

# WOODFIELD

## FS20 ASSEMBLER INSTRUCTION MANUAL

WOODFIELD ENGINEERING LIMITED  
HUGH BUSINESS PARK, WATERFOOT, ROSSENDALE, LANCASHIRE, BB4 7BX

TELEPHONE 0706 831411 FAX 0706 831317 TELEX 635036 WOODTX G

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### INSTALLATION

THE MACHINE SHOULD BE MOUNTED ON A GOOD SOUND FLOOR.

CARE SHOULD BE TAKEN TO ENSURE THAT THE MACHINE BARS ARE LEVEL

**THIS IS MOST IMPORTANT!**

MATPARTS

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### MACHINE SAFETY

SAFE OPERATION OF THE MACHINE SHOULD BE THE TOP PRIORITY AT ALL TIMES.

IT IS IMPORTANT THAT THE FOLLOWING POINTS ARE STRICTLY ADHERED TO  
AT ALL TIMES

- 1 THE MACHINE SHOULD BE COMPLETELY ISOLATED BEFORE AN ELECTRICAL PANEL OR COVER PLATE IS OPENED.
- 2 ALL REPAIRS, ADJUSTMENTS AND SETTINGS TO THE MACHINE SHOULD BE CARRIED OUT BY, OR UNDER, THE CLOSE SUPERVISION OF QUALIFIED PERSONNEL. THE MACHINE SHOULD, OF COURSE, BE ISOLATED ELECTRICALLY/PNEUMATICALLY BEFORE SUCH WORK IS STARTED.
- 3 ALL MACHINE OPERATORS SHOULD BE GIVEN FULL INSTRUCTIONS ON THE MACHINE'S CONTROLS AND OPERATION BEFORE THEY ARE PERMITTED TO OPERATE THE MACHINE.

IT IS IMPORTANT THAT FULL INSTRUCTION IS GIVEN ON THE 'SAFE' OPERATION OF THE MACHINE. WOODFIELD ENGINEERING ARE ABLE TO GIVE SUCH TRAINING UPON REQUEST.

- 4 ALL REPAIRS TO THE MACHINE MUST BE CARRIED OUT WITH PARTS CONFORMING TO THE ORIGINAL PART SPECIFICATION.

# WOODFIELD ENGINEERING LIMITED

## FS20 ASSEMBLER INSTRUCTION MANUAL MACHINE LUBRICATION

### AIRLINE LUBRICATION

The oil bottle(s) should be kept between the full and bottom levels. Oil consumption will depend on the flow setting on a particular machine. As a guide, however, we recommend the level be checked every 40 hours of operation.

We recommend Shell Tellus Oil 23.

### GREASE POINT LUBRICATION

All grease points should be lubricated after 80 hours of operation. Great care must be exercised when greasing the main spinner roller (Drg. No.1 in the manual) not to put too much grease into them, as excess grease will be 'thrown out' when the rollers revolve and this will shorten the life of the Poly 'V' Drive Belts.

We recommend Shell Alvania Grease R3.

### HAND OILED LUBRICATION

The remaining working parts subject to wear should be oiled before the start of each shift.

We recommend Shell Carnea Oil 41.

### HELICAL GIRAFFE LUBRICATION

We recommend a mixture of oil and paraffin be placed into the wire lubrication trays of the Helical Former wire feed rollers. Sufficient lubricant/cleaning agent should be used to keep the giraffes free of the 'soap' deposits that are on the helical wire. Too much liquid would result in the excess amount being carried through to the assembling machine by the helical as it was being formed.

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ENSURE HELICAL WIRE TO BE USED IS SUITABLE FOR THE TOOLING SUPPLIED WITH THE MACHINE.

UNLESS PREVIOUSLY ADVISED TO THE CONTRARY, A MACHINE WILL BE SUPPLIED WITH HELICAL FORMING TOOLING SUITABLE FOR A WIRE TENSILE RANGE OF 1500 - 1700 NEWTONS/m<sup>2</sup>.

To test if the mandrel in the giraffe is correct for the tensile strength of the helical wire you are using, proceed as follows:

Remove pitch adjuster from the giraffe mandrel (drg. no.26) and run a piece of helical about 10" long. Place this on the pitch gauge between the first and second pins (Figure 10). When the helical is pushed firmly on to the first pin it should require stretching by approximately 3/4 of one pitch before it will seat firmly on the second pin, and correspond with all the pitch marks between the pins, (see sketch marked correct). If the helical does not require stretching to seat on the pin and correspond with all the pitch marks between the pins you will need to change the mandrel for one cut higher tensile wire. If the helical requires stretching more than one pitch the wire tensile is lower than the 1500-1700 Newtons/m<sup>2</sup> and a compatible mandrel should be used.

### IMPORTANT

REMEMBER IN RUNNING YOUR MACHINE THAT THE PITCH ADJUSTER WILL ONLY STRETCH THE RAW HELICAL TO THE CORRECT PITCH. IT CANNOT COMPRESS A RAW HELICAL THAT IS ALREADY OVER THE CORRECT PITCH.



# WOODFIELD ENGINEERING LIMITED

## FS20 ASSEMBLER INSTRUCTION MANUAL RAW MATERIAL REQUIREMENTS FOR THE OPERATION OF THE FS20 ASSEMBLER

### Helical Wire

- 1 The minimum wire tensile should be in the range of 1500/1700 newtons per mm<sup>2</sup>.
- 2 For the efficient operation of the machine it is essential that the helicals being produced are consistently in pitch when checked on the helical pitch gauge, supplied with the machine. Should this not be the case please refer to general sheet no.4. The section on 'ensuring helical wire is suitable for the tooling'. If the amount of 'pull' around 3/4 of a pitch, as specified and the helical pitch is **NOT** consistent as required, the problem will be caused with the quality of the particular coil of helical wire being used. A new coil of wire should be used and if the problem persists the wire supplier should be contacted.

### Spring Wire

- 1 A minimum tensile strength of 1400 newtons/mm<sup>2</sup> is recommended.
- 2 As with helical wire above, it is essential that the spring is of consistent quality. To check the wire quality, make six raw coils, which are produced prior to the knotting operation and compare them for consistency of form of the convolution diameters and pitches.
- 3 For the efficient operation of the assembler the finished springs should be as close as practical to the following specification. A standard 135mm x 5 convolution spring is used in our illustration. The same standards apply equally to springs with more or fewer convolutions. A measurement between 25 and 27mm should be allowed for **EACH** convolution. To ensure a quality spring is produced the centre convolution diameter is dependent on the end coil diameter:
  - (a) FLARE 'A' should be approximately 12mm greater than dimension 'B'.
  - (b) SPRING HEIGHT 'B' is the free height of the spring when it is placed on a flat surface and the dimension is taken at the point illustrated.

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### RAW MATERIAL REQUIREMENTS FOR THE OPERATION OF THE FS20 ASSEMBLER (continued)

- (c) END COIL 'C' should be in contact with a flat surface until the point at which the second convolution begins at point 'D'.
- (d) SECOND CONVOLUTION DX should not be more than 6mm higher than the end coil 'C'. When the measurement is taken from the flat surface in (c) above.
- (e) END COIL ALIGNMENT 'E' The spring end coils should be perpendicular at a point 90° from the knots, as shown, when the spring is placed on a flat surface.
- (f) CENTRE CONVOLUTION 'F' should be central with both the spring flare 'A' and spring height 'B'.
- (g) THE REMAINING CONVOLUTIONS 'G' should be equal about the centre convolution 'F'.

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### MACHINE CONTROL REFERENCE INFORMATION

#### A SOLENOID VALVES

1	JAWS CONTROL	VZ5220-5-MNZ-01
2	EJECTORS CONTROL	VZ5220-5-MNZ-01
3	CUT AND CLENCH CONTROL	VZ5220-5-MNZ-01
4	INDEXING CONTROL	VZ5420-5-MNZ-00
5	FEED ROLLER CONTROL	VZ5120-5-MNZ-01

#### B AIR CYLINDERS AND ACTUATORS

1	EJECTORS OPERATION	CDG1 DN-63-50
2	JAWS OPERATION	CDG1 DN-63-75
3	INDEXING OPERATION	CDG1 TN-32-125
4	CUT AND CLENCH OPERATION	CDG1 UN-40-75
5	CLENCH OPERATION	5MC-CDRA1-BW30-180
6	FEED ROLLER PRESSURE	CQ 2B 100-10D

#### C REED SWITCHES

1	ON AIR CYLINDERS	REF D-57L
2	ON CLENCH ACTUATORS	REF D-A73-L

#### D AIR CYLINDER SPEED CONTROLS

1	FOR INDEXING CYLINDER CONTROL	REF AF2201F/01/06
2	FOR EJECTOR CYLINDER RETURN	REF AS2200F-02/08/5

#### E PROXIMITY SWITCHES

1	HELICAL STOP	IS-2002-FROG-IS-5026
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#### F CONTACTORS AND OVERLOADS

1	MOTOR CONTACTORS	LP4D 1201-132
2	CONTACTOR BLOCKS	LP4D 1201-BD
3	MOTOR OVERLOADS	LR2D 1307

#### G COMPRESSED AIR FRL

1	AIR FILTER	F11-200-M3TD
2	PRESSURE REGULATOR (MAIN)	R11-200-NNMD
3	AIR LUBRICATOR	L11-200-MLRD
4	PRESSURE REGULATOR (FEED ROLLERS)	AR 2000

#### I OPERATING PANEL CONTROL UNITS

1	INCH PUSH BUTTONS	ABW-111-B
2	START	ABW-111-G
3	AUTO/MANUAL	ASW-211
4	FORWARD/REVERSE	ASW-211

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### MACHINE CONTROL REFERENCE INFORMATION (CONTINUED)

#### I OPERATING PANEL CONTROL UNIT (CONTINUED)

5	EMERGENCY STOP	AVW-4-02-R
6	CLENCH COMPLETE	APW-115-A
7	UNIT LENGTH	APW-119-s
8	PLC RESET	ABW-101-s
9	UNIT EJECTION	AOLW-29922-A
10	EJECTORS DOWN	ABW-111-G
11	JAWS OPEN	ABW-111-G
12	JAWS CLOSE	ABW-111-G
13	ILLUMINATION LAMPS	LS-2 - 24 VOLT/1 WATT

J PRESSURE BOOSTER REF VBA 2100-3GN (WHERE FITTED)

K POWER SUPPLY UNIT REF PSR-530

#### L LINE PROTECTION

1	FUSES	RS-413-478
2	FUSE HOLDERS	RS-415-339

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### MODEL FS 20 CYCLE - SINGLE STEP

All of the the following steps are carried out by pushing the green start push button:

#### Step 1

Jaw Dies close

#### Step 2

The spinner motors start, there is a slight delay to ensure the jaws are closed when the machine is operated in the automatic mode, driving the helicals through the jaw dies. The motors will run the helicals until they operate their respective helical stop toggles, which in turn will signal the rectangular proximity sensors that are part of the clench assemblies. Input no.13 for the top unit and no.14 for the bottom one.

#### Step 3

Clenching units operate to lock the helicals around the unit edge springs.

#### Step 4

Once all the clench units have operated and clenched there will be a small piece of helical waste between the spinner rollers and the SW4 cut and clench. This is reversed back into the spinners by a short pulse to the motors from the PLC. A signal is then sent to the spinner valves to operate the air cylinders thus opening the spinners and allowing the waste helical to be dispensed down the collecting chute.

**Note** - During steps 4, 5 and 6 the helical former will start to form 2 more helicals down the transfer tubes until the helicals actuate the funnel assembly micro switch toggles.

#### Step 5

Indexing rails move backwards to nudge the springs and helicals clear of the fixed jaw dies to aid the ejectors.

#### Step 6

Ejectors operate to push the springs and helicals clear of the jaw dies.

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### MODEL FS20 SINGLE STEP

#### Step 7

Indexing rails move forwards, passing through the ejector.

#### Step 8

Ejectors retract leaving the springs and helicals on the indexing fingers.

#### Step 9

Indexing fingers move backwards again to locate the springs in the loose jaw dies.

#### Step 10

After a slight delay (to give the springs time to settle in the jaw dies) the compressed air is exhausted from the indexing air cylinders.

Steps 1-10 are repeated until the required number of rows have been assembled to complete the unit length.

To eject the completed unit from the assembler jaw dies simply push the unit eject button (it will lock in and illuminate). Then push the start button once to complete steps 5-10.

Once the unit has been ejected push the unit eject button again to release the lock (the light will go out).

#### **Please note:**

The machine can be changed from single step operation to automatic operation at any point in the single step cycle by first moving the selector switch from the manual to automatic mode then pressing the start button.

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### MODEL FS20 CYCLE - AUTOMATIC

In this mode the machine will carry out all of the steps in the single step mode once the start button has been pressed for the cycle to commence.

To eject a completed unit from the assembler whilst in this mode simply push the unit eject button followed by the start button.

Once the unit has been ejected push the unit eject button again to release the lock.

#### **Please note**

Should the machine get out of cycle in either the single step or automatic mode, it can be reset by completing the remainder of the cycle (from the point where the programme was 'lost') by using the manual override buttons (orange) on the pneumatic valves that control the air cylinders. These are located at the rear of the machine under the unit table.

After completing the cycle with the manual overrides, push the PLC reset push button to return the controller to its cycle 'start' position.

### **CAUTION!**

The helical inch buttons operate independently of the PLC unit. Because of this great care must be taken whenever the switches are used.

This caution applies to both the forward and reverse directions of the spinner drive.

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### NOTES ON MACHINE CONTROLS AND OPERATIONS

1. Compressed air flow controls are fitted to the indexing system for both forward and backward travel and to the ejector system on the return stroke.
2. As described in the machine cycle section, the helicals travel through the assembler jaw dies until the motors are stopped when the helicals reach the helical stop sensors.
3. Only springs conforming to the specifications given on general sheet nos 5 & 6 should be used if the optimum production is to be achieved.

It is most important that care is taken in putting the springs into the assembler jaw dies to ensure the knots are within  $\pm 5$  degrees from a position 90 degrees from the path of the helical through the springs. If during the operation of the machine, a helical fails to pass freely through the springs in the jaw dies:

- (a) Check that the springs are seating correctly in the jaw dies.
- (b) Make another helical and check its pitch.

Adjustments to the shoe spacings should only be made after eliminating all possible causes for the helical stoppage.

#### Note

It is important that the helical wire is kept lubricated to ensure the forming tool is kept lubricated and free from dirt.



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### SETTING THE ASSEMBLER TO PRODUCE A DESIRED UNIT WIDTH

#### CAUTION!

THE FIRST SHOE ON THE ASSEMBLER (NEAREST TO THE HELICAL FORMING TOOLING ON THE RIGHT HAND SIDE OF THE MACHINE) SHOULD NOT BE MOVED AS IT HAS BEEN SET RELATIVE TO THE SPINNER ROLLERS THROUGH WHICH THE HELICAL RUNS BEFORE IT ENTERS THE FIRST SHOE

1. Decide how many shoes will be required to make the unit.
2. Place springs in the jaws of first and last shoes being used.
3. Unfasten the shoe locking screw of the last shoe together with rear clamps and slide the shoe on the machine until the measurement equals the desired unit width (fig.1).
4. Next equally space the remaining shoes inside the first and last shoes. (fig.2).
5. Place TWO springs in the pair of jaws on each shoe.
6. Take a helical that is **EXACTLY** in pitch and which is approximately 1" longer than the width of the unit to be produced.
7. We recommend you to set the lower shoes correctly in pitch with the helicals before the upper.
8. Put the selector switch on the assembler control panel to the manual mode.
9. Close the jaws by operating the START button to clamp the springs.
10. It is MOST IMPORTANT that a LIGHT touch is used in setting the shoes in pitch with the pre-formed helical.
11. Excessive force will damage the helical which will result in the jaws NOT being set correctly.
12. Wind a helical through the first pair of jaws (BY HAND).
13. Test to ensure there is tolerance between the springs and helical by moving the helical longitudinally forwards and backwards **WITHOUT** turning the helical. (See fig.3).

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### SETTING THE ASSEMBLER TO PRODUCE A DESIRED WIDTH

14. Next wind the helical carefully up to and through the second pair of jaws. It may be necessary to move the position of the second pair of jaws, in order to get the helical through by moving the second shoe along the machine bed.

IT WILL BE SEEN THAT IT IS ONLY POSSIBLE TO CHANGE THE DISTANCE BETWEEN TWO SHOES BY INCREMENTS OF THE HELICAL PITCH.

The jaws on the machine are of two types, ODD or EVEN. In order to produce a good quality inner spring unit the helical should WEAVE through the spring first one way (by passing round the front spring first as on ODD jaws) and then the reverse (by passing round the rear spring first as on EVEN jaws). ALL CLENCHING JAWS ARE EVEN JAWS. Because of this and the number of springs in a unit width, it may not be possible to have the perfect setting of ODD-EVEN-ODD-EVEN throughout the unit. There should, however, NOT BE more than two jaws of the same kind side by side in ANY SETTING.

15. Once the helical is through the second pair of springs the shoe should be moved by lightly tapping it with a hide face hammer until the MAXIMUM amount of tolerance (longitudinal movement) of the helical is achieved. (fig. 4).
16. Fasten the locking screw and rear clamps of the second shoe and then wind the helical carefully into and through the third pair of springs and repeat the fine adjustment by tapping the shoe to achieve the MAXIMUM helical movement through the first three pairs of springs.
17. This procedure should be repeated until all of the shoes have been set correctly. The last shoe (which has the clenching unit fitted) should be positioned so that the helical will not be obstructed by the clenching pin. Once the helical has passed round the clenching pin the longitudinal helical movement will be cut to a MINIMUM.
18. Before setting the upper shoes with the helical they should be moved in line with the lower shoes (that have been set) using the outside of the shoes as a guide.
19. Once the shoes have been positioned in this way they can be finally positioned by using the helical the same as on the lower set of shoes.

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### ADJUSTMENTS REQUIRED WHEN THERE IS A CHANGE IN SPRING HEIGHT OR END COIL DIAMETER

#### SPRING HEIGHT CHANGE

The machine can be adjusted to accommodate an overall spring height change by raising the upper assembly by means of the adjusting screws. ITEM 53 shown on drawing no. 432/EA20.

#### SPRING END COILER DIAMETER CHANGE

It may be necessary to adjust the indexing rail stops (ITEM 82 on drawing no.3) to increase or decrease the amount of indexing rail travel to ensure the indexed springs fall into the jaw dies.

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### SETTING THE CUT AND CLENCH UNITS (Drg nos.1 & 2)

As stated on machine adjustment sheet no.1, the cut and clench units should NOT be moved from their factory set positions.

It is important that the units cut the helical wire clearly and WITHOUT damaging the feeding edge of the helical that will have to pass through the next row of springs that are assembled.

A clean cut will be assured if the fixed and rotary cutters are sharp AND they are set with minimum clearance between their cutting edges. The cutters should not need adjusting unless one or both are taken off the unit for re-sharpening or replacement.

If both cutters HAVE to be taken off the clenching unit it is important that ONLY ONE IS TAKEN OFF AND THEN REPLACED BEFORE THE OTHER IS REMOVED FROM THE UNIT. This will ensure that their original setting is retained.

To reset the replaced cutter remove pin 22 (shown on Drawing nos. 1 and 2). This will enable the rotary cutter lever to be moved to a point beyond that where the helical wire would be cut. Then replace the cutter in its holder, making sure it is in a position that will NOT allow the other cutter to pass and just tighten the cutter locking screw(s) by the minimum amount to hold the cutter but NOT to prevent it moving. When this has been done move the rotary cutter lever back carefully and when the cutters pass the replaced cutter will be pushed to its setting. The replaced cutter should then be fully tightened. In the event of a cutter being replaced it is important that the follow check is carried out to ensure the helical is cut clearly AND that it is able to pass through the cut and clench jaw dies WITHOUT catching the fixed or rotary cutters.

- (a) Place two springs in the cut and clench jaw dies and wind a short piece (approx 150mm) of IN PITCH helical through the jaw dies from the opposite end to the cutters. When the helical is just through the jaw dies, lightly pull the helical back onto the springs (moving away from the cutters) and maintaining the pull, wind the helical through the two cutters. IT SHOULD NOT TOUCH THE CUTTERS. If it does, in the case of the FIXED CUTTER it should be ground until the helical wire passes the cutter with a clearance of NOT MORE than 1mm.

In the case of the rotary cutter its position can be adjusted by means of the air cylinder bracket (items 18 and 12 on drawing nos. 1 and 2 respectively).

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### SETTING THE CUT AND CLENCH UNITS (CONTINUED)

The helical clench can be changed by moving the fixed and rotary cutters in their cutter holders. If the helical clench results in a gap between the helical wire in the 'eye' the cutters should be moved towards the fixed cutter holder. If there is too much wire in the 'eye' the cutters should be moved towards the rotary cutter holder.

MATPARTS

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## FS20 ASSEMBLER INSTRUCTION MANUAL

### SETTING THE CLENCHING UNITS (DRG NO 5)

The clenching units are located in a fixed position on the clenching shoe. The clenching shoes are set relative to the 'standard' shoes, so that the helical passes freely through the springs in the clenching jaw dies and between the clenching pin (item 5) and the clenching head (item 4).

The clenching head can be adjusted, when required, to obtain a satisfactory clench. Normally the head would be set in the position illustrated (Drg no 5). It can, however, be moved forward (anti-clockwise) if the 'eye' of the clench would be improved by the end of the helical being turned slightly more.

The helical stop toggle (item 10 or 11) can be adjusted towards or away from the clenching head to ensure the end of the helical catches it. It should be noted that there must be clearance between the toggle and the clenching pin (item 5) for the clenched helical wire to be ejected clear of the jaw dies.

The helical stop toggle can also be adjusted vertically by means of the slot in item no.8. This adjustment will increase or decrease the amount of wire in the 'eye' of the helical.

It should be noted that only a slight adjustment will alter the 'eye' considerably. Care should be taken to ensure the toggle is not lifted so high that the helical wire will not pass beneath the jaw die cut-out without bending the helical wire.

It should also be noted that if the toggle is lowered, the clenching head must still be able to pass it freely when the helical has operated the toggle.

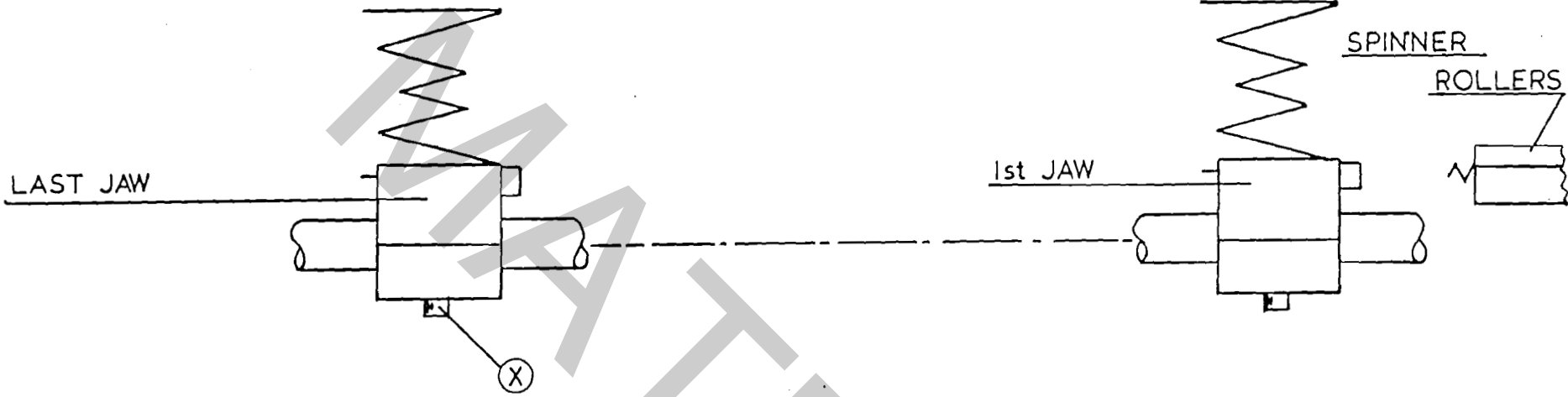


FIG 1

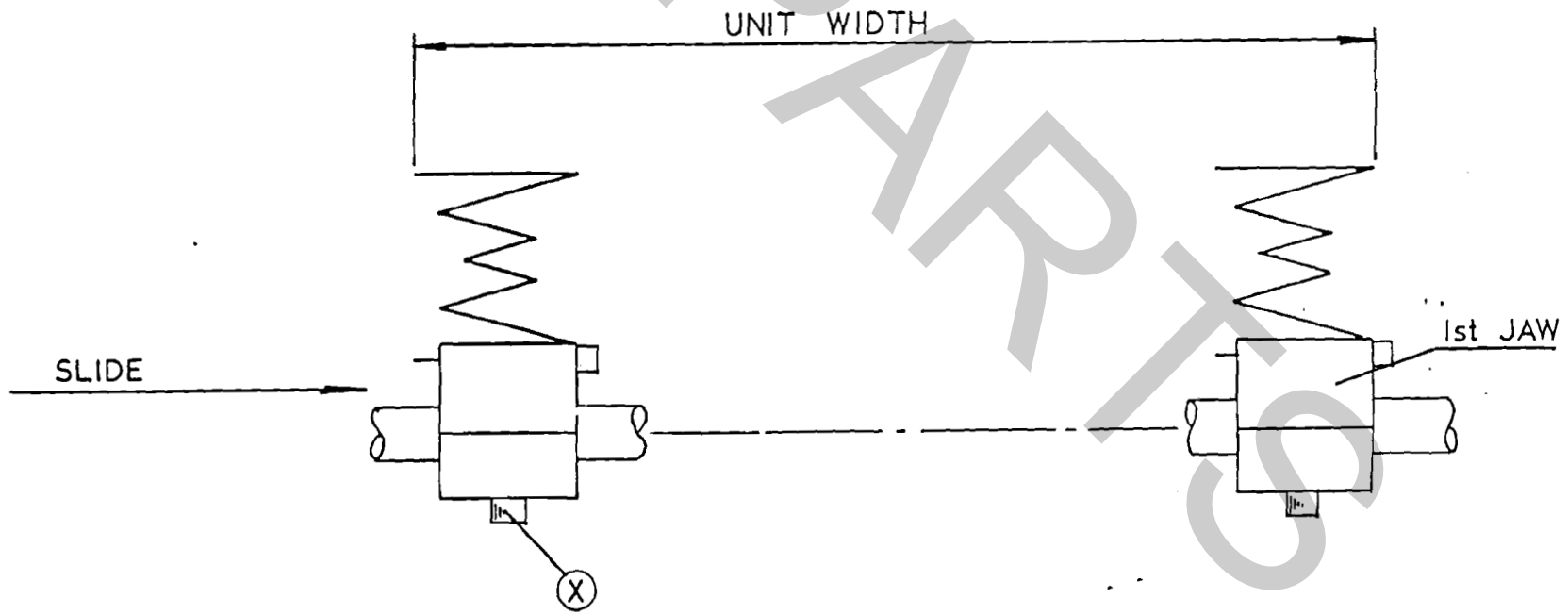
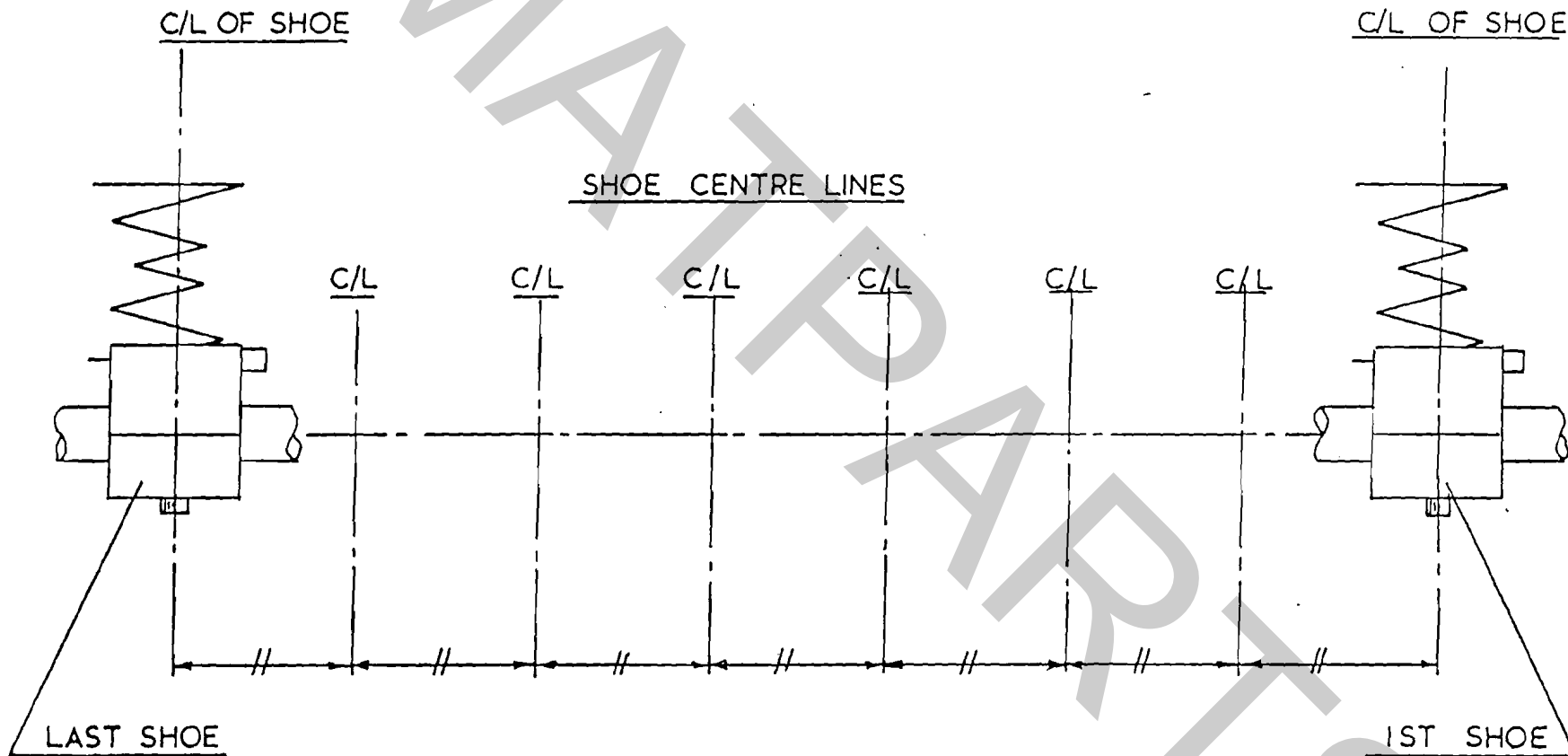


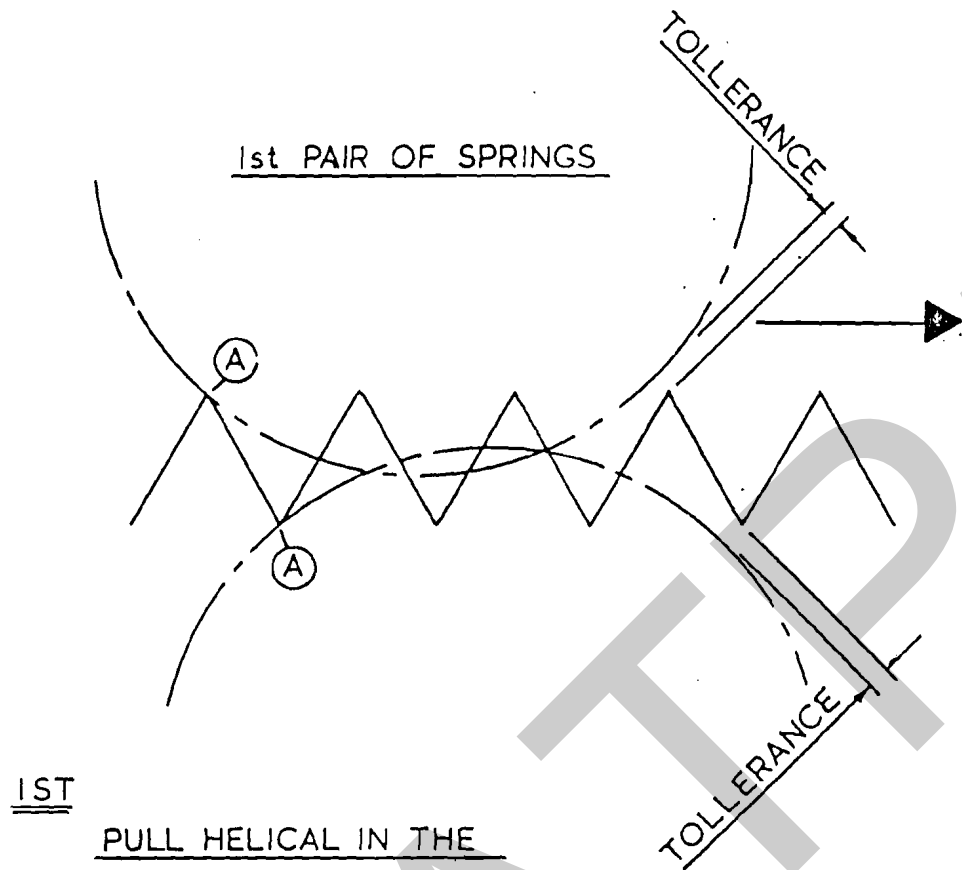
FIG 2



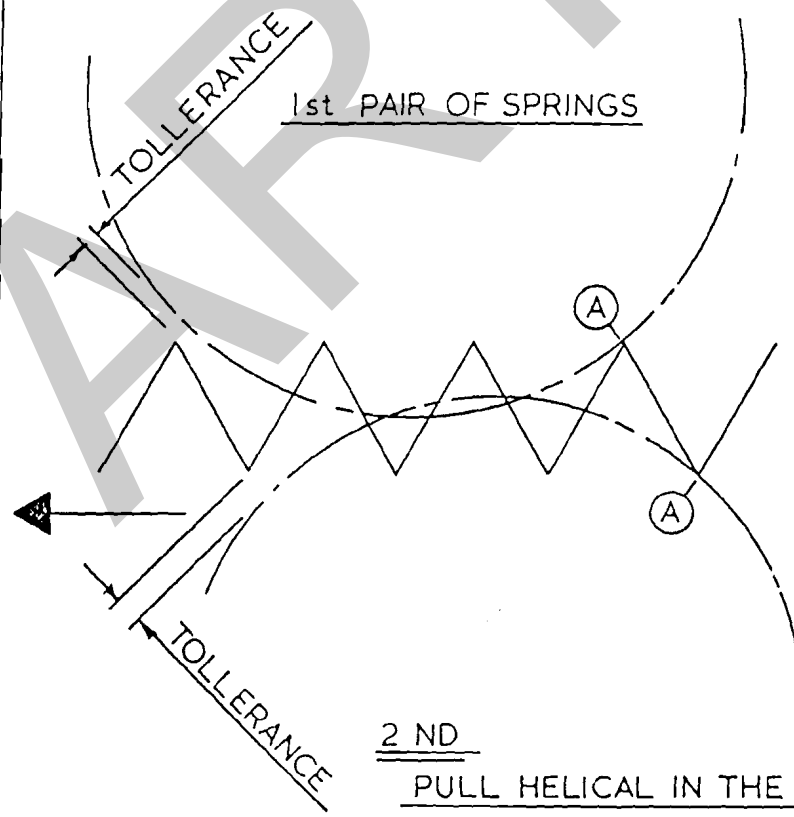
THE SHOES SHOULD BE EVENLY SPACED, INSIDE  
THE FIRST & LAST SHOES  
EXAMPLE SHOWN IS 8 SPRINGS WIDE

FIG 3





1ST  
PULL HELICAL IN THE  
DIRECTION OF THE ARROW.  
THE HELICAL SHOULD TOUCH AT POINT  
'A' ON THE SPRINGS



2 ND  
PULL HELICAL IN THE  
DIRECTION OF THE ARROW.  
THE HELICAL SHOULD TOUCH AT POINT  
'A' ON THE SPRINGS

FIG 4

# WOODFIELD ENGINEERING LIMITED

## FS20 ASSEMBLER INSTRUCTION MANUAL

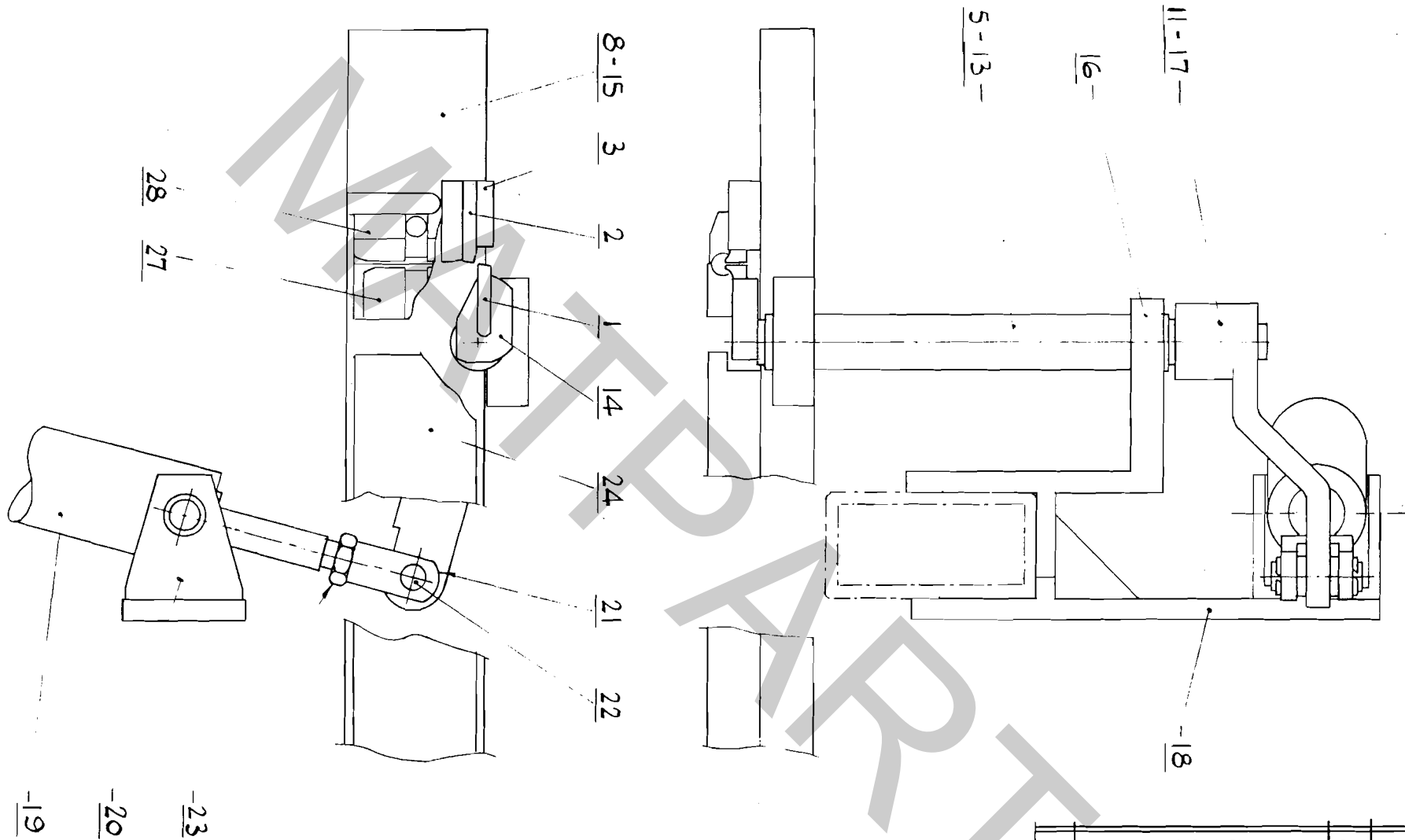
### MODEL EA20 - CUT AND CLENCH ASSEMBLIES

Identification of parts on instruction manual drawing no.1 (Upper assembly)

<u>Item no.</u>	<u>Description</u>	<u>Part no</u>
1	Rotary cutter	SW4/10/N
2	Fixed cutter	SW4/9
3	Fixed Cutter Holder	SW4/7
5	Oilite Bush	AMC 1622x30
8	Oilite Bush	AMC 1015 x 16
11	Oilite Bush	AMC 1418x18
13	Tube for Upper Rotary Cutter Holder	10397 EA/CC
14	Upper Rotary Cutter Holder	2166 EA/CC
15	Upper Cut & Clench Base Shoe	2168 EA/CC
16	Upper Air Cylinder Bracket	2171 EA/CC
17	Upper Cut & Clench Lever	10396 EA/CC
18	Upper Air Cylinder Bracket	2172 EA/CC
19	Air Cylinder	CDG1 UN40-75
20	Receiving Pivot Bracket	CG-040-24A
21	Fork Knuckle Joint	YG 04
22	Knuckle Joint Pin	1 YG 04
23	Rod End Nut	NTG 04
24	Loose Jaw Cap	
27	Upper Loose Jaw	SW4/37 No2
28	Upper Fixed Jaw	SW4/37 No3

DRAWING N°

IF IN DOUBT ASK



ITEM	DESCRIPTION	N° off	MATL	STOCK N°
<b>WOODFIELD ENGINEERING CO. LTD.</b> Bacup Road, Rossendale, Lancs, BB4 7PA Telephone: 0706 831411 Telex: 635036				
3 <sup>RD</sup> ANGLE PROJECTION		TITLE		
		CUT & CLENCH		
		ASSEMBLY (UPPER)		
DRN.	WAS			
DATE	7-1-92			
CH'KD		DRAWING N°		
SCALE	1/2	INSTRUCTION MANUAL DRG N°1		

DO NOT SCALE

METRIC TOLERANCES - UNLESS SPECIFIED	INCH FRACTIONS AT $\pm 1/64"$	MACHINE AT "F"	REF.	MODIFICATION	DATE	INITIAL	SCALE
TWO PLACE (XX) $\pm .25$ mm THREE PLACE (XXX) $\pm .12$ mm	INCH DECIMALS AT $\pm .005"$	ROUGH MACHINE AT "R"					
METRIC COARSE THREADS TO BS 3692	THREADS TO BS 1580	GRIND AT "G" AS FINISH STATED					

# WOODFIELD ENGINEERING LIMITED

## FS20 ASSEMBLER INSTRUCTION MANUAL

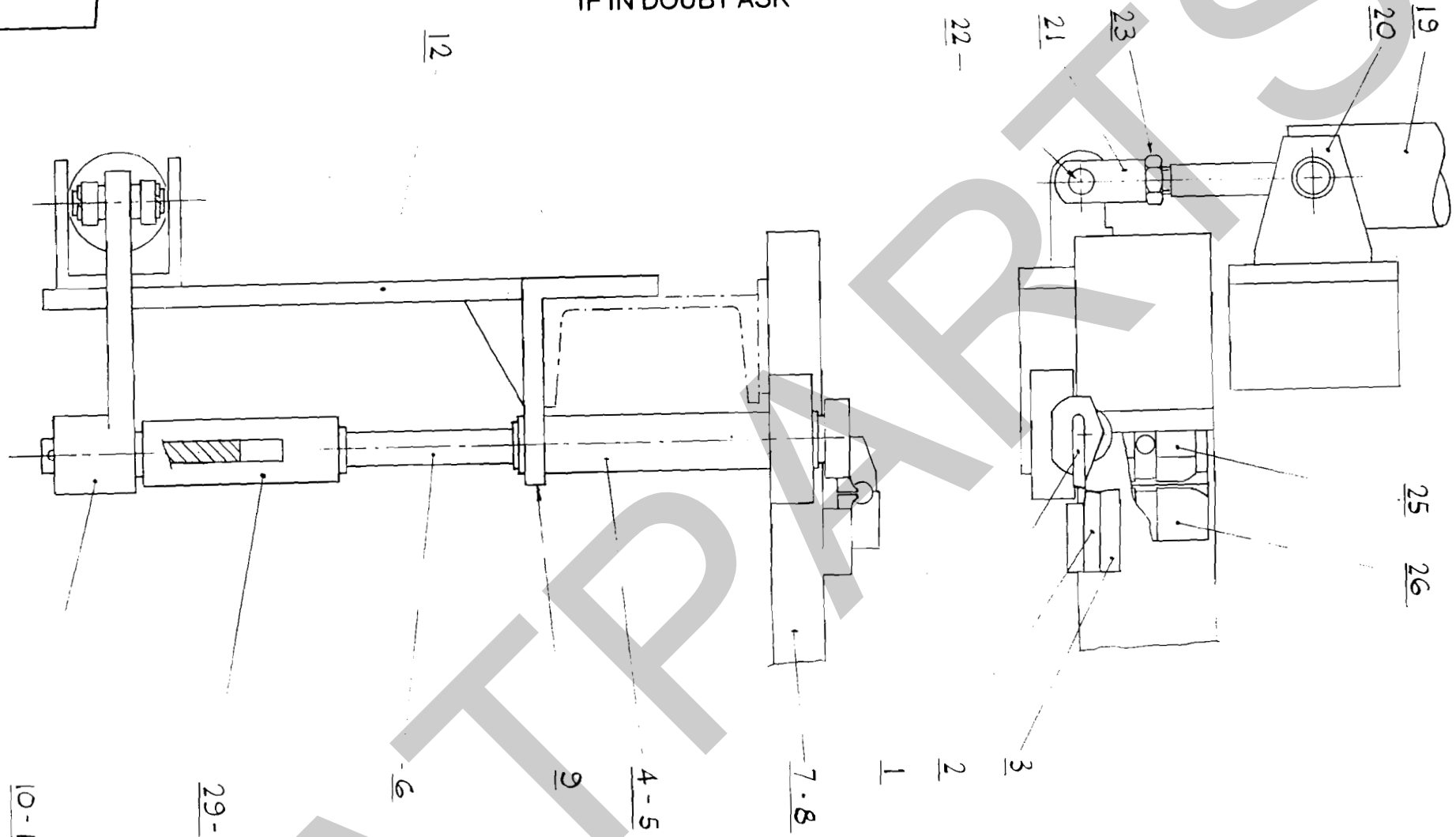
### MODEL FS20 - CUT AND CLENCH ASSEMBLY

Identification of parts on instruction manual drawing no.2 (Lower assembly)

<u>Item</u>	<u>Description</u>	<u>Part no.</u>
1	Rotary cutter	SW4/10/N
2	Fixed cutter	SW4/9
3	Fixed Cutter Holder	SW4/7
4	Tube for Lower Rotary Cutter Holder	10398 EA/CC
5	Oilite Bush	AMC 1622x30
6	Lower Rotary Cutter Holder	2167 EA/CC
7	Lower Cut & Clench Shoe Base	2169 EA/CC
8	Oilite Bush	AMC 1015 x 16
9	Tube Clamp Bracket Lower Unit	2173 EA/CC
10	Lower Cut & Clench Lever	10399 EA/CC
11	Oilite Bush	AMC 1418x18
12	Lower Air Cylinder Bracket	2174 EA/CC
19	Air Cylinder	CDG1 UN40-75
20	Receiving Pivot Bracket	CG-040-24A
21	Fork Knuckle Joint	YG 04
22	Knuckle Joint Pin	1 YG 04
23	Rod End Nut	NTG 04
25	Lower Fixed Jaw	SW4/38 No2
26	Lower Loose Jaw	SW4/38 No3
29	Support Bracket for Lower Rotary Cutter Holder	2180/EA.CC
30	Angle Bracket	Item no2 and 2180/EA.CC

DRAWING N°

IF IN DOUBT ASK



ITEM	DESCRIPTION	N° off	MATL	STOCK N°
WOODFIELD ENGINEERING CO. LTD. Bacup Road, Rossendale, Lancs, BB4 7PA Telephone: 0706 831411 Telex: 635036				
3 <sup>RD</sup> ANGLE PROJECTION		TITLE		
		CUT & CLENCH		
DRN.	WAS	ASSEMBLY (LOWER)		
DATE	6-1-92			
CH'KD		DRAWING N°		
SCALE	1/2	INSTRUCTION MANUAL DRG 2		

DO NOT SCALE

METRIC TOLERANCES - UNLESS SPECIFIED	INCH FRACTIONS AT ± 1/64"	MACHINE AT "C"	REF.	MODIFICATION	DATE	INITIAL	SCALE
TWO PLACE (.XX) ± .25mm THREE PLACE (.XXX) ± .12mm	INCH DECIMALS AT ± .005"	ROUGH MACHINE AT "R"					
METRIC COURSE THREADS TO BS 3692	THREADS TO BS 1580	GRIND AT "G" AS FINISH STATED					

# WOODFIELD ENGINEERING LIMITED

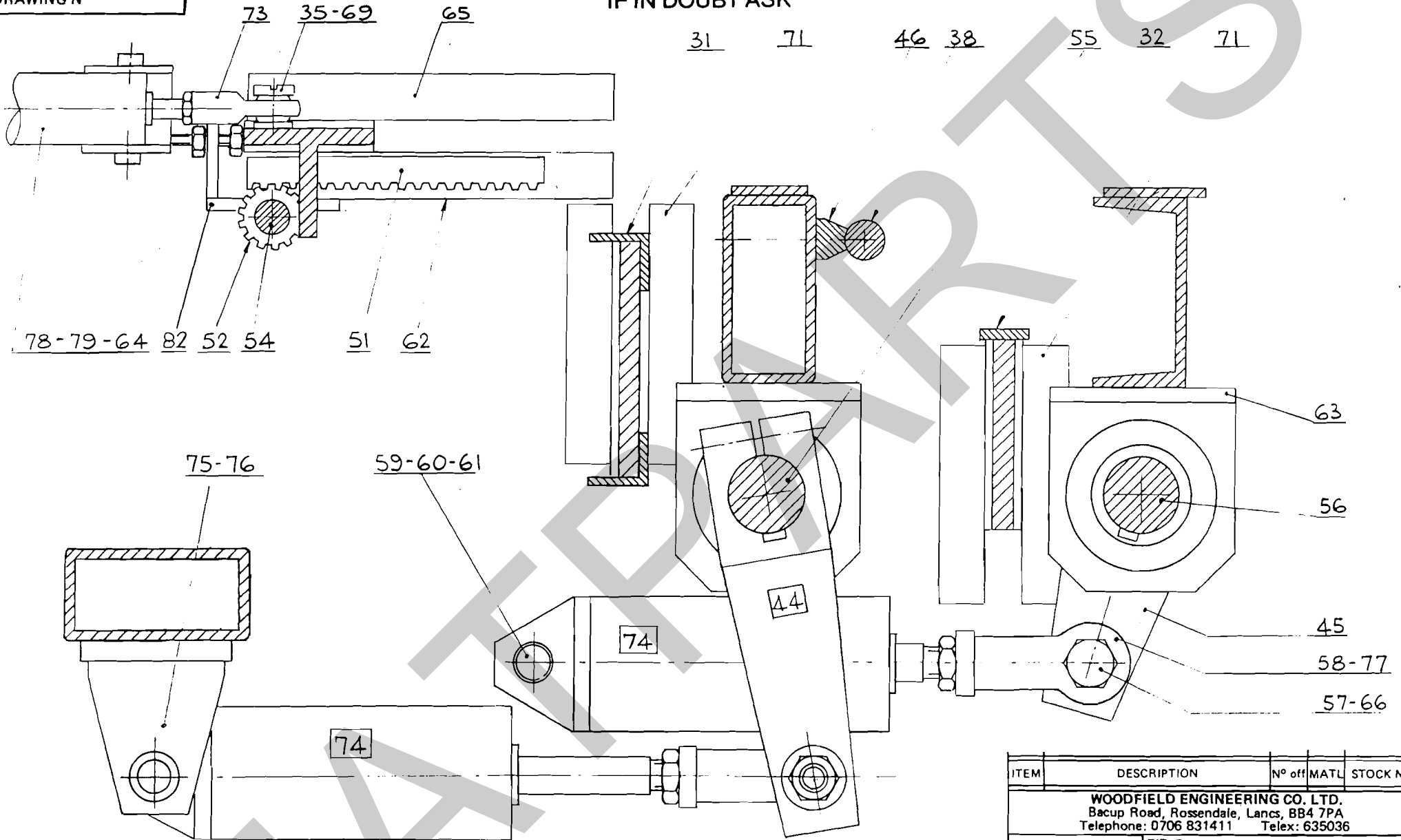
## FS20 ASSEMBLER INSTRUCTION MANUAL

### IDENTIFICATION OF PARTS ON INSTRUCTION MANUAL DRAWING NO.3 MECHANISM FOR INDEXING, EJECTING AND JAW CLOSING

<u>Item no</u>	<u>Description</u>	<u>Part no</u>
31	Jaw Operating Bar	3019/Ea
32	Ejector Bar	3020/EA
35	Shoulder Screw 10mmdia x 16L m8 thread	
38	Linear Bearing Guide Shaft	10392/EA
44	Operating Lever - Jaw Closing Cylinder	2162/EA
45	Operating Lever - Ejector Cylinder	2163/EA
46	Support Linear Bearing Guide Shaft	10350/EA
51	Rack for Indexing Rail	10354/EA
52	Pinion for Indexing	10355/EA
54	Pinion Shaft for Indexing	10357/EA
55	Jaw Operating Shaft	10358/EA
56	Ejector Operating Shaft	10359/EA
57	Pivot Stud	10360/EA
58	Rose Spherical Rod End	MF18G
59	Pivot Stud for Air Cylinder	10361/EA
60	External Circlip D1400 0180 18Dia	D1400
61	Securing Washer - Pivot Stud	10362/EA
62	Rack Support Block	10363/EA
63	Bearing Housing Support Plate items 1 & 2	10364/EA
64	Packing Piece for Indexing Cylinder	10365/EA
65	Retaining Block for Indexing Rail	10366/EA
66	Spacer for Pivot Stud	10368/EA
69	Spacer for MF10 Rod End - Indexing	10380/EA
71	Retaining Block - Jaw & Ejector Operating Bars	10382/EA
73	Rose Spherical Rod End	MF10
74	Air Cylinder CDG1DN 63 x 50	
75	Pivot Bracket	CG-063-24A
76	Pivot Pin	CD-G06
77	Nut	NT-G05
78	Air Cylinder CDG1 TN 32 x 125	
79	Pivot Bracket	CG-032-24A
81	Air Cylinder CDG1DN 63 x 75	
82	Upper and lower indexing stop brackets	10442/EA

DRAWING N°

IF IN DOUBT ASK



DO NOT SCALE

METRIC TOLERANCES - UNLESS SPECIFIED	INCH FRACTIONS AT ± 1/64"	MACHINE AT "M"
TWO PLACE (XX) ± .25mm THREE PLACE (XXX) ± .12mm	INCH DECIMALS AT ± .005"	ROUGH MACHINE AT "R"
METRIC COURSE THREADS TO BS 3692	THREADS TO BS 1580	GRIND AT "G" AS FINISH STATED

REF.	MODIFICATION	DATE	INITIAL

ITEM	DESCRIPTION	N° off	MATL	STOCK N°
<b>WOODFIELD ENGINEERING CO. LTD.</b> Bacup Road, Rossendale, Lancs, BB4 7PA Telephone: 0706 831411 Telex: 635036				
3 <sup>RD</sup> ANGLE PROJECTION		TITLE MECHANISM FOR INDEXING EJECTING + JAW CLOSING.		
DRN	WAS	DRAWING N°		
DATE	17-12-91	INSTRUCTION MANUAL DRG N° 3		
CH'KD		SCALE 1/2		

# WOODFIELD ENGINEERING LIMITED

## FS20 ASSEMBLER INSTRUCTION MANUAL

### IDENTIFICATION OF PARTS ON INSTRUCTION MANUAL DRAWING NO.4

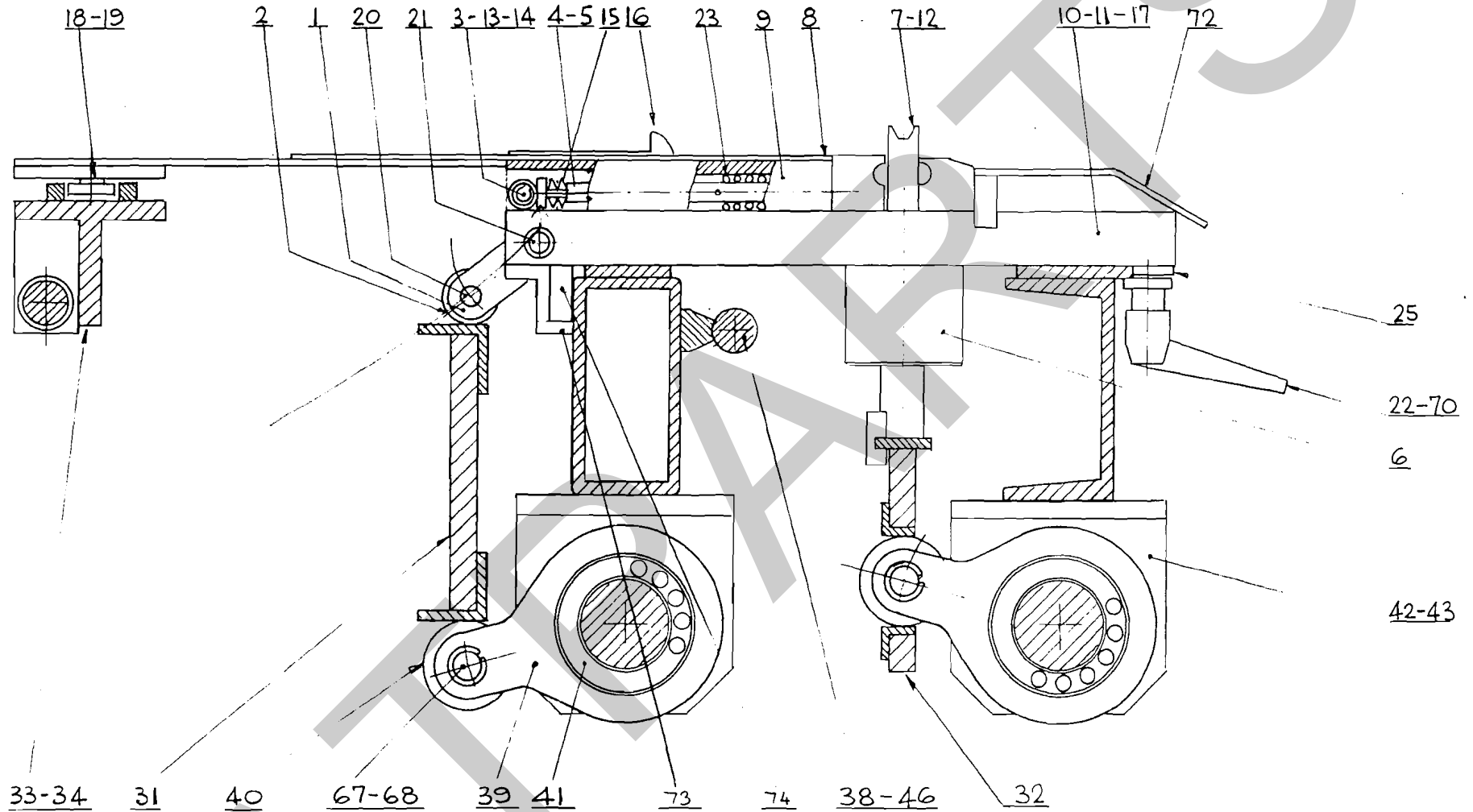
#### STANDARD SHOE ASSEMBLY

<u>Item no</u>	<u>Description</u>	<u>Part no</u>
1	Jaw Toggle	10331/EA
2	Ball Bearing	63000 2RS1
3	Inner Ring	INA IR10x14x16
4	Loose Jaw Spindle	10332/EA
5	Loose Jaw Spindle Insert	10333/EA
6	Guide for Ejector Spindle	10334/EA
7	Clamp for Ejector Spindle	10335/EA
8	Rear Spring Platform	10336/EA
9	Loose Jaw Cap	3014/EA
10	Jaw Base	3015/EA
11	Oilite Bush	AMC 1015x16
12	Spring Ejector Spindle	10337/EA
13	Pin for Bearing	10339/EA
14	External Circlip	D1400 0800-8
15	Disc Springs	12 o/d x 4.2 i/d
16	Indexing Finger	2164/EA
17	Fixed Jaw Datum Block	10353/EA
18	Bearing Stud for Indexing Finger	10369/EA
19	Ball Bearing	608 2 RS1
20	Pin for Bearing - Jaw Toggle	10370/EA
21	Toggle Pin	10371/EA
22	Kipp Clamp Lever	5020802501
23	Compression Spring	FS6/232
25	Jaw Base Clamping Plate	10367/EA
31	Jaw Operating Bar	3019/EA
32	Ejector Bar	3020/EA
33	Indexing Rail	3021/EA
34	Oilite Bush	AMF 1622
38	Linear Bearing Guide Shaft	10392/EA
39	Operating Lever	2160/EA
40	Ball Bearing	6302-2RS1
41	Bikon Locking Element	4000-40-60
42	Bearing Housing	2161/EA
43	Bearing	RHP.1140-40
46	Support - Linear Bearing Guide Shaft	10350/EA
67	Pivot Pin - operating lever	10372/EA
68	External Circlip	D1400 0150
70	Collar for Kipp Clamp Lever	10381/EA
72	Lead Plate for Shoe Base	10385/EA
73	Shoe - rear retaining bracket	10827/FS20
74	Shoe - rear retaining bar	10826/FS20



DRAWING N°

IF IN DOUBT ASK



ITEM	DESCRIPTION	N° off	MATL	STOCK N°
<b>WOODFIELD ENGINEERING CO. LTD.</b> Bacup Road, Rossendale, Lancs, BB4 7PA Telephone: 0706 831411    Telex: 635036				
3 <sup>RD</sup> ANGLE PROJECTION		TITLE <u>STANDARD SHOE ASSEMBLY</u>		
DRN.	WAS			
DATE	19-12-91			
CH'KD		DRAWING N°		
SCALE	1/2	INSTRUCTION MANUAL DRG N°4		

DO NOT SCALE

METRIC TOLERANCES - UNLESS SPECIFIED	INCH FRACTIONS AT ± 1/64"	MACHINE AT "F"
TWO PLACE (XX) ± .25mm THREE PLACE (XXX) ± .12mm	INCH DECIMALS AT ± .005"	ROUGH MACHINE AT "R"
METRIC COARSE THREADS TO BS 3692	THREADS TO BS 1580	GRIND AT "G" AS FINISH STATED

REF.	MODIFICATION	DATE	INITIAL

# WOODFIELD ENGINEERING LIMITED

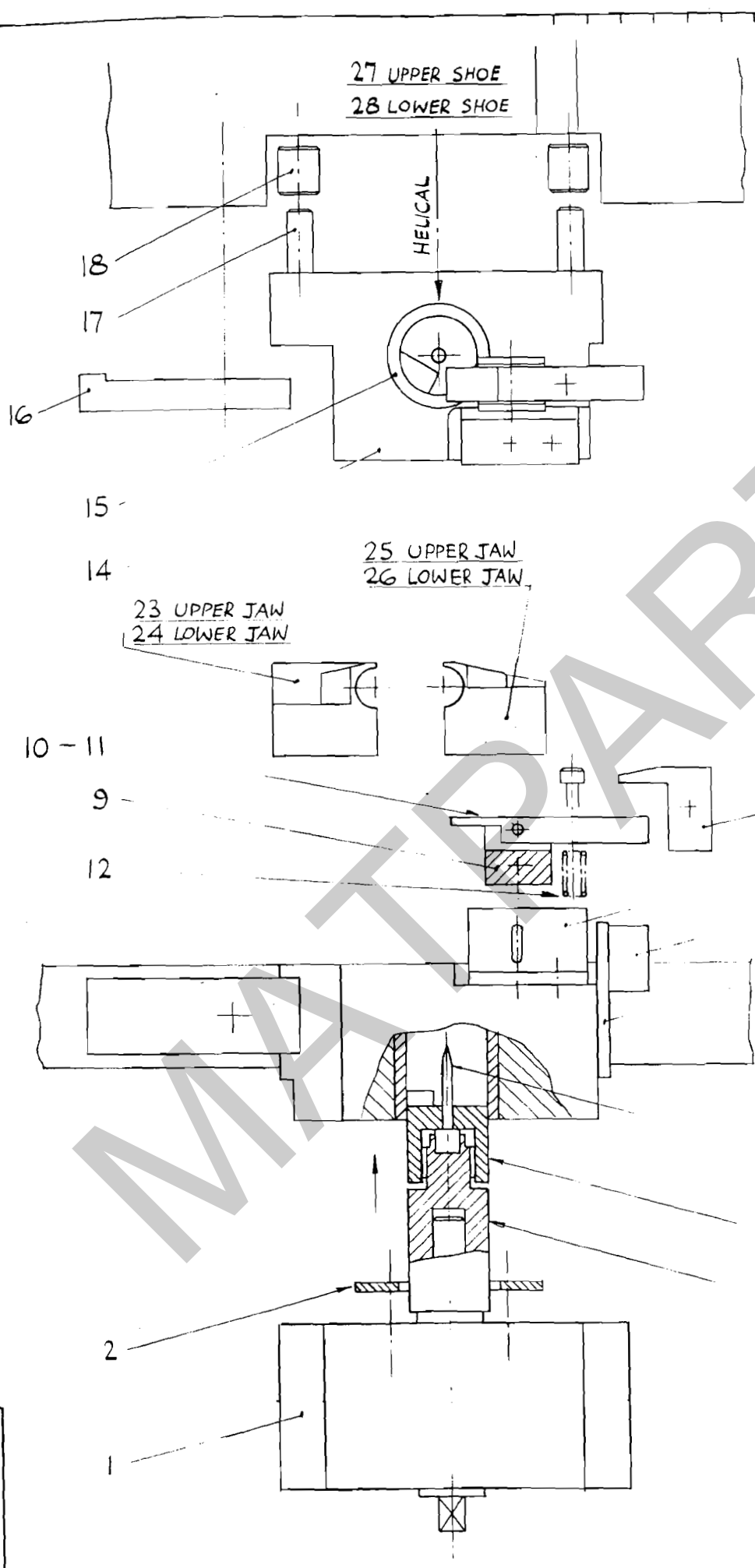
## FS20 ASSEMBLER INSTRUCTION MANUAL

### IDENTIFICATION OF PARTS ON INSTRUCTION MANUAL DRAWING NO.5 (UPPER ASSEMBLY)

<u>Item no</u>	<u>Description</u>	<u>Part no</u>
1	Rotary Actuator	5MC-CDRA1-BW30-180
2	Spacer for Rotary Actuator	10416/QC
3	Clenching Spindle	10404/QC
4	Clenching Head	10431/QC
5	Clenching Pin	10493/QC
6	Sensor Adjustment Plate	10403/QC
7	Sensor - Helical Stop	IS-2002-FROG-IS-5026
8	Adjustment Bracket for Stop Toggle	10402/QC
9	Toggle Carrier	10401/QC
10	Helical Stop Toggle	10400/QC
11	Carbide Tip on Helical Stop Toggle	10400/QC-2
12	Toggle Return Spring	10424/QC
14	Main Body	10395/QC
15	Cast Iron Bush	10406/QC
16	Clenching Unit Clamp	10417/QC
17	Locating Dowel	
18	Locating Bush	
22	Upper Spring Support	10428/QC
23	Upper Loose Jaw	10407/QC-2L
25	Upper Fixed Jaw	10407/QC-3F
27	Upper Clench Shoe	3022/QC/1

IF IN DOUBT ASK

DRAWING NO



ITEM	DESCRIPTION	Nº off/MATL	STOCK Nº
WOODFIELD ENGINEERING CO. LTD. Bacup Road, Rossendale, Lancs. BB4 7PA Telephone: 0706 831411 Telex: 635036			
TITLE		QUICK CHANGE	
ANGLE PROJECTION		GLENCING UNIT	
		ASSEMBLY	
DRN.	DATE	CH'KD	SCALE
		INITIAL	SCALE
		DATE	
		MODIFICATION	
		REF.	
		MACHINE AT "r"	
		ROUGH MACHINE AT "r"	
		GRIND AT "G" AS FINISH STATED	
		INCH FRACTIONS AT ± 1/64"	
		INCH DECIMALS AT ± .005"	
		TWO PLACE (.XX) ± .25mm THREE PLACE (.XXX) ± .12mm	
		METRIC COURSE THREADS TO BS 3692	
		THREADS TO BS 1580	

DO NOT SCALE

DRAWING Nº  
INSTRUCTION MANUAL DRG 5

# WOODFIELD ENGINEERING LIMITED

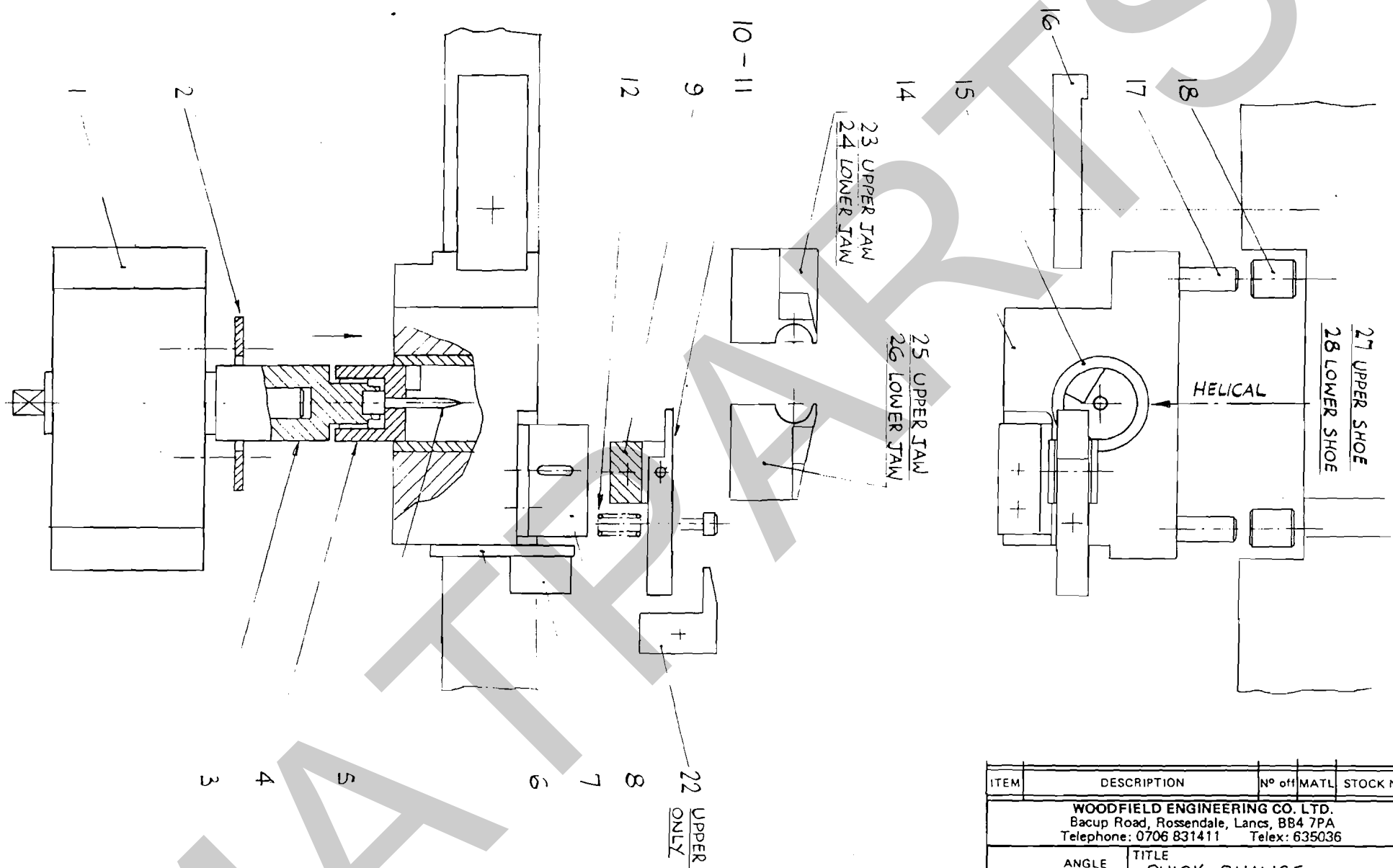
## FS20 ASSEMBLER INSTRUCTION MANUAL

### IDENTIFICATION OF PARTS ON INSTRUCTION MANUAL DRAWING NO.5 (LOWER ASSEMBLY)

<u>Item no.</u>	<u>Description</u>	<u>Part no</u>
1	Rotary Actuator	5MC-CDRA1-BW30-180
2	Spacer for Rotary Actuator	10416/QC
3	Clenching Spindle	10404/QC
4	Clenching Head	10431/QC
5	Clenching Pin	10493/QC
6	Sensor Adjustment Plate	10403/QC
7	Sensor - Helical Stop	IS-2002-FROG-IS 5026
8	Adjustment Bracket for Stop Toggle	10402/QC
9	Toggle Carrier	10401/QC
10	Helical Stop Toggle	10400/QC
11	Carbide Tip on Helical Stop Toggle	10400/QC-2
12	Toggle Return Spring	10424/QC
14	Main Body	10395/QC
15	Cast Iron Bush	10406/QC
16	Clenching Unit Clamp	10417/QC
17	Locating Dowel	1/4 x 1.1/4/SS
18	Locating Bush	PB4
24	Lower Loose Jaw	10407/QC-3L
26	Lower Fixed Jaw	10407/QC-2F
28	Lower Clench Shoe	3023/QC/1

DRAWING N<sup>o</sup>

IF IN DOUBT ASK



ITEM	DESCRIPTION	N <sup>o</sup> off	MATL	STOCK N <sup>o</sup>
<b>WOODFIELD ENGINEERING CO. LTD.</b> Bacup Road, Rossendale, Lancs, BB4 7PA Telephone: 0706 831411 Telex: 635036				
ANGLE PROJECTION		TITLE <b>QUICK CHANGE                      CLENCHING UNIT                      ASSEMBLY</b>		
DRN.				
DATE				
CH'KD				
SCALE				
REF.	MODIFICATION	DATE	INITIAL	
DRAWING N <sup>o</sup> INSTRUCTION MANUAL DRG 5				

DO NOT SCALE

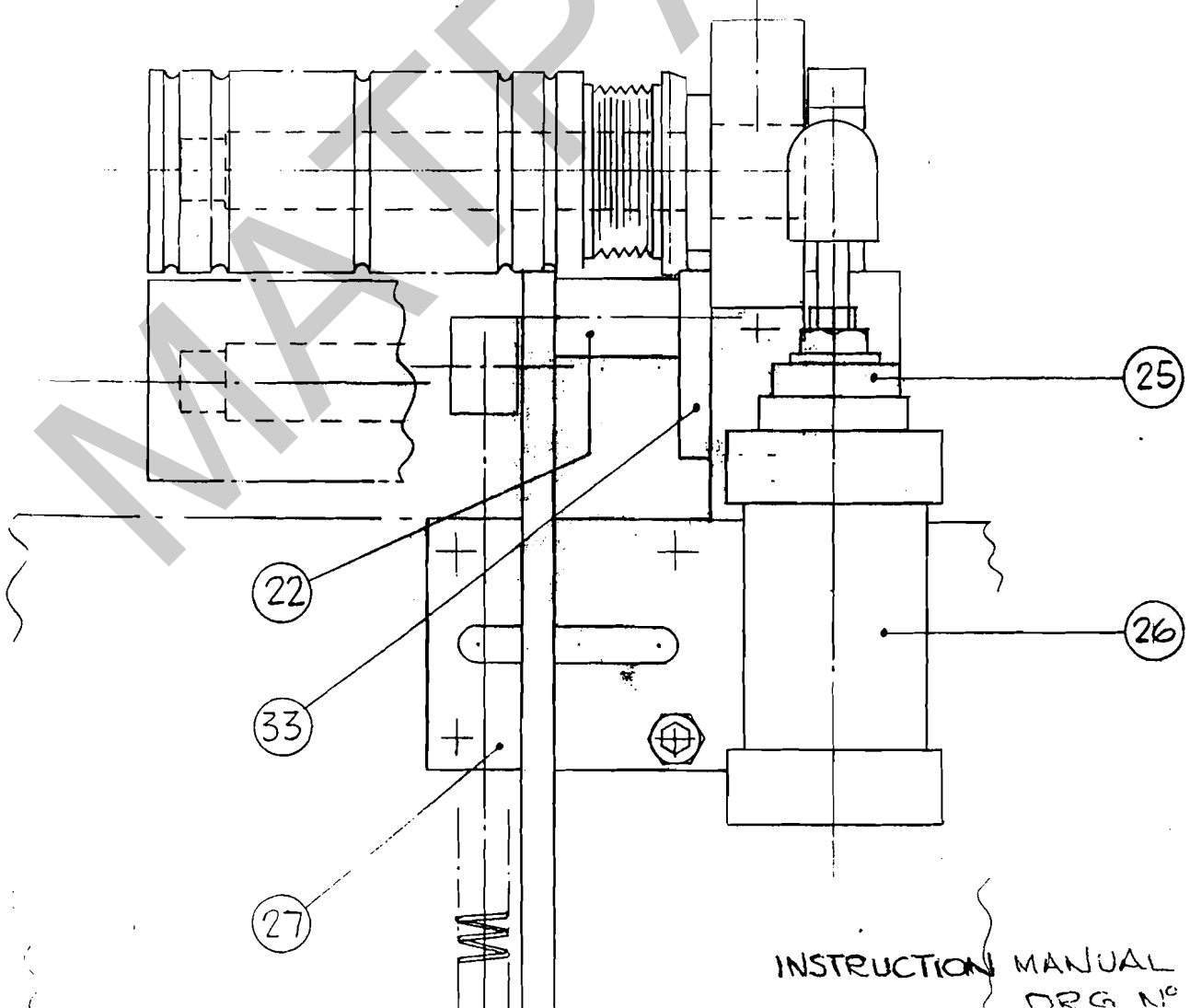
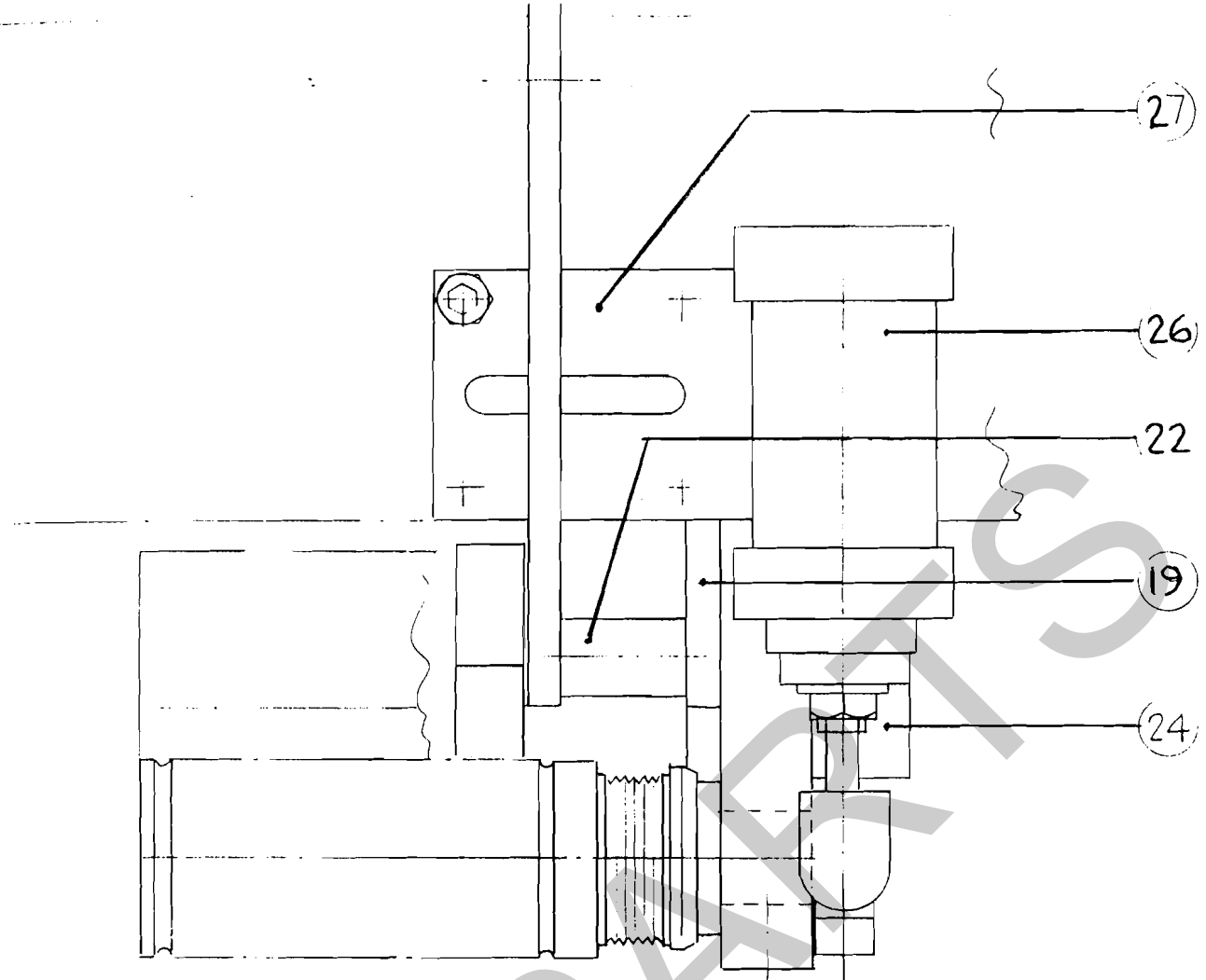
METRIC TOLERANCES - UNLESS SPECIFIED	INCH FRACTIONS AT $\pm 1/64''$	MACHINE AT "C"
TWO PLACE (XX) $\pm .25$ mm THREE PLACE (XXX) $\pm .12$ mm	INCH DECIMALS AT $\pm .005''$	ROUGH MACHINE AT "A"
METRIC COARSE THREADS TO BS 3692	THREADS TO BS 1580	GRIND AT "G" AS FINISH STATED

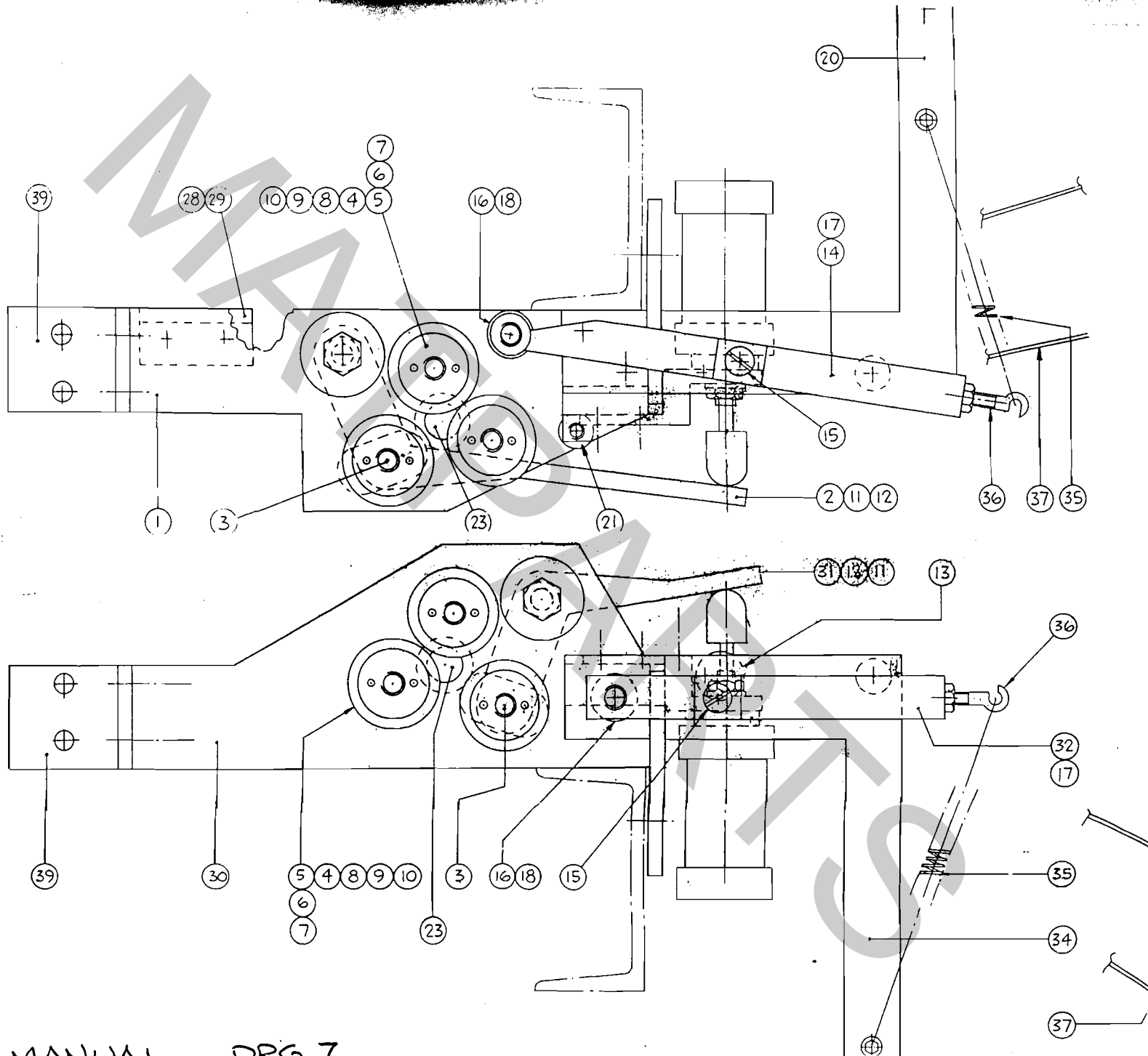
# WOODFIELD ENGINEERING LIMITED

## FS20 ASSEMBLER INSTRUCTION MANUAL

### IDENTIFICATION OF PARTS ON INSTRUCTION MANUAL DRAWINGS 6 & 7 (SPINNER ROLLER DRIVE)

<u>Item</u>	<u>Drg. no.</u>	<u>Description</u>	<u>Qty</u>
1	2225/FS20	Upper Spinner Plate	1
2	10623/FS20	Upper Loose Arm	1
3	10621/FS20	Moving Roller Spindle	2
4	10620/FS20	Fixed Roller Spindle	4
5	2277/FS20	Large Spinner Roller No.1	2
6	2277/FS20	Large Spinner Roller No.2	2
7	2277/FS20	Large Spinner Roller No.3	2
8	B.O.	Deep Groove Ball Bearing No. RL4	6
9	B.O.	Needle Bearing No. BH1012	6
10	10834/FS20	Cap for Spinner Roller	6
11	B.O.	1/8" BSP Hex Nut - 5/8" long	2
12	10639/FS20	Loose Arm Pin	2
13	B.O.	Needle Bearing INA No. SCH 1012	1
14	10835/FS20	Upper Tension Lever	1
15	B.O.	Shoulder Screw WDS 615-204	2
16	B.O.	CAM Follower No. CRS16	2
17	B.O.	Oilite Bush No. PM 1010DX	2
18	10646/FS20	Spacer for CAM Follower	2
19	10641/FS20	Upper Tension Plate - Back	1
20	10833/FS20	Upper Tension Plate - Front	1
21	B.O.	CAM Follower No. CRG 10	1
22	10643/FS20	Tension Plate Spacer	4
23	10648/FS20	Extended Funnel Clamp	2
24	10832/1/FS20	Air Cyl. Brkt - Upper (item 1)	1
25	10832/FS20	Air Cyl. Brkt - Lower (item 2)	1
26	B.O.	Air Cylinder No.M546 A/32 fitted with domed Nut	2
27	10625/FS20	Spinner Plate Bracket	2
28	2289/1/FS20	Cleat for Upper Spinner Plate	1
29	2289/2/FS20	Cleat for Upper Spinner Plate	1
30	2224/FS20	Lower Spinner Plate	1
31	10624/FS20	Lower Loose Arm	1
32	10645/FS20	Tension Lever	1
33	10644/FS20	Lower Tension Plate - Back	1
34	10642/FS20	Lower Tension Plate - Front	1
35	B.O.	Spring for Tension Lever No.MS2/11	2
36	B.O.	Eye Bolt - 1/4" BSF WDS FS6/723 (Modified)	2
37	B.O.	Poly Belt -9/16" Wide 5 Grooves No. 340 J 6	2
39		Rear Spinner Bracket	2

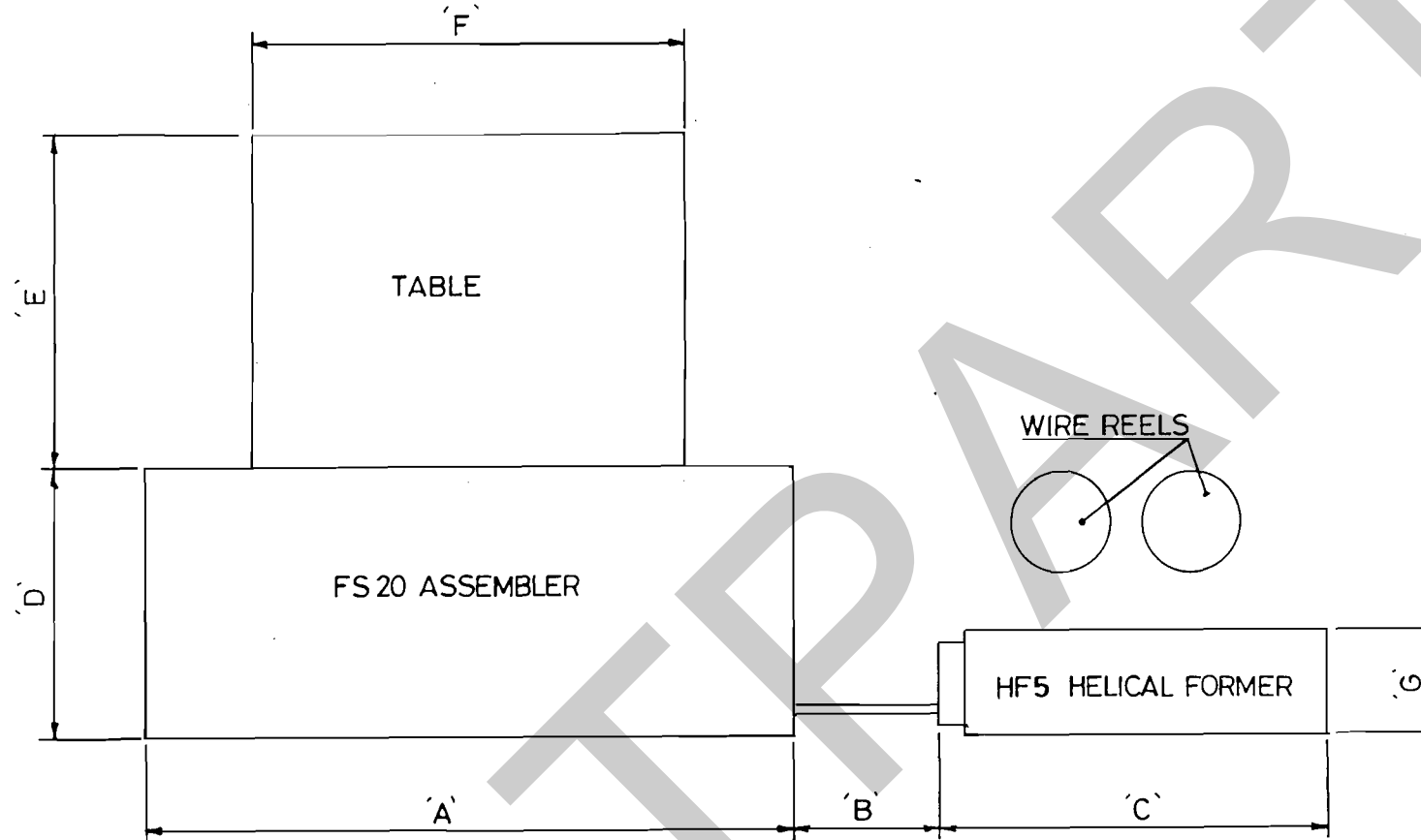






DRAWING N° 10822/FS20

IF IN DOUBT ASK



	MODEL 1500	MODEL 2000
A	2500	
B	560	
C	1480	
D	1040	
E	1300	
F	1680	
G	410	

DO NOT SCALE

METRIC TOLERANCES UNLESS SPECIFIED	INCH FRACTIONS AT ± 1/64"	MACHINE AT "F"	REF.	MODIFICATION	DATE	INITIAL	SCALE
TWO PLACE (.XX) ± .25mm THREE PLACE (.XXX) ± .12mm	INCH DECIMALS AT ± .005"	ROUGH MACHINE AT "RF"					
METRIC COURSE THREADS TO BS 3692	THREADS TO BS 1580	GRIND AT "G" AS FINISH STATED					

ITEM	DESCRIPTION	N° off	MATL	STOCK N°
<b>WOODFIELD ENGINEERING CO. LTD.</b> Bacup Road, Rossendale, Lancs, BB4 7PA Telephone: 0706 831411 Telex: 635036				
ANGLE PROJECTION		TITLE		
		<b>FS 20 FLOOR PLAN</b>		
DRN.	JW			
DATE	19-1-93			
CH'KD				
		DRAWING N°		
		10822/FS20		