OPERATING INSTRUCTIONS AND SPARE PARTS LIST

MUBEA Flat, Bar and Section Steel Shears
with Coper-Notcher and Punch

MODEL KBL OPTIMA Execution F

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

The correct pages respectively the correct figures of this operating instruction and spare parts list which are appropriate for your machine, have been marked.

OPERATING INSTRUCTIONS

SPARE PARTS LIST

SPARE PARTS LIST

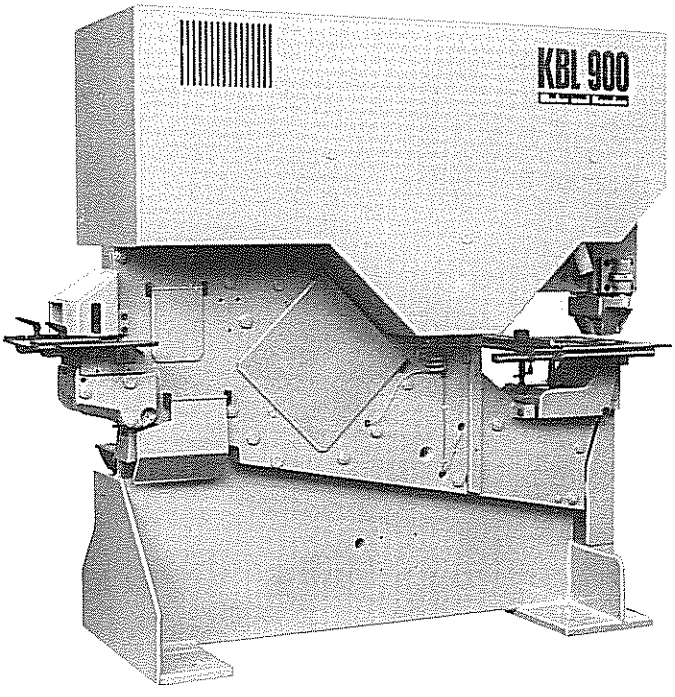
Muhr und Bender Attendorn

D-5952 Attendorn · Telephone: (02722) 62-1 · Cables: muhr attendorn · Telex: 876706-0 mu d

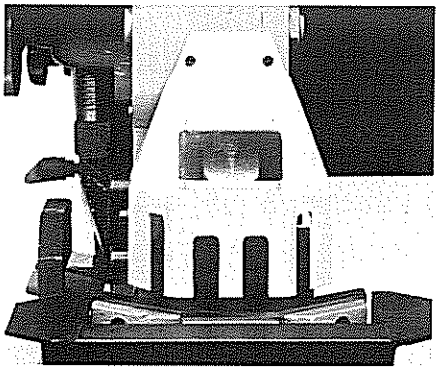
Your MUBEA machine complies with the safety rules and the regulations for the prevention of accidents.

For the safety of the operator, all operating stations are provided with guards, which are not shown in the pictures included in these operating instructions in order to be able to demonstrate the functioning more clearly.

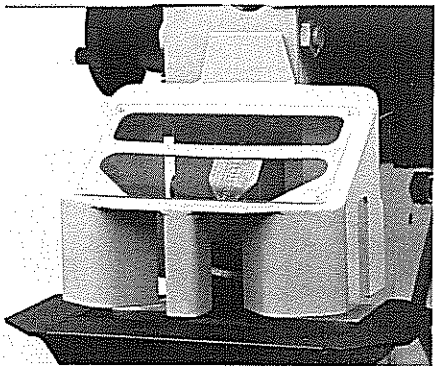
Only punching equipment and tools may be used that are sufficiently guarded up to the cutting points to avoid injuries.



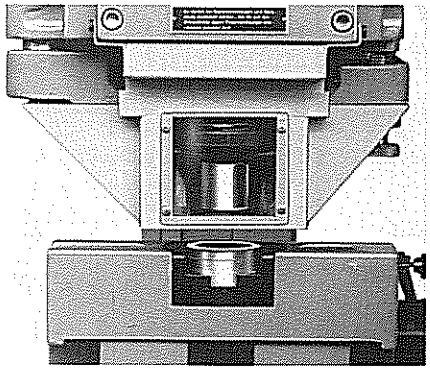
Guards at the discharge side of the section shear, the bar shear, and the plate or flat bar shear



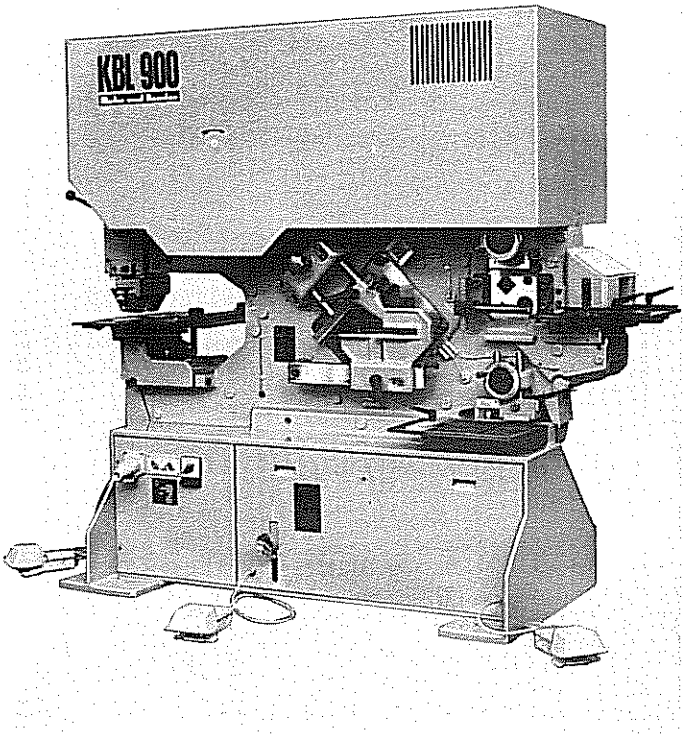
Guard for the triangular notching attachment



Guard for the rectangular coping attachment



Guard for the punching tool



You will soon realize that you have made a very good choice. Your MUBEA machine incorporates decades of experience as well as the latest technical knowledge in the punch and shear construction fields. Many satisfied customers confirm again and again that the merits of this machine become especially evident in everyday use.

Please read these operating instructions carefully and observe them closely so that you can be sure to truly benefit from all advantages of your MUBEA machine.

Past experience has shown that this machine has an exceptionally long service life. All parts subject to normal wear can be replaced quickly and easily. It is essential to use original MUBEA replacement parts exclusively, as otherwise both the service life of the machine and the reliability of its functioning would be impaired. This also applies when you intend to install additional tools in order to extend the operative range of your machine.

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

A detailed survey of the individual machine components (including their ref. Nos.) and their interaction is provided in the back of these operating instructions.

Should further information be desired, please do not hesitate to contact us - our Service Department is at your disposal. A service contract can be made on request on easy terms.

One more thing: Take good care of your machine, it is worth it. Some maintenance recommendations are included in these instructions.

Transportation

Bolt the machine securely onto heavy boards when it is to be moved by truck.

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

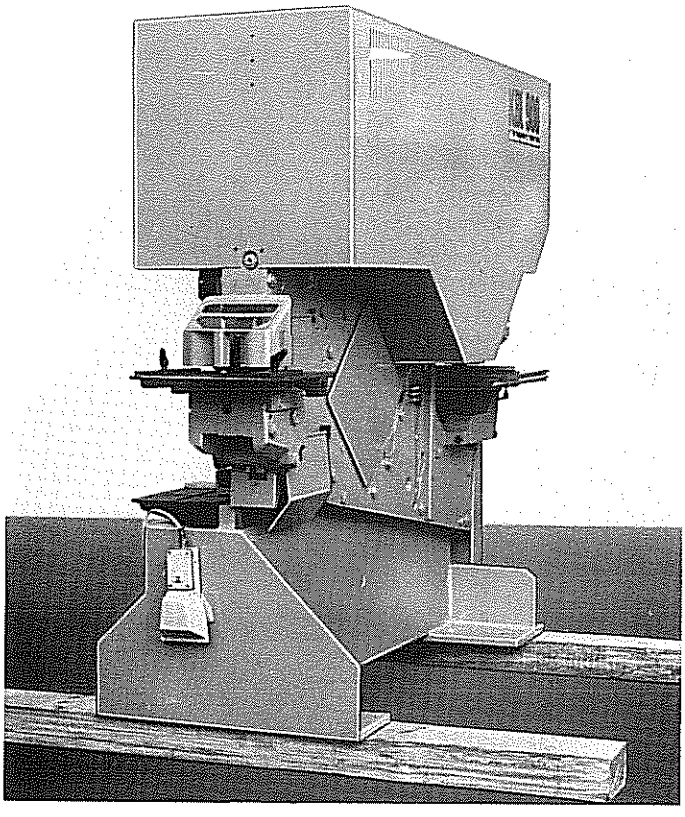


Fig. 1: Trucking the machine

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

Installation

The operating stations of the machine are located at a convenient height so that an additional base or pedestal is not needed.

All the information you need for providing a level foundation for the stationary installation of your machine is contained in the attached foundation plan. Tighten the foundation bolts carefully after the grouting compound has set. Instead of foundation bolts, dowels can be used just as well.

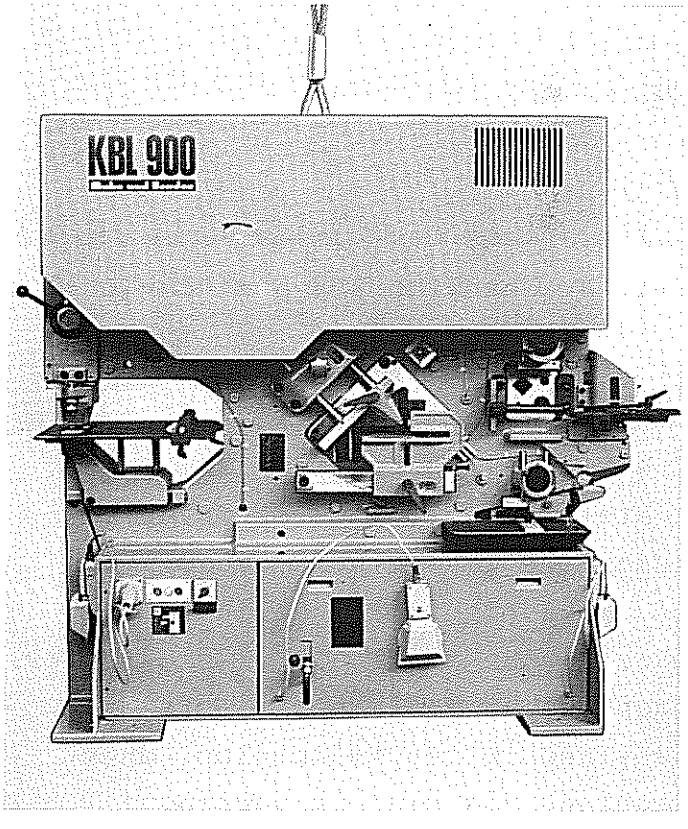


Fig. 2: Moving the machine with a crane

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

If the machine is used with an undercarriage, be sure that it is placed on a level floor and that its wheels are locked during operation.

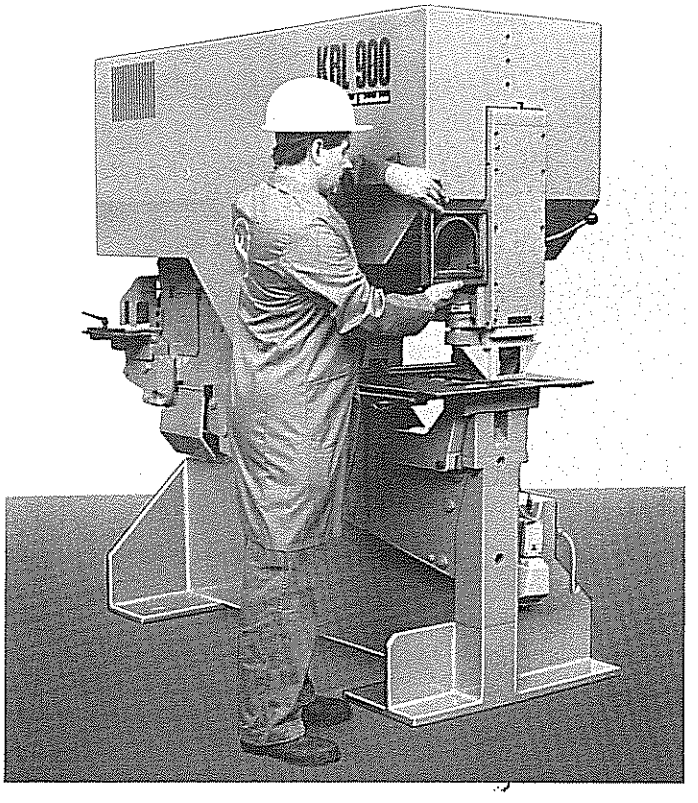


Fig. 3: Checking the position of the punch

Connecting and Commissioning

The machine is supplied ready for installation. The terminal to be connected to the power supply is in the control cabinet in the base of the machine. For stationary machines, a cable duct is to be provided in the foundation. When machines are used in varying locations, the connecting cable runs through the hole drilled through the base of the machine.

Connection must be made in accordance with the attached wiring diagram by a qualified electrician, who must make sure first of all that the voltage for which the machine has been designed is identical with the supply voltage.

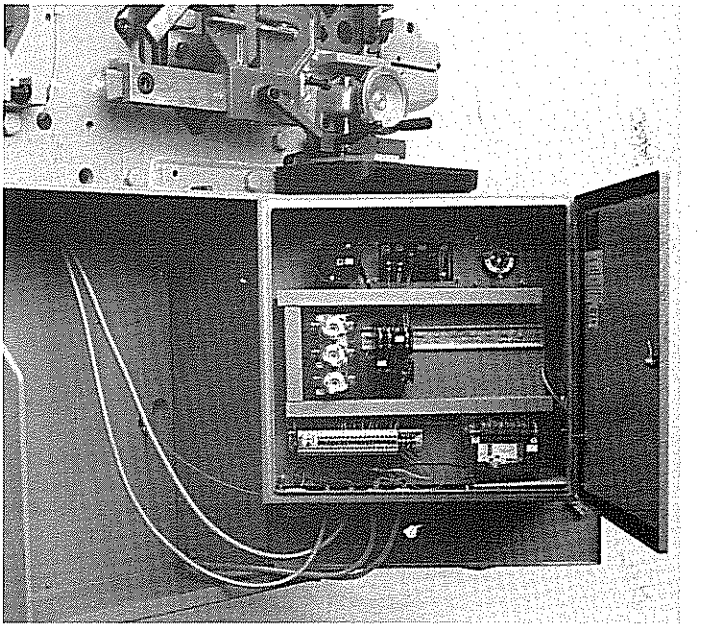


Fig. 4: Connection to the power supply

Start the motor for a moment: If the flywheel does not rotate in the direction indicated by the arrow, two phases must be reversed.

Prior to starting operation, check the functioning of the slides and the tool setting. For that purpose the motor switch has to be actuated for a moment, while the pedal is closed, so that the engagements are released. To move the slides, turn the flywheel in the direction indicated by the arrow.

Lubricate the machine thoroughly, referring to the lubricating chart.

Fig. 5: Check the rotational direction of the flywheel

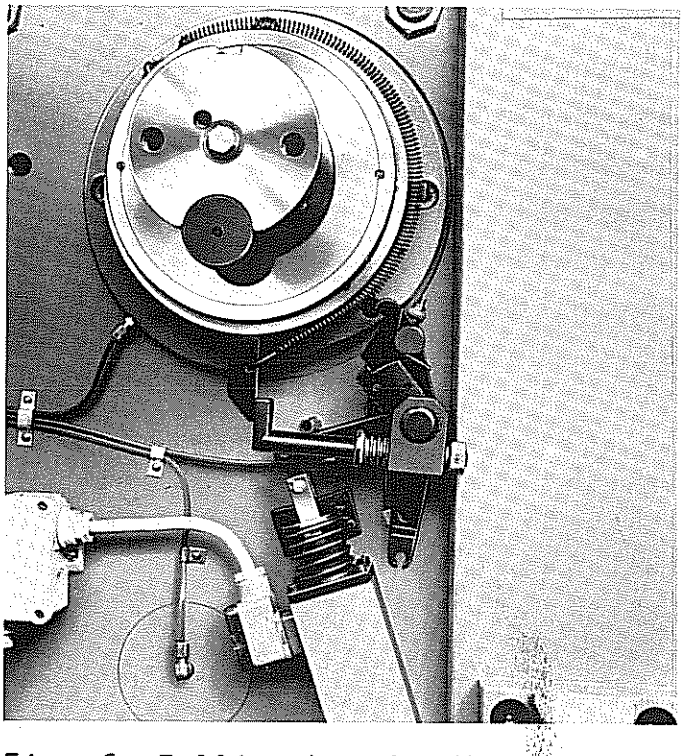


Fig. 6: Rolling key in disengaged position

Clutch and Engagement

1. Clutch

Every slide has its own drive and thus its own clutch and engagement, a feature of all MUBEA machines. The MUBEA clutch is a rugged rolling-key clutch with absolutely reliable performance.

1a) Position of the rolling key

When the clutch is disengaged and the slide in its upper dead center position, the eccentric shaft does not move, while the clutch wheel turns on its journal.

By actuating the pedal, the rolling key stop 1 is swivelled off and the stop plate 2 thus released. The rolling key 4 is engaged by means of the tension spring 3, whereby the eccentric shaft 5 comes into frictional connection with the clutch wheel via the clutch wheel hub. The rotating clutch wheel now drives the eccentric shaft and thus moves the slide (Fig. 7).

After one complete revolution of the eccentric shaft the rolling key is disengaged again, and the eccentric shaft stops in the upper dead center position, while the clutch wheel continues to rotate freely.

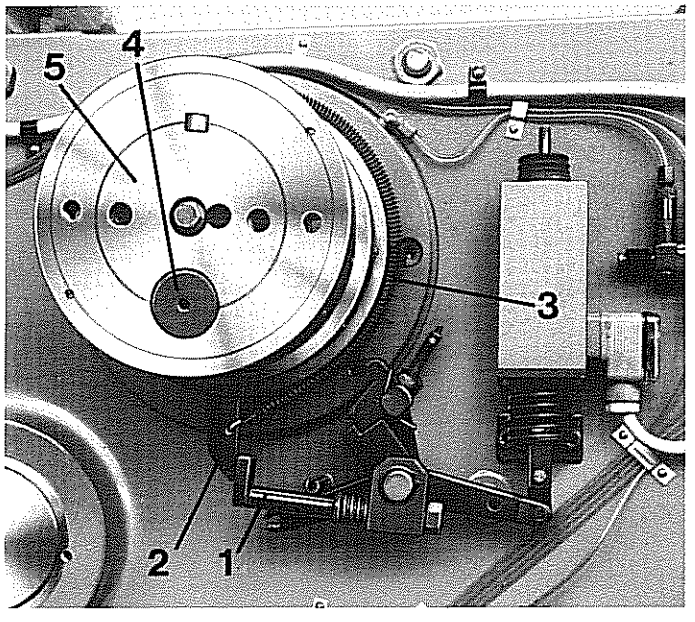


Fig. 7: Rolling key in disengaged position

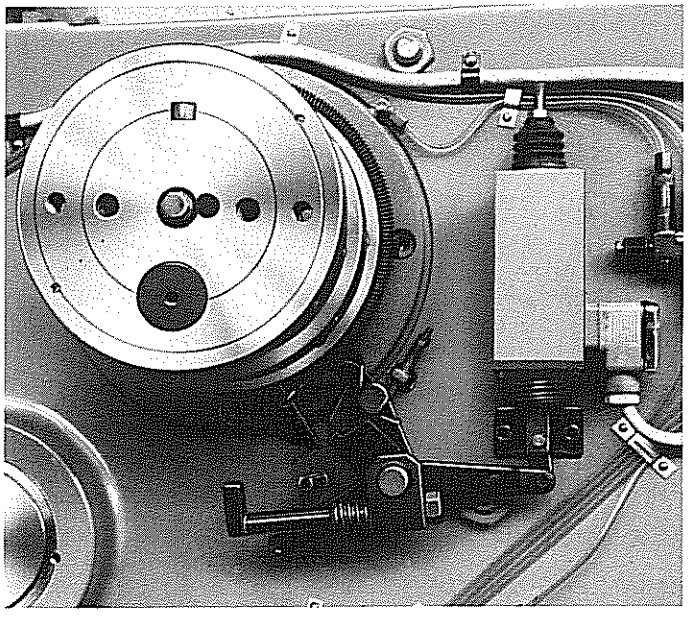


Fig. 8: Rolling key in engaged position

1b) Clicking of the rolling key

If the rolling key starts to produce a clicking sound after the machine has been operated for some time, the eccentric brake 1 must be adjusted by tightening the fillister head screw 2. In addition, the slide guide must be checked and reset, if required. (Fig. 9)
The eccentric brake is adjusted through the hole in the gear guard, through which the lifting lug can also be reached.

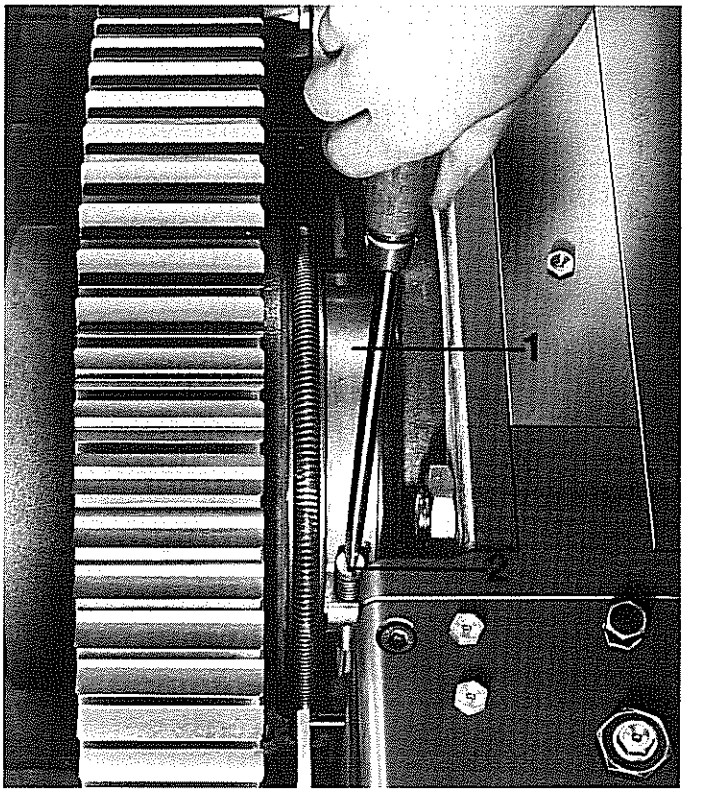


Fig. 9: Adjusting the eccentric brake

1c) Clutch under load

If during the cutting operation the machine stops for some reason (e.g. because of a power failure or a blown fuse), the motor must be switched off immediately. If at that particular moment there is stock in the cutting tool, the machine is subjected to heavy compressive strain. In order to

relieve this strain, the flywheel and with it the clutch wheel must be turned back. The now unstressed rolling key can be swivelled out. The eccentric must be turned back.

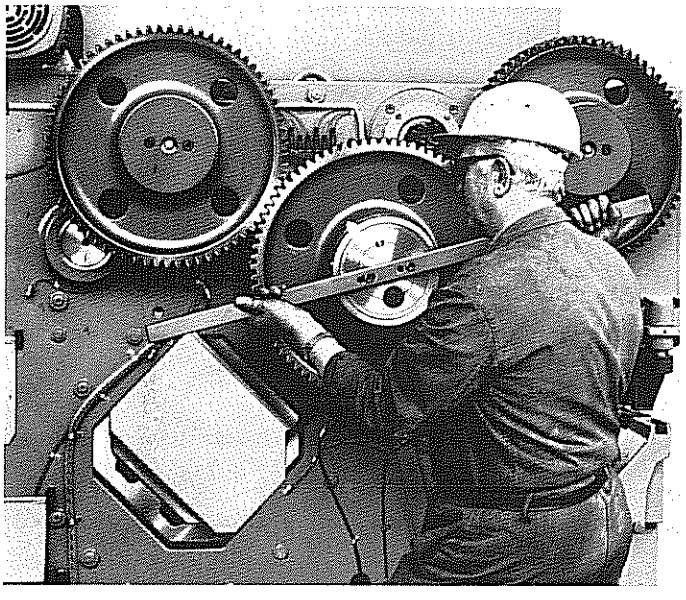


Fig. 10: Turning back the eccentric

If the machine stops because it is overstrained (i.e. if the cross section of the stock to be processed is too large or its tensile strength too high), check first of all if the machine still functions properly or if it has been damaged. Stop the machine, turn on the slides, and then turn the flywheel by hand. (See "Commissioning".)

1d) Single-stroke or repeat safety device

This safety device is absolutely reliable and complies with the accident prevention regulations. It is used in conjunction with foot engagement, solenoid and pneumatic engagements. It prevents repeat of a working stroke even when the engagement is actuated.

If the machine is to operate with continuous stroke, the single-stroke safety device must be neutralized by removing the disengaging pin 1 (Fig. 12).

With the single-stroke safety device neutralized, the machine can be operated with both single and continuous stroke.

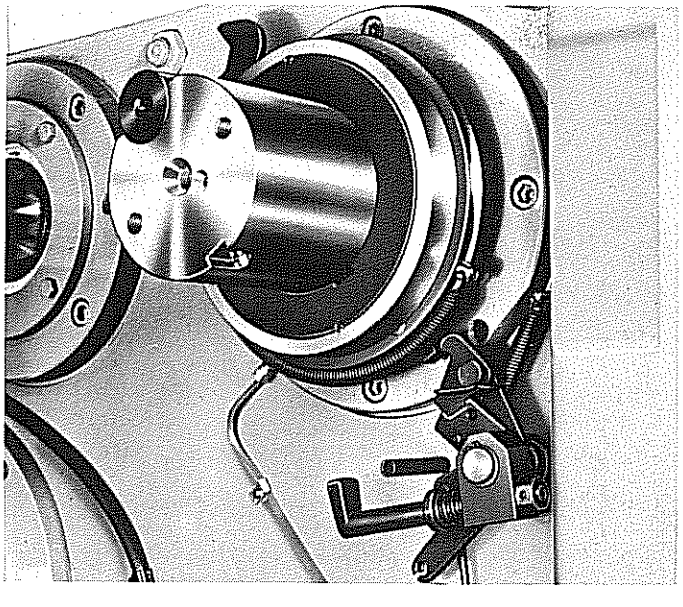


Fig. 11: The single-stroke safety device

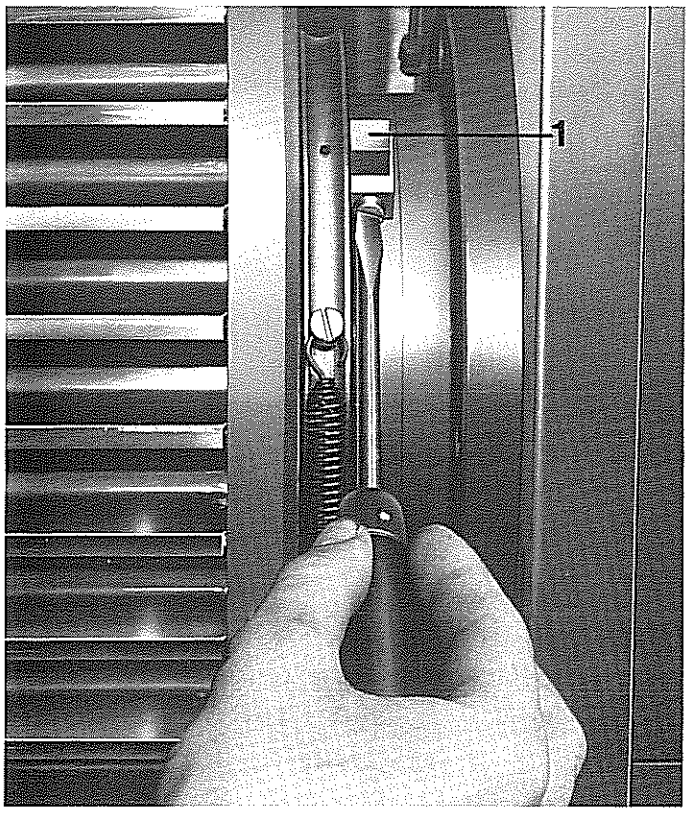


Fig. 12: Removing the disengaging pin

1e) Foot Engagement

All clutches are actuated by pedal switches, leaving both hands of the operator free to hold the workpiece. Depending on the length of the cable, the pedal switch can be actuated from any point convenient to the operator.

1f) Solenoid engagement / Pneumatic engagement

All clutches can also be actuated by pneumatic engagement, which can be recommended in particular when the machine is used in conjunction with duplicators, index rails, etc. with pneumatic control. Stops with contact switches can also be used together with solenoid and pneumatic engagements. There is a rod connection between the rolling-key stop and the solenoid or the pneumatic cylinder respectively. The engagements are actuated by pedal switches, which must be pressed until the slides start moving. The pedal switch, which is connected to the machine by a cable, can be placed wherever it is most convenient to the operator.

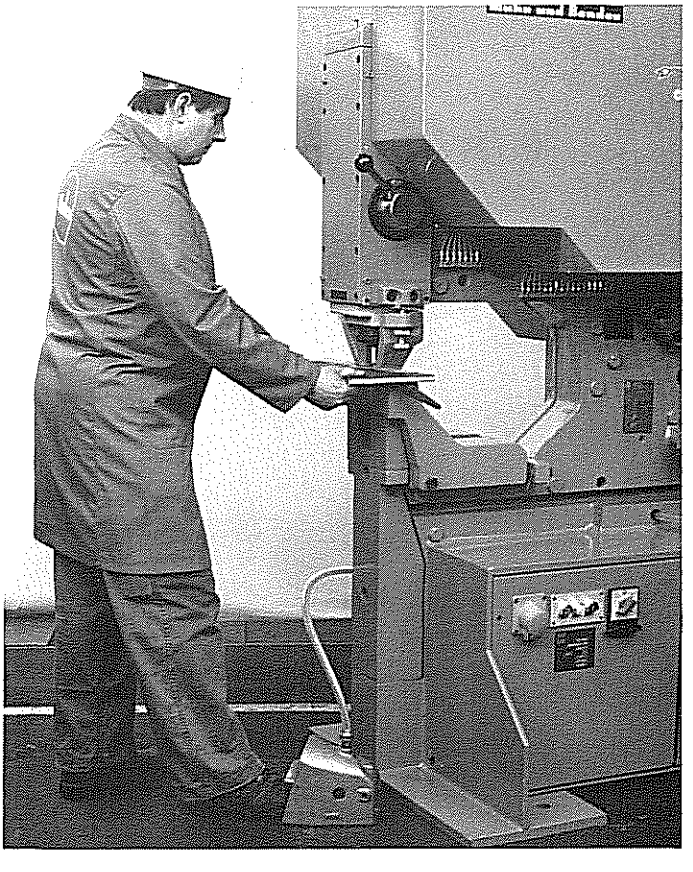


Fig. 13: Foot engagement

MUBEA machines already in your shop can also be equipped with solenoid or pneumatic engagements - preferably this job should be handled by one of our mechanics.

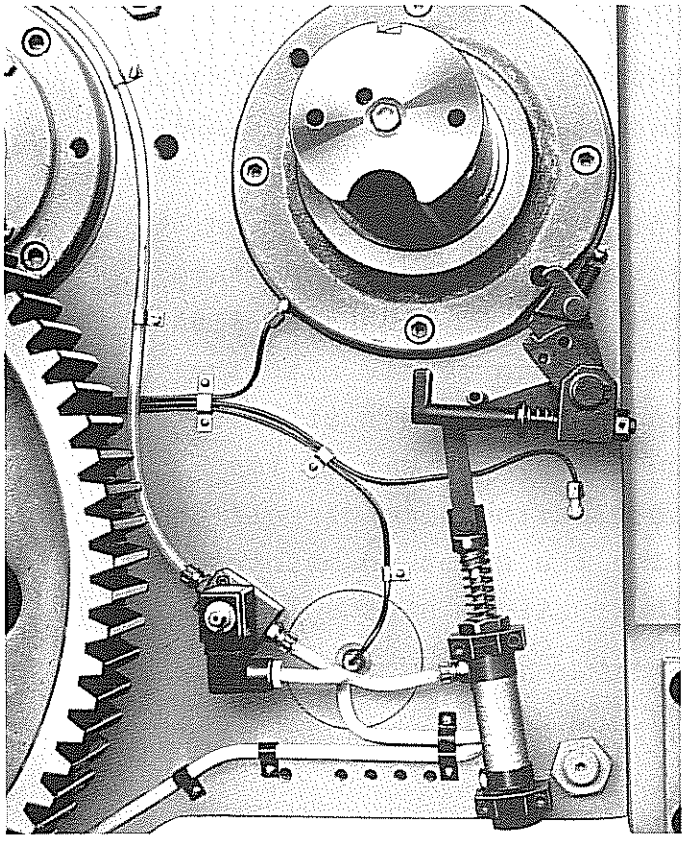


Fig. 14: Pneumatic engagement

Lubrication

a) Lubricant

The machine must be lubricated with oil exclusively; the same oil can be applied to all lubricating points.

At the customer's option, the following brands can be used:

TONNA OIL Z 220
viscosity 128 mm^2 /s at 50° C
(1.984 sq.in./sec.at 122° F)
produced by the German SHELL Co.

VACTRA OIL No. 4
viscosity 125 mm^2/s at 50° C
(1.938 sq.in./sec. at 122° F)
produced by the MOBIL OIL Co.

MILLCOT K 220
viscosity 120 mm^2/s at 50° C
(1.860 sq.in./sec. at 122° F)
produced by the ESSO Co.

ENERGOL HP - C 220
viscosity 127 mm^2/s at 50° C
(1.969 sq.in./sec. at 122° F)
produced by the BP Co.

DEGANIT B 220
viscosity 130 mm^2/s at 50° C
(2.015 sq.in./sec. at 122° F)
produced by the ARAL Co.

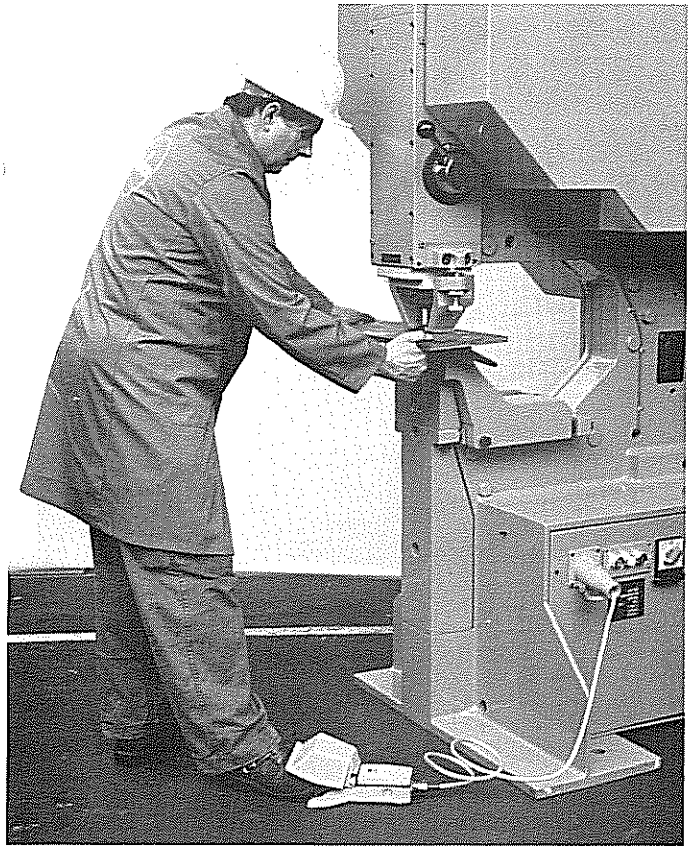


Fig. 15: Electric foot engagement

b) Manual lubrication

Lubrication is made in accordance with the attached lubrication chart by means of an oil gun supplied with the machine. Be sure to inject the specified oil quantities at regular intervals.

The grease on the gears will have been used up after a certain period of operation, which becomes noticeable through the increased noise of the gears. They must then be greased with a suitable gear grease (SURETT FLUID 4 K).

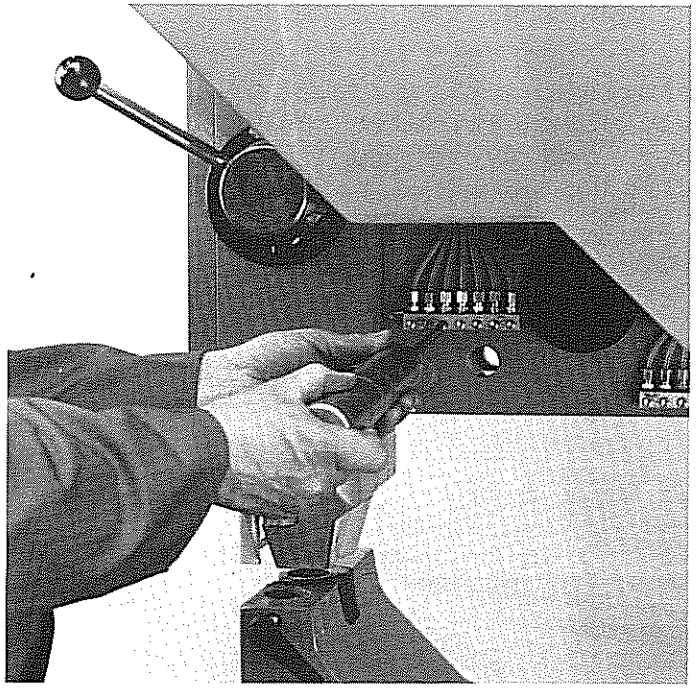


Fig. 16: Manual lubrication with the oil gun

c) Centralized lubrication

The oil brands used for manual lubrication can also be applied for the centralized lubrication. The machine is lubricated by means of a lubricating pump installed in its base. Please be sure to comply with the lubricating instructions given on the plate next to the lubricating pump as well as with the attached maintenance instructions of the TECALEMIT Co.

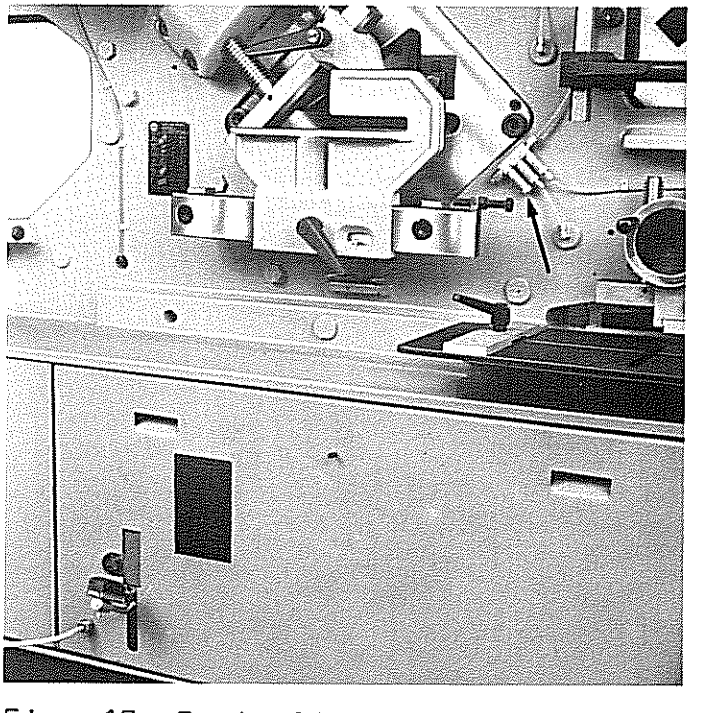


Fig. 17: Centralized lubrication

T H E F L A T B A R S H E A R

1. The Blades

The lower blade has four cutting edges.

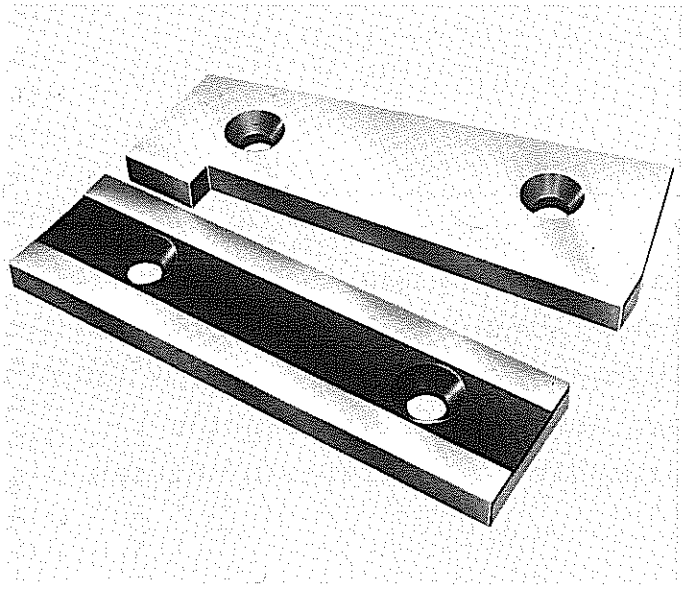


Fig. 18: Flat bar blade

2. Regrinding

Regrind the blades as soon as they appear dull. Regrind the narrow faces only, and be sure to grind at a precise right angle and perfectly even. The faces must remain straight to ensure perfect contact within slide and body as well as an unaltered rake angle. Worn-out blades must be replaced by new MUBEA blades.

3. The Shearing Gap

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

The blades are set for shearing any stock thickness within their capacity range. When shearing very light material, reduce the shearing gap by cardboard or a metal foil.

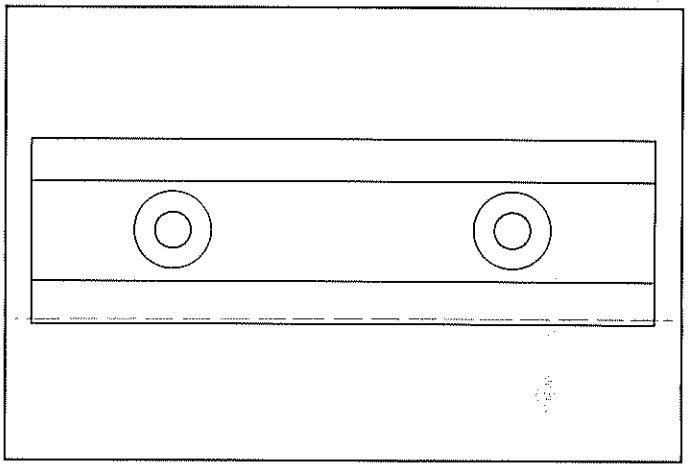


Fig. 19: Regrinding the plate blades

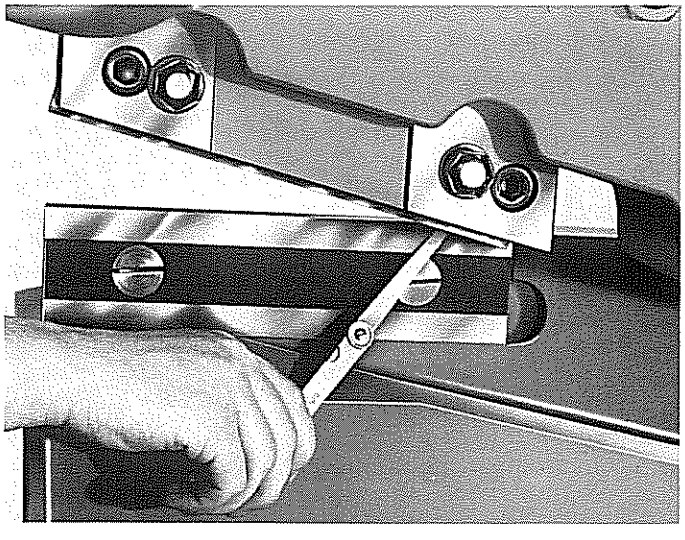


Fig. 20: Checking the shearing gap

4. Setting the Hold-Down

The stock to be sheared must be securely retained in a horizontal position. Incorrect hold-down setting results in damage to the blades or their being forced apart.

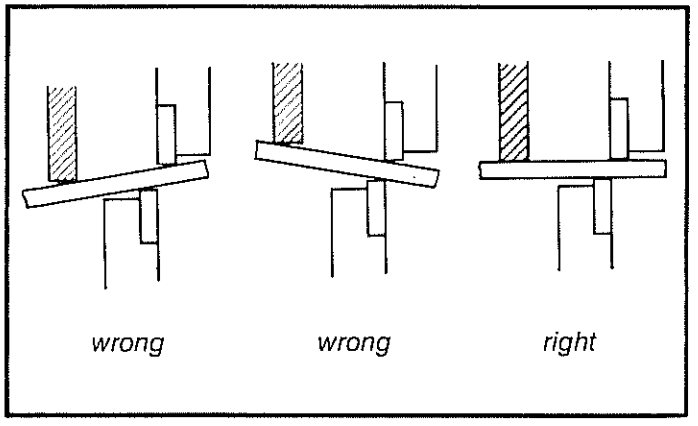


Fig. 21: Wrong and correct hold-down setting

5. Shearing Flat Bars

A special flat bar top blade with a 2.5 degree rake angle is available on request for deformation-free shearing of flat bars. On account of the smaller rake angle of this special blade, the capacity is altered.

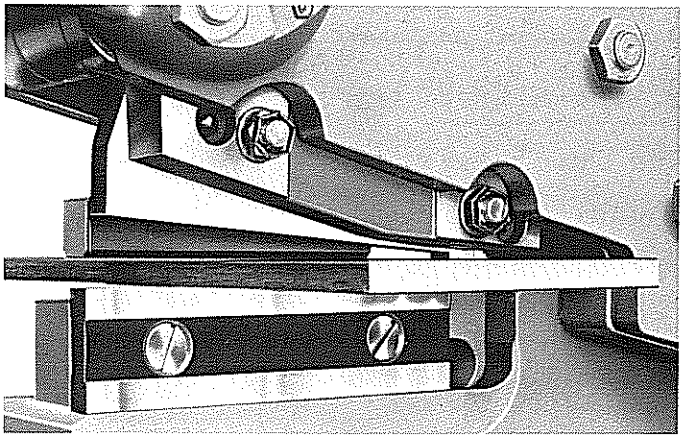


Fig. 22: Deformation-free shearing of flat bars

6. Changing the Blades

Dismount the support and guide table. Loosen the lock nut 1 and the hexagon nut 2, remove the fastening bolts 3 and 4, and take out the blades. Reverse the procedure to install the blades.

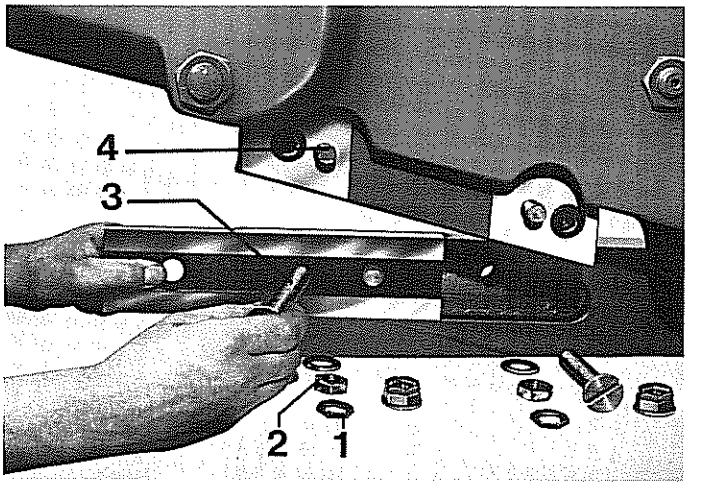


Fig. 23: Changing the plate shear blades

7. Special Blades

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

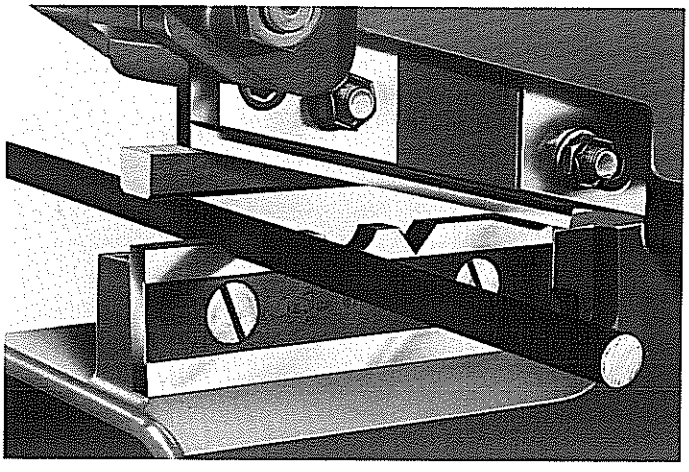


Fig. 24: Profiled plate shear blades

8. Adjusting the Slide Guide

The plate shear slide can be adjusted on all sides.

a) Adjustment at the face (Figs. 25 + 26): Loosen the upper and lower lock nuts 1 between the coper-notcher jaws, and turn the two pressure screws clockwise until you clearly notice a resistance. Then slightly loosen the pressure screws again by turning them about 1/16 of a revolution in the anticlockwise direction, and retighten the lock nut 1.

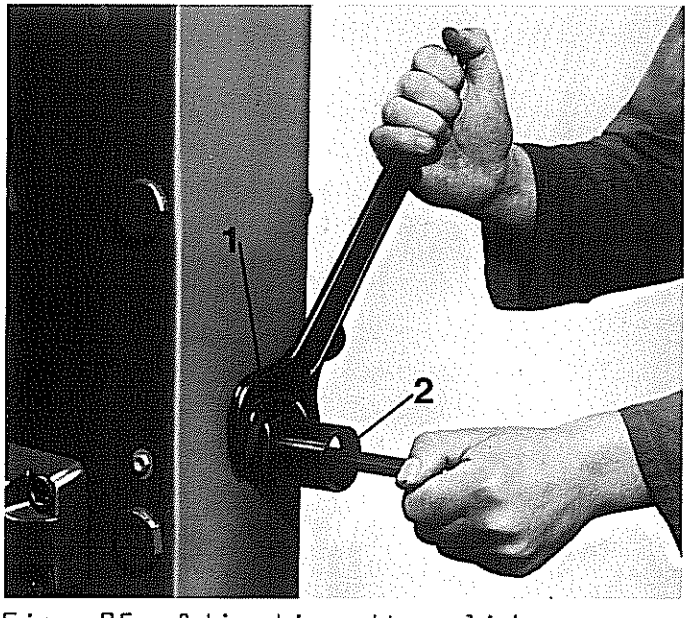


Fig. 25: Adjusting the slide guide at the upper face

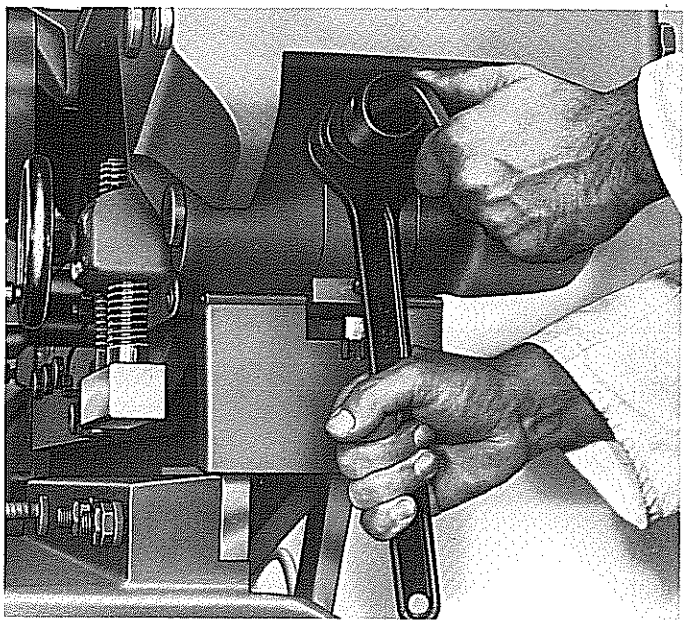


Fig. 26: Adjusting the slide guide at the lower face

b) Adjustment at right angles to the machine (Fig. 27): Loosen the locking screws 1 (two each are fitted at the upper and lower discharge side of the machine). Use an adjustable face spanner to turn the sliding plugs 2 clockwise until you clearly feel a resistance. Then loosen the sliding plugs 2 again slightly by turning them anticlockwise by about 1/16 of a revolution. Drill a 4.5 mm bore into the sliding plugs and screw in locking screws 1.

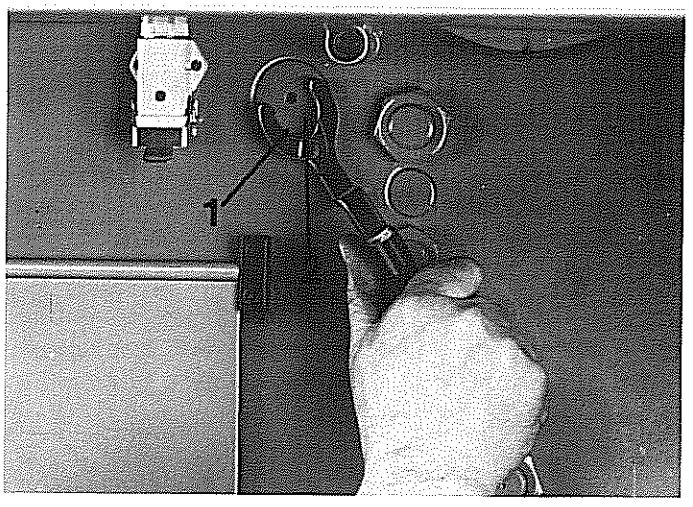


Fig. 27: Adjusting the slide guide at right angles to the machine

T H E C O P E R - N O T C H E R

1. General

In accordance with your order specifications, your machine has been supplied equipped with either a rectangular coper or a triangular notcher. Either of these attachments can be supplied later on, and they are easily interchangeable.

2. The Triangular Notcher

This tool is particularly recommended for the economical production of frames from angles or tees. The tip of the triangular notcher has been flattened to prevent deformation in the center of the section. - The notched section can be bent to form a frame.

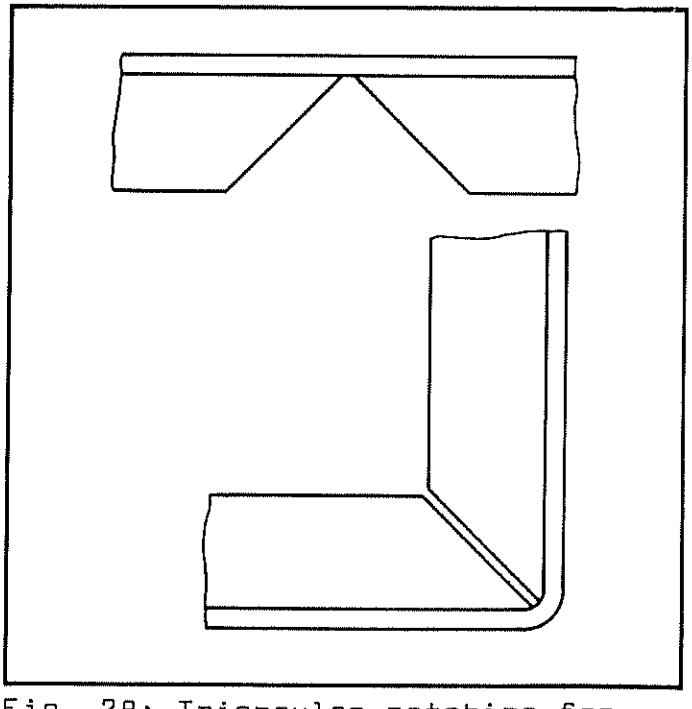


Fig. 28: Triangular notching for frame bending

The triangular notcher can also be used for rectangular coping of angles at the ends, if the stock is fed at a 45-degree angle. By successive infeed, any length can be coped.

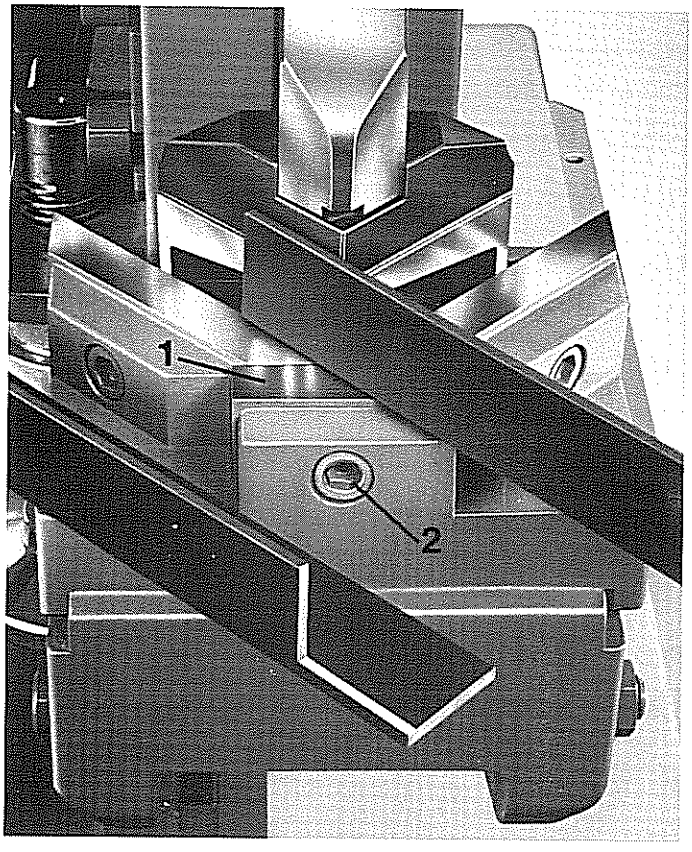


Fig. 29: Rectangular coping with the triangular notcher

If you want to notch tees in the web, remove the front blade 1 by loosening the screw 2 so that there is room for the flange of the tee.

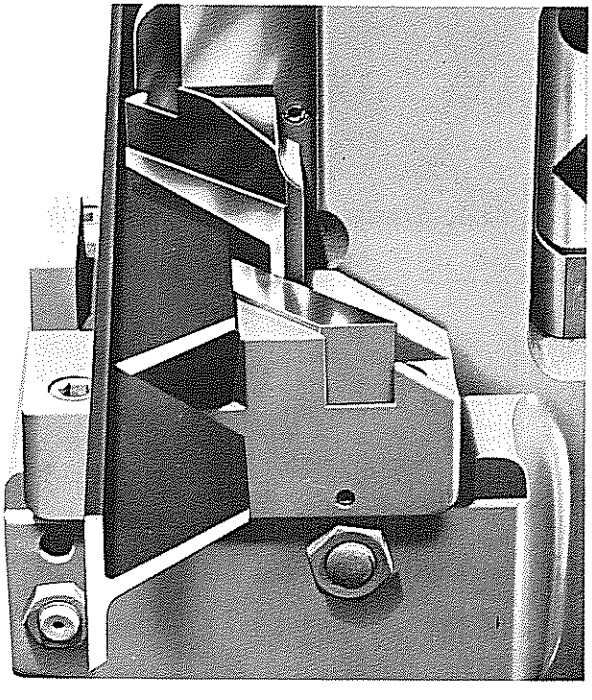


Fig. 30: Notching tees in the web

3. The Rectangular Coper

This attachment is particularly recommended for coping flanges and webs of various sections.

The coping width and depth can be increased by successive cuts. Even triangular notching is possible with this attachment by feeding the stock at an angle of 45 degrees. Because of the sharp point produced, this procedure is not suitable for frame manufacturing, though.

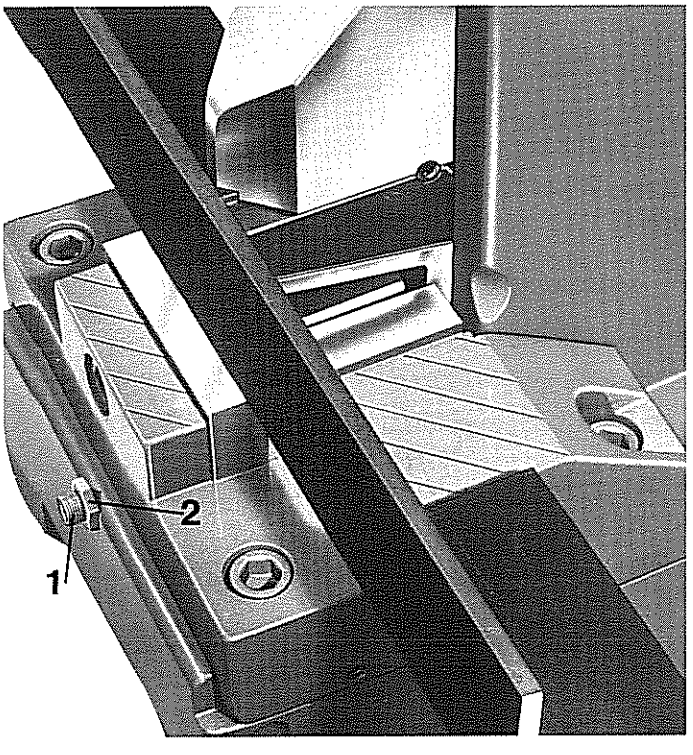


Fig. 31: Wide rectangular coping

4. Adjusting the Coping and Notching Tools

The coper-notcher saddle can be adjusted on all sides, so that the bottom part of the tool can be easily adjusted to the top blade. Make sure that the shearing gap is even.

The shearing gap is set for the maximum capacity, and must therefore be reduced when very light material is processed. Lower the blade slide until the top blade dips into the bottom part of the tool. Measure the shearing gap with a feeler gauge.

For adjustment, loosen the saddle screws 1 and move the saddle to the correct position by means of the adjusting screws 2 (Fig. 33). Firmly retighten the saddle screws, tighten the pressure screw 1, and secure it by means of the nut 2 (Fig. 31).

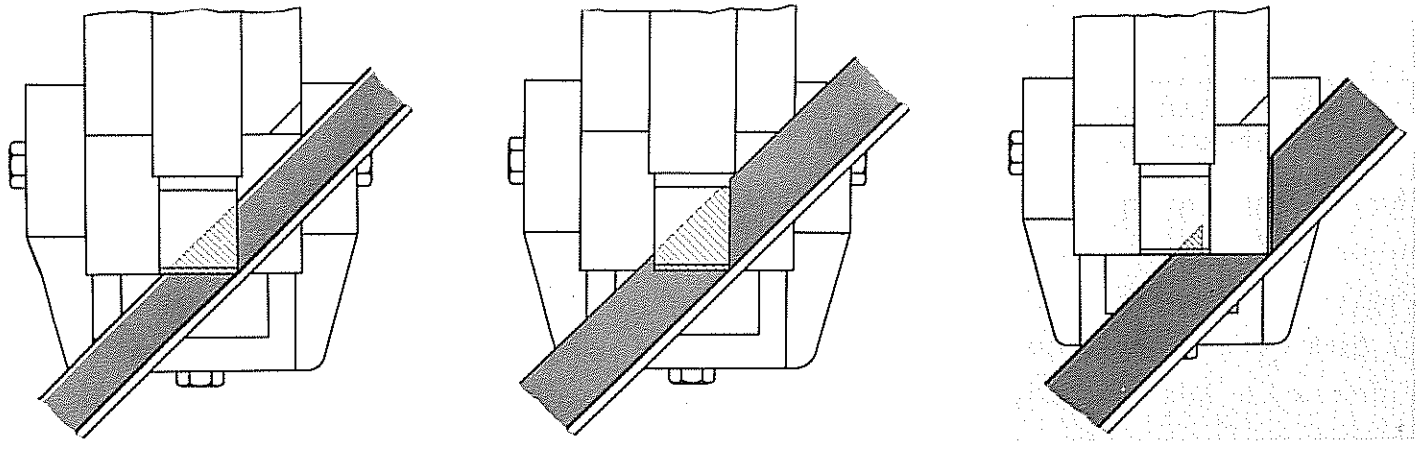


Fig. 32: Makeshift triangular notching with the rectangular coper

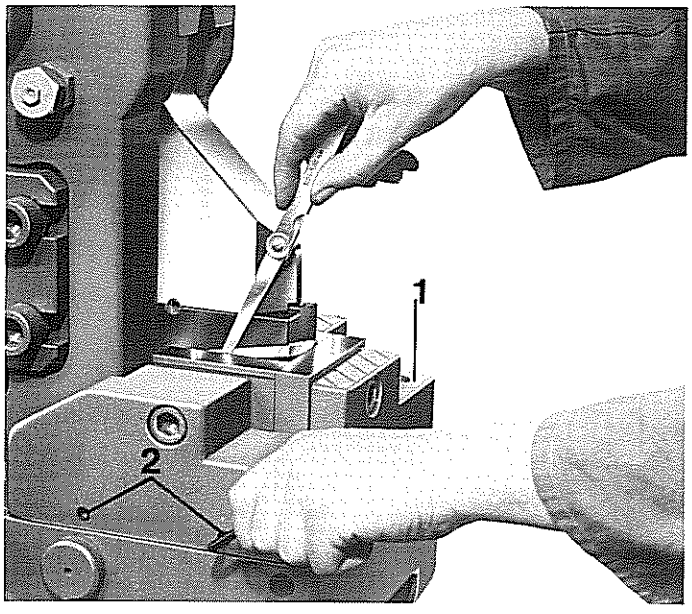


Fig. 33: Checking the shearing gap

5. Regrinding the Rectangular Coper and the Triangular Notcher

Regrind the top blades only at their lower faces and the bottom blades only at their upper faces. (When re-installing the blades, make sure that the shearing gap is accurately set. Apply oil to the cutting edges frequently.)

6. Special Tools

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

7. Special Accessories

If you wish to cope and/or notch without prior marking, we can supply you with special support tables, index rails, etc. Please let us know your specific requirements, so that we can work out the most economical method for you.

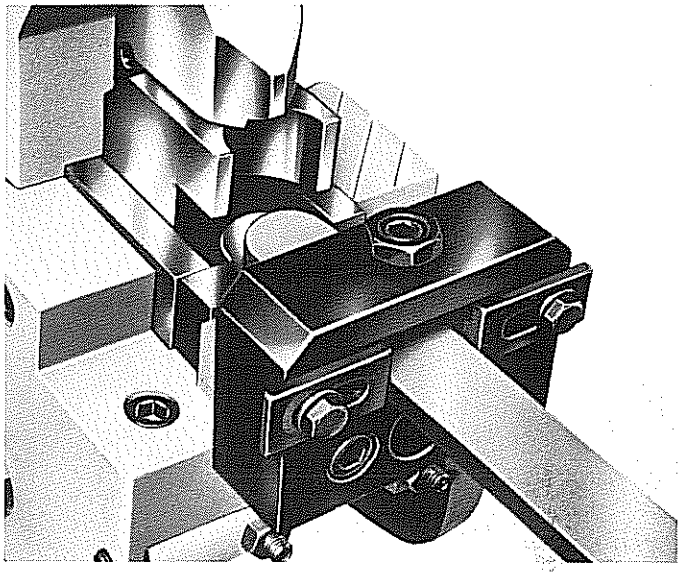


Fig. 34: Convex radiussing of flat bars

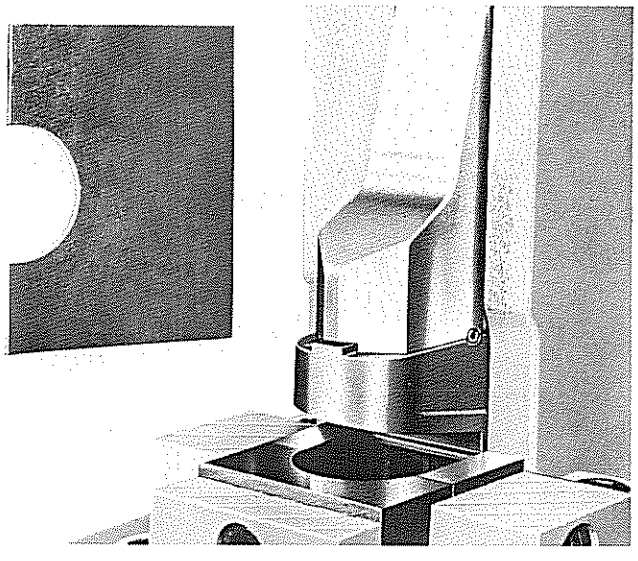


Fig. 35: Concave radiussing of flat bars

Caution

We urgently recommend that the guard fitted to the coper-notcher is used at all times.

T H E B A R S H E A R

1. The Blades

The standard equipment of the machine includes blades for round and square bars. These blades are square and have cutting edges on both faces so that, by turning and rotating the blades, a total of eight cutting edges can be applied.

2. Regrinding

Grind the large faces only. As dull blades require a higher cutting pressure and result in poor cuts, it is important to order new MUBEA blades in time.

3. The Shearing Gap

The bar shear blades must not be forced tightly together. The shearing gap should be approximately 0.3 - 0.5 mm. The blades are properly set prior to delivery.

The clamping plates 1 must not press the blades together. When the blades are reground, the clamping plates must be reworked, too. (Fig. 36)

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

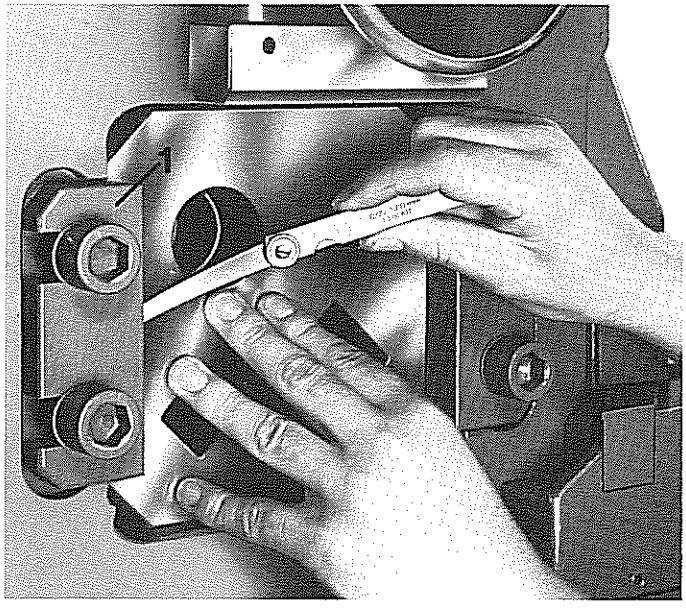


Fig. 36: Checking the shearing gap

4. The Hold-Down

The hold-down must be set in such a way that the workpiece is held in a horizontal position during cutting.

Round and square bars are held in place by the crossbar 1 (Fig. 37). When blades for angles or tees are installed, a special thrust pad must be fitted to the hold-down bar to hold the section in its center.

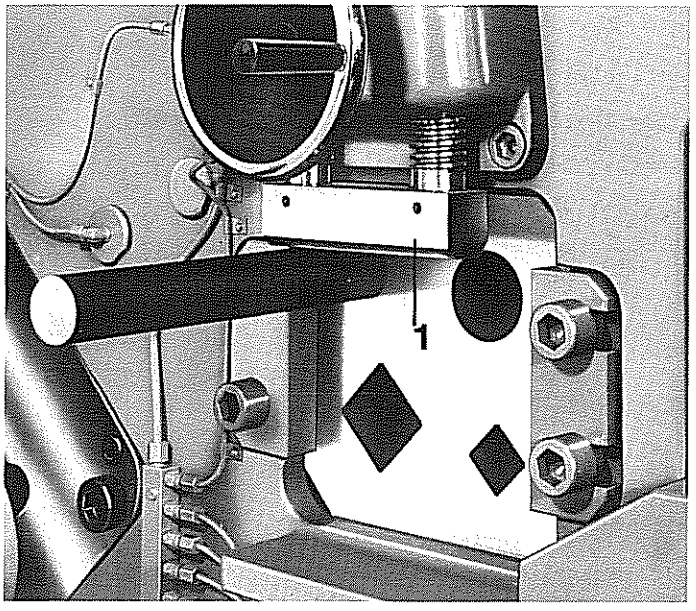


Fig. 37: Cutting round bars

5. Changing the Blades

Loosen the blade bolts 1, withdraw the clamping plates towards the inside, lift the blades and take them out. Reverse the procedure to fit the blades.

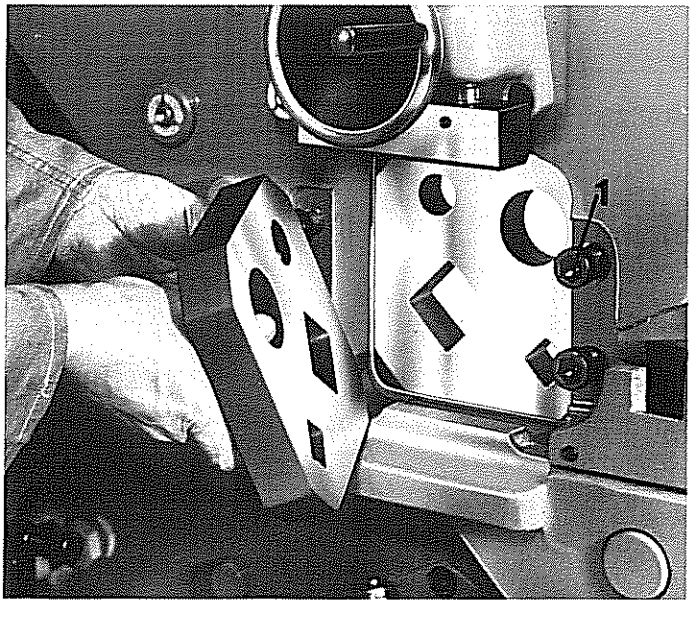


Fig. 38: Changing the blades

6. Special Blades

In case you want to cut round bars only, we can supply you with blades which have only round cutting apertures. The diameters will of course be in accordance with your specifications. If the stock to be cut is to be fed by means of a roller conveyor, please indicate this in your orders, as in this case all cutting apertures will be arranged at the same height. Of course we also supply blades for shearing angles, tees, channels, zees, and other sections.

The possibility of using the bar shear also for cutting sections considerably reduces blade changes. If for instance the section shear is used for cutting regular angles and tees, the bar shear can be used for cutting special sections, or you can cut angles and tees in the bar shear, while cutting large special sections in the section shear. This is an essential advantage of the MUBEA three-slide machine.

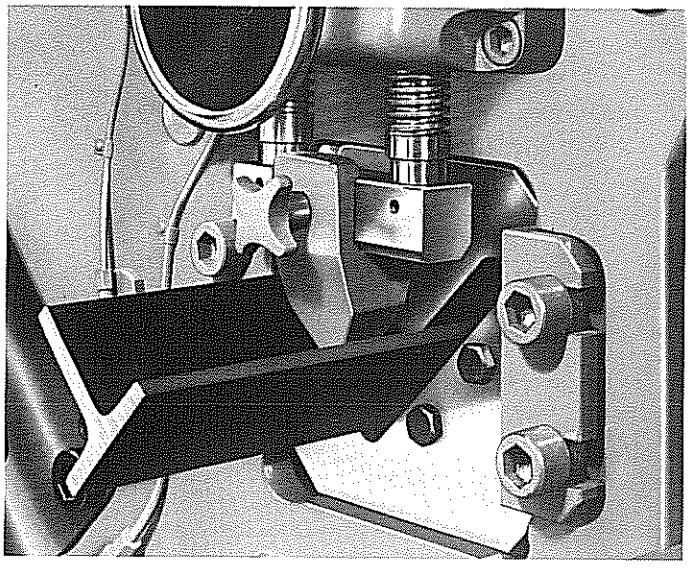


Fig. 39: Shearing tees

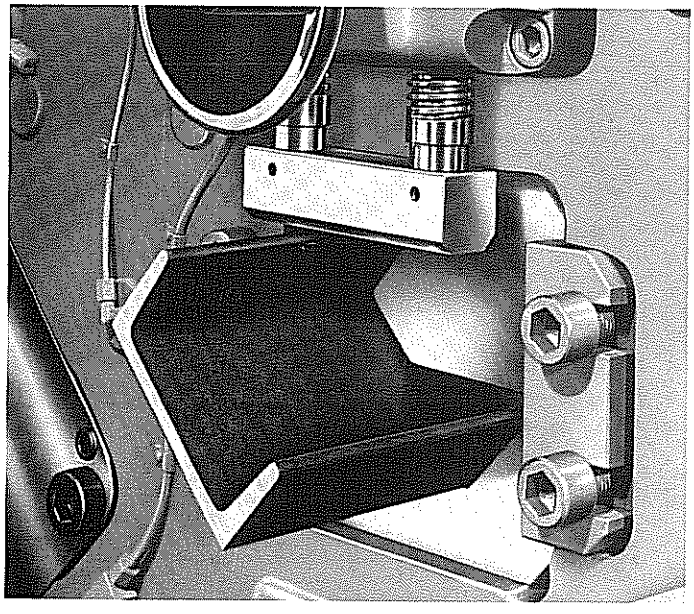


Fig. 40: Shearing channels

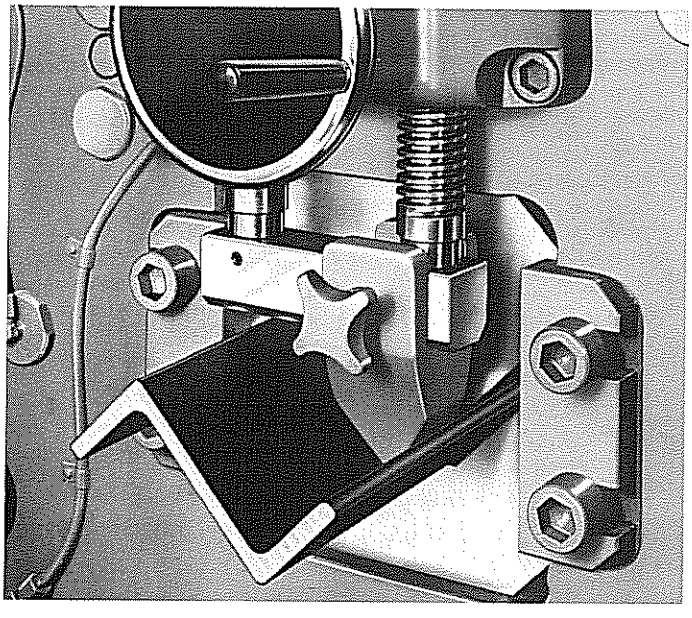


Fig. 41: Shearing zees

7. The Pipe Notching Attachment

The economy-priced pipe notching attachment of the bar shear constitutes another special advantage. Pipes up to a maximum outer dia. of 60 mm and up to a thickness of 6 mm can be notched. For other pipe diameters, only the cutting inserts of the movable and of the fixed knife must be exchanged.

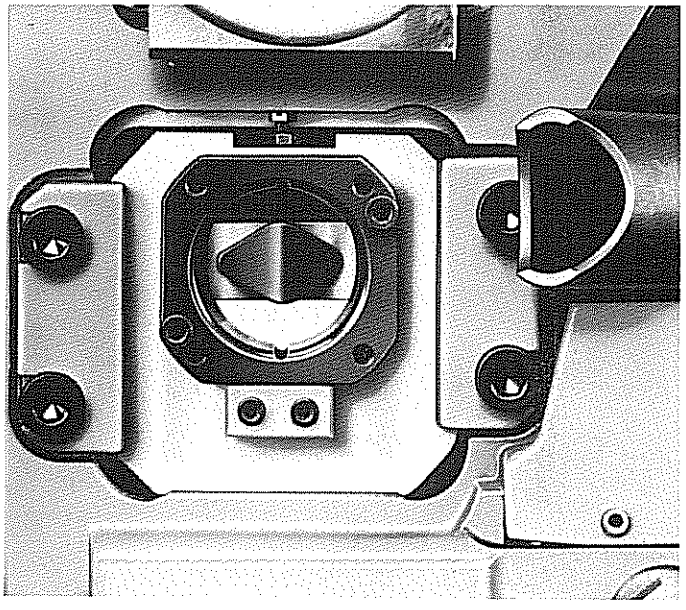


Fig. 42: Pipe notching attachment

8. Scale Removal

The slides have scale removal channels large enough for the removal of dry scale. In case some scale should remain in a channel nonetheless, the channel must be rinsed with kerosine.

THE SECTION SHEAR

1. General

This shear is fitted with a very long, rugged slide, which holds the moveable section blade. Thus the section blade itself does not move, so that blade seizure is prevented.

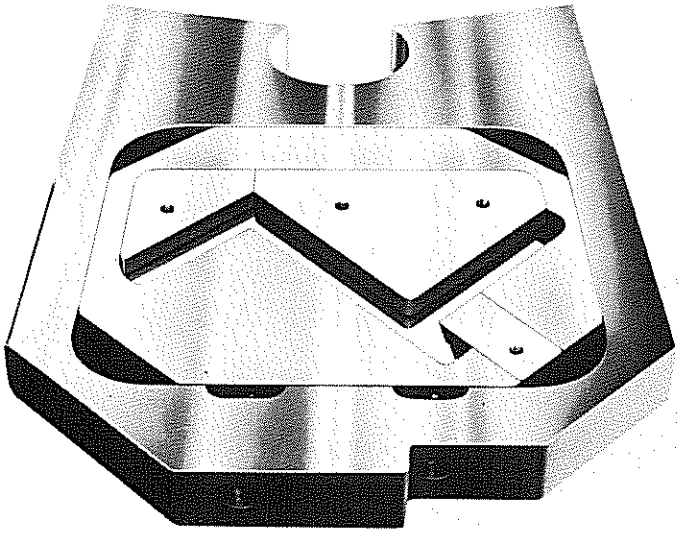


Fig. 43: The moveable section blade securely held in the special section shear slide

2. Adjusting the Slide Guide

The long slide travels on special antifriction guides, which can be adjusted on all sides, thus ensuring perfect alignment even after a long period of operation. In view of the heavy forces produced in the section shear, this is a very important safety feature.

Adjustment is made as follows:

a) At right angles to the machine: (Fig. 44)

Loosen the locking screws 1 (at the top and at the bottom of the discharge side of the machine).

Turn the slide plugs 2 clockwise with an adjustable face spanner until you clearly notice a resistance. Then slightly loosen the slide plugs 2 again by turning them anticlockwise by about 1/16 of a complete revolution. Drill a 4.5 mm bore into the slide plug and screw in the locking screw 1.

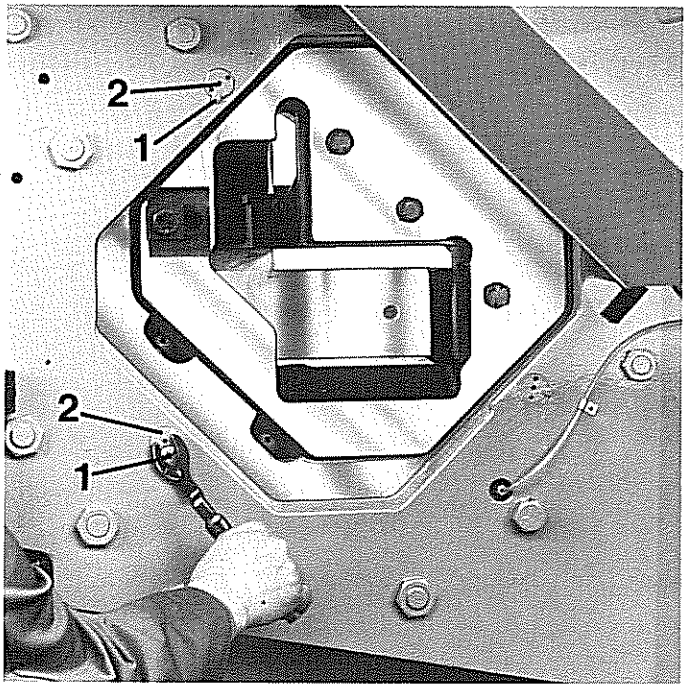


Fig. 44: Adjusting the slide guide at right angles to the machine

b) Adjustment along the Faces - KBL 560:

Loosen the 2 set screws 1 on the front side. Tighten the two set screws 2 in the throat of the punch and in the inclined plate feed channel. When a marked resistance is felt, release the set screws 2 by giving them 1/16 of a complete turn. Then securely tighten the set screws 1 again. (Figs. 45 and 46)

b) Adjustment along the Faces - KBL 750 - 1300:

Loosen 2 hexagon head bolts 1 on the back side of the machine by 3 full anti-clockwise turns. Tighten the 2 hexagon head bolts 2 on the front side until a marked resistance is felt. Then slacken the hexagon head bolts 2 by giving them 1/4 turn. Tighten hexagon head bolts 1 firmly again. (Figs. 47 and 48)

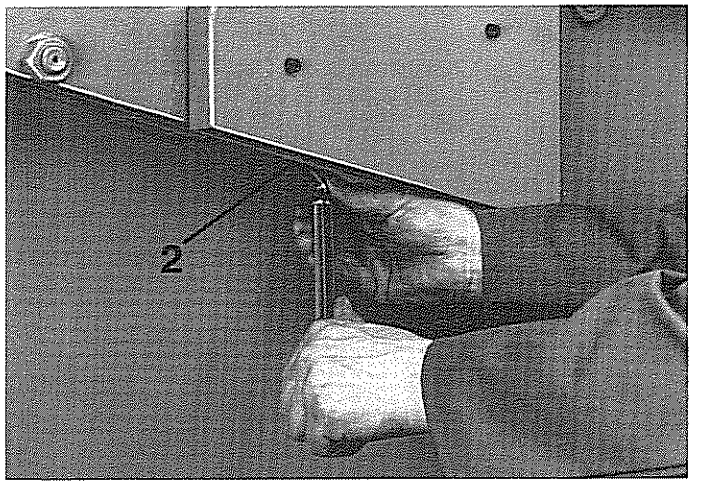


Fig. 45: Adjustment along the faces of the slide guide

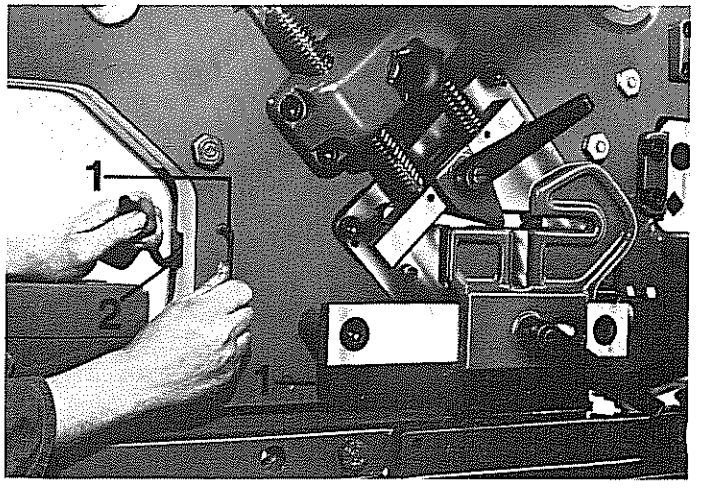


Fig. 46: Adjustment along the faces of the slide guide

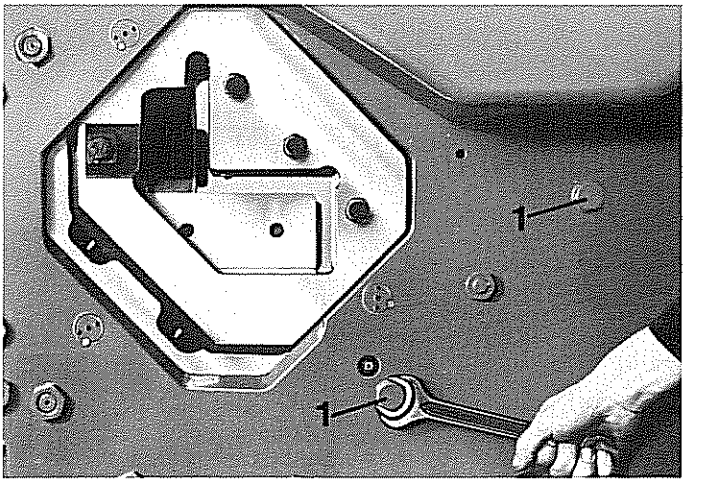


Fig. 47: Adjustment along the faces of the slide guide

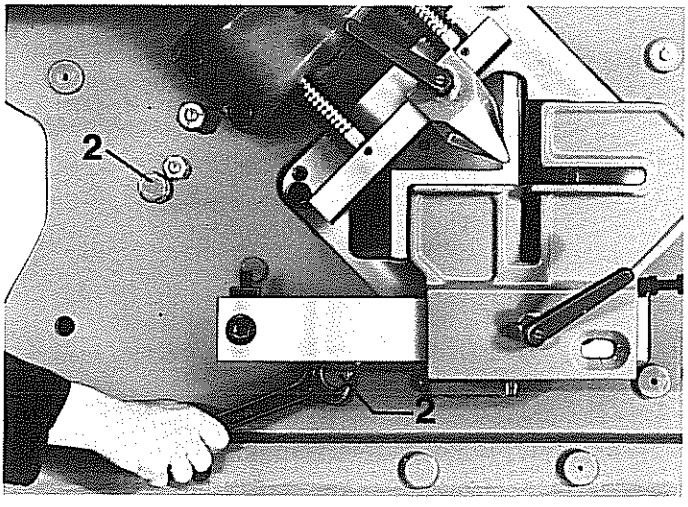


Fig. 48: Adjustment along the faces of the slide guide

3. Removal of Scale

Scale removal channels are machined into the slides. These channels are large enough for allowing dry scale to drop through properly. If these channels should nevertheless occasionally become clogged with scale, wash them out with petrol or other solvent.

4. Types of Blades

a) Standard Design

The machines are normally equipped with blades for cutting angles and tees. For a detailed description, including maintenance and operating instructions, see the following text.

P M A B L A D E S

1. General

Type PMA section blades serve for cutting angles and tees squarely and at any mitre angle up to 45°. The sliding blades close and open automatically and are self-adjusting to any size of section. This is an advantage when angles and tees of varying sizes have to be cut in a quickly alternating sequence.

When PMA blades are used, the automatic hold-down of the machine must be neutralized by pulling out the adjusting wheel.

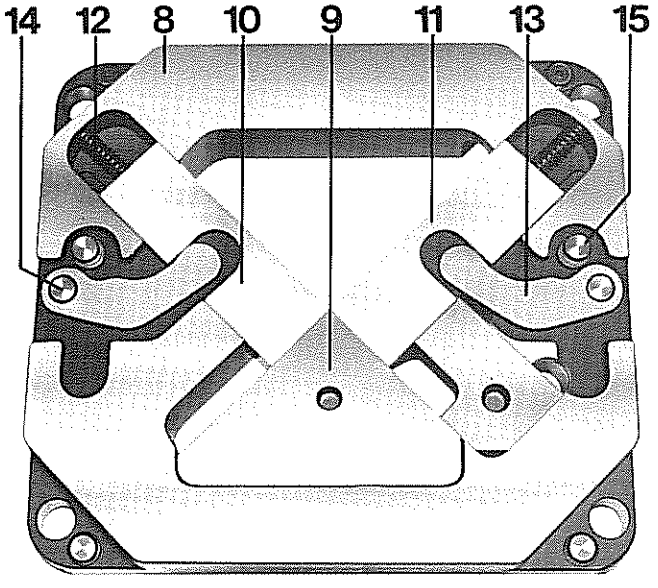


Fig. 49: Fixed section blade PMA

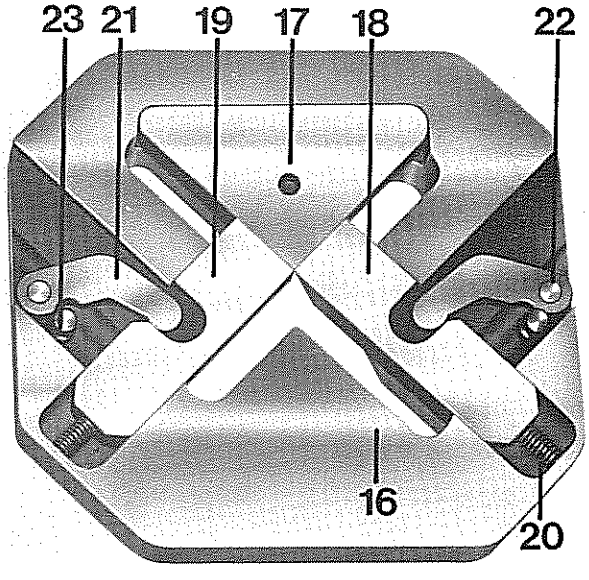


Fig. 50: Moveable section blade PMA

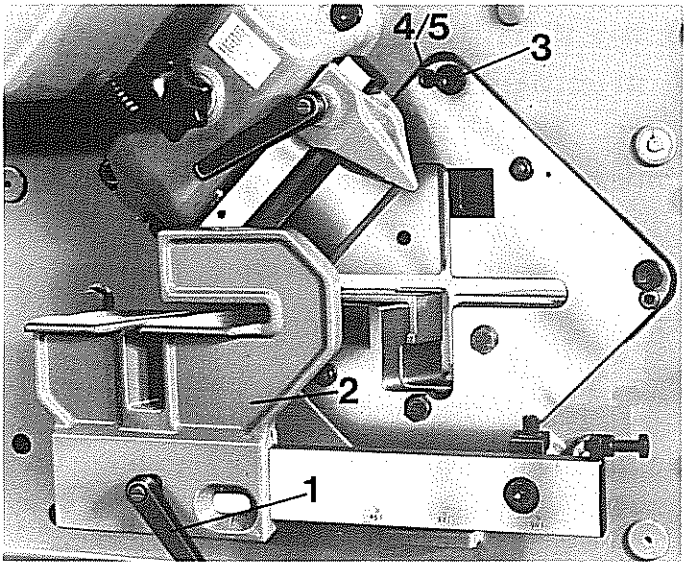


Fig. 51: Section blade PMA from body side

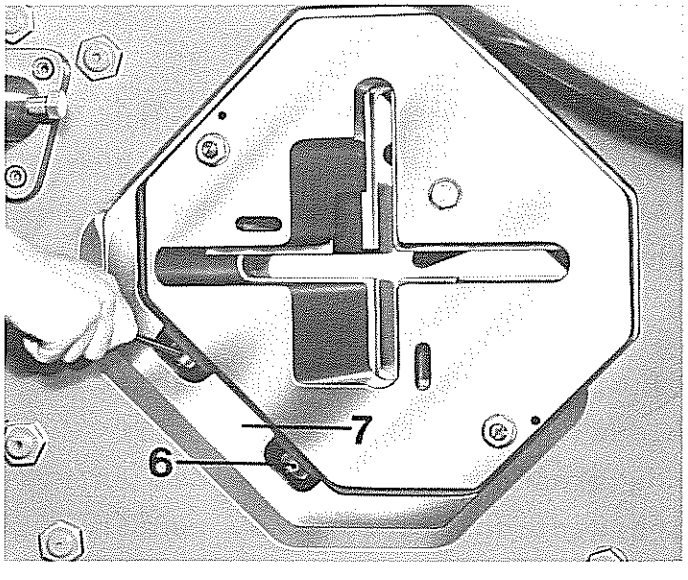


Fig. 52: Section blade PMA from cover plate side

2. Removal of PMA Blades (Figs. 49, 50, 51 and 52)

a) Lower section slide until sliding blades are closed and the automatic system hence relieved.

b) Lift the clamping lever 1 and remove section stop 2. (The clamping lever can be disconnected and moved into any desired position by depressing the lever head.)

c) Turn the automatic double-spindle hold-down completely upwards. Do not put in action the adjusting wheel.

d) Loosen 4 fillister head screws 3 (do not change grub screws 4 and countercap 5).

e) Withdraw the fixed section blade 8 from the body of the machine.

f) Turn the section slide into the top dead center position and loosen the cross-slit screws 6 in the section slide 7.

g) Withdraw the moveable section blade 16 from the machine. (If the blades are to be cleaned only, the section blade 16 may remain in place). For removal and installation of section blade parts, see item 4, page 25.

3. Installation of PMA Blades (Figs. 49, 50, 51 and 52)

a) Insert moveable section blade 16 in the section slide 7 and push to the rear against the stop.

b) Tighten cross-slit screw 6.

c) Turn section slide 7 downward so that adjusting eccentrics 15 and 23 do not touch the slide levers 13 and 21.

d) Insert the fixed section blade 8 in the body.

e) Insert fillister head screws 3 with cup spring and tighten firmly.

f) Tighten grub screws 4.

g) Release fillister head screws 3 one full turn and retighten all 4 grub screws 4 by about 1/8 of a turn. This is necessary to avoid compression of the blades and to maintain the shearing gap. After this, check with the adjusting feeler gauge supplied.

h) Firmly tighten fillister head screw 3 with an extended spanner (approx. 300 mm) and lock grub screws 4 by countercap 5.

i) Turn the flywheel by hand and check for regular opening and closing of the sliding blades.

If the blades close irregularly, it will be necessary to readjust the eccentrics 15 and 23 rotating clockwise or anti-clockwise. To set the adjusting eccentrics, loosen the lock nuts and re-tighten after adjustment has been made.

If adjustment is correct, the sliding blades have just fully opened in the upper position of the slide, or are tightly closed when the slide is in its bottom position.

k) Fit section stop 2 and clamp with tightening lever 1.

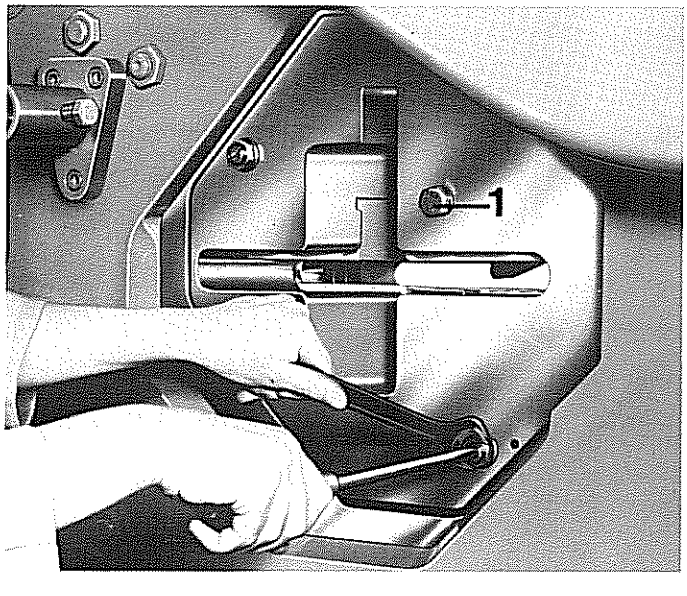


Fig. 53: Adjusting the sliding blades

4. Cleaning the Section Blades (Figs. 49 and 50)

PMA blades must be carefully maintained and cleaned. Since the sliding blades are spring operated, excessive fouling of the blades may result in failure of the automatic system which, in turn, causes poor cuts or even fracture of the blades. Watch the function of the blades closely and clean them in good time.

a) Removal of the section blades according to the instructions under item 2.

b) Remove slide levers 13 and 21.

c) Remove sliding blades 10, 11, 18 and 19 from their holders.

d) Remove springs 12 and 20 from the sliding blades.

e) Clean the sliding blades and section blades, taking particular care to clean the holders to prevent obstruction of the sliding blade movement.

f) Assemble the PMA blades in the reverse sequence. In order to ensure and maintain precision and continuity in operation, it is important that you insist on MUBEA spare blades.

Caution:

If the mill scale encountered is to be kept dry, the section blades must remain free from grease. Only the rear sides of the sliding blades and the bearings of the slide levers have to be slightly greased.

g) Fitting of the section blades according to the instructions under item 3.

The ref. No. (which please indicate in your orders), is stamped on the blades. Remember that MUBEA blades are of special quality, so it pays to specify MUBEA when ordering spare parts.

5. Regrinding the Section Blades

The sliding and insert blades must be reground on their cutting faces only i.e. uniformly on all faces to keep the center cross centric. Of course, grinding must be done only as far as the stroke of the section slide permits, i. e. the cross must be completely closed when the section slide is in its bottom position.

The sliding and insert blades are pointed, so that all sections - even sharped-edged ones - can be cut. For cutting angles of a certain size having root fillets, the insert blade 17 can be provided with a radius corresponding to that of the fillet. Squeezing at the section root is thus eliminated.

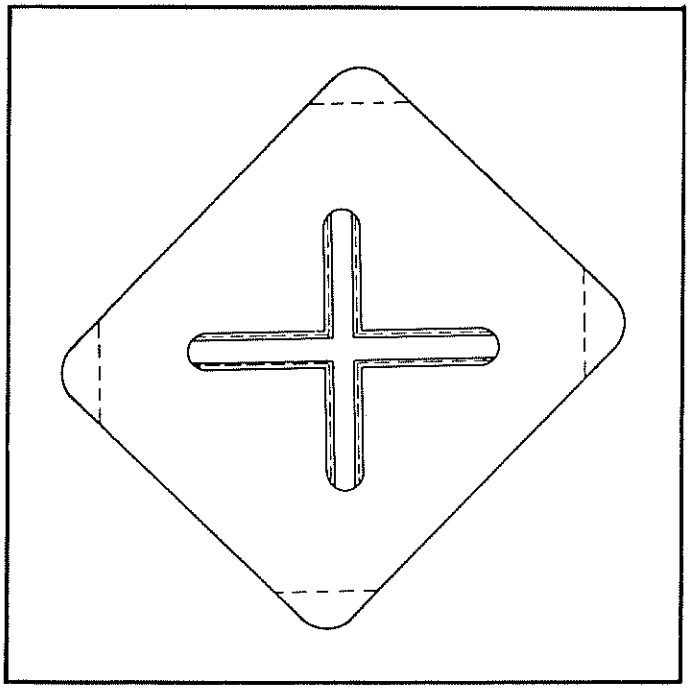


Fig. 54: Regrind blades uniformly

We also supply these insert blades with various radii - from the smallest up to the maximum capacity of the machine, several section sizes being grouped together in each case.

When ordering, please state what kind of angles are to be cut and whether tees are to be dealt with.

These insert blades can be replaced without the section blades having to be removed. Turn down the section slide until the limiting line in the hole through the fixed section blade is free. Now loosen the securing bolt 1 (Fig. 53) and replace the blades.

Long lengths of section should be supported close to the body of the machine so that the section does not exert pressure on the sliding blades. Do not clamp the hold-down too tightly. There must be a small gap between the section and the hold-down.

6. Cutting with PMA Blades

a) Inserting the Sections

Insert the section into the section opening (the section must abut against the right-hand side of the opening and just touch the horizontal sliding blade of the fixed knife but without locking it). Adjustment of the blades is not necessary.

The cutting instructions below demonstrate the way in which square and mitre cuts are made.

The sliding blades are spring operated. Especially when cutting heavy sections, make sure that the sliding blades are not jammed.

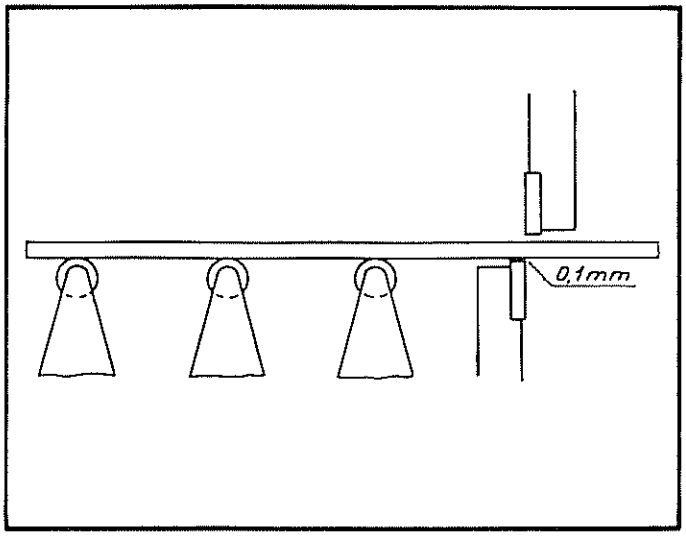


Fig. 55: Inserting an angle

b) Hold-down and Section Stop (Figs. 56, 57 and 58)

The section stop on 2 the guide rail 3 which is adjustable for height, can be set to square or mitre cuts up to 45° by means of a scale. It is clamped in the desired position by means of the tightening lever 1.

For square 90° cuts there is a stop bolt 4 with lock nut 5 on the right-hand side of the guide rail 3. Simply move the section stop against the stop bolt and you have the correct lateral location.

The correct level of the section is adjusted by means of the double-spindle hold-down. Shift the pressure piece 6 on the hold-down 7 so that it touches the section root with its tip when the hold-down is lowered. Adjust hold-down so that automatic clamping is ineffective.

The vertical location of the section is correct when the section is horizontal during cutting.

When processing out-of-angle vertical legs (are formed at different section sizes), readjust the guide rail 3 with the setting screws 8 when processing out-of-angle horizontal legs, correct by means of the section stop and the double-spindle hold-down.

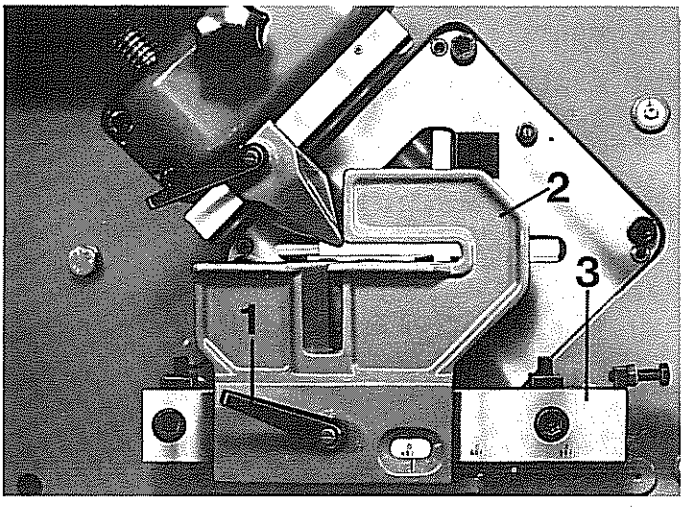


Fig. 56: Section stop for 45° mitre cuts

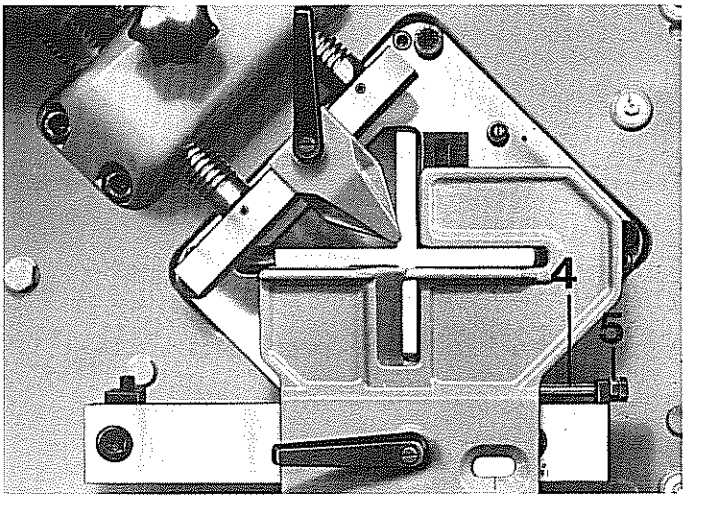


Fig. 57: Section stop for 90° cuts

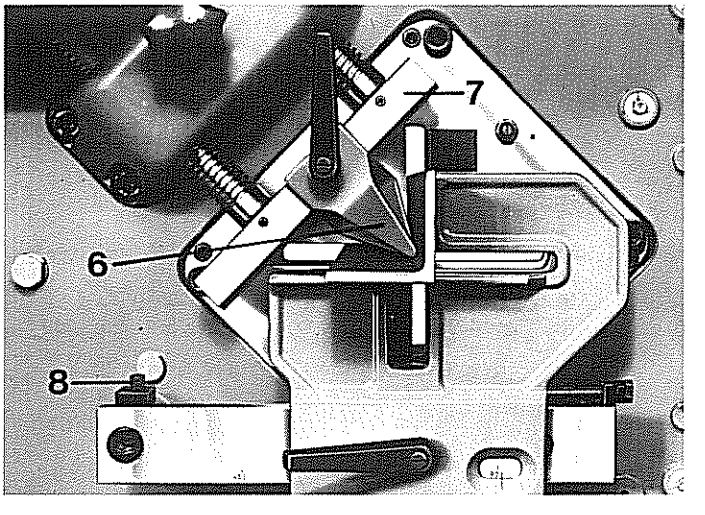


Fig. 58: Adjusting the automatic two-spindle hold-down

c) Cutting Extremely Small Sections

When cutting extremely small angles and tees with PMA blades, make sure that the position of the section within the blade opening is correct. Sections may be brought out of line by jumping sliding blades and hence become deformed during cutting.

eccentrics 15 and 23 (Figs. 49 and 50) in such a way as to make the sliding blades open only far enough for the small sections to be inserted.

If the small sections are to be cut square only, it is advisable to buy special blades for the bar shear to keep the section shear free for larger sections.

Note:

Place small angles against the fixed cutting insert of the moveable blade (Fig. A), small tees being held in the middle of the blade opening (Fig. B).

If you have a large batch of small sections to cut, it is advisable to set the adjusting

d) Cutting Instructions

You will find instructions on the correct insertion of sections for the various kinds of cuts in the table included in the general cutting instructions (see page 31).

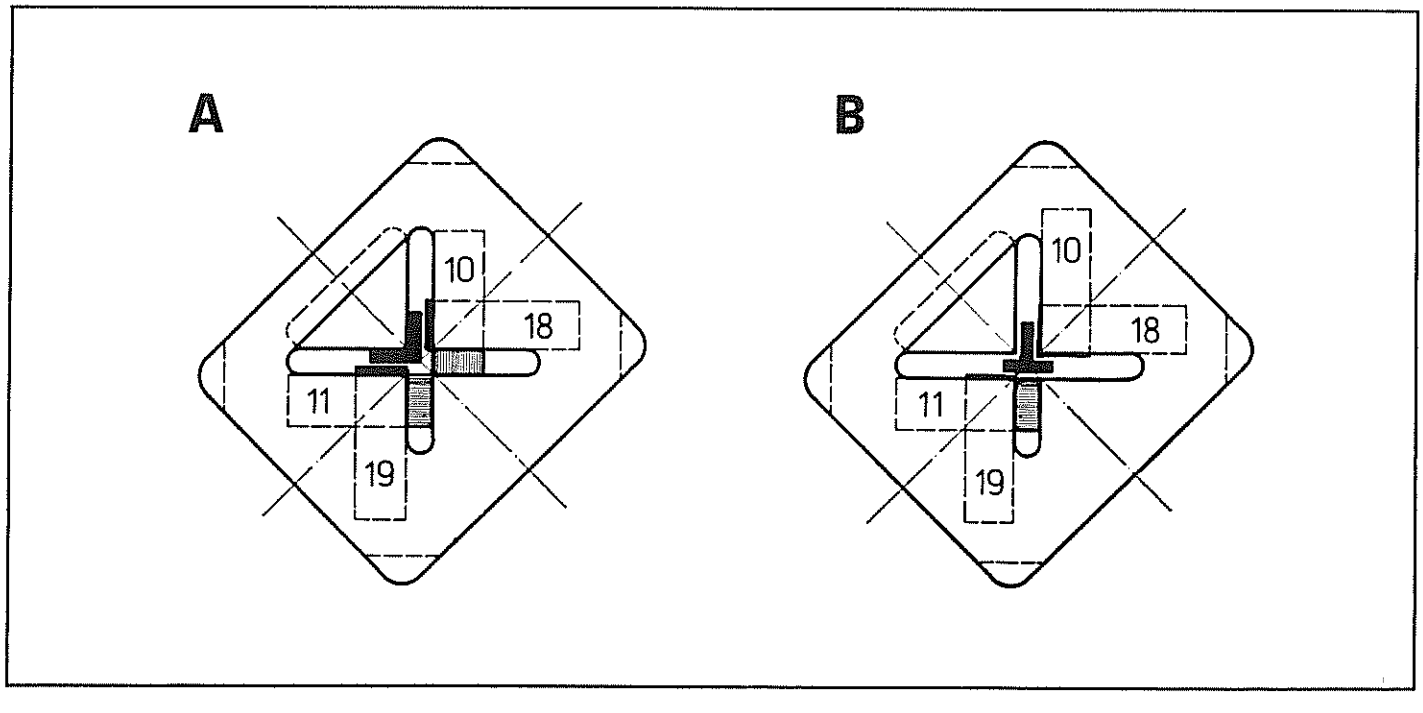


Fig. 59: Cutting of small angles and tees

7. Converting from PMA to PMB Blades

For cutting large batches of identical section sizes, use type PMB blades (similar to PMA, but without the automatic feature) or the still more rugged PMG blades. These blades require almost no maintenance and are thus most economical for identical section dimensions.

Type PMA blades are converted into type PMB blades by removing the automatic system and inserting different sliding blades.

a) New parts to be ordered (Figs. 60 and 61):
1 sliding blade each 10, 11, 14,15
1 insert blade each, 8, 13
2 hexagon head screws
2 hexagon head screws
1 hexagon head screw
4 lock washers
4 spring washers

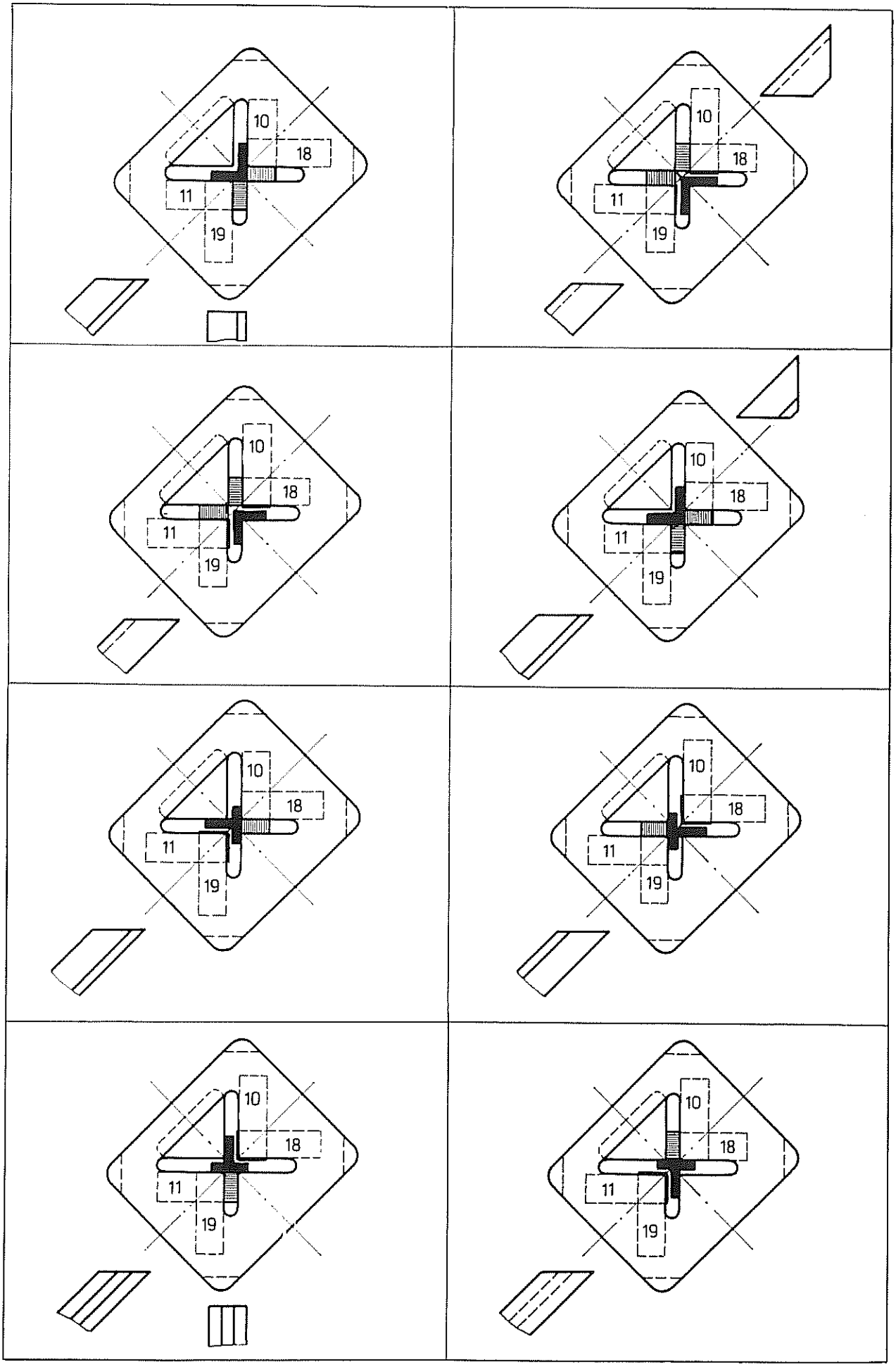
b) Parts to be removed from type PMA blades (Figs. 49 and 50):
Sliding blades 10, 11, 18, 19
Insert blades 9, 17
Slide levers 13, 21
Compression springs 12, 20

c) Install the parts under a) in section blades 8 and 16.

d) Turn the flywheel by hand and check for satisfactory function.

The adjustment of the sliding blades for the various section cuts is explained in the instructions for type PMB blades (see page 37).

e) Cutting Instructions PMA



P M B B L A D E S

1. General

Type PMB section blades serve for cutting angles and tees squarely and at any mitre angle up to 45°. The sliding blades are manually adjusted to the size of section to be handled (see cutting instructions page 37).

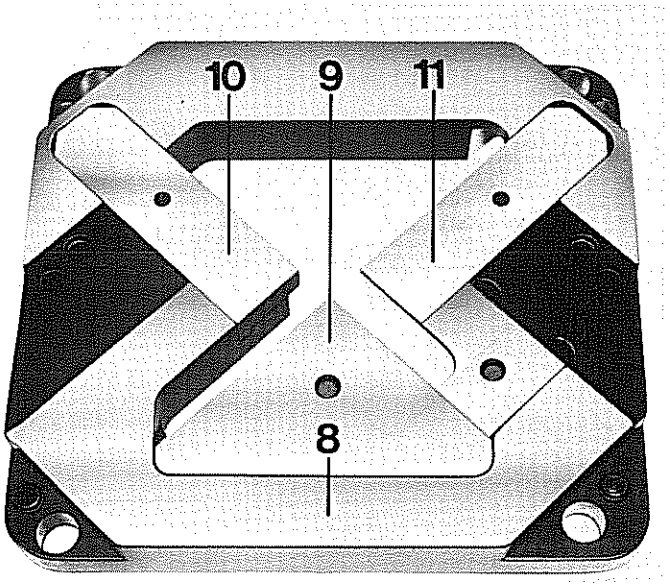


Fig. 60: Fixed PMB section blade

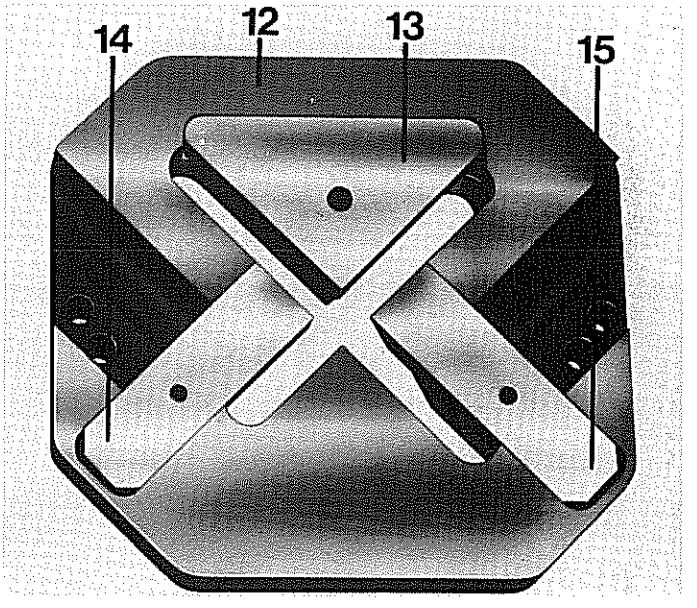


Fig. 61: Moveable PMB section blade

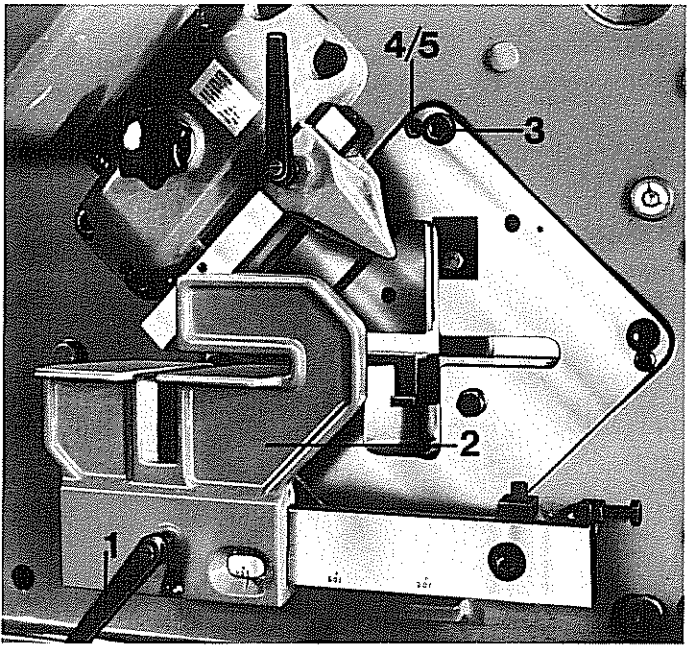


Fig. 62: PMB section blade from the body side

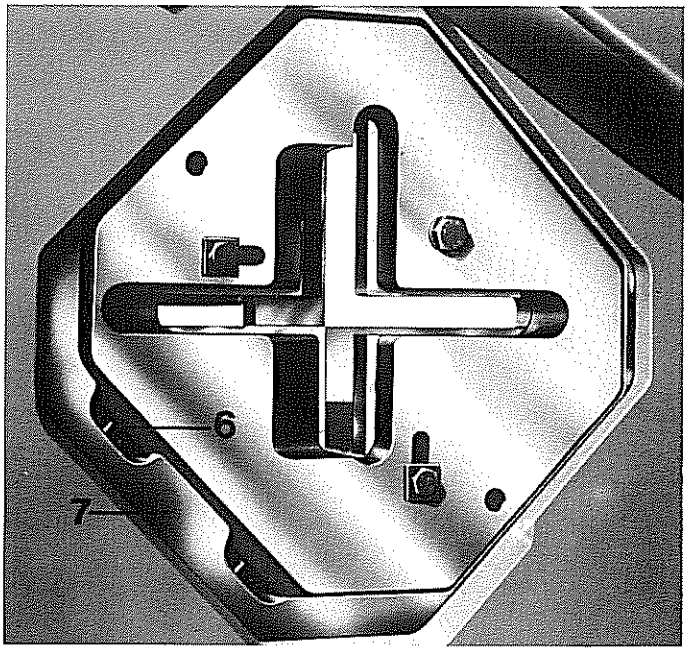


Fig. 63: PMB section blade from the cover plate side

2. Removal of PMB Blades (Figs. 60, 61, 62 and 63)

a) Release tightening lever 1 and remove section stop 2.(The tightening lever can be disconnected and turned into any desired position by pushing in the lever head.)

b) Turn two-spindle hold-down completely upwards. When the automatic hold-down is used, its adjusting wheel must not lock.

c) Loosen the 4 fillister head screws 3.(Do not change setting of set screws 4 and countercap 5.)

d) Remove fixed section blade 8 from the body of the machine.

e) Loosen the cross-slit screw 6 in section slide 7.

f) Remove the moveable section blade 12 from the machine. (If the blades are to be cleaned only, the moveable section blade 12 may remain in place.)

3. Installation of PMB Blades (Figs. 60, 61, 62 and 63)

a) Insert moveable section blade 12 into the section slide 7 and push it against the stop at the rear.

b) Tighten the cross-slit screw 6.

c) Insert the fixed section blade 8 into the body.

d) Securely tighten the fillister head screws 3 with cup springs.

e) Securely tighten the thread pins 4.

f) Loosen the fillister head screws 3 one full turn and re-tighten all four thread pins 4 by giving them about 1/8 of a right-hand turn. This is necessary to prevent the blades from compressing and to maintain a shearing gap. Check the shearing gap with the feeler gauge supplied with the machine.

g)
Securely tighten the fillister head screws 3 with an extended spanner (approx. 300 mm) and lock thread pins 4 by counter-cap 5.

h) Fit the section stop 2 and tighten the tightening lever 1.

4. Cleaning the PMB Blades (Figs. 60 and 61)

PMB blades do not require extensive maintenance as they do not include any sensitive parts. They nevertheless have to be dismounted and cleaned at intervals depending on the amount of mill scale encountered.

a) Remove the section blades according to the instructions under item 2.

b) Remove the sliding blades 10, 11, 14, 15.

c) Clean thoroughly the section and sliding blades.

d) Re-assemble the blades.

Caution

In order to keep the mill scale dry, the blades must be kept free from grease.

e) Fit the section blades according to the instruction under item 3.

5. Regrinding the Section Blades

Regrind the sliding and insert blades perfectly even on the narrow faces only. On wrongly ground blades, the cutting edges no longer converge at one point, which results in poor cuts.

Regrind the sliding and insert blades only to such an extent that the cutter cross covers the cutting edges fully and regularly when the slide is in its bottom position. If this is not the case, replace the blades by new ones. (The ref. Nos. which should be indicated in your orders, are stamped on the blades.)

When ordering spare parts, always make sure to obtain genuine MUBEA blades made of special high-grade steel.

The sliding and insert blades are pointed to cut all sections, even sharped-edged ones. For cutting angles of a certain size having root fillets, use insert blades 13 with the proper radius to avoid squeezing at the section root.

Insert blades with a full range of radii are available, several sizes of section being grouped within this range. When ordering, please state what kind of angles are to be cut or whether tees are to be handled.

Insert blades can be changed without dismounting the section blades by turning the slide slightly downward.

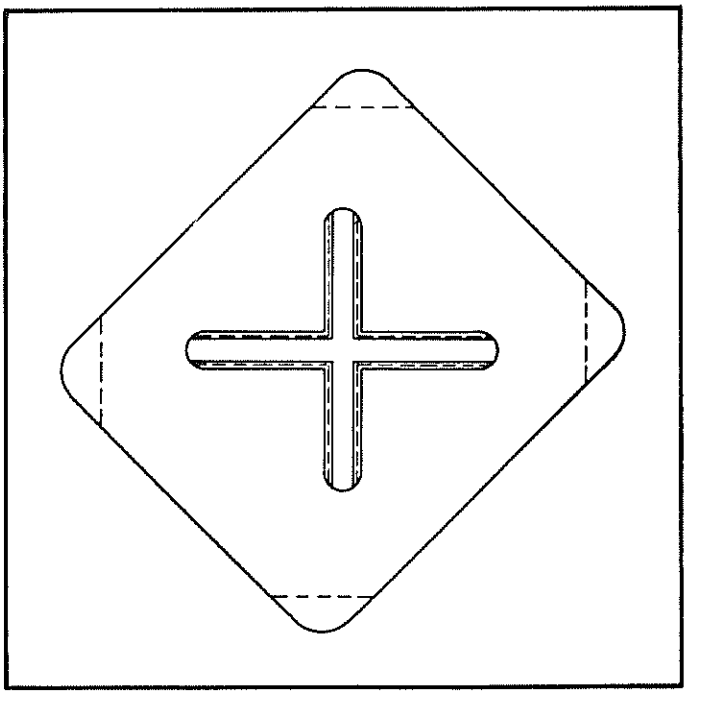


Fig. 64: Regrind blades evenly

6. Cutting with PMB Blades (Figs. 65, 66 and 67)

a) Insertion of Sections:

Insert the section between the opened blades for the first cut and adjust the sliding blades to the section according to the instructions below. Make the adjustment so that a narrow clearance is left between the section and the sliding blade to permit the insertion of the section. The narrower the clearance, the better the cut.

b) Hold-down and Section stop

The machine is equipped with an automatically lifting hold-down which comes down onto the stock prior to commencement of cut and lifts off again automatically after the cut. It lifts off about 5 mm. After the stock has been inserted into the section blade, pull out the adjusting wheel on the hold-down and turn the hold-down by hand to about 3 mm from the material to be cut. Now re-engage the adjusting wheel.

To change the blade, rotate the hold-down into its topmost position. In this position the adjusting wheel must always be pulled out towards the front. If the section slide is engaged in this position of the hold-down for some reason, the adjusting wheel must not be pushed in.

The section stop 2 on the guide rail 3 can be set to 90° - or for mitre cuts up to 45°. It is clamped in the desired position by the clamping lever 1.

For 90° cuts there is a stop bolt 4 with lock nut 5 on the right-hand side of the guide rail 3. Simply move the section stop against the stop bolt and the material is in the correct lateral position. The correct vertical position of the section is adjusted by means of the double-spindle hold-down. Move the pressure piece 6 on the cross-beam 7 in such a way as to make it strike the section root with its tip when the hold-down is lowered.

The vertical position of the section is correctly adjusted when the section is in a horizontal position during cutting. When out-of-angle vertical legs are processed, adjust the stop rail 3 by means of the setting screws 8, when processing out-of-angle horizontal legs, adjust the section stop.

c) Cutting Instructions

You will find the correct insertion of the section to be cut both squarely and at any mitre angle as well as directions for the adjustment of the sliding blades on the following page (page 37).

7. Converting PMB into PMA Blades (Figs. 49 and 50)

If you rearrange your production and various angles and tees have to be cut in a quickly alternating sequence, PMA blades offer greater economy.

Type PMB blades can be readily converted into type PMA blades.

a) New parts to be ordered:

1 sliding blade each, 10, 11, 18, 19
1 insert blade each, 9, 17
2 slide levers each, 13, 21
2 compression springs each 12, 20
2 cylindrical pins each, 14, 22
2 adjusting eccentrics each, 15, 23
2 washers
2 hexagon nuts

b) Fit the parts ordered under a) into the section blades 8 and 12 as shown in Figs. 60 and 61 (see PMA blades, item 3).

c) Turn the flywheel by hand and check for satisfactory function.

When cutting, follow instructions for PMA blades.

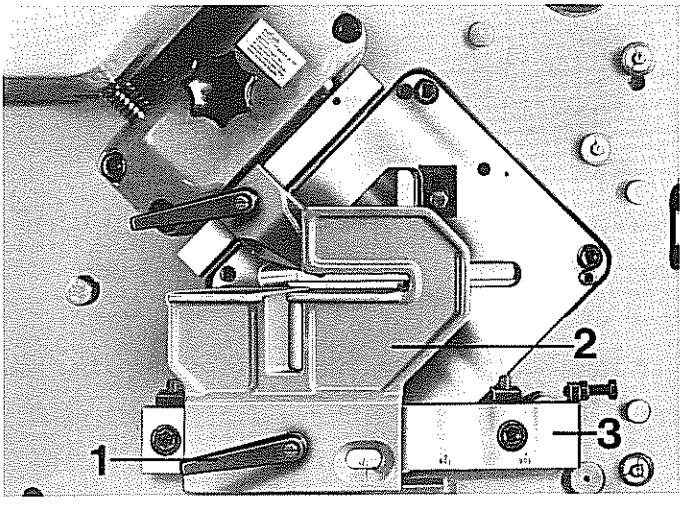


Fig. 65: Section stop for 45° mitre cuts

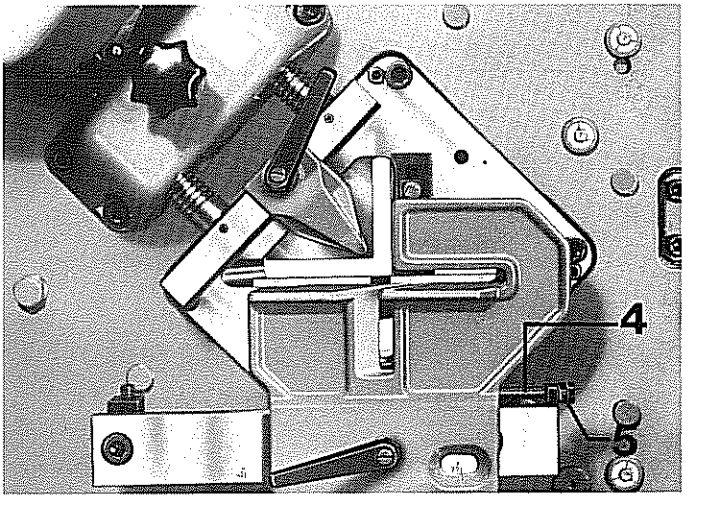


Fig. 66: Section stop for 90° cuts

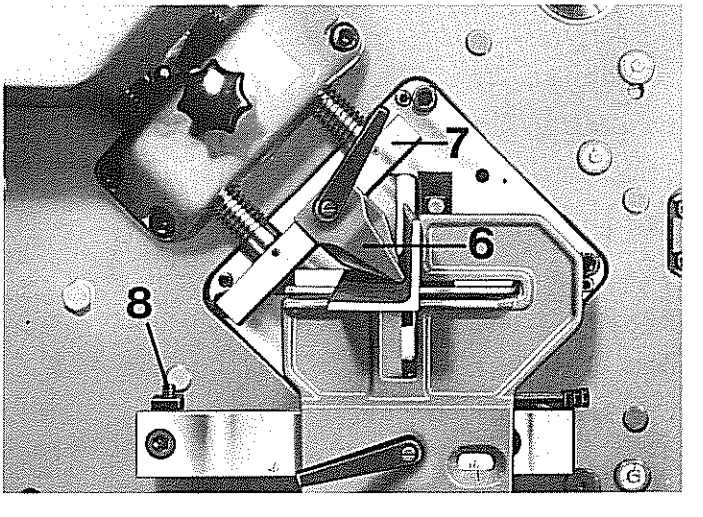
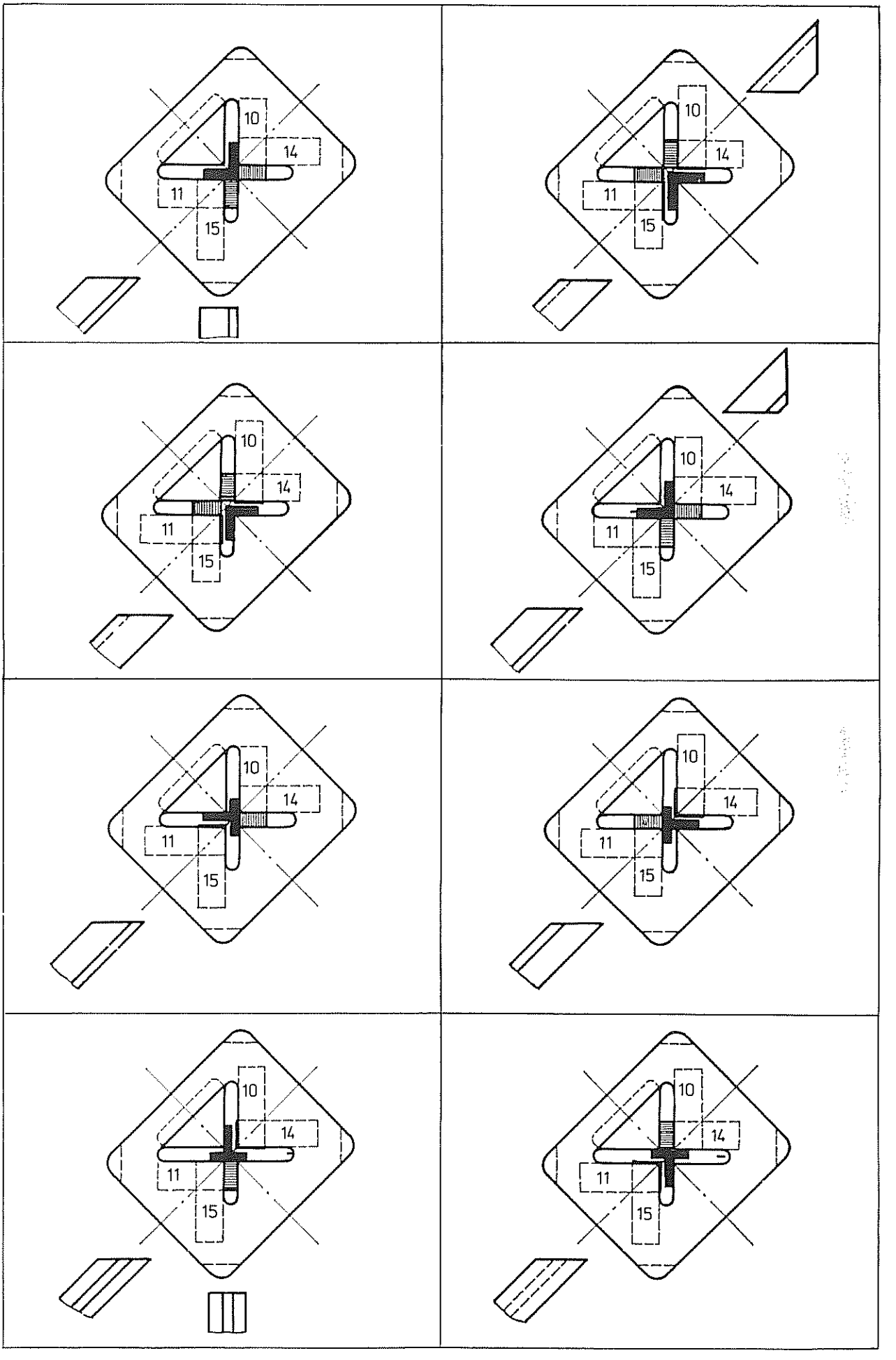


Fig. 67: Adjusting the automatic two-spindle hold-down

d) Cutting Instructions PMB



P M G B L A D E S

1. General

PMG section blades will cut angles at 90° and at any mitre angle up to 45°, and they will also cut tees squarely.

No blade adjustment is necessary when cutting angles. For cutting tees, only 2 slide blades must be adjusted to the section size. These blades are extra rugged and require very little servicing.

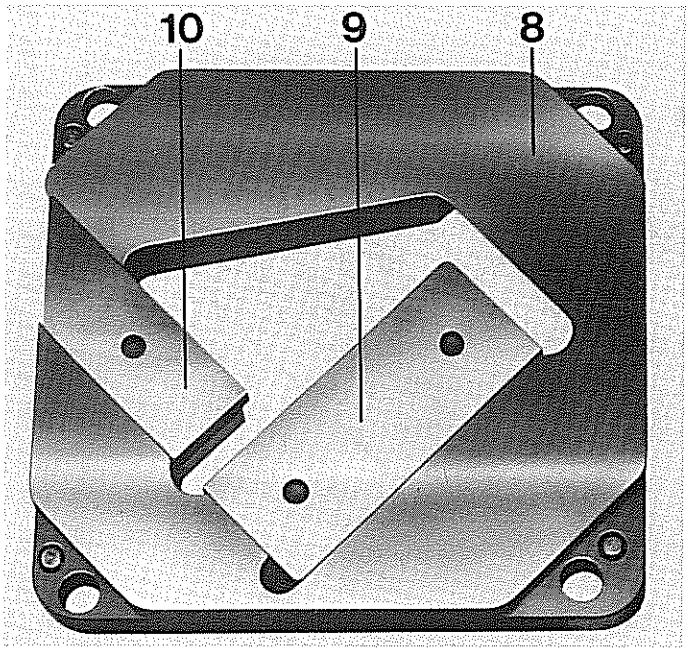


Fig. 68: PMG fixed section blade

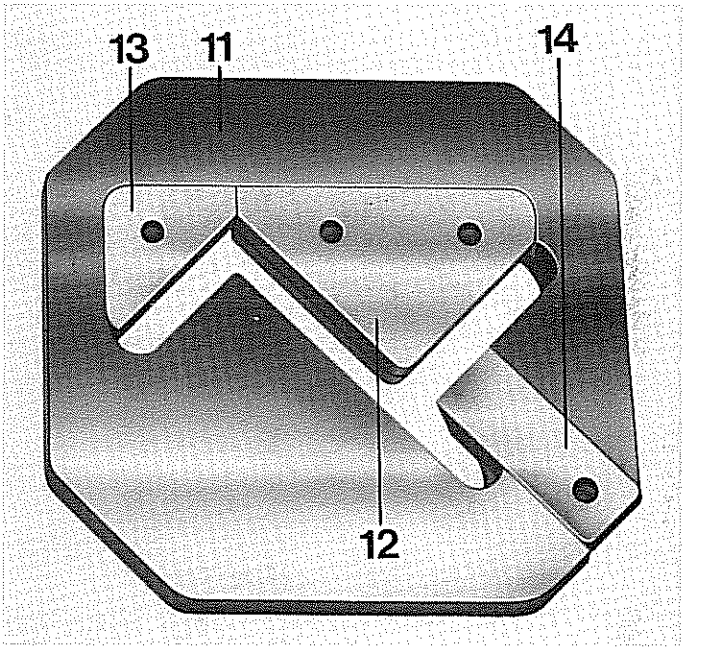


Fig. 69: PMG moveable section blade

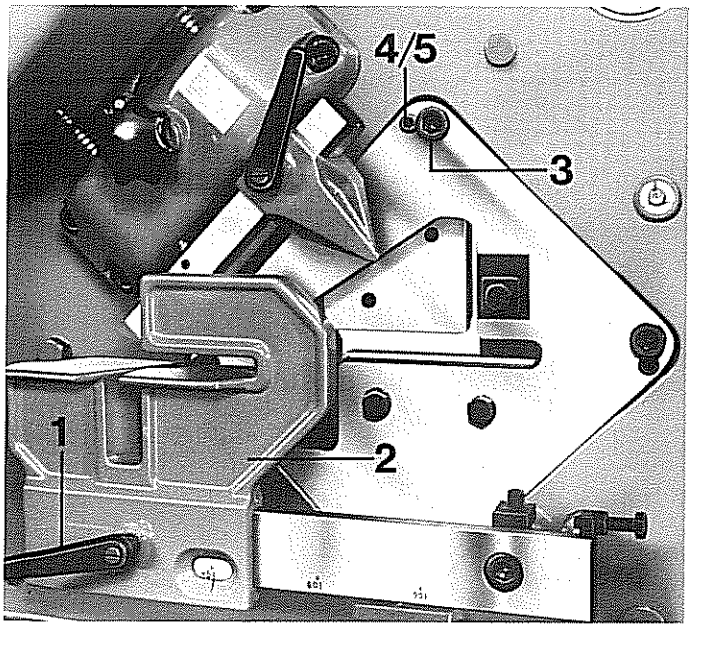


Fig. 70: PMG section blade from body side

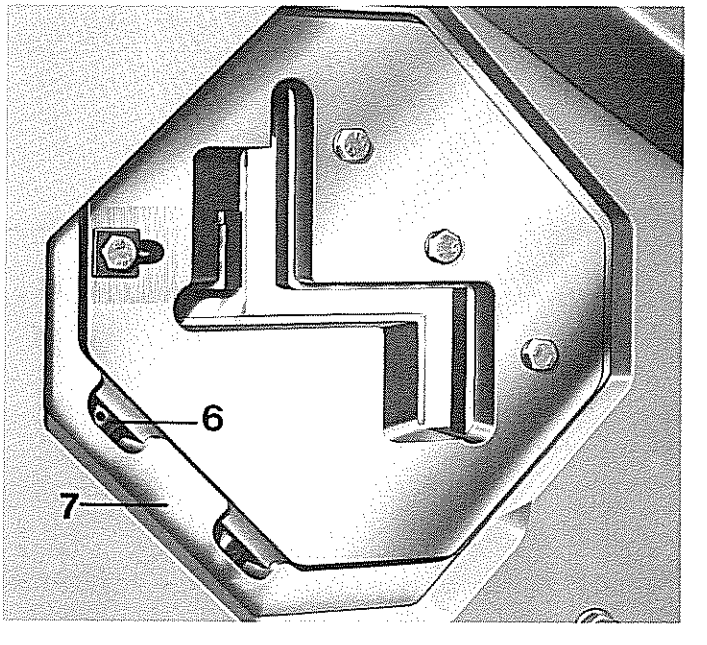


Fig. 71: PMG section blade from cover plate side

2. Removal of PMG Blades (Figs. 68, 69, 70 and 71)

a) Release clamping lever 1 and remove section stop 2. (The clamping lever may be moved to any position after the lever head has been pushed in.)

b) Turn the two-spindle hold-down right to the top. When an automatic hold-down is used, its adjusting wheel must not lock.

c) Remove 4 fillister head screws 3.

d) Withdraw fixed section blade 8 from the machine.

e) Loosen cross-slit screw 6 in slide 7.

f) Remove moveable section blade 11 from the machine (If the blades are to be cleaned only, the moveable section blade 11 may remain in place.).

3. Fitting PMG Blades (Figs. 68, 69, 70 and 71)

a) Insert moveable section blade 11 in the section slide 7 and push it against the stop to the rear.

b) Tighten the cross-slit screw 6.

c) Insert fixed section blade 8 in the body.

d) Securely tighten the fillister head screws 3 with cup spring.

e) Securely tighten thread pins 4.

f) Loosen the fillister head screws 3 by one full turn and retighten all 4 thread pins 4 by turning about 1/8 of a revolution to the right. This is necessary to prevent the knives from compressing and to maintain a shearing gap.

g) Securely tighten fillister head screws 3 with an extended spanner (approx. 300 mm), and lock thread pins 4 by countercap 5.

h) Replace the section stop 2 and clamp it in desired position by means of tightening lever 1.

4. Cleaning the PMG Blades (Figs. 68 and 69)

PMG blades require little maintenance since no sensitive compo-

nents are employed. Depending on the quantity of scale encountered, they should be removed and cleaned from time to time.

a) Remove the section blades according to the instructions under item 2.

b) Remove sliding blades 10 and 14 (Figs. 68 and 69).

c) Thoroughly clean section blades and sliding blades.

d) Assemble in reverse sequence.

Caution: The section blades must be free from grease in order to keep the mill scale dry.

e) Fit the section blades according to the instructions under item 3.

5. Regrinding the section blades

Grind the sliding and insert blades perfectly even at the cutting faces only. If the blades are wrongly ground, i.e. if the edges no longer converge at one point, poor cutting results are obtained.

Regrind the blades only to the extent that the cutting cross completely covers the cutting edges when the slide is in its bottom position; if this is not the case, replace the blades with new ones. (You will find the ref. Nos., which should be indicated in your orders, stamped on the blades.) Please remember to order original MUBEA blades.

The sliding and insert blades are pointed so that all sections including those with sharp edges can be cut. For cutting angles of a certain size with given root radii, the blades can be supplied with accurate radii so that deformation at the root of the section is eliminated.

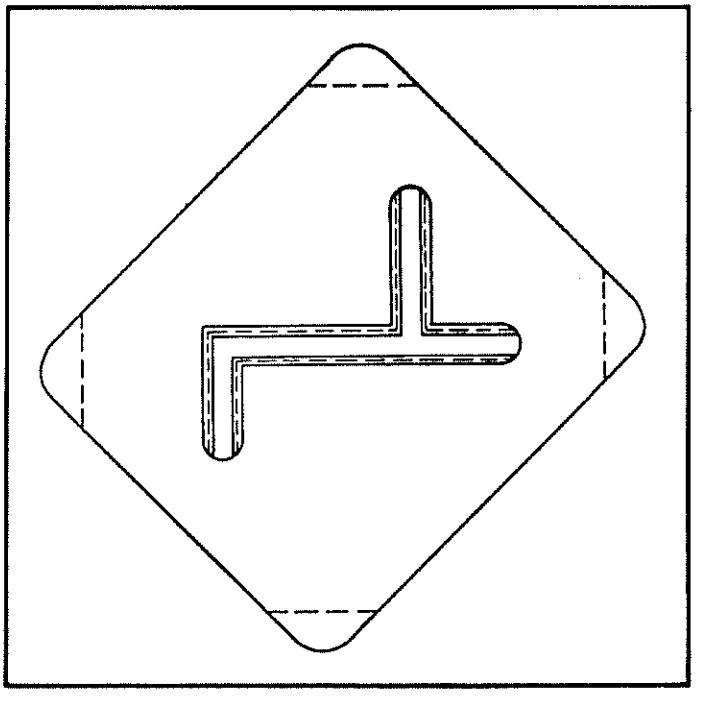


Fig. 72: Regrind blades evenly

6. Cutting with PMG Blades

a) Inserting the Sections

When cutting angles squarely and at any mitre angle, close the sliding blade 10 fully in the fixed section blade and completely open the sliding blade 14 in the moveable section blade. (Figs. 68 and 69).

When cutting tees, place them into position in the blade and slide the two sliding blades up to the tee as closely as possible, yet not so close as to prevent feeding through of the material. The closer the adjustment, the better the cut.

You will find instructions on correct adjustment of the sliding blades and proper insertion of the sections in the cutting directions (page 43).

b) Hold-down and Section Stop (Figs. 73, 74 and 75)

The machine is equipped with an automatic hold-down which comes down on the material prior to the cut and automatically lifts off again on completion of the cut. Lift travel is about 5 mm. After the material has been inserted in the section blade, pull out the adjusting wheel on the hold-down and turn down the hold-down by hand to about 3 mm from the material to be cut. The adjusting wheel must now be engaged again.

Rotate the hold-down into the topmost position for blade changing. In this position the adjusting wheel of the automatic hold-down must always be pulled out towards the front. If the section slide is engaged for any reason when the hold-down is in this position, the adjusting wheel must not be pushed in.

The section stop 2 on the guide rail 3 can be set to square (90°) or mitre cuts up to 45° by means of graduations on the rail. It is clamped in the desired position by means of the clamping lever 1.

For square (90°) cuts there is a stop bolt 4 with a lock nut 5 on the right-hand side of the guide rail 3. Simply move the section stop against the stop bolt to position the section bolt laterally. The correct vertical position of the section is adjusted by means of the double-spindle hold-down. Shift the pressure piece 6 along the bar 7 in such a way that the tip contacts the root of the section when the hold-down is screwed down.

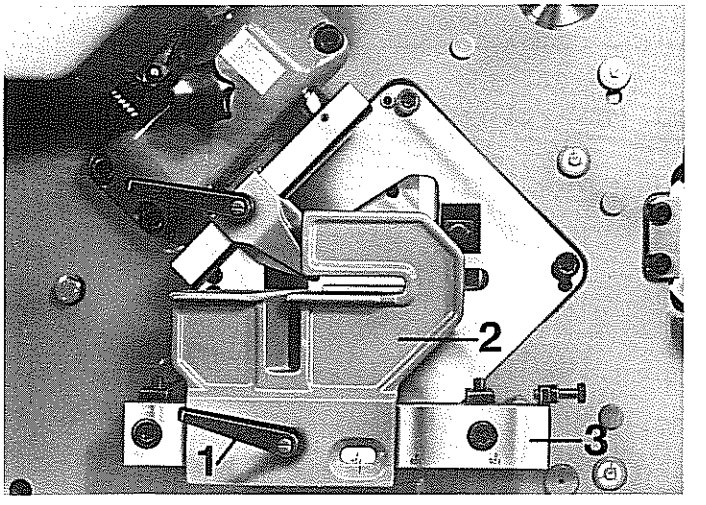


Fig. 73: Section stop for 45° mitre cuts

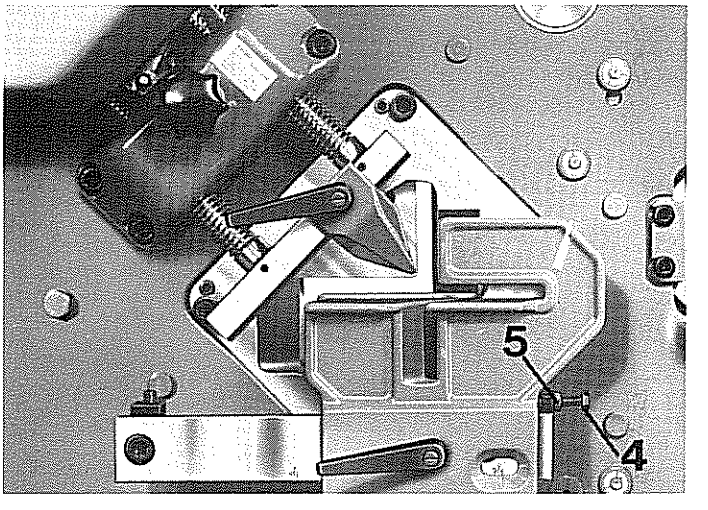


Fig. 74: Section stop for 90° cuts

When cutting in the left-hand blade opening, the section is held down by the crossbar 7.

The vertical position is correctly adjusted when the section is in a horizontal position during cutting. When vertical legs are unequal reset the guide rail 3 with the thread pins 8 (necessary for different section sizes); correct with section stop in the case of horizontal legs which are unequal.

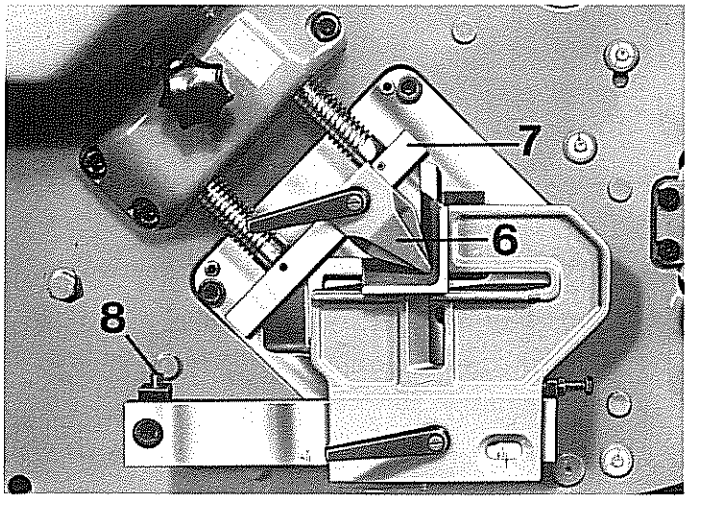
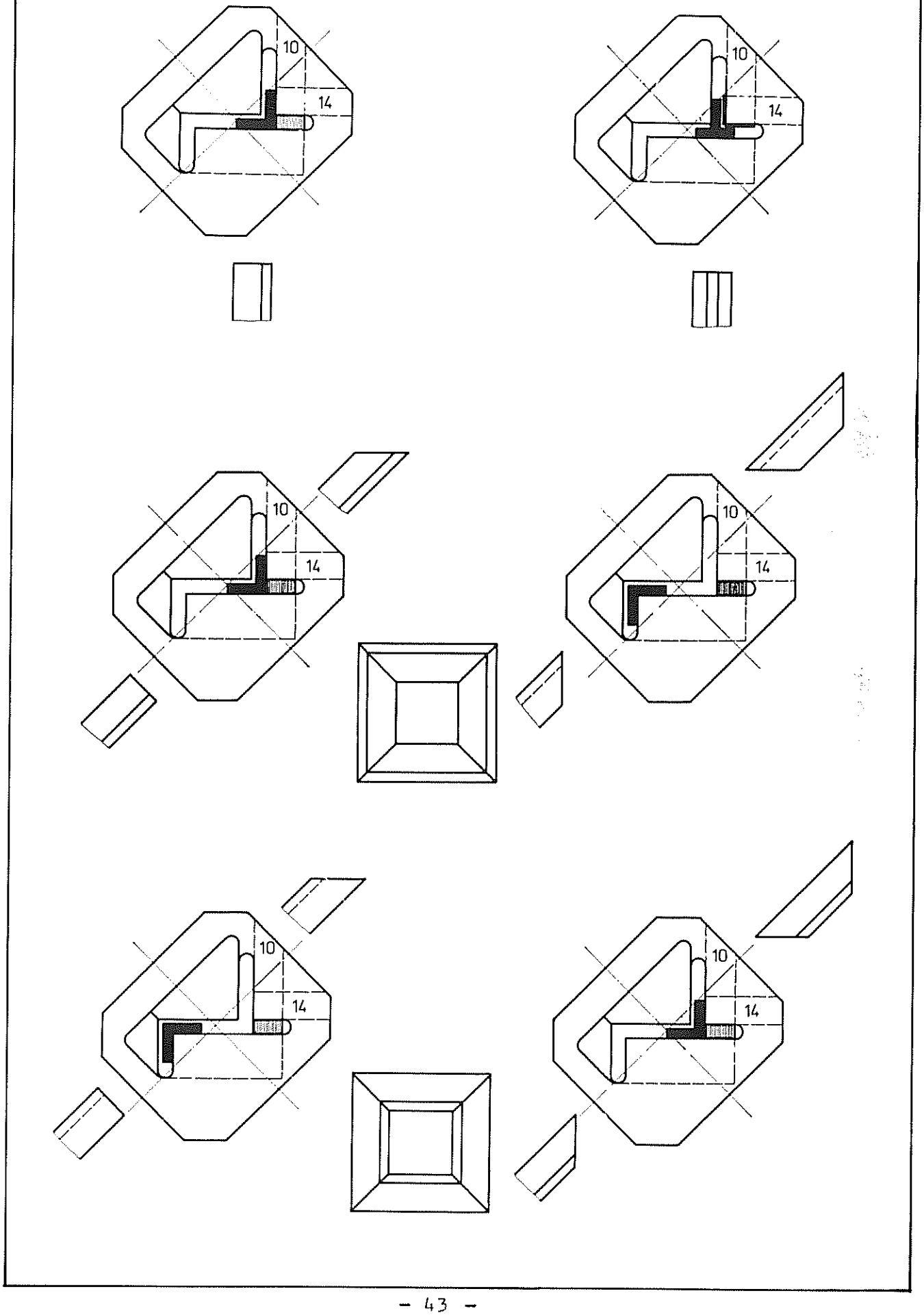


Fig. 75: Adjusting the automatic two-spindle hold-down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S P E C I A L B L A D E S

a) Quick-Change Blades

If you have to cut channels, beams and other sections in rapid alternate succession, we recommend MUBEA quick-change blades consisting of a knife frame and insert blades. You then only need to buy the far cheaper insert blades for each section . The changing of the inserts takes just a few moments. Without any auxiliaries and by a few manipulations you can loosen the clamping levers and change the insert blades.

A further advantage offered by the quickchange blades is that the working height remains the same, even when you switch to a different type of section. This is very important when e.g. infeed is made by a roller conveyor.

b) Section Blades for Special Sections

For cutting channels, beams, zees or other special sections, we supply special section blades with fixed cutting inserts. Depending on the size of the sections, several cutting openings can be made in one pair of blades. Standardized section blades are supplied for channels and I-beams in accordance with DIN. For identical dimensions, combined blades can be supplied.

All sections can be cut not only square but also in flange or web mitre by means of special blades.

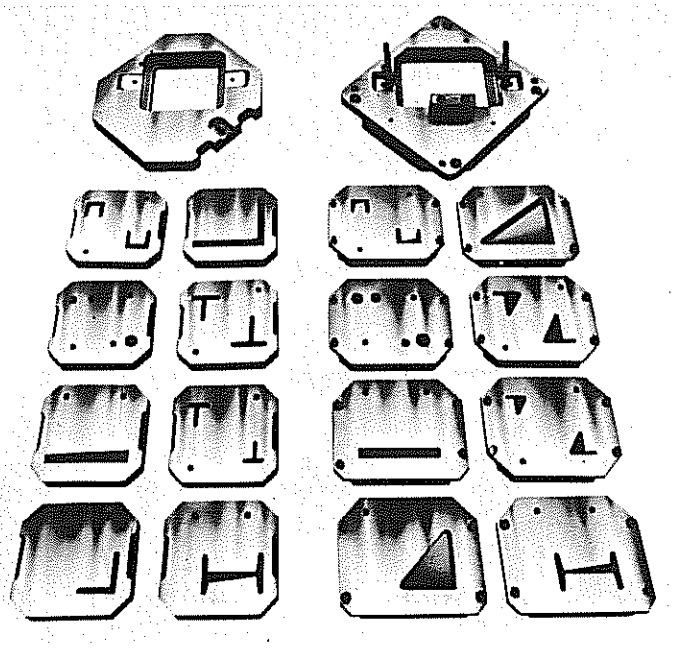


Fig. 76: Quick-Change Blades for the Section Shear

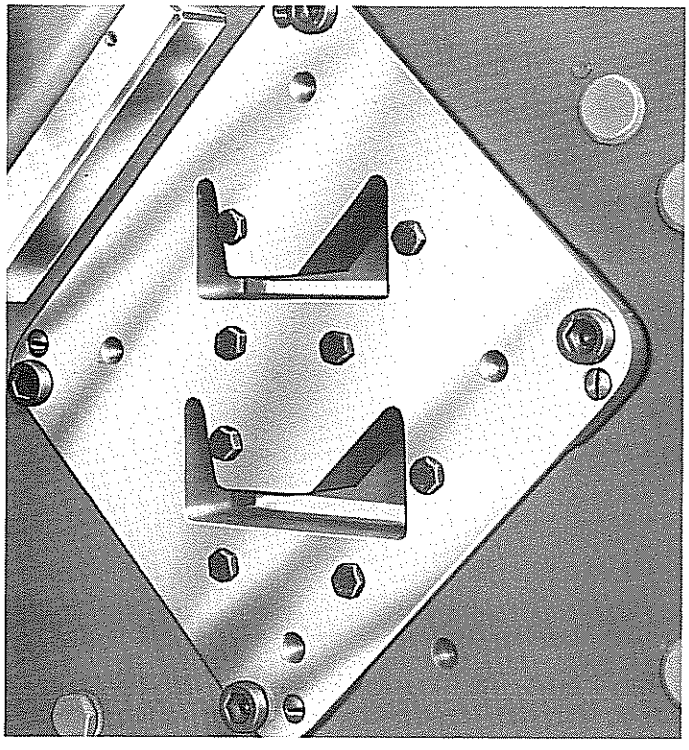


Fig. 77: Section blades for channels, PMF version

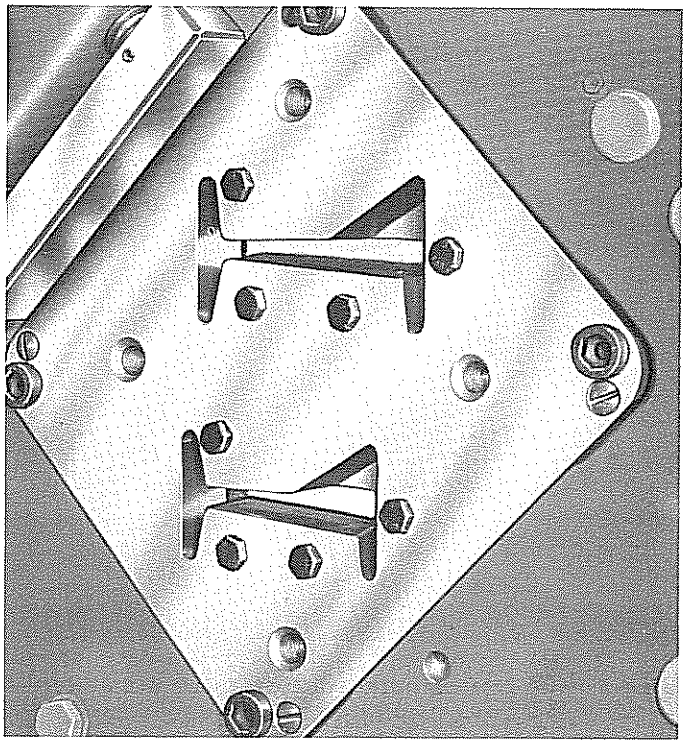


Fig. 78: Section blades for I-beams, PMF version

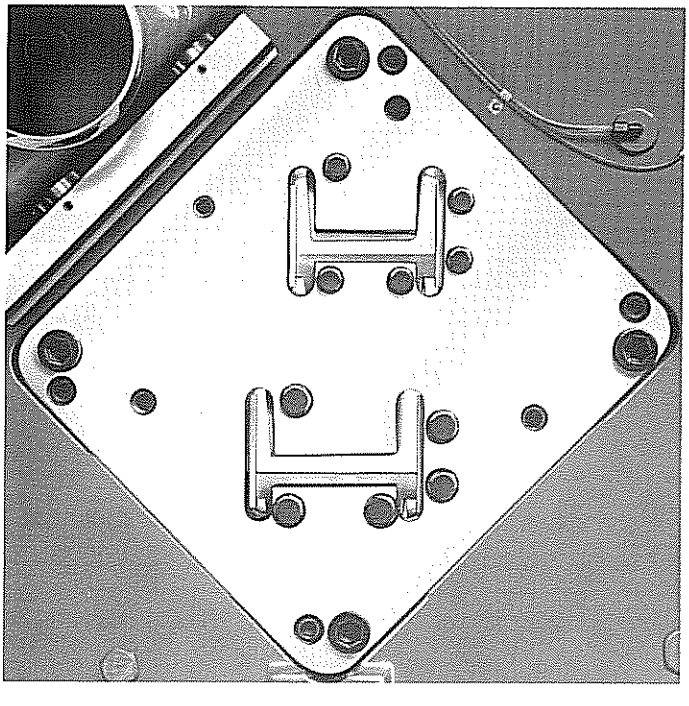


Fig. 79: Combined PME section blade set-up for channels

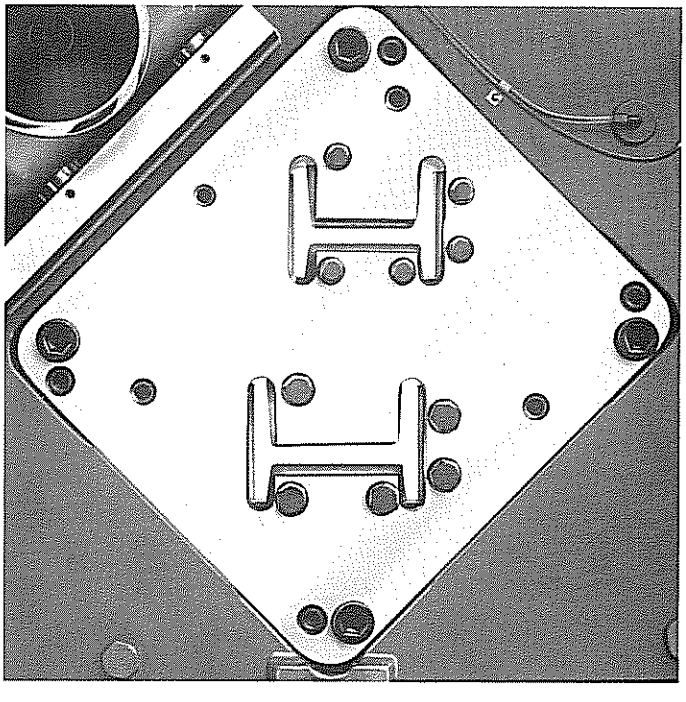


Fig. 80: Combined PME section blade set-up for cutting I-beams

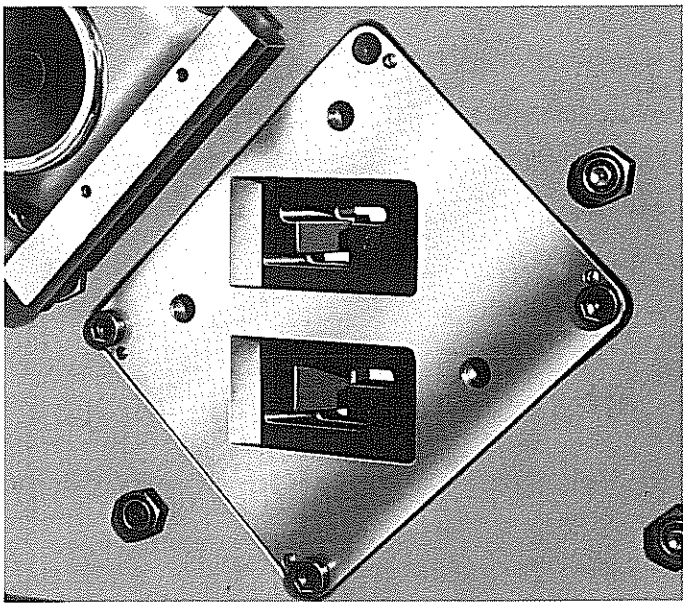


Fig. 81: Section blades for mitre cutting of sections used in dwellings

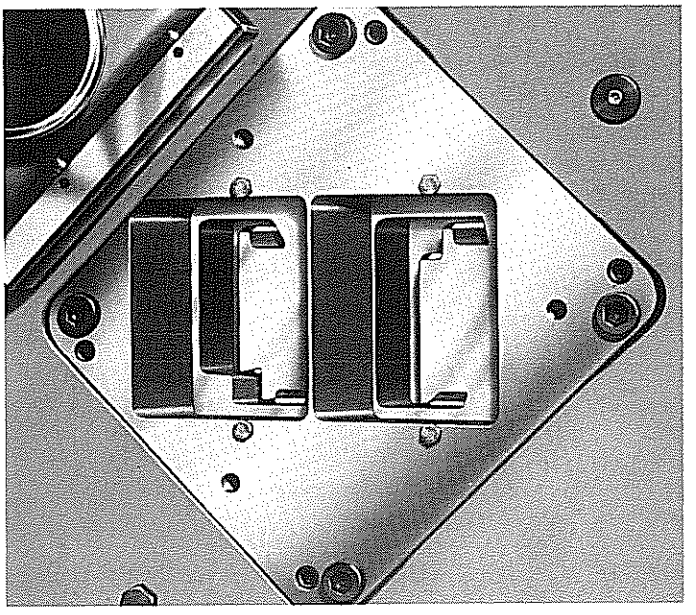


Fig. 82: Section blades for mitre cutting of door frames

T H E P U N C H

1. General

The MUBEA punch is of a particularly advantageous design, exceeding by far the range of application of an ordinary punch in that it can do many jobs that formerly could be performed on eccentric presses only.

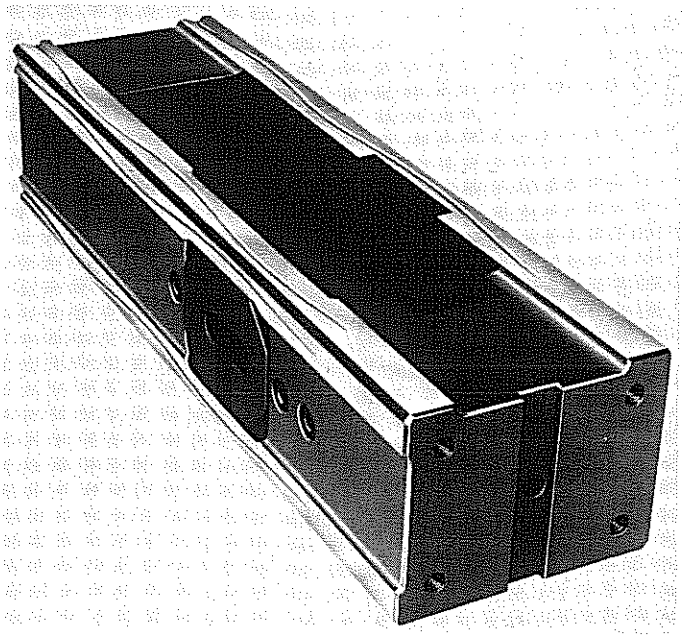


Fig. 83: Punch slide

The extremely long punch slide has a large and almost square clamping surface. It is hence easy to fit big and deep-throated tools, as the slide, thanks to its length, is well suited to absorbing tilting forces.

Only punching equipment and tools may be used that are sufficiently guarded up to the cutting points to avoid injuries.

Even very complicated punching and coper-notching operations are precisely carried out with the various special tools such as multi-punch tools, tool combinations,guide tools etc. manufactured and supplied by the MUBEA tooling division.

2. Adjustment of the Slide Guides

Adjustment of the slide guides is necessary when the punch slide is no longer guided securely. The slide guide is properly adjusted when the punch plunges easily into the die when engaging the spotter lever. The readjustment of the slide is carried out by shifting the conical gib lock plugs.

Adjustment is carried out as follows: (Figs. 84 and 85)

First release the screws 1 by turning anti-clockwise. With a screw driver introduced through the screws 1 the wedges can be adjusted by rotating the set screws 2 in an anti-clockwise direction.

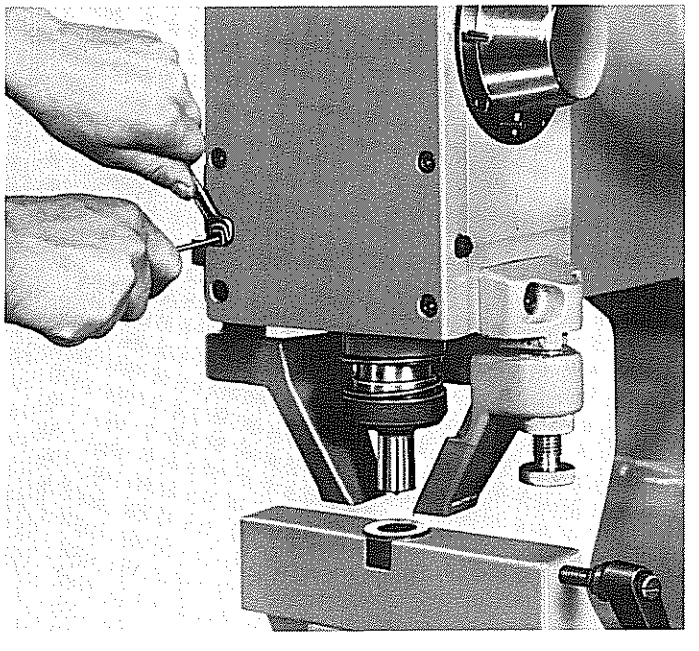


Fig. 84: Adjusting the slide guide, laterally

The wedges are properly adjusted when the punch slide can be moved upwards and downwards easily with the spotter lever. After adjustment has been carried out, re-tighten the screws 1.

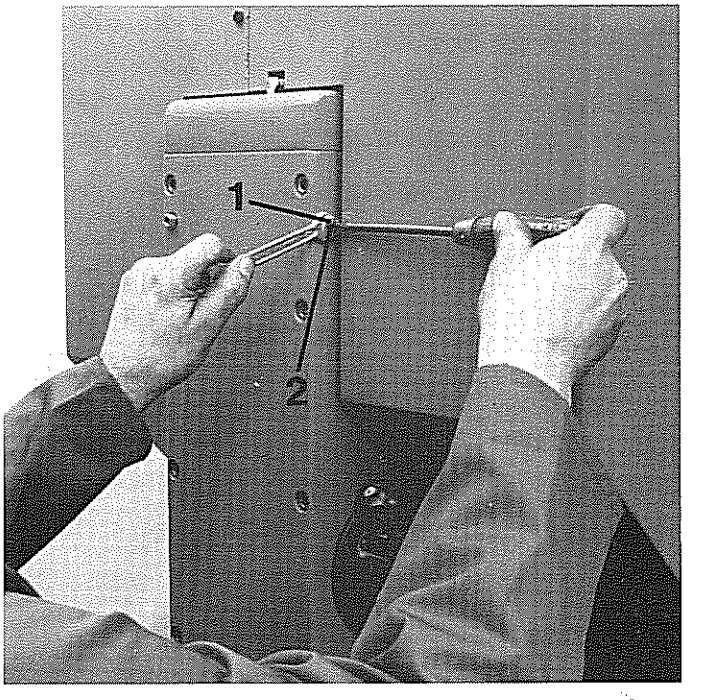


Fig. 85: Adjusting the slide guide, front-side

3. Saddle and Saddle Support (Fig. 86)

MUBEA punches are so designed that the punch saddle 1 is supported by a special saddle support 6/7. This offers the advantage that the saddle can neither give way nor tilt and the punching pressure is introduced vertically into the frame of the machine.

The saddle support remains in place during all punching operations and merely has to be removed when punching the flanges of channels and I-beams. The saddle

support is removed by releasing the retaining bolts 8.

This arrangement is particularly useful when large and deep-throated tools are mounted on the punch, because these can be effectively used with a maximum of support and protection.

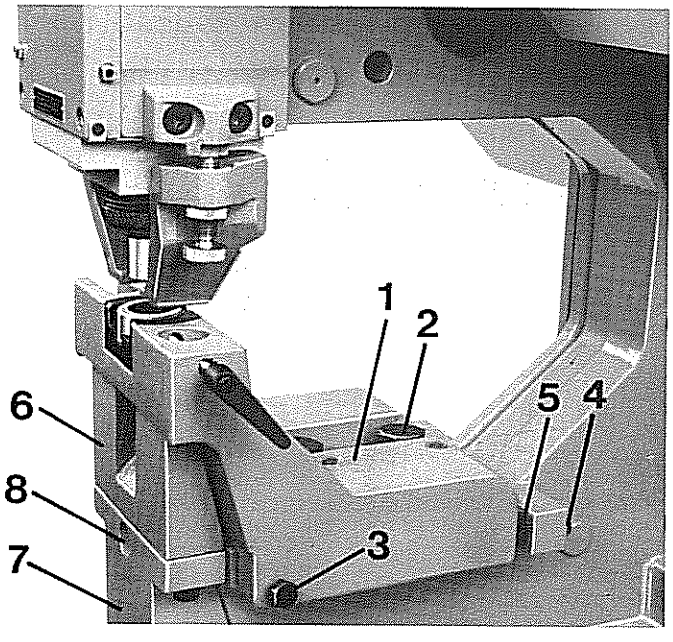


Fig. 86: Saddle with saddle support

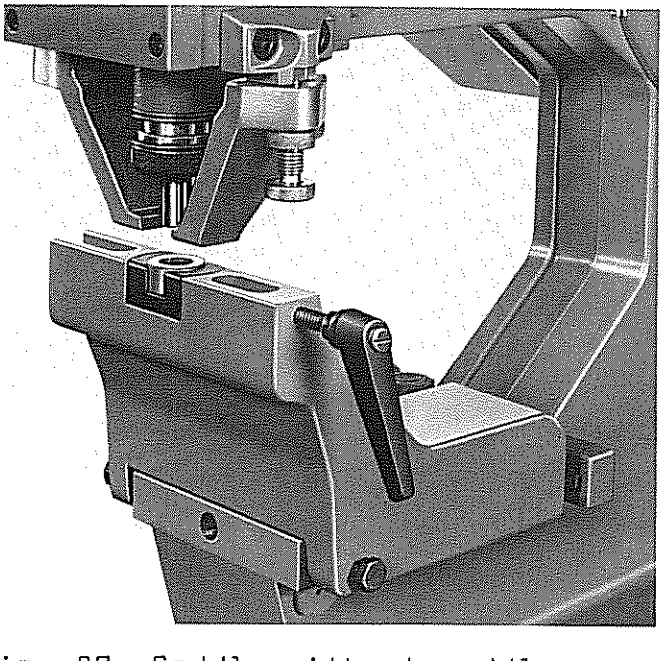


Fig. 87: Saddle without saddle support

4. MUBEA Standardized Punches and Dies

MUBEA punches and dies are available in 4 standard sizes and fit all machines.

Size I	up to 15 mm Ø
Size II	from 15 Ø to 30 Ø
Size III	from 30 Ø to 40 Ø
Size IV	from 40 Ø to 50 Ø

Using standard equipment, punches and dies up to size II can be fitted on machine sizes 560 and 750, while punches and dies up to size III can be fitted to machine sizes 900, 1100, and 1300.

For punches and dies beyond this standardized range, see item 11 on special tools.

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

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

Eccentric dies are needed for sizes 560 and 750 when angles below 45 mm are to be punched, and for sizes 900, 1100 and 1300, when angles below 65 mm leg length are to be punched.

Please ask for the detailed catalogue of MUBEA standard punches and dies.

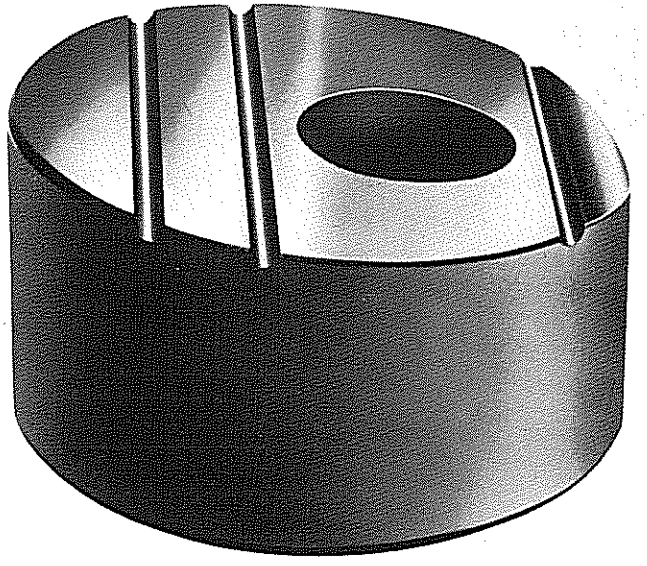


Fig. 88: Flange die for I-beams

Fig. 89: Eccentric die for small angles

5. Adjusting Punch and Die

Punch and die must always be arranged concentrically. 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 alsways specify the thickness of the material when ordering.

After loosening the fixing screws 2 and the set screws 4 the saddle can be moved forward and backward. The adjusting screws 3 serve for fixing the saddle laterally. When punch and die have been properly set, retighten the adjusting screws 3, the set screws 4 and the saddle securing screws 2. (Fig. 86)

Regularly check the position of the tools during punching by dipping the punch into the die by means of the spotter lever.

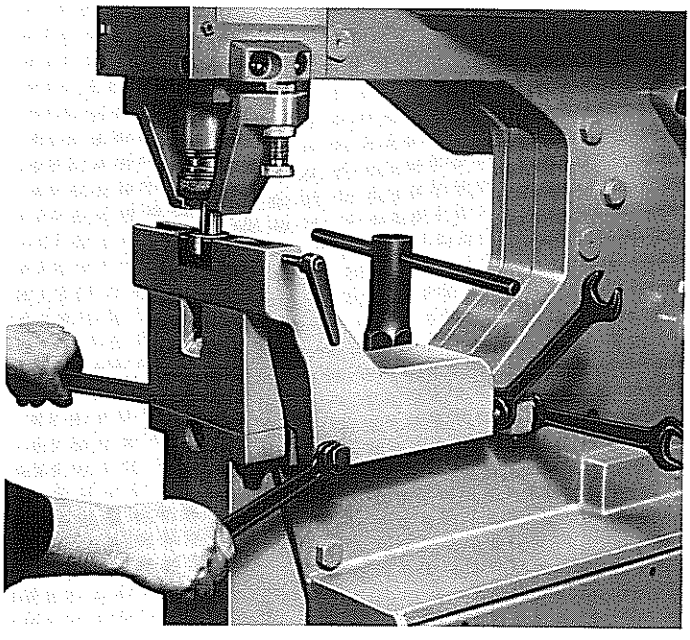


Fig. 90: Adjusting punch and die

When small holes are punched in thin material, a reducing insert secured by 2 countersunk screws is fitted to the stripper.

6. Anti-Twist Device for Shaped Punches

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

A center pin (dia. 4.7 mm) is to be inserted into this groove.

7. The Stripper

The rugged stripper is adjustable to any thickness of material. Adjustment is made by means of the handwheel on the left-hand side of the machine and by means of the knurled screw with nut on the right-hand side of the machine.

8. The Punch Centre Spotter

The punch centre spotter enables the slide to be moved downwards together with the punch by means of the spotter lever, so that the point of the punch touches the punch mark in the material.

When actuating the spotter, push the spotter lever downwards first and then to the left in the direction of the punch housing until the spotter disc has snapped into place. The punch slide is now separated from the control lever, and when the spotter lever is moved upwards, it glides through the effect of its weight onto the material or into the die. The punch slide with the punch is lifted by moving the spotter lever downwards. The centre mark in the material can now be aligned with the centre tip of the punch. When the spotter lever is released, it returns to its original position while the punch remains on the material, thereby eliminating any faulty punching.

In this position the punch is engaged for the working stroke.

By the working stroke, the punch slide is returned to its starting position.

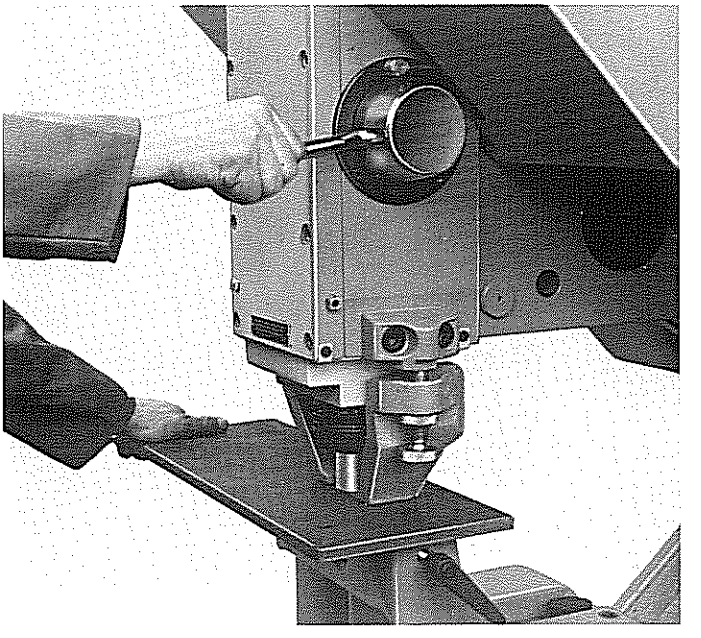


Fig. 91: Punch center spotter

9. 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.

10. Quick-Change Device for Punches and Dies

The machine is equipped as standard with a quick-change device for round punches and dies. In a matter of moments both tool parts can be changed easily and reliably.

This equipment is particularly economical for working small batches which require frequent tool changes.

Square, rectangular and other shaped punches and dies can also be clamped with this device, though the shearing gap has to be checked every time a change is made. Frequently the saddle has to be aligned again. In addition to realignment, the clamping ring for the punch has to be re-tightened after the first punching operation, since the center pin does not enter the aligning groove until after the first punching operation has been performed; this is also required when the punch is secured by a coupling nut.

When large batches are being delt with, it is recommended that the more robust method of fixing the punch by means of a coupling nut is employed. Conversion of the quickchange device for the coupling nut is carried out by loosening the threaded pin "a" which releases the centring ring that it can be screwed off. The coupling nut can then be used. Fitting of the quick-change device is effected in the reverse sequence. If a punch cannot be properly clamped for some reason, the basic position of the centring ring must be corrected. For this purpose the threaded pin "a" must be loosened and the centring ring adjusted slightly and then secured again by the threaded pin.

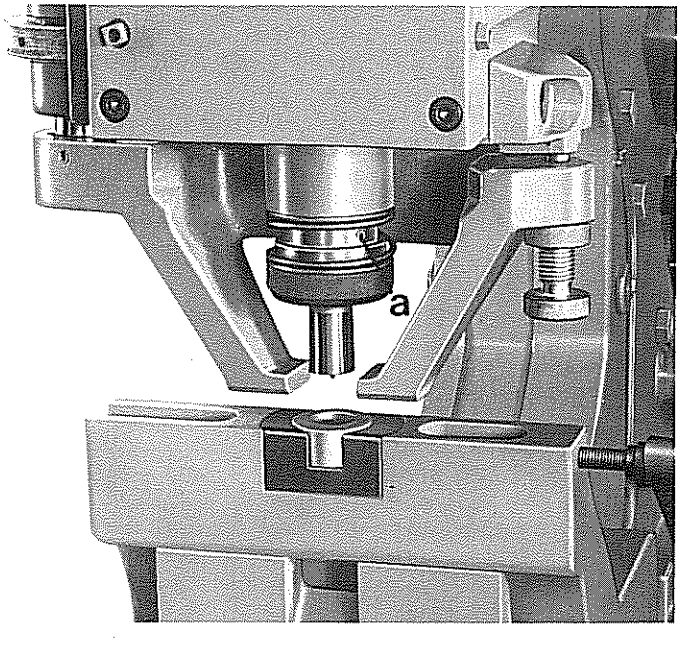


Fig. 92: Quick-change device for punches and dies

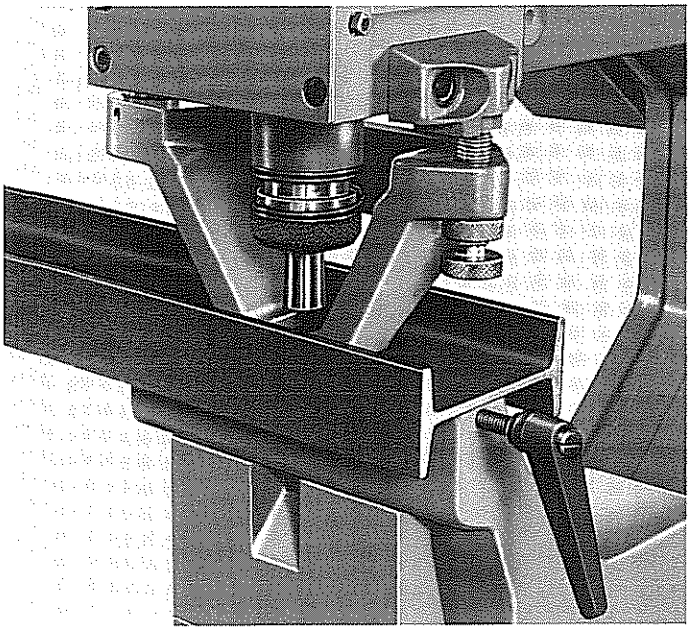


Fig. 93: Punching I-beams in the web

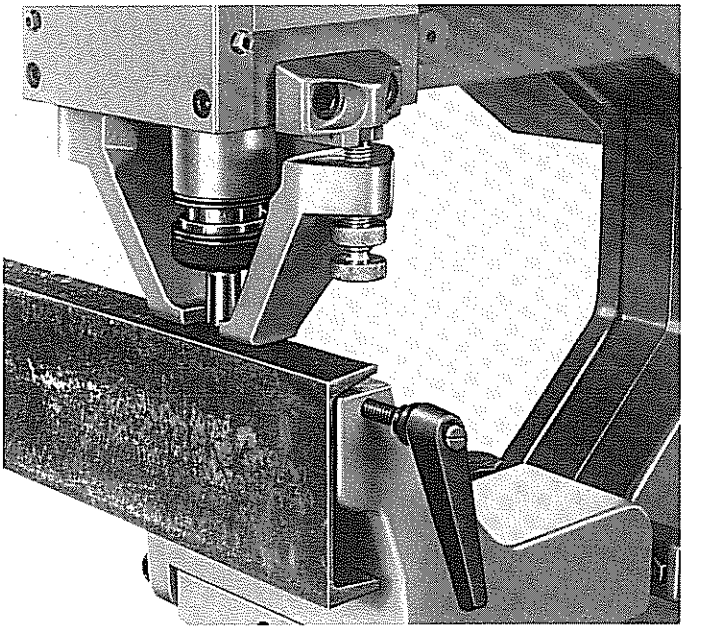
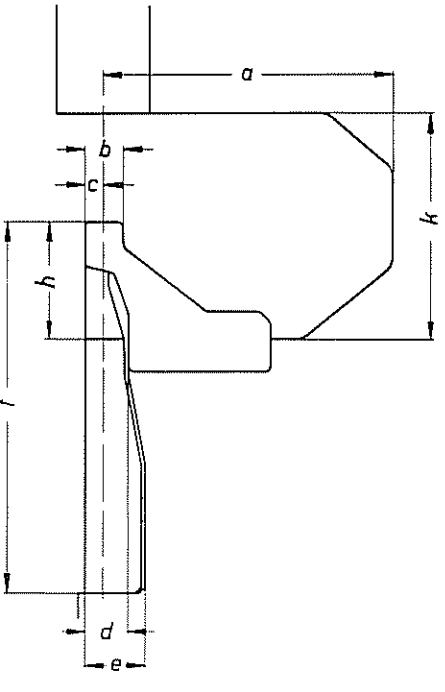
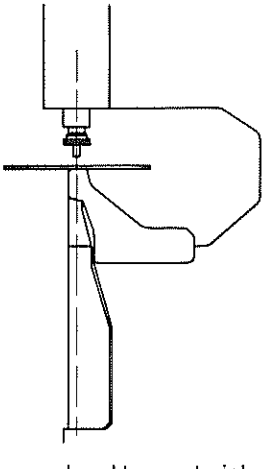
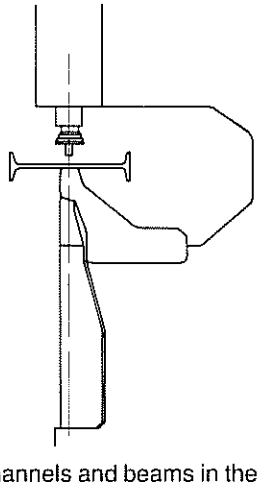


Fig. 94: Punching channels in the flange

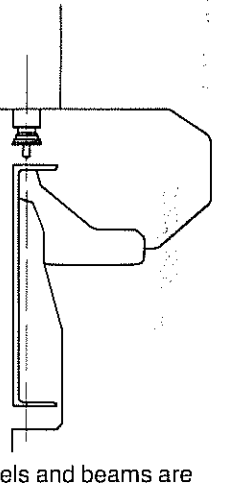




Flat, angel and tee material is being punched with saddle support always.



Channels and beams in the web are being punched with saddle support always.



Channels and beams are being punched in the flange without saddle support.

KBL und KL OPTIMA	560		750		900		1100		1300	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
a	320	12 19/32''	402	15 53/64''	500	19 11/16''	500	19 11/16''	750	29 1/2''
b	47,5	1 7/8''	47,5	1 7/8''	68	2 11/16''	68	2 11/16''	68	2 11/16''
c	22,5	57/64''	22,5	57/64''	30	1 3/16''	30	1 3/16''	30	1 3/16''
d	55,5	2 3/16''	57,5	2 17/64''	62,5	2 15/32''	70	2 3/4''	70	2 3/4''
e	74,5	2 15/16''	82,5	3 1/4''	117	4 39/64''	142	5 19/32''	142	5 19/32''
f	535	21 1/16''	673	26 1/2''	707	27 27/32''	780	30 23/32''	910	35 13/16''
h	130	5 7/64''	178	7''	205	8 5/64''	210	8 17/64''	210	8 17/64''
k	240	9 29/64''	322	12 43/64''	375	14 49/64''	410	16 1/8''	410	16 1/8''

Fig. 95: Punch saddle dimensions of the KBL models

11. Special Tools

The large MUBEA program of standard tools makes available all common special tools at short notice. The special feature of the MUBEA punch design further offers a wide variety of possibilities for employing special tools, though these cannot be described here. The illustrated MUBEA literature gives a better survey of these tools.

a) Stationary Triple Gag Punching Tool

For punching single holes of varying diameters in a quickly alternating sequence, it is advisable to use a triple gag punching tool. This tool punches holes with 3 different diameters in one pass without a tool change. The desired punch is moved into the working position by pulling a slide.

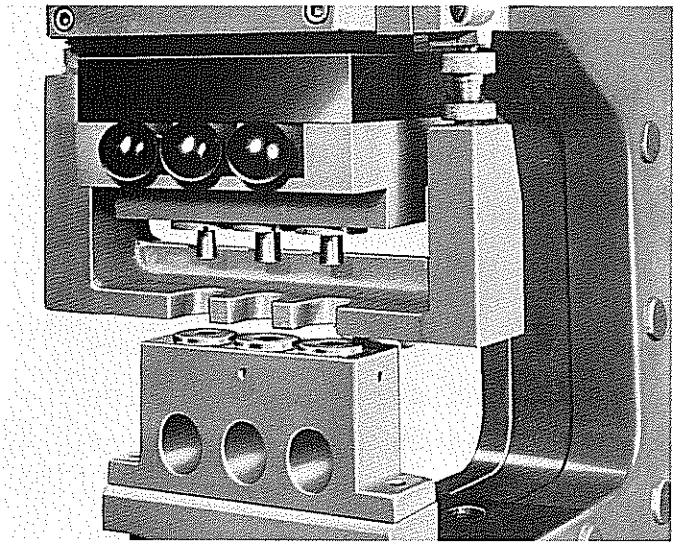


Fig. 96: Stationary triple gag punching tool

b) Adjustable Double Gang Punching Tool

This tool permits simultaneous punching of 2 holes with the same or different diameters at different spacings. The required spacing is set on a scale which can be read off easily, and this is done simultaneously for punch and die so that, when the setting has once been made, no more adjustment is necessary.

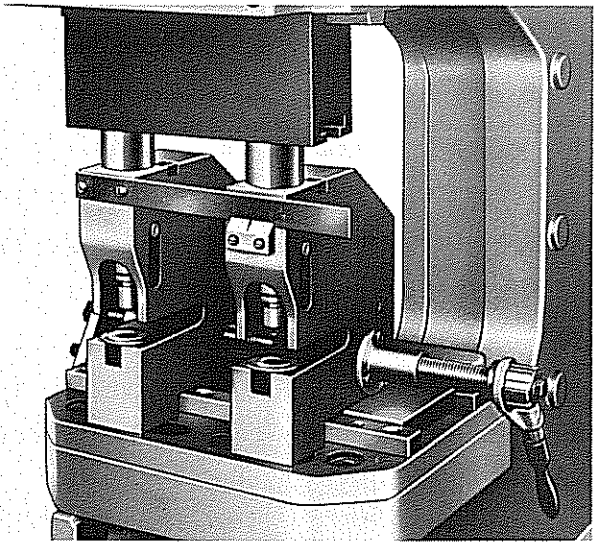


Fig. 97: Adjustable double gag punching tool

c) Special Punching Equipment Accomodating Punches and Dies with a Cutting Diameter of up to 50 mm

All punching tools, e.g. round, square, rectangular, and oblong tools, which are within the following cutting ranges, can be accommodated in this equipment:

Models KBL 560, 750 and KL 560, 750 from 30,5 to 50 mm Ø

Models KBL 900, 1100, 1300 and KL 900, 1100, 1300 from 40,5 to 50 mm Ø

The complete equipment consists of: punch holder M 64, coupling nut M 64 with a through hole of 50 mm, insert with through hole of 40 mm, stripper, saddle with 80 mm seat, die holder 80/60 and saddle support.

The punches are clamped with a coupling nut. All shaped punches are grooved so that the tools can be fitted longitudinally and laterally. When ordering tools, the thickness of the material to be punched and the tensile strength should be indicated.

d) Special Punching Equipment Accomodating Punches and Dies with Diameters Exceeding 50.5 mm

All punch tools, e.g. round, square, rectangular, and oblong tools, included in the following cutting ranges, can be accommodated in this device, consisting of punch holder, stripper, saddle cap, saddle, and saddle support:

Models KBL and KL 560
50,5 to 100 mm Ø

Models KBL and KL 750
50,5 to 150 mm Ø

Models KBL and KL 900
50,5 to 150 mm Ø

Models KBL and KL 1100
50,5 to 150 mm Ø

Models KBL and KL 1300
50,5 to 150 mm Ø

In the case of shaped punches (oblong and rectangular) the order should state whether the tools are to be fitted longitudinally or laterally. In addition, the thickness of the material to be punched and the tensile strength should be indicated.
The punches are fixed with a wedge.

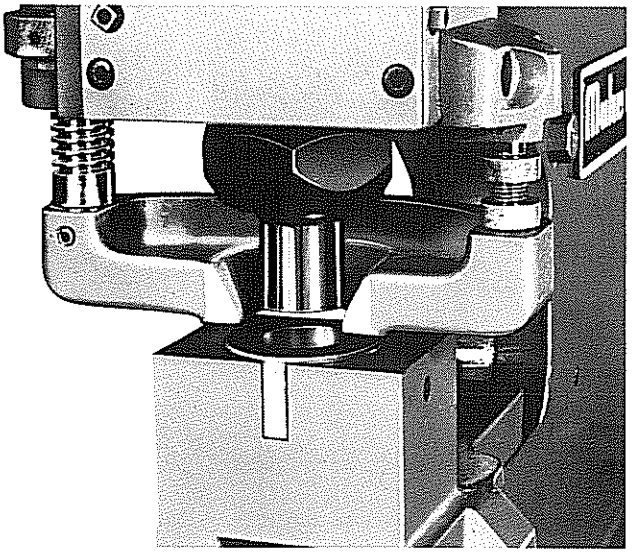


Fig. 98: Special punching equipment accommodating punches and dies with diameters up to 50 mm

e) Pipe Notching Tool

Pipe notching tools serve for notching pipes in such a way that they can be welded together at right angles without additional finishing. This equipment can notch pipes up to 60 mm outer diameter and up to a material thickness of 6 mm. For different tube diameters, only the two cutting inserts for the moveable and the fixed blade must be exchanged . When serding inquiries, please furnish the following information:

a) Pipe dimension to be notched

b) Outer diamter of the pipe to which the notch is to be fitted

c) Material of the pipe to be notched.

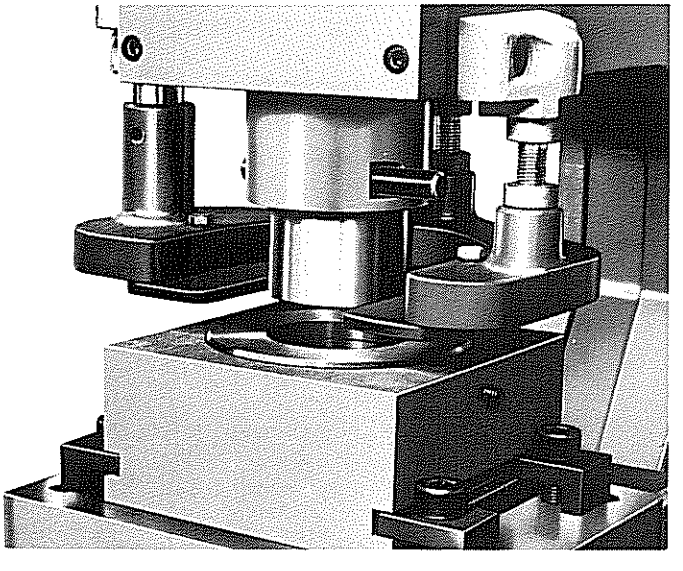


Fig. 99: Special punching equipment accommodating punches and dies with diameters exceeding 50,5 mm

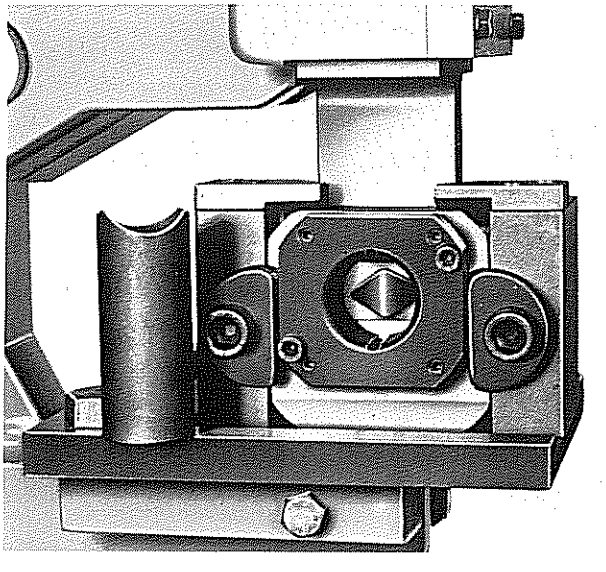


Fig. 100: Pipe notching tool