5

Toolsetting

5 Toolsetting

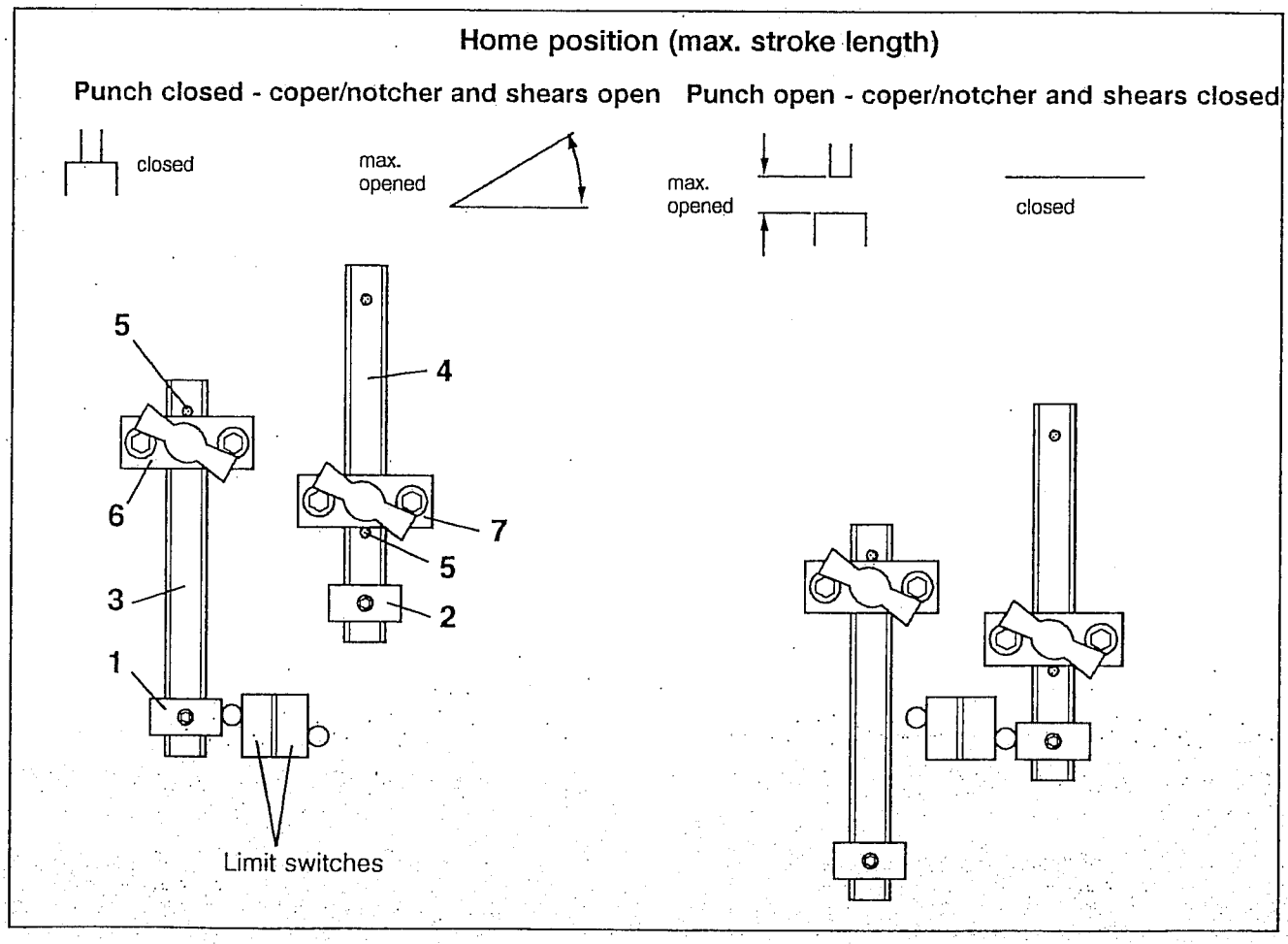
5.1 Setting the Maximum Stroke Length

The switch racks (3 and 4) for setting the stroke length are located behind the doors for the stroke setting (F).

The stroke length is controlled by the two trip cams (1 and 2) on the switch racks (3 and 4). If the switch racks are in their home position, the workstations perform the maximum stroke.

In the home position, the limit stop (5) of the left switch rack (3) must be touching the guide element (6). The lower limit stop (5) of the right switch rack (4) must be touching the guide element (7). The limit stops must not be removed.

The stroke length should always be set to allow work to be done with the shortest possible stroke. Setting the stroke length (reduced work stroke) is described in sections 5.1.1 and 5.1.2.



5.1.1 Setting the Stroke Length for the Holepunch

- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

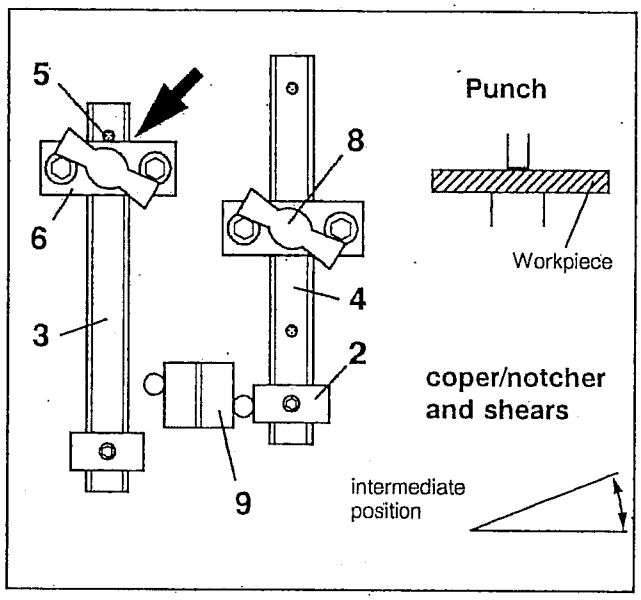
The carriage moves up to the punch starting position.

- Turn the selector keyswitch (D) to "Punch toolsetting".
- Open doors for stroke setting.
- If necessary, bring the left switch rack (3) into its home position.
  The limit stop (5) should then be touching the guide element (7) (arrow).
- With the footpedal (G) in position 2 "Down (search)", carefully move the punch until it is shortly above the workpiece to be machined.
- Loosen the T-screw (8).
- Slide the switch rack (4) down until the trip cam (2) is touching the roller of the limit switch (9).
  This gives you the proper (reduced) stroke length.
- Tighten the T-screw (8).
- Turn the selector keyswitch (D) to "Punch operation".

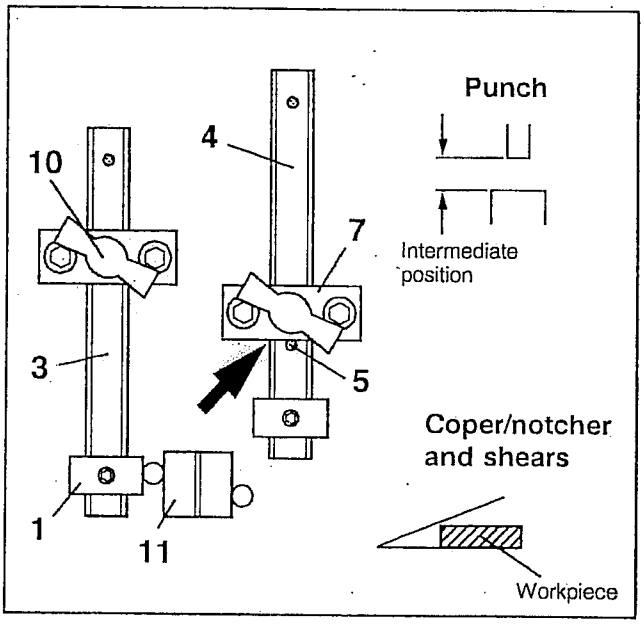
The carriage moves up to the punch starting position.

- Perform a trial stroke and correct the setting, if necessary.
- Close the doors for stroke setting.
- Switch off the ironworker.

Note
Using the above setting procedure for the stroke length will shift the coper/notcher and shears' upper stroke point.
If, by way of exception, the lower stroke point is shifted (not necessary with standard tool), proceed according to section 5.1.2.



5.1.2 Setting the Stroke Length for the Coper/Notcher and Shears



- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Coper/notcher and shears operation".

The carriage moves up to the shears starting position.

- Turn the selector keyswitch (D) to "Coper/notcher and shears toolsetting".
- Open doors for stroke setting.
- If necessary, bring the right switch rack (4) into its home position. The **lower** limit stop (5) should then be touching the guide element (7) (arrow).
- With the footpedal (G) in position 2 "Down (search)", carefully move the knife and coper/notcher until it is shortly above the workpiece to be machined.
- Loosen the T-screw (10).
- Slide the switch rack (3) up until the trip cam (1) is touching the roller of the limit switch (11). This gives you the proper (reduced) stroke length.
- Tighten the T-screw (10).
- Turn the selector keyswitch (D) to "Coper/notcher and shears operation".

The carriage moves up to the shears starting position.

- Perform a trial stroke and correct the setting, if necessary.
- Close the doors for stroke setting.
- Switch off the ironworker.

Note
Using the above setting procedure for the stroke length will shift the punch's upper stroke point. If, by way of exception, the lower stroke point is shifted (not necessary with standard tool), proceed according to section 5.1.1.

- Close the safety cover of the coper/notcher.

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

5.2 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 selector keyswitch to "O" and remove the key.

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

Defective or worn knives or tools should not be used.

5.2.1 Determining Punch and Die Clearance

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

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

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

5.2.2 Centering the Tools

Punch and die must be properly aligned.

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

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

- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the shears starting position.

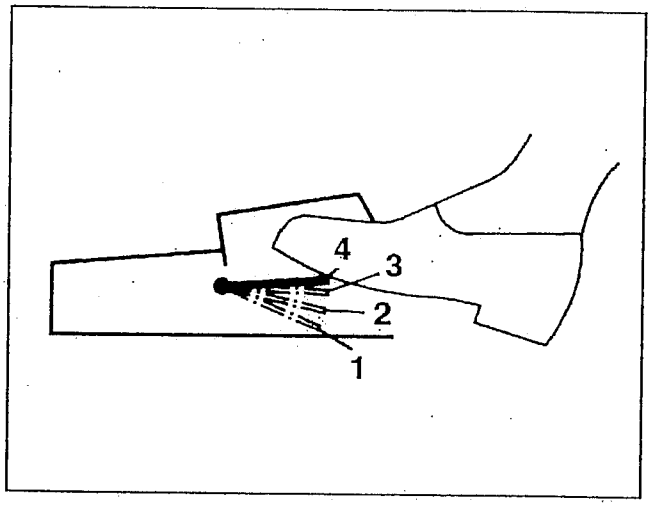
- Turn the selector keyswitch (D) to "Punch toolsetting".
- Open the stripper.
- With the footpedal (G) in position 2 "Down (search)" carefully lower the punch into the die.

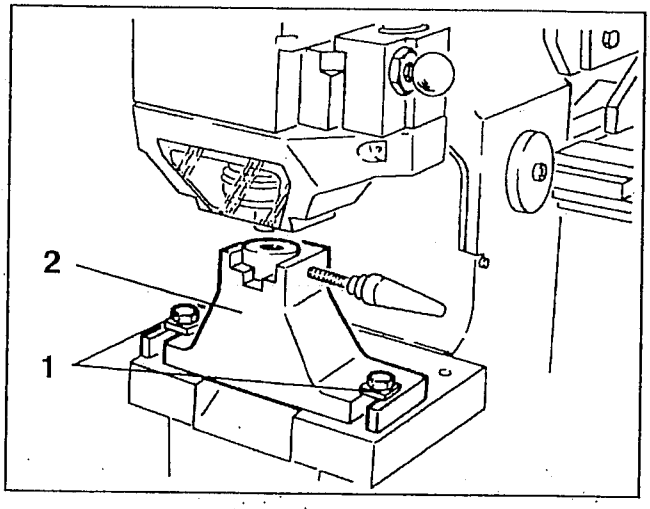
Use extreme caution when entering the punch into the die. Make certain that the punch does not touch down upon the die.

- Switch off the ironworker.
- Loosen the fastening screws (1).
- Shift the punch saddle forward, backward or sideways.
- Tighten the fastening screws (1).
- Switch on the ironworker.
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.

- Close the stripper.
- Switch off the ironworker.





5.3 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 selector keyswitch to "O" and remove the key.

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

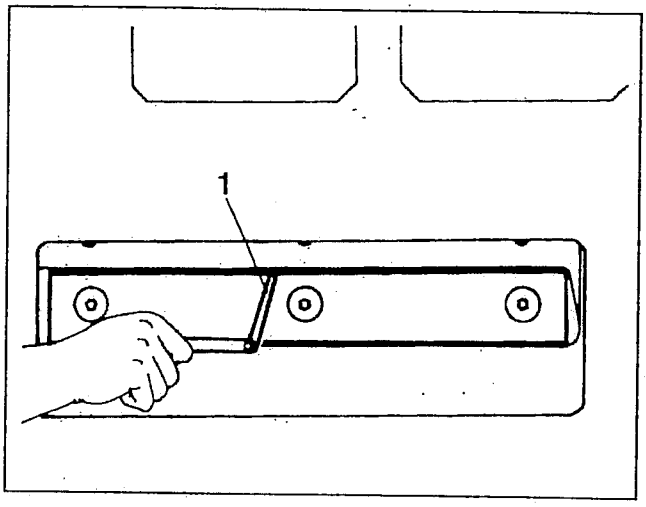
Defective or worn knives or tools should not be used.

5.3.1 Checking and Setting the Blade Clearance

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

- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Toolsetting of coper/notcher and shears".
- With the footpedal (G) in position 2 "Down (search)", carefully move the carriage to the lowermost position.

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



- Switch off the ironworker.
- Using a feeler gauge (1), check the blade clearance from the back of the ironworker over the entire knife length.
- The blade clearance should be 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 carriage guideway will have to be adjusted (see section 6.2).

  If the carriage guideway is adjusted, the blade clearance might become too small due to metal foils 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 foils (see also section 7.2.2).
- **Too small a blade clearance** is only possible if there are no genuine knives installed, the carriage guideway was adjusted or the knife was already backed with foils.
  To remedy this, remove the inserted foils, install genuine knives, or adjust the carriage guideway (note blade clearance of angle-steel and bar-steel shears).

  Note
  The blade clearance for very thin stock is permitted to be smaller than 0.008 inch.
- Switch on the ironworker.
- Turn the selector keyswitch (D) to "Operation of coper/notcher and shears".

The carriage moves up to the shears starting position.

- Switch off the ironworker.

5.4 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.

Defective or worn knives or tools should not be used.

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

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

5.4.1 Checking and Setting the Blade Clearance

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

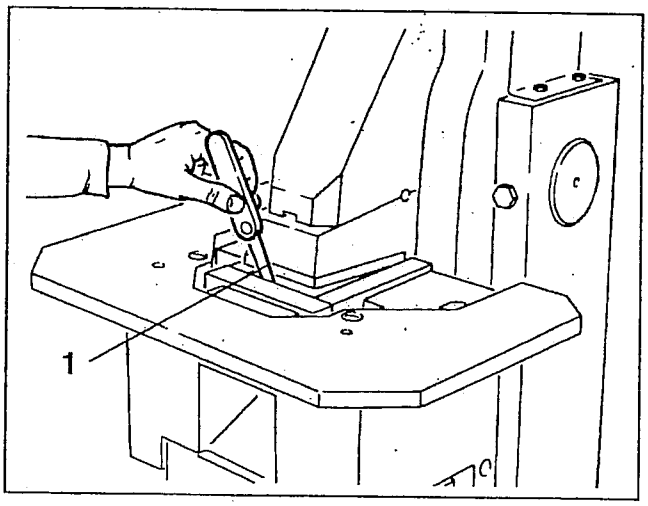
The blade clearance between the upper knife and the lower knives must be equal.

- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Toolsetting of coper/notcher and shears".
- Open the safety hood.
- With the footpedal (G) in position 2 "Down (search)", carefully move the carriage down until the cutting edges of the upper knife have gone into the lower knives.

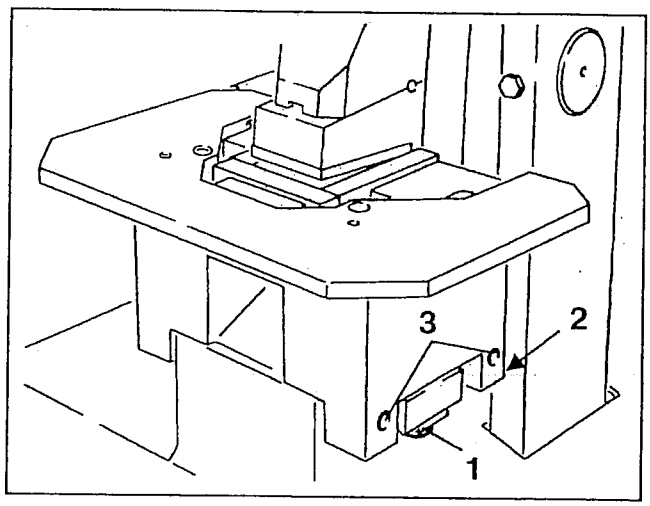
Proceed with extreme caution, so that the top knife does not touch the bottom knives.

- 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 the knives were ground on the flat side - see section 8.3.2).
  For removing the knives, see section 7.3.2.



- 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 section 4.2).
- Turn the selector keyswitch (D) to "Operation of coper/notcher and shears".



The carriage moves up to the shears starting position.

- Close the safety hood.

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

- Switch off the ironworker.

5.5 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 are to be replaced with new ones.

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

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

Defective or worn knives or tools should not be used.

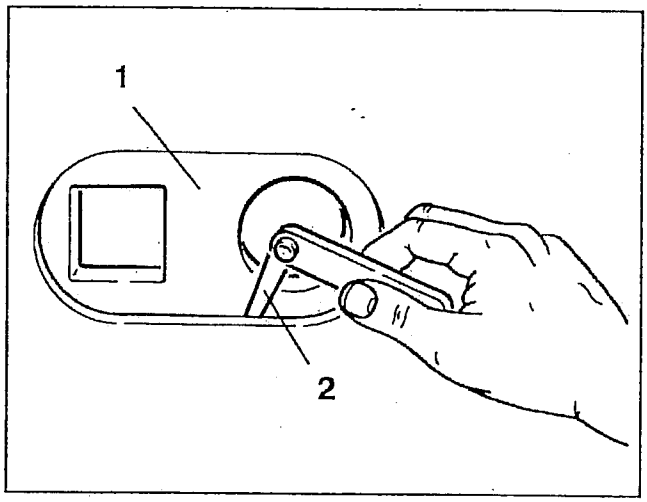
5.5.1 Checking and Setting the Blade Clearance

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 machine (see section 4.2).
- Turn selector keyswitch (D) to "Operation of coper/notcher and shears".

The carriage moves up to the shears starting position.



- Switch off the ironworker.
- Remove the hold-down (see section 7.4.1)
- Push the stationary knife (1) back against the mobile knife.
- Using a feeler gauge (2), check the blade clearance between the machine frame and the stationary knife.
- 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 flat-steel and angle-steel shears.
  If the blade clearance of all three types of shears is too big, the carriage guideway will have to be adjusted (see section 6.2).

  If the carriage guideway is adjusted, the blade clearance might become too small due to metal foils inserted earlier.

  If the bar-steel shear's blade clearance is the only clearance that is too big, reduce the clearance by backing the stationary knives with foils (see also section 7.4.1).
- **To small a blade clearance** is only possible if there are no genuine knives installed, the carriage guideway was adjusted or the knives, of adjust the carriage guideway (note cutting play of flat-steel and angle-steel shears).
- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Operation of coper/notcher and shears".

The carriage moves up to the shears starting position.

- Switch off the ironworker.
- Reattach the hold-down (see section 7.4.4).

5.6 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 are to be replaced with new ones.

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

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

Defective or worn knives or tools should not be used.

5.6.1 Checking and Setting the Blade Clearance

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

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

- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Toolsetting of coper/notcher and shears".

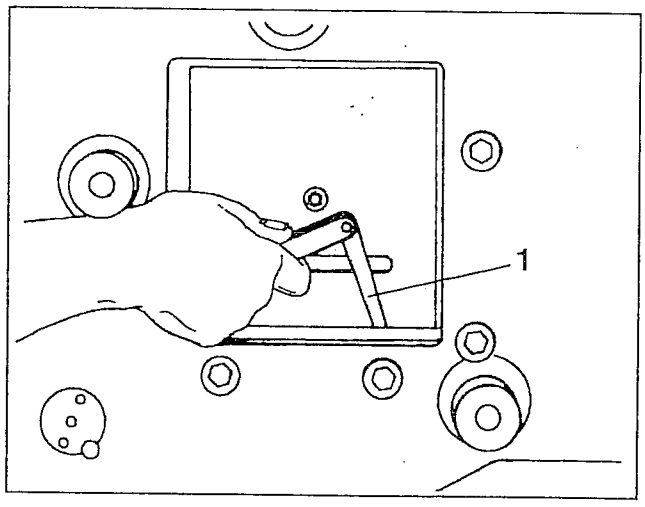
- With the footpedal (G) in position 2 "Down (search)", carefully move the carriage to the lowermost position.

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

- Switch off the ironworker.
- Remove the hold-down (see section 7.5.1).
- Using a feeler gauge (1), check the blade clearance along the entire cutting edge.
- The blade clearance should be between 0.008 inch and 0.012 inch.
- 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 carriage guideway will have to be adjusted (see section 6.2).

  If the carriage guideway is adjusted, the blade clearance might become too small due to metal foils 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 foils (see section 7.5.3).
- **Too small a blade clearance** is only possible if there are no genuine knives installed, the carriage guideway was adjusted or the knives were already backed with foils.
  To remedy this, remove the inserted foils, install genuine knives, or adjust the carriage guideway (note blade clearance of flat-steel and bar-steel shears).



- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Operation of coper/notcher and shears".

The carriage moves up to the shears starting position.

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

6

Maintenance

6 Maintenance

6.1 Knives and Tools

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

Blades and tools must be periodically resharpened. 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.

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

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

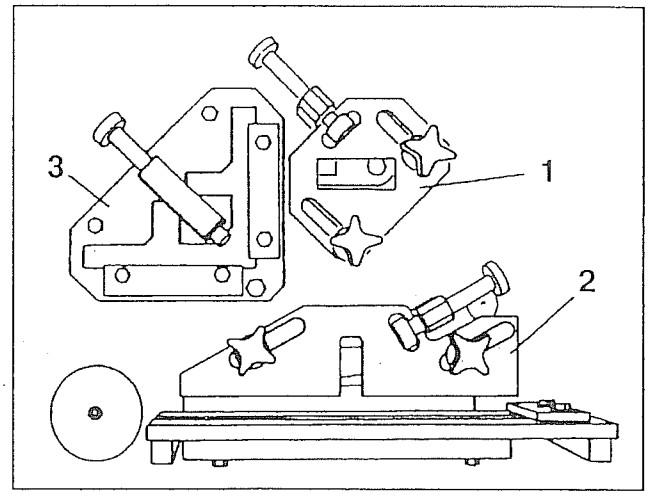
Whenever working near the cutting and punching tools, the ironworker must be deactivated by turning the main switch (E) off. Secure the main switch with a padlock.

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

6.2 Readjusting the Carriage Guideway

The shear carriage runs in altogether 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 carriage are also subjected 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.

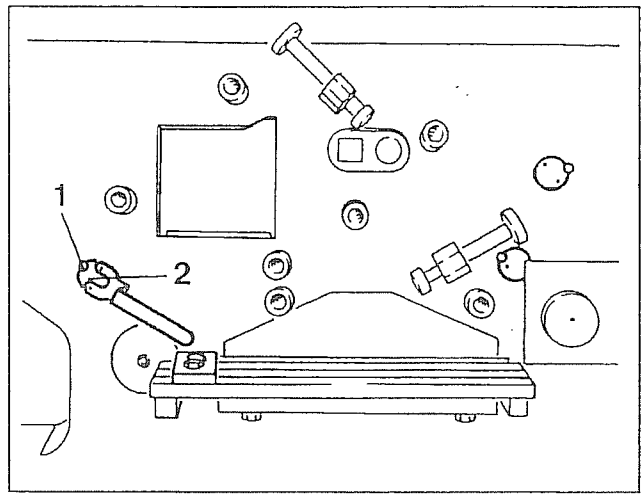
To reset the carriage guideway, the hold-downs must be removed and the coping saddles detached.



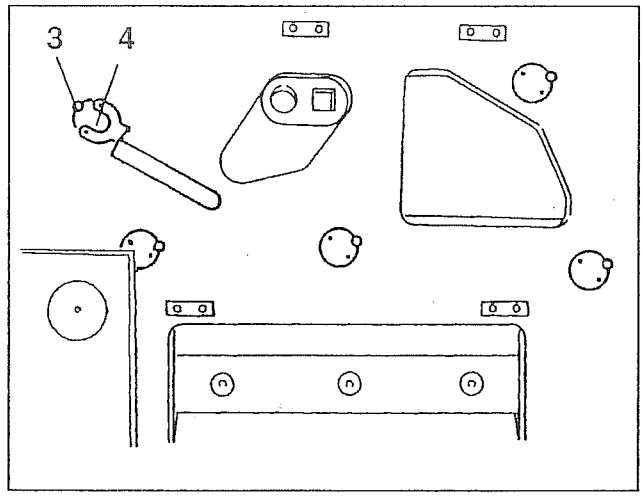
6.2.1 Preparations

- 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.

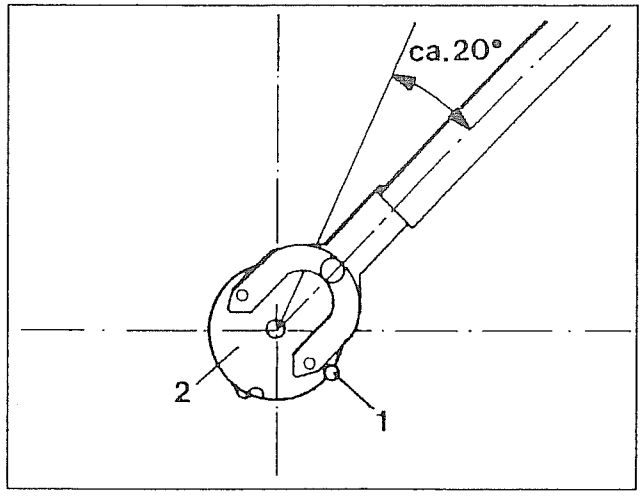
6.2.2 Setting the Carriage Guideway



- Switch on the ironworker (see section 4.2).
- Set the selector keyswitch (D) to "Toolsetting of coper/notcher and shears".
- Using the footpedal (G), move the carriage to the lowermost position.
- Switch off the ironworker.
- Remove all tapping screws (1) on the front of the ironworker.
- Loosen the four guide rollers (2) (one full turn).
- Unscrew the tapping screws (3) on the back of the machine and remove them.



- Adjust the six 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 5.3.1, 5.5.1 and 5.6.1).
- 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 (2) on the front of the ironworker all the way, then loosen them 1/16 of a turn (about 20 degrees). This will give the carriage the proper running fit.



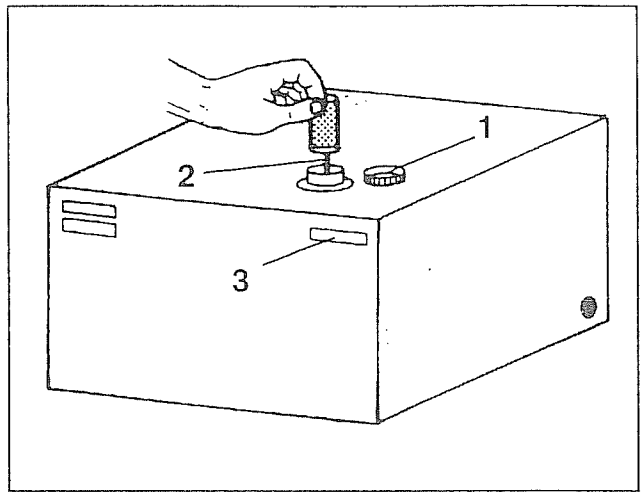
- Drill the guide rollers (2) in this off-center position (drill diameter 0.177 inch).
- Insert the locking screws (1) and tighten them all the way.

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 coper/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).
- Attach punch according to section 7.1.1.
- Check centering of punching tools according to section 7.1.3.

6.3 Hydraulic System

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



6.3.1 Checking the Oil Level

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

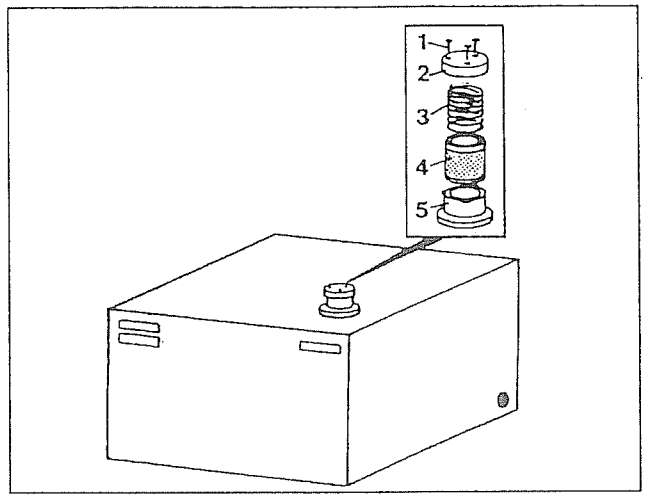
6.3.2 Refilling the Oil

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

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

- Remove the cap (1).
- Refill with oil until the oil level is about 2 cm 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 operating hours.
Routine cleaning of the filter should be done every 600 operating hours.
The same intervals apply to changing disposable filters.

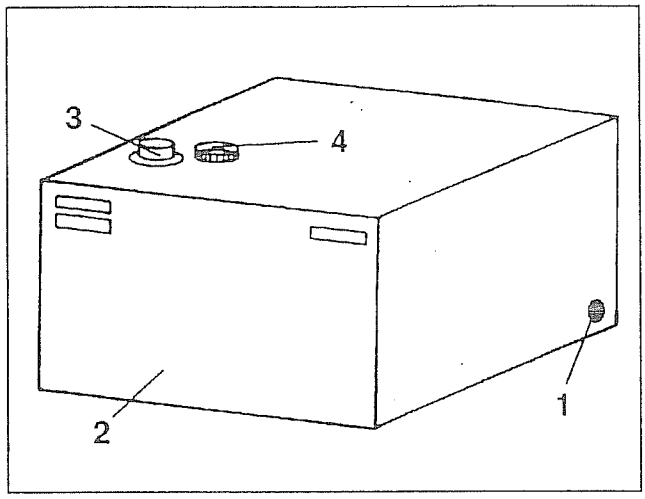
- Open the cover panel at the base.
- Unfasten screws (1) and take off filter cover (2).
- Remove spring (3).
- Pull out filter element (4).
- Clean filter element in scavenging oil or, even better, use new filter element.

Water, lyes or kerosene are unsuitable as cleaning agents.

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

6.3.4 Changing the Oil

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



With every oil change, also change the oil filter.

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

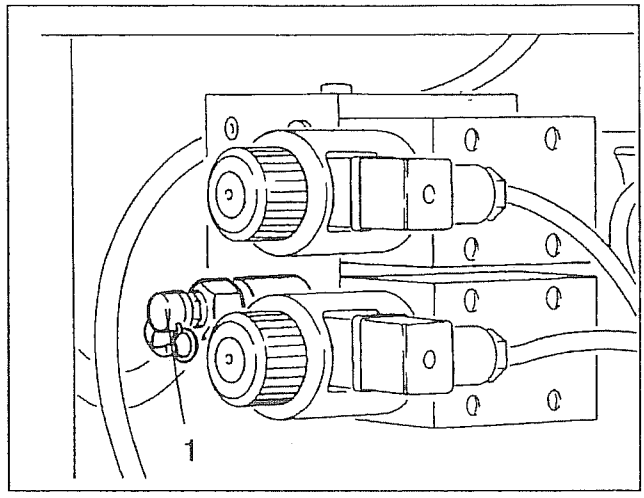
- Open the cover panel on the base.
- Unscrew the oil drain plug (1).
- Drain the used oil.

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

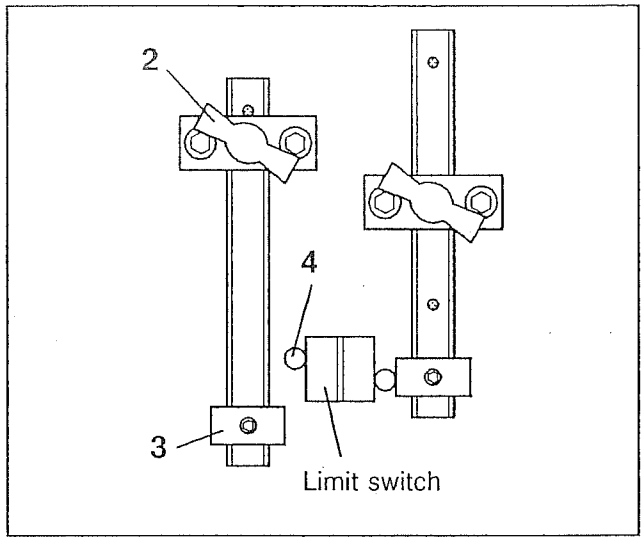
- Clean the oil container (2) and the hydraulic system with scavenging oil.
- Clean sealing surfaces of filler neck (3) and cap (4).
- Check seal of oil drain plug (1) and, if necessary, change.
- Insert oil drain plug (1) and screw tight.
- Pour in new, unused oil. The oil container should be filled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

6.3.5 Checking the Max. Operating Pressure

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.
- Connect the pressure gauge to the test connection (1) and lock it in position. (Special "pressure gauge" 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 (2).
- Slide the trip cam (3) over the roller (4) of the limit switch **for a short time.** Upon contact release, pump begins running under pressure.
- Read pressure off the gauge.
- Reset the trip cam (3) and tighten the T-screw (2).
- Switch off the motor.



Bottoming of the cylinder on the limit switch for an extended time will cause the overload cut-out to activate and the machine will switch off.

- 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.

7

Exchanging Knives and Tools

7 Exchanging Knives and Tools

Knives and tools should be checked regularly for the condition of their cutting edges and for the formation of 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 (E) off. Secure the main switch with a padlock.

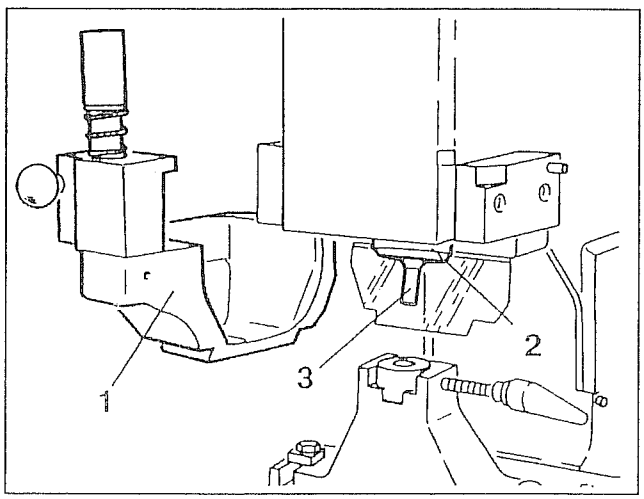
7.1 Holepunch

7.1.1 Changing the Punch

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

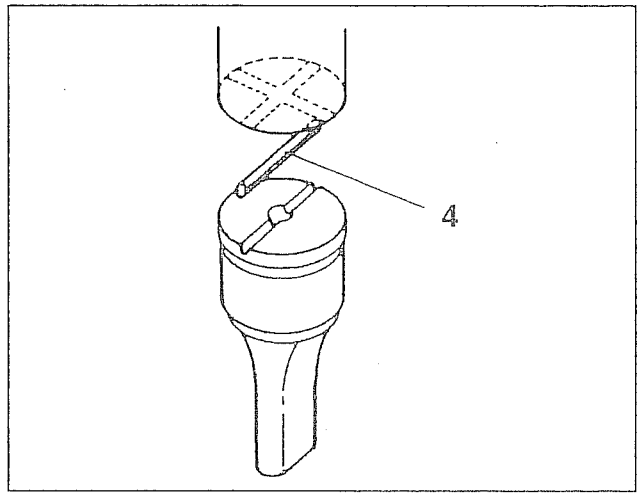
- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.



- Open the stripper (1).
- Turn the selector keyswitch (D) to "Punch toolsetting".
- Press and hold the footpedal (G) to move the punch down until you have access to the quick-change fixture, or to the coupling nut.
- Switch off the ironworker.

- Undo the quick-change attachment (2) by turning it counterclockwise, or:
  Unscrew the coupling nut.
- Take out the punch (3).
- Insert new or resharpened punch.
- For embossing, the anti-torsion pin (4), which is included in the delivery, must also be inserted.
  Make sure the pin is seated properly in the adapter.



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

- Close the quick-change attachment, or:
  Screw on the coupling nut and tighten it.
- Switch on the ironworker
  (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.

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

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

- Switch off the ironworker.

7.1.2 Changing the Die

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

- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.

- Switch off the ironworker.
- Open the stripper (1).
- Loosen the clamping lever (2).
- Take out the die (3).
- Insert new or resharpened die (cutting edge at top).

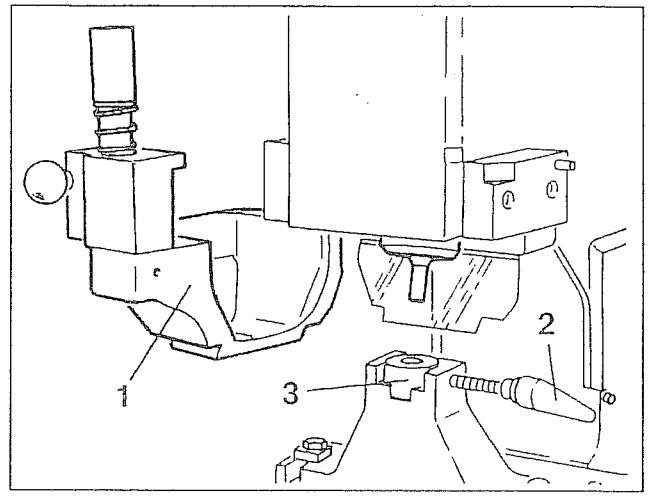
When using shaped tooling, pay attention to the position of the cutting opening.

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

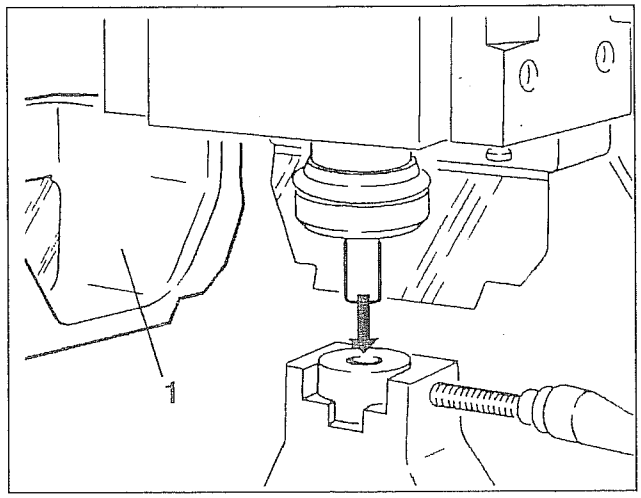
As a rule, check the alignment of punch and die after every tool change and from time to time while punching.

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

- Switch off the ironworker.



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 section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.

- Open the stripper (1).
- Turn the selector keyswitch (D) to "Punch toolsetting".
- With the footpedal (G) in the position 2 "Down (search)", carefully lower the punch into the die.

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

- Switch off the ironworker.
- Adjust incorrect centering according to section 5.2.2.
- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.

- Close the stripper.
- Switch off the ironworker.

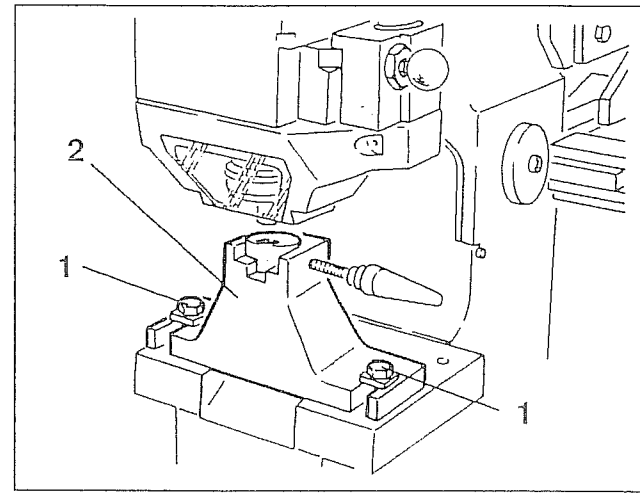
7.1.4 Using Eccentric Dies

Note
The hole in the die must be aligned to the center of the punch.

- Switch off the ironworker.
- Change the die (see section 7.1.2).
- Loosen screws (1).
- Adjust the punch saddle (2) to match the die (see section 5.2.2).
- Center according to section 7.1.3.

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

- Switch off the ironworker.



7.2 Flat-Steel Shear

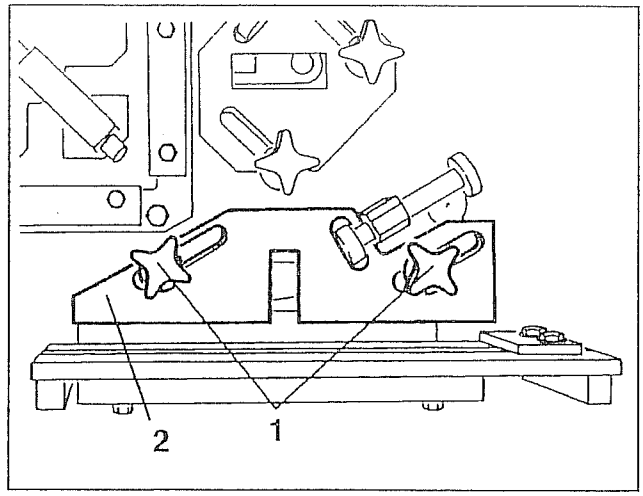
The top and bottom knives are **not** interchangeable.
The bottom knife can be used on four sides, the top knife on only one.
Changing each knife individually is also possible.

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

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

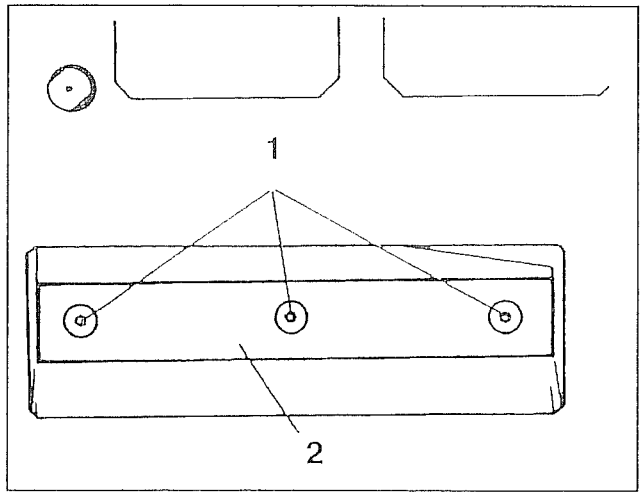
7.2.1 Removing the Hold-Down

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

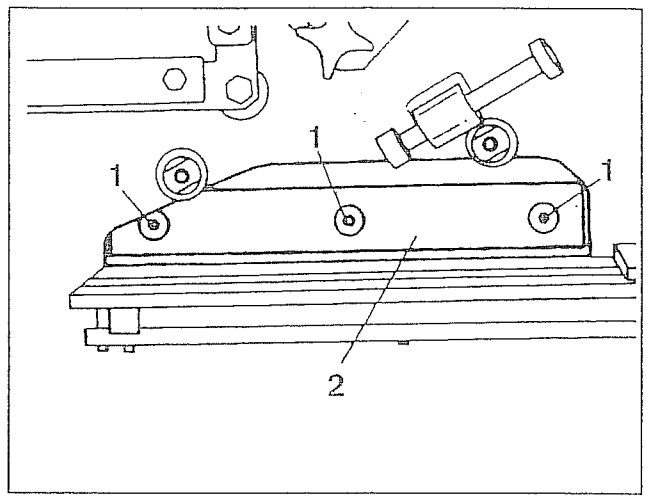


7.2.2 Changing the Bottom Knife

- 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.



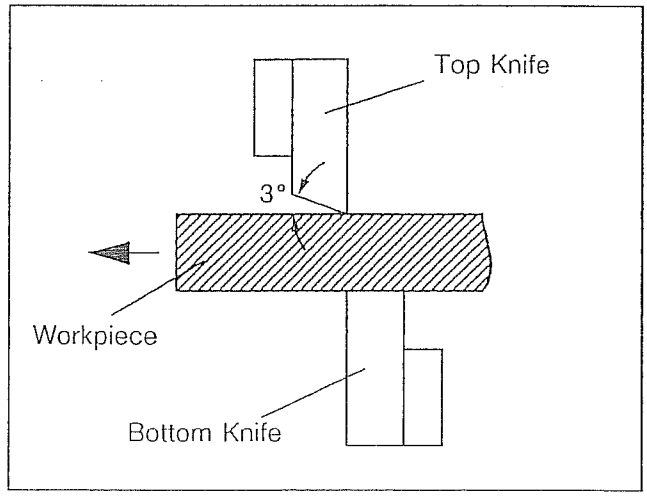
7.2.3 Changing the Top Knife



- Switch on the ironworker (see section 4.2).
- Turn selector keyswitch (D) to "Toolsetting of coper/notcher and shears".
- With the footpedal (G) in position 2 "Down (search)", move the knife carriage to the lowermost position.
- Switch off the ironworker.
- Take off the hold-down according to section 7.2.1.
- Remove the fastening screws (1).

- Remove the knife (2) from the back of the ironworker.
- Mount new/resharpened knife.

Note
Make sure the top knife is seated correctly (see illustration at right).



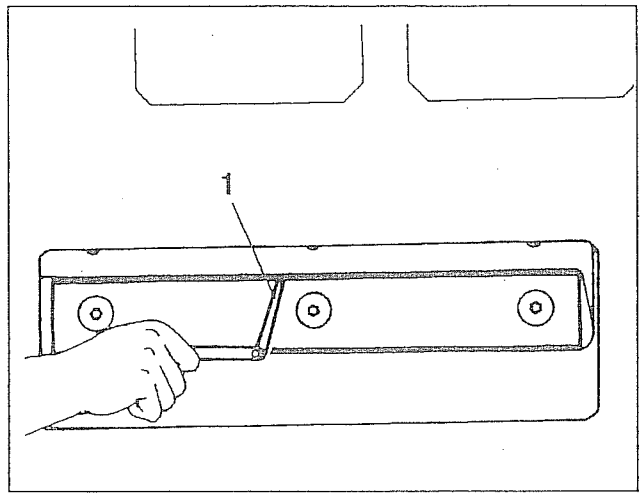
- Insert and tighten fastening screws (1).
- Check blade clearance according to section 7.2.4.
- Mount hold-down plate according to section 7.2.5.

7.2.4 Checking the Blade Clearance

- Switch on the ironworker (see section 4.2).
- Turn selector keyswitch (D) to "Toolsetting of coper/notcher and shears".
- With the footpedal (G) in position 2 "Down (search)", carefully move the carriage to the lowermost position.

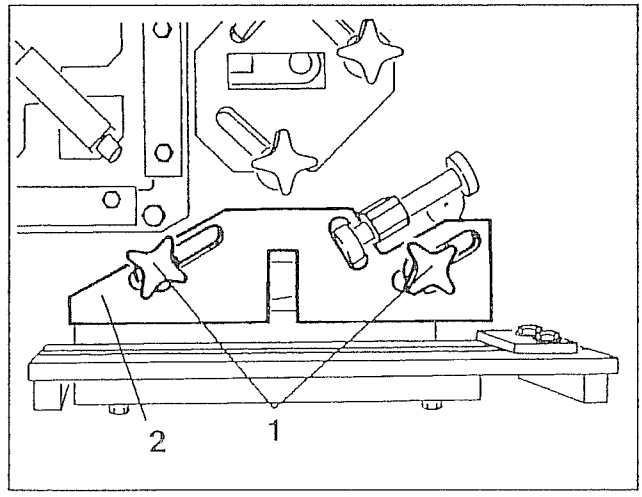
Proceed with extreme caution, so that the top knife does not touch the bottom knife.

- 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 blade clearance, proceed according to section 5.3.1.



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).

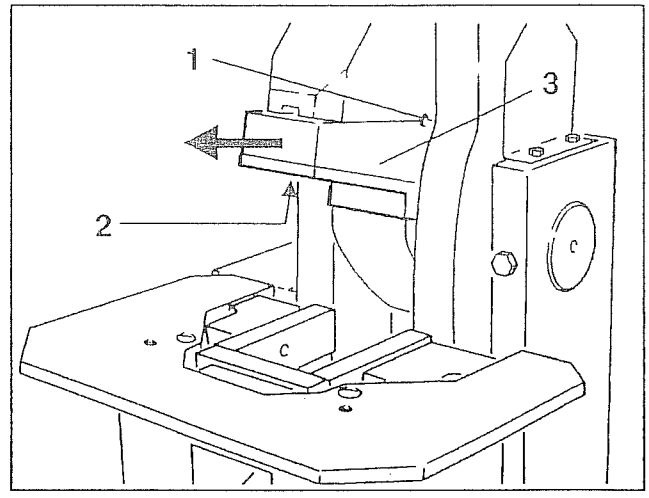


7.3 Coper/Notcher

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

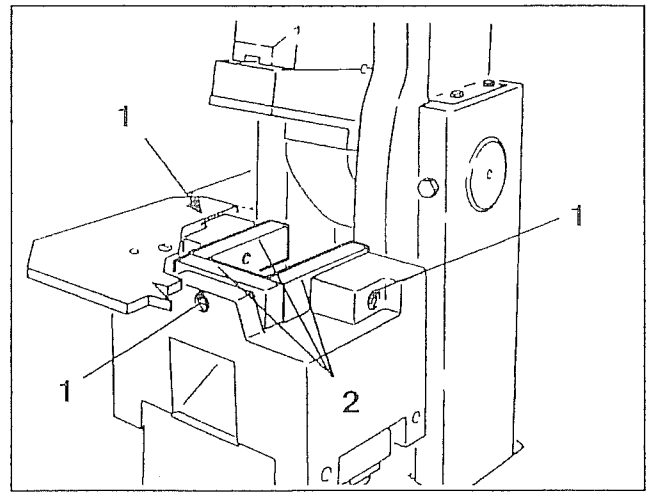
Whenever knives are changed, the blade clearance must be checked.

7.3.1 Changing the Top Knife



- The coper/notcher must be in the uppermost position; if necessary adjust stroke accordingly (see section 5.1.2).
- 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).

7.3.2 Changing the Bottom Knives



- The coper/notcher must be in the uppermost position; if necessary adjust stroke accordingly (see section 5.1.2).
- 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 (1).
- Check blade clearance (see section 5.4.1).

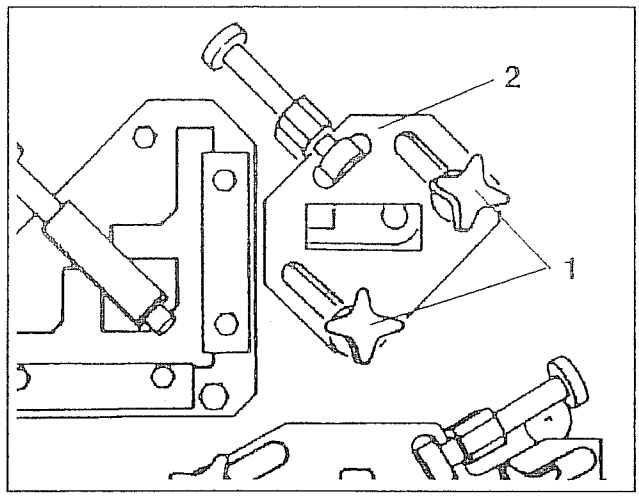
7.4 Bar-Steel Shear

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

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

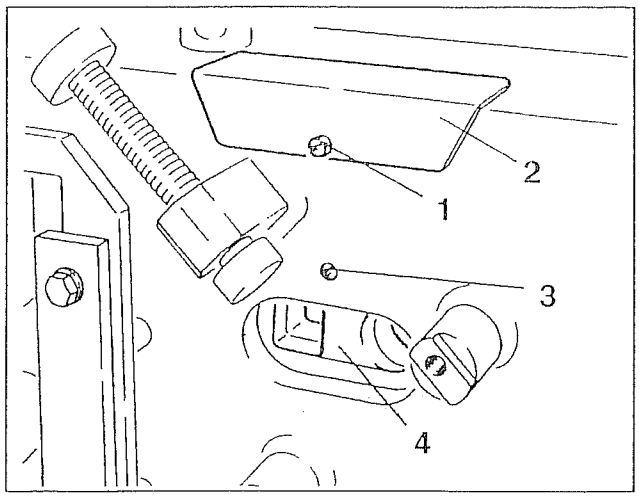
7.4.1 Removing the Hold-Down

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



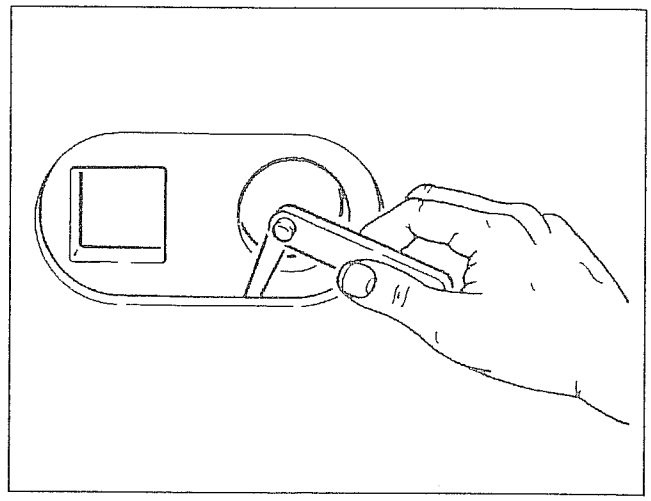
7.4.2 Changing the Knives

- The carriage must be at the topmost position. Otherwise, adjust stroke accordingly (see section 5.1.2).
- Switch off the ironworker.
- Take off the hold-down as described in section 7.4.1.
- Loosen the screw (1).
- Remove the safety cover (2).
- Loosen the locking screw (3).
- Lift out the stationary knife (4).
- Slide the mobile knife forward and then lift it out.
- Turn knives around, or insert new/resharpened knives.
- Tighten the locking screw (3).
- Replace the safety cover (2).
- Tighten the screw (1).



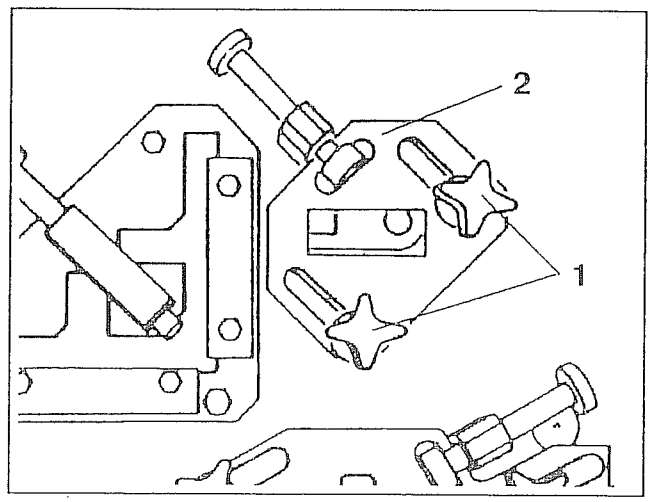
- Check blade clearance (see section 7.4.3).
- Mount the hold-down according to section 7.4.4.

7.4.3 Checking the Blade Clearance



- The carriage must be at the topmost position. Otherwise, adjust stroke accordingly (see section 5.1.2).
- 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 machine frame and the stationary knife (1).
- The blade clearance should be between 0.008 inch and 0.012 inch.
- If necessary, adjust blade clearance according to section 5.5.1.
- 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 plate (2) upon the support studs.
- Screw on and tighten the star handles (1).

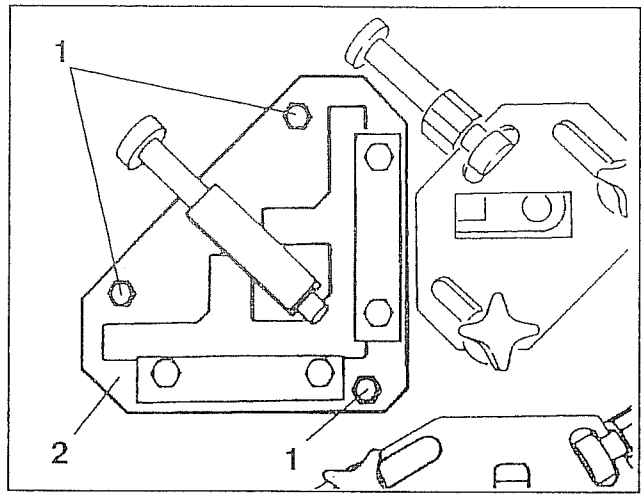
7.5 Angle-Steel Shear

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.

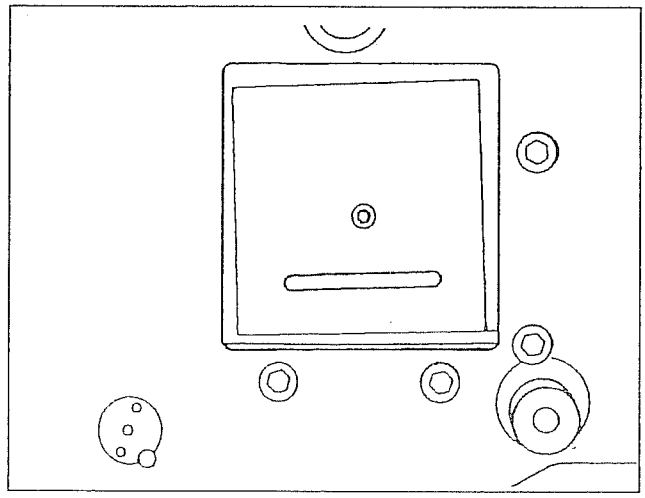
7.5.1 Removing the Hold-Down

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

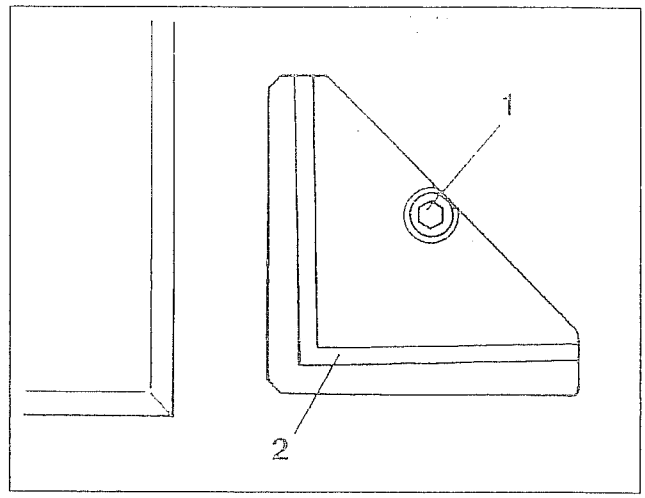


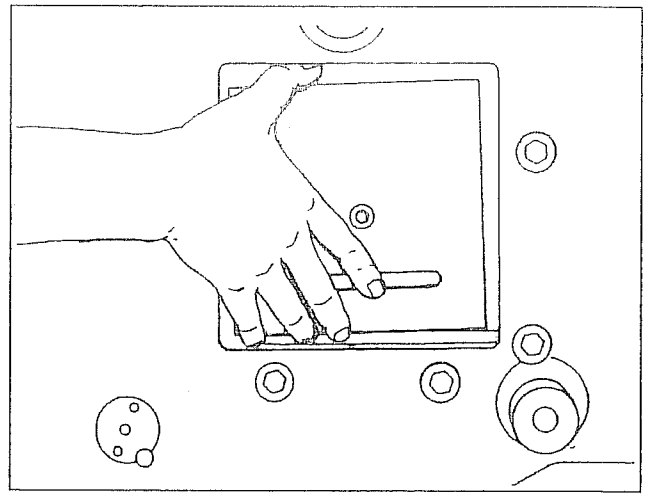
7.5.2 Changing the Mobile Knife

- Lift off the hold-down (see section 7.5.1).
- Switch on the ironworker (see section 4.2).
- Turn selector keyswitch (D) to "Toolsetting of coper/notcher and shears".
- Using the footpedal (G), move the carriage 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.



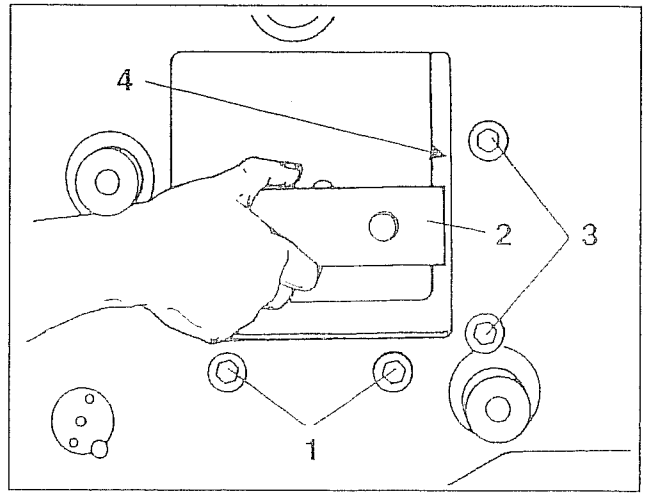
- Remove the fastening screw (1) from the back of the ironworker.
- Take the knife (2) out of the profile window to the front.
- Turn the knife around, or insert new/resharpened knife.
  If you use a resharpened knife, heed instructions in section 8.5.
- Insert fastening screw (1) with lock washer and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



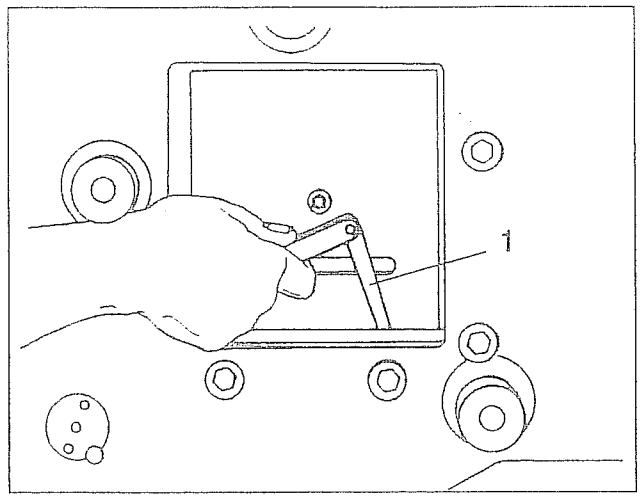


7.5.3 Changing the Horizontal and Vertical Knives

- 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 7.5.4).
- Mount hold-down according to section 7.5.5.

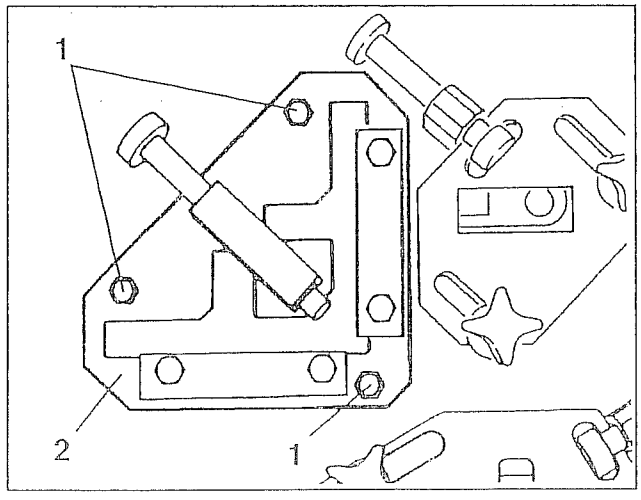


7.5.4 Checking the Blade Clearance

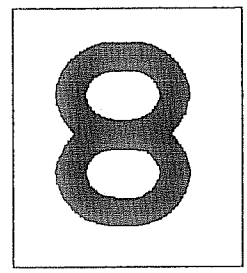


- Switch on the ironworker.
- Turn selector keyswitch (D) to "Toolsetting of coper/notcher and shears".
- With the footpedal (G) in the position 2 "Down (search)", move the carriage to the lowermost position.
- Switch off the ironworker.
- Lift off the hold-down according to section 7.5.1.
- Using a 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 5.6.1.
- Mount the hold-down according to section 7.5.5.

7.5.5 Mounting the Hold-Down



- Tighten the hold-down plate (2) with the fastening screws (1).
- 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 machined.



Resharpening the Knives and the Tools

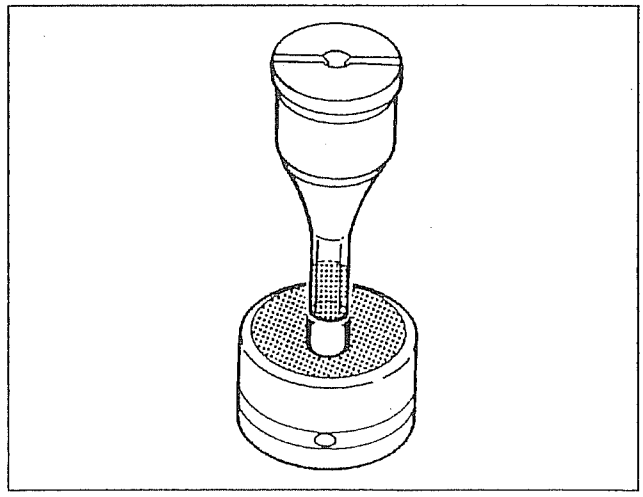
8 Resharpening the Knives and the Tools

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

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 chinks and subsequent fracturing of the tools. Use oil stone to remove grinding fins or flashes.

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



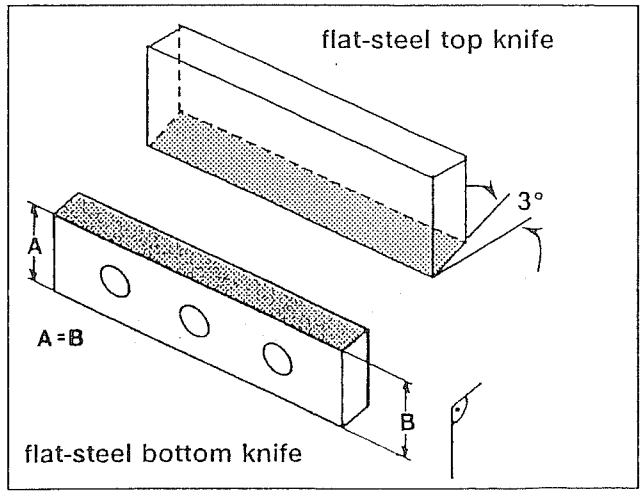
8.1 Resharpening the Punching Tools

8.1.1 Punch

- Grind the punch only on the face.

8.1.2 Die

- Grind the die only on the cutting surface.



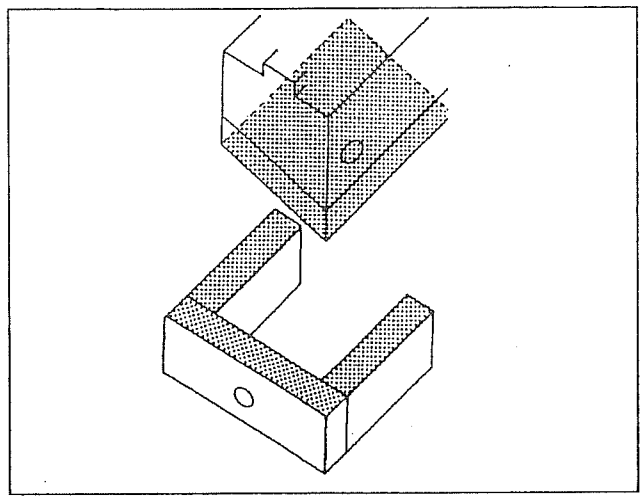
8.2 Resharpening the Flat-Steel Knives

- When grinding the flat-steel top knife, observe the clearance angle (3°).
- 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 5.3.1).

8.3 Resharpening the Notching Tools



8.3.1 Top Knife

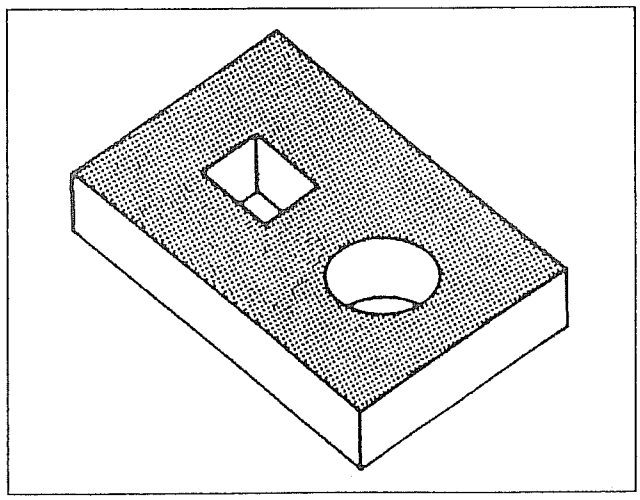
- Grind the top knife only on the lower surface.

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 5.4.1).

8.4 Resharpening the Bar-Steel Knives



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

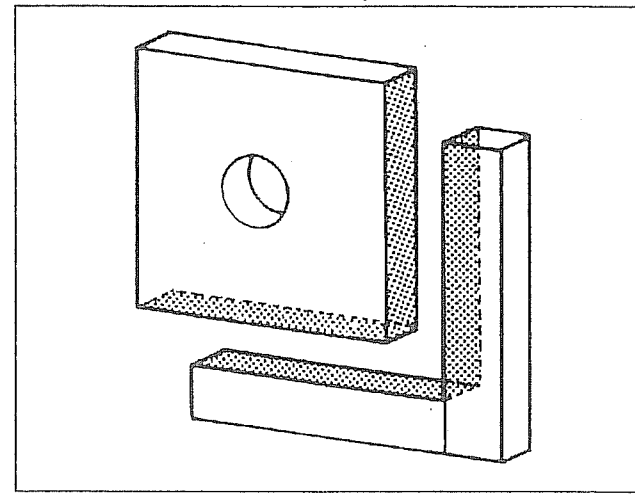
When installing a knife ground on the planar side, particular attention must be paid to the blade clearance (see section 5.5.1).

8.5 Resharpening 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.

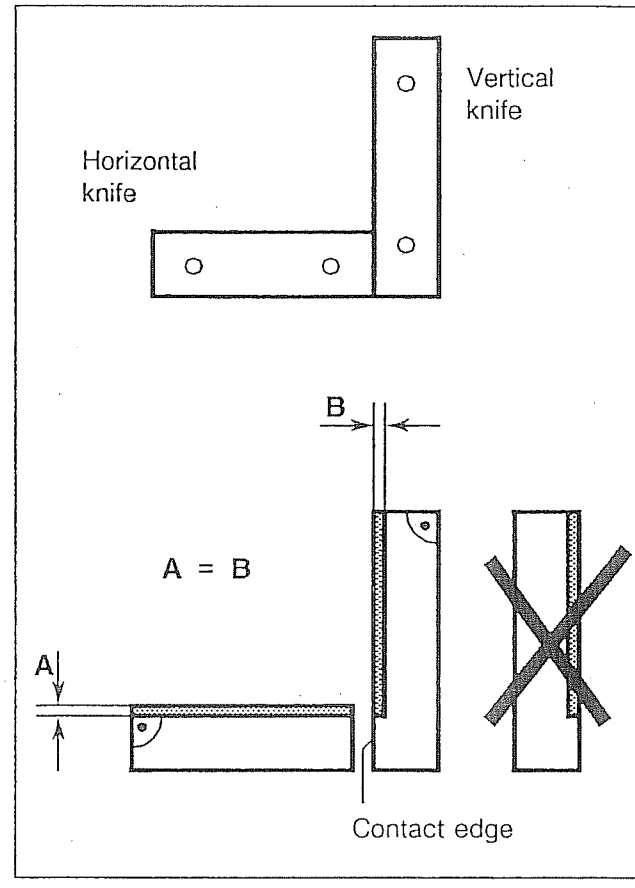
When installing a flat-ground knife, special attention must be paid to the blade clearance (see section 5.6.1).



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 5.6.1).



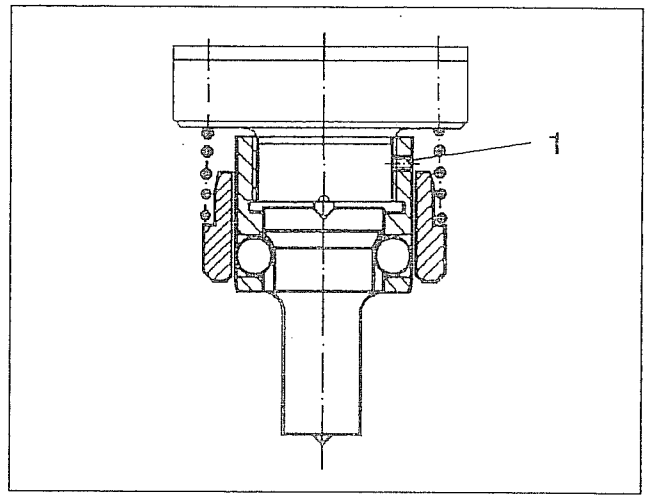
9

Retooling

9 Retooling

9.1 Retooling – Standard Accessories

9.1.1 Changing Over the Punch Attachment to Attachment With Coupling Nut



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

- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.

- Open the stripper.
- Turn the selector keyswitch (D) to "Punch toolsetting".
- Press and hold the footpedal to move the punch down until you have access to the threaded pin.
- Switch off the ironworker.
- Loosen the threaded pin (1).
- Unscrew the quick-change fixture.
- Insert the punch in the coupling nut and screw on the coupling nut.
- Switch on the ironworker (see section 4.2).
- Turn the selector keyswitch (D) to "Punch operation".

The carriage moves up to the punch starting position.

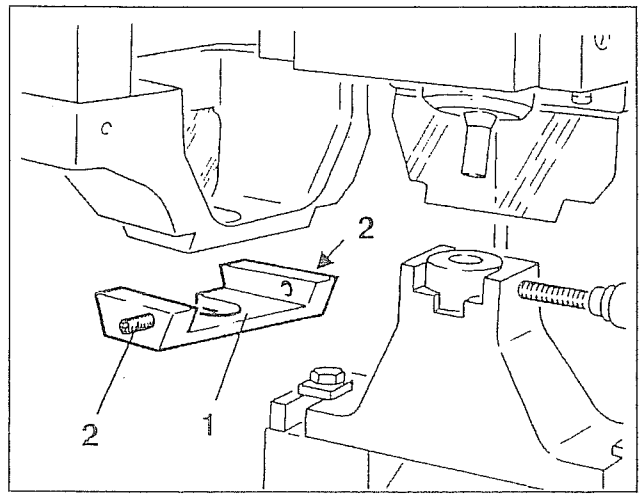
- Close the stripper.
- Check centering according to section 7.1.3.

Punch and die must be properly aligned.

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.



9.2 Retooling - Special Accessories (Not Standard)

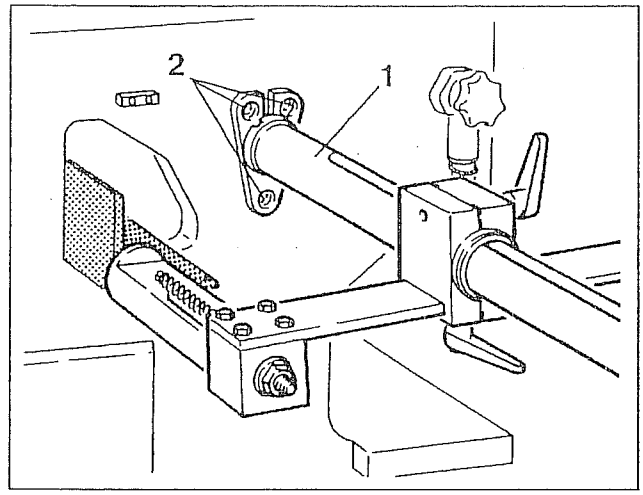
9.2.1 Length Stop

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

Notes:
When switching on the ironworker, turn the selector keyswitch (D) to "Shears length stop" (see section 4.2).

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

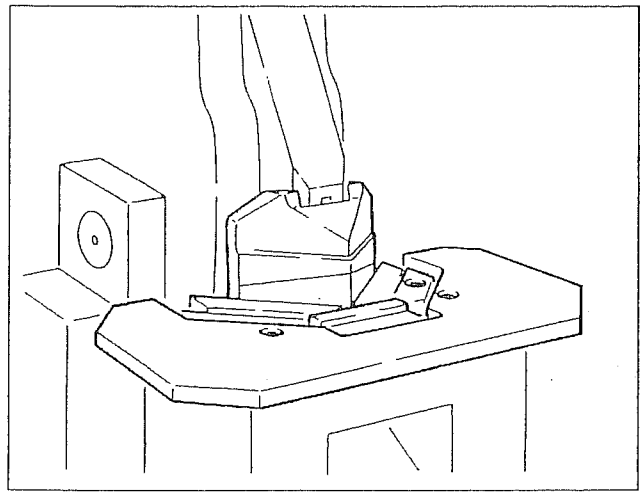
The safety flap of the angle-steel shear has only been removed for the purpose of representation.



9.2.2 Triangular Notching Tool

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

- Exchange the top knife (see section 7.3.1).
- Exchange the bottom knife (see section 7.3.2).

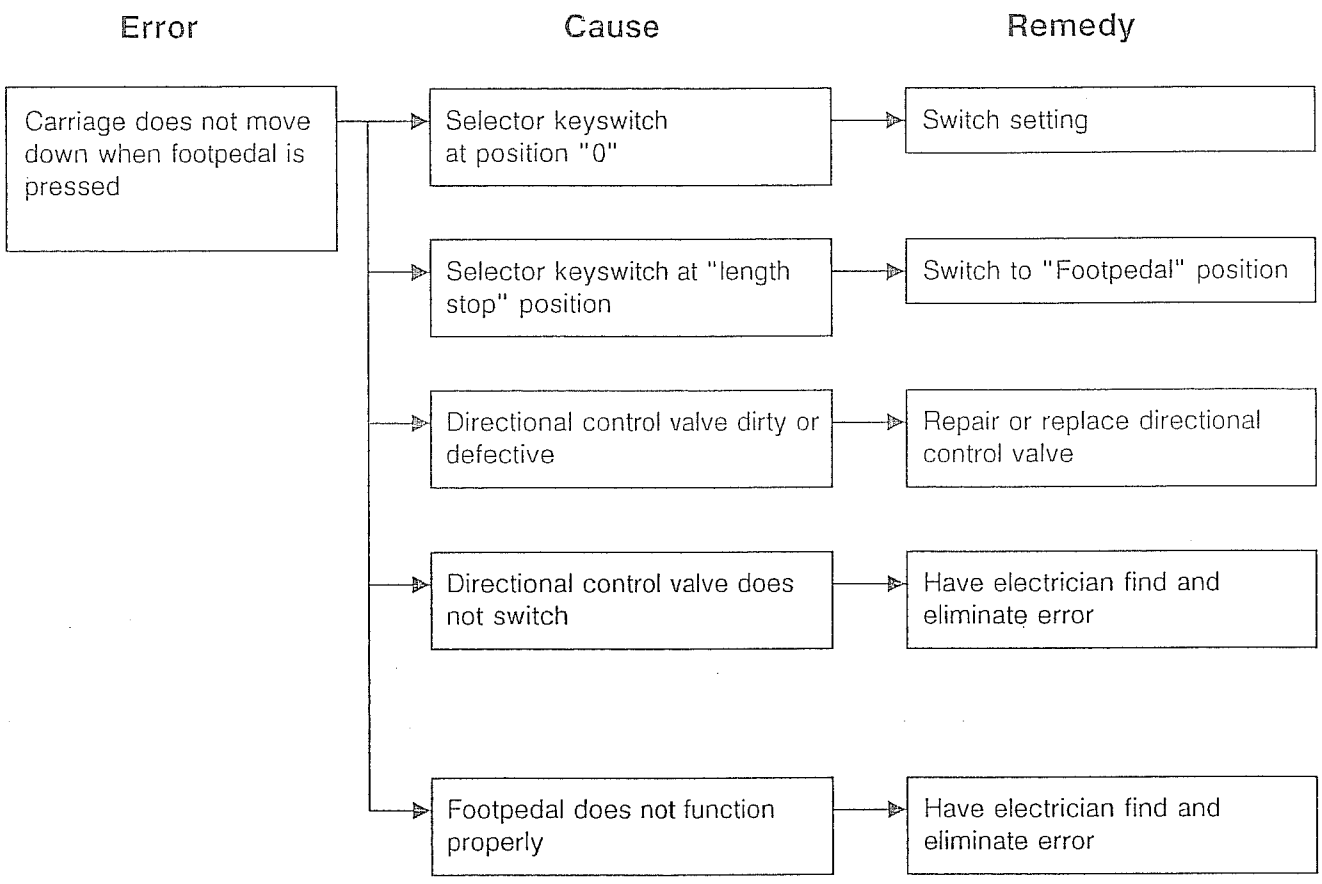


10

Malfunctions and Their Remedy

10 Malfunctions and Their Remedy

10.1 Machining Errors



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

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

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

10.2 Electrical Errors

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

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

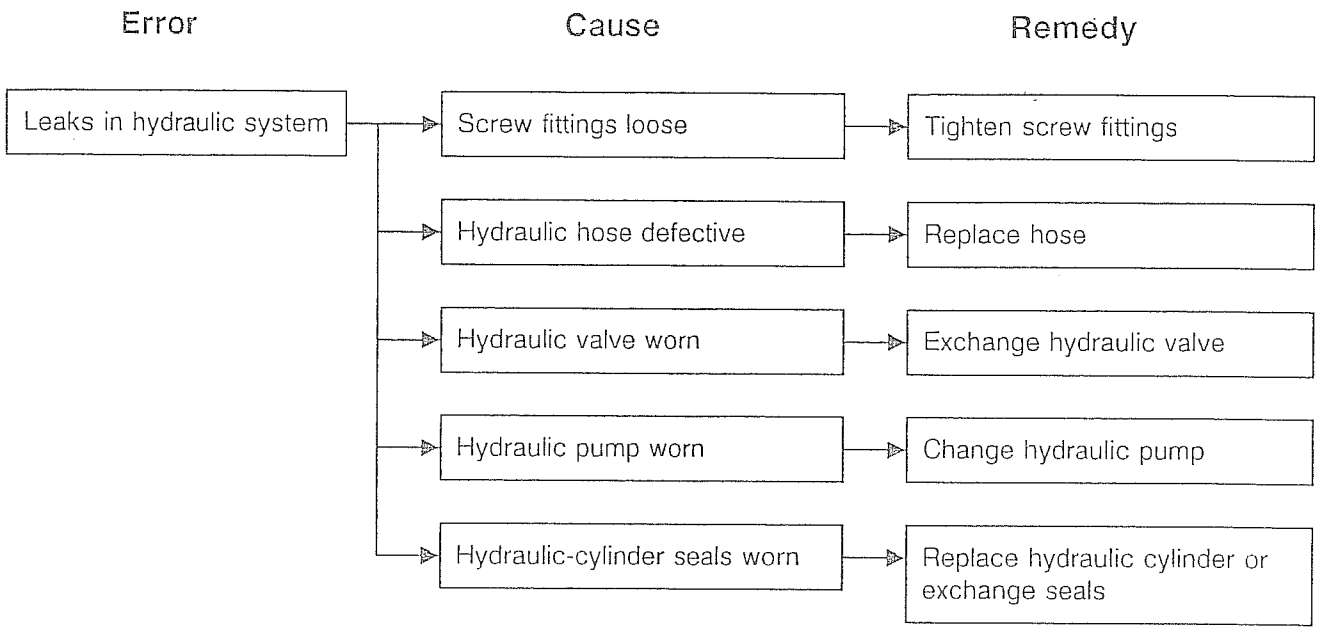
10.3 Hydraulic Errors

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

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

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

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


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

11

Circuit Diagrams and Drawings

*** P A R T S L I S T *** 01706 10304

Offer No. : Order No. : 52/4844 02 Order

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

Date of Negociation :
Date of Receipt : 18.09.91
Date of Handling : 20.09.91
Date of Delivery : 8.11.91
Number of Systems : 20

Negociator :
Telephone :
Project Designation : Steuerungen "PROFI-500" USA
Order No. : 94668/60501 1850
Person in Charge : Howe/Scht
Manner of Delivery : GEEIGNETE
Drawing-No. : SB 043/52-1703.02

Rated Current	: 22	A	Control Voltage	: 115	V
Main Fuse	: 36	A	Frequency-Control Voltage	: 60	Hz
Line Voltage	: 0230	V	System-Control Voltage	:	
Frequency-Line Voltage	: 60	Hz	Auxiliary Voltage	:	V
System-Line Voltage	:		Freq.-Auxiliary Voltage	:	Hz
Mains Type	:				

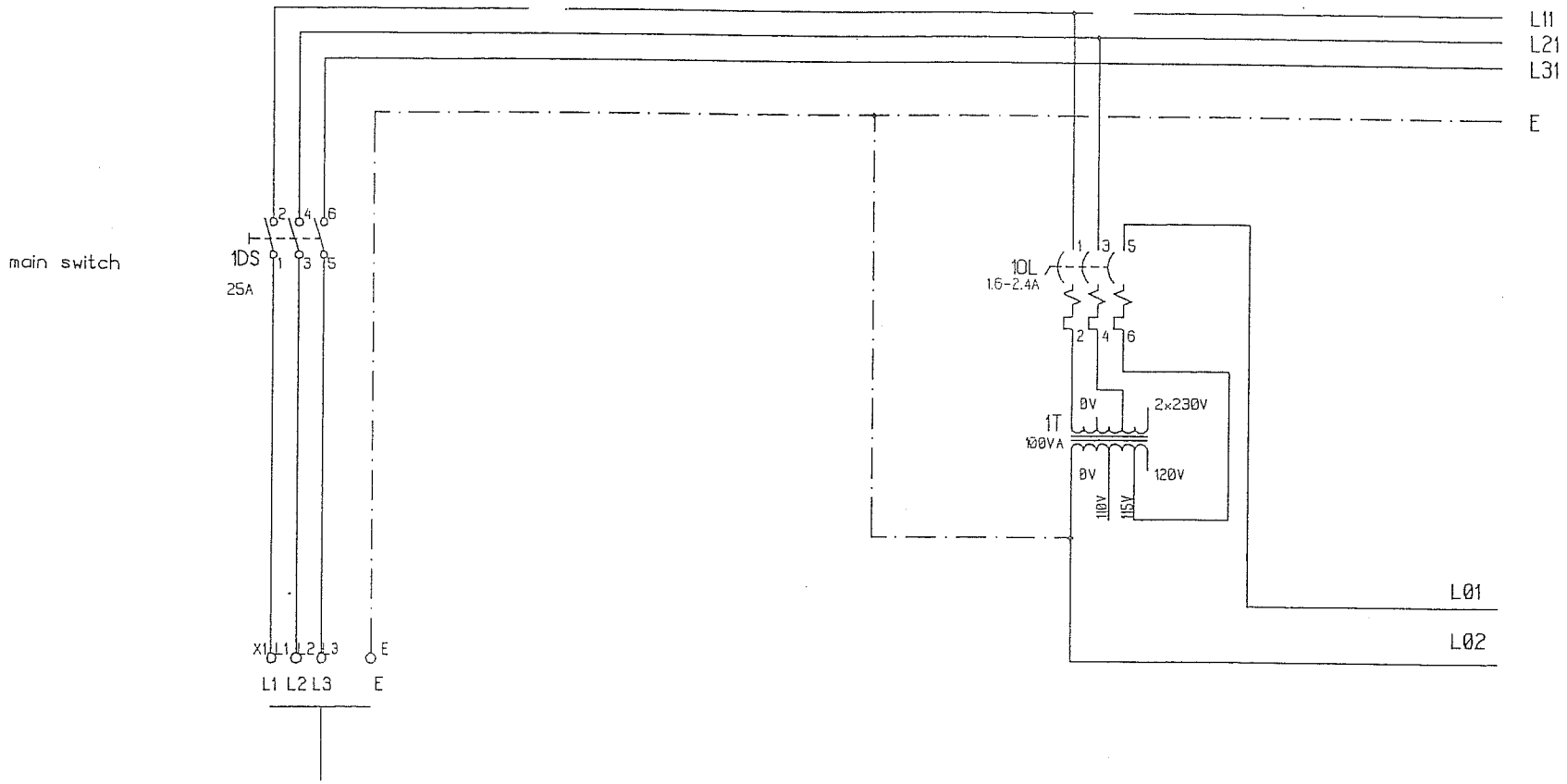
```
*****************************************************************
* Protective measures within the scope of this order: *
* ---------------------------------------------------- *
* This tested LV switchgear and controlgear assembly  *
* corresponds to VDE 0660, part 500.                  *
* Parts, 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 *** 01706 103 04

Offer No. : Order No. : 52/4844 02 Order

Item.	Device Marking	Type	Type Group	Quant.	L.-Price	Item.-Pri
Fd 0:						
10 F		AE1031 (RITTAL)	Control Panel	1		
20	1DS	P1-25/V/SVB	Circuit Interrupter	1		
30	1QL	PKZM1-2,4	Manual Motor Starter	1		
40 F	1T	STTO,1-UL-AUSF.PRIM.2X230V(SEK.110/115/120V)St.Tr.(KLEI		1		
50	1CON	DILOM/22(115V60HZ)	Universal Contactor	1		
60	1FU	Z00-24	Overload Relay	1		
70	1PB,2PB,1LT	QDDL-11/10/K11/F	Operat.Devices-Comb.	1		
80	3S3	TM-4-200.385/EZ/S-H	Rotary Switch	1		
90	1CR	DILER-31(115V60HZ)	Contactor Relay	1		
100	X1	UK10	Terminal Strip	6		
110		USLKG10-1	Terminal Strip	2		
120 F	X2	SLKK5 (PHOENIX)	Terminal Strip	12		
130		ZVV-T0	Acc.Cam Switches	3		
140		ZAV-T0	Acc.Cam Switches	3		



Einspeisung
incoming
supply

230V/460V
60c/s

Steuerspannung
control voltage
115V,60HZ

7,5HP

230V = 36A
460V = 18A

—	+	Typ	Funktion	—	+	Typ	Funktion

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

MUHR & BENDER

KLÖCKNER - MOELLER

Kennzeichnung: SB043/52-1703.02 | Index | lfd.Nr. 1

Anlagenbezeichnung: PROFI-500 USA

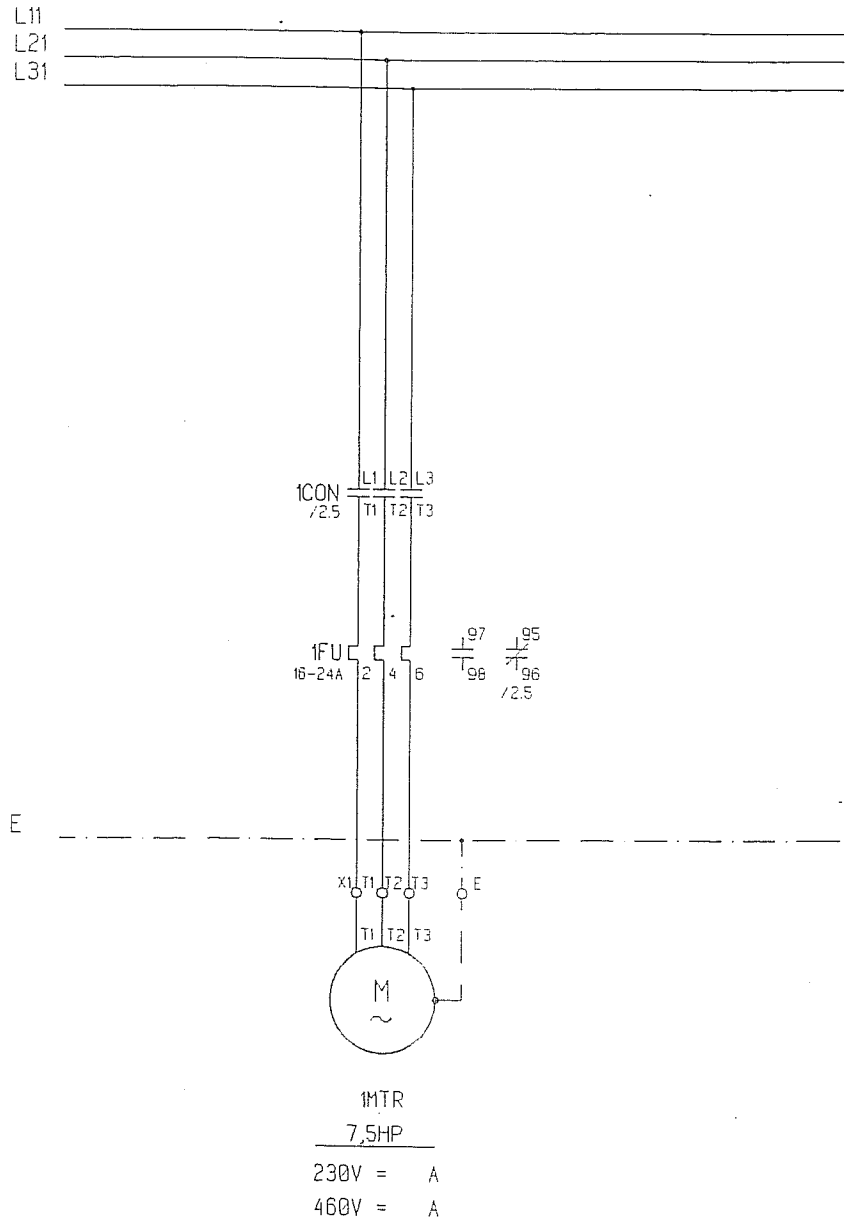
= 01706 103 04

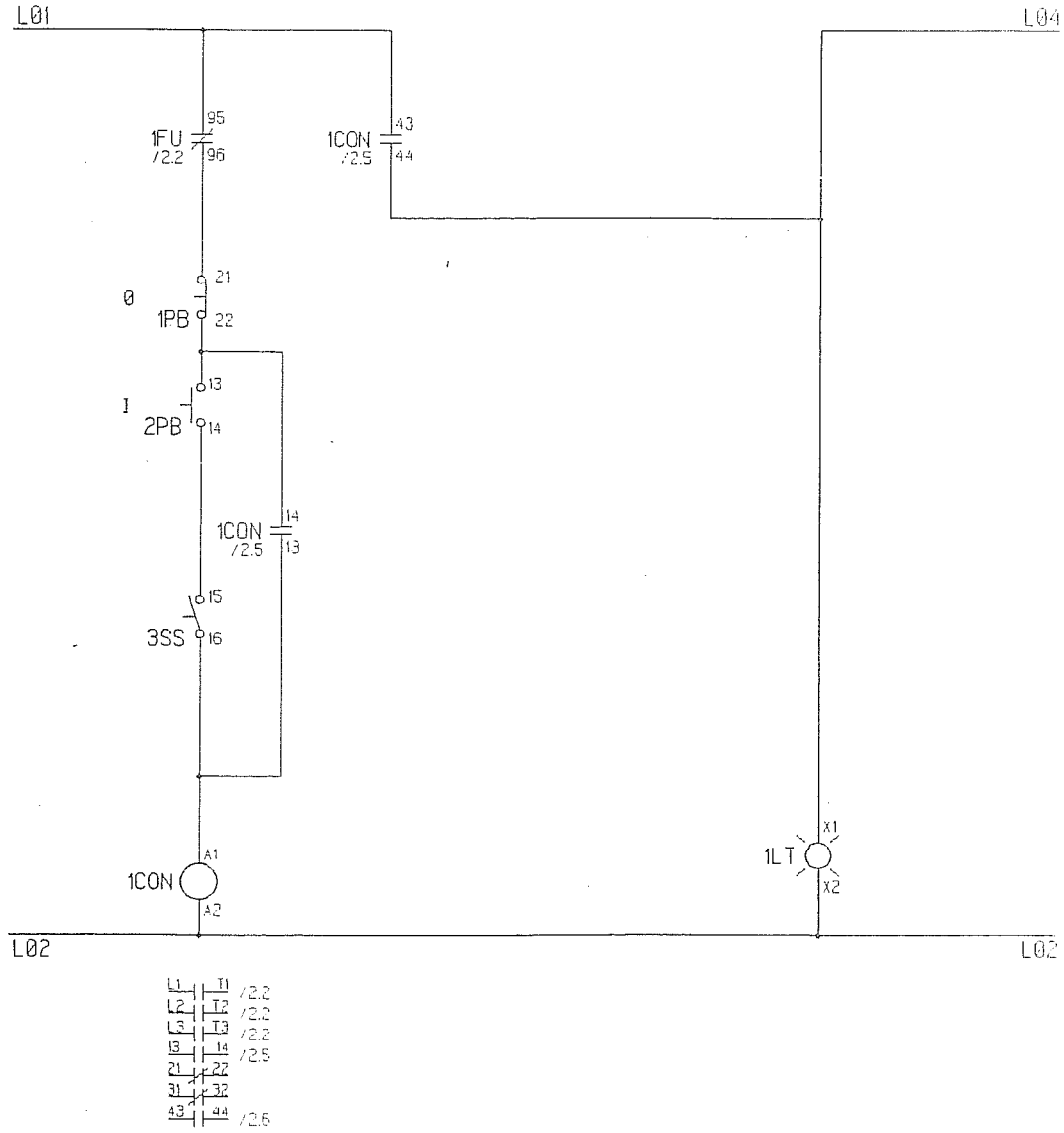
+

Blatt

von

Datum: 09.01.92 | Gez.: ECKEL | Geprüft: HOWE



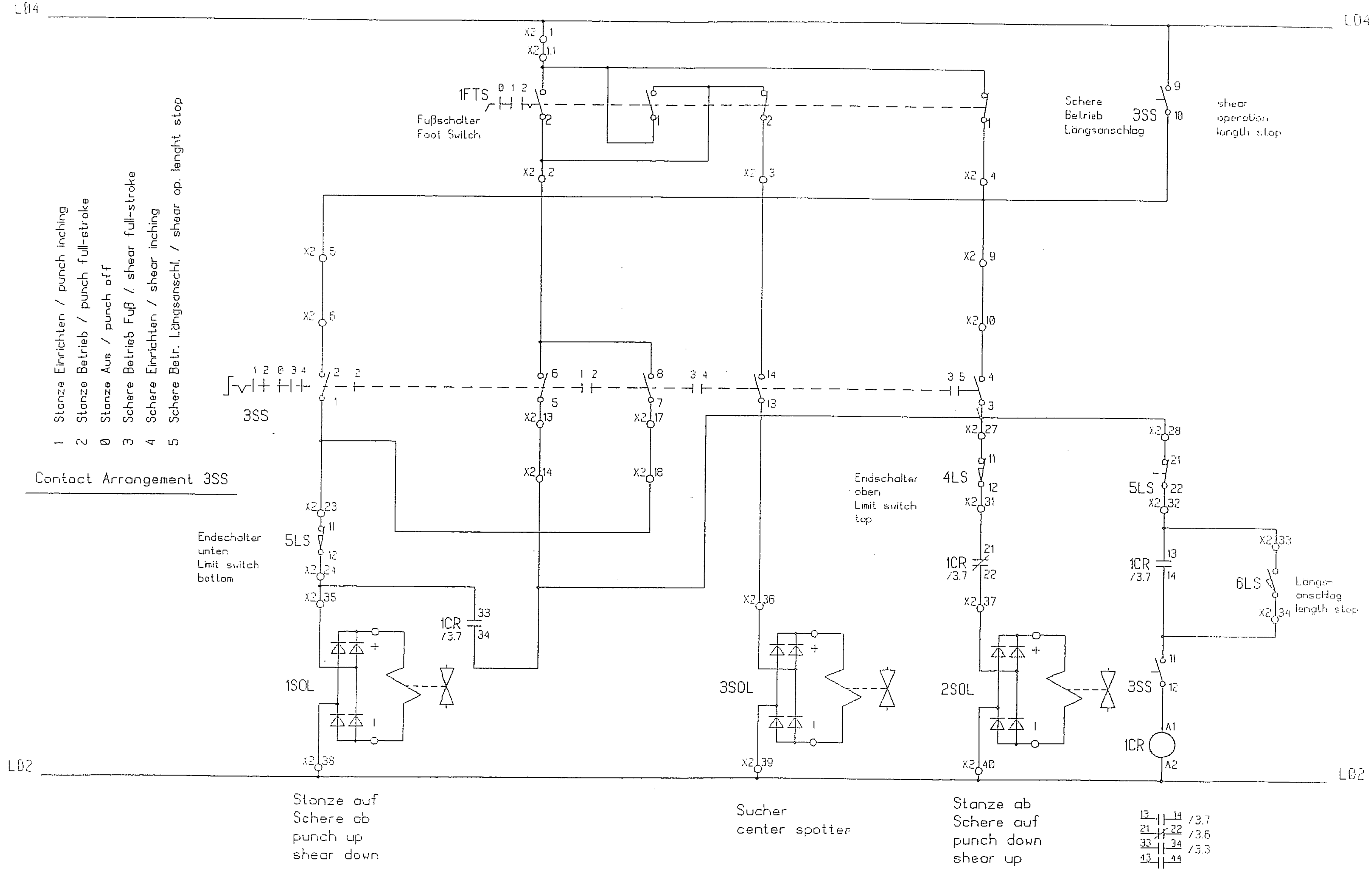


Motor
motor

Betrieb
operation

–	+	Typ	Funktion	–	+	Typ	Funktion

MUHR & BENDER	KLÖCKNER - MOELLER	
	Benennung SB043/52-1703.02	Blatt 2
Anlagenbezeichnung PROFI-500 USA	= 01706 103 04	
	+	



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- Ort	. Anschluss	= Anlage	- Betriebsmittelkennzeichnung (Art. Zahlnummer, Funktion)				

MUHR & BENDER

KLÖCKNER - MOELLER

Kennzeichnung SB043/52-1703.02

lfd.Nr. 3

Anlagenbezeichnung PROFI-500 USA

= 01706 103 04

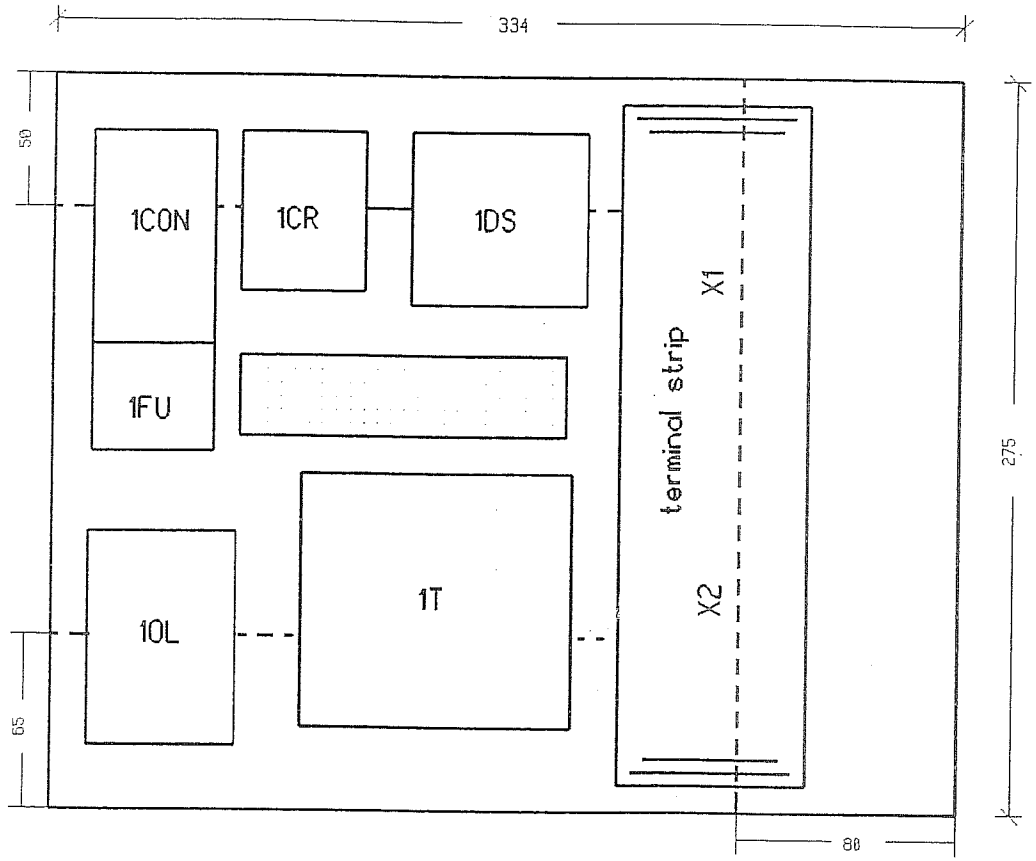
+

Blatt

von

Datum: 21.11.91 Gez.: ECKEL Geprüft: HOWE

mounting plate - Profi 500



measure 1:2

–	+	Typ	Funktion	–	+	Typ	Funktion

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

MUHR & BENDER		KLÖCKNER - MOELLER	
		Kennzeichnung SB043/52-1703.02	Index 5
Anlagenbezeichnung PROFI-500 USA		= 01706 103 04	Blatt
		+	
Datum: 21.11.91	Gez.: ECKEL	Geprüft: HOWE	

		L1	L2	L3	E	T1	T2	T3	E	E
DESTINATION	CONNECTION NO. / DESIGNATION									
TERMINAL STRIP X1	TERMINAL - NO.	L1	L2	L3	E	T1	T2	T3	E	E
	JUMPER	o	o	o	o	o	o	o	o	o
DESTINATION	CONNECTION NO. / DESIGNATION									

DEVICE DESIGNATION	CABLE MARKING	CABLE-TYPE	L1	L2	L3	E	T1	T2	T3	E	E
INCOMING SUPPLY			X	X	X	X					
1MTR							X	X	X	X	X

ROW TERMINAL - TYPE:
TERMINAL ....
TERMINAL ....
TERMINAL ....
TERMINAL ....

TERMINAL STRIP: HORIZONTAL/LEFT / VERTICAL/RIGHT

☐ = CABLE CONNECTION TOP

☐ = CABLE CONNECTION BOTTOM

−	+	Typ	Funktion	−	+	Typ	Funktion

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

MUHR & BENDER	KLÖCKNER - MOELLER	Kennzeichnung SB043/52-1703.02	Index	Urspr. 6
Anlagenbezeichnung PROFI-500 USA		= 01706 103 04		Blatt
		+		
Datum: 25.11.91	Gez.: ECKEL	Geprüft: HOWE		

DESTINATION: CONNECTION NO. / DESIGNATION

TERMINAL STRIP X2

TERMINAL - NO.	1	1.1	2	PE	3	4	PE	5	6	PE	9	10	PE	13	14	PE	17	18	PE	23	24	PE	27	28	31	32	PE	PE
JUMPER	O—O																											

DESTINATION: CONNECTION NO. / DESIGNATION

DEVICE DESIGNATION	CABLE MARKING	CABLE-TYPE	1	1.1	2	PE	3	4	PE	5	6	PE	9	10	PE	13	14	PE	17	18	PE	23	24	PE	27	28	31	32	PE	PE
FOOT SWITCH 1FTS			X	X	X	X	X	X																						
LIMIT SWITCH BOTTOM																						X	X	X		X		X	X	
5LS																									X		X			X
LIMIT SWITCH TOP 4LS																														

ROW TERMINAL - TYPE:
TERMINAL ....
TERMINAL ....
TERMINAL ....
TERMINAL ....

TERMINAL STRIP: HORIZONTAL/LEFT / VERTICAL/RIGHT
☐ = CABLE CONNECTION TOP
☐ = CABLE CONNECTION BOTTOM

−	+	Typ	Funktion	−	+	Typ	Funktion

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

MUHR & BENDER	KLÖCKNER - MOELLER		
Anlagenbezeichnung: PROFI-500 USA	Kennzeichnung: SB043/52-1703.02	Index	lfd.Nr. 7
	= 01706 103 04		Blatt
	+		von
Datum: 21.11.91	Gez.: ECKEL	Geprüft: HOWE	

Terminal strip X2

Device designation	Cable marking	Cable-type	33	34	PE	35	36	37	38	PE	39	PE	40	PE
Destination: Connection no. / Designation														
Jumper			O	O	O	O	O	O	O	O	O	O	O	O
Destination: Connection no. / Designation														
LENGTH STOP 6LS			X	X	X									
1SOL						X			X	X				
3SOL							X				X	X		
2SOL								X					X	X

ROW TERMINAL - TYPE:
TERMINAL ....
TERMINAL ....
TERMINAL ....
TERMINAL ....

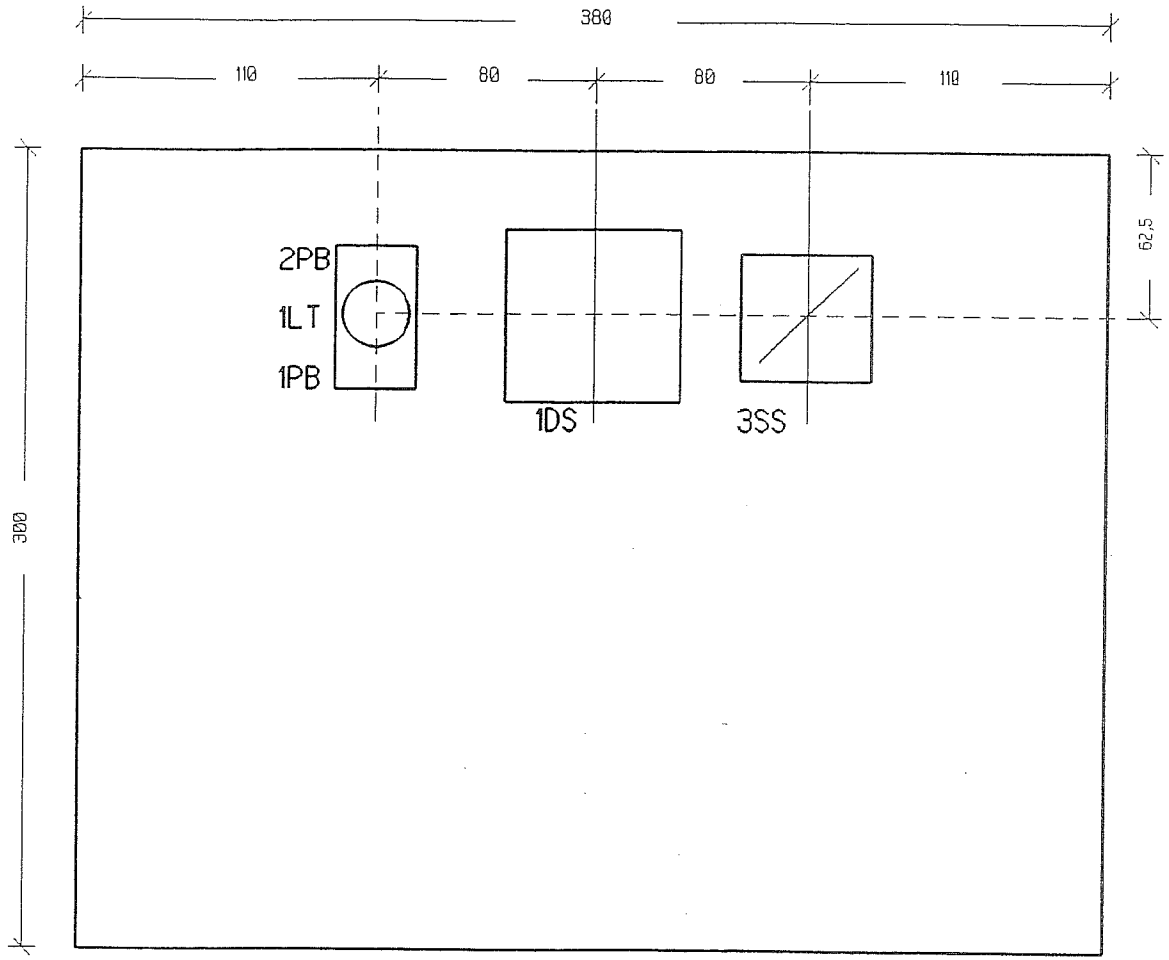
TERMINAL STRIP: HORIZONTAL/LEFT / VERTICAL/RIGHT
☐ = CABLE CONNECTION TOP
☐ = CABLE CONNECTION BOTTOM

MUHR & BENDER
KLÖCKNER - MOELLER
Kennzeichnung: SB043/52-1703.02
Blatt: 8
Anlagenbezeichnung: PROFI-500 USA
= 01706 703 04
+
Datum: 21.11.91 Gez.: ECKEL Geprüft: HOWE

−	+	Typ	Funktion	−	+	Typ	Funktion

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

front view - Profi 500



measure 1:2

–	+	Typ	Funktion	–	+	Typ	Funktion

+ Ort . Anschluss = Anlage - Betriebsmittelkennzeichnung (Art, Zahlnummer, Funktion)

MUHR & BENDER

KLÖCKNER - MOELLER

Kennzeichnung: SB043/52-1703.02 | Index: | Blatt-Nr.: 4

Anlagenbezeichnung: PROFI-500 USA

= 01706 103 04

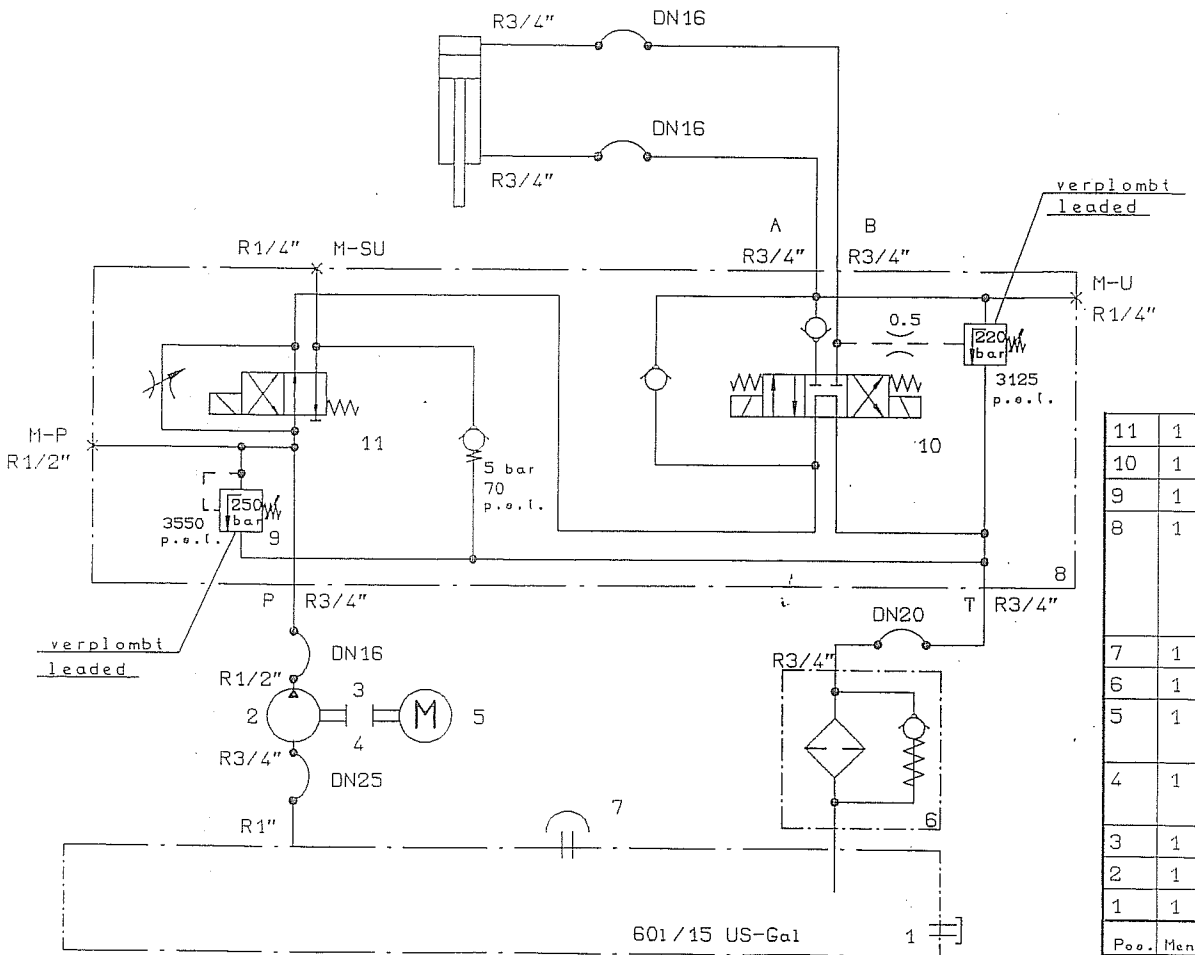
+

Datum: 21.11.91 | Gez.: ECKEL | Geprüft: HOWE

Zylinder

Cylinder

ø140/ø100x165



Pos.	Menge	Einheit	Benennung	Denomination	Typ	Fabrikat
11	1		Magnetventil /Kpl.	Solenoid valve	WEF4/2-10-111a/96V=	HEYPP
10	1		Magnetventil /Kpl.	Solenoid valve	WEE4/3-10-207/96V=	HEYPP
9	1		Druckbegrenzungsventil patrone	Pressure relief valve	HV 03134.1	HEYPP
8	1		Montageplatte/Kpl.mit 1 einstellbarem Drossel - ventil, 3 Rueckschlag - ventilen, 1 Druckschalt- ventil und 1 Duese	Mounting plate with 1 throttle valve, 3 check valve, 1 pressure swtich valve and 1 jet valve	HM 03233.4	HEYPP
7	1		Einfuell-u.Be- lueftungsfilter	Filter cap assembly	TF/1	HEYPP
6	1		Rueklauffilter	Return pass filter	MPF 8/20	HEYPP
5	1		DN - Motor	DN - Motor	AP132 S4 B3/B5 5,5kW 1800min-1 220/440V,60Hz	Birkenb
4	1		Kupplung	coupling assembly	ND 16	HEYPP
3	1		Pumpentraeger	pump support	LS 300	HEYPP
2	1		HD - Pumpe	HD - pump	PLP 20.16	HEYPP
1	1		Oelbehaelter	oiltank	601/15 US-Gal	

Freimass-toleranz nach DIN 7168 mittel

Massstab | Gewicht

Werkstoff
Rohteil-Nr. PROFI 500 Ausf.60Hz (USA
Modell-Nr.

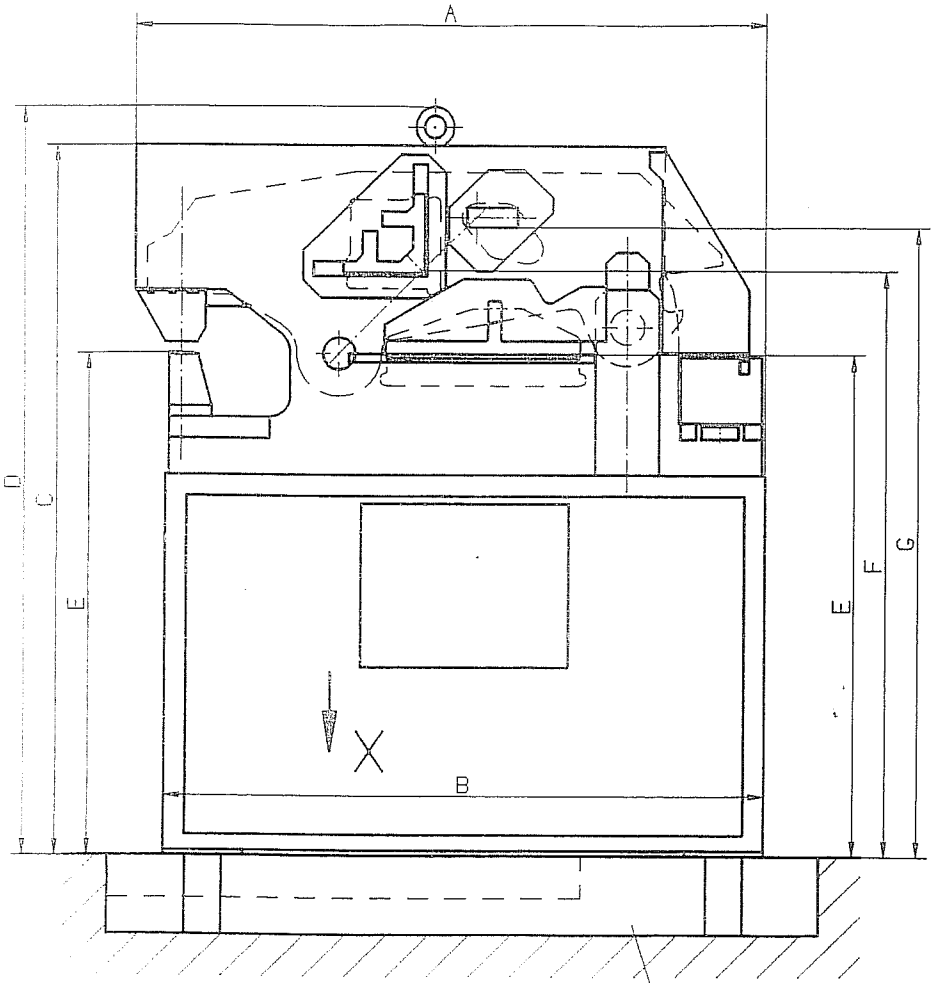
	Datum	Name
1991		
Bearb.	24.09.	Hannig
Gepr.		
Freig.	10.10.91	

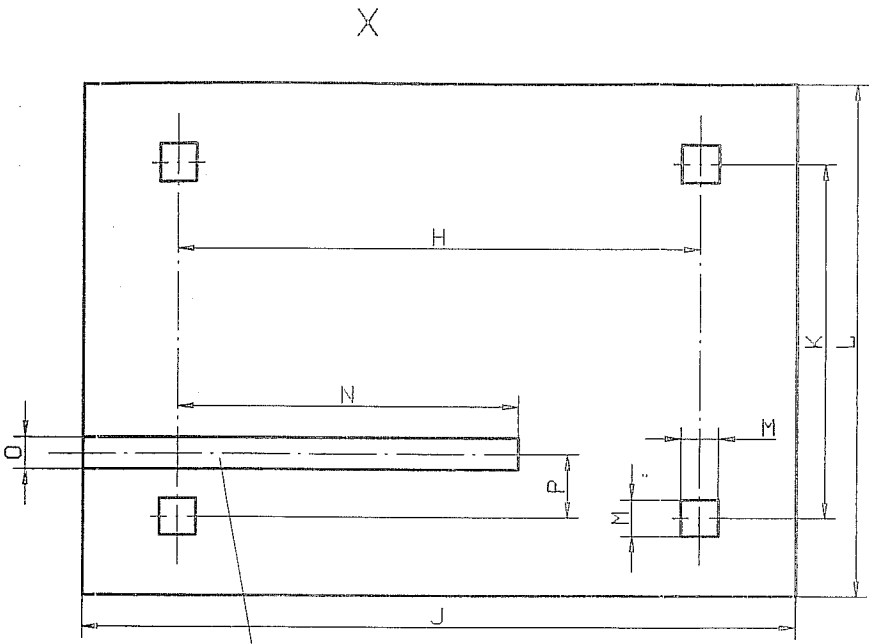
Benennung Hydraulikplan
Hydraulic system
Hydraulik-Steuerung mit Sucherleitrichtung

Muhr und Bender
MASCHINENBAU GMBH

Zeichnungs-Nr.
01706 103 01

A.B. | Zahl | Mittlg | Name | Dat. | Urspr. | Ers.f. | Ers.d.





Kanal fuer Kabeleinfuehrung Richtung beliebig

Channel for feeding cable direction to your choise

Canal pour cables d'alimentation

Tiefe je nach Bodenbeschaffenheit

Depth according to the condition of the ground

Profondeur de la fondation d'apres l'etat du sol

PROFI 50

	01705	0170
	mm	inch
A	1245	49
B	1130	44 1/
C	1340	52 3/
D	1410	55 1/
E	955	37 5/
F	1110	43 3/
G	1195	47
H	980	38 5/
J	1340	52 3/
K	670	26 3/
L	970	38 1/
M	70	2 3/
N	640	25 1/
O	60	2 3/
P	120	4 3/

Pos.	Menge	Einheit	Benennung	Sachnummer	Bl. Gr.	Bemerkung
			Freimass-toleranz nach DIN 7168 mittel			Massstab
						Werkstoff
						Rohteil-Nr.
						Modell-Nr.

	1992	Datum	Name
Bearb		22.01.	Sondermann
Gepr			
Freig		17.2.92	

Muhr und Bender
MASCHINENBAU GMBH

Benennung
Fundamentplan
Foundation drawing
Plan de fondation

Zeichnungs-Nr.
0170510306

3 Bl