'Wadkin' Through Feed Four Side Planing Machine and Moulder

Model GS

M/C No.
TEST No.

Instruction Manual

INSTRUCTION MANUAL

WADKIN

THROUGHFEED FOUR SIDE
PLANING MACHINE AND MOULDER

MODEL GS

PREFACE

Health and Safety
Safeguarding machines

PREFACE

IMPORTANT

IT IS OUR POLICY AND THAT OF OUR SUPPLIERS TO CONSTANTLY REVIEW THE DESIGN AND CAPACITY OF OUR PRODUCTS. WITH THIS IN MIND WE WOULD REMIND OUR CUSTOMERS THAT WHILE THE DIMENSIONS AND PERFORMANCE DATA CONTAINED HEREIN ARE CURRENT AT THE TIME OF GOING TO PRESS, IT IS POSSIBLE THAT DUE TO THE INCORPORATION OF THE LATEST DEVELOPMENTS TO ENHANCE PERFORMANCE, DIMENSIONS AND SUPPLIERS MAY VARY FROM THOSE ILLUSTRATED

THIS MANUAL IS WRITTEN AS A GENERAL GUIDE. DUE TO THE NUMBER OF VARIATIONS (OPTIONS) AVAILABLE A TYPICAL MACHINE IS SHOWN TO ILLUSTRATE THE MAIN FEATURES.

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HEALTH AND SAFETY

This machine is designed and constructed using the principles of safeguarding and practical guidance contained in the British Standard Codes of Practice BS5304: 1988 "Safeguard of machinery", BS6854: 1987 "Safeguard woodworking machines" and current guidance issued by the Health and Safety Executive.

The Health and Safety at Work etc Act 1974 places duties in designers, manufacturers and suppliers to ensure that:-

1. Articles supplied for use at work are, so far as is reasonably practicable, safe and without risks to health during setting, use, cleaning and maintenance.

2 Persons supplied with the articles are provided with adequate information about the use for which they are designed, and about conditions necessary to ensure that they will be safe and without risks to health.

These duties are transferred to you if you resupply the machine by way of sale, lease, hire or hire-purchase.

Persons who install this machine for use at work have a duty under the Health and Safety at Work etc Act 1974, to ensure so far as is reasonably practicable, that nothing about the way in which it is installed makes it unsafe or a risk to health. This includes such aspects as correct assembly, electrical installation, construction of enclosures, fitting of guards and exhaust ventilation equipment. When installing the machine, consideration must be given to the provision of adequate lighting and working space.

The legal duties of designers, manufacturers, importers, suppliers, erectors and installers are explained in the free Health and Safety Executive leaflet IND (G) 1 (L) 1987.

The machine is supplied complete with all necessary safeguards to enable the user to comply with the Woodworking Machines regulations 1974. Details of correct installation and use, together with guidance on fitting and proper adjustment of guards are described in Sections 1 to 4 of this manual.

You are reminded that the Woodworking Machines Regulations place absolute legal duties on employers and employees to ensure that guards and any other safety devices are securely fitted, correctly adjusted and properly maintained.

Repairs and maintenance must only be undertaken by suitably qualified and competent technicians. Ensure that all power supplies are isolated before any maintenance work commences. Instructions of routine maintenance are given in Section 4 of this manual.

Machine operators must have received sufficient training and instruction as to the dangers arising in connection with the machine, the precautions to be observed and the requirements of the Woodworking Machines Regulations which apply, except where they work under the adequate supervision of a person who has a thorough knowledge and experience of the machine and the required safguards.

Persons under the age of 18 years must successfully complete an approved course of training before operating this machine at work, unless participating in a course of training under adquate supervision. (N.B. This paragraph is only relevant to; circular sawing machines, any sawing machines fitted with a circular blade, any planing machine for surfacing which is not mechanically fed or any vertical spindle moudling machine.)

Before commencing work, ensure that the cutters/ blades are, set to cut in the correct direction, securely fitted, sharp, and are compatible with the machine and spindle speed.

Dust

Wood dust can be harmful to health by inhalation and skin contact and concentrations of small dust particles in the air can form an explosive mixture. These concentrations usually occur in dust extraction equipment which may be destroyed unless explosion precautions have been taken in the design and installation of the equipment.

Employees have duties under the Factories Act 1961 and Health and Safety at Work etc Act 1974 to control wood dust in the workplace and from 1st October 1989 more specific requirements will be imposed by the Control of Substances Haxardous to Health Regulations 1988.

Employers should carry out an adequate assessment of the possible risks to health associated with wood dust to enable a valid decision to be made about the measures to control the dust. It may be necessary to provide effective exhaust appliances.

Prevention or control of wood dust exposure should so far as is reasonably practicable, be achieved by measures OTHER than the provisions of personal protective equipment.

Airborne dust levels should not exceed 5 mg/ cub.m

Further information and reference to pratical guidance are contained in the following free leaflets from the Health and Safety Executive:-

Wood dust: Haxards and precuations	IND(S) 10 (L) 1987
Control Hardwood Dust	IND(S) 21 (L) 1988

Noise

Noise levels can vary widely from machine to machine depending on conditions of use. Persons exposed to high noise levels, even for a short time, may experience temporary partial hearing loss and continuous exposure to high levels can result in permanent hearing damage. The Woodworking machines Regulations require employers to take reasonably practicable measures to reduce noise levels where any person is likely to be exposed to a continuous equivalent noise level of 90 dB(A) or more, over an 8 hour working day. Additionally, suitable ear protectors must be provided, maintained and worn.

An adequate assessment of likely noise exposure should be made using manufacturers date and if necessary, a noise survey should be carried out by a competent person. It may be necessary to construct a suitable noise enclosure, in which case professional advice should be saught.

Machines identified as generating unhealthy noise levels should be appropriately marked with a warning of the need to wear hearing protection and it may be necessary to designate particular areas of the workplace as "Ear protections zones". Suitable warning signs are specified in the Safety Signs Regulations 1980.

Further information and reference are contained in the free Health and Safety Executive leaflet - Noise at Woodworking Machines IND(S) 22(L) 1988.

SAFEGUARDING MACHINES

To comply with the Woodworking Machines Regulations 1974, operators must ensure that they fully understand the instructions given and have received sufficient training in the use of the machine and the particular safety instructions to be observed.

NOTE: Persons under the age of 18 years must not operate the machine except under supervision during a course of training.

BEFORE OPERATING THE MACHINE ENSURE THAT:-

All guards and fences are securely fitted and correctly adjusted in accordance with the Regulations.

Cutters / Blades are the correct type and rotate in correct direction of cut, are sharp and securely fastened.

Correct spindle speed is selected for the cutter equipment.

Loose clothing is either removed or fastened and jewellery removed.

Suitable jigs and push sticks are available as appropriate.

Sufficient working space is provided and lighting is adequate.

All dust extraction equipment is switched on, properly adjusted and working efficiently.

DURING MACHINING:-

Wear suitable protective equipment, e.g. goggles, ear defenders, and dust mask.

Stop the machine before making adjustments or cleaning chips from the work area.

Keep the floor area around the machine clean and free from wood refuse.

Do not allow the floor to become slippery with oil or grease

Report immediately to a person in authority, any machine malfunction or operator hazard. Do not attempt to repair the machine unless qualified to do so.

Ensure all power sources are isolated before commencing any maintenance work

WARNING: Failure to comply with the Regulations is a criminal offence and could result in legal proceedings.

SECTION 1 GENERAL DESCRIPTION

OPERATING PRACTICE

General notes on all models of Wadkin Planing and Moulding Machines

A planing and moulding machine produces planed or moulded surfaces on all four sides of lengths of timber, both hard and softwood, at feed speeds determined by the cutter equipment and quality of surface finish requried.

A series of 'ridges' (cutter marks) is created on the surface of the timber as it is moved past a rotating cutterblock (see Fig 1). The quality of surface finish is determined by the number of knife marks per 25mm (1") (the pitch of the cutter marks). The closer the pitch the better the quality of surface finish.

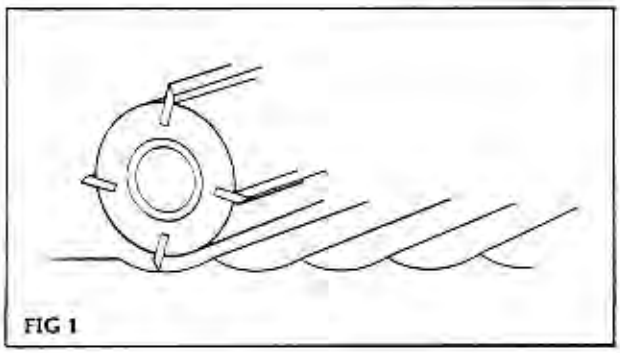


FIG 1

From experience a good quality surface finish has knife marks at a pitch of 1.5 to 2mm. Reducing the pitch improves the surface finish but increases the wear on the cutters, increasing the pitch reduces the quality.

The number of cutter knives in a cutterblock will only be effective when all are rotating in precisely the same cutting circle. Two main factors influence this.

a. The fit of the cutterblock on the spindle
b. The concentricity of grinding

The conventional method of mounting a cutterblock is to lock a plain bore block on to a plain ground spindle with a locknut. The tolerances in each component give a possible 0.05mm (0.002") clearance in the bore and thus eccentric running (see Fig 2).

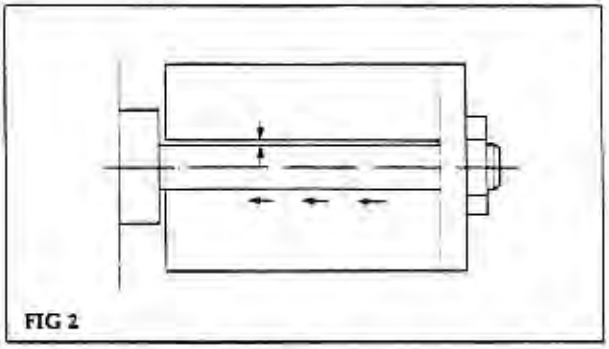


FIG 2

The Wadkin hydrofix locking system eliminates this clearance by pressurising the bore of the cutterblock onto the spindle (see Fig 3).

Axial locking is not required and a simple safety collar is recommended to prevent the cutterblock moving axially, or rotating on the spindle, if the hydraulic pressure is not applied.

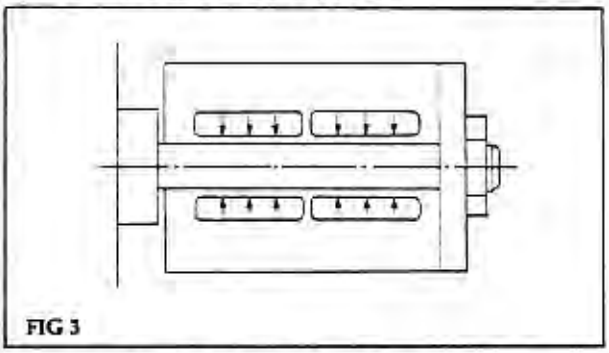


FIG 3

Because the Hydrofix locking is also used while the knives in the cutterblock are ground in the toolroom, it can be seen that the high accuracy of the grinding process is transferred directly to the planing and moulding machine. This accuracy, together with the true running of the precision spindle of the moulder, reduces the running of the knives to within 0.002 to 0.005mm of the true cutting circle. However, this minimum run-out is still such that only one knife leaves a finishing cut, no matter how many are in the block.

To ensure that all the knives in a cutterblock run in an absolutely true cutting circle, the tecnique of jointing is used, in which the jointing 'stone' trues all the knives while rotating at cutting speed in the planing and moulding machine (see Fig 4).

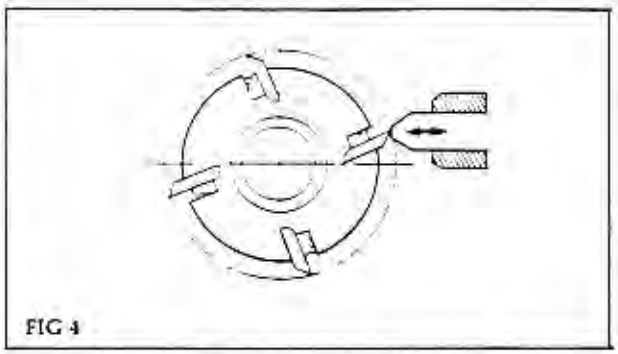


FIG 4

It can be seen that for a given spindle speed and quality of surface finish (pitch of knife marks), the feed speed may be increased in direct relationship to the number of knives in the cutterblock.

Cuttermark pitch = Feed speed in mm per min / Block rpm x No of cutters

For example 12 x 1000 / 6000 x 1 = 2m pitch

for a spindle running at 6000 rpm and a feed speed of 12m/min and unjointed (1 knife finishing)

Jointing a 4 knife block and increasing the feed speed to (4x12) ie: 48M/min gives the same resulting pitch (finish).

Jointing can be carried out on straight planing blocks - 'straight' jointing, and on profile blocks - 'plunge' jointing.

The process of jointing, which can be repeated several times, produces a heel on the knives. In the interests of quality this must not be allowed to exceed a certain width. This is approx 0.5mm on softwood and 0.7mm on hardwood (see Fig 5).

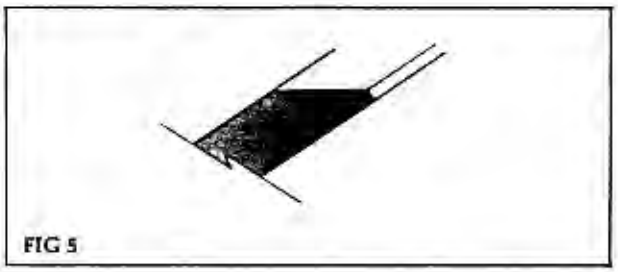


FIG 5

Both high speed steel and carbide knives may be jointed but require a different composition of jointing stone.

An alternative method of increasing output is to increase the spindle speed thus permitting a faster feed speed for a given quality of surface finish. 'Wadkin' can offer alternative spindle speeds up to a maximum of 15000 rpm. This highest spindle speed, achieved with very high precision, lubricated for life bearings, permits a 2 1/2 x (250%) increase in output without jointing.

Typical surface finish pitch values for different applications are listed:

Sawmilling	1.5 to 2.5mm
Joinery	1 .5 to 2.0mm
Strip moulding	1.3 to 2.0mm
Furniture	1.0 to 1.5mm

Machine Feed Systems

Push Feed (Fig 6)

This original method of feeding a planing and moulding machine is still provided, and consists of two top driven and two opposed bottom driven feed rolls at the infeed end of the machine. An idle roller and pad pressures between the cutterheads controls the timber down to the bed and across to the fence as it passes through the machine. It follows that if bowed or twisted stock is fed to the cutters, that while a perfect profile will be produced, the component will be as twisted or bowed as it entered.

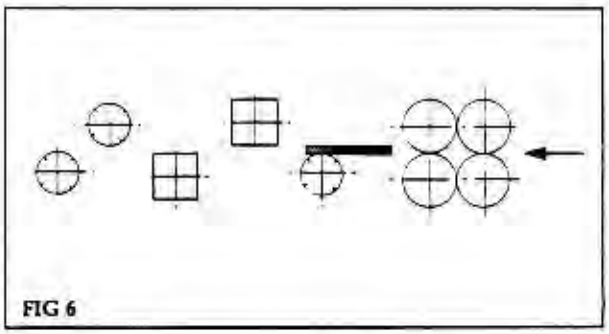


FIG 6

The pushfeed machine has the disadvantage that the last piece of timber is always left in the machine; traction stops as the trailing end leaves the feedworks. The last piece can only be retrieved by following with a scrap length or by reverse feeding, in which case the component is unfinished.

Through feed (fig 7)

Through feed was developed to overcome the handicap of the last piece remaining in cut, and to eliminate the heavy top and side pressures.

Drive rolls between each cutterhead feed the components through the machine.

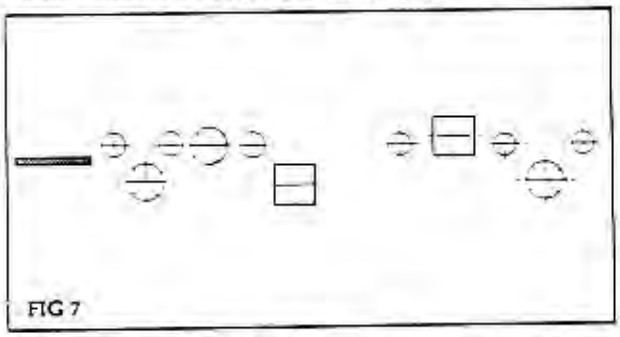


FIG 7

A long infeed table before the first bottom head, together with the much lighter loading on the timber, enables straightening of the component ie: the underside being straightened (surfaced) at the first bottom head, and the edge (fence side) being straightened at he first side head (see Fig 8).

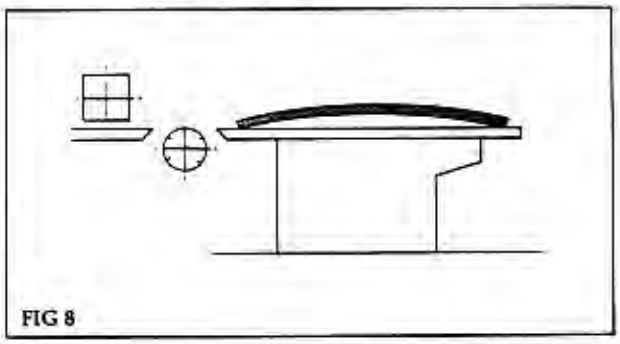


FIG 8

An alternative method of straightening combines underside and fence side straightening, using a single cutterblock, planing the underside in the normal way and machining a reference edge with a rebating disc on the same block (see Fig 9).

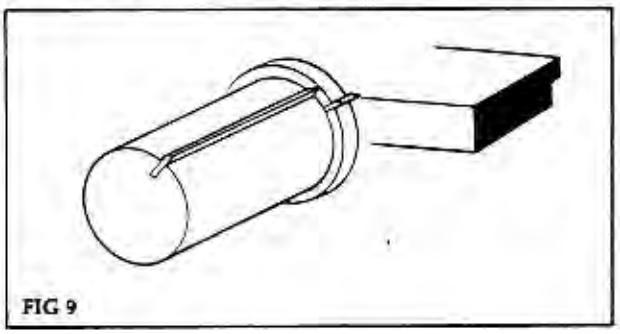


FIG 9

The above straightening techniques are most successful on timber which is bowed and has square ends, typical of softwood. For timber which is twisted and has out-of-square ends, typical of some hardwoods, an alternative technique is provided.

Grooved bed straightening (Fig 10)

In this design, grooving cutters on the first bottom head permit support in the form of rails right through the cut, thus preventing 'dipping in' on the twisted timber, or 'buckling' as out-of-square ends come into contact with each other. The grooves on the underside are subsequently machined out on a second bottom head, which is obligatory. Fitting a standard lip plate and cutterblock converts the machine to conventional use.

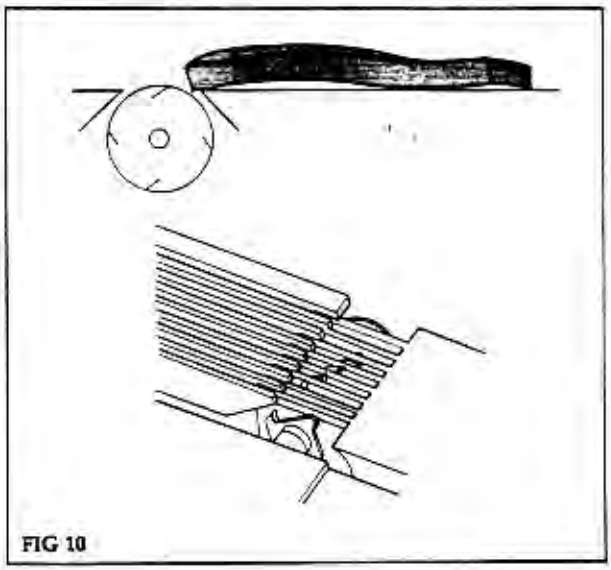


FIG 10

Hopper Feeding (Fig 11)

To enable the operator to feed timber at relatively fast feed speeds and still maintain butt up, (this may be difficult on short lengths), various types of hopper feed are available.

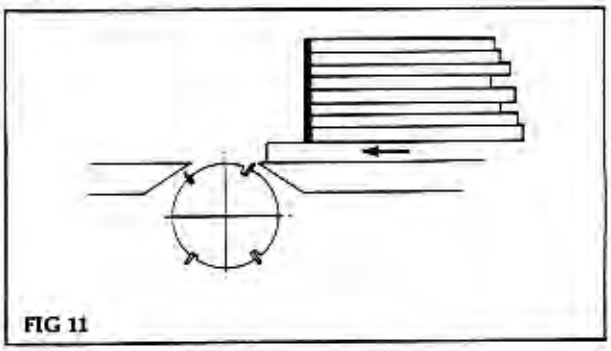


FIG 11

Components are stacked in a hopper at the infeed end of the machine and automatically fed one at a time from the bottom of the stack at a rate to ensure 'butt-up'. A slipping device prevents the hopper feed trying to overide the machine feed.

Feeding at very high feed speeds, typically on flooring, cladding etc, also presents problems to the operator, again a special feeding device (fast feed table Fig 12) can be provided.

The fast feed table, in line with the machine feed, receives timber from a tilt hoist and cross chains, the driven rollers in the fast feed table and an overhead hydraulically driven nip roll ensure 'butt up' before entry into the machine feedworks, a slipping arrangement prevents overiding.

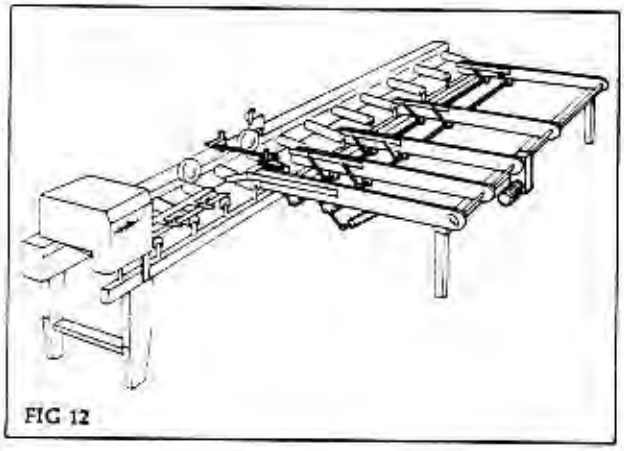


FIG 12

Outfeed Equipment

Generally used on highfeed speed machines, this equipment can be provided at the outfeed end of 'Wadkin' moulders to transfer to another process, ie: stack, bundle, wrap, count, etc. Outfeed equipment can be provided and programmed to print on each component some identifying information. eg. Job No. Date, etc. Combinations of these facilities enable the finished components to be pressented in a variety of ways at the outfeed end of the machine.

Extra Head Positions

Typically a planing and moulding machine has four heads to machine all four faces, these can be augmented with the addition of other heads. The most common is a second bottom head to ensure clean up on the underside. Where the amount of timber to be removed is great, or where the mould detail is complex it may be necessary to provide an extra bottom head, available as an option.

Splitting (Fig 13)

Splitting is a common operation, usually done o the last bottom head, and often requiring very large horse powers. Such a head is available and may be fitted with anti kick-back fingers to prevent ejeciton towards the operator. Only one saw can be fitted on the smaller machines, ie. GC.

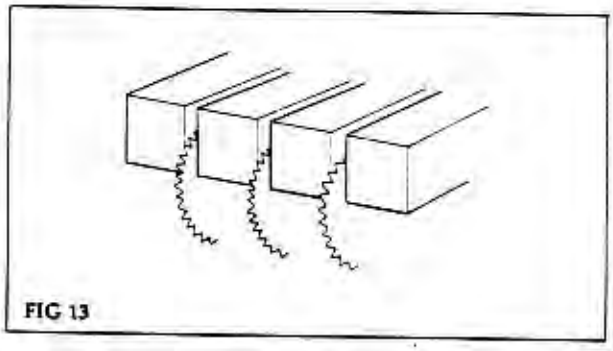


FIG 13

Universal Head

A universal head, either three or four position (always last head on the machine) can be provided to order, or the machine prepared to fit the head at a later date. The three position head may be used as a top head, bottom head or near side head and at any angular position in between. The four position head has the added capability of use as a fence side head.

The universal head gives greater flexibility for splitting and moulding on a conventional machine, and special pressures, chipbreakers, etc can be provided to ensure perfect control of the workpiece.

Dial-a-Size Positioning (Fig 14)

On machines which are used for a large variety of small quantity batches of square dressed material, the set up time can be reduced by fitting Dial-a-Size positioning.

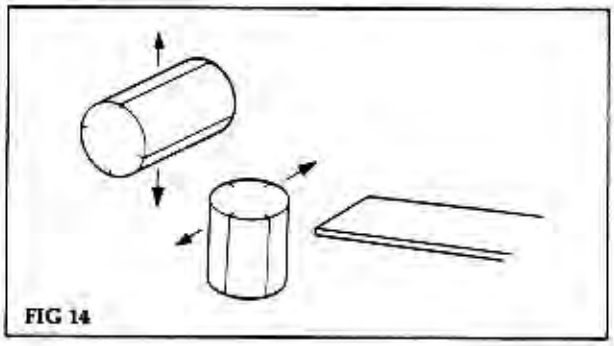


FIG 14

The near side head horizontal adjustment is motorised and fitted with an ecoder, the motorised vertical movement of the top head and feed is also fitted with an encoder.

A programmable memory stores the widths and thicknesses of the workpieces to be produced, and on command the two heads are repositioned to the preset dimensions. In a similar manner, where components of random width are machined (eg. Table tops, see Fig 15)
The machine can be arranged to sense the width of the incoming pieces and automatically move the outside head to the required position.

Whilst being a slow operation, (butt feeding is not possible and the feed speed is slow), the facility does have great advantage to some users.

FIG 15

Feed Enhancement

The 'Wadkin' push feed and through feed systems are the result of years of experience in the planing and moulding industry, and for the great majority of work are exemplary. However, the great variety of timbers available, and the different conditions in which they are presented to the machine is acknowledged in the various options available to enhance feeding and minimise bed wear.

Bed lubrication

A lubricant is introduced to the surface of the machine bed, from a manual or auto pump; this reduces friction, improves feeding capability and reduces bed wear.

An alternative; of introducing air between the timber and the bed of the machine, can be provided for those machines that do not have a second bottom head to machine off the small amount of oil introduced to the underside of the timber, or where the material being machined must not in any circumstances be contaminated with oil.

Feed rolls

The top driven feed rolls of a through feed moulder are normally spring loaded down onto the workpiece. The required amount of load can vary with the nature of the work being run, although as a general rule it must be as light as practicable, and variation in rough timber thickness will of course increase the load as the feed rolls yield more. Adjustment of the loading is done at each individual roll.

Pneumatic loading can be provided; this has a number of advantages. The loading does not vary with any variation in lift, and the amount of loading can be changed more easily, using an air regulator valve.

One regulator controls the loading to rolls before the top head, and the other regulator controls the rolls after to top head.

Noise

Planing and moulding machines,by virtue of the number of cutter heads and the speed of the heads, produce high noise levels, typically between 95dB and 115dB when cutting.

The woodworking machine regulations require that an operator is not to be subjected to noise levels above 90dBA for 8 hours, some precautions are therefore requried and a safety/ acoustic cover can be supplied for this purpose.

It should be noted however, that even with a sound enclosure, under some circumstances, because of 'break out' (at say the infeed end), the noise level at the operating positions will be above 90 dBA.

For personal safety reasons the operator should wear ear defenders.

WARNING Before operating the machine read the Preface and Notice to Operators in section 3, Operating Instructions.

COMMON OPERATING PROBLEMS

When resolving problems, always work in a systematic logical sequence. Work from the infeed end of the machine through to the outfeed end, checking for faults in a progressive manner.

In this way faults will not be overlooked and remedial action can be taken where needed.

Set (spring loaded) top/side pad pressure with minimum amount of lift. Set side guides (not spring loaded) just up to timber; i.e. not clear, not trapping. When feeding wide pieces, on a through feed machine it is normally better to space feed rollers than have a solid bank, (see Setting up the Machine).

FAULT **Timber stops in machine**

Check
Setting of cutterblocks to table and fences.
Amount of pressure applied to feedrolls (pneumatic or spring).
Sharpness of cutters.
Yield of chipbreakers and pad pressures.
Tightness of side guides onto timber.
Oil level of bed lubrication pump (if fitted).
Position of feedrolls on workpiece.

FAULT **Ripples appear on surface of workpiece**

Check
Setting of cutterblocks to table or fences.
Pressure is applied to feedrolls (pneumatic or spring).
Sharpness of cutters.
Chipbreakers are set correctly and have sufficient pressure to control timber.
All locks are applied.
All pressure pads are in contact with timber.
Spindle speed (if two speed spindle fitted).
Tooling is suitable for work.

FAULT **Bumps on infeed or outfeed end of workpieces**

Check
Setting of cutterblocks to table and fences.
Sharpness of cutters.
Chipbreakers are set correctly and have sufficient pressure to control timber.
All locks are applied.
All pressure pads are in contact with timber.
Position of side and top pressure rollers.
Bed and fences for build up of resin or chips.

FAULT **Machine will not straighten timber**

Check
Setting of cutterblocks to table and fences (accurate setting of knife edge to table/fence is critical to obtain perfect straightening).
Sharpness of cutters.
Feed rollers and top/side pressure should not be used before the first bottom head.
Is the amount of cut set at the infeed fence and table adequate for the amount of bow in the timber?
Is the timber to be straightened a stable section?
Is the workpiece within the length of the straightening table and fence?

FAULT **Timber runs away from fence**

Check Position of side pressure roller before first bottom head (if fitted, and section being worked does not require straightening).
Near side head chipbreaker is in contact with timber.
Top idle roller pressures at side head are parallel to fence.
Side guides after fence side head are adjusted correctly.
Mating faces of feed rolls and spacers are clean.

Tooling

When practicable and heads are available, rough out on one head and finish on another, or take part of a mould out on one head and part on another.

Sharp tools produce quality work, therefore change blocks and sharpen knives at regular intervals to obtain best performance. The cutterblocks supplied with the machine are fitted with high speed steel cutter knives, unless otherwise specified. The cutter spindles should not be run at speeds above that indicated.

LEADING PARTICULARS

Principal Dimensions and Capacities

Model	GS220
Maximum size of timber admitted	230mm x 130mm
Maximum size of finished work	220mm x 120mm thick (with 125mm cutterblocks)
Feed speed infinitely variable	6 - 28 metres per min
Pressure adjustment of feed rolls (limit switches for maximum adjustments on rise and fall beam)	6 bar
Diameter of through feed rolls	140mm
Width of feed rolls	2 x 20mm + 1 x 10mm wide and 3 x 20mm + 1 x 40mm steel spacers
Diameter of cutterblock spindles	40mm
Speed of cutterblock spindles	6000 rpm
Diameter of cutting circles	100mm min all heads 125mm max
Maximum diameter of cutting circles (all spindles have vertical and horizontal adjustment)	180mm First Bottom 195mm Side, Top and Second Bottom heads
Maximum cut on First Bottom head	10mm
Maximum cut on First Fence side head	10mm

Output of motors

Feed motor	2.0 kW (3hp)	
Rise and fall motor for beam	0.37 kW (0.5hp)	
Spindle head motors		
First bottom, Fence Side, Near side and Second bottom heads	5.5 kW (7.5hp) (standard)	7.5 kW (10hp) (optional)
Top heads	7.5 kW (10hp) (standard)	11kW (15hp) (optional)

Star delta starting available as on option on all 7.5 kW motors

SECTION 2 INSTALLATION

LIFTING AND TRANSPORTATION

Unloading (Fig 1)

Verify the weight of the machine (**see Installation Data**). Ensure that all lifting equipment used is capable of lifting this weight as a minimum.

To lift the machine, place two 45mm diameter steel rods 1.2 metres long in the holes provided in the machine body (see Fig 1).

Carefully place two short slings of suitable capacity on the crane hook. Keep these as wide apart as possible by inserting wooden chocks between the machine body and the slings to avoid damage. Locate the slings securely on the steel rods.

Moving

In the process of moving, avoid jolting or vibrating the machine. If the ground is flat the machine can be positioned on wooden plinths and moved by rollers instead of lifting.

IMPORTANT: When lifting, the machine has a tendency to tilt backwards (towards the electric motors and the motor mounting brackets). Allowance should be made for this in positioning.

Unpacking

Undo the packing and make sure that damage has not occurred during transit; undo the case of accessories and ascertain that the machine is complete with all fittings.

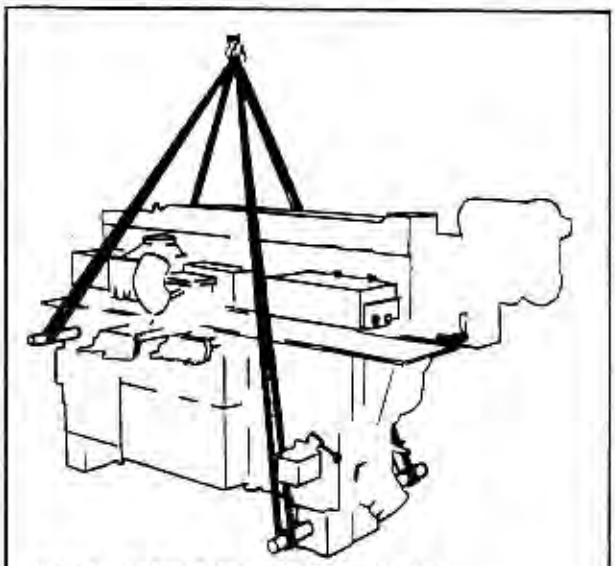


FIG 1 LIFTING THE MACHINE

Cleaning

Before levelling the machine, carefully remove the anti-rust material particularly from the bright parts.

Clean the machine with paraffin or diesel and a soft rag. Do not use a substitute - it may precipitate an explosion.

INSTALLATION DATA

Major Dimensions and Weight

Length	2500mm
Width	1500mm
Height	1550mm
Weight	2000Kg

Location and Foundations

To obtain the best results from the 'Wadkin' woodworking machine it is important that the floor on which the machine is to stand has been prepared and is dry. Level the machine from the middle of the bed between the adjustable screw supports by the use of a spirit level. Place the steel plates supplied with the machine under the adjustable levelling screws.

Suggested Levelling aids:

Straightedge 2 metres long
Feelers (thickness gauges), 0.50, 0.10, 0.15 and 0.2mm
Engineer's spirit level

Levelling longitudinally

Place the spirit level on the table and moving the level lengthwise check any variation. Adjust machine level by use of the adjustment screws in the feet of the machine. Deviation should not be more than 0.2mm.

Levelling transversely

Place the spirit level across the table at right angles to the fence and repeat this action at intervals of 800mm. Total variation at each position should not exceed 0.1mm.

The foundations

The size of the foundations depends upon the specific machine model, format of the heads and disposition of the exhaust outlets and will be provided for individual machines.

If the floor consists of 100mm - 150mm (4 to 6 inches) solid concrete, no special foundation is necessary. M12 'HILTI' type holding down bolts (not supplied with the machine) can be used to secure the machine to the floor.

NOTE: THE MACHINE MUST BE BOLTED DOWN BEFORE USE.

See Foundation Plan for details of floor area required.

Supplies and Services

Electrical Supply

The customer is responsible for and adequate electrical supply. Details of power requirements are provided with the machine.

The machine is delivered with its complete electrical equipment ready for connection.

The electrical connection and schematic diagram are found in the electrical control cubicle of the machine. All that is required is to connect the power supply to the disconnect (isolator) switch at the electrical control cubicle or panel.

POINTS TO NOTE WHEN CONNECTING THE POWER SUPPLY

Check the voltage, phase and frequecny correspond with those on the machine nameplate details.

Check the main fuses are of the correct capacity in accordance with the machine nameplate details.

Connect the incoming supply leads to the appropriate terminals.

Check all connections are sound and that equipment is earthed.

Check the spindle rotation is correct. When looking from the front of the machine the feed rolls should rotate in a clockwise direction. To reverse the rotation on any drive, reverse any two of the line lead connections at the incoming supply.

IMPORTANT: ANY ELECTRICAL MODIFICATIONS SHOULD BE CARRIED OUT BY A COMPETANT ELECTRICIAN

Pneumatic pressure equipment (where fitted).

Where the machine is equipped with pneumatic pressure operated feedrolls, the number of connections are shown on the pneumatic circuit diagram and foundation plan. To make the system operative connect up the air pipes and fittings to a suitable air supply.

The size of the air inlet connection is 1/4in. BSP female.

The size of the pipe is 8mm O.D. x 5mm I.D.

Pressure required is 6 bar (approx 90 psi), see **Operating Instructions** for feed roll pressures.

The air consumption is approximately 235 cu.dm/hr (8.3 cu.feed/hr).

Exhaust (Dust Extraction) Connections

The size of the connections are given on the Foundation and Dust Extraction Plan.

The part of the air extraction pipe fitted to the exhaust hood should be flexible and detachable. The length of the flexible part is dependant on the way the pipe is used and the adjustment required on the work spindle. As a guide use a flexible pipe one metre long for the lower and fence side spindles and two metres for the top and near side spindles.

The flow of air to the exhaust hoods should be approximately 25 to 30 metres per second.

Volume of Air Required

For Horizontal spindles	23.5 cu.metres/min (830 cu.feet/min)
For Vertical Spindles	14.4 cu.metres/min (510 cu.feet/min)

The total volume of air required for the Dust Extraction is directly related to the total number of spindles and will be confirmed on supply of equipment.

Schematic Diagram for Electrical Serives

The electrical wiring and schematic diagram will be in the electrical control cubicle of the machine

SECTION 3 OPERATING INSTRUCTIONS

GENERAL INFORMATION

Safety

The safe operation of woodworking machinery requires constant alertness and close attention to the work in hand.

Read this instruction manual, the Preface, and the Safety Notes carefully before operating the machine.

Blunt cutters often contribute to accidents. An efficient machinist knows when sharpening is necessary, but if there is reluctance to spend time on grinding and resetting, the cutters may run beyond their efficient limits and instead of cutting efficiently and smoothly they will tend to chop and snatch at the workpiece. This not only increases the risk of accidents but also lowers the quality of work.

Customers are strongly advised at all times to use high tensile cutterblock bolts which should be tensioned by means of a torque spanner. When choosing cutterblocks ensure they are suitable for the maximum cutting speed of the machine.

It is recommended that personnel involved with the machine are acquainted with the Woodworking Machines Regulations 1974 and also Booklet No. 41 'Safety in the use of woodworking machines', issued by the Department of Employment and available from Her Majesty's Stationery Office. Also BSI Code of Practice 'Safeguarding Woodworking Machines' Part 1 BS 6854.

Safety Devices

The safety covers and dust hoods must be closed during the time the machine is running. Cover the non-used part of the cutterblocks with the guards provided.

Only remove the feed roller guard when changing rollers and with spindles switched off at the control panel.

Spindles which are run in two directions (ie: Universal head), should be fitted with a locking collar to prevent unforeseen unlocking on mode changeover.

Do not work spindles if the spindle nuts or intermediate collars are not securely tightened.

Only remove the cover of the drive belt housing when changing or retensioning belts. The drive spindle must be stationary before making any adjustments.

WARNINGS

Notice to Operators

Read and follow the guidelines given in **Safeguarding Machines** and **Safety Notes** which are repeated on the front of the machine.

Before operating the machine

Ensure that all guards and fences are securely fitted and correctly adjusted. Guards and other safety devices are NOT to be removed while the machine is in operation. They are there for YOUR SAFETY.

Ensure cutters/blades are the correct type and rotate in correct direction of cut, are sharp and securely fastened.

Correct spindle speed and feed is selected for the cutter equipment.

Remove or fasten loose clothing, confine long hair and remove jewellery, etc.

Ensure suitable jigs and push sticks are available as appropriate.

Ensure sufficient working space is provided and that lighting is adequate.

Switch on all dust extraction equipment, ensure it is working correctly.

During machining

Wear suitable protective equipment, e.g. goggles, ear defenders, dust mask.

Stop the machine before making adjustments or cleaning woodchips from the work area.

Keep the floor area around the machine clean and free from wood refuse.

Do not allow the floor to become slippery with oil or grease.

Report any machine malfunction or operator hazard to a person in authority immediately. Do not attempt to repair the machine unless qualified to do so.

Ensure all power sources are isolated before commencing any maintenace work.

Comply with the Woodworking Machines regulations. Failure to do so could result in legal proceedings.

Machine Controls (Fig 1, Fig 2)

Before starting the machine, operators should familarise themselves with the various controls and their usage.

Check direction of spindle rotation, ensuring that the spindles rotate freely. Check each spindle motor separately.

Check the infeed table raise and lower operation.

The machine has continuous feedworks. When started, timber stock will be fed to the cutter heads until the pass is completed or the machine is stopped. The feed speed is variable and can be adjusted by a handwheel at the drive gearbox to give throughout speeds within the machine range. **Only adjust the variable speed drive while in motion.**

Adjust the variable speed drive unit through the full range once a week to avoid the feed drive mechanism jamming.

The feed rolls have serrated teeth up to the top cutter head after which they are rubber covered. The serrated rolls need to be adjusted to 3mm lower than the thinnest workpiece; the rubber covered rolls should be adjusted to 1mm lower han the workpiece.

The height of the feed roll adjustment is indicated by the graduated scale on the vertical pillar adjacent to the feed table. Adjustment of the feed rolls is made by pressing the pushbuttons marked:

▲ - raise feed rolls

▼ - lower feed rolls

The pushbuttons are positioned on the Electrical Control Panel located at the infeed end of the machine and also at the control station located at the outfeed end of the machine.

The adjustment of the height of the rubber covered (plain) rolls may be made independently to suit the finished workpiece.

The panel mounted control station at the infeed end of the machine contains the following features.

START-STOP Pushbuttons;
with indicator light, for each spindle.
START-STOP Feed Pushbutton;
with indicator light.
FORWARD-REVERSE
(inch) Feed Pushbuttons.
RAISE-LOWER Pushbuttons;
for beam adjustment.
MASTER STOP (Emergency) button.
REVERSING switch;
for universal head operation.

Machine enclosure

The machine can be fitted with a close fitting GRP enclosure. When setting up the machine, be aware of any interlocks fitted. Do not return machine to service until all safety fittings are operational.

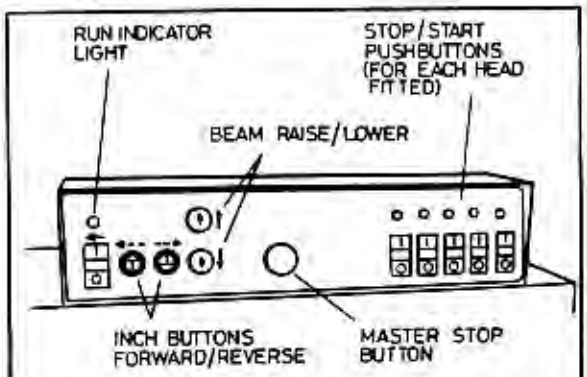
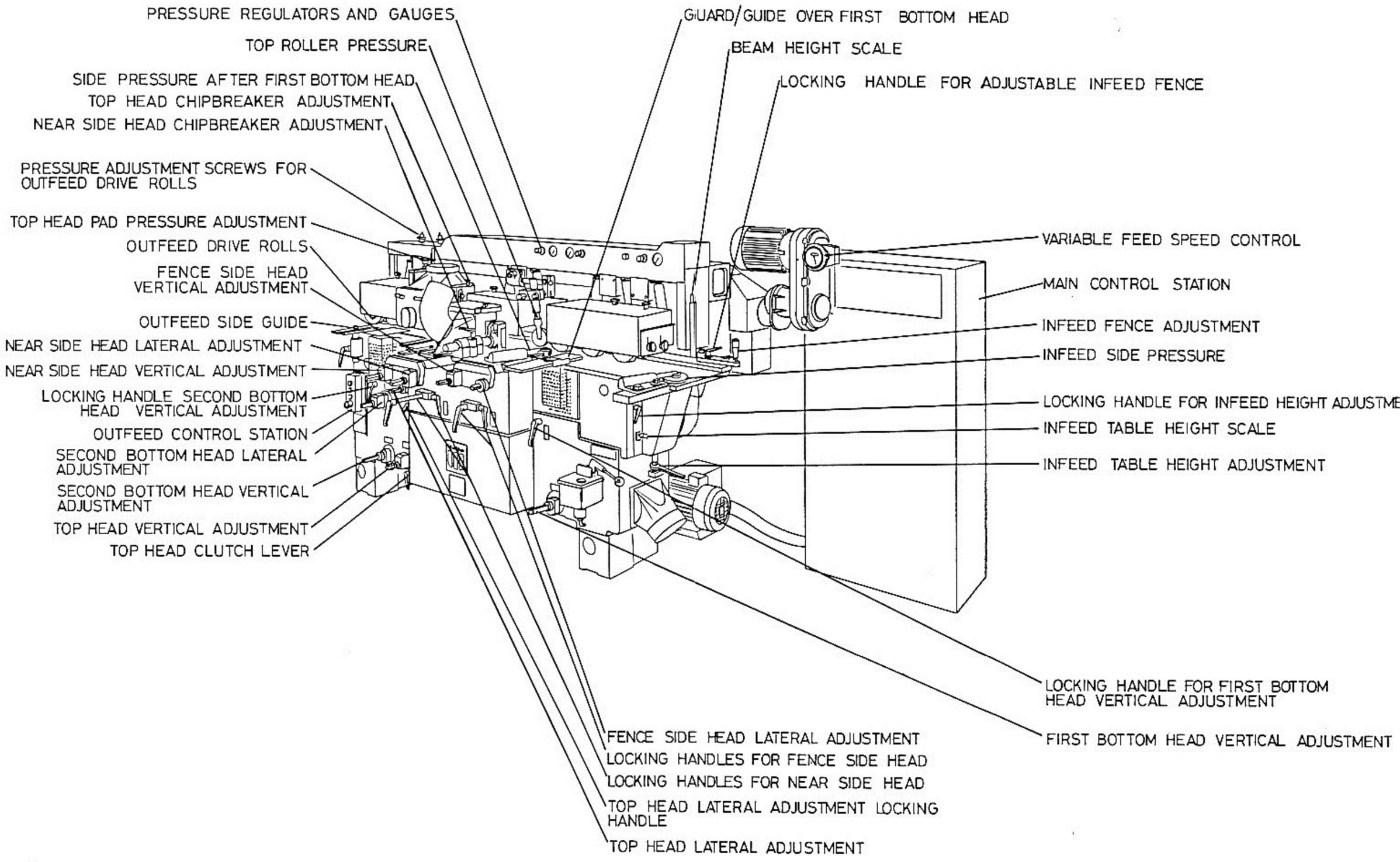


FIG 1 CONTROL PANEL


PRESSURE REGULATORS AND GAUGES
TOP ROLLER PRESSURE
SIDE PRESSURE AFTER FIRST BOTTOM HEAD
TOP HEAD CHIPBREAKER ADJUSTMENT
NEAR SIDE HEAD CHIPBREAKER ADJUSTMENT
PRESSURE ADJUSTMENT SCREWS FOR OUTFEED DRIVE ROLLS
TOP HEAD PAD PRESSURE ADJUSTMENT
OUTFEED DRIVE ROLLS
FENCE SIDE HEAD VERTICAL ADJUSTMENT
OUTFEED SIDE GUIDE
NEAR SIDE HEAD LATERAL ADJUSTMENT
NEAR SIDE HEAD VERTICAL ADJUSTMENT
LOCKING HANDLE SECOND BOTTOM HEAD VERTICAL ADJUSTMENT
OUTFEED CONTROL STATION
SECOND BOTTOM HEAD LATERAL ADJUSTMENT
SECOND BOTTOM HEAD VERTICAL ADJUSTMENT
TOP HEAD VERTICAL ADJUSTMENT
TOP HEAD CLUTCH LEVER
GUARD/GUIDE OVER FIRST BOTTOM HEAD
BEAM HEIGHT SCALE
LOCKING HANDLE FOR ADJUSTABLE INFEED FENCE
VARIABLE FEED SPEED CONTROL
MAIN CONTROL STATION
INFEED FENCE ADJUSTMENT
INFEED SIDE PRESSURE
LOCKING HANDLE FOR INFEED HEIGHT ADJUSTMENT
INFEED TABLE HEIGHT SCALE
INFEED TABLE HEIGHT ADJUSTMENT
LOCKING HANDLE FOR FIRST BOTTOM HEAD VERTICAL ADJUSTMENT
FIRST BOTTOM HEAD VERTICAL ADJUSTMENT
FENCE SIDE HEAD LATERAL ADJUSTMENT
LOCKING HANDLES FOR FENCE SIDE HEAD
LOCKING HANDLES FOR NEAR SIDE HEAD
TOP HEAD LATERAL ADJUSTMENT LOCKING HANDLE
TOP HEAD LATERAL ADJUSTMENT

MOUNTING THE CUTTERBLOCKS

General

The GS machine can be fitted with plain bore or hydrogrip (hydraulic pressure) cutterblocks. Hydrogrip cutterblocks are used to provide an improved surface finish and allow higher feed speeds to be used. The method of fitting the two types differs.

When changing cutterblocks, be aware that the spindles for plain bore blocks have right or left hand threads, dependent on spindle location, and tighten accordingly.

The spindles are threaded as follows:

Bottom Horizontal spindle - left hand thread
Near Side Vertical spindle - left hand thread

Top Horizontal spindles - right hand thread
Fence Side Vertical spindle - right hand thread

The Hydrogrip blocks are not screw fitting and require to be pressurised in position on the spindle. To protect the Hydrogrip cutterblock and the machine spindle in the event of Hydraulic failure, it is necessary for safety drive collars to be used.

The consequence of not using the safety drive collars will result in the cutterblock seizing on the machine spindle in the event or either; the operator neglecting to pressurise the cutterblock and then running the spindle, or the Hydrogrip cutterblock sleeve losing pressure.

If a seizure occurs, the spindle and cutterblock must be returned to Wadkin for repair. An appropriate charge will be made for this service.

Two types of safety collar are used. These are threaded safety collar; for use when full length tooling is in use on the machine spindle. A plain safety collar; for use when short length tooling is used on the machine spindle.

To change cutterblocks

The method of changing cutterblocks depends on the type fitted and it will be first necessary to remove any guards, dust extraction, locking collar, spindle nut, and spacers fitted, as applicable. Isolate machine from power source.

Plain bore type cutterblocks

To remove cutterblocks:

(1) Unscrew the cutterblock nut from the spindle with the spanner/s provided. Can be right or left hand thread. (see general)

a. Place the spanner/s on the hexagon of the spindle and the two flat faces of the cutterblock locknut, or;

b. Hold the spanner (top) securing the spindle firmly in position and unscrew the cutterblock locknut from the spindle with the bottom spanner.

NOTE: DO NOT use any form of percussion tool or damage to spindle bearings can result. **DO NOT** use a box or extension spanner.

Hydrogrip cutterblocks (Fig 3)

To remove cutterblocks:

(1) Release locking screw on safety collar (Fig 4) and remove from spindle.

(2) Depressurise the Hydrogrip cutterblock by turning the pressure release screw (2), located in a recess on the barrel of the cutterblock one quarter turn to release, using a 3mm A/F hexagon key.

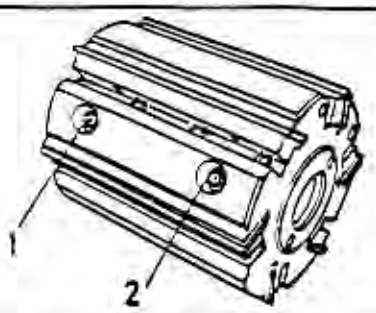


FIG 3 HYDROGRIP CUTTERBLOCK

(3) Slide the cutterblock from the spindle.

(4) Always leave the pressure release screw (2) undone when the cutterblock is not in use to avoid distortion to the cutterblock due to the variation in room temperatures.

To replace both types of cutterblock.

(1) Carefully clean spindles, cutterblocks, spacers and collars before fitting new cutterblocks.

(2) Carefully place the cutterblock on the spindle. On the Hydrogrip blocks tighten pressure release screw (2), and pressurise the cutterblock by applying hydraulic pressure to the pressure nipple (1) located in a recess located on the barrel of the block (see Fig 3).

(3) Fit safety collar (see Fig 4) and tighten securing screw.

(4) On plain bore cutterblocks. Tighten the block to the spindle with the spanner/s provided.

(5) Turn the spindle slowly to ensure the cutterblock is free and replace cover.

(6) Operate the spindle for a short period to ensure it rotates freely and without vibration.

CAUTION

Take care not to allow the cutterblock to fall onto the spindle shoulder while fitting. This can cause damage to spindle bearings and subsequent vibration and is especially applicable to vertical spindles.

Once the new cutterblock has been mounted it may be necessary to reset the digital readout, chipbreaker and pressures. Refer to section 'Setting up the Machine' for these details.

Safety Collars (Fig 4)

Fitting procedure:
A. Threaded Collar

(1) Mount the cutterblock onto the machine spindle. Make sure the cutterblock fits up to the shoulder on the spindle.

(2) Pressurise cutterblock to the correct working pressure.

(3) Unscrew the pins in the threaded safety collar to the fullest extent, using the knurled heads.

(4) Screw the collar onto the spindle, finger tight, against the end face of the cutterblock

(5) Reverse the collar on the threads, sufficient to allow the pins to be brought into line with corresponding holes in the end face of the cutterblock.

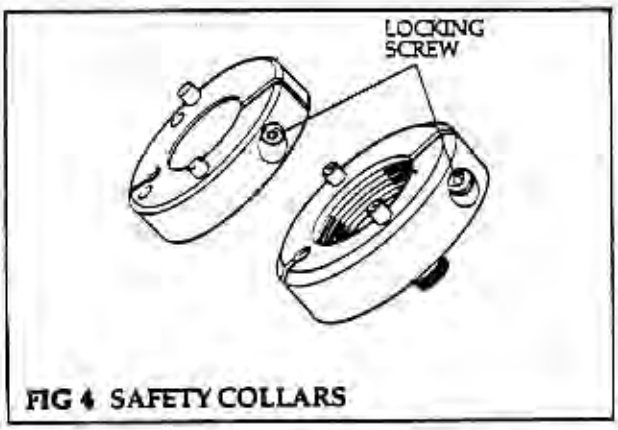


FIG 4 SAFETY COLLARS

(6) When in line, screw the pins into position, locating into the holes of the cutterblock.

(7) Tighten the cap screw in the collar using an Allen key. This causes the collar to grip the threads on the spindle.

(8) The collar will now maintain the drive to the cutterblock in the event of depressurisation.

To release; reverse the procedure

B. Plain collar

(1) Mount the cutterblock onto the machine spindle, making sure it fits up to the spindle shoulder. Pressurise cutterblock to the correct working pressure.

(2) Slide the collar with its pins facing the cutterblock along the machine spindle up to the cutterblock. Locate the pins into the corresponding holes in the block.

(3) Tighten up the cap screw in the collar, using an Allen key. This causes the collar to grip the spindle.

(4) The collar will now maintain the drive to the cutterblock in the event of depressurisation.

To release; reverse the procedure.

SETTING UP THE MACHINE

Set Infeed Table and Fence (Fig 5)

(1) To set the height of the infeed table (1) slacken off the locking handle (11) and turn the handscrew (2) with the ratchet handle provided. Set the height required from direct reading on the graduated scale (3) by moving handle to right or left as required. The maximum adjustment available is 10mm.

(2) Set the fence (4) with handle (5) after first releasing clamp (6). Set the amount of fence side cut required by direct reading on the scale (7). Refasten clamp (6) after adjustment.

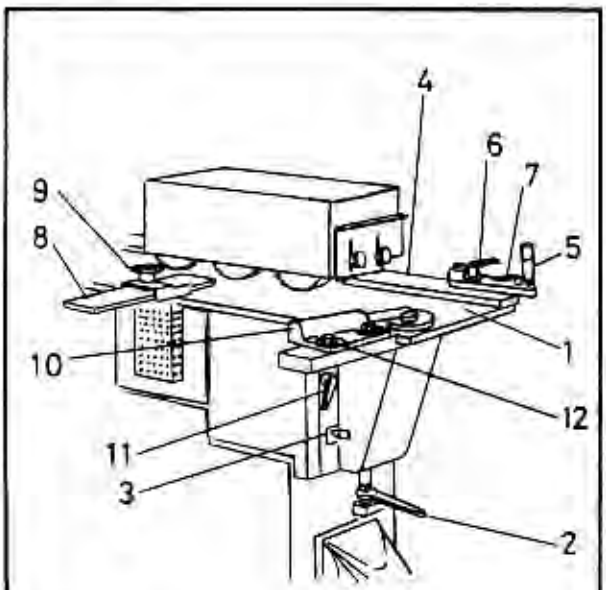


FIG 5 INFEED TABLE SETTING

(3) The adjustable guard (8) must be set to within 5mm of the maximum timber size. Slacken starwheel (9), set guard (8) and retighten starwheel.

(4) Set side roller (10) by loosening the two screws (12) and positioning to suit the minimum width of timber. Then tighten nuts (12).

Set feed rolls (Fig 6, Fig 7)

First Bottom Head described; others are similar

(1) Set the feed rolls (1) to suit width and thickness of timber; ie: width of rolls to be as width of timber.

NOTE: To achieve maximum traction on wide timber, it may be advisable to space rolls apart (Fig 7), rather than having a solid bank of feed rolls.

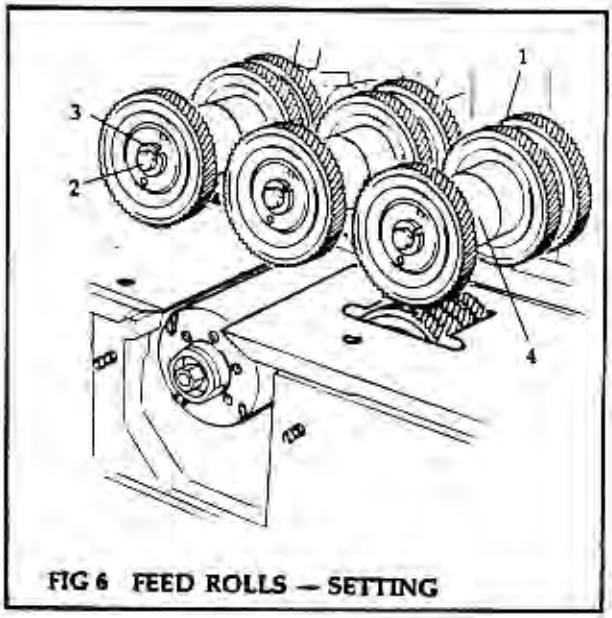


FIG 6 FEED ROLLS — SETTING

Use the Control station pushbuttons (Fig 1 Machine Controls) to set the thickness.

If necessary, change the rolls as follows:

a. Slacken centre screw (2), using a 19mm hexagon spanner.

b. Remove 'C' wahser (3), add or remove rolls, or spacers (4), to suit width of stock. (Fig 7). Ensure that each roll drive engages with its mating part.

c. Refit 'C' wahser (3) and retighten centre screw (2).

(2) Set feed roll height 3mm lower than thinnest workpiece. Set outfeed rolls 1mm lower.

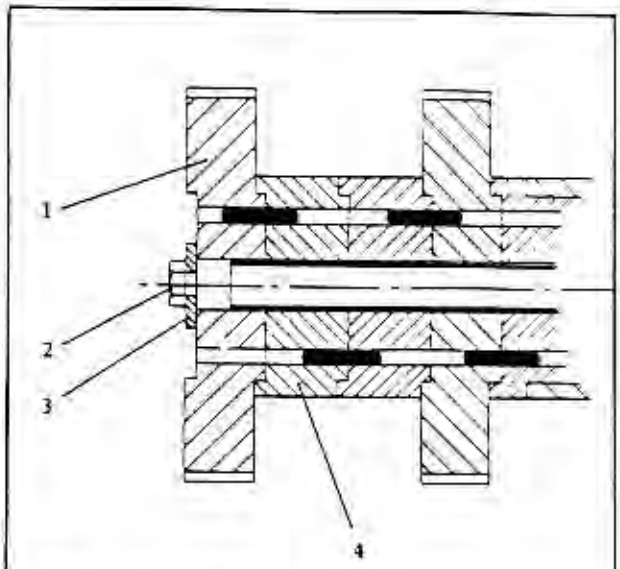


FIG 7 FEED ROLLS — SPACER DETAIL

Set linked top roller and driven table roller (Fig 8)

(1) The driven table roller (1) and the infeed table (2) move in unison, thus once the driven table roller is set there should be no need for adjustment.

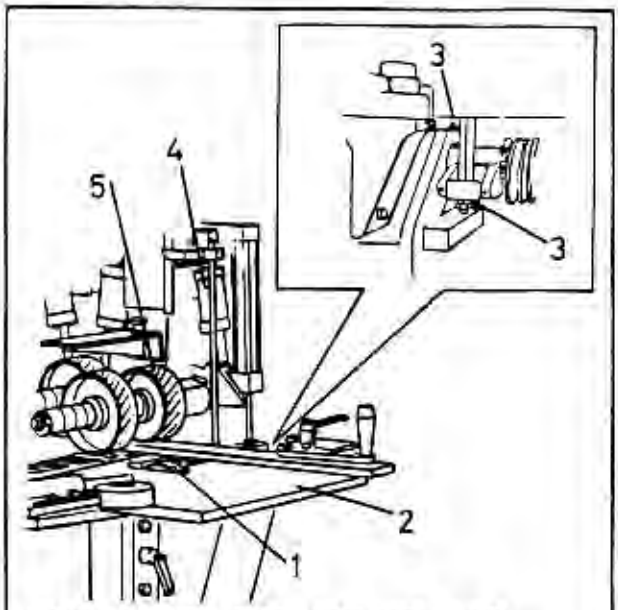


FIG 8 LINKED TOP ROLLER AND DRIVEN TABLE ROLLER

(2) The limit screws (3) are factory set to allow the table roller to raise a maximum of 8mm above the table in operation and rest at approx 1mm below bed level.

(3) The air cylinder (4) is not connected to the pneumatics and acts only as a link/stop. When setting the top through feed rollers this will position the top nip infeed roller (5) in line with the other feed rollers through the machine.

(4) The optimum working pressure is that which just lifts the bottom nip roller (1) of its bottom limit stop. Air pressure is regulated at its respective gauge. For difficult timber where extra grip may be required the pressure should be increased.

First Bottom Head (Fig 9, Fig 10)

The spindle can be adjusted vertically from the front of the machine whilst lateral adjustment is from the rear.

(1) Ensure the outfeed table (1) is clean.

(2) Place a straightedge (2) on the outfeed table projecting over the bottom horizontal cutterblock (3). The cutter blades should just touch the under side of the straightedge.

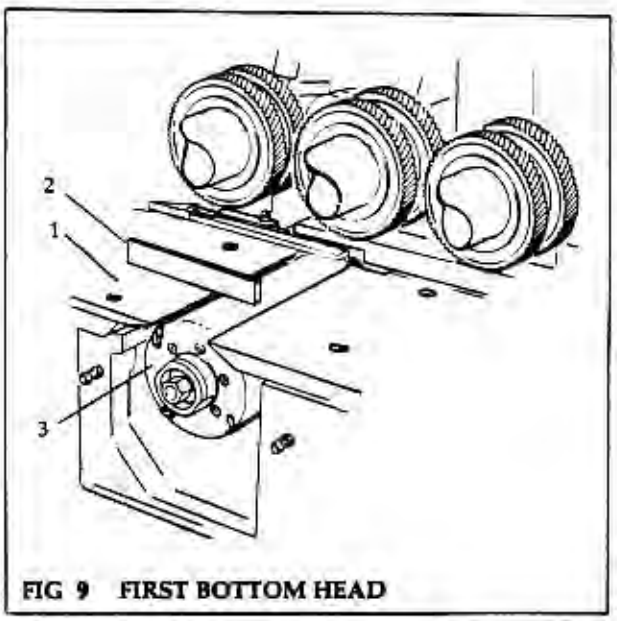


FIG 9 FIRST BOTTOM HEAD

(3) If necessary reset the cutter height as follows:-

a. Release locking handle (5) and adjust by rotating the handscrew (6) clockwise to raise the spindle or anticlockwise to lower.

(4) Refasten handle (5).

NOTE: All handscrews are fitted with a square shaft extension. A winding handle is supplied to fit this.

(5) If necessary adjust the cutterblock laterally as follows:

a. Release the hexagon nut (7) on the bottom head vertical slide casting at the rear of the machine and rotate the spindle adjuster (4) as required.

b. Retighten the hexagon nut (7).

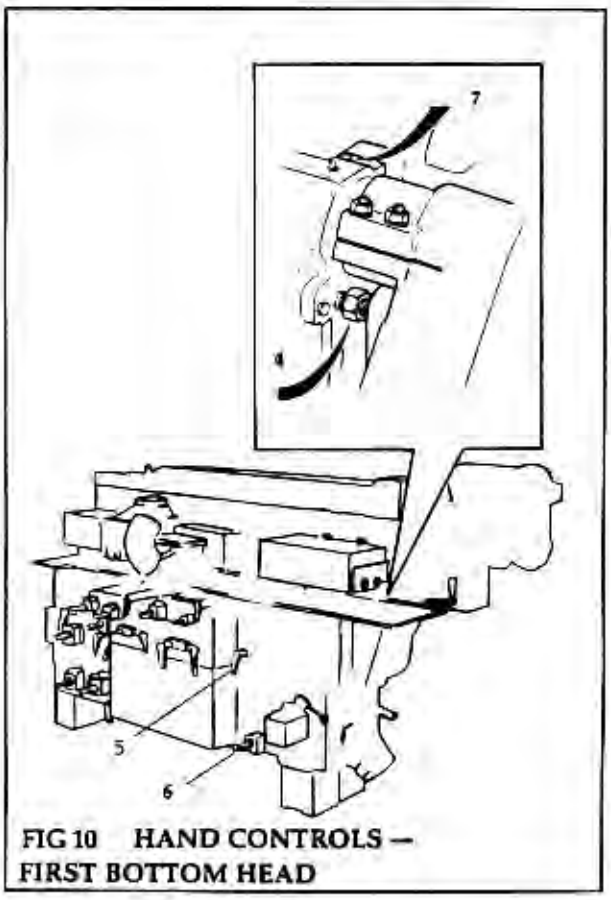


FIG 10 HAND CONTROLS — FIRST BOTTOM HEAD

Fence Side Head (Fig 11, Fig 12)

The spindle can be adjusted vertically and horizontally.

(1) Ensure that the machine bed is clean.

(2) Place a straightedge (2) against the outfeed fence (1) and cutterblock (3). Set the spindle so that when rotated the knives lightly touch the straightedge (2).

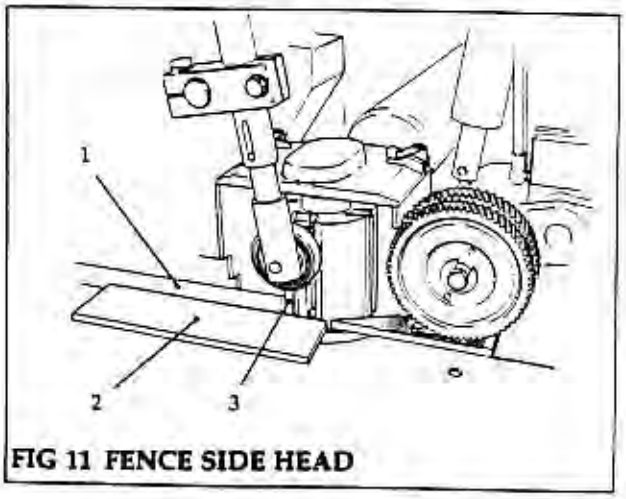


FIG 11 FENCE SIDE HEAD

(3) To adjust the spindle laterally, proceed as follows:

a. Release the locking handle (4).

b. Rotate the adjusting screw (5) clockwise to advance the spindle or anticlockwise to retract the spindle.

NOTE: Maximum lateral movement is 65mm

(4) Set the axial position (height) of the cutterblock (3) as follows:-

a. Release locking handle (4).

b. Release the spindle clamp (7) and adjust by rotating the handscrew (8) anticlockwise to lower the spindle or clockwise to raise the spindle.

c. Refasten handles (4) and (7).

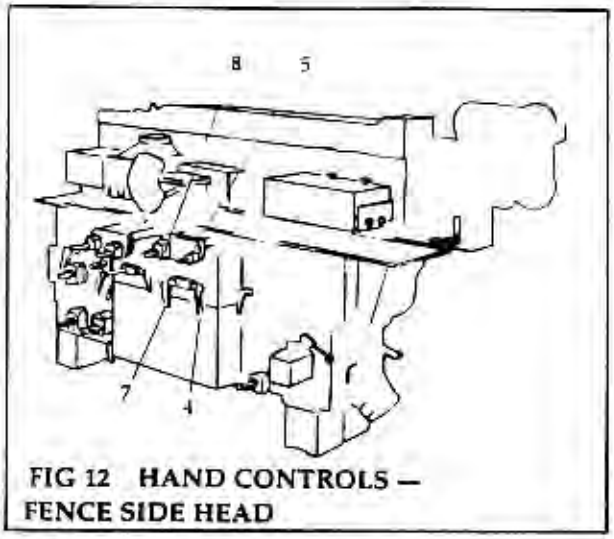


FIG 12 HAND CONTROLS — FENCE SIDE HEAD

Near Side Head (Fig 13, Fig 14)

The spindle can be adjusted vertically and horizontally.

(1) Ensure that the machine bed is clean.

(2) Check the digital readout, using a datum block (1) of known width inserted between the outfeed fence guide (2) and the cutterblock (3).

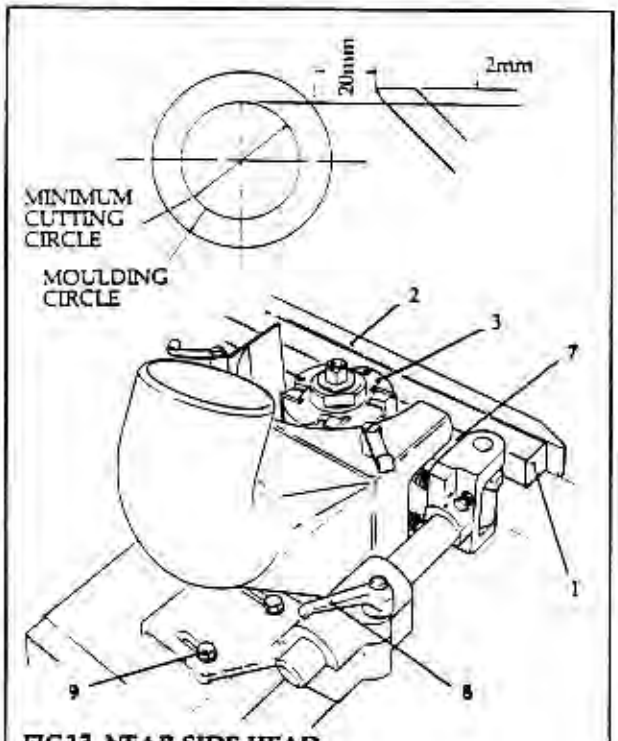


FIG13 NEAR SIDE HEAD

The cutterblades should just touch the nearside of the block

(3) If necessary adjust the spindle laterally as follows:-

a. Release the locking handle (4)

b. Rotate adjusting screw (5) clockwise to advance the spindle, anticlockwise to retract the spindle.

c. Refasten locking handle (4)

(4) Reset the digital readout if required by loosening the grubscrew in the knurled collar and rotating this collar untill the readout matches the width of the datum block. Refasten grubscrew.

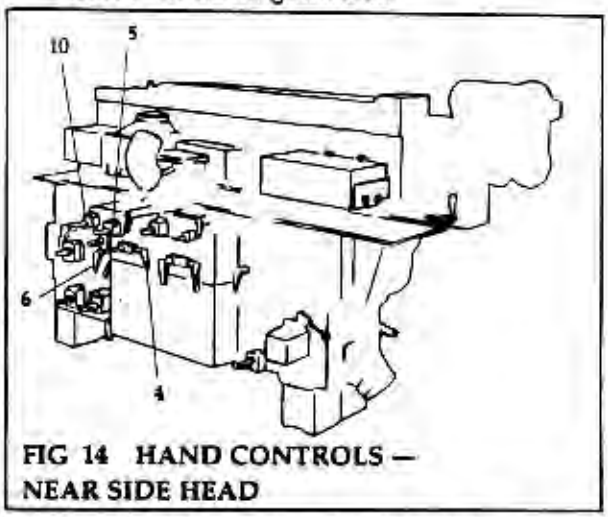


FIG 14 HAND CONTROLS — NEAR SIDE HEAD

(5) Set the axial position (height) of the cutterblock (3) as follows:-

a. Release the locking handle (4) and the spindle clamp (6).

b. Rotate the handscrew (10) clockwise to raise or anitclockwise to lower the cutterblock.

c. Refasten handle (4) and clamp (6)

(6) The chipbreaker adjustment is as follows:-

a. Remove the cover of the dust hood.

b. Release locking handle (8).

c. Adjust the chipbreaker (7) so that it clears the smallest cutting circle by approximately 2mm (Fig 13).

d. Refasten locking handle (8)

e. Loosen bolts (9) and adjust the chipbreaker (7) to suit the cutterblock diameter so that it clears the cutterblock by 20mm (Fig 13).

f. Retighten bolts (9)

(7) Set the outfeed adjustable guard on the dust hood to suit the cutterblock i.e. approx 5mm less than minimum cutting circle.

Top Head (Fig 15, Fig 16)

The spindle can be adjusted vertically and horizontally. The vertical adjustment can be either manual or powered with the beam rise and fall.

(1) Ensure that the machine bed is clean.

(2) Using the same datum block (1) as at the near side head set the cutter vertical adjustment as follows:-

a. Release locking handle (2).

b. Rotate handscrew (3) clockwise to lower the spindle or anticlockwise to raise the spindle untill knives just lightly touch the datum block (1).

c. Refasten locking handle (2).

d. Reset digital readout, if necessary by loosening the grub screw in the knurled readout collar. Rotate this collar until the known block width is indicated. Retighten grubscrew.

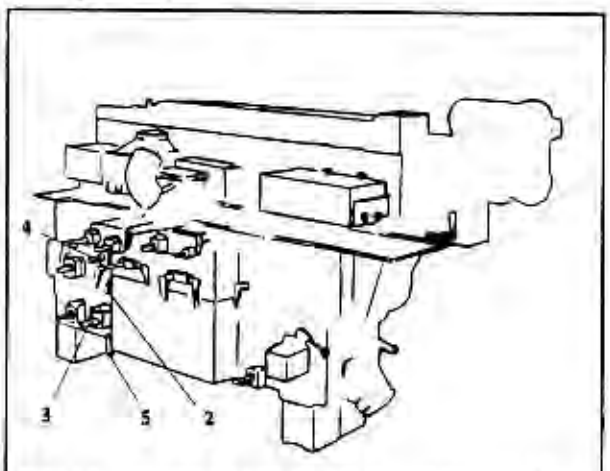


FIG 15 HAND CONTROLS — TOP HEAD

(3) Use the automatic vertical adjustment to move the beam and top head as follows:-

a. Release locking handle (2).

b. Engage lever (5) and hold untill clutch is engaged.

NOTE: If the clutch does not readily engage, operate the handscrew (3) by turning slightly (to right or left) until engagement is made.

c. To raise or lower spindle press the appropriate button at the control station.

The automatic vertical adjustment only works in conjunction with the powered height adjustment to the feedrolls.

d. After positioning the spindle, lift the hand lever (5) to disengage the automatic vertical adjustment.

e. If necessary make any fine adjustments manually using handscrew (3).

(4) To automatically move only the beam vertically, press the relevant raise or lower button on the control station. Check lever (5) is disengaged.

(5) Lateral adjustment is made by first releasing spindle barrel lock (8) and then adjust using handscrew (4). When set refasten barrel lock (8).

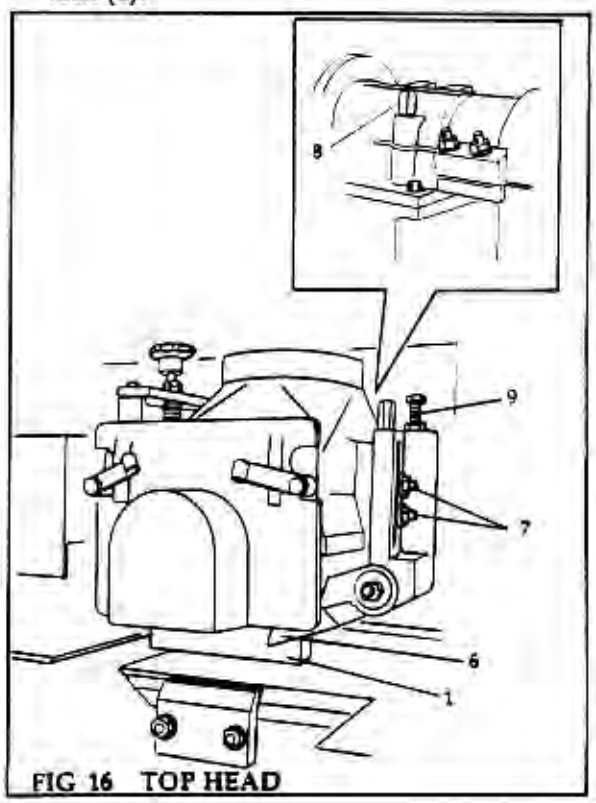


FIG 16 TOP HEAD

(6) The chipbreaker should be set so that the nose of the shoe (6) is just touching the datum block at the same time as the cutterblock knives. The chipbreaker shoe should be a minimum of 20mm from the largest cutting circle. Set the chipbreaker as follows:-

a. Slacken off the two locknuts (7) and adjust to datum block.

b. Refasten locknuts (7).

c. Adjust the spring pressure using tension screw (9) to achieve the required down force.

Second Bottom Head (Fig 17, Fig 18)

The spindle can be adjusted vertically and horizontally. Ensure the outfeed table is clean. Place a straightedge (4) on the outfeed table projecting over the second bottom head.

The cutterblock knives (6) should just touch the straightedge.

(1) If necessary reset as follows:-

a. Release locking handle (1).

b. Adjust cutterblock height by rotating the hand screw (2) clockwise to raise the spindle or anticlockwise to lower.

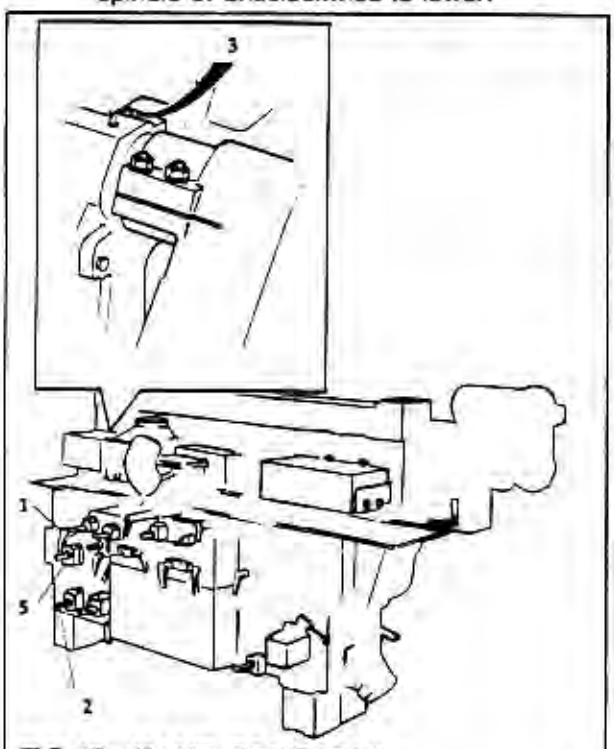


FIG 17 HAND CONTROLS — SECOND BOTTOM HEAD

c. Refasten locking handle (1).

(2) Adjust the spindle laterally if required by:

a. Releasing spindle barrel lock (3).

b. Adjust using handscrew (5).

c. Tighten spindle barrel lock (3).

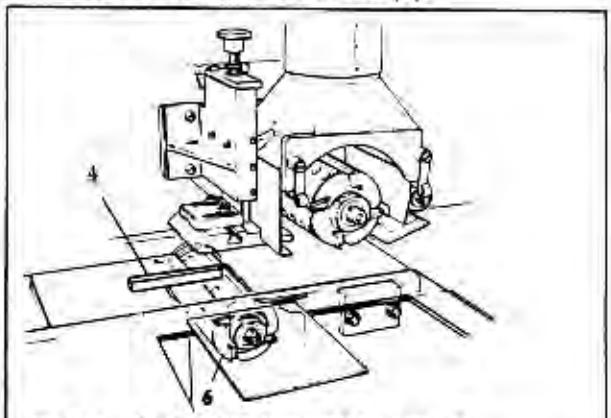


FIG 18 SECOND BOTTOM HEAD

Final Adjustments and Settings (Fig 19, Fig 20)

(1) With machine switched off check setting of infeed table and fence will give required cuts.

(2) Place timber on infeed table and check/ adjust side roller pressure to suit.

(3) Check infeed rolls are 3mm lower than timber thickness. Outfeed rolls should be 1mm lower than timber thickness after being machined by top head.

Set air pressure on feed rolls using the air supply regulators and associated guages.

NOTE: The first regulator and gauge is for the pneumatically linked driven bed roll and top roll, the second regulator and gauge for the feed rolls up to the top head and the third gauge for the remaining outfeed top rollers.

The following pressures are recommended:-

a. Steel rollers 3 bar (1 bar = 14.5 psi)

b. Plain (composition) covered rollers 4 bar

(4) Switch on and inch timber through machine and stop prior to fence side head. Switch off.

(5) Set required cut for fence side head.

(6) Adjust side roller pressure by unscrewing the two nuts (2) and position the roller to suit the maximum timber width. Tighten nuts (2).

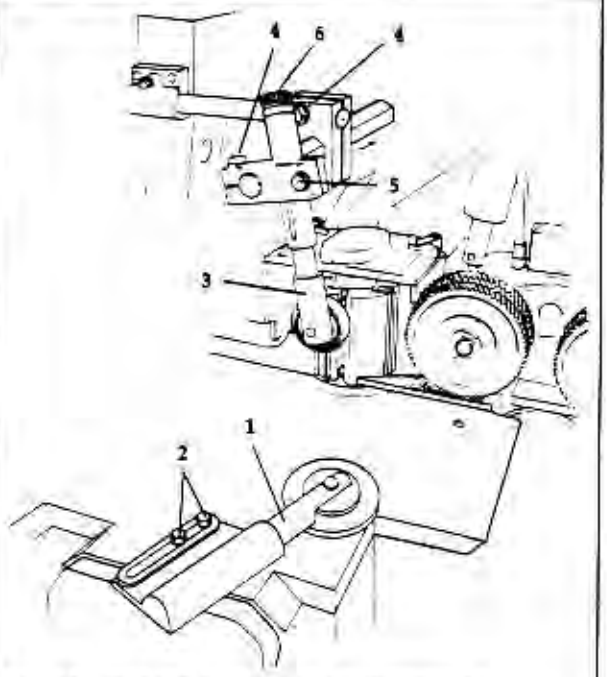


FIG 19 FENCE SIDE HEAD SETTING

(7) Adjust the top roller (3) by loosening screws (4) to give lateral adjustment in two directions. Height adjustment is achieved by slackening screws (5). When set to timber thickness retighten all screws. To increase spring pressure turn the knurled screw (6) on the top of the spring tensioner in a clockwise direction. To decrease spring pressure turn the screw anti clockwise.

NOTE: If the screw is turned through a distance of 5mm, pressure on the roller is approx 250N (25KG). The maximum adjustment (16mm) provides a pressure on the roller of approx 500N (50KG).

(8) Switch on, Inch timber through machine and stop prior to top head. Switch off.

Check chipbreaker setting adjust if necessary. Set adjustable plate on the outfeed side of the near side head just clear of the timber ie. approx 10mm

(9) Switch machine on. Inch timber through machine and stop prior to second bottom head. Switch off.

Set the pressure pad after the top head using adjusting screw (8) so that a moderate pressure is exerted on the wood. The pressure pad is adjusted by loosening the two nuts (7). Position the pad to suit the timber width and also the cutterblock (the pad nose should clear the maximum cutting circle by 10mm). Retighten nuts (7). Check and adjust if necessary top head chipbreaker.

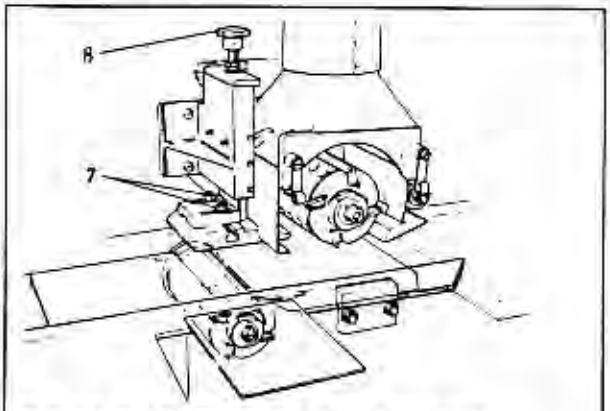


FIG 20 TOP HEAD PAD PRESSURE

(10) Adjust outfeed side guides to suit machined timber.

(11) Shim bedplate after second bottom head to suit required cut.

(12) Switch on and inch wood through. Set machine feed speed by rotation of the hand wheel on the speed indicator dial with the machine running.

NOTE: DO NOT ADJUST SPEED WHEN MACHINE IS STATIONARY.

(13) Pass a test piece through at run speed, check dimensions and make further adjustments if required as described peviously.

FAULTS IN THE WORKPIECES AND THEIR CAUSES

General

FAULT - Blips at the leading end of the underside of the timber.
Cause - The cutterblock is too low in relation to the outfeed bedplate.
Remedy - Adjust the cutterblock correctly.

FAULT - Scars on the trailing end of the underside of the timber.
Cause - The cutterblock is too high in relation to the outfeed bedplate.
Remedy - Adjust the cutterblock correctly.

FAULT - The trailing end of the top face of the timber shows blips.
Cause - Pad and roller pressures are incorrectly adjusted.
Remedy - Adjust the pad pressures correctly.

Faults Caused by Tools

FAULT - Out of square stock after planing.
Cause - The cutters are not parallel to outfeed bedplate, or are badly ground.
Remedy - Adjust, or sharpen the cutter carefully

FAULT - Burn marks on the stock.
Cause - Cutters are blunt and need regrinding.
Remedy - Regrind cutters.

Faults in Grinding and Setting

FAULT - Nicks in the edges of the cutters especially carbide.
Cause - Generally caused by removing too much metal when regrinding. This results in undue stresses and subsequent cracking and breaking away of the cutting edge when machining.
Remedy - Take greater care when regrinding cutters

FAULT - Vibrating heads
Cause - Cutterblocks have been set up incorrectly.
Remedy - Reset.

CLEANING THE MACHINE

Machines are designed to need a minimum of maintenance. However, it is recommended that the machine be cleaned thoroughly once a week. This is essential when working on hard wood such as Sipo (Utile) or similar.

If cleaning with compressed air, take care not to direct the jet onto the spindle and moving shaft, bearing housing ,etc. Clean the spindles and remove all remains of resin and grease. Do the same with the cutterblock collars and machine tables (bedplates) and lightly lubricate.

Check that all machine parts slide easily at friction points. Lubricate as indicated in the lubricating instructions (see Maintenance).

Adjust the variable speed drive unit through the full range once a week to avoid the feed drive mechanism jamming.

SECTION 4 MAINTENANCE

SCHEDULED MAINTENANCE

Scheduled maintenance consists of regularly maintaining the machine in a good operating condition, capable of safely producing good quality trouble free work, with the minimum of downtime.

This includes tasks such as daily/weekly cleaning and lubrication which can and should be performed by the operator. Tasks carried out at longer intervals will require more specialised knowledge and tools to perform.

Lubrication

Much attention has been given to keeping lubrication and maintenance to a minimum. In consequence, 'sealed for life' bearings and 'Oilite' bushes have been used. The cutterblock spindles have been fitted with permanently lubricated bearings; these should only require replacement of lubricant if the spindle bearings are replaced. However, there are exceptions as follows:

Electric motors, where 'sealed for life' bearings have not been fitted, are provided with grease nipples. These should be greased at monthly intervals with Wadkin L6 grease.

There is no requirement for periodic lubrication of the feed rolls motor driven variable speed unit.

Daily

Grease the machine slideways and the various traverse screws with Wakdin Grade L6 grease (see Approved Lubricants)

A hand operated lubricating pump is fitted to provide oil feed lubrication to the machine bed. The hand lever should be operated to deliver the required amount of oil to the bed. A tap is fitted to the pump to control the oil flow rate to a preset amount.

The oil reservoir holds 1 litre (1.76 pints) of oil. Replenish with Wadkin Grade L4 oil (see Approved Lubricants) as needed.

Monthly/3 Monthly

Grease machine drive spindles and drive motor shafts, where fitted with grease nipples, using Wadkin Grade L6 grease unless other wise stated. Do not overfill bearing housings.

Generally, machine drive spindles will be lubricated monthly

Vee-Belt Drive Tensioning (Fig 1)

Check drive belts at regular intervals (as indicated below). If the need arises retension. Insufficient tension causes slipping and premature belt wear. Too much tension causes bearing wear. Tension as indicated in Checking/Adjustment.

Observe the operation of the machine when first put onto service. After approximately one hours effective use, check and retension belts to take up initial belt stretch.

In general, Vee-belts will require adjustment at intervals to take up any slack due to use. Three-monthly intervals are recommended as an initial guide for the feedworks drive.

It is important to check the condition and tension of the cutterspindle drive belts at more frequent intervals, depending on conditions of use, if problems relating to quality of finish are to be avoided. Monthly intervals are recommended initially.

Checking/Adjustment is carried out as follows:

(1) Remove the drive cover.

(2) Check belt tension. The belt should be capable of being depressed approximately 1.5 to 2 cm by application of average thumb pressure (see Fig 1).

(3) To adjust: fit spanner (1) provided, to adjusting screw (2), located at motor support bracket and turn in an anticlockwise direction to tension the belt drive (see Fig 1)

NOTE: Do not over tension belts.

(4) Refit drive cover

There may be occasions where the tensioning arrangement does not follow that described. However, all belt drive adjustment follows the same general principle; this involves moving the drive pulley centres or motor platform, thus taking up any slack in the belt drive. The method used will normally be self evident. Retighten any securing features fitted.

If one or more of the vee-belts becomes faulty it will be necessary to replace as a complete set. (see Replacing Drive Belts). It is impossible to obtain a correctly tensioned drive, with all belts taking an equal share of the load, by mixing old and new, or different belts.

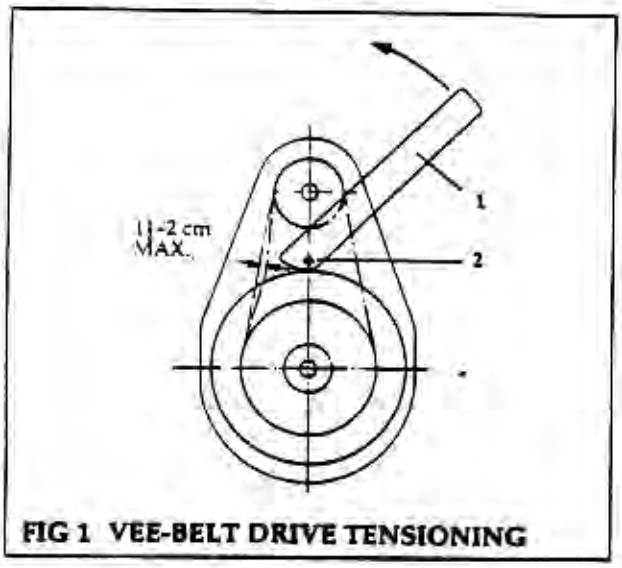


FIG 1 VEE-BELT DRIVE TENSIONING

Cleaning

Woodworking machines are designed to need a minimum of maintenance. However, a certain level of maintenance, especially cleaning and lubrication, will pay dividends in quality of work.

It is recommended that the machine be cleaned thoroughly once a week, especially when working on hardwood or highly resinous material, to prevent choking of ventilator airways and build up of deposits on working parts.

Clean all spindles regularly and remove all remains of resin and grease. Do the same with cutterblock collars and machine tables. Check that all machine parts slide, or rotate freely. Lightly lubricate as directed, do not overlubricate.

If cleaning with compressed air, take care not to direct the jet onto the spindle bearing housings, moving shafts, etc. to avoid forcing dust and debris into bearings and housings.

ADJUST THE VARIALBE SPEED DRIVE UNIT THROUGH THE FULL RANGE ONCE A WEEK TO AVOID THE FEED DRIVE MECHANISM JAMMING.

UNSCHEDULED MAINTENANCE

Unscheduled maintenance consists of replacing or correcting items which are worn, damaged, or are otherwise unserviceable. Generally items which are defective will be replaced.

These tasks require specialised knowledge and tools to perform. Following this type of maintenance, the machine will need to be set up prior to return to work.

All unscheduled tasks - such as changing bearings, should be performed by competant personnel.

Changing Cutterblock Spindle Bearings (Fig 2)

The bearings (5) have been fitted to the cutterblock spindles (6) in an orthodox manner. At the non-drive end of the spindle a liquid engineering adhesive ('Locite' grade 241) has been applied to the internal thread diameter of the bearing nut (4).

NOTE: This nut can be right or left-hand thread, dependant upon spindle rotation and tightens against the direction of rotation.

To dis-assemble parts joined by 'Loctite' adhesive use normal tools and methods. If the holding force of the 'Loctite' joint is too great then apply gentle heat and break the bond while the parts are still hot. The bonding adhesive may be left as a powder and must be removed before applying further adhesive.

Preparation Prior to Fitting Bearings

Before fitting a new bearing, the protective lubricant must be meticulously removed with petroleum spirit, triethamolamine, or other volatile solvent.

In order to prevent the moving parts from being damaged by drying out due to over cleaning, add a small amount of the bearing lubricant to the cleaning agent at the second bath. The film of grease which remains after the solvent has evaporated will provide protection for the bearing until charged with lubricant.

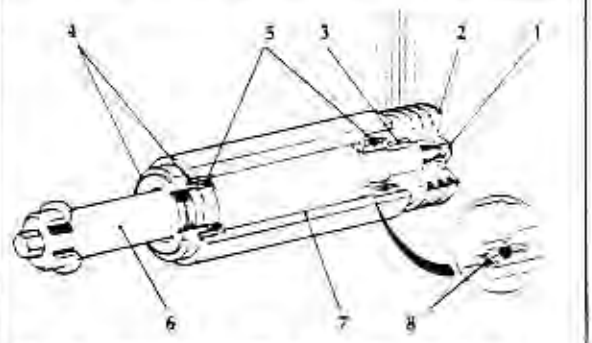


FIG 2 SPINDLE UNIT BEARING ASSEMBLY

The new bearings should be charged with 'Kluber' lubricant, type 'Isoflex' NBU 15. It is important that the correct amount of grease is applied, preferably using the formula:

G (weight in grams) = dxBx0.01
where d = bore of bearing in mm
B = width in mm

This is approximately sufficient to fill one third of the bearing volume.

To remove the bearings:

(1) Remove pulley assembly from spindle by unscrewing the M12 hexagon screw (1). Withdraw pulley (2) and remove parallel key (3) from spindle.

(2) Remove bearing nuts (4). Remove existing bearings (5), using a bearing puller on the bearing rings. Take care not to damage the spindle or housing.

(3) After Preparation; fit new bearings (5) to spindle (6) and housing (7), include spring discs (8) as previously fitted. Use only sufficient pressure to fit bearings, applying pressure to the inner ring only. Ensure that bearing ring fits up to location shoulder on the spindle.

(4) Reassemble spindle unit, lubricate bearing (see **Preparation**). Fit bearing nuts (4). Tighten nuts until assembly is secure. Do not over tighten.

(5) Check that the spindle assembly runs freely and without end float.

(6) Refit parallel key (3), pulley and M12 hexagon securing screw. Tighten screw to spindle until the assembly is secure.

Replacing Drive Belts

Drive belts must be replaced as a set to obtain correct drive performance. Before access can be gained to any drive belt it will be necessary to remove the guard covers.

To Replace a Drive Belt:

(1) Relieve tension on the drive by reducing drive centres. This can be done by either:

a. Releasing the fixing bolts on the motor support bracket and sliding the motor forward, or

b. Slackening off the motor tensioner bolt, or bolts.

(2) Remove old drive belts. Fit a new set of belts, same size, type and reference (see **Motor Drive Belt Data**).

(3) Retension the new belt set (see **Vee-Belt Drive Tensioning - Scheduled Maintenance**), reversing step (1) a. or b., as applicable to drive motor attachment. Secure fixing bolts.

It may at times be necessary to remove a drive pulley. The motor shaft pulleys are fitted with Taper-Lock bushes (see Fig 3), cutterblock spindles are fitted with parallel keys.

Removal and Refit Drive Pulleys (Fig 3)

To remove a Taper-Lock bush pulley:

(1) Slacken off all screws (1) several turns using a hexagonal key. Remove one or two screws according to number of jacking holes (2).

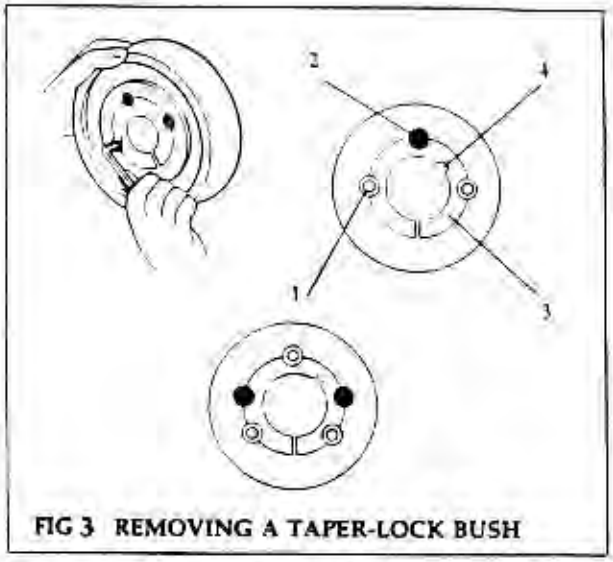


FIG 3 REMOVING A TAPER-LOCK BUSH

(2) Insert screws in jacking holes after oiling thread and point of grub screws, or thread and head of cap screws, as applicable.

(3) Tighten screws (1) alternately until bush (3) is loosened in pulley hub and assembly is free on shaft.

(4) Remove pulley assembly from shaft.

To refit a Taper-Lock bush pulley:-

(1) Ensure that mating taper surfaces are completely clean and free from oil or dirt. Insert bush in hub and line up screw holes.

(2) Oil thread and point of grub screws, or thread and head of cap screws. Place screws (1) loosely in threaded holes in hub of pulley.

(3) Clean shaft, fit hub and bush to the shaft as a unit. Locate in position. On fitting, the bush will nip the shaft first, then hub will be drawn onto bush.

NOTE: It is necessary to axially align drive and driven pulleys.

(4) Using a hexagon key, alternately tighten screws (1), until all screws are pulled up securely. Use a short length of pipe on key to increase leverage.

(5) After the bush (3) has been tightened onto the shaft, fit the parallel key (4). The key is side fitting with top clearance.

(6) After the drive has been running under load for a short time, stop and check tightness of screws. Tighten if needed.

(7) Fill empty screw holes with grease to exclude dirt.

Variable Speed Drive Pulleys (Fig 4)

The variable speed pulleys incorporated within the feed roll drive unit are virtually maintenance free.

The drive arrangement employs the 'Simplabelt' drive unit. The method of power takeoff for the unit is via a gearbox for shaft drive.

Should it be necessary to repair the feed drive, or fit a new drive belt, proceed as follows:

To Dismantle

A. General

(1) Adjust the drive unit to the maximum output speed before dismatling. Switch off drive.

(2) Unscrew socket head capscrews (1) and remove the complete adjustment device (4).

B. Removing wide section drive belt

(1) Unscrew socket head capscrews (15) and support the motor (3).

(2) Seperate cover (7) and connecting casting (2) so that the belt (10) can be removed from the variable speed pulley (13).

(3) Remove belt (10) from the variable speed pulley (9).

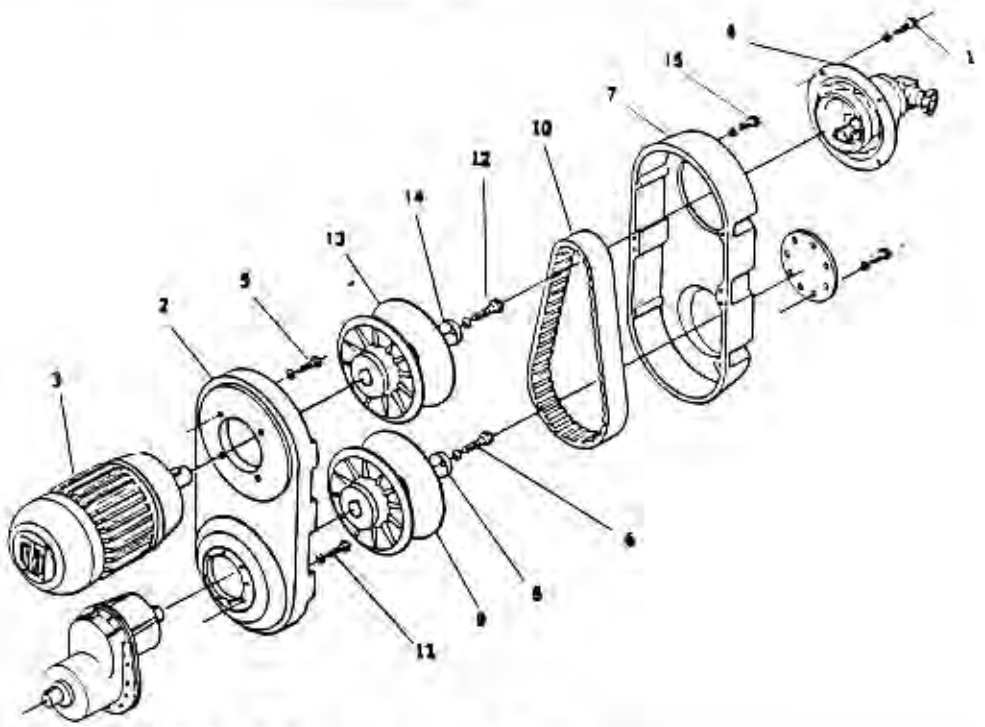


FIG 4 SIMPLABELT VARIABLE SPEED DRIVE UNIT

C. Dismantling variable speed pulleys, motor and housing.

(i) Mechanically adjustable variable speed pulley (motor shaft).

(1) Unscrew axial tightening screw (12) and remove end cap (14).

(2) Position a suitable extractor behind the circlip of the pulley and with an extractor, remove pulley (13) from the motor shaft.

(ii) Spring loaded variable speed pulley (gearbox shaft)

(1) Unscrew axial tightening screw (6) and remove cap (8).

(2) Remove the spring and spring retaining cap with a suitable extractor. Then using an extractor (gripping behind the hub flange) remove the pulley (9) from the gearbox shaft.

(iii) Motor and Housing.

(1) Unscrew hexagon head screws (5) and remove motor.

(2) Unscrew hexagon head screws (11) and remove housing from gearbox.

To Assemble

The assemble procedure is the reverse sequence to dismantle. ie: steps C ,B and A.

(1) When re fitting the wide section drive belt; first place belt onto the fully opened mechanical variable feed pulley (13), then over the rim of the spring loaded variable speed pulley (9).

NOTE: Only original 'Simplabelt' wide section drive belts must be used.

Feed Roll Drives and Gearboxes (Fig 5)

The GS woodworking machine is fitted with shaft drives; having a solid shaft drive to gearboxes mounted on the beam, with cardan shaft drives to the feed rolls. The power transfer to each feedroll is via a right-angle worm and wheel gearbox at each offtake.

IMPORTANT NOTE:

It is important to note that although all the gearboxes look the same externally, there are fundamental differences internally, depending on location. The gearbox arrangements on the GS machine are shown in Fig 5.

When replacing any gearbox, it is important to note the location and reference No. (GA.....) which is shown on a plate attached to the gearbox housing, otherwise the bearing arrangements may not be suitable for the work load.
For reference; gearbox GA 7629 is always located adjacent to the drive unit. This gearbox has a taper roller bearing fitted on the input end of the worm drive shaft in place of a radial bearing to carry the extra loading imposed. The worm shaft, which is solid with parallel keys at both ends, extends through the gearbox to locate with a mating coupling to gearboxes GA 7445.

The intermediate gearboxes GA 7445, are also fitted with extended worm drive shafts. The end which extends through the gearbox is hollow with internal keyway to permit coupling via a flange to a further gearbox in - line. A thrust bearing is fitted to this end of the shaft to accommodate the axial load.
Each gearbox and the helical gearbox fitted to the variable speed control power take-off are filled with lubricant on assembly and 'sealed for life'.

The cardan shaft should be lubricated at monthly intervals using Wadkin Grade L6 grease.

No other maintenance will normally be required on the shaft drive.

Spare parts

when ordering spare parts, all the data shown on the unit nameplate must be quoted.

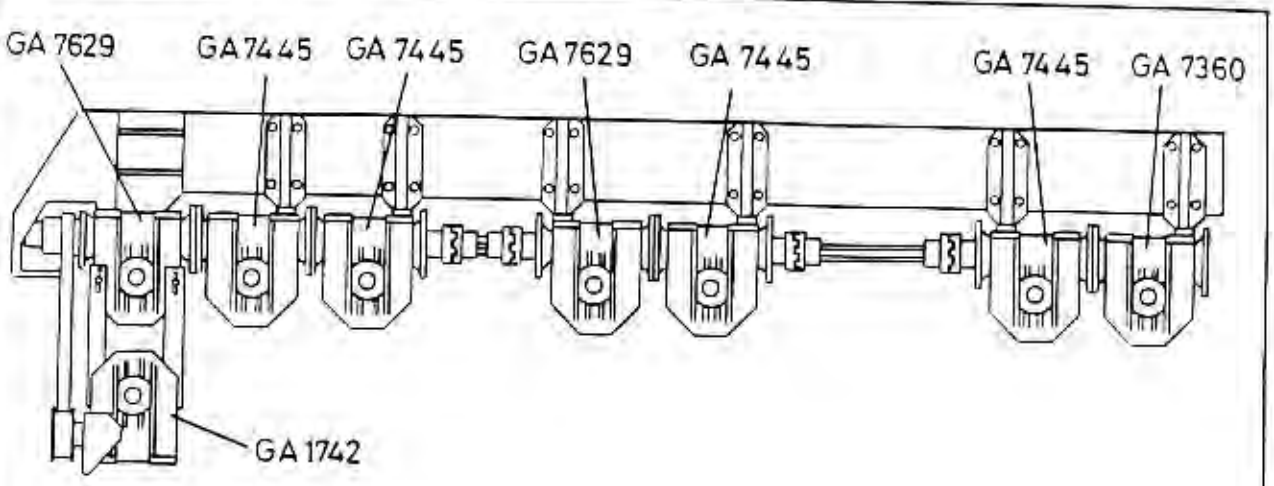


FIG 5 FEED ROLL DRIVES AND GEARBOXES

Cutters and Tool Holders

When choosing cutters, make sure they are suitable for the spindle speed. Dynamically balance and check for defects and cracks.

The life of a cutterblock is directly related to the quality of the steel and nature of timber to be worked. It is impossible to give exact values of cutter life; the following is a guide.

High speed steel	HLS 2 - 5 hours
Very high speed steel	HSS 3 - 8 hours
Carbide steel	HM 20 - 70 hours

Honing at regular intervals will prolong the life of the cutters.

When regrinding cutters it is very important to ensure the edge does not become overheated. Overheating can be prevented if light grinding cuts are taken.

Ensure that all cutters of a multiple cutterblock are the same, the objective being all should cut the timber evenly and equally.

The performance of any tool depends to a large extent on the care in the way it is used. The life of the cutters and the surface finish of the workpiece are directly related to the care which is given to the work.

FAULT FINDING

Mechanical Faults

Apart from mechanical failure (breakage) the majority of mechanical faults can be attributed to incorrectly tensioned drive chains or belts; the setting of cutterblocks and cutterblades; items working lose due to vibration - failure to set or tighten correctly; wrong speed setting; or misuse.

Therefore to get the best performance it is essential that the machine is set-up and used correctly, when many mechanical faults can be avoided.

Elimination of Vibration

It is important to check condition and tension of the cutter spindle drive belts regularly (see **Scheduled Maintenance**).

It is also important that the cutters are evenly ground and set to run true in the cutterblock, the assembled cutterblock should be statically balanced before fitting to the spindle.

In the case of high speed machines it is highly recommended that cutterblocks be dynamically balanced (see **Maintenance: Cutters and Tool Holders**).

Electrical Faults

FAULT **The machine does not run when any 'START' button is operated**

Diagnosis

a. Disconnect (isolator) switch has not been closed
b. Main fuse or control circuit fuse has blown
c. Overload relay has tripped

Remedial Action

a. Check and close if needed
b. Replace fuse
c. Reset relay. Check reason for trip

FAULT **A motor does not start - loud humming sound**

Diagnosis

a. An open circuit in at least two 'line leads' of the motor
b. The fuses of the motor have blown

Remedial Action

a. Check circuit and rectify
b. Replace fuse

FAULT **An air break magnetic contactor does not operate**

Diagnosis

a. The contacts are burned and make improper contact
b. Broken connection wire
c. An overload relay has tripped
d. A fuse has blown

Remedial Action

a. Clean or replace contacts
b. Remake connections
c. Reset relay. Check reason for overload
d. Replace fuse

FAULT **A Star/Delta connected motor does not operate when the connector is connected in Star**

Remedial Action

a. Check/Remedy the symptoms outlined in paragraph above

FAULT **When a motor is started, the fuses blow and the overload relay trips**

Diagnosis

a. The motor does not run freely
b. There is a short circuit in the wiring mains
c. The motor windings or winding are/is earthed

Remedial Action

a. Check that the motor is free running
b. Check the circuit wiring
c. Check the windings in turn for electrical continuity and also earth faults with a 'Megger'

FAULT **The motor overheats when running 'light' (unloaded)**

Diagnosis

a. The motor windings are connected in delta instead of star
b. The mains voltage is too high
c. The ventilating air ducts of the motor frame have become blocked with dust or chips, the cooling air passage has become impeded, or the cooling fan (if fitted) is not functioning correctly

Remedial Action

a. Check connections
b. Check mains voltage and correct
c. Clean airways. Check fan operation

FAULT **A Spindle stops, but the motor still runs**

Diagnosis

a. The drive belts are loose, broken, or have come off

Remedial Action

a. Retension or replace belts

FAULT **The rise and fall drive motor does not operate**

Diagnosis

a. The limit switch on the top horizontal head, or the limit switch at the end of the machine is jammed by wood chips or is damaged
b. The push button is faulty

Remedial Action

a. Check and clean the limit switches
b. Check and clean the push button

FAULT **If the limit switch between the Top Head and Beam is operated simultaneously with either of the two Beam Vertical Traverse limit switches, the Beam will not lower**

Diagnosis

Disengage the clutch on top head and manually wind down the top head until limit switch is released, then bring beam down by normal procedure (pushbutton control)

The foregoing observations are of a general nature and intended to be of assistance to avoid the incidence of breakdown. They do not preclude the user from calling a qualified electrician. In the case of a electrical fault or breakdown, in the interest of personal safety, it is always advisable to call a qualified electrician if the fault repeats.

TABLES

APPROVED LUBRICANTS

WADKIN	CASTROL	B.P.	SHELL	MOBIL	ESSO	GULF	CALTEX
L1 Hyspin	Energol AWS 32	Vitrol HLP 32	Dte Oil 32	Nuto 44 Light 24	Harmony or Esstic H44	Rando 43 AW	Oil HDA
L2	Alpha ZN 150	Energol HP 150 or CS 150	Vitrea 150	Vactra Extra heavy	Esstic 85	Service 13	URSAP40
L4	Magna 68	Energol HP 68 or CS 68	Vitrea 68	Vactral Oil Heavy Medium	Esstic 50	Service 51	URSAP20
L6	Spheerol AP3	Energrease LS3	Alvania Grease No 3	Mobilplex Grease No 48	Beacon 3	Gulfcrown Grease No 3	Regal Startak Premium 3

L1 OIL — Hydraulic oil with anti-corrision, anti-oxidation, anti-wear, anti-foam performance

L2 OIL — Gear oil (viscosity 150 centi - strokes at 40 degrees C)

L4 OIL — Plain mineral oil (Viscosity 68 centi - strokes at 40 degrees C)

L6 GREASE — Grease NLG1 No 3 consistency Lithium bearing grease

The worm drive gearboxes are supplied filled to the correct level with a semi-fluid grease, IP Tevela Compound A. No maintenance will normally be required on these gearboxes which are sealed for life.

The variable speed unit gearbox can be refilled with Wadkin L2 oil.

MOTOR AND DRIVE BELT DATA

Belts and puleys for spindle drive to **FIRST AND SECOND BOTTOM HEADS** 50 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Fenner Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
D112	5.5	7.5	03120223	K3078218	28	2012	K3077114	SPZ850	K3078213	3	GA410	6000
D132	7.5	10	03120223	K3078218	38	2012	K3077113	SPZ850	K3078213	3	GA410	6000

Belts and puleys for spindle drive to **FIRST AND SECOND BOTTOM HEADS** 60 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Fenner Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
D112	5.5	7.5	03120203	K3078272	28	2012	K3077114	SPZ800	K3078208	3	GA410	6000
D132	7.5	10	03120203	K3078272	38	2012	K3077113	SPZ800	K3078208	3	GA410	6000

Belts and puleys for spindle drive to **FENCE SIDE HEAD** 50 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Stephens Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
D132	5.5	7.5		GA416				METEOR CE6P	K3005385	1	GA413	6000
D132	7.5	10		GA416				METEOR CE6P	K3005385	1	GA413	6000

Belts and puleys for spindle drive to **FENCE SIDE HEAD** 60 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Stephens Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
D132	5.5	7.5		GA416				METEOR CE6P	K3005385	1	GA414	6000
D132	7.5	10		GA416				METEOR CE6P	K3005385	1	GA414	6000

Belts and puleys for spindle drive to **NEAR SIDE HEAD** 50 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Stephens Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
D132	5.5	7.5		GA416				METEOR CE6P	K3005418	1	GA413	6000
D132	7.5	10		GA416				METEOR CE6P	K3005418	1	GA413	6000

Belts and puleys for spindle drive to **NEAR SIDE HEAD** 60 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Stephens Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
D132	5.5	7.5		GA416				METEOR CE6P	K3005414	1	GA414	6000
D132	7.5	10		GA416				METEOR CE6P	K3005414	1	GA414	6000

Belts and puleys for spindle drive to **TOP HEAD** 50 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Fenner Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
132	7.5	10	031Z0223	K3078218	38	2012	K3077113	SPZ850	K3078213	3	GA410	6000
132	11	15	031Z0223	K3078218	38	2012	K3077113	SPZ850	K3078213	3	GA410	6000

Belts and puleys for spindle drive to **TOP HEAD** 60 hertz

Motor			Motor Pulley		Taper lock Bush			Belts			Spindle pulley	Spindle speed
Frame Size	K.W	H.P	Fenner Ref	Wadkin Code	Bore M.M	Fenner Ref	Wadkin Code	Fenner Ref	Wadkin Code	Quan	Wadkin Number	R.P.M
132	7.5	10	031Z0203	K307872	38	2012	K3077113	SPZ800	K3078208	3	GA410	6000
132	11	15	031Z0203	K3078272	38	2012	K3077113	SPZ800	K3078208	3	GA410	6000

SECTION 5 ILLUSTRATED PARTS LIST

CONTENTS

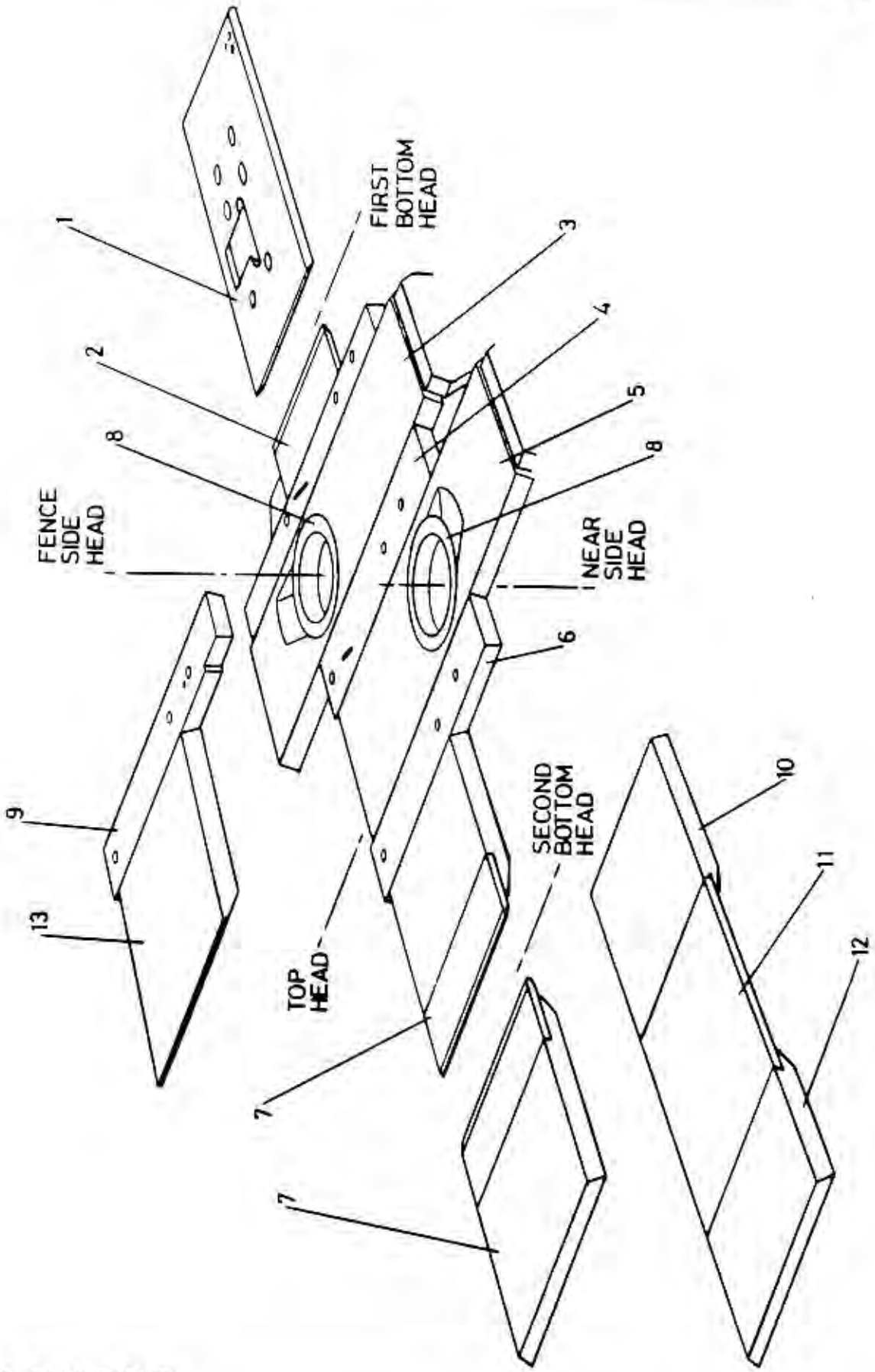


FIG 1 BEDPLATES

1 BEDPLATES

Ref No.	Desctiption	No. Off
1	Bedplate with driven bedroll	1
2	Bedplate after first bottom head	1
3	Fence side head carriage	1
4	Bedplate between side heads	1
5	Near side head carriage	1
6	Bedplate after near side head	1
7	Bedplate before/after second bottom heads	2
8	Fill-in fing for side heads	2
9	Optional bedplate after near side head for front fence scale setting	1
10	Optional bedplate before second bottom head for splitting	1
11	Optional 'permali' insert for splitting	1
12	Optional bedplate after second bottom head for splitting	1
13	Optional 'permali' bedplate before second bottom head for top head splitting	1

ITEMS 1 TO 4 ONLY ON FIRST BOTTOM HEAD

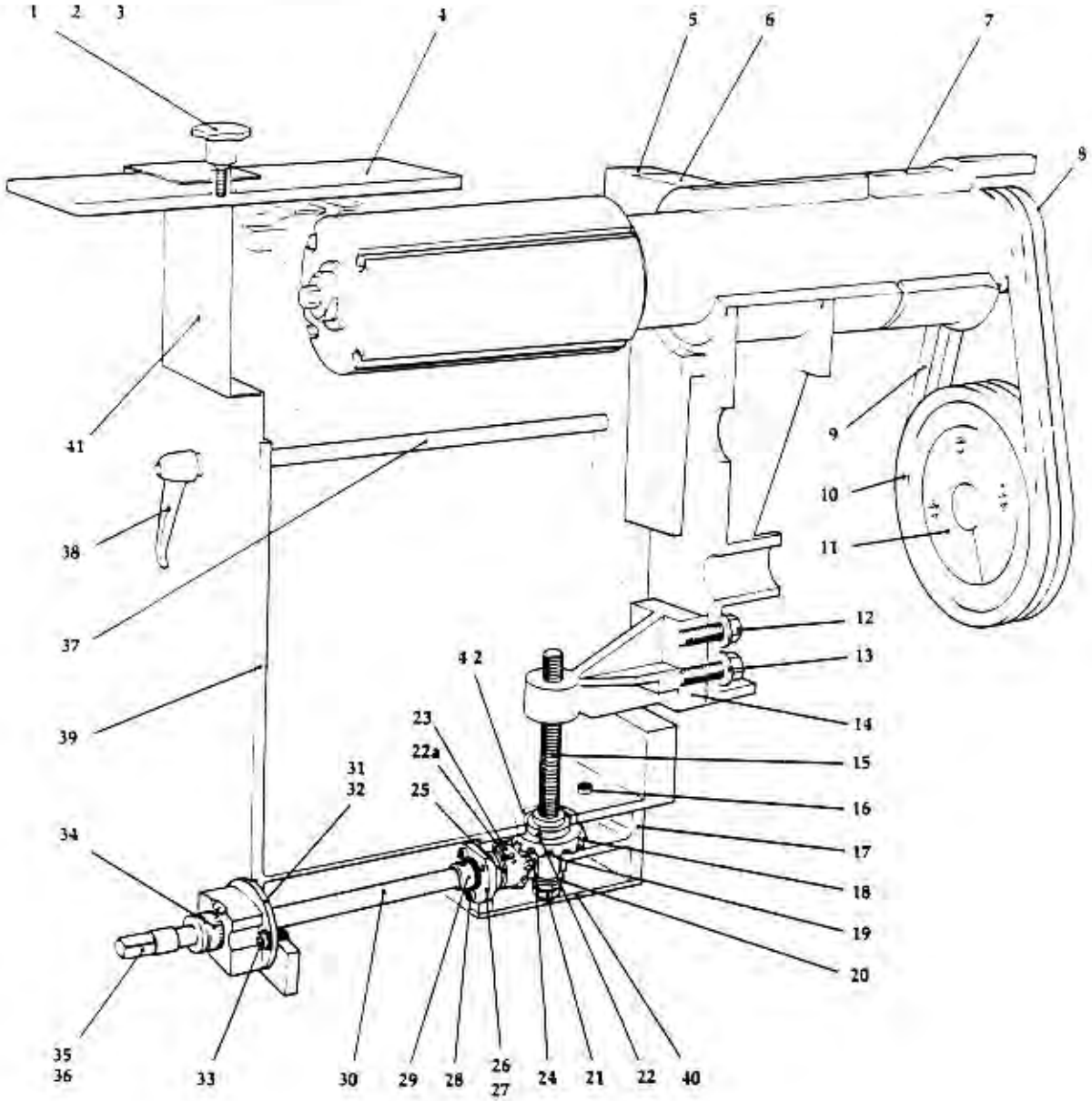


FIG 2 FIRST AND SECOND BOTTOM HEAD HEIGHT ADJUSTMENT

2. FIRST AND SECOND BOTTOM HEADS

Ref. No.	Description	No. Off
1	Handwheel, standard, black plastic moulding, M12 blind hole	1
2	Locking screw for guard, First Bottom Head cutterblock	1
3	Locking pad for cutterblock guard	1
4	Top sliding guard, First Bottom Head	1
5	Slide strip	1
6	Bottom Head spindle housing, vertical slide	1
7	Pulley belt housing, horizontal heads	1
8	Spindle pulley, Bottom and Top Heads	1
9	Fenner vee belt, SPZ850	2 or 3
10	Fenner vee belt pulley (see tables)	1
11	Fenner Taper-lock bush (see tables)	1
12	Hexagon head screw, M10 x 30mm long	4
13	Spring washer, 10mm diameter, single coil	4
14	Bracket nut, Bottom Head vertical adjustment	1
15	Vertical adjustment screw, First Bottom Head	1
16	Hexagon socket capscrews, M6 x 75mm long	4
17	Bevel box, Bottom Head vertical adjustment	1
18	Bevel gear wheel	1
19	Bearing washer, top and bottom	2
20	Thrust washer	1
21	M16 hexagonal nut	2
22	Parallel key 5mm x 5mm x 20mm long	1
22a	Parallel key 8mm x 7mm x 20mm long	1
23	Bevel gear pinion	1
24	Circlip, 16mm external, pinion shaft (not shown)	1
25	Thust washer	1
26	Bronze bush, 25mm ID x 30mm OD x 25mm long	1
27	End cap, bevel box	1
28	Hexagon socket capscrews, M6 x 20mm long	3
29	Collar	1
30	Extension shaft, bevel gear	1
31	Bearing bracket, extension shaft	1
32	Bronze bush, 20mm ID x 25mm OD x 25mm long	2
33	Hexagon socket capscrews, M6 x 20mm long	2
34	Calibrated dial, GA6768	1
35	Square end shaft extension	1
36	Taper pin, No.5	1
37	Extension shaft, vertical lock	1
38	Locking handle, M12 x 25mm, male	1
39	Main frame	1
40	Cover, bevel box	1
41	Front guard, Bottom Head spindles	1
42	Top cover, bevel gear	1

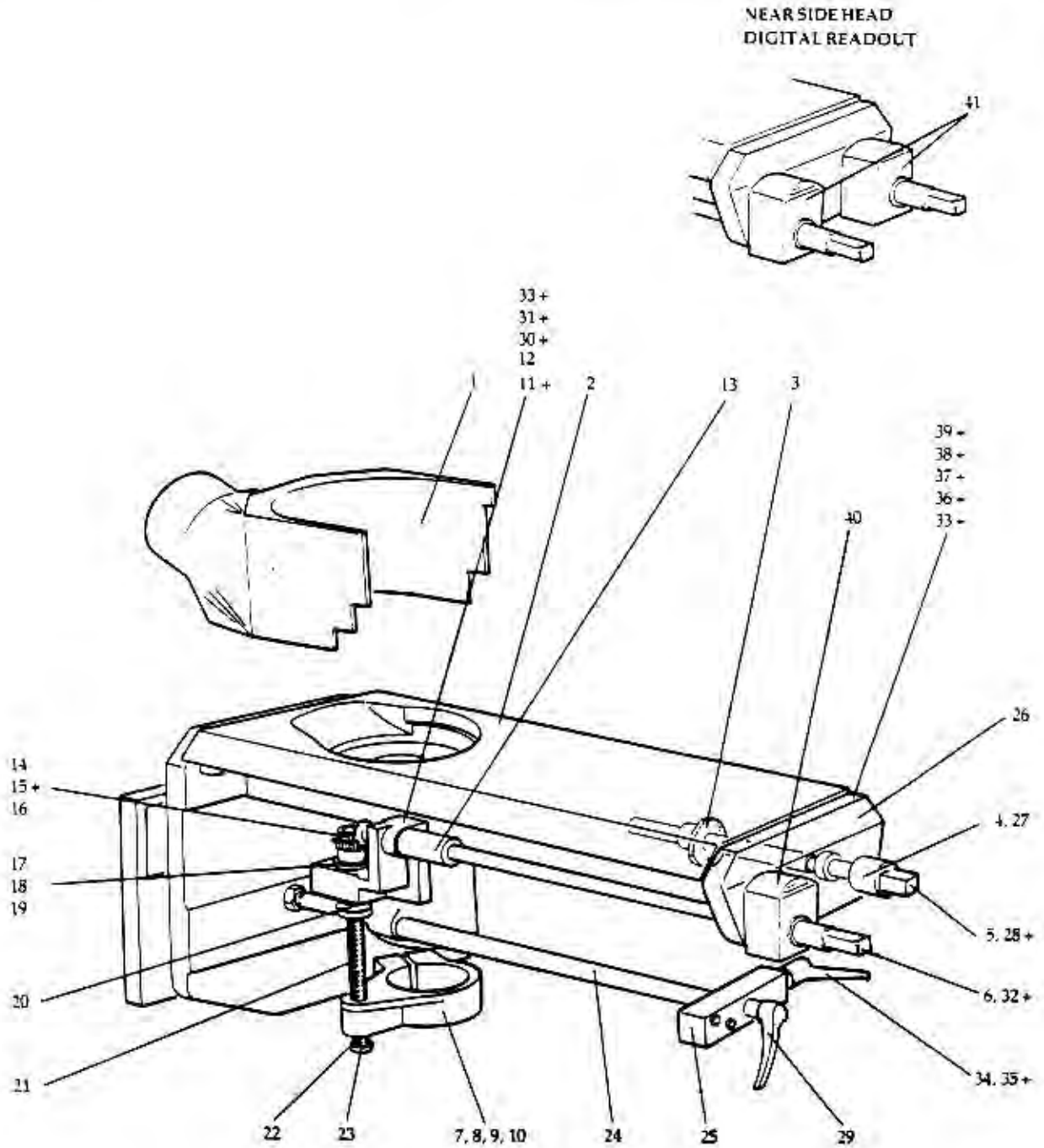


FIG 3 FENCE AND NEAR SIDE HEAD CARRIAGE ADJUSTING MECHANISM

3. FENCE AND NEAR SIDE HEAD CARRIAGE UNIT ADJUSTING MECHANISM (INCLUDING RISE AND FALL WHEN FITTED)

	Ref. No.	Description	No. Off
	1	Exhaust hood (Fence Side Illustrated)	1
	2	Fence or Near Side Head spindle carriage	1
	3	Nut for lateral movement	1
	4	Calibrated dial	2
	5	Horizontal shaft for lateral movement	1
	6	Front horizontal shaft for vertical movement	1
	7	Nut for vertical adjustment	1
	8	Hexagon head screw, M10. dia. x 80mm long	1
	9	Bright mild steel washer size M10	2
	10	Hexagon nut, M10	1
+	11	Rear horizontal shaft for vertical adjustment	1
	12	Mitre gear bracket for side head vertical adjustment	1
	13	Collar for horizontal shaft for vertical adjustment	1
	14	Straight mitre bevel gear (16T 2.5 MOD)	2
+	15	Hexagon socket screw - cup point, M6 dia. x 6mm long	2
	16	M12, self locking nut	1
	17	'INA' bearing AXK2542	2
	18	'INA' bearing AS2542	2
	19	'INA' bearing LS2542	2
	20	Chamfered notch nut, M24 x 1.5	2
	21	Vertical screw for side head vertical adjustment	1
	22	Large dia. Mild steel washer size, M10	1
	23	Hexagon head screw, M10 x 20mm long	1
	24	Locking shaft for fence or near side head spindle barrel	1
	25	Clamping block for side head horizontal movement	1
	26	Legend plate	1
+	27	Collar, M20 dia.	2
+	28	'0' Ring	2
	29	Locking handle, M12 x 25mm, male	1
+	30	Mitre gear bracket guard	1
+	31	Key, 5 x 5 x 20	3
+	32	'INA' bearing thrust washer	1
+	33	Grease nipple	4
	34	Locking handle, M10 x 25mm, male	1
+	35	Brass pad, dia. 6 x 5mm	1
	36	Bearing plate	1
+	37	'INA' bearing AXK2035	2
+	38	'INA' thrust washer AS2035	3
+	39	'INA' shaft washer WS81104	1
	40	Digital readout (fence side head)	1
	41	Digital readout (near side head)	2

\+ Not illustrated

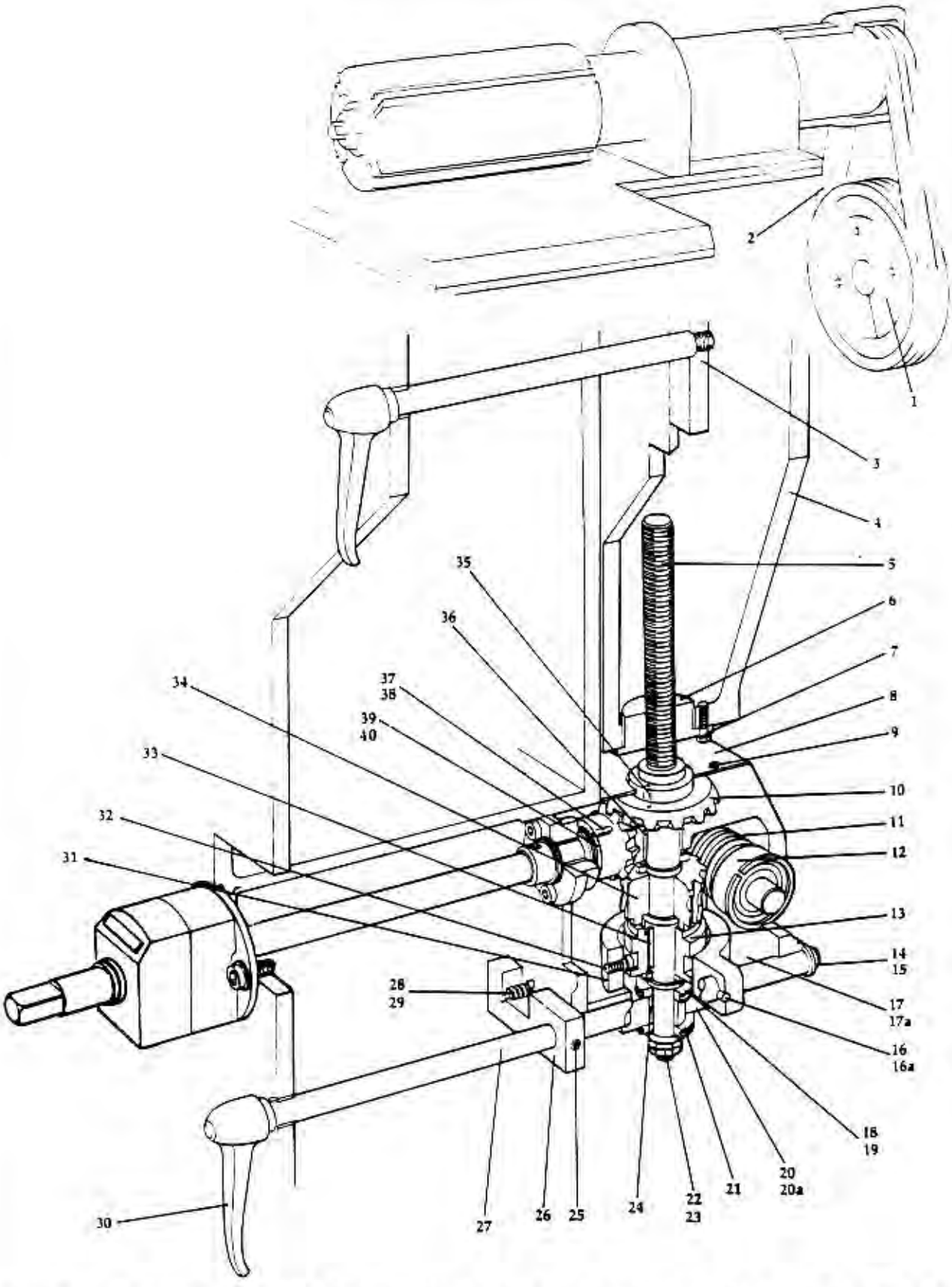


FIG 4 TOP HEAD HEIGHT ADJUSTMENT INCLUDING POWERED RISE AND FALL

4. TOP HEAD INCLUDING POWER RISE AND FALL

Ref. No.	Description	No. Off
1	Fenner vee belt pulley	1
2	Fenner vee belt, SPZ850	2 or 3
3	Slide strip	1
4	Top head vertical slide	1
5	Vertical screw, Top Head rise and fall	1
6	Bracket nut, Top Head rise and fall	1
7	Hexagon head screws, M8 x 25mm long	2
8	Top cover, gearbox/clutch housing	1
9	Socket head capscrews, M6 x 10mm long	4
10	Bevel gear wheel	1
11	Worm gear, rise and fall top beam/head	1
12	Bearing, 6204 RS	2
13	Dogclutch, Top Head rise and fall	1
14	Circlip, 16mm external (not shown)	1
15	Spacer washer	1
16	Tension pin, 6mm x 32mm long	1
16a	Hexagon socket screw cup point, M6 x 6mm long	1
17	Gearbox/clutch housing	1
17a	Socket head capscrews, M12 x 30mm long	4
18	Spacer washer	2
19	Circlip, 30mm external	2
20	Bottom cover, gearbox/clutch housing	1
20a	Securing screws, M8 x 16mm hex. socket	4
21	Thrust washer	2
22	Plain washer, 16mm	1
23	M16 hexagon nut	2
24	Bronze bush, 25mm ID x 30mm OD x 20mm long	1
25	Hexagon socket screw, cup point, M6 x 10mm long	1
26	Clutch location arm	1
27	Clutch shaft	1
28	Spring, clutch location arm lock	1
29	Steel ball, 10mm diameter	1
30	Locking handle, M10 x 25mm, male	1
31	Clutch yoke, top head rise and fall	1
32	Hexagon socket capscrews, M6 x 10mm long	2
33	Parallel key, 8mm x 7mm x 32mm long	1
34	Worm wheel, Top Head rise and fall	1
35	Parallel key, 8mm x 7mm x 14mm long	1
36	Bronze bush, 30mm ID x 35mm OD x 20mm long	1
37	Circlip, 16mm external (not shown)	1
38	Parallel key, 5mm x 5mm x 20mm long	1
39	Spacer washer	2
40	Bevel gear, pinion	1
41	End cap, bevel box	1
42	Socket head capscrew, M6 x 20mm long	3
43	Bronze bush, 20mm ID x 25mm OD x 25mm long	1
44	Collar	1

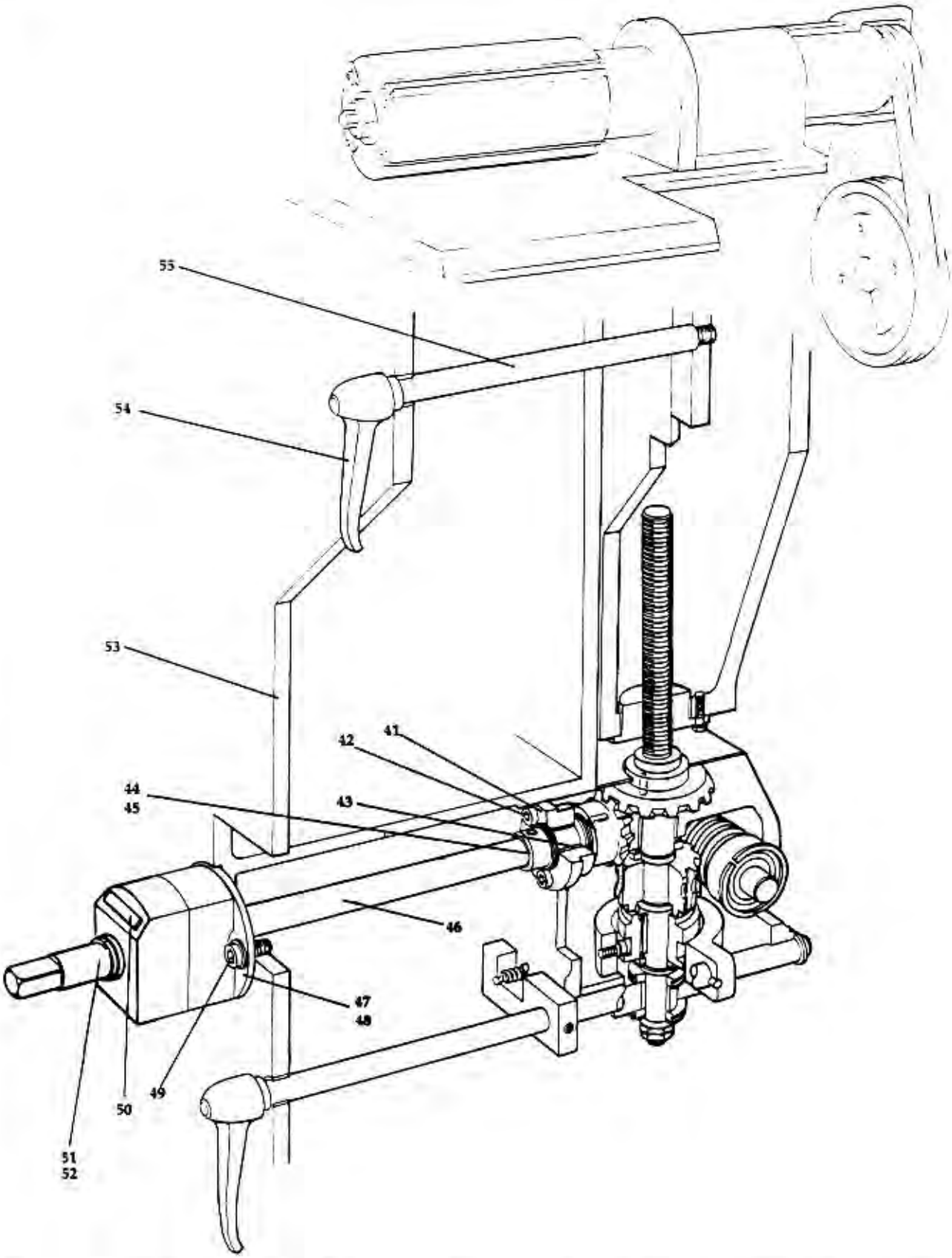


FIG 4 TOP HEAD HEIGHT ADJUSTMENT INCLUDING POWERED RISE AND FALL

4. TOP HEAD INCLUDING POWER RISE AND FALL (Cont.)

Ref. No.	Description	No. Off
45	Hex. socket screw - cup point, M6 x 6mm long	1
46	Extension shaft	1
47	Bearing bracket, extension shaft	1
48	Bronze bush, 20mm ID x 25mm OD x 25mm long	1
49	Hex. socket capscrews, M6 x 20mm long	2
50	Digital readout	1
51	Square end shaft extension	1
52	Taper pin, No.1	1
53	Main frame	1
54	Locking handle	1
55	Extension shaft, vertical lock	1
56 +	Hex. head screw, M12 x 30mm	4
57 +	Circlip (safety feature)	1
58 +	Spring (safety feature)	1

+ Not illustrated. Attachment of gearbox/clutch housing to mainframe.

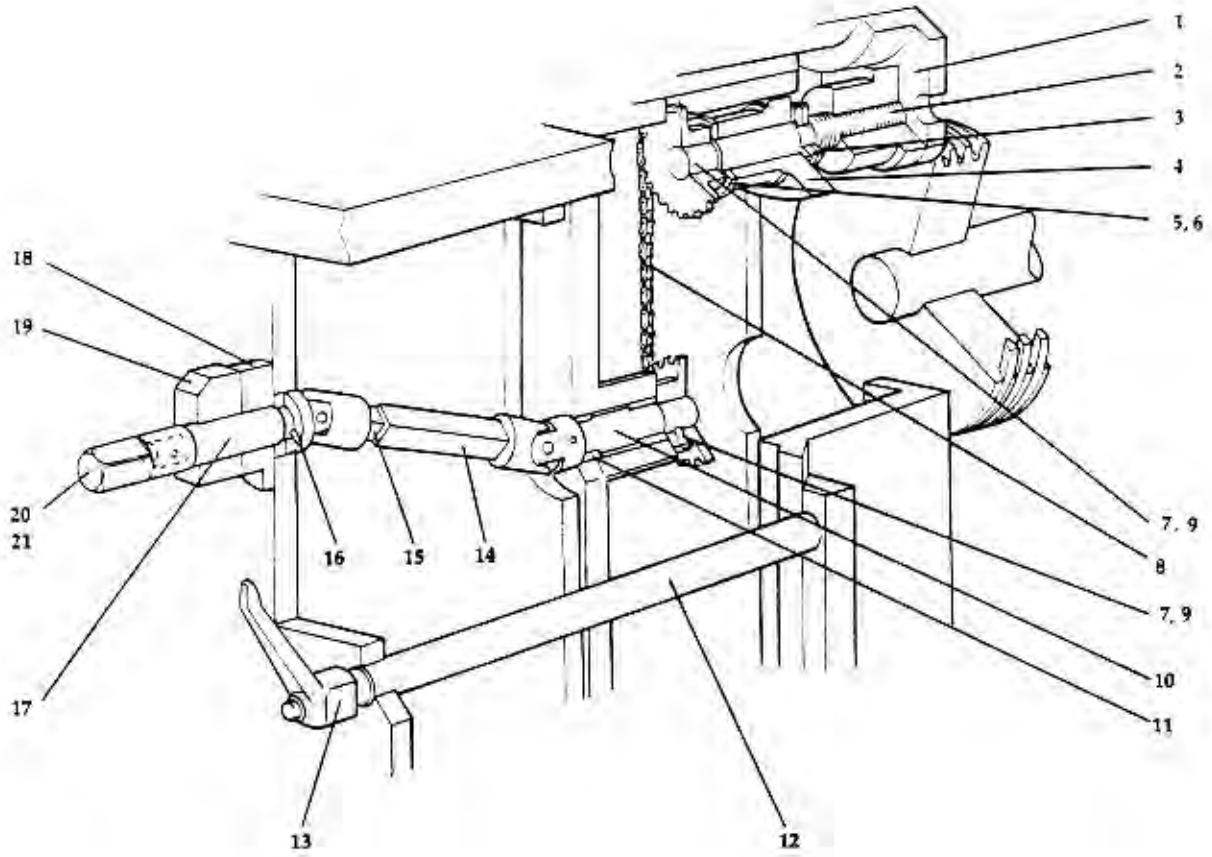


FIG 5 BOTTOM (EXCLUDING FIRST) AND TOP HEAD AXIAL ADJUSTMENT

5. BOTTOM (EXCLUDING FIRST) AND TOP HEADS AXIAL ADJUSTMENT

Ref. No.	Description	No. Off
1	Nut for horizontal head adjustment	1
2	Shaft for horizontal head adjustment	1
3	M24. x 1.5 chamfered notch nuts	2
4	Bearing bracket for horizontal adjustment	1
5	'INA' bearings AXK2542	2
6	'INA' bearings AS2542	4
7	Sprocket for horizontal head axial adjustment	2
8	'RENOLD' Roller chain No. 111046 12.9mm (1/2in.) pitch, 40 pitches including connecting link	1
9	No. 4 taper pin	2
10	Shaft	1
11	20mm ID x 25mm OD x 20mm long bronze bush	2
12	Extension for vertical lock to horizontal heads	1
13	Locking handle M12 x 25mm, male	1
14	Universal coupling and square tube assembly for horizontal head adjustment	1
15	Universal coupling and squre tube assembly for horizontal head cross adjustment	1
16	6mm dia. x 32mm long tension pin	1
17	Shaft for horizontal head cross adjustment	2
18	Bearing block	1
19	Digital readout	1
20	Square shaft extension	1
21	Taper pin. No.1	1

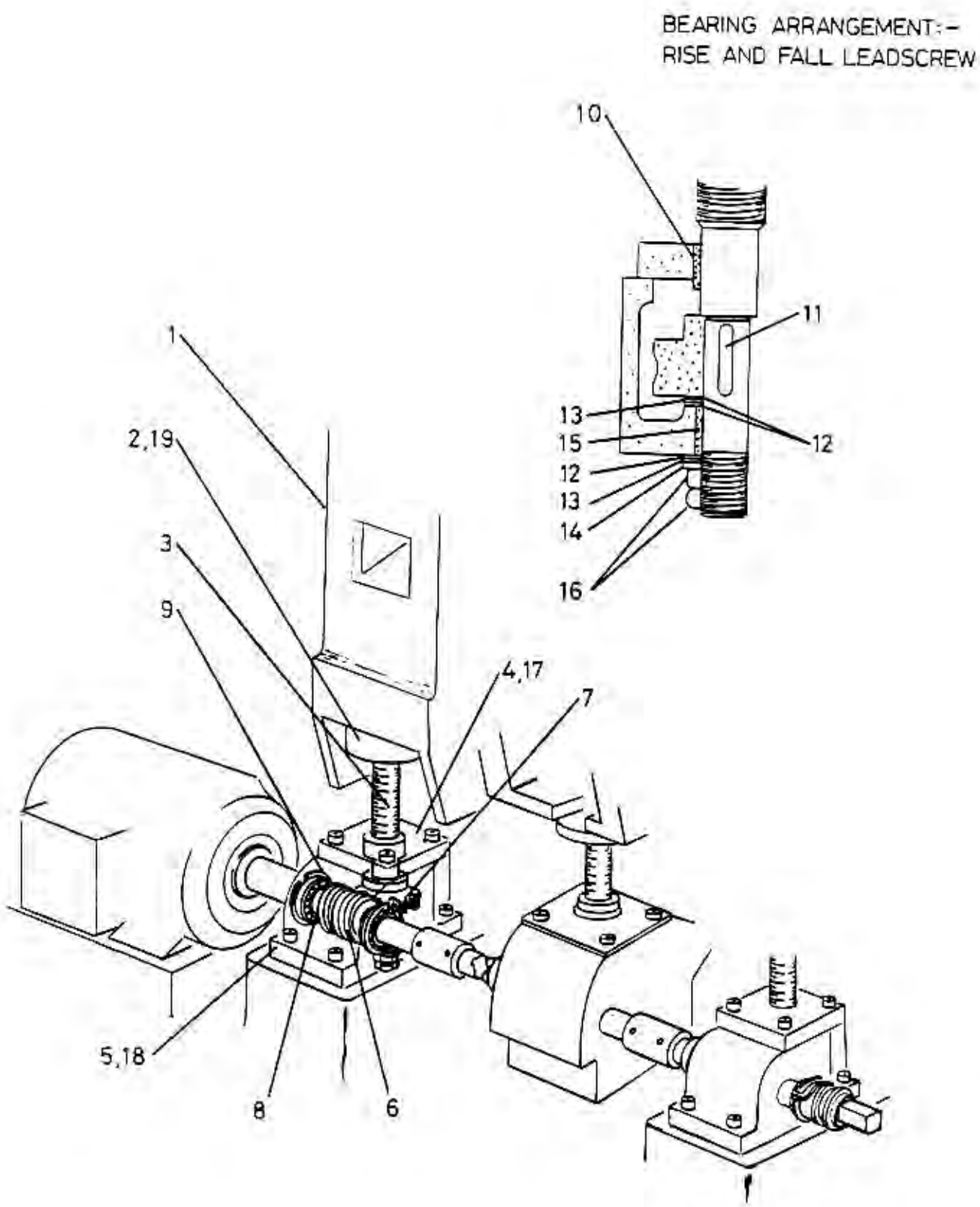


FIG 6 BEAM POWER RISE AND FALL

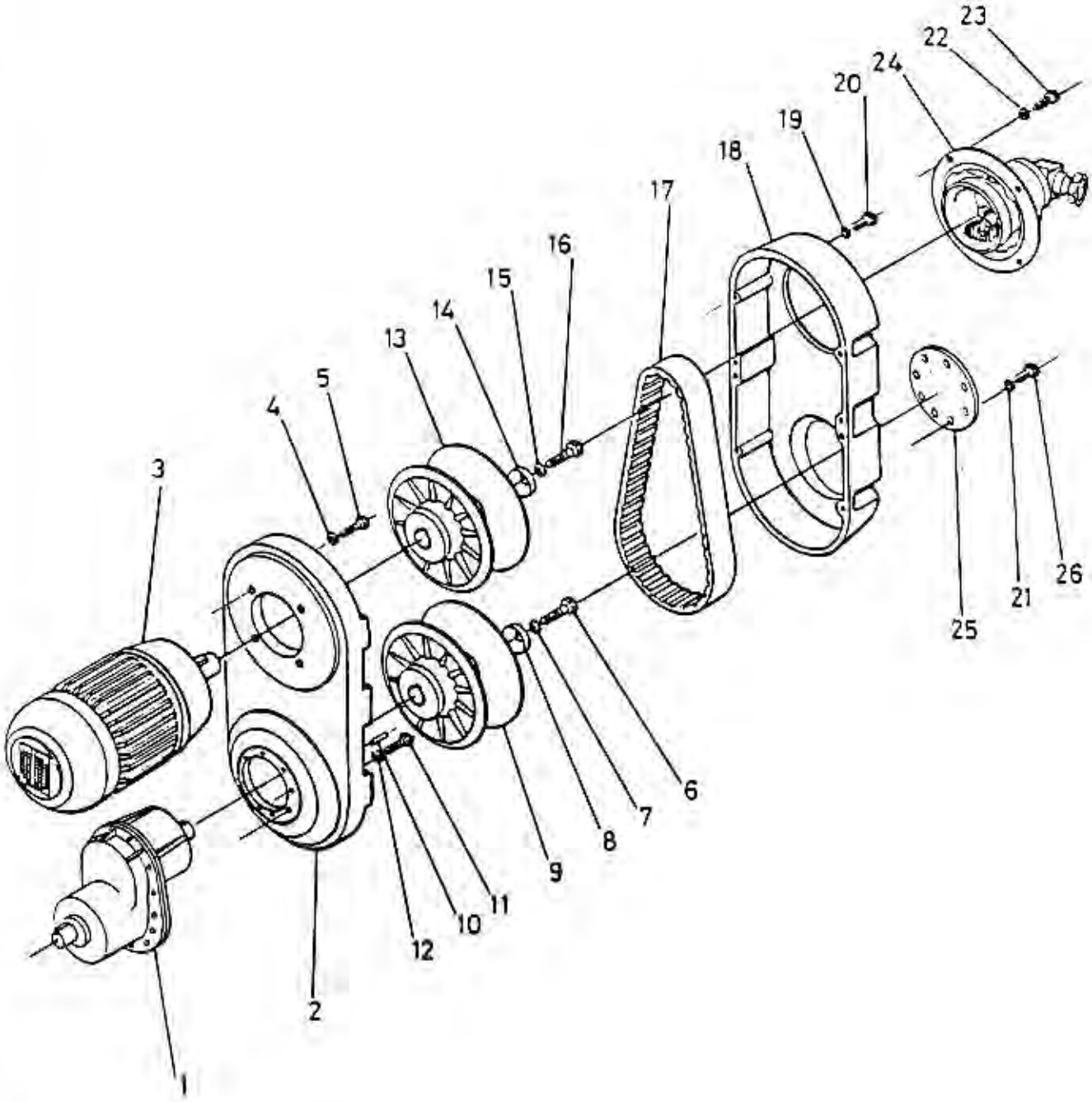


FIG 7 SIMPLABELT VARIABLE SPEED DRIVE UNIT

7. SIMPLABELT VARIABLE SPEED DRIVE UNIT

Ref. No.	Description	No. Off
1	Helical gear transmission (shaft drive)	1
2	Housing	1
3	Standard 3 phase motor	1
4	Lock washer, spring	4
5	Screw, hexagon head	4
6	Screw, cheese head	1
7	Washer disc, or nut	1
8	Locking plate	1
9	Pulley, spring loaded (gearbox)	1
10	Pin	1
11	Screw, hexagon head	8
12	Lock washer, spring	8
13	Pulley, mechanical adjustable (motor)	1
14	Locking plate	1
15	Washer disc, or nut	1
16	Screw, hexagon head	1
17	Vee belt, wide	1
18	Cover	1
19	Lock washer, spring	4
20	Screw, cheese head	4
21	Lock washer, spring	8
22	Lock washer, spring	4
23	Screw, cheese head	4
24	Hand adjustment	1
25	Cover plate	1
26	Screw, hexagon head	8

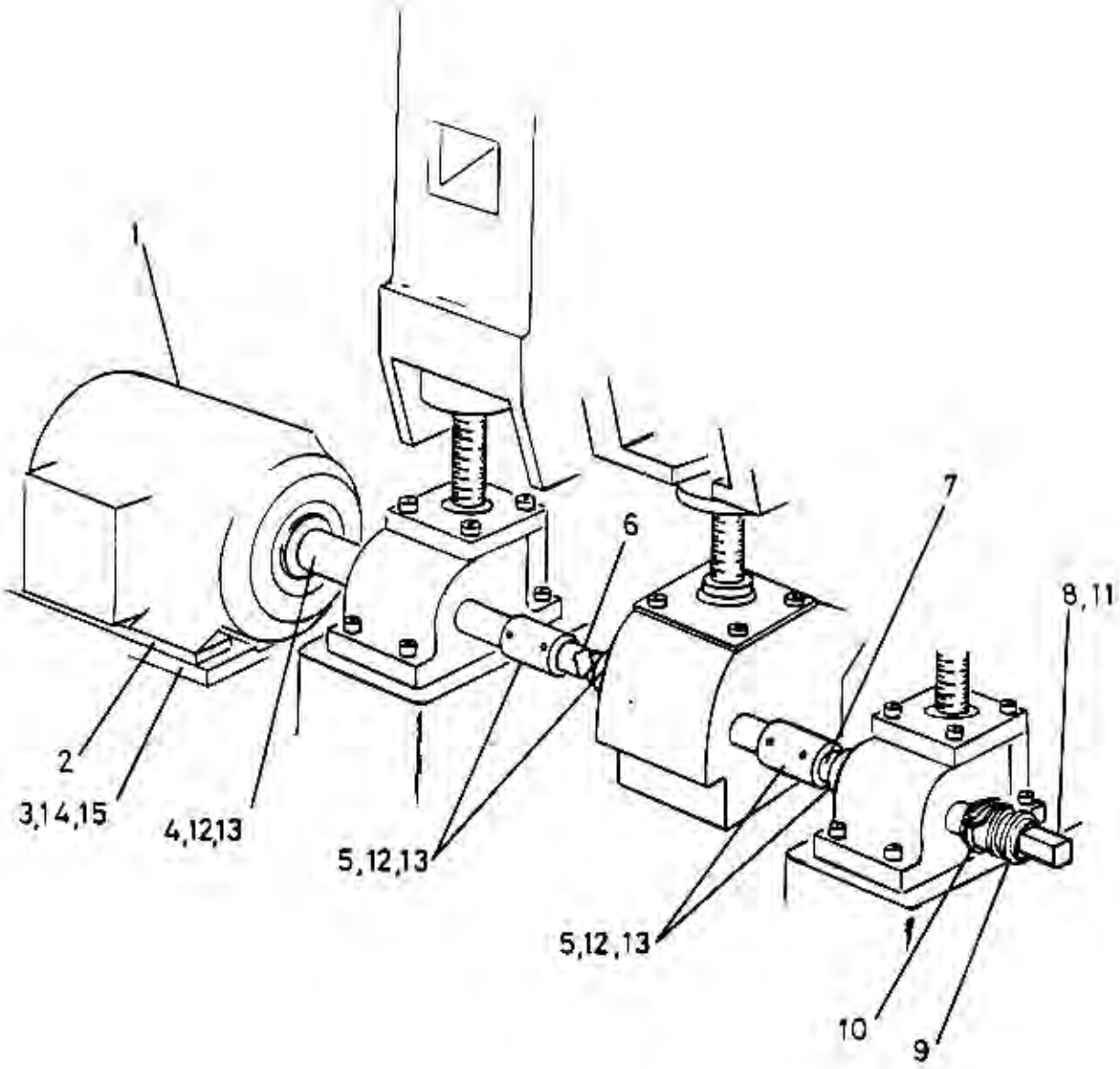


FIG 8 DRIVE SHAFTS TO RISE AND FALL FOR BEAM AND TOP HEAD

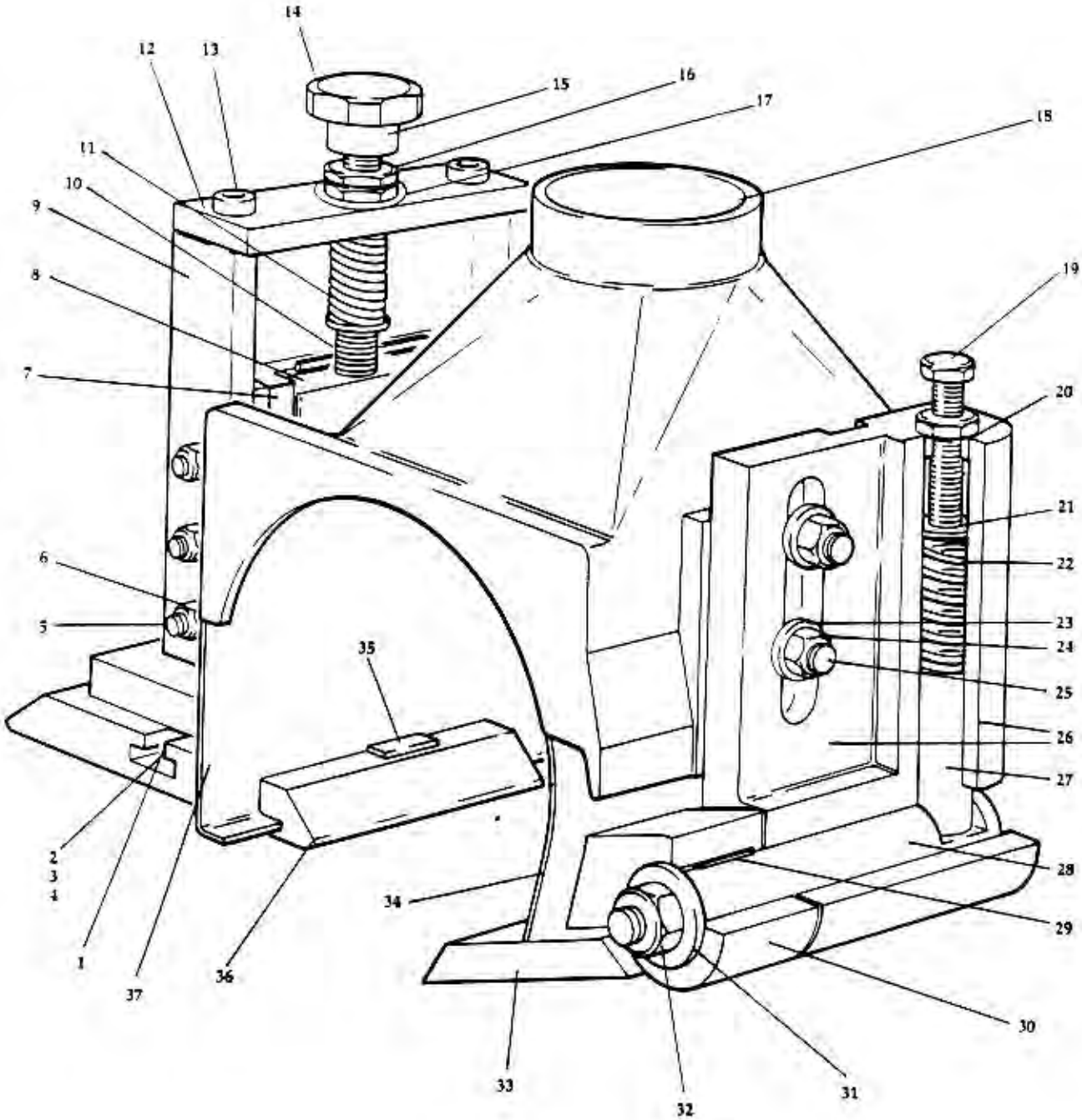


FIG 9 TOP HEAD CHIPBREAKER, PRESSURE PAD AND EXTRACTION HOOD

9. TOP HEAD CHIPBREAKER, PRESSURE PAD AND EXTRACTION HOOD

Ref.No.	Description	No. Off
1	Tee-nut, M10, ref. WDS 664 203	2
2	Screwed stud, M10 x 45mm long	2
3	Washer 10mm, bright mild steel	2
4	Hexagon nut, M10	2
5	Hexagon socket screw, half dog point, M6 x 35mm long	3
6	Hexagon nut, M6	3
7	Gib strip, rise and fall bracket, Top Head pressure pad	1
8	Slide, rise and fall, for shoe Top Head pressure pad	1
9	Bracket, rise and fall, Top Head pressure	1
10	Screw, raise/lower, Top Head pressure pad	1
11	Compression spring, Top Head pressure pad	1
12	Top plate, Top Head pressure pad	1
13	Hexagon socket screw, M8 x 20mm long	2
14	Handwheel, M12 blind hole	1
15	Taper pin, No.0	1
16	Hexagon nut, thin, M12	2
17	Washer, 12mm, bright mild steel	1
18	Exhaust hood, Top Head	1
19	Hexagon head screw, M12 x 40mm long	1
20	Plug, spring loaded Top Head chipbreaker	1
21	Cap, Top Head chipbreaker spring	1
22	Spring, Top Head chipbreaker	1
23	Washer, 10mm, bright mild steel	2
24	Hexagon nut, M10	2
25	Screwed stud, M10 x 50mm long	2
26	Pivot bracket, Top Head chipbreaker	1
27	Plunger, spring loaded Top Head chipbreaker	1
28	Pivot shaft, Top Head chipbreaker	1
29	Parallel key, 8mm x 6mm X 32mm long	1
30	Holder, Top Head chipbreaker shoe	1
31	Washer, chipbreaker pivot shaft	1
32	Nut, M12, self locking	1
33	Shoe Top Head, 70mm long	1
-	Shoe, Top Head, 82mm long 6A5039	1
	Shoe, Top Head, 105mm long	1
34	Chip deflector, Top Head chipbreaker	1
35	Cross tenon for shoe, Top Head pressure	1
36	Shoe, Top Head pressure	1
37	Cover, Top Head pressure pad	1

10. DOUBLE SIDE ROLLER PRESSURE UNIT

Ref. No.	Description	No. Off
1	Bracket, double roller side pressure unit	1
2	Pin, side pressure roller	2
3	Pressure roller	2
4	Sliding shaft, pressure roller	2
5	Infeed pressure spring	2
6	Casing, spring, pressure roller	2
7	Pressure adjusting screw	2
8	Nylon domed plug, black, 8mm hole	2
9	Hexagon head screw, M12 x 35mm long	2
10	Washer, 12mm, bright mild steel	2
11	Circlip, 20mm external	2
12	Bearing, SKF 6004 2RS	2
13	Tension pin, 8mm x 30mm long	2
14	Tension pin, 5mm x 30mm long	2

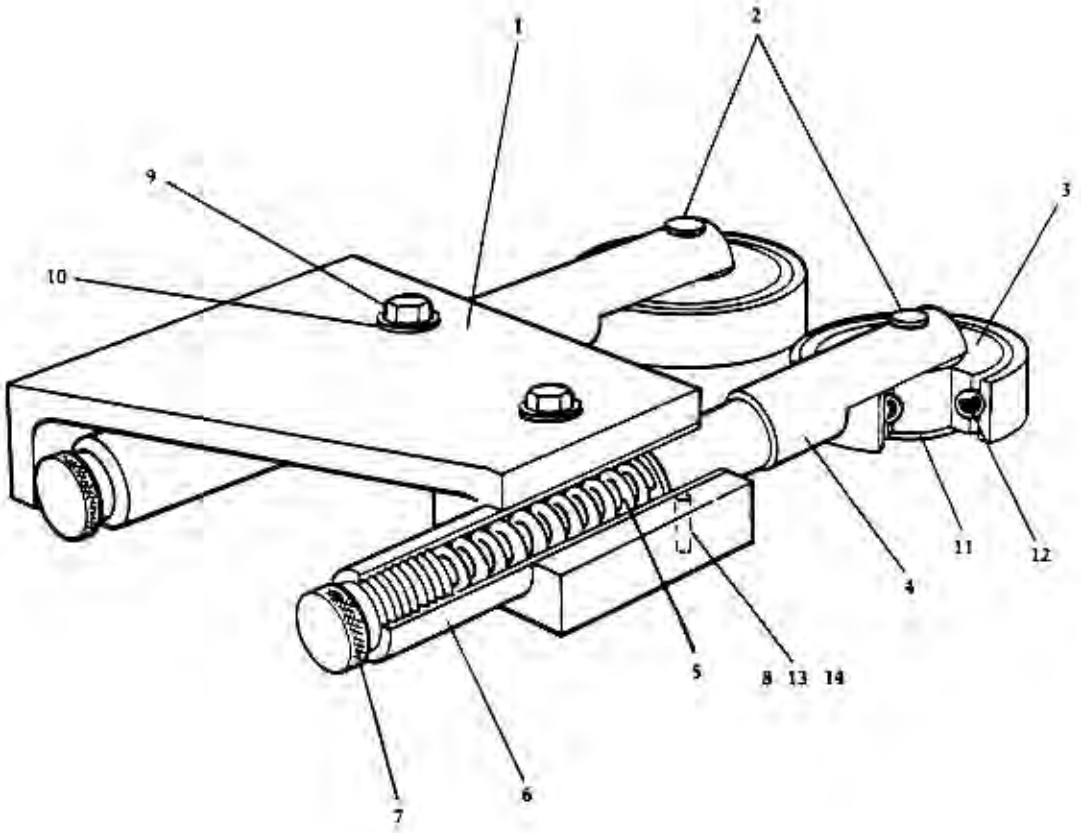


FIG 10 DOUBLE SIDE ROLLER PRESSURE UNIT

11. MOUNTING FOR TOP PAD OR ROLLER PRESSURE UNIT BEFORE TOP HEAD

Ref. No	Description	No. Off
1	Bracket, top pressure	1
2	Horizontal bar, longitudinal adjustment	1
3	Horizontal bar, transverse adjustment	1
4	Split clamp, top pressure horizontal bars	1
5	Screwed stud, M10 x 55mm long	1
6	Hexagon nut, M10	1
7	Washer, 10mm, bright mild steel	1
8	Hexagon socket screw, M10 x 25mm long	2
9	Hexagon head screws, M12 x 40mm long	2

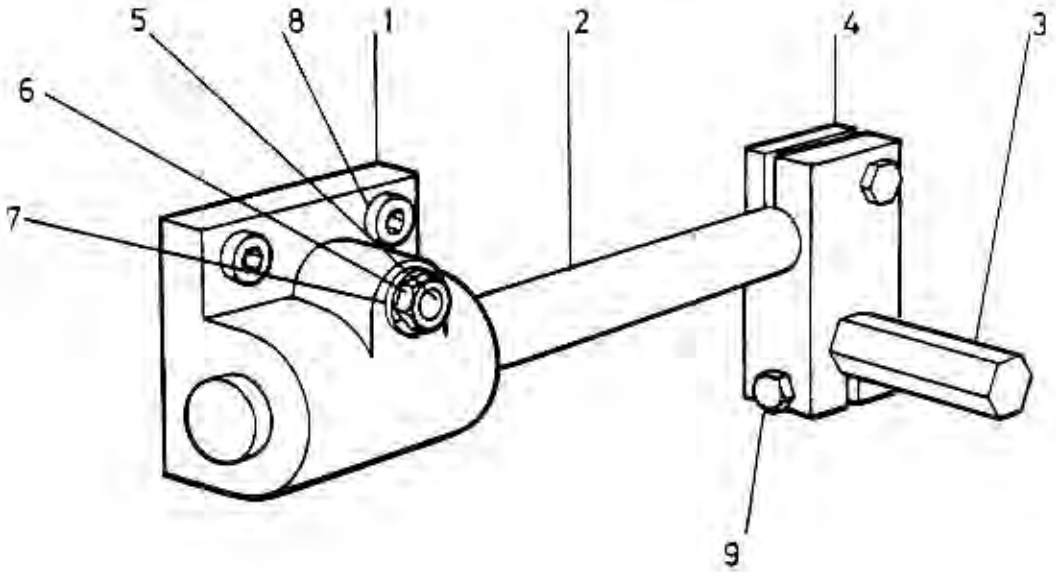


FIG 11 MOUNTING FOR TOP PAD OR ROLLER PRESSURE UNIT BEFORE TOP HEAD

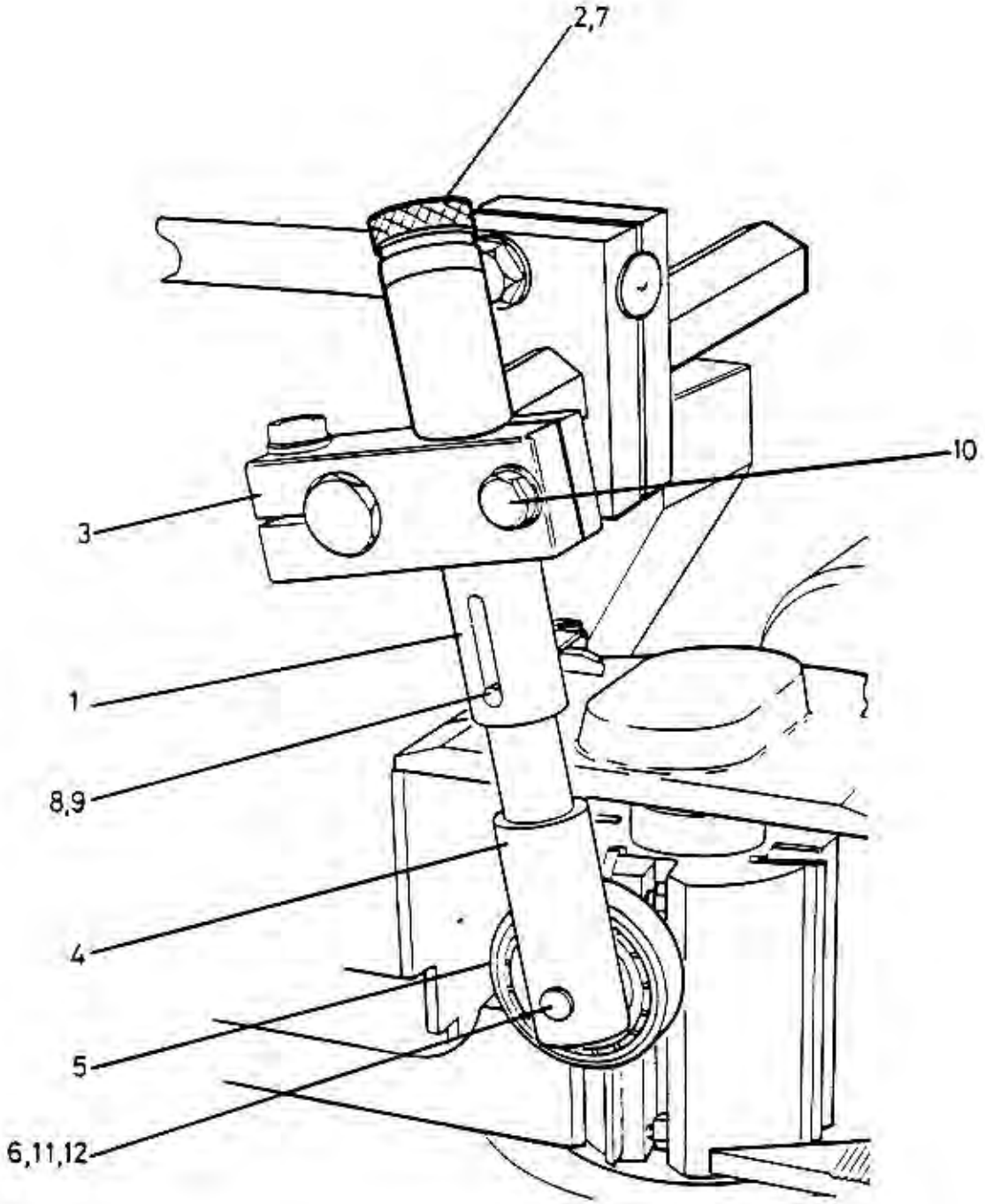


FIG 12 TOP ROLLER PRESSURE UNIT

12. TOP ROLLER PRESSURE UNIT

Ref. No.	Description	No. Off
1	Barrel, top pressure roller	1
2	Spring tensioner, top pressure	1
3	Split clamp, top pressure barrel	1
4	Roller arm, top pressure	1
5	Roller, top pressure	1
6	Roller pin, top pressure	1
7	Spring, infeed pressure	1
8	Tension pin, 8mm dia. x 24mm long	1
9	tension pin, 5mm dia. x 24mm long	1
10	Hexagon head screw, M12 x 45mm long	2
11	Circlip, 20mm external	1
12	Bearing, SKF 6004 2RS	1

13. BOTTOM HEAD SPINDLE UNIT - 40MM DIAMETER SQUARE SHOULDER

Ref. No.	Description	No. Off
1	Bottom head spindle locking nut	1
2	Bottom head spindle, 40mm dia. square shoulder	1
3	Bottom head spindle, bearing nut	1
4	Bearing nut spindle housing	1
5 *	Bearing 'RHP' or 'SKF' 6009	1
6 *	Horizontal spindle barrel	1
7	Bearing 'RHP' or 'SKF' 6306	1
8	Prallel key 8mm x 7mm x 40mm long	1
9	Pulley spigot for spindle	1
10	Hexagon head screw M12 x 45mm long	1
11	'BELLEVILLE' series 'K' disc spring	6

* 'KLUBER' grease packed

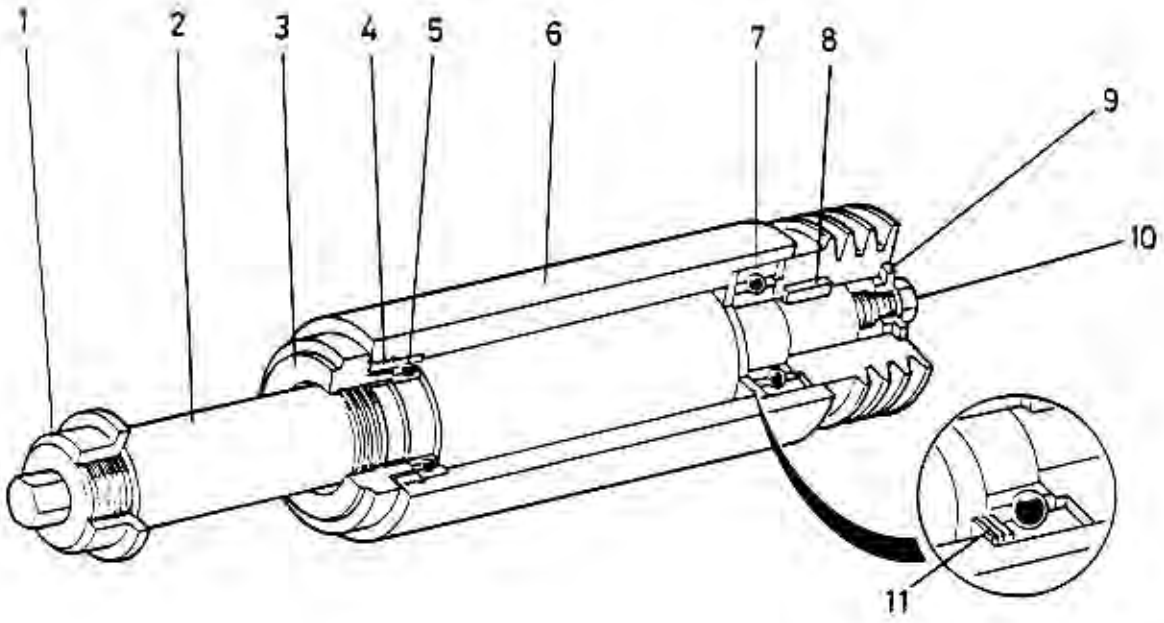


FIG 13 BOTTOM HEAD SPINDLE UNIT - 40MM DIAMETER SQUARE SHOULDER

14. TOP HEAD SPINDLE UNIT 40MM DIAMETER SQUARE SHOULDER

Ref. No.	Description	No. Off
1	Top head spindle locking nut	1
2	Top head spindle, 40mm dia. square shoulder	1
3	Top head spindle bearing nut	1
4	Bearing nut spindle housing	1
5 *	Bearing 'RHP' or 'SKF' 6009	1
6 *	Horizontal spindle barrel	1
7	Bearing 'RHP' or 'SKF' 6306	1
8	Parallel key 8mm x 7mm x 40mm long	1
9	Pulley spigot for spindle	1
10	Hexagon head screw M12 x 45mm long	1
11	'BELLEVILLE' series 'K' disc spring	6

* KLUBER Greased Packed

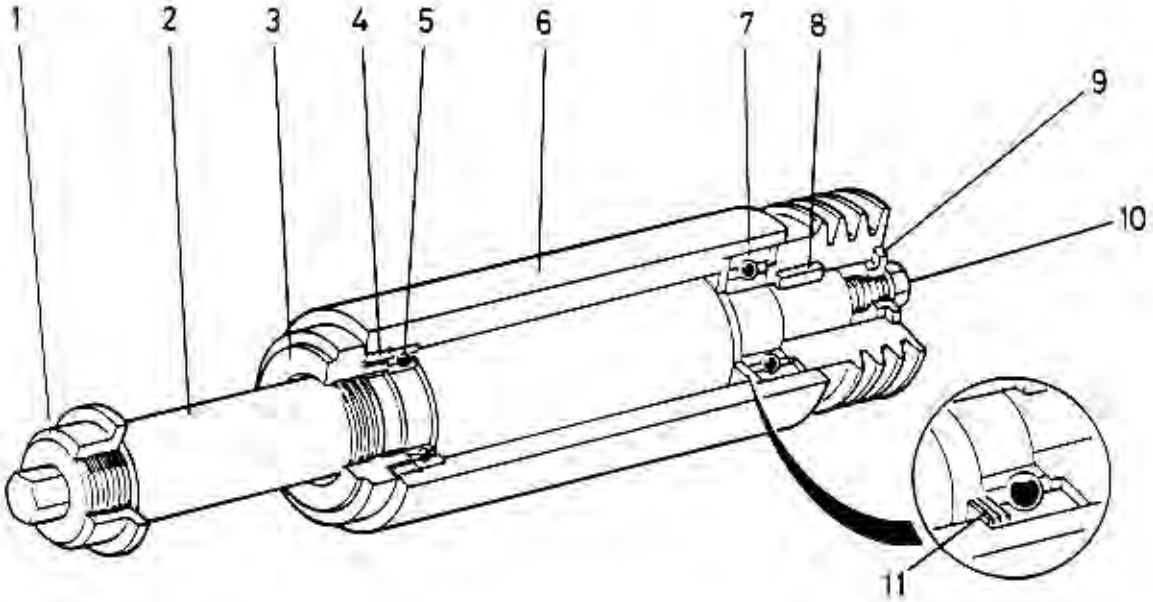


FIG 14 TOP HEAD SPINDLE UNIT - 40MM DIAMETER SQUARE SHOULDER

15. FENCE SIDE HEAD SPINDLE UNIT - 40MM DIAMETER SQUARE SHOULDER

Ref. No.	Description	No. Off
1	Locking nut fence side head spindle	1
2	Fence side head spindle, 40mm, dia. square shoulder	1
3	Bearing nut, fence side head spindle	1
4	Bearing nut, spindle housing	1
5 *	Bearing, RHP or SKF 6009	1
6	Barrel, side head spindles	1
7	Bearing, RHP or SKF 6306	1
8	Pulley spigot for spindle	1
9	Hexagon head screw, M12 x 35mm	1
10	Parallel key, 8mm x 7mm x 40mm long	1
11	'BELLEVILLE' series 'K' disc spring, for bearing 6306, 71.5mm OD x 45.5mm ID x 0.7mm	6

* 'KLUBER' grease packed

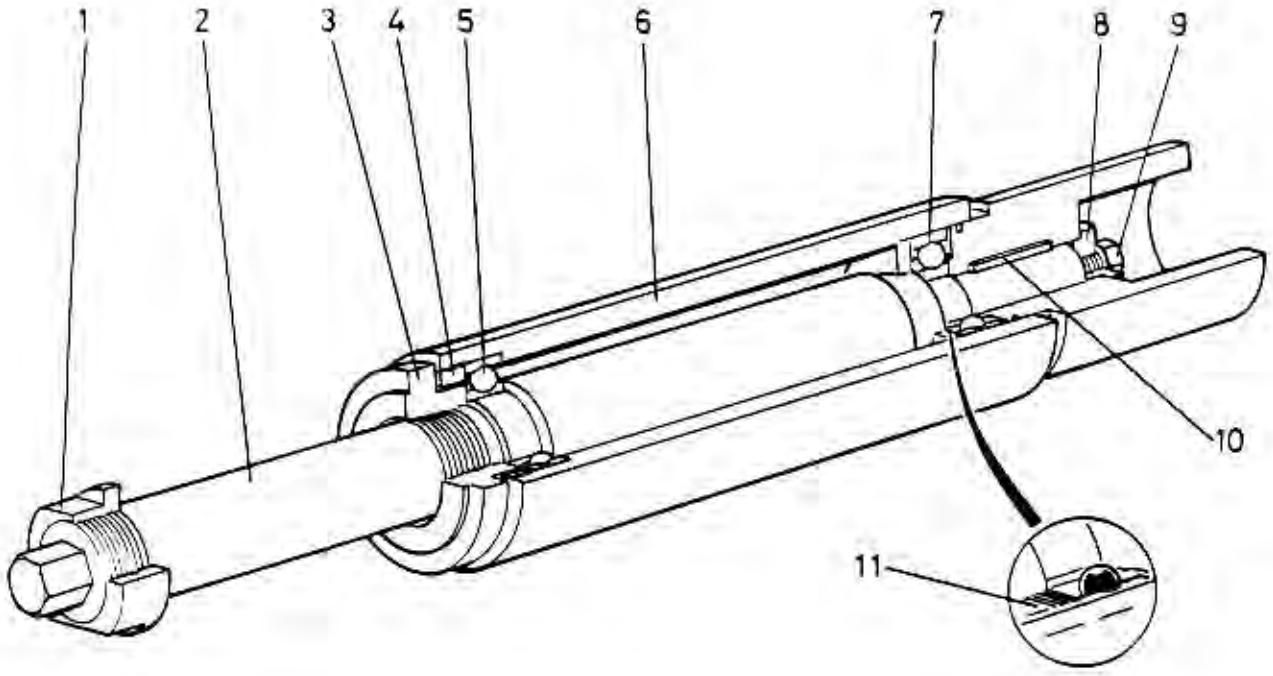


FIG 15 FENCE SIDE HEAD SPINDLE UNIT - 40MM DIAMETER SQUARE SHOULDER

16. NEAR SIDE HEAD SPINDLE UNIT - 40MM DIAMETER SQUARE SHOULDER

Ref. No.		Description	No. Off
1		Locking nut, Near side head spindle	1
2		Near side head spindle, 40mm dia. square shoulder	1
3		Bearing nut, Near side head spindle	1
4		Bearing nut, spindle housing	1
5	**	Bearing, RHP or SKF 6009	1
6		Barrel, Side Head spindles	1
7	**	Bearing, RHP or SKF 6306	1
8		Pulley spigot for spindle	1
9		Hexagon head screw, M12 x 35mm	1
10		Parallel key, 8mm x 7mm x 40mm long	1
11		'BELLEVILLE' series 'K' disc spring, for bearing 6306, 71.5mm OD x 45.5mm ID x 0.7mm	6

** 'KLUBER' grease packed

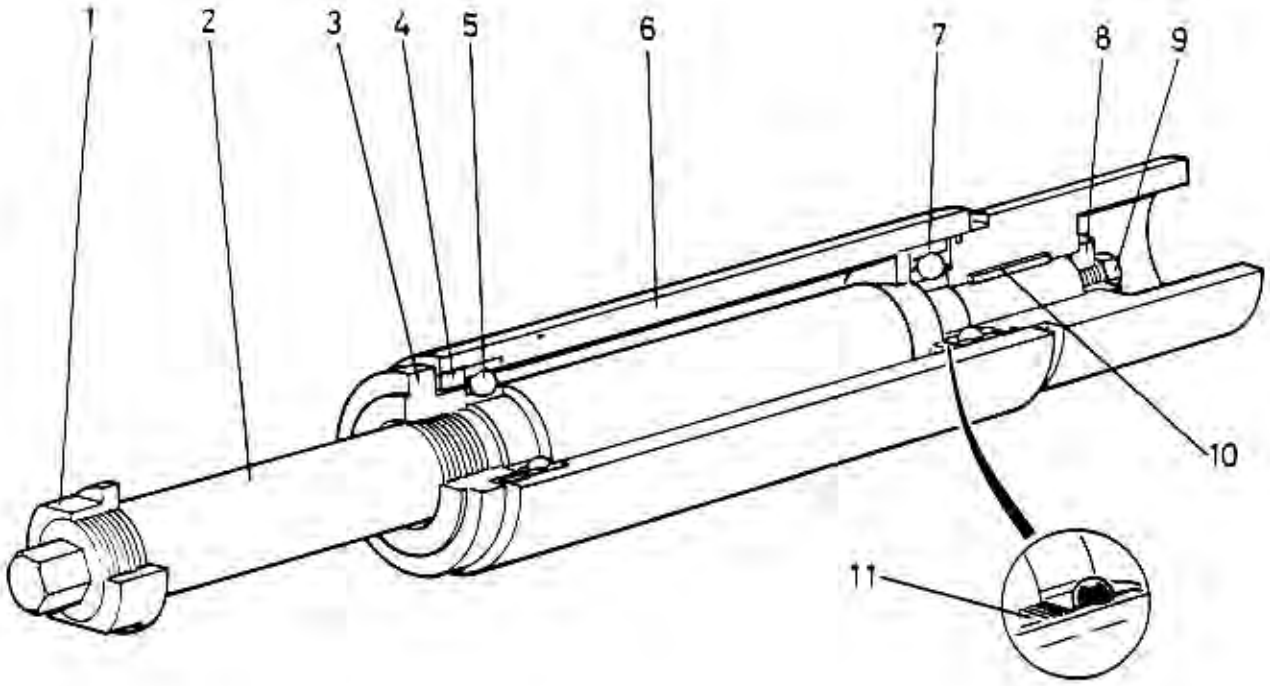


FIG 16 NEAR SIDE HEAD SPINDLE UNIT - 40MM DIAMETER SQUARE SHOULDER

17. SINGLE SIDE ROLLER PRESSURE UNIT OPPOSITE FENCE SIDE HEAD

Ref. No.	Description	No. Off
1	Bracket, single roller side pressure unit	1
2	Pin, side pressure roller	1
3	Pressure roller	1
4	Sliding shaft, pressure roller	1
5	Infeed pressure spring	1
6	Hexagon head screw, M12 x 35mm long,	2
7	Washer 12mm, bright mild steel,	2
8	'Heyco' nylon domed plug, black, 8mm hole,	1
9	Circlip, 20mm external,	1
10	Bearing, SKF 6004 2RS,	1
11	Tension pin, 8mm dia x 30mm long,	1
12	Tension pin, 5mm dia. x 30mm long,	1

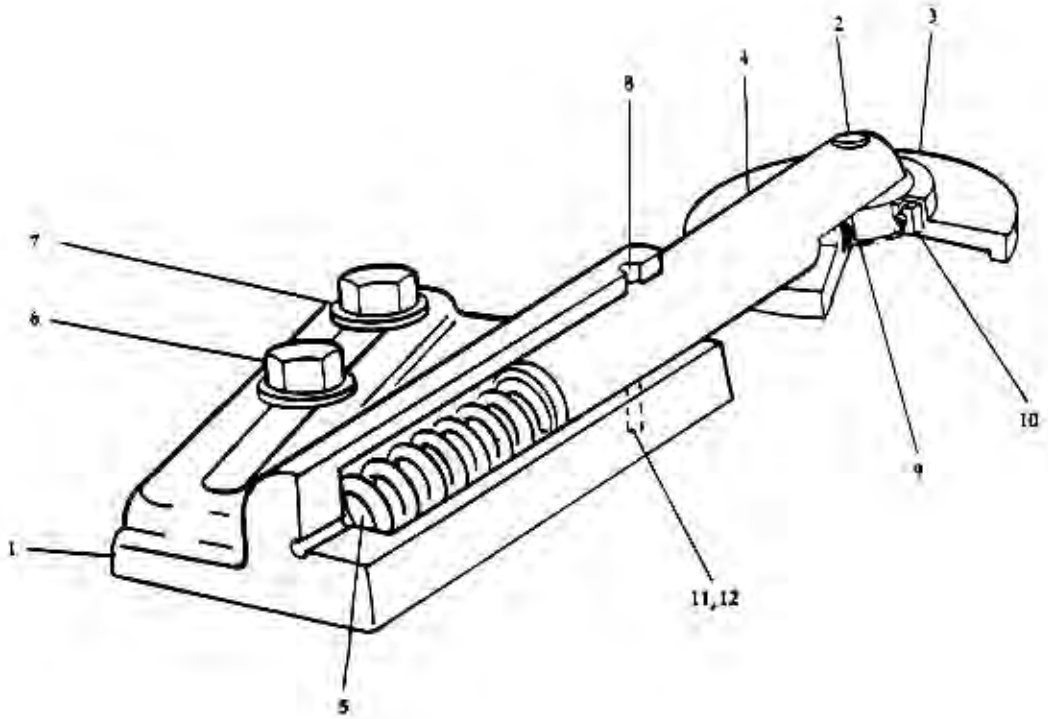


FIG 17 SINGLE SIDE ROLLER PRESSURE UNIT OPPOSITE FENCE SIDE HEAD

18. SINGLE SIDE ROLLER PRESSURE UNIT - INFEED

Ref. No.	Description	No. Off
1	Bracket single roller side pressure	1
2	Pin	1
3	Pressure roller	1
4	Sliding shaft	1
5	Infeed pressure spring	1
6	Hexagon head set screw M12 x 35mm long	2
7	Plain washer M12	2
8	'Heyco' nylon domed black plug, 8mm hole	1
9	Circlip 20mm external	1
10	Bearing 'SKF' 6004 2RS	1
11	Tension pin 8mm dia x 30mm long	1
12	Tension pin 5mm dai x 30mm long	1
13	Pressure bracket support plate	1

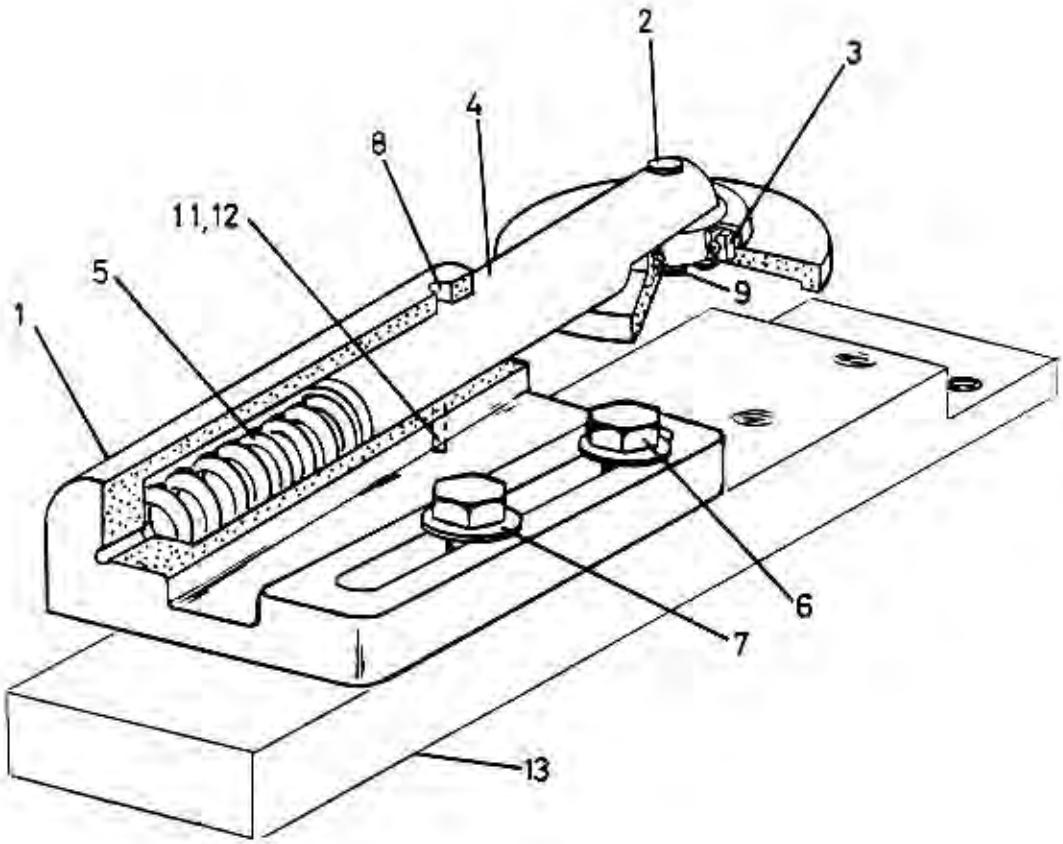


FIG 18 SINGLE SIDE ROLLER PRESSURE UNIT - INFEED

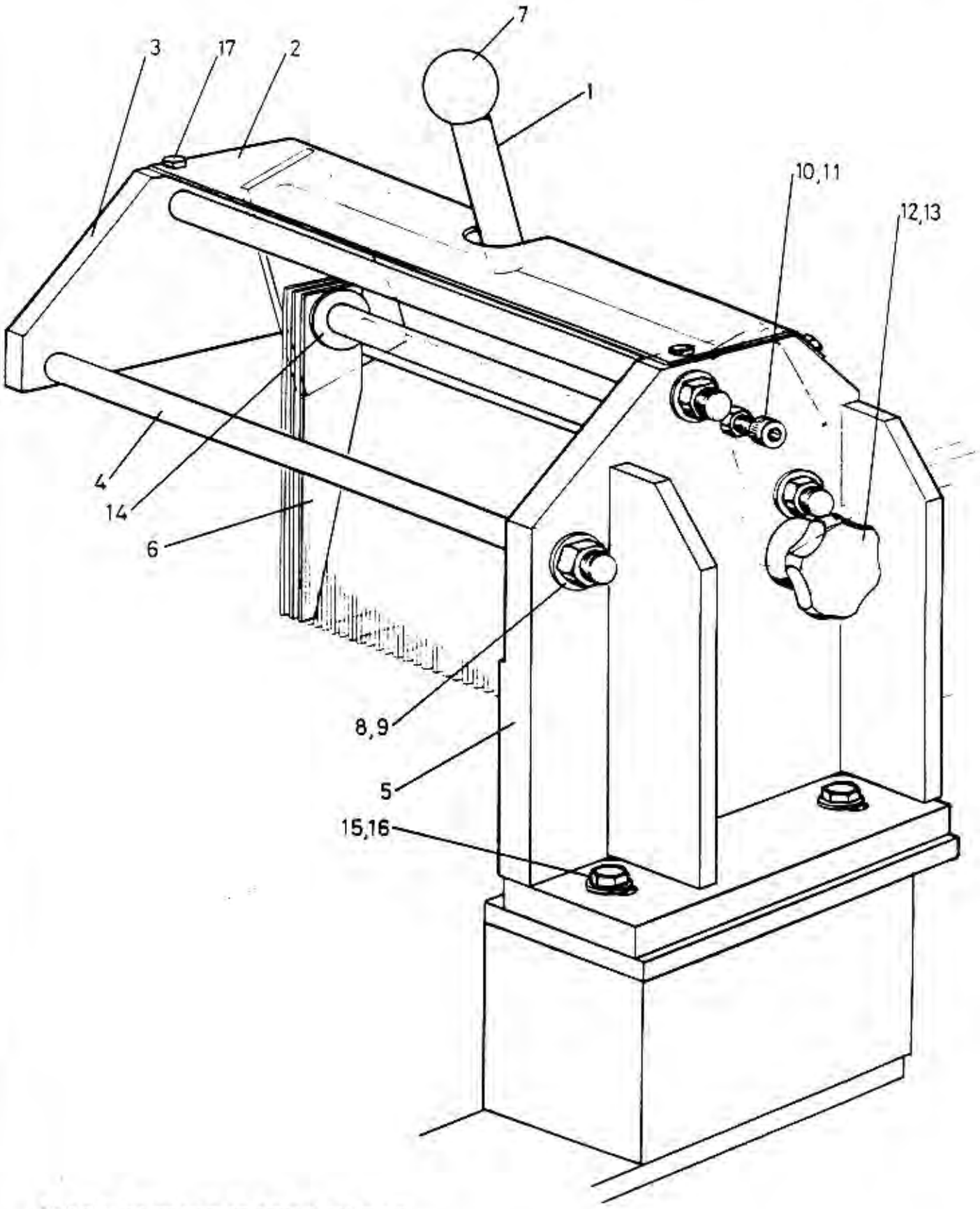


FIG 19 ANTI-KICKBACK FINGERS

19. ANTI-KICKBACK FINGERS

Ref. No.	Description	No. Off
1	Fork lever	1
2	Top cover	1
3	Rear plate	1
4	Support rod	3
5	Front plate	1
6	Infeed fingers	69
7	Knob	1
8	Hexagon nut M16	6
9	Plain washer M16	6
10	Hexagon socket capscrew M12 x 25mm long	1
11	Hexagon nut M12	1
12	Handwheel M10	1
13	Hexagon socket grubscrew M10 x 50mm long	1
14	Thrust washer 'INA' AS-2035	72
15	Hexagon head screw M12 x 35mm long	2
16	Plain washer M12	2
17	Hexagon head screw M4 x 10mm long	4

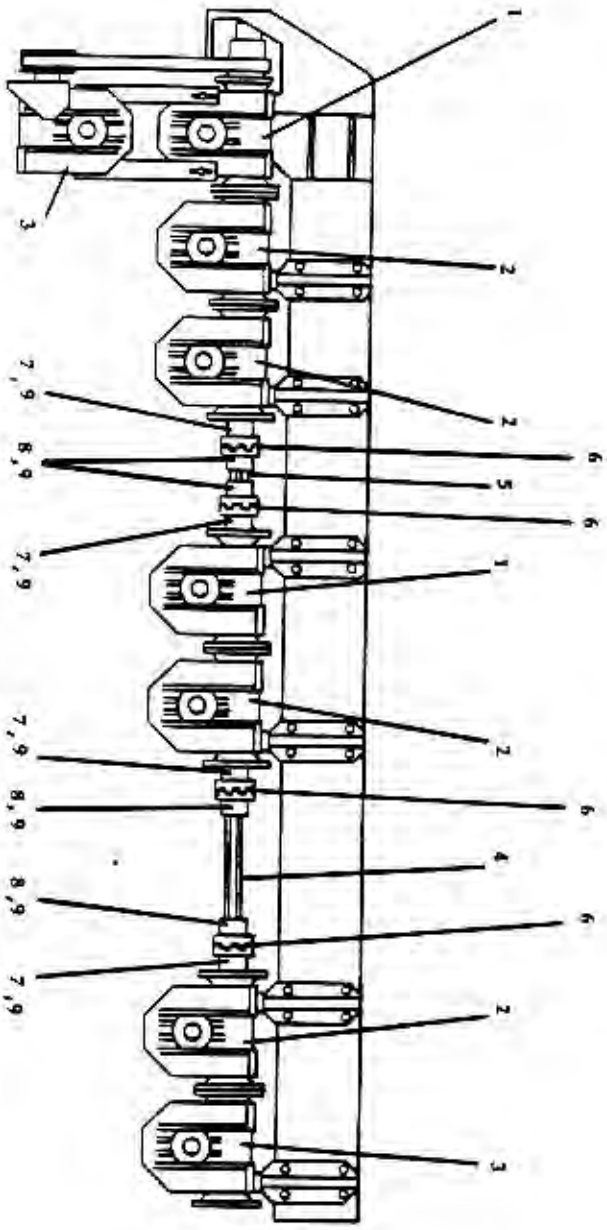


FIG 20 FEED ROLL DRIVES AND GEARBOXES

20. FEED ROLL DRIVES AND GEARBOXES

Ref. No.	Description	No. Off
1	Gearbox GA7629	2
2	Gearbox GA7445	4
3	Gearbox GA7360	2
4	Drive shaft	1
5	Drive shaft	1
6	'Rotex' gear ring	4
7	Coupling segment 19mm bore	4
8	Coupling segment 19mm A/F hex bore	4
9	Hexagon socket grub screw M6 x 8mm long	8

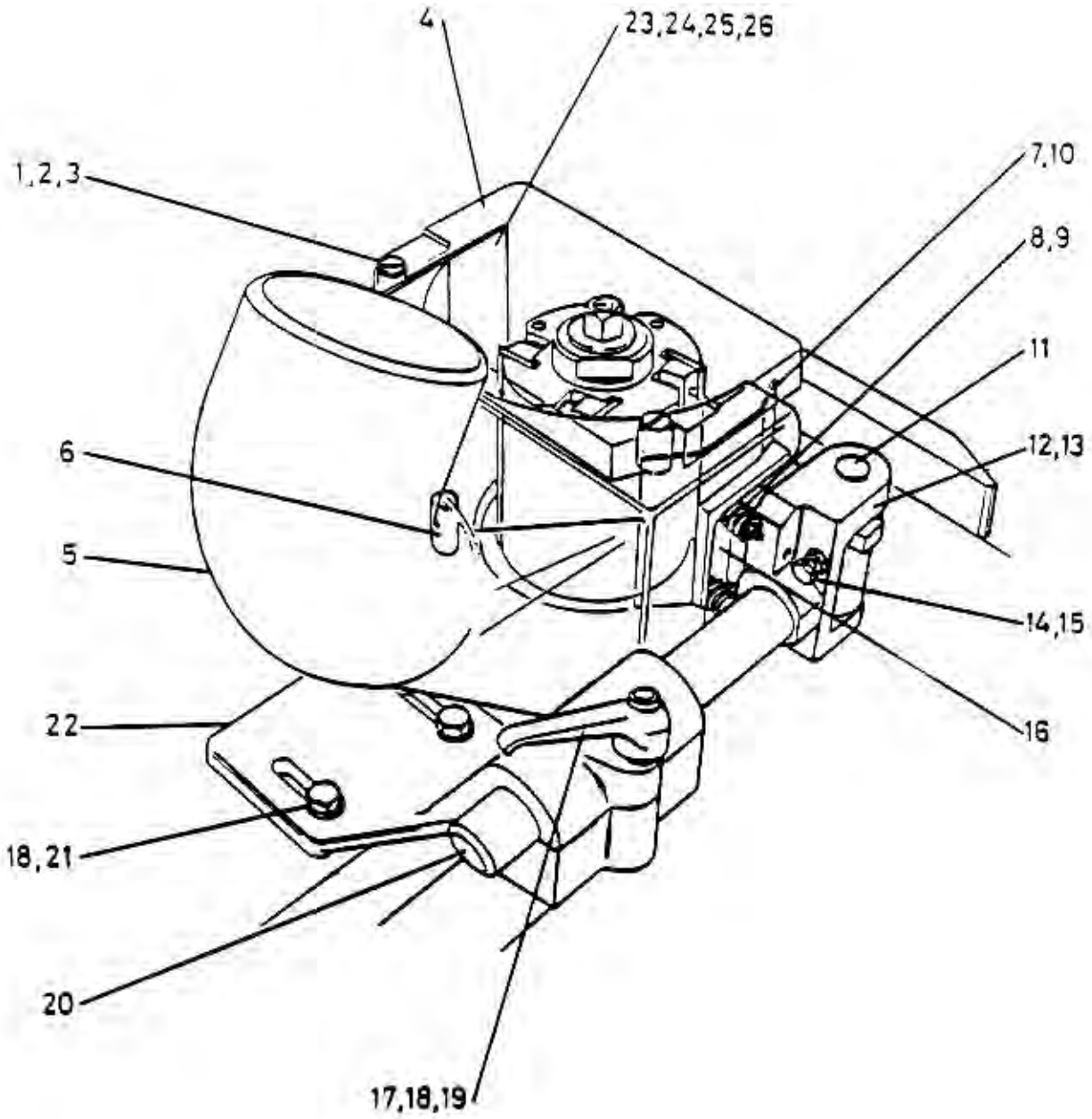


FIG 21 NEAR SIDE HEAD CHIPBREAKER

21. NEAR SIDE HEAD CHIPBREAKER AND EXTRACTION HOOD

Ref. No.	Description	No. Off
1	Spring clip	2
2	Shoulder pin, M16 dia	2
3	Spacer, M20 dia	2
4	Top cover for Near Side Head hood	1
5	Exhaust hood for Near Side Head	1
6	Post	2
7	Near Side Head chip deflector	1
8	Spring	2
9	Hexagon socket capscrew, M8 x 10mm	4
10 +	Hexagon socket countersunk screw, M8 x 10mm	2
11	Pivot pin for Near Side Head chipbreaker	1
12	Near Side Head and chipbreaker shoe pivot bracket	1
13 +	Cup point grub screw, m8 x 12mm	4
14	Hexagon full nut, M8	1
15	Hexagon head screw, M8 x 40mm	1
16	Near Side Head chipbreaker shoe	1
17 +	Screwed stud, 10mm x 60mm, M10	1
18	Washer, 10mm	3
19	Locking handle, M10 female	1
20	Adjusting bar for Near Side Head chipbreaker	1
21	Hexagon head screw, M10 x 25mm	2
22	Shoe chipbreaker bracket	1
23 +	Side cover for Near Side Head hood	1
24	Screwed stud, 6mm x 25mm, M6	2
25 +	Washer, 6mm	2
26	Wing nut M6	2

+ Not illustrated

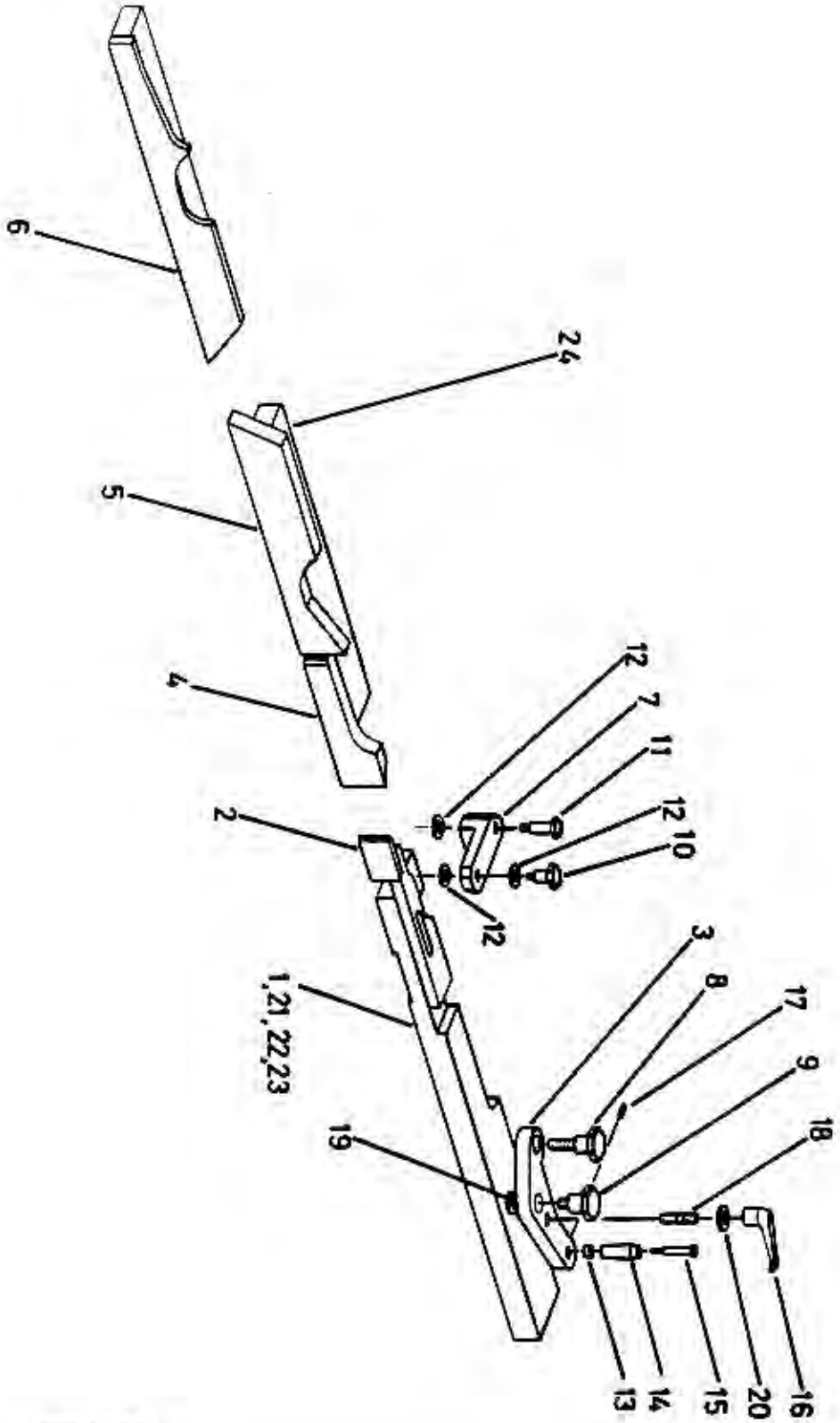


FIG 22 FENCES

22. FENCES

Ref No.	Description	No. Off
1	Short infeed fence	1
2	Infeed fence nose piece	1
3	Hand lever plate for infeed fence	1
4	Adjustable fence before Fence side head	1
5	Fixed fence before Top Head	1
6	Outfeed fence after Top Head	1
7	Link for short infeed table	1
8	Pin for hand lever pivot	1
9	Infeed fence pivot pin	1
10	Pivot pin for short infeed fence	1
11	Pivot pin for short infeed fence	1
12	Thrust washer 'INA' AS 1730	3
13	Collar for fence adjustment handle	1
14	Fence adjustment handle	1
15	Spindle for fence adjustment handle	1
16	Locking handle	1
17	Hexagon socket grubscrew M6 x 12 long	1
18	Infeed fence locking pin	1
19	Thrust washer 'INA' AS 1226	1
20	Clamping washer	1
21	Tenon for infeed fence nose piece	1
22	Hexagon socket countersunk screws M4 x 12mm long for nose piece tenon	2
23	Plain dowel dia 6mm x 12mm long for tenon	2
24	Fence support between Fence Side Head and Top Head	1