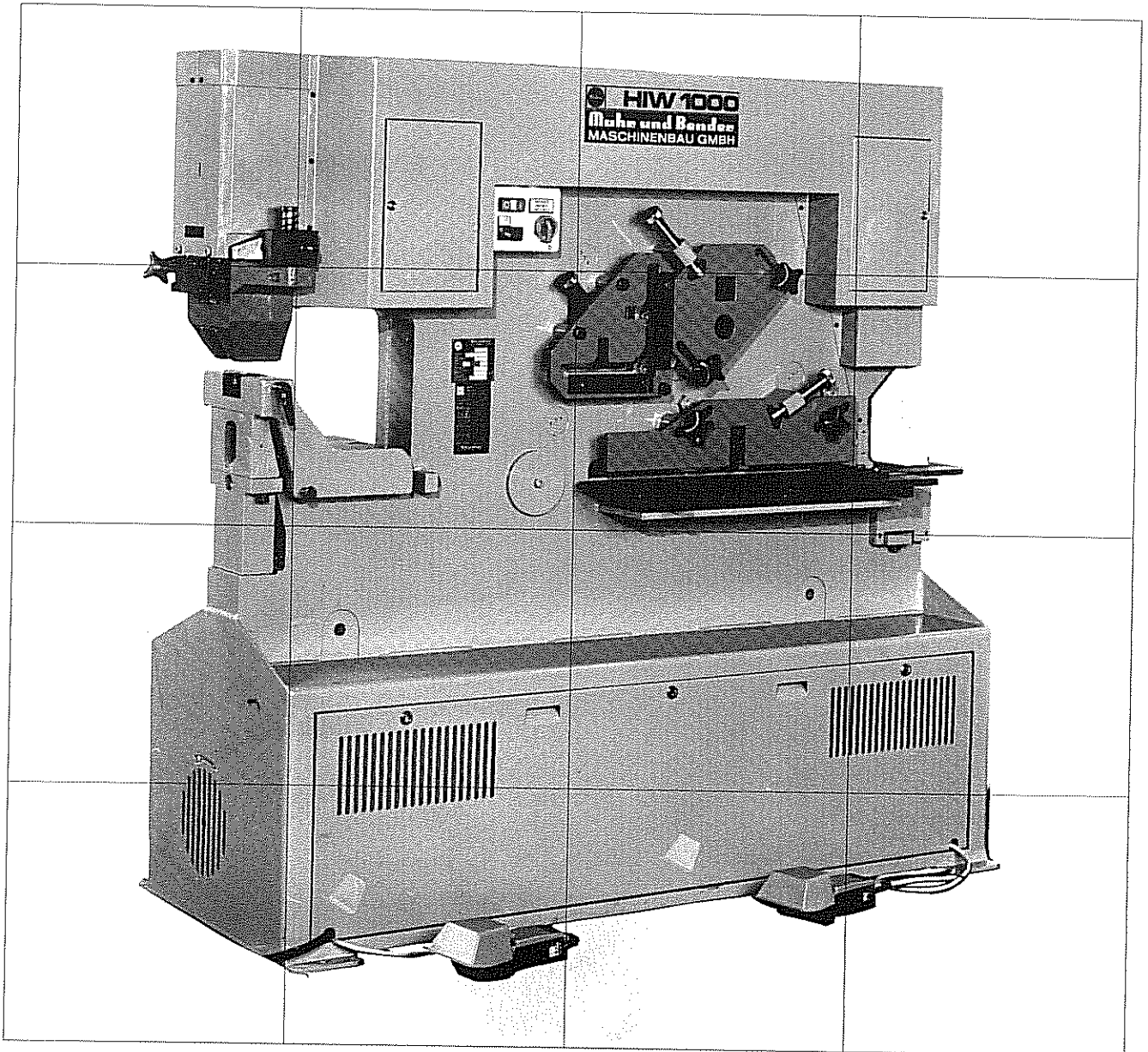


# MUBEA HIW 1000



**User Manual**



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Subject to technical changes.

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## Preface

In this User Manual you will find all the information necessary for operating and maintaining your MUBEA HIW 1000.

Before you start working with the MUBEA HIW 1000, 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 HIW 1000, these safety fixtures must absolutely be installed!

Performing maintenance regularly will ensure smooth operation of your machine.

## Customer Service

For technical service call 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



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**Toolsetting**

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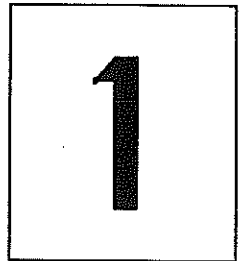




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# General Information





# 1 General Information

## 1.1 Technical Specifications

Machine type .....

Machine number .....

### 1.1.1 Mechanical (in standard version)

Weight	5620 lbs
Length	72 3/4 inches
Width	29 1/2 inches
Height	71 inches

### 1.1.2 Electrical (in standard version)

Motor type	AP 132 M4, B3 / B5
Motor power	11 HP
Power consumption	32 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)	24 gal
Viscosity	ISO VG 46
Operating pressure of hydraulic system	4470 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 HIW 1000 Ironworker is a hydraulically driven flat-steel, angle-steel and bar-steel shearing machine equipped with a notching fixture and a holepunch. It has two heavy-duty hydraulic cylinders, allowing work to be done simultaneously at two workstations. HIW ironworkers have a long life, are especially easy to service and require little maintenance.

Wear-away parts may be replaced with genuine MUBEA spare parts at any time.

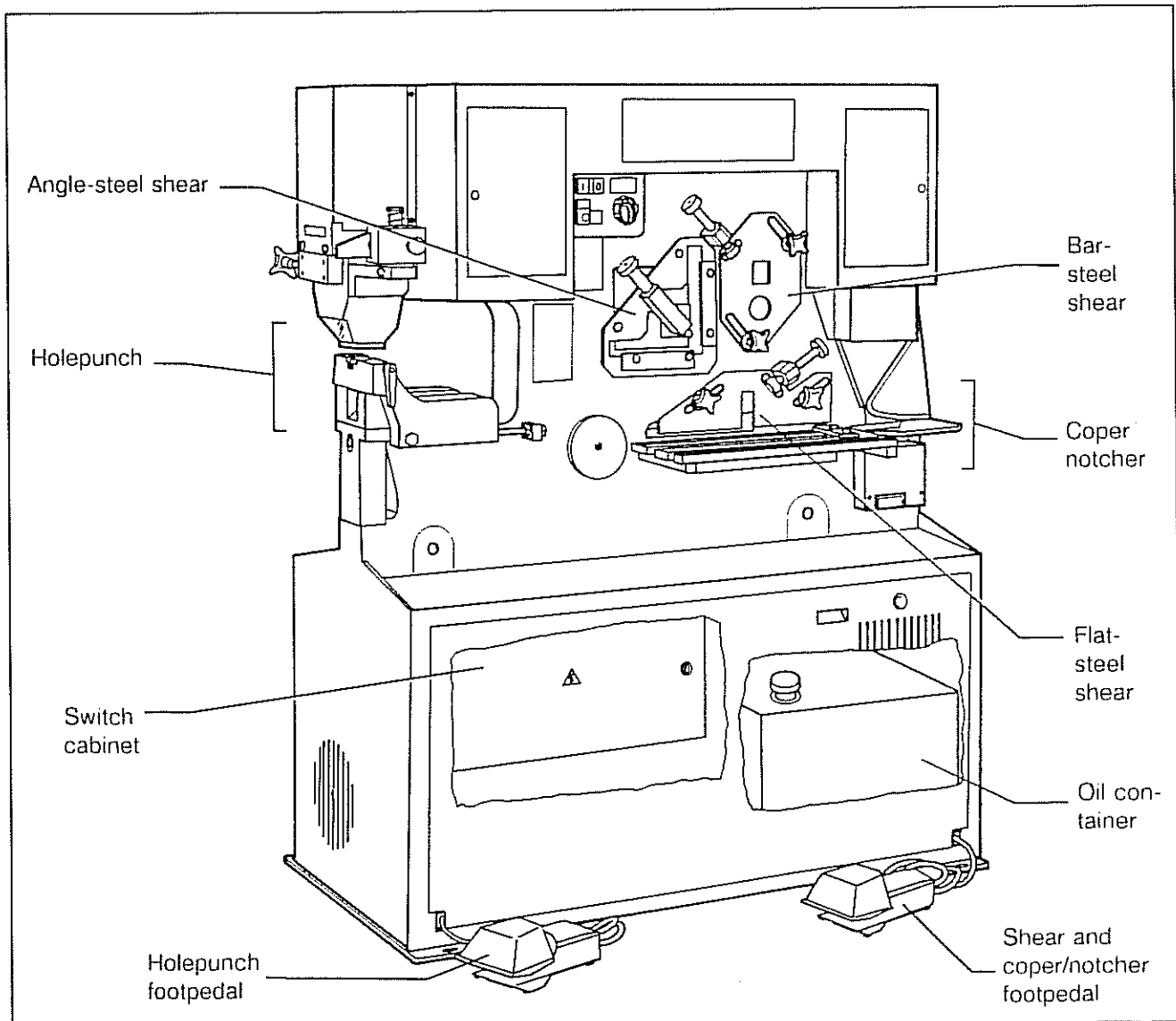
Please contact Mubea Machinery and Systems, Inc. (see spare parts).

The standard version of the HIW 1000 is designed to allow multiple expansion of the work ranges (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
- Angle-steel shear.

### 1.2.2 Electrical

The electrical portion comprises the switch cabinet, the motor, and all other parts such as controls, limit switches, contactors, cables, etc. Circuit diagrams are contained in section 11.

### 1.2.3 Hydraulic System

The hydraulic system consists of the pump, the oil container with oil filter, the two working cylinders, the control block with pressure test connection and the various valves and lines. The hydraulic system is depicted in chapter 11.

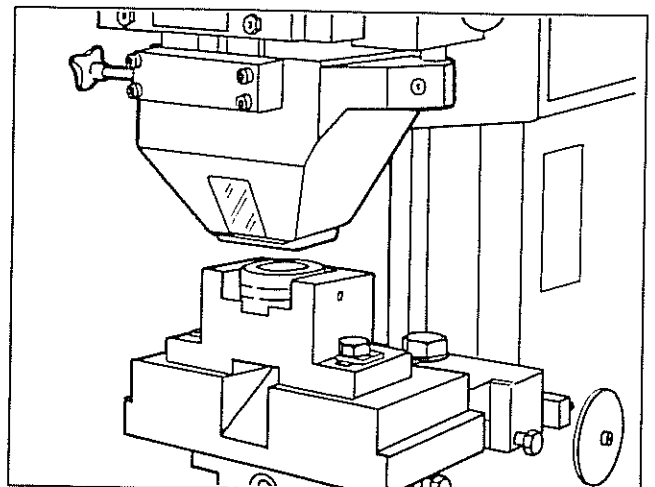
### 1.2.4 Attachments

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

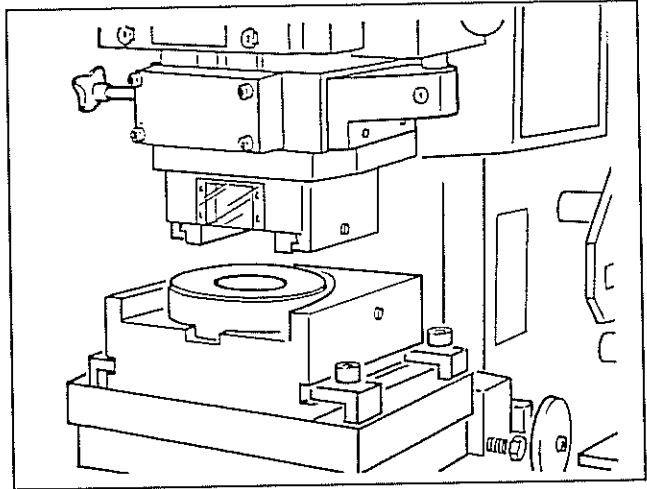
The attachments shown in this section do **not** belong to the standard version. Thus, with the exception of the length stop, they are not discussed in this User Manual.

Attachments for **holepunch**  
(examples)

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

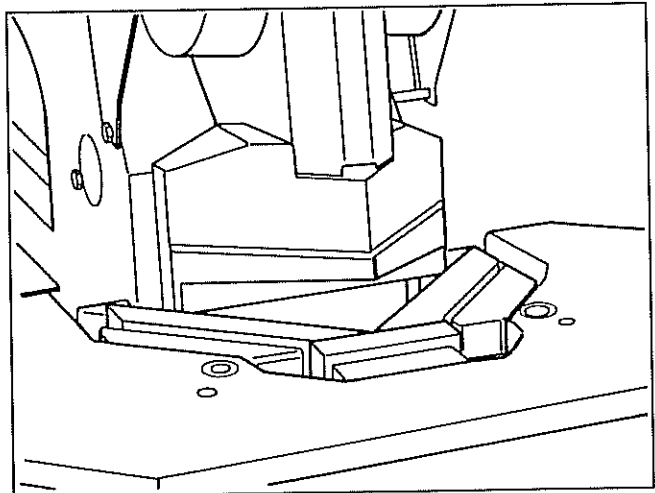


Special punching attachment for mounting punches and dies exceeding a cutting diameter of 2".

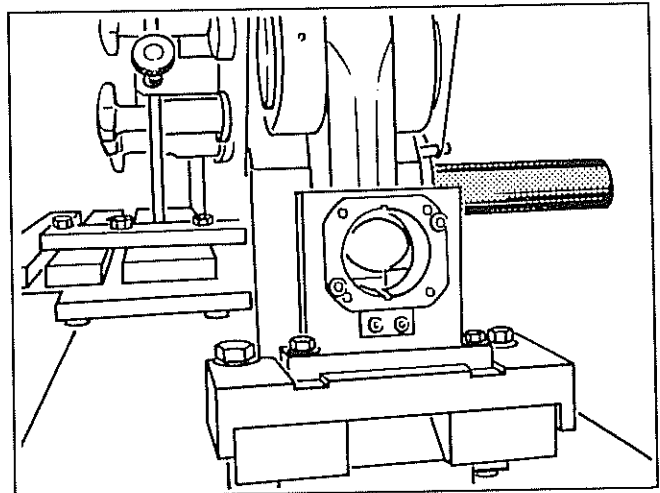


Attachments for **coper/notcher** (examples)

Triangular notching tool



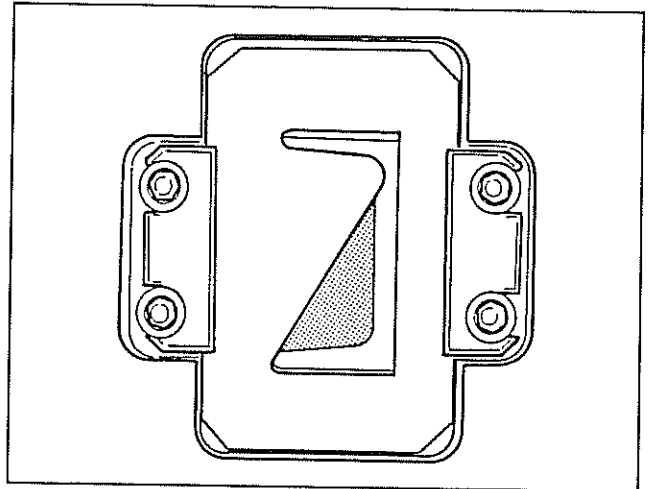
Pipe notching tool



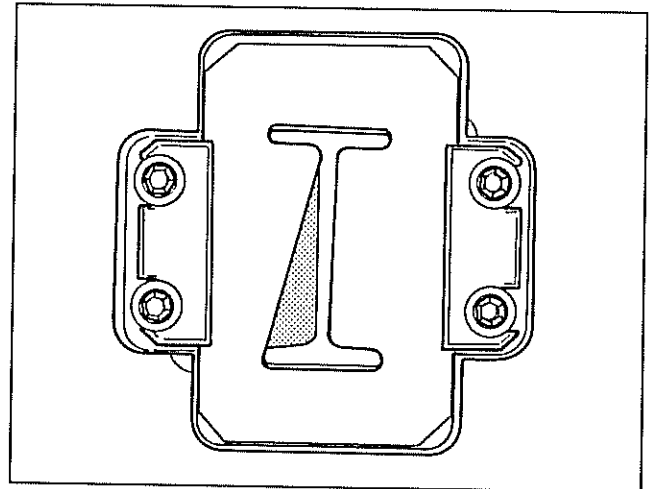


Attachments for **bar-steel shear**  
(examples)

Knife for cutting  
channel sections

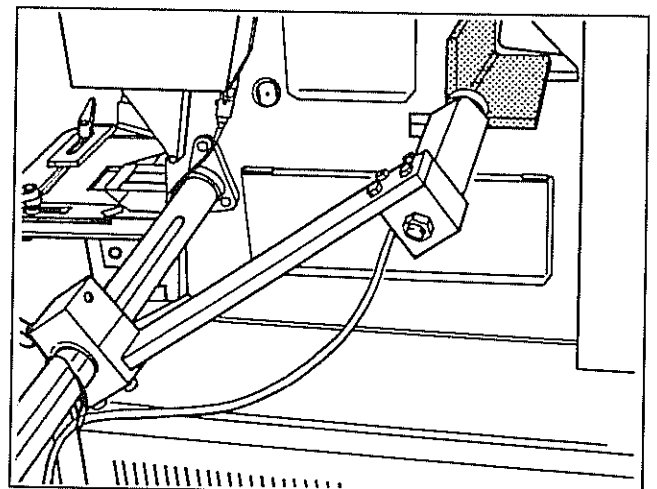


Knife for cutting  
I-sections



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

Adjustable length stop



### 1.3 Controls

#### Main switch (F)

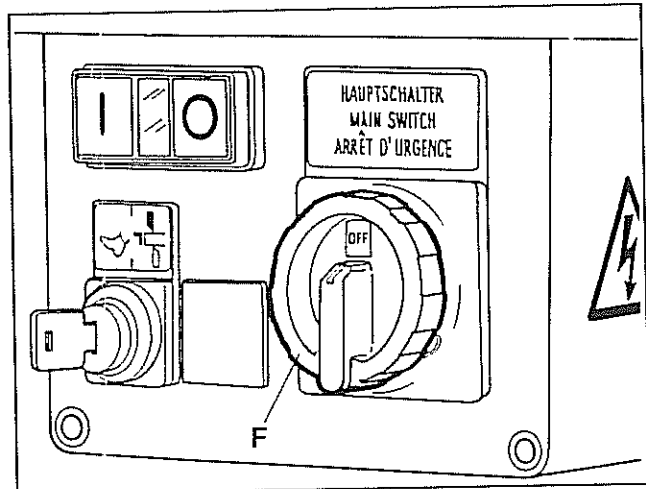
Positions:

Off  
On

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



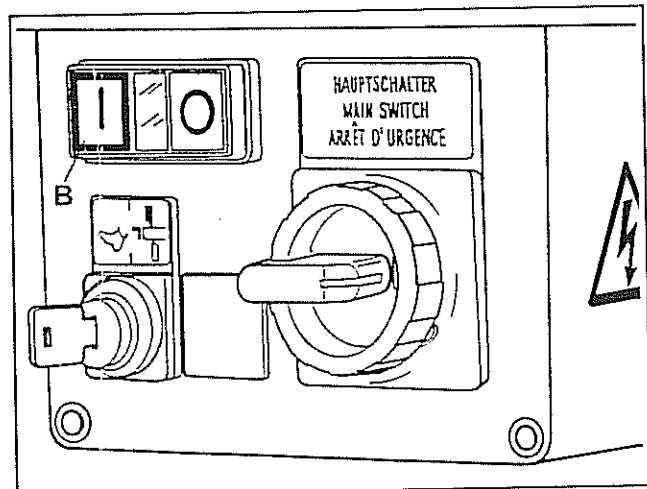
In the "Off" position the supply cables remain live. Therefore, whenever making repairs on the electrical components, make sure to separate the machine from the external power supply.



#### Start button (B)

Positions: none

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



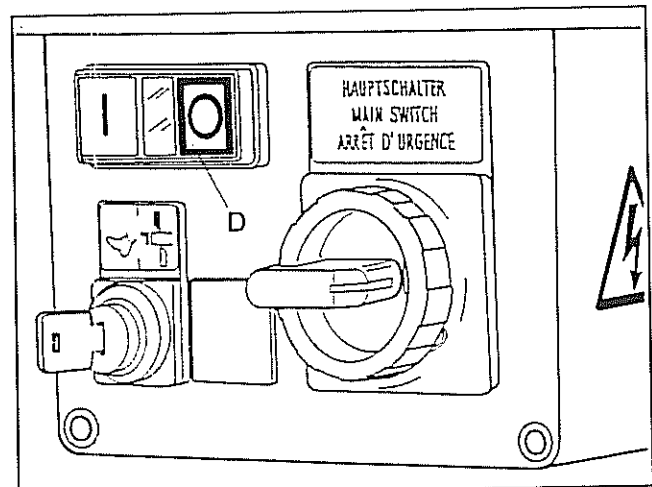
#### Stop button (D)

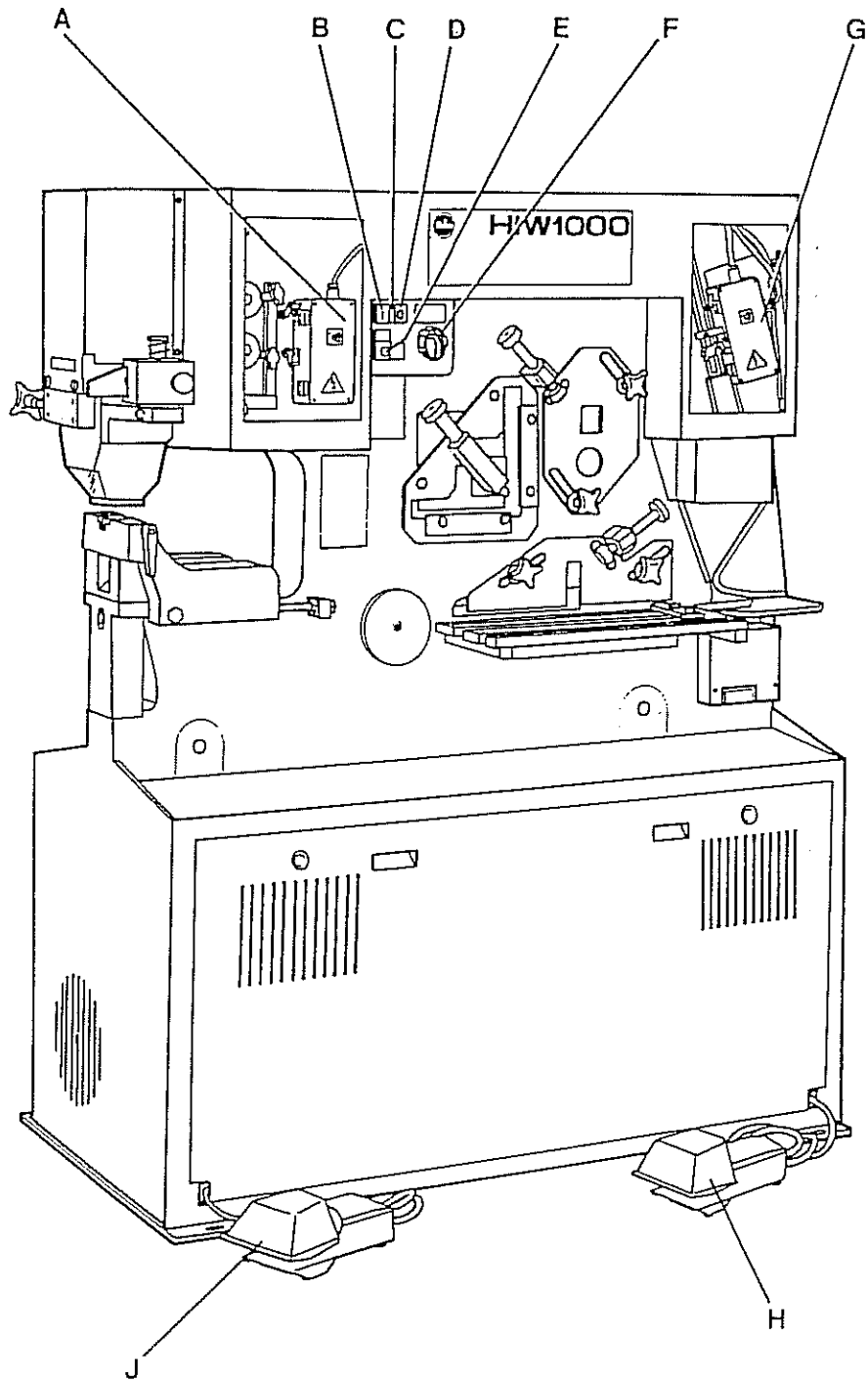
Positions: none

Pressing the Stop button stops the motor.



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

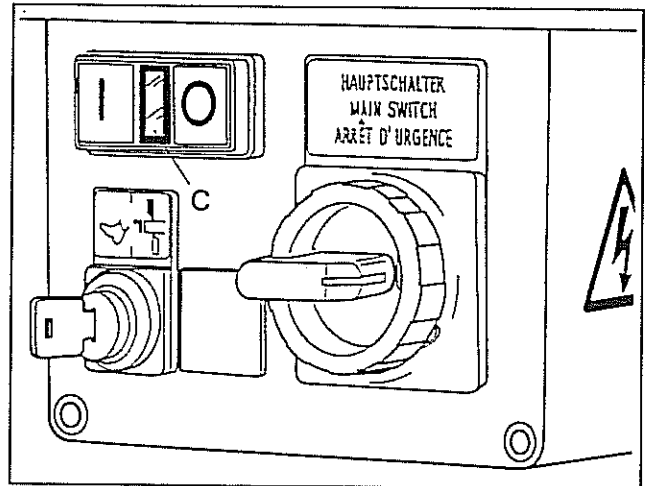






**Pilot lamp (C)**

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



**Inching and Full Stroke switch for the punch (A)**

Positions:

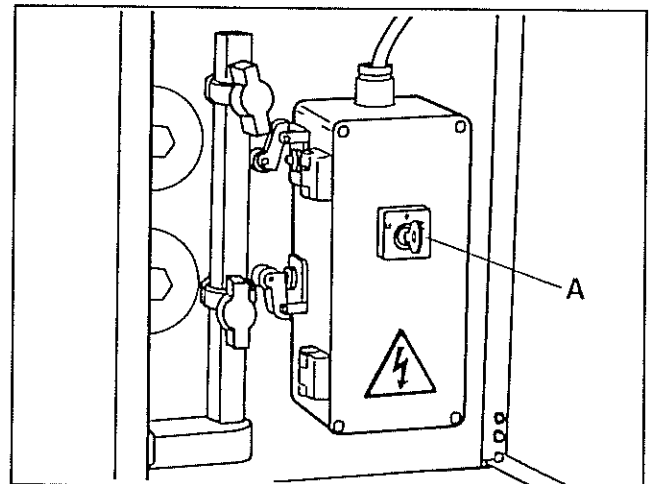
- = Inching
- O = Off
- I = Full Stroke

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

In the "Inching" mode of the slide upon release of the footpedal does not function.

With the switch in the "Full Stroke" position, the punch slide moves down when the footpedal is activated or the lower limit switch is reached.

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



**When the ironworker is not being operated, turn the keyswitch to "O" and remove the key.**

### Footpedal for the punch (J)

Initial position: 4

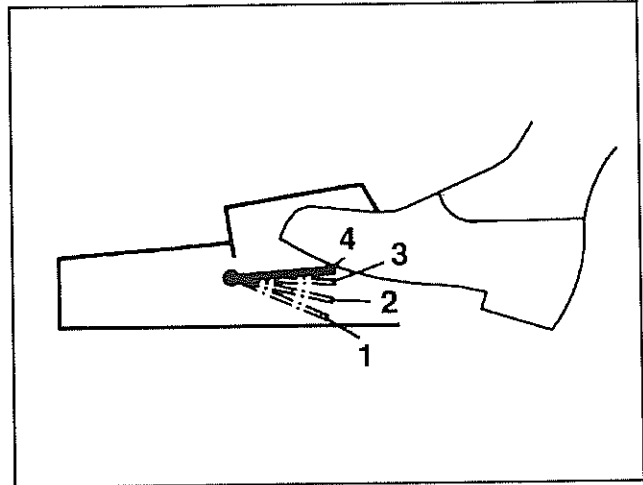
The picture on the right shows the four positions of the footpedal.

Between positions 2 and 1 is a perceptible pressure point.

- 1 = Down
- 2 = Down (search)
- 3 = Pause
- 4 = Up

In footpedal position 2, the slide moves into the "Inching" position and "Full Stroke" position at reduced speed and reduced pressure.

With the Inching and Full Stroke switch (A) in the "Inching" position, the footpedal position 4 does not function, i.e. the punch does **not** move upward automatically upon release of the footpedal.



### Inching and Full Stroke switch for coper/notcher and shears (G)

Positions:

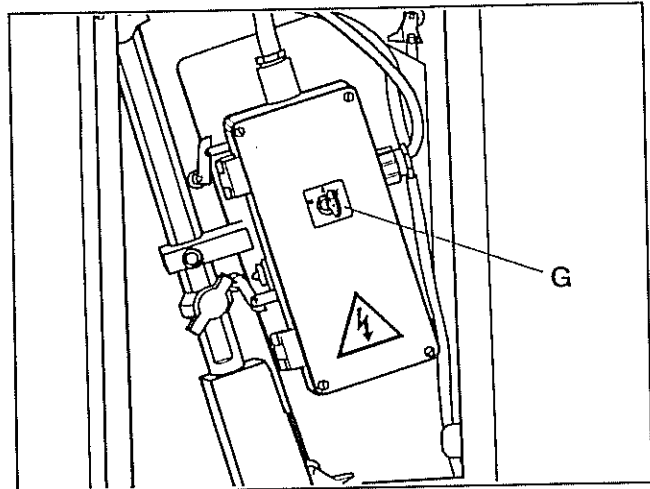
- = Inching
- = Off
- = Full Stroke

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 knife-change 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 as long as the footpedal is pressed down or the bottom limit switch is reached.

Upon release of the footpedal, the slide automatically returns to its initial position.



**When the ironworker is not being operated, turn the keyswitch to "O" and remove the key.**

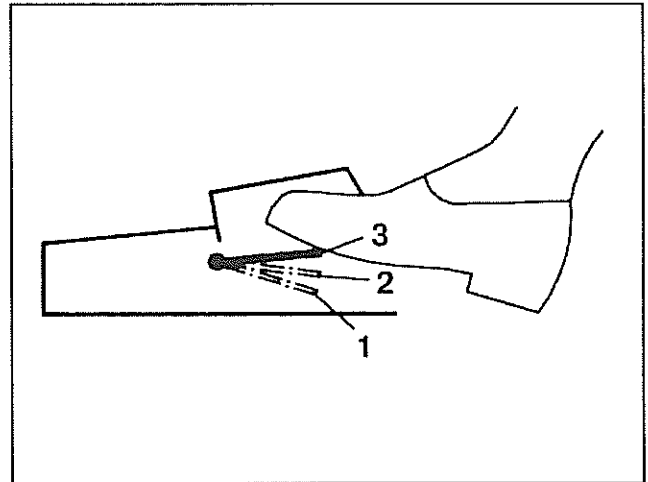
**Footpedal for coper/notcher and shears (H)**

Initial position: 3

The picture on the right shows the three positions of the footpedal. The individual positions have no pressure point.

- 1 = Down
- 2 = Pause
- 3 = Up

With the Inching and Full Stroke switch for coper/notcher and shears (G) is in the "Inching" position, the footpedal position 3 does not function, i.e. the shear slide does **not** move upward automatically upon release of the footpedal.



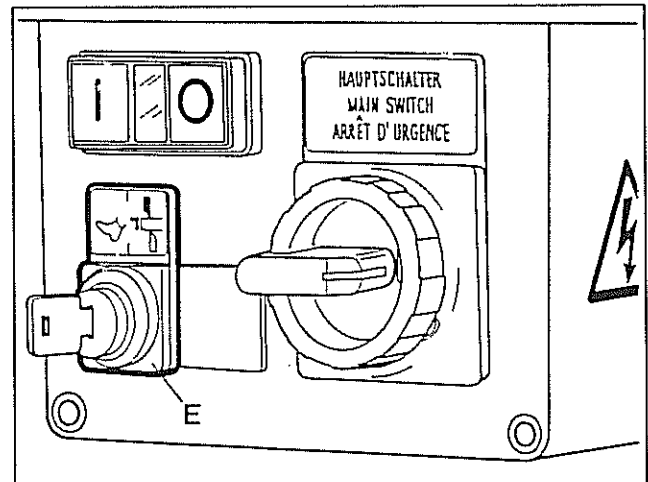
**Selector keyswitch for length stop/footpedal (E)**

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

Postions:

- 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.



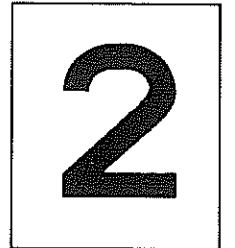
The length-stop outlet on the back of the ironworker is activated when the switch is in pushed position.

**Note on the keyswitches:**

The three keyswitches on the ironworker are different.







# Safety Instructions



## 2 Safety Instructions

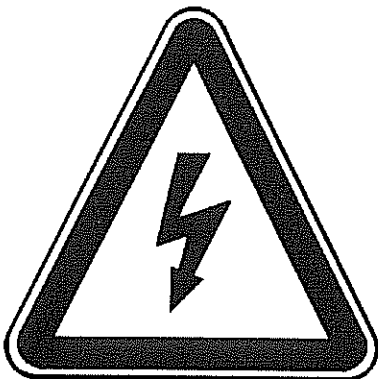
### 2.1 Warning Labels and Explanation of Warning Symbols

Warning labels are affixed to the machine at various places.

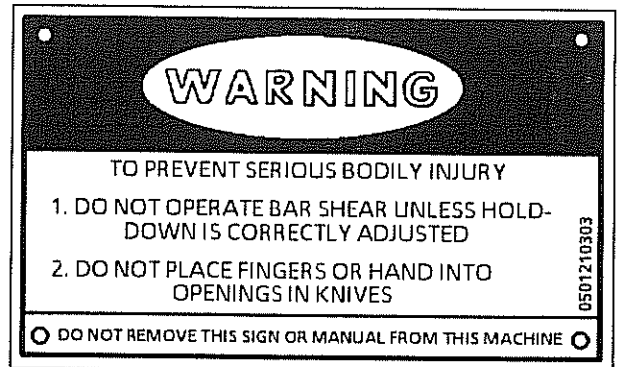


Do not remove the warning labels.  
Replace damaged, scratched or illegible warning labels.  
(Part no. printed on label).

Warning Label 1  
Warning against hazardous electric voltage



Warning Label 2



Warning Label 3

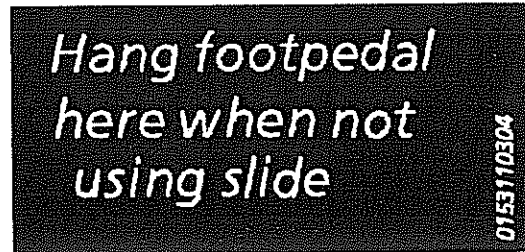




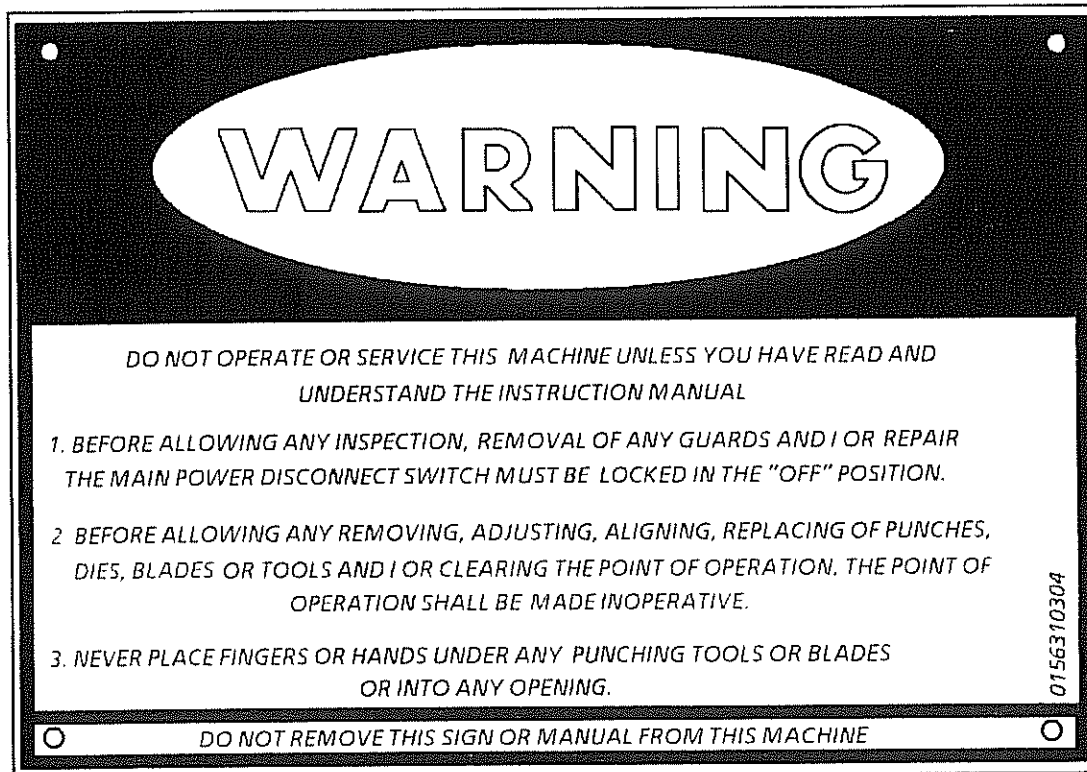
Warning Label 4



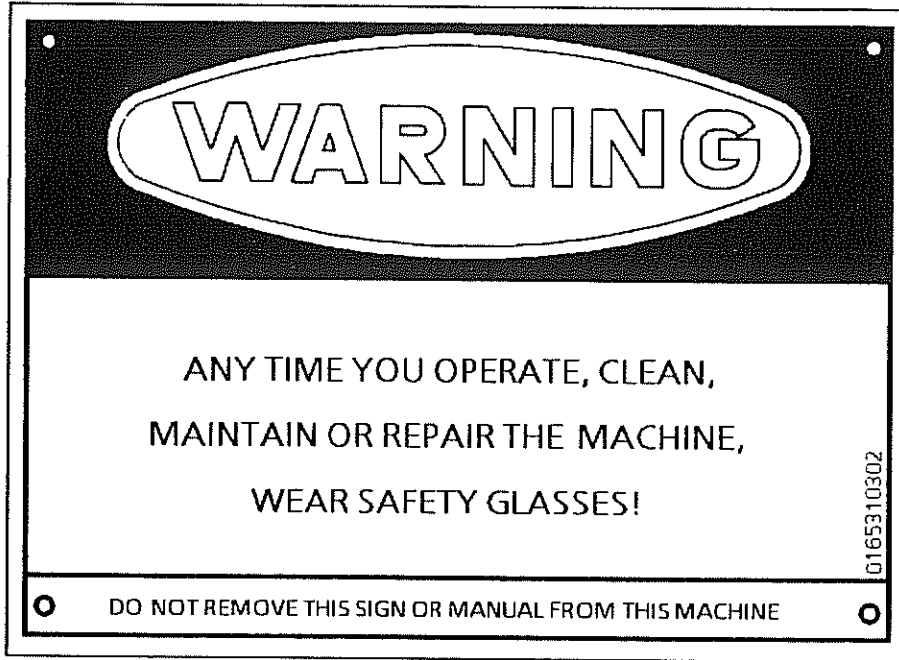
Warning Label 5



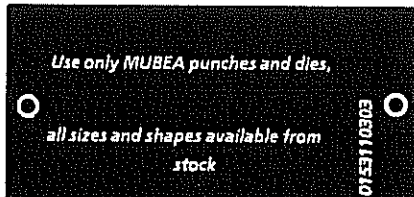
Warning Label 6



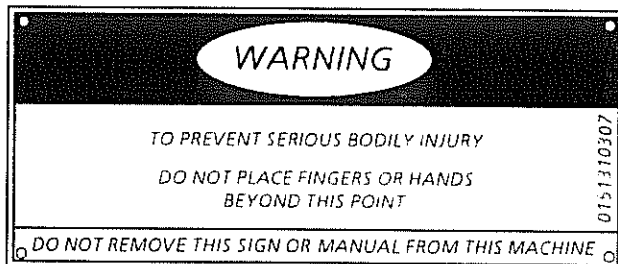
Warning Label 7



Warning Label 8

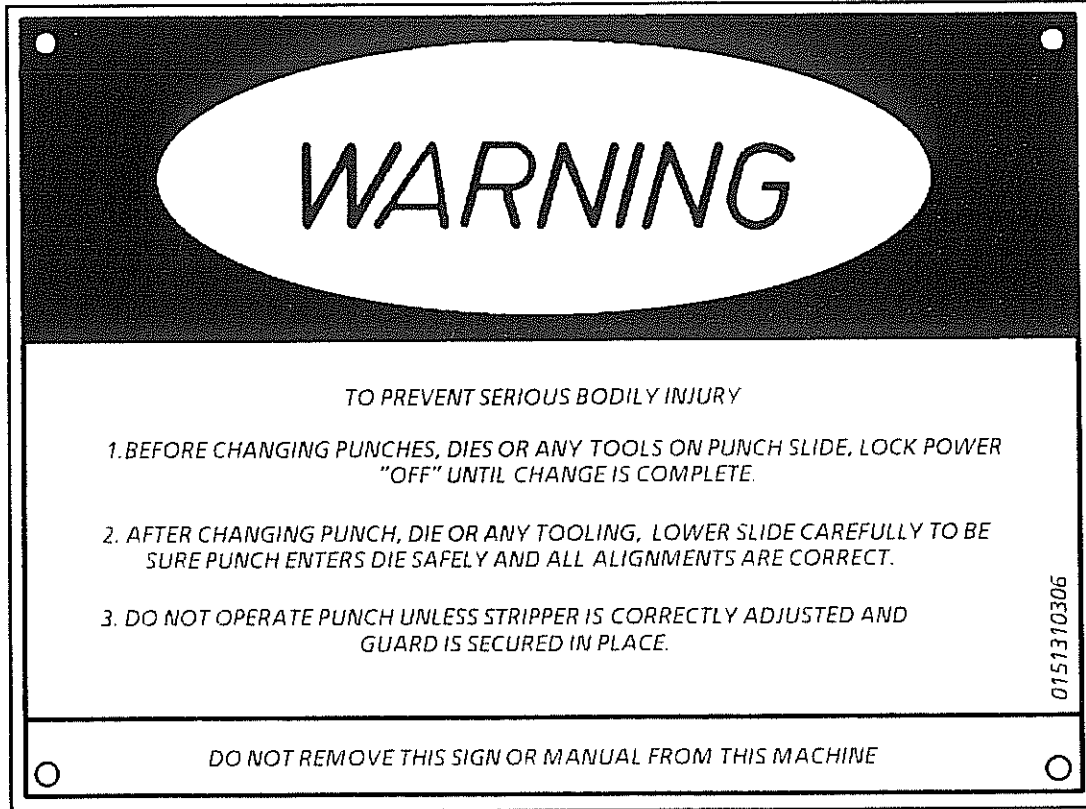


Warning Label 9

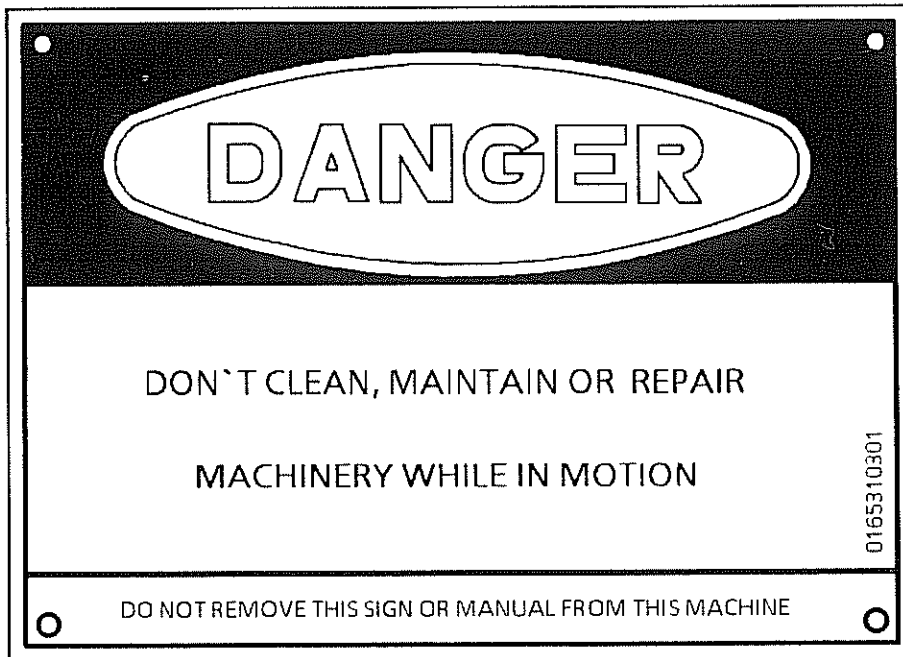




Warning Label 10



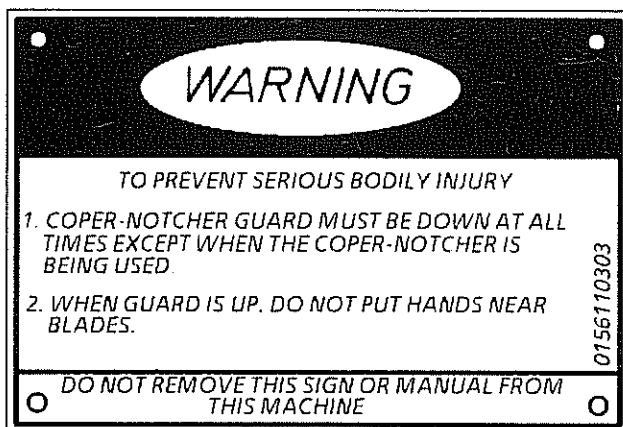
Warning Label 11



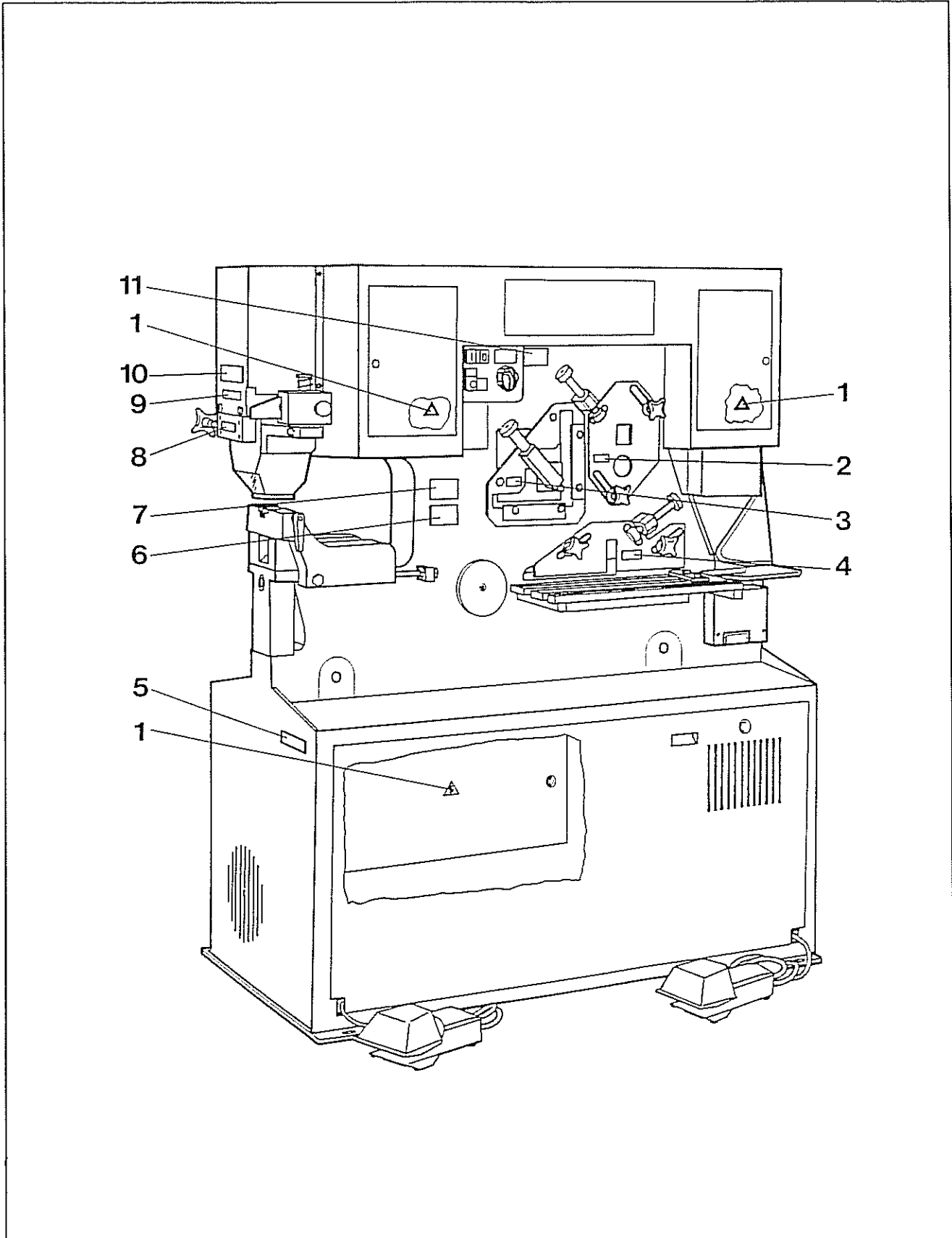
Warning Label 12



Warning Label 13

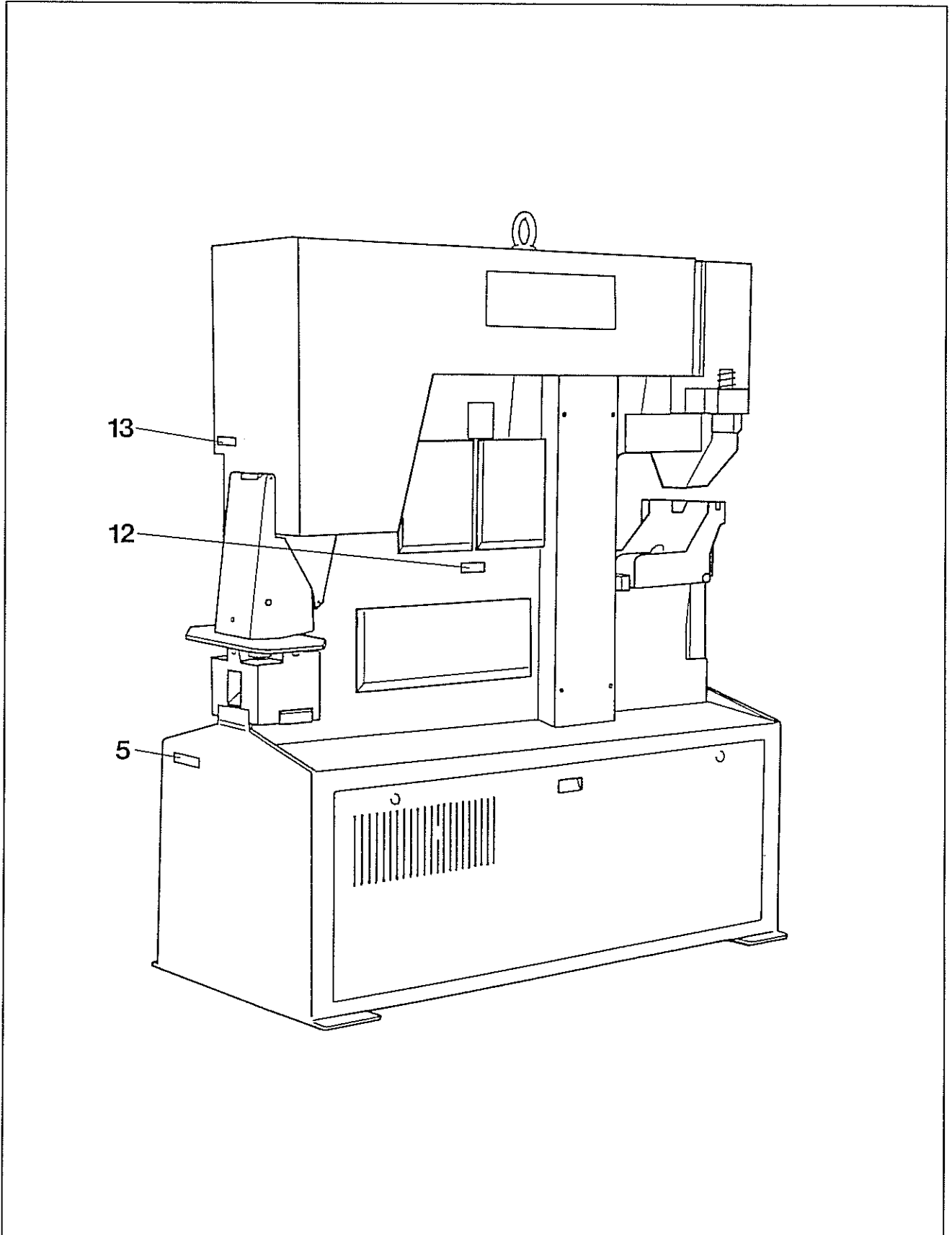


Warning labels on the front of the ironworker





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 (F) off. Secure the main switch with a padlock.



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

### Instruction for safety fixtures



Safety fixtures must not be removed.  
Before switching on the ironworker, they are to be checked for completeness and proper attachment.  
Damaged safety fixtures must be replaced.

### Instruction for the warning labels



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

### 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 the ironworker is not being operated, 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 (F) is off and secured with the padlock.

Instruction for the "length stop / footpedal" keyswitch



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

Instruction for adjustment work

After current is interrupted and the "Start" button (B) is pressed again, the slides move to the starting position when the keyswitch is in the "Full Stroke" position.

The same thing happens when you switch the Inching and Full Stroke switches (A) and (G) to the "Full Stroke" position, if the slides are 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.



Dull, worn and chipped tools and blades 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 certain that the punch enters the die properly.



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.



When using shaped tooling, pay attention to the position of the cutting form of the punch relative to the die.



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

Instructions for the copper/notcher



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



The working cylinder moves up to the coping position.

Instruction for flat-steel shear, copper/notcher and angle-steel shear



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



The safety doors on the discharge side of the machine are placed there for your safety. Use and maintain the doors properly.



Instruction for transport



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

Instructions for crane transport



The crane, ropes, cables or chains used to lift the equipment must have the required lifting capacity (ironworker weight, see technical specifications).  
Do not stand under the hovering load.  
Always tighten the lifting screw.



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 technician. 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



Blades and tools must be periodically sharpened. Dull blades put a strain on the ironworker and result in poor cut quality.

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 sharpened knives are used, then sharpened clamps must also be used.

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



When installing reground knife blades, particular attention must be paid to the blade clearance.



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



Hold onto to the blade 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 proper installed wooden 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 warranty will be void.

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

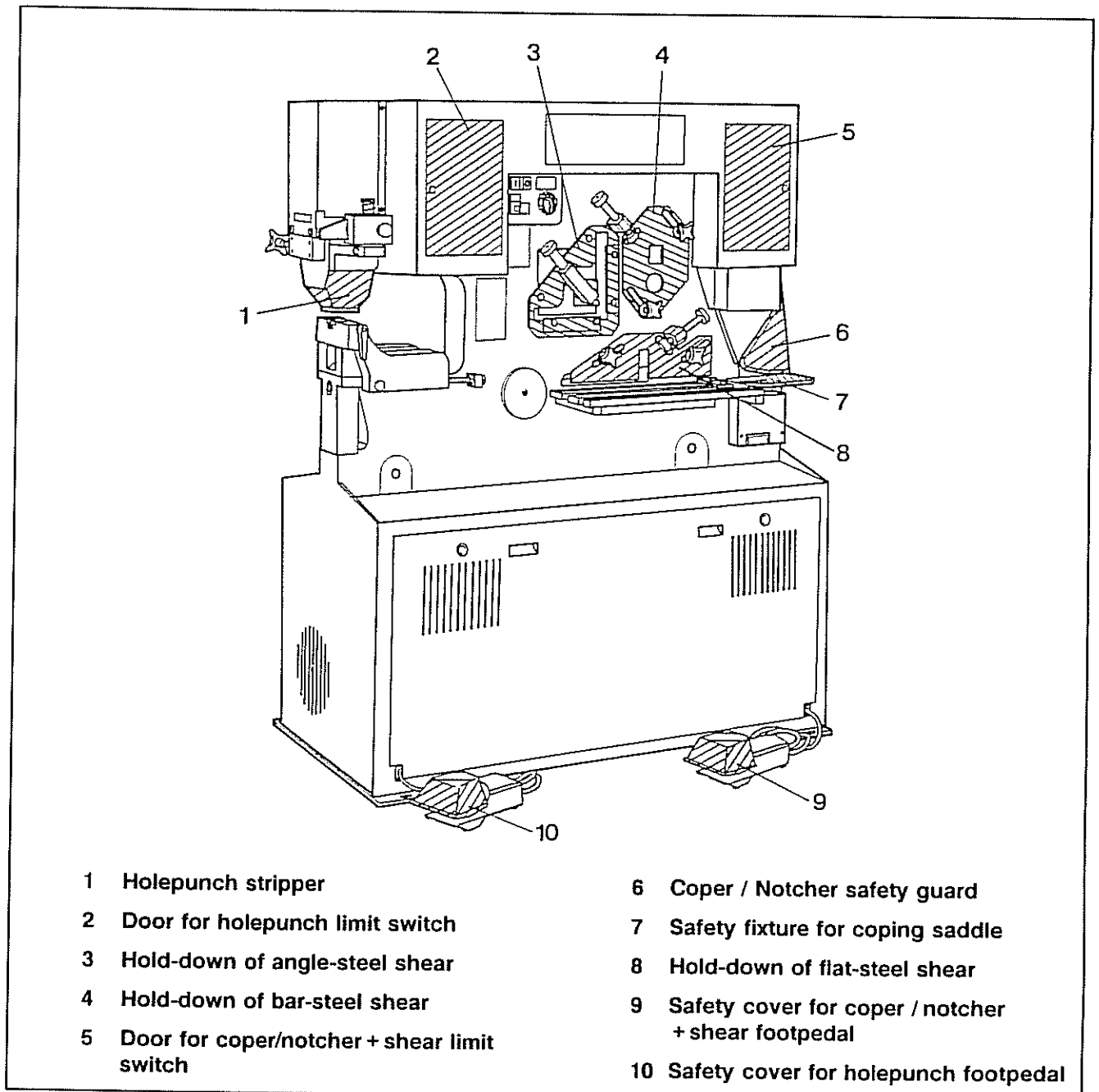


The safety fixtures must not be removed. Whenever the ironworker is switched on, the safety fixtures must be checked beforehand to ensure they are all present, complete and securely fastened. Damaged safety fixtures must be replaced.

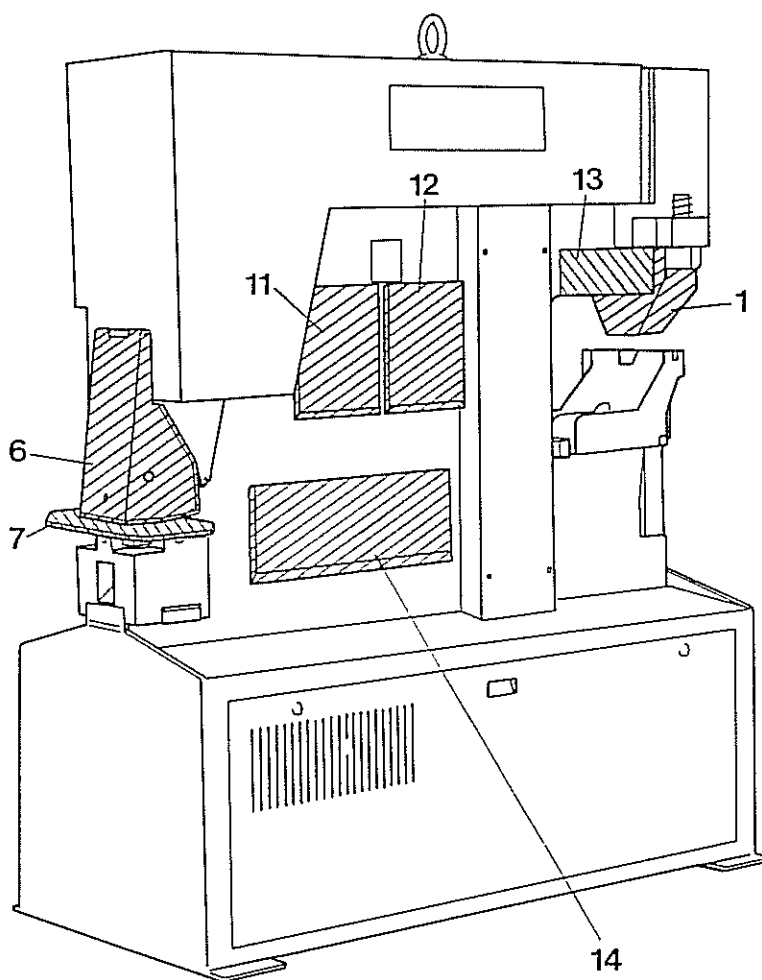
### Note

Components 1, 3, 4, 7 and 8 fulfill dual functions. They are a safety fixture as well as a functional part of the machining process.

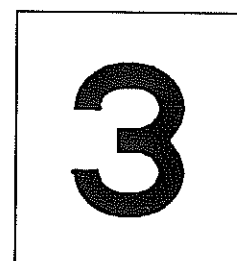
Safety fixtures on the front of the ironworker



Safety fixtures on the back of the ironworker



- |    |                                  |    |                                   |
|----|----------------------------------|----|-----------------------------------|
| 1  | Holepunch stripper               | 12 | Safety flap for angle-steel shear |
| 6  | Coper/Notcher safety guard       | 13 | Safety cover                      |
| 7  | Safety fixture for coping saddle | 14 | Safety flap for flat-steel shear  |
| 11 | Safety flap for bar-steel shear  |    |                                   |



## 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

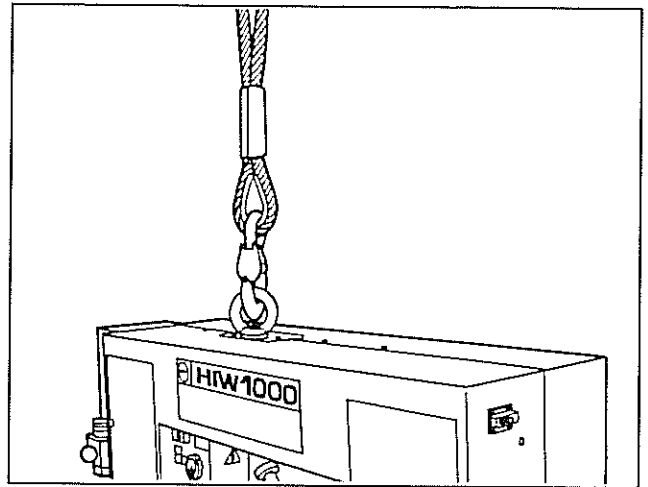
- Make sure the lifting eyescrew is fully tight.
- Transport the ironworker using only the eyescrew designed for that purpose.



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

Do not stand under the hovering load.

Always screw the lifting eye tight.

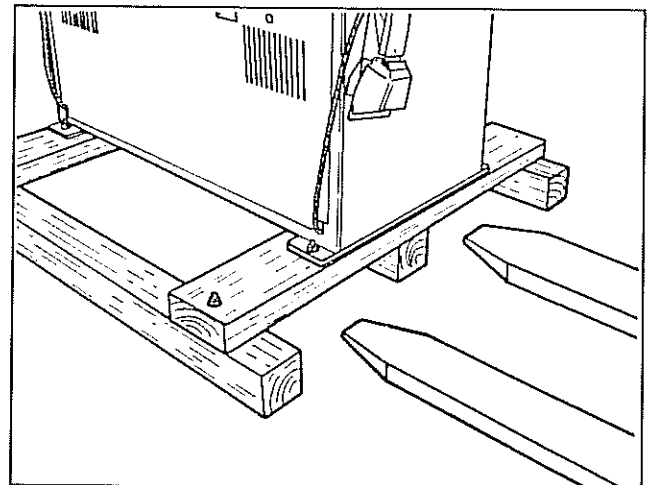


#### 3.1.2 Transporting by Forklift

- 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.

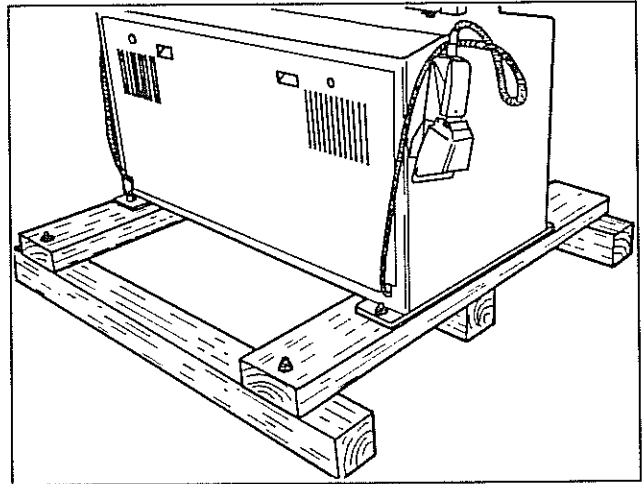


When transporting the ironworker by forklift use only proper installed wooden platform to avoid damage.



### 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).



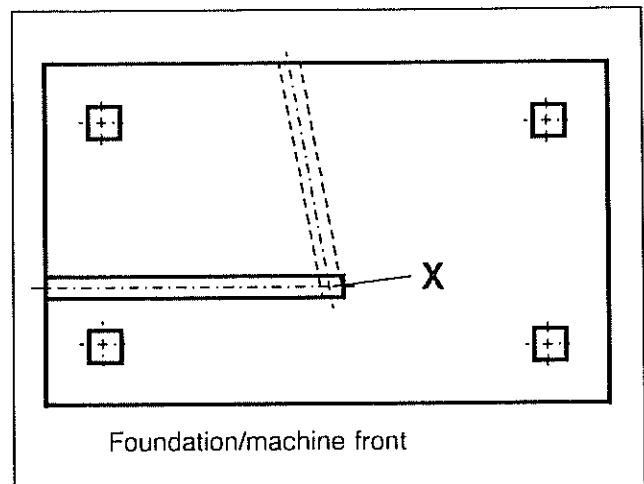
## 3.2 Installation

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 base 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.

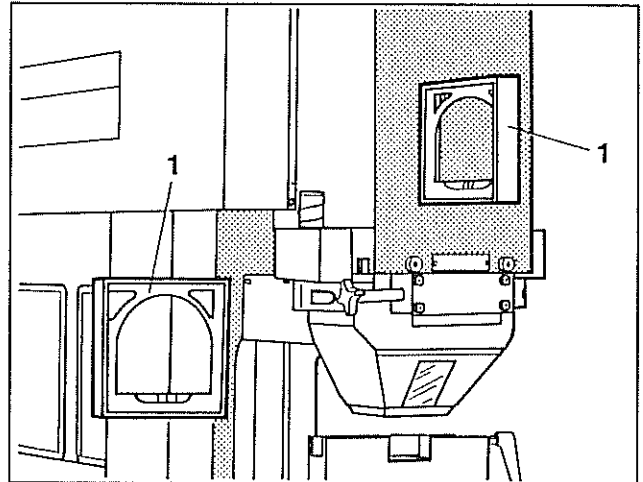


### 3.2.2 Installing the Ironworker



**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.
- 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

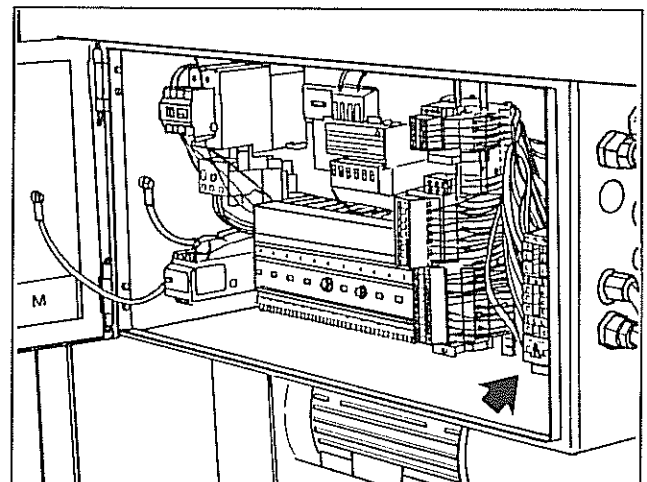
- Hook ironworker up to power source according to electrical connection diagram (see chapter 11). Position of terminal block, see arrow.



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



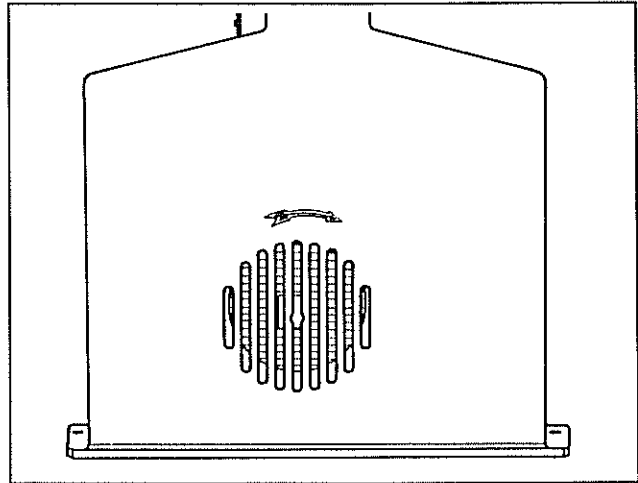
**Prior to turning on the power make certain that the motor and transformer have been changed to correspond to the incoming voltage connection.**



### 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 for the coper/notcher and shears (H) and the footpedal for the punch (J) to move the working cylinders 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 warranty 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.

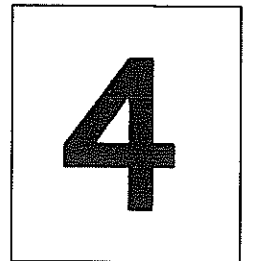


**The safety fixtures must not be removed.**

**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).





# 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)

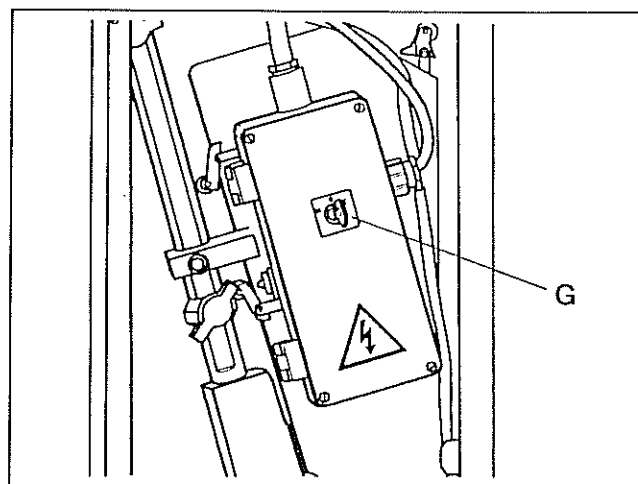
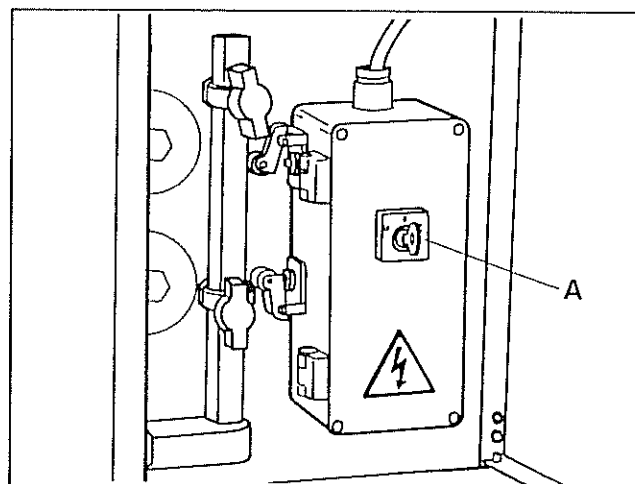
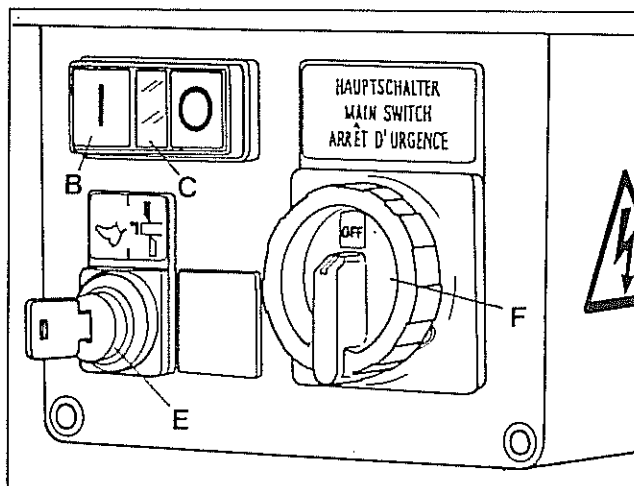
### 4.2 Switching On the Ironworker

- Turn main switch (F) to "ON".
- Press Start button (B).  
When the pilot lamp (C) lights up, the ironworker is ready.
- Turn the Inching and Full Stroke switch for punch (A) to "Full Stroke".
- Turn the Inching and Full Stroke switch for coper/notcher and shear (G) to "Full Stroke".

- **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.



### 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.



Punch and die must be properly aligned.



The choice of punch and die must allow enough cutting play.



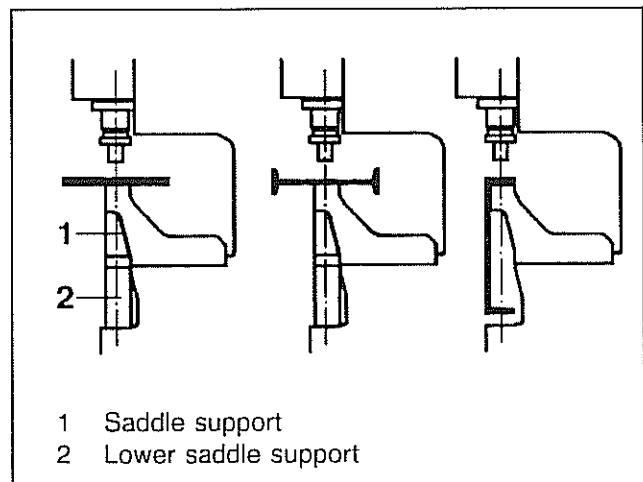
Defective or worn knives and tools should not be used.



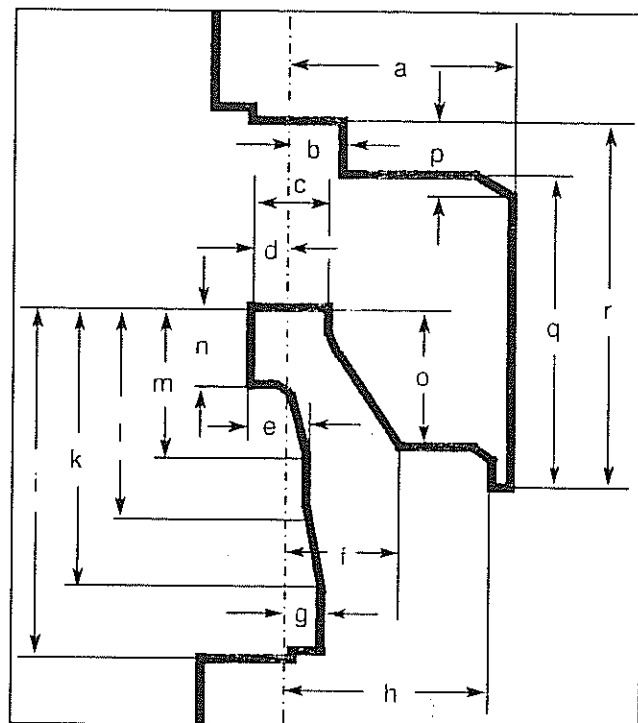
Check knives and tools at regular intervals for dull or chipped blades.

#### 4.3.2 General

- Always use the saddle support (1) and the lower saddle support (2) to perform punching in flat, angle, and tee steel and to perform web punching in channel and I-section steel.
- For flange punching of channel and I-section steel, remove saddle support and lower saddle support. For dimensions without the saddle support and lower saddle support, see following table and drawing.



HIW 1000	inch	HIW 1000	inch
a	13 <sup>3</sup> / <sub>8</sub>	k	12 <sup>13</sup> / <sub>16</sub>
b	2 <sup>1</sup> / <sub>16</sub>	l	9 <sup>3</sup> / <sub>4</sub>
c	2 <sup>11</sup> / <sub>16</sub>	m	8 <sup>1</sup> / <sub>16</sub>
d	1 <sup>3</sup> / <sub>16</sub>	n	3 <sup>1</sup> / <sub>8</sub>
e	1 <sup>9</sup> / <sub>16</sub>	o	5 <sup>7</sup> / <sub>8</sub>
f	5 <sup>1</sup> / <sub>2</sub>	p	4 <sup>13</sup> / <sub>16</sub>
g	2 <sup>3</sup> / <sub>8</sub>	q	13 <sup>5</sup> / <sub>8</sub>
h	12 <sup>3</sup> / <sub>8</sub>	r	17 <sup>7</sup> / <sub>16</sub>
i	15 <sup>15</sup> / <sub>16</sub>		



- For series production or large piece numbers, the coupling nut should be used instead of the quick-change fixture (see section 9.1.1).
- For small sections and for holes with small diameters, the reducing plate included in the delivery is to be attached to the strigger (see section 9.1.2).

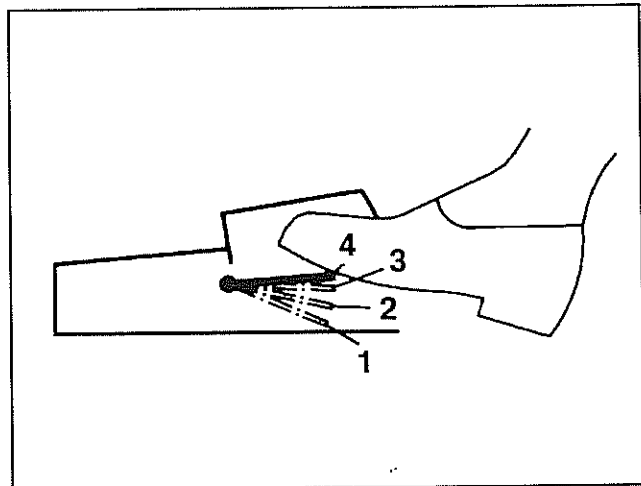
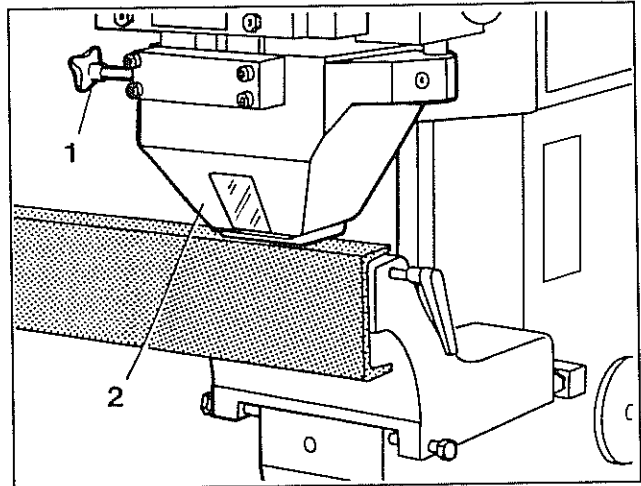
#### 4.3.3 Working With the Holepunch

- Observe safety regulations.
- Switch on the ironworker (see section 4.2).
- Check whether punch and die have the required dimensions. If necessary, change punch and die as described in section 7.1.
- 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 5.3.1.

- 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 (J).

For center spotting bring the punch down slowly with footpedal in position 2 "Down (search)", then after aligning punch to premarked stock push the footpedal down to position 1 to punch the hole.

- After punching, release the footpedal. The holepunch will automatically return to its original position at the top.
- From time to time check the clearance and/or the centering of the tools (see section 5.1).





## 4.4 Operating the Flat-Steel Shear

### 4.4.1 Safety Instructions



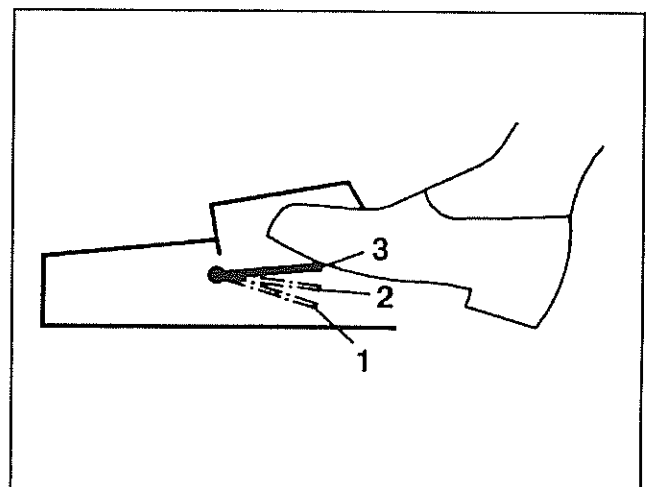
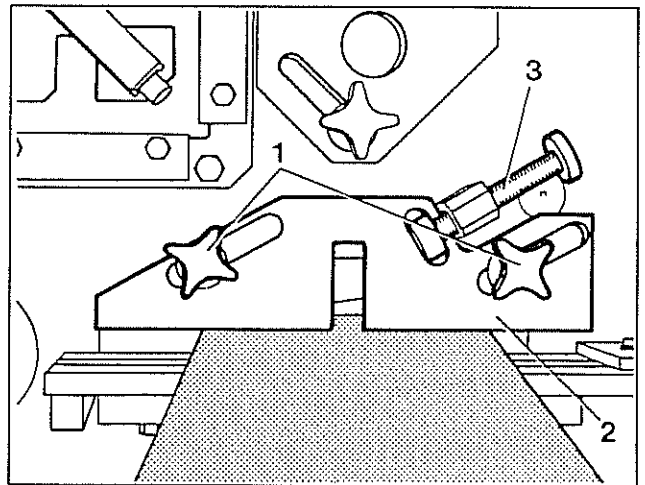
Defective or worn knives or tools should not be used.



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).
- Check whether the slide stroke suits the thickness of the stock to be processed. If necessary, optimize the slide stroke according to section 5.2.2.
- Loosen the star handles (1) of the hold-down (2).
- Insert and position the stock.
- Rotating the spindle (3), set the hold-down onto the stock.
- Tighten the star handles (1).
- Press the footpedal for coper/notcher and shears (H).
- After cutting, release the footpedal. The shear slide will automatically return to its original position at the top.
- From time to time check the clearance of the flat-steel shear blades (see section 5.2.1).



## 4.5 Operating the Coper/Notcher

### 4.5.1 Safety Instructions



When the Coper/Notcher is not needed, the safety guard must be closed.



Defective or worn knives or tools should not be used.



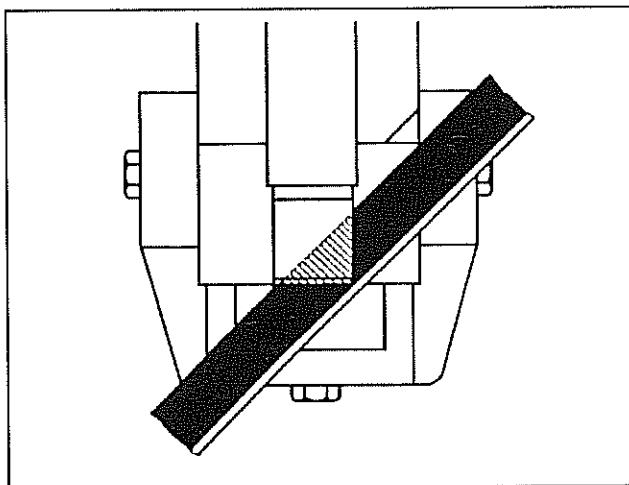
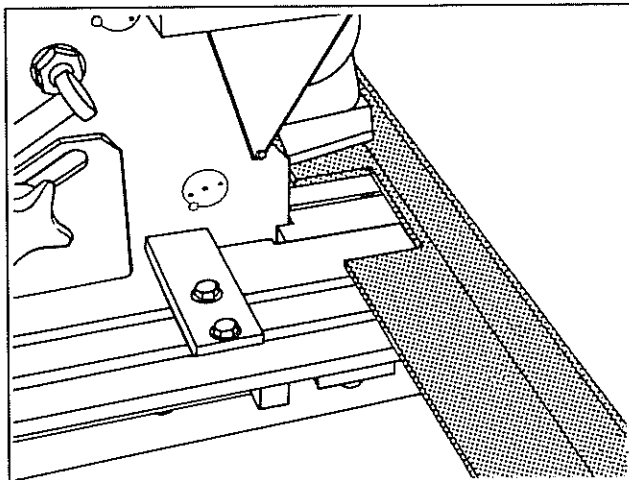
Check knives and tools at regular intervals. Replace dull or chipped tools or blades.

### 4.5.2 General

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

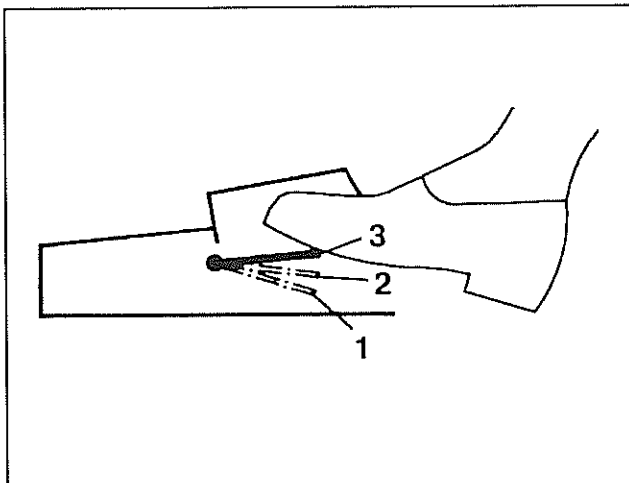
**Note**

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

- Observe safety regulations.
- Switch on machine (see section 4.2).
- With the coper/notcher safety guard closed, press the footpedal for coper/notcher and shears (H) to move the shear slide to the lowermost position; keep holding the footpedal in this position.
- Open the safety guard and secure it by pushing the safety tab through the hole in the sheetmetal machine cover. This activates the coper safety switch.
- Release the footpedal.  
The machine will automatically return to the coping position.  
Now the coper/notcher is in the correct (reduced) working-stroke setting.



- Insert and position the stock.
- Press the footpedal (H).
- After coping, release the footpedal.
- After finishing the work, close the safety guard.



**The working cylinder will move back up to its original position.**

- From time to time check the clearance of the coper/notcher blades (see section 5.3.1).

## 4.6 Operating the Bar-Steel Shear

### 4.6.1 Safety Instructions



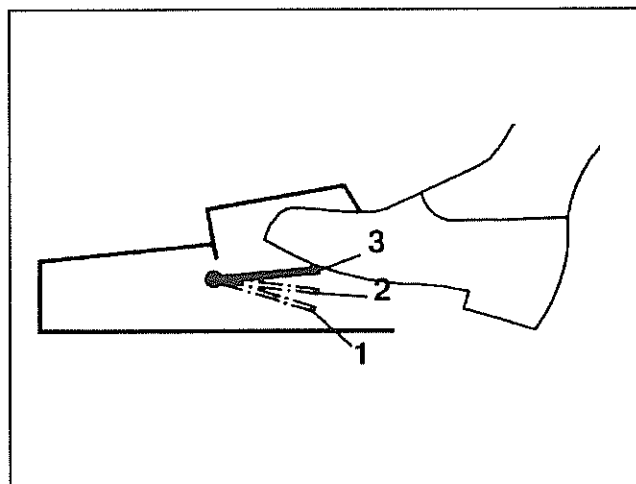
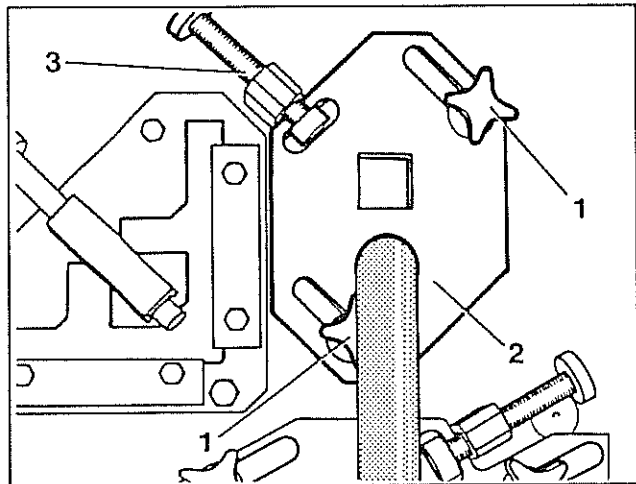
Defective or worn knives or tools should not be used.



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).
- Check whether the slide stroke suits the thickness of the stock to be processed. If necessary, optimize the slide stroke according to section 5.4.2.
- Loosen the star handles (1) of the hold-down (2).
- Insert and position the stock.
- Rotating the spindle (3), set the hold-down.
- Tighten the star handles (1).
- Press the footpedal for coper/notcher and shears (H).
- After cutting, release the footpedal. The shear slide will automatically return to its original position at the top.
- From time to time check the clearance of the bar-steel shear blades (see section 5.4.1).



## 4.7 Operating the Angle-Steel Shear

### 4.7.1 Safety Instructions



Defective or worn knives or tools should not be used.

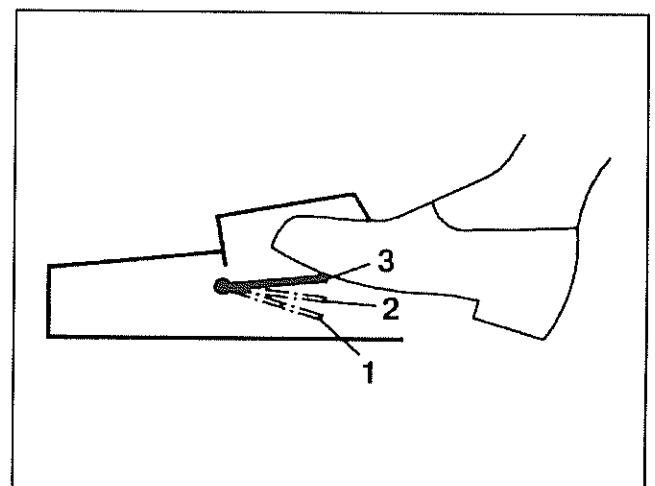
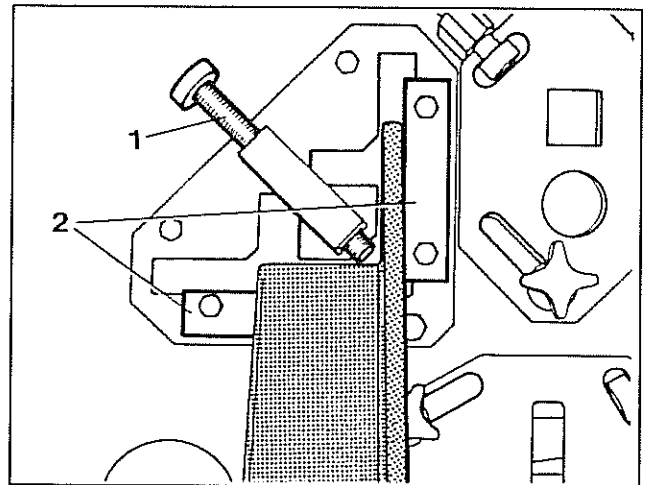


When installing flat-ground blades, particular attention must be paid to the blade clearance.

### 4.7.2 Working With the Angle-Steel Shear

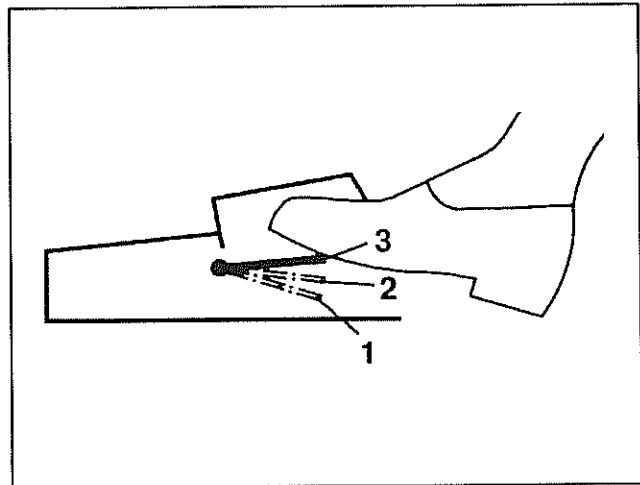
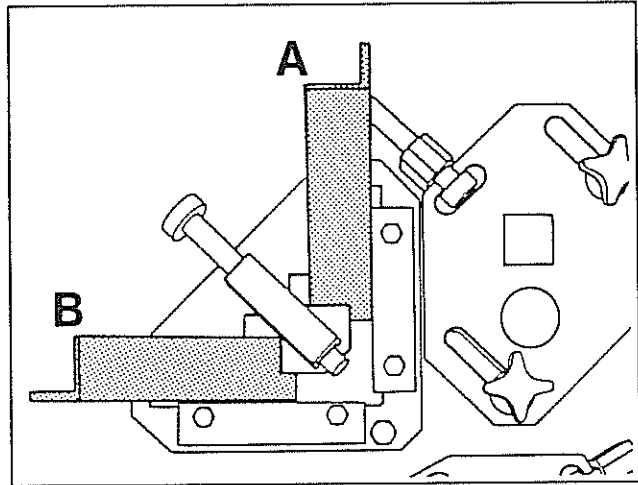
#### a) Rectangular Cut

- Observe safety regulations.
- Switch on machine (see section 4.2).
- Check whether the slide stroke suits the thickness of the stock to be processed. If necessary, optimize the slide stroke according to section 5.5.2.
- Insert and position the stock.
- Screw the hold-down spindle (1) tight.
- Press the footpedal for copier/notcher and shears (H).
- After cutting, release the footpedal. The shear slide will return to its original position at the top.
- If the cut is not square, adjust the stock support rails (2) to attain the proper angle on the workpiece (see section 5.5.3).
- From time to time check the clearance of the angle-steel shear blades (see section 5.5.1).



**b) Bevel (Miter) Cut**

- Observe safety regulations.
- Switch on ironworker (see section 4.2).
- Cut the angle section to the required length using a rectangular cut.
- Depending on the bevel desired, insert the angle section 45° to the vertical (A) or 45° to the horizontal (B).
- Press the footpedal for copier/notcher and shears (H).
- After cutting, release the footpedal. The shear slide will return to its original position at the top.
- From time to time check the clearance of the angle-steel shear blades (see section 5.5.1).





## Toolsetting





## 5 Toolsetting

### 5.1 Holepunch



Safety fixtures must not be removed.

Before switching on the ironworker, they are to be checked for completeness and proper attachment.

Damaged safety fixtures must be replaced.



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



When the ironworker is not being operated, 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 (F) is off and secured with the padlock.



Defective or worn knives or tools should not be used.

#### 5.1.1 Determining 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  $\frac{1}{32}$ " regardless of hole size, material thickness or material tensile strength. If a burr occurs when punching thin material, then  $\frac{1}{64}$ " die clearance is recommended. Round punches  $\frac{1}{8}$ " and  $\frac{5}{32}$ " are furnished with  $\frac{1}{64}$ " 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.

### 5.1.2 Centering the Tools



**Punch and die must be aligned properly**



**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 supplied with the machine have been centered at the factory. If for any reason whatsoever the centering is out of place, correct it by doing as follows:

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for the punch (A) to "Inching".
- Open the stripper.
- Using the footpedal for the holepunch (J), carefully lower the punch into the die. Footpedal position "Down (search)".



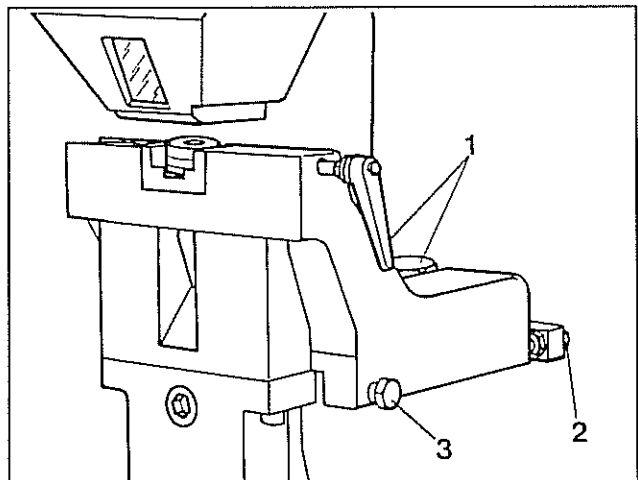
**Use extreme caution when entering the punch into the die. Make certain that the punch enters the die properly.**

- Switch off the ironworker.
- Loosen the fastening screws (1).
- Using the adjustment screws (2), shift the punch saddle forward or backward.
- 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.
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".



**The working cylinder moves up automatically.**

- Close the stripper.
- Switch off the ironworker.



### 5.1.3 Setting the Stroke Length

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

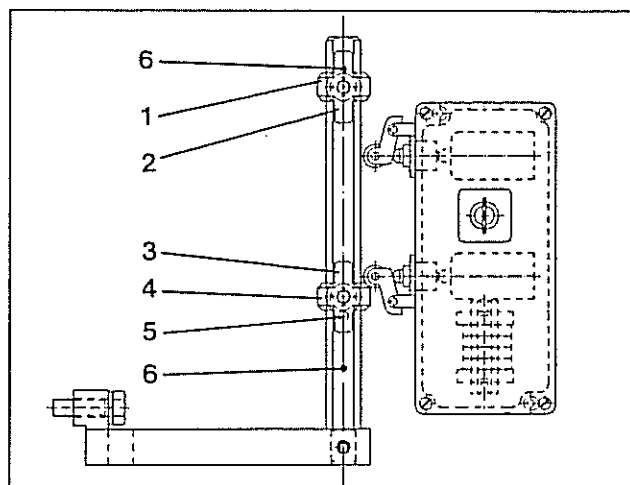
The upper trip cam (1) limits the downward stroke, the lower trip cam (4) limits the upward stroke.

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

The limit stops (6) must not be removed.

#### a) Setting the Upper Dead Center (Stroke Limit)

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch (A) to "Inching".
- Using the footpedal for the punch (J), carefully move the punch until it is slightly above the workpiece to be punched. Footpedal position "Down (search)".
- Loosen the lower T-screw (3) and adjust the trip cam according to the stock thickness.
- Retighten the lower T-screw (3).
- Turn the Inching and Full Stroke switch (A) to "Full Stroke".
- Perform a test punch and, if necessary, correct the setting.
- Switch off the ironworker.



### b) Raising the Upper Dead Center

The maximum upward stroke length of the cylinder is limited by the threaded pin (5) to that stroke which is required for normal punching work.

If a stroke longer than the one provided by the basic setting becomes necessary, the threaded pin (5) will have to be removed.

- Unscrew the threaded pin.
- Adjust the upper dead center as described under heading a).

### Setting the Lower Dead Center

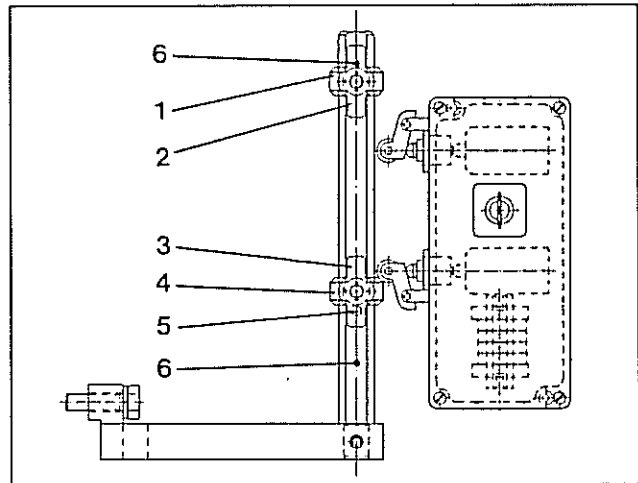
(normally not necessary if a standard tool is used)

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch (A) to "Inching".
- Using the footpedal (J), carefully move the tool to the desired lower position. Footpedal position "Down (search)".
- Undo the upper T-screw (2) and slide the trip cam down to the roller of the limit switch.
- Tighten the T-screw (2).
- 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 Flat-Steel Shear



**Safety fixtures must not be removed.**

**Before switching on the ironworker, they are to be checked for completeness and proper attachment.**

**Damaged safety fixtures must be replaced.**



**When the ironworker is not being operated, 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 (F) is off and secured with the padlock.**



**Defective or worn knives or tools should not be used.**

### 5.2.1 Checking and Setting the Blade Clearance



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



**When installing reground knife blades, pay special attention to the blade clearance.**

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copper/notcher and shears (G) to "Inching".
- Using the footpedal for copper/notcher and shears (H), carefully move the shear slide to the lowermost position. Footpedal position "Down".



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 between 0.008 inch and 0.012 inch.
- If the **blade clearance is too big**, and if genuine knives that have not yet been flat-ground are installed, then also check the blade clearance of the bar-steel and angle-steel shears. If the blade clearance of all three types of shears is too big, the slide guideway will have to be adjusted (see chapter 6.2).

If the slide guideway is adjusted, the blade clearance might become too small due to shims inserted earlier.

If the flat-steel shear's blade clearance is the only clearance that is too big, reduce the clearance by backing the lower knife with shims (see also section 7.2.1).

- **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 shims.  
To remedy this, remove the inserted shims, install genuine knives, or adjust the slide guideway (note clearance of angle-steel and bar-steel shears).
- Switch on the ironworker.
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".

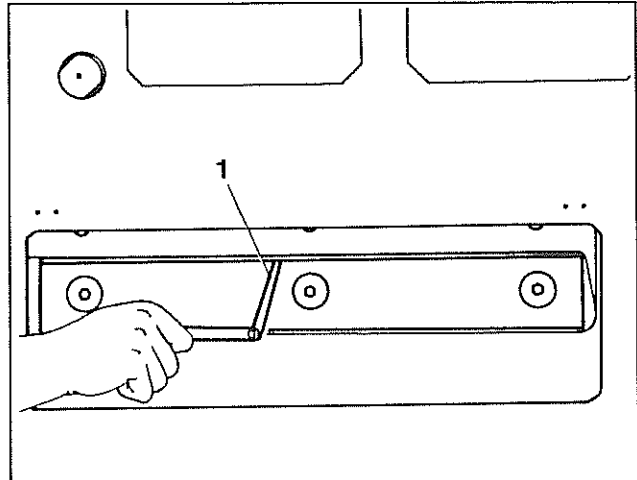


The working cylinder moves up automatically.

- Switch off the ironworker.

#### Note

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



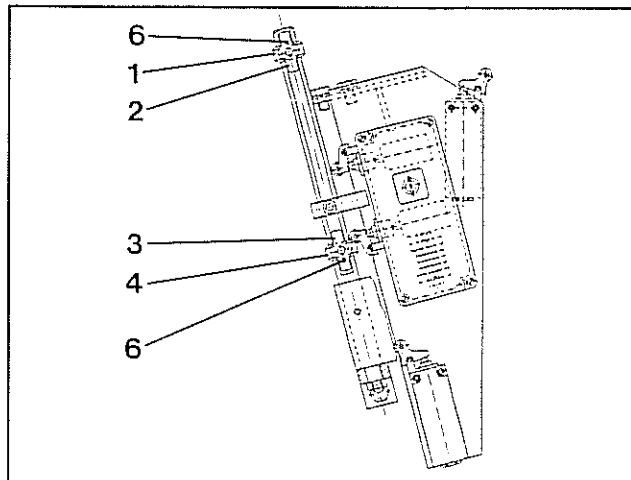
### 5.2.2 Setting the Stroke Length

The stroke length for the flat-steel shear is controlled by the two trip cams (1) and (4).

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

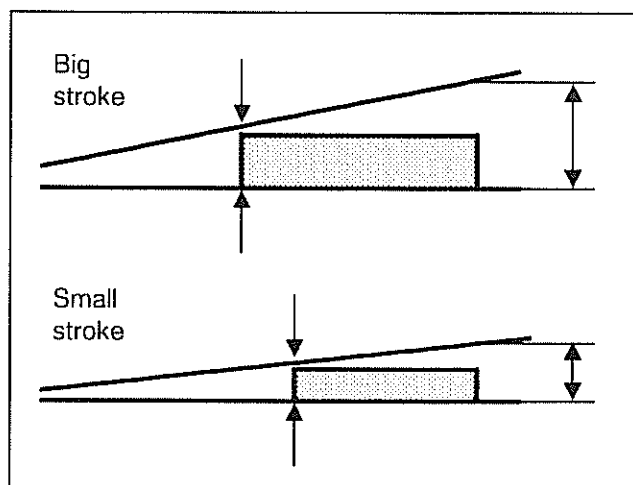
The stroke length should be set so that you are always working with shortest possible stroke (adjusted to the width and thickness of the stock).

The limit stops (6) must not be removed.



#### a) Setting the Upper Dead Center (Limiting the Stroke)

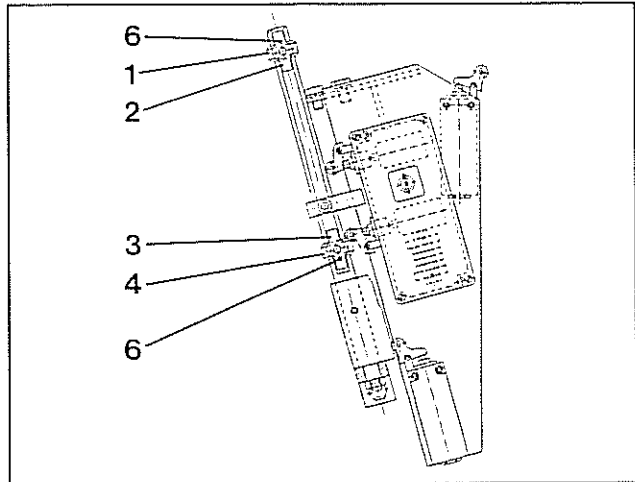
- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copier/notcher and shears (G) to "Inching".
- Using the footpedal for copier/notcher and shears (H), move the shear slide down until the vertical gap (arrows) between the upper and lower knife is just large enough to allow the stock to slide easily under the top blade.
- Loosen the lower T-screw (3).
- Slowly slide the lower trip cam (4) up until you reach the trip point of the limit switch.
- Retighten the lower T-screw (3).
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".
- Perform a test cut and, if necessary, correct the setting.
- Switch off the ironworker.



**b) Setting the Lower Dead Center**

Changing the lower dead center is normally not necessary, unless perhaps when using special knives.

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copers/notcher and shears (G) to "Inching".
- Using the footpedal for copers/notcher and shears (H), move the tool to the desired lower position.
- Undo the upper T-screw (2) and slide the trip cam (1) down to the roller of the limit switch.
- Tighten the T-screw (2).
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".



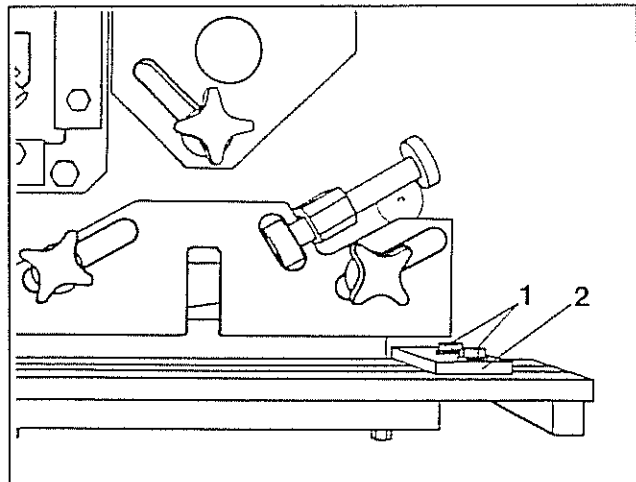
**The working cylinder moves up automatically.**

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

**5.2.3 Setting the Stop Rails on the Supporting Table**

The stop rail on the supporting table can be set according to the requirements.

- Switch off the ironworker.
- Loosen the two fastening screws (1).
- Move the stop rail (2) to the desired position.
- Retighten both fastening screws (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 holddown.**



### 5.3 Coper/Notcher



**Safety fixtures must not be removed.**

**Before switching on the ironworker, they are to be checked for completeness and proper attachment.**

**Damaged safety fixtures must be replaced.**



**When the ironworker is not being operated, 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 (F) is off and secured with the padlock.**



**Defective or worn knives or tools should not be used.**

#### 5.3.1 Checking and Setting the Cutting Play



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

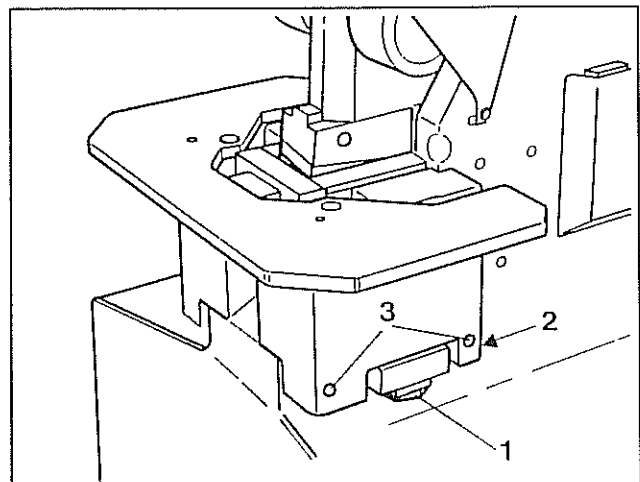
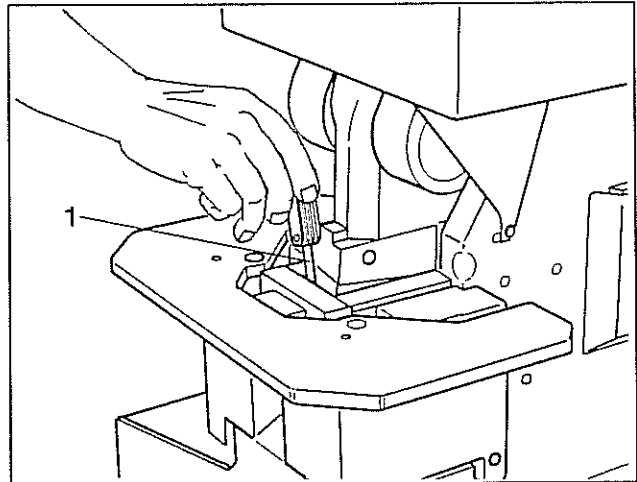
The blade clearance between the upper knife and the lower knives must be equal.

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for coper/notcher and shears (G) to "Inching".
- Open the safety guard and secure it.
- With the footpedal for coper/notcher and shears (H) in position "Down", carefully move the shear slide down until the cutting edges of the upper knife have gone into 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 (1).
- Move the coping saddle forward or back by turning the adjustment screws (2).
- Use the adjustment screws (3) to center the coping saddle sideways.
- Tighten the fastening screws (1).
- Retighten the adjustment screws (2) and (3).
- Check the blade clearance once again.
- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for coper/notcher and shears (G) to "Full Stroke".



**The working cylinder moves up to the coping position.**

- Close the safety guard.



**The working cylinder moves up automatically.**

- Switch off the ironworker.



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

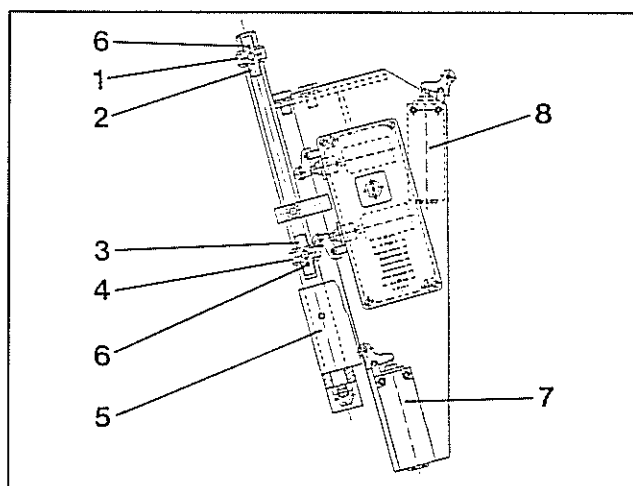
### 5.3.2 Setting the Stroke Length

The stroke length for the coper/notcher is controlled by the two trip cams (1) and (4). The upper trip cam (1) limits the downward stroke, the lower trip cam (4) limits the upward stroke.

The limit stops (6) must not be removed.

**Important:**

Furthermore, due to safety and streamlining reasons, the shear cylinder's stroke, which normally is long, is permanently set at a considerably shortened upper stroke point on the coper/notcher. This is done by the control block (5) with its two trip points and the limit switches (7) and (8). In this position the trip cam (4) is out of operation. The position of the control block (5) must not be changed.



**a) Moving to the Coper/Notcher Position (Upper Stroke Point)**

You may only move to this position immediately prior to working with the coper/notcher.

- Switch on the ironworker (see chapter 4.2).
- With the footpedal for coper/notcher and shears (H) in position "Down", and with the coper/notcher safety guard closed, move the shear slide to the lowermost position. Keep your foot pressed on the footpedal.
- Open the safety guard and secure it.

- Release the footpedal.



**The working cylinder moves up to the coping position.**

- The ironworker is ready for coping work.



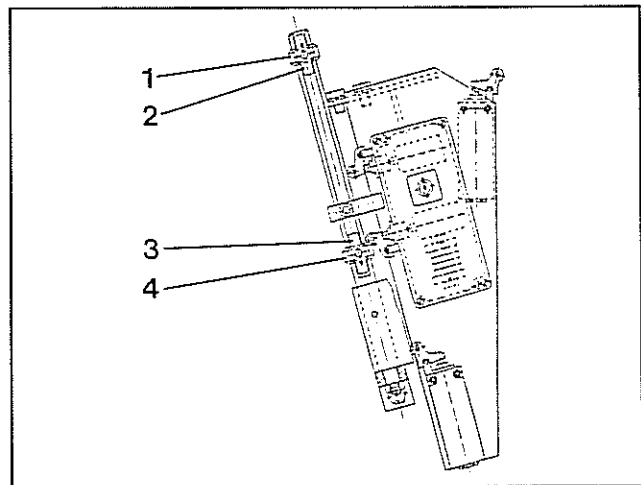
**When the coper/notcher is not being operated, the safety guard must be closed.**

#### b) Setting the Upper Stroke Point

(Normally not necessary when using the standard tool. See section 5.3.2 a)

It is possible to shorten the stroke even more (shorter than the permanently set stroke point) by shifting the trip cam (4).

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for shears and coper/notcher (G) to "Inching".
- Open the safety guard and secure it.
- Using the footpedal for coper/notcher and shears (H), move the shear slide down until you reach the desired position.
- Loosen the lower T-screw (3).
- Slowly slide the lower trip cam (4) upward, until you reach the trip point of the limit switch.
- Retighten the lower T-screw (3).
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".
- Perform a test cut and, if necessary, correct the setting.
- Close the safety guard.
- Switch off the ironworker.

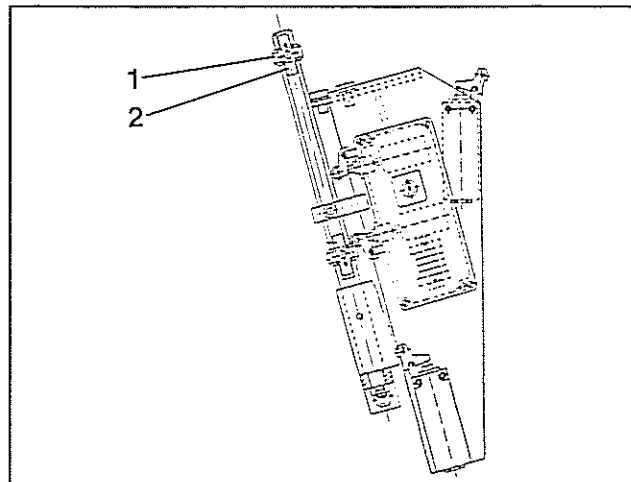


**When the coper/notcher is not being operated, the safety guard must be closed.**

**c) Setting the Lower Dead Center**

(Normally not necessary when using the standard tool.)

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for shears and coper/notcher (G) to "Inching".
- Open the safety guard and secure it.
- With the footpedal for coper/notcher and shears (H) in position "Down", carefully move the tool to the lower position desired.
- Loosen the upper T-screw (2) and slide the trip cam (1) down to the roller of the limit switch.
- Tighten the T-screw (2).
- Turn the Inching and Full Stroke switch for shears and coper/notcher (G) to "Full Stroke".



**The working cylinder moves up to the coping position.**

- Perform a test stroke and, if necessary, correct the setting.
- Close the safety guard.



**The working cylinder moves up automatically to the initial position** (with the coper/notcher stroke setting, after section a).

- Switch off the ironworker.



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

## 5.4 Bar-Steel Shear



**Safety fixtures must not be removed.**

**Before switching on the ironworker, they are to be checked for completeness and proper attachment.**

**Damaged safety fixtures must be replaced.**



**When the ironworker is not being operated, 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 (F) is off and secured with the padlock.**



**Defective or worn knives or tools should not be used.**

### 5.4.1 Checking and Setting the Clearance



**The clamps must not press the knives together.**

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

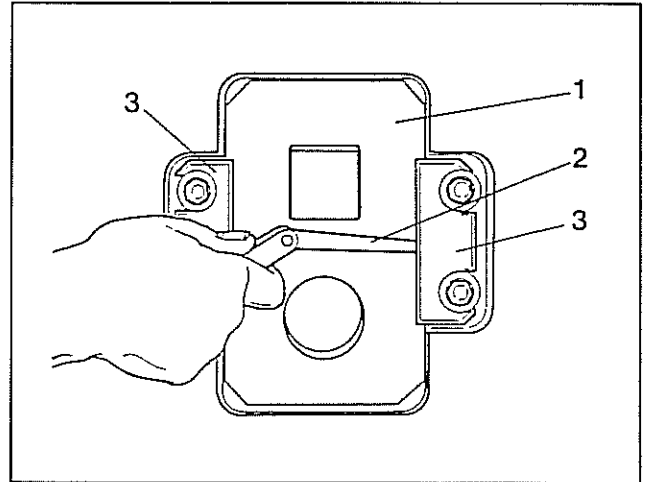
**If resharpened knives are used, then resharpened clamps must also be used.**



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

- The ironworker must be off.
- 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 0.008 inch and 0.012 inch.

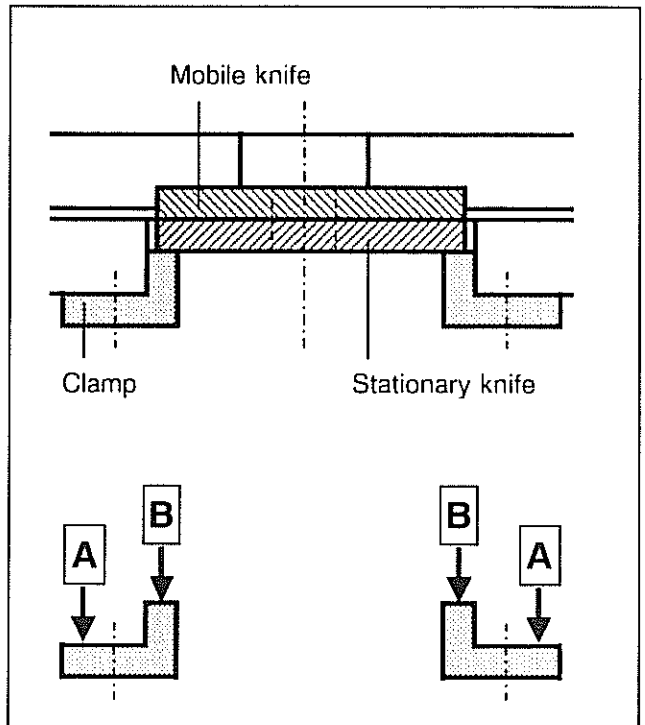


- If the **blade clearance is too big**, genuine knives installed and the clamps not yet reworked, then also check the blade clearance of the flat-steel and angle-steel shears.

If the blade clearance of all three types of shears is too big, the slide guideway will have to be adjusted (see chapter 6.2).

If the bar-steel shear's blade clearance is the only one that 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 big a blade clearance is only possible if there are no genuine knives installed, the slide guideway was adjusted or if the **B** surfaces of the clamps were already reworked once previously.



- **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 sharpening the clamps on the **B** surfaces.

- Reattach the hold-down.

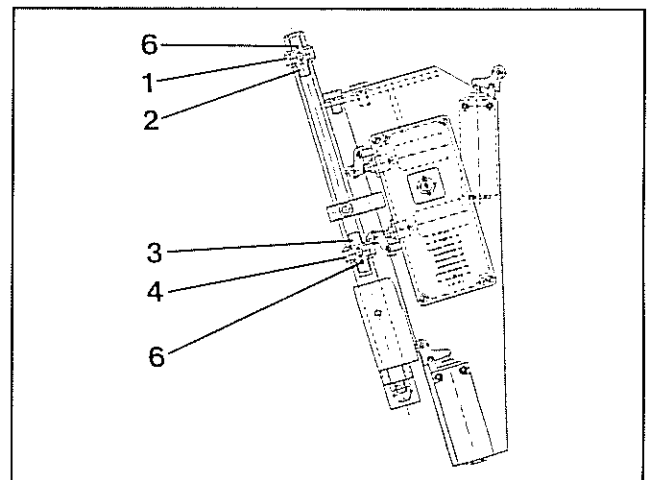
#### 5.4.2 Setting the Stroke Length

The stroke length for the bar-steel shear is controlled by the two trip cams (1) and (4).

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

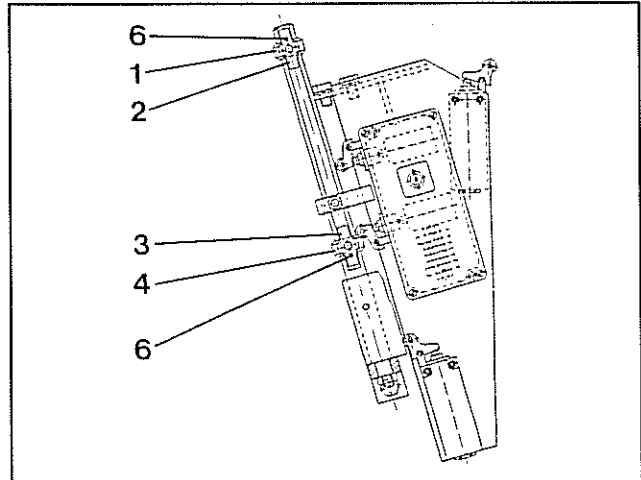
The stroke length should be set so that you are always working with shortest possible stroke (adjusted to the size of the stock).

The limit stops (6) must not be removed.



a) **Setting the Upper Dead Center (Limiting the Stroke)**

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copier/notcher and shears (G) to "Inching".
- Using the footpedal for copier/notcher and shears (H), move the shear slide down until the material to be cut slides easily into the blades.
- Loosen the lower T-screw (3).
- Slowly slide the lower trip cam (4) up until you reach the trip point of the limit switch.
- Retighten the lower T-screw (3).
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".
- Perform a test cut and, if necessary, correct the setting.
- Switch off the ironworker.





**b) Setting the Lower Dead Center**

Changing the lower dead center is normally not necessary, unless perhaps when using special knives.

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copper/notcher and shears (G) to "Inching".
- Using the footpedal for copper/notcher and shears (H), move the tool to the desired lower position.
- Undo the upper T-screw (2) and slide the trip cam (1) down to the roller of the limit switch.
- Tighten the T-screw (2).
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".



**The working cylinder moves up automatically.**

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

## 5.5 Angle-Steel Shear



Safety fixtures must not be removed.

Before switching on the ironworker, they are to be checked for completeness and proper attachment.

Damaged safety fixtures must be replaced.



When the ironworker is not being operated, 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 (F) is off and secured with the padlock.



Defective or worn knives or tools should not be used.

### 5.5.1 Checking and Setting the Cutting Play



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



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

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copers/notcher and shears (G) to "Inching".

- Using the footpedal for coper/notcher and shears (H), carefully move the shear slide to the lowermost position. Footpedal position "Down".



**Proceed with extreme caution, so that the mobile knife does not touch the stationary 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.
- If the **blade clearance is too big**, and if genuine knives that have not yet been flat-ground are installed, then also check the blade clearance of the bar-steel and flat-steel shears.

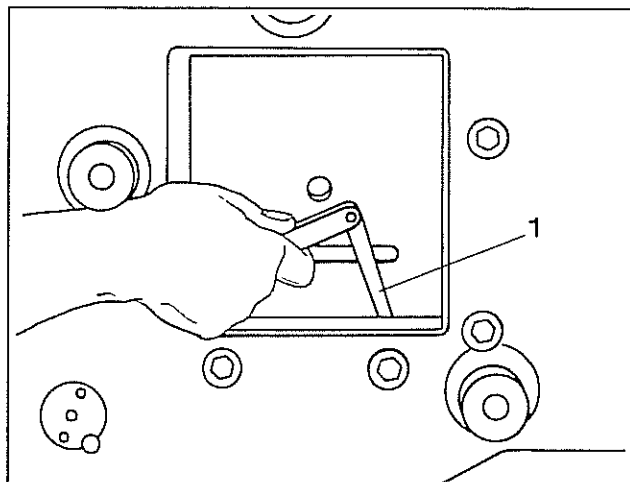
If the blade clearance of all three types of shears is too big, the slide guideway will have to be adjusted (see chapter 6.2).

If the slide guideway is adjusted, the blade clearance might become too small due to shims inserted earlier.

If the angle-steel shear's blade clearance is the only clearance that is too big, reduce the clearance by backing the stationary knife with shims (see also section 7.5.3).

- **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 shims.

To remedy this, remove the inserted shims, install genuine knives, or adjust the slide guideway (note clearance of angle-steel and bar-steel shears).



- Switch on the ironworker.
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".



**The working cylinder moves up automatically.**

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

### 5.5.2 Setting the Stroke Length

The stroke length for the angle-steel shear is controlled by the two trip cams (1) and (4).

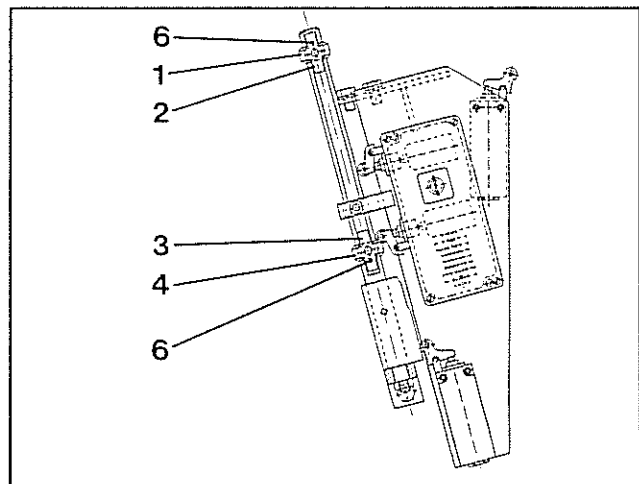
The upper trip cam (1) limits the downward stroke, the lower trip cam (4) limits the upward stroke.

The stroke length should be set so that you are always working with shortest possible stroke (adjusted to the size of the stock to be machined).

The limit stops (6) must not be removed.

#### a) Setting the Upper Dead Center (Limiting the Stroke)

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copier/notcher and shears (G) to "Inching".
- Using the footpedal for copier/notcher and shears (H), move the shear slide down until the gap is still large enough for the stock to fit through.
- Loosen the lower T-screw (3).
- Slowly slide the lower trip cam (4) up until you reach the trip point of the limit switch.
- Retighten the lower T-screw (3).
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".
- Perform a test cut and, if necessary, correct the setting.
- Switch off the ironworker.



**b) Setting the Lower Dead Center**

Changing the lower dead center is normally not necessary, unless perhaps when using special knives.

- Switch on the ironworker (see chapter 4.2).
- Turn the Inching and Full Stroke switch for copier/notcher and shears (G) to "Inching".
- Using the footpedal for copier/notcher and shears (H), move the tool to the desired lower position.
- Undo the upper T-screw (2) and slide the trip cam (1) down to the roller of the limit switch.
- Tighten the T-screw (2).
- Turn the Inching and Full Stroke switch (G) to "Full Stroke".

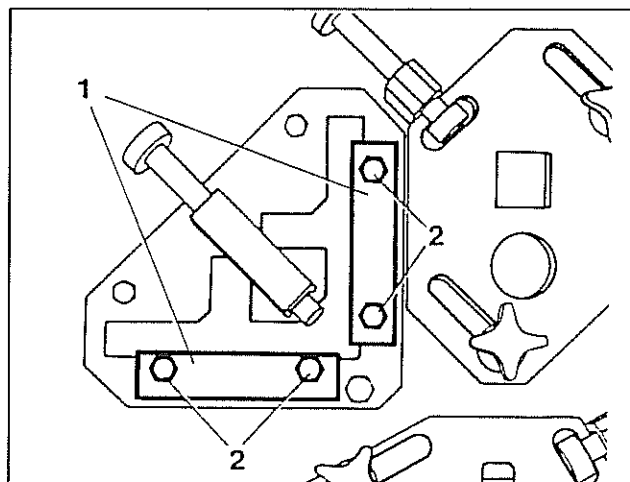


**The working cylinder moves up automatically.**

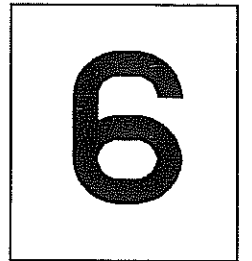
- Perform a test cut and, if necessary, correct the setting.
- Switch off the ironworker.

**5.5.3 Setting the Stock Support Rails**

- After loosening the screws (2), adjust the stock support rails (1) to attain the desired cutting angle (see section 4.7.2)
- Perform a test cut and, if necessary, correct the setting.







# Maintenance





## 6 Maintenance

### 6.1 Knives and Tools



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



Blades and tools must be periodically sharpened. Dull blades put a strain on the ironworker and result in poor cut quality.



Safety fixtures must not be removed.

Before switching on the ironworker, they are to be checked for completeness and proper attachment.

Damaged safety fixtures must be replaced.



Dull, worn and chipped tools and blades leave burrs and jagged spikes on the workpiece and increase the risk of injury



Warning labels must not be removed. Replace damaged, scratched or illegible warning labels.



When the ironworker is not being operated, turn the keyswitch to "O" and remove the key.



Whenever work is done on the cutting and punching tools, first make sure to deactivate the ironworker by turning off the main switch (F). Secure the mainswitch with a padlock.



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

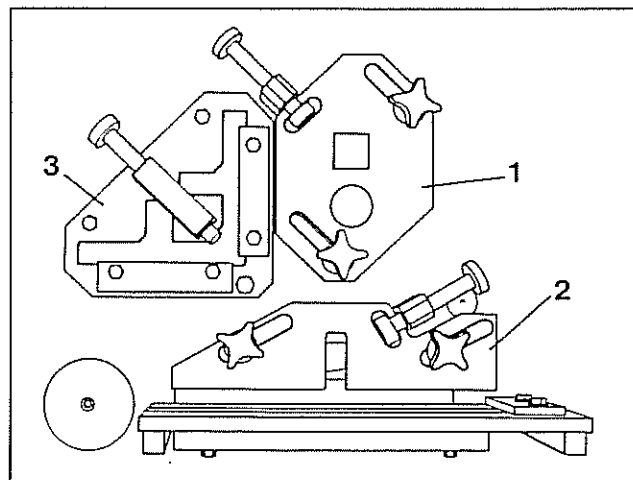
### 6.2 Readjusting the Slide Guideway

The shear slide is guided with nine guideways (four in the front, five in the back of the machine) built into the ironworker housing. Like all of the ironworker's parts, the guideways for the shear slide are also subject to a certain amount of wear, which is noticeable from a **simultaneous** enlarging of the blade clearance on the flat-steel, bar-steel and angle-steel shears.

To reset the slide guideway, the hold-downs must be removed and the coping saddle detached.

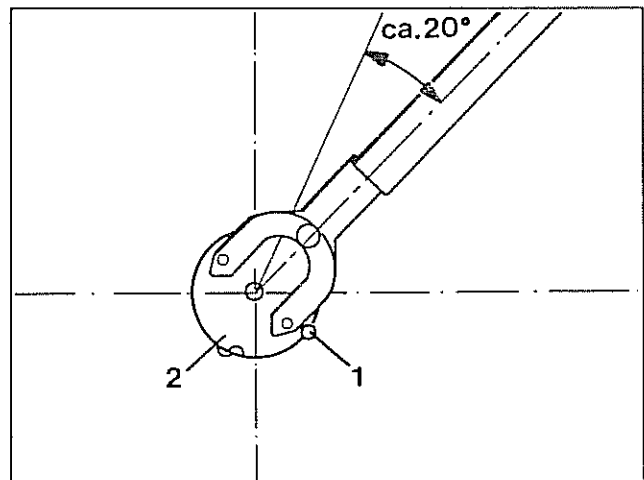
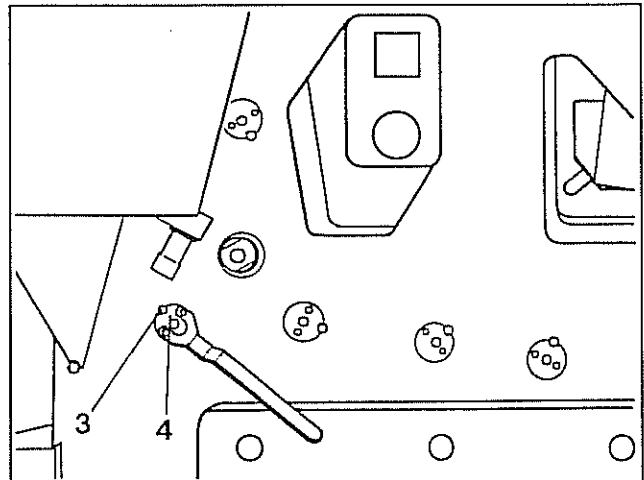
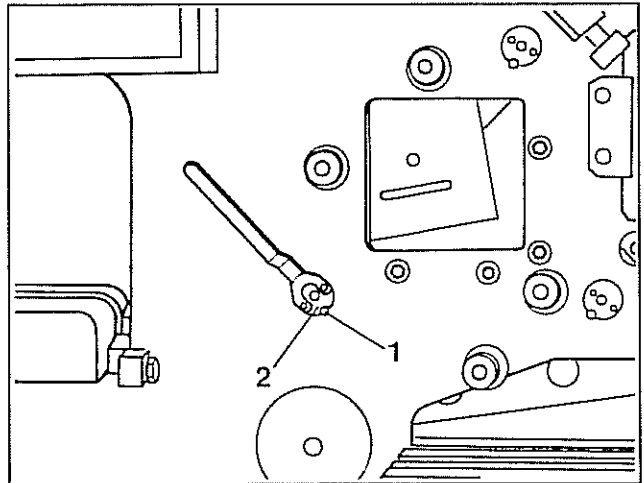
#### 6.2.1 Preparations

- Take off the hold-downs. The removal of the hold-downs for bar-steel, flat-steel and angle-steel shears (1, 2, 3) is described in sections 7.2.1, 7.4.1 and 7.5.1.
- Detach the coping saddle according to section 7.3.1.



### 6.2.2 Setting the Slide Guideway

- Switch on the ironworker (see chapter 4.2).
  - Set the Inching and Full Stroke switch for copier/notcher and shears (G) to "Inching".
  - Using the footpedal for notcher and shears (H), move the shear slide to the lowermost position.
  - Switch off the ironworker.
  - Remove all tapping screws (1) on the front of the ironworker.
  - Loosen the guide rollers (2) (one full turn).
  - Unscrew the tapping screws (3) on the back of the machine and remove them.
  - Adjust the guide rollers (4) until you attain the proper blade clearance at the three work areas for flat-steel, bar-steel and angle-steel shears (see sections 5.2.1, 5.4.1 and 5.5.1).
  - Drill the guide rollers (4) in this off-center position (drill diameter 0.177 inch).
  - Screw in the tapping screws (3).
  - First tighten the guide rollers on the front of the ironworker (2) all the way, then loosen them 1/16 of a turn (about 20 degrees).
- This will give the slide the proper running fit.
- Drill the guide rollers (2) in this off-center position (drill diameter 0.177 inch).
  - Insert the locking screws (1) and tighten them all the way.



### 6.2.3 Final Tasks

- Attach the coping saddle according to section 7.3.4.
- Recheck the blade clearance on the flat-steel, bar-steel and angle-steel shears and on the copier/notcher.
- Replace the hold-down of the flat-steel, bar-steel and angle-steel shears (see sections 7.2.5, 7.4.4 and 7.5.5).

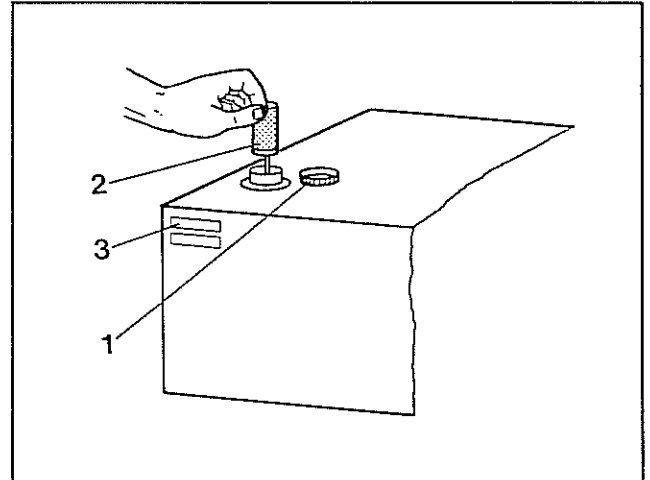
### 6.3 Hydraulic System



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  $\frac{3}{4}$ " 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  $\frac{3}{4}$ " 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.

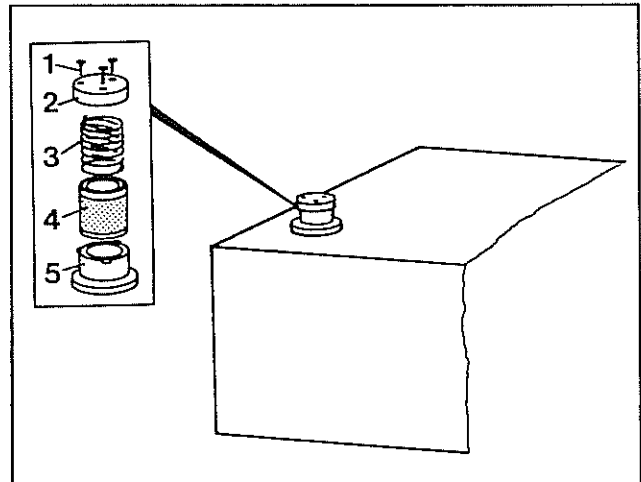
The same intervals apply to changing disposable filters.

- 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 cleaning solution 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.

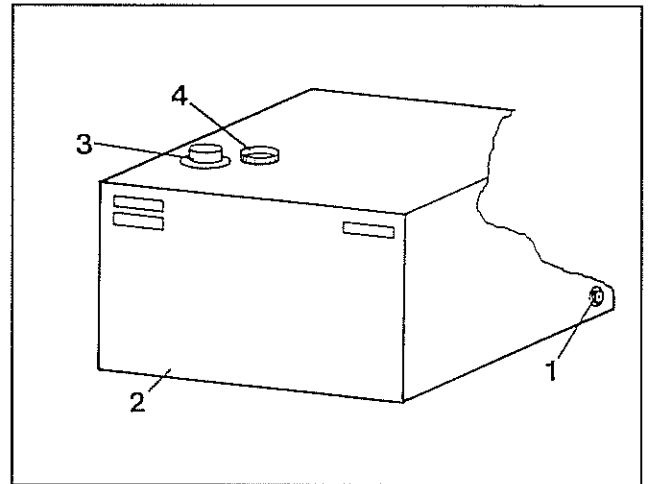


**Before draining the used oil, procure an appropriate collector vessel.**

**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 for coper/notcher and shears (H) and the footpedal for the punch (J) to move the working cylinders a number of times without any load.
- Recheck the oil level.
- Close the cover panel.

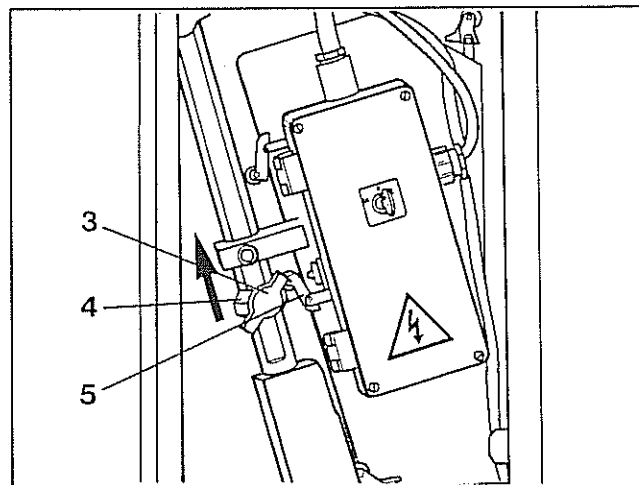
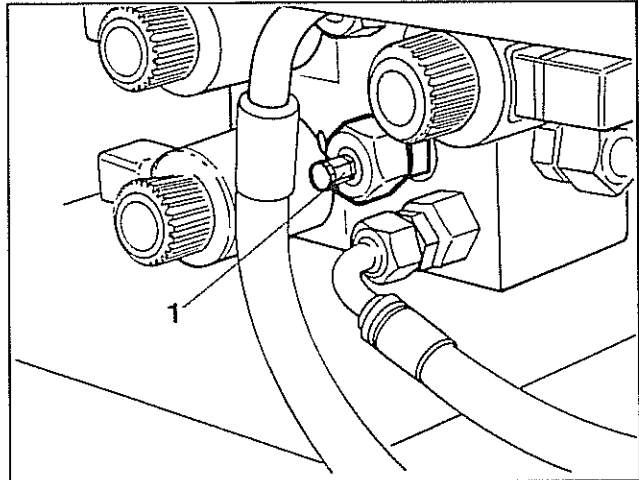


### 6.3.5 Checking the Max. Operating Pressure

#### Note

The max. operating pressure is factory-set, lead-sealed, and need not be tested (for operating pressure, see section 1.1 and instruction label on oil container). If so desired, it can be checked using the factory-installed test lead.

- Switch off the motor.
- Open the cover panel at the base.
- (Special accessories can be ordered from Mubea Machinery and Systems Inc., or are available on the market.)
- Switch on the motor (see chapter 4.2).
- Loosen the T-screw (3) on punch or shear.
- Slide the trip cam (4) up past the limit switch (5) for a short time. Upon contact release, pump begins running under pressure.
- Read pressure off the gauge.
- Reset the trip cam (4) and tighten the T-screw (3).
- 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.**

- 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 warranty 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:

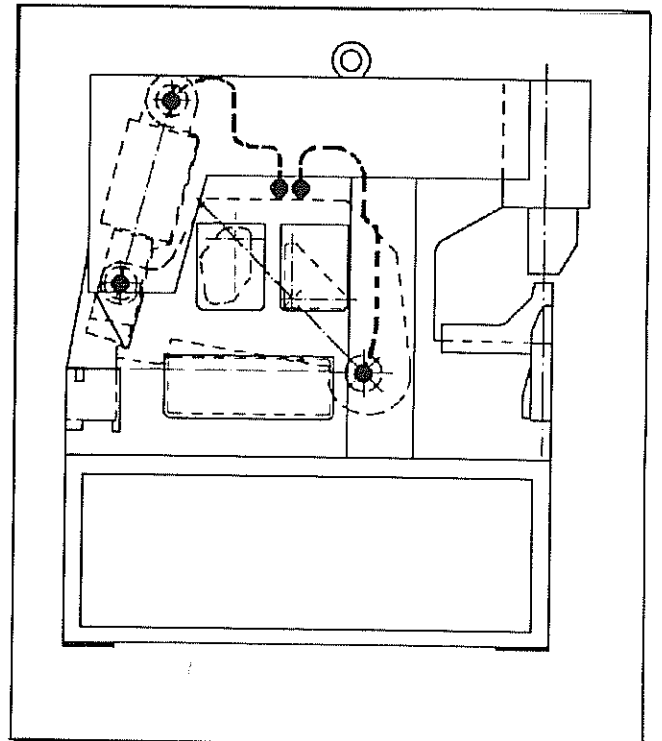
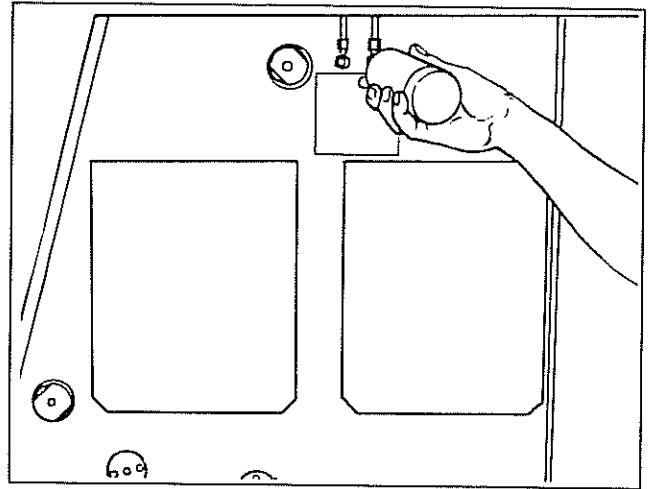
Two pump strokes before operation, and every five operating hours thereafter.

The same oil can be used for all lubricating points.

The following lubricant is recommended for use:

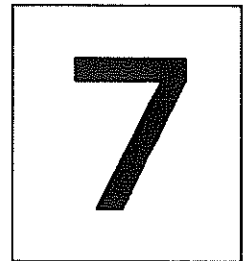
CHEVRON VISTAC OIL 150X

or equivalent.









## 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 (F) off. Secure the main switch with a padlock.**

### 7.1 Holepunch

#### 7.1.1 Changing the Punch

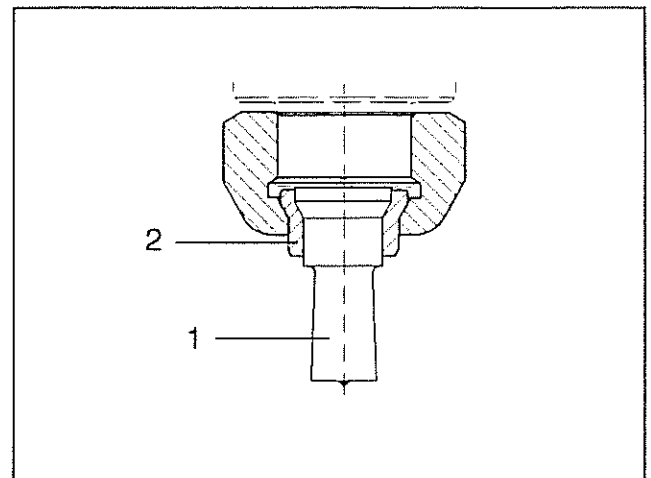
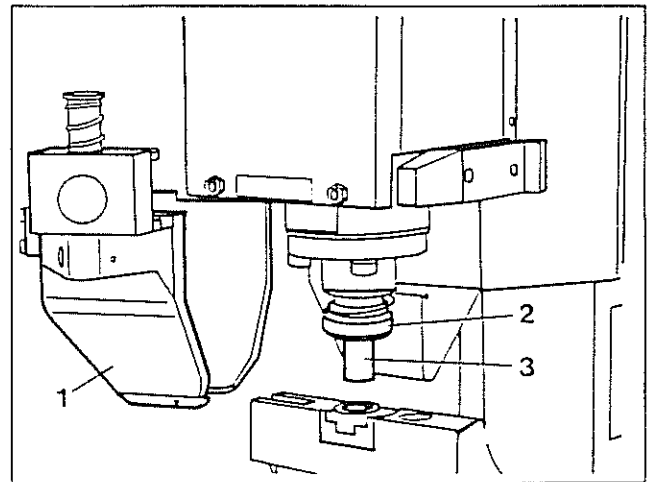


**The clearance between the punch and the die must be carefully controlled.**

- Switch off the ironworker.
- Open the stripper (1) by 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.

#### **Note**

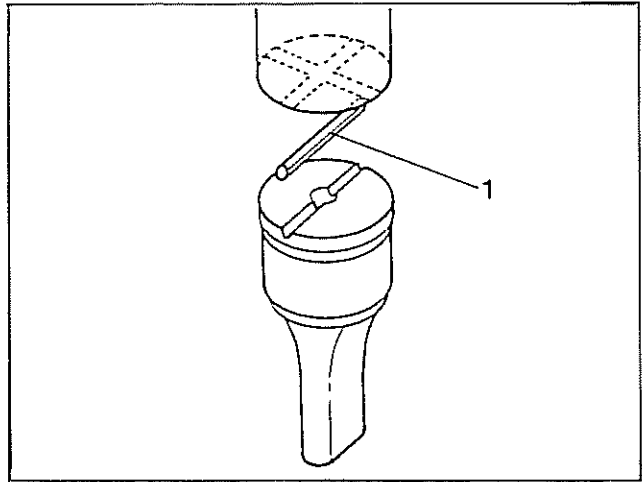
Insert size H II punch (1) using the punch reducer (see illustration at right). The punch reducer is part of the standard delivery of the machine.



- For shaped tooling, the alignment pin (1), which is included in the delivery, must also be inserted. Make sure the pin is seated properly in the adapter.



**When using shaped tooling, pay attention to the position of the cutting form of the punch relative to the die.**



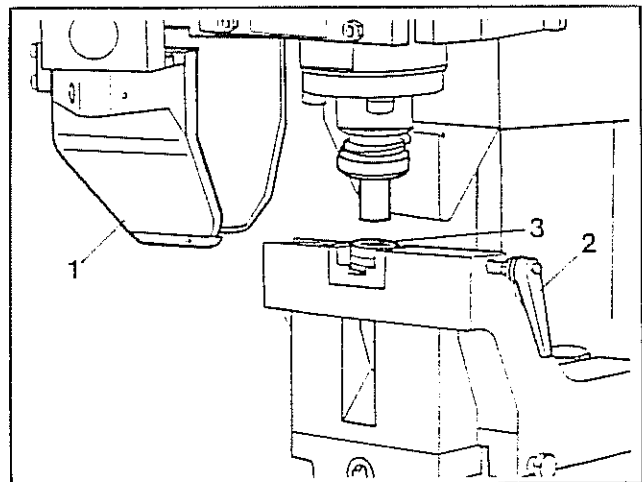
- Close the quick-change attachment, or: Screw on the coupling nut and tighten.
- Close the stripper.
- Check centering according to section 7.1.3.

### 7.1.2 Changing the Die



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

- Switch off the ironworker.
- Open the stripper (1) by 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).



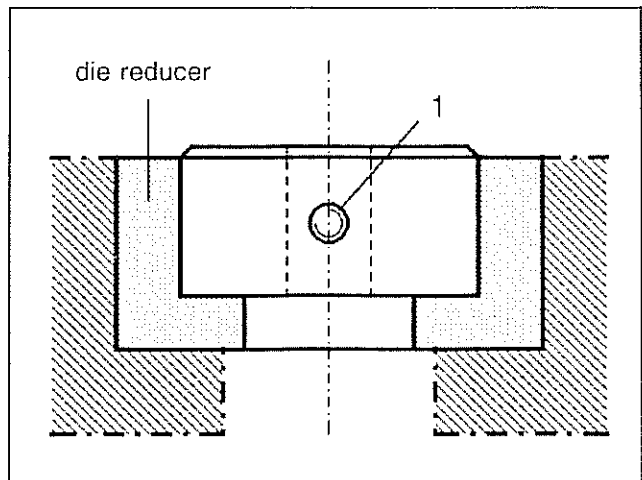
#### Note

Depending on the size, install dies using the matching die reducer (see illustration at right). The corresponding die reducers are part of the standard delivery of the machine.



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

- Tighten the clamping lever. Using the die reducer, also tighten the threaded pin (1).



- Close the stripper.
- Check centering according to section 7.1.3.



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

### 7.1.3 Check Centering



Die and punch must be centered.



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 chapter 4.2).
- Turn Inching and Full Stroke switch for the punch (A) to "Inching".
- Open the stripper by swinging it out to the front.
- With the footpedal for the punch (J) in the position "Down (search)", carefully lower the punch into the die.



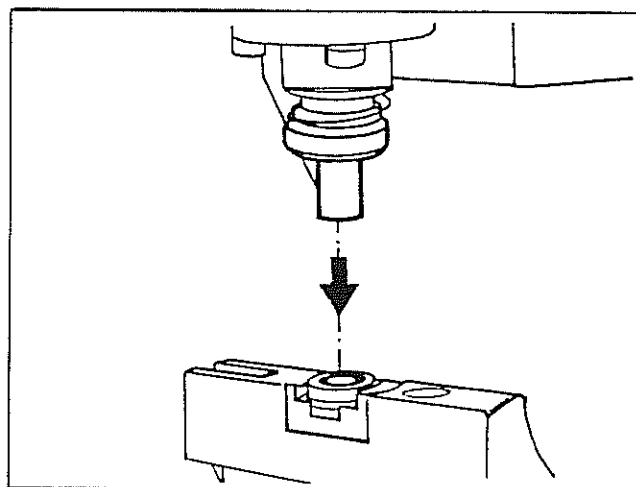
Proceed with extreme caution when moving the punch down into the die. Make sure the punch does not touch the die.

- Switch off the ironworker.
- Adjust incorrect centering according to section 5.1.2.
- Switch on the ironworker.
- Turn the Inching and Full Stroke switch for the punch (A) to "Full Stroke".



The working cylinder moves up automatically.

- Close the stripper.
- Switch off the ironworker.

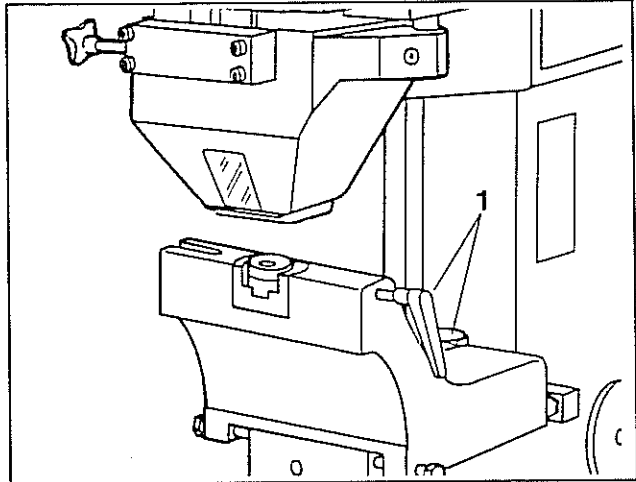


#### 7.1.4 Using Eccentric Dies

(without lower saddle support)

When using eccentric dies, depending on the type of punching to be done, the lower saddle support and the saddle support may have to be removed. The hole in the die must be centered to the punch.

- Switch off the ironworker.
- Remove the lower saddle support and the saddle support according to section 9.1.3.
- Loosen screws (1).
- Adjust the punch saddle to match the die.
- Center according to section 5.1.2.



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

## 7.2 Flat-Steel Shear

The top and bottom knives are interchangeable. They can be used on four sides. Changing each knife individually is also possible.



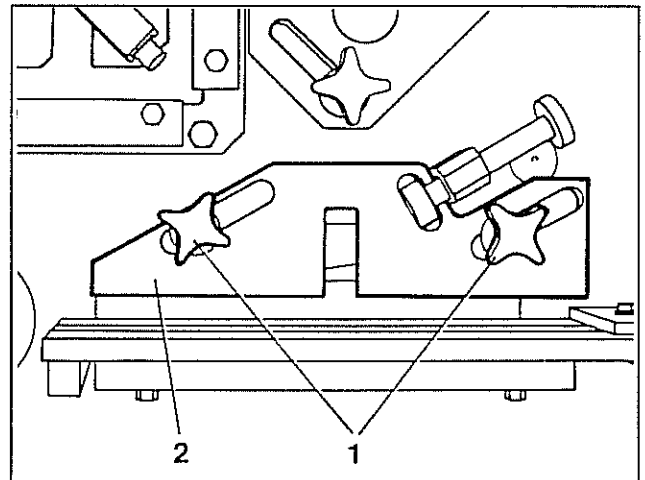
Whenever knives are changed, the blade clearance must be checked.



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

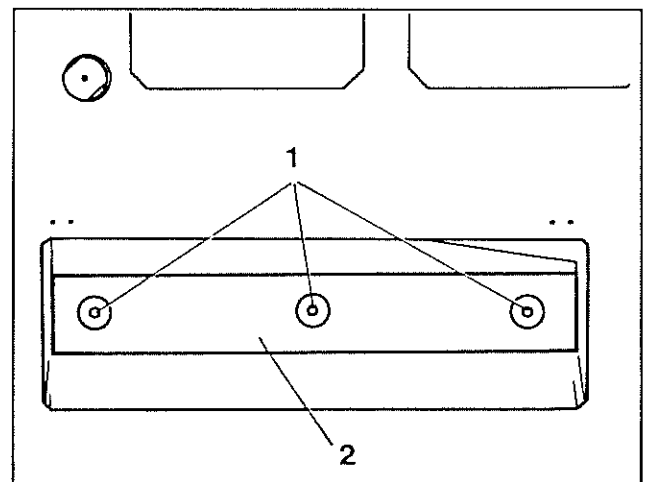
### 7.2.1 Removing the Hold-Down

- Switch off the ironworker.
- Screw off the star handles (1).
- Lift the hold-down plate (2) off the support studs.



### 7.2.2 Changing the Bottom Knife

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



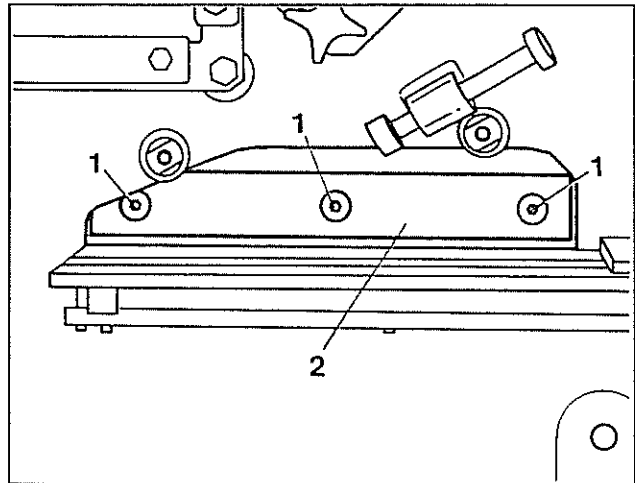
### 7.2.3 Changing the Top Knife

- Switch on the ironworker (see chapter 4.2).
- Turn Inching and Full Stroke switch for coper/notcher and shears (H) to "Inching".
- With the footpedal for coper/notcher and shears (J) in the "Down" position, move the knife slide to the lowermost position.
- Switch off the ironworker.
- Take off the hold-down according to section 7.2.1.
- Remove the fastening screws (1).



**Hold onto to the blade 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.
- Mount hold-down plate according to section 7.2.5.



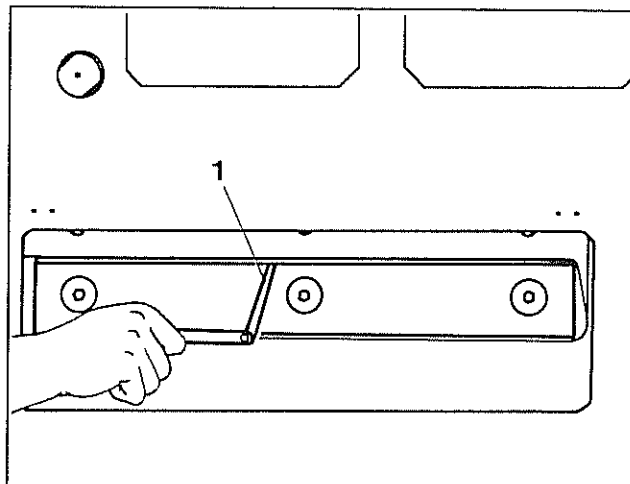


### 7.2.4 Checking the Blade Clearance

- Switch on the ironworker (see section 4.2).
- Turn Inching and Full Stroke switch for coper/notcher and shears (G) to "Inching".
- With the footpedal for coper/notcher and shears (H) in the position "Down", carefully move the shear slide to the lowermost position.



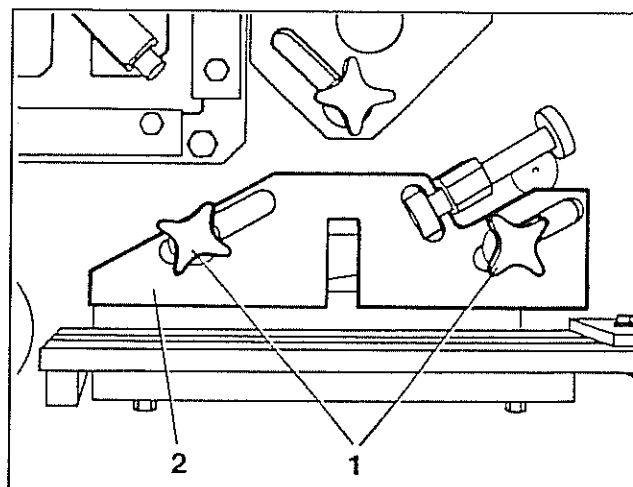
**Proceed with extreme caution, so that the top knife does not touch the bottom knife.**



- Switch off the ironworker.
- Using a feeler gauge (1) from the back of the ironworker, check the blade clearance along the entire length of the knives.
- The blade clearance should be between 0.008 inch and 0.012 inch.
- If it is necessary to adjust the cutting play, proceed according to section 5.2.1.

### 7.2.5 Mounting the Hold-Down

- Switch off the ironworker.
- Place the hold-down plate (2) on the support studs.
- Screw on and tighten the star handles (1).



### 7.3 Coper/Notcher

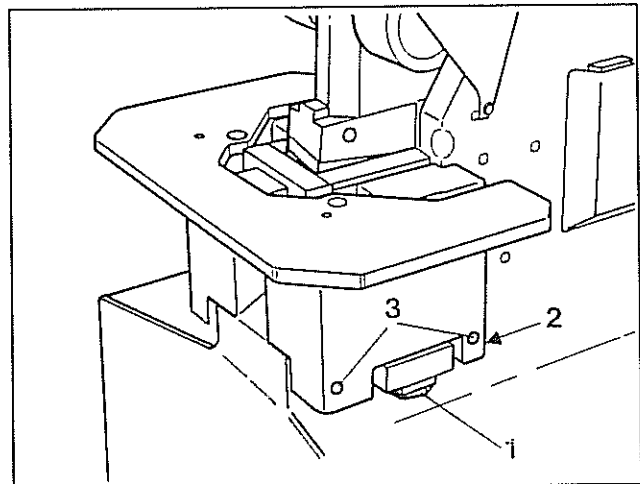
The bottom knives of the rectangular notching tool each have two cutting edges and can be rotated.



**The blade clearance must be checked whenever a tool change is made.**

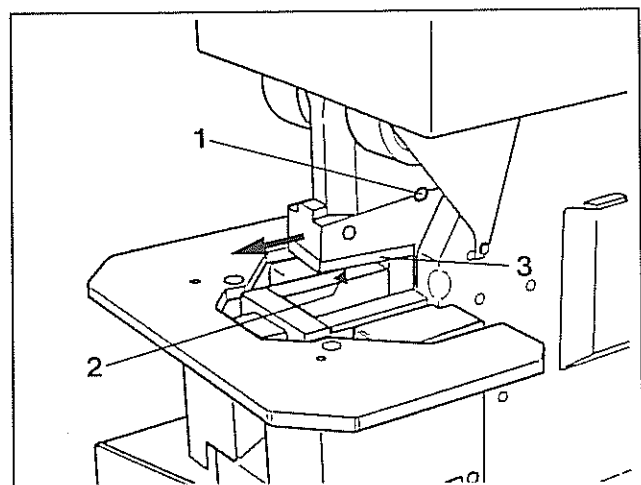
#### 7.3.1 Removing the Coping Saddle (only necessary when changing the top knife)

- Switch off the ironworker.
- Open the safety guard and secure it.
- Loosen the fastening screws (1).
- Loosen the adjustment screws (2) and (3).
- Remove the notching saddle.
- Close the safety guard.



#### 7.3.2 Changing the Top Knife

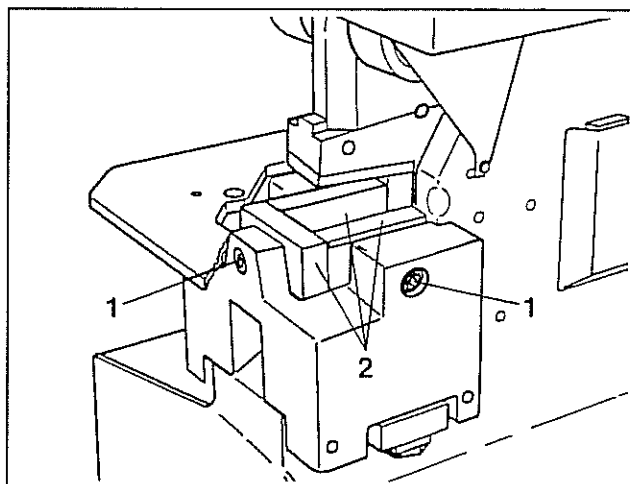
- Switch off the ironworker.
- Detach the coping saddle (see section 7.3.1).
- Switch on the ironworker (see chapter 4.2).
- Turn Inching and Full Stroke switch for coper/notcher and shears (G) to "Inching".
- Open the safety guard and secure it.
- Using the footpedal for coper/notcher and shears (H), move the shear slide to the position in which the dowel pins (1) can be knocked out.
- Switch off the ironworker.
- Using a suitable drive-out punch, knock out the two dowel pins (1).
- Unscrew and remove the fastening screws (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).

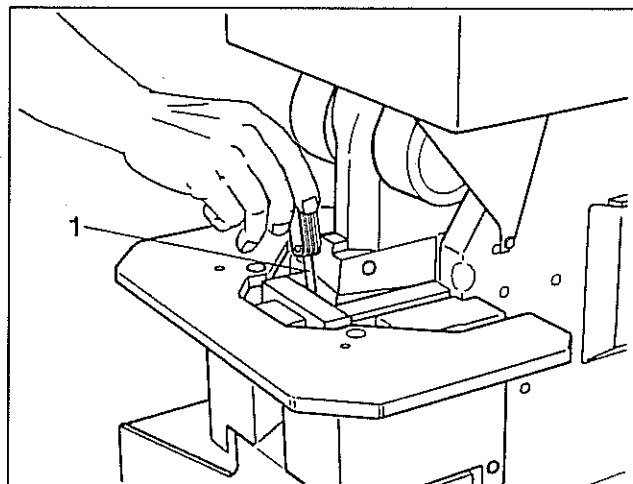
### 7.3.3 Changing the Bottom Knives

- Switch off the ironworker.
- 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 5.3.1).



### 7.3.4 Mounting the Coping Saddle

- Switch on the ironworker (see chapter 4.2).
- Turn Inching and Full Stroke switch for coper/notcher and shears (G) to "Inching".
- Using the footpedal for coper/notcher and shears (H), move the shear slide to the lowermost position.
- Switch off the ironworker.
- Clean the bearing surface for the coping saddle on the ironworker and on the coping saddle.
- Mount and fasten the notching saddle.
- Set and check the blade clearance according to section 5.3.1.



## 7.4 Bar-Steel Shear

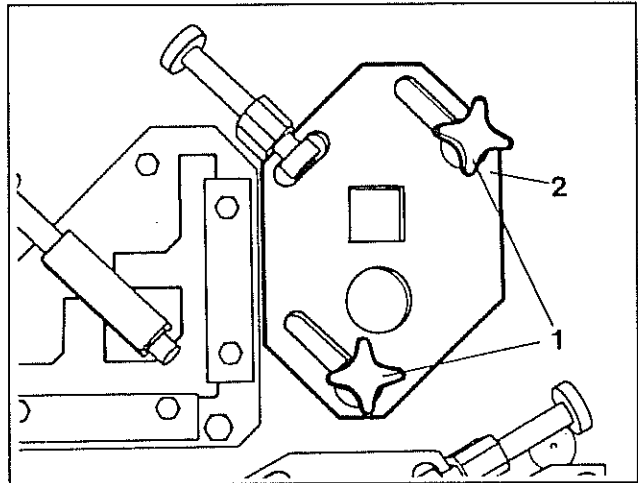
The knives have two cutting edges and can be used on both sides.



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

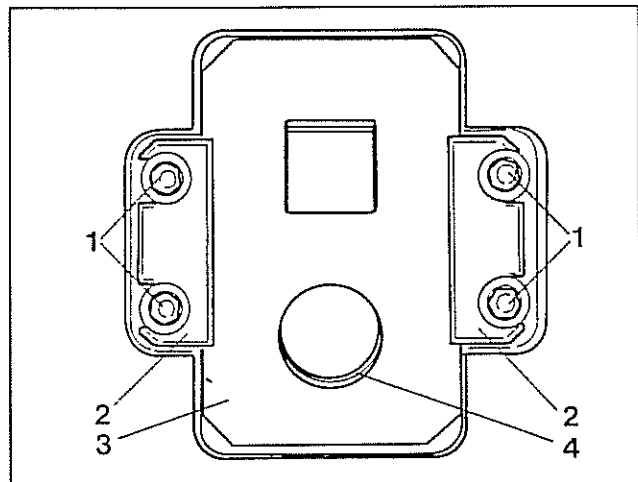
### 7.4.1 Removing the Hold-Down

- Switch off the ironworker.
- Screw off the star handles (1).
- Lift the hold-down plate (2) off the support studs.



### 7.4.2 Changing the Knives

- The shear slide must be at the topmost position. Otherwise, adjust stroke accordingly (see section 5.4.2).
- 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.

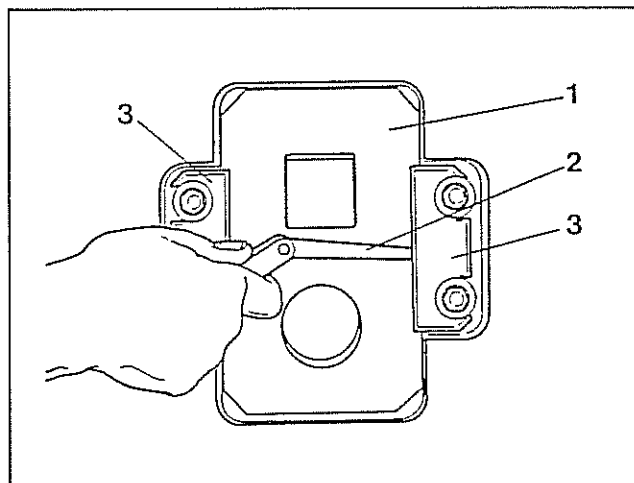
If the knives are ground on the flat side, the clamps must also be reworked.

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

- Mount the hold-down according to section 7.4.4.

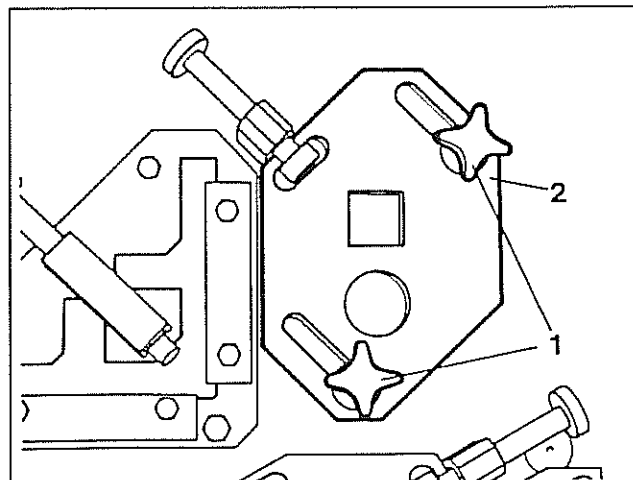
#### 7.4.3 Checking the Blade Clearance

- 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 0.008 inch and 0.012 inch.
- 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.
- Place the hold-down (2) upon the support studs.
- Screw on and tighten the star handles (1).



## 7.5 Angle-Steel Shear

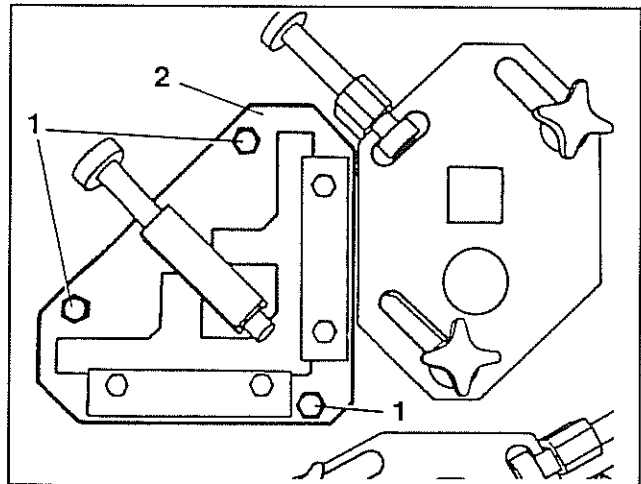
The two stationary knives and the mobile knife have cutting edges on all sides. They can thus be used four times.



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

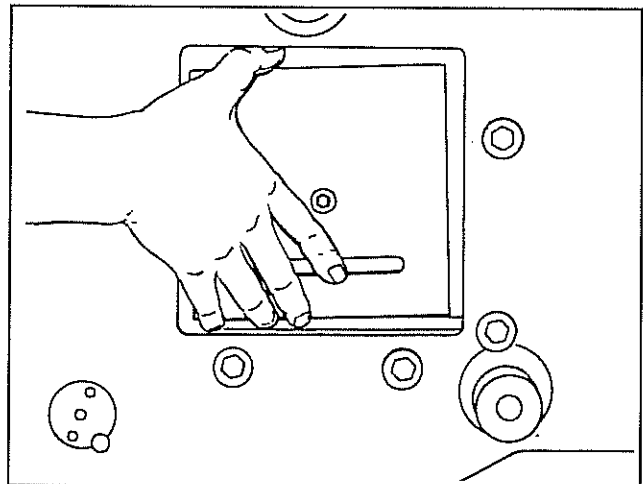
### 7.5.1 Removing the Hold-Down

- Switch off the ironworker.
- Remove the fastening screws (1).
- Lift the hold-down plate (2) off the support studs.

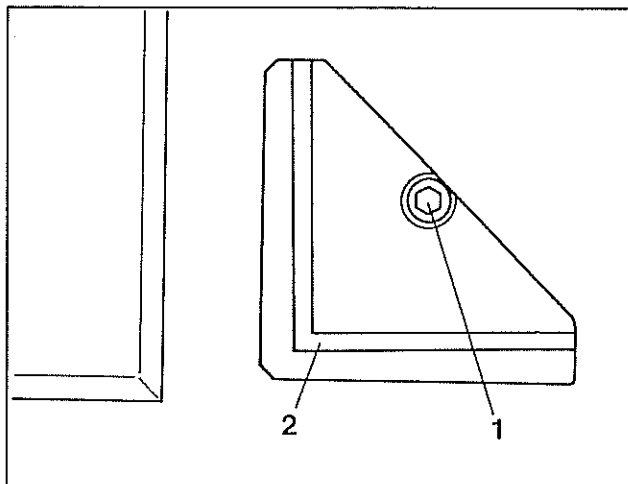


### 7.5.2 Changing the Mobile Knife

- Lift off the hold-down (see section 7.5.1).
- Switch on the ironworker (see chapter 4.2).
- Turn Inching and Full Stroke switch for coper/notcher and shears (G) to "Inching".
- Using the footpedal for coper/notcher and shears (H), move the shear slide down one step at a time, until the edges of the mobile knife are visible in the profile window on the front of the ironworker.
- Switch off the ironworker.

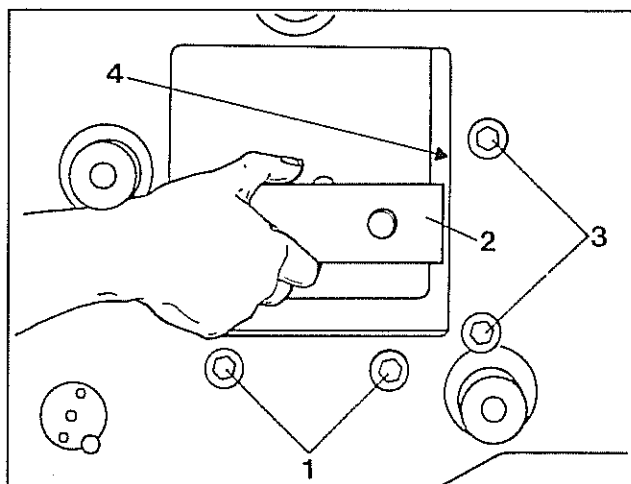


- Remove the fastening screw (1) from the back of the ironworker.
- Take the knife (2) out of the profile window to the front.
- Turn the knife around, or insert new/resharpened knife.  
If you use a resharpened knife, heed instructions in chapter 8.5.
- Insert fastening screw (1) with lock washer and tighten.
- Check the blade clearance (see section 7.5.4).
- Mount hold-down according to section 7.5.5.



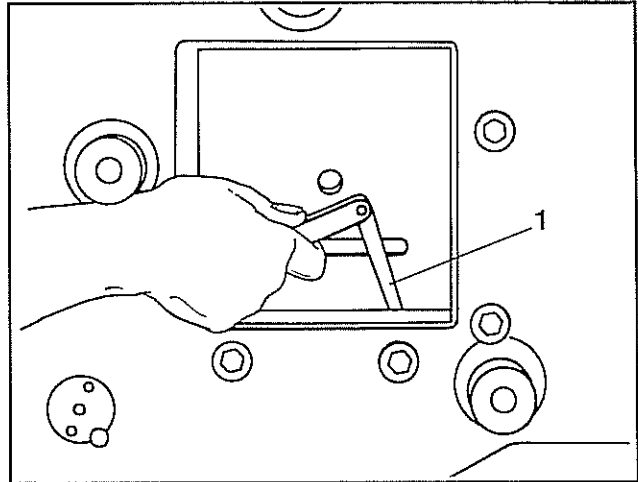
### 7.5.3 Changing the Horizontal and Vertical Knives

- Lift off the hold-down according to section 7.5.1.
- Switch off the ironworker.
- Loosen the fastening screws (1).
- Remove the horizontal knife (2).
- Loosen the fastening screws (3).
- Remove the vertical knife (4).
- Turn knives around, or insert new/resharpened knives.  
If you use resharpened knives, heed instructions in chapter 8.5.
- Insert fastening screws with lock washers and tighten.
- Check blade clearance (see section 5.5.4).
- Mount hold-down according to section 7.5.5.



#### 7.5.4 Checking the Blade Clearance

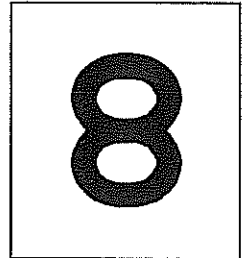
- Switch on the ironworker.
- Turn Inching and Full Stroke switch for coper/notcher and shears (G) to "Inching".
- With the footpedal for coper/notcher and shears (H) in the position "Down", move the shear slide to the lowermost position.
- Switch off the ironworker.
- Lift off the hold-down according 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 5.5.1.
- Mount the hold-down according to section 7.5.5.



#### 7.5.5 Mounting the Hold-Down

- Place the hold-down plate onto the support studs.
- Insert and tighten the fastening screws.
- Check the position of the hold-down spindle. Its tip should hold the stock down in such a way that the workpiece is horizontal while it is being ironworkerd.





# Resharpener the Knives and the Tools



## 8 Resharpener the Knives and the Tools

Knives and tools must be resharpener as necessary. Dull knives put a strain on the ironworker and cause poor cut quality.



**Dull, worn and chipped tools and blades 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 cracks and subsequent fracturing of the tools. Use oil stone to remove grinding marks or burrs.

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.

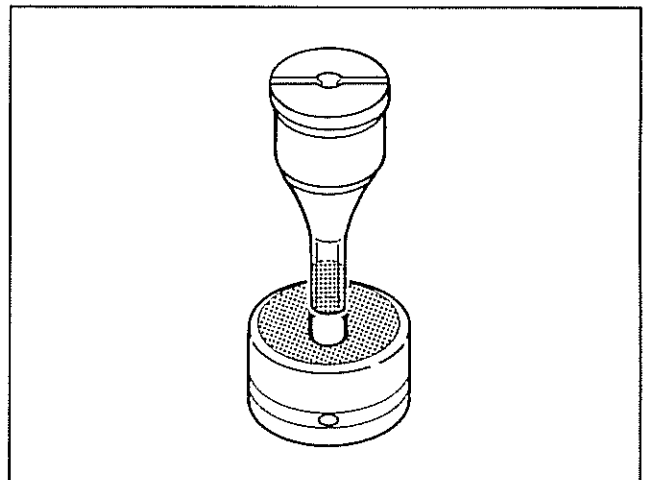
### 8.1 Resharpener the Punching Tools

#### 8.1.1 Punch

- Grind the punch only on the face.

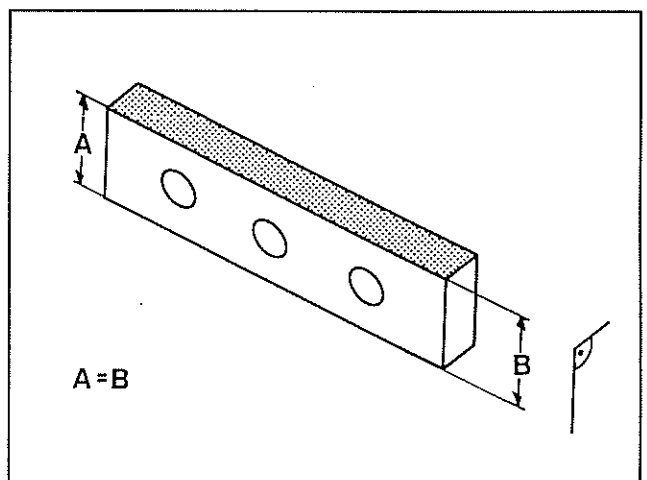
#### 8.1.2 Die

- Grind the die only on the cutting surface.



### 8.2 Resharpener 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 on the flat side.



**When installing the flat-ground knife, particular attention must be paid to the blade clearance (see section 5.2.1).**

### 8.3 Resharpener the Notching Tools

#### 8.3.1 Top knife

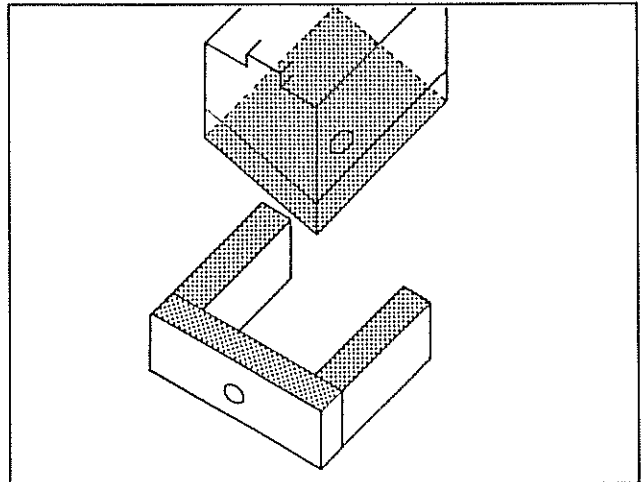
- Grind the top knife only on the lower surface.

#### 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 5.3.1).**

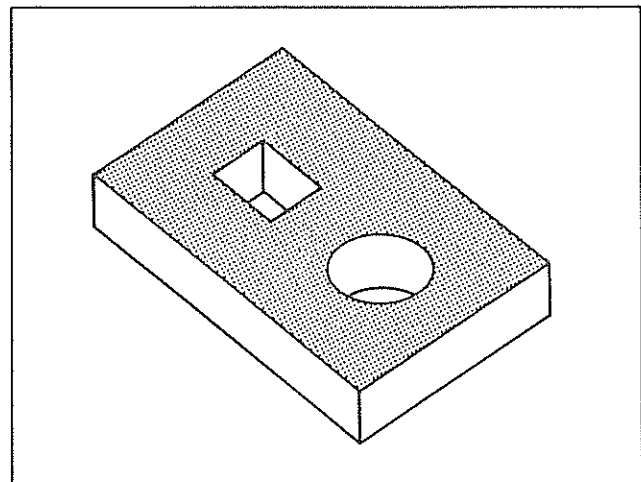


### 8.4 Resharpener the Bar-Steel Knives

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



**When installing a reground knife, particular attention must be paid to the blade clearance (see section 5.4.1).**



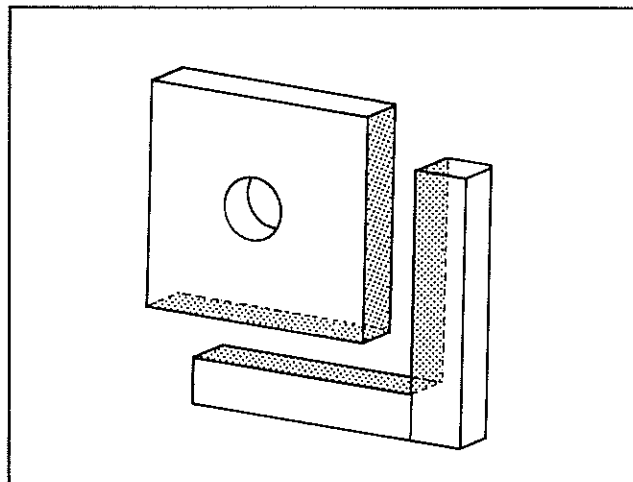
## 8.5 Resharpener the Angle-Steel Knives

### 8.5.1 Mobile Knife

- 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.



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

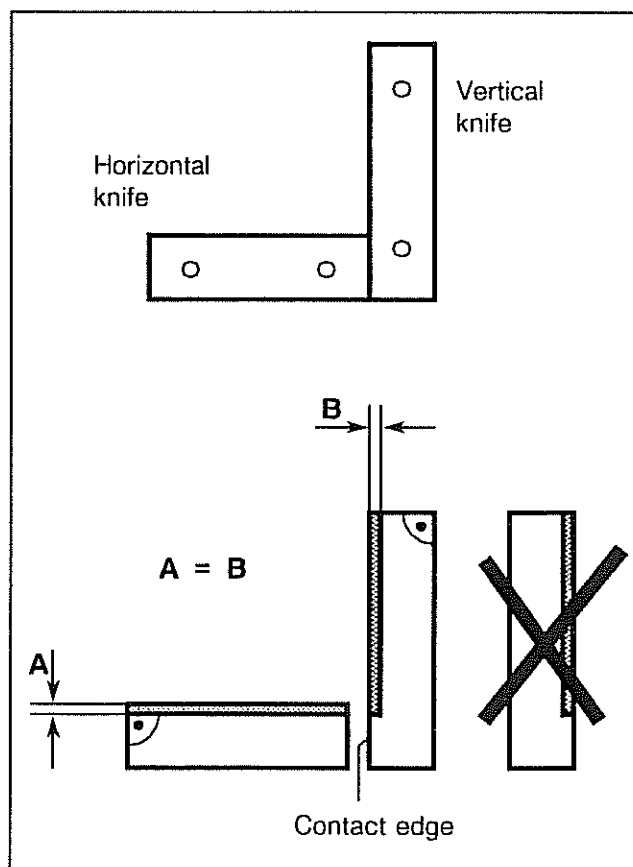


### 8.5.2 Stationary (Vertical and Horizontal) Knives

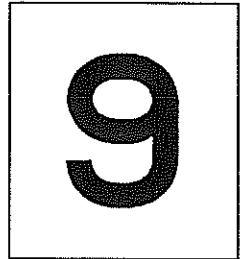
- Grind both knives on their faces, uniformly, and at a right angle. The contact edge on the vertical knife (see figure) **must** remain intact. When the stationary knives are resharpened, the knives must not be turned around in order to preserve the contact edge.
- In exceptional cases, it may be necessary to grind the flat side.



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







## Retooling





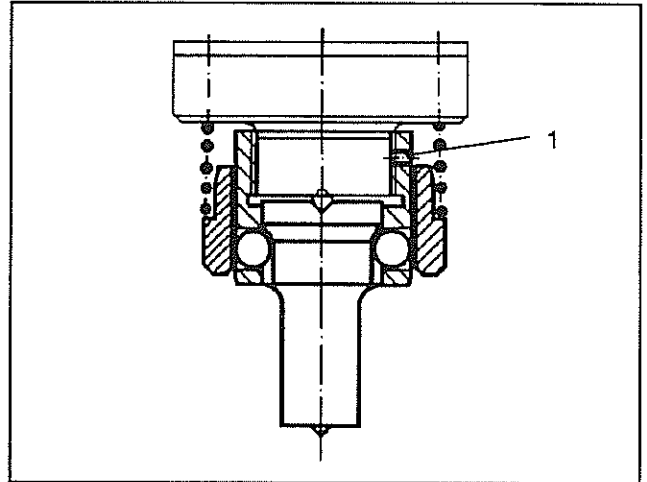
## 9 Retooling

### 9.1 Retooling – Standard Accessories

#### 9.1.1 Changing Over the Punch Attachment to Attachment With Coupling Nut

For large production runs the quick-change fixture should always be replaced by the coupling nut.  
The coupling nut is part of the standard equipment.

- 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.

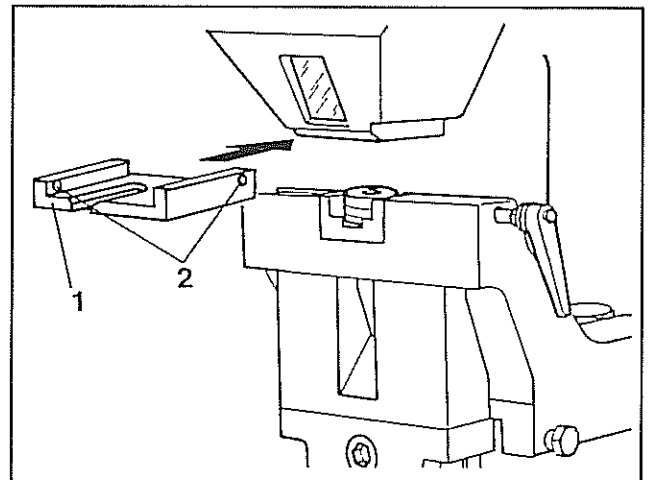


The selection of punch and die must provide appropriate clearance.

#### 9.1.2 Attaching the Stripper Plate to the Holepunch

For punching work using small punches and thin stock you must add the stripper plate, which belongs to the standard equipment.

- Switch off the ironworker.
- Slide on the stripper plate (1) and fasten it to the stripper using two threaded pins (2) on the left and right side.



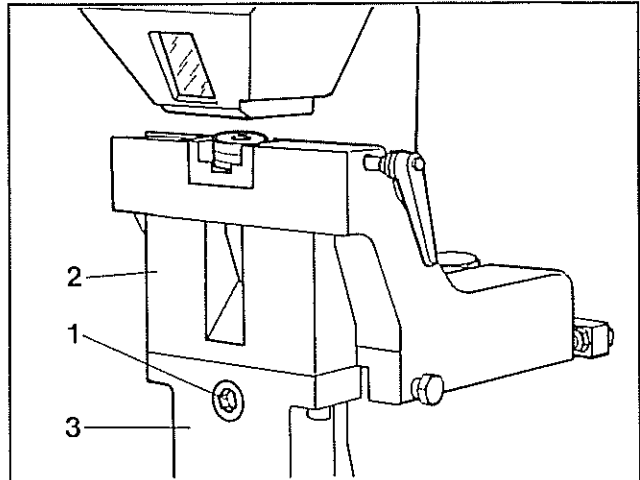
### 9.1.3 Detaching the Lower Saddle Support / Saddle Support

For flange punching in channel steel and I-Beam section steel, you must remove the lower saddle support and the saddle support.

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

After performing the work:

- Reattach the lower saddle support and the saddle support.
- Check centering of punch and die (see section 5.1.2).



## 9.2 Retooling - Special Accessories (Not Standard)

### 9.2.1 Length Stop

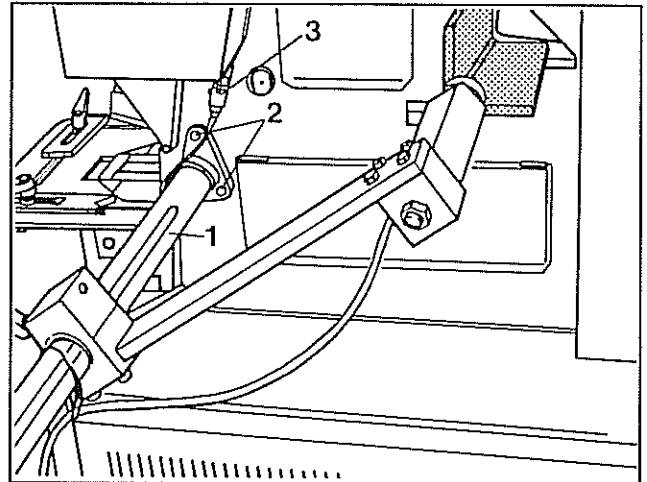
- Attach the length stop (1) with three fastening screws (2) in the tapped holes provided on the back of the ironworker.
- Insert the plug into the socket (3).

**Note:**

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

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

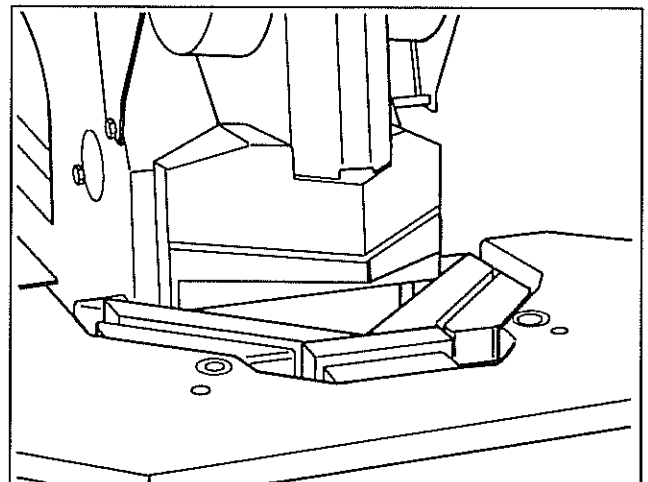
The safety flap of the angle-steel shear has been removed for the purpose of representation only.



### 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

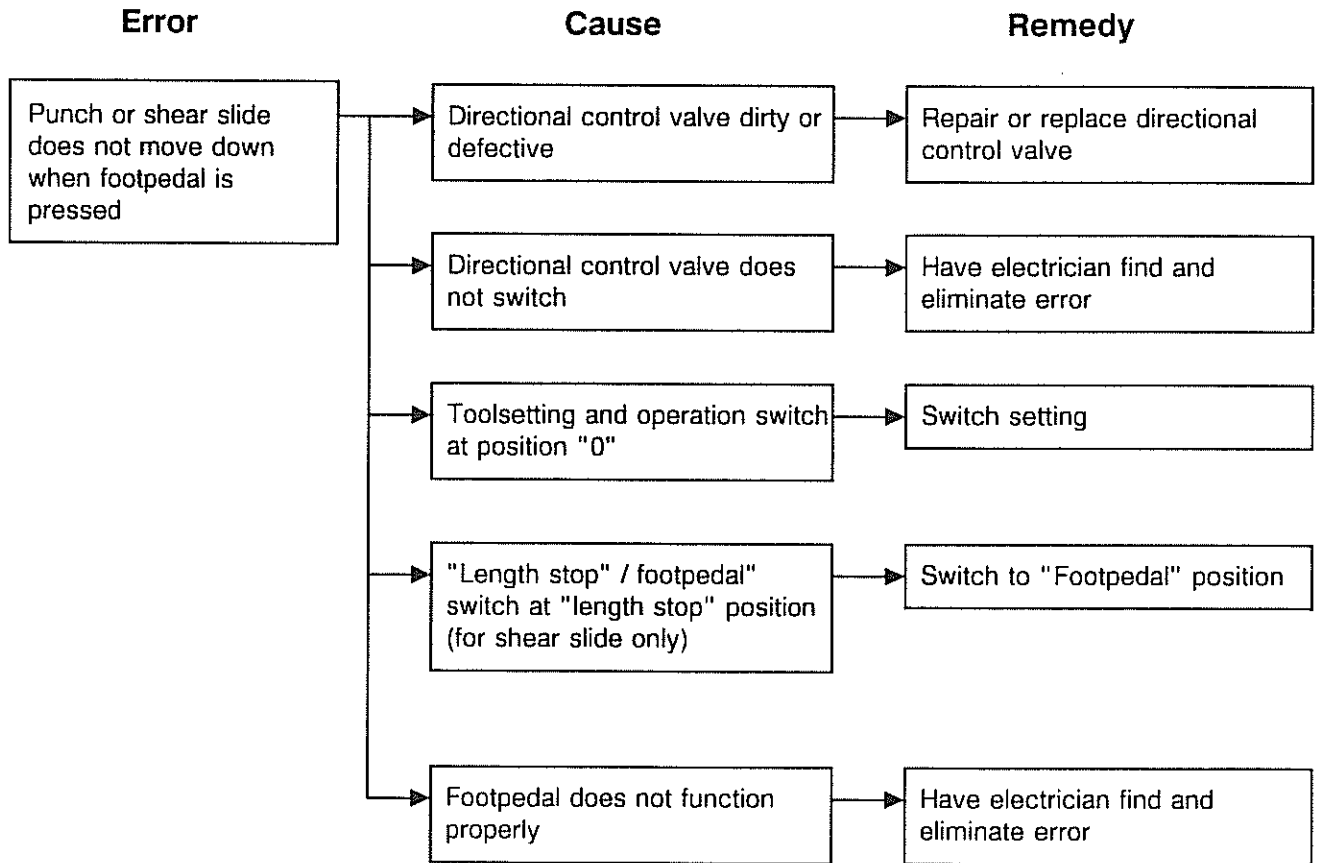
## Malfunctions and Their Remedy

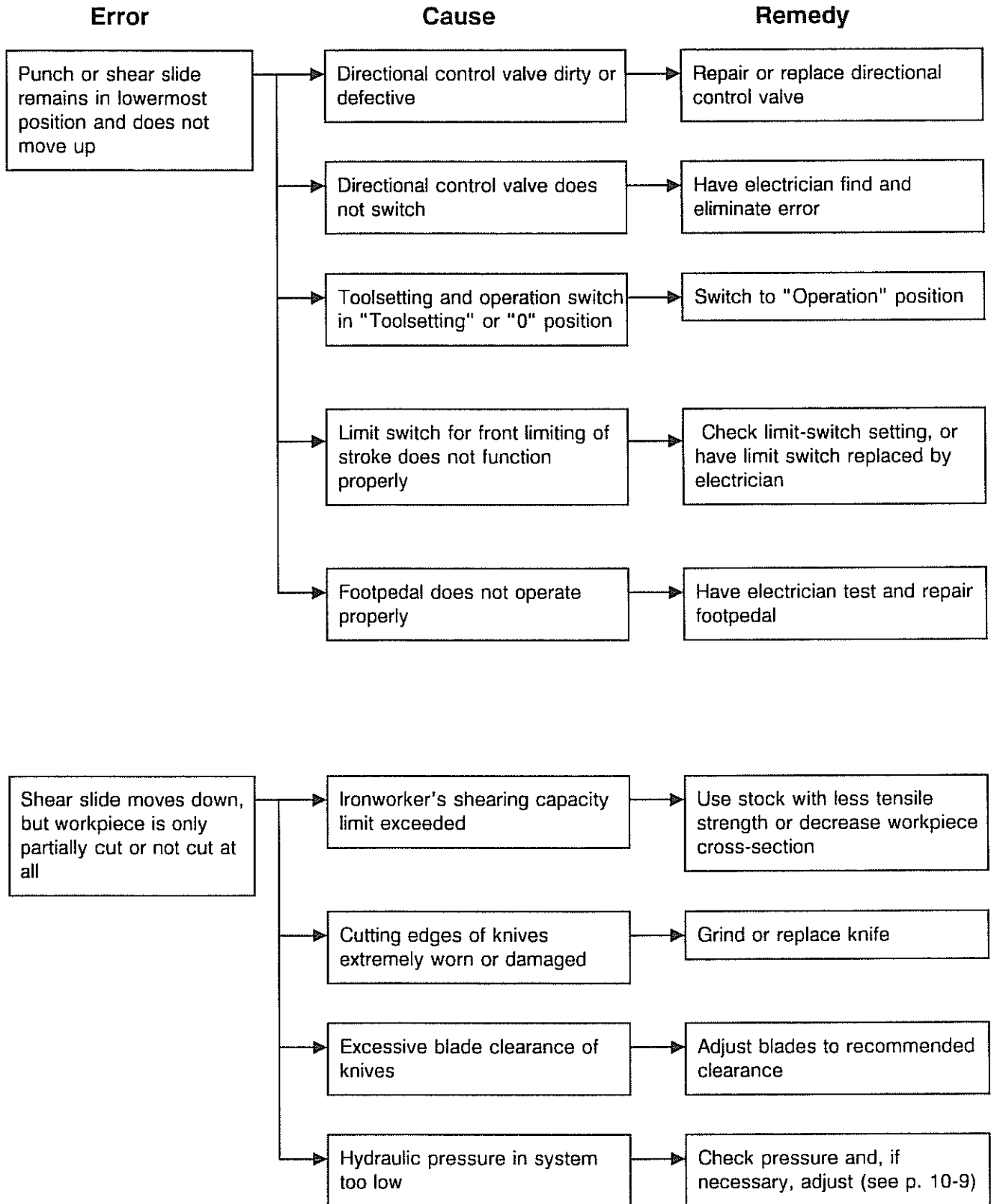




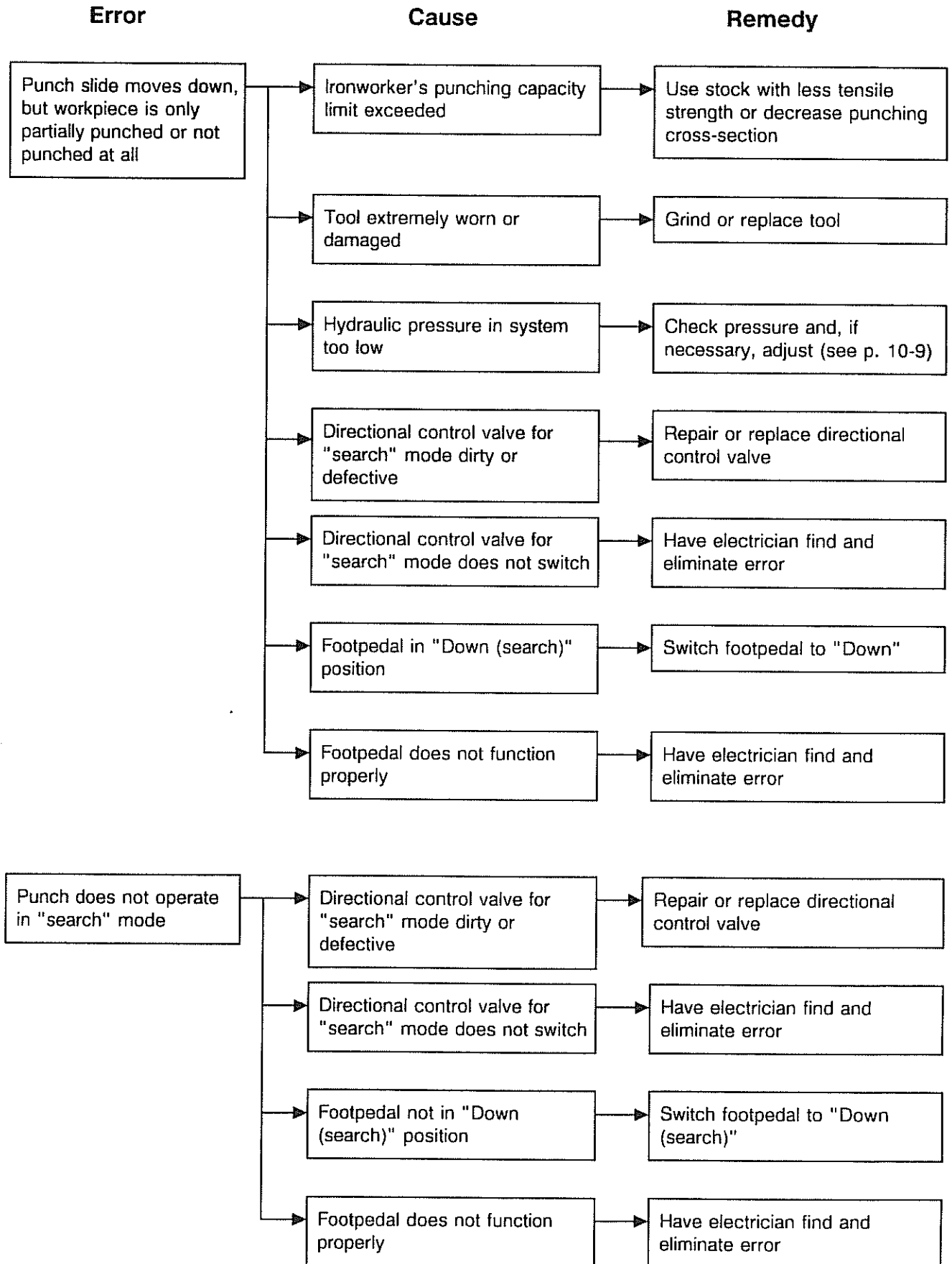
## 10 Malfunctions and Their Remedy

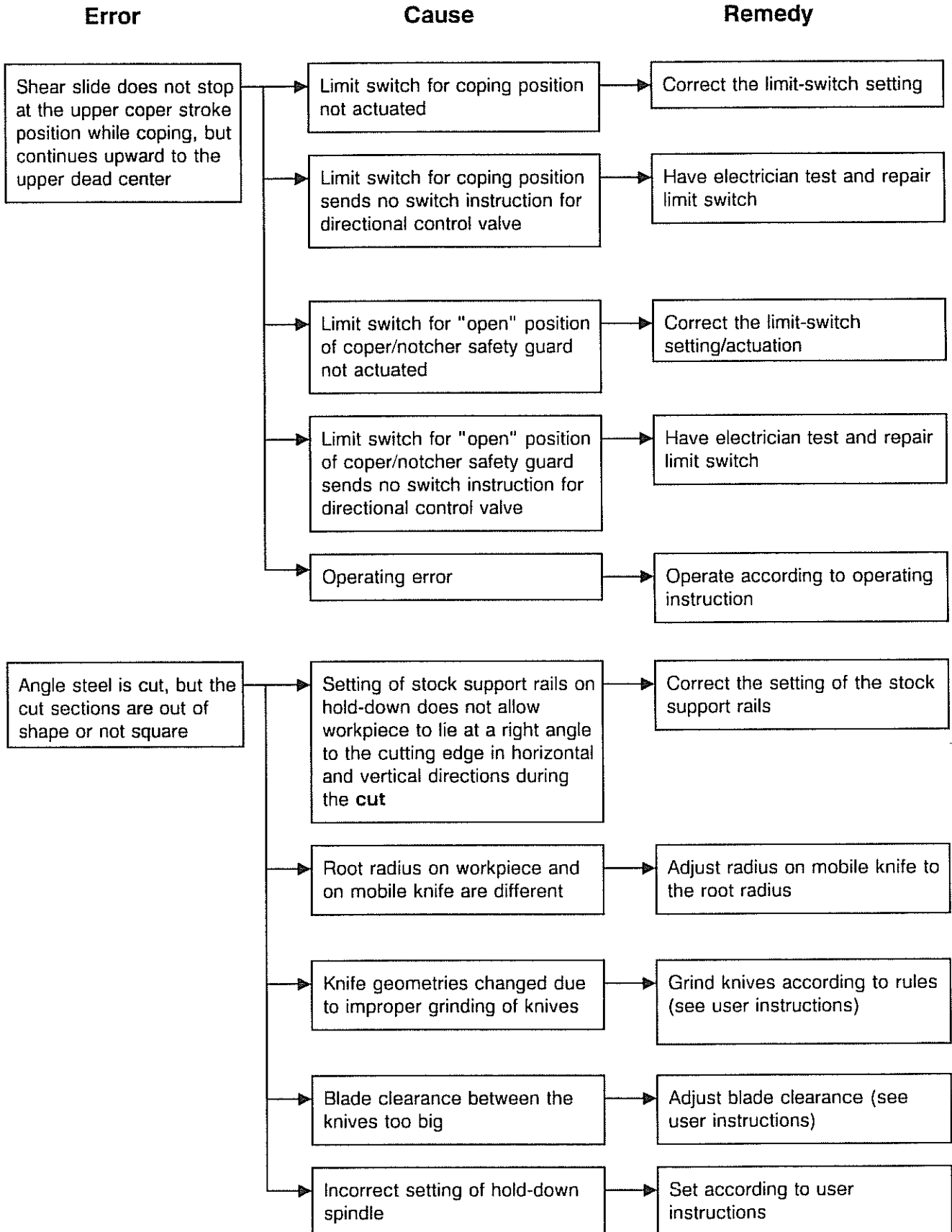
### 10.1 Machine Errors





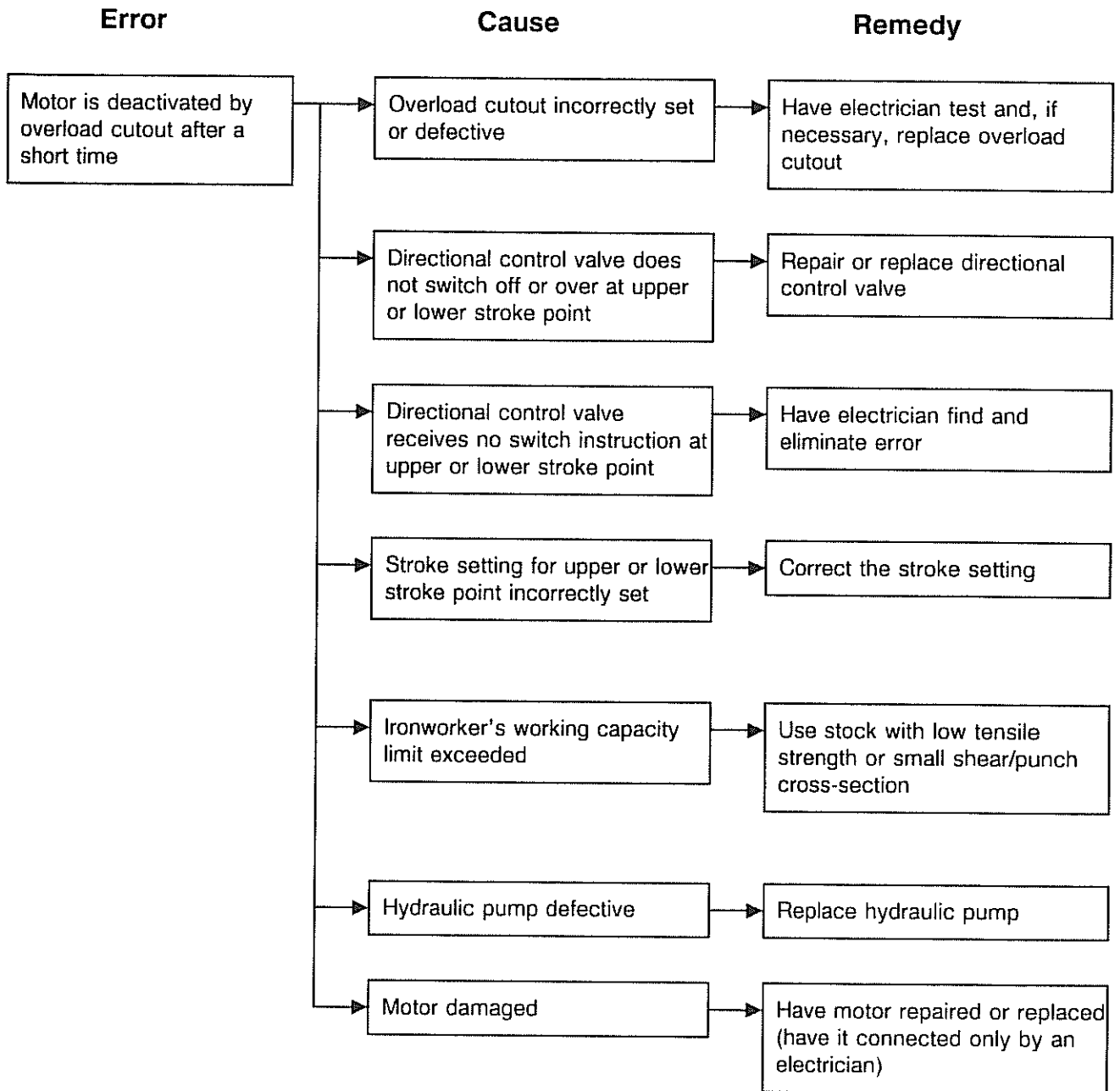


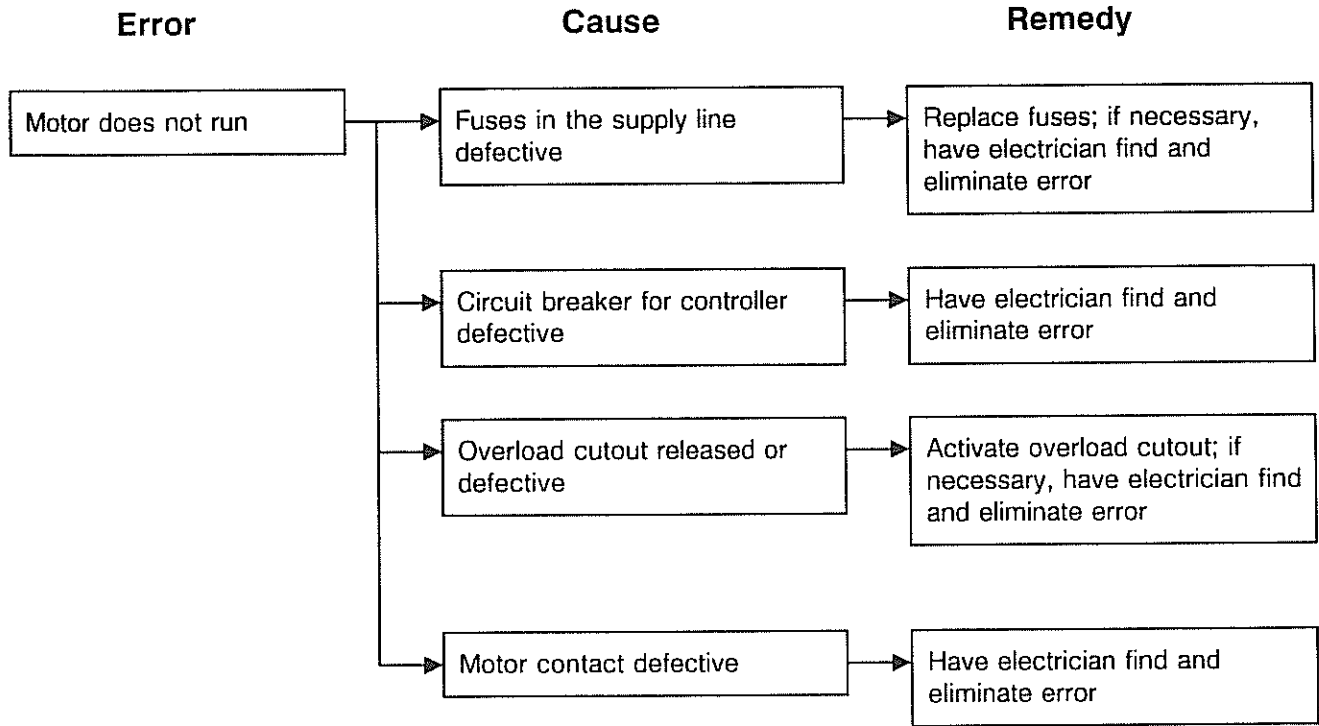






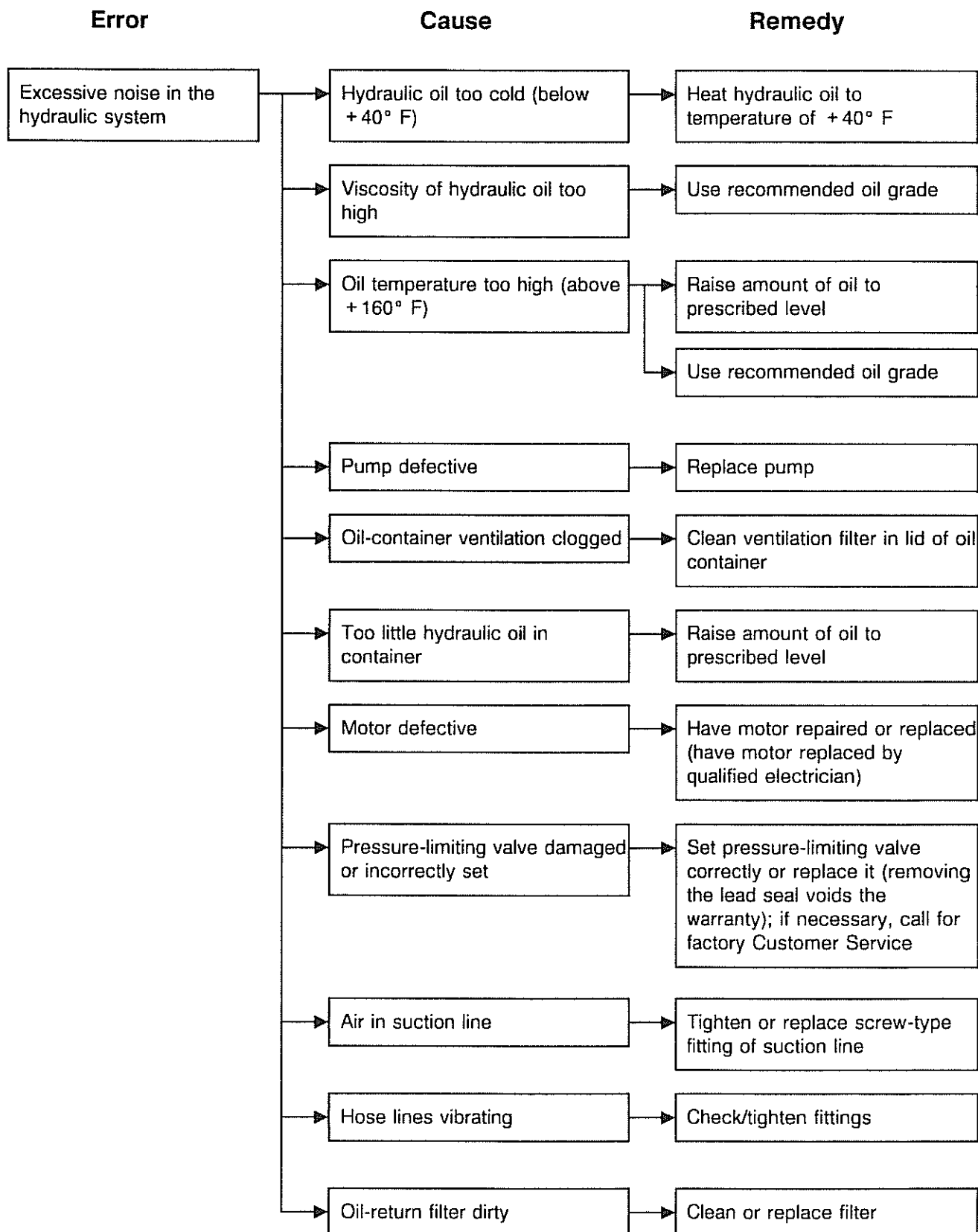
### 10.2 Electrical Errors

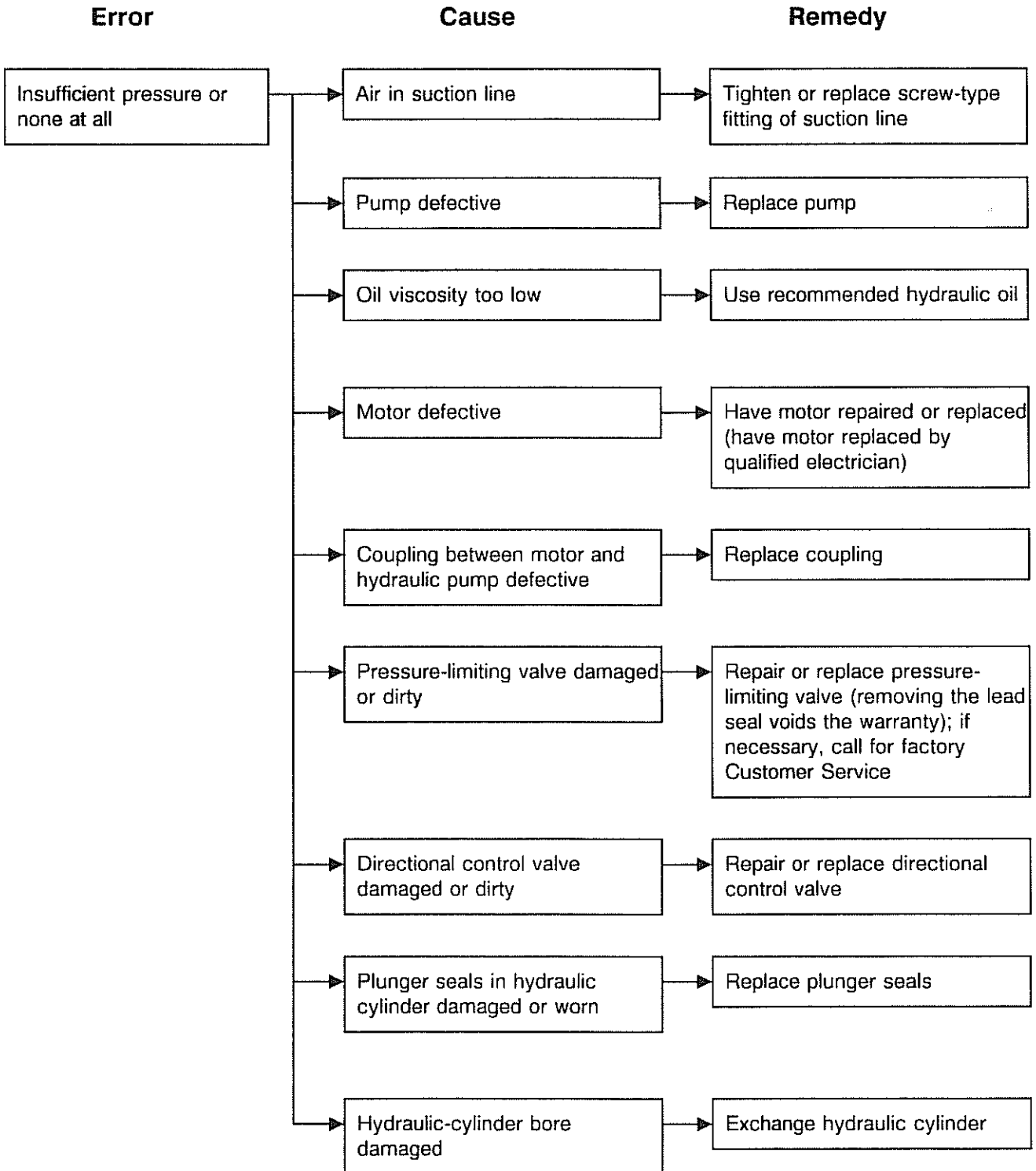


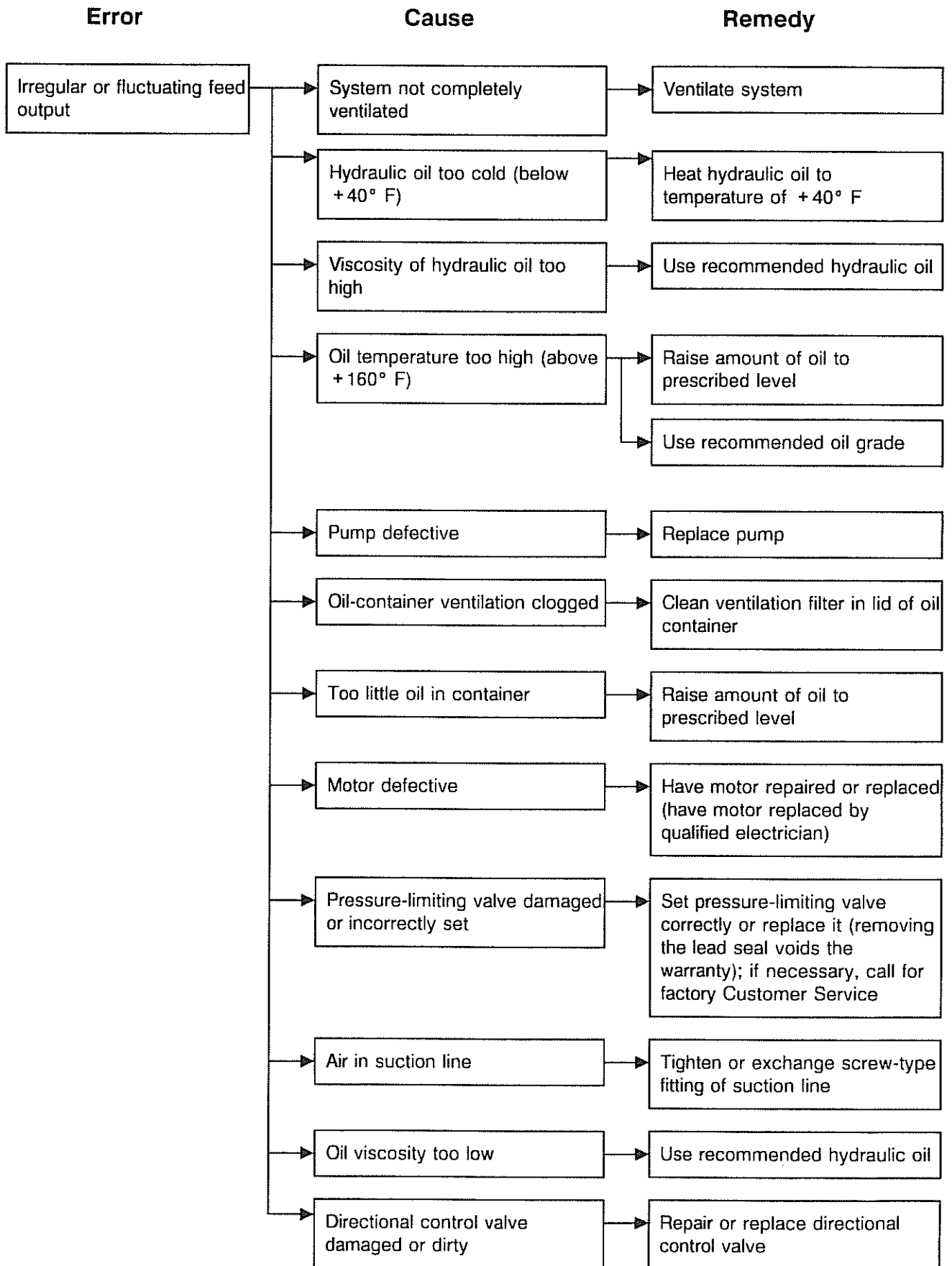


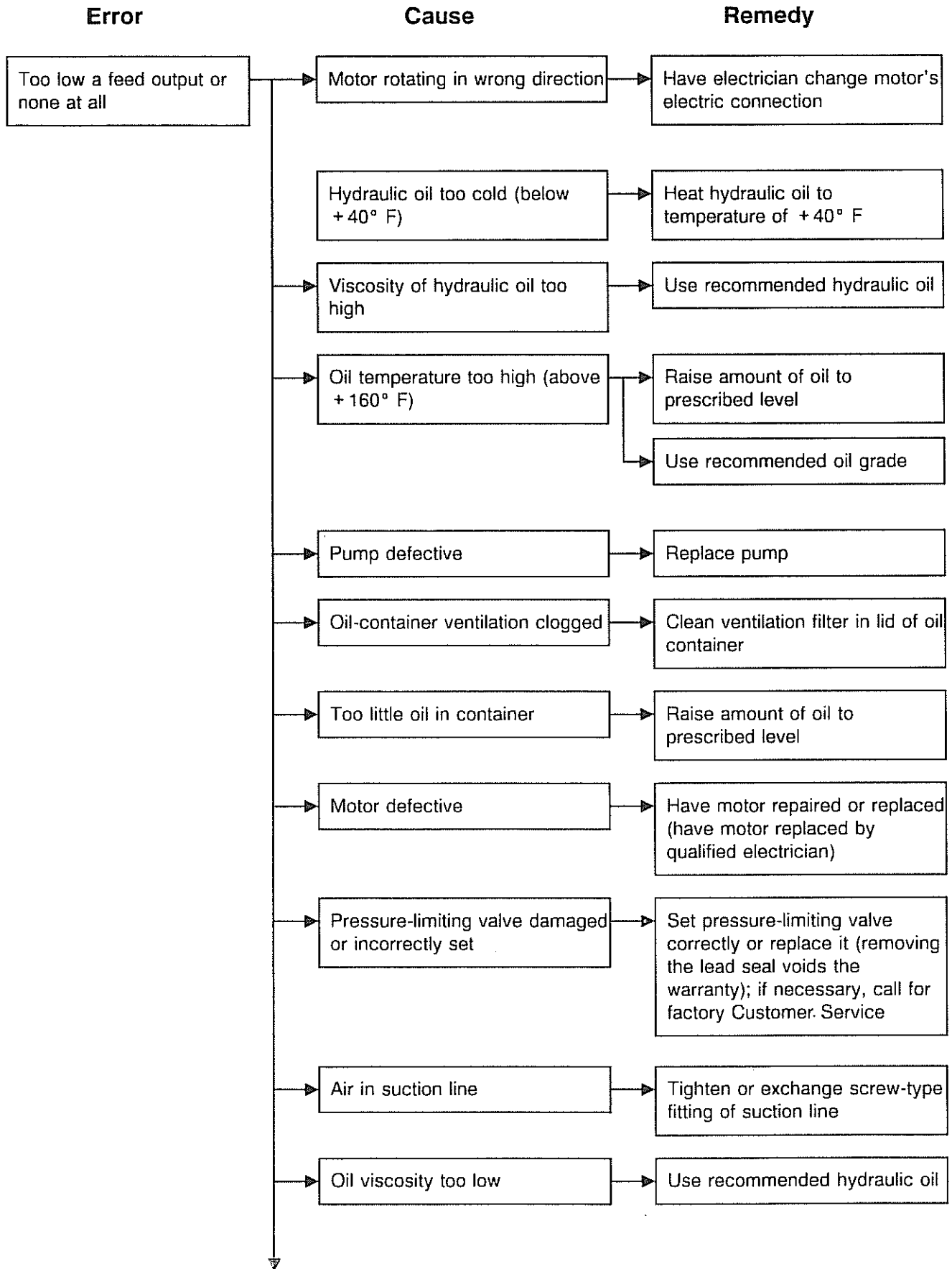


### 10.3 Hydraulic Errors

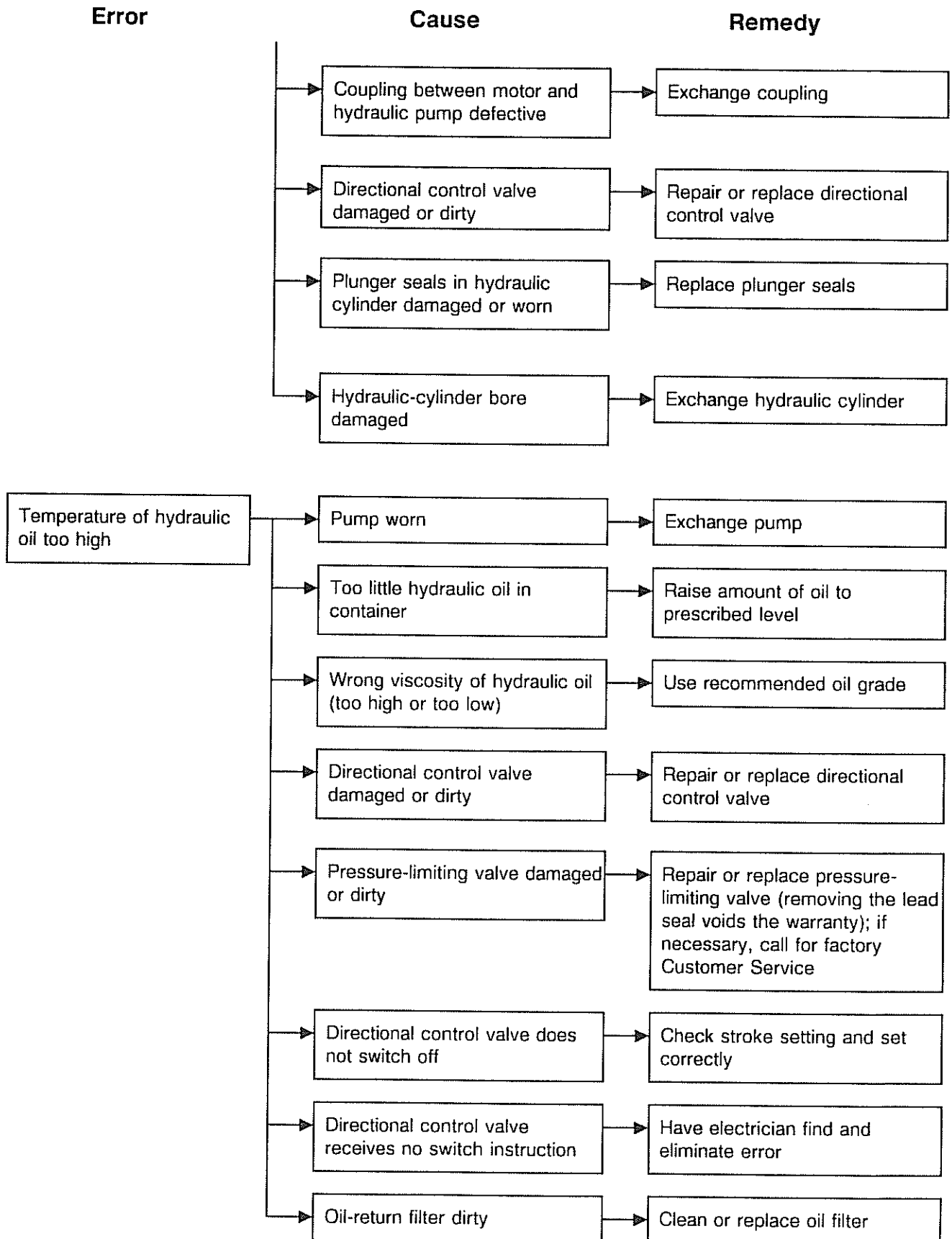


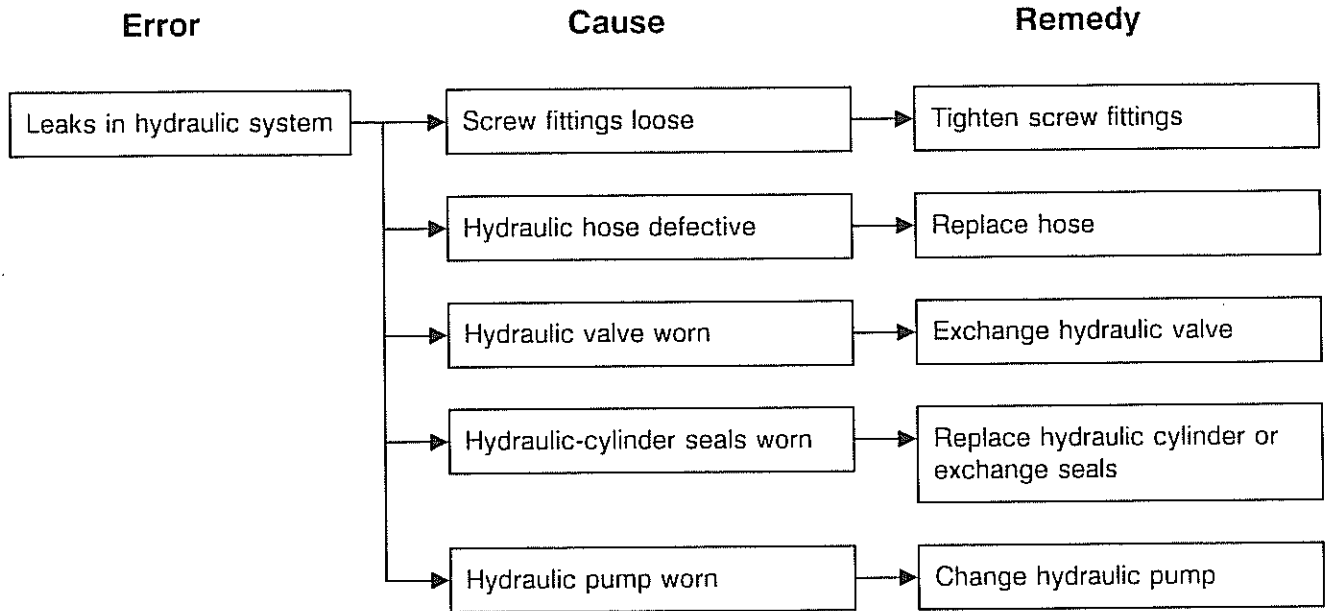














# Circuit Diagrams and Drawings



\*\*\* P A R T S L I S T \*\*\*

Offer No. : Order No. : 52/4838 01 Order

Customer: Muhr + Bender	Date of Negotiation :
Maschinenbau GmbH	Date of Receipt : 18.09.91
Auf der Schlachtwiese	Date of Handling : 18.09.91
5952 /Attendorn	Date of Delivery :
Attendorn	Number of Systems : 01

Negotiator :  
 Telephone :  
 Project Designation : Steuerungs HIW 1000 USA 01685 103 01  
 Order No. :  
 Person in Charge :  
 Manner of Delivery :  
 Drawings-No. :

Rated Current	: 29,4 A	Control Voltage	: 115 V
Main Fuse	: 35 A	Frequency-Control Voltage	: 60 Hz
Line Voltage	: 230 V	System-Control Voltage	:
Frequency-Line Voltage	: 60 Hz	Auxiliary Voltage	: V
System-Line Voltage	:	Freq.-Auxiliary Voltage	: Hz
Mains Type	:		

\*\*\*\*\*  
 \* Protective measures within the scope of this order: \*  
 \* ----- \*  
 \* This tested LV switchgear and controlgear assembly \*  
 \* corresponds to VDE 0660, part 500. \*  
 \* Parts, not belonging to the operating current cir- \*  
 \* cuit, and which can become alive in case of a fault \*  
 \* are connected to the ground wire terminal. \*  
 \* ----- \*  
 \* Further protective measures for compliance with \*  
 \* VDE 0100 ( connection N with PE ) have to be carried \*  
 \* through on site by the installation company. \*  
 \* \*  
 \*\*\*\*\*

Special Notes



\*\*\* P A R T S L I S T \*\*\*

Offer No. : Order No. : 52/4838 01 Order

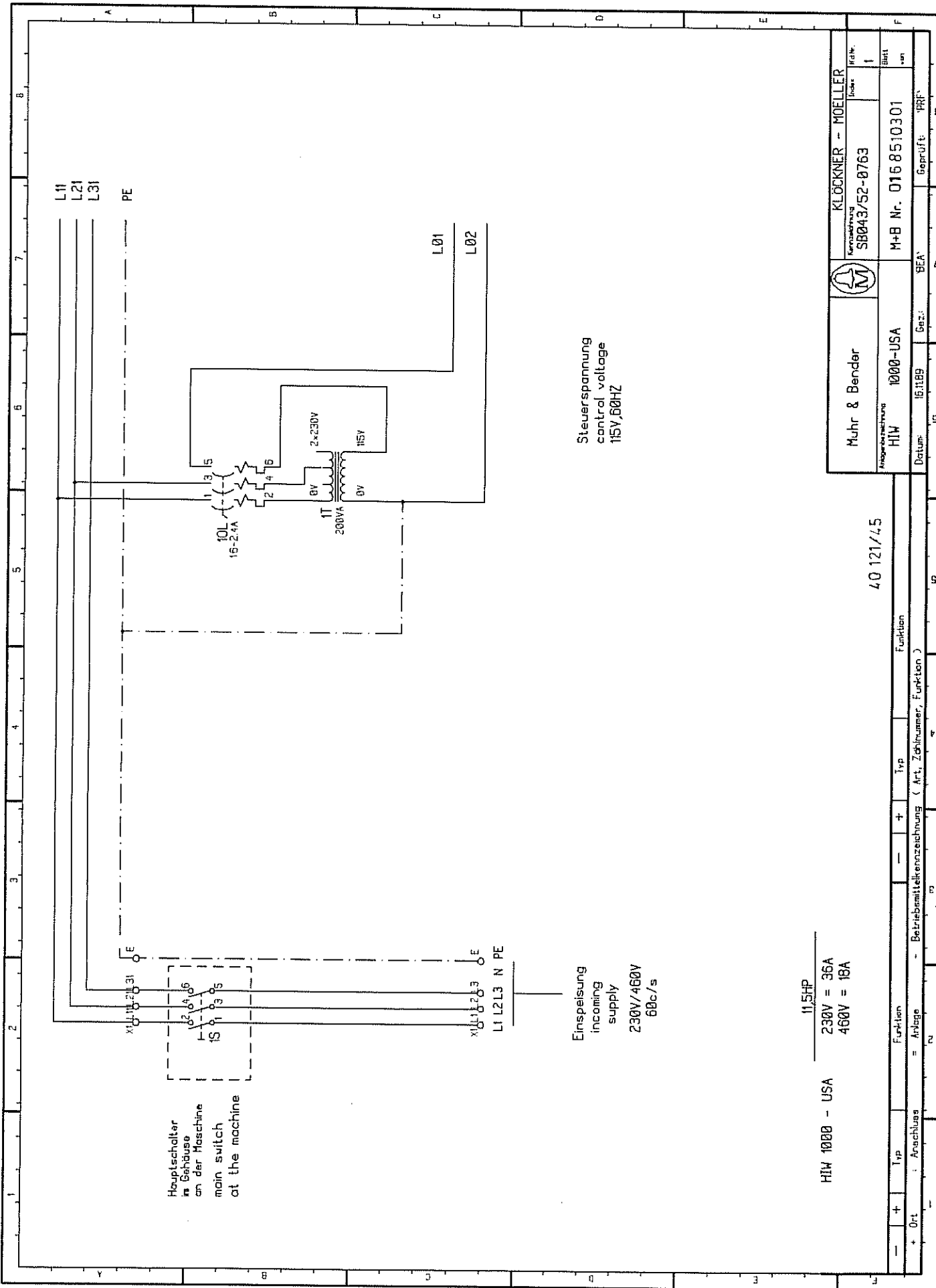
Item.	Device Markings	Type	Type Group	Quant.	L.-Price	Item.-Price
Fd 0:						
10	K	600X300X175 (WESTFA)	Enclosure	1		
20		KT16F	Blind Grommet	1		
30	1FU	Z1-40	Overload Relay	1		
40	1OL	PKZM1-2,4	Manual Motor Starter	1		
50	F 1T	STTO,260C/SPR.2X230VSEK.110-115-120V	Transformer	1		
60	1CON	DIL1AM/22(115V60HZ)	Universal Contactor	1		
70	1CR	DILR31(115V60HZ)	Universal Relay	1		
80		UKN16	Terminal Strip	6		
90		USLKG16N-1	Terminal Strip	2		
100		UK10	Terminal Strip	3		
110		USLKG10-1	Terminal Strip	1		
120	F	UKK5 (PHENIX)	Terminal	15		
130		USLKG4-1	Terminal Strip	7		
140		"EINZELLIEFERUNG"		1		
150		TM-2-8211/EZ/S-H*F*D-076389	Cam Switch	1		
160		TM-2-8219/EZ/S-R*F*D-095289	Cam Switch	1		
170		SPT6	Component	1		











Hauptschalter  
in Gehäuse  
an der Maschine  
main switch  
at the machine

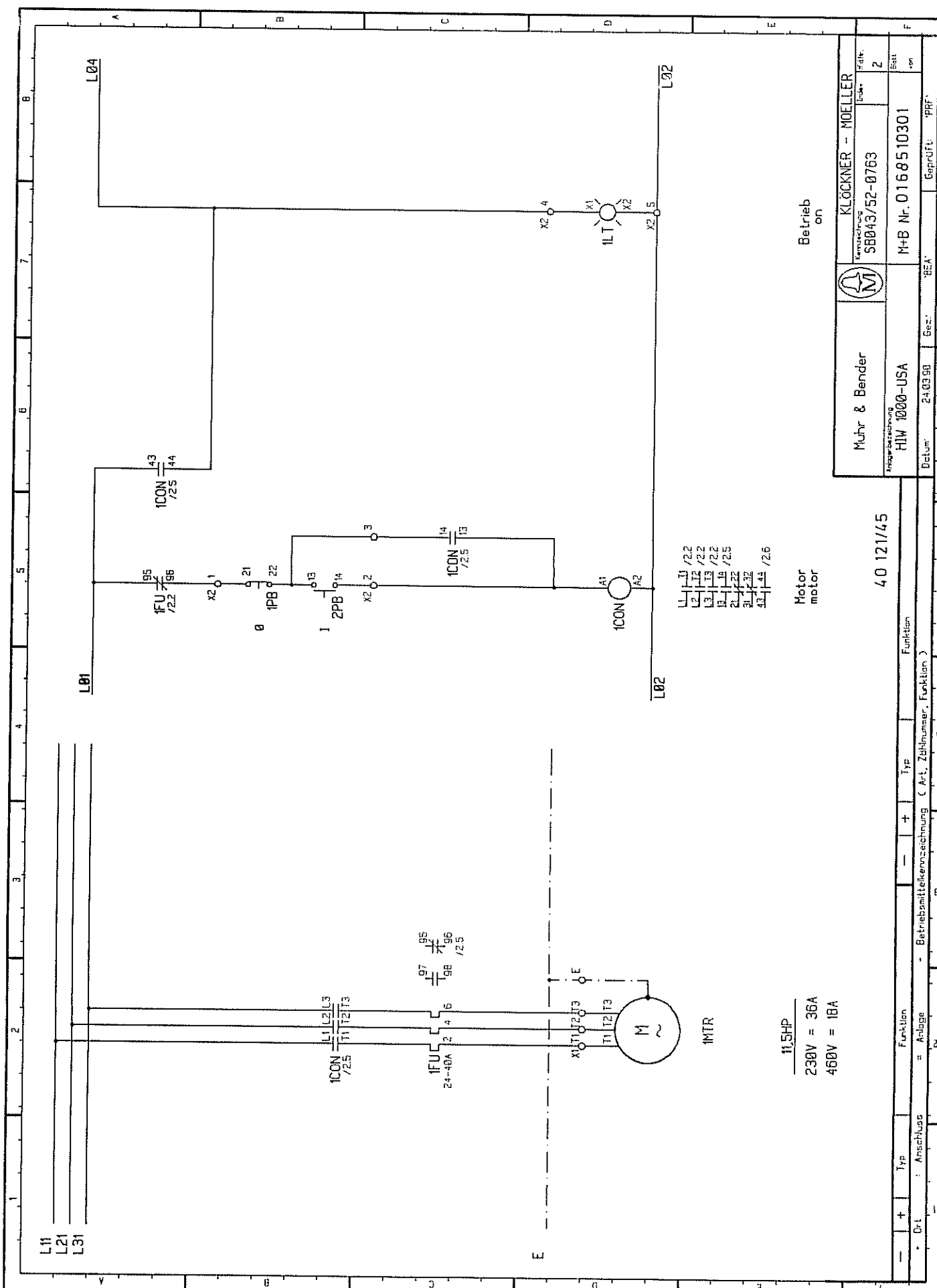
Einspeisung  
incoming  
supply  
230V/460V  
60c/s

Steuerspannung  
control voltage  
115V, 60HZ

HIW 1000 - USA 11.5HP  
230V = 36A  
460V = 18A

Kl. Nr.		Kl. Nr.	
SB043/52-0763		MOELLER	
Angezeichnet		M+B Nr. 016.8510301	
Muh & Bender		BEA	
HIW 1000-USA		Gepr.:	
Datum: 15.11.89		Geprüft: PPR	
40 121/45			
Funktion		Funktion	
= Anlage		= Betriebsmittelkennzeichnung ( Art, Zehlsnummer, Funktion )	

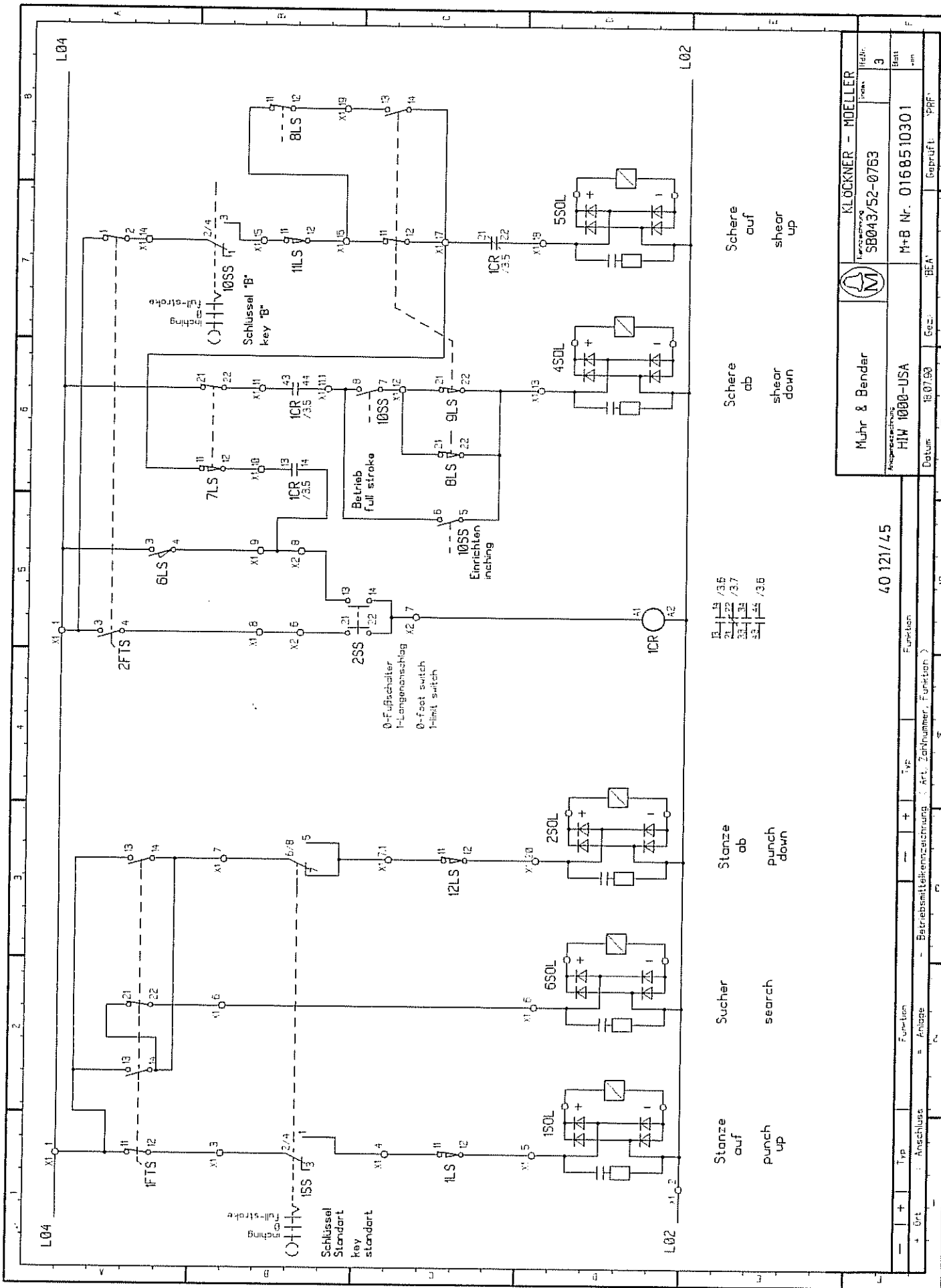




Muhr & Bender	KLÖCKNER - MOELLER
HIW 1000-USA	SB043/52-0763
24.03.90	M+B Nr. 016.85.10301
Bezeichnet	Geprüft
2	2

Motor motor		40 121/45	
Betrieb on			
1	+	Funktion	Funktion
2	-	Anlage	Betriebsmittelkennzeichnung (Art, Zahnnummer, Funktion)
3	+	Typ	Typ
4	-	Anschluss	Anschluss
5	+	Bezeichnung	Bezeichnung
6	-	Geprüft	Geprüft
7	+	Bezeichnet	Bezeichnet
8	-	2	2





Mühr & Bender		KLOCKNER - MOELLER	
HIV 1000-USA		SB043/52-0763	
Datum: 18.07.90		Geprüft: PPF	
40 121/45		Blatt 9	
H-M-B Nr. 0168510301		Blatt von	

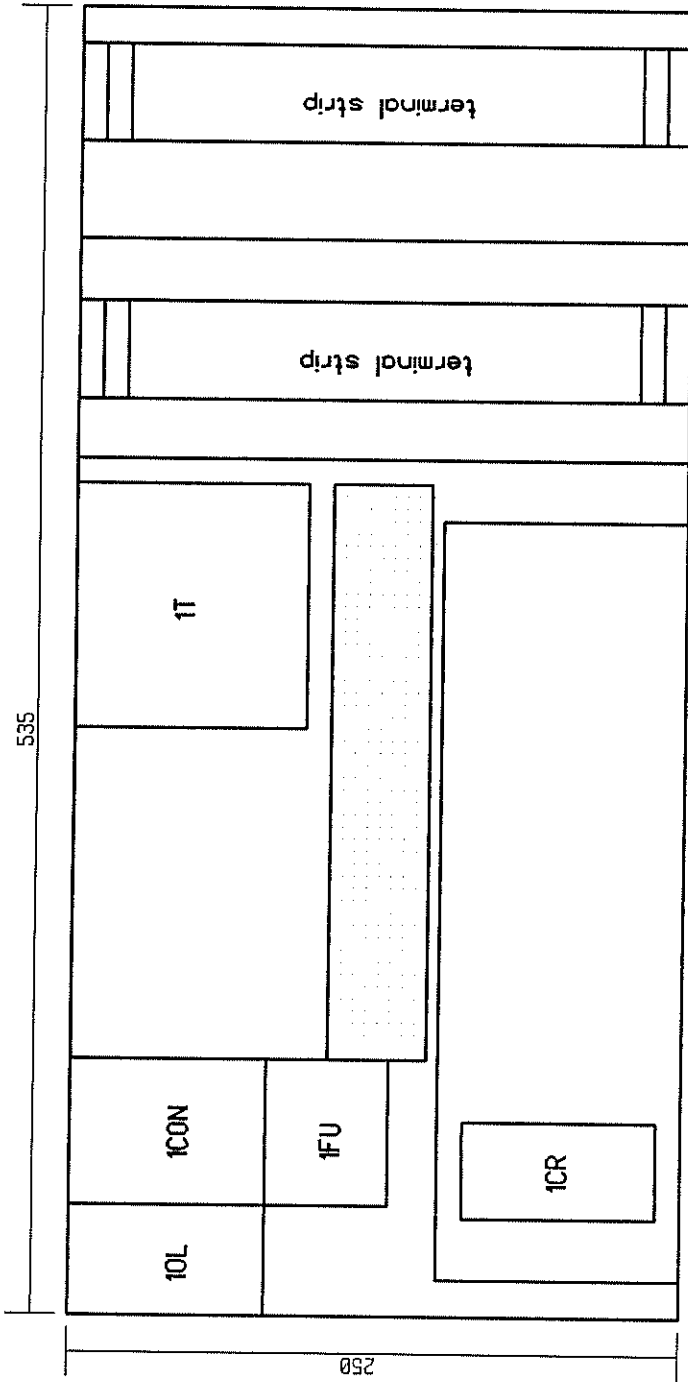








mounting plate HIW - 1000 - USA

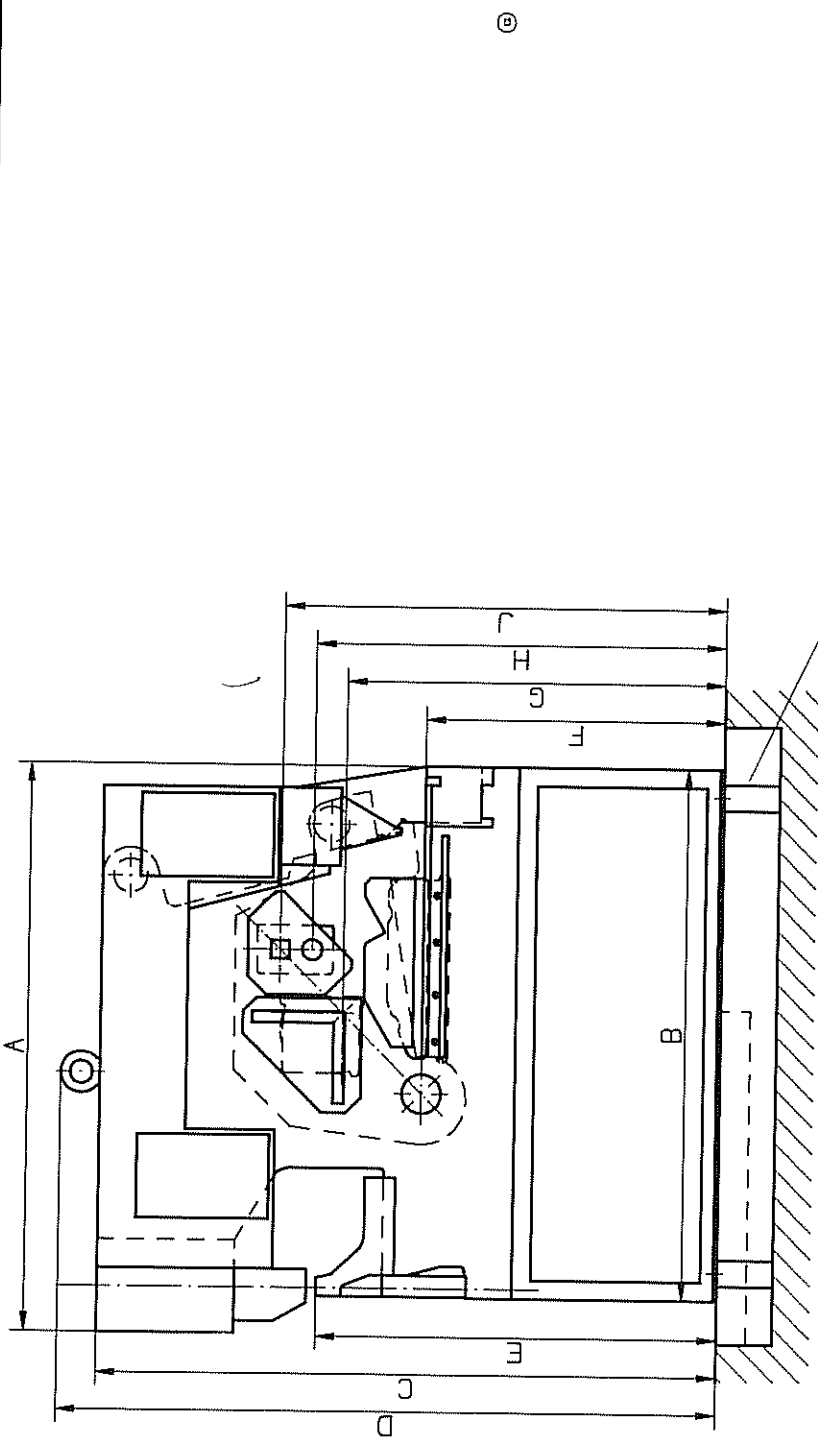


Maßstab 1:2

Muhre & Bender		KLOCKNER - MOELLER		Blatt	
HIW 1000-USA		SB0A3/52-0703		5	
M+B Nr. 0168510301		M+B Nr. 0168510301		Gepr. Uff.	
Datum: 24.03.90		Grz.: 'BEA'		'PRF'	
40 121/45			Funktions		
Anschluß			Betriebsmittelkennzeichnung ( Art, Zahnnummer, Funktion )		
Funktions			Funktions		

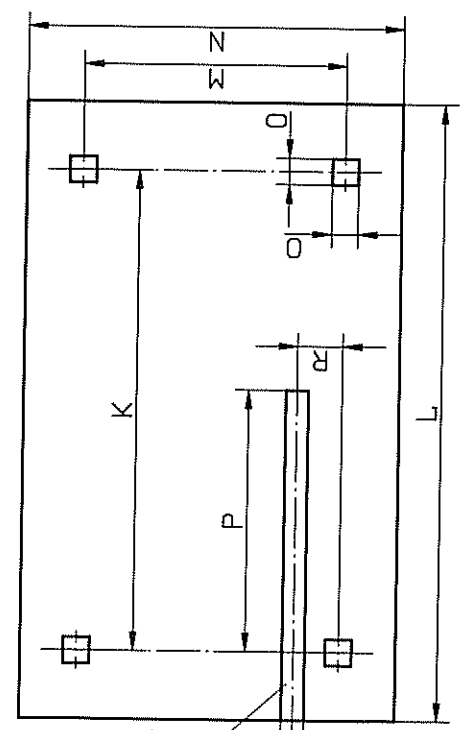


HIW 1000		
01607	01608	
mm	(inch)	
A	1850	72 3/4
B	1770	69 5/8
C	1800	70 7/8
D	1900	74 3/4
E	1135	44 5/8
F	895	35 1/4
G	1135	44 5/8
H	1235	48 5/8
J	1320	52
K	1617	63 5/8
L	1950	76 3/4
M	700	27 9/16
N	1000	39 3/8
O	70	2 3/4
P	700	27 9/16
Q	60	2 3/8
R	120	4 3/4



Tiefe je nach Bodenbeschaffenheit

Depth according to the condition of the ground  
Profondeur de la fondation d'après l'état du sol



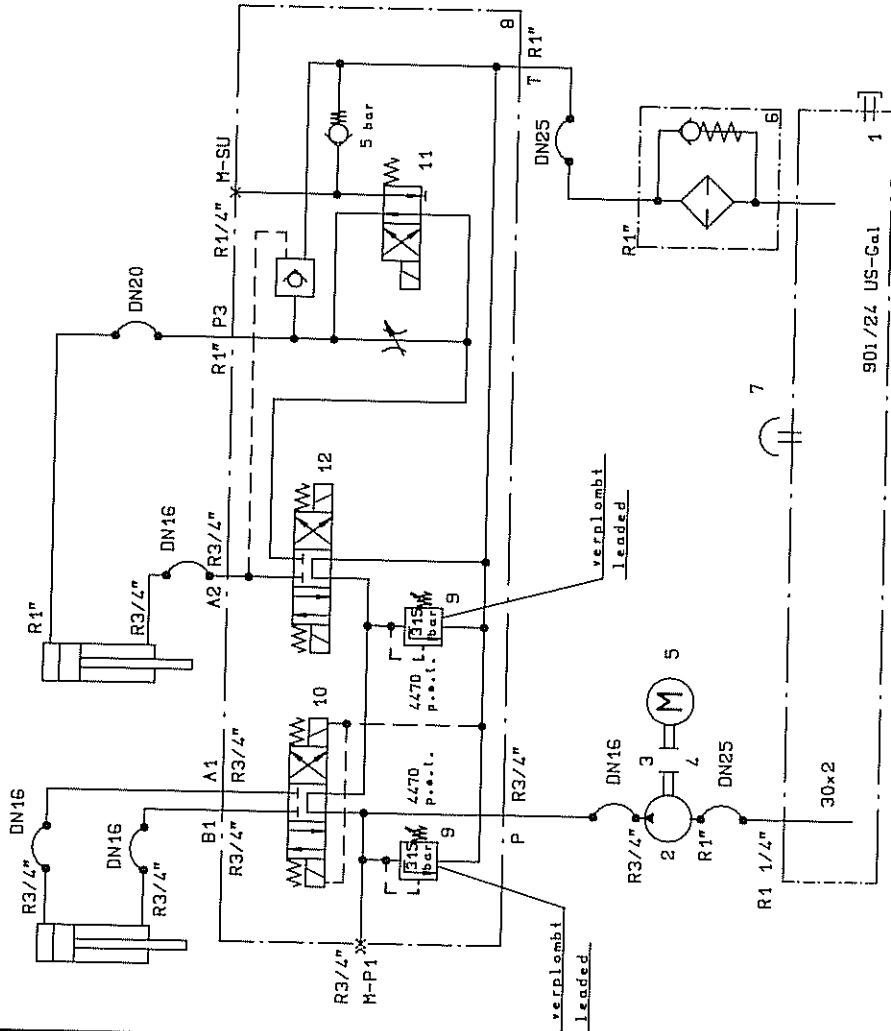
Kanal fuer Kabeleinfuehrung Richtung Betriebs  
Channel for feeding cable direction to your choice  
Canal pour cables d'alimentation

Pos.	Menge	Einheit	Benennung	Sachnummer	Bl.	Bemerkung
			Fräse- bohrer nach DIN 7168 mittel			
			1988	Datum	Name	
			Bearb.	11.05.	Rosache	
			Gepr.			
			Freig.			
			Masstab			
			Verkstoff			
			Modell-Nr.			
			Benennung		Fundamentplan Foundation drawing Plan de fondation	
			Zeichnung-Nr.		0160710307	
			Bl.		3 Bl.	
			Erstf.			

Murt und Bender  
MASCHINENBAU GMBH



Scherenzylinder Stanzzylinder  
 Shear-cylinder Punch-cylinder  
 ø170/ø110x150 ø200/ø140x70



Pos.	Menge	Bezeichnung	Denominat(ion)	Typ	Fabr(ikat)
12	1	Magnetventil 1, 2kpl.	Solenoid valve	VEE4/3-10-207/96V=	HEYPPFA
11	1	Magnetventil 1, 2kpl.	Solenoid valve	VEF4/2-10-111a/96V=	HEYPPFA
10	1	Magnetventil 1, 2kpl.	Solenoid valve	VEE4/3-10-207-S1/96V=	HEYPPFA
9	2	Überbegrenzungsventil 1, 2kpl.	Pressure relief valve	HV 03134.1	HEYPPFA
8	1	Montageplatte 1kpl. mit 1 einstellbarem Drassel - ventill und 2 Rück-schlagventilen	Mounting plate with 1 throttle valve, 2 check valve	HM 03188	HEYPPFA
7	1	Einleit- und BelüftungsfILTER	Filter assembly	TF/1	HEYPPFA
6	1	RücklaufFILTER	Return passage filter	MPF 10/20	HEYPPFA
5	1	DN - Motor	DN - Motor	AP132 M 83/85 B, 5kW 1750min-1	Brünnbau
4	1	Kupplung	coupling assembly	GE 383 B	HEYPPFA
3	1	Pumpentraeger	pump support	L 303 B	HEYPPFA
2	1	HD - Pumpe	HD - pump	HDP 30.22	HEYPPFA
1	1	Ölbehälter	oil tank	901/24 US-Gal	
		Benennung	Denominat(ion)	Typ	Fabr(ikat)
		Fräsmaschine			
		toleranz			
		DIN 7168			
		mittel			
		Jahr	Datum	Name	
		1988	21.04.	Ruesche	
		Bearb.	Gepr.	Ruesche	
		Freig.			
Benennung: Hydraulikplan Hydraulic system Hydraulik-Steuerung mit Sucherföhrung					
Zeichnungs-Nr.: 01608 103 01					
Blatt: 1 Bl.					
Erzd.:					

**Wahlbinder**  
 MASCHINENBAU GMBH

