OPERATOR'S MANUAL AND PARTS LIST

MUBEA MODEL HPSN

Plate, Bar and Angle Shear
with Coper-Notcher and Punch

SIZE
SERIAL NUMBER

OPERATOR'S MANUAL

PARTS LIST

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 high-grade 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 going of the plant 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 load 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 and/or 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 fist 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 on refilling.

During operation there have to be permanently controlled the oil level, the leakage of the plant, 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

Cause	Reason	Elimination
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

Cause	Reason	Elimination
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

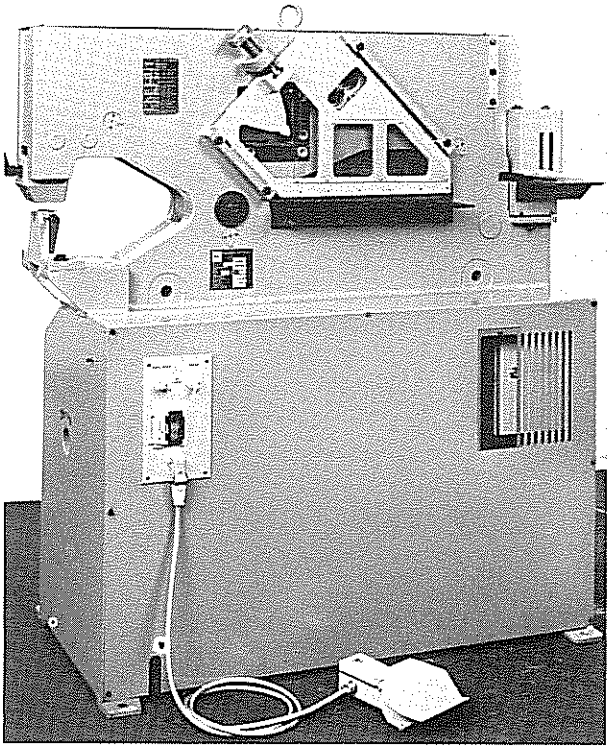
Cause	Reason	Elimination
5.1 Overflow losses	5.1.1 Pressure adjustment too high	Correct the adjustment
5.2 Leak losses from the pressure side in the return motion	5.2.1 Bad functioning of the valves and defective seals	See faults 2.3.1 to 2.3.5
	5.2.2 Wrong viscosity of the hydraulic oil (too low, too 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")

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



General

You have made a good choice, as you will soon see for yourself. The experience of decades and the latest knowhow in the field of punch and shear construction are incorporated in the Original MUBEA machine. As numerous satisfied customers have verified time and time again, it is just the daily routine handling of this machine that makes its advantages particularly apparent.

In order to be able to fully utilize the machine, it is urgently recommended that you read and follow these operating instructions carefully.

Experience shows that the machine has an unusually long service life. Components which are subject to normal wear and tear can be replaced at any time. It is important that you then ask for Original MUBEA spare parts exclusively. Only then can the service life of the machine and uniform quality of the result of its work be attained. This is also true if you wish to extend the range of application of your machine by adding further tools.

Shop practice will very soon show you that MUBEA machines can effectively be complimented and are thus universally useable, at the same time, economical in operation.

To give you a general picture of the components used in the construction machine and how these interact, we refer you to the list with the designations and numbers of the components.

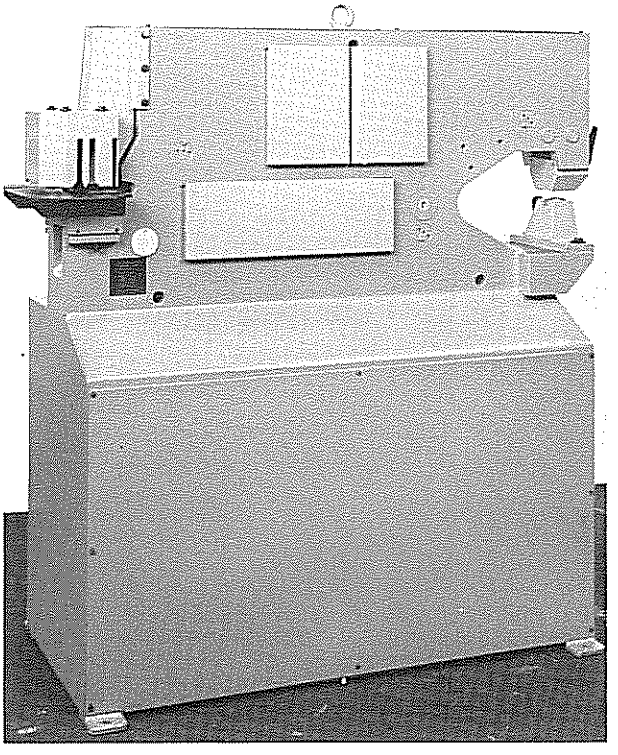
If you should have any questions or problems of any kind, please get into touch with us: Our service staff are always at your service. Upon request you can conclude a maintenance contract at a favourable price.

And another thing: Give your MUBEA machine the care it deserves. You will find many pointers on this throughout this manual.

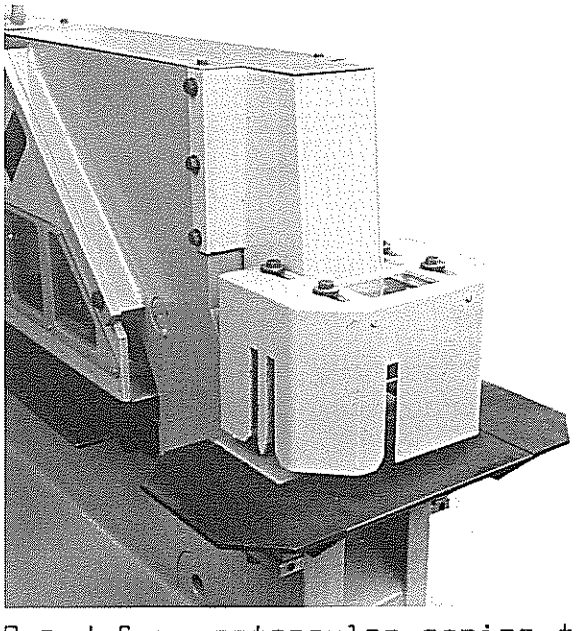
Your MUBEA Machine conforms to the regulations for the prevention of accidents and to the machine protection law.

For safety of operation, all working stations are provided with the necessary guards.

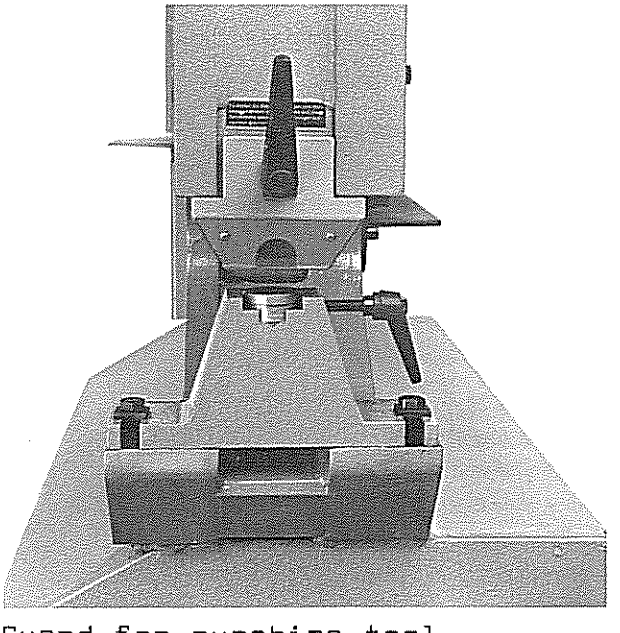
The photos of the various working stations and tools in these operating instructions do not show these guards because the functional representation would be affected.



Guards at discharge side at the section shear, bar steel shear and plate shear



Guard for rectangular coping tool



Guard for punching tool

Transportation

When transporting the machine by truck, stabilize by bolting to sturdy planks and secure to prevent tilting sidewise.

The weight of your machine is stated in the attached brochure.

When handling the machine by crane, insert the hook in the eyebolt provided for that purpose.

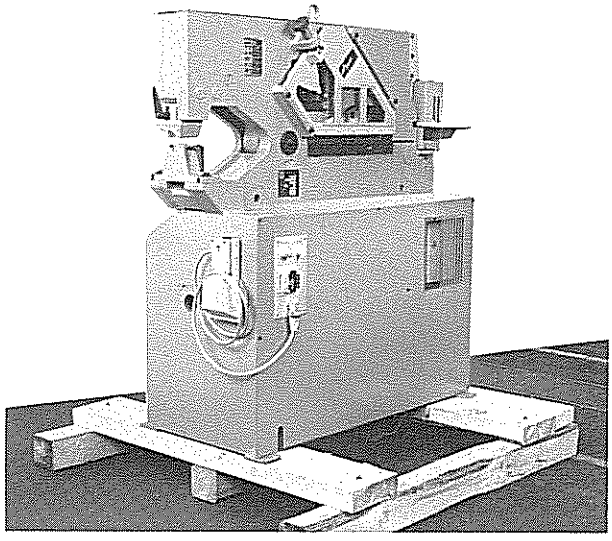


Fig. 1: Transporting the machine by truck

Erection

The working positions of the machine are at normal working level. Adjustment of level by platform or foundation basis is therefore unnecessary.

All the necessary data for providing a foundation level with the ground for stationary installation are given in the attached foundation plan. Tighten the foundation bolts securely after the grouting-in compound has set. Dowel plugs may be used instead of foundation bolts.

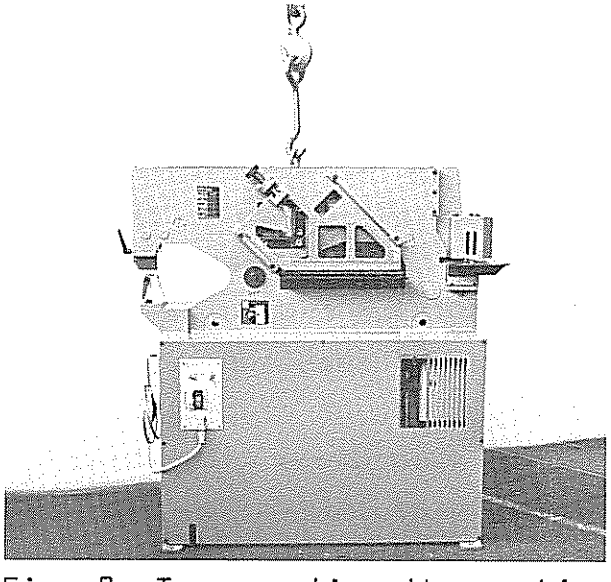


Fig. 2: Transporting the machine by crane

Check whether the machine is properly vertical.

Fig. 3: Checking for suitable erection and footing

CONNECTION AND OPERATION

The drive with the appertaining oil reservoir is located in the machine base. Check whether the reservoir is filled up to approx. 1 in. below its cover. Checking is accomplished through the filling inlet.

When refilling, follow the maintenance instructions.

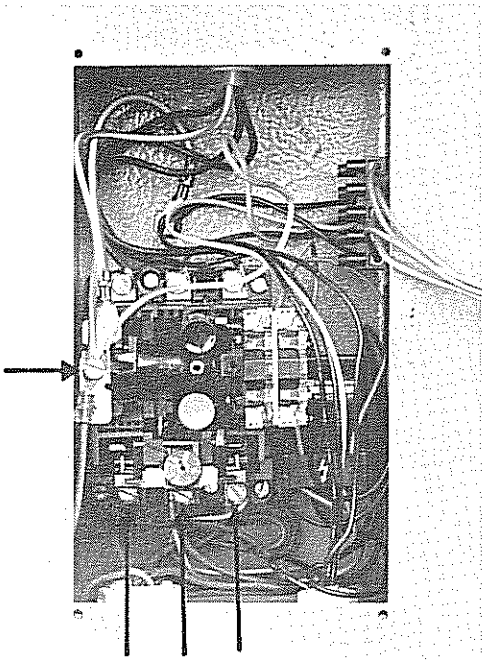


Fig. 4: Connection of the power supply

The machine is installed ready for operation. The machine's main switch is located in the switch cabinet to which the connection lines should be routed. The connections should be performed by an electrical expert in accordance with the wiring diagram (check the uniformity of the supply voltage).

Prior to start-up the machine, check whether the slides move properly and the tools are correctly seated and adjusted. For this purpose switch the selector switch to "inching" and inche the slide gradually into the lower dead center. (Refer to section: Electrical foot engagement)

Switch-on the motor shortly: if the motor does not rotate in the direction indicated by the arrow, 2 phases of the connections have to be interchanged. For controlling start the motor shortly in jog operation only.

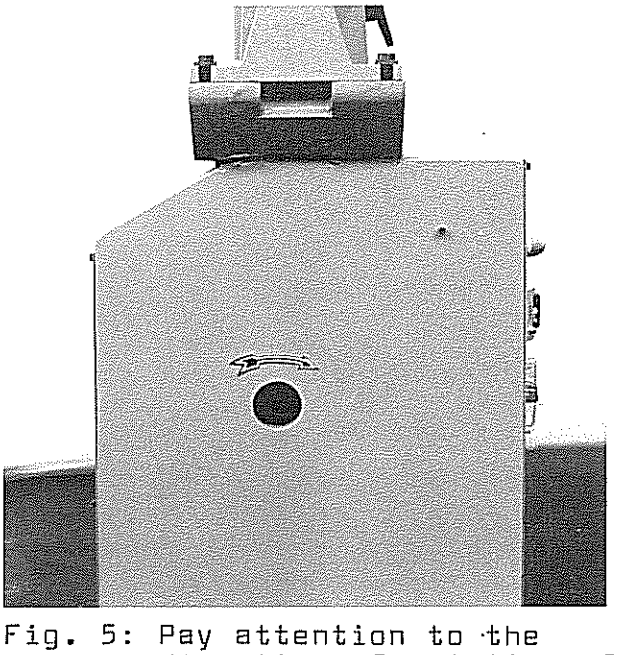


Fig. 5: Pay attention to the direction of rotation of the motor

LUBRICATION OF THE MACHINE

Lubricant

The machine must exclusively be lubricated with o i l . The same type of oil may be used for all lubrication points.

The following brands of oil may be used:

ARAL-Degenit B 220
Viscosity 130 mm^2/s at 50° C

SHELL-Tona Oil T 220
Viscosity 128 mm^2/s at 50° C

MOBIL OIL AG-Vactra Oil Nr.4
Viscosity 125 mm^2/s at 50° C

ESSO AG-MILLCOT K 220
Viscosity 120 mm^2/s at 50° C

BP-Energol HP - C 220
Viscosity 127 mm^2/s at 50° C

Lubricate the machine thoroughly (refer to the lubrication chart).

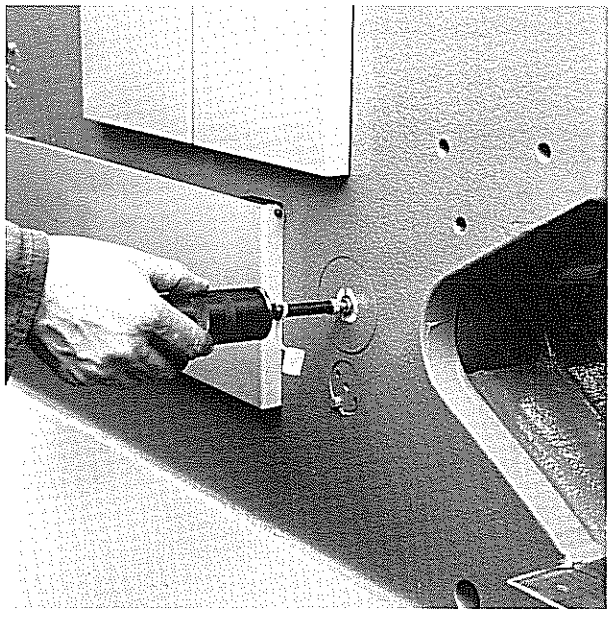


Fig. 6: Lubrication

For the lubrication a oil gun is used which is being supplied in the tool kit. Lubricate in accordance with the lubrication chart enclosed. Make sure that the prescribed quantities of oil are regularly injected. The oiling points are yellow marked.

Electrical foot engagement

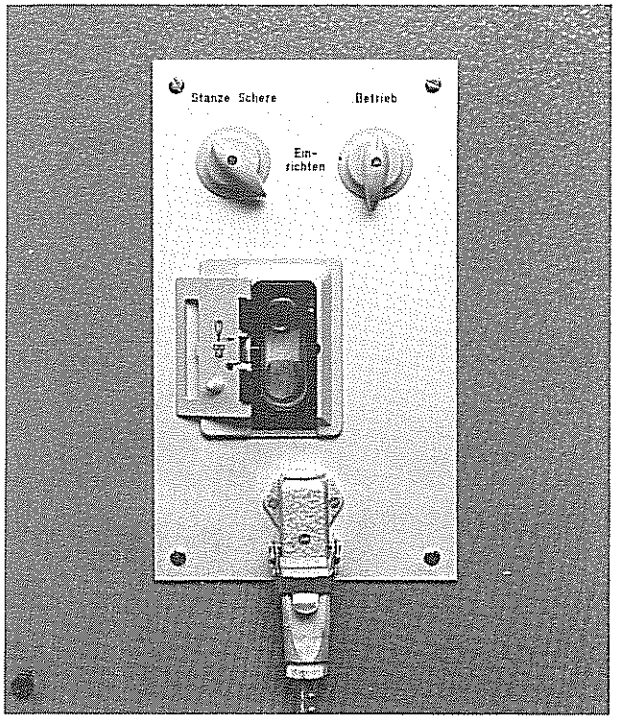


Fig. 7: Control panel

1. Preselection of the working station

The preselector switch for the respetive working station is located in the L.h. upper space of the main switch control panel.

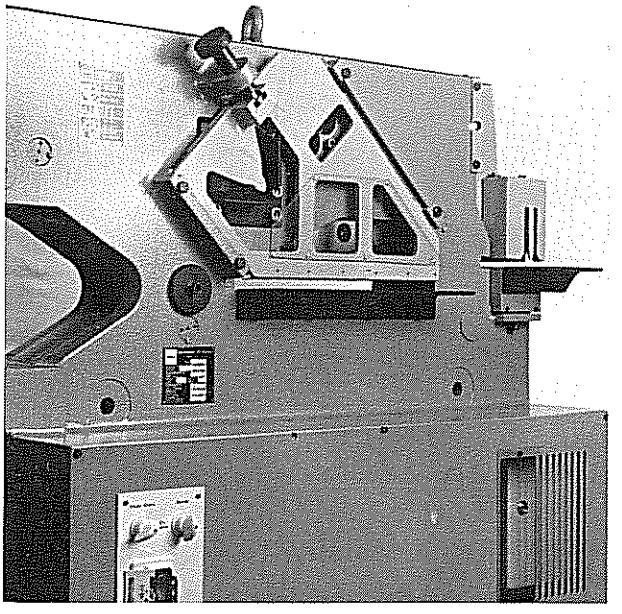


Fig. 8: Shear in working position

With the motor switches on, this switch allows the preselection of the required working position of the working slide. (shear side or punch side).

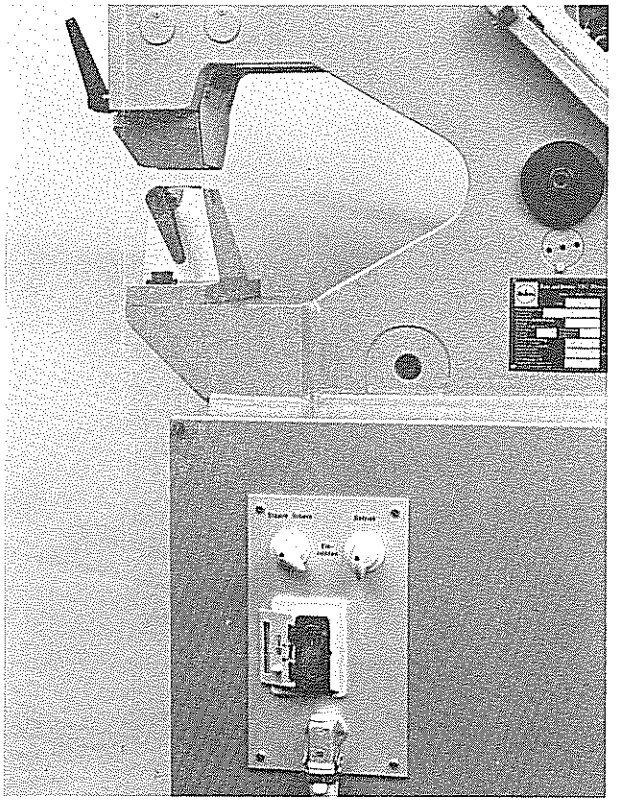


Fig. 9: Punch in working position

2. Inching and operation switch

The selector switch for inching and engagement is located in the upper space of the control panel. With the switch positioned to "Inching" the working slide can be moved gradually into its effective position by actuating the foot pedal.

In this position the shearing or punching tools can be set up respectively installed or be removed.

With the selector switch positioned to "Operation" the working slide returns automatically into its initial position.

3. Function of the foot switch

With the switch positioned to "Operation" a total of three functions can be accomplished by the foot switch.

a) Depressing the foot switch with exceeding its straining point = Slide performs working stroke.

b) Foot switch again releasing over the straining point = Slide stops.

c) Foot switch entirely released = Slide moves back into its initial position.

4. Stroke adjustment

The machine base contains the adjustibility of the stroke position and the stroke length. For specific fabricating work it is not necessarily required to perform the entire stroke.

For time saving reasons, only the actually required stroke should be performed.

Adjusting the stroke position or the stroke travel length is accomplished by the adjustable control rings attached to the control bar.

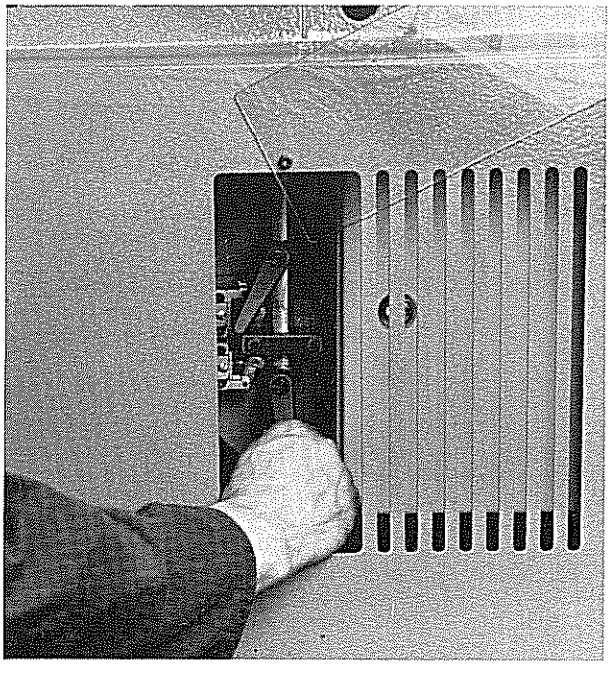


Fig. 10: Stroke adjustment

THE FLAT BAR SHEAR

1. The blades

The upper and lower blades are interchangeable and can be used on two sides.

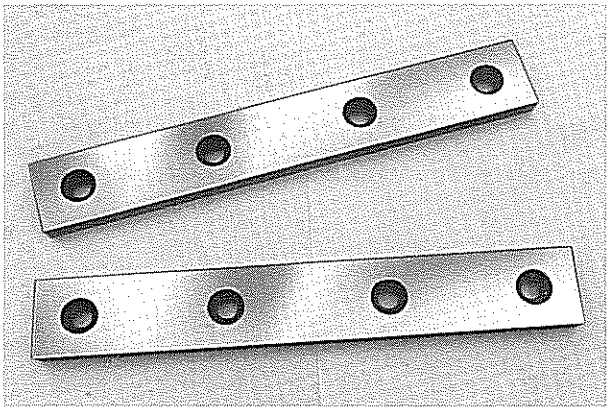


Fig. 11: Flat bar knife with two cutting edges

2. Resharpening

Resharpen the blades in time (at the longer front sides only). Resharpening must be exactly rectangular, and the front surface should be straight. To ensure always a proper rest in the slide and the body care has to be taken that the grinding is performed uniformly in order not to change the rake angle. Worn-out blades must be replaced by new MUBEA Blades.

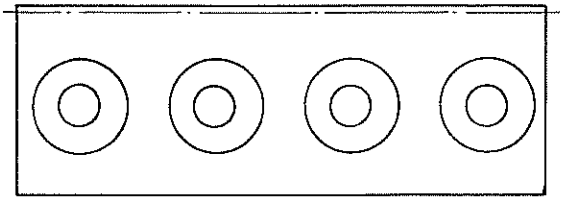


Fig. 12: Resharpening the flat bar blades

3. The Shearing Gap

Adjust the shearing gap between the blades to 0.2 mm - 0.3 mm. Measure the shearing gap with a feeler gauge with the slide lowered.

The blades are adjusted for cutting of all material thicknesses being within the range of the capacity. For cutting of extremely thin stock, reduce the shearing gap by backing the lower blade with a metal or cardboard shim.

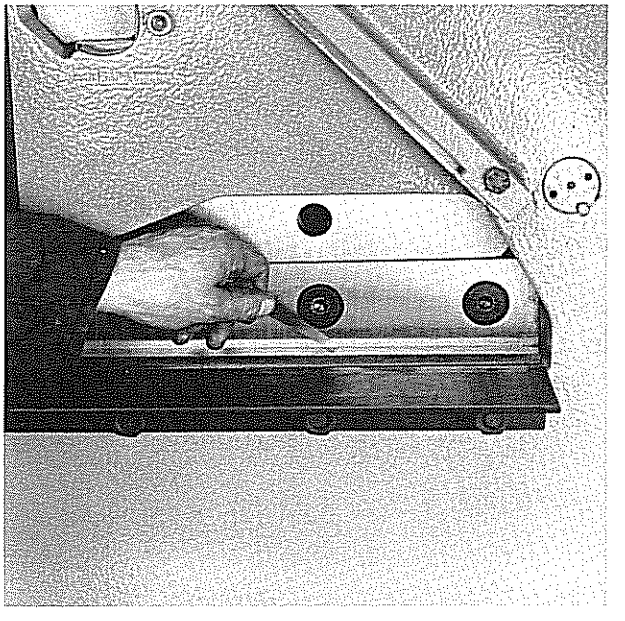


Fig. 13: Checking of the shearing gap

4. Adjusting the Hold-down

The material to be cut must be securely held in the horizontal position. Faulty adjustment of the hold-down results in the blades being damaged or forced apart.

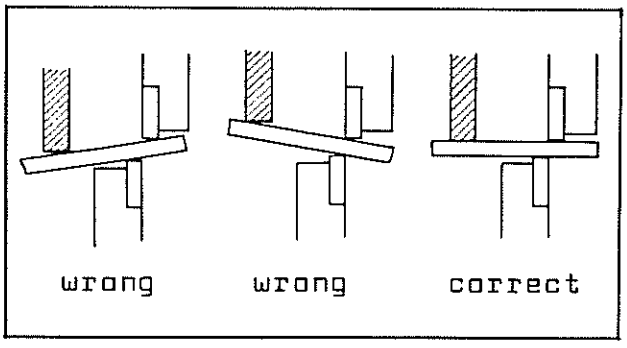


Fig. 14: Correct and wrong setting of the hold-down

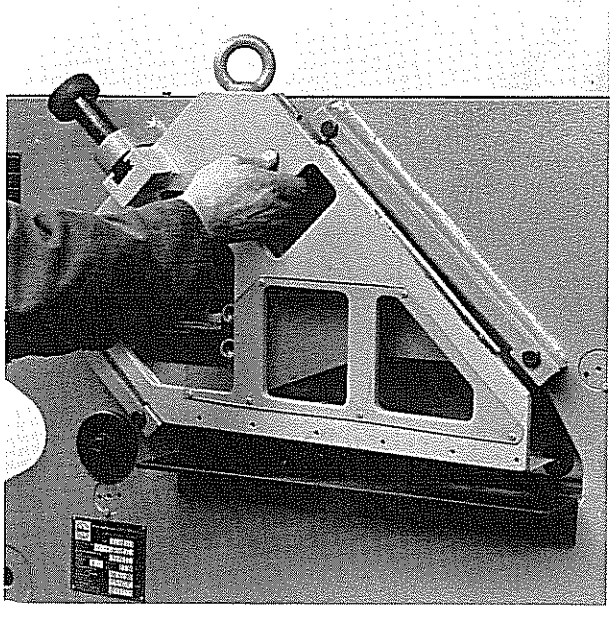


Fig. 16: Removal of the hold-down

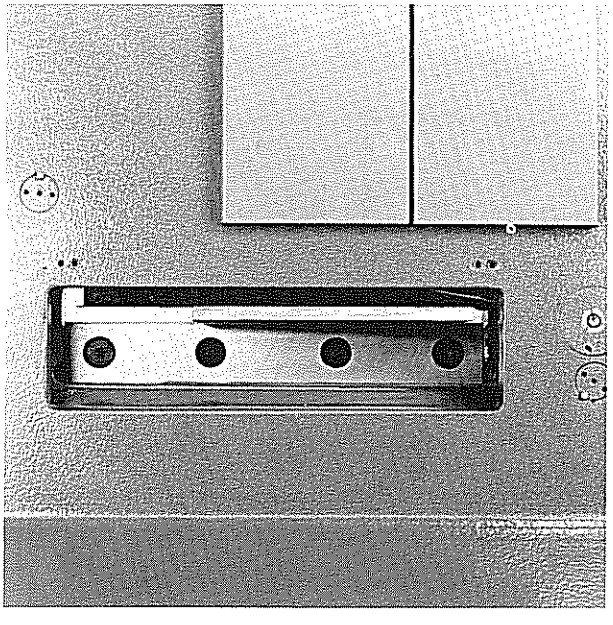


Fig.15: Cutting of flat bar

Removal of the hold-down

Rotate the adjusting spindle and move the hold-down as for upwards until the lateral openings of the hold-down plate coincide with the retainer gibs of the plate guides. In this position the hold-down can be detached to the front.

5. Exchanging of the blades

(refer to Figs. 17 and 18)

a) Lower blade

Screw off the hex. nuts "A" at the feeding side of the machine. Remove the spacers "B" and the supporting table "C" form the machine. Unscrew the blade screw "D" from the outfeed side of the machine and detach blade "E".

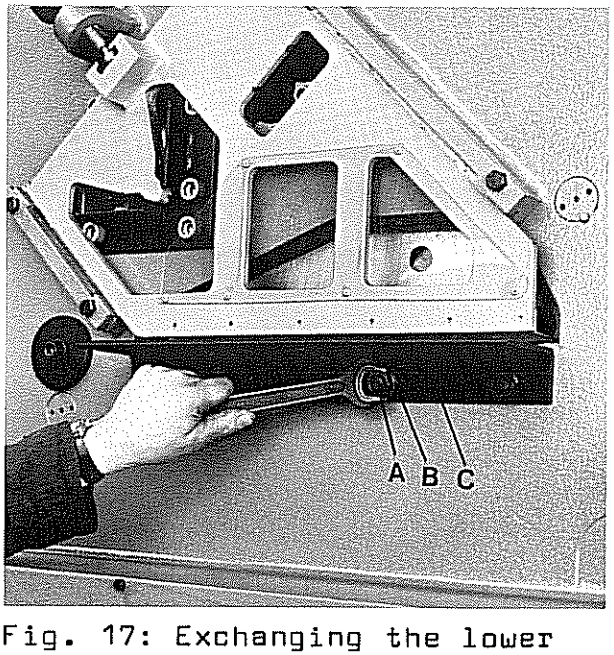


Fig. 17: Exchanging the lower blade

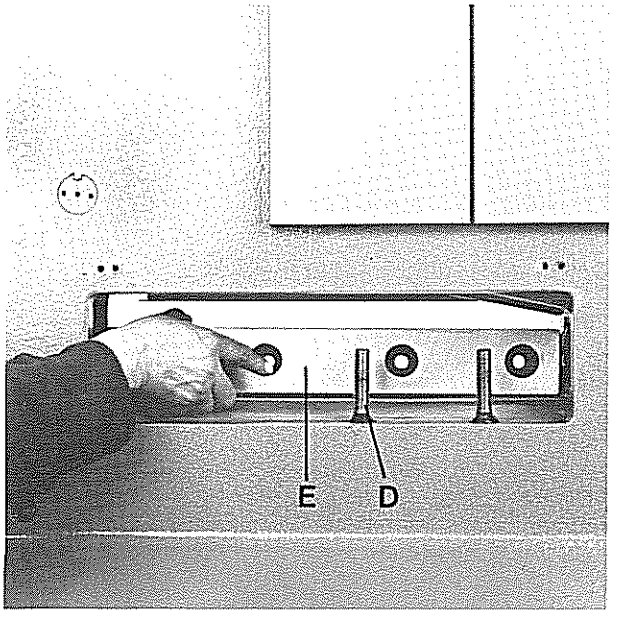


Fig. 18: Exchanging the lower blade

b) Upper blade

Move the knife slide into its lower dead center and unscrew the fastening screws "A" out of the slide. Detach the upper blade "B" from the outfeed side of the machine. Install in reverse order. The supporting table must then be aligned to match the top edge of the lower blade.

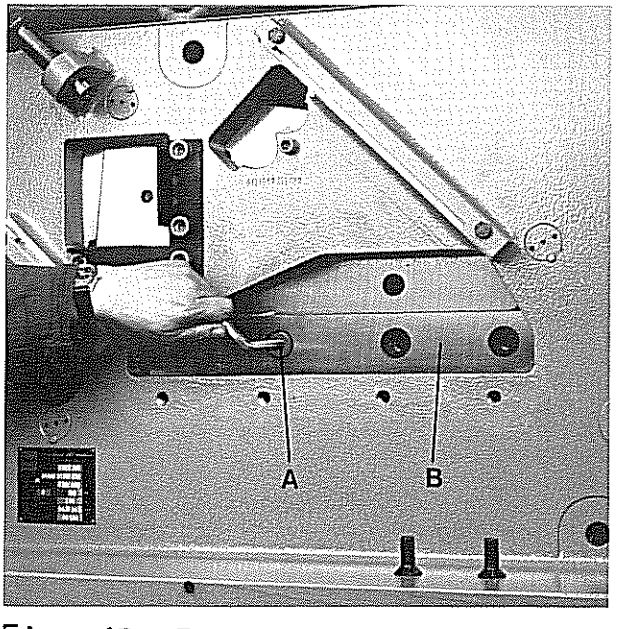


Fig. 19: Exchanging of the upper blade

6. Adjustment of the slide guide

After a prolonged operation the shearing gap may have widened at the flat, section and bar shear. Whenever this is noted the slide guide needs to be readjusted.

At the feed-in side of the machine loosen the securing screws "A" from the machine and slacken the guide screws "B" by about 1 revolution. (Fig. 20)

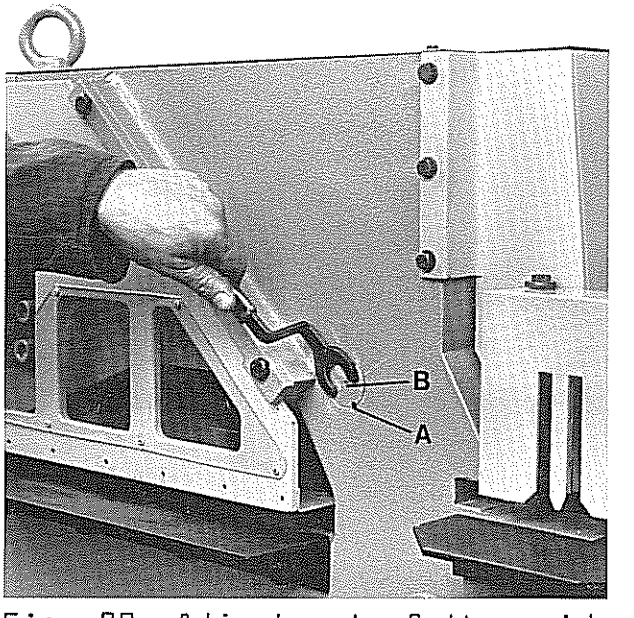


Fig. 20: Adjustment of the guide slide (feed-in side)

At the outfeed side loosen the securing screws "A" from the machine and reset the guide screws "B" by the touch. (Fig. 21)

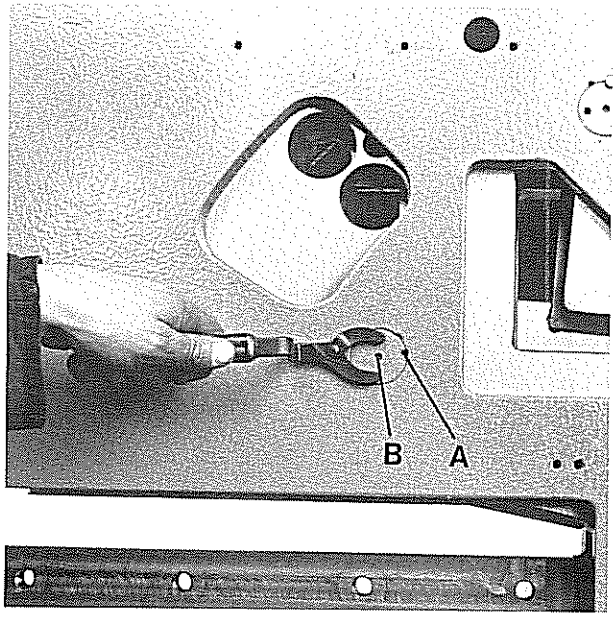


Fig. 21: Adjustment of the guide slide (outfeed side)

Measure the shearing gap with a feeler gauge with the knife slide moved down and make sure that the shearing gap is kept uniform at all 3 cutting stations.

For this adjustment the coper-notcher saddle and the punching tool need to be removed.

Tighten firmly the guide screws "B" at the infeed side and then slacken off the screws by about 1/16 of a revolution. In this position drill-pin the guide screw "B" with 4,5 mm dia. and screw-in securing screw "A" (Fig. 20). At the outfeed side drill-pin guide screws "A" with 4,5 mm dia. and screw-in securing screw "B" (Fig. 21). Then attach again the coper-notcher saddle and the punching tool and align the saddle accordingly. (Refer to section: "Coper-Notcher" and "Punch".)

7. Special blade

For deformation-free cutting of flat bars a non-deform upper blade can be ordered.

Ordering-Nr. 5140100000 for HPSN 450

Ordering-Nr. 5140200000 for HPSN 600

The capacity reduces when using this special blade. For deformation-free cutting of flat bar, only the upper blade needs to bee exchanged.

THE COPER-NOTCHER

1. The rectangular Coper

Particularly suitable for notching and coping the flanges and webs of various sections (Fig. 22)

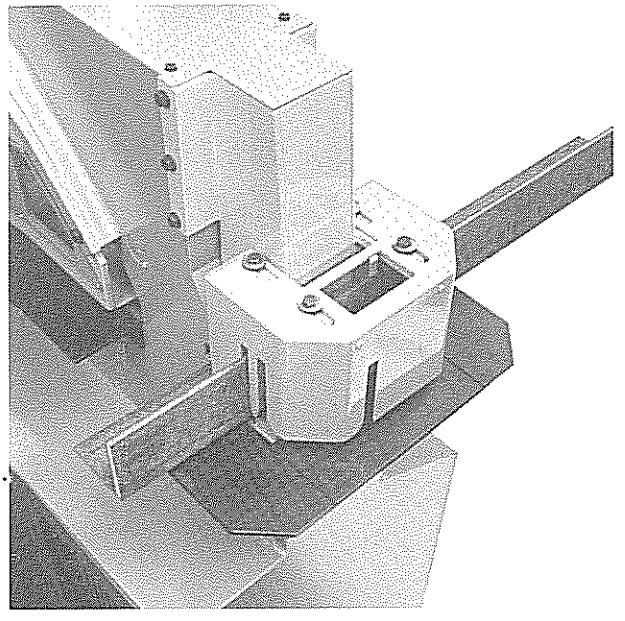


Fig. 22: Coping of angles

Wider notchers are made by successive cuts. When triangular notches are to be made, the stock is placed at an angle of 45^{0} in a frame. However, this procedure is not suitable for manufacturing frames, because of the sharp point produced.

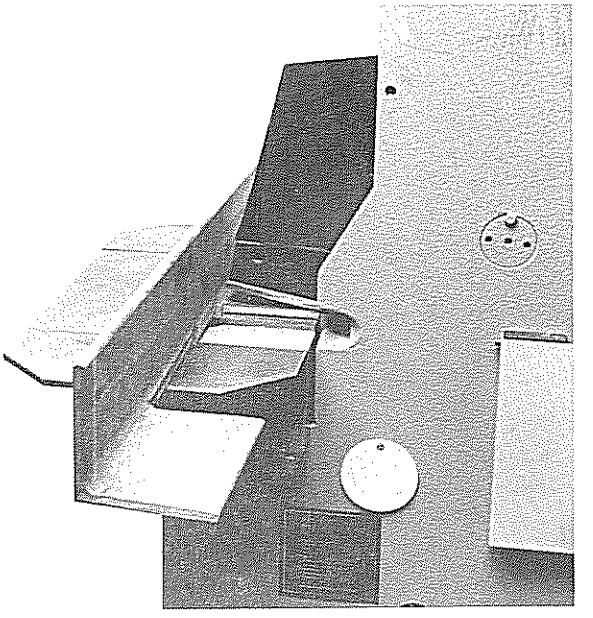


Fig. 23: Wide rectangular notching

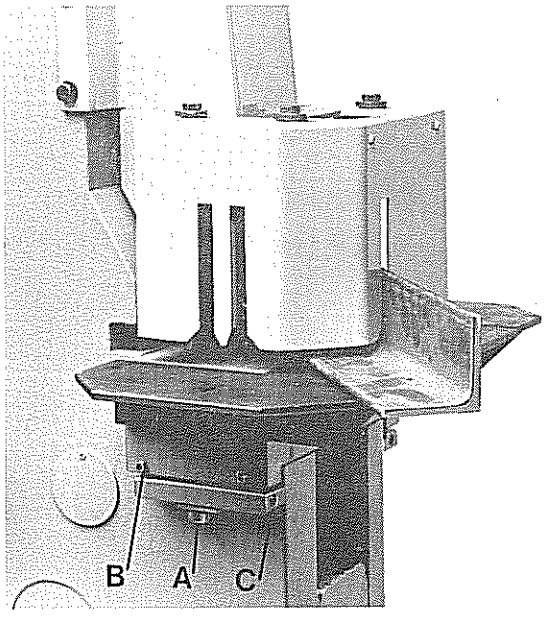


Fig. 24: Triangular notching with the rectangular coper

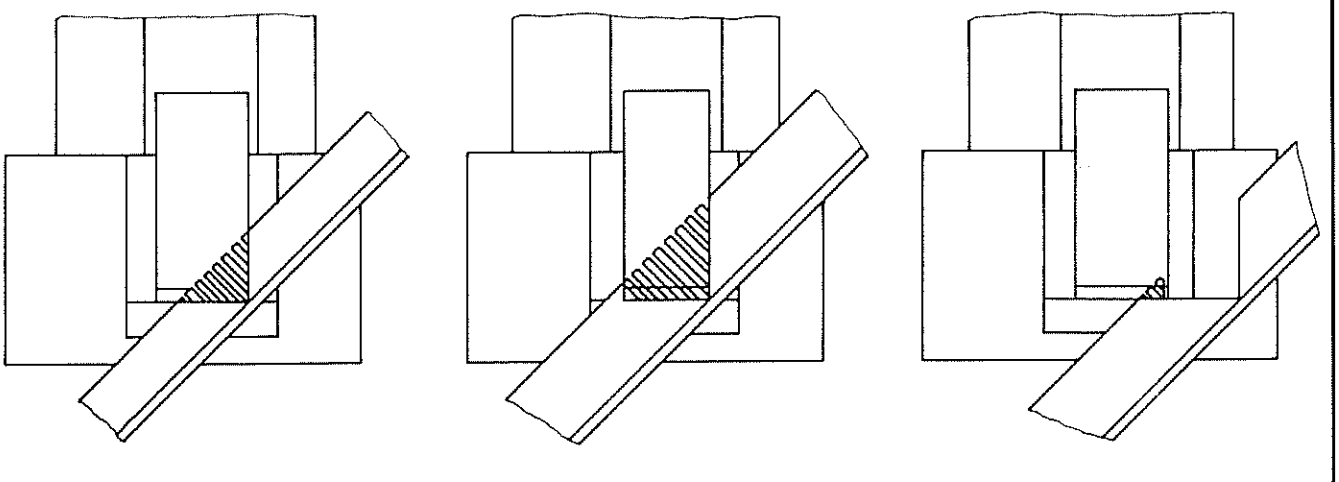


Fig. 25: Auxiliary triangular notching with the rectangular coper

2. Adjusting the Coping and Notching Tools

The notching saddle is adjustable in all directions, thus making it easy to set the lower blades relative to the upper blade. Make sure the shearing gap is uniform. The shearing gap is set for the maximum capacity. If very thin stock is to be notched, reduce the shearing gap by backing the blades with a metal or cardboard shim. Lower the blade slide until the top coping blade dips into the lower part of the tool. Measure with feeler gauge.

For adjustment, loosen saddle screws "A" and move the saddle into correct position by means of the adjusting screws "B". Securely tighten saddle screws and adjusting screw "A" and pressure screws "C" (Fig. 24).

3. Sharpening the Rectangular and Coper

Re-grind the upper blades at their lower faces and the lower blades at their upper faces only. Make sure that the shearing gap is accurately reset when replacing the blades. Frequently wipe the cutting edges with oil.

4. Special Tools

The MUBEA machine may also be equipped with special notching and coping tools, such as those for rounding butt straps, coping flats for their welding to round stock or tube.

5. Special Accessories

If you wish to carry out notching and coping work without marking out, we supply special work support tables etc. Please let us have your enquiries. We will work out the most economic method for you.

Caution

A guard is fitted to the coper-notcher. For coping webs in the root, and for successive deeper coping, the guard is made movable.

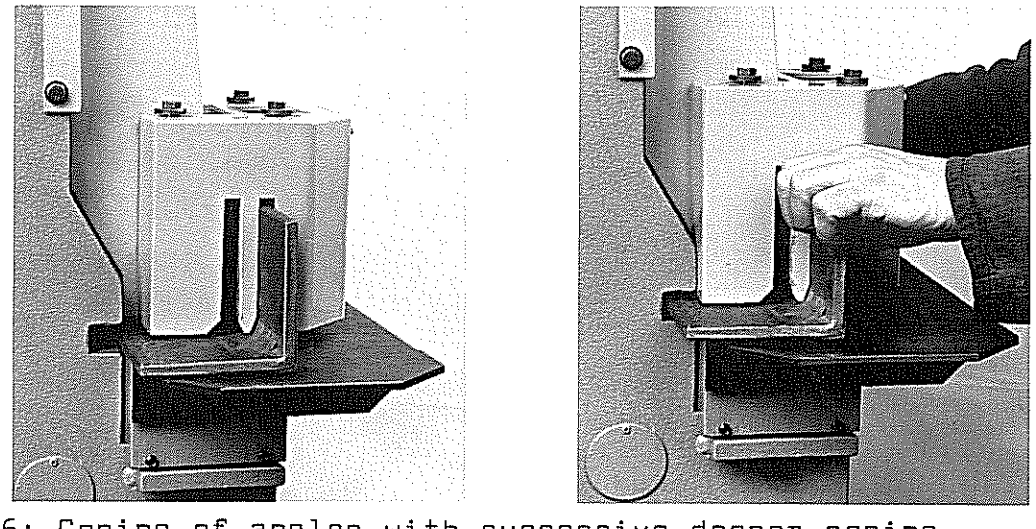


Fig. 26: Coping of angles with successive deeper coping

THE BAR SHEAR

1. Blades

The machine is normally equipped with blades for cutting round and square bars.

2. Sharpening

The blades should be ground in the cutting openings only. Since blunt blades require a higher cutting pressure and result in poor cuts, care should be taken to ensure that new MUBEA blades are ordered in good time.

3. The Shearing Gap

The shearing gap should be 0,2 - 0,3 mm. The shearing gap is correctly set on delivery.

For cutting thin stock, reduce the shearing gap by backing the blades with a metal or cardboard shim.

Check the shearing gap with a feeler gauge. (For doing so with the HPSN 600 the working slide needs to be lowered).

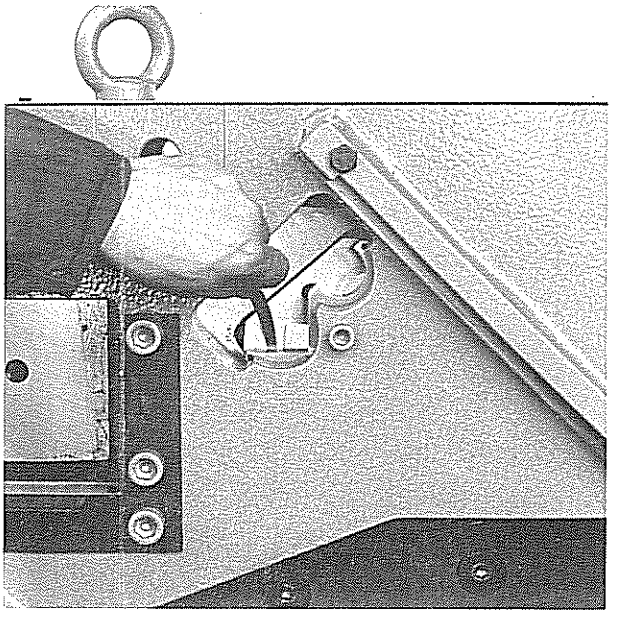


Fig. 27: Checking the shearing gap on HPSN 600

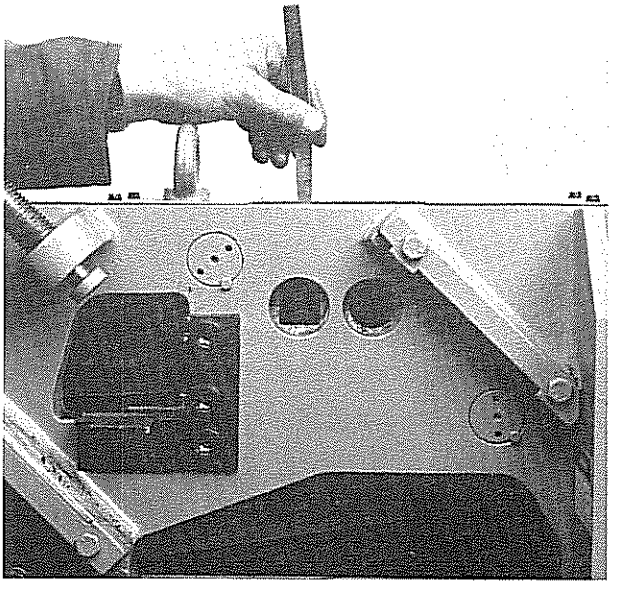


Fig. 28: Checking the shearing gap on HPSN 450

4. Hold-down

The hold-down must always be adjusted in such a way that the work is held in a horizontal position during cutting.

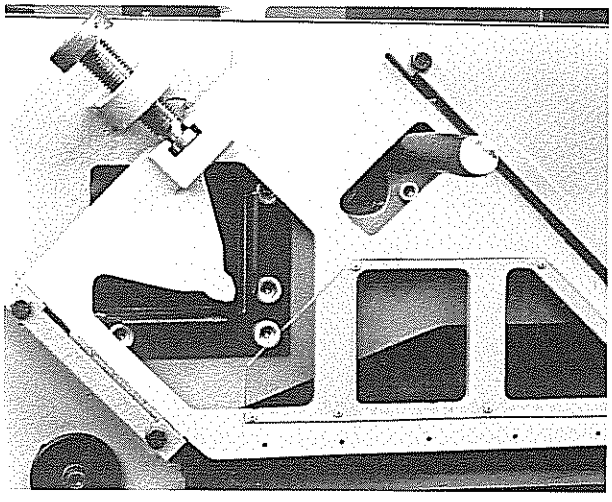


Fig. 29: Cutting of round bar

5. Changing the blades with the HPSN 600 Model

a) Stationary blade

Loosen the blade screw. Lift the blade and take it out.

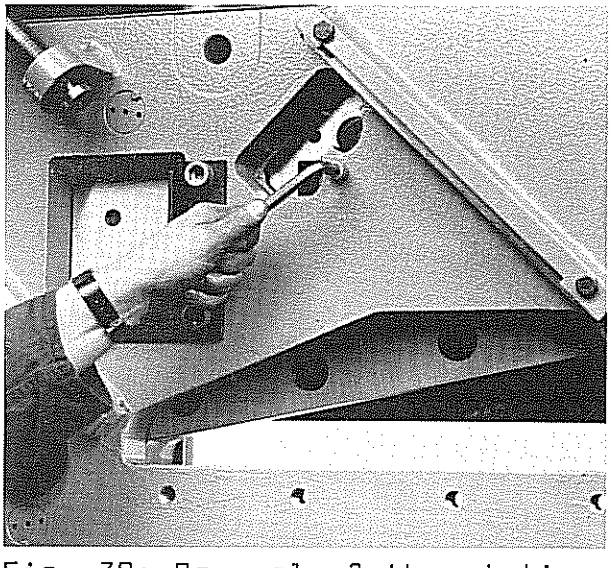


Fig. 30: Removal of the stationary blade (HPSN 600)

b) Movable blade

Loosen the blade screws at the outfeed side and take out the blade through the opening in the infeed side.

Install in reverse order

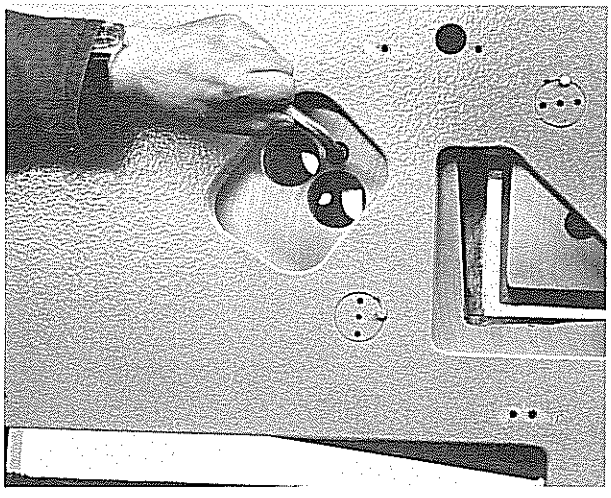


Fig. 31: Removal of the movable blade (HPSN 600)

6. Changing the blades with the HPSN 450 model

Remove the stationary blade in upward direction out of the machine. Shift the movable blade out of the working slide into the blade position in the body plate and take the blade out of the machine in upward direction. Install in reverse order.

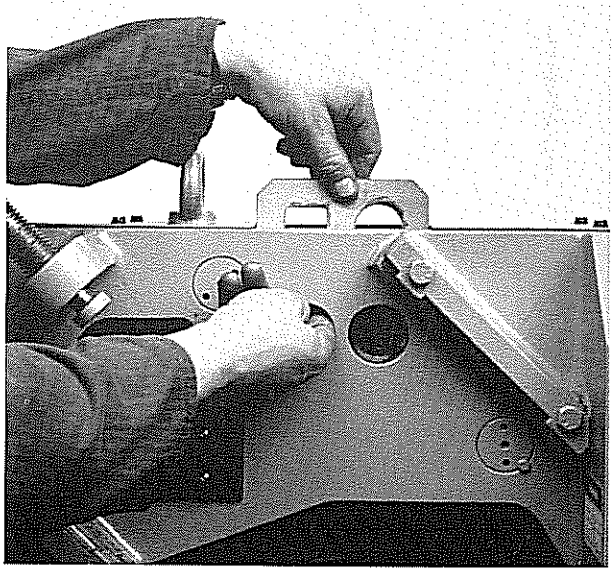


Fig. 32: Removal of the stationary blade (HPSN 450)

7. Special blades

If you wish to cut round stock only, we supply blades which have round cutting openings only. The diameters will be in accordance with your requirements.

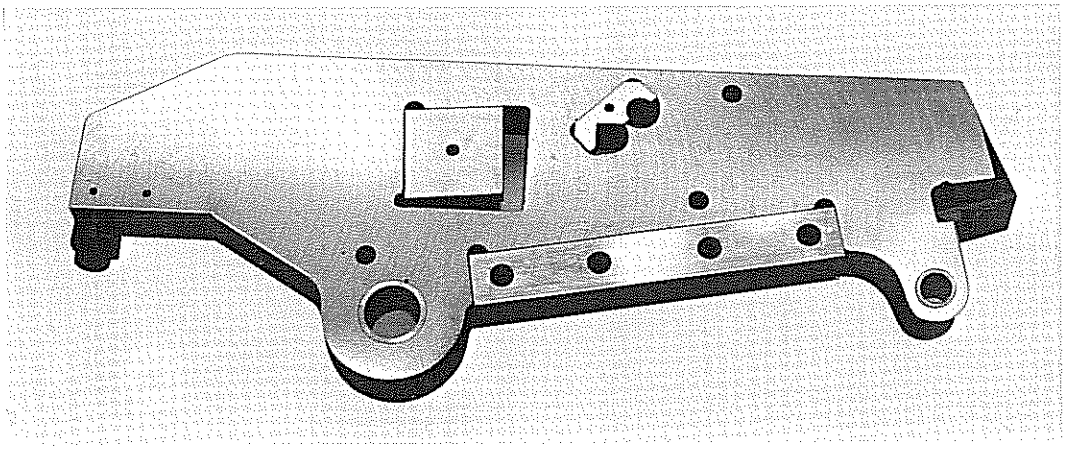


Fig. 33: Working slide

1. General

The machine is equipped for squarting of angles.

2. Sharpening the blades

Sharpening the blades must be performed at the cutting front surfaces only. Resharpening must be uniformly performed in order to ensure that the movable cutting insert meets exactly the knife tip of the stationary insert blade.

Naturally grind off only as much as the stroke of the knife slide permits. Since blunt blades require a higher cutting pressure and result in poor cuts, care should be taken to ensure that new MUBEA blades are ordered in good time.

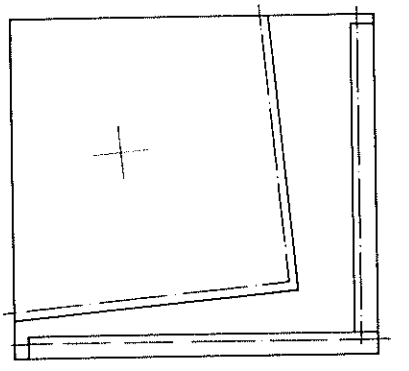


Fig. 34: Sharpening the blades uniformly

3. The shearing gap

The shearing gap of 0,2 - 0,3 mm is correctly set on delivery. By backing the movable cutting insert in the knife slide with thin metal shims the shearing gap can be reduced. Checking the shearing gap is done with a feeler gauge with the knife slide lowered. (Fig. 35).

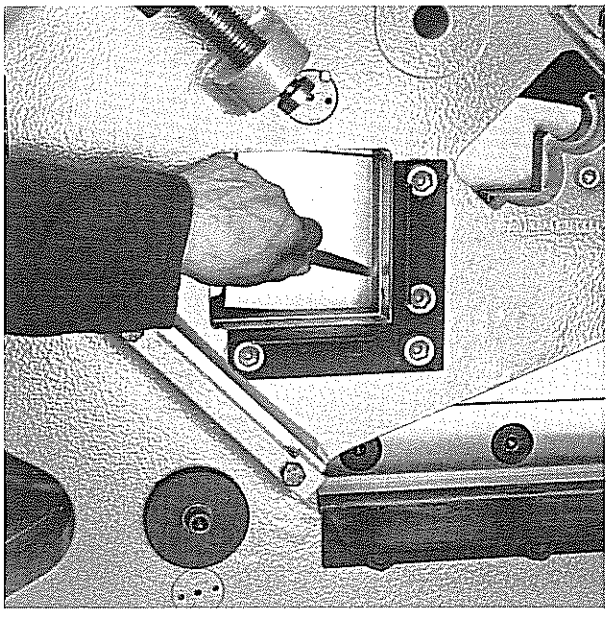


Fig. 35: Checking the shearing gap

4. The hold-down

In order to obtain the required squareness the hold-down must be set properly. Care must be taken to ensure that the angle root rests against the tip of the hold-down.

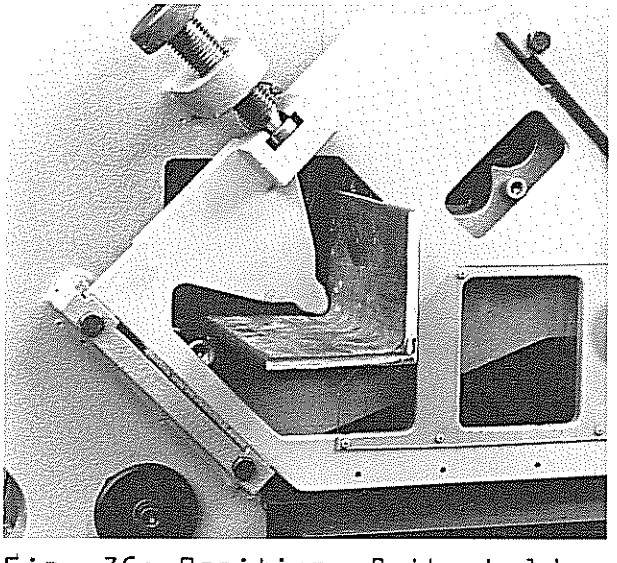


Fig. 36: Position of the hold-down for shearing of angles

5. Changing the blades

a) Movable blade insert

First lower the knife slide until the contours of the movable blade insert become visible in the section opening of the machine body.

Loosen blade screw "A" from the outfeed side of the machine (refer to Fig. 37) and then remove the cutting insert through the section opening in the machine body. (Refer to Fig. 38)

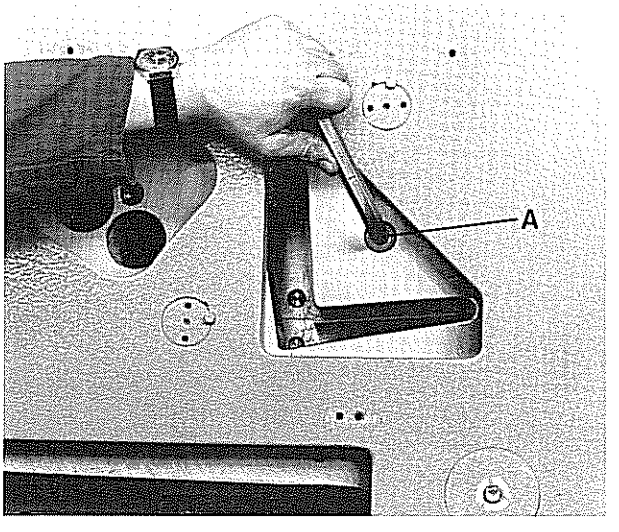


Fig. 37: Removal of the movable blade insert

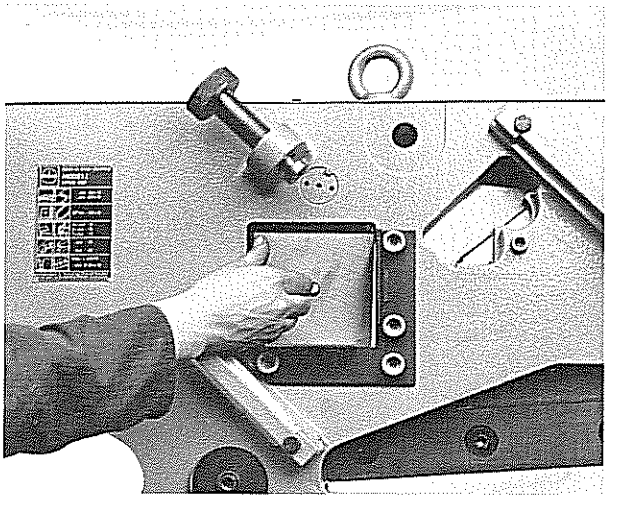


Fig. 38: Removal of the movable blade insert

b) Stationary blade

After loosening the blade screws "A" first remove the vertical blade out of the machine body. Then loose the blade screws "B" and remove the horizontal blade out of the machine body (refer Figs. 39 and 40).

Install the blades in reverse order.

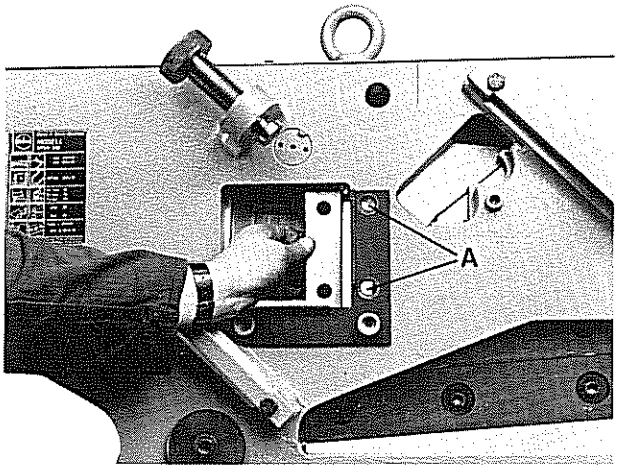


Fig. 39: Removal of the vertical blade

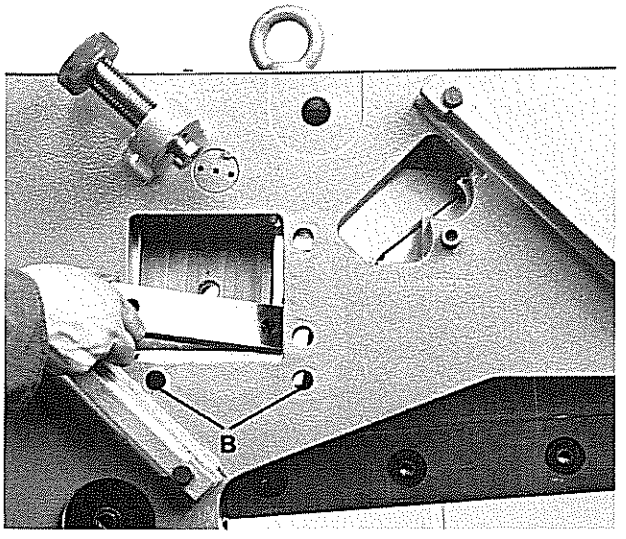


Fig. 40: Removal of the horizontal blade

THE PUNCH

PUNCHING DEVICES AND TOOLS ARE ALLOWED ONLY IF THEY ARE SUFFICIENTLY SECURED AGAINST FINGER INJURIES!

WHEN APPLYING OPEN TOOLS FOR COMPONENTS WHICH NEED TO BE BROUGHT CLOSELY TO THE PUNCHING ZONE, THE RESPECTIVE SAFETY AND REGULATIONS FOR THE PREVENTION OF ACCIDENTS- MUST STRICTLY BE OBSERVED.

1. General

As the punch operates hydraulically and due to the long stroke, the application of the punch is nearly unlimited. The large mounting table allows beside the use of smaller and bigger punching tools also the application of press brake tools.

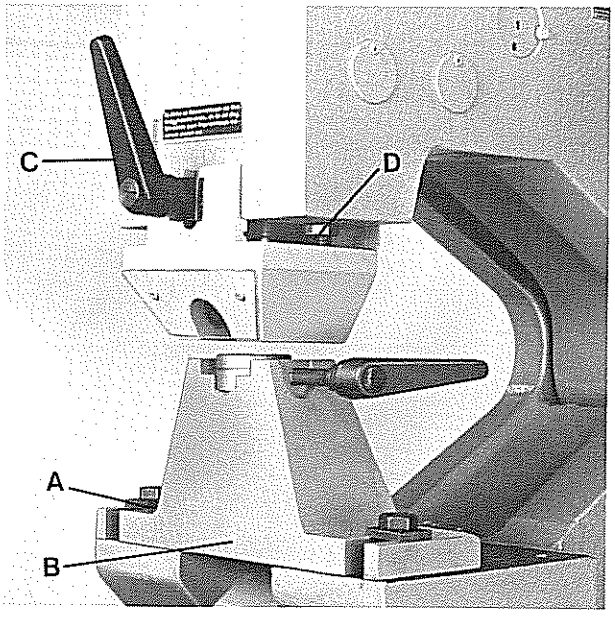


Fig. 41: Normal set-up of the punch

The machine is standard equipped with punching tool up to 30 mm hole diameter. Bigger punching tools are available on request and belong to the MUBEA-Standard program.

2. Fixing of punches

The working slide at the punch side is furnished with an exchangeable punch holder. Applying a coupling nut the punch holder adapts punches up to 30 mm range of diameter.

3. The punch saddle

The punch saddle with its large mounting surface ensures a secure positioning of the tooling. The standard machine accepts dies up to 30 mm hole diameter.

For removing the saddle from the machine only the two fastening screws "A" (Fig. 42) need to be loosened.

The large saddle plate ensures a nearly unlimited mounting of all special-facilities. Press brake tools receive an especially stable support.

4. Setting the tools and aligning to the hole center

The machine is being delivered with the punch and die exactly aligned. Regularly check the Position of the tools during punching by inching the punch into the die under jog operation.

For aligning the punch and die loosen the saddle screws "A" and move the saddle "B" in proper position. (Refer to Fig. 42) When punch and die have been properly set, retighten the saddle screws firmly.

Repeat this procedure whenever changing tools.

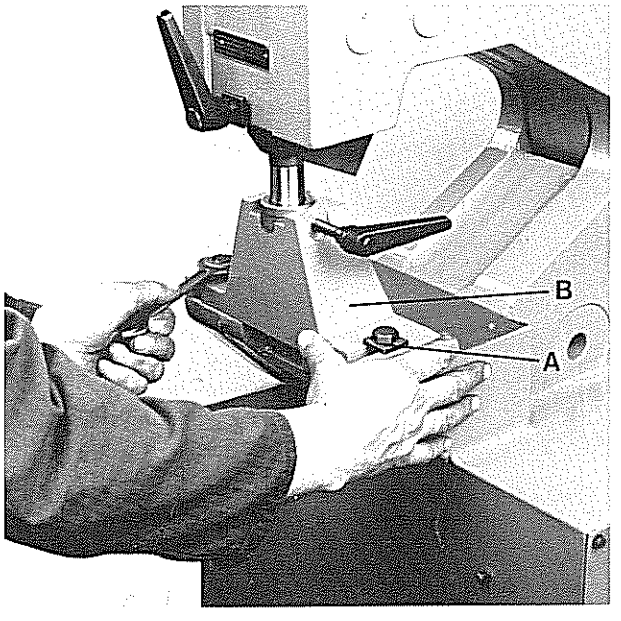


Fig. 42: Setting the punching tools

The shearing gap should be about 5 % of the thickness of the material to be punched. (When punching a thickness of 10 mm, the diameter of the die hole must be 1 mm larger than the punch diameter. The shearing gap is then 0.5 mm). Please therefore always specify the thickness of the material when ordering.

5. Anti-Twist Device for Shaped Punches

Square, rectangular or other shaped punches must be secured against twisting. For this purpose a slot is provided at the contact surface of the punch in the punch holder and on each standard punch on the head surface.

A 4,7 mm dia. pin should be introduced into this groove.

6. The stripper

The rugged stripper is fastened directly on the machine body by means of the clamping lever "C". (Refer to Fig. 41) Hight differences between die and stripper are being compensated by the adjusting screws "D".

7. MUBEA standardized Punches and Dies

For punching holes in the flanges of channels or beams we supply special flange dies with a surface inclination corresponding to the slope of the section flange.

For punching holes in small angles beams, tees or channels near the web, eccentric dies are required having an off-center hole near the end of the die. When fitting eccentric dies, slide the punch saddle backwards until the punch and die hole are again co-axial.

Ask for the supply of the complete schedule of MUBEA standard punches and dies.

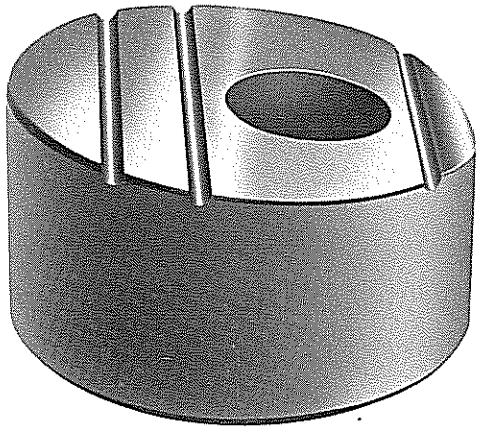


Fig. 43: Flange die for beams

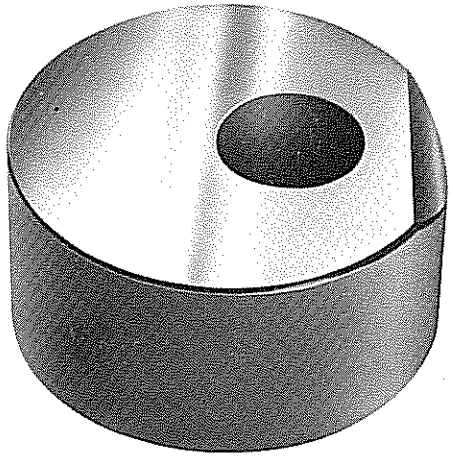
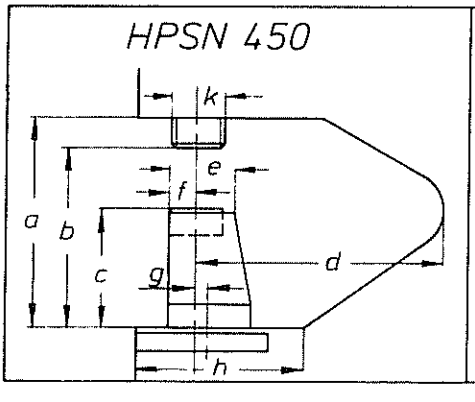
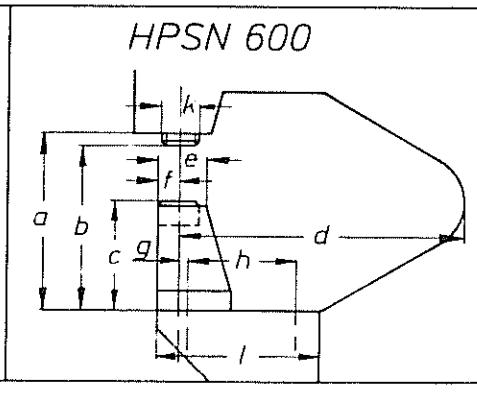


Fig. 44: Eccentric die for small angles





	HPSN 450		HPSN 600	
	mm	inch	mm	inch
a	172	6 49/64	195	7 11/16
b	157	5 25/32	180	6 11/16
c	97	3 13/16	120	4 23/32
d	205	8 1/16	316	12 7/16
e	55	2 11/64	55	2 11/64
f	22,5	57/64	22,5	57/64
g	10	25/64	10	25/64
h	138	5 7/16	120	4 23/32
k	M42×2		M42×2	
l			181,5	7 9/64

Fig. 45: Punch saddle dimension, Model HPSN. Domestically/USA

8. Regrinding the punching tools

Regrind punching tools at their faces only to prevent a change in the clearance between punch and die. To extend service life of the tools regularly wipe the cutting edges with oil.

In many cases it is more convenient to order new tools. This is more economical in the long run and the ground finish is perfect.

9. Special Tools

The large MUBEA programme of standard tools makes available all the common special tools at short notice. The special features of the MUBEA punch design further offer a wide variety of possibilities for employing special tools, though these cannot be described briefly. The illustrated MUBEA literature gives a better review of this area.

a) Special punch equipment for accomodating punches and dies with a cutting diameter of up to 50 mm with HPSN 600

All punching tools, i.e. round, square, rectangular and elongated hole tools which are within the 50 mm cutting range can be accommodated in this equipment:

The complete equipment consists of punch holder, M 60 lock nut with a through hole of 50 mm, insert with through hole of 40mm, stripper, saddle with 80 mm seat.

The HPSN 450 Model accomodates punching tools within the range up to 40 mm. The complete equipment consists of: punch holder, lock nut M 52 with a through hole of 40 mm, stripper and saddle with 60 mm seat.

When ordering the tools the thickness of the material to be punched and the mechanical properties should be stated.

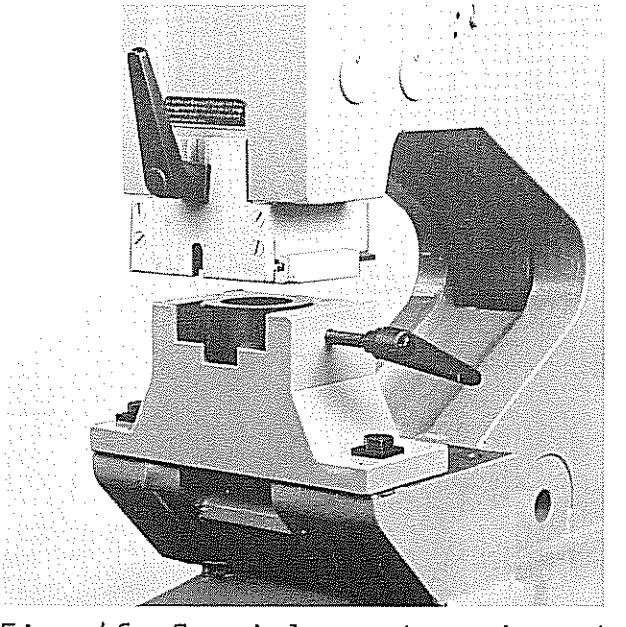


Fig. 46: Special punch equipment for accomodating punches and dies with a cutting diameter of up to 50 mm

b) Special punching equipment for accommodating punches and dies exceeding 50,5 mm including 80 mm cutting diameter with HPSN 600

All punch tools i.e. round, square, rectangular and elongated hole tools, which are included in the 50,5 up to 80 mm cutting ranges can be accommodated in this device, consisting of punch holder, stripper, saddle and saddle cap.

Removing the punch holder is done with the punchstroke in its lower dead center. In this position drift the linking roll pin A out of the slide. For practical reason slip on a sleeve over the threaded stem and tension the sleeve with the coupling nut in order to pull the punch holder out of the slide. Install in reverse order.

In the case of shaped punches (elongated hole and rectangle) the order should state whether the tools are to be employed longitudinally or laterally in the machine. In addition the thickness of the material to be punched and the mechanical properties should be given. The punches are fixed with a wedge.

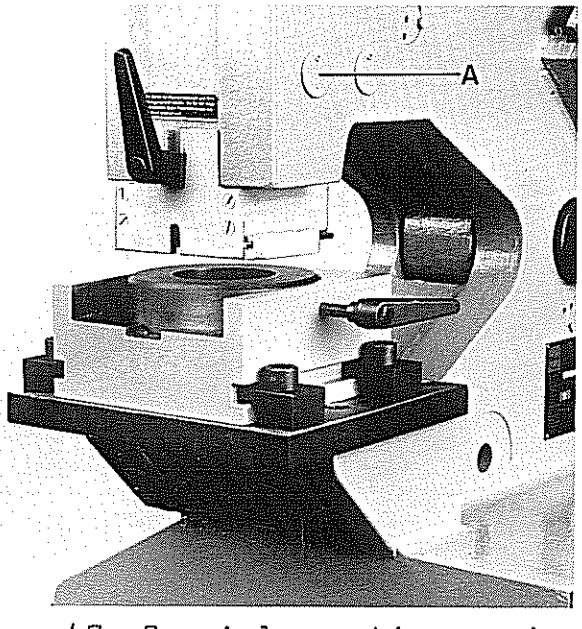


Fig. 47: Special punching equipment for accommodating punches and dies exceeding 50,5 mm including 80 mm cutting diameter with HPSN 600

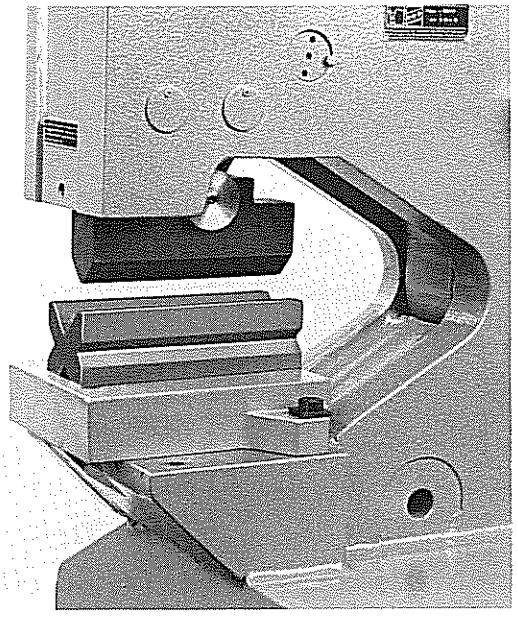


Fig. 48: Bending tool

c) Bending tool

Prior to installing a bending tool in type HPSN 450, the punch holder must be removed and replaced by the bending tool holding fixture.

In the case of type HPSN 600, the punch holder can remain in the slide, as the bending tool holding fixture is installed in the second bore of the working slide. The bending tool must be mounted and positioned in a manner ensuring that the longer lateral portion of the top part faces the front and is in precise central position above the bottom part when plunging into it. In this position, the top part pressing tightly against the bottom part, the saddle bolts must be tightened, the open part of the tool holding fixture being positioned towards the inside.