Operating Instructions

for hydraulically powered MUBEA Ironworker

Model MIW 600

combining 5 working stations: Plate shear, section shear, bar shear, coper / notcher, and punch

Type No.:
Serial No.:
Motor type:
Motor rating:
Operating voltage:

Please be sure to indicate the above serial No. in all orders and enquiries.

Muhr und Bender
MASCHINENBAU GMBH

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Telex 876706-0 mu d · Teletex 27223512 · Telefax (02722) 62-499

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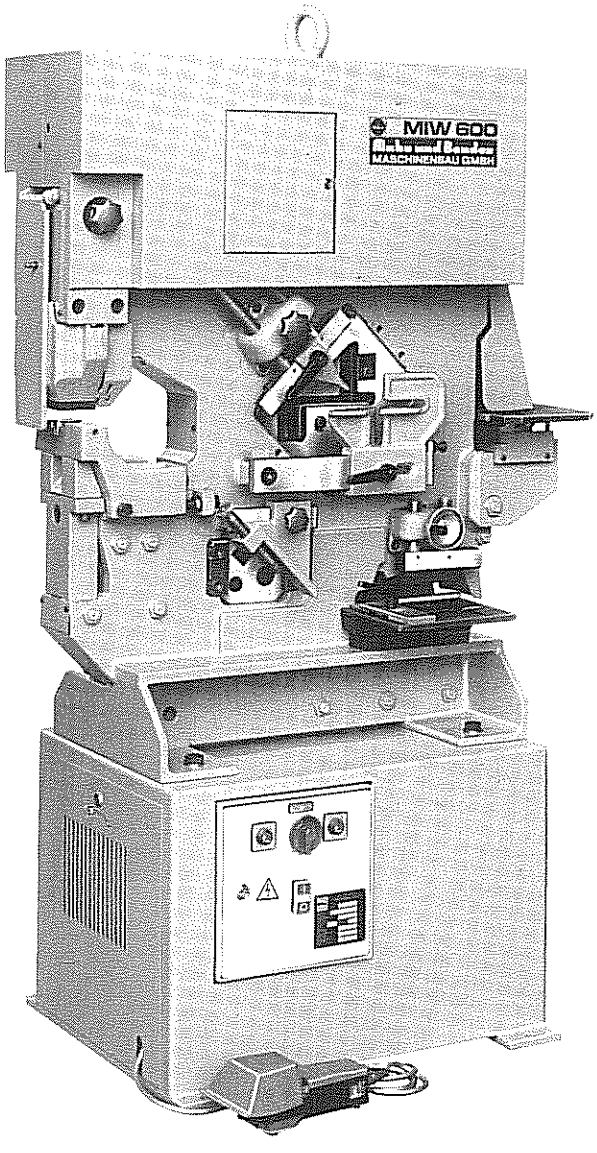
1. GENERAL



You will soon realize that you have made a very good choice. Your new MUBEA ironworker is a state-of-the-art machine that incorporates decades of experience in punch and shear construction. Many satisfied customers confirm again and again that the superiority of MUBEA ironworkers becomes particularly evident in everyday use.

Please read these operating instructions carefully and observe them closely so that you can be sure to benefit from all advantages offered.

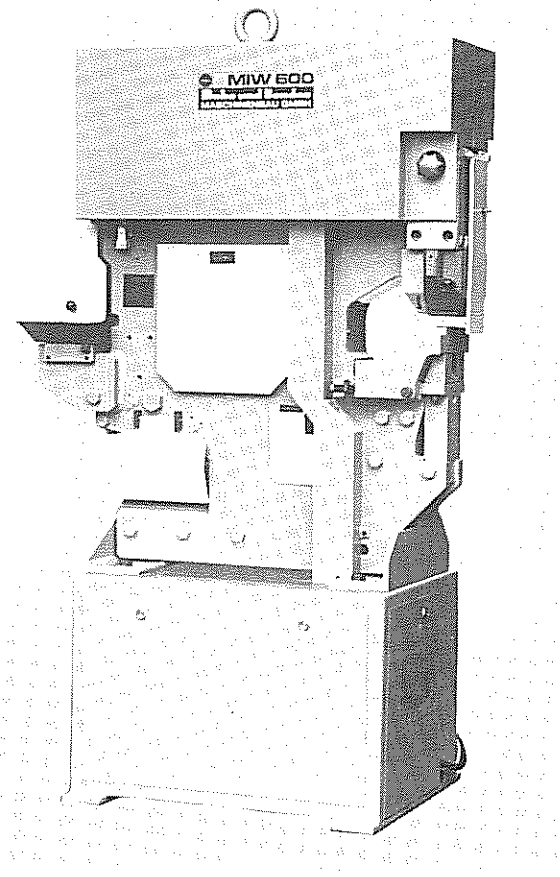
MUBEA ironworkers have exceptionally long service lives. All parts subject to ordinary wear can be replaced quickly and easily. It is important to use original MUBEA parts for replacement exclusively, as otherwise the service life of the machine and the reliability of its performance might be affected. This also applies when you plan to expand the operative range of your ironworker by installing additional tools.

It is indeed one of the special merits of MUBEA ironworkers - as practical experience will convince you, too - that their operative range can be expanded effectively, thus even increasing their versatility and efficiency.

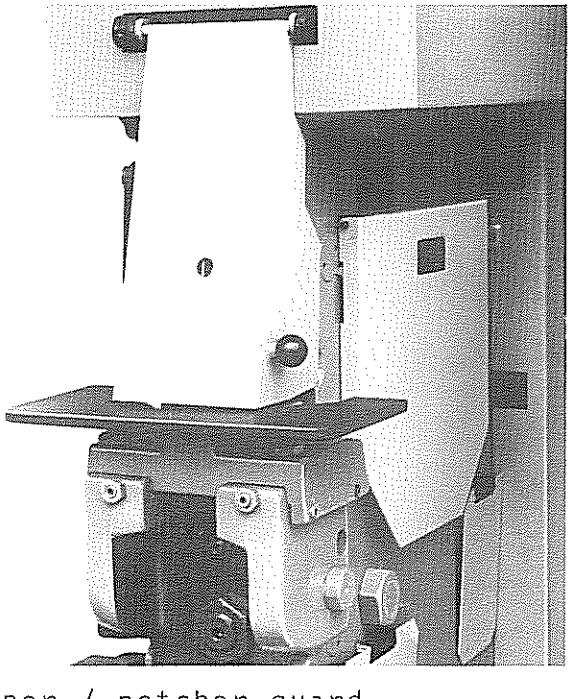
Your MUBEA ironworker complies with the safety rules and with the regulations for the prevention of accidents.

For the safety of the operators, all working stations are fitted with guards, which are not shown in the pictures of the individual working stations and tools in these operating instructions in order to demonstrate the functioning of machine and tools more clearly.

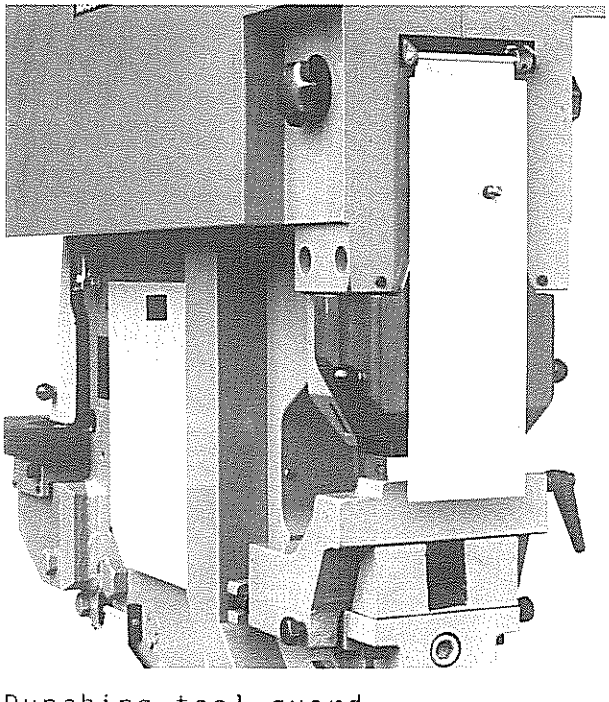
ONLY PUNCHING EQUIPMENT AND TOOLS MAY BE USED THAT ARE SUFFICIENTLY GUARDED UP TO THE CUTTING POINTS TO AVOID INJURIES.



Section, plate, and bar shear guards at the outfeed side of the machine



Coper / notcher guard



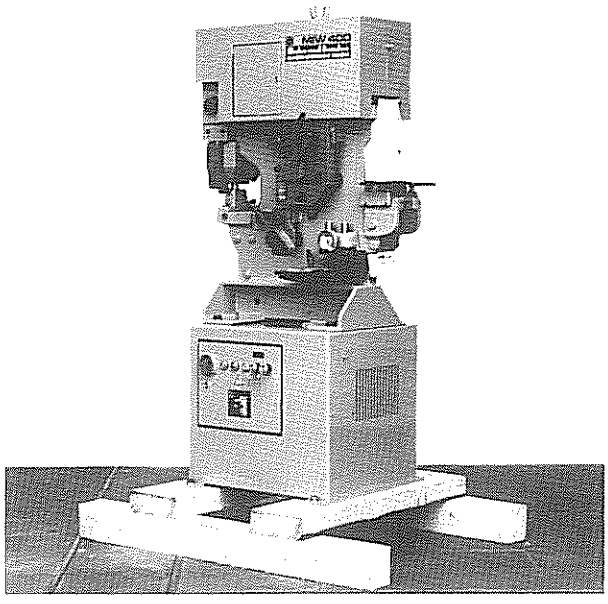
Punching tool guard

1.1 HANDLING THE IRONWORKER

For trucking, bolt the machine securely onto heavy planks.

When the ironworker is to be moved by means of a crane, it must be suspended by the lifting lug provided for that purpose.

The weight of your ironworker can be seen from the attached brochure.



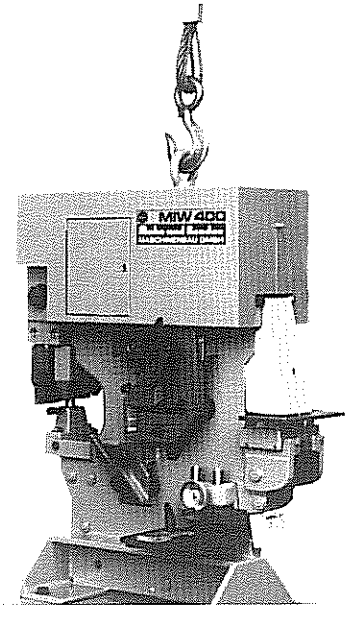
The machine ready for trucking

INSTALLATION

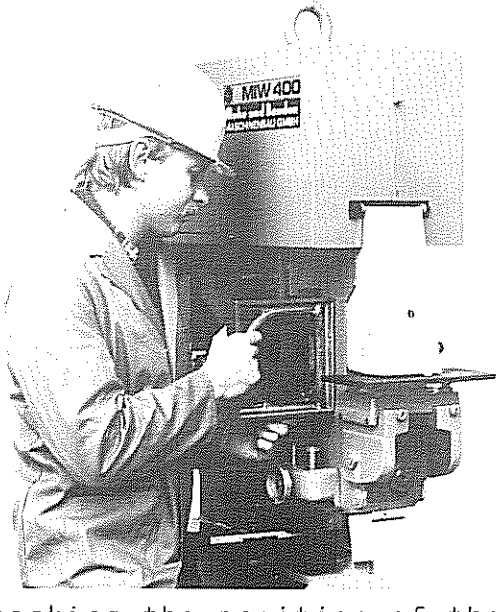
The working stations of the ironworker are arranged at normal operating height so that height adjustment by means of a pedestal or a baseplate is not required.

The attached foundation drawing contains all data needed to prepare a level foundation for the stationary installation of your ironworker. Tighten the foundation bolts carefully after the grouting compound has set. Instead of foundation bolts, dowel pins can also be used.

Make sure that the machine is in a perfectly vertical position.

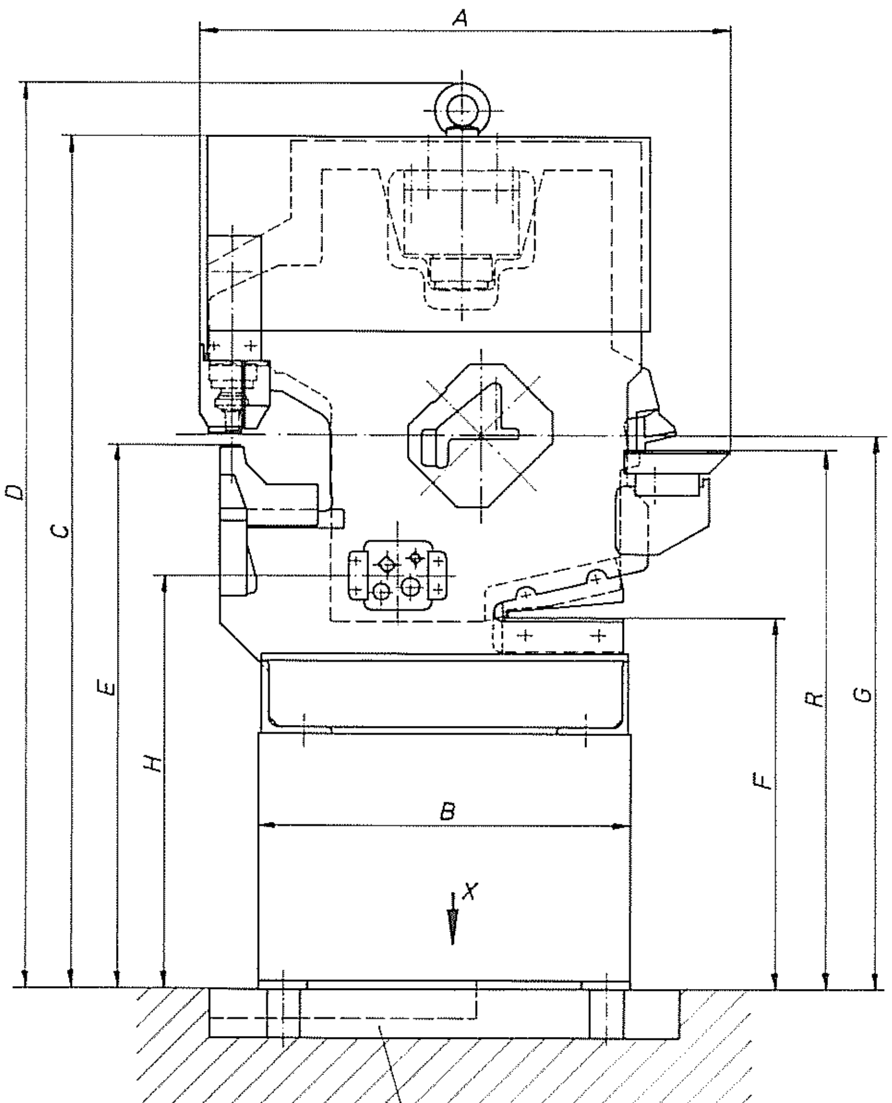


Moving the machine by crane

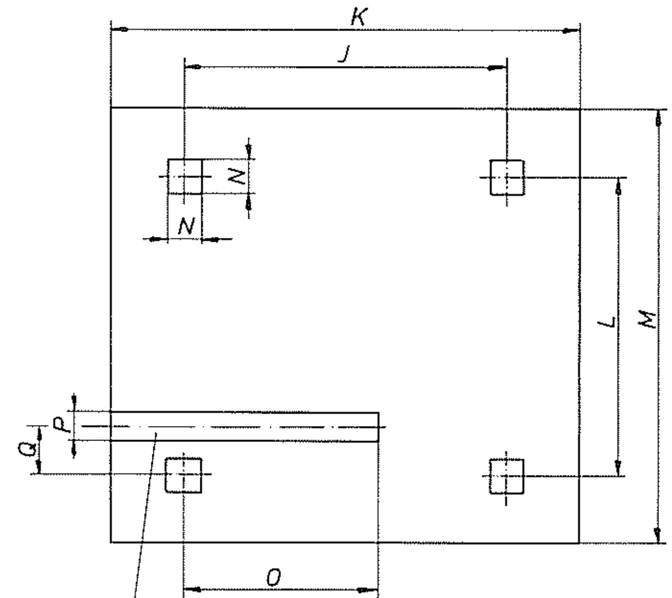


Checking the position of the machine

1.2 MACHINE DIMENSIONS / FOUNDATION DRAWING



Ansicht: X



MIW 600	01605 mm	01606 inch
A	1101	43 3/8
B	770	30 5/16
C	1772	69 3/4
D	1879	74
E	1128	44 7/16
F	772	30 3/8
G	1150	45 1/4
H	860	33 7/8
J	670	26 3/8
K	970	38 3/16
L	620	24 7/16
M	900	35 7/16
N	70	2 3/4
O	400	15 3/4
P	60	2 3/8
Q	100	3 15/16
R	1120	44 1/8

Pos.	Menge	Einheit	Benennung	Sachnummer	Bl-Gr	Bemerkung

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

Maßstab | Gewicht
Werkstoff / Rohteil-Nr / Modell-Nr.

1987	Datum	Name
Bearb	4.09.	Klaszma
Geprüft		
Freigabe		

Benennung: Fundamentplan / Foundation drawing / Plan de fondation

Muhr und Bender Attendorn

Zeichnungs-Nr. 01605 103 04 — Blatt — Blätter

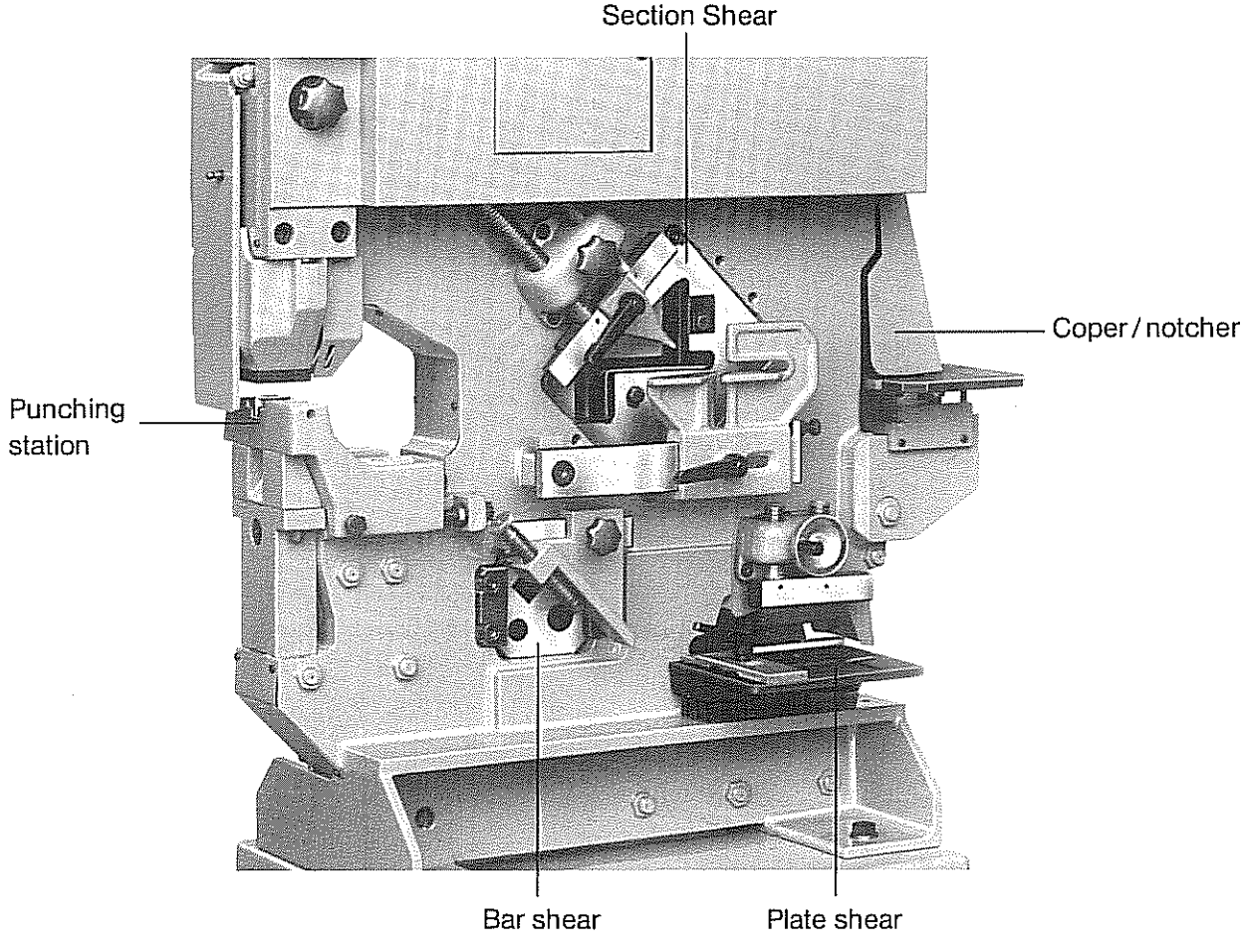
A.B. | Zahl | Mittlg. | Name | Datum | Urspr. | Ers. f. | Ers. d

2. COMMISSIONING

2.1 Description of the machine

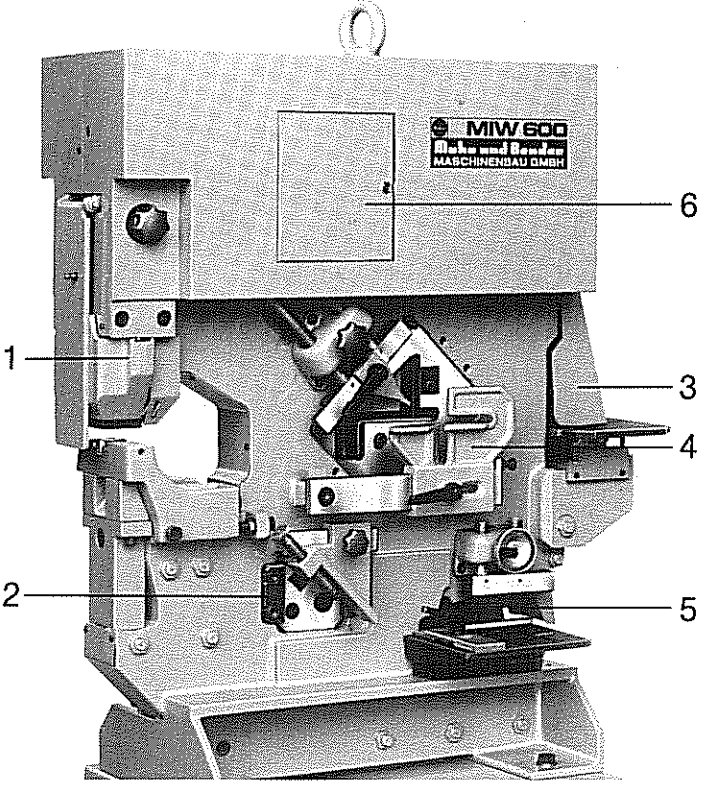
The hydraulically powered MUBEA model MIW 600 combines five working stations in one machine; it is equipped with a plate shear, a section shear, a bar shear, a punching station, and a coper/ notcher.

Special tools are available for all working stations.



2.2 Mechanical Control Elements

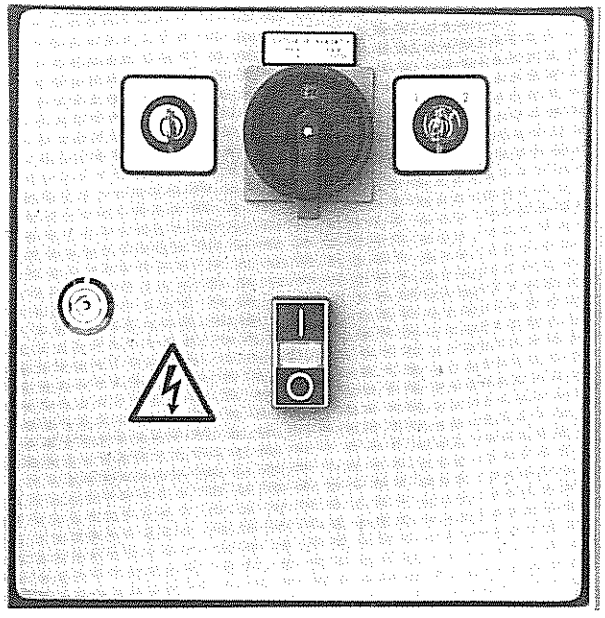
1. Punching station with adjustable stripper and guard
2. Bar shear with hold-down
3. Coper / Notcher with guard
4. Section shear with miter stop
5. Plate shear with adjustable hold-down
6. Stroke adjustment



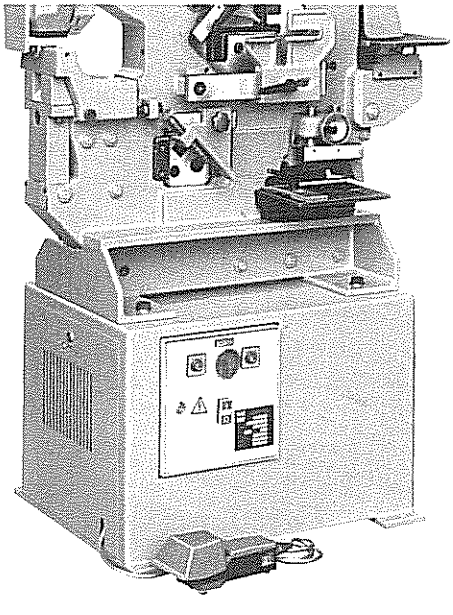
2.3 Electrical Control Elements

1. Main switch
2. "Start" key
3. "Off" key
4. Key switch "Coper/notcher - punching station"
5. Pilot lamp
6. Selector switch for the operating mode ("Inching - Full Stroke")
7. Foot pedal
8. Guard for the punching station
9. Guard for the coper/notcher
10. Key switch "Contact length stop"

The guards at the punching station and at the coper/ notcher have a safety function. Only when one guard is closed and the key switch (4) positioned correctly, the free working station can be used.



Switch cabinet



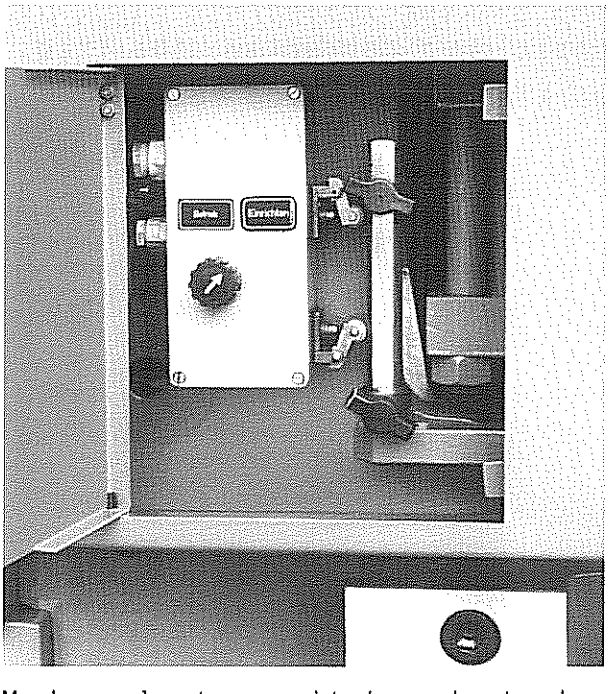
Machine base with foot pedal

2.4 Selector switch for the operating mode

The mode selector switch is fitted under the upper machine cover.

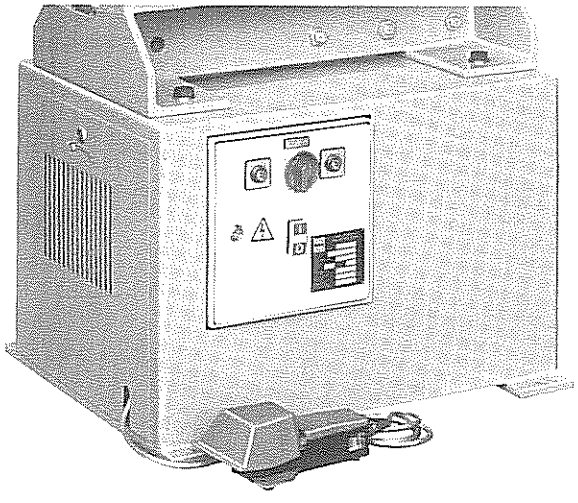
When it is switched to "Inching", the working slide can be lowered step by step by actuating the foot pedal until it has reached its operating position. This operating mode is intended for installing or taking off tools and for tool setup.

When the selector switch is turned to "Full stroke", the working slide automatically moves to its upper starting position.



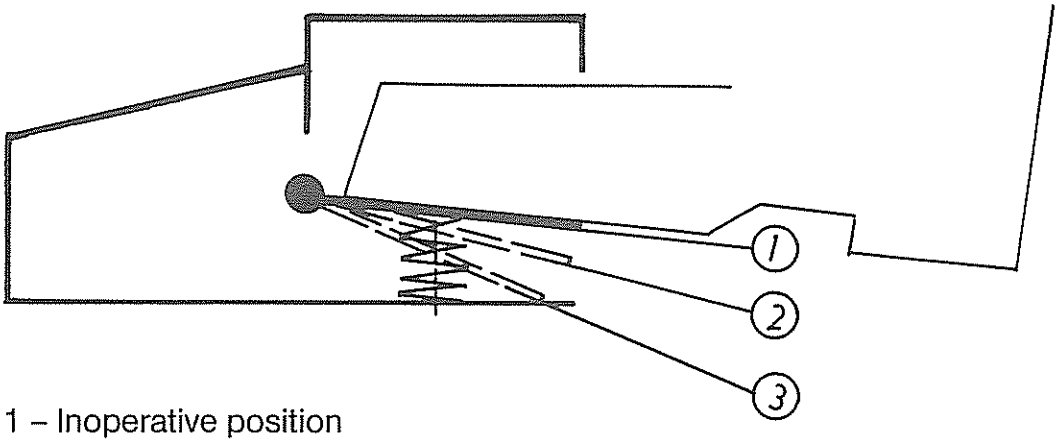
Mode selector switch and stroke control

2.5 Foot Pedal



Machine base with foot pedal

Foot pedal functions

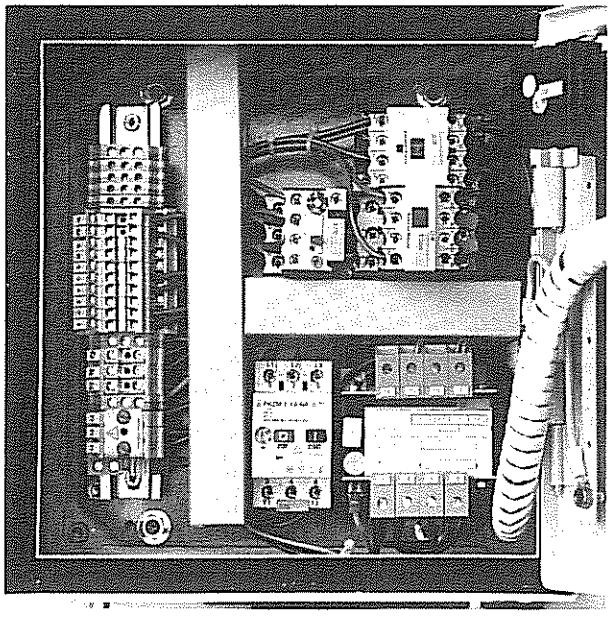


1 – Inoperative position
2 – Stopping the slide
3 – Operating position

2.6 Connecting and commissioning

The drive and the oil tank are installed in the machine base. Please check through the filler nozzle if the oil level is about one inch below the tank cover.

When refilling the tank, please proceed in accordance with the maintenance instructions.

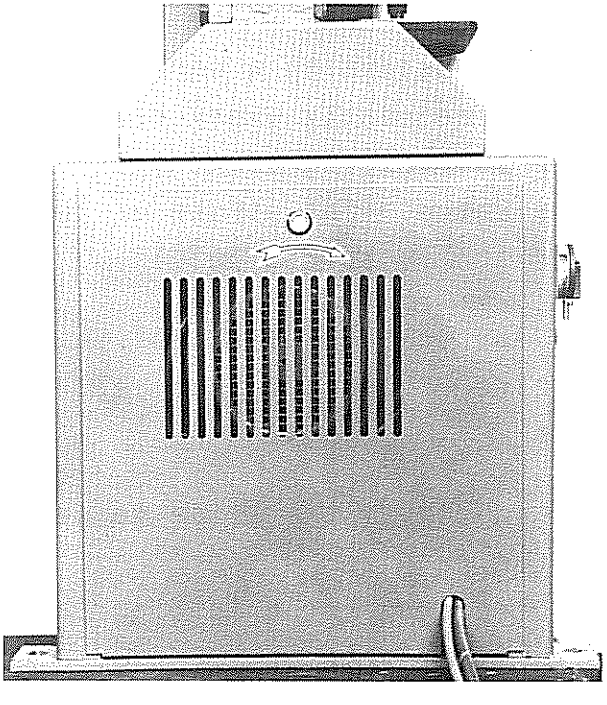


Power supply connection

The machine is supplied ready for operation. The switch cabinet with the main switch for connection to the mains is installed in the machine base. Connection must be made according to the attached wiring diagram by a qualified electrician. (Make sure that the operating voltage of the machine is identical with the mains voltage!)

Turn on the motor for a moment. If it does not rotate in the direction indicated by the arrow, two phases must be interchanged. For this check, the motor must run only very briefly with the selector switch turned to "Inching".

Before starting operation, please check if the working slides function properly, and if the tools have been set up correctly. For this purpose, the selector switch must be turned to "Inching" and the slide moved step by step to its lower dead-center position.



Checking the rotating direction of the motor

3. SERVICING AND MAINTENANCE

3.1 Lubrication - Lubricant

The machine must be lubricated with oil exclusively. The same oil can be used for all lubricating points.

The following oil brands are at the user's option:

ARAL-Deganit B 220
viscosity 220 mm²/sec. at 40° C

SHELL-Tonna Oil T 220
viscosity 220 mm²/sec. at 40° C

MOBIL OIL AG - Vactra Oil No. 4
viscosity 212 mm²/sec. at 40° C

ESSO AG - Millcot K 220
viscosity 230 mm²/sec. at 40° C

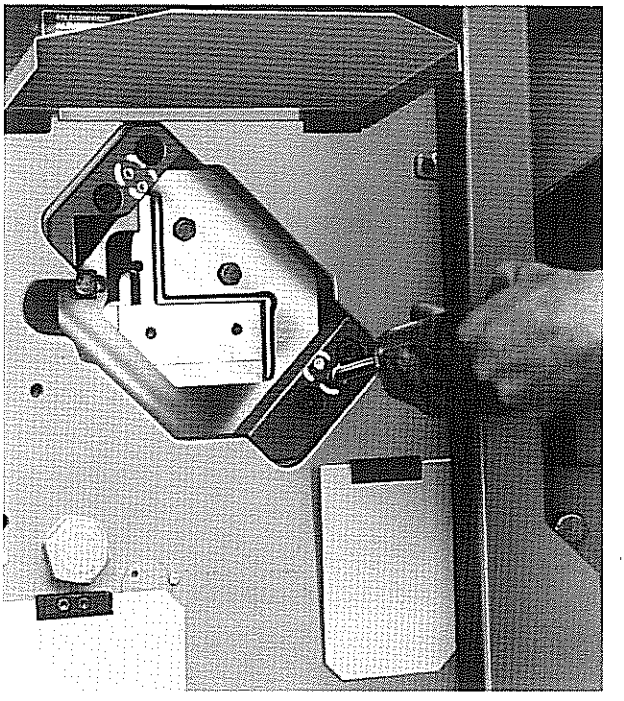
BP - Energol HP - C 220
viscosity 220 mm²/sec. at 40° C

Lubricate the machine thoroughly with the oil gun supplied in the tool kit.

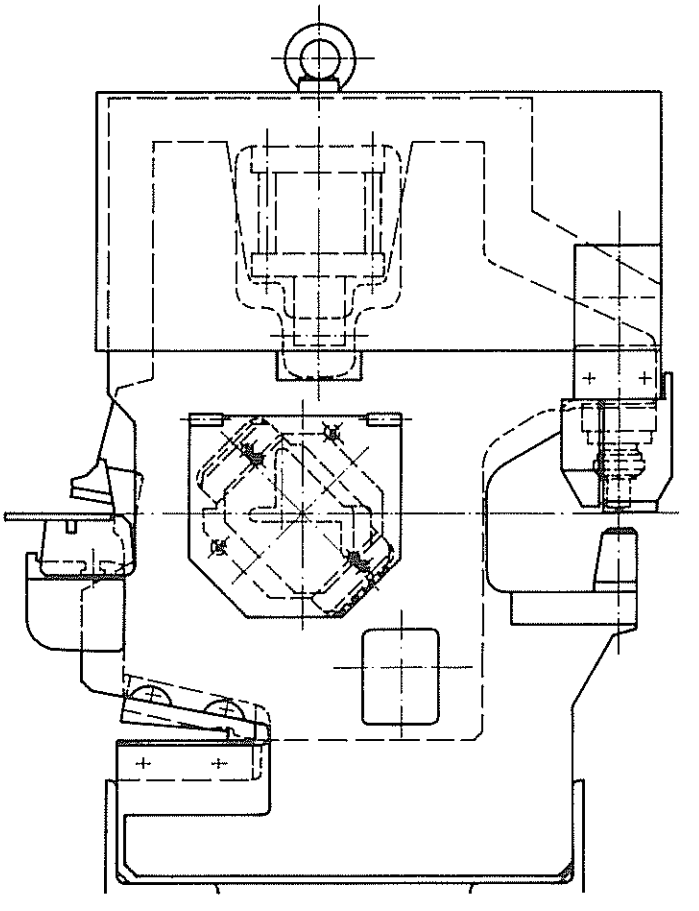
Prior to starting a working shift, and subsequently every five hours, each lubricating point must be lubricated. (One stroke of the hand gun is sufficient.)

All lubricating points of the machine are marked with yellow paint.

For adjusting the slide guides, please see item 9, for maintenance of the cutting tool, please see item 10.



Lubricating the machine



3.1 Maintenance prescriptions for hydraulic plant

A. General

For functioning and service life of the hydraulic plant it is extremely important to observe the following maintenance prescriptions.

B. Filling up the Oil Reservoir

Before starting oil level of the oil reservoir should be checked. The oil level shall be about 3 cm below the reservoir cover. Checking is performed by means of the gauge stick at the filling filter. Filling should be carried out only via the filter element. After filling, the filler has to be perfectly closed.

For filling the plant there has to be used only highgrade branded hydraulic oil. At medium ambient temperatures (5°C to 35°C) there should be employed H y d r a u l i c O i l H L P 46 (Viscosity classification: ISO VG 46 DIN 51 519). At extreme low or high temperature, the manufacturer should be consulted.

All reputable oil manufacturers supply suitable oils. As mixing of the hydraulic oil of various manufacturers is not advisable, there should be always refilled the same type. The oil type of machines filled in the factory is stated on the oil reservoir.

C. Starting

At setting plant into operation there has by all means to be observed the correct direction of rotation of the motor. To avoid damages of the pump, the motor must start up in inching operation. The engagements should then not be actuated. When having ascertained the correct direction of rotation, the motor must be kept running for about 3 to 4 min. without actuating the engagements. To ensure escaping of the air eventually existing in the system, each cylinder has afterwards to be moved out and in repeatedly without loading over the whole stroke. After perfect venting the plant can be started up under load.

The max. operating pressure adjusted in the factory is specified on the reference plate at the oil reservoir. Checking of the pressure can be carried out by means of a manometer at the measuring connection above the oil reservoir.

The stated max. operating pressure should not be exceeded.

D. Maintenance

Current checking of the oil level in the oil reservoir is necessary in order to avoid greater damages.

After approx. 10 operating hours the return filter fixed on the oil reservoir has to be cleaned for the first time. Cleaning should be done in rinsing oil or petroleum.

Throw-away filter cartridges have to be replaced. After having fitted the clean resp. new filter element the plant is again ready for work. Further filter cleaning should be done at normal fouling about every 600 operating hours.

The first oil change should be carried out after approx. 600 operating hours. Afterwards the oil has to be renewed every 1 200 to 1 500 operating hours. After draining of the waste oil, the oil reservoir and the whole system have to be cleaned with rinsing oil. Water, leaches and petroleum are not suitable as purifying agents. After complete cleaning the plant has to be closed and to be filled up with new, unused hydraulic oil. All filters have to be cleaned at every oil change. Of course, there has to be taken care of greatest cleanliness when refilling.

During operation there have to be permanently controlled the oil level, the leakage of the plant, the fastening of the units and pipes as well as state of the hydraulic oil and the filters.

E. Eliminating troubles

Fault 1: Excessive noise in the plant

Cause	Reason	Elimination
1.1 Cavitation in the pump	1.1.1 Hydraulic oil too cold (below + 5°C)	Heat the hydraulic oil to the temperature of + 5°C
	1.1.2 Viscosity of the hydraulic oil is too high	Replace the hydraulic oil by a suitable one (see section "Filling up the Oil Reservoir")
	1.1.3 Steam generation	The max. oil temperature of + 70°C is exceeded. Refill hydraulic oil or replace it by prescribed one
	1.1.4 Failure of the pump	Exchange the pump
	1.1.5 Sealed reservoir	Clean vent-filter in the cover of the filler
1.2 Foam formation or air pockets in the pressure fluid	1.2.1 Pressure fluid level in the reservoir is too low	Fill up on the correct level
	1.2.2 Wrong hydraulic oil	Replace by suitable oil
	1.2.3 Entering of air caused by the screwed joints in the suction pipe	Retighten or replace the screwed joints
1.3 Mechanical vibrations	1.3.1 Vibrations of the pipings	Retighten the attachments
1.3.1 Pump	1.3.1.1 Used up or damaged	Replace
1.3.2 Drive motor	1.3.2.1 Used up or damaged	Repair or replace
1.3.3 Safety or pressure limiting valve	1.3.3.1 Flatters	Adjust correctly or replace

Fault 2: No pressure or unsufficient pressure

Cause	Reason	Elimination
2.1 Pump does not feed correctly	2.1.1 Air enters into the suction pipe	See 1.2.3
2.2 High pump temperature	2.2.1 Used up or damaged pump	Replace the pump
	2.2.2 Unsufficient viscosity of the hydraulic oil	See 1.1.3
2.3 Leakage losses of the pressure side in the return motion	2.3.1 Mechanic control valve not connected through	Reset limitations of the engaging path
	2.3.2 Wrong adjustment of the pressure	Correct the adjustment
	2.3.3 Safety valve does not shut as there are dirt and defective parts	Clean, ascertain the damage, replace or renew
	2.3.4 Way valve open as there are dirt or defective parts electric fault	Clean the damaged unit, repair or replace
	2.3.5 Damaged cylinder bore, piston rod or piston seal	Renew the damaged parts
2.4 Failure of the pump	2.4.1 Damaged pump, defective drive, unsuitable viscosity of the liquid, etc.	See faults 1.3.1.1, 1.1.2

Fault 3: Anomalous pressure or flow fluctuations and vibrations

Cause	Reason	Elimination
3.1 Cavitation in the pump	3.1.1 See faults 1.1.1 to 1.1.5	See faults 1.1.1 to 1.1.5
3.2 Foam formation or air pockets in the liquid	3.2.1 See faults 1.2.1 to 1.2.3	See faults 1.2.1 to 1.2.3
3.3 Mechanic vibrations	3.3.1 See faults 1.3.1	See faults 1.3.1
3.4 Flattering pressure limitating or safety valves	3.4.1 See faults 1.3.3.1	See faults 1.3.3.1
	3.4.2 Damaged valve seat	Repair or renew
3.5 Valves seize	3.5.1 Fouling	Drain the hydraulic oil, clean plant and parts, fill up with clean oil
	3.5.2 Defective or distorted	Replace the unit, eliminate distortion
3.6 Air pockets in the plant which cause irregular or yielding motion	3.6.1 Plant is not completely vented	Vent the plant (see section "Starting")
	3.6.2 Electric equipment defective	Trace and eliminate the error

Fault 4: Unsufficient or no feed current

Cause	Reason	Elimination
4.1 Cavitation in the pump	4.1.1 See faults 1.1.1 to 1.1.5	See faults 1.1.1 to 1.1.5
4.2 Foam formation or air pockets in the pressure liquid	4.2.1 See faults 1.2.1 to 1.2.3	See faults 1.2.1 to 1.2.3
4.3 Used up pump	4.3.1 See faults 1.1.4	See faults 1.1.4
4.4 Leak losses from the pressure side in the return motion	4.4.1 See faults 2.3.1 to 2.3.5	See faults 2.3.1 to 2.3.5
4.5 Pump rotates in the wrong direction	4.5.1 Wrong direction of rotation of the motor	Reverse polarity of the electric connections

Fault 5: Too high temperature of the pressure fluid

Cause	Reason	Elimination
5.1 Overflow losses	5.1.1 Pressure adjustment too high	Correct the adjustment
5.2 Leak losses from the pressure side in the return motion	5.2.1 Bad functioning of the valves and defective seals	See faults 2.3.1 to 2.3.5
	5.2.2 Wrong viscosity of the hydraulic oil (too low, too high)	Drain the hydraulic oil and use the prescribed oil
5.3 Overheated pump	5.3.1 Wear of the pump	Replace the pump
5.4 Too quick circulation of the pressure fluid	5.4.1 Pressure fluid level has become too low in the plant	Filling up of the plant on the prescribed level (see section "Filling up the Oil Reservoir")

4. THE PLATE SHEAR

4.1 Blades

The lower blade has four cutting edges.

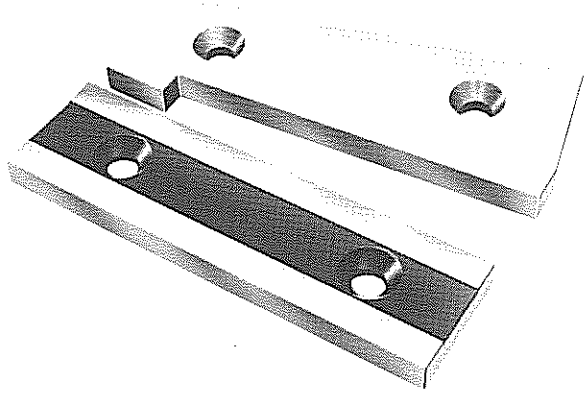
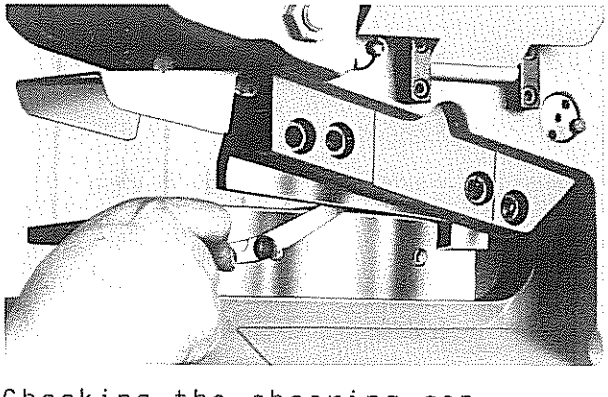


Plate shear blade

4.2 The shearing gap

Adjust the shearing gap between the blades to 5 - 10 % of the plate thickness to be sheared. Measure the shearing gap with a feeler gauge while the slide is down. In front, the shearing gap should be about 0.2 - 0.3 mm narrower than at the rear.

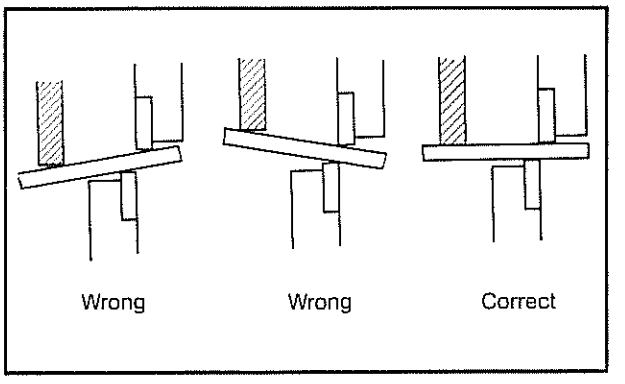
At the factory, the blades have been adjusted to shear any material thickness within their capacity range. For very light material, reduce the shearing gap with metal foil.



Checking the shearing gap

4.3 Setting the hold-down

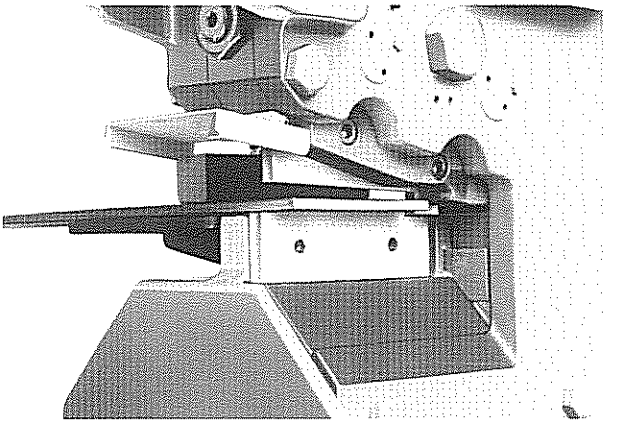
The workpiece to be sheared must be securely held in a horizontal position. Incorrect hold-down setting causes the blades to be damaged or their being forced apart.



Hold-down setting

4.4 Shearing flat bars

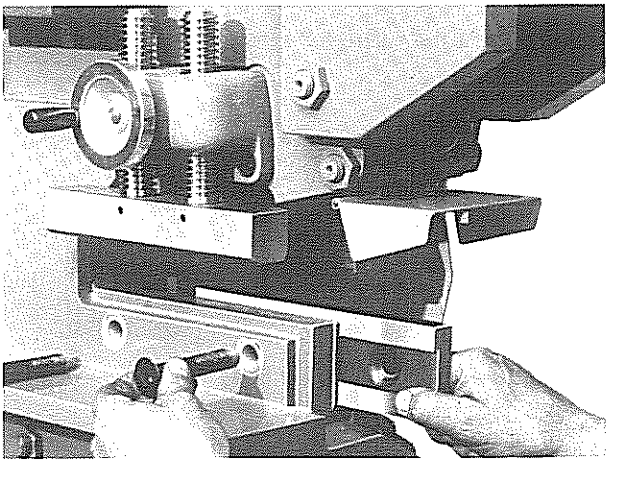
For shearing flat bars, the machine is fitted with an upper blade with a 2.5 degree rake angle. In addition, a special upper flat bar blade with a 5 degree rake angle is available on request. It should be noted that the wider rake angle affects the capacity.



Deformation-free shearing of flat bars

4.5 Removing or installing plate shear blades

Dismount the support and guide table, loosen the bolts, and take off the blades. Reverse the procedure to install the blades.



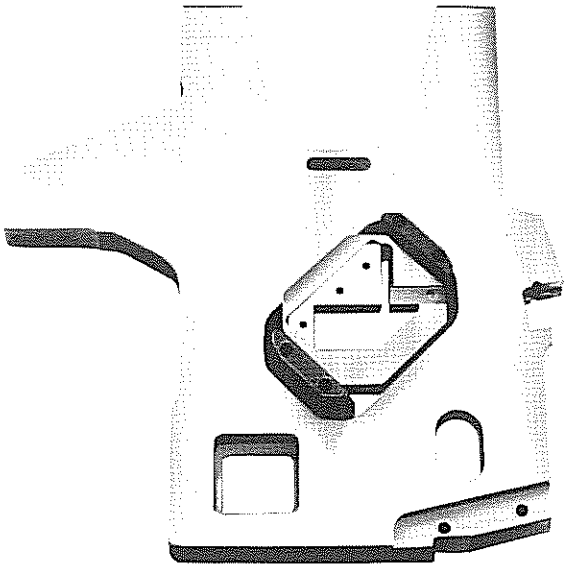
Changing the plate shear blades

4.6 Special blades

Special profiled blades are available for the plate shear for shearing round, square, and hexagon bars as well as flat sections.

5. THE SECTION SHEAR

The movable section blade is driven by the vertically moving slide. By means of guides integrated in the machine body, the direction of the movable section blades is deflected to 45°, which enables miter cuts and also allows angles and steel sections to be fed on level infeed conveyors.



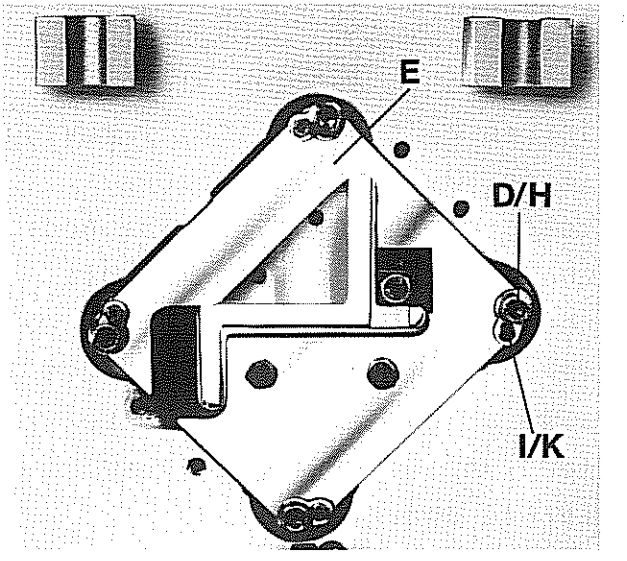
The drive of the movable section shear blade in the shear slide

Scale removal

There are grooves between the body plates and the shear slide, which are large enough for dry scale to fall through. In case scale does remain in the grooves, they must be rinsed with kerosene.

5.1 PMG Section blades for 90° and 45° cuts

The standard equipment of the machine includes blades for shearing angles at 90° and at 45°, and tees at 90°. A detailed description, maintenance and operating instructions are given below.



PMG section blade viewed from the infeed side

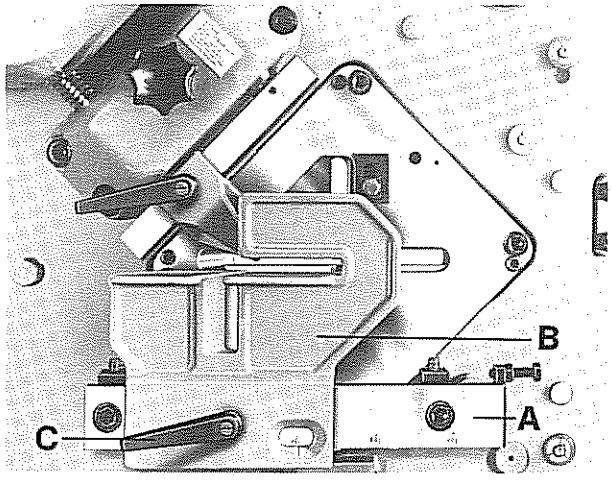
5.2 SETTING THE MITER STOP AND THE HOLD-DOWN

The stop rail A is marked for setting the hold-down B for 90° cuts or for 45° miter cuts. The hold-down is held in position by means of the clamping levers C.

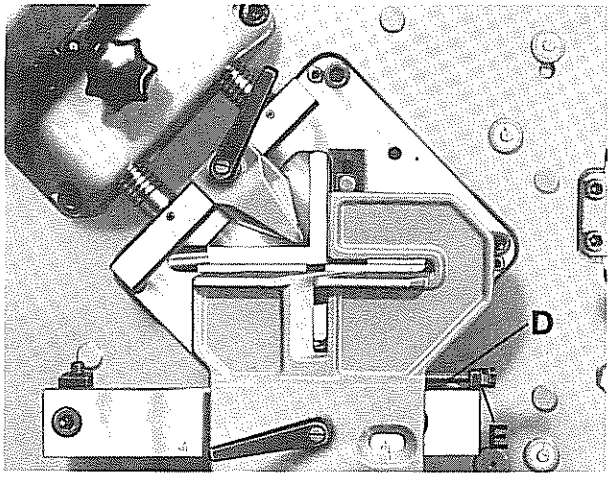
For 90° shearing, there is a stop screw D with locking nut E on the r.h. side of the stop rail. To obtain the proper lateral position of the section, simply move the section stop against the stop screw. The proper vertical position of the section is set by means of the two-spindle hold-down. Move the thrust pad F on bar G so that its tip touches the center of the section when the hold-down is lowered.

When shearing in the l.h. blade opening, the section is held down by means of bar G.

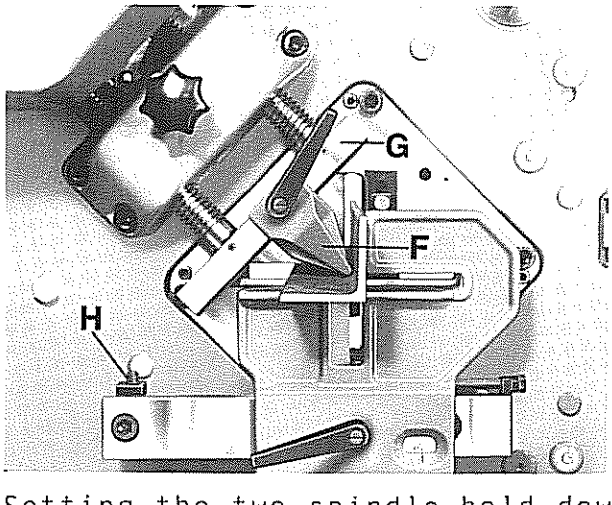
The height adjustment is correct when the section is in a horizontal position when it is being sheared. For vertical legs that are not angular, stop rail A is adjusted by means of the setting screws H. When the horizontal leg is not angular, adjustment is made by means of the section stop.



Section stop for 45° miter cuts



Section stops for 90° cuts



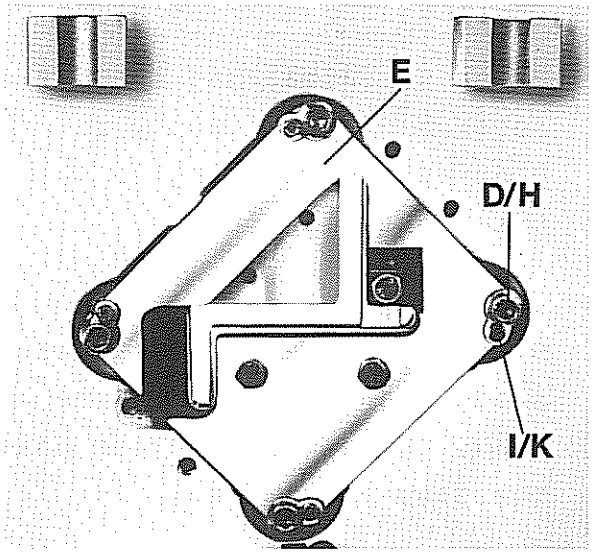
Setting the two-spindle-hold down

5.3 Removing / Installing the section blades

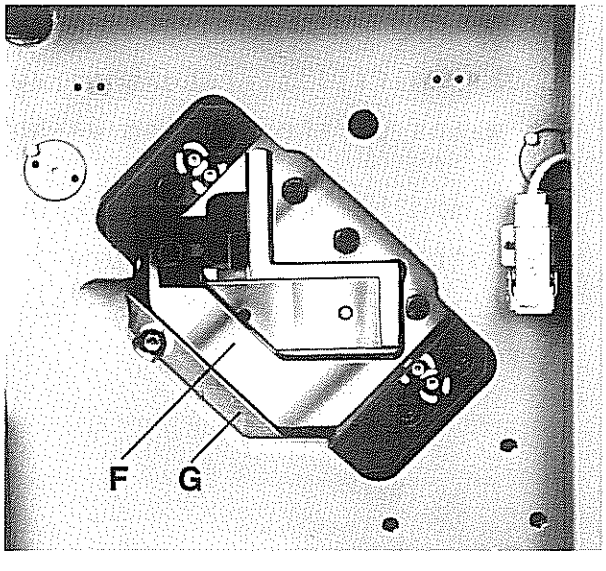
Removal

Loosen the clamping levers and push the hold-down plate from the stop rail.

- Unscrew the four fillister head screws D.
- Take the fixed section blade E from the machine.
- Take the movable section blade F from the machine.
- When cleaning the blades, particular care should be applied to the fixed and the movable guides in the machine body, in the slide, and in the blades.



PMG section blade viewed from the infeed side



PMG section blade viewed from the outfeed side

Installing the section blades

- Prior to installing the movable section blade F, apply a generous oil coating to the outer guide surfaces.

- Install the movable section blade F in the section shear slide G and push it in the blade guides to the rear until the stop is reached.

- Install the fixed section blade E in the machine body.

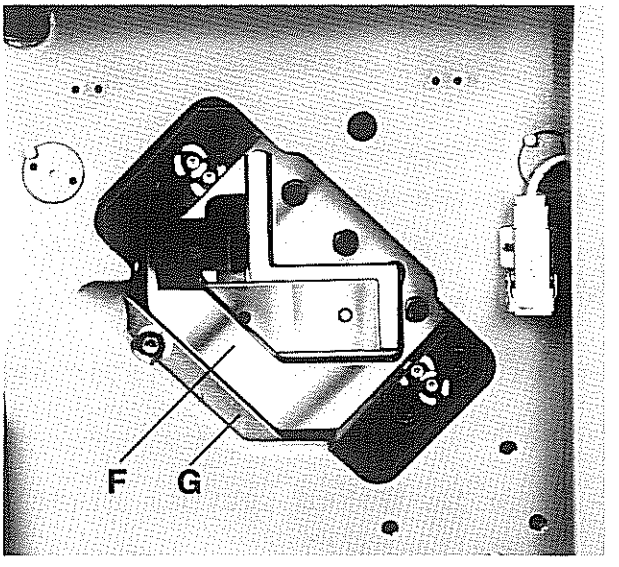
- Fit the fillister head screws D with the spring washers H and tighten them carefully.

- Securely tighten the setscrews I.

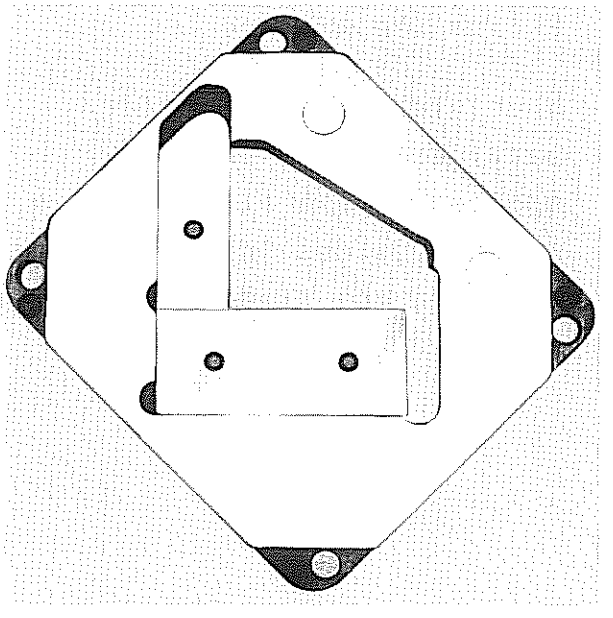
- Loosen the fillister head screws again by one complete turn, and retighten the setscrews I by approx. one eighth of a turn to the right. This must be done to ensure that there is a shearing gap between the two blades.

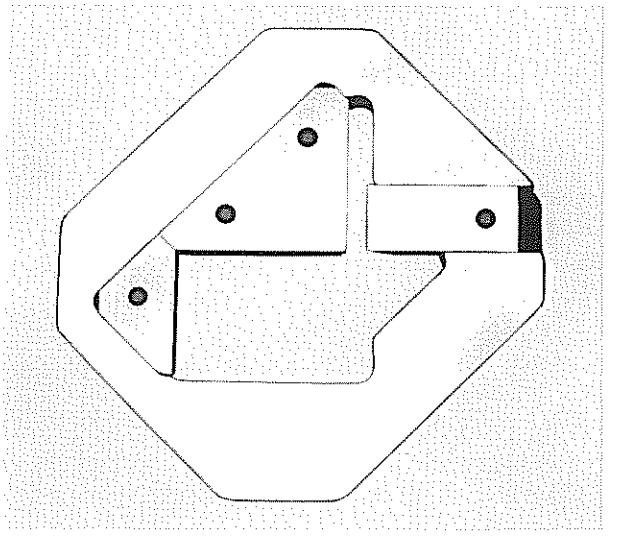
- Lock the fillister head screw D by means of the locking washer K.

- Slip the hold-down plate B onto the stop rail A and secure it by means of the clamping levers C.



The section blade viewed from the outfeed side


The fixed PMG section blade


The movable PMG section blade

Cleaning the section blades

The rugged section blades do not require much maintenance. From time to time they have to be taken down and cleaned; the intervals depend on the amount of slug produced.

- Remove the section blades according to the instructions given in item 5.3
- Remove the sliding blades A and B.
- Thoroughly clean the section blades and the insert blades.
- Reverse the procedure to assemble the blades.
- Install the section blades according to the instructions fiven in item 5.3

IMPORTANT: To ensure that the scale remains dry, the section blades must be free from grease.

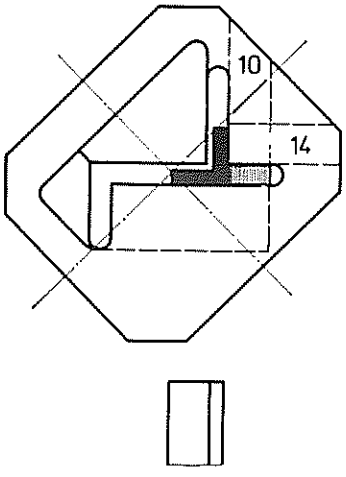
5.4 Blades for special sections

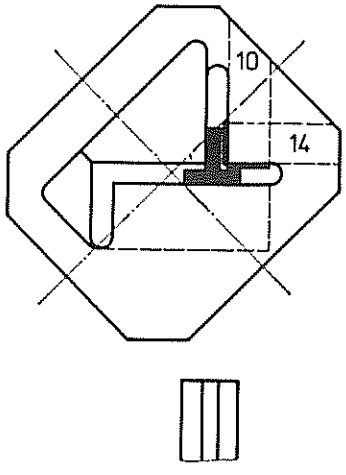
Section blades with fixed insert blades are available for shearing channels, I beams, zees, and other special sections. Depending on the dimensions of the sections to be processed, one pair of blades can have several openings.

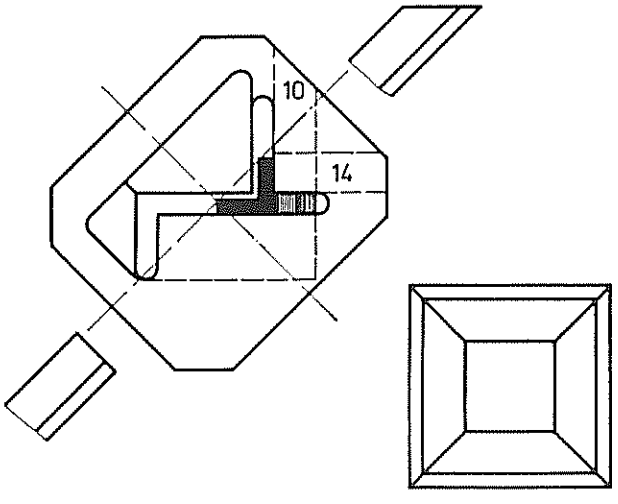
For channels and I beams to DIN standards, standardized section blades can be supplied.

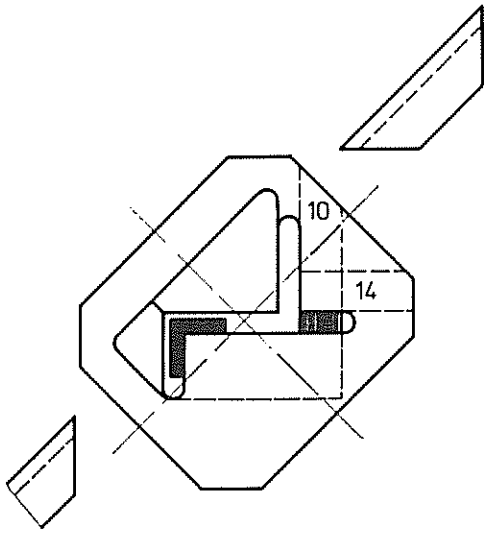
Combined blades are available for channels and I beams with identical dimensions.

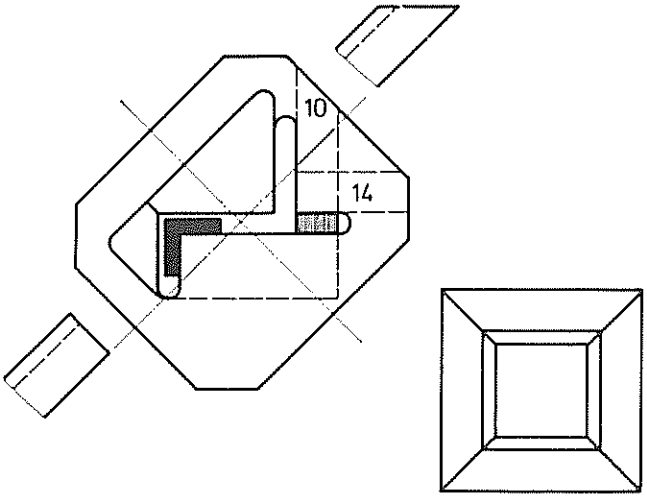
5.5 Shearing instructions for PMG blades

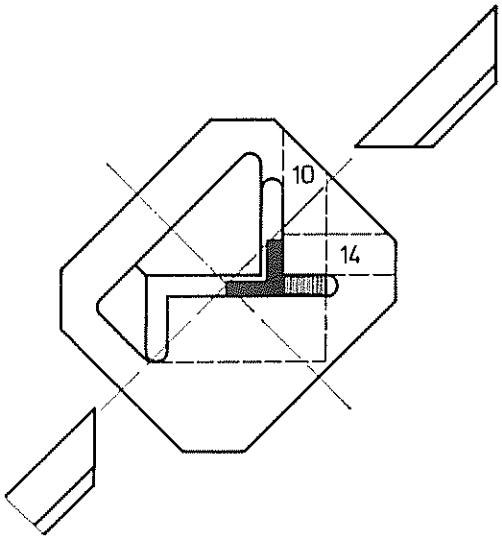






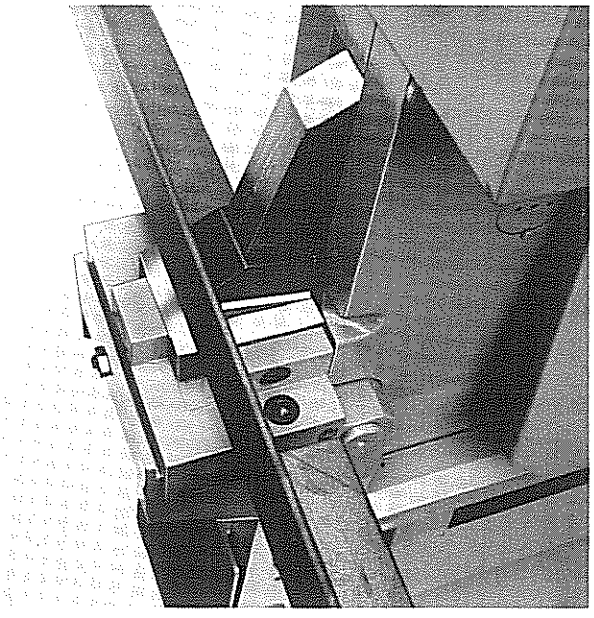






6. THE COPER / NOTCHER

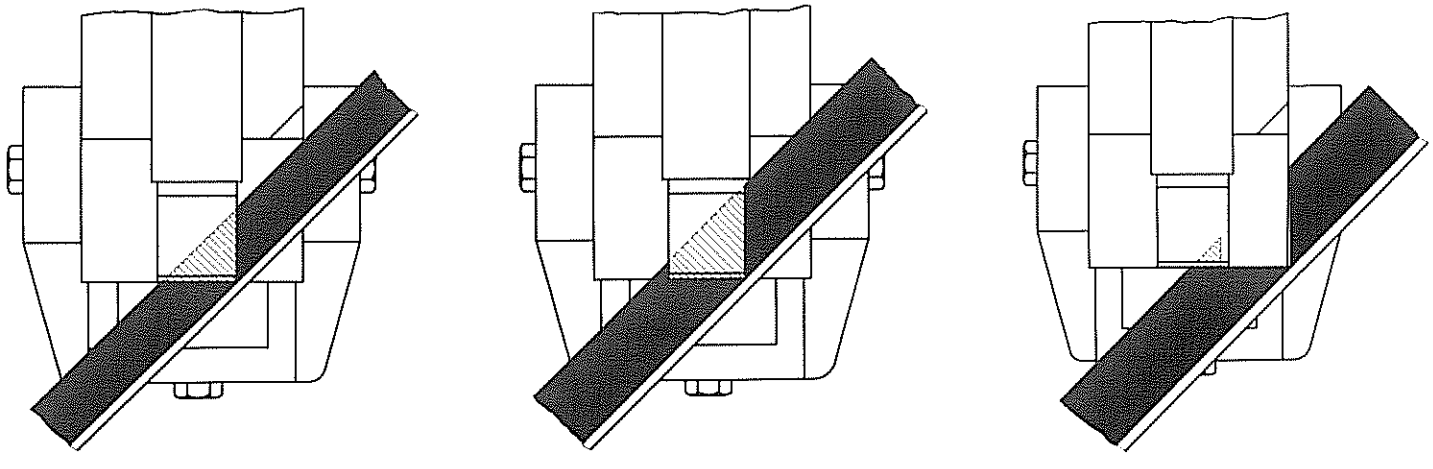
Your ironworker has been supplied fitted with either a triangular notcher or a rectangular coper. Both attachments are easily interchangeable, and can of course also be supplied for retrofitting.



Rectangular coping

6.1 The rectangular coping attachment

This tool is ideally suited for processing sections in the flanges and in the web. Both the coping width and the coping depth can be increased by a repeat stroke. Triangular notching is also possible by positioning the workpiece at a 45° angle. However, on account of the sharp tip produced, this procedure cannot be recommended for frame production.



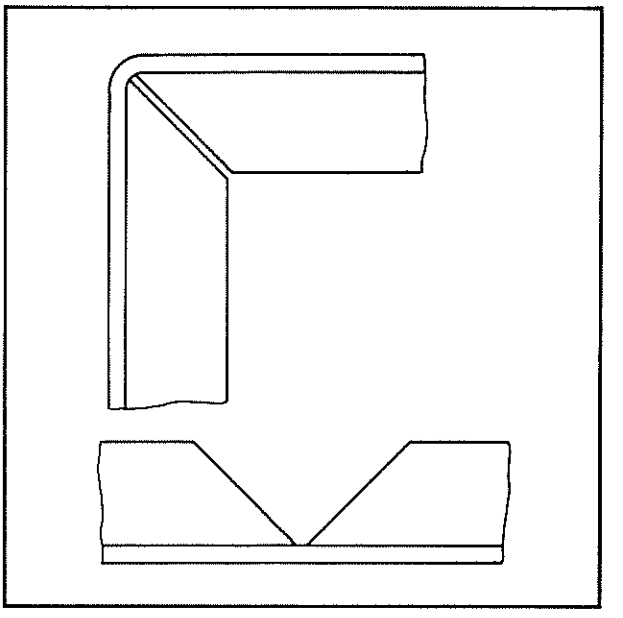
Makeshift triangular notching with the rectangular coping attachment

6.2 The triangular notching attachment

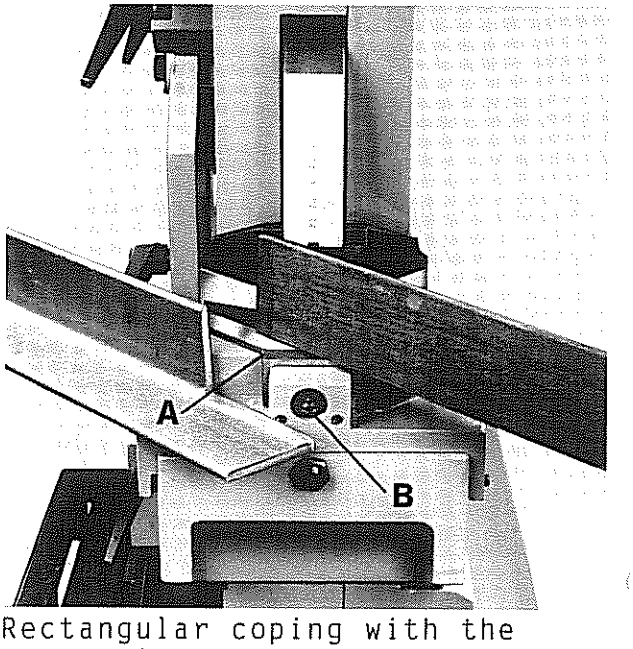
This tool is particularly recommended for the efficient and economic manufacture of frames from angles or tees. The tip of the tool is flattened to avoid deformations in the center of the section. The notched section can be bent to from a frame.

When the workpiece is fed at a 45° angle, the triangular notching attachment can also be used for rectangular coping of angles at the ends. By successive infeed, any length can be coped.

When tees are to be notched in the web, loosen bolt B and remove the front blade A so that there is room for the flange of the tee.



Triangular notching for frame production

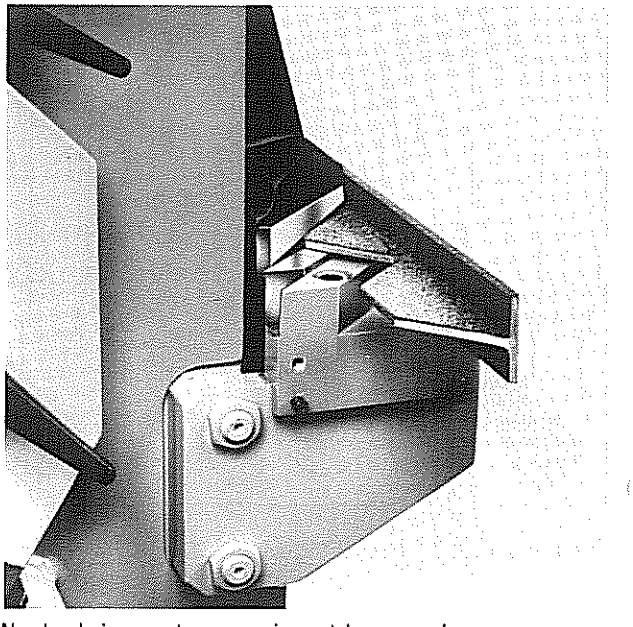


Rectangular coping with the triangular notching attachment

6.3 Adjusting, removing and changing the tools

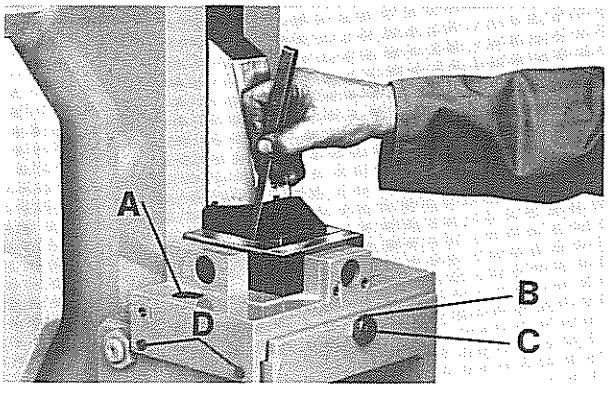
The coper/notcher saddle can be adjusted at all sides, so that the lower part of the tool can be easily adjusted to the upper blade.

Make sure that the shearing gap is even.



Notching tees in the web

At the factory, the shearing gap has been set for the maximum capacity. It must therefore be reduced when very light material is to be processed. To measure the shearing gap with a feeler gauge, lower the blade slide far enough for the upper blade to dip into the bottom part of the tool.

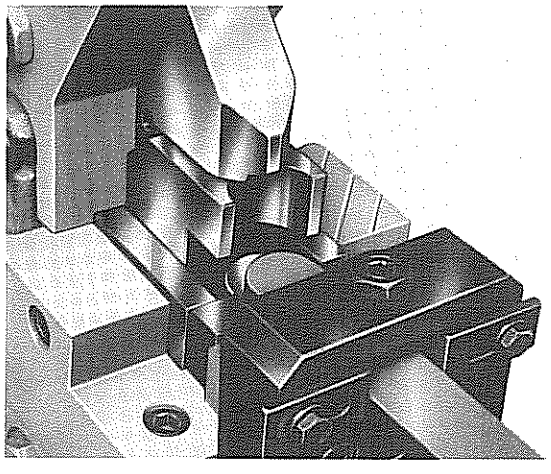


Checking the shearing gap

For adjusting, loosen the saddle bolts A, the counternut B, and the pressure screw C; then adjust the position of the saddle by means of the setting screws D. Securely tighten the saddle screws A. Tighten the pressure screw C and secure it by means of the nut B.

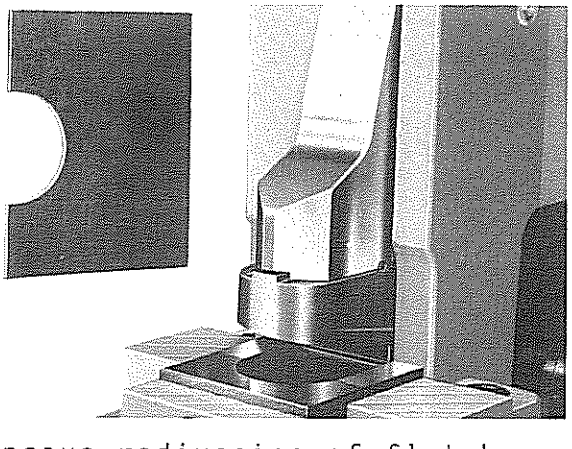
CAUTION:

IT IS URGENTLY RECOMMENDED TO USE THE GUARD FITTED TO THE COPER / NOTCHER AT ALL TIMES.


Convex radiussing of flat bars

6.4 Special tools

Various special tools can be installed instead of the ordinary triangular notching and rectangular coping tools, e.g. tools for convex radiussing of straps, or for concave radiussing of flat bars to be welded to round bars or pipes.

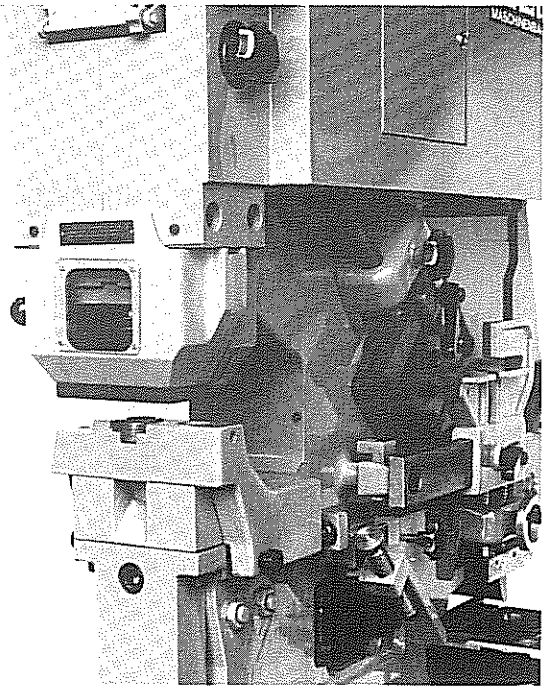

Concave radiussing of flat bars

7. THE PUNCHING STATION

The standard equipment of the punching station includes a quick clamping device for the punches and a die holder suitable for a maximum punch diameter of 30 mm.

Special punching equipment is available at an extra charge.

In addition, the range of equipment includes double separating and radiussing tools, pipe notching tools, as well as dies for separating channels and tees.

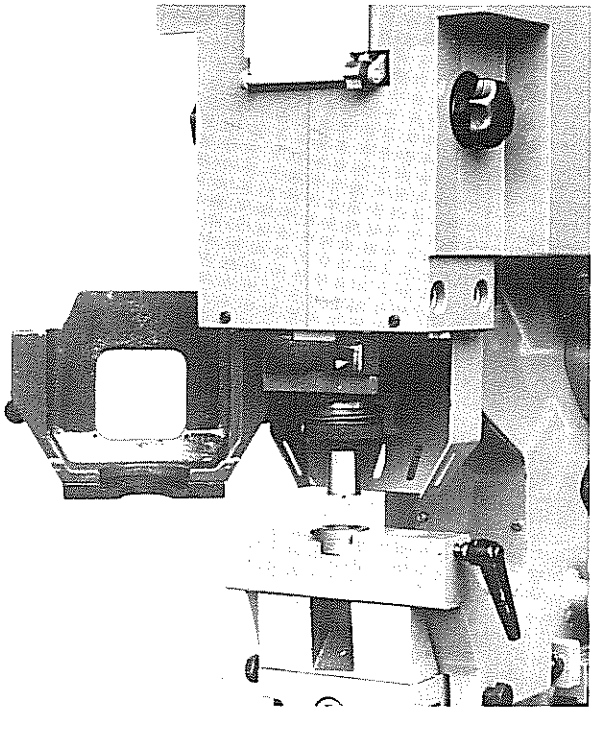


Punching station with stripper and guard

7.1 Set-up of the punching tools

If, after a tool change, punch and die are no longer concentric, they have to be aligned again. Proceed as follows:

- Turn the selector switch to "Inching".
- Slowly lower the punch.
- Loosen the die holder and adjust it so that the shearing gap is even again.
- Securely tighten the die holder.
- Check the shearing gap once again and, if required, make another adjustment.



Punching station with the stripper swung aside

7.2 Changing the punching tools

Proceed as follows:

- Turn off the machine and disconnect the mains connection.
- Swing off the stripper.
- Take off the punch by turning the adapter sleeve to the right.
- Install the required punch.
- Loosen the straining screw and remove the die.
- Install the new die and secure it by tightening the straining screw.
- Check if punch and die are concentric, and make adjustments, if required.

7.3 Adjusting the stripper

The stripper is vertically adjustable and can be swung out of the way.

Height adjustment is made by means of two star knobs and a common shaft, which ensures that the pintle on the l.h. and the support pin on the r.h. are always adjusted together.

Incorrect adjustments are thus prevented.

The stripper must be lowered onto the workpiece as far as possible.

To swing off the stripper, push it to the bottom by about 0.2 in. and swing it in the direction of the operator.

Correct adjustment of the stripper prevents punch breakage and ensures longer service lives of the tools in general.

8. THE BAR SHEAR

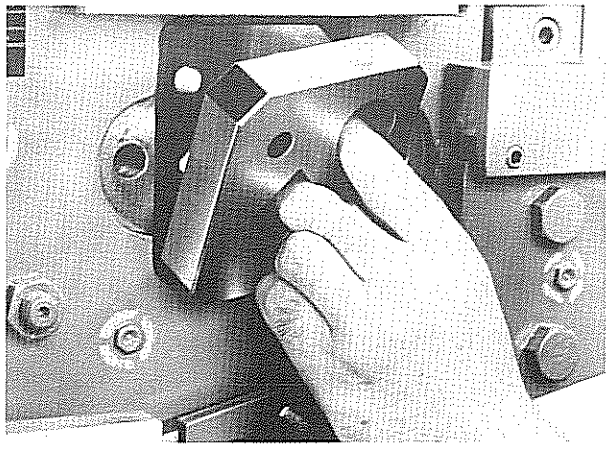
8.1 Installing / removing the bar shear blades

The standard equipment of the ironworker includes blades for shearing round and square bars. The blades are square and have cutting edges on both sides so that - by turning and rotating them - a total of eight cutting edges can be used.

Changing the blades

Loosen the bolts, pull off the brackets to the inside, and take off the blades.

Reverse the procedure to install the blades.



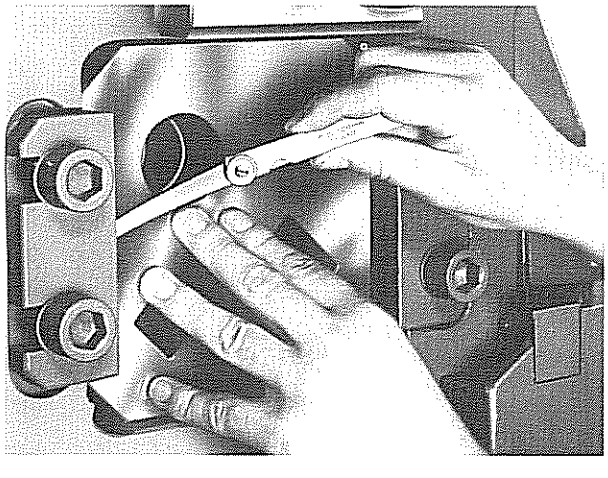
Changing the blades

The shearing gap

The bar shear blades must not be pulled together tightly. The shearing gap should be about 0.3 - 0.5 mm. Prior to shipment, the blades are adjusted properly at the factory.

The brackets must not push the blades together. When the blades are ground, the brackets must be reworked, too.

The shearing gap is checked by forcing the bar shear blades to the rear and measuring the distance between the brackets and the bar shear blades with a feeler gauge.



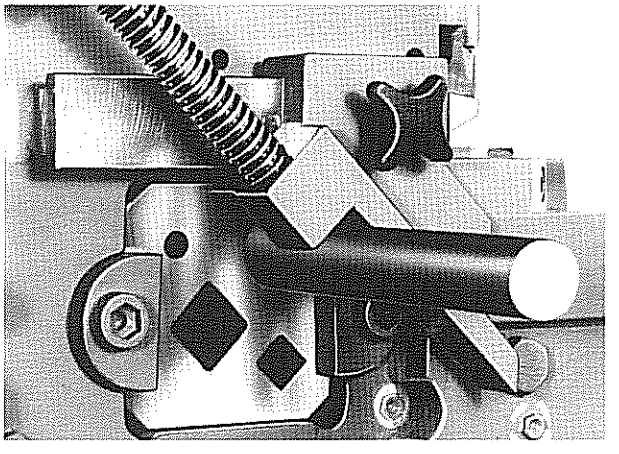
Checking the shearing gap

8.2 Adjusting the hold-down

The hold-down must be set to ensure that the workpiece is in a horizontal position when it is being sheared. Adjustment is made by means of the pressure screw as well as by shifting the complete hold-down.

8.3 Special blades

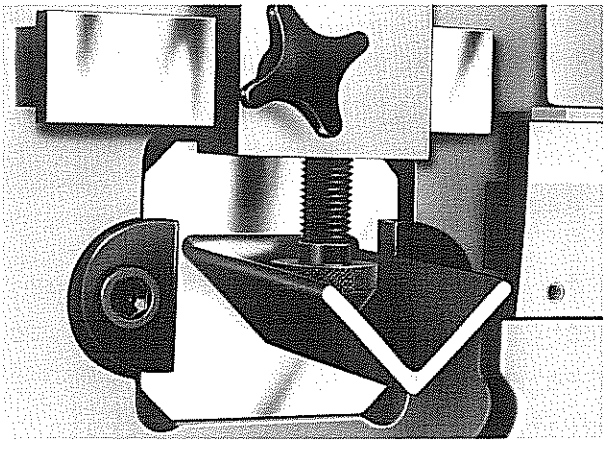
If you want so shear round bars exclusively, we can supply you with blades that have only round openings in accordance with your order specification. When the workpieces are to be fed via a roller conveyor, please indicate this in your order so that all blade openings can be arranged at identical height.



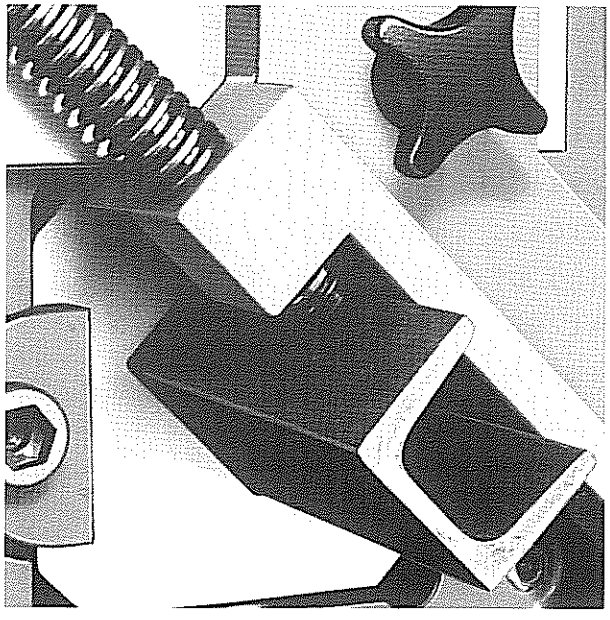
Shearing round bars

Blades for shearing angles, tees, channels, zees, and other sections are also available for the bar shear.

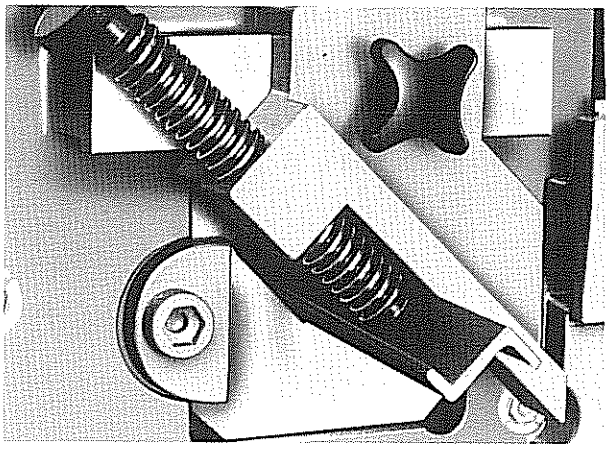
The possibility of shearing sections in the bar shear, too, saves you the trouble of changing the blades at frequent intervals. For instance,when blades for shearing ordinary angles and tees are installed in the section shear, the bar shear is free for shearing special sections, or, vice versa, the bar shear can be used for shearing angles and tees while large special sections are sheared in the section shear.



Shearing angles



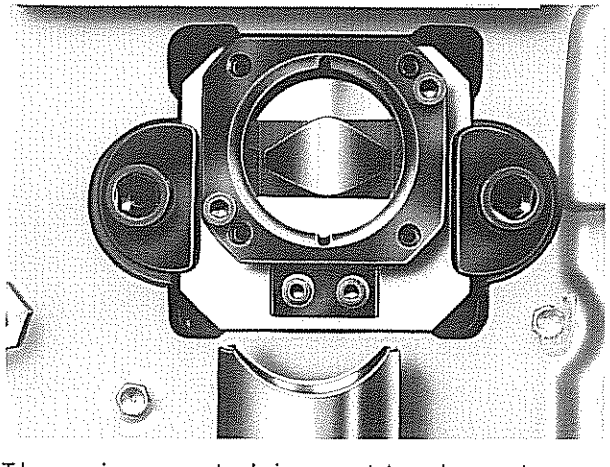
Shearing channels



Shearing zees

The pipe notching attachment

The low-cost pipe notching tool that can be installed at the bar shear offers a special advantage. The attachment handles pipes with a maximum outer diameter of 60 mm (2.36 in.) and a maximum thickness of 6 mm (0.24 in.). When switching from one pipe diameter to another, only the two cutting inserts have to be changed.



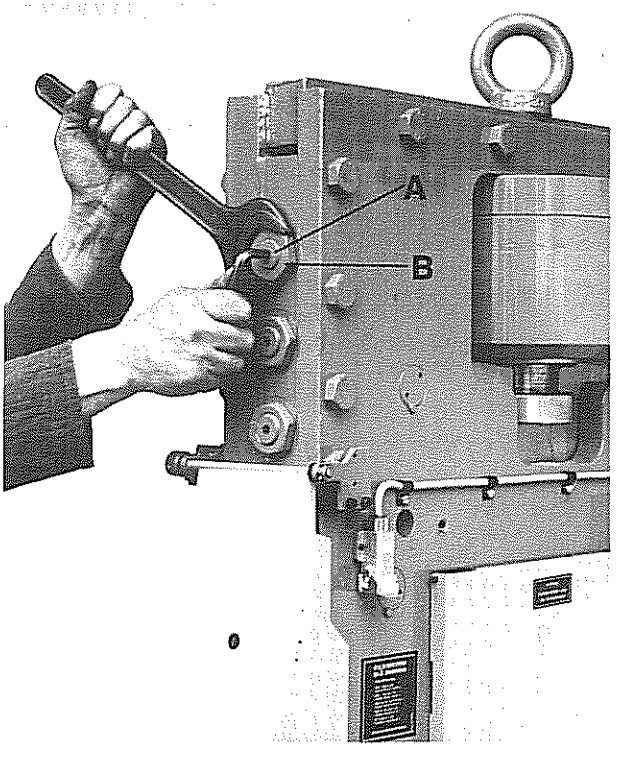
The pipe notching attachment

9. Adjusting the slide guides

The long slide travels on guides of a special antifriction material that are adjustable at all sides. This ensures perfect guiding of the slide, free from play at all sides, even after many years of operation.

To adjust the slide guides proceed as follows:

- Front adjustment
  Loosen the counternuts A by a l.h. turn. Use a screw driver to tighten the pressure screws B until resistance is felt. Then loosen the pressure screws B again by 1/16 of a turn, and tighten the counternut A. The slide now has a perfect running fit.



Front adjustment of the slide guides

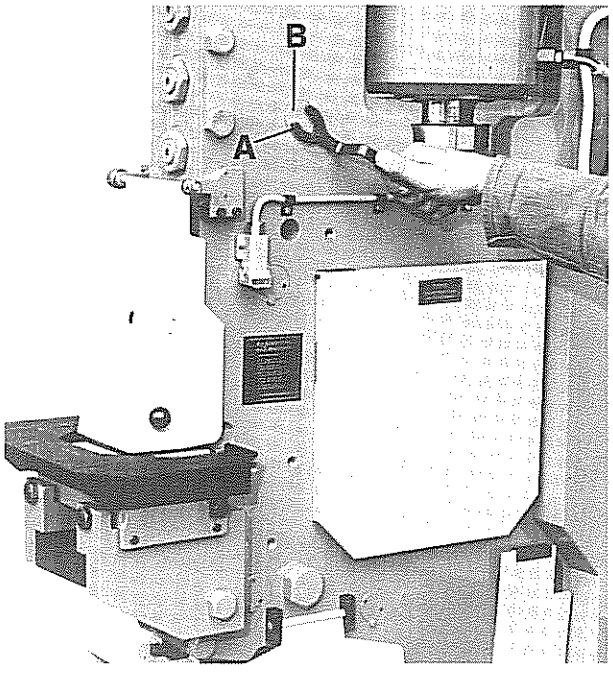
- Lateral adjustment
  Start by taking the section blades, the flat bar blades, and the coper/notcher tools from the machine.

  Loosen the locking screws A, and adjust the guide screws B. Securely tighten the guide screws B, and then loosen them again by 1/16 of a turn to ensure a perfect running fit of the slide. All guide screws must be adjusted in this manner.

  After the guide screws B have been adjusted, drill a 4.5 mm hole for the locking screws A that secure the guide screws.

  Now install the flat bar blades and check the shearing gap while the slide is down. If the clearance is too wide or too narrow, adjustments must be made by inserting a shim or by grinding.

  After the flat bar blades have been reinstalled and checked, fit the section blades and the coper/notcher again. The shearing gap of these tools must also be checked carefully.



Lateral adjustment of the slide guides

10. Maintenance and regrinding of the shearing tools

Every tool is subject to wear, and its service life depends largely on the care it receives.

When you notice small particles welded onto the blades, use an oil stone to remove them.

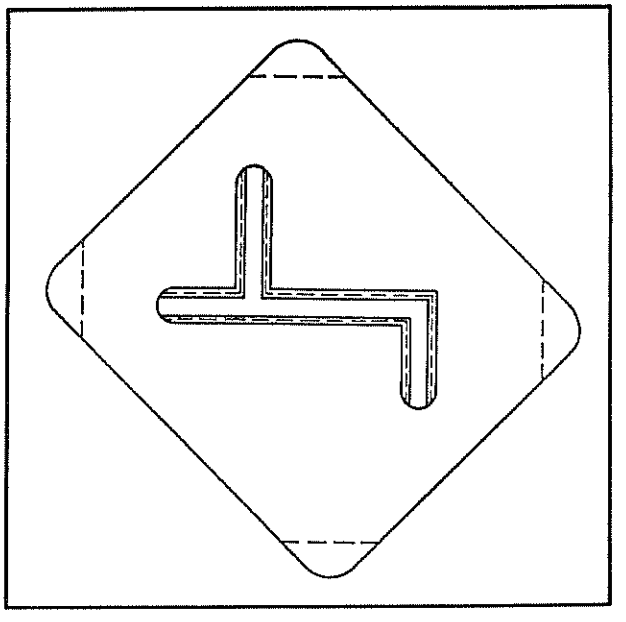
Dull cutting edges affect the shearing quality and increase the strain on the machine. Care should therefore be taken to re-grind the shearing tools in time.

Regrind the blades at the narrow cutting surface by means of a finegrained grinding wheel; adequate cooling must be provided, as too high temperatures cause grinding cracks and subsequent tool breakage.

After grinding, use an oil stone to remove the burr.

10.1 Section blades - maintenance and regrinding

To ensure continued clean cuts, it is important to keep the cutting edges symmetrical when regrinding section blades. For this reason, the grinding of all insert blades of a knife block must be identical.



Even grinding of the blades

10.2 Flat bar blades

Regrind the flat bar blades at the narrow surfaces depending on the degree of wear. Use an oil stone to remove the grinding burr. When the large surfaces have to be reground, the original shearing gap has to be restored by inserting paper or foil shims.

10.3 Coper/Notcher tools

The upper blade of the rectangular coper should first be reground only at the lower contact surface. The lateral surfaces should be reground only when considerable wear becomes noticeable. The lower tools, too, are first reground at the narrow surfaces. When grinding of the lateral surfaces becomes necessary, the original shearing gap must be restored by inserting paper or foil shims.

10.4 Punching tools

The above instructions basically apply also to the punching tools. In addition, care must be taken to ensure that punch and die are always concentric.

10.5 Bar shear blades for round and square bars

Depending on the wear, the blades for shearing round and square bars are reground either at their openings or at the large surfaces. The grinding burr must be removed with an oil stone.

Regrinding of all blades is limited by the shearing stroke of the machine. When the blades have been reground to an extent that prevents proper separation of the material to be sheared, the blades are no longer fit for use and have to be replaced. Care should therefore be taken to ensure that a serviceable cutting edge is obtained through a minimum of grinding.