Pneumatic, hydraulic Universal Riveting Tool PNP 90 UN 2.0

Instruction manual

Art.-No. CHR2301

Translation of the original instructions

Accessories and spare parts:
http://www.chiefautomotive.com

1.1 Information regarding this manual

Information
Legislation stipulates that workers handling hydraulically-driven riveting tools must be protected. Contact Chief Automotive for information.

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 the 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

Some sections of this instruction manual use internationally known warning symbols, warning notes and general instructional symbols.

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

Observe
Instruction manual

Observe
General instructions

Wear face mask

Wear gloves

Warning!
General source of danger

Warning!
Hand could become trapped

Warning!
Fingers could become trapped

Warning!
Danger of environmental contamination

Warning!
System under pressure

Please note the following!

Arrow to clarify compression

Arrow showing direction

For further information see chapter...

Audibly engage

1.3 Designations

Designations on the stamping and riveting tool

1.3.1

A	Type designation
B	Serial number
C	Production date
D	Maximum permissible operating pressure (oil)
E	Label
F	Symbol to read the instruction manual

2.1 Operating principles

The pneumatic/hydraulic universal tool PNP 90 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 assembly. 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 a hydraulic output pressure of 600 bar is generated with an input air pressure of 6 bar. When the equipment's preset 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 depressurized.

The two pneumatic control lines are also connected to the pump. Make sure that the black and the blue hoses are inserted in 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 CHR2301

2.2.2 CHR2204

2.2.3 CHR2203

Scope of supply complete kit PNP 90 UN 2.0
Art.-No. CHR2301

1x Pressure intensifier PNP 90
1x Hydraulic actuator HP 35 UN
1x Hose package
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. CHR2204
1x Rivet clamp NB 230, Art.-No. CHR2203

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 mm²/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	LPAI < 75 db(A)
Vibration emission value	a < 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 accident prevention.

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

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

As a result, there is a risk of severe physical 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 (41°F) and up to a maximum of 50°C (122°F).
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.

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 oil 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).

Period of time	Maintenance work
Every 6 months or if required	External cleaning by the customer
	Check oil level and top up oil if required
After 12 months	Oil change
24 months	Complete maintenance

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 Chief Automotive Technologies. For further information on servicing and training, please contact us at our Service address:

Chief Automotive Technologies
Service
996 Industrial Drive
Madison, IN 47250
Phone: 800-445-9262
Fax: 866-275-0173

Accessories and spare parts:
http://www.chiefautomotive.com

2.6 Warranty

Stamping and riveting tools from Chief Automotive Technologies 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 authorized 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, Chief Automotive Technologies will only repair or replace faulty parts at its own discretion.

Your supplier and service partner:

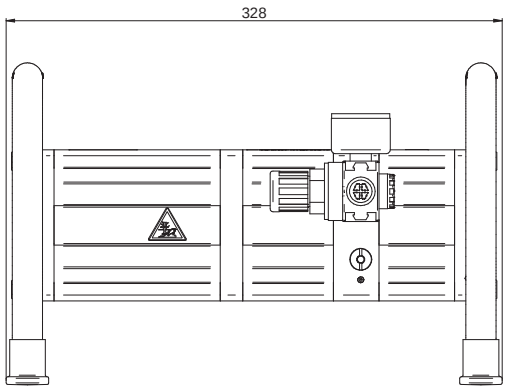
Chief Automotive Technologies
Service
996 Industrial Drive
Madison, IN 47250
Phone: 800-445-9262
Fax: 866-275-0173

Accessories and spare parts:

http://www.chiefautomotive.com

3.1 Technical Data Pump PNP 90 UN 2.0

3.1.1



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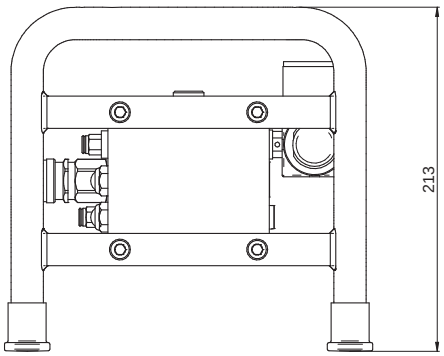

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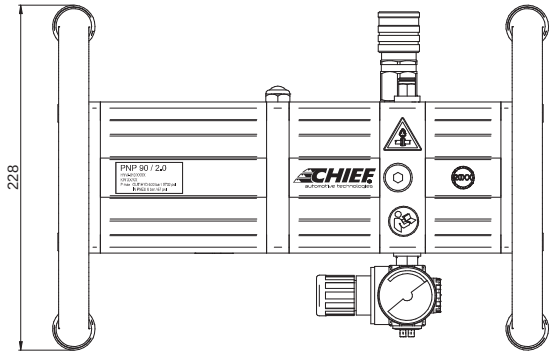
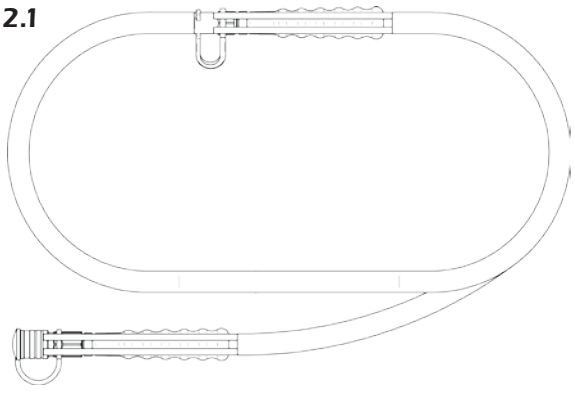


Pump PNP 90 UN 2.0

Length	330 mm
Width	230 mm
Height (incl. handle)	213 mm
Weight	7.665 kg
Max. input pressure	6 bar
Max. operating pressure	600 bar

3.2 Technical Data, Hose package

3.2.1

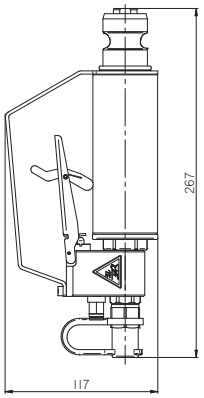


Hose package

Hose length	365 mm
Hose Ø	ca. 20 mm
Weight	1.100 kg

3.3 Technical Data, Hydraulic Actuator HP 35 UN

3.3.1



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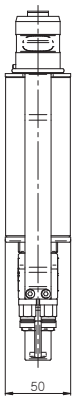
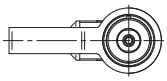


3.3.3

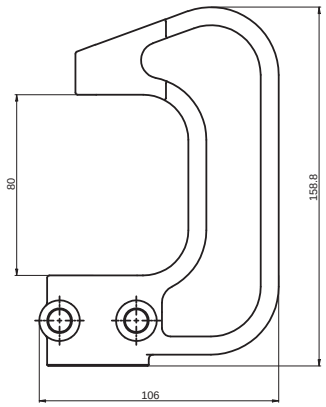


Hydraulic actuator HP 35 UN

Length	267 mm
Width	50 mm
Height (incl. handle)	117 mm
Weight	2.310 kg
Max. operating pressure	600 bar
Travel	15 mm

3.4 Technical Data, Rivet Clamp

3.4.1



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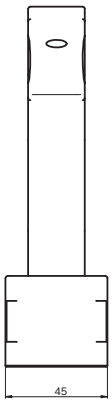

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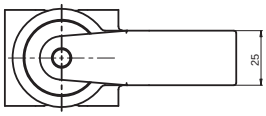
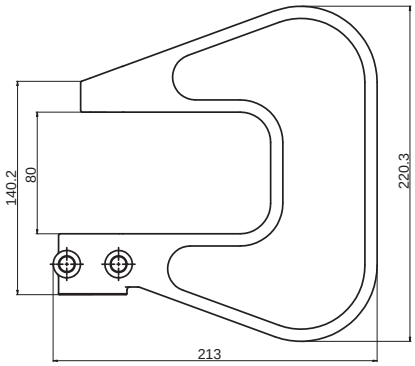


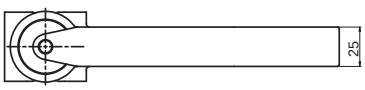
Rivet clamp NB 40

3.4.4



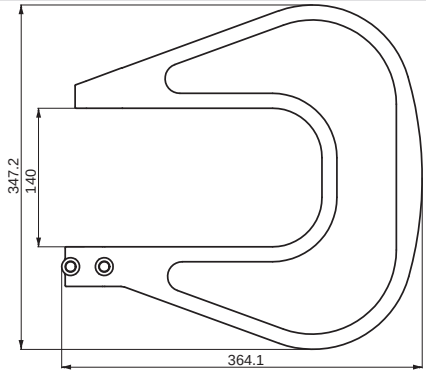
3.4.5

3.4.6



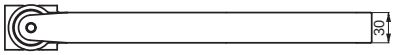
Rivet clamp NB 115

3.4.7



3.4.8

3.4.9



Rivet clamp NB 230

Technical data

	Rivet clamp NB 40[1]	Rivet clamp NB 115	Rivet clamp NB 230
Part number	CHR2405	CHR2204	CHR2203
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

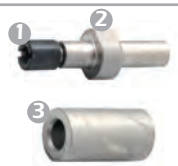
*Length and weight without hoses

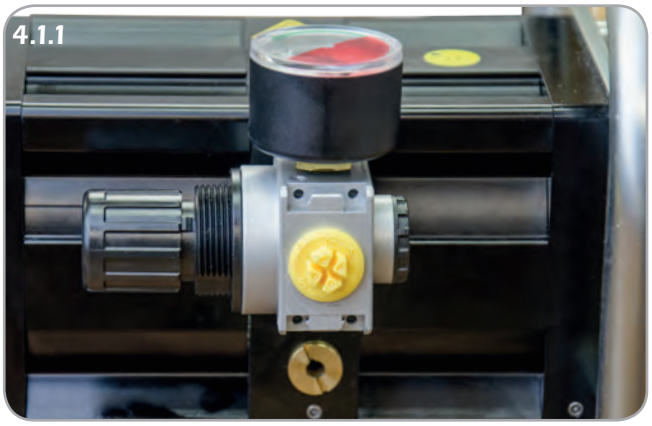
[1]Included in the basic kit

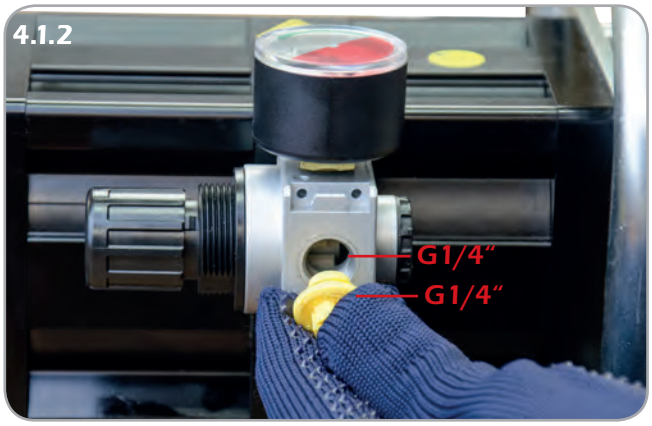
3.5 Technical Data, Riveting Tool Kit RIVKIT UN 2.0

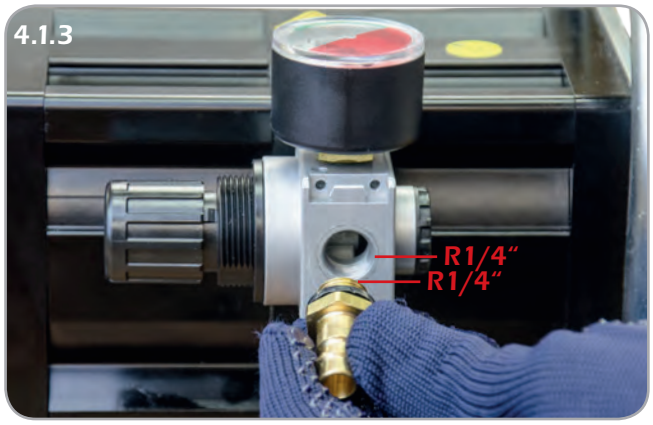
3.5.1 CHR2403

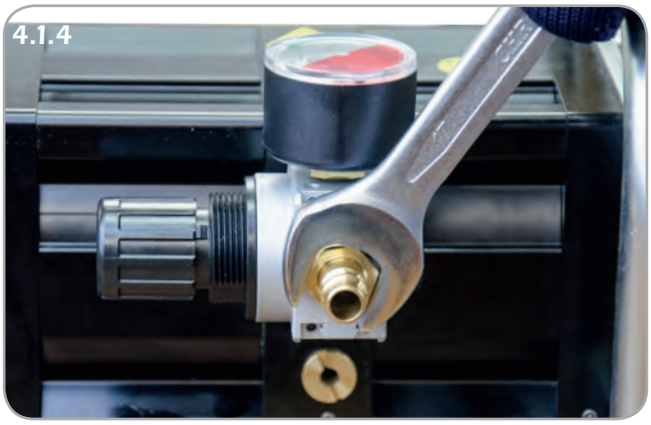
Riveting Tool Kit RIVKIT UN 2.0

Kit number	Item/Description/Article number		Item/Description/Article number	
Set: CHR2403-3	**A** Setting head, 3 mm rivet		**B** Closing head, 3 mm rivet	
Set: CHR2403-4	**C** Setting head, 5 mm rivet		**D** Closing head, 5 mm rivet	
Set: CHR2403-6	**E** Setting head, flow form rivet Marked with 3 rings		**F** Closing head, flow form rivet Marked with 3 rings	
Set: CHR2403-7	**G** Punch and calibration mandrel Marked with 2 rings		**H** Punch and calibration die Marked with 2 rings	
Set: CHR2403-8	**I** Extraction mandrel Marked with 1 ring		**K** Extraction die Marked with 1 ring	
	L Replacement elastomer rings CHR2403-1		**M** Set of fitting spanners CHR2403-2	
Set: CHR2403-5	**N** Spacing adaptor composed of:: **1** Bushing **2** Spacing bolt **3** Spacing sleeve			







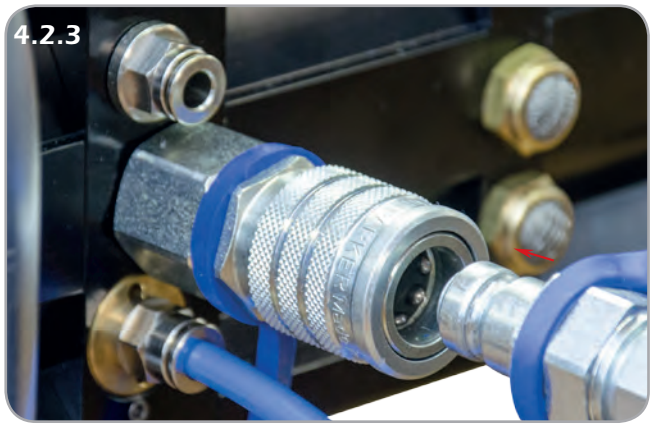


The equipment is supplied from the factory without a compressed air connection. The pressure regulator has a G1/4“ (internal thread) connection thread.

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 Hydraulic Actuator Connection



4.2.5

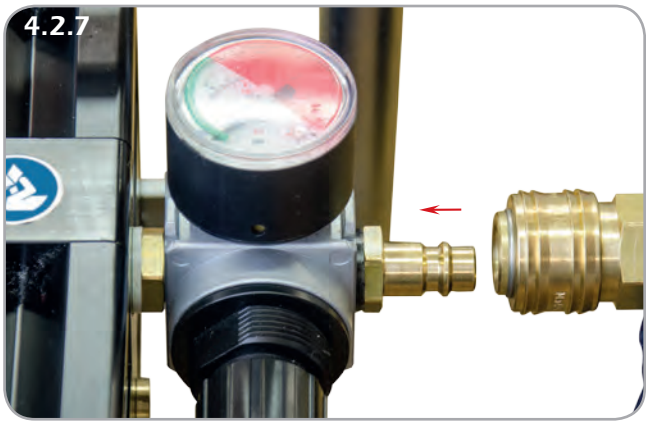
Connect the pneumatic hoses. Make sure that the black hose is attached to the marked coupling.

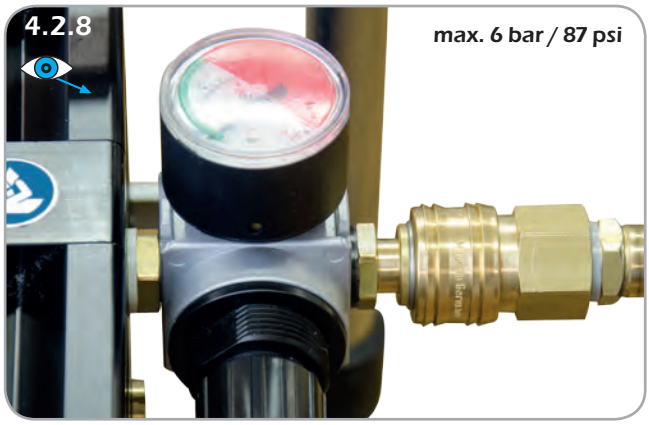
Before using the equipment, check the condition of the hydraulic actuator with add-on component and hoses. Risk of severe physical injury if the pump or the rivet clamp is damaged.

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.





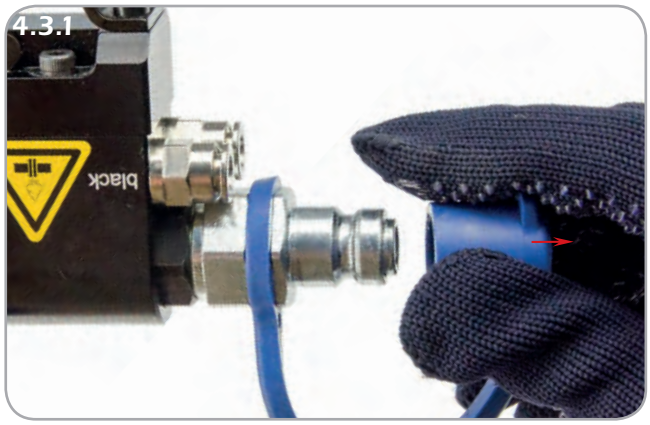
4.2.7

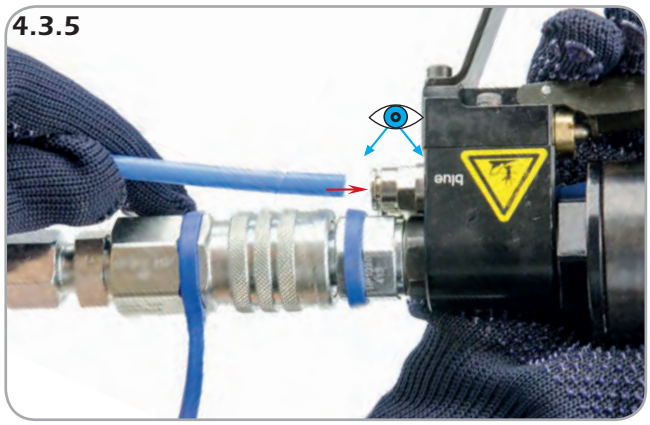
Connect compressed air to the pressure regulating valve and set the pressure.

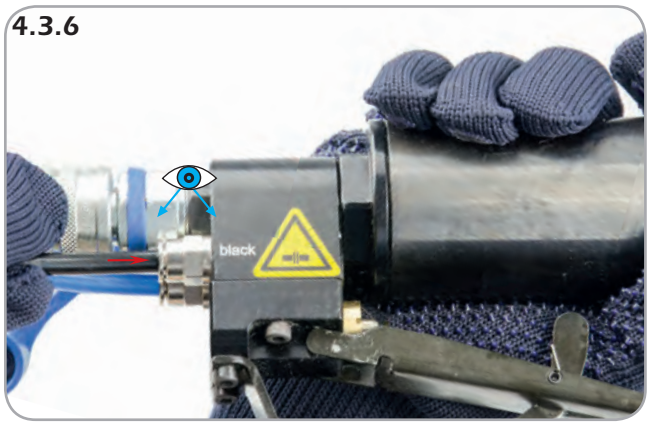
4.2.8

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

4.3 Connecting the Hydraulic Actuator to the hose





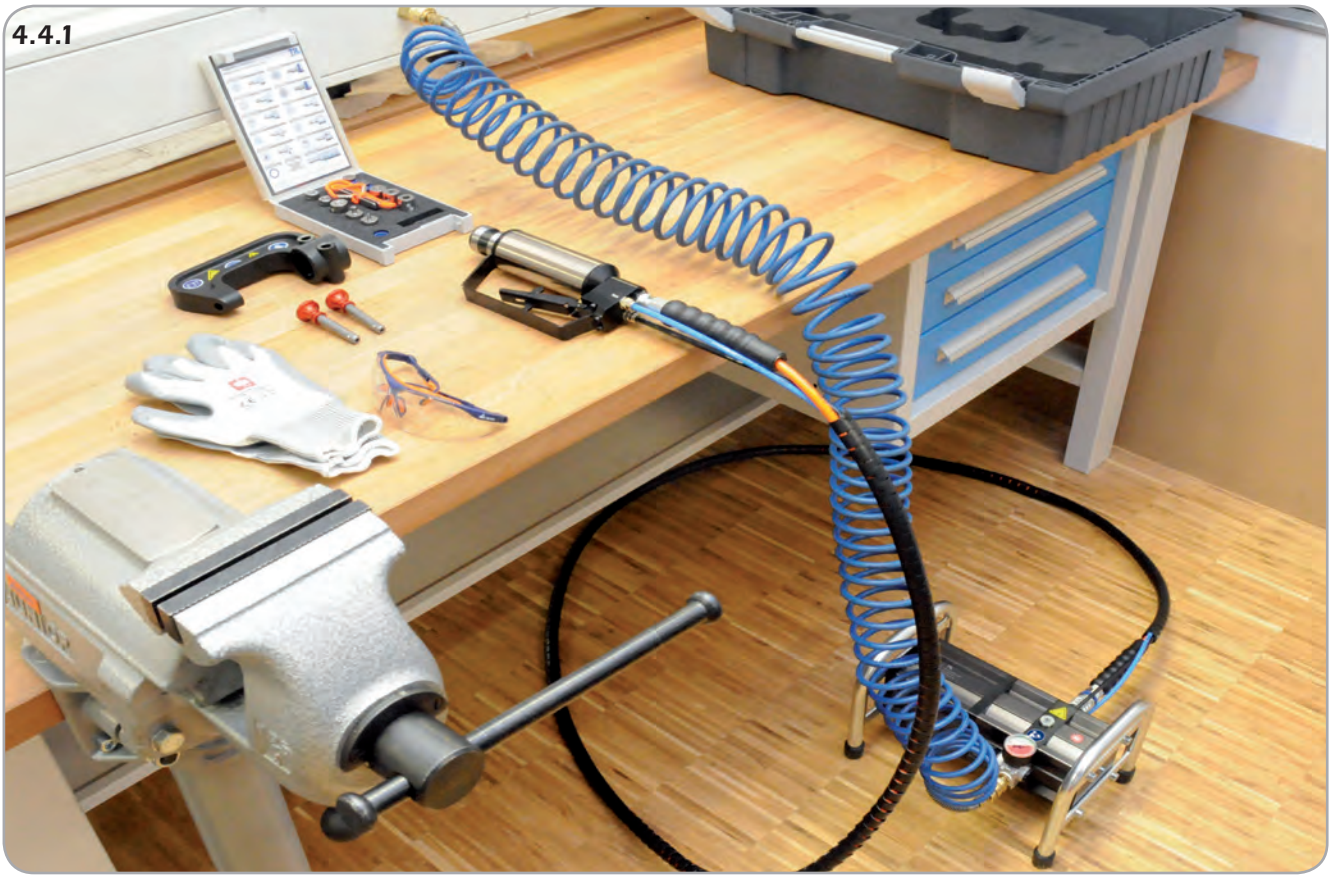


4.3.1/4.3.2
The operating unit and both hose package connections are provided with protective caps. Remove the protective caps from the corresponding couplings.

4.3.3/4.3.4
Connect up the operating unit and the hose by pulling back the quick-release coupling and holding it as it is pushed on. When the quick-release coupling is released the connection is locked.

4.3.5/4.3.6
When connecting the pneumatic control hoses, make sure that the black hose is attached to the coupling indicated. The pneumatic hoses must be inserted right up to the stop.

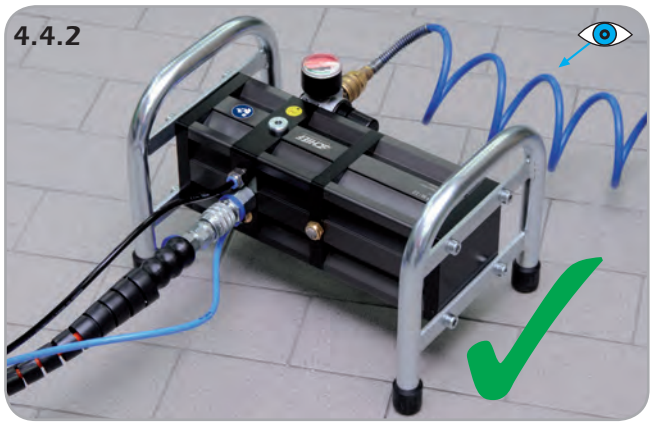
4.3 Safe Set-Up and Positioning of Equipment



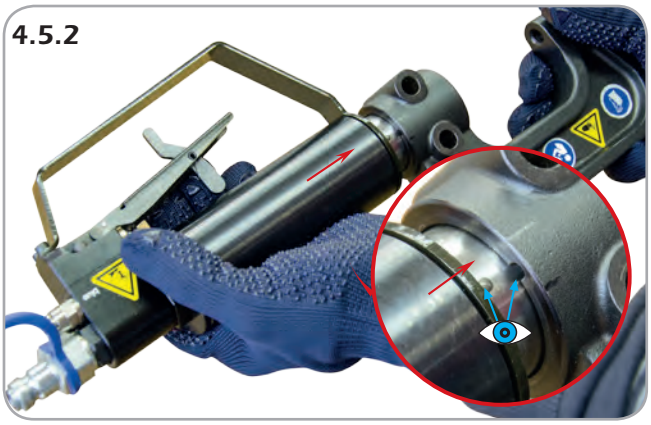
Ensure that the high-pressure pump is always placed on a non-slip surface and that the hoses are routed in a way that prevents them from getting damaged or pinched off. The hoses must also be routed in a way that prevents people from tripping over them.

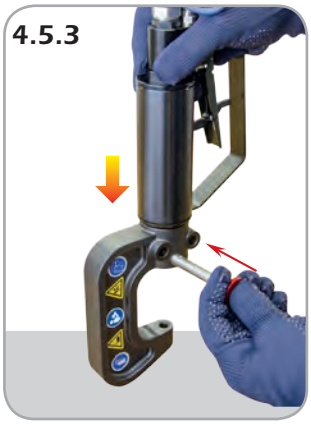
Make sure that the pump and hydraulic actuator are set up in a work area that is free from heat sources (max. 50°C / 120°F), corrosive liquids, greases and oils.

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



4.5 Connecting the Tool to the Hydraulic Actuator





4.5.1/4.5.2

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 adaptor must engage in the corresponding slots in the mounting hole.

4.5.3./4.5.4/4.5.5

The two locking pins are inserted in 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.

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!

4.6 Riveting Tool Kit RIVKIT UN 2.0 – Mounting and Intended Use

4.6.1

4.6.2

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

Rivet clamp	Part No.	Opening depth
NB 40[1]	CHR2405	bis 40 mm
NB 115	CHR2204	bis 115 mm
NB 230	CHR2203	230 mm

[1]Included in the basic kit

4.6.3

4.6.1/4.6.2

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 wrenches provided. Do not use force. Counterhold the nut using a screwdriver if necessary.

4.6.4

4.6.5

4.6.3/4.6.4

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

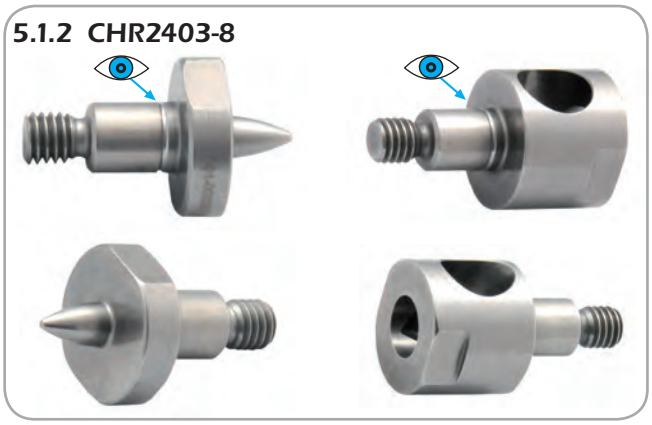
Each time rivet inserts are to be installed, the bolt and die must first be checked for a correct match!
Refer to the usage matrix in the RIVKIT UN 2.0 case for details.

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 equipment damage.

5.1 Pressing out Rivets

5.1.1

5.1.2 CHR2403-8



5.1.3

5.1.4

5.1.5

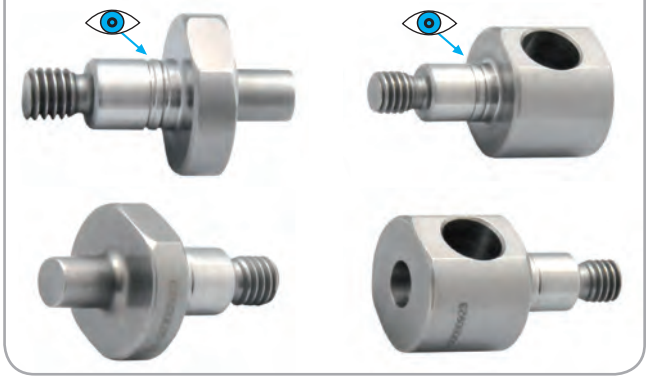
Old or defective rivets often need to be removed from the sheet metal structure when repairing body panels.

5.1.1 – 5.1.5

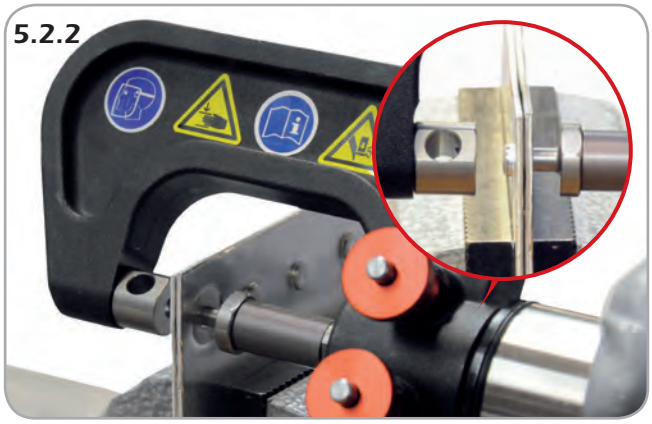
Instead of drilling out the old rivets, they can be pressed out of the sheet metal structure using the extraction mandrel and extraction die (kit CHR2403-8), thereby minimizing damage.

5.2 Punching and Calibration of Holes for Flow Form Rivets

5.2.1 CHR2403-7



5.2.2



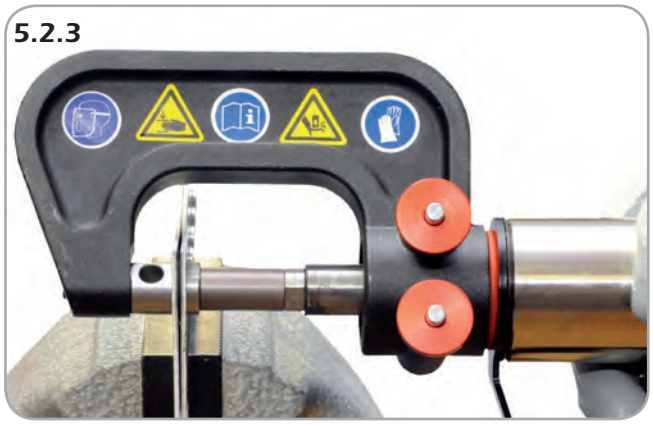
5.2.1 – 5.2.4

There is no need to drill holes in sheet joints when using flow form rivets. Punch and punch die (kit CHR2403-7) enable precise hole punching and simultaneous calibration of rivet holes.

Warning!

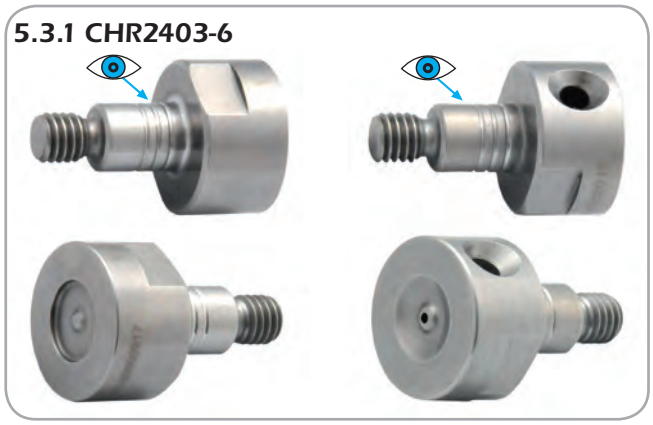
The punch will be stuck in the sheets to be joined after punching. Moving the riveting tool (hydraulic actuator and clamp) back and forth frees the punch, allowing it to be drawn back out of the sheets.

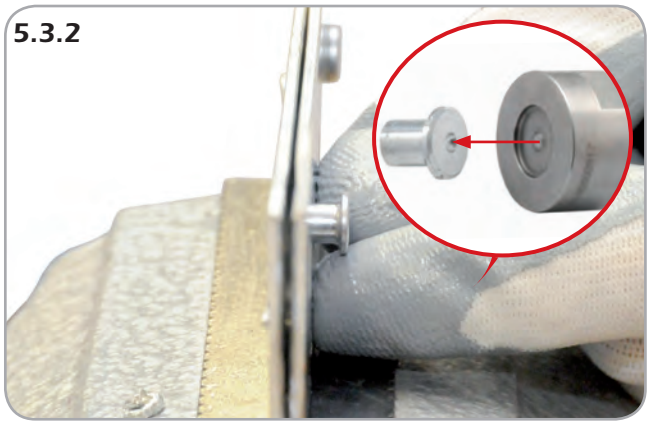
5.2.3

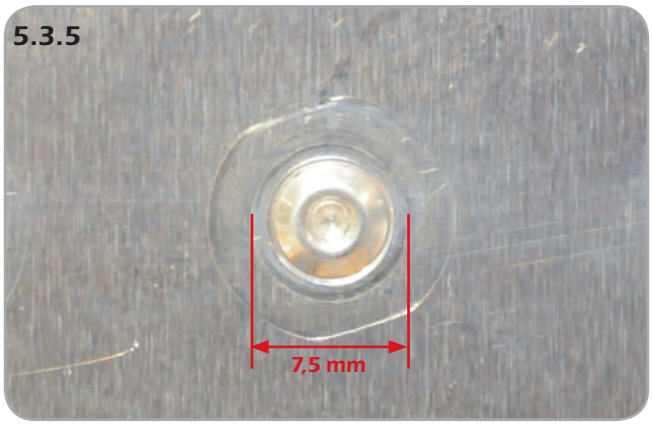


5.2.4

5.3 Setting Flow Form Rivets







5.3.1
The flow form rivets are installed using the die head and corresponding closing head (kit CHR2403-6) intended for this purpose.

5.3.2
It is important that the die head with the centering lug engages in the corresponding depression in the rivet.

5.3.3 – 5.3.5
During the riveting operation, the die 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

5.4.1 CHR2403-3
Ø 3 mm

5.4.2 CHR2403-4
Ø 5 mm

5.4.3

5.4.4

5.4.1 – 5.4.2
Extra care must be taken to ensure that the rivets that are used are properly seated when installing semi-tubular punch rivets. The die head 3 mm / 5 mm and closing head 3 mm / 5 mm must not be damaged because this would make correct riveting impossible. If in doubt, always replace the defective rivet punch with genuine replacement parts (3 mm: kit CHR2403-3, 5 mm: kit CHR2403-4).

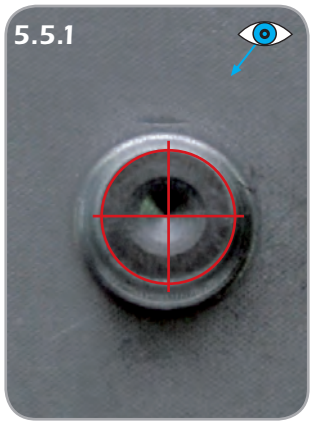
5.4.5

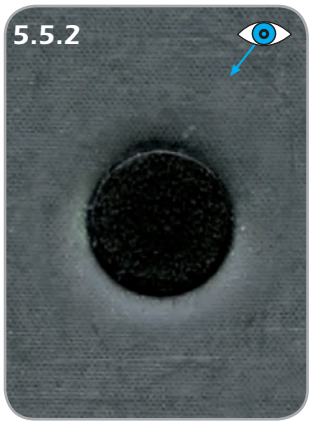
5.4.4, 5.4.5
For each riveting operation, ensure that it is the rivet die – rather than the rivet – that is placed onto the sheets to be joined. In addition, the rivet clamp should be placed onto the sheets to be joined as close to a right angle as possible.

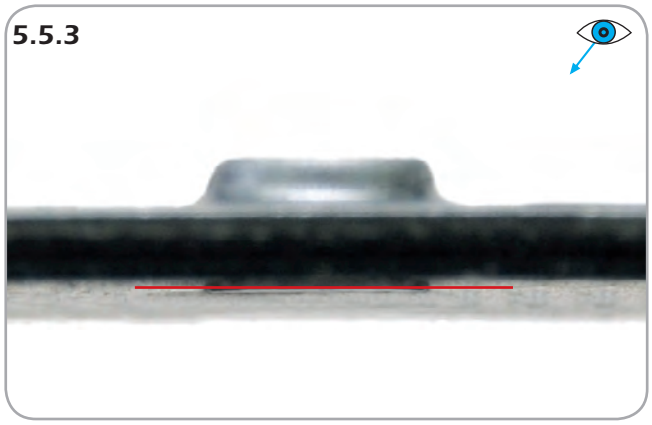
5.4.6

5.4.7

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. If they have come loose, they must be re-tightened using the wrenches 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.

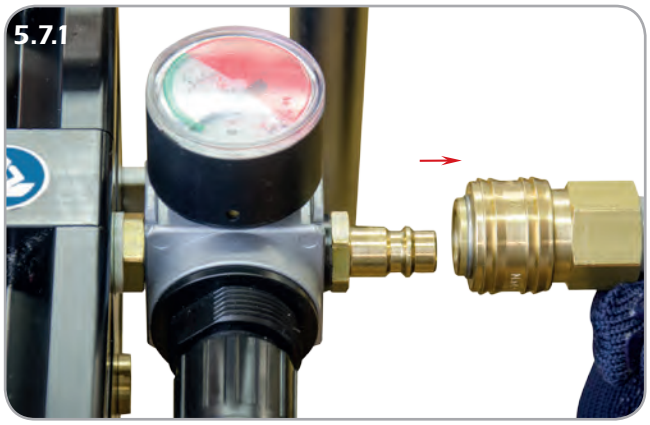
Make sure that the disconnected hoses never make contact with the dirty floor or the ground.

5.7.3
Before and after each operation, check the system for oil leaks. An oil leak indicates a fault in the system. In such cases, discontinue work and locate the fault or submit the equipment for repair at an authorized specialist dealer.

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

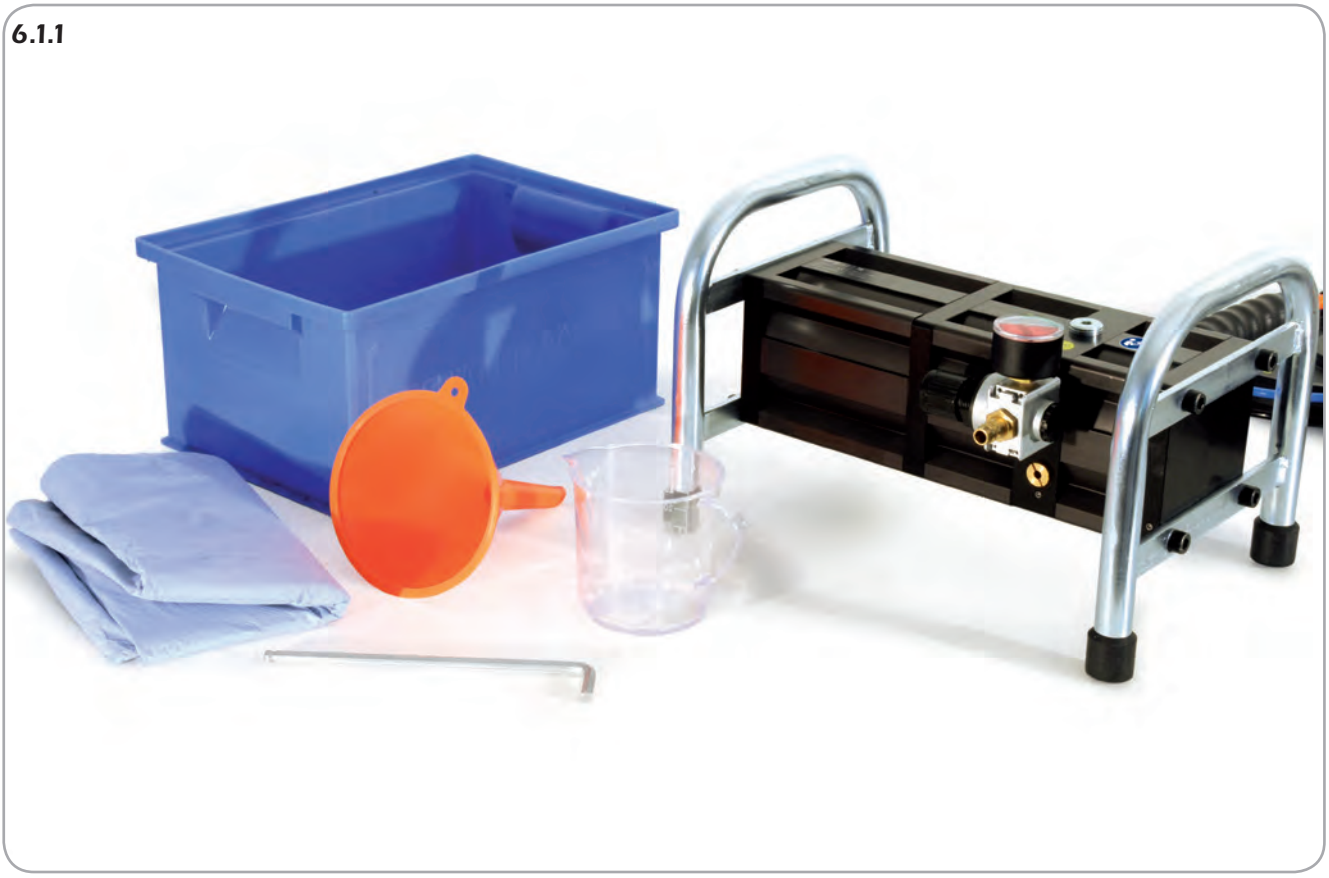
5.7.4/5.7.5
Always store the tool in the transport case designed for this purpose. Make sure that the hoses do not become kinked!

Never transport the tool by the hoses!



6.1 Hydraulic Pump Maintenance

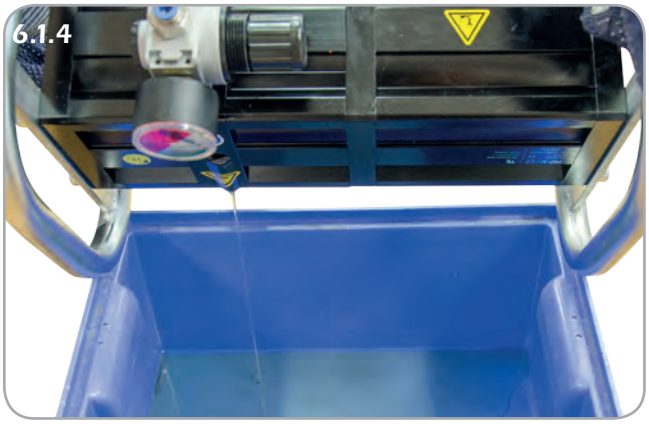
6.1.1



6.1.2

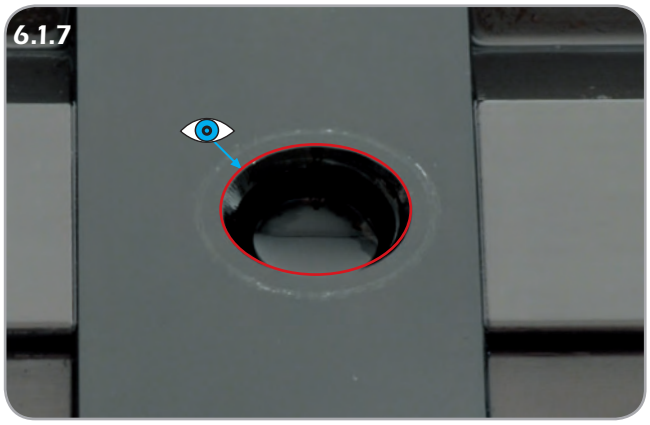
6.1.3

6.1.4



6.1.2 – 6.1.4 Draining oil
Undo the sealing plug on the top of the pump and let the used hydraulic oil flow into a suitable container.

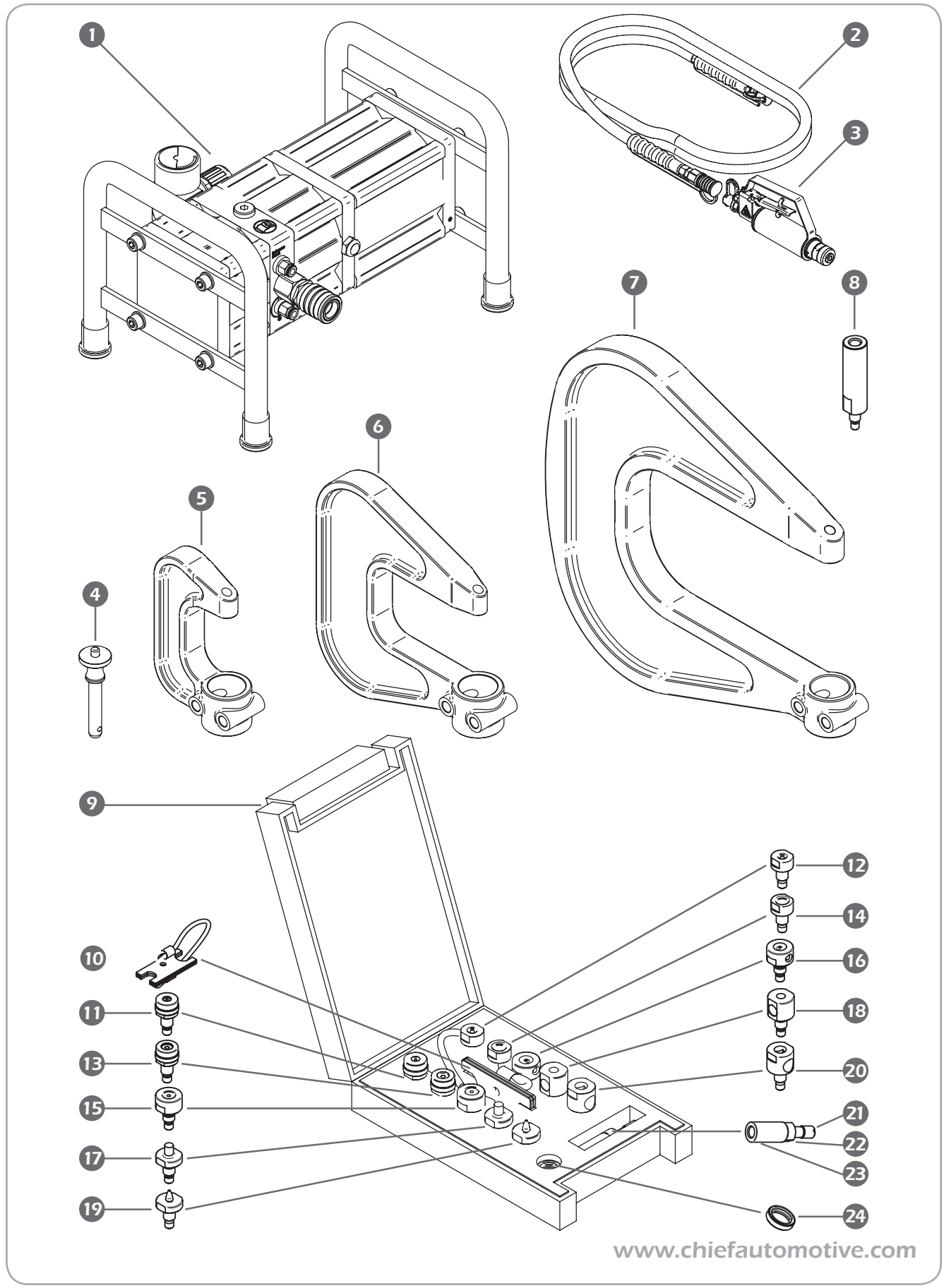
6.1.5, 6.1.6 Filling oil
Fill with fresh oil that complies with the specifications. The nominal filling volume is around 280 cm³/9,47 fl oz.



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!

2.5 Maintenance plan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Pos.-No.	Part No.	Title
1	CHR2402	PNP 90 pressure intensifier (pump)
2	CHR2401	Hose package
3		Hydraulic actuator HP 35 UN
4	CHR2404	Ball lock pin
5	CHR2405	Rivet clamp NB 40
6	CHR2204	Rivet clamp NB 115
7	CHR2203 (composed of pos. 7 + 8)	Rivet clamp NB 230
8		Spacer
8	CHR2203-1	Spacer

Pos.-Nr.	Part No.	Title
9	CHR2403	Rivet insert repair kit (complete)
10	CHR2403-2	Spanner kit
11	CHR2403-3 (composed of pos. 11 + 12)	Rivet bolt Ø 3 mm
12		Rivet die Ø 3 mm
13	CHR2403-4 (composed of pos. 13 + 14)	Rivet bolt Ø 5 mm
14		Rivet die Ø 5 mm
15	CHR2403-6 (composed of pos. 15 + 16)	Flow form bolt
16		Flow form die
17	CHR2403-7 (composed of pos. 17 + 18)	Punch Ø 6 mm
18		Punch die Ø 6 mm
19	CHR2403-8 (composed of pos. 19 + 20)	Extraction mandrel
20		Extraction die
21	CHR2403-5 (composed of pos. 21+22+23)	Bushing
22		Spacing bolt
23		Spacing sleeve
24	CHR2403-1	Elastomer ring

6.3 Troubleshooting

Problem	Cause	Remedy	Page
Pump does not run	No air connected	Connect compressed air	19
	Control lines not connected or incorrectly connected	Connect control lines correctly and make sure they are properly seated	18
	Insufficient air pressure	Check air supply	19
	Hydraulic hose not connected	Connect hydraulic hose as described in the instruction manual	18
	Air pressure not correctly set	Set air pressure to prescribed value	19
	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	18
	Defective control valves	Repair through manufacturer	–
Rivet not affixed correctly	Rivet mandrel or rivet die defective	Replace rivet mandrel or rivet die	23
	Rivet mandrel or rivet die not functional due to adhesive residue	Clean or replace rivet mandrel and/or rivet die	28
	Insufficient press pressure	Too little air pressure or air pressure incorrectly set	19
	Press cylinder does not travel far enough	Too little oil in the pump. Check oil level and fill if necessary.	30
	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 fill if necessary	30
	Hydraulic seal in the pump is worn	Repair through manufacturer	–
	Defective 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 Disposal

Appliances and machinery and components of appliances and machinery must be disposed of in accordance with the laws, regulations and other stipulations of that country in which they are located.

We recommend that disposal be undertaken by licensed professional operators.

6.5 Liability

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Chief makes no written, express or implied warranty whatsoever of merchantability or fitness for a particular purpose or otherwise regarding the equipment or any part of the product other than the limited one-year warranty stated in chapter 2.6.

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