incorrect usage of the riveting tool that leads to equipment damage invalidates the warranty.



6.4

Declaration of Conformity

Riveting tool PNP 90 UN 2.0 has been tested and manufactured in accordance with European guidelines. The Declaration of Conformity has been included with this instruction manual.



The compressed air supply must be disconnected from the equipment before any adjustment or maintenance work is performed.

2.5 Maintenance



The tool's hydraulic system, pneumatic control systems, hoses and couplings must all be kept free of dirt and other contamination. Foreign bodies in the hydraulic fluid or in the control air can cause the tool system to malfunction.



All maintenance and service work on the stamping and riveting tool must only be performed with the pump disconnected.



All maintenance and service work on the pump must only be performed with the air disconnected and the oil drained.



6.1 Normally, pump maintenance only entails a regular oil change (see 2.2 for permissible oils).



All other necessary maintenance work and/or repairs should be performed by the manufacturer or properly trained personnel.

With normal use of the pump, hydraulic oil should be changed every 80 operating hours or every 12 months. Make sure that used oil is disposed of as required by national environmental legislation.



Oil that is not properly disposed of could harm the environment.

The user must only perform the maintenance and repair measures outlined in this instruction manual.



Maintenance and repair work not covered in this instruction manual may only be performed by professionals with proper training by TKR. For further information on servicing and training, please contact us at our Service address:

Car-O-Liner AB
Hulda Mellgrens Gata 1
SE-421 32 Västra Frölunda

Direct +46 31 721 1050
Fax: +46 227 319 00
E-mail: info@car-o-liner.se
Web: <http://www.car-o-liner.se>

2.6 Warranty

Stamping and riveting tools come with a 12-month warranty against material and manufacturing defects.

This does not cover wearing parts (rivet mandrels, rivet dies, spacing bolts and spacing sleeves) or hydraulic oil.

The warranty period begins on the date of delivery, as specified on the invoice or delivery note.

The warranty is valid for the user/customer provided that the tool is obtained from an authorised sales outlet and is used as described in the instructions and for the purposes for which it was designed.

The warranty becomes invalid if the tool is used for purposes other than those for which it was designed.

In addition, the warranty becomes invalid if the tool is not used as described in the instruction manual.

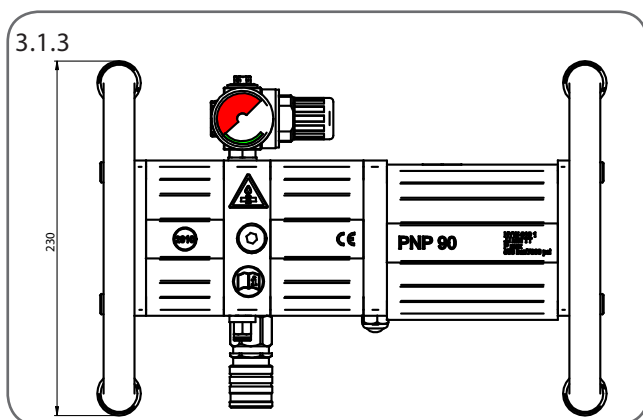
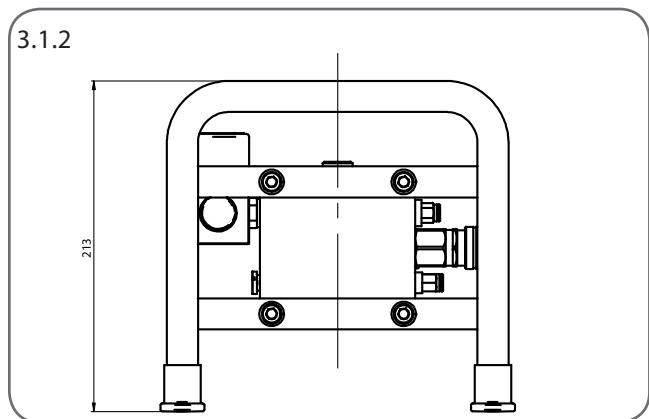
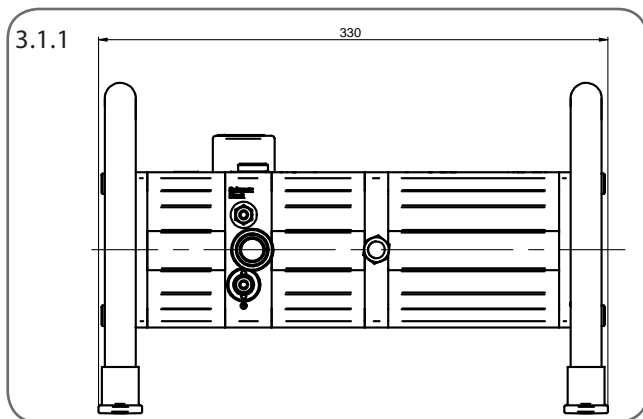
In the event of defect or fault, the manufacturer shall only repair or replace faulty parts at its own discretion.

Your supplier and service partner:

Car-O-Liner AB
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Direct +46 31 721 1050
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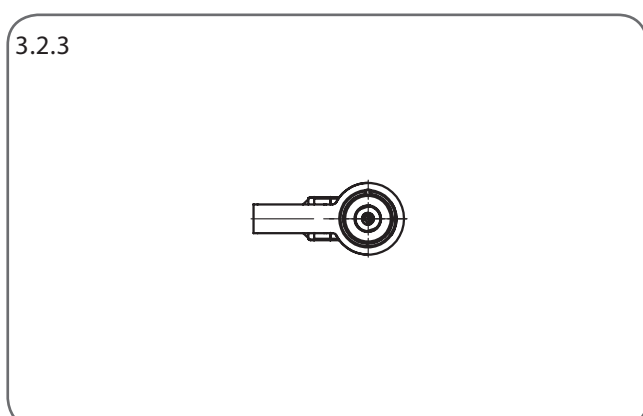
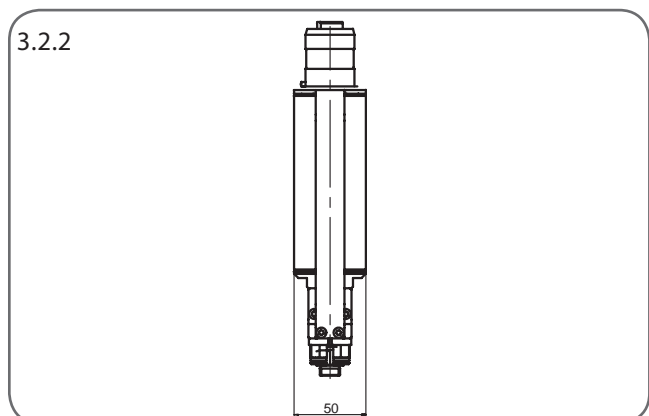
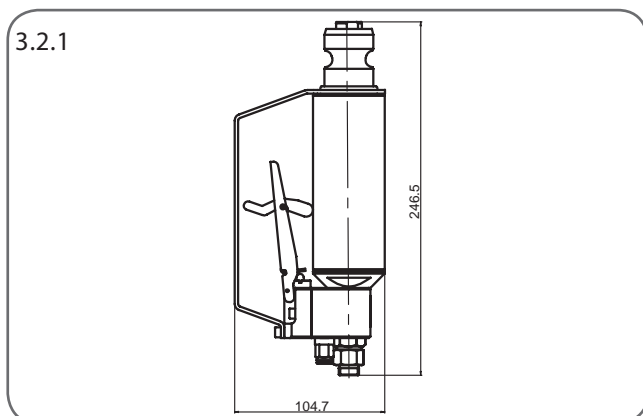
3.1 Technical Data Pump PNP 90 UN 2.0



Pump PNP 90 UN 2.0

Length	330 mm
Width	230 mm
Height (incl handle)	213 mm
Weight	8 kg
Max. input pressure	6 bar
Max. operating pressure	600 bar

3.2 Technical Data Hydraulic Actuator HP 35 UN



Hydraulic actuator HP 35 UN

Length	246.5 mm
Width	50 mm
Height (incl handle)	104.7 mm
Weight	2 kg
Max. operating pressure	600 bar
Travel	15 mm














Length and weight without hoses

3.3 Technical Data Riveting Tool Kit RIVKIT UN 2.0

3.3.1 45709

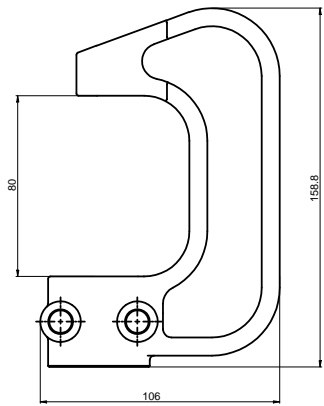


Riveting Tool Kit RIVKIT UN 2.0

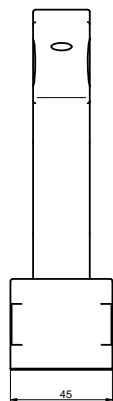
Kit number	Item/Description/Article number		Item/Description/Article number
Kit: 45714	A Setting head, 3 mm rivet		B Closing head, 3 mm rivet 
Kit: 45715	C Setting head, 5 mm rivet		D Closing head, 5 mm rivet 
Kit: 45716	E Setting head, flow form rivet Marked with 3 rings		F Closing head, flow form rivet Marked with 3 rings 
Kit: 45717	G Punch and calibration mandrel Marked with 2 rings		H Punch and calibration die Marked with 2 rings 
Kit: 45718	I Extraction mandrel Marked with 1 ring		K Extraction die Marked with 1 ring 
	L Replacement elastomer rings 45720		M Set of fitting spanners 45713 
Kit: 45719	N Spacing adaptor composed of: 1 Bushing 2 Spacing bolt 3 Spacing sleeve		

3.4 Technical Data Rivet Clamp

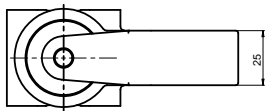
3.4.1



3.4.2



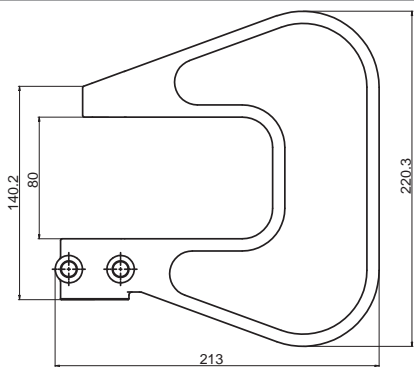
3.4.3



Rivet clamp NB 40



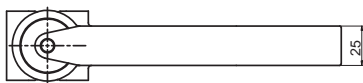
3.4.4



3.4.5

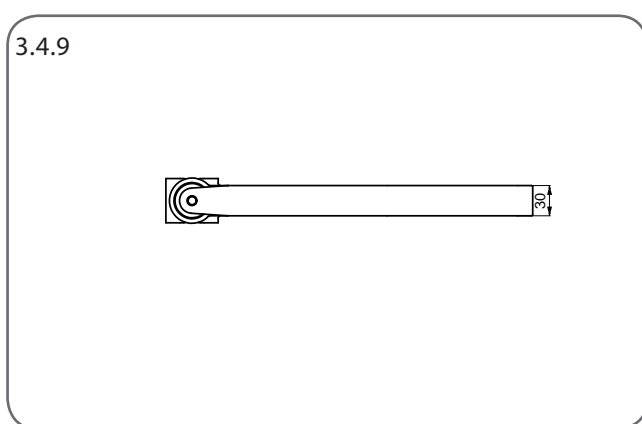
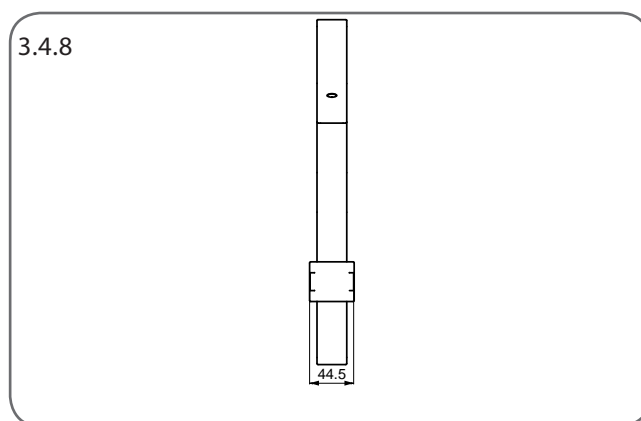
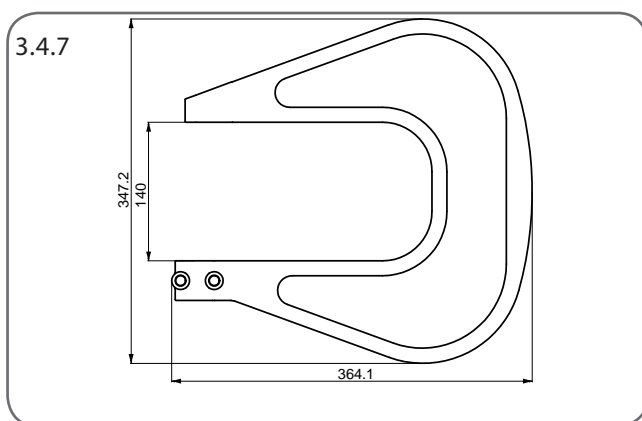


3.4.6



Rivet clamp NB 115





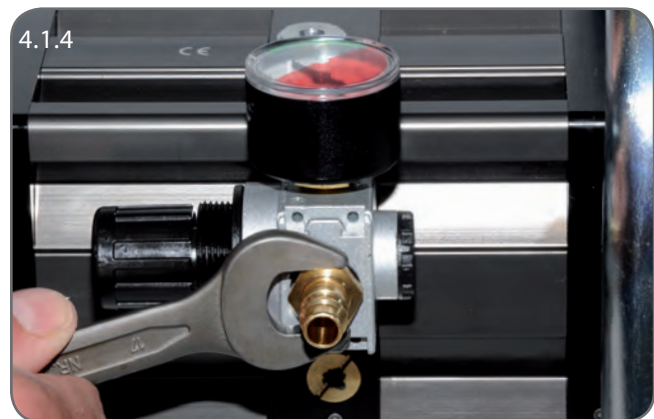
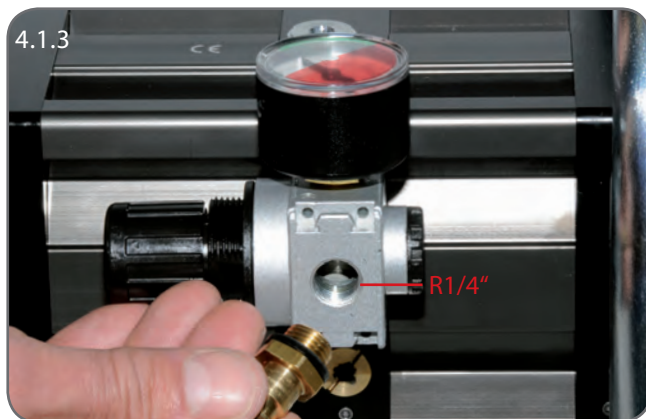
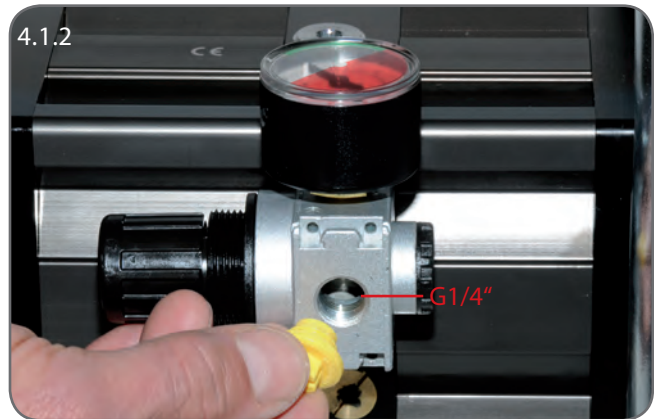
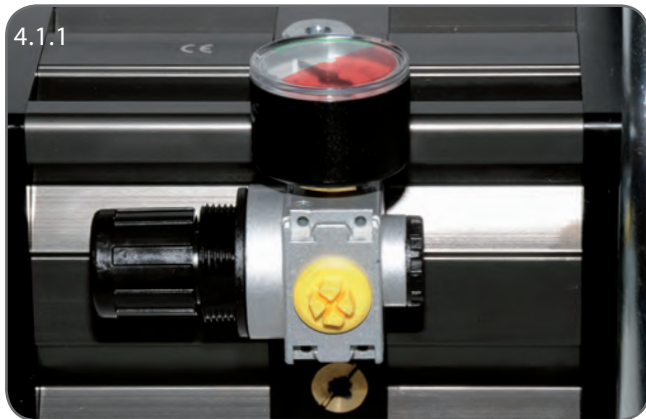
Technical data

	Rivet clamp NB 40 ¹	Rivet clamp NB 115	Rivet clamp NB 230
Article number	45708	45711	45712
Length*	106 mm	213 mm	364.1 mm
Width	45 mm	44 mm	44.5 mm
Height	158.8 mm	220.3 mm	347.9 mm
Clamp opening	80 mm	80 mm	140 mm
Opening depth	40 mm	115 mm	230 mm
Weight*	1.5 kg	3 kg	9.5 kg

*Length and weight without hoses

¹Included in the basic kit

4.1 Startup



The equipment is supplied from the factory without a compressed air connection. The pressure regulator has a G1/4" (internal thread) connection thread.

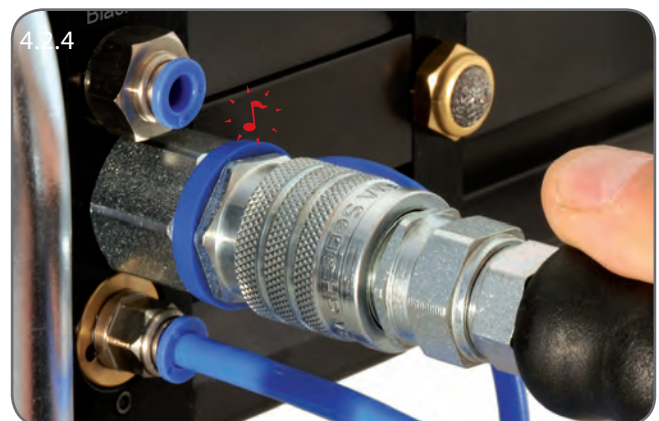
4.1.1/4.1.2

The pressure regulator is supplied with a closing cap fitted. Remove the closing cap.

4.1.3/4.1.4

Use a compressed air connection with R1/4" thread and seal. Screw this into the regulator.

4.2 Riveting Tool Preparation and Connection of the Hydraulic Actuator



4.2.5

Connect the pneumatic hoses. Make sure that the black hose is attached to the marked coupling.



Before using the equipment, check the condition of the hydraulic actuator with add-on component and hoses. Risk of severe physical injury if the pump or the rivet clamp is damaged.



Check the hoses and couplings for damage.



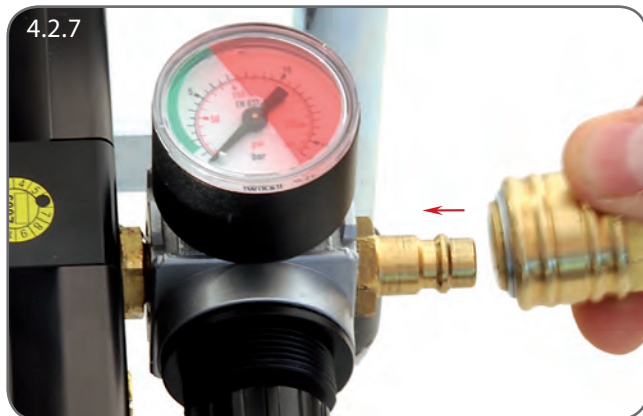
In the event of any noticeable damage, the hydraulic components must be replaced. Damaged hoses or couplings could cause severe injury!



Incorrectly attached hoses could come loose and cause severe physical injury.



4.2 Riveting Tool Preparation and Connection of the Hydraulic Actuator



4.2.7

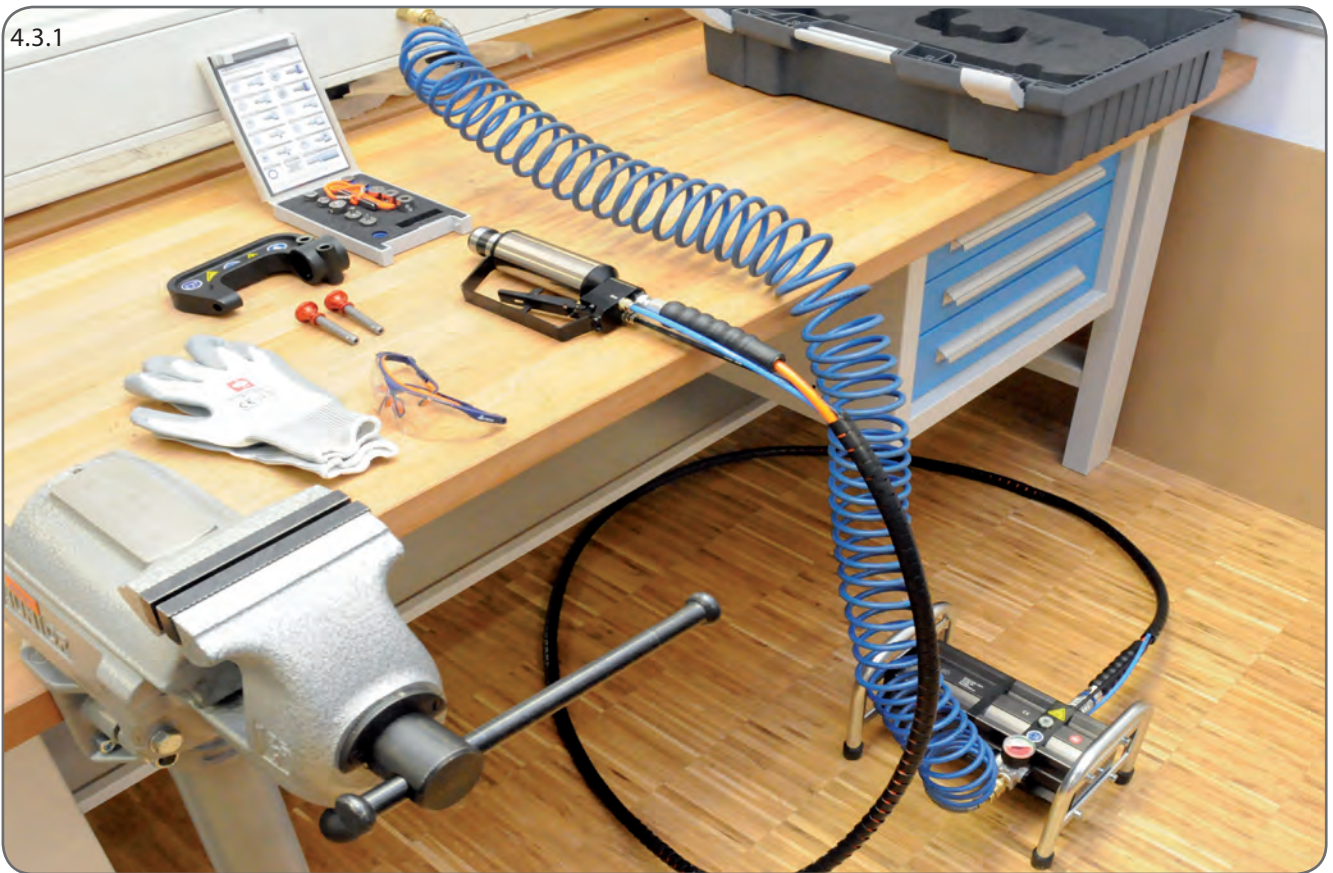
Connect compressed air to the pressure regulating valve and set the pressure.



4.2.8

Never use pressure over the permitted value of 6 bar or 87 psi. This could cause damage to the equipment or even physical injury.

4.3 Safe Set-Up and Positioning of Equipment



Ensure that the high-pressure pump is always placed on a non-slip surface and that the hoses are routed in a way that prevents them from getting damaged or pinched off. The hoses must also be routed in a way that prevents people from tripping over them.



Make sure that the pump and hydraulic actuator are set up in a work area that is free from heat sources (max. 50°C / 120°F), corrosive liquids, greases and oils.



Before using the equipment, make sure that the pump is standing on a secure surface.

4.3.2



4.3.3



4.4 Connecting the Tool to the Hydraulic Actuator

4.4.1



4.4.2



4.4.3



4.4.4



4.4.1/4.4.2

Select tool and prepare locking pins. The tool is carefully pushed onto the mounting adapter by the mounting hole. The indexing pin in the mounting adapter must engage in the corresponding slots in the mounting hole.

4.4.3./4.4.4/4.4.5

The two locking pins are inserted into the locking holes with the release button pressed.

The tool must be pressed gently in the direction of the clamp while doing so. The pin must lock automatically once inserted and must not fall out of the locking hole by itself.

The tool is now ready for use.

4.4.5



Warning!

The mounting adaptor on the hydraulic actuator must be clean and free from damage!

The locking bolts must also be free from contamination and damage.

The mounting hole in each tool must be free from contamination and damage!



Warning!

Damaged or defective locking pins must not be used!

4.5 Riveting Tool Kit RIVKIT UN 2.0 – Fitting and Intended Use

4.5.1



4.5.2



Three rivet clamps are currently available for use with the RIVKIT UN 2.0 riveting tool kit:

Rivet clamp	Art. No.	Opening depth
NB 40 ¹	45708	up to 40 mm
NB 115	45711	up to 115 mm
NB 230	45712	230 mm

¹Included in the basic kit

4.5.3



4.5.4



4.5.1/4.5.2

Screw the riveting tool needed for the working process into a holder in the rivet clamp as required. Hand-tighten the riveting head using the special spanners provided. Do not use force. Counterhold the nut using a screwdriver if necessary.

4.5.3/4.5.4

Screw the corresponding counterpart to the rivet insert into the opposite side of the rivet clamp (plunger rod) with the spacing bushing and bolt, and hand-tighten. Do not use force!



Each time rivet inserts are to be fitted, the bolt and die must be checked for a correct match first!

Refer to the usage matrix in the RIVKIT UN 2.0 case for details.



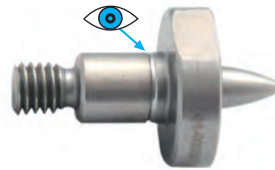
Check that the riveting heads are firmly seated after each riveting operation. Rivet inserts that have come loose present a hazard and can lead to destruction of the equipment.

5.1 Pressing out Rivets

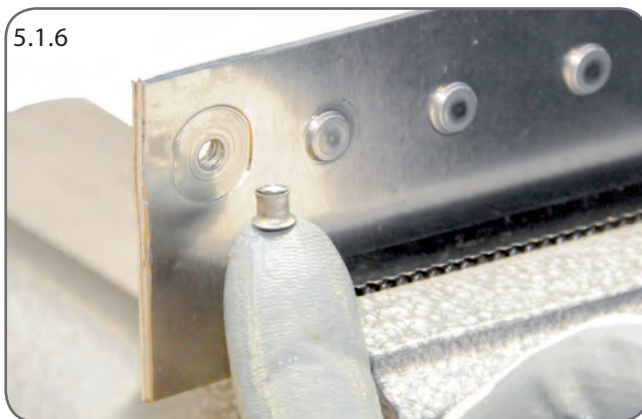
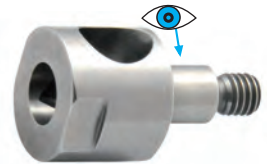


Kit 45718:

5.1.2 01-00000788



5.1.3 01-00000784



Old or defective rivets often need to be removed from the sheet metal structure when repairing body panels.

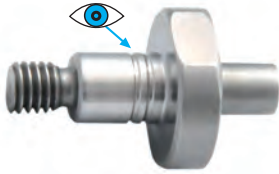
5.1.1 – 5.1.6

To avoid having to drill out these rivets, the old rivet can be pressed out of the sheet metal structure using the extraction mandrel art. no. 01-00000788 and extraction die art. no. 01-00000784 (kit 45718), thereby minimising damage.

5.2 Punching and Calibration of Holes for Flow Form Rivets

Kit 45717:

5.2.1 01-00000922



5.2.2 01-00000923



5.2.3



5.2.1 – 5.2.5

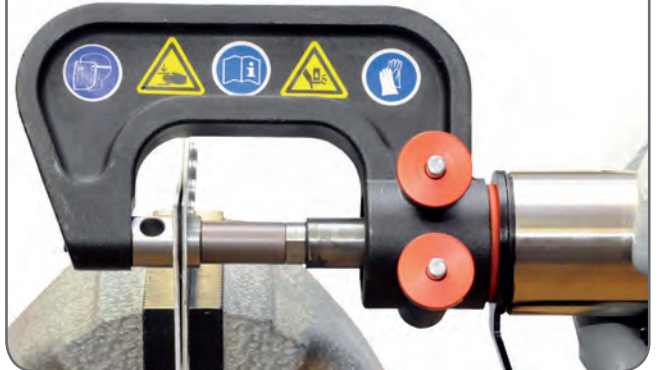
There is no need to drill holes in sheet joints when using flow form rivets. Punch art. no. 01-00000922 and punch die art. no. 01-00000923 (kit 45717) enable precise hole punching and simultaneous calibration of rivet holes.



Warning!

The punch will be stuck in the sheets to be joined after punching. A wobbling movement of the riveting tool (hydraulic actuator and clamp) frees the punch, allowing it to be drawn back out of the sheets.

5.2.4



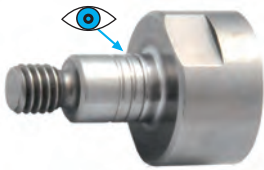
5.2.5



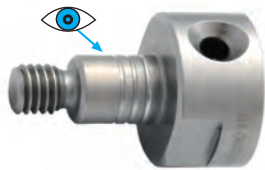
5.3 Setting of Flow Form Rivets

Kit 45716:

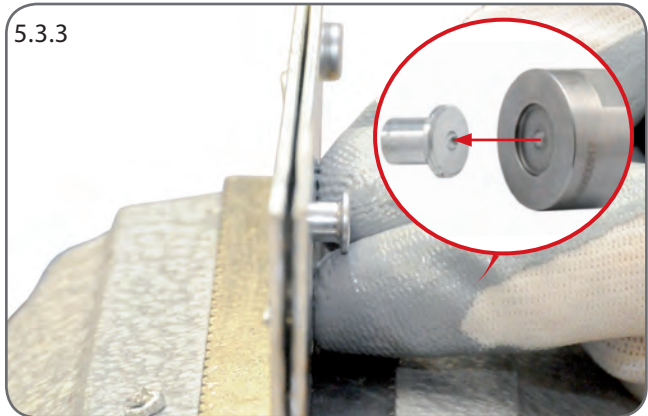
5.3.1 01-00000917



5.3.2 01-00000918



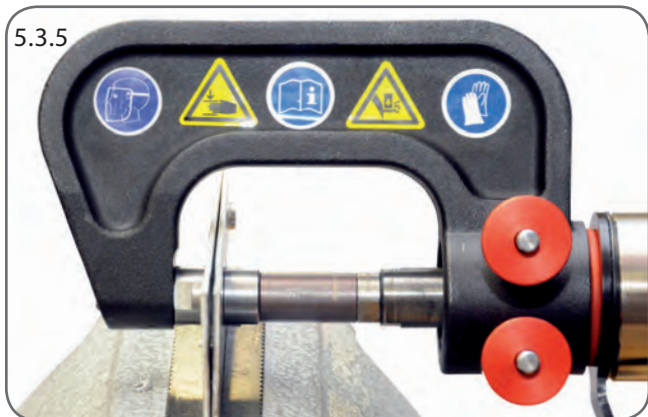
5.3.3



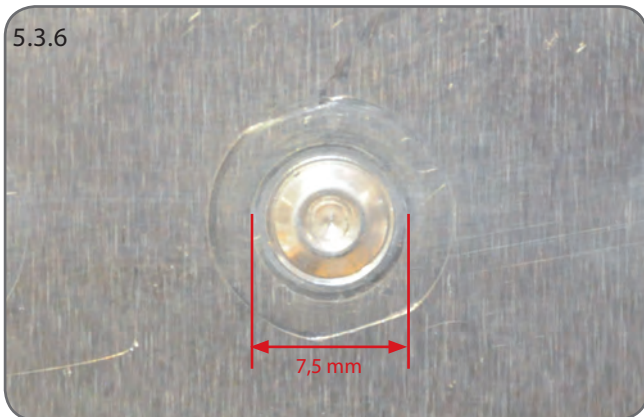
5.3.4



5.3.5



5.3.6



5.3.1, 5.3.2

The flow form rivets are installed using the setting head art. no. 01-00000917 and corresponding closing head art. no. 01-00000918 (kit 45716) intended for this purpose.

5.3.3

It is important that the setting head with the centring lug engages into the corresponding depression in the rivet.

5.3.4 – 5.3.6

During the riveting operation, the setting head is positioned on the rivet until the closing head upsets and hardens the rivet. The diameter of the closing head should be at least 7.5 mm for a 6-mm rivet.

The closing head has a relief hole for adhesive residue. The hole must be blown clear after riveting, otherwise a stable riveting process can no longer be ensured.

5.4 Installation of Semi-Tubular Punch Rivets

Kit 45714:

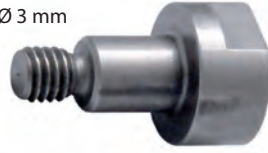
5.4.1 BGR-TKR-00000244

Ø 3 mm



5.4.2 01-00000707

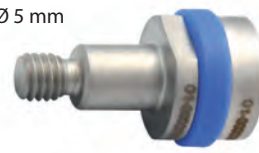
Ø 3 mm



Kit 45715:

5.4.3 BGR-TKR-00000245

Ø 5 mm



5.4.4 01-00000706

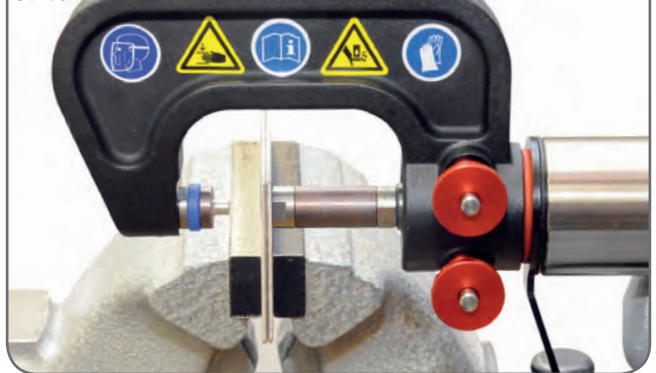
Ø 5 mm



5.4.5



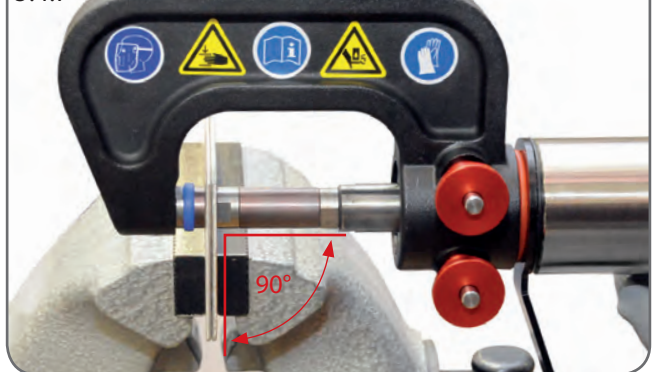
5.4.6



5.4.1 – 5.4.4

Extra care must be taken to ensure that the rivets that are used are properly seated when installing semi-tubular punch rivets. Setting head art. no. BGR-TKR-00000244 (3 mm) / art. no. BGR-TKR-00000245 (5 mm) and closing head art. no. SER-SNW-00000007 (3 mm) / art. no. 01-00000706 (5 mm) must not be damaged, as this would make correct riveting impossible. If in doubt, always replace the defective rivet punch with genuine replacement parts (3 mm: kit 45714, 5 mm: kit 45715).

5.4.7



5.4.6, 5.4.7

For each riveting operation, ensure that the rivet die rather than the rivet is placed onto the sheets to be joined. In addition, the rivet clamp should be placed onto the sheets to be joined as close to a right angle as possible.

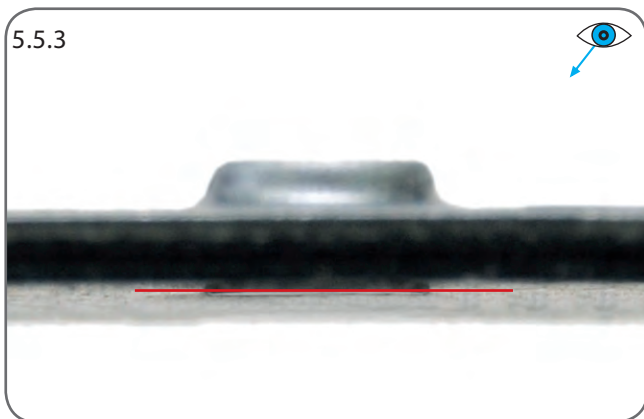
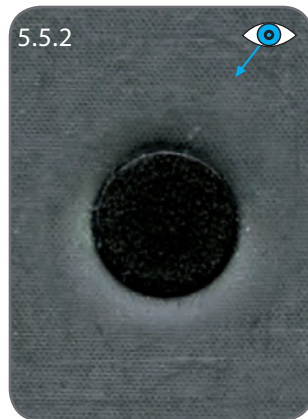
5.4.8



5.4.9



5.5 Checking Riveting Results



5.5.1 – 5.5.3

The results must be checked after the riveting operation. If the installed rivet does not meet quality requirements, the reason for the fault must be determined.

If the quality of the installed rivet is acceptable, the work process can be repeated.



After each riveting operation, check that the rivet mandrel and rivet die are firmly seated. Should they have come loose, they must be re-tightened using the spanners from the RIVKIT.

5.6 Cleaning the Riveting Tools



5.6.1

Remove adhesive residue from all contaminated tools after each completed riveting operation.

5.6.2

To do this, remove all affected tool components and clean using acetone or other solvents.



If adhesive residue is allowed to remain on the riveting tool, it will eventually cause a malfunction. Before starting work, any rivet punches requiring replacement must be replaced with genuine replacement parts.



5.7 Completing an Operation and Riveting Tool Storage



5.7.1

Always disconnect the compressed air supply from the pump after riveting and during work interruptions.

5.7.2

Then disconnect the control hoses and seal the openings.



Make sure that the disconnected hoses never make contact with the dirty floor or the ground.



5.7.3

Before and after each operation, check the system for oil leaks. An oil leak indicates a fault in the system. In this case, discontinue work and locate the fault, or hand the equipment in for repair at an authorised specialist dealer.



Foreign bodies or contamination in the hydraulic oil or in the control lines could cause the equipment to malfunction.

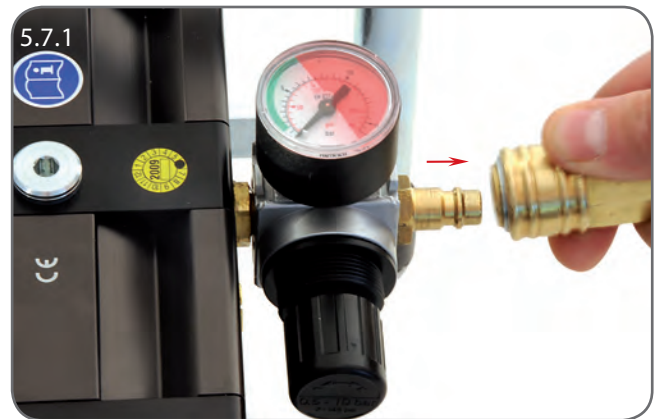


5.7.4/5.7.5

Always store the tool in the transport case designed for this purpose. Make sure that the hoses do not become kinked!



Never transport the tool by the hoses!



6.1 Hydraulic pump maintenance

6.1.1



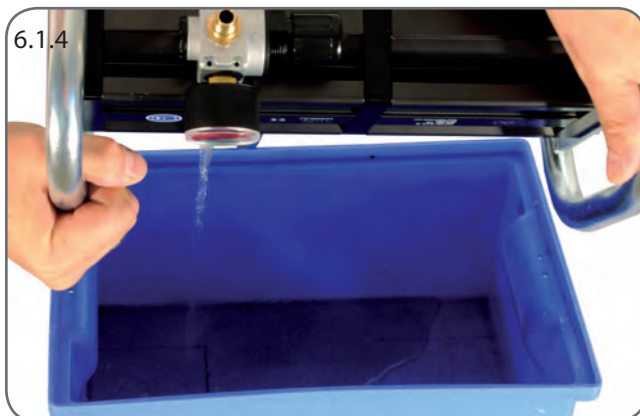
6.1.2



6.1.3



6.1.4



6.1.5



6.1.6



6.1.2 – 6.1.4 Draining oil

Undo the sealing plug on the top of the pump and let the used hydraulic fluid flow into a suitable container.

6.1.5, 6.1.6 Filling oil

Fill with fresh oil that complies with the specifications. The nominal filling volume is around 280 ccm/9,86 fl oz.

6.1.7, 6.1.8

The oil level should reach the filler port when filling, but the thread of the sealing plug must remain visible. Re-seal the filler port with the sealing plug.



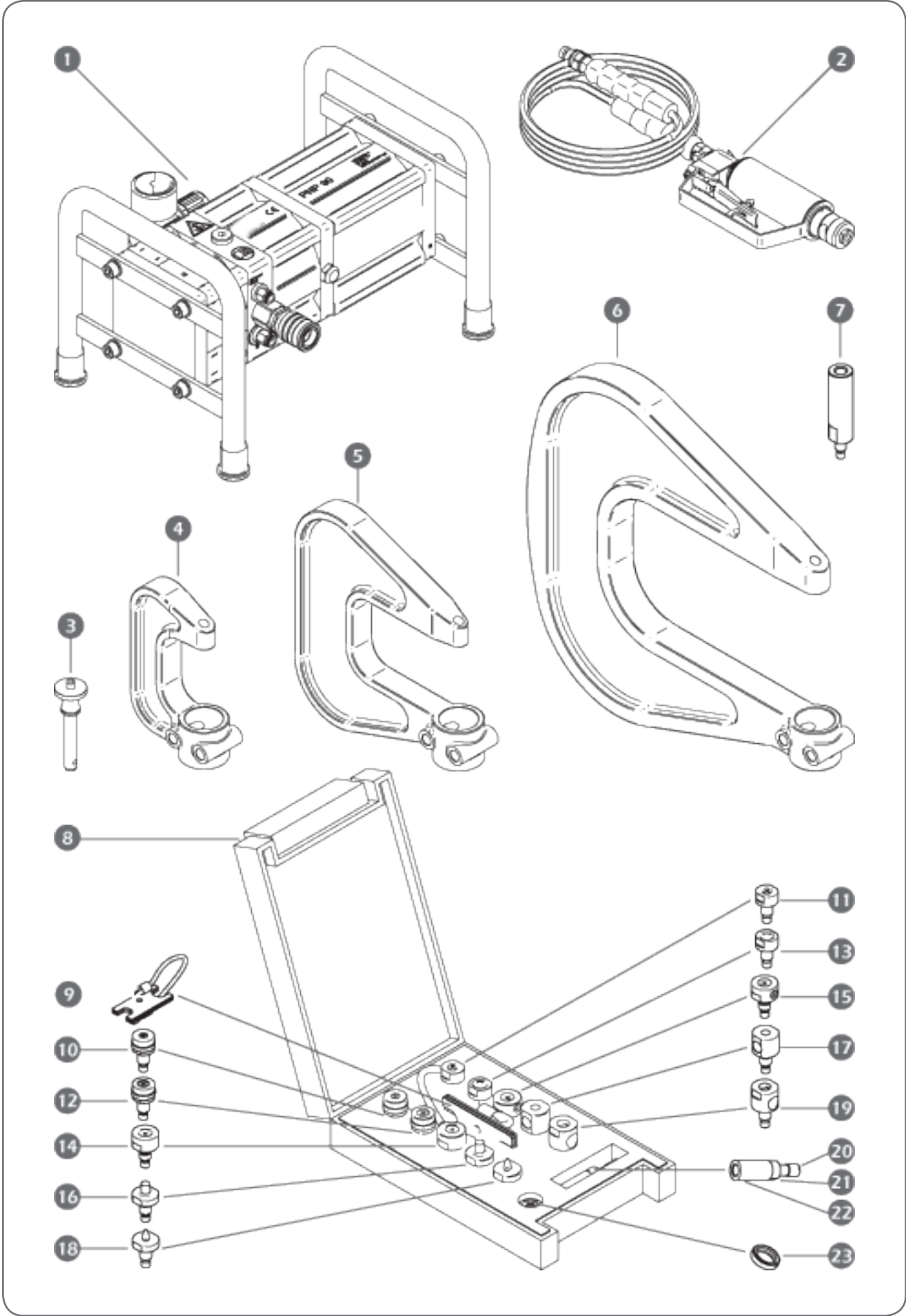
Note that the oil must be free from contamination. Make sure that no dirt or foreign bodies enter the pump reservoir when changing oil!

6.1.7



6.1.8





6.2 Replacement Part List

Pos.-No.	Art.-No.	Title
1	45705	PNP 90 pressure intensifier (pump)
2	45706	Hydraulic actuator HP 35 UN
3	45707	Ball lock pin
4	45708	Rivet clamp NB 40
5	45711	Rivet clamp NB 115 (including toolbox)
6	45712	Rivet clamp NB 230 (including toolbox)
7	(composed of pos. 6 + 7)	Spacer
7	45754	Spacer

Pos.-No.	Art.-No.	Title
8	45709	Rivet insert repair kit (complete)
9	45713	Spanner kit
10	45714	Rivet bolt Ø 3 mm
11	(composed of pos. 10 + 11)	Rivet die Ø 3 mm
12	45715	Rivet bolt Ø 5 mm
13	(composed of pos. 12 + 13)	Rivet die 5 mm
14	45716	Flow form bolt
15	(composed of pos. 14 + 15)	Flow form die
16	45717	Punch Ø 6 mm
17	(composed of pos. 16 + 17)	Punch die Ø 6 mm
18	45718	Extraction mandrel
19	(composed of pos. 18 + 19)	Extraction die
20	45719	Bushing
21	(composed of pos.	Spacing bolt
22	20 + 21 + 22)	Spacing sleeve
23	45720	Elastomer ring

6.3 Troubleshooting

Problem	Cause	Remedy	Page
Pump does not run	No air connected	Connect compressed air	16
	Control lines not connected or incorrectly connected	Connect control lines correctly and make sure they are properly seated	15
	Insufficient air pressure	Check air supply	16
	Hydraulic hose not connected	Connect hydraulic hose as described in the instruction manual	15
	Air pressure not correctly set	Set air pressure to prescribed value	16
	Defective drive piston	Repair through manufacturer	–
Hydraulic pump will not shut off	Control hoses incorrectly connected or mixed up	Connect control hoses as described in the instruction manual	15
	Defective control valves	Repair through manufacturer	–
Rivet not affixed correctly	Rivet mandrel or rivet die defective	Replace rivet mandrel or rivet die	20
	Rivet mandrel or rivet die not functional due to adhesive residue	Clean or replace rivet mandrel and/or rivet die	24
	Insufficient press pressure	Too little air pressure or air pressure incorrectly set	16
	Press cylinder does not travel far enough	Too little oil in the pump. Check oil level and top up if necessary.	26
	Oil leak from the pump	Repair through manufacturer	–
	Air leak from the pump and/or control valve	Repair through manufacturer	–
	Wrong rivet length	Observe repair guidelines	–
The rivet plunger travels too slowly or not at all	Too little oil in the pump	Check oil level and top up if necessary	26
	Hydraulic seal in the pump is worn	Repair through manufacturer	–
	Defect valves in the pump	Repair through manufacturer	–
Air leak	Defective hose	Replace hose	–
	Defective couplings	Replace coupling	–
	Defective seals	Repair through manufacturer	–
Oil leak	Defective hose	Replace hose	–
	Defective coupling	Replace coupling	–
	Pump loses oil	Repair through manufacturer	–

6.4 Declaration of Conformity



ORIGINAL

EC DECLARATION OF CONFORMITY

We

CAR-O-LINER AB
Box 7
SE-736 21 KUNGSÖR
SWEDEN

herewith declare under the sole responsibility that the product:

Type of equipment: **Pneumatic/hydraulic stamping and riveting tool**

Model **PNP 90 UN 2.0**

Serial number(s):

is in conformity with the provisions of the following EC directive(s):

2006/42/EG **Machine Directive**

References of harmonized standards applied for this EC declaration of conformity, or parts thereof:

Tool Safety Law (GPSG)	German Equipment and Product Safety Law for Consumer Products
EN 693	Machine tools, Safety Hydraulic presses
EN 792-1; EN 792-13	Hand-held non-electric power tools – Safety requirements
EN ISO 4413	Hydraulic fluid power - General rules and safety requirements for systems and their components
EN ISO 4414	Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 11200; ISO 11202	Acoustics - Noise emitted by machinery and equipment
EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction

(Place and date of issue)

(Name, signature and title or equivalent marking of authorized person)



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Car-O-Liner products are well known for their high quality, advanced technology and ergonomic design.

Car-O-Liner belongs together with Josam to the Alignment Systems Group, Josam focusing on heavy-duty vehicles and Car-O-Liner on cars and light trucks.

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