

**Name and Address
of Manufacturer:**

Year of Manufacture:

Model Type: **MULTI 125 HYDRAULIC STEELWORKER**

Serial Number:
(Note: last 2 digits represent year of manufacture)

Weight of Machine: **3,100 KG – 6,836 LBS NETT**

MULTI 125 HYDRAULIC STEELWORKER

MULTI 125 HYDRAULIC STEELWORKER

This Steelworker has been developed to give you, the user, a reliable long service - low maintenance machine tool.

These machines are capable of performing five basic functions, with the facility to add various additional tooling arrangements to complement the fully universal aspects of the Steelworker.

These instructions give general guide lines for the use of the Steelworker, commissioning, operating and maintenance, and should be carefully studied by the installation engineer and operator before the machine is put into operation.

Any assistance regarding the machine, should first be sought from the supplier, or alternatively from the manufacturer:

MULTI 125 HYDRAULIC STEELWORKER

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1 SAFETY NOTES FOR STEELWORKERS

In this manual particular references are made regarding aspects of safety and the notes below are intended as a summary to highlight the main areas for your attention.

The machine should be positioned so that the operator has sufficient room to work having regard for the long lengths of material which may be punched or cropped. Electrical supply should be by overhead cable to avoid possible damage.

It should be considered if additional equipment will be required to safely handle long or heavy items being processed.

Any person who will use the machine should be given adequate instruction on the operation and safety aspects of the machine. Extra copies of this manual are available from the manufacturer.

In addition it should be established which persons shall be responsible for the changing and setting of tools and blades and these persons given a more detailed instruction.

Machines are supplied complete with various guards and barriers as standard equipment which provide a generally accepted level of guarding when the machine is used for the purpose for which it was designed.

- 5 The main areas of deviation from design criteria would probably be:
- 6 The use of materials other than mild steel (45 kg/mm²)
- 7 The incorrect use of material hold-downs
- 8 The punching, cropping or notching of small items
(as this would encourage the operator place fingers or hands into danger area).

If at any time additional tooling or equipment is fitted to the machine the question of adequate guarding must be reviewed and the advice of the manufacturer sought if necessary.

Suitably qualified personnel should carry out all maintenance and particular attention must be paid to the correct setting and alignment of punches and dies, blades and other tools.

MULTI 125 HYDRAULIC STEELWORKER

2 BRIEF SPECIFICATIONS

The machine has been developed to perform five basic functions:
Punching, Flat Bar Shearing, Notching, Angle and Section Cutting.

2.1 MEASUREMENTS (FULL DETAILS, SEE PAGE 26-27.)

Length x Width x Height	2,000 x 800 x 2,030 (+100mm lifting eye)
Die Height from floor	1,056 [mm]
Shear Support from floor	900 [mm]
Angle Support from floor	1,160 [mm]
Section Height from floor	1,250 [mm]
Notch Height from floor	900 [mm]

2.2 CAPACITIES (FULL DETAILS, SEE PAGE 26-27.)

Punching*	35 dia x 25mm or 57 dia x 16mm
Shearing	380 x 25mm or 600 x 15mm
Angle Cutting	150 x 18mm
Section Cutting	55 mm Round, 55mm Square
Notching	13 mm Thickness x 60 Wide x 100 Deep

(All capacities are based on materials of 45 kg/mm² Tensile Strength.)

Punch Force	125 Tons
*Standard Size Fitment Punch & Die	24 mm dia.

2.3 STANDARD EQUIPMENT SUPPLIED WITH MACHINE

Punch Retaining Ring	2816
Punch Adaptor	9039
Punch & Die (1 set x 24 mm)	9006 & 9023
Punch Bolster	2770
Shear Blade (1 set)	2900 & 2743
Angle Blades (1 set)	2401 & 3931 (2)
Section Blades (1 pair)	3206 & 3207
Notch Punch & Dies (1 set)	2745, 3537 (2) & 3930
Notch Bolster	2767
Bolster Back Securing Bolt,	M20 x 160
Die Retaining Ring	81101
Large Die Reducer	81102

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TOOL KIT COMPRISING:

- L220/2007 'C' spanner 120/130
- Allen Keys 4, 5, 6, 8, 10, 12, 14, 17mm
- 9040 Punch Adaptor
- 2908 Punch Location Key
- L220/2012 Ring Spanner 30/36
- 19, 24mm Open-Ended Spanner
- 81102 Die Spacer
- 5739 Bolster Back Washer
- K605/7905 Star Lock Washers 12mm (6 off)

3 BRIEF DESCRIPTION OF MACHINE

3.1 PUNCHING (FOR DETAILS SEE PAGES 8-15)

The large punch bed area - which is completely removable - is designed to give a very wide range of punching applications; with the available optional tooling - large holes of any shape up to diameter/square as shown in the capacity chart can be punched; or in the overhang position, with the front block removed, flanges of channel or joist can be punched up to diameter/diagonal of 38mm in maximum capacity (refer to page 26-27). A swan neck bolster can be fitted to enable punching in the flange and web of channel, and a dovetail attachment can be fitted to allow for quick punch changes. Please see page 46-47.

Additional tooling in this versatile work station can provide bending (max. length 700mm), corner notching, tube notching and general die-set work.

3.2 SHEARING (FOR DETAILS SEE PAGE 16-17)

The shearing unit is fitted with a simple robust hold-down which is adjustable to any thickness of material within the cutting capacity of the machine. A shear feed table with adjustable guides is fitted to allow the accurate feeding of materials. The guide can be adjusted to allow mitre cutting up to 45 degrees for flat bars or to trim the flanges of angle sections previously cut at the angle cutting station.

3.3 ANGLE CUTTING (FOR DETAILS SEE PAGE 18-21)

This station provides large capacity angle cutting at 90 degrees and lighter angle cutting at 45 degrees. Angles between 45 and 90 degrees can be achieved by first cutting at 90 degrees and then flange trimming to the required angle in the shearing station.

The hold-down supports the material thus ensuring a true cut.

3.4 SECTION CUTTING (FOR DETAILS SEE PAGES 22-23)

The machines are fitted as standard with blades for cutting round and square bars. With extra equipment, the machines are able to cut, in this aperture, Channels, Joists and Tee Sections. The blades are retained by simple clamps, allowing easy changes without the need for elaborate setting.

3.5 NOTCHING (FOR DETAILS SEE PAGE 24-25)

The notching station is fitted as standard with a rectangular unit and notch table with adjustable back stops allowing repetitive positioning. Extra equipment is available for narrow widths or vee notching of angles up to 90 degrees vee; units are also available for bar end shaping applications.

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3.6 FURTHER INFORMATION

3.6.1 System Pressure

To check any operational loadings, a pressure gauge can be fitted at the manifold position. The max. system pressure has been set at the works to 250 bar (3,500 P. S. I.) which is below the max. continuous working pressure of the pump, thereby giving increased reliability.

3.6.2 Cleaning

On arrival, all anti-corrosion lacquer should be removed from the machined bright parts with petroleum solvent. When the machine is operational, all visible working parts should be regularly cleaned of foreign matter, thus preventing excessive wear and possible failure.

3.6.3 Lifting

The machine is supplied with a lifting eye, mounted on top of the machine. All lifting and manoeuvring should be carried out using this eye along with a suitably rated chain or sling. The eye can be removed if desired after final siting of the machine but hole should be blanked off.

DO NOT USE SLINGS UNDER MACHINE!

3.6.4 Installing

Locate the machine on a solid foundation allowing sufficient area all round for easy working and maintenance. The machine may be used free standing, but bolting to the foundation is recommended. With the machine mounted directly on the floor - this gives a comfortable working height.

3.6.5 Electrical Supply

Input wires should arrive at the machine via suitably protected underground supply directly into the electrics box in the base of the machine. As an alternative by overhead supply to the top of the machine and routed inside the top guard and hydraulic pipe trunking to the electrics box. A 30 amp isolating switch, fuse and appropriate cable should be used for mains supply connection. The circuit provides protection against sustained over-load and phase failure. Should the machine cut out during an operation or whilst running, the cause of the problem should be investigated to prevent re-occurrence.

IMPORTANT

Motor rotation MUST be as arrow on motor fan end cover!

This machine will not operate if the motor is running in the wrong direction. It must be stressed however that the motor must not be allowed to run in the wrong direction for more than a few seconds, as this will cause seizure of the pump. To check motor direction start motor and press the footswitch if machine does not operate reverse two of the incoming 3 phase connections.

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3.7 SAFETY POINTS

- All adjustments, setting, change of tooling and maintenance must be carried out by a suitable qualified engineer in accordance with the manufacturers instructions.
- Remove off-cuts, slugs and any other waste from around the machine before leaving the work station.
- The operator should check all tooling is in good condition before operating machine.
- All stations should be checked for obstructions.
- Heavy work should be supported by a sound work steady.
- The machine should never be left running while unattended.
- When leaving, the machine **MUST** be switched off.
- Always use kingsland original tooling to ensure good tool and machine life.

3.8 OVERLOADING

In the event of an accidental overload to the hydraulic circuit, the oil will be diverted direct back to the tank via a relief valve, until the overload condition is removed.

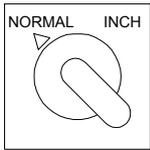
IT MUST BE STRESSED HOWEVER IT IS NOT ADVISABLE TO EXCEED THE CAPACITY OF THE MACHINE USING RELIEF VALVE AS A SAFETY VALVE.

3.9 WARNINGS AND DANGERS

Any point of the machine painted **YELLOW** should be treated as a danger area. Operators should be instructed not to extend any finger or limbs into or beyond the vicinity of the warning labels. Any guards or hold downs removed for maintenance or adjustments **MUST** be replaced before the machine is put back in service.

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3.10 OPERATING MODE SWITCH



The Operating Mode Switch has two positions - **NORMAL** and **INCH**. With the switch set to **INCH** all work stations are in the slow speed Inching Mode.

3.10.1 Inching Positon

In Inching position the punch (for punch also read shear end) will travel down slowly when footswitch is fully depressed. The punch will remain in any position when foot is removed. Turn switch to **NORMAL** to return punch to top of stroke. All tool setting and adjusting and setting of stroke limit switches should be done in the Inching position.

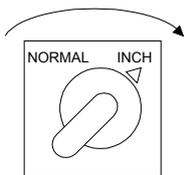
3.10.2 Normal Operating

With Selector Switch to **NORMAL** the punch will travel down at operating speed when footswitch is fully depressed and will return to top of stroke when foot is completely removed.

The footswitch does however have three “positions” giving the very useful facility that after bringing the punch down by full depression of switch, the punch may be held in any position of the stroke by raising the foot to the mid-position. Remove foot and punch will return to top position.

3.10.3 Punch and Die Alignment

Should be checked before using, and **MUST** be checked after punch and die changes have been made.



To check alignment switch operating mode swithc to **INCH**, then inch the punch down by fully depressing the footswitch. Care must be taken as the punch approaches the die, if misalignment is apparent remove foot from switch.

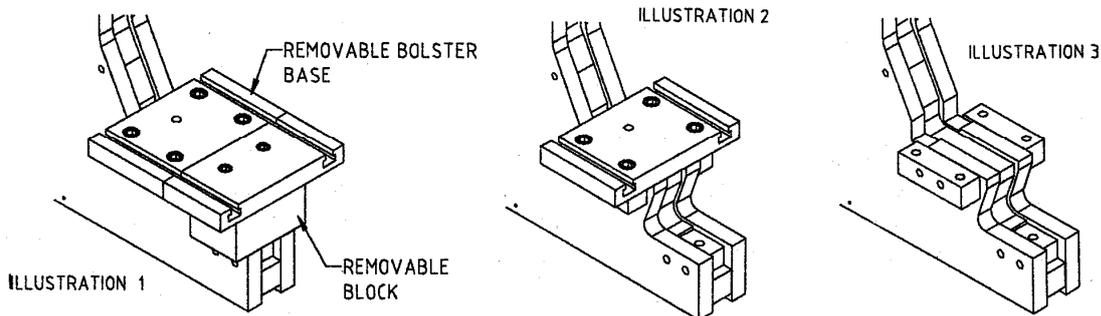
To align punch and die release bolster fixing screws, operate the foot switch with care, aligning the bolster containing the die to the punch, the punch will stay in the down position. Centralise the die clearance around the punch, clamp the bolster in position, tighten die retaining screw, check die maintains in the central position after clamping. Return punch to top position by switching back to normal position.

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4 PUNCHING WORK STATION

4.1 GENERAL DESCRIPTION

The large punch bed area (illustration 1) – is completely removable front block (illustration 2-3) – and is designed to give a very wide range of punching applications: with the available optional tooling - large holes of any shape up to diameter/square as shown in the capacity chart can be punched; or in the overhang position, with the block removed, flanges of channel or joist can be punched up to diameter/diagonal of 38mm in maximum capacity (Refer to page 23-24).



The punch is retained by means of locking ring part 2716, the punch depending on its size may use one of the two adaptors supplied. The die is retained in the bolster by a set screw, ensure the screw locates correctly on the machined flat on the die when shaped punches and dies are being aligned.

The punch stripper plate must be correctly adjusted allowing sufficient clearance for placing and removal of material, but must NOT restrict the punch stroke, ensure the bottom stroke limit switch is correctly adjusted. Punch holes with sufficient material around the hole so that contact will be made on both sides of the stripper plate. Stripping forces can be severe and unbalanced stripping forces, due to contact on one side stripper, may cause punch breakages.

When using stripper fingers for oversize holes or irregular shapes position and adjust fingers equally so as to avoid unbalanced stripping loads.

Additional tooling in this versatile work station can provide bar and plate bending, corner notching, tube notching and general die-set work.

WHEN ORDERING REPLACEMENT PUNCHES AND DIES, ALWAYS QUOTE - MODEL, TYPE AND SERIAL NUMBER OF MACHINE.

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4.2 PUNCH TOOLING

The Punch and Die should be checked for alignment, prior to punching any material. Standard size fitment 24mm, unless specifically ordered otherwise.

4.2.1 Tooling Changes

Punch: To change punch, unscrew locking ring using 'C' Spanner from tool kit, replace punch and retighten locking ring. Adaptors are supplied to suit various punch head sizes.

Die: To change die, slacken set screw in side of bolster, remove die and replace with new die, retighten set screw.

After replacing punches and dies, it is important that they are correctly aligned.

See page 6 for alignment procedure under the heading 'Safety Points'.

Extra care must be taken when fitting square or shaped punches that they are correctly aligned before operating machine.

4.3 PUNCH TOOLING - GENERAL GUIDES

1. The punch stripper plate must be adjusted correctly with sufficient clearance to allow positioning and removal of the material being punched.
2. Punch holes with sufficient material around the hole so contact is made on both sides of the stripper plate. Stripping forces can be severe. Unbalanced stripping forces may cause punch breakage.
3. Liberal oiling of the punch will considerably lengthen the life of the punch and die and also help reduce the stripping forces. Automatic lubrication units are available, for more information please contact
4. The quality of the hole /or blank/ is an immediate indication of the condition of the punch and die.
5. Do not punch material thicker than the punch diameter, this overloads the punch and can result in breakage.
6. Punch full and complete holes, do not punch partial holes /unless tooling is specifically designed to do so.
7. When punching small items (i.e. small pieces of plate, bar etc) these items MUST be places and extracted with suitable handling aids, extra guarding may be required too ensure operator safety.
8. Stay within the rated capacity of the machine.

(All capacities are based on 45 kg/mm² Tensile Strength.)

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4.4 PUNCH AND DIE LUBRICATION

It is recommended that one of the following oils is applied by brush to the punch and die or both sides of the material being punched.

SHELL	- GARIA 927
B. P.	- SERVORA 68
CASTROL	- ILOBROACH 219
DUCKHAMS	- ADFORNOL EP7

When punching aluminium it is recommended that Parafin is used as a lubricant.

Die clearance: It is normal practice to aim for a clearance of 10% material thickness.

Whether clearance is added to the size of the die or deducted from the size of the punch, depends on the nature of the work. When holes of a given size are required the punch is made to size and the die is made larger. Conversely, when blanks of a given size are required the die is made to size and the punch smaller.

Special clearance dies for thin sheet and plate punching, or size dies and special clearance punches can be supplied to order.

4.5 PUNCHING CAPACITY

To keep within the rated capacity of the machine, the following example is intended as a guide for calculating punching pressures.

Punching Force = shear area x tensile strength of material
where shear area = circumference of punch x thickness of material

Example

A 30 mm hole is required in a piece of 25mm thick mild steel plate at 45 kg/mm² Tensile Strength.

Punching Force = $\frac{\text{Shear area} \times \text{tensile strength}}{1000}$

Shear Area = Circumference of punch x thickness of material

Tensile Strength = 45 kg /mm² or 450N/mm²

Therefore: $\frac{30 \times 3.142 \times 25 \times 45}{1000} = 116.4 \text{ Tons}$

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4.6 PRESS BRAKE FACILITY AT PUNCHING STATION

Press Brake attachments/tooling is available for fitting at the Punching Station giving press brake capacity of 250mm x 22mm (bar) up to max. width 700mm x 4mm (sheet).

IMPORTANT NOTICE - HEALTH & SAFETY AT WORK ACT, SECTION 6

Press Brake tooling must not be fitted to this machine until suitable guarding has been fitted. It is normally permitted not to fit additional guarding provided the following instructions are rigidly adhered to:

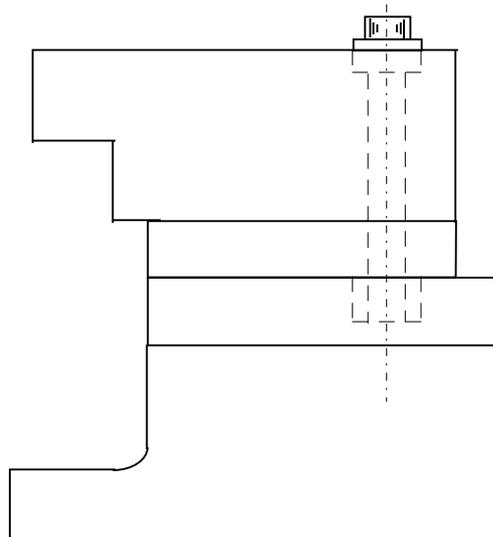
1. The clearance between the top tool and the work piece is kept to a minimum and must not exceed 6mm at any time. This can be maintained by setting the stroke of the machine, see page 27 more more information on this.
2. The press brake tools must be set by a skilled and competent person.

Press brake tooling and required guarding is available from the manufacturers.

IMPORTANT NOTICE:

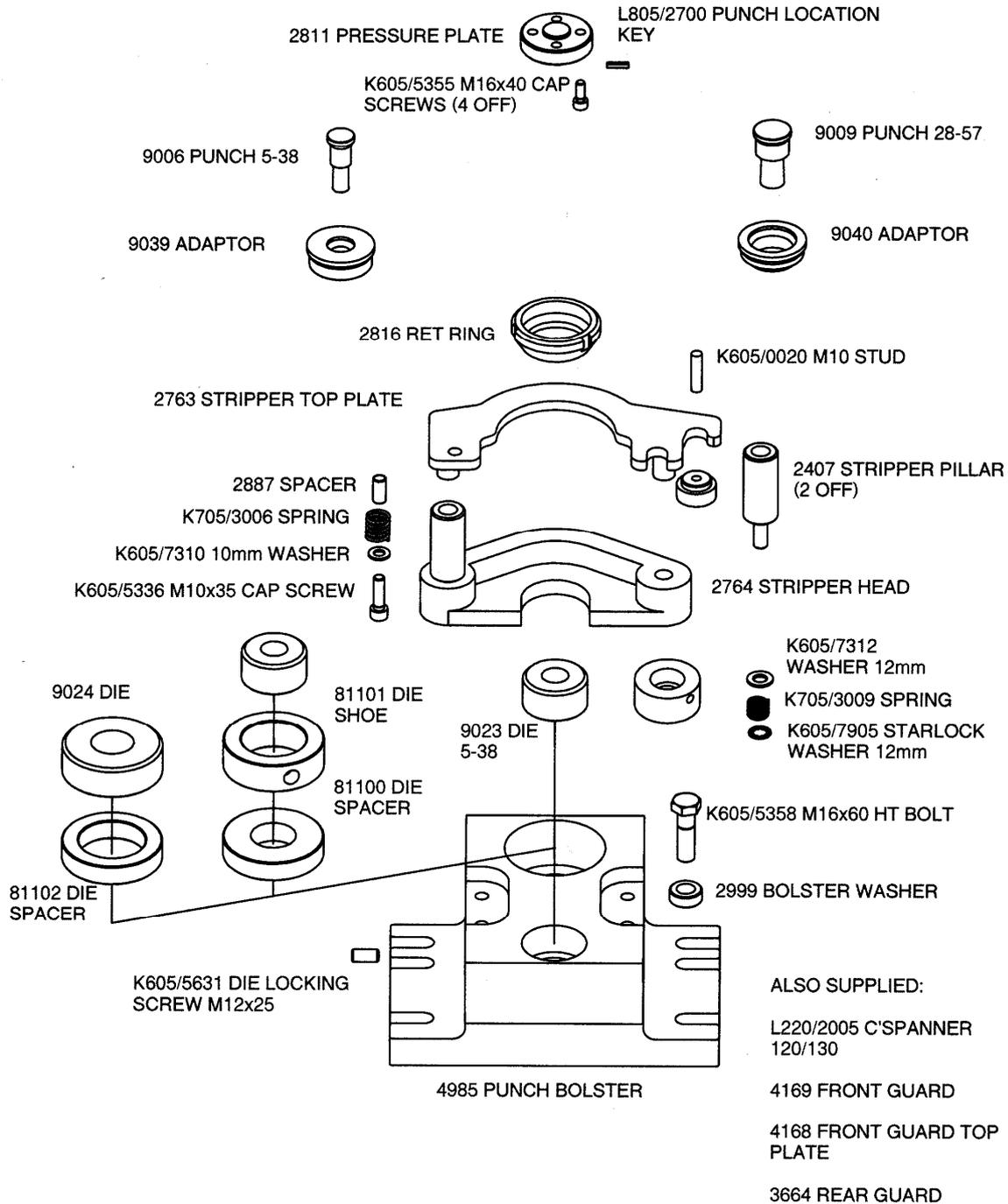
Punching with bolster in overhang position

The back securing bolt must be used!



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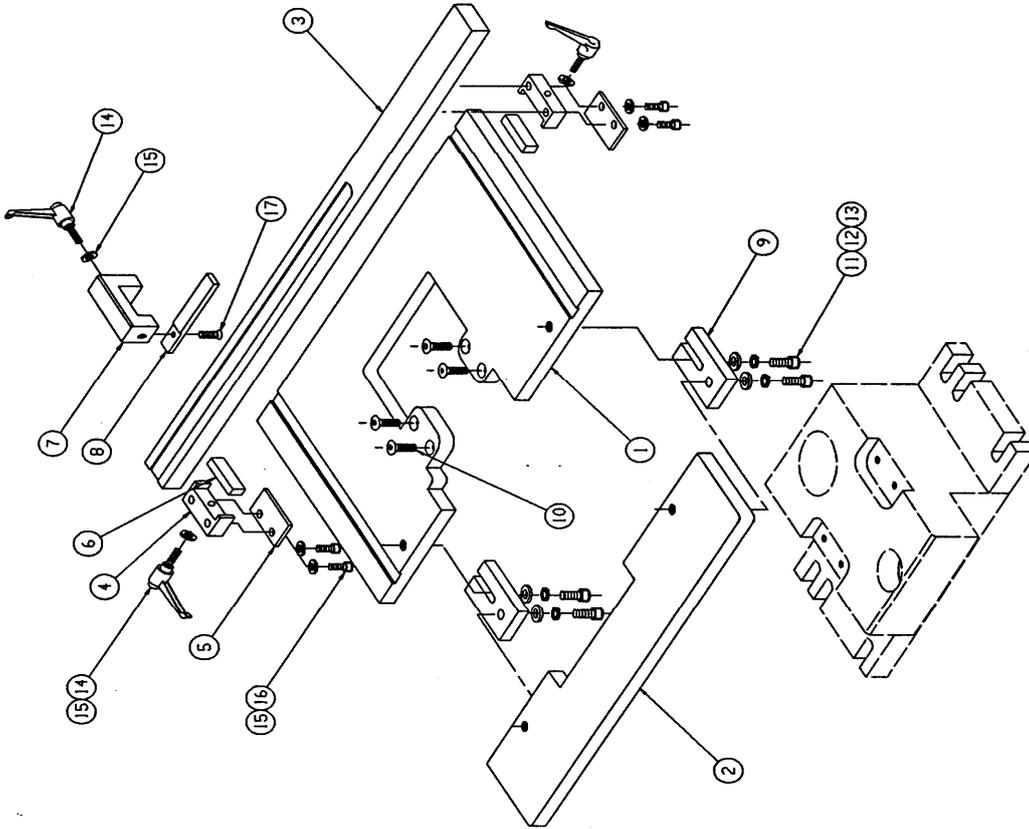
4.7 STANDARD PUNCH TOOLING



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4.8 STANDARD PUNCH TABLE ASSEMBLY

1	4986	PUNCH TABLE	1
2	4986	PUNCH TABLE EXTENSION	1
3	87078	PUNCH TABLE BEAM	1
4	87060	TABLE GUIDE BLOCK	2
5	87061	GUIDE BLOCK RETAINING PLT	2
6	87063	GUIDE BLOCK PAD	2
7	87059	MATERIAL STOP	1
8	87096	MATERIAL STOP EXTENDING BAR	1
9	87081	FRONT TABLE FIXING PLATE	2
10	K605/3530	M12x25 CSK SOCKET SCREW	4
11	K605/5344	M12x30 CAP HEAD SCREW	4
12	K605/7512	12mm SPRING WASHER	4
13	K605/7312	12mm WASHER	4
14	K705/1908	M8 KIPP HANDLE	3
15	K605/7308	8mm WASHER	7
16	K605/5328	M8x50 CAP HEAD SCREW	4
17	K605/3490	M8x20 CSK SOCKET SCREW	1



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4.9 LARGE HOLE PUNCHING

Extra equipment available for punching up to 110mm, 160mm or 255mm dia.

This unit comprises:

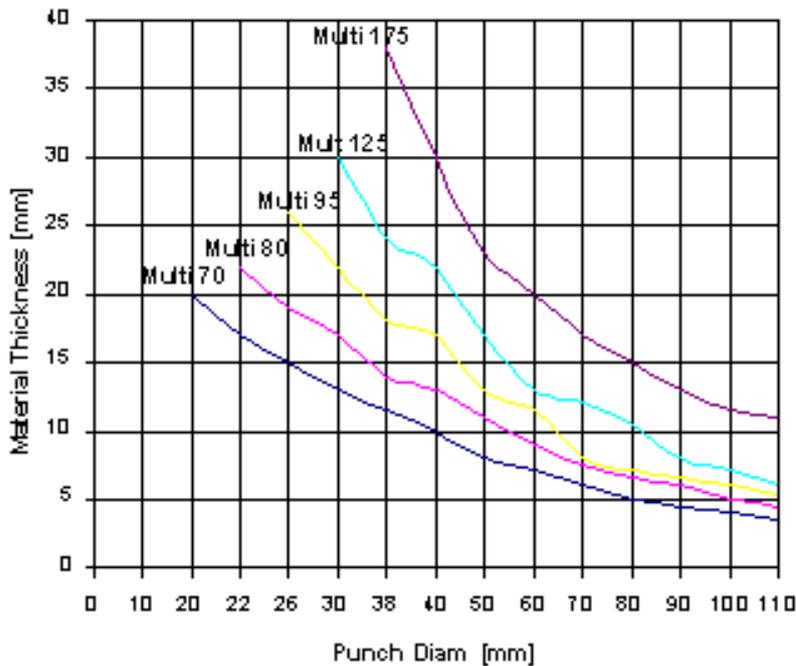
- Special ram pressure plate
- Adaptors
- Retaining Ring
- Bolster with die holder plates
- Large hole stripper head

Punch and die sets available for this unit -

For hole sizes up to - 57mm dia
85mm dia
110mm dia

(Separate unit available for hole sizes up to 225mm dia. - details on request.)
For drawing and part numbers see page 41

4.10 MATERIAL THICKNESS / MAX. HOLE SIZE



(all Capacities based on Material Strength of 45 kg/mm²)

Please Note:

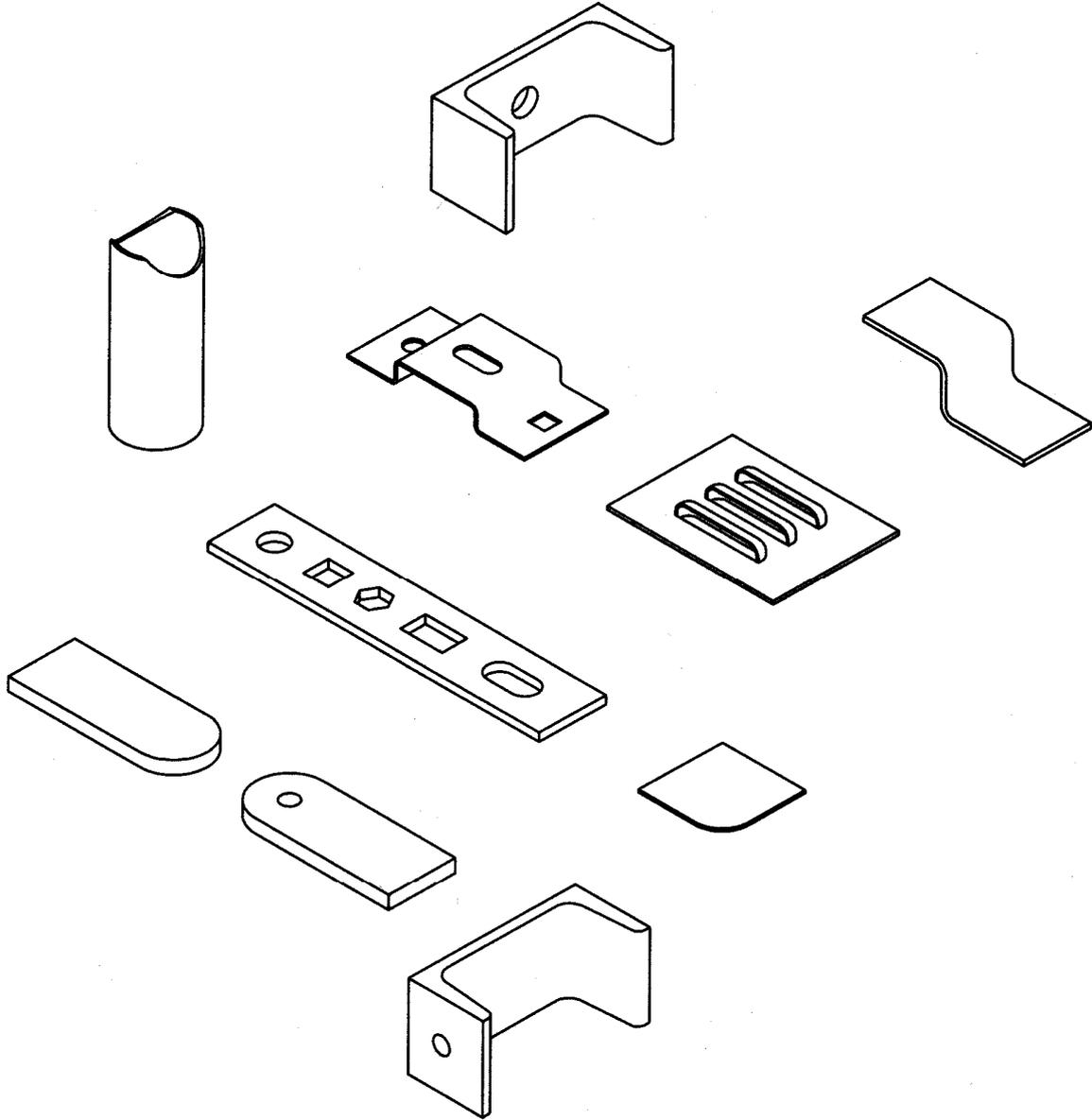
DANGEROUS PRACTICE:
DO NOT ATTEMPT TO PUNCH MATERIAL
THICKER THAN THE PUNCH DIAMETER!

MULTI 125 HYDRAULIC STEELWORKER

4.11

4.12 TYPICAL APPLICATIONS

(achieved with special tooling at punch station)



5 SHEARING STATION

5.1 DESCRIPTION

The shearing unit is fitted with a simple robust hold-down which is adjustable to any thickness of material within the cutting capacity of the machine. A shear feed table with adjustable guides is fitted to allow the accurate feeding of materials. The guide can be adjusted to allow mitre cutting up to 45 degrees for flat bars or to trim the flanges of angle sections previously cut at the angle cutting station.

The standard shear blades as fitted; permit the bottom blade to be turned four times giving new cutting edges, whilst the top blade must be ground to sharpen the cutting edge. These blades give minimum distortion from full capacity down to as light as 2mm thickness.

Parallel top blades can be supplied (Pt. No.2744) to order for cutting narrow bar widths or where flatness of cut is not so important.

When the shear blades require sharpening, grind only on the cutting faces - max. regrinding 0.80mm, after grinding the blades must be adjusted to a clearance of 0.08mm. Adjusting screws have been provided to reset the shear blades, the adjusting screws are positioned around blade fixing screws, accessible when shear table has been removed. Even clearance between top and bottom blades is important along the entire blade length and care should be taken to ensure that the bottom blade is in a vertical plane, parallel to top blade.

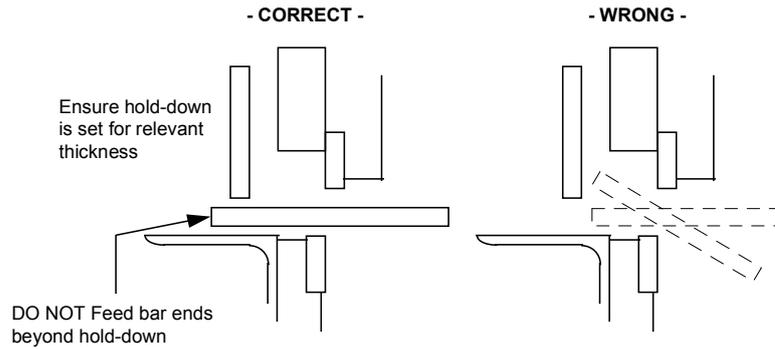
WHEN ORDERING SPARE BLADES, ALWAYS QUOTE - MODEL, TYPE AND SERIAL NUMBER OF MACHINE.

5.2 SHEAR TOOLING - GENERAL GUIDES

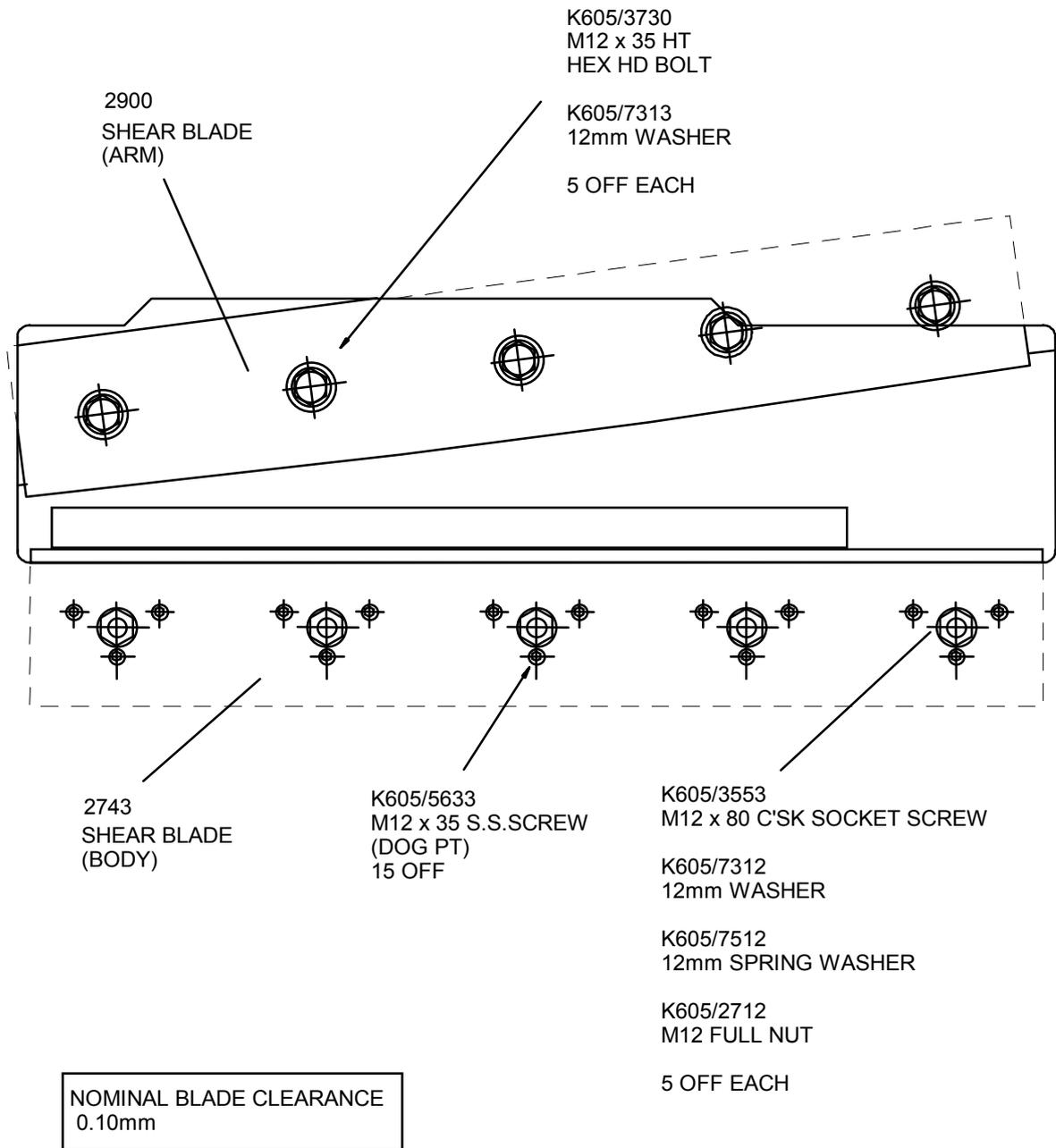
1. The quality of the cut is an immediate indication of the condition of the blades.
2. Ensure hold-down is always set for relevant thickness of material being sheared.
DO NOT allow ends of bars to be fed beyond the hold down, because bar would tend to twist between blades and cause body distortion.
3. Always feed material between blades from the hold down side.
4. Keep the blade area clean. Do not allow 'build up' of mill scale.
5. Stay within the rated capacity of the machine.

(Note: All capacities are based on 45 kg/mm² Tensile Strength.)

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SHEAR BLADES AND FIXING MATERIALS:



6 ANGLE CUTTING

6.1 DESCRIPTION

This working station provides large capacity angle cutting at 90 degrees and lighter angle cutting at 45 degrees.

To cut angle section place the material through the hold down into the cutting area, adjust the support screw to the material but leave sufficient clearance to enable the section to be fed on for progressive cutting.

To mitre cut at 45 degrees:

firstly cut the angles to length allowing approx. 12mm oversize for end trimming.

1. Place the first end into the blade using the higher support position, trim approx. 6mm off the end of the section whilst maintaining 45 degrees to vertical position.
2. Place the other end into the blade using the left hand support position, trim section to length whilst maintaining 45 degrees to face of machine position.

To achieve other angles of cut between 45 degrees and 90 degrees, first cut the angle section to length and then trim the flange to required angle in the shear station.

The slot in the shear hold down allows angle sections to be positioned for left hand on right hand trimming, ensure hold down is set for relevant thickness.

Each cutting blade has four cutting edges and is retained by simple fixing screws.

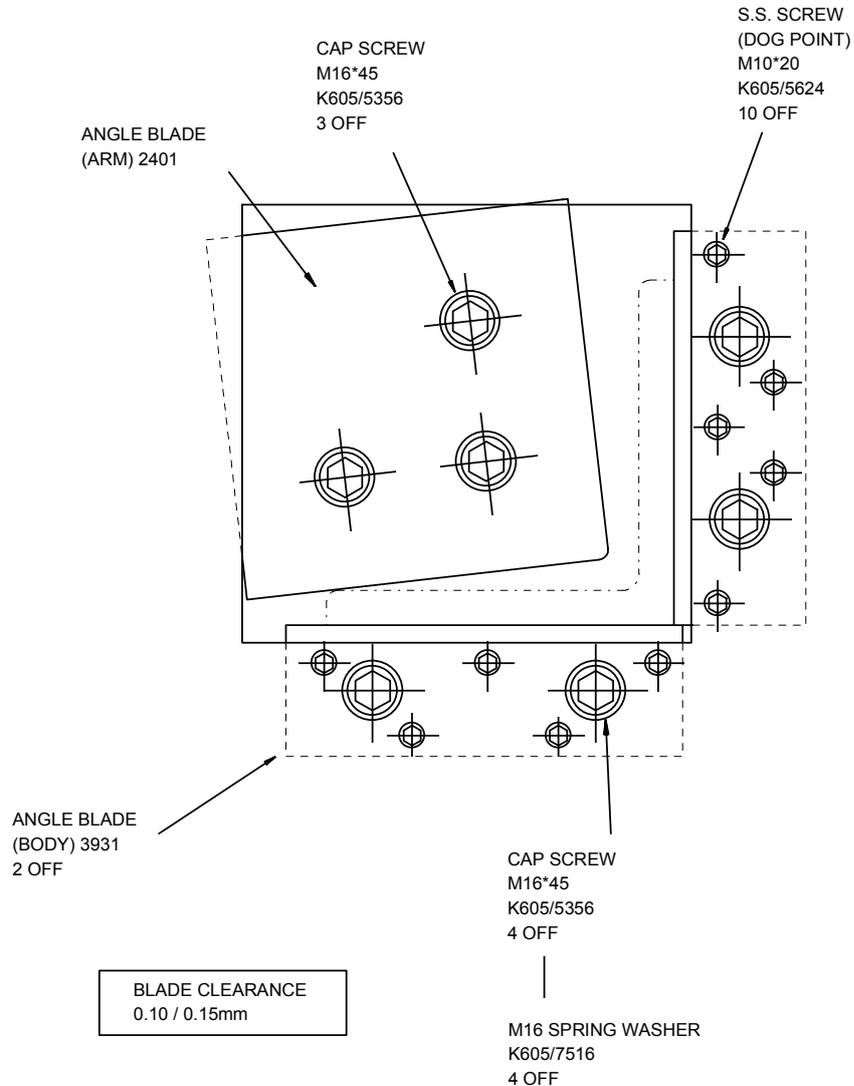
DO NOT resharpen these blades, after turning four times replace with new blades.

MULTI 125 HYDRAULIC STEELWORKER

6.2 ANGLE TOOLING - GENERAL GUIDES

1. The quality of cut is an immediate indication of the condition of the blades.
Keep sharp, keen cutting edges.
2. Ensure support screw is set for relevant thickness of material being cut.
3. Always feed material between blades from hold down side.
4. Keep cutting aperture clean, small slivers, short cuts and any other pieces should be removed from the blade area. DO NOT allow mill scale to 'build up' in the blade area.
5. Stay within the rated capacity of the machine.

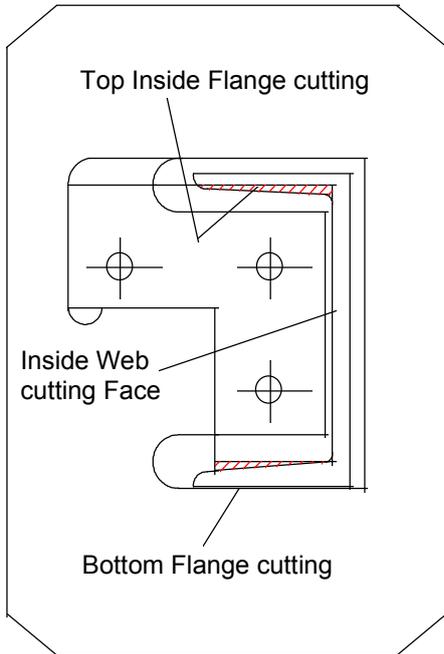
(All capacities are based on material of 45 kg/mm² Tensile Strength.)



MULTI 125 HYDRAULIC STEELWORKER

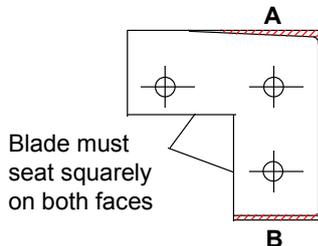
6.3 GRINDING OF CHANNEL INSERT BLADES

Body Blade



Fit blade to carrier, retain position with three screws, ensure blade is seating on both faces, see sketch. Mount a sample of channel, with a cleanly cut end, on to the blade with the bottom flange in line with bottom cutting face and the inside of the web square and in line with the inside web cutting face, as shown in sketch.

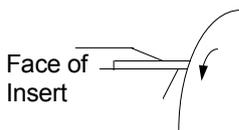
Having mounted channel correctly, scribe round inside of channel flanges.



- Remove blade from carrier.
- With 'mark out' A continue inner flange line as shown.
- With 'mark out' B continue line from radius square to cutting face. Allow a small clearance when grinding to permit easy passage of channel.

Grinding

Grind insert blades to lines scribed, shown shaded in sketch.

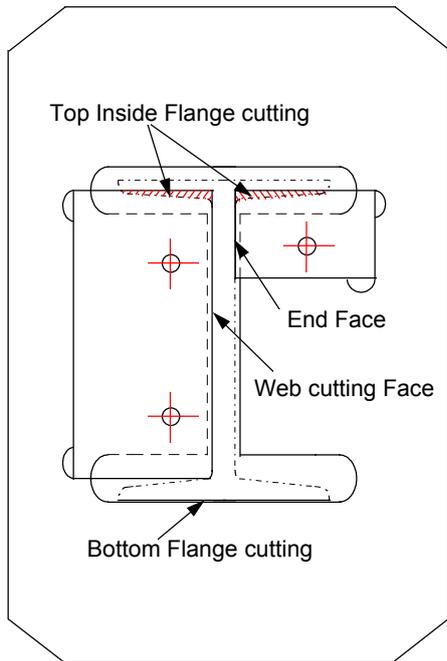


When hand grinding, if using face of grinding wheel, ensure angle between face of insert and cutting face does not exceed 90 degrees.

MULTI 125 HYDRAULIC STEELWORKER

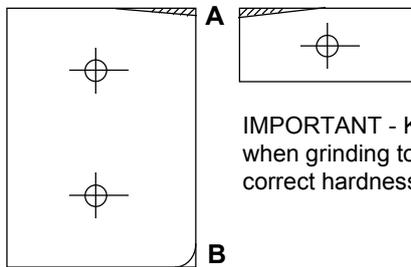
6.4 GRINDING OF JOIST INSERT BLADE

Body Blade



Fit blades to carrier, retain positions with fixing screws, ensure blades are seating correctly. Mount a sample of joist, with a cleanly cut end, on to the blade with the bottom flange in line with BOTTOM CUTTING FACE and the web square and in line with WEB CUTTING FACE, as shown in sketch.

Having mounted joist correctly, scribe round inside of joist flanges.

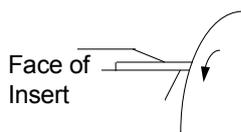


IMPORTANT - Keep blades cool when grinding to maintain correct hardness

- Remove blades from carrier.
- With 'mark out' A continue inner flange line of required.
- With 'mark out' B radius to suit that of sample joist.
- The END FACE may require clearance to permit easy passage of joist for heavy or light sections, when blades are in cutting position.

Grinding

Grind insert blades to lines scribed, shown shaded in sketch.



When hand grinding, if using face of grinding wheel, ensure angle between face of insert and cutting face does not exceed 90 degrees.

MULTI 125 HYDRAULIC STEELWORKER

7 SECTION CUTTING

7.1 DESCRIPTION

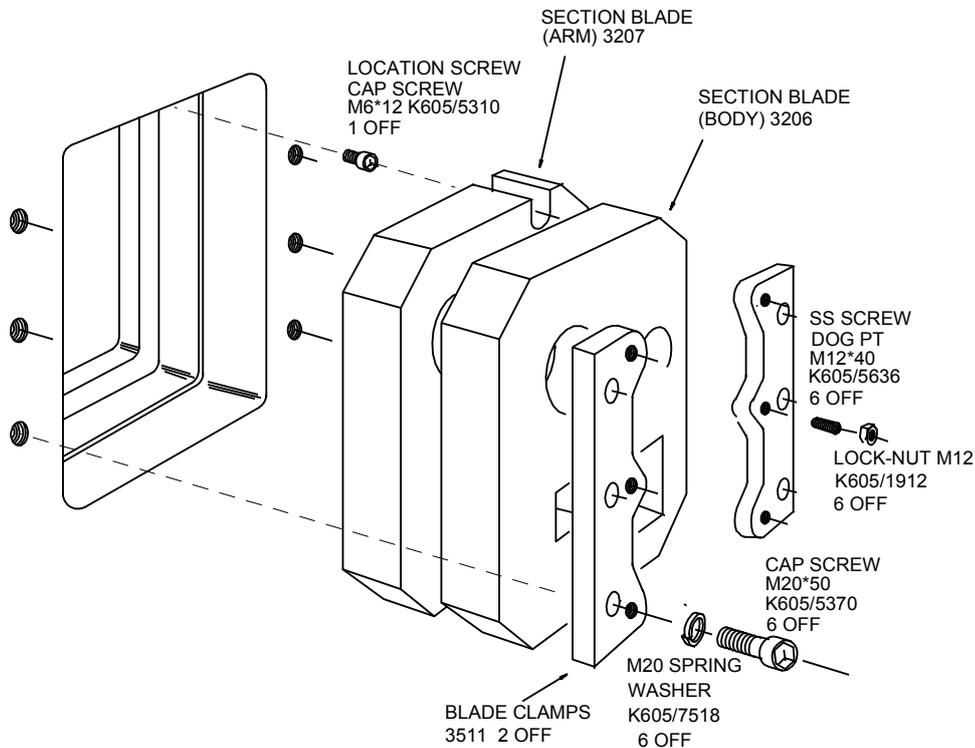
A variety of sections can be cropped at this aperture - round and square sections, unequal angle, channel, joist etc.

Blades for round and square section cropping are fitted as standard equipment and have apertures of varying sizes. The smallest aperture should be chosen, which will accept the material, thus ensuring a complete and well supported cut.

To change the blades, the material support must be removed. Release the four screws securing the blade clamps, remove blade clamps then withdraw the blades.

It will be noticed that the arm blade is smaller than the body blade.

This safeguards incorrect assembly when inserted carrier blades are used. Also notice the safety peg, there is a safety slot in the arm blade to prevent incorrect positioning.



TO SET BLADE CLEARANCE~~
ENSURE ARM BLADE IS PROPERLY SEATED IN SHEAR ARM.
POSITION BODY BLADE IN FRAME FIRMLY PUSHED AGAINST ARM BLADE.
SECURE BLADE CLAMPS TO FRAME.
TIGHTEN THE SIX SS SCREWS, THEN RELEASE EACH ONE 0.2 OF A
TURN. TIGHTEN LOCKNUT WHILST HOLDING THE SS SCREW WITH
ALAN KEY.

MULTI 125 HYDRAULIC STEELWORKER

IMPORTANT:

- ⇒ Never remove screw fitted as safety peg in the arm blade milled recess.
- ⇒ In the case of worn solid blades, new blades must be fitted.
DO NOT attempt to regrind faces; this makes blades undersize for secure fitting.
- ⇒ In the case of worn insert blades, new inserts can be supplied for grinding to worn sample.
- ⇒ When fitting new blades reverse the removal procedure.
- ⇒ To cut sections place the material through the hold down into the cutting area, adjust the hold down screw (if fitted) to achieve square cut.

7.2 SECTION TOOLING - GENERAL GUIDES

1. The quality of the cut is an immediate indication of the condition of the blades.
Keep sharp, keen cutting edges.
2. Ensure bar sizes are used in smallest aperture that will accept them, ensuring well supported cut.
3. Always feed material between blades from hold down side.
4. Keep cutting aperture clean, small slivers, short ends and any other pieces should be removed from the blade area. DO NOT allow mill scale to 'build up' in the blade area.
5. Stay within the rated capacity of the machine.

(All capacities are based on material of 45 kg/mm² Tensile Strength.)

8 NOTCHING STATION

8.1 DESCRIPTION

The notching station has a rectangular punch as standard fitting and is supplied with a notch table complete with adjustable side and back stops which allow repetitive material positioning.

Vee notch tooling can be fitted at this work station, or alternatively units can be supplied for narrow widths of rectangular or vee shapes; units also available for bar end shaping.

A particular feature of this work station, provides for some punch end units to be fitted - i.e. small punching applications up to 70T pressure. (Details on request)

When notch punch requires sharpening, grind side and front faces of punch only. The dies have four cutting edges and should be turned to present new cutting edge.

To adjust dies after punch grinding:

1. Slacken bolster fixing screws and position locking screws.
2. Move bolster into new side and front position on punch; one side of bolster is adjustable on the die.
3. Clearances between punch and die faces should be maintained as follows:
.....at sides of punch 0.1mm
.....at front of punch 0.3mm
Adjust bolster on the two faces accordingly and retighten fixing screws - check clearances.
4. Release adjustable die blade fixing screws and adjust blade to punch, tighten fixing screws and check clearance.
5. Ensure fixing screws are tight and that the positioning locking screws have been reset.

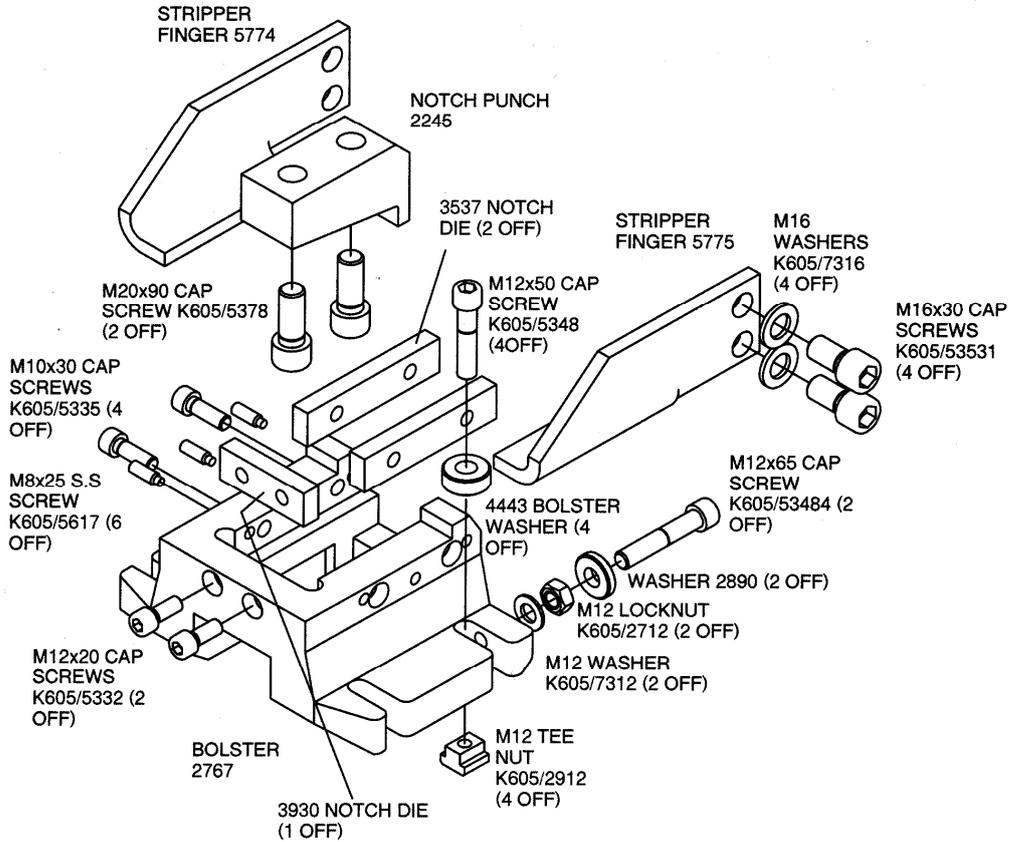
8.2 NOTCHING TOOLING - GENERAL GUIDES

1. The quality of cut is an immediate indication of the condition of the tooling. Keep sharp, keen cutting edges.
2. Check that the notched blank ejects after notching operation, thus avoiding any 'build up' of slugs.
3. Stay within the rated capacity of the machine.

(All capacities based on 45 kg/mm² Tensile Strength.)

MULTI 125 HYDRAULIC STEELWORKER

8.3 RECTANGULAR NOTCH TOOLING ARRANGEMENT



ALSO SUPPLIED WITH:

NOTCH TABLE - 2748

TABLE MOUNTING BLOCKS - 2282 (2 OFF)

M12x30 CSK SCREWS - K605/3543 (2 OFF)

NOTCH GUIDES - 2626 (3 OFF)

M12x35 GUIDE FIXING BOLTS - K605/6130 (3 OFF)

M12 KIPP HANDLES - K705/2010 (3 OFF)

MULTI 125 HYDRAULIC STEELWORKER

9 FURTHER INFORMATION

9.1 CAPACITIES - MULTI 125

9.1.1 Punching

	<u>Metric (mm)</u>	<u>Imperial (inches)</u>
Max. Capacities	35 x 25	1.3/8 x 1
Dia. x Thickness	57 x 16	2.1/4 x 5/8
Max. Stroke Length	80	3.1/8
Speed - 20mm travel	28 full cycles/min	
Throat Depth Standard	355	14
Throat Depth Multi-D Model	625	25 (Deep Throat option)
Largest Hole	225	9 (with optional equip.)
Working Height	1,056	41.1/2
Max. Section Flange Punch	305	12

9.1.2 Shearing

Flat Bar	380 x 25	15 x 1
Alternative	600 x 15	24 x 5/8
Blade Length	610	24.3/8
Angle Flange Trim	120 x 15	5 x 5/8
Working Height	900	35.3/8

9.1.3 Angle Cutting

At 90° with non deforming multi-edged blades	150 x 18	6.3/4
At 45° Mitre	80 x 10	3 x 3/8
Working Height	1,160	45.5/8

9.1.4 Section Cutting

Round/Square Bar	55	2.1/8
Channel Beam	200 x 100	8 x 4
Tee	120 x 12	5 x 1/2

9.1.5 Notching

Material Thickness	13	1/2
Width	60	2.3/8
Depth: Vee-Rect.	80 – 100	3.1/8 - 4
Angle Flange	100 x 13	4 x 1/2
Working Height	900	35.3/8

MULTI 125 HYDRAULIC STEELWORKER

9.2 SPECIFICATION

9.2.1	<u>Metric</u>	<u>Imperial</u>
Motor	7,5 kW	10 Hp
Nett Weight	3,100 Kg	6,836 lbs
Gross Weight	3,370 Kg	7,431 lbs
Machine Dims. (L x W x H)	200 x 80 x 203cm	79 x 32 x 80
Packed Dims.	215 x 95 x 221cm	85 x 37 x 87

9.3 ADDITIONAL TOOLING

Bending

Max. Bar Size	250 x 22 or 700 x 3	10 x 7/8 24 x 1/4 (Sheet)
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Punching at Notch Station

Max. Capacity	38 x 12	1.1/2 x 1/2
Throat Depth	125	5

Corner Notch

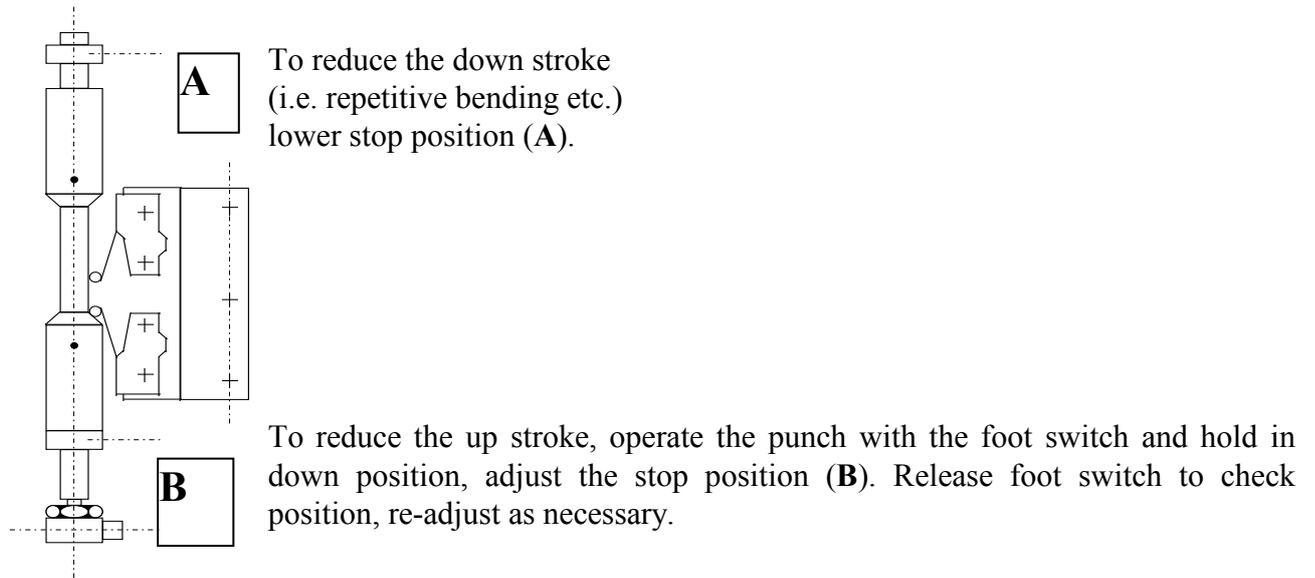
Max.	250sq x 6	10 sq x 1/4
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Tube Notch

Max. Diam.	108	4.1/4
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MULTI 125 HYDRAULIC STEELWORKER

9.4 STROKE ADJUSTMENT



Note: Adjustments to stroke limiters can be arranged by switching to the INCH mode of operation; the punch position and/or shear-cutting position is then set by operating the foot pedal to achieve position required. Adjust appropriate stop position, tighten stop screw; then re-check setting under normal RUN condition.

MULTI 125 HYDRAULIC STEELWORKER

9.5 HYDRAULIC SYSTEM

A 7,5 KW Motor drives a hydraulic pump, which through control valves feed the power cylinders at each end of the machine. The punch cylinder directly loads the punching unit whereas the shear cylinder is connected to a pivoted arm.

Hydraulic Oil - refer to the recommended oils label. The oil filler/breather is positioned on the tank accessible by removing the louvred cover at base of the machine.

Suction Strainer - inspect oil strainer every twelve months. The strainer is accessible, having released the screws in tank cover (Replacement L820/5023).

Sludge Tray - whilst lower cover is removed, check tray located under main frame once every twelve months.

9.6 CLEANING

Under normal operation, all visible working parts should be regularly cleaned of foreign matter, thus preventing excessive wear and possible failure.

9.7 REGULAR MAINTENANCE

Daily - Before starting machine -
Check fluid level in tank - top up as necessary.
Check oil level in oil pump - top up as necessary.
Check condition of all blades, punch and die.
Check surrounding work area is tidy, remove any off-cuts, slugs from floor area.
Clean off any mill scale which may have collected around the cutting apertures.

Weekly - But depending on work load.
Examine power cable and foot pedal cable for damage or chafing.
Check movement of machine is smooth when running under no load condition.

Monthly - Check arm adjustment for any slackness - see page 31.

Yearly - Change hydraulic fluid, inspect oil suction strainer.

MULTI 125 HYDRAULIC STEELWORKER

9.8 HYDRAULIC FLUID

Fill to top level of inspection glass. Use only mineral oil as recommended or equivalent.

Castrol	Hyspin AWS32-6018
B. P.	Energol HLP32
Shell	Pollus 37
Mobil	DTE 24
Esso	Nuto H32

9.9 OILING LUBRICANT

Check oil level in pump reservoir daily, operate pump 2/3 times daily.

Castrol	Magna DR 220
Shell	Tomma T220
B.P.	Energol GHI 220
Mobil	Vactra Oil No. 4
Esso	Febis K220

Note: Oiling system applicable to 'shear End' of machine only.

'Punch End' lubrication - only requires an occasional application of light grease to the flat on the punch ram.

Lubricant Check

Before operating machine, the following important checks should be made.

- The Hydraulic fluid is at top level of inspection glass.
- The oil pump has been operated, and that there is oil pressure indicated at the pressure gauge, check oil level in pump.

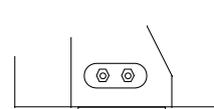
9.10 MACHINE RAM & ARM ADJUSTMENT

Following an initial working in period (say 5/6 days) the machine may require settlement adjustment to be carried out.

Punch Ram

The alignment of the ram is guided by a 'Ram Guide Pad'; this pad may require attention to adjustment.

Adjusting screws are located at the left - hand side of the punch end.



MULTI 125 HYDRAULIC STEELWORKER

Adjusting Ram

Firstly remove punch, then ensure equal adjustment to both screws, lock nuts after adjustment; test by working ram (say 6 times). DO NOT over-adjust the screws, check pad side loading by operating in the 'INCH' mode, if ram does not advance, pad has been over-adjusted.

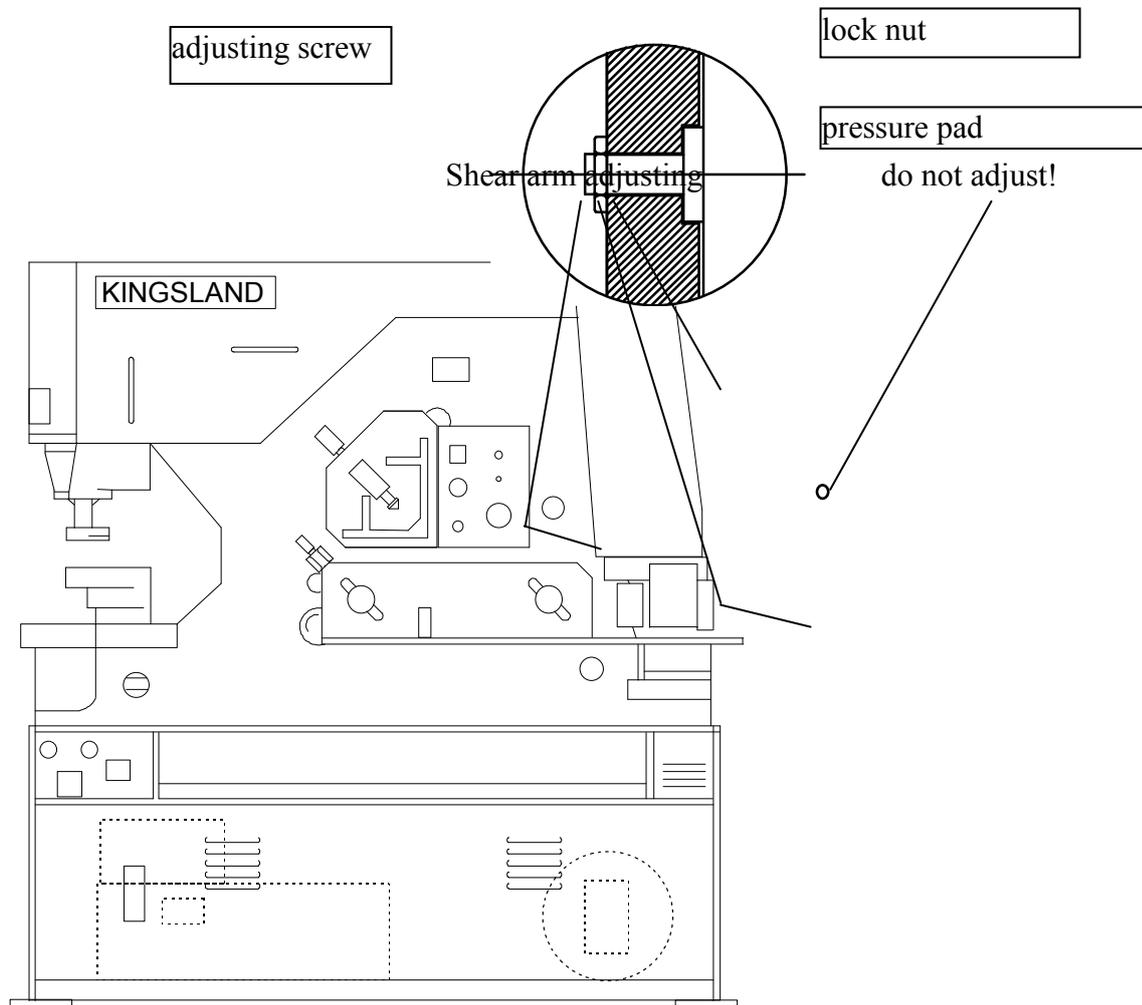
Adjusting Shear Arm

Isolate machine before making any adjustments.

Adjustment to pressure pads are made from the cutting side of the arm (i.e. the feed side of the machine).

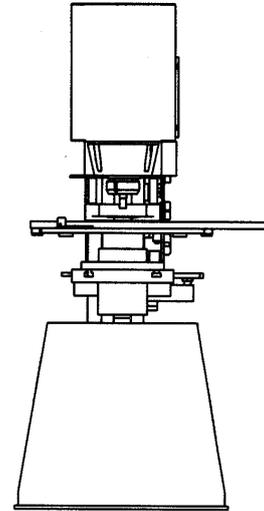
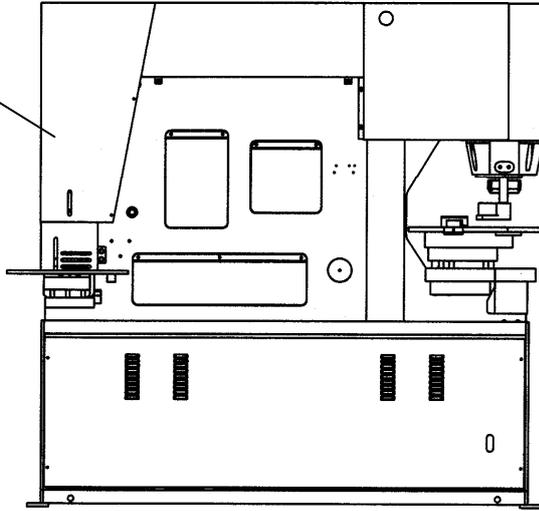
1. Slacken locking nuts at the three pad positions only (M24 lock nuts).
2. Turn adjusting screws clockwise until slight resistance is felt
3. Tighten lock nuts and test movement of arm.+
4. Re-adjust blades before use.

N. B. The arm should be adjusted prior to any adjustment of the shear blade.



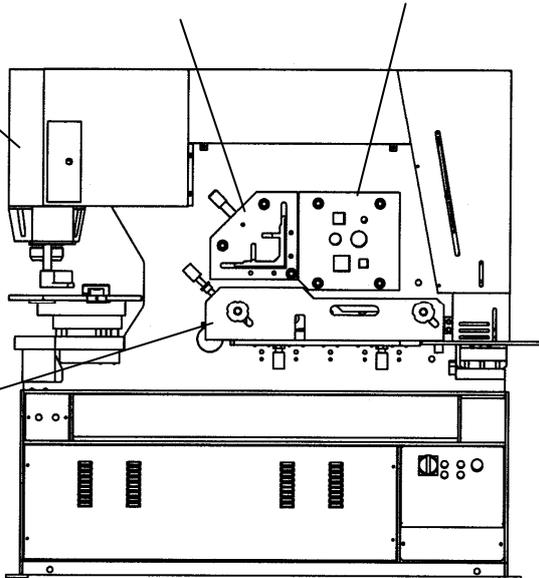
MULTI 125 HYDRAULIC STEELWORKER

NOTCH END

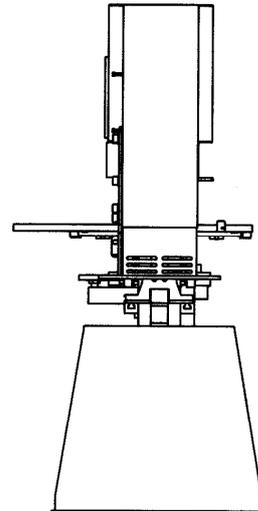


ANGLE CROPPING SECTION CUTTING

PUNCH END



SHEAR STATION



MULTI 125 HYDRAULIC STEELWORKER

9.11 PARTS LIST

When ordering spares always quote model, type and Serial Number of Machine.

Nr.	Part No.	Description	No. off
1		Main Frame	1
		<i>Arm Assembly</i>	<i>unit</i>
2	2702	Arm	1
3	2792	Main pivot bush	1
4	K205/0538	Clevis pin bush	1
5	2869	Main pivot	1
6	4103	Pivot locking ring	1
7	2258	Pressure pad	3
8	2393	Ram Pressure Plate	1
9	2263	Ram guide pad	1
10	2392	Top packing	1
		<i>Power pack assembly</i>	<i>unit</i>
11	K405/7320	Motor 7,5 KW	1
		<i>Power pack hyd assembly</i>	<i>unit</i>
12	L515/3240	Tank & lid	1
13	L820/1505	Bell housing	1
14	K715/7040	Pump	1
15	L820/2020	Drive coupling	1
17	L820/4517DC	Punch control valve	1
18	L820/4514DC	By-pass control valve	1
19	L820/45370	Relief valve	1
20	2346	Manifold	1
21	L820/5041	Filler/breather	1
22	L820/5010	Sight glass	1
23	L820/5030	Diffuser	1
24	L820/5020	Suction strainer	1
25	L815/9050	Punch cylinder (280mm bore)	1
26	L815/9060	Shear cylinder (200mm bore)	1
27	2444	Flex Pipe (Tank - Pump)	1
28	2443	Flex Pipe (Pump - Valves)	1
29	2442	Flex Pipe (Relief return)	1
30	3224	Flex Pipe (A - Punch cylinder)	1
31	3225	Flex Pipe (B - Punch cylinder)	1

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No.	Part No.	Description	No. off
32	3223	Flex Pipe (B - Shear cylinder)	1
33	3222	Flex Pipe (A - Shear cylinder)	1
		<i>Electrical box assy</i>	<i>unit</i>
34	2297	Electrical circuit diagram	-
35	K410/1045	Electrical box	1
36		Wiring Loom	1
37	K410/7009	Foot switch assembly	2
		<i>Cylinder parts</i>	
38	2761	Cylinder Pin	1
39	2703	Clevis	
40	2760	Clevis pin	1
41	2756	Punch cylinder washer	2
		<i>toolings</i>	
42	4931	P/E Removable Block	1
43	4985	Punch Bolster (see tooling)	1
44	2999	Bolster Washer	6
45	5774	Stripper Finger (left hand)	
46	5739	Bolster back bolt washer	1
47	9039	Adaptor (5 - 40mm) (see tooling)	1
48	9040	Adaptor (40 - 57mm) (see tooling)	
49	2891	Punch retaining ring (see tooling)	1
50	9006	Punch (see tooling)	1
51	9023	Die (see tooling)	1
52	2743	Shear blade (body) (see tooling)	1
53	2900	Shear blade (arm) (see tooling)	1
54	2126	Shear blade Cs/k washer	3
55	2401	Angle Blade (arm)	1
56	3931	Angle Blade (body)	2
57	3206	Section Blade (body) (see tooling)	-
58	3207	Section Blade (arm) (see tooling)	-
59	3511	Section Blade clamps (2 off)	1 set
60	2745	Notch Punch (see tooling)	1
61	2767	Notch Bolster (see tooling)	1
62	3930	Notch Die	1
63	3537	Notch Die	2
64	4994	Sliding Notch Guard	1
65	5775	Notch stripper finger (right hand)	1

MULTI 125 HYDRAULIC STEELWORKER

No.	Part No.	Description	No. off
66	2784	Notch table (std)	1
67	2282	Table support block	2
68	2418	Bolster clamps	2
69	2097	Notch guide	1
70	K705/1908	Kipp handle	3
		<i>Lubrication system</i>	<i>unit</i>
		<i>Punch stripper assembly</i>	<i>unit</i>
71	2763	Top plate	1
72	2407	Stripper pillar	2
73	2764	Stripper head	1
74	K705/3009	Stripper pillar spring	2
75	K705/3006	Stripper main spring	1
76	K605/1005	Knurled nut	1
77	K605/0020	Stripper location stud	1
		<i>Shear Hold down assembly</i>	<i>unit</i>
78	2795	Shear hold down	1
79	2079	Hold down adjusting screw	1
80	K705/2015	Star knob	2
		<i>Angle Hold down assembly</i>	
81	2397	Angle Hold down	1
82	2399 / 2266	Hold down screw (comp.)	1
83	2738	Hold down spacers	2
		<i>Section Hold down assembly</i>	
84	2737	Section hold down	1
85	2742	Shear support	1
86	2732	Screw support adj screw	4
87	2097	Shear guide	1
88	K705/2010	Kipp handle	1
		<i>Punch stroke limit assembly</i>	
		<i>Shear stroke limit assembly</i>	
89	K411/338282	Limit switch	4
90	2314	Actuator bracket	1
91	2319	Switch mounting plate	1
92	2412	Mounting plate spacer	2
93	3086	Actuator rod	1
94	3081	Actuator rod lug	1
95	2433	Limit switch actuator	3
96	2435	Rod fixed stop	3

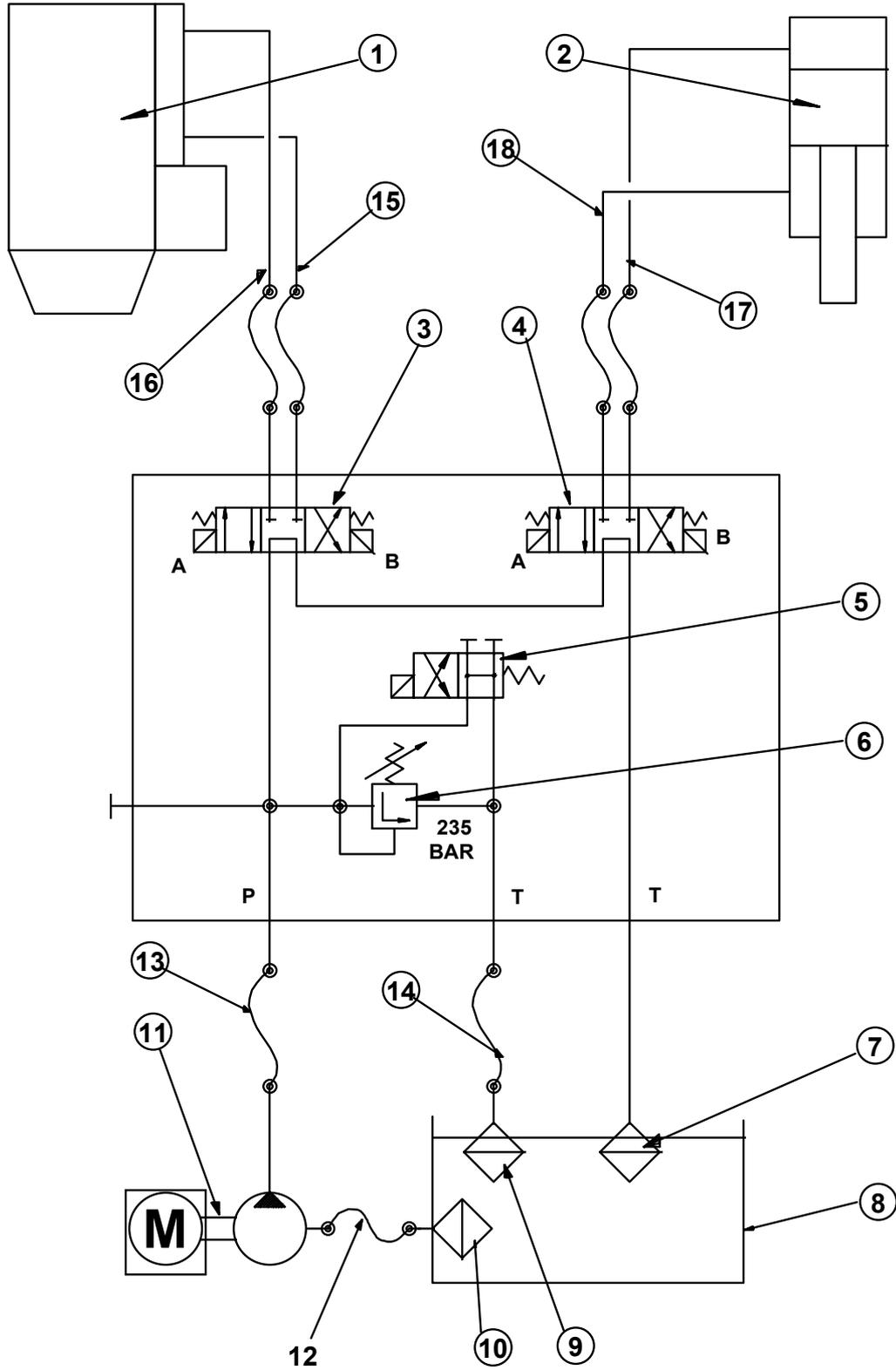
MULTI 125 HYDRAULIC STEELWORKER

No.	Part No.	Description	No. off
97	2290	Shear switch bracket	2
98	2339	Actuator shaft	1
99	2307	Shaft support	1
100	2340	Shaft swivel	1
101	2341	Shaft end boss	1
102	2277	Sludge tray	1
103	2802	Punch end cover (body side)	1
104	2803	Punch end cover (side plate side)	1
105	2806	Notch end cover	1
106	2804	Trunking	1
107		Machine stud	11
108		Rubber 'U' section	
109	3991	Aperture cover (shear)	1
110	3974	Aperture cover (angle)	1
111	3990	Aperture cover (section)	1
112	4990 & 4992	Top cover	1
113	4991 & 4989	Front cover	1
114	4993	Rear cover	1
115	4995	Body wing	1
116	4996	Side wing	1
117		Labels	1 set

MULTI 125 HYDRAULIC STEELWORKER

10 CIRCUITS

10.1 HYDRAULIC CIRCUIT



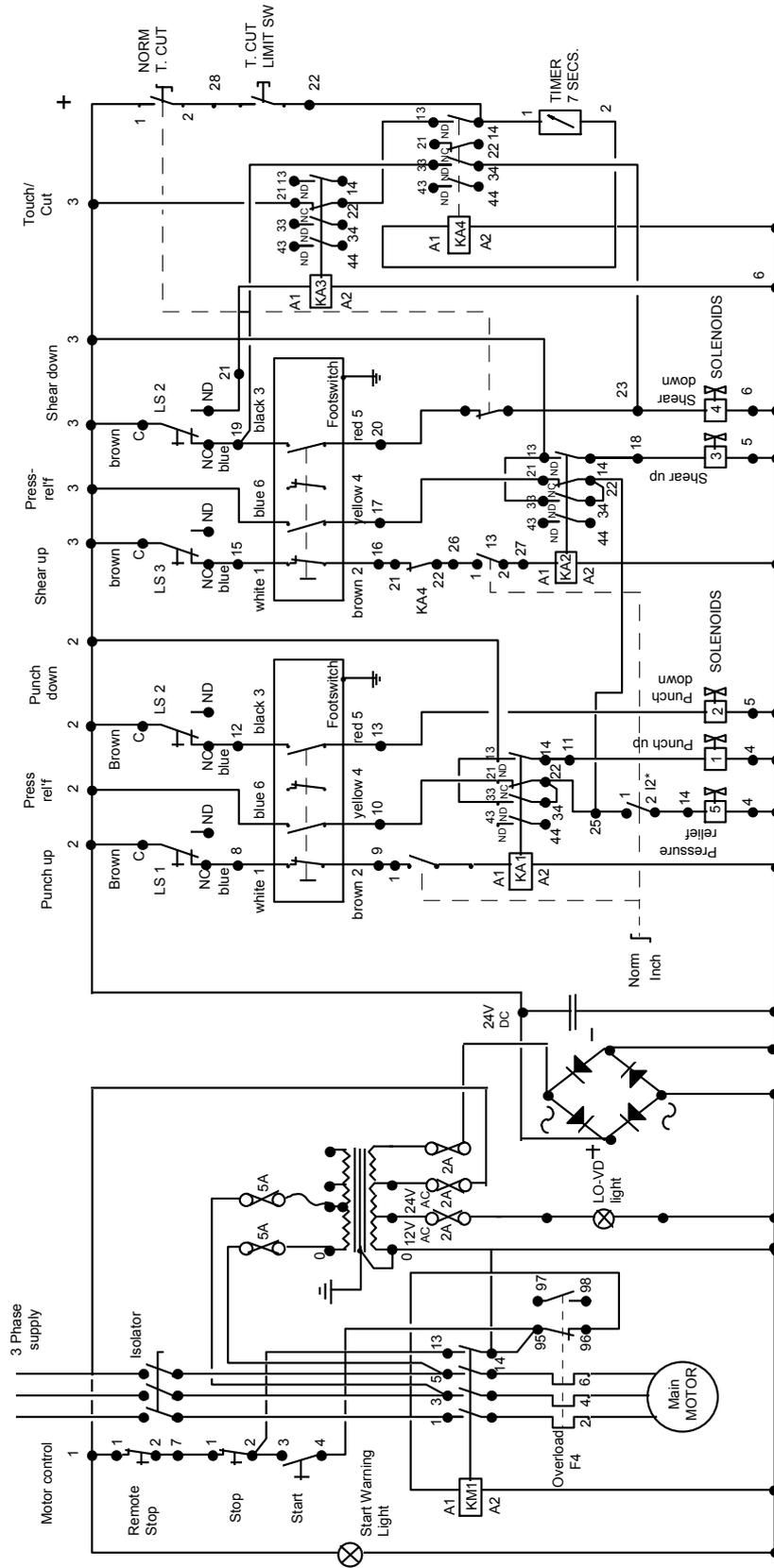
MULTI 125 HYDRAULIC STEELWORKER

Parts of the Hydraulic Circuit:

No.	Part No.	Description	No. off
1	L815/9050	Punch cylinder	1
2	L815/9060	Shear cylinder	1
3	L820/4517DC	Punch control valve	1
4	L820/4517DC	Shear control valve	1
5	L820/4514DC	By-pass control valve	1
6	L820/45370	Relief valve	1
7	L820/5030	Diffuser	1
8	L515/3240	Tank	1
9	L820/5030	Diffuser	1
10	L820/5020	Suction strainer	1
11		Pump	1
12	2444	Flex Pipe (Tank - Pump)	1
13	2443	Flex Pipe (Pump - Valves)	1
14	2442	Flex Pipe (Relief return)	1
15	3225	Flex Pipe (B - Punch cylinder)	1
16	3224	Flex Pipe (A - Punch cylinder)	1
17	3223	Flex Pipe (B - Shear cylinder)	1
18	3222	Flex Pipe (A - Shear cylinder)	1

MULTI 125 HYDRAULIC STEELWORKER

10.2 ELECTRICAL CIRCUIT



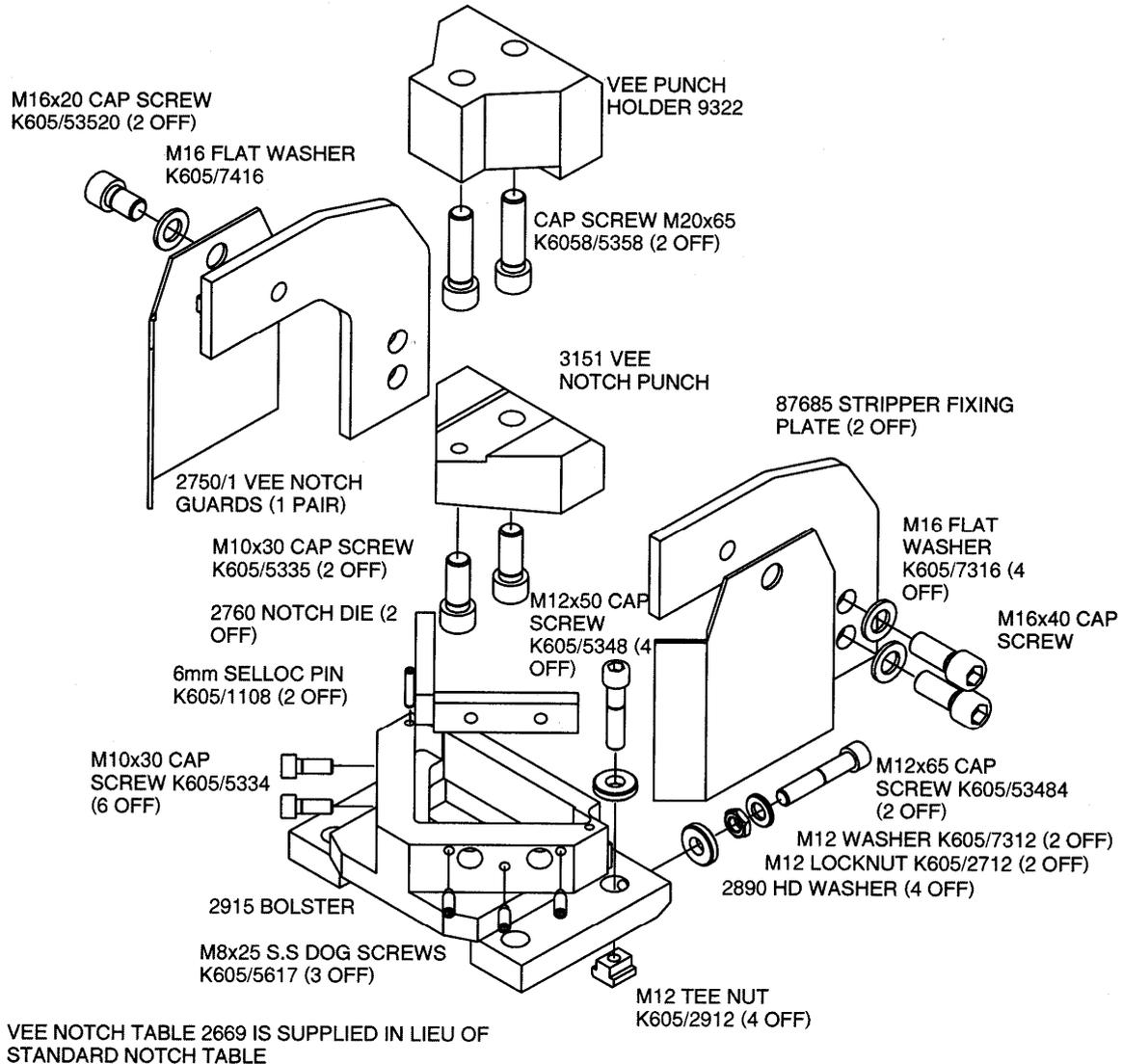
*THIS SWITCH IS NOT FITTED TO 160/175XS MACHINE!

MULTI 125 HYDRAULIC STEELWORKER

11

12 SPECIAL TOOLING

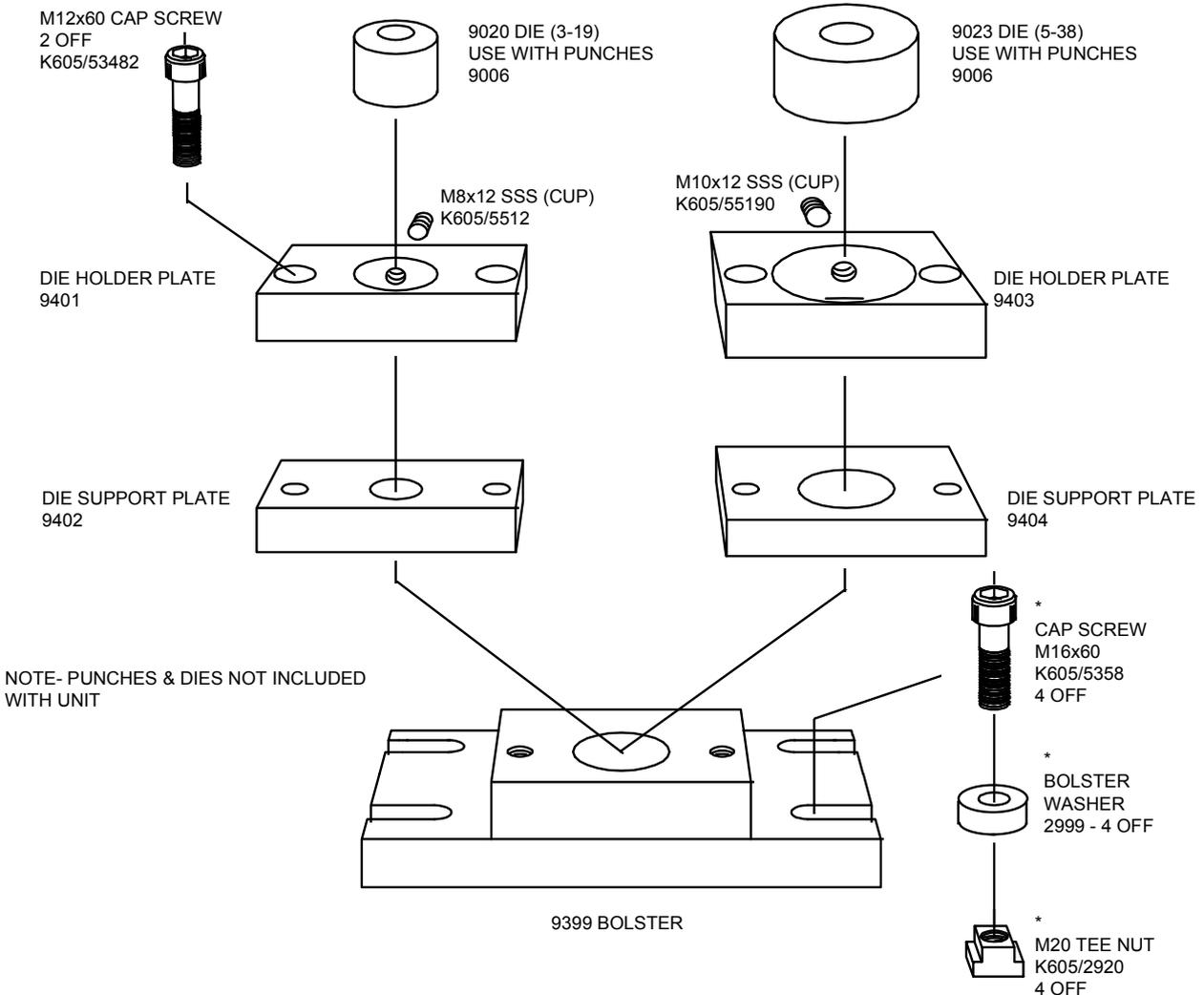
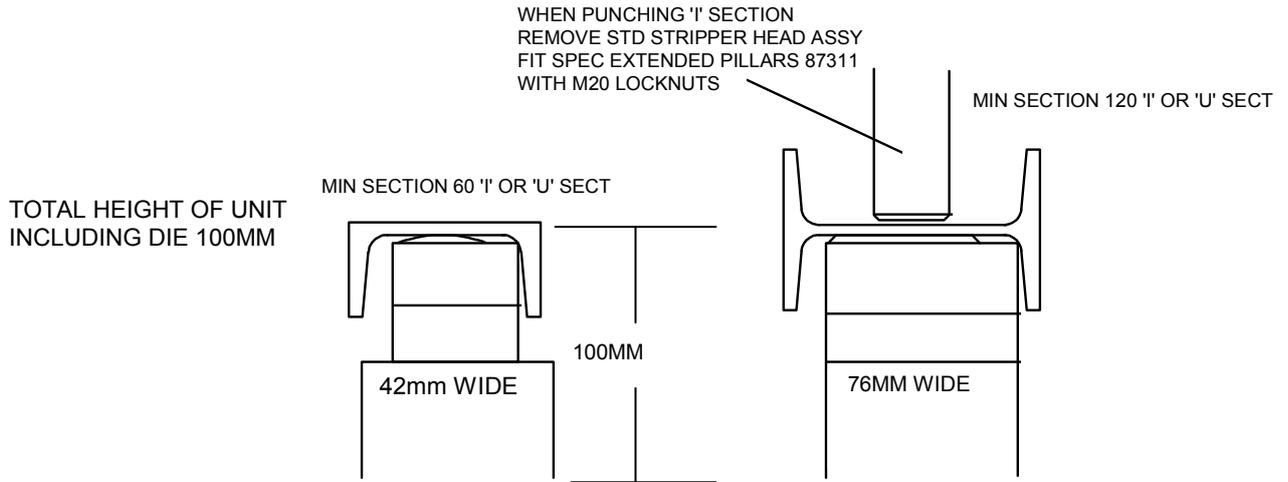
12.1 90° VEE NOTCH TOOLING ARRANGEMENT



RECOMMENDED DIE CLEARANCE 0.15-0.20MM

MULTI 125 HYDRAULIC STEELWORKER

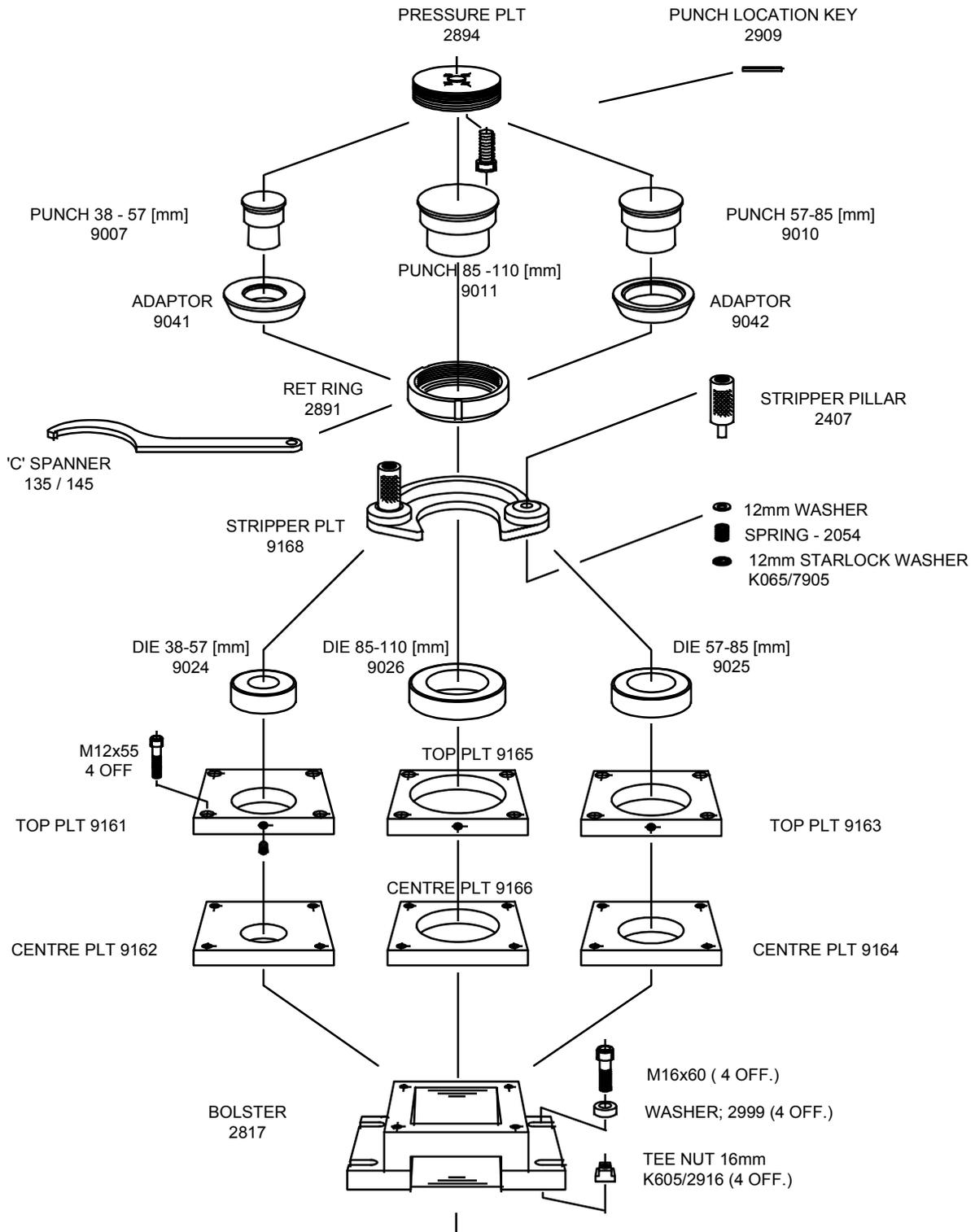
12.2 WEB PUNCHING ARRANGEMENT FOR 'I' & 'U' SECTIONS



* THESE ITEMS ARE FROM STANDARD PUNCH BOLSTER ASSY

MULTI 125 HYDRAULIC STEELWORKER

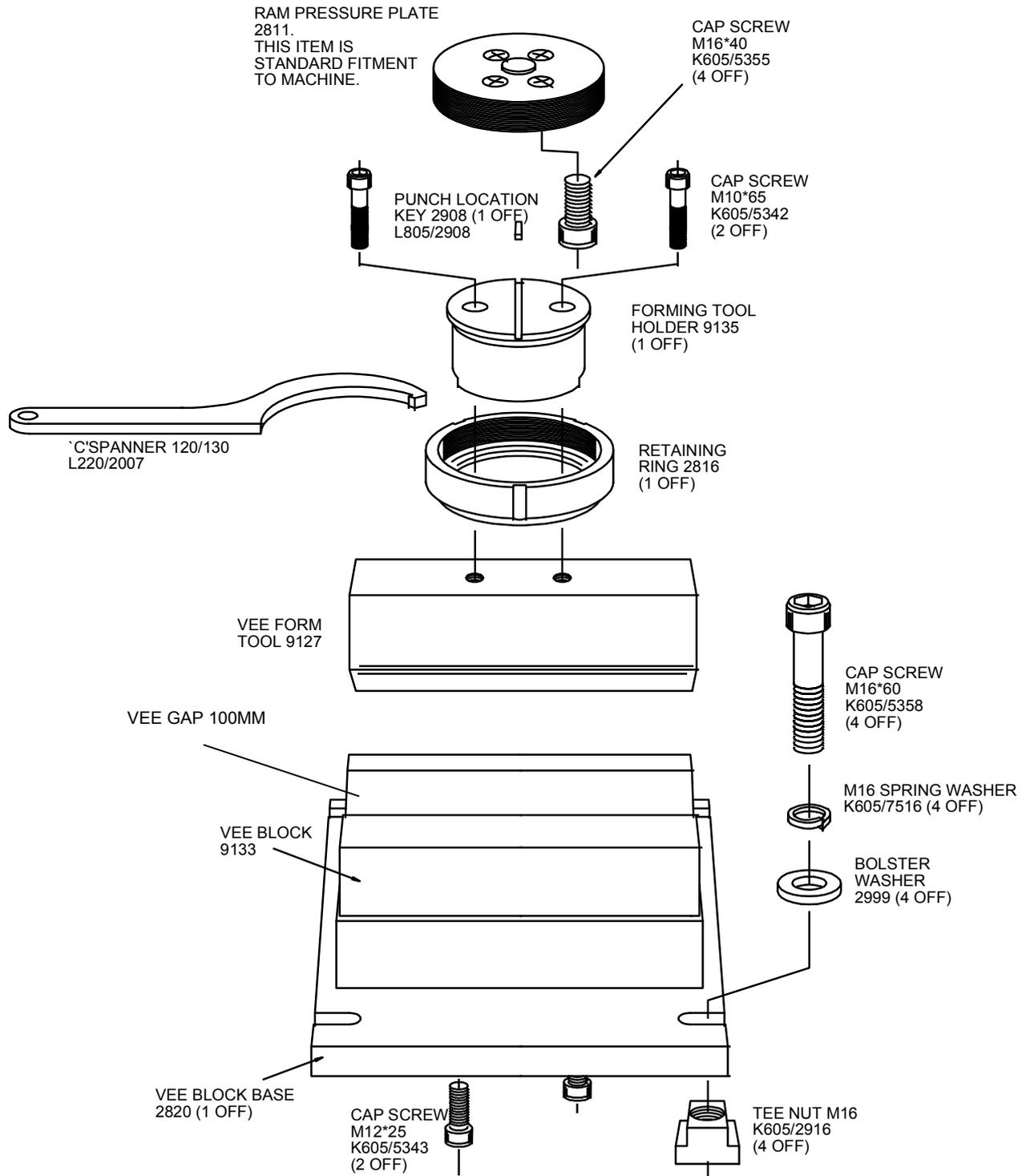
12.3 LARGE HOLE PUNCHING



Note: Punches and Dies are not supplied with unit!
 Optional Punch Table available, Part No. 87053.

MULTI 125 HYDRAULIC STEELWORKER

12.4 BAR BENDING UNIT



To calculate the required tonnage for bending use the following formula:

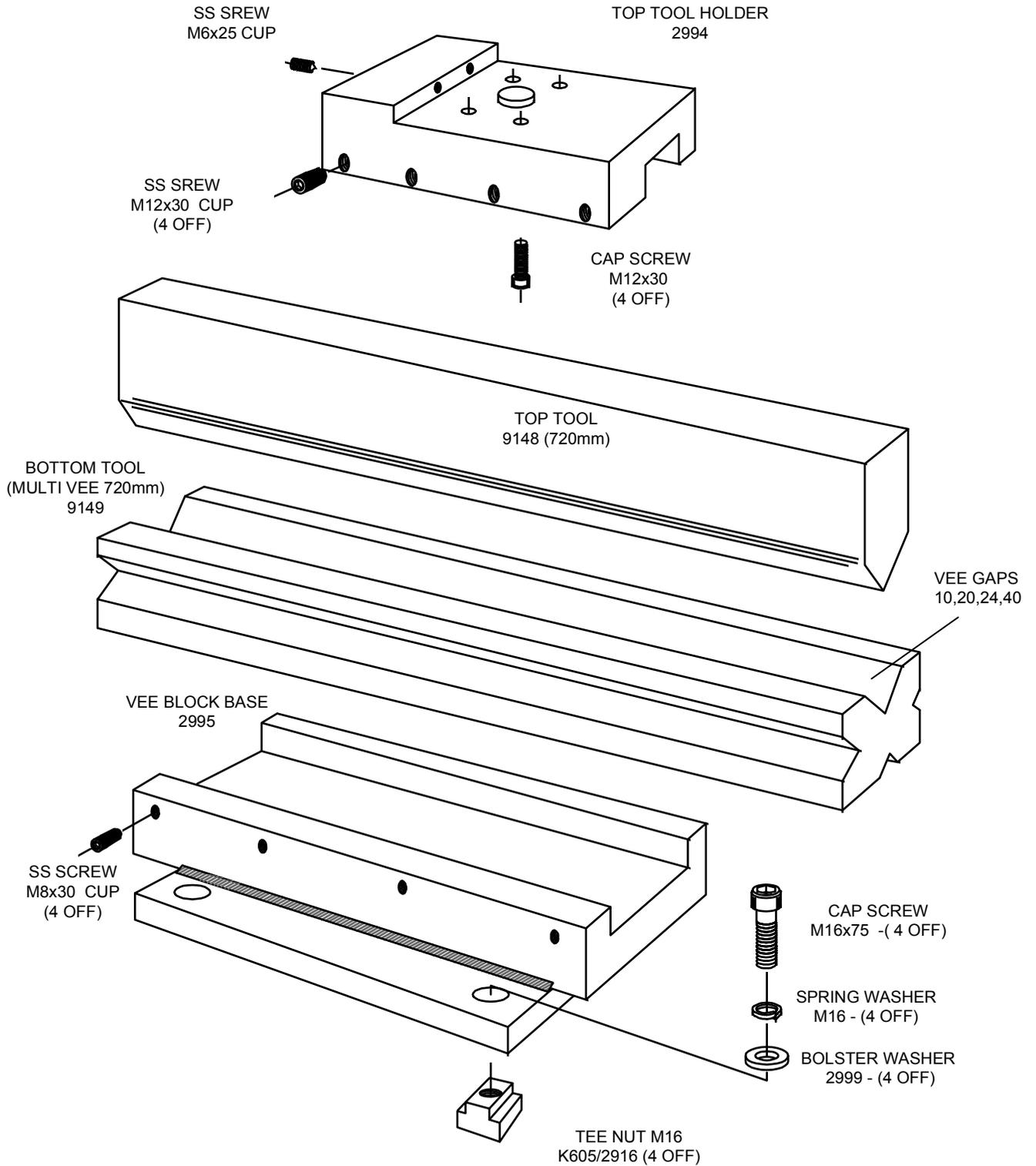
$$\text{Tonnage} = \frac{\text{plate thickness}^2 \times 1.42 \times 45 \times \text{plate length}}{1000 \times \text{vee gap}}$$

When bending always ensure work-piece is positioned central on VEE-Block to avoid side loading ram. Air bending only. Adjust down stroke limit switch to avoid unnecessary pressuring of machine.

Capacity: 250 * 22 [mm²]

MULTI 125 HYDRAULIC STEELWORKER

12.5 SHEET BENDING UNIT

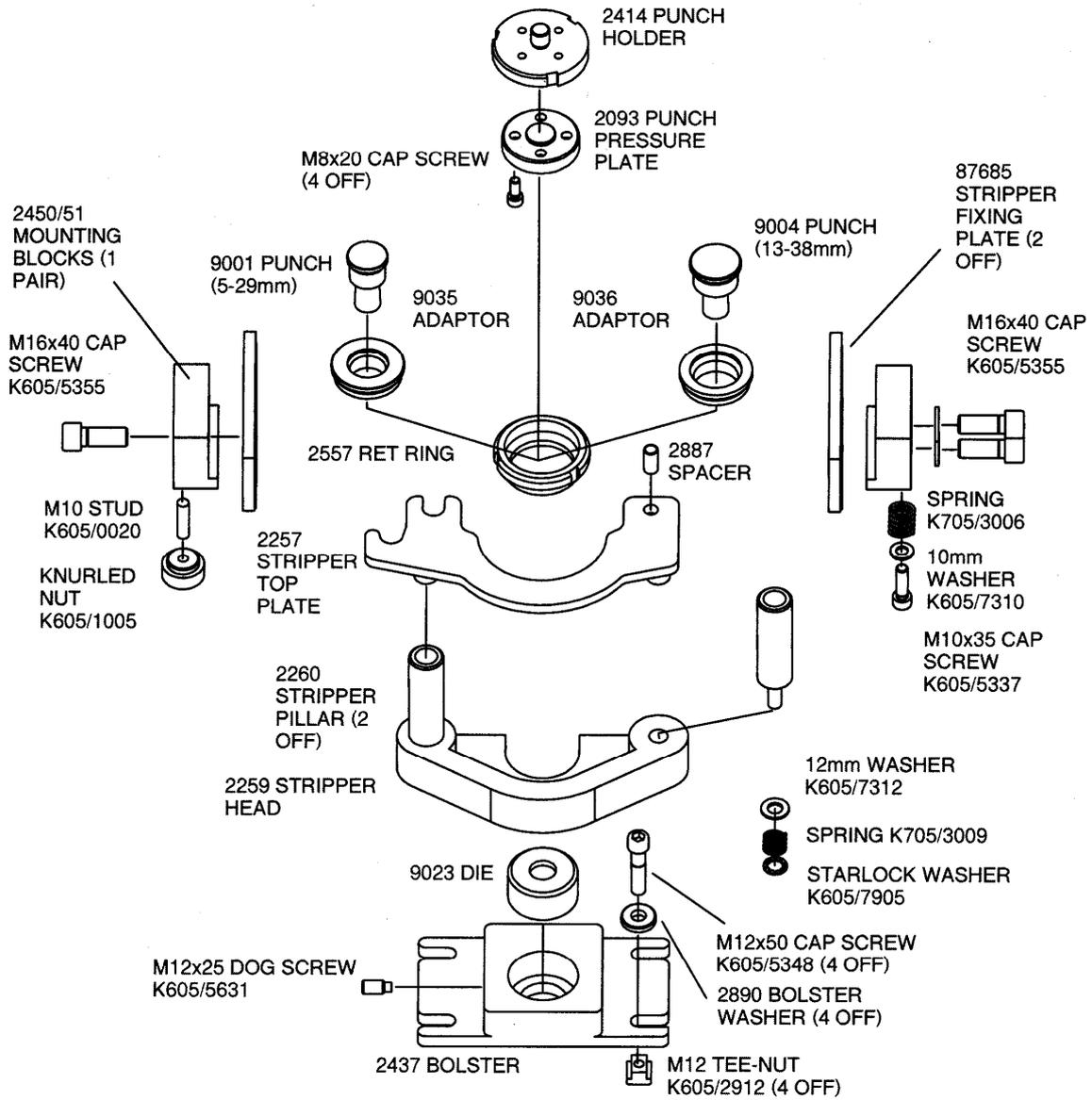


When bending always ensure work-piece is positioned central on VEE-Block to avoid side loading ram. Air bending only. Adjust down stroke limit switch to avoid unnecessary pressuring of machine.

Capacity: 700 * 3 [mm²]

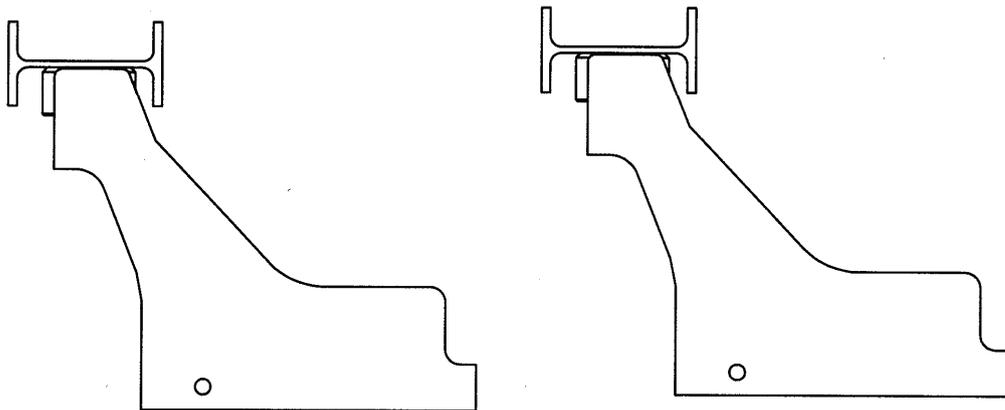
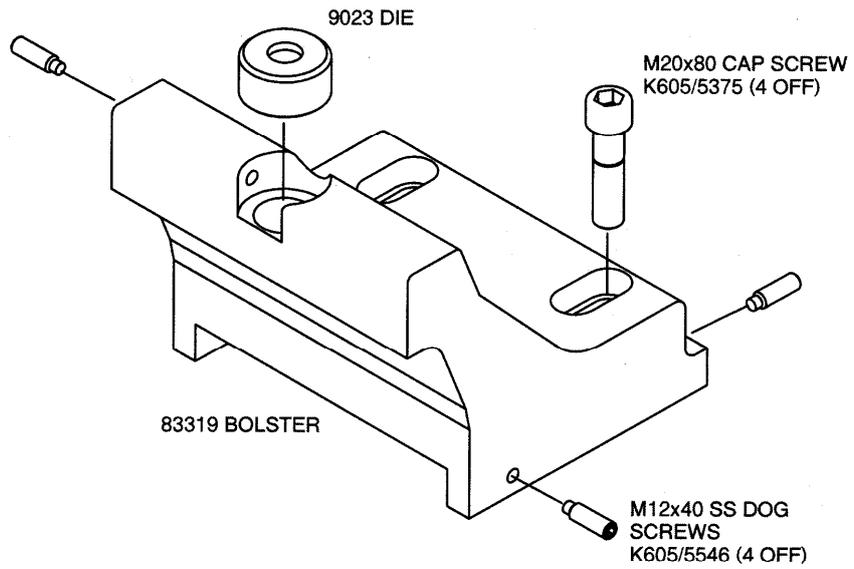
MULTI 125 HYDRAULIC STEELWORKER

12.6 NOTCH END PUNCHING



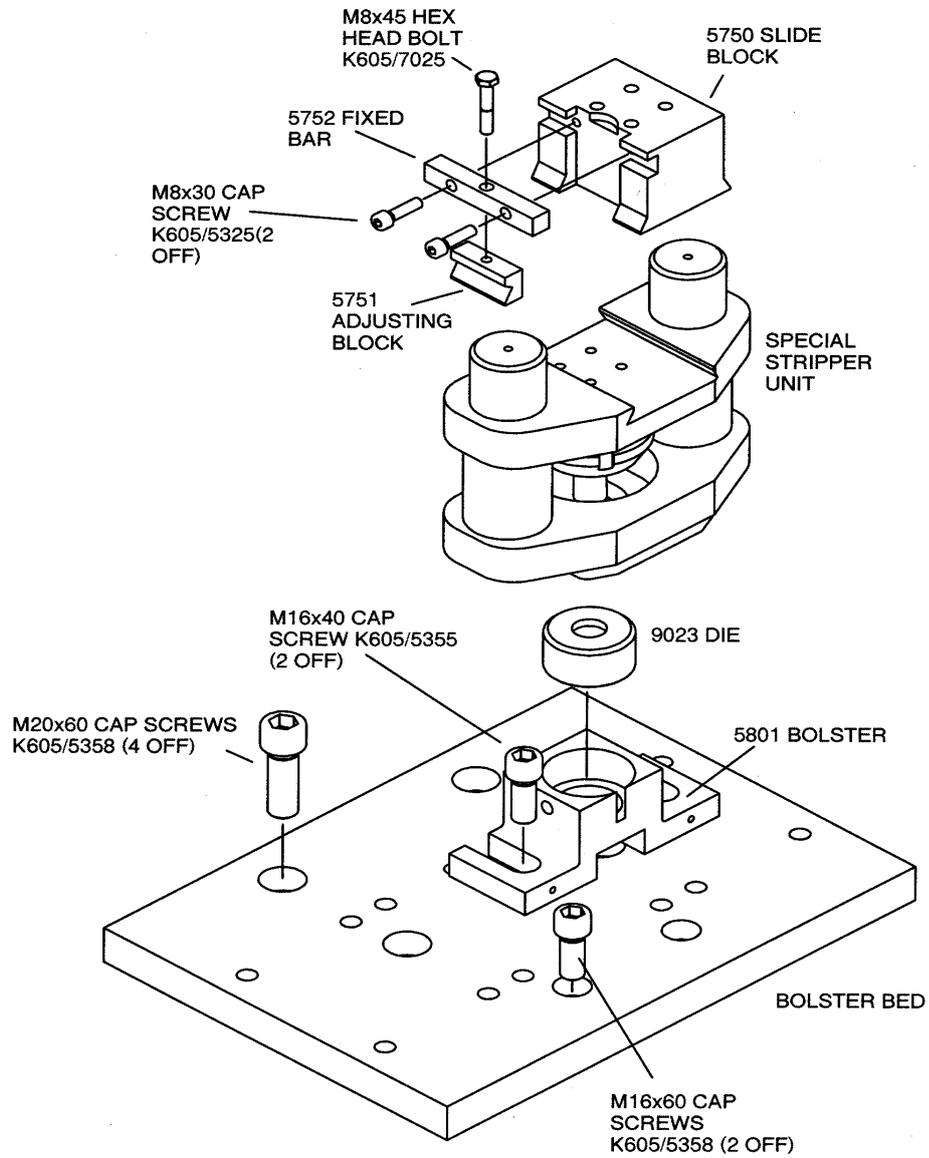
MULTI 125 HYDRAULIC STEELWORKER

12.7 SWAN NECK BOLSTER.



MULTI 125 HYDRAULIC STEELWORKER

12.8 DOVETAIL QUICKCHANGE ATTACHMENT



MULTI 125 HYDRAULIC STEELWORKER

13 SOUND LEVEL TEST

13.1 MAX. SOUND PRESSURE LEVEL

RESULT SHEET

Site:

Date: 09.06.1993

Monitoring Equipment: RS 292 + RS 294

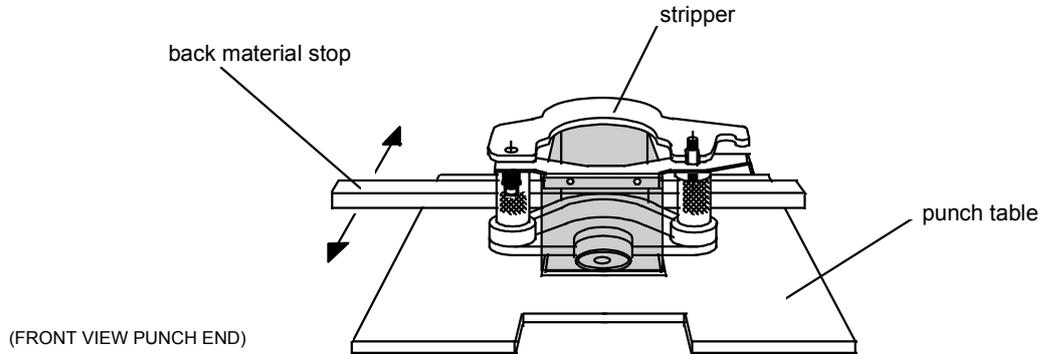
MACHINE UNDER TEST	MONITORING POSITION	TIME IN USE	5 min. LEQ	MAX SPL	MIN SPL	AVG SPL	COMMENTS
Multi 125	1m	-	-	72,8 dB	-	-	-
Multi 125D	1m	-	-	72,8 dB	-	-	-
125P	1m	-	-	72,8dB	-	-	-

13.2

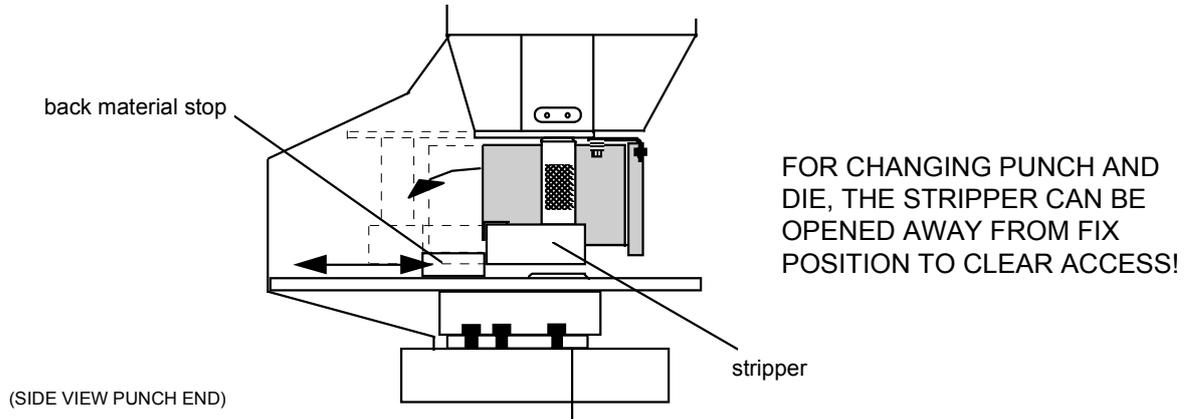
MULTI 125 HYDRAULIC STEELWORKER

14 MANUAL APPENDIX

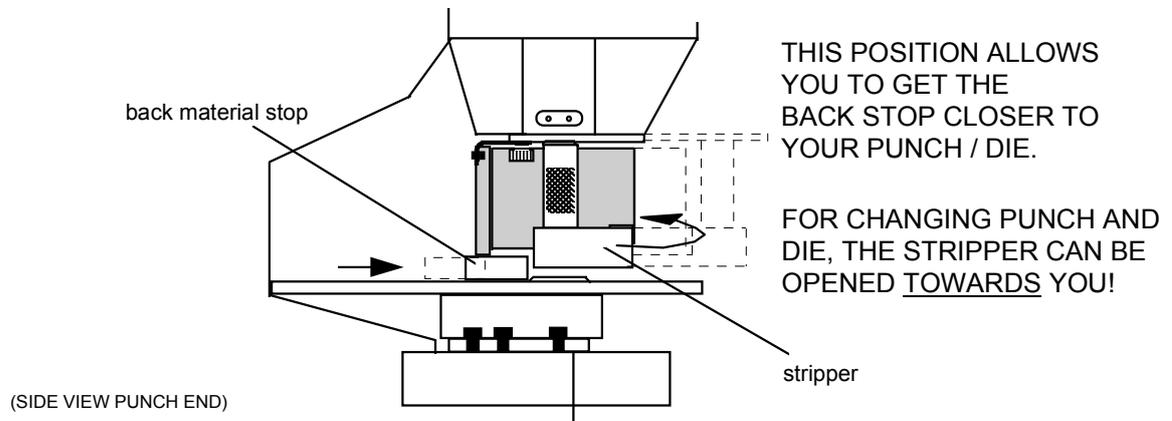
14.1 POSITIONING OF THE PUNCH STRIPPER



NORMAL STRIPPER POSITION



REVERSED STRIPPER POSITION

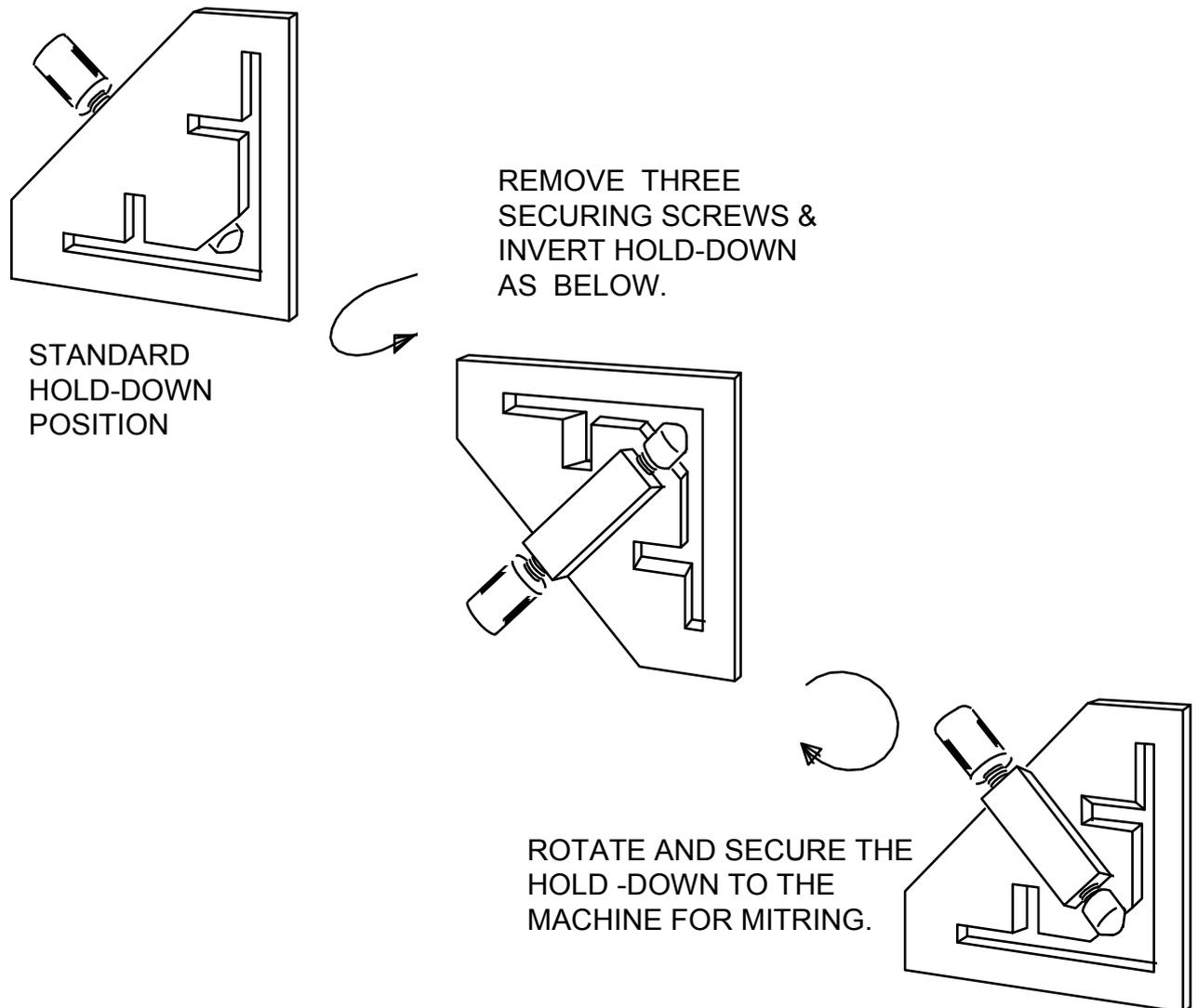


MULTI 125 HYDRAULIC STEELWORKER

14.2 MITRING ANGLE 45 DEGREES ON MULTI MACHINES

Since the introduction of the requirements for health and safety, the accessibility and distance between hold-downs and blades have been amended.

To this effect the operation of mitring angle in the angle cutting station requires the following simple hold-down adjustment.



Once the hold-down is secured for mitring as position 3, it is also possible to use the hold-down for cutting angle at 90 degrees if required.