MUBEA
MIW 800

User Manual

Manufacturer: **Muhr und Bender**
Maschinenbau GmbH
Postfach 340
D-5952 Attendorn

Distributor: **MUBEA**
MACHINERY AND SYSTEMS, INC.
8200 Dixie Highway
Florence, Kentucky 41042
Phone : (606) 525-6499 + 6504
Telefax: (606) 525-0078

Preface

In this User Manual you will find all the information necessary for operating and maintaining your **MUBEA MIW 800.**

Before you start working with the **MUBEA MIW 800**, please read this User Manual through thoroughly.

Wherever you see this symbol in this User Manual, it indicates safety regulations, safety instructions and important information **which absolutely must be heeded.**

Note: For representation purposes, some of the illustrations **do not** depict the prescribed safety fixtures. But for working with the **MIW 800**, these safety fixtures must absolutely be installed!

Performing maintenance regularly will ensure smooth operation of your machine.

Note: Throughout this manual references are made to "steel". Mubea recognizes that other materials i.e., stainless steel, copper, aluminium, may be cut or punched on this machine. Please ask a Mubea Machinery and Systems, Inc. representative for capacities and recommendations.

Customer Service

For technical service call your Mubea Machinery and Systems, Inc. You can reach Mubea Machinery and Systems, Inc. under the following numbers:

(606) 525-6499 or

(606) 525-6504

Toll-free No. 1-800-255-5698

Tools and Spare Parts

For all questions concerning spare parts or tools, please contact Mubea Machinery and Systems, Inc. by dialing:

(606) 525-6499 or

(606) 525-6504

Toll-free No. 1-800-255-5698

Contents

1

General Information

1 General Information

1.1 Technical Specifications

Machine type .....

Machine number .....

1.1.1 **Mechanical** (in standard version)

Weight	2685 lbs
Length	45 inches
Width	27 1/2 inches
Height	74 inches

1.1.2 **Electrical** (in standard version)

Motor type	4 AP 132 S4, B3 / B5
Motor power	7.5 HP
Power consumption	20.6 / 11.9 A
Operating voltage	208-240 / 440-480 V
Control voltage	115 V

1.1.3 **Hydraulic** (in standard version)

Oil grade	See label on oil container
Oil amount (tank capacity)	13 gal
Viscosity	ISO VG 46
Operating pressure of hydraulic system	3690 p.s.i.
Operating temperature	40°F to 160°F
Ambient temperature	40°F to 95°F

Always refill with the same grade of hydraulic oil; do not mix.

With extreme ambient temperatures, you must consult Mubea Machinery and Systems, INC. (see Customer Service).

1.2 General Description

The **MIW 800** Ironworker is a hydraulically driven flat-steel, section-steel and bar-steel shearing machine equipped with a notching fixture and a holepunch. It has a heavy-duty hydraulic cylinder which serves all work-stations simultaneously. The slide performs a vertical movement, and the cutting direction of the mobile section knives is turned 45° on guideways in the machine frame. MIW ironworkers have a long life, are especially easy to service and require little maintenance.

Worn parts may be replaced with **genuine MUBEA spare parts** at any time.

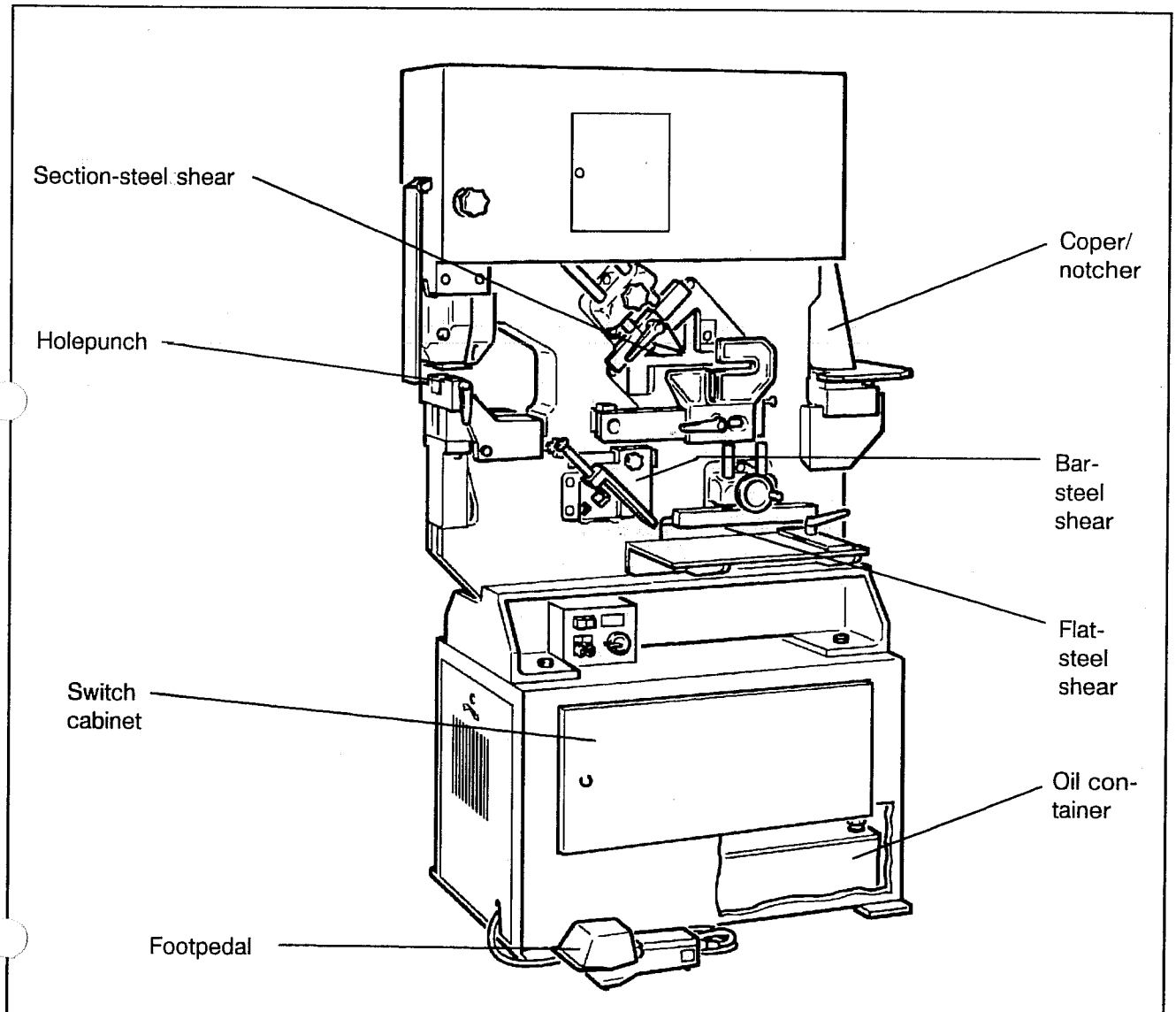
Please contact Mubea Machinery and Systems, Inc. (see chapter 12).

The standard version of the **MIW 800** is designed to permit the use of a variety of options to greatly expand the working range (for examples, see section 1.2.4).

For further information, please contact Mubea Machinery and Systems, Inc..

The machine comprises the mechanical, electrical and hydraulic subsystems.

The individual workstations are covered by safety fixtures.



1.2.1 Mechanical

The mechanical part essentially comprises the ironworker's design with the five work-stations:

- Holepunch
- Flat-steel shear
- Coper/notcher
- Bar-steel shear and
- Section-steel shear.

1.2.2 Elektrical

The electrical portion comprises the switch cabinet, the motor and all other electric parts such as controls, limit switches, contactors, cables, etc. (For circuit diagrams, see chapter 11).

1.2.3 Hydraulic System

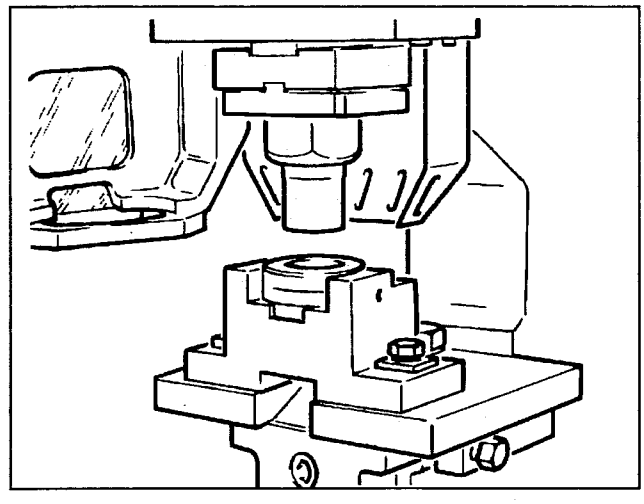
The hydraulic system comprises the pump, the oil container with oil filter, the working cylinder, the control block with pressure test connection and the various valves and lines (For the hydraulic system, see chapter 11).

1.2.4 Attachments

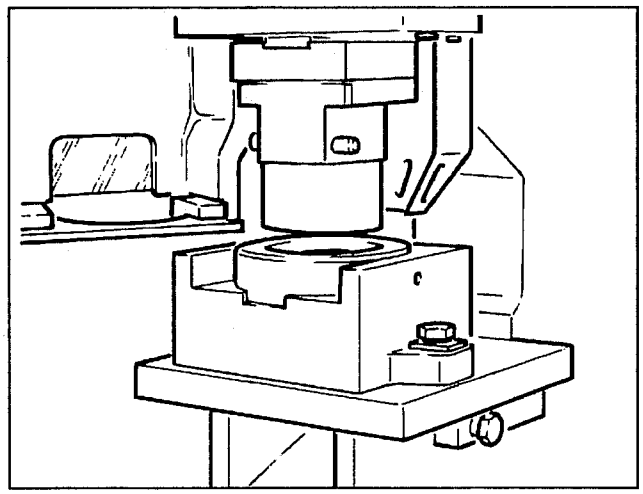
The examples given here are only a selection of the possible attachments. For detailed information, please refer to the **brochure MUBEA MIW**.

The attachments shown in this section **do not** belong to the standard version. Thus, with the exception of the length stop and the triangular notcher, they are not discussed in this User Manual.

Attachments for **holepunch** (examples)

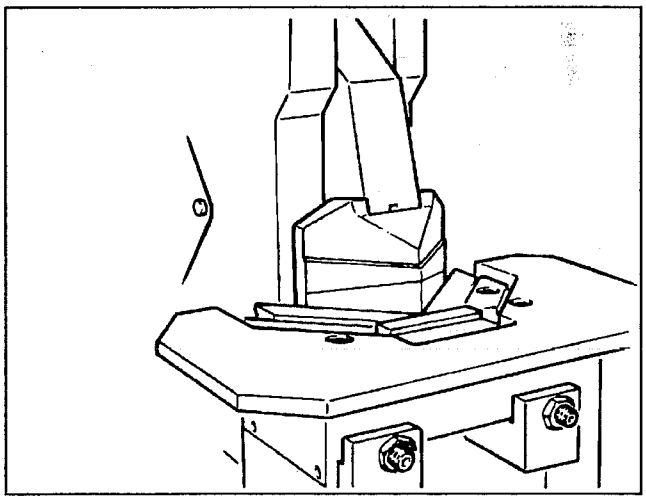


Special punching attachment for mounting punches and dies up to cutting diameter of 2".



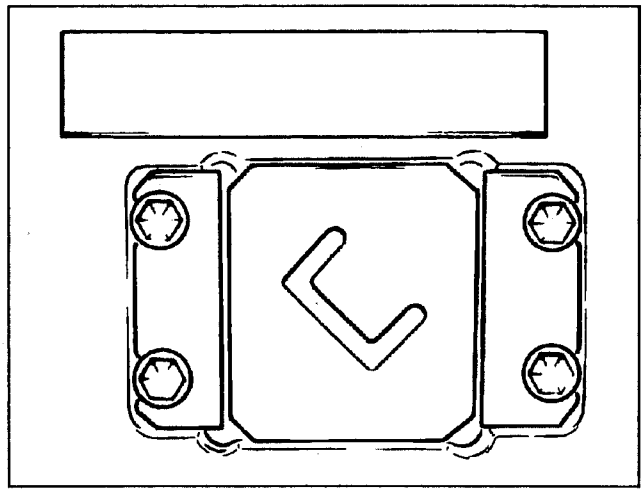
Special punching attachment for mounting punches and dies exceeding a cutting diameter of 2".

Attachment for **coper/notcher** (example)

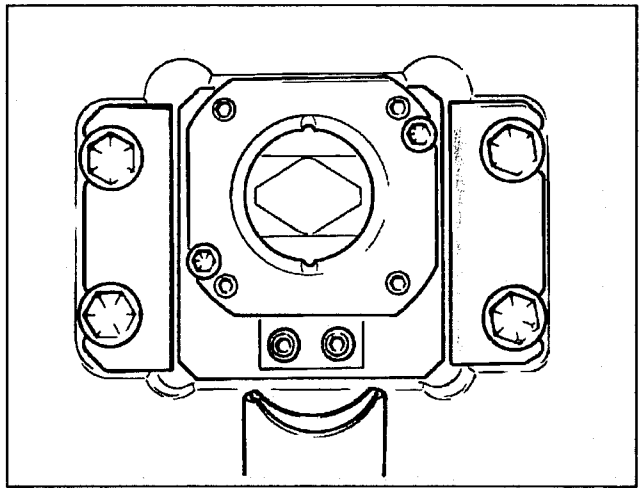


Triangular notching tool

Attachments for **bar-steel shear**
(examples)

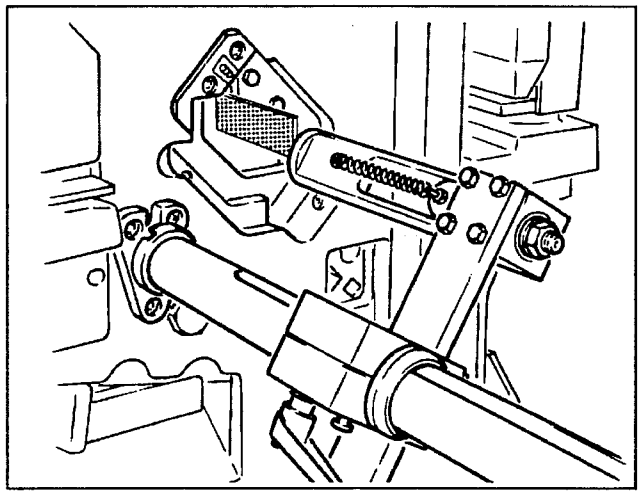


Knife for cutting
channel steel

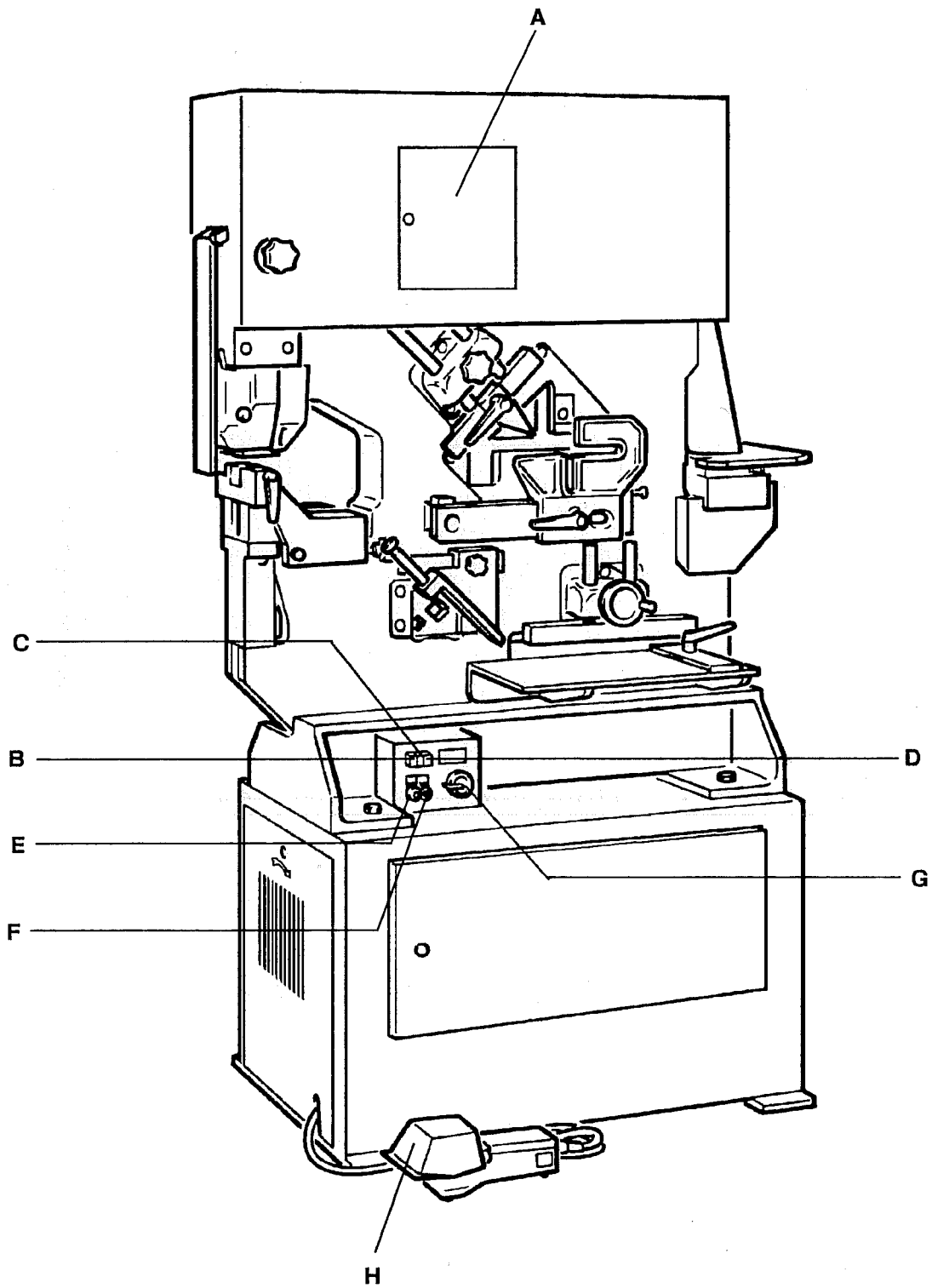


Pipe notching tool

Length stop
(for section-steel shear, bar-steel shear and
flat-steel shear)



Adjustable length stop


A
C
B
D
E
G
F
H

1.3 Controls

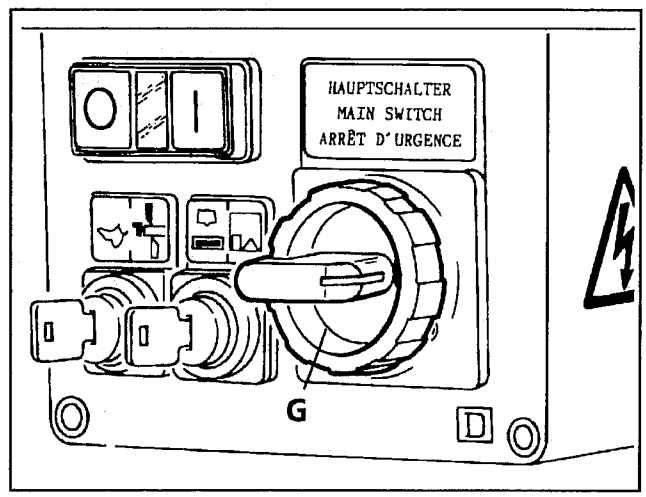
Main switch (G)

Positions:

I = On
O = Off

In the "Off" position the machine is separated from the power supply in all phases. The main switch can be secured with a padlock.

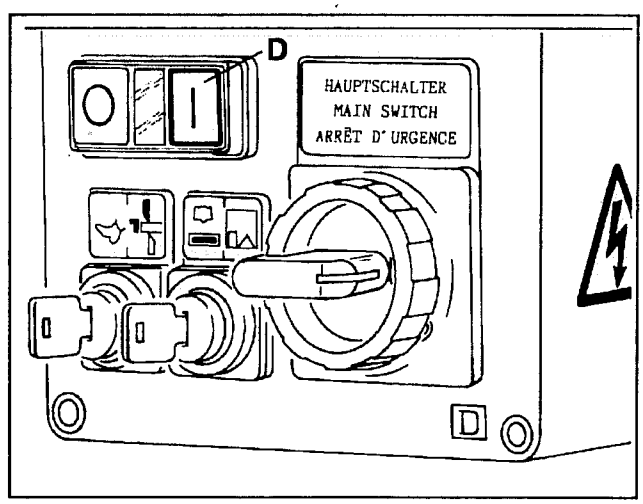
In the "Off" position the supply cables remain live. Therefore, whenever making repairs on the electrical components, make sure to separate the machine from the external power supply.



Start button (D)

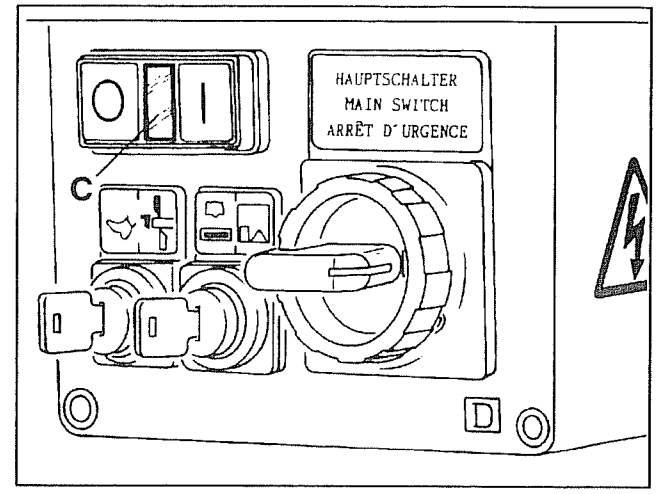
Positions: none

Pressing the Start button activates the motor of the hydraulic pump.



Pilot lamp (C)

The pilot lamp lights up as soon as the motor is ready.

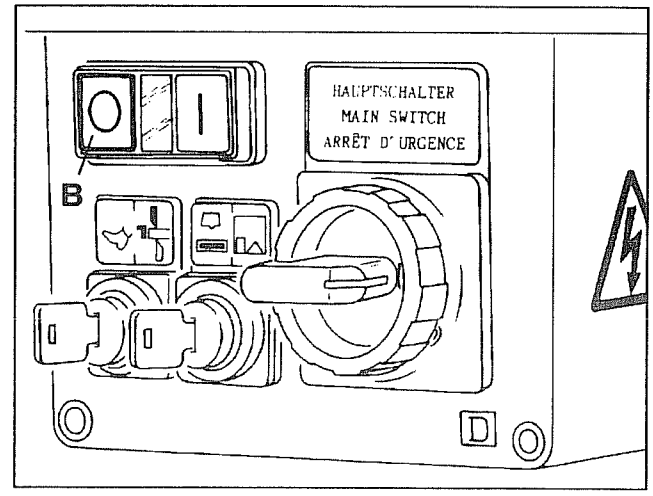


Stop button (B)

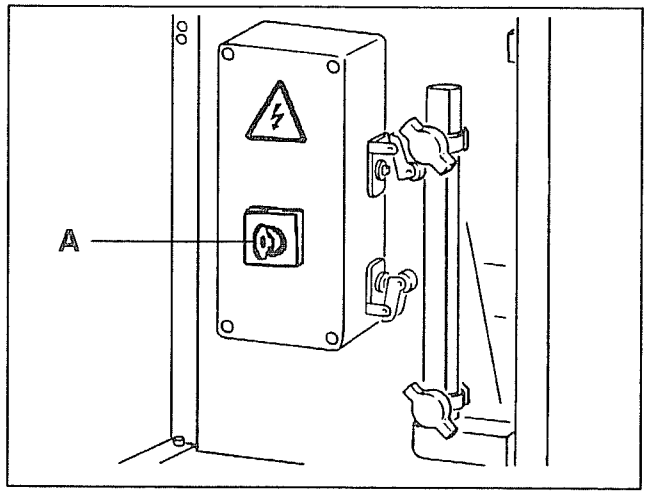
Positions: none

Pressing the Stop button stops the motor.

Electricity is still flowing through the machine.
Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.



Inching and Full Stroke switch (A)



Positions:

⌊● = Inching
O = Off
I = Full Stroke

With the switch in the "Inching" position the slide can be moved down to any desired position by pressing the footpedal (H) (e.g. to the punch toolsetting position).

The automatic return of the slide upon release of the footpedal does not function.

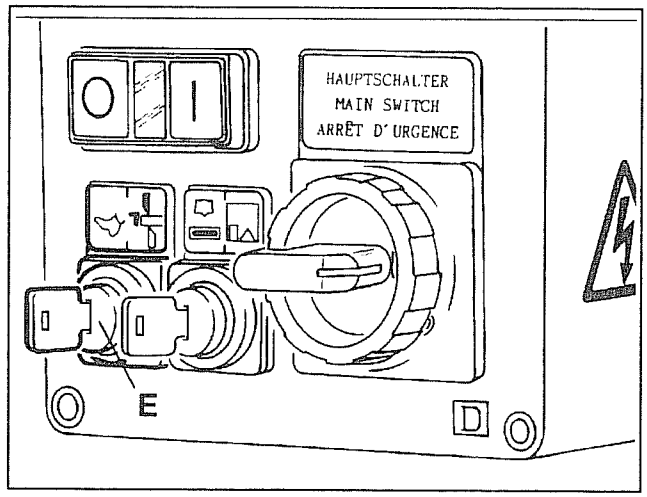
With the switch in the "Full Stroke" position, the slide moves down until the footpedal is released.

Upon release of the footpedal, the slide automatically returns to the upper limit switch position.

When you leave the ironworker, turn the keyswitch to "O" and remove the key.

Selector keyswitch for length stop/footpedal (E)

(for shears only, available also without length-stop attachment)



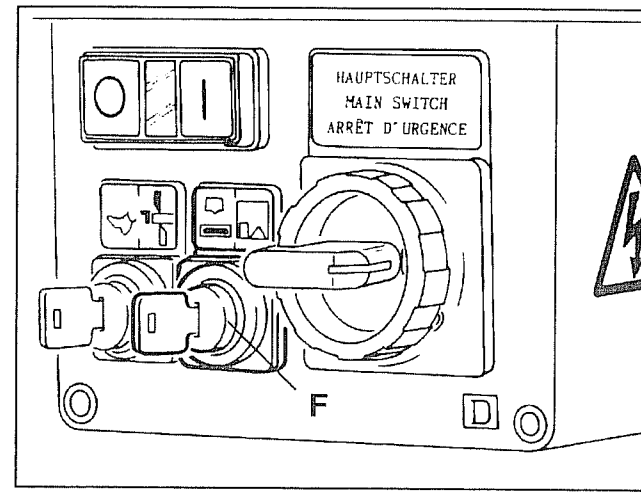
Positions:

Pulled = Footpedal (H) in operation
Length stop out of operation
Pushed = Length stop in operation
Footpedal (H) out of operation.

To push or pull the switch, you must turn the key.

The length-stop outlet on the back of the ironworker is live when the switch is in pushed position.

Selector keyswitch for punch and coper/notcher (F)



The punch and coper/notcher workstations are covered by a protective flap and a safety guard, respectively. If work is to be done at one of these workstations, use the selector keyswitch (F) to select the workstation you wish to work at and to open the corresponding safety cover.
If both safety covers are open, or if the safety cover of the unselected workstation is open, the MIW 800 **cannot** be put into operation.

Note
When working with the shears, keep **both** safety covers closed.

Positions:

Pulled = Punch in operation.
Coper/notcher out of operation.
Pushed = Coper/notcher in operation.
Punch out of operation.

To push or pull the switch, you must turn the key.

Note on the keyswitches:
The three keyswitches (A, E and F) on the ironworker are different.

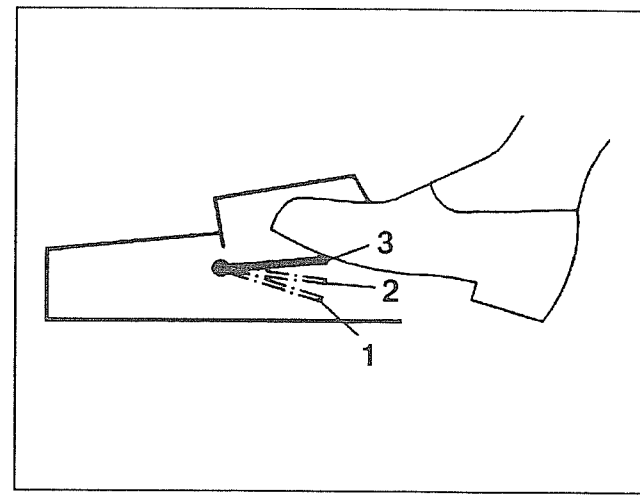
Footpedal (H)

Initial position: 3

The picture on the right shows the three positions of the footpedal. Between pos. 2 and pos. 1 there is a pressure point.

1 = Down
2 = Pause
3 = Up

With the Inching and Full Stroke switch (A) in the "Inching" position, the footpedal position 3 does not function, i.e. the slide does **not** move upward automatically upon release of the footpedal.



2

Safety Instructions

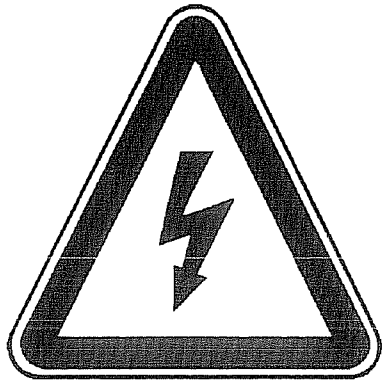
2 Safety Instructions

2.1 Warning Labels and Explanation of Warning Symbols

Warning labels are affixed to the machine at various places.

Do not remove the warning labels.
Replace damaged, scratched or illegible warning labels.
(Part no. printed on label).

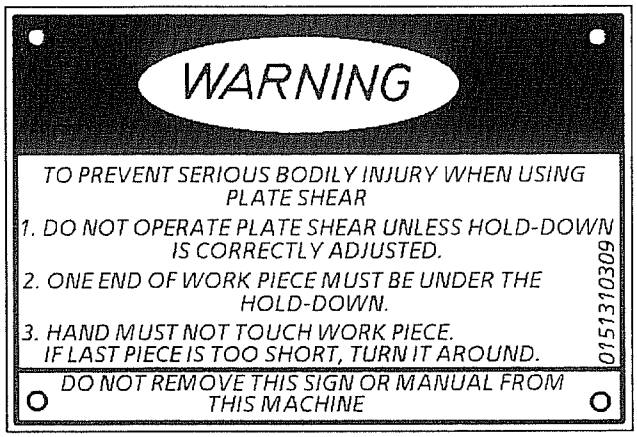
Warning Label 1
Warning against hazardous electric voltage



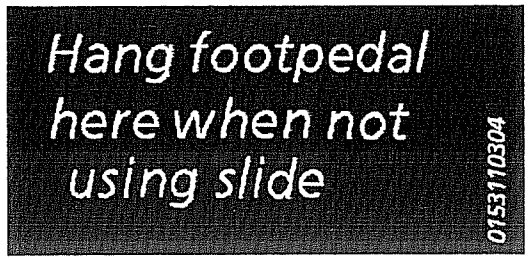
Warning Label 2

Warning Label 3

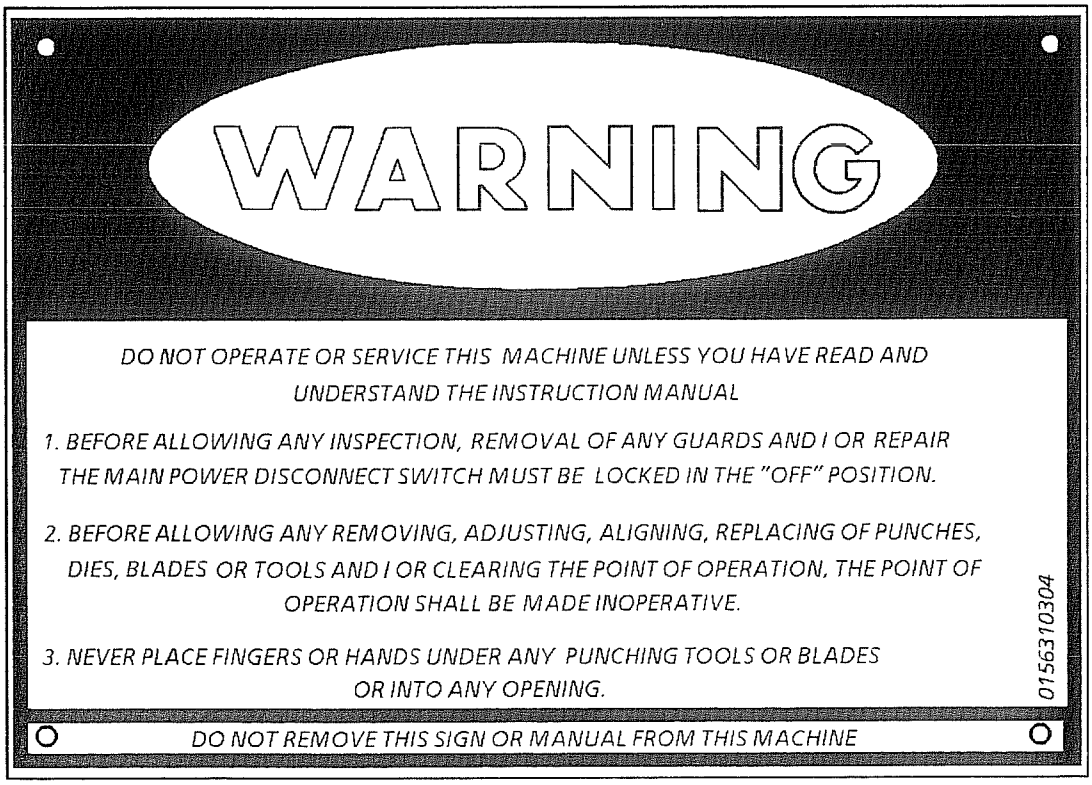
Warning Label 4



Warning Label 5

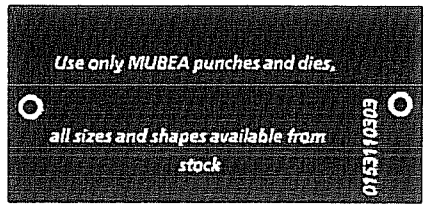


Warning Label 6



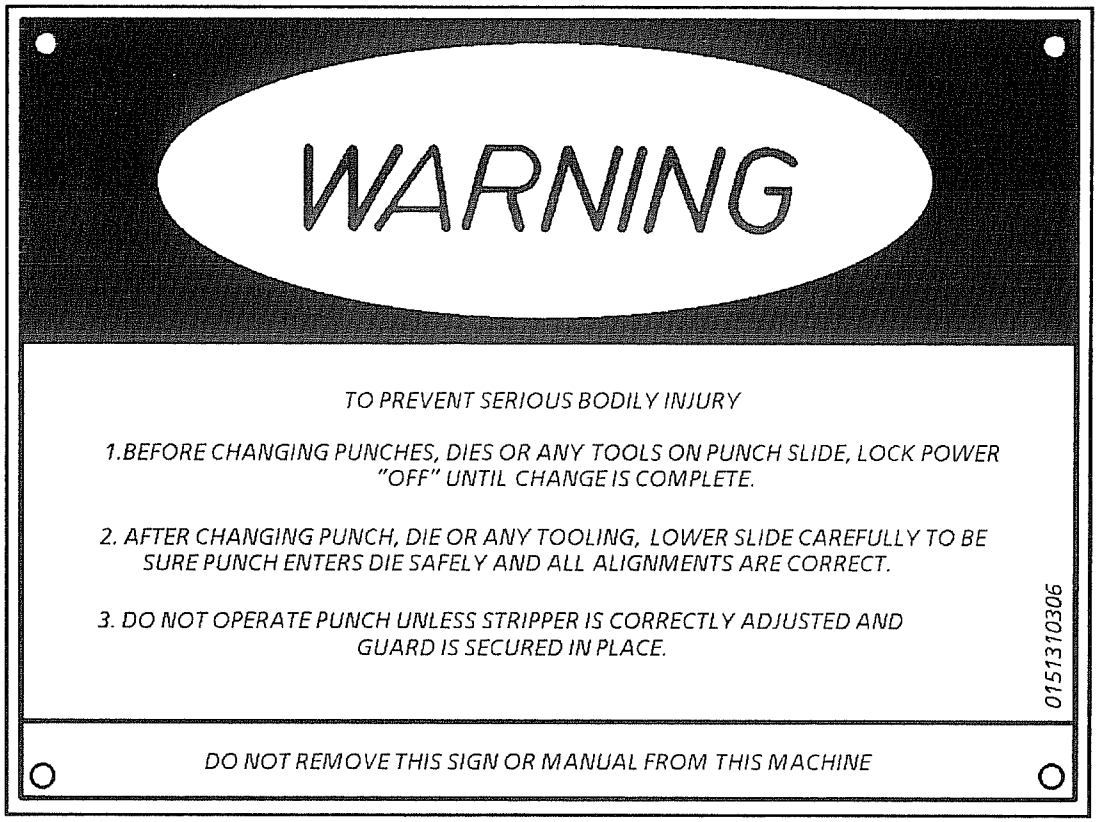
Warning Label 7

Warning Label 8



Warning Label 9

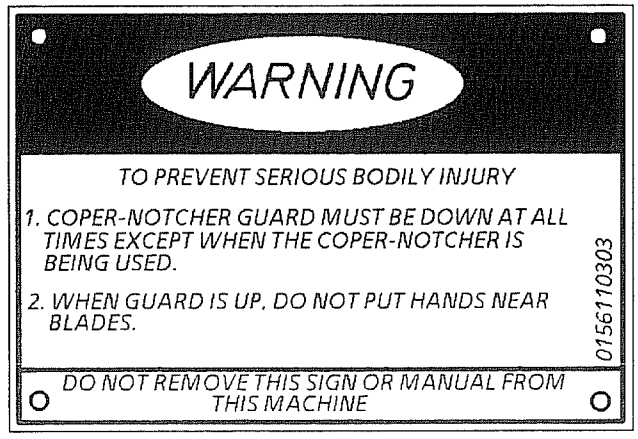
Warning Label 10



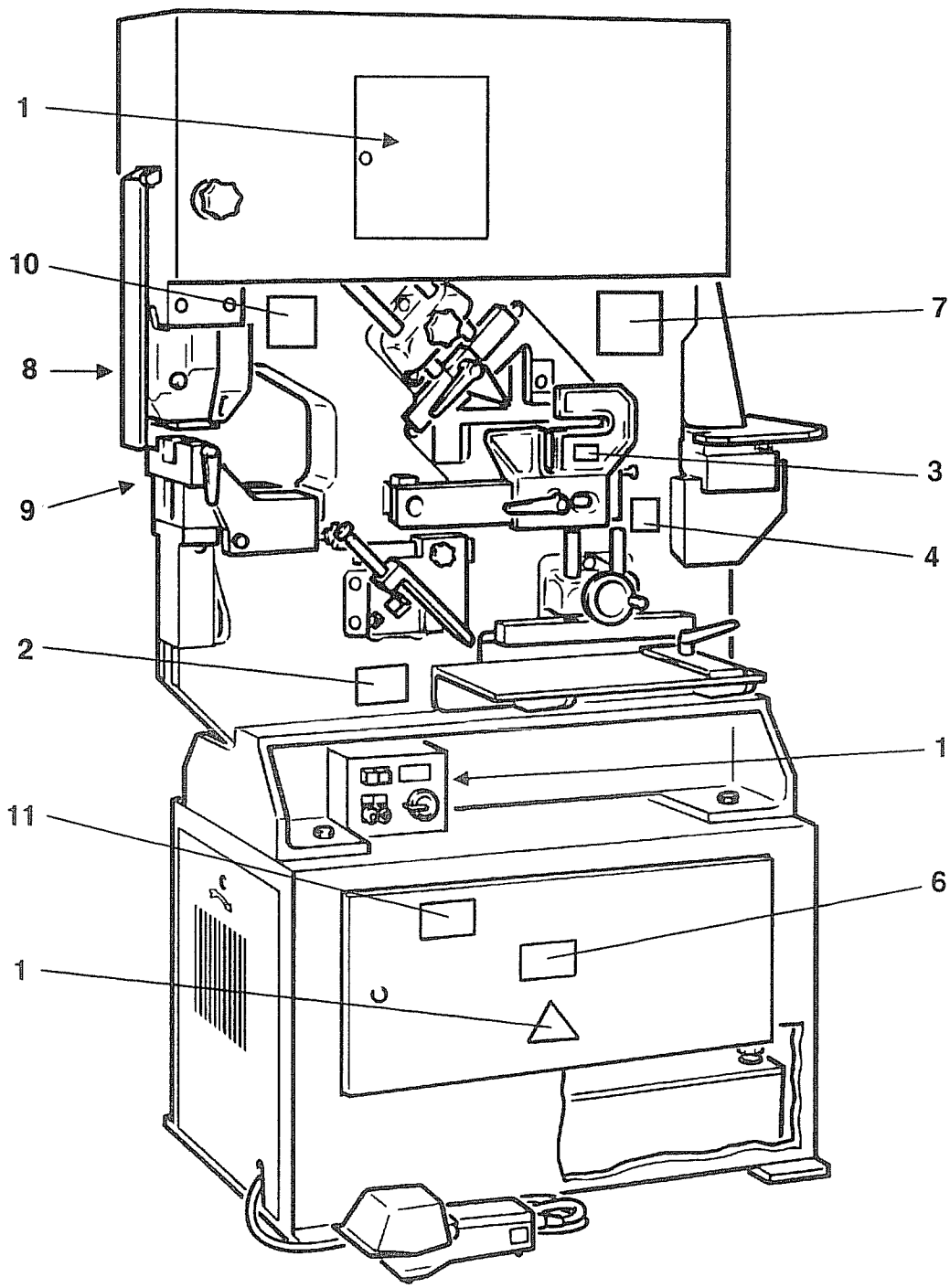
Warning Label 11

Warning Label 12

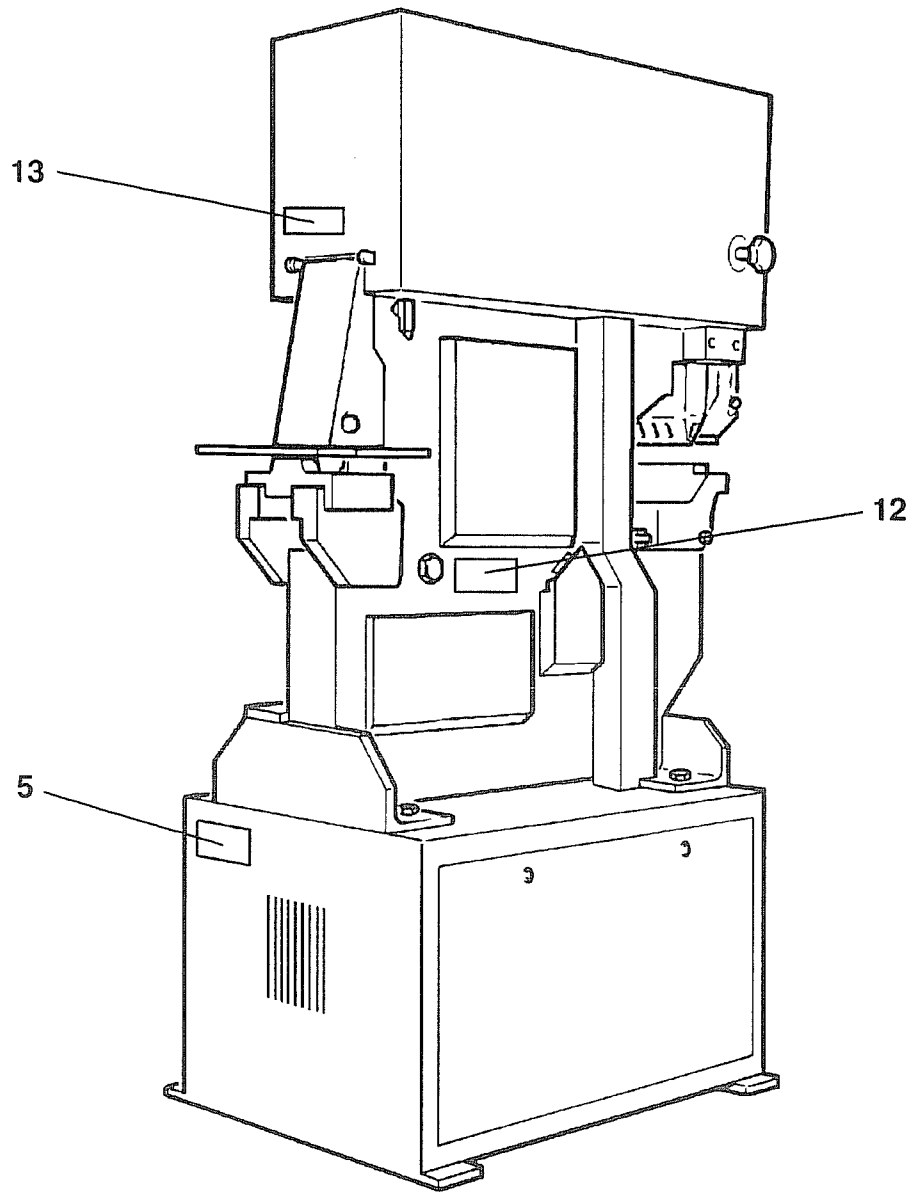
Warning Label 13



Warning labels on the front of the ironworker



Warning labels on the back of the ironworker



2.2 Instructions for Operator Safety

Basic instructions

Whenever performing work on the electrical system, always switch the ironworker off and disconnect it from the external power supply.

Whenever working near the cutting and punching tools, the ironworker must be deactivated by turning the main switch (G) off. Secure the main switch with a padlock.

When special tools are used, they must be designed as safe tools.

Instruction for safety fixtures

The safety fixtures must not be removed.

Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened.

Damaged safety fixtures are to be exchanged for new ones.

Instruction for the warning labels

Do not remove the warning labels. Replace damaged, scratched or illegible warning labels with new ones.

Instruction for the main switch

In the "Off" position the supply cables remain live.
Therefore, whenever making repairs on the electrical components, make sure to separate the ironworker from the external power supply.

Instruction for the keyswitch

When you leave the ironworker, turn the keyswitch to "O" and remove the key.

Instruction for the "Off" button

Electricity is still flowing through the ironworker.
Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.

Instruction for the "length stop / footpedal" selector keyswitch (E)

The length-stop outlet on the back of the ironworker is live when the switch is in pushed position.

Instruction for adjustment work

After current is interrupted and the "Start" button (D) is pressed again, the slide moves to the starting position when the keyswitch is in the "Operation" position.
The same thing happens when you switch the toolsetting and operation switch (A) to the "Operation" position, if the slide is not in the starting position and the motor is running.

The working cylinder moves up automatically.

Instructions for all knives and tools

Defective or worn knives or tools should not be used.

Check knives and tools at regular intervals. Replace dull or chipped tools or blades.

Whenever knives are changed, the blade clearance must be checked.

Unclean cuts leave burrs and jagged spikes on the workpiece and increase the risk of injury.

Instructions for the holepunch

Only punching devices and tools that are equipped with sufficient means of protection against finger injuries up to the cutting point are permitted.

As a rule, check the alignment of punch and die after every tool change and from time to time while punching.

Use extreme caution when entering the punch into the die. Make sure that the punch does not touch the die.

The punch and die alignment must be checked whenever a tool change is made.

Should the view of the punch tool be obscured by a scratched or blind viewing window, it should be replaced with a genuine spare part (see spare parts).
Make absolutely sure that the safety device is securely fastened.

Punch and die must be properly aligned.

The clearance between the punch and the die must be carefully controlled.

Pay attention to the position of the cutting form of the punch relative to the die.

When using shaped dies, pay attention to the position of the cutting opening.

When the punch is not being operated, the cover flap must be closed.

Instructions for the coper/notcher

When the coper/notcher is not being operated, the safety guard must be closed.

Instruction for flat-steel shear, coper/notcher and section-steel shear

Proceed with extreme caution, so that the top knife does not touch the bottom knife.

Instruction for transport

When transporting, make sure that cables and supply lines are not creased or squeezed.

Instructions for crane transport

The crane, ropes or cables, chains and lifting equipment must have the required lifting capacity (machine weight, see technical specifications).
Do not stand under the hovering load.
Always screw the eyescrews tight.

When installing the ironworker, make sure that cables and supply lines are not squeezed or creased.

Instruction for connecting the ironworker

Connection of the ironworker to an electric power source must be done by a qualified technican. All local codes and regulations should be followed.

Prior to turning on the power make certain that the motor and transformer have been changed to correspond to the incoming voltage connection.

2.3 Instructions on Operation Safety

Instruction for all knives and tools

Knives and tools must be resharpened on time. Dull knives put a strain on the ironworker and result in poor cuts.

Instructions for the bar-steel shear

The clamps must not press the knives together.

If the knives are ground on the flat side, the clamps must also be reworked.

If resharpened knives are used, clamps must also be used.

When installing face-ground knives, particular attention must be paid to the blade clearance.

Instructions for the section-steel shear and the flat-steel shear

When installing flat-ground knives, particular attention must be paid to the blade clearance.

Hold onto to the knife firmly to prevent accidental dropping and possible damage.

Instruction for flat-steel shear

If you are cutting stock that is thinner than the stop rail, rotate the rail 180° so that it doesn't interfere with the adjustment of the hold-down.

Instruction for transporting with the forklift

When transporting the ironworker by forklift use only a screw-fastened plank platform to avoid damage.

General instruction for all work on the hydraulic system

Whenever working on the hydraulic system, make sure the equipment remains immaculately clean.

Instruction for operating pressure

Do not exceed the prescribed max. operating pressure.

Do not remove the built-in lead seal of the pressure-limiting valves; otherwise the guarantee will be void.

Bottoming of the cylinder on the limit switch for an extended time will cause the overload cut-out to activate and the machine will switch off. If this happens, inform the electrician.

Instruction for refilling with hydraulic oil

Always refill with the same hydraulic-oil grade; never mix. At extreme ambient temperatures you must consult Mubea Machinery and Systems, Inc. (see Customer Service).

Instruction for cleaning the hydraulic system

Water, lyes or kerosene are unsuitable as cleaning agents.

Instructions for changing the oil

With every oil change, also change the oil filter.

Before draining the used oil, procure an appropriate collector vessel.

Avoid polluting the environment!

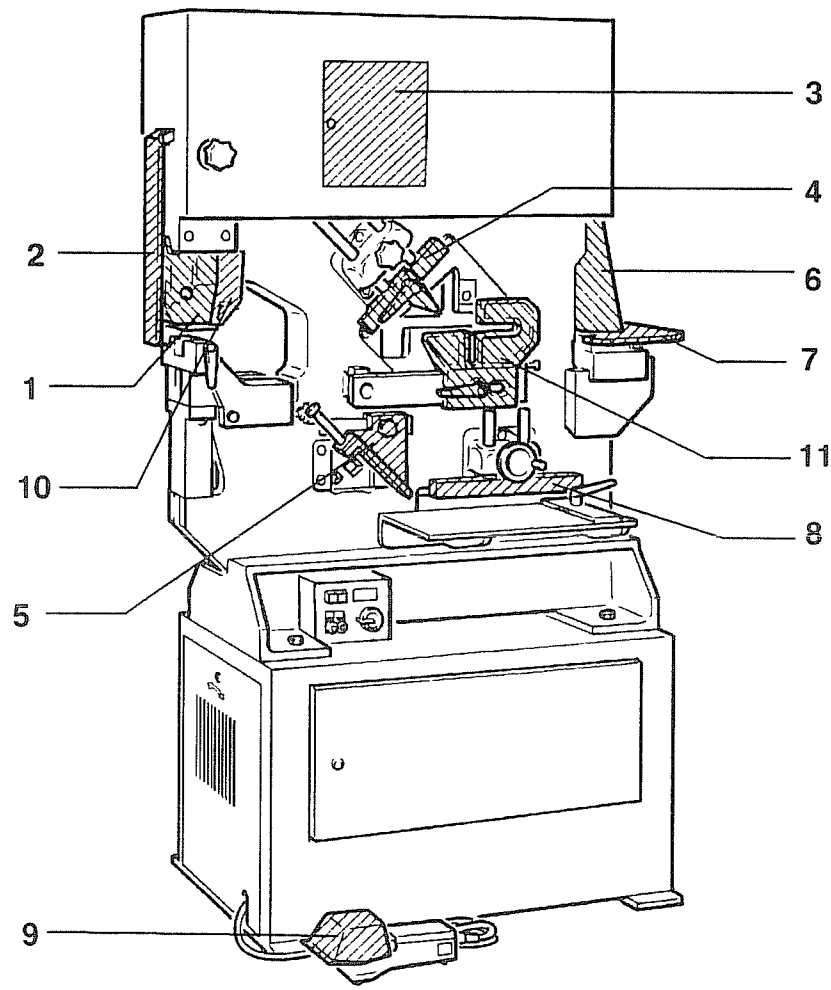
Take the used oil to a waste disposal facility.

2.4 Safety Fixtures

The safety fixtures must not be removed. Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened. Damaged safety fixtures are to be exchanged for new ones.

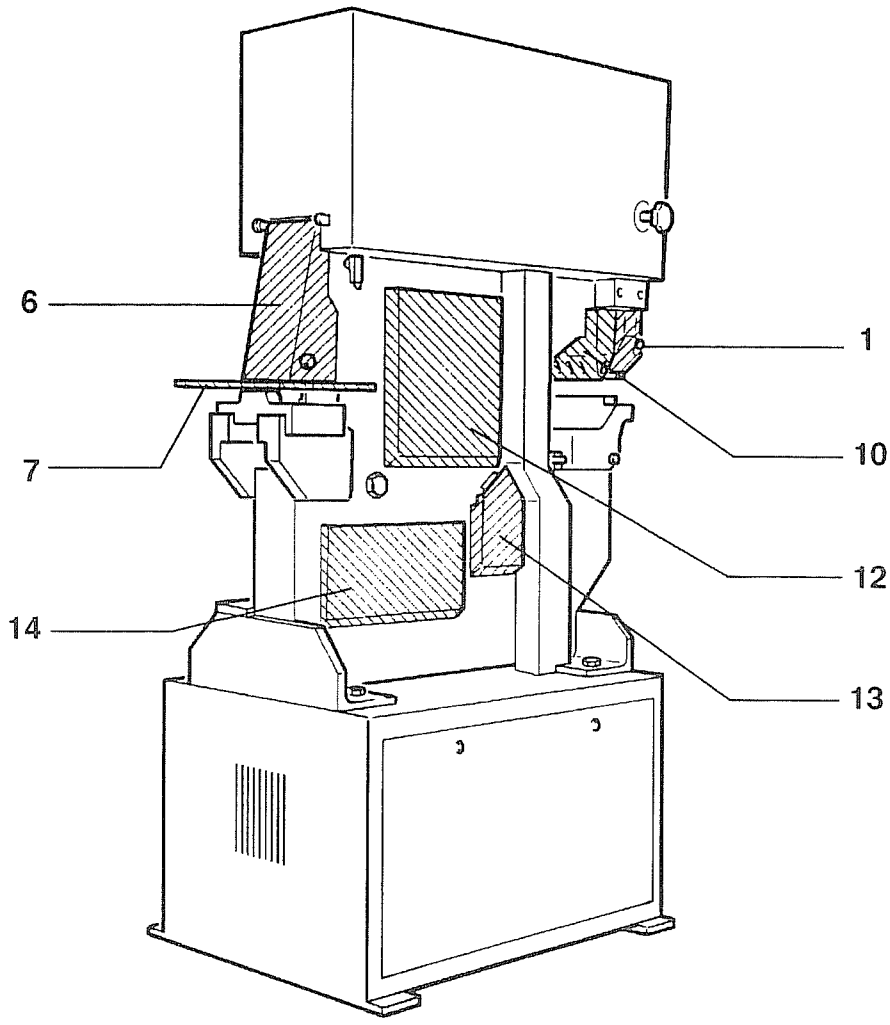
Note
Components 1, 4, 5, 7 and 8 fulfill dual functions. They are a safety fixture as well as a functional part of the machining process.

Safety fixtures on the front of the ironworker



1 Holepunch stripper
2 Holepunch cover flap
3 Door for the Inching and Full Stroke switch
4 Hold-down of section-steel shear
5 Hold-down of bar-steel shear
6 Coper/notcher safety guard
7 Safety fixture for coping saddle
8 Hold-down of flat-steel shear
9 Cover for footpedal
10 Safety cover for holepunch
11 Lateral stop of section-steel shear

Safety fixtures on the back of the ironworker



1 Holepunch stripper
6 Coper/notcher safety guard
7 Safety fixture for coping saddle
10 Holepunch safety guard
12 Safety flap for section-steel shear
13 Safety flap for bar-steel shear
14 Safety flap for flat-steel shear

3

Putting into Operation

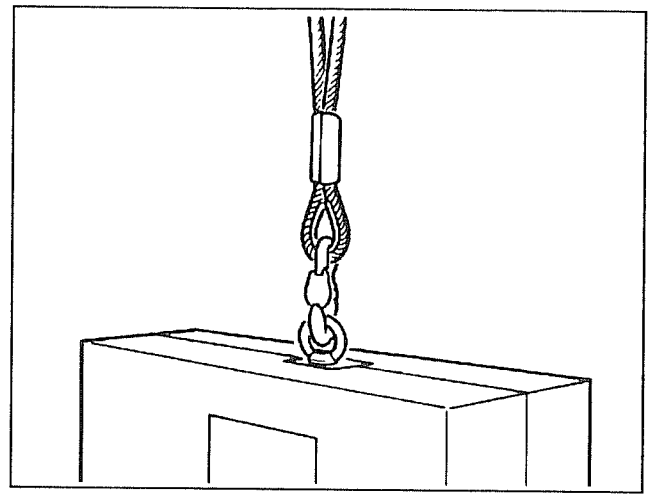
3 Putting into Operation

3.1 Transport

When transporting, make sure that cables and supply lines are not creased or squeezed.

3.1.1 Transporting by Crane

- Make sure the lifting eyescrew is fully tight.
- Transport the ironworker using only the eyescrew designed for that purpose.



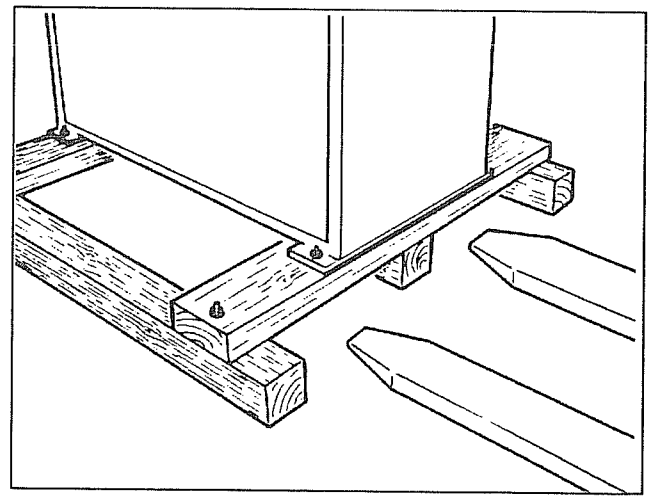
The crane, ropes or cables, chains and lifting equipment must have the required lifting capacity (machine weight, see technical specifications).

Do not stand under the hovering load.

Always screw the eyescrews tight.

3.1.2 Transporting by Forklift

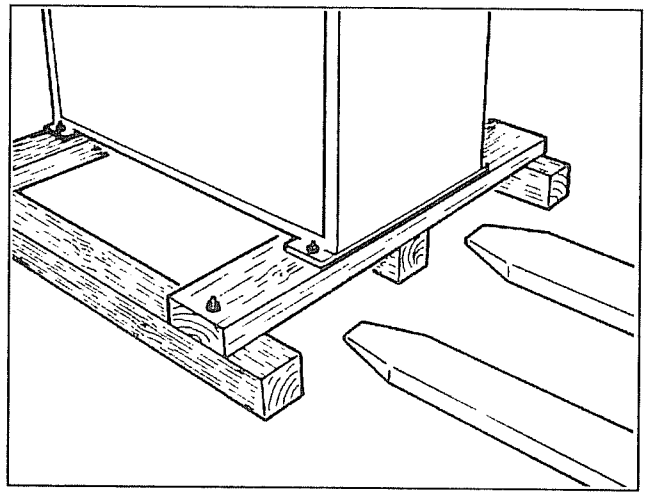
- Screw down the ironworker on a sturdy plank platform in such a way that it can be carried **lengthwise** by the forklift.
- Only carry the ironworker lengthwise, to prevent it from tilting.



When transporting the ironworker by forklift use only a screwfastened plank platform to avoid damage.

3.1.3 Transporting by Truck or Rail

- Screw down the ironworker on sturdy planks so that it rests securely (the shipping agent is responsible for anchoring the thus prepared ironworker on the rail car or truck).



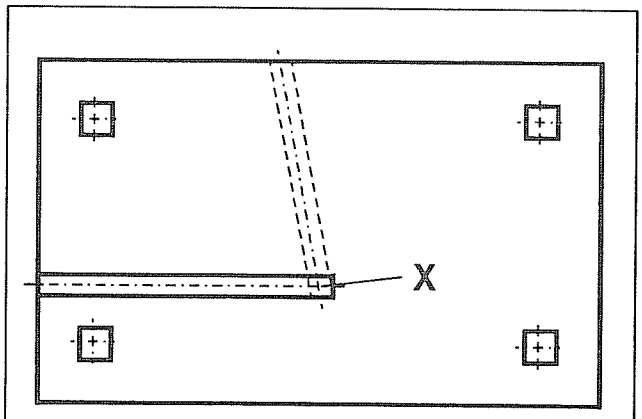
3.2 Installation

The ironworker's work sites have normal operating heights. Thus, it is not necessary to regulate the height using a baseplate or pedestal.

Before installation, check whether the floor is level and sufficiently strong.
If a foundation is required, refer to section 3.2.1.

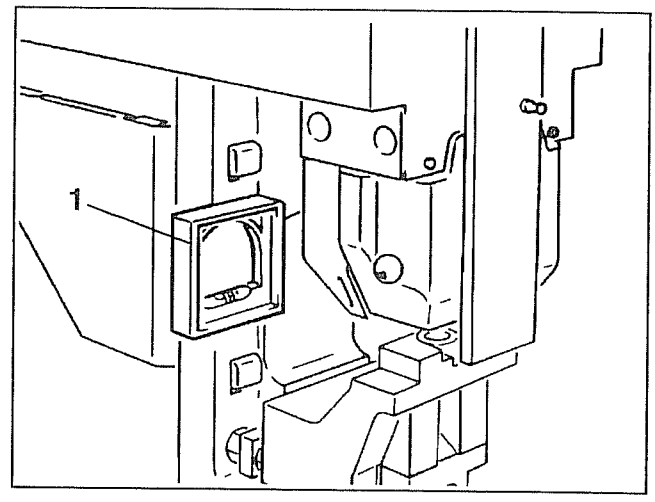
3.2.1 Preparing a Foundation
(if necessary)

- Prepare the foundation. (For foundation diagram, see chapter 11.)
- The depth of the foundation depends on the substructure.
- The cable duct from point "X" may run in any desired direction.



Foundation/machine front

3.2.2 Installing the Ironworker



When installing the ironworker, make sure that cables and supply lines are not squeezed or creased.

- Insert and run in anchor bolts according to foundation diagram, or bore holes according to foundation diagram (see chapter 11).
- Place ironworker at provided site and align it.
- Tighten fastening screws and nuts slightly, in crosswise fashion.
- Check upright alignment of ironworker by measuring with a level (1) frontally and laterally.
- If necessary, correct alignment.
- Tighten fastening screws and nuts all the way.

3.3 Power Connection

- Hook ironworker up to power source according to electrical connection diagram (see chapter 11).

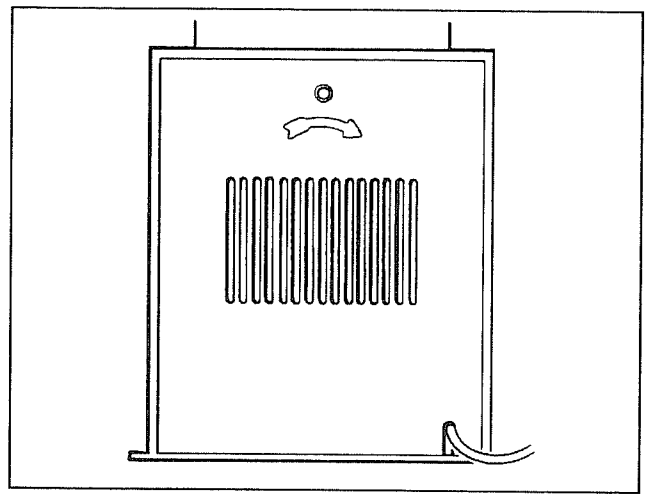
Connection of the ironworker to an electric power source must be done by a qualified technican. All local codes and regulations should be followed.

Prior to turning on the power make certain that the motor and transformer have been changed to correspond to the incoming voltage connection.

3.4 Final Checks Following Installation and Hookup

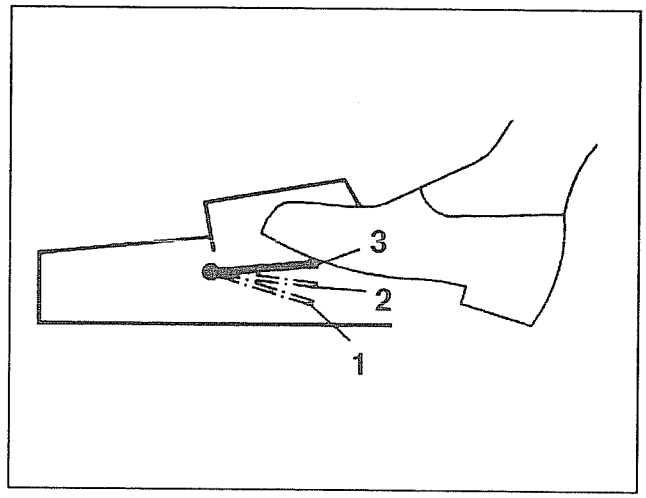
3.4.1 Electrical

- Check motor's direction of rotation.
- If direction of rotation is wrong, have it corrected by a skilled electrician.



3.4.2 Hydraulic

- Check oil level (see section 6.3.1).
- Ventilate system.
  Run the motor, letting it idle for approx. 4 min. Then use the footpedal (H) to move the working cylinder a number of times without any load.
- The max. operating pressure is factory-set, lead-sealed, and need not be tested. If so desired, it can be checked using the factory-installed test lead (see section 6.3.5).



Do not exceed the prescribed max. operating pressure.

Do not remove the built-in lead seal of the pressure-limiting valves; otherwise the guarantee will be void.

3.4.3 Mechanical

- Make sure the ironworker is seated firmly.
- Check whether all safety fixtures are present, securely fastened and operating properly.

The safety fixtures must not be removed.

Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened. Damaged safety fixtures must be replaced.

- Lubricate the ironworker (see section 6.4).

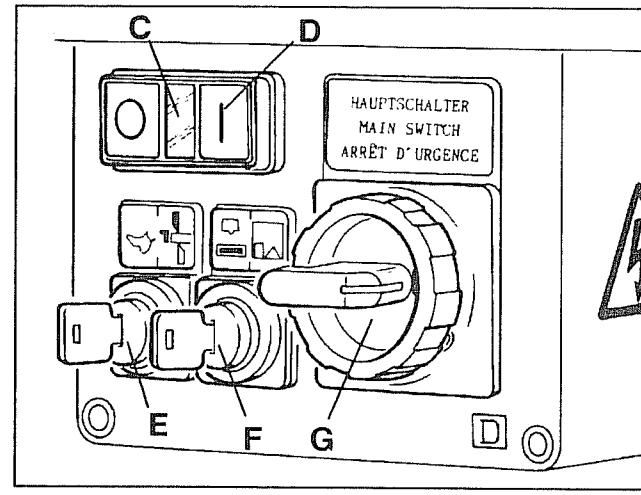
4

Operation

4 Operation

4.1 Preparations

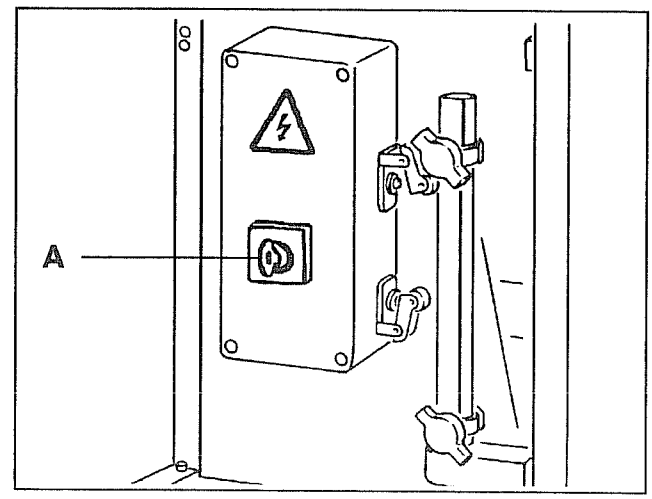
- Check safety fixtures for secure seating and proper operation.
- Test tools for damages, secure seating and sharp cutting edges.
- Lubricate the Ironworker (see section 6.4).



4.2 Switching On the Ironworker

- Turn main switch (G) to "I".
- Press Start button (D).
  When the pilot lamp (C) lights up, the ironworker is ready.
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".
- If necessary, turn the selector keyswitch (F) to the desired workstation. Open the appropriate safety cover and lock it in position.
- **Only when using the electric length stop:**
  Turn the selector keyswitch (E), bringing it into the pressed-in position (footpedal [H] out of operation, length stop in operation).

  Note
  If the length stop is not used, you do **not** have to move (press in) the selector keyswitch (E).



4.3 Operating the Holepunch

4.3.1 Safety Instructions

Only punching devices and tools that are equipped with sufficient means of protection against finger injuries up to the cutting point are permitted.

Should the view of the punch tool be obscured by a scratched or blind viewing window, it should be replaced with a genuine spare part (see spare parts). Make absolutely sure that the safety device is securely fastened.

When the punch is not being operated, the cover flap must be closed.

Punch and die must be properly aligned.

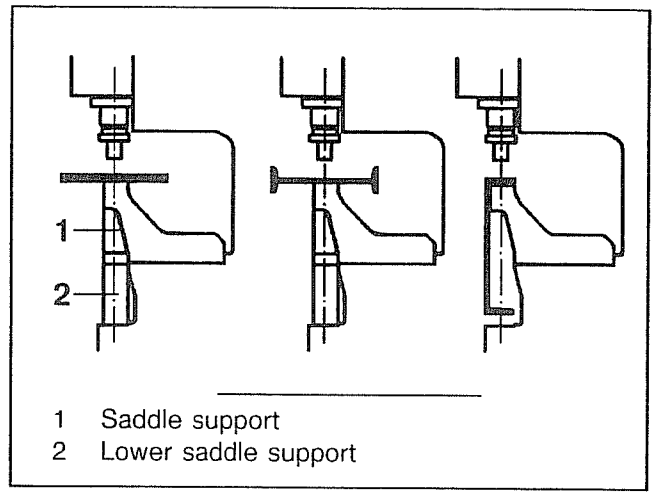
The clearance between the punch and the die must be carefully controlled.

Defective or worn knives or tools should not be used.

Check knives and tools at regular intervals. Replace dull or chipped tools or blades.

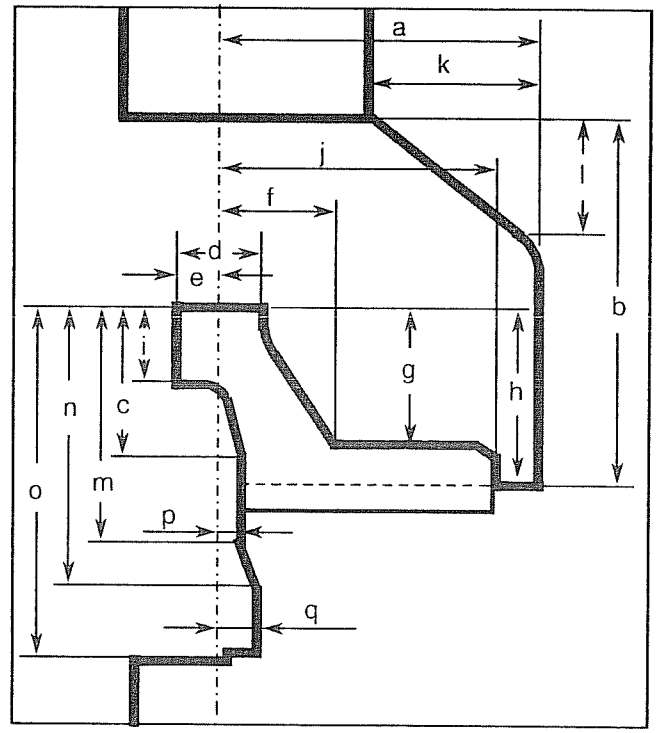
4.3.2 General

- Always use the saddle support (1) and the lower saddle support (2) when performing punches in plate, angle and tee steel and when making web punches in channel steel and I-beams.
- To flange-punch channel steel and I-beams, remove the saddle support and the lower saddle support. See following table and drawing for dimensions without saddle support and lower saddle support.
- For small sections and for punching with small diameters, attach the stripper reducing plate included in the delivery (see section 9.1.2).
- For continuous production or large piece numbers, the coupling nut should be used instead of the quick-change fixture (see section 9.1.1).



1 Saddle support
2 Lower saddle support

MIW 800	inch	MIW 800	inch
a	8 5/8	j	7
b	9 1/2	k	3 3/4
c	5 1/8	l	2 1/8
d	1 7/8	m	7 11/16
e	7/8	n	10 7/16
f	2 15/16	o	12 3/16
g	3 1/8	p	1 5/16
h	5 1/8	q	2 1/16
i	2 7/16		



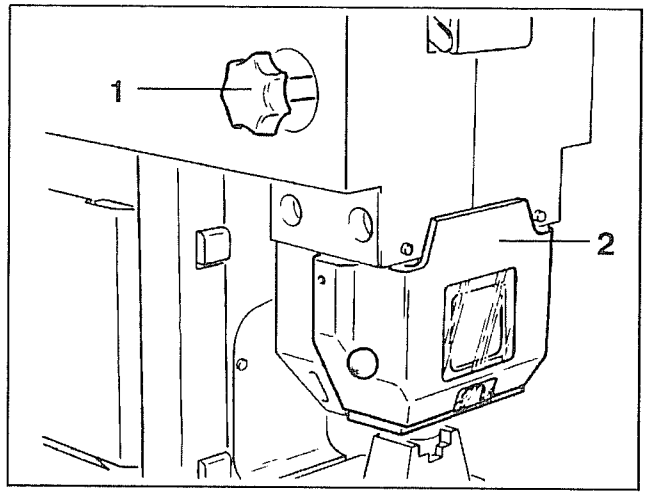
4.3.3 Working With the Holepunch

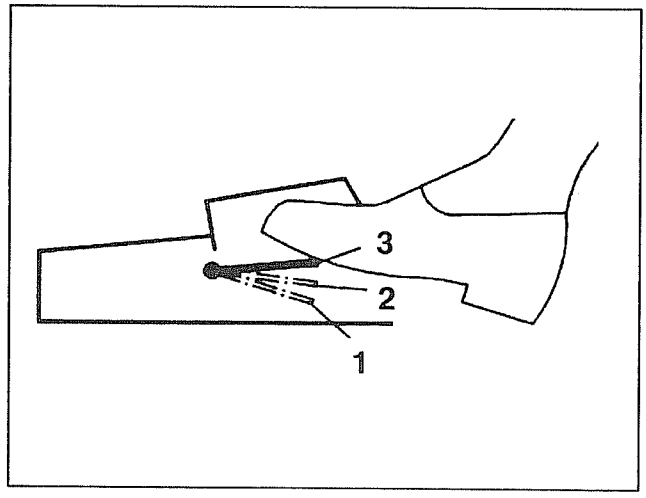
- Observe safety regulations.
- Switch on the ironworker (see section 4.2).

  Notes
  When working with the punch, the selector keyswitch (F) must be in pulled position.

  The safety guard of the coper/notcher must be closed.
- Open the cover flap of the punch and lock in position.
- Check whether the punch and die have the required dimensions, and determine the clearance according to section 5.2.1. If necessary, change punch and die as describe in sections 7.1.1 and 7.1.2.
- Check whether the stroke of the punch suits the thickness of the stock to be processed. If necessary, optimize the punch stroke according to section 5.1.
- Insert and position the stock.
- Using the star handle (1), adjust the height of the stripper (2) according to the stock thickness.
- Press the footpedal (H).

  For precise punching (e.g. premarked stock), first bring the punch down slowly in inching mode (i.e., by pressing the footpedal a number of times to position 1 and raising it to position 2) and, after positioning the stock, press it down all the way.
- After punching, release the footpedal. The holepunch will automatically return to its original position at the top.
- From time to time check the cutting play and/or the centering of the tools (see section 5.2.2).
- On completion of work, close the cover flap on the holepunch.





4.4 Operating the Flat-Steel Shear

4.4.1 Safety Instructions

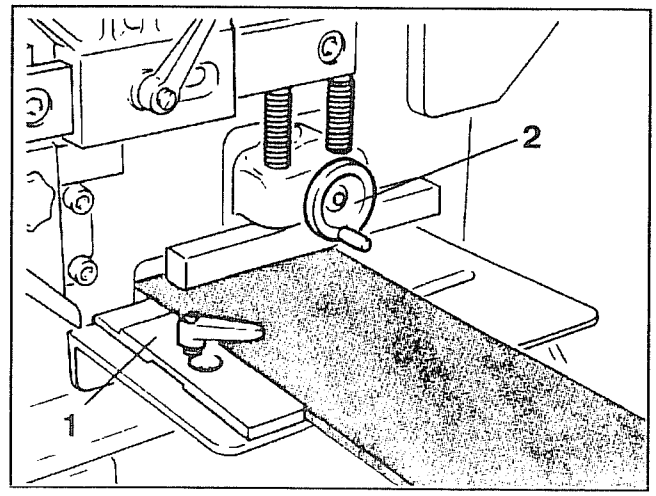
Defective or worn knives or tools should not be used.

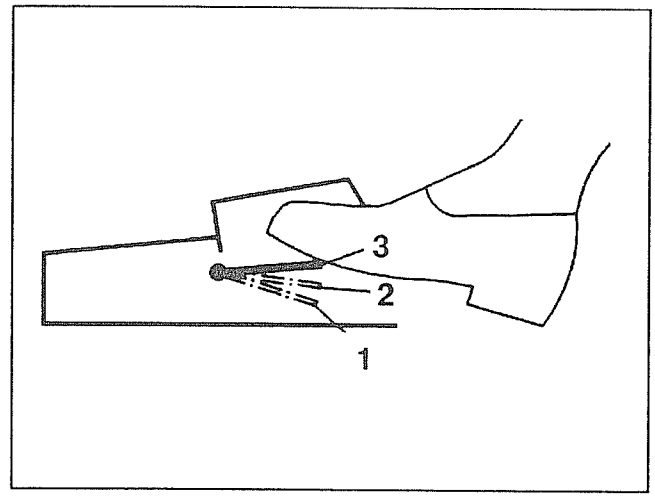
Check knives and tools at regular intervals. Replace dull or chipped tools or blades.

4.4.2 Working With the Flat-Steel Shear

- Observe safety regulations.
- Switch on ironworker (see section 4.2).

  Note
  Keep the safety covers of the punch and the coper/notcher closed while working with the flat-steel shear.
- Check the stroke of the flat-steel shear, and make sure it suits the thickness of the stock to be processed. If necessary, optimize the stroke according to section 5.1.
- If necessary, adjust the stop rail (1) (see section 4.4.3).
- Insert and position the stock.
- Using the handwheel (2), set the hold-down onto the stock.
- Press the footpedal (H).
- After cutting, release the footpedal. The slide will automatically return to its original position at the top.
- From time to time check the clearance of the flat-steel shear (see section 5.3.1).



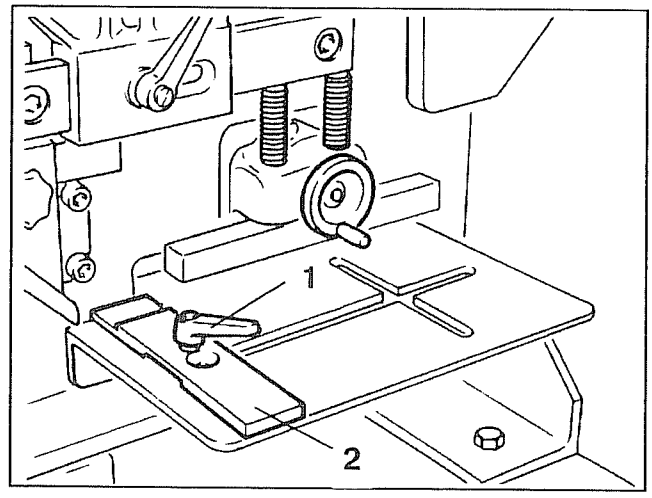


4.4.3 Adjusting the Stop Rail on the Supporting Table

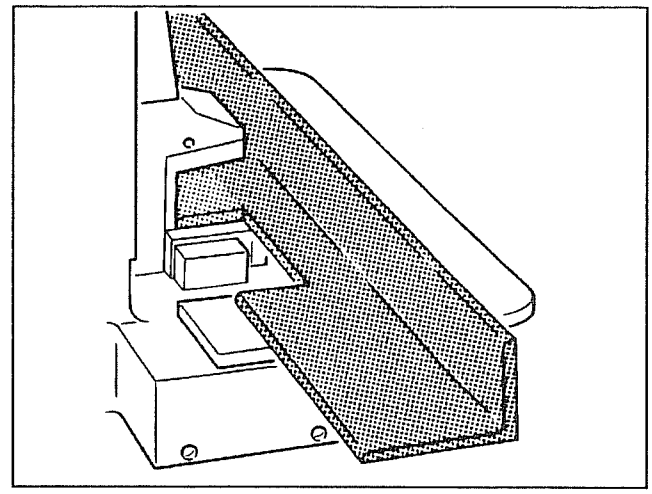
The stop rail on the supporting table can be adjusted to meet the requirements of the cut.

- Switch off the machine.
- Loosen the locking lever (1).
- Move the stop rail (2) to desired position.
- Tighten the locking lever (1).

If you are cutting stock that is thinner than the stop rail, rotate the rail 180° so that it doesn't interfere with the adjustment of the hold-down.



4.5 Operating the Coper/Notcher

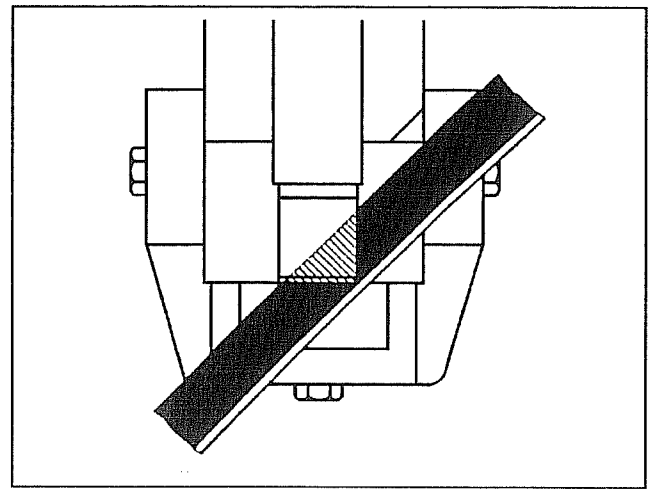


4.5.1 Safety Instructions

When the coper/notcher is not being operated, the safety guard must be closed.

Defective or worn knives or tools should not be used.

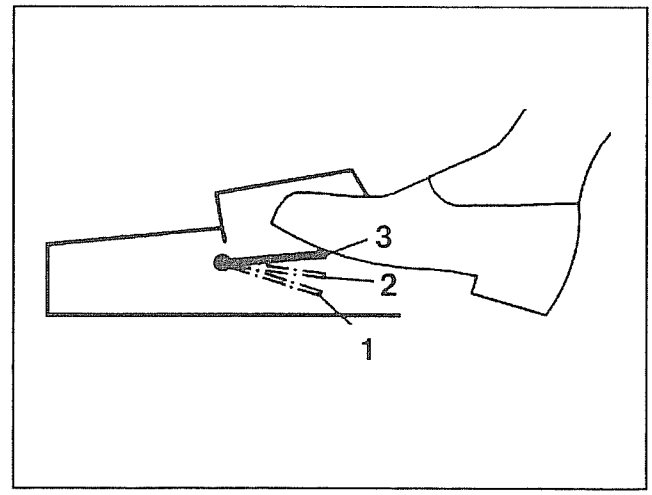
Check knives and tools at regular intervals. Replace dull or chipped tools or blades.



4.5.2 General

- Make wider copes by repositioning the stock.
- Make triangular notches by placing the stock at a 45° angle.

  Note
  Due to the sharp tips in the notched triangle, these notches are not suitable for making frames.



4.5.3 Working With the Coper/Notcher

Notes
When working with the coper/notcher, the selector keyswitch (F) must be in the pushed position.

The cover flap of the punch must be closed.

- Observe safety regulations.
- Switch on machine (see section 4.2).
- Open the coper/notcher safety guard and secure it in position.

- Insert and position the stock.
- Press the footpedal (H).
- After coping, release the footpedal. The coper will return to its initial position at the top.
- From time to time check the blade clearance of the coper/notcher (see section 5.4.1).
- After finishing the work, close the safety guard.

4.6 Operating the Bar-Steel Shear

4.6.1 Safety Instructions

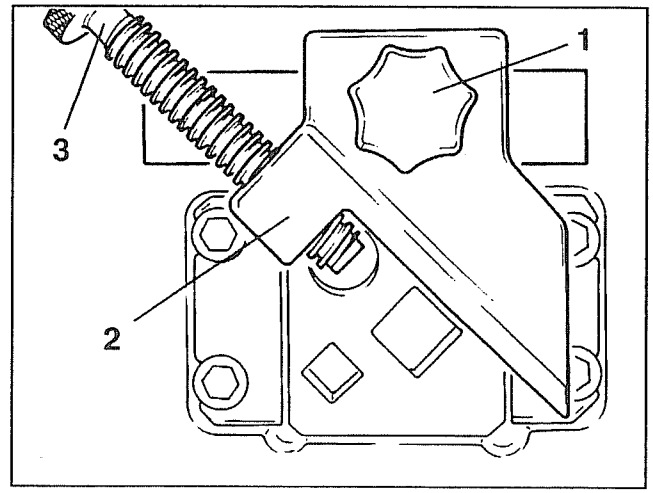
Defective or worn knives or tools should not be used.

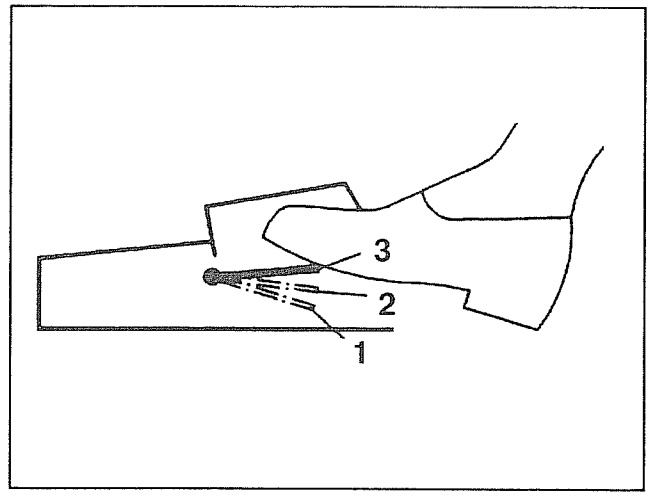
Check knives and tools at regular intervals. Replace dull or chipped tools or blades.

4.6.2 Working With the Bar-Steel Shear

- Observe safety regulations.
- Switch on ironworker (see section 4.2).

  Note
  Keep the safety cover of the punch and the coper/notcher closed while working with the bar-steel shear.
- Check the stroke of the bar-steel shear, and make sure it suits the thickness of the stock to be processed. If necessary, optimize the stroke according to section 5.1.
- Insert and position the stock.
- After loosening the star handle (1), adjust the complete hold-down (2) and spindle (3) so that the stock is lying horizontal when it is cut.
- Tighten the star handle (1).
- Press the footpedal (H).
- After cutting, release the footpedal. The slide will return to its original position at the top.
- From time to time check the blade clearance of the bar-steel shear (see section 5.5.1).





4.7 Operating the Section-Steel Shear

4.7.1 Safety Instructions

Defective or worn knives or tools should not be used.

4.7.2 Working With the Section-Steel Shear

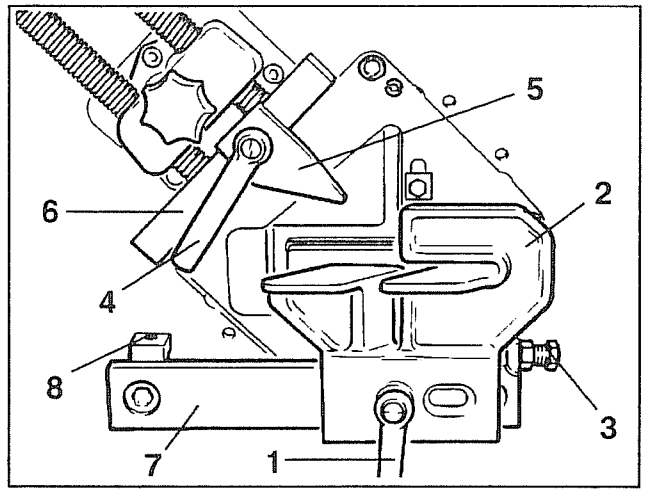
a) Rectangular Cut

Note
Heed figures 1 and 2 in section 4.7.3 "Cutting Instructions".

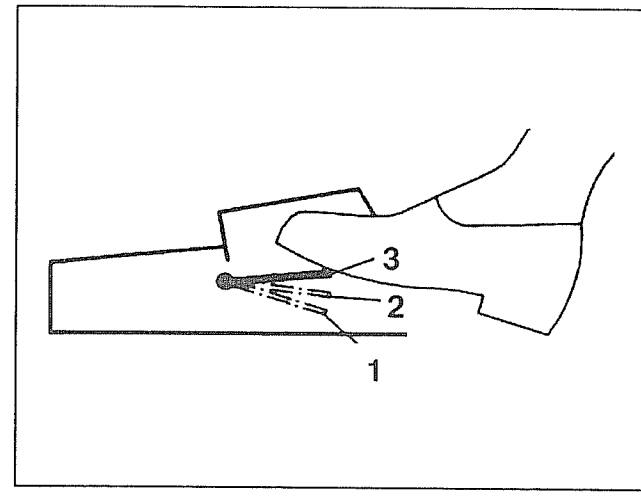
- Observe safety regulations.
- Switch on ironworker (see section 4.2).

Note
Keep the safety cover of the punch and the coper/notcher closed while working with the section-steel shear.

- Check the stroke of the section-steel shear, and make sure it suits the thickness of the stock to be processed. If necessary, optimize the stroke according to section 5.1.
- Loosen the locking lever (1) and slide the lateral stop (2) to the stop screw (3) to set the lateral position of the section.
- Tighten the locking lever (1).
- Insert and position the material.
- To set the proper height, loosen the locking lever (4) and shift the thrust pad (5) so that the thrust pad hits the root of the section when the hold-down spindle (6) is lowered.
- Tighten the locking lever (4).



- Press the footpedal (H).
- After cutting, release the footpedal. The slide will return to its original position at the top.
- If the vertical leg is not square enough, reset the stop rail (7) with the two setting screws (8). It may also be necessary to set the stop rail if the section sizes are different.
- From time to time check the blade clearance of the section-steel shear blades (see section 5.6.1).



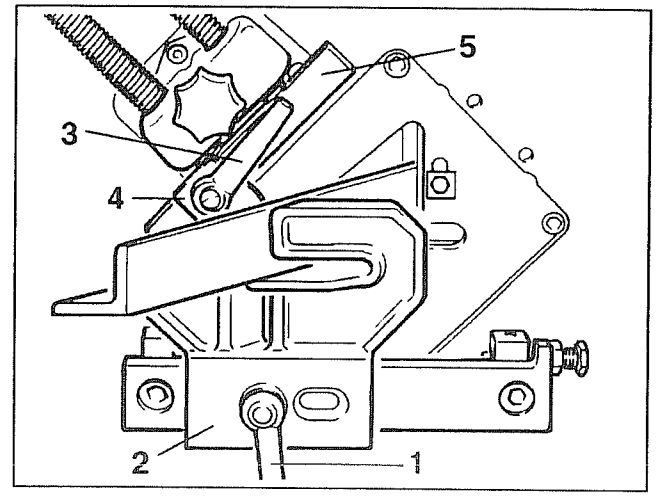
b) Bevel (Miter) Cut

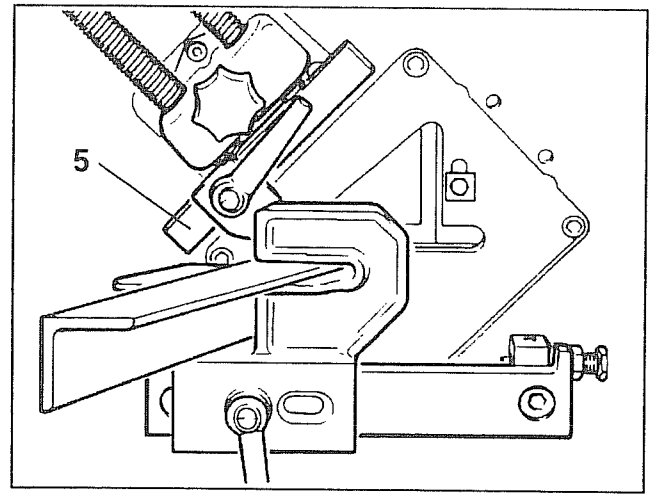
Note
Heed figures 3 and 4 in section 4.7.3 "Cutting Instructions".

- Observe safety regulations.
- Switch on ironworker (see section 4.2).

Note
Keep the safety cover of the punch and the coper/notcher closed while working with the section-steel shear.

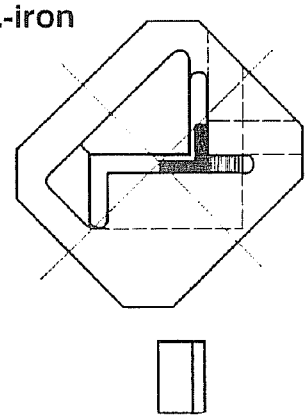
- Loosen the locking lever (1) and slide the lateral stop (2) to the left on to the 45° bevel mark.
- Tighten the locking lever (1).
- Insert and position the stock.
- Loosen the locking lever (3) and shift the thrust pad (4) so that the thrust pad hits the root of the section when the hold-down spindle (5) is lowered.
- Tighten the locking lever (3).
- Press the footpedal (H).
- After cutting, release the footpedal. The slide will return to its original position at the top.
- To cut the opposite bevel, insert the stock as required and tighten the hold-down spindle (5).
- From time to time check the blade clearance of the section-steel shear (see section 5.6.1).



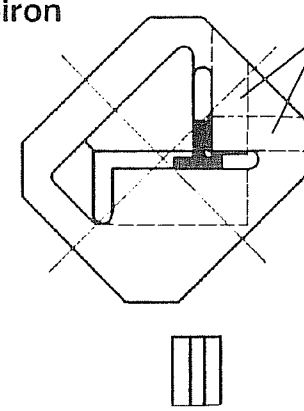


4.7.3 Cutting Instructions

1 L-iron

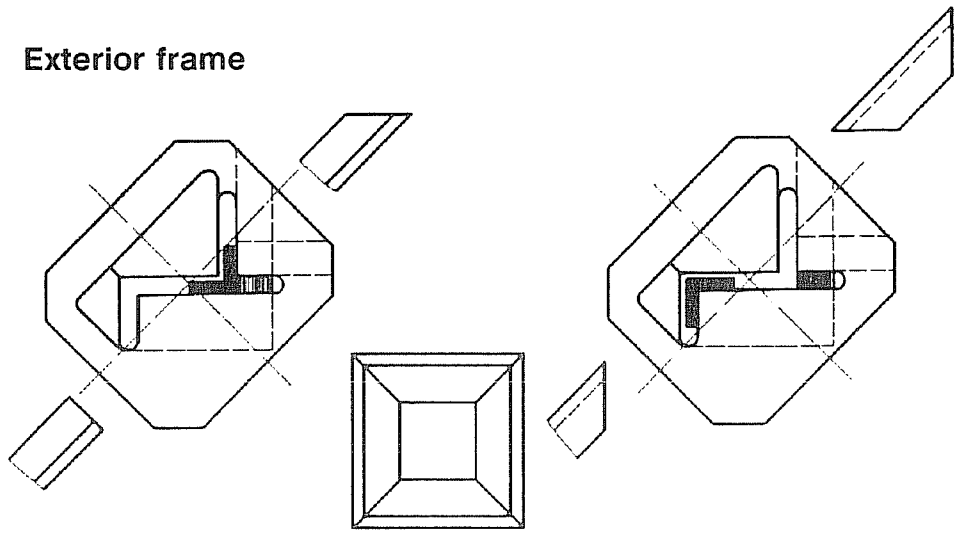


2 T-iron

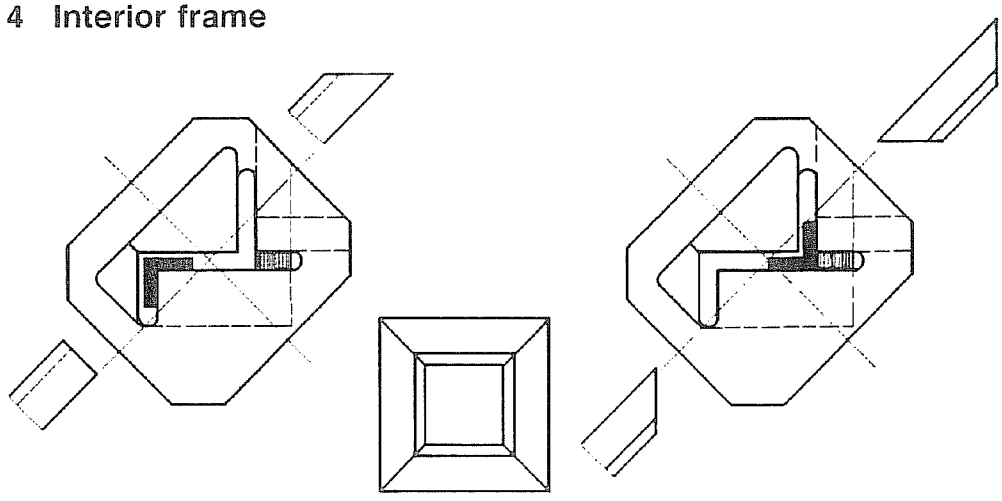


Place both knives on stock

3 Exterior frame



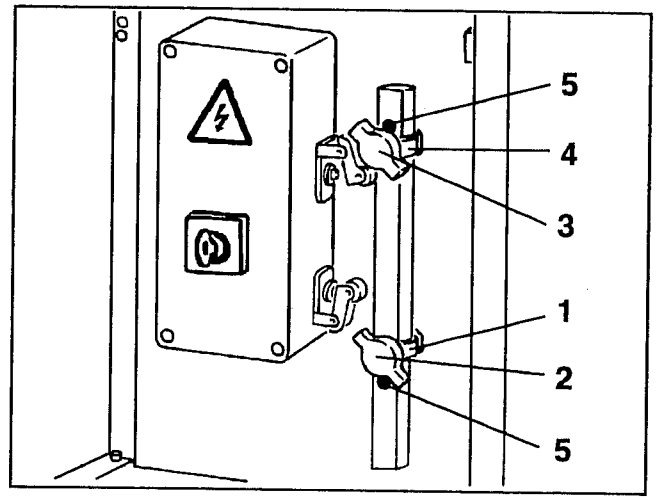
4 Interior frame



5

Toolsetting

5 Toolsetting



5.1 Setting the Stroke Length

The stroke length is controlled by the two trip cams (1) and (4).

The upper trip cam (4) limits the downward stroke, the lower trip cam (1) limits the upward stroke.

The stroke length should be set so that you are always working with shortest possible stroke.

The limit stops (5) must not be removed.

a) Setting the Upper Dead Center (Stroke Limit)

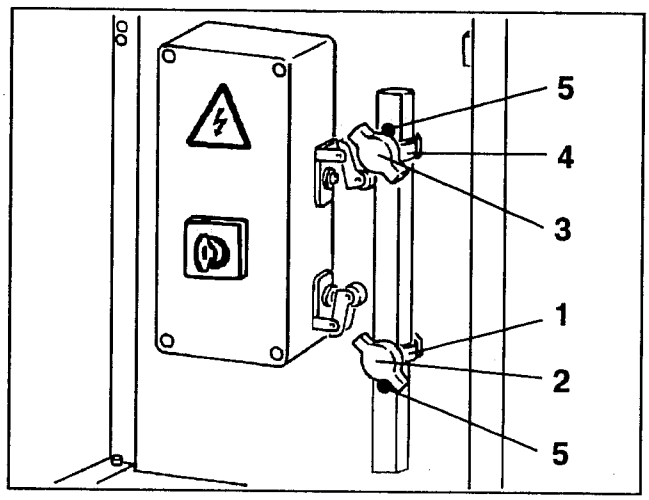
- Switch on the ironworker (see section 4.2).
- Turn the Inching and Full Stroke switch (A) to "Inching".
- Using the footpedal (H), carefully inch the punch down to the point where you can still easily insert the workpiece to be processed.
- Loosen the lower T-screw (2) and slide the trip cam up to the roller of the limit switch.
- Retighten the lower T-screw (2).
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".
- Perform a test stroke and, if necessary, correct the setting.
- Switch off the ironworker.

b) Setting the Lower Dead Center
(not necessary if a standard tool is used)

- Switch on the ironworker (see section 4.2).
- Turn the Inching and Full Stroke switch (A) to "Inching".
- Using the footpedal (H), carefully move the tool to the desired lower position.
- Undo the upper T-screw (3) and slide the trip cam down to the roller of the limit switch.
- Tighten the upper T-screw (3).
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".

The working cylinder moves up automatically.

- Perform a test stroke and, if necessary, correct the setting.
- Switch off the ironworker.



5.2 Holepunch

The safety fixtures must not be removed.

Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened.

Damaged safety fixtures are to be exchanged for new ones.

When special tools are used, they must be designed as safe tools.

When you leave the ironworker, turn the selector keyswitch to "O" and remove the key.

Electricity is still flowing through the ironworker. Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.

Defective or worn knives or tools should not be used.

5.2.1 Determining the Punch and Die Clearance

The cutting play of the tools for the hole-punch is a fixed value resulting from the punch diameter and the diameter of the die bore; for this reason, it cannot be set.

Clearance: The correct die clearance is $^1/_{32}$" regardless of hole size, material thickness or material tensile strength. If a burr occurs when punching thin material, then $^1/_{64}$" die clearance is recommended. Round punches $^1/_8$" and $^5/_{32}$" are furnished with $^1/_{64}$" clearance die.

For further information, refer to the "STOCK LIST-MUBEA PUNCHES AND DIES", which you can order free of charge from **Mubea Machinery and Systems Inc..**

5.2.2 Centering the Tools

Punch and die must be properly aligned.

As a rule, check the alignment of punch and die after every tool change and from time to time while punching.

The punch and die have been centered at the factory.
If the centering is out of place, correct it by doing as follows:

- Switch on the ironworker (see section 4.2).

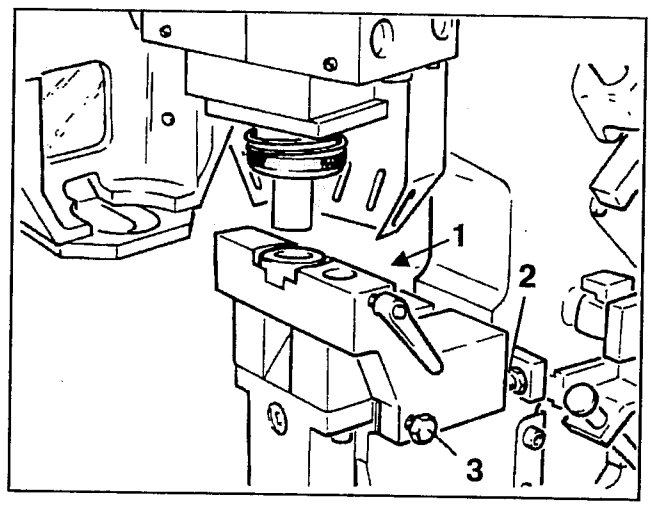
  Notes
  When working with the punch, the selector keyswitch (F) must be in pulled position.

  The coper/notcher safety guard must be closed.

- Open and arrest the cover of the holepunch.
- Turn the Inching and Full Stroke switch for the punch (A) to "Inching".
- Open the stripper by pushing it down and swinging it forward.
- Using the footpedal (H), carefully inch the punch down into the die.

Use extreme caution when entering the punch into the die. Make certain that the punch does not touch down upon the die.

- Switch off the ironworker.
- Loosen the fastening screws (1).
- Shift the punch saddle forward or backward using the adjustment screws (2).
- Using the adjustment screws (3), laterally center the punch saddle.
- Tighten the fastening screws (1).
- Tighten the adjustment screws (2) and (3).



- Switch on the ironworker (see section 4.2).

The working cylinder moves up automatically.

- Close the stripper and the cover flap.
- Switch off the ironworker.

5.3 Flat-Steel Shear

Safety fixtures must not be removed.

Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened.

Damaged safety fixtures are to be replaced with new ones.

When you leave the ironworker, turn the keyswitch to "O", and remove the key.

Electricity is still flowing through the ironworker. Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.

Defective or worn knives or tools should not be used.

5.3.1 Checking and Setting the Blade Clearance

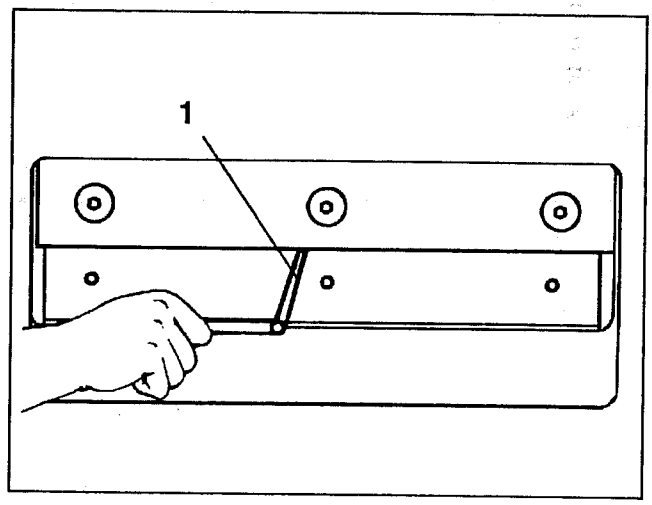
Whenever knives are changed, the blade clearance must be checked.

When installing face-ground knives, particular attention must be paid to the blade clearance.

- Switch on the ironworker (see section 4.2).
- Turn the Inching and Full Stroke switch (A) to "Inching".
- Using the footpedal (H), carefully move the slide to the lowermost position.

Proceed with extreme caution, so that the top knife does not touch the bottom knife.

- Switch off the ironworker.
- Using a feeler gauge (1), check the blade clearance from the back of the ironworker over the entire knife length.
- The blade clearance should be 5-10% of the material thickness to be cut. The blade clearance at the front should be approx. 0.008 inch narrower than at the rear.
- If the blade clearance is too big, reduce the clearance by backing the lower knife with foils (for removing knives, see section 7.2.2).
- **Too small a blade clearance** is only possible if there are no genuine knives installed, the slide guideway was adjusted or the knife was already backed with foils. To remedy this, remove the inserted foils, install genuine knives, or refinish the lower knive's standard foil.



- Switch on the ironworker (see section 4.2).
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".

The working cylinder moves up automatically.

- Switch off the ironworker.

Note
The blade clearance for very thin stock is permitted to be smaller than 0.008 inch.

5.4 Coper/Notcher

Defective or worn knives or tools should not be used.

The safety fixtures must not be removed.

Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened.

Damaged safety fixtures are to be replaced with new ones.

When you leave the ironworker, turn the keyswitch to "O", and remove the key.

Electricity is still flowing through the ironworker. Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.

5.4.1 Checking and Setting the Blade Clearance

Whenever knives are changed, the blade clearance must be checked.

The blade clearance between the upper knife and the lower knives must be equal.

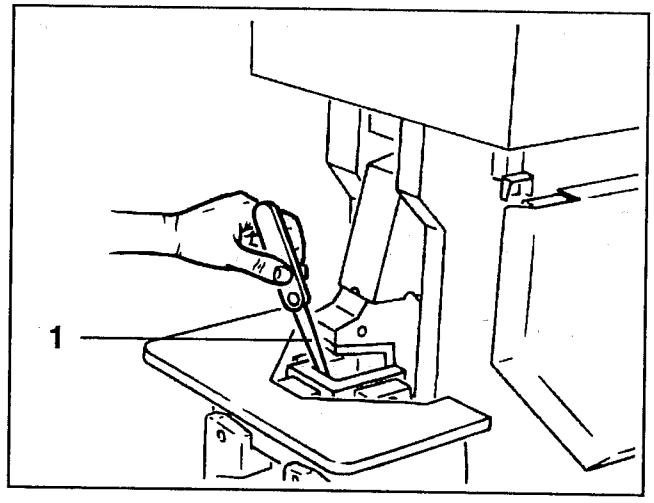
- Switch on the ironworker (see section 4.2).

  Notes
  When working with the coper/notcher, the selector keyswitch (F) must be in pushed position.

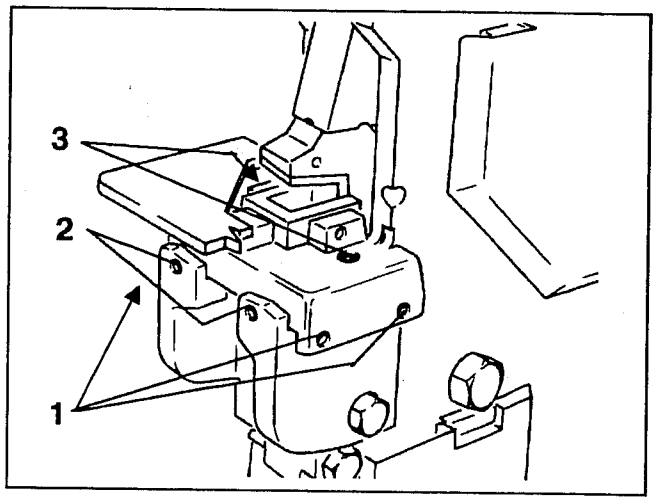
  The cover flap of the punch must be closed.

- Turn the Inching and Full Stroke switch (A) to "Full Stroke".
- Open the safety guard and arrest it.
- Using the footpedal (H), carefully move the slide down until the cutting edges of the upper knife enter the lower knives.

Proceed with extreme caution, so that the top knife does not touch the bottom knives.



- Switch off the ironworker.
- Using a feeler gauge (1), check the blade clearance on all sides.
- The blade clearance should be between 0.008 inch and 0.016 inch.
- If the ironworker is equipped with **genuine MUBEA knives and spare parts**, the lateral blade clearance cannot be too small.
- Nor can the lateral blade clearance be too big, if **genuine MUBEA knives and spare parts** are used. But if the clearance is too big, it can be decreased by backing the lower knives with a shim (may be necessary if, by way of exception, the knives were ground on the flat side - see section 8.3.2).
  For removing the knives, see section 7.3.3.



- Unequal lateral blade clearances are corrected by adjusting the coping saddle.
- Too big or too small a lengthwise blade clearance is rectified by shifting the coping saddle.
- To adjust the coping saddle, loosen the fastening screws (3).
- Use the adjustment screws (1) to move the coping saddle sideways.
- Move the coping saddle forward or back by turning the adjustment screws (2).
- Tighten the fastening screws (3).
- Retighten the adjustment screws (1).
- Check the blade clearance once again.
- Switch on the ironworker (see section 4.2).
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".

The working cylinder moves up automatically.

- Close the safety guard.
- Switch off the ironworker.

When the coper/notcher is not being operated, the safety guard must be closed.

5.5 Bar-Steel Shear

The safety fixtures must not be removed.

Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened.

Damaged safety fixtures are to be replaced with new ones.

When you leave the ironworker, turn the keyswitch to "O", and remove the key.

Electricity is still flowing through the ironworker. Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.

Defective or worn knives or tools should not be used.

5.5.1 Checking and Setting the Blade Clearance

The clamps must not press the knives together.

If the knives are ground on the flat side, the clamps must also be reworked.

If resharpened knives are used, then resharpened clamps must also be used.

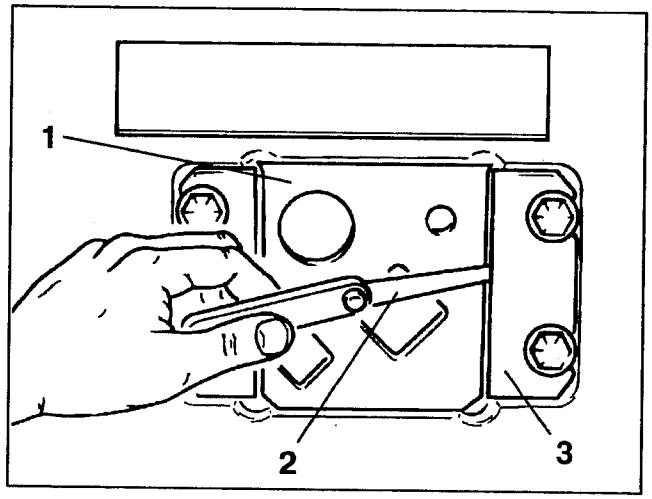
Whenever knives are changed, the blade clearance must be checked.

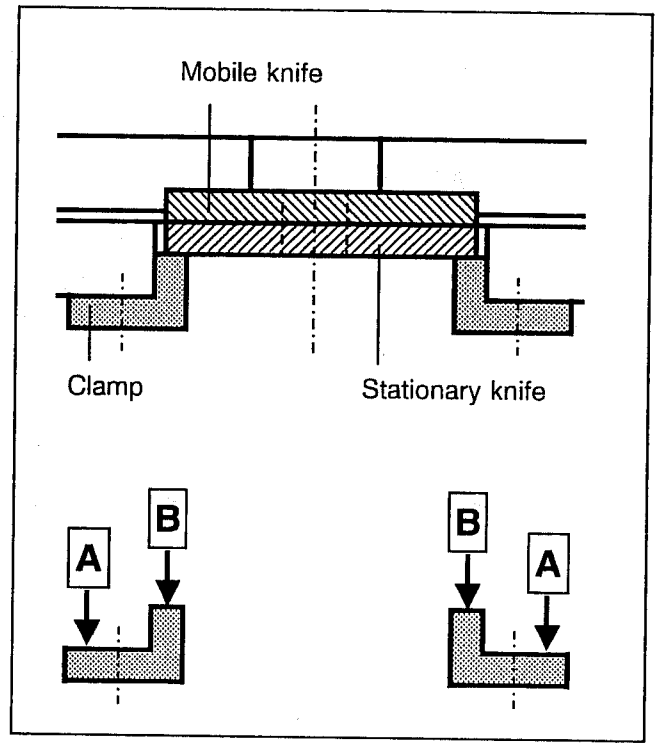
- Switch off the ironworker
- Remove the hold-down (see section 7.4.1).

- Push the stationary knife (1) back against the mobile knife.
- Using a feeler gauge (2), check the blade clearance between the clamps (3) and the knife on all surfaces.
- The blade clearance should be between 0.012 inch and 0.020 inch.

  If the **blade clearance is too big**, it can be decreased by reworking the clamps (3) on surface **A** (see also section 7.4.2 Changing the Knives).

  Too small a blade clearance is only possible if there are no genuine knives installed, the slide guideway was readjusted or the **A** surfaces of the clamps were already reworked once previously. The fault can be rectified by resharpening the clamps on the **B** surfaces.
- Reattach the hold-down (see section 7.4.4).





5.6 Section-Steel Shear

The safety fixtures must not be removed.

Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened.

Damaged safety fixtures are to be replaced with new ones.

When you leave the ironworker, turn the keyswitch to "O", and remove the key.

Electricity is still flowing through the ironworker. Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.

Defective or worn knives or tools should not be used.

5.6.1 Checking and Setting the Blade Clearance

Whenever knives are changed, the blade clearance must be checked.

When installing knives ground on the flat side, pay special attention to the blade clearance.

- Switch on the ironworker (see section 4.2).
- Turn the Inching and Full Stroke switch (A) to "Inching".

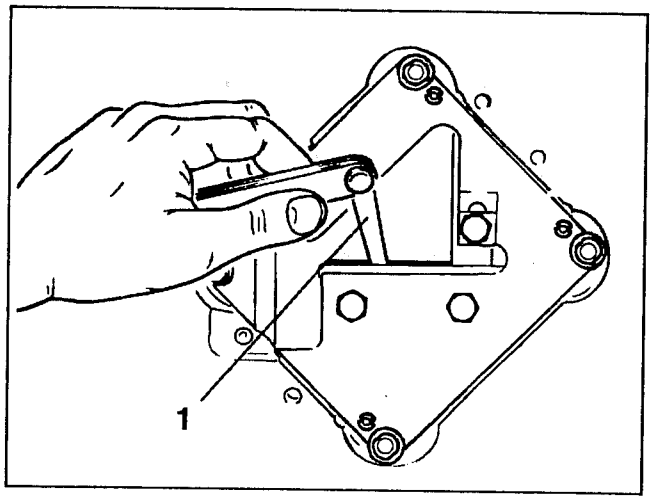
- Using the footpedal (H), carefully move the slide to the lowermost position.

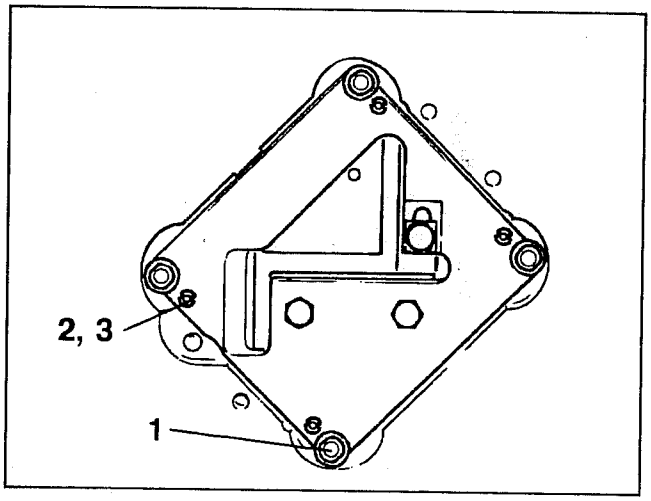
Proceed with extreme caution, so that the top knife does not touch the bottom knife.

- Switch off the ironworker.
- Remove the hold-down (see section 7.5.1).
- Using a feeler gauge (1), check the blade clearance along the entire cutting edge.
- The blade clearance should be between 0.008 inch and 0.012 inch.
- To set the blade clearance, loosen the four cheesehead screws (1).
- Loosen the locking caps (2).
- Turn the four threaded pins (3) to the right (clockwise) to increase the blade clearance, to the left to decrease the blade clearance (to do this, push the knives back).
- Tighten the cheesehead screws (1).
- Tighten the locking caps (2).
- Check the blade clearance again.
- If necessary, adjust the setting.
- Switch on the ironworker.
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".

The working cylinder moves up automatically.

- Switch off the ironworker.
- Reattach the hold-down (see section 7.5.5).





6

Maintenance

6 Maintenance

6.1 Knives and Tools

Check knives and tools at regular intervals for dull or chipped blades.

Knives and tools must be resharpened on time. Dull knives put a strain on the ironworker and result in poor cuts.

Unclean cuts leave burrs and jagged spikes on the workpiece and increase the risk of injury.

When you leave the ironworker, turn the keyswitch to "O" and remove the key.

Whenever working near the cutting and punching tools, the ironworker must be deactivated by turning off the main switch (G). Secure the mainswitch with a padlock.

Do not remove the warning labels.
Replace damaged, scratched or illegible warning labels.

The safety fixtures must not be removed.

Whenever the ironworker is switched on, the sufety fixtures must be checked before hand to ensure they are all present, complete and securely fastened.

Damaged safety fixtures must be replaced.

Electricity is still flowing through the ironworker.
Only perform maintenance and adjustment work when the main switch (G) is off and secured with the padlock.

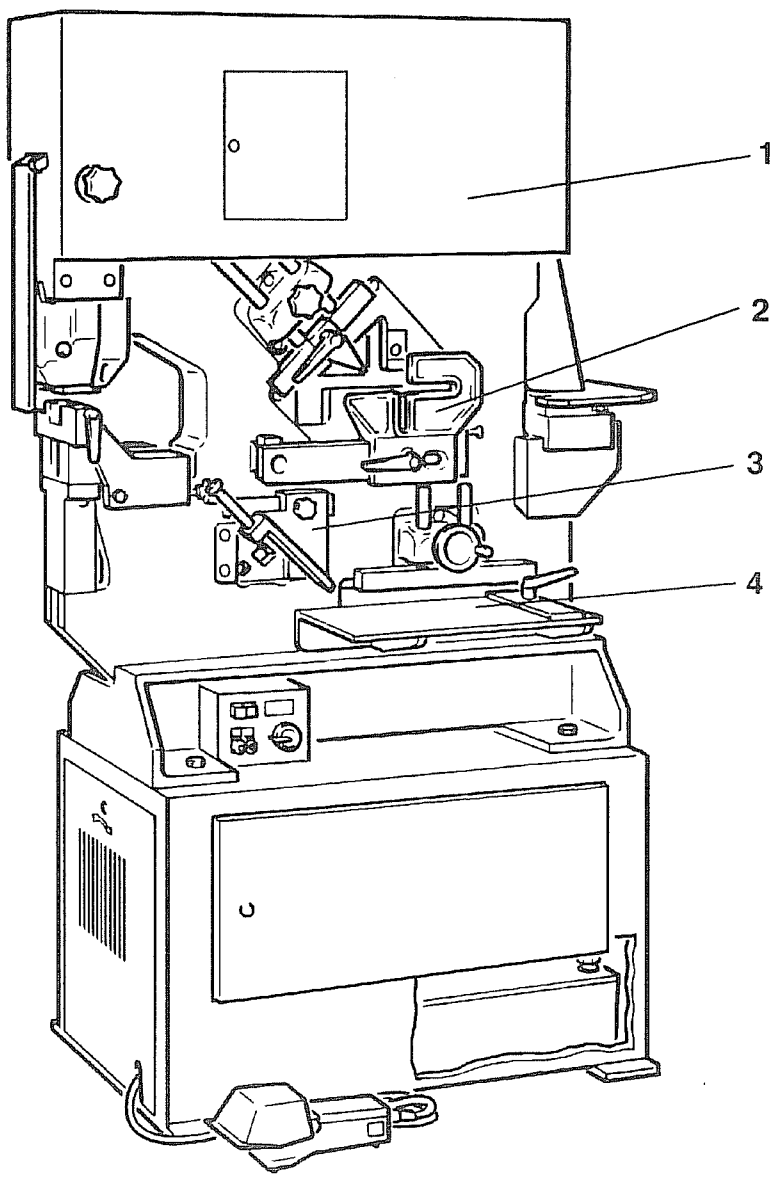
6.2 Readjusting the Slide Guideway

Like all of the ironworker's parts, the lengthwise and crosswise guideways for the slide are also subject to a certain amount of wear.

To reset the slide guideway, the section-, bar- and flat-steel knives, the punch tools and the coper/notcher tools have to be removed.

6.2.1 Preparations

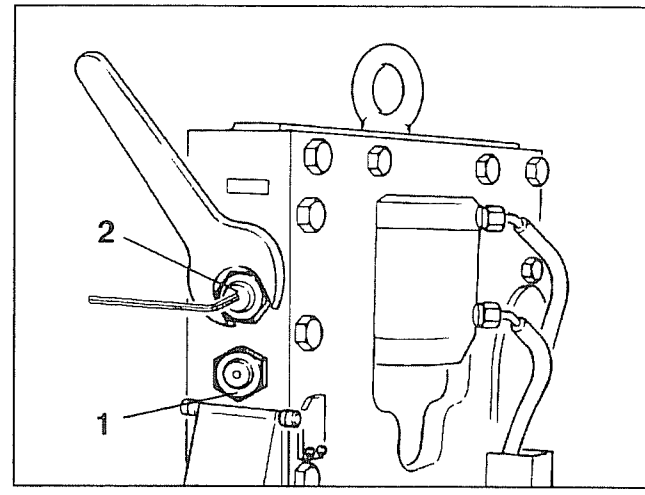
- Switch off the ironworker.
- Remove the machine's safety cover (1).
- Remove the lateral stop (2) and the hold-down (3) according to section 7.4.1 and 7.5.1.
- Remove the supporting and guide table (4) (see section 7.2.1).
- Dismantle the section-steel knives, flat-steel knives, bar-steel knives, punch tools and coper/notcher tools (see chapter 7).



6.2.2 Setting the Slide Guideway

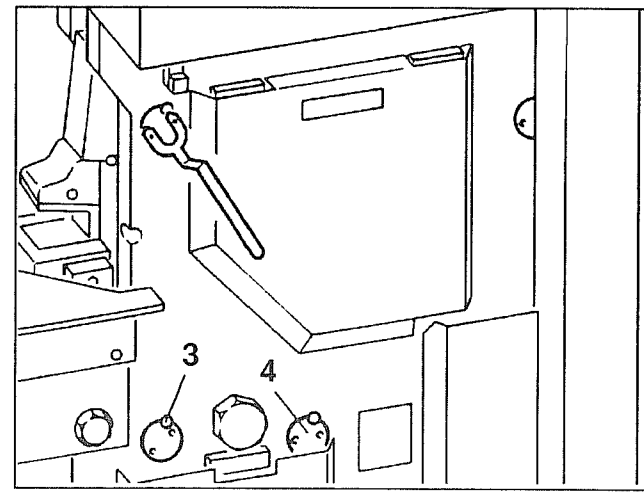
a) Lengthwise guideway

- Loosen the six lock nuts (1) on the front (coper side) of the machine.
- Tighten the pressure screws (2) all the way.
- Loosen the pressure screws (2) slightly; this will give the slide its proper running fit.
- Tighten the lock nuts (1) all the way.



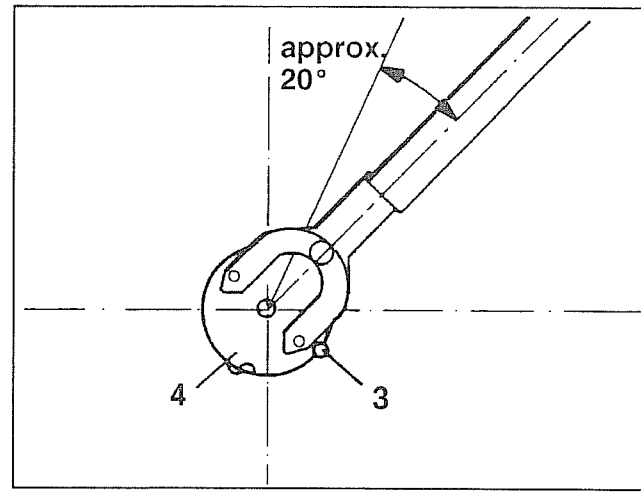
b) Crosswise guideway

- To adjust the lateral slide guideway, loosen the locking screws (3).
- Tighten the guide rollers (4) all the way.
- Then loosen the guide rollers (4) 1/16 of a turn (about 20 degrees); this will give the slide its proper running fit.
- Drill the guide rollers (4) in this position (drill diameter 0.177 inch).
- Tighten the locking screws (3) all the way.



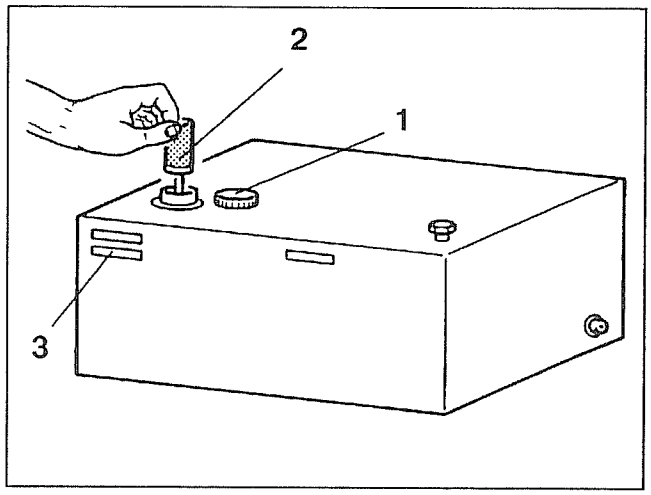
6.2.3 Final Tasks

- Mount the punch tools and check alignment (see section 7.1).
- Mount flat-steel knives and check blade clearance (see section 7.2).
- Mount coping tools, bar- and section-steel knives and check blade clearances (see sections 7.3, 7.4, 7.5).
- Attach hold-down for bar-steel shear (see section 7.4.4).
- Attach lateral stop for section-steel shear (see section 7.5.5).
- Attach supporting and guide table (see section 7.2.5).
- Mount the machine's safety cover.



6.3 Hydraulic System

Whenever working on the hydraulic system, make sure the equipment remains immaculately clean.



6.3.1 Checking the Oil Level

- Open the cover panel at the base.
- Remove the cap (1).
- Regularly check the oil level with the measuring gauge (2). The oil container should be filled to about $^3/_4$" below the cap.
- Replace the cap (1), closing it tightly.
- Close the cover panel.

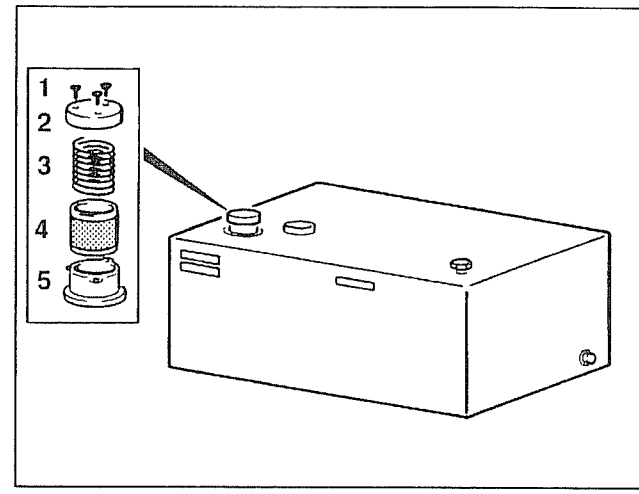
6.3.2 Refilling the Oil

- Open the cover panel at the base.
- Read the oil grade off of the instruction label (3) on the hydraulic container.

Always refill with the same hydraulic-oil grade; never mix. At extreme ambient temperatures you must consult Mubea Machinery and Systems Inc. (see Customer Service).

- Remove the cap (1).
- Refill with oil until the oil level is about $^3/_4$" below the container cap.
- Replace the cap (1), closing it tightly.
- Close the cover panel.

6.3.3 Cleaning the Reflux Filter



The first cleaning is to be done after 10 hours of operation.
Routine cleaning of the filter should be done every 600 operating hours.
The same intervals apply to changing disposable filters.

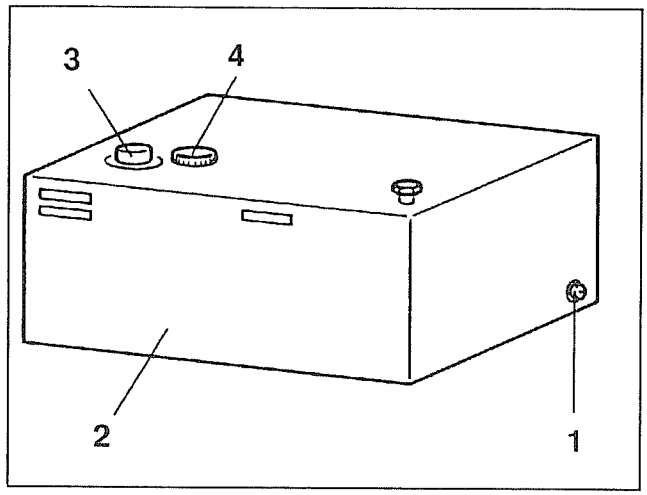
- Open the cover panel at the base.
- Unfasten screws (1) and take off filter cover (2).
- Remove spring (3).
- Pull out filter element (4).
- Clean filter element in scavenging oil or, even better, use new filter element.

Water, lyes or kerosene are unsuitable as cleaning agents.

- Clean the sealing surfaces of the cover (2) and connection piece (5).
- Put in a cleaned or new filter element (4).
- Insert spring (3).
- Replace cap (2) and fasten with the screws (1).
- Close cover panel.

6.3.4 Changing the Oil

The first oil change should be made after 600 operating hours.
After that, the oil must be changed every 1,200 to 1,500 operating hours.



With every oil change, also change the oil filter.

If the grade of oil is changed, the new oil grade should be indicated on the cover cap of the hydraulic container.

- Open the cover panel on the base.
- Unscrew the oil drain plug (1).
- Drain the used oil.

Before draining the used oil, procure an appropriate collector vessel.
Avoid polluting the environment!
Take the used oil to a waste disposal facility!

- Clean the oil container (2) and the hydraulic system with scavenging oil.
- Clean sealing surfaces of filler neck (3) and cap (4).
- Check seal of oil drain plug (1) and, if necessary, change.
- Insert oil drain plug (1) and screw tight.
- Pour in new, unused oil. The oil container should be filled up to $^3/_4$" below the cap.
- Close filler neck (3) and cap (4) and screw tight.
- Ventilate system.
  Switch motor on, letting it idle for about 4 min. Then use the footpedal (H) to move the working cylinder a number of times without any load.
- Recheck the oil level.
- Close the cover panel.

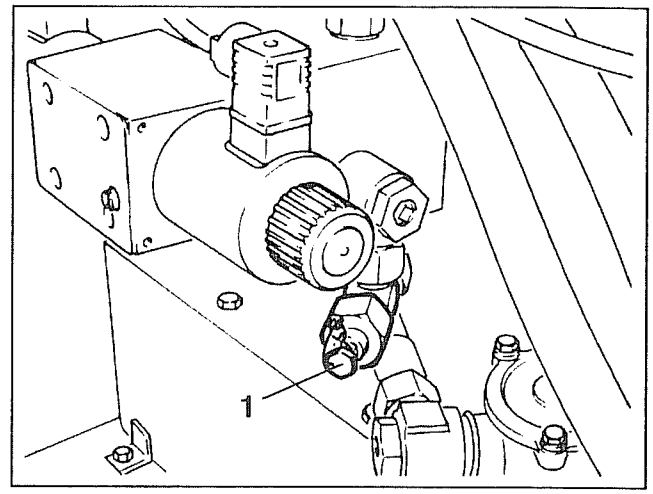
6.3.5 Checking the Max. Operating Pressure

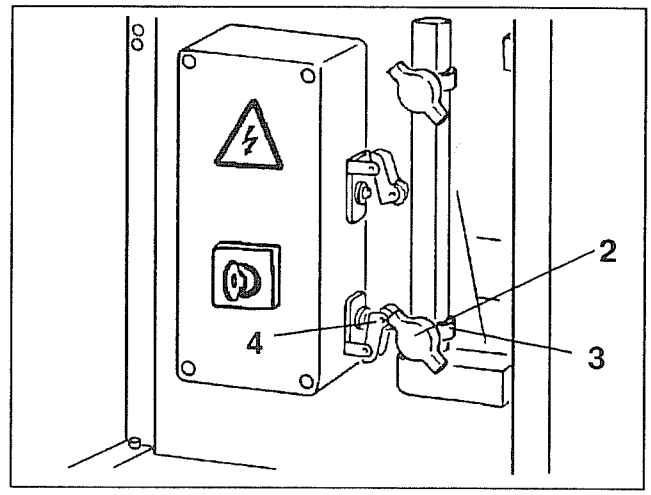
- Switch off the motor.
- Open the cover panel at the base.
- Connect and secure the pressure gauge to the test connection.
  (Special accessory "pressure gauge" can be ordered from **Mubea Machinery and Systems Inc.**, or is available on the market.)
- Switch on the motor (see section 4.2).
- Loosen the T-screw (2).
- Slide the trip cam (3) up past the limit switch (4) **for a short time**. Upon contact release, pump begins running under pressure.
- Read pressure off the gauge.
- Reset the trip cam (3) and tighten the T-screw (2).
- Switch off the motor.

Bottoming of the cylinder on the limit switch for an extended time will cause the overload cut-out to activate and the machine will switch off. If this happens, inform the electrician.

- Remove the pressure gauge.
- Close and lock the test connection (1).
- Close the cover panel.

Do not remove the built-in lead seal of the pressure-limiting valves; otherwise the guarantee will be void.





6.4 Lubricating the Ironworker

As a rule, the machine must be thoroughly lubricated using the pressure grease gun that is supplied together with the ironworker.

The lubricating points have been marked in yellow; the locations of the lubricating points can be seen in the figure below.

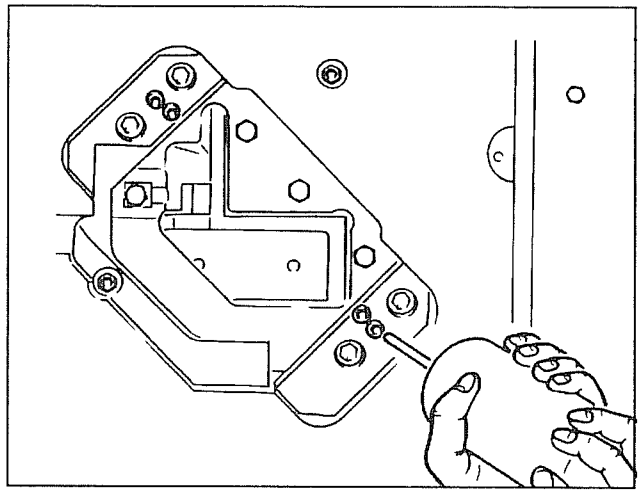
Lubrication intervals:
One pump stroke before operation, and every five operating hours thereafter.

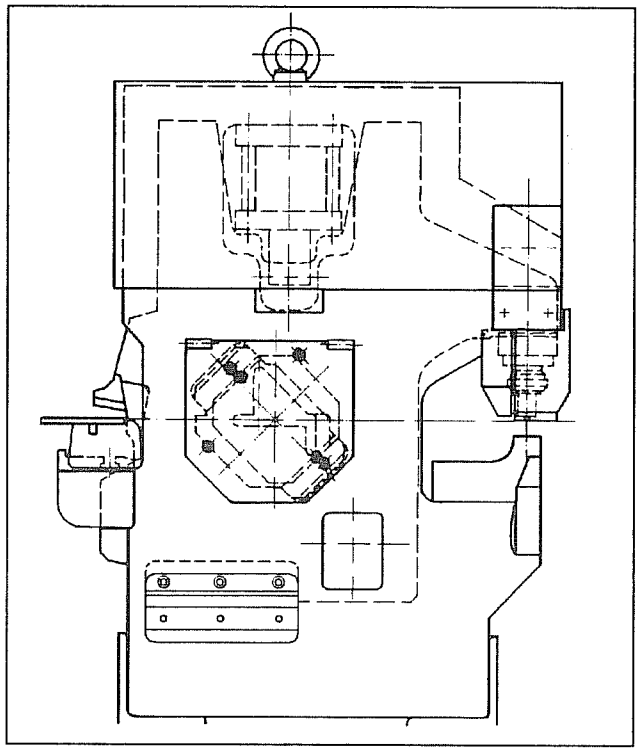
The same oil can be used for all lubricating points.

The following lubricant is recommended for use:

CHEVRON VISTAC OIL 150X

or equivalent.





7

Exchanging Knives and Tools

7 Exchanging Knives and Tools

Knives and tools should be checked regularly for the condition of their cutting edges and for the formation of burrs or cracks. Dull or damaged knives have to be resharpened or exchanged for new ones. The possibility for resharpening the knives and tools is limited in each case by the cutting stroke of the ironworker.

Defective or worn knives or tools should not be used.

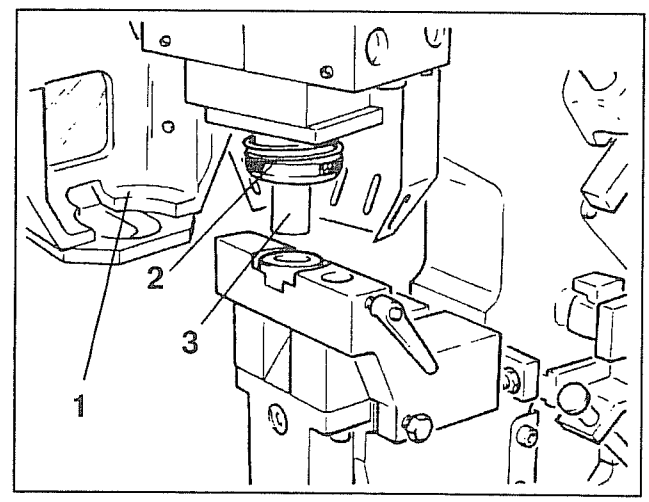
Whenever working near the cutting and punching tools, the ironworker must be deactivated by turning the main switch (G) off. Secure the main switch with a padlock.

7.1 Holepunch

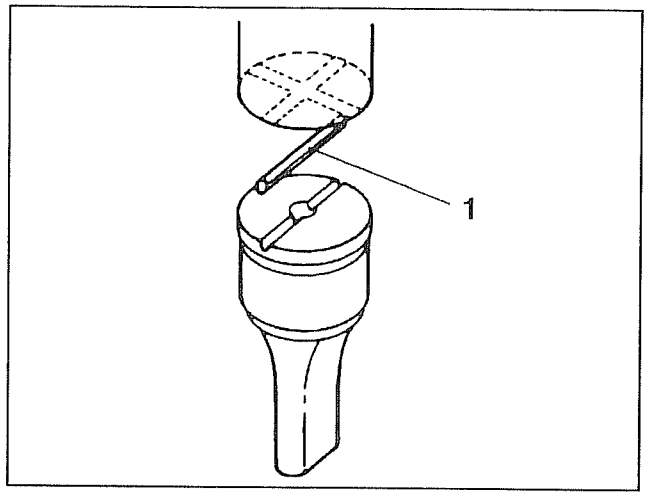
7.1.1 Changing the Punch

The clearance between the punch and the die must be carefully controlled.

- Switch off the ironworker.
- Open the cover flap at the punch and secure it in position.
- Open the stripper (1) by pressing it down and swinging it out to the front.
- Undo the quick-change attachment (2) by turning it counterclockwise, or: Unscrew the coupling nut.
- Take out the punch (3).
- Insert new or resharpened punch.



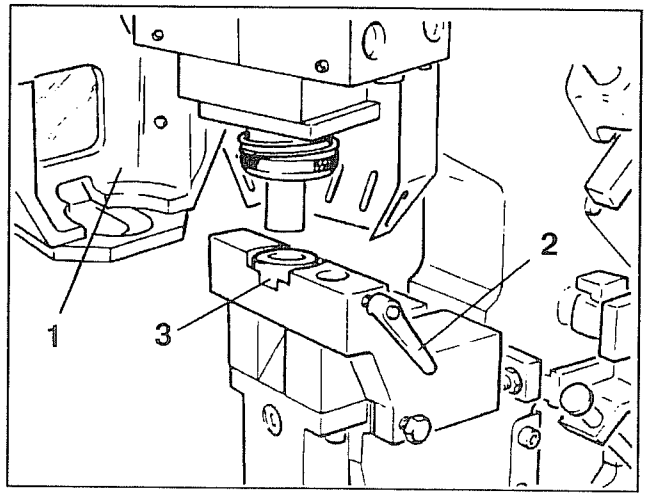
- For embossing, the anti-torsion pin (1), which is included in the delivery, must also be inserted.
  Make sure the pin is seated properly in the adapter.



Pay attention to the position of the cutting form of the punch relative to the die.

- Close the quick-change attachment, or: Screw on the coupling nut and tighten it.
- Close the stripper.
- Check alignment according to section 7.1.3.

7.1.2 Changing the Die



The clearance between the punch and the die must be carefully controlled.

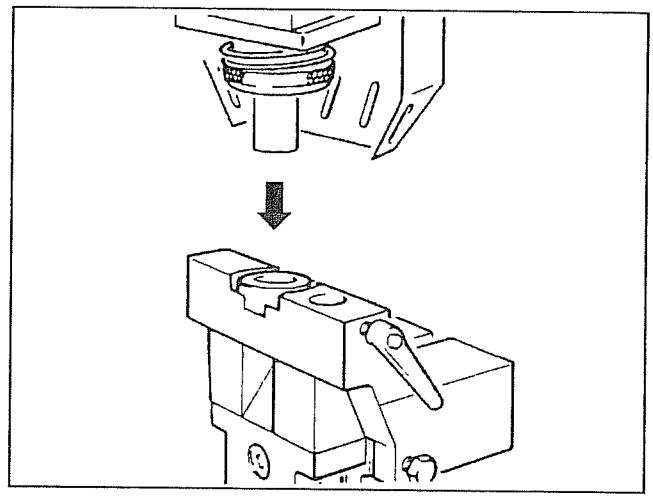
- Switch off the ironworker.
- Open the cover flap at the punch and secure it in position.
- Open the stripper (1) by pressing it down and swinging it out to the front.
- Loosen the clamping lever (2).
- Take out the die (3).
- Insert new or resharpened die (cutting edge at top).

When using shaped dies, pay attention to the position of the cutting opening.

- Tighten the clamping lever.
- Close the stripper.
- Check alignment according to section 7.1.3.

When special tools are used, they must be designed as safe tools.

7.1.3 Check Alignment



Punch and die must be properly aligned.

As a rule, check the alignment of punch and die after every tool change and from time to time while punching.

- Switch on the ironworker (see section 4.2).
- Turn the Inching and Full Stroke switch (A) to "Inching".
- Open the cover flap at the punch and secure it in position.
- Open the stripper by pressing it down and swinging it out to the front.
- Using the footpedal (H) in inching mode, carefully lower the punch into the die.

Use extreme caution when entering the punch into the die. Make sure the punch does not touch the die.

- Switch off the ironworker.
- Adjust incorrect centering according to section 5.2.2.
- Switch on the ironworker.
- Turn the Inching and Full Stroke switch (A) to "Inching".

The working cylinder moves up automatically.

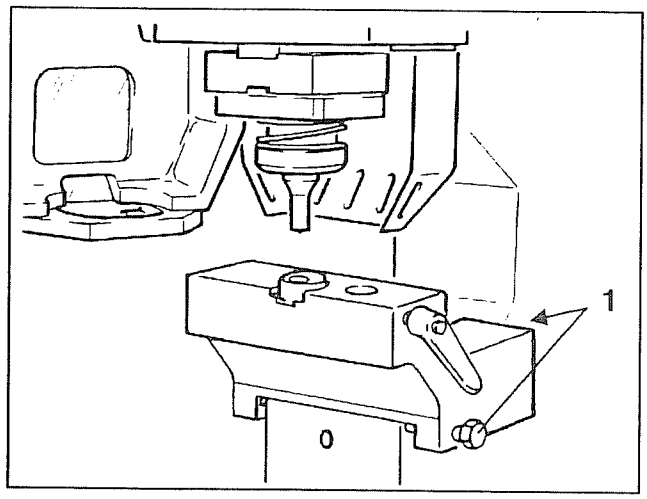
- Close the stripper.
- Close the cover flap of the punch.
- Switch off the ironworker.

7.1.4 Using Eccentric Dies

(without lower saddle support)

When using eccentric dies, it may be necessary to remove the saddle support and the lower saddle support, depending on the punching operation.
The hole in the die must be aligned with the punch.

- Switch off the ironworker.
- Remove the lower saddle support and the saddle support according to section 9.1.4.
- Change the die (see section 7.1.2)
- Loosen screws (1).
- Adjust the punch saddle to match the die (see section 5.2.2)
- Tighten screws (1).
- Check alignment according to section 7.1.3.



The punch and die alignment must be checked whenever a tool change is made.

7.2 Flat-Steel Shear

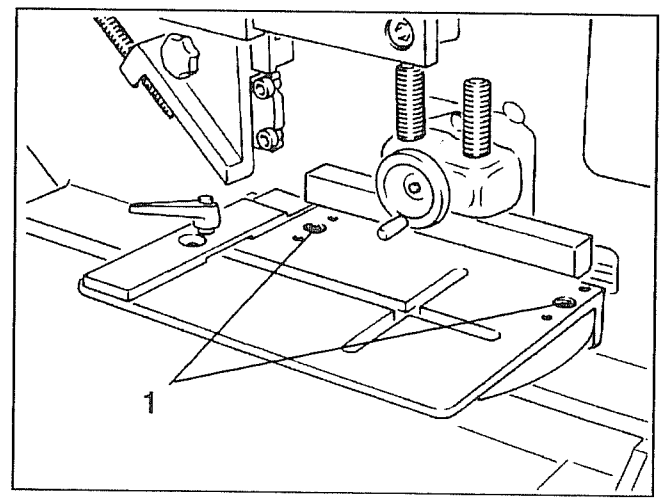
The bottom knife can be used on four sides. Changing each knife individually is also possible.

Whenever knives are changed, the blade clearance must be checked.

When installing flat-ground knives, special attention must be paid to the blade clearance.

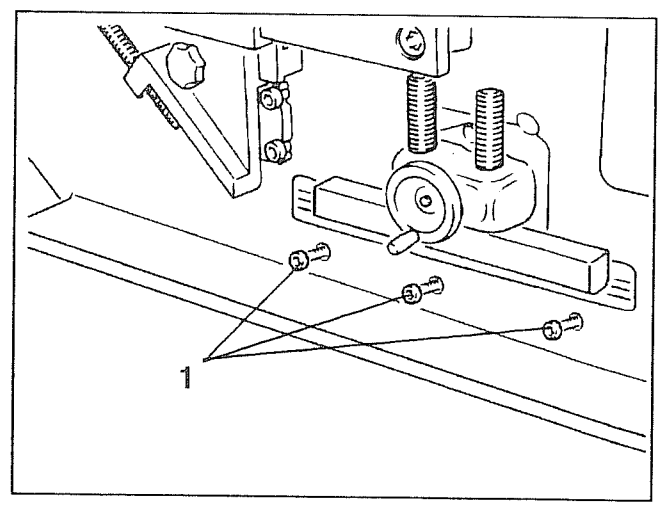
7.2.1 Removing the Supporting and Guide Table

- Switch off the ironworker.
- Unscrew and remove the hex socket screws (1).
- Lift off the supporting and guide table.



7.2.2 Changing the Bottom Knife

- Switch off the ironworker.
- Unmount supporting and guide table according to section 7.2.1.
- Remove the fastening screws (1).
- Take out the knife and knife shim.
- Turn the knife around, or mount new/resharpened knife together with the shim.
- Insert and tighten the fastening screws (1).
- Check blade clearance according to section 7.2.4.
- Mount the supporting and guide table according to section 7.2.5.

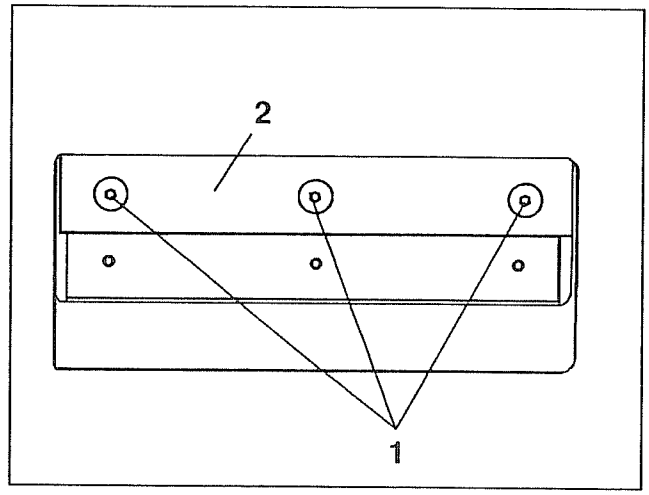


7.2.3 Changing the Top Knife

- Switch off the ironworker.
- Remove the fastening screws (1) from the back of the ironworker.

Hold onto to the knife firmly to prevent accidental dropping and possible damage.

- Remove the knife (2) from the back of the ironworker.
- Turn the knife around, or mount new/resharpened knife.
- Insert and tighten fastening screws (1).
- Check blade clearance according to section 7.2.4.

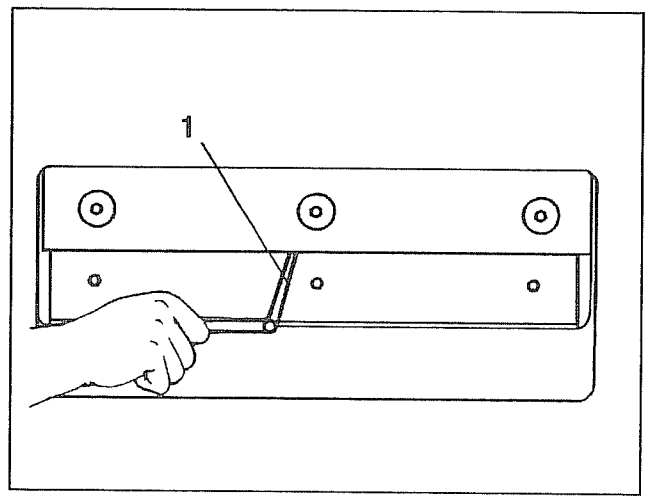


7.2.4 Checking the Blade Clearance

- Switch on the ironworker (see section 4.2).
- Turn Inching and Full Stroke switch (A) to "Inching".
- Using the footpedal (H), carefully move the slide to the lowermost position.

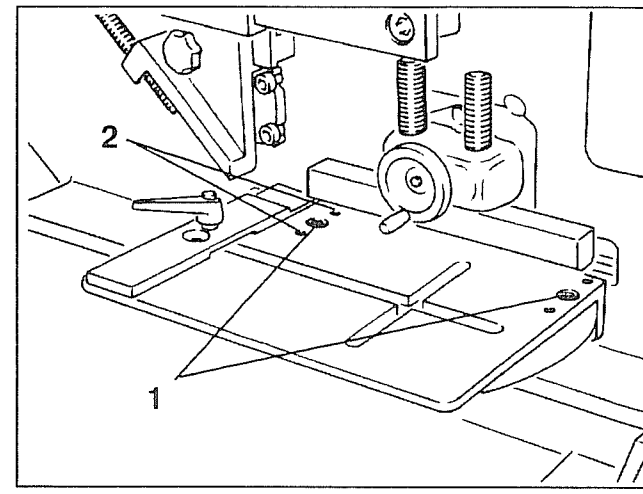
Proceed with extreme caution, so that the top knife does not touch down upon the bottom knife.

- Switch off the ironworker.
- Using a feeler gauge (1) from the back of the ironworker, check the blade clearance along the entire length of the knives.
- The blade clearance should be 5-10% of the material thickness to be cut. The blade clearance at the front should be approx. 0.008 inch narrower than at the rear.
- If necessary, adjust the blade clearance according to section 5.3.1.



7.2.5 Mounting the Supporting and Guide Table

- Switch off the ironworker.
- Place the supporting and guide table in position and fasten with the hex socket screws (1).
- If necessary, use the adjustment screws (2) to align the table with the upper edge of the bottom knife.



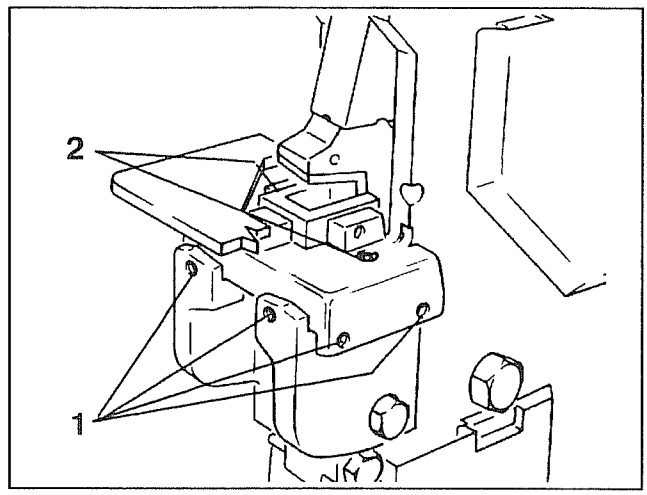
7.3 Coper/Notcher

The bottom knives of the rectangular notching tool each have two cutting edges and can be rotated.

Whenever knives are changed, the blade clearance must be checked.

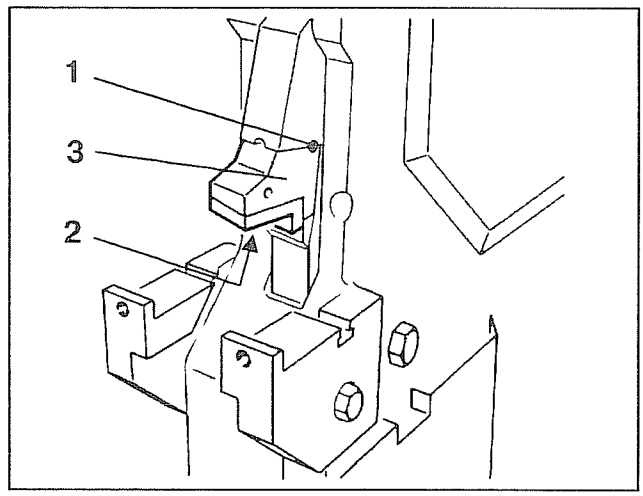
7.3.1 Removing the Coping Saddle
(only necessary when changing the top knife)

- Switch off the ironworker.
- Open the safety guard and arrest it.
- Loosen the adjustment screws (1).
- Loosen and remove the adjustment screws (2).
- Remove the coping saddle.
- Close the safety guard.

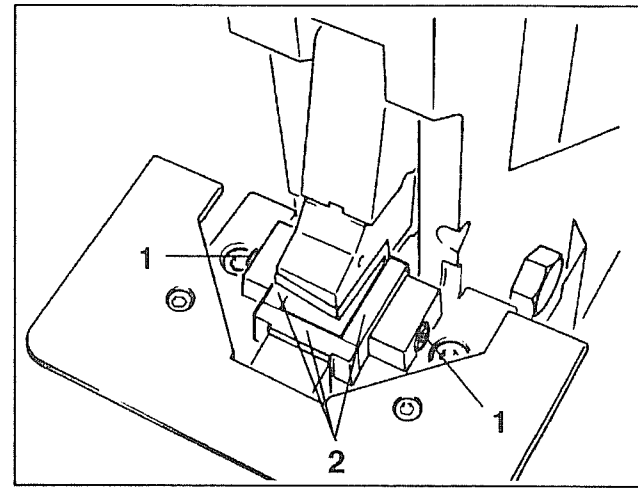


7.3.2 Changing the Top Knife

- Switch off the ironworker.
- Detach the coping saddle (see section 7.3.1).
- Open the safety guard and secure it.
- Using a suitable drive-out punch, knock out the two dowel pins (1).
- Unscrew and remove the fastening screw (2).
- Detach the top knife (3) from its mounting, removing it to the front.
- Insert a new or resharpened top knife in its mounting.
- Hammer in both dowel pins (1).
- Insert and tighten the fastening screw (2).
- Mount the coping saddle (see section 7.3.4).

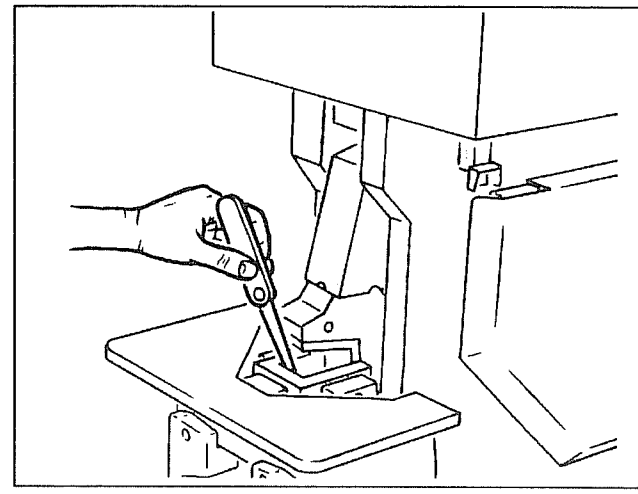


7.3.3 Changing the Bottom Knives



- Switch off the ironworker.
- Open and secure the coper safety guard.
- Unscrew and remove the fastening screws (1).
- Take knives (2) out of saddle.
- Turn knives around, or insert new/resharpened knives.
- Insert and tighten fastening screws.
- Check blade clearance (see section 5.4.1).

7.3.4 Mounting the Coping Saddle



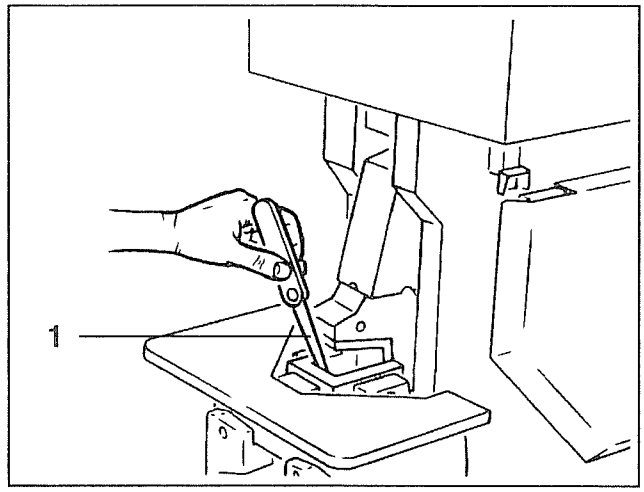
- Switch on the ironworker (see section 4.2).
- Turn toolsetting and operation switch (A) to "Inching".
- Using the footpedal (H), move the slide to the lowermost position.
- Switch off the ironworker.
- Open and secure the coper safety guard.
- Clean the bearing surface for the coping saddle on the ironworker and on the coping saddle.
- Mount and fasten the coping saddle.
- Set and check the blade clearance according to section 5.4.1.

7.3.5 Checking the Blade Clearance

- Switch on the ironworker (see section 4.2).
- Turn Inching and Full Stroke switch (A) to "Inching".
- Using the footpedal (H), carefully move the slide down until the cutting edges of the upper knife enter the lower knives.

Proceed with extreme caution, so that the top knife does not touch the bottom knives.

- Switch off the ironworker.
- Using a feeler gauge (1), check the blade clearance on all sides.
- The blade clearance should be between 0.008 inch and 0.016 inch.
- If necessary, adjust the blade clearance according to section 5.4.1.

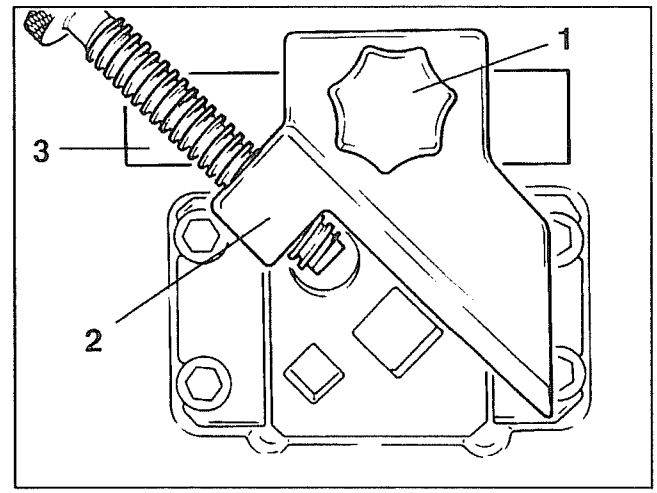


7.4 Bar-Steel Shear

The knives are square-shaped and have cutting edges on both sides.
By rotating and tilting the knives, eight cutting edges can be used.

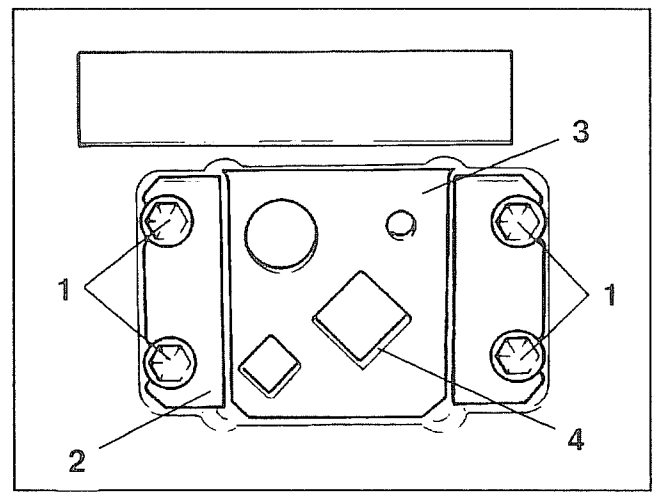
Whenever knives are changed, the blade clearance must be checked.

7.4.1 Removing the Hold-Down



- Switch off the ironworker.
- Loosen the star handle (1).
- Slide the hold-down plate (2) off the stop rail (3).

7.4.2 Changing the Knives



- The slide must be at the topmost position. If necessary, adjust stroke accordingly (see section 5.1).
- Switch off the ironworker.
- Take off the hold-down as described in section 7.4.1.
- Loosen the fastening screws (1).
- Remove the clamps (2).
- Take out the stationary knife (3).
- Take out the mobile knife (4).
- Turn knives around, or insert new/resharpened knives.

- Reattach clamps.
- Tighten fastening screws.
- Check blade clearance (see section 7.4.3).

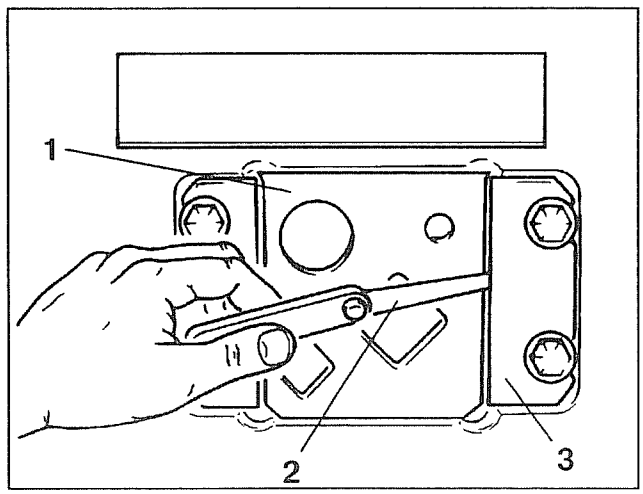
The clamps must not press the knives together.

If resharpened knives are used, reworked clamps must also be used.

- Mount the hold-down according to section 7.4.4.

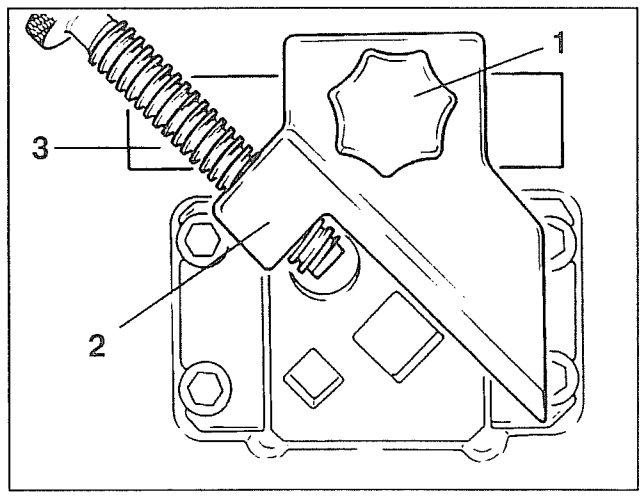
7.4.3 Checking the Blade Clearance

- Switch off the ironworker.
- Take off the hold-down according to section 7.4.1.
- Press the stationary knife (1) back against the mobile knife.
- Using a feeler gauge (2), check the blade clearance between the clamps (3) and the knife on all surfaces.
- The blade clearance should be between 0.012 mm and 0.020 mm.
- If necessary, adjust blade clearance according to section 5.4.1.
- Mount the hold-down according to section 7.4.4.



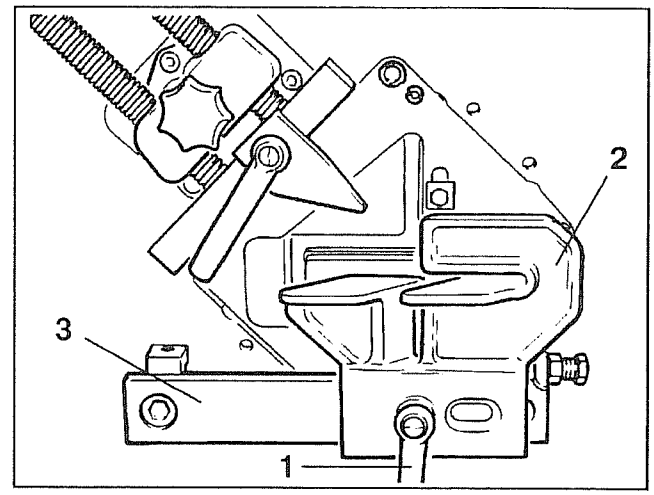
7.4.4 Mounting the Hold-Down

- Switch off the ironworker.
- Slide the hold-down (2) onto the stop rail (3).
- Tighten the star handle (1).



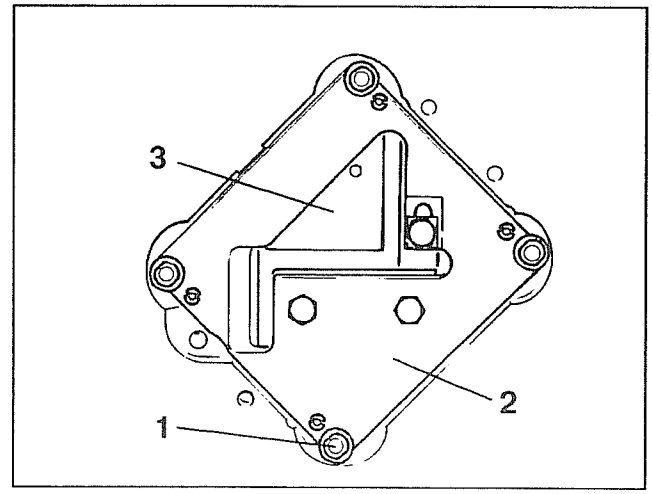
7.5 Section-Steel Shear

7.5.1 Removing the Lateral stop



- Switch off the ironworker.
- Release the locking lever (1).
- Slide the lateral stop (2) off the stop rail (3).

7.5.2 Removing the Section-Steel Knives

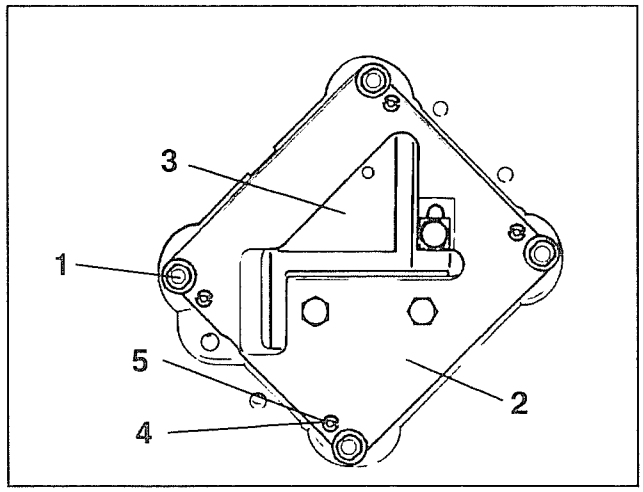


Whenever knives are changed the blade clearance must be checked.

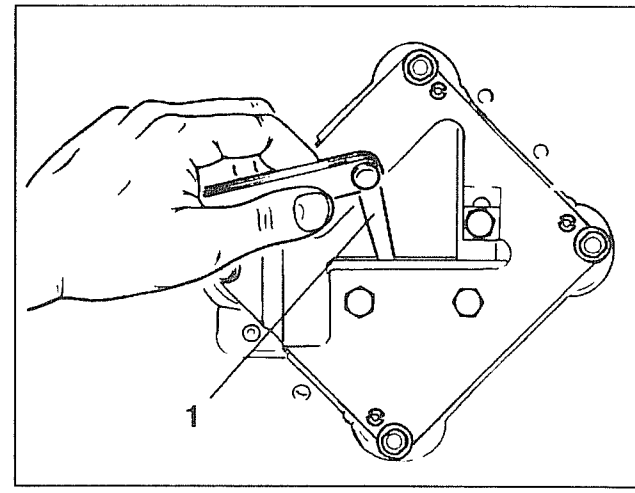
- Using the footpedal (H), move the slide to the topmost position.
  If necessary, adjust stroke length according to section 5.1.
- Switch off the ironworker.
- Remove the lateral stop (see section 7.5.1).
- Screw out the four cheesehead screws (1) with the disk springs.
- Take the stationary section-steel knife (2) out of the profile window, removing it to the front.
- Take the mobile section-steel knife (3) out of the profile window, removing it to the front.
- Replace dull or damaged cutting inserts with new/resharpened ones.
  When mounting resharpened section-steel knives, follow instructions in section 8.5.
- Clean the guideways in the body, in the slide and on the knife.

7.5.3 Mounting the Section-Steel Knives

- Switch off the ironworker.
- Before mounting the section-steel knives, oil the outer guide surfaces of the mobile section-steel knife (3).
- Insert mobile section-steel knife (3) into the slide and push it into the knife guideways all the way back.
- Insert stationary knife (2) and screw the four cheesehead screws (1) with disk springs tight.
- Screw threaded pins (4) tight.
- Loosen the cheesehead screws (1) one turn and tighten the threaded pins (4) about 1/8 of a turn.
  This is necessary, to prevent the two section-steel knives from being pulled toward each other and to maintain a blade clearance.
- Screw the cheesehead screws (1) tight.
- Screw the threaded pins (4) locking caps (5) tight.
- Check blade clearance
  (see section 7.5.4).
- Mount lateral stop according to section 7.5.5.

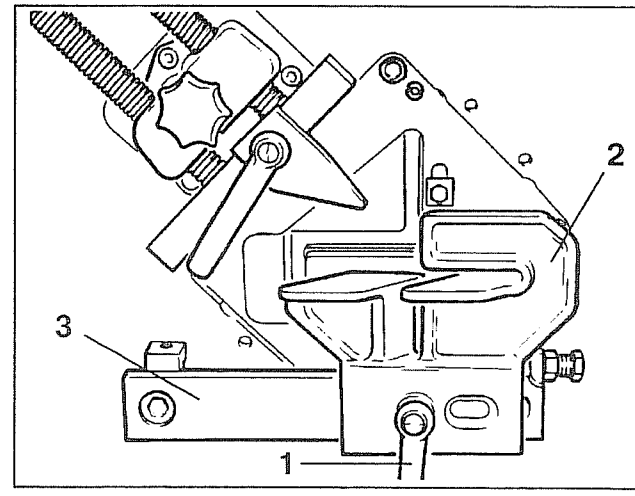


7.5.4 Checking the Blade Clearance



- Switch on the ironworker.
- Turn toolsetting and operation switch (A) to "Inching".
- Using the footpedal (H), move the slide to the lowermost position.
- Switch off the ironworker.
- Detach the lateral stop according to section 7.5.1.
- Using a feeler gauge (1), check the blade clearance along the entire cutting edge.
- The blade clearance should be between 0.008 inch and 0.012 inch.
- If necessary, adjust the blade clearance according to section 5.6.1.
- Mount the lateral stop plate according to section 7.5.5.

7.5.5 Mounting the Lateral stop



- Slide the lateral stop (2) onto the stop rail (3).
- Pull the locking lever (1) tight.

8

Resharpening the Knives and the Tools

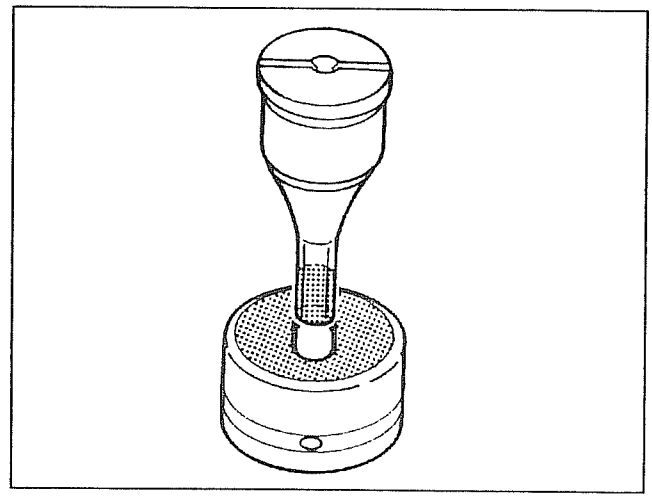
8 Resharpening the Knives and the Tools

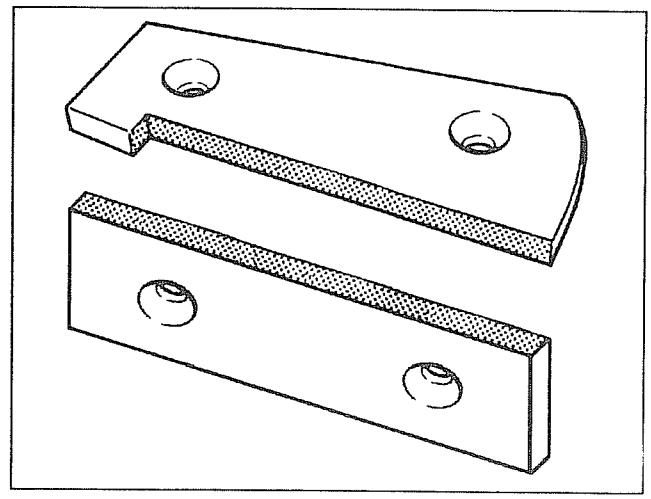
Knives and tools must be resharpened on time. Dull Knives put a strain on the ironworker and cause unclean cuts.

Unclean cuts leave burrs and jagged spikes on the workpiece and increase the risk of injury.

All knives and tools should be sharpened with a fine-grained grinding wheel.
Make sure there is sufficient cooling!
Excessive local heating will lead to the development of chinks and subsequent fracturing of the tools. Use oil stone to remove grinding fins or flashes.

Instead of regrinding, it may be better to use new tools.
Refer to the "STOCK LIST-MUBEA PUNCHES AND DIES" which can be ordered free of charge from **Mubea Machinery and Systems, Inc.**.





8.1 Resharpening the Punching Tools

8.1.1 Punch

- Grind the punch only on the face.

8.1.2 Die

- Grind the die only on the cutting surface.

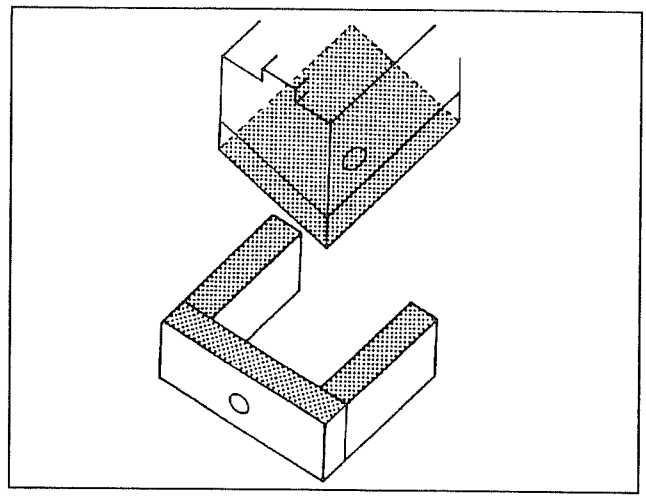
8.2 Resharpening the Flat-Steel Knives

- Grind the flat-steel knives only on the face and at a right angle.
- Grind off uniformly, in order that the pitch between the knives remains unchanged.

- In exceptional cases, it may be necessary to grind the flat side.

When installing the flat-ground knife, particular attention must be paid to the blade clearance (see section 5.3.1).

8.3 Resharpening the Coping Tools



8.3.1 Top Knife

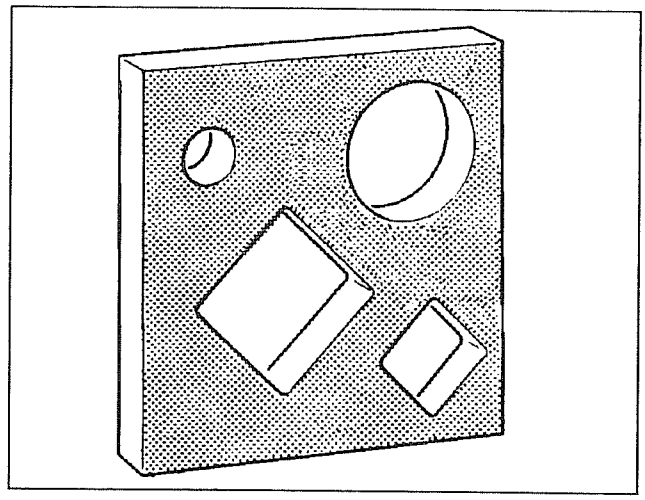
- Grind the top knife only on the lower surface.

8.3.2 Bottom Knife

- Grind the bottom knife only on the upper surfaces.
- In exceptional cases, it may be necessary to grind on the flat side.

When installing a flat-ground bottom knife, particular attention must be paid to the blade clearance (see section 5.4.1).

8.4 Resharpening the Bar-Steel Knives



- Grind the knife on its planar side.
- Depending on the amount of wear, it may also be necessary to grind the profile.

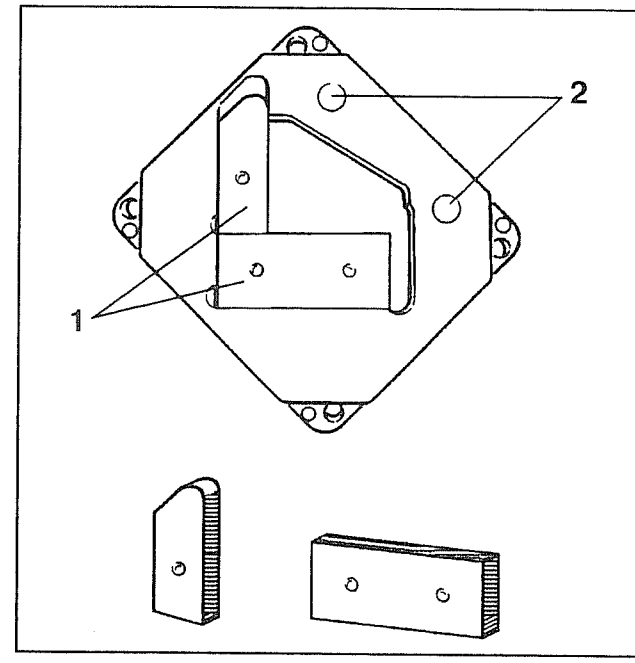
When installing a surface-ground knife, particular attention must be paid to the blade clearance (see section 5.5.1).

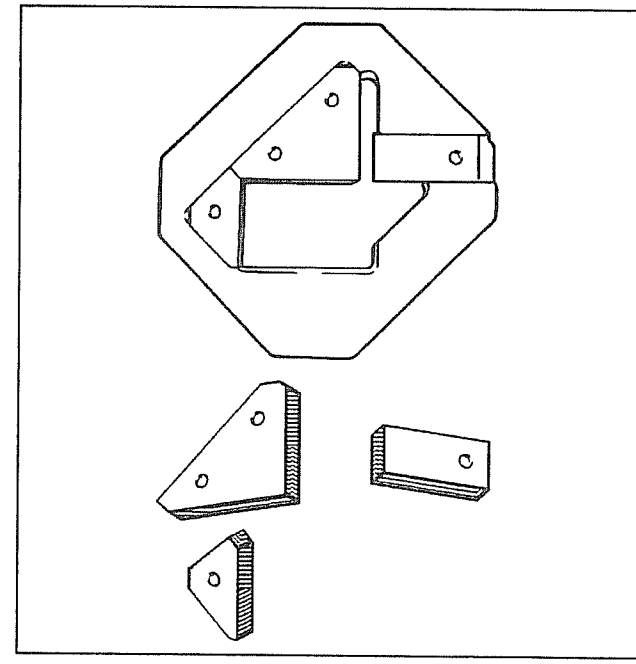
8.5 Resharpening the Section-Steel Knives

- Remove the cutting inserts from the knife mounting.
- Grind the knife only on its faces, uniformly, and at a right angle.
- In exceptional cases, it may be necessary to grind on the flat side.

Note
Grinding on the flat side is only possible if this is allowed by the projecting length of the knives (1) and the guides (2).

When installing a flat-ground knife, special attention must be paid to the blade clearance (see section 5.6.1).





9

Retooling

9 Retooling

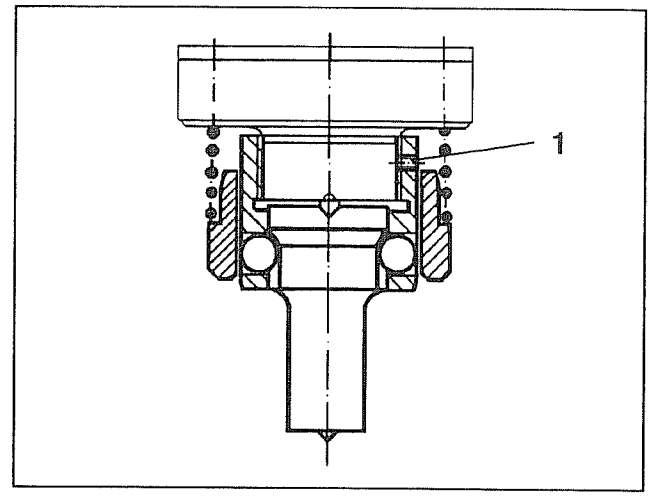
9.1 Retooling – Standard Accessories

9.1.1 Changing Over the Punch Attachment to Attachment With Coupling Nut

For large series production the quick-change fixture should always be replaced by the sturdier punch attachment with coupling nut. The coupling nut is part of the standard delivery.

- Switch off the ironworker.
- Open the stripper.
- Loosen the threaded pin (1).
- Unscrew the quick-change fixture.
- Insert the punch in the coupling nut and screw on the coupling nut.
- Close the stripper.

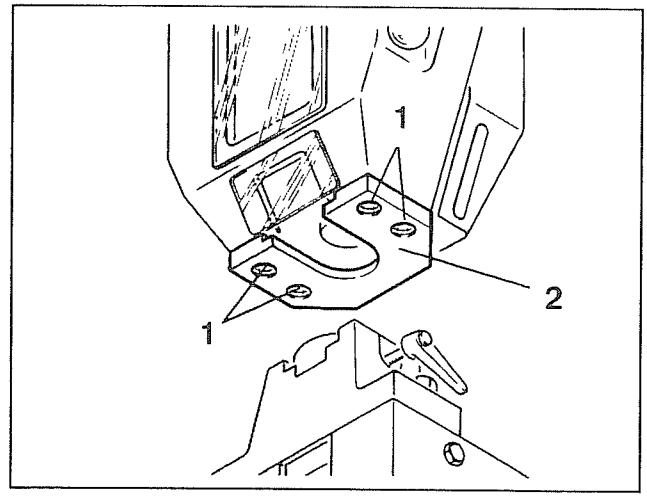
The clearance between the punch and the die must be carefully controlled.



9.1.2 Detaching the Stripper Plate from the Holepunch

The stripper plate, which is part of standard equipment, can be detached if necessary.

- Switch off the ironworker.
- Screw out the hex socket screw (1) and remove the stripper plate (2).



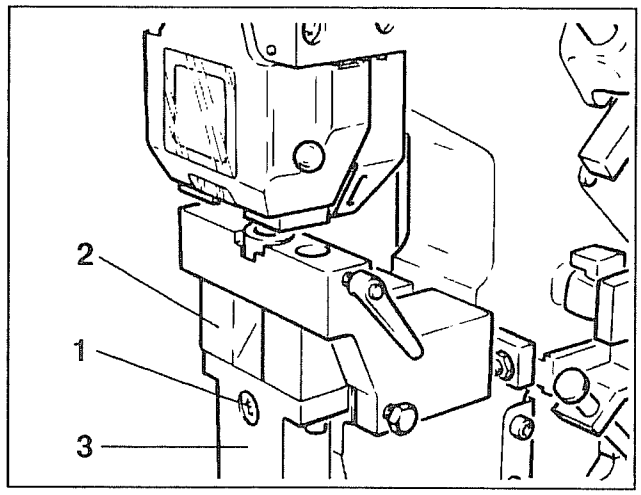
9.1.3 Detaching the Lower Saddle Support / Saddle Support

When performing flange-punching operations in channel steel and I-beams, the lower saddle support and the saddle support must be removed.

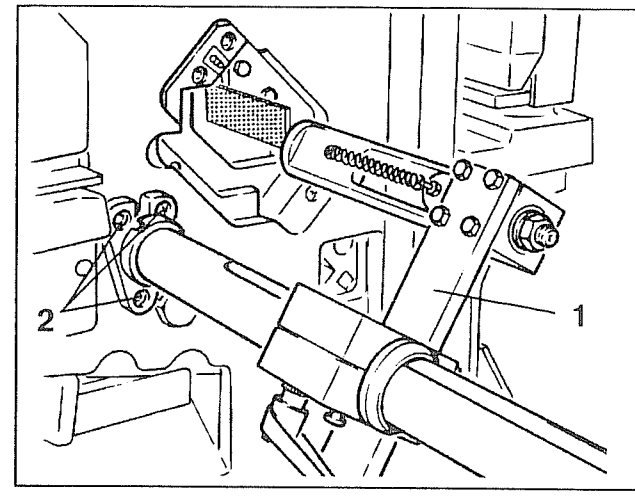
- Switch off the ironworker.
- Unscrew the retaining screw (1).
- Remove the lower saddle support (2) and the saddle support (3).

After finishing work:

- Remount the lower saddle support and the saddle support.
- Check alignment of punch and die (see section 5.2.2).



9.2 Retooling - Special Accessories (Not Standard)



9.2.1 Length Stop

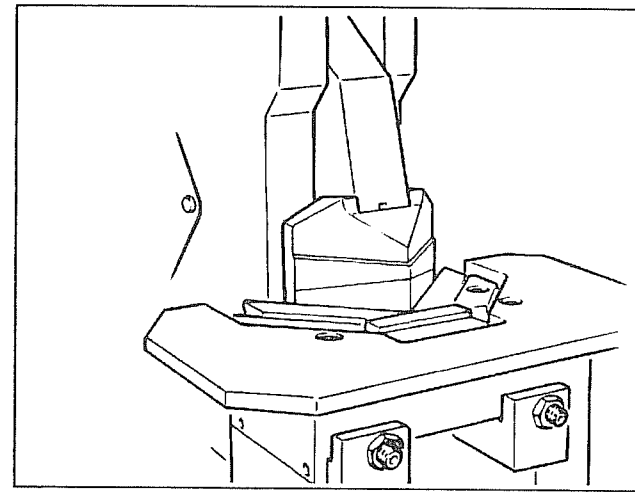
- Attach the length stop (1) with three fastening screws (2) in the boreholes provided on the back of the ironworker.
- Insert the plug into the socket.

Note
When switching on the ironworker, press the selector keyswitch for length stop/footpedal (E) (see section 4.2).

For operation of length stop, refer to the separate user manual.

The safety flap of the section-steel shear has only been removed for the purpose of representation.

9.2.2 Triangular Notching Tool



Converting to the triangular notching tool follows the same procedure as exchanging the top and bottom knives of the rectangular coping tool.

- Remove the coping saddle (see section 7.3.1).
- Exchange the top knife (see section 7.3.2).
- Exchange the bottom knife (see section 7.3.3).
- Attach the coping saddle (see section 7.3.4).

10

Malfunctions and Their Remedy

10 Malfunctions and Their Remedy

10.1 Machining Errors

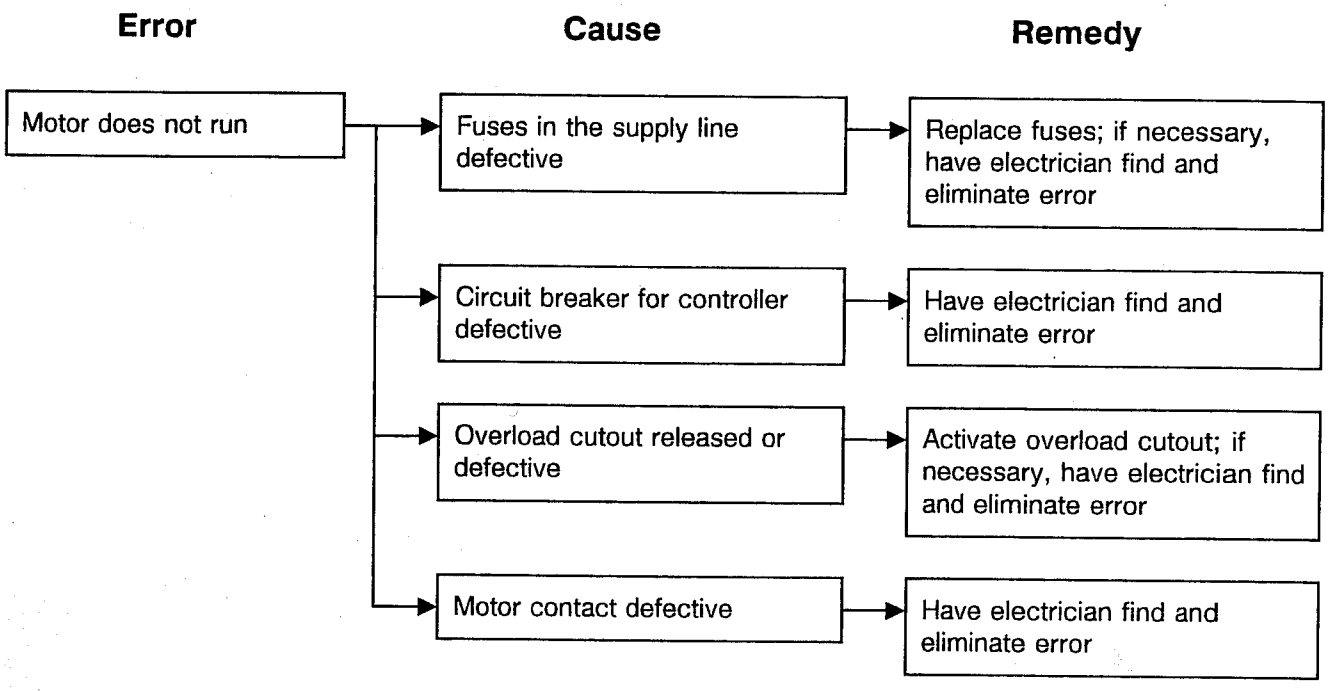
Error	Cause	Remedy
Slide does not move down when footpedal is pressed	Inching and Full Stroke switch at position "0"	Switch setting
	"Holepunch/coper" switch at "holepunch" position, "coper" safety guard is open	Close "coper" safety guard
	"Holepunch/coper" switch at "coper" position, "holepunch" cover flap is open	Close "holepunch" cover flap
	"Length stop" / footpedal" switch at "length stop" position	Switch to "Footpedal" position
	Directional control valve dirty or defective	Repair or replace directional control valve
	Directional control valve does not switch	Have electrician find and eliminate error
	Footpedal does not function properly	Have electrician find and eliminate error

Error	Cause	Remedy
Slide remains in lowermost position and does not move up	Inching and Full Stroke switch in "Inching" or "0" position	Switch to "Full Stroke" position
	Limit switch for the lower stroke limit does not function properly	Check limit-switch setting, or have limit switch replaced by electrician
	Directional control valve dirty or defective	Repair or replace directional control valve
	Directional control valve does not switch	Have electrician find and eliminate error
	Footpedal does not operate properly	Have electrician test and repair footpedal
Slide moves down, but workpiece is only partially cut or not cut at all	Ironworker's working capacity limit exceeded	Use stock with less tensile strength or decrease workpiece cross-section
	Cutting edges of knives extremely worn or damaged	Grind or replace knife
	Blade clearance of knives much too big	Adjust blade clearance to correct width
	Hydraulic pressure in system too low	Check pressure and, if necessary, adjust (see p. 10 - 9)

Error	Cause	Remedy
Slide moves down, but workpiece is only partially punched or not punched at all	Ironworker's working capacity limit exceeded	Use stock with less tensile strength or decrease punching cross-section
	Tool extremely worn or damaged	Grind or replace tool
	Hydraulic pressure in system too low	Check pressure and, if necessary, adjust (see p. 10 - 9)
	Footpedal does not function properly	Have electrician find and eliminate error
Angle steel is cut, but the cut sections are out of shape or not square	Blade clearance between the knives too big	Adjust blade clearance (see user instructions)
	Root radius on workpiece and on mobile knife are different	Adjust radius on mobile knife to the root radius
	Knife geometries changed due to improper grinding of knives	Grind knives according to rules (see user instructions)
	Incorrect setting of hold-down	Set according to user instructions

10.2 Electrical Errors

Error	Cause	Remedy
Motor is deactivated by overload cutout after a short time	Overload cutout incorrectly set or defective	Have electrician test and, if necessary, replace overload cutout
	Directional control valve does not switch off or over at upper or lower stroke point	Repair or replace directional control valve
	Directional control valve receives no switch instruction at upper or lower stroke point	Have electrician find and eliminate error
	Stroke setting for upper or lower stroke point incorrectly set	Correct the stroke setting
	Ironworker's power-range limit exceeded	Use stock with low tensile strength or small shear/punch cross-section
	Hydraulic pump defective	Replace hydraulic pump
	Motor damaged	Have motor repaired or replaced (have it connected only by an electrician)


Error
Cause
Remedy
Motor does not run
Fuses in the supply line defective
Replace fuses; if necessary, have electrician find and eliminate error
Circuit breaker for controller defective
Have electrician find and eliminate error
Overload cutout released or defective
Activate overload cutout; if necessary, have electrician find and eliminate error
Motor contact defective
Have electrician find and eliminate error

10.3 Hydraulic Error

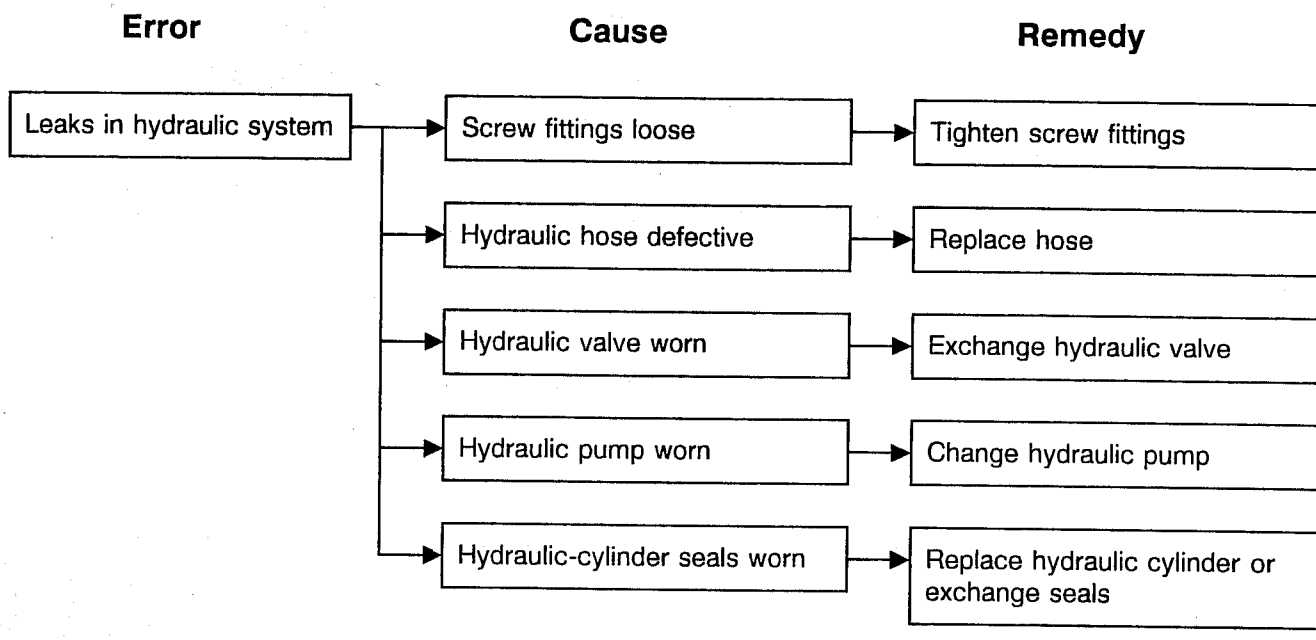
Error	Cause	Remedy
Excessive noise in the hydraulic system	Too little hydraulic oil in container	Raise amount of oil to prescribed level
	Hydraulic oil too cold (below +40 °F)	Heat hydraulic oil to temperature of +40 °F
	Oil temperature too high (above +160 °F)	Raise amount of oil to prescribed level
		Use prescribed oil grade
	Oil-return filter dirty	Clean or replace filter
	Oil-container ventilation clogged	Clean ventilation filter in lid of oil container
	Viscosity of hydraulic oil too high	Use appropriate oil
	Hose or pipe lines vibrating	Check/tighten fastenings
	Pressure-limiting valve damaged or incorrectly set	Set pressure-limiting valve correctly or replace it (removing the lead seal voids the guarantee); if necessary, call for factory Customer Service
	Air in suction line	Tighten or replace screw-type fitting of suction line
	Motor defective	Have motor repaired or replaced (have it connected only by an electrician)
	Pump defective	Replace pump

Error	Cause	Remedy
Insufficient pressure or none at all	Air in suction line	Tighten or replace screw-type fitting of suction line
	Oil viscosity too low	Use appropriate hydraulic oil
	Directional control valve damaged or dirty	Repair or replace directional control valve
	Motor defective	Have motor repaired or replaced (have it connected only by an electrician)
	Pressure-limiting valve damaged or dirty	Repair or replace pressure-limiting valve (removing the lead seal voids the guarantee); if necessary, call for factory Customer Service
	Hydraulic-cylinder bore damaged	Exchange hydraulic cylinder
	Coupling between motor and hydraulic pump defective	Replace coupling
	Plunger seals in hydraulic cylinder damaged or worn	Replace plunger seals
	Pump defective	Replace pump

Error	Cause	Remedy
Irregular or fluctuating feed output	System not completely ventilated	Ventilate system
	Hydraulic oil too cold (below +40 °F)	Heat hydraulic oil to temperature of +40 °F
	Viscosity of hydraulic oil too high	Use appropriate hydraulic oil
	Oil temperature too high (above +160 °F)	Raise amount of oil to prescribed level
		Use prescribed oil grade
	Directional control valve damaged or dirty	Repair or replace directional control valve
	Oil-container ventilation clogged	Clean ventilation filter in lid of oil container
	Too little hydraulic oil in container	Raise amount of oil to prescribed level
	Motor defective	Have motor repaired or replaced (have it connected only by electrician)
	Pressure-limiting valve damaged or incorrectly set	Set pressure-limiting valve correctly or replace it (removing the lead seal voids the guarantee); if necessary, call for factory Customer Service
	Air in suction line	Tighten or exchange screw-type fitting of suction line
	Oil viscosity too low	Use appropriate hydraulic oil
	Pump defective	Replace pump

Error	Cause	Remedy
Too low a feed output or none at all	Motor rotating in wrong direction	Have electrician change motor's electric connection
	Hydraulic oil too cold (below +40 °F)	Heat hydraulic oil to temperature of +40 °F
	Viscosity of hydraulic oil too high	Use appropriate hydraulic oil
	Oil temperature too high (above +160 °F)	Raise amount of oil to prescribed level
		Use prescribed oil grade
	Oil viscosity too low	Use appropriate hydraulic oil
	Oil-container ventilation clogged	Clean ventilation filter in lid of oil container
	Too little oil in container	Raise amount of oil to prescribed level
	Air in suction line	Tighten or exchange screw-type fitting of suction line
	Pressure-limiting valve damaged or incorrectly set	Set pressure-limiting valve correctly or replace it (removing the lead seal voids the guarantee); if necessary, call for factory Customer Service
	Motor defective	Have motor repaired or replaced (have it connected only by electrician)
	Pump defective	Replace pump

Error	Cause	Remedy
Temperature of hydraulic oil too high	Coupling between motor and hydraulic pump defective	Exchange coupling
	Directional control valve damaged or dirty	Repair or replace directional control valve
	Plunger seals in hydraulic cylinder damaged or worn	Replace plunger seals
	Hydraulic-cylinder bore damaged	Exchange hydraulic cylinder
	Oil-return filter dirty	Clean or replace oil filter
	Too little hydraulic oil in container	Raise amount of oil to prescribed level
	Wrong viscosity of hydraulic oil (too high or too low)	Use prescribed oil grade
	Directional control valve damaged or dirty	Repair or replace directional control valve
	Pressure-limiting valve damaged or dirty	Repair or replace pressure-limiting valve (removing the lead seal voids the guarantee); if necessary, call for factory Customer Service
	Directional control valve does not switch off	Check stroke setting and set correctly
	Directional control valve receives no switch instruction	Have electrician find and eliminate error
	Pump worn	Exchange pump


Error
Cause
Remedy
Leaks in hydraulic system
Screw fittings loose
Tighten screw fittings
Hydraulic hose defective
Replace hose
Hydraulic valve worn
Exchange hydraulic valve
Hydraulic pump worn
Change hydraulic pump
Hydraulic-cylinder seals worn
Replace hydraulic cylinder or exchange seals

11

Circuit Diagrams and Drawings

*** S T Ü C K L I S T E ***

Angebots-Nr.: Auftrags-Nr.: 52/5544 00 Auftrag

Kunde : Muhr + Bender
Maschinenbau GmbH
Auf der Schlachtwiese
5952 /Attendorn
Attendorn

Bespr.-Datum :
Eing.-Datum : 10.10.
Bearb.-Datum : 10.10.
Liefertermin : 11.12.
Anzahl Anlagen : 06

Verhandlungspartner :
Telefon :
Projektbezeichnung : STEUERUNG MIW 800 - USA 0162610301 40121/49
Bestell-Nr. :
Sachbearbeiter :
Versandart :
Zeichnungs-Nr. : SB 043/52-0689.1

Nennbetriebs-Strom	: 0000 A	Steuerspannung	: 115 V
Sicherung in Zuleitung	: 0000 A	Frequenz-Steuerspannung	: 60 Hz
Betriebsspannung	: 0230 V	System-Steuerspannung	: 1
Frequenz-Betriebsspannung	: 60 Hz	Hilfsspannung	: V
System-Betriebsspannung	: 0003	Frequenz Hilfsspannung	: Hz
Netzform	:		

```
**********************************************************
* Schutzmaßnahmen im Lieferumfang dieses Auftrags:       *
* ------------------------------------------------------ *
* Sie erhalten eine geprüfte Schaltgeräte-Kombination    *
* nach VDE 0660 Teil 500.                                *
* Nicht zum Betriebsstromkreis gehörende Teile,die im    *
* Fehlerfall Spannung annehmen können, sind mit dem      *
* gekennzeichneten Schutzleiteranschluß verbunden.       *
* ------------------------------------------------------ *
* Weitere Maßnahmen zur Erfüllung der Schutzmaßnahmen    *
* am Aufstellungsort nach VDE 0100 ( z.B. Verbindung     *
* N mit PE ) sind bauseitig durchzuführen.               *
*                                                        *
**********************************************************
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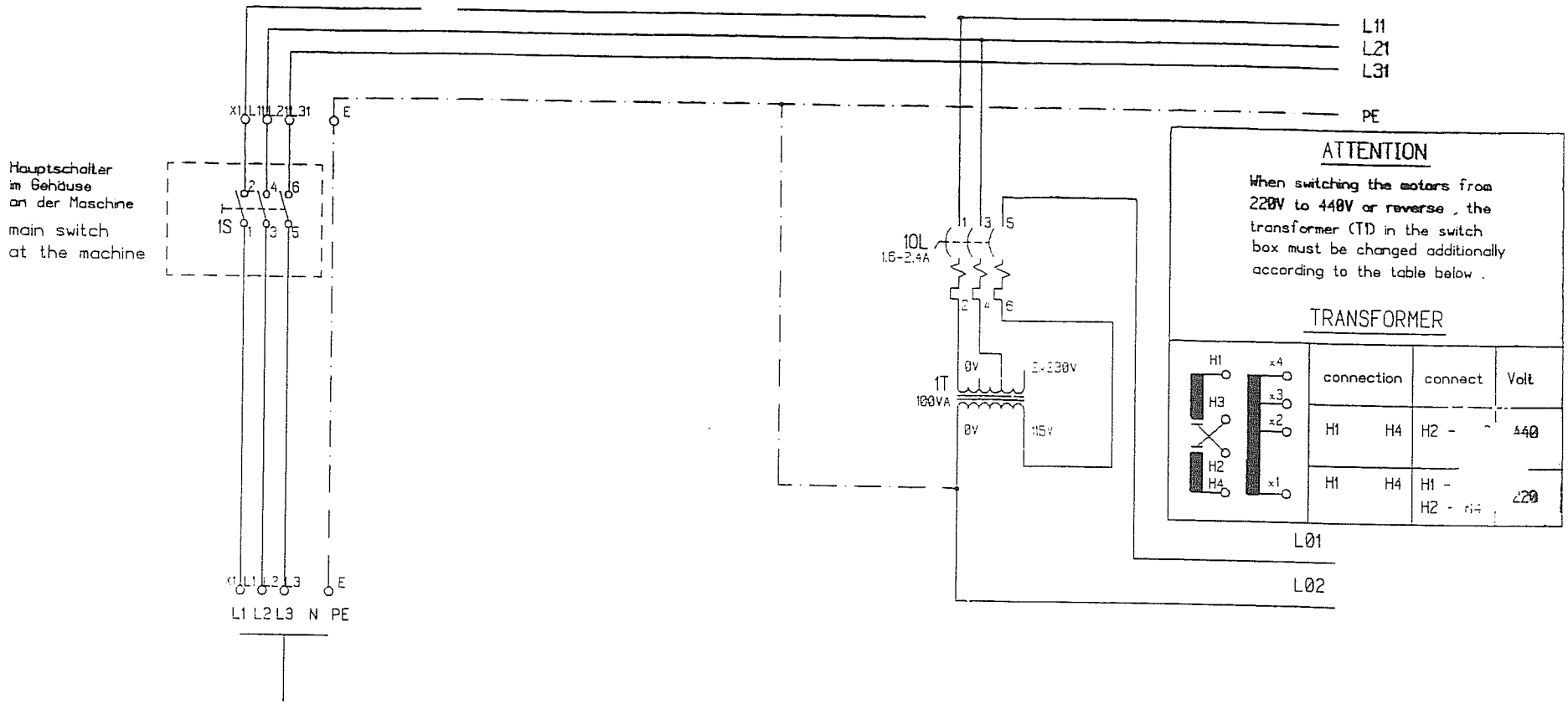
Ausführungsangaben

**** Stueckliste MIW 800 USA ****

Kloeckner Moeller Schaltplan Nr.: SB43/52-0689.1 Blatt 2

Nr.	G.K.Z.	T.Bezeich.	T.Gruppe	St.	Ident Nr.
10	F	500x300x175mm(Westfa)	Gehaeuse	1	8510020180
20		KT16F	Kabeltuelle	2	8520150900
30	10L	PKZM1-2,4-NA	Motorschutzschalter	1	8540050070
40	1T	ET100(PR2x230V SEC.110-120V)	Steuertransformator	1	8530400410
50	1CON	DILOAM/22 115V	Universalschuetz	1	8540011110
51	2CR	DILR31 115V.	Hilfsschuetz	1	8540010315
60	2CR	Z00-24	Motorschutzrelais	1	
80		UK10	Reihenklemme	6	8550010630
90		USLKG10-1	Reihenklemme	2	8550010600
100		UK5	Reihenklemme	3	8550010610
110F		UKK5(Phoenix)	Doppelklemme	18	8550010700
120		USLKG4-1	Reihenklemme	7	8550010650
140	M1	4AP112M-4	Motor	1	8530030840
150	1S/1PB 2PB/1LT 1SS/2SS	DS1X-2027	Hauptscha.kpl.	1	8540080200
160	2LS/3LS 3SS	Art.Nr.1180171	Endschalterkpl	1	8540311910
170	4LS/5LS	GC-A2HTW	Endschalter	2	8540310710
180	1FTS	F1-U2DUK	Fusschalter	1	8540310670
190		HAN 3	Anbaugehaeuse	1	8550060610
195		HAN 3	Steckdoseneinsatz	1	8550060200
200	4LS/5LS	AZ15zvr	Endschalter	2	8540311510
		Pos.150 besteht aus:			
250		PC-Gehaeuse Nr.356		1	8510030850
260		D1M2Z	Zweifachdrucktaste mit Meldeleuchte	1	8540200755
280		DFGN11 + Z32	Kontaktboeckchen mit Kontrolleuchte	1	8540200855
290		D1LAO	Schluesselschalter	2	8540200425
300		DG11 +	Kontaktboeckchen	2	8540200495
310		Z15 +	Schildtraeger	2	8540300490
320		VC1 +	Hauptschalter	1	8540070040
330		KZ16	Schildtraeger	1	8540300480
340		Glimmlampe	BA9S 130V	1	8580011500
		Position 160 besteht aus:			
350	2LS	U16	Endschaltereinsatz	1	8540311770
360	3LS	U1	Endschaltereinsatz	1	8540311800
360	3SS	TM-2-15423/EZ/S-H	Nockenschalter	1	8540200470
370		Schluessel Nr.601		1	8540200475



40121/49

-	+	Typ	Funktion	-	+	Typ	Funktion
* Ort	Anschluß	= Anlage	- Betriebsmittelkennzeichnung (Art, Zahlnummer, Funktion)				

Muhr & Bender

KLÖCKNER - MOELLER

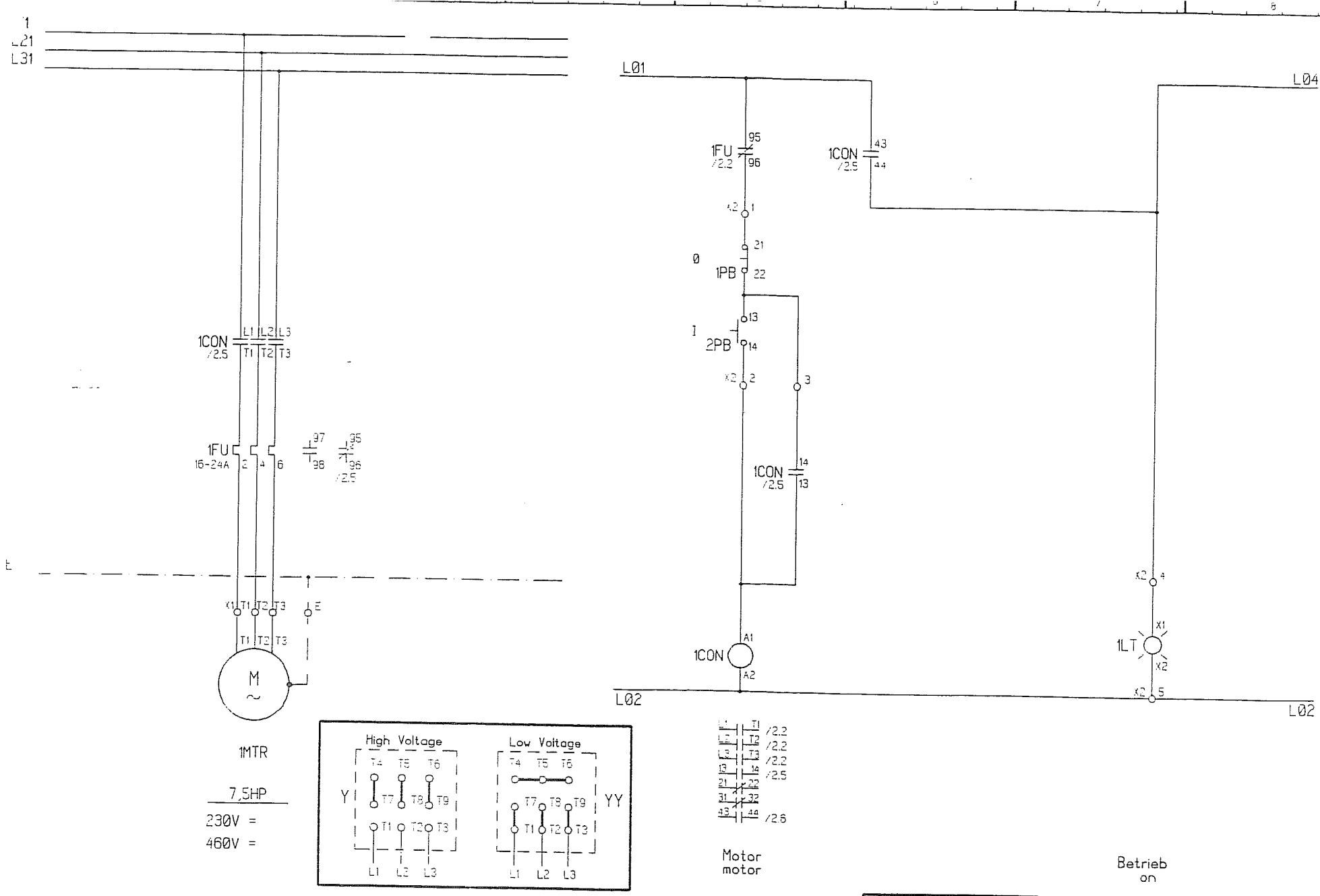
Kennzeichnung: SB043/52-0689.1 | Index | lfd.Nr: 1

Anlagenbezeichnung: MIW 800 - USA

M+B Nr. 0162610301 | Blatt | von

Datum 20.07.93 | Gez.: Rübsamen | Geprüft: Rübsamen

Rückseiten (Blatt 2)



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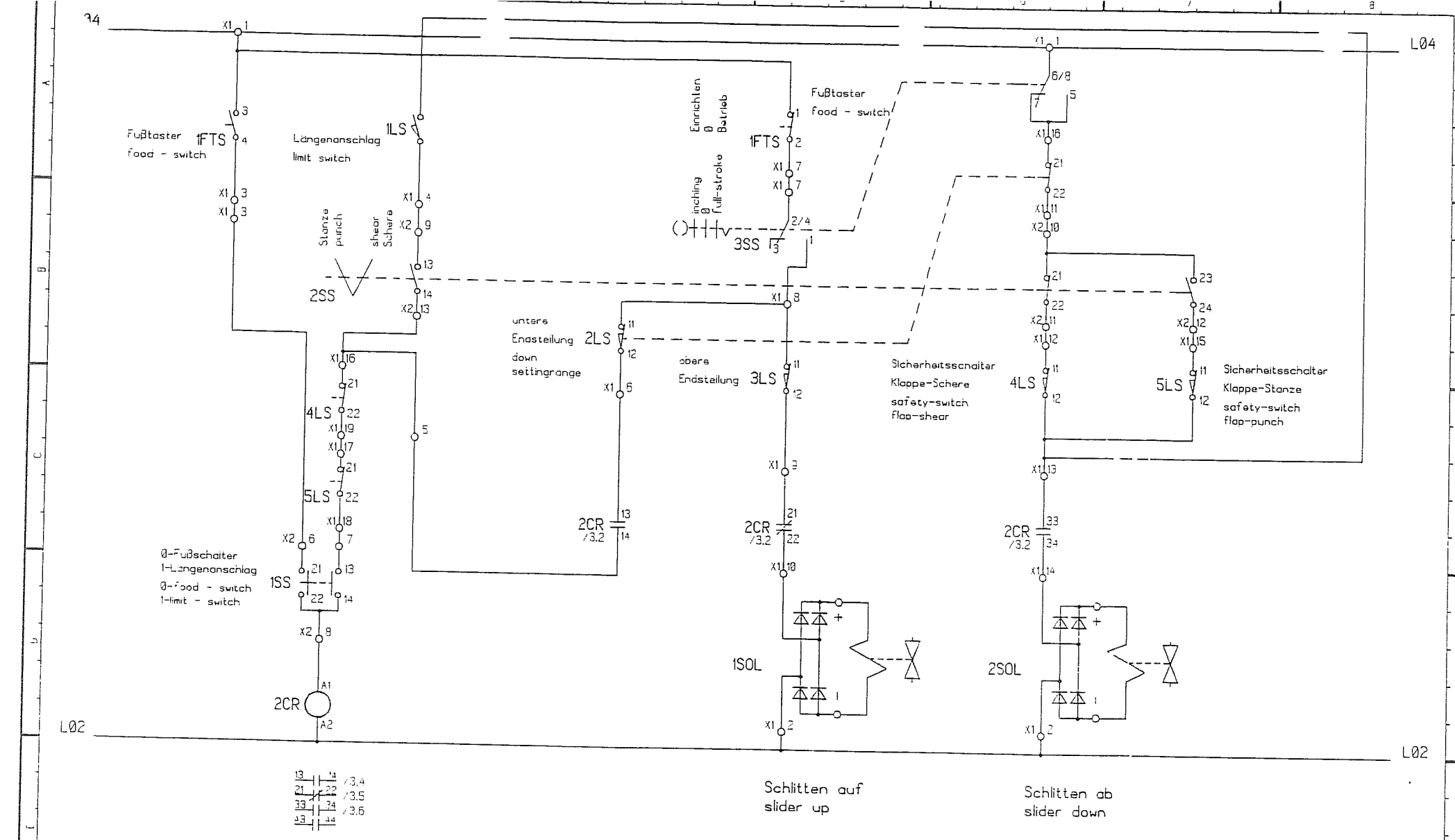
+ Ort	Anschluss	= Anlage	− Betriebsmittelkennzeichnung	Art, Zählnummer	Funktion		

Rahmen (Blatt 2)

40121/49

Muhr & Bender		KLÖCKNER - MOELLER	
	Kennzeichnung SB043/52-0689.1	Index	lfd.Nr 2
Anlagenbezeichnung MIW 800 - USA	M+B Nr. 0162610301		Blatt von
Datum 30.07.93	Gez. Rübsamen	Geprüft: Rübsamen	



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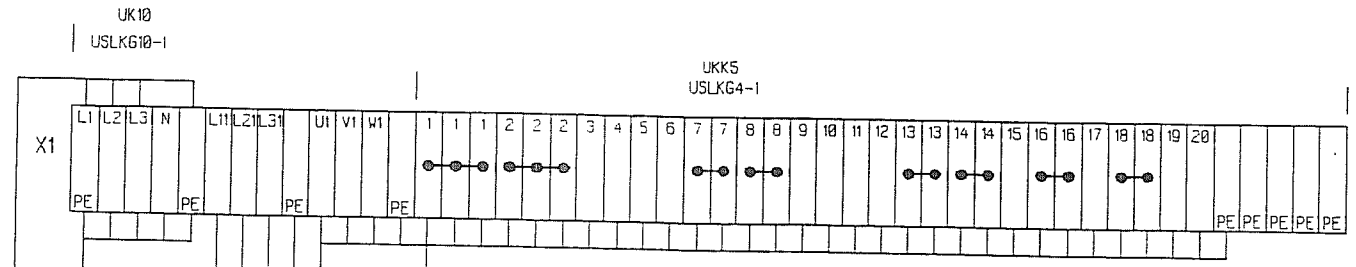
= Ort	Anschluss	= Anlage	– Betriebsmittelkennzeichnung (Art, Zählnummer, Funktion)				

Rahmen (Blatt 2)

Muhr & Bender		KLÖCKNER - MOELLER	
		Kennzeichnung: SB043/52-0689.1	Index: – / lfd.Nr.: 3
Anlagenbezeichnung: MIW 800 - USA		. M+B Nr. 0162610301	Blatt: – von –
Datum: 15.03.93	Gez.: 'BEA'		Geprüft: 'PRF'

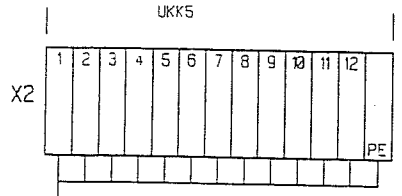
terminal strip

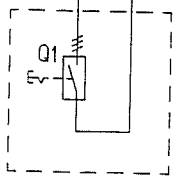


Einspeisung
incoming supply

M1
1MTR

Maschine
machine





Hauptschalter
im Gehäuse

main switch
at the machine

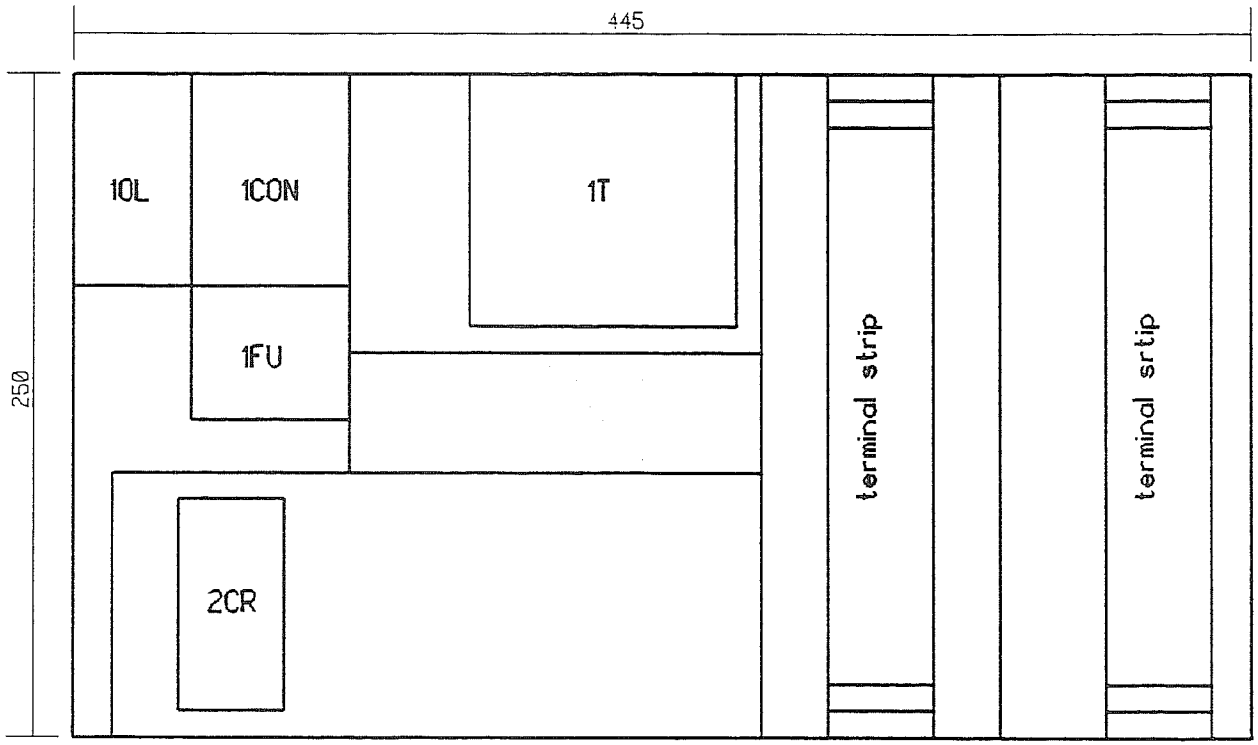
Steuerstelle
an der Maschine
push-button station
at the machine

—	+	Typ	Funktion	—	+	Typ	Funktion
= Ort	Anschluss	= Anlage	- Betriebsmittelkennzeichnung (Art, Zählnummer, Funktion)				

Muhr & Bender	KLÖCKNER - MOELLER	
	Kennzeichnung SB043/52-0689.1	Index 4
Anlagenbezeichnung MIW 800 - USA	M+B Nr. 0162610301	Blatt von
Datum: 15.03.93	Gez.: 'BEA'	Geprüft: PRF'

Rahmen (Blatt 2)

mounting plate MIW 800 - USA



Maßstab 1:2

40 121/49

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+ Ort	: Anschluss	= Anlage	- Betriebsmittelkennzeichnung (Art, Zählnummer, Funktion)				

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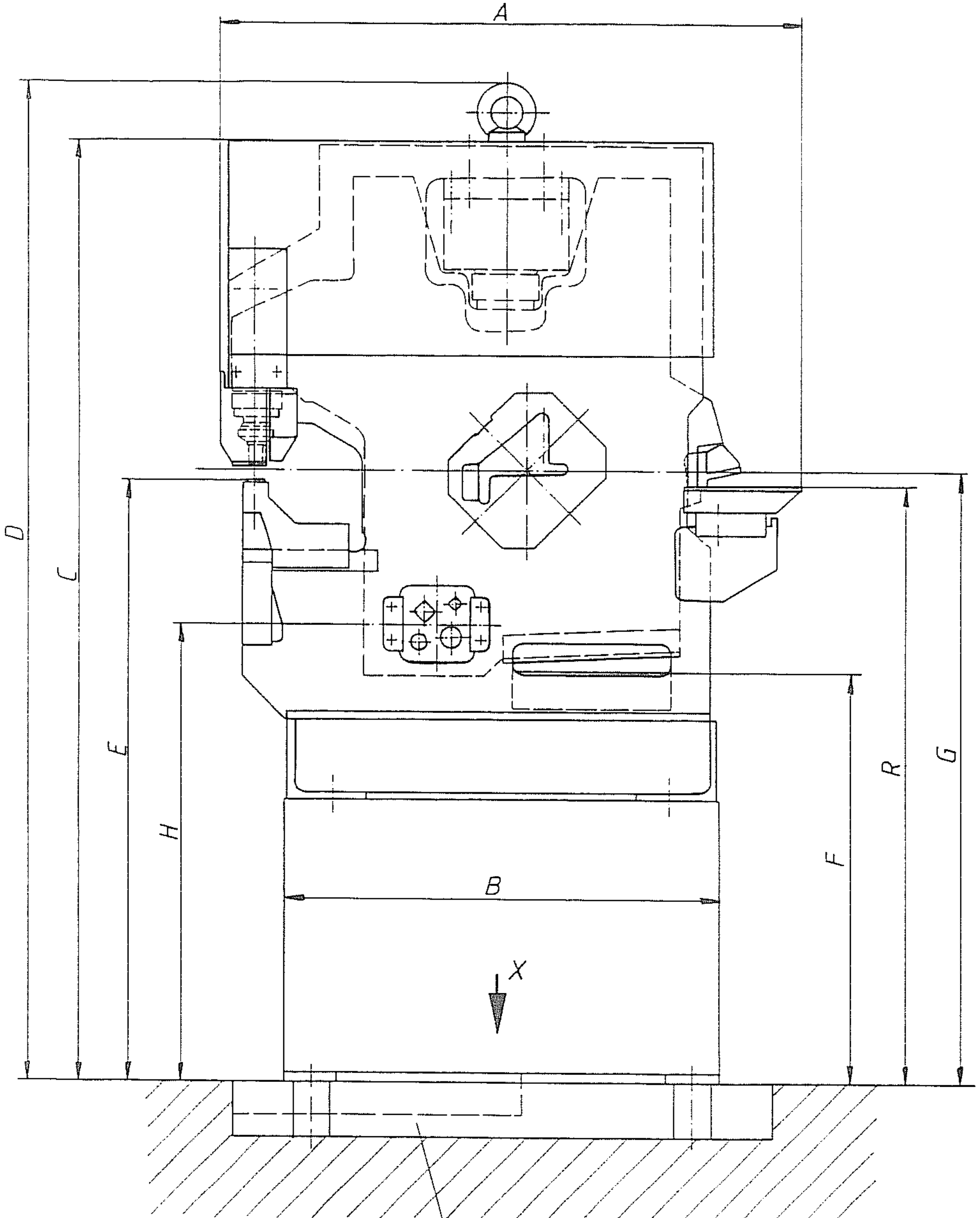
		Kennzeichnung SB043/52-0689.1	Index	lfd.Nr. 5
Anlagenbezeichnung MIW 800 - USA		M+B Nr. 0162510301		Blatt .en
Datum: 05.12.89	Gez.: 'BEA'	Geprüft: 'PRF'		

Rahmen (Blatt 2)

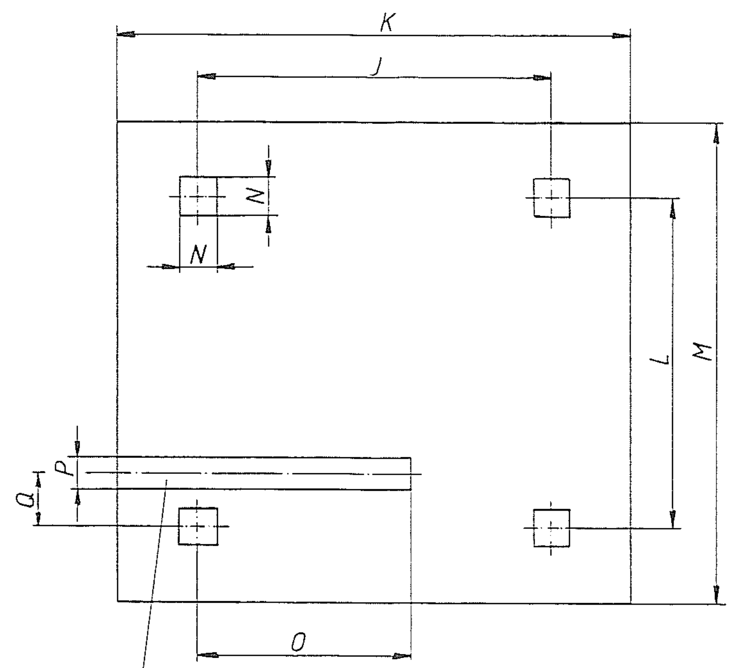


Tiefe je nach Bodenbeschaffenheit

Depth according to the condition of the ground

Profondeur de la fondation d âprês l´ètat du sol

Ansicht : X



Kanal für Kabeleinführung Richtung beliebig

Channel for feeding cable direction to your choise

Canal pour câbles d âlimentation

IW 800	01625	01626
	mm	inch
A	1101	43 3/8
B	870	34 1/4
C	1772	69 3/4
D	1879	74
E	1130	44 1/2
F	770	30 5/16
G	1150	45 1/4
H	870	34 1/4
J	770	30 5/16
K	1070	42 1/8
L	670	26 3/8
M	950	37 3/8
N	70	2 3/4
O	400	15 3/4
P	60	2 3/8
Q	100	3 15/16
R	1120	44 1/8

Pos.	Menge	Einheit	Benennung	Sachnummer	Bl. Gr.	Bemerkung

Freimaßtoleranz nach DIN 7168 mittel — ~ glatt roh, geschruppt, geschlichtet, feingeschlichtet

Maßstab — Gewicht

Werkstoff / Rohteil-Nr / Modell-Nr

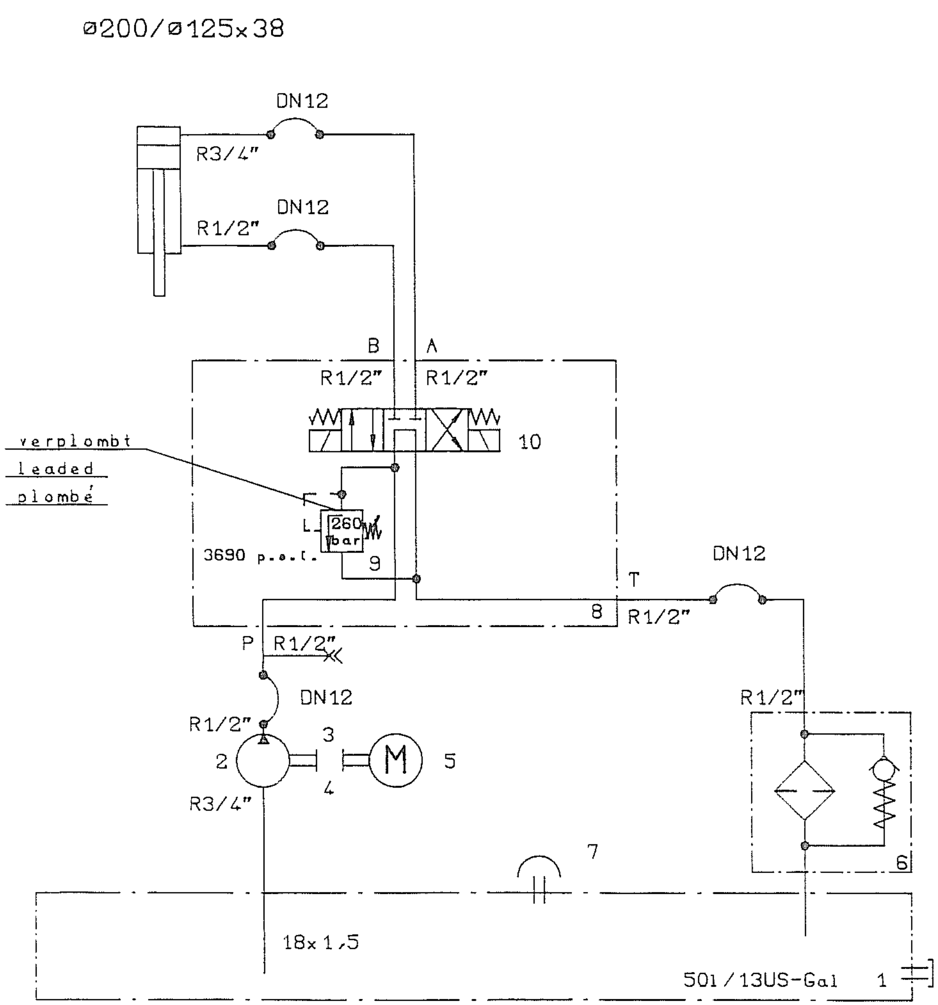
1990	Datum	Name
Bearb.	2.2.	Höller
Geprüft		
Freigabe		

Benennung: **Fundamentplan**
Foundation drawing
Plan de fondation

Muhr und Bender Attendorn

Zeichnungs-Nr 01625 103 04

Blatt / Blätter



Pos.	Menge	Benennung	Denomination	Désignation	Typ	Fabrik.
10	1	Magnetventil,kpl.	Solenoid valve	Electrovanne complète	WEE4/3-10-207/96V=	HEYPF/
9	1	Druckbegrenzungsventilpatrone	Pressure relief valve	Cartouche de limiteur de pression	HV 03134.1	HEYPF/
8	1	Montageplatte	Mounting plate	Plaque de montage	HM 3202	HEYPF/
7	1	Einfuell- u.Belueftungsfilter	Filter cap assembly	Filtre de remplissage et d'aération	TF/1	HEYPF/
6	1	Ruecklauffilter	Return pass filter	Filtre sur retour	MPF 3/20	HEYPF/
5	1	DN-Motor	DN-Motor	Monteur DN	AP132 S4 B3/B5 5,5kW 1700min- 220/440V,60Hz Birkenbeu	
4	1	Kupplung	coupling assembly	Embrayage	GE 382	HEYPF/
3	1	Pumpentraeger	pump support	Support de pompe	L 302	HEYPF/
2	1	HD-Pumpe	HD-pump	Pompe HP	PLP 20.14	HEYPF/
1	1	Oelbehaelter	oiltank	Réservoir à huile	501/13US-Gal	

Freimass-toleranz nach DIN 7168 mittel

Massstab | Gewicht

Werkstoff / Rohteil-Nr. / Modell-Nr.: MIW 800 Ausf.60Hz(USA)

1989	Datum	Name
Bearb.	21.07.	Hessner
Gepr.		
Freig.		

Benennung: Hydraulikplan / Hydraulic system / Schéma hydraulique

MuhrundBender MASCHINENBAU GMBH

Zeichnungs-Nr. 0162610302

Bl. 3

A.B. Zahl Mittl. Name Dat. Urspr. Ers.f. Ers.d.

12

Spare Parts List

PARTS LIST MIW 800

TYPE-NO.
01626

MUBEA HYDRAULICALLY POWERED SHEARS FOR PLATE, BAR AND SECTION STEEL, WITH COPER/NOTCHES AND PUNCH

SERIAL NO.:

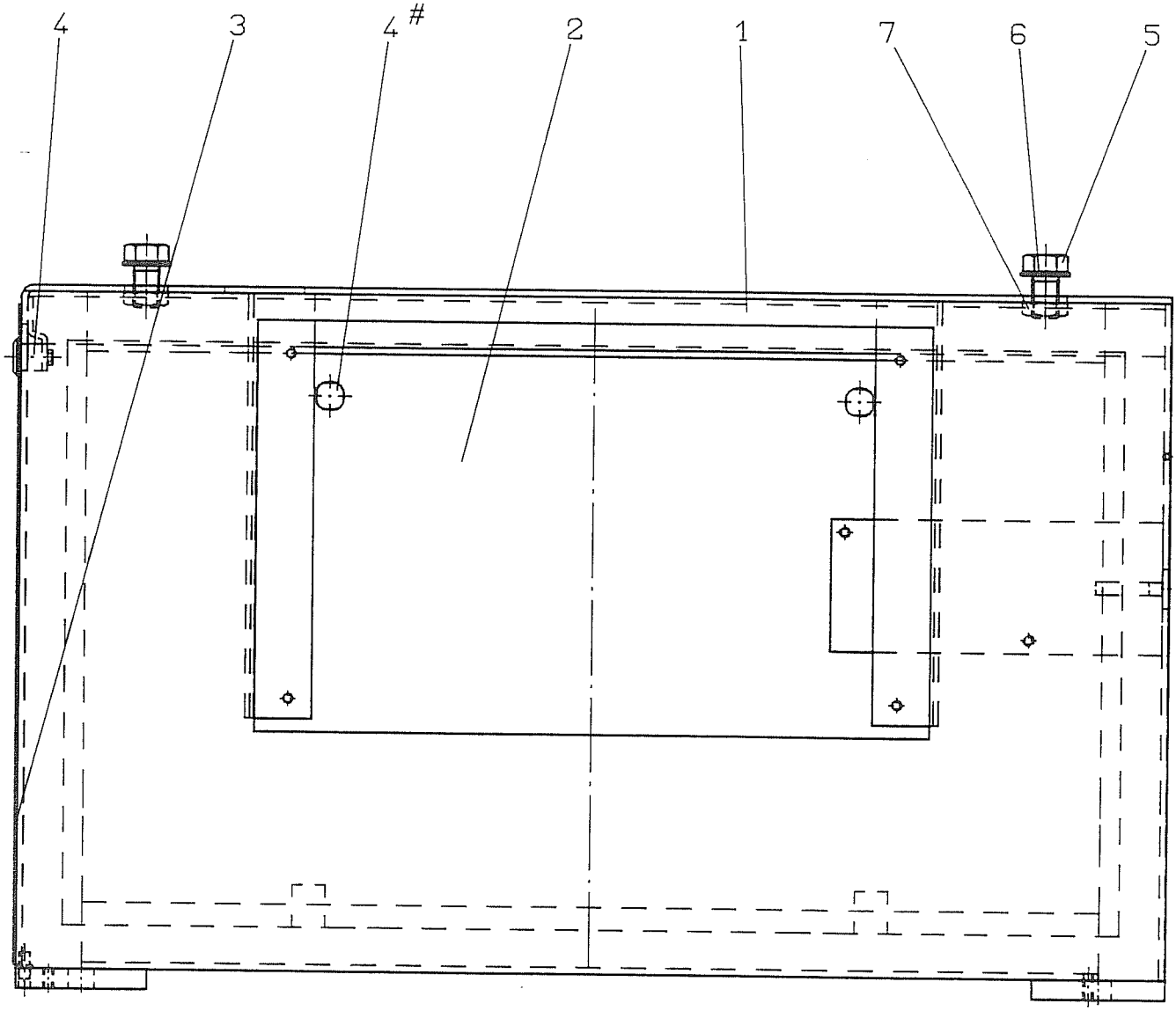
PLEASE BE SURE TO INDICATE THE ABOVE SERIAL NO. IN ALL ORDERS AND ENQUIRIES

MACHINE BODY, COMPLETE	0162500100	AUSF. 01
BASE, COMPLETE	0162500400	AUSF. 01
SECTION SHEAR AND SLIDE, COMPLETE	0162503100	AUSF. 01
STROKE ADJUSTMENT, COMPLETE	0162504600	AUSF. 01
PLATE SHEAR BLADE, COMPLETE	0162505100	AUSF. 01
BAR SHEAR BLADE, COMPLETE	0160005200	AUSF. 01
RECTANGULAR COPER, COMPLETE	0162505300	AUSF. 01
SECTION SHEAR KNIFES, COMPLETE	0162605600	AUSF. 01
PUNCH TOOL, COMPLETE	0162605900	AUSF. 01
HOLD-DOWN, COMPLETE (PLATE SHEAR)	0162506100	AUSF. 01
HOLD-DOWN, COMPLETE (BAR SHEAR)	0160506200	AUSF. 01
HOLD-DOWN, COMPLETE (SECTION-SHEAR)	0501106300	AUSF. 01
MITRE GUIDE, COMPLETE	0162606400	AUSF. 01
STRIPPER, COMPLETE	0160606500	AUSF. 01
SUPPORT TABLE FOR PLATES, COMPLETE	0501906600	AUSF. 01
ELECTRIC SYSTEM, COMPLETE	0162607100	AUSF. 01
SWITCH CABINET, COMPLETE	0162607101	AUSF. 01
HAND LUBRICATION, COMPLETE	0160508100	AUSF. 01
HYDRAULIC POWER UNIT, COMPLETE	0162608300	AUSF. 01
HOSE PIPES, COMPLETE	0162608400	AUSF. 01
GUARD, COMPLETE	0160609100	AUSF. 01
MOVABLE GUARD, COMPLETE	0162509500	AUSF. 01
MOVABLE GUARD, COMPLETE	0156009600	AUSF. 01
MOVABLE GUARD, COMPLETE	0160609700	AUSF. 01
NOTCHER GUARD, COMPLETE	0160509800	AUSF. 01
SUPPORT BRACKET FOR COPER-NOTCHER SADDLE	0158612500	AUSF. 01

MUBEA
MACHINERY AND SYSTEMS, INC.
8200 Dixie Highway · Florence, Kentucky 41042
PHONE: (606)525-6300 · TELEX: 214130 mubea TELEFAX: (606)525-0835

PODEST. KPL.
BASE. COMPLETE
SOCLE COMPL.

0162500400



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

01.07.91

PODEST, KPL.
BASE, COMPLETE
SOCLE COMPL.

0162500400

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162500401	PODEST	BASE	SOCLE
2	1	0162500402	VERKLEIDUNGSBL. SEITL	SIDE COVER	COUVERCLE LATERAL
3	1	0162500403	VERKLEIDUNGSBL. ,VOR.	FRONT COVER	COUVERCLE AVANT
4	3	8106005015	VORREIBER ,EINSCHR.	SASH FASTENER	TOURNIQUET AVEC VIS DE SERRAGE
5	4	9009334580	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
6	4	9001254400	SCHEIBE	WASHER	RONDELLE PLATE
7	4	9009363100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

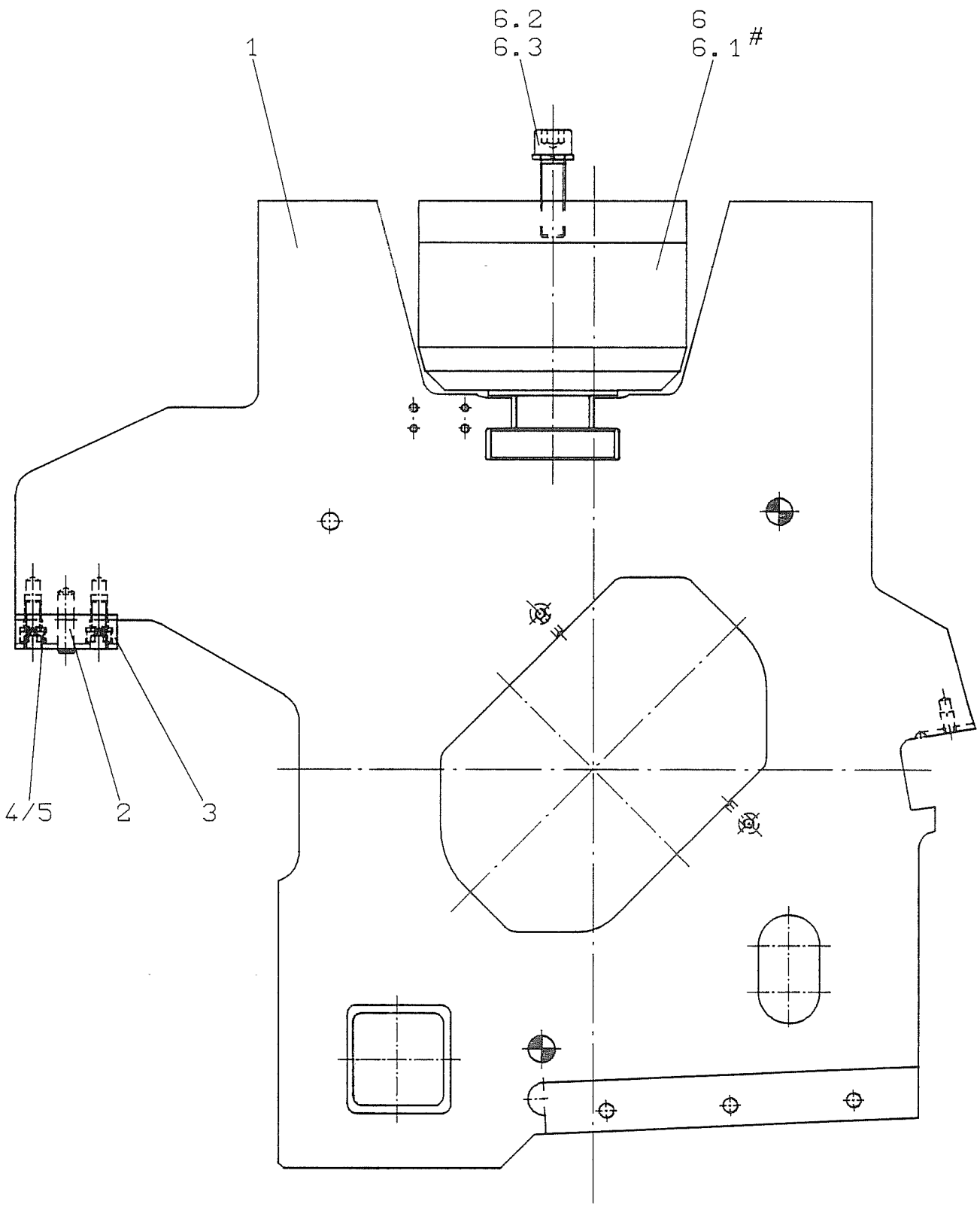
ab 0162589249137 ...

AUSF. 01

01.07.91

SCHERENSCHLITTEN UND SCHERENZYLINDER, KPL.
SECTION SHEAR AND SLIDE, COMPLETE
CYLINDRE ET COULISSEAU POUR CISAILLE COMPL.

0162503100



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

01.07.91

SCHERENSCHLITTEN UND SCHERENZYLINDER, KPL.
SECTION SHEAR AND SLIDE, COMPLETE
CYLINDRE ET COULISSEAU POUR CISAILLE COMPL.

0162503100

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162503101	SCHLITTEN	SLIDE	COULISSEAU
2	1	9079795500	ZYLINDERSTIFT	PIN	GOUPILLE CYLINDRIQUE
3	1	0160003105	DISTANZPLATTE	DISTANCE PLATE	PLAQUE DE DISTANCE
4	2	9069124030	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
5	2	9079802700	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
6	1	0162503400	HYDR. ZYLINDER,KPL.	HYDRAULIC-CYLINDER, COMPLETE	CYLINDRE HYDRAULIQUE COMPL.
6.1 #	1	0162503404	DICHTSATZ,KPL.	SET OF SEALS, COMPLETE	JEU DE JOINTS COMPL.
6.2	2	9009125060	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
6.3	2	9001274100	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

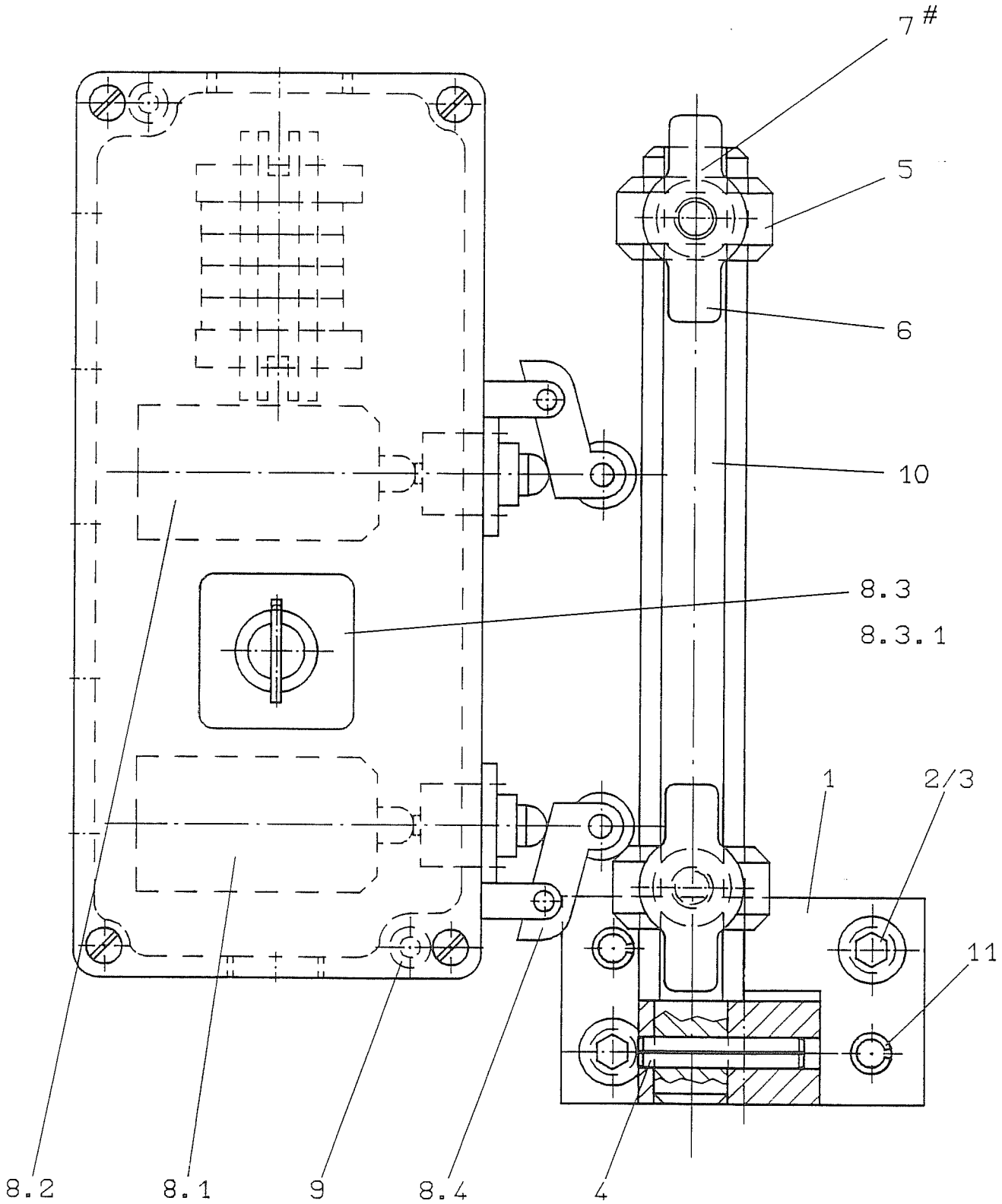
ab 0162589249137 ...

AUSF. 01

01.07.91

HUBEINSTELLUNG, KPL.
STROKE ADJUSTMENT, COMPLETE
REGLAGE DE COURSE COMPL.

0162504600



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

01.07.91

HUBEINSTELLUNG, KPL.
STROKE ADJUSTMENT, COMPLETE
REGLAGE DE COURSE COMPL.

0162504600

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162504602	HALTER,KPL.	HOLDER, COMPLETE	FIXATION COMPL.
2	2	9009122530	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
3	2	9001271400	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
4	1	9014813300	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
5	2	0153404702	NOCKEN	CAM	CAME
6	2	8106004910	KNEBELSCHRAUBE	T-SCREW	VIS A CLE
7 #	2	9014811100	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
8	1	0164304704	ENDSCHALTER,KPL.	LIMIT SWITCH, COMPLETE	INTERRUPTEUR FIN DE COURSE COMPL.
8.1	1	8540311770	TASTSCHALTER	FLIP KEY	INTERRUPTEUR A TOUCHE
8.2	1	8540311800	TASTSCHALTER	FLIP KEY	INTERRUPTEUR A TOUCHE
8.3	1	8540200470	SCHLUESSELSCHALTER	KEY SWITCH	INTERRUPTEUR A CLE
8.3.1	1	8540200475	SCHLUESSEL	KEY	CLE
8.4	2	8540311970	HEBEL	LEVER	LEVIER
9	2	9009121290	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
10	1	0151604607	FUEHRUNGSBOLZEN	GUIDE BOLT	BOULON DE GUIDAGE
11	2	9014814200	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

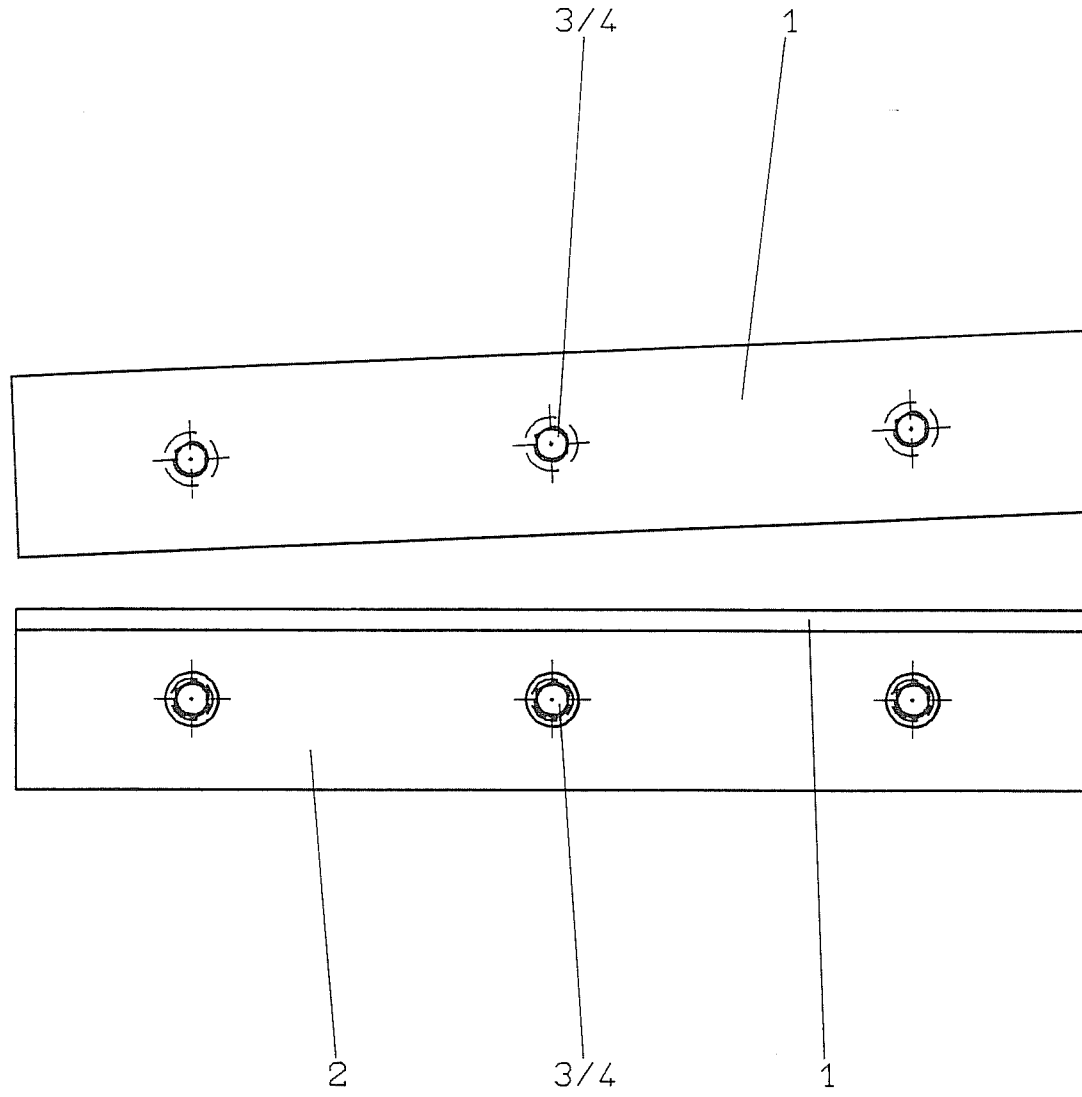
ab 0162589249137 ...

AUSF. 01

01.07.91

FLACHSTAHLMESSER, KPL.
PLATE SHEAR BLADE, COMPLETE
LAME A FERS PLATS COMPL.

0162505100



ab 0162589249137 ...

AUSF. 01

02.07.91

FLACHSTAHLMESSER, KPL.
PLATE SHEAR BLADE, COMPLETE
LAME A FERS PLATS COMPL.

0162505100

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	2	5142200000	BLECHMESSER	PLATE SHEAR BLADE	LAME A TOLES
2	1	0162505101	BEILAGE	SPACER	PIECE DE CALAGE
3	6	9009123550	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
4	6	9001272100	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE

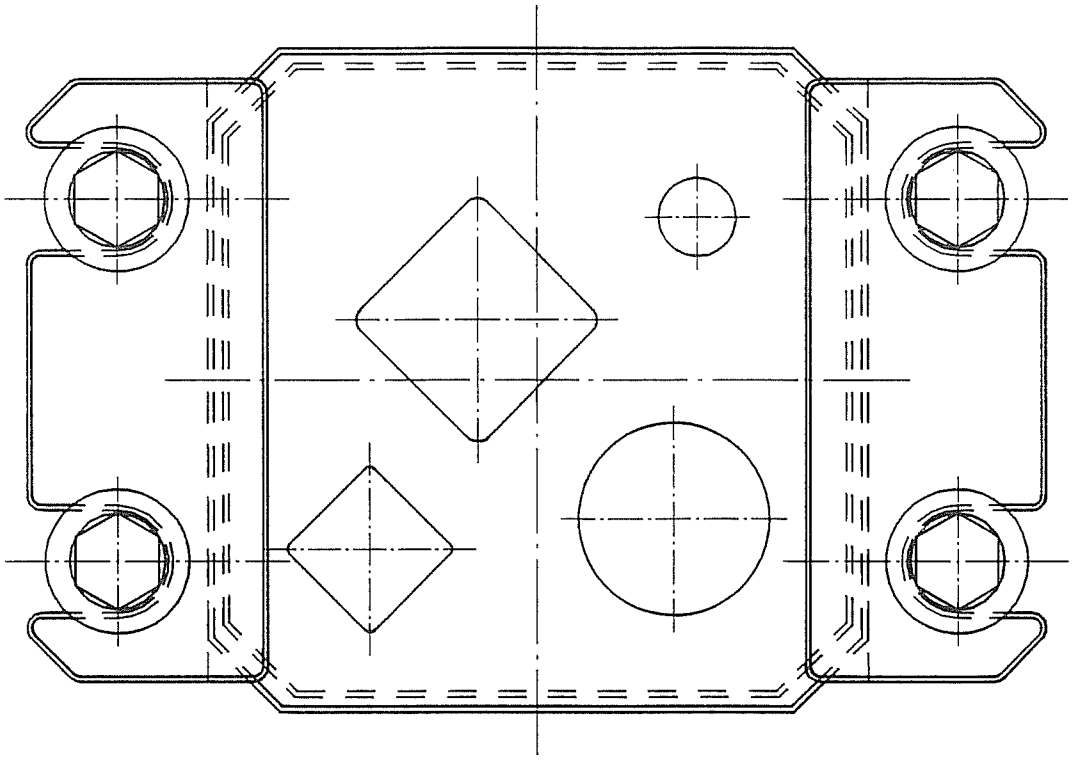
ab 0162589249137 ...

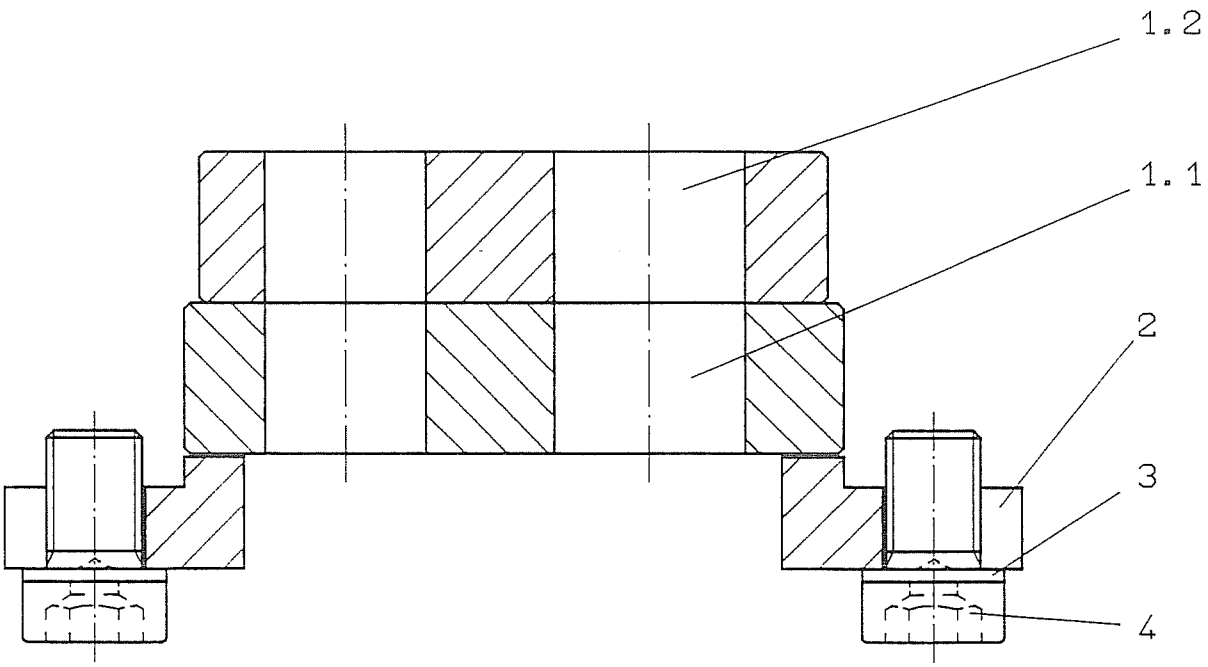
AUSF. 01

02.07.91

STABSTAHLMESSER, KPL.
BAR SHEAR BLADE, COMPLETE
COUTEAU A BARREAUX EN ACIER COMPL.

0160005200





ab 0164890238114 ...

AUSF. 01
07.06.90

STABSTAHLMESSER, KPL.
BAR SHEAR BLADE, COMPLETE
COUTEAU A BARREAUX EN ACIER COMPL.

0160005200

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0500205201	MESSERSATZ,KPL.	SET OF BLADES, COMPLETE	JEU DE LAMES COMPL.
1.1	1	0500205202	STABSTAHLMESSER,FEST	BAR SHEAR BLADE, STATIONARY	COUTEAU A BARRES D'ACIER, FIXE
1.2	1	0500205203	STABSTAHLMESSER,BEW.	BAR SHEAR BLADE, MOVABLE	COUTEAU A BARRES D'ACIER, MOBILE
2	2	0501005203	SPANNLASCHE	CLAMPING LOUVRE	ECLISSE
3	4	8106000170	SICHERUNGSSCHEIBE	SAFETY WASHER	BAGUE DE FREIN
4	4	9069124040	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX

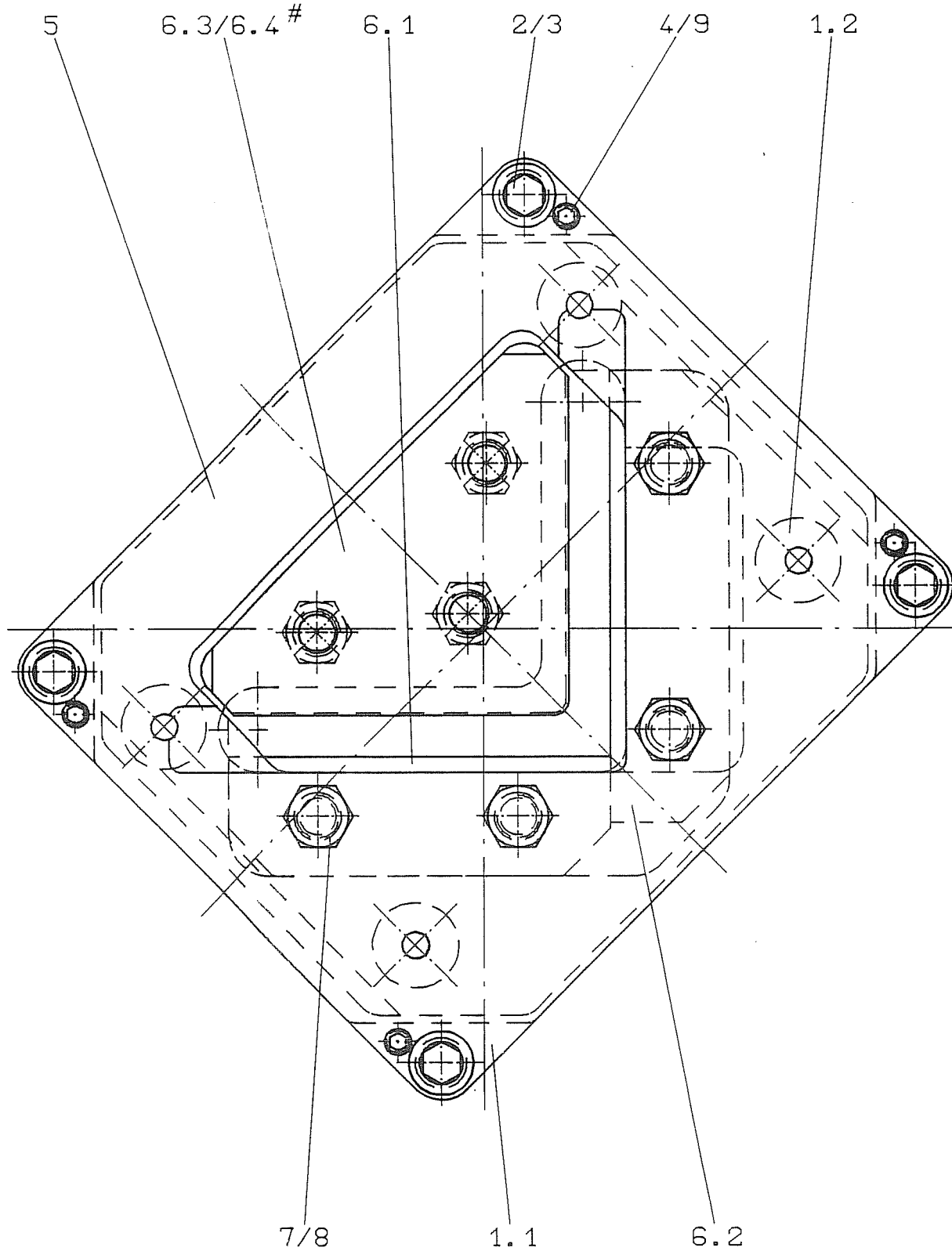
ab 0164890238114 ...

AUSF. 01

12.06.90

PROFILMESSER, KPL.
SECTION SHEAR KNIFES, COMPLETE
COUTEAU PROFILE COMPL.

0162605600



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

10.07.91

PROFILMESSER, KPL.
SECTION SHEAR KNIFES, COMPLETE
COUTEAU PROFILE COMPL.

0162605600

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162605601	MESSERKOER. ,FEST ,KPL	KNIFE BLOCK, STATIONARY ,COMPL.	COUTEAU PROFILE FIXE COMPL.
1.1	1	0162605602	MESSERKOERPER ,FEST	KNIFE BLOCK, STATIONARY	COUTEAU PROFILE FIXE
1.2	4	0151000114	FUEHRUNGSSCHEIBE	GUIDING WASHER	RONDELLE-GUIDE
2	4	9069124040	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
3	4	0501005503	TELLERFEDER	DISK SPRING	RONDELLE RESSORT
4	4	0151005702	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
5	1	0162605606	MESSERKOERPER ,BEW.	KNIFE BLOCK, MOVABLE	COUTEAU PROFILE MOBILE
6	1	0162605610	MESSERSATZ ,KPL.	SET OF BLADES, COMPLETE	JEU DE LAMES COMPL.
6.1	1	0162605605	EINSATZMESSER	INSERT BLADE	LAME D' INSERTION
6.2	1	0162605604	EINSATZMESSER	INSERT BLADE	LAME D' INSERTION
6.3	1	0162605608	EINSATZMESSER	INSERT BLADE	LAME D' INSERTION
6.4 #	1	0162605609	EINSATZMESSER	INSERT BLADE	LAME D' INSERTION
7	7	9009334090	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
8	7	9001272700	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
9	4	0501005519	KONTERKAPPE	COUNTERCAP	CONTRE-CAPOT

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

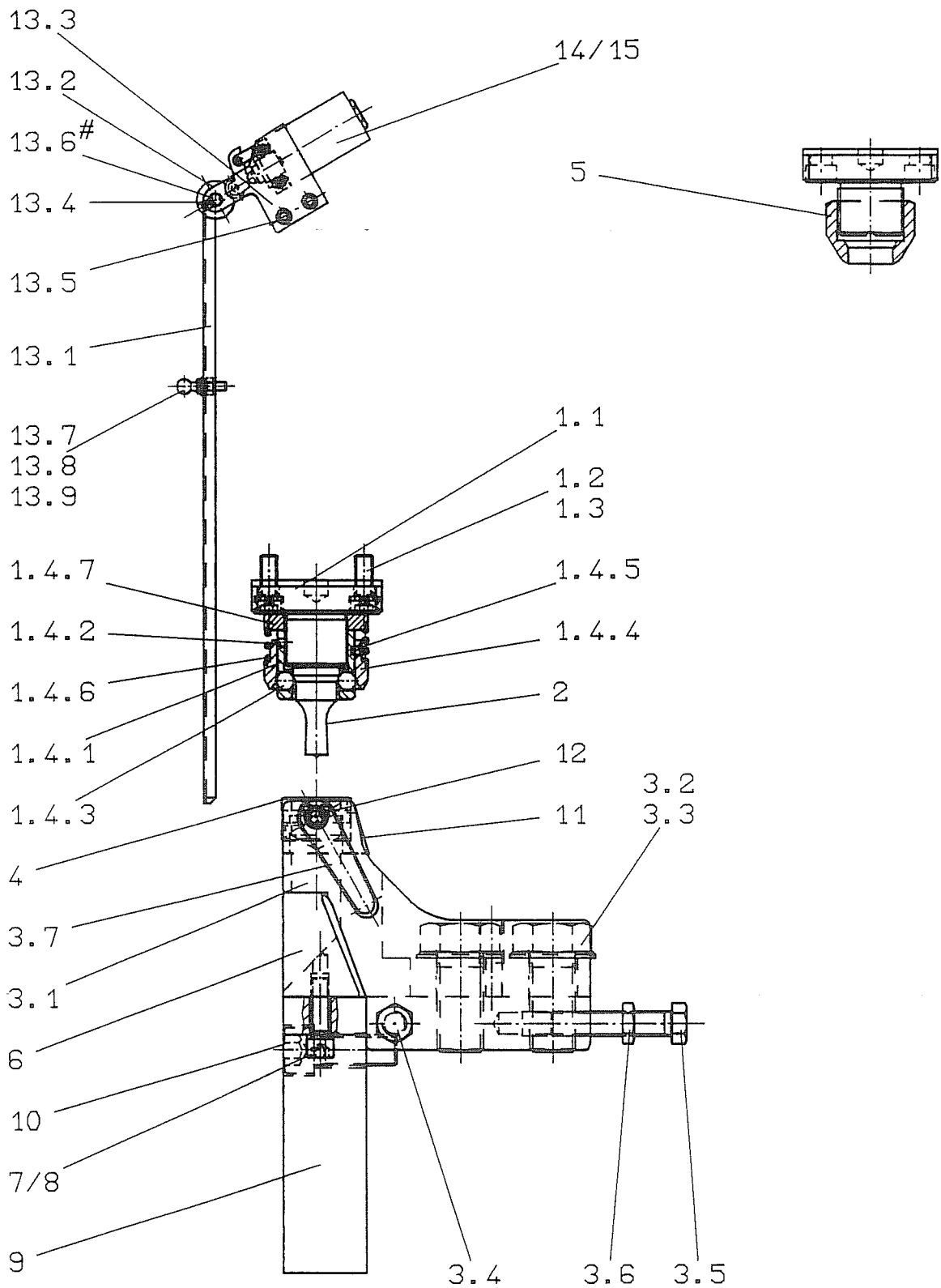
ab 0162589249137 ...

AUSF. 01

10.07.91

STANZWERKZEUG, KPL.
PUNCH TOOL, COMPLETE
OUTIL POINCONNAGE COMPL.

0162605900



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

04.07.91

STANZWERKZEUG, KPL.
PUNCH TOOL, COMPLETE
OUTIL POINCONNAGE COMPL.

0162605900

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0501205905	STEMPELHALTER,KPL.	PUNCH HOLDER, COMPLETE	PORTE-POINCON COMPL.
1.1	1	0501205902	STEMPELHALTER	PUNCH HOLDER	PORTE-POINCON
1.2	4	9069123540	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
1.3	4	9079802100	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
1.4	1	0501205906	SCHNELLSPANNV.,KPL.	QUICK CHUCKING FIXTURE, COMPL.	DISPOSITIF DE SERRAGE RAPIDE COMPL.
1.4.1	1	0501205903	ZENTRIERRING	CENTERING RING	BAGUE DE CENTRAGE
1.4.2	1	9009142100	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
1.4.3	8	9054014000	KUGEL	STEEL BALL	BILLE
1.4.4	1	0501005911	AUSSENRING	CLAMPING RING	BAGUE EXTERIEURE
1.4.5	1	0501005912	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
1.4.6	1	0501005913	DRUCKFEDER	SPRING	RESSORT DE PRESSION
1.4.7	1	0501205904	SCHEIBE	WASHER	RONDELLE PLATE
2	1	5053411638	STEMPEL	PUNCH	POINCON
3	1	0162505901	STANZSATTEL,KPL.	PUNCH SADDLE, COMPLETE	SELLE POUR POINCONNEUSE COMPL.
3.1	1	0162505902	SATTEL	SADDLE	SELLE
3.2	2	9009335570	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
3.3	2	9001255700	SCHEIBE	WASHER	RONDELLE PLATE
3.4	2	9009334100	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
3.5	2	9009334170	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
3.6	2	9009362500	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
3.7	1	8106001350	VERSTELLB.KLEMMHEBEL	ADJUSTABLE HANDLE	LEVIER DE SERRAGE REGLABLE
4	1	5066011642	MATRIZE	DIE	MATRICE
5	1	5053510000	UEBERWURFMUTTER	COUPLING NUT	ECROU DE SERRAGE
6	1	0501005906	SATTELUNTERSTUETZUNG	SADDLE SUPPORT	SUPPORT SELLE
7	2	9009123540	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
8	2	9079802100	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
9	1	0156005901	SATTELUNTERSATZ	LOWER SADDLE SUPPORT	SUPPORT SELLE
10	1	9009124540	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
11	1	0150505902	SATTELEINSATZ	SADDLE INSERT	PIECE D' INSERTION POUR SELLE
12	1	9009144500	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
13	1	0160505902	SCHUTZH. STANZE,KPL.	GUARD, PUNCH, COMPLETE	CAPOT DE PROTECTION COMPL.
13.1	1	0160605903	SCHUTZHAUBE STANZE	GUARD, PUNCH	CAPOT DE PROTECTION POINCONNEUSE
13.2	1	0160509808	STELLRING	ADJUSTING RING	BAGUE DE REGLAGE
13.3	2	0160005307	LASCHE	BRACKET	ECLISSE
13.4	1	9009142100	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
13.5	4	9009122030	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
13.6 #	2	9001252400	SCHEIBE	WASHER	RONDELLE PLATE
13.7	1	9718032000	KUGELZAPFEN	BALL-HEADED	TOURILLON A BOULET
13.8	1	9001251700	SCHEIBE	WASHER	RONDELLE PLATE
13.9	1	9009342100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
14	1	8101001120	ENDSCHALTER	LIMIT SWITCH	INTERRUPTEUR FIN DE COURSE
15	2	9009121340	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

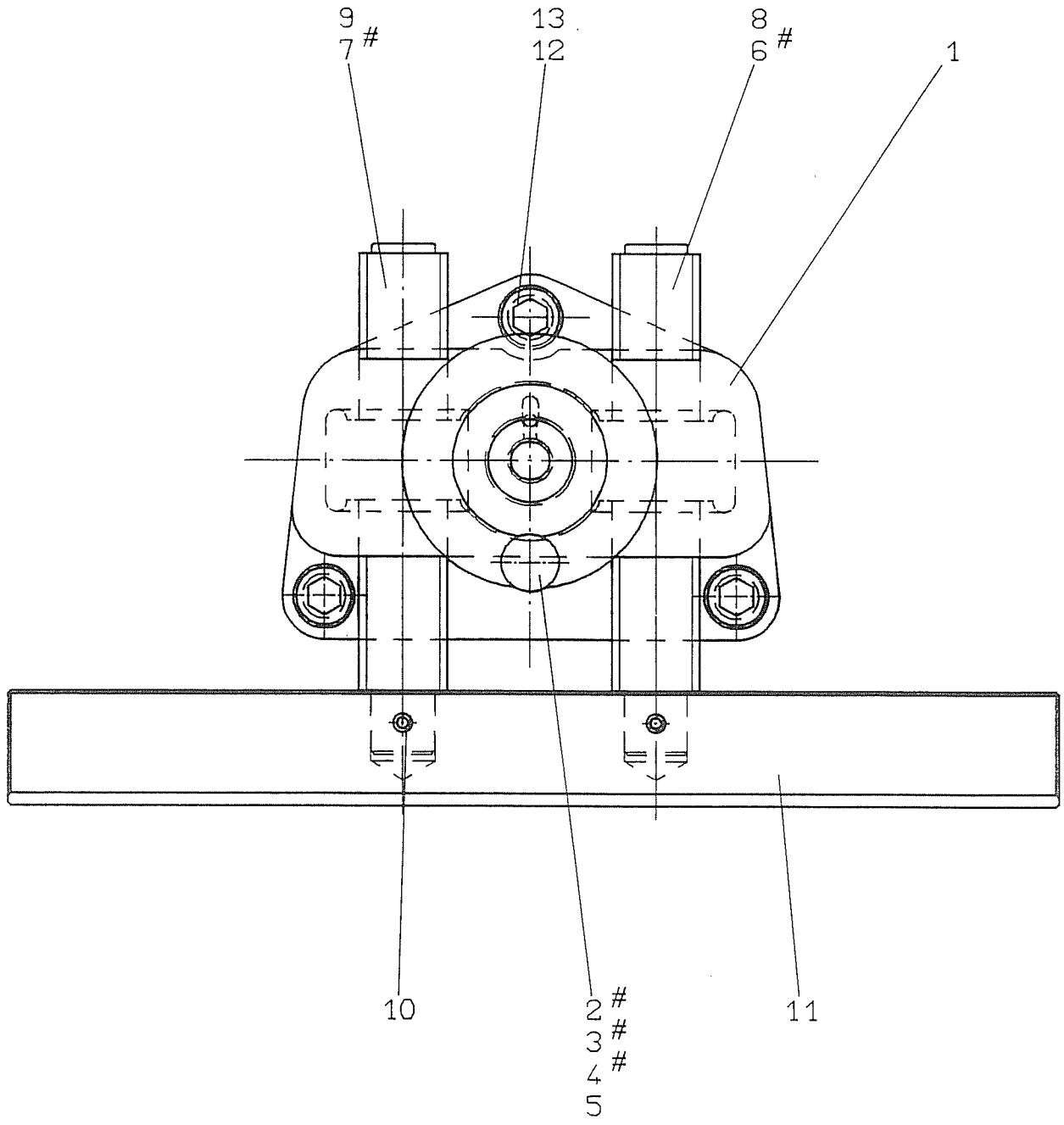
ab 0162589249137 ...

AUSF. 01

04.07.91

NIEDERHALTER, KPL. (FLACHSTAHLSCHERE)
HOLD-DOWN, COMPLETE (PLATE SHEAR)
SERRE-FLANC. COMPL. (CISAILLE A FERS PLATS)

0162506100



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

02.07.91

NIEDERHALTER, KPL. (FLACHSTAHLSCHERE)
HOLD-DOWN, COMPLETE (PLATE SHEAR)
SERRE-FLANC, COMPL. (CISAILLE A FERS PLATS)

0162506100

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0501106301	NIEDERHALTERBOCK	HOLD-DOWN TRESTLE	SUPPORT POUR PRESSE-MATERIAUX
2 #	1	0501106302	SCHRAUBENRAD	HELICAL GEAR	ENGRENAGE A DENTURE HELICOILADE
3 #	1	0501006103	WELLE	SHAFT	ARBRE
4 #	2	9073461500	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
5	1	8106003540	SCHEIBENHANDRAD	DISK HAND WHEEL	MANIVELLE
6 #	1	0501006104	SCHR.-RAD,RECHTSGAE.	HELICAL GEAR WHEEL, RIGHT-HAND	ROUE HELICOILADE FILETEE A DROITE
7 #	1	0501006105	SCHR.-RAD,LINKSGAE.	HELICAL GEAR WHEEL, LEFT-HAND	ROUE HELICOILADE FILETEE A GAUCHE
8	1	0160506101	SPINDEL,RECHTSGAENG.	SPINDLE, RIGHT HAND	BROCHE FILETEE, A DROITE
9	1	0160506102	SPINDEL,LINKSGAENGIG	SPINDLE, LEFT HAND	BROCHE FILETEE, A GAUCHE
10	2	9014813300	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
11	1	0162506101	QUERBALKEN	TRANSVERSAL BEAM	TRAVERSE
12	3	8106001190	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
13	3	8106000030	SICHERUNGSSCHEIBE	SAFETY WASHER	BAGUE DE FREIN

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

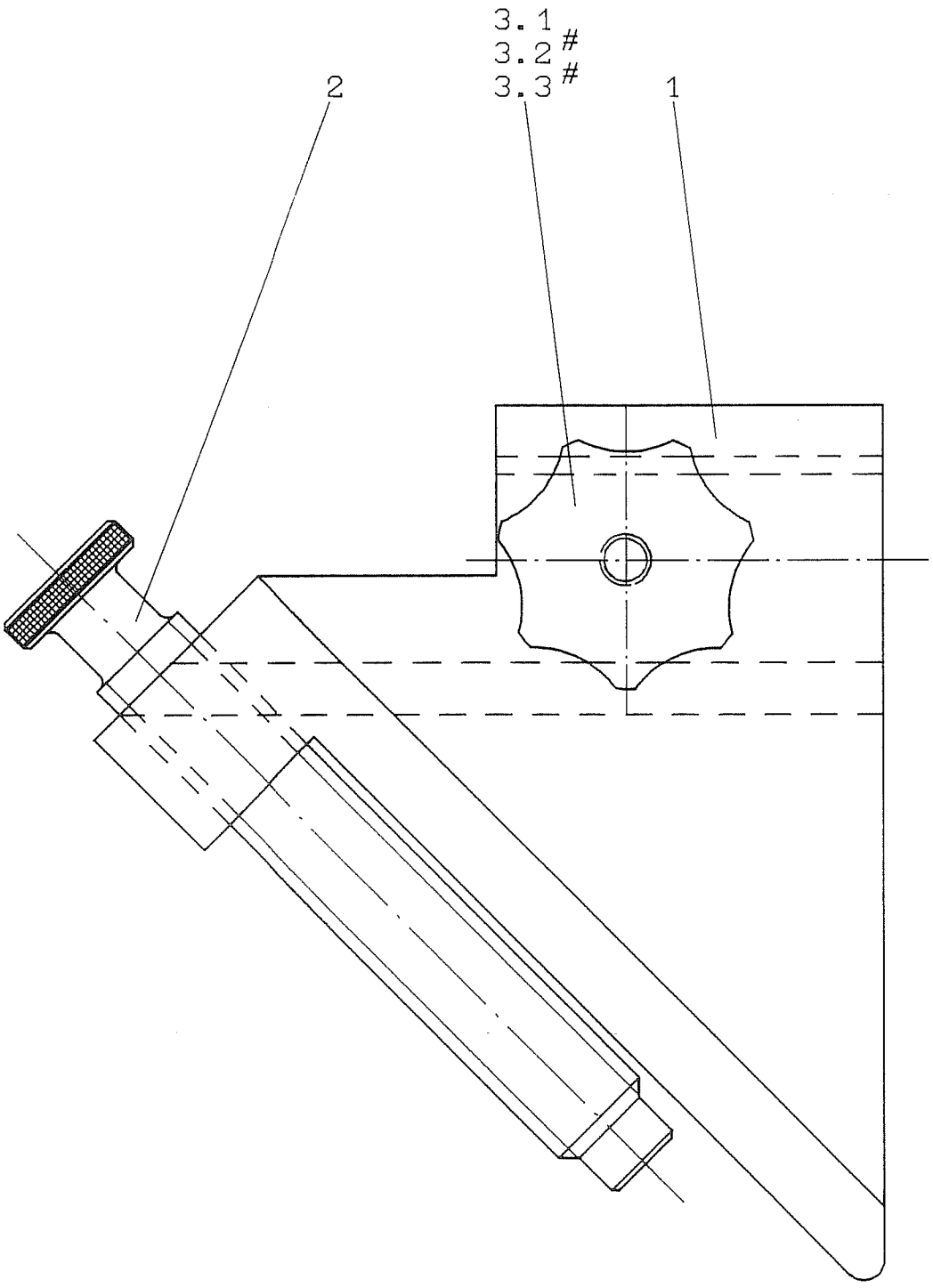
ab 0162589249137 ...

AUSF. 01

02.07.91

NIEDERHALTER, KPL. (STABSTAHLSCHERE)
HOLD-DOWN, COMPLETE (BAR SHEAR)
SERRE-FLANC, COMPL. (CISAILLE A BARRES)

0160506200



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0165090253946 ...

AUSF. 01

24.11.91

NIEDERHALTER, KPL. (STABSTAHLSCHERE)
HOLD-DOWN, COMPLETE (BAR SHEAR)
SERRE-FLANC, COMPL. (CISAILLE A BARRES)

0160506200

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0160506201	DRUCKSTUECK	PRESSURE PIECE	PIECE DE PRESSION
2	1	0160506202	DRUCKSCHRAUBE	PRESSURE SCREW	VIS DE PRESSION
3	1	0500206205	STERNGRIFF,KPL.	STAR KNOB, COMPLETE	POIGNEE ETOILE COMPL.
3.1	1	9063365300	STERNGRIFF	STAR KNOB	POIGNEE ETOILE
3.2 #	1	0500206206	GEWINDEBOLZEN	THREADED BOLT	BOULON FILETE
3.3 #	1	9014811300	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

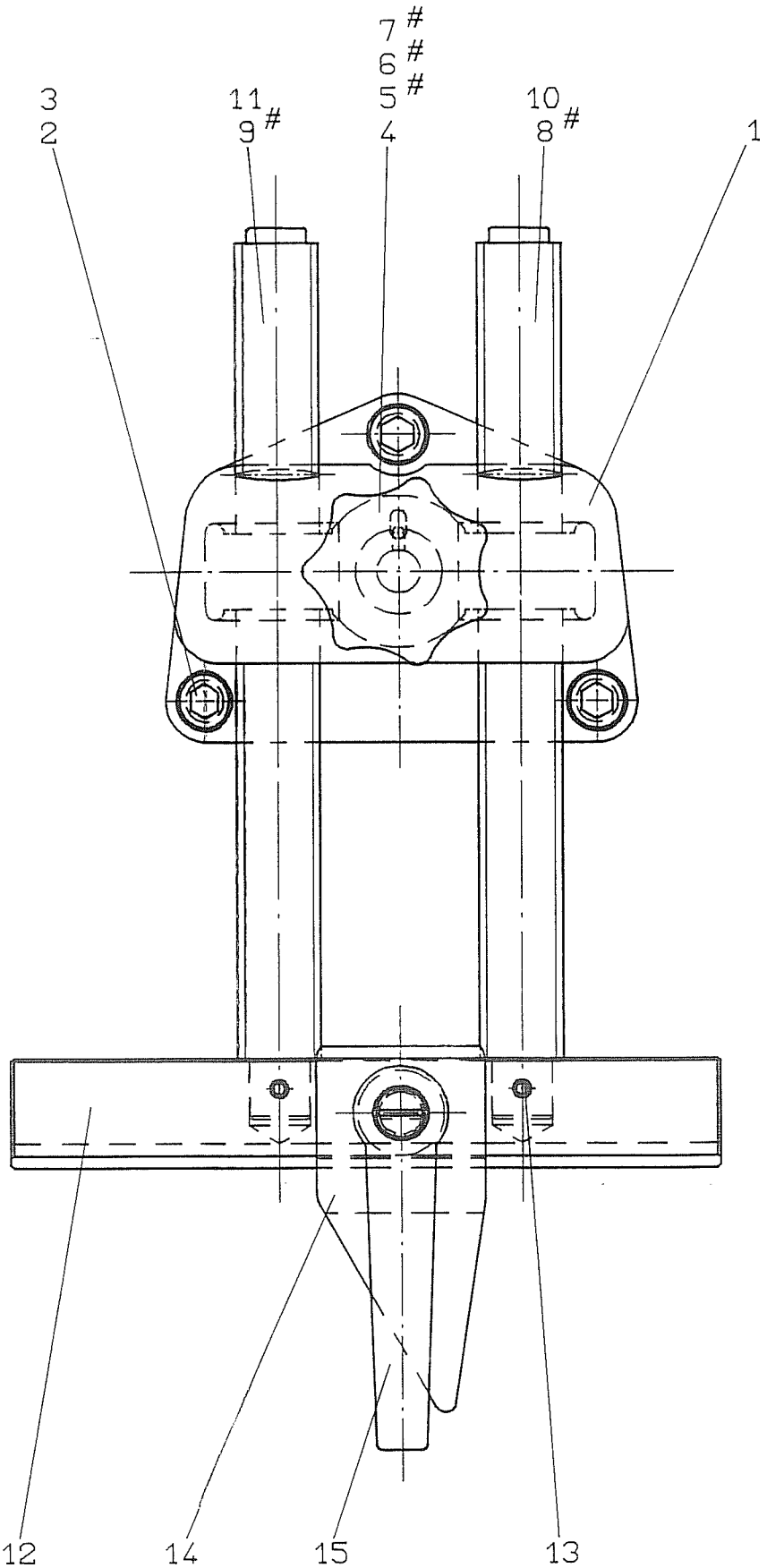
ab 0165090253946 ...

AUSF. 01

24.11.91

NIEDERHALTER, KPL. (PROFILSTAHLSCHERE)
HOLD-DOWN, COMPLETE (SECTION-SHEAR)
SERRE-FLANC. COMPL. (CISAILLE A PROFILES)

0501106300



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0165090253946 ...

AUSF. 01

20.02.91

NIEDERHALTER, KPL. (PROFILSTAHLSCHERE)
HOLD-DOWN, COMPLETE (SECTION-SHEAR)
SERRE-FLANC. COMPL. (CISAILLE A PROFILES)

0501106300

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0501106301	NIEDERHALTERBOCK	HOLD-DOWN TRESTLE	SUPPORT POUR PRESSE-MATERIAUX
2	3	8106001190	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
3	3	8106000030	SICHERUNGSSCHEIBE	SAFETY WASHER	BAGUE DE FREIN
4	1	9063366300	STERNGRIFF	STAR KNOB	POIGNEE ETOILE
5 #	1	0501106302	SCHRAUBENRAD	HELICAL GEAR	ENGRENAGE A DENTURE HELICOILADE
6 #	1	0501006103	WELLE	SHAFT	ARBRE
7 #	2	9073461200	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
8 #	1	0501006104	SCHRAUBENRAD	HELICAL GEAR	ENGRENAGE A DENTURE HELICOILADE
9 #	1	0501006105	SCHRAUBENRAD	HELICAL GEAR	ENGRENAGE A DENTURE HELICOILADE
10	1	0501006809	SPINDEL	SPINDLE	BROCHE FILETEE
11	1	0501006810	SPINDEL	SPINDLE	BROCHE FILETEE
12	1	0501006811	QUERBALKEN	TRANSVERSAL BEAM	TRAVERSE
13	2	9014813300	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
14	1	0501006812	DRUCKSTUECK	PRESSURE PIECE	PIECE DE PRESSION
15	1	8106000180	VERSTELLB.KLEMMHEBEL	ADJUSTABLE HANDLE	LEVIER DE SERRAGE REGLABLE

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

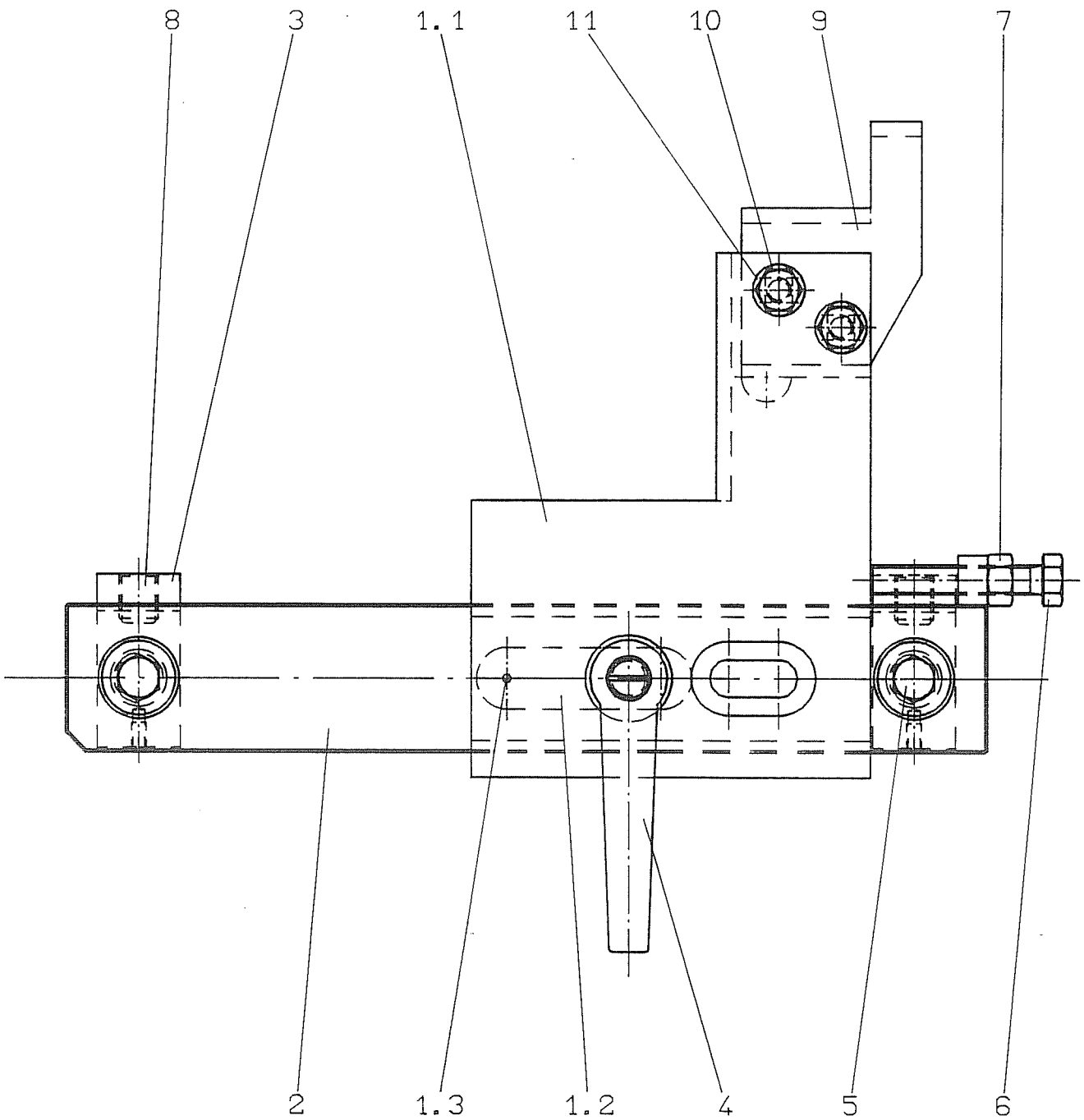
ab 0165090253946 ...

AUSF. 01

20.02.91

PROFILANSCHLAG, KPL.
SECTION STOP, COMPLETE
BUTEE A PROFILES, COMPL.

0162606400



ab 0162589249137 ...

AUSF. 01

11.07.91

PROFILANSCHLAG, KPL.
SECTION STOP, COMPLETE
BUTEE A PROFILES, COMPL.

0162606400

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162606401	PROFILHALTER,KPL.	SECTION HOLDER, COMPLETE	PORTE-PROFILES, COMPL.
1.1	1	0162606402	ANSCHLAG,KPL.	STOP, COMPLETE	BUTEE, COMPL.
1.2	1	0501006402	FEDERBLECH	WIPER	TOLE ELASTIQUE
1.3	1	8106000120	HAMMERSCHRAUBE	DRIVE SCREW	VIS A TETE A MARTEAU
2	1	0501006407	ANSCHLAGLEISTE,KPL.	STOP RAIL, COMPLETE	LISTEL DE BUTEE, COMPL.
3	2	0501006405	SCHIEBER	PUSHER	COULISSE
4	1	8106000180	VERSTELLB.KLEMMHEBEL	ADJUSTABLE HANDLE	LEVIER DE SERRAGE REGLABLE
5	2	9069124510	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
6	1	9009333660	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
7	1	9009343500	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
8	2	9009136100	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
9	1	0162606405	ANSCHLAG	STOP	BUTEE
10	2	9009313000	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
11	2	9001252700	SCHEIBE	WASHER	RONDELLE PLATE

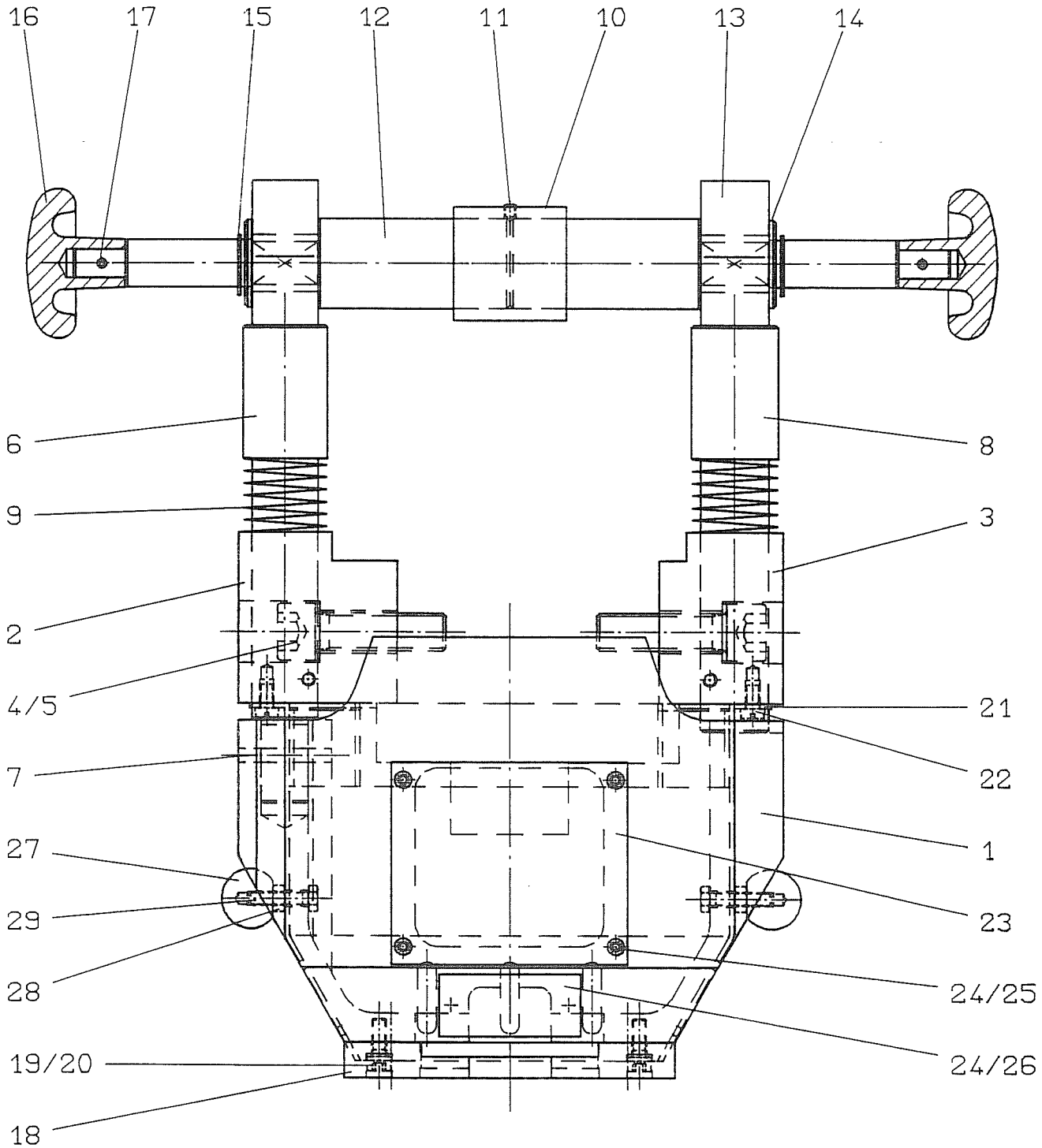
ab 0162589249137 ...

AUSF. 01

11.07.91

ABSTREIFER, KPL.
STRIPPER, COMPLETE
RACLEUR COMPL.

0160606500



ab 0165090253946 ...

AUSF. 01

03.01.91

ABSTREIFER, KPL.
STRIPPER, COMPLETE
RACLEUR COMPL.

0160606500

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0160006505	ABSTREIFER	STRIPPER	RACLEUR
2	1	0160006501	FUEHRUNGSSTUECK,LI.	GUIDING PIECE, LEFT	PIECE DE GUIDAGE, GAUCHE
3	1	0160006502	FUEHRUNGSSTUECK,RE.	GUIDING PIECE, RIGHT	PIECE DE GUIDAGE, DROITE
4	4	9009124060	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
5	4	8106000170	SICHERUNGSSCHEIBE	SAFETY WASHER	BAGUE DE FREIN
6	1	0160506502	BOLZEN	BOLT	BOULON
7	1	9014813500	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
8	1	0160506501	BOLZEN	BOLT	BOULON
9	2	0159006506	DRUCKFEDER	SPRING	RESSORT DE PRESSION
10	1	0160006506	DISTANZSTUECK	SPACER	PIECE D'ECARTEMENT
11	1	9009131000	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
12	1	0161106507	WELLE	SHAFT	ARBRE
13	2	0160006508	DRUCKSTUECK	PRESSURE PIECE	PIECE DE PRESSION
14	2	9001254400	SCHEIBE	WASHER	RONDELLE PLATE
15	2	9004713100	SICHERUNGSRING	LOCKING RING	ANNEAU DE SECURITE
16	2	9063366300	STERNGRIFF	STAR KNOB	POIGNEE ETOILE
17	2	9014811300	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
18	1	0160606510	ABSTREIFERPLATTE	STRIPPER PLATE	PLAQUE DEVETISSEUR
19	4	9009122030	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
20	4	8106002290	SICHERUNGSSCHEIBE	SAFETY WASHER	BAGUE DE FREIN
21	1	0160506503	SCHUTZHAUBE	GUARD	CAPOT DE PROTECTION
22	2	9000844100	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
23	1	0160006512	ABDECKUNG	COVER	TOLE DE PROTECTION
24	6	9009121280	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
25	4	8106002270	SICHERUNGSSCHEIBE	SAFETY WASHER	BAGUE DE FREIN
26	1	0160006515	ABDECKUNG	COVER	TOLE DE PROTECTION
27	2	9003195100	KUGELKNOPF	BALL KNOB	BOUTON SPHERIQUE
28	2	9009342100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
29	2	9009332090	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL

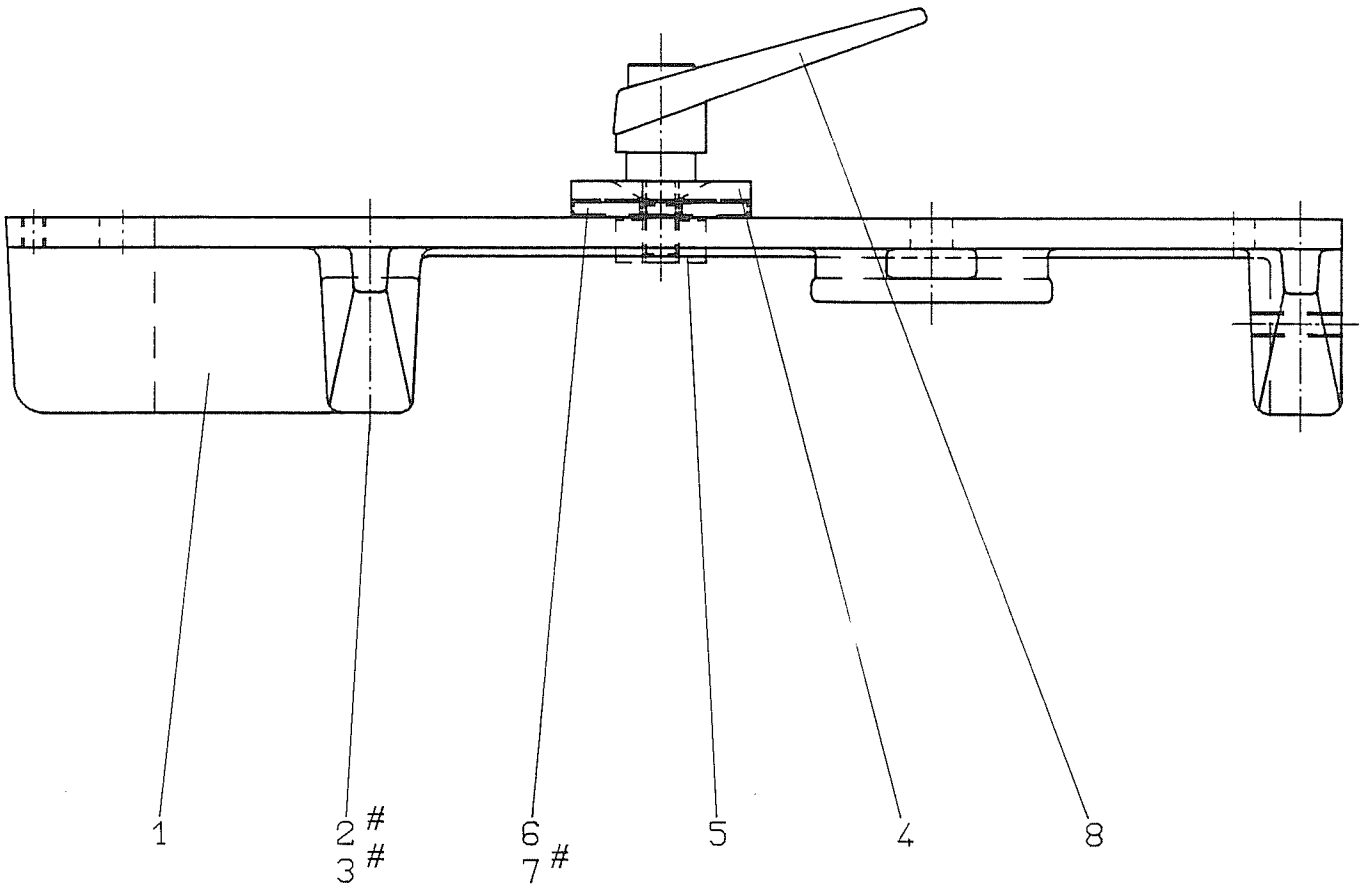
ab 0165090253946 ...

AUSF. 01

03.01.91

BLECHAUFLAGETISCH, KPL.
SUPPORT TABLE FOR PLATES, COMPLETE
TABLE DE SUPPORT COMPL.

0501906600



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

02.07.91

BLECHAUFLAGETISCH, KPL.
SUPPORT TABLE FOR PLATES, COMPLETE
TABLE DE SUPPORT COMPL.

0501906600

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0501906601	BLECHAUFLAGETISCH	SUPPORT TABLE FOR PLATES	TABLE DE SUPPORT
2 #	4	9005517500	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
3 #	2	9009123600	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
4	1	0501906602	ANSCHLAGLEISTE	STOP RAIL	LISTEL DE BUTEE
5	1	0501006603	NUTENSTEIN	SLIDING BLOCK	COULISSEAU
6	1	0501006604	SCHEIBE	WASHER	RONDELLE PLATE
7 #	1	0501006605	MASSKALA	MEASURING SCALA	ECHELLE DRADUEE
8	1	8106001450	VERSTELLB.KLEMMHEBEL	ADJUSTABLE HANDLE	LEVIER DE SERRAGE REGLABLE

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

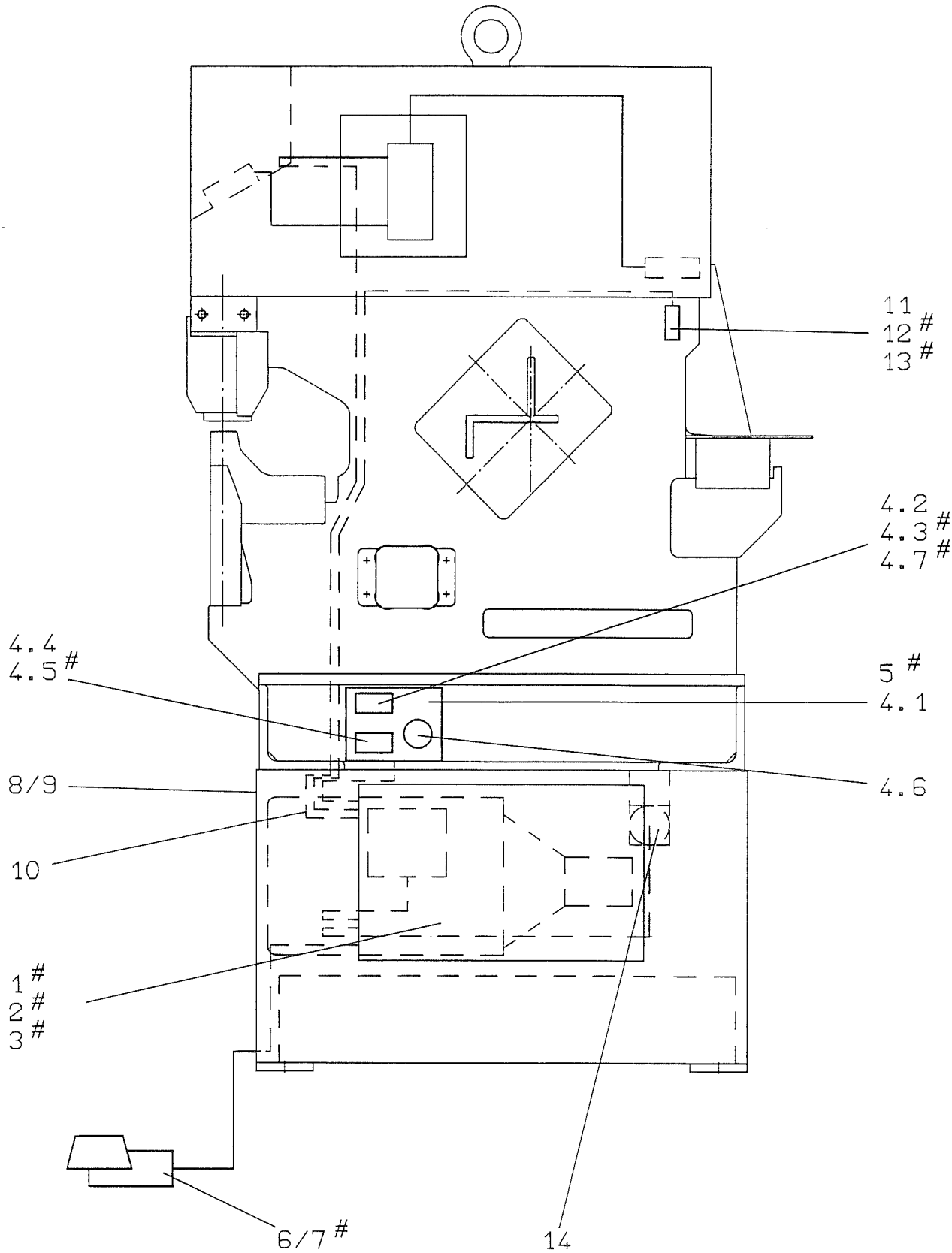
ab 0162589249137 ...

AUSF. 01

02.07.91

ELEKTRIK, KPL.
ELECTRIC SYSTEM, COMPLETE
GROUPE ELECTRIQUE COMPL.

0162607100



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

16.07.91

ELEKTRIK, KPL.
ELECTRIC SYSTEM, COMPLETE
GROUPE ELECTRIQUE COMPL.

0162607100

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1 #	3	9009122510	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
2 #	3	9079801400	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
3 #	3	9001252400	SCHEIBE	WASHER	RONDELLE PLATE
4	1	0164807103	HAUPTSCHALTER,KPL.	MAIN SWITCH, COMPLETE	INTERRUPTEUR PRINCIPALE COMPL.
4.1	1	0168007104	GEHAEUSE	HOUSING	CORPS
4.2	1	8540200755	ZWEIFACHDRUCKTASTER	DOUBLE PRESS BUTTON	BOUTON-POUSSOIR DOUBLE
4.3 #	1	8540200855	KONTAKTBOECKCHEN	CONTACT BRACKET	PETIT SUPPORT DE CONTACT
4.4	2	8540200425	SCHLUESSELSCHALTER	KEY SWITCH	INTERRUPTEUR A CLE
4.5 #	2	8540200945	KONTAKTBOECKCHEN	CONTACT BRACKET	PETIT SUPPORT DE CONTACT
4.6	1	8540070050	HAUPTSCHALTER	MAIN SWITCH	INTERRUPTEUR PRINCIPALE
4.7 #	1	8580011500	GLIMMLAMPE	BULB	LAMPE
5 #	4	9009121290	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
6	1	8540311670	FUSSTASTER,KPL.	FOOT PEDAL, COMPLETE	INTERRUPTEUR COMPL.
7 #	1	0501007108	AUFHAENGEBLECH	HANGING PLATE	TOLE DE SUSPENSION
8	1	9009121540	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
9	1	9009341500	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
10	1	0162507102	KABELGARNITUR,KPL.	CABLE SET, COMPLETE	GARNITURE DE CABLE COMPL.
10.1 #	4	8520020260	KABEL 3X1 -METERW.	ELECTR. CABLE 3X1 -YARD WARE	CABLE 3X1 (METRE)
10.2 #	1	8520020270	KABEL 4X1 -METERW.	ELECTR. CABLE 4X1 -YARD WARE	CABLE 4X1 (METRE)
10.3 #	1	8520020290	KABEL 7X1 -METERW.	ELECTR. CABLE 7X1 -YARD WARE	CABLE 7X1 (METRE)
10.4 #	1	8540020310	KABEL 12X1 -METERW.	ELECTR. CABLE 12X1 -YARD WARE	CABLE 12X1 (METRE)
10.5 #	1	8520020450	KABEL 4X2.5 -METERW.	ELECTR. CABLE 4X2.5 -YARD WARE	CABLE 4X2.5 (METRE)
10.6 #	1	8520020470	KABEL 7X2.5 -METERW.	ELECTR. CABLE 7X2.5 -YARD WARE	CABLE 7X2.5 (METRE)
10.7 #	1	8520020320	KABEL 18X1 -METERW.	ELECTR. CABLE 18X1 -YARD WARE	CABLE 18X1 (METRE)
11	1	8550060610	STECKVORRICHTUNG,KPL	PLUG DEVICE, COMPLETE	PRISE DE COURANT COMPL.
12 #	2	9001250900	SCHEIBE	WASHER	RONDELLE PLATE
13 #	2	9000841200	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
14	2	8101000020	GLEICHRICHT. M.KAPPE	RECTIFIER	REDRESSEUR AVEC CAPOT

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

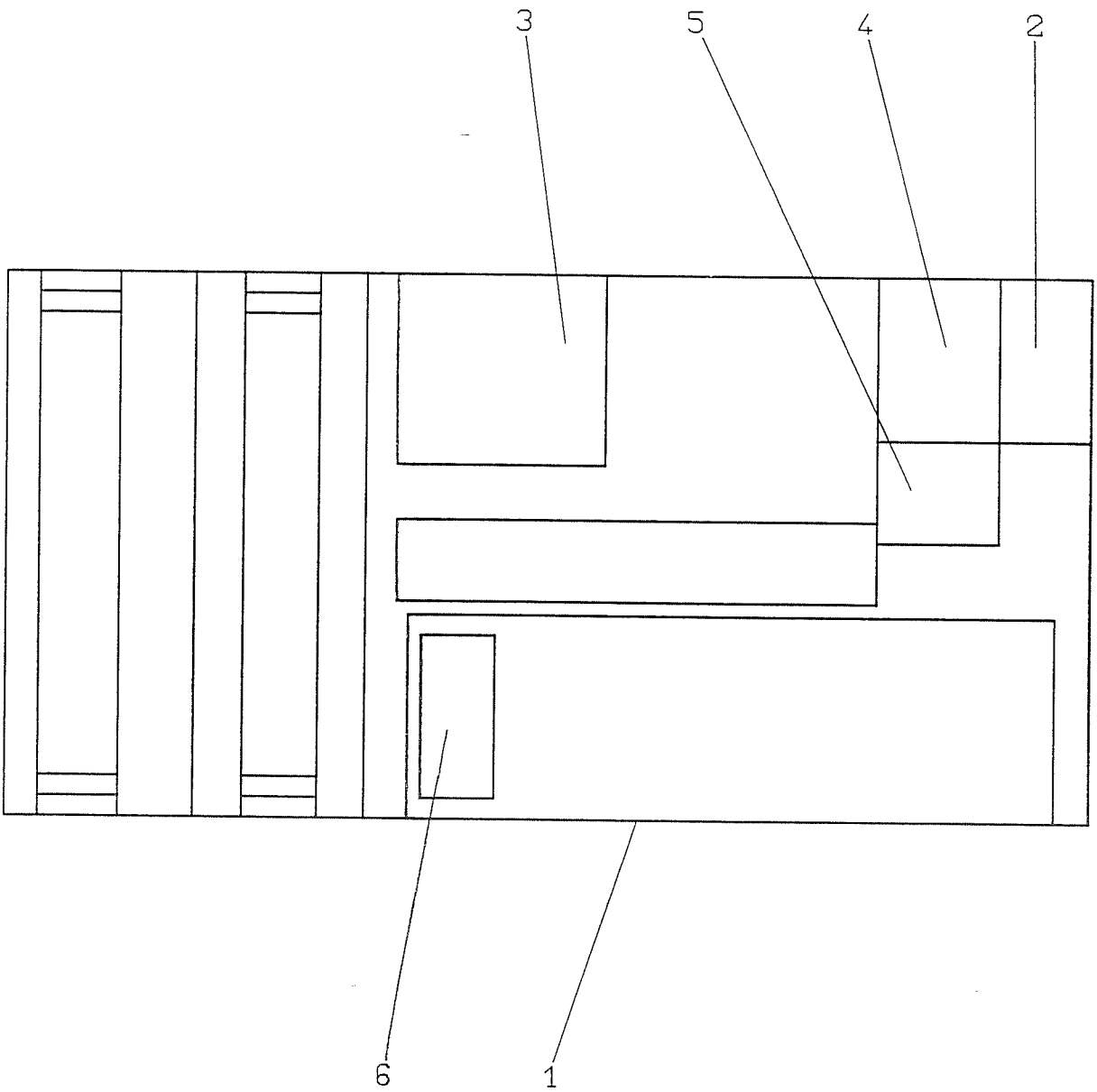
ab 0162589249137 ...

AUSF. 01

18.07.91

SCHALTSCHRANK, KPL.
SWITCH CABINET, COMPLETE
ARMOIRE ELECTRIQUE COMPL.

0162607101



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

19.07.91

SCHALTSCHRANK, KPL.
SWITCH CABINET, COMPLETE
ARMOIRE ELECTRIQUE COMPL.

0162607101

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0164807102	GEHAEUSE	HOUSING	CORPS
2	1	8540000160	MOTORSCHUTZSCHALTER	OVERLOAD SWITCH	DISJONCTEUR
3	1	8530400420	STEUERTRAFO	TRANSFORMER	TRANSFORMATEUR DE COMMANDE
4	1	8540011150	UNIVERSALSCHUETZ	UNIVERSAL CONTACTOR	CONTACTEUR UNIVERSAL
5	1	8540030520	MOTORSCHUTZRELAIS	MOTOR PROTECTION RELAY	RELAIS POUR DISJONCTEUR-PROTECTEUR
6	1	8540011210	HILFSSCHUETZ	CONTACTOR RELAY	CONTACTEUR AUXILIAIRE

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

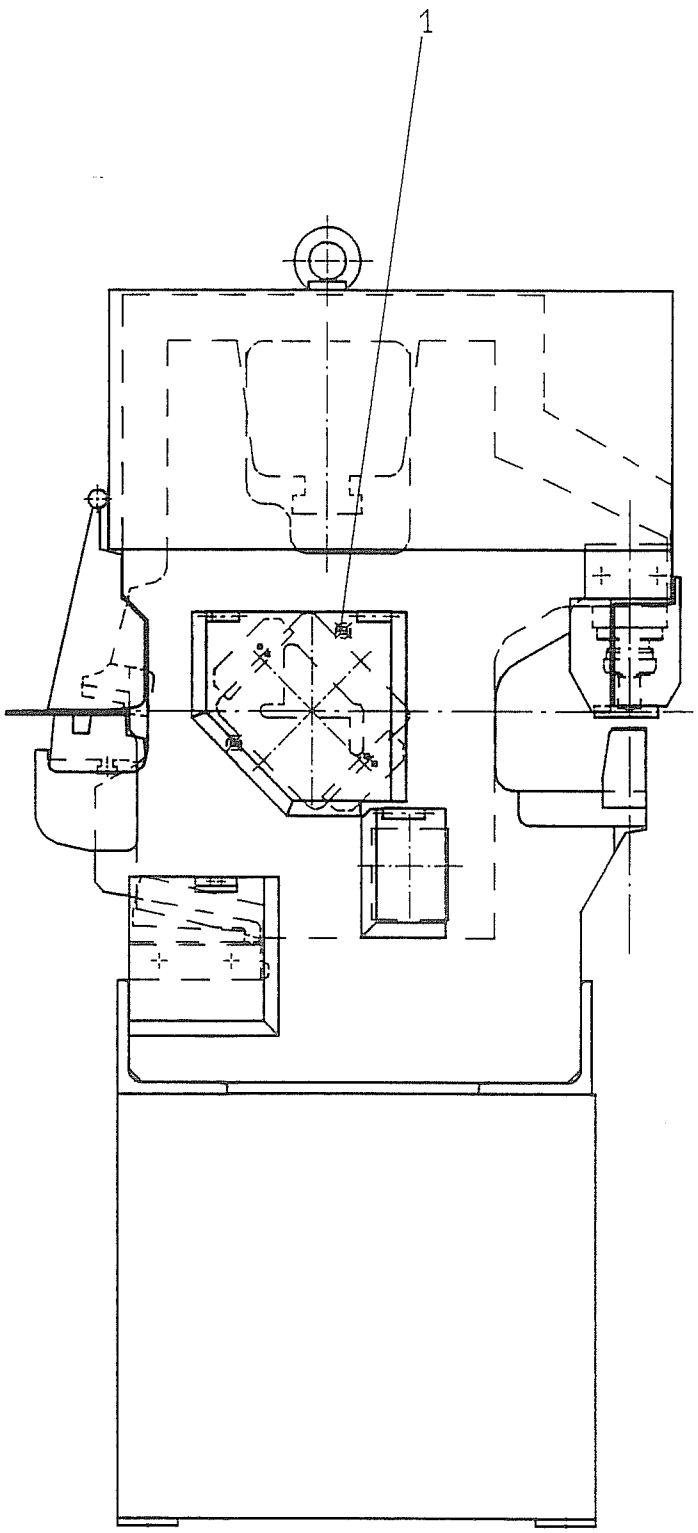
ab 0162589249137 ...

AUSF. 01

19.07.91

HANDSCHMIERUNG, KPL.
HAND LUBRICATION, COMPLETE
GRAISSAGE MANUEL COMPL.

0160508100



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AUSF. 01

18.01.91

HANDSCHMIERUNG, KPL.
HAND LUBRICATION, COMPLETE
GRAISSAGE MANUEL COMPL.

0160508100

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	6	8111001070	EINSCHLAGNIPPEL	OIL-FITTING	GRAISSEUR

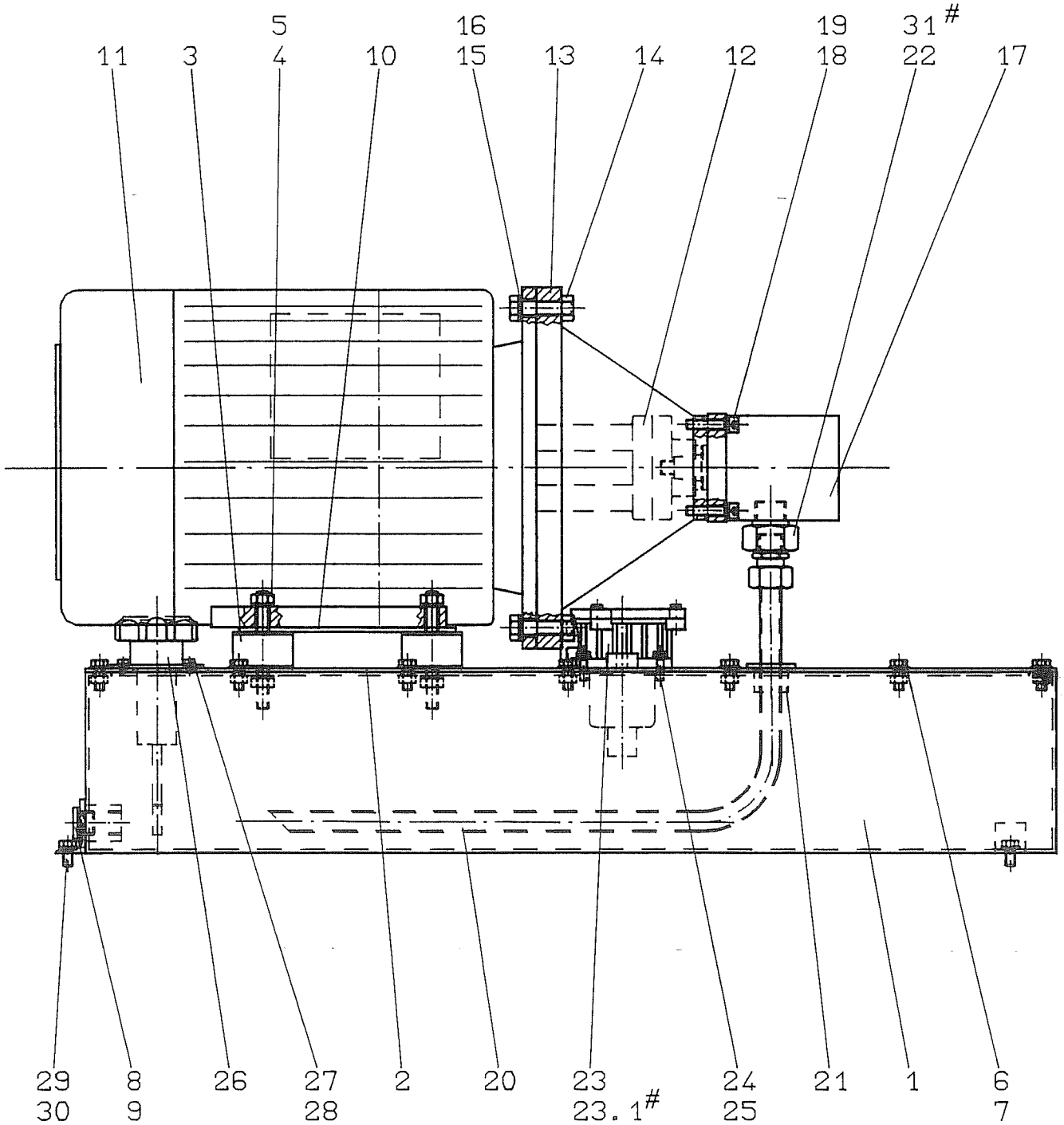
ab 0165090253946 ...

AUSF. 01

18.01.91

HYDRAULIKSTATION, KPL.
HYDRAULIC POWER UNIT, COMPLETE
STATION HYDRAULIQUE COMPL.

0162608300



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

04.07.91

HYDRAULIKSTATION, KPL.
HYDRAULIC POWER UNIT, COMPLETE
STATION HYDRAULIQUE COMPL.

0162608300

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162508301	OELBEHAELTER	OIL TANK	RESERVOIR A HUILE
2	1	0162608302	DECKEL	TANK COVER	COUVERCLE
3	4	8106000920	SCHWINGMETALL-PUFFER	VIBRATION FITTING	SILENT-BLOC
4	8	9001271700	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
5	8	9009343100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
6	20	9009332560	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
7	20	9001252400	SCHEIBE	WASHER	RONDELLE PLATE
8	1	9009083000	VERSCHLUSSCHRAUBE	SCREW PLUG	BOUCHON FILETE
9	1	9076034500	DICHTRING	WASHER	ANNEAU
10	2	0150108303	UNTERLEGPLATTE	PLATE	PLAQUE D' ASSISER
11	1	8101001850	MOTOR	MOTOR	MOTEUR
12	1	8116002120	KUPPLUNG	COUPLING ASSEMBLY	RACCORD
13	1	8116002100	PUMPENTRAEGER	PUMP SUPPORT	PORTE-POMPE
14	4	9009313510	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
15	4	9001272100	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
16	4	9009343500	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
17	1	8116000054	HOCHDRUCKPUMPE	HIGH-PRESSURE PUMP	POMPE POUR HAUTE PRESSION
18	4	9009122550	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
19	4	9079801400	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
20	1	0160508303	ANSAUGROHR	SUCTION PIPE	TUYAU D' ASPIRATION
21	1	8106001400	GUMMITUELLE	RUBBER BUSHING	PASSE-TUBE
22	1	8116002210	GERADE EINSCHR.VERS.	STRAIGHT CONNECTOR	RACCORD DROIT
23	1	8116003000	RUECKLAUFFILTER	RETURN FILTER	FILTRE DE RECUL
23.1 #	1	8116004610	ERSATZPATRONE	SPARE CARTRIDGE	CARTOUCHE DE RECHANGE
24	2	9009332080	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
25	2	9001271100	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
26	1	8116002170	EINF.-BELUEF.-FILTER	FILL-AIRING-FILTER	FILTRE DE REMPLISSAGE ET D' AERATION
27	3	9000843100	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
28	3	9001251400	SCHEIBE	WASHER	RONDELLE PLATE
29	3	9009332540	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
30	3	9001271400	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
31 #	1	8116002470	GEWINDEREDUZIERUNG	THREAD REDUCER	REDUCTION

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

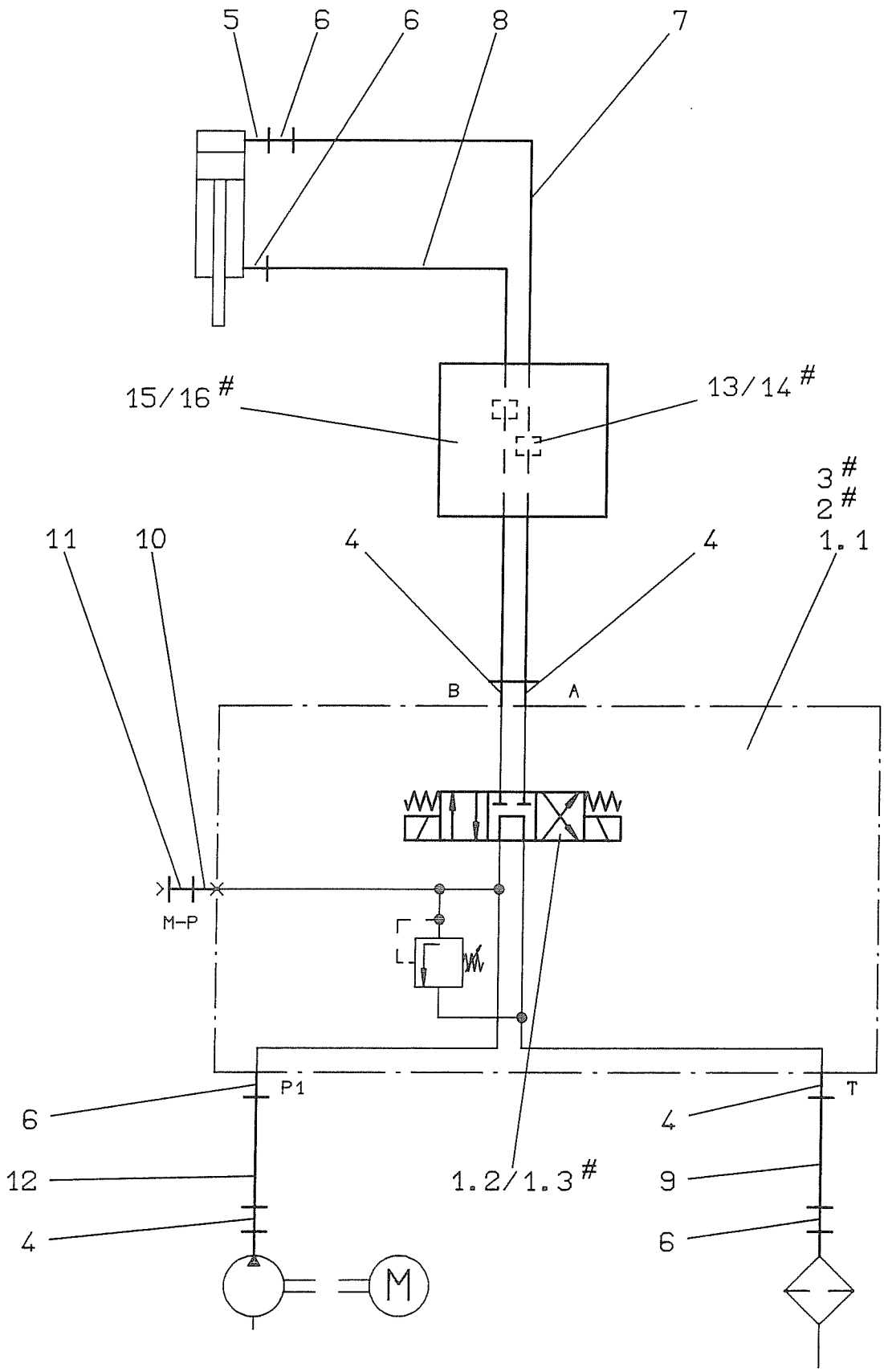
ab 0162589249137 ...

AUSF. 01

04.07.91

VERSCHLAUCHUNG, KPL.
HOSE PIPES, COMPLETE
TUYAUTERIE COMPL.

0162608400



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0162589249137 ...

AUSF. 01

04.07.91

VERSCHLAUCHUNG, KPL.
HOSE PIPES, COMPLETE
TUYAUTERIE COMPL.

0162608400

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162608401	HYDR. STEUERUNG,KPL.	HYDRAULIC CONTROL, COMPLETE	COMMANDE HYDRAULIQUE COMPL.
1.1	1	8116000057	MONTAGEPLATTE,KPL.	ASSEMBLING PLATE, COMPLETE	PLAQ DE MONTAGE COMPL.
1.2	1	8116003200	MAGNETVENTIL,KPL.	SOLENOID VALVE	ELECTROVANNE COMPL.
1.3 #	4	9009122070	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
2 #	2	9009122680	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
3 #	2	8106002300	SICHERUNGSSCHEIBE	SAFETY WASHER	BAGUE DE FREIN
4	4	8116002480	GERADE EINSCHR.VERS.	STRAIGHT CONNECTOR	RACCORD DROIT
5	1	8116002470	GEWINDEREDUZIERUNG	THREAD REDUCER	REDUCTION
6	4	8116002500	SCHWENKVERSCHRAUBUNG	SWIVEL CONNECTOR	RACCORD PIVOTANT
7	1	8116003470	HOCHDRUCKSCHLAUCH	HIGH-PRESSURE HOSE	TUYAU FLEXIBLE POUR HAUTE PRESSION
8	1	8116003420	HOCHDRUCKSCHLAUCH	HIGH-PRESSURE HOSE	TUYAU FLEXIBLE POUR HAUTE PRESSION
9	1	8116009450	HOCHDRUCKSCHLAUCH	HIGH-PRESSURE HOSE	TUYAU FLEXIBLE POUR HAUTE PRESSION
10	1	8116000051	EINSTELLB.T-VERSCHR.	SWIVEL BRANCH TEES	TES ORIENTABLES
11	1	8116006620	DKO-STUTZEN M.KUPPL.	CONNECTION PIECE WITH COUPLING	MANCHON DKO AVEC RACCORD
12	1	8116003390	HOCHDRUCKSCHLAUCH	HIGH-PRESSURE HOSE	TUYAU FLEXIBLE POUR HAUTE PRESSION
13	6	8116003520	SCHLAUCHSCHELLE	HOSE CLIP	COLLIER POUR TUYAU
14 #	12	9009122070	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
15	1	0160608401	SCHLAUCHABDECKUNG	HOSE COVER	COUVERTURE DE PROTECTION POUR TUYAU
16 #	2	9009332180	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

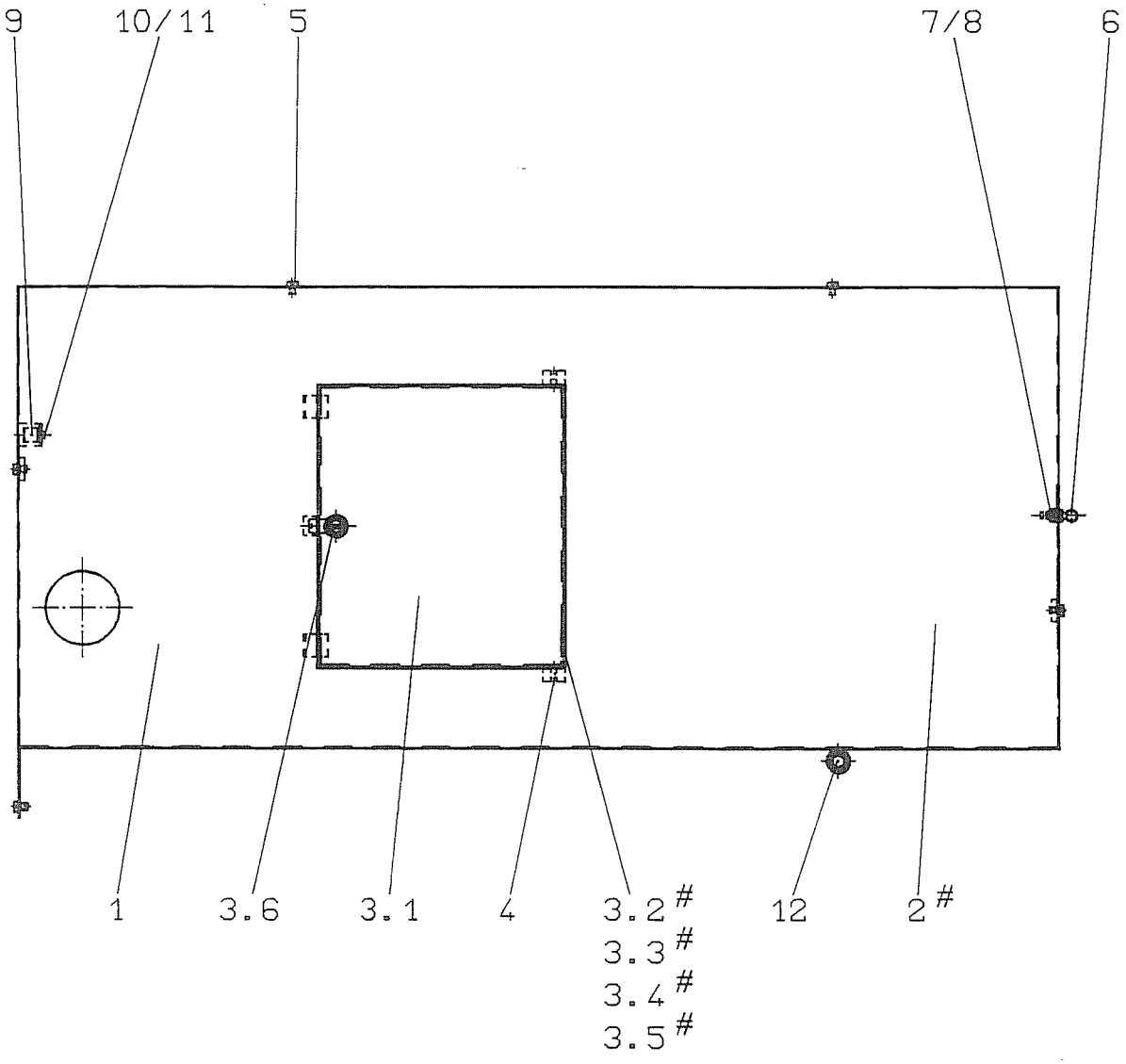
ab 0162589249137 ...

AUSF. 01

04.07.91

SCHUTZHAUBE, KPL.
GUARD, COMPLETE
CAPOT DE PROTECTION COMPL.

0160609100



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0165090253946 ...

AUSF. 01

24.01.91

SCHUTZHAUBE, KPL.
GUARD, COMPLETE
CAPOT DE PROTECTION COMPL.

0160609100

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0160609103	SCHUTZHAUBE,KOERPER.	GUARD, BODY PLATE	CAPOT DE PROTECTION PLAQUE DE BATI
2 #	1	0160609102	SCHUTZHAUBE,DECKPL.	GUARD, COVER PLATE	CAPOT DE PROTECTION CONTRE-PLAQUE
3	1	0156609103	VERKLEIDUNGSTUER,KPL	GUARD FLAP, COMPLETE	PORTE DE COFFRAGE COMPL.
3.1	1	0156609104	VERKLEIDUNGSTUER	GUARD FLAP	PORTE DE COFFRAGE
3.2 #	1	0504704704	BLATTFEDER	LEAF SPRING	RESSORT A LAMES
3.3 #	2	9000842100	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
3.4 #	2	9009341100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
3.5 #	2	9001270700	FEDERRING	LOCK WASHER	RONDELLE ELASTIQUE
3.6	1	8106004920	VORREIBER,EINSCHR.	SASH FASTENER	TOURNIQUET AVEC VIS DE SERRAGE
4	2	9014812200	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
5	8	9000844000	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
6	1	9718032000	KUGELZAPFEN	BALL-HEADED	TOURILLON A BOULET
7	2	9001251700	SCHEIBE	WASHER	RONDELLE PLATE
8	1	9009342100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
9	1	0509005402	KLEMMFEDER	CLAMP	RESSORT DE BLOCAGE
10	1	9000841200	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
11	1	9009340500	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
12	2	9009123590	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

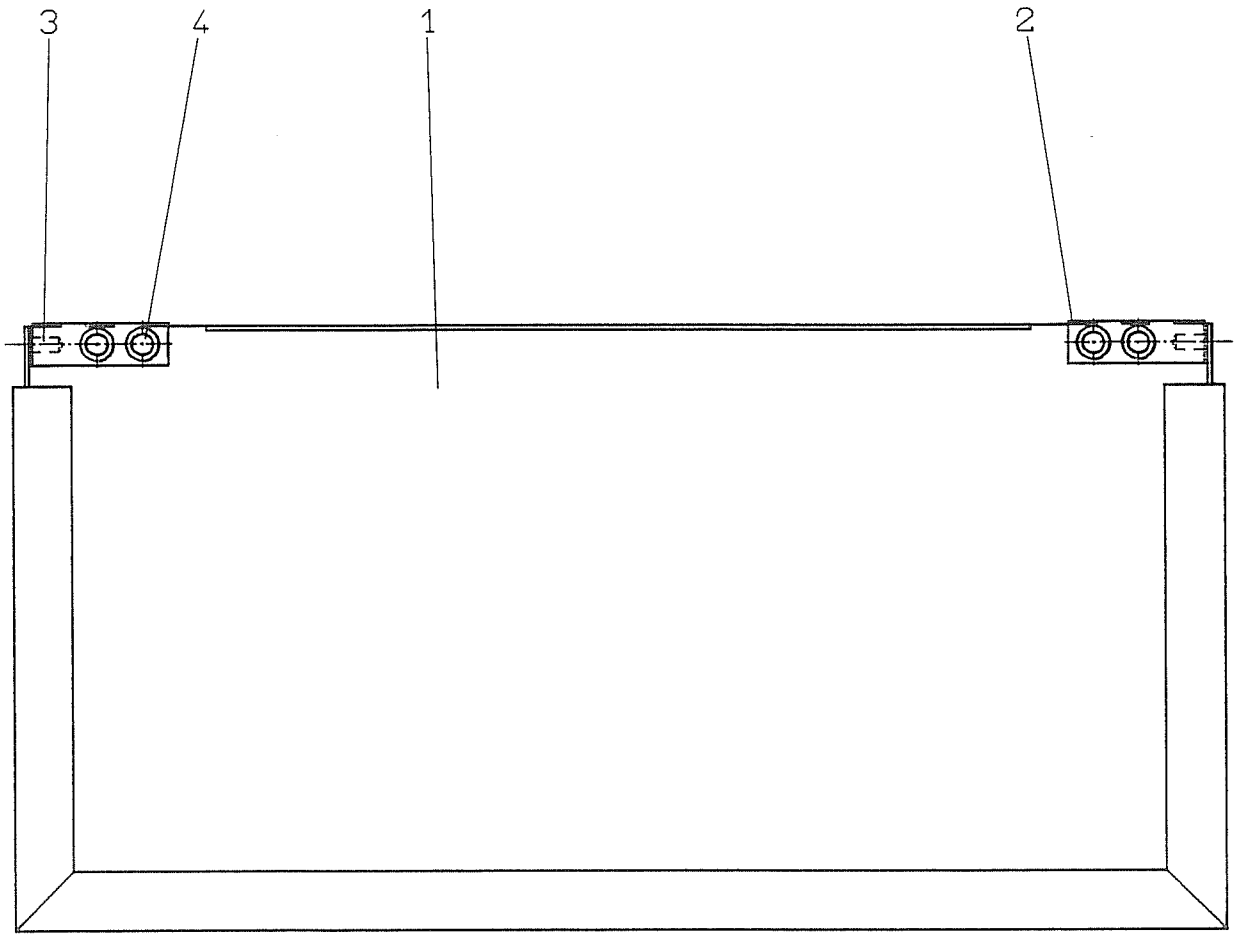
ab 0165090253946 ...

AUSF. 01

24.01.91

SCHUTZKLAPPE, KPL.
MOVABLE GUARD, COMPLETE
PLAQUE DE PROTECTION COMPL.

0162509500



ab 0162589249137 ...

AUSF. 01

03.07.91

SCHUTZKLAPPE, KPL.
MOVABLE GUARD, COMPLETE
PLAQUE DE PROTECTION COMPL.

0162509500

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0162509501	SCHUTZKLAPPE	PROTECTION FLAP	PLAQUE DE PROTECTION
2	2	0504009502	BOECKCHEN	BRACKET	SUPPORT
3	2	9014812100	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
4	4	9009122030	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX

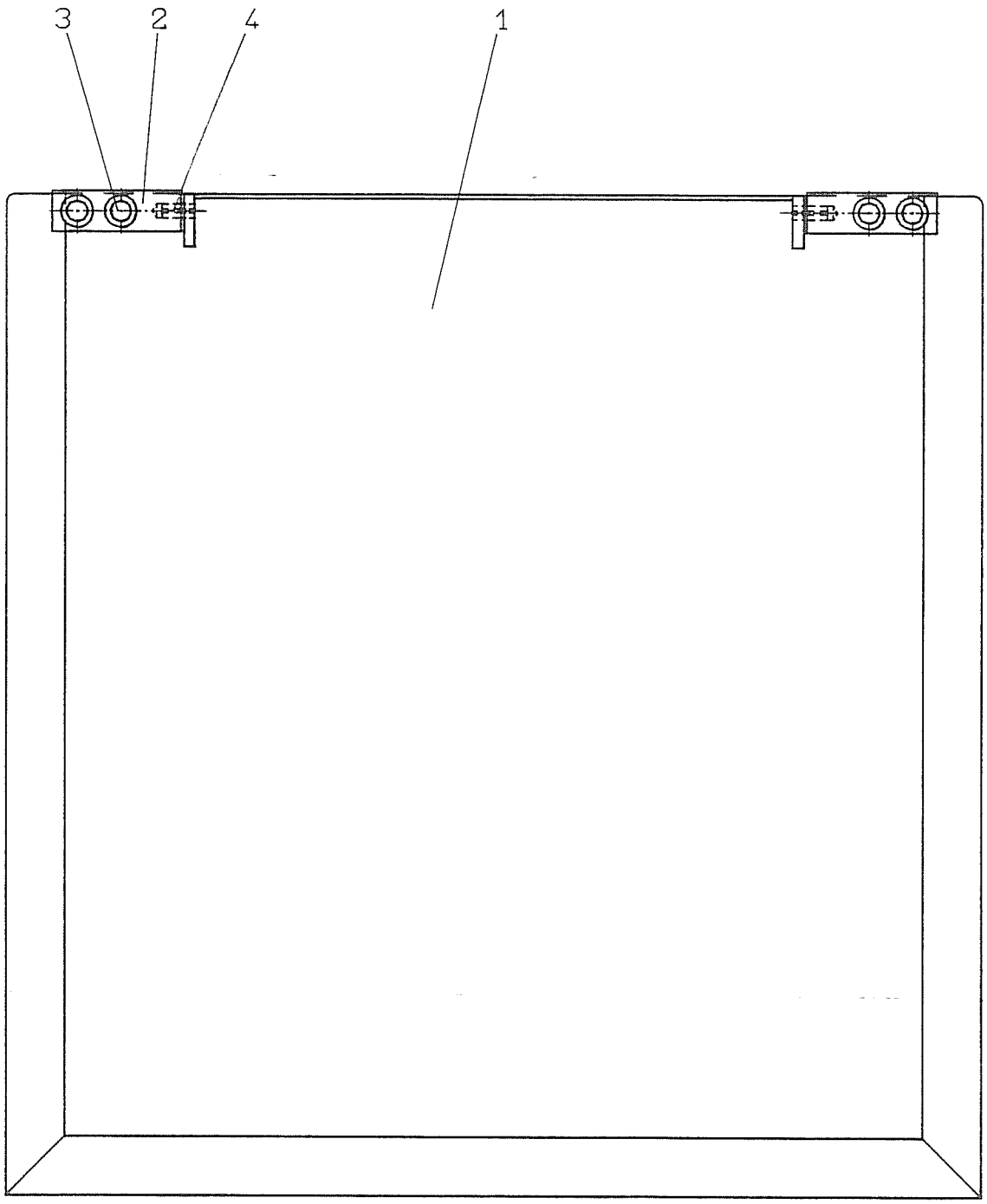
ab 0162589249137 ...

AUSF. 01

03.07.91

SCHUTZKLAPPE, KPL.
MOVABLE GUARD, COMPLETE
PLAQUE DE PROTECTION COMPL.

0156009600



ab 0165090253946 ...

AUSF. 01

SCHUTZKLAPPE, KPL.
MOVABLE GUARD, COMPLETE
PLAQUE DE PROTECTION COMPL.

0156009600

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0156009601	SCHUTZKLAPPE	PROTECTION FLAP	PLAQUE DE PROTECTION
2	2	0504009502	BOECKCHEN	BRACKET	SUPPORT
3	4	9009122030	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
4	2	9014812100	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE

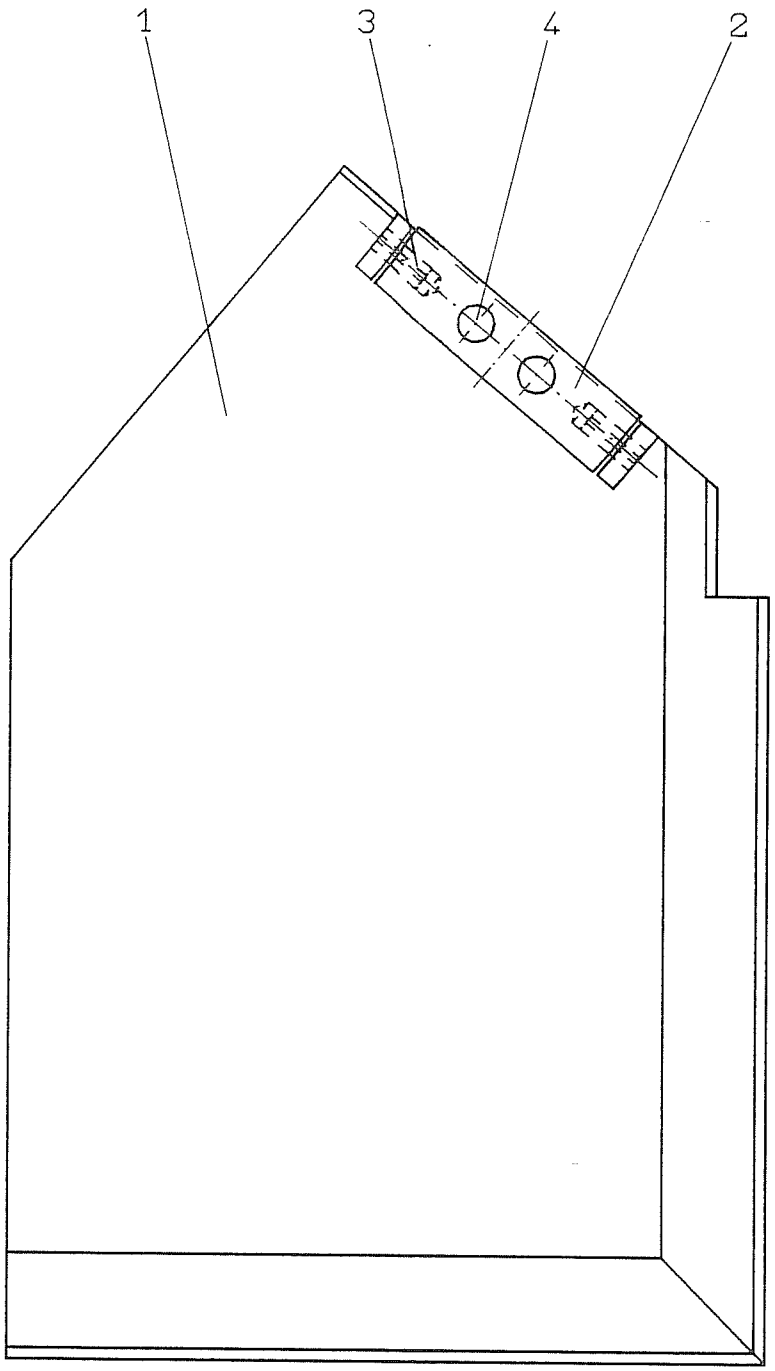
ab 0165090253946 ...

AUSF. 01

19.03.91

SCHUTZKLAPPE, KPL.
MOVABLE GUARD, COMPLETE
PLAQUE DE PROTECTION COMPL.

0160609700



ab 0165090253946 ...

AUSF. 01

27.02.91

SCHUTZKLAPPE, KPL.
MOVABLE GUARD, COMPLETE
PLAQUE DE PROTECTION COMPL.

0160609700

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0160609701	SCHUTZKLAPPE	PROTECTION FLAP	PLAQUE DE PROTECTION
2	1	0152009502	BOECKCHEN	BRACKET	SUPPORT
3	2	9014812100	SPANNSTIFT	CLAMPING PIN	DOUILLE DE SERRAGE
4	2	9009122030	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX

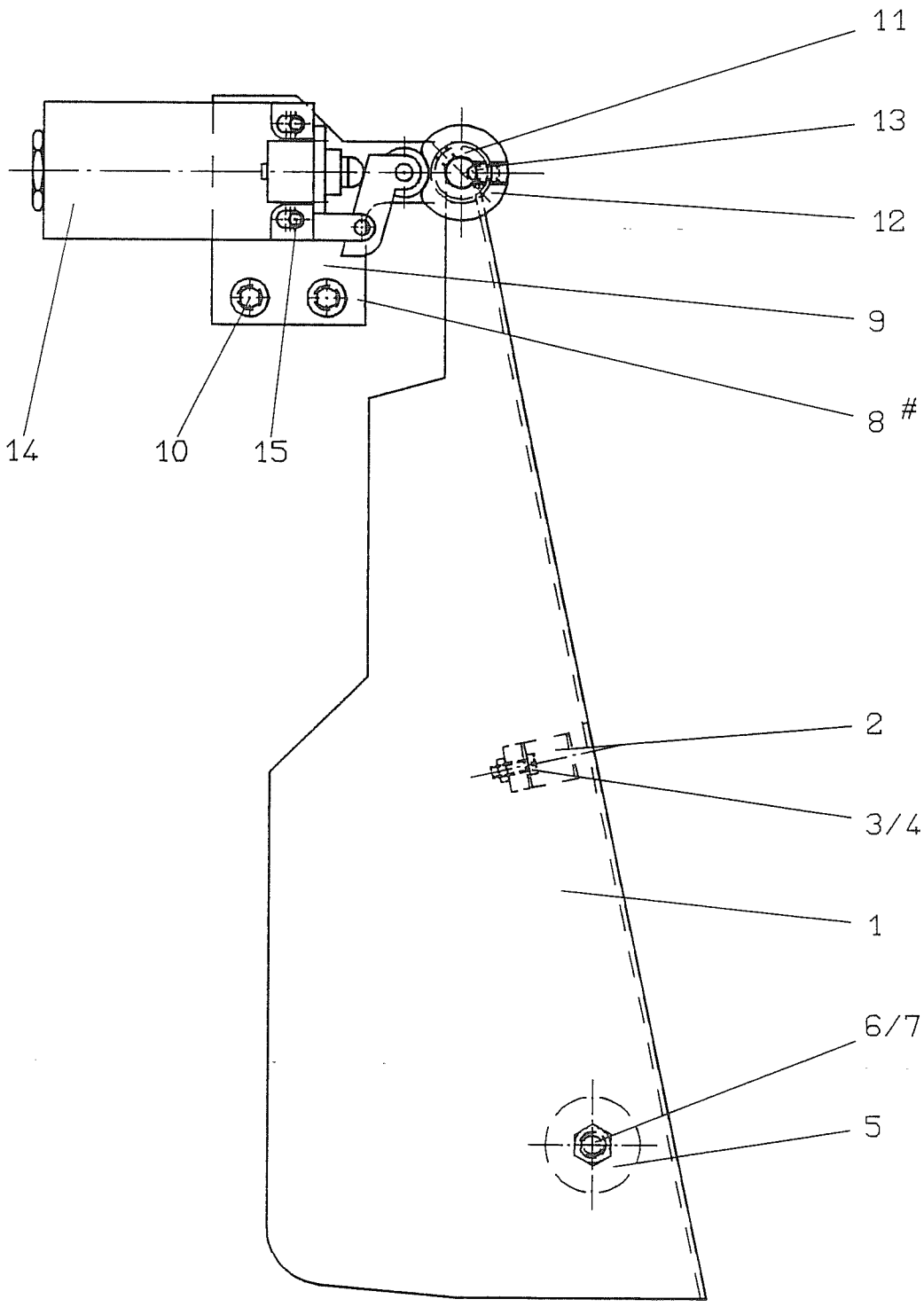
ab 0165090253946 ...

AUSF. 01

27.02.91

KLINKERHAUBE, KPL.
NOTCHER GUARD, COMPLETE
CAPOT DE GRUGEAGE COMPL.

0160509800



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0165090253946 ...

AUSF. 01

25.01.91

KLINKERHAUBE, KPL.
NOTCHER GUARD, COMPLETE
CAPOT DE GRUGEAGE COMPL.

0160509800

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0160509802	KLINKERHAUBE	NOTCHER GUARD	CAPOT DE GRUGEAGE
2	1	0509005402	KLEMMFEDER	CLAMP	RESSORT DE BLOCAGE
3	1	9000841200	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
4	1	9009340500	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
5	1	9003195100	KUGELKNOPF	BALL KNOB	BOUTON SPHERIQUE
6	1	9009332060	SECHSKANTSCHRAUBE	HEX. CAP SCREW	VIS A TETE HEXAGONAL
7	1	9009342100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
8 #	2	0160509806	ZWISCHENSTUECK	INTERMEDIATE PIECE	PIEE INTERCALAIRE
9	2	0160005307	LASCHE	BRACKET	ECLISSE
10	4	9009122070	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
11	1	9007052500	STELLRING	ADJUSTING RING	BAGUE DE REGLAGE
12	1	0160509808	STELLRING	ADJUSTING RING	BAGUE DE REGLAGE
13	1	9009142100	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
14	1	8101001120	ENDSCHALTER	LIMIT SWITCH	INTERRUPTEUR FIN DE COURSE
15	2	9009121330	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

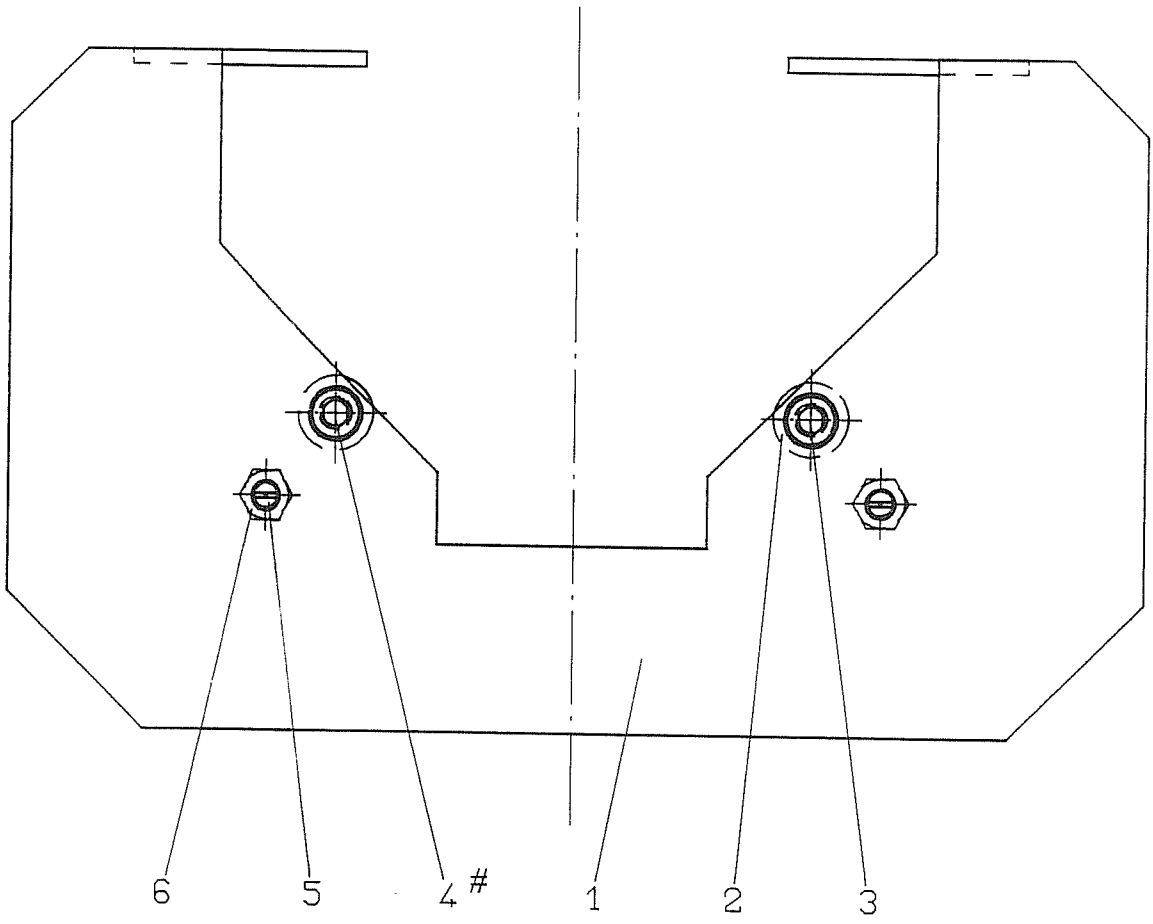
ab 0165090253946 ...

AUSF. 01

25.01.91

SCHUTZVORRICHTUNG ZUM AUSKLINKSATTEL, KPL.
SUPPORT BRACKET FOR COPER-NOTCHER SADDLE, COMPLETE
DISP. DE SECURITE POUR SELLE GRUGEOIR COMPL.

0158612500



TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0165090253946 ...

AUSF. 01

23.01.91

SCHUTZVORRICHTUNG ZUM AUSKLINKSATTEL, KPL.
SUPPORT BRACKET FOR COPER-NOTCHER SADDLE, COMPLETE
DISP. DE SECURITE POUR SELLE GRUGEOIR COMPL.

0158612500

POS. ITEM REP.	STCK. PIECE PIECE	ARTIKEL-NR. ARTICEL-NO. ARTICEL-NO.	BENENNUNG	DENOMINATION	DESIGNATION
1	1	0158612501	PLATTE	PLATE	PLAQUE
2	2	0158612503	BOLZEN	BOLT	BOULON
3	2	0158612504	ZYLINDERSCHRAUBE	SOCKET HEAD SCREW	VIS A TETE CYLINDR. A 6 PANS CREUX
4 #	2	9009362100	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL
5	2	9005517600	GEWINDESTIFT	THREADED PIN	VIS SANS TETE
6	2	9009361500	SECHSKANTMUTTER	HEX. NUT	ECROU HEXAGONAL

TEIL NICHT DARGESTELLT
PART NOT DEPICTED
PIECE PAS FIGUREE

ab 0165090253946 ...

AUSF. 01

23.01.91