

THE GABRO COMBINED APERTURE-GUILLOTINE & HOLE PUNCHER.

INSTRUCTION SHEETS.

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NOTES.

- (1) THESE GABRO MACHINES ARE UNIQUE, THEIR BASIC CONSTRUCTION AND METHOD OF OPERATION DIFFERS FROM THAT OF ANY ORTHODOX EQUIPMENT. FOR THIS REASON THESE SHEETS SHOULD BE GIVEN VERY CAREFUL ATTENTION.
- (2) AFTER ASSEMBLY AND BEFORE USING THE MACHINE FOR ANY PURPOSE, THE ITEMS AT THE END OF THIS PARAGRAPH SHOULD BE READ. THE OTHERS CAN BE USED AS AND WHEN A NEED ARISES:-
- (3) THESE SHEETS ARE INTENDED TO BE USED WITH A SALES BROCHURE AND THE COPY HERewith SHOULD BE KEPT WITH THEM.
- (4) THE PRICE LISTS ALSO CONTAIN A GREAT DEAL OF INFORMATION ON THE WIDE RANGE OF TOOLING AVAILABLE. UP-TO-DATE COPIES ARE AVAILABLE ON REQUEST.

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THE GABRO COMBINED APERTURE GUILLOTINE & HOLE PUNCHER.

INSTRUCTION SHEET I.

CUSTOMER GUIDE FOR UNPACKING.

AC 450.

- (1) Remove the top of the case.
- (2) Remove loose items packed in the top of the Machine.
- (3) Remove the Fence Bar Assembly packed vertically in a corner of the crate at the front of the Machine and, if supplied, the Wheel Assembly in the other corner.
- (4) Release the Stand End and Front Plates fastened together across the front of the Machine, and lift out.
- (5) Lift out the two Stand Side Plates by manoeuvring them so that the lugs on the sides of the Machine can pass through the gaps between the top and side flanges.
- (6) Remove the side of the crate.
- (7) Remove the Stand Top Plate from in front of the Machine.
- (8) Remove the 4 nuts & bolts holding the Machine to the floor of the crate.
- (9) Remove the piece of hardboard nailed to the end of the crate at the rear of the Machine.
- (10) Remove the Machine from the crate making sure that the SCRAP BOX packed inside is free to come out with the Machine.

AC 750.

- (1) Remove the polythene cover and lift out the box from the back of the Machine. This box contains all fittings etc.
- (2) Unbolt the piece of wood which holds the Pedestal to the pallet.
- (3) Release the machine from the pallet (4 bolts).

CASES ARE NON-RETURNABLE. FOR SAFETY'S SAKE DO NOT LEAVE BOARDS LYING ABOUT WITH NAILS STANDING UP.

INITIAL ASSEMBLY OF THE MACHINE. ALL FIXINGS ARE IN THE PLASTIC BAG/S.

AC 450 ONLY.

- (1) Observe the assembled shape of the Stand from the Brochure.
- (2) Fit the front plate (longest piece) to the two side plates with 6 off M8 x 20 hx. hd. bolts and nuts. Leave the nuts slack.
- (3) Fit the back plate with 6 off M8 x 20 hx. hd. bolts and nuts. Leave the nuts slack.
- (4) Fit the top plate with 8 off M8 x 20 hx. hd. bolts and nuts:- 3 off along each side, one in the centre of the front and one in the centre of the back. Leave the nuts slack. The other holes are for the Machine
- (5) Tighten the 8 bolts and nuts on the top, making sure that the 4 holes for the Machine line up with their corresponding holes beneath.
- (6) Tighten up the rest of the bolts and nuts (easily done with the Stand upside down) and, at this stage, fit the Axle and Wheels if supplied, using the two bottom bolts at the back.
- (7) Place the Machine on the Stand and secure with 4 off M8 x 20 hx. hd. bolts and nuts. Use the opening at the back for access to the nuts.

AC 750 ONLY.

- (8) Bolt the Machine firmly to the Pedestal with the 4 off M10 x 25 hx. hd. bolts and nuts. Level off with the set screws in the front feet.

BOTH MACHINES.

- (9) Slacken off the T-handled nuts on the Strippers (the plates which pull the work from the Blade or Punch on the upstroke) to release the packing on the Bolster.
- (10) Fit the Front Table Angle (assembled with a Fence Bar, knurled Hand-wheels, spring etc.,) with the two countersunk steel screws M6 x 70. Leave the nuts slack. The "Table Angles" are the two cross members which carry the Table Slats. Both can be seen at 7 in the Brochure.
- (11) Lay the Rear Table Angle in its place, but leave the screws out.
- (12) Remove the two Fence Clamps from the second Fence Bar and also the Knurled Hand-wheels, but leave the spring. Put the Fence Bar in its place, which can be seen in the Brochure, by passing the plain end through the loose Rear Table Angle, and the screwed end through the Front Table Angle. Re-fit the knurled Hand-wheels.
- (13) Secure the Rear Table Angle with two countersunk steel screws M6 x 70. Leave the nuts slack.
- (14) Fit the four or six long Table Slats with the countersunk screws M6 x 16 REMEMBERING TO FIT THE PIECES OF SQUARE PACKING BENEATH THE ENDS OF THE SECOND SLAT FROM THE LEFT SIDE. This is to allow the rear Fence or guide to lie flat. Leave the nuts slack until all are in place.
- (15) Swing the Line Guide (18 in the Brochure) away by pulling it sideways.
- (16) Remove the Bolster with a gentle lifting and rocking motion, keeping it level to avoid its jamming on its pins. When it comes free move it towards the back of the machine and sideways, to avoid the possibility of its knocking against the Blade.
- (17) Fit the short Centre Table Slat (with its knurled handle) over the bracket welded to the Rear Table Angle, with the joggled end to the rear and the forked piece under the round spacer bar.
- (18) Re-fit the Bolster, (bring it in from the back) and slide the Centre Table Slat forward to fit into the recess at the rear of the Bolster, and lightly tighten the knurled handle, to secure it.

(CONTINUED ON SHEET III)

INITIAL ASSEMBLY OF THE MACHINE (CONT).

- (19) Fit the Handle as follows:-
- (a) Remove the two lock nuts and bolts. (Size as 14mm sparking plugs).
 - (b) Fit to the machine; tighten and lock the bolt. Provide free movement, but with all side play taken up. N.B. Keep this pivot oiled, properly adjusted and locked tight, to prevent wear in the Handle.
 - (c) Lever the spring-held Delta Plate down a little with a screwdriver and fit the second bolt. Adjust, lock and oil as at (b).
 - (d) Gently check the entry of the Blade into the Die. In the unlikely event of this being unsatisfactory, read Instruction Sheets IV to VII for full explanation, and then slacken off the screws "P" (Sheet IV) and proceed from (12) Sheet VII.
- (20) Fit the Handle Hold-down Hook.

THE FENCES. There are two Side Fences, identical for either 450 or 750, one for use to the extremity of the Table, and an extended one to give extra width. The Rear Fences cover the full width of the Table. There is one for the 450 Machine and two for the 750. These are not identical,

Set the Side Fences first, each in turn, as follows:-

- (21) Fit the Fence in place and loosen the countersunk screws.
- (22) Bring the Blade down into the Die and secure it there with the Handle Hold-down Hook.
- (23) Move the Fence up to the Blade and line the two together with the Fence Bracket clamped tight with its Tommy-nut (use the fine adjustment Hand-wheel to get the Fence close to the Blade without pressing against it), and when the Blade and Fence are parallel, securely tighten the screws.

Assemble and set the Rear Fence or Fences on the Machine as follows:-

- (24) Fit the Clamp to the Fence Bar (see illustration on front of Brochure).
- (25) Pass the Fence from left to right across the Table behind the Bolster with the pivotted arm and U-clamp held out more or less straight.
- (26) Drop the Slotted Bracket over its bolt and leave the Tommy-nut loose.
- (27) Loosen the Clamping Screw in the U-clamp, swing the arm forward and hook the Clamp under the outer flange of the Table Slat, lifting the other end of the Fence a little to facilitate this. Leave the Clamping Screw in the U-clamp loose, but tighten the Tommy-nut.
- (28) Loosen the countersunk screws and set the Fence at right angles to the Side Fence. Securely tighten the screws.
- (29) Check that the Clamping Screw on the U-clamp tightens up below the level of the Table. If it does not, reset the abutting screw set in the opposite side of the U-clamp. The end of this screw must stand slightly proud.

MAINTENANCE. Apart from oiling, little is needed. Adjust the case-hardened Pivot Bolts in the Handle to take up side play and keep them tightly locked. They are screwed into one of the side plates and locked, to concentrate the wear on a replaceable bush and the Link. The ball-bearings on which the Delta Plate turns are sealed and need no attention.

OIL:-

The Handle & Link pivots.	Centre Locator Clamps & pivots.
Stripper Mounting Pins & Tommy-nuts.	Bolster knurled Clamping Handle.
The ends of the springs.	The Wheels.
The two Stop Screws.	Blade & Dies (occasionally).
Fence Hand-wheels & Tommy-nuts.	Line Guide Blade at pivotted end.

LIGHTLY GREASE:-

The Fence Bars.
The Telescopic Arms and Mounting Sockets of the Centre Locator.

THE GABRO COMBINED APERTURE GUILLOTINE & HOLE PUNCHER. AC 450.

INSTRUCTION SHEET IV

INITIAL ASSEMBLY & ALIGNMENT OF BLADE & DIE ON TYPE "A" BOLSTER.

THIS IS THE MOST IMPORTANT of all the initial setting operations, and although it is carried out at works in the first place, it is most important that a user should fully understand it, not only for sharpening, renewal and other purposes, but also because it provides an introduction to the basic ideas which make the Gabro internal guillotine possible. THE SETTING IS BROKEN DOWN INTO A SERIES OF SIMPLE OPERATIONS WHICH ARE NEITHER TEDIOUS NOR VAGUE, AND A LITTLE TIME AND CONCENTRATION SPENT ON THIS WILL QUICKLY LEAD TO A COMPLETE UNDERSTANDING OF THE MACHINE WITH ALL THE ADVANTAGES THAT WILL FOLLOW IN TERMS OF USE AND RELIABILITY.

THE LAYOUT AND TABLE OF BLADES AND CORRESPONDING DIE PIECES FOR EACH BLADE SIZE IS GIVEN BELOW. THE ASSEMBLY PROCEDURE STARTS ON SHEET V.

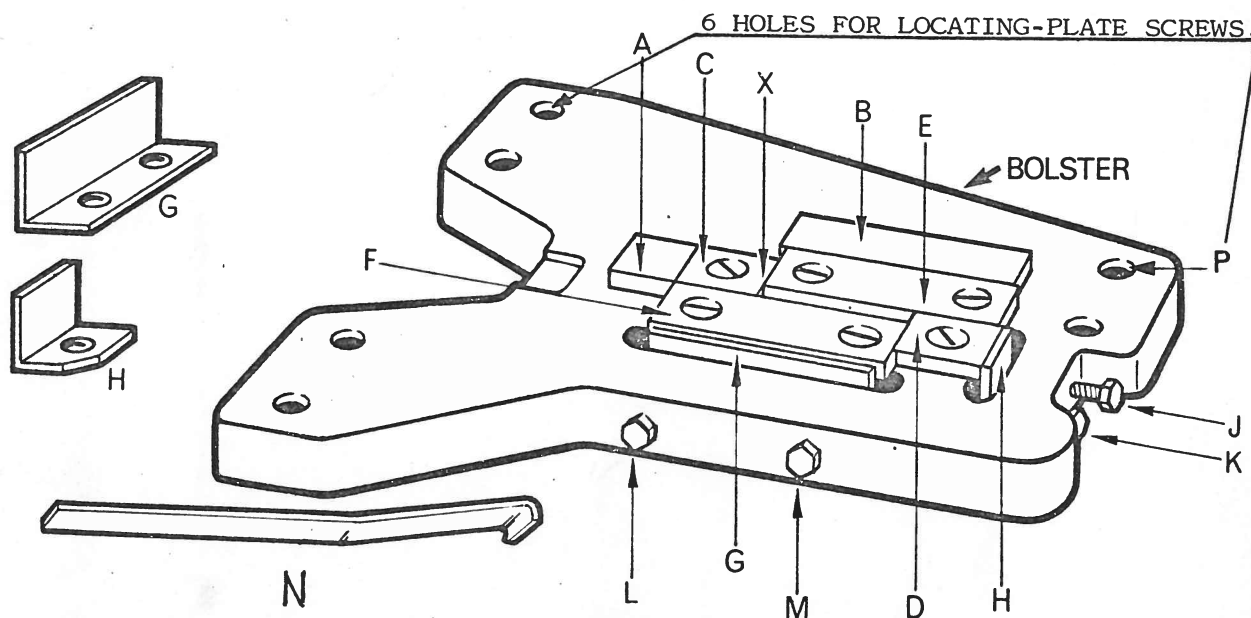


FIG. I

BLADE	DIE			
	C	D	E	F
50 x 6 Pt.No. 97	25 x 25 x 5 Pt.No. 41	25 x 25 x 5 Pt.No. 41	75 x 25 x 5 Pt.No. 40	75 x 25 x 5 Pt.No. 40
25 x 6 Pt.No. 99	50 x 30 x 5 Pt.No. 43	25 x 25 x 5 Pt.No. 41	50 x 25 x 5 Pt.No. 42	75 x 25 x 5 Pt.No. 40
50 x 3.3 Pt.No. 182 Plus Packing Pt.No. 187	25 x 20 x 5 Pt.No. 184	25 x 25 x 5 Pt.No. 41	75 x 25 x 5 Pt. No. 40	75 x 30 x 5 Pt.No. 185
25 x 3.3 Pt.No. 183 Plus Packing Pt.No. 187	50 x 27 x 5 Pt.No. 186	25 x 25 x 5 Pt.No. 41	50 x 25 x 5 Pt.No. 42	75 x 30 x 5 Pt.No. 185

(CONTINUED ON SHEET V)

GALE BROS., (ENGINEERS) LTD. Hathersham Close, Smallfield, Surrey, RH6 9JE.
England.

INITIAL ASSEMBLY & ALIGNMENT OF BLADE & DIE ON TYPE "A" BOLSTER (CONT).

NOTE. Blade screws must be very secure. Die screws reasonably tight.

- (1) Fit piece "C" firmly against abutment "A" using one or two, as required, M6 x 35mm countersunk screws (slotted or hex socket) lightly tightened. The large holes in the Bolster are for adjustments needed later on.
- (2) Fit piece "E" firmly against both abutment "B" and piece "C" using two M6 x 35mm countersunk screws (slotted or hex socket) firmly tightened.
- (3) Fit piece "F" against "C" to leave the die opening about 1mm longer than the Blade, e.g. 51mm for a 50mm blade. Use two M6 x 35mm countersunk screws (slotted or hex socket) and nuts, and fit the moveable abutment "G" with it as shown. No washers are needed. Lightly tighten.

IT IS NOW NECESSARY TO ADJUST THE WIDTH OF THE DIE TO THE BLADE PLUS THE CLEARANCE, WHICH FOR GENERAL USE IS .1mm PER SIDE OR .2mm (.008") TOTAL.

- (4) Try the Blade in the partly completed Die. It has to be a fit plus a .2mm (.008") feeler gauge or piece of shim.
 - (a) If the space is too wide adjust "F" inwards with the screws "L" and "M". The piece "C" will be pushed along with it as its screw is only lightly tightened. KEEP THE OPENING PARALLEL. Finally tighten the screw holding "C".
 - (b) If the space is too narrow, retract the screws "L" and "M" and lever piece "F" outwards by putting the turned down end of the Die Opening Tool "N" into the die and pulling sideways. Move "C" up to "F" by lightly tapping with a hammer and soft punch. If more than a little movement is needed loosen the screw first and re-tighten lightly. Now proceed as at (a).
- (5) Retract the screws "J" and "K" and fit piece "D" using one M6 x 35mm countersunk screw (slotted or hex socket) fitting the moveable abutment "H" at the same time. Lightly tighten the nut, no washer is needed.

THE BOLSTER IS NOW READY TO BE MOUNTED INTO THE MACHINE.

- (6) Clean the underside of the Bolster and the three pairs of locating and clamping plates (illustration 6 in the Brochure). Assemble the plates with 6 M6 x 25mm socket head cap screws (Allen screws) and leave them slack. Clean off the three locating pins on which the Bolster rests. ABSOLUTE CLEANLINESS OF ALL PARTS IS VERY IMPORTANT AT THIS STAGE.
- (7) Put the Bolster into the machine by holding it in the left hand, forked end away, and passing it from left to right behind the area of the blade mounting and bringing it forward on to its pins. THIS IS THE BEST WAY TO HANDLE THE BOLSTERS AS IT REDUCES THE RISK OF ACCIDENTALLY KNOCKING A PUNCH IF ONE HAPPENS TO BE IN PLACE. REVERSE THE PROCEDURE FOR REMOVAL.
- (8) Make sure that the pins have entered their plates and are firmly against the underside of the Bolster, which it will be noted can be moved around within the limits of the clearance holes for the screws, "P". If the Bolster rocks adjust the hex head screw which forms the fourth support.

THE BLADE MUST NOW BE FITTED AND IT IS NECESSARY TO EXPLAIN THE PRINCIPLES WHEREBY ADJUSTMENT FACILITY IS PROVIDED.

(CONTINUED ON SHEET VI)

INITIAL ASSEMBLY & ALIGNMENT OF BLADE & DIE ON TYPE "A" BOLSTER. (CONT).

THE CLAMPING AND ADJUSTMENT OF THE BLADE.

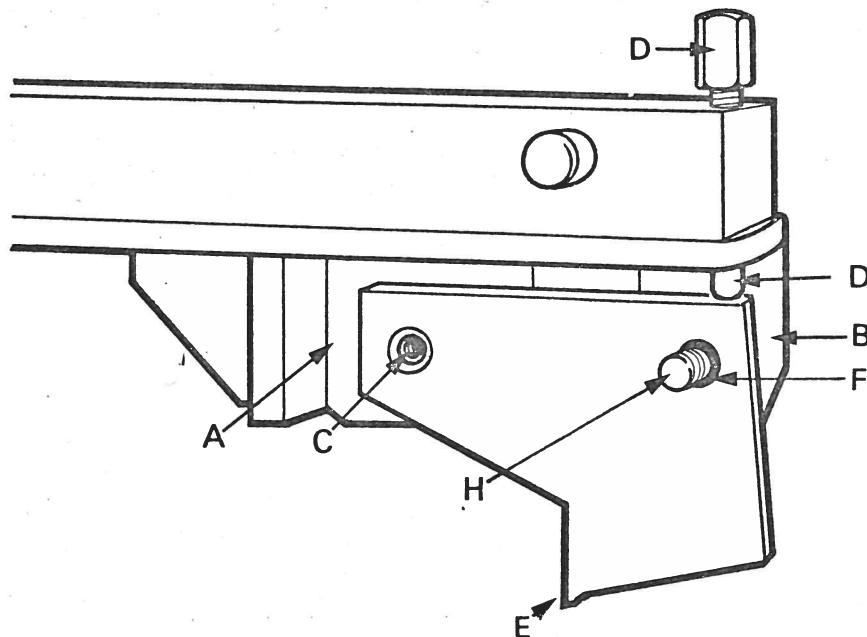


FIG. II

In the diagram the Blade clamps against the flat surface A, pivots on the bush C and abuts the adjusting screw D.

When the machine is in use the point E moves in an arc and must pass the Die Piece C in Fig. I with almost no clearance. This is arranged as explained later, but the bedding down process of the Blade on its mountings, however slight, could cause excessive clearance to develop. To deal with this the point E can be moved back by the adjustment of the screw D causing the Blade to turn (within the limits provided by the clearance hole F). The amount of adjustment is small, but is quite adequate.

TO FIT THE BLADE.

- (9) Clean off the surfaces of both the Blade and the Mounting Block B. This is important as alignment of tools, however well set up, cannot be satisfactory if mating surfaces are not kept absolutely clean.
- (10) Fit the Blade on to the bush C with the front end touching the adjusting screw D, and adjust this screw so that the clamping screw H is roughly in the centre of the hole in the Blade, i.e. ensure that the Blade can be moved either up or down by turning the screw D. If a Blade less than 6mm thick is being fitted, its corresponding packing piece must be fitted with it.
- (11) Fit the loose clamping block and tighten the two M8 x 35mm socket head cap screws (Allen screws) WHILST THE FRONT OF THE BLADE IS PUSHED TIGHTLY UP TO THE ADJUSTING SCREW D. To ensure this, put a block of wood under the blade and apply pressure by pulling down the Handle.

THE NEXT OPERATION IS TO SET THE BOLSTER IN ALIGNMENT WITH THE BLADE, AND LOCK THE LOCATING PLATES.

(CONTINUED ON SHEET VII)

INSTRUCTION SHEET VII

INITIAL ASSEMBLY & ALIGNMENT OF BLADE & DIE ON TYPE "A" BOLSTER. (CONT).

- (12) Gently lower the Blade into the Die moving the Bolster as necessary and adjust the knurled depth screw (illustration 8 in the Brochure) so that the front of the Blade enters the Die by no more than 1mm.
- (13) Carefully pull the Bolster forward so that the back of the Die touches the Blade.
- (14) Allow the Blade to rise out of the Die but be careful not to move the Bolster once the Blade is clear. The bolster is now almost in place.
- (15) Take two pieces of cloth about .15mm thick and 40mm wide and feed one end of each over each of the two Die sides a little way into the Die, and then carefully lower the Blade to draw the pieces of cloth into the Die to centralise it. Hold the Handle firm. IF THE BOLSTER MOVED FORWARDS OR BACKWARDS, GO BACK TO (12) AND REPEAT.
- (16) The six screws marked P in Fig.I Sheet IV must now be tightened whilst the Handle is held. Do this GRADUALLY, tightening each screw a little at a time until all are moderately tight.
- (17) Lift the Blade and discard the cloth. Clamp the Bolster by sliding the centre table slat forward and tightening the knurled handle, and finally tighten the six screws.

THE BOLSTER IS NOW SET SO THAT IT CAN BE LIFTED OFF OR REPLACED AT WILL, BUT FINISH SETTING THE DIE.

- (18) Check the entry of the Blade into the Die. It will almost certainly be found to be perfectly in place except for the back of the Die where the Blade will probably be touching. To correct this, loosen the two screws holding the Blade and unscrew the adjusting screw D, (Fig.II Sheet VI). Lightly re-tighten the Blade screws FOLLOWING THE PROCEDURE AT (11) and then adjust the screw D until the point of the Blade just clears the Die as it enters. Fully tighten the Blade screws.

ALL THAT REMAINS NOW IS TO SET THE FRONT PIECE D (Fig. I SHEET IV).

- (19) Refer again to Fig. I Sheet IV and note the two screws K & J. Bring the Blade down into the Die and adjust the two screws K & J evenly together until the Blade just clears the Front Die Piece. The Side Piece will move along with it. IF THE ADJUSTMENT IS CARRIED TOO FAR, retract the screws and AFTER LIFTING OFF THE BOLSTER, drive both the Side and Front pieces forward together by using a soft punch and hammer at the end of the Side Piece. Only a very little force is necessary as the nuts holding the Die Pieces need to be only moderately tight. DONT DRIVE THE DIE PIECES WHILST THE BOLSTER IS IN PLACE OR THE LOCATING PLATES MAY BE DISTURBED. Carry out the adjustment again.

THE SETTING OF THE BLADE AND DIE IS NOW COMPLETE. BLADE AND BOLSTER MAY BE REMOVED AND REPLACED REPEATEDLY, BUT THE BLADE SHOULD ALWAYS BE TRIED GENTLY INTO THE DIE AFTER EACH REPLACEMENT. IT MAY BE FOUND NECESSARY TO ADJUST THE SCREW D OCCASIONALLY, BUT MORE THAN THIS IS UNLIKELY TO BE FOUND NECESSARY.

INITIAL ALIGNMENT OF TYPE "B" BOLSTER. (See 2, 4, 6 & 27 in the Brochure).

The "B" Bolster is used primarily for the circular Dies used with flat-faced (unsheared) Punches. To carry out the initial aligning, which normally would already have been done if the "B" Bolster had been ordered and sent with the Machine, the following items will be required:- one Punch about 25mm dia. is best, but other sizes can be used, with corresponding punch holder, die and adaptor ring. Also a scrap of cloth about .15mm thick, 75mm square.

N.B. Initial lining up is best carried out by the simple practical method outlined below, the use of dial indicators and similar instruments would prove to be difficult for two main reasons, (1) The top tool moves in an arc and not a straight line, and (2) The top tool spigots are set at 2° from the vertical.

PROCEED AS FOLLOWS.

- (1) Make sure that all relevant surfaces are free from paint, dirt, rust or burrs. These surfaces are (1) The 25mm bore in the top tool mounting block. (2) The 3 pegs on which the Bolster fits. (3) The underside of the Bolster with its 3 locating and clamping plates all of which should be cleaned disassembled. (4) The large bore in the Bolster. (5) The adaptor ring. (6) The spigot and punch recess of the punch holder. (7) The head of the punch. (8) The surfaces and edge of the Die. This initial work is most important as alignment of tools, however well set up, cannot be satisfactory if mating surfaces are not absolutely clean.
- (2) Fit the adaptor ring and the die into the Bolster using three M6 x 25 and three M6 x 12mm socket head countersunk screws.
- (3) Assemble the three pairs of locating and clamping plates on to the Bolster with six M6 x 30mm socket head cap screws (Allen Screws) and leave them slack.
- (4) Set the Bolster into the machine by holding it in the left hand - forked end away - and passing it from left to right behind the area of the blade mounting and bringing it forward on to its pins. THIS IS THE BEST WAY TO HANDLE THE BOLSTERS AS IT REDUCES THE RISK OF ACCIDENTALLY KNOCKING A PUNCH IF ONE HAPPENS TO BE IN PLACE. REVERSE THE PROCEDURE FOR REMOVAL.
- (5) Make sure that the pins have entered their plates and are firmly against the underside of the Bolster which it will be noted can be moved around within the limits of the clearance holes for the screws. If the Bolster rocks, adjust the hexagon screw which forms the fourth support.
- (6) Fit the punch holder into the mounting block (illustrations 2 & 4 in the Brochure) clamping the two halves together with the 2 M8 x 35mm socket head cap screws (Allen screws). IT IS MOST IMPORTANT TO TIGHTEN THE TWO SCREWS EQUALLY AND MODERATELY. IF THE TWO HALVES OF THE MOUNTING BLOCK ARE NOT KEPT PARALLEL, THE SCREWS WILL BECOME TIGHT IN THEIR THREADS AND ULTIMATELY BE DAMAGED. LEAVE THE SCREWS MODERATELY TIGHT ONLY. MAKE QUITE SURE THAT THE LOOSE HALF IS PARALLEL TO THE FIXED HALF BY SIGHTING ALONG THE TOP EDGE AS THE SCREWS ARE TIGHTENED.
- (7) Fit the Punch (without a Pilot) into the Holder and, using the short handled Gabro spanner, tighten the nut firmly but not excessively.
- (8) Gently lower the punch into the die moving the Bolster as necessary and adjust the knurled depth screw (illustration 8 in the brochure) so that the punch only just enters the die.
- (9) Carefully raise the punch clear of the die without disturbing the Bolster.

(CONTINUED ON SHEET IX)

THE GABRO COMBINED APERTURE-GUILLOTINE & HOLE PUNCHER.

INSTRUCTION SHEET IX.

INITIAL ALIGNMENT OF TYPE "B" BOLSTER (CONT.)

- (10) Cover the die with the piece of cloth mentioned in the opening paragraph, and lower the punch into the die drawing the cloth with it to centralise the die, assisting this process by slightly relieving and restoring the pressure a time or two. Hold the Handle firm.
- (11) The 6 screws holding the locating plates must now be tightened whilst the Handle is held down. Do this GRADUALLY, tightening each screw a little at a time until all 6 are moderately tight. Discard the cloth
- (12) Make a final check of the clean entry of the punch into the die. If it fouls, which is most unlikely, loosen the 6 screws holding the locating plates and return to (10) above. Repeated trials have shown that if these instructions are faithfully followed, punch and die alignment is assured and can almost be taken for granted.
- (13) Finally tighten the 6 screws and clamp the Bolster in place by sliding the centre table slat forward and tightening the knurled handle.

THE BOLSTER IS NOW SET IN ALIGNMENT WITH THE BORE OF THE TOP TOOL MOUNTING BLOCK AND ALL GABRO FLAT FACED (UNSHEARED) PUNCHES WITH THEIR CORRESPONDING DIES WILL BE FOUND TO LINE UP WHICHEVER HOLDER OR ADAPTOR IS USED. NEVERTHELESS, THE TOOLSETTER'S GOLDEN RULE OF ALWAYS CAREFULLY CHECKING THE PUNCH ENTRY BEFORE THE TOOLS ARE USED, MUST ALWAYS BE OBSERVED.

THE BOLSTER MAY BE LIFTED OFF OR REPLACED AS OFTEN AS REQUIRED WITHOUT ALTERING THE ALIGNMENT.

PUNCHES, DIES, PUNCH HOLDERS & ADAPTORS ARE LISTED AND PART NUMBERED IN THE PRICE LISTS.

TYPE "D" BOLSTER (TURRET BOLSTER Pt.No. 340)

This Bolster carries a Turret (Pt.No. 341) holding up to 8 Dies (Pt.Nos. 344/dia.) which operate with the same Punches, up to 18mm dia., as those used with Bolster "B", i.e. Pt.Nos. 53/dia., 45/dia., & 90/dia. up to 18mm. and the same Punch Holders i.e., Pt.Nos. 87/92/73 & 92/296.

INITIAL ALIGNMENT OF "D" BOLSTER.

This operation is very similar to that for type "B" Bolster and the same instructions can be used as follows:-

- (1) Refer to Sheet VIII and follow instruction (1) insofar as it applies, and include the Locating Plate welded to the Bolster.
- (2) Follow instructions (3), (4), (5), (6) & (7) and at (7) use a Punch preferably 15 to 18mm dia.
- (3) Clean the heads of the Dies on the underside of the Turret and assemble it on the Bolster with the Die corresponding to the Punch already fitted, located in the Locating Plate. Tighten the Turret Screw no more than is necessary to hold the Turret firmly.
- (4) Follow instructions (8), (9), (10), (11), (12) & (13).

THE BOLSTER IS NOW SET IN ALIGNMENT WITH THE BORE OF THE TOP TOOL MOUNTING BLOCK AND ALL GABRO FLAT FACED (UNSHEARED) PUNCHES (UP TO 18mm dia.) WITH THEIR CORRESPONDING DIES WILL LINE UP WHICHEVER PUNCH HOLDER IS USED.

CHANGING DIES IN THE TURRET.

This can be done under a fly-press or strong drill press. In either case it is recommended that a simple tool with a shank to fit the press or chuck and a head 23mm dia. by about 25mm long is made up. Die shanks are 25mm dia.

USING SINGLE DIES.

Single Dies can be used without the Turret and clamped with Die Clamp Plate Pt.No. 343/347.

THE GABRO COMBINED APERTURE GUILLOTINE & HOLE PUNCHER.

INSTRUCTION SHEET X.

SETTING UP BOLSTER "C" AND ALIGNING PUNCHES & DIES. Notes at the end are IMPORTANT

- (1) Mount the Bolster into the machine following the instructions (6), (7) & (8) on INSTRUCTION SHEET V, and proceed as follows:-
- (2) Move the Bolster to a position central within the limits of movement allowed and securely tighten the six hexagon socket screws. THE BOLSTER IS NOW SET UP and can be lifted on and off as required. Align the Punches & Dies as follows:-
- (3) Assemble a Die on to its Locating Plate using the two hx. hd. set screws & washers making sure that the "V" marked sides are kept together. Leave the screws slack.
- (4) Fit the assembled Die & Plate to the Bolster with the two "V" marked sides against the three locating blocks using the four hx. hd. screws & washers. Leave the screws slack.
- (5) Fit the relevant Punch into the machine. PUNCHES WITH SPIGOTS have a short Locating Pin set into the spigot. This goes to the rear and ensures that the Punch is always assembled the correct way round. PUNCHES WHICH BOLT ON do so in exactly the same way as the Blade as shown on Sheet VI, fig.II and paragraphs(9), (10) & (11) apply. Remember that the Punch must be firmly abutted to the Adjuster Screw "D".
- (6) Carefully bring the Punch down into the Die and adjust the front Depth Stop (illustration 8 in the Brochure) so that the Punch is only just fully into the Die.
- (7) Raise the Punch, being careful not to disturb the Die.
- (8) It is now necessary to centralise the Die. One method is as follows:- Take 4 strips of cloth or polythene about .25mm thick and about 10 to 20 wide by 50 long, and lay them on the Die with the ends hanging down into the opening, one each side, one back and one front. Lower the Punch and it will centralise the Die as the material is drawn in.
- (9) With the handle held down and the Locating Plate FIRMLY AGAINST the three locating blocks on the Bolster, tighten the four hx. hd. screws. BE CAREFUL NOT TO PULL THE HANDLE SIDEWAYS, as this may move the Die.
- (10) Discard the material and make a final check of the clean entry of the Punch into the Die.
- (11) Remove the Bolster and Die complete from the machine, and with a socket wrench securely tighten the hx. hd. screws which hold the Die to the Locating Plate. These screws should not again be disturbed.
- (12) Return the Bolster to the machine, recheck the Punch entry and make sure that the four hx. hd. screws are tight. Only these screws are removed when changing Dies.

NOTES.

- (1) The Adjuster Screw "D" may need further adjustment after a few holes have been cut and the Punch settles down. It can be used to provide a small amount of backward or forward movement of the Punch.
- (2) Always check the Punch & Die alignment after a few holes and occasionally thereafter. If all the screws have not been fully tightened, some creepage could have occurred.
- (3) In order to avoid damage to the tools, it is important to prevent the Punch from entering the Die any further than is necessary to complete the cut. This is accomplished by using the Depth Stop at the top of the Link. It should be set to low to start with and gradually withdrawn until the material is punched. A certain amount of "spring" in the machine framework is normal, and it is this that could send the Punch too far into the Die if the Stop is not properly set.

INITIAL ALIGNMENT & SETTING OF LOUVRE TOOL.

- (1) Remove the two Pressure Bars from the Top Tool and fit it into the Machine with the slotted hole to the rear, over the bush and with the Adjuster Screw ("D" on sheet VI) protruding about 6mm. Use the two M8 x 45 socket hd. screws provided to replace the normal shorter ones, and clamp the Tool securely.
- (2) Fit the Bottom Tool to the Machine exactly as other Bolsters described in detail on sheet V at (6), (7) & (8) and leave it free to "float".
- (3) Bring the Top Tool down very carefully to avoid damage to the cutting edges, and move the Bottom Tool until the Top Tool fits down into it so that it is central between the blocks at each end and with the faces of the cutting members in contact throughout their length but not tightly together. (The Depth Stop Screws must be inoperative).
- (4) With the position at (3) held, gradually tighten the six screws which hold the Bolster in place, tightening each pair a little at a time. Before the final tightening lift the Top Tool clear and check the re-entry. The Top Tool must not hit the edge of the Bottom Tool but just slide against it without clearance and throughout its length. When the setting is satisfactory, finally tighten the six screws.
- (5) Loosen the two screws holding the Top Tool and allow it to drop (both ends) to its lowest position, and then tighten the screws to a point where it is securely held but will move under moderate pressure. Fully retract the Adjuster Screw "D".
- (6) Bring the Tool down again slowly and when it touches bottom, push the Handle further down so that the Tool is pushed upwards in its partially tightened holder. The button on the top edge will provide an abutment for the back of the Tool when it reaches the top, and the Adjuster Screw must be turned down to provide abutment for the front. The purpose of the operation is to ensure that the Top & Bottom Tools are Parallel and that the Top Tool has firm abutments. The Adjuster Screw must not be turned hard enough to move the Tool once it is in place. Finally tighten the two screws.
- (7) Re-assemble the two Pressure Bars on to the Top Tool, first allowing them to drop to their lowest position and then, as before, tighten them so that they will move under pressure.
- (8) Bring the Tool down and when the Pressure Bars contact the Bottom Tool continue the pressure to cause the Bars to slide upwards until the Tool bottoms. N.B. It may be necessary to move the Spacing Gauge. Finally securely tighten the screws holding the Pressure Bars.

THE TOOL IS NOW SET UP. When refitting after removal it is necessary only to ensure that the Top Tool is firmly up against the Button at the back and the Adjuster Screw at the front, before finally tightening. Do this with the Tools engaged.

THE SPACING GAUGE. When setting the Gauge keep it parallel to the Die.

SHARPENING THE LOUVRE TOOL. Makers will gladly undertake this if requested. It is necessary to send only the Top Tool (without the Pressure Bars) and the Die (the square bar which acts with the Top Tool cutting edge). See below for re-assembly.

TOP TOOL:- This is sharpened by surface-grinding the vertical face which engages the Die, only.

BOTTOM TOOL:- The square bar or Die is reversible, and when both sides are blunt they may both be surface ground. If the top is ground it will be necessary to grind the remainder of the upper surface of the Bottom Tool as well, to keep the whole level.

RE-ASSEMBLY:- The only point not already covered in the alignment instructions above is the possibility that the Bottom Tool Die may need to be backed with shim if it cannot be set firmly against its abutment.

THE GABRO COMBINED APERTURE GUILLOTINE & HOLE PUNCHER.

INSTRUCTION SHEET XII

THE STRIPPERS. The Strippers for flat Blades are shown clearly at 19 in the Brochure, and for round Punches at 14 (one of the pair has been removed for clarity). The FEET (sliding lower ends) are interchangeable. For FLAT BLADES there is only one size of Foot. For ROUND PUNCHES there is a range of sizes, each suitable for several punch dias., and also for most shaped Punches. The table below lists the ideal use of each of the available sizes, but it will be found in practice that a Foot with a hole much larger than as shown will satisfactorily strip the work. The exceptions are usually materials such as Formica etc., and possibly aluminium (see "USE OF CUTTING LUBRICANTS Sheet XIV), and cases where slight distortion is unacceptable.

STRIPPERS CAN BE PUSHED ON OR OFF THE SPINDLES FROM THE ENDS OR SIDES.

STRIPPERS AVAILABLE, with Pt.Nos. and sizes of holes in Feet. Dias. in mm.

PUNCH DIAS.	HOLE DIA.	PT.NO.	PUNCH DIAS.	HOLE DIA.	PT.NO.
0 to 6	8	68/155	29+ to 38	40	68/157
6+ " 9	12	68/79	38+ " 47	50	68/77
9+ " 14	16	68/78	47+ " 56	60	68/180
14+ " 18	20	68/74	56+ " 65	70	68/76
18+ " 23	25	68/179	65+ " 75	80	68/75
23+ " 29	30	68/156			

By adjusting the Feet, the Strippers can be set for clearance over the work, and for general purposes they are best set 9mm above the Die. One good way to do this is to put a piece of 9mm plywood on the Die, and bring both Stripper feet down on to it and firmly tighten the T-nuts. Afterwards the plywood gauge can be slid out from under. IT IS IMPORTANT TO SET THE STRIPPERS LEVEL WITH EACH OTHER TO GIVE EASY STRIPPING WITHOUT JAMMING. Set as above the Strippers can be swung sideways over material up to 3mm thick and this is convenient for obtaining a clear view of the work.

N.B. THE INNER CLAMP PLATE IS REVERSIBLE TO ENABLE THE FEET TO BE LOCKED. When the work involves a series of regular strokes of the Blade, it is usually better to set the Strippers closer to the material to prevent it moving up and down excessively.

NOTE. The end of the Blade can be used for notching and then the Strippers may need to be brought forward on their pins if the notch is shallow.

THE FENCES.

N.B. Each Fence Bar is locked either by a knurled Locking Wheel on top of the main Hand-wheel, or by a split boss and Tommy-bolt in the bracket which supports the outer (unscrewed) end.

- (1) To set the SIDE FENCE:- Release the Fence Bar by unlocking whichever method (see N.B. above) is used. Set the Fence in the required position, roughly by unclamping it and sliding it along and reclamping, and finely by using the knurled Hand-wheel. Re-lock and, if the split boss is used, push the Fence firmly down before tightening.
- (2) To set the REAR FENCE:- Release the Fence Bar by unlocking whichever method (see N.B. above) is used. Unclamp and hold BOTH ends of the Fence, and slide it to roughly the required position. Clamp it at the Fence Bar end ONLY and finish setting with the knurled Hand-wheel. Lock the Fence Bar and LASTLY clamp the outer end of the Fence.

CHANGING BACK TO FLAT BLADE AFTER OTHER TOOLS HAVE BEEN FITTED. Assuming that the initial alignment of Bolsters etc., has been carried out and not disturbed, the only item likely to need attention is the Adjuster Screw "D" on Sheet VI, which may have been disturbed since the Blade was last fitted. Proceed as follows:-

- (a) Retract the Screw "D" with the Blade loose and in contact with it.
- (b) Lightly tighten the Blade and adjust the Screw downwards until the Blade enters the Die cleanly.
- (c) Fully tighten the Blade.

MAXIMUM AND MINIMUM CAPACITIES. The capacity of these machines is fully tabulated on page 11 of the Brochure. An important point to remember is that the "Parrot's Beak" Blade (which shows particularly well at 5 in the Brochure) cuts the maximum possible, given as 3mm mild steel. However, it can be used on occasion for 3.2mm ($\frac{1}{8}$ " 10 SWG) mild steel provided the instructions on clearances (see Sheet XVII) are adhered to and a little lubrication is used. (See "USE OF CUTTING LUBRICANTS" Sheet XIV). The capacities for round punches given in the table apply to general use and should not be exceeded.

CUTTING RADIAL SLOTS. Slots such as those in the second item up, in the bottom right-hand corner of illustration 3 in the Brochure, and the wider one just above to the left, are cut using the Centre Locator set up as in either of the positions shown at 12, 13 or 14. Any of the tapped holes in the Head can be used and a hole drilled or punched at the radial centre of the slot to fit either the standard 4mm end of the knurled Centre Pin supplied, or any other size made as required. The thread is 6mm coarse.

METHOD.

- (1) Set up the Centre Locator if possible as at 14 in the Brochure, with the knurled Centre Pin in the hole shown there. Other positions may have to be used for some jobs, but that one is usually the first choice.
- (2) Set the distance between the Centre Pin and the Punch equal to the radius of the slot. This should be checked with a try-out on a piece of scrap.
- (3) Set the Strippers level about 1mm above the work.
- (4) Punch a hole at each end of the slot.
- (5) Punch a row of holes along the remainder of the slot, close together but NOT OVERLAPPING.
- (6) Punch out the "bridges" between the holes, placing each as nearly central across the Die as possible.
- (7) If they are large enough, punch out any "peaks" left and again try to place them central on the Die.
- (8) Finish off with a file if required.

IT WILL BE SEEN THAT THE ABOVE PROCEDURE AVOIDS THE USE OF "NIBBLING" AT THE SIDE OF A HOLE. ALTHOUGH THIS CAN BE DONE ON VERY LIGHT WORK IT SHOULD NOT BE REGARDED AS GOOD PRACTICE AS THERE IS ALWAYS THE DANGER OF THE PUNCH BEING FORCED OVER TO FOUL THE DIE. (Less likely if cutting at the front).

OPENINGS OF BLADE WIDTH, BUT SHORTER. Refer to illustrations 8 & 11 in the Brochure where this work is illustrated and described. The important point to note is that the first cut across one end made with the tip only of the "parrot's beak" part of the Blade, is kept as short as possible, (using one of the Stops at 8) so that the small nib of material pressed through will lift out of the Die easily, and when the work is turned round will slip back into the Die for re-alignment.

OPENINGS NOT WIDE ENOUGH FOR A FULL CUT ACROSS THE ENDS. Where these are wider than can be dealt with under "OPENINGS A LITTLE WIDER THAN THE BLADE THICKNESS", they are best cut by cutting down each side, and then along each end using a Depth Stop (illustration 8 in the Brochure) to prevent overcutting. Alternatively the "slot and bridge" technique shown under "OPENINGS IN WORK WHICH CANNOT BE TURNED ROUND" can be used. (Sheet XVI).

THE DEPTH STOPS. These are illustrated at 8 in the Brochure where their use for cutting "OPENINGS OF BLADE WIDTH, BUT SHORTER" is described (see Sheet XIII), but one of them, preferably the inner, should be in constant use to ENSURE THAT PUNCHES AND BLADES DO NOT ENTER THE DIES FURTHER THAN IS NECESSARY TO SEVER THE MATERIAL. THIS HELPS PROLONG TOOL LIFE, AND WITH THE ADDITIONAL HELP OF LUBRICATION (see below) ENSURES CLEAN AND EASY STRIPPING.

Two Stops are provided so that two settings can be used at the same time. The moveable abutment of the outer Stop can be swung away to bring the second one into use.

THE CENTRE LOCATOR. Illustrated in the Brochure at 9, 12, 13, 14 and 15. This accessory fits into the pair of sockets welded one each side of the machine behind the Table, and provides a means of establishing a pivotal point over a large area of the left hand side of the Table. A reverse handed model can be supplied to order.

The choice of holes in the Head are tapped M6 x 1 (coarse). The Centre Pin provided is for a hole 4mm dia. which can be drilled or punched for that part of the job needing the Centre Locator, and opened up afterwards if necessary.

Where a larger existing hole has to be the pivotal point, a stepped bush of the needed dia. and about 5mm thick can be made up with an M6 x 1 tapped centre hole. Such bushes can be saved for indefinite future use. The telescopic arms and the mounting sockets should be GREASED and the other pivots and screws oiled. See also "CUTTING RADIAL SLOTS", Sheet XIII.

THE LINE GUIDE. This is illustrated at 18 in the Brochure and is used for working to a line. When not in use it can be swung away from the cutting area by pulling the head to the right. It is pivotted in its mounting and located by ball plunger. This area of mechanical movement should be kept lightly oiled on rubbing surfaces.

The notch in the standard head is for a 6mm thick Blade and is set to indicate the position of the sides and end of the Die when these are hidden by the work. Line Guides with heads with notches for other thicknesses of Blade can be supplied, but scribe lines on the standard head can sometimes be satisfactory.

SETTING THE LINE GUIDE ACCURATELY IN PLACE. The ball plunger which locates the spring blade is in a block which pivots on the same spindle, and this is held by a small hex. head screw on the top. If this screw is loosened, the block can be moved and the Guide set accurately to the Die and the screw re-tightened.

AVOIDING DAMAGE TO TOOLS.

- (1) ALWAYS check the alignment of the Tools before starting after set-up.
- (2) Don't cut with one side only of the Blade or Punch. See "OPENINGS A LITTLE WIDER THAN THE BLADE THICKNESS" on Sheet XVI and "CUTTING RADIAL SLOTS" on Sheet XIII.
- (3) Use the Depth Stops described above.
- (4) Ensure that there is no scrap on the Die and that the work LIES FLAT.
- (5) Use the screws to hold the Dies and Adaptors in the Bolster. There is a temptation to miss these out as the Dies do not always lift, but if they do they could be damaged at the next stroke. Three screws are provided, but better to put one in each part than to omit them entirely.
- (6) Support large sheets to prevent movement breaking small Punches.
- (7) Use cutting lubricants, especially on aluminium. (See below).

USE OF CUTTING LUBRICANTS. Cutting and stripping is much easier if the Tools are oily. Although special lubricants are available, light machine oil for general use and paraffin (kerosene) for ALUMINIUM will be satisfactory. Never work aluminium dry. Such materials as Formica strip more easily from an oiled Punch. Thicker grades of STEEL should always be oiled.

THE GABRO COMBINED APERTURE GUILLOTINE & HOLE PUNCHER.

INSTRUCTION SHEET XV

SHARPENING BLADES, PUNCHES & DIES. (For LOUVERING TOOL see Sheet XI).

NOTE.

Detailed sharpening instructions are given below, but tools returned to makers for sharpening will be dealt with quickly and efficiently, and returned as promptly as Post Office service will allow.

FLAT BLADES. These will almost certainly need grinding before the Die. They may be ground on an ordinary bench grinder with a properly dressed wheel. As the periphery of a grinding wheel leaves a concave surface, the work-rest should be set half a Blade's thickness below the centre of the wheel. This keeps the concave central - not essential but better for accurate cutting. Grinding can be by three different methods.

METHOD (1) Where only a bench grinder is available.

Lay the Blade flat on the work-rest and grind the profile. If the Blade has a "parrot's beak" try to keep it the same size and shape, but if this is badly worn it may be ground off to leave the Blade straight. Without the beak, the Blade will be less useful for cutting the short slots at 11 in the Brochure and will have a reduced maximum capacity, otherwise it will be a very useful normal Blade.

METHOD (2) Where a surface grinder is available.

Grind the surfaces of the Blade, a little at a time from each side in turn to avoid the distortion which occurs if too much metal is removed from one side only.

The reduction in thickness creates no problem as the Die can be adjusted by means of the two screws "L" & "M" on Sheet IV.

METHOD (3) Where both bench and surface grinders are available.

Use a combination of methods (1) & (2). This is probably the method which is best where there is a lot of wear, a little experience will quickly establish a pattern of grinding to suit prevailing circumstances. It should be remembered that a great deal of grinding can be done before the Blades are worn out, because of the adjustable nature of the Dies.

DIE PIECES. These are reversible and fresh cutting edges can be brought into use by both turning round and turning over, and grinding can be deferred until all are blunt. The small pieces such as part "D" in the table and diagram on Sheet IV, are best discarded after all edges have been used.

METHOD. Grind the edges on a surface grinder with means for holding the pieces absolutely vertical; preferably a precision vice. If the edges are not square to the faces, the reversible quality will be lost as a "bell mouthed" die could be made.

The faces can be ground, but experience favours the grinding of edges only because variations of thickness could creep in, especially if new pieces are mixed with old and the resulting uneven Die would be unsatisfactory.

ROUND PUNCHES. These are of 3 types. (See 27 in the Brochure). All have a 2° taper with 1 or 2mm left parallel for grinding. A "shear", also of 2° is built into the machine so that the punches are parallel top and bottom, yet still have the advantages that a small "shear" gives. The head of the small (6mm & under) punches is separate (Pt.No.73) so that they can be cheaply renewed from 6mm silver steel. But this can only be done on a D.I.Y. basis where facilities ensure absolute concentricity.

(CONTINUED ON SHEET XVI)

ROUND PUNCHES (CONT). Grind on a surface grinder. All except the 6mm and under can be ground by placing straight on the magnetic chuck. The small ones will need some means of support. A precision vice or simple holding block will do.

CIRCULAR DIES. Grind the top surface only on a surface grinder. The Dies are parallel for 2mm giving ample grinding allowance.

OPENINGS WITH BOTH SIDES A BLADE'S LENGTH OR MORE. These are simple, as can be seen at 10 in the Brochure. One or both Fences can be used to locate the work, or the Line Guide shown at 18. When the Fences are used it is sometimes advisable to secure them additionally with a "G" clamp over one of the Table Slats. This can be particularly important if the work-piece is heavy. The work is turned for each side.

OPENINGS IN WORK WHICH CANNOT BE TURNED ROUND. The whole or part of two of the sides of such openings must be cut with the ends of the Blade. A satisfactory way of doing this is shown at Fig. 1 below. The sides are cut first and then a series of slots made with "bridges" between which are a little narrower than the Blade thickness. The "bridges" are then cut out. With a job of this sort there is a temptation to make a series of side by side cuts, but this could force the Blade over against the side of the Die and bring about premature blunting. The "bridges" balance the forces.

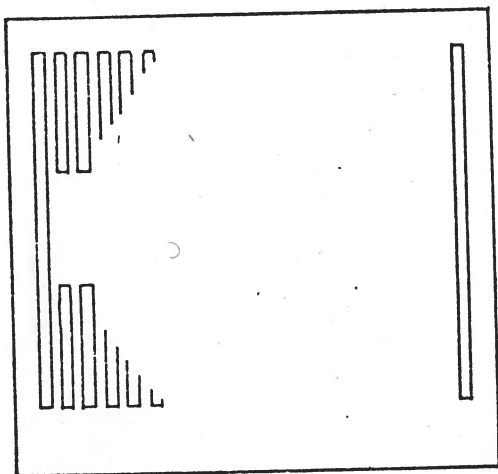
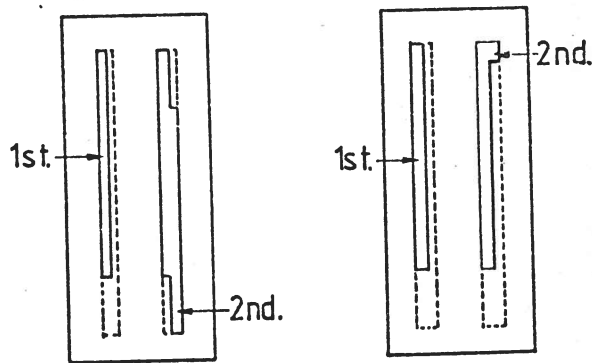


FIG. 1.



METHOD 1.

METHOD 2.

FIG. 2.

OPENINGS A LITTLE WIDER THAN THE BLADE THICKNESS. These must not be made with a trimming cut except by using some method which allows part of the Blade to be in the Die before the trim starts. Fig. 2 shows two methods of cutting a slot 9mm wide. If this is cut full length along one side first, and then trimmed, the Blade could be forced over if the material is thick. The diagrams show how this can be avoided. In Method 1 the work is turned right round for the second cut, and in Method 2 it is turned at right angles, and the end of the Blade, controlled by the Depth Stop used to cut the notch. The final trimming is easily carried out with the Blade in the Die before the cuts start. Other methods will suggest themselves; all that is necessary is to ensure that at the start of a cut the BLADE IS EITHER CUTTING BOTH SIDES OR HAS, FOR AT LEAST A SHORT DISTANCE, ENTERED THE DIE.

If the slot is shorter than the Blade's length, the first cut can be made as under "OPENINGS OF BLADE WIDTH, BUT SHORTER" and the second as at Method 2 above but by notching both ends.

THE GABRO COMBINED APERTURE GUILLOTINE & HOLE PUNCHER.

INSTRUCTION SHEET XVII

CLEARANCE BETWEEN FLAT BLADE & DIE.

In all cutting by the "blanking" process there must be clearance between the punch and the die, whatever form they may take. The two should never be in actual contact. On normal press tools this clearance is fixed at the time of manufacture and is un-alterable. On the GABRO APERTURE GUILLOTINE the clearance is adjustable because of the sectional nature of the Die. The amount of clearance has a considerable effect on the cleanliness of cut and on the effort required; for example, thick material cut with too little clearance requires more effort than if cut with the correct clearance, and thin material cut with too much clearance acquires a burr.

As ideally each thickness (and type) of material would need a different clearance an average must be used on a general purpose machine. On the GABRO an all-round compromise of .1mm (.004") each side of the Blade has been found to be satisfactory for almost all practical purposes, and rarely needs altering. Clearance at the ends is not essential because the slope of the Blade allows displaced metal to move away from the Die ends, in turn, creating no expansion pressure.

The STANDARD CLEARANCES are therefore .1mm (.004") each side of the Blade and the minimum possible without rubbing at the ends. Only the sides ever need to be adjusted, except when wear or sharpening require otherwise. (See "INITIAL ASSEMBLY & ALIGNMENT OF BLADE & DIE ON TYPE "A" BOLSTER" for full information).

Theoretically, both sides of the Die should be adjusted, but in practice moving the left only, is acceptable. If perfection in this matter is sought, a study of "INITIAL ASSEMBLY etc." as above, will provide the instructions.

TO REDUCE THE CLEARANCE. Refer to the Diagram on Sheet IV.

- (a) Slightly slacken the screws holding "C" & "F".
- (b) Lower the Blade into the Die and hook it down.
- (c) With a feeler gauge equal to twice the required clearance per side held in between the Blade and the left Die Side Piece, adjust the two screws "L" & "M" until the feeler gauge fits evenly along the Die.
- (d) Re-tighten the screws holding "C" & "F".

TO INCREASE THE CLEARANCE. Refer to the diagram on Sheet IV.

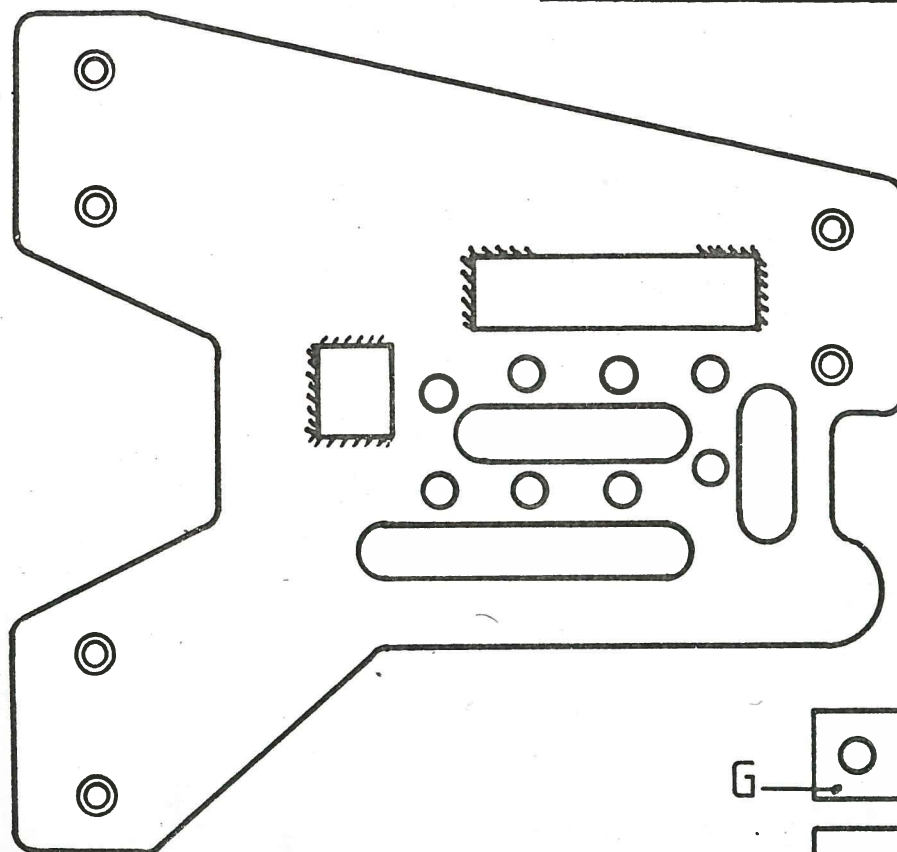
- (a) Slightly slacken the screws holding "C" & "F".
- (b) Retract the screws "L" & "M".
- (c) Lever "F" outwards by putting the turned down end of the Die Opening Tool "N" into the Die and pulling sideways. Move "C" up to "F" by lightly tapping with a hammer and soft punch.
- (d) Proceed as from (b) in "TO REDUCE THE CLEARANCE" above.

NON-GABRO BLADES, PUNCHES ETC. The use of tools other than genuine GABRO is strongly deprecated. This machine and its tools have been developed and patented as integral parts of a single conception. The design, construction and manufacturing tolerances of each are interrelated and inseparable. No responsibility for the correct functioning of the machine can be accepted if tools other than GABRO are used, and guarantees are invalidated.

SPECIAL TOOLS. One example of a special tool is illustrated at 22 in the Brochure. The component is part of a circular saw-guard made from 2mm mild steel. The slots are 60mm long and 12mm wide with radius ends. THIS IS BUT ONE EXAMPLE OF SMALL BATCH REPETITION WORK OF THE KIND THAT CAN BE SUCCESSFULLY AND CHEAPLY PUT ON A GABRO. TOOLS FOR SUCH WORK WILL BE GLADLY QUOTED FOR ON SUBMISSION OF DETAILS, SUBJECT TO FEASIBILITY AS THE MAKERS ASSESS THIS. ADDRESS AS BELOW.

GALE BROS., (ENGINEERS) LTD. Hathersham Close, Smallfield, Surrey. RH6 9JE.
England.

GABRO AC APERTURE CUTTER "A" BOLSTER WITH BLADES & DIE PIECE LAYOUT.
INSTRUCTION SHEET XVIII



"PARROT'S BEAK" POINT FOR MAKING SMALL OPENINGS AS SHOWN IN THE BROCHURE AT 11. ALL BLADES CAN BE SUPPLIED WITH OR WITHOUT THIS FEATURE, BUT IT IS NECESSARY FOR HEAVY GAUGE MATERIALS E.G. 12 G. 2.6mm

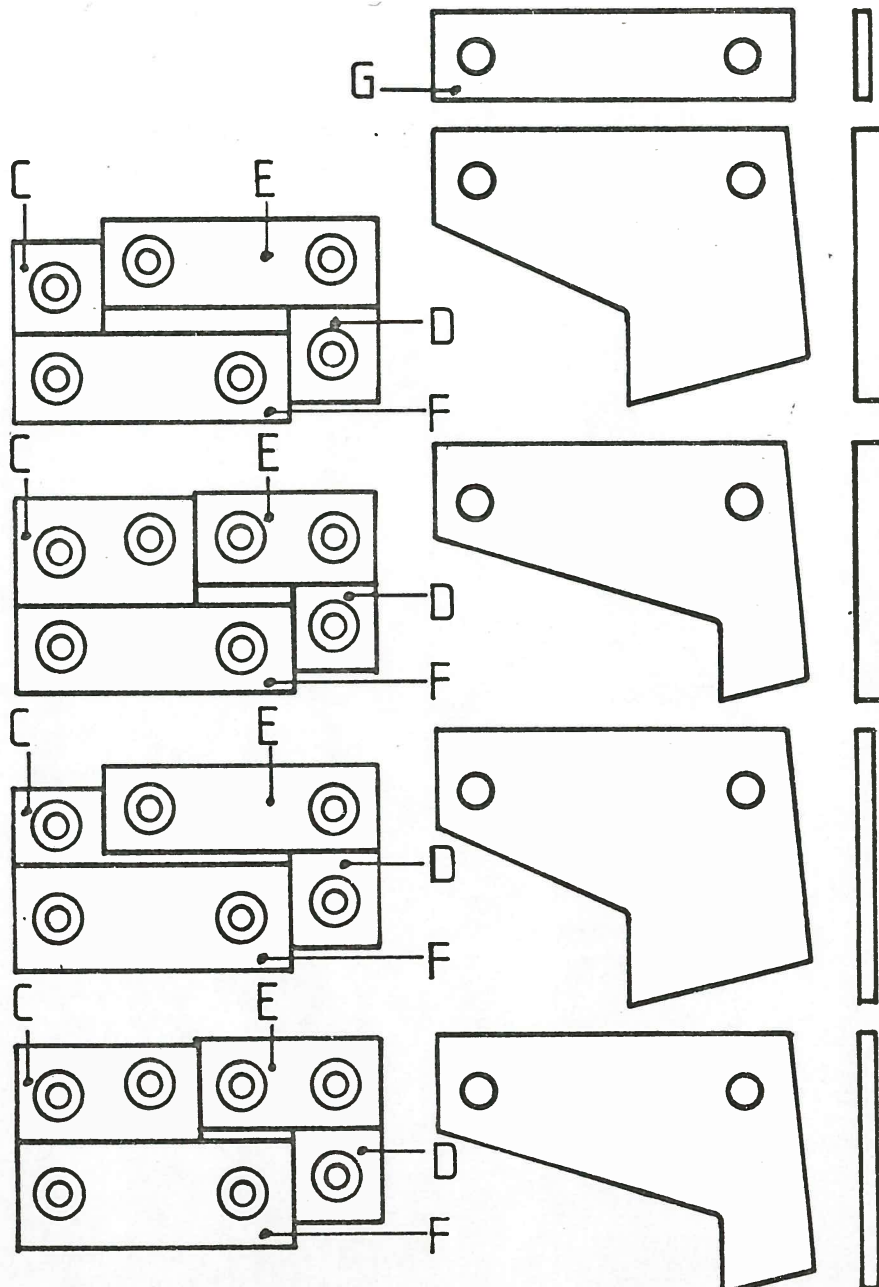
BLADES & DIE PIECES LISTED BELOW ARE STANDARD. SPECIAL SIZES SUPPLIED TO ORDER.

	Pt.No.
BLADE 50 x 6mm	97
C 25 x 25 x 5	41
D 25 x 25 x 5	41
E 75 x 25 x 5	40
F 75 x 25 x 5	40

	Pt.No.
BLADE 25 x 6mm	99
C 50 x 30 x 5	43
D 25 x 25 x 5	41
E 50 x 25 x 5	42
F 75 x 25 x 5	40

	Pt.No.
BLADE 50 x 3.3mm	182
C 25 x 20 x 5	184
D 25 x 25 x 5	41
E 75 x 25 x 5	40
F 75 x 30 x 5	185
G Packing	187

	Pt.No.
BLADE 25 x 3.3mm	183
C 50 x 27 x 5	186
D 25 x 25 x 5	41
E 50 x 25 x 5	42
F 75 x 30 x 5	185
G Packing	187



PACKING
Pt.No.187

BLADE
50 x 6mm
Pt.No. 97

BLADE
25 x 6mm
Pt.No. 99

BLADE
50 x 3.3mm
Pt.No. 182
Requires
Packing
Pt.No. 187

BLADE
25 x 3.3mm
Pt.No. 183
Requires
Packing
Pt.No. 187