

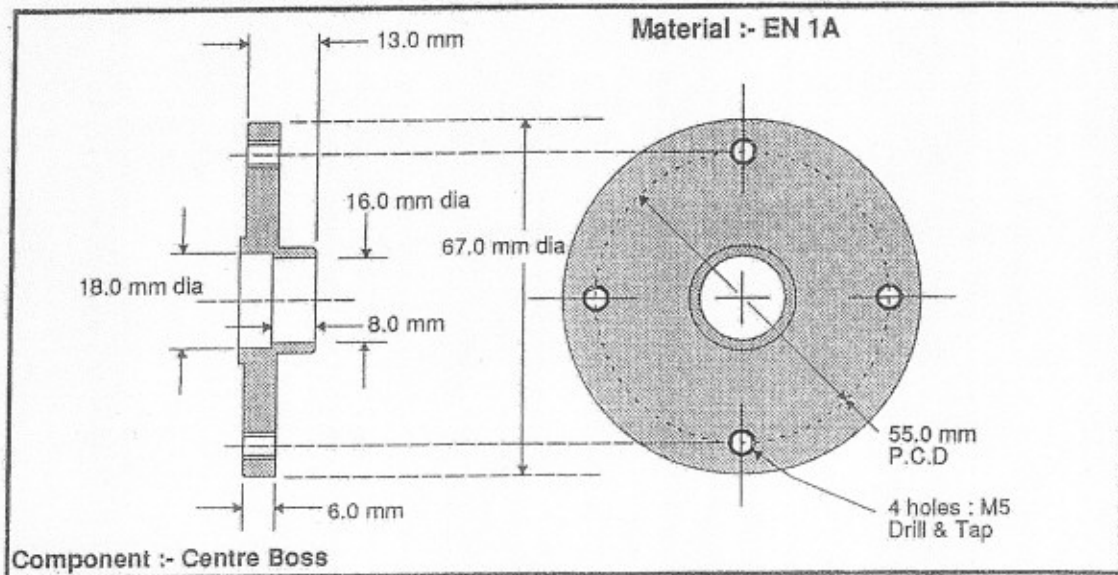
WICKMAN  
PRODUCTION  
HIGHLIGHTS





# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-01



**MANUFACTURED COMPLETE IN 57.0 SECS ON WICKMAN 3 1/4"(82mm)-6 SPINDLE BAR AUTOMATIC**

This component was previously produced in the traditional manner of manufacturing a Turned Blank on a Multi-Spindle Lathe and then carrying out two further operations (Multi-drilling and Tapping) of the 4 x M5 holes on the 55mm pitch circle diameter.

Wickman engineers provided a solution to manufacture the part complete in one operation.

In order to overcome introducing costly spindle stopping features the Wickman approach utilised **Multi-Spindle Drilling and Tapping Attachments running synchronously with the workspindle, with controlled spindle orientation.**

Two drives were utilised for this Multi-Spindle Drilling application. One for rotation of the attachment synchronous with the Work Spindle and one for driving the 4 drills at the correct drilling speed.

The Multi-Spindle Tapping Unit was set to run synchronously with the Work Spindle and also correctly oriented to the previously drilled holes. An additional feature of a **Threading Clutch** was also required to provide a **Tapping 'In' and 'Out' condition.**

A **Synchronous Pick-up and Back Boring Attachment** allowed the rear Bore to be machined after cutting off the part from the Bar Material.

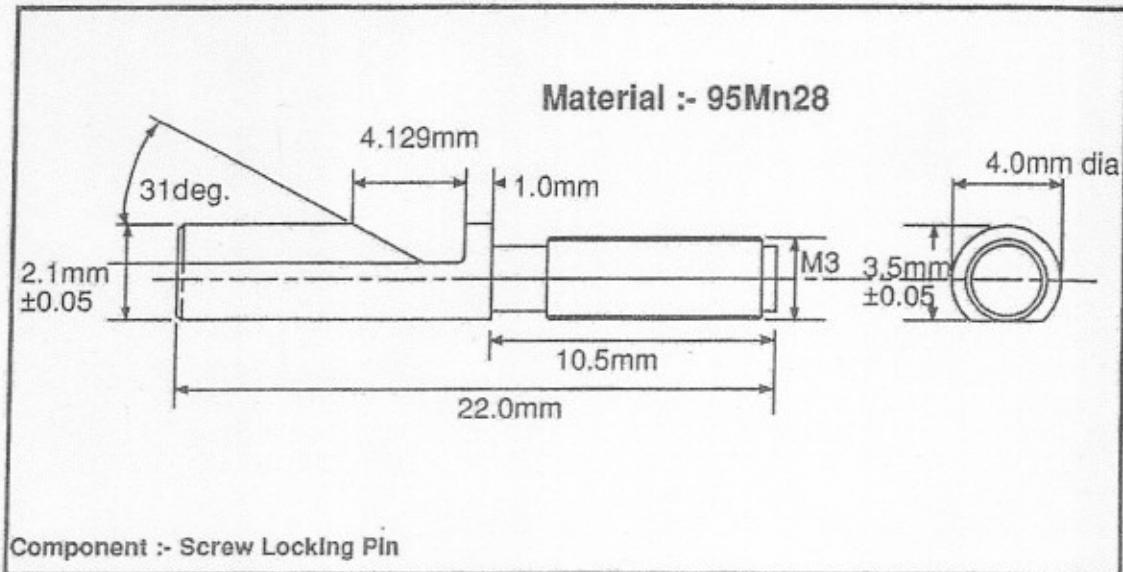
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-02



**MANUFACTURED COMPLETE IN 4.7 SECS ON WICKMAN 5/8"-6 SPINDLE BAR AUTOMATIC**

This small intricate part was required complete from the Multi-Spindle Lathe with Milled Slot, Flat and Thread Rolling of the M3 Thread. These features were also required to be completely Burr free.

Wickman's solution to this involved :-

1. Thread Rolling of the M3 at Station 3 using the **Wickman Thread Rolling Attachment** carrying a "Fette" F0012 stationary type Rolling Head.
2. The Machine Spindle was stopped at Station 4 and a specially designed **Caliper Type Milling Attachment** carrying a **Form Milling Cutter** and a **Flat Type Milling Cutter** passed across the work to give the two features required.
3. At Station 5 the drive to the spindle was engaged and a **Rotating Wire Brush** was applied to the work for complete Burr removal.
4. The part was finally supported in a standard **Wickman Synchronous Pick-up Attachment** to allow the component to be cut off with a completely Flat Burr Free Face.

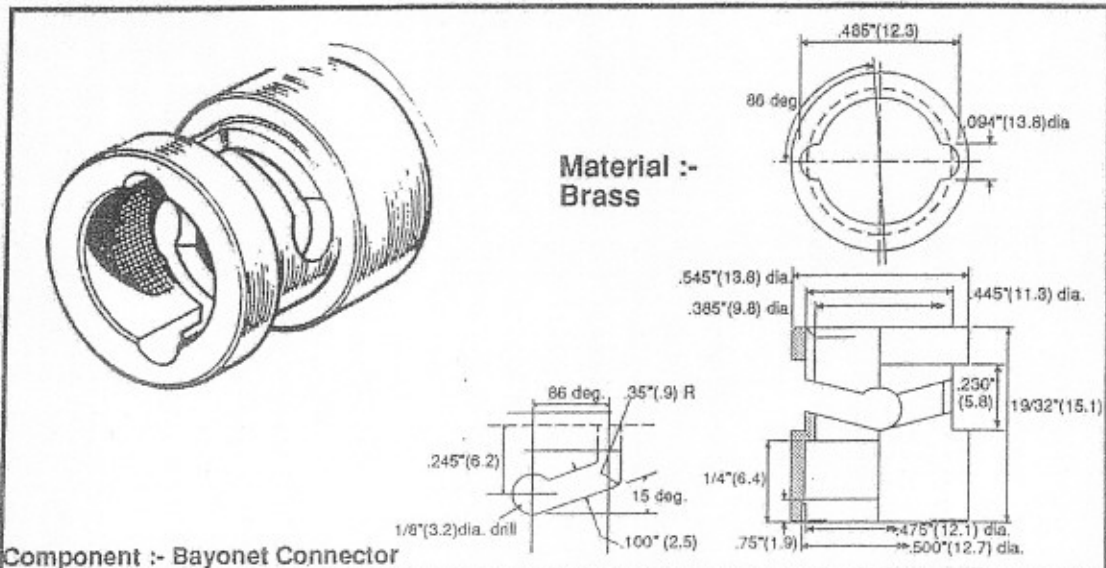
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# WICKMAN AUTOMATIC LATHES

**Production Highlights : 90-03**



**Component :- Bayonet Connector**

**MANUFACTURED COMPLETE IN 9.6 SECS ON WICKMAN 5/8"-6 SPINDLE BAR AUTOMATIC**

Wickman Engineers were requested to investigate the possibility of producing the above component, complete in one operation.

The part is used in large quantities in the electronics and computer industries for connection of "Coaxial Cables".

A layout was developed, based on the Wickman 5/8"-6 spindle machine fitted with **Spindle Stopping Facilities**.

The component was rough machined at Stations one and two in readiness for the specialised machining operations.

At Station 3 the Spindle was stopped to allow **Drilling** of the two small entry holes on the front face of the part and also **Cross Drilling the Hole** which is to form the end of the Bayonet Slot.

The Spindle was retained braked into Station 4 for **Cross Milling** of the Two Slots to join up with the end face holes and the Cross Hole.

Station 5 was used for finishing the outside diameter and bore and at Station 6 a **Synchronous Pick-up and Back Counter Boring Attachment** finish machined the rear Counterbores after cut off.

The sequence also included for **Roll Marking** the part number on the outside diameter.

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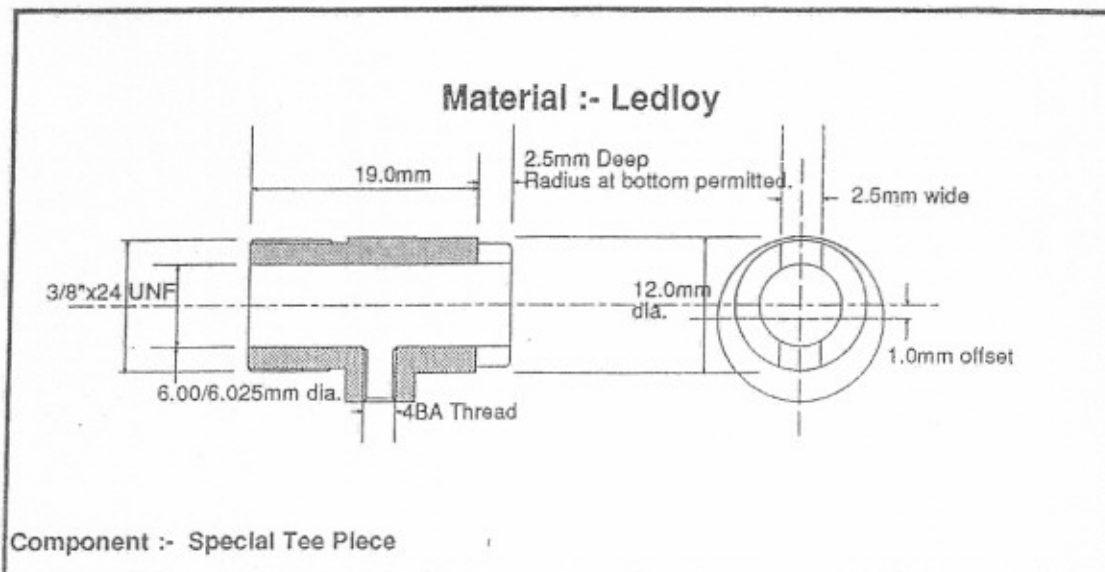
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-04



**MANUFACTURED COMPLETE IN 4.2 SECS ON WICKMAN 5/8"-6 SPINDLE BAR AUTOMATIC**

The above component was machined utilising the special features listed below.

1. A standard **Wickman Chasing Attachment** arranged to produce the 3/8" x 24 Thread.
2. Spindle Stopping at Station 3 to allow **Single Point Generation** of the eccentric portion of the part.
3. Spindle remaining stopped at Station 4 for **Cross Drilling and Milling** of the 2.5mm wide slot at the correct relationship to each other and also the eccentric.
4. Spindle remaining stopped at Station 5 for **Cross Tapping** and also a **Live Reaming** operation to finish the bore to size.
5. At Station 6 the part was **Back Chamfered** in the Bore after Cutting off using the standard **Wickman Synchronous Pick-up and Back Boring Attachment**.

This is another good example of Wickman providing a complete manufacturing solution to a customers specific requirement.

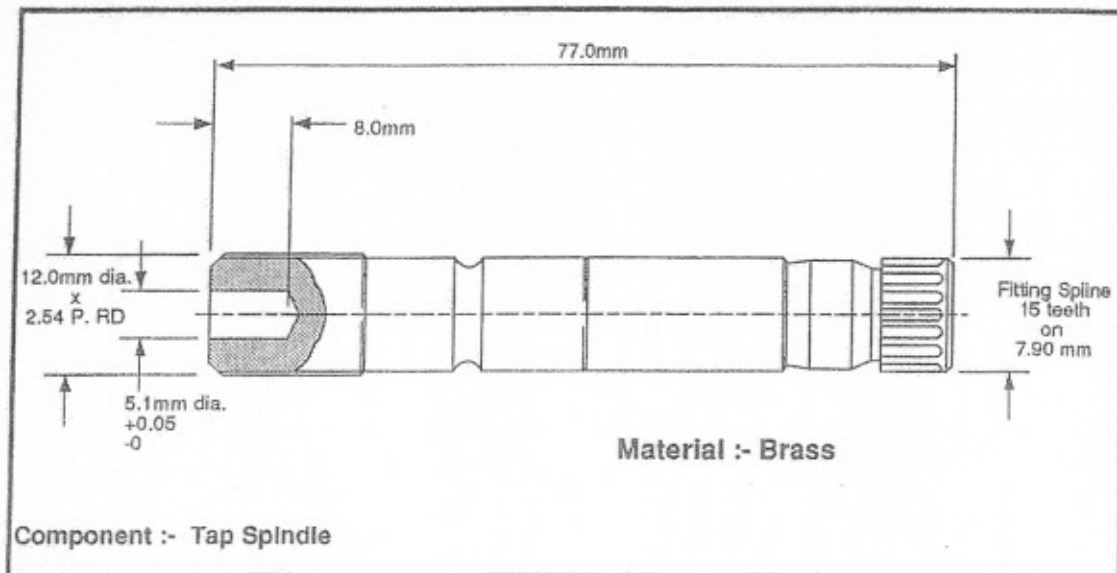
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-05



MANUFACTURED COMPLETE IN 3.9 SECS ON WICKMAN 5/8"-6 SPINDLE BAR AUTOMATIC

At the outboard end of the piece there is a 15 tooth spline which requires an interference fit with its mating part. This form was achieved with the **Synchronous Driven Drifting Attachment** fitted with a special **External Broaching Tool** which has been manufactured with a spark erosion process.

After cut off a specially adapted standard Wickman Pick-up and Back Boring Attachment was used for the Back Drilling of the 5.1mm diameter bore.

Special requirements for the fast traversing of the attachment were necessary in order to provide sufficient machining revolutions within the 3.9 second cycle time.

This part demonstrated the 5/8"-6 machine is capable of handling relatively long components where second operations are involved.

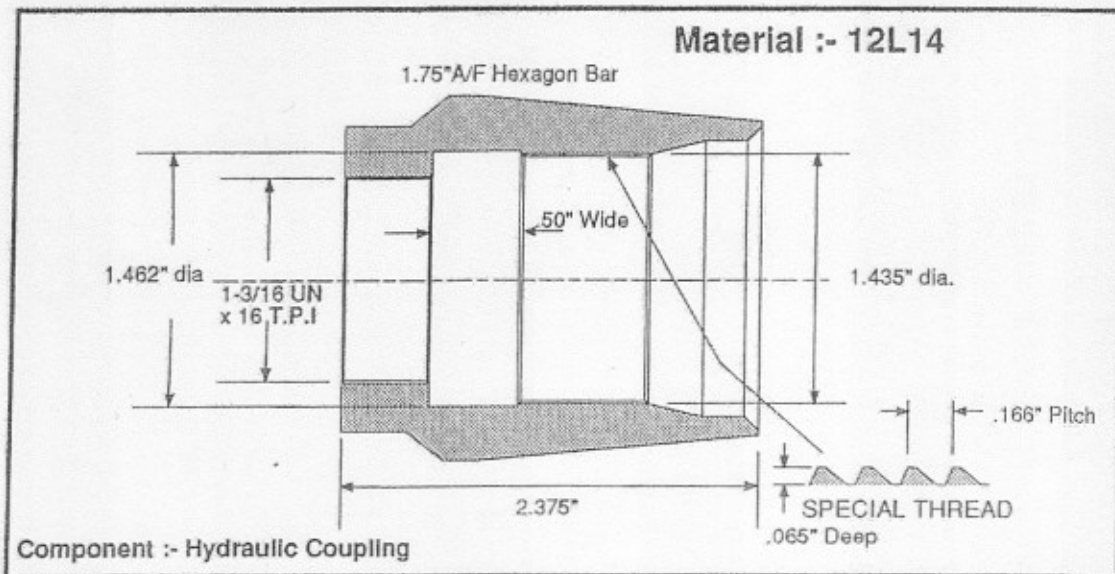
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-06



**MANUFACTURED COMPLETE IN 33 SECS ON WICKMAN 2 1/4"-6 SPINDLE BAR AUTOMATIC**

This part is one frequently found in the Hydraulic Hose fitting industry and requires considerable metal removal and the inclusion of a special type thread having an angled buttress form with a pitch of .166".

To achieve the parts successful production it was extremely important to consider the removal of swarf particularly from the 1.462" diameter .5" wide chamber. A normal recessing operation would tend to produce swarf which will collect within the chamber and could cause obstruction to the retraction of the recess tool.

Wickman engineering solution to this problem involved the use of a **Centre Block Mounted Ramp Type Recess Milling Attachment**. The Milling Cutter Rotating Counter clockwise to the spindle produced minute particles of swarf which could be flushed clear of the workpiece. This application is frequently applied to this type of problem.

Where long Internal Chambers are involved a push over type of attachment, allowing the Milling Cutter to be fed into depth and then traversed longitudinally to achieve the length of chamber, is also available.

The special .166" pitch buttress thread required the development of a **single point type cross slide mounted chasing attachment**, due to the large cross section of material to be removed. This attachment is also designed for external threading and both applications can be single point cutting or conventional multi-tooth cutting.

Threading of the 1 3/16" UN x 16 T.P.I. Thread was produced with the standard **Wickman Full Threading Attachment**.

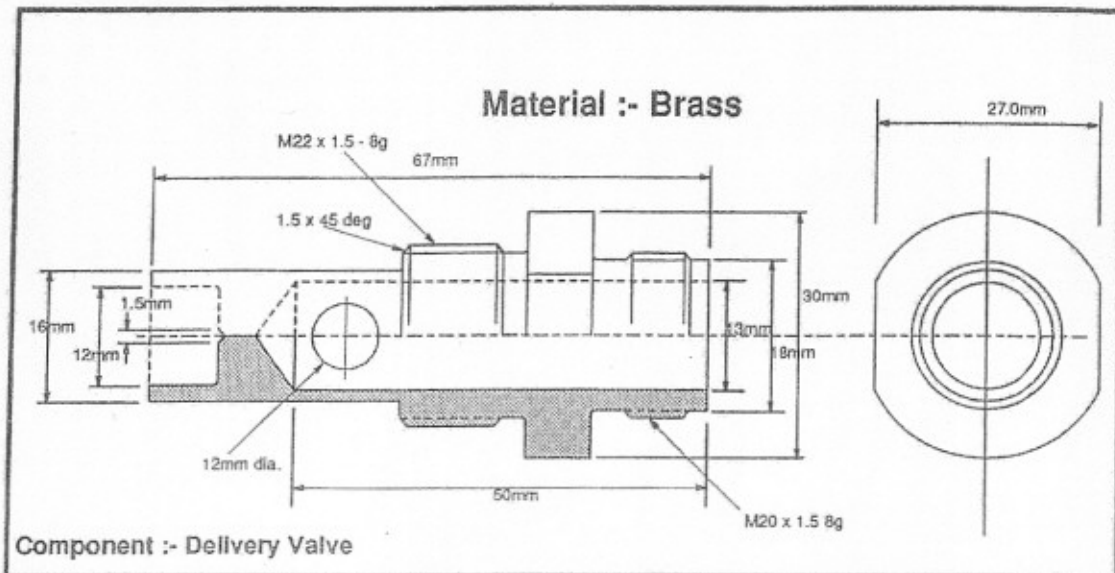
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# WICKMAN AUTOMATIC LATHES

**Production Highlights : 90-07**



**MANUFACTURED COMPLETE IN 8.0 SECS ON WICKMAN 1 3/4"-6 SPINDLE BAR AUTOMATIC**

The component blank was prepared at Stations one and two, followed by Spindle Stopping at Station three to enable the cross hole to be completed.

At Station four the Spindle Drive was engaged to enable flat generation of this 27.0mm flats to be completed.

As both threads are the same pitch, although different diameters, these are chased together at Station five with a Double Cutter Chasing Attachment.

During cut off this component was gripped on the outside diameter utilising the standard Wickman Synchronous Pick-up and Back Boring Attachment. The part was then transferred to a Back Drilling Cutter for machining of the 12.0mm bore.

The method utilised enabled the part to be completely machined at one setting.

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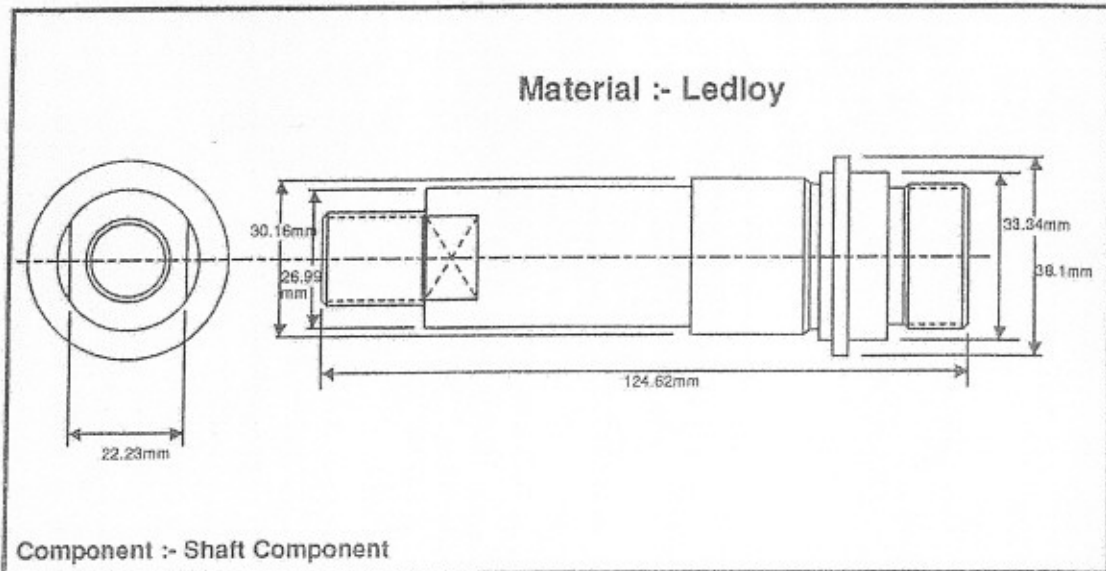
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-08



**MANUFACTURED COMPLETE IN 13.8 SECS ON WICKMAN 1 3/8"-6 SPINDLE BAR AUTOMATIC**

Thread Rolling of the large thread was carried out using a Callper type thread rolling attachment operating from the fifth Station Cross Slide and Rolling of the small thread was achieved in Station six prior to component cut off.

A Wickman Synchronous Milling Attachment mounted at Station four allowed the two flats to be produced within the machine cycle.

This layout utilised Tungsten Carbide Tooling where practical to achieve the stated cycle time.

This method enabled the part to be machined complete in one setting.

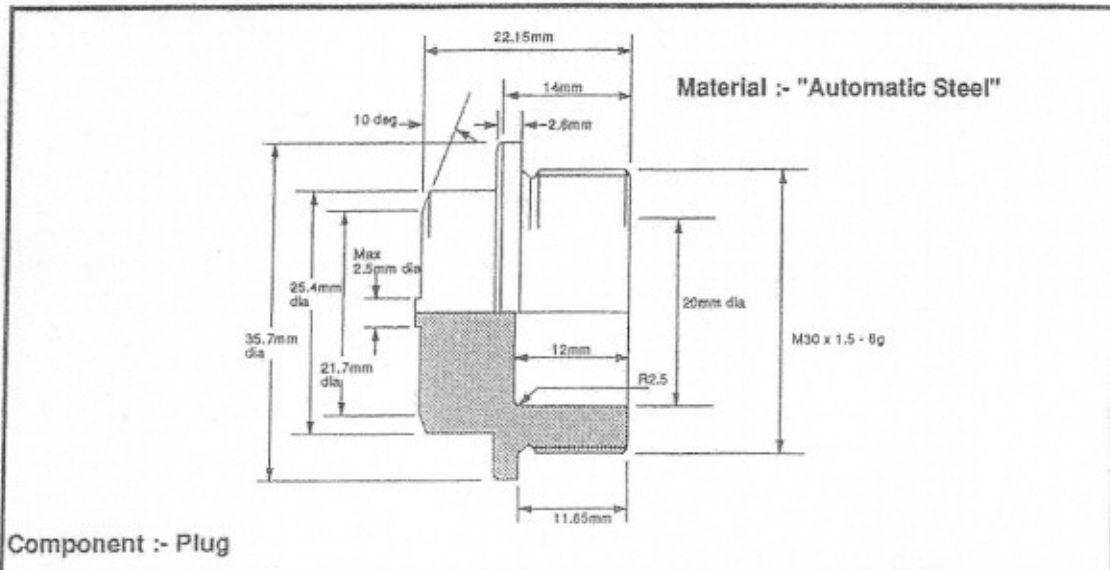
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-09



MANUFACTURED COMPLETE IN 24 SECS ON WICKMAN 50mm-8 SPINDLE BAR AUTOMATIC

The above part was produced complete on one of the above machines fitted with Double Bar Feed enabling two parts to be manufactured in the stated cycle time.

The two main features of this part are the requirement to produce it with the M30 x 1.5mm pitch thread rolled, and the Flange Sealing Face to have a angled face of 3 deg.

The rolling of the Thread was achieved from the Cross-slide utilising a Caliper Type Thread Rolling Attachment. Pre-sizing of the Blank being carried out at the previous Station using a specially developed Shaving Unit.

The 3 deg. back angle on the Sealing Face was produced by a Centre Block mounted under the cutting slide.

The Double Indexing feature of the machine enables one part to be completely machined on Stations 1-3-5 and 7 and the second part on Stations 2-4-6 and 8. Thus effectively doubling component output.

Components were supported during cut off and transported by special chutes to a work collector designed to minimise part damage.

The machine was fitted with full pre-setting facilities of Wickman design.

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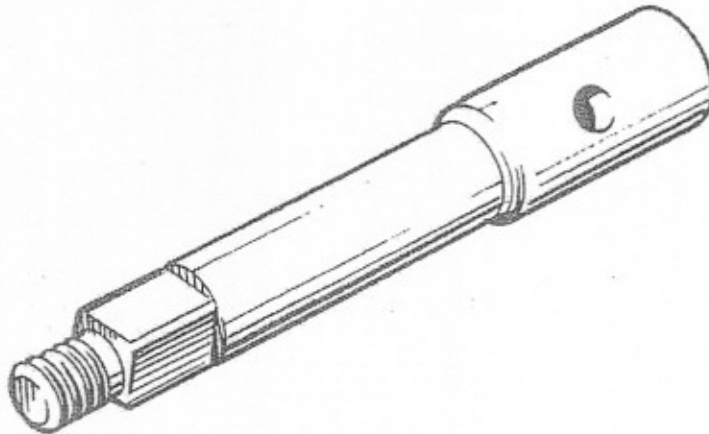
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-10

Material :- Stainless Steel



Component :- Tap Spindle

**MANUFACTURED COMPLETE IN 35 SECS ON WICKMAN 1"-6 SPINDLE BAR AUTOMATIC**

This component requires milling of a square on the outboard end of the component together with a cross hole which has to be relative to the flats.

This was achieved by stopping the machine spindle at Station four and cross drilling from the Cross Slide with **Motorised Drilling Attachment**.

At the same time a **Milling Attachment** mounted on the **Independent Slide** milled one pair of flats, retracted, indexed through 90 deg. and milled the second pair of flats to complete the square.

During cut off the component was held in a standard **Wickman Synchronous Pick-up Attachment** to enable cutting off to be achieved with a Burr free face.

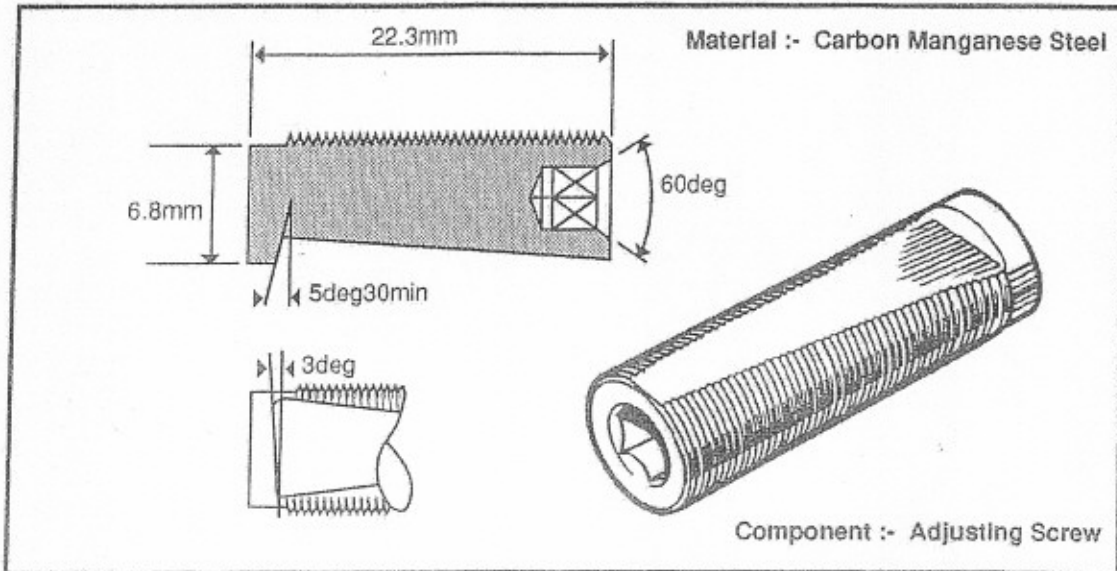
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-11



MANUFACTURED COMPLETE IN 21 SECS ON WICKMAN 1"-6 SPINDLE BAR AUTOMATIC

The bar size is the blank diameter for Thread Rolling which is performed by an F12 "Fette" head.

A Hexagon was broached at Station two utilising a Synchronous Broaching Attachment.

An interesting feature is the Milling Attachment which machines the large flat at a compound angle.

Use of a Pick-up Unit provided for a pipless part-off.

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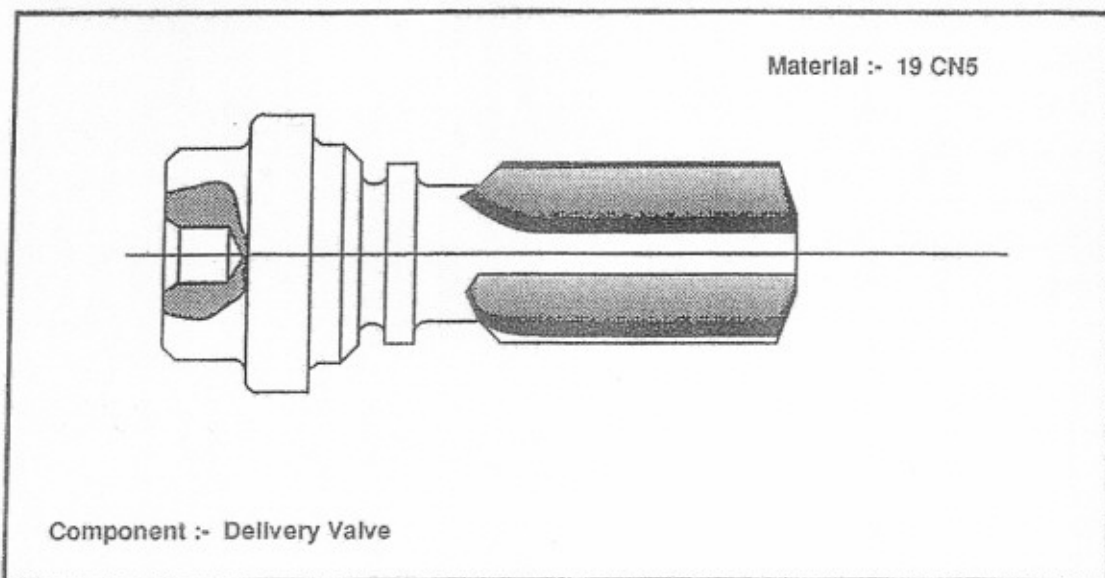
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-12



MANUFACTURED COMPLETE IN 11.2 SECS ON WICKMAN 1"-6 SPINDLE BAR AUTOMATIC

The complex **Cruciform** shape was machined on one station with the spindle held stationary and with a specially designed **Milling Attachment** with **four Milling Cutters** being traversed longitudinally along the component.

Later Stations finish formed the part and removed milling burrs.

After cut off the part was centred at the cut off end whilst held in a **Synchronous Pick-up Back Bore Attachment**.

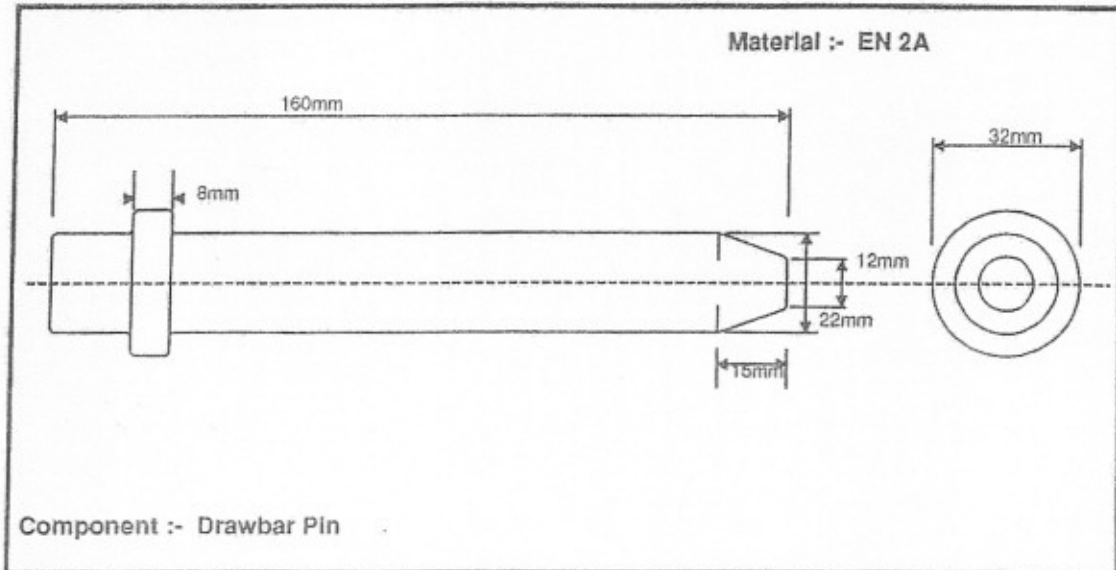
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-13



MANUFACTURED COMPLETE IN 50 SECS ON WICKMAN 2 1/4"-6 SPINDLE BAR AUTOMATIC

The requirement for this part was to achieve the fastest cycle time possible but maintaining a step free surface along the 22.0mm diameter.

This was achieved by utilising three Stations for **Rough Roller Turning** to remove the bulk of the material. Then at Station five a "Fette" **Hollow Mill** turning head was applied to traverse the total length of the diameter. This head carries four inserts thus enabling a feed rate of 0.53mm/rev to be achieved by distributing the cut over the inserts.

At Station six a Wickman Synchronous Pick-up Attachment supported the part to give a pip free cut off face.

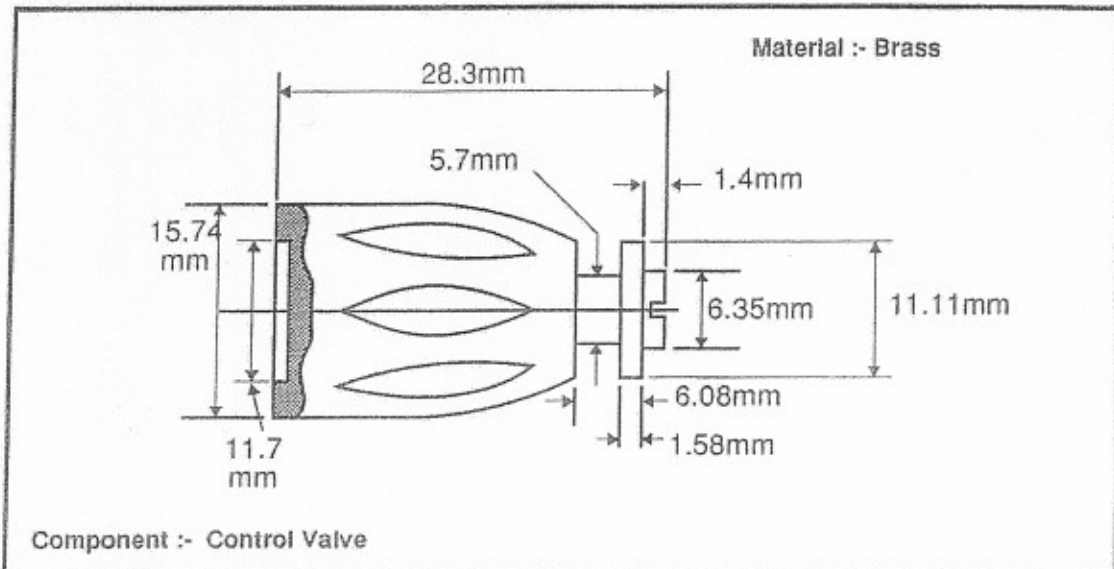
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-14



MANUFACTURED COMPLETE IN 5.5 SECS ON WICKMAN 1"-6 SPINDLE BAR AUTOMATIC

This particular Brass Component is part of a bathroom shower unit control valve.

The important features on this component are the eight grooves around the outside of this part. These were previously milled as a secondary operation which was time consuming and extremely expensive.

Wickman investigated the problem into including these into a tooling sequence on the 1"-6 spindle machine.

It was found possible to produce these grooves utilising a **Modified Flat Generating Attachment** arranged to rotate at a 1:1 ratio and using an **eight Toothed Milling Cutter**.

The production of the grooves was achieved within the cycle time for the part thus avoiding extra costing operations.

**Synchronous Milling** of the end face slot was also included and a **Standard Wickman Synchronous Pick-up and Back Boring Attachment** held the part during cut off.

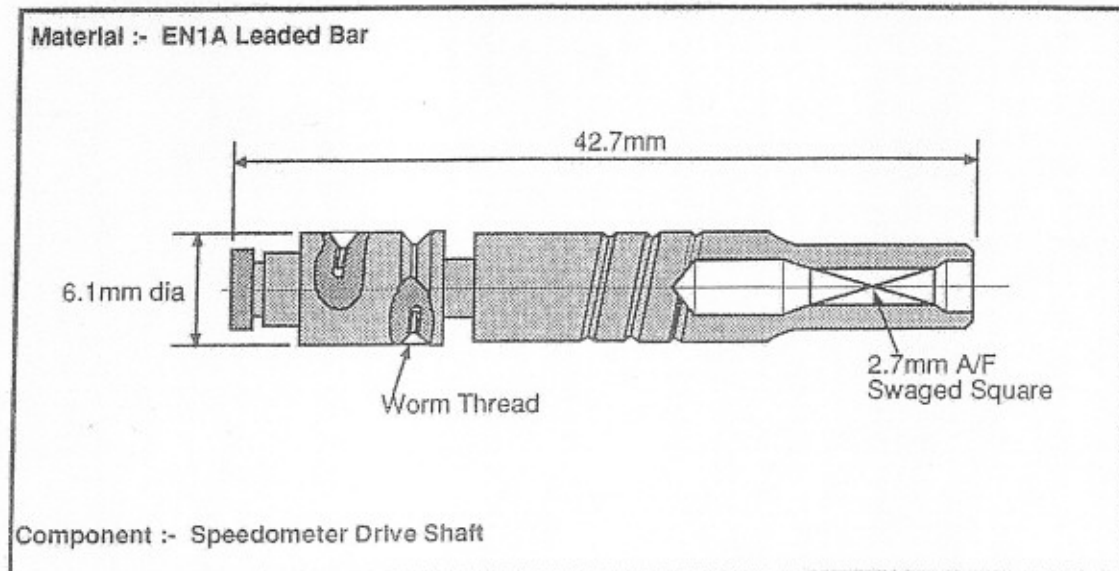
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-15



**MANUFACTURED COMPLETE IN 4.7 SECS ON WICKMAN 5/8"-6 SPINDLE BAR AUTOMATIC**

This component shows a number of operations that can be accommodated onto a Wickman 5/8"-6 Spindle Bar Automatic to produce the above part to a finished stage.

One important area on the component is the **Worm Form** where a high degree of finish is required on the flanks. This is to avoid wear on its mating to **Nylon Gear** component.

This feature was achieved in two operations -

1. Machining was carried out by using a modified standard **Wickman Chasing Attachment** mounted in Station two.
2. In Station three another similar **Chasing Attachment** with a spring loaded assembly was allowed to follow the **Worm Form**. This effectively burnished the flanks of the thread to give the desired surface finish.

A further **Chasing Attachment** was mounted at Station five to produce the 90 deg. oil groove.

Another interesting feature is the production of the internal square form. This was achieved using a **Special Swaging Head Carrying** four rollers and an internal square master around which the rollers formed the work to give the desired shape.

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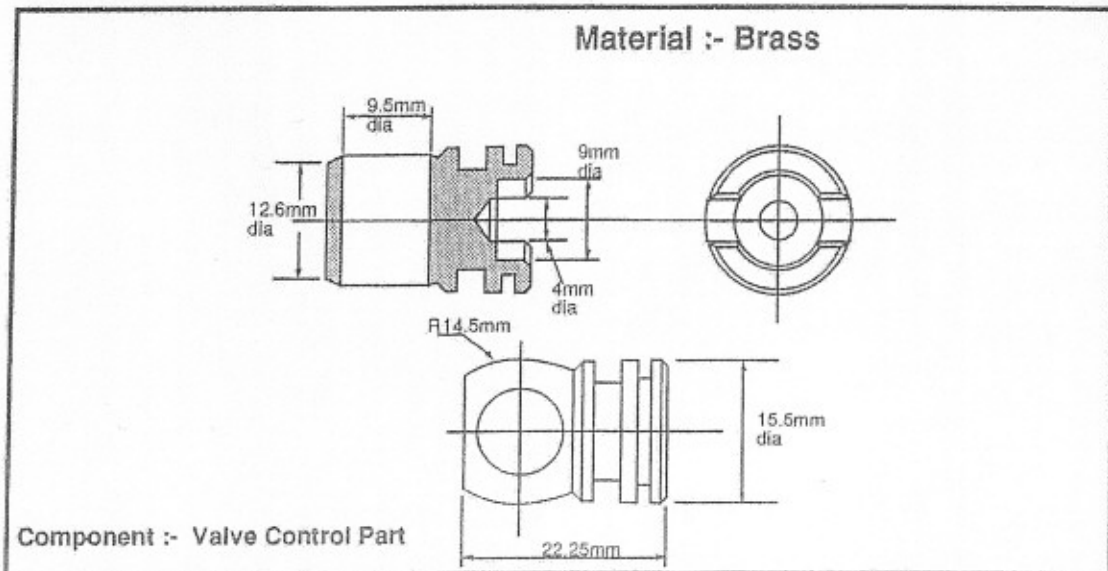
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-16



**MANUFACTURED COMPLETE IN 4.0 SECS ON WICKMAN 1"-6 SPINDLE BAR AUTOMATIC**

The production of this part required the milling of the end face slot to be at 90 deg. to the Cross Drilled Hole.

This was achieved by **Spindle Stopping** in two adjacent Stations and setting the **Milling Attachment** relative to **Cross Slide** position used for the **Cross Hole**.

The Tooling layout incorporated a **Final Forming** and **Reaming** operation to remove all Burrs left by the **Milling** and **Cross Drilling**.

In Station six a **Wickman Synchronous Pick-up Attachment** was incorporated into the layout in order to produce the part with a Burr free cut off face.

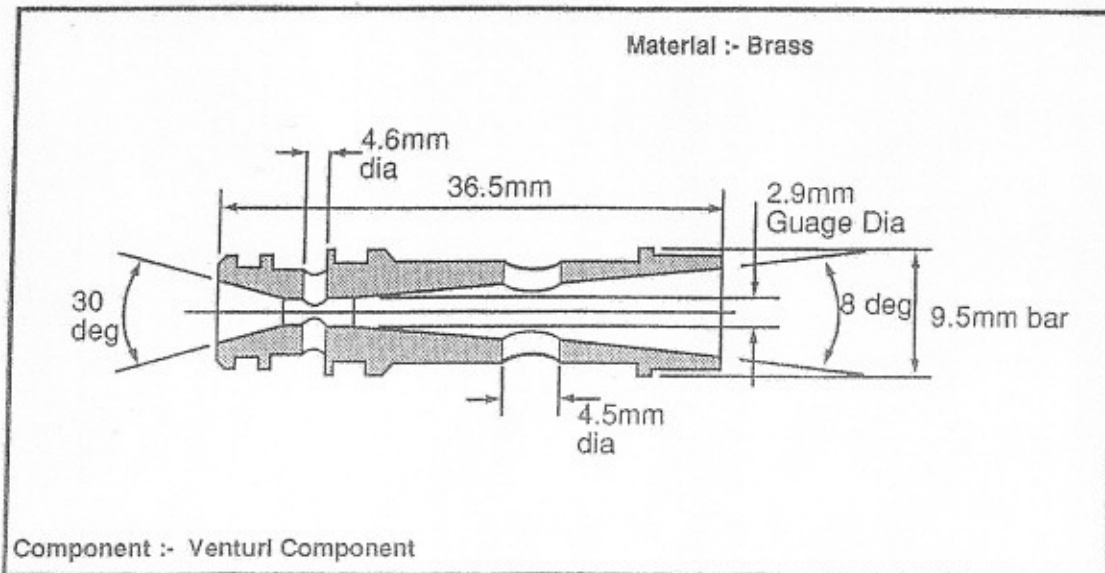
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-17



**MANUFACTURED COMPLETE IN 6.5 SECS ON WICKMAN 1"-6 SPINDLE BAR AUTOMATIC**

This particular component is representative of parts used where metering of fluids or gases are involved.

Requirements of production include the two tapered bores which have to be completely Burr Free and with a high degree of finish.

This was achieved by specially developed taper finishing cutters being applied to the bore after completion of the two Cross Drilling Operations.

**Spindle Stopping** is utilised at Stations three and four for the Cross Drilling Operations. Special motions used allowed driven end working tools to be used at the same time.

During cut off the part is held in a **Synchronous Pick-up and Back Machining Attachment** and afterwards transferred to a **Back Machining Cutter** to produce the 30 deg. included tapered bore.

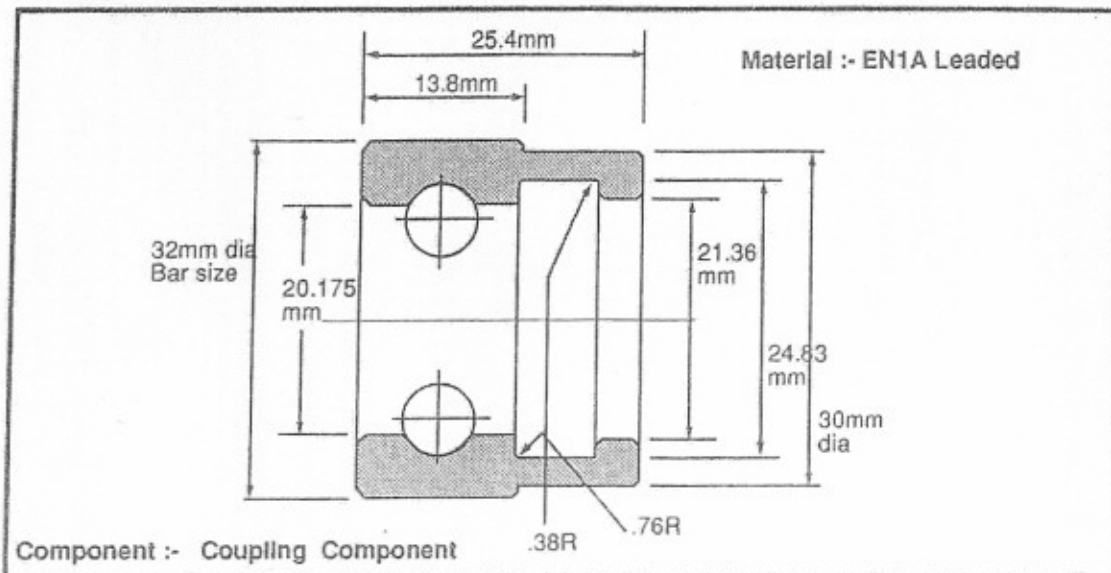
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-18



**MANUFACTURED COMPLETE IN 15.0 SECS ON WICKMAN 1 3/4"-8 SPINDLE BAR AUTOMATIC**

The sequence of operations required **Cross Drilling** and **Reaming** of the two **Cross Holes**. These must be parallel with each other and free from burrs.

As there was a strong possibility that the drills would tend to run off on the outside diameter of the part it was felt necessary to incorporate a prior **End Milling Operation** to allow the drills to start on a flat face.

All these operations were incorporated into the tooling layout.

Other operations provided for **Drilling and Recessing** of the bore to remove all internal burrs and single point turning to provide a burr free outside diameter.

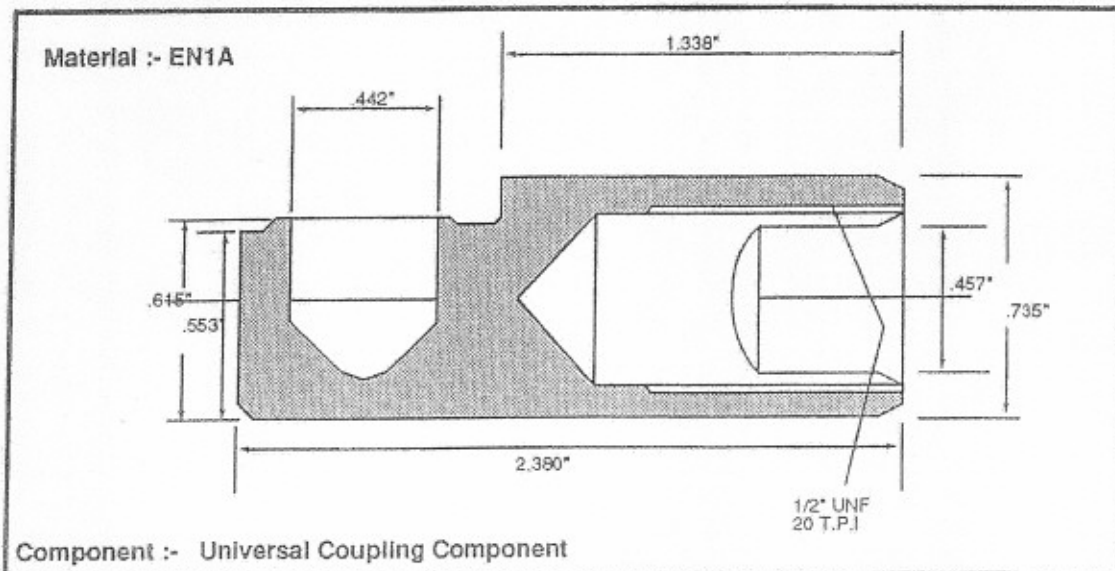
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-19



**MANUFACTURED COMPLETE IN 14.5 SECS ON WICKMAN 1 3/4"-6 SPINDLE BAR AUTOMATIC**

This particular component was produced by a number of separate operations and Wickman engineers were requested to consider complete production on a 1 3/4"-6 spindle arranged with **Spindle Stopping Facilities**.

Station one and two were arranged to prepare the drilled and turned blank.

At Station three the machine spindle was stopped and a specially mounted **Cross Drilling Attachment** rough drilled the cross hole and at the same time a stationary type **Milling Attachment** milled the two flats, correctly orientated to the cross hole.

In Station four the spindle remained stationary for cross reaming of the previously drilled bore and at the same time a face trepanning operation formed the flat bottoming operation around the cross hole. Also in Station four a specially adapted **Tapping Attachment** produced the internal thread.

At Station five provision was made for a **Cross Recessing Attachment** to produce a circlip groove inside the cross hole. (Not required on this part).

A **Wickman Synchronous Pick-up Attachment** supported the part during cut off to provide a burr free cut off face.

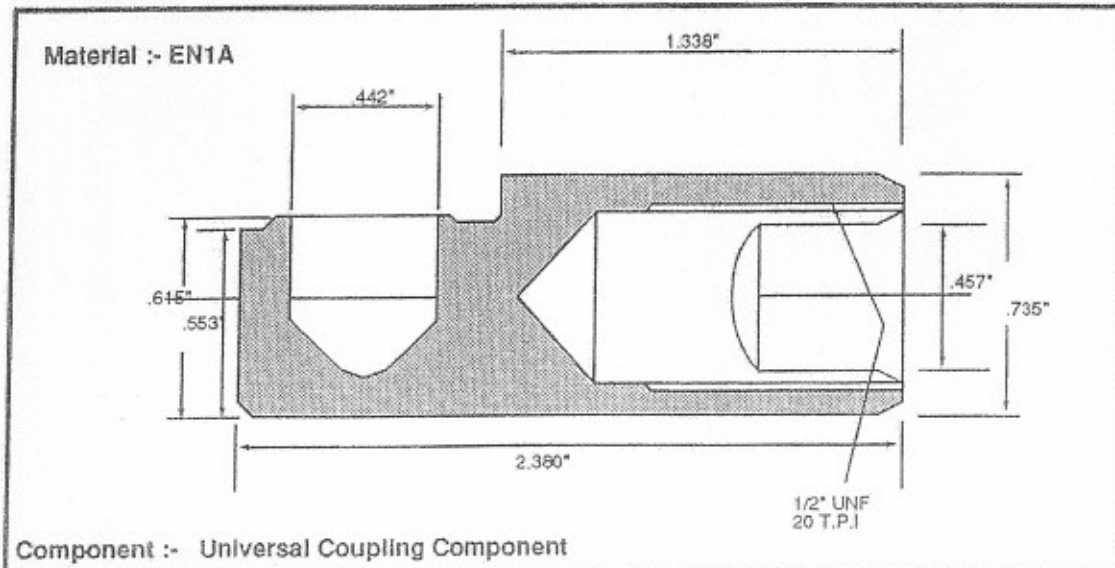
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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-19



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At Station five provision was made for a Cross Recessing Attachment to produce a circlip groove inside the cross hole. (Not required on this part).

A Wickman Synchronous Pick-up Attachment supported the part during cut off to provide a burr free cut off face.

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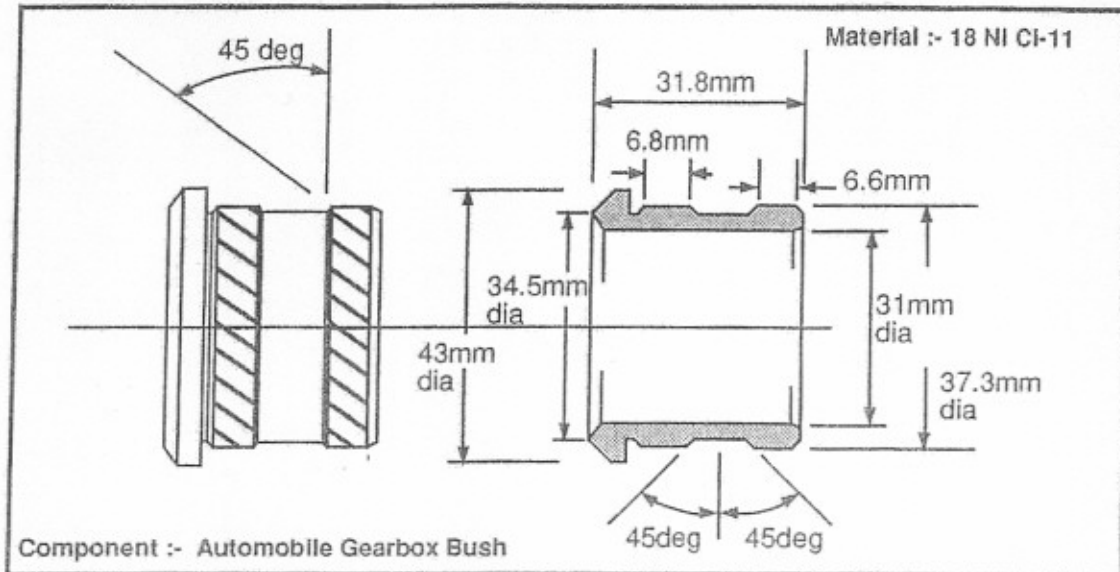
Wickman  
Multi-Spindle  
Automatics  
have been solving  
Turning problems for  
companies all around  
the world for more  
than 60 Years





# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-20



MANUFACTURED COMPLETE IN 58 SECS ON WICKMAN 2 5/8"-6 SPINDLE BAR AUTOMATIC

Important features to be noted are :-

1. The undercut groove at the intersection of the head of the part and the 37.3mm diameter. This was produced by a Wickman designed Undercutting Attachment mounted on the Cross Slide and operated from a Longitudinal motion.
2. Rolling from the Cross Slide of the 20 equispaced grooves around the 37.3mm diameter utilising a Wickman designed caliper type attachment.
3. Final boring and reaming was carried out after rolling of the grooves in order to maintain maximum wall thickness during the rolling process. Also burrs thrown up by rolling were removed by a centre block turning operation.

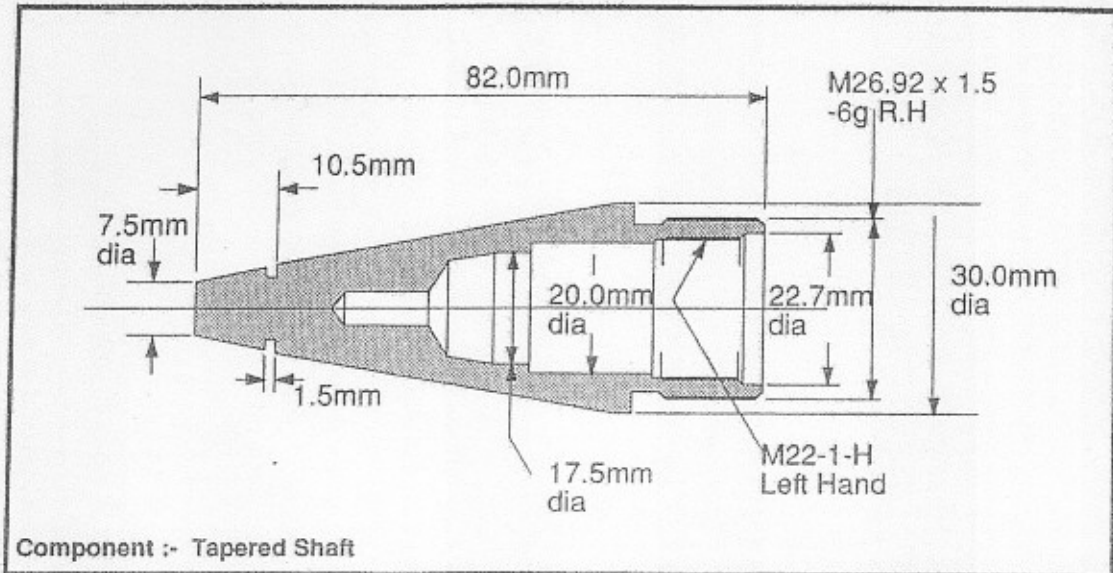
If you have a requirement for New Wickman Multi-Spindle Lathes, tooled to manufacture your components, please contact :

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# WICKMAN AUTOMATIC LATHES

## Production Highlights : 90-21



**MANUFACTURED COMPLETE IN 50 SECS ON WICKMAN 1 3/4"-8 SPINDLE BAR AUTOMATIC**

The nature of the operations involved and the slender back end of the component necessitated the use of an eight spindle machine.

Operations involved the need for rough drilling of the bore followed by reaming operations. Drilling of the small bore was carried out in the cut off Station utilising an accelerated drilling slide.

**Tapping and Dieheading** were carried out using standard Wickman Threading Attachments.

An interesting point on this layout involved skiving of the tapered form to remove any steps left by the various form tools.

As the rear end of the part was very slender it was necessary to support the component with a specially designed Synchronously driven Internal support during the skiving operation.

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## WICKMAN PATENT PRESETTING

Wickman are introducing their own patented preset tooling system for WICKMAN MULTI SPINDLE AUTOMATICS.

The Wickman design system, with the reference and datum points built into the machine, provides a rigid one-piece toolholder which clamps directly to the machine slides and centre block. A further advantage is gained because the toolholder has been designed to enable coolant to be directed at the tool's cutting edge with a quick-release connection for the coolant pipes.

The Wickman system will enable the initial set-up of the component to be achieved to close tolerances with only minor adjustments required to enable the final drawing tolerances to be obtained.

The setting of the toolholders and tools on the cross slides and centre block is carried out as follows. The operator uses the optical setting device to zero the toolholder fixture to the master datum setting block. The setting block is then removed and the tool and toolholder placed in position on the fixture. The tool is set to the required X and Y dimensions. This is then repeated for each station of the machine using the appropriate toolholder fixture and datum blocks.

The next stage is to set the location blocks on the slide of the machine in their specified positions and the toolholder clamped on the slide or in the holder.

The first component is produced on the multi spindle automatic and measured and any errors noted. From the figures obtained the corrected X and Y dimensions are recorded. The tool is then returned to the optical setting fixture and reset to the new figures.

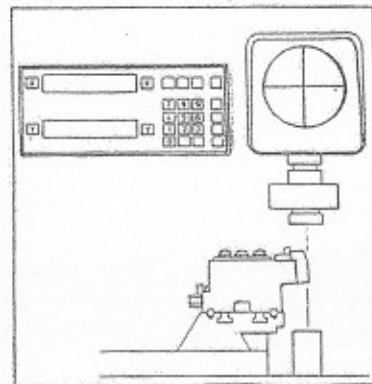
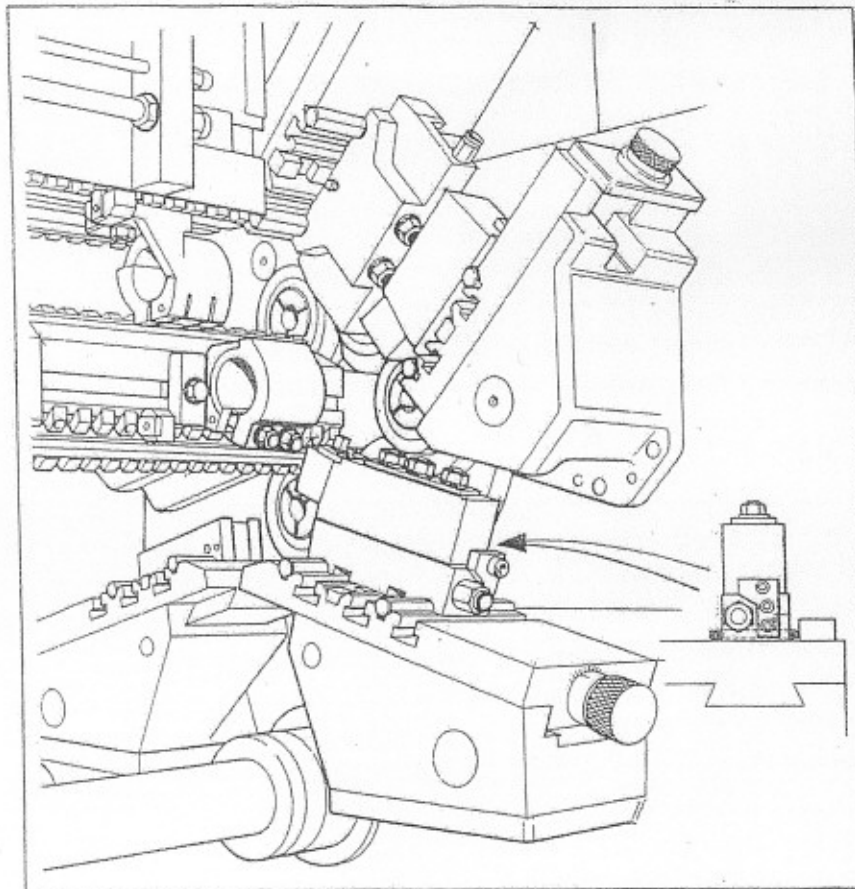
Additional tooling can then be set on the optical setting fixture to the revised X and Y dimensions, ready for use as a presetting system as and when required.

These two stages of presetting allow for small component size variations which can occur first time due to several factors, namely speeds, feeds; depth of cut, material, tool geometry, and tool load.

On previously available systems difficulties had been experienced on directing the coolant to the cutting edge of the tool. The Wickman toolholders, in most applications, will allow the coolant to pass through the toolholder directly to the tool cutting edge. A quick release connection for the coolant pipe is incorporated to facilitate rapid tool changeovers.

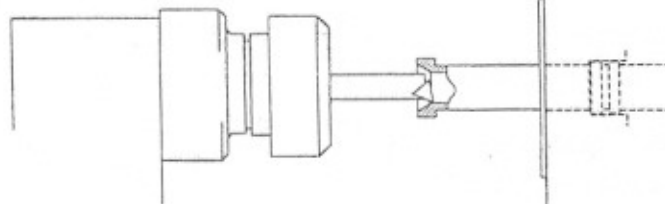
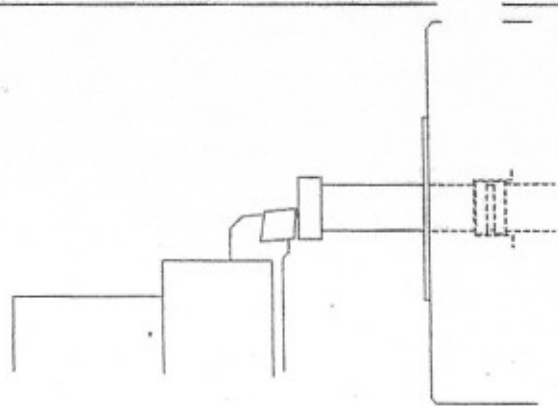
Another feature which Wickman have designed into the system is that the tooling can be used on both new machines and on machines remanufactured by WICKMAN AUTOMATIC LATHES.

It is important to note that although the system will eventually become part of the standard specification of the machine, it does not in any way inhibit the use of standard toolholders and attachments currently available.

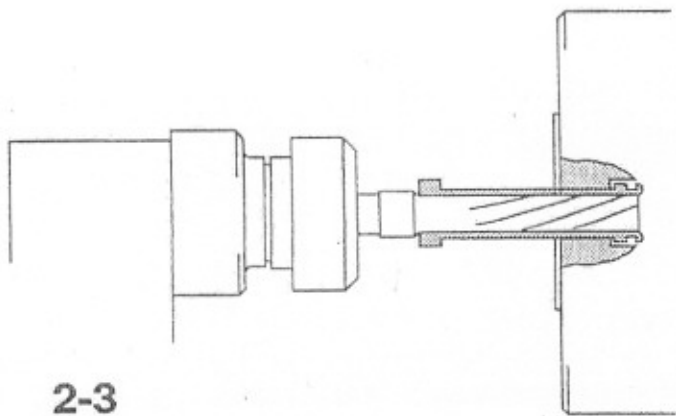


**WE BUILD QUALITY MACHINES - USUALLY AT  
A PROFIT - SOMETIMES AT A LOSS - BUT  
ALWAYS WITH QUALITY.**

2-1

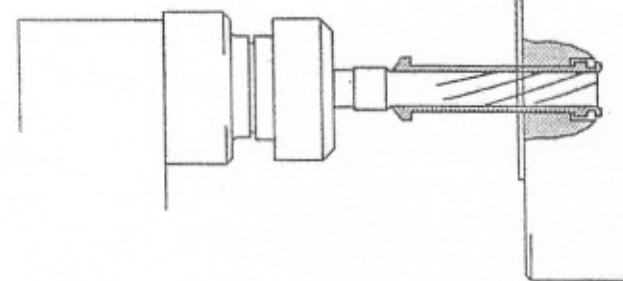
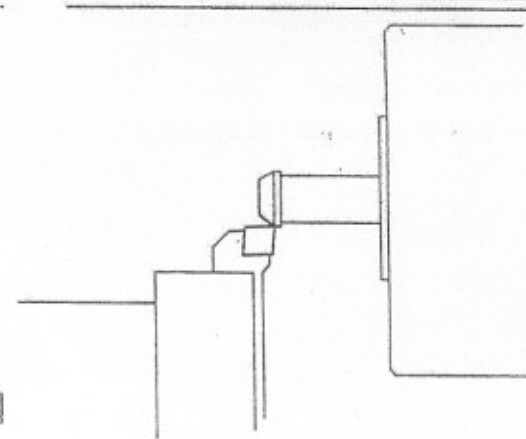


2-2



2-3

2a-1



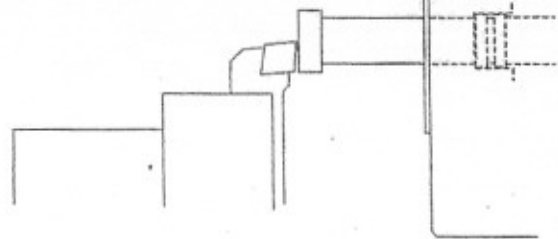
2a-3

### Sequence of Operations on 'Multiplus' CNC Side

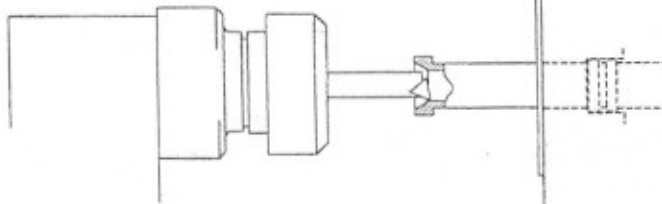
Either of the Two Final components may be produced by programming different 2nd operations on the CNC Workhead side of the Machine.



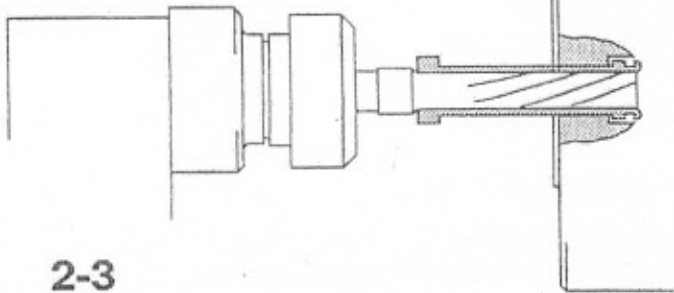
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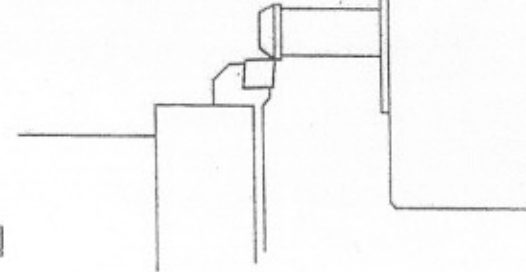
2-2



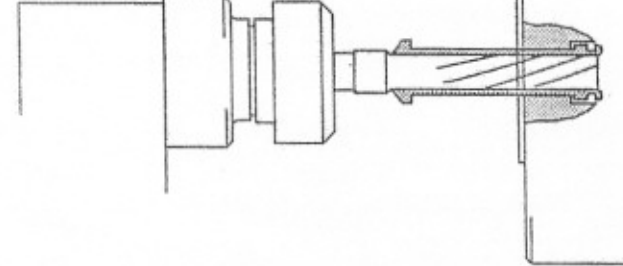
2-3



2a-1

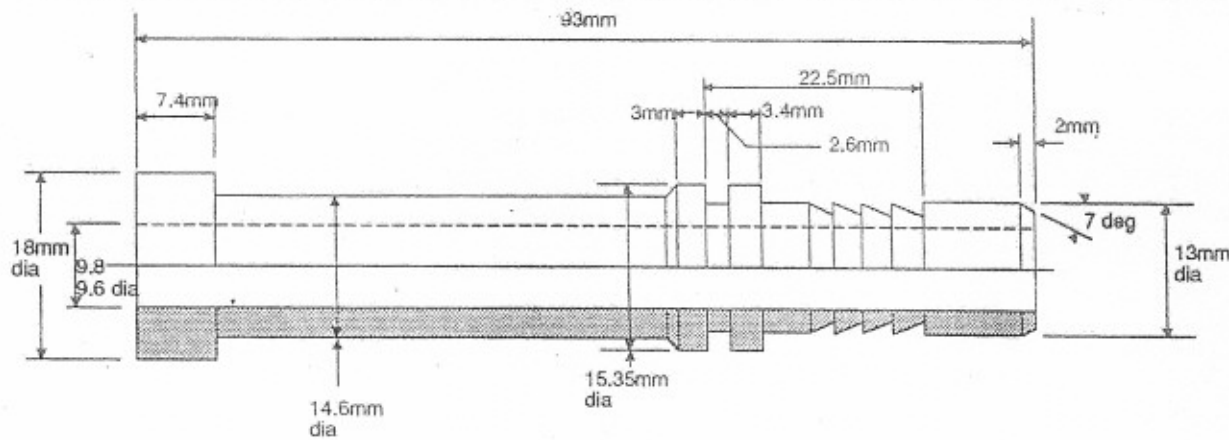


2a-3

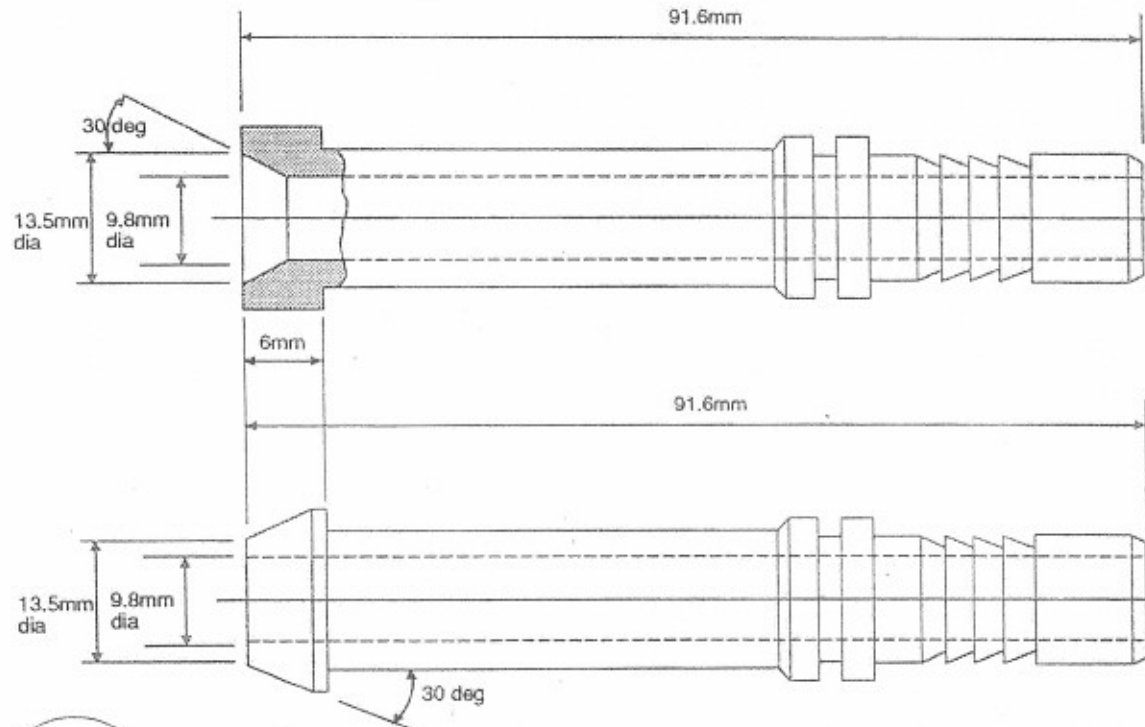


### Sequence of Operations on 'Multiplus' CNC Side

Either of the Two Final components may be produced by programming different 2nd operations on the CNC Workhead side of the Machine.



Hose End Component -  
being produced on  
'Conventional' Head of  
Wickman Multiplus Machine



Hose End Component -  
being produced during 2nd  
Operation (type 1) on 'CNC'  
Pickup Head

Hose End Component -  
being produced during 2nd  
Operation (type 2) on 'CNC'  
Pickup Head

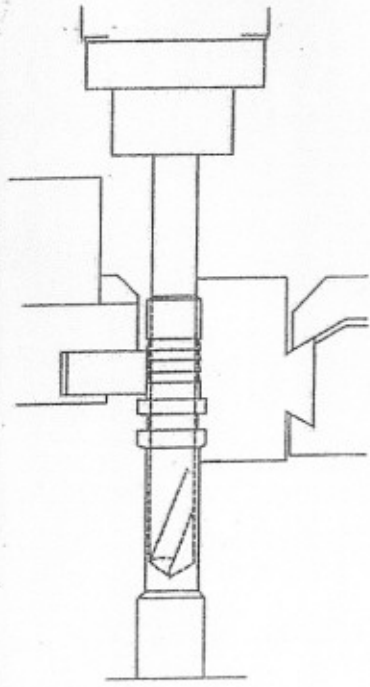


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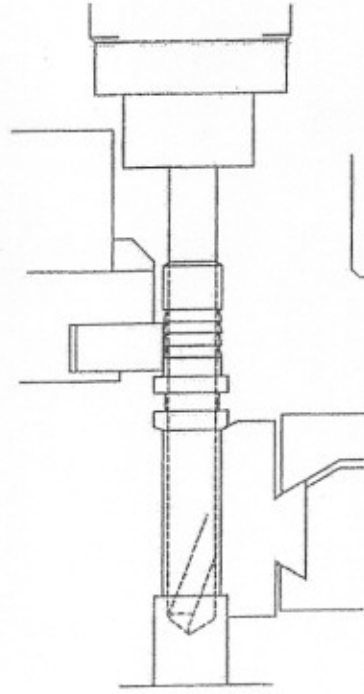
BANNER LANE, COVENTRY CV4 9GE

Phone 0203 465231 Telex 311941 Facsimile 0203 461596

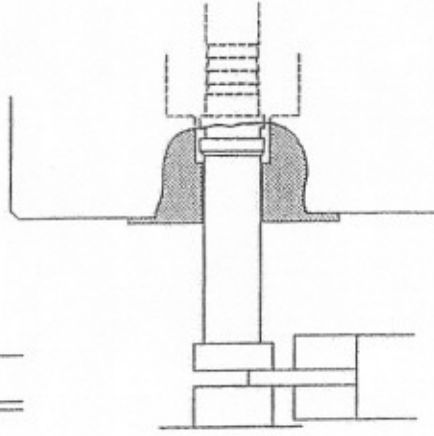




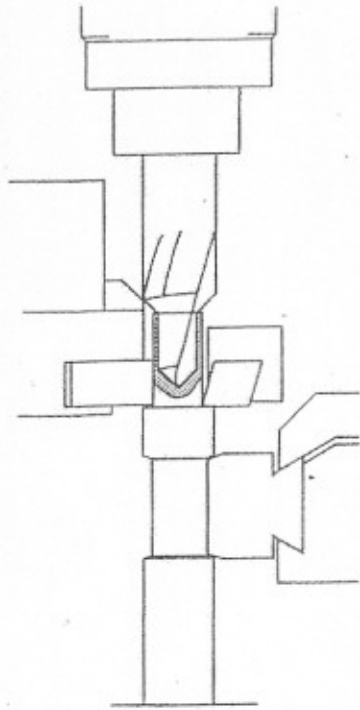
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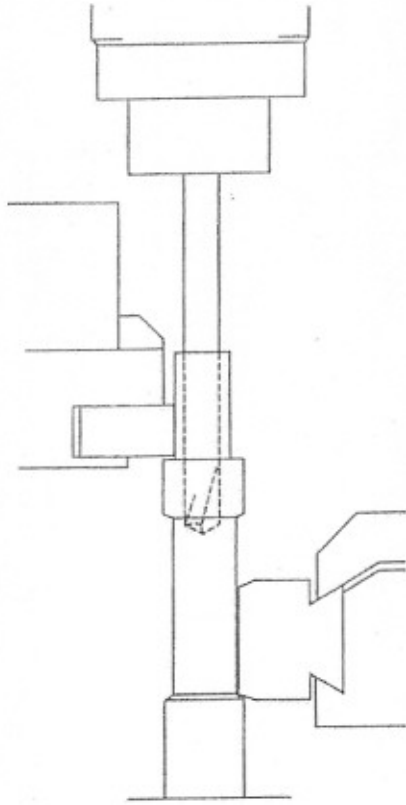
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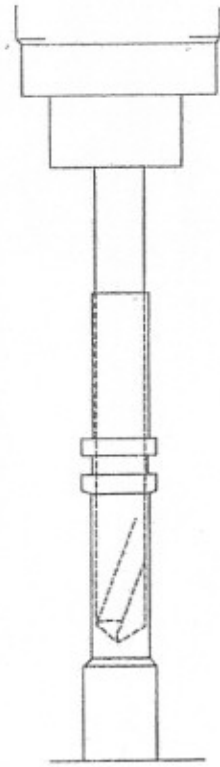
6



1



2



3

Sequence of Operations on 'Conventional' Multi Side

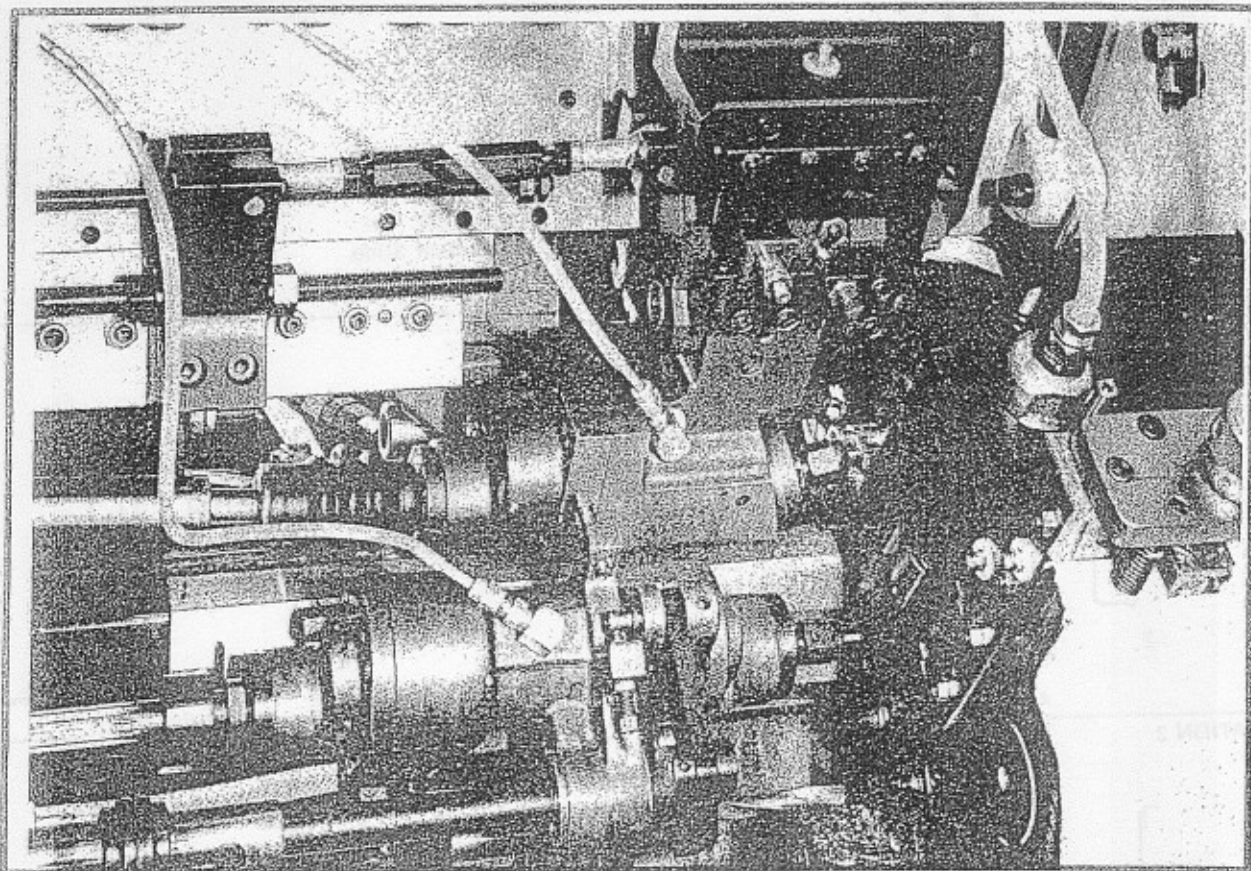


# WICKMAN APPLICATION SHEETS





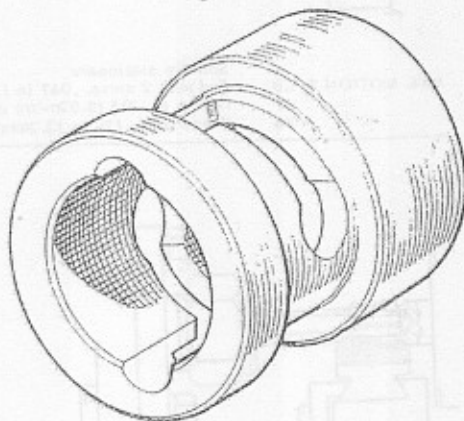
# WICKMAN Multi-Spindle Automatic 5/8" - 6 Spindle Bar Machine



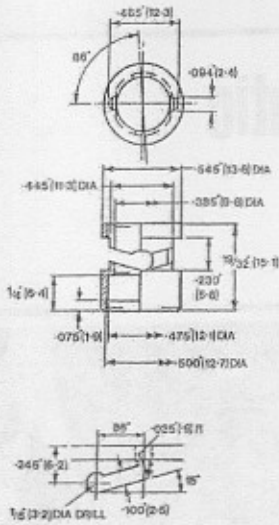
## Connector

High speed and Wimet carbide tools are used to produce this component in a cycle time of 9.6 seconds.

The spindles are stopped at station 3 and 4 to allow the component's bayonet fitting to be cross drilled, with a pneumatic cross drilling attachment, milled with an indexing infeed angle milling attachment and end milled with a two position end milling attachment. The component is held by a pick up and back burr attachment during part-off, and while the back is counterbored, and then automatically ejected into the workchute.



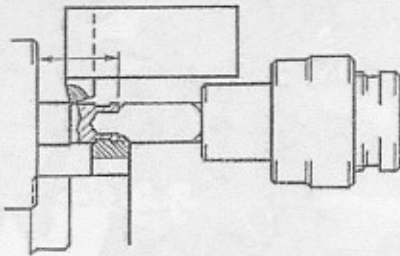
WICKMAN MACHINE TOOL SALES LIMITED  
BANNER LANE COVENTRY CV4 9GE



Cycle time: 9.6 seconds  
 Material: Brass  
 Spindle Speed: 2240 rev/min

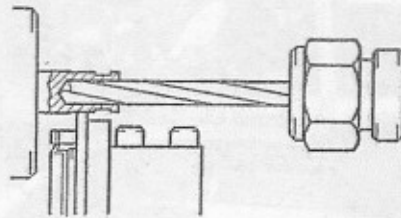
CB Centre block  
 XS Cross slide  
 I.S. Independent Slide

STATION 1



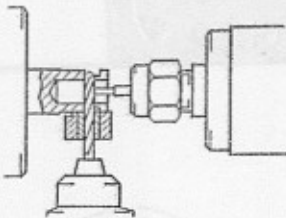
CB Semi-finish turn .545 in (13.8mm) o/d.  
 XS Pilot drill for .385 in (9.8mm) bore  
 XS Rough form .445 in (11.3mm) groove

STATION 2



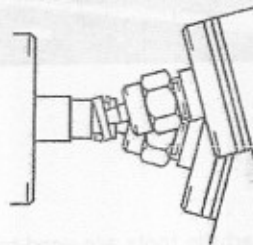
CB Drill for .385 in (9.8mm) reamer  
 XS Roll lettering on o/d

STATION 3



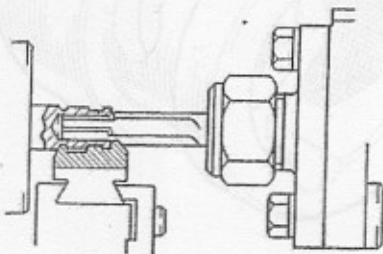
AUX. MOTION & CB Spindle stationary  
 XS End mill 2 slots, .047 in (1.2mm) radius at .391 (9.92mm) centres  
 XS Cross drill .125 in (3.2mm) hole

STATION 4



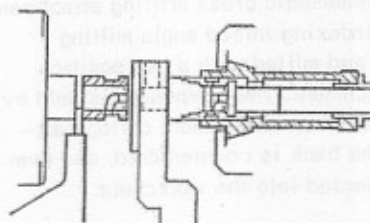
X/S & I.S. Spindle stationary  
 Angularly mill 2 slots .100 in (2.5mm) wide

STATION 5



CB Ream bore .385 in (9.8mm) diameter  
 XS Form outside diameter and face end

STATION 6

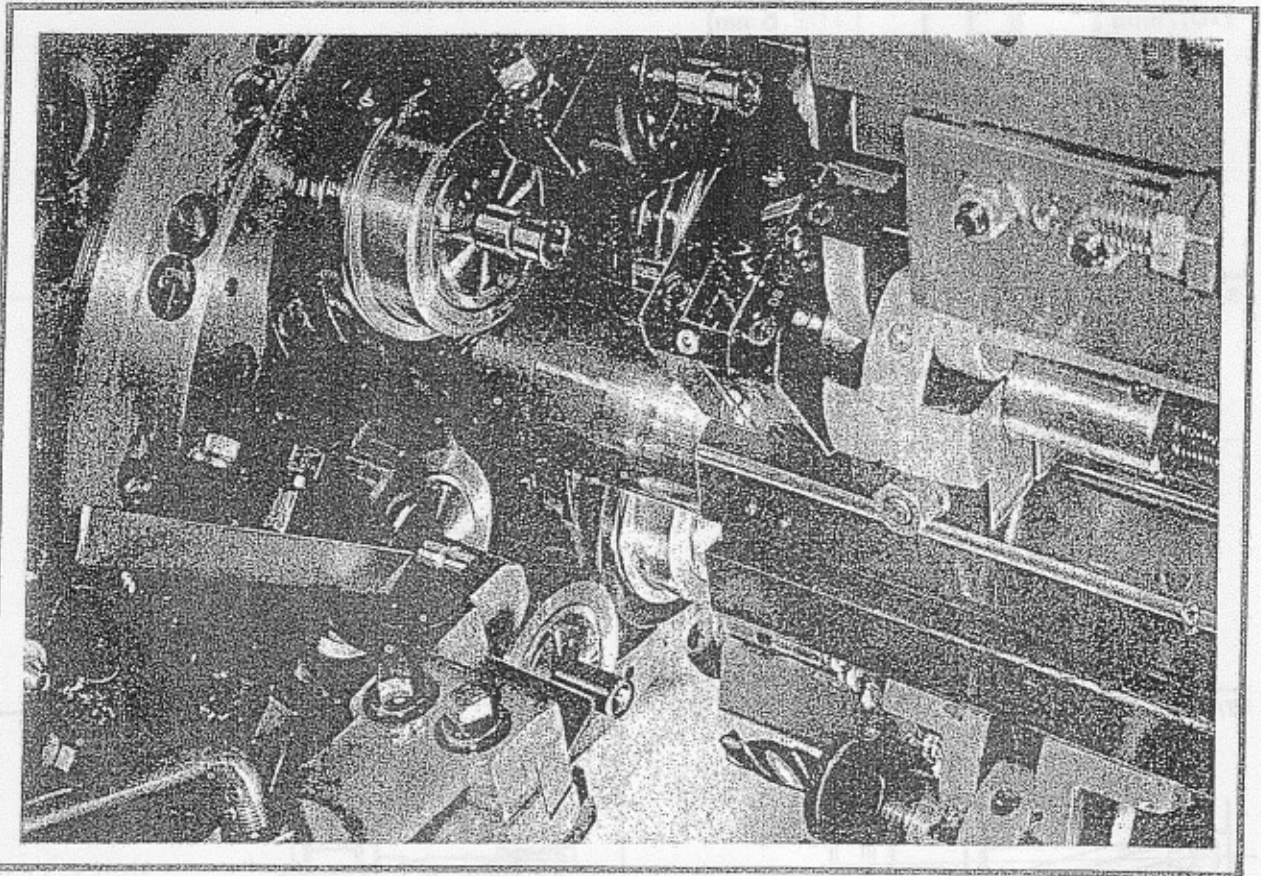


XS Part off  
 CB Pick up component and back form .475 in (12.1mm) and 0.5 in (12.7mm) bores





# WICKMAN Multi-Spindle Automatic 5/8"-6 Bar Machine

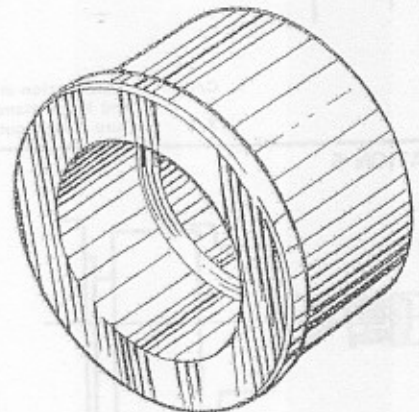


## Bush

This small component is manufactured from free cutting mild steel utilising high-speed steel cutting tools. Fairly straightforward drilling, forming and reaming operations are carried out, plus a recessing operation to obtain a chamfer at station 5.

After initial drilling, the large internal diameter is produced by combination drilling at station 3 and finish reaming at station 4.

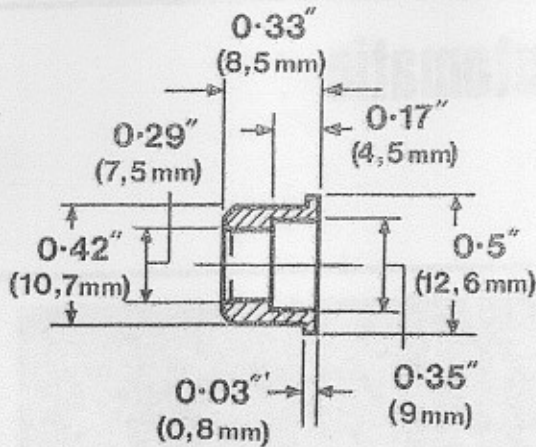
Parting off completes the component in a cycle time of 2.2 seconds.



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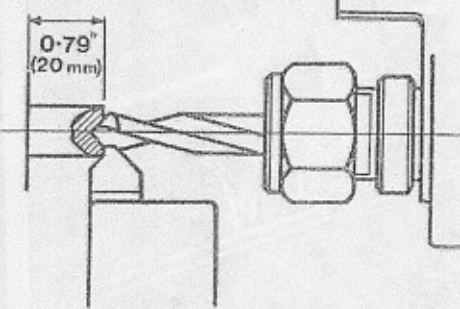
Layout to produce a Bush



Cycle time: 2.2 sec  
 Material: Free cutting mild steel.  
 Spindle speed: 1600 rev/min  
 Cutting speed: 213.25 ft/min (65 m/min)

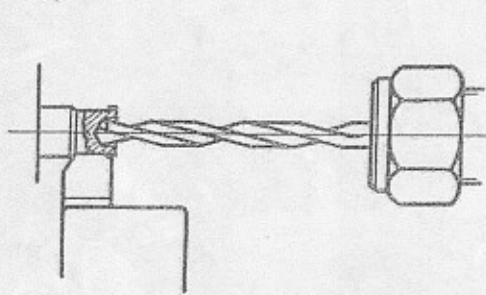
C/B = Centre Block  
 X/S = Cross Slide  
 I/S = Independent Slide

STATION 1



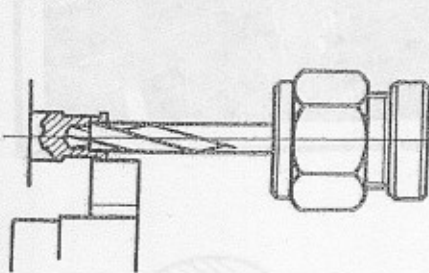
C/B X/S Centre drill. Face and chamfer front.

STATION 2



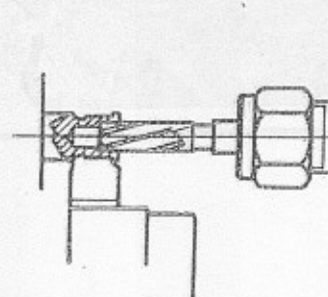
C/B X/S Drill front diameter. Breakdown rear.

STATION 3



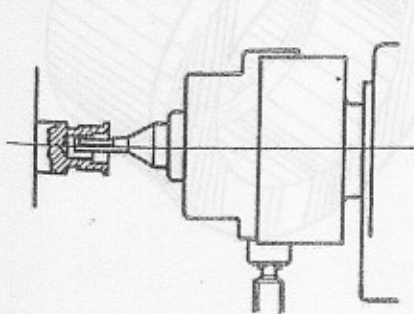
C/B X/S Combination drill small diameter and large diameter. Turn flange outside diameter.

STATION 4



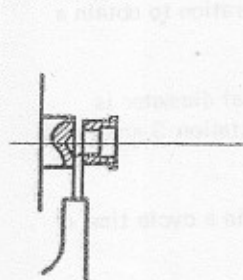
C/B I/S Finish rear. Finish form rear and break down for part off.

STATION 5



I/S and X/S Ream to produce rear internal chamfer.

STATION 6



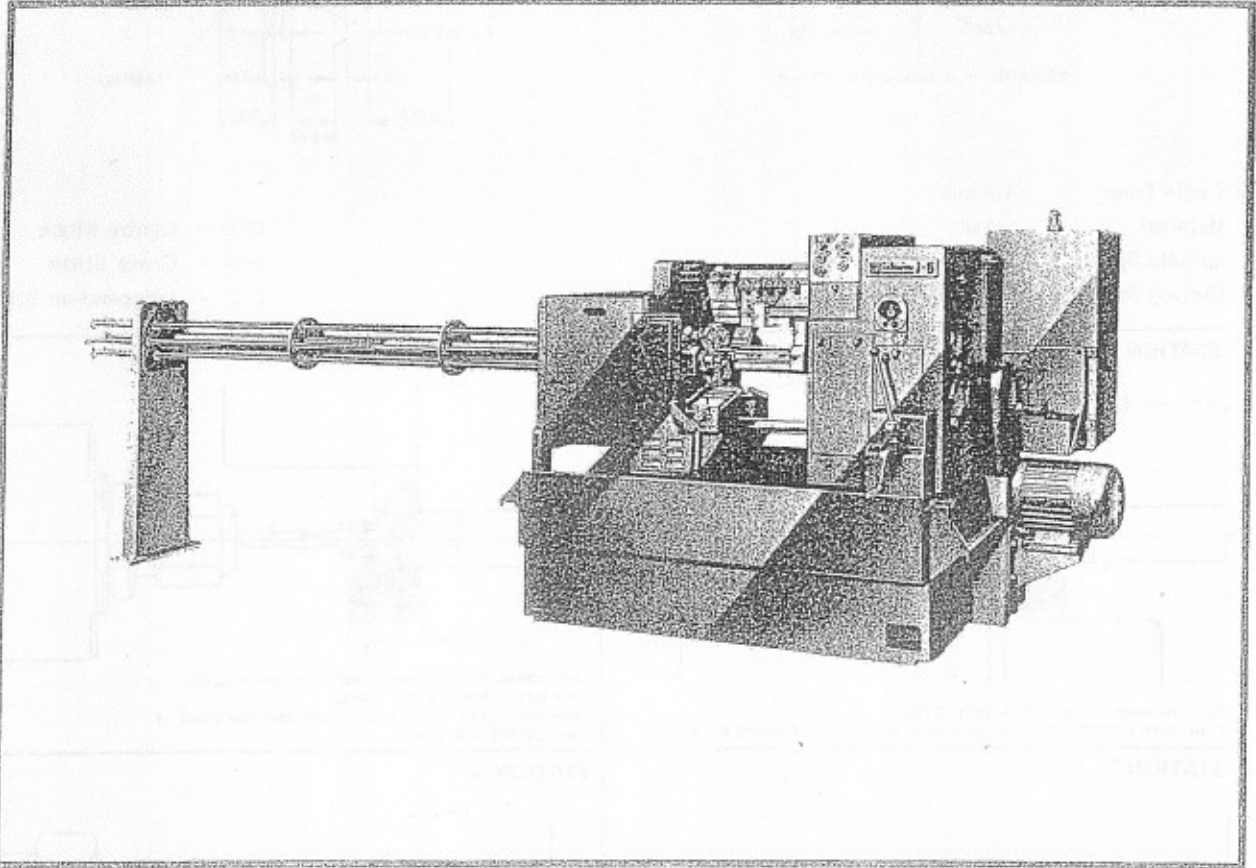
X/S Part off.





# WICKMAN Multi-Spindle Automatic

## 5/8" - 6 Spindle Bar Machine



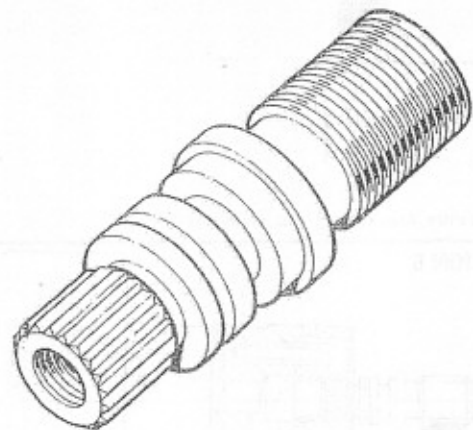
### Spindle

This component is machined from brass utilising carbide forming and turning tools to produce the complete main body shape.

A high speed drilling attachment is used to drill the hole prior to threading with the full threading attachment at Station 4.

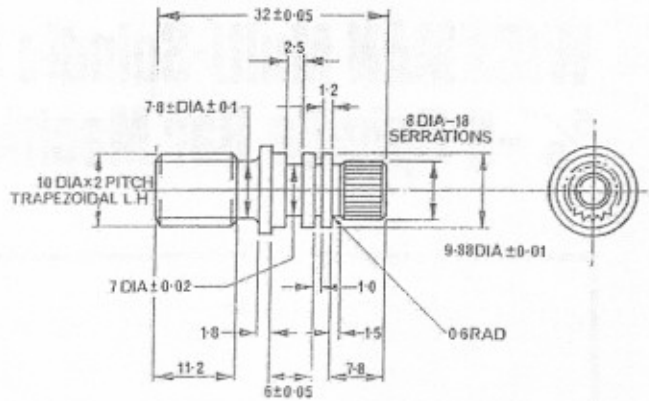
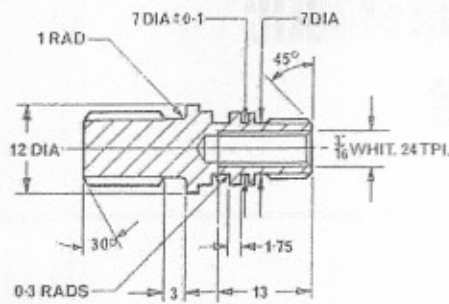
Station 5 comprises the operations carried out by an Independent Slide mounted drifting attachment which produce the 18 serrations and a Cross Slide mounted chasing attachment using a carbide chaser which produces the left-hand trapezoidal thread.

The component is completed in a cycle time of 4.7 secs.



WICKMAN MACHINE TOOL SALES LIMITED

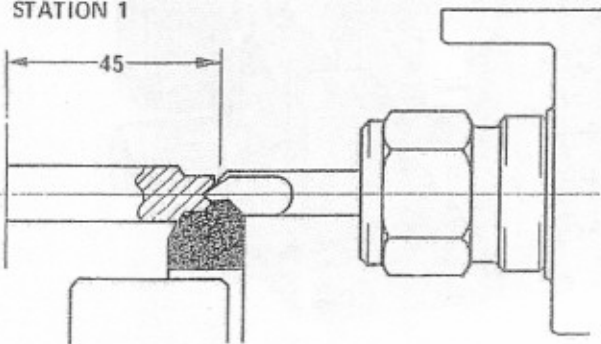
P.O. Box 44 BANNER LANE COVENTRY CV4 9GE



Cycle Time: 4.7 secs  
 Material: Brass  
 Spindle Speed: 2500 rev/min  
 Cutting Speed: 13 - 94 m/min (42.65 - 308.4 ft/min)

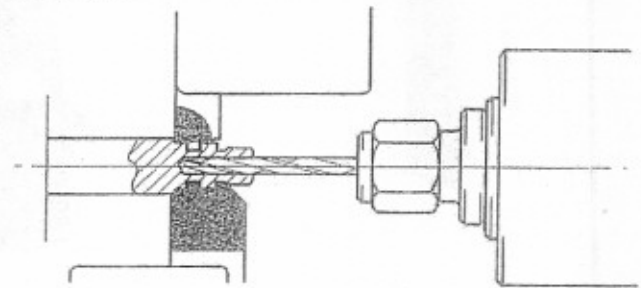
C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide

**STATION 1**



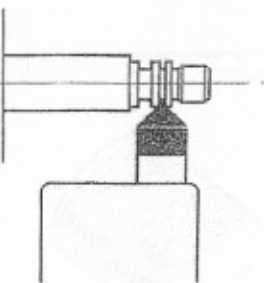
Feed to length and centre drill (C/B)  
 Form 8mm (.315") dia. for serrations face end and chamfer (X/S).

**STATION 2**



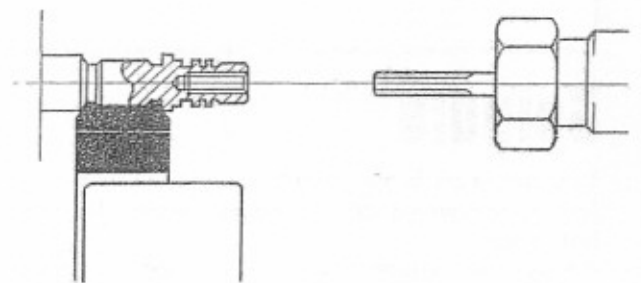
High speed drill 3.7mm (.146") dia. hole (C/B)  
 Knee turn 9.88mm (.389") dia.  
 Form 7mm (.276") dia. groove and chamfer back of 8mm (.315") dia. (X/S)

**STATION 3**



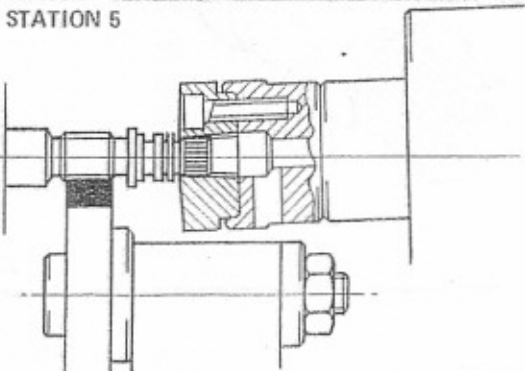
Form centre 7mm (.276") dia. groove (X/S)

**STATION 4**



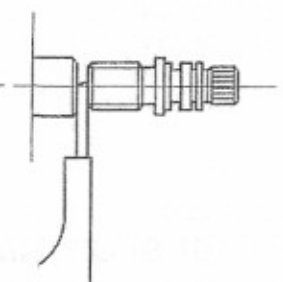
Form 10mm (.394") dia. back chamfer and part off groove, plus 7.8mm (.307") dia. thread space (X/S)  
 Tap Hole 3/16" WHIT x 24 T.P.I. x 13mm (.512") deep (I/S)

**STATION 5**



Chase 10mm (.394") dia. x 2mm (.079") PITCH L.H. Thread (X/S)  
 Broach 8mm (.315") dia. x 18 serrations (I/S)

**STATION 6**

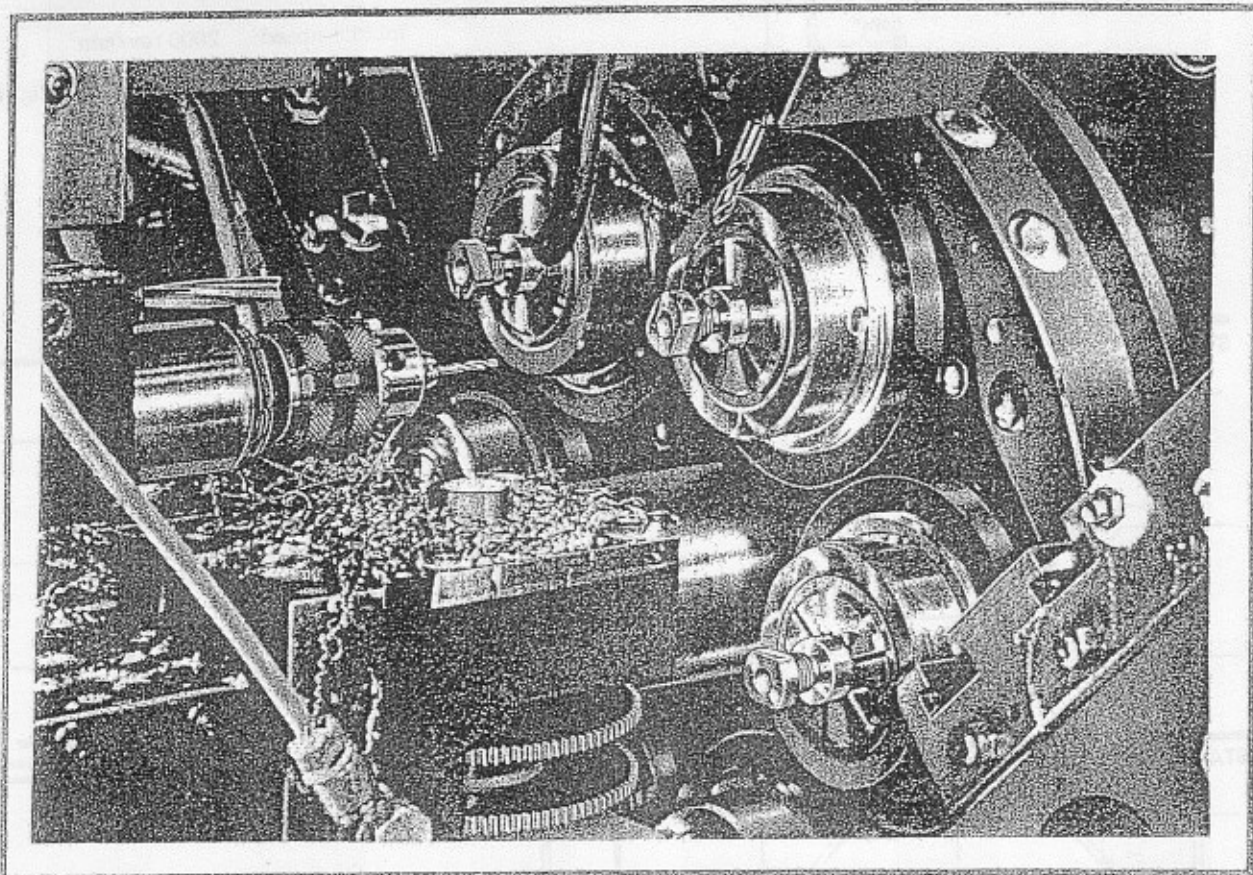


Part off to length (X/S)



# WICKMAN Multi-Spindle Automatic

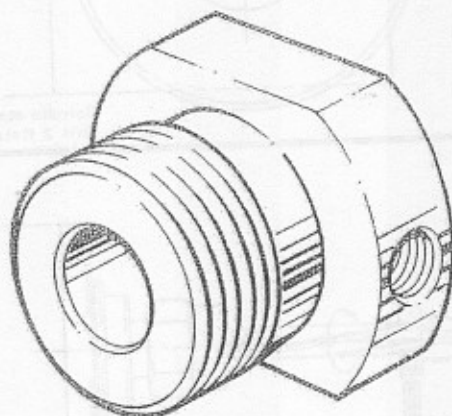
## 5/8" — 6s Bar Machine



### Location Screw

In the production of this small component, the machine's spindle stopping facility is used at stations 3, 4 and 5 to permit cross-drilling and tapping, flat milling, and off-set drilling. Reaming is carried out at station 5 utilising a high-speed drilling drive which revolves at 2,160 rev/min.

High speed steel tools are used with the exception of carbide form-tools at stations 1 and 6.

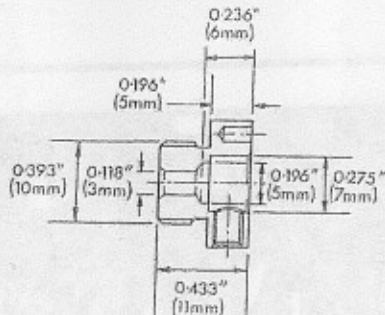
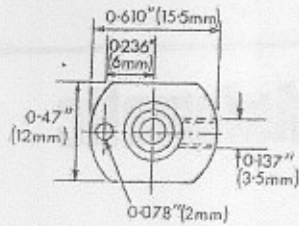


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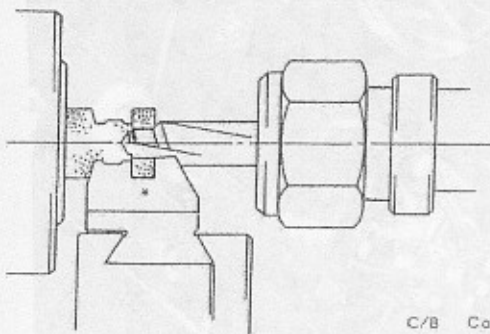
Layout to produce a Location Screw

Cycle time: 3.9 sec  
 Material: Mild steel  
 Spindle speed: 2000 rev/min  
 Cutting speed: 328 ft/min (99.7 m/min)

\* Carbide Tools

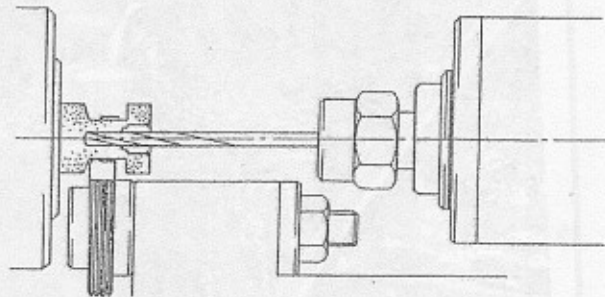
C/B - Centre block  
 X/S - Cross slide  
 I/S - Independent slide  
 A/S - Auxiliary slide

STATION 1



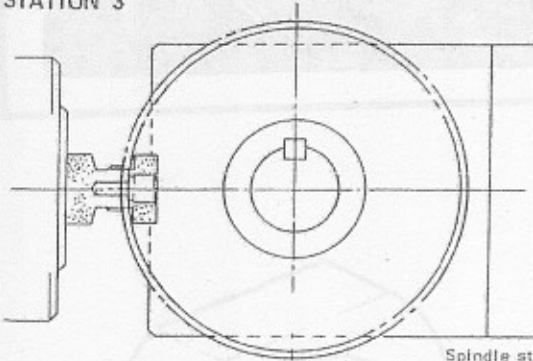
C/B Combination drill  
 X/S Form complete

STATION 2



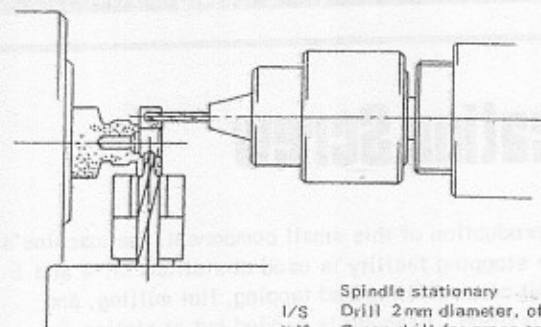
C/B Drill 3mm diameter  
 X/S Chase external thread

STATION 3



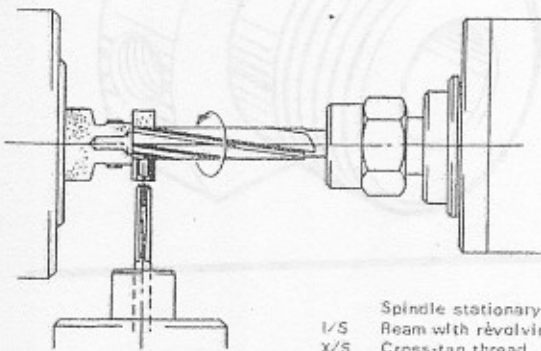
Spindle stationary  
 C/B Mill 2 flats

STATION 4



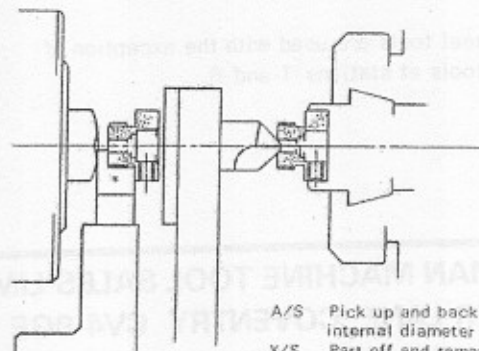
Spindle stationary  
 I/S Drill 2mm diameter, off-centre  
 X/S Cross drill for cross tapping

STATION 5



Spindle stationary  
 I/S Ream with revolving reamer  
 X/S Cross-tap thread

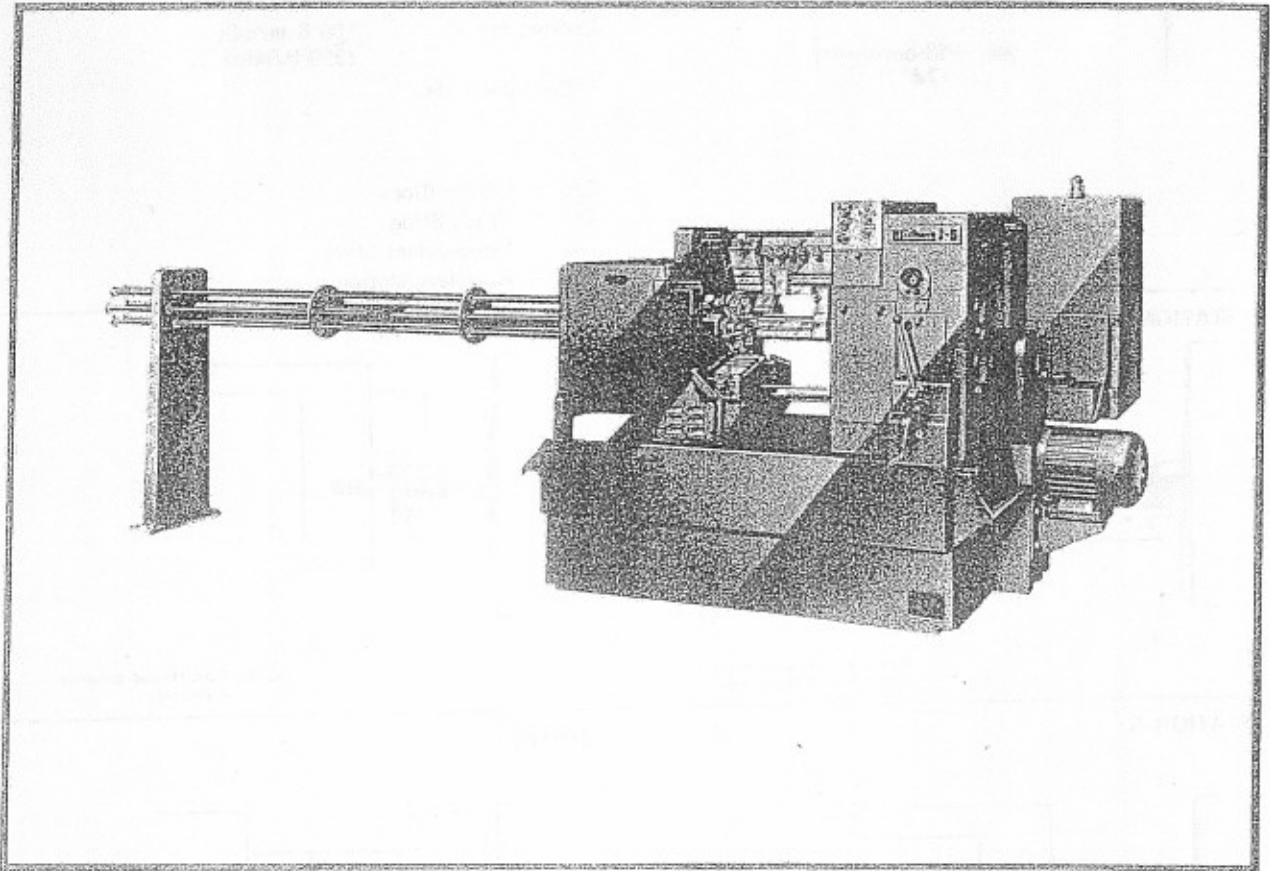
STATION 6



A/S Pick up and back burr small  
 internal diameter  
 X/S Part off and remove milling burr



# WICKMAN Multi-Spindle Automatic 5/8" - 6 Bar Machine

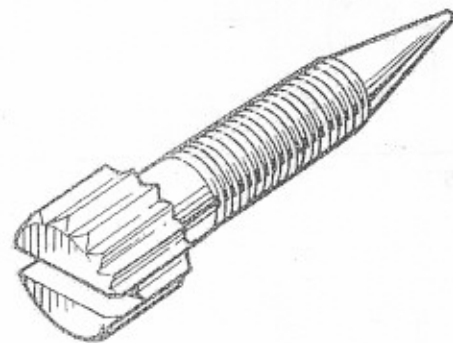


## Volume Control Screw

This component is manufactured in a cycle time of 3 seconds from reeded brass, using high-speed-steel and carbide tools.

Usage of a pointing toolholder with a steady bush at the fourth station gives concentricity of the point with the thread diameter.

Slotting of the head is carried out on a standard slotting attachment incorporating a transfer arm.

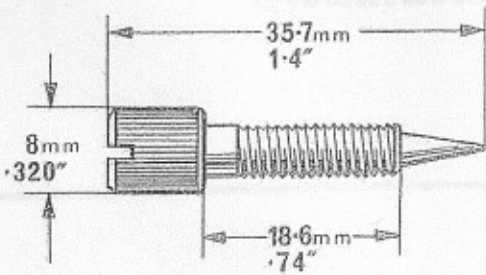


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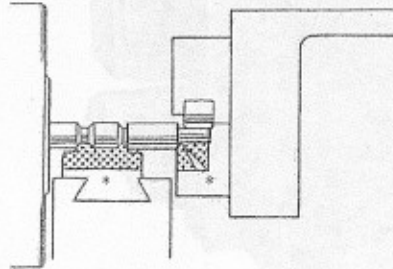


Layout to produce a Volume Control Screw

Cycle time: 3 sec  
 Material: Reeded brass  
 Spindle speed: 3150 rev/min  
 Cutting speed: 106.6 m/min (350 ft/min)  
 \* Carbide Tools

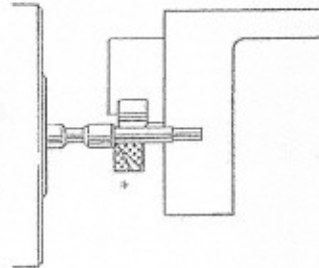
C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide  
 A/M - Auxiliary Motion

STATION 1



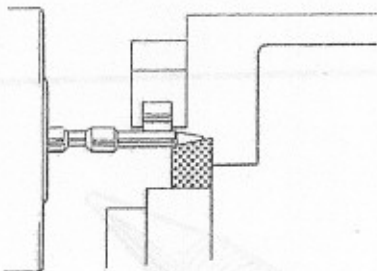
C/B Rough turn point.  
 X/S Finish form rear.

STATION 2



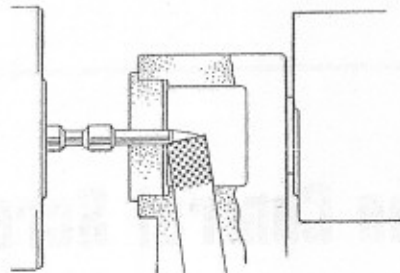
C/B Turn thread outside diameter.

STATION 3



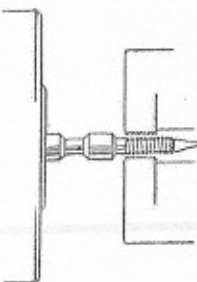
C/B Roll steady.  
 X/S Rough form point.

STATION 4



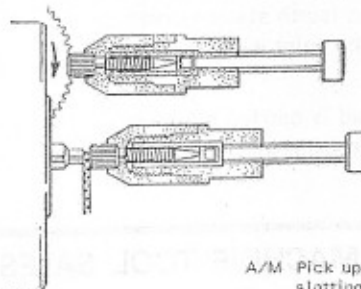
I/S Finish the point.

STATION 5



I/S Thread.

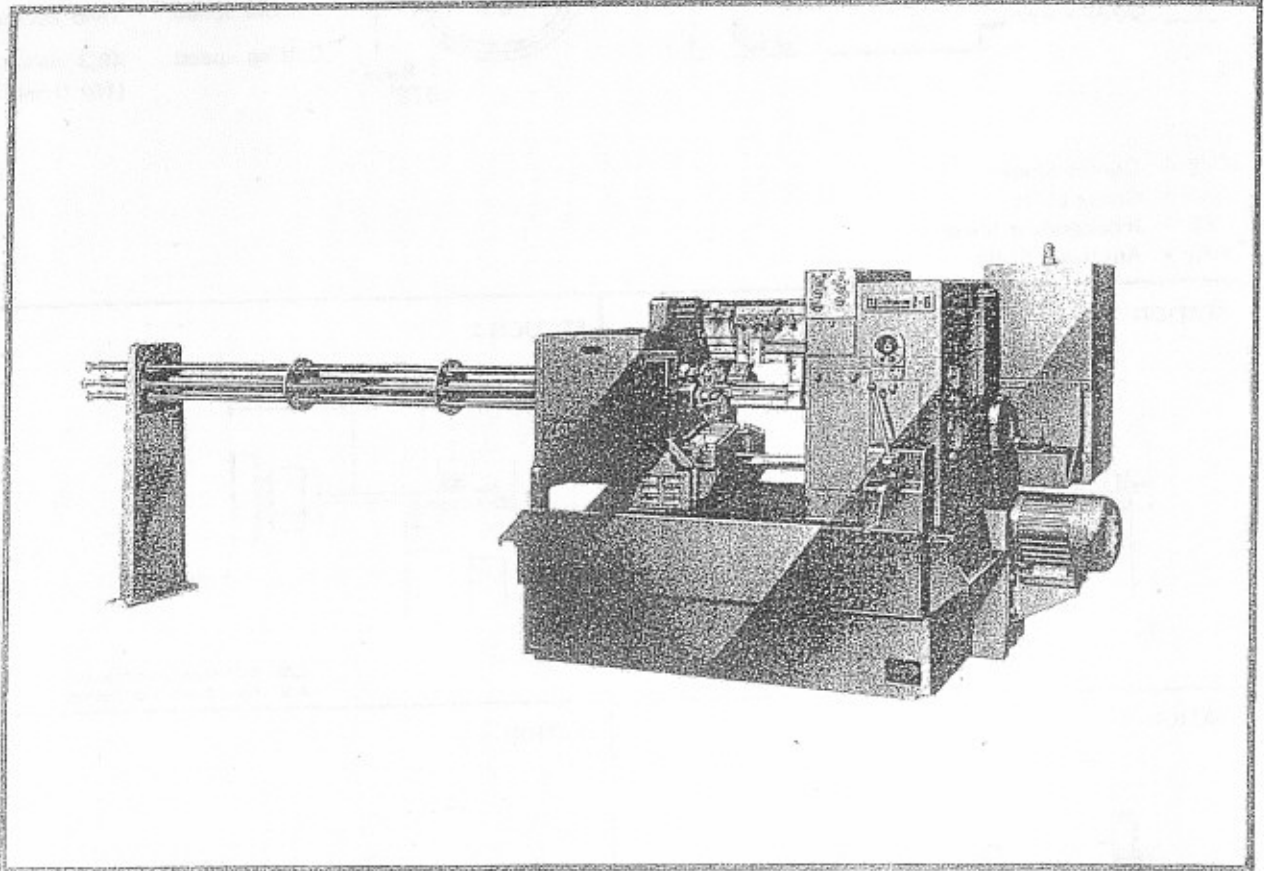
STATION 6



A/M Pick up, transfer to slotting attachment, mill slot and eject.



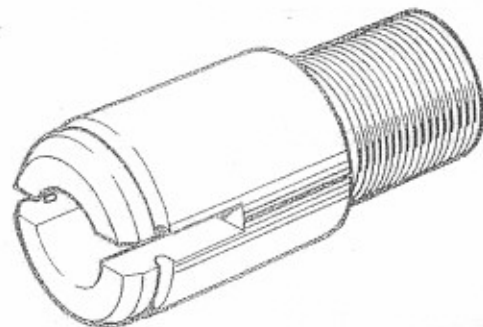
# WICKMAN Multi-Spindle Automatic 5/8" - 6S Bar Machine



## Thermostat Stem

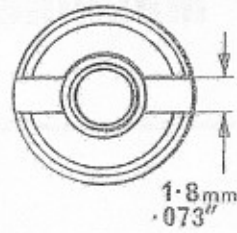
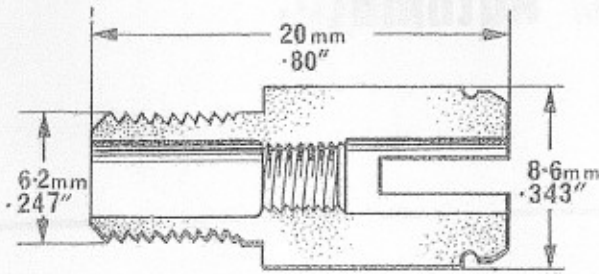
In the machining of this small part, the operations are, drilling, reaming, forming, internal and external threading.

The spindle is stopped at station 3 to permit slot milling. Reaming with the back burring attachment after part off completes the component in a cycle time of 7.6 seconds.



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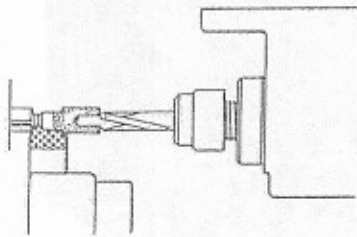


Layout to produce a Thermostat Stem

|                |                            |
|----------------|----------------------------|
| Cycle time:    | 7.6 sec                    |
| Material:      | EN. 1A                     |
| Spindle speed: | 1800 rev/min               |
| Cutting speed: | 49.3 m/min<br>(162 ft/min) |

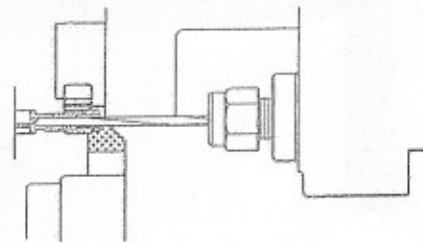
- C/B - Centre Block
- X/S - Cross Slide
- I/S - Independent Slide
- A/S - Auxiliary Slide

STATION 1



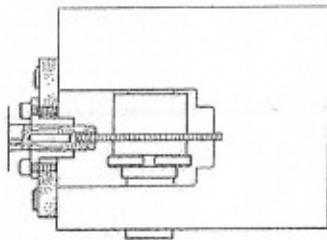
C/B Drill with combination drill.  
X/S Form external thread diameter and chamfer rear.

STATION 2



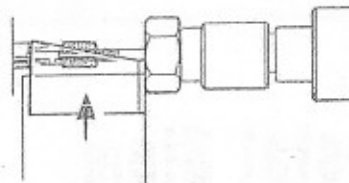
C/B Roll steady and drill.  
X/S Form front and groove.

STATION 3



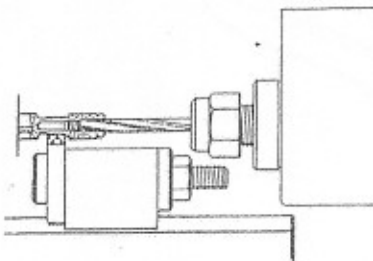
Spindle stationary.  
C/B Mill slot.

STATION 4



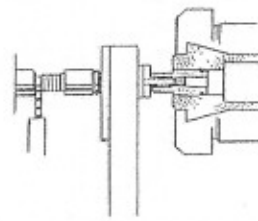
I/S Tap thread.  
X/S Skive outside diameter, groove, and front chamfer.

STATION 5



I/S Ream front diameter.  
X/S Chase external thread.

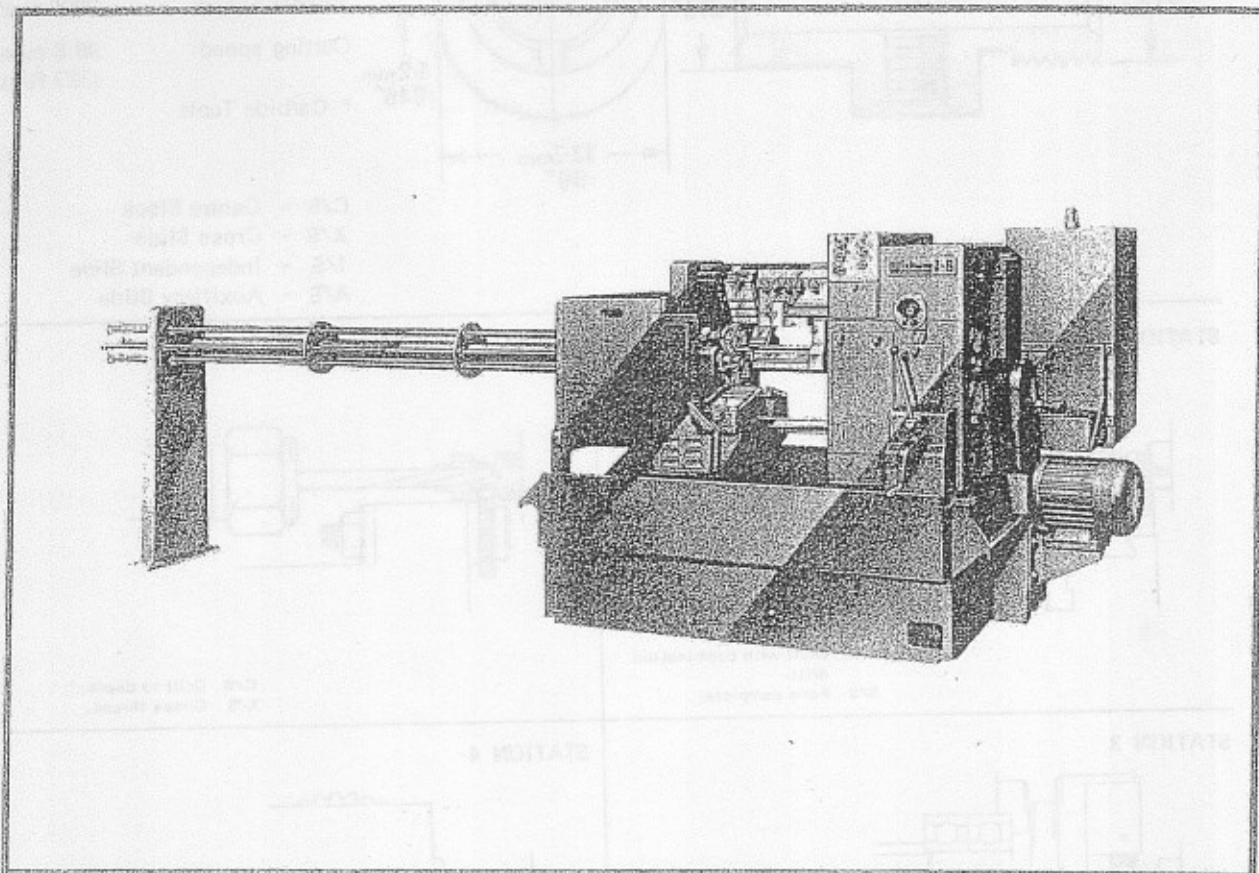
STATION 6



A/S Pick up.  
X/S Part off.  
A/S Ream internal diameter.



# WICKMAN Multi-Spindle Automatic 5/8" - 6S Bar Machine



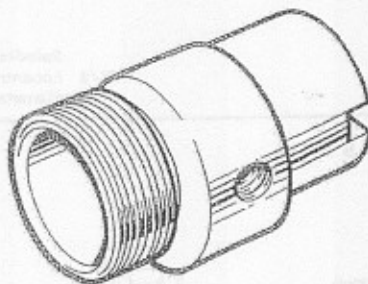
## Threaded Tee Piece

High speed and carbide tools are used to produce this component in a cycle time of 4.2 seconds.

The spindles stop at stations 3, 4 and 5, to permit the production of an eccentric diameter with the synchronously driven eccentric turning attachment, the production of a threaded cross hole in the eccentric diameter, and an end slot with the stationary milling attachment.

Accelerated high speed reaming at station 5 utilises the high speed drill attachment.

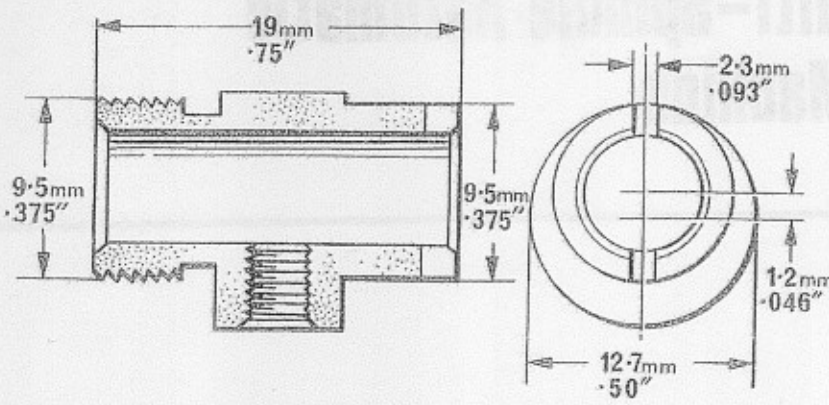
Back burring after pick up and forming and part off completes the component.



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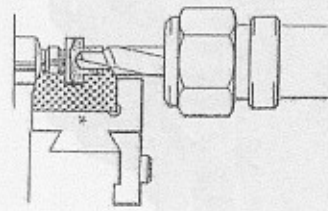


Layout to produce a Threaded Tee Piece

Cycle time: 4.2 sec  
 Material: Ledkut  
 Spindle speed: 2000 rev/min  
 Cutting speed: 99.6 m/min (327 ft/min)  
 \* Carbide Tools

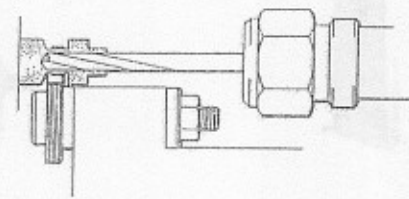
C/B = Centre Block  
 X/S = Cross Slide  
 I/S = Independent Slide  
 A/S = Auxiliary Slide

STATION 1



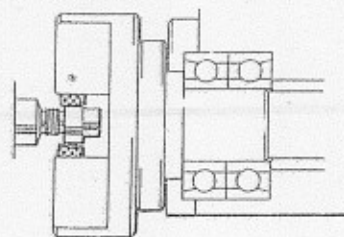
C/B Drill with combination drill.  
 X/S Form complete.

STATION 2



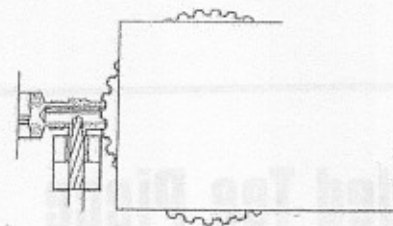
C/B Drill to depth.  
 X/S Chase thread.

STATION 3



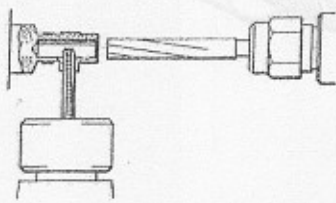
Spindle stationary.  
 C/B Eccentric turn large diameter.

STATION 4



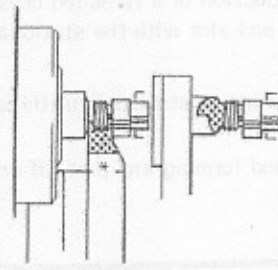
Spindle stationary.  
 X/S Cross drill.  
 I/S Mill slot.

STATION 5



Spindle stationary.  
 X/S Cross-tap thread.  
 I/S High speed ream.

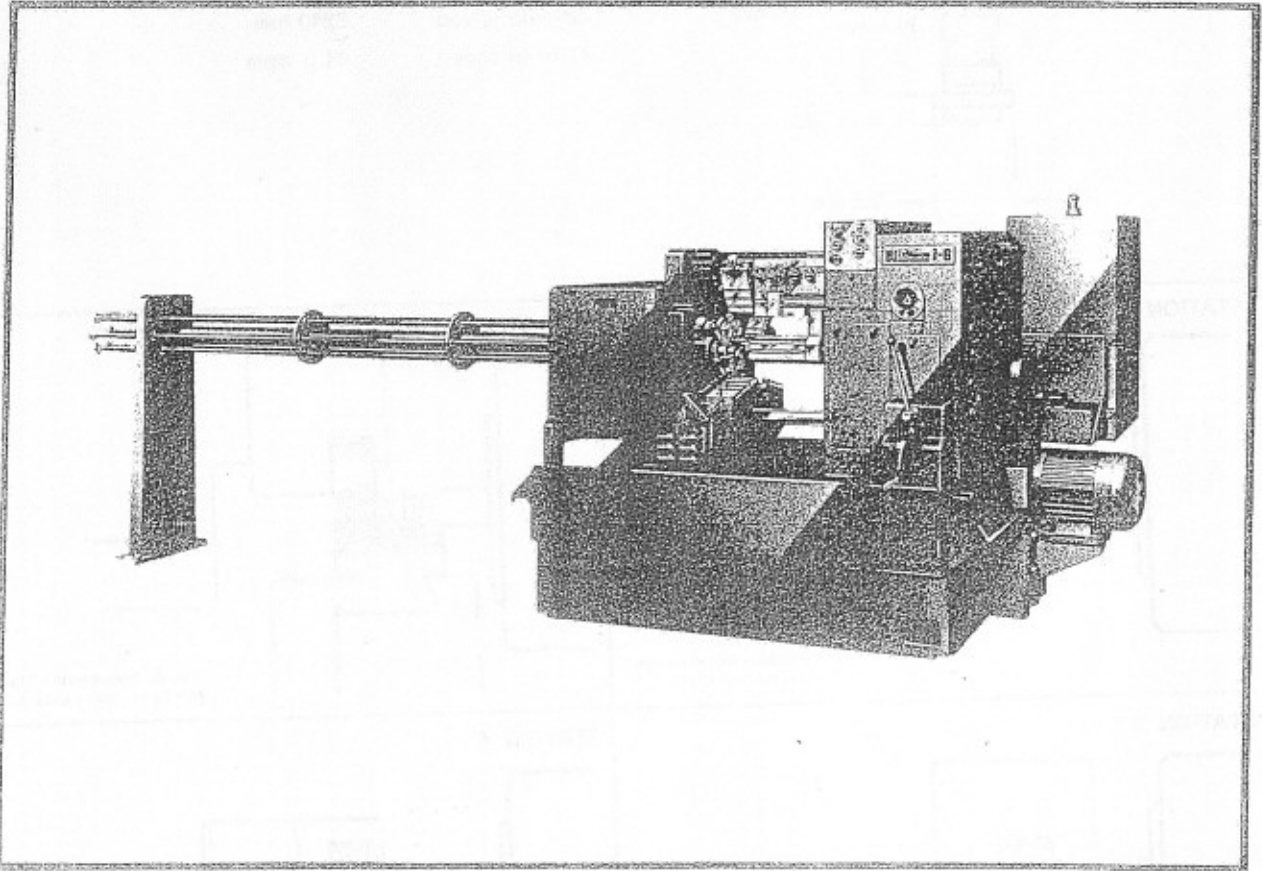
STATION 6



A/S Pick up.  
 X/S Form and part off.  
 A/S Chamfer rear internal diameter.



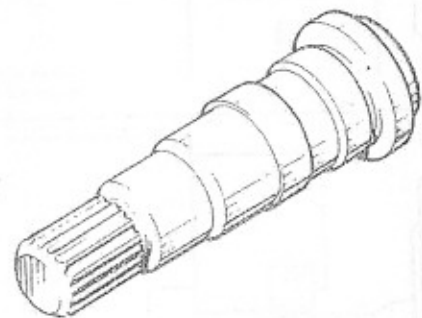
# WICKMAN Multi-Spindle Automatic 5/8" - 6 Bar Machine



## Spindle

The production of this small component demonstrates the accuracy of the machine. A tolerance of 0.02 mm being maintained on 3 diameters.

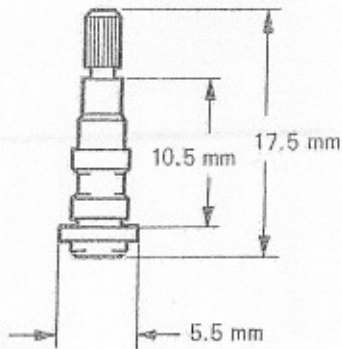
An interesting feature is the straight knurling operation produced by a F.001 Fette rolling head.



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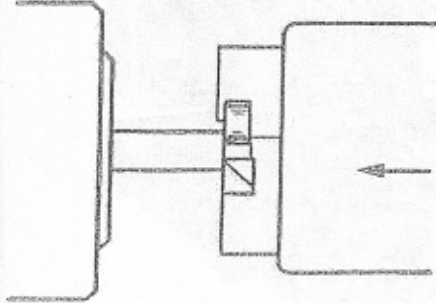
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Layout to produce a Spindle

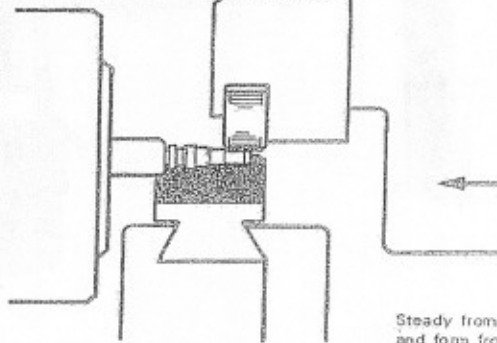
Cycle time: 3.6 sec  
Material: EN.32M.  
Spindle speed: 2240 rpm  
Cutting speed: 44.5 mpm

STATION 1



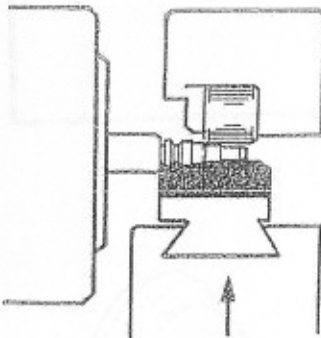
Turn knurled diameter from centre block.

STATION 2



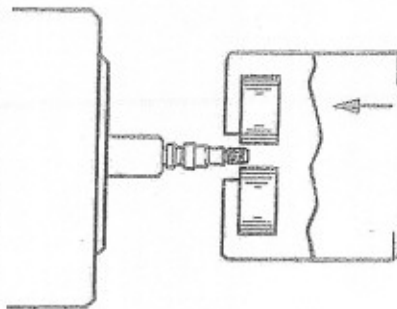
Steady from centre block and form from cross slide.

STATION 3



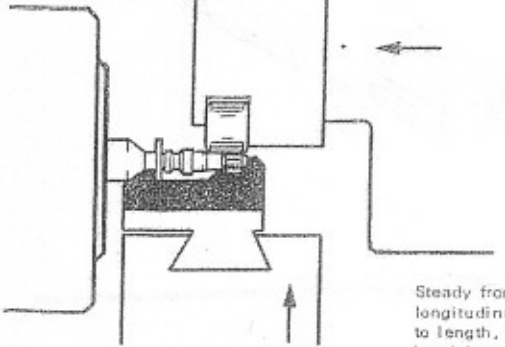
Shave diameters from cross slide.

STATION 4



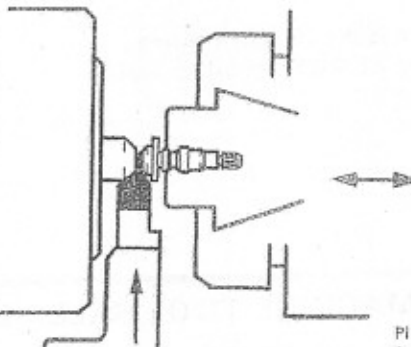
Roll knurl from longitudinal independent slide.

STATION 5



Steady from auxiliary longitudinal slide. Face to length, form undercut, breakdown rear.

STATION 6

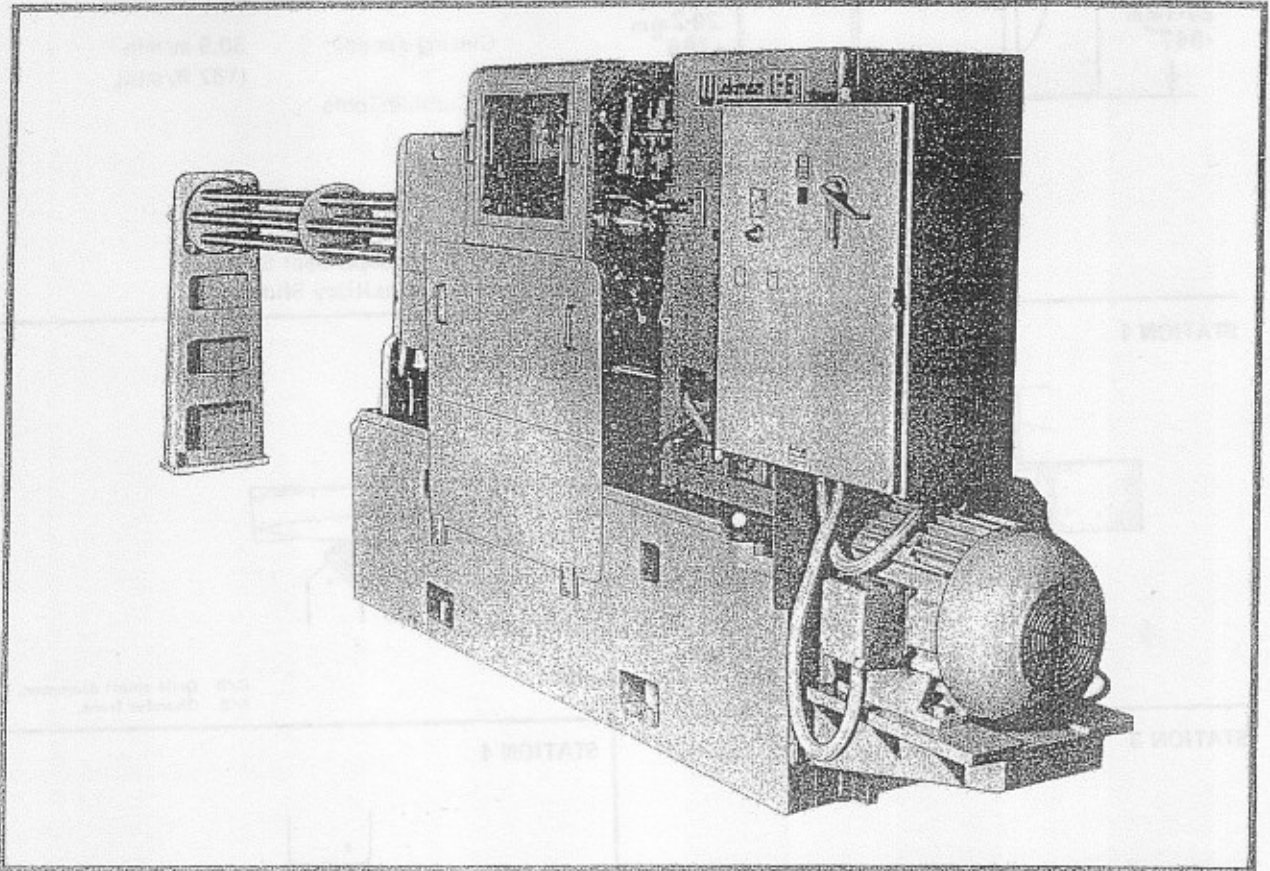


Pick up. Form part off from cross slide.





# WICKMAN Multi-Spindle Automatic 1"-6 Bar Machine



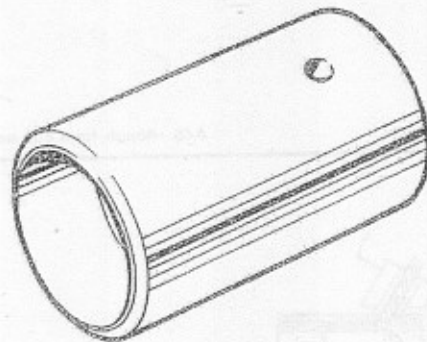
## Tappet

Drilling and forming operations are performed on a cast-iron blank to produce this component in a cycle time of 16.9 seconds.

The blank is pre-ground on the outside diameter and has a hard-chilled face which is ground at a later stage.

A pick-up unit and an automatic feed drill unit are used at station 5 to angular cross-drill.

The component blanks are loaded into the lengthened spindle noses at station 6 utilising a magazine loading chute, a cradle, and a horizontal loading slide.



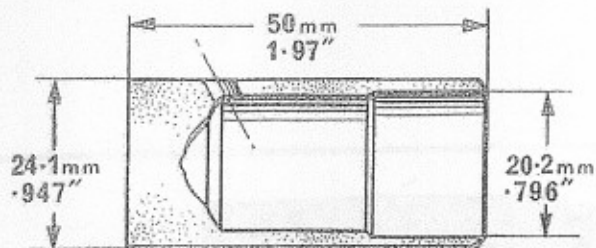
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Layout to produce a Tappet

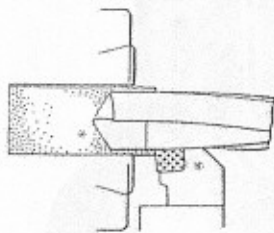


Cycle time: 16.9 sec  
 Material: Cast iron alloy  
 Spindle speed: 672 rev/min  
 Cutting speed: 50.9 m/min (167 ft/min)

\* Carbide Tools

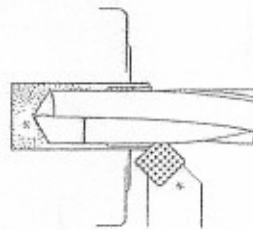
C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide  
 A/S - Auxiliary Slide

STATION 1



C/B Drill large diameter.  
 X/S Face front.

STATION 2



C/B Drill small diameter.  
 X/S Chamfer front.

STATION 3



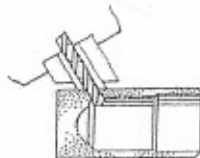
A/S Rough form cup seat.

STATION 4



I/S Finish form cup seat and chamfer large bore.

STATION 5



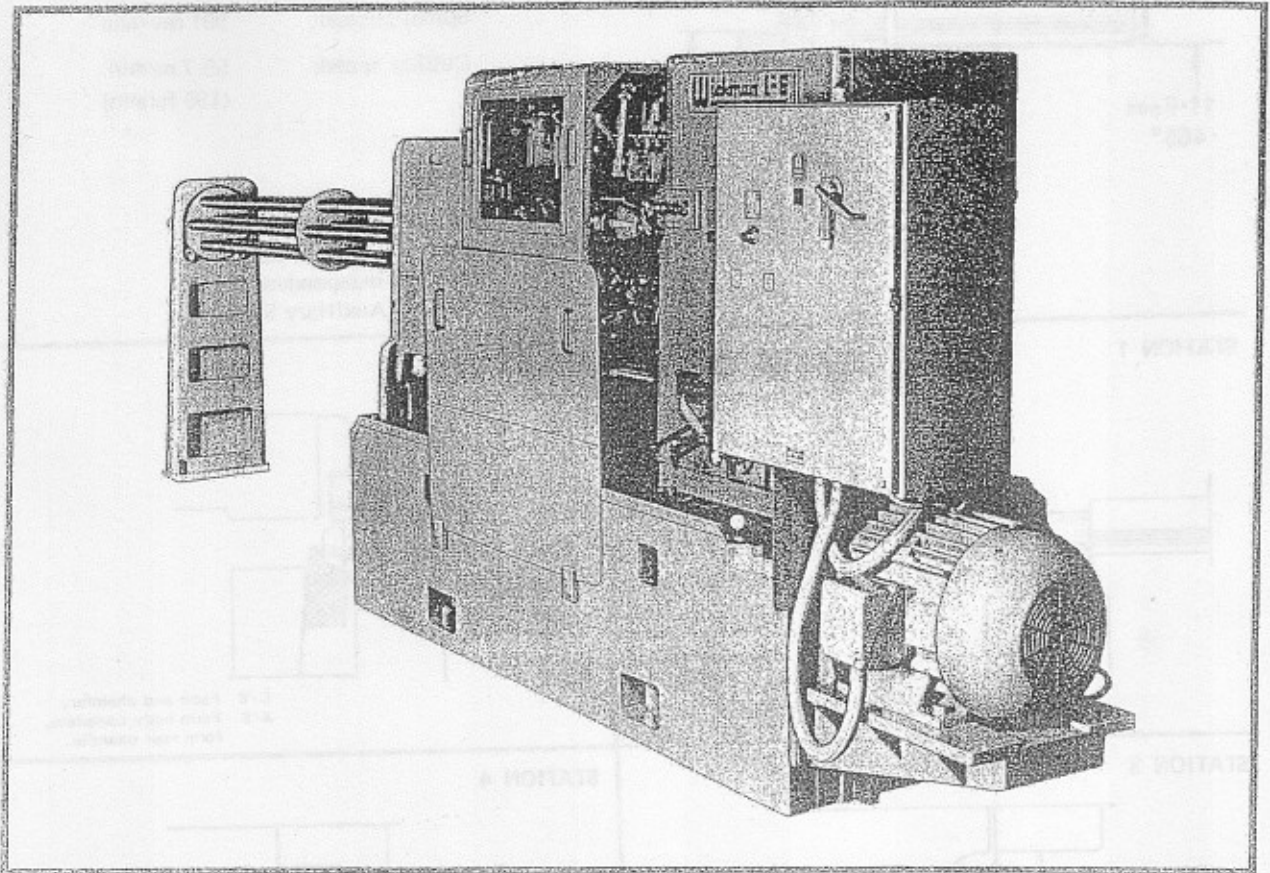
I/S Pick up, transfer.  
 X/S Cross drill.  
 I/S Unload.

STATION 6

A/S Auto load into work spindle.



# WICKMAN Multi-Spindle Automatic 1"-6S Bar Machine

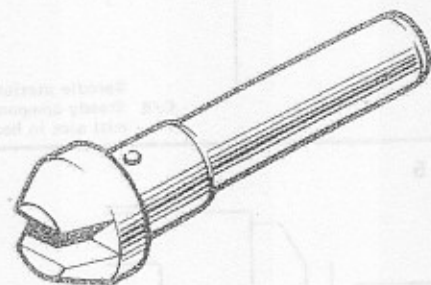


## Expander Adjuster

This set up illustrates typical machining operations which may be carried out on a spindle-stopping automatic.

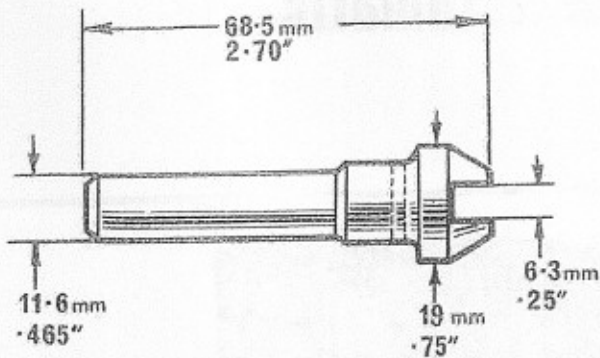
At station 3 a large-radius slot is milled across the head of the component, and in station 4 a hole is cross drilled in fixed relationship to the slot.

The pick-up attachment produces a pipless part-off face, completing the component in a cycle time of 12.2 seconds



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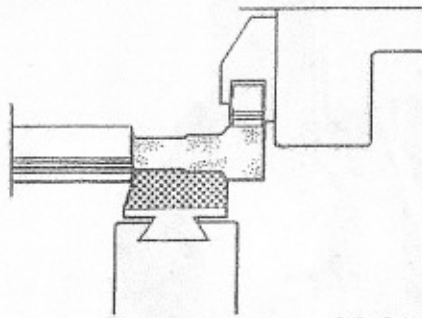


Layout to produce a Brake Cylinder Expander Adjuster

Cycle time: 12.2 sec  
 Material: EN. 1A  
 Spindle speed: 991 rev/min  
 Cutting speed: 59.7 m/min (196 ft/min)

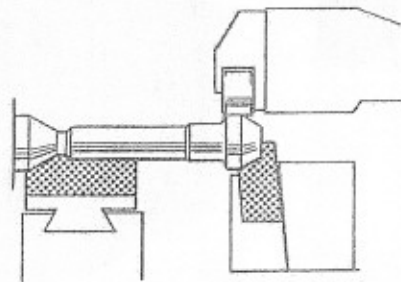
C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide  
 A/S - Auxiliary Slide

STATION 1



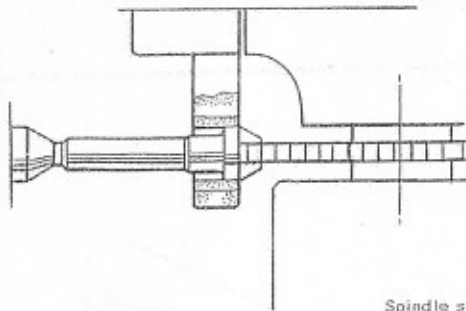
C/B Roll steady.  
 X/S Form body part way.

STATION 2



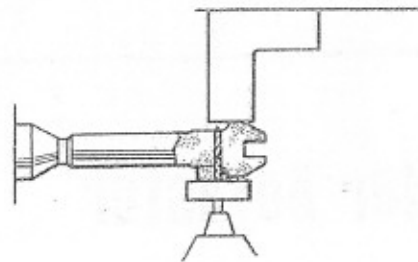
C/B Face and chamfer.  
 X/S Form body complete, form rear chamfer.

STATION 3



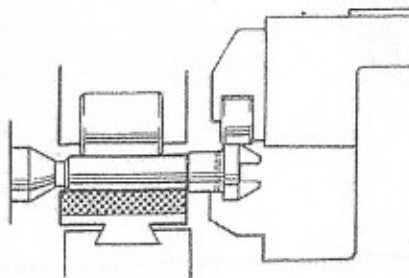
Spindle stationary.  
 C/B Steady component, and mill slot in head.

STATION 4



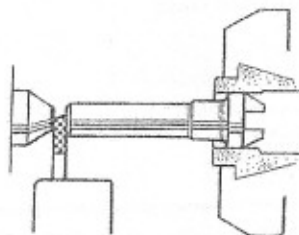
Spindle stationary.  
 C/B Steady component.  
 X/S Cross drill.

STATION 5



I/S Roll steady.  
 X/S Shave small diameter.

STATION 6

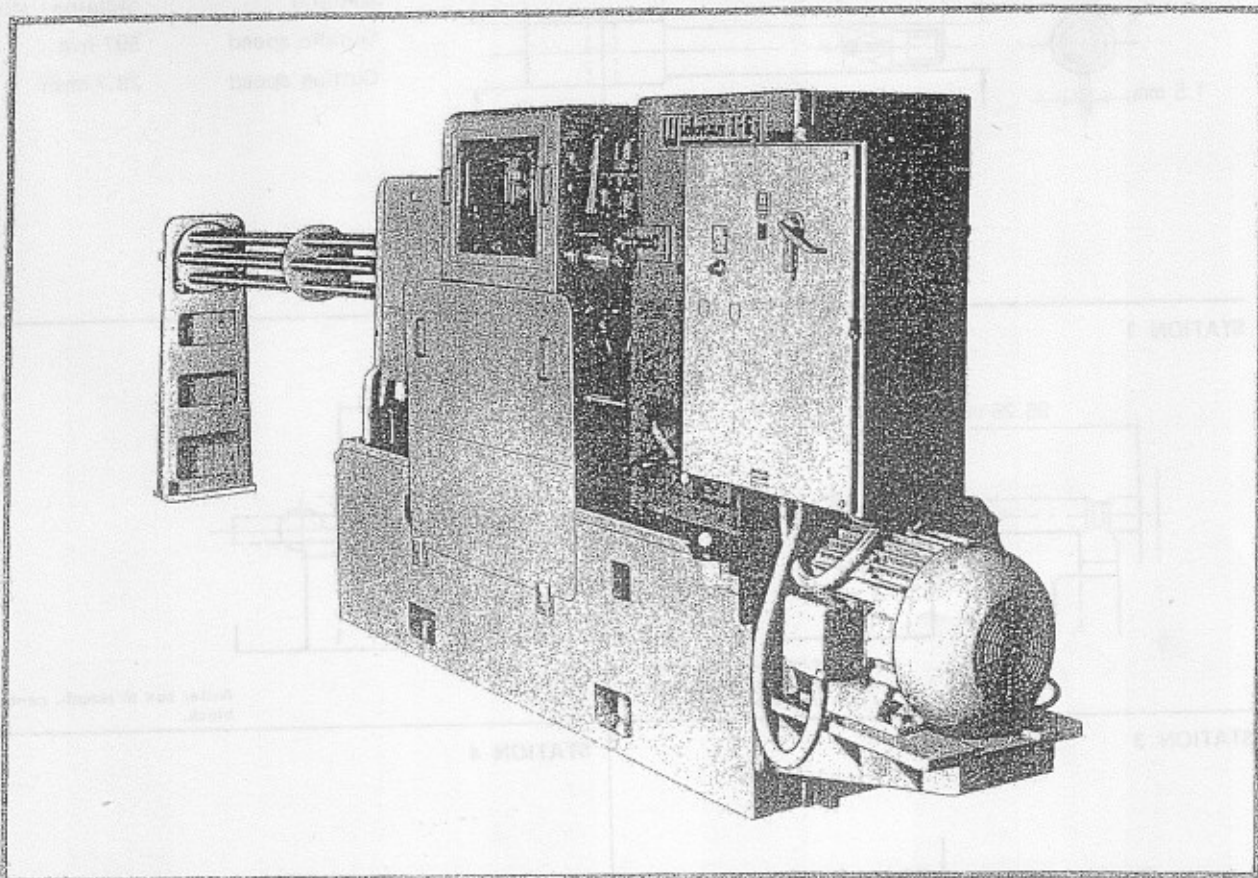


A/S Pick up.  
 X/S Part off.



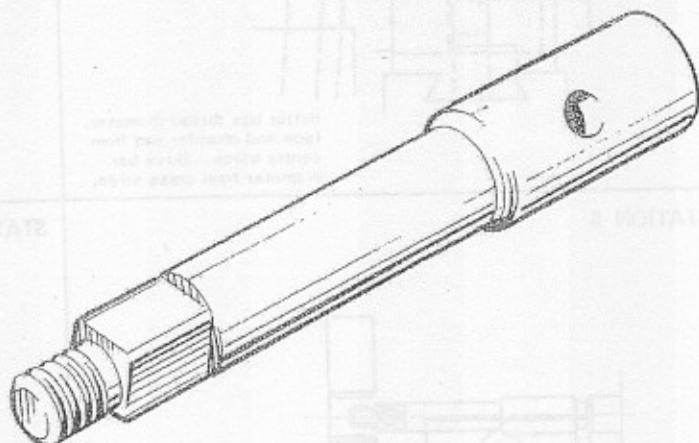


# WICKMAN Multi-Spindle Automatic 1"-6S Bar Machine



## Cock Plug

This component is a stainless steel cock plug, produced complete with 4 flats, cross drilled hole, and external thread. Parting off from the cross slide produces a pipless finish.

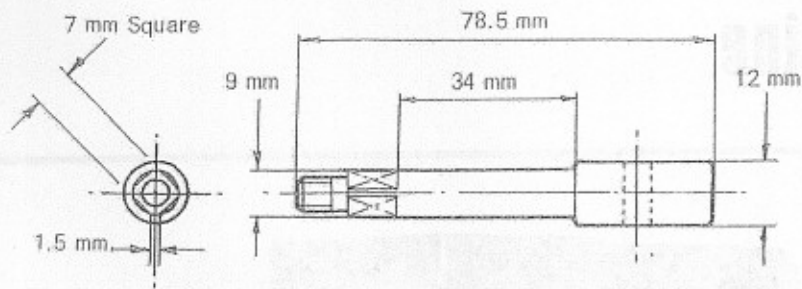


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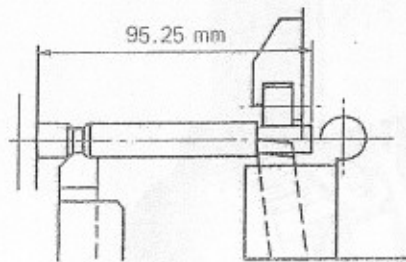
# Roller Box Milling Machine



Layout to produce a Cock Plug

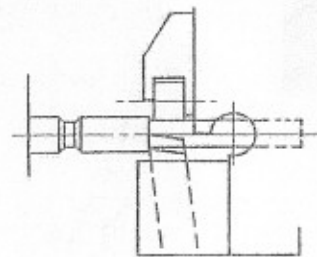
|               |                 |
|---------------|-----------------|
| Cycle time    | 36 sec          |
| Material      | Stainless steel |
| Spindle speed | 597 rpm         |
| Cutting speed | 23.7 mpm        |

STATION 1



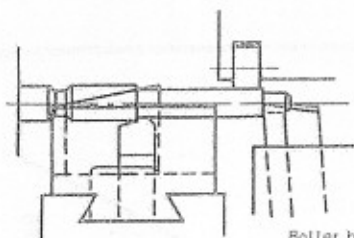
Roller box part way from centre block. Break down rear from cross slide.

STATION 2



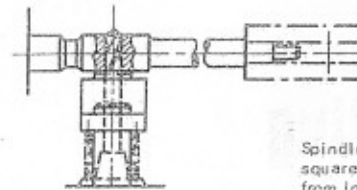
Roller box to length, centre block.

STATION 3



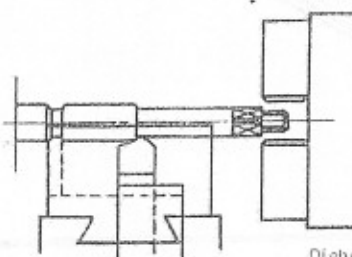
Roller box thread diameter, face and chamfer end from centre block. Skive bar diameter from cross slide.

STATION 4



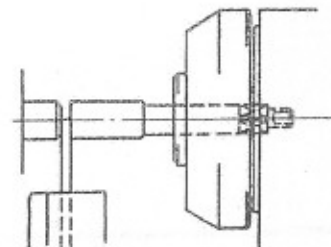
Spindle stationary, mill square form with 2 passes from independent slide, utilising indexing milling head. Cross drill from cross slide.

STATION 5



Diehead thread from independent slide. Form bar diameter from cross slide.

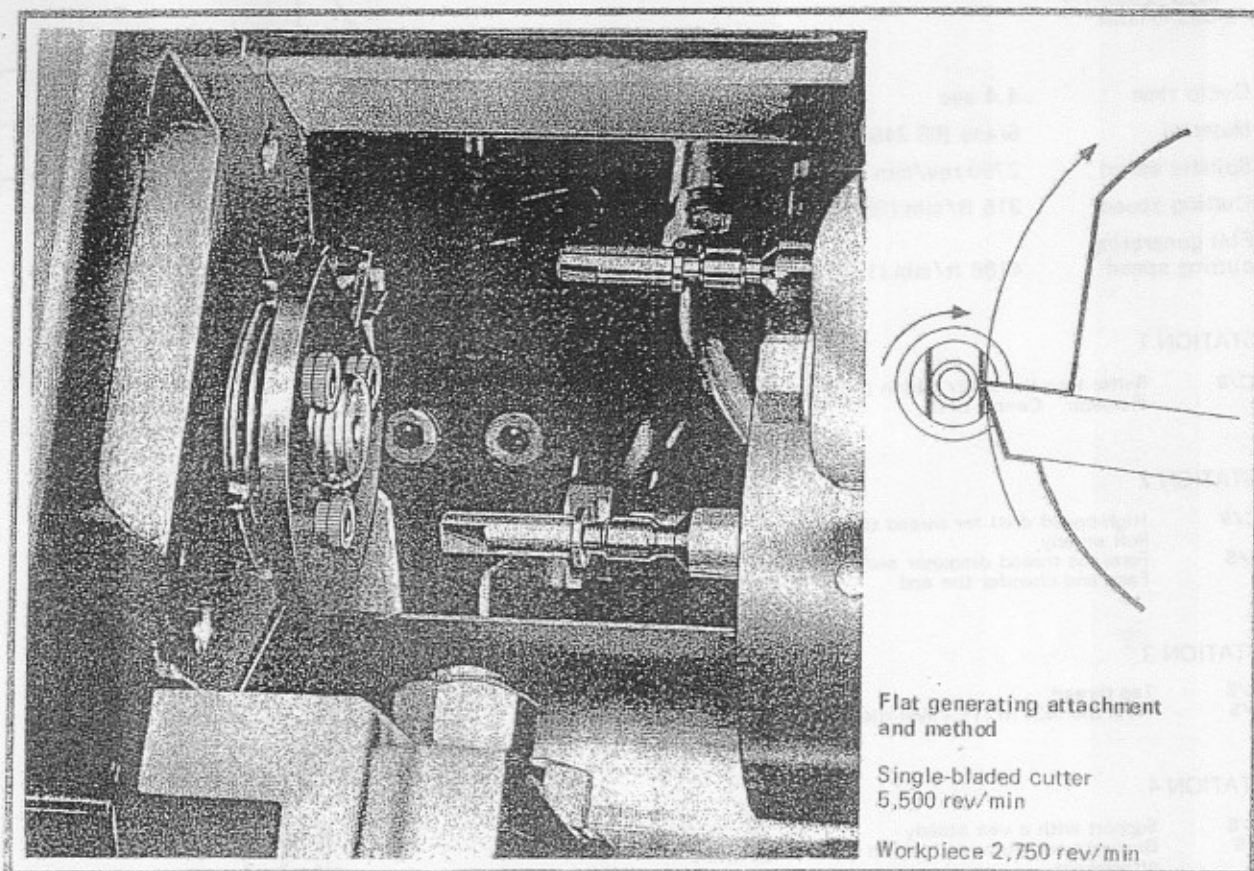
STATION 6



Synchronous pick-up attachment on auxiliary longitudinal slide. Part off from cross slide.



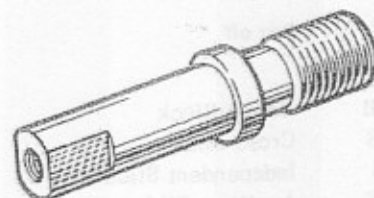
# WICKMAN Multi-Spindle Automatic 1"-6 Bar Machine



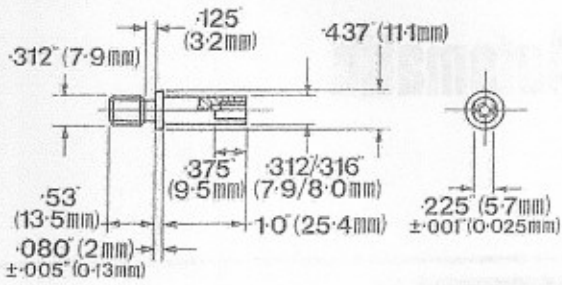
## Valve Spindle

High-speed steel end-working tools and carbide form-tools are used to produce this component from brass in a cycle time of 4.4 seconds. A revolving drill attachment is used at Station 2 to drill the component prior to thread tapping at Station 3, and an external thread is chased at Station 5.

The free-cutting non-ferrous material permits flat generating to be carried out from the independent slide at Station 4 where the single-bladed cutter revolves at twice the revolution rate of the workpiece, and is fed at a rate of .0034 in/rev (0.086 mm/rev).



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|                               |                            |
|-------------------------------|----------------------------|
| Cycle time                    | 4.4 sec                    |
| Material                      | Brass (BS 249)             |
| Spindle speed                 | 2750 rev/min               |
| Cutting speed                 | 315 ft/min (96 m/min)      |
| Flat generating cutting speed | 4186 ft/min (1275.9 m/min) |

**STATION 1**

C/B Roller turn the .312/.316 in (7.9/8.0 mm) diameter. Centre drill

**STATION 2**

C/B High-speed drill for thread tapping.  
Roll steady  
X/S Form the thread diameter and undercut.  
Face and chamfer the end

**STATION 3**

A/S Tap thread  
X/S Form the .437 in (11.1 mm) diameter

**STATION 4**

C/B Support with a vee steady  
I/S Generate two flats with a flat generating attachment

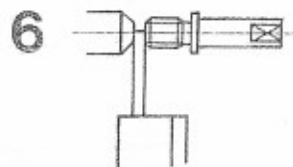
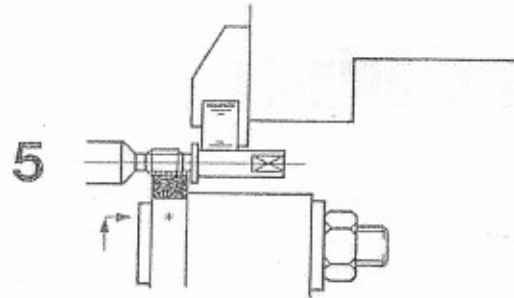
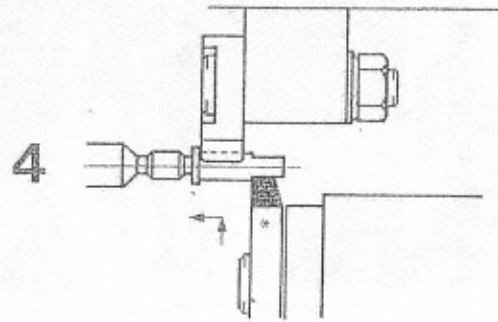
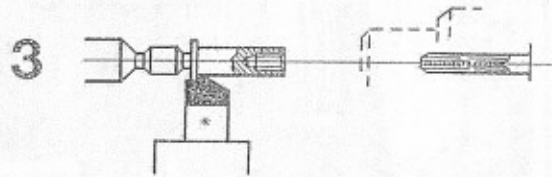
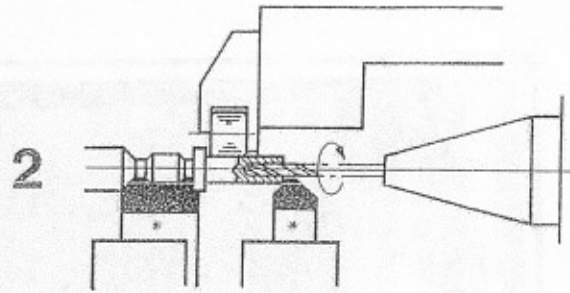
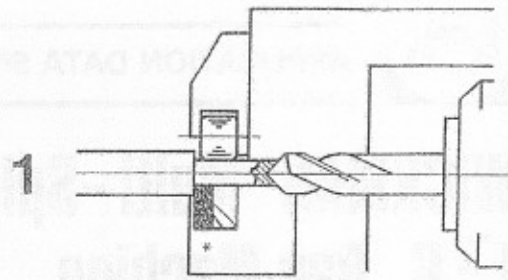
**STATION 5**

I/S Roller steady  
X/S Chase thread

**STATION 6**

P/O X/S Part off

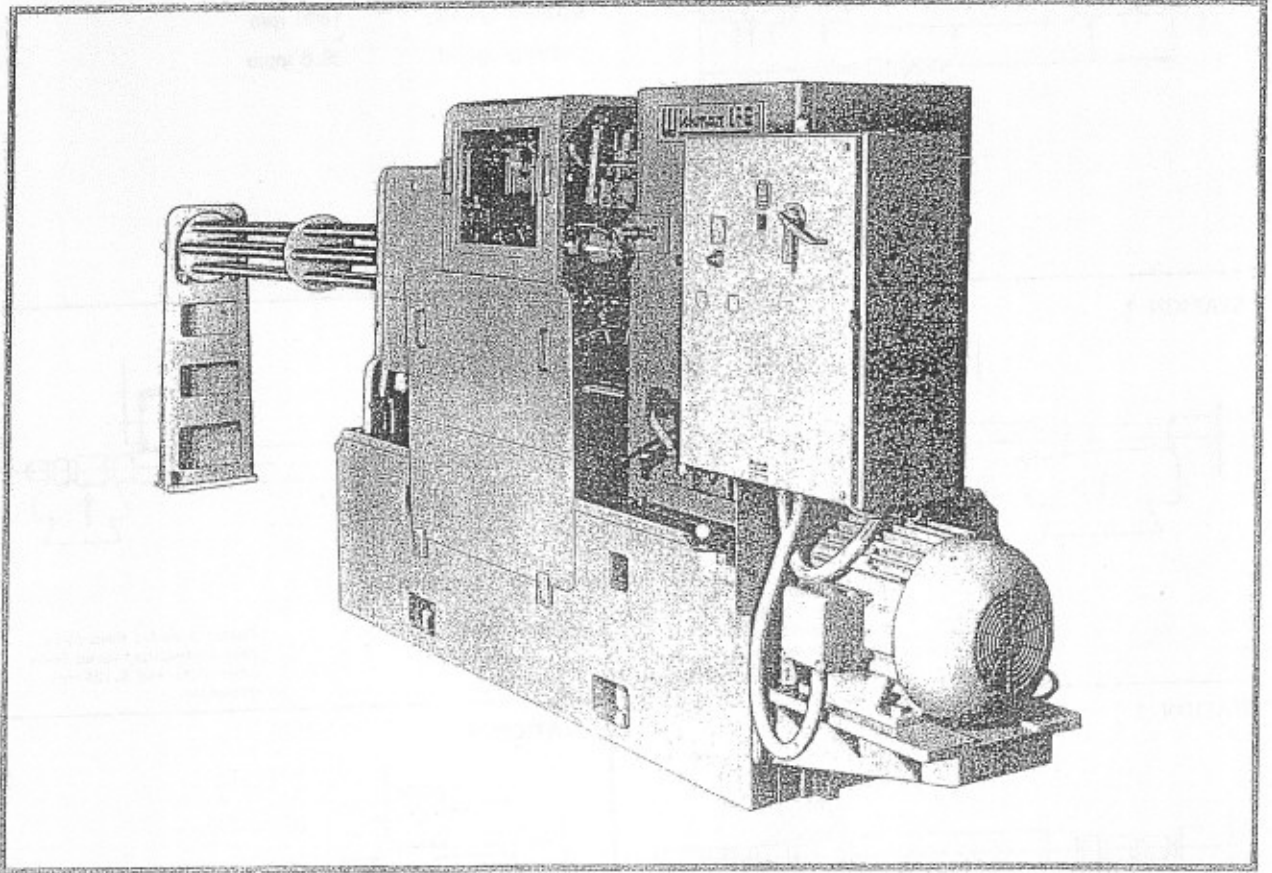
C/B Centre Block  
X/S Cross Slide  
I/S Independent Slide  
A/S Auxiliary Slide  
P/O X/S Part Off – Cross Slide



\* Carbide Tools

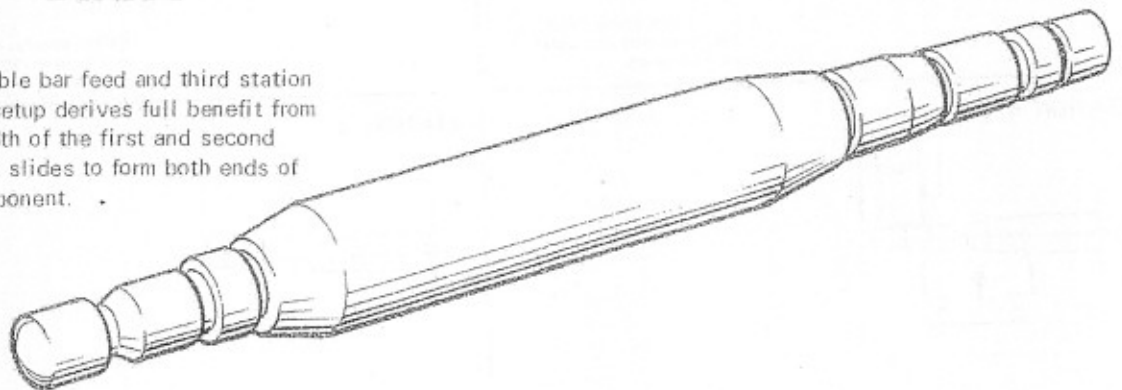


# WICKMAN Multi-Spindle Automatic 1"-6D Bar Machine



## Rotor Shaft

By using double bar feed and third station cutoff, this setup derives full benefit from the extra width of the first and second station cross slides to form both ends of the long component.

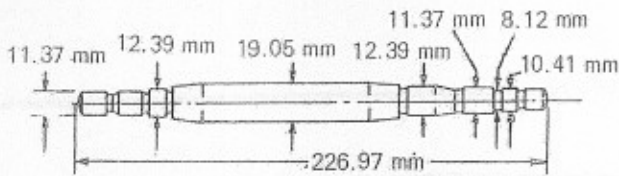


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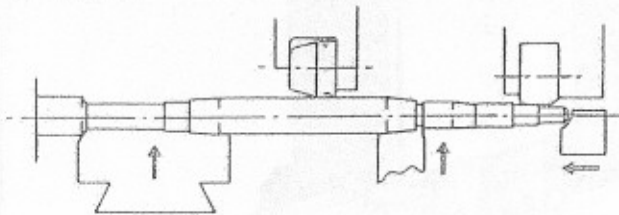


Layout to produce a Rotor Shaft



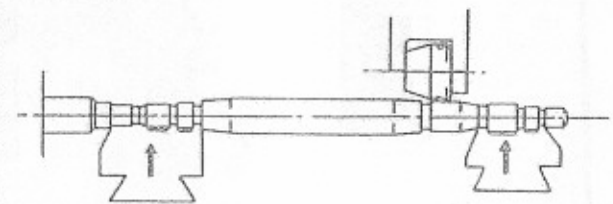
Cycle time: 8.8 sec  
 Material: SAE 1140  
 Spindle speed: 1400 rpm  
 Cutting speed: 39.6 mpm

STATION 1



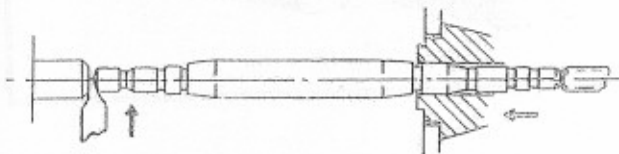
Roller steady and end form rear 12.39 mm and 11.37 mm diameters within 0.050 mm, form rear and front tapers and undercut.

STATION 2



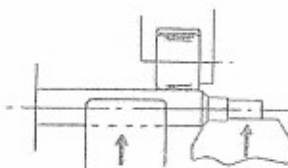
Roller steady, form three rear undercuts, three front undercuts and 8.128 mm diameter.

STATION 3



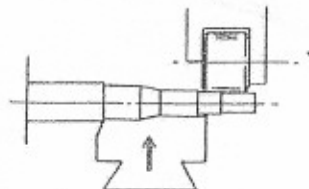
Synchronous steady and eject, form part off; bar feed half length.

STATION 4



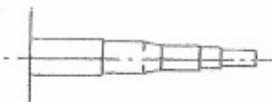
Roller steady, wedge steady and form 8.128 mm and 10.414 mm diameters.

STATION 5



Roller steady and form 12.39 mm and 11.37 mm diameters.

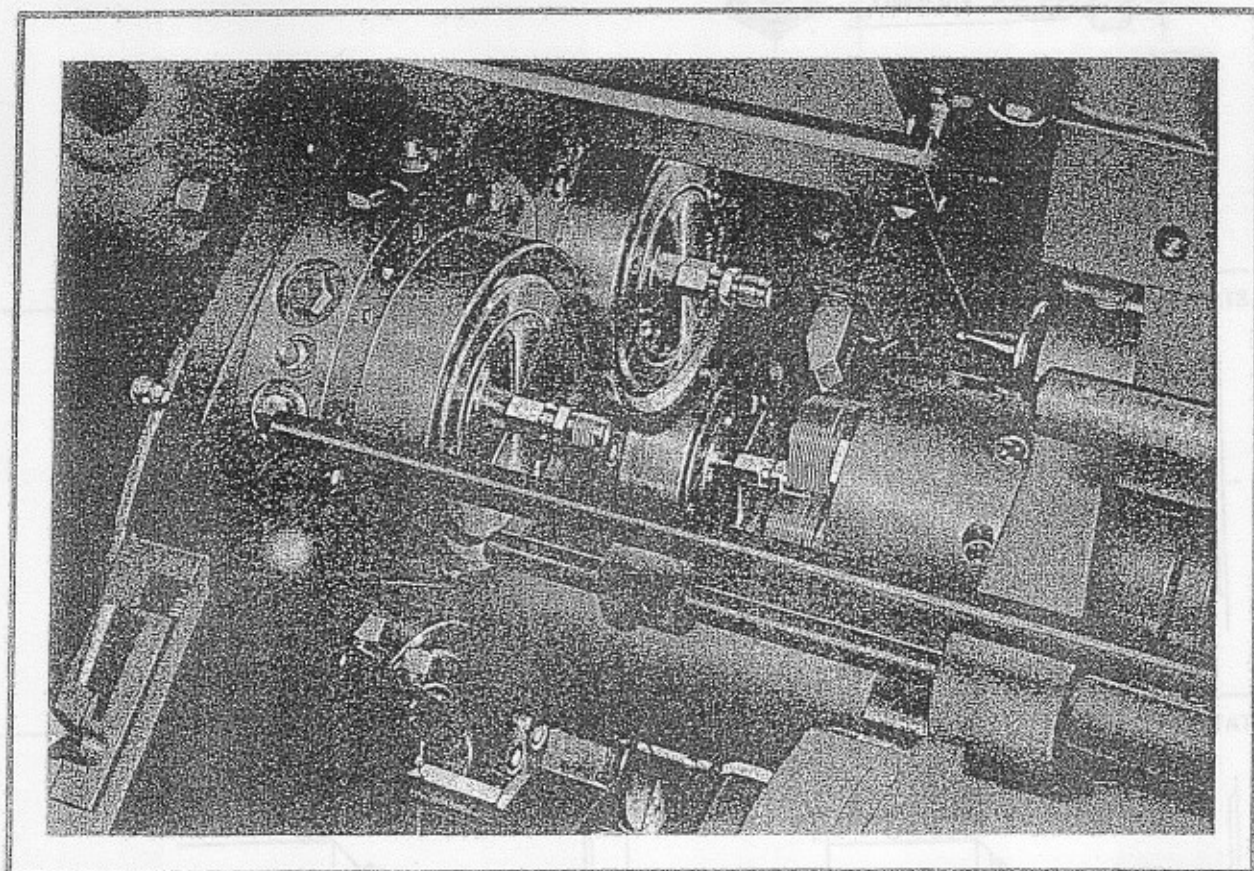
STATION 6



Bar feed to length.



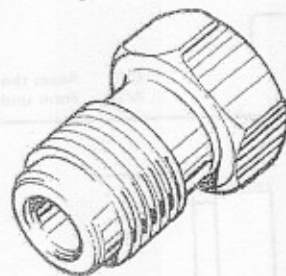
# WICKMAN Multi-Spindle Automatic 1"-6 Bar Machine



## Nut

High-speed steel tools are used to produce this small component from free-cutting mild steel hexagon bar in a cycle time of 8.4 seconds.

An interesting feature is the utilisation of a back-burring attachment at station 6 to produce an internal radius, thus eliminating the necessity for a second operation.



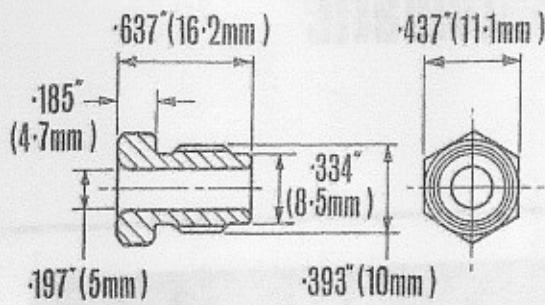
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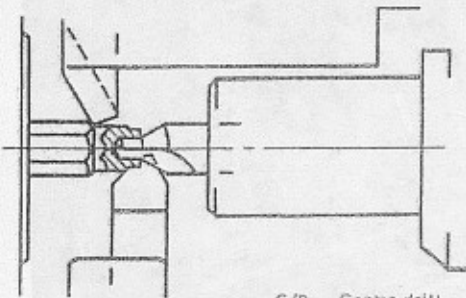
Layout to produce a Nut



Cycle time: 8.4 seconds  
 Material: EN 1 A (Free cutting mild steel)  
 Cutting speed: 169 ft/min (51.5 m/min)  
 Spindle speed: 1280 rev/min

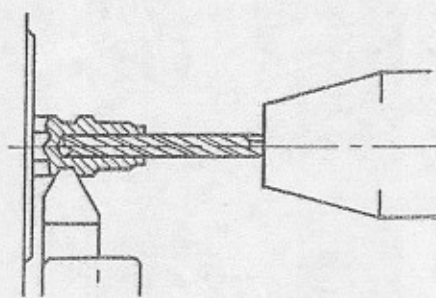
C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide  
 A/S - Auxiliary Slide

STATION 1



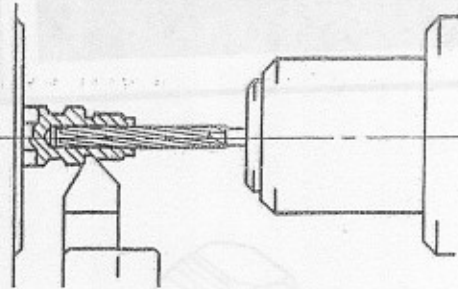
C/B Centre drill.  
 Knee turn thread O/D  
 X/S Form, face and radius the front

STATION 2



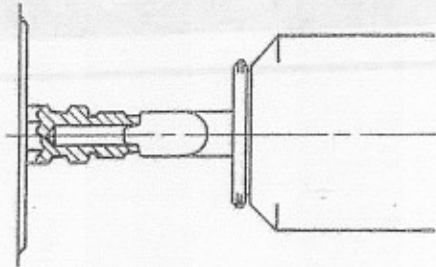
C/B Drill through to depth  
 X/S Breakdown rear

STATION 3



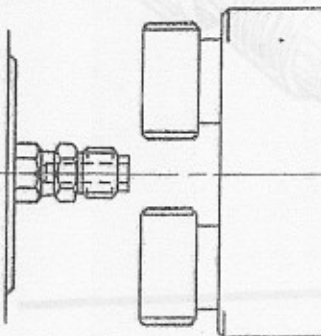
C/B Ream the bore  
 X/S Form undercut

STATION 4



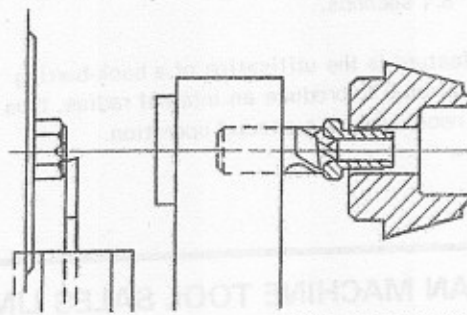
I/S Radius the bore mouth

STATION 5



A/S Diehead thread

STATION 6

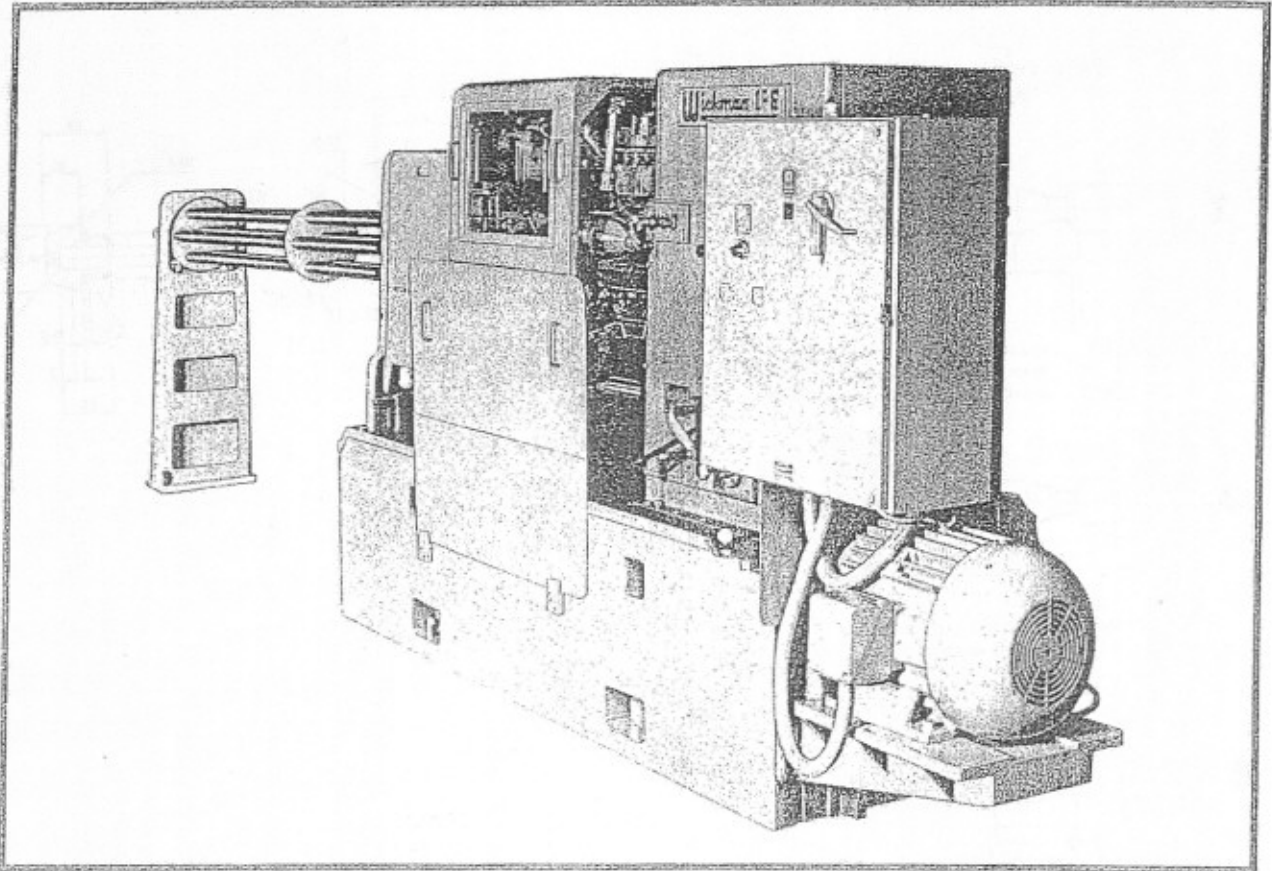


A/S Pick up and radius rear of bore  
 X/S Part off



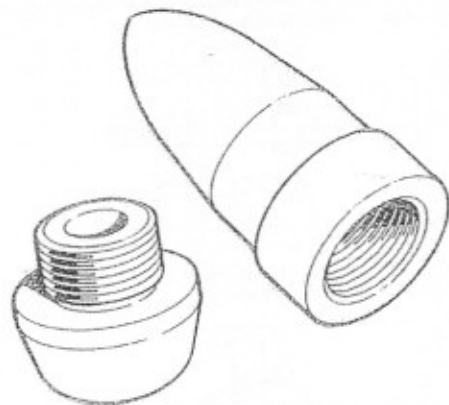


# WICKMAN Multi-Spindle 1"-6 Bar Automatic



## Plumb bob

The exhibition machine is equipped to produce both parts of a plumb bob in one tooling set-up using standard attachments and high speed steel cutting tools.

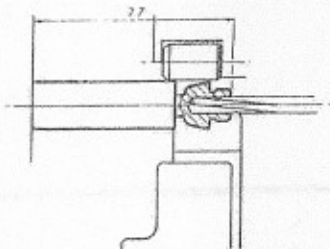


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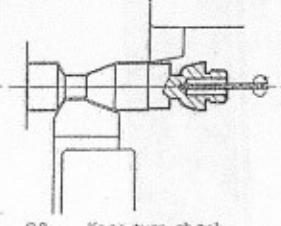


1



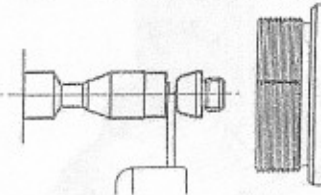
CB Drill to depth and roll steady  
X/S Finish form end cap

2



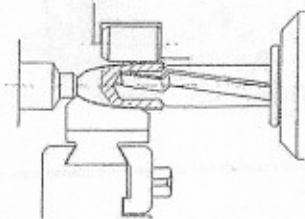
CB Knee turn shank  
High speed drill 2mm dia. hole  
X/S Breakdown form front end of body

3



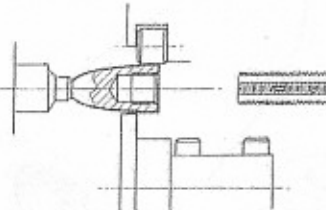
CB Roll M12 I.S.O. Thread  
X/S Part off end cap

4



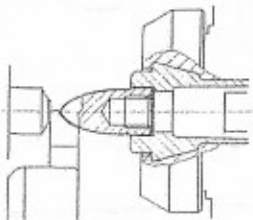
CB Combination drill to depth and roll steady  
X/S Finish form body shape

5



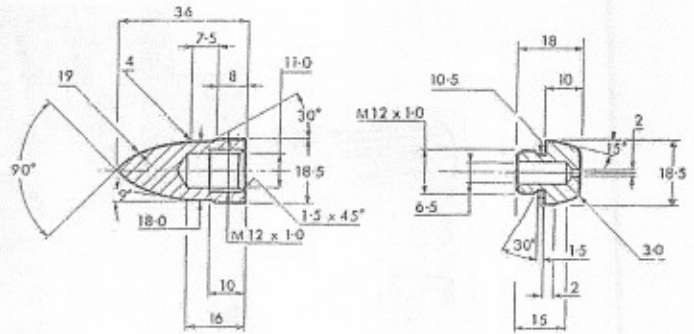
CB Tap M12 I.S.O. Thread and roll steady  
X/S Roll characters

6



CB Pick-up  
X/S Form end and part off

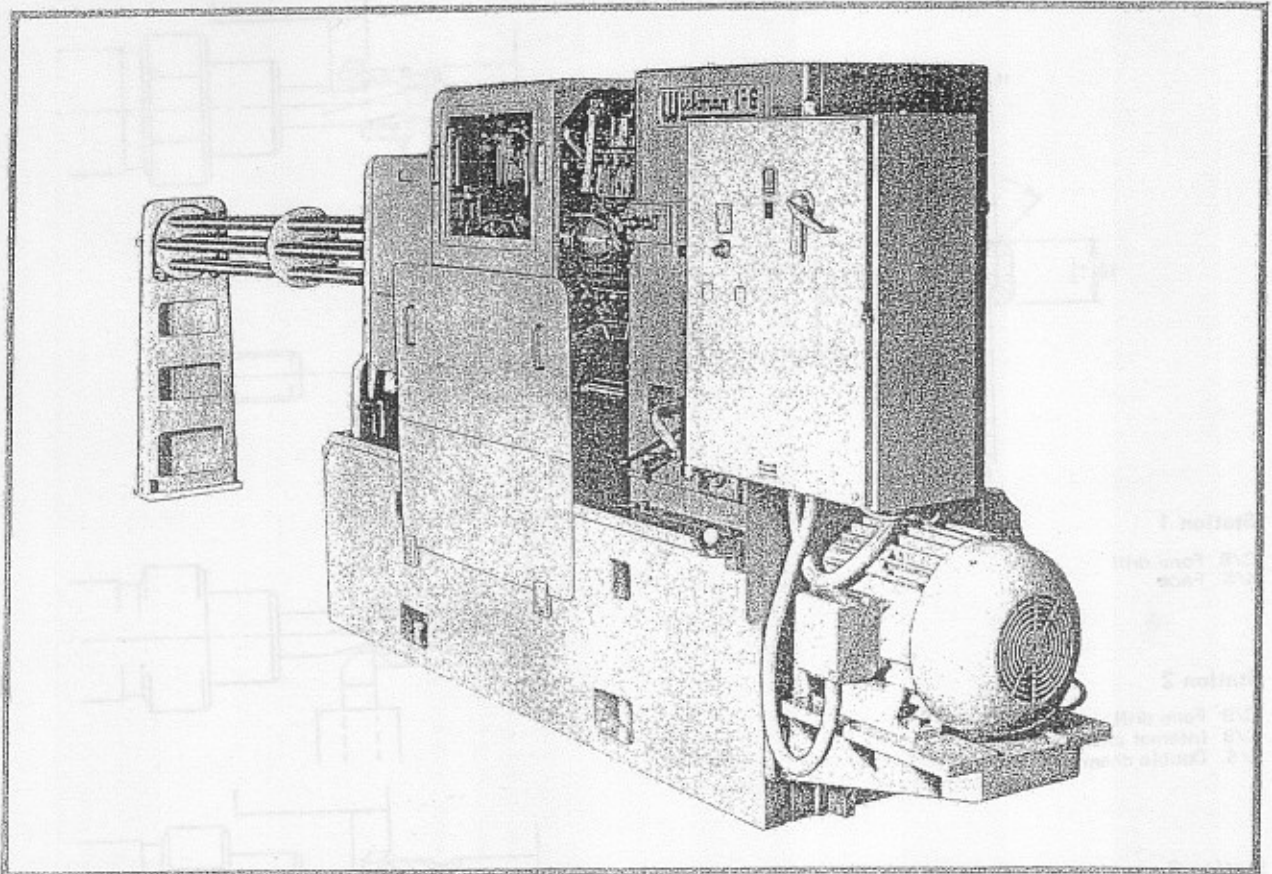
Cycle time: 11.2 seconds  
Material: Super Ledkut (EN1A)  
Spindle Speed: 1400 rev/min  
Cutting Speed: 83.5 m/min



CB - Centre block  
X/S - Cross slide



# WICKMAN Multi-Spindle Automatic 1"-6 Bar Machine

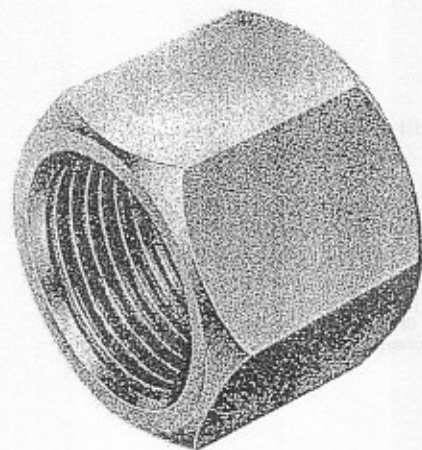


## Nut

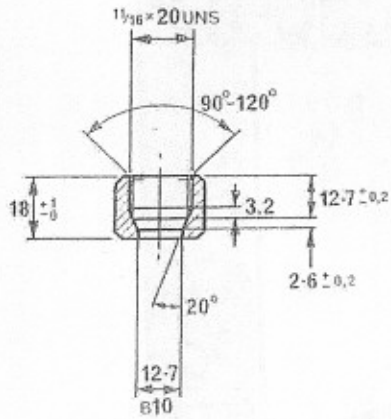
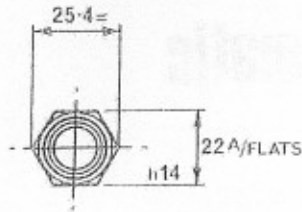
High Speed tooling is used to produce this 1/2" nut with 11/16 x 20 UNS thread in Free cutting Steel 1926-4.

In stations 1, 2 and 3 a sequence of Form Drilling, Facing, Chamfering Tapping and Part-off complete the machining of this component.

In stations 4, 5 and 6 all operations are duplicated giving a cycle time of 14.5 seconds for two components.



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**Station 1**

C/B Form drill  
X/S Face

**Station 2**

C/B Form drill  
C/B Internal chamfer  
X/S Double chamfer

**Station 3**

C/B Tap 11/16 in x 20 UNS  
X/S Part-off

**Station 4**

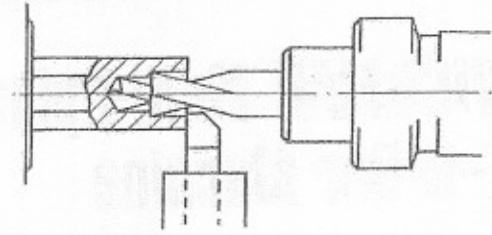
C/B Form drill  
X/S Face

**Station 5**

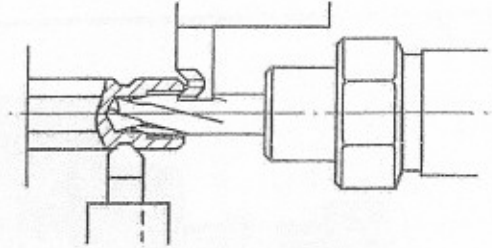
C/B Form drill  
C/B Internal chamfer  
X/S Double chamfer

**Station 6**

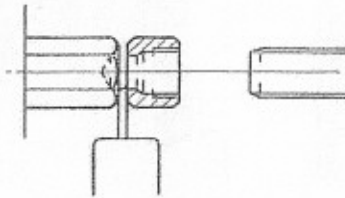
C/B Tap 11/16 in x 20 UNS  
X/S Part-off



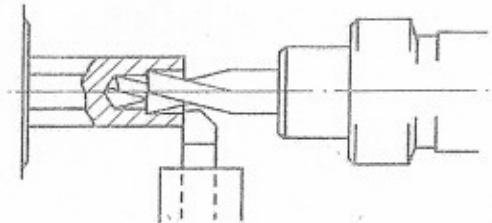
1



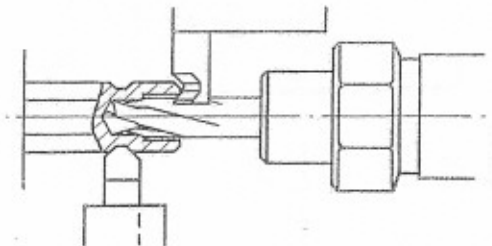
2



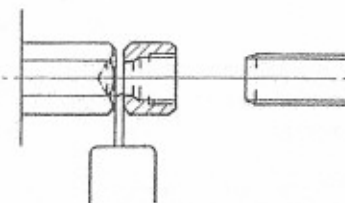
3



4



5



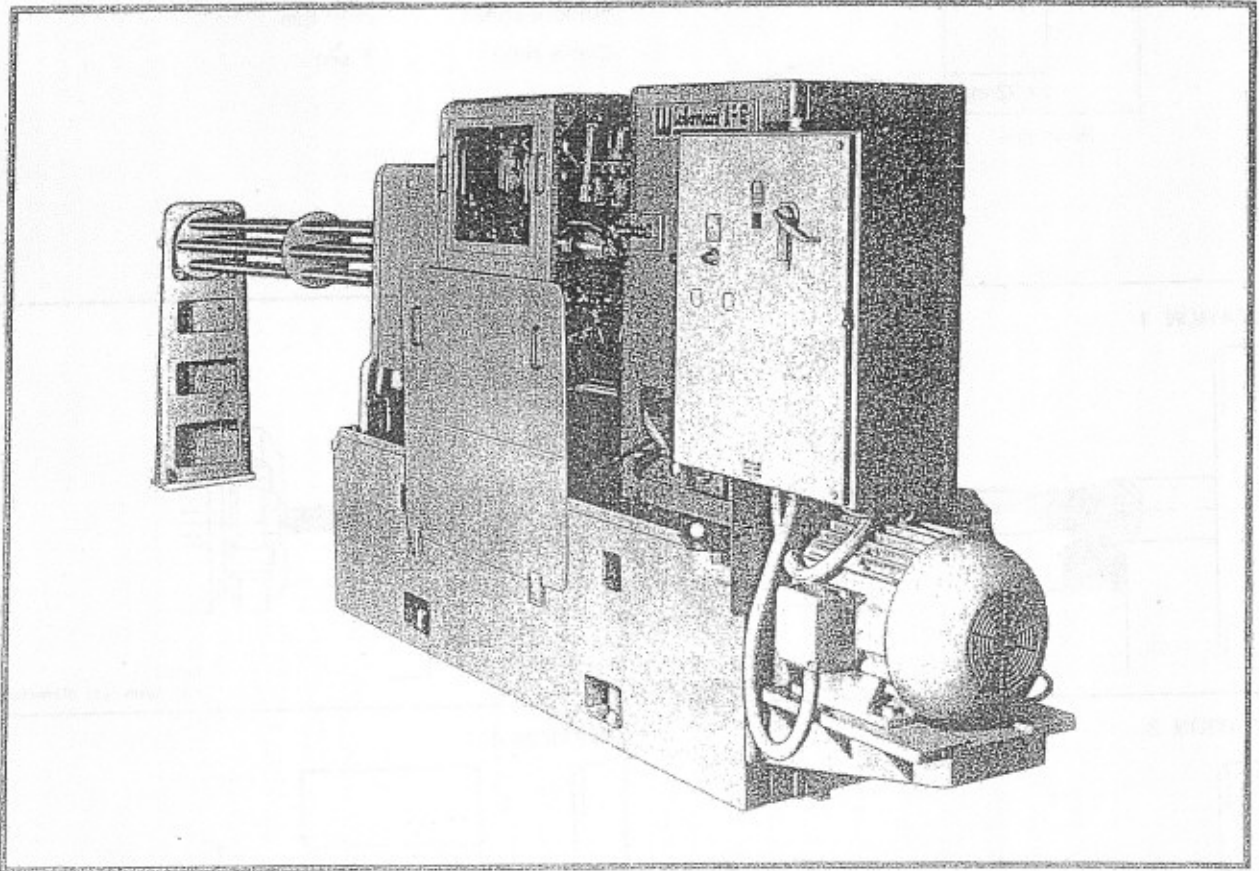
6

C/B - Centre block  
X/S - Cross slide



## APPLICATION DATA SHEET

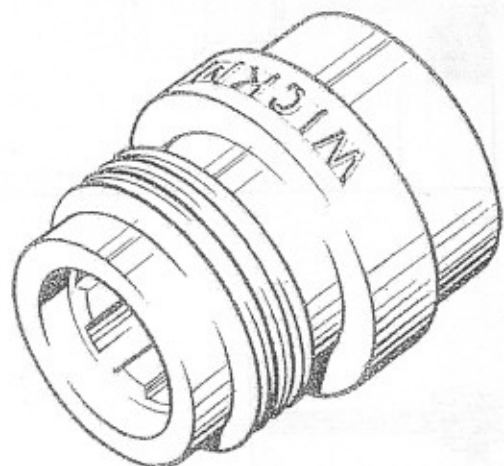
# WICKMAN Multi-Spindle Automatic 1"-6 Bar Machine



## Coupling

The operations in the manufacture of this small coupling are performed in only 3 seconds, using carbide and high speed steel tools for forming, drilling, threading and broaching. Lettering is rolled on to the outside diameter.

The back burring attachment completes the component after part off.

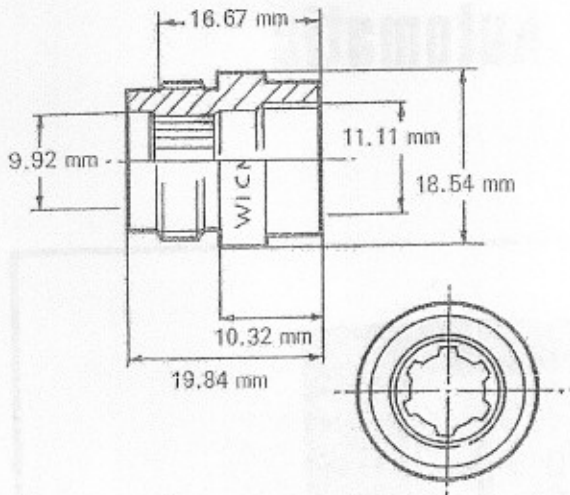


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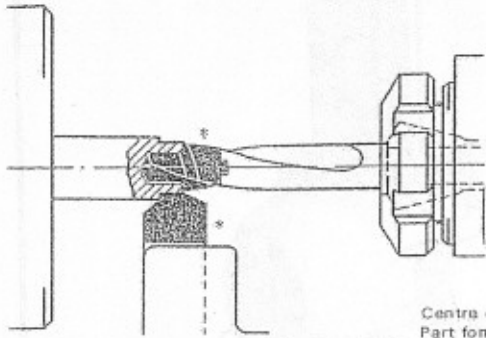


Layout to produce a coupling

|               |           |
|---------------|-----------|
| Material      | Ledloy    |
| Cutting speed | 149.9 mpm |
| Spindle speed | 2510 rpm  |
| Cycle time    | 3 sec     |

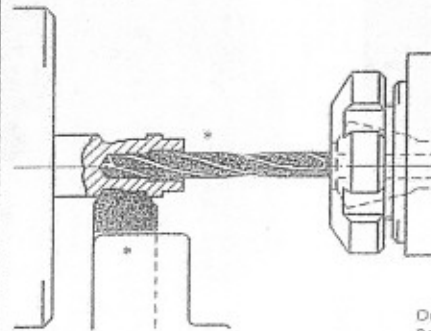
\* Carbide tools.

STATION 1



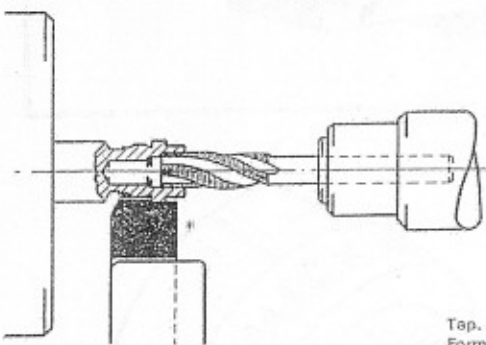
Centre drill and chamfer.  
Part form first diameter.

STATION 2



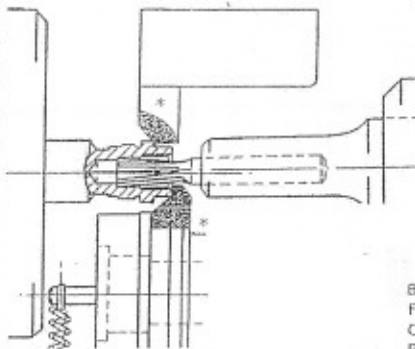
Drill.  
Part form rear diameter.

STATION 3



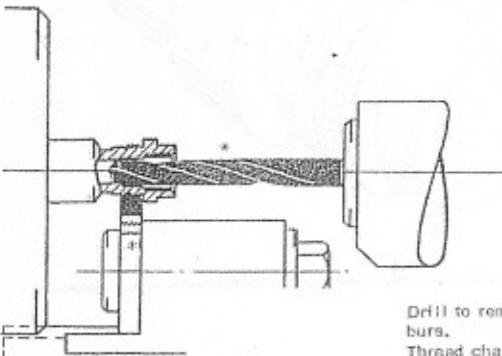
Tap.  
Form thread diameter.

STATION 4



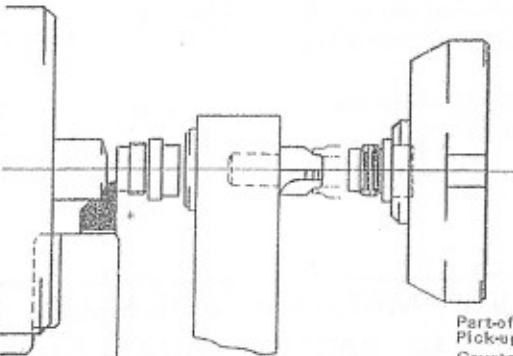
Broach.  
Face and chamfer front.  
Chamfer large diameter.  
Roll-on lettering

STATION 5



Drill to remove broaching  
bars.  
Thread chase.

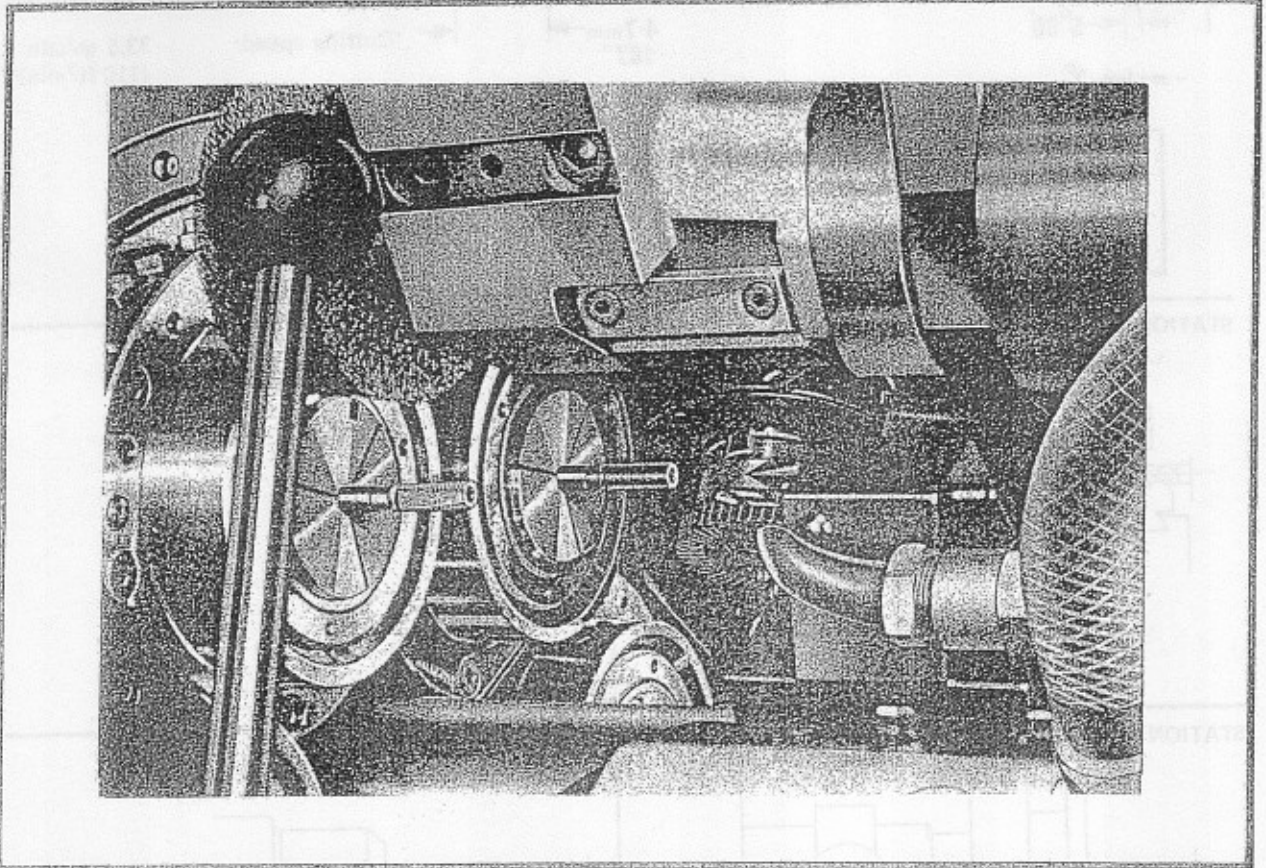
STATION 6



Part-off.  
Pick-up  
Counter bore rear.



# WICKMAN Multi-Spindle Automatic 1"-6S Bar Machine



## Adjusting Screw

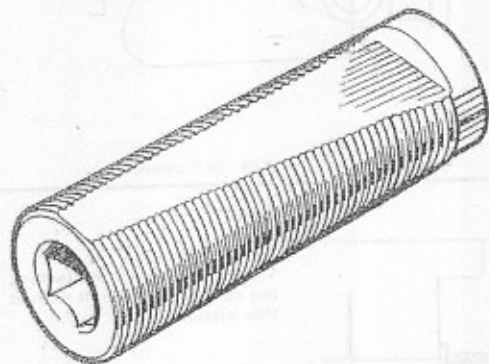
This small accurately machined component is manufactured in a cycle time of 21 seconds from pre-ground free cutting carbon manganese steel bar.

The bar size is the blank diameter for thread rolling which is performed by a F12 Fette head.

A hexagon is broached at station 2 utilising a synchronous broaching attachment.

An interesting feature is the milling attachment which machines the large flat at a compound angle.

Use of a pick-up unit provides for a pipless part-off.

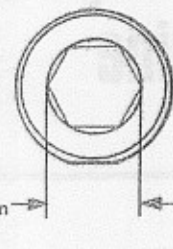
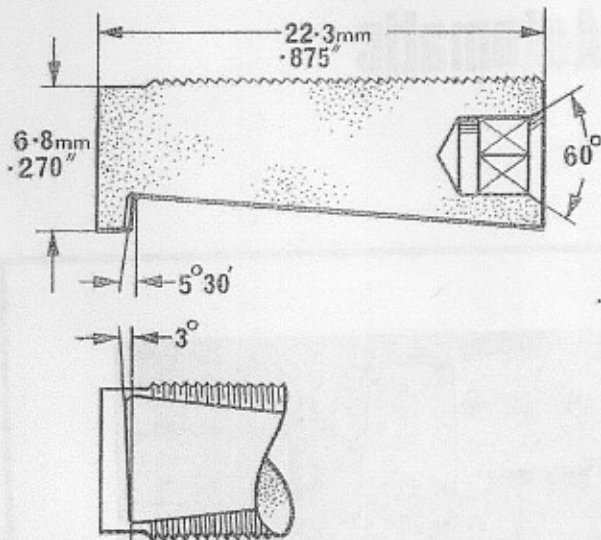


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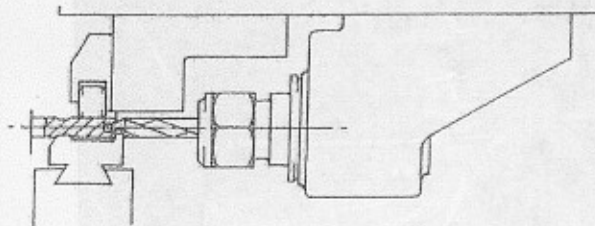


Layout to produce Adjusting Screw

Cycle time: 21 sec  
 Material: EN. 15AM (Leaded)  
 Spindle speed: 1422 rev/min  
 Cutting speed: 33.5 m/min (110 ft/min)

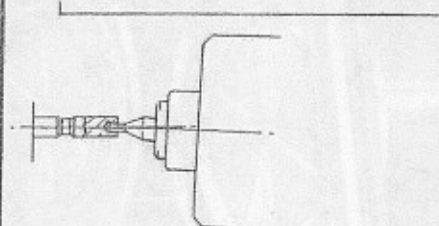
C/B = Centre Block  
 X/S = Cross Slide  
 I/S = Independent Slide  
 A/S = Auxiliary Slide

STATION 1



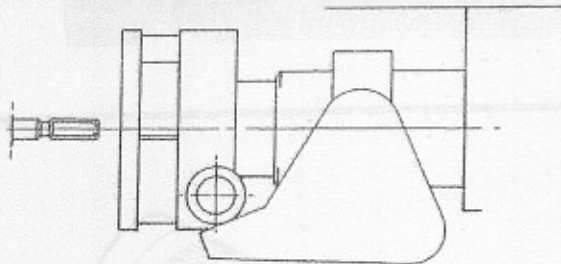
C/B Drill and produce 60° centre with combination drill, roll steady.  
 X/S Face and chamfer front, form rear.

STATION 2



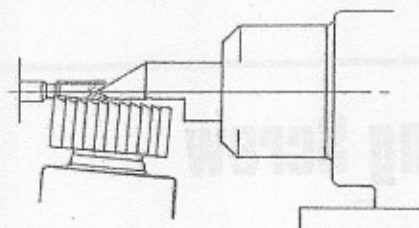
C/B Broach hexagon.

STATION 3



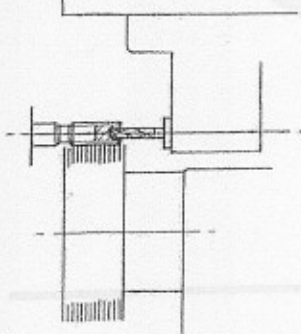
A/S Roll thread.

STATION 4



Spindle stationary.  
 I/S Steady from 60° centre.  
 X/S Mill angular flat.

STATION 5

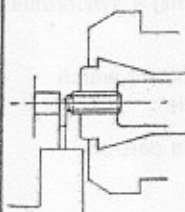


Note:

The important task of cleaning the component is dealt with at this station.

C/B Drill to remove broaching swarf.  
 X/S Wire-brush thread.

STATION 6

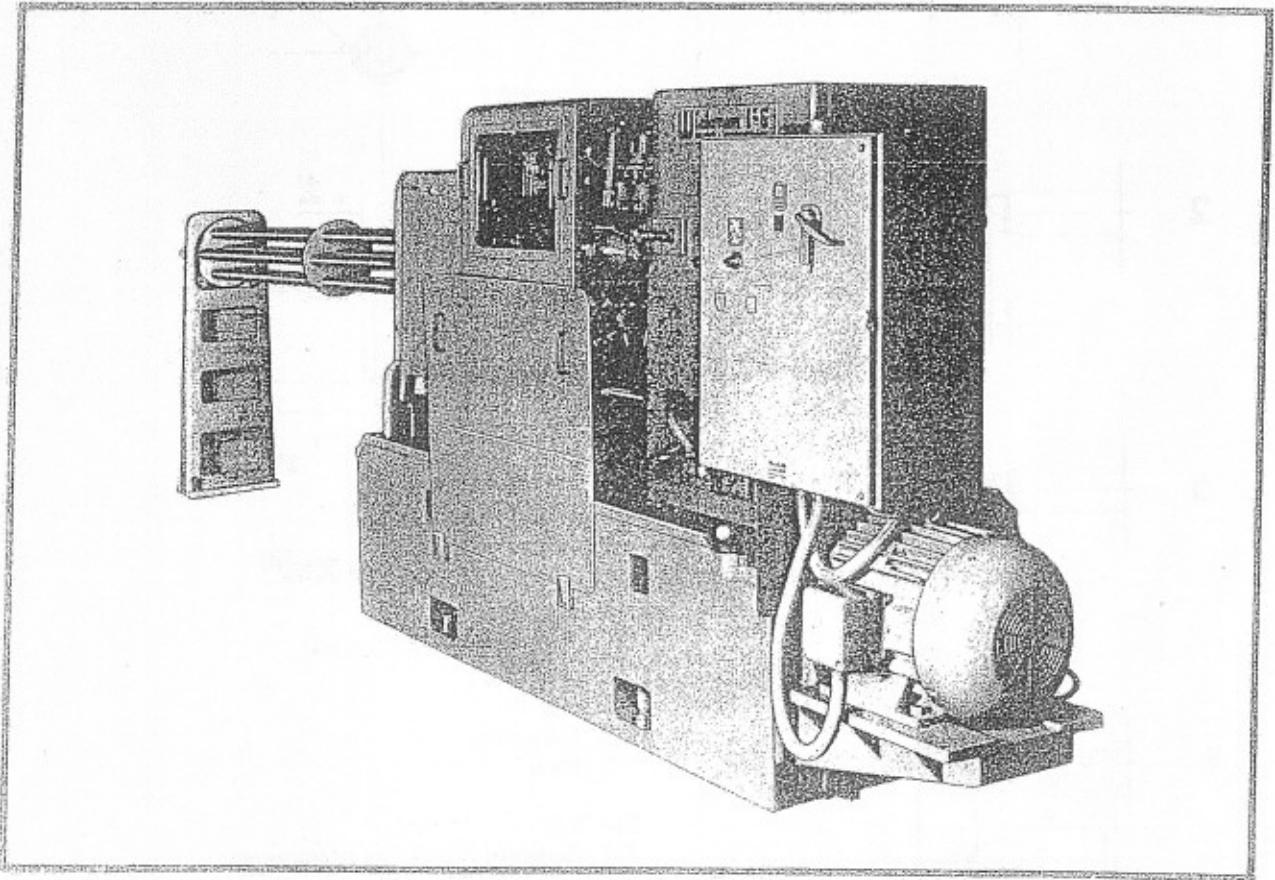


A/S Pick up.  
 X/S Part off.



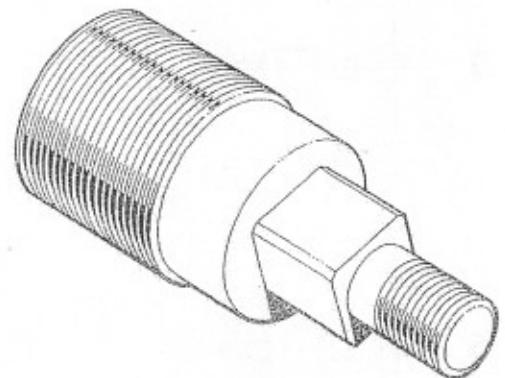


# Wickman Multi Spindle Automatic 1"-6 Bar Machine



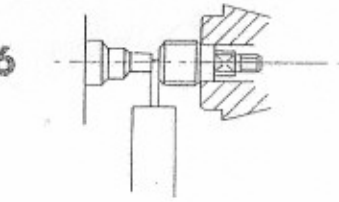
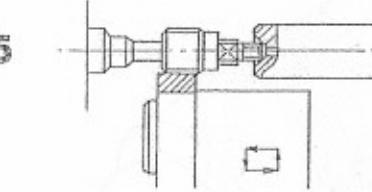
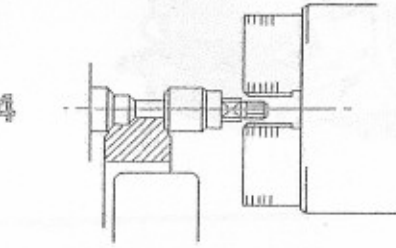
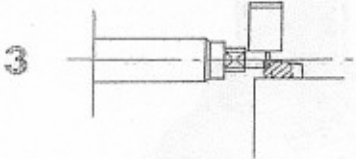
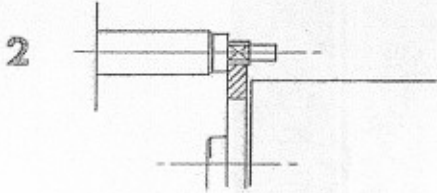
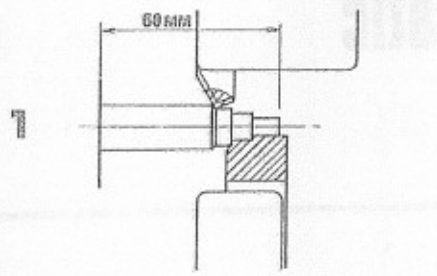
## Spindle

This machine is producing a half hard bronze component in 4.8 seconds, carbide tooling being used throughout apart from the high speed steel chasers of the full threading attachment in station 4. The attachments used during manufacture of the component include a flat generating attachment in station 2, and full threading attachment in station 4, a chasing attachment in station 5, and a pick-up attachment in station 6.

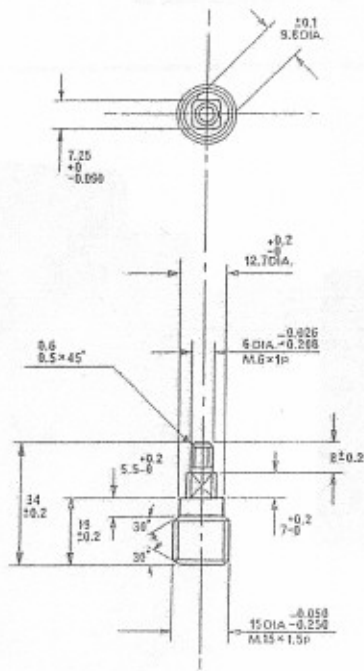


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BANNER LANE COVENTRY CV4 9GE





Cycle Time: 4.8 seconds  
 Material: Half hard bronze  
 Spindle Speed: 1600 rev/min.

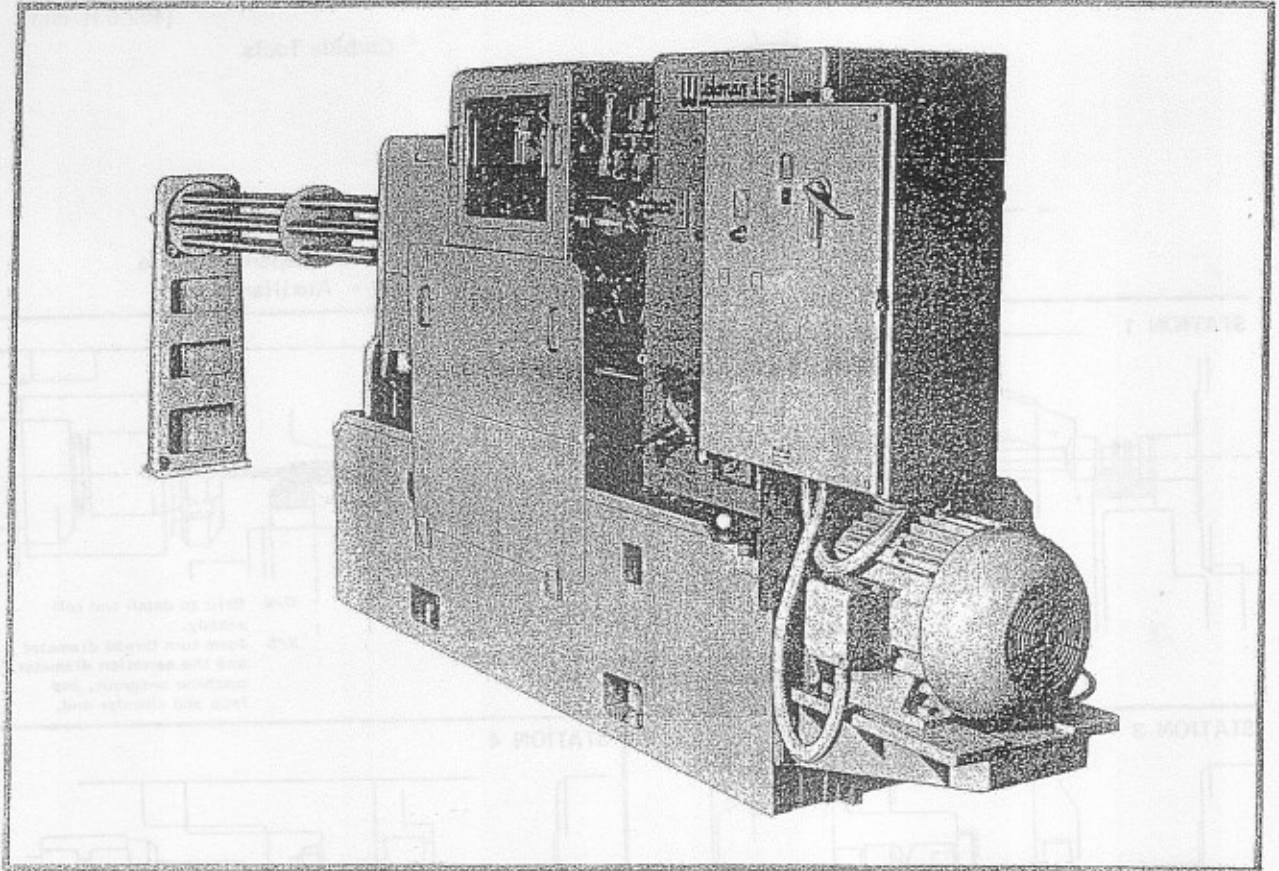


ALL DIMENSIONS IN  $\frac{1}{32}$ "

- STATION 1  
C/B Knee turn  
X/S Form
  - STATION 2  
X/S Generate four flats (attachment)
  - STATION 3  
C/B Tangential turn
  - STATION 4  
I/S Thread (attachment)  
X/S Form
  - STATION 5  
I/S Revolving centre support  
X/S Thread (attachment)
  - STATION 6  
C/B Pick-up  
PO/XS Part-off
- C/B Centre block  
 X/S Cross slide  
 I/S Independent slide  
 PO/XS Part off cross slide



# WICKMAN Multi-Spindle Automatic 1"-6 Bar Machine



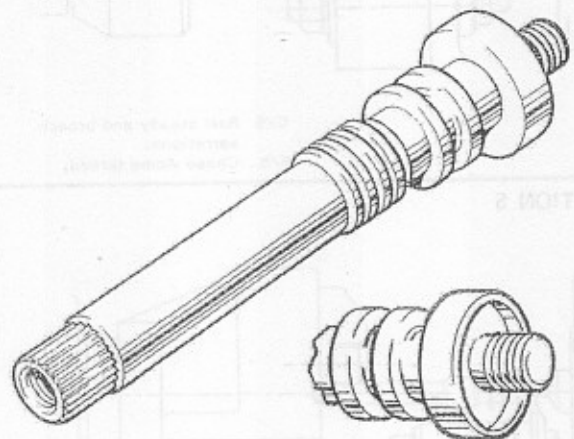
## Tap Spindle

The use of a special hollow mill type Genesee cutter permits bulk stock removal and produces a high class turned finish in the manufacture of this component.

The set up illustrates the use of two chasing attachments, a full-threading attachment, a broaching attachment, a pick up and back trepanning attachment.

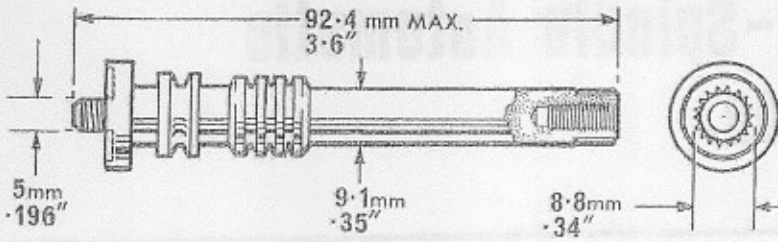
A drive unit for 3rd position chasing which permits broaching in the same station has been specially designed.

The longitudinal stroke of the special pick up and back trepanning attachment is complemented pneumatically.



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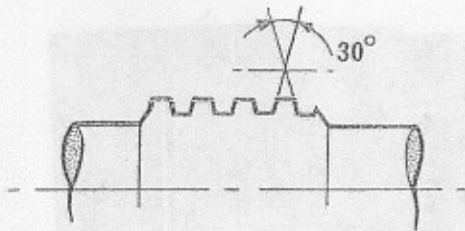
BANNER LANE COVENTRY CV4 9GE



Layout to produce a Tap Spindle

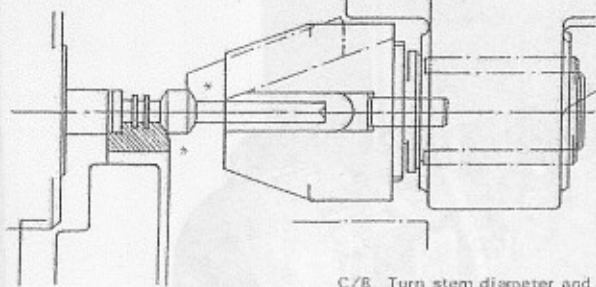
Cycle time: 8.5 sec  
 Material: Brass  
 Spindle speed: 2510 rev/min  
 Cutting speed: 141 m/min (462.6 ft/min)

\* Carbide Tools



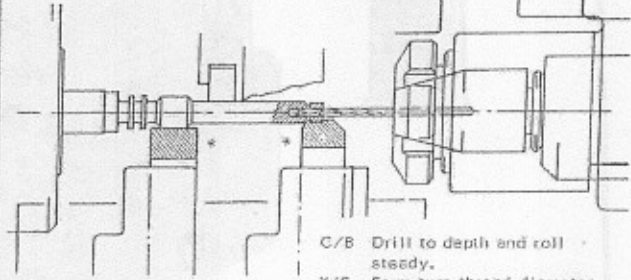
C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide  
 A/S - Auxiliary Slide

STATION 1



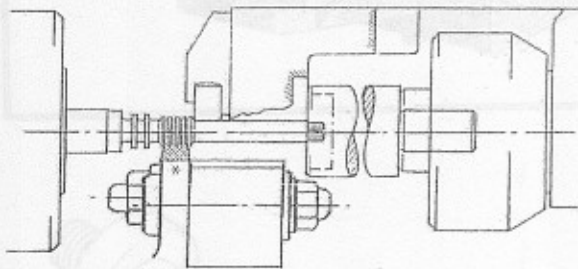
C/B Turn stem diameter and adjacent shoulder, and face and centre the end.  
 X/S Finish form rear.

STATION 2



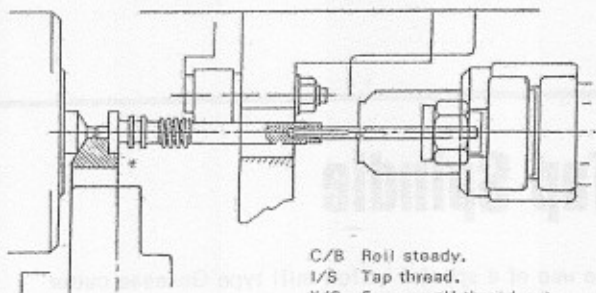
C/B Drill to depth and roll steady.  
 X/S Form turn thread diameter and the serration diameter, machine undercut, and face and chamfer end.

STATION 3



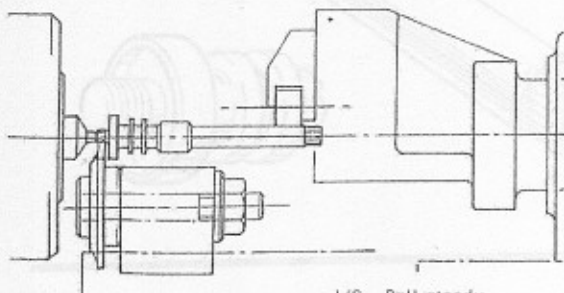
C/B Roll steady and broach serrations.  
 X/S Chase Acme thread.

STATION 4



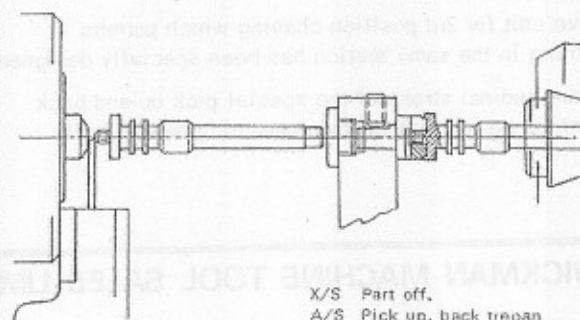
C/B Roll steady.  
 I/S Tap thread.  
 X/S Form small thread outside diameter, breakdown for part off and face large shoulder.

STATION 5



I/S Roll steady.  
 Chase small rear end thread.

STATION 6

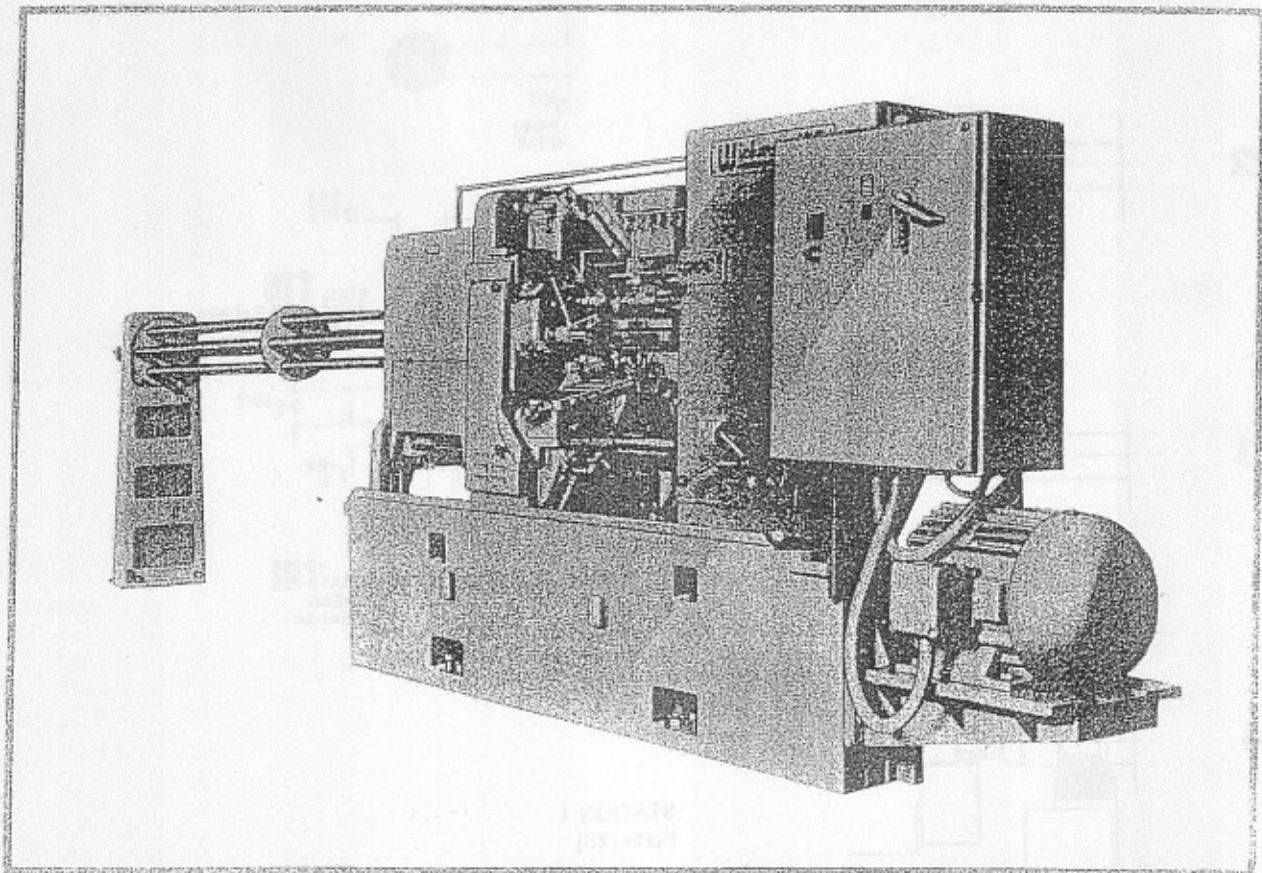


X/S Part off.  
 A/S Pick up, back trepan and eject.





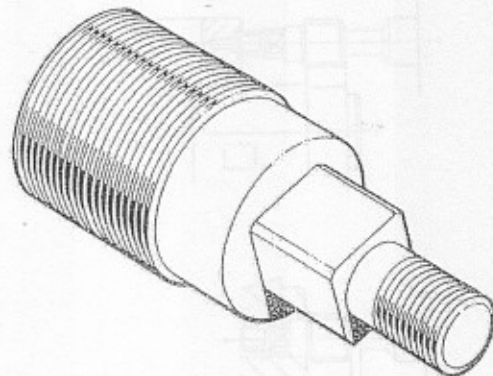
# Wickman Multi Spindle Automatic 1.3/8"-6 Bar Machine



## Spindle

This machine is producing a half hard bronze component in 4.8 seconds, carbide tooling being used throughout apart from the high speed steel chasers of the full threading attachment in station 4.

The attachments used during manufacture of the component include a flat generating attachment in station 2, and full threading attachment in station 4, a chasing attachment in station 5, and a pick-up attachment in station 6.

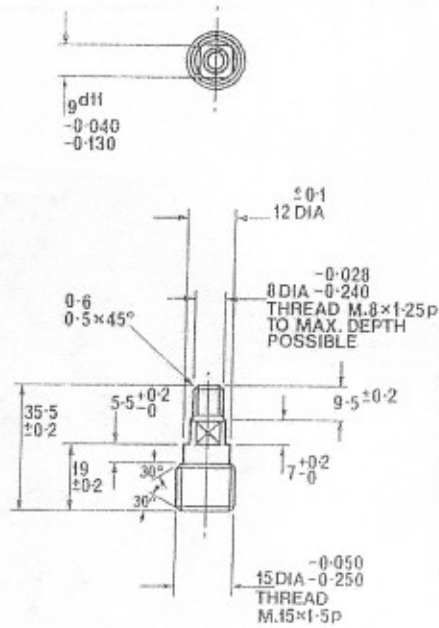
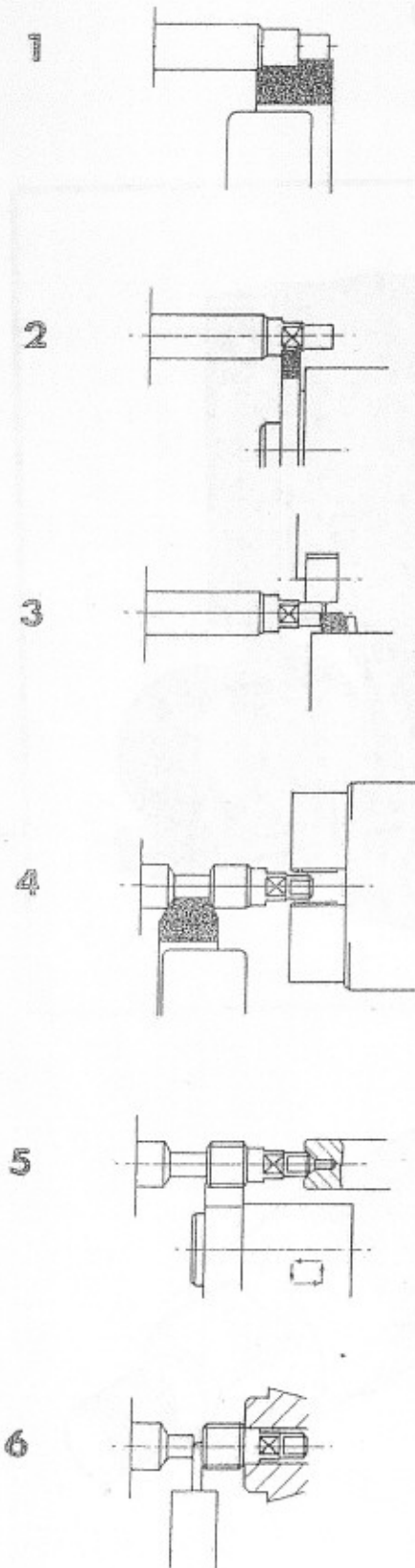


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Cycle Time: 4.8 seconds  
Material: Half hard bronze



STATION 1  
Form (XS)

STATION 2  
Flat generation (attachment) (XS)

STATION 3  
Roller-ending (T)

STATION 4  
Thread chasing (attachment) (T)  
Breakdown (XS)

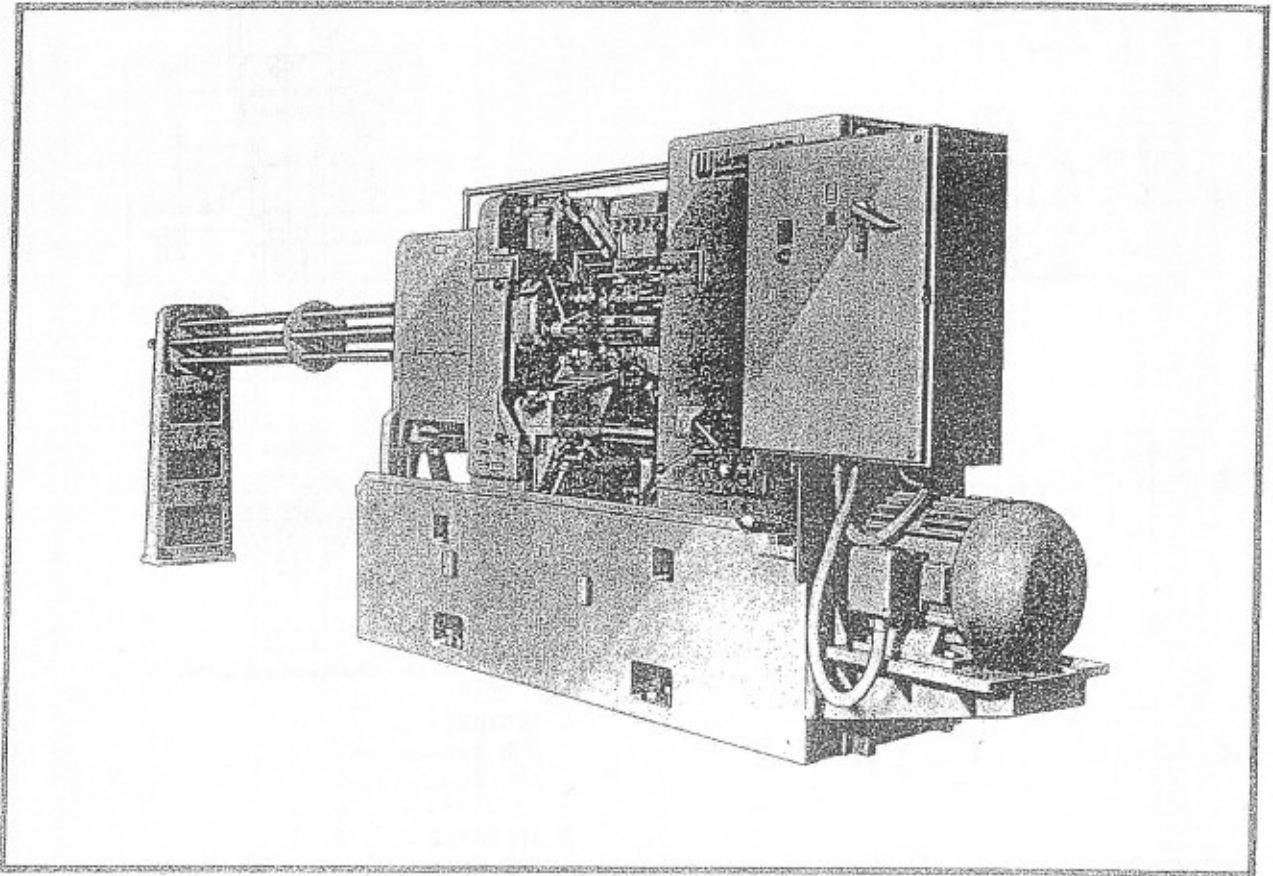
STATION 5  
Thread chasing (attachment) (XS)

STATION 6  
Pick-up and Part-off (attachment)

XS - Cross Slide  
T - Turret

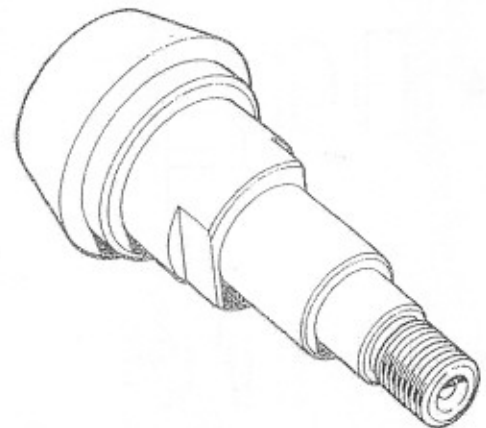


# Wickman Multi Spindle Automatic 1 $\frac{3}{8}$ "-6 Bar Machine

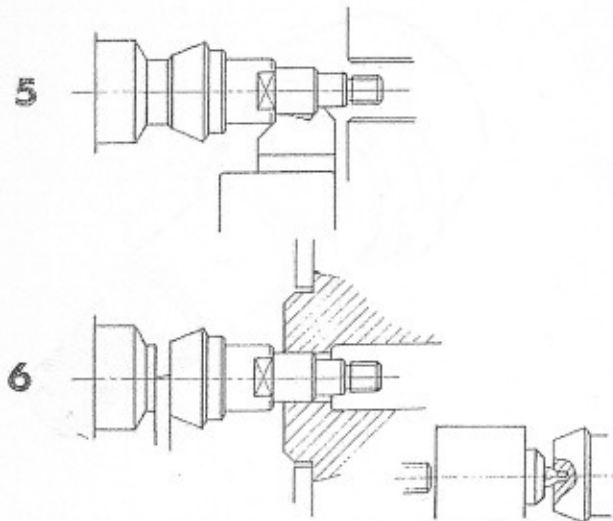
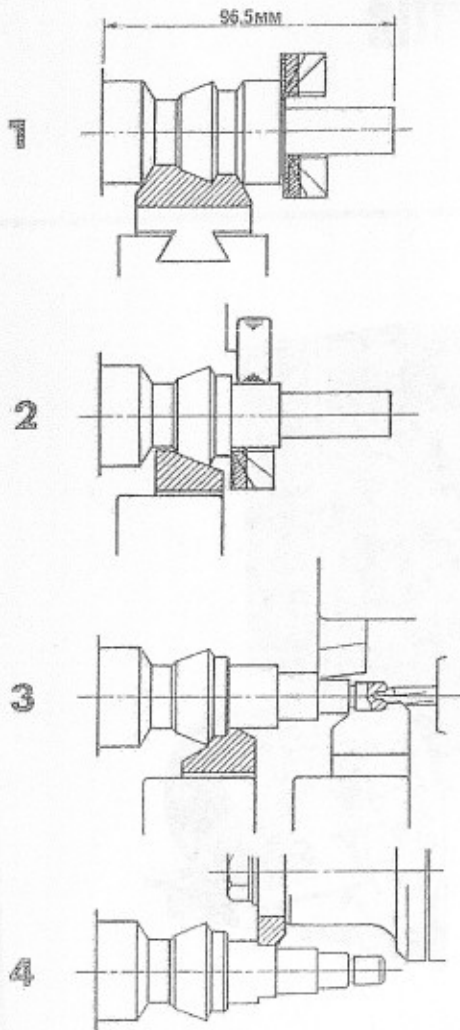


## Pinion Gear Blank

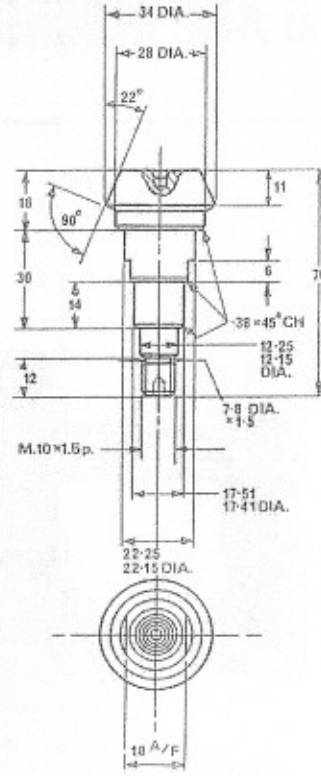
This component is of Super Ledkut and is produced in 28 seconds. Attachments used during manufacture include an independent reaming attachment in station 3, a flat generating attachment in station 4 and a pick-up and back centre drill attachment in station 6.



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Cycle Time: 28 seconds  
 Material: Super Ledkut  
 Spindle Speed: 688 rev/min.

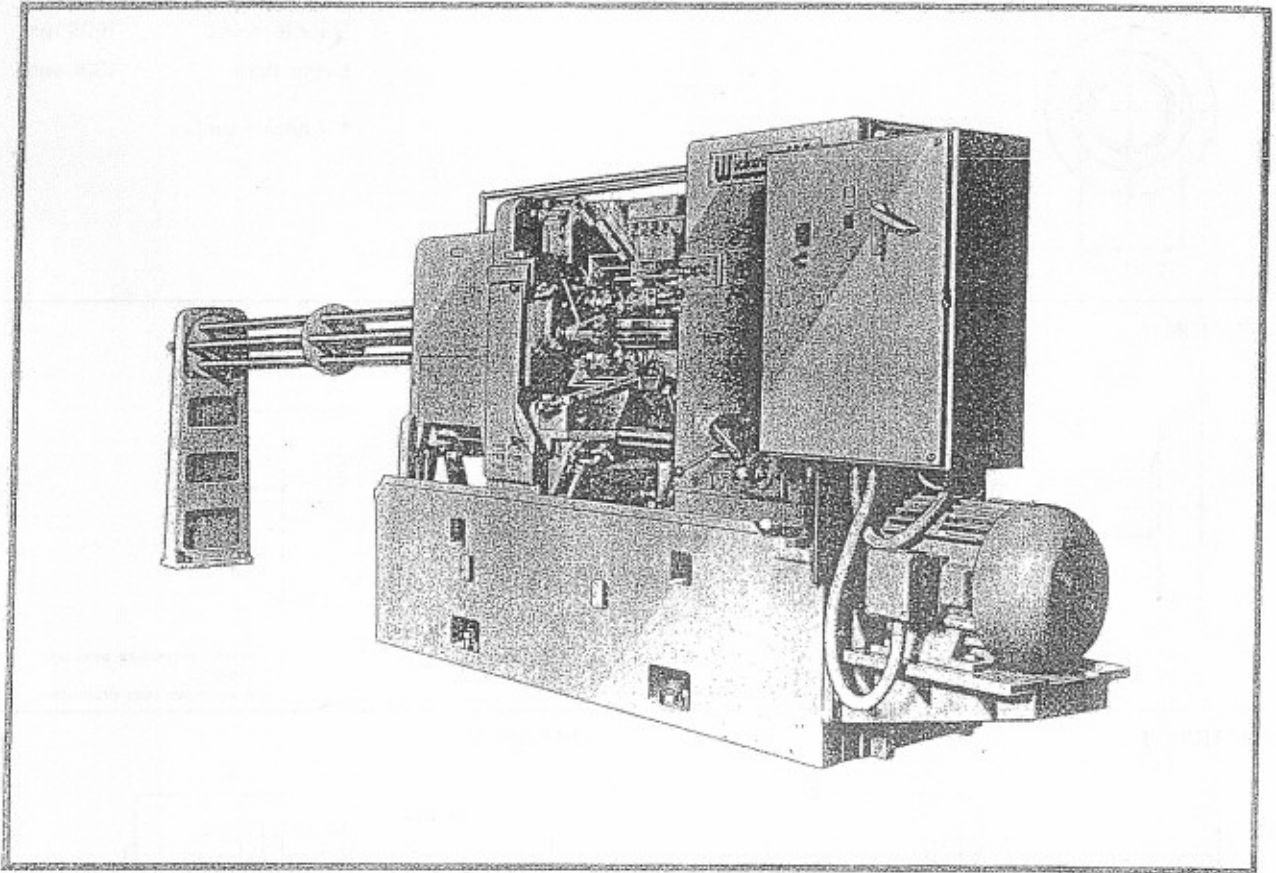


ALL DIMENSIONS ARE IN M/M

- STATION 1  
 C/B Balance turn  
 X/S Dovetail form
- STATION 2  
 C/B Roller turn  
 X/S Form
- STATION 3  
 C/B Accelerated centre drill (attachment) Knee turn  
 X/S Form
- STATION 4  
 X/S Flat generation (attachment)
- STATION 5  
 C/B Diehead chasing  
 X/S Form
- STATION 6  
 PO/XS Part-off  
 C/B Pick-up and back centre drill (attachment)
- C/B Centre block  
 X/S Cross slide  
 PO/XS Part-off cross slide



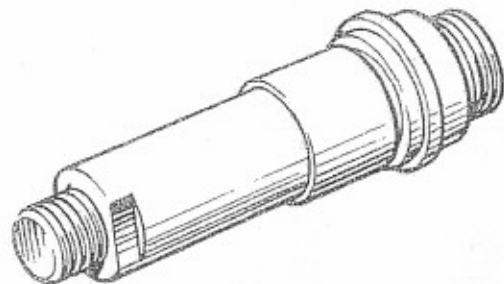
# WICKMAN Multi-Spindle Automatic 1 $\frac{3}{4}$ "-6 Bar Machine



## Shaft

A synchronous milling attachment and thread rolling attachments are used in the production of this component; cycle time is 13.8 seconds.

Normal forming and turning operations are carried out-externally on the component.



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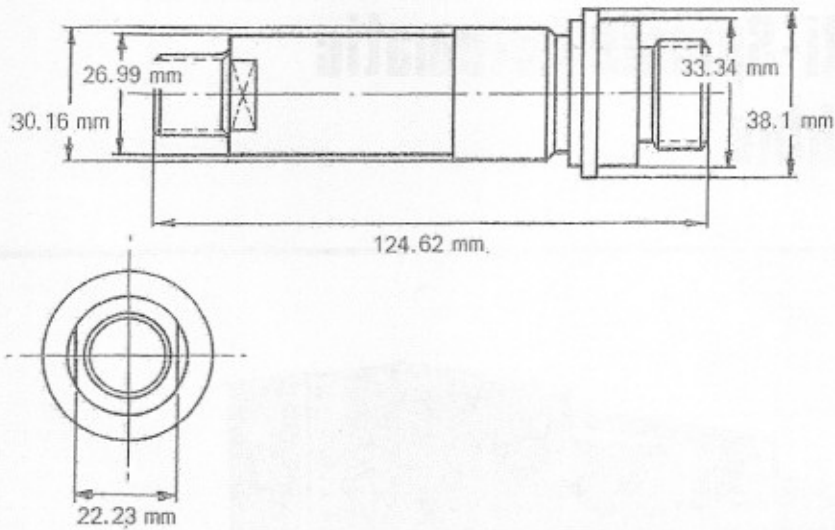
WICKMAN MACHINE TOOL SALES LIMITED  
BANNER LANE COVENTRY CV4 9GE

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ATAC NO. 1801

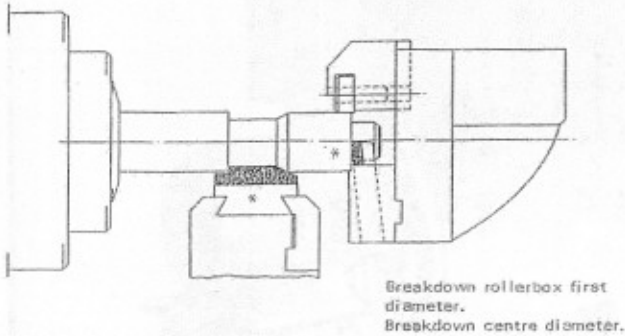


**Layout to produce a shaft**

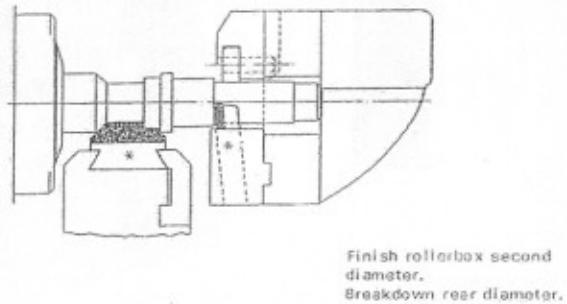
|               |           |
|---------------|-----------|
| Material      | Ledloy    |
| Cutting speed | 185 mpm   |
| Spindle speed | 1525 rpm  |
| Cycle time    | 13.8 sec. |

\* Carbide tools.

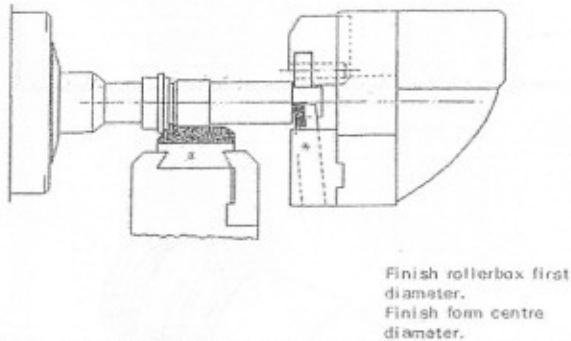
**STATION 1**



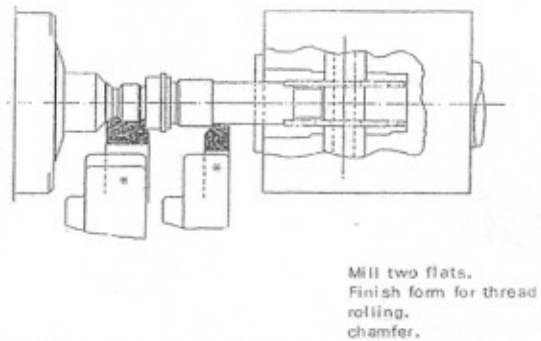
**STATION 2**



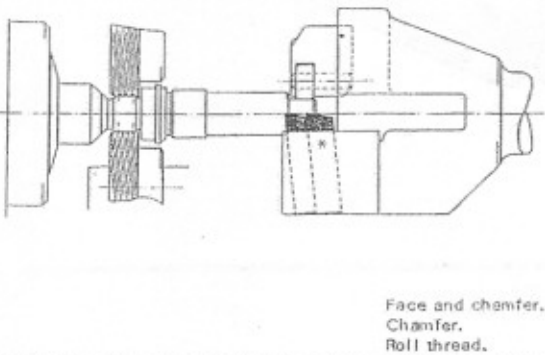
**STATION 3**



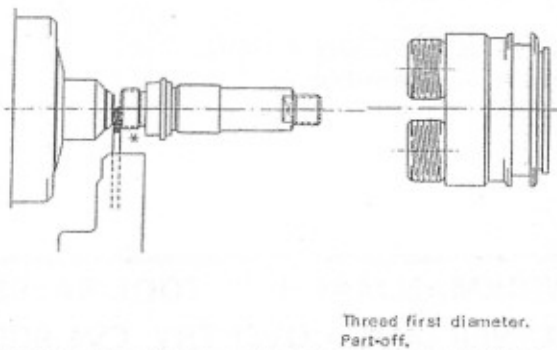
**STATION 4**



**STATION 5**



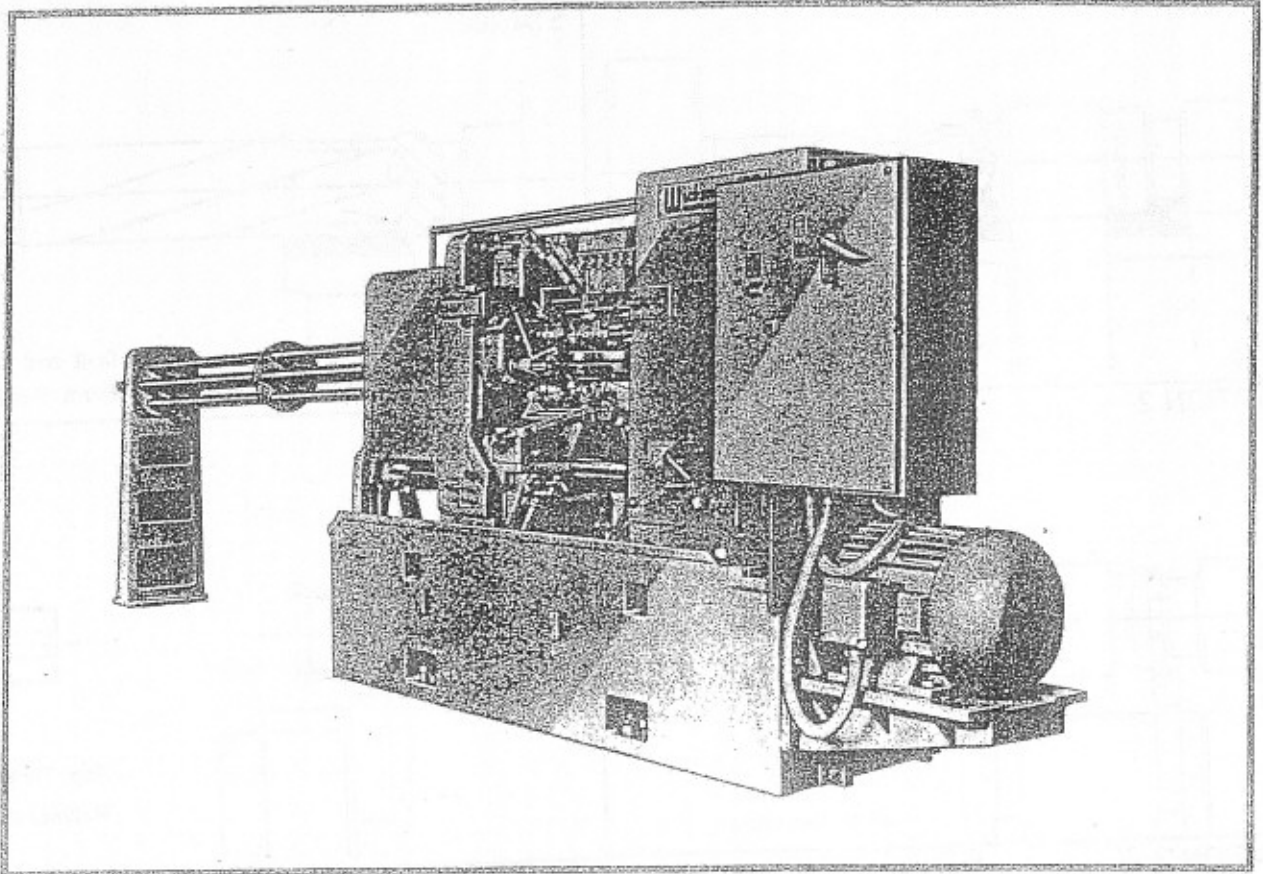
**STATION 6**





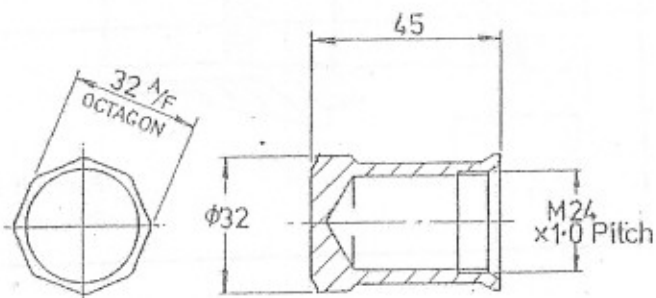
## APPLICATION DATA SHEET

# WICKMAN Multi-Spindle Automatic 1 $\frac{3}{4}$ "-6 Bar Machine

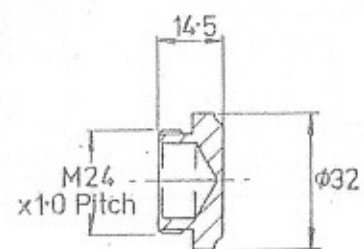


DICE SHAKER AND HOLDER

Cycle Time :- 11seconds  
 Material:- Aluminium. C800  
 Spindle Speed:- 2000 rpm.  
 Cutting Speed:- 220mpm



Body.



Cap.

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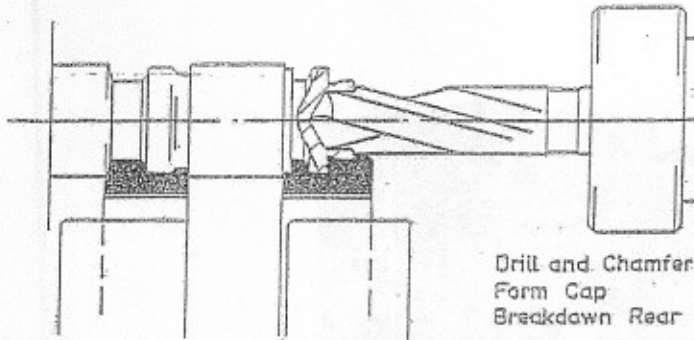
**Wickman Automatic Lathes Limited**

 BANNER LANE, COVENTRY CV4 9GE, ENGLAND
 

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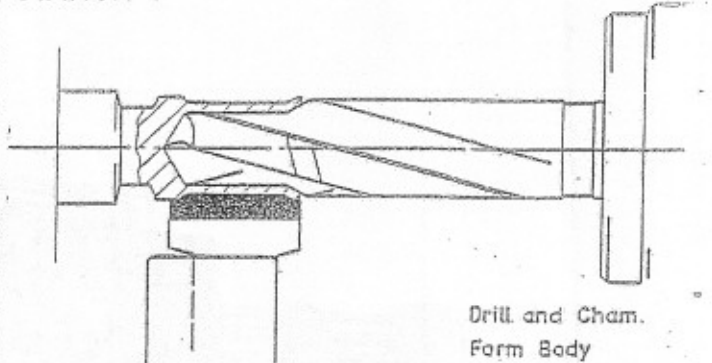


STATION 1



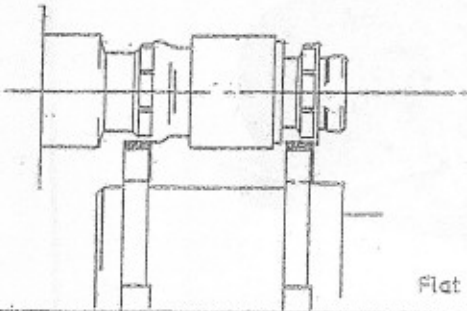
Drill and Chamfer  
Form Cap  
Breakdown Rear

STATION 4



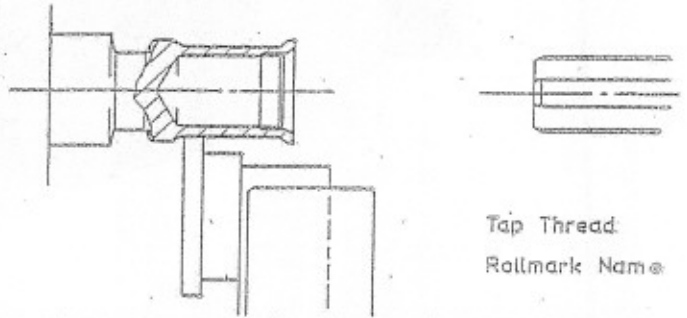
Drill and Cham.  
Form Body

STATION 2



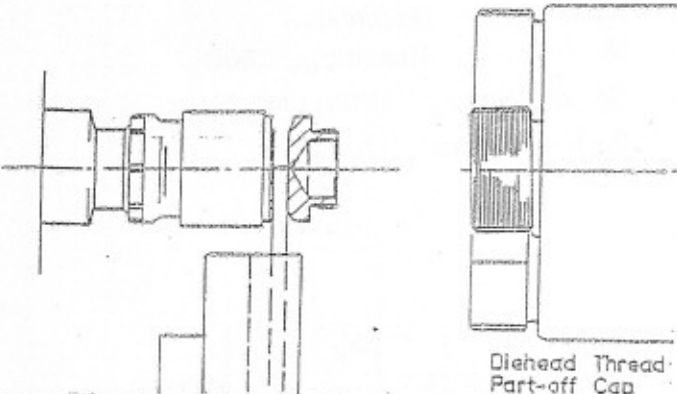
Flat Generate

STATION 5



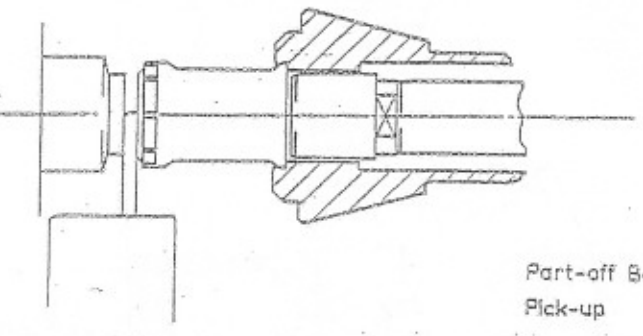
Tap Thread  
Rollmark Name

STATION 3



Diehead Thread  
Part-off Cap

STATION 6

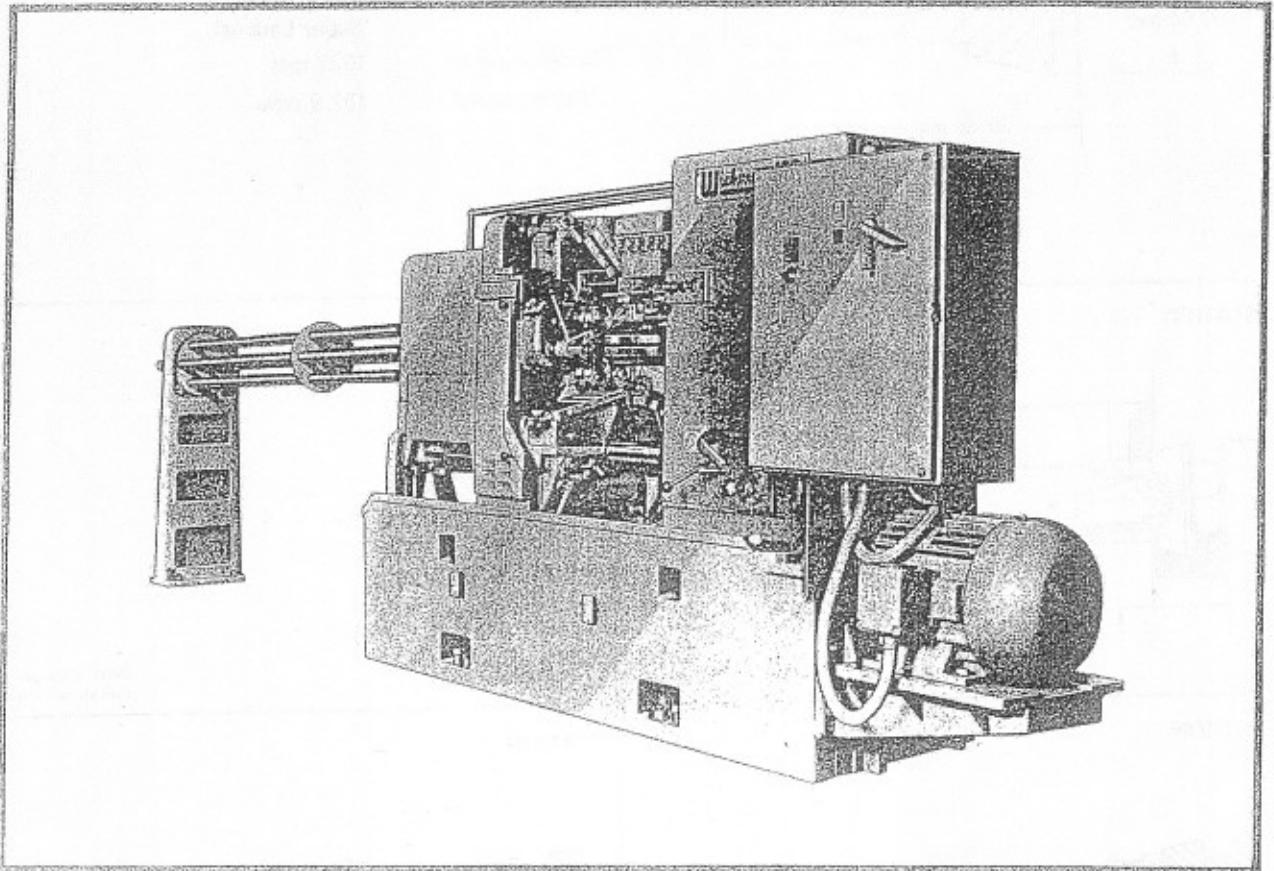


Part-off Body  
Pick-up



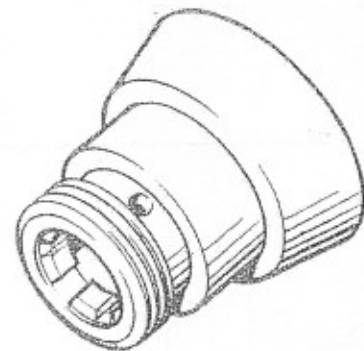
## APPLICATION DATA SHEET

# WICKMAN Multi-Spindle Automatic 1 $\frac{3}{4}$ "-6 Bar Machine



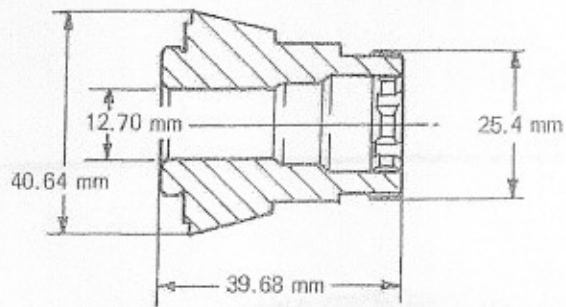
## Splined Hub

Internal machining operations are performed in the manufacture of this component, plus the external forming, cross drilling, and threading. The back burring attachment completes the component after part off. Total cycle time is 11.4 seconds.



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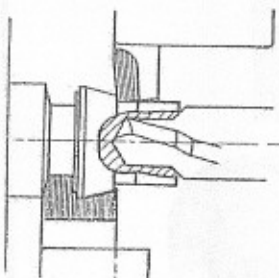




Layout to produce a Splined Hub

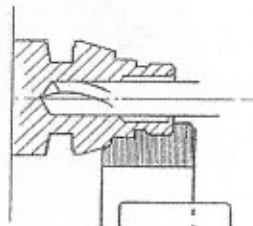
|               |                                |
|---------------|--------------------------------|
| Cycle time    | 11.4 sec                       |
| Material      | Bright drawn<br>'Super Ledkut' |
| Spindle speed | 1029 rpm                       |
| Cutting speed | 132.9 mpm                      |

STATION 1



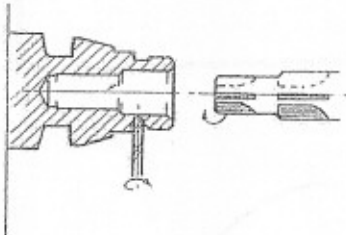
Drill & Chamfer  
Knee turn  
Breakdown rear

STATION 2



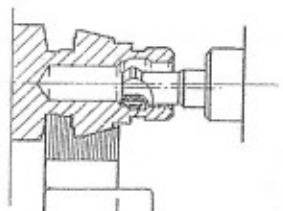
Drill through  
Finish form front

STATION 3



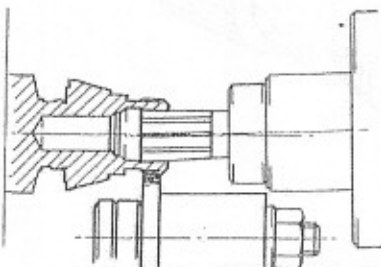
Finish rear bore  
Cross drill

STATION 4



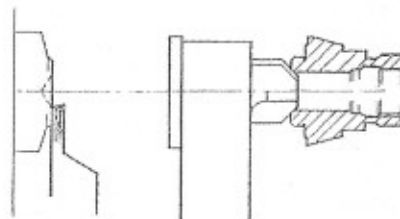
Recess  
Finish form  
cone & rear

STATION 5



Drift splines  
Chase threads

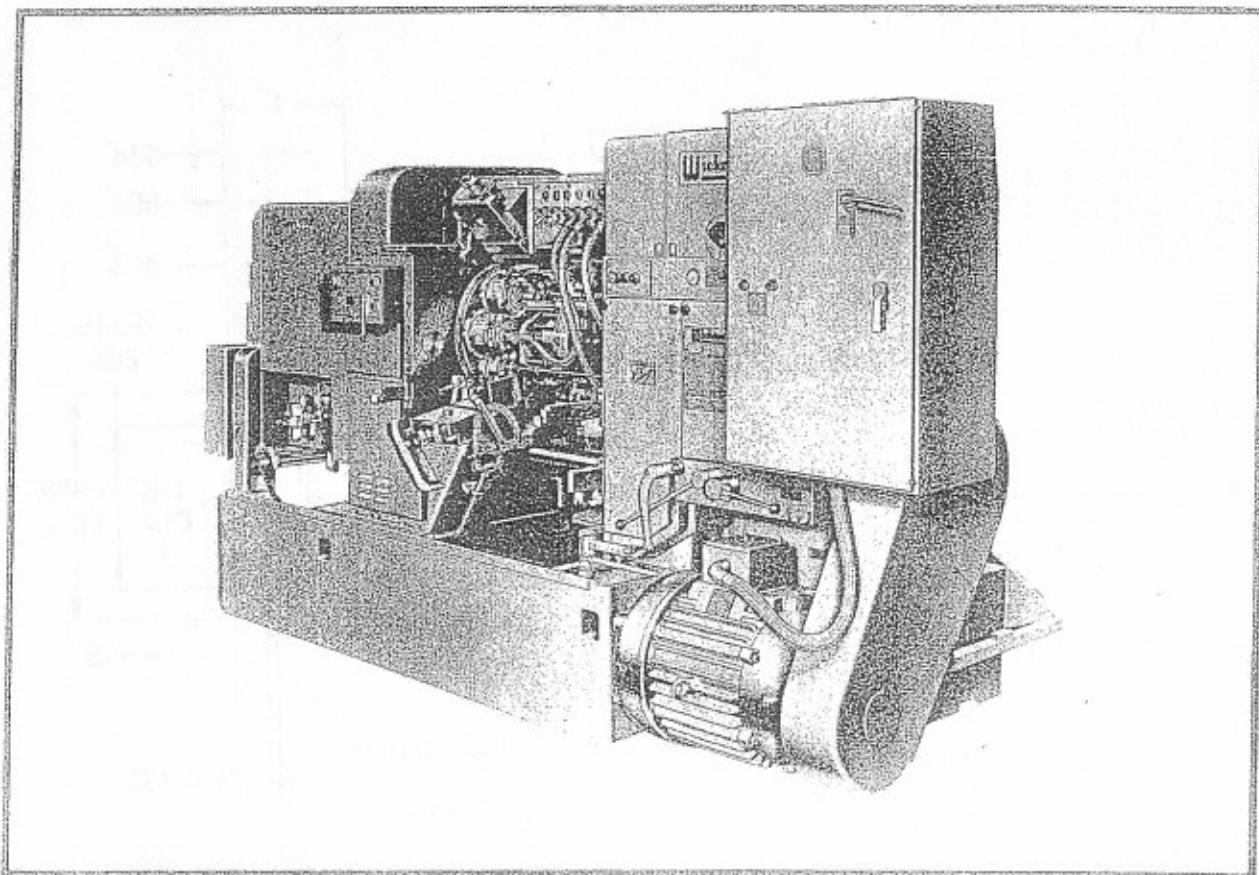
STATION 6



Part off  
Pick up & Chamfer rear



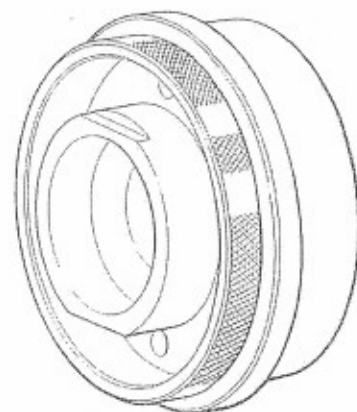
# WICKMAN Multi-Spindle Automatic 6<sup>5</sup>/<sub>8</sub>"-6 Chucking Machine



## Hub

The 6<sup>5</sup>/<sub>8</sub>"- Six is one of the range of five Wickman chucking automatics. The machines have the 'No Cam Change' feature. The 6<sup>5</sup>/<sub>8</sub>"- Six has electromagnetic clutches in the feed drive and the exhibition machine is fitted with self-contained hydraulic chucking. A large number of attachments are available to reduce the requirement for second operation.

The exhibition component, which is magazine loaded and unloaded, is a hub that is produced in 17.8 secs.

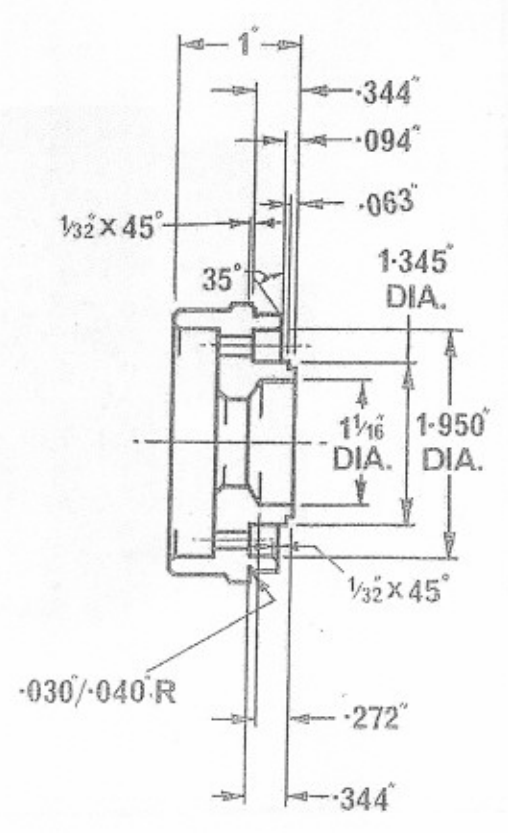
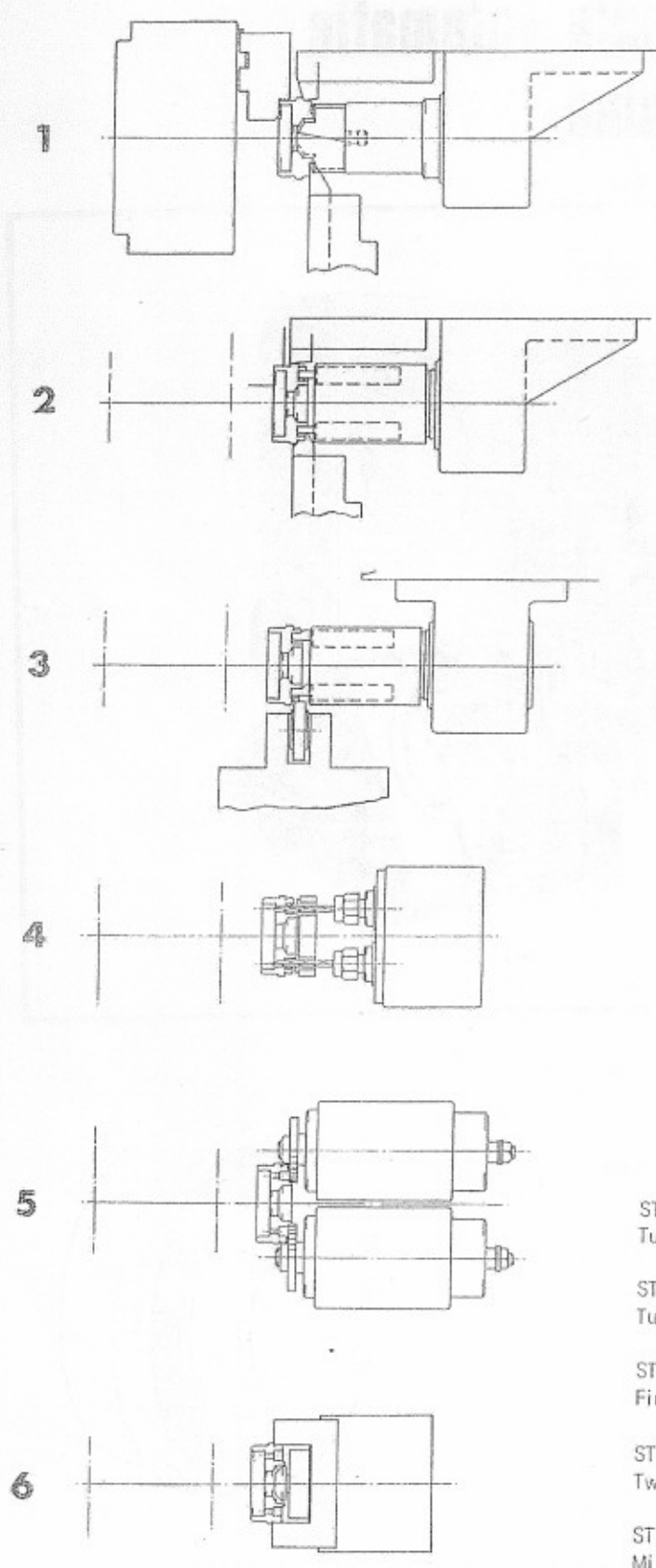


WICKMAN MACHINE TOOL SALES LIMITED

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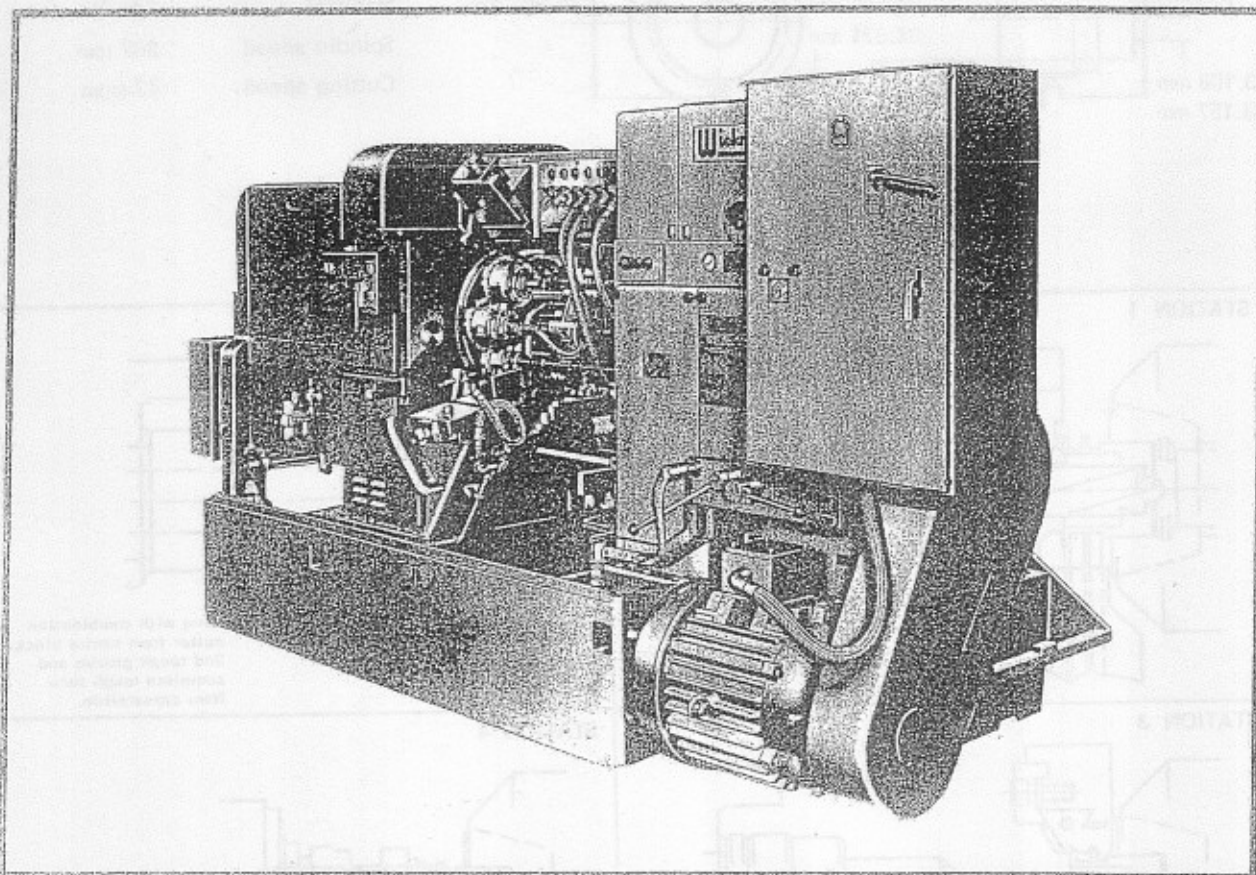
Component: Hub  
 Material: EN 1A  
 Cycle Time: 17.8 secs.



- STATION 1  
Turn thread diameter, Spade drill & Face forming
- STATION 2  
Turn OD, Form, Rough trepan
- STATION 3  
Finish trepan and Knurl
- STATION 4  
Two-spindle drill (Spindle stopped)
- STATION 5  
Mill flats (Spindle stopped)
- STATION 6  
Automatic load/unload

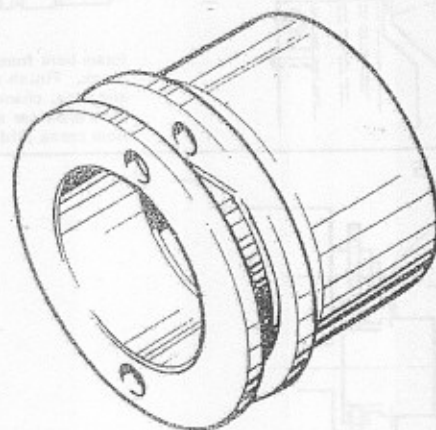


# WICKMAN Multi-Spindle Automatic 6<sup>5/8</sup>"-6 Chucking Machine



## Planet Cage

The machining of this component is carried out on a cold flow extrusion, on which drilling and milling is performed, thus avoiding second operation time.

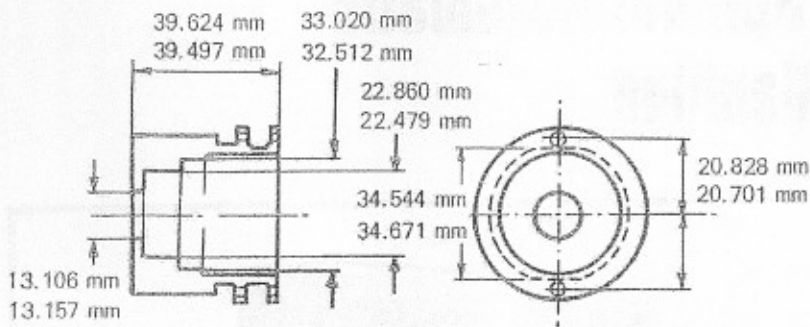


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BANNER LANE COVENTRY CV4 9GE





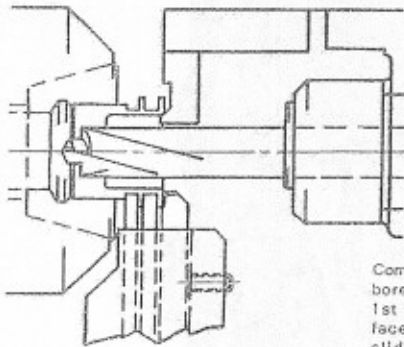
ATAD M...



**Layout to produce a Planet Cage**

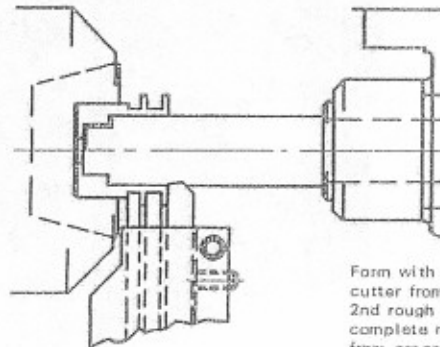
|               |             |
|---------------|-------------|
| Cycle time    | 24 sec      |
| Material      | RAL No. 1.A |
| Spindle speed | 267 rpm     |
| Cutting speed | 43 mpm      |

**STATION 1**



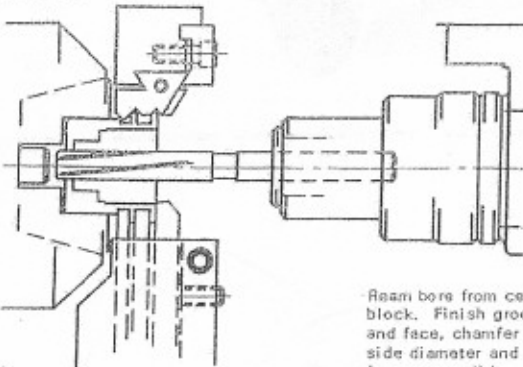
Combination drill, chamfer bore from centre block. 1st rough groove and rough face part way from cross slide.

**STATION 2**



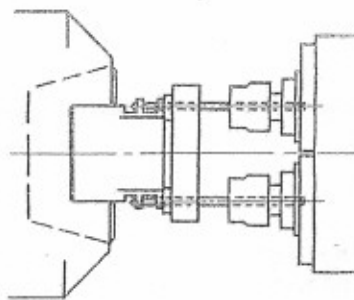
Form with combination cutter from centre block. 2nd rough groove and complete rough face from cross slide.

**STATION 3**



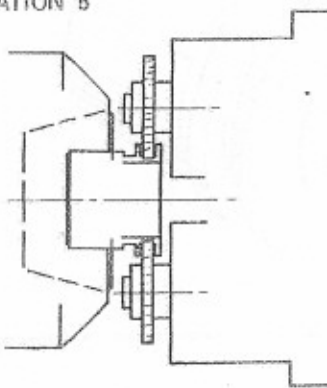
Ream bore from centre block. Finish grooves and face, chamfer outside diameter and flanges from cross slide.

**STATION 4**



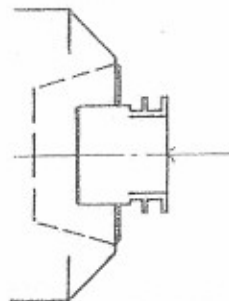
Spindle stationary, drill 2 axial holes in flanges.

**STATION 5**



Spindle stationary; from cross slide, mill 2 flats in groove, relative to previously drilled holes.

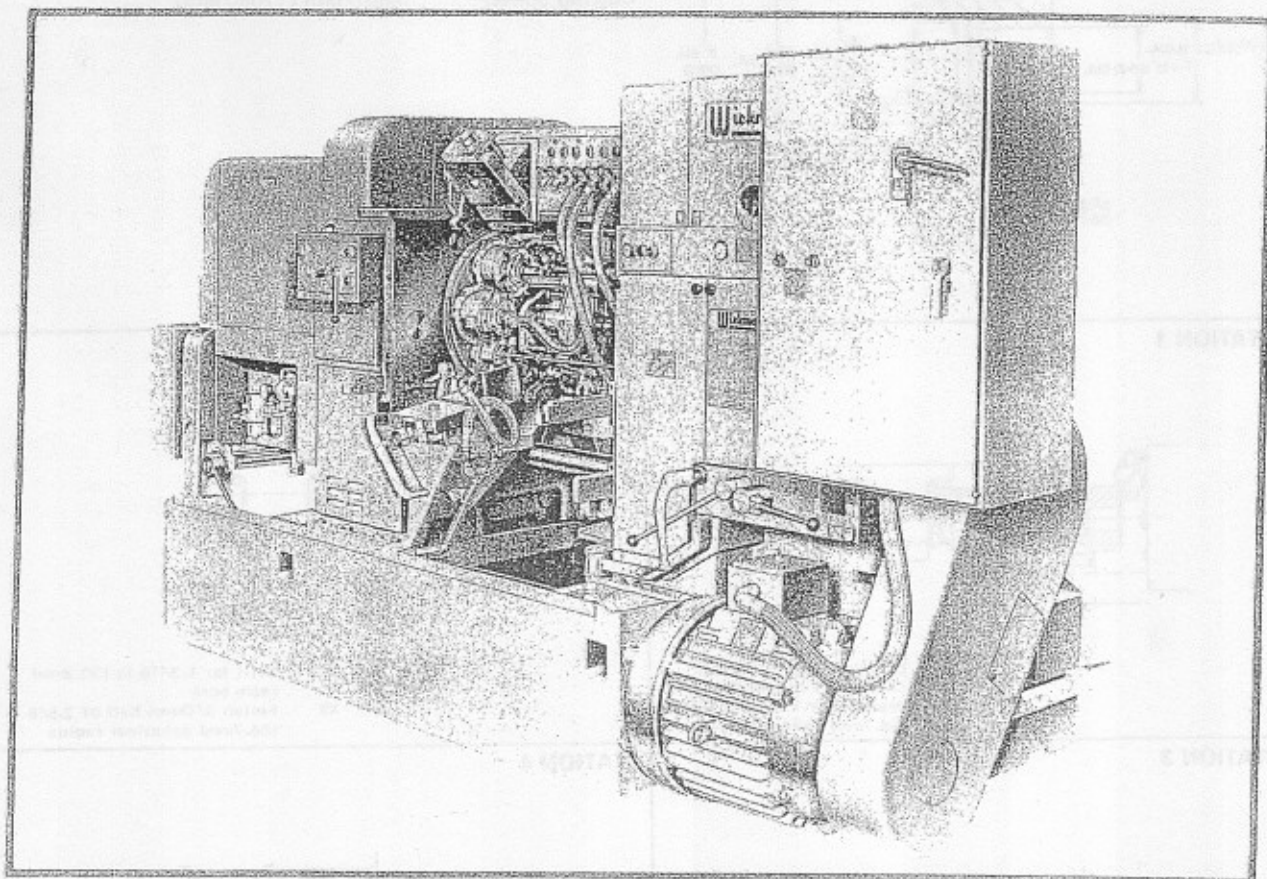
**STATION 6**



Automatic load and unload.



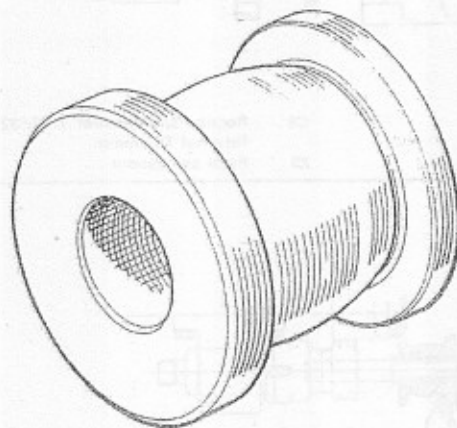
# WICKMAN Multi-Spindle Automatic 6<sup>5</sup>/<sub>8</sub>"-6 Chucking Machine



## Pulley

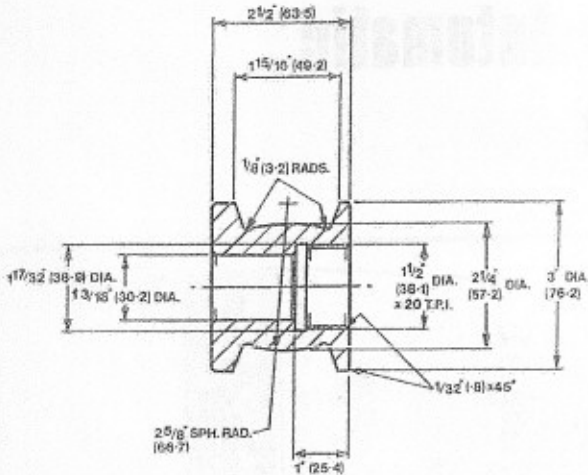
This machine is producing pulleys from Ledloy blanks. The component is drilled (recessed internally) and tapped. The outside diameter is rough turned with form tools, and finished with a Sauter copy turning attachment in an 18.7 second cycle.

Extra equipment includes a Lang 3 jaw hydraulically operated chuck, motorised swarf conveyor, 3rd station Form Slide and 4th Station Independent Slide. The machine is equipped with fully automatic loading and unloading attachment.



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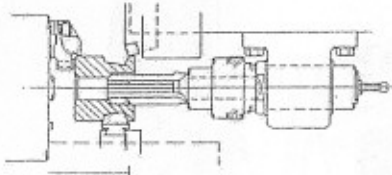
P.O. Box 44 BANNER LANE COVENTRY CV4 9GE



Cycle time: 18.7 sec  
 Material: Ledloy  
 Spindle speed: 711 rev/min  
 Cutting speed: 658ft/min (170m/min)

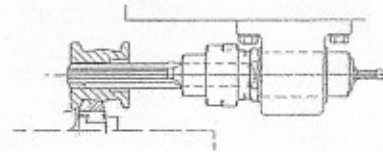
CB Centre block  
 XS Cross slide

STATION 1



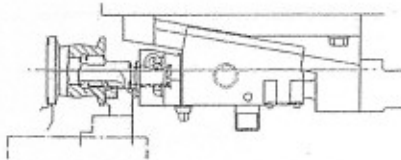
CB Drill for Internal Thread  
 Clean up 3 in (76.2mm) o/d  
 XS Break Down Part of 2.5/8 in (66.7mm) spherical radius

STATION 2



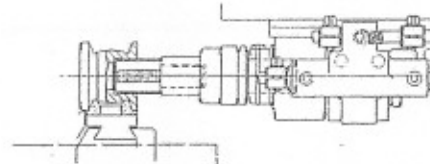
CB Drill for 1.3/16 in (30.2mm) ream bore  
 XS Finish B/Down half of 2.5/8 in (66.7mm) spherical radius

STATION 3



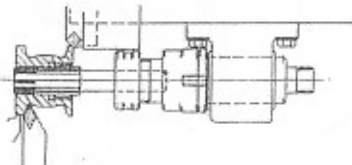
CB Recess and chamfer 1.17/32 in Internal Diameter  
 XS Face component

STATION 4



CB Tap bore 1.1/2 in (38.1mm) x 20 T.P.I. Whit. Form  
 IS Form 1/8 in (3.2mm) radii

STATION 5



CB Ream 3/16 in (30.2mm) bore  
 Chamfer 3 in (76.2mm) dia. face  
 XS Copy turn 2.5/8 in (66.7mm) spherical radius

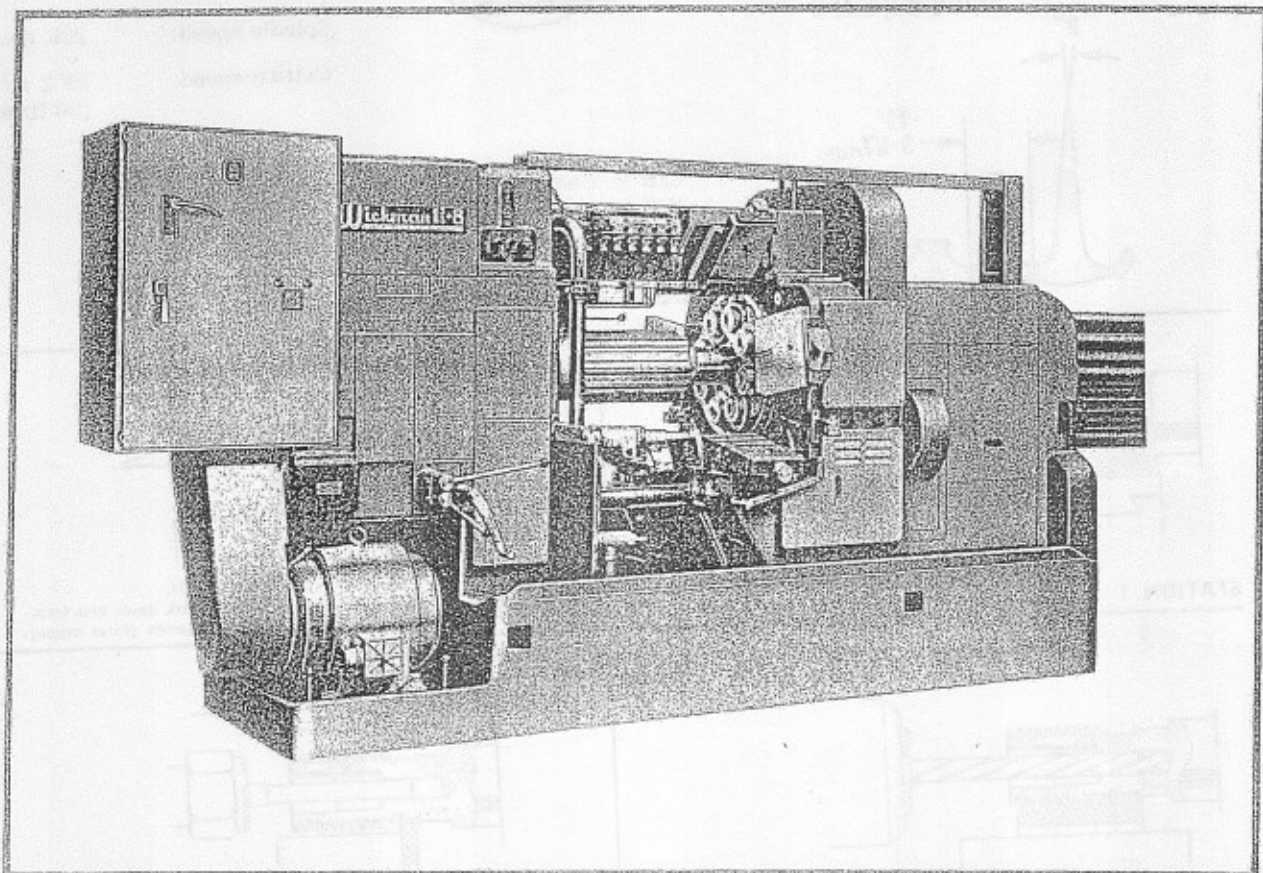
STATION 6

Automatically load and unload.





# WICKMAN Multi-Spindle Automatic 1 $\frac{3}{4}$ " - 8 Bar Machine

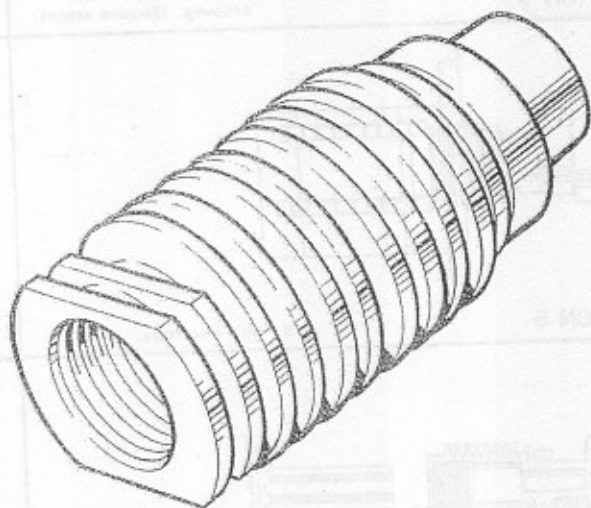


## Special Component

In this set up, the 8 spindle machine provides for the numerous operations required to manufacture the component in a cycle time of 55 seconds.

The synchronous milling attachment is utilised at station 5 to produce two flats.

After drilling; and boring with a 'D' bit, the small diameter is finished by accelerated reaming.



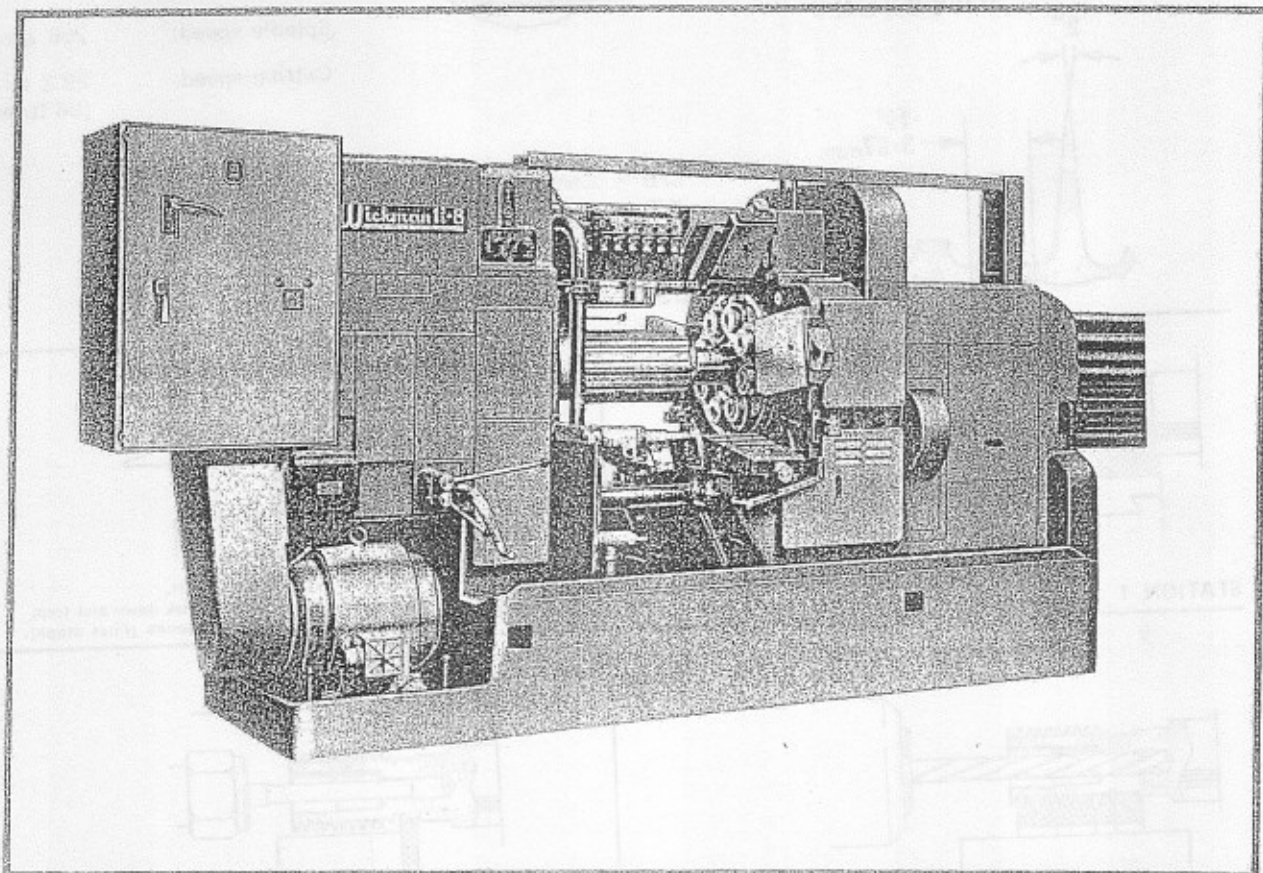
WICKMAN MACHINE TOOL SALES LIMITED

BANNER LANE COVENTRY CV4 9GE





# WICKMAN Multi-Spindle Automatic 1 $\frac{3}{4}$ "-8 Bar Machine

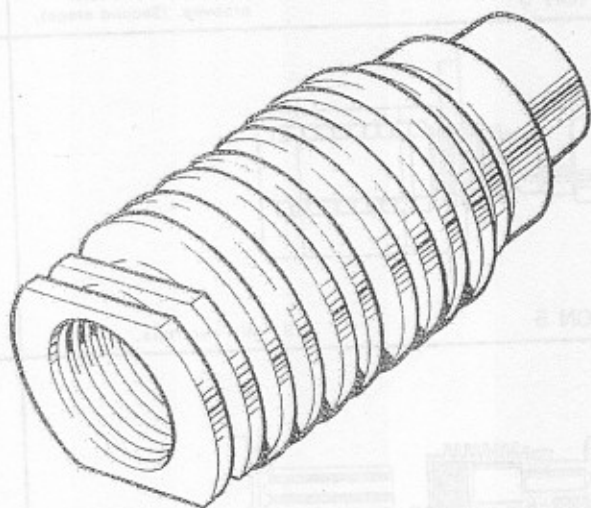


## Special Component

In this set up, the 8 spindle machine provides for the numerous operations required to manufacture the component in a cycle time of 55 seconds.

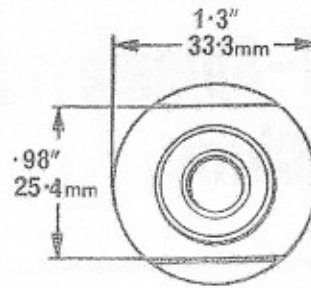
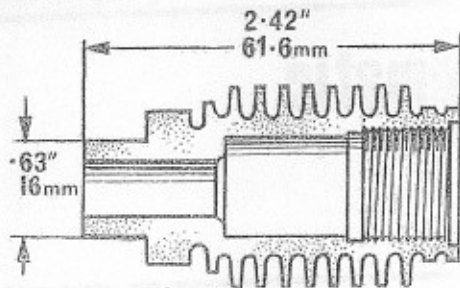
The synchronous milling attachment is utilised at station 5 to produce two flats.

After drilling; and boring with a 'D' bit, the small diameter is finished by accelerated reaming.



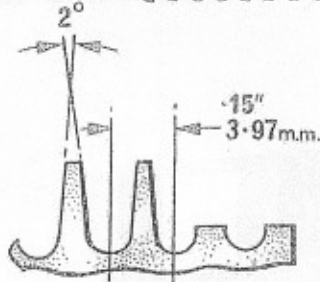
WICKMAN MACHINE TOOL SALES LIMITED

BANNER LANE COVENTRY CV4 9GE

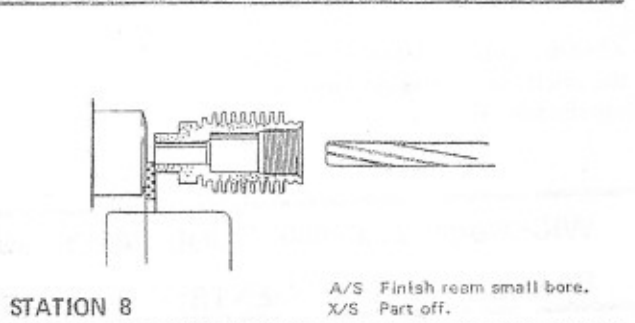
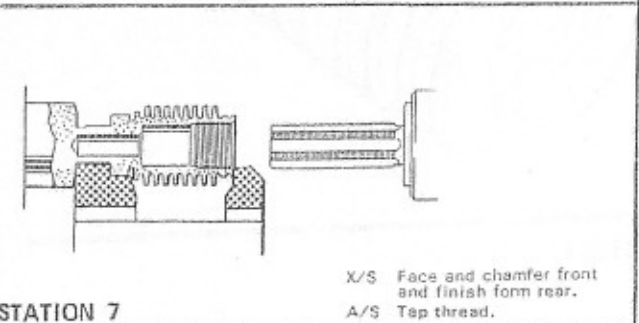
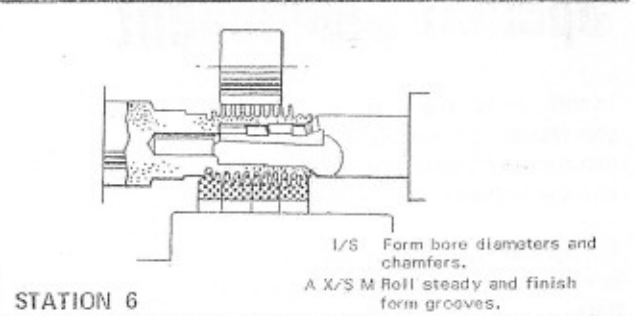
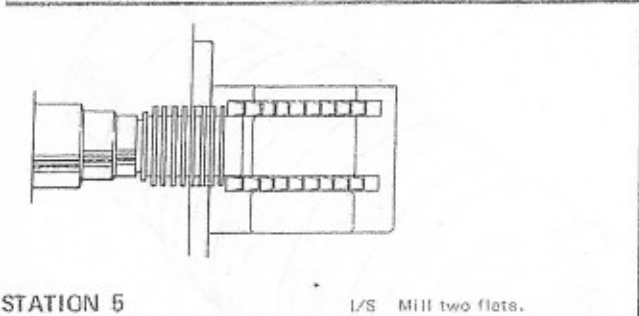
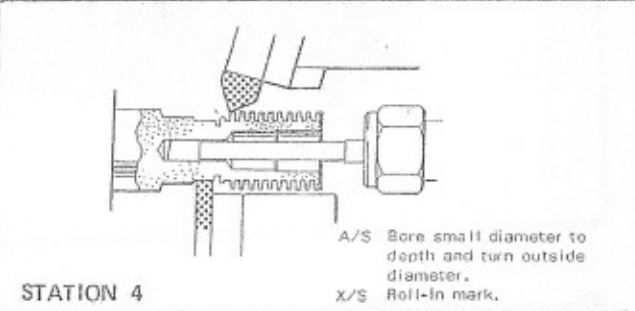
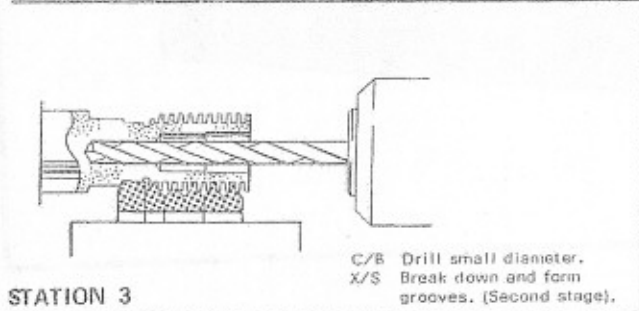
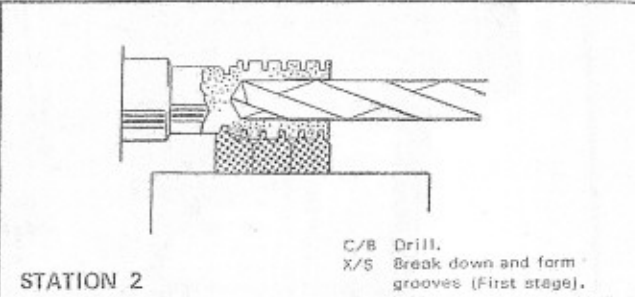
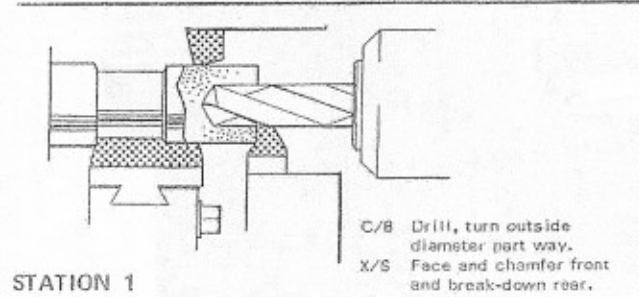


Layout to produce a Special Component

Cycle time: 55 sec  
 Material: EN. 8D  
 Spindle speed: 266 rev/min  
 Cutting speed: 29.2 m/min (96 ft/min)

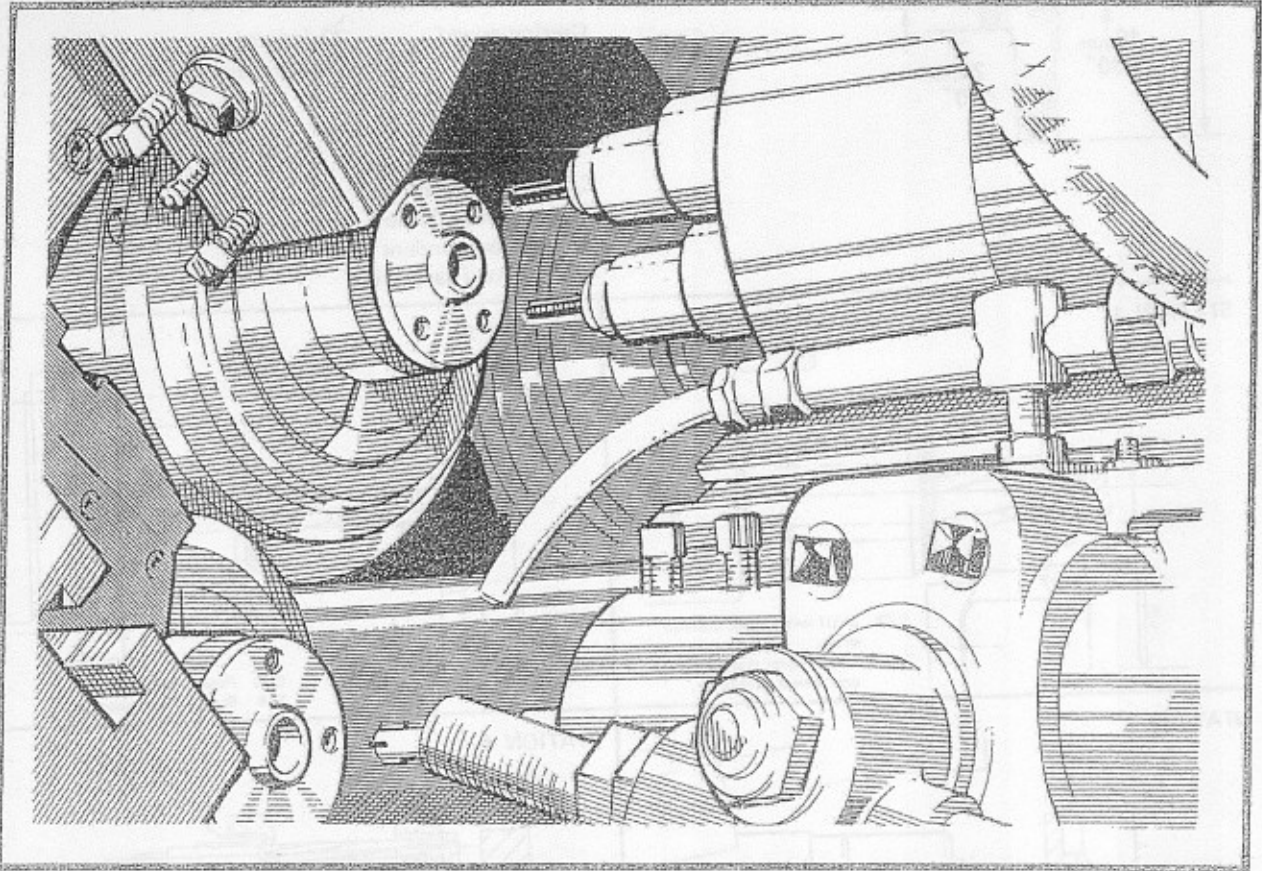


C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide  
 A/S - Auxiliary Slide  
 AX/SM - Auxiliary Cross Slide Motion





# WICKMAN Multi-Spindle Automatic 3 $\frac{1}{4}$ "-6 Bar Machine

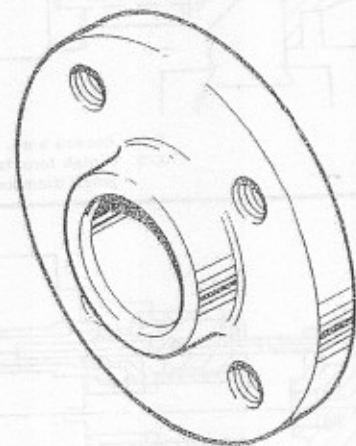


## Pulley Centre

High speed steel tools are used to produce this component in a cycle time of 57 seconds.

Four tapped holes in the flange are produced with separate synchronous drilling and tapping heads in adjacent stations.

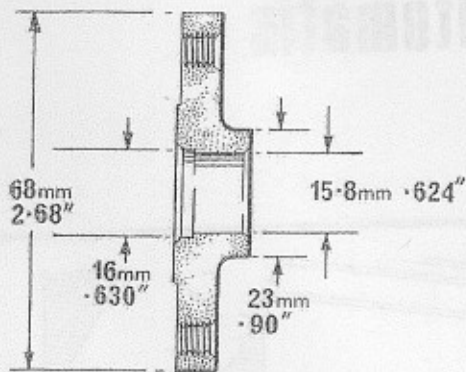
A floating-blade reamer is used in an accelerated slide for the reaming operation.



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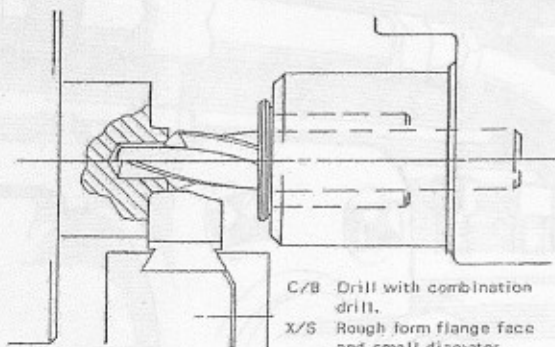


Layout to produce a Water Pump and Fan Pulley Centre

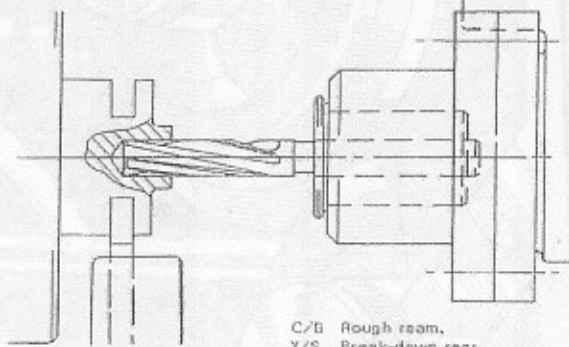
Cycle time: 57 sec  
 Material: EN. 1A  
 Spindle speed: 342 rev/min  
 Cutting speed: 73.1 m/min (240 ft/min)

C/B - Centre Block  
 X/S - Cross Slide  
 I/S - Independent Slide  
 A/S - Auxiliary Slide

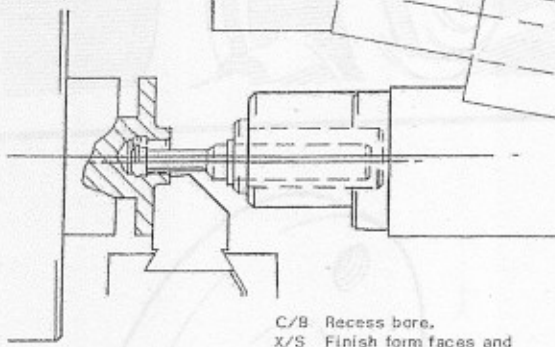
STATION 1



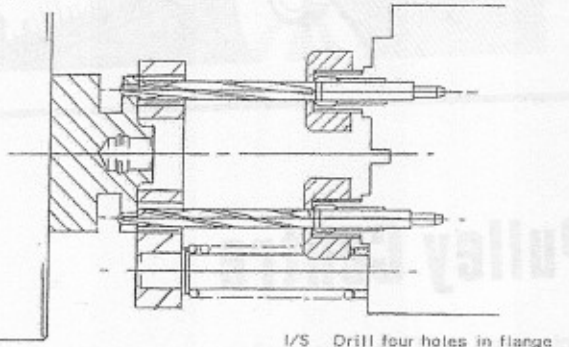
STATION 2



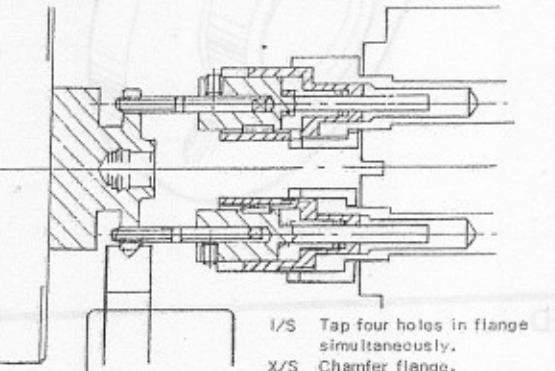
STATION 3



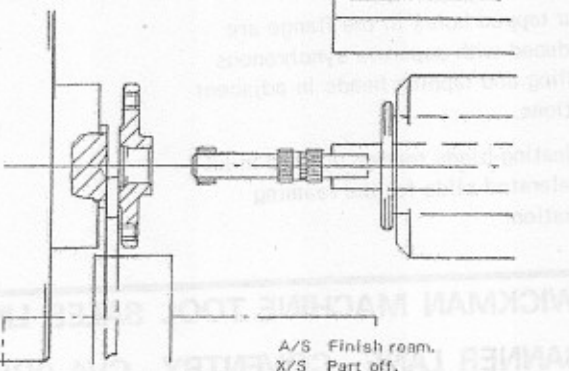
STATION 4



STATION 5



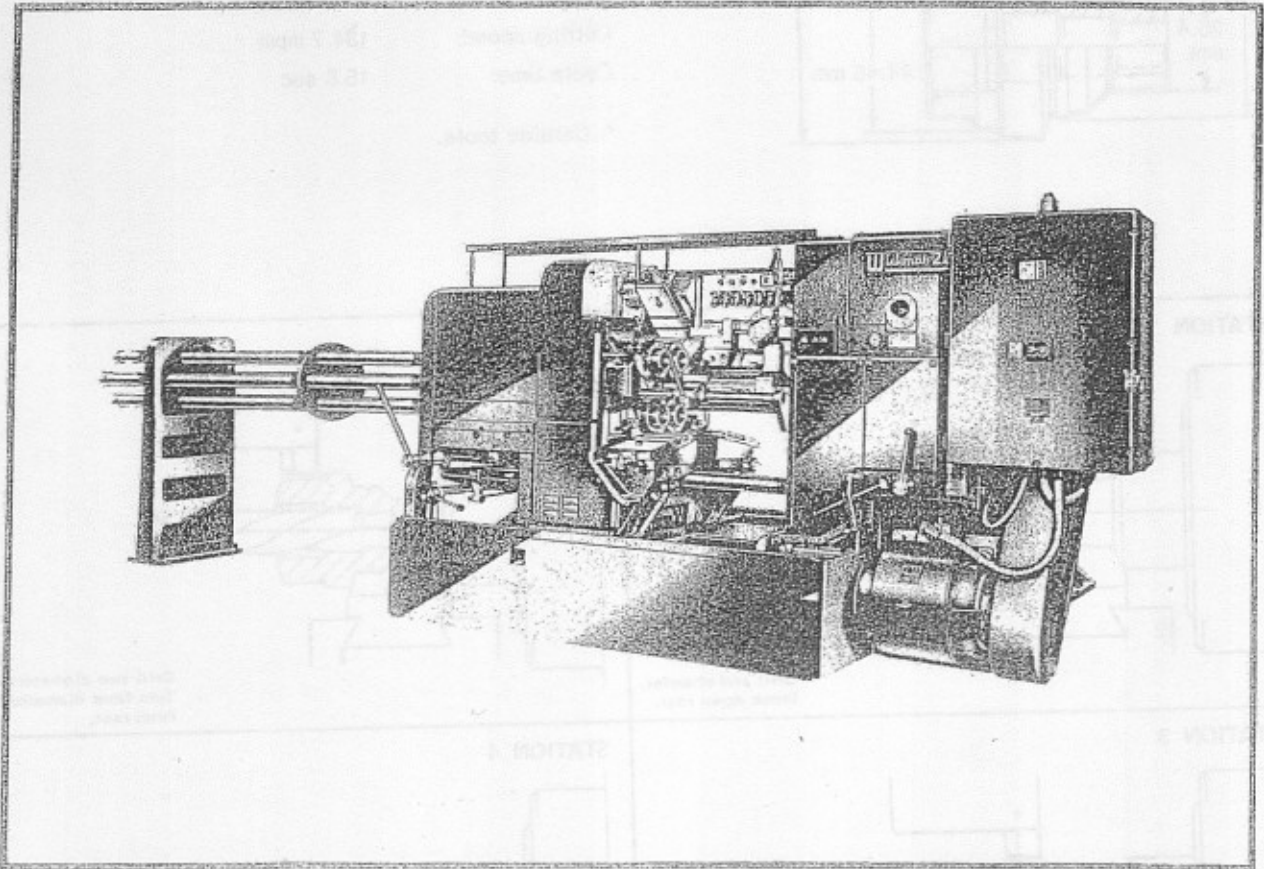
STATION 6





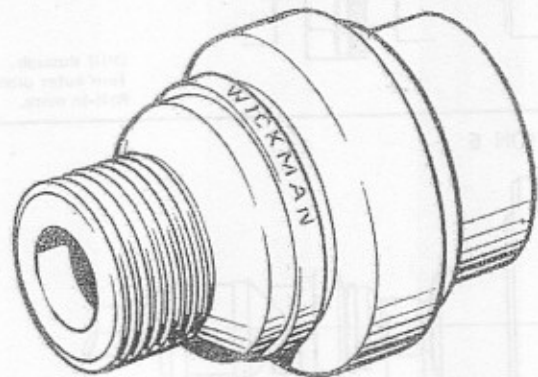


# WICKMAN Multi-Spindle Automatic 2 1/4"-6 Bar Machine

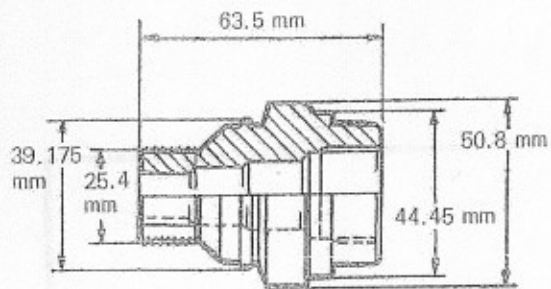


## Special Part

This component is produced in 15.8 seconds utilizing a combination of high speed steel and tungsten carbide cutting tools, the operations being: turning and forming, drilling, reaming and tapping, plus name and thread rolling:



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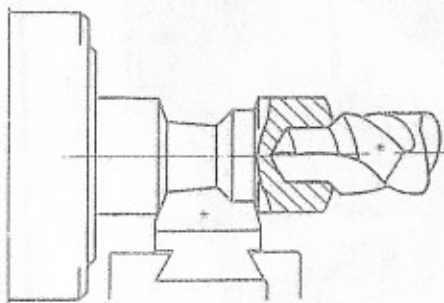


Layout to produce a Special Part

Material: Mild steel  
 Spindle speed: 1158 rpm  
 Cutting speed: 184.7 mpm  
 Cycle time: 15.8 sec

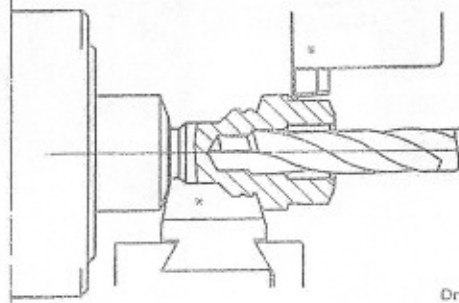
\* Carbide tools.

STATION 1



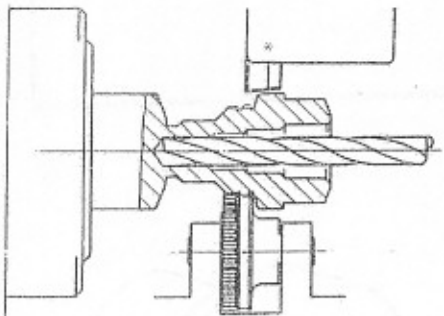
Drill and chamfer.  
 Break down rear.

STATION 2



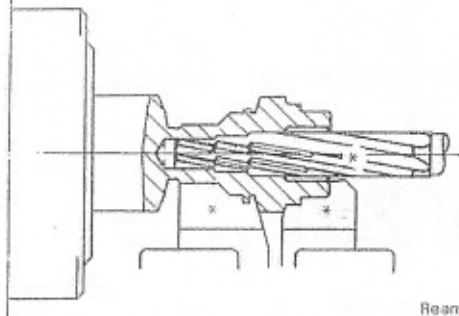
Drill two diameters.  
 Turn front diameter.  
 Form rear.

STATION 3



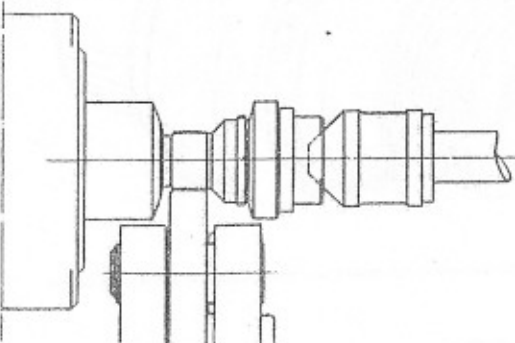
Drill through.  
 Turn outer diameter.  
 Roll-in mark.

STATION 4



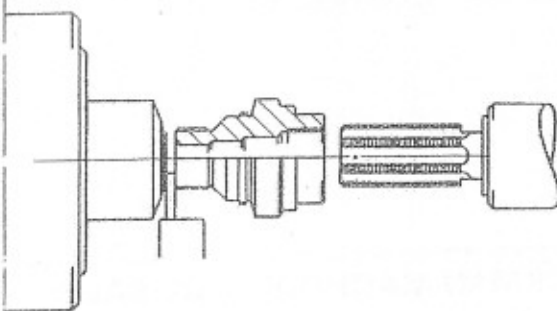
Ream three diameters.  
 Form and face front.  
 Form thread diameter.

STATION 5



Roll thread.

STATION 6



Tap.  
 Part-off.