

Name and Address

**of Manufacturer: THE KINGSLAND ENGINEERING COMPANY LTD
WEYBOURNE ROAD
SHERINGHAM
NORFOLK NR26 8HE
ENGLAND**

Year of Manufacture:

Model Type: COMPACT 60 HYDRAULIC STEELWORKER

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

Weight of Machine: 1,250 KG NET

KINGSLAND COMPACT 60 HYDRAULIC STEELWORKER

This Kingsland 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 machines, should first be sought from the supplier, or alternatively from the manufacturer:

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1 SAFETY NOTES FOR KINGSLAND 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.

Kingsland 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.

1. The main areas of deviation from design criteria would probably be:
2. The use of materials other than mild steel (45 kg/mm²)
3. The incorrect use of material hold-downs
4. 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.

All maintenance should be carried out by suitably qualified personnel and particular attention must be paid to the correct setting and alignment of punches and dies, blades and other tools.

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 | 1,520 x 590 x 1,700 (+100mm lifting eye) |
| Die Height from floor | 940 [mm] |
| Shear Support from floor | 940 [mm] |
| Angle Support from floor | 1,140 [mm] |
| Notch Height from floor | 940 [mm] |

2.2 CAPACITIES

(Full details, see page 26-27.)

| | |
|-----------------|--|
| Punching* | 38 dia x 11mm or 28dia x 15 mm |
| Shearing | 200 x 20mm or 300 x 15mm |
| Angle Cutting | 127 x 12mm |
| Section Cutting | 40 mm Round, 35mm Square |
| Notching | 10 mm Thickness |

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

| | |
|------------------------------------|-------------------|
| Punch Pressure | 600 kN or 60 Tons |
| *Standard Size Fitment Punch & Die | 22 mm |

2.3 STANDARD EQUIPMENT SUPPLIED WITH MACHINE

| | |
|-----------------------------|---------------------------------------|
| Punch Retaining Ring | 2557 |
| Punch Adaptor | 9036 |
| Punch & Die (1 set x 32 mm) | 9004 - 22 & 9023 - 22 |
| Punch Bolster | 3319 |
| Shear Blade (1 set) | 3409 & 3309 |
| Angle Blades (1 set) | 3549 & 3550 (Arm), 3548 & 3547 (Body) |
| Section Blades (1 pair) | 3427 & 3428 |
| Notch Punch & Dies (1 set) | 3310, 3537 (2) & 3536 |
| Notch Bolster | 3315 |

Tool Kit comprising:

- 'C' spanner 80 / 90
- Punch Adaptor 81029, 81031, 9035
- Punch Location Key L805/2700
- 12mm star lock washer (6 off) K605/7905
- 19 and 24mm Open-Ended Spanner
- Allen Key 4, 5, 6, 8, 10, 12, 14, 17mm

3 BRIEF DESCRIPTION OF MACHINE

3.1 PUNCHING (For details see pages 8-15)

The large punch bed area 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 26-27).

Additional tooling in this versatile work station can provide bending (max. length 150mm), 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.

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 234 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 and stop motor with foot on footswitch if machine does not operate reverse two of the incoming 3 phase connections.

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.

3.8 OVERLOADING

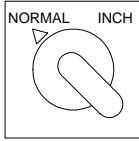
In the event of an accidental overload to the hydraulic circuit, the oil will be diverted direct back to the tank via a relief valve, until the overload condition is removed.

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.

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 Position

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

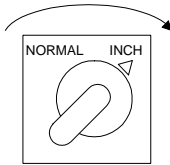
3.10.2 Normal Operating

With Selector Switch to **NORMAL** the arm 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 arm down by full depression of switch, the arm may be held in any position of the stroke by raising the foot to the mid-position. Remove foot and arm 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 mode of operation **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 run position.

4 PUNCHING WORK STATION

4.1 GENERAL DESCRIPTION

The punch station is a particular well equipped station. It offers many features normally associated with much larger machines.

The large punch bed area is designed to give a very wide range of punching applications, including overhang work in small channel sections. The punch table is particularly useful when the side and back stops are set for small repetitive work. This coupled with a finely adjusted stroke length gives a very productive machine. The table is assembled in two parts of which the front is removable for flange punching.

The punch is retained by means of locking ring part 2557, 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 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.**

4.2 PUNCH TOOLING

The Punch and Die should be checked for alignment, prior to punching any material. Standard size fitted 22mm, 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.
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 placed and extracted with suitable handling aids, extra guarding may be required too ensure operator safety.
8. Stay within the rated capacity of the machine.

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 |

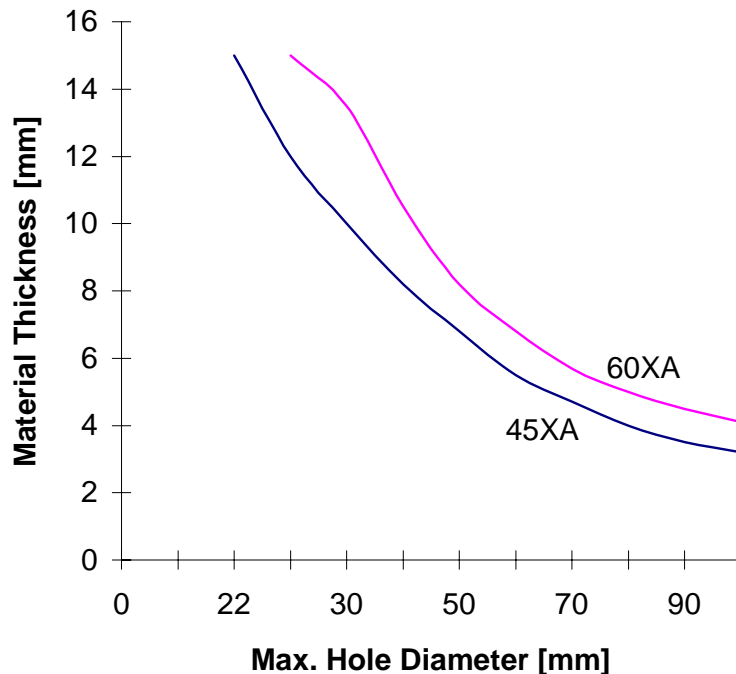
Die clearance: It is normal practice to aim for a clearance of 10% material thickness.

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

The graph shows the punch capacity curves for the Compact 60 and 45 machines. As an example it can be seen to punch material 15mm thick, the maximum diameter is 22mm on the Compact 45 and the maximum diameter on the Compact 60 is 28mm. As an alternative it is possible to calculate a capacity by using the machine constant. By dividing the machine constant by the material thickness will give the maximum diameter through that thickness.



The machine constants are:

| | |
|------------|-----|
| Compact 45 | 330 |
| Compact 60 | 420 |

If you want to calculate the max. Material thickness / max. hole sizes use one of the following formulars:

Constants / Material Thickness = max. Diameter

or:

Constants / Diameter = Max. Material Thickness

Note:

All capacities are based on materials to be punched having a tensile strength of 45 kg/mm². Always keep within the rated capacity of the machine and never attempt to punch a hole smaller in diameter than the thickness of material being punched.

1. Example:

You are going to work with a material of 10mm thickness on a Compact 60 machine.
The max. hole size is then calculated by:

$$420 / 10 = 42 \text{ [mm]} \quad \Rightarrow \text{The max. hole size is 42mm.}$$

2. Example:

Your punch / die diameter is 26mm.

The max. material thickness you can punch is calculated by:

$$420 / 26 = 15,4 \text{ [mm]} \quad \Rightarrow \text{The max. material thickness is 15mm.}$$

This system will probably prove to be convenient because when the machine capacity constant has been memorised, no tables or graphs are required to establish max. diameters through a known thickness of material.

Please Note:

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

4.6 BAR BENDING FACILITY AT PUNCHING STATION

Press Brake type tooling is available for fitting at the Punching Station giving press brake capacity of 150mm x 12mm.

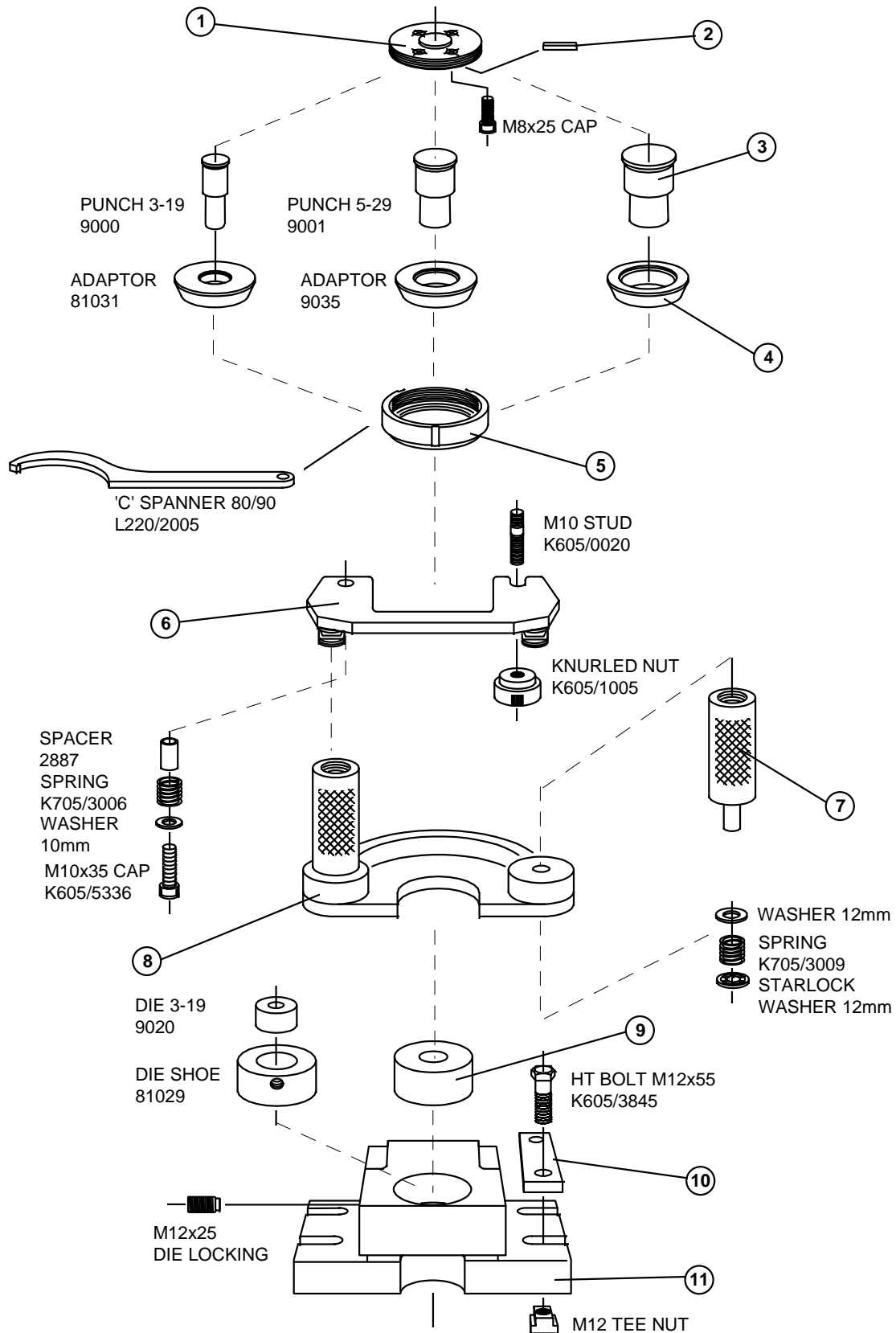
IMPORTANT NOTICE - HEALTH & SAFETY AT WORK ACT, SECTION 6

Bending tools must not be fitted to this machine until adequate safety measures have been implemented. It is normally permitted to use the bending tools without additional fixed guarding provided the following steps have been taken:

1. The clearance between the top tool and the work piece is kept to a minimum and must not exceed 6mm at any time.
2. The bending tool is set by a skilled and competent person.
3. A lockable cover has been fitted to prevent unauthorised alteration of limit switch.
The key should be retained by the setter.

Bending Tools are supplied with suitable cover and lock as standard.

4.7 STANDARD PUNCH TOOLING



In the following table you can find a list of the standard punch tooling for the Compact 60. It includes which equipment is supplied with the machine. The standard punch tooling includes 22mm punch (9004) and die (9023). Other punches and dies are available on request.

| No. | Part No. | Description | No. off |
|-----|-----------|--------------------|---------|
| 1 | 2093 | pressure plate | 1 |
| 2 | L805/2700 | punch location key | 1 |
| 3 | 9004-22 | Punch 22 mm dia. | 1 |
| 4 | 9036 | Adaptor | 1 |
| 5 | 2557 | retaining ring | 1 |
| 6 | 3335 | stripper top plate | 1 |
| 7 | 2407 | stripper pillar | 1 |
| 8 | 3336 | stripper head | 2 |
| 9 | 9023-22 | Die 22 mm dia. | 1 |
| 10 | 2556 | bolster clamp | 2 |
| 11 | 3319 | bolster | 1 |

4.8 LARGE HOLE PUNCHING

Extra equipment available for punching up to 110mm dia.

This unit comprises:

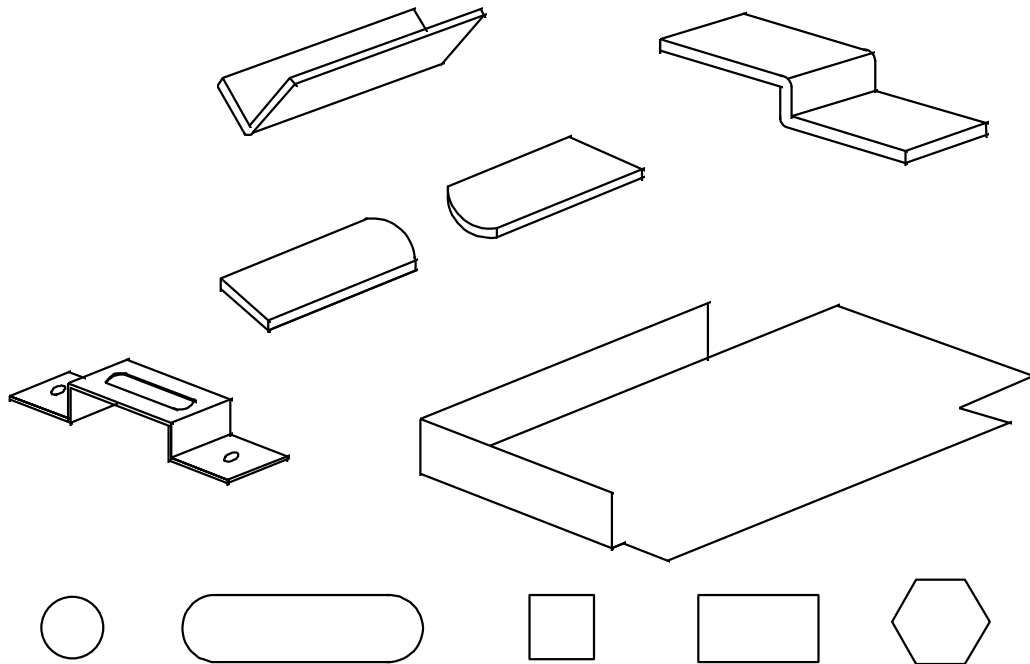
- Special ram pressure plate
- Adaptors
- Retaining Ring
- Bolster with die holder plates
- Large hole stripper head

Punch and die sets available for this unit -
 For hole sizes up to - 57mm dia
 85mm dia
 110mm dia

For drawing and part numbers see page 40.

4.9 TYPICAL APPLICATIONS

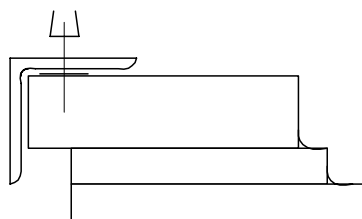
(achieved with special tooling at punch station)



4.10 FLANGE PUNCHING

The standard bolster (3319) can accommodate flange punching in small sections. To achieve the correct back-mark it will be necessary to use an eccentric die so as to off-set the bolster.

The front portion of the punch table must be removed and the bolster re-positioned for flange punching.



NORMAL FLANGE PUNCHING



ECCENTRIC FLANGE PUNCHING

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.

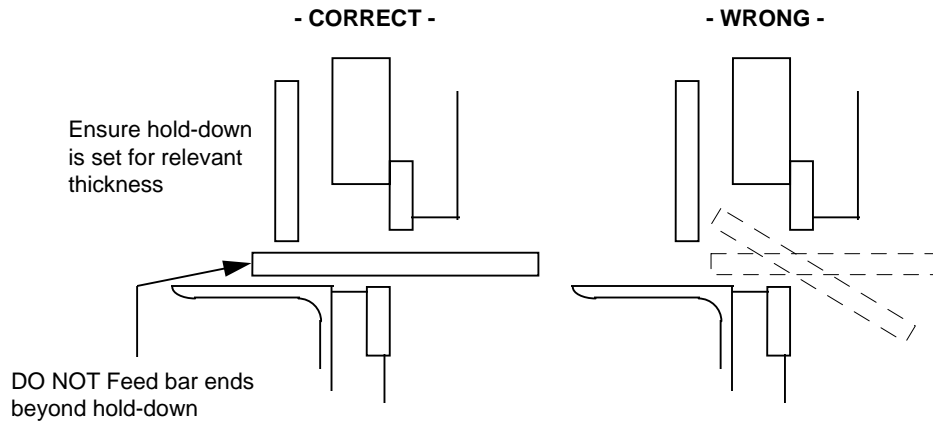
Parallel top blades can be supplied (Pt. No.3309) to order for cutting narrow bar widths or where flatness of cut is not so important.

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 0.10mm. 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.

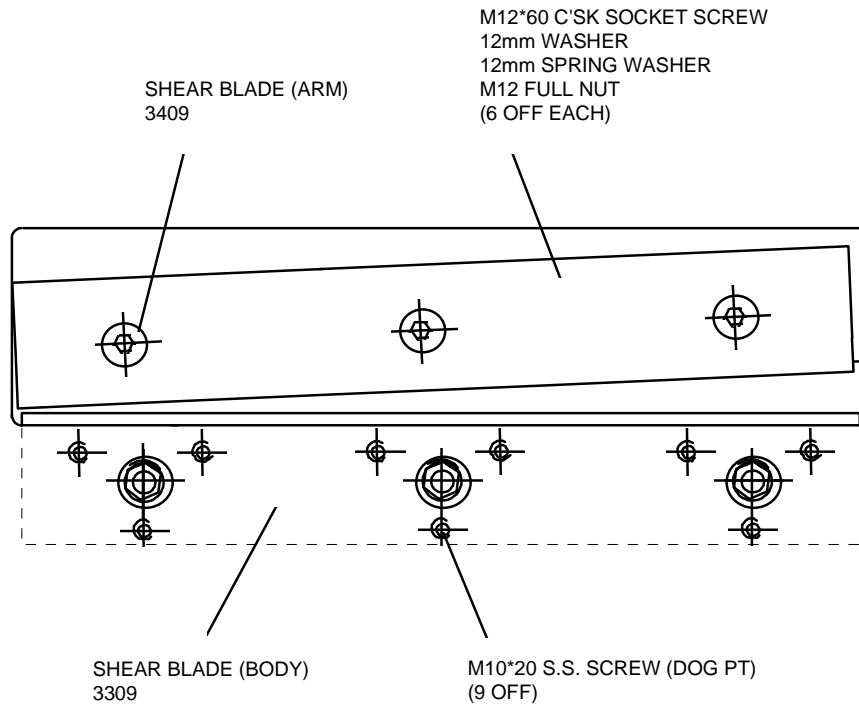
**WHEN ORDERING SPARE BLADES, ALWAYS QUOTE -
MODEL, TYPE AND SERIAL NUMBER OF MACHINE.**

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.



5.3 SHEAR BLADES



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.

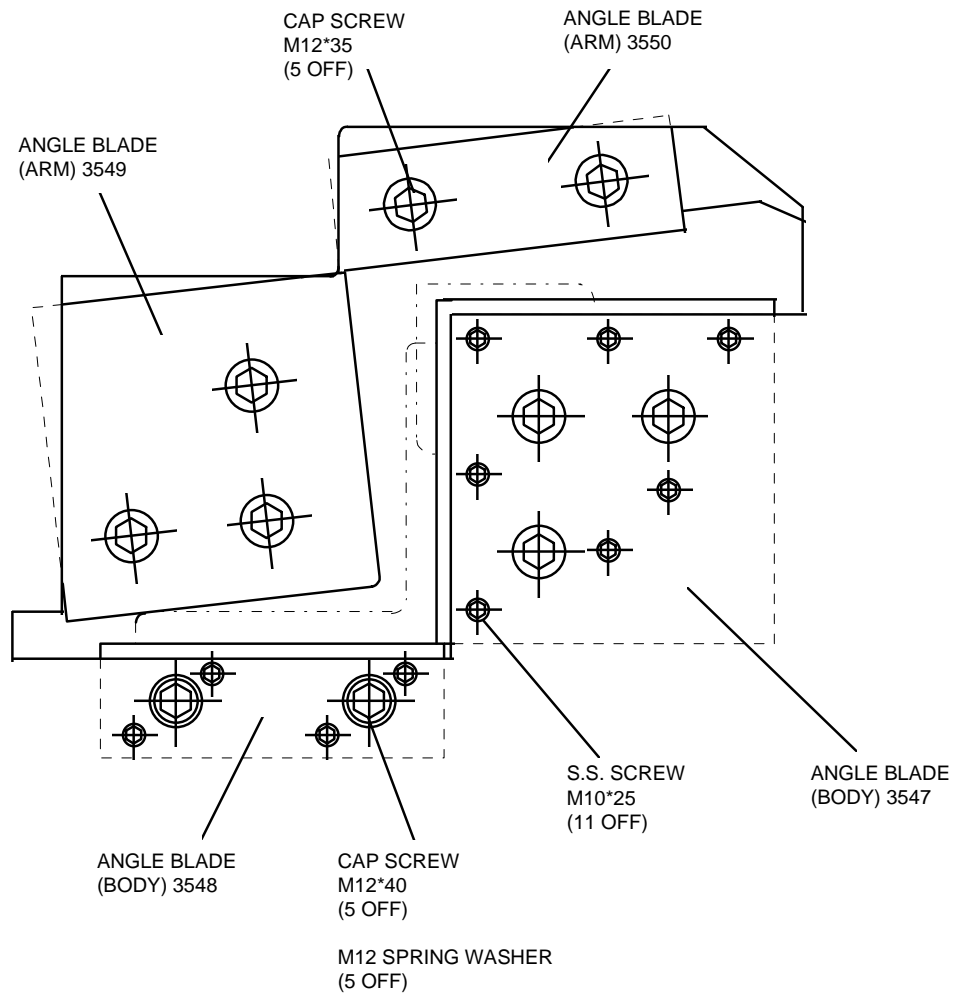
Each cutting blade has four cutting edges and is retained by simple fixing screws.

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

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

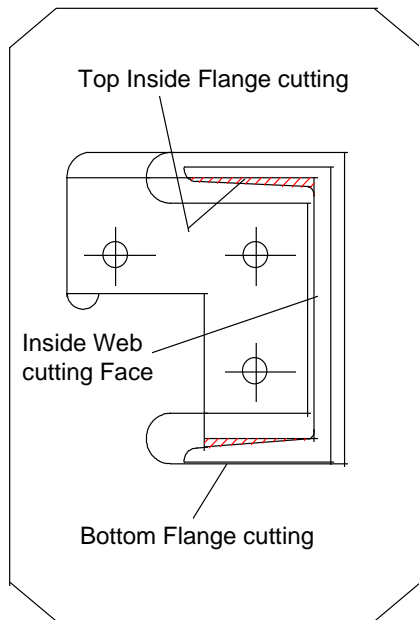
6.2 ANGLE TOOLING - GENERAL GUIDES

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.



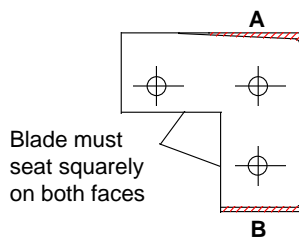
6.3 GRINDING OF CHANNEL INSERT BLADES

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.

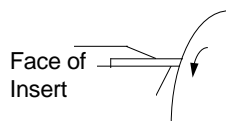
Having mounted channel correctly, scribe round inside of channel flanges.



- 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

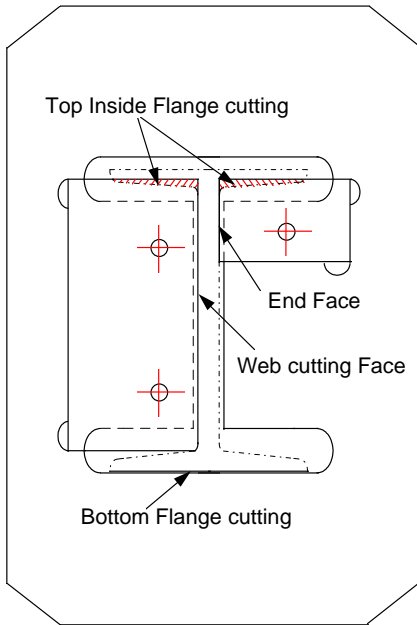
Grind insert blades to lines scribed, shown shaded in sketch.



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

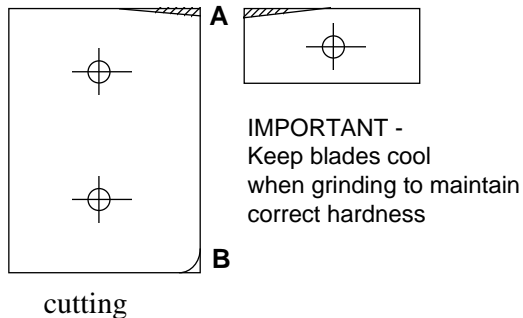
6.4 GRINDING OF JOIST INSERT BLADE

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.

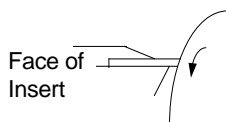
Having mounted joist correctly, scribe round inside of joist flanges.



- 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 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.

7 SECTION CUTTING

7.1 DESCRIPTION

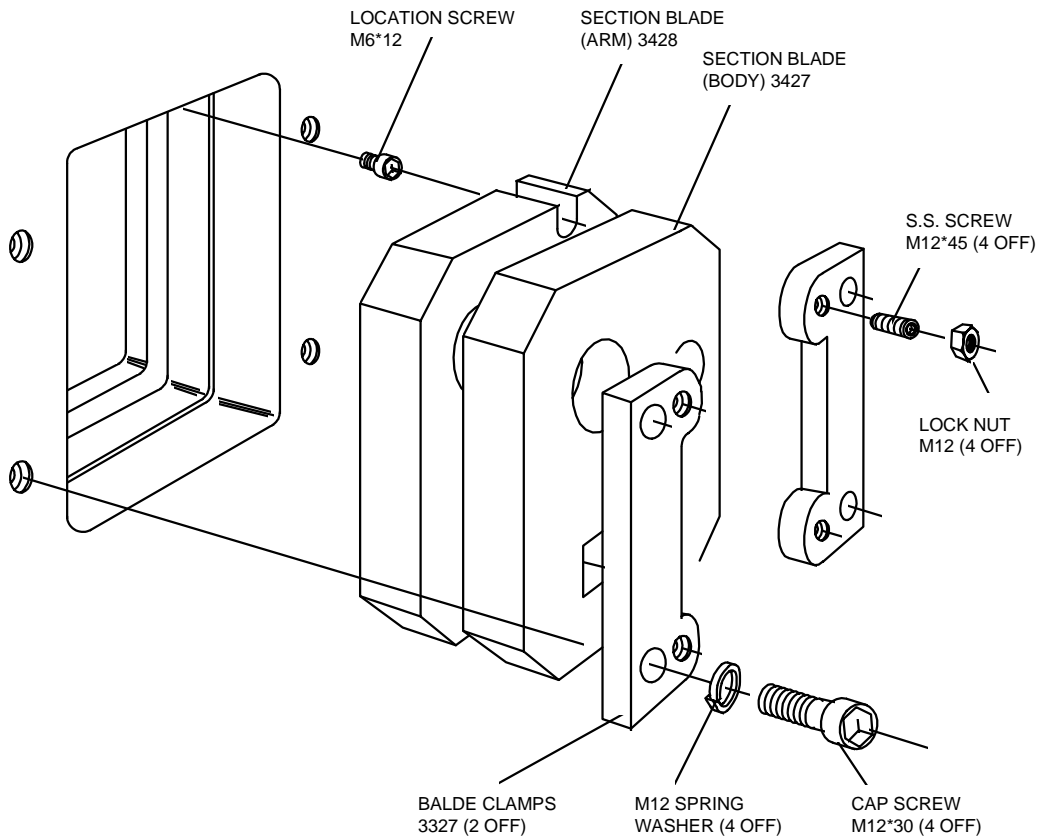
A variety of sections can be cropped at this aperture - round and square sections, unequal angle, channel, joist etc.

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 clamp to frame.

Tighten the four SS screws, then release each one 0,2 of a turn.

Tighten locknut whilst holding the SS screw with alan key.

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.
- ⇒ The blade clamps are marked (RH) right hand and (LH) left hand, ensure they are replaced correctly.
- ⇒ 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.

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

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.

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.

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:

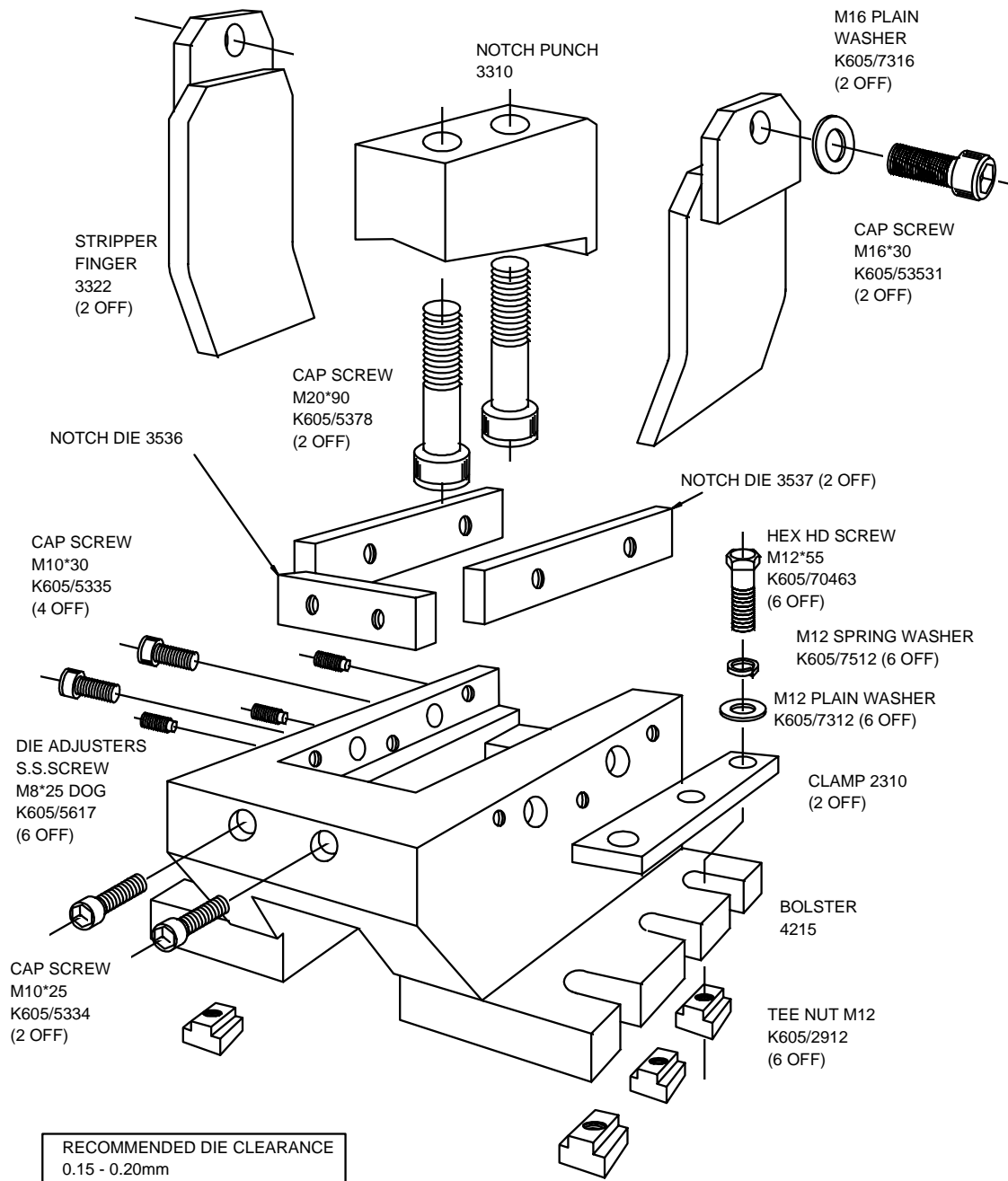
1. Slacken bolster fixing screws and position locking screws.
2. Move bolster into new side and front position on punch;
one side of bolster is adjustable on the die.
3. Clearances between punch and die faces should be maintained as follows:
.....at sides of punch 0.1mm
.....at front of punch 0.3mm
Adjust 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.

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

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.

8.3 RECTANGULAR NOTCH TOOLING ARRANGEMENT



9 FURTHER INFORMATION

9.1 CAPACITIES

9.1.1 Punching

| | |
|--------------------------|--------------------|
| Rated Capacity | 600 kN - 60T |
| Max. Capacities | 28 x 15 mm |
| Dia. x Thickness | 38 x 11 |
| Max. Stroke Length | 55 |
| Speed – 16 mm travel | 26 full cycles/min |
| Throat Depth Standard | 220 |
| Largest Hole | 110 |
| Working Height | 940 |
| Max. Height UPN (web) | 160 |
| Max. Height UPN (flange) | 102 |

9.1.2 Shearing

| | |
|-------------------|----------|
| Flat Bar | 200 x 20 |
| Alternative | 300 x 15 |
| Blade Length | 318 |
| Angle Flange Trim | 80 x 10 |
| Working Height | 940 |

9.1.3 Angle Cutting

| | |
|-------------------------------|----------|
| At 90° | 127 x 12 |
| At 90° (with modified blades) | 130 x 13 |
| At 45° Mitre | 80 x 8 |
| Working Height | 1,140 |

9.1.4 Section Cutting

| | |
|------------------|----------|
| Round/Square Bar | 40 / 35 |
| Channel Beam | 102 x 51 |
| Tee | 76 x 10 |

9.1.5 Notching

| | |
|--------------------|----------|
| Material Thickness | 10 |
| Width | 42 |
| Depth: Vee-Rect. | 60 - 100 |
| Angle Flange | 100 x 10 |
| Working Height | 940 |

9.2 SPECIFICATION

| | |
|---------------|-------------------|
| Motor | 4 KW |
| Nett Weight | 1,250 Kg |
| Gross Weight | 1,370 Kg |
| Machine Dims. | 152 x 59 x 170 cm |
| Packed Dims. | 166 x 77 x 190 cm |

9.3 ADDITIONAL TOOLING**Bending**

| | |
|---------------|-------------|
| Max. Bar Size | 150 x 12 mm |
|---------------|-------------|

Punching at Notch Station

| | |
|---------------|---------|
| Max. Capacity | 20 x 12 |
| Throat Depth | 110 |

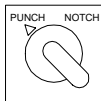
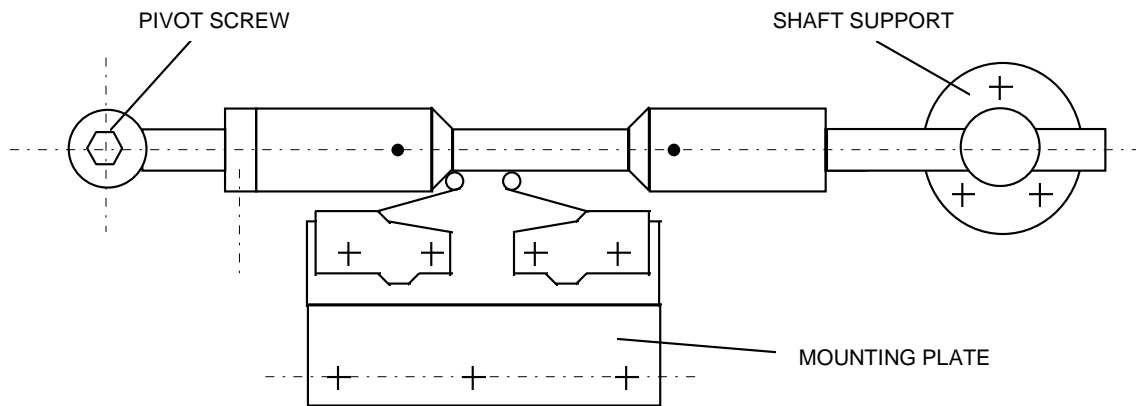
Corner Notch

| | |
|------|-----------|
| Max. | 150sq x 4 |
|------|-----------|

Tube Notch

| | |
|------------|----|
| Max. Diam. | 60 |
|------------|----|

9.4 STROKE ADJUSTMENT



Selecting PUNCH on control switch returns punch to top of stroke position.

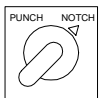
Re-adjustments

Before making any positional adjustments of switch CHECK:

1. Pivot screw is locked securely.
2. Shaft support screws are secure.

Having checked above, reposition mounting plate as required.

Switches should be operated by actuators before hydraulic system “pressure“, (i.e. before cylinder piston reaches end of cylinder, full cylinder stroke length).



Selecting NOTCH on control switch returns notch / shear to open operating position.

Re-adjustments

Switch selector to PUNCH and make adjustments as above.

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.

9.5 HYDRAULIC SYSTEM

A 4 KW Motor drives a hydraulic pump, which through control valves feed the power cylinder of the machine. The 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, if necessary wash in paraffin (Replacement L820/5020).

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.
- Yearly** - Change hydraulic fluid, inspect oil suction strainer.

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 |

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, check oil level in pump.

9.10 MACHINE ARM ADJUSTMENT

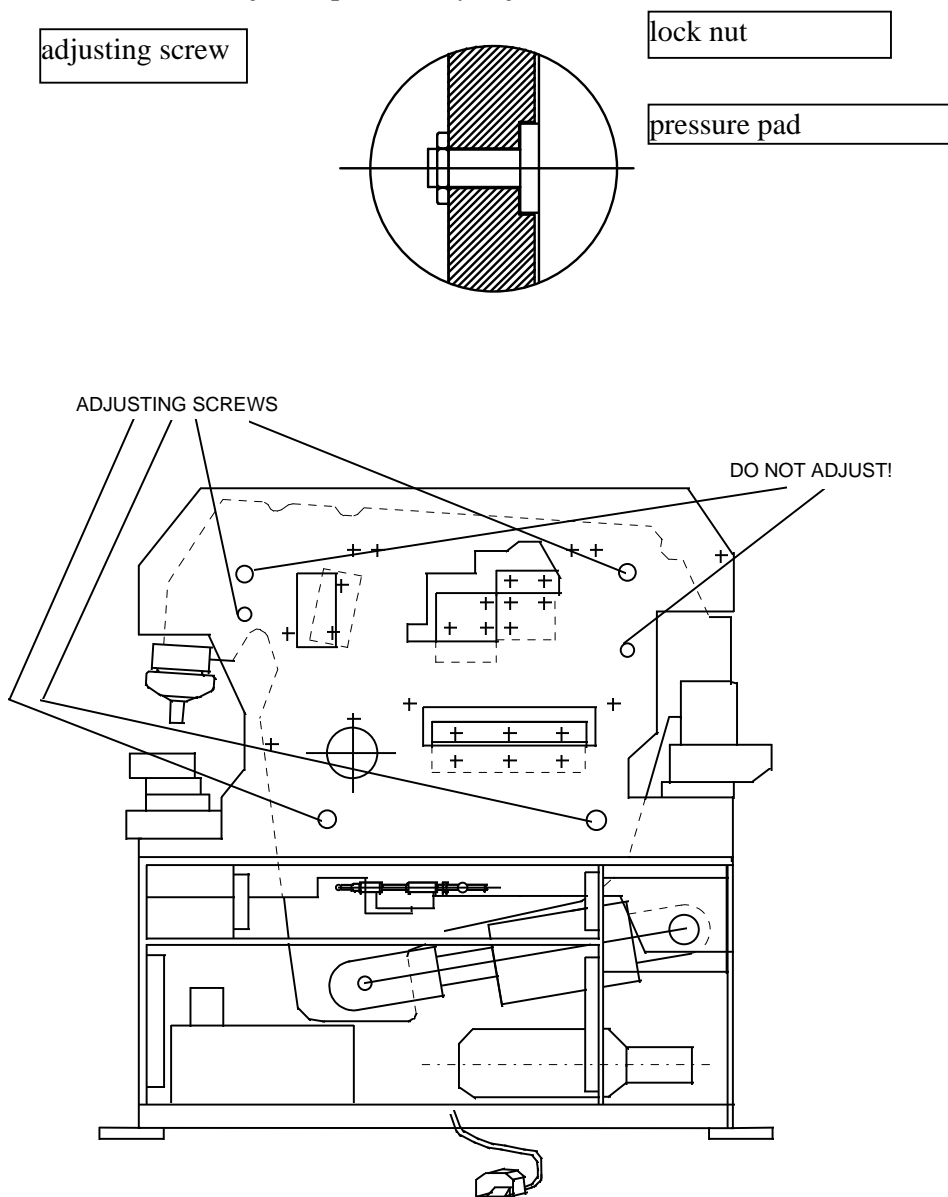
The Shear Arm is adjusted by four 24mm Socket Set Screws which apply pressure to the Internal Bronze Pressure Pads. These are located on the Feed (Hold Down) Side of the machine as shown in the figure below.

Adjusting Arm

Isolate machine before making any adjustments.

1. Slacken locking nuts at the four 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.

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



9.11 PARTS LIST

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

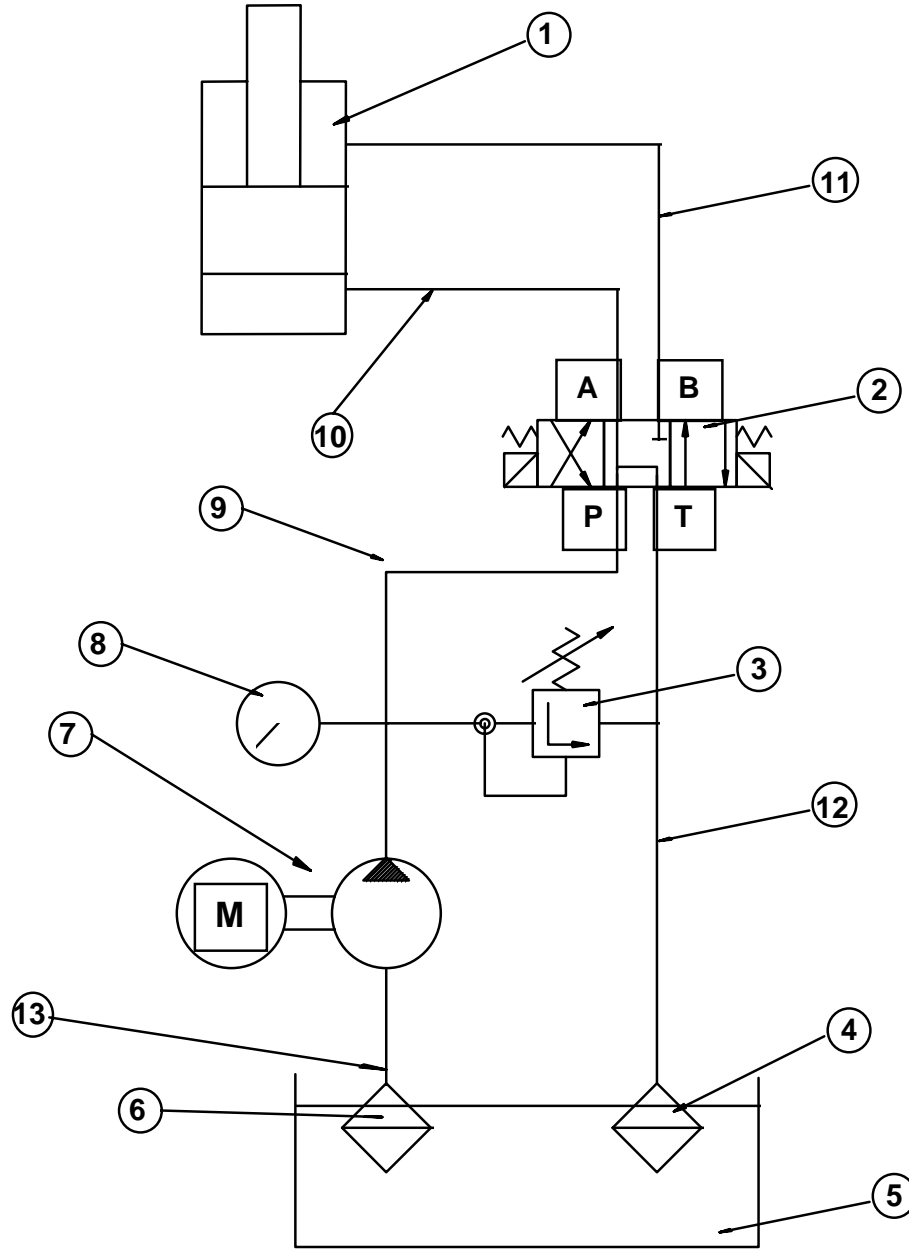
| Nr. | Part No. | Description | No. off |
|------------|-----------------|---------------------------|----------------|
| 1 | 3283 | 60 XA Lower rem panel | 1 |
| 2 | 3289 | 60 XA Clevis | 1 |
| 3 | 3290 | 60 XA Main pivot | 1 |
| 4 | 3291 | 60 XA Main pivot bush | 1 |
| 5 | 3292 | 60 XA Cylinder pin | 2 |
| 6 | 3293 | 60 XA Cylinder pin bush | 1 |
| 7 | 3366 | 60 XA Lmt sw cover | 1 |
| 8 | 3395 | 60 XA Top cover | 1 |
| 9 | 3411 | P.E. & N.E. Covers 60 XA | 2 |
| 10 | 3418 | 60 XA Louv front cover | 1 |
| 11 | 3419 | 60 XA Louv rear cover | 1 |
| 12 | L815/5000 | 60 XA Hydraulic cylinder | 1 |
| 13 | 2079 | Hold down adjusting screw | 1 |
| 14 | 2093 | RAM pressure plate | 1 |
| 15 | 2097 | notch / shear guide | 1 |
| 16 | 2307 | LMT sw shaft support s/e | 1 |
| 17 | 2340 | Shaft swivel | 1 |
| 18 | 2407 | Stripper pillar | 2 |
| 19 | 2433 | Limit switch actuator | 2 |
| 20 | 2434 | s/e lmt boss adj collar | 1 |
| 21 | 2435 | Rod fixed stop | 2 |
| 22 | 2556 | Bolster clamps | 2 |
| 23 | 2557 | Punch retaining ring | 1 |
| 24 | 2835 | Angle wear bar | 1 |
| 25 | 2887 | Stripper pivot sleeve | 1 |
| 26 | L515/4124 | 45/69 XA Notch end cover | 1 |
| 27 | L515/4126 | 45/60XA P/End rear guard | 1 |
| 28 | 3309 | shear blade (body) 45/60 | 1 |
| 29 | 3310 | 60 XA Rect notch punch | 1 |
| 30 | 4215 | XA Notch bolster | 1 |
| 31 | 4221 | 45/60 Punch bolster | 1 |
| 32 | 3321 | 60 XA shear table | 1 |
| 33 | 3322 | 60 XA Notch strip finger | 2 |
| 34 | 4220 | 60 XA Notch table | 1 |
| 35 | 4223 | 60 XA Punch table | 1 |

| No. | Part No. | Description | No. off |
|-----|-----------|--------------------------------------|---------|
| 36 | 3327 | 60 XA Blade retainer plt | 2 |
| 37 | 3976 | Section aperture cover | 1 |
| 38 | 3977 | Shear/angle apert cover | 2 |
| 39 | 3335 | 60 XA stripper top plt | 1 |
| 40 | 3336 | 60 XA stripper head | 1 |
| 41 | 3339 | 60 XA H/down plate weld | 1 |
| 42 | 3353 | 60 XA H/D adj screw | 1 |
| 43 | 3359 | 60 XA gear drive pin | 1 |
| 44 | 3401 | actuator shft assym | 1 |
| 45 | 3402 | switch mounting plate | 1 |
| 46 | 3409 | shear blade (arm) 45/60 | 1 |
| 47 | 3410 | adj screw ret block 60 XA | 1 |
| 48 | 3420 | 60 XA shear chute | 1 |
| 49 | 3421 | Angle/sect H/D cover | 1 |
| 50 | K705/1910 | VD 100 FP A 16 | 1 |
| 51 | 3427 | 60 XA section blade (body) | 1 |
| 52 | 3428 | 60 XA scetion blade (arm) | 1 |
| 53 | 4227 | 45/60 XA P/table ext | 1 |
| 54 | 3466 | Ext support plate 60 XA | 2 |
| 55 | 3536 | Notch die | 1 |
| 56 | 3537 | Notch die | 2 |
| 57 | 3547 | Angle blade (body) | 1 |
| 58 | 3548 | Angle blade (body) | 1 |
| 59 | 3549 | Angle blade (arm) | 1 |
| 60 | 3550 | Angle blade (arm) | 1 |
| 61 | 3552 | Punch stripper mntg blk (LH) | 1 |
| 62 | 3553 | Punch stripper mntg blk (RH) | 1 |
| 63 | 3554 | cover spacer 60 XA | 1 |
| 64 | 3821 | 45/60 Sub plt | 1 |
| 65 | 4242 | XA Notch bolster clamp | 2 |
| 66 | 4096 | 45/60 Angle h/d screw | 1 |
| 67 | 4098 | 45/60 Angle h/d screw | 1 |
| 68 | 4102 | XA locking collar | 2 |
| 69 | 4128 | 45/60 Punch stripper guard | 1 |
| 70 | L830/3872 | Flex pipe (tank to pump) | 1 |
| 71 | L830/3873 | Flex pipe (manifold „B“ to pump) | 1 |
| 72 | L830/3874 | Flex pipe (manifold „C“ to cylinder) | 1 |
| 73 | L830/3875 | Flex pipe (manifold „D“ to cylinder) | 1 |

| No. | Part No. | Description | No. off |
|-----|-------------|-------------------------|---------|
| 74 | 9004 - 22 | Round punch 22mm | 1 |
| 75 | 9023 - 22 | Round die 22mm | 1 |
| 76 | 9036 | Punch adaptor | 1 |
| 77 | K410/7009 | Foot switch | 1 |
| 78 | K411/338282 | Micro switch | 2 |
| 79 | K705/2010 | MRX 100 B M12 | 5 |
| 80 | K705/3006 | Stipper spring | 1 |
| 81 | K715/1005 | IB 24 meter valve strt | 2 |
| 82 | K715/1203 | IM 24 meter valve | 3 |
| 83 | K715/1538 | 114838 4 Way connector | 1 |
| 84 | K715/1539 | 114838 4 Way connector | 3 |
| 85 | K715/2015 | Cone LE205 | 8 |
| 86 | K715/2016 | Bushing LE 305 | 8 |
| 87 | K715/5040 | Adaptor 50-1202-03 | 1 |
| 88 | K715/6010 | 4mm Oil pipe | 2 |
| 89 | K715/6510 | Pressure gauge | 1 |
| 90 | K715/7040 | Oil pump | 1 |
| 91 | K715/7085 | Elbow | 1 |
| 92 | K905/4020 | Bevel gears | 2 |
| 93 | L605/2626 | Notch / shear guide | 5 |
| 94 | L605/3320 | Shear hold down | 1 |
| 95 | L605/4104 | 60 XA Section plate | 1 |
| 96 | L820/1012 | Bellhousing | 1 |
| 97 | L820/2013 | 60 XA Coupling | 1 |
| 98 | L820/4510DC | Direction control valve | 1 |
| 99 | L820/45350 | Sandwich plate | 1 |
| 100 | L820/5010 | Oil sight glass | 1 |
| 101 | L820/5020 | Strainer | 1 |
| 102 | L820/5030 | Diffuser | 1 |
| 103 | L820/5041 | Filler | 1 |
| 104 | L910/55000 | Hydraulic pump | 1 |

10 CIRCUITS

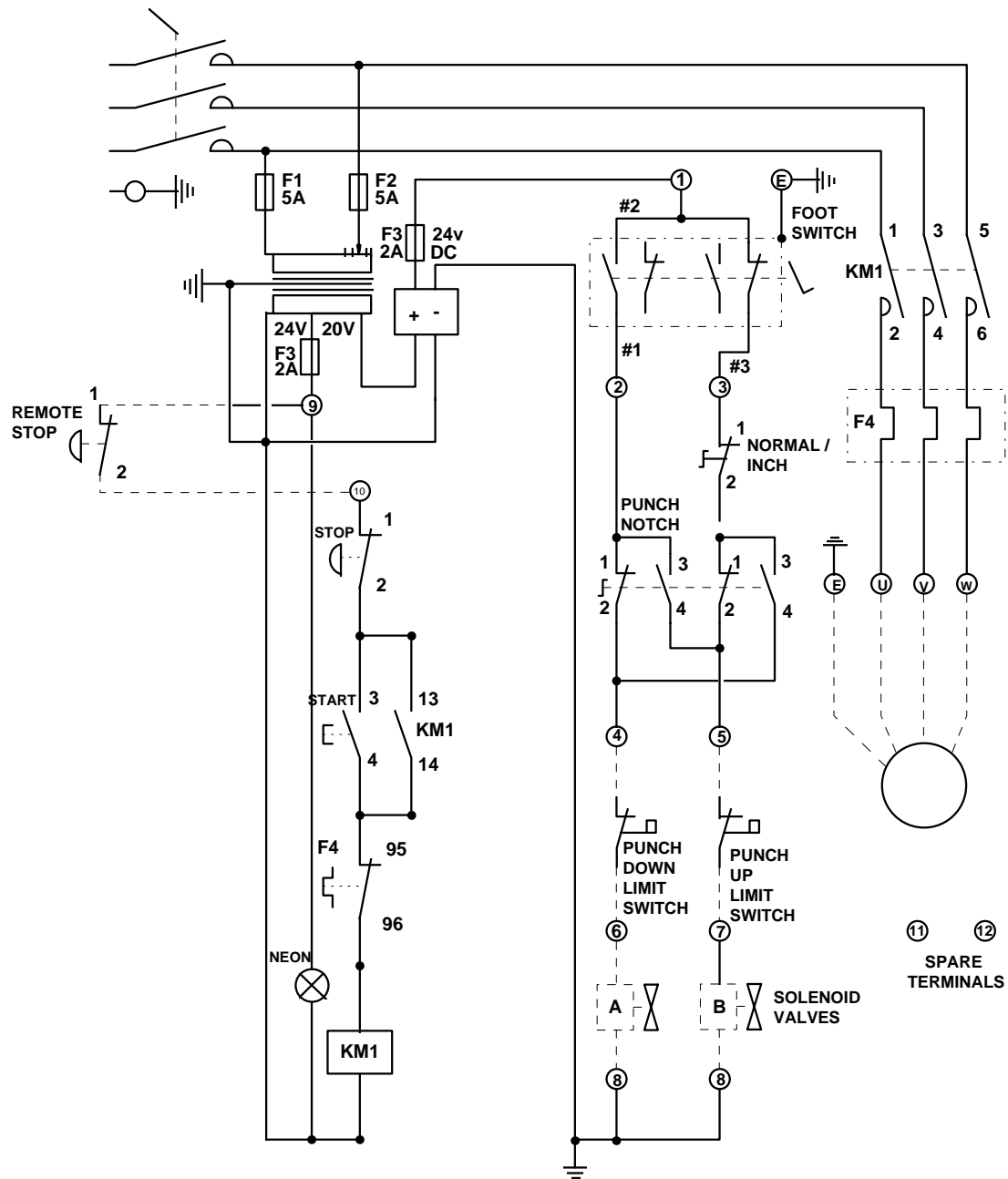
10.1 HYDRAULIC CIRCUIT



Parts of the Hydraulic Circuit:

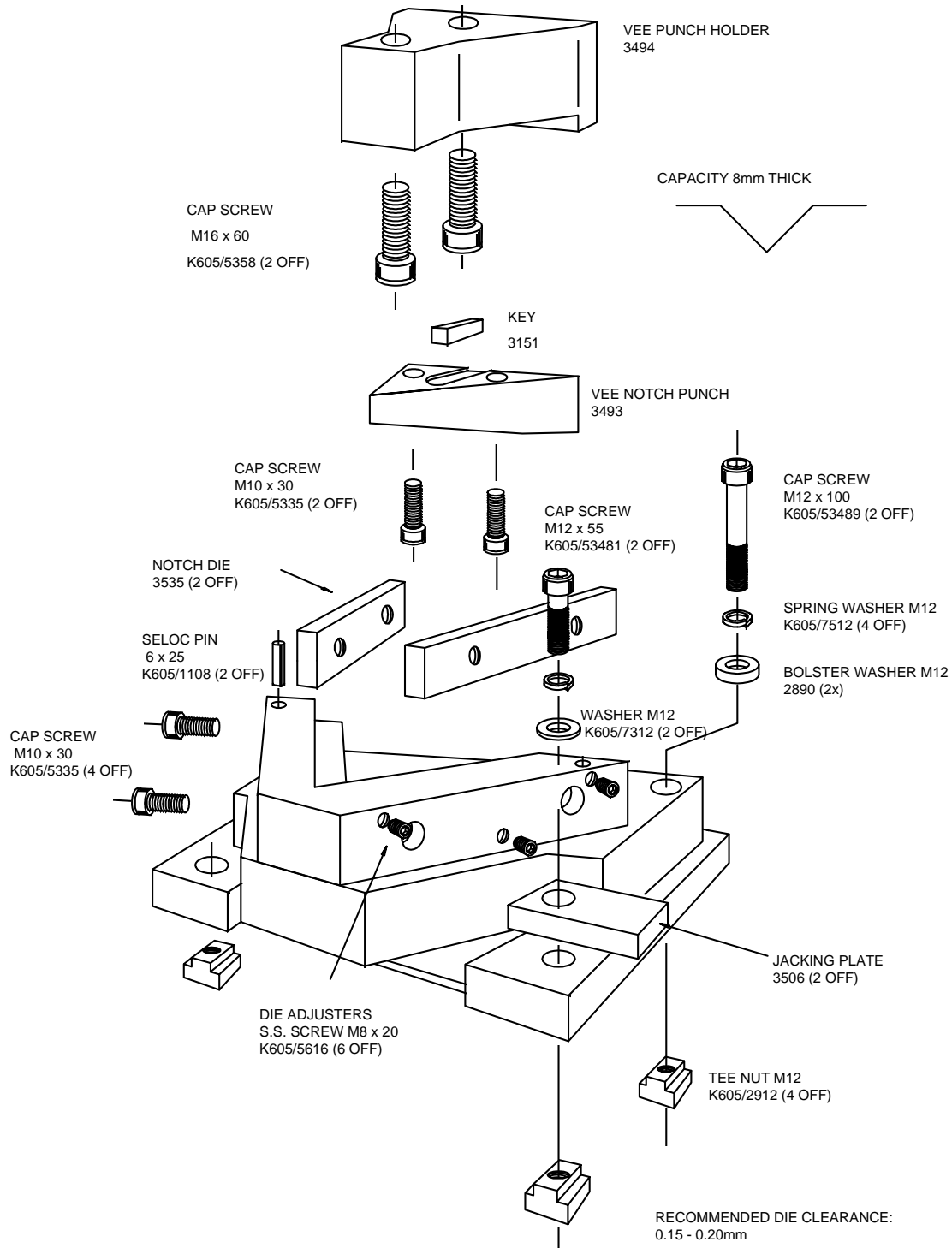
| No. | Part No. | Description | No. off |
|------------|-----------------|--------------------------|----------------|
| 1 | L815/5000 | 60 XA hydraulic cylinder | 1 |
| 2 | L820/4513 | Direction control valve | 1 |
| 3 | L820/45350 | Relief valve | 1 |
| 4 | L820/5030 | Diffuser | 1 |
| 5 | L920/6000 | Tank (54 l) | 1 |
| 6 | L820/5020 | Suction strainer | 1 |
| 7 | L910/55000 | Hydraulic Pump | 1 |
| 8 | | Manometer | 1 |
| 9 | 3540 | Flex Pipe (P.P.) | 1 |
| 10 | 3539 | Flex Pipe (A.A.) | 1 |
| 11 | 3538 | Flex Pipe (B.B.) | 1 |
| 12 | 3542 | Flex Pipe (T.T.) | 1 |
| 13 | 3541 | Flex Pipe (S.T.) | 1 |

10.2 ELECTRICAL CIRCUIT

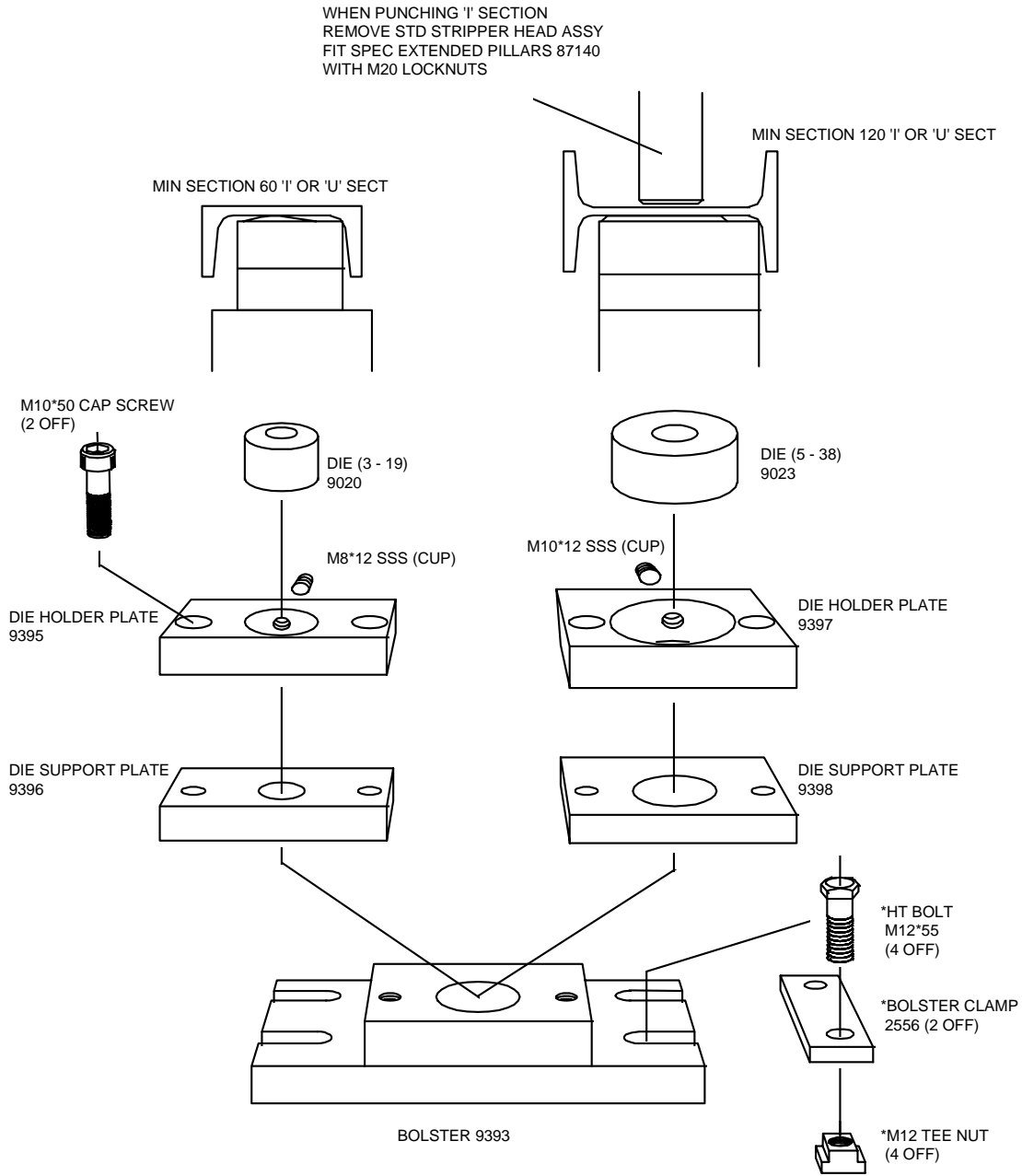


11 SPECIAL TOOLING

11.1 90° VEE NOTCH TOOLING ARRANGEMENT

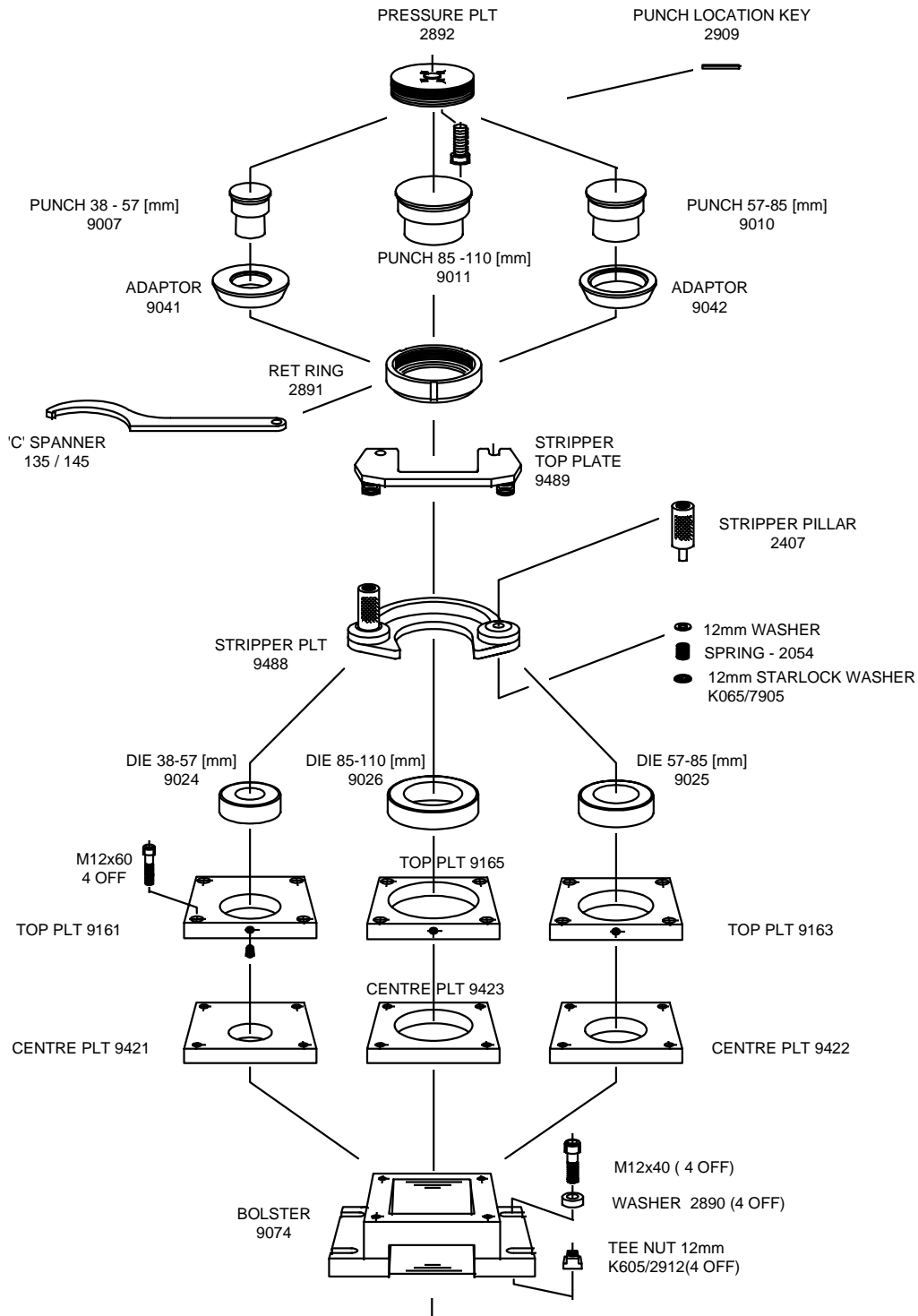


11.2 WEB PUNCHING ARRANGEMENT FOR 'I' & 'U' SECTIONS



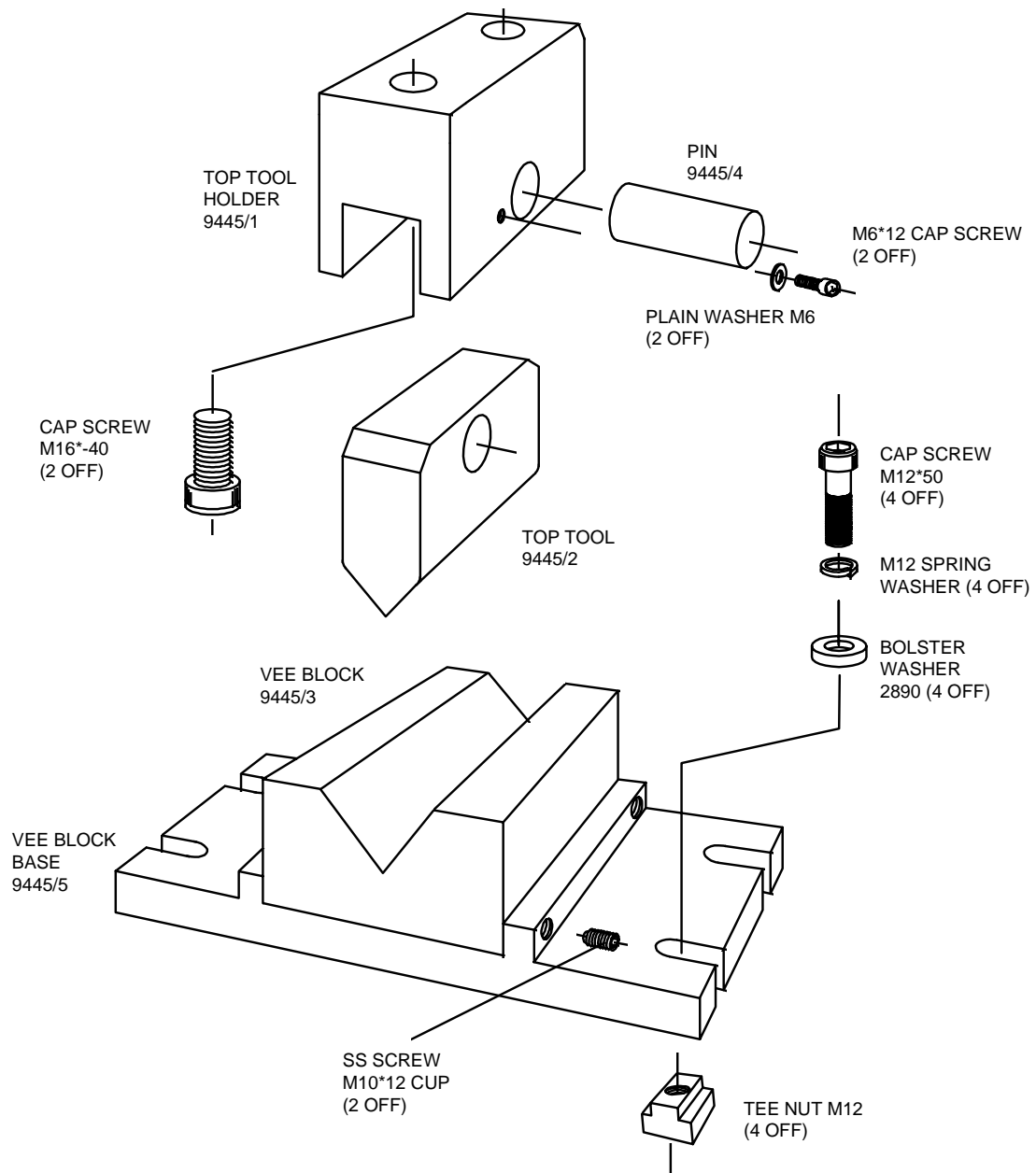
NOTE: PUNCHES AND DIES NOT INCLUDED WITH UNIT
 * THESE ITEMS ARE FROM STANDARD PUNCH BOLSTER ASSY

11.3 LARGE HOLE PUNCHING



NOTE: PUNCHES & DIES ARE NOT SUPPLIED WITH UNIT

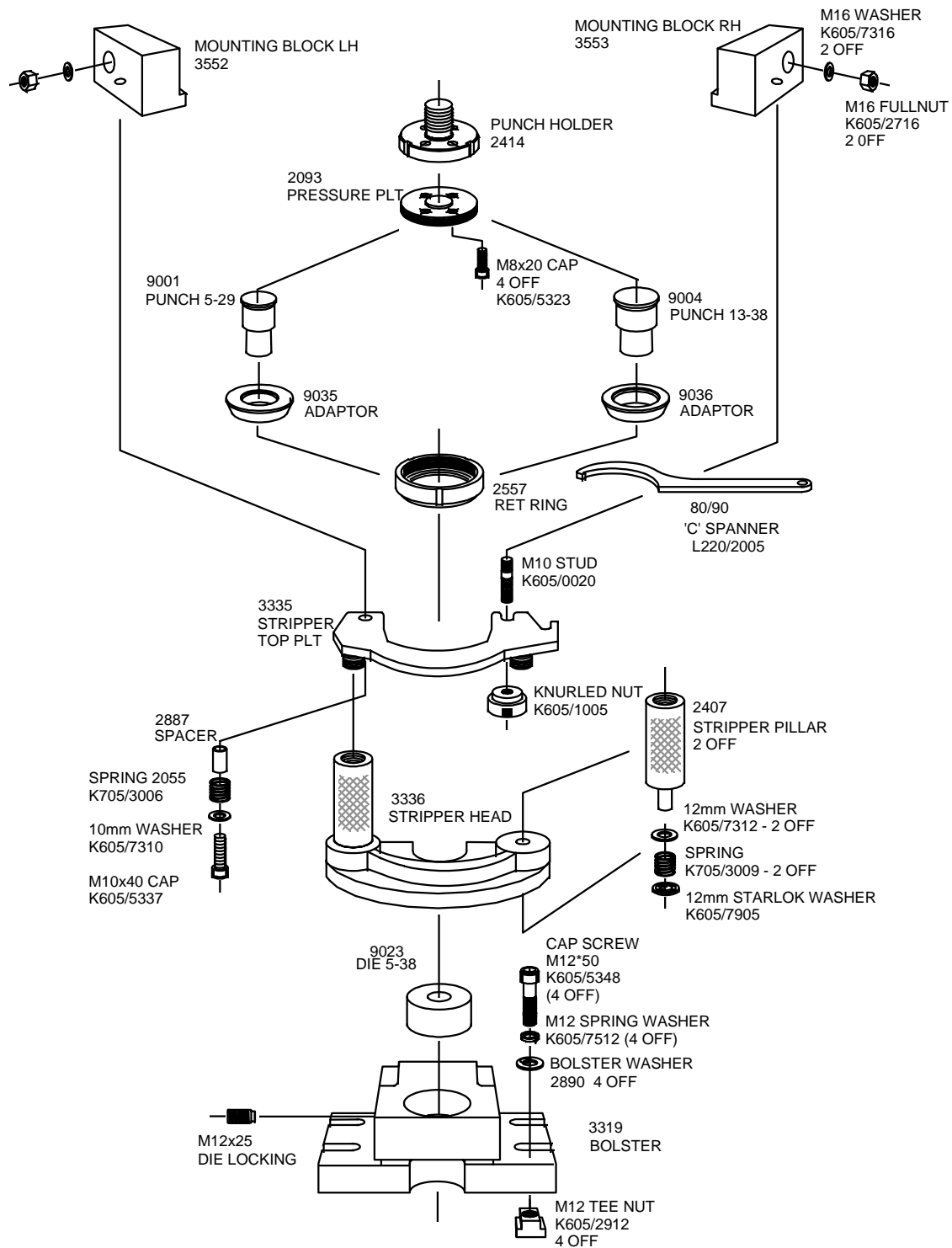
11.4 BAR BENDING UNIT



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: 150 * 12 [mm²]

11.5 NOTCH END PUNCHING



12 SOUND LEVEL TEST**12.1 MAX. SOUND PRESSURE LEVEL****RESULT SHEET**

Site: Kingsland Engineering
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 |
|--------------------|---------------------|-------------|------------|---------|---------|---------|----------|
| Kingsland 60 XA | 1m | - | - | 76.2 dB | - | - | - |

12.2 CONVERTED OCTAVE BAND SOUND PRESSURE LEVELS (A-WEIGHTED)

13