Wadkin **ULTRACARE**
At the Cutting Edge of Industry

SUPER 220 XJS

THROUGH FEED FOUR SIDE PLANING MACHINE

INSTRUCTION MANUAL No.2020/4

M/C.SERIAL Nos.6150 onwards

THROUGH FEED FOUR SIDE PLANING MACHINE

MODEL:220XJS

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IMPORTANT

SAFETY PROCEDURES AND CONSIDERATIONS

To ensure safe working conditions, persons operating and assisting with the operation of this machine must ensure that they read and fully understand the instructions given within this manual and have received sufficient training in the use of the machine and the safety aspects to be observed.

Note:- Persons under the age of 18 years must not operate the machine except during the course of training under the supervision of a trained operator.

A) POINTS TO NOTE BEFORE OPERATING OR ASSISTING WITH THE OPERATION OF THE MACHINE.

1) You have read and understand the operation and safety aspects of the machine and have been checked out by a qualified supervisor.

2) The machine is supplied with full safe guarding. The machine shall not be operated unless the safe guardings are in position and are functional.

3) Cutters/blades are the correct type, suitable for the machine and working conditions, rotate in the correct direction of cut, are sharp and correctly fitted.

4) Correct spindle and speeds are selected for the cutter equipment and working conditions.

5) Loose clothing is either removed or securely fastened back and jewellery removed.

6) Adequate working space and lighting is provided.

7) All dust extraction equipment is switched on, properly adjusted and working adequately.

8) The machine is securely installed (refer to installation section within this manual).

9) The machine should only be used for cutting wood or materials with physical and technological characteristics similar to wood, and for which the chip or particle removal process is similar.

10) Only use tooling that complies with prEN 847-1. Sawblades made of High Speed Steel (HSS) MUST NOT be used.

B) DURING MACHINING:-

1) Wear suitable protective clothing e.g, approved eye protection, ear defenders and dust masks. Gloves shall be worn when handling tooling.

2) Stop the machine using the emergency stop or at the mains isolator before making adjustments, cleaning or carrying out maintenance.

3) Keep the floor area around the machine clean and free from wood refuse. Do not allow the floor around the machine to be come slippery.

4) Stop the machine and report immediately to a person in authority any actual or potential malfunction or operator hazard. Do not attempt to repair or rectify the machine unless qualified or authorised to do so.

5) The operator must not leave the machine running whilst unattended.

6) Never by-pass interlocks.

WARNING:-

Failure to observe correct operating procedures prior to and during operation of this machine can result in severe injury.

DO NOT attempt to operate the machine while under the influence of anything that reduces your alertness.

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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Wadkin

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.

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 moulding 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.

In order to protect the cutter block and spindle against failure of the hydraulic pressure, safety drive collars must be used. Failure to use safety drive collars can result in seizure of the cutter block on the spindle in the event of the operator failing to pressurise the cutter block before running the spindle or failure of the hydraulic pressure.

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Note: Because of the modular contruction of the XJS only the sections relevent to each machine are included. It is also not possible to cover all the options and customers special requests that may have been added to thier machine. If you should require information not contained within the manual please contact Wadkin at the address given on the front page.

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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.

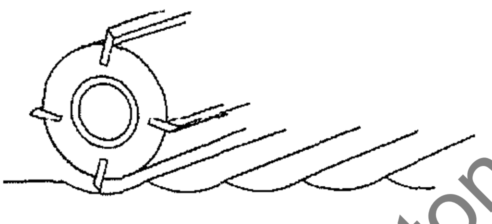

FIG 1

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).

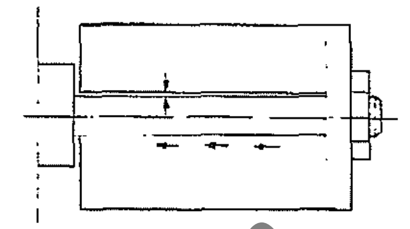

FIG 2

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.

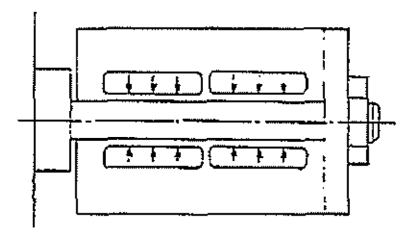

FIG 3

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).

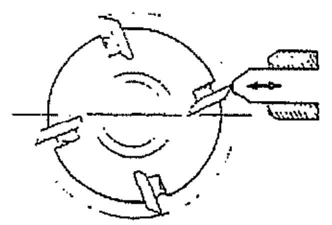

FIG 4

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.

$$\text{Cuttermark pitch} = \frac{\text{Feed speed in mm per min}}{\text{Block rpm x No of cutters}}$$

$$\text{For example} \quad \frac{12 \times 1000}{6000 \times 1} = 2\text{m pitch}$$

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).

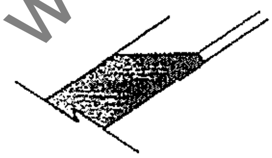

FIG 5

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.

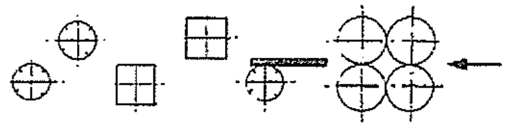

FIG 6

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.

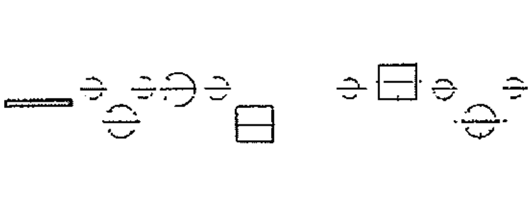

FIG 7

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).

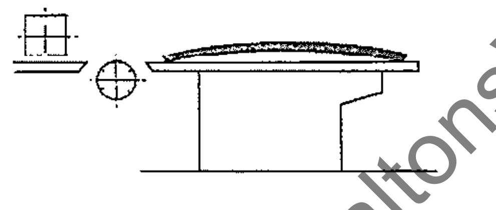

FIG 8

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).

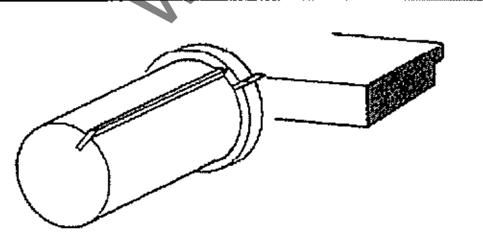

FIG 9

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.

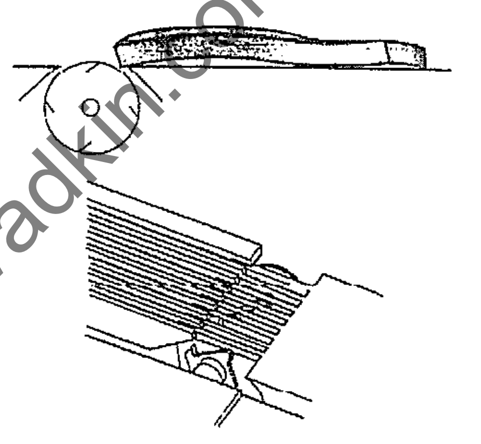

FIG 10

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.

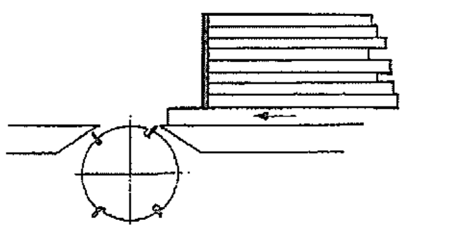

FIG 11

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.

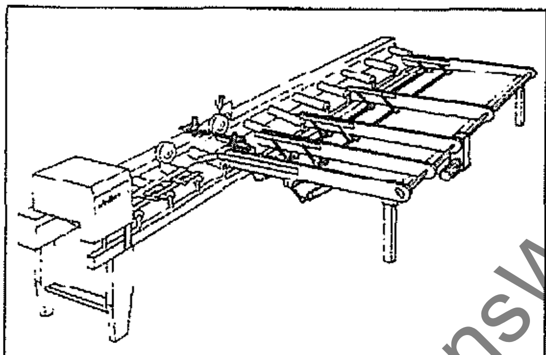

FIG 12

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.

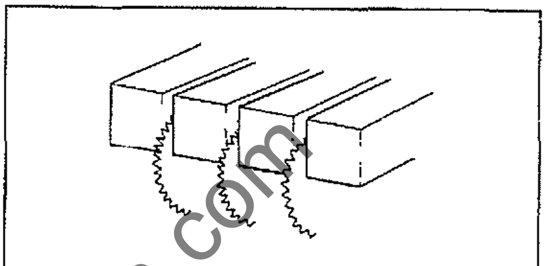

FIG 13

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.

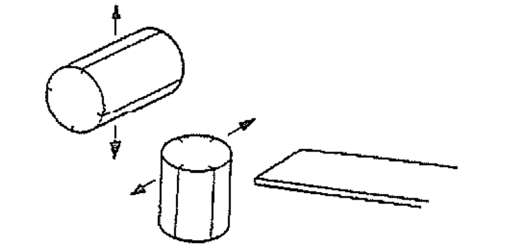

FIG 14

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.

LEADING PARTICULARS

Principal dimensions and capacities of Super XJS220

Maximum size of timber admitted	230mm x 130mm
Maximum size of finished timber	220mm x 120mm thick
Minimum size of finished timber	15mm x 6mm thick
Feed speed infinitely variable	10-120 meters per min
Pressure adjustment of feed rolls	6 bar (reduced)
Limit switch at the extremities of the rise fall beam.	
Feed rolls on each infeed shaft (pushfeed)	3 x (42mm wide x 186mm dia.) serrated rollers.
Feed rolls at each throughfeed station (shaft mounted)	3 x (50mm wide x 140mm dia)
Feed rolls at each throughfeed station (flange mounted)	2 x (20 wide x 140mm dia.), 1 x (40 wide x 140mm dia.) Serrated or polyurethane rolls + spacers
Driven table rollers	220 wide x 140mm dia. plain steel roll.
Diameter of cutter spindles	50mm standard, 1.13/16in or 2.1/8in - options.
Speed of cutter spindles	6000 rpm
Maximum cut of first bottom head	10mm
Maximum cut of first fence side vertical head	10mm

Diameter of cutterblocks

Minimum cutting circle (all heads with dia 40mm spindles)	125mm
Maximum cutting circle top heads	190mm planing 250mm moulding
Maximum cutting circle fence and near side heads	190mm planing, 205mm moulding (up to 15mm below bed level).
Maximum cutting circle bottom heads	190mm planing 250mm moulding 180mm planing (first bottom)

Unit G

Maximum saw size	400mm
Minimum saw size	250mm
Sleeve size	3 1/4" 0/D x 50mm I/D x 240mm long opposed double key drive 3/8" wide

Output of motors

Feed motor (hydraulic)	30kw (40hp)
Rise and fall motor	1.1kw (1 1/2hp)

Spindle motors

All heads - standard	5.5kw (75hp)
All heads - options	7.5kw (10hp), 11kw (15hp), 15kw (20hp), 18.75kw (25hp)
Horizontal heads only - options	22.5kw (30hp)
Splitting unit motors - options	18.75kw (25hp), 22.5kw (30hp), 30kw (40hp) 37.5kw (50hp) 45kw (60hp), 55kw (75hp), 75kw (110hp)

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SECTION 2 LIFTING AND TRANSPORTATION

Unloading

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 55mm diameter steel rods 1.5 meters long in the holes provided in the machine feet.

Carefully place slings of suitable capacity on the crane hook. The angle between the slings not to exceed 90 degrees. 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.

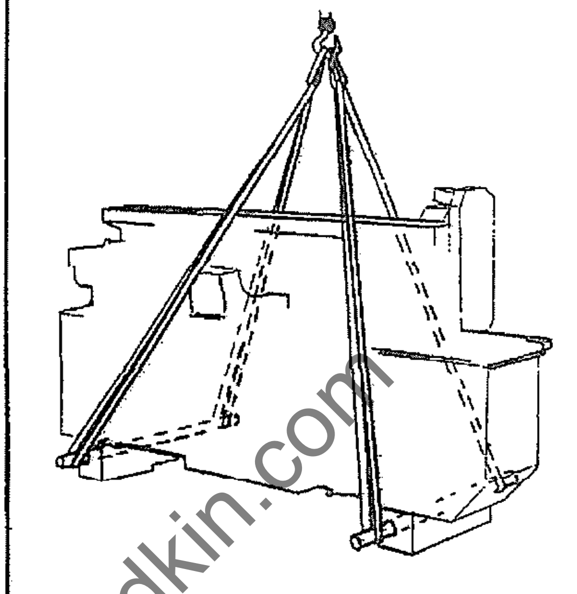

FIG 1 TYPICAL LIFTING OF MACHINE

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 occured during transit; undo the case of accessories and ascertain that the machine is complete with all fittings.

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.

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SECTION 3 INSTALLATION DATA

Major Dimensions and Weight

Machine Dimensions and Weights

Maximum length	6200mm
Maximum width	2200mm
Maximum height	1700mm
Weight	7000kg

Locations and Foundations

To obtain the best result 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 with the aid of a spirit level. Place the steel plates supplied with the machine under the adjustable levelling screws.

Suggested levelling aids:
Straight edge 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.

The straightening table (i.e. table before the first bottom head), should be in line with the table after the first bottom head. Maximum tolerance is 0.1mm in 1600mm.

Levelling transversely

Place the spirit level across the table at right angles to the fence and repeat this section 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 an 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.

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POINTS TO NOTE WHEN CONNECTING THE POWER SUPPLY.

Check the voltage, phase and frequency correspond with those on the machines nameplate details.

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

Connect the incoming supply of 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 lead connections at the incoming supply.

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

Pneumatic pressure equipment (where fitted).

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 air pipe is 8mm O/D x 5mm I/D.

Pressure required is 6 bar (approximately 90 PSI), see **Operating Instructions** for feedroll pressures.

The air consumption is approximately 200 cu.dm/hr (7 cu. feet/hr).

Exhaust (Dust Extraction) Connection.

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 bottom heads
51-54 cu.metres/min.
(1800-1900 cu.ft/min.)

For fence and near side heads
27-30 cu.metres/min.
(953-1053 cu./F/min.)

For top heads
37-40 cu. metres/min.
(1305-1411 cu.ft/min)

The total volume of air required for the Dust Extraction is directly related to the total number of spindles.

Schematic Diagram for Electrical Services

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

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SECTION 4 GENERAL OPERATING INSTRUCTIONS

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 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 minimum 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 Stationary 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 fitted covers from 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 guide-lines 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.

Cutter equipment is suitable for machine spindle speed.

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

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 working area.

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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 maintenance work.

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

Machine Controls

Before starting the machine, operators should familiarise 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 (if adjustable).

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 control dial on the panel, to give speeds throughout the machine range.

The feed rolls are rubber covered and should be adjusted to 1mm lower than the workpiece.

The height of the feedroll adjustment is indicated by the graduated scale on the panel above the infeed roll cover. Adjustment of the feed rolls is made by pressing the pushbuttons marked:

↑ Raise feed rolls

↓ Lower feed rolls

Note: The powered vertical adjustment of the beam is electrically interlocked with the Top head and cannot move until the hydraulic locks are disengaged.

The pushbuttons are positioned on the Electrical Control Panel located at the infeed end of the machine and also at control stations located at various points on the machine, depending on modular construction.

The adjustment for height of the intermediate 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 may contain the following features.

1) START - STOP pushbutton with indicator light for each spindle. Buttons numbered from infeed end.

2) FEED START

3) FEED STOP

4) RAISE - LOWER pushbutton for beam adjustment.

5) MASTER STOP (emergency) button with indicator light.

6) CLAMP ON/OFF push button for hydraulic locking of top head vertical movement.

7) HYDRAULIC PUMP ON pushbutton. This initialises pump for hydraulic drive. It can only be switched off at either master stop or main power button.

8) INDEPENDENT/TRANSFER switch for machine use in a line or for independent use.

9) WARNING LIGHT for feed speed. If illuminated the feed will stop (see FAULT FINDING).

10) FORWARD - REVERSE (inch) pushbutton used for setting.

11) VARIABLE FEED SPEED CONTROL with readout.

12) MOTOR BRAKING pushbutton where brake motors are fitted this releases brake when motor is stationary.

13) OIL ON/OFF switch only for automatic bed lubrication. Oil is not pumped until machine is running.

14) LOW OIL WARNING

15) MAIN POWER ON/OFF pushbutton.

16) MOTOR OVERLOAD WARNING when illuminated indicates a motor has tripped and is 'running down'.

17) WOOD METERAGE COUNTER the bottom right hand meter records total meters through machine. The top left hand meter indicates the amount of timber machined of a particular run. The middle left hand meter indicates the required amount of timber to be machined in a run. This figure is set by pressing the white lever down (bottom left hand corner) and then pressing the relevant button under each unit counter to advance/retard the figure displayed.

At the end of a run the feed rollers will stop. To restart zero the top left hand counter, reset (if required) the 'run' length and then press the feed start pushbutton.

18) AMPERAGE METER for splitting saws.

The motor rating on the splitting saw is 67 amps and the feed speed should be adjusted so as not to exceed this value when splitting.

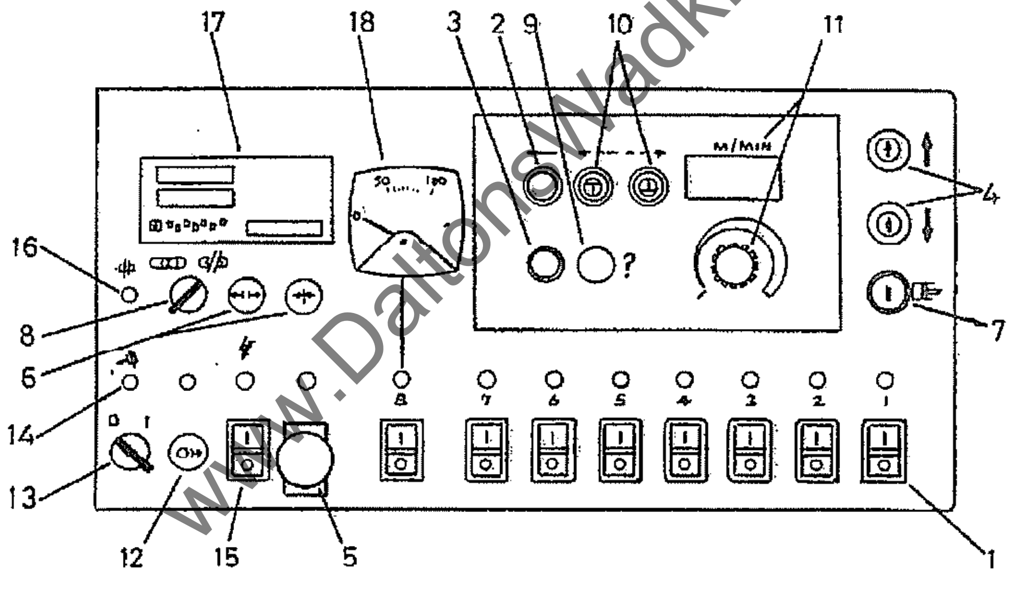


FIG 1 ILLUSTRATION OF CABINET CONTROL LAYOUT

Dial-a-Size Electronic Positioning to Near Side Head and Top Head

The powered traverse movement to the near side head is by a 'KEMO' geared motor.

The traverse movements of the heads are each connected to an 'encoder' which sends pulse signals to its respective 'Elgo' digital read out controller situated in the main control panel.

The traverse of the heads reacts to data put into the 'Elgo' controller which displays the cutterblock position in relation to its datum face. The datum face for the near side head is the fence. Datum for the top head is the bedplate.

The head traverse movements may be hand or power operated and a switch is provided for this purpose.

Setting Up

All setting parameters are available via the front keypad. Programming is inhibited until a link at the back of the unit is opened.

The prgramming link is in the form of a two terminal plug-in block, with a shorting wire. Unplug to set in parameters. Re-insert plug to operate.

Note: The controller will not run with the link open.

Setting of the parameters is achieved as follows:-

1) Press T, top display extinguishes and 'CH' is displayed. This ensures that the operator knows when the T button has been depressed (even by accident).

2) Enter [T] functions [1]...........[5], 'CH' is extinguished. Title name is displayed in top window; value of parameter is displayed in bottom window.

3) Press C to clear existing value, enter required value.

4) Press T again to revert to operating mode.

The [T] functions/parameters are as follows:-

[1] This sets the slowdown point during approach to position. 'SLSP' is displayed.
[2] This sets the stop correction offset. 'COR' is displayed.
[3] Saw width compensation is entered. 'SABL' is displayed.
[4] Time at standstill during backlash over-run and delay in drop-off of 'In Position' relay after drive stop is initiated.

'Ti' is displayed. Time can be set from 00.0 to 15.9 seconds. Also sets the auto retract time (i.e., distance).

[5] This sets the decimal point in the displays.
'DP' is displayed.
1:- means units only (i.e., no decimal point).
2:- means tenths displayed (i.e., one decimal place 0.0)
3:- means hundreds displayed (i.e., two decimal places 0.00).

One [T] function is available with programme link either open or closed. That is Inch/Metric selection. This is used as follows:

(1) Press [T], 'CH' appears in display.
(2) Press [O], 'inch' or 'mm' appears in display.
(3) Press [C] to changeover.
(4) Press [T] to revert to operation.

The decimal point is automatically moved and any actual value correctly recalculated. The set up parameters are also in the chosen units.
When [T] is pressed inadvertently, 'CH' is displayed to warn operator that he has pressed the button. Simply pressing [T] again returne controller to operating mode.

Note: All these parameters will be preset by Wadkin during the setting-up of the machine.

Method of Operation

To Set Datum

1) Switch to 'Hand' operation (Fig 2).

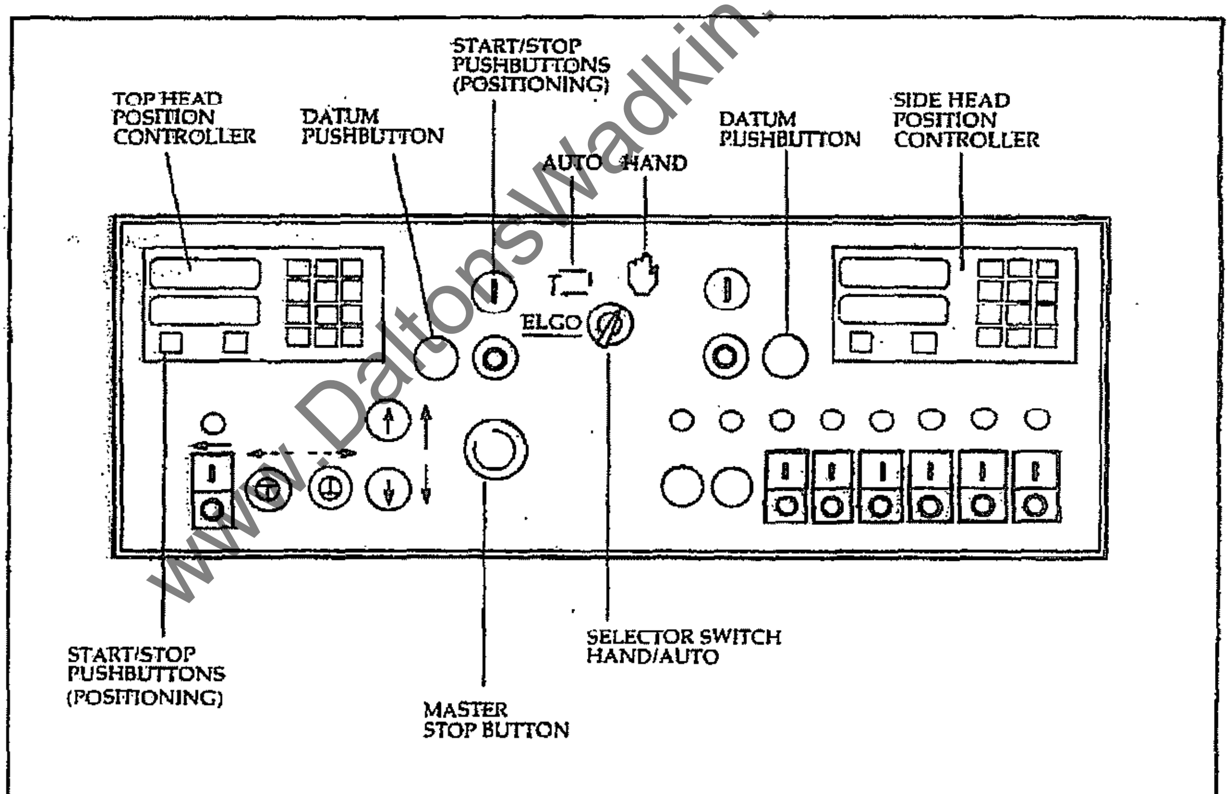


FIG 2 DIAL A SIZE CONTROL PANEL

2) Determine the distance between the cutterblock and either the fence or bedplate, by use of a known thickness setting block or piece of timber; by hand winding the spindle up to the setting block.

3) Enter this figure using the keypad.

4) Press Datum pushbutton (Blue) on control panel.

These figures will be displayed on the demand value display (bottom window). The Datum figure is now set.

Note: (a) These Datum figures need only be re-set at machine switch-on, or if the cutterblocks are changed.

Note: (b) To hand set the height of the top horizontal spindle independently of the beam, disengage clutch (i.e., operate power rise/fall lever, (see **Setting Up Machine**).

To move the heads to a pre-determined position

1) Switch to 'Elge' operation (Fig 2).

2) Enter the required position using the kepad.

3) Press 'Start' push button.

The head selected will now move automaitcally to the set position and the figures will be displayed in the actual value display (top window).

4) To move to a new position, repeat steps (2) and (3).

Note: The feed can only be inched in this mode.

To run the machine

1) Switch to 'Auto' position.

2) The feed can now be run continuously, or inched.

In order to protect the cutter block and the spindle against failure of the hydraulic pressure, safety drive collars must be used. Failure to use safety drive collars can result in seizure of the cutter block on the spindle in the event of the operator failing to pressurise the cutter block before running the spindle or failure of the hydraulic pressure.

99 SETTING PROGRAMMABLE MEMORY POSITIONING

Near Side Head and Top Head

This unit has the capacity to be programmable for ninty-nine positional head settings.

The powered traverse movement to the near side head is by a geared motor.

The traverse movements of the heads are each connected to an 'encoder' which sends pulse signals to its respective digital read out controller situated in the electrical control panel.

The traverse of the heads reacts to data put into the controller which displays the cutter block position in relation to its datum face. The datum face for the near side head is the fence. Datum for the top head is the bedplate.

The head traverse movements may be hand or power operated and a switch is provided for this purpose.

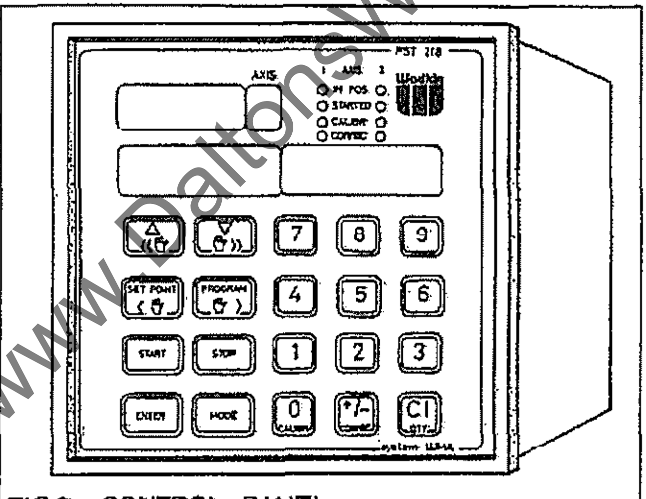


FIG 3 CONTROL PANEL

The illustrations (buttons) on the left hand side of each page show the buttons to be pressed, and in what order.

If buttons are shown with an '&' sign between them, they must then be pressed simultaneously.

POSITIONING PST 218

SWITCH ON MACHINE

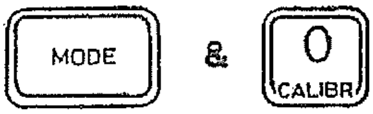
CALIBRATION (Manual)

Each axis must be datumed before production is started.

The calibrating procedures is as follows:

The PST 218 unit can control 2 axes, both of which must be independently datumed.

Push the button until the axis to be datumed (either axis 1 or axis 2) is shown as a number in the LED display



The mode and calibration buttons must be pressed simultaneously.

Enter new value.

Press enter.

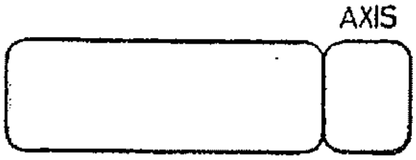
The axis should now be datumed. Repeat the same operation for the second axis. When both axes have been datumed, the unit is ready for use.

Confirmation is in the top right of the unit where there are LED lights for each axis which represent the calibration.

MANUAL POSITIONING

The axis to be moved must be selected first.

Push the button until the axis to be moved (either axis 1 or axis 2) is shown as a number in the LED display.



For manual positioning of the unit, the mode key and the direction of travel must be pressed simultaneoulsy.

Move to a higher value than the position.

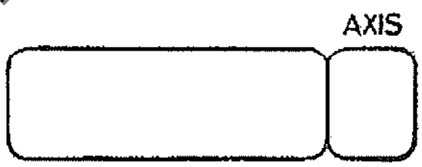
Move to a lower value than the position.

When manual positioning is finished, the stop button must be pressed to put the unit back into the automaitc mode.

DIAL-A-SIZE POSITIONING (SET POINTS)

The axis to be moved must be selected first.

Push the button until the axis to be moved (either axis 1 or axis 2) is shown as a number in the LED display.



To use the Dial-A-Size option, this is simply a case of pressing the set point button and then the dimension.

Pressing the 'start' button will send the axis to the position.

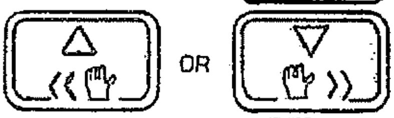
When in position, an LED in the top right of the unit will be lit.

Whilst positioning is taking place, the 'started' LED will be lit.

PROGRAM POSITIONING (For programming of, see later instructions)

CALLING UP PROGRAM

By pressing the 'program' button, the display will change to the program mode.



Pushing either of the two buttons will increase or decrease the program number to the one required.

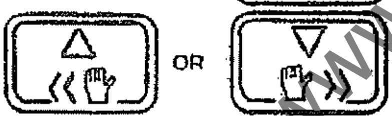
Pushing the 'start' button will drive the axis to the position stated in the program.

NOTE: To escape from the program mode of the unit, press the 'program' button.

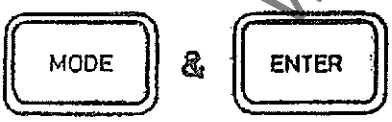
When the axis is in position, the 'in position' LED will be illuminated in the top right of the unit.

PROGRAMMING OF THE UNIT

By pressing the 'program' button, the display will change to the program mode.



Push either of the two buttons until the program number required to be programmed is found.



The buttons 'mode' and 'enter' when pressed simultaneously will enable you to have the access to the program number that is illustrated in the display.

You will now have access to the axis.

Enter the required figures if a new number or alteration.

NOTE: If the figures for axis 1 are correct and it is only axis 2 which has to be altered, press 'ENTER' without altering any figures to give access to axis 2.

Pushing the 'enter' button will enter the figures into the memory and give you access to axis 2.

Enter the required figures.

Pressing the 'enter' button will enter the new figures into the memory.

The unit is now ready for use as 'calling up program'.

NOTE: Program P O is only for test purposes.

To clear existing information, press 'CL Qty' before entering new figures.

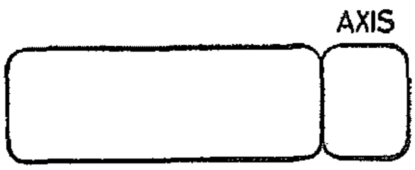
TO USE THE RADIUS OFF-SET FEATURE

CALIBRATION (MANUAL)

The centre of both the left hand and top head spindle must be calibrated to use the off-set feature.

Each axis must be datumed before production is started. **NOTE:** Maximum travel limit parameters may require changing. Calibration for using radius off-set is as follows:

Push button until the axis to be datumed (either axis 1 or axis 2) is shown as a number in the LED display.



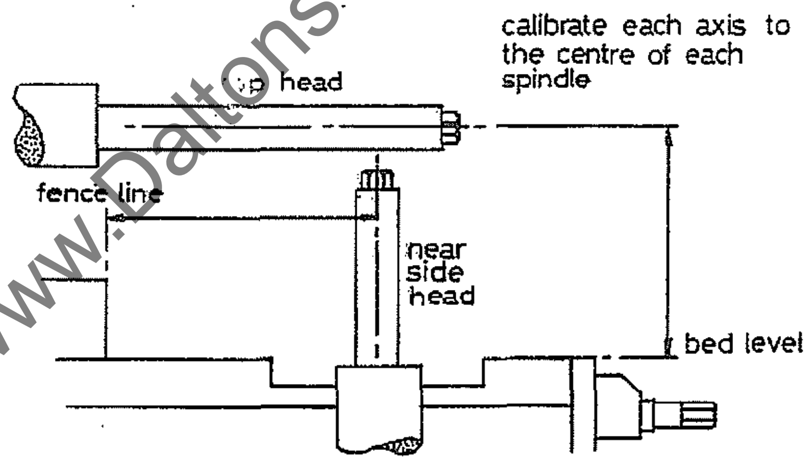
The mode and calibration buttons must be pressed simultaneously.

Enter the distance from the centre of the spindle to the bed, or fence, depending which axis is being calibrated.

Press enter

The axis should now be datumed, repeat the same operation for the second axis. When both axis have been datumed, the unit is ready for use.

Confirmation is in the top right hand of the unit where there are LED lights for each axis, which represents the calibration.



To enter the radius off-set

Measure and record the radius of the cutterheads to be used.

Push the button until the axis to be off-set (either axis 1 or axis 2) is shown as a number in the Led display.

The 'Mode' and 'Correct' buttons must be pressed simultaneously.

Enter radius value of the cutterhead for that particular axis.

Press 'Enter' twice.

Repeat the same procedure for the second axis.

When both axis have had the radius off-sets entered, the unit can be used as 'calling up a program'.

When the heads are moving into their programmed positions and, when they are in position, the display will show the relevant position of the centre of the spindle.

To display the actual 'finished' size positions, of the cutterheads, push the 'program' button.

PARAMETER SECTION - To enable the E.S.P. System to function in either Metric (MM) or Imperial (Inches)

PARAMETERS - This section should only be entered into by a competent person, who fully understands their function.

To enter into the parameter section, press 'mode' and '1' then '2' '0' '5'

	Imperial Axis 1 Axis 2	Metric Axis 1 Axis 2
Decimal Point Display = PA Press '0' to change Press Enter		
Calibration Method Display = PAD Press Enter		
Pre-Switch off Value/Over run Display = PA Press Enter This parameter to correct any positioning error due to "over run"		
Tolerance Value Display = PA Press Enter		
Loop Mode Positioning direction Display = PAb Press Enter		
Loop Value Display = PAb Press Enter		

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Delay Time Display = PAde Press Enter		
Minimum Travel Limit Display = PA Press Enter		
Maximum Travel Limit Display = PA Press Enter NOTE: If the radius off-set feature is used then the maximum travel limit should be		
Spindle Factor Counter For Generator Matching Display = PA Press Enter		
Spindle Factor Denominator Display = PA Press Enter		
Conversion (mm - Inch) Display = PA		

Press mode and then Enter to switch from Axis 1 to Axis 2, and go through the same parameters

When finished with both Axis 1 and Axis 2, press Mode and 1 to exit parameter section.

FAULT FINDING

FAULT	SOLUTION/CHECK
Axis will not position accurately.	Check that unit is calibrated (LED top right if unit calibrated), recalibrate if necessary. Physical object causing an obstruction. Remove object and check overload. Try again. Movement is greater than the axis limits. Insert new figures. Negative value in positioning memory.

SECTION 5 HEAVY DUTY PUSH FEED MODULE

General

This unit comprises of four infeed shafts, two above and two below bed level. The gearboxes at the rear driving the shafts, may be hydraulically or mechanically driven. Three serrated steel rollers are fitted to each shaft.

When coupled to the Bottom head module the unit is adjustable in the vertical plane to a maximum of minus 10mm below fixed bed level. Movement in this direction sets the 'cut' on the Bottom head.

Side pressures before and after the feed rolls exert a small force on the timber to keep it in contact with the fence up to the first cutting head.

The standard side pressures are of a skid type design. If the timber is to be 'hand fed' then the first side pressure changes to a 'roller' type to ease feeding. Both types may be operated pneumatically instead of the standard spring pressure.

As a secondary measure to ensure timber is fed parallel and along the fence line, the infeed shafts are pitched. This has the effect of driving the timber not only through the machine but also up to the fence.

An adjustable bedplate with acoustic slotted fingers positioned after the feedrolls, caters for varying cutting circles when the Bottom Head module is fitted. (see **Bedplates and Fences** for further information).

Adjusting Infeed Table Height (Fig 1)

1) Release locking handle (1).

2) Use the ratchet spanner (2) to adjust the table rise and fall screw. Drive direction of the spanner is adjusted by a lever at the ratchet end.

   Adjustment from fixed bed level may be read off the height scale (3).

3) After setting re-tighten locking handle (1).

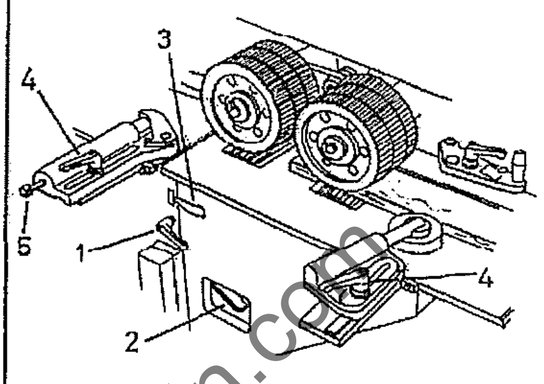

FIG 1 INFEED TABLE ADJUSTMENTS

Adjusting Side Pressure (Fig 1)

1. Release locking handle (4) and adjust the side pressure to suit timber width.

2) When set re-tighten handle (4).

3) Turning screw (5) in a clockwise direction increases the spring tension and stiffens the 'skid' movement. Turned in an anti-clockwise direction the opposite occurs.

Bottom Infeed Roller Adjustments (Fig 2).

The bottom feed rollers have two adjustable stops for maximum and minimum height setting.

Each stop is adjusted by slackening off the locknut (1), adjusting the screw (2) until the desired position of the roller is achieved and then tightening locknut.

1) The first infeed roller (3) should be set at 0.6mm above bed level with the air off.

2) Place a straight edge (4) across the first infeed roller to the middle of the adjustable bedplate (5) before the First Bottom Head.

3) Adjust the second infeed roller (6) until it just touches the bottom of the straight edge.

4) The maximum height setting is factory set at 8mm above the bed level but this should be adjusted by the customer to suit the wood type, cut and thickness of timber at time of machining.

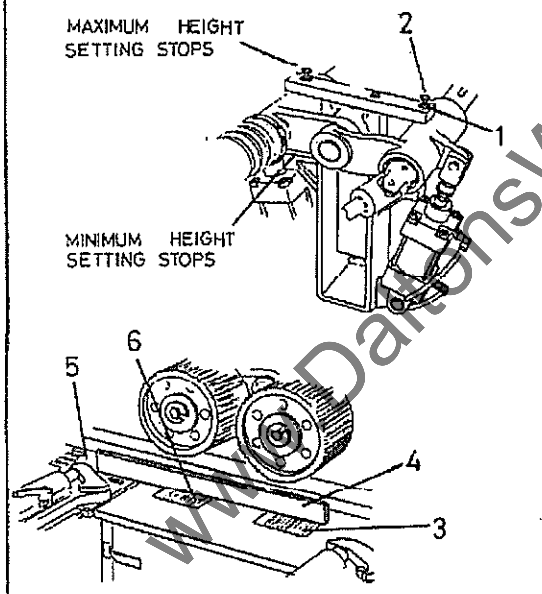

FIG 2 BOTTOM FEED ROLLERS - HEIGHT ADJUSTMENT

5) The pressure to the bottom feedroll may be adjusted using the pressure regulator and its corresponding gauge.

Top Infeed Roller Adjustments (Fig 3).

The top set of infeed rollers are normally set flush with the through feed rollers. They should not normally be adjusted unless when being replaced, maintained etc.

Adjustments are made by:-

1) Slackening off locknut (1).

2) Place a spanner on the flats of the piston rod (2) near the locknut. Turn either clockwise or anti-clockwise depending on whether the roller needs to be raised or lowered.

3) When set re-fasten locknut (1).

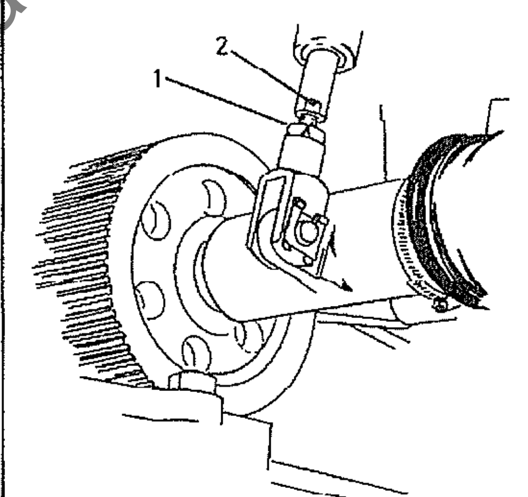

FIG 3 TOP INFEED ROLLERS ADJUSTMENT

MAINTENANCE

Routine Maintenance

The slideway and the rise and fall screw for the adjustable infeed table should be oiled weekly using Wadkin L4 oil **(see approved lubricants)**. Once oiled they should be adjusted through their total movement to ensure even distribution of lubricant and prevent dust build up on slide faces or screw.

Oil points are provided at the front of the machine (Fig 1).

The rear bearings on the feed roller shafts are 'sealed for life' and require no maintenence. However the front needle roller bearings, that carry the main loading, do need greasing at monthly intervals with Wadkin L6 grease **(see approved lubricants)**.

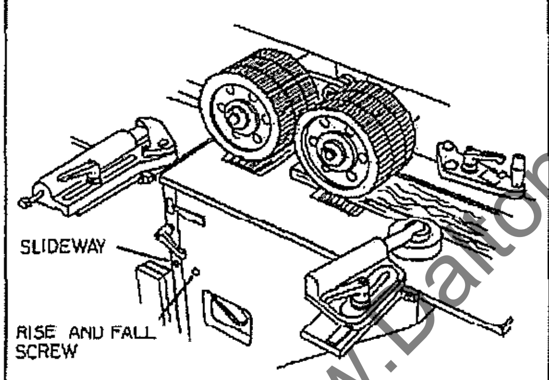

FIG 1 LUBRICATION POINTS

Fluted feed rollers should be cleared weekly with a wire brush.

Changing Feed Rolls (Fig 2)

The feed rolls are shaft mounted with a key location to provide the drive.

The serrated feed rolls may be changed around to even out their wear rate i.e. rollers changed top to bottom, fence side to near side.

Bottom and top rollers are removed in the same manner although the bedplate (4) must be removed to gain excess to the bottom rollers (See **Bedplates and Fences** for removing parts).

1) Slacken off setscrew (1) a quarter of a turn

2) With a soft faced mallet gently tap the rollers to break the clamping adhesion.

3) Slacken off the setscrew (1) a further couple of turns and remove 'C' washer (2). The feed roller nearest the 'C' washer should be gently supported by hand whilst doing this.

Note: Serrated rollers have sharp edges and care should be taken when handling them.

4) Remove rollers and exchange positions or for new.

When refitting ensure shaft roller bores and rims are clean. Application of a sprayed film of oil onto the shafts not only eases fitting but also helps prevent rollers tightening on shafts, especially where working with wet or resinous timber.

Check rims of rollers 'butt' up to each other.

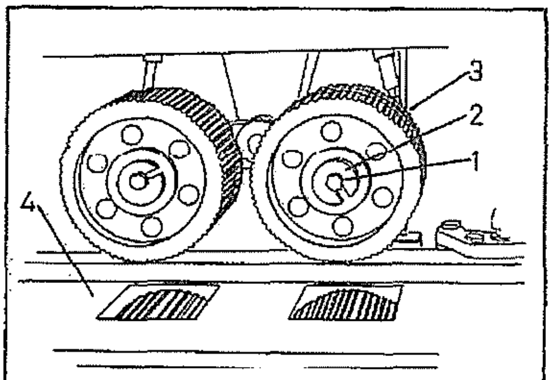

FIG 2 CHANGING FEED ROLLERS

5) Supporting outer feed roll replace 'C' washer (2) and tighten screw (1).

Replacing Top Feed Roller Shaft Bearings (Fig 3 and 4)

The bearings may be replaced with the feed roll swings (1) either in situ or by removing a unit as a sub assembly and working on a bench.

To Dismantle a Feed Roll Swing.

1) Isolate power at master stop or main isolator.

2) Remove serrated feed rolls (see **changing feed rollers**).

3) Slacken off jubilee clip screws (2) at either end or the P.V.C. boot (3).

4) Push back the boot near the swing (1) to expose the end of the universal coupling (4). Using an allen key remove the grubscrew (5) securing the coupling to the feed roll shaft.

Repeat this procedure at the gearbox end.

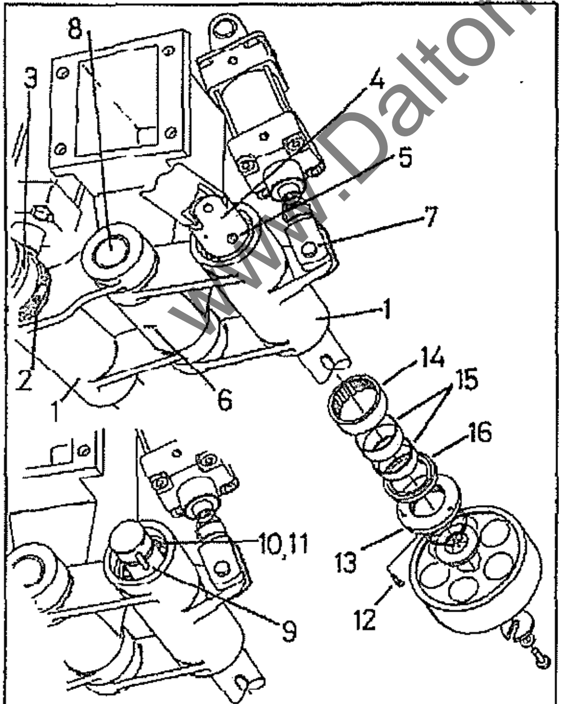

FIG 3 BEARING REPLACEMENT - TOP FEED ROLLERS

5) The output shafts of the 'Siti' gearboxes have a 10mm tapped hole in their face. Insert a grubscrew and extract the shaft approximately 50mm.

Note: Whilst the shaft is being extracted the universal coupling must be supported to prevent it dropping.

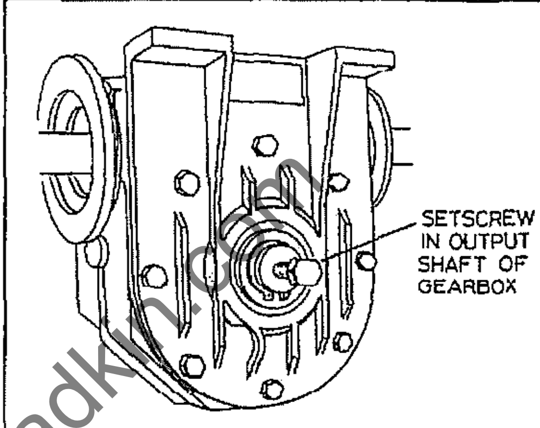

FIG 4 EXTRACTION OF GEARBOX OUTPUT SHAFT

6) With the universal coupling (4) free at the gear box end slide off the P.V.C. boot (3). Ease the coupling off the feed roller shaft taking care not to separate the two halves of the coupling.

Follow procedures 7),8),9), and 10) only if removing swing as a unit otherwise go to 11).

7) Remove the locking grubscrew (6) securing pivot shaft (8).

8) Remove pivot pin (7) locating pneumatic cylinder to feed roll swing.

Note: With the pin (7) removed the swing is free to rotate on shaft (8) and therefore to prevent damage the swing should be supported as the pin is being removed.

9) Using a suitable driver remove pivot shaft (8) whilst supporting both swings.

10) The bushes (17) should be pressed out and then the bores cleaned and de-burred before pressing new bushes in.

When assembling, the left hand swing (when viewed from the rear) should have its cranked arm at the rear most part of the pivot shaft (8).

11) Remove key (9) and internal and external circlips (10 and 11).

12) Unscrew the three M3 capscrews (12) and remove them and the dust cap (13).

13) The feed roll shaft may now be extracted from the front of the machine.

Note: It may be necessary to tap the feed roll shaft from the rear using a soft faced mallet to break the bond between bearing and shaft.

14) Using a suitable driver tap the needle bearing out of the front of the swing. By doing this it also removes the seal (16). Care must be taken when removing the bearing not to damage the bores.

15) Using a suitable driver then top the roller bearing out of the rear of the swing again taking care not to damage the bores.

The inner needle bearings rings (fitted to the shaft) are hardened are should not normally need replacing.

Preparation Prior to Reassembly

Ensure shaft and bores are clean and free from burrs.

The rear roller bearing is 'sealed for life' and does not need charging with grease.

Before fitting the new needle roller bearing (15) 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 othe 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.

The new needle bearing 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) = d x B x 0.01
d = Bore of bearing in mm
B = Width in mm

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

To Re-Assemble:-

16) When assembling components reverse the 'strip down' procedure.

When fitting new bearings use 'Loctite 641' on the outer cage (fixture time 5 sec, full cure 3-6 hours)

Care should be taken when fitting new bearings that they 'butt' up to shoulders.

Do not re-use seal (16) always replace with new item. The open face of the seal should face the dust cap.

Replacing Bottom Feed Roller Shaft Bearings (Fig 4 and 5)

The bottom feed roll shafts are only accessible when separate from the machine. Therefore the bottom feed roll swings and mounting bracket are removed as a complete sub assembly.

To Remove Unit as a Sub Assembly

1) Position beam at approximately half its maximum travel height and then isolate machine at master stop or main isolator.

2) Remove serrated feed rolls (see **changing feed rollers**).

3) Slacken off jubilee clip screws (1) at either and of the P.V.C. boots (2).

4) Push back the boots (2) near the swings (3) to expose the ends of the universal couplings (4). Using an allen key remove the grubscrews (5) securing couplings to the feed roll shafts (6).

Repeat this process at the gearbox end.

5) The output shafts of the 'siti' gearboxes which connect to the universal couplings have a 10mm tapped hole in the face. Insert a setscrew to full thread depth of each in turn and use this to extract the output shaft approximately 50mm (see Fig 4).

Note: Whilst each output shaft is being extracted the respective universal coupling must be supported at the gearbox end to prevent it dropping.

6) With the universal couplings (4) free at the gearbox end slide the P.V.C. boot (2) off each shaft. Ease the universal coupling of the feed roller shafts taking care not to separate the two halves of each coupling.

7) Isolate air supply and then disconnect air pipes from cylinders (7).

8) Unscrew the four capscrews holding the swing bracket (8) and remove, complete with swings, shafts etc. to a bench.

9) There is no need to separate the individual swings from the swing bracket unless to renew the bronze bushes (9).

If this is the case remove stop bar (10) by unscrewing the two setscrews securing it. This allows access to the grubscrew securing the pivot shaft (11). Unscrew and remove this. Remove pivot pins (12) between air cylinders and swings (3) taking care to support and lower the cylinders to bench level.

With the cylinder pivots removed the pivot shaft (11) may now be driven out again taking care not to allow swing assemblies to fall.

The bushes (9) should be pressed out and then the bores cleaned and deburred before fitting new bushes.

When re-assembling, the right hand swing (when viewed from the rear) should have its cranked arm at the rear part of the pivot shaft (11).

To Dismantle a Feed Roll Swing

10) Remove key (13) and internal and external circlips (14 and 15).

11) Unscrew the three M3 capscrews (16) and remove them and the dust cap (17).

12) The feed roll shaft may now be extracted from the front of the swing.

Note: It may be necessary to tap the feed roll shaft from the rear using a soft faced mallet to break the bond between bearing and shaft.

13) Using a suitable driver tap the needle bearing (18) out of the front of the swing. By doing this it also removes the seal (19).

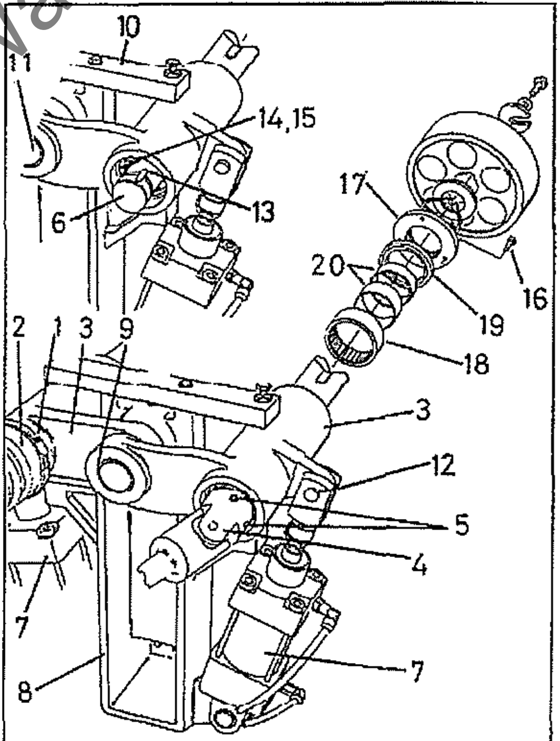

FIG 5 BEARING REPLACEMENT - BOTTOM FEED ROLLES

14) Using a suitable driver tap the roller bearing out of the rear of the swing (1) taking care not to damage the bores.

15) The 'inner rings' (20) are hardened and should not normally need changing.

Preparation Prior To Re-assembly

Ensure all bores and shafts are clean and free from burrs. The rear roller bearing is 'sealed for life' and does not need charging with grease.

Before fitting the new needle roller bearing (18) 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.

The new needle bearing 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) = d x B x 0.01
d= Bore of bearing in mm
B= Width in mm

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

To Assemble a Feed Roll Swing

16) Assembly is the reversal of the dismantling procedure although a few points should be noted:-

a) When fitting new bearings use 'Loctite 641' on the outer cage (fixture time 5 sec, full cure 3-6 hours).

b) Ensure bearings 'butt up' to housing shoulders.

c) Do not re-use seal (16) always replace with new. The open face of the seal should face the dust cap.

ILLUSTRATED PARTS LIST

CONTENTS

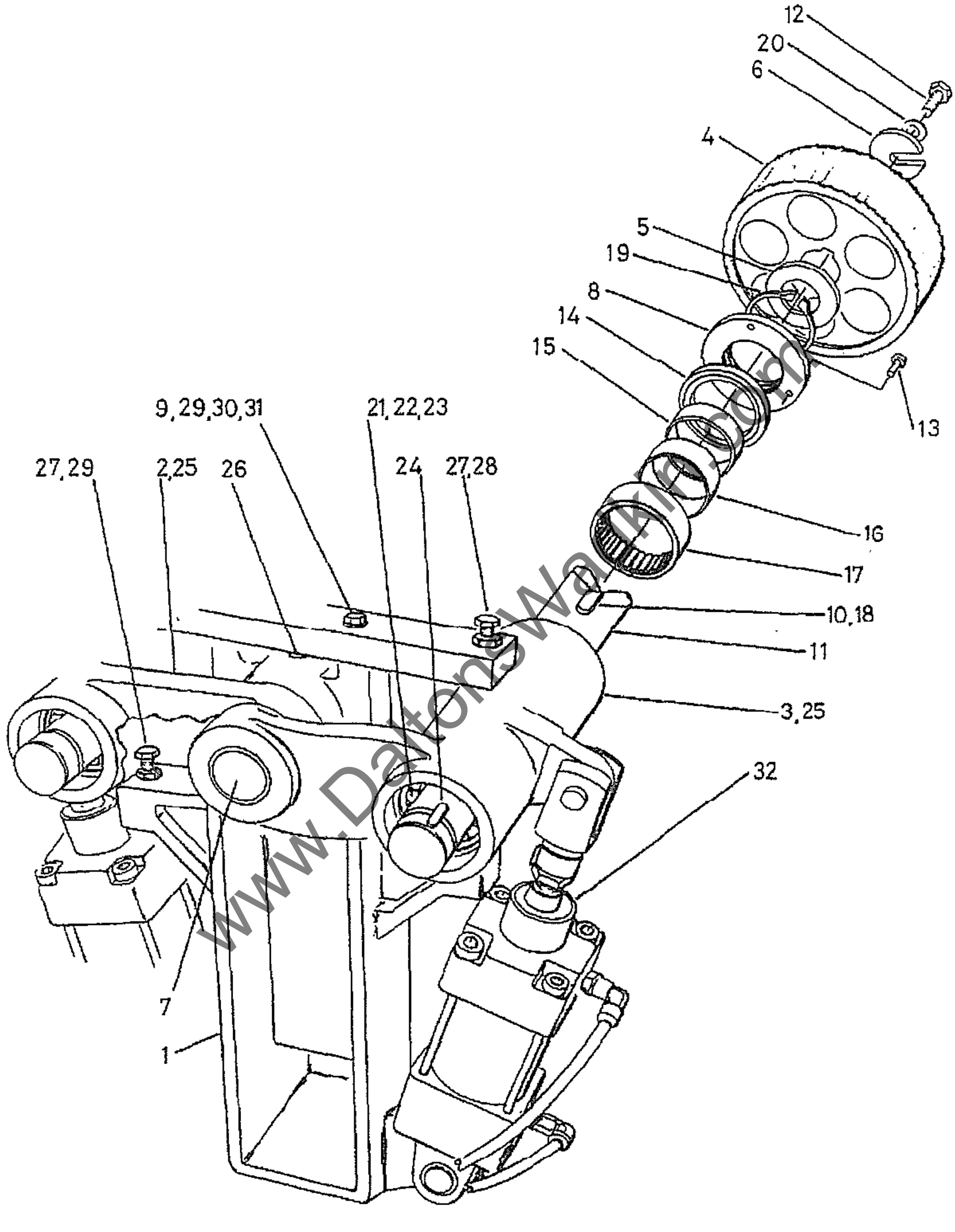

FIG 1 BOTTOM INFEED ROLLERS

1. BOTTOM INFEED ROLLERS

Ref No.	Description	No Off.
1.	Swing bracket	1
2	Feed roll swing - left hand	1
3.	Feed roll swing- right hand	1
4.	Feed rolls - chromed	8
5.	Spacing collar	2
6.	'C' washer	2
7.	Pivot shaft for swing	1
8.	Dust cap	2
9	Stop bar	1
10.	Key 10mm x 8mm x 170mm long	2
11.	Feed roll shaft	2
12.	Hexagon head setscrew M12 x 25mm long	2
13.	Hexagon socket capscrew M3 x 8mm long	6
14.	Seal 'INA' G45 x 55 x 4	2
15.	Inner race 'INA' IR 40 x 45 x 17	2
16.;	Inner race 'INA' IR 40 x 45 x 20	2
17.	Needle bearing 'INA' NK45/20	2
18.	Hexagon socket counter sunk screw M4 x 16mm long	4
19.	External circlip 40mm dia.	2
20.	Plain washer M12	2
21.	Bearing 'SKF' 6006-2RS	2
22.	Internal circlip 55mm dia.	2
23.	External circlip 30mm dia.	2
24.	Key 8mm x 7mm x 36mm	2
25.	Bronze bush 35mm O/D x 30mm I/D x 25mm wide	4
26.	Hexagon socket grubscrew M10 x 16mm long	1
27.	Locknut M10	4
28.	Hexagon head setscrew M10 x 50mm long	2
29	Hexagon head setscrew M10 x 35mm long	4
30.	Plain washer M10	2
31.	Spring washer M10	2
32.	Cylinder 'Parker' 5E63 B30/5 RC63 (complete with pivot pins, clevis and clips)	2

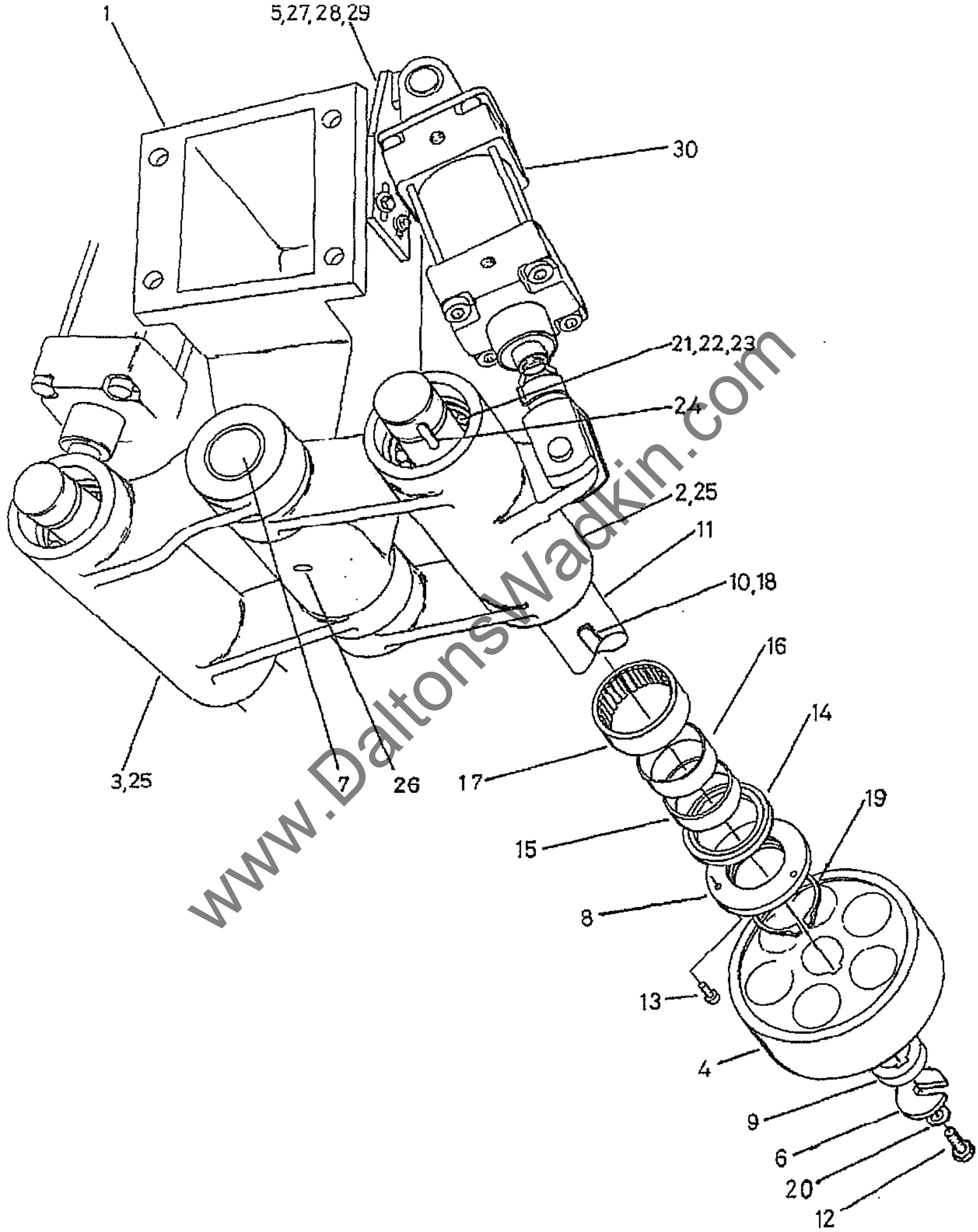

FIG 2 TOP INFEED ROLLERS

2. TOP INFEED ROLLERS

Ref No.	Description	No Off.
1.	Swing bracket GA 5392	1
2	Feed roll swing - left hand	1
3.	Feed roll swing- right hand	1
4.	Feed rolls - polyurethane	8
5.	Mounting for top feedroll cylinders	2
6.	'C' washer	2
7.	Pivot shaft for swing	1
8.	Dust cap	2
9	Spacers for feed rolls (specify width)	
10.	Key 10mm x 8mm x 170mm long	2
11.	Feed roll shaft	2
12.	Hexagon head setscrew M12 x 25mm long	2
13.	Hexagon socket capscrew M3 x 8mm long	6
14.	Seal 'INA' G45 x 55 x 4	2
15.	Inner race 'INA' IR 40 x 45 x 17	2
16.;	Inner race 'INA' IR 40 x 45 x 20	2
17.	Needle bearing 'INA' NK45/20	2
18.	Hexagon socket counter sunk screw M4 x 16mm long	4
19.	External circlip 40mm dia.	2
20.	Plain washer M12	2
21.	Bearing 'SKF' 6006-2RS	2
22.	Internal circlip 55mm dia.	2
23.	External circlip 30mm dia.	2
24.	Key 8mm x 7mm x 36mm long	2
25.	Bronze bush 35mm O/D x 30mm I/D x 25mm wide	4
26.	Hexagon socket grubscrew M10 x 16mm long	1
27.	Hexagon head setscrew M10 x 25mm long	4
28.	Plain washer M10	4
29.	Hexagon socket grub screw M6 x 6mm long	2
30.	Cylinder 'Parker' 5E63 B30/5 RC63 (complete with pivot pins, clevis and clips)	2
31.	Feed roll hub	8

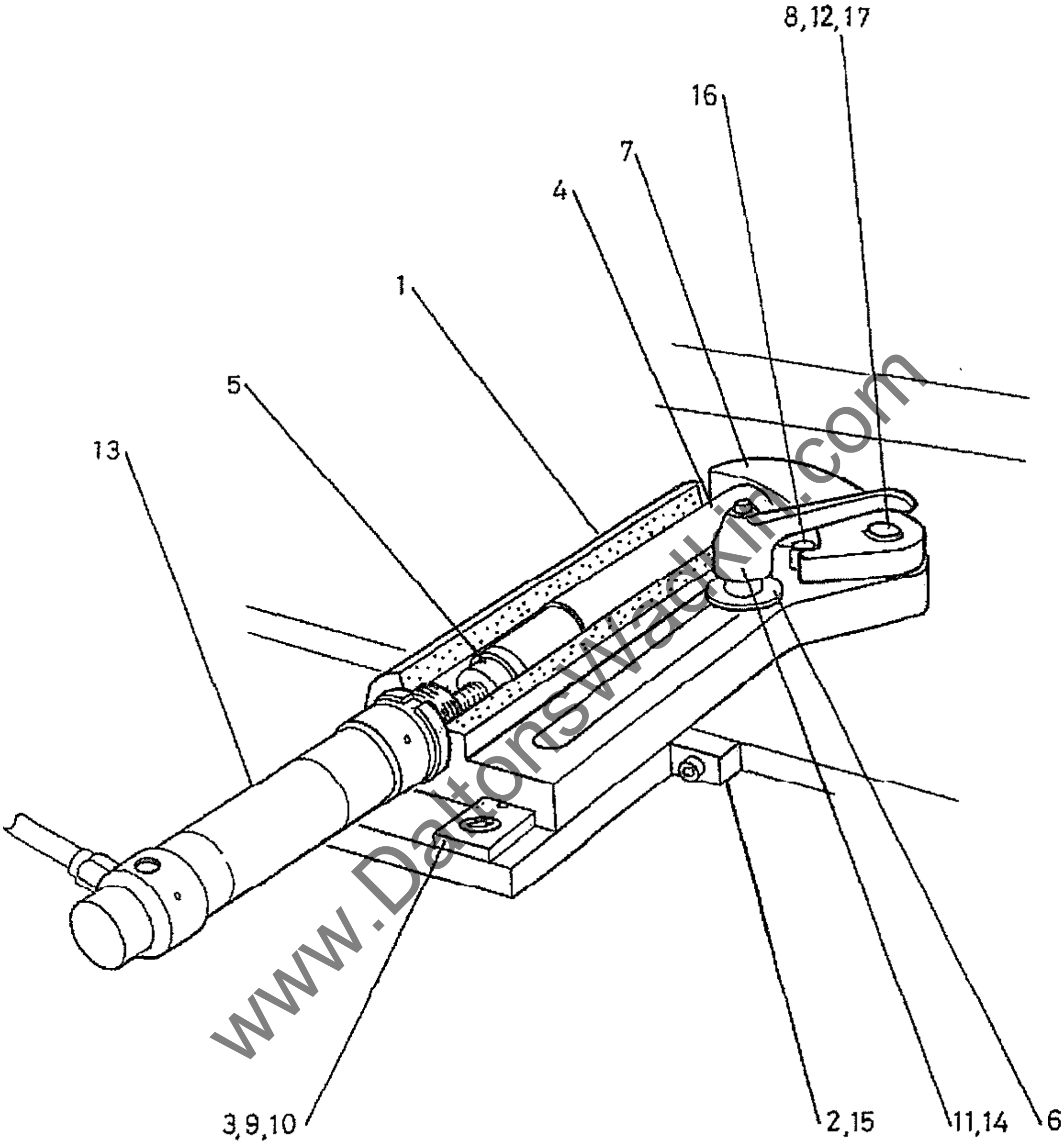

FIG 3 PNEUMATIC 'SKID' TYPE SIDE PRESSURE

3. PNEUMATIC 'SKID' TYPE SIDE PRESSURE

Ref No.	Description	No Off.
1.	Bracket	1
2.	Support for bracket	1
3.	Tenon for support	1
4.	Plunger	1
5.	Sleeve	1
6.	Clamping washer	1
7.	Skid link	1
8.	Pivot link	1
9.	Tension pin dia. 8mm x 24mm long	2
10.	Hexagon socket counter sunk setscrew M8 x 16mm long	2
11.	Locking handle M12 (female)	1
12.	Bronze bush O/D 25mm x I/D 20mm x 15mm	1
13.	'Festo' single acting cylinder ref ESW-32-50P	1
14.	Stud M12 x 50mm long	1
15.	Hexagon socket capscrew M10 x 30mm long	2
16.	Plain dowel dia. 12mm x 40mm long	1
17.	Taper pin	1

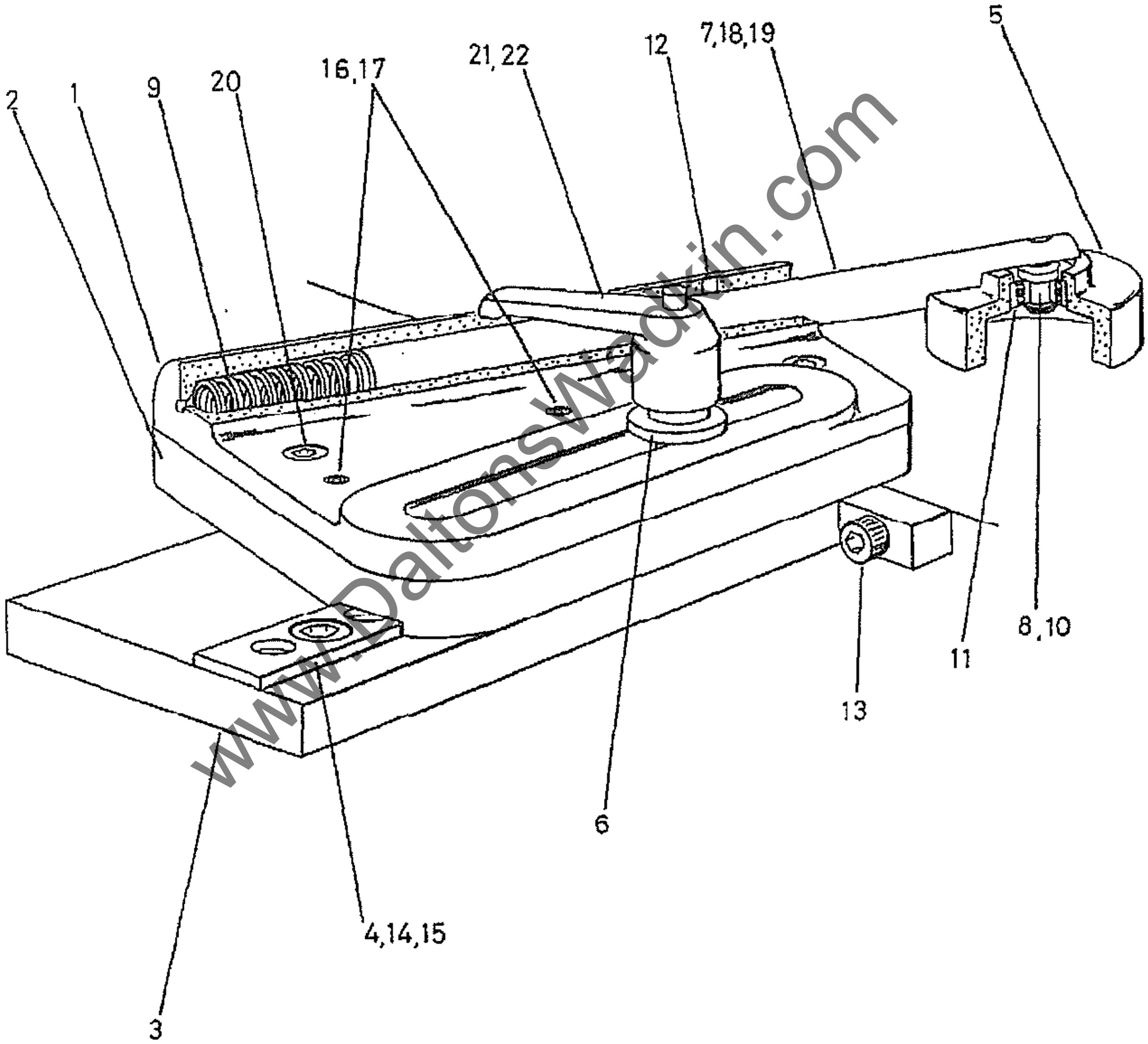

FIG 4 SIDE ROLLER PRESSURE

4. SIDE ROLLER PRESSURE

Ref No.	Description	No Off.
1.	Side pressure bracket	1
2.	Block for pressure bracket	1
3.	Support for pressure bracket	1
4.	Check strip	1
5.	Roller	1
6.	Clamping washer	1
7.	Sliding shaft	1
8.	Roller pin	1
9.	Compression spring 70mm free length,12 coils,O/D 23.35mm, I/D 17.46mm, 2.9mm wire thickness	1
10.	External circlip 20mm	1
11.	Bearing 'SKF' 6004-2RS	1
12.	Black nylon plug	1
13.	Hexagon socket capscrew M10 x 30mm long	2
14.	Hexagon socket counter sunk screw M8 x 20mm long	2
15.	Tension pin dia. 8mm x 20mm long	2
16.	Tension pin dia. 8mm x 24mm long	2
17.	Tension pin dia. 4mm x 28mm long	2
18.	Tension pin dia. 8mm x 30mm long	1
19.	Tension pin dia. 5mm x 30mm long	1
20.	Hexagon socket counter sunk screw M6 x 25mm long	2
21.	Locking handle M12 (female)	1
22.	Stud M12 x 65mm long	1

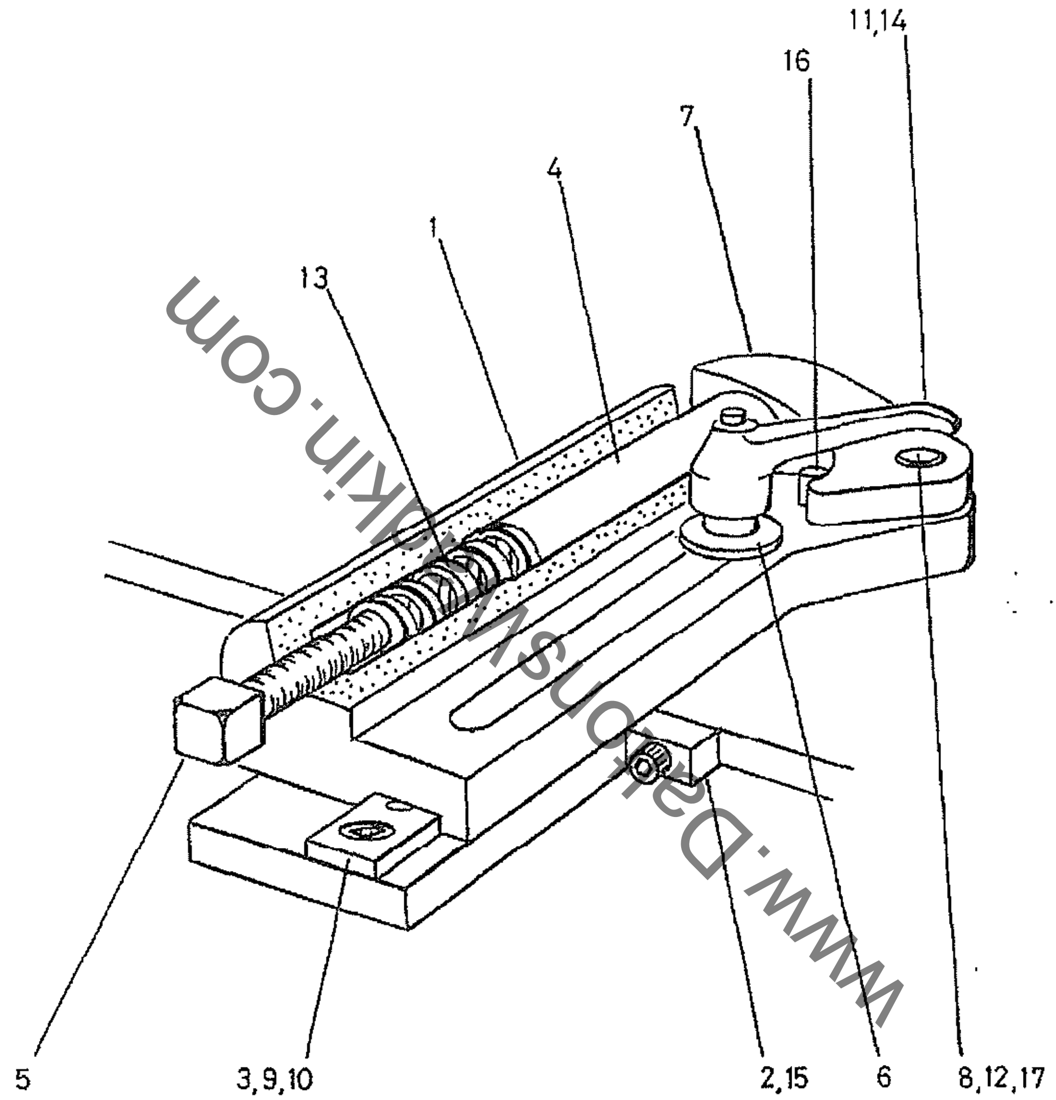

FIG 5 'SKID' TYPE SIDE PRESSURE – SPRING OPERATED

5. 'SKID' TYPE SIDE PRESSURE - SPRING OPERATED

Ref No.	Description	No Off.
1.	Bracket	1
2.	Support for bracket	1
3.	Tenon for support	1
4.	Plunger	1
5.	Tension screw	1
6.	Clamping washer	1
7.	Skid link	1
8.	Pivot link	1
9.	Tension pin dia. 8mm x 24mm long	2
10.	Hexagon socket counter sunk setscrew M8 x 16mm long	2
11.	Locking handle M12 (female)	1
12.	Bronze bush O/D 25mm x I/D 20mm x 15mm	1
13.	Compression spring 187.3mm free length, O/D 24.6mm, I/D 17.3mm, 31 coils	1
14.	Stud M12 x 50mm long	1
15.	Hexagon socket capscrew M10 x 30mm long	2
16.	Plain dowel dia. 12mm x 40mm long	1
17.	Taper pin	1

SECTION 6 BOTTOM HEAD MODULE

General (Fig 1)

This unit comprises of a cutterblock spindle, belt driven from a horizontally mounted motor at the rear of the module.

Timber passage over the module is via shaft mounted top through feed rollers leading and trailing the cutterblock and an opposed top roller/bottom roller combination at the outfeed end of the unit. All rollers are driven at the back of the module through 'Siti' gearboxes (see chapter - **Gearboxes and Drive Shafts**).

Due to modern machining techniques movement in the horizontal (lateral) plane is seldom if ever required. When fitted movement in this direction is factory set to give approximately 12mm adjustment backwards from the datum face of the fence when it is set at zero.

If it should be necessary to obtain further lateral movement when at the maximum rearward position, it may be obtained in the following manner:-

Isolate power supply at mains or by using master stop.

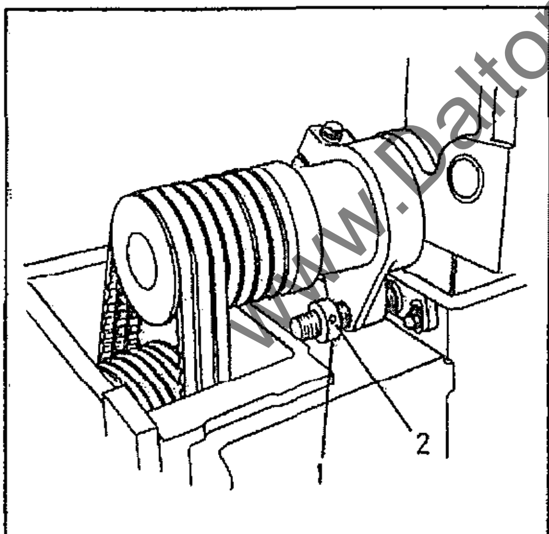

FIG 1 HORIZONTAL HEAD ADJUSTMENT

Remove the pulley guard and release the belt tension (refer to Maintenance - **Vee Belt Drive Tensioning**). Move the belts onto the next vacant pulley groove to bring them back into line and then re-tension the belts.

Locking collars prevent the spindle movement exceeding the original factory set boundaries and therefore if the belts are repositioned, then the rear stop (1) must also be reset.

This may be done by slackening off the grub screw (2), moving the collar back a further 12mm and then retightening the grubscrew (2).

Botom Head Vertical and Horizontal Adjustment (Fig 2, Fig 3)

Spindle adjustment where provided may be adjusted within its limits in both planes from the front of the module.

To Check Cutterblock Height

1) Isolate power supply at mains or by using master stop.

2) Remove/raise guards to allow clear access to bedplates and cutterblock.

3) Ensuring bedplates are clean place a straight edge (1) on the outfeed table of the module projecting over the bottom horizontal cutterblock.

   If set correct the blades should just touch the underside of the straight edge. Adjust cutterblock height if necessary.

Vertical Adjustment

4) Isolate power supply at mains or at master stop if not already isolated.

5) Release outboard housing locking handles (2).

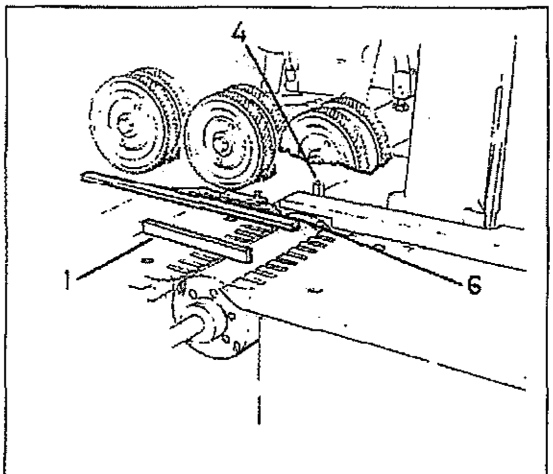

FIG 2 SETTING CUTTERBLOCK

6) Using supplied winding handle rotate adjusting screw (3) clockwise to raise the spindle of anti-clockwise to lower.

7) When the correct height has been achieved tighten locking handles (2) and engage power if no further adjustments are necessary.

Horizontal Adjustments (if fitted).

8) Ensure power is isolated at mains or at master stop. Remove conical outboard bearing cover.

9) Before making any lateral adjustments, the hexagon spindle barrel lock (4) situated behind the fence must be released and the outboard bearing (9) depressurised by turning the pressure release valve (5) one quarter turn anti-clockwise using a 3mm Allen key.

10) Position cutterblock as required using adjusting screw (8). If edge reference is fitted a straight edge (6) should be placed along the main fixed fence to set the blades of the edge reference cutter approximately 0.75mm behind datum fence line.

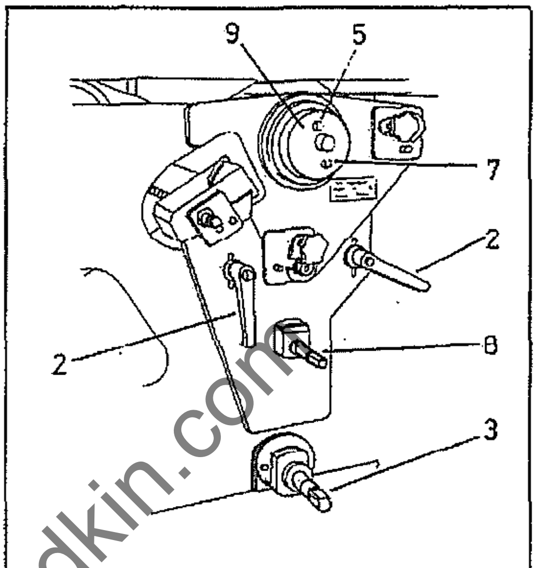

FIG 3 BOTTOM HEAD ADJUSTMENTS

11) Refasten spindle barrel lock (4) and close pressure release valve (5). Pressurise bearing to 300 bar by application of hydraulic pressure to the nipple (7) in the recess on the face of the outboard (9). Replace outboard cover and engage power if no further adjustments are required.

Adjustment to Top and Bottom Through Feed Rollers

For information relating to adjustment, maintenance and parts refer to chapter - **Driven Bed and Top Through Feed Rollers.**

Adjustment of Side Pressure after Bottom Head (Fig 4)

The 'skid' type side pressure is only fitted when the bottom module is followed by a Top or Top/Bottom Head Module. The side pressure mounting, fixed to the bedplate, carries a tenon which guides the pressure tangential to the timber.

1) Release locking handle (1) and adjust the side pressure to suit timber width.

2) When set re-tighten handle

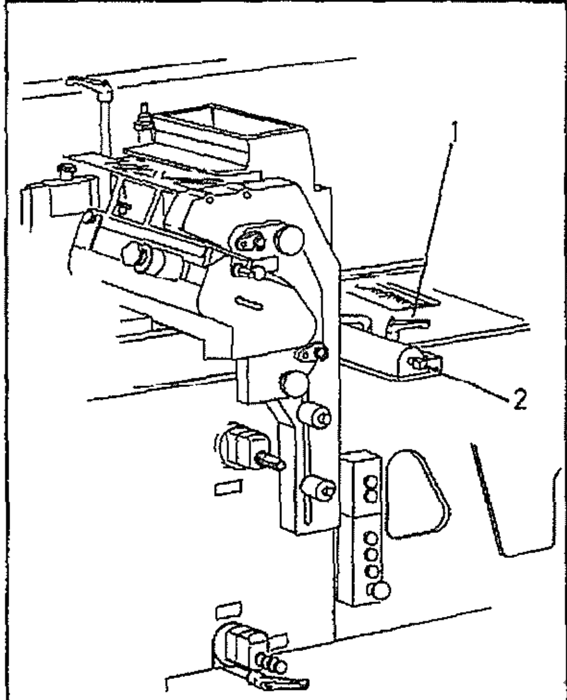

FIG 4 SIDE PRESSURE AFTER BOTTOM HEAD

3) Turning screw (2) in a clockwise direction increases the spring tension and stiffens the 'skid' movement.

Turning the screw in an anti-clockwise direction has an opposite effect.

MOUNTING THE CUTTERBLOCKS

General

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

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 of 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 a 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.

Outboard bearings are fitted to the horizontal spindles to give greater rigidity to the cutterblock; these support each spindle at its outer position.

The outboard bearing support bracket on the bottom heads is attached and locked to the support plate manually.

The outboard bearings must be depressurised before removal or making lateral (horizontal) adjustments to the bottom heads.

To Change Cutterblock (Fig 1, Fig 2, Fig 3)

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

1) Remove the conical shaped outboard bearing cover.

2) Depressurise the outboard bearing (8) by turning the pressure release valve (4) one quarter of a turn using a 3mm Allen Key.

3) Slacken off the two 12mm collar nuts (1), swing captive 'C' washers (2) clear and remove outboard bearing housing (3).

Note: This housing is spigoted and must be pulled off parallel to the spindle.

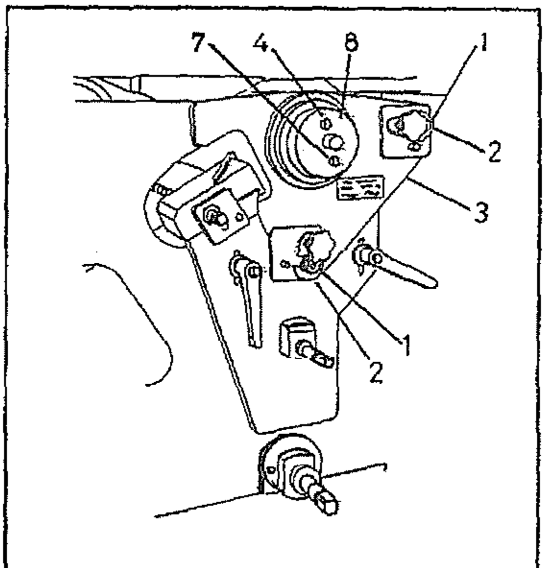

FIG 1 BOTTOM HEAD OUTBOARD

4) Remove cutterblock off spindle.

Caution When handling cutterblocks care should be taken to avoid injury on knife blades. The method of removal varies depending on the type of block.

a) *Plain bore cutterblock.*

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

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

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

Remove cutterblock.

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

b) *Hydrogrip cutterblock with Plain Collar*

Untightening the capscrew in the collar using an Allen key, releases the collars grip on the spindle allowing it to be slid off.

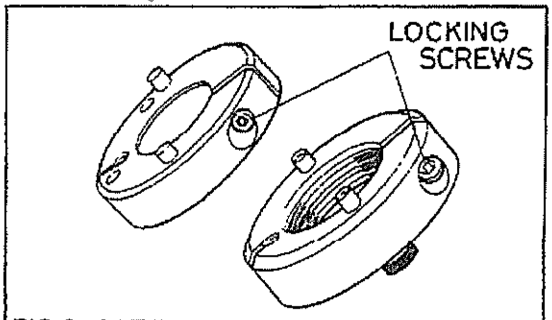

FIG 2 SAFETY COLLARS

Note: On reassembly ensure the collar is fitted with its locating pins facing cutterblock.

Depressurise the hydrogrip cutterblock by turning the pressure release screw (5), located in a recess on the barrel of the cutterblock one quarter turn to release, using a 3mm A/F hexagon key.

Slide the cutterblock from the spindle.

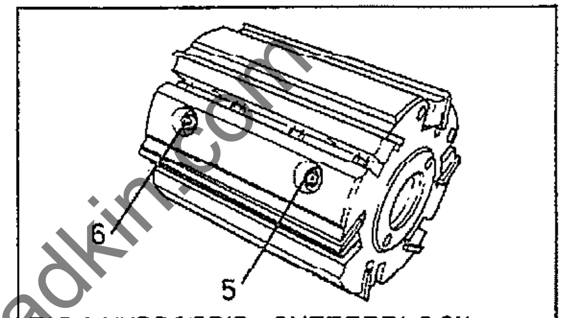

FIG 3 HYDROGRIP CUTTERBLOCK

Always leave the pressure release screw (5) undone when the cutterblock is not in use to avoid distortion to the cutterblock due to the variation in room temperatures.

c) *Hydrogrip cutterblock with threaded collar.*

Release the capscrew in the safety collar using an Allen Key. Unscrew the two knurled headed pins until the collar is free to unscrew.

Note: On assembly this collar must be screwed finger tight against the pressurised block and then if needed unscrewed until the pins line up with corresponding cutterblock holes.

Depressurise the hydrogrip cutterblock by turning the pressure release screw

(5), located in a recess on the barrel of the cutterblock one quarter turn to release, using a 3mm A/F hexagon key.

Slide the cutterblock from the spindle.

Always leave the pressure release screw (5) undone when the cutterblock is not in use to avoid distortion to the cutterblock due to the variation in room temperatures.

5) Before replacing cutterblock ensure spindle, spindle shoulder, shoulders of cutterblock and bores are all clean.

6) Carefully place the cutterblock on the spindle. On the Hydrogrip blocks tighten pressure release screw (5), and pressurise the cutterblock by applying hydraulic pressure to the pressure nipple (6) located in a recess located on the barrel of the block (see fig 3).

7) Fit safety collars and/or spacers as applicable. On the plain bore cutterblocks, tighten the block to the spindle with the spanner/s provided.

8 Replace bearing housing (3) and retighten captive 'C' washer (2) and collar nuts (1). Tighten pressure release valve (4) and pressurise bearing to 300 bar (4350 p.s.i.) by application of hydraulic pressure to the nipple (1) in the recess on the face of the bearing. **See NB.**

9) Rotate spindle slowly by hand to check knives are clear off chipbreaker etc. Replace cover, engage power and start head for a short period of time to ensure smooth rotation without vibration.

NB. before pressurising the outboard bearing, set the bearing in the mid position of its axial adjustment, to allow for final setting of the cutter block.

MAINTENANCE

Routine Maintenance

Caution: Before proceeding with any maintenance ensure power is off at mains or at master stop.

Weekly

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 the cutterblock collars and machine tables.

Check that all machine parts slide, or rotate freely. Lightly lubricate as directed, do not over-lubricate.

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

Centralised lubrication points at the front of the machine allows for oiling of the bottom head slideway as part of an overall oiling operation.

The slideways should be oiled at weekly intervals and then adjusted through its extrem positions to ensure even distribution of oil and prevent dense sawdust particle build up. 'Wadkin' grade '4' oil should be used (see **Approved lubricants**).

Three Monthly (Fig 1)

Electric drive motors have 'sealed for life' bearings and are maintenance free. However the fan cowl should be removed at intervals and the fan checked for damage, excessive end float, signs of overheating, etc. If the cowl itself is damaged it should be replaced.

Remove drive belt cover at rear of module and clean the spindle barrel lateral adjustment screw (1). Grease traverse screw using Wadkin L6 grease.

With the cover off, the spindle drive belts and tension can be checked. The belts (2) should be capable of being depressed approximately 1 1/2 to 2cm per metre of span, by application of average thumb pressure of 2.2 - 3.2 kgf (5-7 lbf).

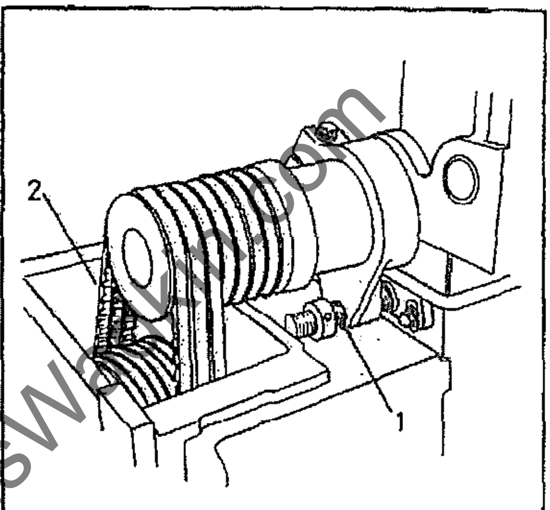

FIG 1 TRAVERSE SCREW LUBRICATION AND DRIVE BELT TENSION

Retension if required and refit cover.

Vee Belt Drive Tensioning (Fig 2)

It is important that drive belts are correctly set as insufficient tension causes slipping and premature belt wear. The method of adjustment is as follows.

1) Isolate power at master stop or mains.

2) Remove cover to expose spindle pulley and belts (Fig 1).

3) Slacken off motor mounting plate bolts (1).

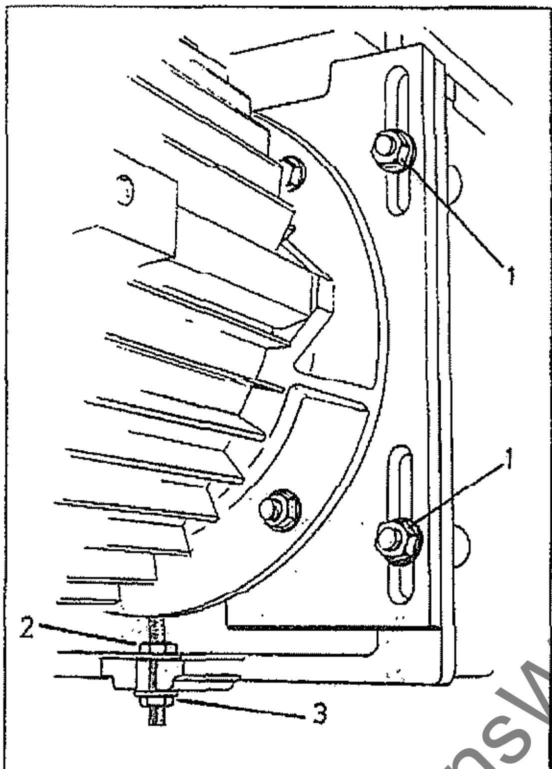

FIG 2 VEE-BELT DRIVE TENSIONING

4) Tension belt by slackening the top locknut (2) and turning the bottom locknut (3) in an anti-clockwise direction.

5) When tensioned lock up both nuts (2 and 3) and motor mounting bolts (1). Refit cover and engage power.

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. Always retighten any securing features fitted.

If one or more of the vee-belts becomes faulty it will usually 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.

Replacing Drive Belts (Fig 2)

Drive belts must be replaced as a set to obtain correct drive performance.

1) Isolate power at master stop or mains.

2) Remove cover.

3) Relieve tension on belts by reducing drive centres i.e. slacken off the four motor mounting bolts (1), the locknut (3) and raise the motor by rotating nut (2) in a clockwise direction.

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

5) Retension the new belt set (see **Vee Belt Tensioning**).

Note: It may at times be necessary to remove a drive pulley. The fitted motor shaft pulleys are fitted with Taper-Lock bushes (see fig 4), cutterblock spindles are fitted with parallel keys. (See **Remove and Refit Drive Pulleys**).

Remove and Refit of 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).

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

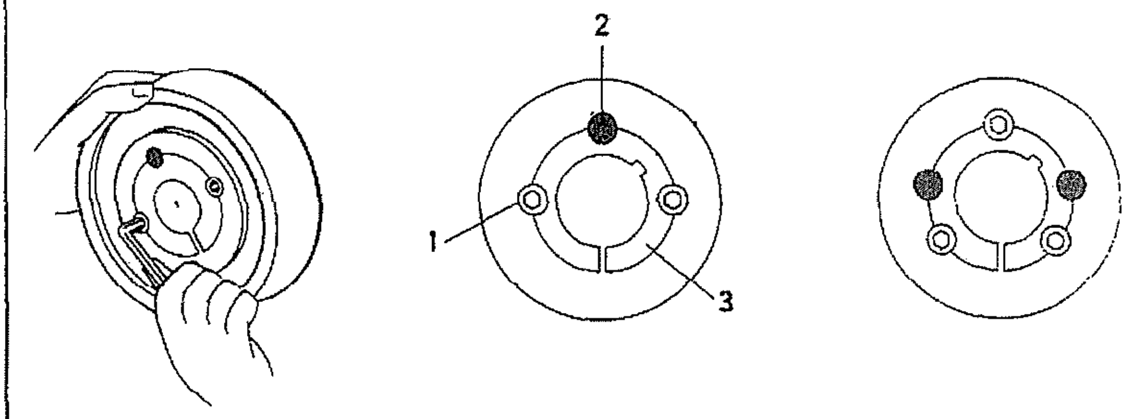

FIG 3 REMOVING A TAPER-LOCK BUSH

3) Tighten screws (1) alternatively 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, alternatively tighten screws (1), until all screws are pulled up securely. Use a short length of pipe on key to increase leverage.

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

6) Fill empty screw holes with grease to exclude dirt.

Changing Outboard Bearing (Fig 4)

Work must be carried out in a clean and dry environment. Failure to do so could result in premature bearing failure.

Preparation Prior to Fitting Bearings

Before fitting a new bearing, the protection 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.

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) = d x B x 0.01
d = bore of bearing in mm
B = width in mm

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

Changing Outboard Bearing

1) Isolate power at master stop or at mains.

2) Remove conical shaped outboard bearing cover.

3) Depressurise and remove outboard bearing as described previously in **'Changing Cutterblock/Saws'**.

4) Remove bearing locknut (2), un-screw hexagon socket capscrews (10) and remove the protective ring (1), it is not necessary to remove the grease nipple (9) or the pressure release valve (8).

5) Remove the end cap for the outboard bearing housing (5) by removing 4-off hexagon socket capscrews (11).

6) Withdraw the ETP sleeve (12), the bearing spacer (3) and the spring disc (4). The bearing (6) should be withdrawn with the sleeve, unless the failure of the bearing (6) has caused it to seize in the housing (7). If the bearing is stuck in the housing remove it using a bearing puller on the bearing rings. Take care not to damage the housing (7).

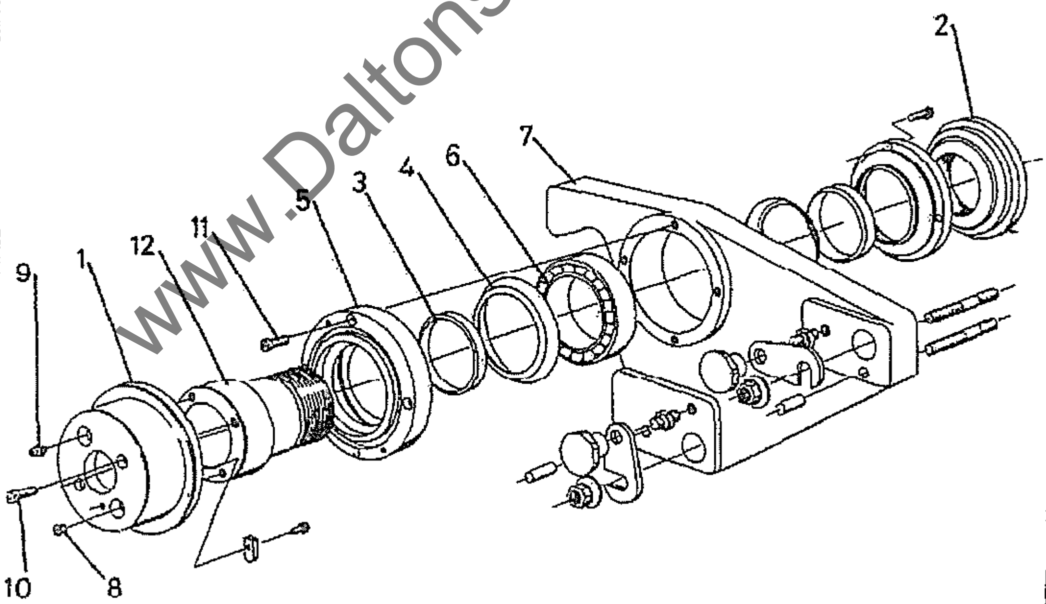

FIG 4 OUTBOARD BEARING - BOTTOM HEAD

7) After preparation, (see *preparation prior to fitting bearing*) fit new bearing (6) to ETP sleeve (12) ensuring that the bearing spacer (3) and the disc spring (4) have also been fitted.
Use only sufficient pressure to fit bearings, applying pressure to the inner ring only. Ensure that bearing ring fits up to location.

8) Lubricate bearing (see *preparation*).

9) Reassemble unit by reversing stages 3),2),1) ensuring that the labrinyth seals in the outboard bearing end caps (5) are refilled with grease.
Care must be taken when fitting bearing locknut (2) not to overtighten. A small amount of engineering adhesive (Loctite grade 241) should be applied to the thread of the bearing locknut (2).

Note: The bonding adhesive from the previous assembly may be left as a powder and must be removed before applying further adhesive.

10) Check that outboard assembly runs freely when turned by hand.

11) Re-position bearing housing, secure and re-pressurise as described in **'Changing Cutterblock Saws'**

12) Replace outboard cover and engage power.

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER.

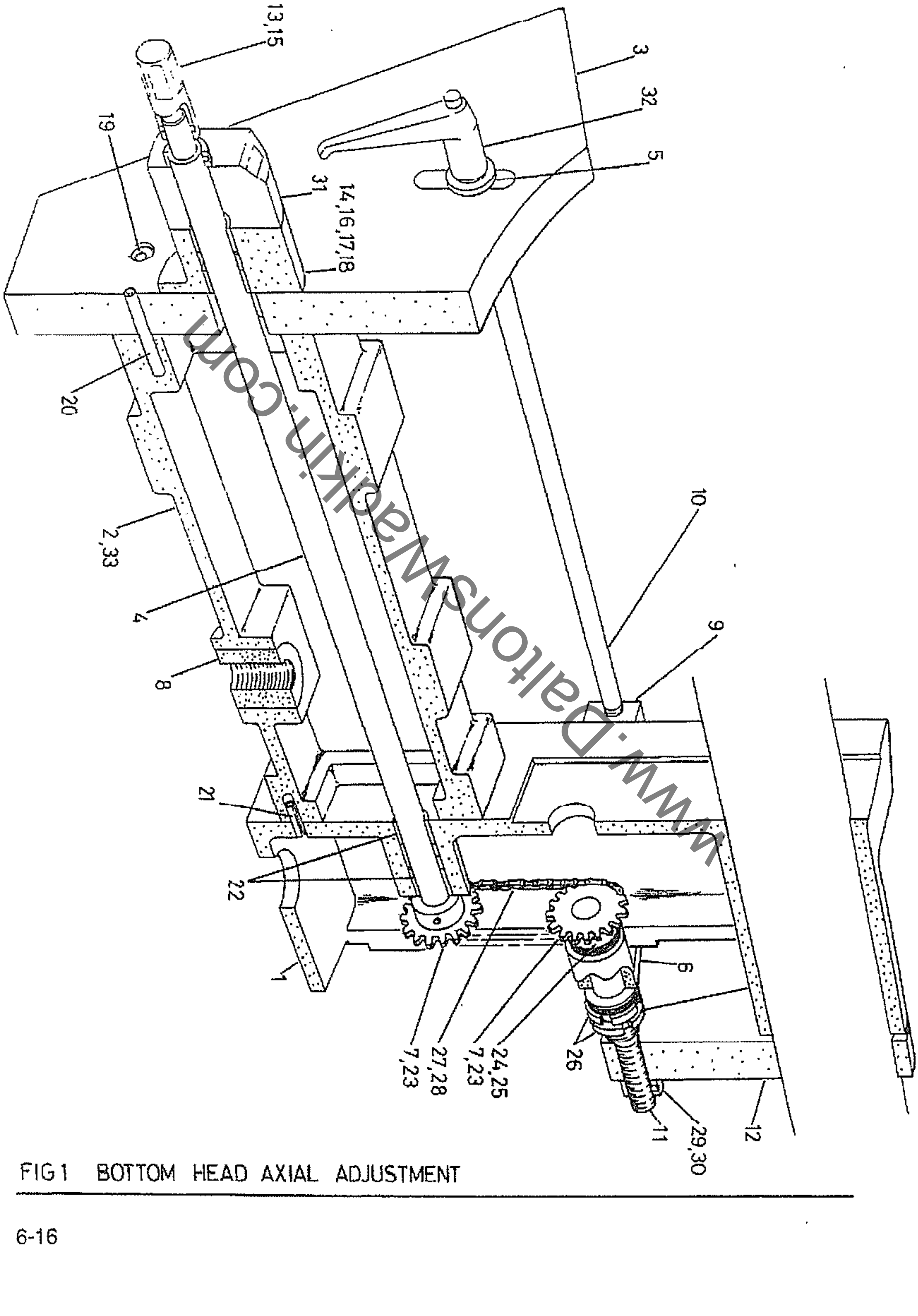

FIG 1 BOTTOM HEAD AXIAL ADJUSTMENT

1. BOTTOM HEAD AXIAL ADJUSTMENT

Ref No.	Description	No Off.
1.	Bottom head vertical slide	1
2.	Stretcher for bottom head	1
3.	Front plate	1
4.	Axial adjustment shaft	1
5.	Clamping washer	2
6.	Bearing bracket	1
7.	Chain sprocket	2
8.	Nut for bottom head rise and fall	1
9.	Locking pad for slide	1
10.	Shaft for bottom head clamping	1
11.	Sprocket shaft for axial adjustment	1
12.	Barrel clamping nut for axial adjustment	1
13.	Square end shaft extension	1
14.	Bracket for axial shaft bearings	1
15.	No 1 Taper pin	1
16.	Hexagon socket cap screw M8 x 25mm long	2
17.	Plain washer M8	2
18.	Bush 25mm O/D x 20mm I/D x 15mm long	2
19.	Hexagon socket cap screw M10 x 25mm long	4
20.	Dowel 8mm diameter x 40mm long	2
21.	Tension pin 8mm diameter x 35mm long	2
22.	Bush 25mm O/D x 20mm I/D x 20mm long	2
23.	Taper pin No 4	2
24.	'INA' Thrust bearing AXK - 2542	2
25.	'INA' Thrust washer AS 2542	4
26.	Notch nut M24 x 1.5mm pitch	2
27.	Chain connecting link No 26	1
28.	'Reynold' chain 1/2" pitch x 39 pitches	1
29.	Threaded collar M20 trapezodial	1
30.	Hexagon socket grubscrew M8 x 8mm long	1
31.	'Siko' position indicator 0902E 4mm	1
32.	Locking handle M12	2
33.	Hexagon socket capscrew M10 x 30mm long (stretcher to side fastening)	4

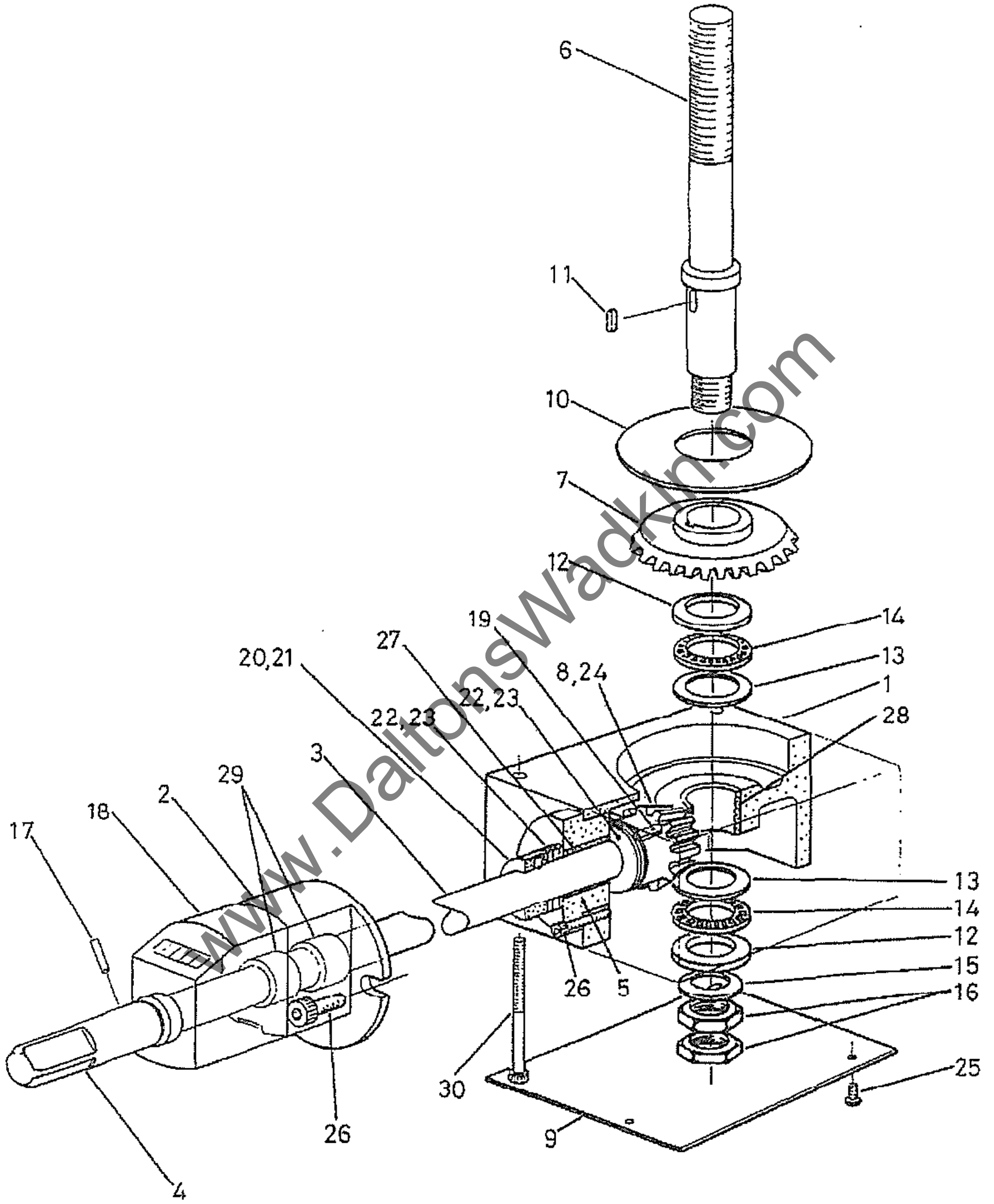

FIG 2 BOTTOM HEAD RISE AND FALL

2. BOTTOM HEAD - RISE AND FALL ADJUSTMENT

Ref No.	Description	No Off.
1.	Bevel box for bottom head adjustment	1
2.	Bracket for cross shaft bearing	1
3.	Cross shaft for bottom head rise and fall	1
4.	Square end shaft extension	1
5.	End cap for rise and fall bevel box	1
6.	Screw for bottom head rise and fall	1
7.	Bevel gear for rise and fall	1
8.	Bevel gear for rise and fall	1
9.	Cover for bevel box	1
10.	Sealing ring	1
11.	Key 8mm x 7mm x 20mm	1
12.	'INA' Shaft washer WS 81105	2
13.	'INA' Thrust washer AS 2542	2
14.	'INA' Thrust bearing AXK 2542	2
15.	Plain washer M16	1
16.	Hexagon lock nut M16	2
17.	Taper pin	1
18.	Siko position indicator 09011 2mm	1
19.	Key 5mm x 5mm x 20mm	1
20.	Collar dia 20mm bore	1
21.	Hexagon socket grubscrew M6 x 6mm long	1
22.	'INA' Thrust washer AS 2035	4
23.	'INA' Thrust bearing AXK 2035	2
24.	External circlip dia. 16mm	1
25.	Pan head screw M4 x 10mm long	3
26.	Hexagon socket capscrew M6 x 20mm long	3
27.	Bush 25mm O/D x 20mm I/D x 25mm long	1
28.	Bush 30mm O/D x 25mm I/D x 25mm long	1
29.	bush 25mm O/D x 20mm I/D x 15mm long	2
30.	Hexagon socket capscrew M6 x 75mm long	4

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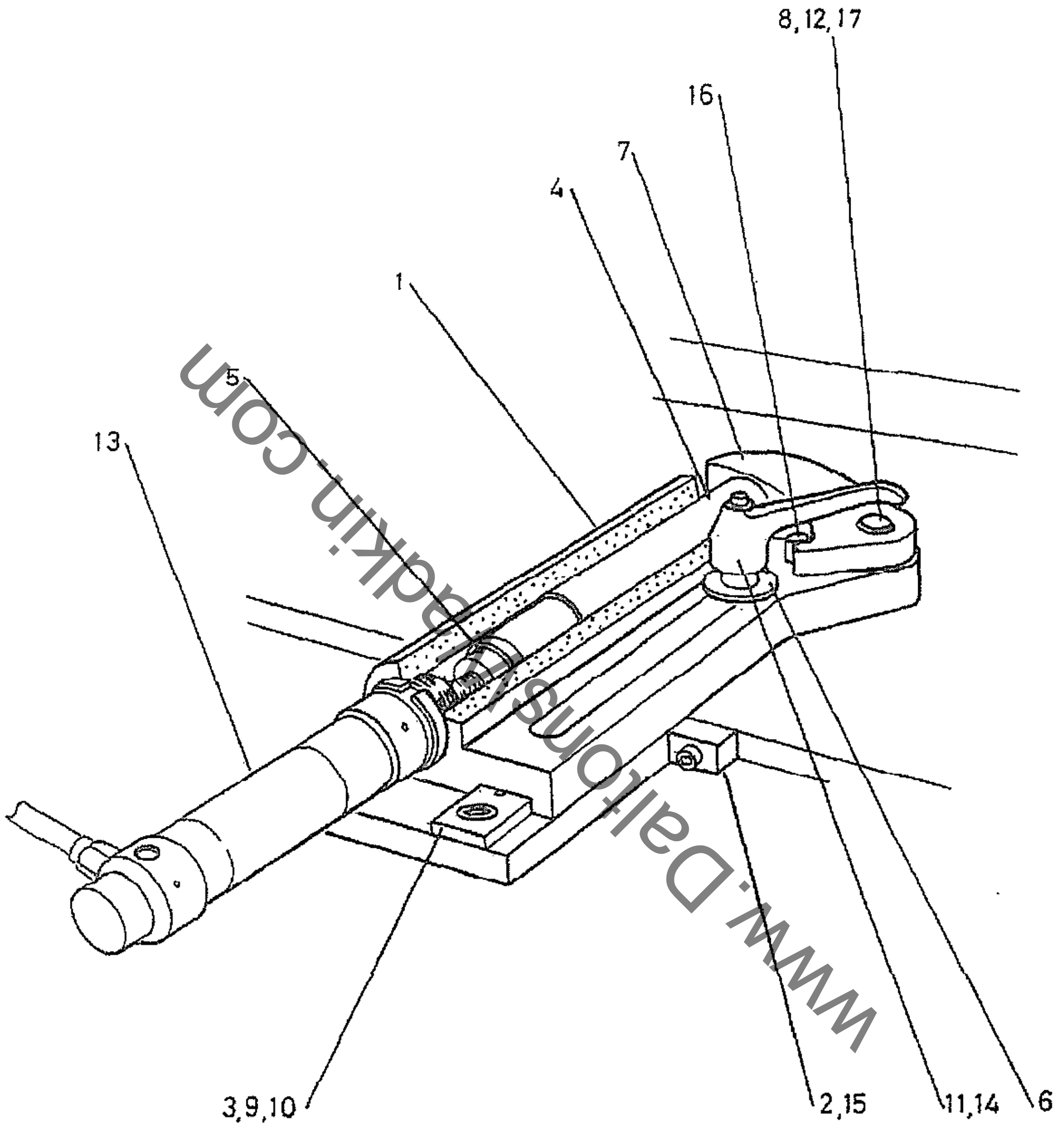

FIG 3 PNEUMATIC 'SKID' TYPE SIDE PRESSURE

3. PNEUMATIC 'SKID' TYPE SIDE PRESSURE

Ref No.	Description	No Off.
1.	Bracket	1
2.	Support for bracket	1
3.	Tenon for support	1
4.	Plunger	1
5.	Sleeve	1
6.	Clamping washer	1
7.	Skid link	1
8.	Pivot link	1
9.	Tension pin dia. 8mm x 24mm long	2
10.	Hexagon socket counter sunk setscrew M8 x 16mm long	2
11.	Locking handle M12 (female)	1
12.	Bronze bush O/D 25mm x I/D 20mm x 15mm	1
13.	'Festo' single acting cylinder ref ESW-32-50P	1
14.	Stud M12 x 50mm long	1
15.	Hexagon socket capscrew M10 x 30mm long	2
16.	Plain dowel dia. 12mm x 40mm long	1
17.	Taper pin	1

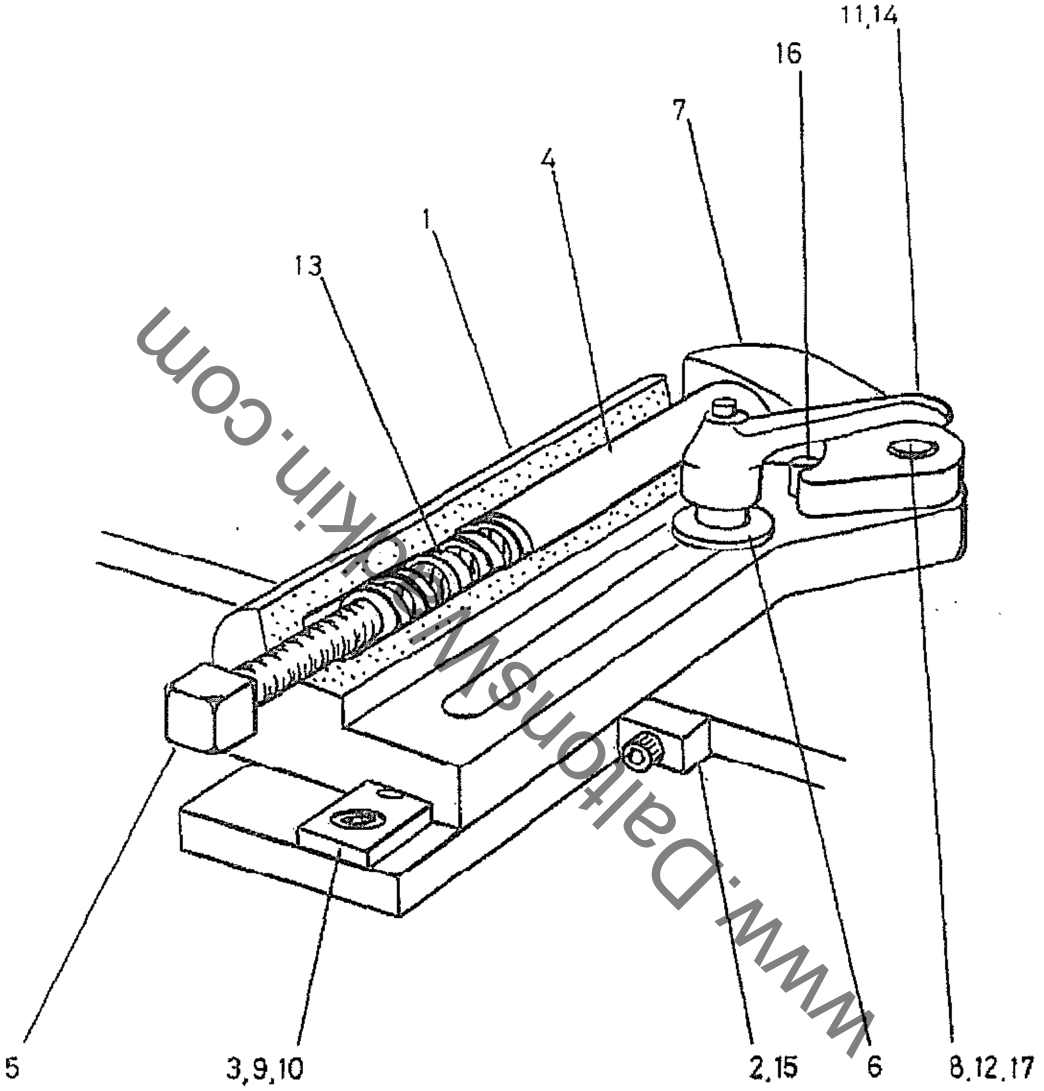

FIG 4 'SKID' TYPE SIDE PRESSURE – SPRING OPERATED

4. 'SKID' TYPE SIDE PRESSURE - SPRING OPERATED

Ref No.	Description	No Off.
1.	Bracket	1
2.	Support for bracket	1
3.	Tenon for support	1
4.	Plunger	1
5.	Tension screw	1
6.	Clamping washer	1
7.	Skid link	1
8.	Pivot link	1
9.	Tension pin dia. 8mm x 24mm long	2
10.	Hexagon socket counter sunk setscrew M8 x 16mm long	2
11.	Locking handle M12 (female)	1
12.	Bronze bush O/D 25mm x I/D 20mm x 15mm	1
13.	Compression spring 187.3mm free length, O/D 24.6mm, I/D 17.3mm, 31 coils	1
14.	Stud M12 x 50mm long	1
15.	Hexagon socket capscrew M10 x 30mm long	2
16.	Plain dowel dia. 12mm x 40mm long	1
17.	Taper pin	1

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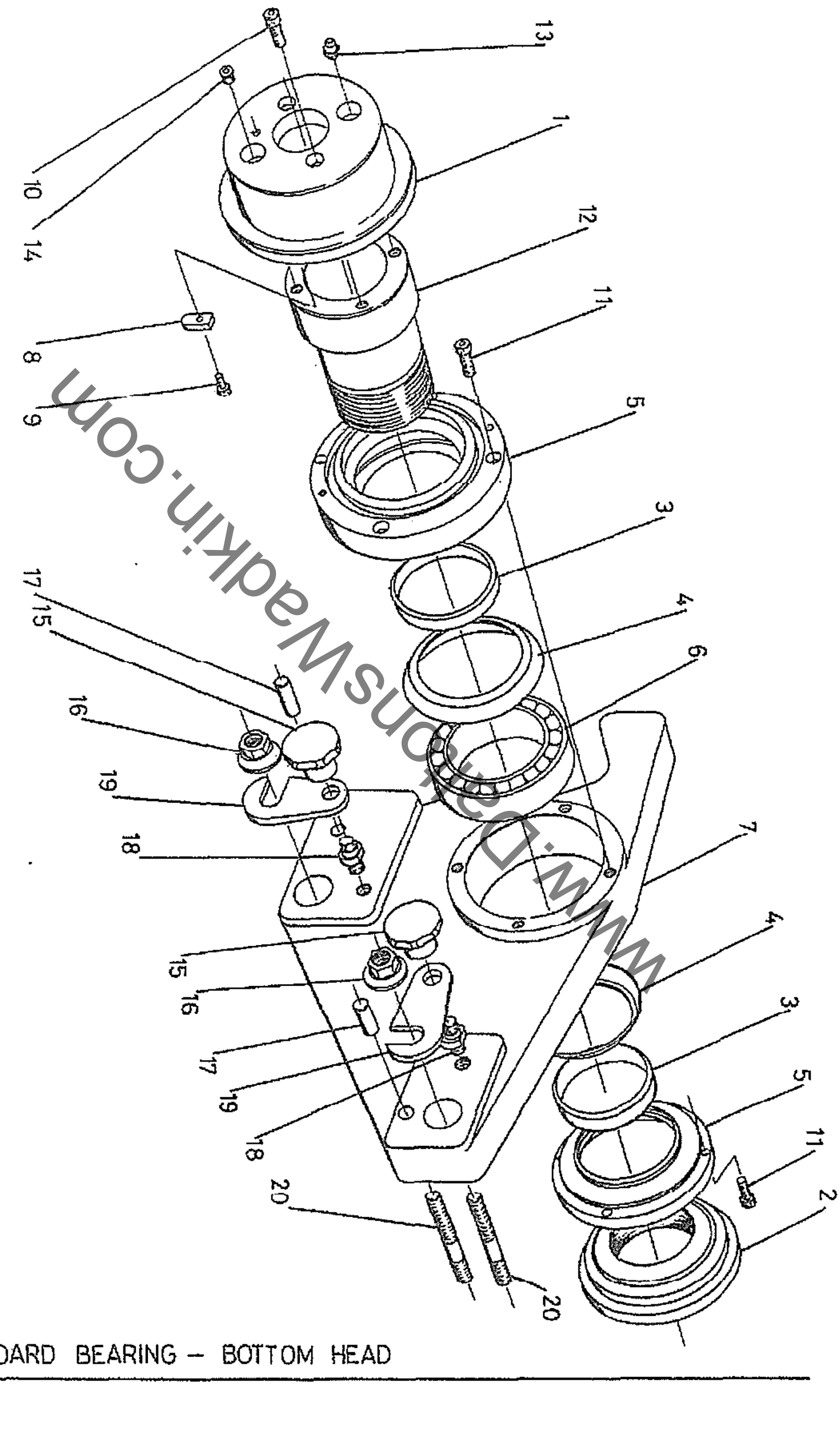

FIG 5 OUTBOARD BEARING – BOTTOM HEAD

5. OUTBOARD BEARING - BOTTOM HEADS

Ref No.	Description	No Off.
1.	Protective ring for hydrogrip sleeve	1
2.	lockout for outboard bearing	1
3.	Bearing spacer	2
4.	Disc spring 99mm O/D x 70.5mm I/D x 1mm	2
5.	End cap for outboard bearing housing	1
6.	'RHP'grease packed bearing 6211-TB-EP7	1
7.	Outboard bearing housing	1
8.	Drive key	1
9.	Hexagon socket capscrew M3 x 12mm long	1
10.	Hexagon socket capscrew M5 x 12mm long	2
11.	Hexagon socket capscrew M6 x 12mm long	8
12.	'ETP' sleeve (less front plate)	1
13.	Grease nipple }items only supplied	1
14.	Pressure release valve } with ETP sleeve	1
15.	Hand wheel M8 threaded	2
16.	Collar nut 'WDS' 404-204 M12	2
17.	Taper dowel dia. 12mm x 40mm long	2
18.	Shoulder screw	2
19.	'C' washer	2
20.	Stud M12 x 70mm long	2

SECTION 7 STAGGERED SIDE HEADS

General

This is the standard side head module with a 300mm stagger between heads. Timber is driven through by two top through feed rolls opposite the near side head followed by an opposed top/bottom roller combination. 'Sitl' gearboxes at the rear, transfer the drive from the shafts to the feed rolls.

A side pressure opposite the fence side head, a top roller pressure for the fence side head and a near side head guide all help ensure timber is presented to the cutterblocks correctly.

Fence Side Head (Fig 1, Fig 2)

1) Isolate power at mains or at master stop.
Ensure that the machine bed is clean.

2) Set the fence guide (1) with a straightedge (2) against the fence guide and cutters (3) in a similar manner to that used for the First Bottom Head. If necessary adjust the spindle laterally as follows:

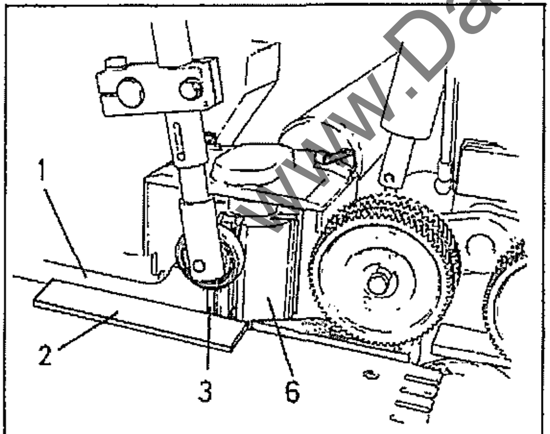

FIG 1 FENCE SIDE HEAD

a. Release the locking handle (4).

b. Rotate the handscrew (5) clockwise to advance the spindle or anti-clockwise to retract the spindle.

c. Refasten the locking handle (4).

NOTE: Maximum lateral adjustment is 33mm.

3) Set the axial position (height) of the cutterblock (6) as follows:

a. Release the locking handle (4).

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

c. Refasten the spindle clamp (7)

d Refasten the locking handle (4)

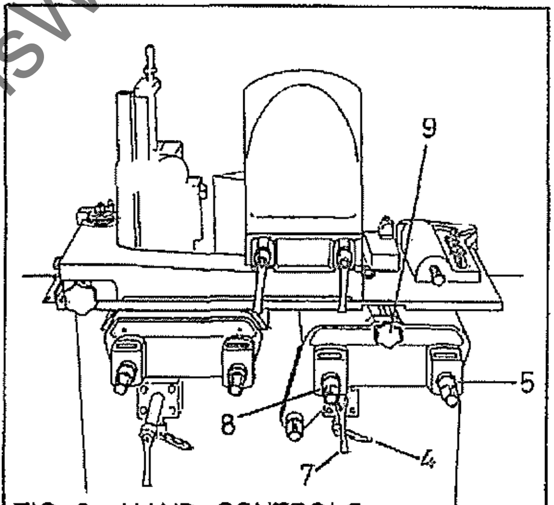

FIG 2 HAND CONTROLS - FENCE SIDE HEAD

4) Set the sliding bedplate using adjusting knob (9) to within 5mm of the cutterblock.

Near Side Head (Fig 3, Fig 4)

1) Isolate power at mains or at master stop.

Ensure that the machine bed is clean.

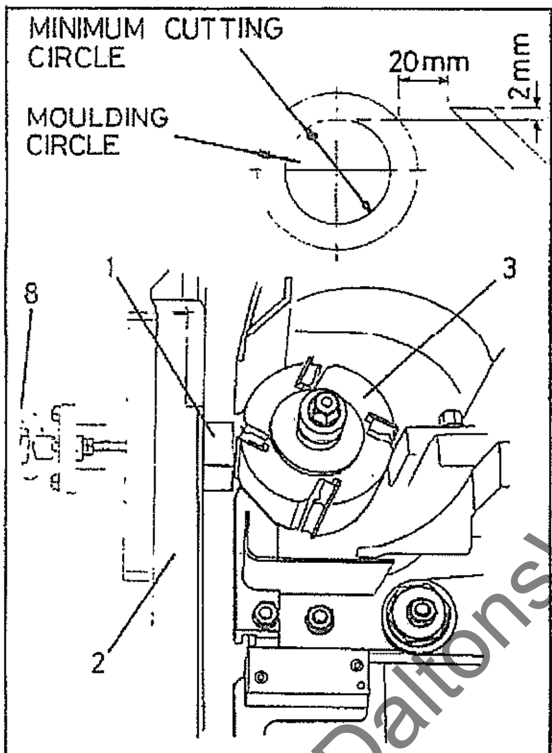

FIG 3 NEARSIDE HEAD

2) Check the digital readout (if fitted) using a datum block (1) of known width inserted between the fence guide (2) and cutterblock (3) The cutter blades should just touch the near side of the datum block. If necessary, reposition as follows:

a. Release locking handle (5)

b. Rotate handscrew (6) clockwise to advance the spindle or anti-clockwise to retract the spindle.

c. Refasten locking handle (5)

d. Reset digital readout, (where fitted) to the known dimension.

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

a. Release the locking handle (5)

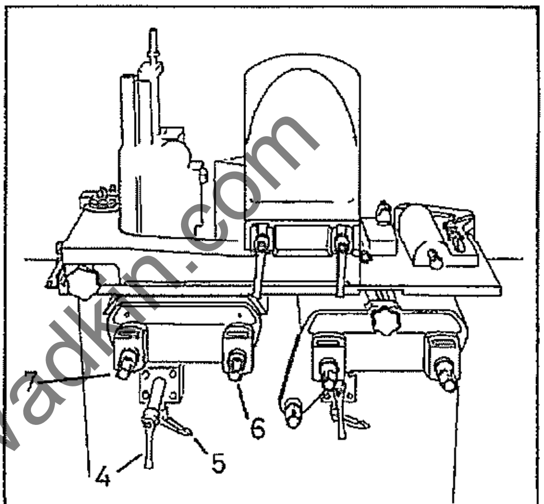

FIG 4 HAND CONTROLS - NEAR SIDE HEAD

b. Release the spindle clamp (4) and adjust the cutter height by rotating the handscrew (7) anti clockwise to lower the spindle or clockwise to raise the spindle.

c. Refasten the spindle clamp (4)

d. Refasten locking handle (5)

4) Set the sliding bedplate using adjusting knob (8) to within 5mm of the cutterblock.

Near Side Head Chipbreaker and Side Pressure (Fig 5, Fig 6)

The relationship between the side pad pressure and chipbreaker is factory pre-set but may, if required, be adjusted by slackening off lock nut (7) and turning stop screw (8) to adjust chipbreaker arm.
The tension on the chipbreaker arm may be varied by adjusting the screw (9) on the spring loaded standard version or by adjusting the pressure regulator for the chipbreaker arm on the pneumatic option.

(1) Set up as follows:

a. Isolate power at mains or at master stop.

b. Remove dust/jointer hood (4)

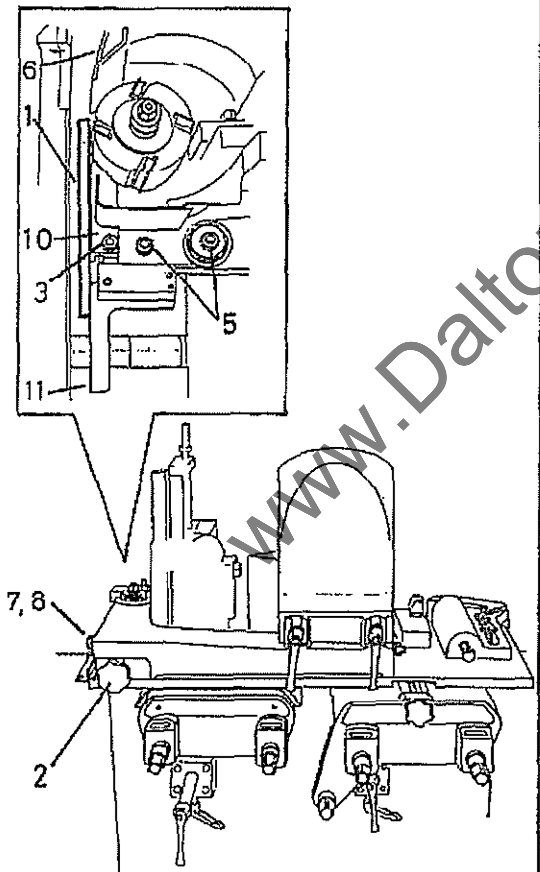

FIG 5 NEAR SIDE HEAD - SIDE PRESSURE AND CHIPBREAKER

c. Slacken off the two locking nuts (5)

d. With a straightedge (1) placed along the side pad pressure (10) and side guide (11) after the near side head, position the whole radial chipbreaker unit by turning the hand wheel (2) such that the cutterblades just touch the straightedge. With this set the chipbreaker should be approximately 2mm nearer the fence than the side guide.

2) Tighten up locking nuts (5)

3) Slacken off the side pad pressure locking nut (3) and reposition the pad pressure laterally so the nose is approximately 5mm from the cutterblock. When set tighten nut (3)

4) Loosen the two nuts (12) holding the chipbreaker (6) and reset this so that the nose is approximately 20mm from the cutterblock.

5) Tighten up nuts (12)

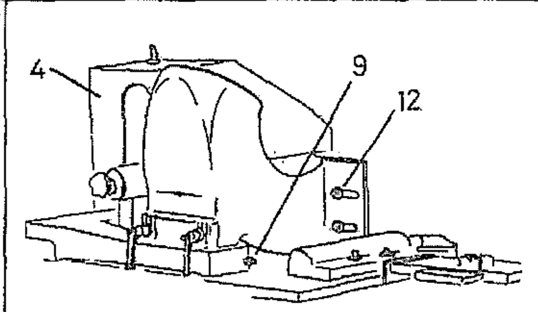

FIG 6 NEAR SIDE HEAD CHIPBREAKER ADJUSTMENT

Side Pressure Opposite Fence Side Head (Fig 7)

The side pressure although independently adjustable is mounted to the near side head chipbreaker carrier and thus once set maintains its relationship to the near side head. Adjust the side pressure to exert a moderate force on the timber as follows:-

1) Isolate power at mains or at master stop

2) Slacken off the two locking nuts (2)

3) Using a rule or timber of the correct width position side pressure (1)

4) Retighten nuts (2)

5) The tension on the skid may be varied by adjusting screw (3) clockwise to stiffen the skid movement on the spring version or by adjusting the air pressure regulator on the pneumatic optional version.

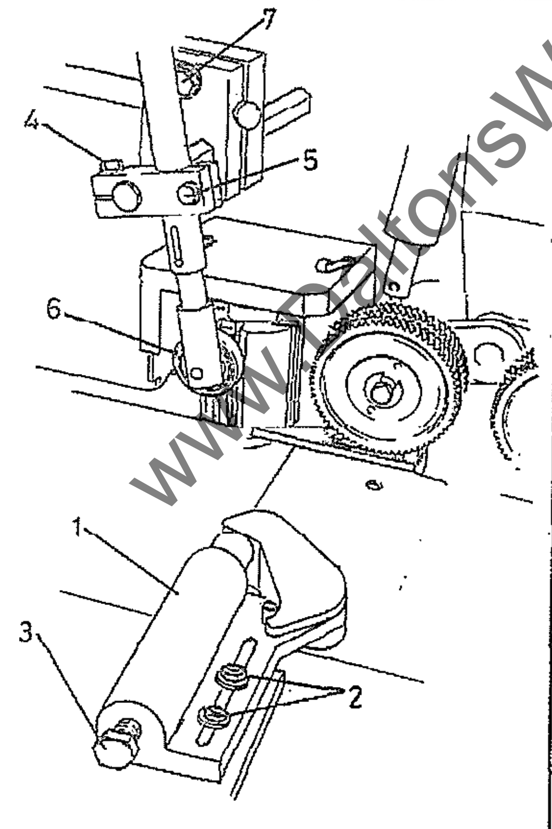

FIG 7 TOP AND SIDE PRESSURES

Top Roller Pressure - Fence Side Head (Fig 7)

1) Isolate power at mains or at master stop

2) Slacken screw (7) to position top roller pressure unit laterally along the bed. Retighten screw (7) when set.

3) Slacken screws (4 and 5) to adjust the roller pressure (6) to suit timber width and thickness. Refasten when set.

Adjustment to Top and Bottom Through Feed Rolls

For information relating to adjustment maintenance and parts refer to chapter - **Driven Bed Rolls and Top Through Rolls.**

MOUNTING THE CUTTERBLOCKS

General

The XJS 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:

Near Side Vertical spindle - left 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 of 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 a 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 on Fence and Near Side Heads (Fig 1)

The method of changing cutterblocks depends on the type fitted.

1) Isolate power at mains or at master stop

2) Remove covers, guards and extraction ducts as required to allow easy unimpeded access to cutterblock

3) Remove cutterblocks as follow taking suitable care when handling:-

Plain Bore Type

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

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

c. 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 Type

a. Release locking screw on safety collar (fig 2) and remove from spindle.

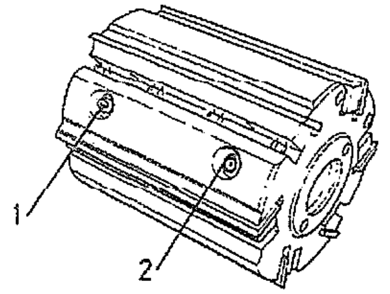

FIG 1 HYDROGRIP CUTTERBLOCK

b. 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.

c. Slide the cutterblock from the spindle. 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.

4) To replace both types of cutterblock:

a. Carefully clean spindles, cutterblocks, spacers and collars before fitting new cutterblocks.

b. 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 1).

c. Fit safety collar (see fig 2) and tighten securing screw.

d. On plain bore cutterblocks. Tighten the block to the spindle with the spanner/s provided.

e. Turn the spindle slowly to ensure the cutterblock is free and replace covers, guards, extraction ducts etc.

f. 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.

Safety Collars (fig 2)

Fitting procedure:

1) *Threaded collar*

a. Mount the cutterblock onto the machine spindle. Make sure the cutterblock fits up to the shoulder on the spindle.

b. Pressurise cutterblock to the correct working pressure.

c. Unscrew the pins in the threaded safety collar to the fullest extent, using the knurled heads.

d. Screw the collar onto the spindle, finger tight, against the end face of the cutterblock.

e. 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.

f. When in line, screw the pins into position, locating into the holes of the cutterblock.

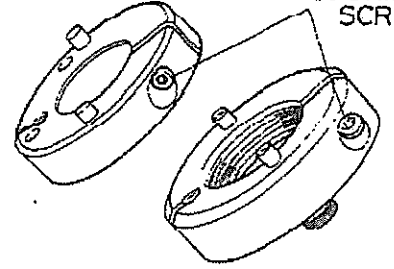

FIG 2 SAFETY COLLARS

g. Tighten the capscrew in the collar, using an Allen Key. This causes the collar to grip the threads on the spindle.

h. The collar will now maintain the drive to the cutterblock in the event of depressurisation.

i. To release; reverse the procedure.

2) Plain collar

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

b. Slide the collar with its pins facing the cutterblock along the machine spindle up to the cutterblock. Locate the pins in to the corresponding holes in the block.

c. Tighten up the cap screw in the collar, using an Allen Key. This causes the collar to grip the spindle.

d. The collar will now maintain the drive to the cutterblock in the event of depressurisation.

e. To release; reverse the procedure.

MAINTENANCE

Routine Maintenance

Before proceeding with any maintenance ensure power is isolated at mains or at master stop.

Weekly (Fig 1)

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. Ensure sawdust build-up at rear of machine is clear of motors and belts.

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 over-lubricate.

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

The Side Head Slideways should be greased weekly using Wadkin grade L6 (see **Approved Lubricants**). Grease nipples for the slide way are located underneath the Near Side Head chipbreaker carrier plate. After lubrication the Heads should be adjusted to their extremes to evenly distribute the grease and prevent sawdust/resin build-up on the slideway.

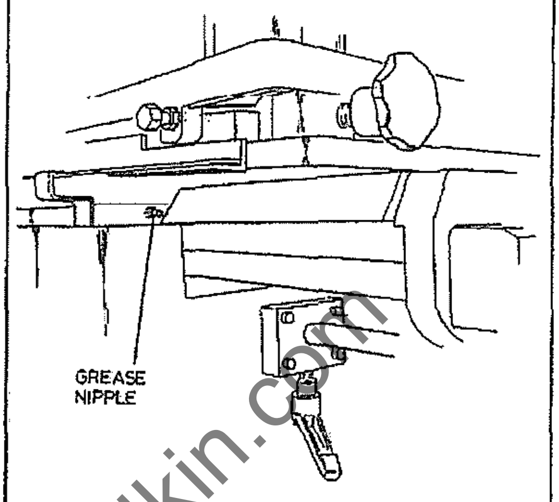

FIG 1 SIDE HEAD LUBRICATION

Three Monthly (Fig 2)

Electric drive motors have sealed for life bearings and are maintenance free. However the fan cowls should be removed at intervals and the fans checked for damage, check for excessive end float, signs of overheating etc. If a cowl itself is damaged it should be replaced. Check tension and condition of drive belts. The belts should be capable of being depressed approximately 1 1/2 to 2cm per metre of span by application of average thumb pressure of 2.2 - 3.2 kgf (5-7 bf) If necessary retension (see vee **Belt Drive Tensioning**). Unscrew the two nuts (1) retaining the cover (2) over the bevel gears for the motor rise and fall(near the side head motors). Clean and regrease using Wadkin grade L6. Replace and secure cover.

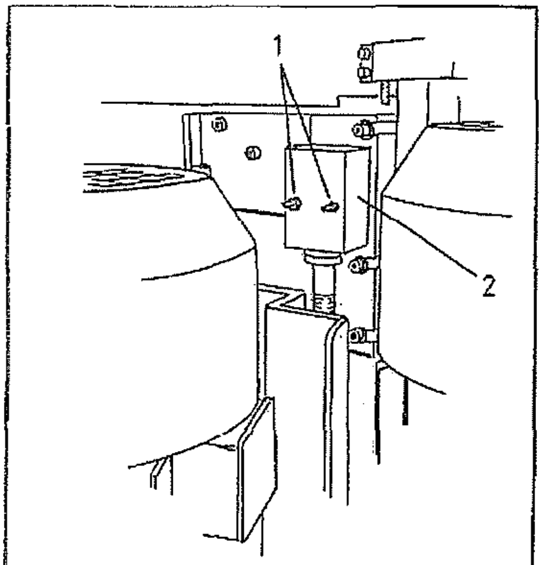

FIG 2 BEVEL GEAR LUBRICATION

Vee Belt Drive Tensioning (Fig 3)

Both fence and side head motors are mounted in the same way and adjustment to each is similar.

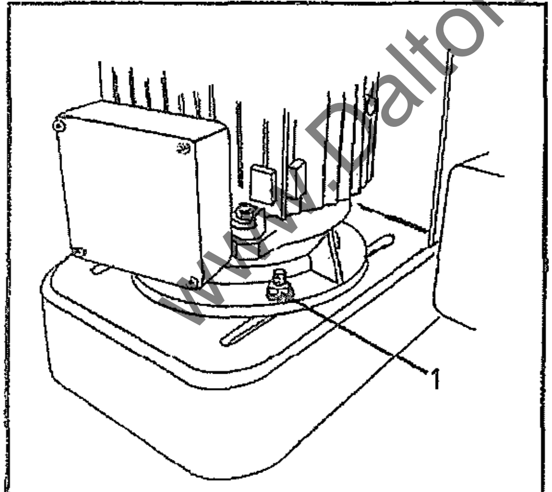

FIG 3 DRIVE BELT TENSIONING

1) Slacken off the four motor clamping bolts (1)

2) Tension the belts using an outward force on the motor

3) Tighten motor clamping bolts

Replacing Vee Belts (Fig 3)

Drive belts must be replaced as a <u>set</u> to obtain correct drive performance.

1) Relieve tension on the drive belts by slackening off the four bolts (1)

2) Slide the motor towards machine until belts may be removed

3) Fit new belts (check size, type and reference)

4) Retension and secure bolts.

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT :- When ordering spares always quote model and machine number

STAGGERED SIDE HEAD MODULE

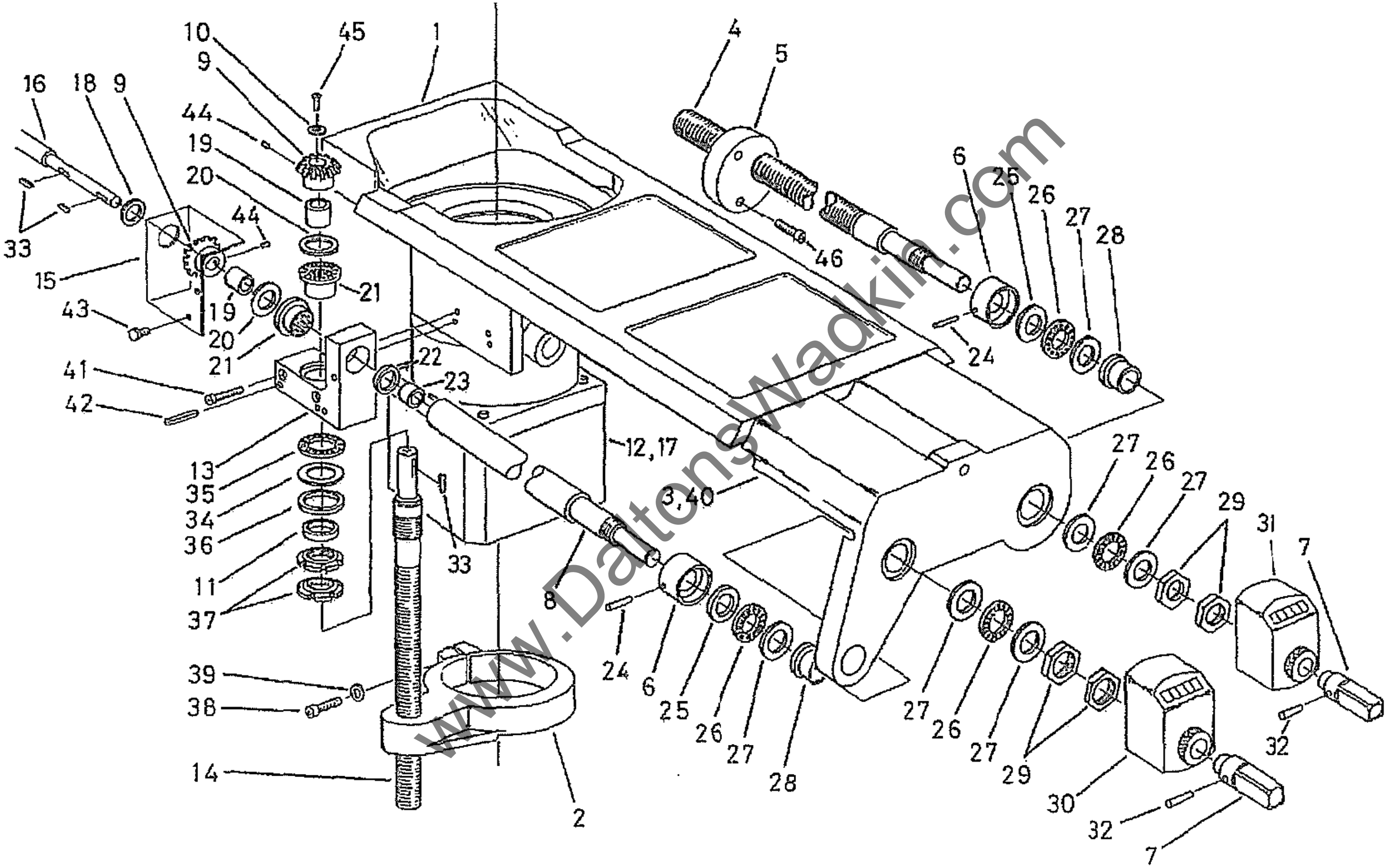

FIG 1 FENCE SIDE HEAD CARRIAGE ADJUSTMENTS

7-12

1. FENCE SIDE HEAD CARRIAGE ADJUSTMENTS

Ref No.	Description	No. Off
1.	Fence side head carriage 105mm dia. barrel	1
2.	Adjusting nut for spindle barrel	1
3.	Carriage extension	1
4.	Horizontal adjustment screw	1
5.	Nut for horizontal adjustment screw	1
6.	Collar	2
7.	Square end shaft extension	2
8.	Horizontal adjustment shaft for spindle rise and fall	1
9.	Bevel gear	2
10.	Special washer	1
11.	Spacer	1
12.	Carriage extension	1
13.	Bevel gear housing	1
14.	Adjusting screw for spindle rise and fall	1
15.	Bevel gear housing cover	1
16.	Extension shaft for horizontal rise and fall	1
17.	Hexagon socket capscrew M8 x 30mm long	4
18.	Grommet to suit 25mm hole, 20mm shaft	1
19.	'Nadella' bearing sleeve IM 15 x 20 x 20	2
20.	'Nadella' thrust plate CP 32035	2
21.	'Nadella' bearing RAX 720	2
22.	'Nadella' seal ET 2026	1
23.	'Nadella' bearing sleeve IM 15 x 20 x 16.4	1
24.	Taper pin No3	2
25.	'INA' Shaft washer WS 81104	2
26.	'INA' Thrust bearing AXK 2035	6
27.	'INA' Thrust washer AS 2035	6
28.	Bronze flanged bush 26mm O/D, 20mm I/D, 20mm long	2
29.	Locking nut M20 x 1.5p	4
30.	'Siko' dial indicator 0902 E (4mm)	1
31.	'Siko' dial indicator 0902 I (4mm)	1
32.	Taper pin No 0	2
33.	Key 5mm x 5mm x 2mm long	3
34.	'Nadella' thrust plate CP 32542	1
35.	'Nadella' thrust bearing AX 2542	1
36.	'Gaco' Lip seal SMIM 32427	1
37.	Notched nut M24 x 1.5p	2
38.	Hexagon socket capscrew M10 x 50mm long	1
39.	Plain washer M10	1
40.	Hexagon socket capscrew M10 x 35mm long	4
41.	Hexagon socket capscrew M8 x 45mm long	2

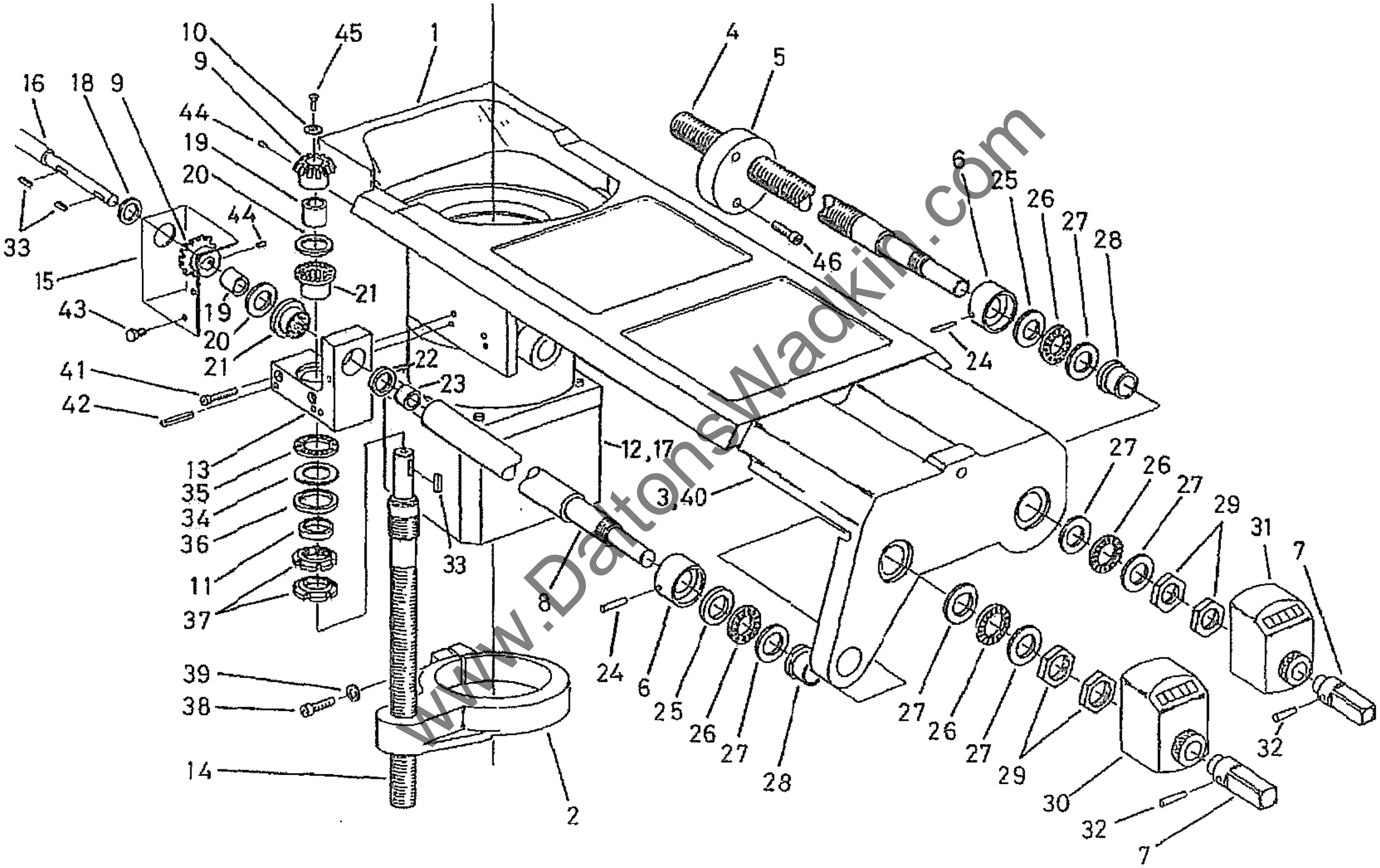

FIG 1 FENCE SIDE HEAD CARRIAGE ADJUSTMENTS

1. FENCE SIDE HEAD CARRIAGE ADJUSTMENTS (CONT....)

Ref No.	Description	No Off.
42.	Tension pin 6mm dia x 50mm long	2
43.	Hexagon set screw M6 x 10mm long	2
44.	Hexagon socket grubscrew M6 x 6mm long	2
45.	Hexagon socket countersunk screw M8 x 16mm long	1
46.	Hexagon socket capscrew M8 x 40mm long	2

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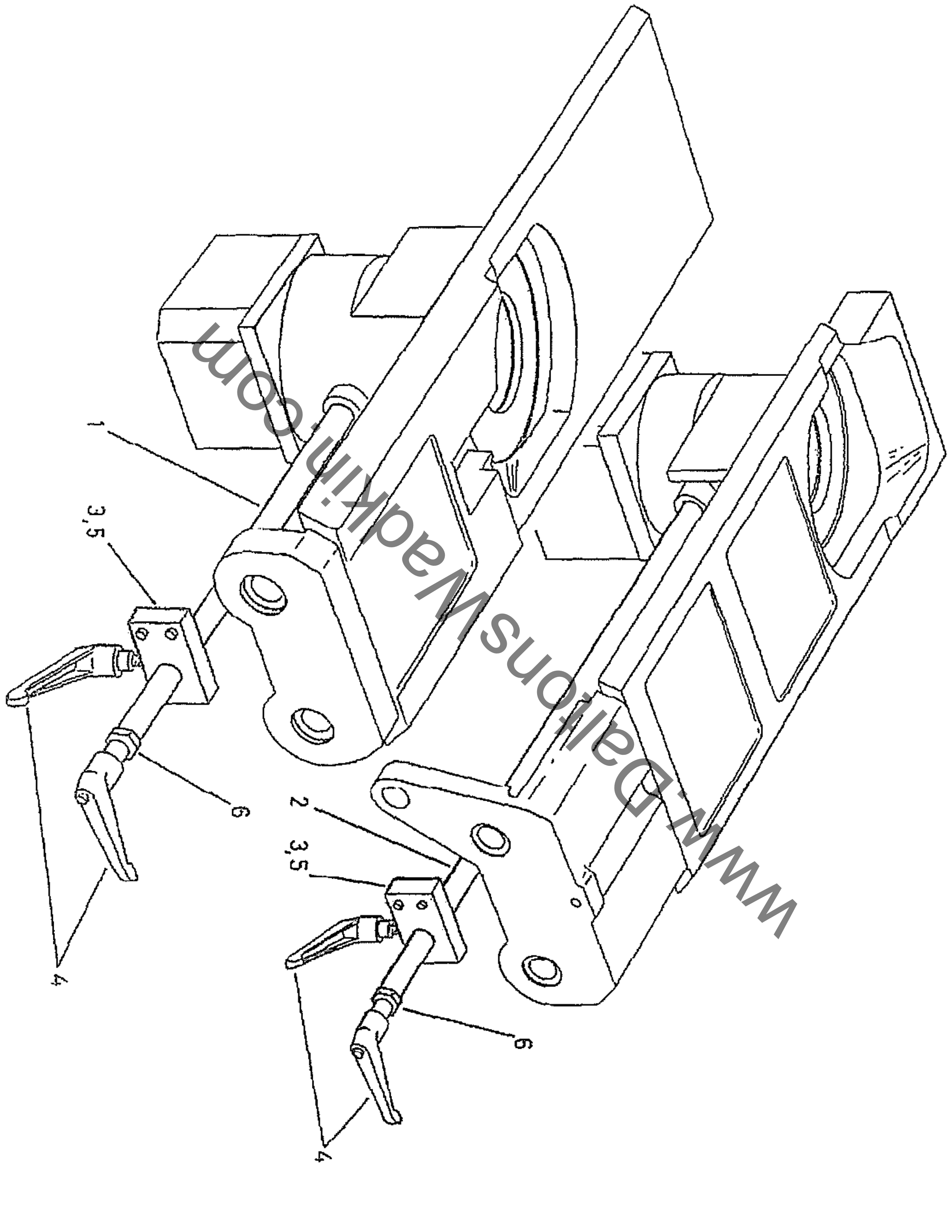

FIG 2 SPINDLE BARREL LOCKS FOR FENCE AND NEAR SIDE HEADS

2. SPINDLE BARREL LOCKS FOR FENCE AND NEAR SIDE HEADS

Ref No.	Description	No.off
1.	Shaft for near side head barrel lock	1
2.	Shaft for fence side head barrel lock	1
3.	Block for side head clamps	2
4.	Bristol lock handle (male) M12 x 25	4
5.	Hexagon socket capscrew M8 x 40mm long	4
6.	Hexagon lock nut M12	2

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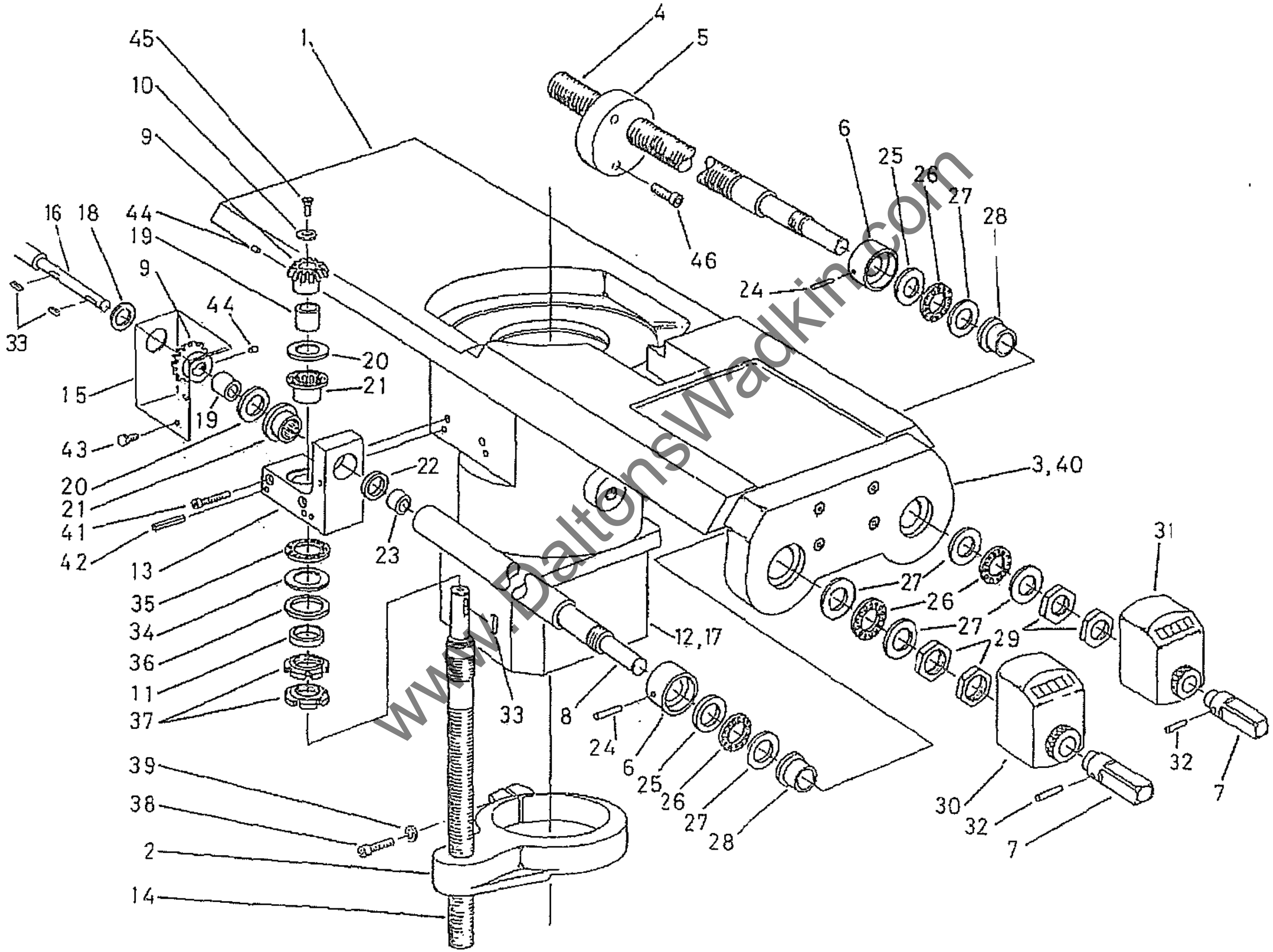

FIG 3 NEAR SIDE HEAD CARRIAGE ADJUSTMENTS

3. NEAR SIDE HEAD CARRIAGE ADJUSTMENTS

Ref No.	Description	No. off
1.	Near side head carriage 105mm dia barrel	1
2.	Adjusting nut for spindle barrel	1
3.	Carriage extension	1
4.	Horizontal adjustment screw	1
5.	Nut for horizontal adjustment screw	1
6.	Collar	2
7.	Square end shaft extension	2
8.	Horizontal adjustment shaft for spindle rise and fall	1
9.	Bevel gear	2
10.	Special washer	1
11.	Spacer	1
12.	Carriage extension	1
13.	Bevel gear housing	1
14.	Adjusting screw for spindle rise and fall	1
15.	Bevel gear housing cover	1
16.	Extension shaft for horizontal rise and fall	1
17.	Hexagon socket capscrew M8 x 30mm long	4
18.	Grommet to suit 25mm hole, 20mm shaft	1
19.	'Nadella' bearing sleeve IM 15 x 20 x 20	2
20.	'Nadella' thrust plate CP 32035	2
21.	'Nadella' bearing RAX 720	2
22.	'Nadella' seal ET 2026	1
23.	'Nadella' bearing sleeve IM 15 x 20 x 16.4	1
24.	Taper pin No 3	2
25.	'INA' shaft washer WS 81104	2
26.	'INA' thrust bearing AXK 2035	6
27.	'INA' thrust washer AS 2035	6
28.	Bronze flanged bush 26mm O/D, 20mm I/D, 20mm long	2
29.	Locking nut M20 x 15p	4
30.	'Siko' dial indicator 0902 E (4mm)	1
31.	'Siko' dial indicator 0902 I (4mm)	1
32.	Taper pin No 0	2
33.	Key 5mm x 5mm x 20mm long	3
34.	'Nadella' thrust plate CP 32542	1
35.	'Nadella' thrust bearing AX 2542	1
36.	'Gaco' lip seal SMIM 32427	1
37.	Notched nut M24 x 1.5p	2
38.	Hexagon socket capscrew M10 x 50mm long	1
39.	Plain washer M10	1
40.	Hexagon socket capscrew M10 x 45mm long	4
41.	Hexagon socket capscrew M8 x 45mm long	2
42.	Tension pin 6mm dia x 50mm long	2

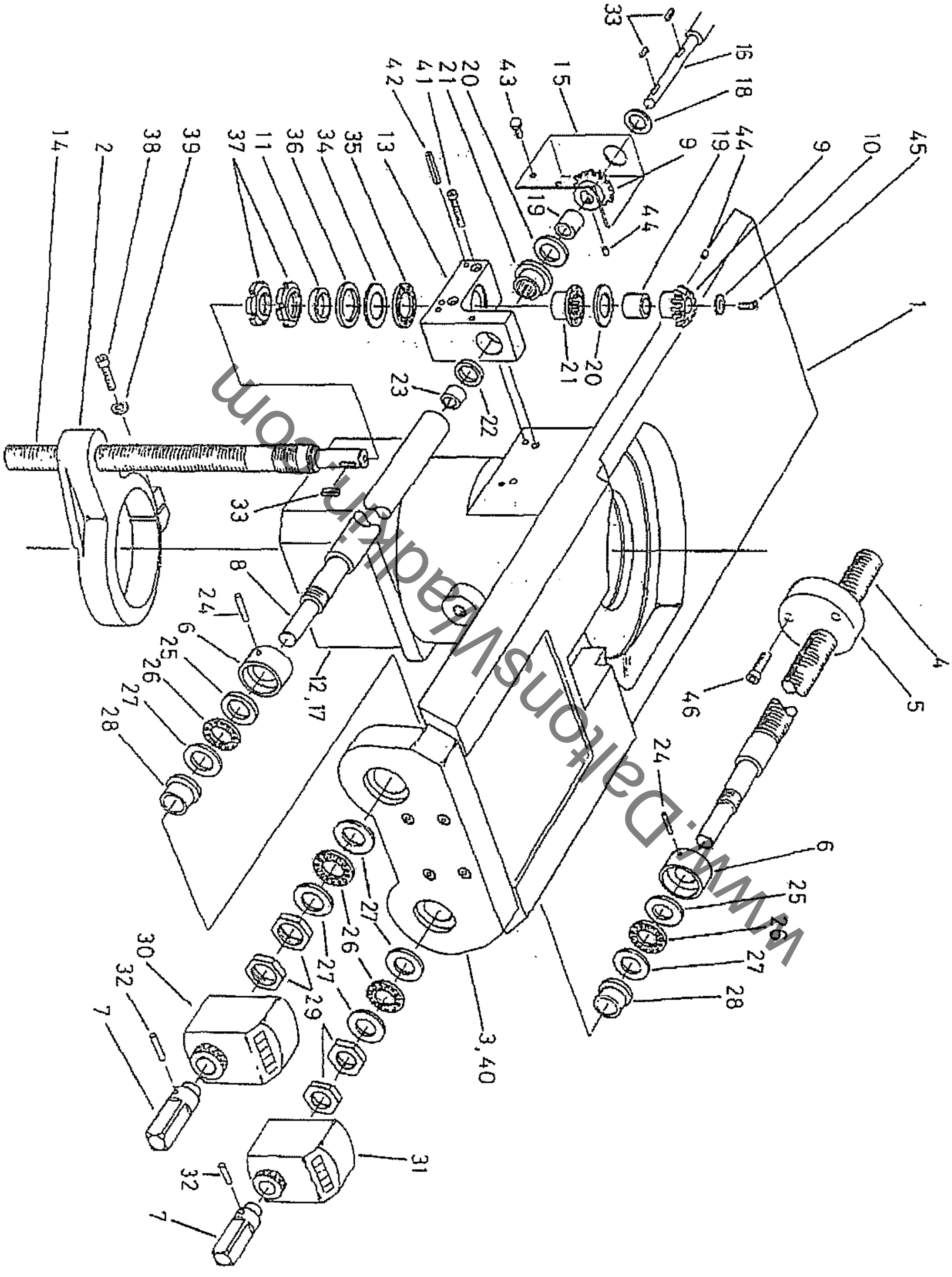

FIG 3 NEAR SIDE HEAD CARRIAGE ADJUSTMENTS

3. NEAR SIDE HEAD CARRIAGE ADJUSTMENTS (CONT...)

Ref No.	Description	No Off.
43.	Hexagon set screw M6 x 10mm long	2
44.	Hexagon socket grubscrew M6 x 6mm long	2
45.	Hexagon socket screw countersunk screw M8 x 16mm long	1
46.	Hexagon socket capscrew M8 x 40mm long	2

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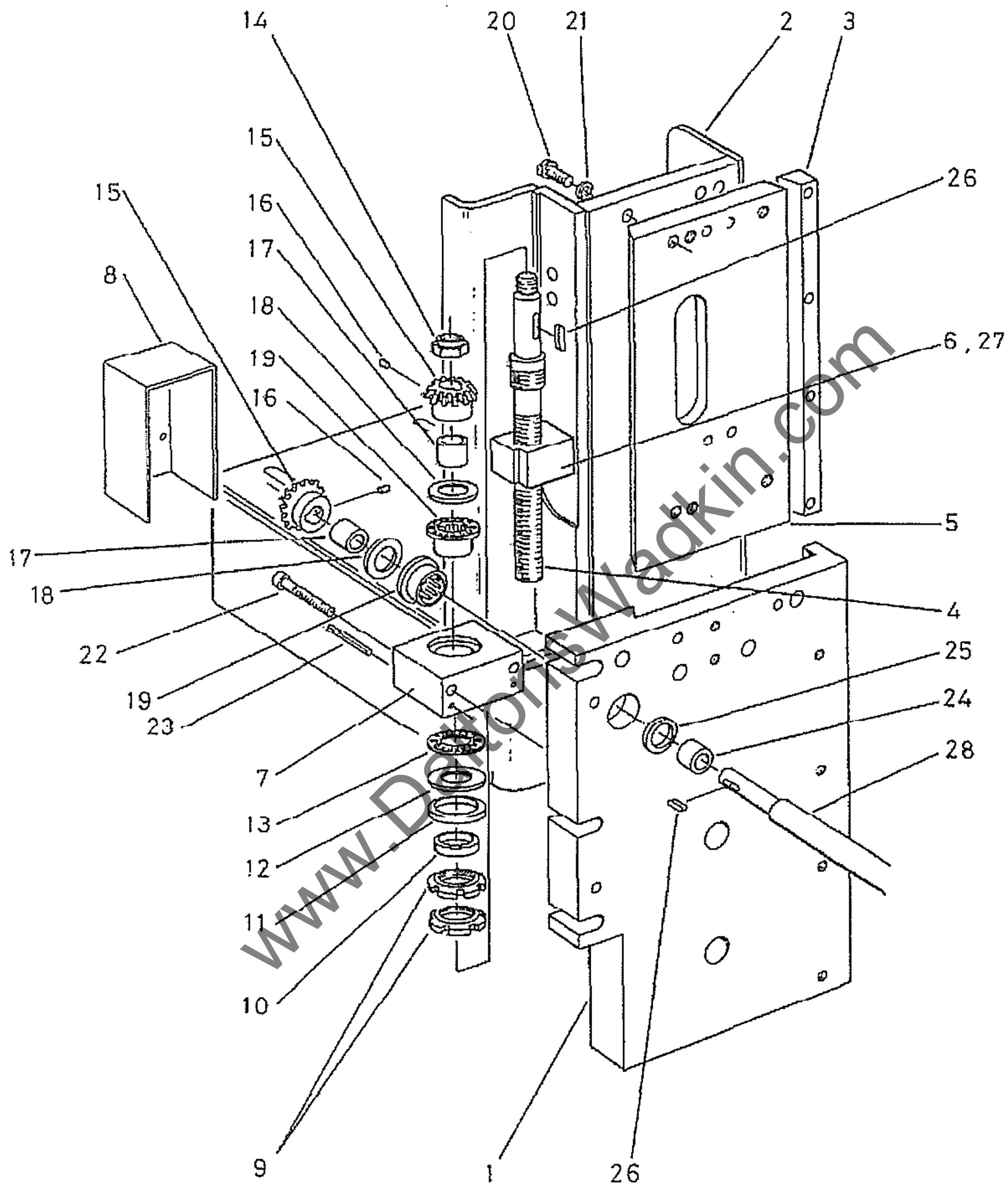

FIG 4 MOTOR RISE AND FALL FOR SIDE HEADS

4. MOTOR RISE AND FALL FOR SIDE HEADS

Ref No.	Description	No off.
1.	Slideway for side head motor mounting	1
2.	Bracket for mounting side head motors	1
3.	Wear strip	1
4.	Vertical adjustment screw	1
5.	Slide for mounting side head motor	1
6.	Nut for side head motor rise and fall	1
7.	Bearing block	1
8.	Cover for bevel gears	1
9.	Notched nut M24 x 1.5p	2
10.	Spacer	1
11.	'Gaco' lip seal SMIM 32427	1
12.	'Nadella' thrust plate CP 32542	1
13.	'Nadella' thrust bearing AX 2542	1
14.	Self locking nut M12	1
15.	Bevel gear	2
16.	Hexagon socket grubscrew M6 x 6mm long	2
17.	'Nadella' bearing sleeve IM 15 x 20 x 20	1
18.	'Nadella' thrust plate CP 32035	1
19.	'Nadella' bearing RAX 720	2
20.	Hexagon head setscrew M12 x 35mm long	4
21.	Spring washer M12	4
22.	Hexagon socket capscrew M8 x 55mm long	2
23.	Tension pin dia 6mm x 50mm	2
24.	'Nadella' bearing sleeve IM 15 x 20 x 20	2
25.	'Nadella' seal ET 2026	1
26.	Key 5mm x 5mm x 20mm long	1
27.	Hexagon socket capscrew M10 x 25mm long	2
28.	Extension shaft for horizontal rise and fall	1

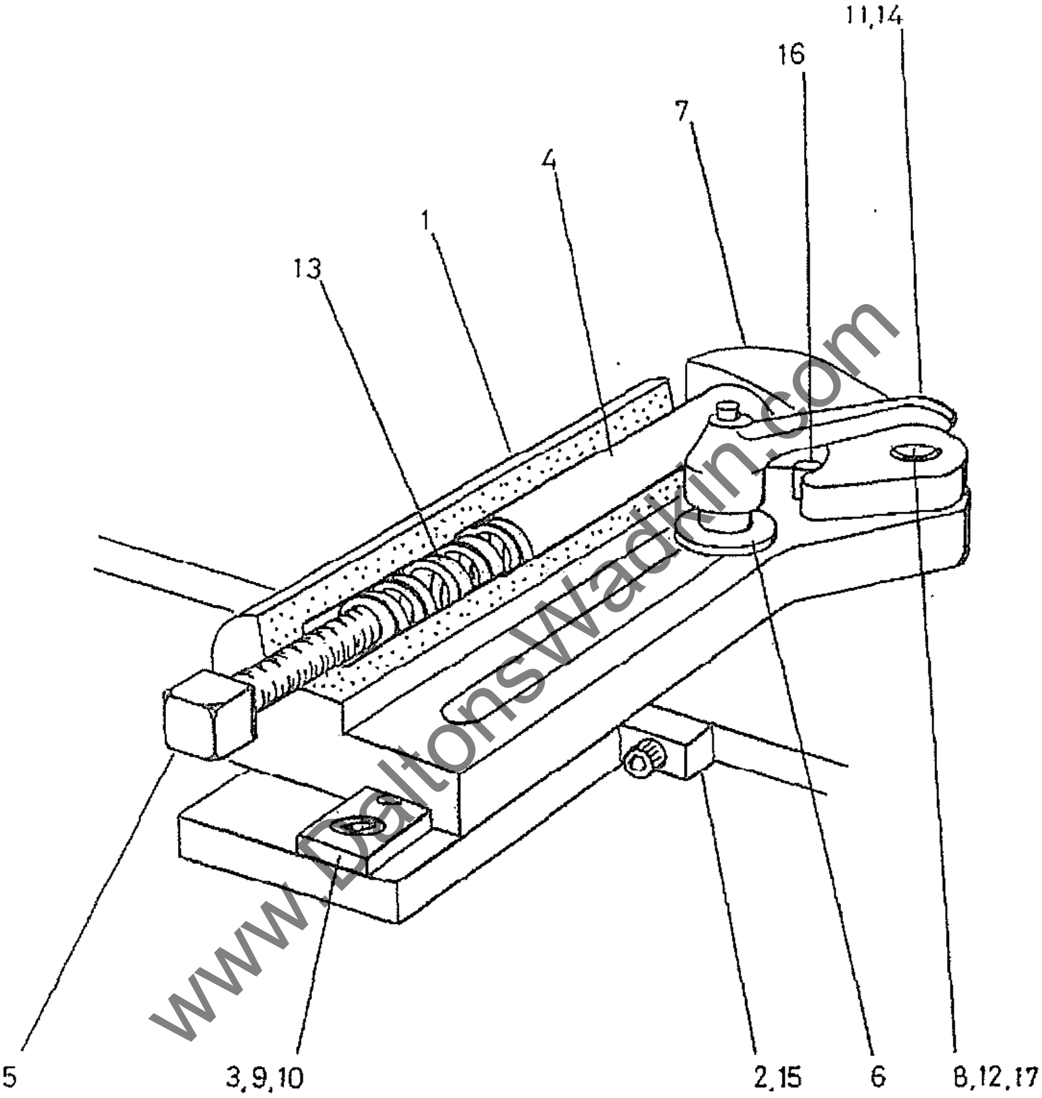

FIG 5 'SKID' TYPE SIDE PRESSURE – SPRING OPERATED

5. 'SKID' TYPE SIDE PRESSURE - SPRING OPERATED

Ref No.	Description	No Off.
1.	Bracket	1
2.	Support for bracket	1
3.	Tenon for support	1
4.	Plunger	1
5.	Tension screw	1
6.	Clamping washer	1
7.	Skid link	1
8.	Pivot link	1
9.	Tension pin dia. 8mm x 24mm long	2
10.	Hexagon socket counter sunk setscrew M8 x 16mm long	2
11.	Locking handle M12 (female)	1
12.	Bronze bush O/D 25mm x I/D 20mm x 15mm	1
13.	Compression spring 187.3mm free length, O/D 24.6mm, I/D 17.3mm, 31 coils	1
14.	Stud M12 x 50mm long	1
15.	Hexagon socket capscrew M10 x 30mm long	2
16.	Plain dowel dia. 12mm x 40mm long	1
17.	Taper pin	1

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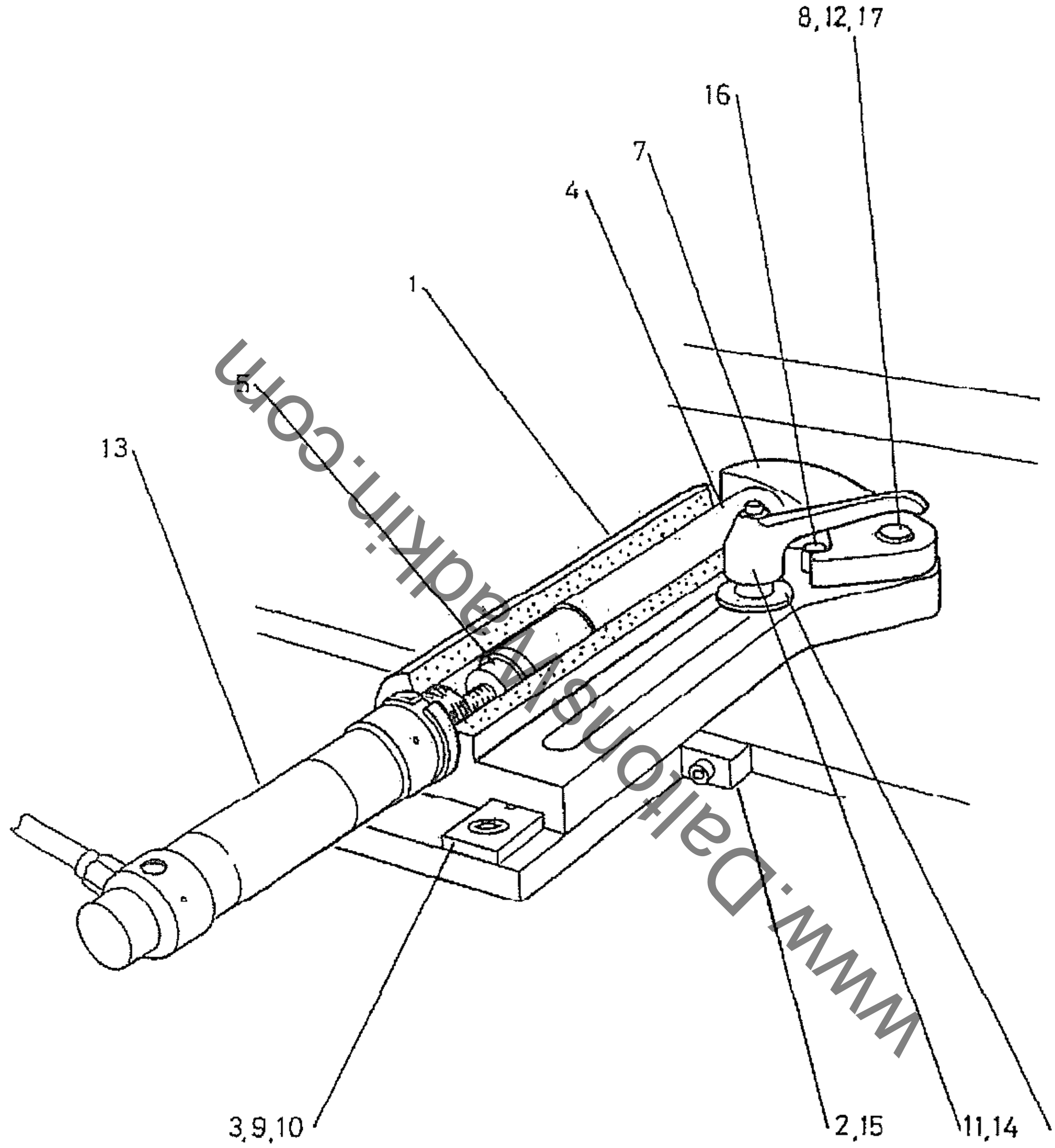

FIG 6 PNEUMATIC 'SKID' TYPE SIDE PRESSURE

6. PNEUMATIC 'SKID' TYPE SIDE PRESSURE

Ref No.	Description	No Off.
1.	Bracket	1
2.	Support for bracket	1
3.	Tenon for support	1
4.	Plunger	1
5.	Sleeve	1
6.	Clamping washer	1
7.	Skid link	1
8.	Pivot link	1
9.	Tension pin dia. 8mm x 24mm long	2
10.	Hexagon socket counter sunk setscrew M8 x 16mm long	2
11.	Locking handle M12 (female)	1
12.	Bronze bush O/D 25mm x I/D 20mm x 15mm	1
13.	'Festo' single acting cylinder ref ESW-32-5OP	1
14.	Stud M12 x 50mm long	1
15.	Hexagon socket capscrew M10 x 30mm long	2
16.	Plain dowel dia. 12mm x 40mm long	1
17.	Taper pin	1

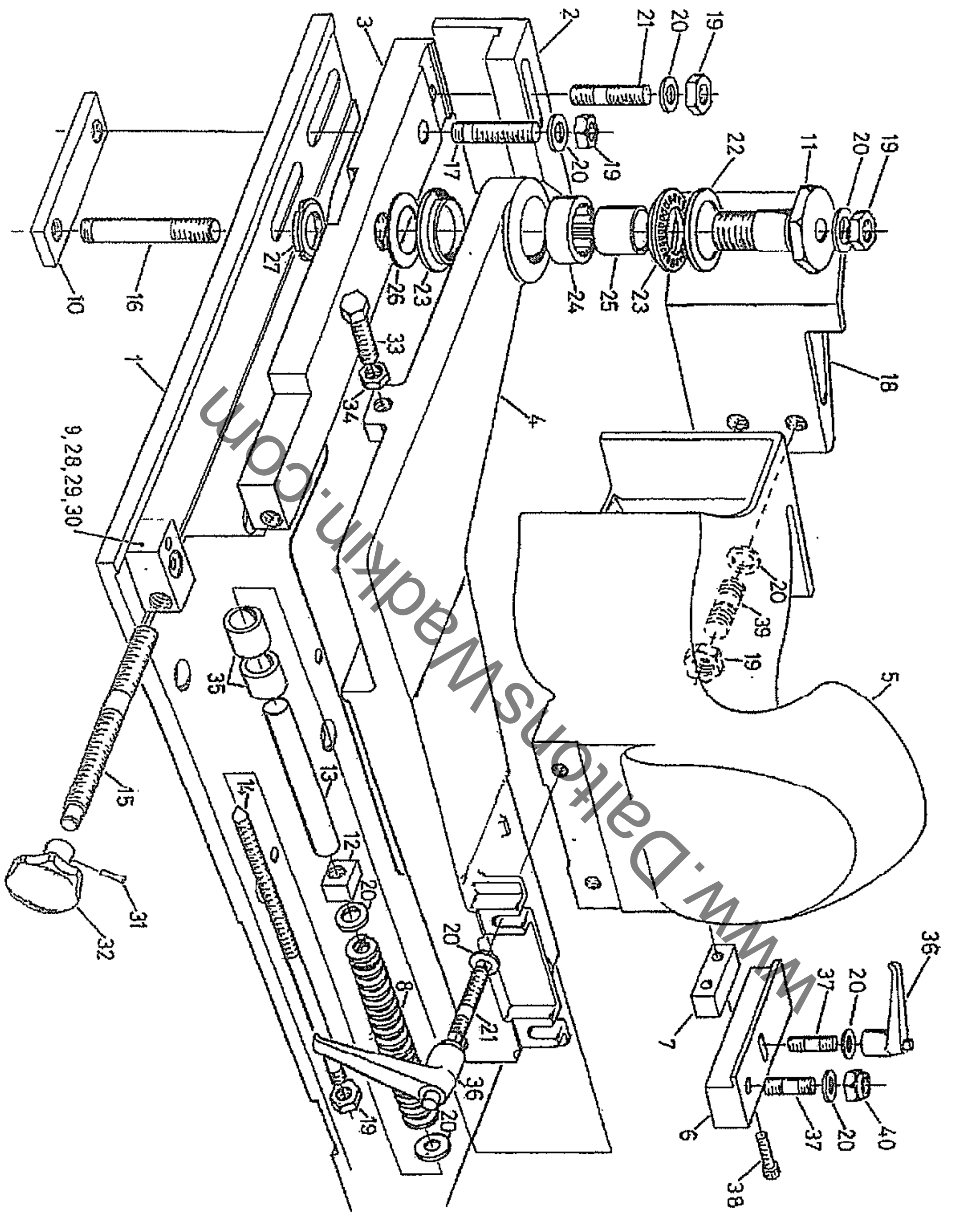

FIG 37. NEAR SIDE HEAD CHIPBREAKER MK III

37. NEAR SIDE HEAD CHIPBREAKER MK III

Ref No.	Description	No. off
1	Plate for mounting near side head chipbreaker	1
2	Pad for near side head side guide	1
3	Block for mounting near side head chipbreaker	1
4	Arm for near side head chipbreaker	1
5	Hood for near side head	1
6	Latch for near side head chipbreakers	1
7	Block for retaining near side head chipbreaker	1
8	Spring	1
9	Block for near side head adjustment	1
10	Clamp for near side head adjustment	1
11	Bolt for near side head chipbreaker pivot	1
12	Nut for near side head chipbreaker spring	1
13	Plunger	1
14	Guide for spring	1
15	Screw for side guide adjustment	1
16	Stud for pivot bolt	1
17	Stud for block	1
18	Shoe for chipbreaker	1
19	Nut M12	6
20	Plain washer M12	11
21	Stud M12 x 55mm long	3
22	'INA' Thrust washer LS-3552	1
23	'INA' Thrust bearing AXW - 30	2
24	'INA' Needle bearing HK 3020	1
25	'INA' Inner ring IR25 x 30 x 30	1
26	(INA) Thrust washer AS-3047	1
27	Notch nut	1
28	Tension pin dia 8mm x 40mm long	1
29	Hexagon socket cap screw M10 x 35mm long	1
30	'helicoil' insert M12	1
31	Taper pin No. 1	1
32	Handwheel	1
33	Hexagon head setscrew M12 x 35mm long	1
34	Locknut M12	1
35	Oilite bush	2
36	Locking handle	3
37	Stud m12 x 65mm long	2
38	Hexagon socket capscrew M12 x 30mm long	2
39	Stud M12 x 45mm long	2
40	Self locking nut M12	1

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SECTION 8 CLOSE COUPLED STAGGERED SIDE HEADS

General

This optional side head module has the heads staggered 80mm. The timber is driven through by two top through feed rolls opposite the near side head, followed by an opposed top/bottom roller combination. 'Siti' gearboxes at the rear, transfer the drive from the shafts to the feedrolls via a cardan prop shaft.

Side pressures, side guides and top roller pressures all help ensure timber is presented correctly to the cutterheads.

Fence Side Head (Fig 1)

1) Isolate power at mains or at master stop.
Ensure machine bed is clean.

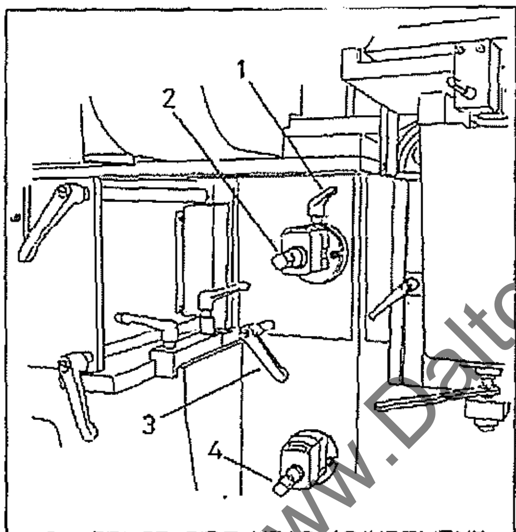

FIG 1 FENCE SIDE HEAD ADJUSTMENT

2) To adjust the spindle laterally proceed as follows:

a. Release the locking handle (1).

b. Rotate the handscrew (2) clockwise to advance the spindle towards the fence and anti-clockwise to retact the spindle away from the fence.

c. When set refasten locking handle (4).

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

a. Release the spindle barrel lock (3).

b. Turn the handscrew (4) clockwise to lower or anti-clockwise to raise the spindle.

c. When set refasten locking handles.

Near Side Head (Fig 2)

Because of the close distance (80mm) between the side head spindles movement of the near side head also moves the bedplate (between the side heads) at 45^{0} degrees.

1) Horizontal spindle adjustment.

To avoid any damage to the tooling, horizontal adjustments should be carried out in the following order:

Near side head carriage out - adjust spindle first then the side guide.

Near side head carriage in - adjust the side guide first then the spindle.

Refer to **Section 20** for side guide adjustment.

Ensure machine power is isolated before adjustments.

a. Slacken off the two locking handles (1).

b. With the machine bed clean place a block of known width or a piece of timber to a set size between fence and near side head cutter.

c. Rotate the handscrew (2) clockwise to move the spindle towards fence and anti-clockwise to retract it away from the fence.

Adjust the cutter until the knives are just touching the setting piece. Opening/removal of the lid on the near side head hood will facilitate viewing.

By noting the reading on the siko indicator (3) and adding or deducting the difference between the block width and the required cut, a new siko reading may be obtained.

d. remove the setting piece close/replace hood lid and adjust to new reading.

2) Vertical spindle adjustment.

a. Release the two spindle barrel locks (4).

b. Turn handscrew (5) clockwise to raise and anti-clockwise to lower spindle.

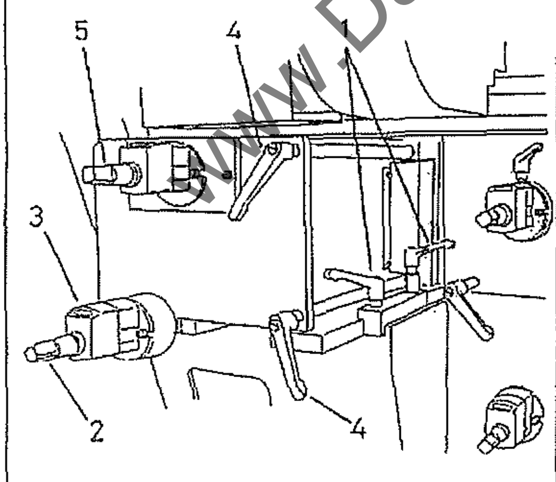

FIG 2 NEAR SIDE HEAD ADJUSTMENT

Note: Rotation of the handscrew also raises and lowers the drive motor.

c. When set to the desired height refasten barrel locks (4).

Adjustment to Top and Bottom Through Feed Rolls

For information relating to adjustment maintenance and parts refer to section '**Driven Bed Rolls and Top Through Rolls**'.

MOUNTING THE CUTTERBLOCKS

General

The XJS 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:

Near Side Vertical spindle - left 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 of 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 a 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 on Fence and Near Side Heads (Fig 1)

The method of changing cutterblocks depends on the type fitted.

1) Isolate power at mains or at master stop.

2) Remove covers, guards and extraction ducts as required to allow easy unimpeded access to cutterblock

3) Remove cutterblocks as follows taking suitable care when handling:-

Plain Bore Type

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

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

c. 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 Type

a. Release locking screw on safety collar (fig 2) and remove from spindle.

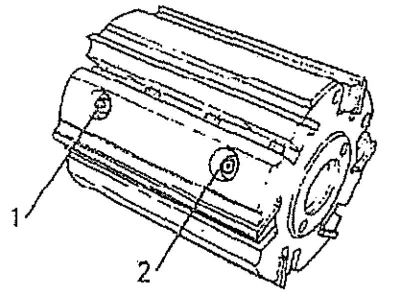

FIG 1 HYDROGRIP CUTTERBLOCK

b. 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.

c. Slide the cutterblock from the spindle. 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.

4) To replace both types of cutterblock:

a. Carefully clean spindles, cutterblocks, spacers and collars before fitting new cutterblocks.

b. 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 1).

c. Fit safety collar (see fig 2) and tighten securing screw.

d. On plain bore cutterblocks. Tighten the block to the spindle with the spanner/s provided.

e. Turn the spindle slowly to ensure the cutterblock is free and replace covers, guards, extraction ducts etc.

f. 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.

Safety Collars (fig 2)

Fitting procedure:

1) *Threaded collar*

a. Mount the cutterblock onto the machine spindle. Make sure the cutterblock fits up to the shoulder on the spindle.

b. Pressurise cutterblock to the correct working pressure.

c. Unscrew the pins in the threaded safety collar to the fullest extent, using the knurled heads.

d. Screw the collar onto the spindle, finger tight, against the end face of the cutterblock.

e. 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.

f. When in line, screw the pins into position, locating into the holes of the cutterblock.

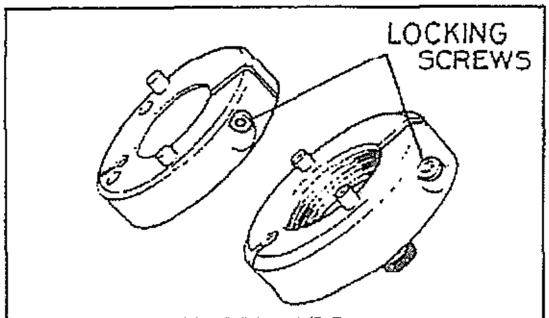

FIG 2 SAFETY COLLARS

g. Tighten the capscrew in the collar, using an Allen Key. This causes the collar to grip the threads on the spindle.

h. The collar will now maintain the drive to the cutterblock in the event of depressurisation.

i. To release; reverse the procedure.

2) Plain collar

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

b. Slide the collar with its pins facing the cutterblock along the machine spindle up to the cutterblock. Locate the pins in to the corresponding holes in the block.

c. Tighten up the cap screw in the collar, using an Allen Key. This causes the collar to grip the spindle.

d. The collar will now maintain the drive to the cutterblock in the event of depressurisation.

e. To release; reverse the procedure.

MAINTENANCE

Routine Maintenance

Before proceeding with any maintenance ensure power is isolated at mains or at master stop.

Weekly

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. Ensure sawdust build-up at rear of machine is clear of motors and belts.

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 over lubricate.

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

The Side Head Slideways should be greased weekly using Wadkin grade L6 (see **Approved Lubricants**). Grease nipples for the slideway are located underneath the Near Side Head chipbreaker carrier plate. After lubrication the Heads should be adjusted to their extremes to evenly distribute the grease and prevent sawdust/resin buid-up on the slideway.

Three Monthly

Electric drive motors have sealed for life bearings and are maintenance free. However the fan cowls should be removed at intervals and the fans checked for damage, check for excessive end float, signs of overheating etc. If a cowl itself is damaged it should be replaced. Check tension and condition of drive belts. The belts should be capable of being depressed approximately 1 1/2 to 2cm per metre of span by application of average thumb pressure of 2.2 - 3.2 kgf (5-7 bf) if necessary retension (see **Vee Belt Drive Tensioning**).

Vee Belt Drive Tensioning (Fig 1)

Both fence and side head motors are mounted in the same way and adjustment to each is similar.

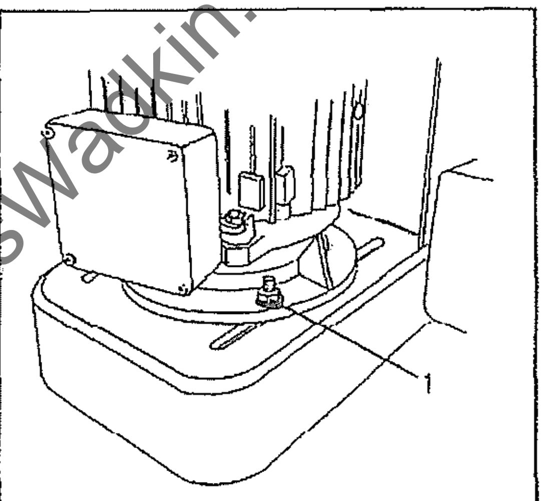

FIG 1 DRIVE BELT TENSIONING

1) Slacken off the four motor clamping bolts (1).

2) Tension the belts using an outward force on the motor.

3) Tighten motor clamping bolts.

Replacing Vee Belts (Fig 1)

Drive belts must be replaced as a set to obtain correct drive performance.

1) Relieve tension on the drive belts by slackening off the four bolts (1).

2) Slide the motor towards machine until belts may be removed.

3) Fit new belts (check size, type and reference).

4) Retension and secure bolts.

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: When ordering spares always quote model and machine number.

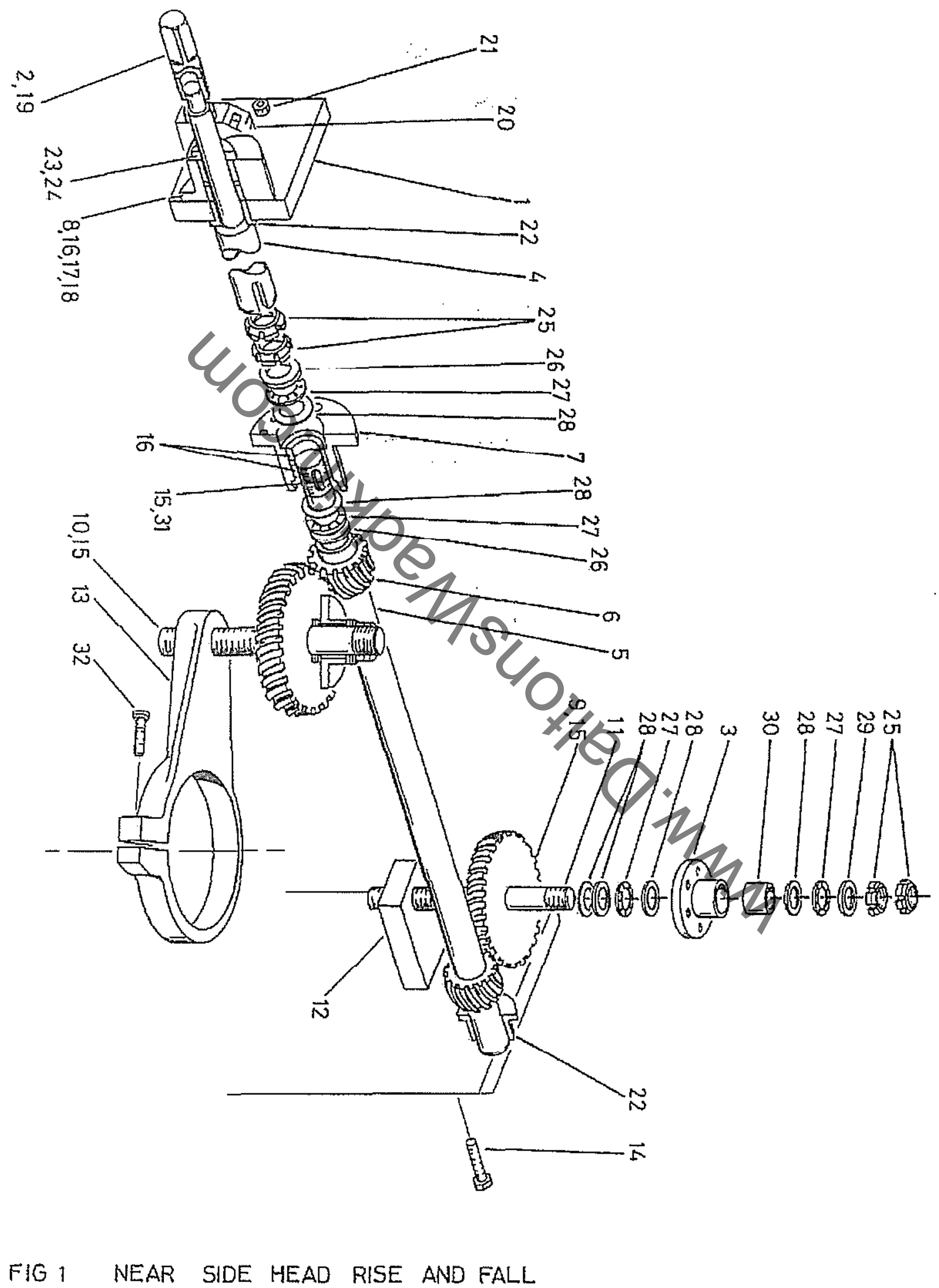

FIG 1 NEAR SIDE HEAD RISE AND FALL

1. NEAR SIDE HEAD RISE AND FALL

Ref No.	Description	No. Off
1.	Plate for shaft extension	1
2.	Square end shaft extension	1
3.	Housing for vertical shaft bearings	2
4.	Extension shaft	1
5.	Horizontal winding shaft	1
6.	Pinion	2
7.	Housing for horizontal shaft bearings	1
8.	Bracket for shaft bearing	1
9.	Gear	2
10.	Rise and fall leadscrew (left hand thread)	1
11.	Rise and fall leadscrew (right hand thread)	1
12.	Screw block for motor slide	1
13.	Adjusting screw clamp for spindle barrel	1
14.	Hexagon head setscrew M12 x 45mm long	2
15.	Key 6mm x 6mm x 20mm long	3
16.	Bronze bush 25mm O/D x 20mm I/D x 15mm long	4
17.	Hexagon socket capscrew M8 x 16mm long	2
18.	Plain washer M8	2
19.	Taper pin No.1	1
20.	'SIKO' digital indicator 0902E 4mm	1
21.	Hexagon socket capscrew M8 x 25mm long	2
22.	Bronze headed bush 26mm O/D x 20mm I/D x 15mm long	2
23.	Locking collar	1
24.	Hexagon socket grubscrew M6 x 6mm long	1
25.	Notch nut M20 x 1.5mm	6
26.	Shaft washer 'INA' WS81104	4
27.	Thrust bearing 'INA' AXK 2035	6
28.	Thrust washer 'INA' AS 2035	8
29.	Thrust washer 'INA' WS 81104	2
30.	Bronze bush 25mm O/D x 20mm I/D x 20mm long	2
31.	Hexagon socket capscrew M4 x 12mm long	1
32.	Hexagon head setscrew M10 x 55mm long	1

NOTE: Both leadscrew assemblies are identical apart from the 'Handed' Leadscrews

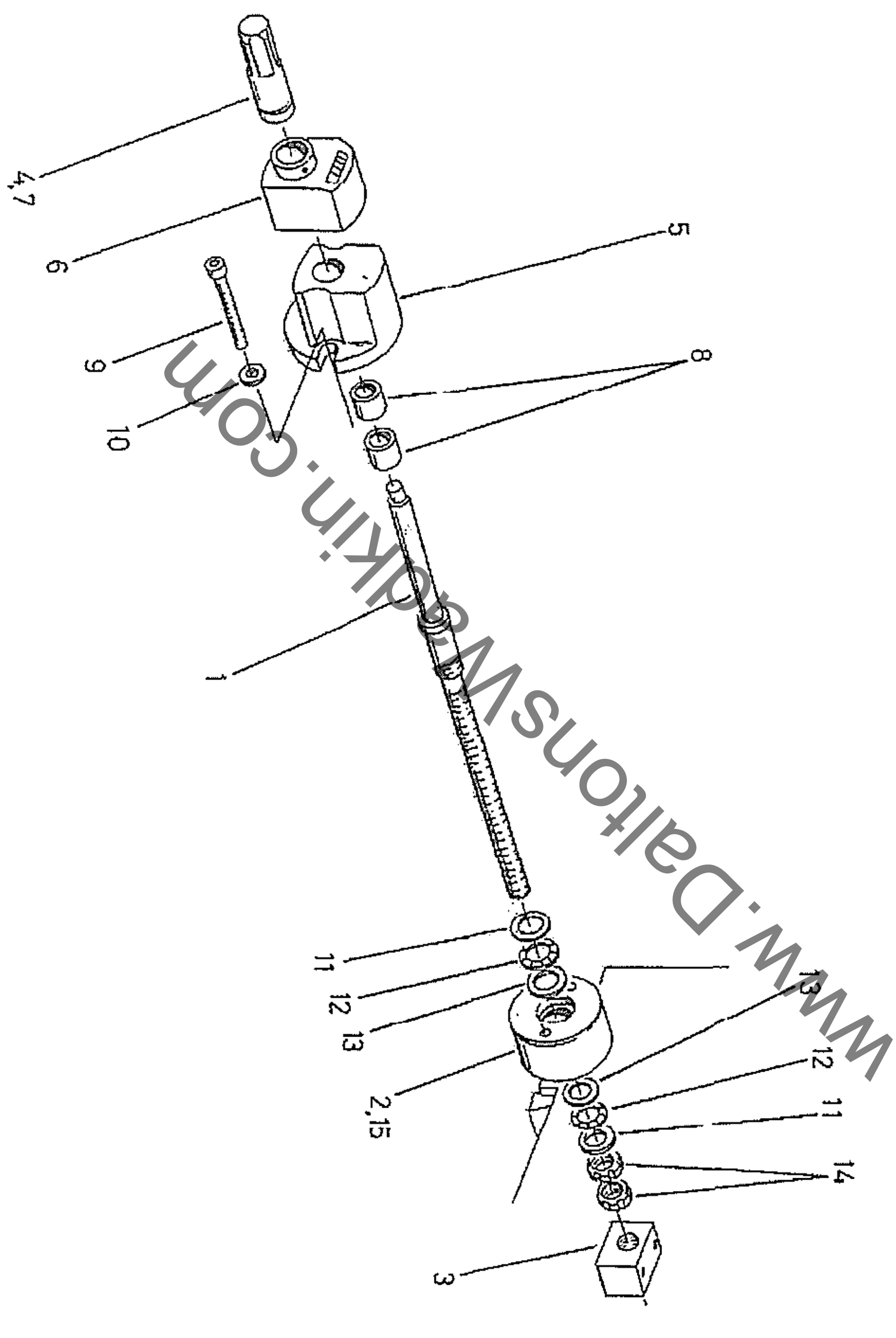

FIG 2 NEAR SIDE HEAD LATERAL ADJUSTMENT

2. NEAR SIDE HEAD LATERAL ADJUSTMENT

Ref No.	Description	No Off.
1.	Screw for cross traverse	1
2.	Housing for traverse screw bearings	1
3.	Nut traverse	1
4.	Shaft extension	1
5.	Bracket for shaft bearings	1
6.	'SIKO' digital indicator 0902 I 2mm	1
7.	Taper pin No.1	1
8.	Bronze bush 25mm O/D x 20mm I/D x 15mm long	2
9.	Hexagon socket capscrew M8 x 60mm long	2
10.	Plain washer M8	2
11.	Thrust washer 'INA' LS 2542	2
12.	Thrust bearing 'INA' AXK 2542	2
13.	Thrust washer 'INA' AS 2542	2
14.	Notch nut M24 x 1.5mm P.	2
15.	Bronze bush 30mm O/D x 25mm I/D x 20mm long	1

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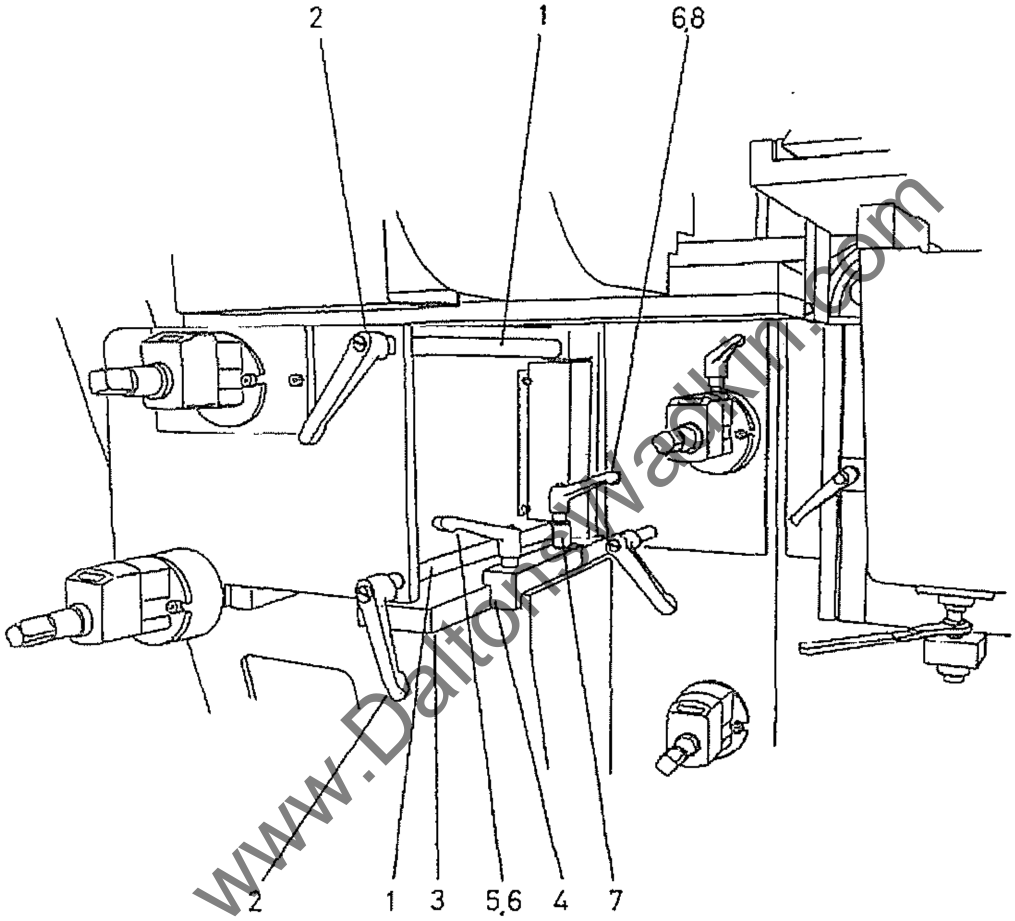

FIG 3 NEAR SIDE HEAD SPINDLE AND CARRIAGE LOCKS

3. NEAR SIDE HEAD SPINDLE AND CARRIAGE LOCKS

Ref No.	Description	No Off.
1.	Shaft for side head lock	2
2.	Handle (male) M12 x 25mm	2
3.	Slide plate	1
4.	Lock bar	1
5.	Stud M12 x 70mm long	2
6.	Kipp handle (female) M12	2
7.	Spacing collar 25mm O/D x 14mm I/D x 50mm long	1
8.	Stud M12 x 125mm long	1

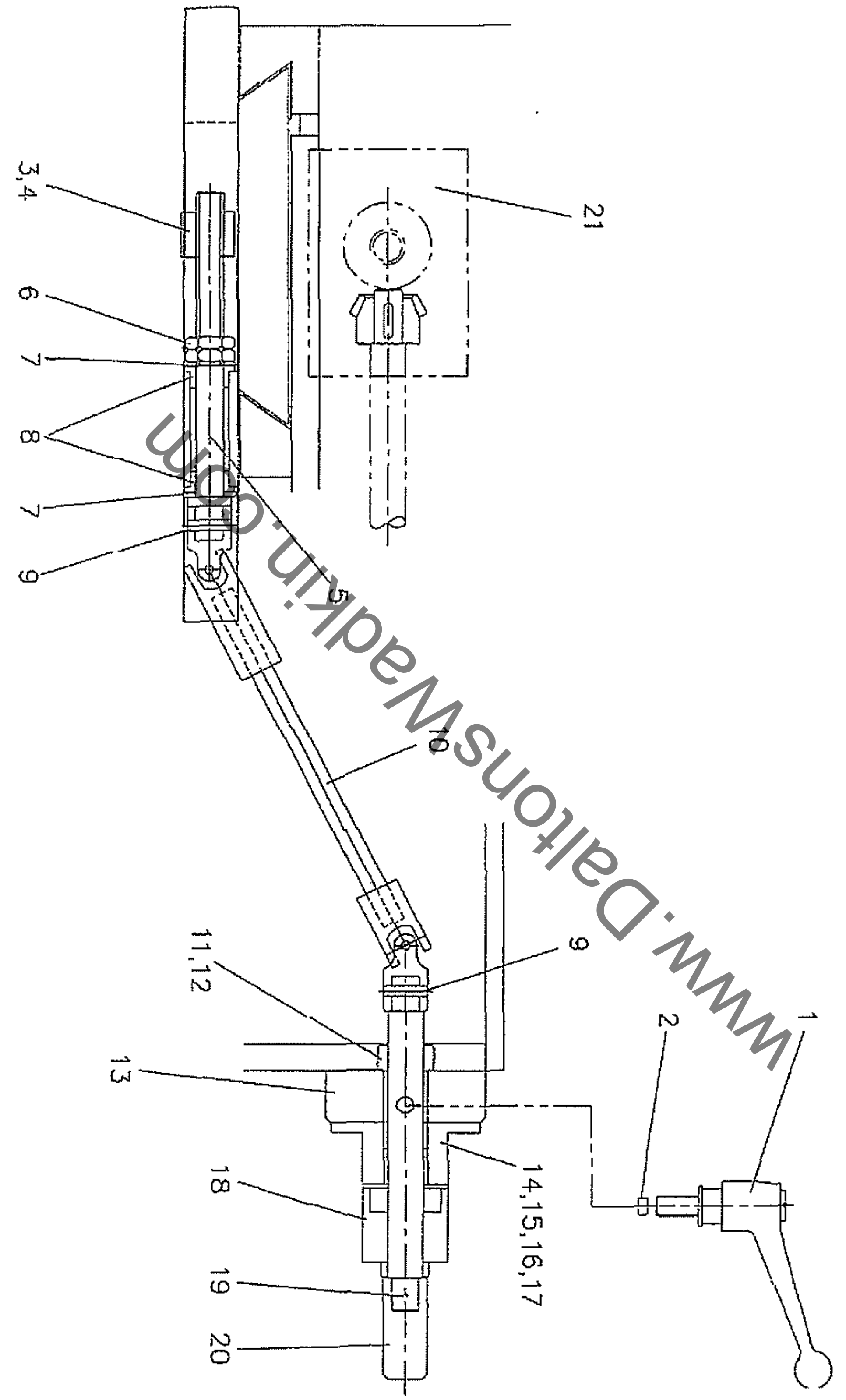

FIG 4 FENCE SIDE HEAD LATERAL ADJUSTMENT

4. FENCE SIDE HEAD LATERAL ADJUSTMENT

Ref No.	Description	No Off.
1.	Locking handle	1
2.	Brass pad	1
3.	Traverse nut	1
4.	Hexagon socket capscrew M8 x 35mm long	2
5.	Traverse screw	1
6.	Nut M16	2
7.	Washer M16	2
8.	Flanged bush 16mm I/D x 22mm O/D x 12mm long	2
9.	Tension pin dia. 6mm x 24mm long	2
10.	Universal coupling shaft	1
11.	Collar	1
12.	Hexagon socket grubscrew M6 x 6mm long	1
13.	Spacer	1
14.	Housing	1
15.	Bush 20mm I/D x 25mm O/D x 15mm long	2
16.	Hexagon socket capscrew M8 x 50mm long	2
17.	Washer M8	2
18.	'SIKO' indicator - 0902E 2mm	1
19.	Taper pin No.1	1
20.	Square end	1
21.	Rise and fall gearbox (Shown for reference)	

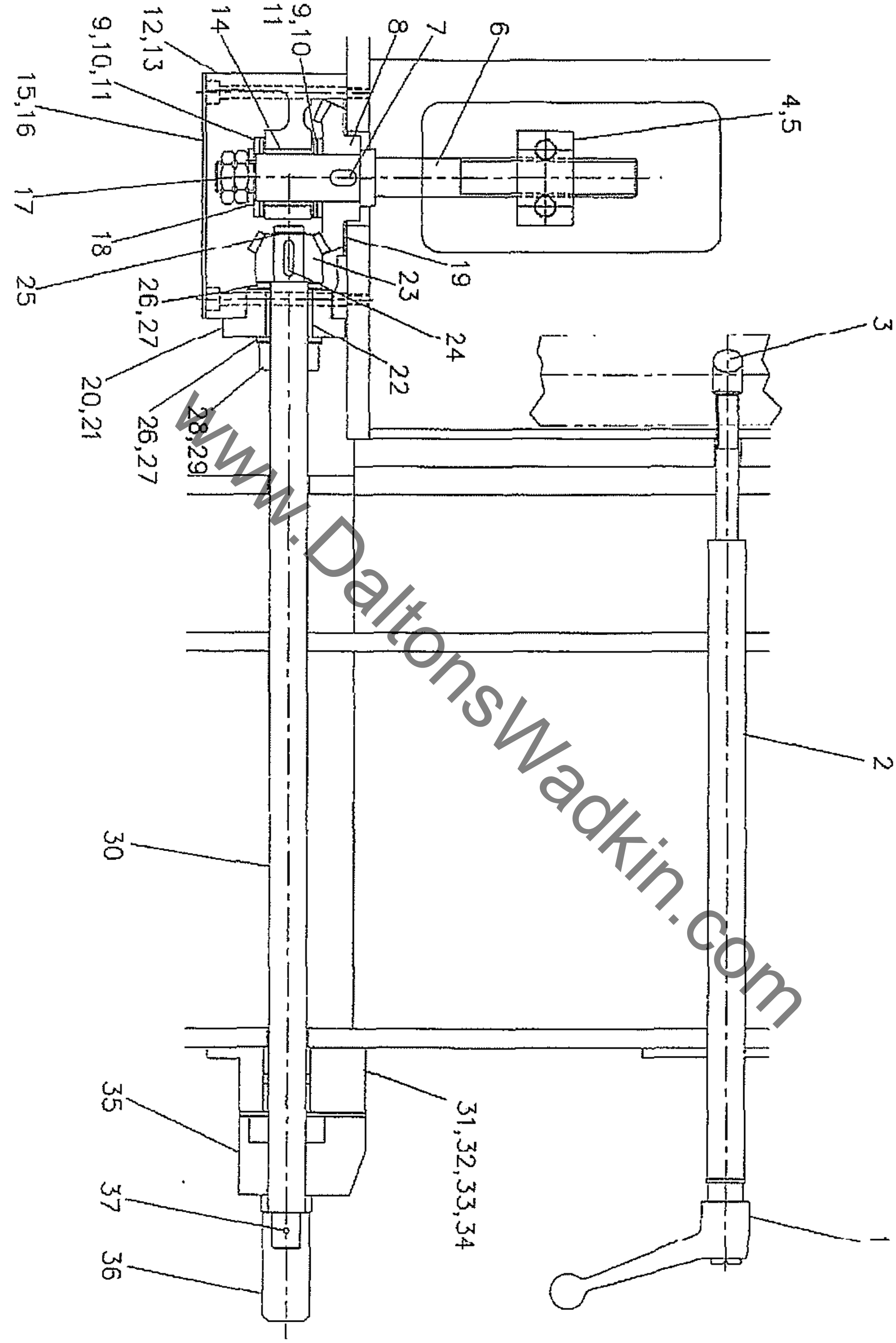

FIG 5 FENCE SIDE HEAD RISE AND FALL

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5. FENCE SIDE HEAD RISE AND FALL

Ref No.	Description	No Off.
1.	Locking handle	1
2.	Locking shaft	1
3.	Clamping pad	1
4.	Rise and fall nut	1
5.	Hexagon socket capscrew M12 x 35mm long	2
6.	Rise and fall screw	1
7.	Key 8mm x 7mm x 14mm long	1
8.	Bevel gear 32 teeth	1
9.	'INA' Thrust bearing AXK 2542	2
10.	'INA' Thrust washer AS 2542	2
11.	'INA' Thrust washer WS 81105	2
12.	Bevel gear box	1
13.	Hexagon socket capscrew M6 x 75mm long	4
14.	Bush 25mm I/D x 30mm O/D x 25mm long	1
15.	Cover	1
16.	Pan head screw M4 x 10mm long	3
17.	Locknut M16	2
18.	Washer M16	1
19.	Sealing ring	1
20.	End cap	1
21.	Hexagon socket capscrew M6 x 20mm long	3
22.	Bush 20mm I/D x 25mm O/D x 25mm long	1
23.	Bevel gear 16 teeth	1
24.	Key 5mm x 5mm x 20mm long	1
25.	Circlip - 16mm dia. external	1
26.	'INA' Thrust bearing AXK 2035	2
27.	'INA' Thrust washer AS 2035	4
28.	Collar	1
29.	Hexagon socket grubscrew M6 x 6mm long	1
30.	Shaft	1
31.	Housing	1
32.	Bush 20mm I/D x 25mm O/D x 15mm long	2
33.	Hexagon socket capscrew M8 x 20mm long	2
34.	Washer M8	2
35.	'SIKO' Indicator 0902 I 2mm	1
36.	Square end	1
37.	Taper pin No.1	1

SECTION 9 TOP HEAD MODULE

General (Fig 1)

The Top head cutterblock carrier has attached to it, a bank of three individual chipbreakers prior to the spindle and a pad pressure following the spindle.

An opposed top roller/bottom roller combination, driven at the rear of the module by 'Siti' gearboxes, trails the cutterblock.

A small amount of adjustment is catered for on the horizontal heads.

Note: The machine is factory set to give 12mm movement backwards from the datum face of the fence when it is set at zero.

If it should be necessary to obtain further lateral movement when at the maximum rearward position, it may be obtained by removing the pulley guard and releasing the belt tension. (Refer to Maintenance - **Vee Belt Drive Tensioning**). Move the belts onto the next vacant pulley groove to bring them back into line and then re-tension the belts.

Locking collars prevent the spindle movement exceeding the original factory set boundaries and therefore if the belts are repositioned, then the rear stop (1) must also be reset.

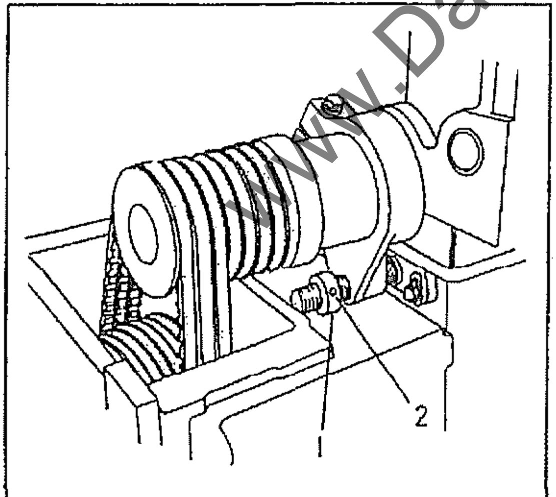

FIG 1 HORIZONTAL HEAD ADJUSTMENT

This may be done by slackening off the grubscrew (2), moving the collar back a further 12mm and then retightening the grubscrew (2).

Top Head Verical and Horizontal Adjustment (Fig 2, Fig 3)

Before making any horizontal adjustment ensure that the jointer is 'parked' clear (see **Jointer** chapter).

Horizontal Adjustment

1) Isolate power at master stop or mains.

2) Release the spindle barrel lock (2).

3) Adjust using the handscrew (1).

4) Tighten barrel lock (2).

Manual Vertical Adjustment - Top Head Only.

Note: The outboard bearing support is hydraulically locked into position and MUST be released before any vertical adjustment is made. The lock and unlock control buttons are found on the main control cabinet and on the infeed and outfeed sub control unit (6) depending on modular assembly.

1) Release hydraulic locks (7) by pressing button indicated thus ←||→ . Then isolate power supply at master stop or at mains.

2) Ensure bed is clean.

3) Remove jointer cover (3) by slackening off thumb screws (4) or remove blanking cover if no jointers are fitted. This allows easy access to cutter.

4) Place a datum block (5) of known thickness under the cutterblock.

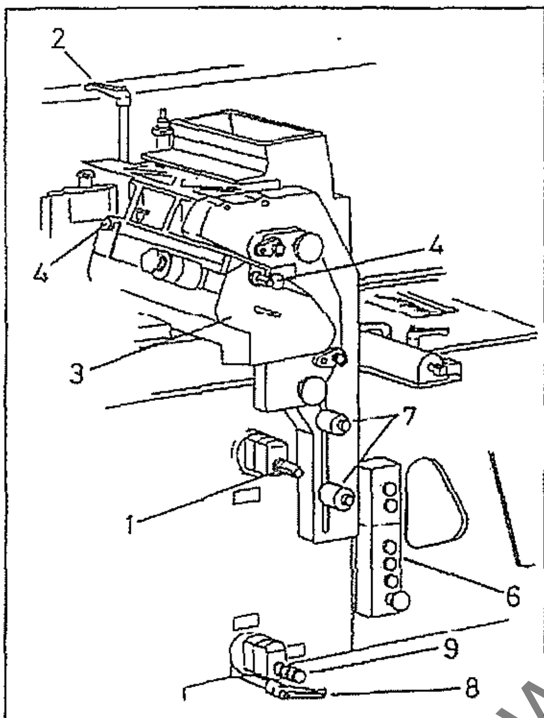

FIG 2 TOP HEAD SETTING

5) Rotate the hand screw (9) clockwise to lower the spindle or anti-clockwise to raise the spindle. The knives should just touch the block when the spindle is rotated slowly by hand via the outboard bearing.

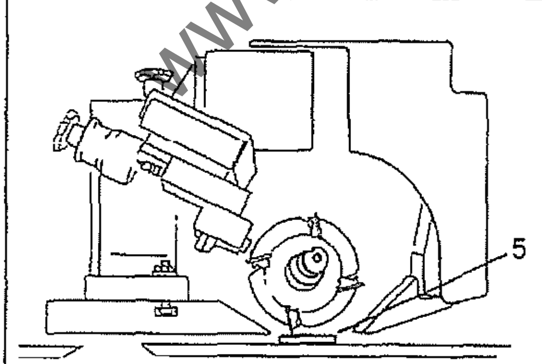

FIG 3 SETTING TOP HEAD TO DATUM BLOCK

6) When setting to a datum block check the digital readout. If necessary reset counter by loosening grubscrew in collar of the readout and then turning collar until the reading coincides to the thickness of the datum block. When set remove block.

7) Set head to desired position and replace cover (3).

8) Switch power on and engage hydraulic locks by pressing button indicated →|←.

Electrical Vertical Adjustment - Top Head and Beam

Note: The powered vertical adjustment of the beam is electrically interlocked with the Top head and cannot move until the hydraulic locks are disengaged.

1) Release outboard bearing support locks by pressing button marked thus ←||→ . The lock and unlock buttons are found on the main control cabinet or on the infeed sub control station.

2) Engage clutch lever (8). If the clutch does not readily engage, turn the handscrew (9), slightly to the left or right until it engages.

3) To raise the head/beam press the button marked ' ↑ '. The button with the downward pointing arrow moves the head/beam down. These buttons again are found on the main control cabinet or on the infeed sub station.

4) When in the required position re-engage locks by pressing button marked →|← . Disengage clutch.

Top Head Chipbreaker and Pad Pressure (Fig 4)

Ensure power is isolated from machine. The bed should be clean and the cuterblock already 'set up'. Place a straight edge on the table under the pad pressure, cutterblock and chipbreakers. When set all three should be in line with each other.

To Adjust Pad Pressure

1) Use adjusting screw (1) to raise and lower pad.

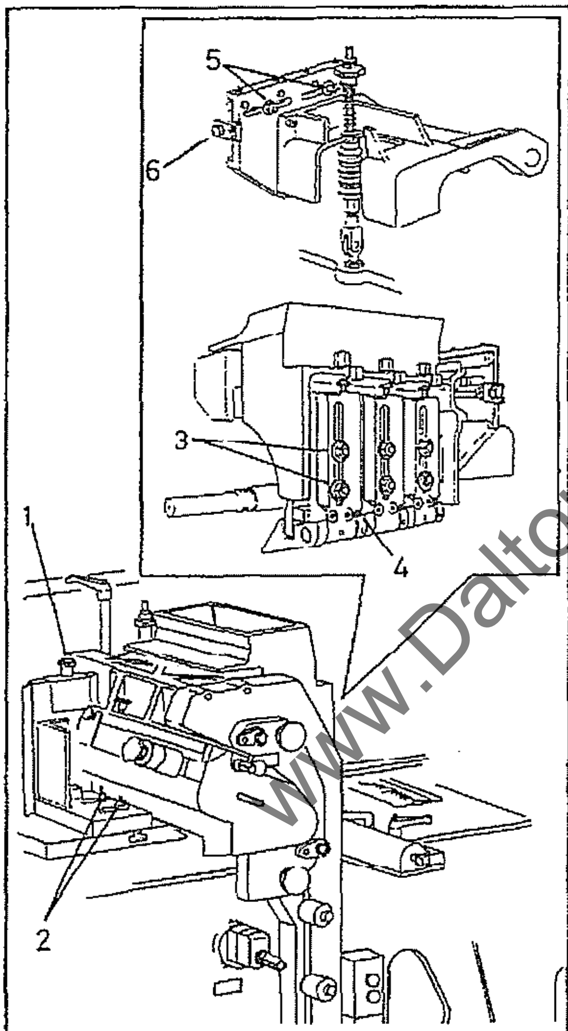

FIG 4 TOP HEAD CHIPBREAKER AND PAD PRESSURE

2) Slacken off pad pressure locking nuts (2) and laterally position the pad nose 5mm clear of the maximum cutting circle. Also position pad, width wise, to suit timber.

3) Retighten nuts (2).

To Ajust Chipbreaker

The chipbreaker is made up of a bank of three individual units each positioned in a similar way.

Set the height of each unit as follows.

4) Slacken off the two locknuts (3).

5) Raise/lower the chipbreaker unit until the nose touches the straight edge placed under the pad pressure after the top head.

6) Tighten the locknuts (3).

7) A stop screw (4) provides for small adjustment to align all the chipbreaker nose pieces.

Lateral adjustment

8) Slacken off the two locknuts (5) at the rear of the top head and turn the adjusting screw (6) until the chipbreaker nose is approximately 20mm from the cutter knives.

9) Fasten rear locknuts (5).

Adjustment to Top and Bottom Through Feed Rollers

For information relating to adjustment, maintenance and parts refer to chapter - **Driven Bed and Top Through Feed Rolls.**

MOUNTING THE CUTTERBLOCKS

General

The XJS 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 acordingly.

The top horizontal spindle has a 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 cuterblock seizing on the machine spindle in the event of 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 a 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.

Outboard bearings are fitted to the horizontal spindles to give greater rigidity to the cutterblock; these support each spindle at its outer position.

The outboard bearing support bracket on the Top heads is hydraulically locked from the control panel or infeed station and is interlocked to the powered rise and fall of the spindle to ensure the plate is free to move with the spindle. The bearing plate locks must be released before making adjustments and once released the power can be isolated before commencing to change/alter cutterblocks.

To Change Cutterblock (Fig 1, Fig 2, Fig 3)

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

1) Slacken off shoulder screws (1) and remove outboard bearing cover (2). If jointers are fitted the cover and position of shoulder screws may vary to those illustrated.

2) Depressurise the outboard bearing by turning the pressure release valve (6) one quarter of a turn using a 3mm Allen key.

3) Ensure pad pressure, chipbreaker and jointer are all well clear of cutterblock especially if fitting a larger cutting circle.

4) Slacken off the two 12mm collar nuts (3), swing captive 'C' washers (4) clear and remove outboard bearing housing (5).

Note: This housing is spigoted and must be pulled horizontally.

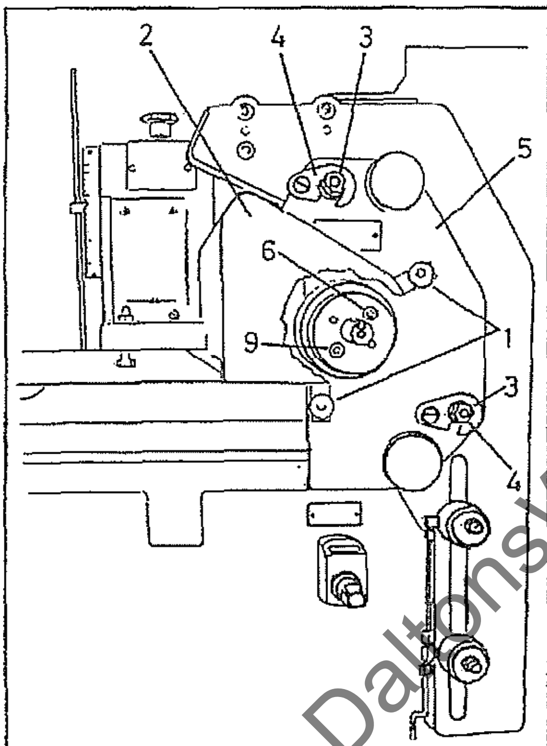

FIG 1 TOP HEAD CUTTERBLOCK CHANGE

5) Remove cutterblock off spindle. When handling cutterblocks care should be taken to avoid injury on knife blades. The method of removal of the cutterblocks varies depending on the block type.

a) Plain Bore Cutterblock

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

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

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 the spindle bearings can result. **DO NOT** use a box or extension spanner.

Remove cutterblock.

b) Hydrogrip Cutterblock with Plain Collar.

Release the capscrew in the collar using an Allen key. This causes the collar to loosen its grip on the spindle and slide off.

Note: On reassembly ensure this collar is fitted with locating pins facing cutterblock.

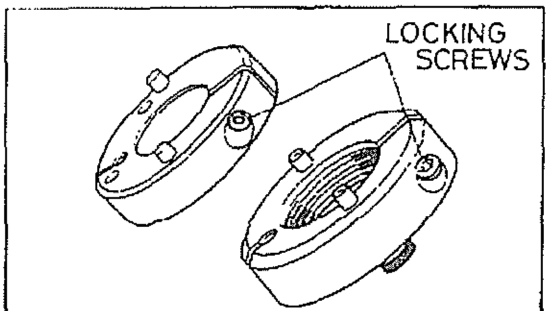

FIG 2 SAFETY COLLARS

Depressurise the hydrogrip cutterblock by turning the pressure release screw (8), located in a recess on the barrel of the cutterblock one quarter turn to release, using a 3mm A/F hexagon key.

Slide the cutterblock from the spindle.

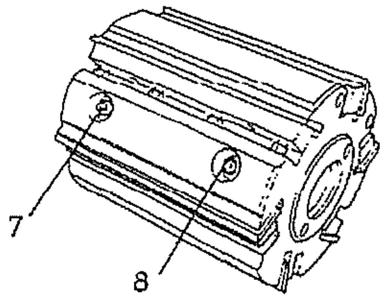

FIG 3 HYDROGRIP CUTTERBLOCK

Always leave the pressure release screw (8) undone when the cutterblock is not in use to avoid distortion to the cutterblock due to the variation in room temperatures.

c) Hydrogrip Cutterblock with Threaded Collar

Release the capscrew in the collar using an Allen key. Unscrew the two knurled headed pins until the collar itself is free to unscrew.

Note: On reassembly this collar must be screwed finger tight against the pressurised block and then, if needed, unscrewed until the pins line up with the corresponding cutterblock holes.

Depressurise the hydrogrip cutterblock by turning the pressure release screw (8), located in a recess on the barrel of the cutterblock one quarter turn to release, using a 3mm A/F hexagon key.

Slide the cutterblock from the spindle.

Always leave the pressure release screw (8) undone when the cutterblock is not in use to avoid distortion to the cutterblock due to the variation in room temperatures.

6) Before replacing cutterblock ensure spindle, spindle shoulder, shoulder of cutterblock and bores are all clean.

7) Carefully place the cutterblock on the spindle. On the hydrogrip blocks tighten pressure release screw (8), and pressurise the cutterblock by applying hydraulic pressure to the pressure nipple (7) located in a recess located on the barrel of the block (see Fig 3).

8) Fit safety collars and/or spacers as applicable. On the plain bore cutterblocks, tighten the block to the spindle with the spanner/s provided.

9) Replace bearing housing (5) and retighten captive 'C' washer (4) and collar nuts (3). Tighten pressure release valve (6) and pressurise bearing to 300 bar (4350 p.s.i) by application of hydraulic pressure to the nipple (9) in the recess on the face of the bearing.

10) Rotate spindle slowly by hand to check knives are clear of chipbreaker, pad pressure etc. Replace outboard bearing cover, engage power and start head for a short period of time to ensure cutterblock is running smoothly and without vibration.

MAINTENANCE

Routine Maintenance

Caution: Before maintenance is performed on the machine the power must be switched off at master stop or mains.

Weekly

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 over-lubricate.

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

Centralised lubrication points at the front of the machine allows for oiling of the top head slideway as part of an overall oiling operation.

The slideways should be oiled at weekly intervals. Once lubricated the head should be traversed to its maximum and minimum position to ensure even distribution of oil and to prevent sawdust/resin 'build up' on slideways. 'Wadkin' grade L4 oil should be used (see **Approved Lubricants**).

Three Monthly (Fig 1)

Electric drive motors have sealed for life bearings and are maintenance free.

However the fan cowl should be removed at intervals and the fan checked for damage, check for excessive end float, signs of overheating etc. If the cowl itself is damaged it should be replaced.

At the rear of the module remove the cover over the top head spindle pulley. Clean and grease using Wadkin L6 grease (see **Approved Lubicants**) the spindle barrel lateral adjustment screw (1).

NB see page 10-10

Whilst the cover is off also check tension and condition of drive belts. The belts (2) should be capable of being depressed approximately 1 1/2 to 2cm per metre of span by application of average thumb pressure of 2.2 - 3.2 kgf (5-7 lbf). If necessary retension (see **Vee Belt Drive Tensioning**).

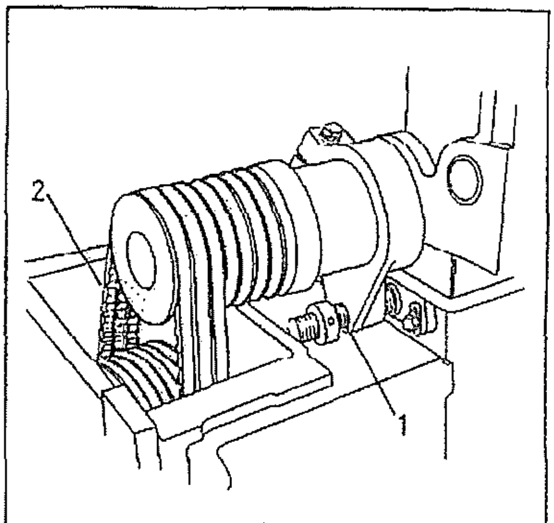

FIG 1 TRAVERSE SCREW LUBRICATION AND DRIVE BELT TENSION

Vee Belt Drive Tensioning (Fig 2)

It is important that drive belts are correctly set as insufficient tension causes slipping and premature belt wear.
Too much tension causes bearing wear. The method of adjustment is as follows:

1) Isolate power at master stop or mains.

2) Remove cover to expose spindle pulley and belts (Fig 1).

3) Slacken off motor mouting plate bolts (1).

4) Tension belt by slackening the top locknut (2) and turning the bottom locknut (3) in an anticlockwise direction.

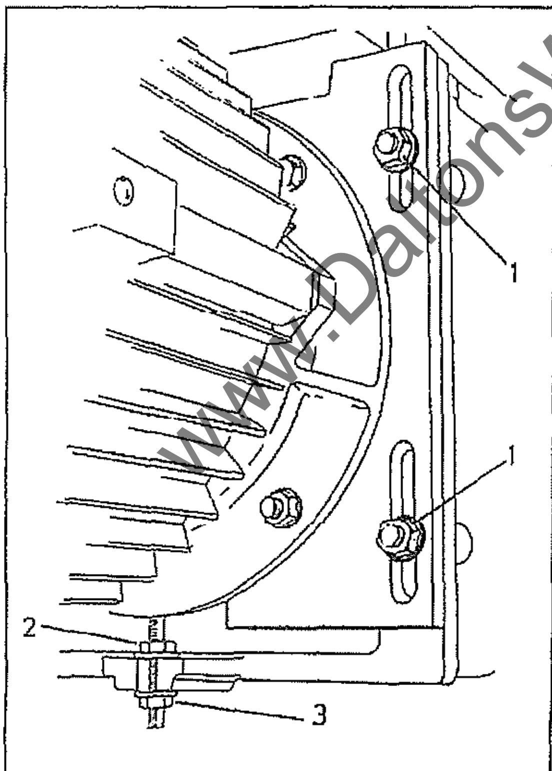

FIG 2 VEE-BELT DRIVE TENSIONING

5) When tensioned lock up both nuts (2 and 3) and motor mounting bolts (1). Refit cover and engage power.

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. Always retighten any securing features fitted.

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

Replacing Drive Belts

Drive belts must be replaced as a set to obtain correct drive performance.

1) Isolate power at master stop or mains.

2) Remove cover.

3) Relieve tension on belts by reducing drive centres i.e. slacken off the four motor mounting bolts (1), the locknut (3) and raise the motor by rotating nut (2) in a clockwise direction.

4) Remove old drive belts and fit a new <u>set</u> of belts of the same size, type and reference (see **Motor and Drive Belt Data**).

5) Retension the new belt set (see **Vee Belt Tensioning**).

Note: It may at times be necessary to remove a drive pulley. The motor shaft pulleys are fitted with taper lock bushes (see fig 3). Spindle pulleys are located on tolerance rings and held on by spigot washer and screw.

Removal and Refit of 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 kacking holes (2).

2) Insert screws in jacking holes after oiling thread and point of grubscrews, or thread and head of capscrews, as applicable.

3) Tighten screws (1) alternatively 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 grubscrews, or thread and head of capscrews. 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, alternatively tighten screws (1), until all screws are pulled up securely. Use a short length of pipe on key to increase leverage.

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

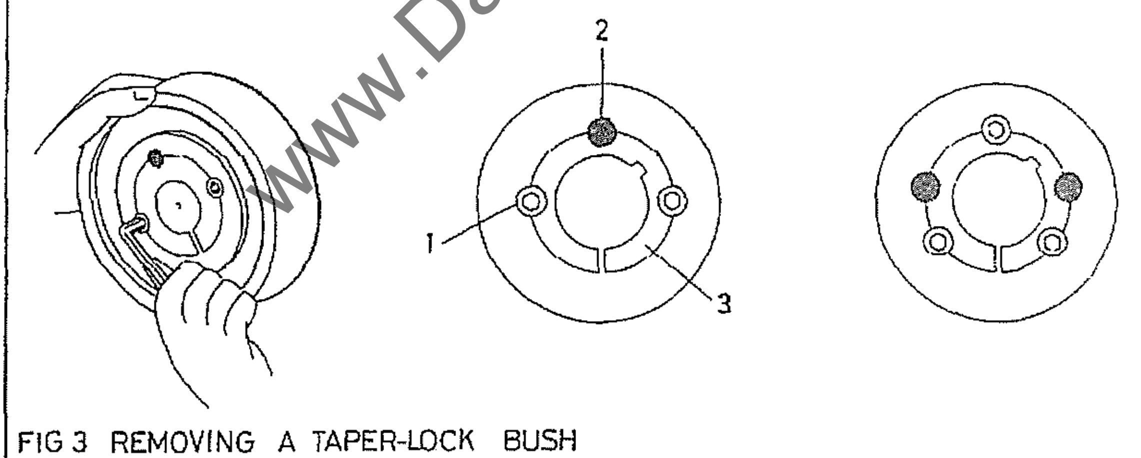

FIG 3 REMOVING A TAPER-LOCK BUSH

6) Fill all empty screw holes with grease to exclude dirt.

Preparation prior to fitting bearings

Wadkin strongly recommend buying an exchange spindle rather than attempting a bearing change.

Before fitting a new bearing, the protection lubricant must be meticulouly 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.

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) = d x B x 1.01
d = bore of bearing in mm
B = width in mm

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

Outboard Bearing Change Top Head (Fig 4)

Note: Work must take place in a clean and dry environment, failure to do so could result in premature bearing failure. Isolate power at mains or at master stop before proceeding.

1) Remove outboard bearing assembly from machine (see **Changing Cutterblock**).

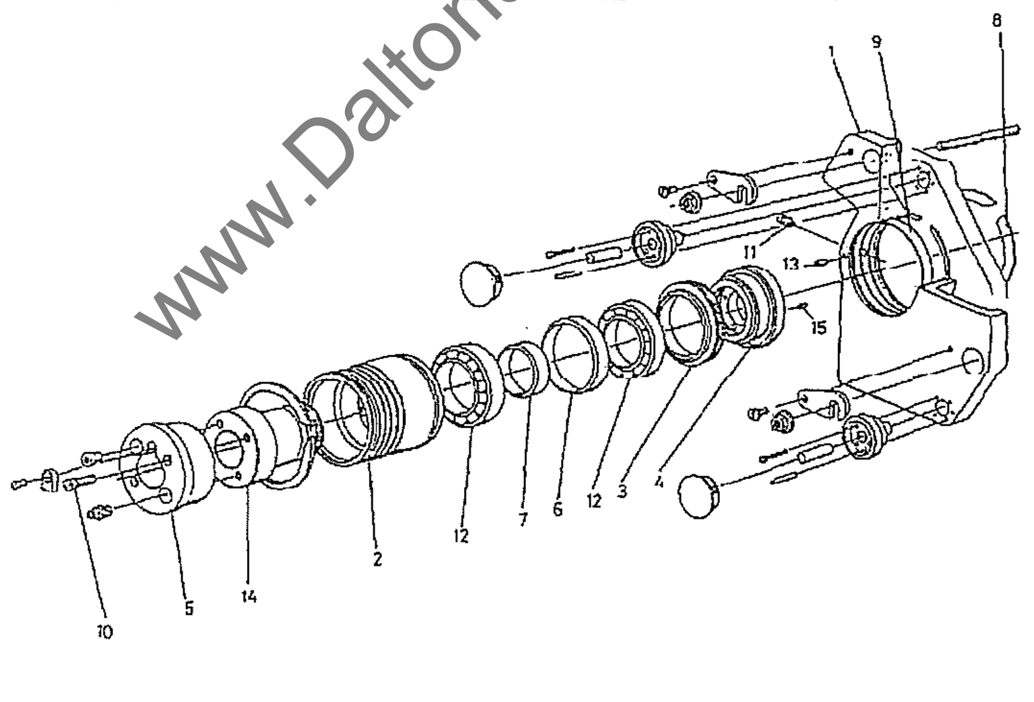

FIG 4 OUTBOARD BEARING - TOP HEAD

Note: It is not necessary to remove the housing assembly (2) from the mounting place (1), unless the housing (2) has become damaged. To remove see later note 'Housing Removal'.

2) Remove 2 off grubscrew (15). Remove ETP sleeve locknut (4), remove 2 off hexagon socket capscrew (10) which will then allow the ETP end cap (5) to be withdrawn. Remove bearing locknut (3), the ETP sleeve (14) and the bearing assembly can be withdrawn from the rear of the housing (2).

3) The bearings (12) can now be removed along with the bearing spacers (6 and 7) using a bearing puller.

Note: Care must be taken not to damage the ETP sleeve (14).

4) After preparation (see preparation prior to fitting bearings), and lubrication. The new bearings (12) can now be fitted to the ETP sleeve (14) complete with the bearing spacers (6 and 7). Ensure that the bearings (12) are fitted the correct way round. Use only sufficient pressure to fit bearings, applying pressure to the inner ring only. Ensure tha the bearing ring fits up to the location shoulder.

5) Refit ETP sleeve (14) and bearing assembly into the housing (2) ensuring that the assembly fits right up to the shoulder of the housing (2). Refit bearing locknut (3) ensuring that it is tight. Refit sleeve end cap (5) and sleeve locknut (4) insert grubscrews (15).

Note: Ensure all labyrinth seals are re-filled with grease.

Outboard Bearing Housing Removal (Fig 4)

1) Remove outboard bearing assembly from machine.

2) Remove grubscrew (13), remove anti rotation pin (11). Remove the external circlip (8) from the rear of the housing, this will allow the housing assembly to be removed from the front of the machine. Care must be taken not to damage the housing assembly (2) or the mounting plate (1).

3) To refit the housing reverse the previous steps. Re-assembly will be aided by smearing the bore of the housing plate (1) with oil.

Note: Care must be taken when re-assembly not to damage the tape strip (9) in the housing plate (1).

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER

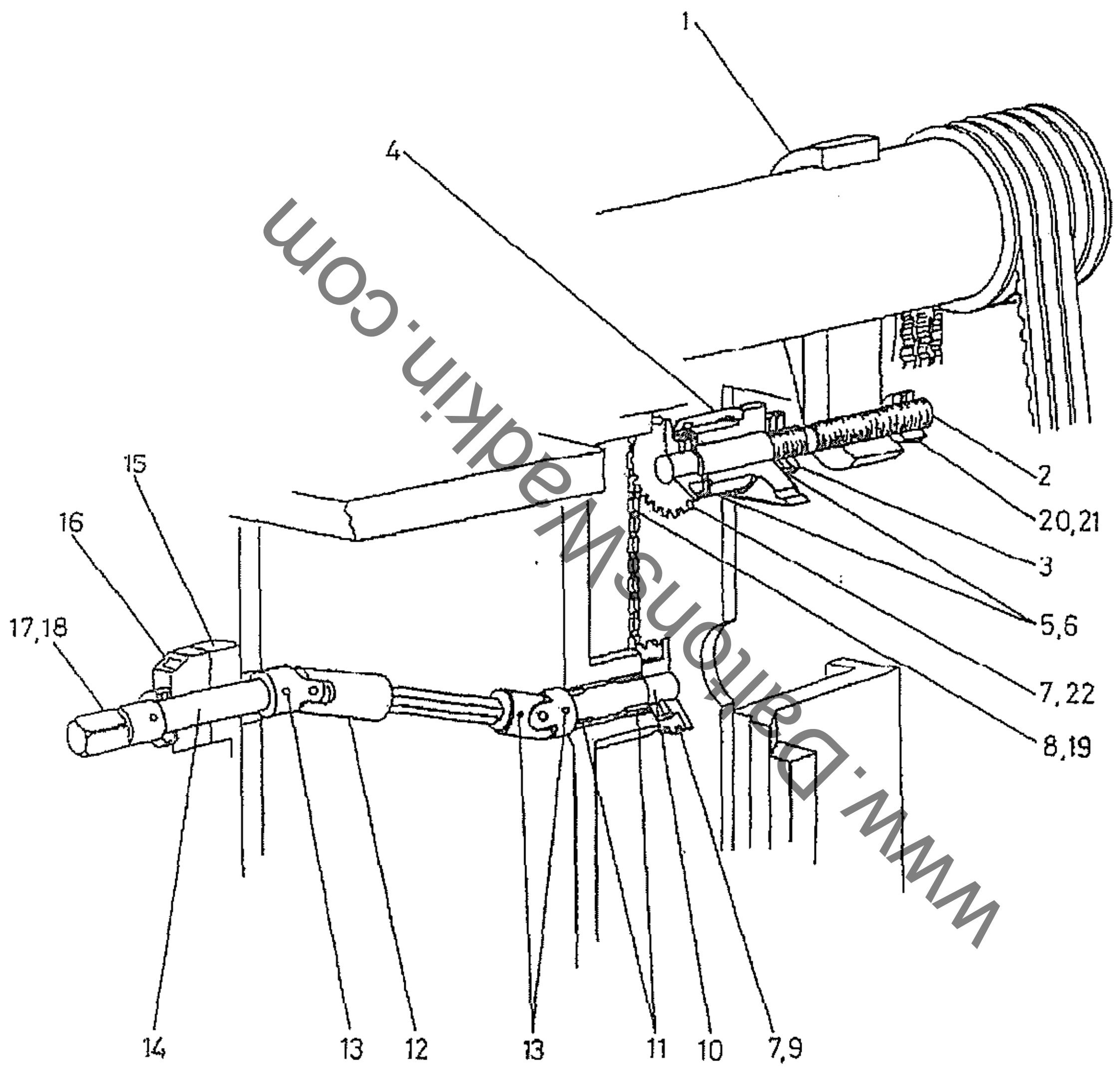

FIG 1 TOP HEAD AXIAL ADJUSTMENT

1. TOP HEAD 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 nut	2
4.	Bearing bracket for horizontal head adjustment	1
5.	'INA' Thrust bearing AXK 2542	2
6.	'INA' Thrust washer AS 2542	4
7.	Sprocket for horizontal head axial adjustment	2
8.	'REYNOLD' Roller chain no. 111046 12.9mm (1/2") pitch, 40 pitches	1
9.	No. 4 Taper pin	1
10.	Shaft	1
11.	20mm I/D x 25mm O/D x 20mm long bronze bush	2
12.	Universal coupling with 12mm A/F telescopic shaft	1
13.	6mm dia. x 24mm long tension pin	1
14.	Shaft for horizontal head cross adjustment	1
15.	Bearing block	1
16.	Digital readout	1
17.	Square shaft extension	1
18.	Taper pin no. 1	1
19.	Chain connector link	1
20.	Threaded collar M20 trapezoidal	1
21.	Hexagon socket grubscrew M8 x 8mm long	2
22.	6mm dia. x 40mm long tension pin	1

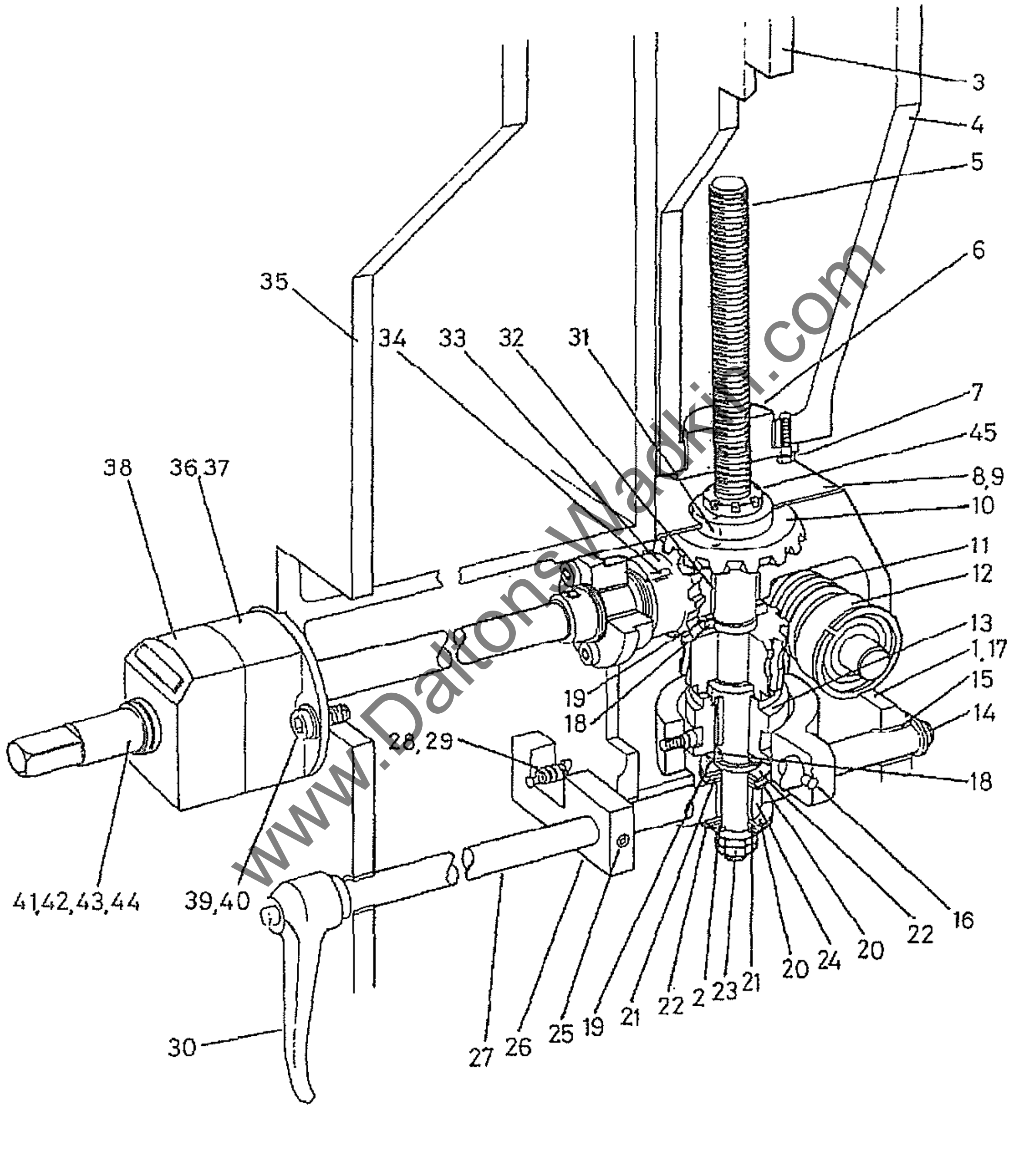

FIG 2 TOP HEAD POWER RISE AND FALL

2. TOP HEAD POWER RISE AND FALL

Ref No.	Description	No Off.
1.	Socket head capscrew M12 x 30mm long	4
2.	Plain washer M16	1
3.	Slide strip	1
4.	Top head vertical slide	1
5.	Vertical rise and fall screw	1
6.	Nut for rise and fall screw	1
7.	Hexagon head setscrew M8 x 25mm long	2
8.	Top cover	1
9.	Hexagon socket capscrew M6 x 8mm long	4
10.	Bevel gear	1
11.	Worm gear	1
12.	Bearing 'SKF' 6204 RS	2
13.	Dog clutch	1
14.	External circlip 16mm dia.	2
15.	Bronze bush 20mm O/D x 16mm I/D x 16mm long	2
16.	Tension pin 6mm dia. x 32mm long	1
17.	Gearbox/clutch housing	1
18.	Clutch spacer washer	2
19.	External circlip 30mm dia.	2
20.	Thrust washer 'INA' AS 2542	2
21.	Thrust bearing 'INA' AXK 2542	2
22.	Shaft washer 'INA' WS 2542	2
23.	Locknut M16	2
24.	Bronze bush 30mm O/D x 25mm I/D x 20mm long	1
25.	Hexagon socket grubscrew M6 x 10mm long	1
26.	Clutch location arm	1
27.	Clutch adjusting shaft	1
28.	Spring for spindle lock	1
29.	Stell ball 10mm dia.	1
30.	Locking handle M10 x 25mm male	1
31.	Parallel key 8mm x 7mm x 14mm long	1
32.	Bronze bush 35mm O/D x 30mm I/D x 20mm long	1
33.	Bevel gear	1
34.	Parallel key 5mm x 5mm x 20mm long	1
35.	Main frame	1

cont/....

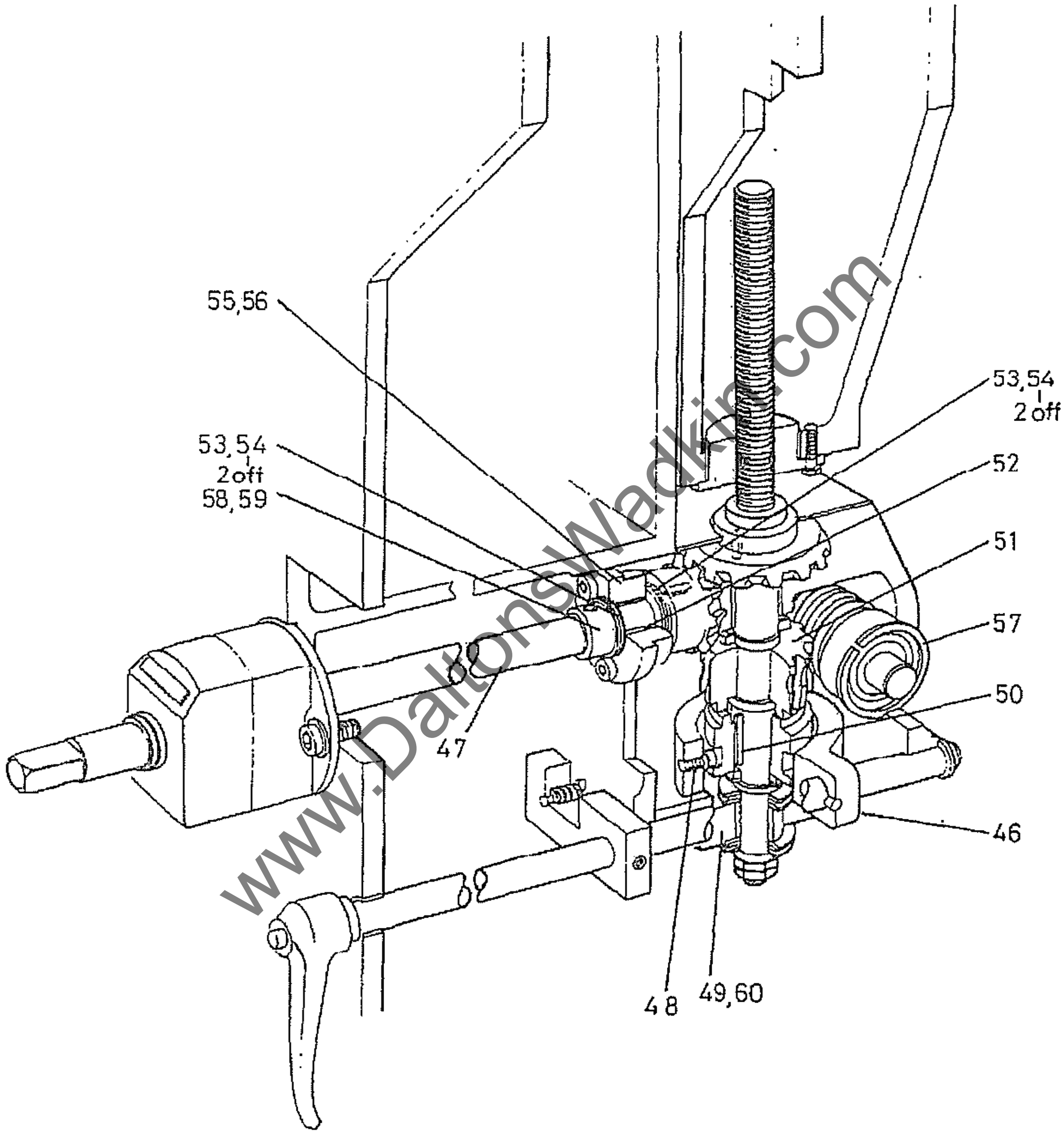

FIG 2 TOP HEAD POWER RISE AND FALL

2 TOP HEAD POWER RISE AND FALL (cont....)

Ref No.	Description	No Off.
36.	Bearing bracket	1
37.	Bronze bush 25mm O/D x 20mm I/D x 15mm long	2
38.	'SIKO' digital readout 0902E 2mm	1
39.	Hexagon socket capscrew M6 x 20mm long	2
40.	Plain washer M6	2
41.	Square end shaft extension	1
42.	Taper pin No. 1	1
43. +	Compression spring	1
44.	External circlip 25mm dia.	1
45.	Notch nut M24 x 1.5mm	1
46.	Clutch yoke	1
47.	Adjusting shaft	1
48.	Hexagon socket capscrew M6 x 10mm long	2
49.	Bottom cover	1
50.	Parallel key 8mm x 7mm x 32mm long	1
51.	Worm wheel	1
52.	Bronze bush 25mm O/D x 20mm I/D x 25mm long	1
53.	Thrust bearing 'INA' AXK 2035	2
54.	Thrust washer 'INA' AS 2035	4
55.	End cap	1
56.	Hexagon socket capscrew M6 x 20mm long	3
57.	Internal circlip 47mm dia.	2
58.	Collar 32mm O/D x 20mm I/D x 14mm	1
59.	Hexagon socket grubscrew M6 x 6mm long.	1
60.	Hexagon socket capscrew M8 x 16mm long	4

+ Not illustrated

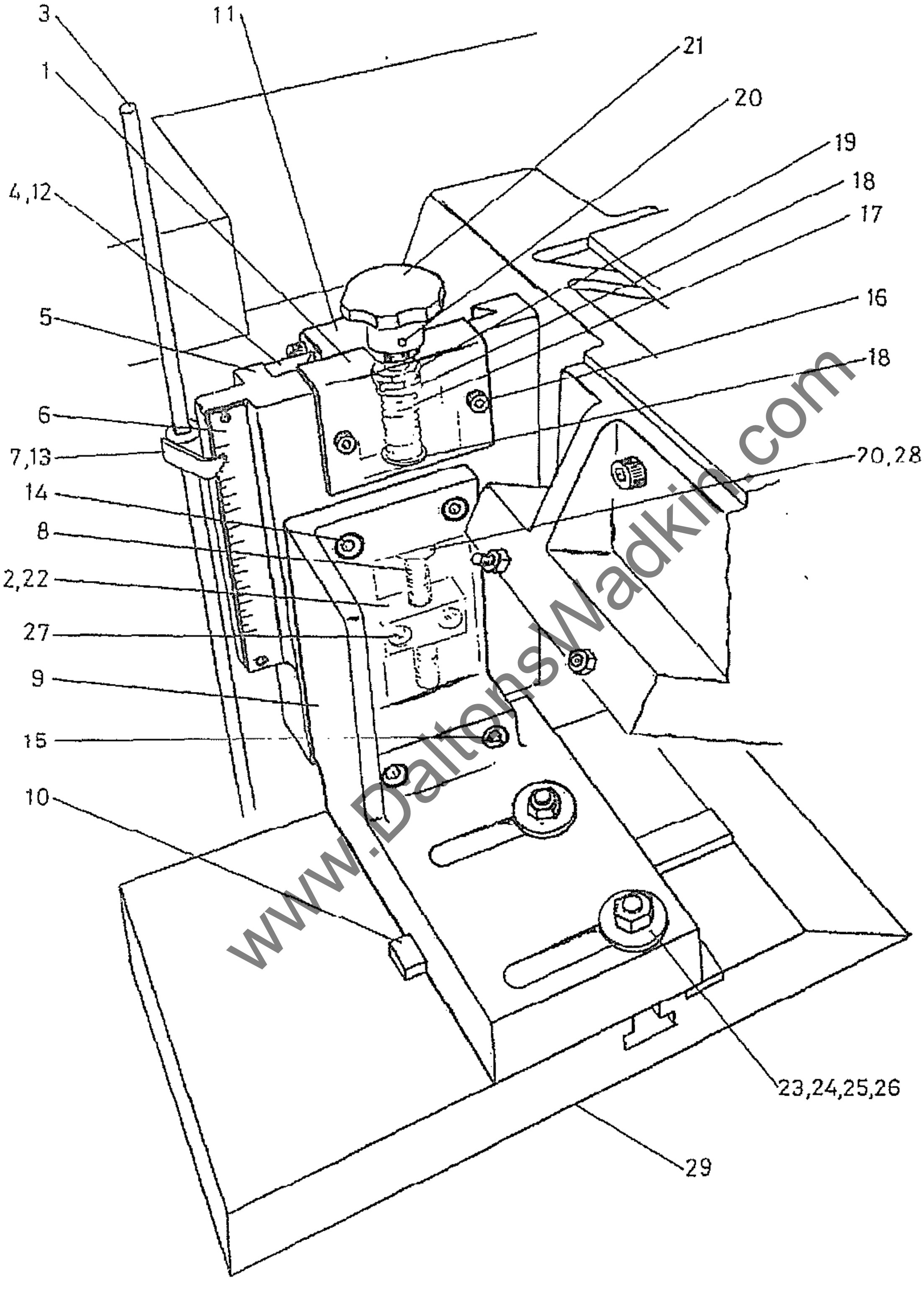

FIG 3 TOP HEAD PRESSURE PAD

3. PAD PRESSURE AFTER TOP HEAD

Ref No.	Description		No Off.
1.	Cover for top head pressure spring		1
2.	Nut for top head pressure adjustment		1
3.	Pointer support first top head		1
OR	Pointer support second top head		1
4.	Wear strip		1
5.	Saddle for top head pressure		1
6.	0-130mm Metric scale		1
7.	Pointer		1
8.	Screw for top head pressure adjustment		1
9.	Bracket for mounting top head pressure pad		1
10.	Cross tenon		1
11.	Slide for top head pressure		1
12.	Hexagon head setscrew		4
13.	Hexagon socket grubscrew M6 x 6mm long		1
14.	Hexagon socket capscrew M10 x 16mm long		2
15.	Hexagon socket capscrew M10 x 50mm long		2
16.	Hexagon socket capscrew M6 x 10mm long		2
17.	Compression spring 'Flexo' 283816		1
18.	Thrust washer 'INA' AS 1226		2
19.	Locknut M12		2
20.	Taper pin		2
21.	Handwheel M12		1
22.	Helicoil insert M12		1
23.	Tee nut 'WDS' 664203		2
24.	Stud M10 x 55mm long		2
25.	Nut M10		2
26.	Plain large washer M10		2
27.	Hexagon socket capscrew M8 x 20mm long		2
28.	Collar		1
29.	Pad pressure shoe	}for machine with	
OR	Pad pressure shoe for splitting/counter profiling	}one top head only }	
OR	Pad pressure shoe Pad pressure shoe for dia. 125 cutting circle	}for machine with two }or more top heads }	
OR	Pad pressure shoe for soft pads (optional)		

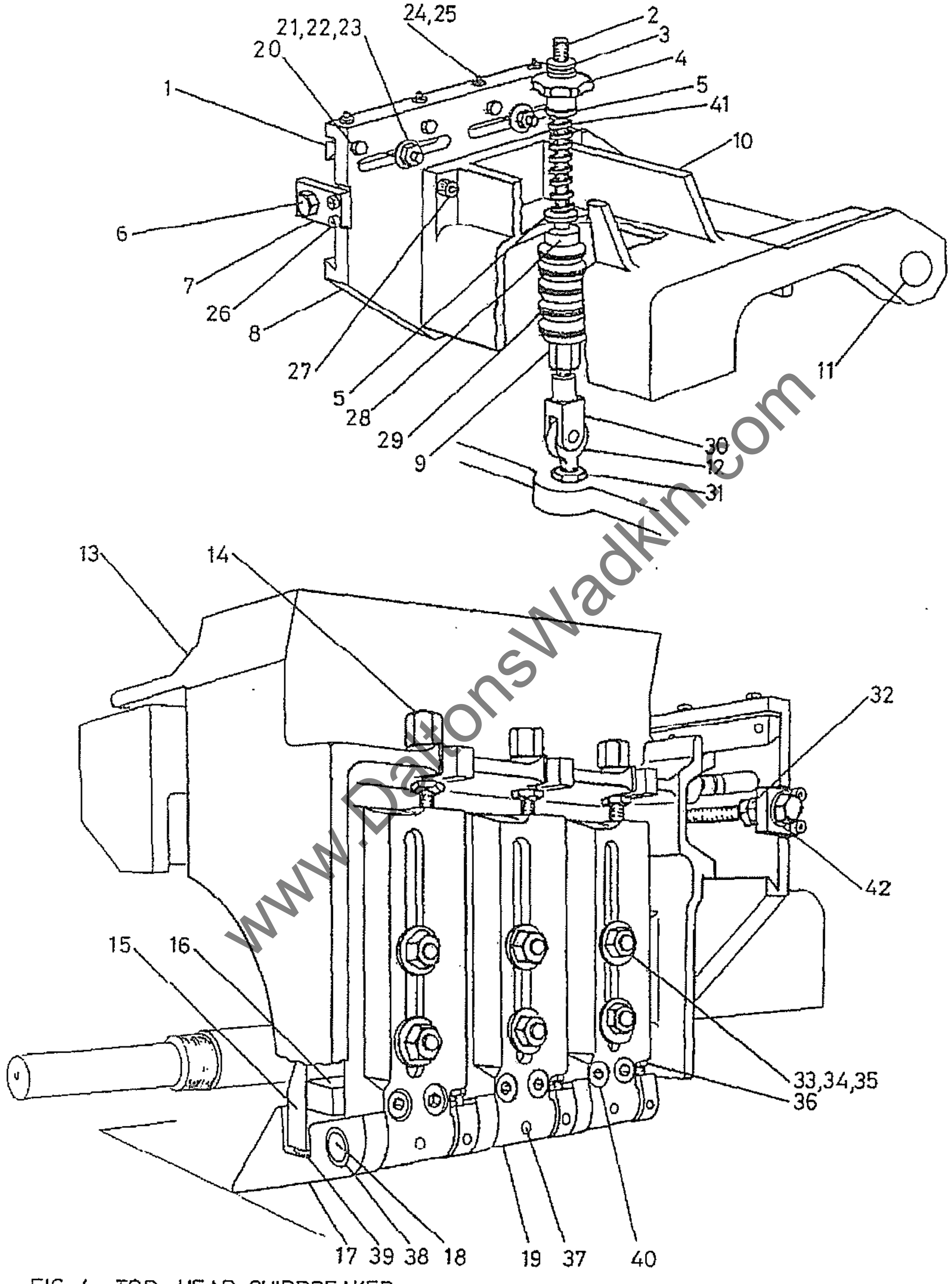

FIG 4 TOP HEAD CHIPBREAKER

4. TOP HEAD CHIPBREAKER MK 111

Ref No.	Description	No Off.
1.	Wear strip	1
2.	Screw	1
3.	Thumb nut 'WDS' 614-204	1
4.	Hand knob	1
5.	Cap for tension spring	2
6.	Adjusting screw	1
7.	Plate for adjusting screw	1
8.	Swing for chipbreaker (front)	1
9.	Stop for top head chipbreaker	1
10.	Swing for chipbreaker (rear)	1
11.	Shaft for chipbreaker pivot	1
12.	Eye bolt	1
13.	Hood for chipbreaker carrier	1
14.	Adjusting screw for top chipbreaker	3
15.	Baffle/spring housing	3
16.	Block for spacing baffle	3
17.	Shoe for chipbreaker	3
18.	Pin for chipbreaker shoe pivot	3
19.	Bracket for mounting chipbreaker shoe	3
20.	Hexagon head setscrew M8 x 20mm long	4
21.	Stud M12 x 50mm long	2
22.	Large washer M12	2
23.	Nut M12	2
24.	Hexagon head grubscrew M6 x 20mm long	4
25.	Locknut M6	4
26.	Hexagon socket capscrew M6 x 16mm long	2
27.	Hexagon socket capscrew M12 x 30mm long	4
28.	Collar 40mm O/D x 25mm I/D x 16mm wide	1
29.	Disc springs 50mm O/D x 25.4mm I/D x 1.5	10
30.	Rod clevis festo SG M12	1
31.	Nut M12	1
32.	Lock screw M12	2
33.	Stud M12 x 65mm long	6
34.	Washer M12	6
35.	Nut M12	6
36.	Hexagon head setscrew M6 x 30mm long	3
37.	Hexagon socket grubscrew M6 x 10mm long	3
38.	Oilite bronze bush 20mm O/D x 16mm I/D x 12mm long	6

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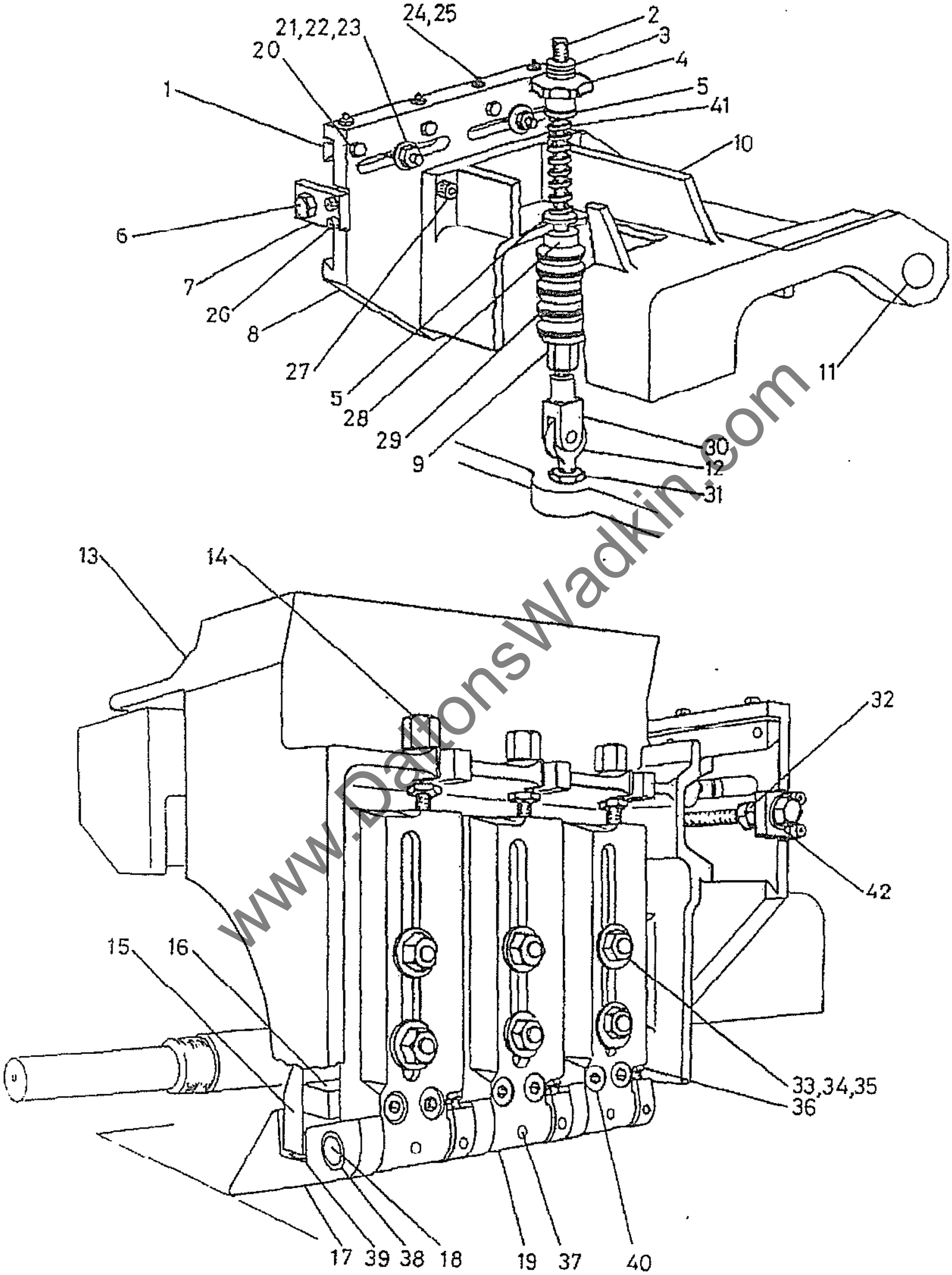

FIG 4 TOP HEAD CHIPBREAKER

4. TOP HEAD CHIPBREAKER MK 111 (CONT....)

Ref No.	Description	No Off.
39.	Compression spring	1
40.	Hexagon socket capscrew M10 x 60mm long	6
41.	Compression spring 135mm long x 28.2 O/D x 21.8 I/D	1
42.	Thrust washer 'INA' AS 1226	2

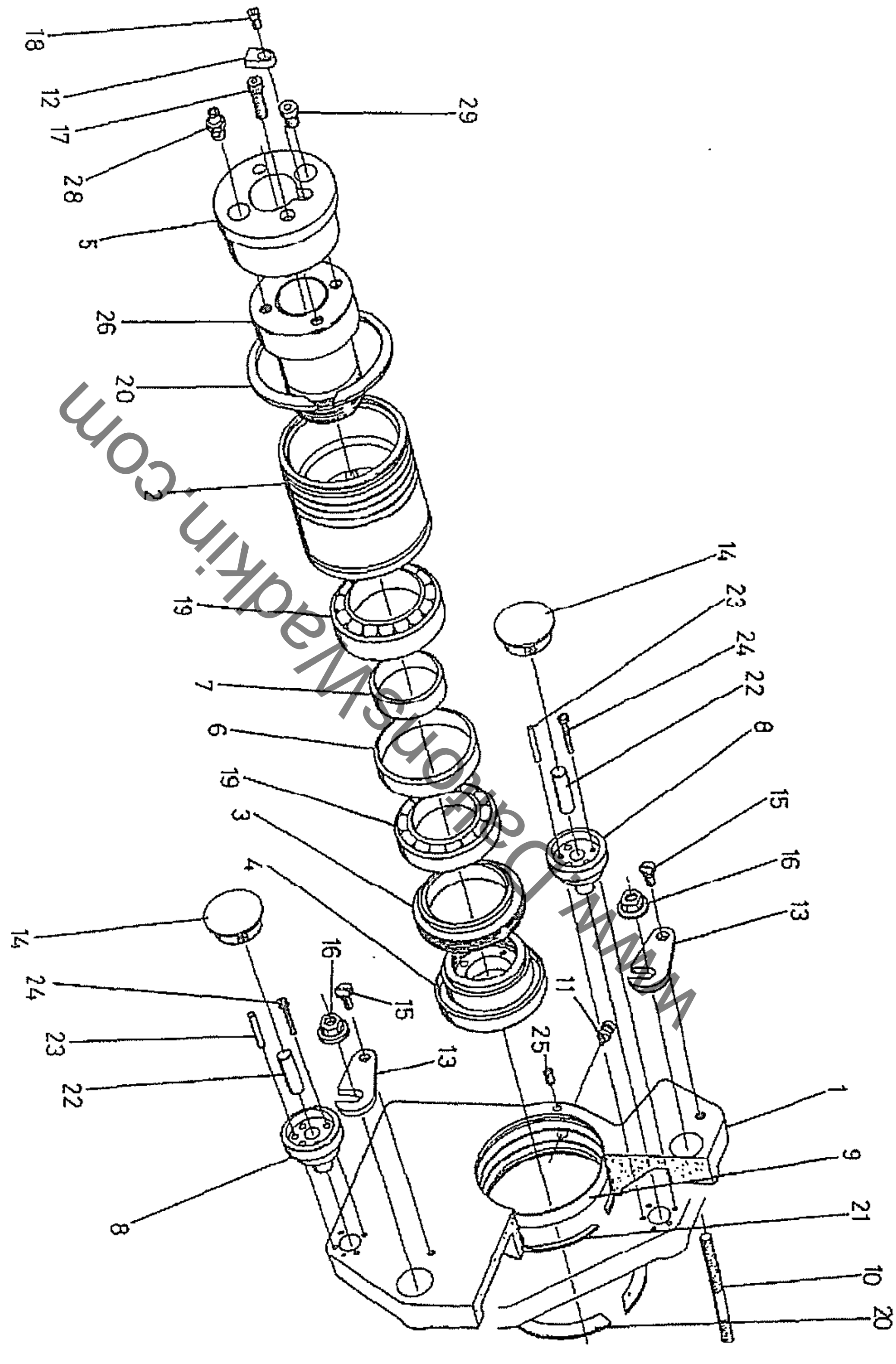

FIG5 OUTBOARD BEARING - TOP HEAD

5. OUTBOARD BEARING - MK 111 TOP HEAD

Ref No.	Description	No Off.
1.	Plate for mounting outboard bearing housing	1
2.	Housing for adjustable outboard bearing	1
3.	Locknut for outboard bearing housing	1
4.	Locknut for hydro grip sleeve	1
5.	End cap for hydro grip sleeve	1
6.	Outer bearing spacer } supplied as matched	1
7.	Inner bearing spacer } pair	1
8.	Knob for outboard location	2
9.	Tape strip for outboard bearing housing	2
10.	Stud for outboard bearing plate	1
11.	Anti rotation pin for housing	1
12.	Drive key	1
13.	'C' Washer	2
14.	DP 2000, 2783 black plug	2
15.	Shoulder screw 'WDS' 615-203	2
16.	Collar nut 'WDS' 404-204 M12	2
17.	Hexagon socket capscrew M5 x 12mm long	2
18.	Hexagon socket capscrew M3 x 12mm long	1
19.	'RHP' bearing 7911 x 2 TAU EP7	2
20.	'INA' external circlip WR95	2
21.	'INA' Internal snap ring BR100	4
22.	Plain dowel dia. 12 x 45mm long	2
23.	Tension pin dia. 6 x 32mm long	4
24.	Hexagon socket capscrew M6 x 30mm long	6
25.	Hexagon socket grubscrew M6 x 16mm long	1
26.	ETP sleeve (less front plate)	1
27.	Pressure relieve valve } items only supplied	1
28.	Grease nipple } with ETP sleeve	1

Wadkin

SECTION 10 TOP HEAD/BOTTOM HEAD MODULE

General (Fig 1)

This module has a top head followed directly by a bottom head. Timber is fed through the unit by a single top feed roll and an opposed top/bottom roller combination at the outfeed end. Drive to the through feed rollers is via 'siti' gearboxes at the rear of the module (see chapter - **Gearboxes and Drive Shafts**).

A small amount of adjustment is catered for on the horizontal heads.

Note: The machine is factory set to give 12mm movement backwards from the datum face of the fence when it is set at ZERO.

If it should be necessary to obtain further lateral movement when at the maximum rearward position, it may be obtained by first isolating the power at the master stop or mains, removing the pulley guard and releasing the belt tension (see Maintenance - **Vee Belt Drive Tensioning**). Move the belts onto the next vacant pulley groove to bring them back into line and then re-tension the belts.

Locking collars prevent the spindle movement exceeding the original factory set boundaries and therefore if the belts are repositioned, then the rear stop (1) must also be reset.

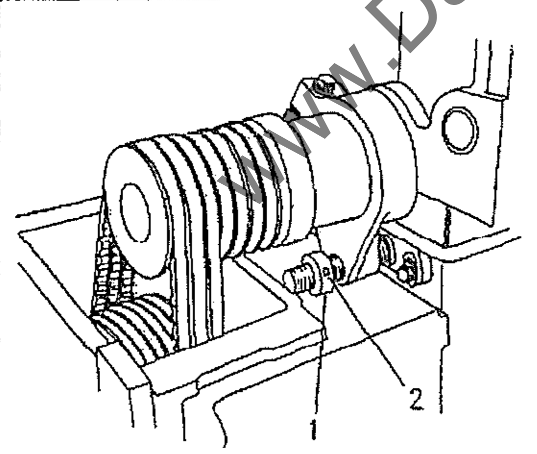

FIG 1 HORIZONTAL HEAD ADJUSTMENT

This may be done by slackening off the grubscrew (2), moving the collar back a further 12mm and then retightening the grubscrew (2).

Top Head Vertical and Horizontal adjustment (Fig 2, Fig 3)

Before making any horizontal adjustment ensure that the jointer is 'parked' clear (see chapter - **Jointers**).

Horizontal Adjustment

1) Isolate power at master stop or mains.

2) Release the spindle barrel lock (2).

3) Adjust using the handscrew (1).

4) Tighten barrel lock (2).

Manual Vertical Adjustment - Top Head Only

Note: The outboard bearing support is hydraulically locked into position and MUST be released before any vertical adjustment is made. The lock and unlock control buttons are found on the main control cabinet and on the infeed and outfeed subcontrol stations (6) depending on moduler assembly.

1) Release hydraulic locks (7) by pressing button indicated thus -<||>-. Then isolate power supply at master stop or at mains.

2) Ensure bed is clean.

3) Remove jointer cover (3) by slackening off thumbscrews (4) or remove blanking cover if no jointers are fitted. This allows easy access to cutter.

4) Place a datum block (5) of known thickness under the cutterblock.

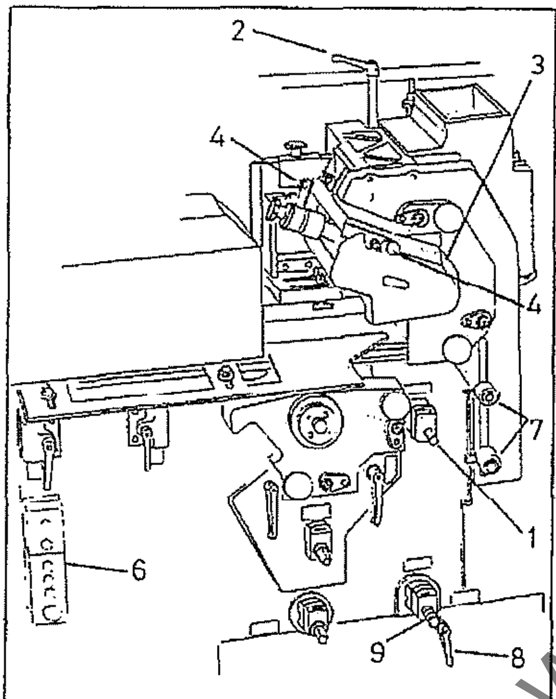

FIG 2 TOP HEAD SETTING

5) Rotate the handscrew (9) clockwise to lower the spindle or anti-clockwise to raise the spindle. The knives should just touch the block when the spindle is rotated slowly by hand via the outboard bearing.

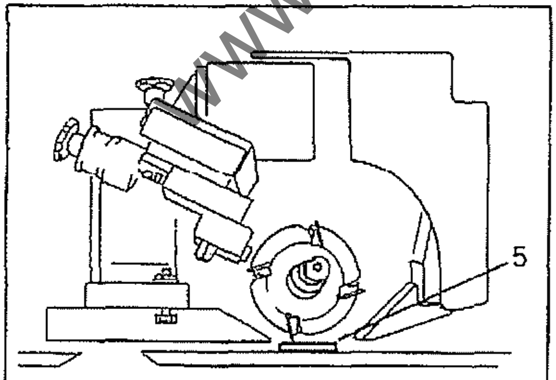

FIG 3 SETTING TOP HEAD TO DATUM BLOCK

6) When setting to a datum block check the digital readout. If necessary reset the counter by loosening grubscrew in collar of the readout and then turning collar until the reading coincides to the thickness of the datum block. When set remove block.

7) Set head to desired position and replace cover (3).

8) Switch power on and engage hydraulic locks by pressing button indicated →|←.

Electrical Vertical Adjustment - Top Head and Beam

Note: The powered vertical adjustment of the beam is electrically interlocked with the Top head and cannot move until the hydraulic locks are disengaged.

1) Release outboard bearing support locks by pressing button marked thus ←||→. The lock and unlock buttons are found on the main control cabinet or on the infeed sub control station.

2) Engage clutch lever (8). If the clutch does not readily engage, turn the handscrew (9), slightly to the left or right until it engages.

3) To raise the head/beam press the button marked ' ↑ '. The button with the downward pointing arrow moves the head/beam down. These buttons again are found on the main control cabinet or on the infeed sub station.

4) When in the required position re-engage locks by pressing button marked →|←. Disengage clutch.

Top Head Chipbreaker and Pad Pressure (Fig 4)

Ensure power is isolated from machine. The bed should be clean and the cutterblock already 'set up'. Place a straight edge on the table under the pad pressure, cutterblock and chipbreakers. When set all three should be in line with each other.

To Adjust Pad Pressure

1) Use adjusting screw (1) to raise and lower pad.

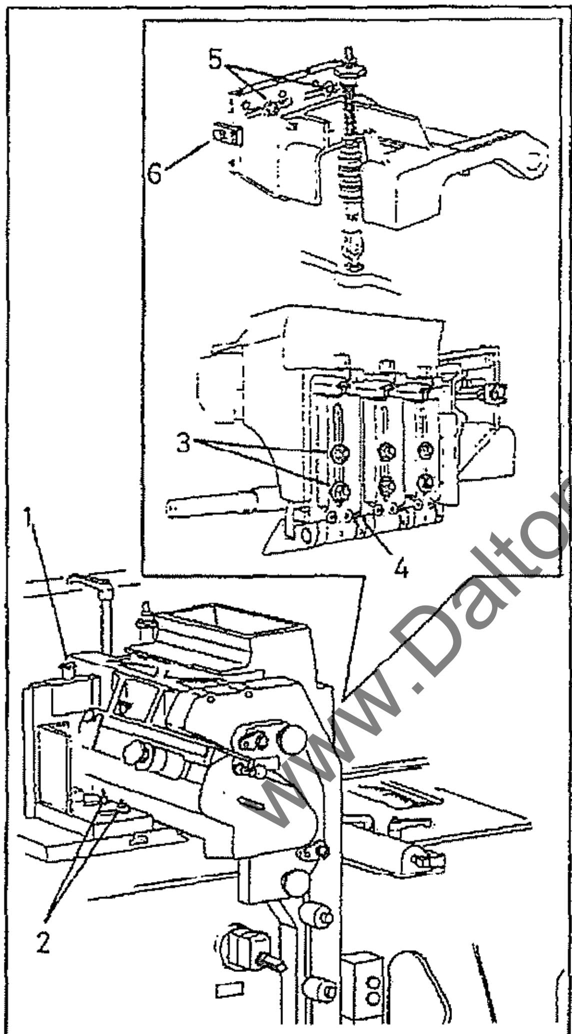

FIG 4 TOP HEAD CHIPBREAKER AND PAD PRESSURE

2) Slacken off pad pressure locking nuts (2) and laterally position the pad nose 5mm clear of the maximum cutting circle. Also position pad width wise to suit timber.

3) Retighten nuts (2)

To Adjust Chipbreaker

The chipbreaker is made up of a bank of three individual units each positioned in a similar way.

Set the height of each unit as follows.

4) Slacken off the two locknuts (3).

5) Raise/lower the chipbreaker unit until the nose touches the straight edge placed under the pad pressure after the top head.

6) Tighten the locknuts (3).

7) A stop screw (4) provides for small adjustment to align all the chipbreaker nose pieces.

Lateral adjustment

8) Slacken off the two locknuts (5) at the rear of the top head and turn the adjusting screw (6) until the chipbreaker nose is approximately 20mm from the cutter knives.

9) Fasten rear locknuts (5).

Bottom Head Vertical and Horizontal Adjustment (Fig 5, Fig 6)

Spindle adjustment where provided may be adjusted within its limits in both planes from the front of the module.

To Check Cutterblock Height

1) Isolate power supply at mains or by using master stop.

2) Remove/raise guards to allow clear access to bedplates and cutterblock.

3) Ensuring bedplates are clean place a straight edge (1) on the outfeed table of the module projecting over the bottom horizontal cutterblock. If set correct the blades should just touch the underside of the straight edge. Adjust cutterblock height if necessary.

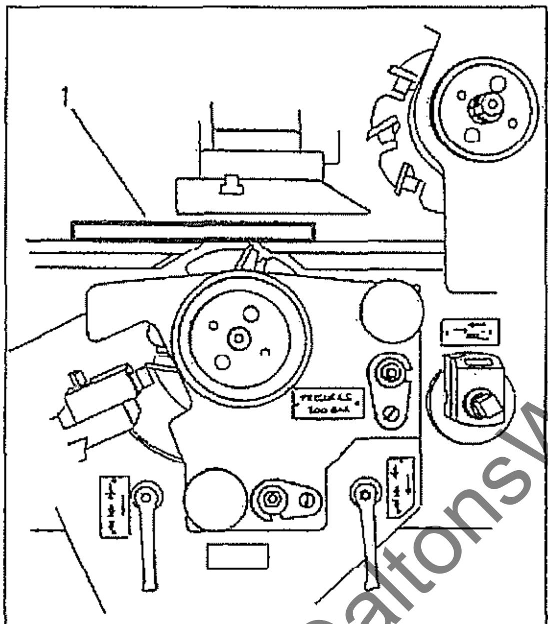

FIG 5 BOTTOM HEAD SETTING

Vertical Adjustment

4) Isolate power supply at mains or at master stop if not already isolated.

5) Release outboard housing locking handles (2).

6) Using supplied winding handle rotate adjusting screw (3) clockwise to raise the spindle of anti-clockwise to lower.

7) When the correct height has been achieved tighten locking handles (2) and engage power if no further adjustments are necessarary.

Horizontal Adjustments (if fitted)

8) Ensure power is isolated at mains or at master stop. Remove conical outboard bearing cover.

9) Before making any lateral adjustment first release the spindle barrel lock (4).

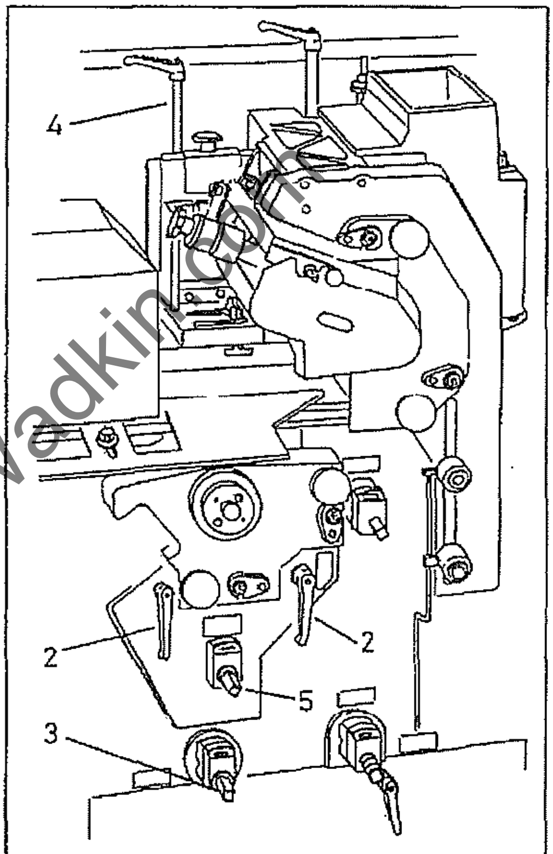

FIG 6 BOTTOM HEAD ADJUSTMENTS

10) Position cutterblock as required using adjusting screw (5).

11) Refasten spindle barrel lock (4). Replace cutboard cover and engage power if no further adjustments are required.

Adjustment to Top and Bottom Through Feed Rollers

For information relating to adjustment, maintenance and parts refer to chapter - **Driven Bed Rolls and Top Through feed Rollers.**

Adjustment of Side Guide (Fig 7)

The side guide as its name suggests is designed to guide the timber through the machine.
As such when set there should be no positive pressure on the timber just a light rubbing action.

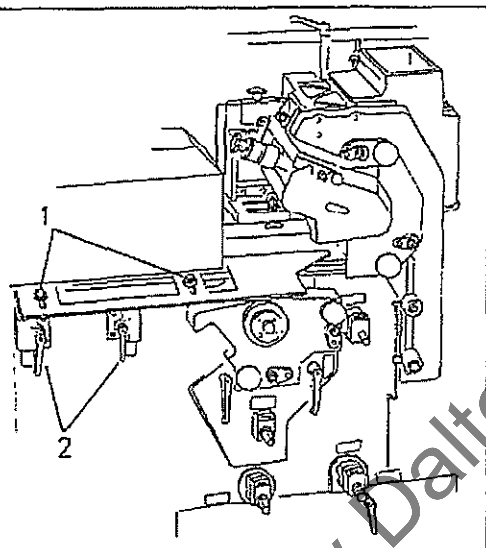

FIG 7 SIDE GUIDE ADJUSTMENT

1) To set the width slacken the two locknuts (1). Adjust the guide to suit the finished timber width. Ensure the guide is parallel to the fence. Refasten locknuts.

2) The side guide height is adjusted by slackening the two locking handles (2) and altering the height to suit the timber section. Normal practice is to leave the side guide at bed level and only adjust its height if the timber has a moulded edge. Then it would be necessary to adjust the guide to 'run' on a flat of the moulding. After adjustment refasten locking handles.

MOUNTING THE CUTTERBLOCKS

General

The XJS 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 Spindles - Left Hand Thread

Top Horizontal Spindles - 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 of 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 a 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.

Outboard bearings are fitted to the horizontal spindles to give greater rigidity to the cutterblock; these support each spindle at its outer position.

The outboard bearing support bracket on the bottom heads is attached and locked to the support plate manually. The top heads are hydraulically locked from the control panel or side locks and are interlocked to the powered rise and fall of the spindle to ensure the plate is free to move with the spindle. The bearing plate locks on either head must be released before making vertical adjustments to that head. Once the locks on the top head are released the power can be isolated before commencing to change/alter cutterblocks. Power to the bottom head should be isolated prior to any work being carried out.

To Change Cutterblocks on Top and Bottom Heads (Fig 1, Fig 2, Fig 3)

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

1) Open/remove covers to allow access to and removal of outboard bearing housing.

2) Depressurise the outboard bearing (6) by turning the pressure valve (2) one quarter of a turn using a 3mm Allen key.

3) Ensure the pad pressure and chipbreaker on the Top head and jointers (if fitted) on both heads are well clear of the cutterblock especially if replacing it with a larger cutting circle block.

4) Slacken off the two 12mm collar nuts (3), swing captive 'C' washers (4) clear and remove outboard bearing housing (5).

Note: The housings are spigoted and must be pulled horizontally.

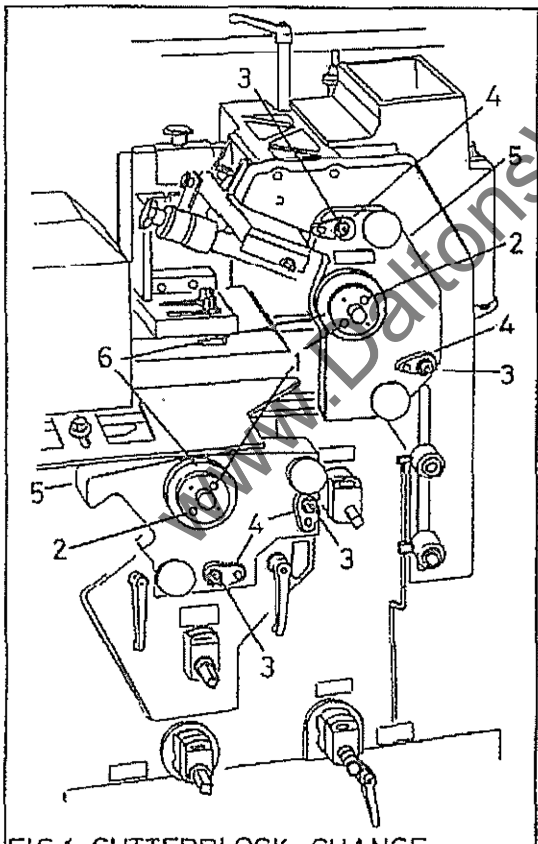

FIG 1 CUTTERBLOCK CHANGE

5) Remove cutterblock off spindle. When handling cutterblocks care should be taken to avoid injury on knife blades. The method of removal of the cutterblocks varies depending on the block type.

a) Plain Bore Cutterblock

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

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

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.

b) Hydrogrip Cutterblock with Plain Collar

Release the capscrew in the collar using an Allen key. This causes the collar to loosen its grip on the spindle and slide off.

Note: On reassembly ensure this collar is fitted with locating pins facing

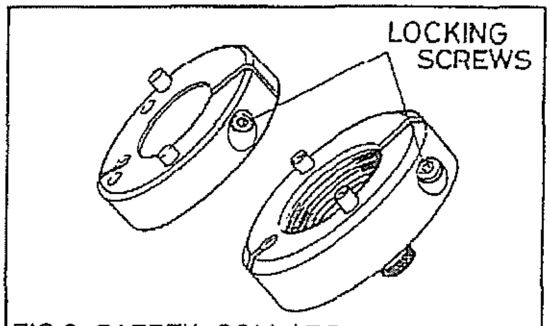

FIG 2 SAFETY COLLARS

Depressurise the hydrogrip cutterblock by turning the pressure release screw (8), located in a recess on the barrel of the cutterblock one quarter turn to release, using a 3mm A/F hexagon key.

Slide the cutterblock from the spindle.

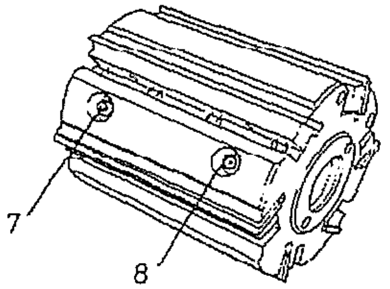

FIG 3 HYDROGRIP CUTTERBLOCK

Always leave the pressure release screw (8) undone when the cutterblock is not in use to avoid distortion to the cutterblock due to the variation in room temperatures.

c) Hydrogrip Cutterblock with Threaded Collar

Release the capscrew in the collar using an Allen key. Unscrew the two knurled headed pins until the collar itself is free to unscrew.

Note: On reassembly this collar must be screwed finger tight against the pressurised block and then, if needed, unscrewed until the pins line up with the corresponding cutterblock holes.

Depressurise the hydrogrip cutterblock by turning the pressure release screw (8), located in a recess on the barrel of the cutterblock one quarter turn to release, using a 3mm A/F hexagon key.

Slide the cutterblock from the spindle.

Always leave the pressure release screw (8) undone when the cutterblock is not in use to avoid distortion to the cutterblock due to the variation in room temeratures.

6) Before replacing cutterblock ensure spindle, spindle shoulder, shoulders of cutterblock and bores are all clean.

7) Carefully place the cutterblock on the spindle. On the hydrogrip blocks tighten pressure release screw (8), and pressurise the cutterblock by applying hydraulic pressure to the pressure nipple (7) located in a recess located on the barrel of the block (see Fig 3).

8) Fit safety collars and/or spacers as applicable. On the plain bore cutterblocks, tighten the block to the spindle with the spanner/s provided.

9) Replace bearing housing (5) and retighten captive 'C' washer (4) and collar nuts (3). Tighten pressure release valve (2) and pressurise bearing to 300 bar (4350 p.s.i) by application of hydraulic pressure to the nipple (1) in the recess on the face of the bearing. **NB.see page 10-10**

10) Rotate spindle slowly by hand to check knives are clear of chipbreaker, pad pressure etc. Replace outboard bearing cover, engage power and start head for a short period of time to ensure cutterblock is running smoothly and without vibration.

NB. Before pressurising the outboard bearing, set the bearing in the mid position of its axial adjustment, to allow for final setting of the cutter block.

MAINTENANCE

Routine Maintenance

Caution: Before proceeding with any maintenance ensure power is off at mains or at master stop.

Weekly

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 over-lubricate.

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

Centralised lubrication points at the front of the machine allows for oiling of the Top and Bottom head slidways as part of an overall oiling operation.

The slideways should be oiled at weekly intervals. Once lubricated the heads should be traversed to their maximum and minimum positions to ensure even distribution of oil and to prevent sawdust/resin 'build-up' on slideways. 'Wadkin' Grade L4 oil should be used (see **Approved Lubricants**).

Three Monthly (Fig 1)

Electric drive motors have sealed for life bearings and are maintenance free.
However the fan cowels should be removed at intervals and the fans checked for damage, excessive end float, signs of overheating etc.
If a cowl itself is damaged it should be replaced.

At the rear of the module remove the covers over the Top and Bottom head spindle pulleys. Clean and grease using Wadkin L6 grease (see **Approved Lubricants**) the spindle barrel lateral adjustment screws (1). Whilst the covers are off also check tension and condition of drive belts. The belts (2) should be capable of being depressed appoximatley 1 1/2 to 2cm per metre of span by application of average thumb pressure of 2.2 - 3.2 kgf (5-7 bf). If necessary retension (see **Vee Belt Drive Tensioning**)

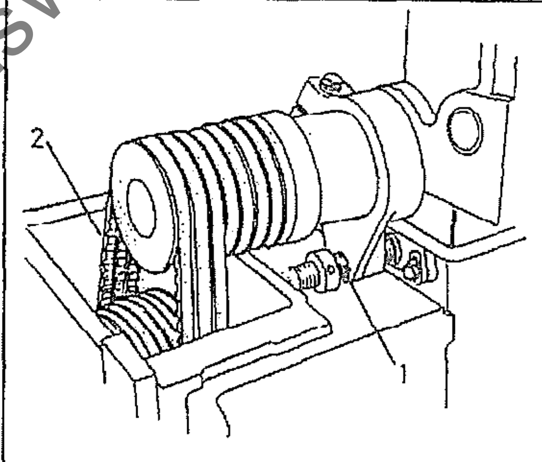

FIG 1 TRAVERSE SCREW LUBRICATION AND DRIVE BELT TENSION

Vee Belt Drive Tensioning (Fig 2)

It is important that drive belts are correctly set as insufficient tension causes slipping and premature belt wear. Too much tension causes bearing wear. The method of adjustment is as follows.

1) Isolate power at master stop or mains.

2) Remove cover to expose spindle pulley and belts (Fig 1).

3) Slacken off motor mounting plate bolts (1).

4) Tension belt by slackening the top locknut (2) and turning the bottom locknut (3) in an anti-clockwise direction.

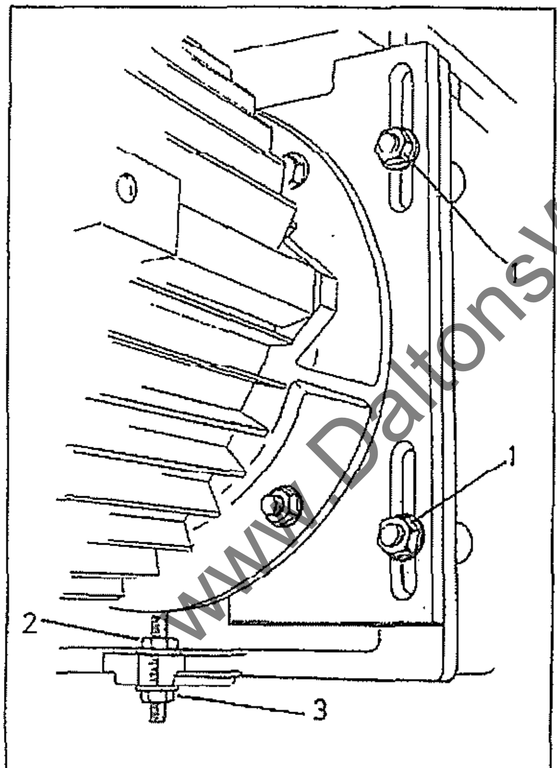

FIG 2 VEE-BELT DRIVE TENSIONING

5) When tensioned lock up both nuts (2 and 3) and motor mounting bolts (1). Refit cover and engage power

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. Always retighten any securing features fitted.

If one or more of the vee-belts becomes faulty it will usually 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.

Replacing Drive Belts (Fig 2)

Drive belts must be replaced as a set to obtain correct drive performance.

1) Isolate power at master stop or mains.

2) Remove cover.

3) Relieve tension on belts by reducing drive centres i.e. slacken off the four motor mounting bolts (1), the locknut (3) and raise the motor by rotating nut (2) in a clockwise direction.

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

5) Retension the new belt set (see **Vee Belt Tensioning**).

Note: It may at times be necessary to remove a drive pulley. The motor shaft pulleys are fitted with taper lock bushes (see fig 3). Spindle pulleys are located on tolerance rings and held on by spigot washer and screw.

Removal and Refit of 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).

2) Insert screws in jacking holes after oiling thread and point of grubscrews, or thread and head of capscrews, as applicable.

3) Tighten screws (1) alternatively 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 capscrews. 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 hxagon key, alternatively tighten screws (1) until all screws are pulled up securely. Use a short length of pipe on key to increase leverage.

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

6) Fill all empty screw holes with grease to exclude dirt.

Preparation Prior to Fitting Bearings

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

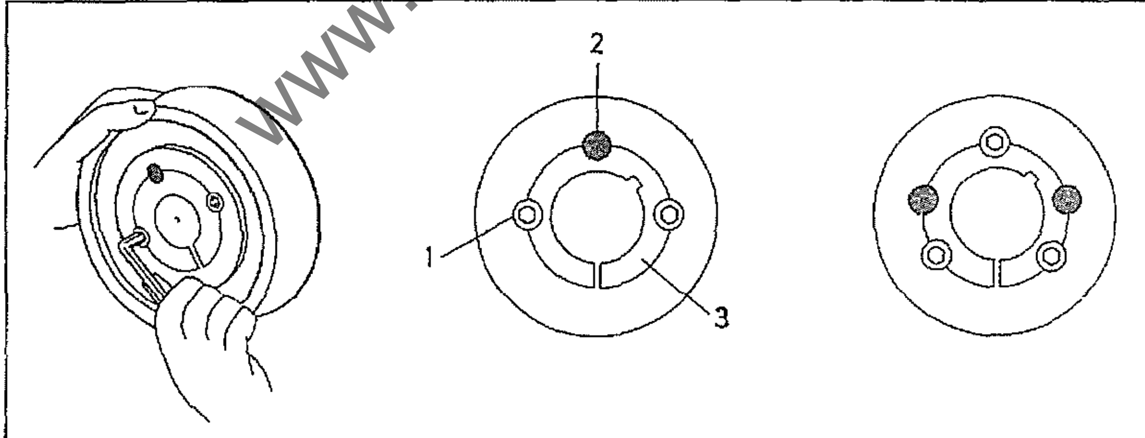

FIG 3 REMOVING A TAPER-LOCK BUSH

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.

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) = d x B x 0.1
d = bore of bearing in mm
B = width in mm

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

Outboard Bearing Change for Top and Bottom Heads (Fig 4, Fig 5)

Note: Work must take place in a clean and dry environment, failure to do so could result in premature bearing failure.

Isolate power at mains or at master stop before proceeding.

1) Remove outboard bearing assembly from machine (see **Changing Cutterblocks**).

Note: It is not necessary to remove the housing assembly (2) from the mounting place (1), unless the housing (2) has become damaged. To remove see later note **'Housing Removal'**.

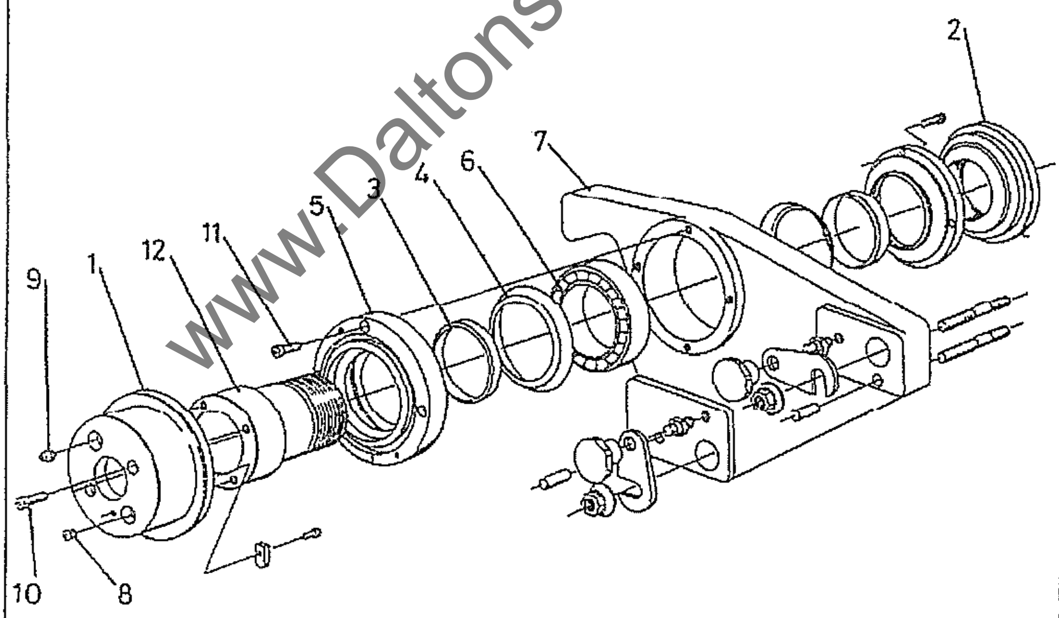

FIG 4 OUTBOARD BEARING - BOTTOM HEAD

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2) Remove 2 off grubscrew (15). Remove ETP sleeve locknut (4), remove 2 off hexagon socket capscrew (10) which will then allow the ETP end cap (5) to be withdrawn. Remove bearing locknut (3), the ETP sleeve (14) and the bearing assembly can be withdrawn from the rear of the housing (2).

3) The bearings (12) can now be removed along with the bearing spacers (6 and 7) using a bearing puller.

Note: Care must be taken not to damage the ETP sleeve (14).

4) After preparation (see **Preparation Prior to Fitting Bearings**), and lubrication. The new bearings (12) can now be fitted to the ETP sleeve (14) complete with the bearing spacers (6 and 7). Ensure that the bearings (12) are fitted the correct way round (back to back). Use only sufficient pressure to the inner ring only. Ensure that the bearing ring fits up to the location shoulder.

5) Refit ETP sleeve (14) and bearing assembly into the housing (2) ensuring that the assembly fits right up to the shoulder of the housing (2). Refit bearing locknut (3) ensuring that it is tight. Refit sleeve end cap (5) and sleeve locknut (4) insert grubscrews (15).

Note: Ensure all labyrinth seals are re-filled with grease.

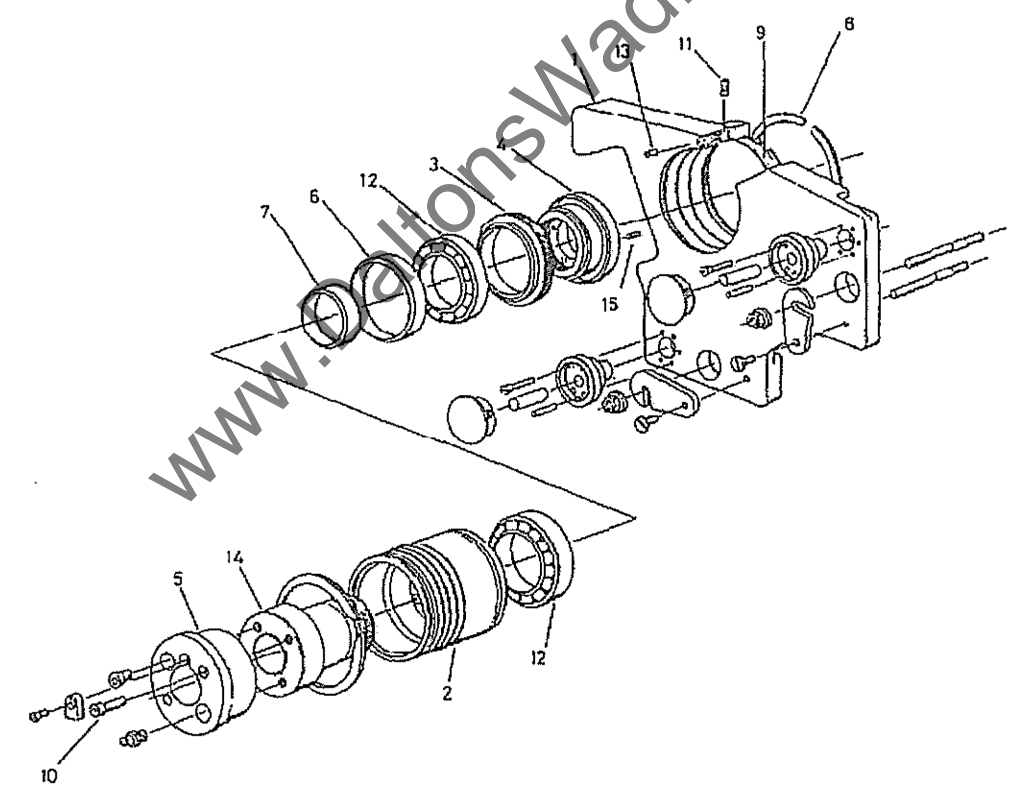

FIG 5 OUTBOARD BEARING - BOTTOM HEAD

Outboard Bearing Housing Removal - Top and Bottom Heads (Fig 4, Fig 5)

1) Remove outboard bearing assembly from machine (see **Changing Cutterblocks**).

2) Remove grubscrew (13), remove anti rotation pin (11). Remove the external circlip (8) from the rear of the housing, this will allow the housing assembly to be removed from the front of the machine. Care must be taken not to damage the housing assembly (2) or the mounting plate (1).

3) If the housing has been subject to excessive heat, the bearing tape (9) may have shrunk. Depending on the shinkage it may need to be replaced or just shimed out. When fitting new bearing tape the edges should be 'feathered' at the joint.

4) To refit the housing reverse the previous steps. Re-assembly will be aided by smearing the bore of the housing plate (1) with oil.

Note: Care must be taken when re-assembly not to damage the tape strip (9) in the housing plate (1).

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER

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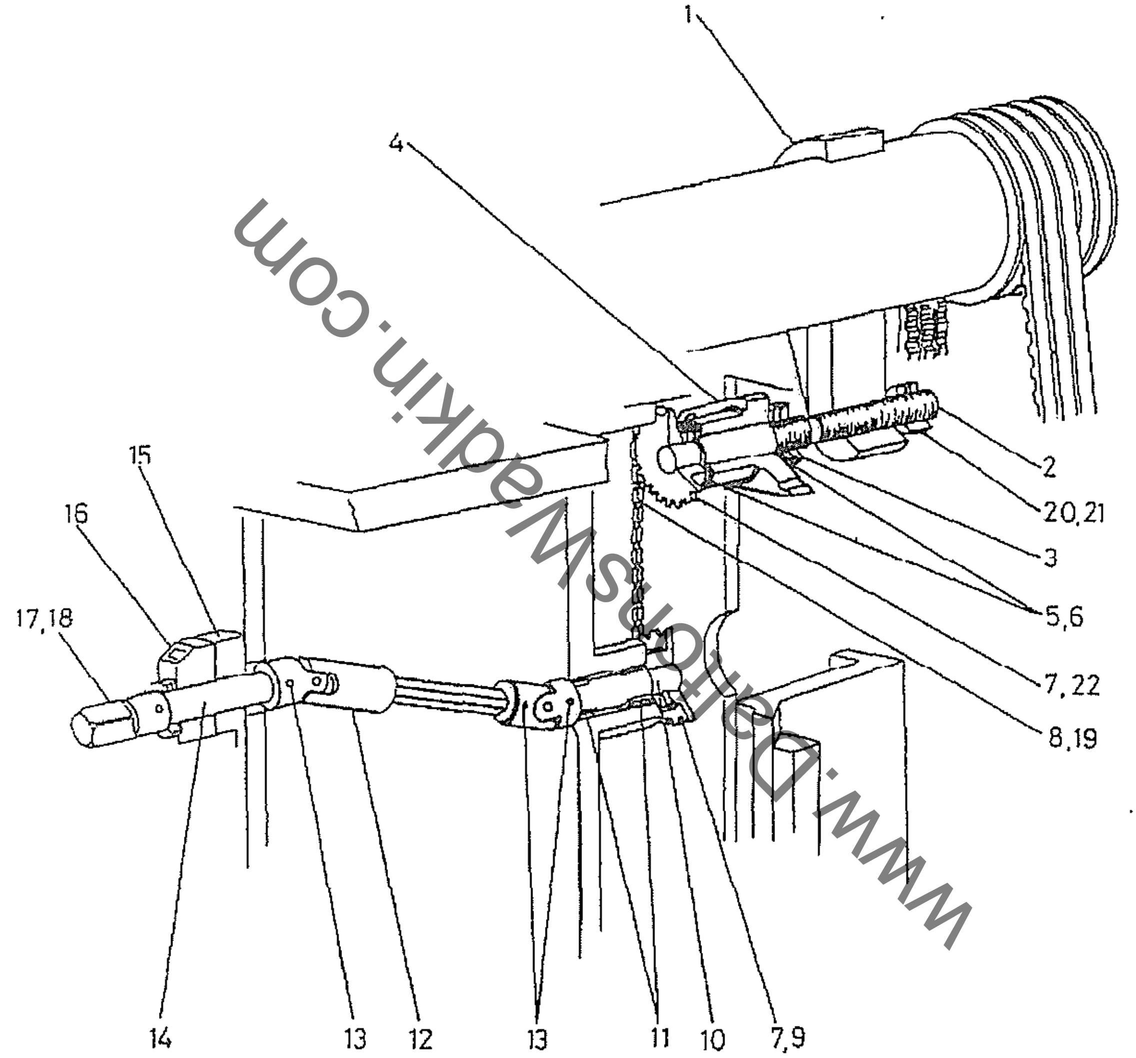

FIG 1 TOP HEAD AXIAL ADJUSTMENT

1. TOP HEAD 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 nut	2
4.	Bearing bracket for horizontal head adjustment	1
5.	'INA' Thrust bearing AXK 2542	2
6.	'INA' Thrust washer AS 2542	4
7.	Sprocket for horizontal head axial adjustment	2
8.	'RENOLD' Roller chain No. 111046 12.9mm (1/2") pitch, 40 pitches	1
9.	No. 4 Taper pin	1
10.	Shaft	1
11.	20mm I/D x 25mm O/D x 20mm long bronze bush	2
12.	Universal coupling with 12mm A/F telscopic shaft	1
13.	6mm dia. x 24mm long Tension pin	1
14.	Shaft for horizontal head cross adjustment	1
15.	Bearing block	1
16.	Digital readout	1
17.	Square shaft extension	1
18.	Taper pin No.1	1
19.	Chain connector link	1
20.	Threaded collar M20 Trapezoidal	1
21.	Hexagon socket grubscrew M8 x 8mm long	2
22.	6mm dia. x 40mm long Tension pin	1

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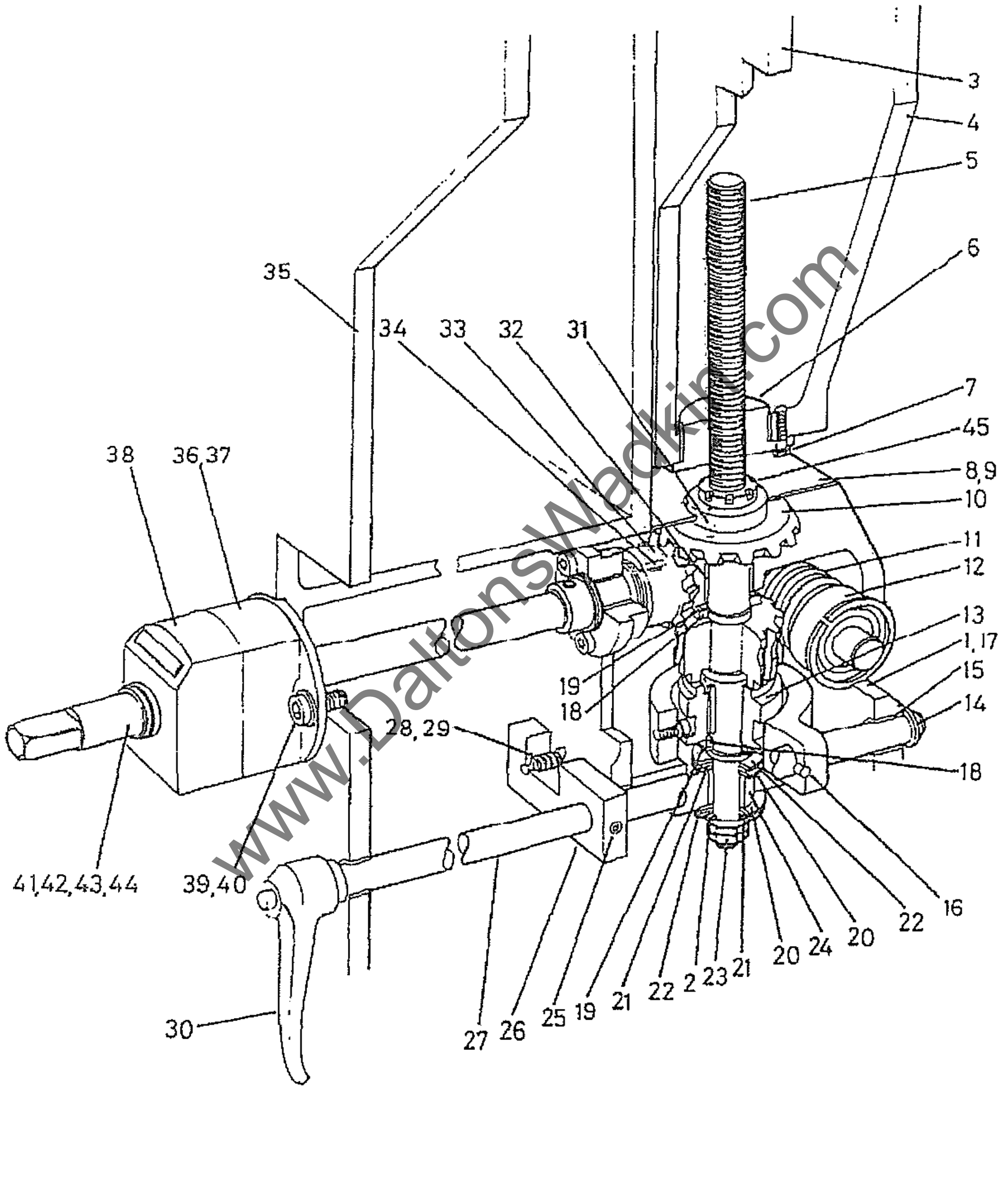


FIG 2 TOP HEAD POWER RISE AND FALL

2. TOP HEAD POWER RISE AND FALL

Ref No.	Description	No Off.
1.	Socket head capscrew M12 x 30mm long	4
2.	Plain washer M16	1
3.	Slide strip	1
4.	Top head vertical slide	1
5.	Vertical rise and fall screw	1
6.	Nut for rise and fall screw	1
7.	Hexagon head setscrew M8 x 25mm long	2
8.	Top cover	1
9.	Hexagon socket capscrew M6 x 8mm long	4
10.	Bevel gear	1
11.	Worm gear	1
12.	Bearing 'SKF' 6204 RS	2
13.	Dog clutch	1
14.	External circlip 16mm dia.	2
15.	Bronze bush 20mm O/D x 16mm I/D x 16mm long	2
16.	Tension pin 6mm dia. x 32mm long	1
17.	Gearbox/clutch housing	1
18.	Clutch spacer washer	2
19.	External circlip 30mm dia.	2
20.	Thrust washer 'INA' AS 2542	2
21.	Thrust bearing 'INA' AXK 2542	2
22.	Shaft washer 'INA' WS 2542	2
23.	Locknut M16	2
24.	Bronze bush 30mm O/D x 25mm I/D x 20mm long	1
25.	Hexagon socket grubscrew M6 x 10mm long	1
26.	Clutch location arm	1
27.	Clutch adjusting shaft	1
28.	Spring for spindle lock	1
29.	Stell ball 10mm dia.	1
30.	Locking handle M10 x 25mm male	1
31.	Parallel key 8mm x 7mm x 14mm long	1
32.	Bronze bush 35mm O/D x 30mm I/D x 20mm long	1
33.	Bevel gear	1
34.	Parallel key 5mm x 5mm x 20mm long	1
35.	Main frame	1
36.	Bearing bracket	1
37.	Bronze bush 25mm O/D x 20mm I/D x 15mm long	2
38.	'SIKO' digital readout 0902E 2mm	1
39.	Hexagon socket capscrew M6 x 20mm long	2
40.	Plain washer M6	2
41.	Square end shaft extension	1
42.	Taper pin No 1	1
43. +	Compression spring	1
44.	External circlip 25mm dia.	1
45.	Notch nut M24 x 1.5mm	1

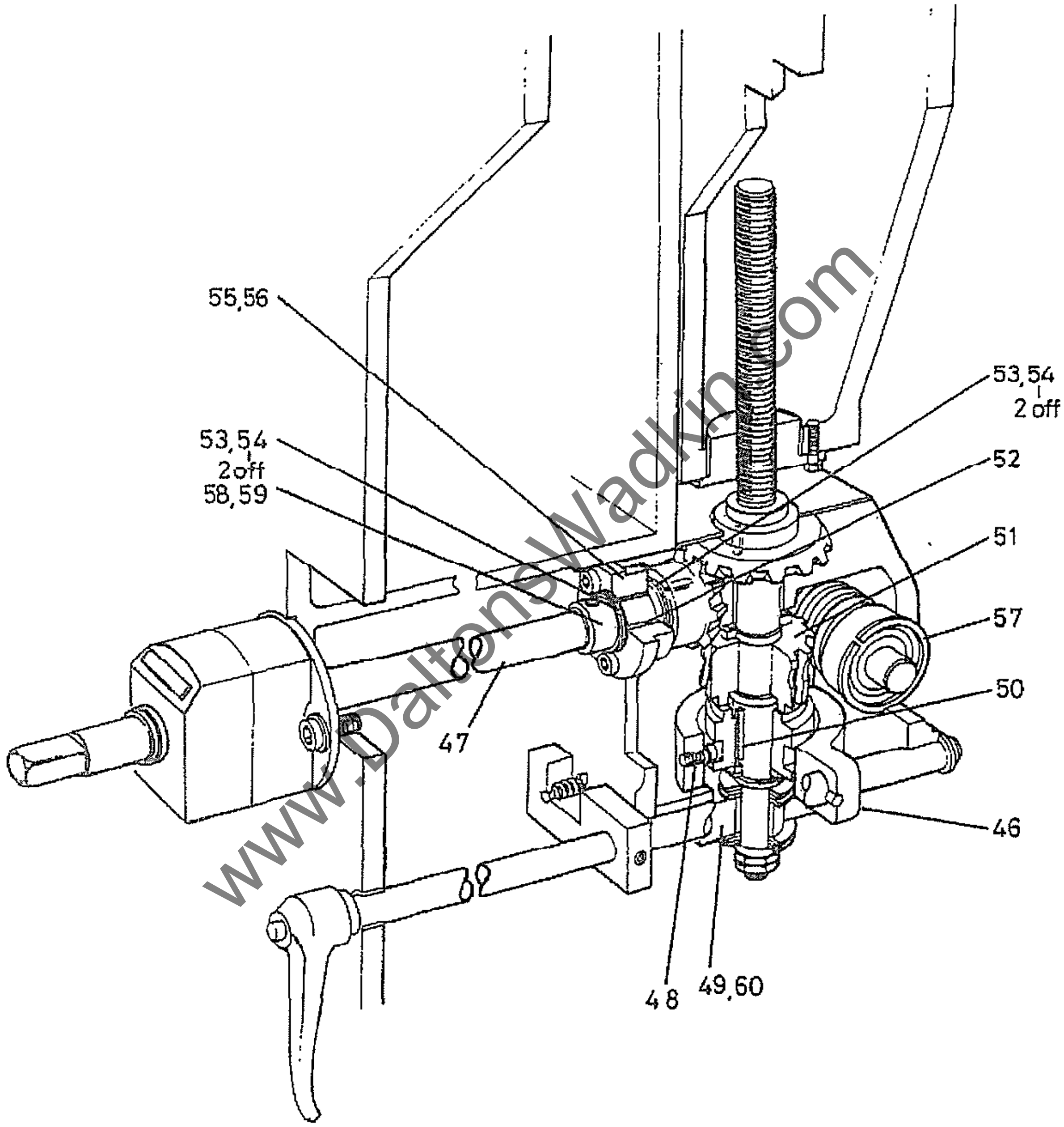


FIG 2 TOP HEAD POWER RISE AND FALL

2. TOP HEAD POWER RISE AND FALL (CONT...)

Ref No.	Description	No Off.
46.	Clutch yoke	1
47.	Adjusting shaft	1
48.	Hexagon socket capscrew M6 x 10mm long	2
49.	Bottom cover	1
50.	Parallel key 8mm x 7mm x 32mm long	1
51.	Worm wheel	1
52.	Bronze bush 25mm O/D x 20mm I/D x 25mm long	1
53.	Thrust bearing 'INA' AXK 2035	2
54.	Thrust washer 'INA' AS 2035	4
55.	End cap	1
56.	Hexagon socket capscrew M6 x 20mm long	3
57.	Internal circlip 47mm dia.	2
58.	Collar 32mm O/D x 20mm I/D x 14mm	1
59.	Hexagon socket grubscrew M6 x 6mm long	1
60.	Hexagon socket capscrew M8 x 16mm long	4

\+ Not illustrated

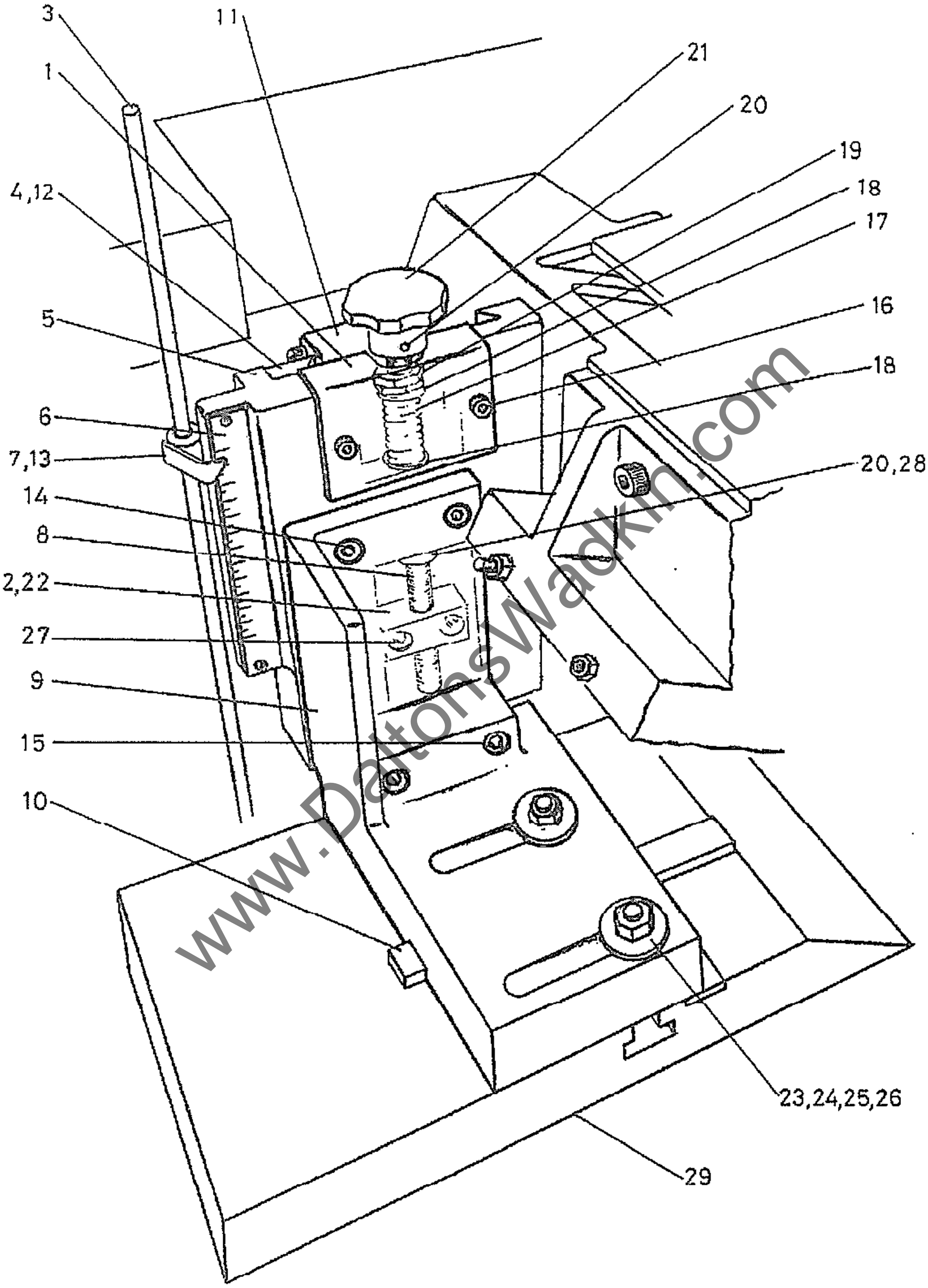
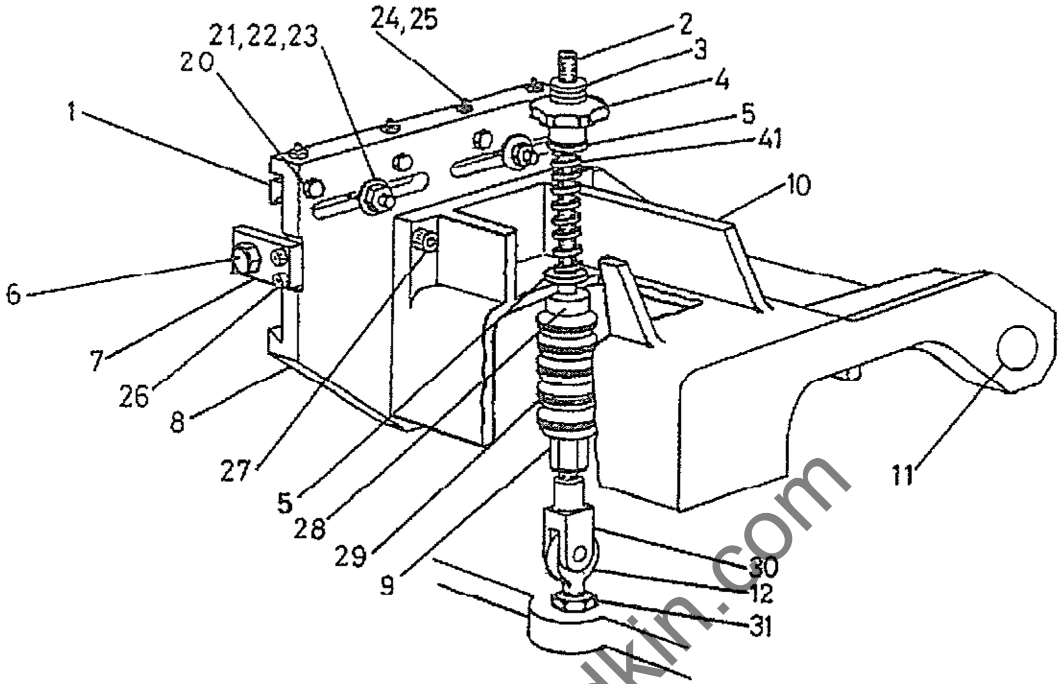


FIG 3 TOP HEAD PRESSURE PAD

3. PAD PRESSURE AFTER TOP HEAD

Ref No.	Description	No Off.
1.	Cover for top head pressure spring	1
2.	Nut for top head pressure adjustment	1
3.	Pointer support first top head	1
OR	Pointer support second top head	1
4.	Wear strip	1
5.	Saddle for top head pressure	1
6.	0-130mm Metric scale	1
7.	Pointer	1
8.	Screw for top head pressure adjustment	1
9.	Bracket for mounting top head pressure pad	1
10.	Cross tenon	1
11.	Slide for top head pressure	1
12.	Hexagon head setscrew	4
13.	Hexagon socket grubscrew M6 x 6mm long	1
14.	Hexagon socket capscrew M10 x 16mm long	2
15.	Hexagon socket capscrew M10 x 50mm long	2
16.	Hexagon socket capscrew M6 x 10mm long	2
17.	Compression spring 'Flexo' 283816	1
18.	Thrust washer 'INA' AS 1226	2
19.	Locknut M12	2
20.	Taper pin	2
21.	Handwheel M12	1
22.	Helicoil insert M12	1
23.	Tee nut 'WDS' 664203	2
24.	Stud M10 x 65mm long	2
25.	Nut M10	2
26.	Plain large washer M10	2
27.	Hexagon socket capscrew M8 x 20mm long	2
28.	Collar	1
29.	Pad pressure shoe	
OR	Pad pressure shoe for splitting/counter profiling — for machine with one top head only	
OR	Pad pressure shoe Pad pressure shoe for dia. 125 cutting circle — for machine with two or more top heads	
OR	Pad pressure shoe for soft pads (optional)	



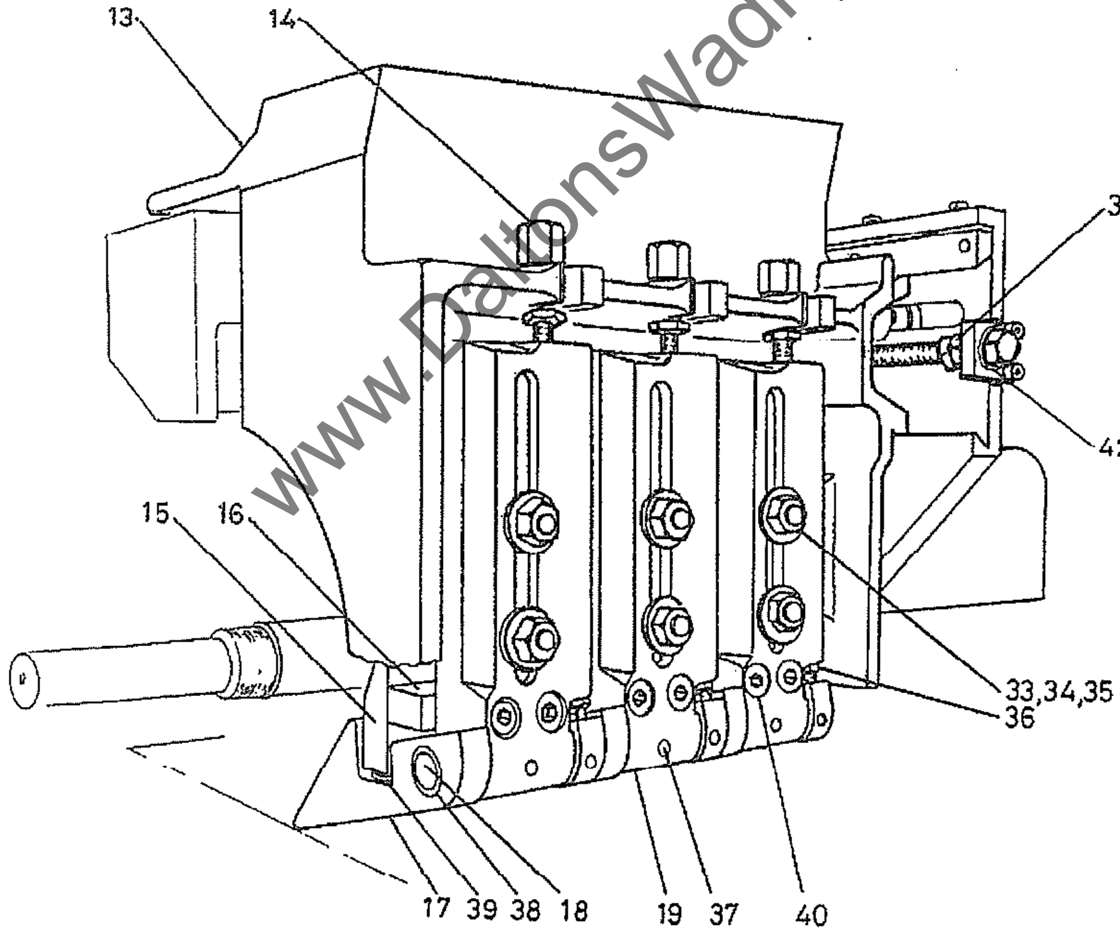


FIG 4 TOP HEAD CHIPBREAKER

4. TOP HEAD CHIPBREAKER MK III

Ref No.	Description	No Off.
1.	Wear strip	1
2.	Screw	1
3.	Thumb nut 'WDS' 614-204	1
4.	Hand knob	1
5.	Cap for tension spring	2
6.	Adjusting screw	1
7.	Plate for adjusting screw	1
8.	Swing for chipbreaker (front)	1
9.	Stop for top head chipbreaker	1
10.	Swing for chipbreaker (rear)	1
11.	Shaft for chipbreaker pivot	1
12.	Eye bolt	1
13.	Hood for chipbreaker carrier	1
14.	Adjusting screw for top chipbreaker	3
15.	Baffle/spring housing	3
16.	Block for spacing baffle	3
17.	Shoe for chipbreaker	3
18.	Pin for chipbreaker shoe pivot	3
19.	Bracket for mounting chipbreaker shoe	3
20.	Hexagon head setscrew M8 x 20mm long	4
21.	Stud M12 x 50mm long	2
22.	Large washer M12	2
23.	Nut M12	2
24.	Hexagon head grubscrew M6 x 20mm long	4
25.	Locknut M6	4
26.	Hexagon socket capscrew M6 x 16mm long	2
27.	Hexagon socket capscrew M12 x 30mm long	4
28.	Collar 40mm O/D x 25mm I/D x 16mm wide	1
29.	Disc springs 50mm O/D x 25.4mm I/D x 1.5	10
30.	Rod clevis 'Festo' SG M12	1
31.	Nut M12	1
32.	Lock screw M12	2
33.	Stud M12 x 65mm long	6
34.	Washer M12	6
35.	Nut M12	6
36.	Hexagon head setscrew M6 x 30mm long	3
37.	Hexagon socket grubscrew M6 x 10mm long	3
38.	Oilite bronze bush 20mm O/D x 16mm I/D x 12mm long	6
39.	Compression spring	1
40.	Hexagon socket capscrew M10 x 60mm long	6
41.	Compression spring 135mm long x 28.2 O/D x 21.8 I/D	1
42.	Thrust washer 'INA' AS 1226	2

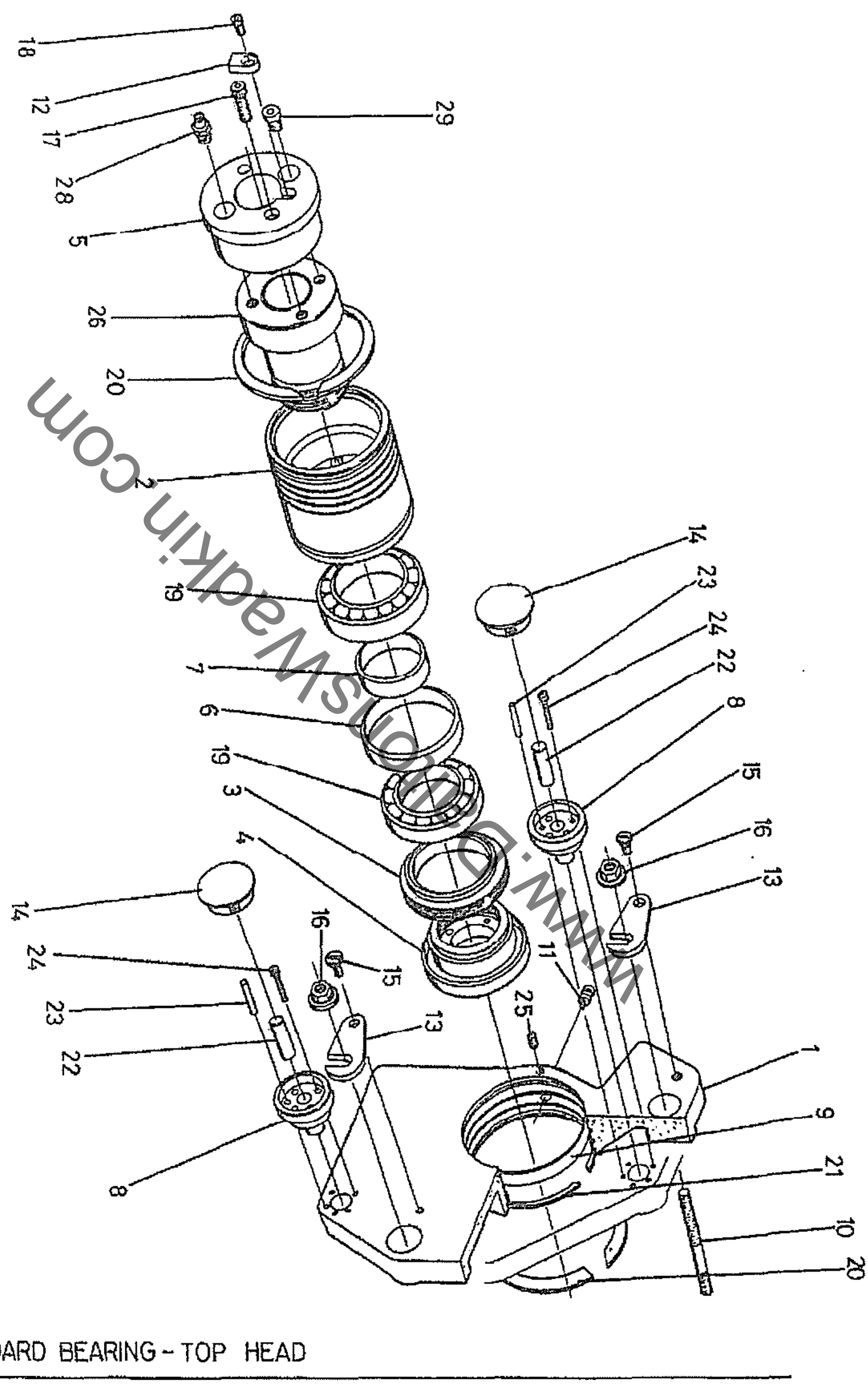


FIG 5 OUTBOARD BEARING - TOP HEAD

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5. OUTBOARD BEARING - MK 111 TOP HEAD

Ref No.	Description	No Off.
1.	Plate for mounting outboard bearing housing	1
2.	Housing for adjustable outboard bearing	1
3.	Locknut for outboard bearing housing	1
4.	Locknut for hydrogrip sleeve	1
5.	End cap for hydro grip sleeve	1
6.	Outer bearing spacer } supplied as matched	1
7.	Inner bearing spacer } pair	1
8.	knob for outboard location	2
9.	Tape strip for outboard bearing housing	2
10.	Stud for outboard bearing plate	1
11.	Anti rotation pin for housing	1
12.	Drive key	1
13.	'C' Washer	2
14.	DP 2000, 2783 black plug	2
15.	Shoulder screw 'WDS' 615-203	2
16.	Collar nut 'WDS' 404-204 M12	2
17.	Hexagon socket capscrew M5 x 12mm long	2
18.	Hexagon socket capscrew M3 x 12mm long	1
19.	'RHP' bearing 7911 x 2TAU EP7	2
20.	'INA' external circlip WR95	2
21.	'INA' internal snap ring BR100	4
22.	Plain dowel dia. 12 x 45mm long	2
23.	Tension pin dia. 6 x 32mm long	4
24.	Hexagon socket capscrew M6 x 30mm long	6
25.	Hexagon socket grubscrew M6 x 16mm long	1
26.	ETP sleeve (less front plate)	1
27.	Pressure relieve valve } items only supplied	1
28.	Grease nipple } with ETP sleeve	1

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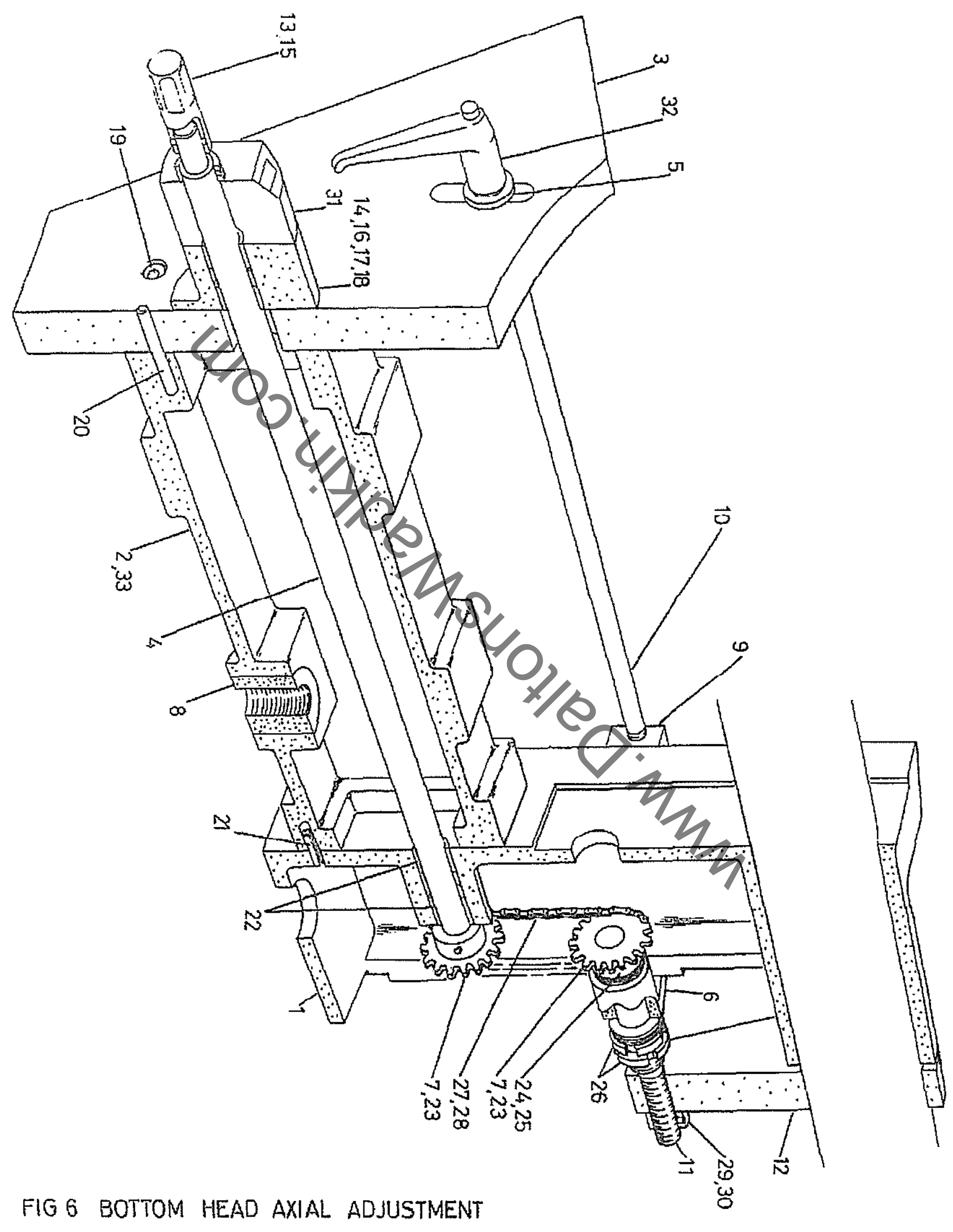

FIG 6 BOTTOM HEAD AXIAL ADJUSTMENT

6. BOTTOM HEAD AXIAL ADJUSTMENT

Ref No.	Description	No Off.
1.	Bottom head vertical slide	1
2.	Stretcher for bottom head	1
3.	Front plate	1
4.	Axial adjustment shaft	1
5.	Clamping washer	2
6.	Bearing bracket	1
7.	Chain sprocket	2
8.	Nut for bottom head rise and fall	1
9.	Locking pad for slide	1
10.	Shaft for bottom head clamping	1
11.	Sprocket shaft for axial adjustment	1
12.	Barrel clamping nut for axial adjustment	1
13.	Square end shaft extension	1
14.	Bracket for axial shaft bearings	1
15.	No 1 Taper pin	1
16.	Hexagon socket capscrew M8 x 25mm long	2
17.	Plain washer M8	2
18.	Bush 25mm O/D x 20mm I/D x 15mm long	2
19.	Hexagon socket capscrew M10 x 25mm long	4
20.	Dowel 8mm diameter x 40mm long	2
21.	Tension pin 8mm diameter x 35mm long	2
22.	Bush 25mm O/D x 20mm I/D x 20mm long	2
23.	Taper pin No 4	2
24.	'INA' Thrust bearing AXK - 2542	2
25.	'INA' Thrust AS 2542	4
26.	Notch nut M24 x 1.5mm pitch	2
27.	Chain connecting link No 26	1
28.	'Reynold' chain 1/2" pitch x 39 pitches	1
29.	Threaded collar M20 trapezodial	1
30.	Hexagon socket grubscrew M8 x 8mm long	1
31.	'SIKO' position indicator 0902E 4mm	1
32.	Locking handle M12	2
33.	Hexagon socket capscrew M10 x 30mm long (stretcher to side fastening)	4

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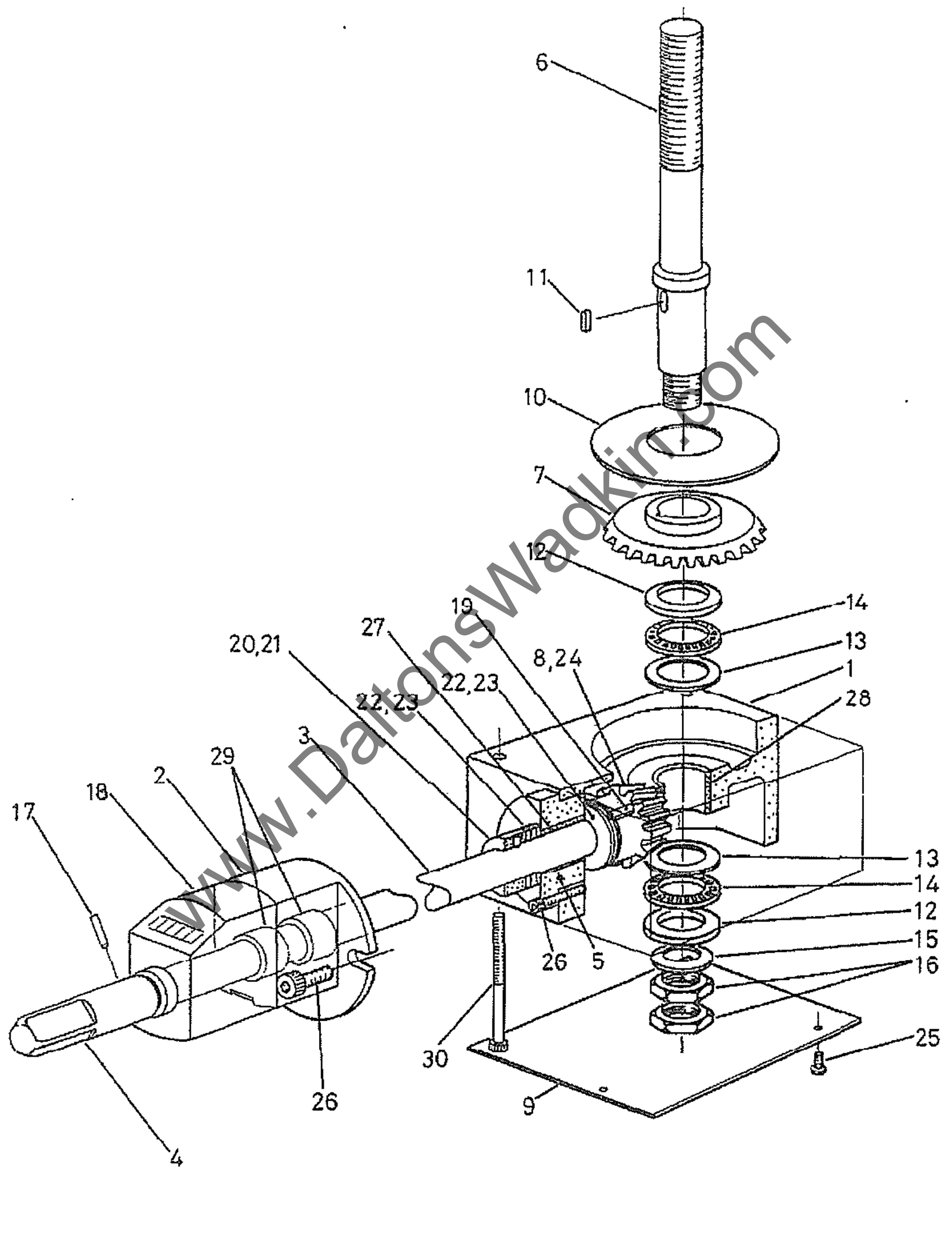

FIG 7 BOTTOM HEAD RISE AND FALL

7. BOTTOM HEAD - RISE AND FALL ADJUSTMENT

Ref No.	Description	No Off.
1.	Bevel box for bottom head adjustment	1
2.	Bracket for cross shaft bearing	1
3.	Cross shaft for bottom head rise and fall	1
4.	Square end shaft extension	1
5.	End cap for rise and fall bevel box	1
6.	Screw for bottom head rise and fall	1
7.	Bevel gear for rise and fall	1
8.	Bevel gear for rise and fall	1
9.	Cover for bevel box	1
10.	Sealing ring	1
11.	Key 8mm x 7mm x 20mm	1
12.	'INA' Shaft washer WS 81105	2
13.	'INA' Thrust washer AS 2542	2
14.	'INA' Thrust bearing AXK 2542	2
15.	Plain washer M16	1
16.	Hexagon lock nut M16	2
17.	Taper pin	1
18.	Siko position unicator 09011 2mm	1
19.	Key 5mm x 5mm x 20mm	1
20.	Collar dia. 20mm bore	1
21.	Hexagon socket grubscrew M6 x 6mm long	1
22.	'INA' Thrust washer AS 2035	4
23.	'INA' Thrust bearing AXK 2035	2
24.	External circlip dia. 16mm	1
25.	Pan head screw M4 x 10mm long	3
26.	Hexagon socket capscrew M6 x 20mm long	3
27.	Bush 25mm O/D x 20mm I/D x 25mm long	1
28.	Bush 30mm O/D x 25mm I/D x 25mm long	1
29.	Bush 25mm O/D x 20mm I/D x 15mm long	2
30.	Hexagon socket capscrew M6 x 75mm long	4

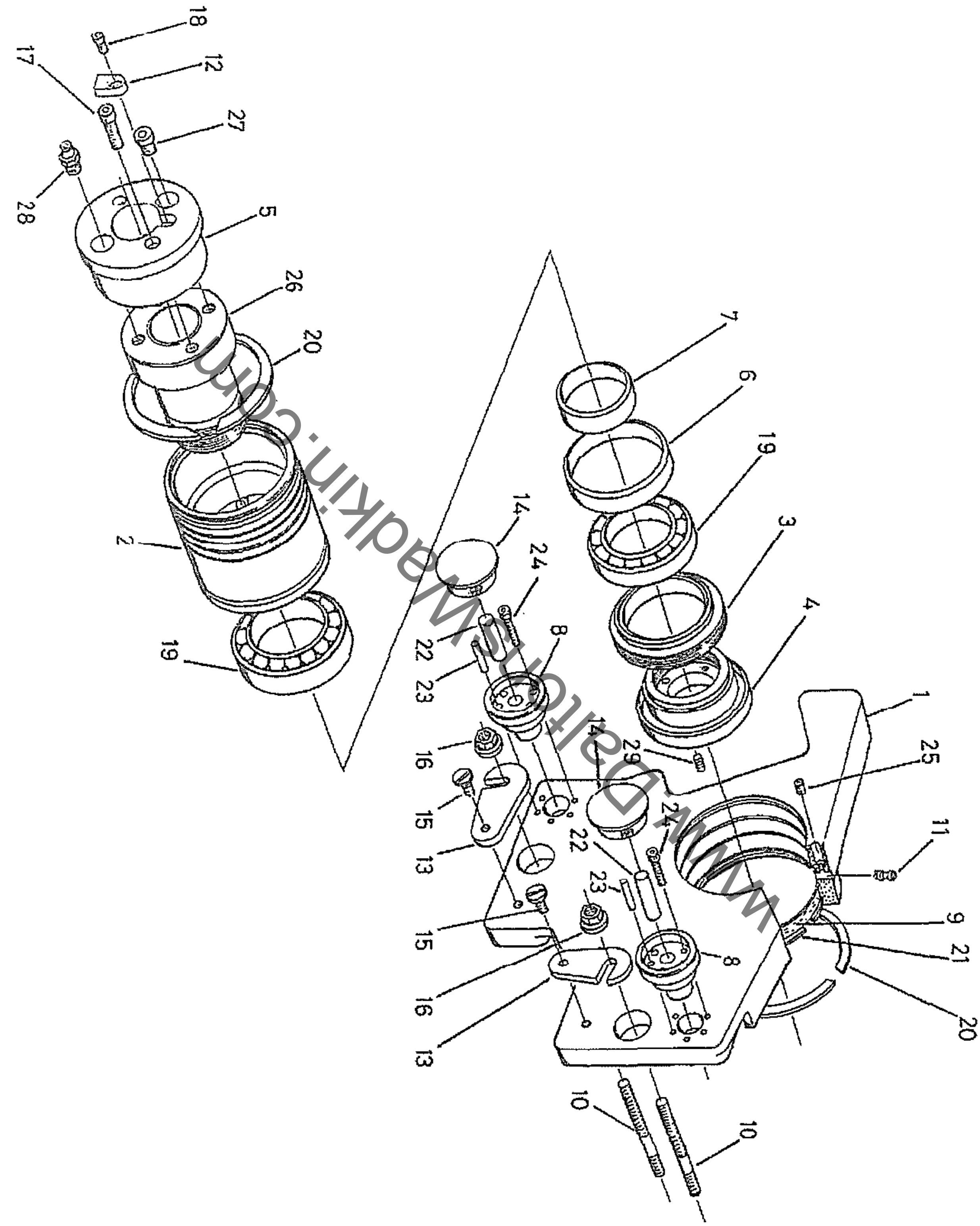

FIG 8 OUTBOARD BEARING - BOTTOM HEAD

8. OUTBOARD BEARING - BOTTOM HEAD

Ref No.	Description	No Off.
1.	Plate for mounting outboard bearing housing	1
2.	Housing for adjustable outboard bearing	1
3.	Locknut for outboard bearing housing	1
4.	Locknut for hydrogrip sleeve	1
5.	End cap for hydrogrip sleeve	1
6.	Outer bearing spacer } supplied as matched	1
7.	Inner bearing spacer } pair	1
8.	Knob for outboard bearing location	2
9.	Tape strip for outboard bearing housing	2
10.	Stud for outboard bearing plate	1
11.	Anti rotation pin for housing	1
12.	Drive key	1
13.	'C' Washer	2
14.	DP 2000, 2783 Black plug	2
15.	Shoulder screw 'WDS' 615-203	2
16.	Collar nut 'WDS' 404-204 M12	2
17.	Hexagon socket capscrew M5 x 12mm long	2
18.	Hexagon socket capscrew M3 x 12mm long	1
19.	'RHP' bearing 7911 x 2 TAU EP7	2
20.	'INA' External circlip WR95	2
21.	'INA' Internal snap ring BR 100	4
22.	Plain dowel dia. 12 x 45mm long	2
23.	Tension pin dia. 6 x 32mm long	4
24.	Hexagon socket capscrew M6 x 30mm long	6
25.	Hexagon socket grubscrew M6 x 16mm long	1
26.	ETP sleeve (less front plate)	1
27.	Pressure relieve valve } items only supplied	1
28.	Grease nipple } with ETP sleeve	1
29.	Hexagon socket grub screw M6 x 10mm long	1

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SECTION 11 UNIT G SPLITTING HEAD MODULE

General

This unit comprises of a heavy duty keyed spindle with a plain Tufnol outboard for easy axial adjustment. The drive may be transmitted by either a heavy duty toothed belt or by a number of vee belts. Also included is an anti-kick back device, top pad pressure, riving knife guides and an outfeed driven bottom/top roller combination.

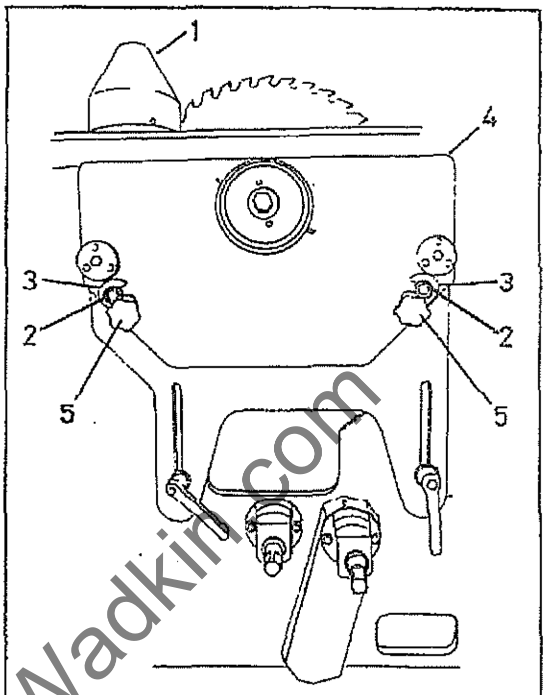

FIG 1 REMOVING OUTBOARD PLATE

Replacing/setting of saws (Fig. 1)

1) Adjust vertical setting of saw until blades are below bed level (see **vertical saw adjustment**). Isolate power at master stop.

2) Remove outboard dust cover (1) - (shown removed in illustration). This is a snap fit and can be pulled horizontally off.

3) Slacken off the locking nuts (2).

4) Pivot 'C' washers (3) clear.

5) Remove the outboard plate (4) using handles (5).
Note: The outboard plate has locating pins fitted and therefore must be pulled horizontally off, taking care not to let the weight of the plate rest on the end of the spindle.

6) The spindle sleeve unit comprising of the sleeve saws, spacers and lock ring can be removed by unscrewing the sleeve locknut (left hand thread).

When units are 'built up' off the machine, the sleeve should be mounted on some sort of mandrel to avoid the saw teeth resting on a bench.

7) Clean the spindle before refitting the new/reset sleeve unit.

8) Replace the sleeve locknut onto the spindle and retighten. Refit the outboard plate by reversing the removal procedure. Re position conical cover and restore power.

Vertical saw adjustment (Fig.2)

1) Ensure power is isolated.

2) Release lock handles (1).

3) Turn the adjustment screw (2) to raise and lower spindle.

4) When in the desired position fasten lock handles.

5) If no further adjustments are required re-engage power.

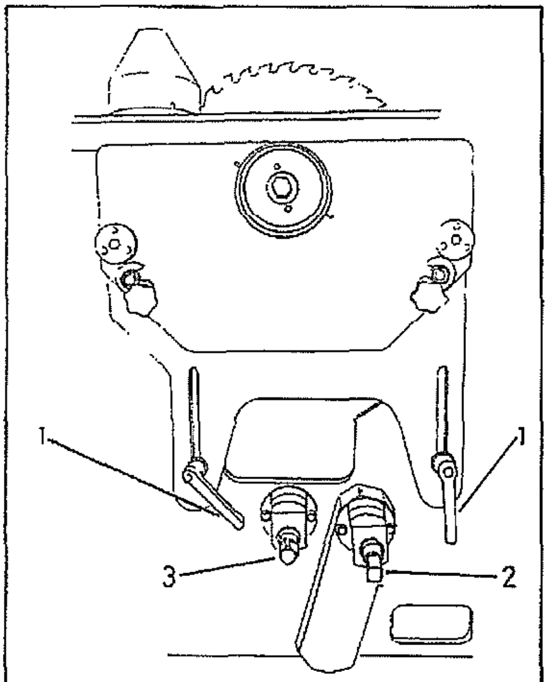

FIG 2 SAW ADJUSTMENT

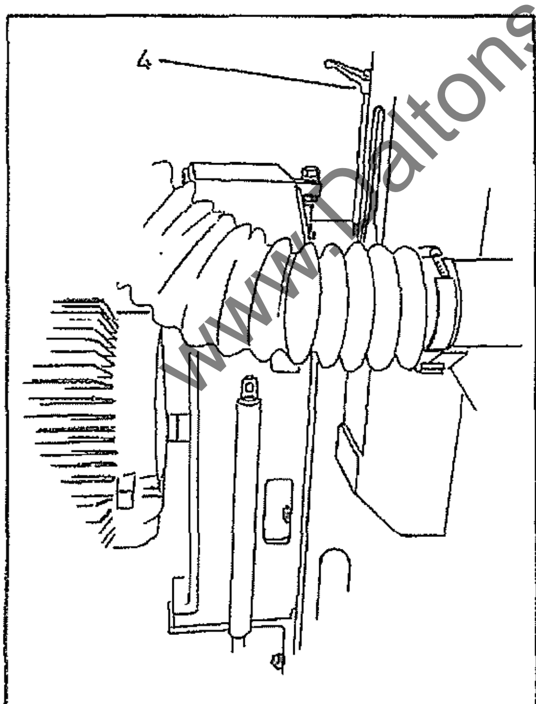

FIG 3 LATERAL ADJUSTMENT LOCK

Lateral saw adjustment (Fig.2, Fig.3)

1) Isolate power at master stop or mains.

2) Release the spindle barrel lock (4) at the rear of the unit.

3) Using the adjusting screw (3) position the saws to suit job requirements.

4) Tighten lock (4) and re-engage power if adjustments are finalised.

Anti-kick back fingers (Fig.4)

These fingers (1) are normally in the down position, but may be raised to aid setting up, cleaning etc. To raise the fingers pull back on the lever (2) until the finger frame hits the stops (3), then tighten locking handle (4) to hold in this position.

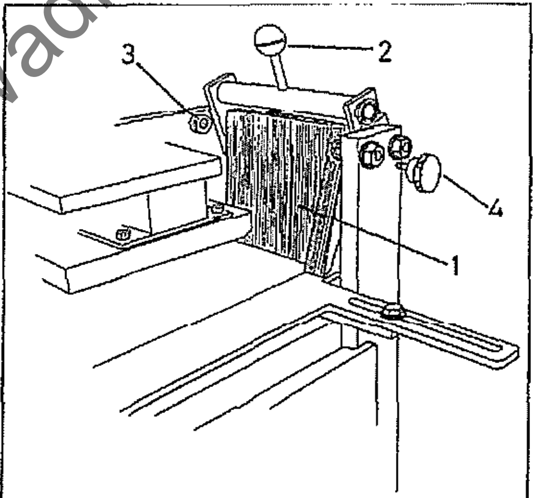

FIG 4 ANTI-KICK BACK FINGERS

Adjustment of top pad pressure and riving knives (Fig.5)

The mounting bracket (1) for the pad and riving knives is factory set to be parallel to the bed. However, if it should need adjusting/resetting, it may be carried out by slackening off the four mounting bolts (2) and by placing a spirit level (3) as shown, adjust the pitch by means of the two set screws (4).

1) Isolate power at master stop.

2) Release adjustment screw lock (5).

3) Turn adjustment screw (6) to lower pad to timber thickness (the pad should only lightly rub on the timber).

4) Tighten screw lock (5).

5) The riving knives should only be set when running through a test piece.

a. Inch the timber through saws and stop before knives.

b. Isolate power at master stop.

c. Release locking screws (7) and line knives up by sight.

d. Engage power and inch timber until knives are engaged approximately 150mm.

e. Isolate power.

f. Tighten locking screws (7).

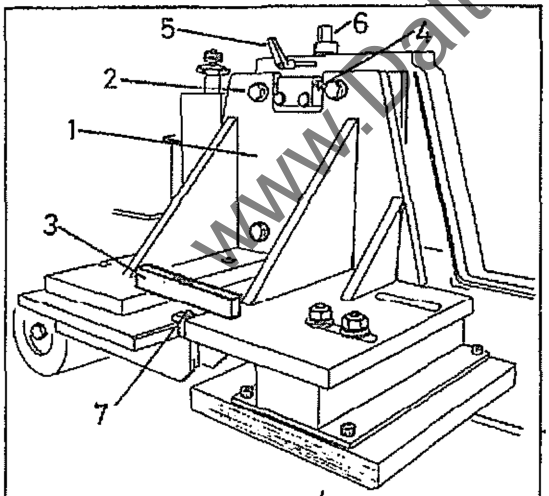

FIG 5 PAD PRESSURE/RIVING KNIVES

Machining permali bedplate and top pad pressure

The bedplate as supplied is solid and should be machined to suit customers needs.

1) With the power isolated and bedplate off position spindle by setting the distance from fence to the first sawblade, i.e. the blade nearest the fence, to correspond to the machining requirements. If the sleeve unit was set up correctly, then all the saws should now be in position.

2) Adjust the pad pressure to suit timber thickness.

3) Lower the saws - approximately 30mm below bed level.

4) Replace and secure bedplate.

5) The machining should be carried out when the first test piece is passed through. This test piece should be inched through and stopped over the saw.

Using the vertical adjustment screw, then raise the saws slowly through the bed and test piece until they cut approximately 0.1mm to 0.5mm into the permali top pad.

Slide guide setting

The slide guide is adjusted by slackening the two set screws and adjusting to timber width. The guide should only gently rub the timber. Adjustment should be carried out with the power isolated. After setting, tighten the screws.

MAINTENANCE

Routine maintenance

Before proceeding with any maintenance, ensure power is isolated at mains or at master stop.

Weekly

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 over-lubricate.

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

Oil lubrication points are found at the lower left hand front of the unit (lubricates head slides) and in front of the top pad pressure adjusting screw (lubricates slides for pad pressure/riving knives). Once lubricated, they should be adjusted into their maximum and minimum positions to ensure even distribution of oil and to prevent saw dust /resin 'build-up'. Use Wadkin Grade L4 oil (see **Approved Lubricants**).

Three monthly

Electric drive motors have sealed for life bearings and are maintenance free. However, the fan cowls should be removed at intervals and the fans checked for damage, excessive end float and signs of overheating. If a cowl itself is damaged, it should be replaced.

Check the tension and condition of the drive belts. They should be capable of being depressed approximately 1.5 - 2 c.m. per metre of span by application of average thumb pressure of 2.2 - 3.2 kgf (5-7 lbf).

Retension if necessary (see **drive belt tensioning**).

Oil chain drives at rear for the axial adjustment and at the front for vertical adjustment using Wadkin Grade L4 oil.

Preparation prior to fitting bearings.

Before fitting a new bearing, the protection 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 provid protection for the bearing until charged with lubricant.

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

G (weight in grams) = d x B x 0.01
d - bore of bearing in mm
B = width in mm

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

Changing cutterblock spindle bearings (Fig.1, Fig.2).

The bearings have been fitted to the cutterblock spindles in an orthodox manner. At the non-drive end of the spindle a liquid engineering adhesive ('Loctite'grade 241) has been applied to the internal thread diameter of the spindle locknut (2).

To disassemble 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.

Note: Work must take place in a clean and dry environment, failure to do so could result in premature bearing failure.

1) Remove the pulley (11) from end of spindle (12). Depending on type of belt drive the method of removal varies.

'V' belt

a) Unscrew and remove set screw (10) and washer ( ).

b) Remove pulley.

Timing belt

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

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

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

d. Remove pulley assembly from shaft.

2) Unscrew spindle locknut (5) and barrel locknut (6) from both ends of the spindle barrel. A spacer (8) is also fitted at the pulley end.
Note: The spindle locknut (5) has a left hand thread.

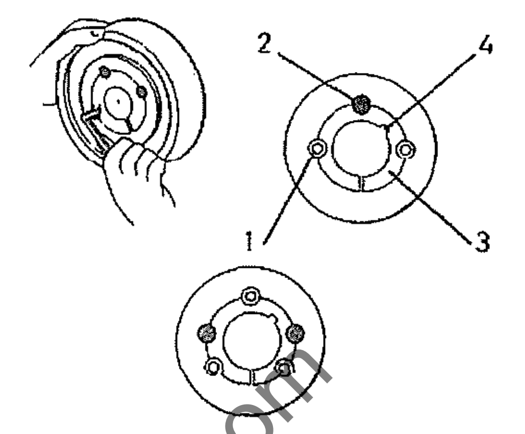

FIG 1 REMOVING A TAPER-LOCK BUSH

3) Using a soft faced mallet or press, drive the spindle out of the saw sleeve end of the barrel. One set of matched bearings, fitted to the spindle, will also be removed from the barrel at the same time. These will need to be separated from the spindle and replaced with new ones.

4) Using a suitable drive or bearing puller, and taking care not to damage the barrel, remove the remaining set of bearings from the pulley end of the barrel.

5) After preparation fit new bearings (7) to spindle and barrel ensuring that they are fitted as a pair back to back. Use only sufficient pressure to fit bearings applying pressure to the inner rings only. Check that bearings fit up to location shoulders.

6) Refit locknuts (5) and (6) and spacer (8).

7) Refit and secure pulley.
When fitting the timing belt pulley, the following points should be noted:-

d. 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.

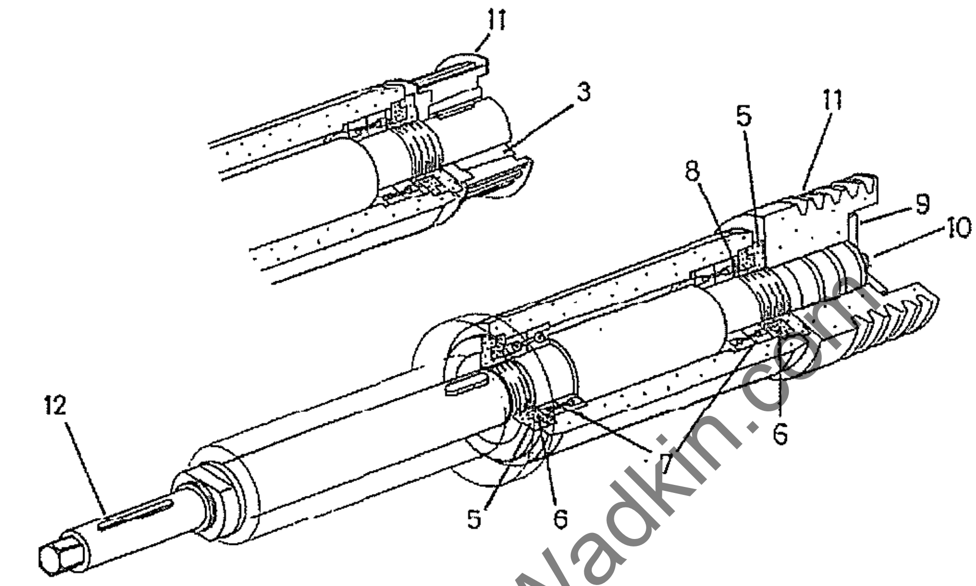

FIG 2 SPINDLE

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

b. 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.

c. Clean shaft, fit hub and bush to the shaft as a unit. Locate in position using key way (4). 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.

Replacing and tensioning drive belts (Fig 3)

'V' drive belts must be replaced as a set to obtain correct drive performance.

1) Relieve the tension on the drive belts by slackening off the six locking bolts (1).

2) Release adjusting screw locknut (2) and turn screw (3) to raise motor. With the pulley centres now reduced the belts may be removed.

3) Replace all belts with new ones.

4) Tension belts using screw (3) lock in position with locknut (2).

5) Tighten locking bolts (1).

Note: The centre bolt on the infeed side also locks the chain tensioner for the axial adjustment. Therefore this should be tensioned also before tightening this bolt.

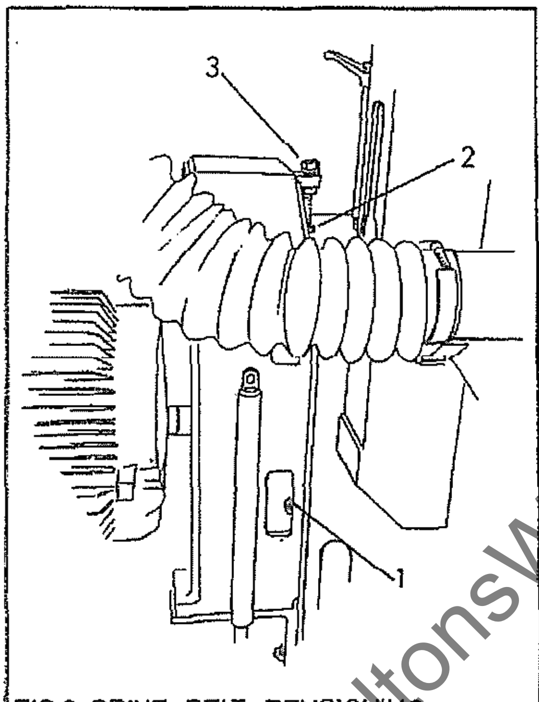

FIG 3 DRIVE BELT TENSIONING

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER.

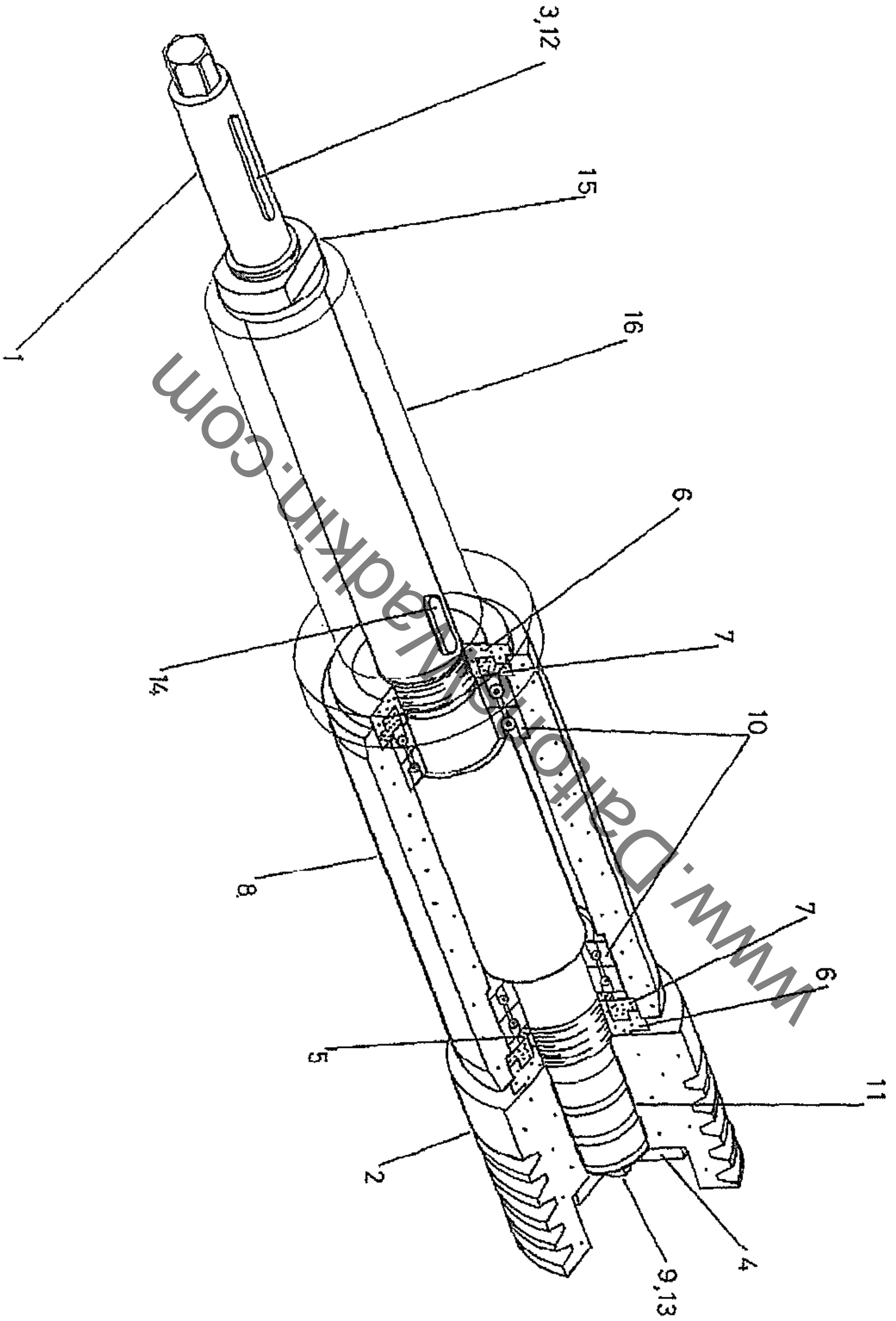

FIG 1 SPINDLE UNIT ('V' BELT)

1. SPINDLE UNIT ('V' BELT)

Ref No.	Description	No Off.
1.	Spindle	1
2. *	Pulley	1
3.	Key 8mm x 7mm x 80mm long	2
4.	Pulley retainer/extractor	1
5.	Spacer	1
6.	Locknut for Spindle	2
7.	Locknut for spinide barrel	2
8.	Spindle barrel	1
9.	Hexagon socket capscrew M12 x 35mm long	1
10.	Bearings 'RHP' 7011 IAU EP7	4
11.	Tolerance rings 'Rencol' SV50 x 20	3
12.	Hexagon socket capscrew M3 x 8mm long	2
13.	Spring washer M12	1
14.	Key 14mm x 9mm x 40mm long	1
15.	Spindle saw sleeve locking nut	1
16.	Saw sleeve	1

* Specify drive motor horse power and motor speed.

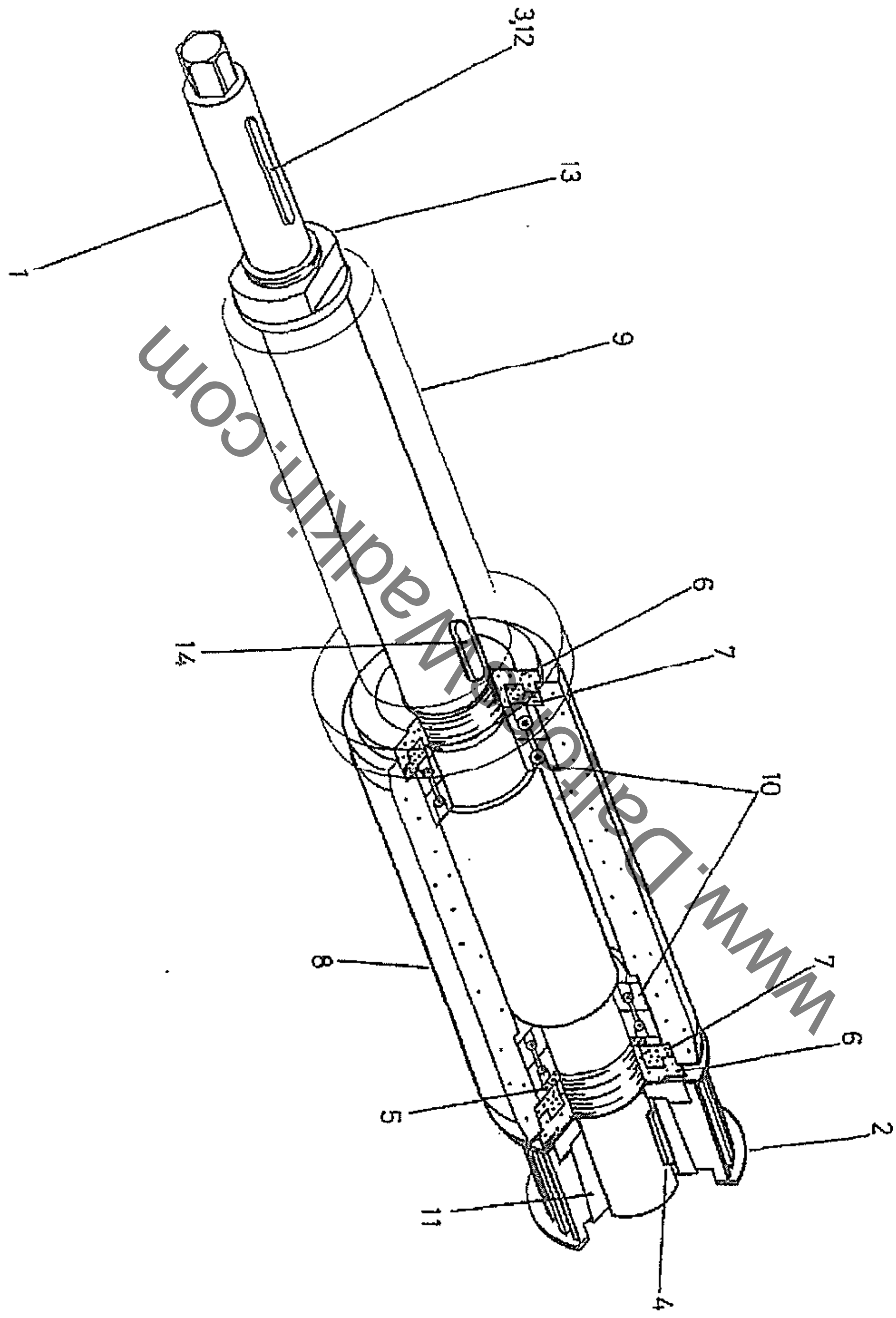

FIG 2 SPINDLE UNIT (TIMMING BELT)

2. SPINDLE UNIT (TIMING BELT)

Ref No.	Description	No Off.
1.	Spindle	1
2. *	Pulley	1
3.	Key 8mm x 7mm x 80mm long	2
4.	Key 12mm x 8mm x 40mm long	1
5.	Spacer	1
6.	Locknut for spindle	2
7.	Locknut for spindle barrel	2
8.	Spindle barrel	1
9.	Saw sleeve	1
10.	Bearings 'RHP' 7011 IAU EP7	4
11. *	Taper lock bush	1
12.	Hexagon socket capscrew M3 x 8mm long	2
13.	Locking nut for saw sleeve	1
14.	Key 14mm x 9mm x 40mm long	1

* Specify drive motor horse power and motor speed

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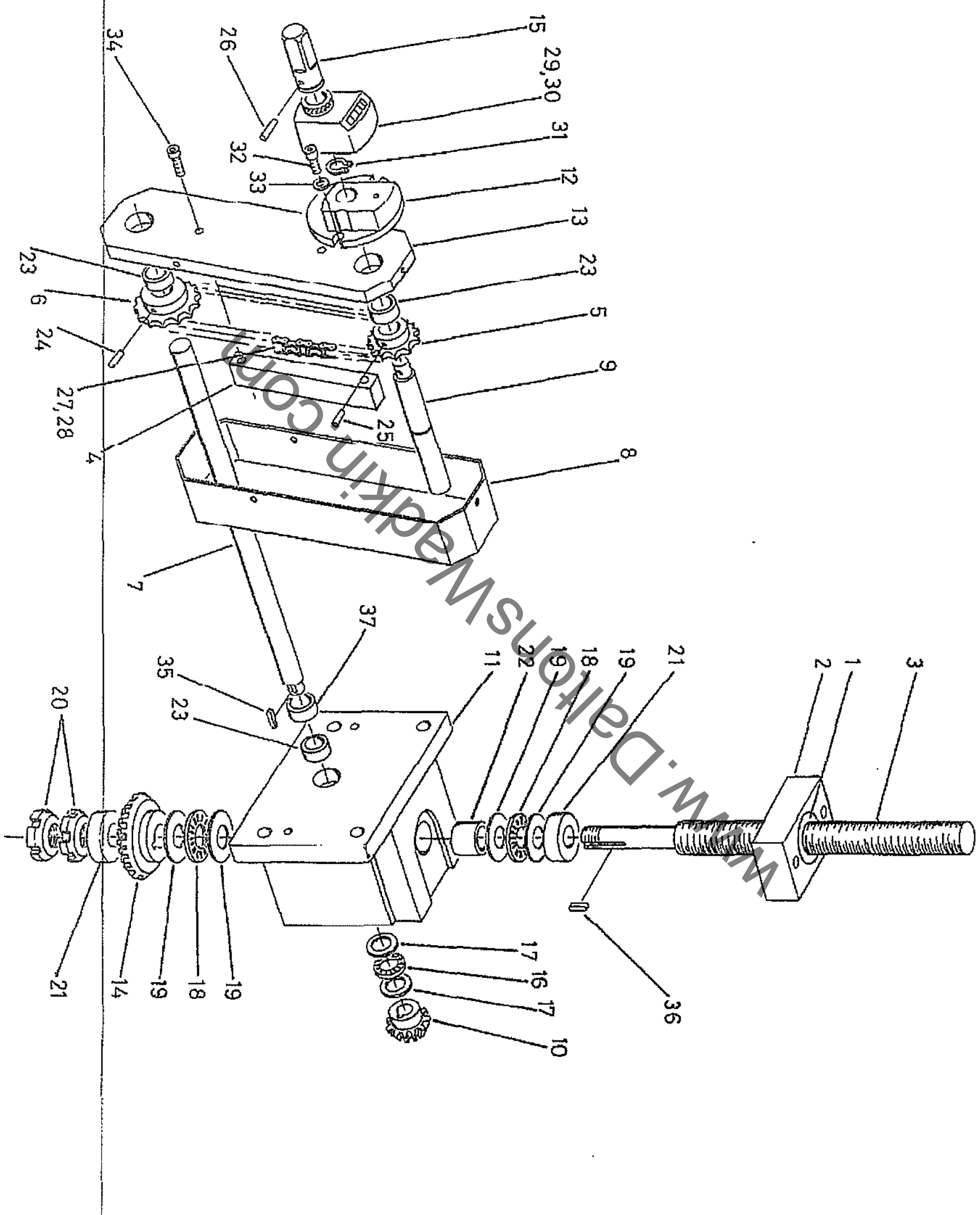

FIG 3 SPINDLE RISE AND FALL

3. SPINDLE RISE AND FALL

Ref No.	Description	No Off.
1.	Horizontal adjusting nut	1
2.	Block for mouting nut	1
3.	Traverse screw	1
4.	Block for adjustment plate	1
5.	Sprocket 12 teeth, 1/2" pitch, dia. 20mm bore	1
6.	Sprocket 15 teeth, 1/2" pitch, dia. 20mm bore	1
7.	Rise and fall shaft	1
8.	Cover for chain	1
9.	Rise and fall top shaft	1
10.	Bevel gear	1
11.	Bracket for bevel gears	1
12.	Bracket for shaft bearing	1
13.	Adjustment plate	1
14.	Bevel gear	1
15.	Shaft extension	1
16.	Thrust bearing 'INA' AXK 2035	1
17.	Thrust washer 'INA' AS 2035	2
18.	Thrust bearing 'INA' AXK 2542	2
19.	Thrust washer 'INA' AS 2542	4
20.	Notch nut M24 x 1.5mm	2
21.	Plain collar 40mm O/D x 25mm I/D x 16mm	2
22.	Bronze bush 30mm O/D x 25mm I/D x 25mm long	1
23.	Bronze bush 25mm O/D x 20mm I/D x 15mm long	3
24.	Taper pin No 3	1
25.	Tapor pin No 2	1
26.	Taper pin No 1	1
27.	Chain 1/2" pitch, 44 pitches long	1
28.	Chain connecting link	1
29.	'SIKO' position indicator	1
30.	'O' Ring 'Gaco' RM 0196-24	1
31.	External circlip 20mm dia	1
32.	Hexagon socket capscrew M8 x 20mm long	2
33.	Plain washer M8	2
34.	Hexagon socket capscrew M8 x 60mm long	2
35.	Key 5mm x 5mm X 20mm long	1
36.	Key 8mm x 7mm x 14mm long	1
37.	Collar 32mm O/D x 20 I/D x 14mm	1

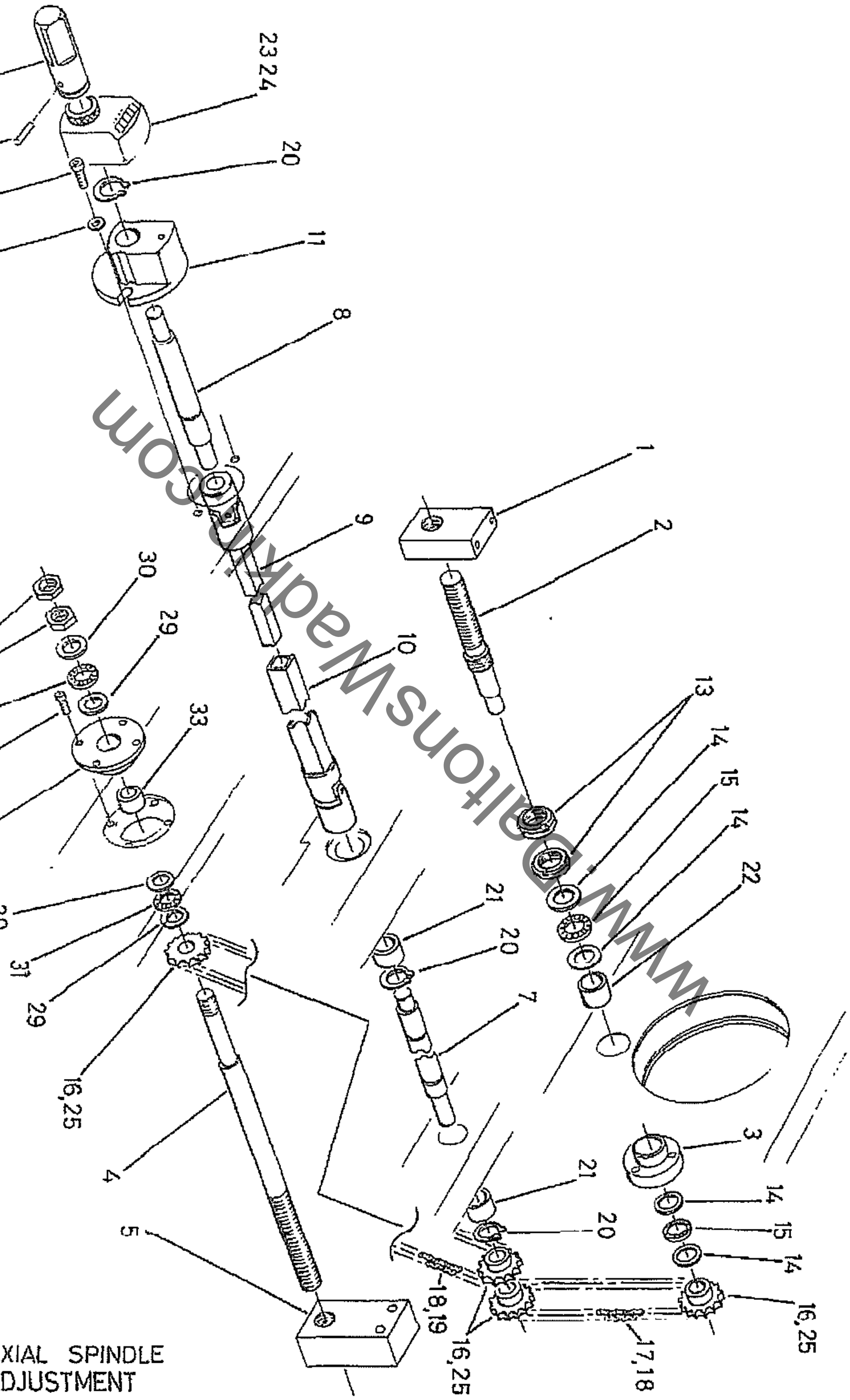

FIG 4 AXIAL SPINDLE ADJUSTMENT

4. AXIAL SPINDLE ADJUSTMENT

Ref No.	Description	No Off.
1.	Spindle barrel traverse nut	1
2.	Traverse screw	1
3.	Bearing housing for traverse screw	1
4.	Motor traverse screw	1
5.	Motor traverse nut	1
6.	Bearing housing for motor traverse screw	1
7.	Shaft for lateral adjustment	1
8.	Lateral adjustment shaft	1
9.	Universal coupling and square shaft assembly	1
10.	Universal coupling and square tube assembly	1
11.	Bracket for adjustment shaft	1
12.	Square end shaft extension	1
13.	Notched nut M24 x 1.5p	2
14.	Thrust washer 'INA' AS 2035	4
15.	Thrust bearing 'INA' AXK 2035	2
16.	Sprocket for axial adjustment	4
17.	Chain 1/2" pitch, 40 pitches long	1
18.	Connecting link	2
19.	Chain 1/2" pitch, 41 pitches long	1
20.	External circlip dia. 20mm	3
21.	Bronze bush 25mm O/D x 20mm I/D x 15mm long	2
22.	Bronze bush 25mm O/D x 20mm I/D x 25mm long	1
23.	'SIKO' position indicator	1
24.	'O' Ring 'Gaco' RM 0196-24	1
25.	Taper pin No 1	5
26.	Hexagon socket capscrew M8 x 20mm long	2
27.	Plain washer M8	2
28.	Hexagon locknut M16	2
29.	Thrust wahser 'INA' AS 1730	3
30.	Shaft washer 'INA' WS 81103	1
31.	Thrust bearing 'INA' AXK 1730	2
32.	Hexagon socket capscrew M6 x 16mm long	4
33.	Bronze bush 20mm O/D x 16mm I/D x 16mm long	1

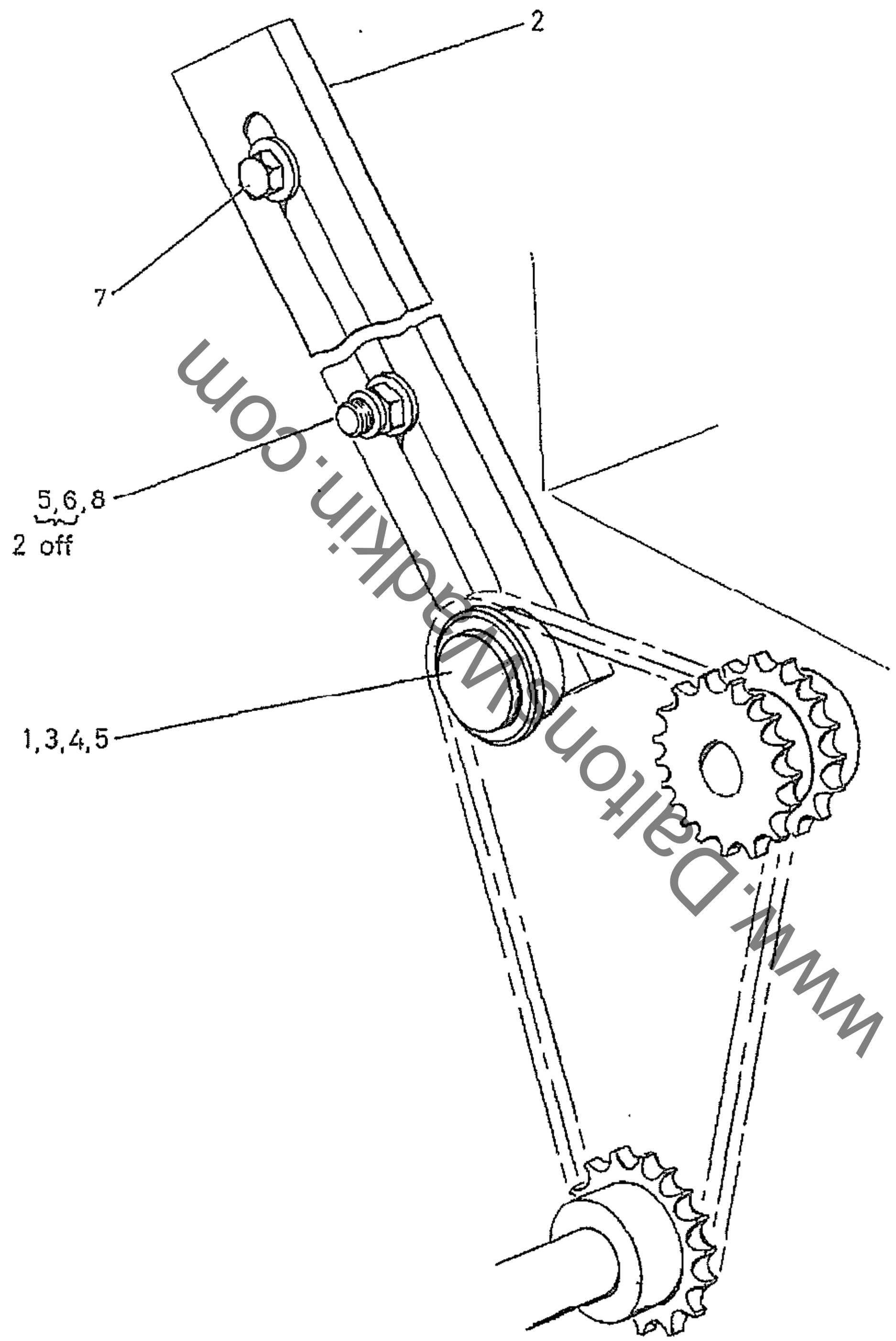

FIG 5 CHAIN TENSIONER TO AXIAL SPINDLE ADJUSTMENT

5. CHAIN TENSIONER TO AXIAL SPINDLE ADJUSTMENT

Ref No.	Description	No Off.
1.	Chain tensioner	1
2.	Bar for chain tensioner	1
3.	Pin	1
4.	Hexagon nut M12	1
5.	Plain washer M12	3
6.	Nyloc nut M12	2
7.	Setscrew and washer (one of the four motor mouting plate screws)	
8.	Stud M12 x 65mm long	1

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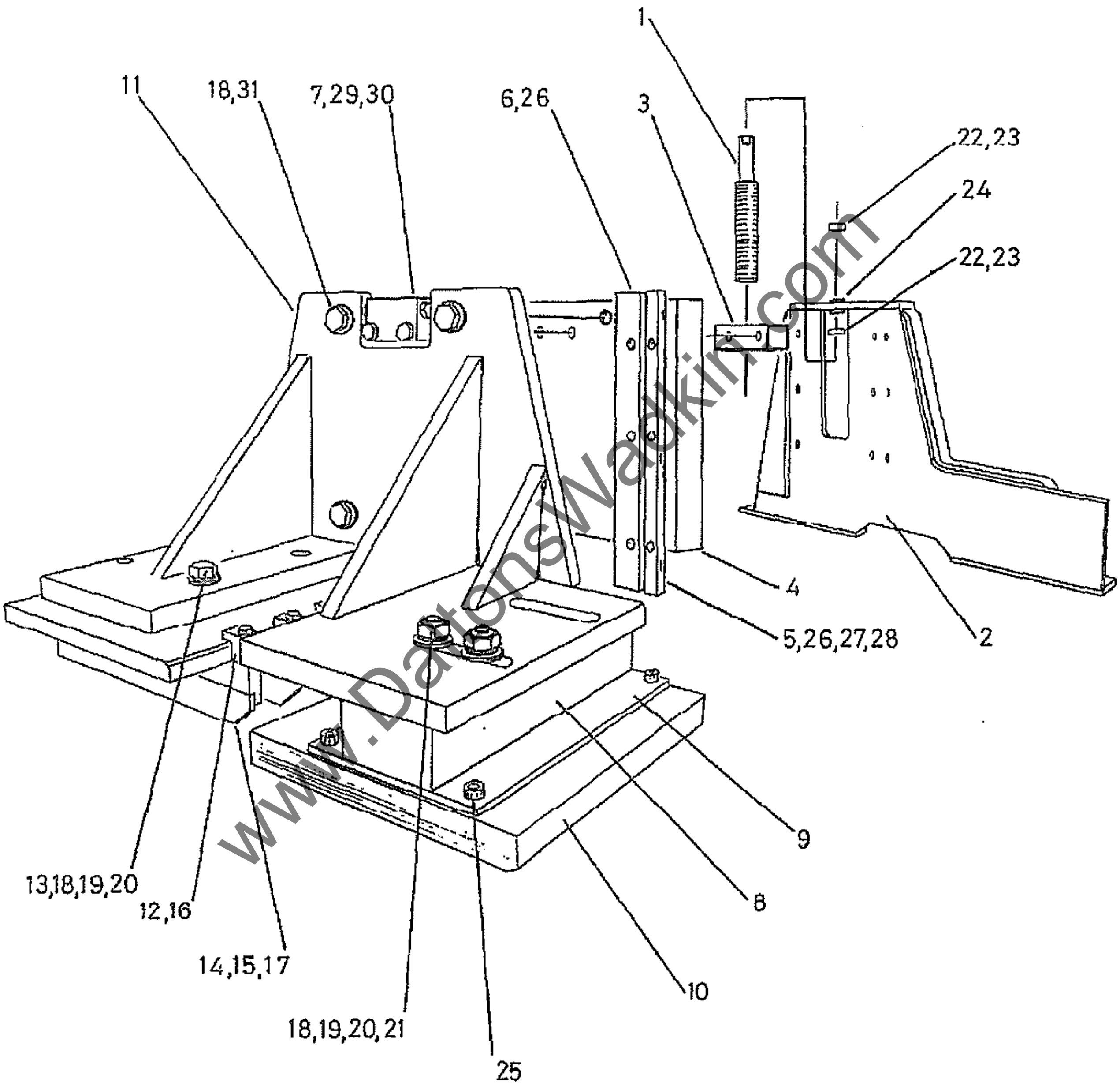

FIG 6 TOP PAD PRESSURE AND RIVING KNIVES

6. TOP PAD PRESSURE AND RIVING KNIFES

Ref No.	Description	No Off
1.	Screw for pressure slide	1
2.	Bracket for mounting top pressure	1
3.	Nut for splitting saw motor plate	1
4.	Slide	1
5.	Strip for jacking pressure slide	1
6.	Strip for pressure slide	2
7.	Stop for pressure bracket	1
8.	Block for pressure pad	1
9.	Plate for mounting pressure pad	1
10.	Pressure pad	1
11.	Bracket for top pressure	1
12.	Mounting block for riving knife carrier	20
13.	Stud for mounting riving knifes	4
14.	Riving knife	10
15.	Carrier for riving knife	10
16.	Hexagon socket capscrew M6 x 30mm long	20
17.	Hexagon socket coutersunk screw M4 x 10mm long	30
18.	Plain washer M12	12
19.	Spring washer M12	8
20.	Plain nut M12	8
21.	Stud M12 x 40mm long	4
22.	Loose collar 28mm O/D x 16mm I/D x 12mm long	2
23.	Taper pin No 2	2
24.	Bronze headed bush	2
25.	Hexagon socket capscrew M6 x 12mm long	4
26.	Hexagon socket capscrew M8 x 25mm long	12
27.	Hexagon socket grubscrew M6 x 30mm long	3
28.	Locknut M6	3
29.	Hexagon setscrew M8 x 50mm long	2
30.	Hexagon setscrew M8 x 16mm long	2
31.	Hexagon setscrew M12 x 30mm long	2

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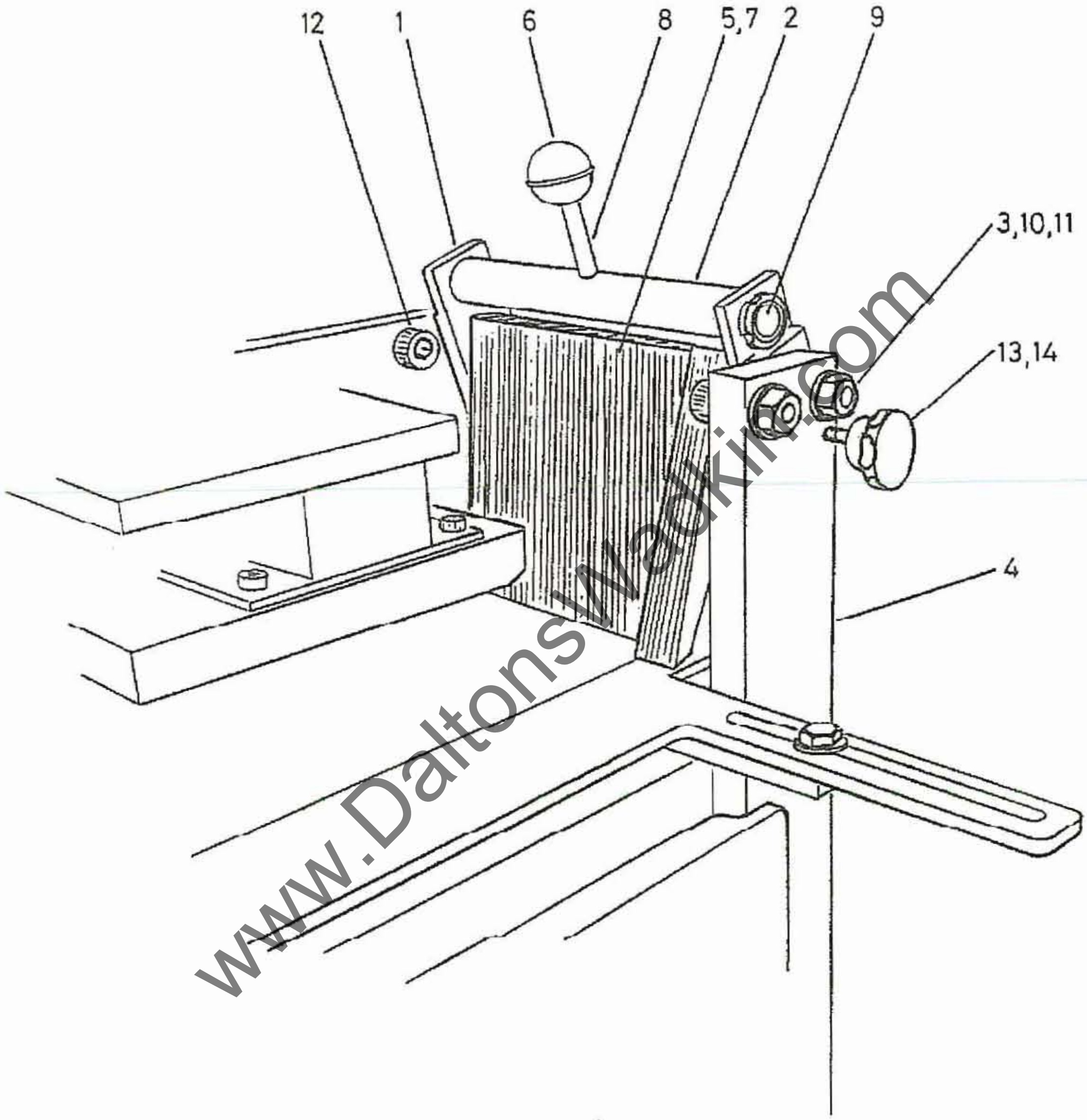

FIG 7 ANTI-KICK BACK FINGERS

7. ANTI-KICK BACK FINGERS

Ref No.	Description	No Off.
1.	Plate for anti-kick back finger frame	2
2.	Bar for anti-kick frame	1
3.	Shaft for finger pivot	1
4.	Plate for mounting anti-kick fingers	1
5.	Fingers	57
6.	Ball knob M12	1
7.	Thrust washer 'INA' AS 2035	58
8.	Stud M12 x 65mm long	1
9.	Notch nut M20 x 1.5p	2
10.	Locknut M16	4
11.	Plain washer M16	4
12.	Hexagon socket capscrew M16 x 40mm long	2
13.	Black plastic handle M8	1
14.	Stud M8 x 70mm long	

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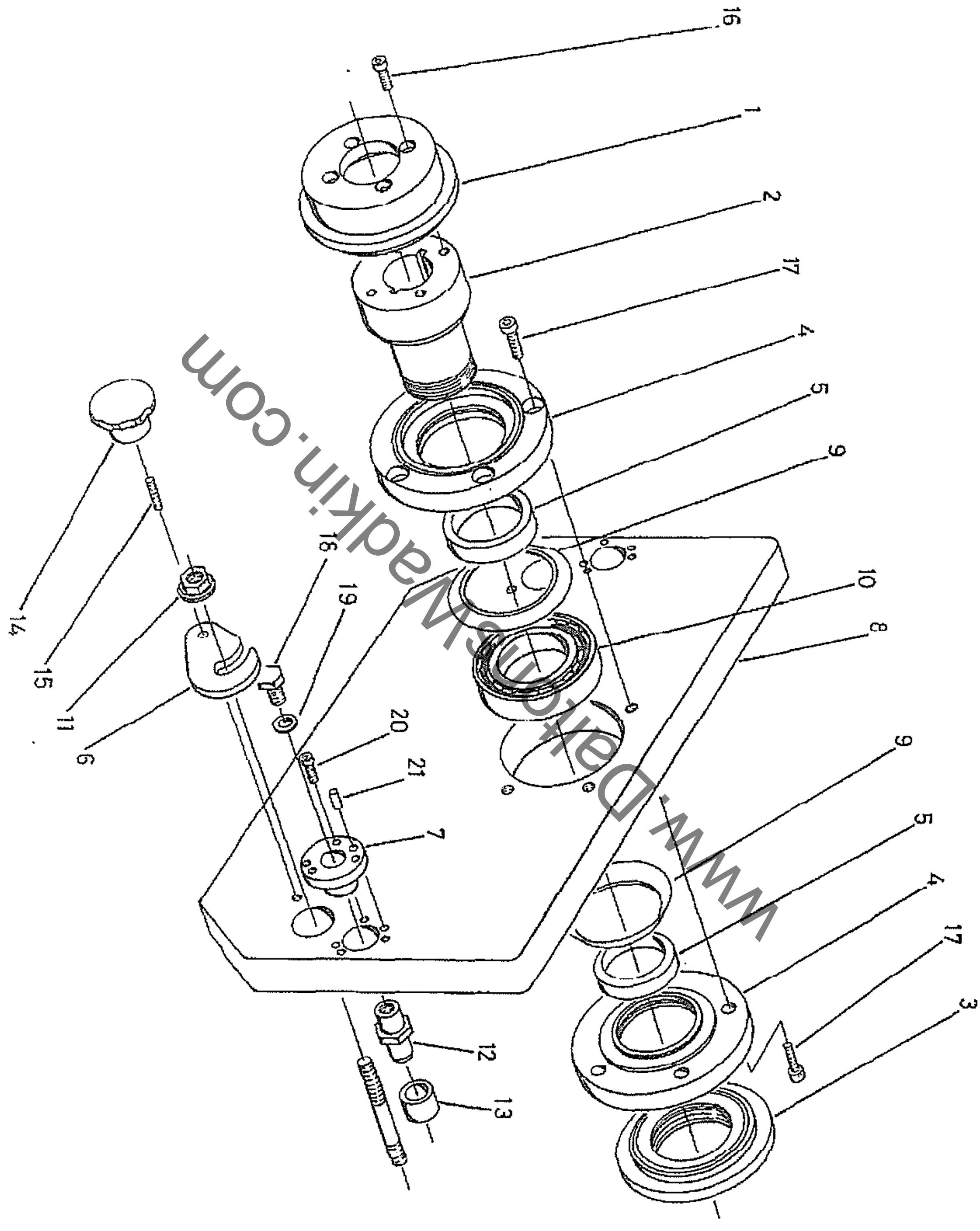

FIG 8 OUTBOARD BEARING

8. OUTBOARD BEARING

Ref No.	Description	No Off.
1.	Protective ring	1
2.	Outboard bearing sleeve	1
3.	Locknut for outboard bearing	1
4.	End cap for bearing housing	2
5.	Bearing spacer	2
6.	'C' Washer	2
7.	Bush for locating pin	2
8.	Housing for bearing	1
9.	Disc spring	2
10.	Bearing 'RHP' 6211-TB-EP7	1
11.	Collar nut 'WDS' 404-204 M12	2
12.	Locating pin	2
13.	Locating bush	2
14.	Black plastic handle M8	2
15.	Grubscrew M8 x 30mm long	2
16.	Hexagon socket capscrew M5 x 16mm long	4
17.	Hexagon socket capscrew M6 x 12mm long	8
18.	Hexagon setscrew M8 x 20mm long	2
19.	Plain washer M8	2
20.	Hexagon socket capscrew M6 x 20mm long	6
21.	Tension pin dia. 6mm x 20mm long	4

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SECTION 12 DRIVEN BED ROLLS AND TOP FEED ROLLS

General

The through feed top rollers are always mounted on the beam and are driven by 'siti' gearboxes. They be shaft or flanged mounted. Pressure loading is via a pneumatic cylinder. A small amount of adjustment is provided for on the top through feed rolls up to the first Top Head. This adjustment allows for all the rolls to be set level in line. After the Top Head where the timbor thickness may have been reduced the rolls have an additional spring adjustment to cater for larger individual roller adjustment. The rolls may be serrated steel or a polyurethane tyre which is replaceable as an individual item without replacing the hub.

The bedroll is a chromed steel drum which is set slightly above bed level to ensure constant contact with timber. Pressure loading uses the same pneumatic cylinder as the top through feed rolls.

Setting Driven Bed Rolls (Fig 1)

The intermediate bed rolls should be set at 0.05 mm (0.002") above bed level with the air pressure off. With the cylinder pressurised the roll should be 0.25 mm (0.01") above bed level.

The outfeed bedroll is set slightly higher to ensure the finished timer face is not damaged. A setting of 0.25 mm (0.01") above bed level with the air off and 0.76 mm (0.03") above bed level with the cylinder pressurised is recommended. Adjustment screws are located at the rear of the module body.

To adjust proceed as follows:-

1) Isolate power at mains or master stop

2) Isolate air supply to bed roll

3) Slacken locking screw (1) and adjust screw (2) to raise or lower bed roll to required setting

4) Tighten locking screw (1) ensuring adjusting screw (2) does not turn.

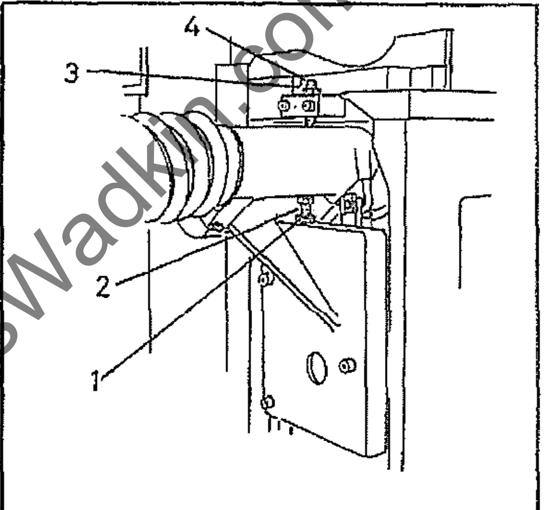

FIG 1 DRIVEN BEDROLL ADJUSTMENT

5) Slacken lock nut (3)

6) With air supply to the cylinder adjust stop screw (4) with an Allen key until desired setting is achieved

7) Retighten nut (3) whilst preventing the stop screw from turning

8) If no further adjustments are necessary re-engage power.

Adjusting Top Through Feed Rolls (Fig 2)

Rolls prior to the top head should all be set to the same height above bed level.

All through feed rolls are factory set to ensure drive to timber when using a maximum 205 mm cutting circle. If resetting after a maintenance operation this is the criteria to work to.

To adjust:-

1) Isolate power at mains or at master stop.

2) Slacken locknut (1) and turn cylinder piston (2) to raise or lower swing. Use a suitable measure to check rolls are all set at the same height above bed level.

3) Retighten locknut (1).

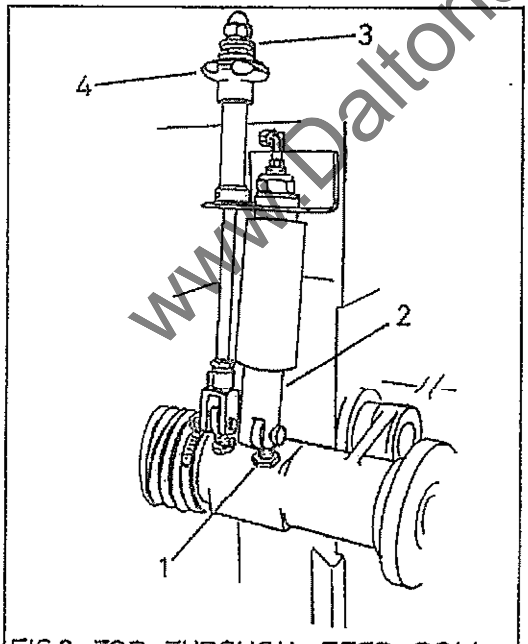

FIG 2 TOP THROUGH FEED ROLL

To set Feedrolls with Individual Adjustment:-

There is no requirement to set the individual rolls in the same manner as above since the adjusting screw provides movement.

A thumb nut (3) acts as a lock on the hand wheel (4) and must be slackened off before adjusting and tightened after.

MAINTENANCE

General

Scheduled maintenance is kept to a minimum on the through feed top and bed roll, requiring only a daily visual check followed by a clean of the rolls/tyres to remove resin/wood particle build up.

Changing Top Through Feed Rolls (Fig 1, Fig 2)

Shaft Mounted

1) Isolate power at mains or at master stop

2) Slacken set screw (1)

3) Remove 'C' washer, spacers and rolls (2, 3 and 4). It may be necessary to gently tap the rolls with a soft faced mallet to break the adhesion between spacers, rolls and shaft.

Note: The shaft, spacers and rolls are keyed.

Caution If the rolls are of the steel serrated type, care should be taken when handling them.

4) Clean and lightly oil shaft

5) Replace rolls and spacers in the correct order to suit timber section being machined

6) Replace 'C' washer and tighten set screw

Flange Mounted

1) Isolate power at mains or at master stop

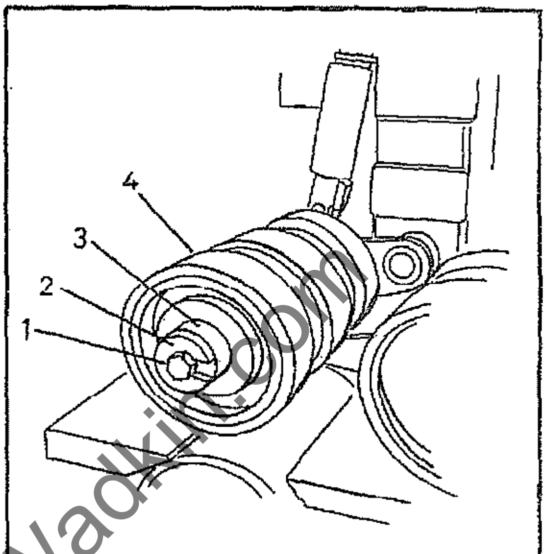

FIG 1 SHAFT MOUNTED FEEDROLLS

2) Slacken set screw (5) and slide off 'C' washer (6)

3) Remove rolls (7) and spacers (8). Replace to suit timber width and maximum traction. Ensure drive pins engage with their mating parts.

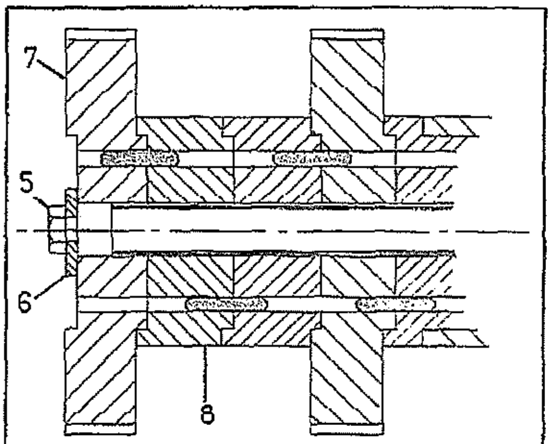

FIG 2 FLANGE MOUNTED FEEDROLLS

4) Replace 'C' washer (6) and tighten set screw (5)

Changing Bed Rolls

The bed roll unit must be removed before changing the actual rolls (see **Bearing Change to Bed Rolls**).
Once the unit is removed unscrew the locknuts and remove rolls. Clean and lightly oil the shaft before fitting new rollers. Reassembly in the reverse procedure.

Preparation Prior to Fitting Bearings

Before fitting a new bearing, the protection 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.

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) = d x B x 0.01
d = bore of bearing in mm
B = width in mm

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

Bearing Change to Top Through Feed Rolls (Fig 3, Fig 4, Fig 5)

The shaft and flange mounted rolls follow the same basic stripdown and assembly procedure.

1) Isolate power at master stop or mains

2) Remove rolls, spacers and rear screwed flange (flange mounted feed rolls only) (see **Changing Top Through Feed Rolls**)

3) Remove pin (1) securing pneumatic cylinder (2) to feed roll swing (3). If individual adjustment is also fitted remove the pin (4) from the clevis.

Note: The feed roll swing should be supported whilst removing pins and then lowered to rest after removal.

4) Slacken the jubilee clip (5) and push the p.v.c. boot (6) back to expose the end of the drive shaft coupling. Using an Allen key slacken the two grubscrews locking the coupling to the roll shaft.

5) A grubscrew located at the bottom of the pivot shaft housing and locating in a groove on the pivot shaft (7) must be loosened enough to allow the shaft to be tapped out.

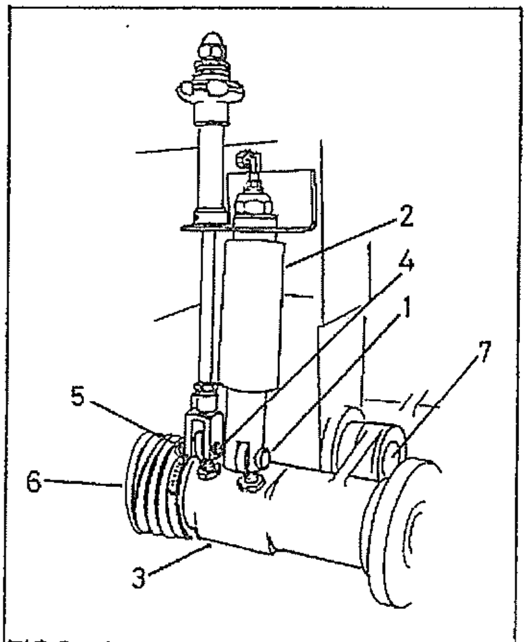

FIG 3 FEEDROLL BEARING CHANGE

Note: When the pivot shaft is through a beam slide, the grubscrew is located on the side of the slide column.

6) Note the position of any spring washer, spacers and position of cracked arms before tapping pivot shaft (7) out.

Note: Ensure swing is supported whilst driving out the pin to avoid it dropping on bed. If two swings pivot ot the same shaft then both should be supported when the pin is removed.

7) Pulling the swing forward disengages it from the drive shaft coupling and frees the unit for bench disassembly. The drive shaft must be supported whilst the swing is pulled forward to prevent it dropping and causing damage.

8) The build of the shaft mounted and flange mounted rolls varry and are disassembled in the following manner:

Shaft Mounted

a. Remove key (8) from drive shaft coupling end

b. Remove the two circlips (9 and 10)

c. Remove the shaft (11) from the swing (3) by gently tapping with a soft faced mallet from the drive shaft end. The front bearing (12) and the tolerance ring (4) will be removed with the shaft.

Note: Both bearings have been fitted into the swing with bearing adhesive (Loctite 641) applied to the outter race. If the holding force 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 from the swing bores before fitting new bearings and adhesive.

d. To remove the bearing off the shaft first remove the two circlips (13). Lightly oil the shaft as this will help the bearing slide off. Use a suitable puller to remove bearing or alternatively adjust the jaws of a vice so the shaft fits loosely in but the bearing rests on the jaws. A sharp blow with a soft mallet should drive the shaft through the bearing.

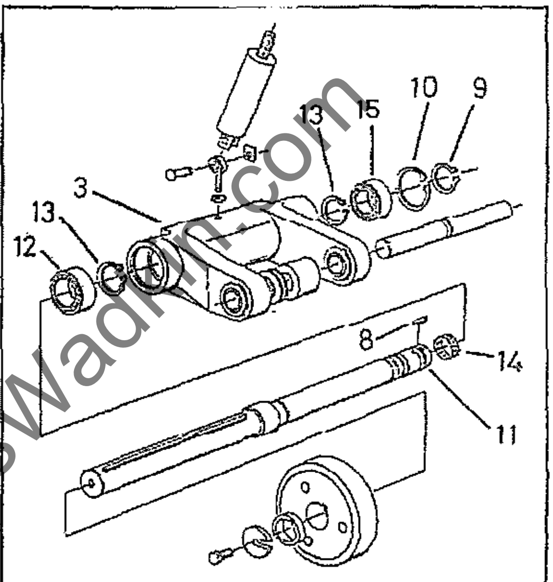

FIG 4 SHAFT MOUNTED FEEDROLL BEARING CHANGE

Using a suitable driver tap the bearing (15) out of the swing.

e. To re-assemble reverse the procedure using a new tolerance ring. When assembled check for excessive end play and ease of rotation.

Flange Mounted

a. Remove key (16) from drive shaft coupling end

b. Remove two circlips (17 and 18)

c. Remove the shaft (19) from the swing (3) by gently tapping with a soft faced mallet from the drive shaft end. The front bearing (20) will be removed with the shaft.

Note: Both bearings have been fitted into the swing with bearing adhesive (Loctite 641) applied to the outter race. If the holding force 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 from the swing bores before fitting new bearings and adhesive.

d. To remove the bearing off the shaft use a suitable puller or alternatively adjust the jaws of a vice so as the shaft fits loosely in but the bearing rests on the jaws. A sharp blow to the shaft centre with a driver should separate them. Appropriate care should be taken not to damage the shaft.

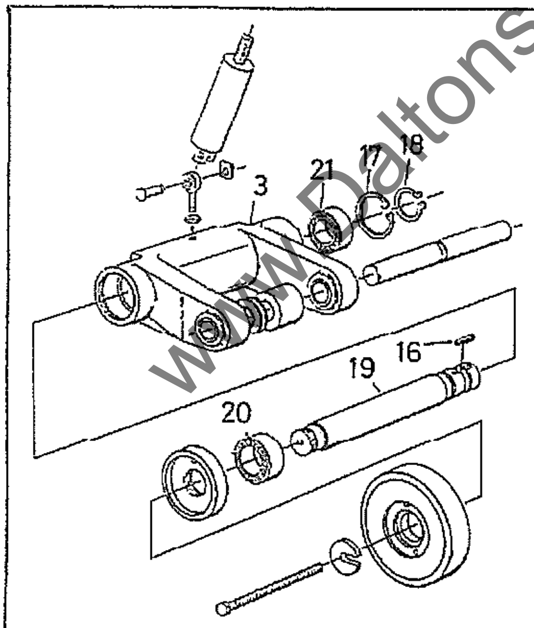

FIG 5 FLANGE MOUNTED FEEDROLL BEARING CHANGE

e. Use a driver to remove bearing (21) from the coupling end taking care not to damage swing bores.

f. To re-assemble reverse the procedure applying Loctite to bearing outter races. When the unit is assembled check for excessive end play and ease of rotation.

g. Mounting of swings is the reversal of the dismantling procedure

Bearing Change to Bed Rolls (Fig 6, Fig 7, Fig 8)

1) Isolate power at mains or at master stop

2) Remove gearbox drive pulley covers from rear of machine for the particular feedroll. Also remove rear cover plate.

3) Slacken jubilee clip securing p.v.c boot to the bedroll swing. Push the p.v.c boot back to expose the end of the drive shaft coupling. Slacken the two grubscrews locking the coupling to the roll shaft.

4) Remove the taper lock bush pulley to the bed roll gearbox in the following manner:-

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

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

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

d. Remove pulley assembly from shaft.

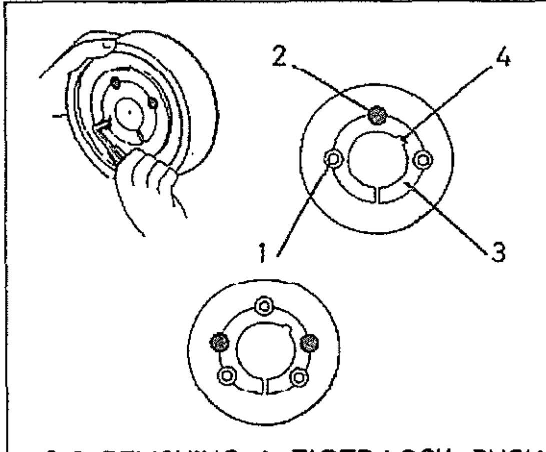

FIG 6 REMOVING A TAPER-LOCK BUSH

5) Remove gearbox complete with p.v.c boot and drive coupling.

6) Unscrew three retaining screws (5) and remove bed roll unit.

7) Remove drive key (6) and the two circlips (7 and 8)

8) Using a soft faced mallet tap the shaft (9) through the swing (10). The bearing (11) fitted to the shaft may be separated after removal of the two circlips (12).

9) The other bearing (13) may be removed using a suitable driver. Care should be taken not to damage the bores.

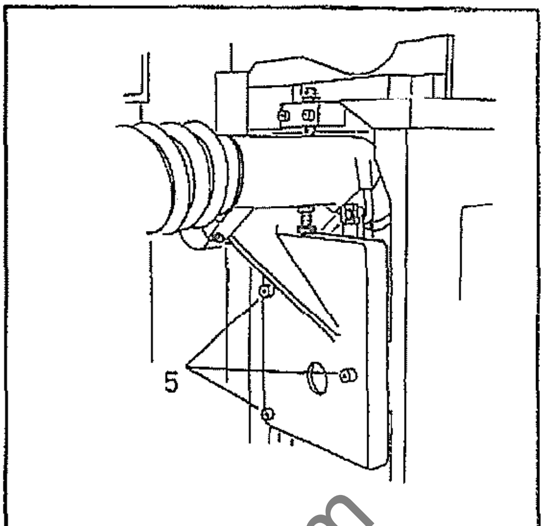

FIG 7 DRIVEN BEDROLL REMOVAL

Note Both bearings have been fitted into the swing with bearing adhesive (Loctite 641) applied to the outter race. If the holding force 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 from the swing bores before fitting new bearings and adhesive.

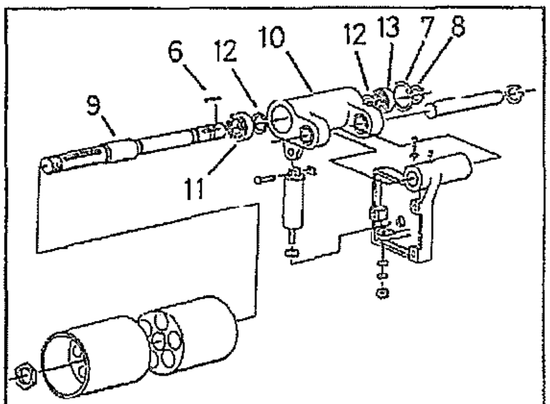

FIG 8 DRIVEN BEDROLL BEARING CHANGE

10) Re assemble in the reverse manner ensuring shaft and bore are clean. The taper lock bush pulley should be refitted as follows.

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

b. 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.

c. 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.

d. 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.

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

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

g. Fill empty screw holes with grease to exclude dirt.

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER

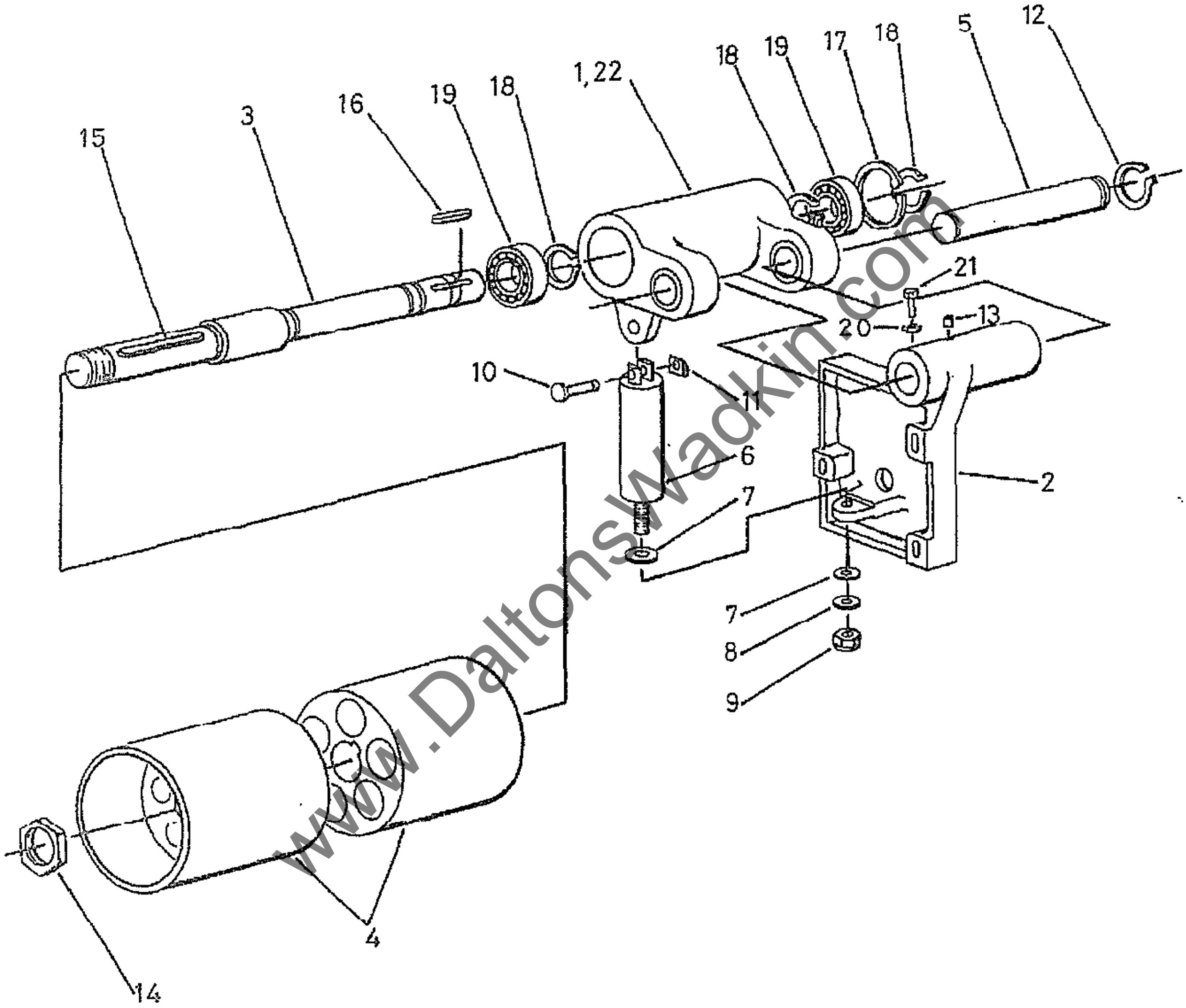

FIG 1 INTERMEDIATE BED ROLLER

1. INTERMEDIATE BED ROLLER

Ref No.	Description	No Off.
1.	Swing for bed roll	1
2.	Bracket for mounting swing	1
3.	Shaft for bed roll	1
4.	Chromed bed-roll (ordered in pairs)	1
5.	Pivot shaft for swing	1
6.	Single acting cylinder	1
7.	Rubber Washer - supplied with cylinder	2
8.	Steel Washer - supplied with cylinder	1
9.	Nyloc nut - supplied with cylinder	1
10.	Pivot pin supplied with cylinder	1
11.	Retaining clip for pivot pin - supplied with cylinder	1
12.	External circlip dia. 25mm	1
13.	Hexagon socket grubscrew M10 x 10mm long	1
14.	Chamfered notch nut	1
15.	Key 10mm x 8mm x 90mm long	1
16.	Key 8mm x 7mm x 36mm long	1
17.	Internal circlip dia. 55mm	1
18.	External circlip dia. 30mm	3
19.	Bearing 'SKF' 6006-2RS	2
20.	Locknut M10	1
21.	Hexagon set screw M10 x 40mm long	1
22.	Bronze bush 30mm O/D x 25mm I/D x 25mm long	2

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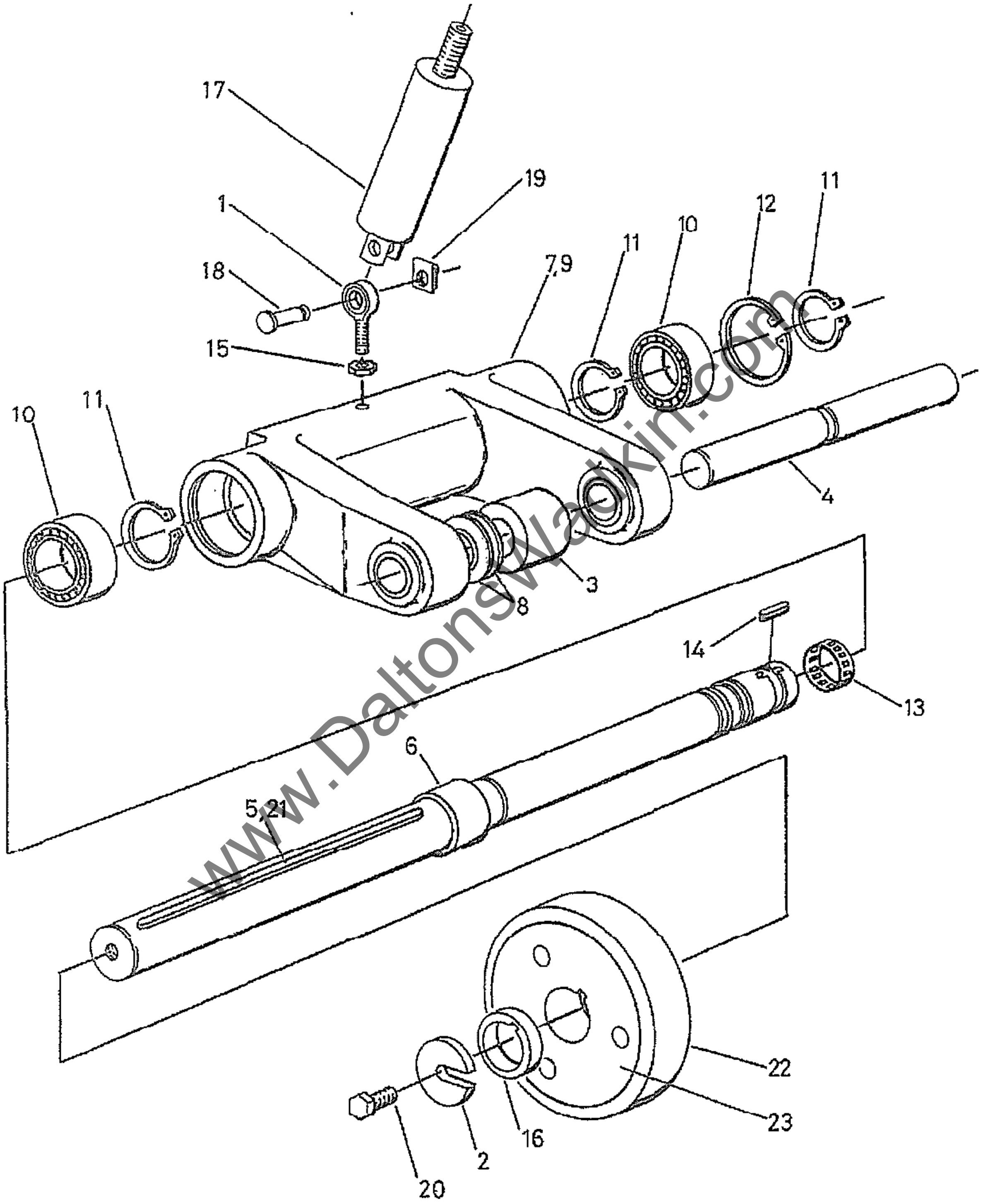

FIG 2 SHAFT MOUNTED FEEDROLL

2. SHAFT MOUNTED FEEDROLL

Ref No.	Description	No Off.
1.	Eye bolt M12	1
2.	'C' washer	1
3.	Spacer for swing	1
4.	Pivot shaft for swing	1
5.	Key	1
6.	Shaft	1
7.	Feedroll swing	1
8.	Disc spring 50mm O/D x 25.4mm I/D x 1.5 mm	2
9.	Bronze bush 30mm O/D x 25mm I/D x 25mm long	2
10.	Bearing 'SKF' 6006-2RS	2
11.	External circlip 30mm dia.	3
12.	Internal circlip 55mm dia.	1
13.	Tolerance ring 'Rencol' SV30 x 8SS	1
14.	Key 8mm x 7mm x 20mm	1
15.	Locknut M12	1
16.	Spacer (specify width)	
17.	Single acting cylinder	1
18.	Pivot pin } supplied with	1
19.	Retaining clip } cylinder	1
20.	Hexagon head setscrew M12 x 25mm long	1
21.	Hexagon socket counter sunk screw M4 x 12mm long	2
22.	Feed roll (Specify width and type i.e polyurethane or serrated steel)	
23.	Feed roll hub for polyurethane tyre	

Note:- The swing, depending on location, may not require items 3 and/or 8 (spacer and disc spring). It may also be mounted in the reverse position to that shown i.e. with the cranked arm to the rear.

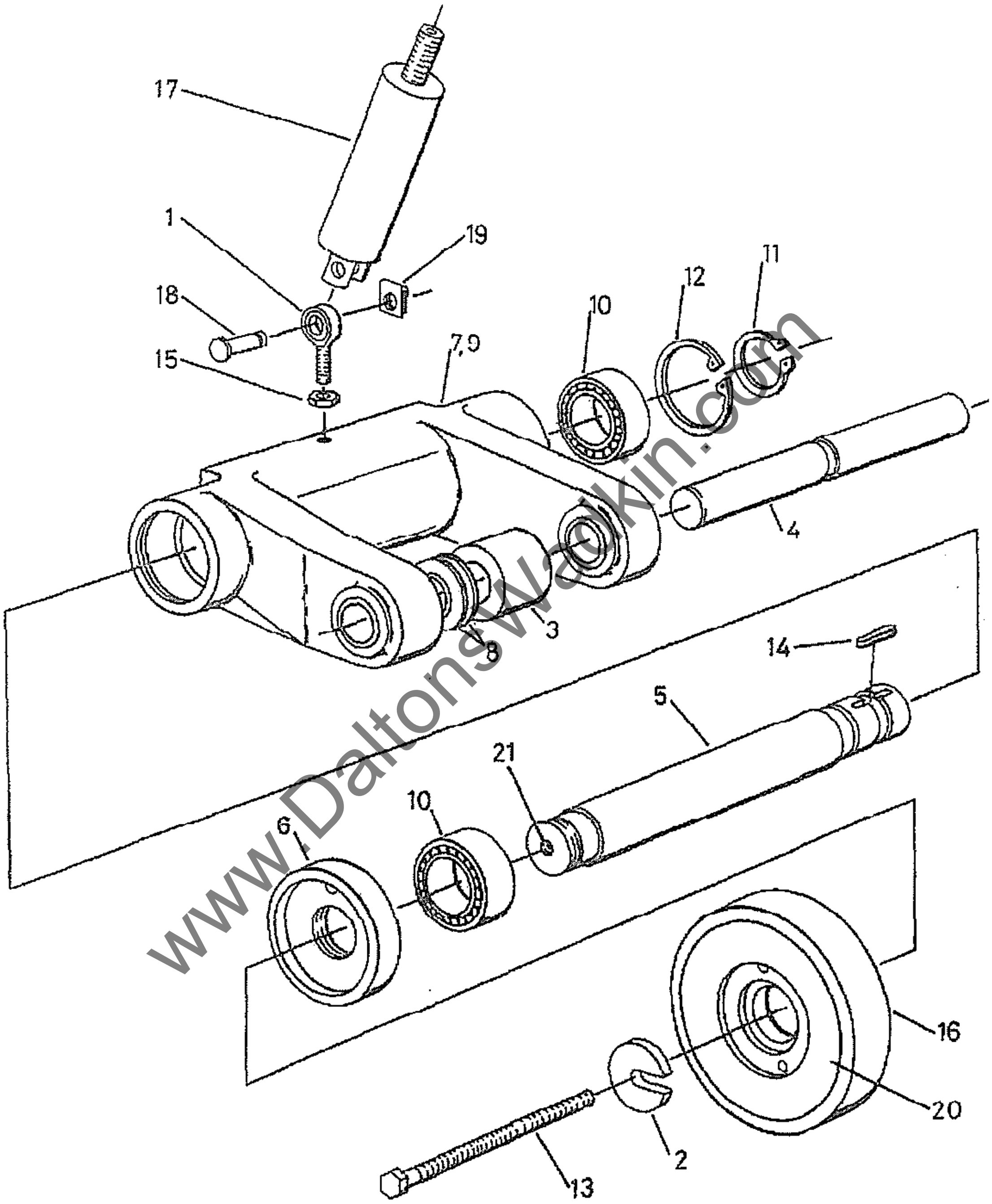

FIG 3 FLANGED MOUNTED FEEDROLL

3. FLANGE MOUNTED FEEDROLL

Ref No.	Description	No Off.
1.	Eye bolt M12	1
2.	'C' washer	1
3.	Spacer for swing	1
4.	Pivot shaft for swing	1
5.	Shaft	1
6.	Flange	1
7.	Feedroll swing	1
8.	Disc spring 50mm O/D x 25.4mm I/D x 1.5mm	2
9.	Bronze bush 30mm O/D x 25mm I/D x 25mm long	2
10.	Bearing 'SKF' 6006-2RS	2
11.	External clip 30mm dia.	1
12.	Internal circlip 55mm dia.	1
13.	Hexagon head setscrew M12 x 190mm long	1
14.	Key 8mm x 7mm x 20mm	1
15.	Locknut M12	1
16.	Feed roll (specify width and type i.e. polyurethane or serrated steel)	
17.	Single acting cylinder	1
18.	Pivot pin } supplied with	1
19.	Retaining clip } cylinder	1
20.	Feed roll hub for polyurethane tyre	1
21.	Heli-coil insert M12 x 1.75p	1

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SECTION 13 GEARBOXES AND DRIVE SHAFTS

General

The main drive either mechanical or hydraulic is transmitted to the top through feed rollers by a series of 'Siti' gearboxes and drive shafts. A toothed belt (to prevent slip) driven of a top gearbox provides drive to the bed roll gearbox.

A drive shaft line connecting smaller worm boxes at the rear base of the machine provides for top head and/or beam vertical movement.

Positioning of all drive shafts, gearboxes and wormboxes is dependant on selected head sequence.

Gearboxes, whilst visually appearing the same, may vary and reference to the label indicating the part number should always be made.

Replacing Feed Roll Drive Shaft and Coupling Insert (Fig 1)

Gearboxes when not flange mounted to one another are generally connected by a hexagonal drive shaft with drive couplings either end. The couplings are segmentally interlocked with a flexible insert to absorb any shock.

1) Isolate power at mains or at masterstop

2) To remove a drive shaft (1) or replace an insert (2) unscrew the grub screw (3) in the drive shaft half of each coupling (4).

3) By sliding the released halves of the couplings towards each other the drive shaft and inserts can be replaced.

Note: Under certain head sequence conditions gearboxes may be so closely coupled that there is insufficient room for a drive shaft. In these instances it may be necessary to remove a gearbox to replace a flexible insert.

4) Reverse procedure to re assemble.

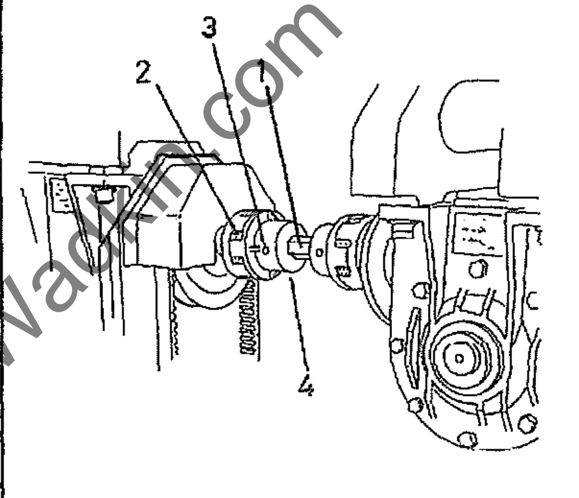

FIG 1 DRIVE SHAFT AND COUPLING

Replacing Drive Belt to Bottom Feed Rolls (Fig 2)

Due to zero strech on the toothed drive belt the drive pulleys are at fixed centers. Therefore to remove the belt the bottom pulley must be removed.

1) Issolate power at mains or at master stop

2) Remove upper and lower belt covers

3) Unscrew grub screw (1) and slide coupling half (2) along shaft

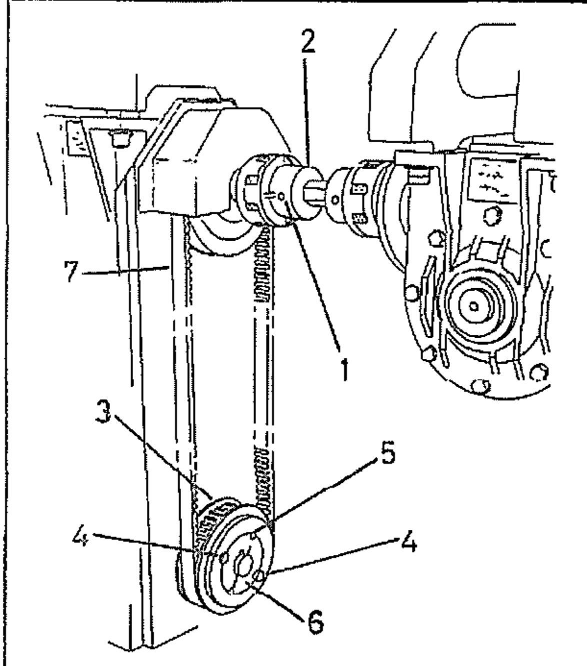

FIG 2 REPLACING DRIVE BELT

4) Remove the taper lock bush (6) as follows:

a. Slacken off all screws (4) several turns using a hexagonal key. Remove one or two screws according to number of jacking holes (5).

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

c. Tighten screws (4) alternatively until bush (6) is loosened in pulley hub and assembly is free on shaft

Remove bush from shaft.

5) The bottom driven pulley (3) can now be removed.

6) Remove and replace drive belt (7)

7) Position pulley (3) into the drive belt 'loop' and over gearbox output shaft.

8) Refit taper lock bush into pulley as follows.

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

b. Oil thread and point of grub screws, or thread and head of cap screws. Place screws (4) loosely in threaded holes in hub of pulley.

c. On fitting the bush will nip the shaft first, then the hub will be drawn onto the bush.

Note: It is necessary to axially align the drive and driven pulleys. This may be done by placing a straight edge across the face of the top drive pulley and adjusting driven pulley in line.

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

e. Fill empty screw holes with grease to exclude dirt

9) Reposition flexible insert and coupling half (2). Secure grub screw(1).

10) Replace covers

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

Replacement of Main Feed Drive Belt (Hydraulic Drive)

The removal and replacement of the drive belt is covered in the maintenance section of the Hydraulic Drive chapter.

Tachometer Belt Replacement

1) Remove the front cover

2) Remove gearbox driven pulley

3) Remove and replace drive belt

4) Refit pulley and cover

Replacing Chain Drive To Beam Rise And Fall (Fig 3)

1) Remove chain cover (1)

2) Slacken off screws (2). Apply a small upward pressure on the bearing block (4) to relieve the tension.

3) Remove and replace chain and link (3)

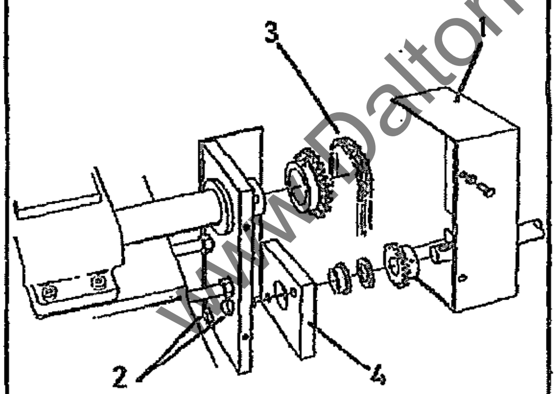

FIG 3 CRANKED CHAIN DRIVE TO BEAM RISE AND FALL

4) Tension chain by applying downward pressure on bearing block (4).

Note: Tension chain to remove slack only and lubricate

5) Tighten screws (2) and replace cover (1).

Monthly Maintenance

Feedworks Maintenance

The gearboxes used on Wadkin through-feed moulders are designed for the minimum of maintenance through the use of long life synthetic oils and high specification seals.

As such machinery can operate for prolonged periods within a hostile working environment we recommend that a visual inspection is made of the feed system (universal joints, gearboxes etc) every month. It is recommended that a record is kept of all such inspections to ensure continued trouble-free operation.

Whilst "wetting" of seal faces is normal with the use of high speed gearboxes, excessive seepage may lead to premature failure of the unit.

An oil change is recommended after 5000 hrs (2.1/2 years single shift) of operation. It is advisable to combine the lubricant change with thorough cleaning of the gear unit and replacement of any worn/damaged seals.

Size 63 gearbox	=	0.40 Litre
Size 80 gearbox	=	0.56 Litre

Oil Equivalents (type 320 grade, Polygloycol)

Agip	Telium VSF320
BP	Energol SG-XP320
Castrol	Alphasyn PG320
Esso	S220
Mobil	Glygoyle 30
Shell	Tivela oil SC320

ILLUSTRATED PARTS LIST

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IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER

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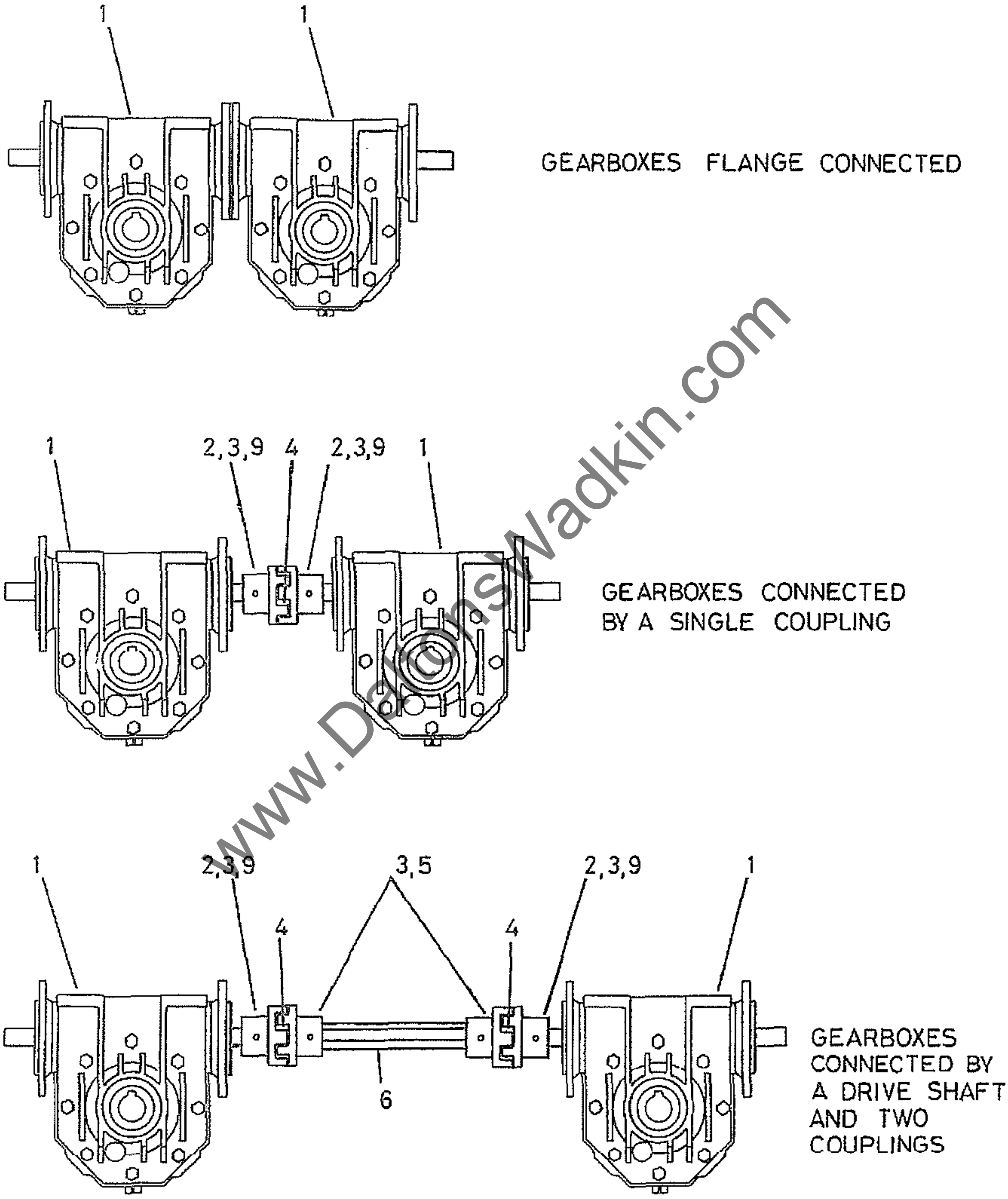

FIG 1 GEARBOX COUPLINGS

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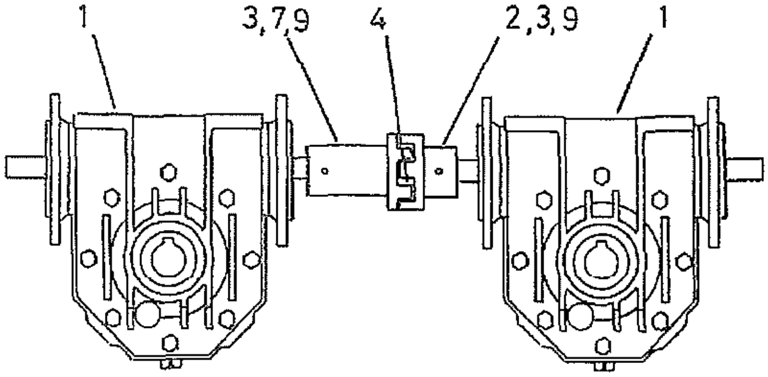
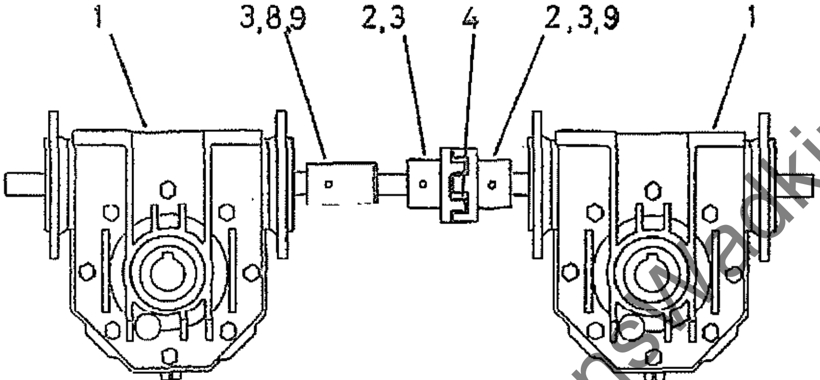
1, 1a GEARBOX COUPLINGS

Ref No.	Description	No Off.
1.	Gearbox	1
2.*	Coupling segment dia. 19mm bore or dia. 24mm bore	1
3.	Hexagon socket grubscrew M6 x 10mm long	1
4.	Flexible spider insert	1
5.	Coupling segment 19mm A/F	1
6.*	Hexagonal drive shaft 19mm A/F	1
7.	Extended coupling segment dia. 19mm bore or dia. 24mm bore	1
8.	Gearbox extension shaft	1
9.	Key 6mm x 6mm x 35mm long	1
10.	Flange coupling	1
11.	Taper lock bush ref 029K0019	1
12.	Pulley	1
13.	Hexagon socket capscrew M6 x 12mm long	4
14.	Boss for drive coupling	4
15.	'Gaco' 'O' ring ref RMO 156-24	4

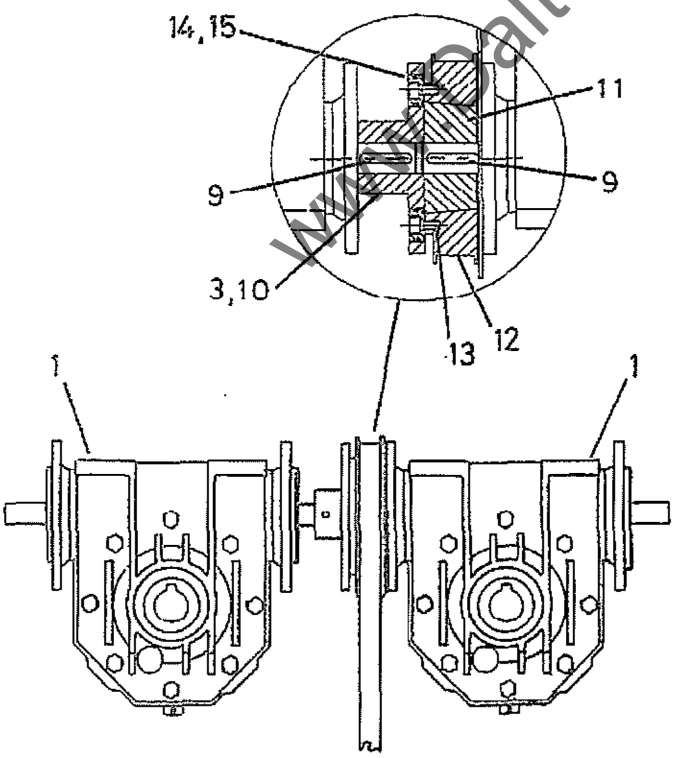
* Note: Specify bore size on couplings and length on drive shaft.



GEARBOXES CONNECTED BY A STANDARD COUPLING HALF AND AN ELONGATED HALF



GEARBOXES CONNECTED BY A COUPLING AND AN EXTENSION SHAFT



GEARBOX PROVIDING DRIVE TO BOTTOM FEED ROLL GEARBOX CONNECTED BY PULLEY AND FLANGED COUPLING

FIG 1a GEARBOX COUPLINGS (cont)

1, 1a GEARBOX COUPLINGS

Ref No.	Description	No Off.
1.	Gearbox	1
2.*	Coupling segment dia. 19mm bore or dia. 24mm bore	1
3.	Hexagon socket grubscrew M6 x 10mm long	1
4.	Flexible spider insert	1
5.	Coupling segment 19mm A/F	1
6.*	Hexagonal drive shaft 19mm A/F	1
7.	Extended coupling segment dia. 19mm bore or dia. 24mm bore	1
8.	Gearbox extension shaft	1
9.	Key 6mm x 6mm x 35mm long	1
10.	Flange coupling	1
11.	Taper lock bush ref 029K0019	1
12.	Pulley	1
13.	Hexagon socket capscrew M6 x 12mm long	4
14.	Boss for drive coupling	4
15.	'Gaco' 'O' ring ref RMO 156-24	4

* Note: Specify bore size on couplings and length on drive shaft.

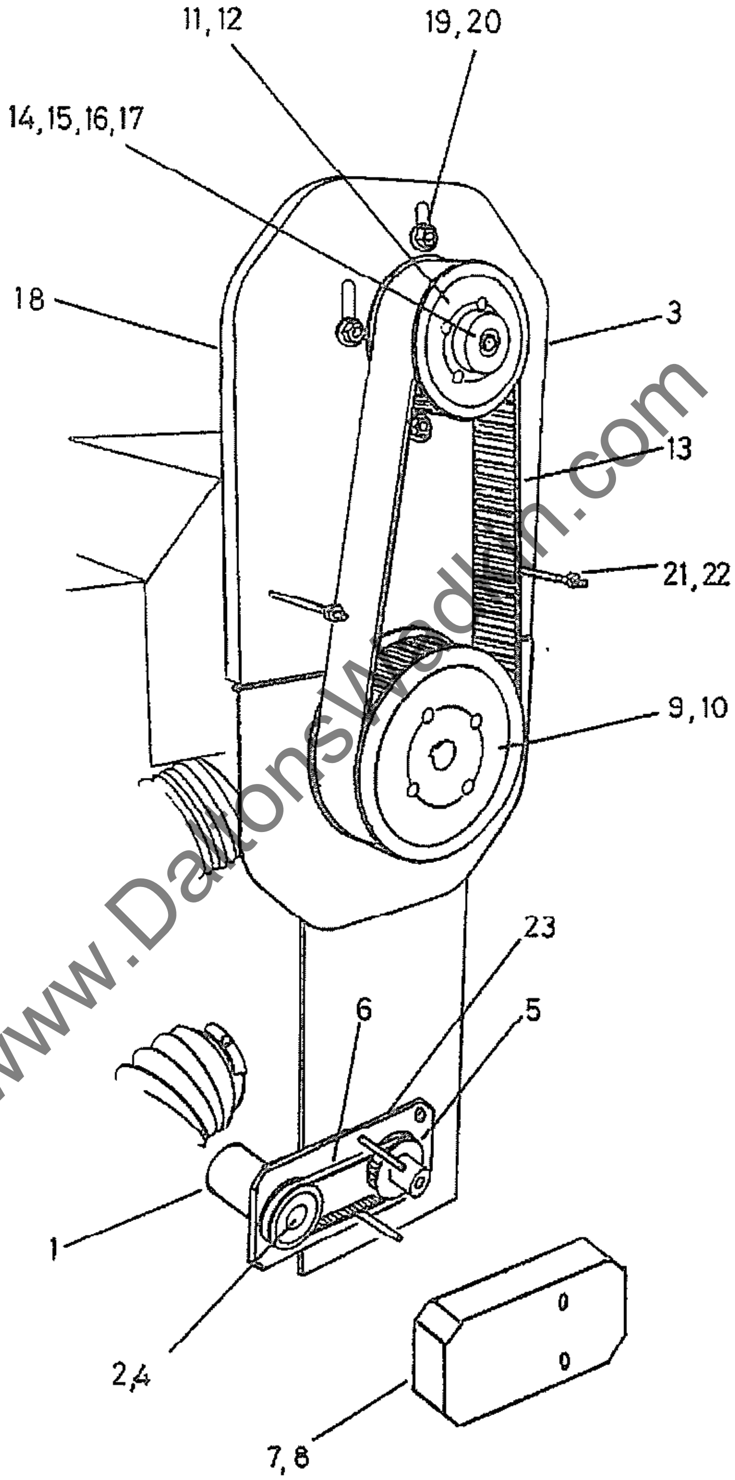


FIG 2 HYDRAULIC DRIVE TRANSFER TO FEED ROLL GEARBOXES

2. HYDRAULIC DRIVE TRANSFER TO FEED ROLL GEARBOXES

Ref No.	Description	No Off.
1.	Tachometer	1
2.	Special pulley	1
3.	Mounting plate for hydraulic motor	1
4.	Hexagon socket grubscrew M3 x 6mm long	1
5.	Special pulley	1
6.	Timing belt	1
7.	Cover for tachometer drive	1
8.	Nut M8	2
9.	Pulley	1
10.	'Fenner' tape lock bush ref 2517 24mm bore	1
11.	Pulley	1
12.	'Fenner' taper lock bush ref 1615 42mm bore	1
13.	Timing belt	1
14.	Splined motor adaptor	1
15.	Key 12mm x 8mm x 40mm long	1
16.	Special retaining bolt (supplied with motor)	1
17.	Special retaining washer (supplied with motor)	1
18.	Hydraulic drive motor (not shown)	1
19.	Nut M10	4
20.	Washer M10	4
21.	Timing belt cover (not shown)	1
22.	Nut M8	2
23.	Support plate for tachometer	1

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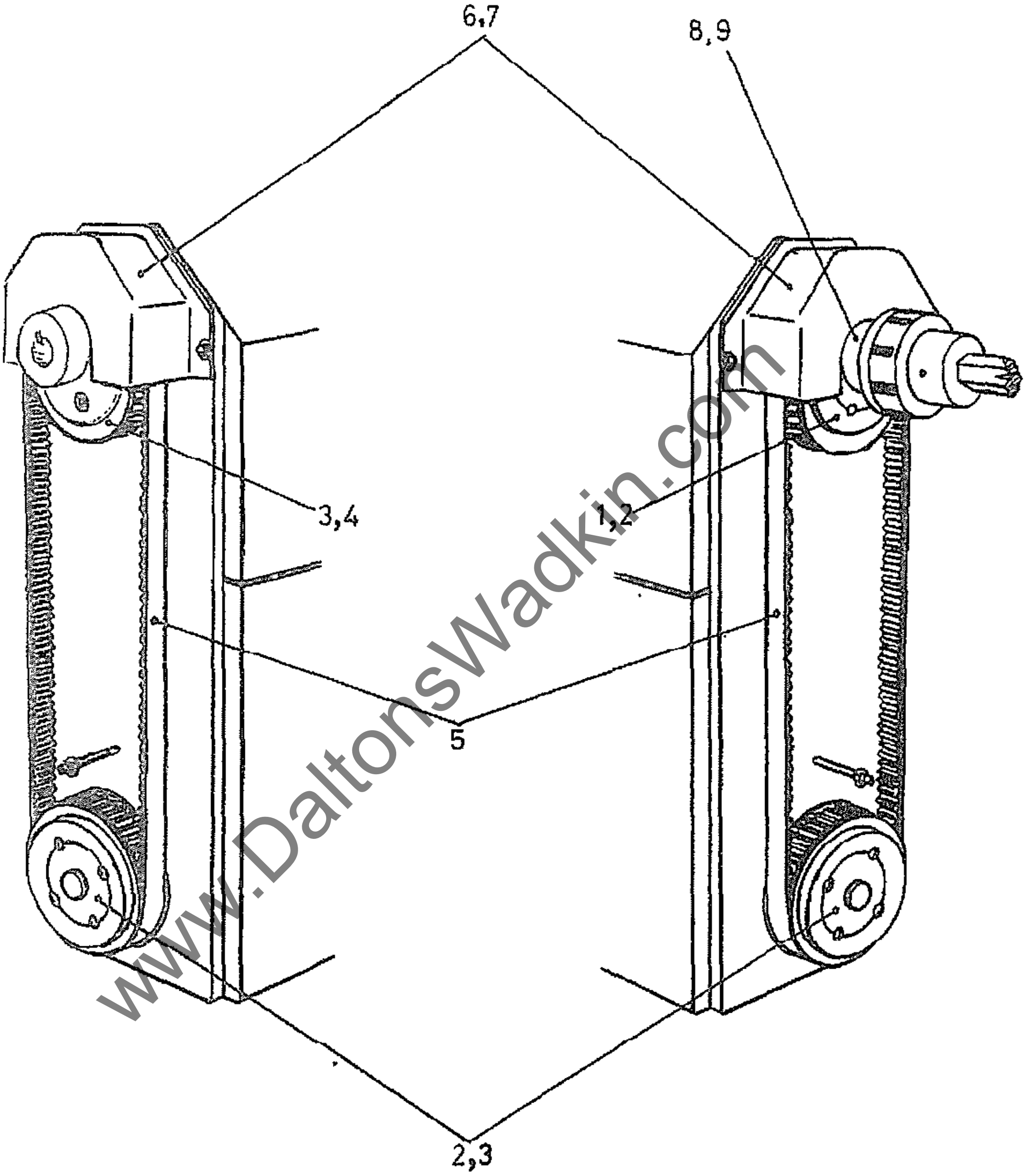

USED WHEN GEARBOX IS CONNECTED TO A FLANGED COUPLING

USED WHEN CONNECTING TO ANOTHER SERRATED SEGMENT

FIG 3 DRIVE TO BOTTOM FEEDROLLS

3. BELT DRIVE TO BOTTOM FEED ROLLS

Ref No.	Description	NO Off.
1.	Taper lock bush 'Fenner' ref 2012 48mm bore	1
2.	Pulley 'Fenner' ref P48 8M 20F	3
3.	Taper lock bush 'Fenner' ref 2012 19mm dia bore or 24mm dia bore	3
4.	Special pulley for drive coupling	1
5.	Timing belt 'Fenner' ref 1200 8M 20	2
6.	Top timing belt cover	2
7.	Bottom timing belt cover (not shown)	2
8.	Extended coupling segment 19mm dia bore or 24mm dia bore	1
9.	Hexagon socket grubscrew M6 x 10mm long	1

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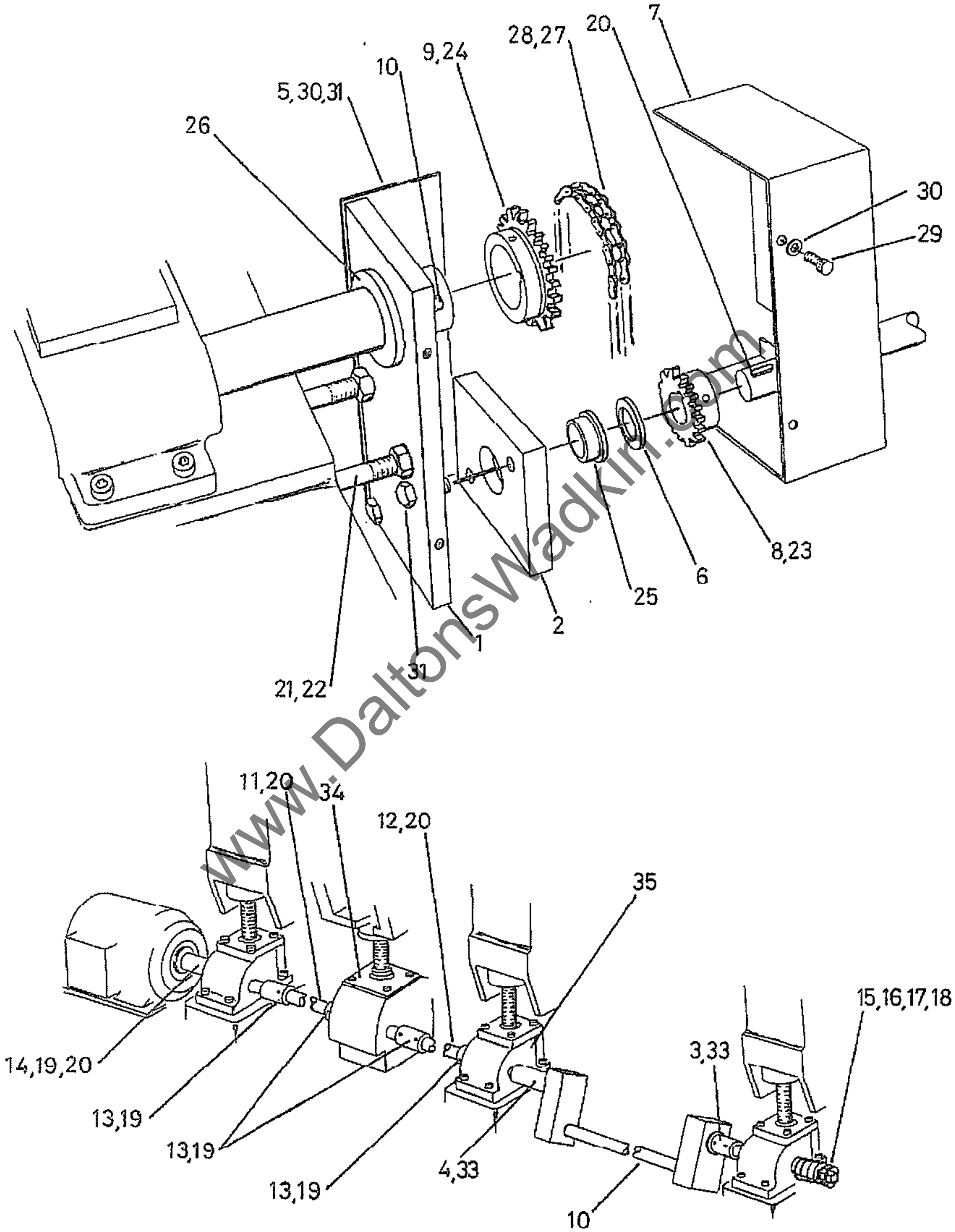


FIG 4 DRIVE SHAFTS TO BEAM RISE AND FALL

4. DRIVE SHAFTS TO BEAM RISE AND FALL

Ref No.	Description	No Off.
1.	Support plate for bearing block	2
2.	Bearing block	2
3.	Chain sprocket hub	1
4.	Chain sprocket hub	1
5.	Rear plate for chain cover	2
6.	Spacer	2
7.	Chain cover RH	1
or	Chain cover LH	1
8.	Chain sprocket	2
9.	Chain spocket	2
10.	Outfeed connecting shaft	1
11.	Infeed connecting shaft	1
12.	Intermidiate connecting shaft	1
13.	Connecting shaft collar	4
14.	Collar (motor to first worm gear housing)	1
15.	Square end adaptor	1
16.	Taper end no.2	1
17.	Compression spring	1
18.	External circlip 30mm dia	1
19.	Nyloc grubscrew M6 x 8mm long	13
20.	Key 6mm x 6mm x 20mm long	7
21.	Stud M12 x 105mm long	4
22.	Nut M12	8
23.	Hexagon socket grubscrew M6 x 20mm long	4
24.	Hexagon socket grubscrew M8 x 12mm long	4
25.	Headed bush 26mm O/D x 20mm I/D x 20mm long	2
26.	Headed bush 45mm O/D x 35mm I/D x 25mm long	2
27.	Chain	2
28.	Link connector	2
29.	Hexagon socket capscrew M6 x 12mm long	4
30.	Plain washer M6	4
31.	Hexagon head setscrews M10 x 35mm long	4
32.	Key 10mm x 8mm x 25mm long	2
33.	Hexagon socket grubscrew M6 x 6mm long	4
34.	Top head rise and fall wormbox (see Top Head module)	
35.	Beam power rise and fall wormbox	

BEARING ARRANGEMENT:- RISE AND FALL LEADSCREW

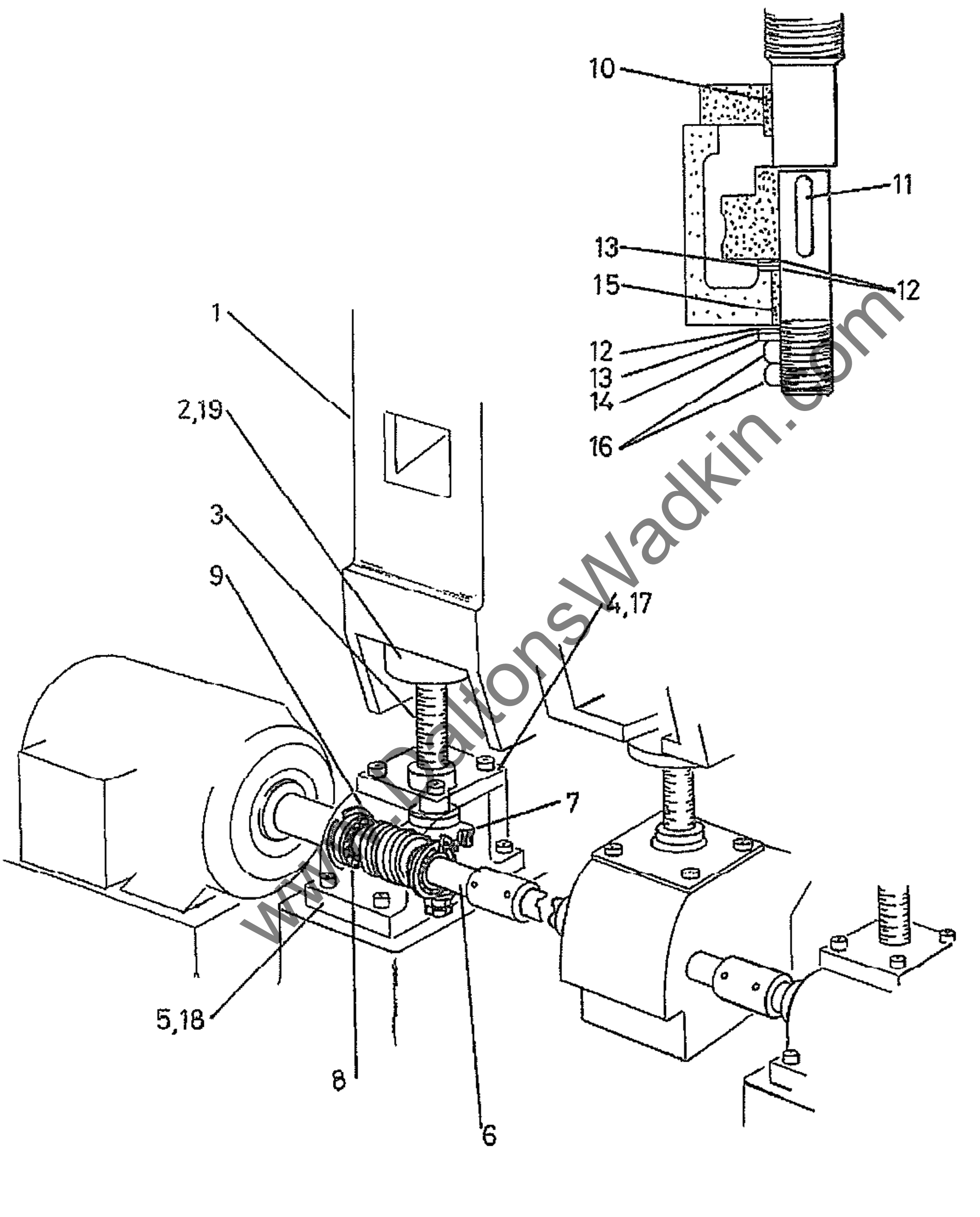
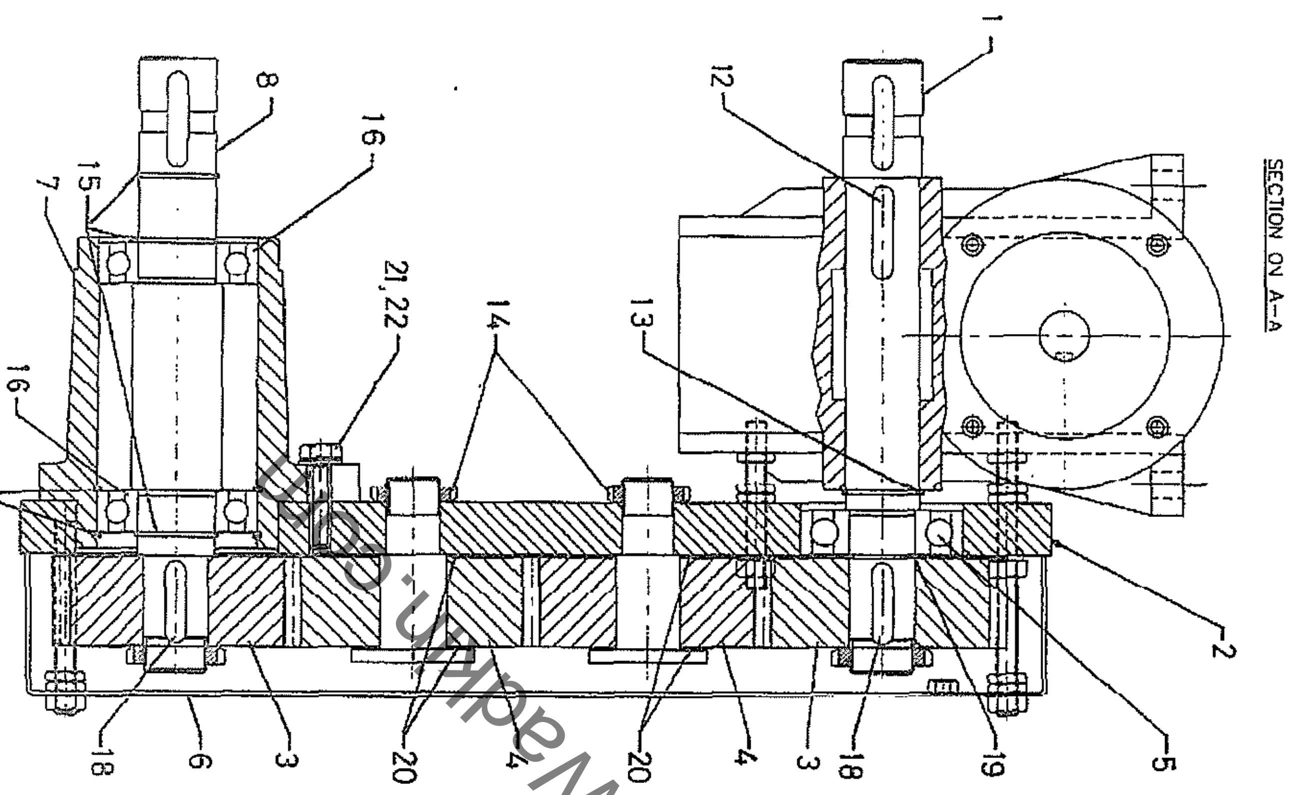


FIG 5 BEAM POWER RISE AND FALL

5. BEAM POWER RISE AND FALL

Ref No.	Description	No Off.
1.	Top beam slide bracket	1
2.	Nut for rise and fall leadscrew	1
3.	Rise and fall leadscrew	1
4.	Top cover for worm-gear housing	1
5.	Worm-gear housing	1
6.	Worm	1
7.	Worm wheel	1
8.	Bearing 'SKF' for 'RHP' 6204-RS	2
9.	Internal circlip 47mm diameter	2
10.	Bush 25mm I/D x 30mm O/D x 20mm long	1
11.	Key 6mm x 6mm x 32mm long	1
12.	Thrust washer 'INA' AS2035	3
13.	Thrust bearing 'INA'AXK - 2035	2
14.	Shaft washer 'INA' WS81104	1
15.	Bush 20mm I/D x 25mm O/D x 20mm long	1
16.	Hexagon locknut M20	2
17.	Hexagon socket capscrew M6 x 25mm long	4
18.	Hexagon socket capscrew M8 x 30mm long	4
19.	Hexagon socket capscrew M8 x 60mm long	4

Quantities off are per slide bracket unit.



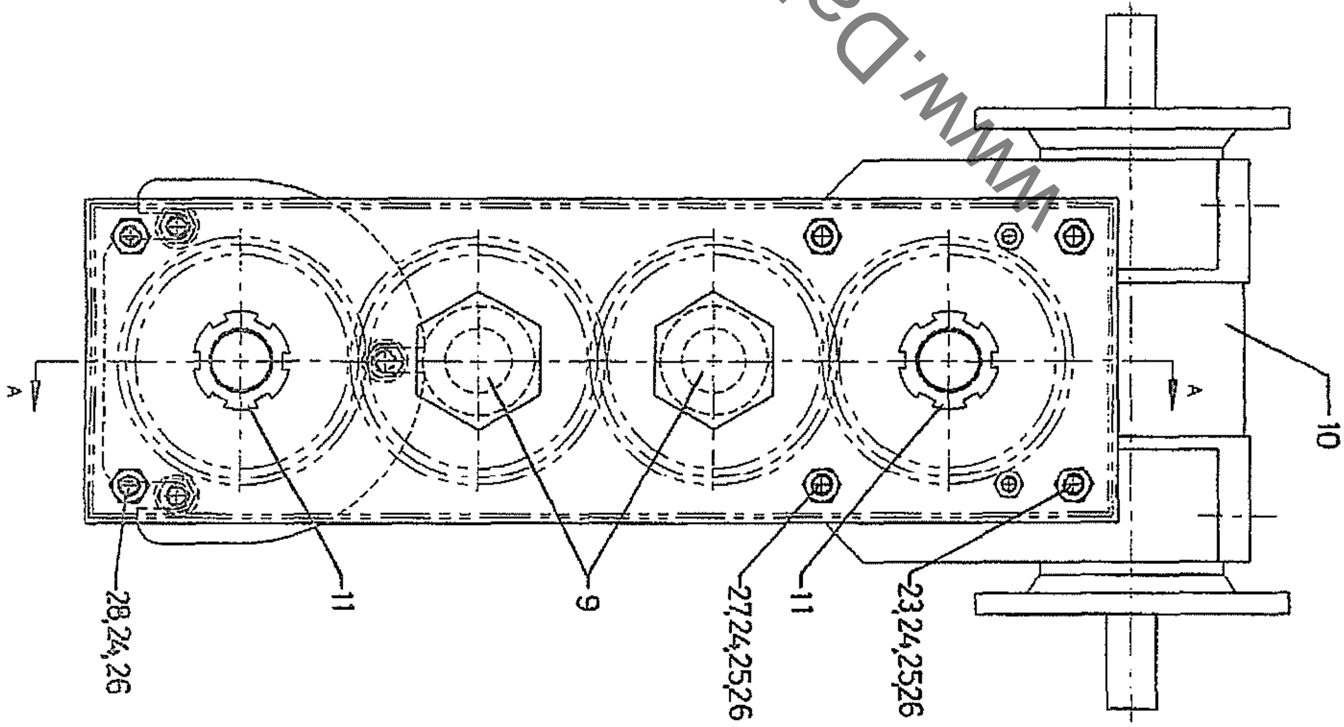


FIG 6 GEAR DRIVE TO BOTTOM FEEDROLLS

6. GEAR DRIVE TO BOTTOM FEED ROLLS

Ref No.	Description	No Off.
1.	Output shaft	1
2.	Mounting plate	1
3.	Steel gear 30 teeth	2
4.	Delrin gear 30 teeth	1
5.	'SFK' Bearing 6305 2RS	1
6.	Cover	1
7.	Bearing housing	1
8.	Drive shaft for bottom feed roll	1
9.	Idler gear shaft	2
10.	'Siti' Gearbox	1
11.	Notch nut M24 x 1.5p	2
12.	Key 8mm x 7mm x 36mm long	1
13.	External circlip dia. 28mm	1
14.	Notch nut M20 x 1.5p	2
15.	External circlip dia. 30mm	3
16.	'SFK' Bearing 6206 2RS	2
17.	Internal circlip dia. 62mm	2
18.	Key 8mm x 7mm x 32mm long	2
19.	External circlip dia. 25mm	1
20.	'INA' Thrust washer AS 2542	4
21.	Hexagon head setscrew M8 x 35mm long	3
22.	Washer M8	3
23.	Stud M8 x 115mm long	2
24.	Nut M8	8
25.	Spring washer M8	4
26.	Hexagon locknut M8	20
27.	Stud M8 x 65mm long	2
28.	Stud M8 x 75mm long	2

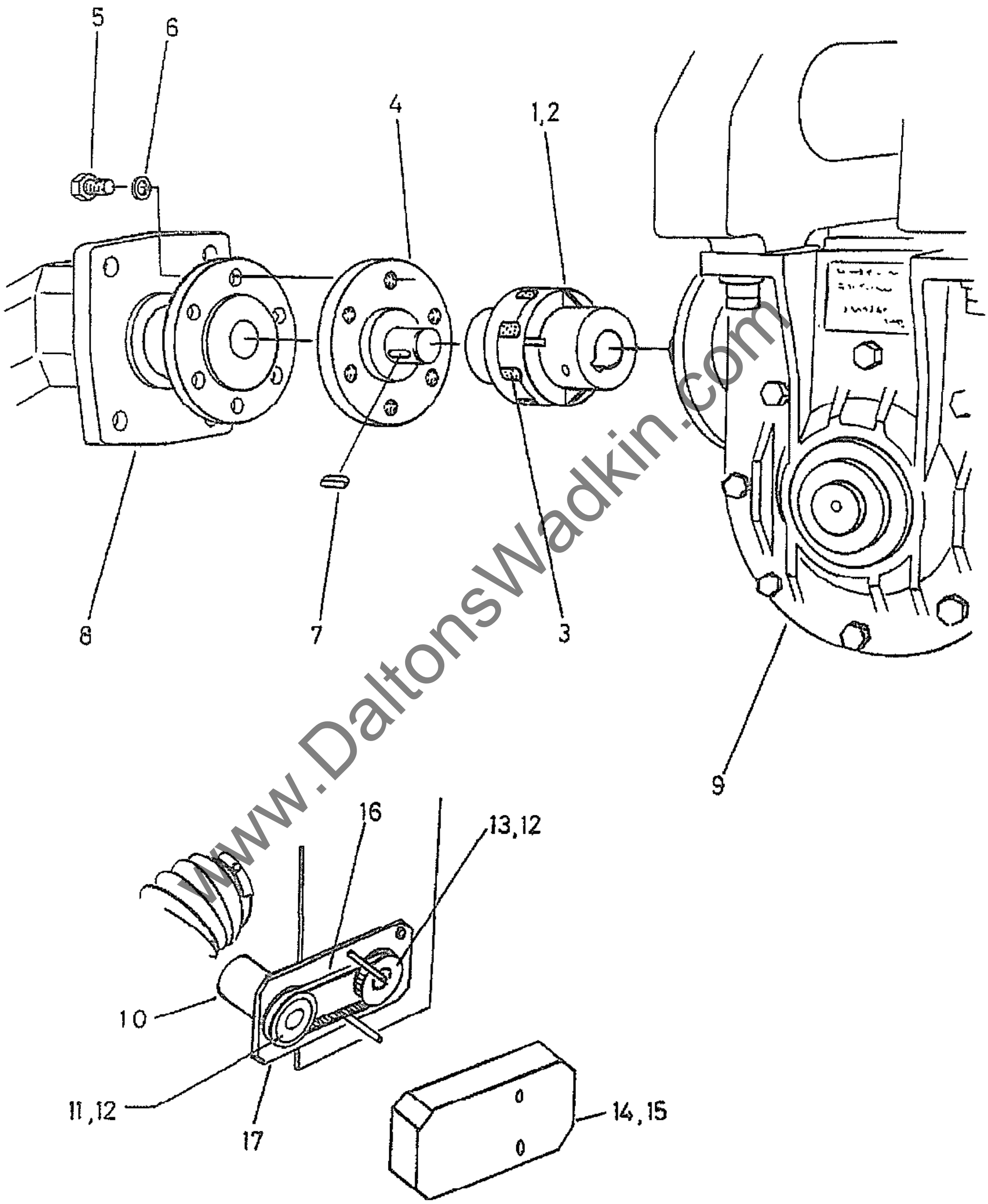


FIG 7 DIRECT HYDRAULIC DRIVE TO FEED ROLL GEARBOXES

7. DIRECT HYDRAULIC DRIVE TO FEED ROLL GEARBOXES

Ref No.	Description	No Off.
1.	Coupling segment 19mm bore	2
2.	Hexagon socket grubscrew M6 x 10mm long	2
3.	Flexible spider insert	1
4.	Hydraulic drive coupling	1
5.	Hexagon head setscrew M8 x 20mm long	6
6.	Plain washer M8	6
7.	Key 6mm x 6mm x 20mm	1
8.	Hydraulic drive motor	1
9.	Gearbox	
10.	Tachometer	1
11.	Special pulley	1
12.	Hexagon socket grubscrew M3 x 6mm long	2
13.	Pulley	1
14.	Cover for drive	1
15.	Nut M8	2
16.	Timing belt	1
17.	Support plate	1

SECTION 14 SPINDLES

General

Although there are various types of spindle e.g. long barrel, short barrel, plain, threaded etc., the same basic removal, stripdown and replacement procedure may be followed.

Following this type of maintenance the machine will need to be 'set up' prior to return to work.

Bearing changes should be performed by competent personnel and Wadkin strongly recommend buying an exchange spindle unit rather than attempting a bearing change.

Where reference is made to other 'headings' then these may be found in the chapter relevant to the head module being worked on.

Spindle Removal (Fig 1)

1) Isolate power at mains or at master stop.

2) Remove cutterblocks, outboard bearing if fitted, and any surrounding covers which may impede the removal of the spindle (see - **Changing Cutterblocks**).

3) Remove spindle pulley covers and drive belts (3). (See - **Changing Drive Belts.**)

4) Release spindle barrel lock (1) and also the clamp screw (2) on the spindle adjustment collar nut (4).

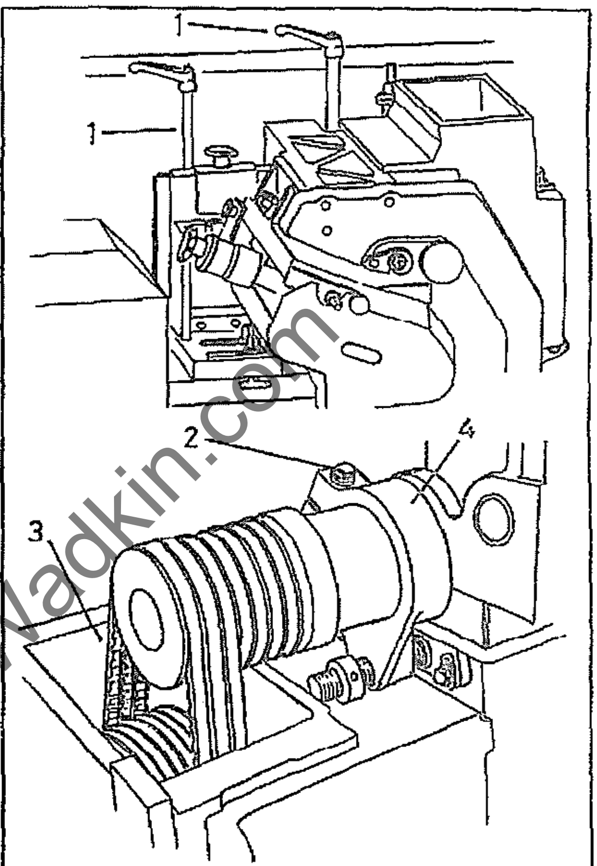


FIG 1 SPINDLE BARREL LOCK AND ADJUSTMENT COLLAR FOR TOP AND BOTTOM HEADS

Caution: When releasing clamp screw on side head spindles ensure they are supported to avoid them dropping down and damaging pulley and/or spindle.

5) Withdraw Top and Bottom head spindles from the front of the machine and side heads from the top.

6) Inspect bore and barrel housing for scoring. Replace bearings etc as needed.

7) To re-assemble reverse procedure. The bore and barrel housing should be clean and dust free. Smear the tip of the bore with oil before inserting housing which should be sprayed with a dry 'running in' lubricant.

Preparation Prior to Fitting Bearings

Before fitting a new bearing, the protection 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.

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) = d x B x 0.01
d = bore of bearing in mm
B = width in mm

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

Changing Cutterblock Spindle Bearings (Fig 2)

The bearings have been fitted to the cutterblock spindles in an orthodox manner. At the non-drive end of the spindle a liquid engineering adhesive ('Loctite' grade 241) has been applied to the internal thread diameter of the spindle locknut (2).
To disassemble 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.

Note: Work must take place in a clean and dry environment, failure to do so could result in premature bearing failure.

1) Remove pulley (8) and pulley spigot (10) by unscrewing M12 socket screw (11).

2) Unscrew spindle locknut (2) and barrel locknut (3). The spindle (1) can now be withdrawn from the cutterblock end of the barrel (5).

Note: The spindle locknut (2) can be right or left hand thread as follows:

Top head spindle - right hand
Bottom head spindle - left hand
Near side head - left hand
Fence side head - right hand

Remove existing bearings (4) and (7) from the spindle and barrel using a bearing puller.

Note: Care must be taken not to damage the spindle or the barrel.

3) After preparation, refit the disc springs (6) correctly and fit new bearings (4) and (7) to spindle and barrel ensuring that the bearings are fitted in tandem the correct way round. Use only sufficient pressure to fit bearings, applying pressure to the inner rings only. Ensure that bearing fits up to location shoulder. Bearings must be lubricated (see **preparation prior to fitting**).

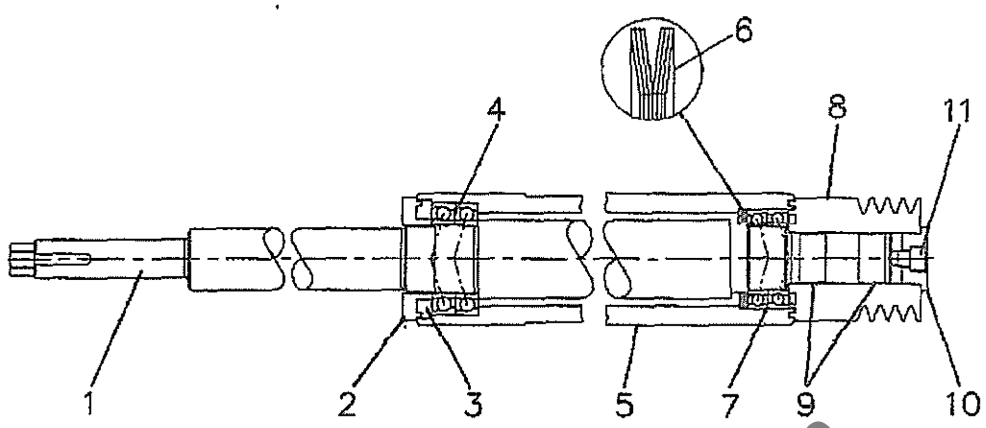


FIG2 SPINDLE UNIT

4) Reassemble spindle unit, tighten locknuts (2) and (3), refit pulley (8) ensuring tolerance rings (9) are fitted.

Note: Do not overtighten locknuts.

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

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER.

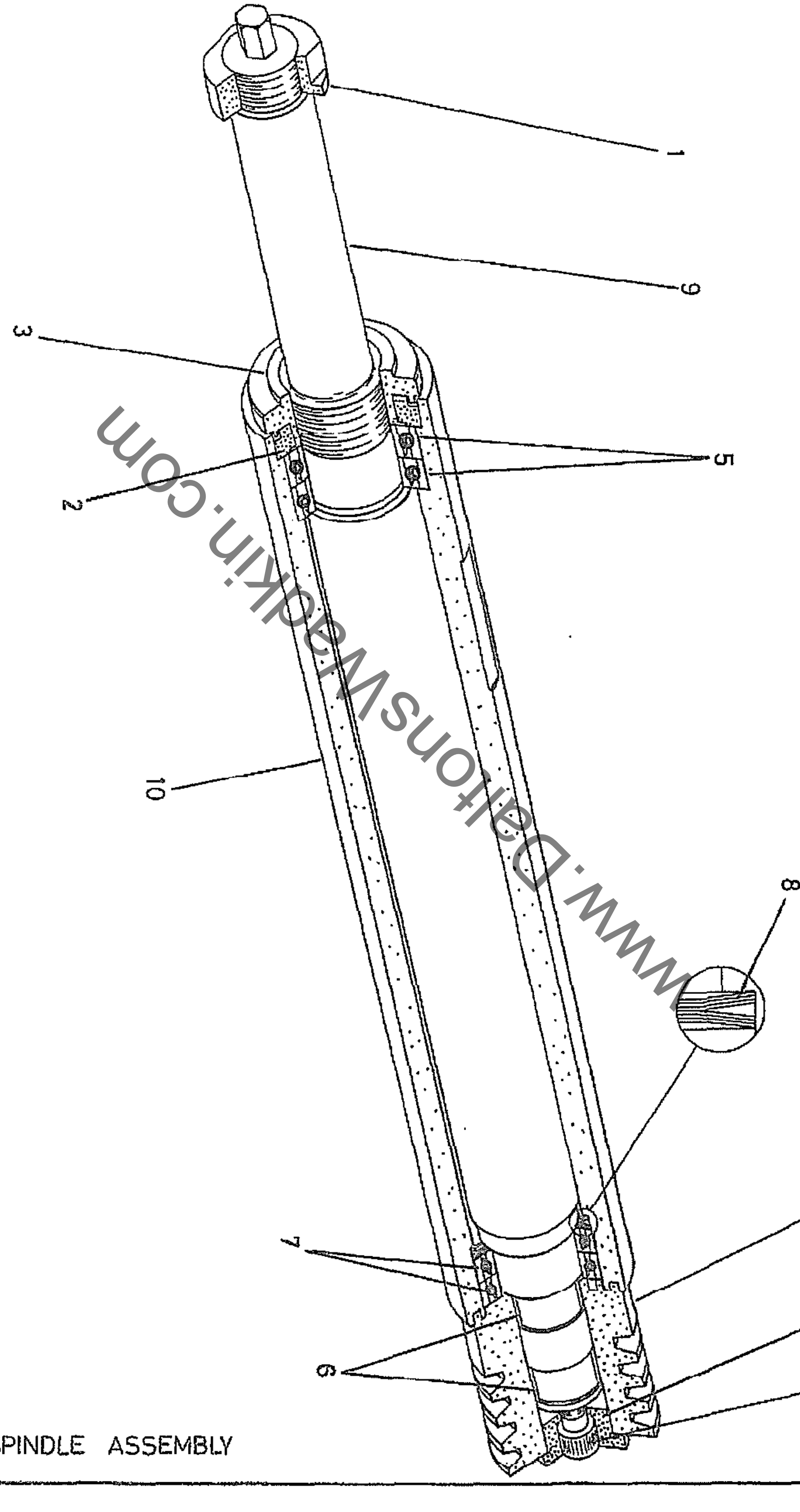


FIG 1 SPINDLE ASSEMBLY

1. SPINDLE

Ref No.	Description	No Off.
1.	Locking nut (left or right hand thread)	1
2.	Lock nut for spindle barrel	1
3.	Locknut for spindle (left or right hand thread)	1
4.	Pulley spigot	1
5.	Matched pair angular contact bearings ref 'RHP' B7011 x 2 TADTL - EP7	1 pair
6.	Tolerance rings 'Rencol' SV40 x 20	2
7.	Matched pair angular contact bearings ref 'RHP' 7010 x 2 TADTL - EP7	1 pair
8.	Disc Springs	6
9.	Spindle	1
10.	Spindle barrel	1
11.	Pulley	1
12.	Hexagon socket screw M12	1

Note: When ordering items 9, 10 or 11 please specify which head position the components are for as well as machine model and number.

SECTION 15 BEDPLATES AND FENCES

General

Because of the modular nature of the machine build it is not possible to describe all the possible 'set ups'. However there are general principals which apply and they are stated in the following headers. Bedplate fixings are usually self evident but on occasions a fence may need to be removed to gain access to a bolt fixing.

Infeed Fence Removal and Replacement (Fig 1)

The infeed fence operates on eccentric pins which are factory set. Unless absolutely necessary only the following fixings should be touched.

1) Isolate power at mains or master stop.

2) Unscrew and remove the intermidiate locking nuts (1) and washers for the infeed fence (2) (positions and number off may vary depending on build).

3) Remove front pivot pin (3) from the hand adjusting lever (4).

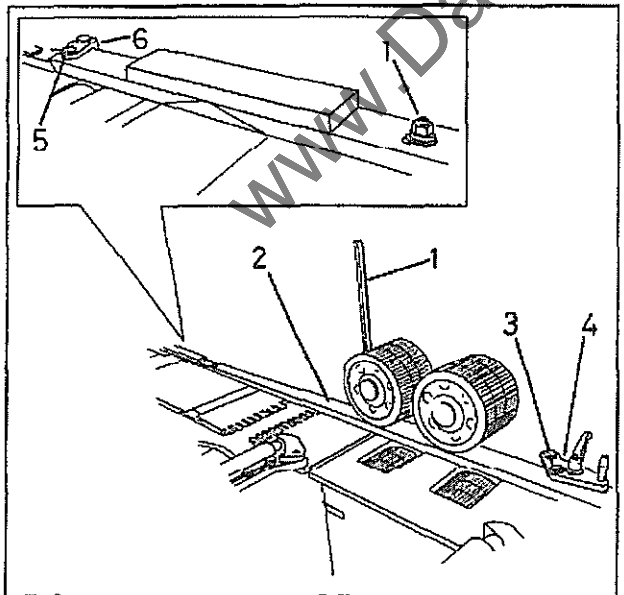


FIG 1 INFEED FENCE

4) Remove front pivot pin (5) from the pivot link (6).

5) Swing the pivot link (6) and adjusting lever (4) clear of the fence. Lift the fence up to clear studs for locking nuts and remove.

Note: Take care not to damage the bed plates.

6) To replace the fence reverse the procedure ensuring the bed and bottom of fence are clean. Once replaced position a straight edge from the fixed fence to check settting at zero is still correct.

Intermediate and Outfeed Fences

These fences are fixed in position with capscrew and tension pins.

1) Isolate power at mains or at master stop.

2) Unscrew and remove securing capscrews.

3) Remove fence and tension pins from fence/bed plate.

4) Before replacing ensure bed and underside of fence are clean.

5) Place a straight edge so it straddles the fence to be set or if this is not possible position the straight edge along a fixed fence so it projects over the fence to be set.

6) Push the fence up to the straight edge and tighten capscrew enough to lightly hold fence in position.

7) Using feeler gauges check the gap between fence and straight edge. This should not be greater than 0.05mm (0.002").

8) If necessary gently tap the fence mouting to adjust gap setting. When correct fully tighten capscrews and re-pin.

9) Finally re-check fence gap.

Bedplate Removal/Replacement

The bedplates are generally straight bolt down the exceptions being the dovetail mounting permali bedplates and the sliding side heads.

1) Isolate power at mains or at master stop.

2) Examine bedplate and determine whether fence removal is necessary.

3) Side pressure and other ancillary equipment may be fitted to a bedplate and the disconnection of such items might ease bed removal.

4) Before replacing bedplate ensure bottom face and machine base is clean. Refit any removed shims.

5) Place a straight edge on an undisturbed bed projecting over or if possible bridging the new/replaced bedplate. The gap between bedplate and straight edge should not exceed 0.076mm over a 1220mm span (0.003" over 4').

Shim if required.

Bed Lubrication (Fig 2)

This is a standard feature on all machines with the lower feed speed machines having a manual system and the machines with a feed speed of 100m/min plus having an automatic system. The manual system feeds oil continuously to the fence side half of the bed with a lever operated valve (1) on the infeed base casting bring in the outer half of the bed lubrication when needed on wider timber.

Pumping the lever (2) on the hand operated oil reservoir (3) pressurises the oil in the tubes and it slowly seeps out the oil groove in the bedplate.

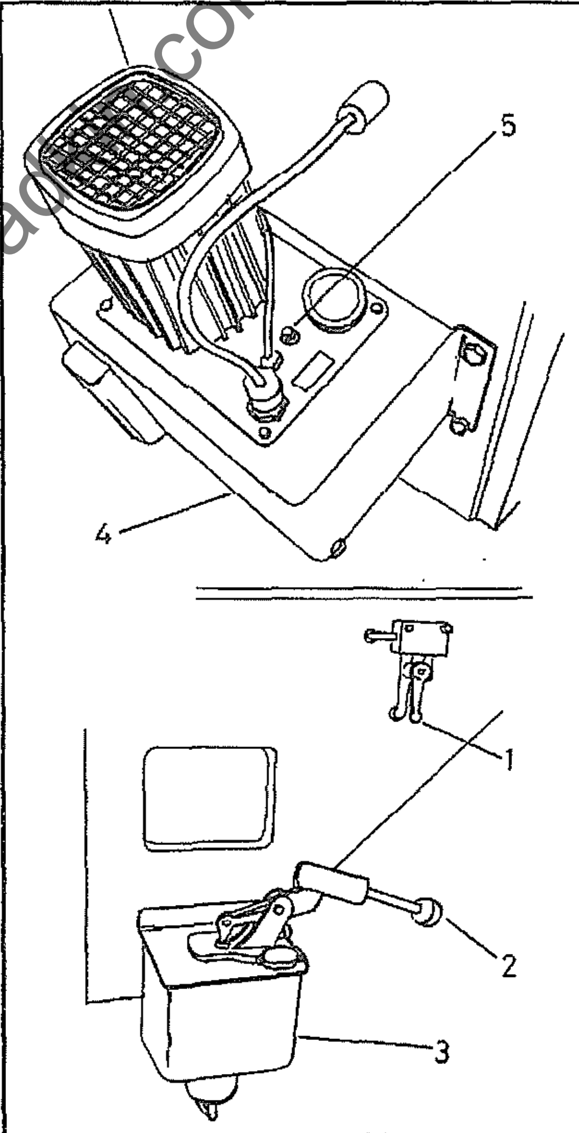


FIG 2 LUBRICATION PUMPS

The continuous oil flow on the automatic system is delivered by an electric pump (4) with the flow being regulated by an adjustment (5) on the pump body. An anticlockwise movement of the adjusting screw decrease the flow whilst a clockwise movement increases it.

The amount of oil required varies depending on hardness, type of wood, porousity, required finish, feed speed, etc. and should be determined on site. Two pumps of the manual lever may be sufficient for a hundred meter run.

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SECTION 16 JOINTERS

Principles and practice (Fig 1, Fig 2)

Jointing is a dressing technique which is applied to a rotating cutterblock in order to true all the knives to a common cutting circle. By applying this technique the feed speed of the machine can be increased by a factor equal to the number of knives in the cutterblock.

In order to appreciate this fact, the nature of the machined surface of the timber resulting from the rotary cutting technique must be understood.

The surface finish consists of a series of adjacent waves, (as shown in Fig 1), the pitch and depth of these waves being directly related to the cutter spindle speed, number of finishing knives, feed speed and radius of cutter head.

Wave pitch p (mm) $= \frac{f \times N}{n}$

Where: f = Feed speed (mm/min)
n = Spindle speed (r.p.m)
N = Number of finishing knives

Wave height h (mm) $= R - (R^2 - \frac{p^2}{4})^{0.5}$

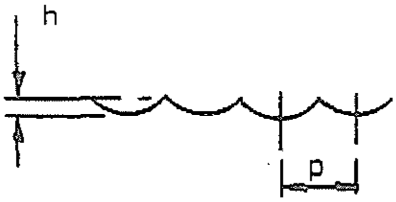


FIG 1 SURFACE FINISH

Under normal toolsetting techniques only one knife in the cutterblock produces a finishing wave, the other knives cut the timber but do not affect the finish.

When jointing is applied the cutting edges are trued exactly and consequently all the knives in the cutterblock produce a very fine wave pitch if run at the feed speed suitable for a single finishing knife. This would produce overcutting and power requirements would also increase.

In practice wave pitch values of 1.0 to 2.5mm are necessary, depending on the end use of the timber. Therefore, when jointing the feed speed must be increased to give desired wave pitch.

Typical wave pitch values for different applications are:

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

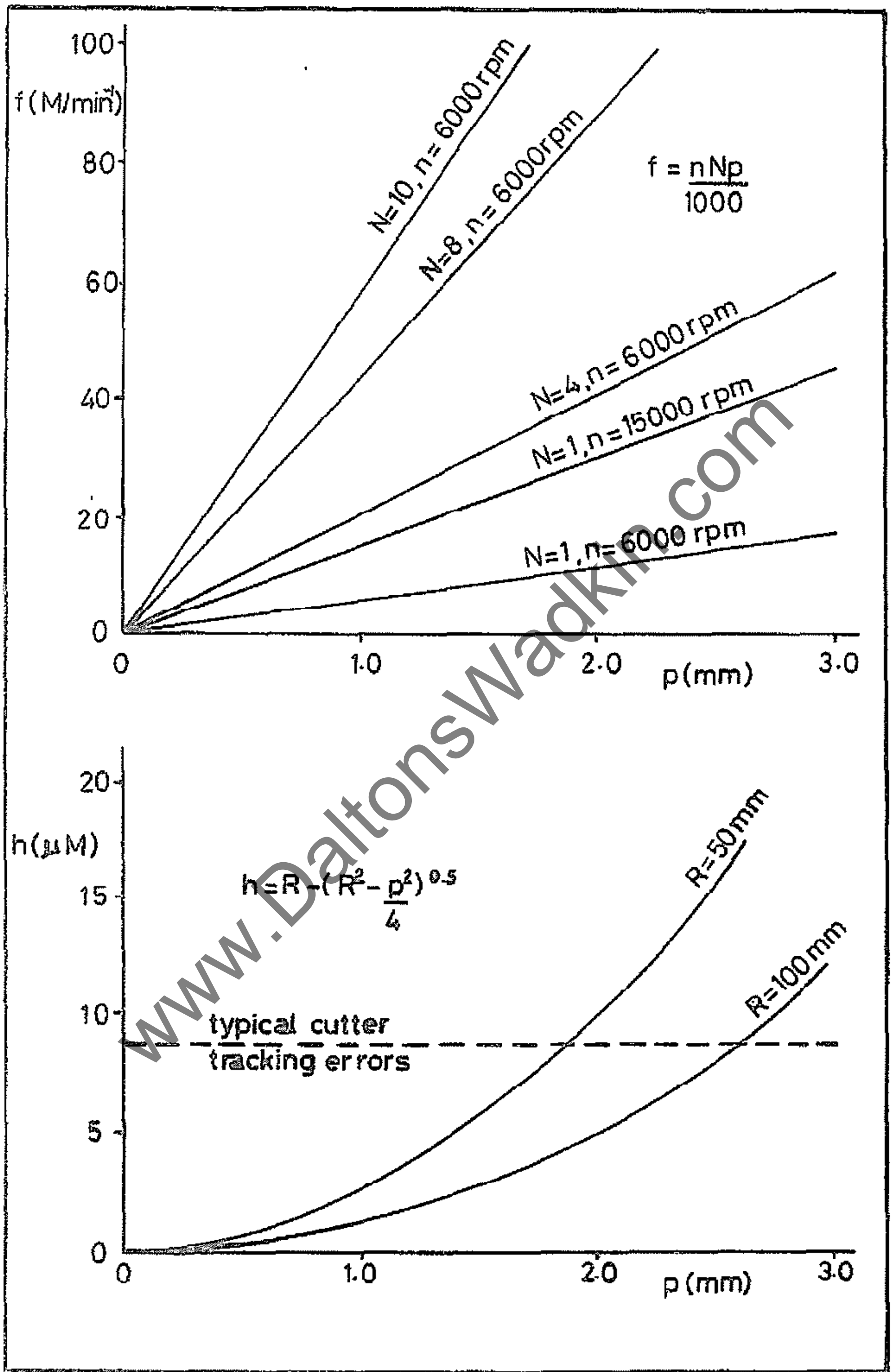
These are for the visible surfaces of a product, clearly larger values can be permitted on hidden faces.

It should be noted that as wave pitch and depth of cut are reduced the power required may increase, due to the cutting edge tending to rub over the timber surface rather than cutting.

Practice

The technique of jointing is achieved by grinding all cutting edges of the knives in the cutterblock within 0.010mm of the true cutting circle in the toolroom. When mounted in the machine an abrasive stone is traversed across the width of the cutterblock (straight jointing) while it rotates at the correct operating speed, (normally 4500 or 6000 RPM).

This action effectively puts a flat on the cutting edges of the knives in the cutterblock. The



f and h against p , R= 50mm R=100

50A

width of flat (joint) produced increases for each successive jointing and for efficient operation should not exceed 0.5mm.

There are two types of jointing, depending on the cutters to be jointed. 'Straight', across the knife, for planing; or 'Profile', toward the knife, for profiled moulding cutters. The latter operation is also referred to as 'plunge' jointing.

The stone used in straight jointing is relatively hard (see maintenance). This is set to the cutter **(see Chapter - Method of Use)** then traversed across the cutterblock face to ensure that all cutters touch. The spindle is then rotated under power and a traverse taken to true the cutting circle.

The stone used in profile jointing is relatively soft (see maintenance). This is fed toward the cutterblock knife faces, the stone being shaped to suit the cutter profile. Both methods are described.

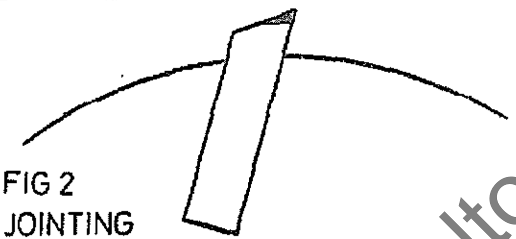


FIG 2
JOINTING

Straight Jointing

1. Using the index wheel, set the jointing stone to just touch the cutter knives, then traverse the stone across the cutter head (stationary) to ensure that all cutters touch. Park the stone 5 to 10mm away from cutters until ready to use.

2. Set spindle in operation. When up to normal operating speed, traverse once. Set a further increment of cut on the index wheel and repeat traverse. A smooth hand operation is best.

3. Switch off spindle head. Bring the spindle to rest as smoothly as possible using automatic braking (if fitted).

4. Check the cutter joint using a light to ascertain if even jointing has been applied to all cutting edges.

5. Repeat as necessary until and even joint has been achieved. Park the stone away from the cutters.

When rejointing, it is useful to apply a black ink marker along the cutting edges. This will help identify when all the cutters have been successfully jointed.

Profile Jointing

1. The profile to be used is first marked out on the stone, which is then hand ground to the required shape, using a profile template. It is good practice to finally bevel the stone edges (see Fig 3).

2. Mount the profiled stone in the holder located on the machine body and secure in position with the locking screws.

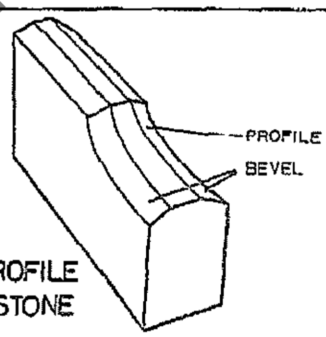


FIG 3
TYPICAL PROFILE
JOINTING STONE

3. Position the stone to the cutterhead using the jointer cross traverse and radial feed screws. Lock the jointer slide in the correct axial position, making sure that the stone profile corresponds to the cutter knives.

4. The stone is finally shaped to the cutters turning the spindle slowly by hand - termed 'chipping'.

5. Carry out jointing operation, steps (2) to (5) as for 'straight' jointing, except that instead of traversing the cutter knives, the stone is now progressively fed (plunged) into the tool face until the correct heel or land is achieved on the cutter knives.

6. When profile jointing, the index ratchet may be disengaged to allow the stone to be retracted quickly after the required joint has been achieved.

7. Park the profile jointing stone 5 to 10mm away from the cutters.

Jointer - Fence Side Head (Fig 4)

This is a combined straight knife and profile jointer with traverse screw and index feed, located on a post fitted to the fence side head cross slide and positioned adjacent to the cutterblock.

The traverse screw is operated from the front of the machine via a bevel gear arrangement using a removable handle applied to a square on the geared shaft extension which forms part of the fence side head controls.

The jointer locating post and bevel gear form an integral part of the head cross slide. The jointer itself is demountable , but will normally remain in position.

Method of Use

1. Fit pre set profile or straight jointer stone cartridge (1) to head clamp block (2) and secure.

2. Move the jointer head into position relative to the cutterblock using the traverse (3) and index wheel (4).

3. Proceed as described in **Jointing Practice - Methods**, as applicable until an even joint has been obtained.

4. When straight jointing. Fit winding handle to the square on the traverse screw (3).

5. When profile jointing: Lock the traverse screw in position. Feed the profile stone to the cutter using index wheel (4).

6. On completion, retract the jointing stone and park away from the cutter knives. Restore head covers to original position.

   Note: When straight jointing the stone is positioned in the angled slot. When profile jointing, parallel to the cutters

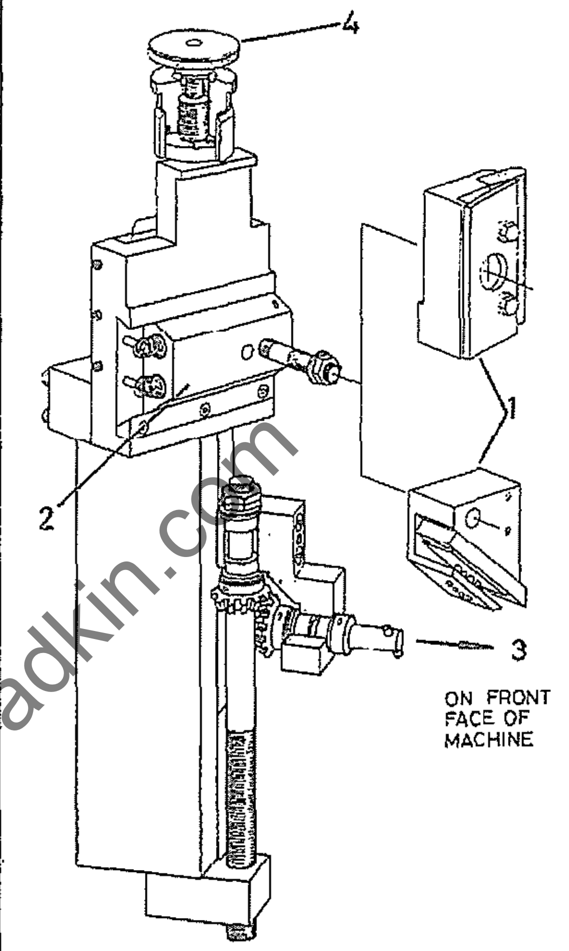


FIG 4 FENCE SIDE HEAD JOINTER

Jointer - Near Side Head (Fig 5)

This is a combined straight knife and profile jointer with traverse and indexed feed similar to the fence side head. The jointer is located on a post positioned adjacent to the cutter spindle on the near side.

The traverse screw is operated by a removable hand applied to a square extension located at the top of the jointer slide. The feed index operates in a similar way to the fence side head.

When the jointer is in use the cover of the near side hood may be removed to give increased access to the cutterblock. After use retract and park the stone. Replace covers or guards removed.

Method of Use

1. Proceed as described in Fence Side Head, items (1) to (3), until an even joint has been obtained.

2. When square jointing: Fit winding handle to the square on the traverse screw (1).

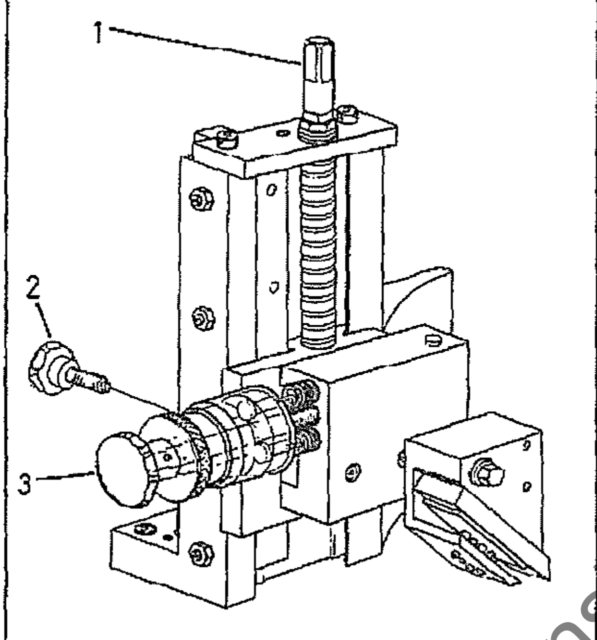


FIG 5 NEAR SIDE HEAD JOINTER

3. When profile jointing: Lock the traverse screw in position with screw (2). Feed the profile stone to the cutter using index wheel (3).

4. On completion, retract the jointing stone and park away from the cutter knives in nearside position. Restore head covers to original position.

Note: When straight jointing the stone is positioned in the angled slot. When profile jointing, use the slot parallel to the cutters.

Jointer - Top Heads (Fig 6)

This is a built-in combined straight and profile jointer, forming part of the assembly which also carries the top head chipbreaker and outboard bearing attachment.

The method of traverse and feed are similar to the bottom heads. When straight knife jointing, the axial traverse is effected by a winding handle applied to the square end of the traverse screw. A locking screw is provided to lock the slide traverse while profile jointing.

Method Of Use

1. Fit pre set profile or straight jointer stone cartridge (1) to head clamp block (2) and secure.

2. Move the jointer head into position relative to the cutterblock using the traverse (3) and index feed (4).

3. Proceed as described in **Jointing practice - Methods**, as applicable, until an even joint has been obtained.

4. When straight jointing: Fit winding handle to the square on the traverse screw (3).

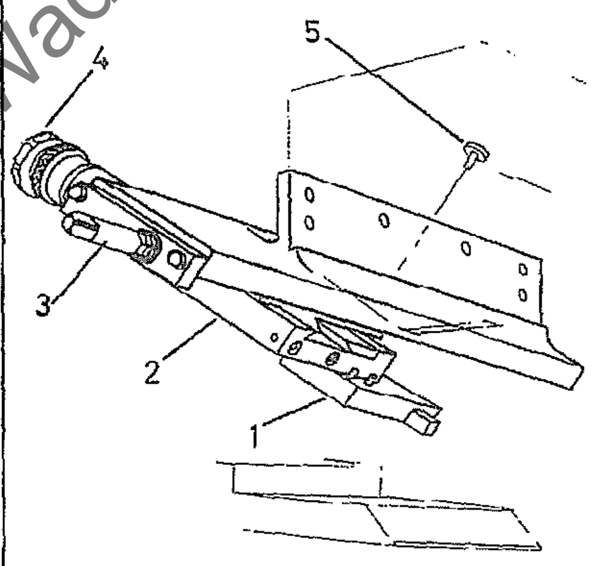


FIG 6 TOP HEAD JOINTER

5. When profile jointing: Lock the traverse screw in position with screw (5). Feed the profile stone to the cutter using index wheel (4).

6. On completion, retract the jointing stone and park away from the cutter knives in nearside position.

Note: When straight jointing, the stone is positioned in the angled slot. When profile jointing, use the slot parallel to the cutters

Jointer - Second Bottom Head (Fig 7)

This is a 'built in' combined straight knife and profile jointer, with index feed wheel and traverse screw similar to the top head jointer. The method of operation is similar.

On the Second Bottom head the outfeed bedplate can be retracted to give increased access to the jointer by slackening two screws on the bedplate.

When straight jointing the axial traverse is effected by using a winding handle on the square end of the traverse screw.

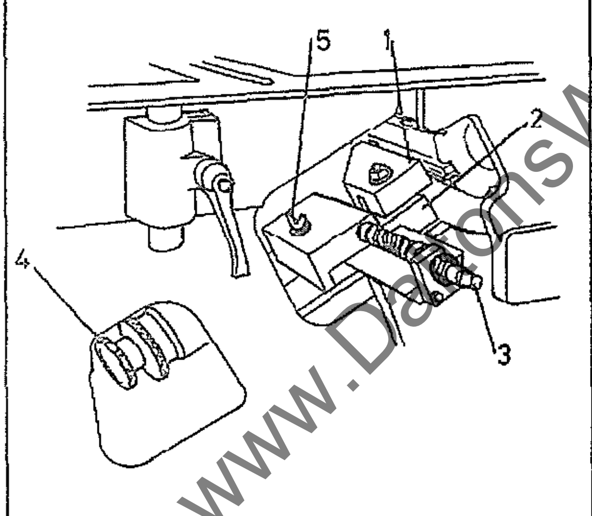


FIG 7 BOTTOM HEAD JOINTER

Method of Use

1. Fit pre set profile or straight jointer stone cartridge (1) to head clamp block (2) and secure.
2. Move the jointer head into position relative to the cutterblock using the traverse screw (3) and index wheel (4).
3. Proceed as described in **Jointing Practice - Methods**, as applicable until and even joint has been obtained.
4. When straight jointing: Lock the traverse screw in position with screw (5). Feed the profile stone to the cutter using index wheel (4).
5. When profile jointing: Lock the traverse screw in position with screw (5). Feed the profile stone to the cutter using index wheel (4).
6. On completion, retract the jointing stone and park away from the cutter knives in nearside position.

MAINTENANCE

General

The jointers have been designed to be maintenance free apart from the changing of the stones as and when required.

An example of the type of hard stone used when straight jointing is one with alumnus oxide particles resin bonded with a grit reference of 100. The softer stone used when profile jointing is an atlantic grit again bonded with a grit reference of 402.

If the jointers re not in regular use or if used predominantly in the profile mode then it is a good practice to adjust them weekly through their limits to prevent sawdust/resin build up on slides and screws.

If the traverse movement should become stiff then clean the threads and very lightly oil using Wadkin Grade L4 **(See approved Lubricants)**

Note: Excess oil can attract and hold saw dust particles.

ILLUSTRATED PARTS LIST

CONTENT

IMPORTANT: WHEN ORFERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER

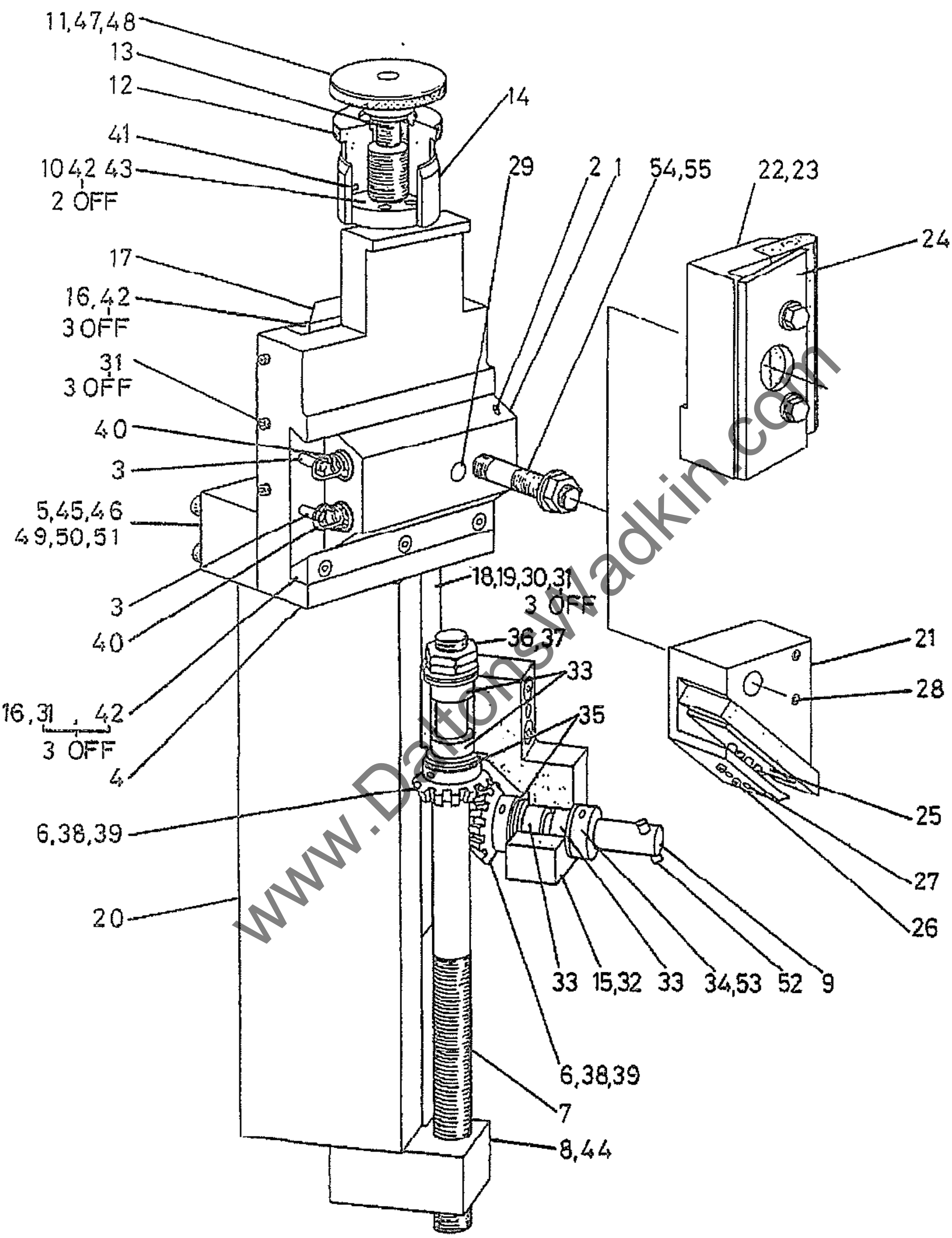


FIG 1 FENCE SIDE HEAD JOINTER

1. FENCE SIDE HEAD JOINTER MK 11

Ref No.	Description	No Off.
1.	Slide for fence side head jointer feed	1
2.	Spring anchor post	1
3.	Post for spring	2
4.	Slideway for jointer	1
5.	Foot for jointer slideway	1
6.	Bevel gear	2
7.	Screw for jointer rise and fall	1
8.	Nut for jointer rise and fall	1
9.	Shaft for bevel gear	1
10.	Nut for jointer feed	1
11.	Knob	1
12.	Dial for jointer adjustment	1
13.	Screw for jointer feed	1
14.	Sleeve for jointer feed	1
15.	Bracket for bevel gears	1
16.	Wear strip for jointer	1
17.	Slide for feed control	1
18.	Vertical wear strip	1
19.	Vertical slideway	1
20.	Vertical slide	1
21.	Holder for straight jointer stone	1
22.	Body for profile jointer stone	1
23.	Washer	1
24.	Plate	1
25.	Clamp	1
26.	Tension pin 4mm dia. x 12mm long	2
27.	Hexagon head setscrew M6 X 12mm long	2
28.	Tension pin 6mm dia. x 40mm long	2
29.	Plain dowel 10mm dia. x 25mm long	1
30.	Hexagon socket capscrew M6 x 20mm long	3
31.	Hexagon socket grubscrew M6 x 12mm long	9
32.	Hexagon socket capscrew M8 x 60mm long	2
33.	Headed bronze bush 22mm O/D x 12mm long	4
34.	Loose collar 28mm O/D x 16mm I/D x 12mm thick	1
35.	'INA' Thrust washer AS 1730	2
36.	Hexagon locknut M16	2
37.	Plain washer	1
38.	Hexagon socket grubscrew M6 X 6mm long	2
39.	Key 5mm x 5mm x 20mm long	2
40.	Extension spring	2
41.	'GACO' 'O' ring seal RMO 445-30	2
42.	Hexagon socket capscrew M6 x 16mm long	1
43.	M12 Helicoil insert	8
44.	Hexagon socket capscrew M6 x 65mm long	1
45.	Hexagon socket capscrew M8 x 45mm long (foot to slide)	1
46.	Tension pin 6mm dia x 50mm long	2
47.	No. 1 Taper pin	1
48.	M10 Plain washer	1

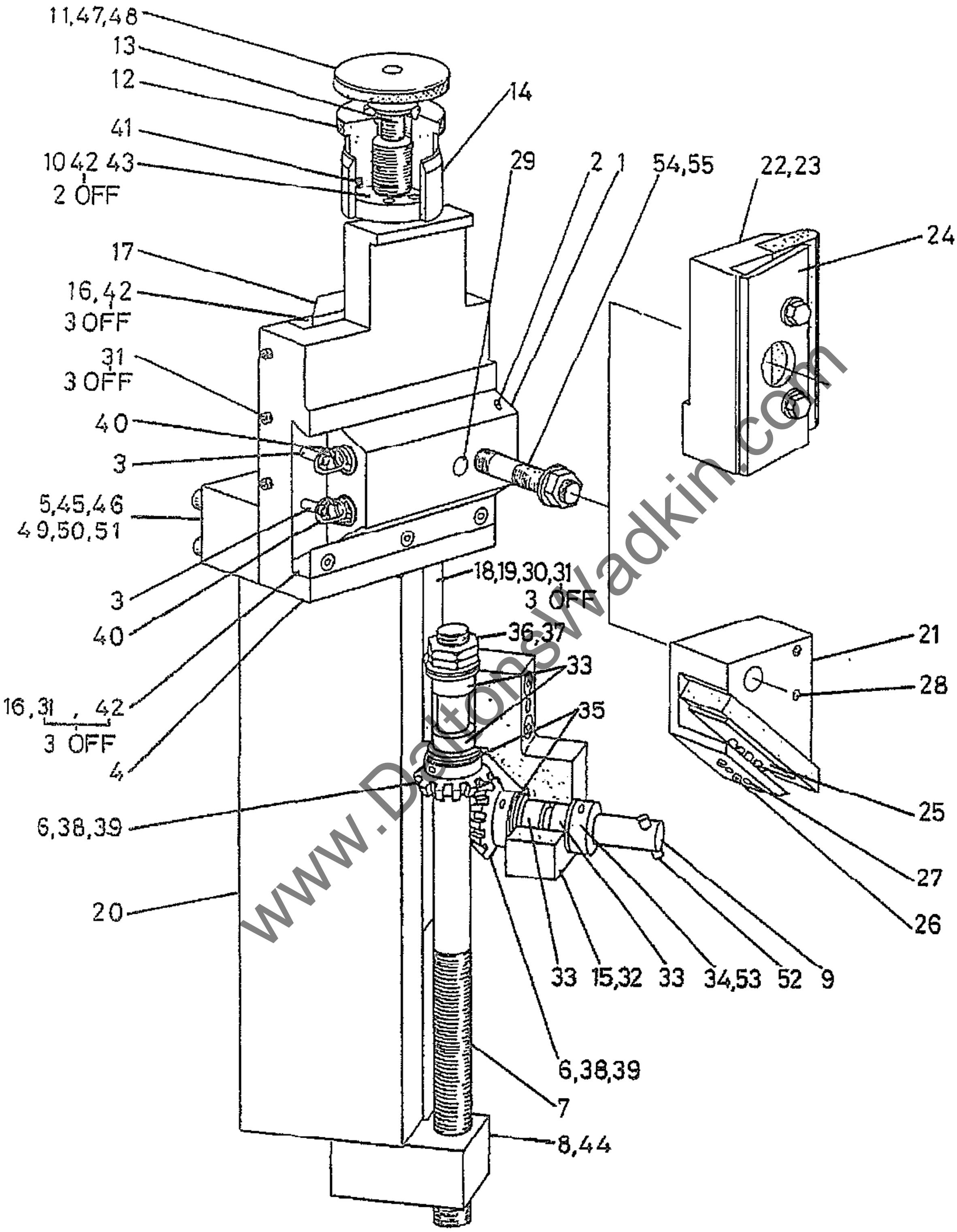


FIG 1 FENCE SIDE HEAD JOINTER

1. FENCE SIDE HEAD JOINTER MK 11 continued

Ref No	Description	No.Off
49.	Hexagon socket capscrew M6 x 60mm long	4
50.	Spring washer M6	4
51.	Tension pin 6mm dia x 32mm long (foot to slideway)	2
52.	Tension pin 6mm dia x 32mm long	1
53.	Taper pin No. 2	1
54.	Stud M12 x 55mm long	1

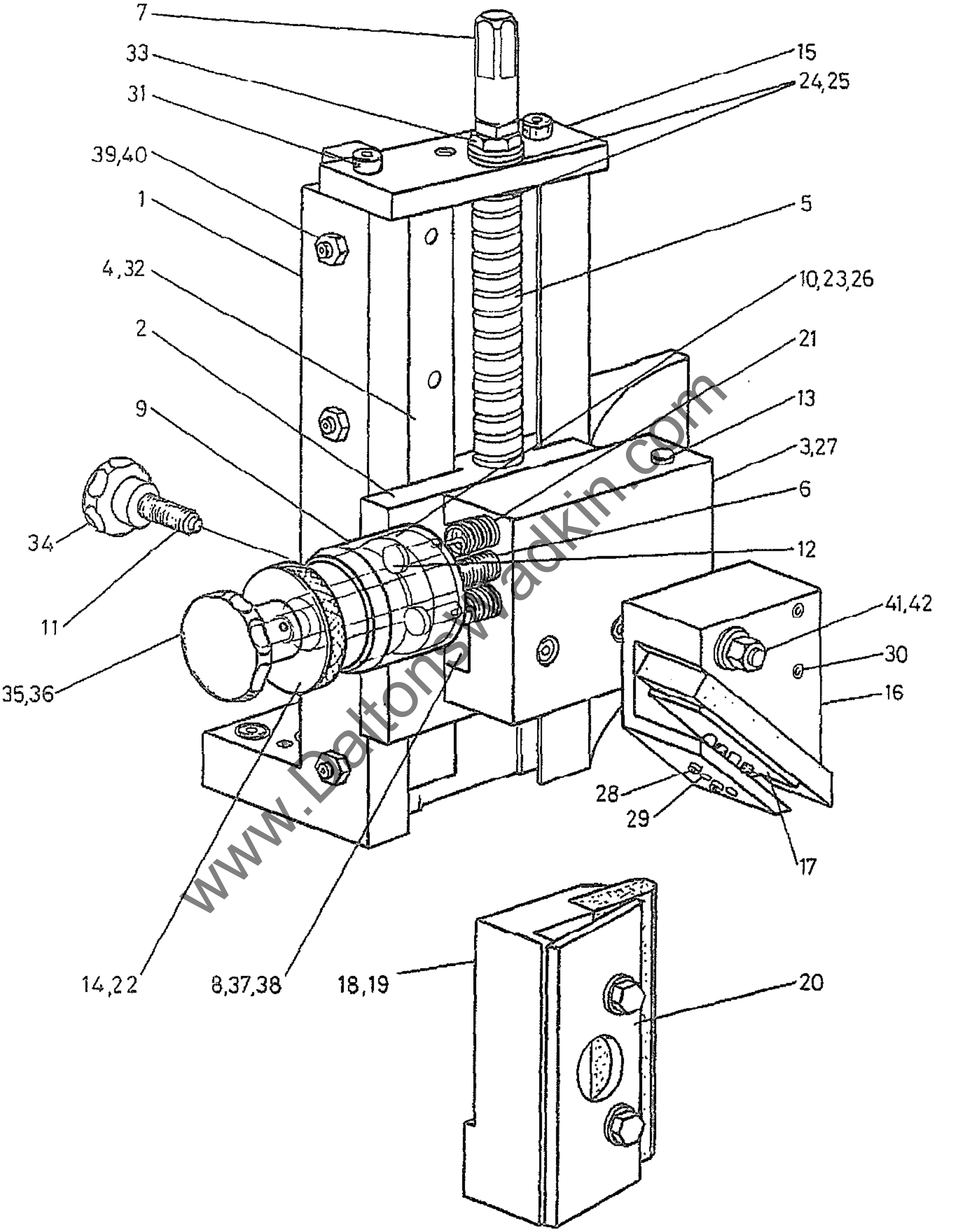


FIG 2 NEAR SIDE HEAD JOINTER

2. NEAR SIDE HEAD JOINTER MK 11

Ref No.	Description	No Off.
1.	Slide for near side head jointer	1
2.	Intermediate slide for jointer	1
3.	Saddle for near side head jointer	1
4.	Wear strip	1
5.	Traverse screw	1
6.	Screw for jointer feed	1
7.	Square drive adaptor	1
8.	Wear strip for saddle	1
9.	Sleeve for jointer feed	1
10.	Nut for jointer feed	1
11.	Clamp screw	1
12.	Spring anchor pin	2
13.	Spring anchor post	1
14.	Dial for jointer adjustment	1
15.	Block for jointer screw bearing	1
16.	Holder for straight jointer stone	1
17.	Clamp	1
18.	Body for profile jointer stone	1
19.	Washer	1
20.	Plate	1
21.	Extension spring	1
22.	'GACO' 'O' ring RMO 445-30	1
23.	Helicoil insert F112 - N24 M12	1
24.	Bronze headed bush 16mm O/D x 10mm I/D x 10mm long	2
25.	Plain washer M10	2
26.	Hexagon socket capscrew M6 x 16MM long	2
27.	Hexagon socket capscrew M6 X 12mm long	3
28.	Tension pin 4mm dia. x 12mm long	2
29.	Hexagon head setscrew M6 x 12mm long	2
30.	Tension pin 6mm dia x 40mm long	2
31.	Hexagon socket capscrew M8 x 30mm long	2
32.	Hexagon head setscrew M8 X 25mm long	4
33.	Lock nut M12	1
34.	Handwheel	1
35.	Handwheel	1
36.	Taper pin	1
37.	Hexagon socket grubscrew M6 x 25mm long	2
38.	Lock nut M6	2
39.	Hexagon socket grubscrew M8 x 25mm long	4
40.	Lock nut M8	4
41.	Stud M12 x 55mm long	1
42.	Collar nut 'WDS' 404-204 M12	1

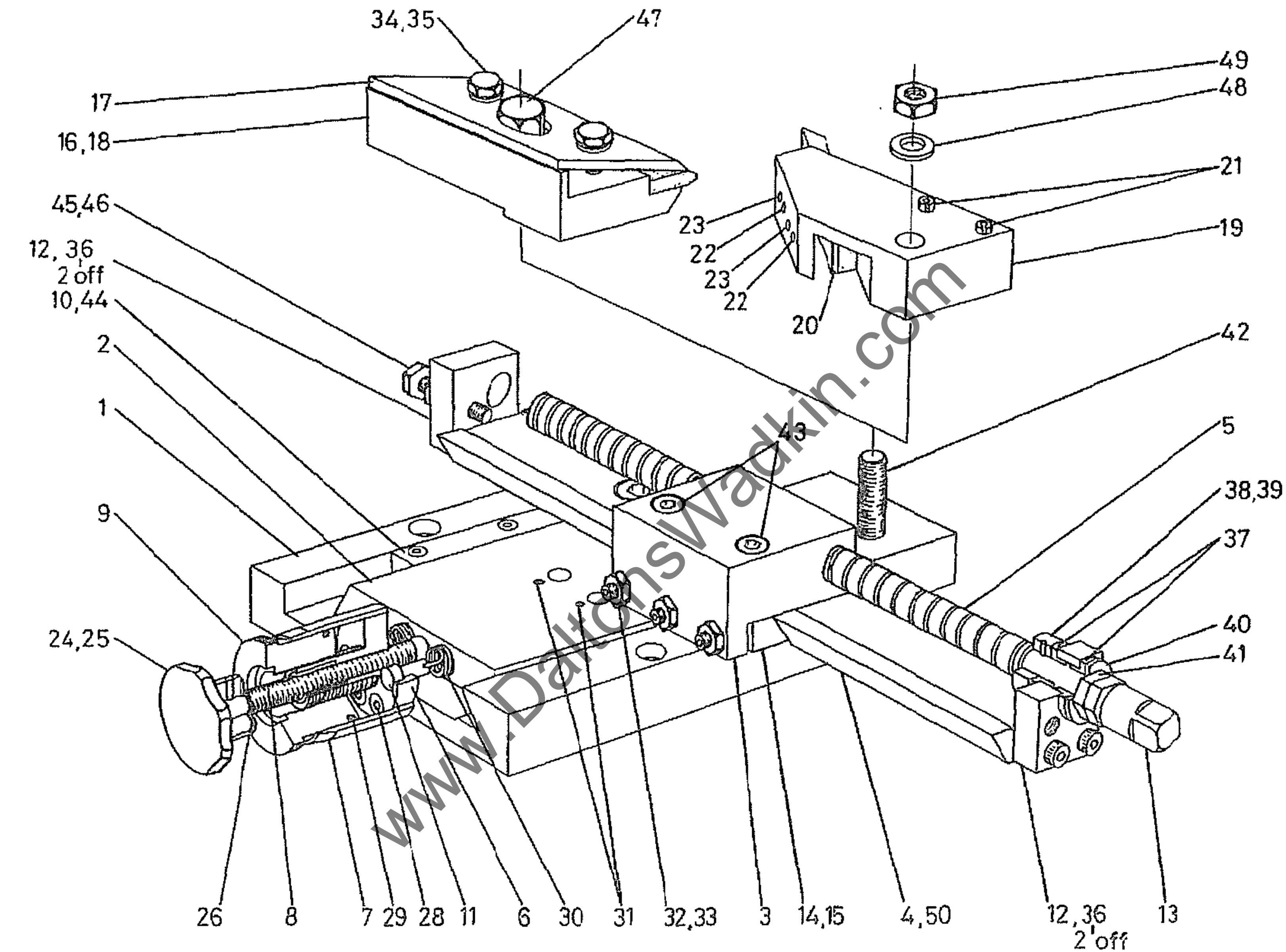


FIG 3 BOTTOM HEAD JOINTER

3. SECOND BOTTOM HEAD JOINTER

Ref No.	Description	No Off.
1.	Slideway for bottom head jointer feed	1
2.	Slide for bottom head jointer feed	1
3.	Saddle for bottom head jointer	1
4.	Slide for bottom head jointer traverse	1
5.	Screw for horizontal jointer traverse	1
6.	Nut for jointer feed	1
7.	Sleeve for jointer feed	1
8.	Screw for jointer feed	1
9.	Dial for jointer adjustment	1
10.	Jointer feed slide strip	1
11.	Spring anchor pin	2
12.	Block for jointer traverse/stop	2
13.	Square drive adaptor	1
14.	Wear strip	1
15.	Clamp Block	1
16.	Body for profile jointer stone	1
17.	Plate for profile jointer stone holder	1
18.	Washer for profile jointer stone holder body	1
19.	Holder for straight jointer stone	1
20.	Clamp plate	1
21.	Tension pin 6mm dia x 40mm long	2
22.	Tension pin 4mm dia x 12mm long	2
23.	Hexagon socket grubscrew M6 x 12mm long	2
24.	Handwheel	1
25.	Taper pin	1
26.	Large diameter plain washer M10	1
27.	Helicoil insert M12 F112-N24	1
28.	Hexagon socket capscrew M6 x 16mm long	2
29.	'GACO' 'O' ring RMO 445-30	1
30.	Extension spring	2
31.	Tension pin 4mm dia x 16mm long	2
32.	Hexagon socket grubscrew M8 x 25mm long	3
33.	Hexagon locknut M8	3
34.	Hexagon head setscrew M8 x 30mm long	2
35.	Plain washer M8	2
36.	Hexagon socket capscrew M6 x 25mm long	4
37.	Bronze headed bush 18mm O/D x 12mm I/D x 8mm long	2
38.	Plain collar 25mm O/D x 12mm I/D x 12mm width	1
39.	Tension pin 4mm dia x 24mm long	1
40.	Plain washer M12	1
41.	Hexagon locknut M12	1
42.	Stud M12 x 55mm long	1
43.	Hexagon socket capscrew M8 x 50mm long	2
44.	Hexagon socket capscrew M8 x 25mm long	3
45.	Hexagon socket capscrew M8 x 40mm long	1
46.	Hexagon locknut M8	1
47.	Collar nut 'WDS' 404-204 M12	1
48.	Plain washer M12	1
49.	Hexagon nut M12	1
50.	Hexagon socket capscrew M10 x 20mm long	2

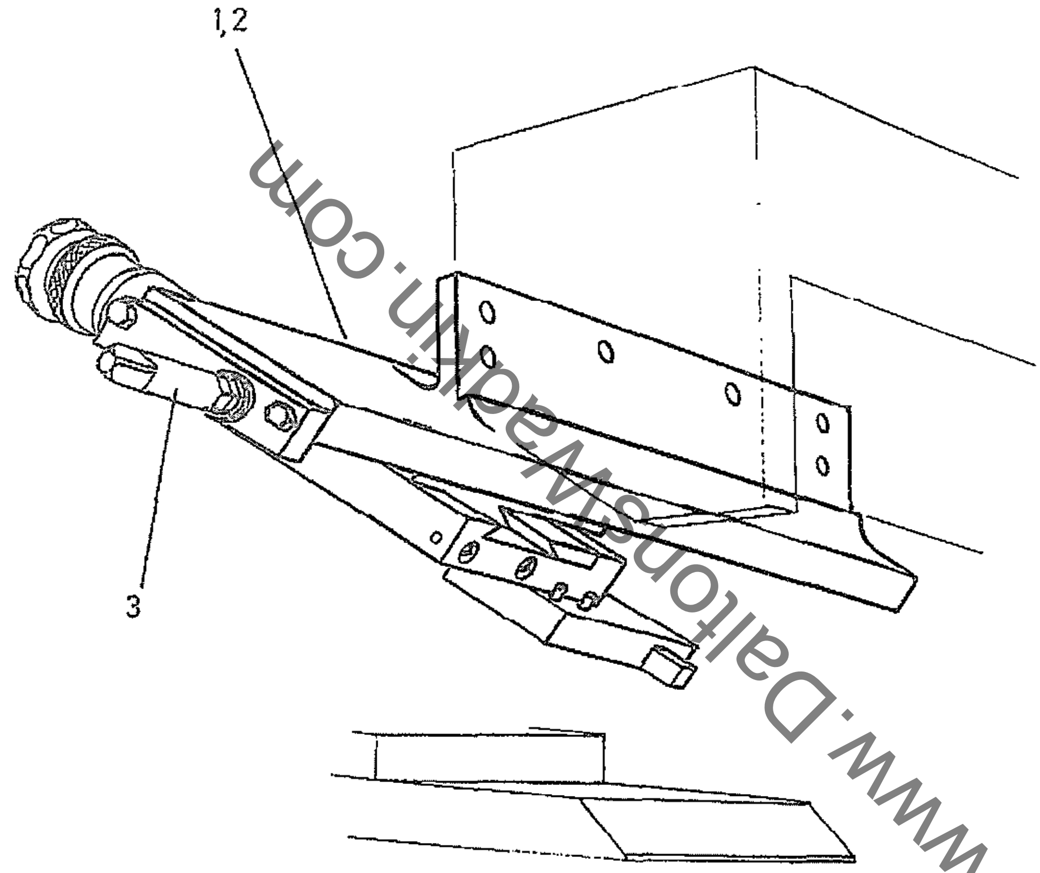


FIG 4   TOP HEAD JOINTER

4. TOP HEAD JOINTER

Build of the top head Jointer is the same as the MK 11 Near side head Jointer with the exceptions of the below items:

Ref No.	Description	No Off.
1.	Slide for Top head Jointer	1
2.	Wear strip	1
3.	Traverse screw	1

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SECTION 17 HYDRAULIC DRIVE

General

Machines running at less than 50m/min may have a direct hydraulic drive as opposed to a drive via a belt.

The orientation of the hydraulic motor varries depending on drive. With direct drive the vent port is uppermost whilst when belt driven the port is on the side.

The system must be filled under completely clean conditions. Before removing filters or filter caps ensure that components and surrounding areas are clean and completely free from all dirt, sawdust and wood chippings.

If the system does become contaminated due to ingress of foreign matter, it must be thoroughly cleaned and flushed out before reuse, and if necessary, the pipelines and hydraulic unit dismantled.

Filling must be carried out systematically, so that all air can escape from the high pressure circuit before the unit is operated under load. Motor vent hose connection must always point upwards to allow air to escape. An integral purge valve is fitted to assist in the venting of the system, this valve discharges a controlled flow of oil from the high pressure circuit,

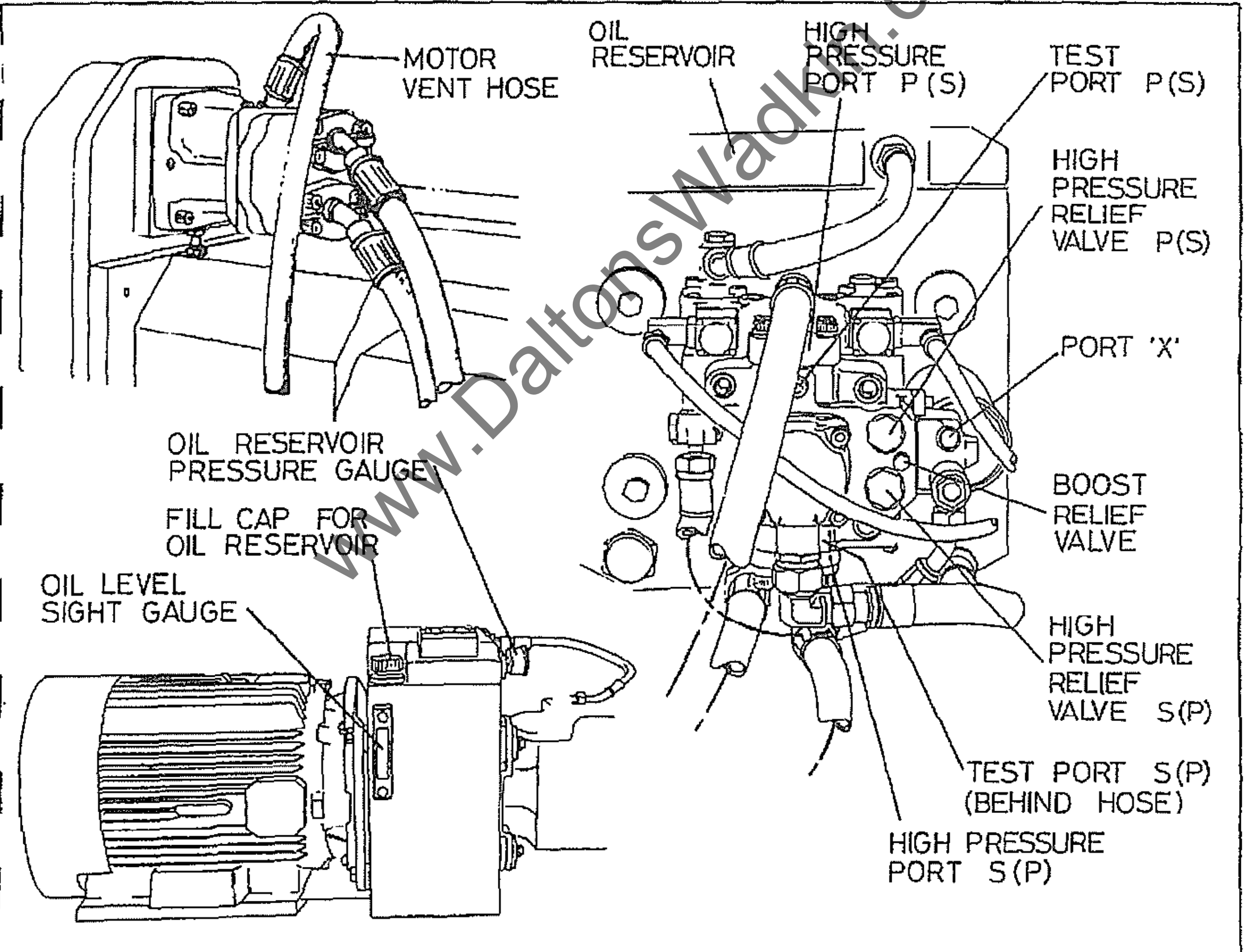

FIG 1 HYDRAULIC DRIVE UNIT

so that any entrained air can escape freely to the vent tank.

Procedure for filling

1) The hydraulic motor must be free to rotate under 'no load' conditions.

2) Loosen vent plug in port 'X' on the pump filter body.

3) Fill the oil reservoir (and thus also the pump housing) to the maximum level on the fluid gauge. Fill the motor housing via the vent port on the body.

4) To prime the system:

a. If the machine is in a line, position switch on control panel to 'independent'. With the machine power on, start hydraulic pump and run for approximately 10 seconds then stop machine using master stop. Wait for 2 or 3 minutes to allow air to escape from the pump housing via vent hose.

b. Disengage master stop. Switch machine power on and repeat above process (a) 3 to 5 times. During this time the fluid reservoir must be kept topped up to prevent further ingress of air.

c. Check the vent plug on the filter block, close the plug when oil appears.

5) To purge the system of air:

a. With machine power on and the hydraulic pump on, select maximum speed. Using the inch forward button run the machine for 20 seconds then stop. Reset machine and using the inch reversal button run the machine for 20 seconds at full speed then stop.

b. Repeat this three times in both directions.

6) Run the hydraulic motor for several minutes at low speed to bring the operating fluid up to working temperature, then increase speed/load steadily to ensure that any residual air in the system is released to the vent tank.

Note: No wood should be passed through during above procedures.

On some applications, a complete fluid change may not be necessary. In this case; only the filter of the pump is changed after initial start up and then every 500 hours. Any fluid lost during filter changing must be replaced by fresh fluid of the same type added to the cooler/fluid tank. Consult Wadkin if in doubt.

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MAINTENANCE

General

Maintenance of the hydraulic system is limited to changing the filter element of the power unit pump and the pressure fluid. Hoses will only need replacement if damaged.
No other maintenance should be carried out unless by trained personnel.

Hydraulic Feed Drive Belt (Fig 1)

1) To replace drive belt, first remove cover (1)

2) Slacken off locking nuts (2) and (3)

3) Turn jacking screw (4) clockwise to lower motor.

4) Remove and replace drive belt.

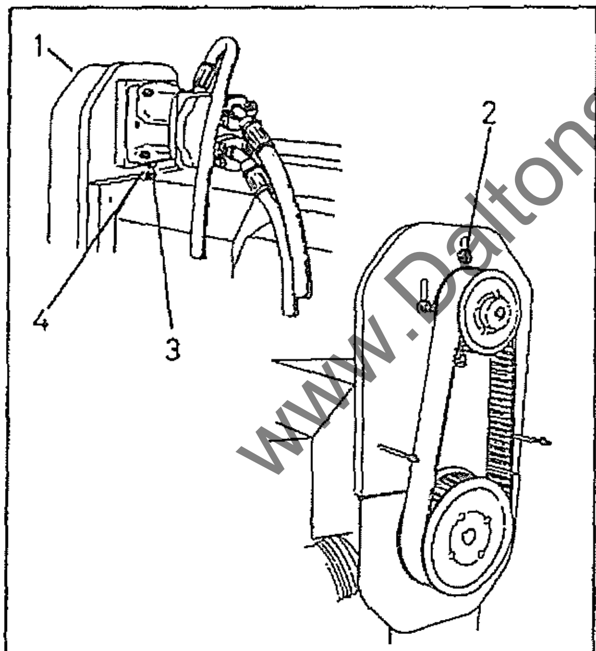

FIG 1 HYDRAULIC FEED DRIVE BELT

5) Raise motor, turning jacking screw (4) anti-clockwise to remove any slack.

Note: Do not over tension belt

6) Tighten locking nuts (2) and (3) and refit cover (1).

Changing the Pressure Fluid

The high pressure fluid must be changed at intervals of 1000 to 2000 hours, according to application.

The change is carried out by draining the vent tank, cooler, pump and motor housings, then replenishing with fresh fluid of the correct type, (see **pressure fluids**).

Note: High working temperatures and frequent cooling down phases with low temperatures (condensation) will shorten the life of the fluid.

The oil remaining in the pressure circuit (power pack to pump) need not be changed. Do not open up the high pressure lines unless the hoses are damaged and require replacement.

Changing the Filter

The filter cartridge fitted to the pump must be replaced not later than 50 operating hours after initial start up.

Use filter element, ref, 000-983-06-15, obtainable from Wadkin.

Further filter changes should be made at 500 operating hours intervals.

Pressure fluids

Suitable hydraulic fluids are: Wadkin Ref: L1 (refer to lubricants table).

FAULT FINDING PROCEDURE

FOR

LINDE BPV PUMP/BMF AND BMV MOTOR SYSTEMS

System operating pressure can be taken by connecting a 600 bar (8000 psi) pressure guage into each side of the closed circuit at the pressure test tappings provided at the side of the main port flanges P(s) and S(p) on the pump. The test tappings are threaded M14 x 1,5.

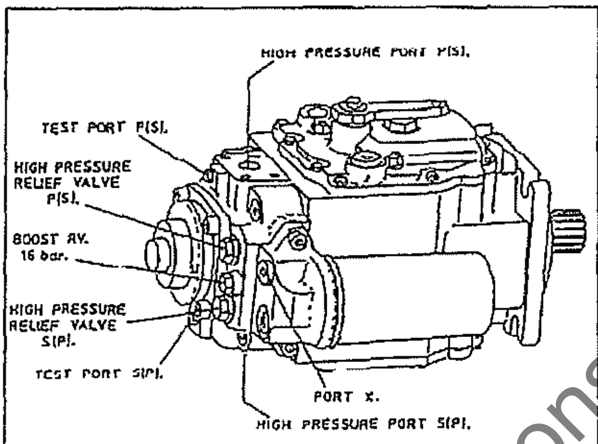

FIG 2 SYSTEM PRESSURE TESTING

The pressure taken at P(s) is the operating pressure in that side of the closed circuit and it is limited by the high pressure relief valve on that side of the pump. Similarly, the guage reading at S(p) is the operating pressure on that side of the circuit, again limited by the adjacent high pressure relief valve. The relief valves have a three digit number stamped on the exposed end. This denotes the valve setting (i.e., 420 - 420 bar).

Boost pressure is taken by connecting a 40 bar (600 psi) guage to port 'X' which is threaded M14 x 1.5. The normal boost pressure is 16 bar (230 psi) and this is regulated by the 16 bar relief valve.

SYMPTOM	CAUSE	REMEDY/CHECK
1.System will not operate in either direction.	A. Low oil level system.	1. Check oil level in reservoir and replenish as necessary with the correcthydraulic oil. 2. Locate and repair the leaks causing the loss of oil. 3. Thoroughly fill and vent the pump and motor casings, the closed loop and (where fitted) the coolant circuit.
	B. Insufficient pilot pressure or flow. Remote electro/ hyfraulic controlled pump -'EH'	1. 'EH' - check a) That forward/Reverse direction is selected out of neutral. b) The continuity of wiring from battery through to solenoids on pump control. c) With an ammeter, check the output from the amplifiers, through the full range of the speed controller. If incorrect consult the manufacturer of the control. d) If the amplifier output is correct, then remove the solenoid/solenoid valve from pump and check operation. Replace as necessary e) Check the pressure at port X of the pump. If 16 bar is not achieved see symptom 1.D.1
	C.Damaged or disconneted coupling or clutch.	1. Check to ensure that couplings between electric motor and pump shaft and hydraulic motor shaft to gearbox are functioning correctly. Rectify as necessary.
	D. Low boost	1. Connect a 40 bar (600 psi) pressure guage into port X on the filter block of the pump. 2. Operate the pump in neutral at approximately 1000 RPM and observe the boost pressure which should be 16 bar (230 psi). If boost pressure is normal in neutral, operate the pump in forward and reverse and again check the boost pressure. 3. Low boost pressure may be caused by:- a) Boost relief valve not seating correctly. Dismantle and check. Replace as necessary.

SYMPTOM	CAUSE	REMEDY/CHECK
1.continued		b) Cold start relief valve not seating correctly. Dismantle and check. Replace as necessary. c) Low oil level in system. See symptom 1.A. d) Restricted inlet to gear pump. Check external inlet pipework and remove restrictions. e) Gear pump drive coupling sheared. f) Worn or damaged pump or motor causing excessive internal leakage. Replace damaged components after a thorough examination for subsequential damage. If in doubt, contact the manufacturer.
	E. Low and fluctuating boost pressure	1. Air in system. Air will also cause the system to be noisy. Check the system oil level,ensure all pipe connections are tight, with particular attention to the inlet circuit where a gear pump with external inlet is fitted. Ensure the system is thoroughly vented of air.
2.System operates flow in one direction only.	A. Insufficient pilot pressure or flow in one direction Electro/ Hydraulic controlled pump 'EH'.	1. See symptom 1.C.1.
	B. Faulty high pressure relief valve/ non return valve.	1. Switch the two high pressure relief valve assemblies from one side to the other. If the system then operates in the direction to which it would not operate before, one of the valves is faulty. Examine and rectify as necessary. NOTE: Each high relief valve assembly also incorporates a boost non-return valve.
	C. Damaged shuttle valve (where fitted in BMF motor).	1. Remove shuttle valve components and check for damage. Replace as necessary.

SYMPTOM	CAUSE	REMEDY/CHECK
	D. Damaged pump control pistons or piston seals.	1. Control effect will be normal in the drive direction, but hard in the direction which is not driving. Replace the damaged parts in the pump, or replace the complete pump.
3.Neutral is difficult or impossible to find i.e. motor in system when the pump is in neutral.	A. Pilot system malfunction (remote hydraulic controlled pump-'HF'	1. Tee pressure guages into pilot lines at ports Y and Z at the pump. Check pressure differential does not exceed 0.5 bar with the pilot valve in its neutral position. If pressure differential is excessive, examine and rectify as necessary. 2. Pilot line damaged or restricted. Check lines and rectify as necessary.
	B. Control system malfunction Electro/ Hydraulic controlled pump-'EH'.	1. Check continuity of wiring from speed controller through to both solenoid valves. 2. Check output from the amplifier with the speed controller in neutral. There should be no zero output. Rectify as necessary. **WARNING:** Motors will rotate while checks and adjustments are made under symptom 3, therefore before commencing, ensure no timber is in the the machine and it is free to rotate. Appropriate action must be taken to protect against the rotation of other types of equipment.
	C. Pump servo out of adjustment. Electro/ Hydraulic controlled pump-'EH'.	1. If in 3.B.1., 3.B.2. and 3.C.1 above, the external control is found to be in order, but motors continue to rotate when control is neutral then the hydraulic neutral of the pump must be adjusted as follows:- a) Slacken the large hexagon nut which secures the eccentric pivot in the centre of the cover. b) Run the pump at full specified speed.

SYMPTOM	CAUSE	REMEDY/CHECK
		c) With the speed control ('EH') in neutral, turn the eccentric pivot using a hexagon key in the socket provided.
		d) After turning the eccentric pivot slightly, check to determine whether the motor has slowed or increased in speed. If speed has increased, turn the pivot in the opposite direction. Continue to turn pivot until motor
		e) Tighten the locknut on the eccentric pivot, while preventing the pivot from turning.
4. System over-heating	A. System operating at maximum pressure for longer periods.	1. Limit periods of maximum pressure operation to manufacturers recommendations
	B. Incorrect oil viscosity.	1. Refer to list of recommended oils.
	C. Oil level too low.	1. Replenish oil to the correct level. Refer to Symptom 1.A.
	D. Cooler inoperative or working at reduced efficiency.	1. Check adequate water supply to cooler.
		2. Blow through cooler matrix to clear dirt build up in air cooler (where fitted).
	E. Oil lines to or from cooler restricted.	1. Remove restrictions.
	F. Cold valve not seating properly.	1. Dismantle and clean the cold start valve if necessary.
	G. Relief valve not seating properly (this would also show loss of speed and power).	1. Install pressure guages check the high pressure relief valve settings. If low dismantle and clean the respective HP relief valve.

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SYMPTOM	CAUSE	REMEDY/CHECK
	H. Purge valve in motor not opening.	1. Dismantle and clean the purge valve. Ensure the ball is free to move and that portings are not restricted by contaminent particles. Fit a replacement valve if necessary.
	I. Shuttle valve in motor not opening.	1. Dismantle and clean the shuttle valve. Replace any damaged components.
	J. Worn components allowing excessive internal leakage.	1. Check the boost pressure. If low, replace the worn components or replace the complete unit, after first carrying out all the checks related to low boost pressure (Refer to Symptom 1.E.).
5.Excessive noise.	A. Air leak in system.	1. Fill system correctly and purge air out of system. 2. Suction line to boost pump leaking allowing air to be drawn into the system. A good indication of air in the system is given by foaming of the oil in the reservoir. the reservoir.
	B. Cavitation. A hammering effect caused by starvation of the supply to the main pump due to low boost pressure.	1. Carry our checks related to low boost pressure (Refer to Symptom 1.D).
	C. Prolonged operation against the high pressure valve.	1. Refer to Symptom 4.A.1.
	D. System pipework vibrating.	1. Check pipes and hoses. Clamp pipes and ensure they are not touching metal components such as oil tanks, fuel tanks or panelling which can act as sounding board.
	E. Drive misalignment or worn coupling.	1. Check for alignment and for wear in the coupling. Rectify as necessary.

SYMPTOM	CAUSE	REMEDY/CHECK
	F. Mechanical damage to component parts i.e. damaged bearings, broken pistons etc.	1. Replace broken components after a thorough examination for subsequential damage. If in doubt, contact the manufacturer.
6.Loss in power.	A. Loose pipe connection or fractured pipe in the system.	1. Tighten connection or replace fractured pipe.
	B. Relief valve not seating properly.	1. Refer to Symptom 4.G.
	C.Reduced power from prime mover.	1. Check output from prime mover and rectify as necessary.
	D. Low boost pressure	1. Refer to Symptom 1.D.
7. Motor in system does not rotate or rotates at low Speed.	A. Prime mover speed too low.	1. Adjust prime mover to give correct speed.
	B. High pressure reliefvalves not seating properly.	1. Refer to Symptom 4.G.
	C. Damaged shuttle valve in purge system.	1. Dismantle and clean the shuttle valve. Replace damaged components.
	D. Low boost pressure.	1. Refer to Symptom 1.D.
	E. Worn components allowing excessiv3e internal leakage.	1.Replace worn unit.

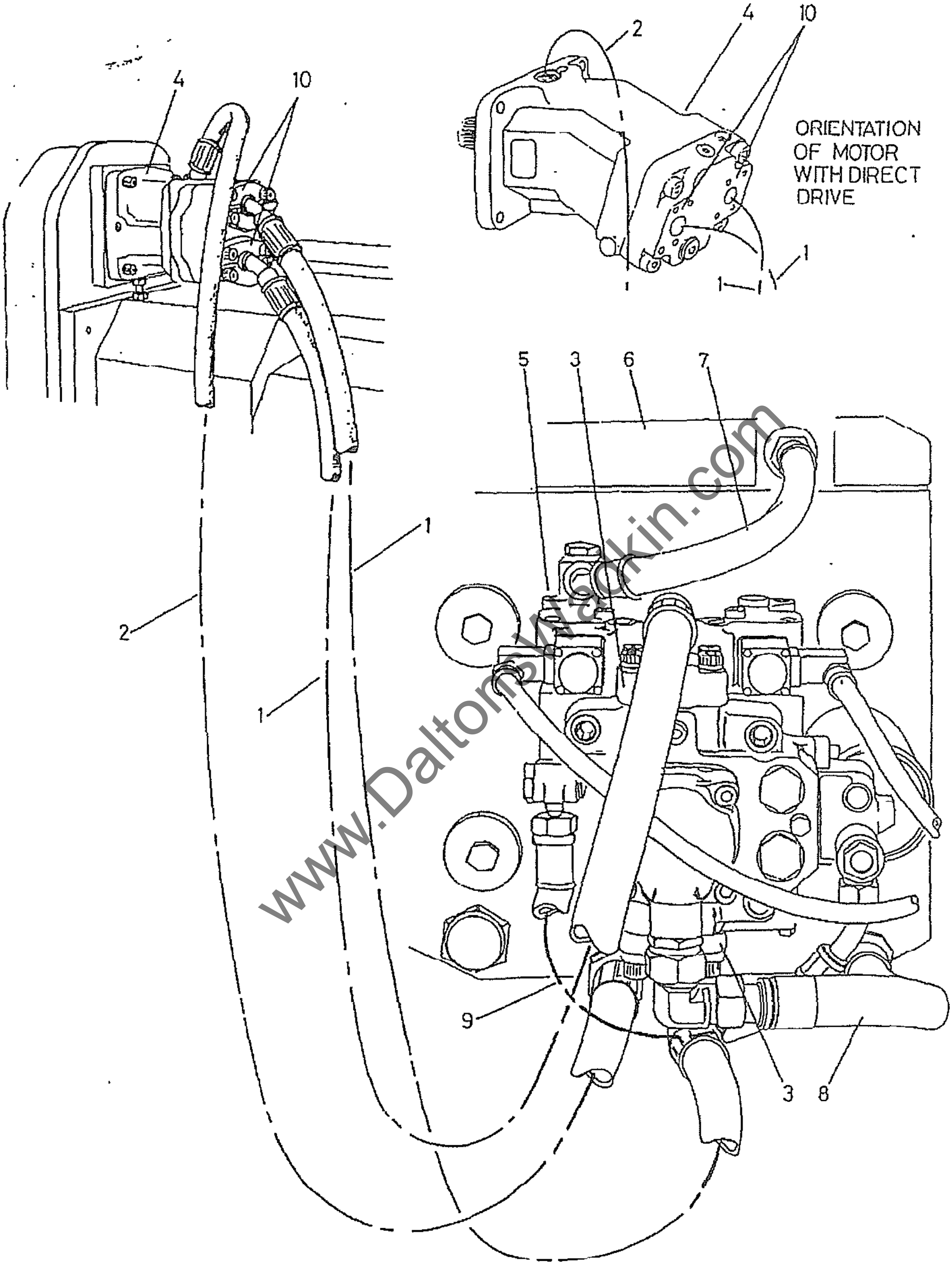

FIG 1 HYDRAULIC DRIVE UNIT

ILLUSTRATED PARTS LIST

CONTENTS

IMPORTANT: WHEN ORDERING SPARES ALWAYS QUOTE MODEL AND MACHINE NUMBER

1. HYDRAULIC DRIVE UNIT

Ref No.	Description	No Off.
1.	Inlet/return hose; SAE 100R2AT, 3/4" bore x 3 metres long, 45 degree flange 3/4" and 90 degree flange 1" end fittings	2
2.	Vent hose; SAE 100RIT, 5/8" bore x 3 metres long, stand pipe fittings both ends (including olive and nut)	1
3.	Flange kit 16PA to suit 1" end fitting (includes 2 flange halves, 4 bolts, 4 washers and 'O' rings)	2
4.	Hydraulic motor 'Linde' BMF 35TFC	1
5.	Variable displacement axial piston pump 'Linde' BVP 1005	1
6.	Cooler/reservoir assembly driven by 40 hp, 200 LD frame, 3 phase electric motor	1
7.	Top vent hose from pump to oil reservoir	1
8.	External suction hose from reservoir to pump	1
9.	Filter hose	1
10.	Flange kit 12 PA to suit 3/4" end fitting (includes 2 flange halves, 4 bolts, 4 washers and 'O' rings)	2

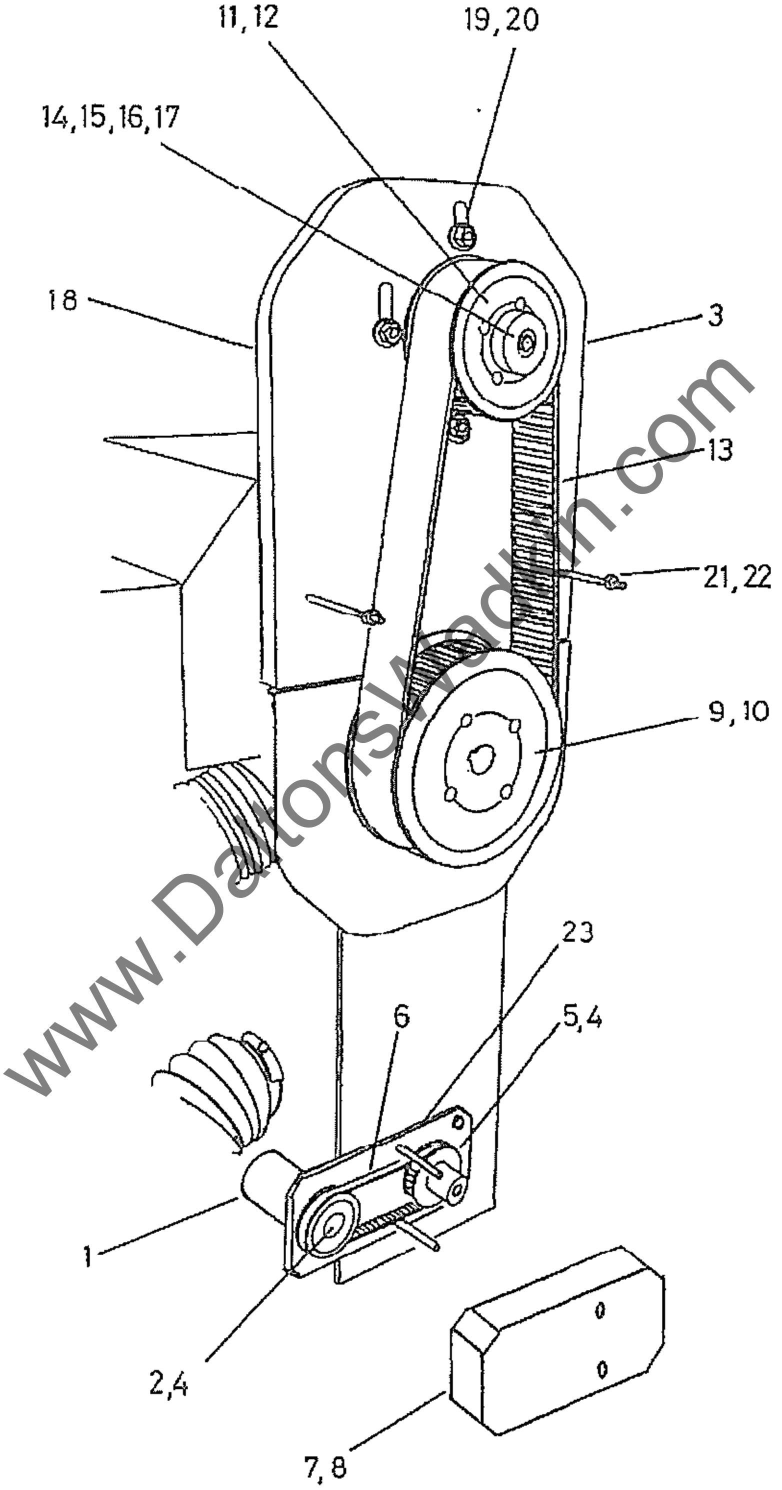

FIG 2 HYDRAULIC DRIVE TRANSFER TO FEED ROLL GEARBOXES

2. HYDRAULIC DRIVE TRANSFER TO FEED ROLL GEARBOXES.

Ref No.	Description	No Off.
1.	Tachometer	1
2.	Special pulley	1
3.	Mounting plate for hydraulic motor	1
4.	Hexagon socket grub screw M3 x 6mm long	1
5.	Special pulley	1
6.	Timing belt	1
7.	Cover for tachometer drive	1
8.	Nut M8	2
9.	Pulley	1
10.	'Fenner' taper lock bush ref 2517 24mm bore	1
11.	Pulley	1
12.	'Fenner' taper lock bush ref 1615 42mm bore	1
13.	Timing belt	1
14.	Splined motor adaptor	1
15.	Key 12mm x 8mm x 40mm long	1
16.	Special retaining bolt (supplied with motor)	1
17.	Special retaining washer (supplied with motor	1
18.	Hydraulic drive motor (not shown)	1
19.	Nut M10	4
20.	Washer M10	4
21.	Timing belt cover (not shown)	1
22.	Nut M8	2
23.	Support plate	1

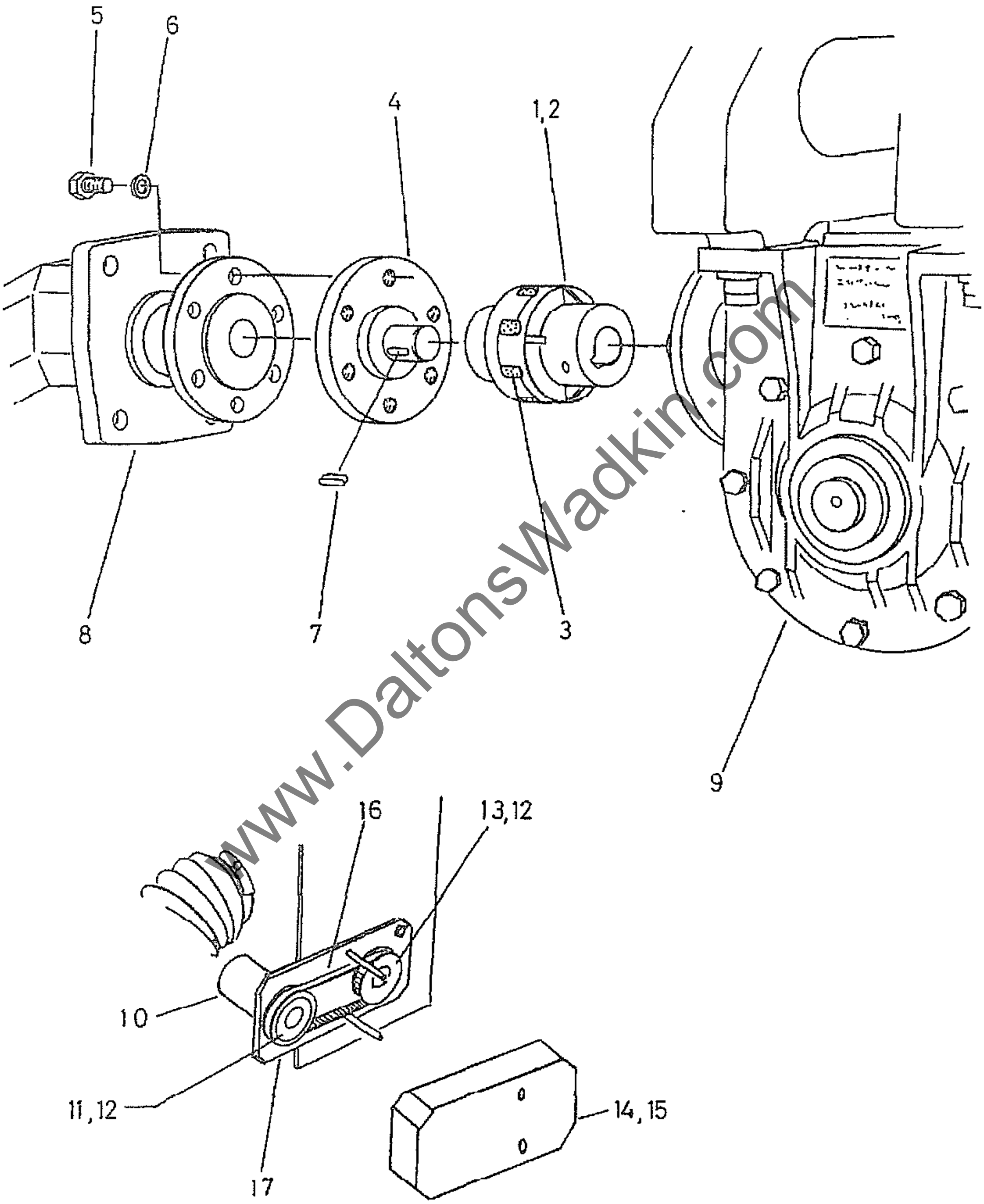

FIG 3 DIRECT HYDRAULIC DRIVE TO FEED ROLL GEARBOXES AND TACHOMETER DRIVE

3. DIRECT HYDRAULIC DRIVE TO FEED ROLL GEARBOXES

Ref No.	Description	No Off.
1.	Coupling segment 19mm bore	2
2.	Hexagon socket grubscrew M6 x 10mm long	2
3.	Flexible spider insert	1
4.	Hydraulic drive coupling	1
5.	Hexagon head setscrew M8 x 20mm long	6
6.	Plain washer M8	6
7.	Key 6mm x 6mm x 20mm	1
8.	Hydraulic drive motor	1
9.	Gearbox	
10.	Tachometer	1
11.	Special pulley	1
12.	Hexagon socket grubscrew M3 x 6mm long	2
13.	Pulley	1
14.	Cover for drive	1
15.	Nut M8	2
16.	Timing belt	1
17.	Support plate	1

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SECTION 18 GENERAL OPERATING AND WORK FAULTS

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 or pneumatic loaded) top/side pad pressures with minimum amount of lift. Set side guides (not spring loaded) just up to timber ie. 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.

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?

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 Toolholders**).

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 need
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 Motor overheats while working

Diagnosis

a. The motor is overloading
b. The motor is running under single phase conditions

Remedial Action

a. Check reason and correct
b. Check electrical circuits

FAULT The motor makes an abnormal noise

Diagnosis

a. The cause can be of a mechanical or electrical nature
b. If the noise is caused by an electrical fault, the noise will disappear when power is switched off
c. If the noise is caused by a mechanical fault, the noise will diminish as speed of rotation decreases

Remedial Action

a. Establish mechanical or electrical origin
b. c. Check symptoms. Deduce by elimination to locate position and nature of fault

FAULT The air break magnetic starter is noisy

Diagnosis

a. The mains voltage is too low
b. The surfaces of the 'fixed' and 'moving' contacts are dirty

Remedial Action

a. Check mains voltage and correct
b. Replace contactor

FAULT The air break magnetic starter remains 'closed' after a STOP button has been operated

Diagnosis

a. The contactor 'fixed' and 'moving' contacts have welded together following a short circuit

Remedial Action

a. Check and remove cause of the short circuit. Replace the complete contactor

FAULT **The machine stops feeding and the red warning light on the control panel illuminates**

Diagnosis

a. Fault has occurred in the tachometer or the drive to the tachometer
b. Line fault caused by dirt/dust particles

Remedial Action

a. Check drive belt to tachometer, replace/retension if necessary
b. Switch machine 'off' Restart machine, start hydraulic pump and if after a short period of time the machine does not feed and the light reappears call a service engineer

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 an electrical fault or breakdown, in the interest of personal safety, it is always advisable to call a qualified electrician if the fault repeats.

Faults in the Workpieces and Causes

General Faults	Cause	Remedy
Blips at the leading end of the underside of the timber.	The cutterblock is too low in relation to the outfeed bedplate.	Adjust the cutterblock correctly.
Scars on the trailing end of the underside of the timber.	The cutterblock is too high in relation to the outfeed bedplate.	Adjust the cutterblock correctly.
The trailing end of the top face of the timber shows blips.	Pad and roller pressures are incorrectly adjusted.	Adjust the pad pressure correctly.

Faults caused by tools	Cause	Remedy
Out of square stock after planing.	The cutters are not parallel to the outfeed bedplate, or are badly ground.	Adjust or sharpen the cutters carefully.
Burn marks on the stock	Cutters are blunt and need regrinding.	Regrind cutters.

Faults in grinding and setting	Cause	Remedy
Nicks in the edges of the cutters especially carbide.	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.	Take greater care when regrinding cutters.
Vibrating heads.	Cutterblocks have been set up incorrectly.	Reset.

SECTION 19 TABLES

APPROVED LUBRICANTS

WADKIN	CASTROL	B.P.	SHELL	MOBIL	ESSO	GULF	ELF
L1	Hyspin AWS 32	Energol HLP 32	Vitrol 32	DTE Oil Light 24	Nuto 44 or Esstic H44	Harmony 43 AW	ELFOLNA 32
L2	Alpha ZN 150	Energol HP 150 or CS 150	Vitrea 150	Vactra Exra heavy	Esstic 65	Service 13	
L4	Magna 68	Energol HP 68 or CS 68	Vitrea 68	Vactral Oil Heavy Medium	Esstic 50	Service 51	
L6	Spheerol AP3	Energrease LS3	Alvania Grease No 3	Mobilplex Grease No 48	Beacon 3	Gulfcrown Grease No 3	

L1 Oil — Hydraulic oil with anti-corrosion, anti-oxidation, anti-wear, anti-foam performanc

L2 Oil — Gear oil (viscosity 150 centi - stokes at 40 degrees C)

L4 Oil — Plain mineral oil (viscosity 68 centi - stokes at 40 degrees C)

L6 Grease — Grease NLG1 No 3 consistency lithium bearing grease

BELTS AND PULLEYS FOR SPINDLE DRIVES														FREQUENCY 50 HERTZ
POSITION	MOTOR			MOTOR PULLEY		MOTOR TAPER LOCK BUSH			BELTS				SPINDLE PULLEY	SPINDLE SPEED
	FRAME SIZE	KW	HP	FENNER REF	WADKIN REF	BORE	FENNER REF	WADKIN REF	OPTIBELT REF	FENNER REF	WADKIN REF	QTY HEAD	WADKIN REF	R.P.M
FIRST BOTTOM HEAD	D160	18·75	25	031Z 0266	K3078240	42	2517	K3077101	960 PL		K3078655	5	GA 1854	6000
FIRST TOP HEAD	D160	22·5	30	031Z0266	K3078240	48	2517	K3077260	960 PL		K3078655	5	GA1854	6000
FENCE SIDE HEAD	D160	18·75	25	031Z 0264	K3078239	42	2517	K3077101		SPZ 1387 CR	K3078657	4	GA 8512	6000
NEAR SIDE HEAD	D160	18·75	25	031Z 0264	K3078239	42	2517	K3077101		SPZ 1800 CR	K3078638	4	GA 8512	6000
SECOND TOP HEAD	D160	18·75	25	031Z 0266	K3078240	42	2517	K3077101	960 PL		K3078655	5	GA 1854	6000
SECOND BOTTOM HEAD	D160	18·75	25	031Z 0266	K3078240	42	2517	K3077101	960 PL		K3078655	5	GA1854	6000

BELTS AND PULLEYS FOR HYDRAULIC DRIVE

MOTOR PULLEY		MOTOR TAPER LOCK BUSH			GEARBOX PULLEY		GEARBOX TAPER LOCK BUSH			BELTS		
UNIROYAL REF	WADKIN REF	BORE MM	FENNER REF	WADKIN REF	UNIROYAL REF	WADKIN REF	BORE MM	FENNER REF	WADKIN REF	H.T.D REF	WADKIN REF	QTY
40 8M 50F	K3078696	42	1615	K3077320	72 8M 50F	K3078697	42	2517	K3078693	1120 8M 50	K3078700	1

BELTS AND PULLEYS FOR DRIVE TO BOTTOM ROLLS

GEARBOX PULLEY		TAPER LOCK BUSH FOR BEDROLLS/TOP OUTFEED GEARBOXES			TAPER LOCK BUSH/ 180 INFEED GEARBOX			TAPER LOCK BUSH FOR TOP GEARBOXES			BELTS		
UNIROYAL REF	WADKIN REF	BORE MM	FENNER REF	WADKIN REF	BORE MM	FENNER REF	WADKIN REF	BORE MM	FENNER REF	WADKIN REF	H.T.D REF	WADKIN REF	QTY
P48 8M 20F	K3078689	19	029K0019	K3078690	24	029K0024	K3078691	48	029K0048	K3078340	1200 8M 20	K3078688	1

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SECTION 20 OPTIONAL EXTRAS

THROATING HEAD ATTACHMENT (Fig 21)

The throating head, supplied as an independently driven attachment, can be used in either the top or Side Head positions.

A switch for changing the direction of cutterblock spindle rotation is provided on the side of the control panel.

Note: check direction of cutter rotation before commencing work.

To change position of head:

(1) Remove the extraction hood and flexible hose.

(2) Slacken nuts (1) on motor mounting plate and rotate motor through 90 degrees.

(3) Slacken nuts (2) on radial clamps, rotate pulley/belt housing to reposition cutter towards the fence or bedplate.

(4) Retighten nuts (1) and (2) after repositioning head

Vertical Adjustment

(5) Slacken off slide nuts (3), adjust height of cutting head using the vertical traverse screw (4).

(6) Retighten slide nuts (3)

Horizontal Adjustment

(7) Slacken off slide nuts (5) on left hand side (not shown) adjust position of cutting head using the horizontal traverse screw (6).

(8) Retighten slide nuts (5) refit extraction hood and hose.

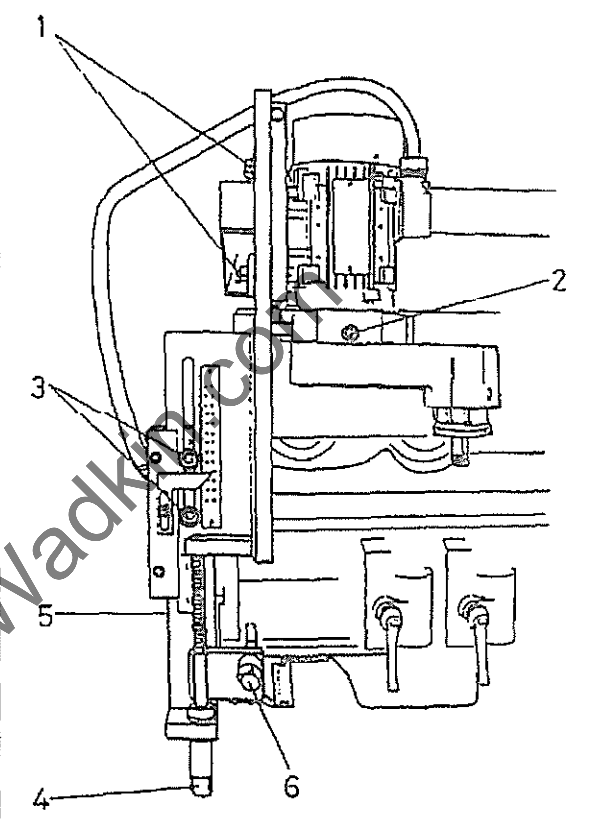

FIG 21 THROATING HEAD

(9) Select direciton of rotation required for cutter at the control panel. Ensure that the cutter has been correctly mounted and locked to suit direction of rotation and position of head.

Warning: As the throating head can be run in the reverse direction of rotation, depending on position, it is essential the locking collar is always fitted.

ILLUSTRATED PARTS LIST

CONTENTS

THROATING HEAD

Ref. No.	Description	No. Off
1	Nut M10	3
2	Self locking nut M10	3
3	Nut M10	2
4	Vertical traverse screw	1
5	Nut M10	2
6	Horizontal traverse screw	1
7	Throating head spindle assembly	1
8	Washer M10	9
9	Large washer M10	1
10	Collar 20mm I/D x 32mm O/D x 14mm wide	2
11	Flanged bush 20mm I/D x 26mm O/D x 10mm long	4
12	Collar 20mm I/D x 32mm O/D x 12mm wide	2
13	Taper pin No. 2	4
14	'SIKO' digital readout ref. 0902 E 2mm	1
15	'SIKO' digital readout ref. 0904 I 2mm	1
16	Extraction hood and clamp for 200mm dia. saw (not shown)	1

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THROATING HEAD SPINDLE ASSEMBLY

Ref. No.	Description	No. Off
1	Motor	1
2	Friction plate	1
3	Hexagon socket capscrew M8 x 20mm long	4
4	Spigot	1
5	Clamp	3
6	Stud M10 x 40mm long	3
7	Self locking nut M10	3
8	Washer M10	3
9	Housing	1
10	Hexagon head setscrew M6 x 20mm long	4
11	Spacer for pulley	1
12	Motor pulley	1
13	Key 8mm x 30mm x 30mm long	1
14	Special washer	1
15	Hexagon socket countersunk screw M8 x 20mm long	2
16	Belt 'Poly vee' Ref. 180J 6	1
17	Spindle pulley	1
18	Key 5mm x 5mm x 15mm long	1
19	Special washer	1
20	Spindle	1
21	Nut 3/4" x 14 T.P.I. right hand	1
22	Key 6mm x 6mm x 18mm long	1
23	Bearing housing	1
24	Circlip 40mm internal	1
25	Bearing 'SKF' 6203 - 2RS	2
26	Bearing spacer	1
27	Waved washer 'EMO' EP 34	1
28	Hexagon socket capscrew M8 x 60mm long	1
29	Hexagon head setscrew M5 x 25mm long	2
30	Nut M5	2
31	Cover	1
32	Hexagon head setscrew M5 x 10mm long	3

UNIVERSAL HEAD

Universal Head Cutters (Fig 1)

(1) The cutterblock (1) is removed and replaced in the same manner to the screw on type, (see **Operating Instructions — general**), using the combination spanner on nut (2) and the cutterblock flats, with the head in Bottom Horizontal mode.

(2) Check direction of cut. Ensure the locking collar (3) is fitted.

NOTE: In the Bottom Head position always change the cutterblock from the rear of the machine. However, in the Vertical mode it is possible to change the cutterblock from the nearside, using a similar procedure. Fig 1 shows the head of the nearside vertical (angled or canted) mode.

WARNING
As the universal head can be run in the reverse direction of rotation, depending on position, it is essential the locking collar is always fitted.

Universal Head Modes (Fig 2)

The universal spindle attachment can be positioned above or below the bed and at any angle between horizontal and vertical, in the following modes.

Bottom Horizontal modes
Top Horizontal mode
Nearside Vertical mode (at any angle 0-90 degrees.)

NOTE: After any change of mode, run the motor momentarily to check direction of spindle rotation (see **Reversing Switch**).

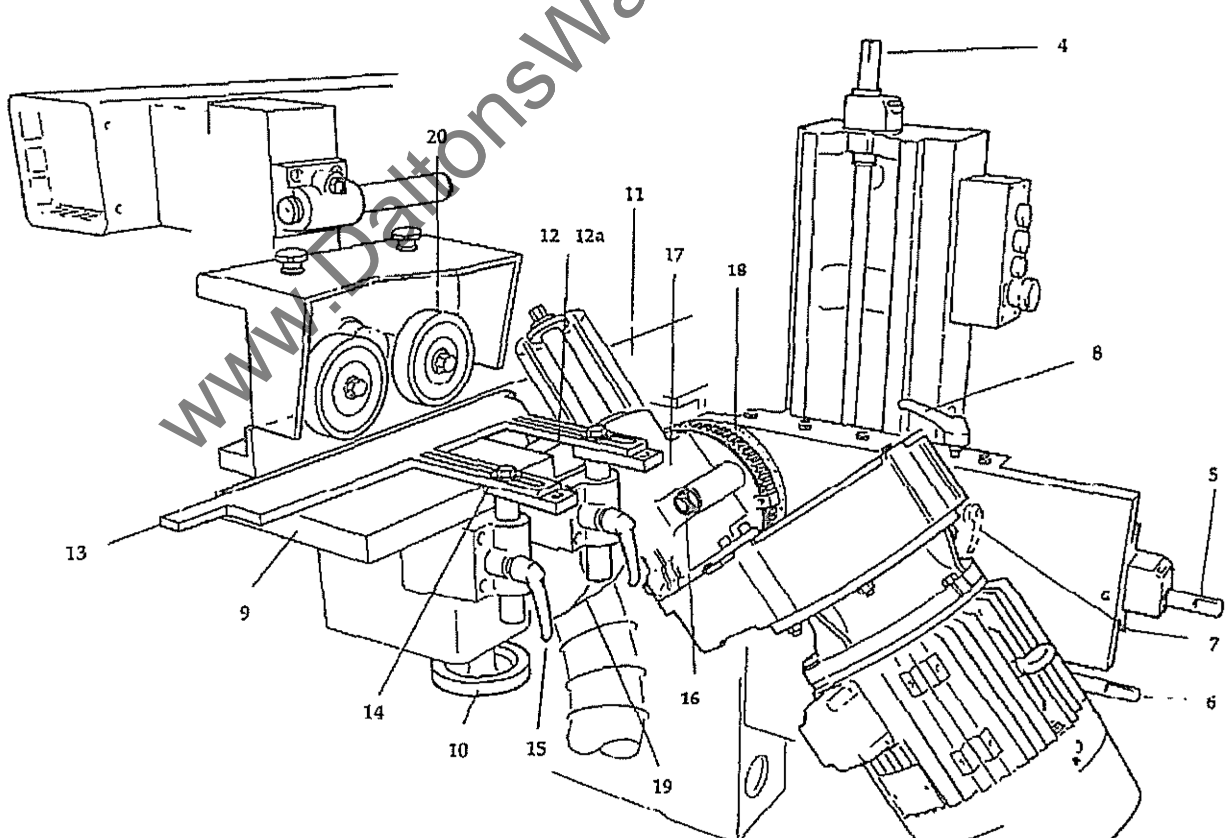


FIG 1 UNIVERSAL HEAD ATTACHMENT

NOTE: In raising or moving the spindle, ensure it does not come into contact with any part of the machine. Check direction of rotation of spindle after each change of mode.

(3) Adjust the outfeed table (9) to the same height as the infeed table (11). Replace bedplates with the metal rails (12) (12a) provided. These are placed side by side ; the last rail fitted prevents sideways movement of the others.

The rails ensure a continuous feed transfer between the infeed and outfeed tables.

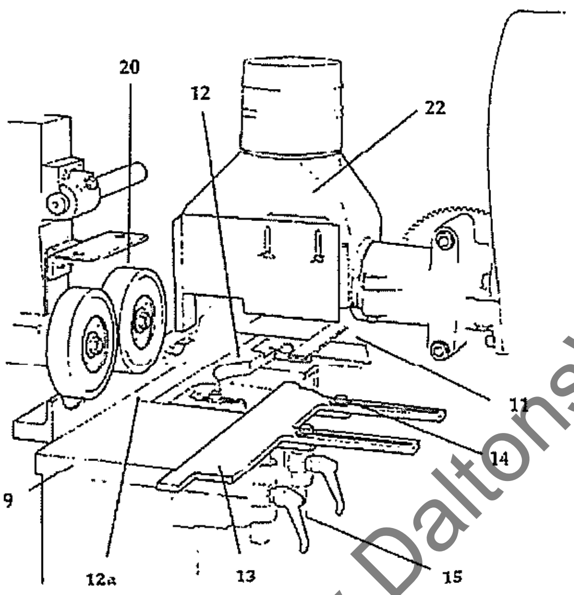


FIG 3 UNIVERSAL HEAD — TOP HORIZONTAL MODE

(4) Fit the cutterblock. Note change in direction of spindle rotation. Adjust vertically and laterally, using traverse screws (4) and (5), as required.

(5) Mount pressure shoes, when supplied, before and after the cutterblock.

(6) Select reverse motor drive (left hand position REV) at control panel. Check rotation of spindle.

(7) Before feeding the timber, spin the cutterblock to ensure there is adequate clearance at dust hood and moving parts.

(8) Set guide (13) to suit width of timber in the same way as **Bottom Horizontal Mode** after releasing setscrews (4). Vertical height is set using handles (15). Retighten after adjustment.

In Nearside Vertical Mode

The universal head in the nearside vertical mode will accomodate a cutterblock having a cutting circle of 125 to 180 mm. The spindle can be positioned at any angle between vertical and horizontal as required (see Fig 1), using the wormdrive shaft (6). In addition, the cutter can be positioned vertically and laterally in relation to the workpiece, in increments of 0.1mm, using the traverse screws (4) and (5).

NOTE: In the nearside and angled positions it is necessary to remove the dust-hood (19).

(1) To adjust vertically: release the locking handle (7), place crank handle on square of vertical traverse screw (4), turn clockwise to raise head or anticlockwise to lower. Refasten locking handle (7) after adjustment.

(2) To adjust laterally: release the locking handle (8), place crank handle on square of lateral traverse screw (5), turn clockwise to move forward or anticlockwise to move back. Refasten locking handle (8) after adjustment.

(3) To angle (cant) the spindle: unscrew the two hexagon nuts (16) at the spindle carriage (17), place crank handle on square of worm drive (6) and adjust angle. Retighten the two nuts (16) after adjustment. The angle is measured in degrees from the horizontal on the graduated scale (18).

(4) Fit metal rails (12a) to suit width of the work.

(5) Select reverse motor drive (lefthand position REV) at the control panel. Check rotation of spindle.

(6) Adjust the feed roll pressure, pressure shoes and side guides on first workpiece to ensure a smooth feed.

Wadkin

ILLUSTRATED PARTS LIST

CONTENTS

UNIVERSAL HEAD ADJUSTING MECHANISM

Ref. No.	Description	No. Off
1	Universal Head spindle, 40mm dia.sq.shoulder	1
2	Locking nut	1
3	Locking collar assembly	1
4	Vertical traverse screw	1
5	Digital readout (option)	1
6	Vertical slide stand	1
7	Locking handle, M10×50mm, male	1
8	Saddle, Universal Head	1
9	Locking handle	1
10	Digital readout (option)	1
11	Horizontal traverse screw	1
12	Cross slide, Universal Head	1
13	Worm gear shaft	1
14	Electric motor, frame D132	1
15	Drive pulley	1
16	Drive belt, Fenner, SPZ 940	3
17	Pulley/belt housing	1
18	Pulley/belt housing cover	1
19	Spindle carriage, Universal head	1
20	Bolt, spindle carriage	2
21	Wormwheel, Universal Head	1

HYDRAULIC SERVO CONTROL RACK

WITH MANUAL SPEED CONTROL

QUINTON CRANE ELECTRONICS

www.DaltonsWadkin.com

WADKIN HYDRAULIC FEED CONTROL (WITH CLOSED LOOP INCHING) SETTING UP PROCEDURE

This procedure relates to:
Wadkin hydraulic control units, part number K12-16-784 with
Quinton Crane Servo cards, part number K12-16-799.

As the unit is set up it is important that readings are taken where specified and entered on the special test report sheet (see page 5). Doing this will enable spare parts to be calibrated before sending them to the customer; this will eliminate the need for subsequent on-site calibration.

NOTES

1. See layout drawing for location of potentiometers, LEDs and test points etc.
2. Unless specified otherwise, all voltages are dc, measured with respect to system Ov. (white test point on Servo or Personality cards)
3. Tools required:- Digital voltmeter, hand tacho and 1 Amp moving coil ammeter.
4. Stages A - E are performed without pressing the RUN pushbutton. Stages F & G require the RUN pushbutton to be pressed

A. INITIAL CHECKS

1. Ensure power supply links (on the motherboard) are set to the correct voltage (see Table 1).
2. Ensure link LK1 on Interface card PC1, is in the position nearest the edge connector (Test position).
3. On Servo card PC2, ensure jumper link (near R25) is set parallel to the edge connector.
4. On Personality card PC3, adjust potr. P1 fully anti-clockwise.
5. Check all four printed circuit boards are correctly fitted.
6. Apply power and check the following voltages:

PC3:TP1 -	-12v	(PERSONALITY CARD)
PC3:TP3 -	+12v	" "
PC1:TP2 -	+ 5v	(INTERFACE CARD)
PC2:TPA -	-8v	(SERVO CARD)
PC2:TPB -	+8v	" "

B. ADJUST ACCEL/DECEL RAMP RATE

1. Set PC2:P4 (servo:ramp rate) fully clockwise (= 0.5 sec. ramp).
(fully anti-clock = 5 sec. ramp).
Note potr. setting (1).

C. SET SPEED REFERENCE SPAN

1. Monitor the voltage at PC3:TP4 (personality:ref hi) and adjust PC3:P2 (personality:ref hi) for the appropriate maximum voltage as shown in Table 2.
Note this voltage (3).

2. Monitor the voltage at PC3:TP6 (personality:ref lo) and adjust PC3:P3 (personality:ref lo) for the appropriate minimum voltage as shown in Table 2.
Note this voltage (4).

D. CALIBRATE DISPLAY

1. Turn the front panel speed control potr. to maximum and ensure that PC3:SW1 (display switch) is set to REF. Adjust PC3:P4 (personality:display ref) until display reads the maximum speed for the machine.

2. Set PC3:SW1 (display switch) to F/B. Start the hydraulic pump and adjust PC2:P3 (servo:balance) so that the feedworks runs at approximately half of full speed. Measure the actual speed at the feed rolls using the hand tacho. Adjust PC3:P5 (personality:display f/b.) until the display reads the same as the hand tacho.

E. SET ZERO SPEED

1. Insert the ammeter in place of the upper link on the rear connector panel with the positive lead to the upper socket.
Adjust PC2:P3 (servo:balance) so that the feed is running and the current is positive.
Adjust PC2:P3 (servo:balance) until the feed just stops running. Note the current (9).
Adjust PC2:P3 (servo:balance) until the current is zero.

F. CALIBRATE TACHO FEEDBACK

1. Set PC3:SW1 (display:switch) to F/B. and front panel potr. to max. Press **RUN** button. Adjust PC3:P1 (personality:tacho f/b) until the display reads the maximum speed correctly. Note the following measurements:

Max speed from Table 2	(5)	
Voltage on PC3:TP8 (servo:T +ve)	(6)	
Voltage on PC3:TP7 (servo:T f/b)	(7)	
Solenoid current	(8)	Press **STOP** button.

G. SET SERVO ZERO THRESHOLD

1. Ensure PC3:SW1 (display switch) is set to F/B. and front panel speed potr. to minimum. Monitor PC2:TP9 (servo:output) and press **RUN** pushbutton. Adjust PC2:P3 (servo:balance) until the voltage on PC2:TP9 (servo:output) is zero.
Press **STOP** pushbutton.

NB Feed may creep with link LK1 (on personality card) set to Test position. This should not happen once the link is returned to the normal position (furthest from edge connector) - see I. "Leave unit ready for use".

H. SET INCH SPEED

1. Ensure PC3:SW1 (display switch) is set to F/B. Monitor the voltage on PC2:TP3 (servo:inch). Press INCH FOR pushbutton and adjust PC2:P7 (servo:inch) until display reads the appropriate speed from Table 2. Press INCH REV and check speed is the same.

2. Note the inch speed (12) and the voltage (13).

I. LEAVE THE UNIT READY FOR USE

1. Remove the ammeter and replace the upper link.
2. Replace link LK1 on PC1 (interface) in posn. furthest from the edge connector.
3. Ensure PC3:SW1 (display:switch) is set to REF.

J. FINAL CHECK

1. Check that feed is smooth over the entire speed range.
2. Ensure that the feed starts smoothly at both minimum and maximum speeds and that the tacho failure light remains off when starting at minimum speed.
3. Ensure that if the tacho is disconnected whilst the feed is running continuously, then the feed is shut down and the tacho failure warning light is illuminated.

TABLE 1 - POWER SUPPLY LINKS

N.B. These links are fitted on the mother board.

SUPPLY VOLTAGE	LINK POSITIONS
110v	1 3 5 7
120v	2 3 5 8
220v	1 4 6 7
240v	2 4 6 8

TABLE 2 - SPEED RANGES

SPEED	VOLTAGE ON PC3:TP4	VOLTAGE ON PC3:TP6	INCH SPEED
6-60 m/min	8.0v	0.8v	15m/min
10-100m/min	8.0v	0.8v	15m/min

HYDRAULIC FEED CONTROL TEST REPORT

MACHINE TYPE : MACHINE No: DATE

CUSTOMER :

SPEED RANGE : M/MIN

UNIT REFERENCE :

CALIBRATED BY :

TEST		PARAMETER MEASURED	REF	READING	UNITS
B.	Acc/Dec ramp	PC2:P4 setting	(1)		
C	Reference Span	Voltage on PC3:TP4 Voltage on PC3:TP6	(3) (4)		volts volts
F	At max speed	Speed of feed rolls Tacho volts at PC3:TP8 Scaled tacho volts PC3:TP7 Solenoid current	(5) (6) (7) (8)		m/min volts volts mA
E	At zero speed	Solenoid current	(9)		mA
H	At inch speed	Speed at feed rolls Voltage on PC2:TP3	(12) (13)		m/min volts

CNR1 - PUSHBUTTONS
CNR2 - TACHO
CNR3 - SOLENOIDS
CNR4 - MAINS SUPPLY

RL1.4 RUN
RL6 TACHO FAIL
RLT1 RUN TIMER
RL3 INCH REV
RL2 INCH

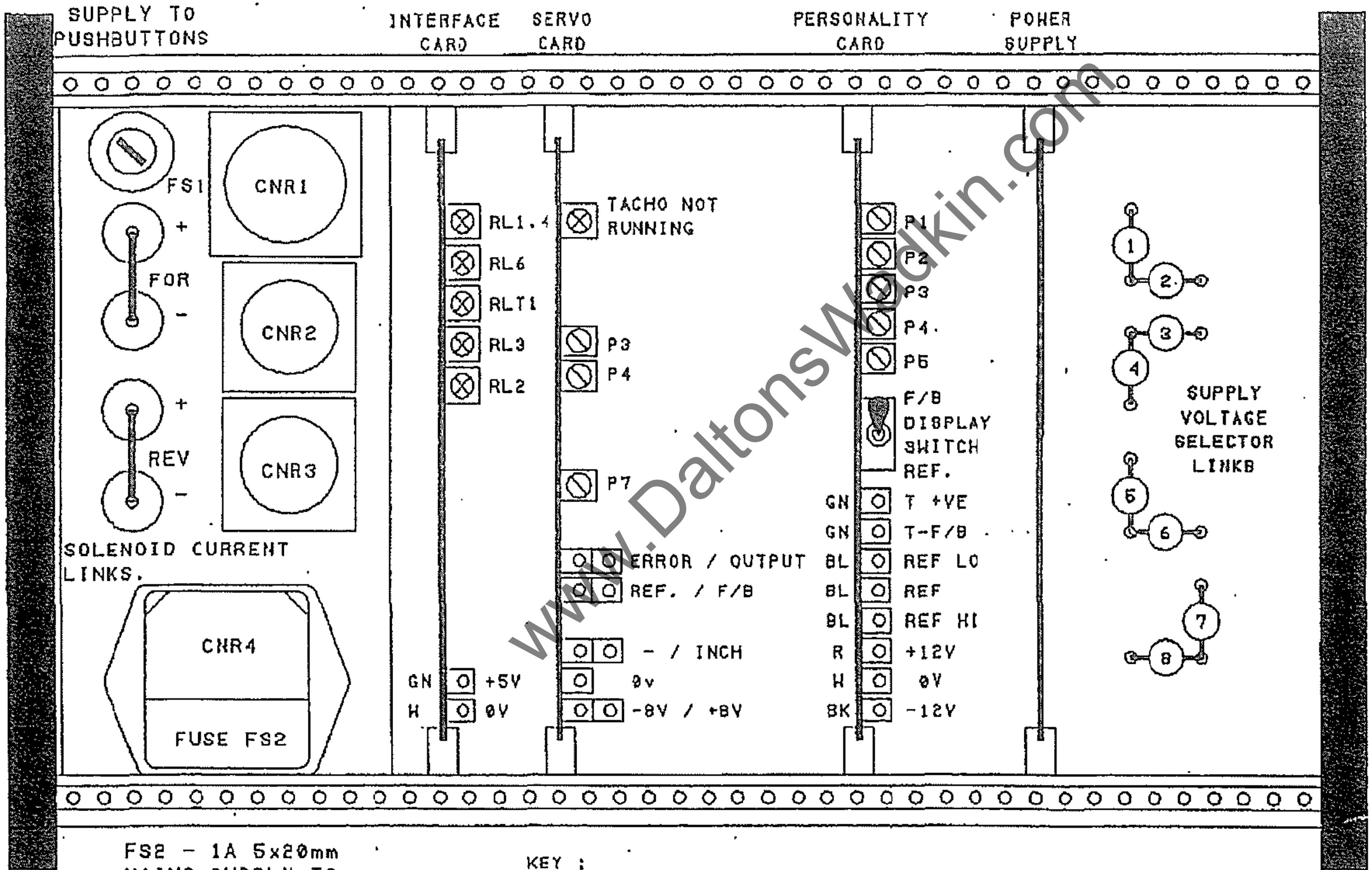
P3 BALANCE
P4 RAMP
P7 INCH

P1 TACHO F/B
P2 REF HI
P3 REF LO
P4 DISPLAY REF
P5 DISPLAY F/B

SUPPLY VOLTAGE SELECTOR LINKS

110V - 1 3 5 7
120V - 2 3 5 8
220V - 1 4 6 7
240V - 2 4 6 8

FS1
1A 5x20mm 24V DC
SUPPLY TO
PUSHBUTTONS



FS2 - 1A 5x20mm
MAINS SUPPLY TO
POWER SUPPLY BOARD.

KEY :

⊗ - LED LAMP
▢ - TEST POINT
⊘ - TEN TURN POTR.

REAR GA DWG
HYDRAULIC SERVO RACK

QC-E-4174

QUINTON CRANE ELECTRONICS

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