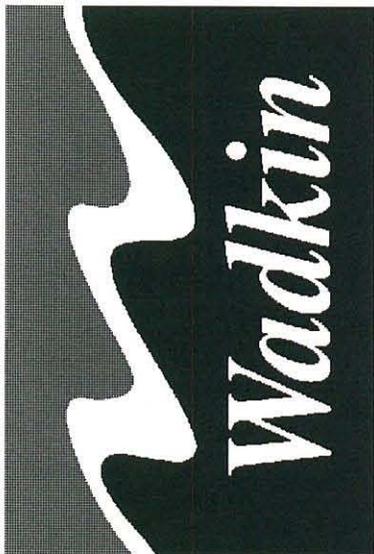


'Wadkin' Through Feed Four Side Planing Machine and Moulder

Models GA

INSTRUCTION MANUAL No. 2029/1



'Wadkin' Through Feed Four Side Planing Machine and Moulder

Models GA

M/C No.

TEST No.

Instruction Manual

MANUFACTURERS E.C. DECLARATION OF CONFORMITY

The following machine has undergone "Conformity Assessment" and is "self" certified in accordance with:-

Supply of Machinery (Safety) Regulations 1992
and Amendment No. 2063

COMPANY

WADKIN LTD
Green Lane Road
Leicester
LE5 4PF

RESPONSIBLE PERSON

Mr A C Lott (Managing Director)

MACHINE DESCRIPTION

TYPE THROUGH FEED FOUR SIDE
PLANING MACHINE AND MOULDER

MODEL GA

DIRECTIVES COMPLIED WITH

Supply of Machinery (Safety) Regulations 1992
Amendment No. 2063 1994
Draught Proposal CEN/TC 142
ISO 9001 Part 1

SIGNED ON BEHALF OF WADKIN PLC



.....

Through Feed Four Side
Planing and Moulding Machine

Model GA

OPERATION AND MAINTENANCE MANUAL

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CONTENTS

EXTENT OF MANUAL

Section		Page
1	HEALTH AND SAFETY	1-1
1.1	Health and Safety	1-1
1.1.1	Factories Act	1-1
1.1.2	Health and Safety at Work Act	1-2
1.1.3	Electricity Regulations	1-2
1.1.4	Provisions and use of Work Equipment Regulations	1-2
1.1.5	Woodworking Machines Regulations	1-2
1.1.6	Other Documents for Reference	1-2
1.2	Supply of Machinery (Safety) Regulations 1992	1-3
1.3	Specific Information	1-3
1.3.1	Noise	1-3
1.3.2	Dust	1-4
2	MACHINE SPECIFICATION	2-1
3	INSTALLATION	3-1
3.1	Receipt of the Machine	3-1
3.2	Preparation for Installation	3-1
3.3	Lifting and Locating the Machine	3-1
3.4	Connecting the Services	3-2
3.4.1	Electrical Supply	3-2
3.4.2	Pneumatic Air Supply	3-3
3.4.3	Dust Extraction	3-3
4	MACHINE USAGE AND CONTROLS	4-1
4-1	Safe Practices	4-1
4.1.1	Pre-operation Checks	4-1
4.1.2	Checks During Operation	4-1
4.1.3	Safety Devices	4-2
4.2	Machine Controls	4-2
4.2.1	Machine Control Panel	4-2
4.2.2	Infeed End Controls	4-4
4.2.3	Optional Equipment	4-4
5	SETTING-UP THE MACHINE	5-1
5.1	General	5-1

Section		Page
5.1.1	Preparation	5-1
5.1.2	Remove/Refit Cutter Block in Spindle	5-2
5.2	Setting First Bottom Head	5-3
5.3	Setting Fence Side Head	5-4
5.4	Setting Near Side Head	5-6
5.5	Setting First Top Head	5-8
5.6	First Top Head Pad Pressure and Chipbreaker	5-10
5.7	Setting Second Bottom Head	5-11
5.8	Setting the Feed Rolls	5-12
5.9	Infeed Table and Fence Adjustment	5-14
6	OPERATION	6-1
6.1	General	6-1
6.1.1	Pre-operation Checks	6-1
6.1.2	Setting Controls and Adjustments	6-1
7	MAINTENANCE	7-1
7.1	General	7-1
7.2	Scheduled Maintenance	7-1
7.2.1	Daily	7-1
7.2.2	Monthly	7-2
7.2.3	Three-Monthly	7-2
7.3	Unscheduled Maintenance	7-3
7.3.1	Re-tension Top/Bottom Head Drive Belt	7-3
7.3.2	Re-tension Fence/Side Head Drive Belt	7-4
7.3.3	Replace Top/Bottom Head Drive Belt	7-4
7.4.3	Replace Fence/Side Head Drive Belt	7-4
7.3.5	Replace Outfeed Bottom Drive Belt on Machine fitted with Straightening Infeed Table	7-4
7.3.6	Replace Shaft-Mounted Top Feed Roll	7-5
7.3.7	Replace Flange-Mounted Top Feed Rolls/Spacers	7-5
7.3.8	Replace Bottom/Top Head Spindle	7-6
7.3.9	Replace Fence/Near Side Head Spindle	7-6
7.4	Fault Finding	7-8
7.4.1	General	7-8
7.4.2	Workpiece Faults	7-8
7.4.3	Machine Faults	7-9
7.5	Lubrication Chart	7-11
7.5.1	Lubricants Specified	7-11
7.5.2	Approved Lubricants	7-11
7.6	Tool and Toolholder Care	7-12
8	ADDITIONAL EQUIPMENT APPENDICES	
8.1	Universal Head	8-1

8.2	Splitting Bedplate	8-9
8.3	Infeed Nip Driven Roller System	8-10
Section		Page
8.4	Push Feed System	8-11
8.5	Grooved Bed	8-12
8.6	Unit G	8-14
8.7	Intermediate Feed Roll	8-19

GLOSSARY

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EXTENT OF MANUAL

This Operation and Maintenance Manual is intended to provide users with all relevant information concerning the operation and maintenance of a Through Feed Four Side Planing and Moulding Machine, Model GA.

The document is produced in seven sections.

Section One gives advice general safety aspects of the machine usage including references to the various current statutory and safety regulations in force, advice on record keeping of machine operation and maintenance, and also instructions on recommended procedures when accepting and receiving the machine from the manufacturer.

Sections Two to Seven provide the information necessary to install, operate and maintain the machine including procedures for fault finding.

At the end of the manual is a Glossary of terms used throughout the body of the manual.

Also, depending upon any special machine features and/or nature of operation, Additional Equipment Appendices are included to complement the standard sections within the manual.

The policy of the Company is one of continuous development, and the company reserves the right to alter specification without prior notice.

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1 HEALTH AND SAFETY

This Section covers all aspects of safe operation and safe use of woodworking machinery. It refers to various statutory Health and Safety regulations, and also includes information and advice derived from many years' experience in the in the building, operation and maintenance of woodworking machinery.

It is of the utmost importance that the user or employer reads this Section of the document and understands clearly all of the stated requirements concerning safe operation of the equipment.

1.1 Health and Safety

There are a number of statutory regulations which apply to the safe operation of woodworking machinery in the UK. These regulations are listed below, and the user is advised to refer to the relevant parts of these regulations and ensure that the requirements are complied with.

Where the machinery is used outside the UK, then the regulations of that country will apply, and should be complied with.

Note:

The list below relates to the most recent published editions of the regulations including all amendments and supplements.

Factories Act.

Health and Safety at Work Act.

Electricity Regulations.

Provision and use of Work Equipment Regulations.

Woodworking Machines Regulations.

1.1.1 Factories Act

This Act requires that rotating machinery shall be of good mechanical construction and that it shall be **properly maintained and serviced by competent and experienced persons.**

1.1.2 Health and Safety at Work Act

This Act imposes obligations to apply similar standards to those of the Factories Act as a minimum requirement, **especially where a machine is installed in a place of work where no suitable legislation applies.**

1.1.3 Electricity Regulations

These regulations place general requirements on the installation and maintenance of electrical equipment. Users should be aware of the requirements concerning the availability of lighting and free working space for maintenance personnel, and the importance of personnel being fully competent and trained when working on electrical equipment.

1.1.4 Provision and use of Work Equipment Regulations

Compliance with these regulations is necessary for equipment to be considered to be conforming with the EC declaration of conformity.

The regulations also place obligations on the user (see Section 1.2).

1.1.5 Woodworking Machines Regulations

These regulations place absolute legal requirements on employers and users to ensure **that all fitted guards and safety devices are always used, securely fitted, correctly adjusted and properly maintained.**

The regulations also require that **maintenance be undertaken only by suitably qualified and competent personnel, and that all power supplies are isolated from the machine before any maintenance is undertaken.**

It is also required that **operators (users) receive suitable training and instruction into the possible dangers arising from machine usage and that local working practices are followed.**

1.1.6 Other Documents for Reference

Other documents which refer to woodworking machinery operation and maintenance in the UK include:

Noise at Work Regulations.

Control of Substances Hazardous to Health Regulations.

Code of Practice BS5304 - Safeguard of Machinery.

Code of Practice BS6854 - Safeguard of Woodworking Machines.

Health and Safety Executive note IND(G) 1(L).

1.2 Supply of Machinery (Safety) Regulations 1992

A machine manufactured in accordance with the Essential Health and Safety Requirements of the Supply of Machinery (Safety) Regulations 1992, complies with the EC conformity requirements and can thus have the CE mark appended (Harmonised Standard PREN 12750: 1997).

These regulations also impose legal requirements on both the employer and the user of the machine with regard to proper usage, user working conditions, risks of injury and many more. These requirements are wide ranging, and in some cases specific to only certain types of machine or process. Some of the more general requirements which apply to woodworking machinery are briefly detailed below.

- 1 An employer shall ensure that the equipment is constructed/adapted as to be suitable for the purpose that it is used.
- 2 In selecting the equipment, the employer shall have due regard to the working conditions and the risks to health and safety of persons which exist in the premises in which the equipment is to be used.
- 3 The employer shall ensure that the equipment is used for the operations for which, and under the conditions for which it is suitable.

Other requirements include provision of suitable training of users, provision of suitable documentation (information and instructions), and declarations of any specific risks.

1.3 Specific Information

Section 4 of this manual - Machine Usage and Controls identifies and details general safe working practices and specific local practices which should be adopted when using the machine. In addition to this information two hazards, specific to woodworking machinery should be considered in more detail.

1.3.1 Noise

Noise levels can vary widely depending upon the machine and the conditions of use.

Planing and moulding machines produce high noise levels, typically in the region of 95dB to 115dB when cutting.

The Noise at Work Regulations require that an operator is not subjected to continuous noise levels above 90dB over an 8 hour period. Thus, some form of noise protection is necessary.

A machine manufacturer may supply (or provide information) a suitable sound enclosure. It is possible that, given the types of materials available in the works (ie sawmill), a suitable enclosure may be produced on site.

It should be noted however, that even with an enclosure, noise levels might still exceed the 90dB limit (especially at the machine infeed end).

As a precaution suitable ear protection should be worn by all machine operatives.

Refer to use of ear defenders in Section 4.1.2 of this manual.

1.3.2 Dust

Wood dust can be harmful to health through inhalation and also skin contact.

The Control of Substances Hazardous to Health Regulations place legal requirements on **employers** to prevent exposure of the user to substances hazardous to health or, where prevention is not practicable, to adequately control the exposure. Adequate control should be achieved by measures other than provision of personal protective equipment.

The Regulations require that airborne dust levels should not exceed 5mg/m³.

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2 MACHINE SPECIFICATION

Machine Details

Model	GA170/GA220
Dimensions	Refer to machine Foundation Plan
Services	Refer to the machine Specification Plate located on the machine frame

Capacities and Adjustments

Maximum timber size admitted	180/230mm x 130mm
Maximum finished work size	170/220mm x 120mm
Feed speeds	6 to 36m/min (standard)
Pneumatic Air Requirement	0.25 m ³ /min

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3 INSTALLATION

3.1 Receipt of the Machine

Before accepting the machine at its destination check the packages/items against the bill of loading. Confirm that all listed fittings/accessories have been received and carry out a visual inspection of the packages/items for obvious signs of damage.

Report any omissions or damage; note these for any future reference.

3.2 Preparation for Installation

Ensure that all the necessary external services are available ie electricity, pneumatic air, etc., as identified on the machine Specification Plate and in Section 2 Machine Specification.

Check also that adequate space is available on the installation site for lifting and manoeuvring access.

Ensure that any covers or guards are removed and stored away from the machine.

Check that the following lifting equipment is available and of is of adequate capacity:

- crane or approved lifting equipment
- 45mm diameter steel rods, 1.2m long (certified as suitable for lifting purposes)
- lifting slings (capacity according to machine Foundation Plan)
- wooden chocks.

Refer to the Foundation Plan for details of the floor area required and for any special foundations necessary

Ensure that the final location of the machine has been levelled.

3.3 Lifting and Locating the Machine

Place the steel rods through the holes in the machine base.

Position the lifting slings on the crane/lifting equipment hook.

Locate the slings securely on the steel rods. Insert the wooden chocks between the slings and the machine base to prevent damage to the base.

Position a steel levelling plate at each machine jacking screw point (refer to the machine Foundation Plan).

Lift and position the machine on the prepared location, and remove any transit clamps that may have been fitted.

Level the machine (as detailed below) using an engineer's level by adjusting the jacking screws located at each machine foot position.

Levelling longitudinally

With the engineer's level lengthways on the table of the machine, adjust the machine longitudinally by adjusting the jacking screws. Check level at approximately every 300mm along the machine length. Deviation should not exceed 0.1mm/m.

Levelling transversely

Position the engineer's level across the table (at right angle to the fence), and adjust the machine transversely by adjusting the jacking screws. Repeat this action at points similar to the longitudinal checks. Deviation should not exceed 0.1mm/m.

WARNING:

The machine must be firmly bolted down before connecting any services.

3.4 Connecting the Services

3.4.1 Electrical Supply

The customer is responsible for an electrical supply suitable to meet the power requirements of the machine. These requirements are shown on the machine Specification Plate on the machine frame, and are also shown on the electrical schematic/connection diagram accompanying the machine.

Electrical connections should be made to the isolating switch on the electrical control cubicle.

WARNING:

Connection of the supply must be made by a competent and experienced electrician.

The connection procedure should include, but not be limited to:

Confirm that the supply is of the correct voltage, phase and frequency to that identified on the machine Specification Plate.

Check that the incoming fuse ratings can accommodate the full load current shown on the machine Specification Plate.

Connect the incoming supply to the relevant terminals on the electrical control cubicle (L1, L2 and L3).

Make a good earth connection to the machine.

WARNING:

Before continuing further, refer to Section 4 for advice on safe operation of the machine. Also, ensure that when undertaking any of the following operations all relevant safety requirements and procedures detailed in Section 1 are complied with.

Close the isolator on the electrical control cubicle, and run each spindle in turn to ensure direction of rotation is correct:

Bottom horizontal spindles - clockwise when viewed from front.

Top heads - counterclockwise when viewed from front.

Fence side head - counterclockwise when viewed from above.

Near side head - clockwise when viewed from above.

Note:

Incorrect rotation of the spindles can be corrected by reversing any two of the incoming supply connections to the terminals of the electrical control cubicle.

WARNING:

Phase changes must be made by a competent and experienced electrician.

3.4.2 Pneumatic Air Supply

The customer is responsible for a pneumatic air supply suitable to meet the requirements of the machine as shown on the machine Foundation Plan (0.25m³/min).

The air supply connection in the machine base is ¼BSP female.

Check the condition of the air connectors, confirm their cleanliness, and make the air connection.

3.4.3 Dust Extraction

The customer is responsible for the supply and fitting of suitable dust extraction equipment.

The number and length of the flexible connections from the exhaust hood to the machine should be as shown on the machine Foundation Plan.

See the machine Foundation Plan for:

Airflow requirements in m³/hour.

Cross-sectional dimensions of machine extraction connections.

Duct air velocities in m/second.

Average pressure drop at machine extraction connections are shown below.

Duct Diameter (mm)	Required Air Volume (m ³ /hour at 30m/sec)	Pressure Drop (Pa)
120	1222	1000
150	1909	850

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4 MACHINE USAGE AND CONTROLS

Note:

Refer also to Section 1 for information on general statutory requirements when operating woodworking machinery.

4.1 Safe Practices

Safe and proper working practices must be followed when setting-up and operating the machine. Adequate advice and information are readily available in the form of local working practices, notices, warnings and the information contained in this manual.

IT IS THE OPERATOR'S RESPONSIBILITY TO USE THE MACHINE FOLLOWING THE PROCEDURES LAID DOWN AND ONLY FOR THE PURPOSES FOR WHICH IT WAS DESIGNED.

4.1.1 Pre-operation Checks

All guards and fences are fitted securely and properly adjusted to suit their purpose.

Dust extraction equipment is working correctly.

Machine controls are functioning correctly (see Section 4.2).

Adequate working space is provided and lighting is available.

4.1.2 Checks During Operation

Proper protective equipment is available and employed (goggles, ear defenders, face mask, etc).

Area around the machine is kept clean and free of wood refuse.

Any machine malfunction is recorded and reported to person in authority.

Machine is made stationary and electrically isolated before any cleaning of work area or ANY adjustments are made to the machine or ancillary equipment.

4.1.3 Safety Devices

In order to avoid injury or accidental damage to personnel or equipment, a number of interlocking features have been incorporated into the machine operation. These are:

- 1 Infeed trip device (1) (see Figure 4.1.2) will trip the operation of the machine feed. The spindles will continue to run. This trip level is set through the height of the beam setting.

Before attempting to restart the machine electrically isolate the machine. The feed must be restarted at the control panel after removal of the cause of the trip.

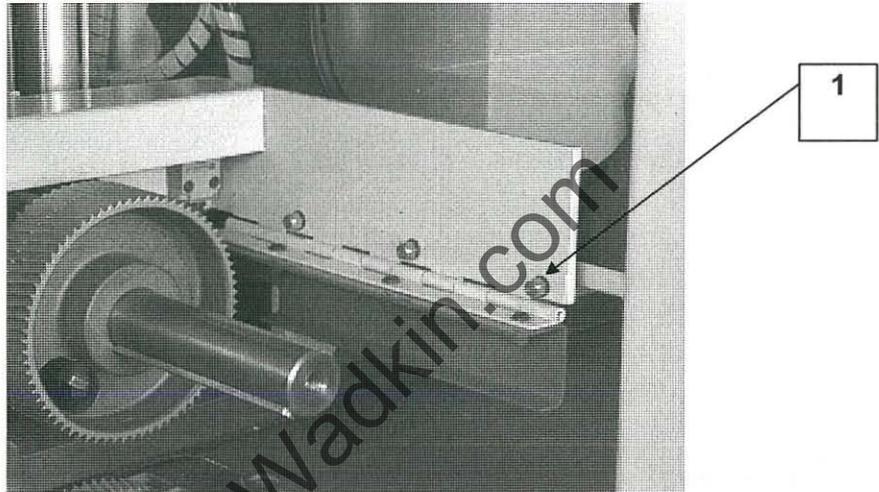


Figure 4.1.2

- 2 A splinter catching device protects against splinters at the machine infeed (fitted when the machine is specified for splitting use).
- 3 If the enclosure door is opened during normal operation all spindles and feed rolls stop.
- 4 With the enclosure open, the machine may be used for setting-up and test purposes only.
- 5 The machine feed does not operate unless the spindles are running and the enclosure is closed.
- 6 Brakes are fitted to all spindles.

4.2 Machine Controls

4.2.1 Machine Control Panel

Before using the machine, operators should familiarise themselves with the machine control panel and other controls.

The machine control panel is mounted at the infeed end of the machine and consists of a number of buttons, switches and indicators (see Figure 4.2.1). Depending upon the model of the machine and special features fitted, the illustration of the control panel may differ slightly from the panel on the machine being installed.

Feed Stop/Start (1)

Toggle start/stop button with indicator lamp which controls the operation of the feed rolls.

Inch Forward/Reverse (2)

Two buttons and a keyswitch enable the feed to be inched forward or backwards - for setting-up or other maintenance purposes.

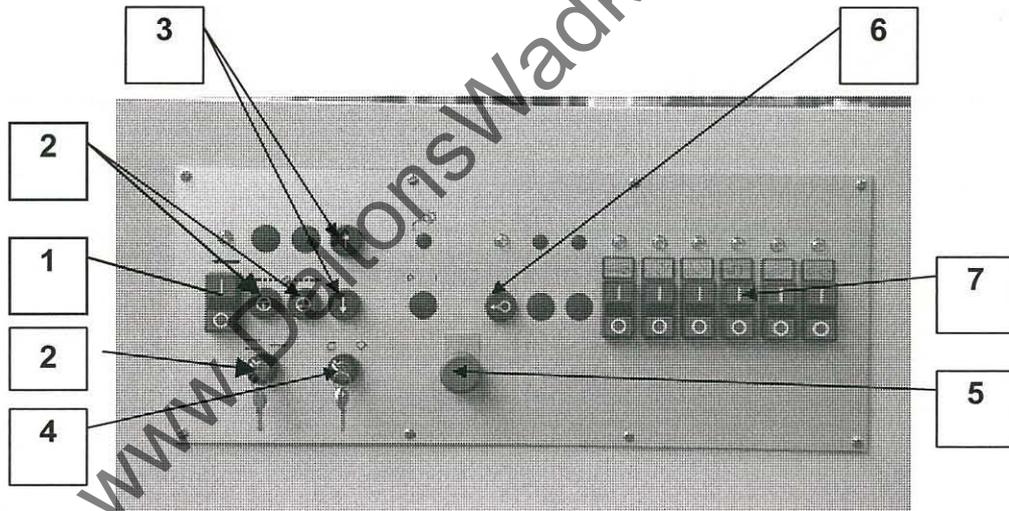


Figure 4.2.1

Beam Raise/Lower (3)

Two buttons enable the beam to be raised or lowered within predetermined limits.

Similar buttons are also on the local control panel located beneath the first top head (see Figure 5.5).

Enclosure Override (4)

Two-position keyswitch which enables the machine drives to operate when the enclosure is raised - for setting-up and other maintenance purposes.

Emergency Stop (5)

Emergency stop button shuts down machine operation when depressed. Must be unlocked to reset.

Emergency stop buttons are also located at other points on the machine in compliance with Machinery Directive requirements.

Spindle Head Brake Release (6)

Releases the spindle brakes to enable free rotation of the spindles for changing cutter blocks, belts, etc; lamp indication when enabled.

Spindle Start/Stop (7)

Each spindle has a toggle start/stop button with lamp indicator. These enable spindles to be started and stopped independently.

Other optional controls not shown on Figure 4.2.1, but which can be mounted on the machine control panel include:

Power On/Off

Toggle power on/off button with lamp indicator. Controls power through the control panel.

Clamp On/Off

Two buttons enable the vertical movement of the top head to be hydraulically clamped/unclamped.

Automatic Lubrication

Two-position on/off switch providing automatic lubrication to machine bed when set on. Associated 'low oil level' lamp indicator.

4.2.2 Infeed End Controls

Other controls used in setting-up and operating the machine are located at the infeed end of the machine (see Figure 4.2.2).

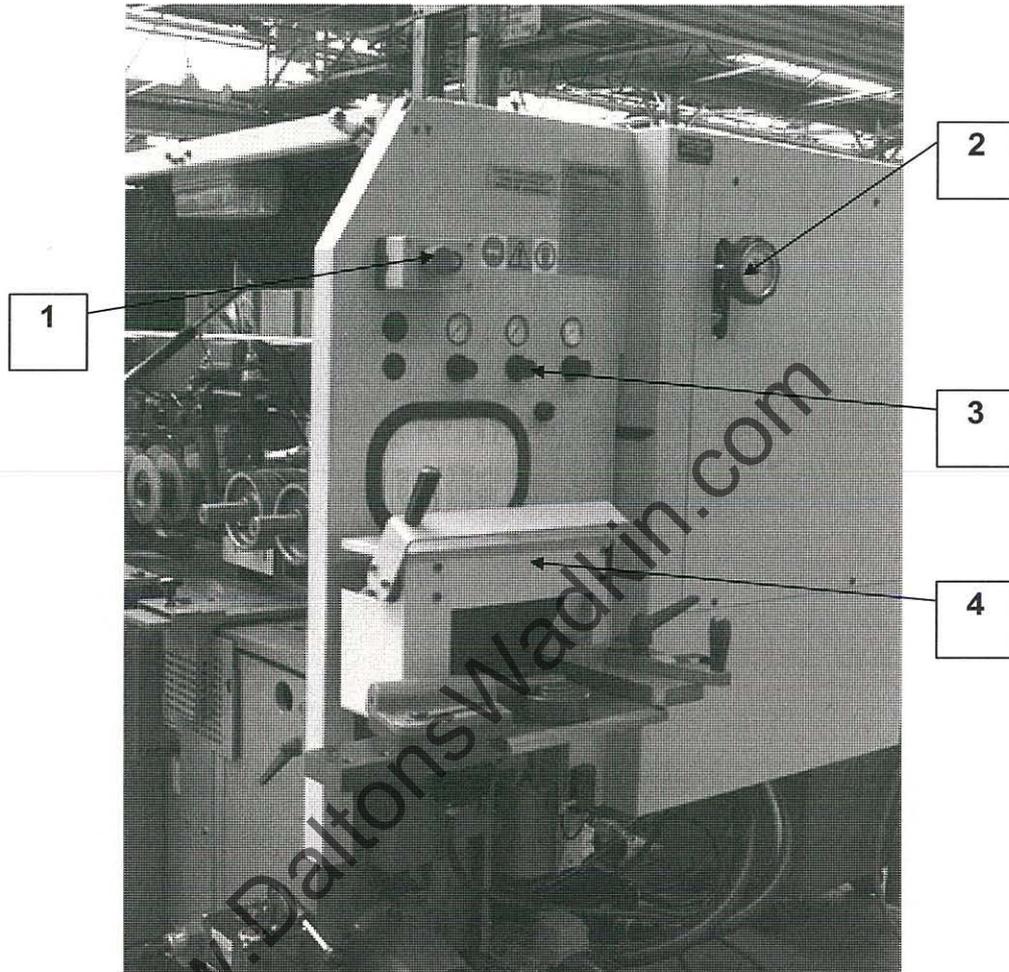


Figure 4.2.2

Emergency Stop (1)

Emergency stop button shuts down machine operation when depressed. Must be unlocked to reset.

Feed Speed (2)

Controls the speed of the feed through the machine. Must be adjusted only when the feed is operating.

Air Pressure Regulators/Gauges (3)

Set the feedroll pressures.

Splinter Catching Device (4)

Prevents splinters exiting the machine at the infeed.

4.2.3 Optional Equipment

Other optional equipment can be fitted to the machine. (When fitted, the options are described fully in the Additional Equipment Section of this manual).

Universal Head

Universal head device with start, stop buttons and direction of rotation switch.

Splitting Bedplate

Enables timber passing through the machine to be split into predetermined widths.

Infeed Nip Driven Roller System

This equipment enables improved feeding of wet timber and permits timber straightening to be undertaken.

Push Feed System

Provides additional positive feed of timber through top and bottom hydraulic feed rolls.

Grooved Bed

Processes short lengths of twisted timber.

Unit G

The unit G is a heavy duty splitting unit.

Intermediate Feed Roll

Used with short lengths of timber at the fence side head.

Pneumatic First Top Head Pad Pressure and Chipbreaker

Provides pneumatic control over pad pressure and chipbreaker movement.

5 SETTING-UP THE MACHINE

5.1 General

This Section describes the procedures to set-up a five-spindle Model GA machine for a planing operation.

Because the number and combination of features which can be built into the Model GA machine cover a wide variety, these procedures describe the setting-up of those features which appear on all types of Model GA machine. The differences between individual machines will be only in the number and combination of the features described.

Setting-up comprises setting tool spindles to basic positions relative to the table and the fence using a straight edge, and setting feed roll height.

To achieve a good product, the tool must be adjusted very accurately to the table or fence **behind** the tool.

The basic procedure for setting-up all cutting tools is as follows:

- 1 Place the straight edge on the table or against the fence **behind** the tool and hold in position.
- 2 Rotate the tool by hand in the opposite direction of the cut.
- 3 Adjust the position of the tool using the crank handle until **a cutting edge** of the tool touches the straight edge.

To eliminate spindle backlash, always move the bottom head and edge spindles in the direction of the workpiece to their final positions, but move the top head and feed rolls in an upward direction.

- 4 Secure the tool in position, and note the digital indicator display reading.

5.1.1 Preparation

Before beginning the setting-up procedure carry out the following checks:

- 1 Cutter blocks are securely fitted (see Section 5.1.2).
- 2 Adequate working space is provided and lighting is available.
- 3 Proper protective equipment (goggles, ear defenders, face mask, etc) is available and employed if required.

- 4 Area around the machine is clean and free of wood refuse.
- 5 Machine spindles and feed rolls are stationary and the machine is electrically isolated.

Equipment required:

- 1 Straight edge.
- 2 Standard tool kit.

5.1.2 Remove/Refit Cutter Block in Spindle (Figure 5.1.2)

WARNING:
ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

Notes:

All spindles have right-hand threads.

Do not strike any component; do not use a box or extension spanner.

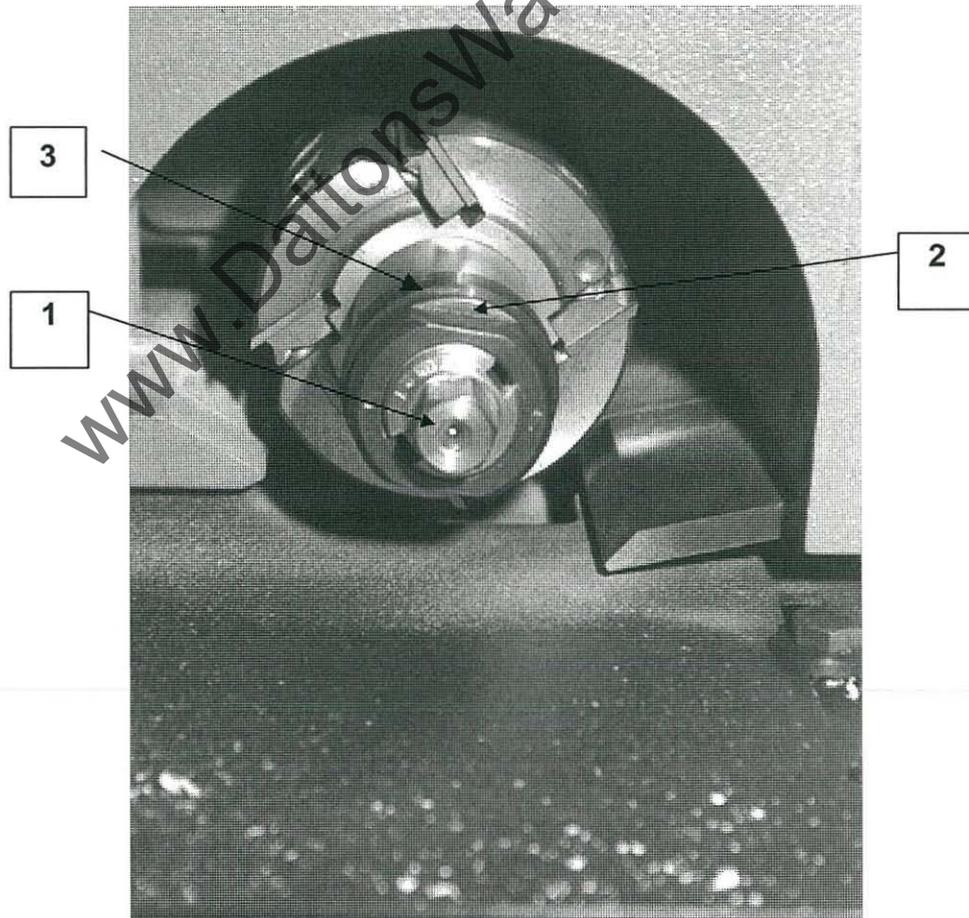


Figure 5.1.2

- 1 Open or remove any guards to permit easy access to the cutter block.
- 2 Using a combination spanner, unscrew the spindle nut from the spindle by locating the spanner on the hexagon (1) of the spindle and the two flat faces of the cutter block locknut (2), (unscrew counterclockwise).
- 3 Remove the locking collar (3).
- 4 Before refitting the cutter block, carefully clean the spindle and the cutter block.
- 5 Locate the cutter block on the spindle and the locking collar, and tighten the hexagon (clockwise) using a combination spanner.

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5.2 Setting First Bottom Head (Figure 5.2)

Setting the first bottom head involves a radial (vertical) and axial (horizontal) adjustment. It sets the cutter block level with the outfeed side bed of the head, the actual cut size being set by the infeed table adjustment (see a later procedure); it also sets the edge reference knives (when fitted).

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

Vertical Setting

- 1 Open or remove any guards to permit easy access and ensure that the bottom head outfeed side bed is clear.
- 2 Place the straight edge (1) on the outfeed side bed extending over the bottom head cutter block.
- 3 Release the spindle brake.
- 4 Release locking handle (2).
- 5 Turn the cutter block by hand counterclockwise and using the crank handle, adjust shaft (3) until a cutting edge of the cutter block **just touches** the straight edge. The final movement of the spindle should be **towards** the workpiece.
- 6 Lock handle (2).
- 7 Check that adjustment is correct **across whole width** of the cutter block.

Horizontal Setting

This adjustment is used only when the machine is employing an edge reference block.

- 8 Release spindle barrel clamp (4).
- 9 Place the straight edge (1) along the reference fence (5) extending over the bottom head cutter block.
- 10 Using the crank handle, adjust shaft (6) until the edge reference knives **just touch** the straight edge. The final movement of the spindle should be **towards** the workpiece.
- 11 Tighten barrel clamp (4).
- 12 Refit/replace guards.

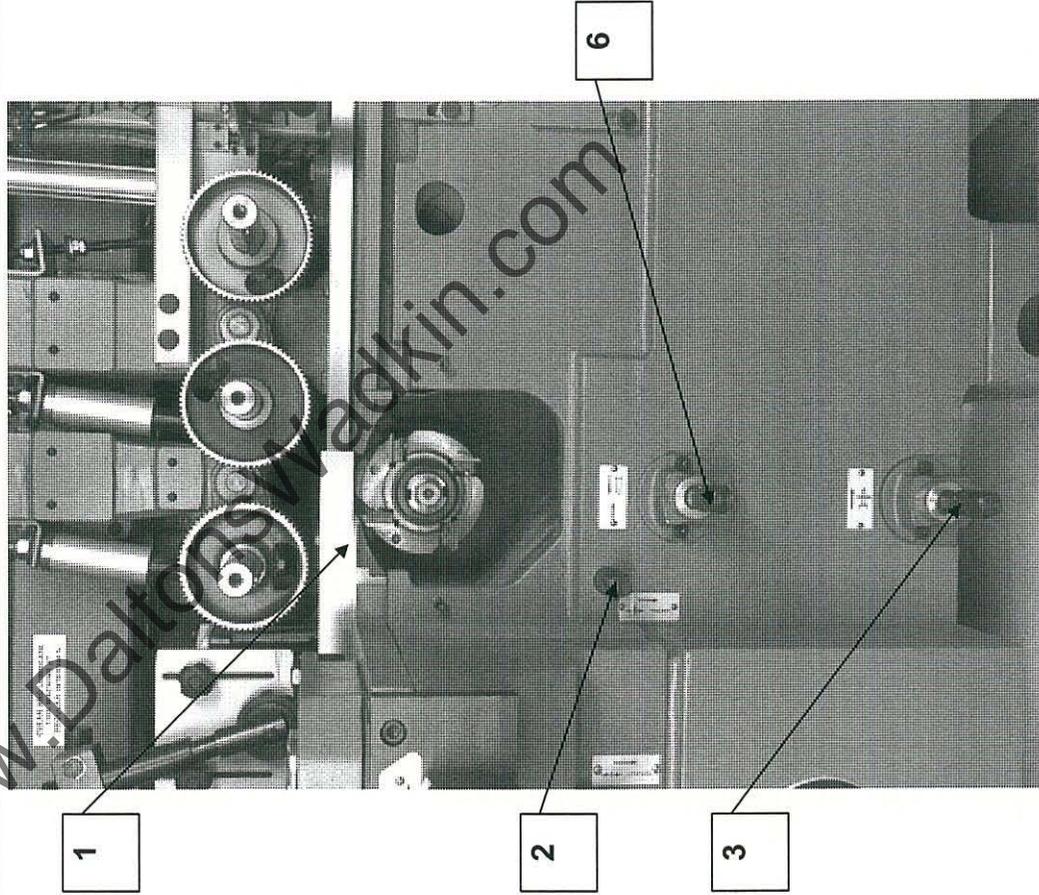
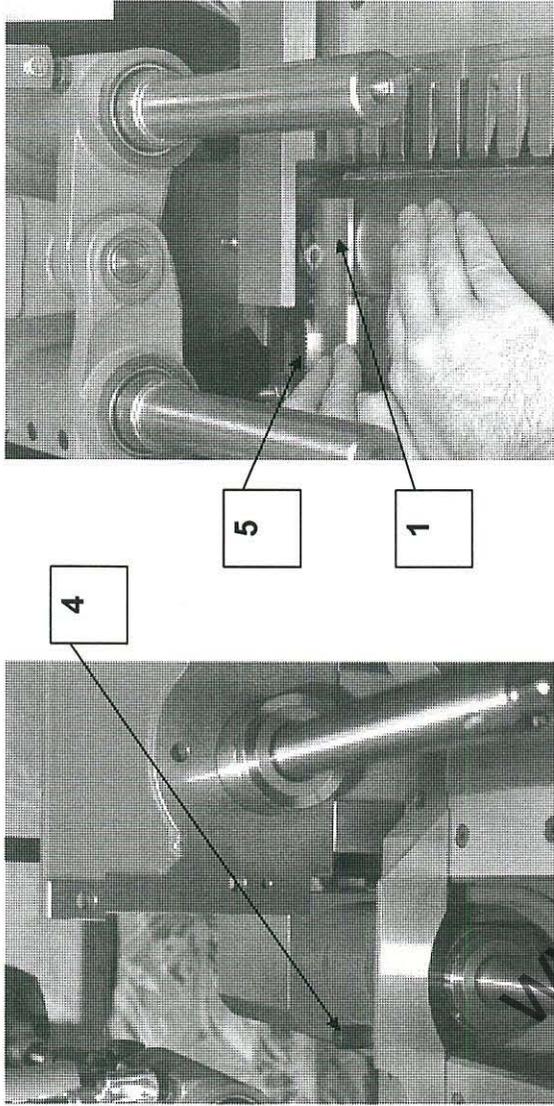


Figure 5.2

5.3 Setting Fence Side Head (Figure 5.3)

Setting the fence side head involves a radial (horizontal) and axial (vertical) adjustment. It sets the cutter block level with the outfeed side bed of the fence, the actual cut having been set by the infeed fence adjustment (see a later procedure). It also sets the depth of the cutter block below the bed.

WARNING:
ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

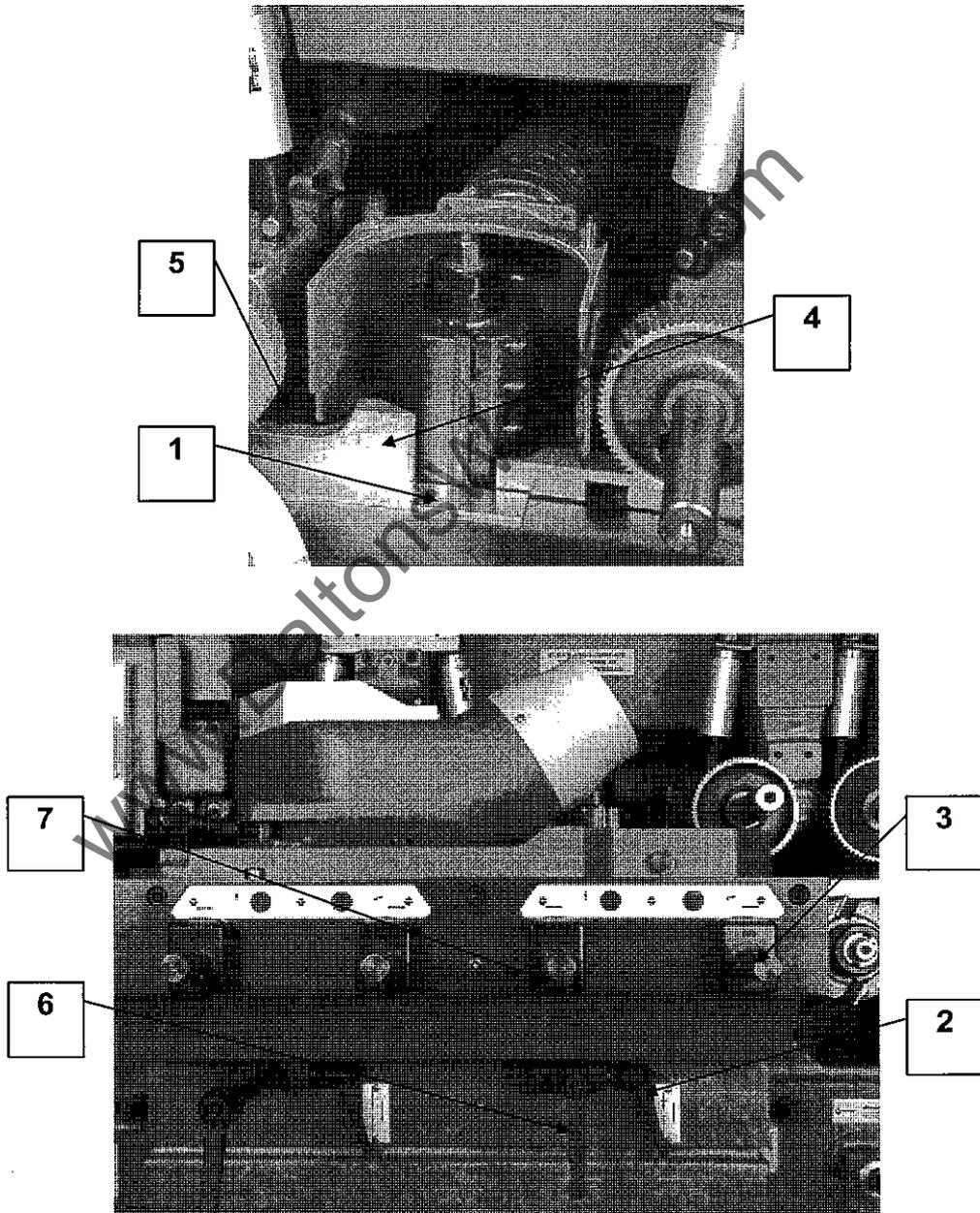


Figure 5.3

Horizontal Setting

- 1 Open or remove any guards to permit easy access and ensure that the fence side head outfeed bed is clear.
- 2 Place the straight edge (1) against the outfeed side fence extending over the fence side head cutter block.
- 3 Release the spindle brake.
- 4 Release locking handle (2).
- 5 Turn the cutter block by hand counter clockwise and using the crank handle adjust shaft (3) until a cutting edge of the cutter block **just touches** the straight edge. The final movement of the spindle should be **towards** the workpiece.

Clockwise rotation of the crank handle moves the cutter block away from the fence (giving a positive count on the digital indicator), counterclockwise rotation moves it towards the fence.

- 6 Lock handle (2).
- 7 Position outfeed fence nose piece (4) by slackening the two locking screws (5), located behind the fence and then locating the nose piece 3 to 5mm from the cutter block.
- 8 Retighten screws (5).

Vertical Setting

- 9 Establish depth of the cutter block below the bed, and note the reading on the digital indicator.
- 10 Release locking handle (2) and clamp (6).
- 11 Using the crank handle, adjust shaft (7) until the spindle flange is 5mm below the level of the bed. The final movement of the spindle should be **towards** the workpiece.

Clockwise rotation of the crank handle raises the cutter block (giving a negative count on the digital indicator), counterclockwise rotation lowers it.

Maximum achievable adjustment is 38mm vertically (axially).

- 12 Lock handle (2) and clamp (6).
- 13 Refit/replace guards.

5.4 Setting Near Side Head (Figure 5.4)

Setting the near side head involves a radial (horizontal) and axial (vertical) adjustment. It datums the cutter block to the width of the product and also sets the depth of the cutter block below the bed. This procedure also includes the setting of the near side head chipbreaker and the near side head pad pressure.

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

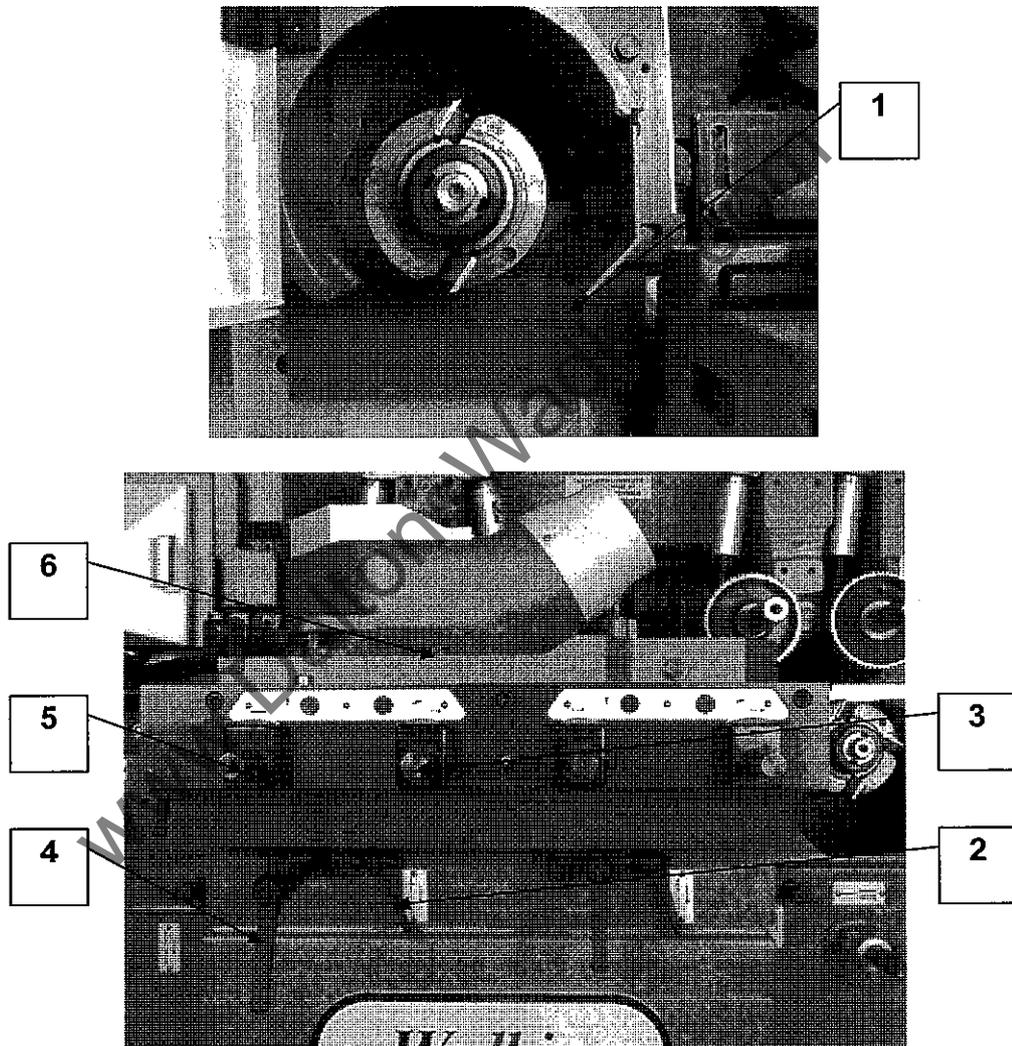


Figure 5.4

Horizontal Setting

- 1 Open or remove any guards to permit easy access and ensure that the near side head outfeed bed is clear.
- 2 Place a datum block (1) of known width between the near side head fence and the cutter block.

- 3 Release the spindle brake.
- 4 Release locking handle (2).
- 5 Turn the cutter block by hand counterclockwise and using the crank handle adjust shaft (3) until a cutting edge of the cutter block **just touches** the datum block. The final movement of the spindle should be **towards** the workpiece.

Clockwise rotation of the crank handle moves the cutter block towards the fence (giving a negative count on the digital indicator), counterclockwise rotation moves it away from the fence.

Adjustment with a 125mm diameter planing tool is 15mm to 220mm.

- 6 Check that the digital indicator indicates the width of the block. If not, slacken the grub screw in the indicator collar and rotate the **indicator collar only** until the reading corresponds to the datum block. Retighten the grub screw.
- 7 Lock handle (2).

Vertical Setting

- 8 Establish depth of the cutter block below the bed, and note the reading on the digital indicator.
- 9 Release locking handle (2) and clamp (4).
- 10 Using the crank handle, adjust shaft (5) until the spindle flange is 5mm below the level of the bed. The final movement of the spindle should be **towards** the workpiece.

Clockwise rotation of the crank handle raises the cutter block (giving a negative count on the digital indicator), counterclockwise rotation lowers it.

Maximum achievable adjustment is 38mm vertically (axially).

- 11 Lock handle (2) and clamp (4).

Chipbreaker and Pad Pressure Setting

- 12 Slacken bolts (6) and move the chipbreaker forward to touch the datum block. (This action also sets the position of the side head pad pressure guide).

Check that the side head pad pressure shoe, the knife tip and the front face of the chipbreaker shoe are all in line with the datum block.

Check that the tip of the pad pressure shoe is between 3 and 5mm from the tip of the cutter.

- 13 Tighten bolts (6).
- 14 Refit/replace guards.

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5.5 Setting First Top Head (Figure 5.5)

Setting the first top head involves a radial (vertical) and axial (horizontal) adjustment. It can also datum the cutter block to the height of the product.

The vertical adjustment is accomplished by powered and/or manual adjustment of rise and fall of the beam.

The setting procedure when an outboard bearing support is fitted is covered at the end of this Section.

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

Vertical Setting

- 1 Open or remove any guards to permit easy access and ensure that the first top head outfeed bed is clear.
- 2 Place a datum block (1) of known height on the bed beneath the top head.

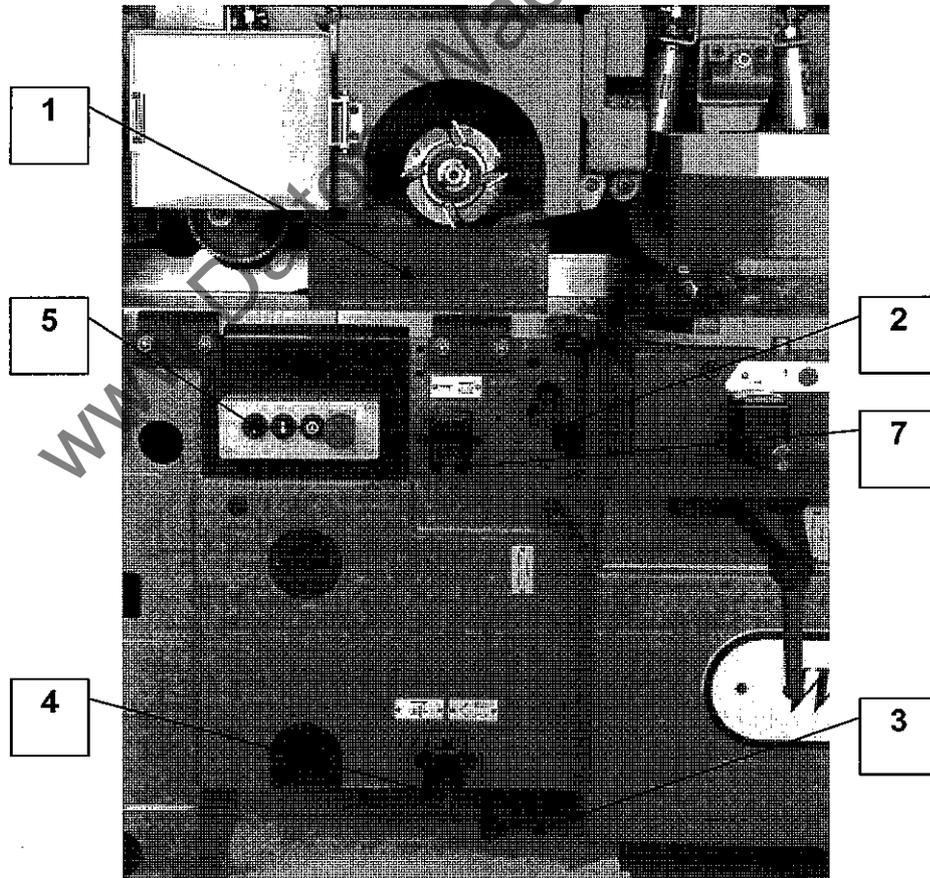


Figure 5.5

- 3 Reset the emergency stop.
- 4 Release the spindle brake.
- 5 Release locking handle (2).
- 6 Lower lever (3) and hold until automatic adjustment engages. (If engagement does not occur, adjust shaft (4) to right or left until engagement is achieved).
- 7 Press the raise/lower buttons (5) on the local control station to position the cutter block close to the datum block.
- 8 Lower lever (3) to disengage the automatic adjustment.

Note:

The proximity of the spindle to the datum block is dependent on the beam setting - Steps 9 to 12 achieve accurate setting.

- 9 Operate the emergency stop.
- 10 Turn the cutter block by hand counterclockwise and using the crank handle adjust shaft (4) until a cutting edge of the cutter block **just touches** the datum block. The final movement of the spindle should be **away from** the workpiece.

Clockwise rotation of the crank handle lowers the cutter block towards the block (giving a negative count on the digital indicator), counterclockwise rotation raises it.

- 11 Check that the digital indicator indicates the height of the block. If not, slacken the grub screw in the indicator collar and rotate the **indicator collar only** until the reading corresponds to the datum block. Retighten the grub screw.
- 12 Lock handle (2).

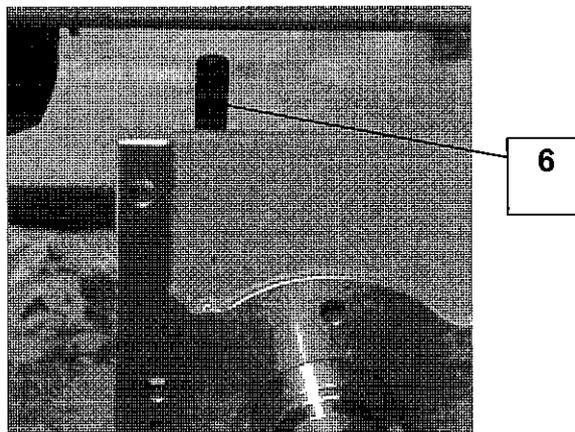


Figure 5.5

Horizontal Setting

- 13 Slacken locking bolt (6).
- 14 Using the crank handle, adjust shaft (7) until the spindle flange is 5mm behind the fence line. The final movement of the spindle should be **towards** the workpiece.
- 15 Tighten bolt (6).
- 16 Refit/replace guards.

Outboard Bearing

Where an outboard bearing support is fitted, the vertical setting procedure is modified as follows.

If hydraulic locks are used on the outboard bearing, then these must first be disengaged by operation of the 'clamp off' button on the main control panel.

Alternatively, if no hydraulic locks are fitted the outboard bearing lock must be released.

After adjustment, the hydraulic locks should be re-engaged by operation of the 'clamp on' button, or the outboard bearing must be locked.

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5.6 First Top Head Pad Pressure and Chipbreaker (Figure 5.6)

Depending upon the machine type, the chipbreaker may be of either of two types. The setting-up procedure is identical for both types. This procedure sets the pad pressure and chipbreaker to the base cutting circle of the first top head cutter block. The pneumatic option of chipbreaker is illustrated in Section 8).

WARNING:
ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

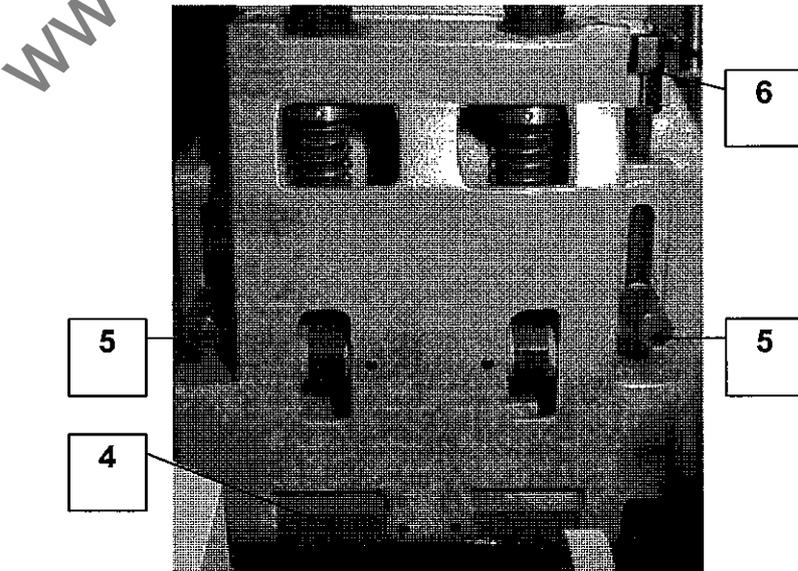
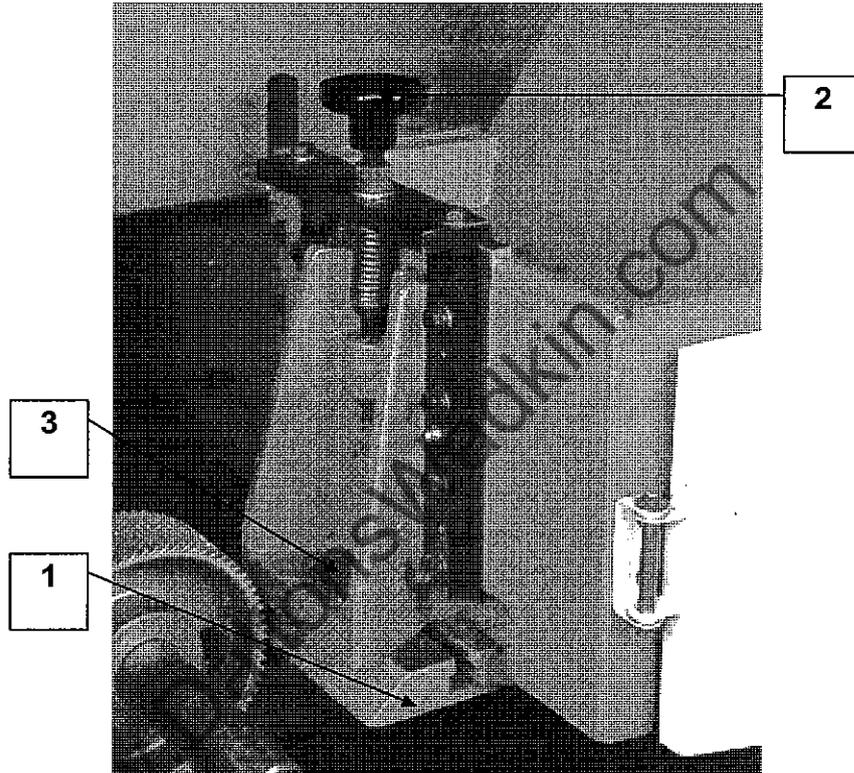


Figure 5.6

- 1 Open or remove any guards to permit easy access and ensure that the first top head outfeed bed is clear.
- 2 Ensure that the face of the pad (1) is clean and place a datum block across the bed extending from the pad across the cutter block to the chipbreaker (see Figure 5.5).
- 3 Rotate the handwheel (2) until the face of the pad just touches the datum block (Step 10 of Section 5.5).
- 4 Slacken locknut (3) and position the pad nose 5mm from the cutter block.
- 5 Position the pad laterally over the bed to suit the product width and tighten locknut (3). Ensure that the pad is in front of the fence line.
- 6 Check that the chipbreaker shoes (4) are compatible with the diameter of the cutter block. (Each top head is supplied with three different lengths of chipbreaker shoe to suit various diameters of cutter block. Each shoe is secured by two countersunk screws through the bottom face).

The shoe should be as close as possible to the maximum cutting circle while also allowing only safe chipbreaker operation.
- 7 Slacken locknuts (5) and turn the adjusting screw (6) until the bottom face of the chipbreaker is touching the datum block.
- 8 Tighten locknuts (5).
- 9 Remove the datum block.
- 10 Refit/replace guards.

5.7 Setting Second Bottom Head (Figure 5.7)

(When planing or moulding) the outfeed side bed of the second bottom head is shimmed to be nominally 0.5mm above bed normal level.

Setting the second bottom head sets the cutter block between these two bed levels.

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

Vertical Setting

- 1 Open or remove any guards to permit easy access and ensure that the bottom head outfeed side bed is clear.
- 2 Place the straight edge (1) on the outfeed side bed extending over the bottom head cutter block.
- 3 Release locking handle (2).
- 4 Release the spindle brake.

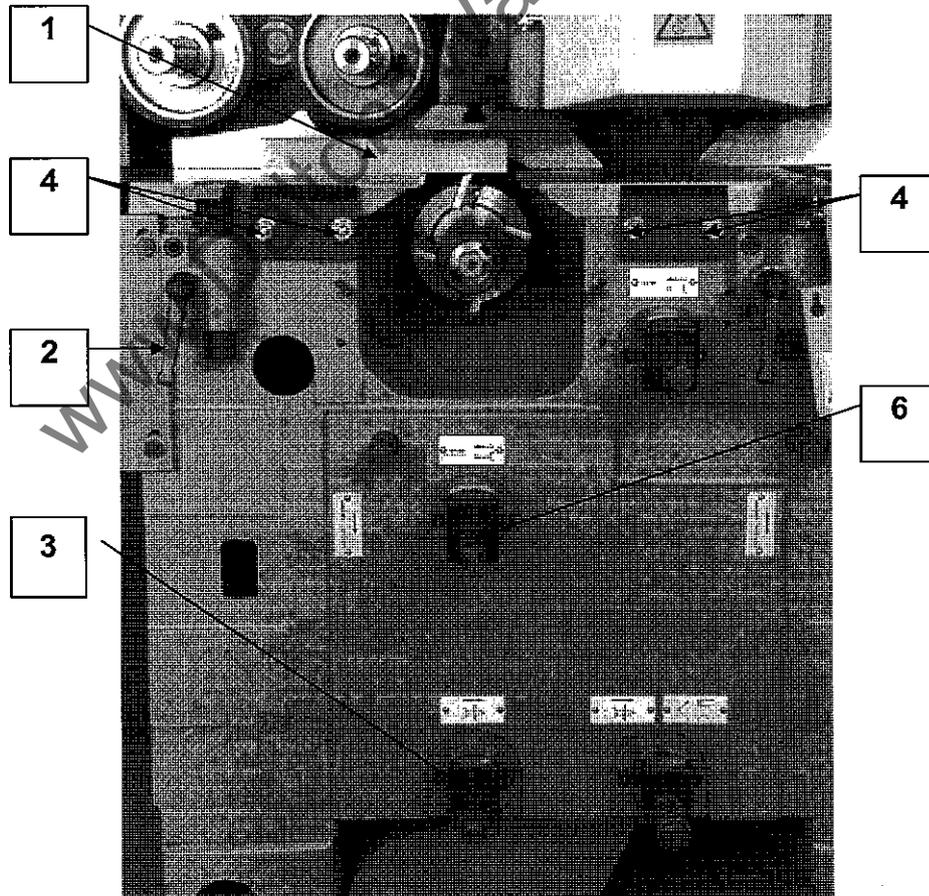


Figure 5.7

- 5 Turn the cutter block by hand counterclockwise and using the crank handle, adjust shaft (3) until a cutting edge of the cutter block **just touches** the straight edge. The final movement of the crank handle should be **towards** the workpiece.
- 6 Release bedplate clamps (4) and position the bedplate to be between 3 and 5mm of a cutting edge on the cutter block.
- 7 Retighten clamps (4).
- 8 Lock handle (2).
- 9 Check that adjustment is correct **across whole width** of the cutter block.

Horizontal Setting

- 10 Release spindle barrel clamp (5).

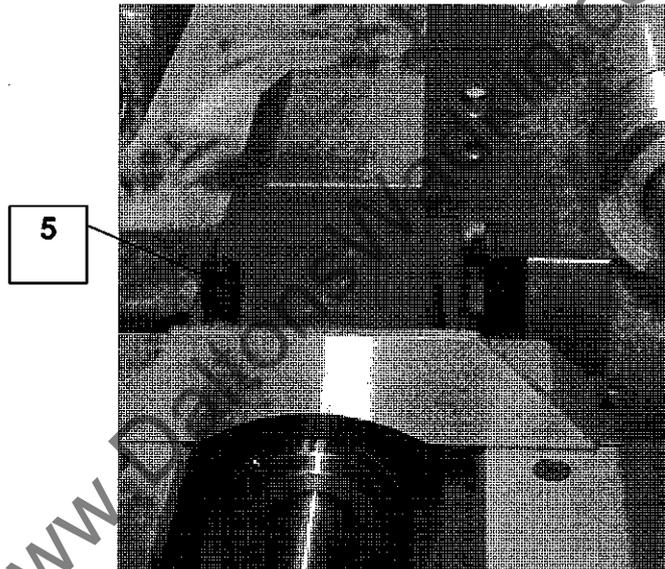


Figure 5.7

- 11 Using the crank handle, adjust shaft (6) until the spindle flange is 5mm behind the fence line. The final movement of the spindle should be **towards** the workpiece.
- 12 Tighten barrel clamp (5).
- 13 Refit/replace guards.
- 14 **Check that bedplate clamps (4) are tight and the bedplate is positioned as described in Step 6.**

5.8 Setting the Feed Rolls (Figures 5.8.1, 5.8.2 and 5.8.3)

The throughfeed, gearbox-driven top feed rolls are mounted on the beam and pressure is exerted via pneumatic cylinders (with additional manual adjustment on feed rolls after the top head). The feed rolls are either flange-mounted (near side head position) or shaft-mounted (bottom head, fence side head and top head positions).

Initial setting of the feed rolls is made through the beam control setting (beam 'raise/lower' buttons on the machine control panel). This setting should be the height of the finished product.

Maximum traction over the full width of the product is achieved by using spacers (flange-mounted feed rolls) and by positioning of rolls at points along the shaft (shaft-mounted feed rolls).

Feed rolls shall be fitted not less than 4mm from a fence.

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

Positioning Shaft-Mounted Feed Rolls (Figure 5.8.1)

- 1 Ensure that shaft is clean.
- 2 Slacken set screw (1).
- 3 Position feed roll(s) to suit product width.
- 4 Tighten set screw (1).

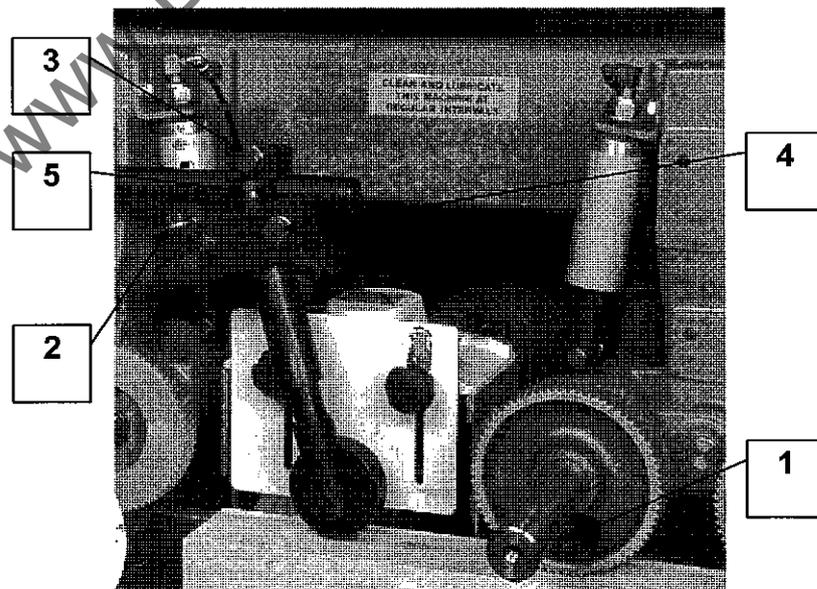


Figure 5.8.1

Positioning Flange-Mounted Feed Rolls (Figure 5.8.2)

- 1 Slacken the draw bolt (1), remove the 'C' washer (2) and withdraw the bolt.
- 2 Load spacers and feed rolls over the draw bolt engaging drive pins of spacers and feed rolls into opposite holes.

The combination of feed rolls and spacers will depend upon the product width.
- 3 Hold the assembly against the drive flange and screw in draw bolt until close to the face of the end feed roll.
- 4 Slot the 'C' washer (2) over the draw bolt (1) and tighten the draw bolt.

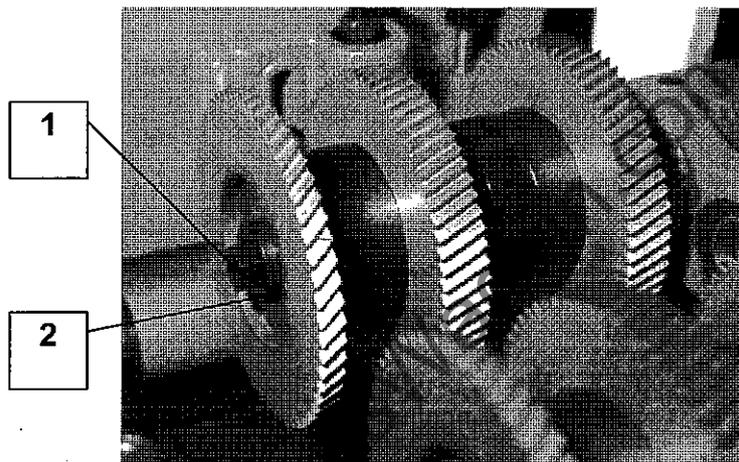


Figure 5.8.2

Setting Feed Rolls after the Top Head (Figure 5.8.3)

This procedure is undertaken **after the beam control setting**, and the setting should be approximately 3mm less than the finished product height.

- 1 Slacken nut (1).
- 2 Rotate handwheel (2) to adjust the height of the feed roll from the bed to approximately 3mm less than the height of the finished product.
- 3 Tighten nut (1).
- 4 Check height of the feed roll from the bed and reset if necessary.

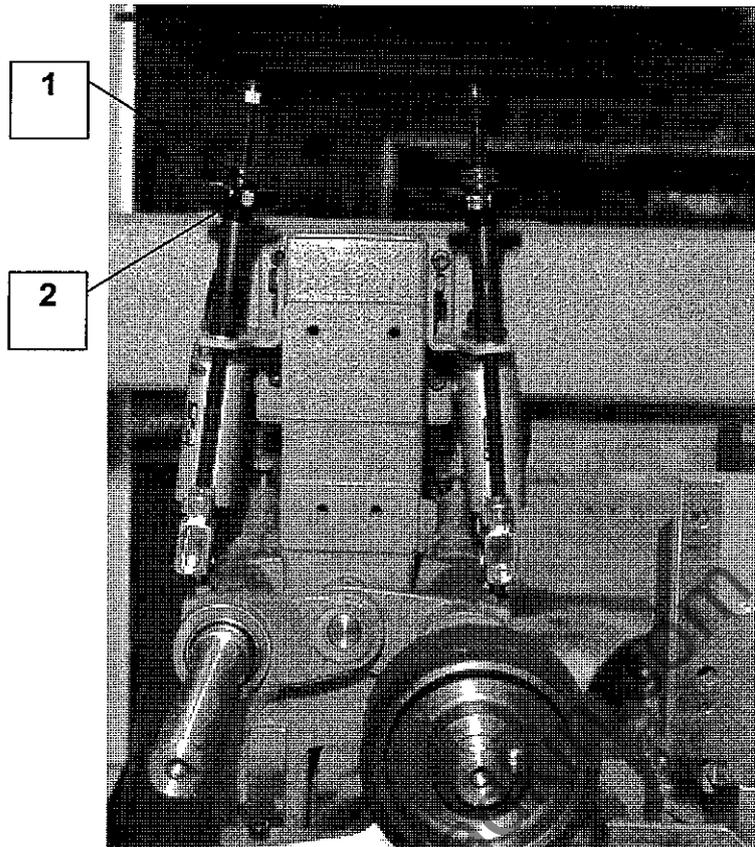


Figure 5.8.3

Setting Top Roller Pressure (Figure 5.8.1)

This procedure is undertaken **after the beam control setting**, using, if possible, a piece of timber the same thickness of the finished product.

- 1 Place the timber beneath the top roller assembly.
- 2 Slacken bolt (2) and position the roller as close as possible to the cutter block
- 3 Slacken bolt (3) and move the roller laterally to be central to the cutter block.
- 4 Slacken bolt (4) and lower the roller until it touches the timber.
- 5 Rotate screw (5) to increase or decrease pressure on the roller.
- 6 Tighten bolts (2), (3) and (4).

5.9 Infeed Table and Fence Adjustment (Figure 5.9)

The height of the infeed table determines the cut to the first bottom head. There is a maximum adjustment of 10mm. When the adjustment is zero, the infeed table is level with the table after the first bottom head.

Infeed fence adjustment determines the cut at the first fence side edge. There is a maximum adjustment of 10mm.

Note:

There are two types of infeed table, the straightening table and the short infeed table. Each type has a dedicated adjustment procedure.

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

Straightening Infeed Table Adjustment

- 1 Rotate knurled handle (1) counterclockwise to release locking mechanism.
- 2 Position handle until the indicator (2) reads the required cut depth.
- 3 Rotate handle (1) clockwise to lock the table.

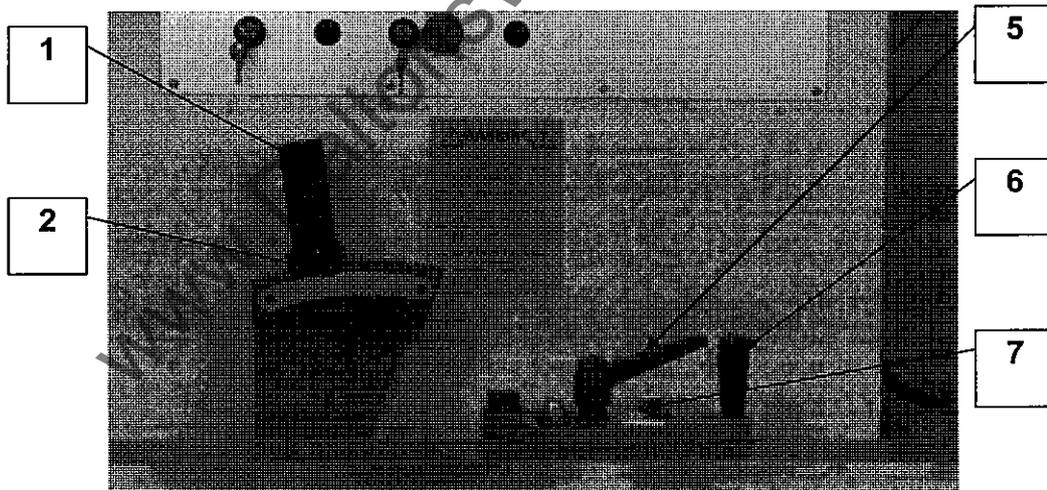


Figure 5.9

Short Infeed Table Adjustment

- 1 Release locking handle (3).
- 2 Turn the captive spanner (4) clockwise/counterclockwise until the scale reads the required cut depth. (The scale is mounted on the underside of the infeed table).
- 3 Lock handle (3).

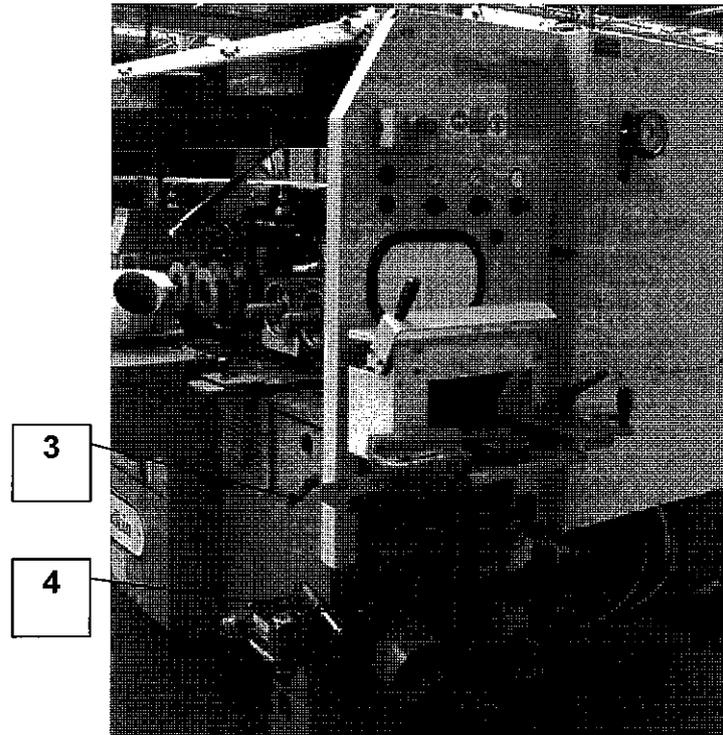


Figure 5.9

Infeed Fence Adjustment

Note:

This adjustment procedure is the same for both types of infeed table.

- 1 Rotate handle (5) counterclockwise to release locking mechanism.
- 2 Using handle (6) adjust the infeed fence until the scale (7) reads the required measurement.
- 3 Rotate handle (5) clockwise to lock the infeed fence.

6 OPERATION

6.1 General

This Section gives a typical operating sequence for a Model GA machine using the controls described in Section 4 and the basic set-up procedures described in Section 5.

It should be noted that the sequence is typical only - the use of machine controls in conjunction with the setting-up procedures vary depending upon the features of the machine and also the process it is to undertake.

Users are expected to establish operating procedures which comply with local requirements and practices.

6.1.1 Pre-operation Checks

Undertake all the pre-operation checks detailed in Section 4.1.1.

6.1.2 Setting Controls and Adjustments

- 1 Close the electrical supply isolator and connect the pneumatic air supply at the electrical control cubicle.
- 2 Power-up the machine at the main control panel.
- 3 Position the near side head, chipbreaker and pad pressure to the width of the finished product (see Section 5.4).
- 4 Set the first top head to the height of the finished product (see Section 5.5).
- 5 Lower the beam to the height of the finished product (see Section 5.8).

Before continuing, check all guards and check that the dust extraction system is switched on and working properly.

- 6 With the spindle brakes released, carefully rotate all cutter blocks by hand to ensure free rotation.
- 7 With the enclosure door open, turn the 'enclosure override' keyswitch to door open, and the 'inch feed' keyswitch to forward.
- 8 Start all spindles.

During the set-up procedure the main feed is inoperative; only the inch control forward is enabled allowing the workpiece to move forward a short distance at a time, each movement requiring a pressure on the button.

- 9 Using the 'inch forward' control pass a 'test piece' timber through the machine and check the dimensions for specification and the quality of finish.

Inspection of the timber should be carried out at each position and at this point, if necessary, adjustments of cut, pressure, etc. should be undertaken.

WARNING:

ALWAYS ELECTRICALLY ISOLATE THE MACHINE BEFORE EACH AND EVERY ADJUSTMENT DURING A 'TEST PIECE' PROCEDURE.

- 10 Repeat Step 9 until the 'test piece' timber meets all dimensional and quality requirements.
- 11 Set the machine to operate in production mode by setting the 'enclosure override' keyswitch to door closed, starting main feed and setting feed speed to between 10 and 12m/min.

The machine is now ready for production operation.

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7 MAINTENANCE

7.1 General

This Section covers scheduled and unscheduled maintenance of the machine, and also covers some basic fault-finding procedures.

Scheduled maintenance comprises the maintenance necessary, at regular intervals, to maintain the machine in good working order.

Unscheduled maintenance is that work necessary to replace or repair worn, unserviceable or damaged components.

Scheduled maintenance can normally be undertaken by a competent, but not necessarily specialised person (operator); unscheduled maintenance must be undertaken by an engineer experienced on this type of equipment and equipped with special tools.

7.2 Scheduled Maintenance

The following schedule, when undertaken, should be recorded in a maintenance log.

Equipment required:

- 1 Compressed air gun.
- 2 Standard tool kit.
- 3 Lubricants as detailed.
- 4 Grease gun.
- 5 Oil hand pump.
- 6 Replacement parts as necessary.

7.2.1 Daily

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY AND PNEUMATICALLY ISOLATED BEFORE UNDERTAKING ANY OF THE FOLLOWING TASKS.

- 1 Clean the machine using a compressed air gun taking care not to direct the air jet directly on to spindles, shafts, bearing housings, etc.

Clean the spindles and cutter block collars and lightly lubricate with hydraulic oil (see the lubrication chart at the end of this Section for oil types).

- 2 If a manual machine bed lubricating system is installed, operate the pump lever to lubricate the bed as is necessary. (The pump is located at the right-hand end, lower front of the machine).

Note:

The amount of lubrication and the frequency of application depends upon the type of wood being processed and speed of throughput. This requirement is based on experience and could well be necessary a number of times a day. A tap is fitted to the oil pump to preset the flow rate.

When it is necessary to replenish the oil reservoir use hydraulic oil.

- 3 Carry out a visual check of the machine and the surrounding area to check for any obvious signs of damage, wear, etc., and to ensure safe working conditions exist.

7.2.2 Monthly

- 1 If machine is fitted with centralised lubrication:

Apply hydraulic oil using a hand pump via the lubrication points on the front of the machine (see the lubrication chart at the end of this Section for oil types).

- 2 If the machine is manually lubricated:

Grease the machine slideways and handscrew mechanisms with lithium grease using a grease gun via the grease nipples on the front and at the rear of the machine (see the lubrication chart at the end of this Section for grease types).

- 3 Grease the feed roll drive shafts and pressure pads via the associated grease nipples using lithium grease.

7.2.3 Three-Monthly

- 1 Remove covers from all spindle drive belts (top, bottom, fence and side heads) and check the belt tension. (If re-tensioning is necessary, refer to Section 7.3).
- 2 Check the main/infeed/outfeed toothed drive belts for wear or cracking. (If replacement is necessary, refer to Section 7.3).
- 3 Remove the cowls from the electric drive motors and clean the motor fans; check for signs of overheating or excessive end-float of the motors.

7.3 Unscheduled Maintenance

Unscheduled maintenance is that work necessary to replace or repair worn, unserviceable or damaged components.

Generally, following any procedure covered in this Section, a set-up procedure will need to be undertaken (see Section 5) before the machine is put into service.

This Section covers checks and replacement procedures in isolation. There will be times, depending upon the work to be undertaken, where many of these procedures will be carried out sequentially.

Equipment required:

- 1 Standard tool kit.
- 2 Hexagonal key.
- 3 Replacement parts as necessary.

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY AND PNEUMATICALLY ISOLATED BEFORE UNDERTAKING ANY OF THE FOLLOWING TASKS.

ENSURE THAT PROPER PROTECTIVE CLOTHING IS USED THROUGHOUT THESE TASKS.

7.3.1 Re-tension Top/Bottom Head Drive Belt (Figure 7.3.1)

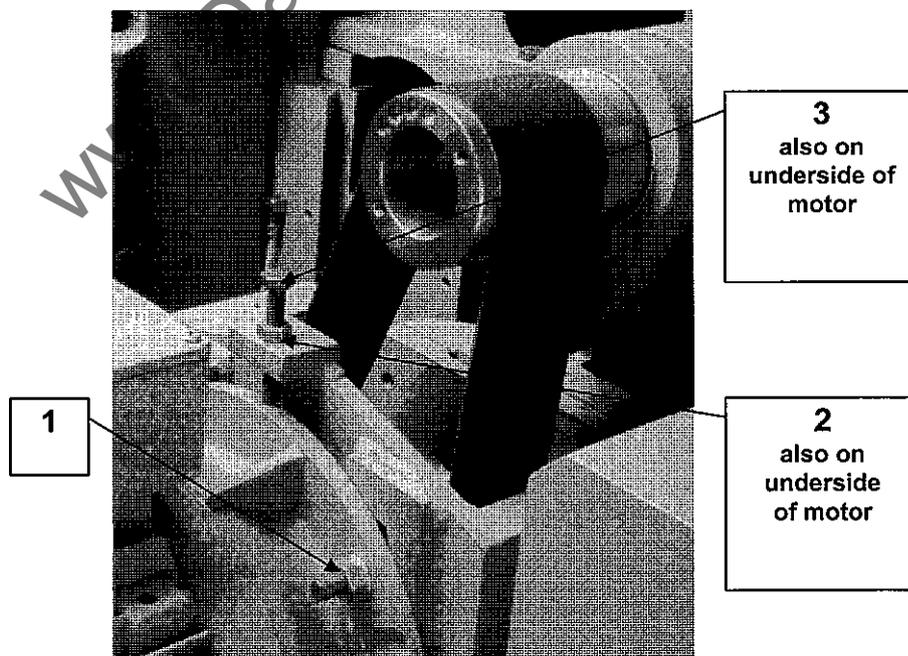


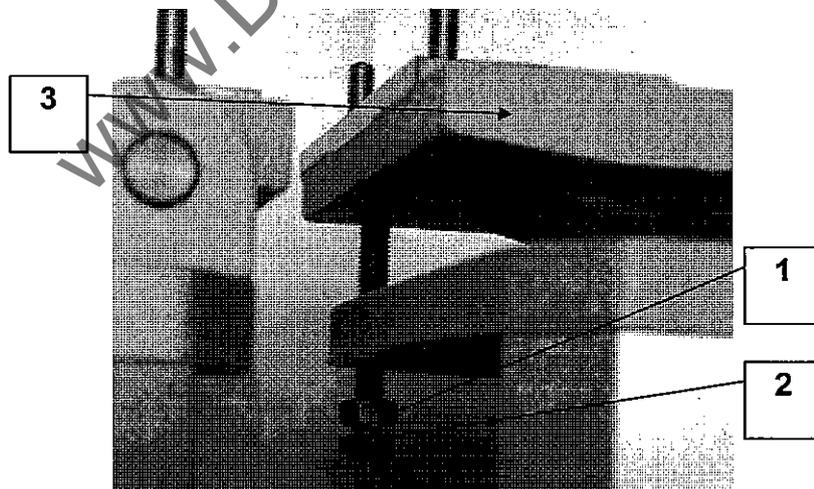
Figure 7.3.1

- 1 Slacken the four plate nuts (1).
- 2 Slacken the two top and bottom locking nuts (2).
- 3 Slacken the bottom adjusting bolt until it is at least 10mm clear of the motor rim.
- 4 Screw top lock nut (2) up 10mm from the mounting bracket. Screw down top bolt (3) until top nut (2) contacts the mounting bracket. (This applies the required tension on the belt).
- 5 Screw in the bottom bolt until it touches the motor rim. Tighten bottom nut (2).
- 6 Tighten top nut (2).
- 7 Tighten the four nuts (1).

When slackening the drive belt, reverse Steps 3) and 4).

7.3.2 Re-tension Fence/Side Head Drive Belt (Figure 7.3.2)

- 1 Slacken locking nut (1).
- 2 Screw adjusting bolt (2) counterclockwise until pressure is removed from pivot plate (3).
- 3 Screw nut (1) 10mm away from the mounting bracket. Screw in bolt (2) until nut (1) contacts the mounting bracket. (This applies the required tension on the belt).
- 4 Tighten nut (1).



(Shown with motor removed)

Figure 7.3.2

7.3.3 Replace Top/Bottom Head Drive Belt (Figure 7.3.1)

- 1 Slacken the four plate nuts (1).
- 2 Slacken the two top and bottom locking nuts (2).
- 3 Slacken and screw out top bolt (3) until it is clear of the motor rim.
- 4 Screw in the bottom bolt to raise the motor so slackening the drive belt.
- 5 Remove the belt and replace with a suitable belt.
- 6 Tension the belt as described in Section 7.3.1.

7.3.4 Replace Fence/Side Head Drive Belt (Figure 7.3.2)

- 1 Slacken locking nut (1).
- 2 Screw adjusting bolt (2) counterclockwise until pressure is removed from pivot plate (3) and tension is removed from the drive belt.
- 3 Remove the belt and replace with a suitable belt.
- 4 Tighten nut (1).
- 5 Tension the belt as described in Section 7.3.2.

7.3.5 Replace Outfeed Bottom Drive Belt on Machine fitted with Straightening Infeed Table (Figure 7.3.5)

- 1 Remove the belt cover (1).
- 2 Remove the two grub screws (2) using an hexagonal key.
- 3 Insert one of the grub screws into jacking hole (3).
- 4 Screw in the grub screw until bush (4) is loosened.
- 5 Remove the bush from the shaft and remove the pulley (5); remove grub screw (2) from the jacking hole (3).
- 6 Remove the belt and replace with a suitable belt.
- 7 Position the pulley (5) over the drive shaft.
- 8 Insert bush (4) into the shaft ensuring that the screw holes are aligned correctly.

Using a straight edge check that both pulleys are vertically aligned.

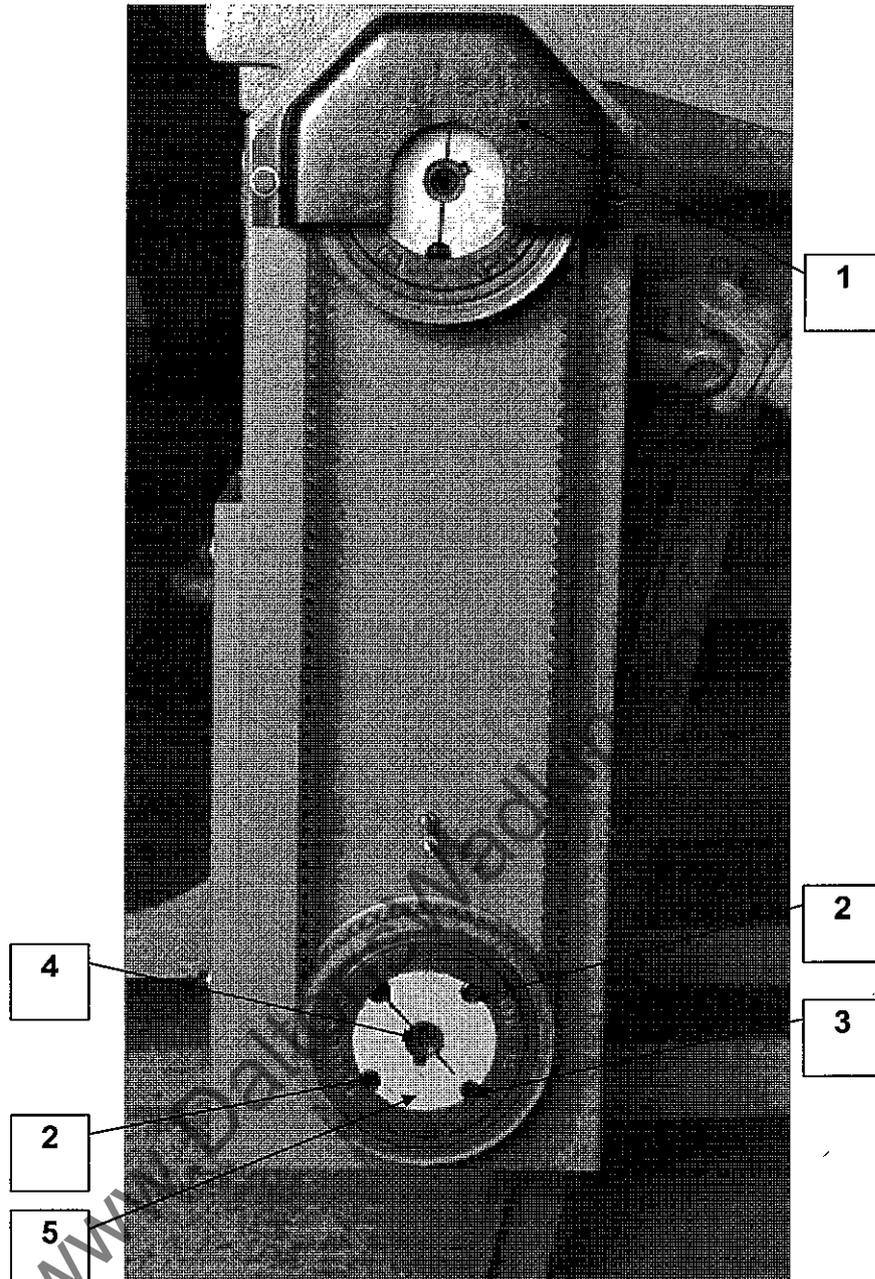


Figure 7.3.5

- 9 Insert grub screws (2) into the pulley hub and tighten fully.

Notes:

When replacement of other drive belts is necessary, ie main feed drive belt, infeed drive belt and outfeed drive belt (machine with short infeed table), it is recommended that Wadkin is contacted owing to the complexity of the work to be undertaken.

For supply and information of all drive belts, contact Wadkin Service Department.

7.3.6 Replace Shaft-Mounted Top Feed Roll (Figure 7.3.6)

- 1 Slacken set screw (1).
- 2 Ensure that the shaft is clean and withdraw the feed roll.
- 3 Replace the feed roll ensuring that the shaft key is correctly located.
- 4 Position the feed roll to suit the product width and tighten set screw (1).

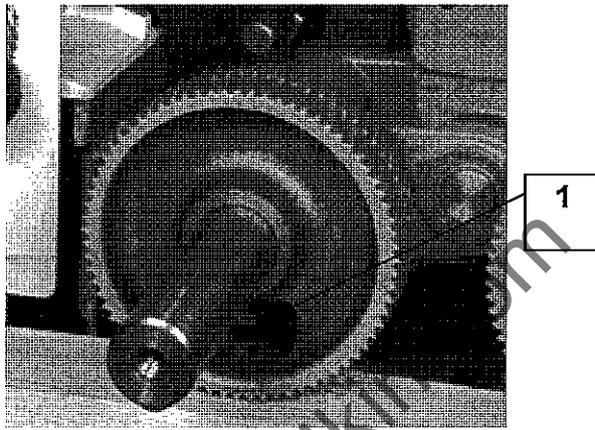


Figure 7.3.6

7.3.7 Replace Flange-Mounted Top Feed Rolls/Spacers (Figure 7.3.7)

- 1 Slacken the draw bolt (1), remove the 'C' washer (2) and withdraw the bolt.
- 2 Dismantle spacers and feed rolls from the draw bolt.

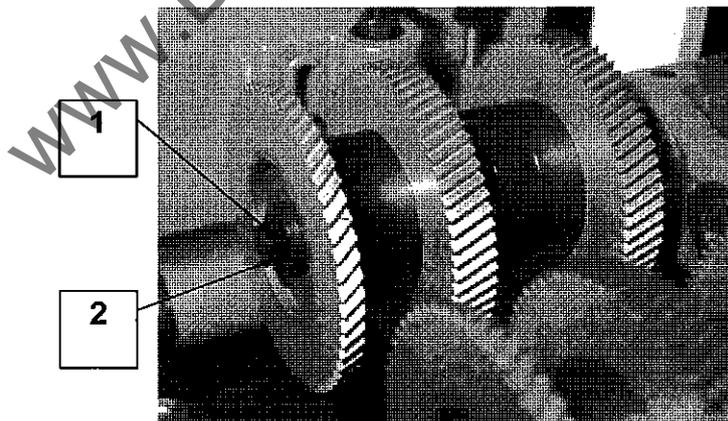


Figure 7.3.7

- 3 Fit new spacers and feed rolls over the draw bolt engaging drive pins of spacers and feed rolls into opposite holes.

The combination of feed rolls and spacers will depend upon the product width.

- 4 Hold the assembly against the drive flange and screw in draw bolt until close to the face of the end feed roll.
- 5 Slot the 'C' washer (2) over the draw bolt (1) and tighten the draw bolt.

7.3.8 Replace Bottom/Top Head Spindle (Figure 7.3.8)

- 1 Remove the cutter block from the spindle (see Section 5.1.2).
- 2 Using the appropriate crank handle, adjust the shaft until the digital indicator reads zero (see Figures 5.2, 5.5 or 5.7 depending upon the head spindle being replaced). At this position, the spindle shoulder and the reference fence should be in line.
- 3 Remove the drive belt (see Section 7.3.3).
- 4 Slacken the spindle barrel clamp (1). Insert a wedge into the clamp housing (2) to help release of the spindle.
- 5 Slacken the axial adjustment clamp ring (at the rear of the spindle) and insert a wedge into the split.

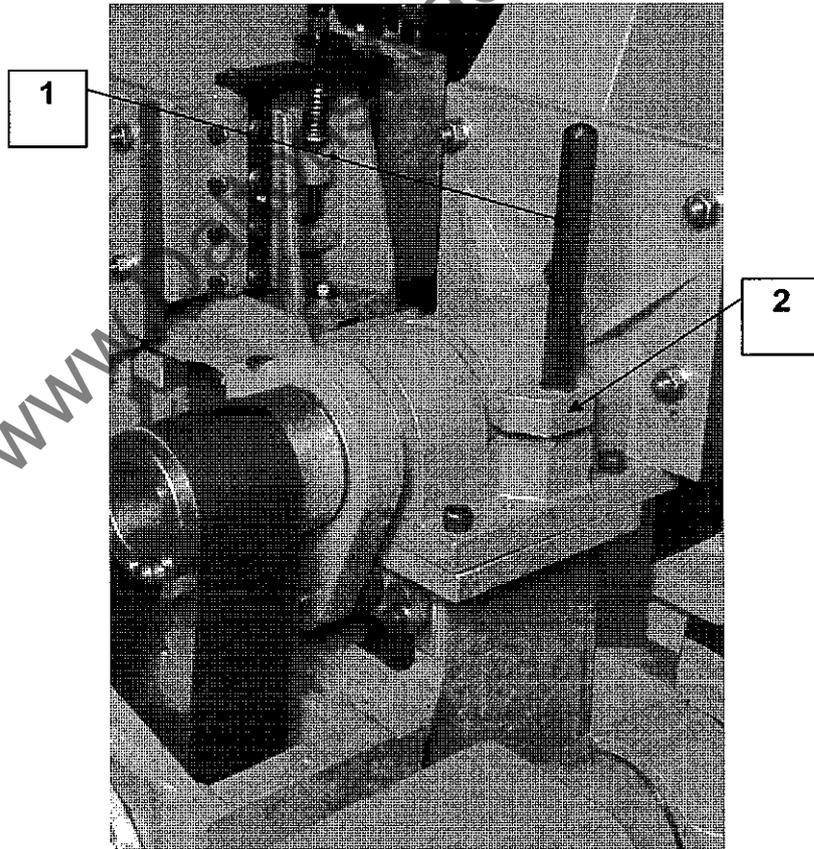


Figure 7.3.8

- 6 Withdraw the spindle rearwards from its housing and place in a clean area.
- 7 Before fitting a new or refurbished spindle ensure that the spindle and clamp housings are clean.
- 8 Smear the inside face of the spindle bore with hydraulic oil, and before inserting the spindle, spray the barrel with a graphite grease. (see the lubrication chart at the end of this Section for oil/grease types).
- 9 Locate the spindle so that the shoulder of the spindle and the reference fence are in line.
- 10 Remove the wedges from the clamp housing (2) and the axial adjustment clamp ring and tighten spindle barrel clamp (1) and the axial clamp.
- 11 Ensure that the spindle rotates freely.
- 12 Fit the drive belt (see Section 7.3.3) and tension (see Section 7.3.1).
- 13 Fit the cutter block (see Section 5.1.2).

7.3.9 Replace Fence/Near Side Head Spindle (Figure 7.3.9)

- 1 Reinstall the electrical and air supplies to the machine, and raise the beam to its fullest extent.
- 2 Isolate the electrical and air supplies before progressing further.
- 3 Remove the cutter block from the spindle (see Section 5.1.2).
- 4 Using the appropriate crank handle, adjust the shaft until the digital indicator reads zero (see Figures 5.3. or 5.4. depending upon the head spindle being replaced). At this position, the spindle shoulder and the bed should be level.
- 5 Remove the drive belt (see Section 7.3.4).

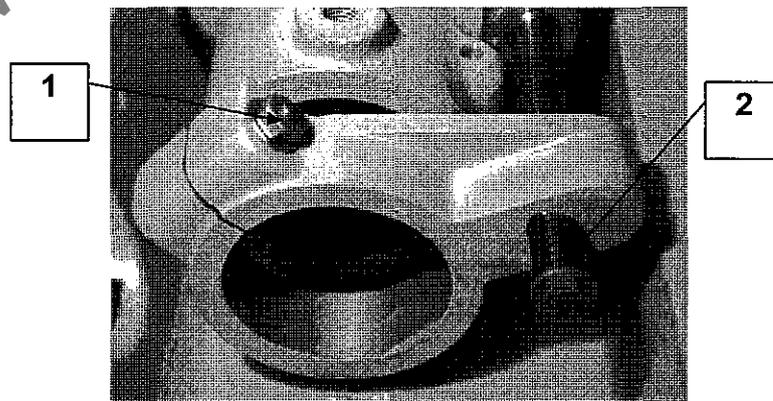


Figure 7.3.9

WARNING:**BEFORE PROCEEDING ENSURE THAT THE SPINDLE BARREL CLAMP IS LOCKED.**

- 6 Using the appropriate crank handle, adjust the shaft to position the spindle as far forward as possible (towards operator) to allow maximum clearance of spindle from beam on removal.
- 7 Provide support for the spindle from below (with blocking).
- 8 Slacken screw (1). (Approached from the rear of the machine). Insert a wedge into the clamp housing to help release of the spindle.
- 9 Slacken spindle barrel clamp (2).
- 10 Withdraw the spindle upwards from its housing and place in a clean area.
- 11 Before fitting a new or refurbished spindle ensure that the spindle and clamp housings are clean.
- 12 Smear the inside face of the spindle bore with hydraulic oil, and before inserting the spindle, spray the barrel with a graphite grease. (see the lubrication chart at the end of this Section for oil/grease types).
- 13 Lower and locate the spindle so that the shoulder of the spindle is level with the bed.
- 14 Remove the wedge and tighten spindle barrel clamp (2) and screw (1)
- 15 Ensure that the spindle rotates freely.
- 16 Fit the drive belt (see Section 7.3.4) and tension (see Section 7.3.2).
- 17 Fit the cutter block (see Section 5.1.2).

7.4 Fault Finding

7.4.1 General

Many of the faults occurring on woodworking machinery, apart from those caused by electrical or major mechanical failure, can be attributed to incorrect setting-up of the machine. Badly-tensioned drive belts, incorrectly set cutter blocks and loose components are frequent causes of irritating, often minor, faults.

When a fault occurs, unless the cause is because of a major mechanical or electrical failure or an operator error, it is recommended that the machine set-up is reviewed before any other investigative work is undertaken.

7.4.2 Workpiece Faults

Listed below are problems identified on the product after processing, with an indication of the diagnosis and remedy.

FAULT - Blips at leading end of underside of product

Diagnosis/Remedy

Cutter block set too low in relation to bedplate - Adjust cutter block.

FAULT - Blips on trailing end of underside of product

Diagnosis/Remedy

Cutter block set too high in relation to bedplate - Adjust cutter block.

FAULT - Trailing end of product top face shows blips

Diagnosis/Remedy

Pad and roller pressures are set incorrectly - Adjust pressures.

FAULT - Out of square product

Diagnosis/Remedy

Cutter block cutters not set parallel to bedplate or badly ground - Inspect/adjust cutter block.

FAULT - Burn marks on product

Diagnosis/Remedy

Cutter block cutters blunt - Inspect/regrind.
Timber stationary in machine - Remove timber.

7.4.3 Machine Faults

Detailed below is a number of fault conditions with associated diagnoses and the recommended remedial action. The diagnoses should be considered only advisory; a proper determination of any fault is more likely to be ascertained by the competent engineer called to rectify the problem.

Note that obvious operator errors (switches not closed, enclosure open, etc.) are not listed in the diagnoses below.

FAULT- None of the spindle drives nor the feed drive operates when the Start buttons are pressed

Diagnosis/Remedy

Circuit breaker out - Reset circuit breaker.

Main fuse or control fuse blown - Check fuses and replace.

If either fault re-occurs, investigate for cause on the machine.

FAULT - A spindle motor or feed motor does not start

Diagnosis/Remedy

Circuit breaker out - Reset circuit breaker.

Motor fuse blown - Check fuse and replace.

Motor contactor failed - Check contactor for pitted contacts or mechanical failure.

Open circuit in motor line leads - Check circuit and correct.

If fuse or circuit breaker fault re-occurs, investigate for cause on the motor.

FAULT - Motor contactor makes noise on closing

Diagnosis/Remedy

Supply voltage too low - Check supply voltage with meter.

Contactor contacts pitted or dirty - Clean or replace contacts.

FAULT - After a motor has started, circuit breaker trips or a motor fuse blows

Diagnosis/Remedy

Motor/spindle seized on bearings - Check and replace.

Failure in circuit to motor (line lead earthed or short circuit) - Check with resistance and continuity meter.

FAULT - Motor overheats while running unloaded

Diagnosis/Remedy

Supply voltage too high - Check supply voltage with meter.

Motor windings incorrectly connected - Check for correct starting/running connections.

Motor air ducts blocked impeding flow of cooling air - Clear ducts.

FAULT - Motor overheats while running loaded

Diagnosis/Remedy

Establish if mechanical problem - Check spindle for seizure/incorrect setting.

Single phase operation in motor line leads - Check circuit and correct.

FAULT - Motor noisy when running

Diagnosis/Remedy

Establish if mechanical or electrical problem - If mechanical, noise will change in intensity/frequency with change in motor speed; if electrical, noise will continue after motor has stopped. Carry out appropriate investigation.

FAULT - Spindle stops while motor is still running

Diagnosis/Remedy

Slipping or broken belt - Check and retighten or replace.

FAULT - Motor contactor remains closed after operation of Stop button

Diagnosis/Remedy

Contactors contacts have 'welded' together - Replace contacts.

7.5 Lubrication Chart

7.5.1 Lubricants specified

Hydraulic oil with anti-corrosion, anti-oxidation and anti-foam qualities.

Grease - Lithium bearing grease with NLG1 No.3 consistency.

7.5.2 Approved Lubricants

Hydraulic Oil	Grease
Castrol Hyspin AWS32	Castrol Spheerol AP3
BP Energol HLP32	Energrease LS3
Shell Tellus 32	Shell Alvania grease R3
Mobil DTE light 24	Mobilplex 48
Esso Nuto 44/ESSTIC H44	Esso Beacon 3
Gulf Harmony 32AW	Gulf Crown No.3
Elf Elfona 32	Elf Multi 3 grease

7.6 Tool and Toolholder Care

When selecting tools, care must be taken to ensure that they are suitable for 6000rev/min operation (dynamically balanced and tested for cracks).

The life of the tool depends upon the quality of the steel used in its manufacture and the type of wood being machined.

When resharpening, care should be taken to ensure that the blade is not unduly heated by using the correct type of grinding wheel, coolant, chip removal process, etc.

Moreover, with multi-toothed tools, the correct tooth pitch is important to ensure effective cutting.

Whether a tool is effective depends much on how it is used. Careful handling will ensure longer service life and improved product quality.

Tooling should comply with the Tooling Standard PREN 847-1: 1997.

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8 ADDITIONAL EQUIPMENT APPENDICES

This Section covers the additional equipment which can be added to the Model GA but which does not form part of the basic machine described in the previous Sections of this Operation and Maintenance Manual.

Each Section gives a brief description of the equipment features, its purpose and any setting-up procedures necessary to integrate it into the machine operation.

All preparation and safety procedures detailed in the setting-up procedures given in Section 5 must also be complied with when carrying out the procedures given in this Section.

8.1 Universal Head (Figures 8.1.3 to 8.1.7)

The universal head is normally fitted to the machine at the time of ordering.

When fitted, it can be used in four positions and for angled work in the range shown below.

Bottom head position: horizontal and between +15° and -90°.

Fence side head position: vertical and between +15° and -15°.

Near side head position: vertical and between +90° and -15°.

Top head position: horizontal and between +15° and -90°.

8.1.1 Equipment

The universal head equipment consists of the following:

Universal head unit.

Two extraction hoods one for use in the bottom head position and a second for use in the fence, near side and top head positions.

Fence assembly allowing for conversion to suit all four positions.

Bedplates to convert to a solid bed for the fence, near side and top head positions and an open bed for the bottom head position.

Two pressure rollers and a pad pressure shoe for use with the universal head.

0.5mm shim for use after the universal head.

8.1.2 Reversing Switch

A reversing switch is fitted on the machine infeed end control panel which allows the direction of the universal head to be set according to the position of the head

WARNING:

THE DIRECTION OF ROTATION MUST BE CHECKED AFTER ANY CHANGE IN POSITION OF THE UNIVERSAL HEAD.

When viewed from the front, the spindle rotates clockwise for the bottom and fence side positions, and counterclockwise for the near side and top head positions.

WARNING:

BECAUSE THE UNIVERSAL HEAD IS RUN IN BOTH CLOCKWISE AND COUNTERCLOCKWISE DIRECTIONS, A LOCKING COLLAR MUST ALWAYS BE FITTED.

8.1.3 Setting the Universal Head

Bottom Horizontal Head (Figures 8.1.3 and 8.1.7)

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

ENSURE THAT THE SPINDLE IS SET FOR CLOCKWISE ROTATION.

- 1 If necessary, remove the spindle dust cover and fit the bottom head extraction hood underneath the bedplate by locating the hood on the two studs underneath the table securing with the two 8mm nuts provided.
- 2 Fit the fence assembly components to provide a straight-through fence, fit the open bed and secure.

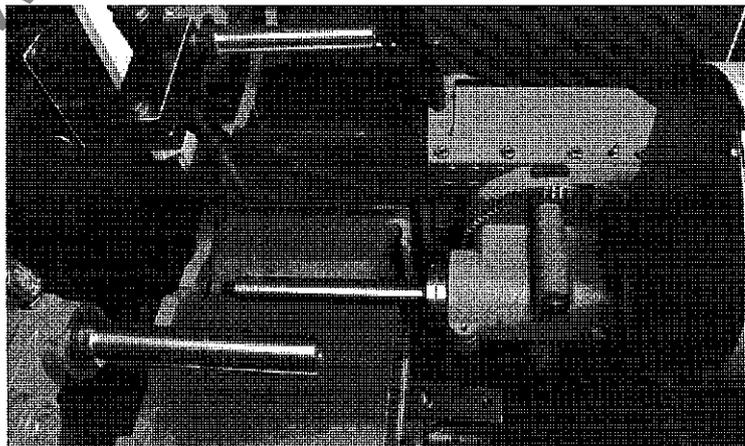


Figure 8.1.3

- 3 Fit the cutter block to the spindle (see Section 5.1.2) (before the spindle is located in its working position).
- 4 Fit bottom head bedplates and slide them apart as far as possible. Fit the 0.5mm shim (if second bottom head is being used).
- 5 Release the two locking bolts (1) (Figure 8.1.7) and cant the spindle to the horizontal position using a crank handle on shaft (2).
- 6 Lock bolts (1).
- 7 Adjust the vertical and horizontal position of the cutter block in relation to the fence side and the bedplate respectively by adjusting shafts (3) and (4) with the crank handle.
- 8 Release the bottom head bedplates and move as close as possible to the cutter block; lock the bedplates.
- 9 If necessary, remove the fence insert (at the centre of the fence) to avoid possible contact with the cutter block.
- 10 Set-up the cutter block accurately by following, generally, the procedure given in Section 5.2.
- 11 Fit the pressure rollers and/or pad pressure shoe after the cutter block to provide timber control when operating the machine. Details of setting the top roller pressure and setting the pad pressure are given in Sections 5.8 and 5.4 respectively.
- 12 Fit the side guide to suit the timber width.

Top Horizontal Head (Figures 8.1.4 and 8.1.7)

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

ENSURE THAT THE SPINDLE IS SET FOR COUNTERCLOCKWISE ROTATION.

- 1 If necessary, remove the spindle dust cover and fit the top head extraction hood above the bedplate securing with the bolts provided.
- 2 Fit the fence assembly components to provide a straight-through fence, fit the solid bed between the existing bedplate sections and secure with clamps located beneath the bedplate.
- 3 Fit the 0.5mm shim (if second bottom head is being used).
- 4 Fit the cutter block to the spindle (see Section 5.1.2).

- 5 Release the two locking bolts (1) (Figure 8.1.7) and cant the spindle to the horizontal position using a crank handle on shaft (2).

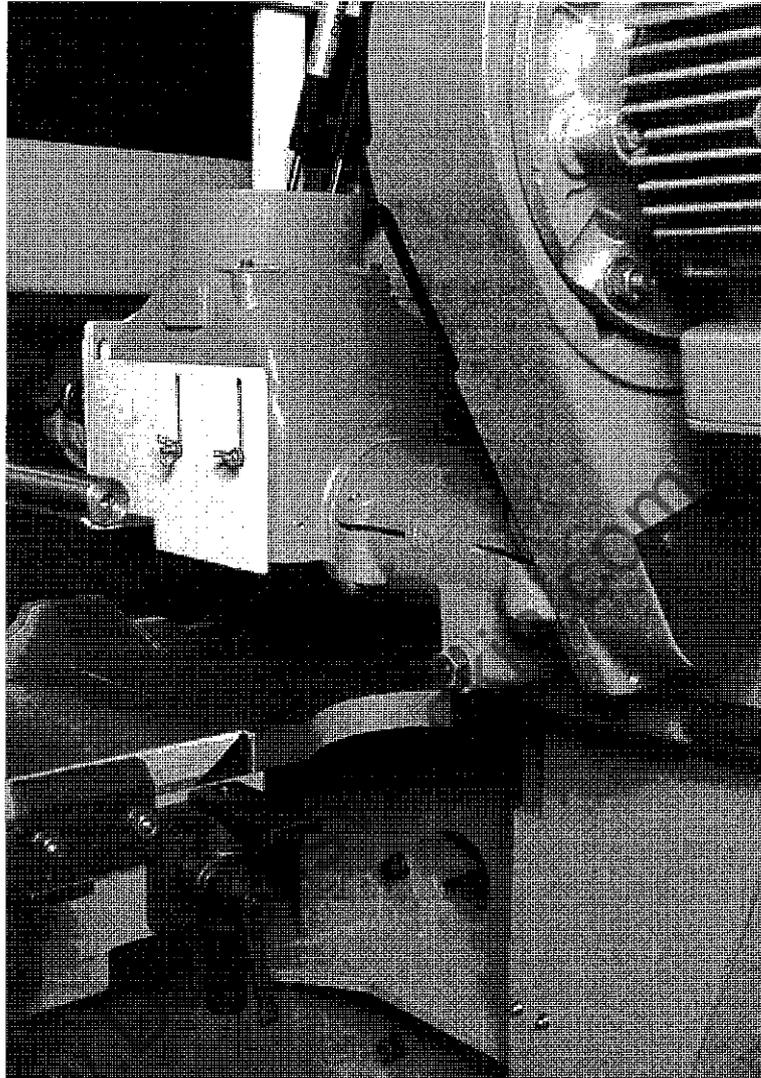


Figure 8.1.4

- 6 Lock bolts (1).
- 7 Adjust the vertical and horizontal position of the cutter block in relation to the fence side and the bedplate respectively by adjusting shafts (3) and (4) with the crank handle.
- 8 If necessary, remove the fence insert (at the centre of the fence) to avoid possible contact with the cutter block.
- 9 Set-up the cutter block accurately by following, generally, the procedure given in Section 5.5 (using only the manual procedure when making the vertical adjustment).

- 10 Fit the pressure rollers before after the cutter block to provide timber control when operating the machine. Details of setting the top roller pressure are given in Section 5.8.
- 11 Fit the side guide to suit the timber width.

Caution:

When undertaking the following procedure ensure that the conditions stated in Section 6.1.2 are followed with regard to passing a 'test piece' through the machine.

- 12 Pass a 'test piece' timber through the machine to check for dimensional accuracy.
- 13 Reset the pressure rollers and side guide if necessary.

Near Side Vertical Head (Figures 8.1.5 and 8.1.7)**WARNING:**

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

ENSURE THAT THE SPINDLE IS SET FOR CLOCKWISE ROTATION (LOOKING FROM ABOVE).

- 1 If necessary, remove the spindle dust cover and fit the near side head extraction hood securing with the bolts provided, and fit the fence assembly components to provide a straight-through fence. Fit the solid bed between the existing bedplate sections and secure with clamps located beneath the bedplate.
- 2 Release the two locking bolts (1) (Figure 8.1.7) and cant the spindle to the vertical position using a crank handle on shaft (2).
- 3 Lock bolts (1)
- 4 Fit the cutter block to the spindle (see Section 5.1.2).
- 5 If necessary, slide the solid bed underneath the fence to suit the width of timber.
- 7 Adjust the vertical and horizontal position of the cutter block in relation to the timber size by adjusting shafts (3) and (4) with the crank handle.
- 7 Set-up the cutter block accurately by following, generally, the procedure given in Section 5.4.
- 8 Fit the pressure rollers before after the cutter block to provide timber control when operating the machine. Details of setting the top roller pressure are given in Section 5.8.
- 9 Fit the side guide to suit the timber width.

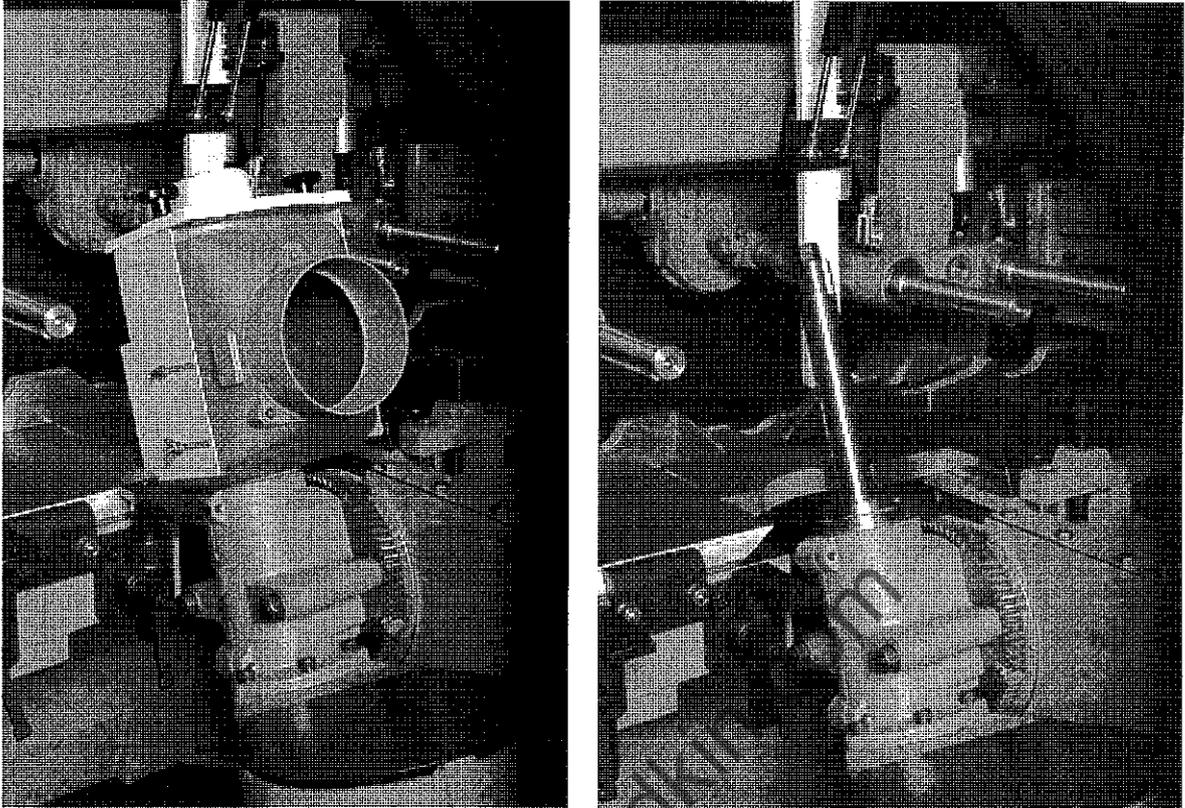


Figure 8.1.5

Caution:

When undertaking the following procedure ensure that the conditions stated in Section 6.1.2 are followed with regard to passing a 'test piece' through the machine.

- 10 Pass a 'test piece' timber through the machine to check for dimensional accuracy.
- 11 Reset the pressure rollers and side guide if necessary.

Fence Side Vertical Head (Figures 8.1.6 and 8.1.7)**WARNING:**

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

ENSURE THAT THE SPINDLE IS SET FOR COUNTERCLOCKWISE ROTATION.

- 1 If necessary, remove the spindle dust cover and fit the fence side head extraction hood securing with the bolts provided. Remove the fence section and replace with two nose piece sections (similar to those fitted at the first fence side head position (see Section 5.3)).
- 2 Fit the solid bed between the existing bedplate sections and secure with clamps located beneath the bedplate.

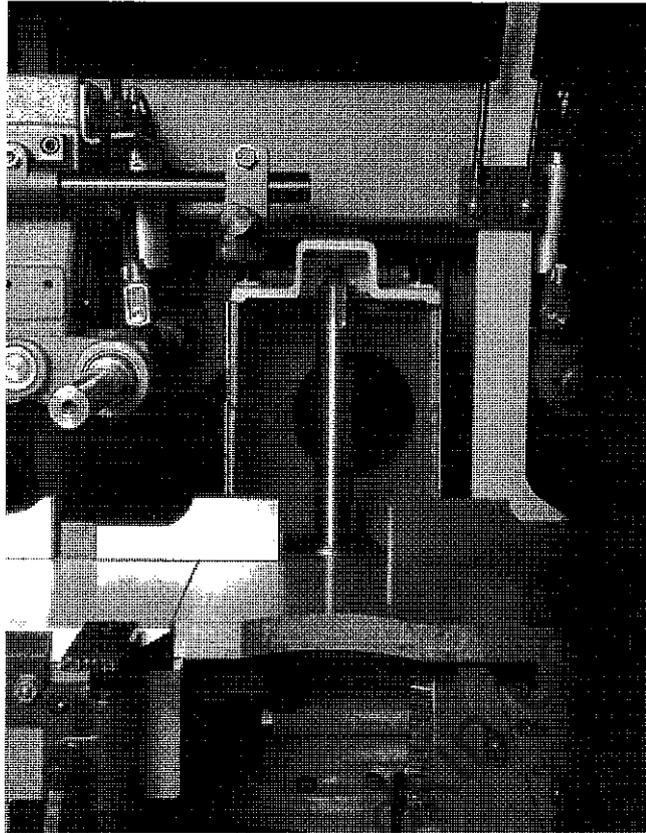


Figure 8.1.6

- 3 Release the two locking bolts (1) (Figure 8.1.7) and cant the spindle to the vertical position using a crank handle on shaft (2).
- 4 Lock bolts (1)
- 5 Fit the cutter block to the spindle (see Section 5.1.2).
- 6 Adjust the vertical and horizontal position of the cutter block in relation to the fence side by adjusting shafts (3) and (4) with the crank handle
- 7 Set-up the cutter block accurately by following, generally, the procedure given in Section 5.3.
- 8 Fit the pressure rollers before after the cutter block to provide timber control when operating the machine. Details of setting the top roller pressure are given in Section 5.8.
- 9 Fit the side guide to suit the timber width.

Caution:

When undertaking the following procedure ensure that the conditions stated in Section 6.1.2 are followed with regard to passing a 'test piece' through the machine.

- 10 Pass a 'test piece' timber through the machine to check for dimensional accuracy.
- 11 Reset the pressure rollers and side guide if necessary.

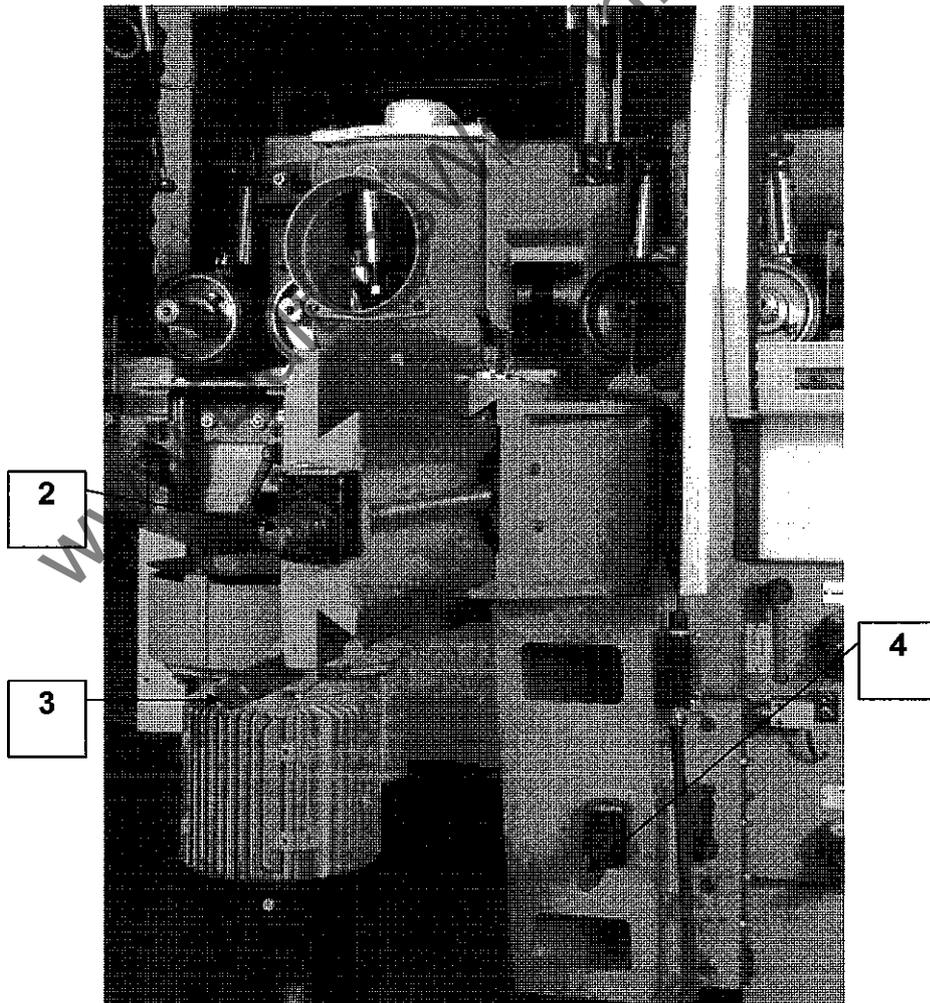
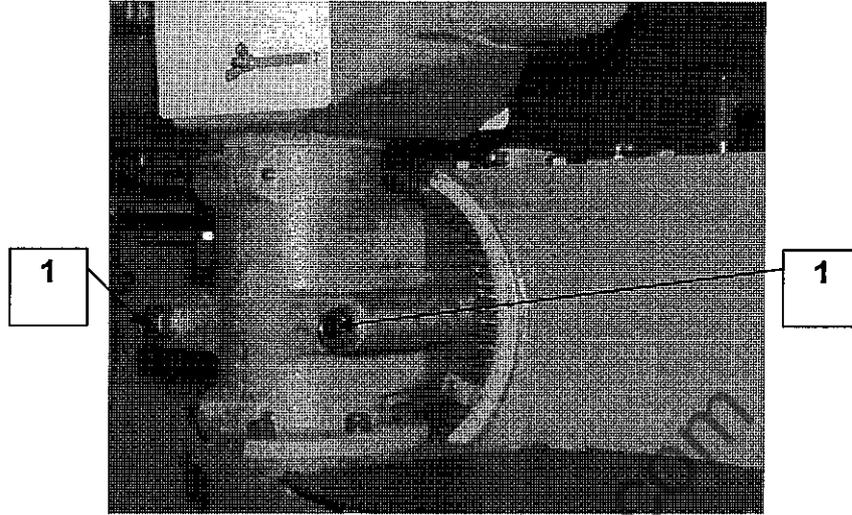


Figure 8.1.7

8.2 Splitting Bedplate (Figure 8.2)

This enables timber passing through the machine to be split into predetermined widths as set by the positions of the blades on the rotating spindle.

The splitting bedplate consists of a Permali splitting bedplate, two sections of splitting bedplate and a Permali pad pressure plate.

8.2.1 Fitting

- 1 Slacken nuts and remove clamps (1); remove bedplates.
- 2 Remove the pad pressure plate from the first top head (refer to Section 5.6).
- 3 Fit the rotating saw and spacers (see Section 5.1.2); set the first blade to the required distance from the fence to give the width of timber. Set the other spacers as necessary.

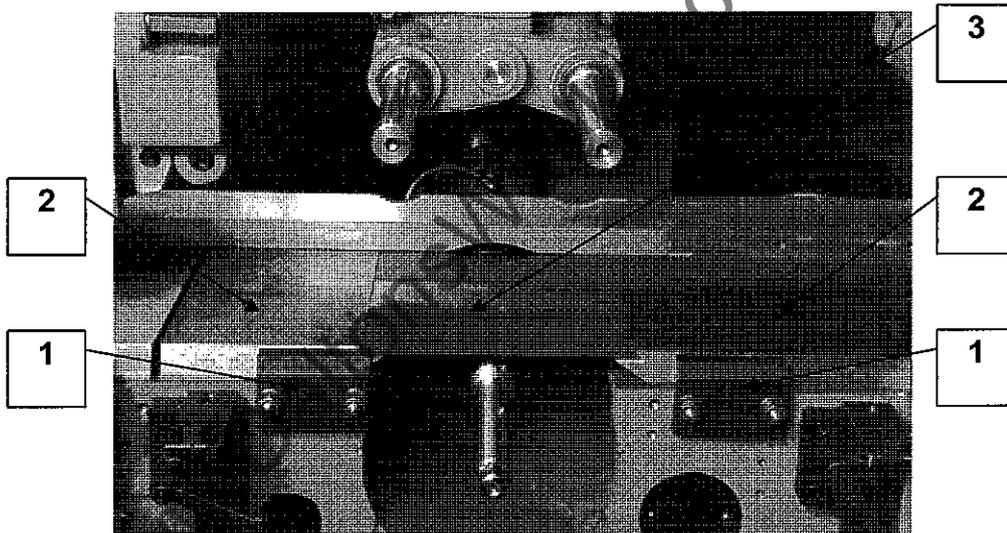


Figure 8.2

- 4 Fit the Permali pad pressure plate to first top head.
- 5 Fit the two splitting bedplates (2) and hold in position with the clamps (1) with the nuts only finger tight.
- 6 Fit the Permali splitting bedplate (3) between the two splitting bedplates, sliding the rear edge beneath the fence of the machine.
- 7 Centralise all three bedplates ensuring that dovetails are correctly located, and tighten nuts.
- 8 Ensure that saw blades are positioned correctly to align with slots in the Permali splitting bedplate (if already pre-cut).

If a new Permali bedplate is being used, position saws beneath the bedplate and cut slots in the bedplate with the saws.

- 9 Adjust the height of the saw blades (see Section 5.7) to provide the required cut to suit the timber thickness.
- 10 The splitting bedplate is now set-up.

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8.3 Infeed Nip Driven Roller System (Figure 8.3)

This equipment, which comprises pneumatically controlled top and bottom feed rolls (1 and 2), improves the feeding of wet timber and enables straightening of timber to undertaken.

The machine can be operated with this equipment either active or inactive; selection is via a two-position switch located at the infeed end of the machine. Additional to the switch is an air pressure regulator and air gauge.

When the infeed nip roller system is activated, air pressure causes the top and bottom feed rolls lower/raise respectively to grip the timber firmly.

A balance spring adjustment (3) is used to reduce unnecessary pressure on the timber when applying straightening of the timber.

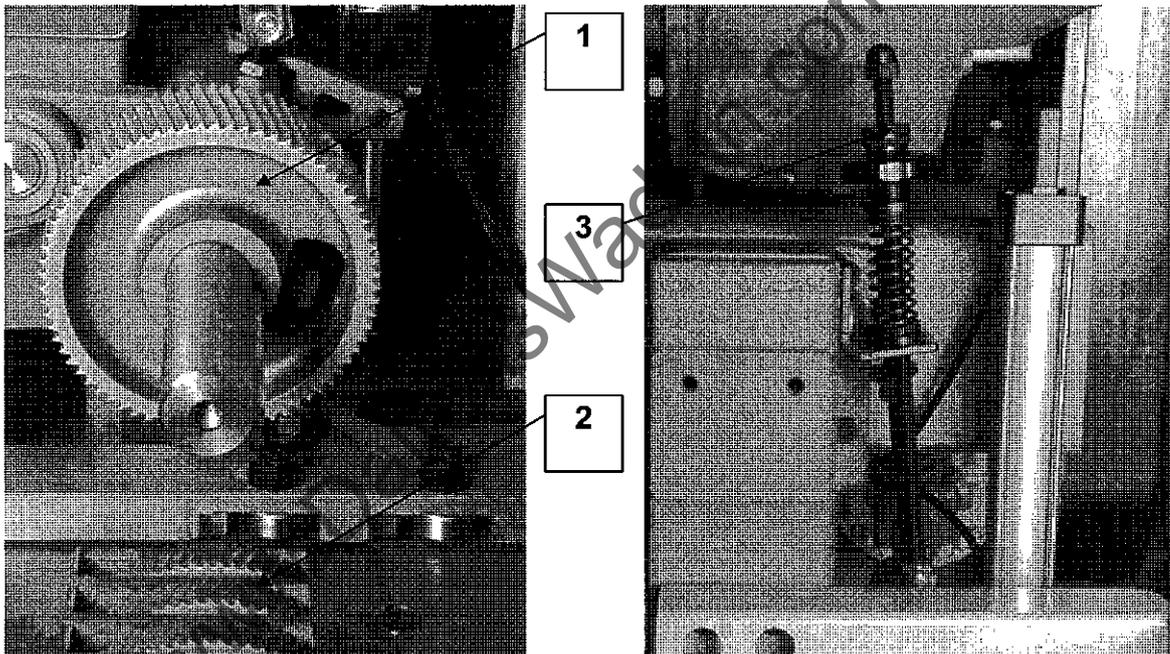


Figure 8.3

8.4 Push Feed System (Figure 8.4)

This equipment is similar in function to the infeed nip driven roller system (see Section 8.3), and provides, additionally, positive feeding of the timber. Unlike the infeed nip driven roller system this has no timber straightening feature.

It has pneumatically controlled top and bottom feed rolls (1 and 2) and the equipment can be active or inactive depending upon requirements. Selection is via a two-position switch located at the infeed end of the machine. Additional to the switch is an air pressure regulator and air gauge.

Side pressure rollers (3) are fitted to prevent any lateral movement of the timber as it is fed into the machine. The first roller is set to contact the timber, the second roller applies greater pressure to the timber via a compressed spring (4).

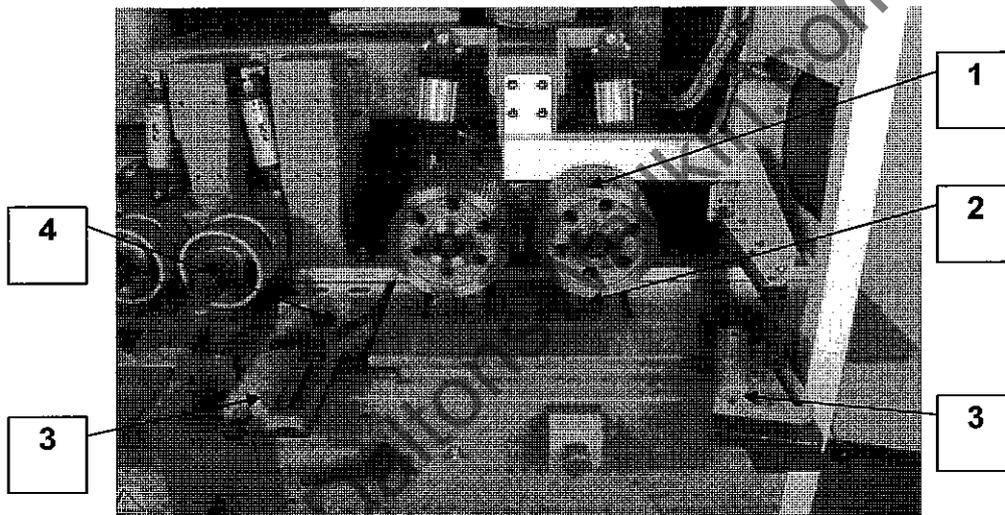


Figure 8.4

8.5 Grooved Bed (Figure 8.5)

Typically used in furniture making, processing short lengths of twisted timber, this equipment comprises a cutter block (used in the first bottom head position) and a grooved bed which extends to the second bottom head position.

Two spur cutters located an exact distance from the fence side edge of the bed, cut a groove in the underside of timber. This (master) groove locates in the groove nearest the fence side of the grooved bedplate to provide exact location of the timber as it feeds through the machine.

Note:

In this mode of operation the fence through the machine has no timber location function. When setting-up the fence side head (see Section 5.3) with a grooved bed fitted, locate the cutting edge of the cutter block approximately 0.2mm in front of the fence.

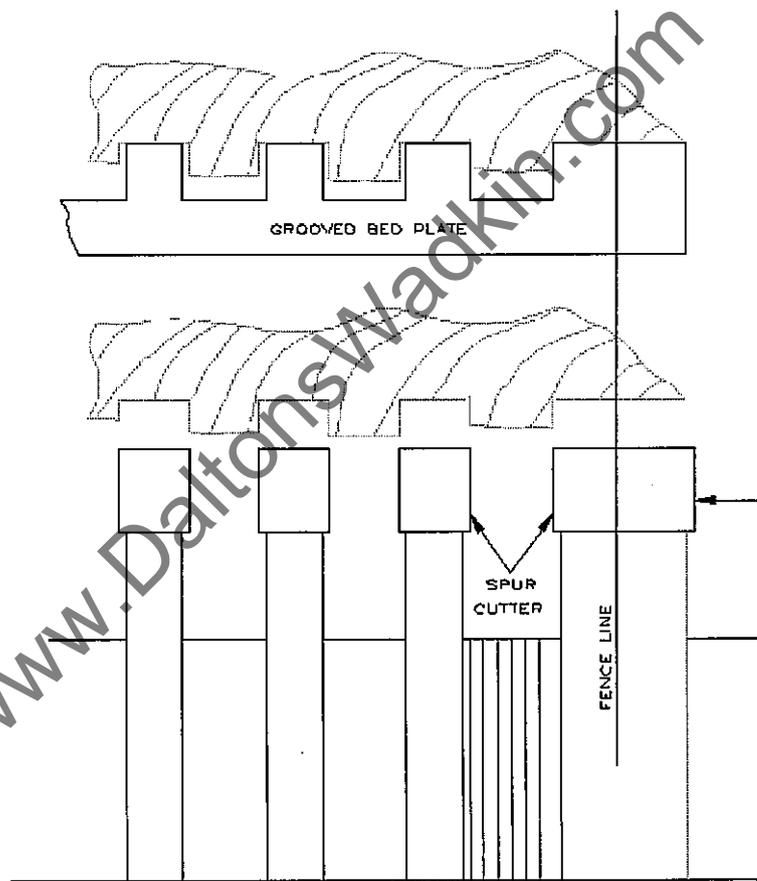


Figure 8.5

8.5.1 Setting-up the Cutter Block

- 1 Fit the cutter block (see Section 5.1.2) and set the edge of the first spur cutter exactly in line with the inside edge of the master groove of the grooved bed (this acts as the machine fence).
- 2 Shim the cutter block and fit the second spur cutter 12mm from the first cutter.

- 3 Fit the second cutter block.
- 4 Set the vertical position of the cutter block (see Section 5.3) taking into account that the first spur cutter must align with the inside edge of the master groove and that the planing cutter tips are level with the top of the grooved bed.

Align the tips of the grooving cutters with the top surface of the grooved bed.

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8.6 Unit G (Figure 8.6)

The unit G is a heavy duty splitting unit. It is fitted where the splitting depth, or number of saws, or sawing speed exceeds the capabilities of a standard second bottom head.

The unit, which is normally fitted to the machine at the time of ordering, can be provided with a motor in the range 30kW to 75kW depending upon workload requirements.

The unit G consists of a Permali bedplate insert (through which saw cuts are made to provide support for the saw blades), a splinter catching device at the infeed side of the unit, a Permali pad pressure shoe and a plate carrying ten riving knives.

The riving knives are set in-line with the saw blades so relieving stress during cutting by preventing the timber from 'gripping' the saw blades.

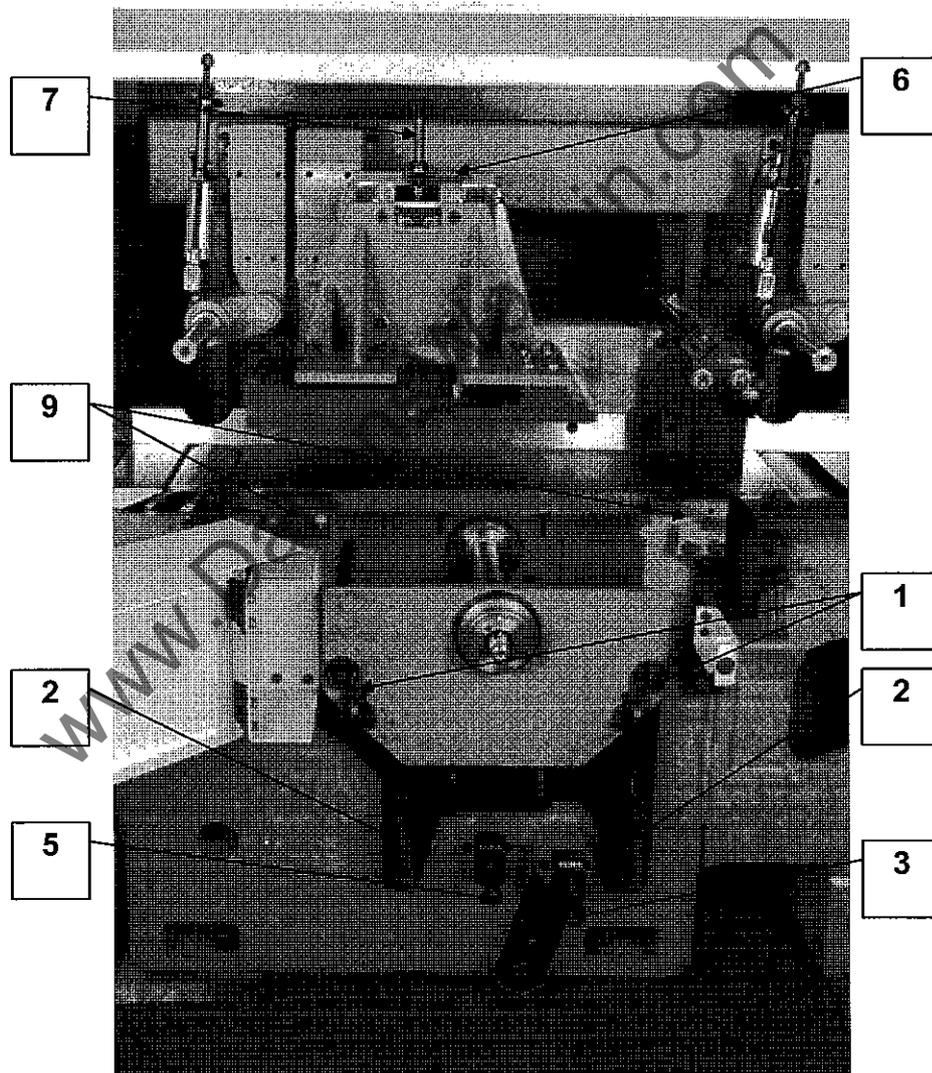


Figure 8.6

8.6.1 Setting the Unit G

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

- 1 On the outboard bearing faceplate loosen nuts (1) and release the C washers.
- 2 Grip the faceplate at the left and right hand positions and remove the outboard bearing.
- 3 Release locking handles (2) and using a crank handle adjust shaft (3) to set the spindle to its lowest position (counterclockwise rotation).
- 4 With the required number of saws/spacers on the saw sleeve, fit the sleeve on to the spindle (see Section 5.1.2). Ensure that the spindle rotates freely.
- 5 Refit the outboard bearing and secure with the C washers and nuts (1).
- 6 Lock handles (2).
- 7 Release spindle barrel clamp (4) and using the crank handle adjust shaft (5) to position the spindle to the fence to suit the size of the timber.

Clockwise rotation of the crank handle moves the spindle away from the fence (giving a positive count on the digital indicator), counterclockwise rotation moves it towards the fence.

- 8 Lock clamp (4).
- 9 Release the pad pressure locking handle (6) and using a small crank handle (supplied) adjust shaft (7) to position the pad pressure slightly above that of the finished timber thickness (final setting the pad pressure is carried out when passing a 'test piece' of timber through the machine).
- 10 Release in turn each riving knife locking screw (8) and align each knife to suit the spacing of the saws on the saw sleeve. Ensure that all screws are retightened after adjustment of the knives.

Caution:

When undertaking any of the following procedures involving rotating spindles and passing a 'test piece' through the machine, ensure that the conditions stated in Section 6.1.2 are closely followed.

WARNING:

ALWAYS ELECTRICALLY ISOLATE THE MACHINE BEFORE EACH AND EVERY ADJUSTMENT DURING A 'TEST PIECE' PROCEDURE.

- 11 Start the saw spindle.

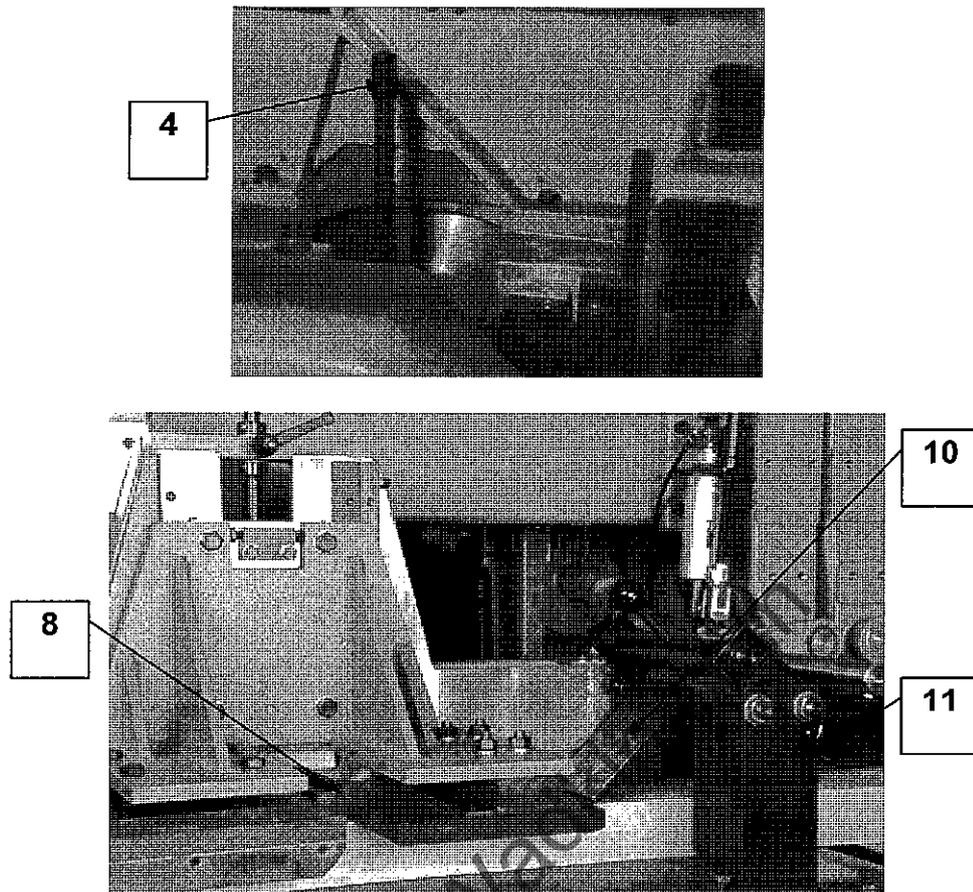


Figure 8.6

- 12 Release locking handles (2) and using the crank handle slowly adjust shaft (3) to wind the saw blades through the Permalit bedplate until the blades project above the bedplate the thickness of the finished timber **+3mm**. (At this setting the saw blades should cut 3mm into the pad pressure).
- 13 Stop the saw spindle.
- 14 Fit the side guide and secure in position with clamps (9) to slightly wider than that of the finished timber width.
- 15 Ensure that the fingers of the splinter catching device (10) are 'down'. If necessary, release locking handle (11) to lower the fingers.
- 16 Start the saw spindle and pass a 'test piece' through the machine stopping when the 'test piece' reaches the pad pressure.
- 17 Release the locking handle (6) and using the small crank handle adjust shaft (7) to position the pad pressure until it touches the timber; lock handle (6).
- 18 Continue passing the 'test piece' through the machine stopping when it is just in front of the riving knives.
- 19 Check the alignment of the riving knives with the saw cuts.

- 20 Continue passing the 'test piece' stopping when it is fully past the riving knives.
- 21 Recheck that the knives are properly aligned and parallel to each other; ensure that all locking screws (8) are tight.
- 22 Continue passing the 'test piece' through the machine to the outfeed bed.
- 23 Reset the side guide so that it lightly touches the timber; relock with clamps (9).
- 24 Check the 'test piece' for quality and sawn sizes.

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8.7 Intermediate Feed Roll (Figure 8.7)

The intermediate feed roll is fitted to facilitate the feeding of short lengths of timber through the machine. The unit replaces the second shaft-mounted feed roll at the fence side head position.

The unit consists of a mounting bracket (1), pneumatic cylinder (2) and mounting plate for two shaft-mounted feed rolls.

The intermediate feed roll is set up by the beam control setting procedure.

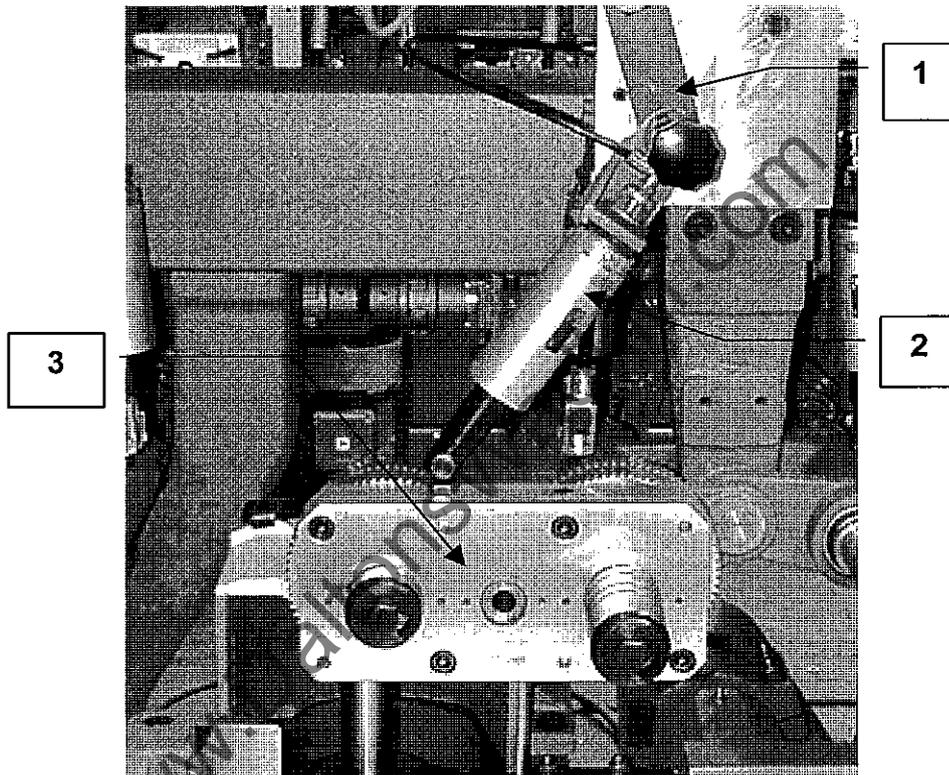


Figure 8.7

8.8 XE E-Unit (Figures 8.8.1 to 8.8.5)

The XE E-unit is a combined bedplate housing a top head, a second bottom head and associated top head and bottom head jointers.

Jointing is a dressing technique which is applied to a rotating cutter block in order to true all cutter blades to a common cutting circle. By applying this technique, the feed speed of the machine by a factor equal to the number of blades on the cutter block.

8.8.1 Setting Top Head (Figure 8.8.1)

Vertical adjustment of the top head is achieved by powered and manual means.

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

- 1 Remove the guard to access the outboard bearing and ensure the outfeed table is clear.
- 2 Place a datum block of known height on the bed beneath the top head.
- 3 Reset the emergency stop.
- 4 Depressurise the outboard bearing by turning the pressure release screw counterclockwise $\frac{1}{4}$ turn using a 3mm hexagon key.
- 5 Lower lever (3) and hold until automatic adjustment engages. (If engagement does not occur, rotate adjusting screw (4) to right or left until engagement is achieved).
- 6 Press the raise/lower buttons on the machine control panel/outfeed control unit to position the cutter block close to the datum block.
- 7 Raise lever (3) to disengage the automatic adjustment.

Note:

Carry out Steps 8 to 10 to achieve an accurate setting manually.

- 8 Operate the emergency stop.
- 9 Rotate adjusting screw (4), using the winding handle provided, to lower (clockwise) or raise (counterclockwise) the cutter block until the cutters just touch the datum block.
- 10 Set the digital indicator (if fitted) to indicate the height of the datum block.
- 11 To laterally adjust the cutter block, unlock the spindle barrel lock (2).

- 12 Rotate adjusting screw (1), using the winding handle provided, to advance (clockwise) or retract (counterclockwise) the cutter block.
- 13 Lock the spindle barrel lock (2).

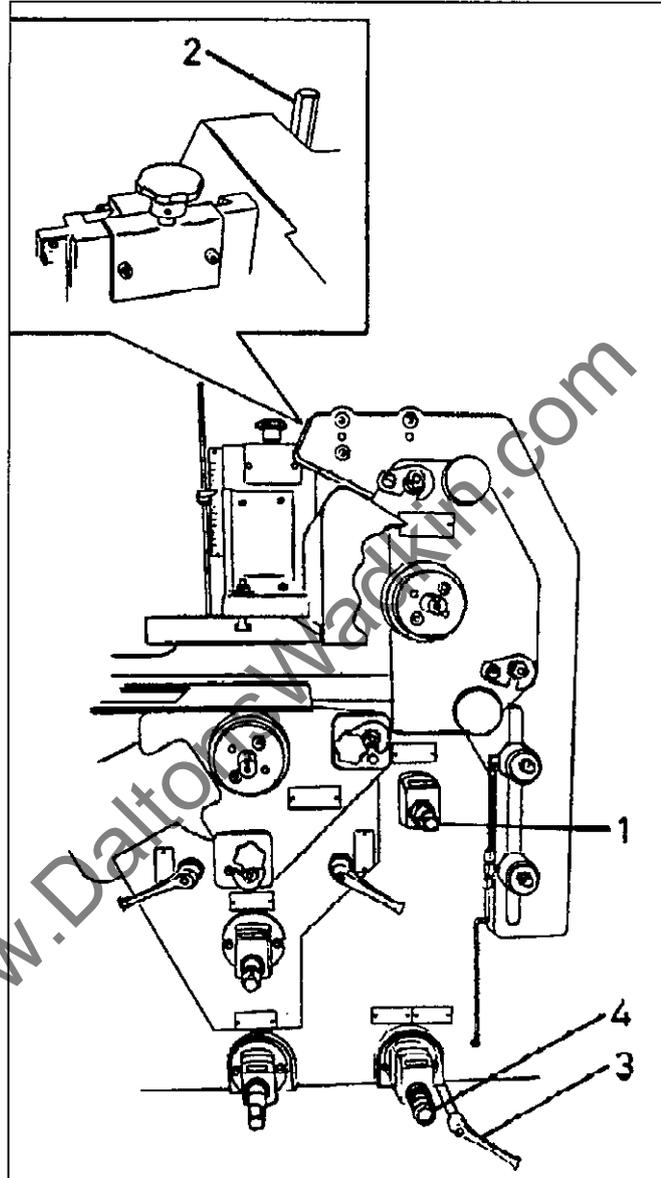


Figure 8.8.1

- 14 Tighten the pressure release screw and pressurise the bearing to 300bar by applying hydraulic fluid to the pressure nipple located in the recess on the front of the bearing.
- 15 Refit the guard.

8.8.2 Top Head Pad Pressure and Chipbreaker (Figure 8.8.2)

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

- 1 Ensure that the outfeed table is clear and the top head has been set-up.
- 2 Place a straight edge under the pad pressure and adjust the height of the pad pressure by turning adjuster (1) until the pad pressure is **just touching** the straight edge.
- 3 Slacken the pad pressure locking nuts (2) and position the pad pressure so that the nose is approximately 5mm from the cutter block.
- 4 Position the pad pressure laterally over the table to suit the product width and tighten locking nuts (2).

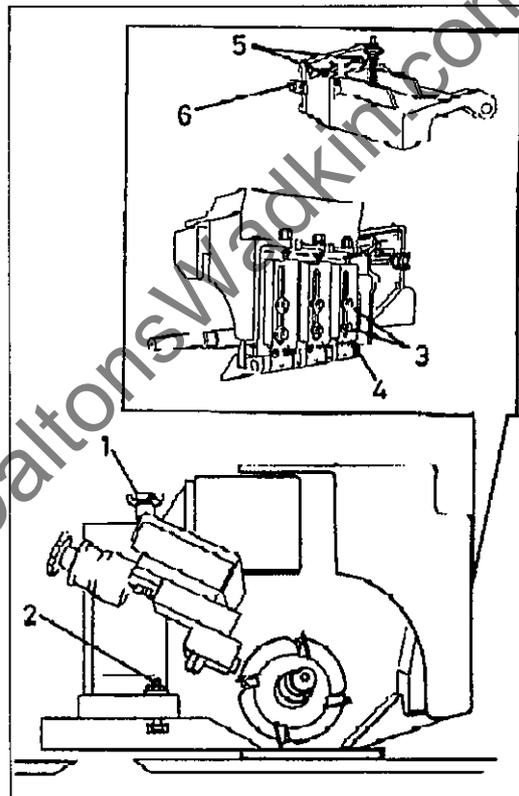


Figure 8.8.2

The chipbreaker comprises three individual units; each is set-up in the same way. Set each unit as follows.

- 5 Slacken the two locking nuts (3).
- 6 Manually raise/lower the unit until the nose **just touches** the straight edge located beneath the pad pressure.

- 7 Tighten locking nuts (3).
- 8 If necessary, use stop screws (4) to achieve accurate alignment of all three chipbreaker noses.
- 9 To adjust the chipbreaker laterally, slacken the two locking nuts (5) and position the nose using adjuster (6) until it is 10 to 15mm from the cutter block.
- 10 Tighten locking nuts (5).

8.8.3 Setting Second Bottom Head (Figure 8.8.3)

WARNING:

ENSURE THAT THE MACHINE IS ELECTRICALLY ISOLATED (EMERGENCY STOP ACTIVATED) BEFORE PROCEEDING.

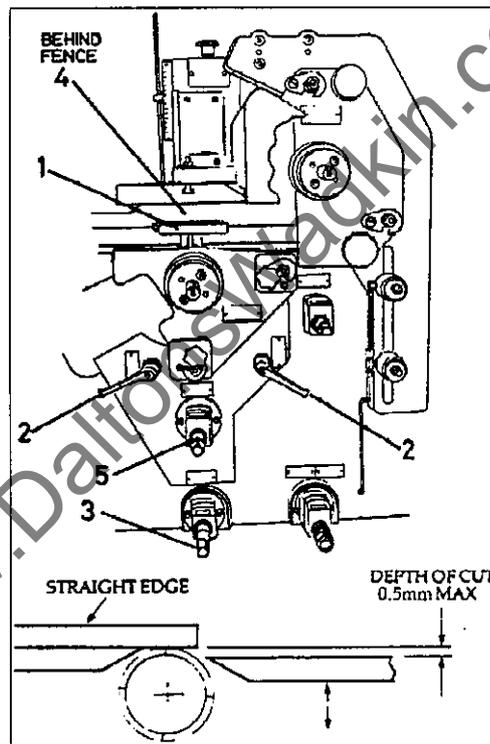


Figure 8.8.3

- 1 Remove the guard.
- 2 Ensure that the outfeed table is clear.
- 3 Place a straight edge (1) on the outfeed table projecting over the cutter block. The cutter blades should **just touch** the straight edge.

If necessary, reset the cutter block height as follows.

- 4 Release the two locking handles (2).
- 5 Rotate adjusting screw (3), using the winding handle provided, to raise (clockwise) or lower (counterclockwise) the cutter block until the blades **just touch** the straight edge.
- 6 Tighten locking handles (2).
- 7 Place the straight edge against the outfeed fence and check that the fence and edge reference knives are aligned (both **just touching** the straight edge).

Laterally adjust the cutter block as follows.
- 8 Unlock the spindle barrel lock (4) at the rear of the head.
- 9 Depressurise the outboard bearing by turning the pressure release screw counterclockwise $\frac{1}{4}$ turn using a 3mm hexagon key.
- 10 Rotate adjusting screw (5), using the winding handle provided to position the cutter block.
- 11 Lock the spindle barrel lock (4).
- 12 Tighten the pressure release screw and pressurise the bearing to 300bar by applying hydraulic fluid to the pressure nipple located in the recess on the front of the bearing.
- 13 Refit the guard.

8.8.4 Top Head Jointer (Figure 8.8.4)

This is a built-in combined straight knife and profile jointer forming part of the assembly which carries the top head chipbreaker and outboard bearing attachment.

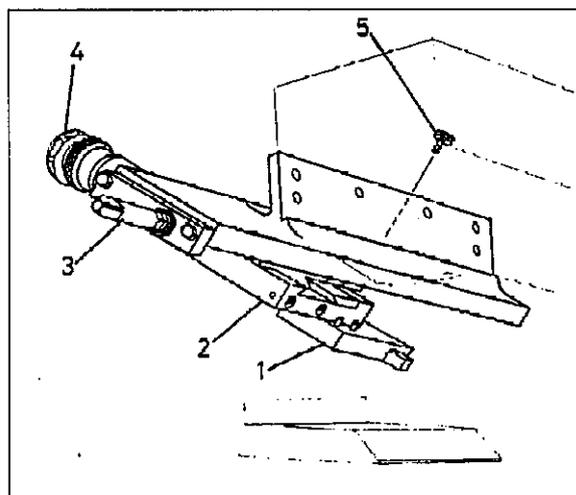


Figure 8.8.4

The method of traverse and feed are similar to the second bottom head (see Section 8.8.5). When straight jointing, the axial traverse is effected by a removable handle connected to the traverse screw. A locking screw is provided to lock the slide traverse while profile jointing.

- 1 Fit the pre-set profile or straight jointer stone cartridge (1) to the head clamp block (2) and secure.
- 2 Move the jointer into position relative to the cutter block using the traverse (3) and/or the index wheel (4).

Note:

When straight jointing, fit a winding handle to screw (3); when profile jointing lock the screw in position with screw (5), and feed the stone to the cutter block using index wheel (4).

- 3 Proceed as described in Section 8.8.6.
- 4 On completion, retract the jointing stone and park away from the cutter block - when straight jointing, locate at the fence side or near side position, when profile jointing, retract as far as possible from the cutter block using index wheel (4). Relocate head covers.

8.8.5 Second Bottom Head Jointer (Figure 8.8.5)

This is a built-in combined straight knife and profile jointer with index wheel and traverse screw similar to the top head jointer. The method of traverse and feed are similar to the top head.

On the second bottom head the outfeed bedplate can be retracted, if required, to give increased access to the jointer by slackening two screws on the bedplate.

When straight jointing, the axial traverse is effected by a removable handle connected to the traverse screw.

- 1 Fit the pre-set profile or straight jointer stone cartridge (1) to the head clamp block (2) and secure.
- 2 Move the jointer into position relative to the cutter block using the traverse (3) and/or the index wheel (4).

Note:

When straight jointing, fit a winding handle to screw (3); when profile jointing lock the screw in position with screw (5), and feed the stone to the cutter block using index wheel (4).

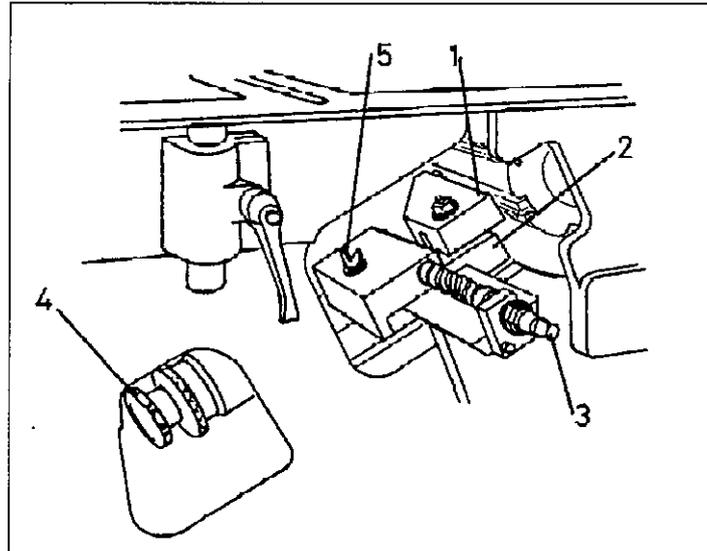


Figure 8.8.4

- 3 Proceed as described in Section 8.8.6.
- 4 On completion, retract the jointing stone and park away from the cutter block - when straight jointing, locate at the fence side or near side position, when profile jointing, retract as far as possible from the cutter block using index wheel (4). Relocate head covers.

8.8.6 **Practice**

The technique of jointing is achieved by grinding all cutting edges of the blades to within 0.01mm of the cutting circle.

When mounted in the machine, an abrasive stone is traversed across the width of the cutter block (straight jointing) while it rotates at its operating speed (normally 4500 rev/min or 6000 rev/min).

This action effectively puts a flat on the edges of the blades. The width of the flat (joint) produced increases for every successive jointing, but should exceed 0.5mm.

There are two types of jointing, depending upon the cutter block blades to be jointed. 'Straight' (across the blade) is used for planing applications, while 'profile' (towards the blade) is used for profiled moulding.

Straight Jointing

- 1 Set the jointing stone to just touch a blade, then traverse the stone across the stationary cutter block and ensure that the stone touches all of the blades in turn. Park the stone 5-10mm away from the cutter block.

- 2 Set the spindle in operation; traverse the cutter block once. Set a further incremental cut (using the relevant index wheel) and traverse again.
- 3 Switch off the spindle, bringing it to rest as smoothly as possible, using braking if available.
- 4 Check the jointing using a light, if necessary, to aid inspection. Ensure that even jointing has been applied to all blades.
- 5 Repeat Steps 2 to 4 if necessary to achieve an even joint heel . Park the stone away from the cutter block.

Profile Jointing (Stone Production using Soft Stone)

- 1 Mark out on the jointing stone the profile to be jointed, then hand grind, hacksaw or file to the required shape.
- 2 Mount the profiled stone in a holder located on the machine body and secure with locking screws.
- 3 Position the stone relative to the cutter block using the jointer cross traverse and radial feed screws (see Figure 8.8.4). Lock the jointer slide in the correct axial position, ensuring that stone profile corresponds to the blades.
- 4 Shape the stone to the blades by turning the spindle slowly by hand – termed 'chipping'.
- 5 Carry out Steps 2 to 5 as detailed in 'Straight Jointing' except that instead of traversing the blades, the stone is progressively fed into the face of the blades ('plunged') until the correct heel or land is achieved.
- 6 On completion disengage the index wheel to allow the stone to be retracted quickly after a joint has been made. Park the stone away from the cutter block in order to prevent wood chippings eroding the stone.

8.9 First Top Head Pneumatic Pad Pressure and Chipbreaker (Figure 8.9.1)

The first top head pneumatic pad pressure and chipbreaker is set-up as described in Section 5.6.

Single acting cylinder (1) functions in the capacity of the compression spring.

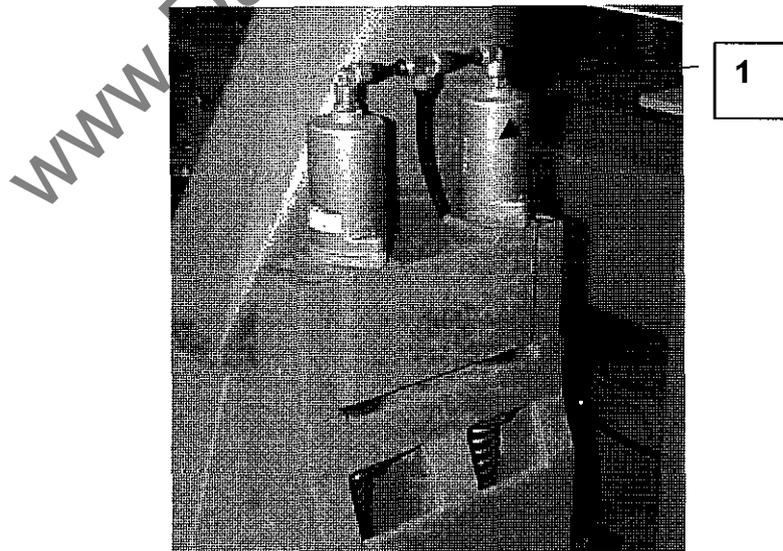
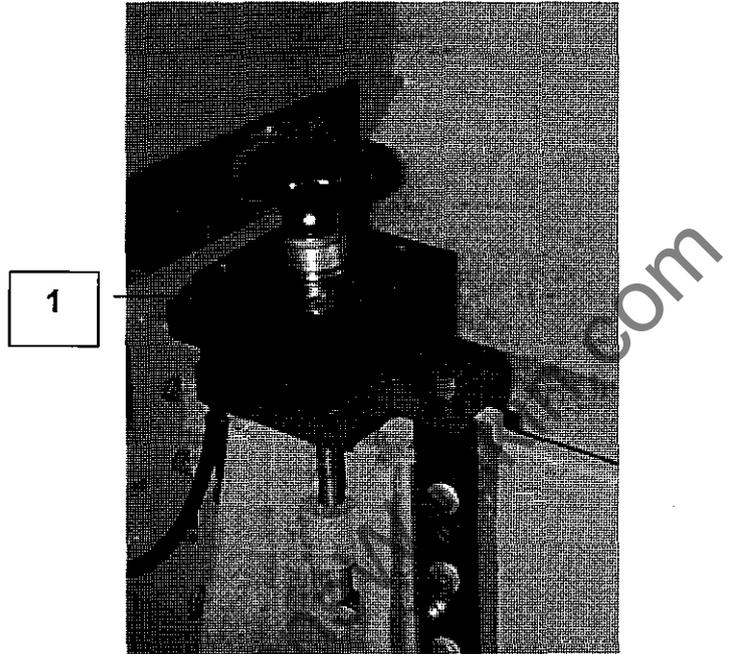


Figure 8.9

GLOSSARY

Below is a Glossary of terms used in this manual specific to the equipment being described. Other documents which should be referred to are listed in Section 1.1.6.

Bed	Machine level on which timber travels during machining.
Blips	Marks on planed timber indicating fault in processing.
Chipbreaker	Tool which provides pressure to hold the timber on to the machine bed; it also prevents the breaking of wood chips.
Cutter block	Cutting tool(s) mounted on a spindle of the machine.
Datum block	Block of timber of known height/width used as tool to datum machine settings.
dB	Decibel of noise (measurement of noise level).
Drive belt	Flat, 'V' or toothed belt which drives the spindles from the drive shaft.
Feed rolls	Rotating rolls which move the timber through the machine while exerting necessary pressure to enable proper processing.
Feed speed	Speed at which timber is passed through the machine.
Fence side head	Planing process on the right-hand side of the timber (when viewed from the infeed end of the machine).
First bottom head	First process on the machine; planes the bottom face of the timber.
First top head	Planing process on the top of the timber.
Infeed	End of machine where timber is introduced.

Near side head	Planing process on the left-hand side of the timber (when viewed from the infeed end of the machine).
Outfeed	End of machine where finished product is produced.
Spindle	Rotating shaft carrying the cutter block.
Spindle backlash	Natural movement of rotating cutter block towards/away from workpiece depending upon direction of rotation.
Test piece	Timber on which setting-up processes are conducted.

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